Appendix B

Geotechnical Engineering Report

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Appendix B

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

HARRIS COUNTY, TEXAS

July 17, 2024
AAI File: 18-2876-006

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
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 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

DANIEL M. CIMINO, MSCE, P.E.
ASST. BRANCH MANAGER/SR. PROJECT ENGINEER

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PRINCIPAL GEOTECHNICAL ENGINEER

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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 Remedial Design (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). However, in the revised BMP design, the sheet pile tips stay within the Beaumont Clays and do not penetrate into the Beaumont Sands.

The analyses for the BMP are included in the BMP Structural Design Report which 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 RD.

GEOTECHNICAL ENGINEERING REPORT
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 Remedial Design (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 dated May 20,2024 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 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 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," which according to the criterion given in Table 20.3-1 of the IBC, and ASCE 7-10 includes 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 10.

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 9.

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 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. Borings are shown on Figure 10.

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 RD package and detailed in the Northern Impoundment BMP Wall-Type Analysis (Appendix I to the 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 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.

It should be noted that no impact hammers are anticipated to install the BMP; the press-in method of sheetpile installation or resonance driver will be utilized.

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).

Since the current 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 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 RD includes a design which terminates the BMP within the Beaumont Clays and does not enter the Beaumont Sands.

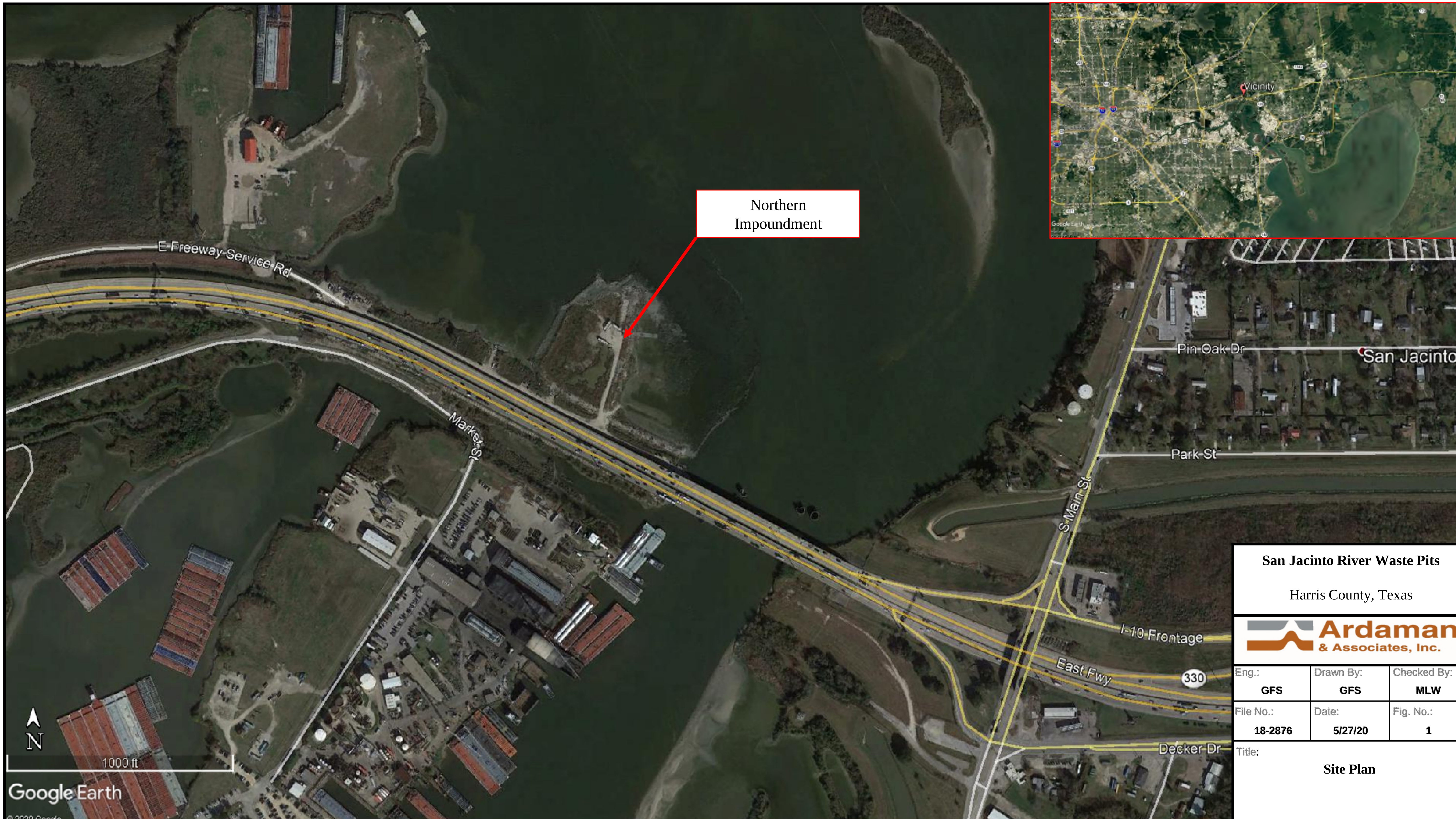
- **Soil Remolding:** If the BMP were driven into the Beaumont Sand, the piles would shear the soils located at the soil-pile interface, and to a lesser extent, soils located at some distance away from the pile (typically assumed as 1 to 2 pile diameters). When clay soils are sheared, or remolded, they 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 May 20, 2024, and is included as Attachment E. Safe excavation depth limits were established across the Northern Impoundment to ensure the charged sand layers beneath the 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



San Jacinto River Waste Pits

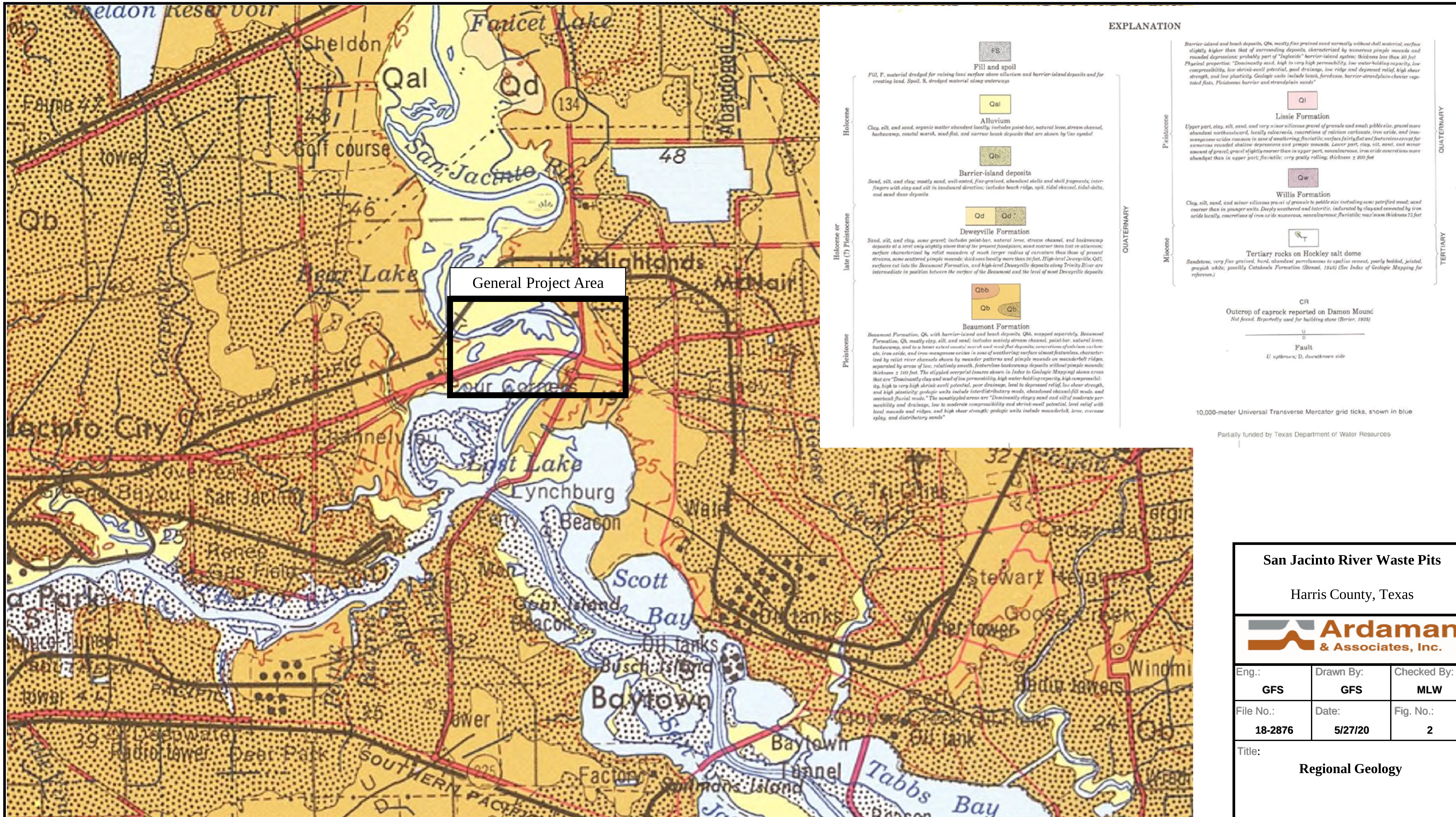
Harris County, Texas

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



San Jacinto River Waste Pits

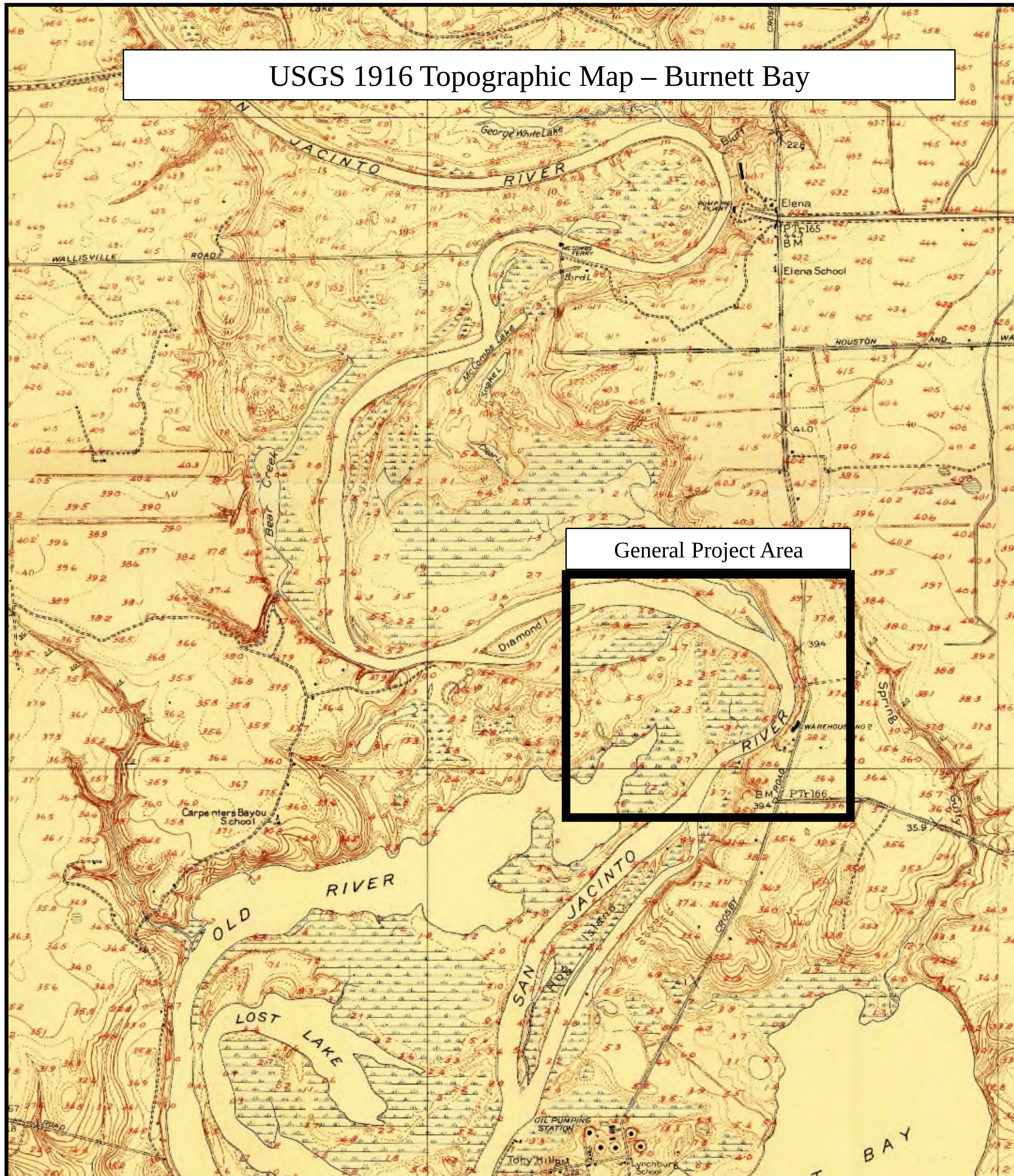
Harris County, Texas

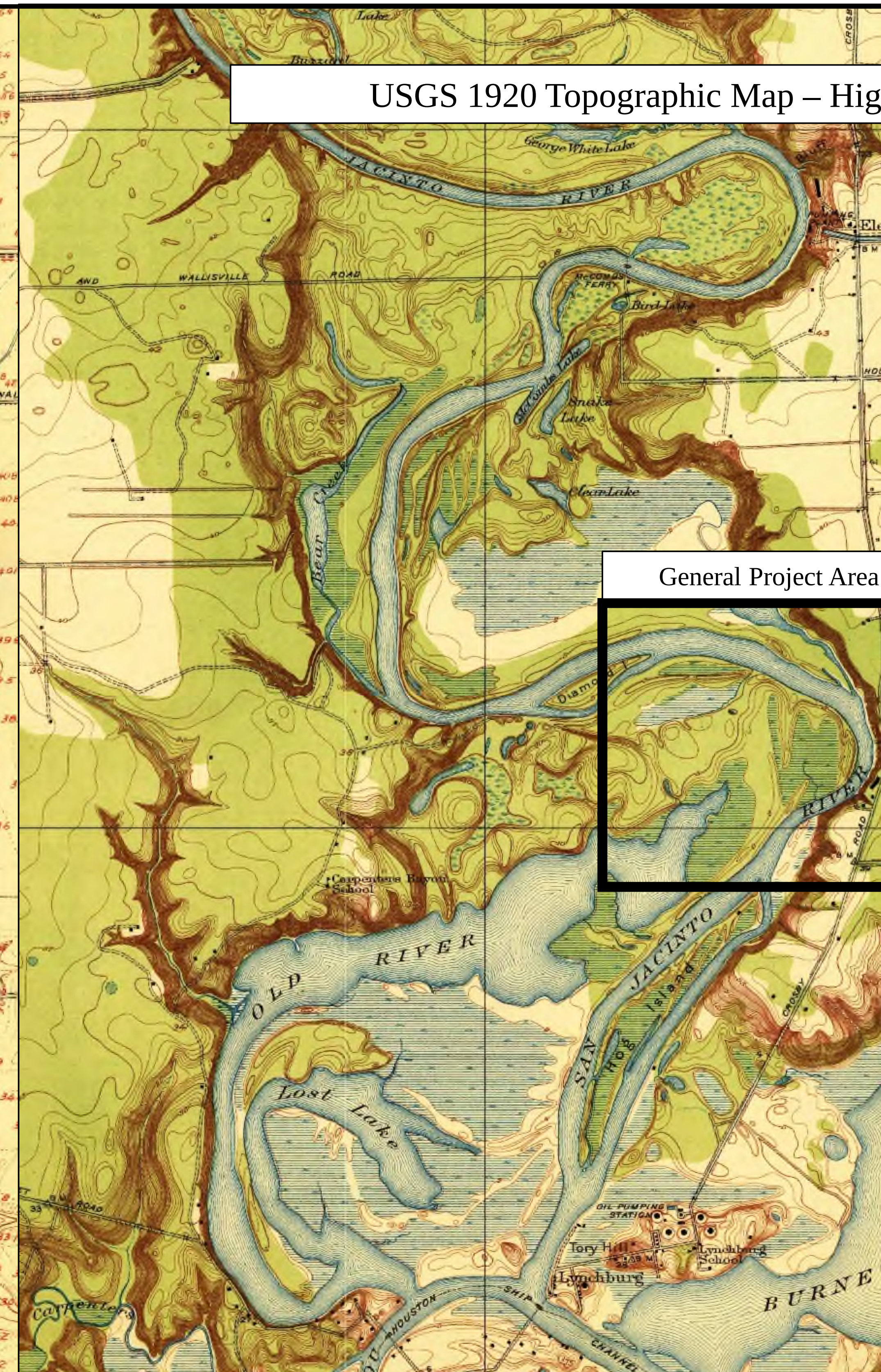
Ardaman & Associates, Inc.

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

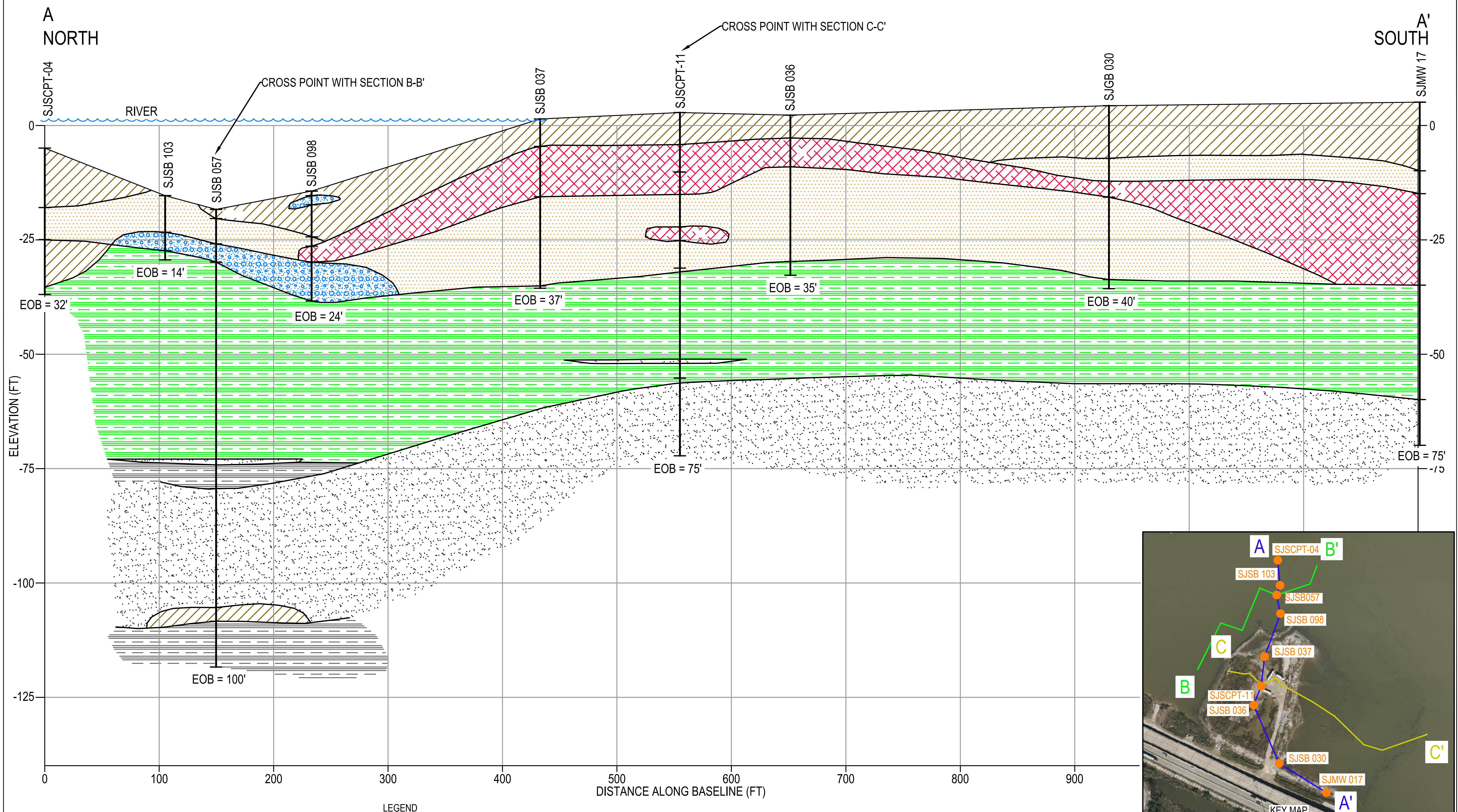
Harris County, Texas

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



LEGEND

SJSB — WELL ID — GROUND — WELL	SILTY CLAY TO CLAYEY SILT, SOFT (CL-ML)	CLAYEY SILTY SAND (SC-SM)
	SILTY SAND WITH CLAY (SM)	GRAVELLY SAND (SW)
	BEAUMONT CLAY (CH)	GRAY CLAY (CH)
EOB = END OF BORING (DEPTH BELOW SURFACE)	SANDY TO SILTY CLAY (CL)	

HORIZONTAL 1" = 80 ft: 0, 40, 80Ft

VERTICAL 1" = 20 ft: 0, 10, 20Ft

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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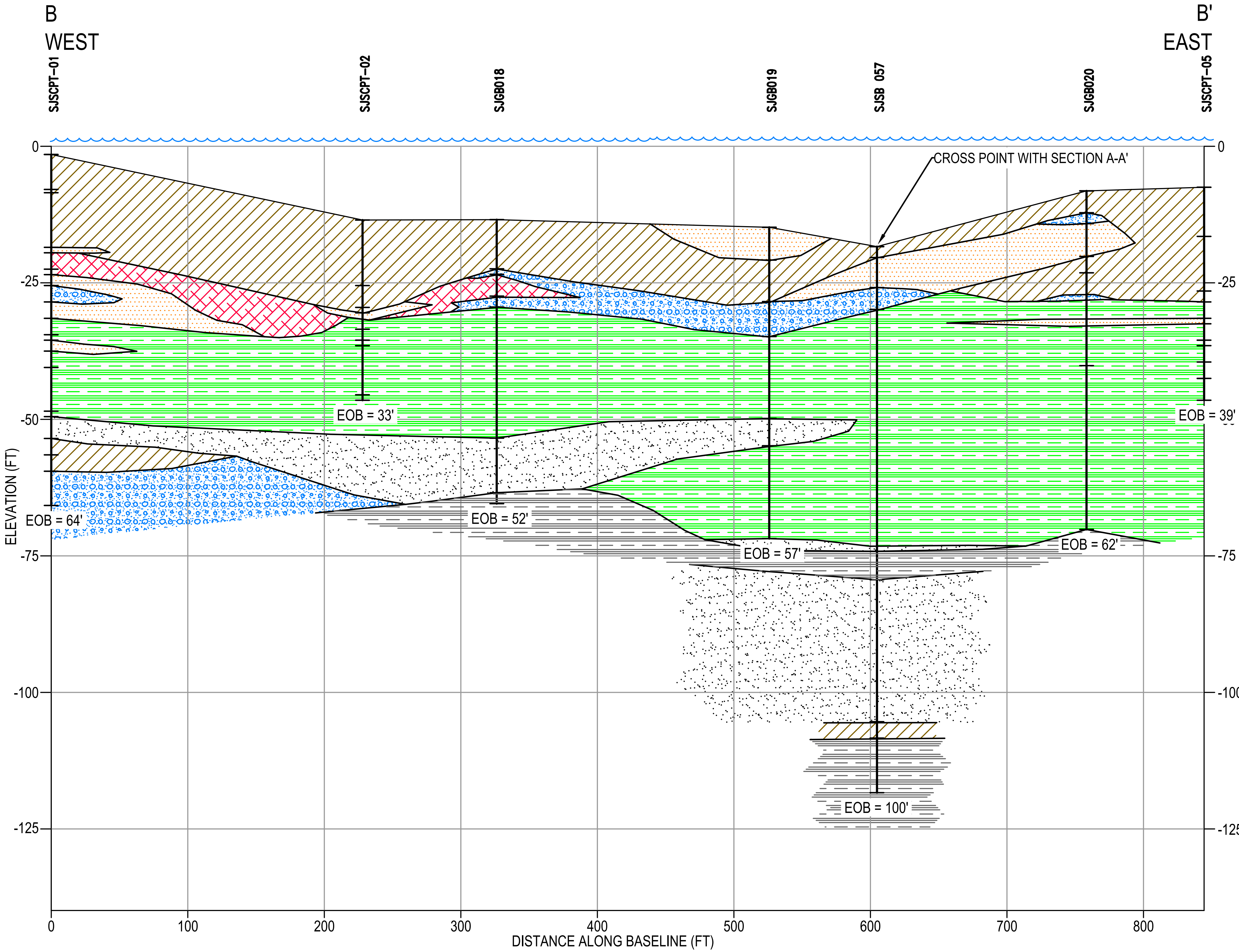

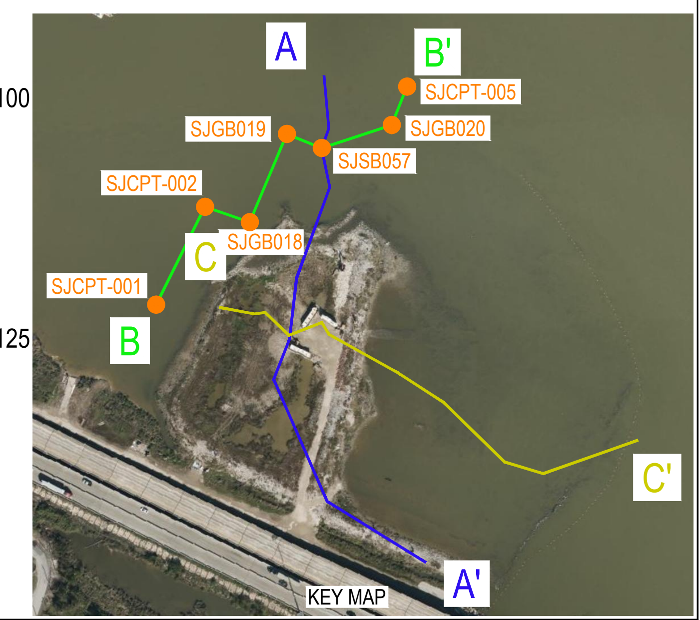

LEGEND

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

Project No. 11215702
Date December 2021

GEOLOGIC CROSS-SECTION B-B'

FIGURE 5

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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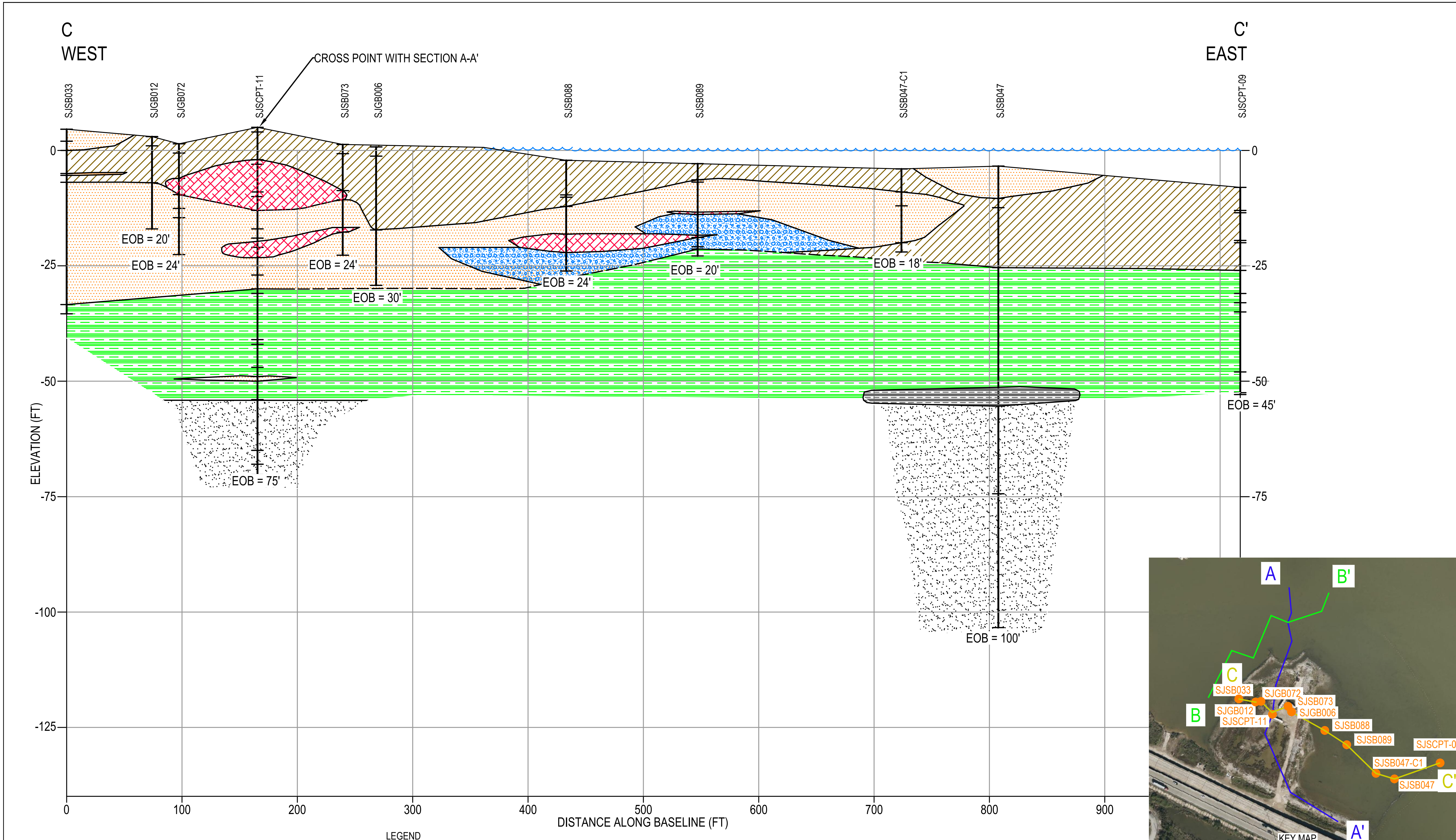


LEGEND

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 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

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

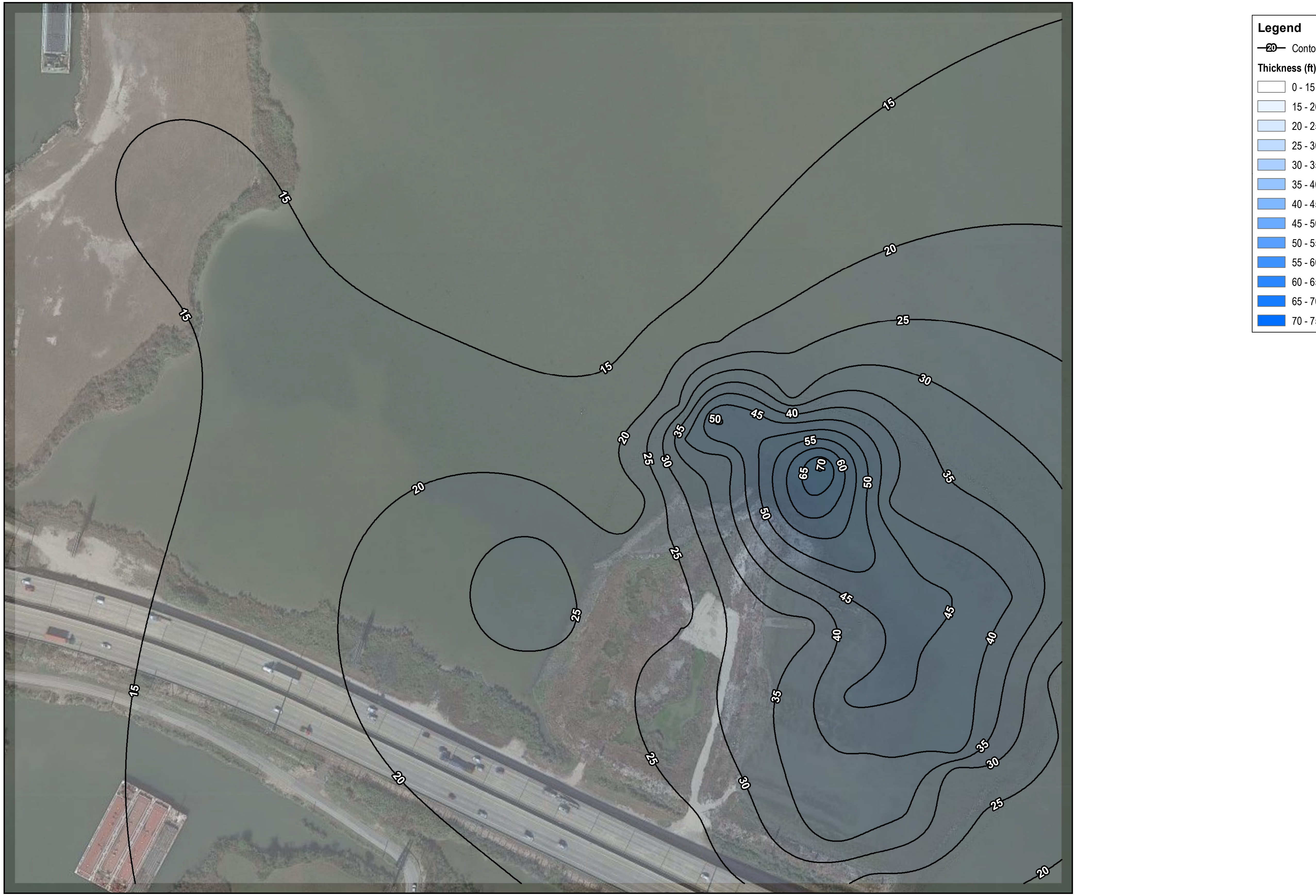
BEAUMONT CLAY
TOP ELEVATION

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

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

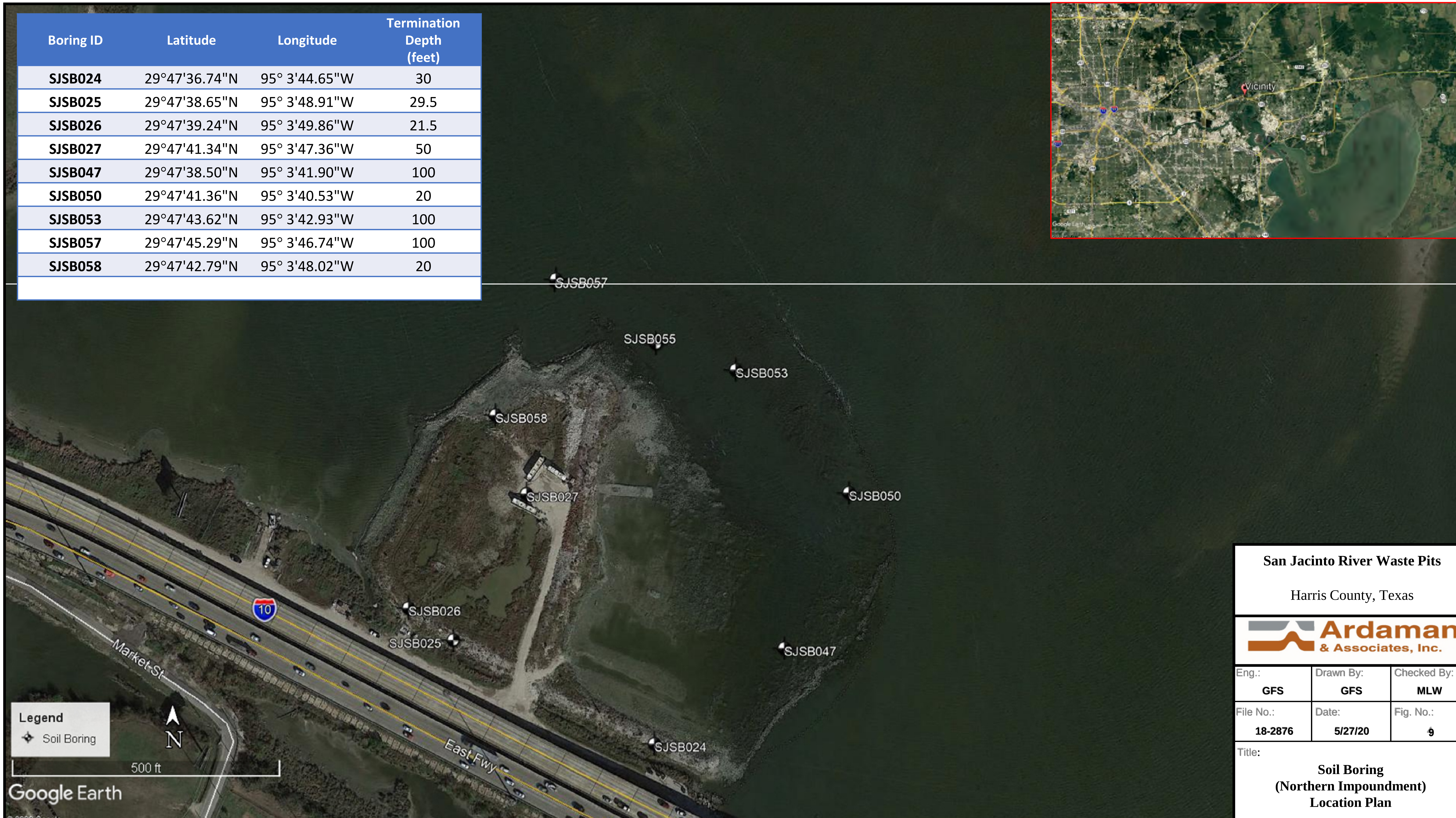
Project No. **11215702**
Revision No. **-**
Date **Dec 6, 2021**

FIGURE 8

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

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

Boring ID	Latitude	Longitude	Termination Depth (feet)
SJSB024	29°47'36.74"N	95° 3'44.65"W	30
SJSB025	29°47'38.65"N	95° 3'48.91"W	29.5
SJSB026	29°47'39.24"N	95° 3'49.86"W	21.5
SJSB027	29°47'41.34"N	95° 3'47.36"W	50
SJSB047	29°47'38.50"N	95° 3'41.90"W	100
SJSB050	29°47'41.36"N	95° 3'40.53"W	20
SJSB053	29°47'43.62"N	95° 3'42.93"W	100
SJSB057	29°47'45.29"N	95° 3'46.74"W	100
SJSB058	29°47'42.79"N	95° 3'48.02"W	20



San Jacinto River Waste Pits

Harris County, Texas

Ardaman & Associates, Inc.

Eng.:	Drawn By:	Checked By:
GFS	GFS	MLW
File No.: 18-2876	Date: 5/27/20	Fig. No.: 9

Title:

Soil Boring (Northern Impoundment) Location Plan

Legend

- Supplemental Design Boring
- SDI CPT Boring Location
- CPT Calibration Boring
- SDI Shallow Piezometer Location
- SDI Intermediate Piezometer Location
- SDI Deep Piezometer Location
- SDI Deep Piezometer with SPT and Shelby Tubes Location
- BMP Alignment
- Non-impacted Berm Area
- TCRA Cap Perimeter
- Extent of ACBM

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

Project No. 11215702
Revision No. -
Date Jul 9, 2024

SUPPLEMENTAL DESIGN
INVESTIGATION BORING LOCATIONS

FIGURE 10

Q:\GIS\PROJECTS\11215000s\11215702\MISC003\11215702_202205_MISC003_GIS001.mxd
Print date: 09 Jul 2024 - 08:23

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 (TSI) MARSH BUGGY		
	Drill Type/ Method ROTARY		
Elevation: Datum:	Sampling Method SPT/ST	ATD Water Level Depth	
Obs. Well Install. Yes ~~No~~ No	Bottom of Boring 60 ft		

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	CR1-A CR1-B S1	2.2'		(Very soft), moist ~~brn~~ grayish brown, sl. sandy SILT w/ abund. tr. organics (roots) @ 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/ ~~chem-like~~ unknown odor Methane? Sulfur? 0-2'	odor Not rotten egg H2S	OL Black Muck
–	–	–	1000	2	4	ST	S2	2'		2-4' ST FOR GEOTECH STRENGTH/CONSOL		
<5	<5	95	1010	4	6	SPT	S3	2'	0 0 0 0	4-6' WOR, V. soft, wet, dk gray w/ gray patches tr. sand + gravel CLAY (Muck/mud) w/ tr. ~~chem-like odor~~ (Sulfur, Methane, muck)	unknown odor	
<5	10	90	1020	6	8	SPT	S4	2'	0 0 0	6-8' ⓪ V. SOFT, SAME AS ABOVE @ sampler shoe ~0.1' lt gray moist clayey SAND	unknown odor @ 8'	
–	80	20	1040	8	10	SPT	S5	1.1'	6 6 14	8-10' ⑳ Md. dense, moist to wet, lt gray, clayey w/ layer Med grained SAND w/ layers (0.1) of clay (SP)	hammer not falling 30"	SC unknown tr. odor 8-10' in sand
–	65	35	1050	13	15	SPT	S6	1.6'	6 7 13	⑳ Md. dense, moist, lt gray clayey SAND w/ layer of ~~cla~~ sandy CLAY ~0.4 Alternating layers ~0.2-0.4' thick of SP, SC + CL	gravel sized unknown particles in slough	
–	85	15	1100	18	20	SPT	S7	1.1'	5 5 12	⑰ Md. dense, same as above seams of CLAY tr. shells		SP

Attachment Figure A.1-1

Soil Boring Processing Log

ANCHOR QEA

Boring Location:	Boring SJGB001 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 (PSI) JOE/CHARLES
	Drill Type/ Method ROTARY
Elevation: Datum:	Sampling Method 2' SPT / 2' ST ATD Water
Obs. Well Install. Yes ~~No~~ (No)	Bottom of Boring 60 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			Digging trench for drilling water	SC/SP
–	70	30	1110	23	25	SPT	S8	1.4'	7, 6, 10	(16) Md. dense, wet, lt. gray clayey SAND (SC). ALTERNATING LAYERS/SEAMS up to 0.1' of silty gray CLAY + lt gray medium grained SAND tr. shells		
15	35	50	1125	28	30	SPT	S9	1.6'	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)		~~SC~~ CH transit. Beaumont
5	<5	95	1130	33	35	ST NR; SPT	S10	1'	12, 20, 23	ST NR. USE SPT. (43) V. HARD, damp, reddish brown CLAY w/ tr. gravel	TRY w/ ST. Rig could only push 1 ft NR, clean out hole, add mud, + resample w/ SPT. Rough Drilling	
10	–	90	1145	38	40	SPT	S11	1.2'	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 60 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)
								40			Rough Drilling bit is stopped occassionally Rig Shaking	Beaumont
–	–	100	1220	43	45	SPT	S12	43	7 10 10	(20) Stiff, damp, reddish brown w/ tr. lt blue gray mottling CLAY	Unable to drive ST	color change
								47				CL
–	25	75	1240	48	50	SPT	S13	48 1.1'	10 23 24	(47) Very hard, damp, lt bluish gray, sandy silty CLAY grades to very sandy to clayey SAND. At bottom F.g. Sand.	G.S.	
–	5	95	1330	53	55	SPT	S14	53	23 24 18	(42) V. hard, dry, lt bluish gray clayey SILT (MH) tr. fine grained SAND		MH
–	5	95	1345	58	60	SPT	S15	58 1'	4 27 27	(54) V. hard dry to damp, lt bluish gray SAME AS ABOVE		
								60		BOTTOM OF BORING @ 60'		

1400 10/27/10

Soil Boring Processing Log

ANCHOR QEA

Boring Location: 2.6' FROM WATER TO MUDLINE; 3.2' FROM DECK TO MUDLINE	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			
Elevation:	Datum:	Sampling Method SPT/ST	ATD Water	
Obs. Well Install. Yes / No (circled)		Bottom of Boring 59.5	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)
–	10	90	0820	0	2	ST/SPT	S1		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. S1 is V. SOFT, WET DK OLIVE GRAY ORGANIC SILT w/ STRONG CHEM LIKE ODOR. TRACE SAND.		
				2	4	ST/SPT			NR			
–	10	90	830	4	5.5	SPT	S2	0.9	WOH	V. soft, wet, dk olive gray organic silt OL @ 0.2 lt gray, like soft, moist, sandy SILT. w/ black layer separating. Mod chem odor	OL / ML	
–	15	85	835	6	7.5	SPT	S3	0.8	5, 4, 3	(7) M. stiff, damp, lt gry w/ lt brown + greenish gray mottling sandy CLAY (CL)	CL	
			0840	8	10	ST	S4	2'				
–	85	15	0850	13	14.5	SPT	S5	0.4	4, 1, 2	(3) Loose, wet, gray, silty, clayey SAND (SM) w/ slight chem-like odor		
–	95	5	0900	18	19.5	SPT	S6	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)		

Soil Boring Processing Log

ANCHOR QEA

Boring Location:	Boring SJGB032	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
Obs. Well Install. Yes (No)	Bottom of Boring 59.5		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)
								20				
								21				
								22				
–	80	20	0910	23	24.5	SPT	S7	23–24	4 / 6 / 13	(19) md. dense, wet, gr, lt gray w/ black specs, SAND w/ gray clay interbeds	SP	
								25				
								26				
								27				
–	85	15	915	28	29.5	SPT	S8	28–29 (2')	3 / 4 / 15	(19) Md. dense, wet, lt gray w/ black, red, + some shell grains, SAND w interbeds of gray CLAY LAYER OF Gray clay in bottom 0.2'	SP - SC	
								30				
								31				
								32				SM SP
–	35	65	925	33	34.5	SPT	S9	33–34 (1.4)	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 tube is only clay)	CH	
								35				
								36				
								37				
5	5	90	935	38	39.5	SPT	S10	38–39 (2')	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
Obs. Well Install. Yes (No)	Bottom of Boring 59.5 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)
			945	43	45	ST	S11	43–45				
--	--	100	1000	48	49.5	SPT	S12	48–49.5; 1.4	10, 19, 26	(45) HARD, damp, lt reddish-brown w/ gray + black mottling, CLAY w/ occassional chert		(CH)
–	–	100	1015	53	54.5	SPT	S13	53–54.5; 1.7	14, 18, 22	(40) HARD, damp, lt bluish-gray w/ lt reddish brown throughout CLAY (CH)		(CH)
–	–		1030	58	59.5	SPT	S14	58–59.5; 2'	28, 50/4"	(50/4") Bottom 0.9' collected HARD, damp, lt bluish-gray CLAY F to M grained gray SAND in sampler head		CH / SP
								60		BOTTOM OF BORING AT 59.5 FT	BORING COMPLETED	

~100?

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 5/8/16
	Job San Jacinto Waste Pits
	Logged By WES MACDONALD
	Drilled By TRIANGLE RESOURCES
	Drill Type/ Method ROTARY
Elevation: Datum:	Sampling Method SPT / ST
Obs. Well Install. Yes (No)	Bottom of Boring 119.5

Sheet 1 of 6
Job No. 090557-01
Weather CLOUDY 75°F
ATD Water 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)
			815	0	2	SPT ST	S1	2'		Appears to be soft gray sandy SILT w/ wood		
–	60	40	820	2	3.5	SPT	S2		0	WOH @ VERY LOOSE, WET GRAY v. silty SAND (SM)		
–	50	50	825	6	7.5	SPT	S3	2'	1 / 0 / 1	⑥ Very loose wet gray silty SAND (SM) w/ shells + H2S odor. to grading to soft wet gray sandy SILT to sandy CLAY (MH-CH)		
			835	10	12	ST	S4	1.9				
–	30	70	900	13	14.5	SPT	S5	1.6	2 / 4 / 6	⑬ M. STIFF, wet to moist, gray CLAY W LAYERS of light gray SAND F.M grained @ 0.3 ft reddish brown stiff clay. (BEAUMONT FORM)	(RECENT SED.) gray clay SILT/SAND / RED CLAY	
–	5	95	925	18	19.5	SPT	S6	1.8	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 (077 MAX?) SAND		

Attachment Figure A.1-7

Soil Boring Processing Log

ANCHOR QEA

Boring Location:

Elevation: Datum:

Obs. Well Install. Yes No

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
Sampling Method SPT/ST ATD Water
Bottom of Boring 119.5 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)
								20				
								21				
								22			CH	
–	<5	95	926	23	24.5	SPT	S7	23 / 1.7 / 24	8 / 14 / 20	(34) STIFF, MOIST, very LT gray to white CLAY (CH) w/ TRACE Lt yellowish brown f.g. SAND		
								25				
								26				
								27		~~overpushed? large amount of sand~~ mmm		
	935		935	28	30	ST	S8	28 / 2.1 / 29		tube v. slightly damaged yellow-red CLAY		
								30				
								31				
								32			NT	
5	5	90	940	33	34.5	SPT	S9	33 / 34	8 / 10 / 11	(21) poor recovery, poor sample (md. stiff, moist/damp, lt gray clay w trace of reddish brown clay (CL)		
								35				
								36				
								37				
–	–	100	945	38	39.5	SPT	S10	38 / 1.5 / 39	10 / 15 / 24	39 v. stiff, STIFF, DAMP, lt reddish brown, CLAY w/ pockets of lt gray CLAY (CH)		
								40				

Soil Boring Processing Log

ANCHOR QEA

Boring Location:	Boring SJGB023 Date 5/8/10
	Job San Jacinto Waste Pits
	Logged By MACDONALD
	Drilled By TRIANGLE RESOURCES
	Drill Type/ Method ROTARY
Elevation: Datum:	Sampling Method SPT/ ST
Obs. Well Install. Yes / No	Bottom of Boring 119.5

Sheet 3 of 6
Job No. 090557-01
Weather P. CLOUDY WINDY ~75°F
ATD Water 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	1000	~~53~~ 43	~~54.5~~ 44.5	SPT	S11	43–44.5; 2'	12 / 21 / 35	1.2 ft of good sample, remainder slough. (56) V. STIFF, DAMP, lt. reddish brown to lt bluish gray CLAY (beaumont)		
–	–	~~10~~ 100	1010	48	49.5	SPT	S12	48–49.5; 1.4	11 / 17 / 21	GOOD sample (38) STIFF, DAMP, lt. bluish gray CLAY (Beaumont)		
–	–	100	1020	53	54.5	SPT	S13	53–54.5; 1.2	6 / 6 / 8	(14) ~~v~~ med. stiff, damp, lt gray CLAY more plastic – containing occasional wood fibers & debris w/depth grades to darker brown gray w/ wood content ↑ depth (beaumont)	AL	
–	10	90	1030	58	59.5	SPT	S14	58–59.5; 1.5	8 / 12 / 20	(32) STIFF, damp, lt gray sl. fine-grained sandy CLAY w/ Trace wood fragments.		

Depth scale: 40–60

Attachment Figure A.1-9

Soil Boring Processing Log

ANCHOR QEA

Boring Location:	Boring SJGB003 Date 25/8/10	Sheet 4 of 6	
	Job San Jacinto Waste Pits	Job No. 090557-01	
	Logged By MACDONALD	Weather P. cloudy 75°F windy	
	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)
								60				
								61				
								62				
—	5	95	1040	63	64.5	SPT	S15	63, 1.5, 64	5, 8, 15	(23) STIFF, damp, dk. gray GRAY CLAY w/ trace f. gravel SAND + trace wood fragments (Beaumont?)		
								65				
								66				
								67		(45) sample overpenetrated (full of slough? slough is top 0.5'+ SAME AS ABOVE		
—	<5	95	1055	68	69.5	SPT	S16	68, 69	11, 17, 28			
								70				
								71				
								72		top 0.5' was slough		
—	—	100	1105	73	74.5	SPT	S17	73, 2', 74	6, 11, 15	(26) STIFF, damp, Dark gray CLAY w/ trace of wood fragments		
								75				
								76			switched drillers + cathead pullers	
			1150	77	79	ST	S18	77, 2', 78, 79				
								80				

Soil Boring Processing Log

ANCHOR QEA

Boring Location:	Boring SJGB003 Date 5/8/10	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 (circled)	Bottom of Boring 119.5	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)
								80				
								81				
								82				NR
–	40	60	1200	83	84.5	SPT	S19	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.		
								85				
								86			SM	
								87		WM 5/8		
–	15	85	1245 1210	88	89.5	SPT	S20	88 / 89	14, 22, 26	48 31, 50/5" 50/5" v. dense, moist, sl. silty to silty SAND (SM) F. grained sand		
								90				
								91				
								92				
			1230	93	94.5	SPT	S21	93 / 2' / 94	11, 17, 25	top 0.1' slough 42 From 1.9 to 1.2 ft: Dense, Moist, lt gray f. to m. grained sl. 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	S22	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 [illegible] sand or red gray clay		

Soil Boring Processing Log

ANCHOR QEA

Boring Location:	Boring SJGB003 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 FROM N
	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

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				
								101				
								102		2' OF MAT. IN SAMPLE		
–	–	100	1305	103	104.5	SPT	S23	103 / 1.6 / 104	10 / 12 / 22	32 Stiff, damp, lt. bluish gray CLAY (CH)		
								105				
								106				
								107		39 SAME AS ABOVE		
–	–	100	1325	108	109.5	SPT	S24	108 / 2' / 109	15 / 15 / 24			
								110				
								111				
								112		50/4" V. DENSE (md. dense), wet, lt bluish gray f. grained silty SAND (SM)		
–	70	30	1340	113	114.5	SPT	S25	113 / 1.1 / 114	30 / 50/4"	slough has sand clay + lard gravel	SM	
								115				
								116				
								117		0.7 good sample rest was slough		
–	80	20	1400	118	119.5	SPT	S26	118 / 0.7 / 119	15 / 30 / 45	75 V. Dense, gray f.g. silty SAND (SM)		
								120				

Soil Boring Processing Log

ANCHOR QEA

Boring Location: 5.6 FT TO MUDLINE	Boring SJGB004 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
Obs. Well Install. Yes No	Bottom of Boring 59.5
	ATD Water 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	80	1315	0	1.5	SPT	S1	0.4	6, 2, 2	poor recovery · cathun in backwards; soft, wet, dk gray sl. sandy SILT w trace shells + organic debris (wood)		NT
–	15	80	1330	2	3.5	SPT	S2	0.1	1, 1, 1	poor recovery · cathes in backwards; SAME AS ABOVE		NT
–	25	100	1345	4	6	ST push	S3	2'		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	2'	0, 0, 0	(WOR) V. SOFT, WET, DK GRAY CLAY w/TR. SILT + sand		
–	10	90	1355	8	9.5	SPT	S5	2'	0, 0, 0	(WOR) V. SOFT, WET, DK GRAY CLAY w/ TR SAND LAYERS, gray	CH	
			1400	10	12	ST push	S6	2'				
–	35	65	1410	13	14.5	SPT	S7	2'	0, 0, 0	(WOH) @ 14 ft change; V. SOFT, WET, DK GRAY CLAY to MD. dense, wet, lt gray SAND w black specks fine to med grained	CH / SP	
–	35	65	1420	18	19.5	SPT	S8	1.4	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
	Job San Jacinto Waste Pits
	Logged By WES MACDONALD
	Drilled By TRIANGLE RESOURCES
	Drill Type/ Method ROTARY
Elevation: Datum:	Sampling Method SPT/ST
Obs. Well Install. Yes No	Bottom of Boring 59.5

Sheet 2 of 3
Job No. 090557-01
Weather SUNNY 85°F WINDY
ATD Water 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)
			1430	23	24.5	SPT	S9	23–24.5	8, 15, 15	(30) No Recovery shoe of sampler was lost in ground		
5	–	95	1440	28	29.5	SPT	S10	28–29.5, 1.3	7, 12, 20	(32) V. HARD, damp, lt reddish brown CLAY w/ trace gravel	CH	
–	–	100	1455	33	34.5	SPT	S11	33–34.5, 2	10, 12, 15	Upper 1.4 of sample appears to be slough (CH gray sand w pockets of gray + red-brown clay) (27) HARD, damp to dry, lt reddish-brown w/ black / lt gray splotches CLAY	CH	
–	–	100	1505	38	39.5	SPT	S12	38–39.5, 0.6	8, 11, 17	Upper 1.4 slough (28) HARD, damp + same as above fewer to no splotches of other color trace gravel @ sample top (slough?)		

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 Heavy from SE	
	Drilled By TRIANGLE RESOURCES		
	Drill Type/ Method ROTARY		
Elevation: Datum:	Sampling Method SPT/ST	ATD Water	
Obs. Well Install. Yes (No)	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)
			1525	43	45	ST	S13	43–45; 7				
–	25	75	1530	48	49.5	SPT	S14	48–49; 1.3	12, 50/6"	50/6" V. Hard, moist, lt. bluish gray sl. f.g sandy CLAY. bottom 0.2 ft lt bluish gray, wet silty SAND	(CL)	
–	10	90	1550	53	54.5	SPT	S15	53–54; 1.5	8, 12, 22	(34) V. HARD, wet to moist, lt. bluish-gray sl. sandy CLAY		
–	10	90	1605	58	59.5	SPT	S16	58–59; 1.4	8, 12, 20	(32) V. HARD, moist, lt. bluish gray sl. sandy CLAY	(CL)	
								60		BOTTOM OF BORING 59.5' 5/11/10	1625	

Depth scale: 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60

Attachment Figure A.1-15

Soil Boring Processing Log

ANCHOR QEA

Boring Location: water level 5.4 ft to deck 1006 5-6-10	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		
Elevation: Datum:	Sampling Method SPT & Push		ATD Water Level Depth
Obs. Well Install. Yes No	Bottom of Boring 61.5		

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)
-	-	100		0	2		SJGB005-S1	0–2		(Soft), wet, brown organic SILT with abundant wood fibers		
-	95	5						2–4		, wet, gray, fine to medium SAND		
—	40	60	1040	4	5.5	SPT	S2	1.1	9/18"	V. SOFT, WET, GRAY V. SANDY CLAY (CL) w/ MOD. ALTERNATING LAYERS OF CLAY & SAND		
—	20	80	1058	10	11.5	SPT	S3		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	16"	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" each		

Soil Boring Processing Log

ANCHOR QEA

Boring Location:	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
Elevation: Datum:	Sampling Method SPT & Shelby ATD Water Level Depth
Obs. Well Install. Yes No	Bottom of Boring 101.5

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)
0	90	10	1120	20	21.5	X	S-5	20–21.5	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	25–26.5	11, 20, 30	(50) Dense to v. dense, moist lt. gray F-C SAND		
0	5	95								Hard, damp, brown and gray CLAY (Beaumont)		
0	5	95	1130	30	30.5	X	S-7	30–31.5	15, 20, 31	(51) Hard, damp gray transitioning to brown CLAY (Beaumont)		
0	10	90	1140	35	36.5	X	S-8	35–36.5	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

Attachment Figure A.1-17

Soil Boring Processing Log

ANCHOR QEA

Boring Location:	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
Elevation: Datum:	Sampling Method SPT & PUSH ATD Water
Obs. Well Install. Yes No	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)
0	10	90	1145	40	41.5	X	S-9	40–41.5	10, 16, 25	(41) Hard, damp, red brown CLAY (Beaumont) with lt gray mottling		
0	15	85	1155	45	46.5	X	S-10	45–46.5	14, 18, 22	(40) Hard, damp, gray sl. sandy, silty CLAY		
0	50	50	1205	50	51.5	X	S-11	50–51.5	50, 50/5½"	(50/5½") Dense to hard, gray, damp, silty, clayey fine SAND to sandy, silty CLAY		
0	10	90	1220	55	56.5	X	S-12	55–56.5	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	60–61.5	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) Mash 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	From	To	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	100	1030 1035 1040	0-6" 6"-12" 12"-24" 0'	0-2' 2'	ST	CR1-A CR1-B S1	0–2 (1.3')		Soft to med stiff) 0 to 0.4 Brown ~~moist to~~ damp SILT w/abundant roots 0.4' to ~~gray, moist~~ and brownish gray moist w/ silty gray patches, blocky, low plasticity, w/occassional roots SILT	2 STs taken & composited for 0-2'	Topsoil R/O waste
(5)	–	100	1100	2	4	SPT	S2	2–4 (0.8')	0 0 2 2	(2) soft brown SILT @ 0.3' dark gray v.soft, moist CLAY (muck) w/ small unknown gravel sized particles		MUCK (waste?)
–	–	–	1110	4	6	ST	S3	4–6 (2')		shelby tube		
–	30	70	1120	6	8	SPT	S4	6–8 (1.5')	11 7 8 9	(15) stiff, damp to moist, gray sandy CLAY (CL) ~~sandy~~ clayey sand in upper 0.3' tr. shells + yellow mottling.		CL
–	–	–	1130	8	10	ST	S5	8–10 (1.5)				
–	25	75	1140	13	15	SPT	S6	13–15 (1.9')	0 0 0 0	(0) WOH V. soft, wet to moist, gray, sandy silty CLAY (CL) @ 0.9 v.soft moist gray clay (CH) w/ trace organics @ fraicities		
–	75	25	1150	18	20	SPT	S7	18–20 (1.2')	3 7 14 14	(28) Med dense, lt grey, moist m to f grained clayey SAND SC w/SP containing layers of grey soft clay.		SP-SC

Attachment Figure A.1-19

Soil Boring Processing Log

ANCHOR QEA

Boring Location: CATHEAD MANUAL PULL HAMMER	Boring SJGB006 Date 10/29/11 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 4¼" BIT
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	From	To	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		

Depth scale: 20, 1, 2, 3, 4, 5, 6, 7, 8, 9, 30, 1, 2, 3, 4, 5, 6, 7, 8, 9, 0

Soil Boring Processing Log

ANCHOR QEA

Boring Location: LL WATER DEPTH 5' 5.6' FROM DECK TO MUDLINE @ 0820	Boring SJGB007 Date 5/7/16	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		
Elevation: Datum:	Sampling Method SPT + SHELBY	ATD Water Level Depth	
Obs. Well Install. Yes / No (circled: No)	Bottom of Boring 119.5FT		

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	2–3.5; 2'	0	WOH V. SOFT, GRAY, WET V. SANDY SILT (ML) w/ OCCASIONAL WOOD DEBRIS		
–	55	45	0840	6	~~8~~ 7.5	SPT	S3	6–7.5; 2'	1, 1, 2	(3) LOOSE, WET, GRAY, V. SILTY SAND (SM) w/ OCCASIONAL TO MOD. WOOD DEBRIS	ML/SM	
											CC	
–	15	85	0905	10	11.5	SPT	S4	10–11.5; 2'	1, 1, 1	(2) - SOFT, WET, GRAY CLAY w OCCASIONAL INTERBEDS OF GRAY SAND		
			910	13	15	ST	S5	13–15; 2.2				
– / –	100 / –	– / 100	~~0912~~ 0910	18	19.5	ST	S6	18–19.5; 2.2'	1, 16, 14	(30) MD. DENSE, WET, GRAY, LT GRAY w/ BLACK SPECS SAND (SP) w 2x 4"–6" DK gray CLAY/SILT LAYERS (CH) SOFT	(Lower sample in depth picture)	

NOTE: - NO DRY ERASE MARKER, PICTURES OF SAMPLES ARE THERE IN ORDER. Some ST Sample pictures are omitted.

- SPT sample have extra material in upper 0.5'. This material is considered to be fallen through here.

Attachment Figure A.1-21

Soil Boring Processing Log

ANCHOR QEA

Boring Location:	Boring SJGB007 Date 5/7/10
	Job San Jacinto Waste Pits
	Logged By MACDONALD
	Drilled By TRIANGLE RESOURCES
	Drill Type/ Method ROTARY
Elevation: Datum:	Sampling Method SPT / ST
Obs. Well Install. Yes (No)	Bottom of Boring 119.5 FT

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			(BEAMONT FORM)	
–	5	95	425	23	24.5	SPT	S7	23–24, 2'	13 / 18 / 24	(42) HARD, DRY, Lt bluish gray, sl. sandy CLAY (CL)		
								25–27			" "	
–	10	90	0945	28	29.5	SPT	S8	28–29, 1.5	11 / 47 / 50	(97) V. HARD, DAMP, Lt bluish gray w/ RED Brown Mottling, sl. sandy CLAY (CL-CH)	1st picture on board	
								30–32			color change	
–	–	100	955	33	34.5	SPT	S9	33–34, 2'	11 / 15 / 26	(41) HARD, MOIST, reddish brown w gray/white veins + mottling CLAY (CH) sand in overlying material		
								35–37			" "	
–	–	100	1000	38	39.5	SPT	S10	38–39, 2'	11 / 14 / 18	(32) HARD, MOIST to damp, reddish brown CLAY 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: Datum:	Sampling Method SPT/ST ATD Water
Obs. Well Install. Yes ~~No~~ (No circled)	Bottom of Boring 119.5 FT Level Depth

Gravel	Sand	Fines	Time/ PID	From	To	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 / 2.2' / 44 / 45		Appears to be sl. sandy blvish H gry CLAY	~~gr. transitn~~	
								46				
								47				
–	20	80	1020	48	49.5	SPT	S12	48 / 2' / 49	20 / 20 / 31	(51) HARD, MOIST, lt bluish gray F.G. sandy CLAY (CL) Low to No Plasticity		
								50			~~gr. transitn~~ gr. transit	
								51				
								52				
–	90	~~5~~ 10	1030	53	54.5	SPT	S13	53 / 1.2 / 54	18 / 26 / 32	(58) V. DENSE, moist to wet, lt gray fine to med.-grained SAND SP, sl. silty soft clay/sand mix	~~gr. transitn~~	
								55				
								56				
								57				
–	80	20	1040	58	59.5	SPT	S14	58 / 1.1 / 59	~~18~~ 15 / ~~28~~ 26 / ~~32~~ 31	~~(58)~~ (57) V. DENSE, wet, lt. gray silty F to M-grained SAND (SM)		
								60				

Soil Boring Processing Log

ANCHOR QEA

Boring Location:	Boring SJGB007 Date 8/7/10 Sheet 4 of 6
	Job San Jacinto Waste Pits Job No. 090557-01
	Logged By MACDONALD W Weather P-SUNNY 78°F
	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 FT Level Depth

162631

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)
						S		60				
								61				
								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 (SM) TO STIFF, DAMP, Lt gray to Lt bluish gray f.g. sandy CLAY (CL)	color darkens + sl. mat. change	
								65				
								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			?	NR
~	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		
								75				
								76				
								77				NR
			1130	78	79.5	SPT	S18	78 / 0.5 / 79	26 / 50/5"	50/5" poor recovery mat rec likely slough but sampled anyway. SAME AS ABOVE: gray red 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/8T ATD Water Level Depth
Obs. Well Install. Yes (No)	Bottom of Boring 119.5 FT

Grain size (%) 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)
								80				
								81				
								82				
—	85	15	1318 wet on Coc	83	84.5	SPT	S19	83 / 1.8 / 84	36, 46, 36 (32, 46)	78 V. DENSE, WET LT GRAY w Black grains (occasionally) (appearance of dirty sand - subrounded F-M grained SAND w occasional pockets of clay. gray to red-brown		
								85				
								86			color/texture change	
								87				
—	60	40	1335	88	89.5	SPT	S20	88 / 1.1' / 89	40, 50/5"	50/5" Md. Dense, Moist, gray f.g. clayey SAND (SC) grades from clayey to f.g. SAND @ bottom		
								90				
								91				
								92				
-	-	100	1350	93	94.5	SPT	S21	93 / 2' / 94	10, 10, 10	20 STIFF, MOIST TO DAMP, GRAY CLAY (CH)		
								95				
								96				
								97				
\	-	100	1405	98	99.5	SPT	S22	98 / 2' / 99	10, 17, 18	35 STIFF, ~~MOIST~~ DAMP, DARK GRAYISH BROWN silty CLAY w moderate wood fragments to @ 0.7' M. stiff, moist, gray CLAY w/ Occasional wood fragments		
								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
Obs. Well Install. Yes No (circled)	Bottom of Boring 119.5 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)
–	–	100	1420	103	104.5	SPT	S23	103–104; 1.3	15 / 24 / 26	(50) V. STIFF, MOIST, LT bluish gray CLAY (CH) (MATERIAL was pulled back through auger on retrieval)		
–	5	95	1435	108	109.5	SPT	S24	108–109; 2'	13 / 50/5"	(50/5") TOP 1.2' Appeared to be slough. V. STIFF, DAMP, lt bluish gray to lt gray sl. sandy silty CLAY. (CL)		
–	30	70	1450	113	114.5	SPT	S25	113–114; 1.0	16 / 18 / 28	(46) only 1.6 was sample 0.3 slough. ~~med stiff~~ stiff moist, gray f.g. sandy CLAY w/ (CL) LAYERS of clayey SAND		
–	10	90	1510	118	119.5	SPT	S26	118–119; 2'	50/4"	POOR RECOVERY MOST OF SAMPLE IS SLOUGH. BOTTOM 0.4 SOFT, GRAY, MOIST ~~CLAY~~ CH ~~w/ SAND~~ sandy CLAY	(High blow counts, soft sample, sample may not be indicative)	
								120		BOTTOM OF BORING AT 119.5 FT 5/7/10		

65'

Soil Boring Processing Log

ANCHOR QEA

Boring Location: WATER DEPTH 5.0 Ft to Deck 1315 5/6/10	Boring SJGB008 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 - Joe Linder
	Drill Type/ Method Rotary
Elevation: Datum:	Sampling Method SPT & Push ATD Water
Obs. Well Install. Yes No	Bottom of Boring Level Depth

Grain size (%) 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	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) Soft ~~very loose~~, 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		

Soil Boring Processing Log

ANCHOR QEA

Boring Location:

Elevation: Datum:

Obs. Well Install. Yes No

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
Sampling Method SPT ATD Water
Bottom of Boring 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				
5	10	85	1345	23	24.5	X	S-6	23–24	9, 9, 13	(22) Very stiff, moist, blue gray CLAY with brown mottling. (Beaumont)		
								25				
								26				
								27				
0	5	95	1400	28	29.5	X	S-7	28–29	11, 12, 20	(32) Hard, damp to moist, blue gray and brown CLAY (Beaumont)	Gray / Brown	
								30				
								31				
								32				
0	5	95	1405	33	34.5	X	S-8	33–34	8, 14, 19	(33) Hard, damp, brown & red CLAY (Beaumont) with scattered black clasts		
								35				
								36				
								37				
0	5	95	1415	38	39.5	X	S-9	38–39	12, 14, 17	(31) Hard, damp, brown and red CLAY (Beaumont)		
								40				

Soil Boring Processing Log

ANCHOR QEA

Boring Location:	Boring SJGB008 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
Elevation: Datum:	Sampling Method SPT-R ATD Water
Obs. Well Install. Yes No	Bottom of Boring 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)
								40–42				
0	80	20	1425	43	44.5	X	S-10	43–44.5	21 / 32 / 36	(68) Very dense, moist lt gray clayey fine SAND		
								47		— ? — ? — ? — ? — ? — ?		
0	10	90	1430	48	49.5	X	S-11	48–49.5	15 / 15 / 20	(35) Hard, moist blue-gray, sl. sandy silty CLAY		
0	10	90	1440	53	54.5	X	S-12	53–54.5	16 / 18 / 34	(52) Hard, moist, blue-gray, sl. sandy silty CLAY		
0	80	20	1450	58	59.5	X	S-13	58–59.5	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 ESCB009 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 Kelly, Mark (PSI) Charles
	Drill Type/ Method ~~BS~~ 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	0	2	ST	CRI-A CRI-B	0–2, 1.8'		SOFT, MOIST, GRAY, PULP WASTE (soft) w/H2S odor sl. sandy, no plasticity, blocky; @1.3 dk brownish gray, ~~silty~~ SILT (ML) w/much increased plasticity/w/hair-like fibers w/H2S ODOR to organics (lignin?)	#2 samples taken ~6" apart for chemistry	PULP WASTE (ML)
			1130				S1					
–	5	95	1150	2	4	SPT	S2	2–4, 2'	0 0 0	WOR		
–	5	95	1200	4	6	SPT	S3	4–6, 1.5'	0 0 0 0 0 0	⓪ WOR, v. soft, gray to dk gray, wet silty CLAY tr. sand + @0.4' LARGE amount of organics (OL) @ bottom w/ strong chemical-like odor; tr. organics + shells (lignin)		
–	~~8~~	95	1215	6	8	SPT	S4	6–8, 1.6'	0 1 2	WOR ⑥ 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										
–	15	85	1230	8	10	SPT	S5	8–10, 1.3	1 3 3	③ soft, same as above; @ 0.6' soft, moist, gray w/ black splotches, sandy (fine grained) CLAY	Shelby tube attempted @8' (No Recov) Resample w/SPT	
–	85	15										SP
		WOH	1245	~~10~~	~~12~~	S(NR) SPT	S6	10–12		⑥ V. soft, moist gray w/ black splotches sl. sandy CLAY (CL)	sample S5 from lower portion (SP)	
–	~~20~~ 40	~~70~~ 60	1310	13	15	SPT	S6	13–15, 1.1'	0 1 0	@0.7 loose, wet, lt gray SAND slightly clayey Md. grained SP to SC; 13-15' ⓪ Soft, wet lt. gray, m.g. sandy CLAY w/ alternating layers of CLAY / SAND clayey sand towards bottom	no sample @10' ST NR; *problem w/ RIG SPT Hoist	SP; CL
5	85	10	1430	18	20	SPT	S7	18–20, 1.2	10 13 25	㊳ Dense, moist, lt gray Coarse to M.G. sand w/ tr. fine gravel + occassional pockets of gray tr. fine shells	Rig hoist temp. fixed perhaps not 30" fall	

Soil Boring Processing Log

ANCHOR QEA

Boring Location: SPT CATHEAD MANUAL PULL	Boring ~~AQ~~ SJGB009 Date 10/26/10 Sheet 2 of 2
	Job San Jacinto Waste Pits Job No. 090557-01
	Logged By WES MACDONALD Weather Mo. Sunny 90°F
	Drilled By TRIANGLE RESOURCES (RSI) Marsh Buggy
	Drill Type/ Method ROTARY (MUD) NO CIRCULATION
Elevation: Datum:	Sampling Method 2' SPT / 2' ST ATD Water
Obs. Well Install. Yes No (circled)	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)
								20				
–	70	30	1500	23	24.5	SPT	S8	1.7'	9 18 23	(41) Dense, wet, lt gray, clayey SAND SC 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)
– 10	95/85 90	<5 –	1520	28	29.5'	SPT	S9	1.4'	6 12 23	(35) Dense, moist, lt gray, fine to med grained SAND (SP) @ 0.3' grades to Coarse grained SAND w/ Fine gravel	blow counts may be overestimated due to manual pulling (not 30") + hammer not falling directly over rods consistently	(SP)
								30		BOTTOM OF BORING 29.5' 1530 10/26/10		
								40				

Soil Boring Processing Log

ANCHOR QEA

Boring Location: drilling @ sl 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's
	Drilled By TRIANGLE RESOURCES (RSI) MARSH BUGGY
	Drill Type/ Method ROTARY 4¼" BIT
Elevation: Datum:	Sampling Method 2' SPT / 2' ST ATD Water
Obs. Well Install. Yes No	Bottom of Boring 15 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)
-	15	85	1500 1505 1510	0	2	ST	CR1-A CR1-B S1	1.4'		0' to 0.2' (v. soft) brown, moist organic SILT w/ abundant roots tr. H2S odor. 0.2' to bottom (v. soft), gray, pulp waste material sandy w/ abundant roots + large woody debris up to 3" long tr. thick @ bottom		OL; pulp waste
-	5	95	1540	2	4	SPT	S2	1.7'	0, 0, 0, 0	⓪ v. soft, wet, black, silty clay tr. unknown odor (muck) tr. sand. in sampler shoe M.D. dense moist. gray SAND		black muck
-	-	-	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 & tr. layer of shell hash (0.1') @ 0.6' Shells throughout (fragments) top to 0.5'		SP
-	90	10	1615	8	10	SPT	S5	1.1'	10, 3, 4, 4, 5	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	1626	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	1.5'	5, 4, 9, 16	⑬ Md. dense, wet to moist, lt gray f to m gr. SAND (SP) w/ seams of gray clay w/ tr. shells in clay		

BOTTOM OF BORING 15', FILLING HOLE w/ MED. 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: · Datum:	Sampling Method 2' SPT / 2' ST · ATD Water
Obs. Well Install. Yes / (No)	Bottom of Boring 20' · Level Depth

Gravel	Sand	Fines	Time/PID	From	To	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	830 / 835	0 / 0" / 6"	6" / 12" / 2	ST	CR1A / CR1B	2'		(V. soft), moist, gray to lt gray, sl. sandy SILT, block texture, occasionally non plastic w/ occ. organics + occasional small shells	2 SHELBY TUBES TAKEN FROM 0-2' DIRECTLY NEXT TO EACH OTHER FOR SAMPLE VOLUME FOR COMPOSITE	PULP WASTE
			840	1	2		S1			@ 1.9' black, (v. soft) moist clay.		
–	<5	100	850	2	4	SPT	S2	1.9'	0, 0, 0, 0	lt gray to silver pockets moderate in upper 6" sl. H2S ODOR 2-4 ⓪ WOR, v. soft, wet, gray to dk gray silty CLAY (MUD) w/ unknown odor		MUCK
–	<5	100	900	4	6	ST / NR / SPT	S3	1.6'	0, 0, 0, 0	4-6 Shelby Tube NO Recovery sampling w/ SPT		
– / 60	<5 / 60	100 / 40	910	6	8	SPT	S4	1.4'	0, 0, 0, 0	⓪ WOR, v. soft, same as above black to gray w/ flat fibrous chunk ~½" w/ unknown odor	@S4 long shell, hard chunks of debris in upper clay sample + slough	
–	50	50	920	8	10	SPT	S5	1.9'	0, 0, 2, 3	6-8 ⓪ v. soft same as above ~1.1' Md dense, moist, lt gray sand w/ layers (0.1') of gray c/w black patches, CLAY		CL / SC / Sand w/clay
–	85	15	930	10	12	SPT	S6	1.2'	3, 3, 6, 7	8-10 ② 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' ([illegible] thick) 10-12 tr. organics throughout		SC/SP / SP/SC
–	85	15	940	13	15	SPT	S7	1'	2, 5, 7, 9	⑨ Loose, wet, lt gray, clayey SAND (SC) w/ layers of clay (0.1') in (SP) f to m. grained sand 13-15 ⑫ Md. dense same as above		
–	95	5	950	18	20	SPT	S8	1.2'	2, 7, 14, 13	㉑ 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 1000

Attachment Figure A.1-33

Soil Boring Processing Log

ANCHOR QEA

Boring Location:	
Elevation:	Datum:
Obs. Well Install.	Yes / No (No circled)
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
Sampling Method	2' SPT 2' ST
ATD Water Level Depth	
Bottom of Boring	20 FT

Gravel	Sand	Fines	Time/ PID	From	To	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	0930 935 940	0	2	ST	CR1-A CR1-B S1	2.2'		Soft, moist, gray to brown, Sandy SILT w/ abundant organics roots, some mottled like consistency w/ H2S ODOR @ 0.8' LAYER OF ORGANICS @ sample bottom 2.2' wet (v. soft) black	2 STs taken directly next to each other	PUCP WASTE/ TOPSOIL; MUCK BUCKET
—	10	90	1245	2	4	SPT	S2	2'	0 0 0 0	⓪ WOR. v. soft, wet, Black sl. sandy CLAY w/ (MUCK) w/ unknown odor	live fiddler crab at surface	CL
—	<5	100	1330	4	6	SPT	S3	1.5'	0 0 0 0	WOR ⓪ SAME AS ABOVE w/ pocket of gray unknown round debris @ 0.3' tr. hairlike fibers (unknown)	After S1 rig moved to assist w/ vibecoring & haul Benchmarks across site	
—	—	—	1345	6	8	ST	S4	2'		SHELBY TUBE		
— / —	35 / 100	65 / <5	1350	8	10	SPT	S5	1.4'	0 0 3 7	③ Soft, wet, gray sandy ~~CLAY~~ w/ unknown particles (flat rounded) (similar to above). w/ unknown odor @ 0.5 Md dense, wet, lt gray SAND mgrained SP	Resume on location @1245 10/28/10	SP
—	80	20	1400	10	12	SPT	S6	1.9	7 6 9 13	⑮ Md. dense, wet, lt gray, clayey silty SAND fine to medium grained SAND (SM-SC) w/ pocket ~~layers~~ seams up to 1cm w/ occasional organics (wood debris)		
—	95	5	1410	13	15	SPT	S7	1'	0 0 13 11	⑬ Md. dense, moist, lt gray sl. silty SAND SP w/ tr. pockets of Clay. w/ flat metal shavings in sample that appear to be flakes off of SPT split spoon sampler		
—	95	5	1420	18	20	SPT	S8	1.5'	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

Attachment Figure A.1-34

Soil Boring Processing Log

ANCHOR QEA

Boring Location: 12.3' MUDLINE	Boring SJGB013 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
Elevation: Datum:	Sampling Method SPT/ST ATD Water
Obs. Well Install. Yes No	Bottom of Boring 10 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)
–	5	95	1045	0	2	ST push	S1	2'		0 to 2.0 Very soft, wet, dark gray w/ occasional gray pockets, sl sandy silty CLAY w/ trace organic fibers + shells, trace H2S-like + chem-like odor when initially broken. Layer of whole shells near (0.2') surface	ML/OL	
–	5	95	1100	2	4	ST push	S2	2'		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								3.5 to 4 FT Loose, wet, gray SAND w occasional silt + clay pockets. SAMPLE was very disturbed upon extrusion	SP	
–	5	95	1150	4	6	ST PUSH	S3	2'		~~0 to~~ 4 to 5.6 Very soft, wet dark gray w/ pockets of gray, sl. sandy SILT, ~~trace~~		
–	85	15								5.6 to 6 M. dense, wet, gray sl silty SAND		
			1210	6	8	ST	S4					
–	95	5	1230	8	10	SPT	S5	1.5'	5 / 7 / 7	No Recovery in ST. SPT sample (14) Med. Dense, wet, gray sl silty fine to med grained SAND sub rounded		

Depth scale: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10

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	Boring SJGB014 Date 5/10/10 Sheet 1 of 2
	Job San Jacinto Waste Pits Job No. 090557-01
	Logged By WES MACDONALD Weather P. Sunny Windy 80°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 12

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)
			1000	0	2	ST	NR	0 NR	2	1st ATTEMPT w/ TUBE, NO RECOVERY		
				0	1.5	SS SPT			1	TRY AGAIN WITH SPLIT SPOON No recovery w/ split spoon strong chemical-like odor (similar to CO2) from sampling equipment		
								1	3			
–	5	95	1015	2	4	ST	S2	2 1.8'		SOFT, MOIST DARK GRAY TO OLIVE GRAY Sl. sandy SILT w/ TRACE ORGANICS 0 to 1.8 to 0.3 FT STRONG H2S odor 0 to 0.3 ft, Gray, sl wet silty sand		
–	55	45						3				
–	~~85~~ 15	~~15~~ 85	1030	4	6	ST	S3	4 1.9'		0' to 1.3' Appears to be soft dk gray wet, sandy SILT (possible slough from drag down + fallen. CLAM shell observed at material border w/ wood fibers 1.3 to 1.9' (loose) wet, gray sl. silty SAND		
–	~~5~~ 95	~~95~~ 5						5				
–	70	30	1035	6	8	SPT	S4	6 0.8' 7	1 1 1	② 0 to Loose, wet, gray, silty SAND w/ dark gray silt w/ few wood fragments in silt.		
			1140	8	10	ST	S5	8 9 10		SHELBY TUBE FOR GEOTECH		

Soil Boring Processing Log

ANCHOR QEA

Boring Location:	Boring SJGB014 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 (No circled)	Bottom of Boring 12 Level Depth

Gravel	Sand	Fines	Time/ PID	From	To	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 – 12 (1.5')		SOFT, WET, DK gray sandy SILT w/ trace shell fragments		
								12		BOTTOM OF BORING 12' COMPLETED 5/10/10 1150		

Depth scale: 10, 11, 12, 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
	Job San Jacinto Waste Pits
	Logged By WES MACDONALD
	Drilled By TRIANGLE RESOURCES
	Drill Type/ Method ROTARY
Elevation: Datum:	Sampling Method SPT/ST
Obs. Well Install. Yes No	Bottom of Boring 10 FT

Sheet 1 of 1
Job No. 090557-01
Weather SUNNY 85°F WIND FROM SOUTH
ATD Water Level Depth

Gravel	Sand	Fines	Time/ PID	From	To	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	80	1515	0	2	PUSH ST	S1	0		SOFT, MOIST GRAY SANDY SILT w/occasional layers of SAND(<0.1') + brown silty wood @ 1.1 TO .8(<0.1') sl. H2S odor.		
—	15	85	1525	2	4	ST push	S2	1.8		SOFT, DAMP, gray to dk gray sandy SILT w/occasional pockets of CLAY		
—	15	85	1540	4	6	SPT	S3	1.5	0, 0, 0	INITIAL TRY WITH ST resulted in NR TRY W/ SPT WOH SAME AS ABOVE		
—	10	90	1610	6	8	SPT	S4	0.9	0, 0, 0	NO RECOVERY IN ST, TRY SPT WOH SOFT, WET, GRAY TO DK GRAY SANDY CLAY (CL)		
			1625	8	10	ST	S5	2		Not extruded. Shelby tube for geotech		
								10		BOTTOM OF BORING 5/10/10 1625		

Attachment Figure A.1-38

Soil Boring Processing Log

ANCHOR QEA

Boring Location: 3.5 Depth from water to mudline 1210	Boring SJGB016 Date ~~5/7/10~~ 5/10/10
	Job San Jacinto Waste Pits
	Logged By MACDONALD
	Drilled By TRIANGLE RESOURCES
	Drill Type/ Method ROTARY
Elevation: Datum:	Sampling Method SPT + ST
Obs. Well Install. Yes (No)	Bottom of Boring 12FT

Sheet 1 of 2
Job No. 090557-01
Weather SUNNY 80°F wind from S
ATD Water 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	1210	0	2	ST	S1	2'		0 to 0.1 loose, wet, gray sl. silty SAND w/ trace wood debris 0.1 to 1.1 soft, moist, dk gray to black CLAY w/ trace wood debris (CH) (OH) 1.1 to 1.4 soft, moist dk brown to dk gray organic silt w/ moderate wood debris + mod. chem-like odor 1.4 to 2 soft, moist, gray, clayey SILT w/ mod. chem-like odor	This sample was logged in reverse order from bottom to top	
–	30	70	1330	2	4	ST	S2	1.1		~~1.9~~ 1.1 to ~~1.1~~ 0.8 dk gray, soft sandy silt, damp ~~1.9~~ 0.8 to ~~0.8~~ 0.6 lt gray, wet, SAND loose ~~0.8~~ 0.6 to 0.4 dk brown, damp, SILT w/ wood debris 0.4 to 0.0 M. dense, dk lt. gray SAND w/ occasional silt pockets		
			1350	4	6	ST	S3	2'		NOT EXTRUDED (Geotech)		
–	20	80	1406	6	8	ST	S4	2'		STIFF, MOIST, GRAY sandy SILT w/ occasional pockets + layer of lt. gray SAND		
–			1416	8	10	ST	S5	2'		SOFT, WET, GRAY SANDY SILT w/ LAYERS of sand occasional intact trace shells throughout ~~Not shell AT 0.2 FT~~		

Depth scale: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 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
Obs. Well Install. Yes No (circled)	Bottom of Boring 12 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)
			1425	10	12	ST	S6	10		Not extruded		
								2' 11		GEOTECH BORN		
								12		BORING TERMINATED		
								3				
								4				
								5				
								6				
								7				
								8				
								9				
								20				

Soil Boring Processing Log

ANCHOR QEA

Boring Location: 2.9' Depth from water to mudline; 3.7' " " deck " "	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
Elevation: Datum:	Sampling Method SPT/ST ATD Water
Obs. Well Install. Yes No	Bottom of Boring 12 Level Depth

Gravel	Sand	Fines	Time/ PID	From	To	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	2'		0 to 0.3 Loose, wet, gray silty SAND; 0.3 to 2 Soft, moist to damp, dk gray to black CLAY to SILT w/ trace organic fibers. Long, skinny clam at soil border horizon (intact)	wood in sand; wood on the border of two soils	
–	<5	100	0845	2	4	ST push	S2	2.2'		0 to 1.7 soft to md. stiff, dk gray to blk, damp CLAY; thin gray sand layer @ 1.7'; 1.7' to 2.2' soft, dk brownish gray CLAY w/ moderate organic fibes		
–	25	75	0900	4	6	SPT	S3	1.5	0, 0, 0	ATTEMPTS TO OBTAIN SAMPLE w/ PUSH TUBE FAILED. SAMPLE OBTAINED w/SPT. WOH SOFT, WET, GRAY, sandy SILT w/ occasional interbeds of black CLAY		
–	20	80	0915	6	8	SPT	S4	1.4	0, 0, 0	ATTEMPTS OF ST FAILED. SPT used. WOH SAME AS ABOVE		
			0930	8	10		S5	2'		Not extruded. Geotech sample		

Attachment Figure A.1-41

Soil Boring Processing Log

ANCHOR QEA

Boring Location:	Boring SJGB017 Date 5/11/10	Sheet 2 of 2	
	Job San Jacinto Waste Pits	Job No.	090557-01
	Logged By W. MACDONALD	Weather	SUNNY 85% lt. breeze
	Drilled By TRIANGLE RESOURCES		
	Drill Type/ Method ROTARY		
Elevation: Datum:	Sampling Method SPT/ST	ATD Water Level Depth	
Obs. Well Install. Yes / No (No circled)	Bottom of Boring 12		

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)
—	90	10	1015	10	12	SPT	S6	10	0	ATTEMPTED SAMPLE w/ push ST. NO Recovery sample & obtained via SPT		
										~~no~~ recovery.		
								11	0	WOH (M 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 Gianalos
DRILLING CONTRACTOR: Cascade Drilling
DRILLING METHOD: Sonic
HOLE DIAMETER: 6 inches

BORING #: SJGB18
DATE BEGAN: 12/3/18
DATE COMPLETED: 12/3/18
TOTAL DEPTH: 52'
PAGE 1 OF 3
SAMPLING METHOD: 3 in. by 2 ft

Field location of boring: Water depth to TOP: 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, WOH	SJGB018-G01 SL0860 1050	.4	0-2'	1		very soft, wet, black slimy silt with small gravel	10		90
					2		Casing sunk in this material to a depth of 8'			
					3					
					4					
					5					
					6					
					7					
SS	4, 2, WOH, WOH	SJGB018-G02 SL0861 1120	1.0	8'-10'	8		@ 8.8': black slime			
					9		@ 9': very loose wet light grey fine SAND grades to silty SAND @ 9.6'	~~100~~ ~~90~~ 10	50 50	100 90
SS	WOH, WOH, WOH, WOH	SJGB018-G03 SL0862 1135	1.9	10-12 (30-32)	0		very soft light grey moist SILT with clay			100
					1					
ST	PUSH	SJGB018-G04 SL0863 1150	2	12-14	2					
					3					
					4					
SS	WOH, 2, 7, 8	SJGB018-G05 SL0864 1300	1.4	14-16	5		loose, wet, Coarse SAND with CLAY laminations, CLAY at 15.8'	5	60	35
					6					
SS	4, 9, 13, 17	SJGB018-G06 SL0865 1315	1.7	16-18'	7					
					8	CL	stiff, damp to dry, bluish grey CLAY			100
					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 Gianakos
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)	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	21		SAA @ 16': Color changes to yellowish brown CLAY			100
	8	SL0866		(40-42)						
	14	1330								
	17				22		SAA to 21'			
SS	7	SJGB018-G08	2.0	20-22						
	3	SL0867			23		21': orangish brown damp CLAY with gravel	5		95
	9	1345								
	17				24					
					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 kg/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
BORING # SJGB018
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 %
SS	20 44 48 50	SJGB018-G11 SL0870 1510	2.0	40-42'	1 2		very dense dry light grey SILTY FINE SAND with clay laminations		60	40
					3 4					
ST	PUSH	SJGB018-G12 SL0871 1545	2.3	45-47'	5 6 7		SAA @ 40', wood fragment at 45'			
					8 9 0					
SS	WOH 4 11 16	SJGB018-G13 SL0872 16		50-52'	1 2		stiff, dry to damp, light grey SILTY CLAY. Boring complete @1405			100
					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 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 12/3/18
TOTAL DEPTH 57'
PAGE 1 OF 3

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 / WOH / WOH / WOH	SJGB019-G01 SL0847 1225	0.1	0-2' ~~(18-20)~~ (20-22)	1		rock in ~~catcher~~, no sample recovered. Very loose sand (grey) with dark substance		50	50
					2					
					3					
SS	WOH	SJGB019-G02 SL0848 1245	0.4	4-6' (24-26)	4					
					5		rock in catch, minimal recovery. Very soft + dark grey CLAY w/ silt			100
SS	WOH	SJGB019-G03 SL0849 ~~125~~ 1300	.7	8'-10' ~~6-8~~ SG ~~26-28~~ 28-30	6					
					7		casing fell under own weight to 10', sample depth actual 8'-10'			
					8		Very soft dark grey moist silty CLAY Catcher forced inside of SS.			100
					9					
					10		Casing sunk under weight, 30' casing, 33' hole			
SS	WOH / 1 / 5	SJGB019-G04 SL0850 1325	2.0	~~10-12~~ SG 13-15 (33-35)	11		Very soft, moist, dark grey silty CLAY			100
					12		@13.6' grades to loose grey. medium Silty SAND with clay laminations		60	40
~~ST~~	~~PUSH~~	~~SJGB019-G04~~ SG ~~SL0851~~		~~35-37'~~	13					
					14					
ST	PUSH	SJGB019-G04 ~~SL0851~~ SG 1345		15-17 35-37	15					
					16		No sample recovered, hit rock or gravel? bent shelby. Sheared off bolts			
					17					
					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

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 # SJGB019
DATE BEGAN 12/2
DATE COMPLETED
TOTAL DEPTH
PAGE 2 OF
SAMPLING METHOD 3 in. by 2 ft

ANCHOR QEA

SOIL BORING LOG

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, 4, 8, 11	SJGB-019-G05 SL0851 1400	2.0	20-22 (40-42)	21		Stiff, dry to damp, yellowish brown CLAY reddish brown layer @ 20.1' PP: 2.25, VT: 4.25			100
					22					
					23					
					24					
					25					
ST	PUSH	SJGB019-G06 SL0852 1425	1.0	25-27 (45-47)	26		SAA @ 20'			
					27					
					28					
					29					
					30		Sluss on top of sample.			
SS	7, 13, 20, 26	SJGB019-G07 SL0853 1450	1.7	30-32	31		Hard, dry. reddish brown CLAY			100
					32					
					33					
					34					
					35					
SS	WOH, ~~1WOH~~, WOH, 3	SJGB019-G08 SL0854 1530	2.0	35-37	36		very soft, moist. orange brown mottled with bluish grey clayey SILT			100
					37					
					38					
					39					
					40					

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

Notes:

Attachment Figure A.2-5

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, 11, 17, 26	SJGB019-G9 SL0855 1600	2.0	40'-42' (60-62)	41	CL	Hard, dry, reddish brown marbeled with bluish grey CLAY			10
					42					
					43					
					44					
ST	PUSH	SJGB019-G10 SL0856 1630	2.3	45-47' (65-67)	45		SAA @ 40'			
					46					
					47					
					48					
					49					
SS	6, 7, 10, 14	SJGB019-G11 SL0857 0840	2.0	50-52	50		Stiff, dry to damp, light bluish grey to dark grey CLAY. Woody fragments when broken apart			100
					51					
					52					
					53					
					54					
SS	4, 8, 6, 13	SJGBD19-G12 SL0858 ~~0920~~ 915		55-57'	55					
					56		Stiff dark grey dry to damp CLAY grades to SILTY CLAY @ 56.5'			10
					57					
SS		SJGB019-G13 SL0859		~~60-62~~ 54 ~59'	58		Driller hit sand @ ~57', brought up drill head and slurry of wet sand fell out. Sample w/ approx depth taken, no SPT			
					60					
					62					

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 Giannakos
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 ~~SL0832~~ SG 1245	0	0-2' (10-12')	1 2 3		No sample recovered (rock in catcher) Shell fragments inside & around spoon.			
SS	1 2 WOH WOH	SJGB020-G02 SL0832 1255	1.0	4-6' (14-16')	4 5		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')	6 7		very loose, wet dark silty Sand		80	20
SS	WOH WOH WOH	SJGB020-G04 SL0834 1325	1.7	8'-10' (18-20')	8 9		very loos, moist, dark grey silty SAND with Clay	5	60	35
ST	PUSH	SJGB020-G05 1335	—	10'-12 (20-22)	0 11		NO sample recovered			
ST	PUSH	SJGB020-G06 SL0835 1350	0.4	12-14 (22-24)	12 13		Clayey Silt recovered.			
SS	WOH WOH WOH	SJGB020-G07 SL0836 1415	2.0	15-17 (25-27)	14 15		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	16 17 18					
~~SS~~		~~SJGB020-G10~~ SG ~~SL0838~~			19 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	CLIENT/PROJECT NAME: San Jacinto PDI Investigation
SOIL BORING LOG	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, 6, 6, 13	SJGB020-G10 SL0838 1415	2.0	20-22 (30-32)	21		loose, damp to moist light grey, med to SAND		100	
					22		@22': Beaumont reddish brown CLAY		10	90
					23					
					24					
SS					25					
SS	2, 4, 6, 10	SJGB020-G11 SL0839 1505	1.9	25-27 (35-37)	26	CH	Stiff, damp, orangish brown & bluish grey CLAY lamination of fine wet SILT @ 26'			100
					27					
					28					
					29					
					30		Stiff, damp, yellowish CLAY			100
SS	1, 6, 6, 8	SJGB020-G12 SL0840 1520	2.0	30-32 (40-42)	31					
					32					
					33					
					34					
ST					35		SAA @ 30'			
	PUSH	SJGB020-G13 SL0841 1540	2.0	35-37 (45-47)	36					
					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 Giannakos
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 16 22 29	SJGB020-G14 SL0842 1620	2.0	40-42	41		Hard, dry, orangish brown CLAY VT: .7 PP: >4.5 TSF			10[illegible]
					42					
					43					
					44					
ST	PUSH	SJGB020-G15 SL0843 0820 (12/12)	2.3	45-47 (55-57)	45					
					46		SAA @ 40'			100
					47					
					48					
					49					
SS	WOH WOH 11	SJGB020-G16 SL0844 0840	2.0	50-52 (60-62)	50					
					51		SAA @ 40'			100
					52					
					53					
					54					
SS	5 8 12 23	SJGB020-G17 SL0845 0920	2.0	55-57	55		Very stiff, dry to damp, greenish gray CLAY			
					56		@ 56.3' grades to Silty CLAY			100
					57					
SS		SJGB020-G18 SL0846 0950	60'-62'		~~58~~ 60		SAA @ 56'			
					~~59~~					
					62 ~~60~~		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
SAMPLING METHOD 3 in. by 2 ft

BORING # SJGB021
DATE BEGAN 11/30/18
DATE COMPLETED 12/1
TOTAL DEPTH
PAGE 1 OF 3

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, 2, 3, 1	SJGB021-G01 SL0821 1145	0.4	0-2 (11-13)	1	SC	~~0'~~ 0-1': V. soft, wet, black SILT w/ substantial shell hash.	-	-	100
					2		1-2': Soft, wet, gray, v. clayey SAND (fine)	-	70	30
					3					
SS	WOH	SJGB021-G02 SL0822 1155	0.7	4-6' ~~15-17~~ 15-17	4					
					5	CL	SA 1-2' above. ~~V. Clay~~ Grades to v. silty, sandy CLAY	-	~~60~~ 30	~~40~~ 70
SS	1, 3, WOH, WOH	SJGB021-G03 SL0823 1220	~~0.5~~ 1.0	6'-8' (17'-19')	6					
					7		6-8: ~~SAA.~~ Grades to slightly sandy CLAY	-	~~15~~ 5	95
					8		@ 8': Rock blocking shoe.			
ST	Push	SJGB021-G04 Tube Damaged 1330	0	8-10 19-21	9					
		Casing fell			10					
					11					
ST	Push	SJGB021-G05 SL0824 1345	0.9	12-14 (23-25)	12					
					13		SA 6-8' above			
SS	WOH, 3, 3, 5	SJGB021-G06 SL0825 1400	2.0	14-16 (25-27)	14					
					15		v soft, moist, dark grey CLAY to 14.9'		5	95
							@ 14.9': ~~laminations of~~ SP fine to med. sand with laminations of CLAY		70	30
					16					
					17					
					18					
SS	2, 1, 1	SJGB021-G07 SL0826 1415	1.4'	19-21 (30-32) SP	19		very loose moist grey sand, clean SAND		~~100~~ 95	5
					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	21		See previous page			
					22					
					23					
SS	9, 26, 25, 21	SJGB021-G08 ~~SL0827~~ SG 1435	—	24-26' (35-37)	24, 25, 26		No sample recovered, Hammer to 29'-31'			
					27					
					28					
SS	7, 12, 17, 25	SJGB021-G09 SL0827 1455	1.7'	29-31 (40-42)	29, 30, 31		very stiff, damp to dry, orangish to reddish brown CLAY PP: 74.5, 4.0 TSF VT: 5.75			100
					32					
					33					
SS	6, 9, 16, 20	SJGB021-G010 SL0828 1530		34-36 (45-47)	34, 35, 36		SAA @ 29'			100
					37					
					38					
ST	PUSH	SJGB021-G011 SL0829 1550	2.3	39-41 (50-52)	39, 40		@ Top SAA @ 29' graded to bluish grey CLAY at bottom			

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					
SS	11	SJGB021-G12	2.0	44'-46'	44					
	21	SL0830		(55-5[illegible])	45	MH	SG, Hard, damp, light grey SILT			100
	37	1630								
	39									
					46					
					47					
					48					
~~SS~~ SS	12	~~SJGB021-G13~~ SG SL0831	2.0	49-51'	49		SAA @ 44', grades to fine sandy grey SILT		10	90
	21	SJGB021-G13								
	33	0830			50					
	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					
					0					

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 47 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~~ CJ			1					
	10	1310								
	33			~~2-4~~ CJ	2		@1.5' → hammer bouncing →			
					3					
					4					
					5		5-6.8			
SS	WOH	SJGB022-G02	1.6	5-7						
		SL0811		19-21	6		V. soft, wet, olive gray slightly silty CLAY	—	5	95
		1340								
					7		6.8-7: Lense			
ST	Push	SJGB022-G03	1.8	7-9'		SM	V loose, wet, olive gray, v. silty f. SAND	—	60	40
		SL0812			8	CL	ST: Top + Bot: soft, wet, gray CLAY as 5-6.8' above			
		1400			9					
					10					
SS	WOH	SJGB022-G04	2.0	10-12						
		SL0813		(24-26)	11		SAA CLAY. silty. No plasticity. Moist	—	—	100
		1420								
					12					
					13					
~~SS~~	~~WOH~~ CJ	~~Slough~~ CJ			14		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:

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, 10, 17, 29	SJGB022-G06 SL0815 1530	1.8	20-22	21	CH	V. stiff, damp, blish-gray Beaumont CLAY			
							@21.1': grades to bluish-gray + l. brown mottling			
					22		@21.9': grades to gravelly			
					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, 14, 21, 27	SJGB022-G07 SL0816 1620	1.9	25-27			Hard, damp to dry, orangish brown CLAY	-	-	100
					26					
					27		- @27' end day 11/29 resume 11/30			
					28					
					29					
					30					
ST	Push	SJGB022-G08 SL0817 0825	2.3	30-32 (44-46)			SAA			
					31					
					32					
					33					
					34					
SS	5, 7, 13, 18	SJGB022-G09 SL0818 0855	2.0	35-37 (49-51)	35	CH	Hard, damp to dry, orangish brown CLAY	-	-	100
					36		~~BC~~ SG PP 3 to 3.5 TSF			
					37		VT = .675 x 2.5			
					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 # SJGB022
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 %
SS	5 10 14 21	SJGB022-G10 SL0819 0930	2.0	40-42 (54-56)	40 41 42	CH	very stiff, damp to dry, bluish gray CLAY PP: 3.25 TSF VT: .275 x 2.5=	–	–	100
					43					
					44					
SS	6 9 9 10	SJGB022-G11 SL0820 1000	2.0	45-47 (59-61)	45 46 47	SC	~~[illegible]~~ SG loose to med dense, damp, greenish gray CLAYEY SAND Slightly more clayey sand grades to 90% sand 10% fns at 46'.	–	90	10
					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

~~Water~~ 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 slime grades to soft silty CLAY
		↓		6-01		WOH	(7-9)	1		odorous damp to moist, @ .5'
			SL08	73		2				
		↓		1000		3		2		
		SS	SJGB0	23	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
			SL08	76		1				light grey
		↓		1030		WOH		8		
		SS	SJGB	023		WOH	8-10			loose, damp to ~~wet~~ moist light grey silty SAND
		↓	~~SL08~~	605	1.8	1	(15-17)	9		
			SL08	77		2				
		↓		1040		4		10		
		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
		↓		607		8	(19-21)	13		with patch of Clay
			SL08	79		5				
		↓		1115		3		14		
		~~SS~~								
								15		
		SS	SJGB	023	3	1.8	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	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
LOG OF EXPLORATORY BORING	DRILLING METHOD	SHEET 2 OF 3
	HOLE DIAMETER	

OTHER*	WELL OR PIEZOMETER DETAILS	SAMPLING DATA: SAMPLING METHOD	SAMPLE NUMBER	FID / PID (ppm)	RECOVERY (feet)	BLOWS / 6 INCHES	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	Field location of boring / LITHOLOGIC DESCRIPTION
		~~SS~~	~~SjGB~~	~~023~~	~~SC~~		7			
				~~609~~				21		
			SL08	81						
								22		
		SS						23		
		↓	SJGB	023 G09	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,
		↓		G10		15		29		layer above stiff bluish CLAY (dry) @29.6' 0, 10
			SL08	82/83		12				
				1200		13		30		SJGB023G10A: 28-29.6' (SL0882)
										SJGB023G10B: 29.6-30' (SL0883)
								31		
								32		
								33		
		ST	SJGB	023	1.8	PUSH	PUSH			SAA @ 29.6'
		↓		G11		↓	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
		↓		G12		10		39		PP 4.25 TSF
			SL08	85		13				
				1425		20		40		

Remarks:

Attachment Figure A.2-17

ANCHOR QEA

LOG OF EXPLORATORY BORING

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

BORING # SJGB023
DATE BEGAN
DATE COMPLETED
TOTAL DEPTH
SHEET 3 OF 3

Field location of boring

OTHER*	WELL OR PIEZOMETER DETAILS	SAMPLING DATA: 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	2.0	2	43-45			V. stiff dry redish orange grading to bluish 0 0 100
				G18		9		41		grey CLAY (damp)
			SL08	86		12				
				1445		17		42		
								43		
								44		
								45		
								46		
								47		
		SS						48		
			SJGB	023	2.0	4	48-50			V stiff, dry, bluish grey silty CLAY 0,0,100
				G14		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'
				G15				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
				G16		14		59		wet fine light grey sand @ 59.8' 0 100 0
			SL08	88+89		20				SJGB023 G16A, SL0588 @ 58-59.3
				1415		16		60		SJGB023 G16B, SL0589 @ 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
SAMPLING METHOD 3 in. by 2 ft

BORING # SJSB028
DATE BEGAN 11-19-18
DATE COMPLETED 11/19/18
TOTAL DEPTH 37
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 %
SS	30, 7, 16, ~~16~~ 11	SJSB028-G01 0850 SL0699	1.0	0-2	1, 2	Fill / ML	0-0.8: brown, damp, v. dense sandy silty GRAVEL 0.8-2: stiff, moist, dk brown slightly sandy SILT	70	10	20
SS	1, 2, 4, 26	SJSB028-G02 1005 SL0800	1.6	2-4	3, 4	CL	2-13.2: soft, moist, gray CLAY w/ ~~trace~~ organic matter + trace gravel, silty.	5	5	90
SS	1, 2, 1, 2	SJSB028-G03 1015 SL0801	0.8	4-6	5, 6		4-6 SAA			
SS	2, 1, 3, 2	SJSB028-G04 1030 SL0802	2.0	6-8	7, 8		6-8: SAA. Thin laminations of v. silty f. SAND and sandy CLAY. moist to wet			
SS	1, 1, 1, 1	SJSB028-G05 1045 SL0803 SG, GS, AL	2.0	8-10	9, 10 (0.8025 0.8025)		SAA @ 8.6: ~~sub~~ moderate organic fibers. Substantial organic fibers @ 10.3' + 10.6'			
SS	2, 1, WOH, 1	SJSB028-G06 1100	2.0	10-12	11, 12		@ 11-11.5: 2 thin lam. of l. brn silty f. SAND			
SS	2, 1, 1, 1	SJSB028-G07 1115	2.0	12-14	13, 14	ML	13.2-13.9: l. olive gray, v. soft, moist v. sandy SILT.	–	35	65
SS	1, 1, 1, 1	SJSB028-G08 1130 SL0804	2.0	14-16	15, 16	CL / SM	13.9-14.6: SA 2-13.2' above 14.6-16.9: l. gray, moist, v. loose, v. silty f. SAND. Trace lam. of gray CLAY	–	70	30
SS	WOH	SJSB028-G09 1140	1.7	16-18	17, 18	CL	16.9-20': v. soft, moist, gray, no plasticity CLAY.	–	–	100
					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~~ CJ SL0810

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
BORING # SJSB028
DATE BEGAN 11/19/18
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
ST	Push	SJSB028-G10 1335 SL0805	1.8	20-22	21	ML	Gray, moist, soft, v. sandy, clayey SILT	–	30	70
					22					
					23					
					24					
					25	CL	AOPP 16-20'			
SS	WOH 1	SJSB028-G11 SL0806 1355 GS, SG, AL	2.0	25-27	26					
					27					
					28					
					29					
					30		SAA			
SS	WOH 2	SJSB028-G12 1420 SL0807 ~~4~~	2.0	30-32	31					
					32					
					33					
					34					
					35		35-35.7' SAA			
SS	2 8 12 16	SJSB028-G13 1435 SL0808 SL0809	2.0	35-37	36	CH	35.7-37': Beaumont CLAY			
					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 BORING # SB029

PROJECT NUMBER: 180557-01.01 Task 03 DATE BEGAN 11/6/18

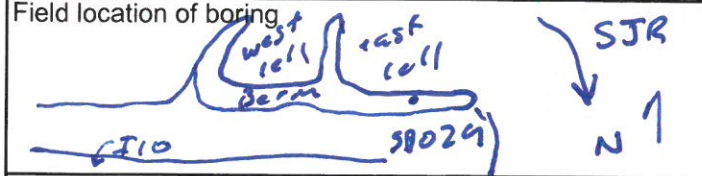
GEOLOGIST/ENGINEER Torell DATE COMPLETED 11/6/18

DRILLING CONTRACTOR: Cascade TOTAL DEPTH 40'

DRILLING METHOD 8" Sonic SHEET 1 OF 2

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
		sonic	~~0505~~ 0600					0		DK BRN - BL PEAT, ROOTS MOIST SILT SOME CLAY & VF SAND MOIST
		CRT	~~0507~~ 0601					1–3		AHEAD ON 11/7/18 (moved over feet to Shelby tube 5-7' SL 0612)
		CRT	~~0502~~ ~~0502~~ 0602					4	ST pull	WET @ 5'
		CRT	~~0505~~ 0603					5–7	SL 0612	SAND VF LIGHT GREY some silt, little clay, clayey lense 5.5-6.0; as 0-5 occ thin 1" sand/or zones
		CRT	~~0504~~ 0604					8		As ~~6-8~~ 5-6 CRT
		CRT	~~0505~~ 0605					10		AS 0-5
								12–14		CRT
GS, SG			0606					15		SAND LIGHT GREY f-m little silt trace clay & rootlets 12.5-15
								17		Same as 12.5-15
								18–20		Dk brn black clay & silt some vf sand & shells plastic

Remarks:

Attachment Figure A.3-3

TW014

ANCHOR QEA

LOG OF EXPLORATORY BORING

CLIENT/PROJECT NAME: IPC/MIMC - SJRWP PDI-1 BORING # SB029

PROJECT NUMBER: 180557-01.01 Task 03 DATE BEGAN 11/6/18

GEOLOGIST/ENGINEER T.o'Neil DATE COMPLETED 11/6/18

DRILLING CONTRACTOR: Cascade TOTAL DEPTH 40'

DRILLING METHOD 8" sonic SHEET 2 OF 2

HOLE DIAMETER 8"

Field location of boring: Seep 8 !

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 fr 30-32 (NT)
								25		
			0608					26		SHELBY TUBE
								27		
								28		saa — 25-27.5 saa soupy
								29		
								30		
			0609					31		SHELBY TUBE 1450
								32		saa
								33		
								34		
								35		34.9-35 co light brn sand
	GS		0610	35-36.5				36		co sand & gravel shells
	AL							37		grey green v hard clay
								38		grading to tan-brn @ 39
						39.5-40		39		
			0611					40		BEAUMONT CLAY

NOTE: INTERGRAL TOOK PHOTOS OF 0-40' + AO 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

Field location of boring

SAMPLING METHOD	BLOW COUNTS (140-Lb Hammer)	SAMPLE ID	RECOVERY (ft recovered/ft driven)	DEPTH SAMPLED
SS	19, 24, 29, 21	SJSB030-G01 1050 SL0688	2.0	0-2
SS	2, 7, 12, 15	SJSB030-G02 1055 SL0689	0.9	2-4
SS	1, 4, 8, 9	SJSB030-G03 1120 SL0690	2.0	4-6
SS	2, 4, 5, 8	SJSB030-G04 1125 SL0691	2.0	6-8
SS	WOH, ↓, 2, 6	SJSB030-G05 1135 SL0692 AL, SG	1.8	8-10
SS	3, 7, 8, 9	SJSB030-G06 1150	2.0	10-12
SS	WOH, 9, 10, 10	SJSB030-G07 1200	1.7	12-14
SS	WOH, 2, 4, 4	SJSB030-G08 1215 SL0693 GS	2.0	14-16
SS	WOH, 1, 1, 2	SJSB030-G09 1225 ~~SL0694-CT~~	2.0	16-18

DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION Den., moist., color, minor, MAJOR CONSTITUENT, Non-Soil	GRVL %	SND %	FNS
0-1.8	Fill GM	0-1.8: damp, dense, brown, silty sandy GRAVEL	60	15	25
1.8-4.6	ML	1.8-4.6: damp to dry, ~~hard~~ v. stiff, slightly sandy SILT	–	10	90
3.6	ML/SM	@3.6: grades to intermixed w/ yellowish-brown, dry, v. silty f. SAND.			
4.6-5.2	ML	4.6-5.2: lense of damp, light olive brown, v. sandy SILT	–	30	70
5.2-6	CL	5.2-6 dk gray, moist, stiff, sandy silty, low plasticity CLAY.			
6-6.4	ML	6-6.4: SA 1.8-4.6' above, moist			
6.4-7.1	CL	6.4-7.1: dk olive gray, moist, m. stiff CLAY	–	–	100
7.1-11.4	ML	7.1-11.4: dk brown, damp, stiff, sandy SILT	–	20	80
8-10	SL0698	8-10 SAA. grades to olive gray.			
9.7-10		@9.7-10': substantial shell hash.			
11.4-14.6	SM	11.4-14.6: moist, m. dense, l. gray w/ l. brown mottling; v. silty SAND (v. fine SAND)	–	60	40
12-14		12-14: SAA			
14.6-15.1	CL	14.6-15.1: lense of gray, moist soft, CLAY	–	–	100
15.1-16	SP/SM	15.1-16; wet, loose, l. gray v. fine silty Sand. occassional laminations of gray & dk gray CLAY throughout	–	80	20
16-16.5	SM	16-16.5: SA 11.4-14.6' above			
16.5-20	CL	16.5-~~18~~ 20: dk gray grading to gray; v. soft, moist slightly sandy CLAY. Trace organic fibers.	–	5	95

Remarks: 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	BORING #:
	PROJECT NUMBER: 180557-01.01	DATE BEGAN:
	GEOLOGIST/ENGINEER: Casey Janisch	DATE COMPLETED:
	DRILLING CONTRACTOR: Cascade Drilling	TOTAL DEPTH: 40'
	DRILLING METHOD:	PAGE 2 OF 2
	HOLE DIAMETER ___ inches	SAMPLING METHOD 3 in. by 2 ft

Field location of boring

SAMPLING METHOD	BLOW COUNTS (140-Lb Hammer)	SAMPLING DATA: SAMPLE ID	SAMPLING DATA: RECOVERY (ft recovered/ft driven)	SAMPLING DATA: 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, l. 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

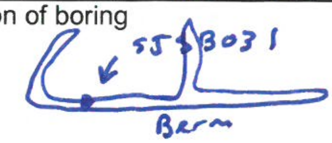
GEOLOGIST/ENGINEER Torelli DATE COMPLETED

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 integral
						13		3		has 0-18
						15				pics
						9		4	KRT	
	930	SS	0615			4				as above grading to gray
						4		5		5.5-6.0 black peat, roots
						4				~~Shelby tube~~ 11/10/18 ~~SL0627~~
						5		6		~~pull ahead~~
	945	SS	0616			7				as 4.0-5.5 occ rootlets, interbedded
	955					5		7		wet bedding decreases w/ depth
						4				ST 7-24, 5-7 poor recovery
	300# hammer					5		8		0800 SL0627
SG		SS	0617			5				as above
GS						5		9		
AL				HOLD		8				
						13		10		
	1015	SS	0618		WEIGHT OF HAMMER					as above
					3	~~WOH~~ CUT		11		
	11/9/18			HOLD		5				TAN BRN F-M SAND TRACE
						11		12		SILT, WET
	~~1025~~ 830	SS	0619			7				SAA, wet
						7		13		
						6				
						9		14		
	840	SS	0620			4				SAA, dk brn 14-15, tan brn
						8		15		15-16
						13				
						9		16		
	905	SS	0621			WOH				SAA tan brn dk brn
						WOH		17		16.8-17.2 graying w/
						1				depth
						4		18		
		NS			NR					
								19		
								20		

Remarks:

Attachment Figure A.3-7

ANCHOR QEA

LOG OF EXPLORATORY BORING

CLIENT/PROJECT NAME: IPC/MIMC - SJRWP PDI-1
BORING # SJSB031/ well
PROJECT NUMBER: 180557-01.01 Task 03
DATE BEGAN 11/8/18
GEOLOGIST/ENGINEER Tarell
DATE COMPLETED
DRILLING CONTRACTOR: Cascade
TOTAL DEPTH
DRILLING METHOD 4x6 Sonic 300# 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		
		ss						30		
	1140	ss	0624			3				saa
						5		31		
						7				
						4		32		
								33		
								34		
	1200	ss	0625					35		saa grey plastic clay lense 2" thick @ 36'
						26				
						27		36		
						21				
						24		37		
	1345	ST	0626							Attempt shelby tube 37-39 as above on top
								38		
								39		
								40		Bearmount in tip set well

Remarks: have to overdrill to 40' to set 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
BORING # SJSB032
DATE BEGAN 11/17/18
DATE COMPLETED
TOTAL DEPTH
PAGE 1 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	3, 8, 10, 7	SJSB032-G01 1405 SL0675	1.2	0-2	1, 2	Fill GM; ML	0-1.5': moist, med. dense, brown, silty sandy Gravel (Fill).	60	15	25
							@ 1.5': grades to dk gray to black, damp, med. stiff SILT.	–	5	95
							@2.0': Liner (Fabric, geotextile, fabric)			
SS	4, 6, 9, 10	SJSB032-G02 1410 SL0676	1.7	2-4	3, 4	SM	2-2.7 SAA			
							2.7-4.3 brown, damp to dry, m. dense, very silty f. SAND. PP = 2.25 to 3.0 tsf	–	70	30
SS	5, 6, 12, 21	SJSB032-G03 1420 SL0677	2.0	4-6	5, 6	CL; SC; CL	4.3-~~5.0~~ 4.7: dk brown, damp, stiff sandy CLAY	–	30	70
							4.7-5.0: grades to clayey SAND	–	60	40
							5-5.3: m. dense, damp, gray silty SAND			
SS	WOH, 4, 5, 7	SJSB032-G04 1435 SL0678	2.0	6-8	7, 8	CL/OL; CH	5.3-5.9: v. stiff, gray, damp sandy CLAY			
							@ 5.6 grades to dk. gray			
							5.9-6.9: dk gray, moist, CLAY w/ mod. organic fibers m. stiff ~~soft~~ (Peat) CJ	–	15	85
SS	4, 7, 7, 10	SJSB032-G05 1445 SL0679 AL, SG	2.0	8-10	9, 10		6.9-~~9.0~~: v. stiff, damp, gray sandy silty CLAY w/ high ~~low~~ plasticity (6.9-10.6) CJ			
							~~9 : light gray~~ CJ			
SS	1, 5, 6, 8	SJSB032-G06 1505 ~~SL0680~~ CJ	2.0	10-12	11, 12	SM	10.6 - l. gray, damp, m. dense, v. silty f. SAND	–	70	30
SS	2, 2, 3, 4	SJSB032-G07 1515	1.5	12-14	13, 14		SAA. Grades to loose, moist.			
							@ 13.5 - 13.8: lense of soft, moist, dk gray SILT			
SS	WOH, ↓, 3, 3	SJSB032-G08 1530 SL0680 GS	1.1	14-16	15, 16	SM	@ 14': grades to v. loose, wet, silty f. SAND (heaving)	–	90	10
SS	3, 1, 1, 3	SJSB032-G09 1540	2.0	16-18	17, 18		16-18 SAA			
					19, 20					

Depth column annotations: SL0686 (approx. 5-7 ft); SL0687 (approx. 10-12 ft)

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, silty clayey 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

BORING # SJSB032
DATE BEGAN
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	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 # SBST032
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)	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	STSB032-G14		40-42						
	8	1705			41		Beaumont CLAY. V. Stiff, damp, orangish-brown, high plasticity CLAY.	-	-	100
	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
BORING # SJSB033
DATE BEGAN 11-12-18
DATE COMPLETED 11-14-18
TOTAL DEPTH 40
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	2, 5, 9, 42	SJSB033 - G01 ~~SL0640 No Sample~~ 1540 SL0640 11-15-18 0830	0.6	0-2	1	SP	Damp, brown, m. dense F-C SAND. Trace silt ~~& clay~~ clay. Trace organic roots/fibers	–	80	20
					2		2-2.5: moist, v. loose, brn f. SAND	–	95	5
SS	1, 1, 2, 3	SJSB033 - G02 SL0641 1550	2.0	2-4	3	SC	2.5-4: moist, loose, gray clayey f. SAND	–	80	20
SS	4, 3, 2, 2	SJSB033 - G03 SL0642 1605	1.3	4-6	4, 5	CL	4-4.2: Rock, 4.2-4.5: dk gray, moist, soft CLAY. 4.5: m. stiff, moist, grays, sandy CLAY. occasional organic material. Trace f. sand laminations			
SS	6, 7, 3, 4	SJSB033 - G04 SL0643 1625 SG, AL	1.8	6-8	6, 7 (SL0649 0900)		SAA			
SS	2, 2, 3, 3	SJSB033 - G05 SL0644 1635	1.9	8-10	8, 9		SAA. Trace Org. mat.			
					10	SC	@9.5: grades to loose clayey SAND	–	60	40
SS	18, 15, 10, 10	SJSB033 - G06 1655	1.7	10-12	11	~~SC~~ CL	@10: grades to dk gray to brn-gray slightly sandy CLAY. @11.2: Gravel up to 0.2			
SS	4, 4, 4, 8	SJSB033 - G07 1705		12-14	12, 13	SM	11.4-14.6: damp, m. dense, l. gray w/ brown mottling slightly silty f. SAND. 12-14: SAA	–	90	10
SS	15, 14, 5, 5	SJSB033 - G08 SL0645 1035 SG AL GS	1.9	14-16	14, 15		14-14.6 SAA. 14.6-16 grades to light gray. Sandy CLAY laminations @ 14.7' & 15.6'			
SS	~~1~~5, 4, 3, 2	SJSB033 - G09 1045	2.0	16-18	16, 17		SAA light gray to gray, wet, loose sand, clayey/silty	–	90	10
					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

Attachment Figure A.3-12

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 Dented			
	10	SL0646			21		AOPP. One 1½" x 2" gravel			
	9	1135								
	13				22					
					23					
					24					
					25		Try ST @ 25-27' → cannot penetrate.			
SS	50/5"	STSB033-G11	0	0.4						
		1200			26					
		No Recovery								
					27					
					28					
					29					
					30					
SS	5	STSB033-G12	0.6	30-32		SM	wet, m.dense, gray, f-c, silty gravelly SAND	15	70	15
	13	1320			31		trace shells. 3"x2" gravel conglomerate of sand			
	17	SL0647					+ f. gravel			
	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	CH	Beaumont CLAY.			
					39		Bluish gray grading to greenish brown			
		SL0648								
					40		PP = 2.0 tsf			

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

Notes:

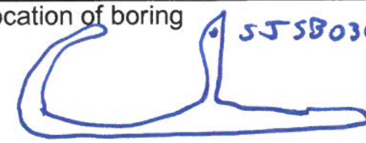
Attachment Figure A.3-13

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/TW018



OTHER*	WELL OR PIEZOMETER DETAILS	SAMPLING DATA: 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 5n, 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	~~1~~			~~SM~~	vf sand & silt little clay, roots,
		↓			1	~~7~~		7	ML	shells dk brn/black peaty
					2	~~1~~				wet
					7			8		loose
	1345	SS	0632			4				8-9 as above, shells layer
		↓	↓			2		9		9-10 grey m sand some f sand
			0633			5			SP	& little silt wet
			↓			7		10		ST SL 0639 11/10/18 1015
	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
				CN		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 11/6/18

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		gray clay dense 1.6-1.7
						1				
		↓				2		2		
		NS				NS				
								3		
								4		
		↓				↓		25		25-26.2
	1520	SS	0636			WOH			CL	~~35-36.2~~ 4" 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
										cat
								9		
		↓				↓		30		
	1550	ST	0637			ST				SHELBY TUBE
								1		
		↓				↓		2		
		NS				NS				
								3		
								4		
		↓				↓		35		Med
	1615	SS	~~063~~ 8 CAT			1				No Recovery, <1" coarse sand
						1		6		in spoon
						2				
		↓				3		7		
								8		
								9		
								0		

Remarks: closing hrs pics

Attachment Figure A.3-15

ANCHOR QEA

LOG OF EXPLORATORY BORING

CLIENT/PROJECT NAME: IPC/MIMC - SJRWP PDI-1 BORING # SSJB034/TW017

PROJECT NUMBER: 180557-01.01 Task 03 DATE BEGAN 11/10/18

GEOLOGIST/ENGINEER Torcy DATE COMPLETED

DRILLING CONTRACTOR: Cascade TOTAL DEPTH

DRILLING METHOD 8" sonic SHEET 3 OF

HOLE DIAMETER 8"

Field location of boring

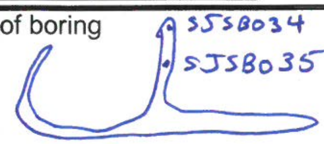
OTHER*	WELL OR PIEZOMETER DETAILS	SAMPLING DATA: SAMPLING METHOD	SAMPLE NUMBER	FID / PID (ppm)	RECOVERY (feet)	BLOWS / 6 INCHES	DEPTH SAMPLED	DEPTH IN FEET	SOIL GROUP SYMBOL (USCS)	LITHOLOGIC DESCRIPTION
	1705	SS	0638			3			GP	40- 40.8 f-m gravels & shells
		↓		↑		5		41	CH	40.8 – 42 BEAUMONT CLAY
				gravel only		12				GREY TO REDBRN
						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	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
LOG OF EXPLORATORY BORING	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		fill moist grading to grey f sand little silt
						14				
						12		2		
	1315	SS	SL0641			3				dk brn clay + some silt, little
						5		3		f sand coarsening w/ depth
						6				
						9		4		
	1325	SS	0642			4				Tan brn f sand + 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		11		11.5 – 12 dk grey f-m sand trace
						3				silt + clay
						5		12		
	1410	SS				7				SAA to 12.5
						7		13		12.5 – 14 tan brn f sand little silt
						13				+ mid sand
						14		14		
	1420	SS	SL0645			4				SAA occ clayier lenses ≤ 1"
						6		15		
						5				
						3		16		
		SS				5				SAA, occ shells
						7		17		
						4				
						3		18		
		NS				NS				
								19		
								20		

Remarks: Intersect was 0-18 pictures

Attachment Figure A.3-17

ANCHOR QEA	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
LOG OF EXPLORATORY BORING	DRILLING METHOD
	SHEET 2 OF
	HOLE DIAMETER

Field location of boring

OTHER*	WELL OR PIEZOMETER DETAILS	SAMPLING DATA: 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 grey plastic clay
			21-8-22		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				f-m sand grey, occ shells
						4		1		
						4				
						4		2		
		NS				NS				
								3		
								4		
								5		
	1600	ST				ST				TRY SHELBY TUBE
								6		ST EMPTY go to 40'
								7		heaving sands
		NS				NS				
								8		
								9		
								40		

Remarks:

Attachment Figure A.3-18

ANCHOR QEA

LOG OF EXPLORATORY BORING

CLIENT/PROJECT NAME: IPC/MIMC - SJRWP PDI-1

PROJECT NUMBER: 180557-01.01 Task 03

GEOLOGIST/ENGINEER

DRILLING CONTRACTOR: Cascade

DRILLING METHOD

HOLE DIAMETER

BORING # SJSB035

DATE BEGAN

DATE COMPLETED 11/12/18

TOTAL DEPTH

SHEET ____ OF ____

Field location of boring

OTHER*	WELL OR PIEZOMETER DETAILS	SAMPLING DATA: 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 check
										w/ split spoon
								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 boring
								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

BORING # SJSB036AB
DATE BEGAN 11/16/18
DATE COMPLETED 11/17/18
TOTAL DEPTH 35'
PAGE 1 OF 3
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	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			
		SL0665					lenses.			
		1435 GS, AL, SG			4		@ 3.6: Moderate organic fibers + yellow wood debris			
SS	5	SJSB036-G03	2.0	4-6			4-4.7: SAA (v. soft, moist to wet, gray to black silty			
	8	SL0666			5	CH	CLAY) Strong hydroC odor!	–	–	100
	7	1445								
	8				6		4.7-11.3 stiff, damp, ~~dk~~ brownish gray CLAY. ~~Strong~~			
SS	WOH	SJSB036-G04	1.7	6-8			~~odor. (hydroC)~~ Trace hydroC odor to			
	1	SL0667			7		5.6 ft. Mod. organic fibers @ 4.9'			
	4	1540					@ 5.7 grades to light/med gray. High Plast.			
	4	SG, AL			8		@ 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~~ ST								
	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				
	1	1630			13		12-13.2: dk gray, moist, v. soft CLAY	–	–	100
	5	ST				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 logo]

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, 7, 7, 8	SJSB036-G09 0815 SL0670 GS	1.6	20-22	21	SM	AOPP. Thin laminations of gray silt + gray clay throughout.	–	85	15
					22					
					23					
					24					
					25					
SS	4, 9, 13, 7	SJSB036-G10 0830 SL0671	1.7	25-27	26		SAA. Lense of dk gray silt @ 27.' (4") thick)			
					27					
					28					
					29					
					30					
SS	8, 6, 7, 9	SJSB036-G11 0845 ~~SL0672~~ CJ	0	30-32	31		No recovery. Silty f-c Sand in shoe.			
					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	36		END @ 35' 0905			
					37					
					38					
					39					
					40					

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

Notes:

Attachment Figure A.3-21

ANCHOR QEA

SOIL BORING LOG

CLIENT/PROJECT NAME: San Jacinto PDI Investigation

BORING # SJSB036 B

PROJECT NUMBER: 180557-01.01

DATE BEGAN

GEOLOGIST/ENGINEER: Casey Janisch

DATE COMPLETED

DRILLING CONTRACTOR Cascade Drilling

TOTAL DEPTH

DRILLING METHOD:

PAGE 3 OF 3

HOLE DIAMETER inches

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 %
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					
					1		End @ 10' @ 1120			
					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
BORING # SJSB037
DATE BEGAN 11-15-18
DATE COMPLETED 11-16-18
TOTAL DEPTH 37'
PAGE 1 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	3	SJSB037-G01	1.6	0-2			moist, dk brown, v. soft gravelly silt. Occasional organic material. (Fill)	15	20	65
	WOH	SL0651			1	Fill				
	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~~, moist, CLAY w/ odor Munsell: 2.5Y (2.5/1) + 7.5YR (3/2)			
	6	~~14~~ 1510			5					
	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 Native, Black mottling throughout.			
	7	SL0654								
	7				8		Muncell: 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~~					11-12: laminations of black, v. soft SILT ~1/4" thick			
	2				12					
SS	1	SJSB037-G07					12-12.6 SAA			
	2	1650			13		12.6: grades to dk gray SILT laminations w/in bluish-gray sandy CLAY.			
	1	SL0656								
	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					

Remarks: 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
SAMPLING METHOD ____ in. by ____ ft
BORING # ____
DATE BEGAN ____
DATE COMPLETED ____
TOTAL DEPTH ____
PAGE ____ 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	6	SJSB037-G09	1.4	20-22	21	SM	Wet, loose, gray silty f-m. SAND	–	85	15
	3	0805								
	6	SLD658								
	10				22					
					23					
					24					
					25		ST: No Recovery. Do SS.			
ST SS	4	SJSB037-G10	1.6	25-27		SP	SAA	–	95	5
	8	0845			26					
	11	SL0659								
	12	GS			27					
					28					
					29					
					30					
SS	1	SJSB037-G11	0.7	30-32			SAA, Shell halves + pieces (trace).			
	2	0900			31					
	1	SL0660								
	2				32					
					33					
					34					
					35					
SS	2	SJS037-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

BORING # STSB037B
DATE BEGAN 11-16-18
DATE COMPLETED
TOTAL DEPTH
PAGE 3 OF
SAMPLING METHOD 3 in. by 2 ft

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 1030 STSB037-G13	0	0-2	1					
					2					
ST	Push	~~1045~~ 1050 SL0662 STSB037-G14	1.8	2-4	3					
					4					
SS	WOH	1100 STSB037-G15 No Sample	1.6	4-6	5		Wet to moist, v. soft, dk brown CLAY (waste). Occassional to moderate wood debris.			
					6					
ST	Push	No Recovery STSB037-G16	0	6-8	7					
					8					
ST	Push	STSB037-G17 1120 SL0663	1.2	8-10	9					
					10		Bottom: Native, sandy CLAY, moist, dk bluish-gray	–	15	85
					1		End @ 10'			
					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 BORING # ~~SJGB038~~

PROJECT NUMBER: 180557-01.01 Task 03 DATE BEGAN 12/9/18

GEOLOGIST/ENGINEER Sam Giannakos DATE COMPLETED 12/9

DRILLING CONTRACTOR: Cascade TOTAL DEPTH 36'

DRILLING METHOD Sonic SHEET 1 OF 2

HOLE DIAMETER 6", 2' by 3" Samples

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.
			~~G01~~ G0[illegible]			33	(0-1)	1		geotextile fragments; 1'-2' below cap
		~~G03~~	~~890~~			18				
						12		2		
		SJGB	038		0.1	2	2-4'			gravel (large) with sand (no sample)
			~~G02~~			2	(1-3)	3		
		~~SLO~~	~~891~~			3				
						WOH		4		
		SJGB	038		0	1	4-6			no sample recovered
			~~G03~~			WOH	(3-5)	5		
		~~SLO~~				1				
						WOH		6		
					0		6-8'			Soft → casing at 6', ~~hole~~ at 8' - no sample
							(5-7)	7		
								8		
		SJGB	~~038~~		0.6	WOH	8-10			Oily - hydrocarbon odor (chem sample)
			G04			WOH	(7-9)	9		waste: black ooze
			1130			1				
						WOH		0		
		SJGB	038		1.0	1	10-12			grading out of waste:
			G05			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/ pockets of
			G06			↓		3		fine grey sand
		SL08	890							
			1200					4		
		SJGB	038		2.0	WOH	14-16			SAA @ 12'
			G07			↓	(13-15)	5		
		SL08	891							
			1315					6		
		SJGB	G08		2.0	WOH	19'-21'			Very loose, grey, med. Silty SAND 64/40
		SLO	892			↓		7		
			1325							
								8		
								9		
								0		

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

⚓ ANCHOR QEA	
LOG OF EXPLORATORY BORING	CLIENT/PROJECT NAME: IPC/MIMC - SJRWP PDI-1
	PROJECT NUMBER: 180557-01.01 Task 03
	GEOLOGIST/ENGINEER
	DRILLING CONTRACTOR: Cascade
	DRILLING METHOD
	HOLE DIAMETER

BORING # SJSB038
DATE BEGAN
DATE COMPLETED
TOTAL DEPTH
SHEET 2 OF 2

Field location of boring

OTHER*	WELL OR PIEZOMETER DETAILS	SAMPLING DATA: 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		
	SS	SJSB	038		2.0	4	24-26'			loose, grey, moist medium to coarse SAND 90%, 10%
			G09			3		25		laminations of clay in cap.
		SL08	93			2				
			1335			2		26		
								27		
								28		
								29		~~med~~
	SS	SGSB	038		1.3	3	29-31			med. dense, moist, light grey coarse 100%
			G10			7		30		SAND
		SLD	894			12				
			1345			8		31		
								32		
								33		
								34		
	ST	SJSB	038		2.3'	PUSH	34-36			Beaumont
			G11					35		
		SLD	895							
								36		
								37		
								38		
								39		
								40		

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

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 : 110° Celsius

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GeoTesting EXPRESS

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 : 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:	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 : 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: 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 : 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:	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 : 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: 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 : 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:	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 : 110° Celsius

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GeoTesting EXPRESS

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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GeoTesting EXPRESS

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 : 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: 12/06/18	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 : 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: 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 : 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: 01/11/19	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 : 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:	01/11/19	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

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 : 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: 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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GeoTesting EXPRESS

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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GeoTesting EXPRESS

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 : 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: 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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GeoTesting EXPRESS

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 : 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:	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.

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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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.

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.

GeoTesting EXPRESS

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.

GeoTesting EXPRESS

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.

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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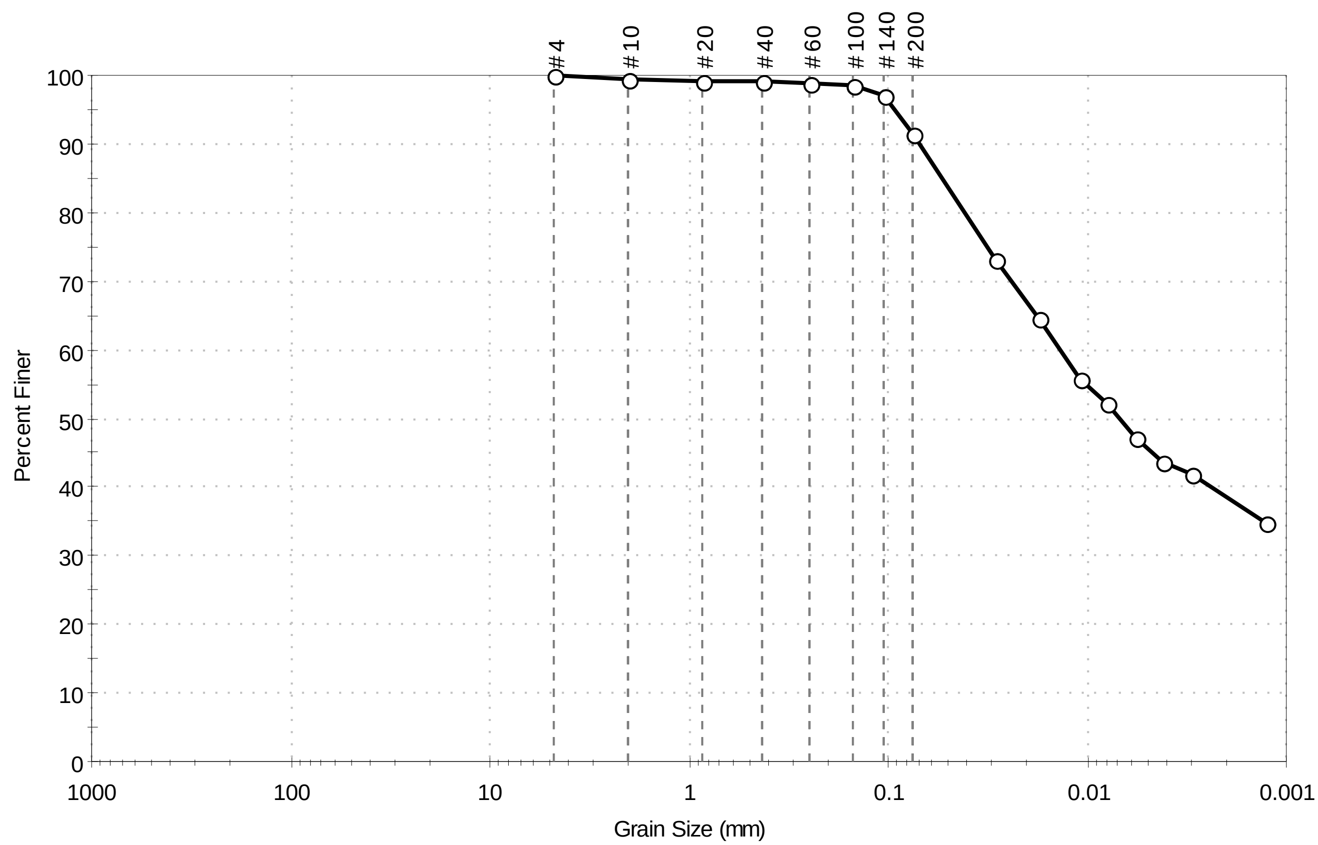
Client:	Anchor QEA, LLC
Project:	San Jacinto Pre-Design Investigation
Location:	
Project No:	GTX-309154
Boring ID:	SJGB018
Sample ID:	SL0866
Depth :	18-20 ft
Sample Type:	bag
Test Date:	02/25/19
Test Id:	486394
Tested By:	ckg
Checked By:	bfs
Test Comment:	---
Visual Description:	Moist, mottled light 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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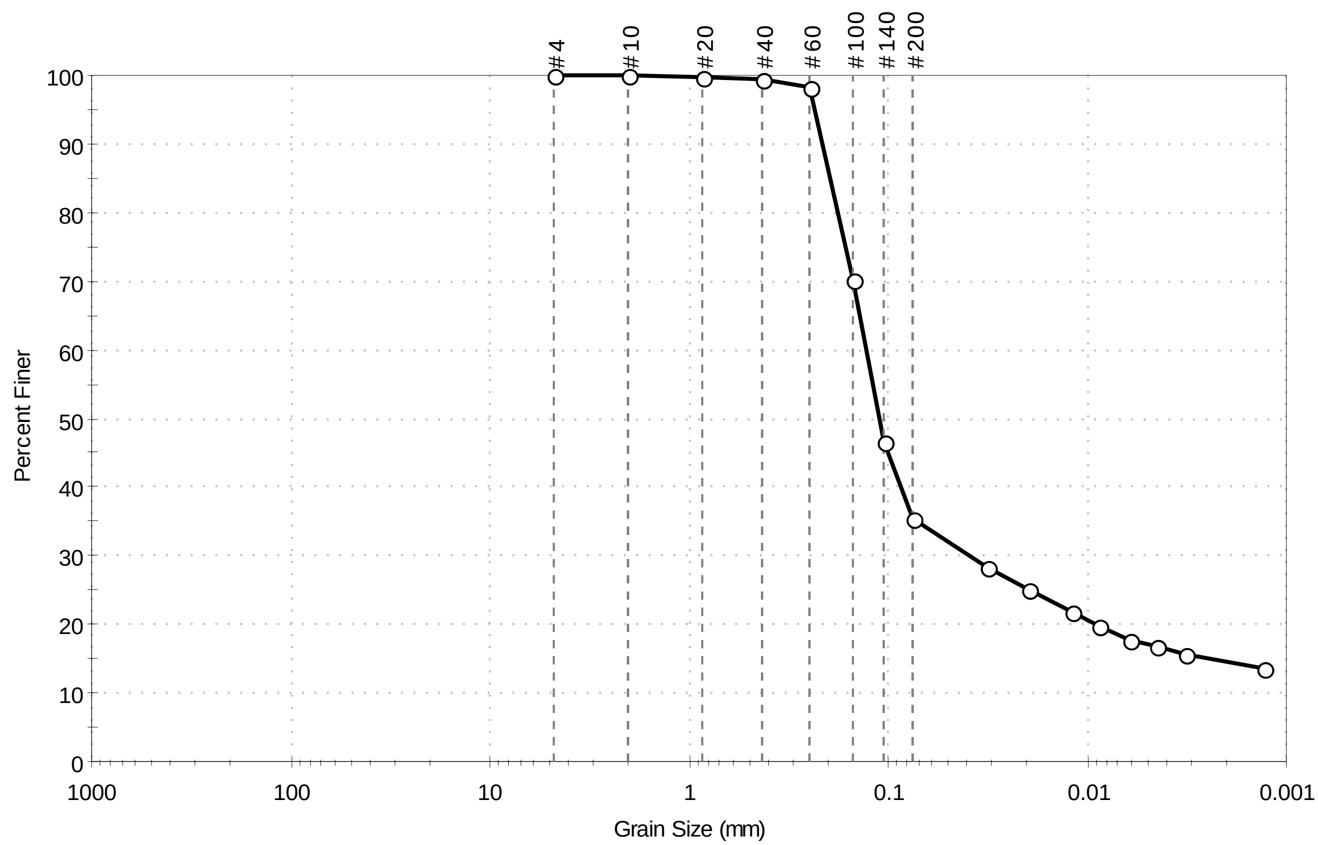
Client:	Anchor QEA, LLC		
Project:	San Jacinto Pre-Design Investigation		
Location:		Project No:	GTX-309154
Boring ID: SJGB018	Sample Type: bag	Tested By:	ckg
Sample ID: SL0870	Test Date: 02/25/19	Checked By:	bfs
Depth : 40-42 ft	Test Id: 486395		
Test Comment:	---		
Visual Description:	Moist, light 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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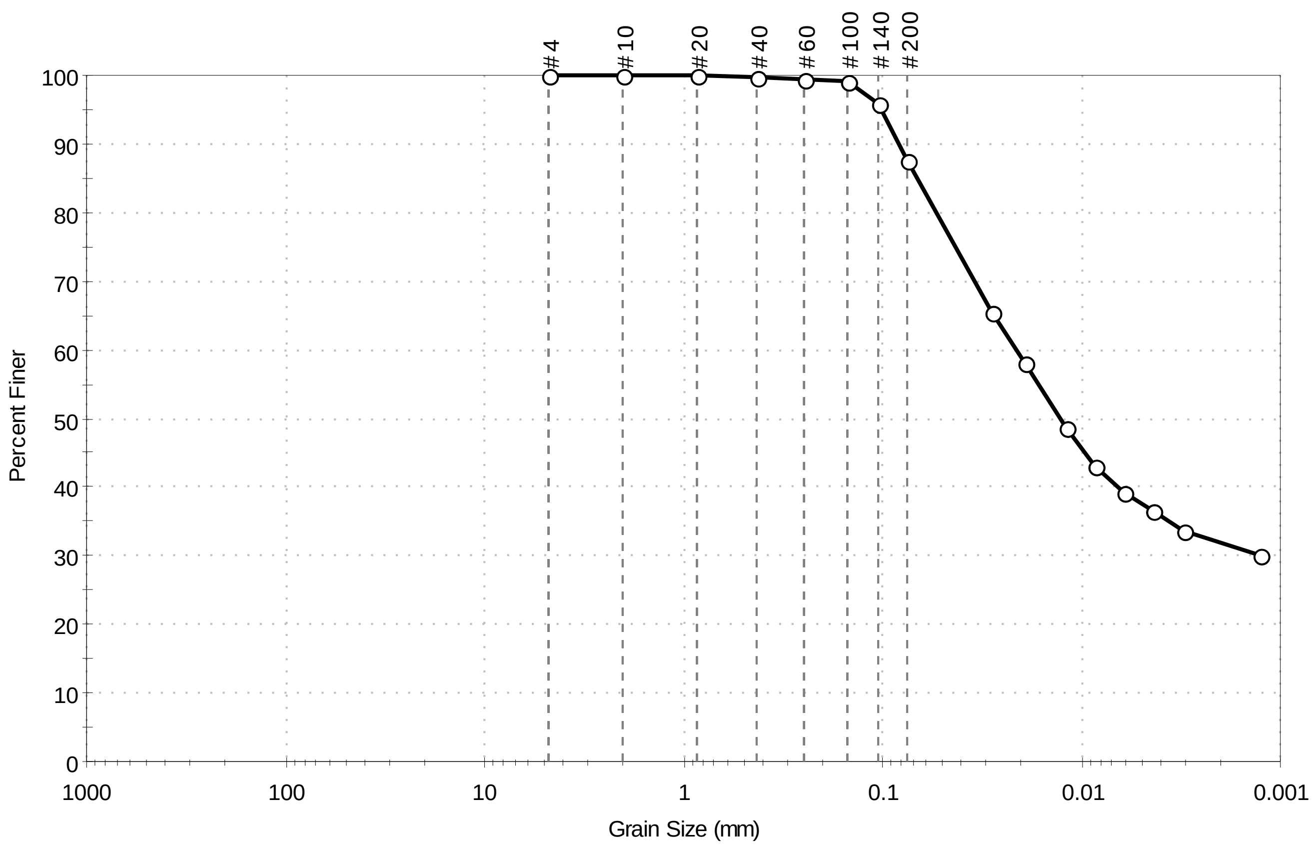
Client:	Anchor QEA, LLC
Project:	San Jacinto Pre-Design Investigation
Location:	
Project No:	GTX-309154
Boring ID: SJGB019	Sample Type: bag
Tested By: ckg	
Sample ID: SL0851	Test Date: 02/25/19
Checked By: bfs	
Depth : 20-22'	Test Id: 485119
Test Comment:	---
Visual Description:	Moist, light yellowish 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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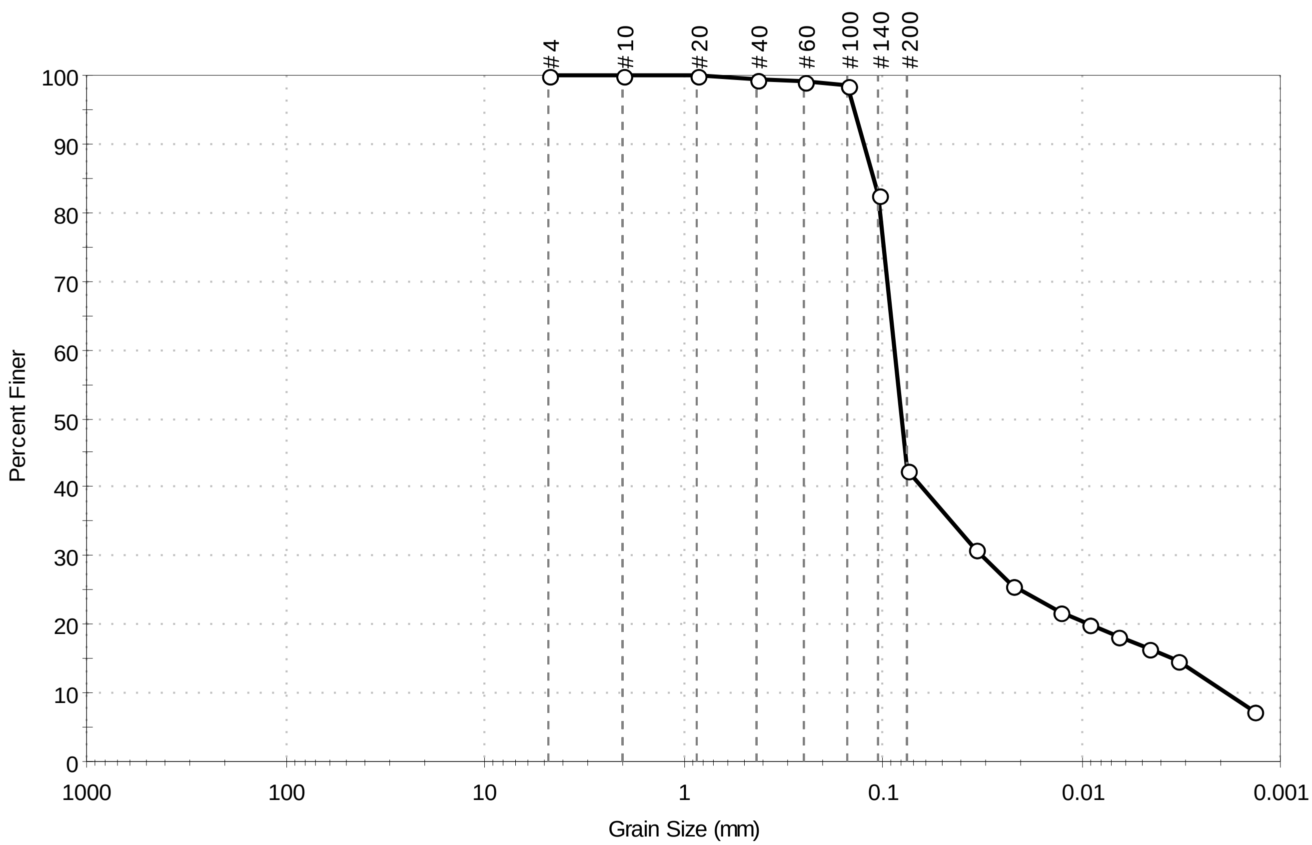
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJGB019	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL0854	Test Date:	02/26/19	Checked By:	bfs
Depth :	35-37'	Test Id:	485120		
Test Comment:	---				
Visual Description:	Moist, 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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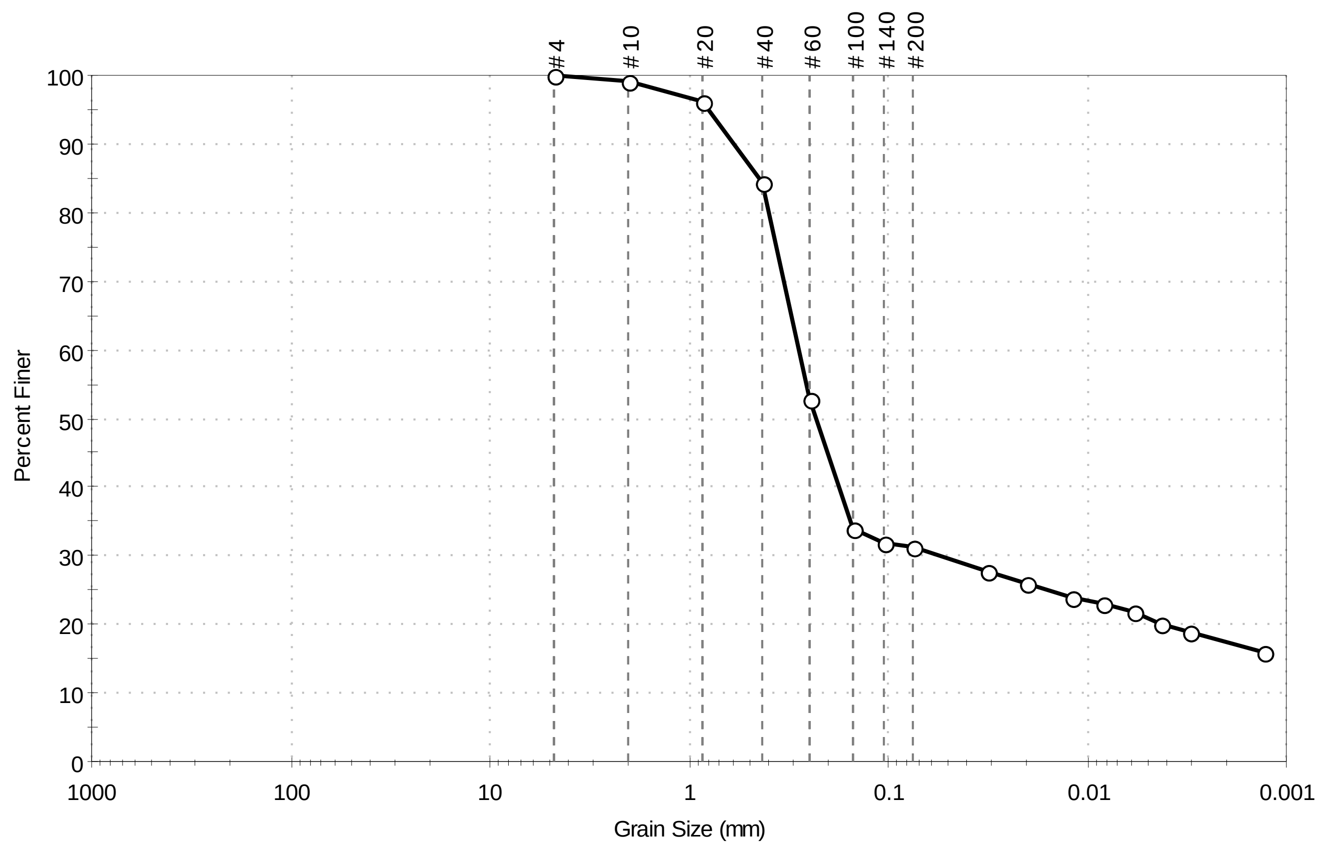
Attachment Figure A.4-39

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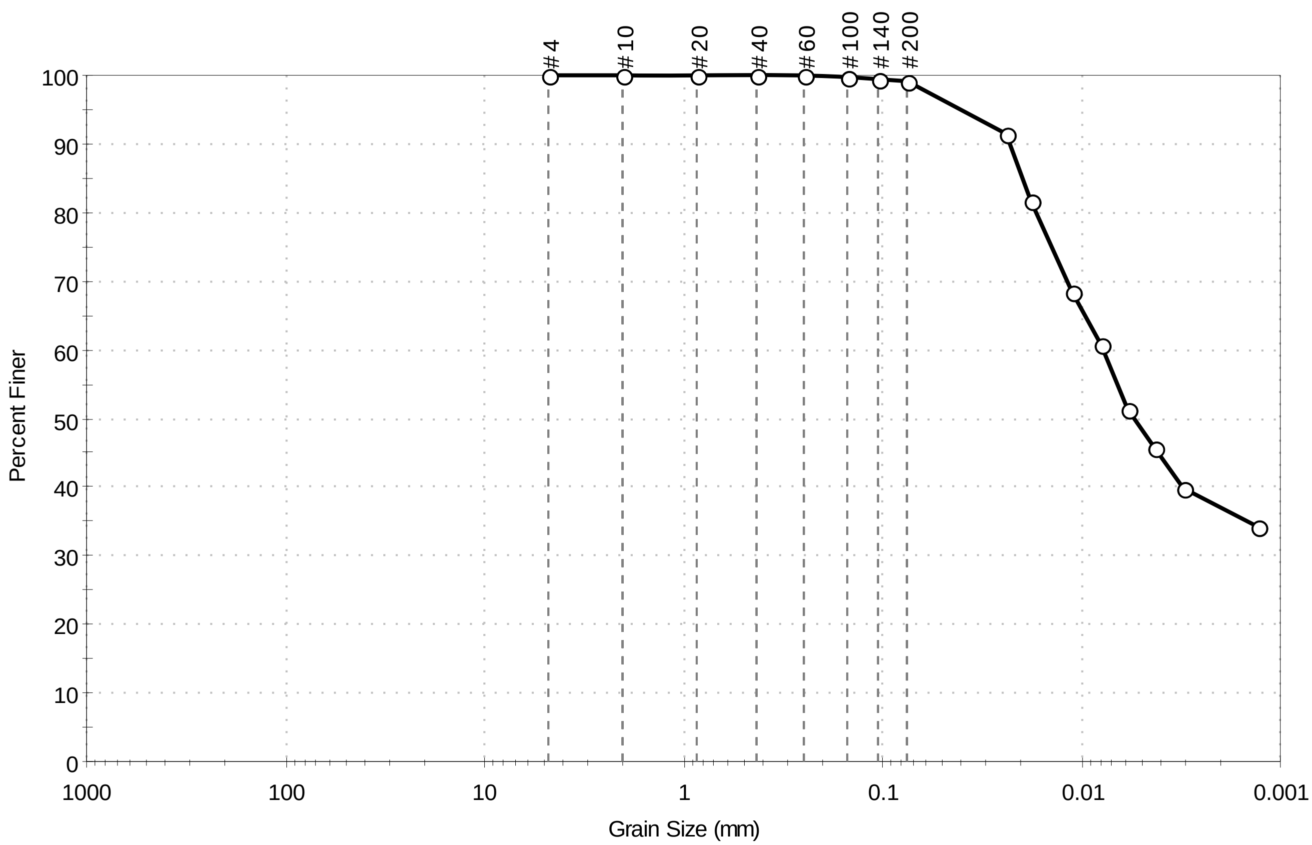
Client:	Anchor QEA, LLC
Project:	San Jacinto Pre-Design Investigation
Location:	
Project No:	GTX-309154
Boring ID:	SJGB020
Sample Type:	bag
Tested By:	ckg
Sample ID:	SL0846
Test Date:	02/25/19
Checked By:	bfs
Depth :	60-62'
Test Id:	485118
Test Comment:	---
Visual Description:	Moist, grayish brown clay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

printed 3/15/2019 12:44:00 PM

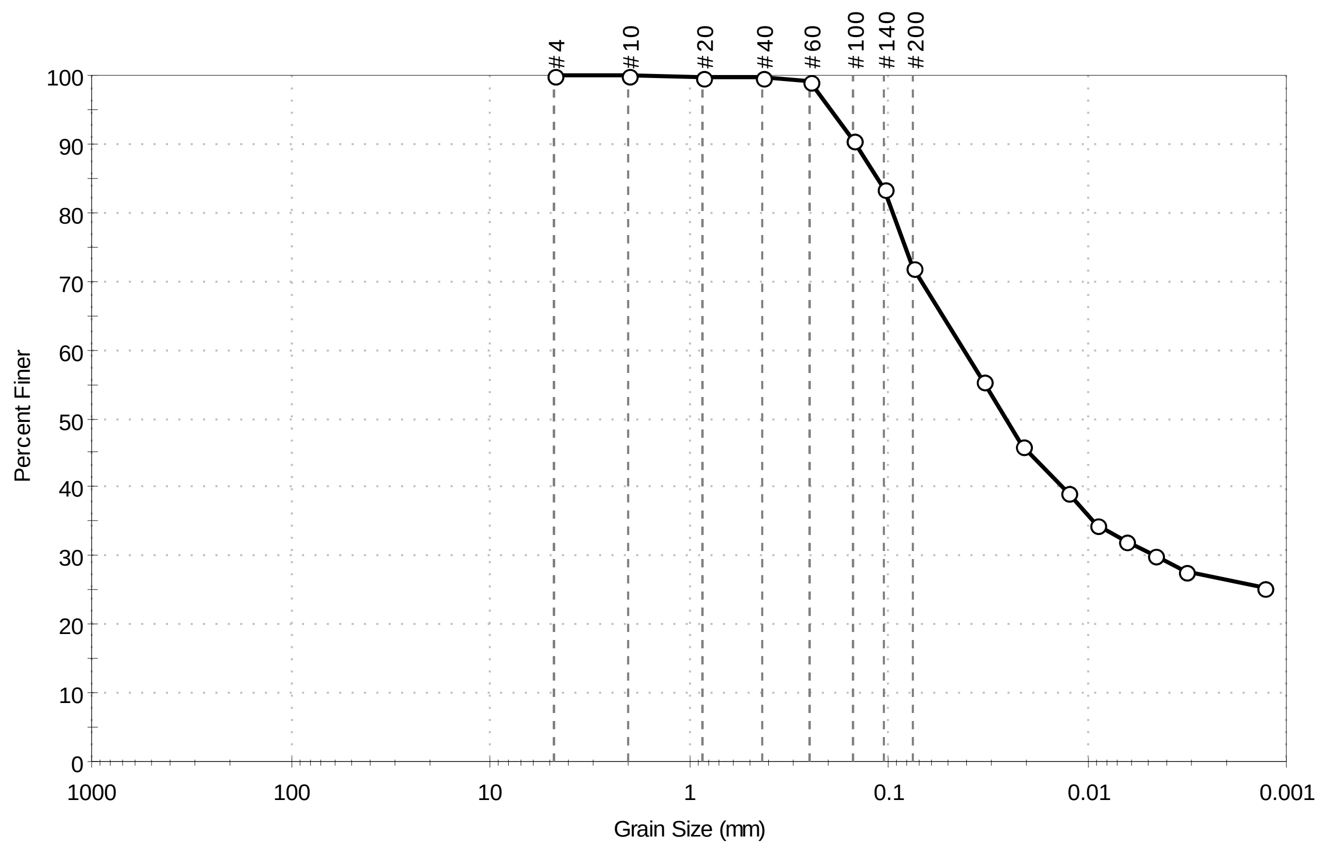
Client:	Anchor QEA, LLC			
Project:	San Jacinto Pre-Design Investigation			
Location:			Project No:	GTX-309154
Boring ID: SJGB021		Sample Type: bag	Tested By:	ckg
Sample ID: SL0823		Test Date: 02/25/19	Checked By:	bfs
Depth : 6'-8'		Test Id: 485161		

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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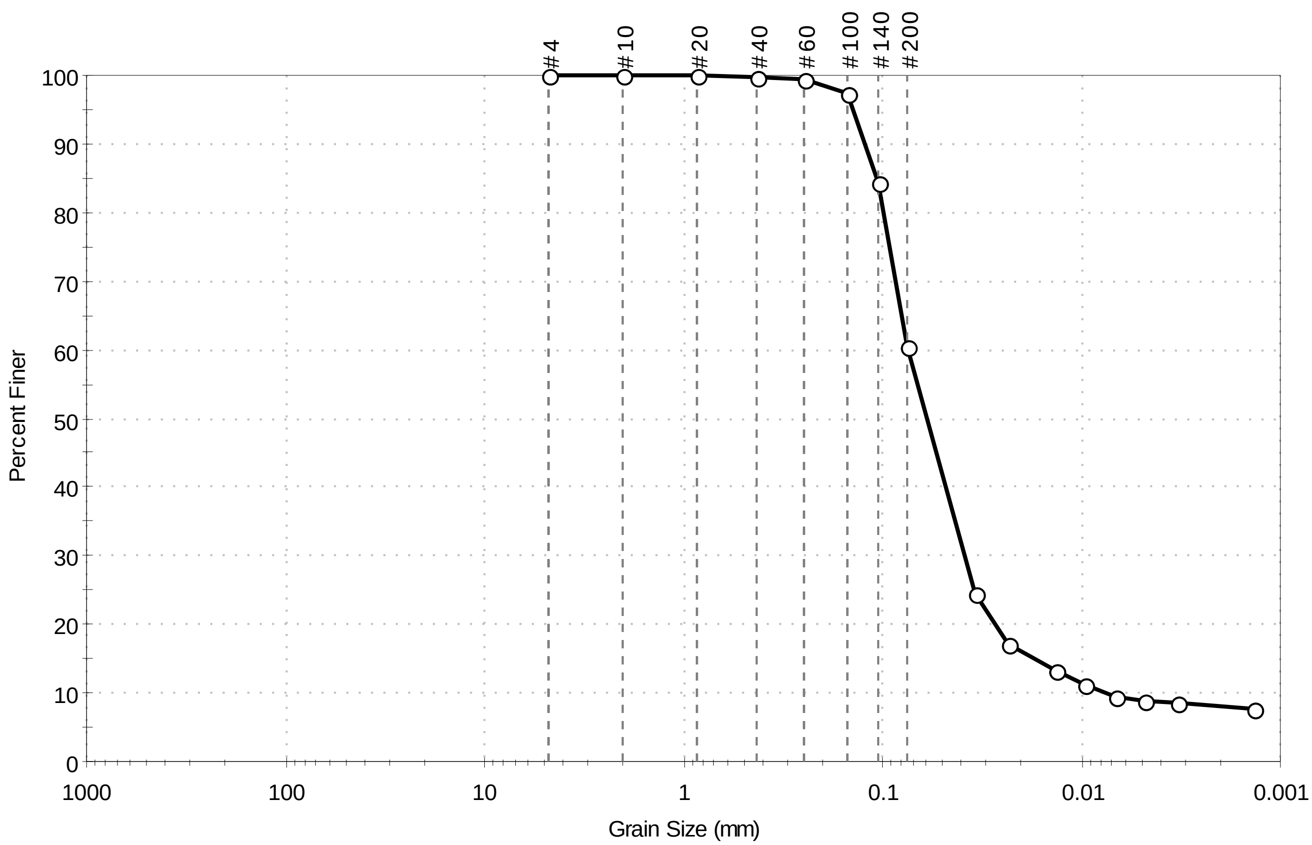
Client: Anchor QEA, LLC
Project: San Jacinto Pre-Design Investigation
Location: Project No: GTX-309154

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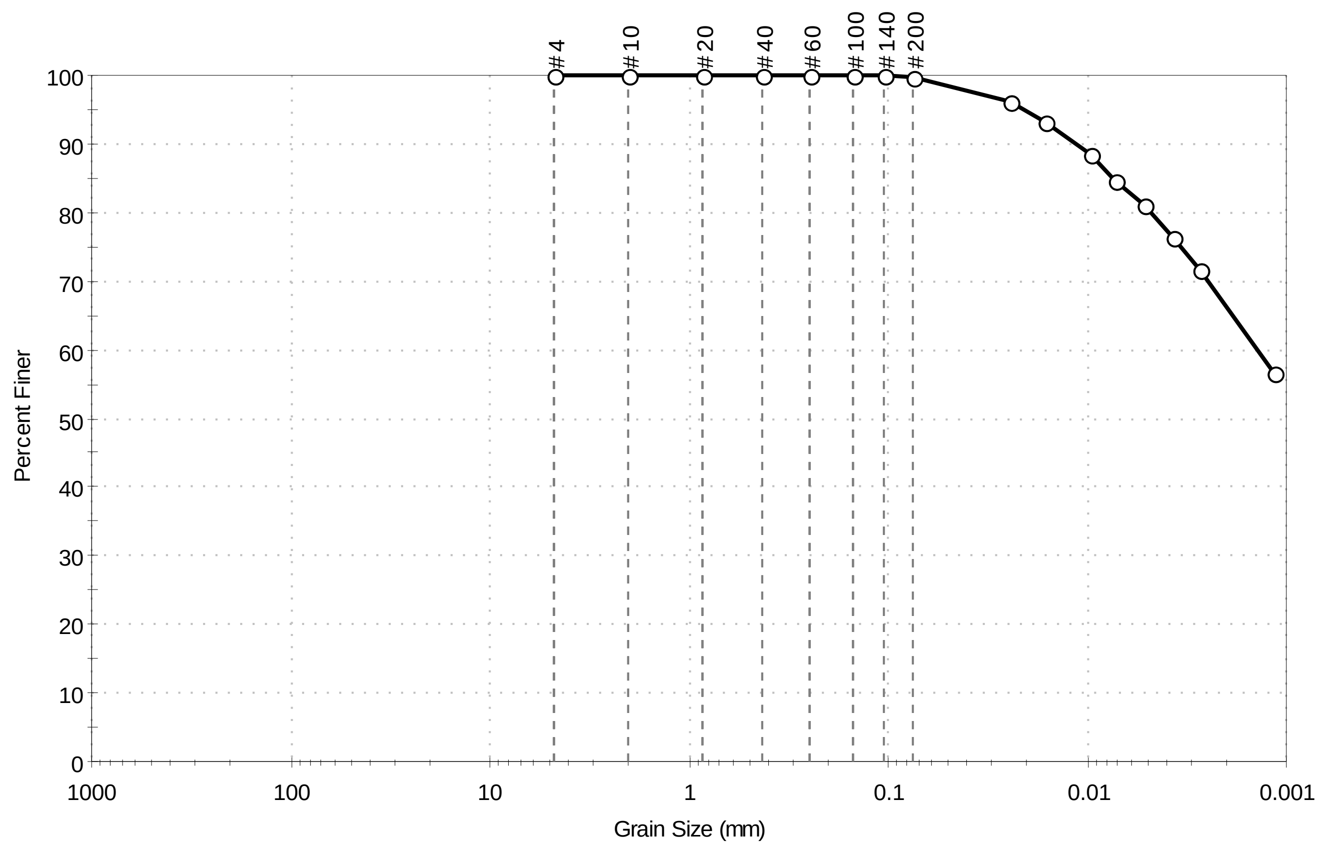
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJGB022	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL0818	Test Date:	02/26/19	Checked By:	bfs
Depth :	35'-37'	Test Id:	485159		
Test Comment:	---				
Visual Description:	Moist,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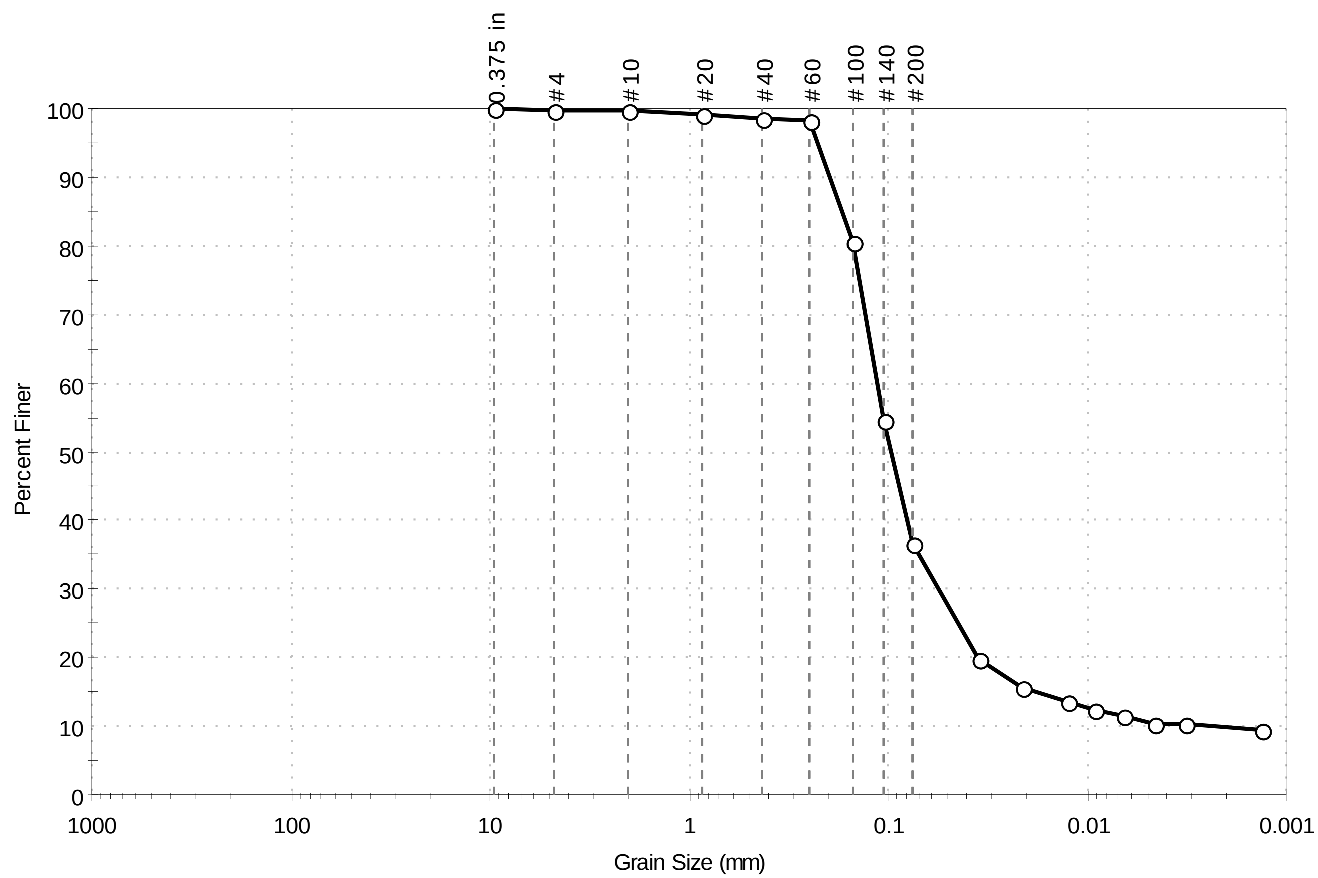
Client:	Anchor QEA, LLC		
Project:	San Jacinto Pre-Design Investigation		
Location:		Project No:	GTX-309154

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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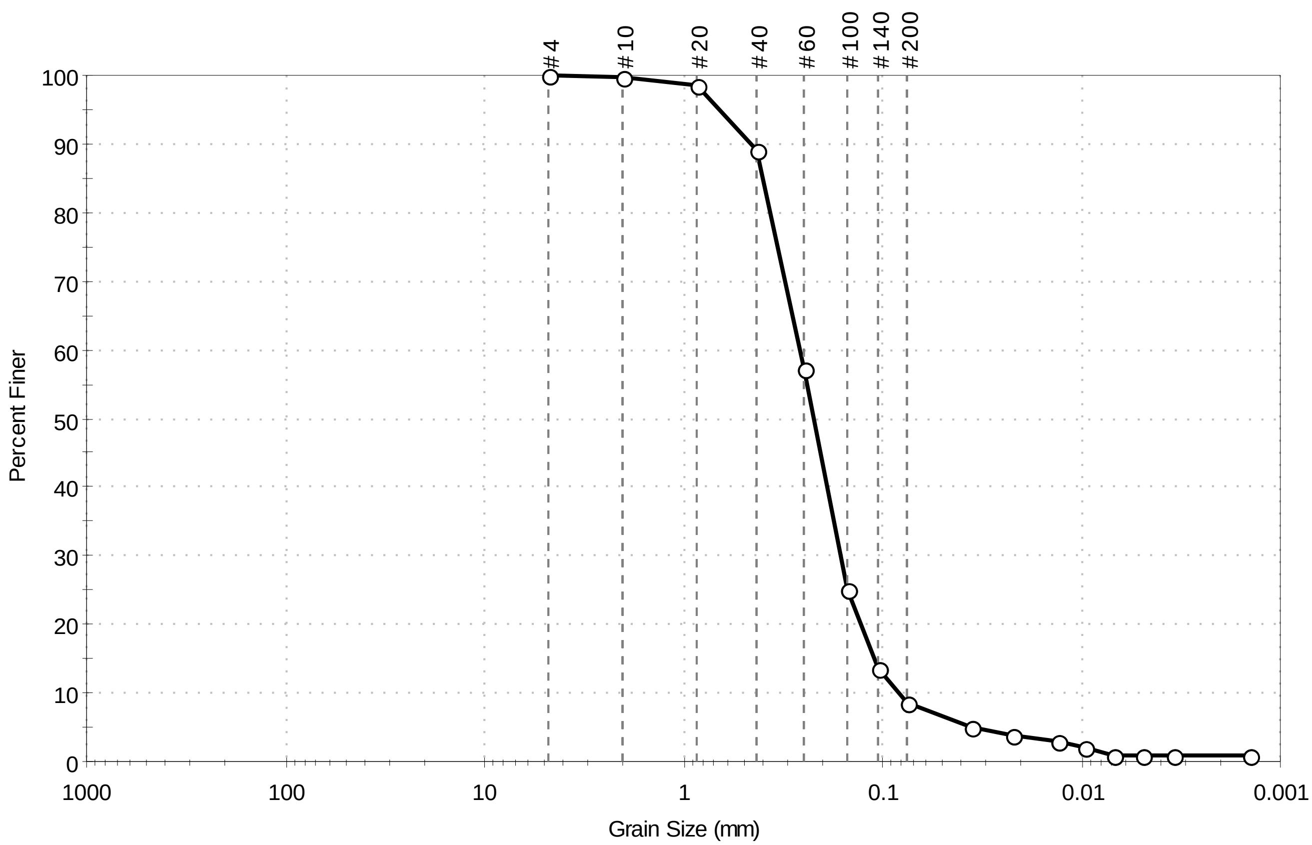
GeoTesting EXPRESS

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

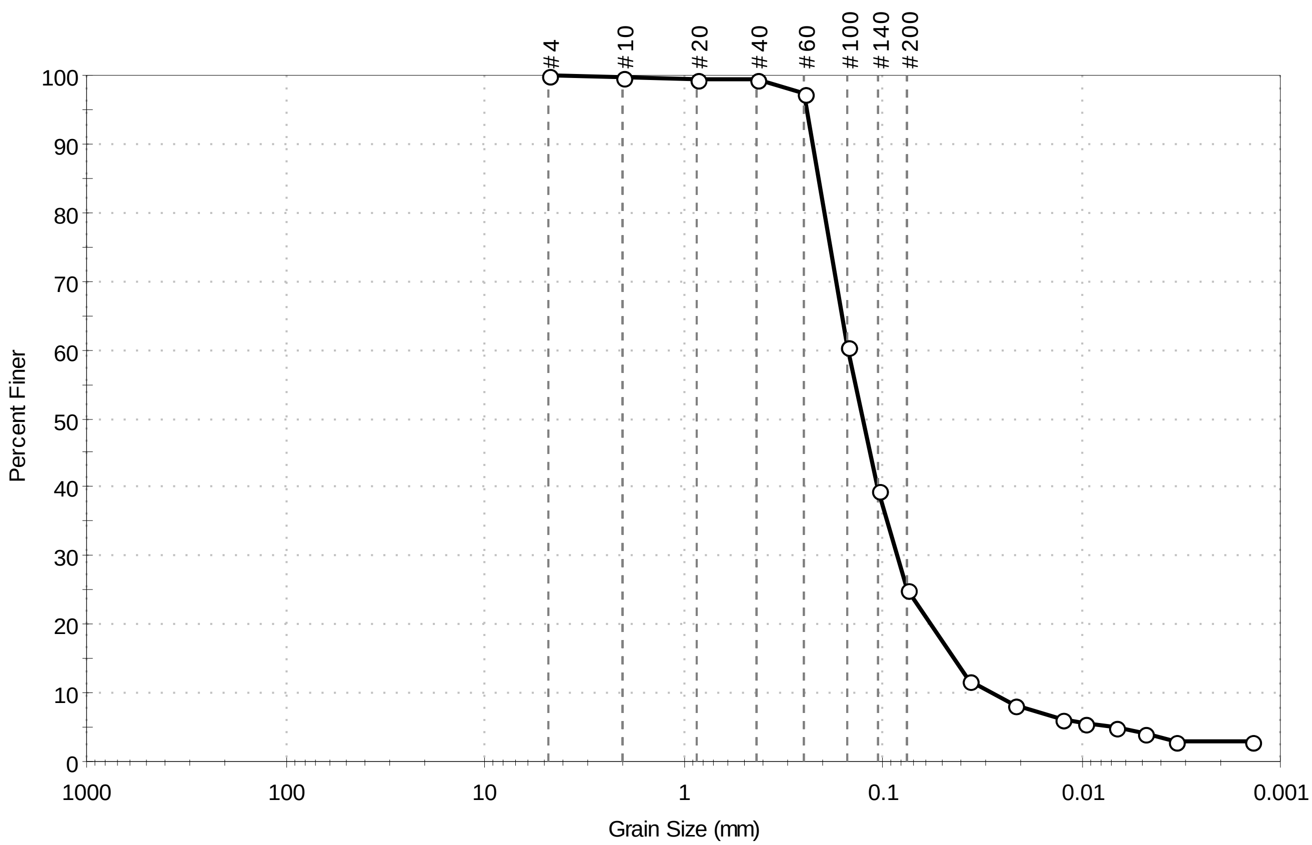
Boring ID:	SJGB023G16B	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL0889	Test Date:	02/25/19	Checked By:	bfs
Depth :	59.3-60 ft	Test Id:	486393		

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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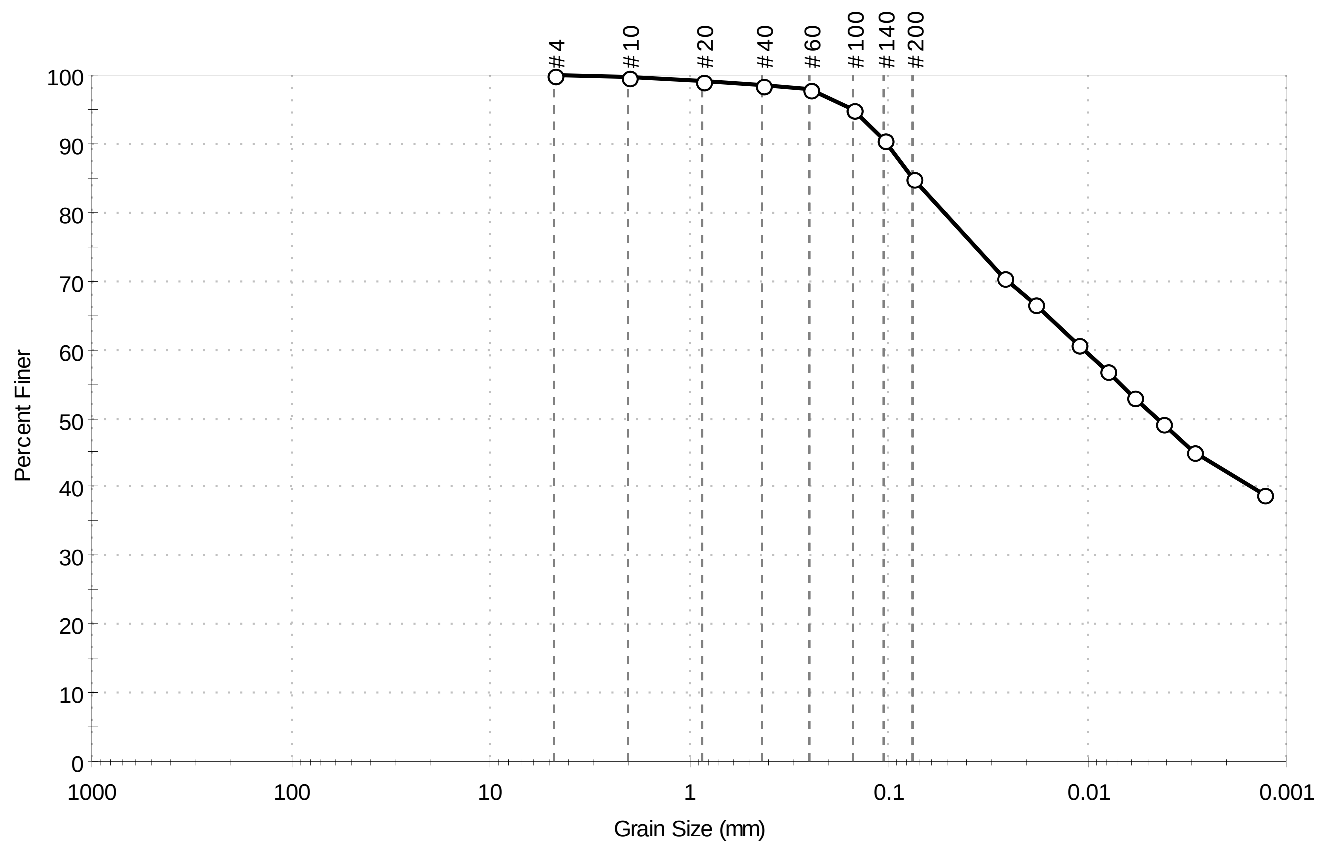
GeoTesting EXPRESS

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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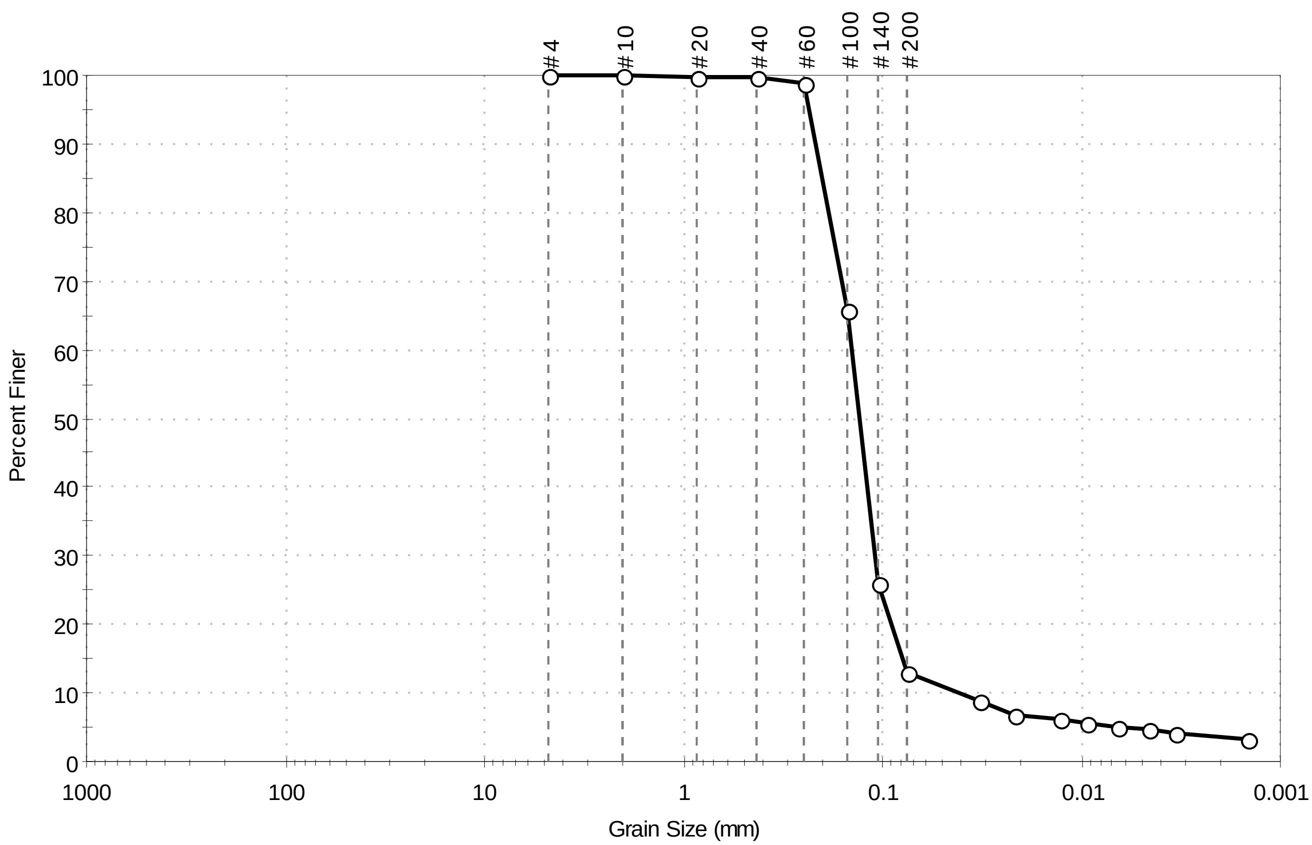
GeoTesting EXPRESS

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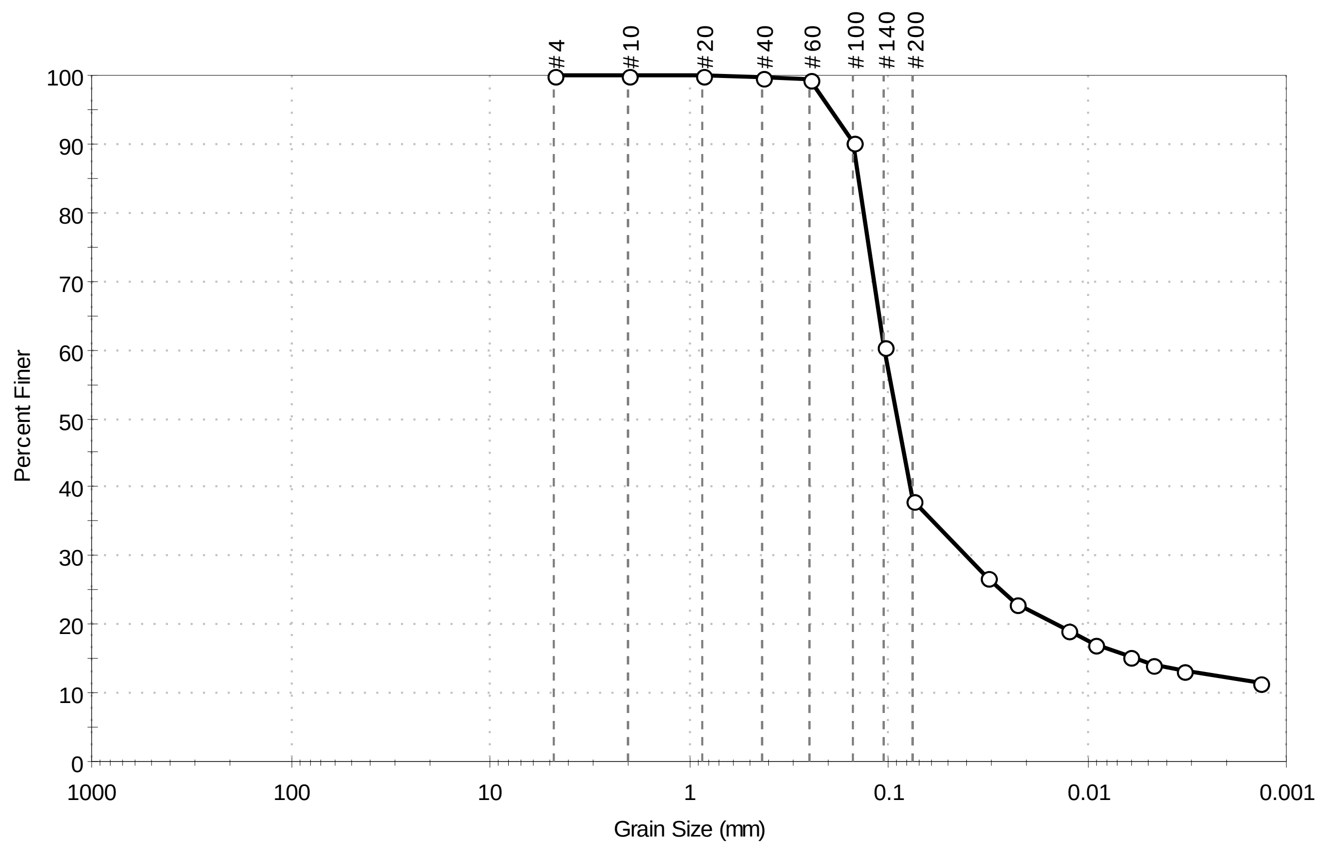
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB012-W1	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL1050	Test Date:	01/21/19	Checked By:	emm
Depth :	15-17 ft	Test Id:	482973		
Test Comment:	---				
Visual Description:	Moist,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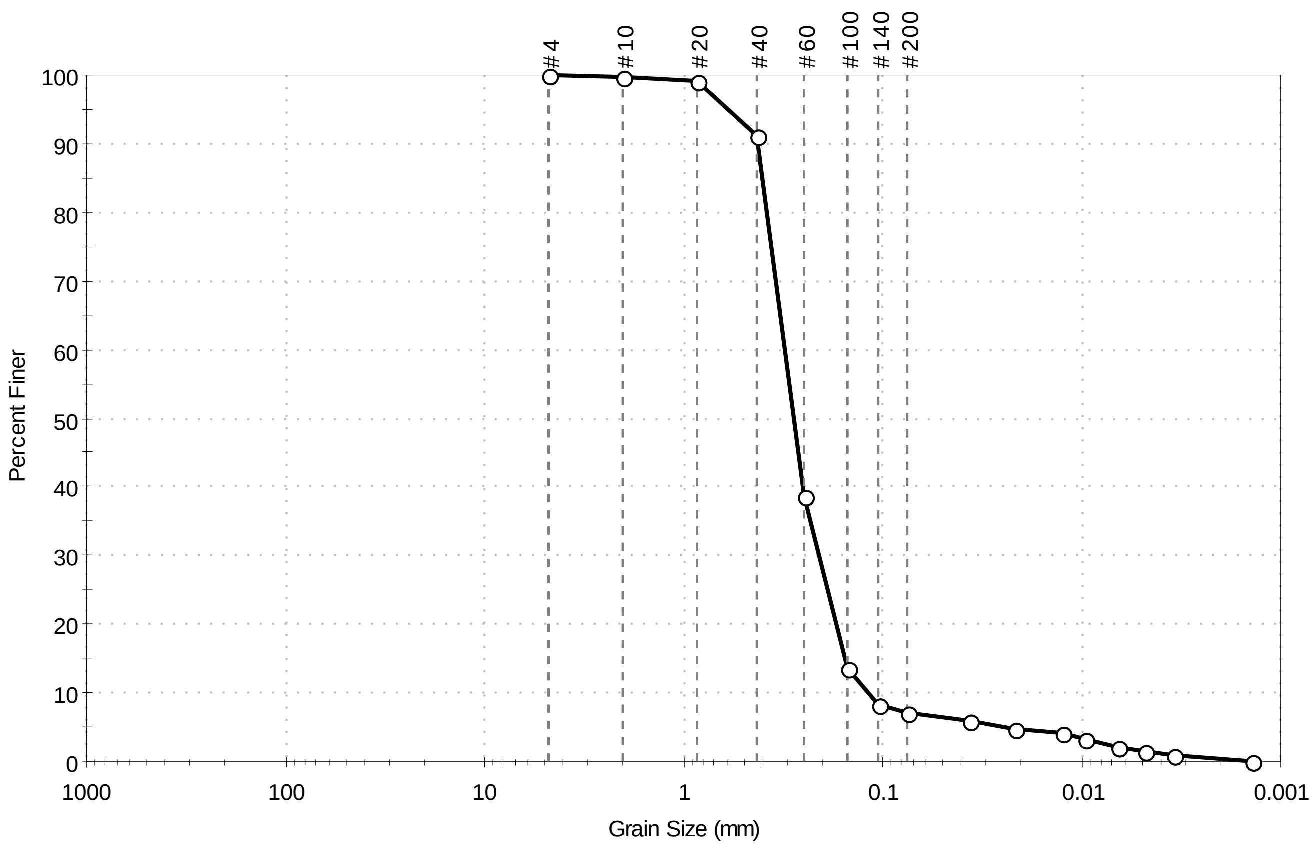
GeoTesting EXPRESS

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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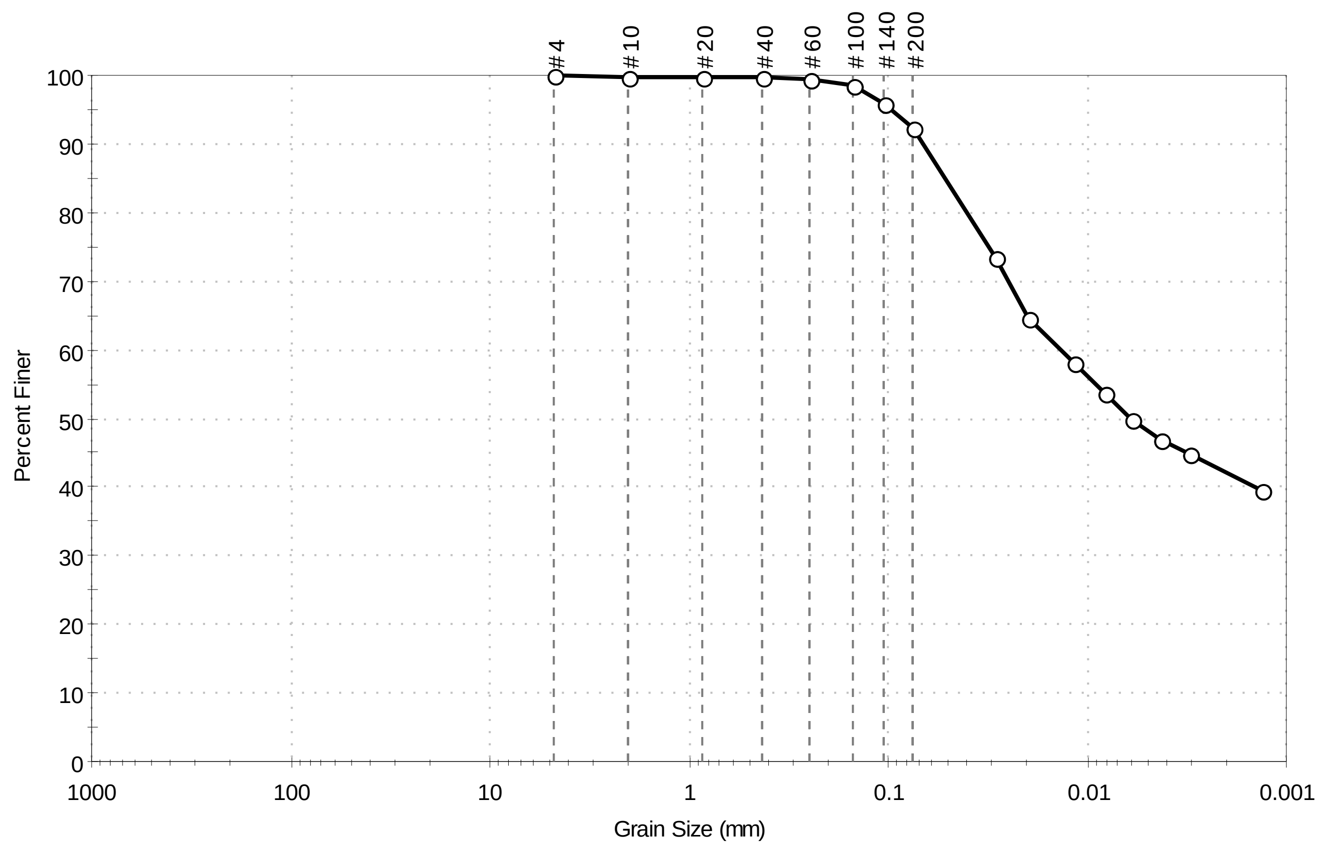
Client: Anchor QEA, LLC
Project: San Jacinto Pre-Design Investigation
Location:
Project No: GTX-309154

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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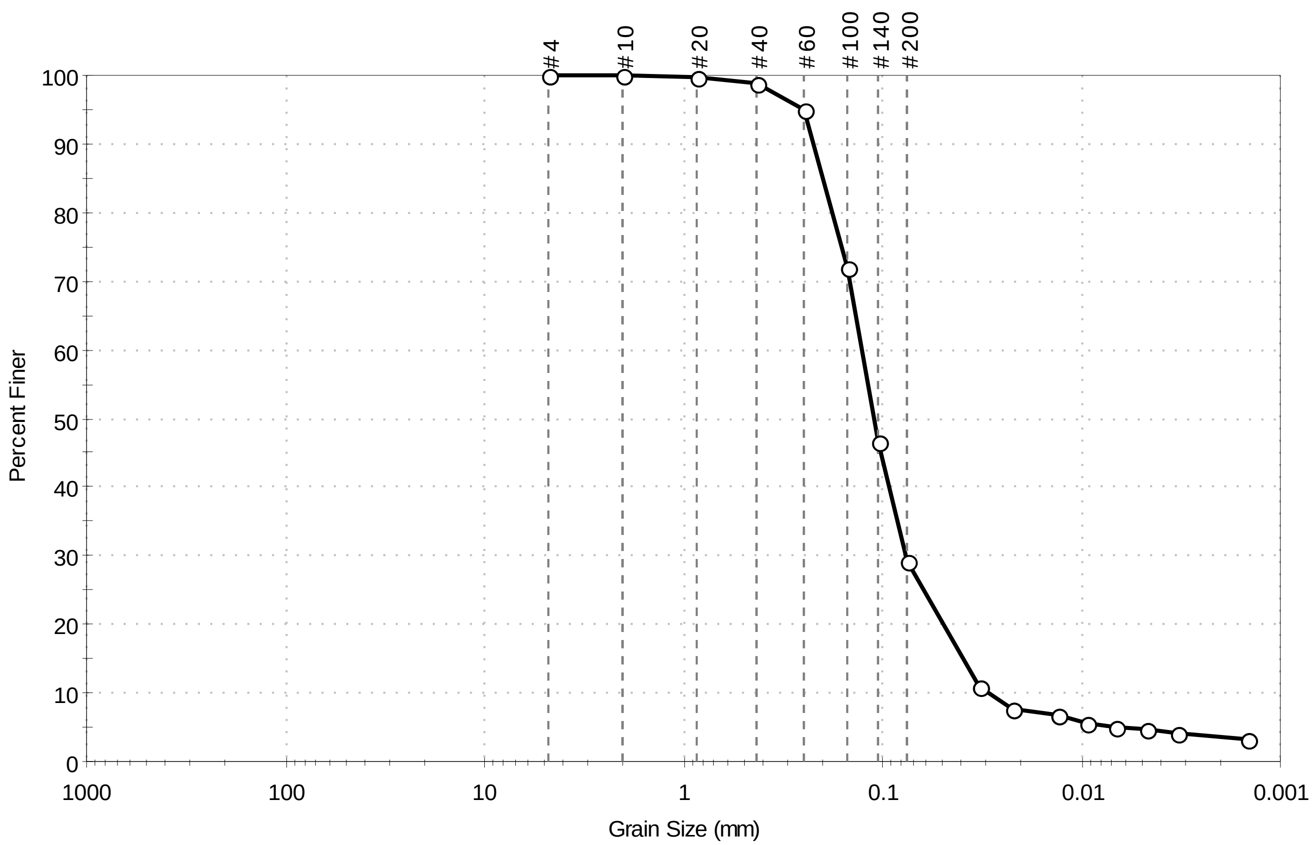
Client:	Anchor QEA, LLC
Project:	San Jacinto Pre-Design Investigation
Location:	
Project No:	GTX-309154
Boring ID:	SJSB019-E1
Sample Type:	bag
Tested By:	ckg
Sample ID:	SL1005
Test Date:	01/02/19
Checked By:	emm
Depth :	14-15 ft
Test Id:	482722
Test Comment:	---
Visual Description:	Moist, dark grayish 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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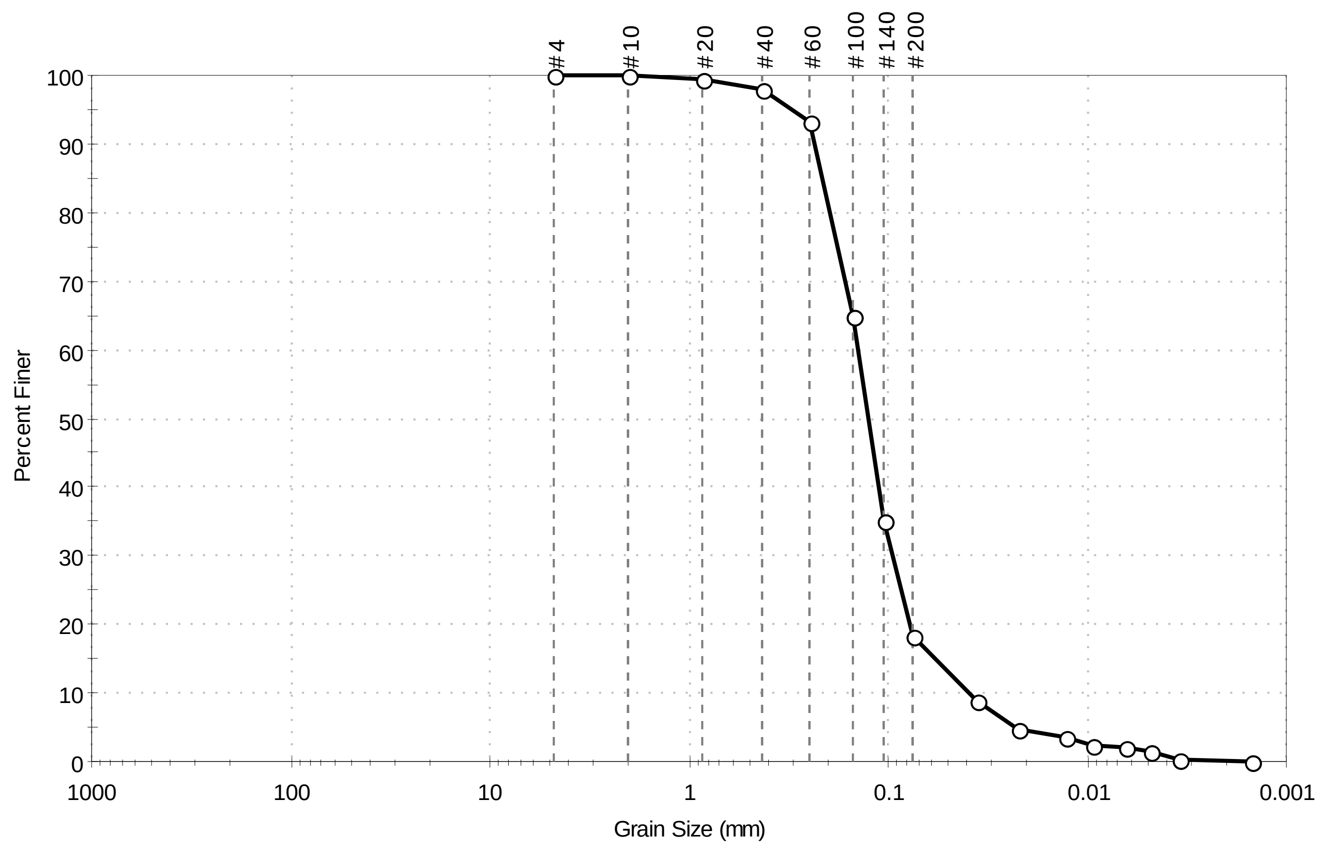
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB023-E1	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL1017	Test Date:	01/02/19	Checked By:	emm
Depth :	10-12 ft	Test Id:	482723		

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

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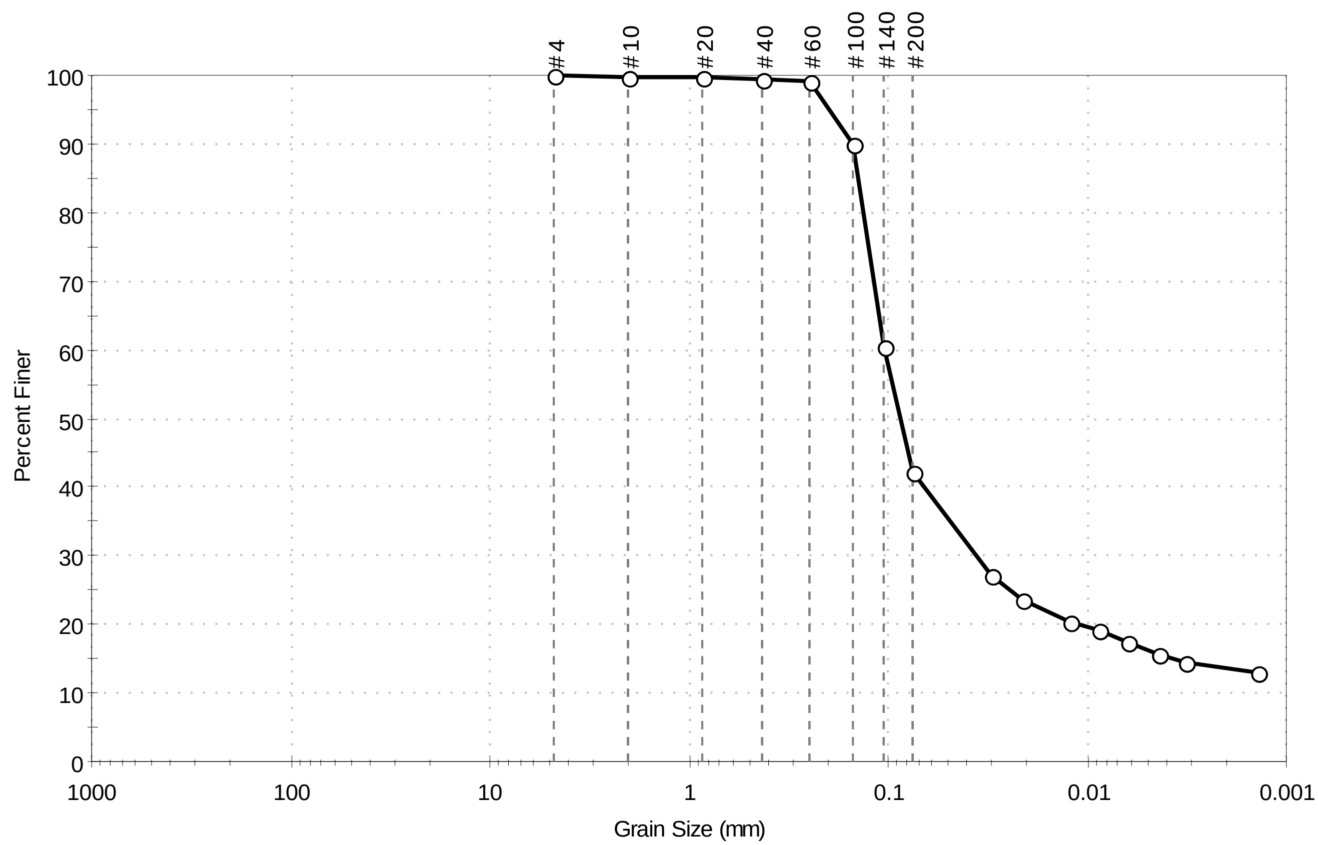
Client:	Anchor QEA, LLC		
Project:	San Jacinto Pre-Design Investigation		
Location:		Project No:	GTX-309154
Boring ID: SJSB023-E1	Sample Type: bag	Tested By:	ckg
Sample ID: SL1022	Test Date: 01/02/19	Checked By:	emm
Depth : 24-26 ft	Test Id: 482724		
Test Comment:	---		
Visual Description:	Moist, dark 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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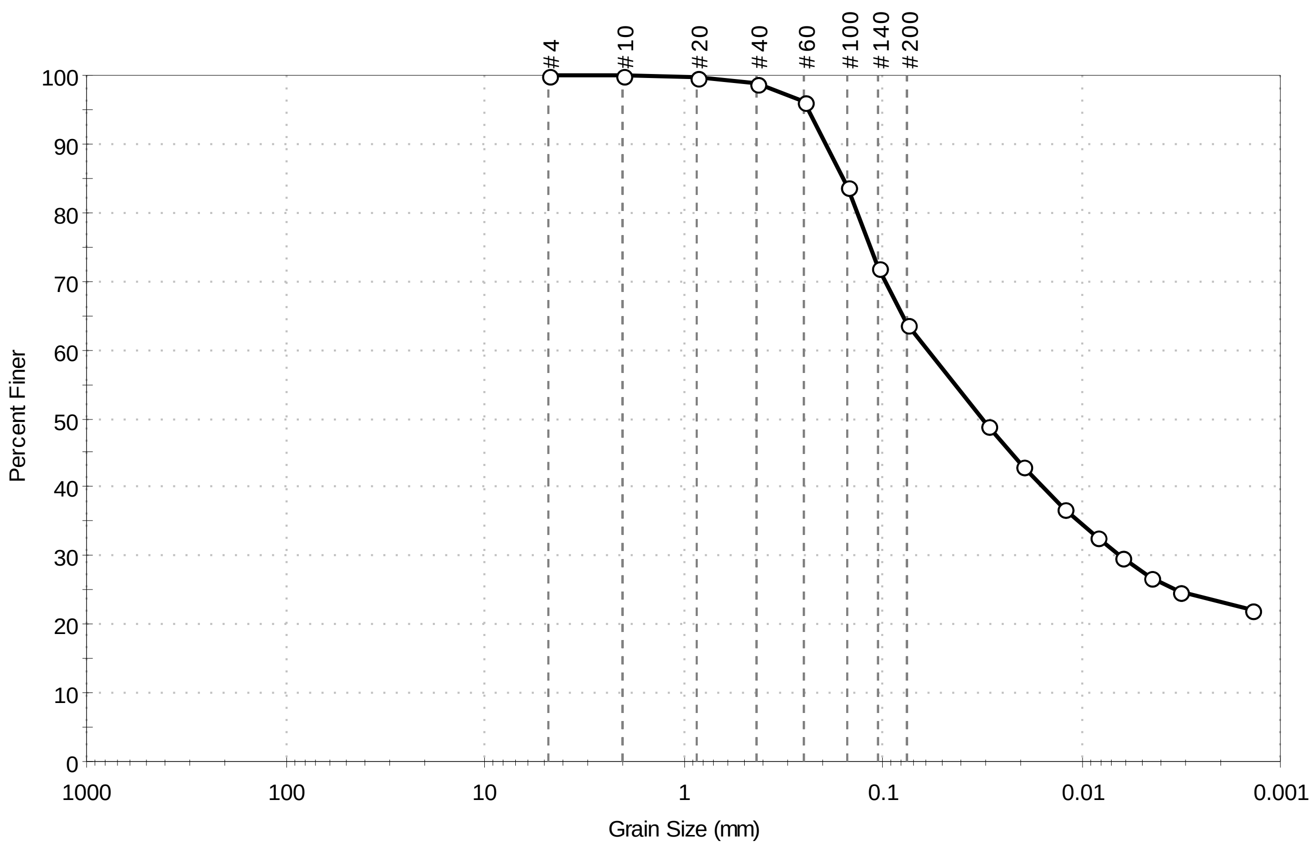
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB025-1W	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL1040	Test Date:	01/02/19	Checked By:	emm
Depth :	8-10 ft	Test Id:	482727		

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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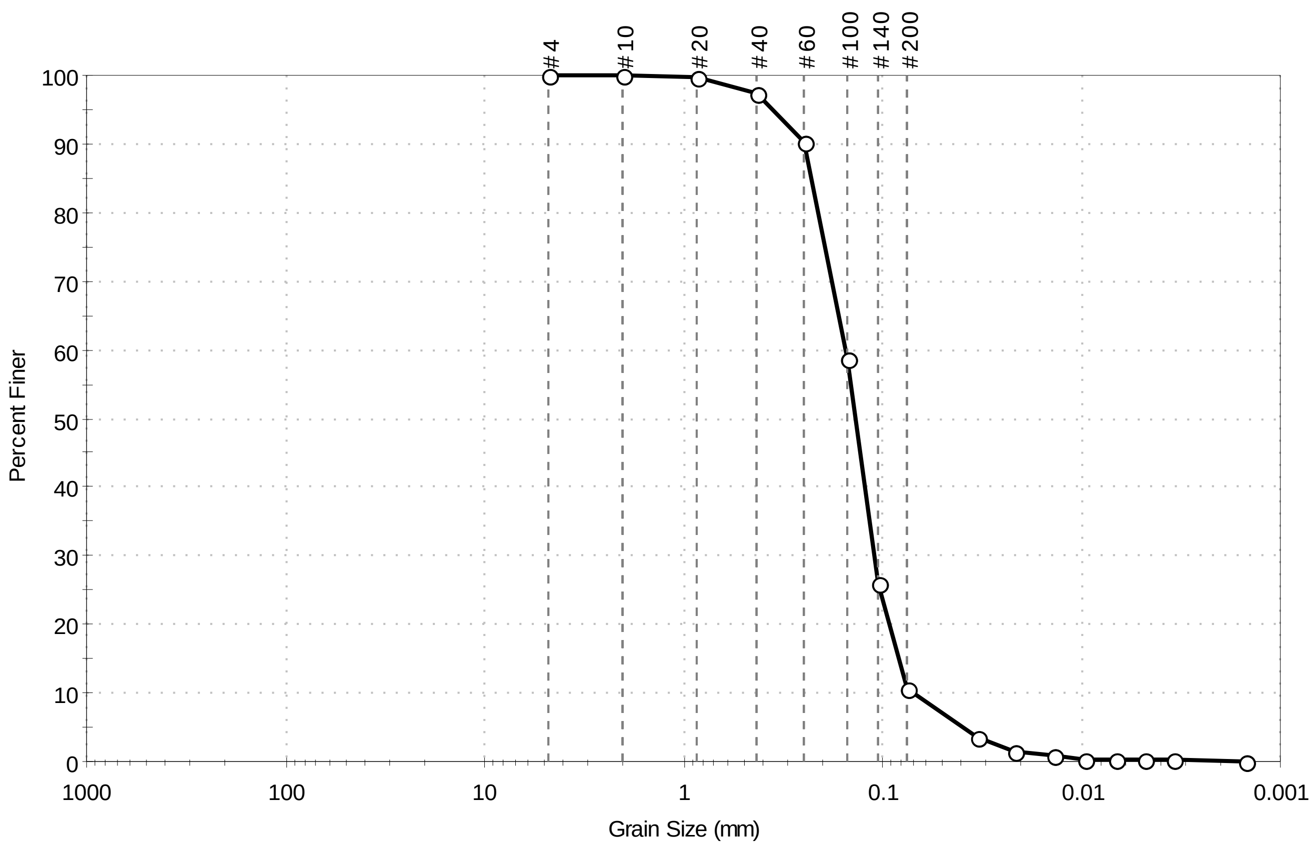
Client:	Anchor QEA, LLC		
Project:	San Jacinto Pre-Design Investigation		
Location:		Project No:	GTX-309154

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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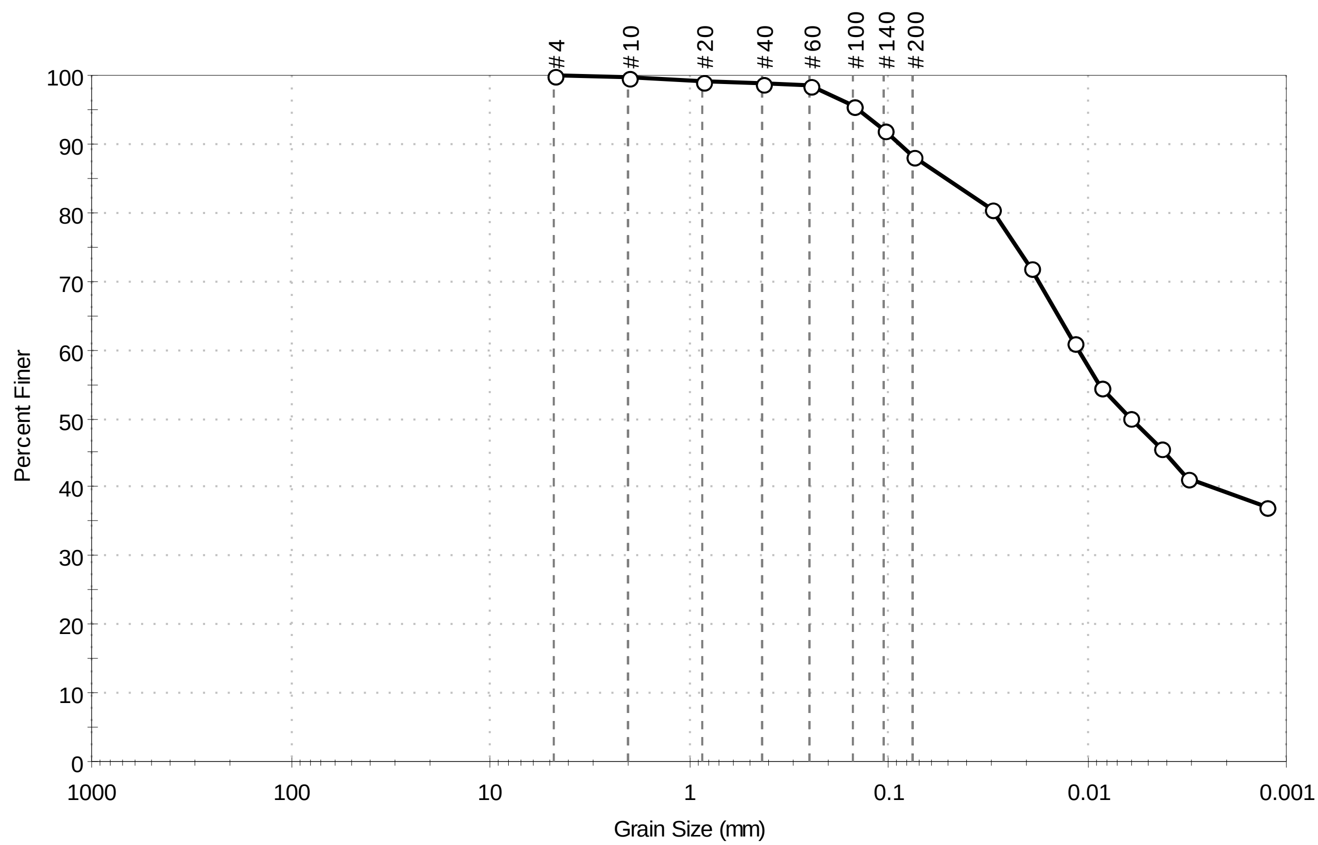
GeoTesting EXPRESS

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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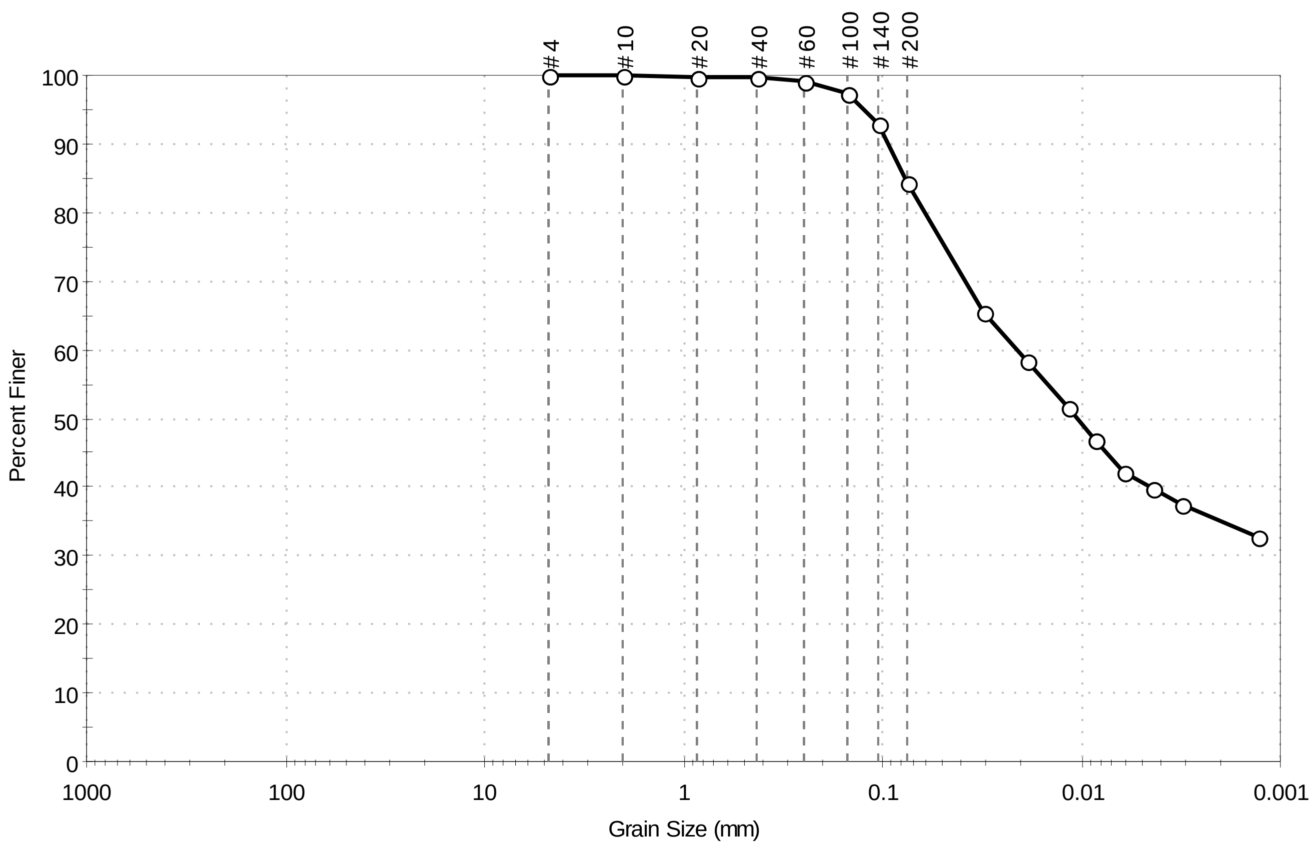
Client:	Anchor QEA, LLC
Project:	San Jacinto Pre-Design Investigation
Location:	Project No: GTX-309154
Boring ID: SJSB028	Sample Type: bag	Tested By: ckg
Sample ID: SL0806	Test Date: 02/25/19	Checked By: bfs
Depth : 25-27 ft	Test Id: 483657
Test Comment:	---
Visual Description:	Moist, very dark brown 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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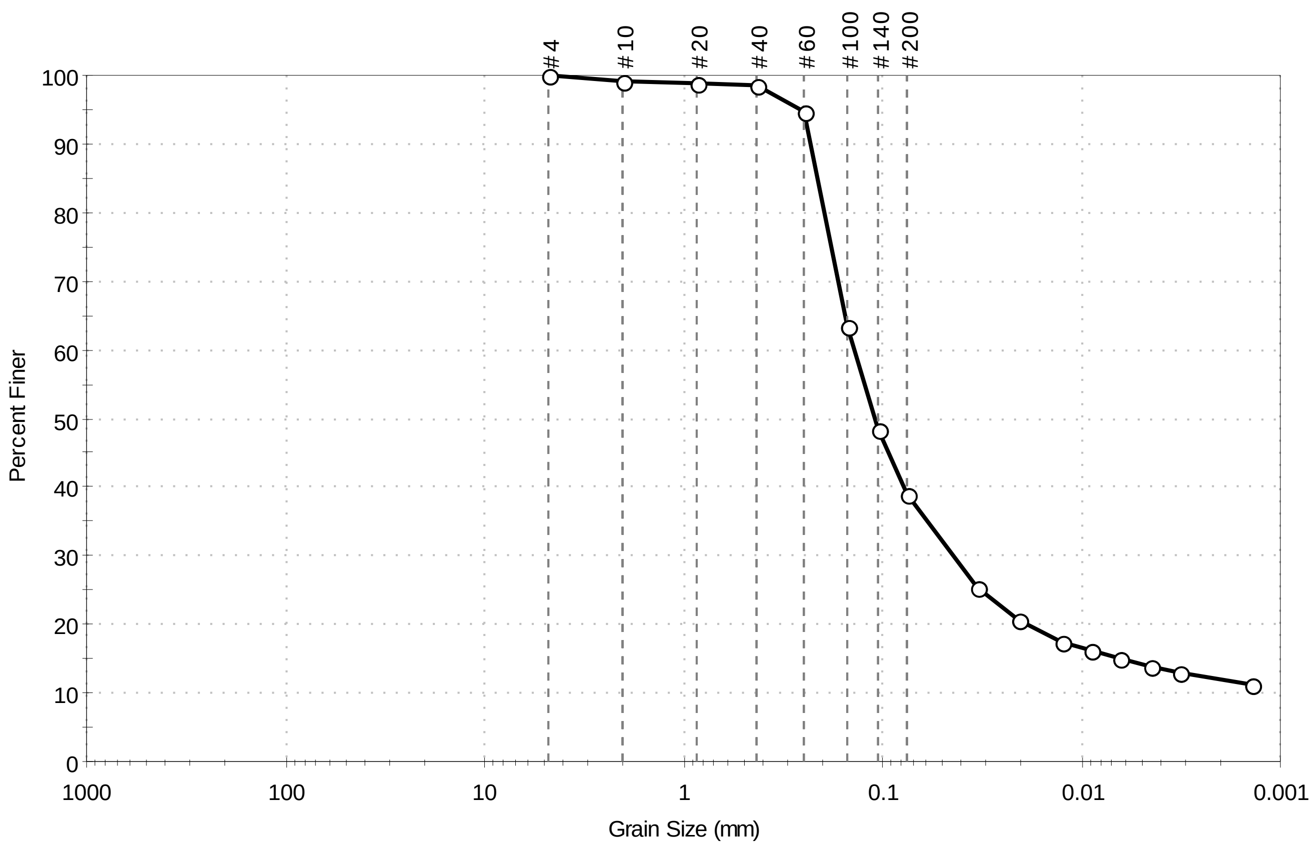
Client:	Anchor QEA, LLC
Project:	San Jacinto Pre-Design Investigation
Location:	
Project No:	GTX-309154
Boring ID:	SJSB029
Sample Type:	bag
Tested By:	ckg
Sample ID:	SL0606
Test Date:	01/02/19
Checked By:	emm
Depth :	15-17 ft
Test Id:	482729
Test Comment:	---
Visual Description:	Moist, dark grayish brown 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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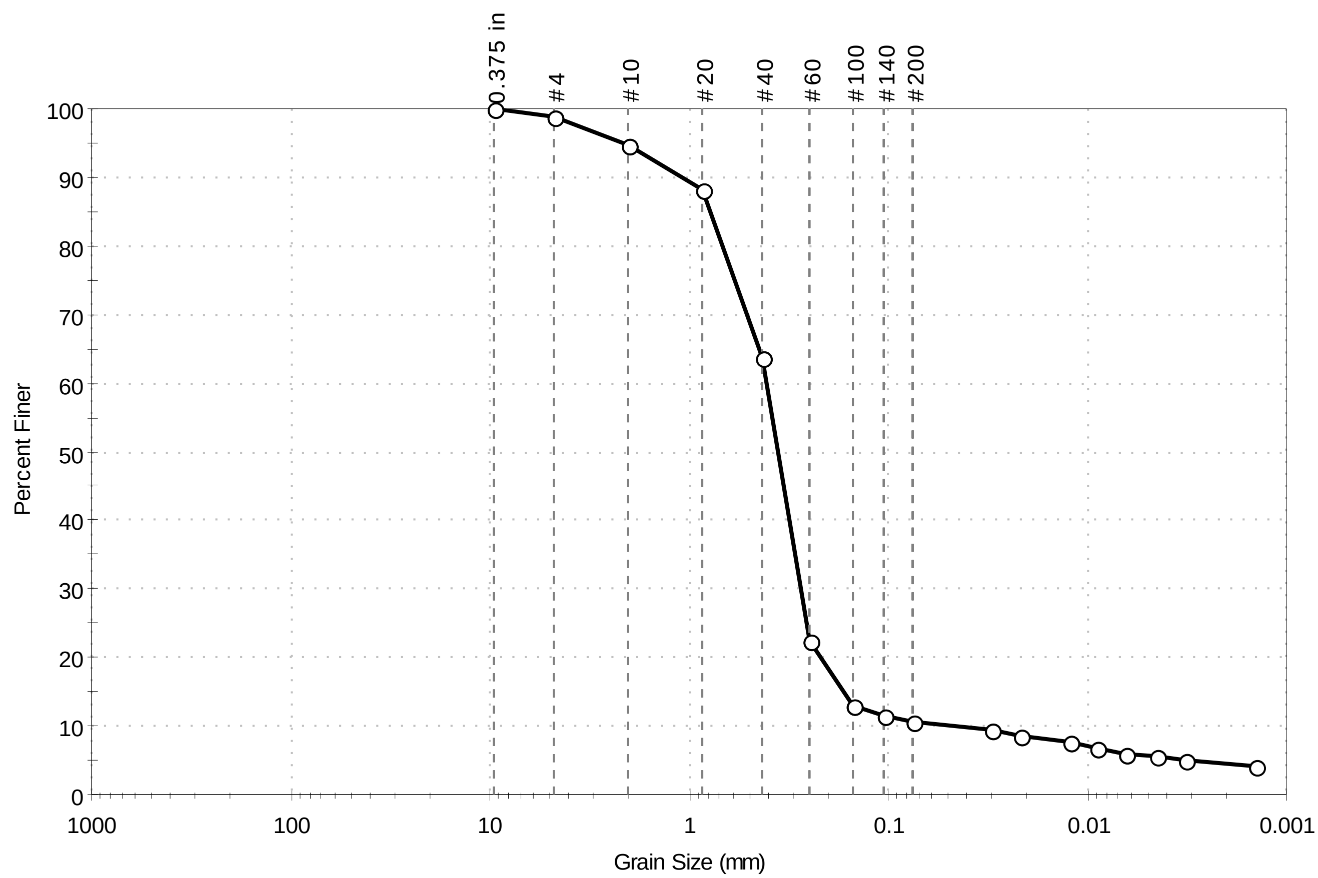
Client:	Anchor QEA, LLC			
Project:	San Jacinto Pre-Design Investigation			
Location:			Project No:	GTX-309154
Boring ID:	SJSB029	Sample Type: bag	Tested By:	ckg
Sample ID:	SL0610	Test Date: 01/21/19	Checked By:	emm
Depth :	35-36.5 ft	Test Id: 482730		
Test Comment:	---			
Visual Description:	Moist, 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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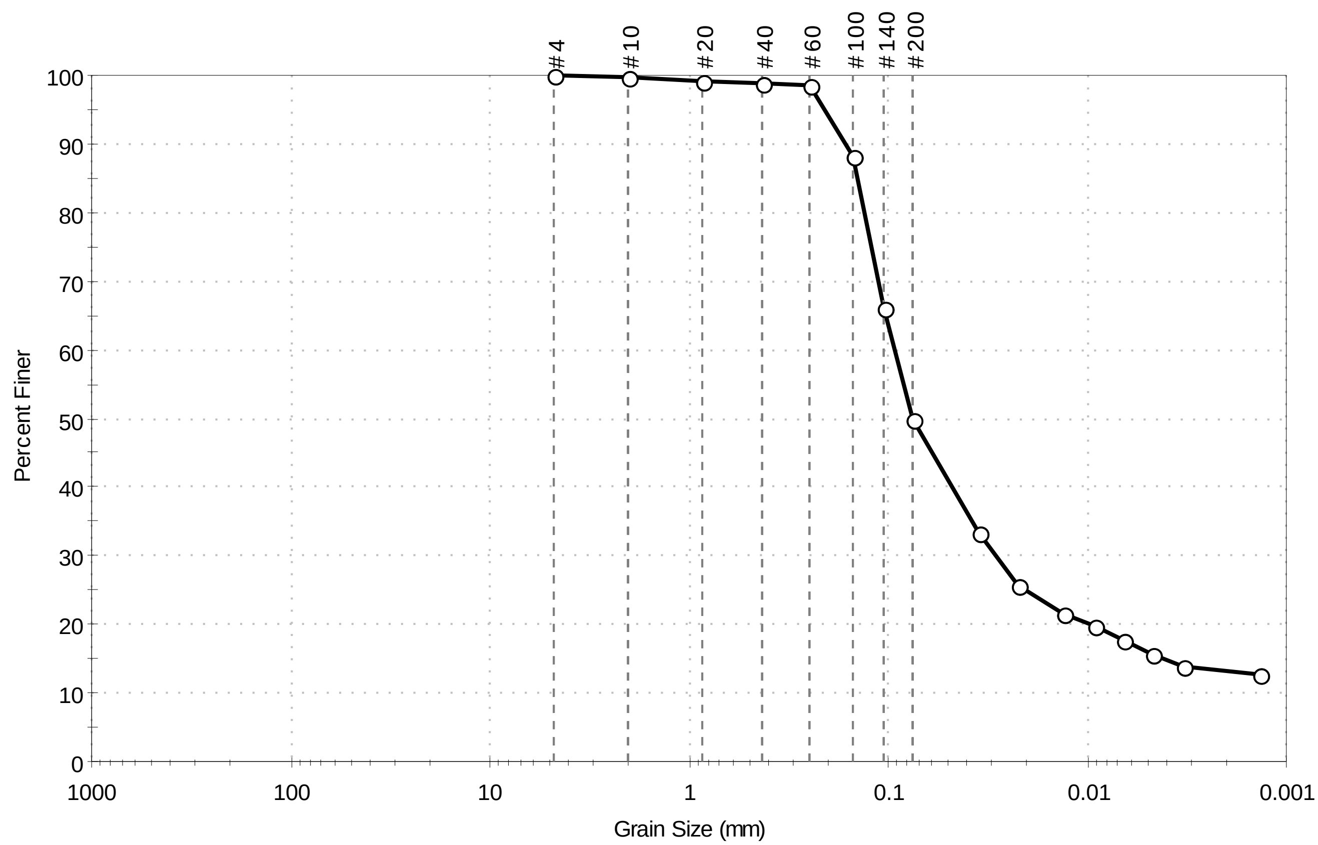
Client:	Anchor QEA, LLC		
Project:	San Jacinto Pre-Design Investigation		
Location:		Project No:	GTX-309154
Boring ID: SJSB030	Sample Type: bag	Tested By:	ckg
Sample ID: SL0693	Test Date: 02/25/19	Checked By:	bfs
Depth : 14-16 ft	Test Id: 483654		
Test Comment:	---		
Visual Description:	Moist, dark grayish 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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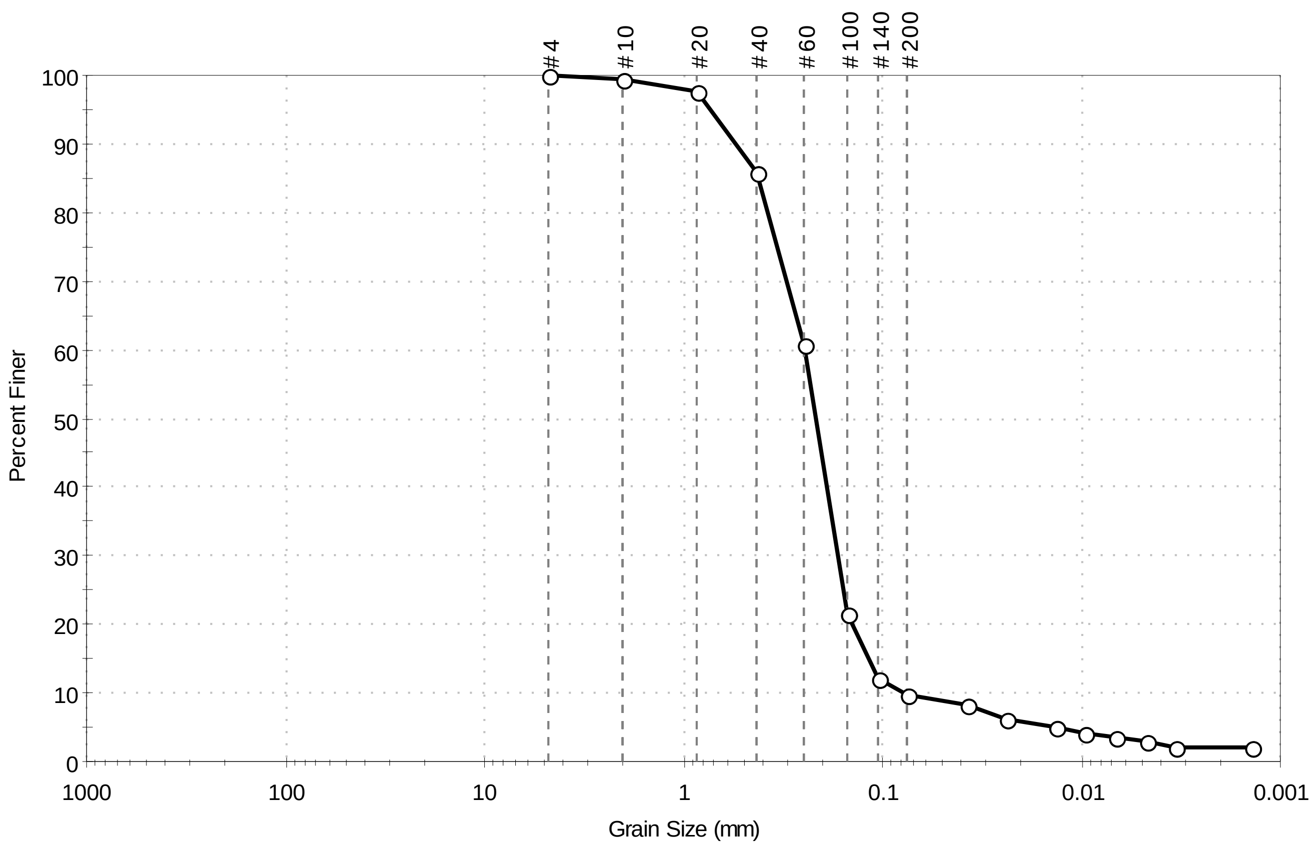
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB030	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL0696	Test Date:	02/25/19	Checked By:	bfs
Depth :	30-32 ft	Test Id:	483655		
Test Comment:	---				
Visual Description:	Moist, 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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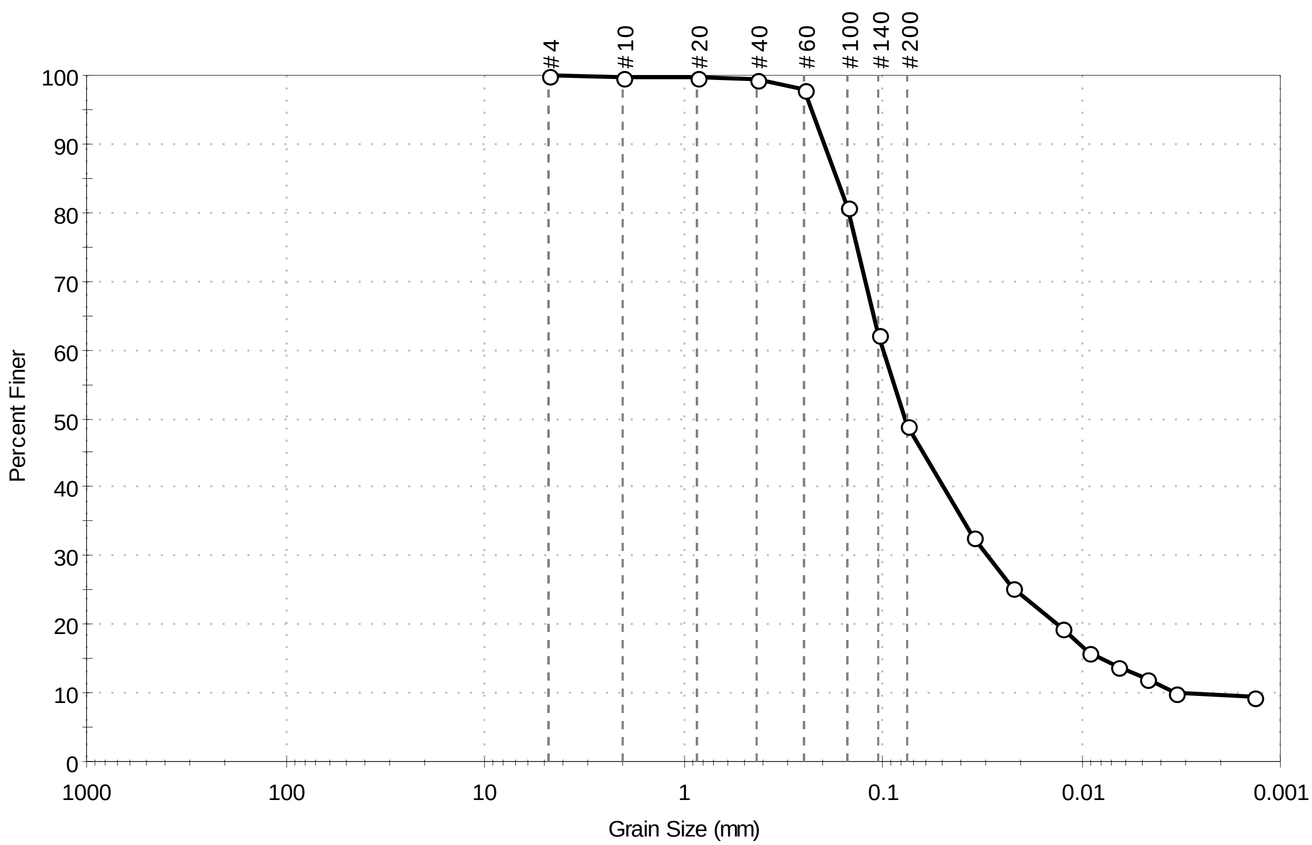
GeoTesting EXPRESS

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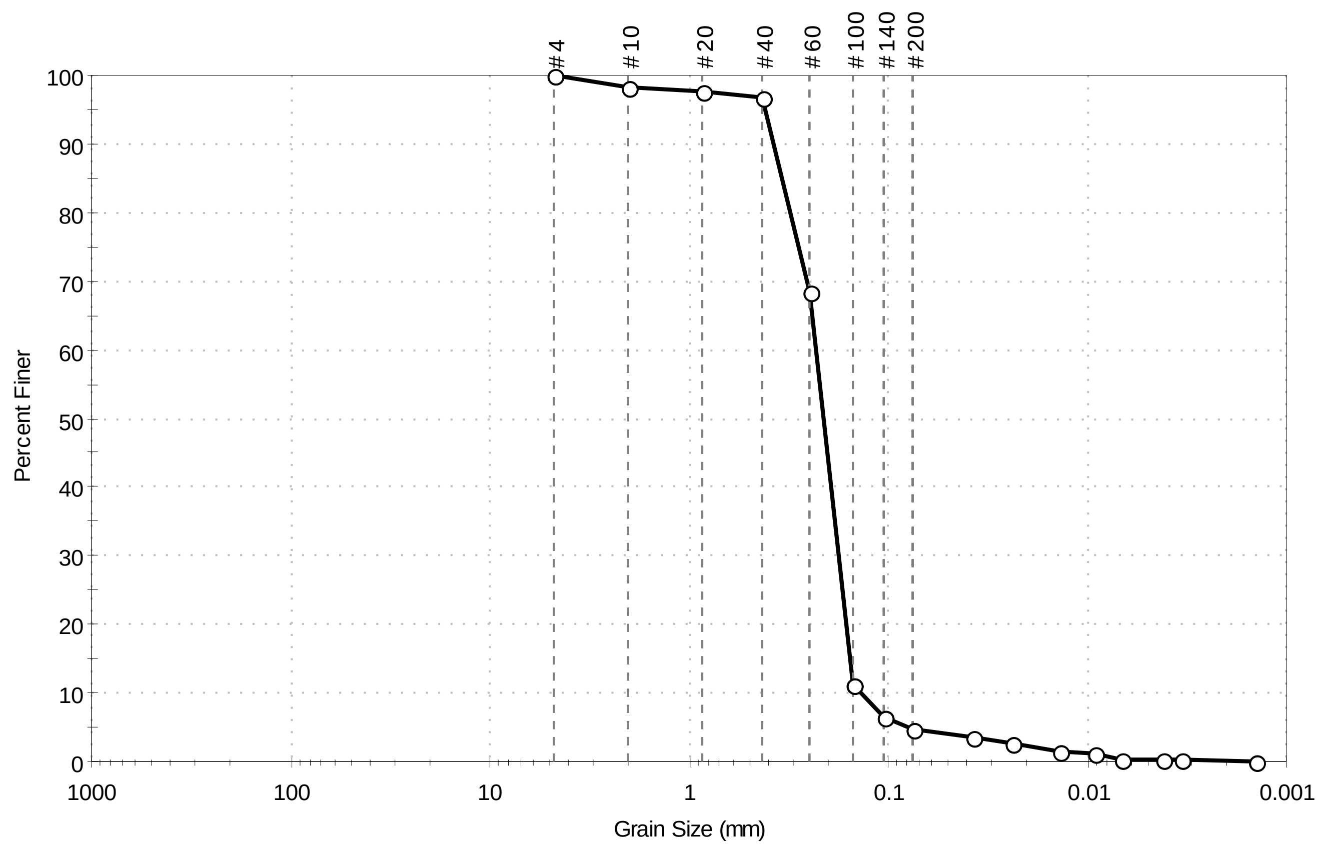
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB031	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL0622	Test Date:	01/02/19	Checked By:	emm
Depth :	20-22 ft	Test Id:	482924		
Test Comment:	---				
Visual Description:	Moist,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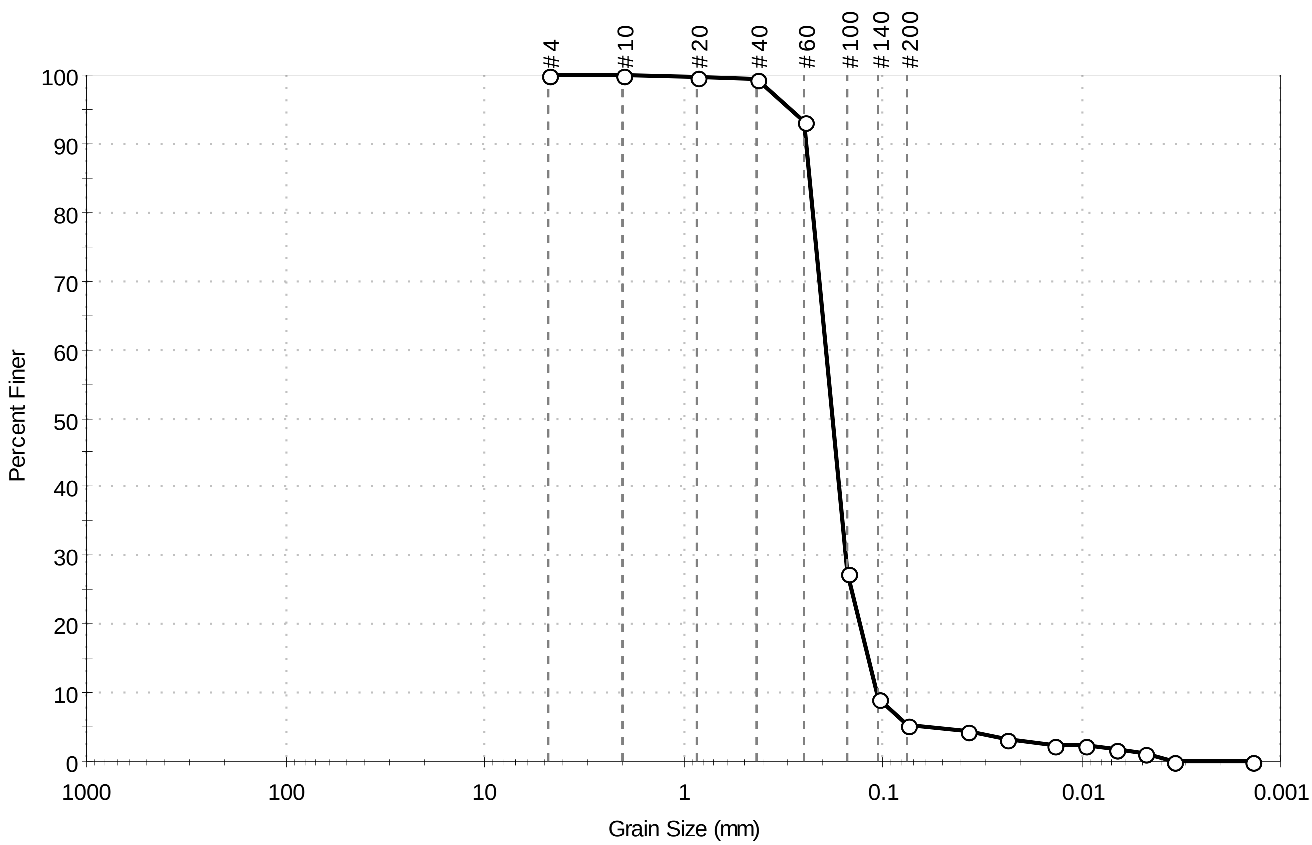
GeoTesting EXPRESS

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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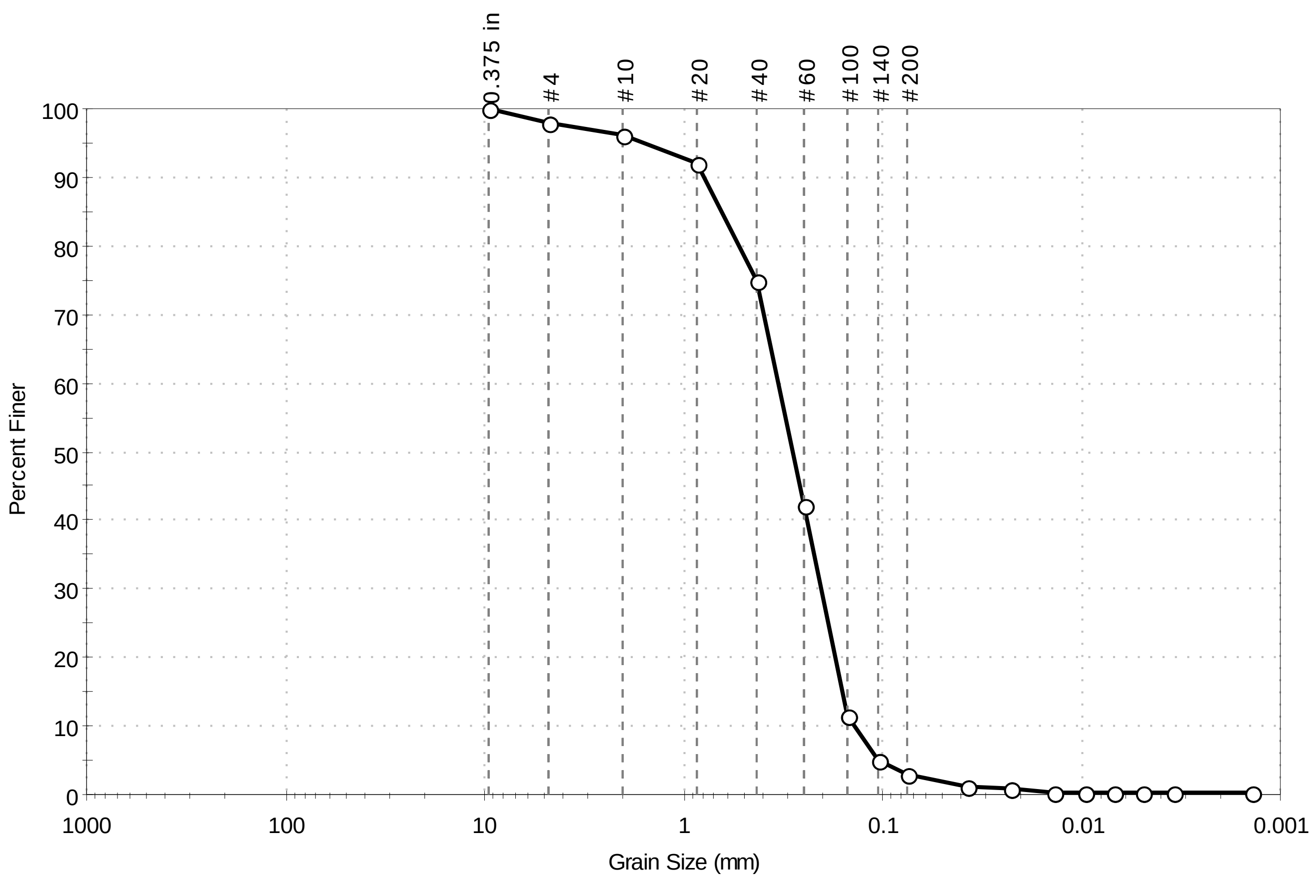
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB032	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL0684	Test Date:	02/26/19	Checked By:	bfs
Depth :	35-37 ft	Test Id:	483653		
Test Comment:	---				
Visual Description:	Moist, 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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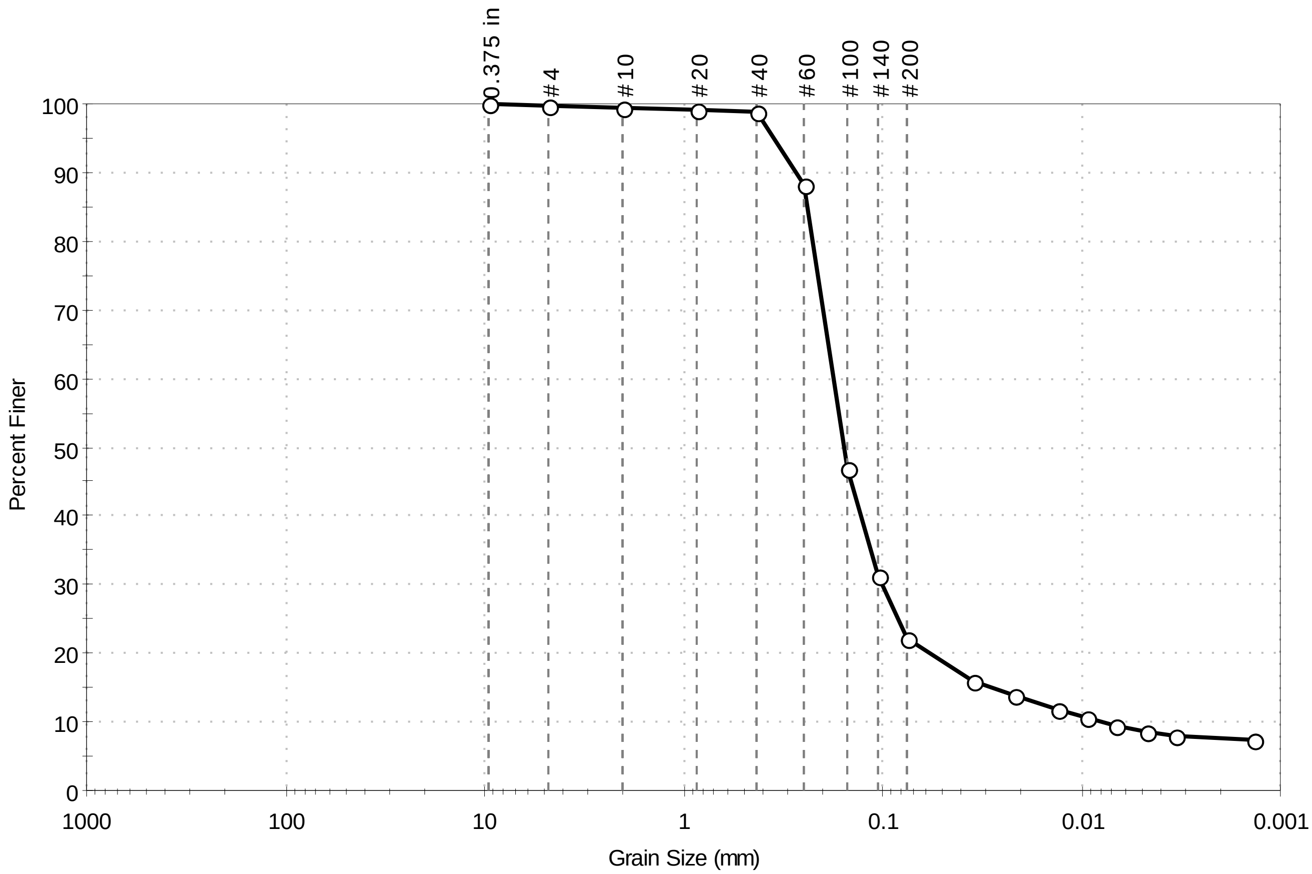
Client:	Anchor QEA, LLC		
Project:	San Jacinto Pre-Design Investigation		
Location:		Project No:	GTX-309154
Boring ID: SJSB033	Sample Type: bag	Tested By:	ckg
Sample ID: SL0645	Test Date: 03/08/19	Checked By:	bfs
Depth : 14-16 ft	Test Id: 483678		
Test Comment:	---		
Visual Description:	Moist, grayish 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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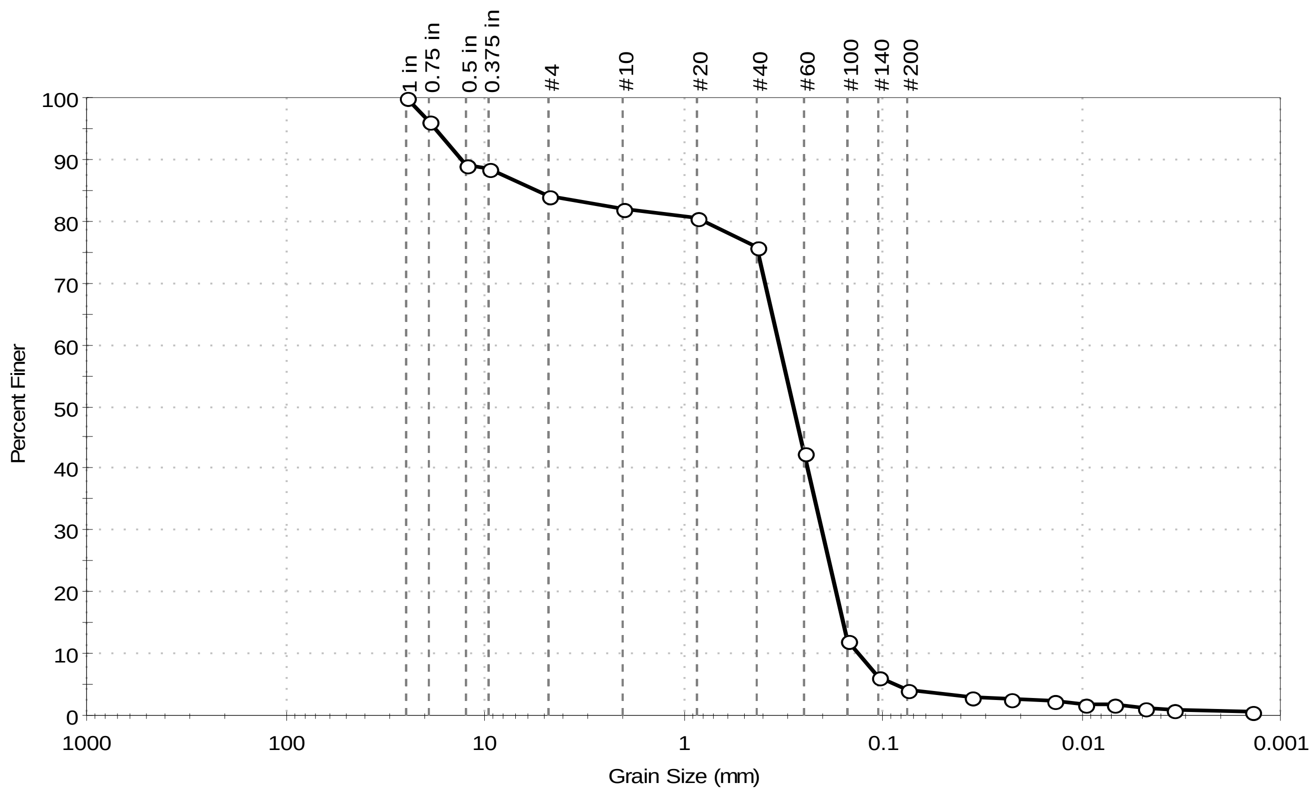
Client:	Anchor QEA, LLC			
Project:	San Jacinto Pre-Design Investigation			
Location:			Project No:	GTX-309154
Boring ID: SJSB033		Sample Type: bag	Tested By:	ckg
Sample ID: SL0647		Test Date: 02/26/19	Checked By:	bfs
Depth : 30-32 ft		Test Id: 483679		
Test Comment:	---			
Visual Description:	Moist, 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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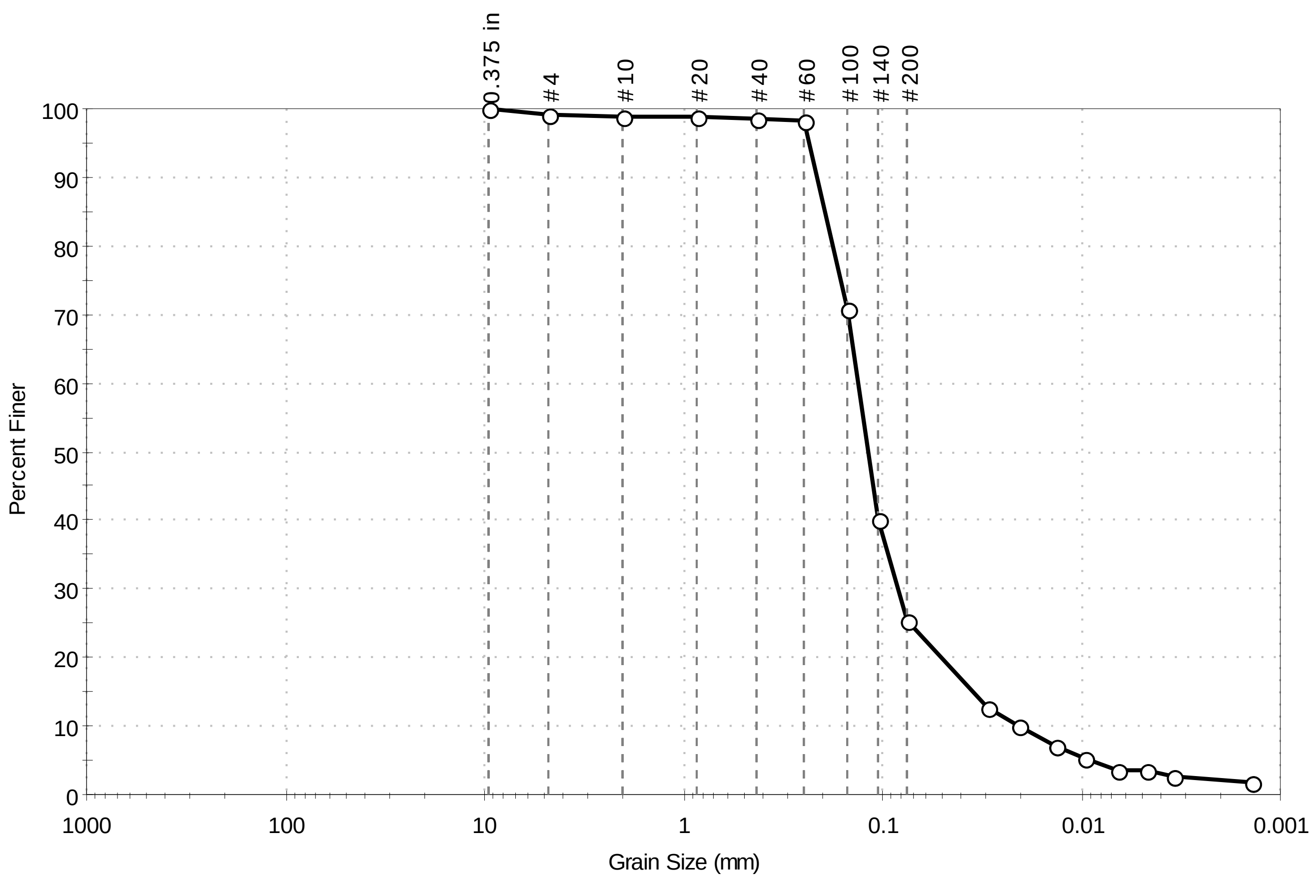
Client:	Anchor QEA, LLC
Project:	San Jacinto Pre-Design Investigation
Location:	
Project No:	GTX-309154
Boring ID:	SJSB034
Sample Type:	bag
Tested By:	ckg
Sample ID:	SL0634
Test Date:	01/21/19
Checked By:	emm
Depth :	14-16 ft
Test Id:	482971
Test Comment:	---
Visual Description:	Moist, light yellowish 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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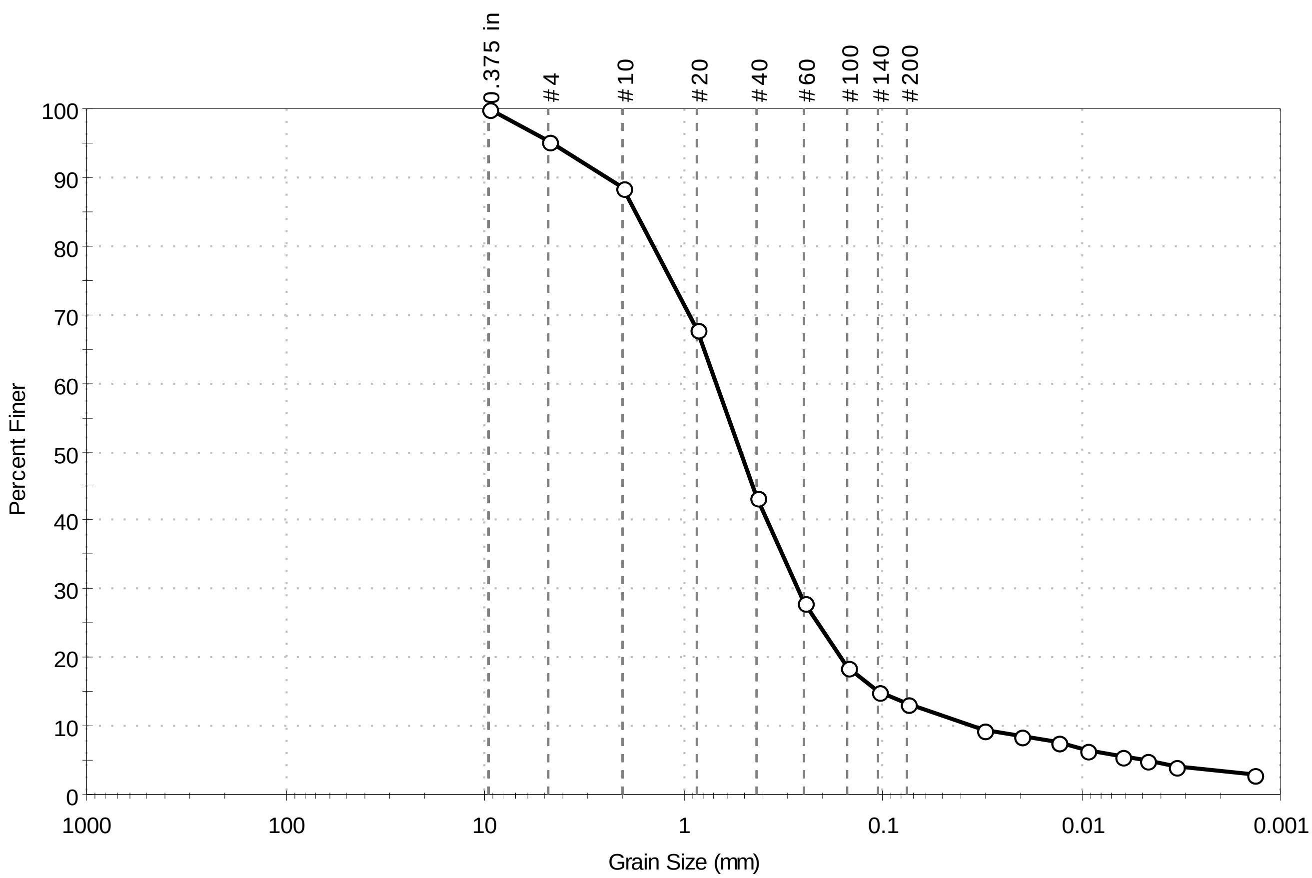
Client:	Anchor QEA, LLC		
Project:	San Jacinto Pre-Design Investigation		
Location:		Project No:	GTX-309154

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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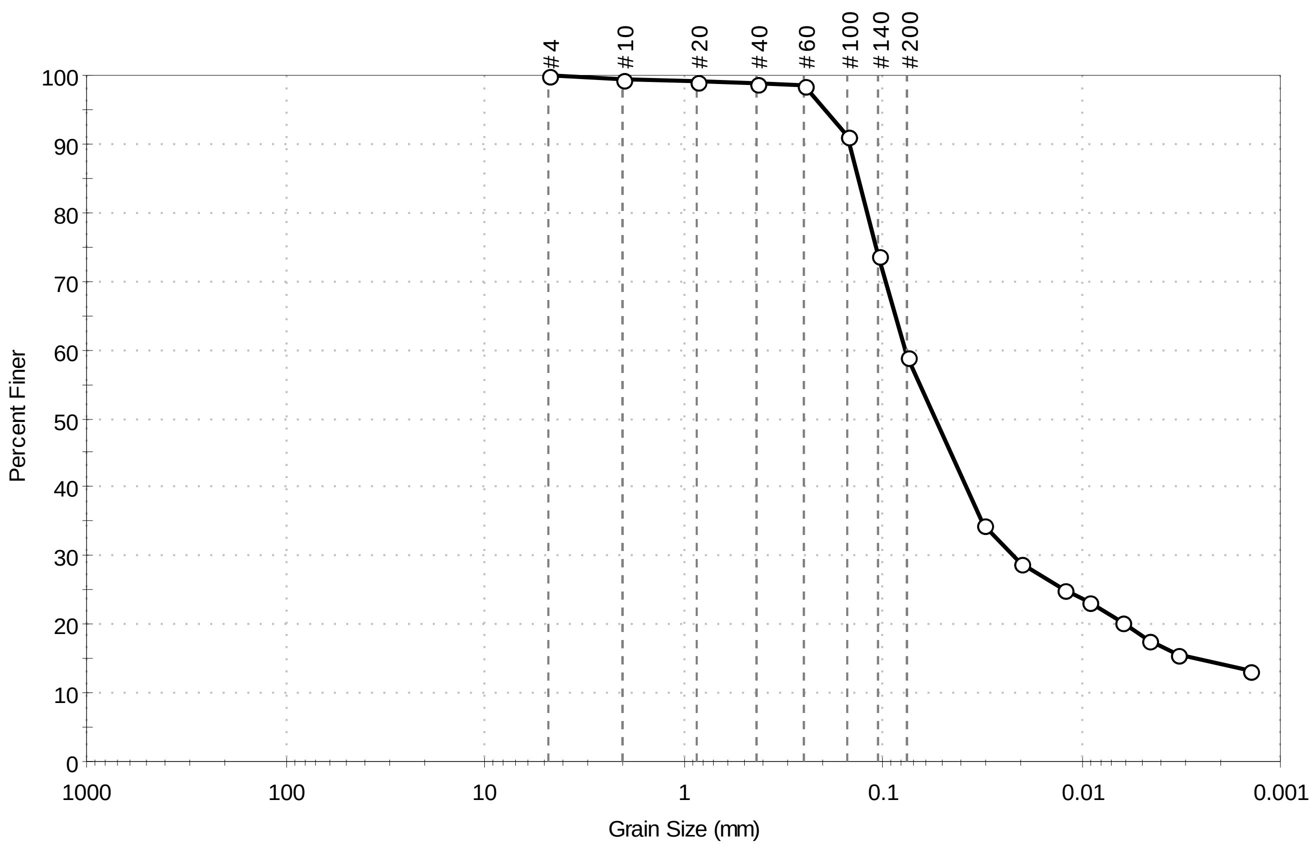
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB035	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL0644	Test Date:	01/02/19	Checked By:	emm
Depth :	8-10 ft	Test Id:	482969		
Test Comment:	---				
Visual Description:	Moist, 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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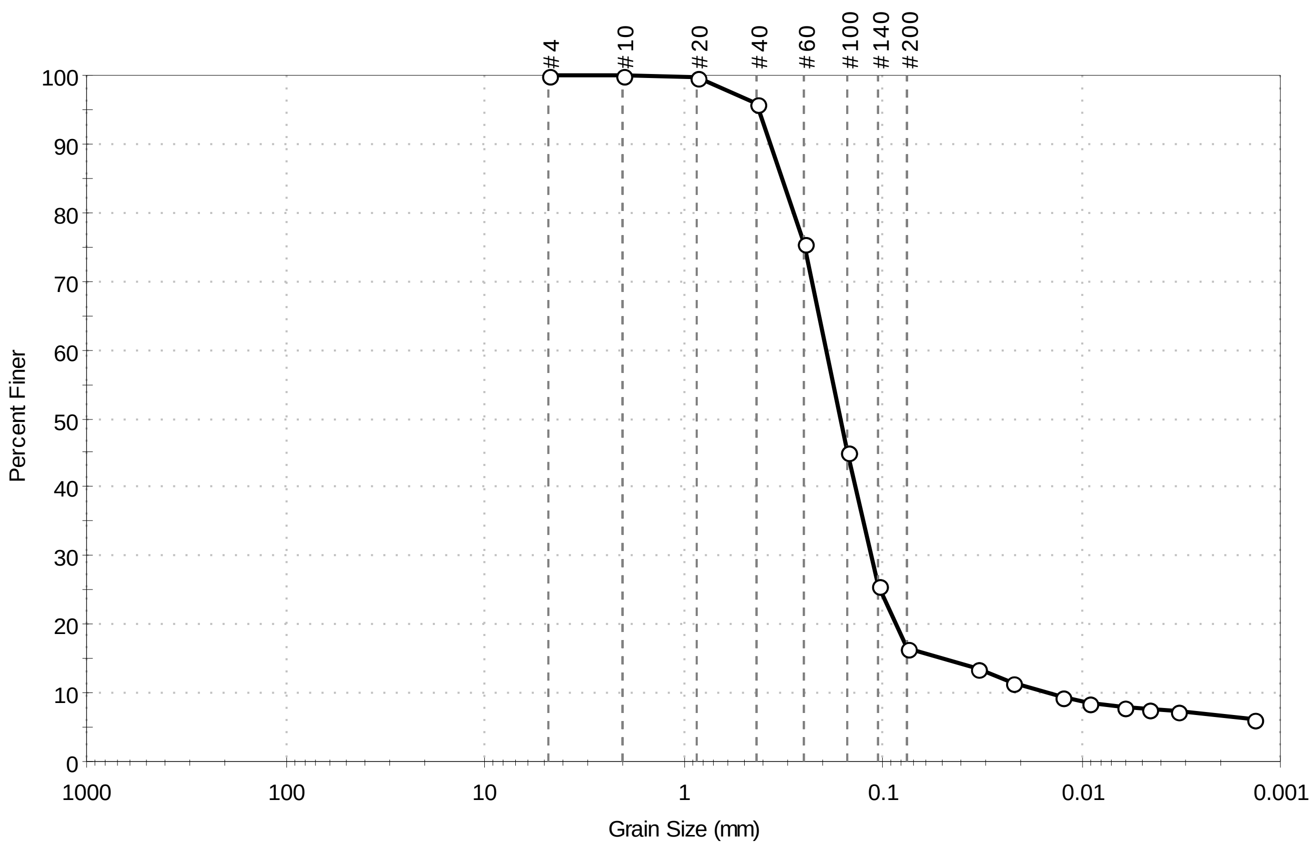
Client:	Anchor QEA, LLC			
Project:	San Jacinto Pre-Design Investigation			
Location:			Project No:	GTX-309154
Boring ID: SJSB035		Sample Type: bag	Tested By:	ckg
Sample ID: SL0647		Test Date: 01/21/19	Checked By:	emm
Depth : 25-27 ft		Test Id: 482970		

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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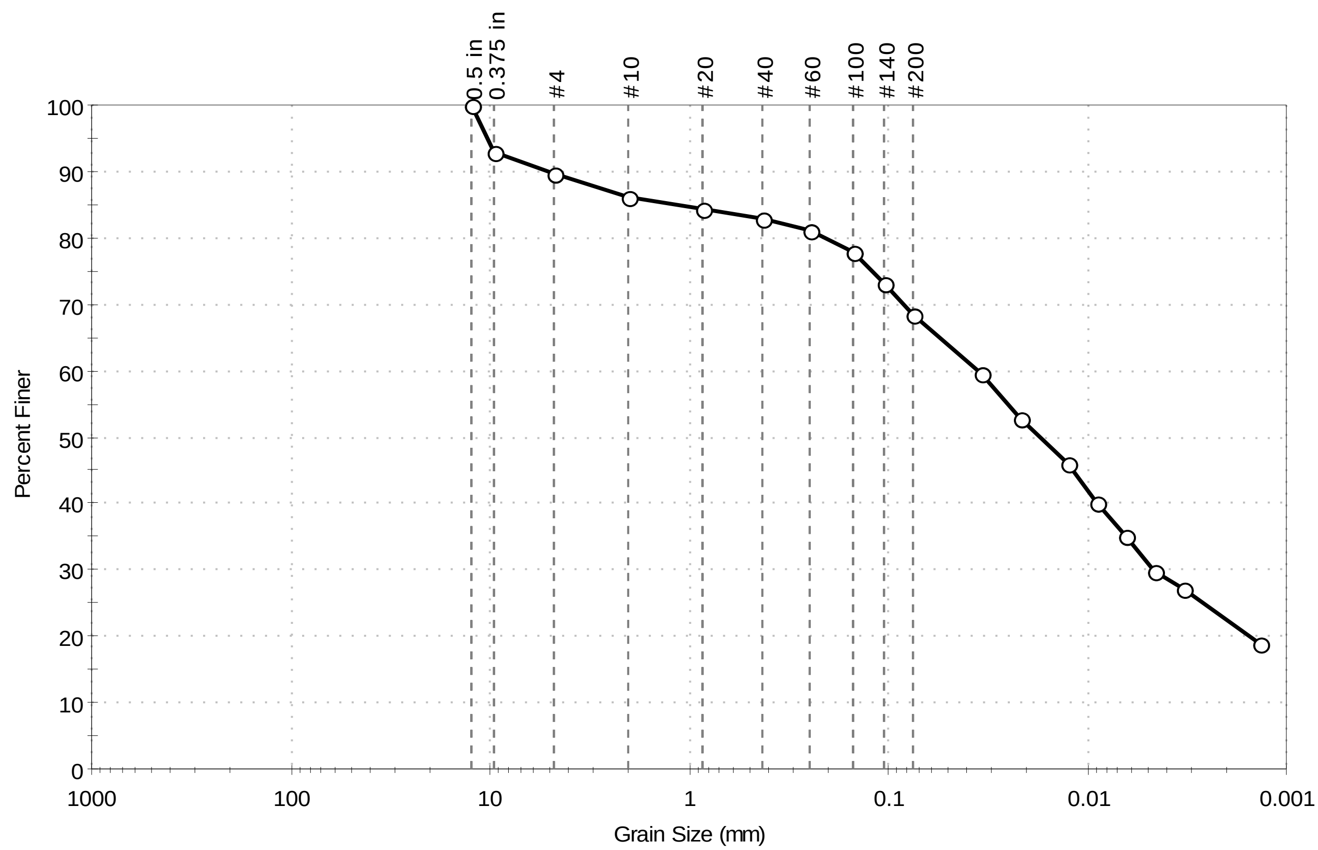
GeoTesting EXPRESS

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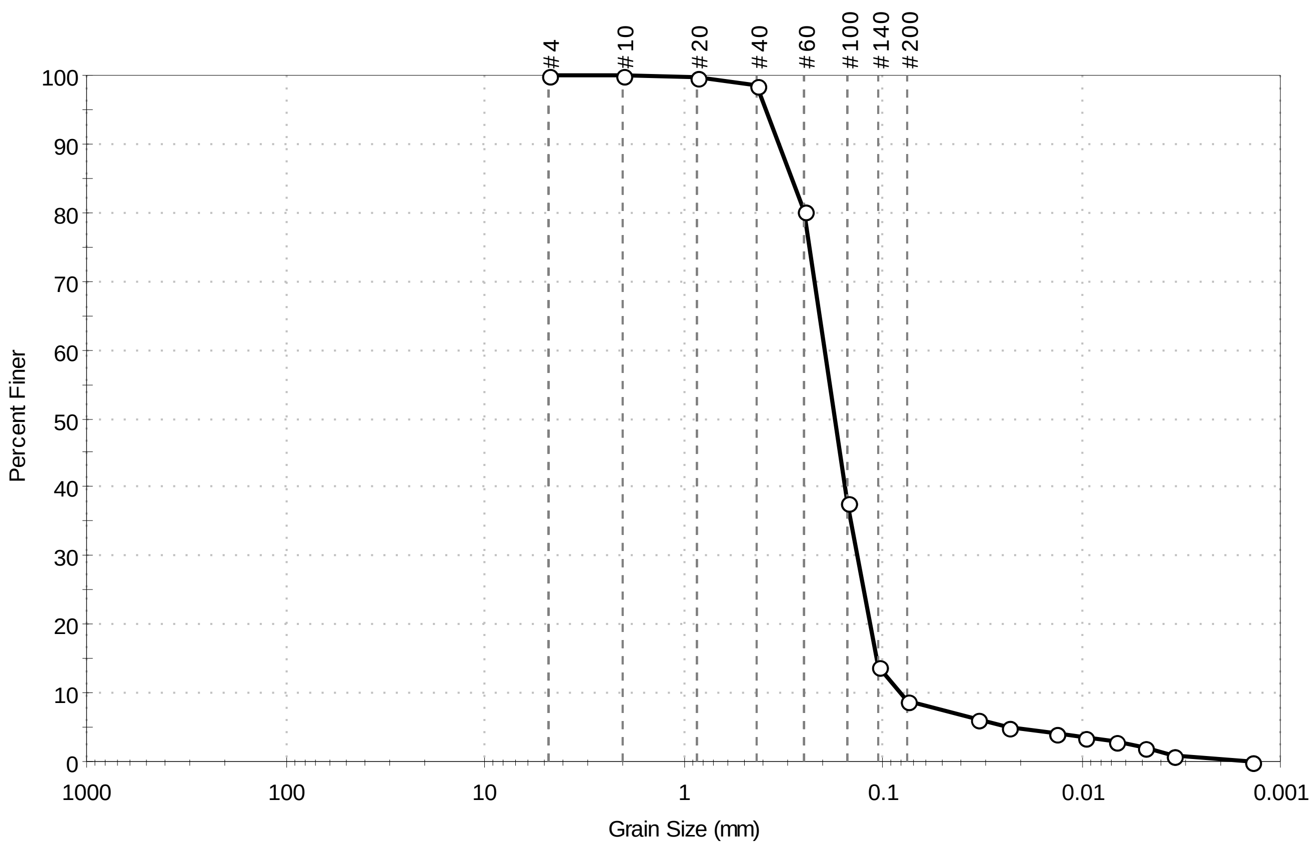
Client:	Anchor QEA, LLC		
Project:	San Jacinto Pre-Design Investigation		
Location:		Project No:	GTX-309154
Boring ID: SJSB036	Sample Type: bag	Tested By:	ckg
Sample ID: SL0670	Test Date: 02/25/19	Checked By:	bfs
Depth : 20-22 ft	Test Id: 483683		
Test Comment:	---		
Visual Description:	Moist, dark gray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

Client:	Anchor QEA, LLC		
Project:	San Jacinto Pre-Design Investigation		
Location:		Project No:	GTX-309154

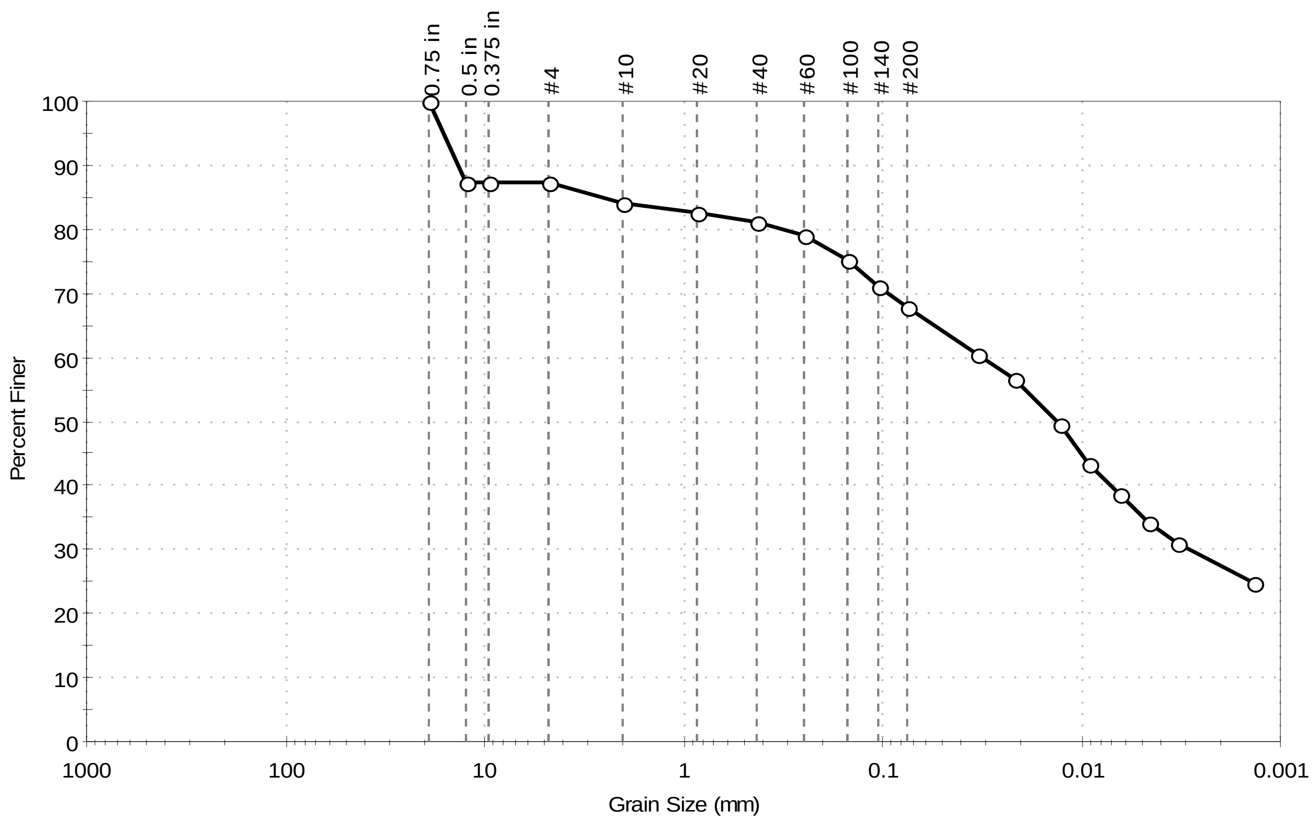
Boring ID:	SJSB037	Sample Type:	bag	Tested By:	ckg
Sample ID:	SL0652	Test Date:	03/05/19	Checked By:	bfs
Depth :	2-4 ft	Test Id:	483680		

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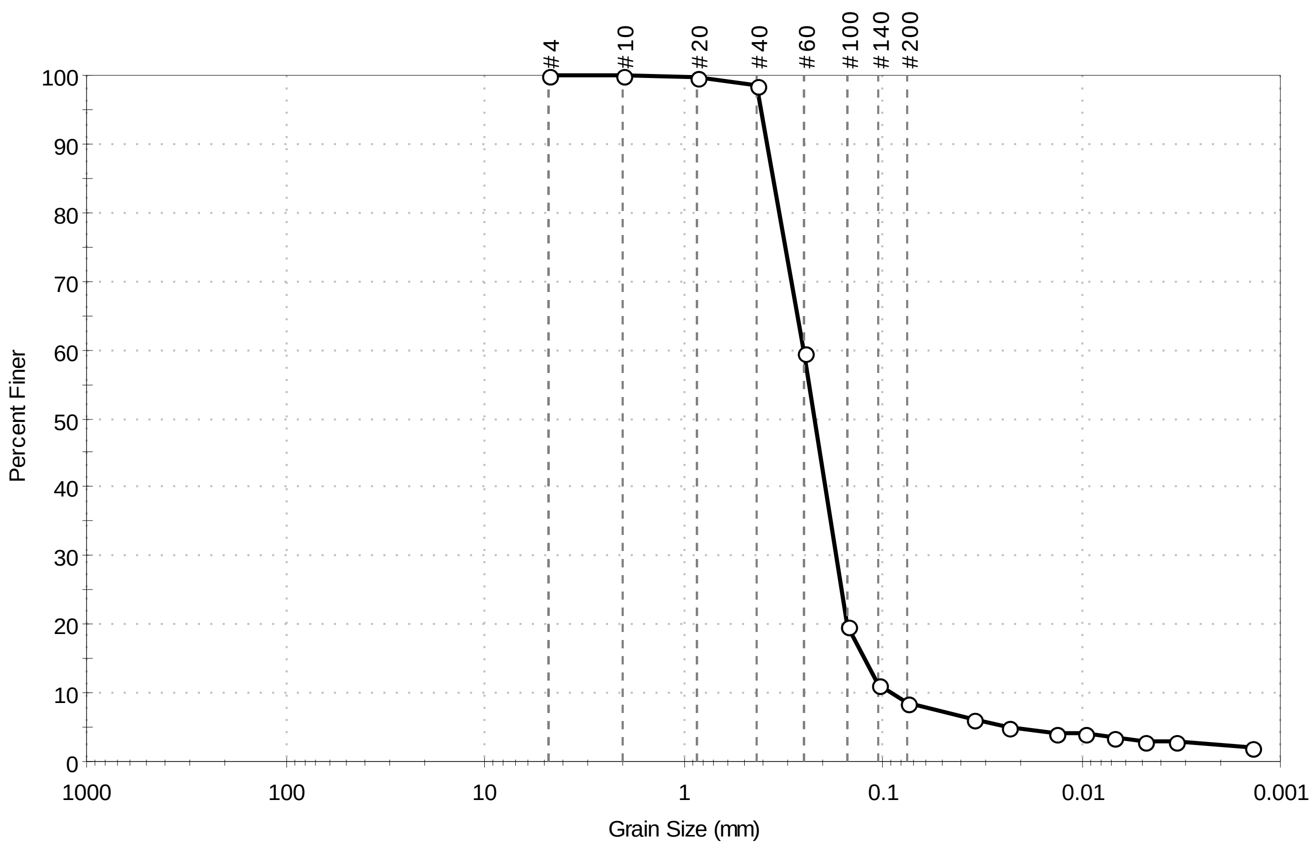
Client:	Anchor QEA, LLC
Project:	San Jacinto Pre-Design Investigation
Location:	
Project No:	GTX-309154
Boring ID: SJSB037	Sample Type: bag / Tested By: ckg
Sample ID: SL0659	Test Date: 02/26/19 / Checked By: bfs
Depth : 25-27 ft	Test Id: 483681
Test Comment:	---
Visual Description:	Moist, grayish brown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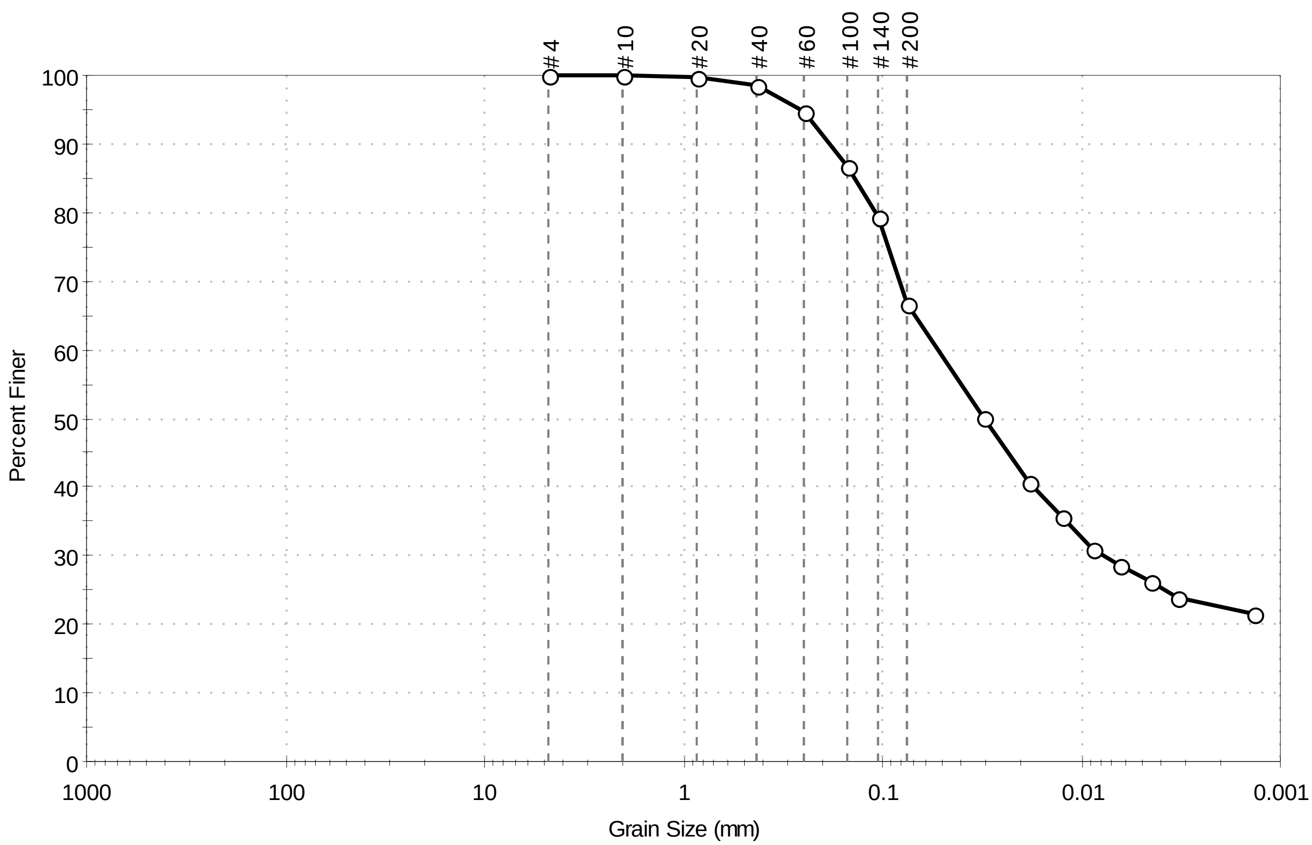
Client:	Anchor QEA, LLC		
Project:	San Jacinto Pre-Design Investigation		
Location:		Project No:	GTX-309154

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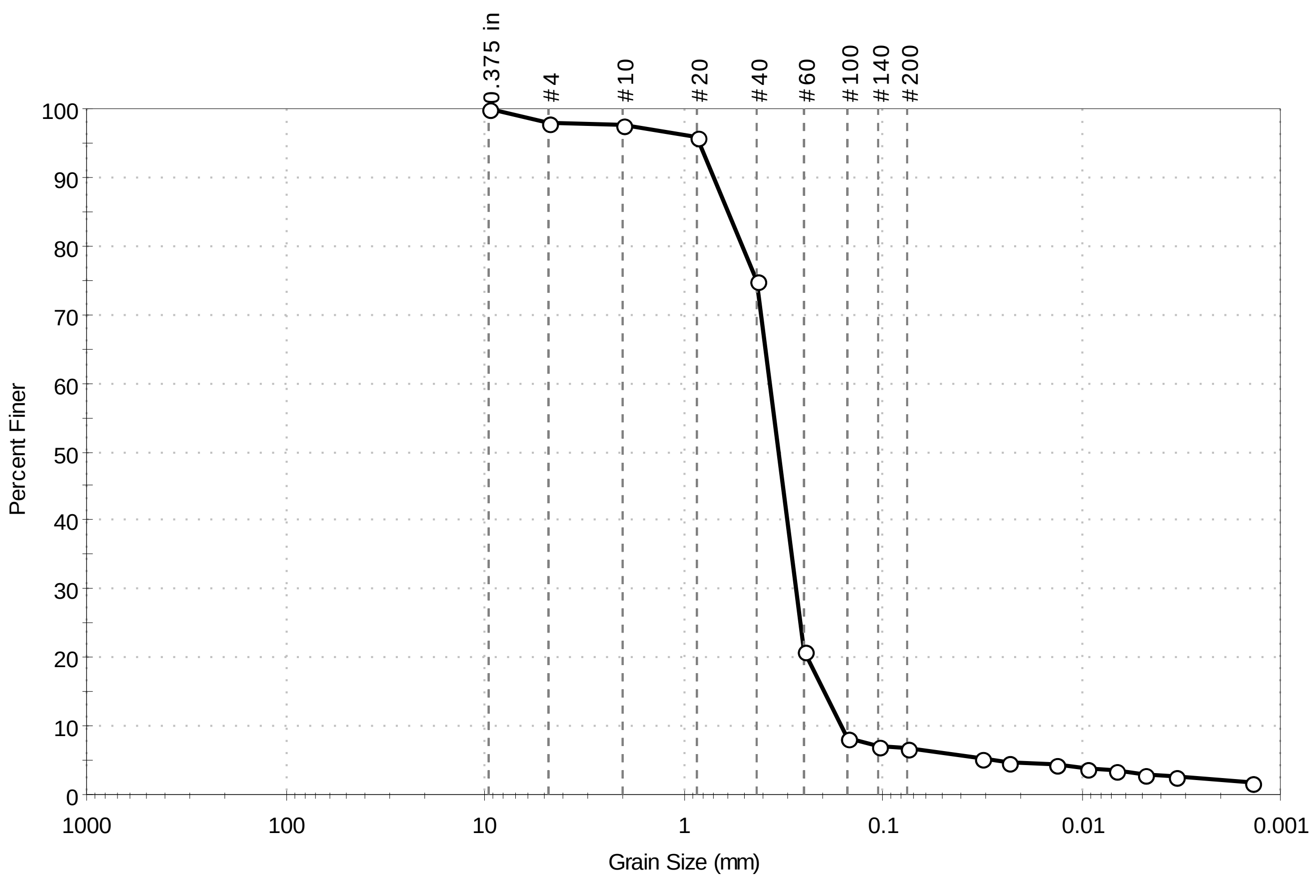
Client:	Anchor QEA, LLC		
Project:	San Jacinto Pre-Design Investigation		
Location:		Project No:	GTX-309154
Boring ID: SJSB038	Sample Type: bag	Tested By:	ckg
Sample ID: SL0893	Test Date: 02/25/19	Checked By:	bfs
Depth : 24-26 ft	Test Id: 486512		

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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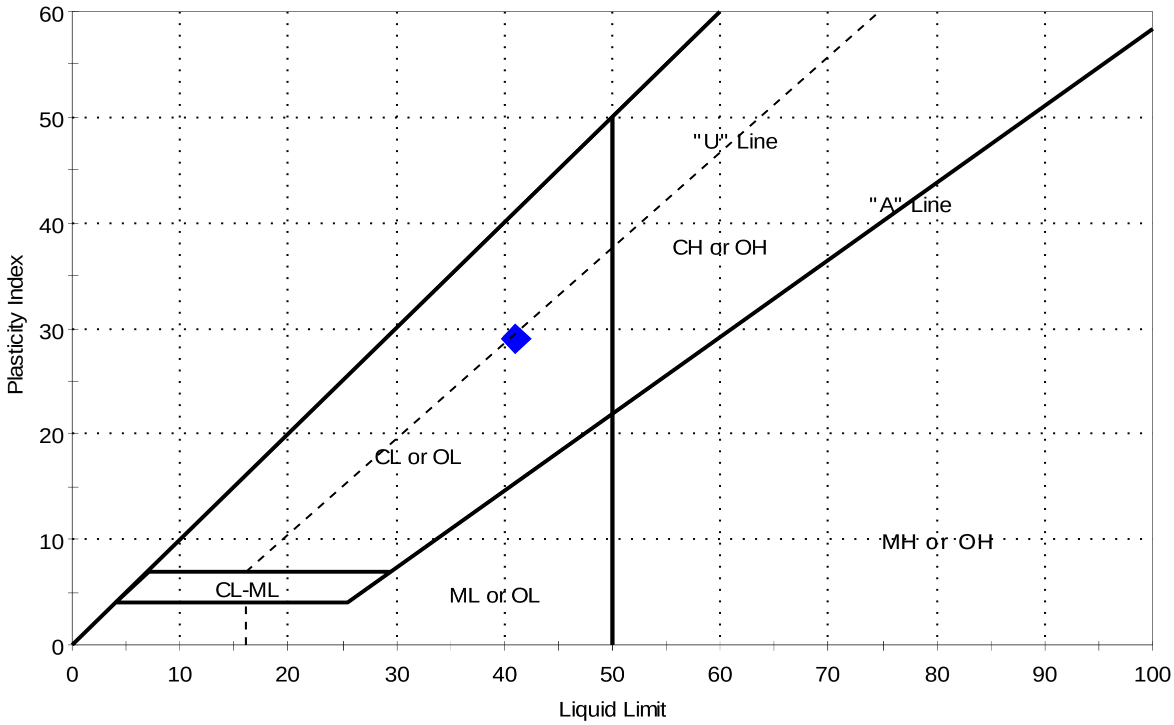
GeoTesting EXPRESS

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

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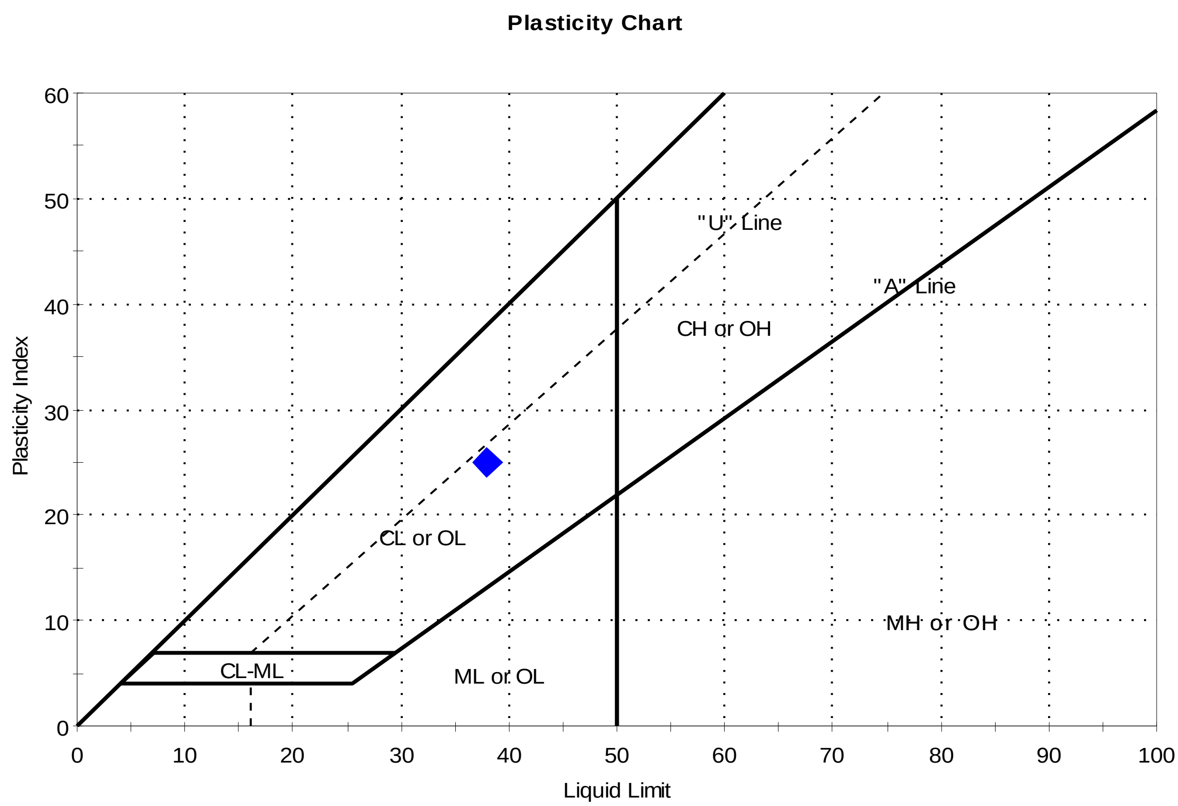
Client: Anchor QEA, LLC			
Project: San Jacinto Pre-Design Investigation			
Location:		Project No:	GTX-309154
Boring ID: SJGB019	Sample Type: bag	Tested By:	cam
Sample ID: SL0851	Test Date: 03/01/19	Checked By:	bfs
Depth : 20-22'	Test Id: 485095		
Test Comment: ---			
Visual Description: Moist, light 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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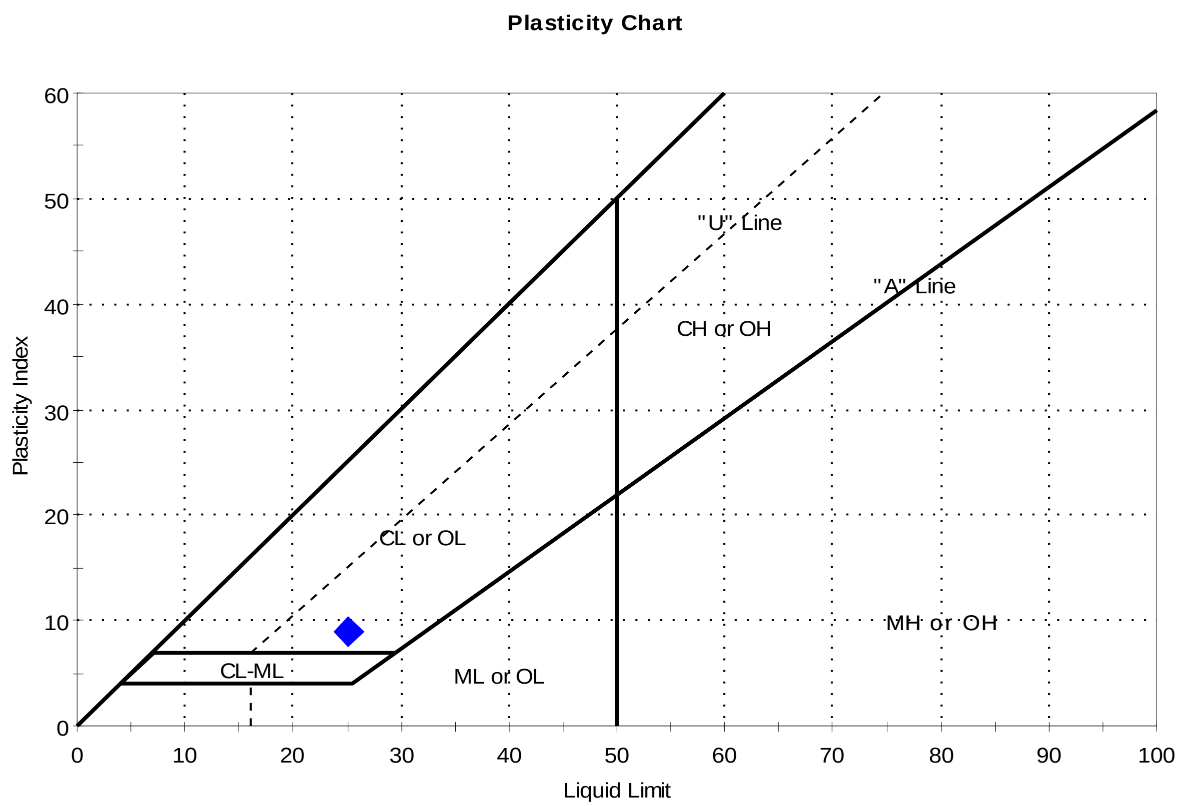
Client:	Anchor QEA, LLC		
Project:	San Jacinto Pre-Design Investigation		
Location:		Project No:	GTX-309154
Boring ID: SJGB019	Sample Type: bag	Tested By:	cam
Sample ID: SL0854	Test Date: 03/05/19	Checked By:	bfs
Depth : 35-37'	Test Id: 485096		
Test Comment:	---		
Visual Description:	Moist, brownish 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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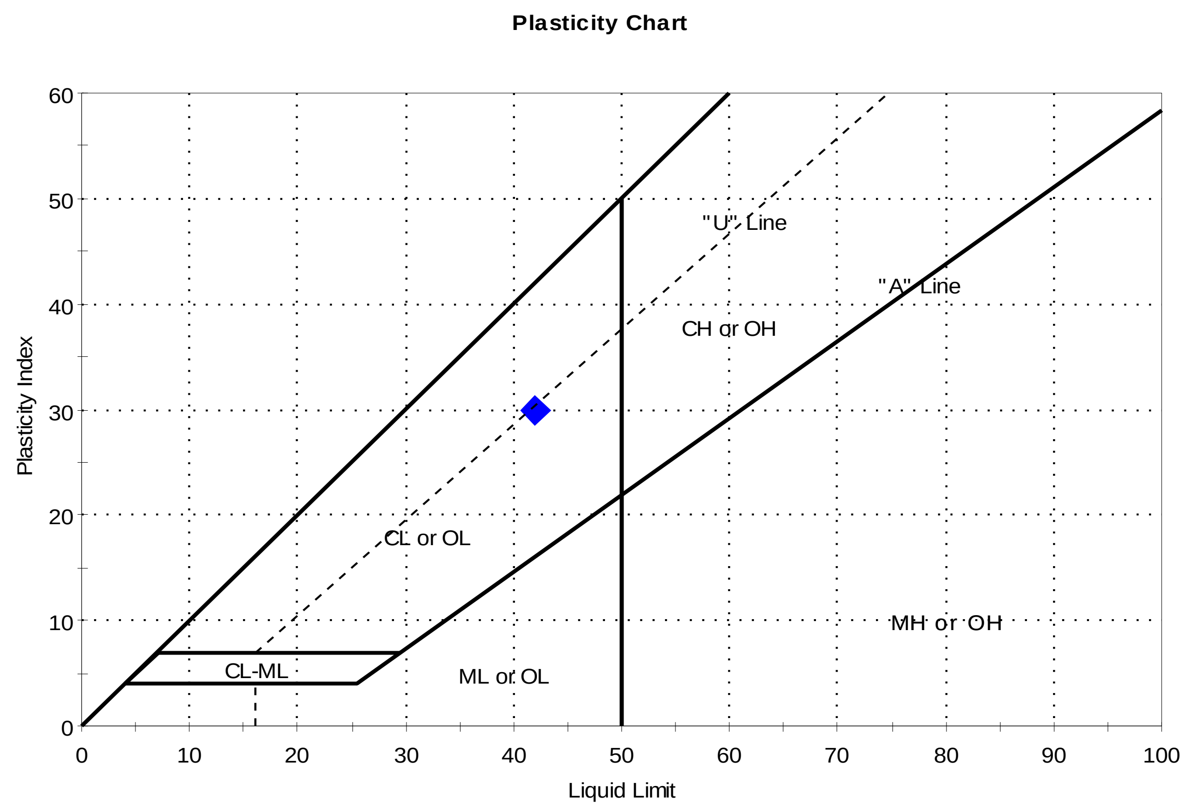
GeoTesting EXPRESS

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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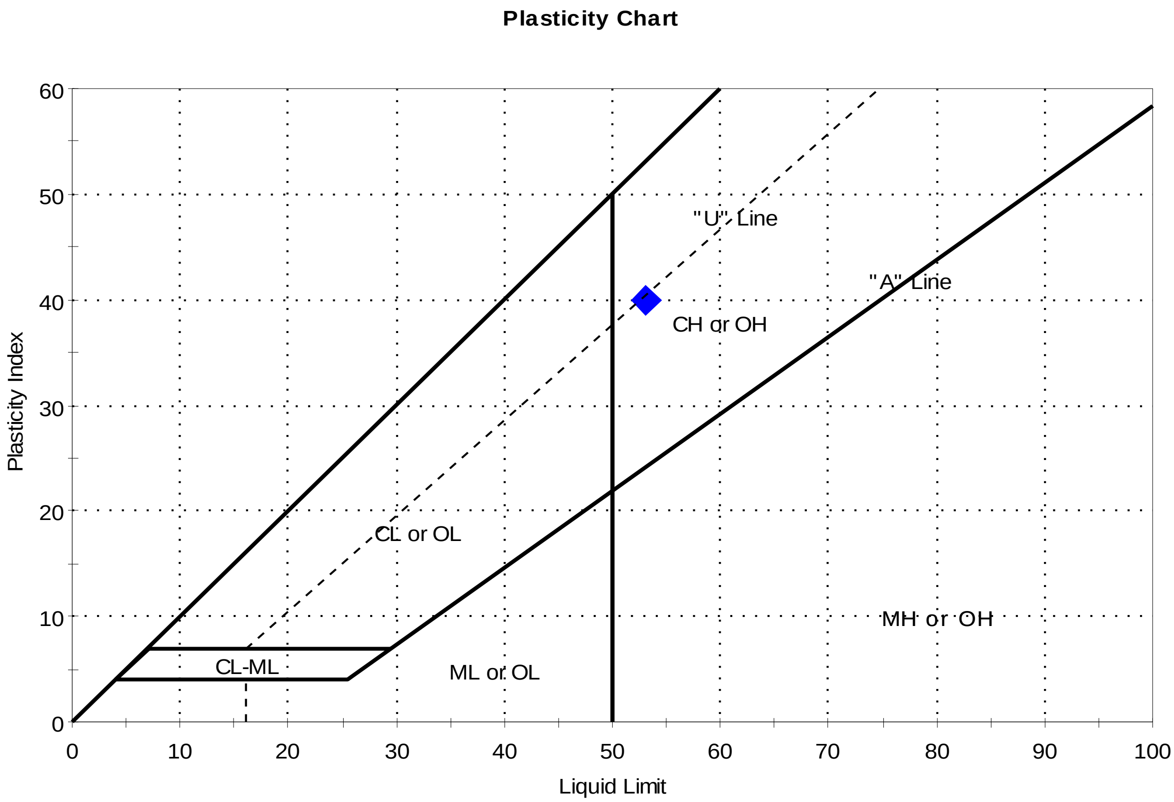
Client:	Anchor QEA, LLC			
Project:	San Jacinto Pre-Design Investigation			
Location:			Project No:	GTX-309154
Boring ID:	SJGB020	Sample Type: bag	Tested By:	cam
Sample ID:	SL0846	Test Date: 03/06/19	Checked By:	bfs
Depth :	60-62'	Test Id: 485094		
Test Comment:	---			
Visual Description:	Moist, grayish 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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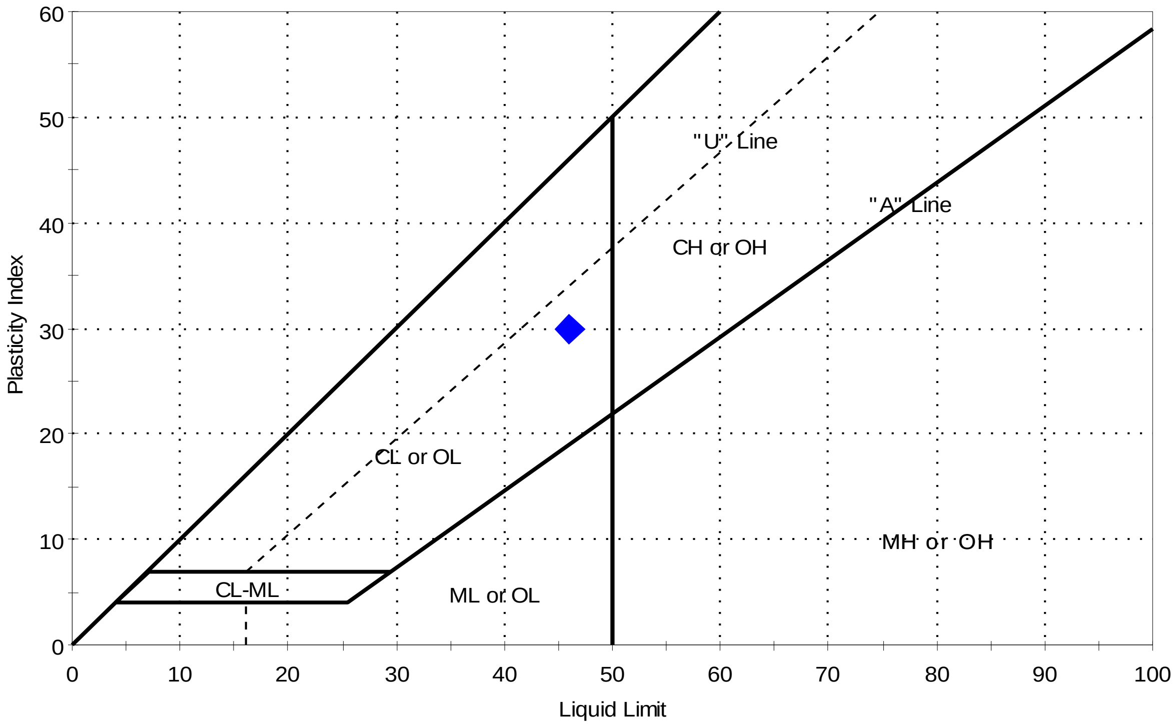
Client:	Anchor QEA, LLC
Project:	San Jacinto Pre-Design Investigation
Location:	
Project No:	GTX-309154
Boring ID:	SJGB021
Sample Type:	bag
Tested By:	cam
Sample ID:	SL0823
Test Date:	02/28/19
Checked By:	bfs
Depth :	6'-8'
Test Id:	485153
Test Comment:	---
Visual Description:	Wet, dark brown clay with 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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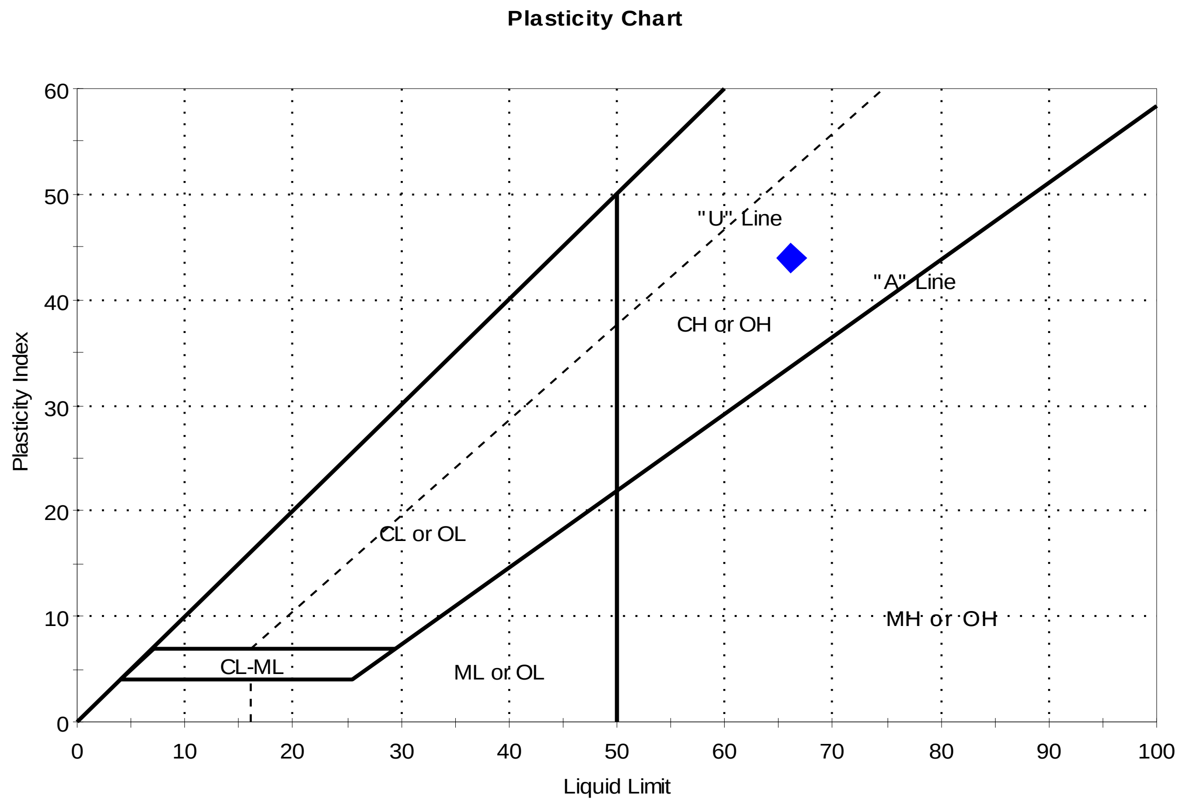
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJGB022	Sample Type:	bag	Tested By:	cam
Sample ID:	SL0818	Test Date:	03/05/19	Checked By:	bfs
Depth :	35'-37'	Test Id:	485151		

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

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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:	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

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	JGB023G(	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

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

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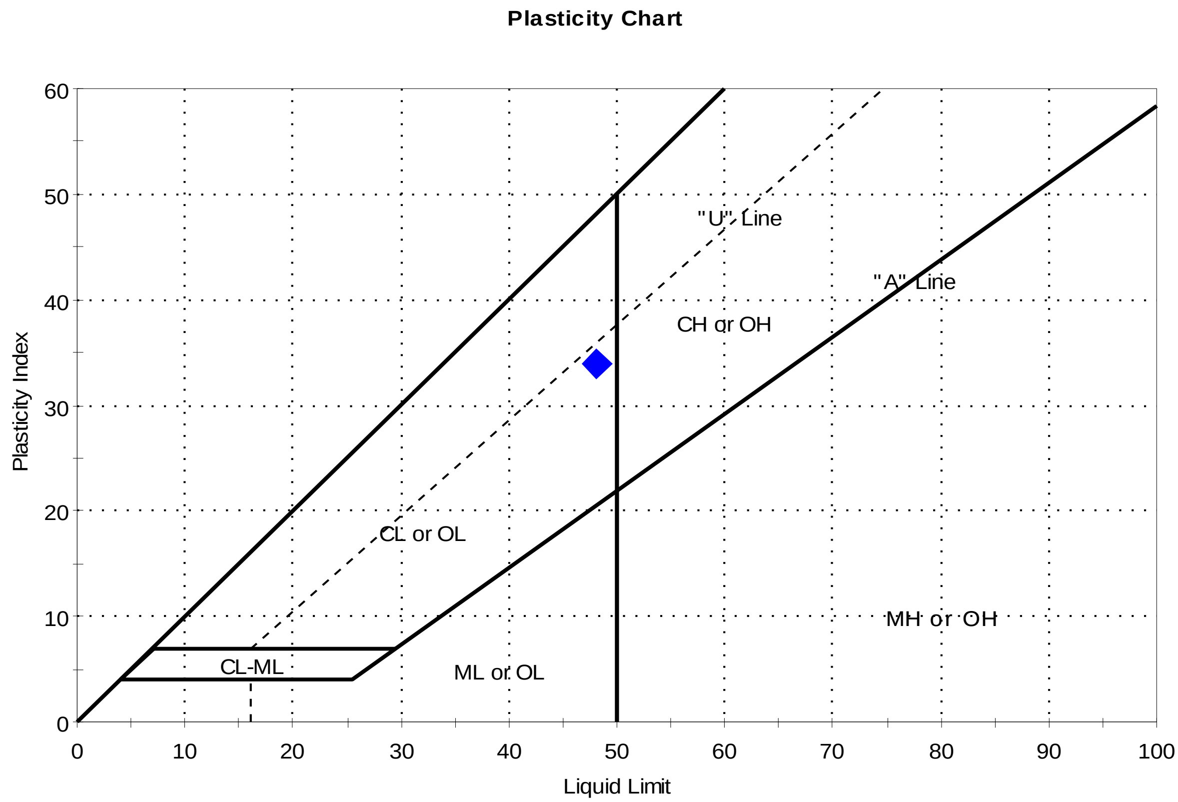
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB008-E1	Sample Type:	bag	Tested By:	cam
Sample ID:	SL1026	Test Date:	12/10/18	Checked By:	emm
Depth :	2-4 ft	Test Id:	482735		
Test Comment:	---				
Visual Description:	Moist,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

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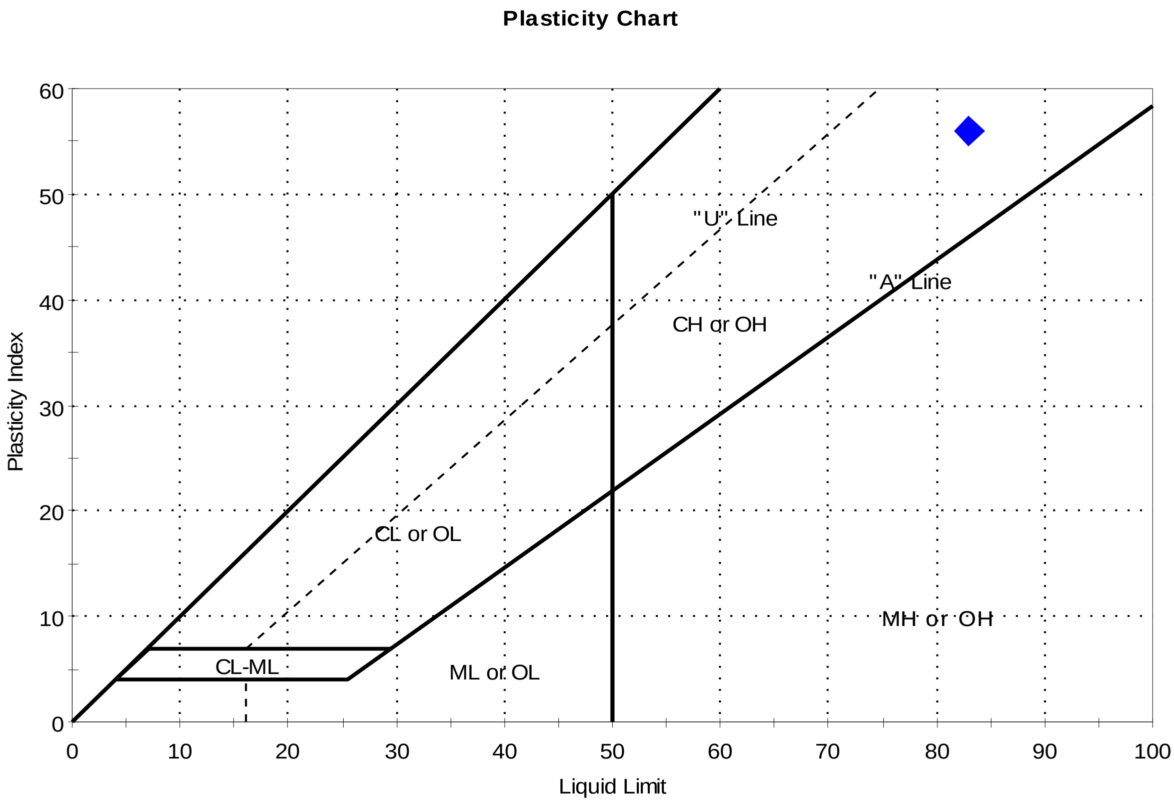
Client: Anchor QEA, LLC			
Project: San Jacinto Pre-Design Investigation			
Location:		Project No:	GTX-309154
Boring ID: SJSB008-E1	Sample Type: bag	Tested By:	cam
Sample ID: SL1029	Test Date: 12/28/18	Checked By:	emm
Depth : 8-10 ft	Test Id: 482736		

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

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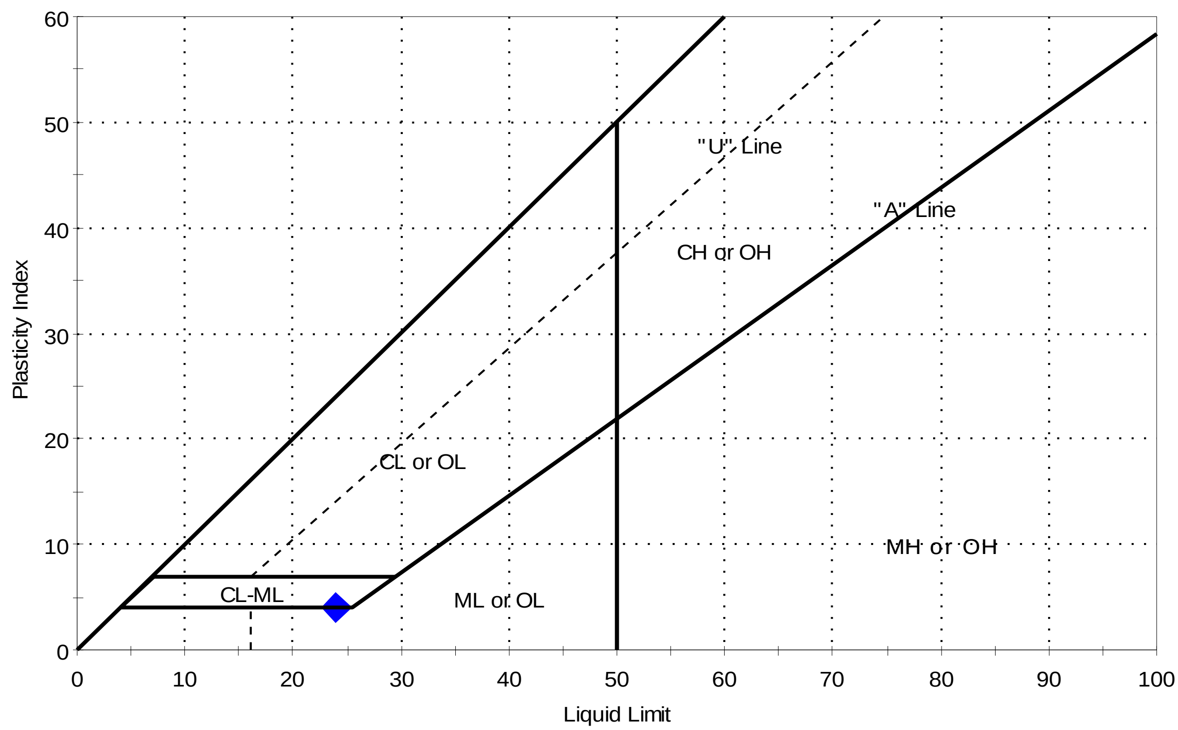
Client:	Anchor QEA, LLC			
Project:	San Jacinto Pre-Design Investigation			
Location:			Project No:	GTX-309154
Boring ID: SJSB012-W1		Sample Type: bag	Tested By:	cam
Sample ID: SL1050		Test Date: 01/05/19	Checked By:	emm
Depth : 15-17 ft		Test Id: 482979		
Test Comment:	---			
Visual Description:	Moist, 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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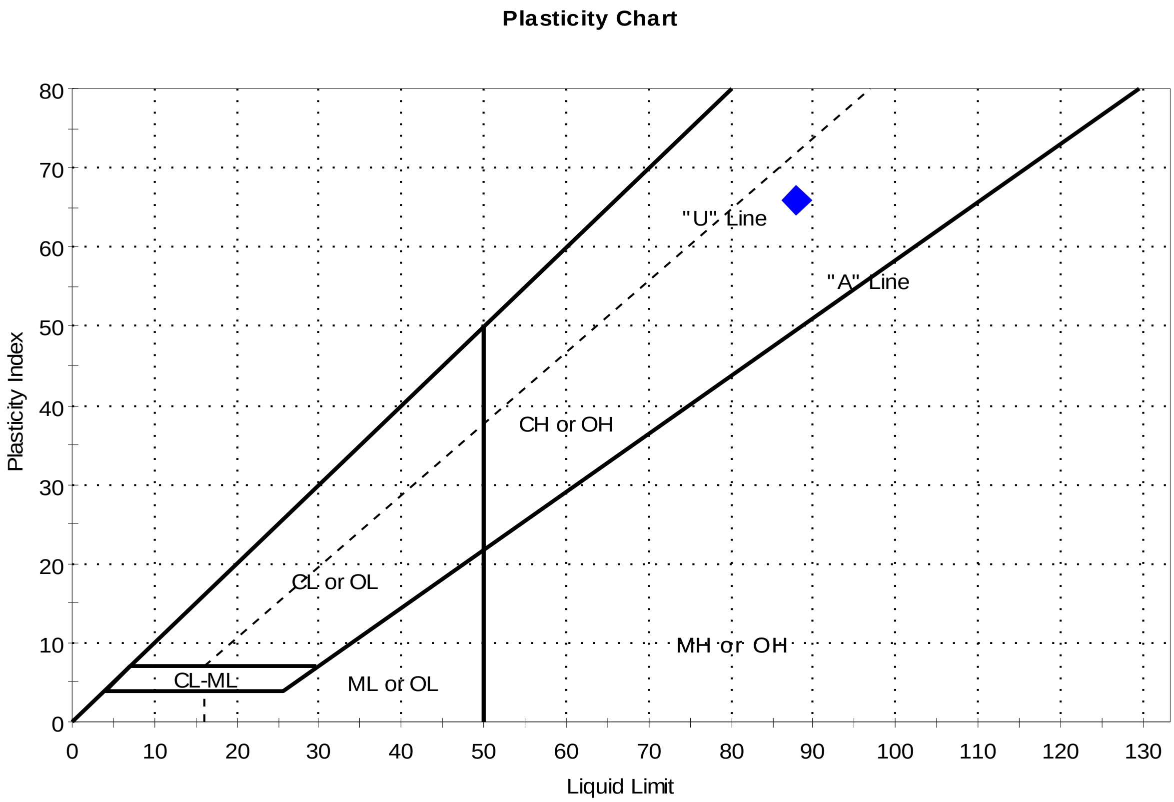
Client:	Anchor QEA, LLC
Project:	San Jacinto Pre-Design Investigation
Location:	
Project No:	GTX-309154
Boring ID:	SJSB019-E1
Sample ID:	SL1004
Depth :	8-10 ft
Sample Type:	bag
Test Date:	01/02/19
Test Id:	482731
Tested By:	cam
Checked By:	emm
Test Comment:	---
Visual Description:	Moist, very dark gray 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

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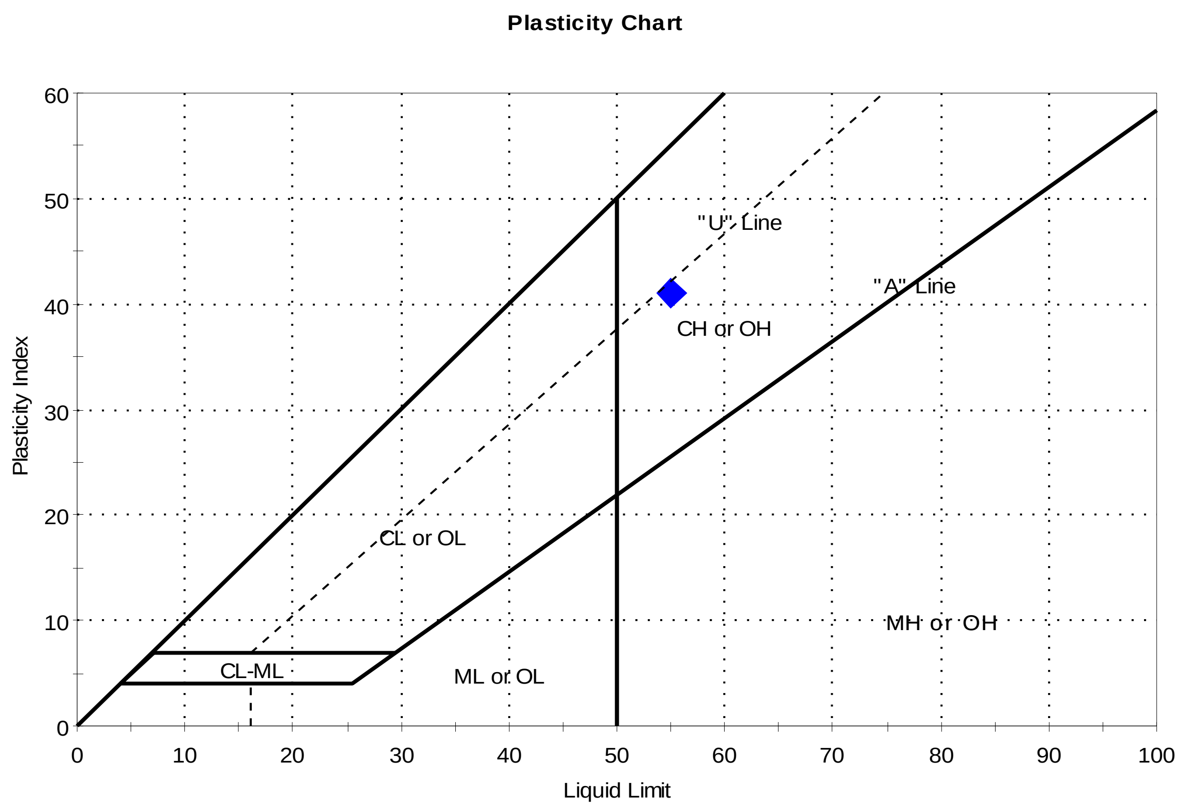
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB019-E1	Sample Type:	bag	Tested By:	cam
Sample ID:	SL1008	Test Date:	12/10/18	Checked By:	emm
Depth :	19-21 ft	Test Id:	482732		
Test Comment:	---				
Visual Description:	Moist, 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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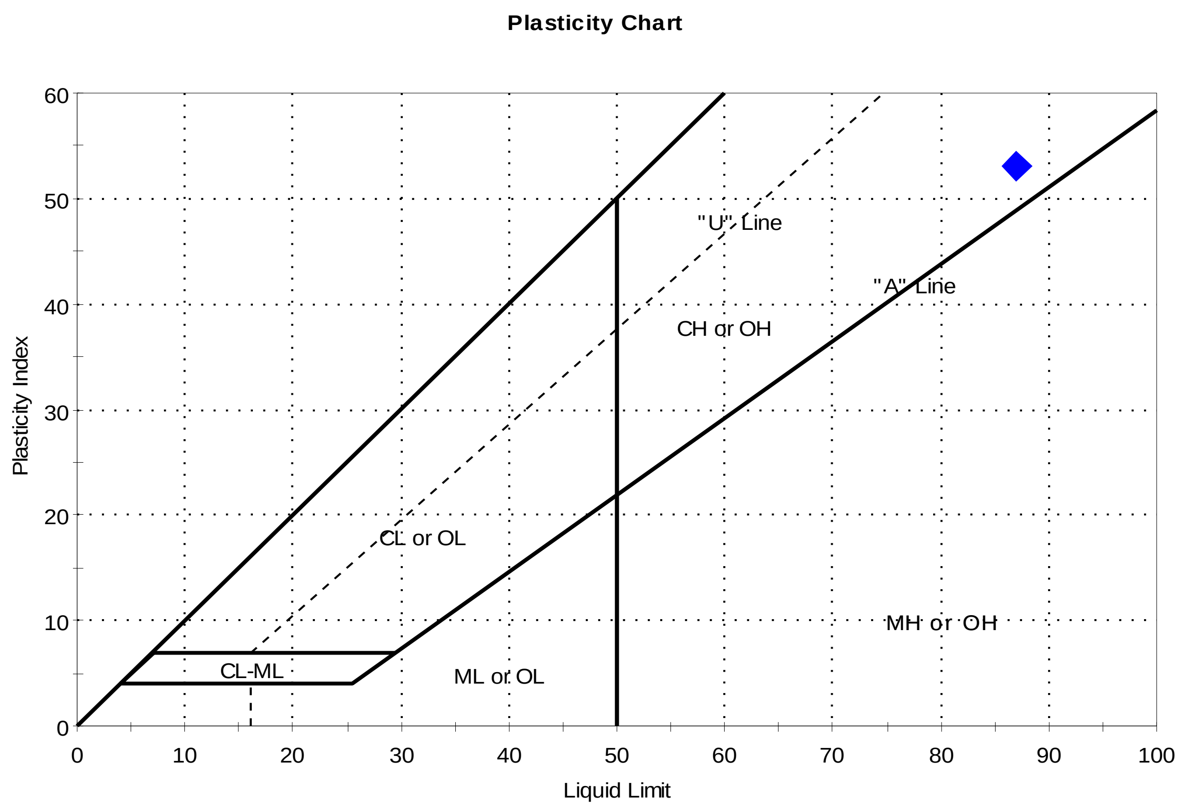
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB023-E1	Sample Type:	bag	Tested By:	cam
Sample ID:	SL1015	Test Date:	12/19/18	Checked By:	emm
Depth :	4-6 ft	Test Id:	482733		

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

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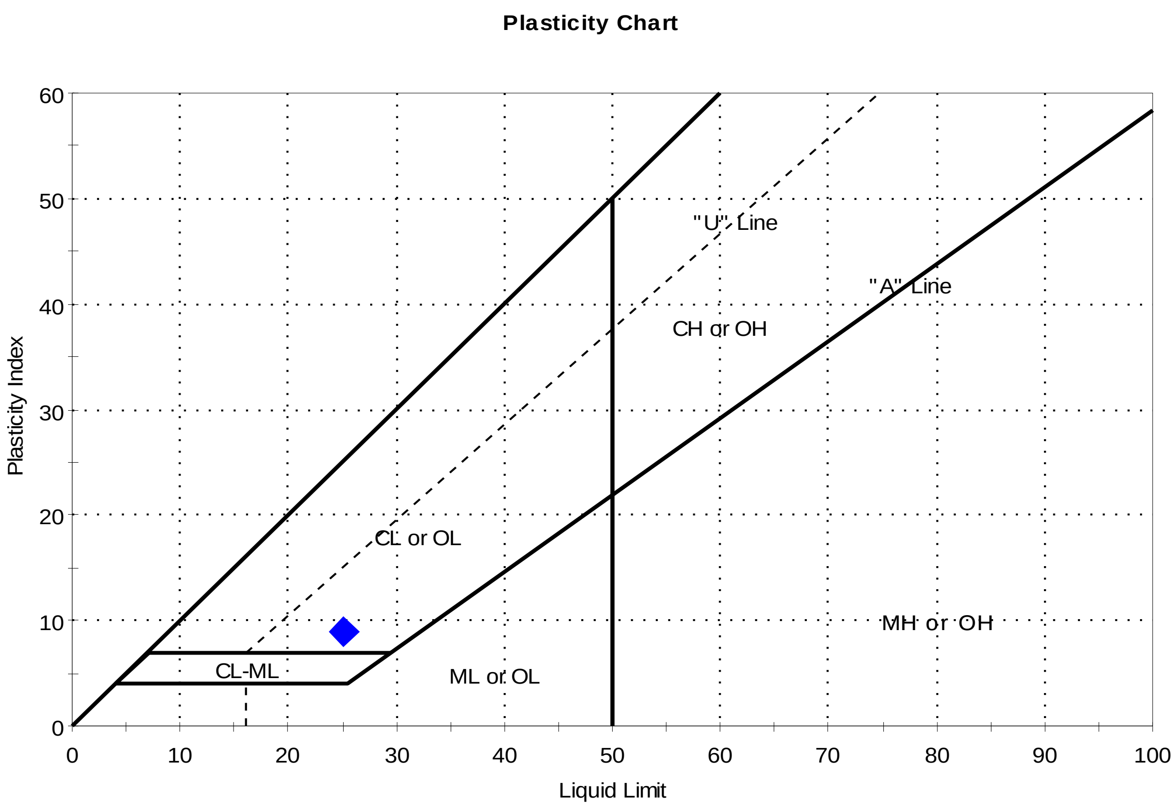
GeoTesting EXPRESS

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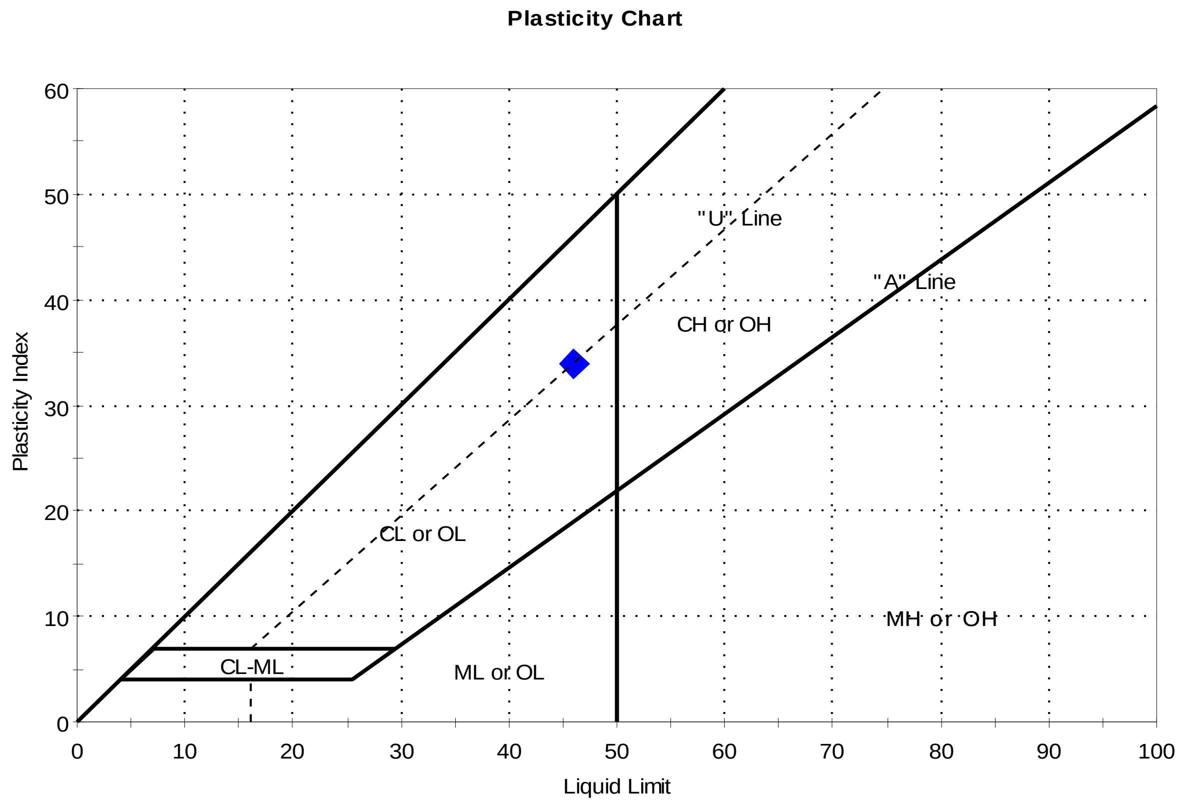
Client: Anchor QEA, LLC			
Project: San Jacinto Pre-Design Investigation			
Location:		Project No:	GTX-309154
Boring ID: SJSB025-1W	Sample Type: bag	Tested By:	cam
Sample ID: SL1040	Test Date: 12/19/18	Checked By:	emm
Depth : 8-10 ft	Test Id: 482737		

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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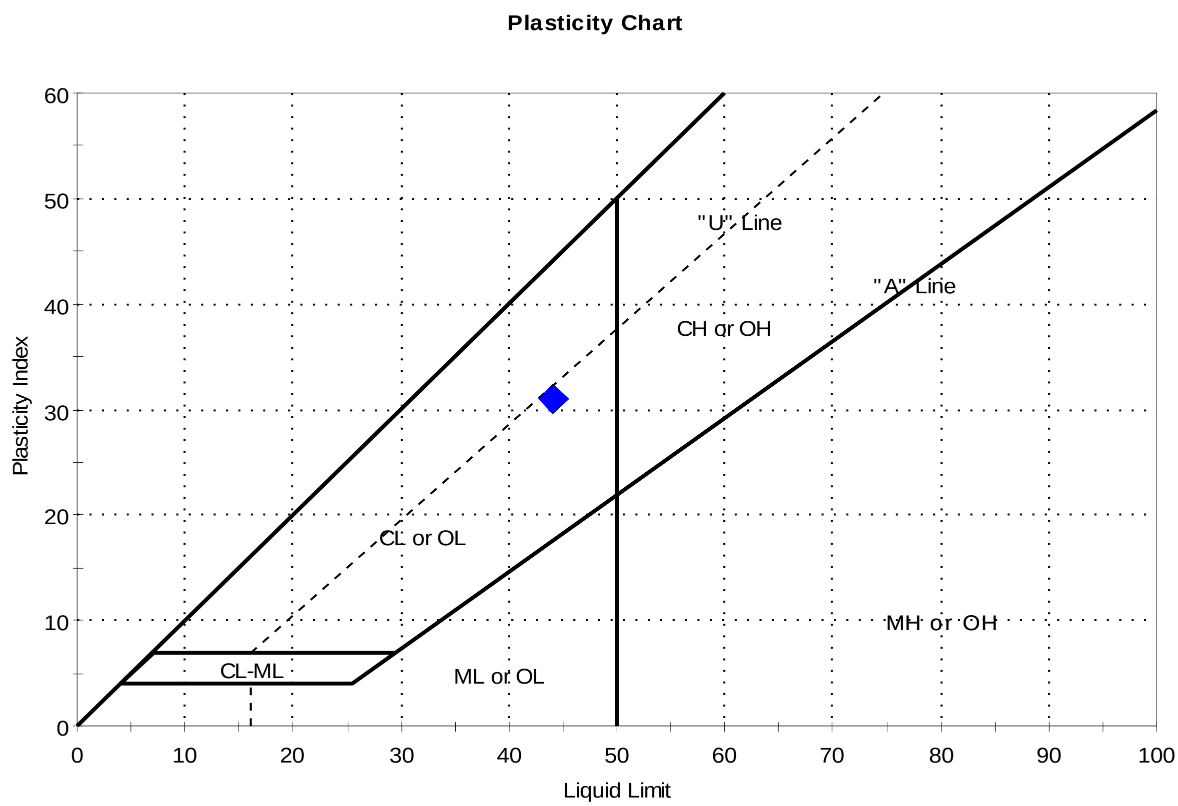
GeoTesting EXPRESS

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

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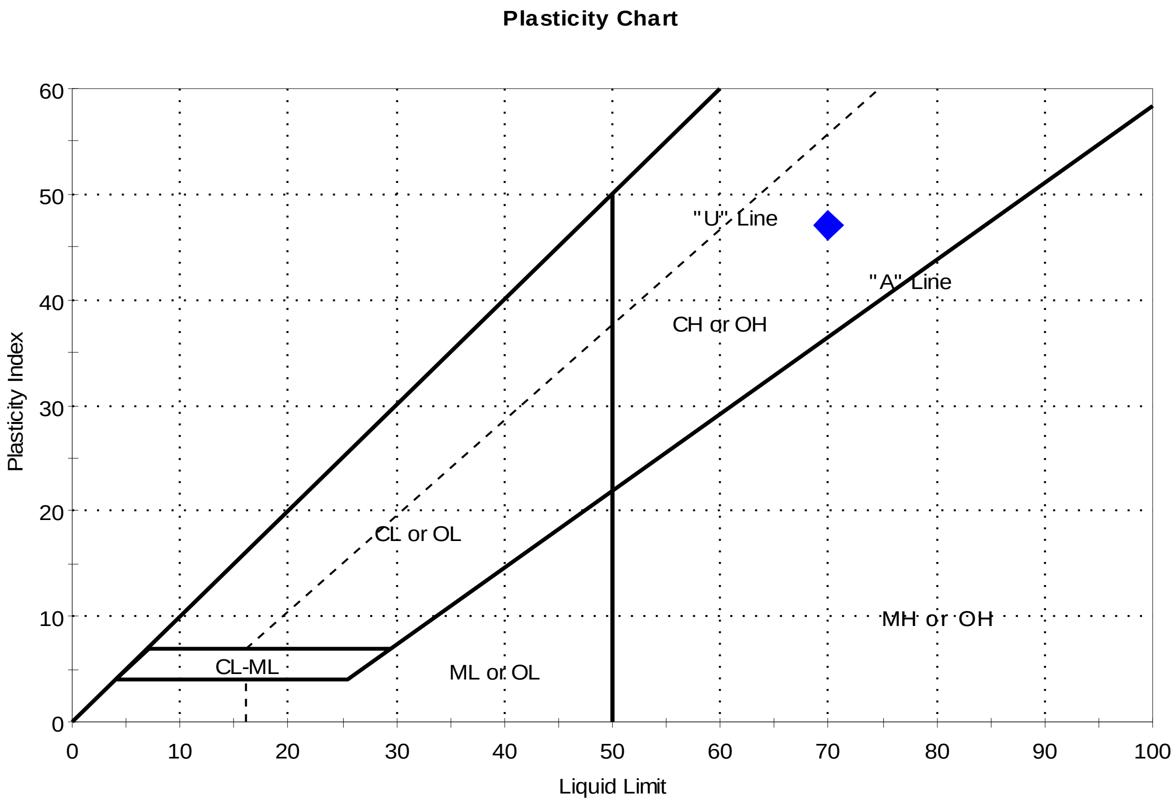
GeoTesting EXPRESS

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

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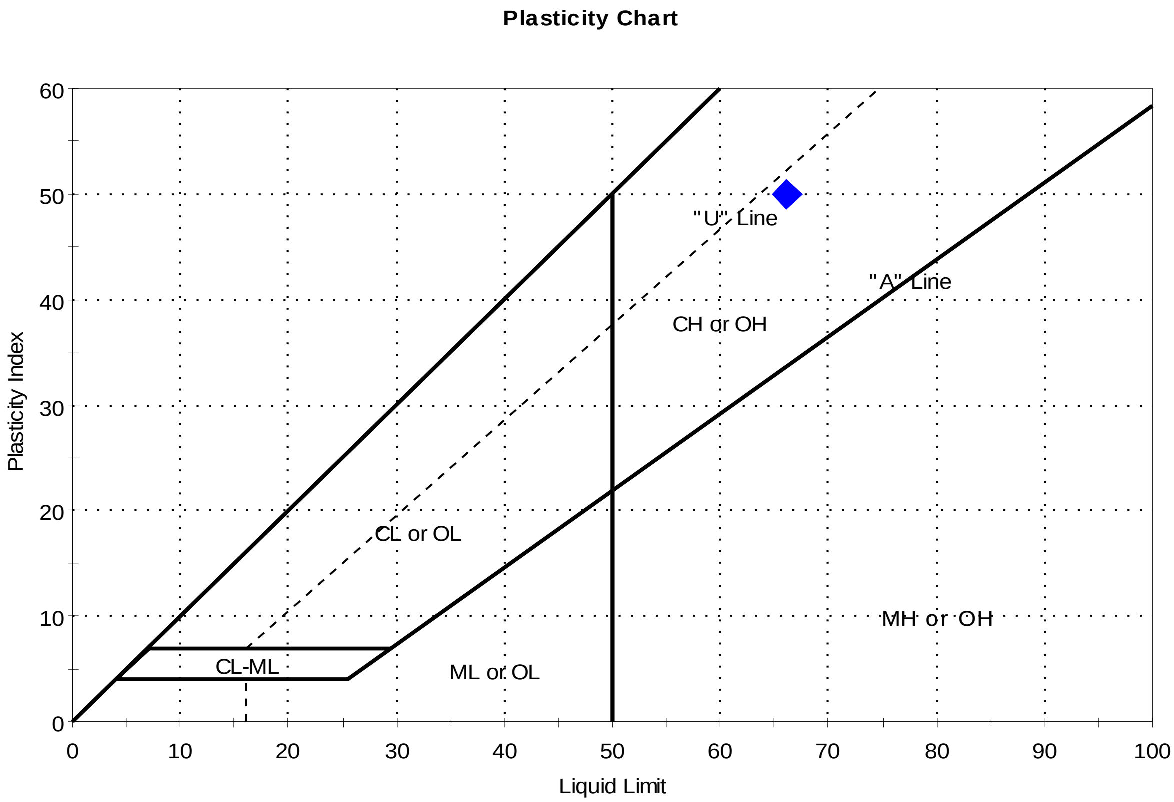
GeoTesting EXPRESS

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

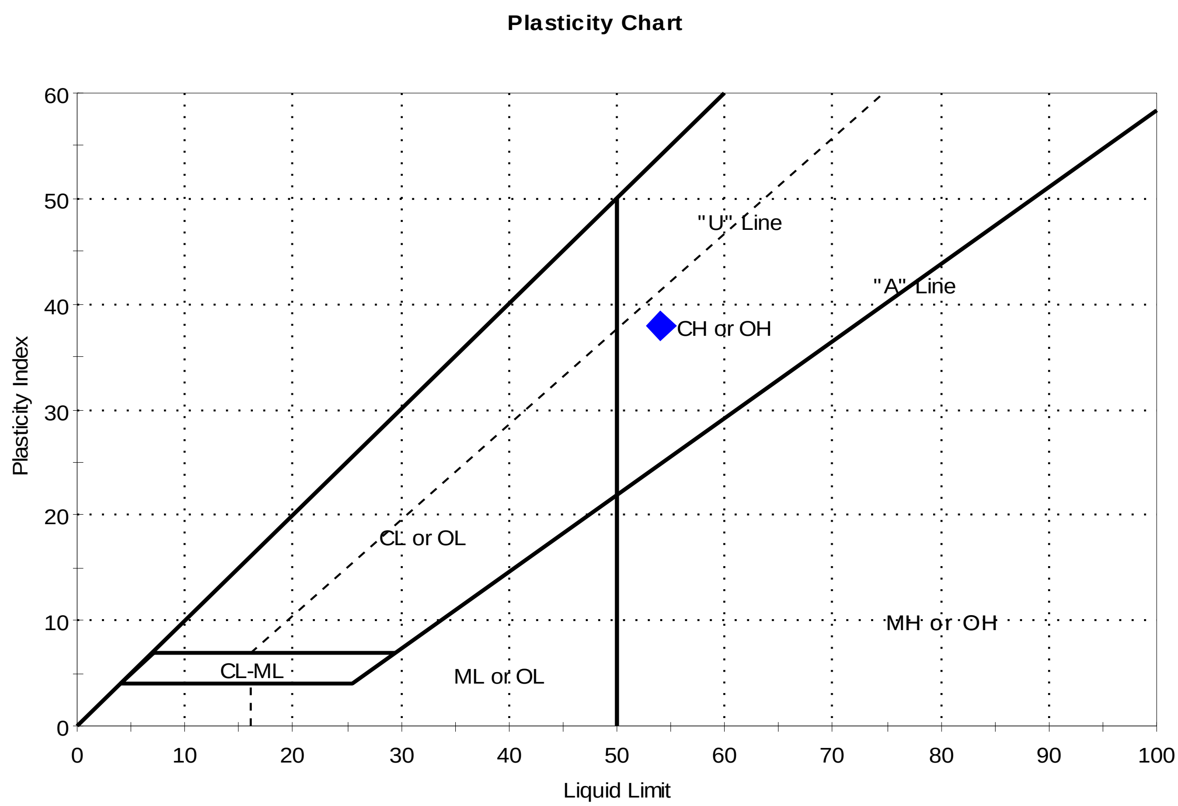
Dilatancy: SLOW

Toughness: LOW

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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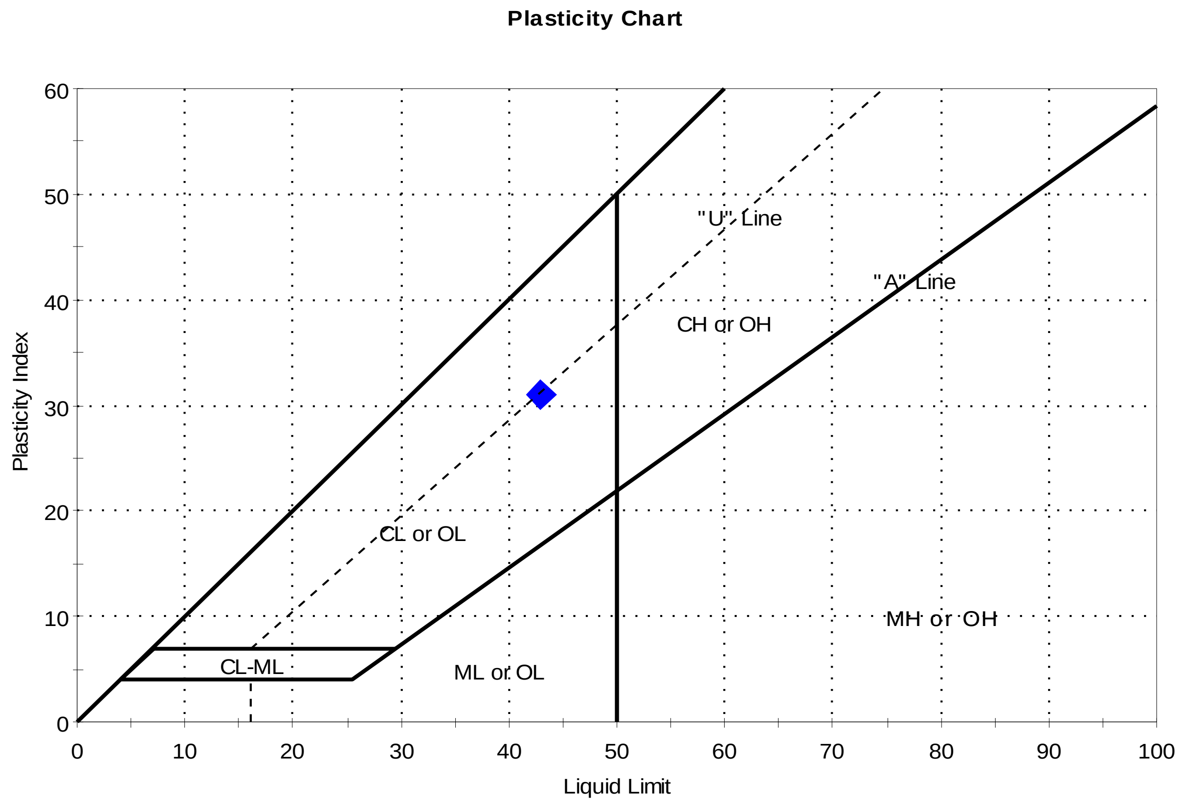
GeoTesting EXPRESS

Client:	Anchor QEA, LLC
Project:	San Jacinto Pre-Design Investigation
Location:	
Project No:	GTX-309154
Boring ID:	SJSB029
Sample ID:	SL0611
Depth :	39.5-40 ft
Sample Type:	bag
Test Date:	01/02/19
Test Id:	482740
Tested By:	cam
Checked By:	emm
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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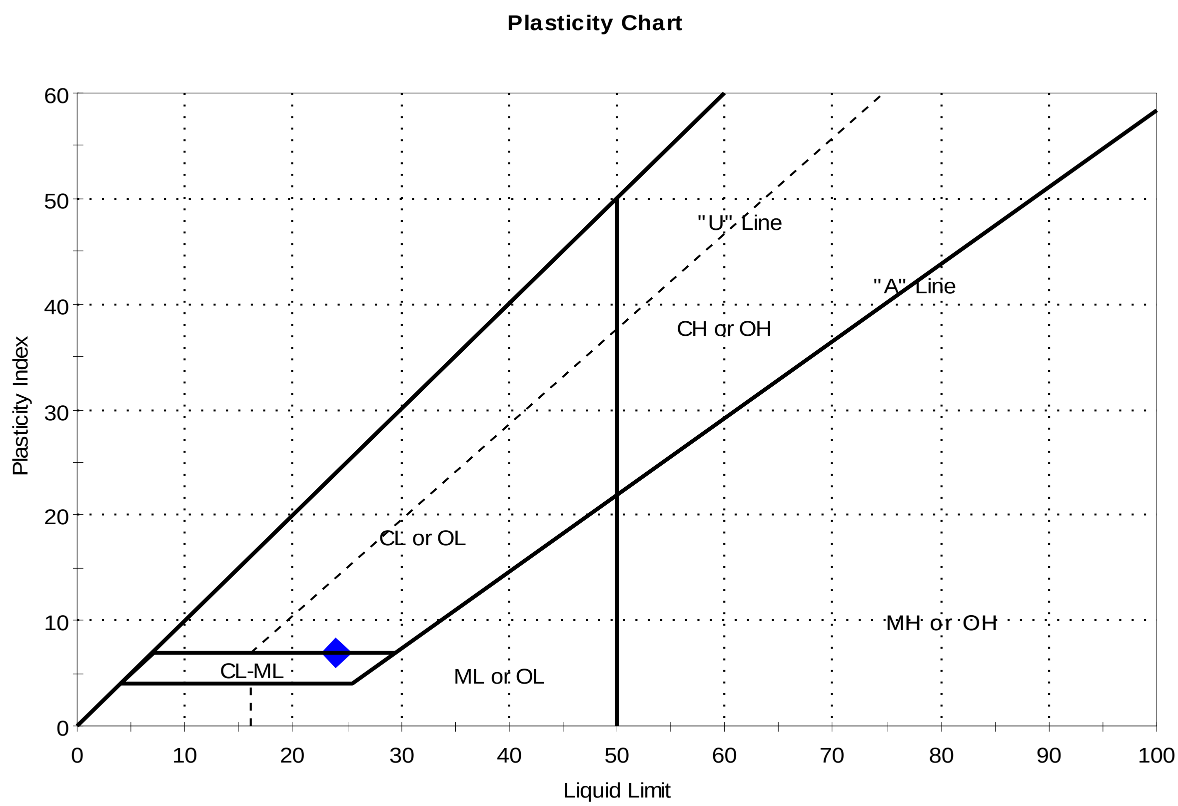
Client:	Anchor QEA, LLC			
Project:	San Jacinto Pre-Design Investigation			
Location:			Project No:	GTX-309154
Boring ID:	SJSB030	Sample Type: bag	Tested By:	cam
Sample ID:	SL0692	Test Date: 03/05/19	Checked By:	bfs
Depth :	8-10 ft	Test Id: 483638		
Test Comment:	---			
Visual Description:	Moist, dark 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

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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: 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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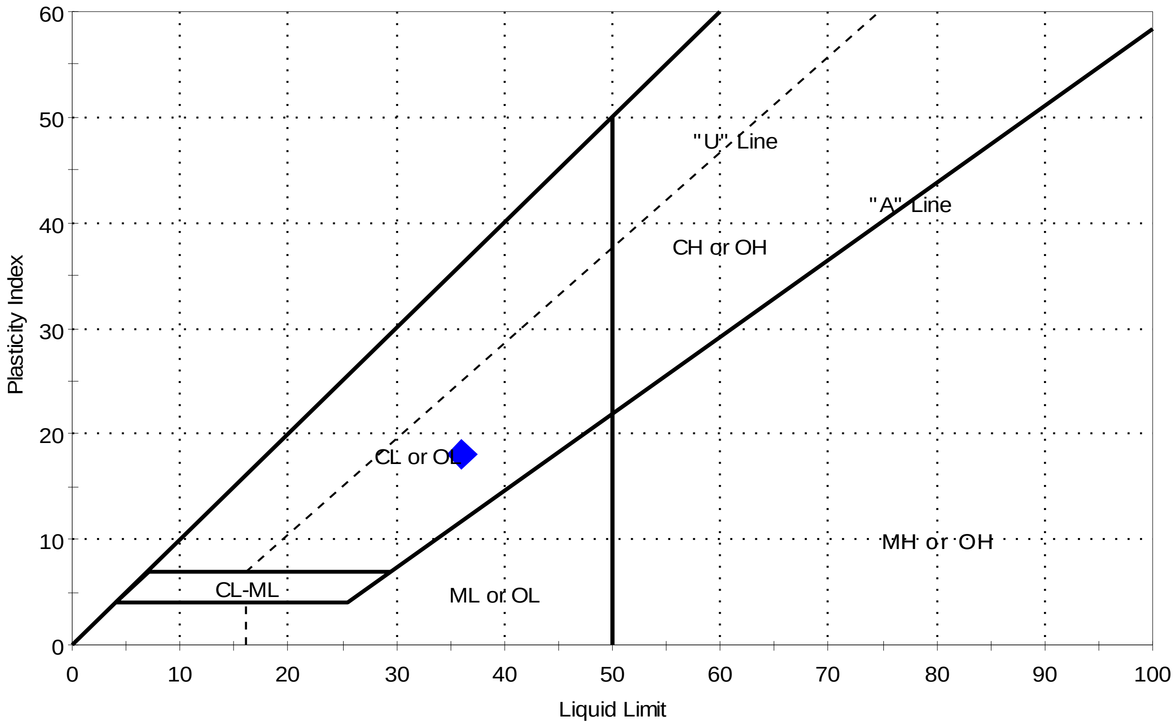
Client:	Anchor QEA, LLC		
Project:	San Jacinto Pre-Design Investigation		
Location:		Project No:	GTX-309154
Boring ID: SJSB031	Sample Type: bag	Tested By:	cam
Sample ID: SL0617	Test Date: 12/11/18	Checked By:	emm
Depth : 8-10 ft	Test Id: 482741		
Test Comment:	---		
Visual Description:	Moist, very dark 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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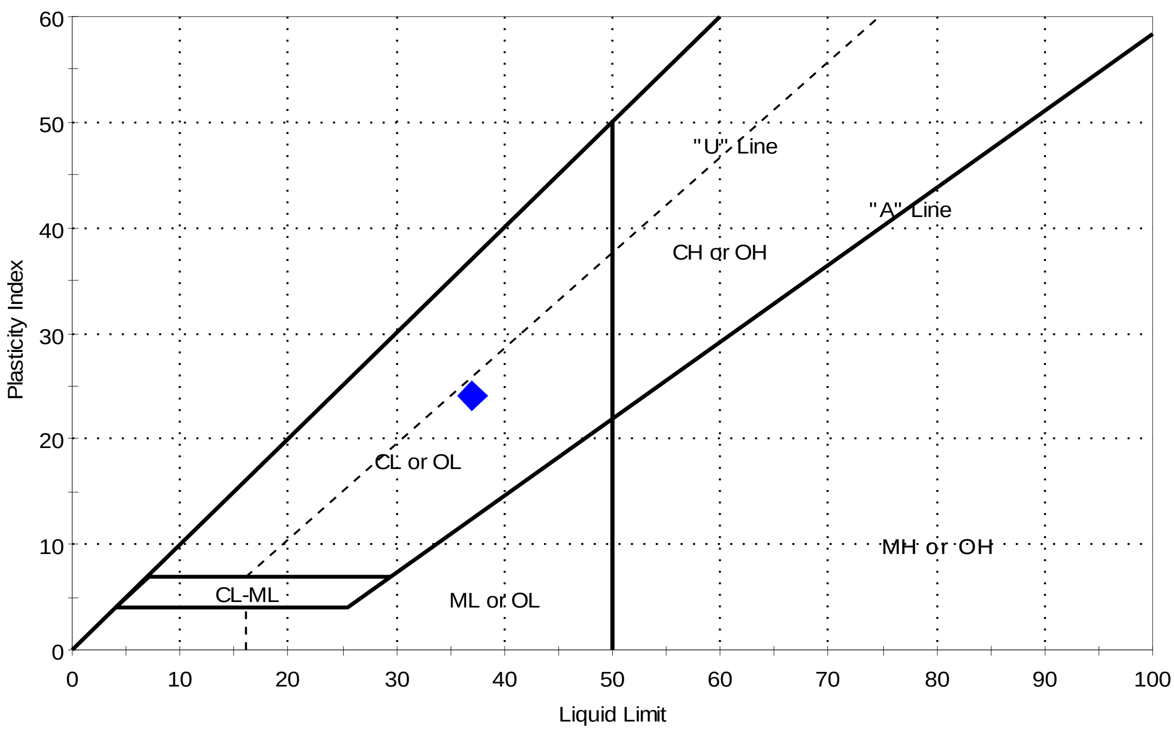
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB032	Sample Type:	bag	Tested By:	cam
Sample ID:	SL0679	Test Date:	02/28/19	Checked By:	bfs
Depth :	8-10 ft	Test Id:	483636		
Test Comment:	---				
Visual Description:	Moist, 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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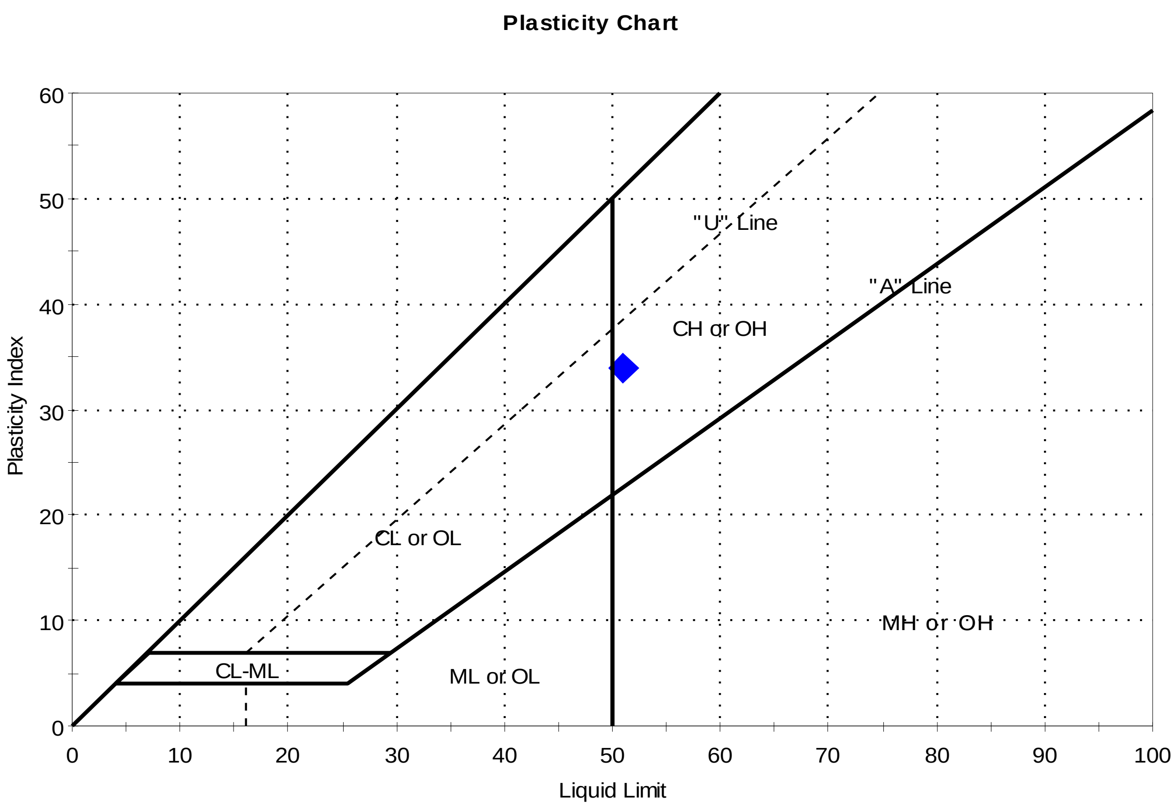
Client:	Anchor QEA, LLC				
Project:	San Jacinto Pre-Design Investigation				
Location:				Project No:	GTX-309154
Boring ID:	SJSB032	Sample Type:	bag	Tested By:	cam
Sample ID:	SL0685	Test Date:	02/28/19	Checked By:	bfs
Depth :	38-40 ft	Test Id:	483637		

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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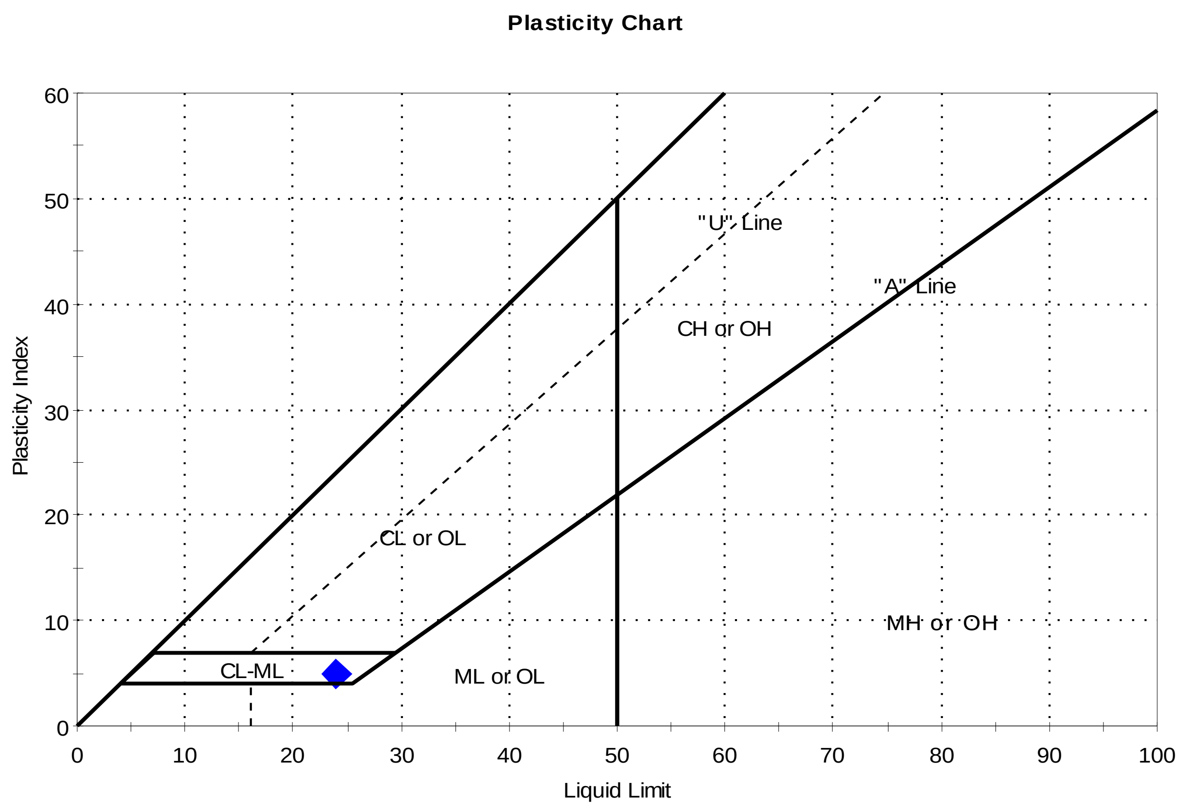
GeoTesting EXPRESS

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

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GeoTesting EXPRESS

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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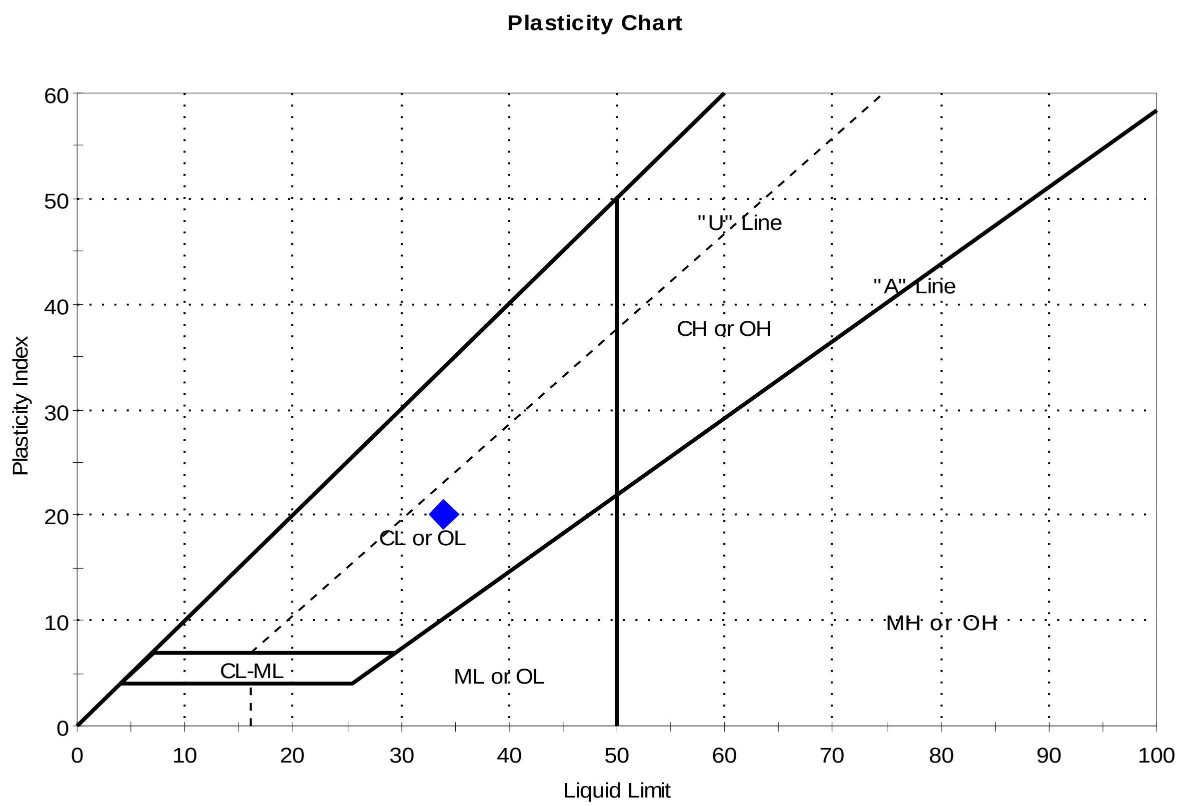
GeoTesting EXPRESS

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

printed 3/15/2019 12:35:30 PM

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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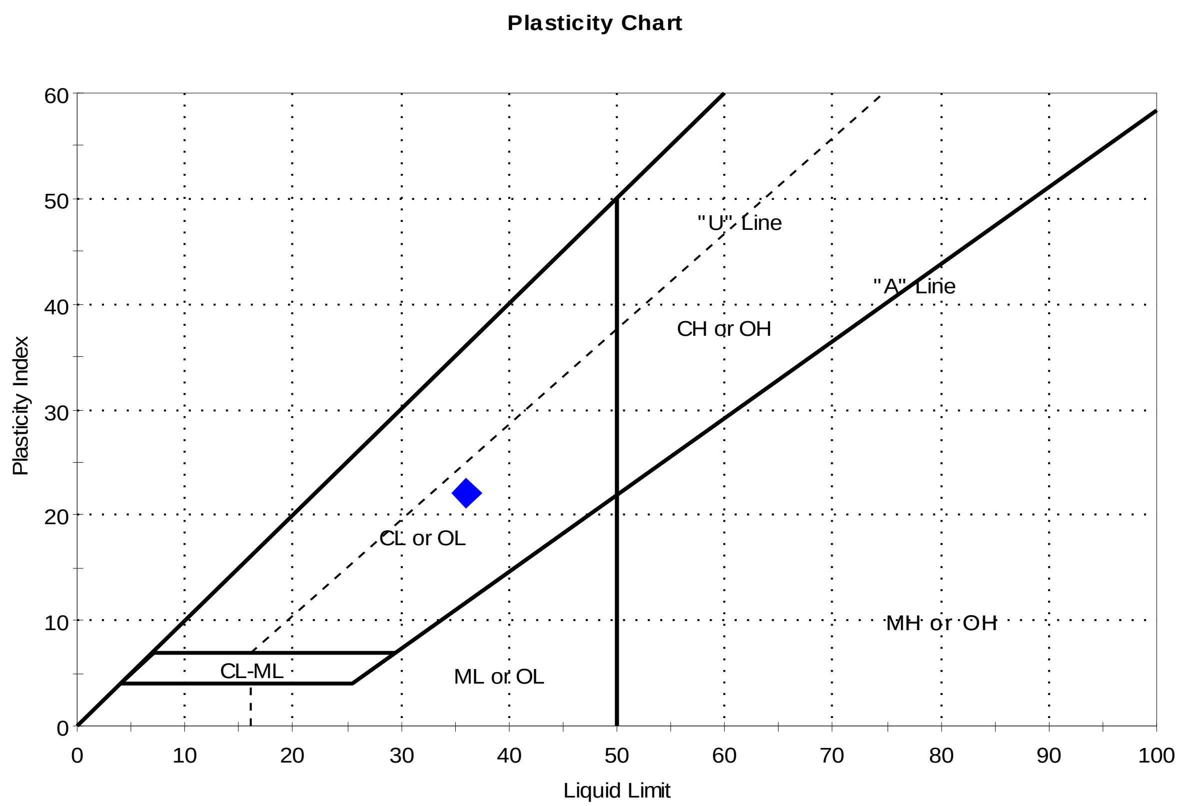
GeoTesting EXPRESS

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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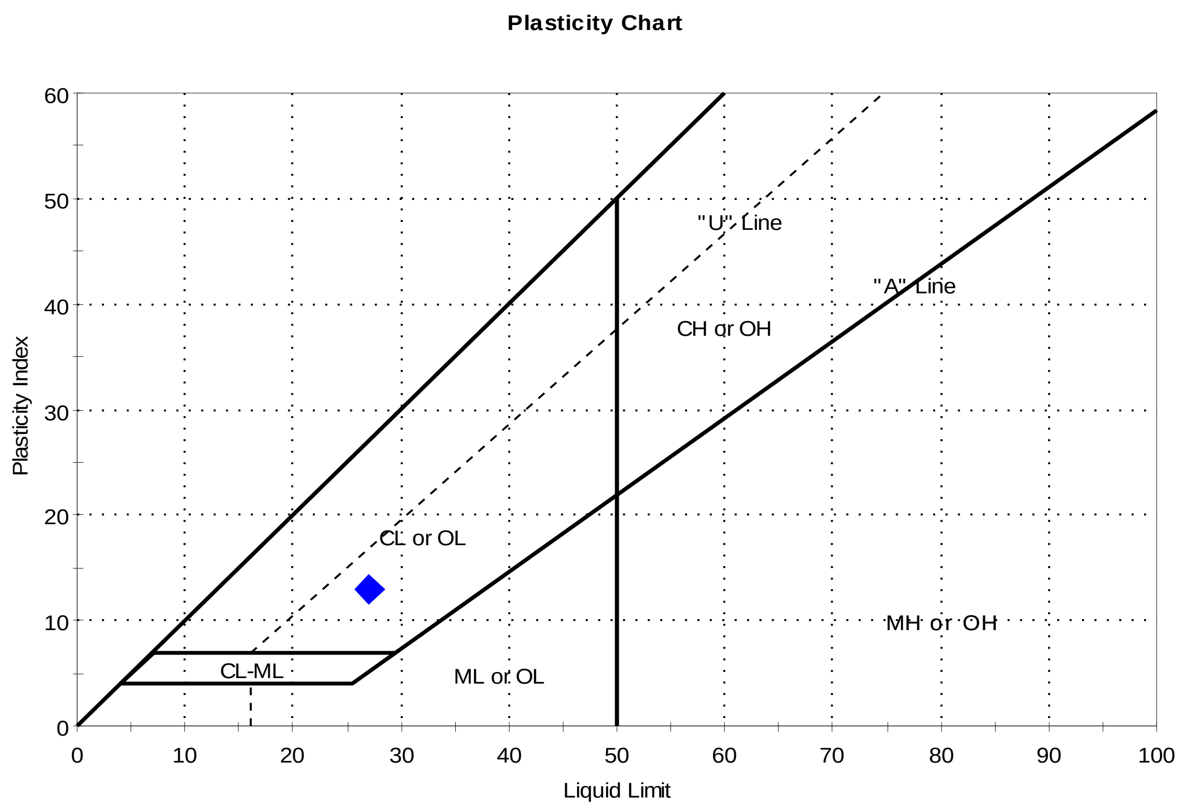
Client:	Anchor QEA, LLC
Project:	San Jacinto Pre-Design Investigation
Location:	Project No: GTX-309154

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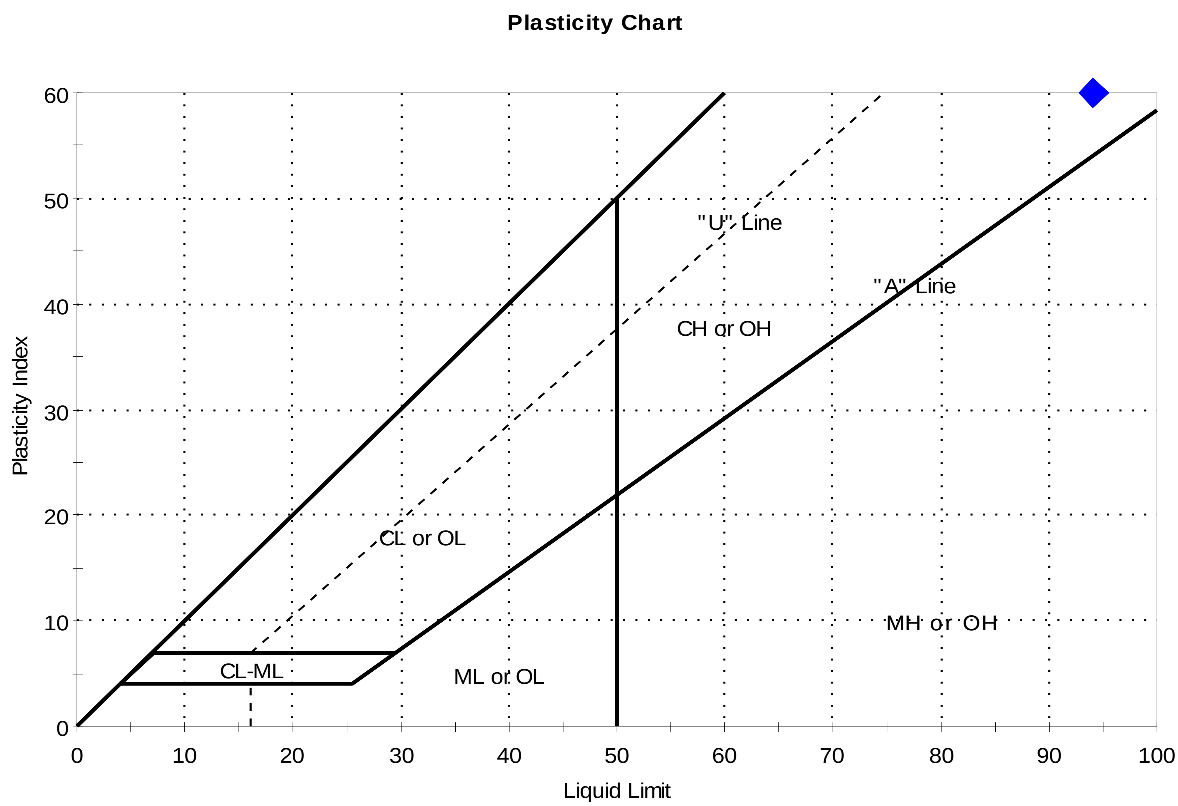
Client:	Anchor QEA, LLC		
Project:	San Jacinto Pre-Design Investigation		
Location:		Project No:	GTX-309154
Boring ID: SJSB036	Sample Type: bag	Tested By:	cam
Sample ID: SL0665	Test Date: 02/28/19	Checked By:	bfs
Depth : 2.6-4 ft	Test Id: 483634		
Test Comment:	---		
Visual Description:	Moist, very dark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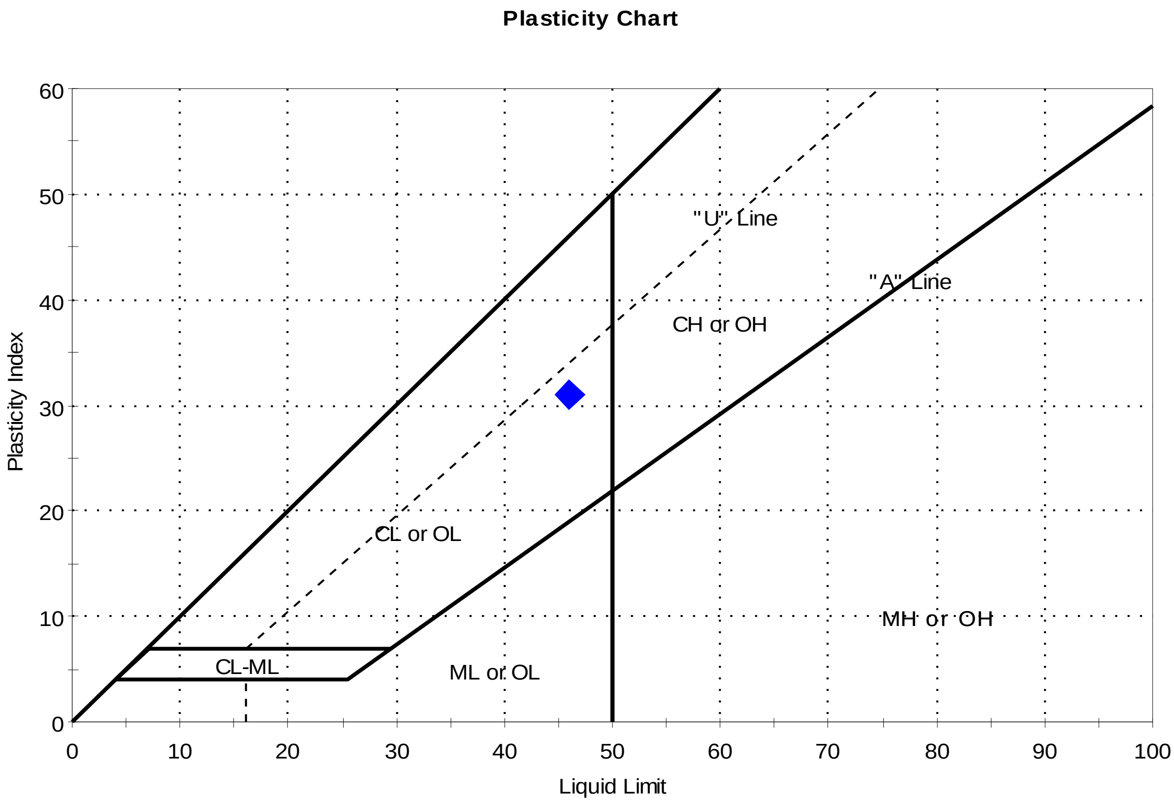
Client:	Anchor QEA, LLC		
Project:	San Jacinto Pre-Design Investigation		
Location:		Project No:	GTX-309154

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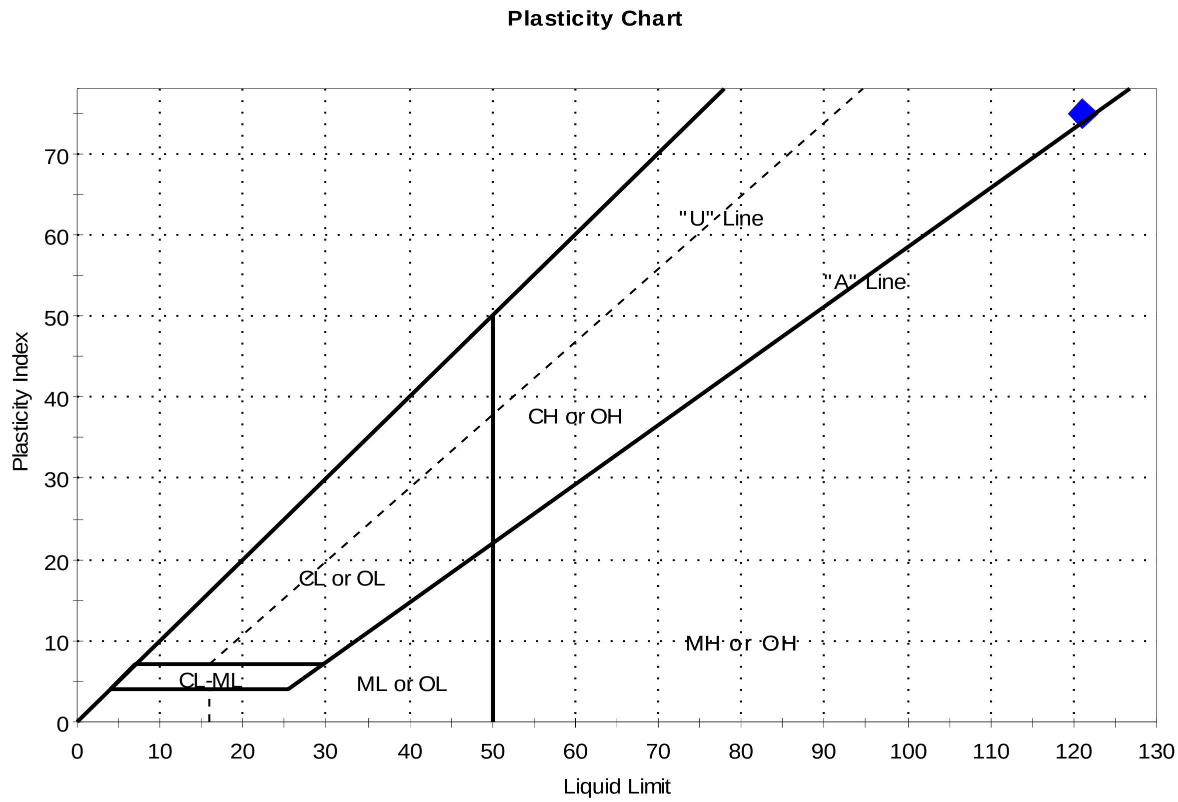
Client: Anchor QEA, LLC			
Project: San Jacinto Pre-Design Investigation			
Location:		Project No:	GTX-309154
Boring ID: SJSB037	Sample Type: bag	Tested By:	cam
Sample ID: SL0652	Test Date: 03/01/19	Checked By:	bfs
Depth : 2-4 ft	Test Id: 483632		
Test Comment: ---			
Visual Description: Moist, very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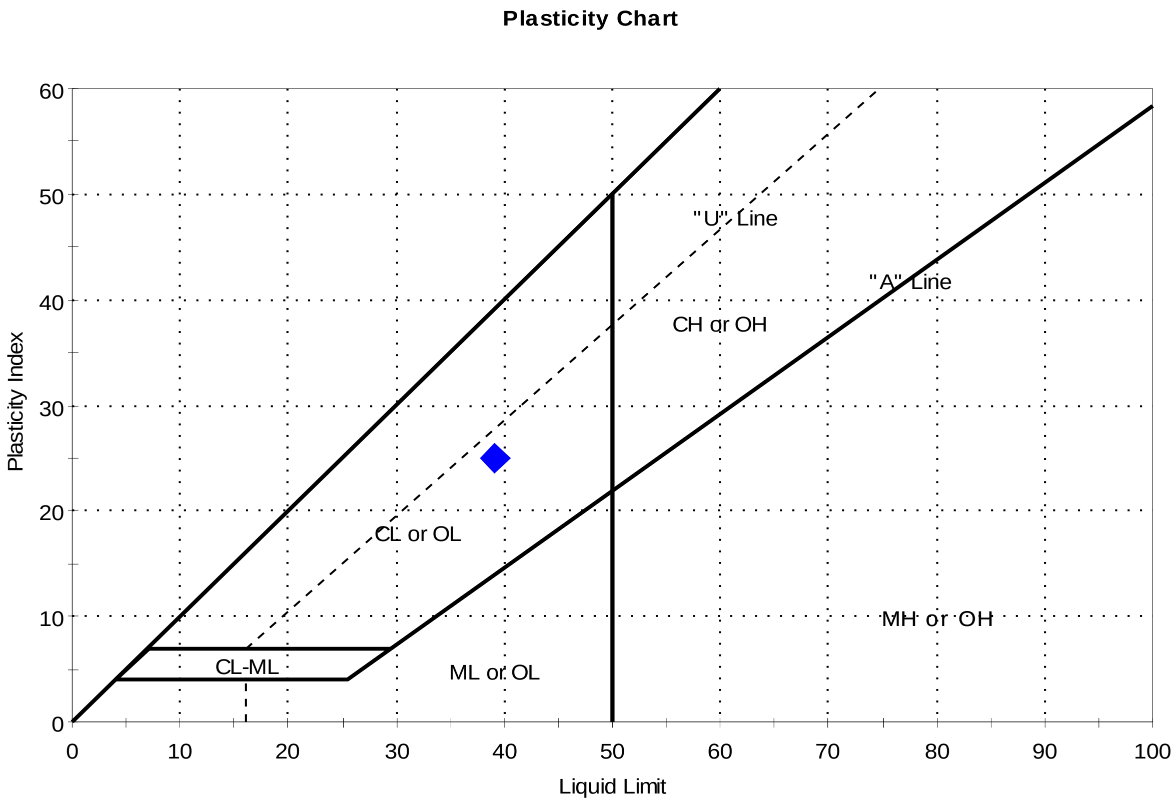
GeoTesting EXPRESS

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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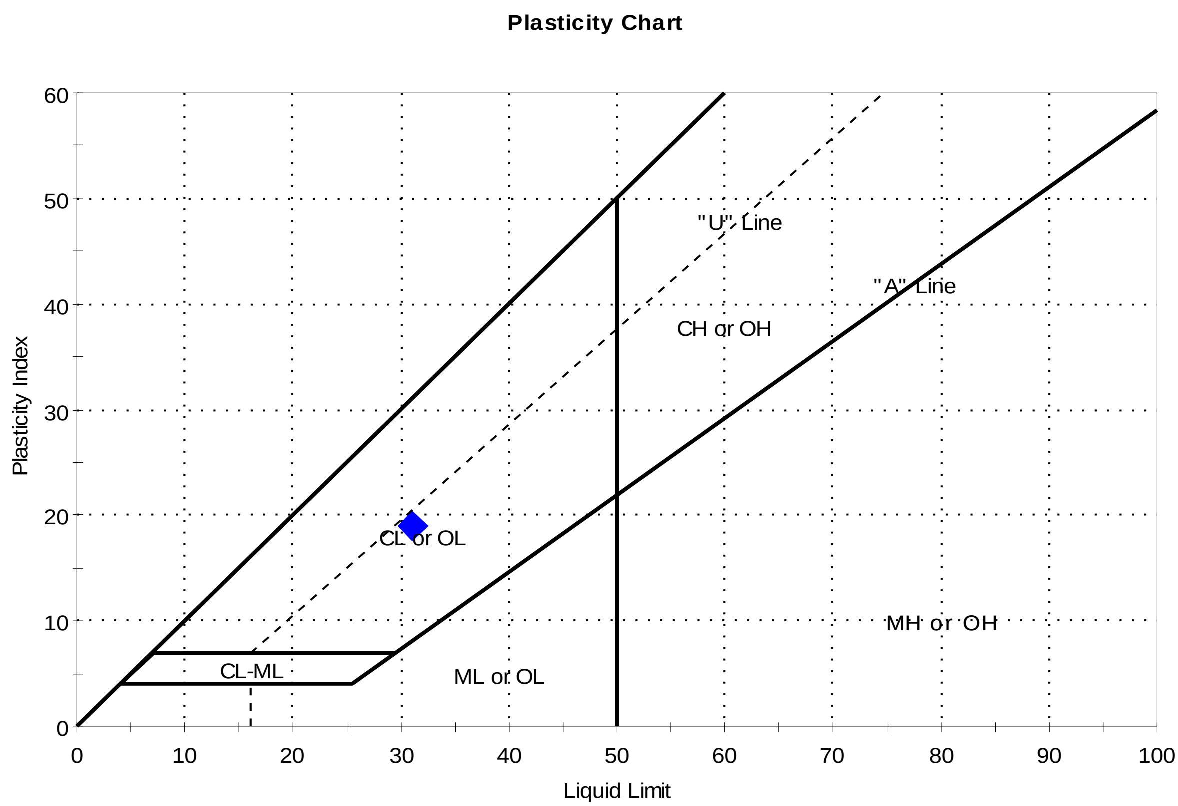
GeoTesting EXPRESS

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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GeoTesting EXPRESS

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	Pressure, psi Inlet	Pressure, psi Outlet	Gradient	Flow Volume, cc In	Flow Volume, cc Out	Flow Volume, cc Δ In	Flow Volume, cc 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: 1.8×10^{-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			Gradient	Flow Volume, cc				Temp, °C	R_t	Permeability K @ 20 °C, cm/sec
		Cell	Inlet	Outlet		In	Out	Δ In	Δ Out			
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: 6.4×10^{-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
End Date:	3/11/2019
Tested By:	jlw
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

Orientation: Vertical

Permeant Fluid: De-aired Distilled water

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			Gradient	Flow Volume, cc				Temp, °C	R_t	Permeability K @ 20 °C, cm/sec
		Cell	Inlet	Outlet		In	Out	Δ In	Δ Out			
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)

GeoTesting EXPRESS

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%.

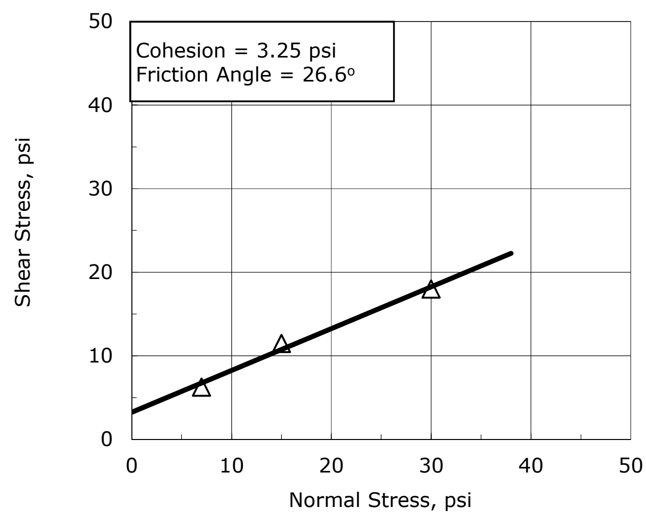
FLOW DATA

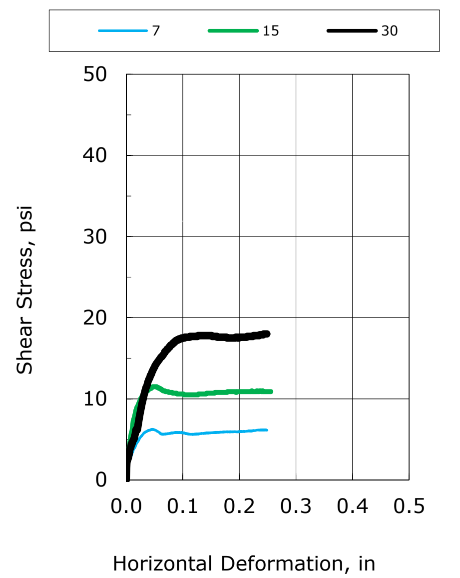
Date	Time, sec	Pressure, psi Cell	Pressure, psi Inlet	Pressure, psi Outlet	Gradient	Flow Volume, cc In	Flow Volume, cc Out	Flow Volume, cc Δ In	Flow Volume, cc Δ Out	Temp, °C	R_t	Permeability K @ 20 °C, cm/sec
2/25	---	90.0	88.5	87.5	10.7	7.00	14.00	---	---	---	---	---
2/25	3708	90.0	88.5	87.5	10.7	7.60	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: 3.2×10^{-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

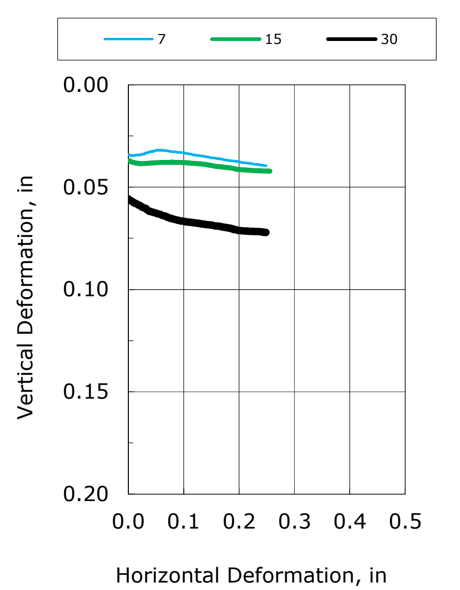
Direct Shear Test of Soils Under Consolidated Drained Conditions by ASTM D3080





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

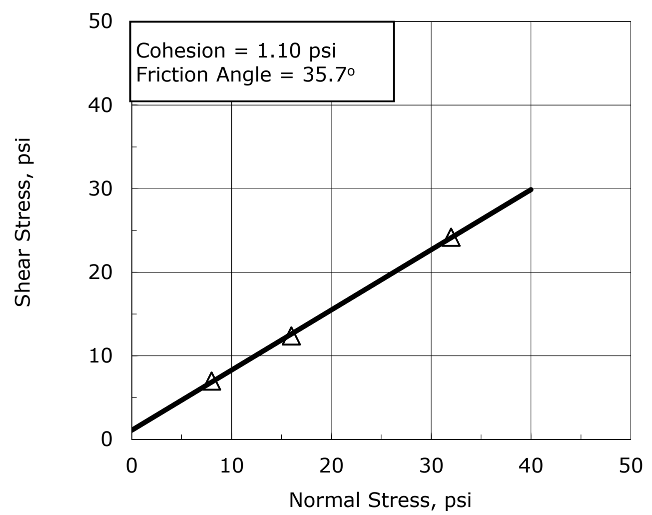
Extruded from tube, cut, trimmed and placed into apparatus at the as-received density and moisture content

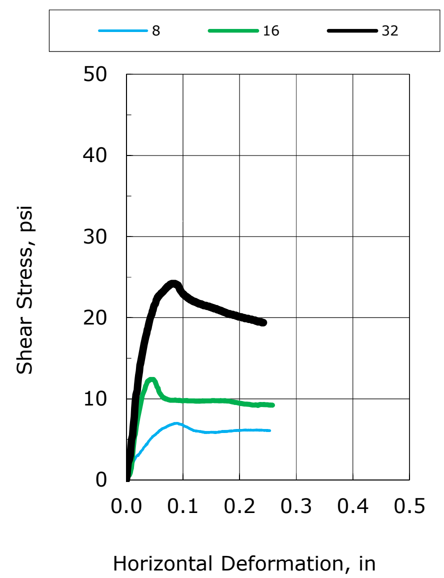
Values for cohesion and friction angle determined from best-fit straight line to the data for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site-specific conditions.

"---" 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

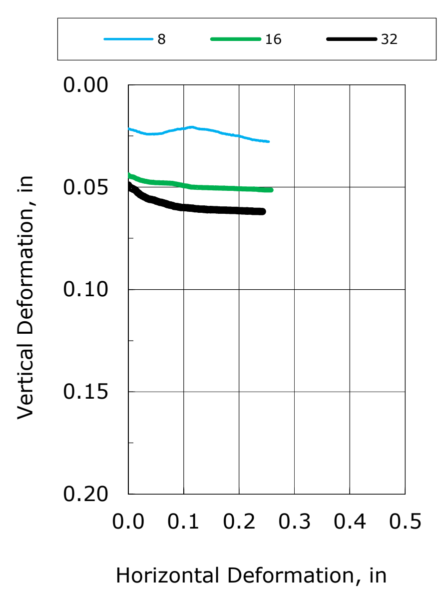
Direct Shear Test of Soils Under Consolidated Drained Conditions by ASTM D3080





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

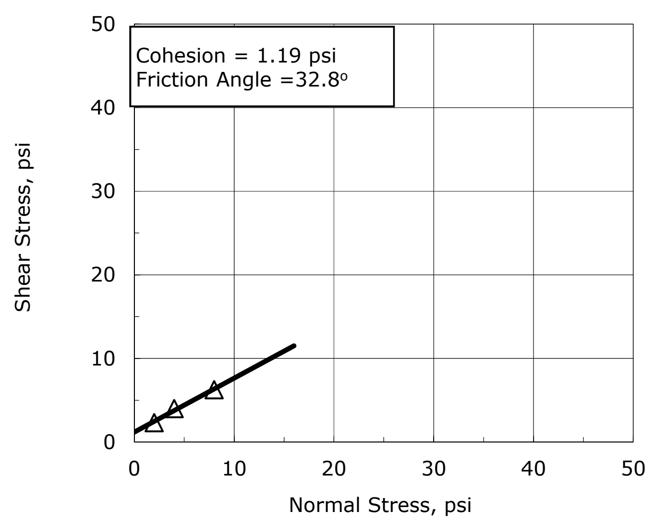
Extruded from tube, cut, trimmed and placed into apparatus at the as-received density and moisture content

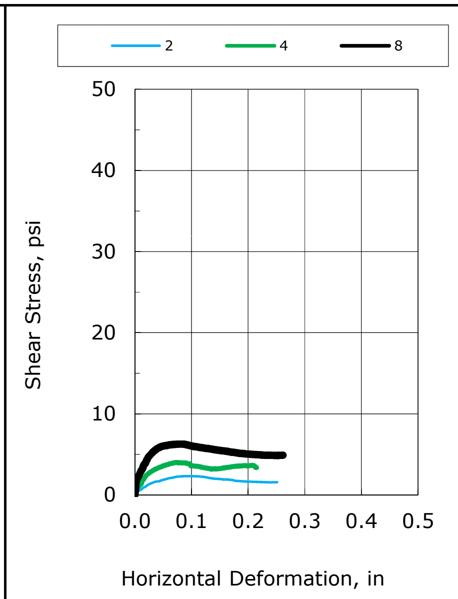
Values for cohesion and friction angle determined from best-fit straight line to the data for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site-specific conditions.

"---" 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

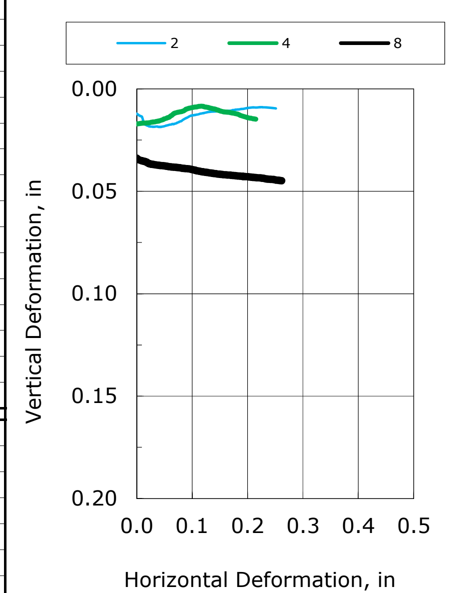
Direct Shear Test of Soils Under Consolidated Drained Conditions by ASTM D3080





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

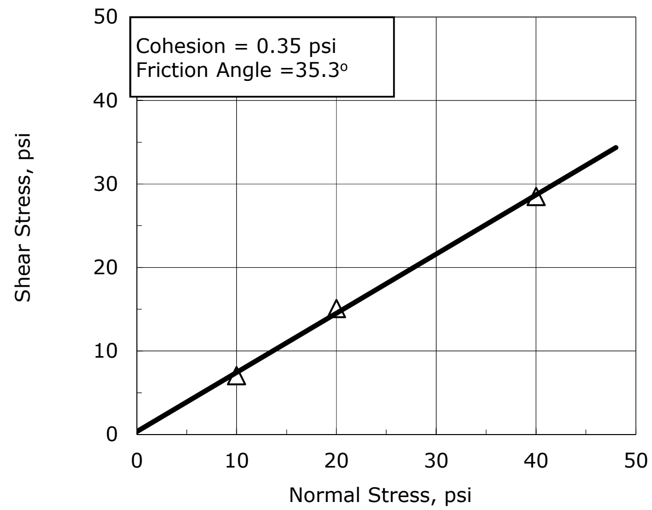
Extruded from tube, cut, trimmed and placed into apparatus at the as-received density and moisture content

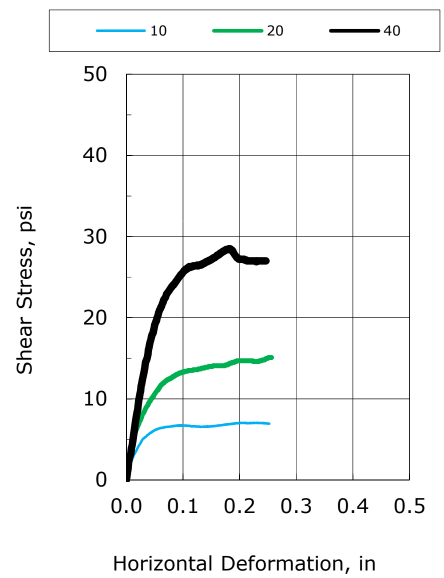
Values for cohesion and friction angle determined from best-fit straight line to the data for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site-specific conditions.

"---" 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

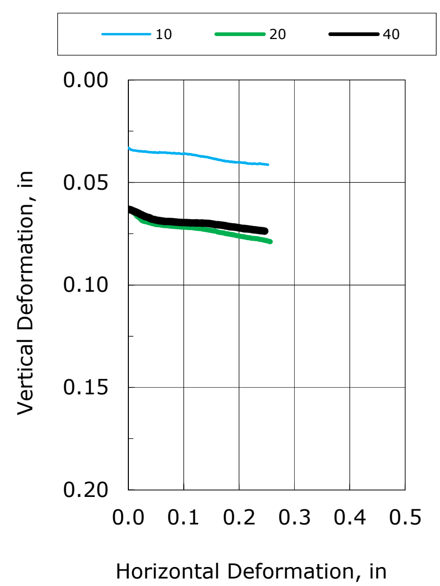
Direct Shear Test of Soils Under Consolidated Drained Conditions by ASTM D3080





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

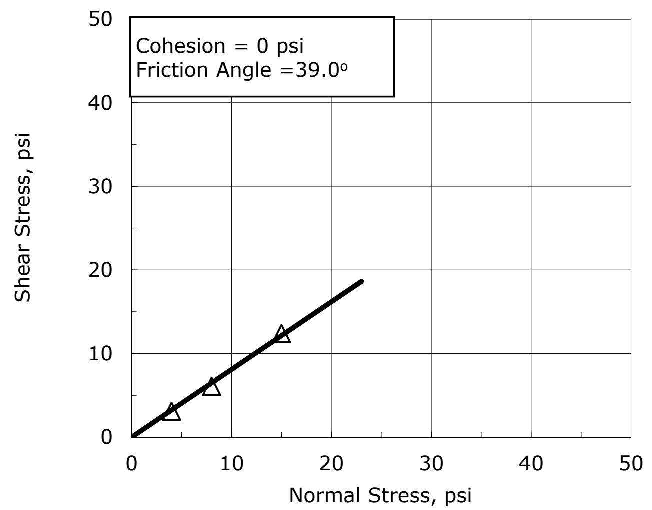
Extruded from tube, cut, trimmed and placed into apparatus at the as-received density and moisture content

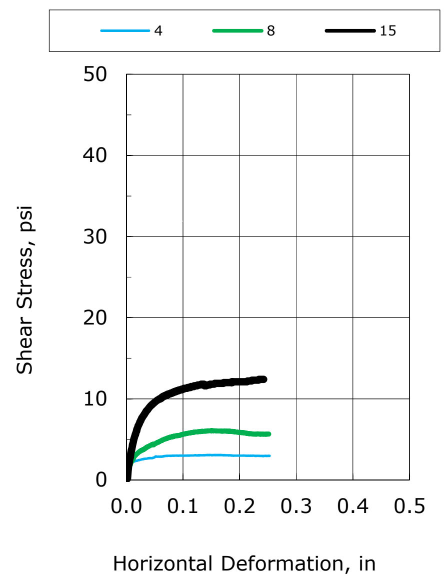
Values for cohesion and friction angle determined from best-fit straight line to the data for the specific test conditions. Actual strength parameters may vary and should be determined by an engineer for site-specific conditions.

"---" 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

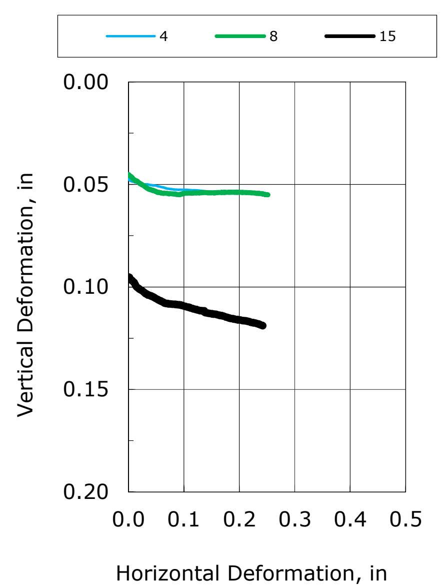
Direct Shear Test of Soils Under Consolidated Drained Conditions by ASTM D3080





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:	---

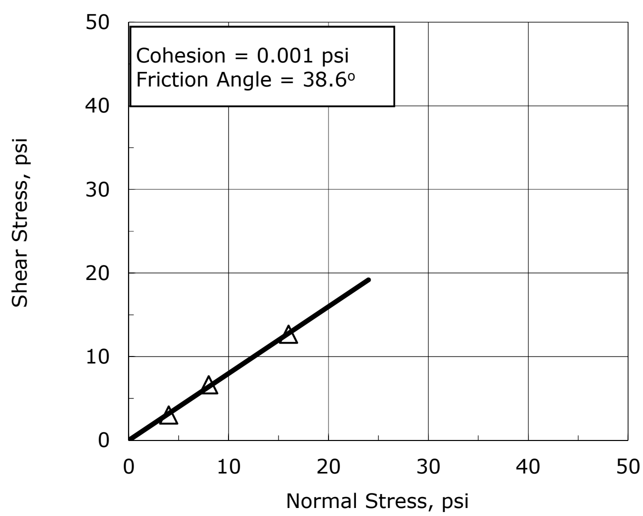


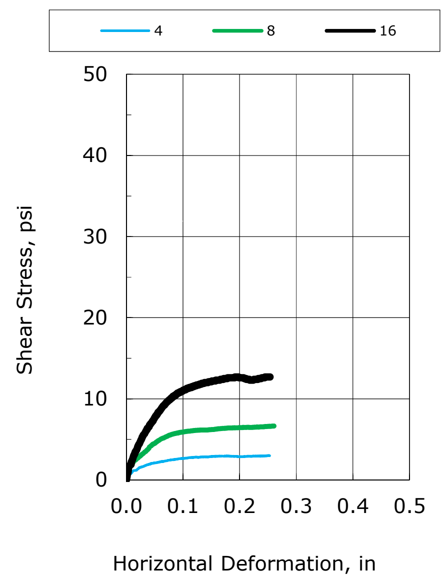
Notes:

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

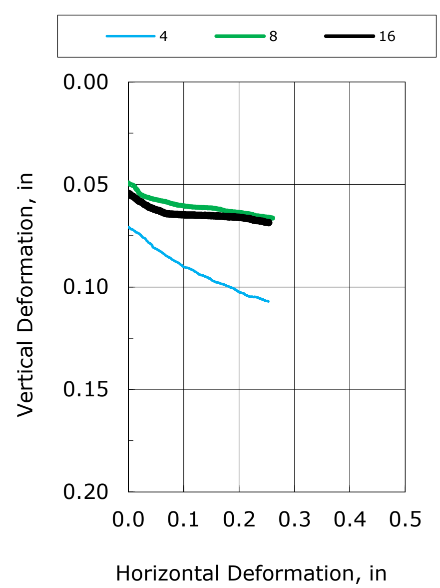
Direct Shear Test of Soils Under Consolidated Drained Conditions by ASTM D3080





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

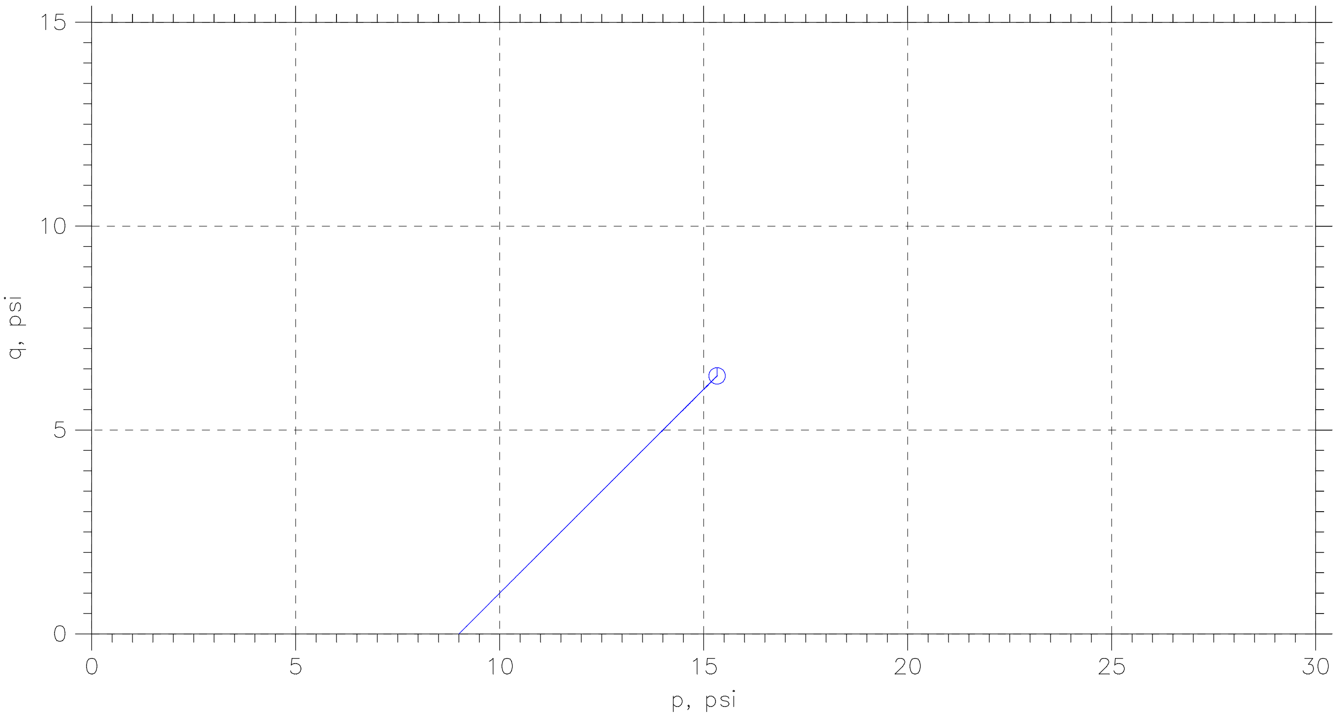
Moisture Content determined by ASTM D2216

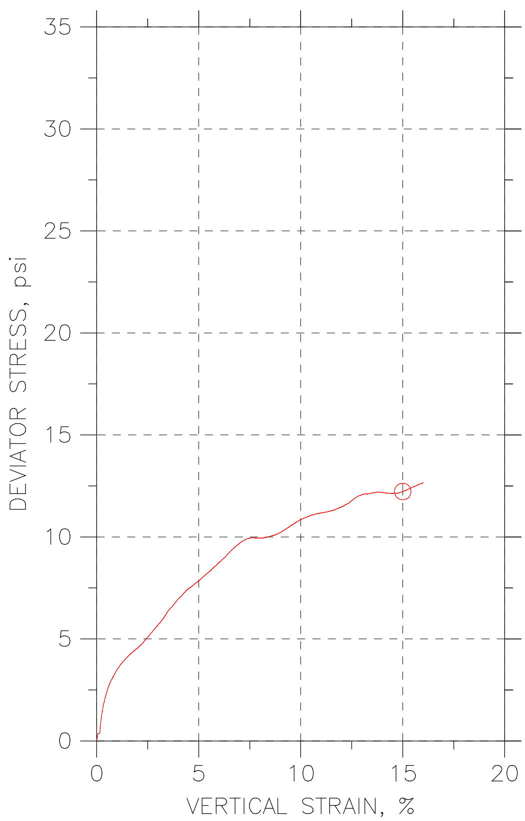
Extruded from tube, cut, trimmed and placed into apparatus at the as-received density and moisture content

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

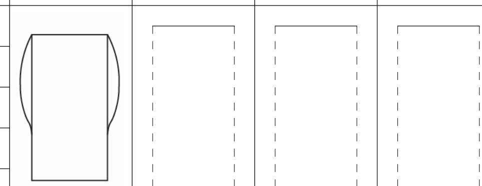
Project: San Jacinto Pre-Design

Location: ---

Project No.: GTX-309154

Boring No.: SJGB019

Sample Type: intact



Description: Moist, pale brown clay

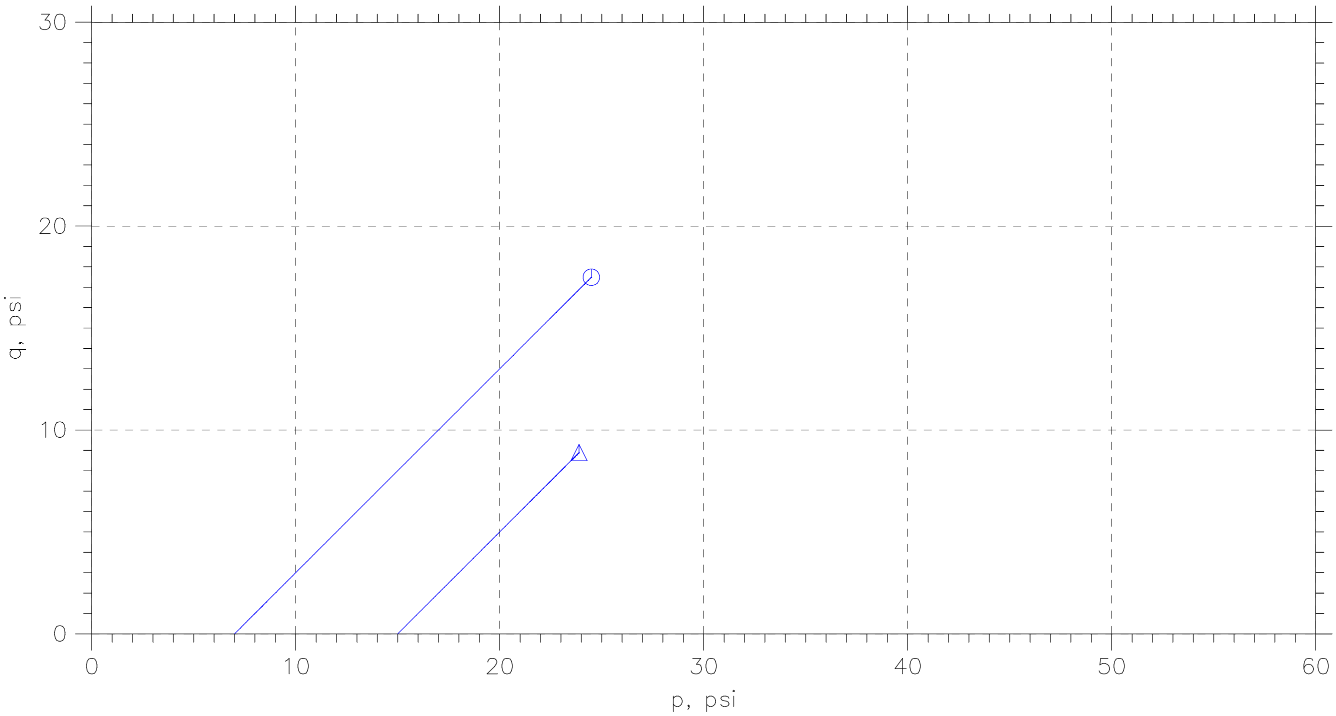
Remarks: System W

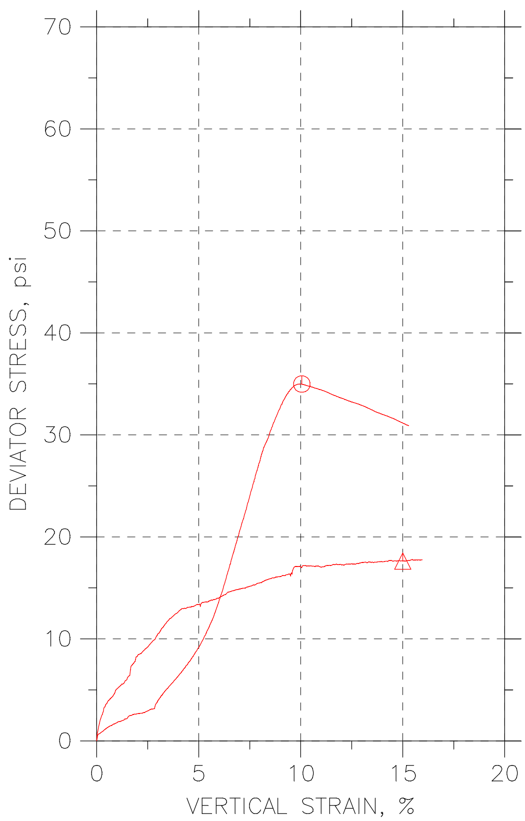
Phase calculations based on start and end of test.

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: ---

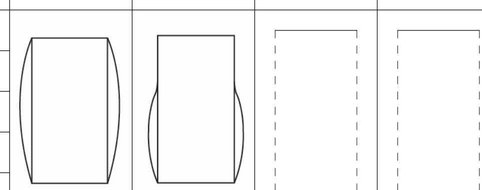
Project No.: GTX-309154

Boring No.: SJGB019

Sample Type: intact

Description: Moist, light gray clay and silt

Remarks: System LL

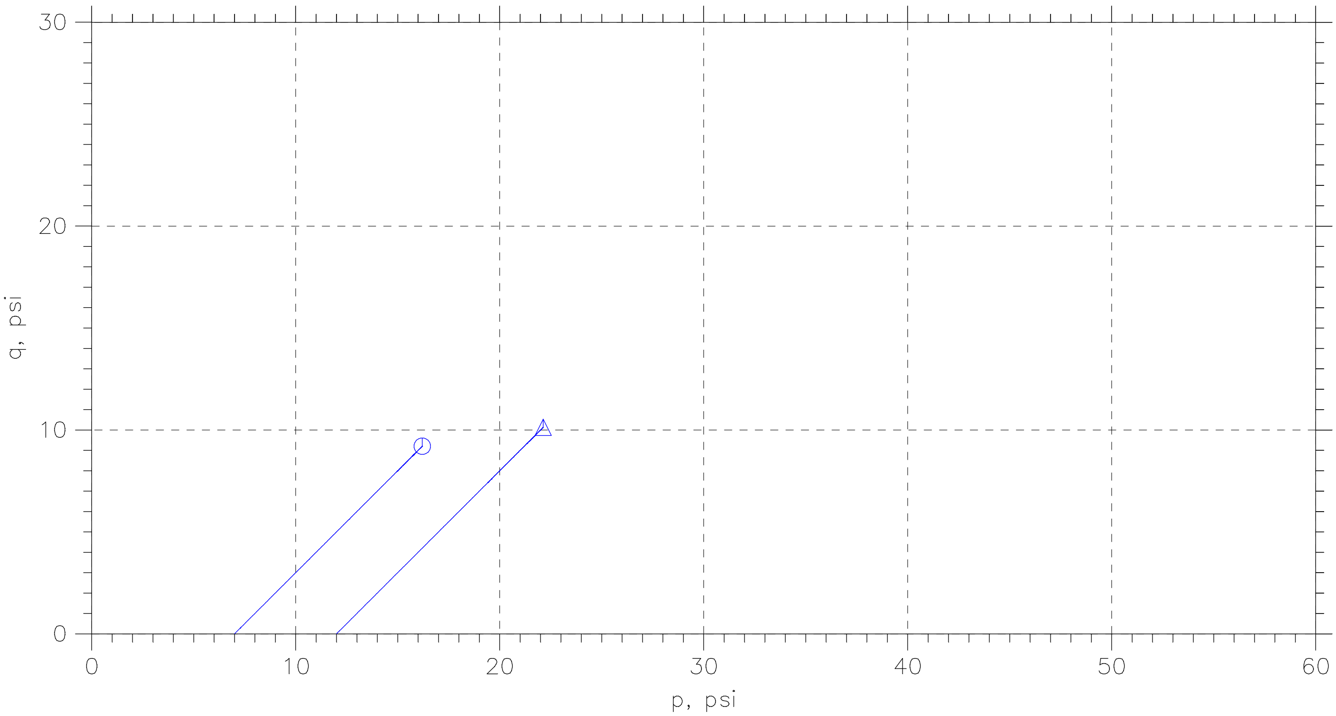


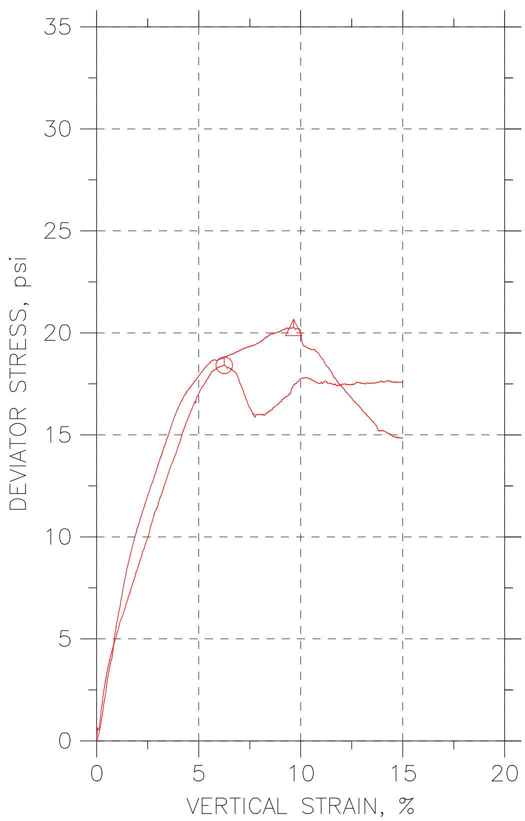
Phase calculations based on start and end of test.

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

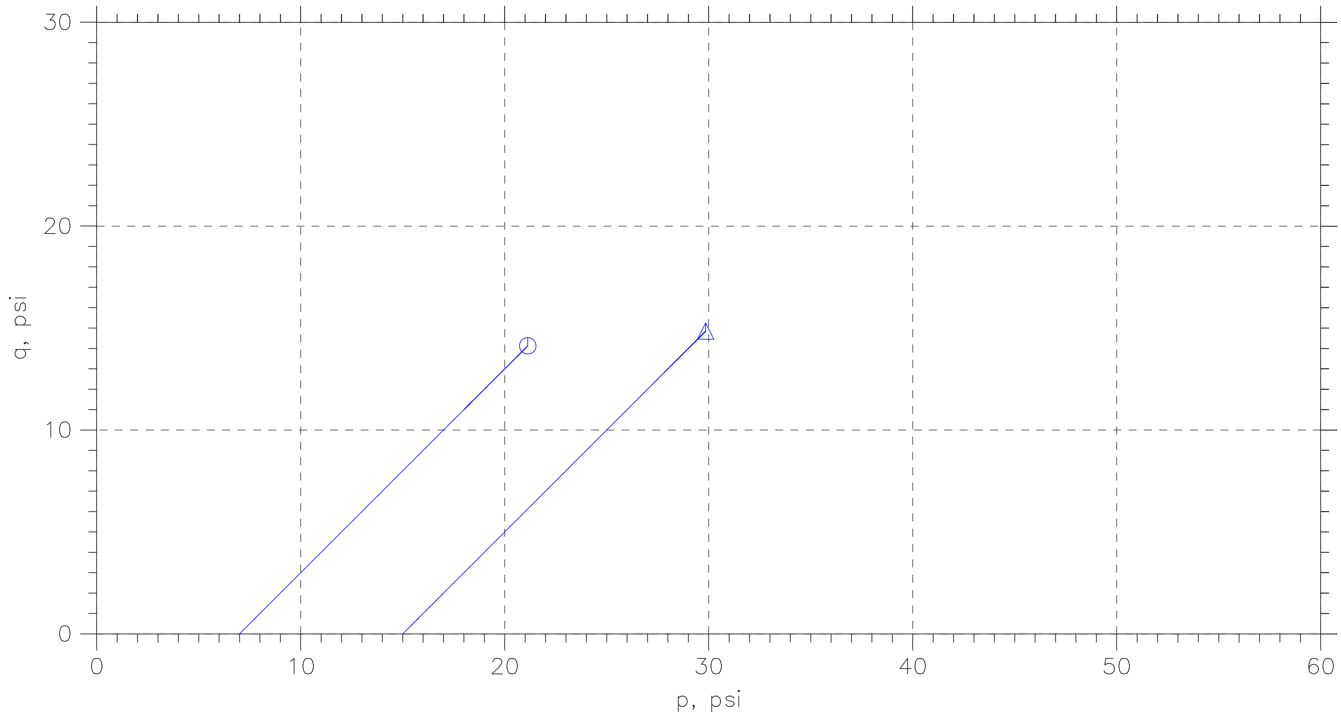
Remarks: System R

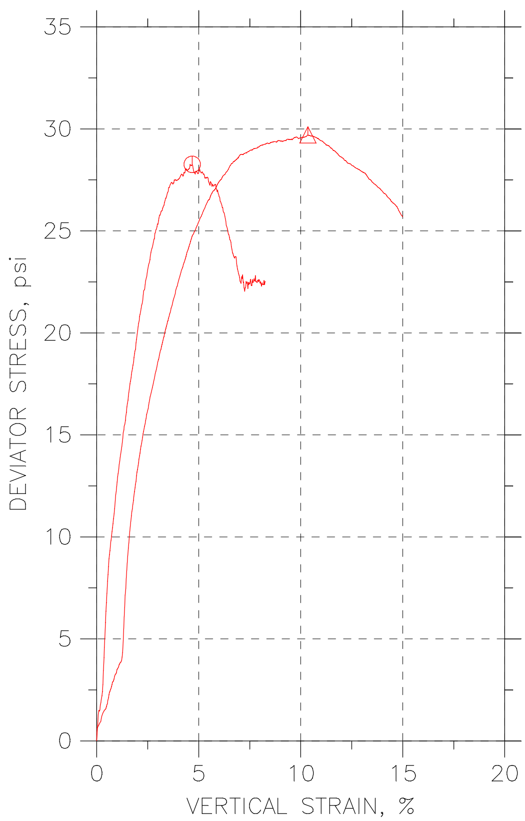
Phase calculations based on start and end of test.

Attachment Figure A.4-135

Wed, 13-MAR-2019 13:17:14

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D2850

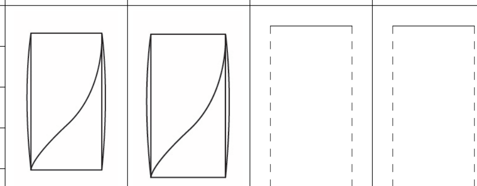




Symbol	○	△		
Sample No.	SL0843	SL0843		
Test No.	UU-10-1	UU-10-2		
Depth	45-47	45-47		
Tested by	trm	trm		
Test Date	1/25/19	1/25/19		
Checked by	njh	njh		
Check Date	3/13/19	3/13/19		
Diameter, in	2.87	2.87		
Height, in	5.95	6.6		
Water Content, %	30.7	28.1		
Dry Density, pcf	90.69	95.86		
Saturation, %	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

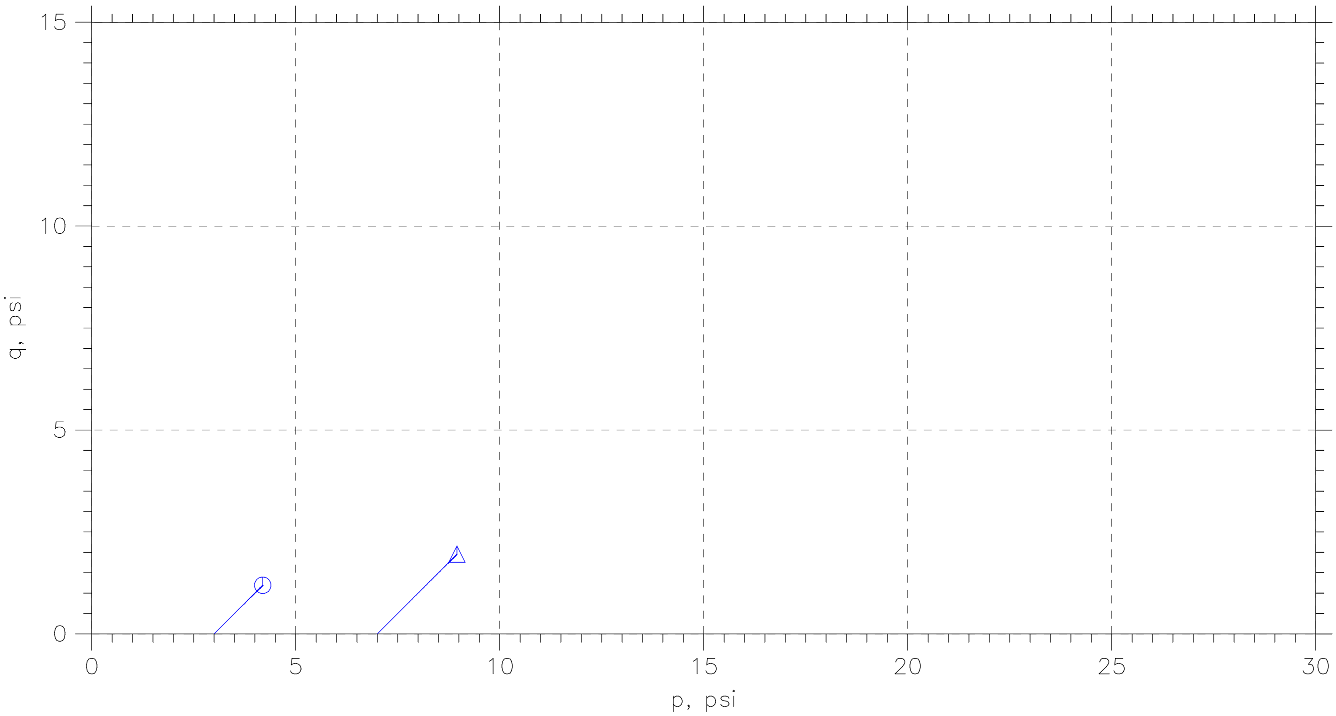
Project: San Jacinto Pre-Design
Location: ---
Project No.: GTX-309154
Boring No.: SJGB020
Sample Type: intact
Description: Moist, light brown clay
Remarks: System R

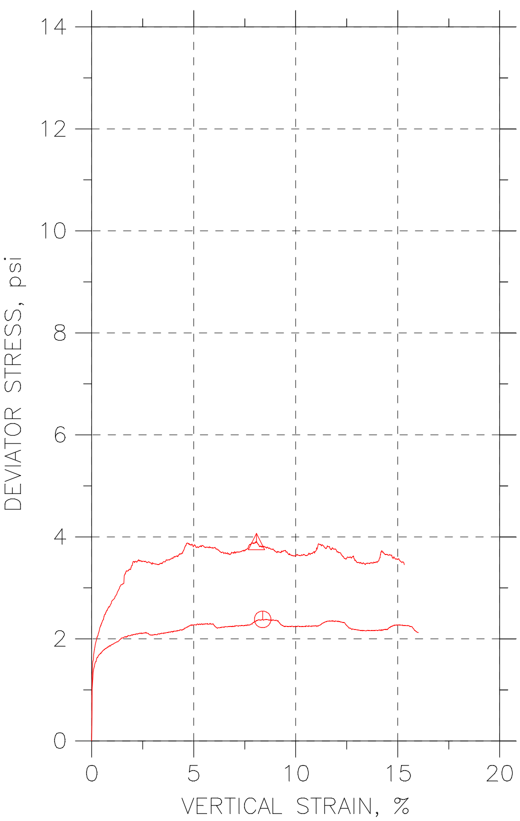


Phase calculations based on start and end of test.

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	---	---		

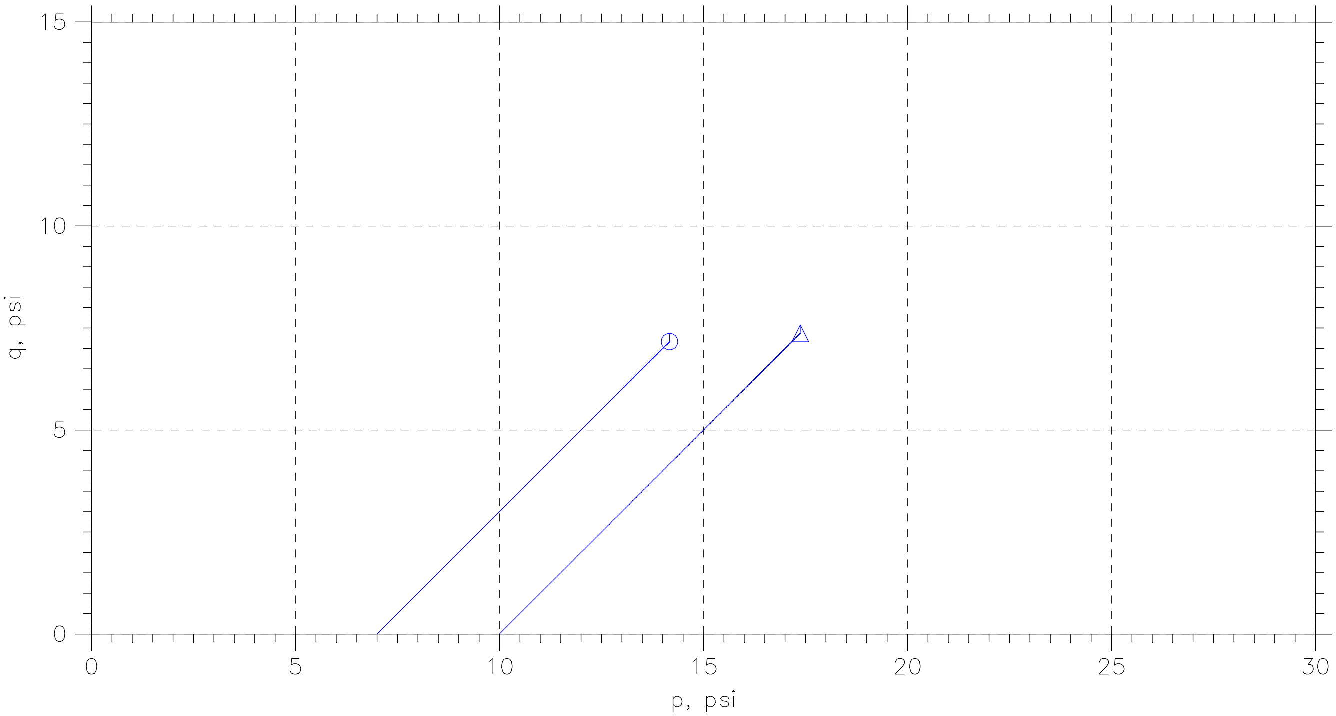
GeoTesting EXPRESS

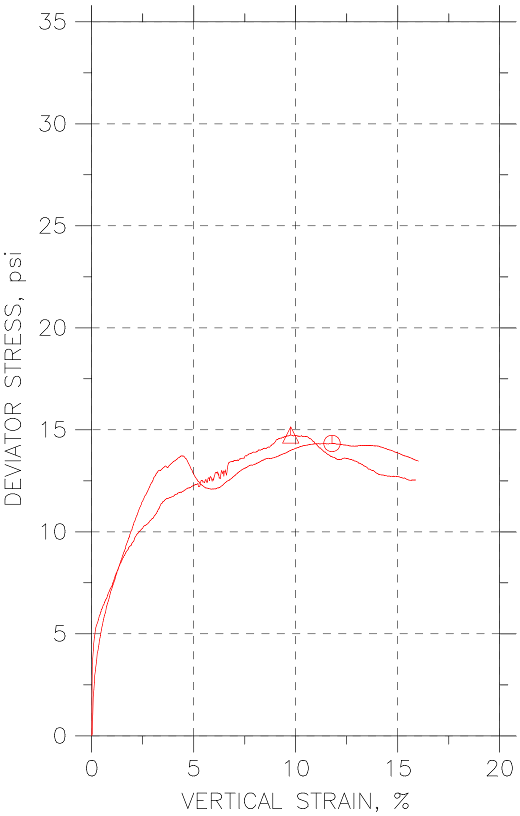
Project: San Jacinto Pre-Design
Location: ---
Project No.: GTX-309154
Boring No.: SJGB022
Sample Type: intact
Description: Moist, grayish brown clay
Remarks: System LL

Phase calculations based on start and end of test.

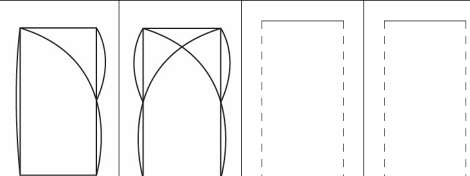
Thu, 14-MAR-2019 12:02:16

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

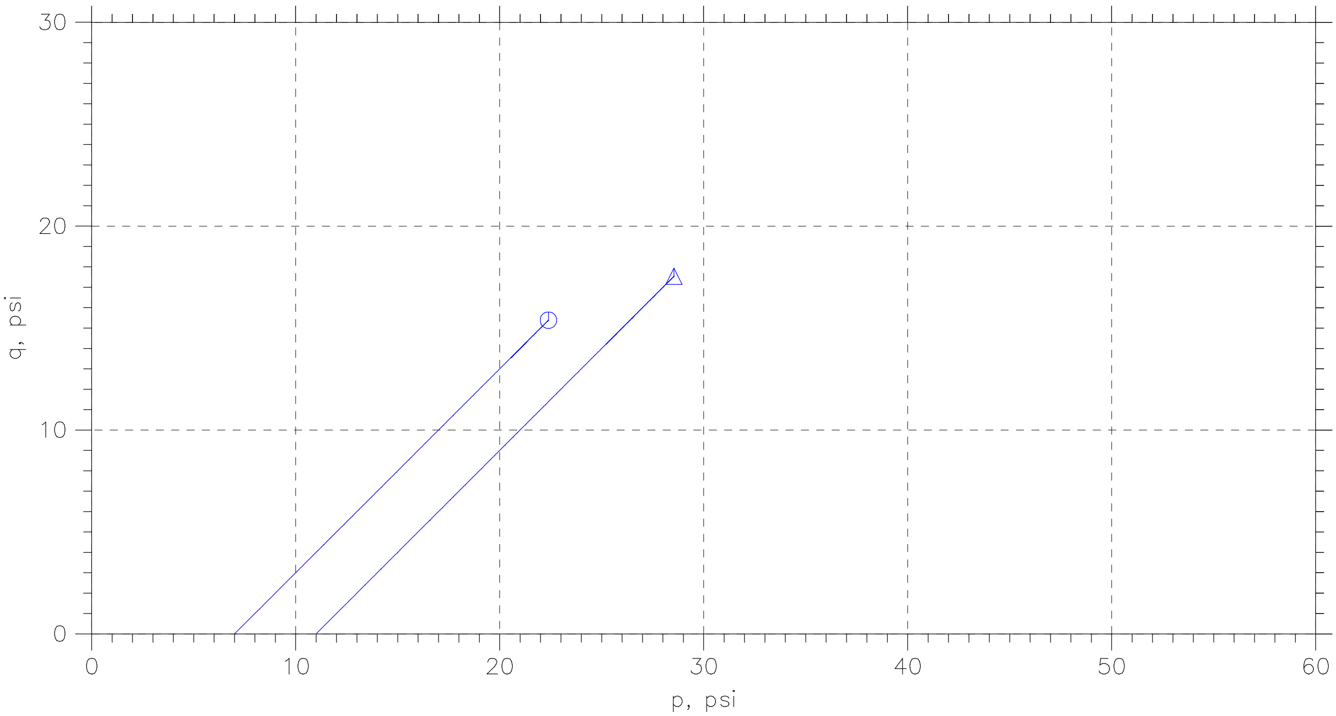
Project: San Jacinto Pre-Design
Location: ---
Project No.: GTX-309154
Boring No.: SJGB022
Sample Type: intact
Description: Moist, reddish brown clay
Remarks: System LL

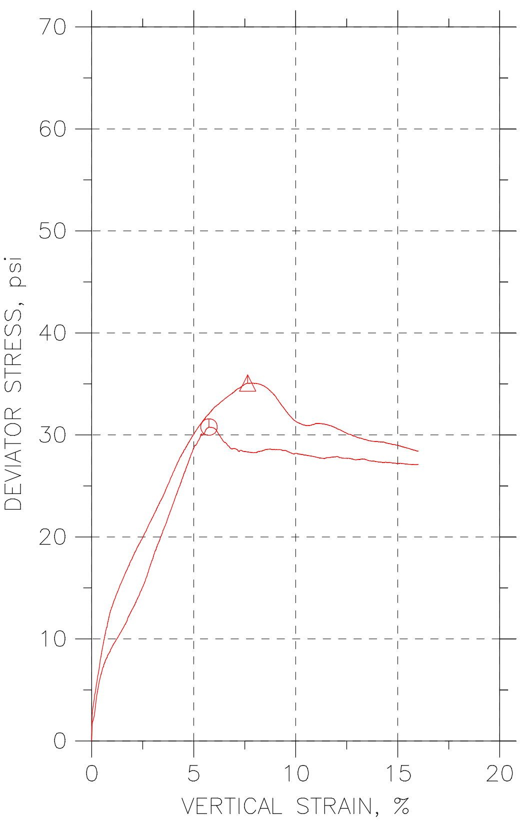
Phase calculations based on start and end of test.

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

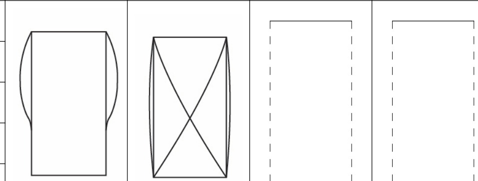
Project: San Jacinto Pre-Design

Location: ---

Project No.: GTX-309154

Boring No.: SJGB023

Sample Type: intact



Description: Moist, light brown and light gray clay

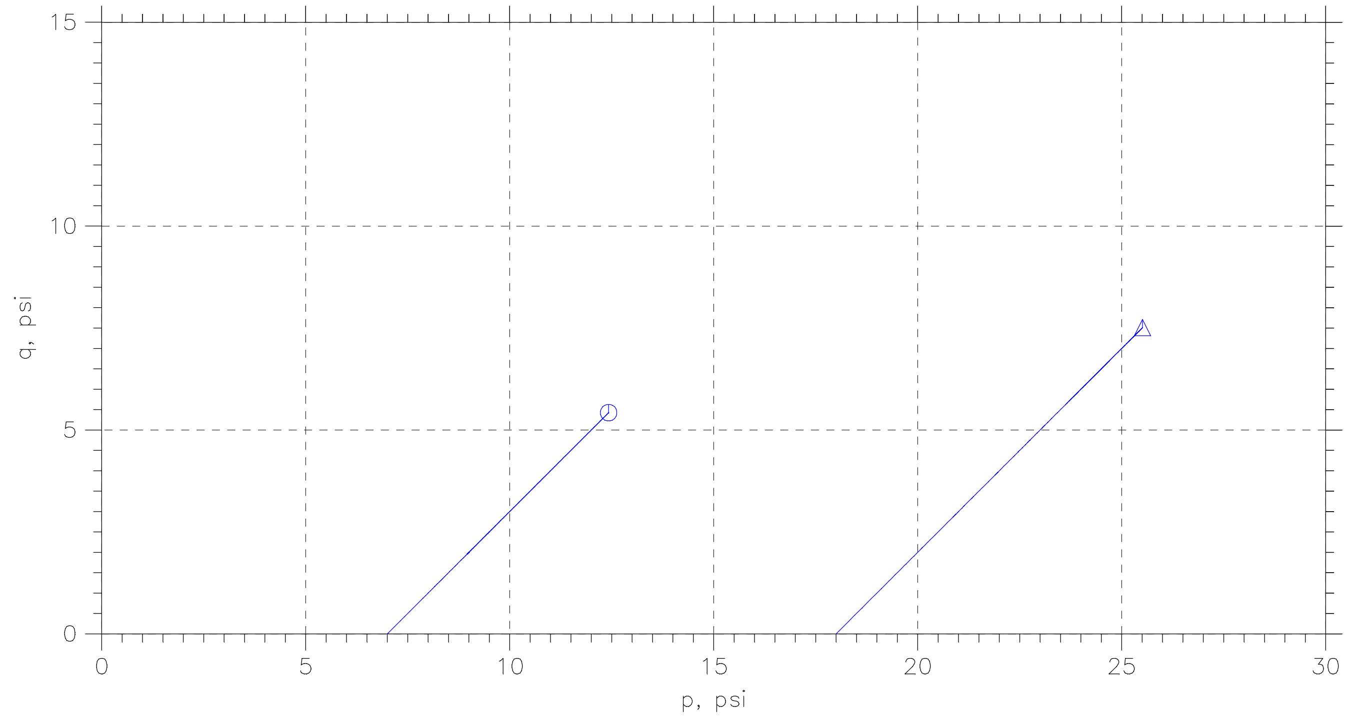
Remarks: System Q

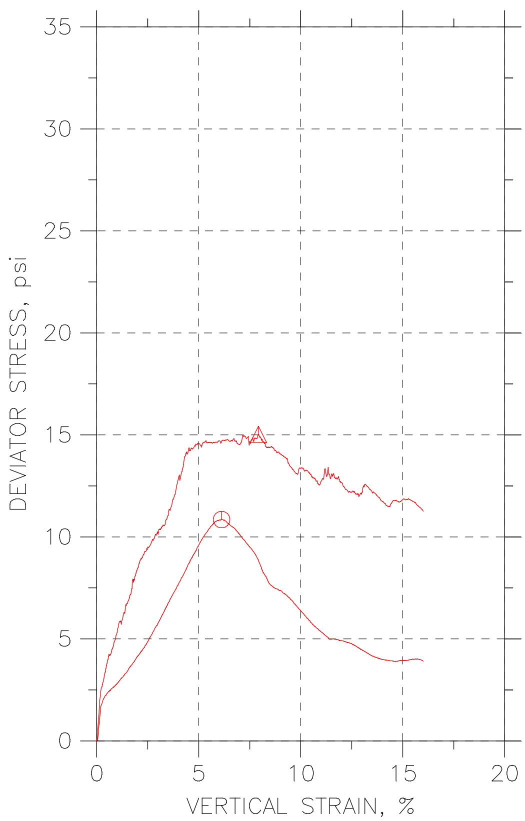
Phase calculations based on start and end of test.

Attachment Figure A.4-139

Wed, 13-MAR-2019 13:47:00

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D2850

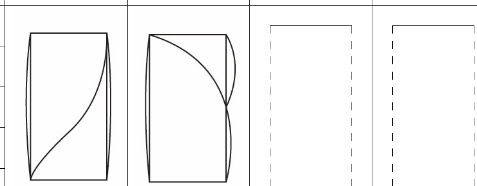




Symbol	○	△		
Sample No.	SL0887	SL0887		
Test No.	UU-18-1	UU-18-2		
Depth	53-55 ft	53-55 ft		
Tested by	trm	trm		
Test Date	1/28/19	1/28/19		
Checked by	njh	njh		
Check Date	3/14/19	3/14/19		
Diameter, in	2.85	2.85		
Height, in	6.15	6.1		
Water Content, %	21.0	19.0		
Dry Density, pcf	105.6	103.		
Saturation, %	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

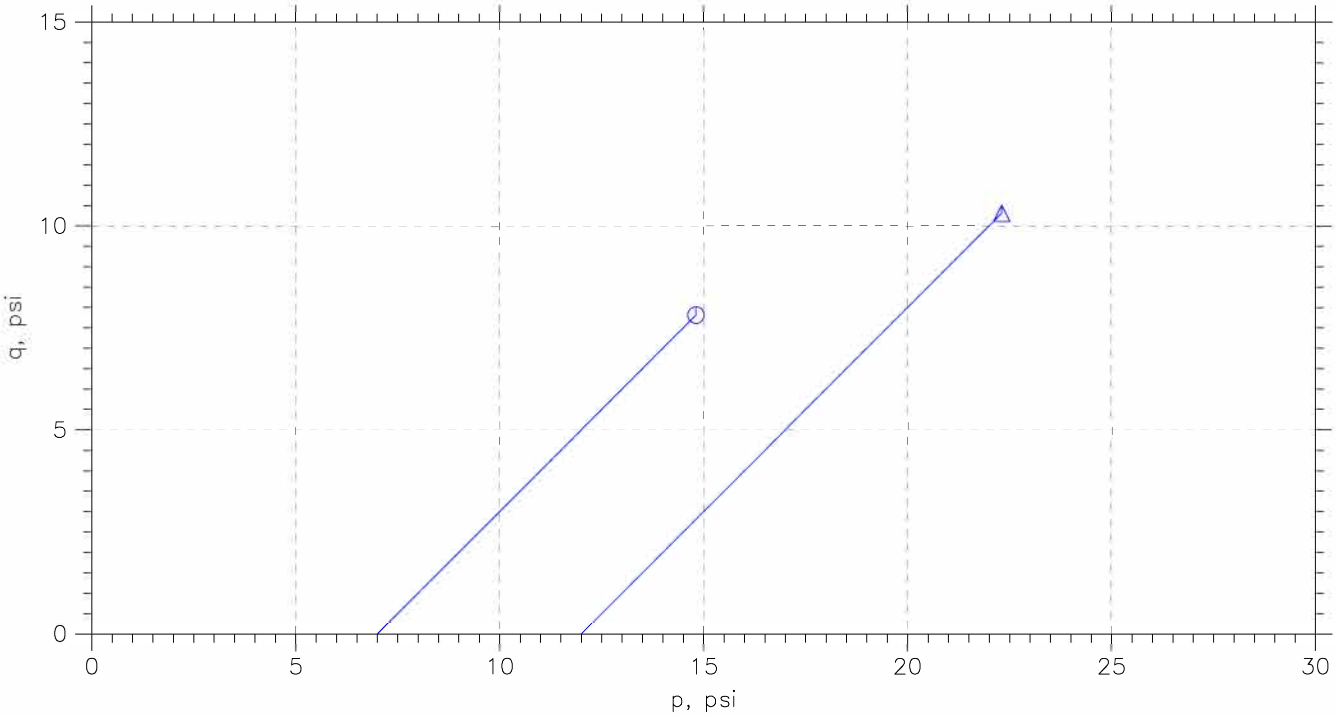


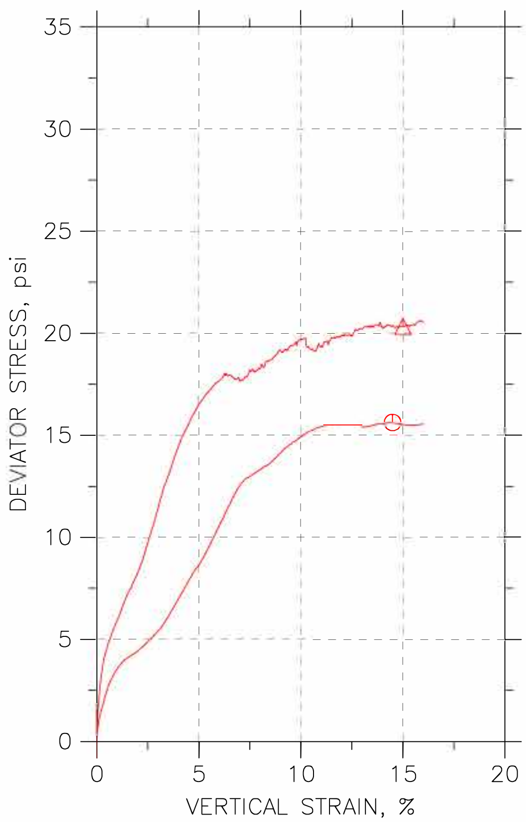
Phase calculations based on start and end of test.

Attachment Figure A.4-140

Thu, 14-MAR-2019 12:10:58

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D2850

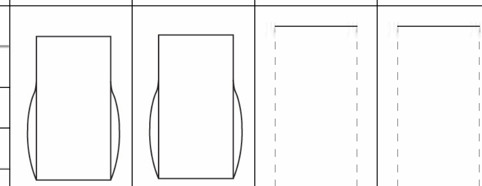




Symbol	⏀	△		
Sample No.	SL0895	SL0895		
Test No.	UU-14-1	UU-14-2		
Depth	34-36 ft	34-36 ft		
Tested by	trm	trm		
Test Date	1/29/19	1/29/19		
Checked by	njh	njh		
Check Date	3/13/19	3/13/19		
Diameter, in	2.85	2.84		
Height, in	6	6		
Water Content, %	21.5	19.9		
Dry Density, pcf	100.3	105.1		
Saturation, %	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

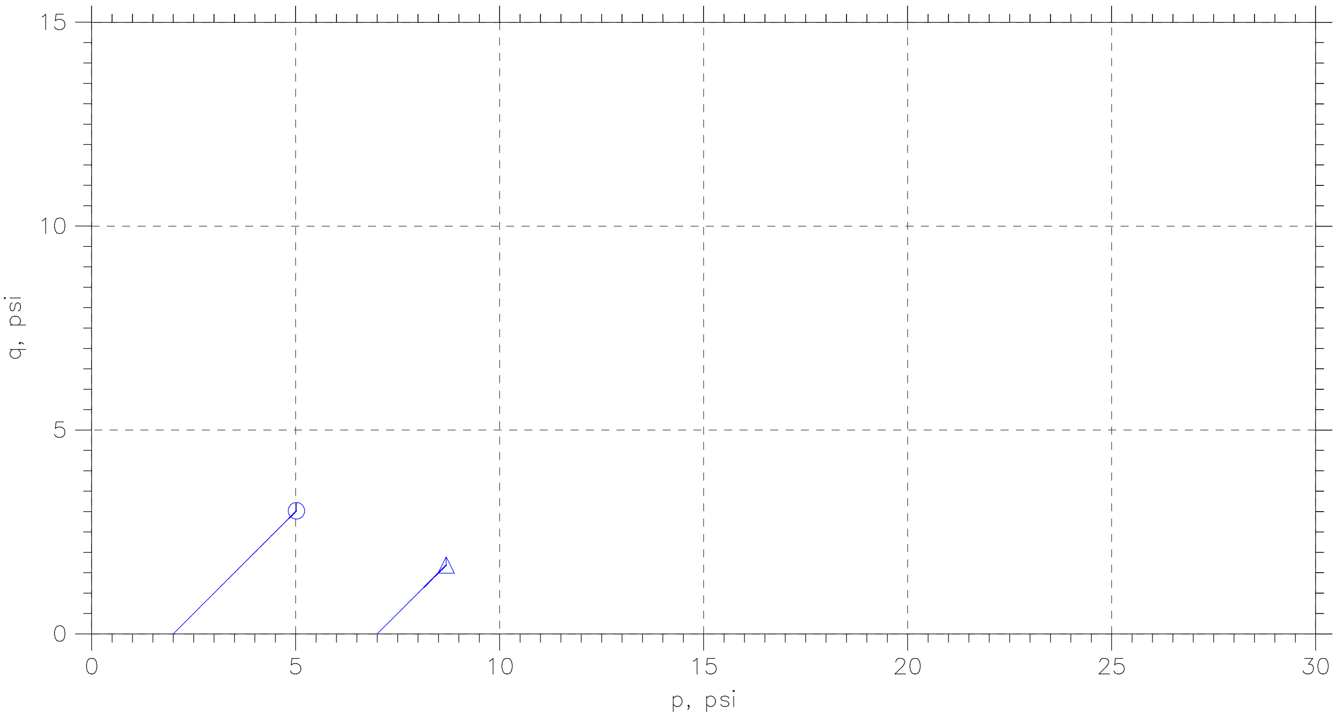
Project: San Jacinto Pre-Design
Location: ---
Project No.: GTX-309154
Boring No.: SJGB038
Sample Type: intact
Description: Moist, brown and reddish brown clay
Remarks: System Q

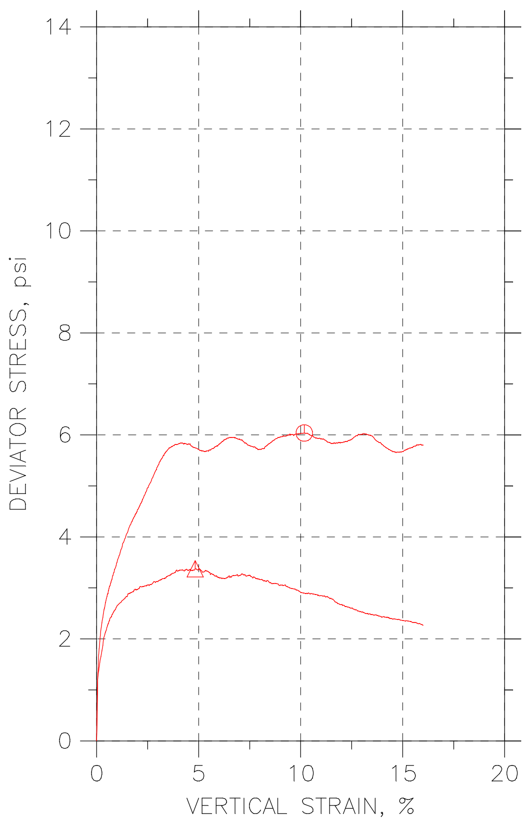


Phase calculations based on start and end of test.

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

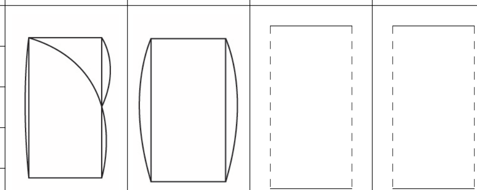
Project: San Jacinto Pre-Design

Location: ---

Project No.: GTX-309154

Boring No.: SJSB025

Sample Type: intact



Description: Moist, grayish brown sandy clay

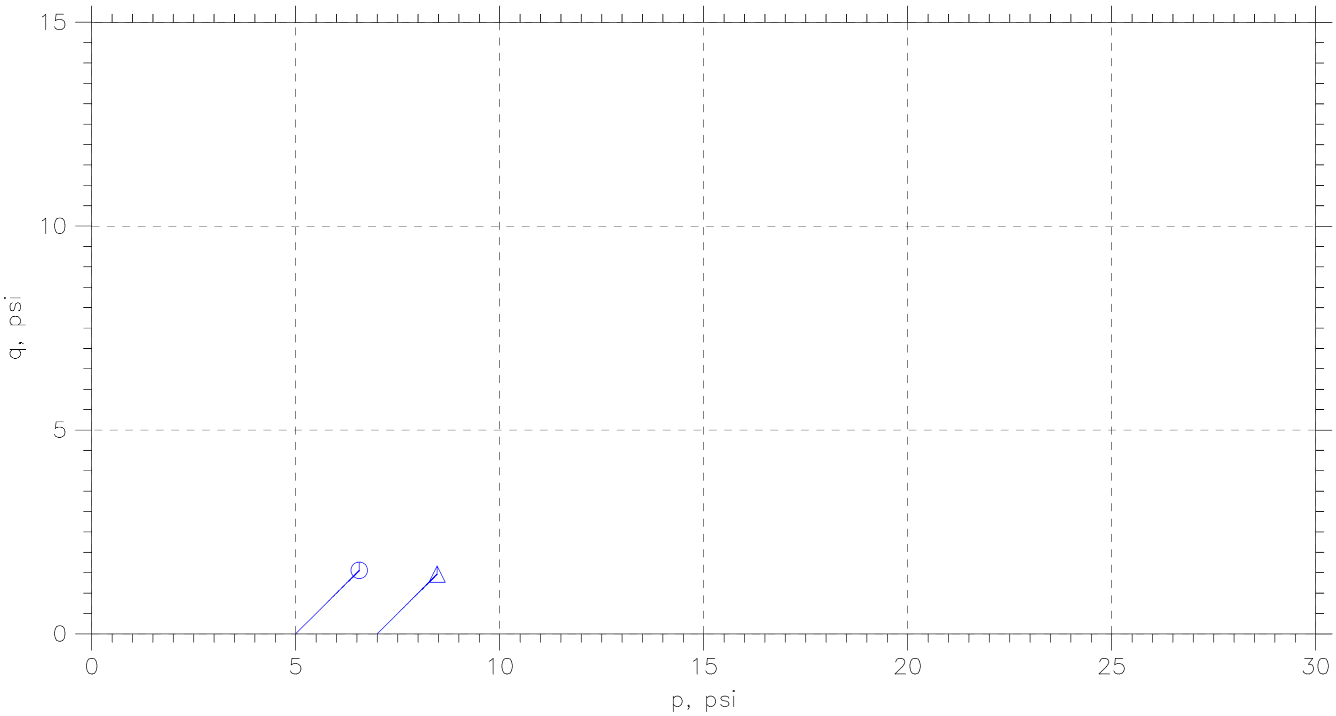
Remarks: System W

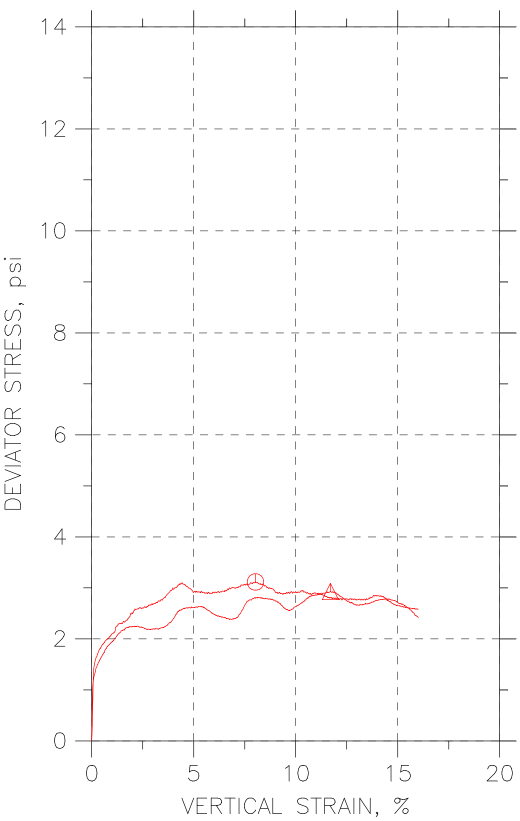
Phase calculations based on start and end of test.

Attachment Figure A.4-142

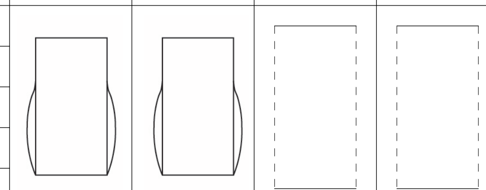
Thu, 28-FEB-2019 15:37:41

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	---	---		



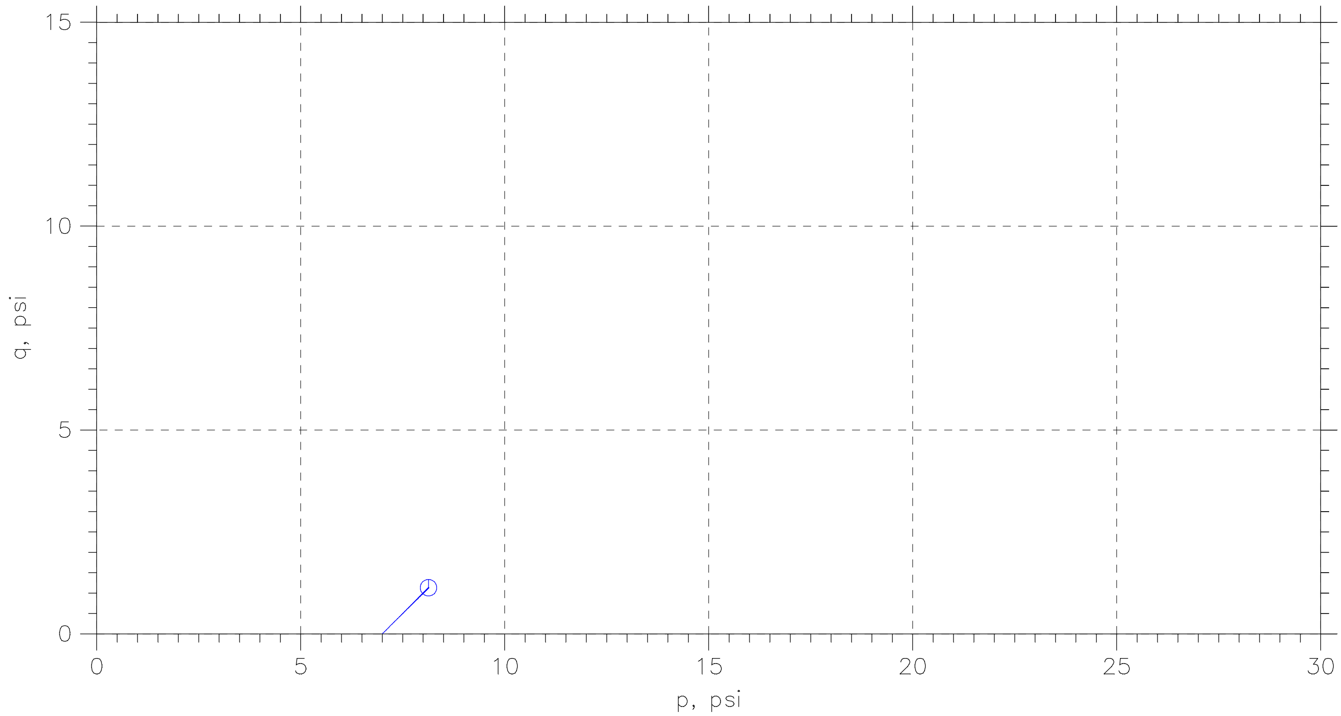
Project: San Jacinto Pre-Design
Location: ---
Project No.: GTX-309154
Boring No.: SJSB028
Sample Type: intact
Description: Moist, gray sandy clay
Remarks: System W

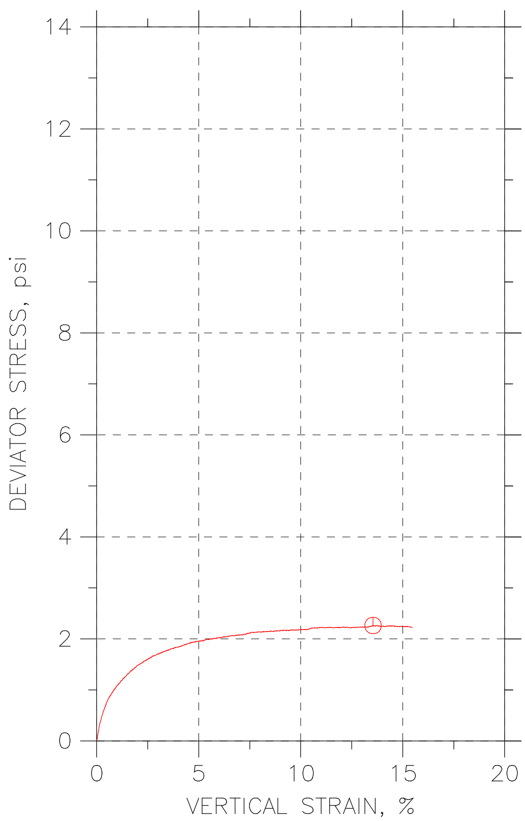
Phase calculations based on start and end of test.

Attachment Figure A.4-143

Fri, 01-MAR-2019 12:26:24

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D2850

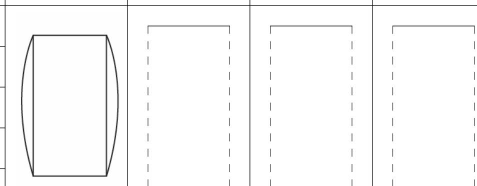




Symbol	○			
Sample No.	SL0612			
Test No.	UU-9			
Depth	5-7 ft			
Tested by	trm			
Test Date	1/2/19			
Checked by	njh			
Check Date	3/1/19			
Diameter, in	2.82			
Height, in	6.6			
Water Content, %	29.8			
Dry Density, pcf	86.92			
Saturation, %	85.7			
Void Ratio	0.939			
Confining Stress, psi	7			
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

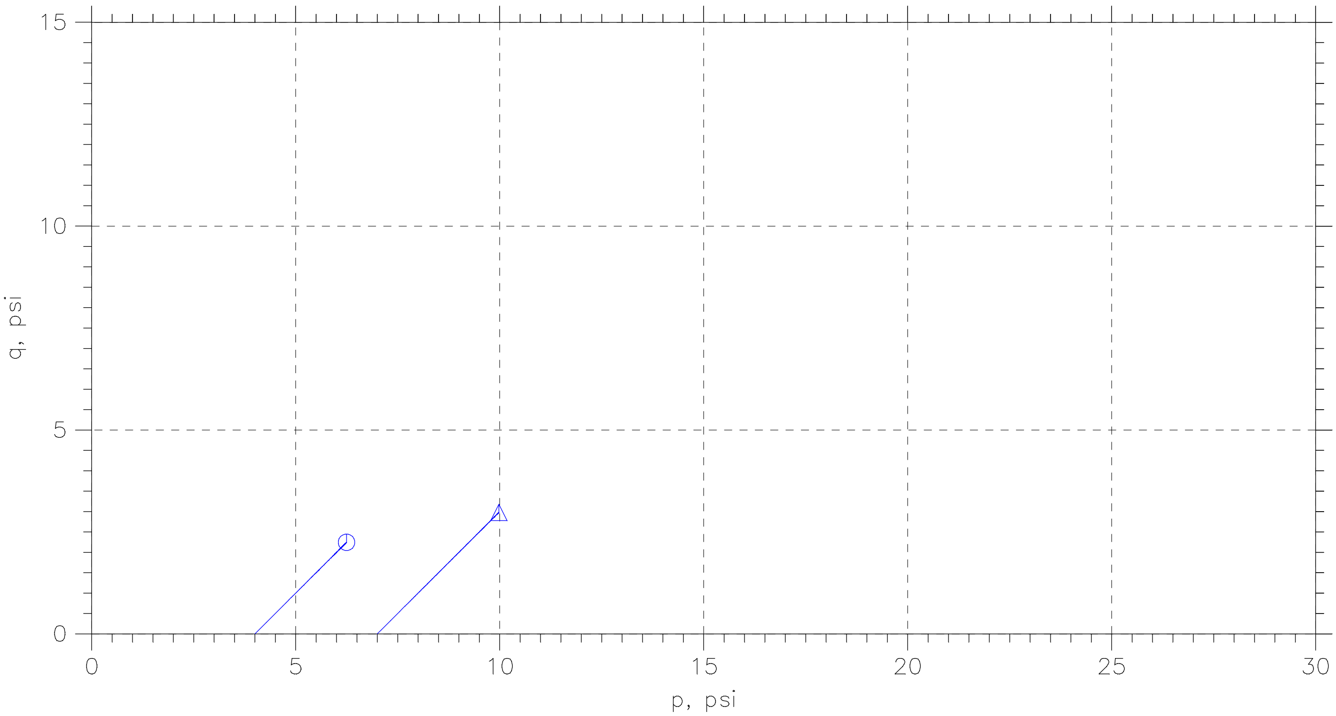


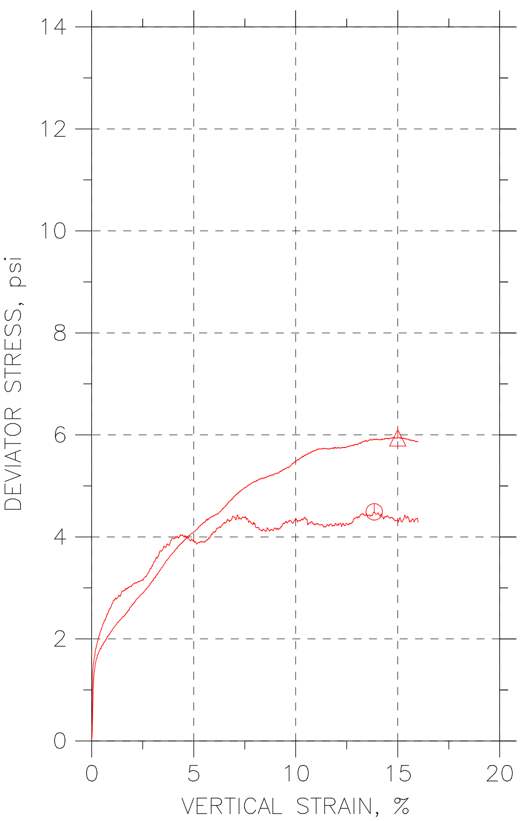
Phase calculations based on start and end of test.

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

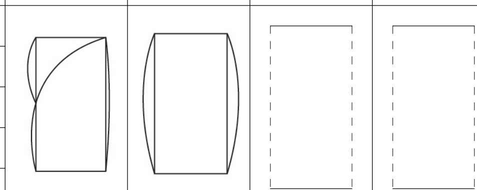
Project: San Jacinto Pre-Design

Location: ---

Project No.: GTX-309154

Boring No.: SJSB030

Sample Type: intact



Description: Moist, brownish gray sandy clay

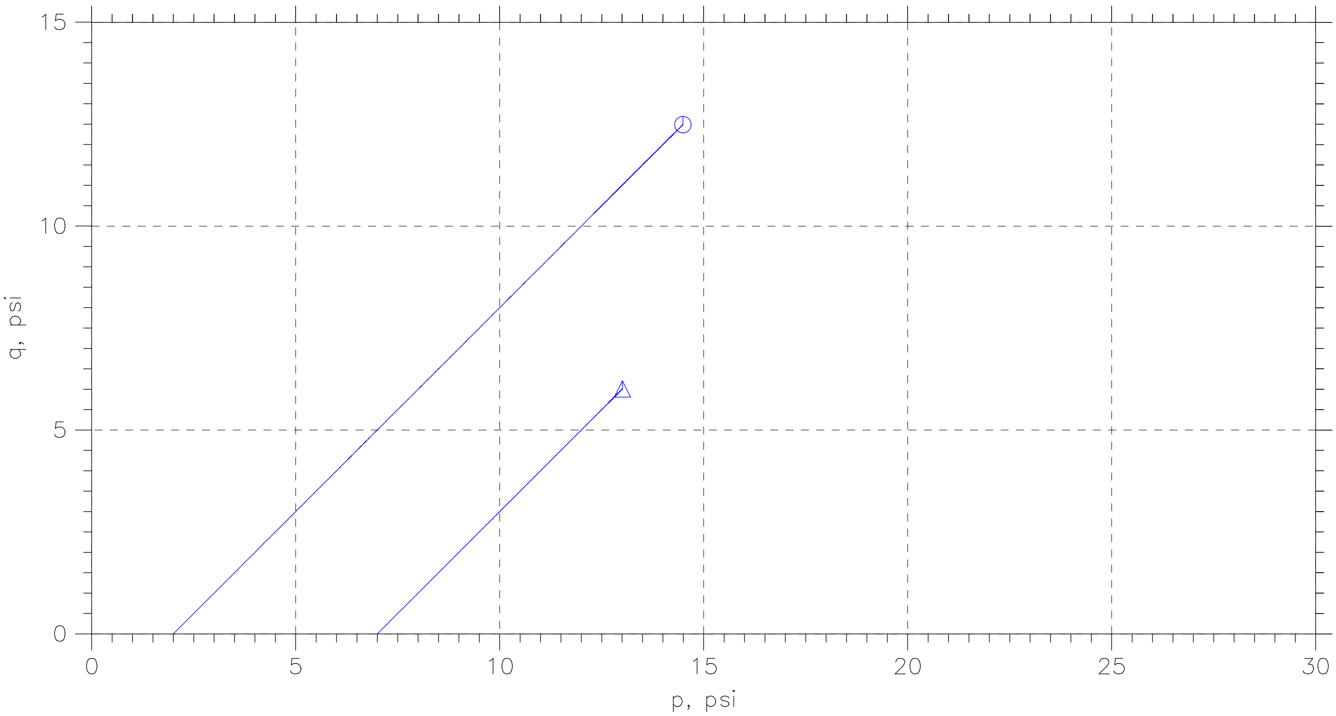
Remarks: System W

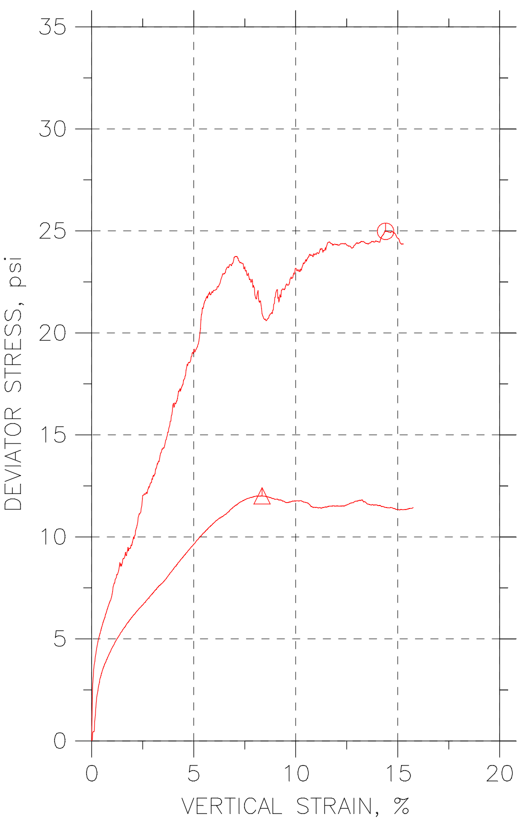
Phase calculations based on start and end of test.

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

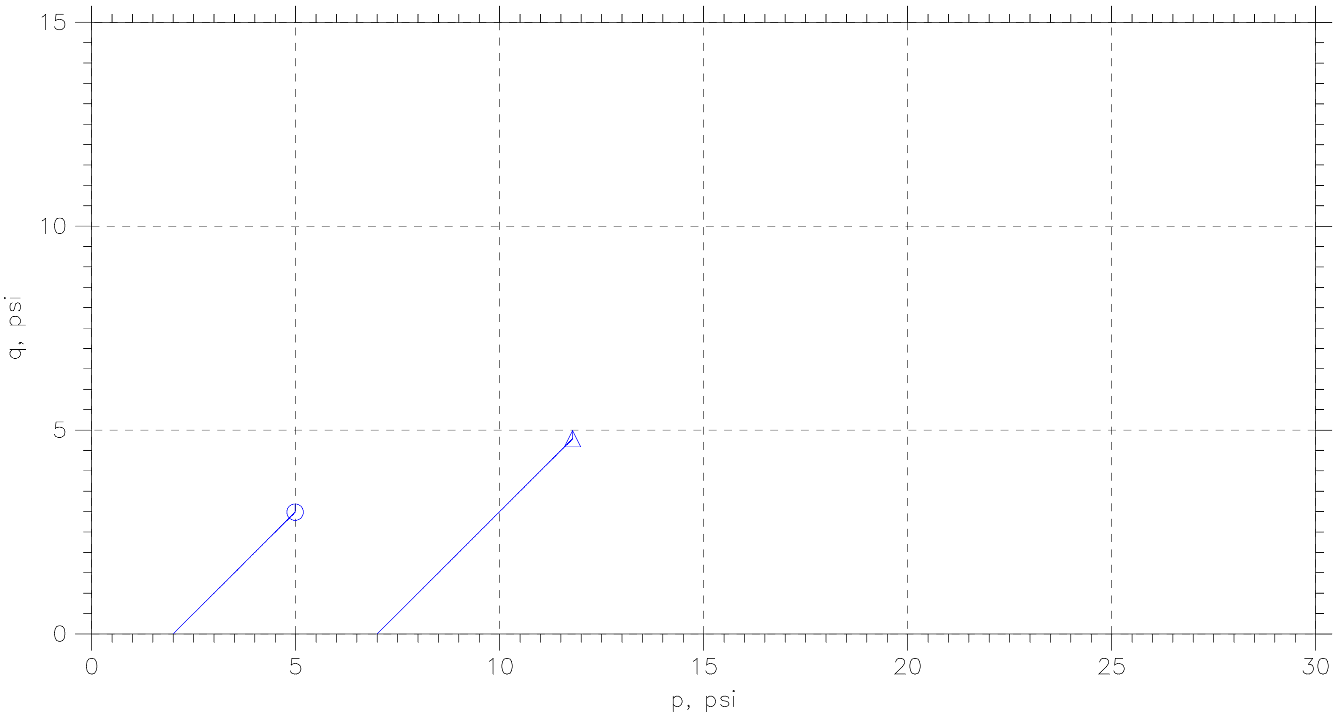
Description: Moist, brown clay with sand

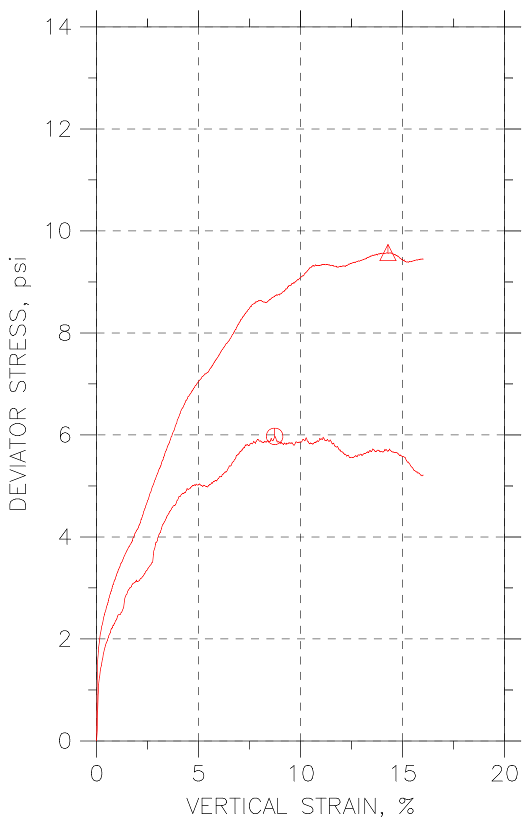
Remarks: System Q

Phase calculations based on start and end of test.

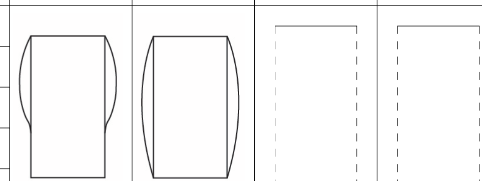
Wed, 13-MAR-2019 16:11:11

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	---	---		



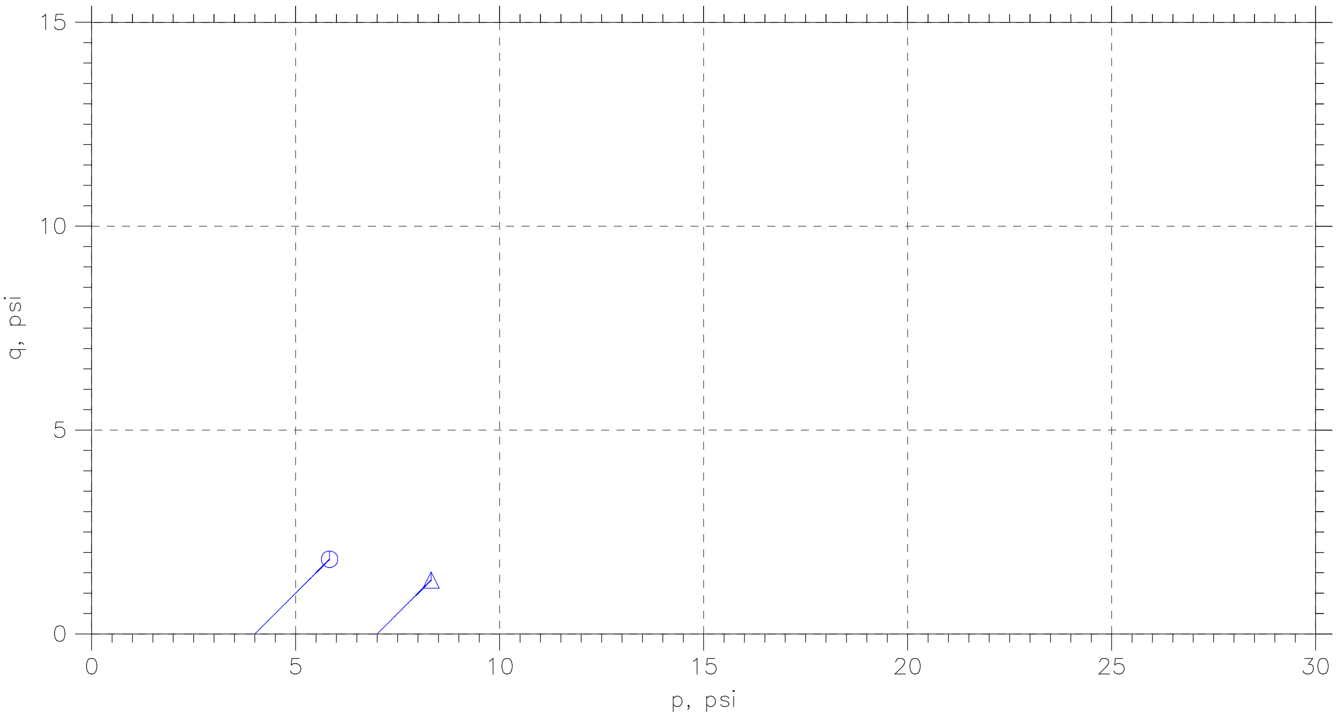
GeoTesting EXPRESS

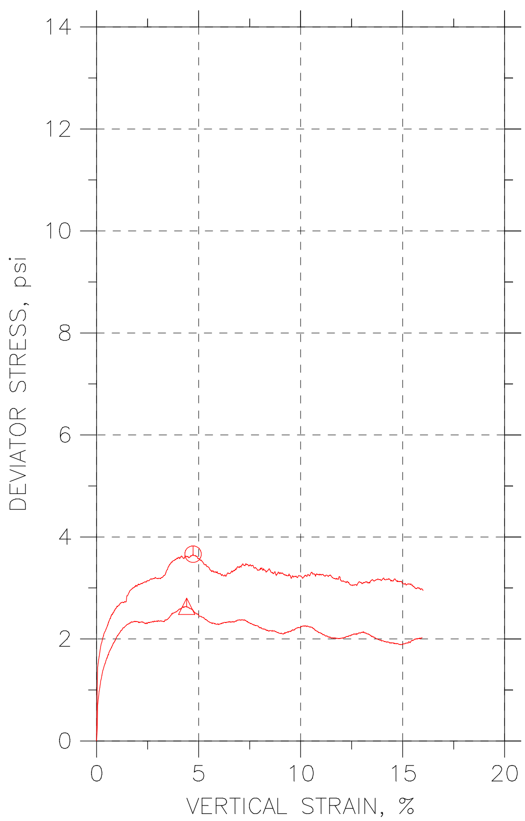
Project: San Jacinto Pre-Design
Location: ---
Project No.: GTX-309154
Boring No.: SJSB032
Sample Type: intact
Description: Moist, gray clay
Remarks: System W

Phase calculations based on start and end of test.

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: ---

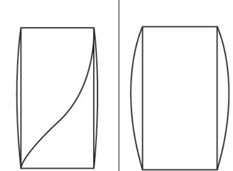
Project No.: GTX-309154

Boring No.: SJSB032

Sample Type: intact

Description: Moist, gray sandy clay

Remarks: System W

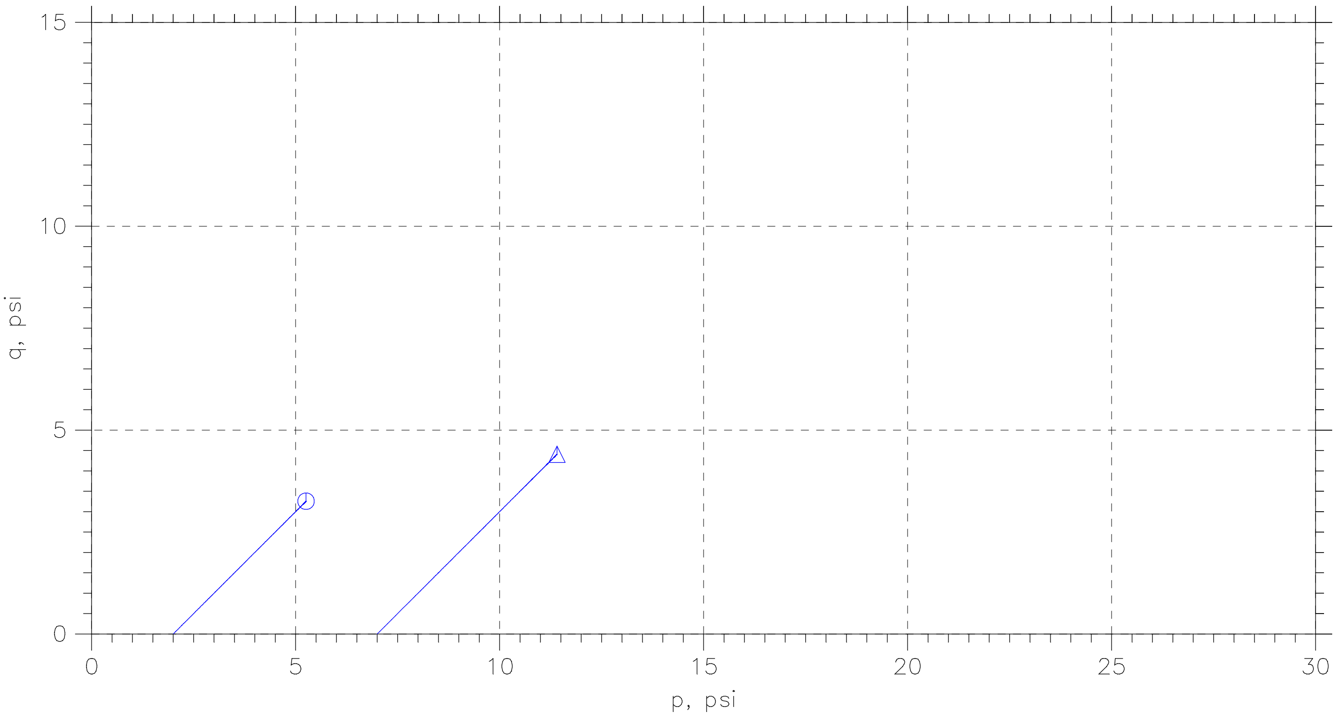


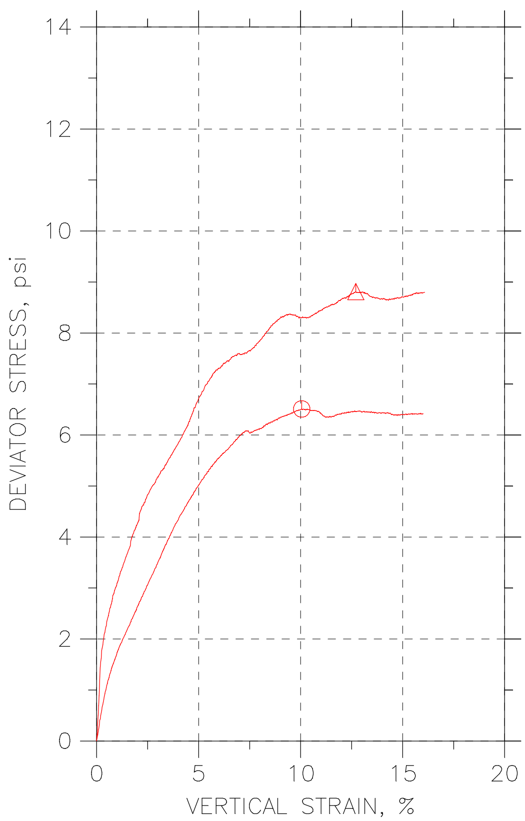
Phase calculations based on start and end of test.

Thu, 28-FEB-2019 15:59:12

Attachment Figure A.4-148

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

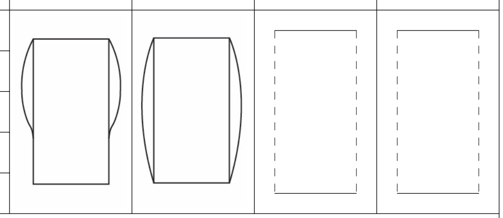
Project: San Jacinto Pre-Design

Location: ---

Project No.: GTX-309154

Boring No.: SJSB033

Sample Type: intact



Description: Moist, gray sandy clay

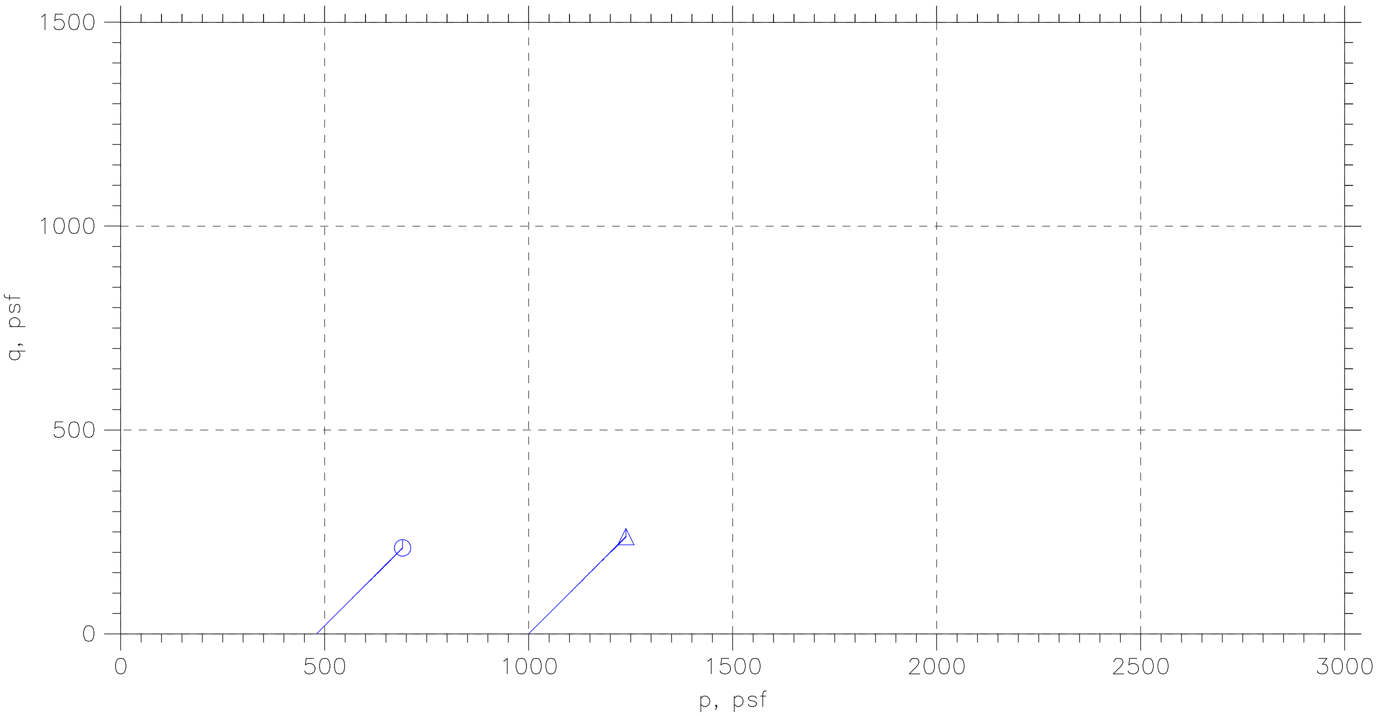
Remarks: System W

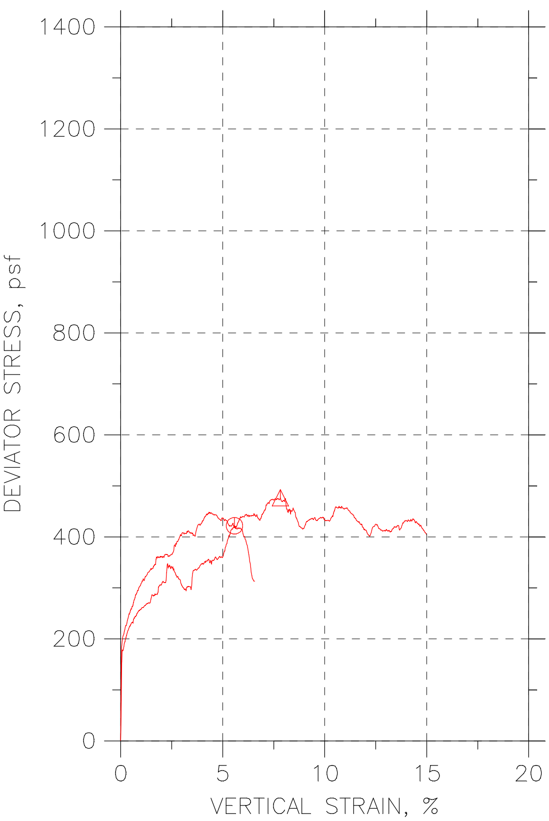
Phase calculations based on start and end of test.

Attachment Figure A.4-149

Thu, 28-FEB-2019 09:08:50

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D2850

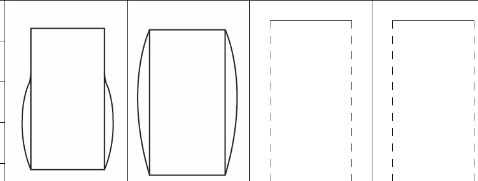




Symbol	○	△		
Sample No.	SL0672	SL0672		
Test No.	UU-19-1	UU-19-2		
Depth	2-4 ft	2-4 ft		
Tested by	trm	trm		
Test Date	2/11/19	2/11/19		
Checked by	njh	njh		
Check Date	3/14/19	3/14/19		
Diameter, in	2.84	2.84		
Height, in	5.9	6		
Water Content, %	80.1	71.8		
Dry Density, pcf	45.45	53.38		
Saturation, %	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

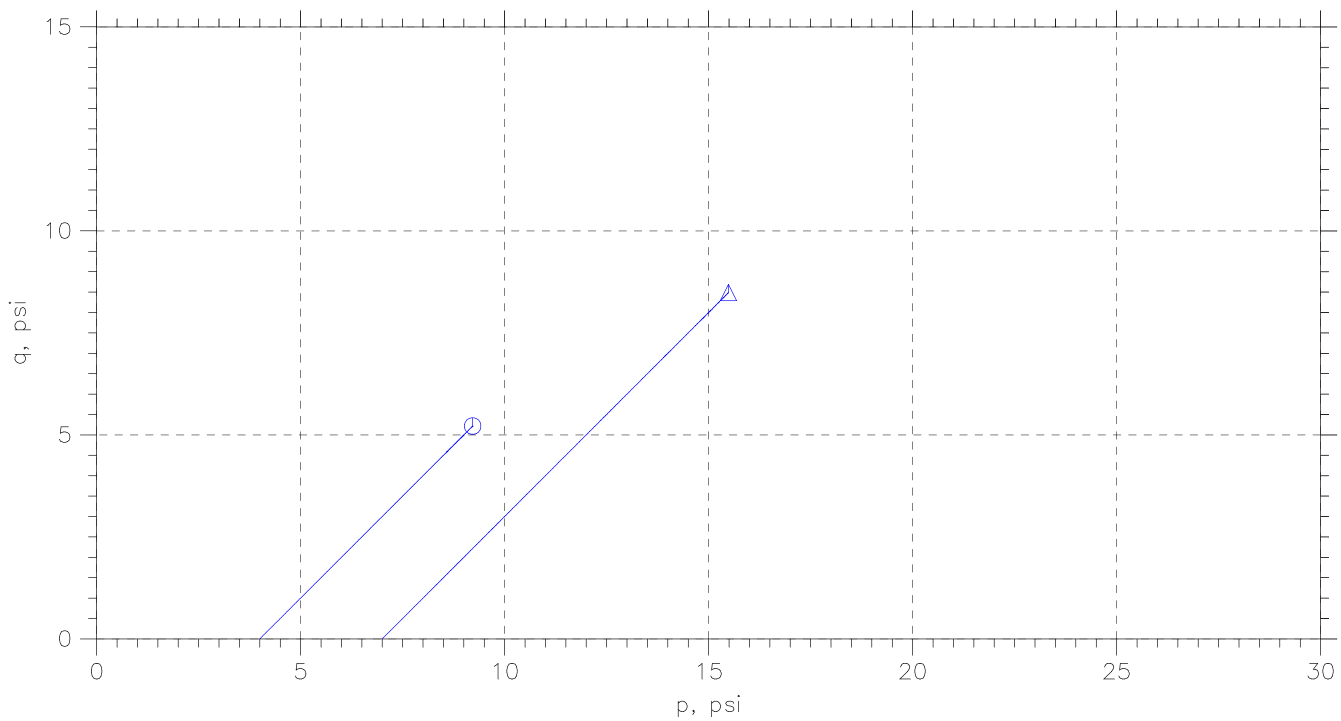


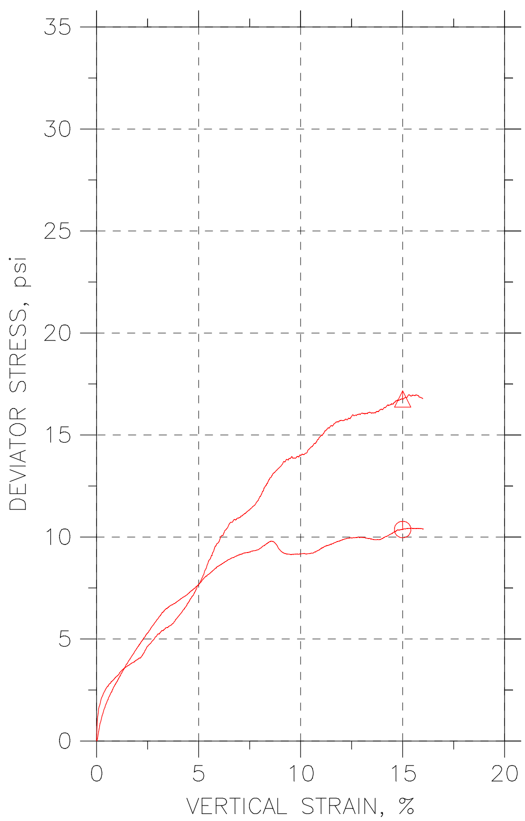
Phase calculations based on start and end of test.

Attachment Figure A.4-150

Thu, 14-MAR-2019 12:58:46

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D2850

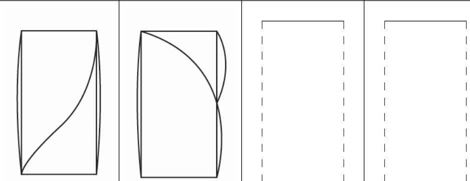




Symbol	○	△		
Sample No.	SL0673	SL0673		
Test No.	UU-2-1	UU-2-2		
Depth	6-8 ft	6-8 ft		
Tested by	trm	trm		
Test Date	12/26/18	12/26/18		
Checked by	njh	njh		
Check Date	2/28/19	2/28/19		
Diameter, in	2.85	2.83		
Height, in	6.6	6.9		
Water Content, %	18.1	17.9		
Dry Density, pcf	106.3	102.7		
Saturation, %	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	

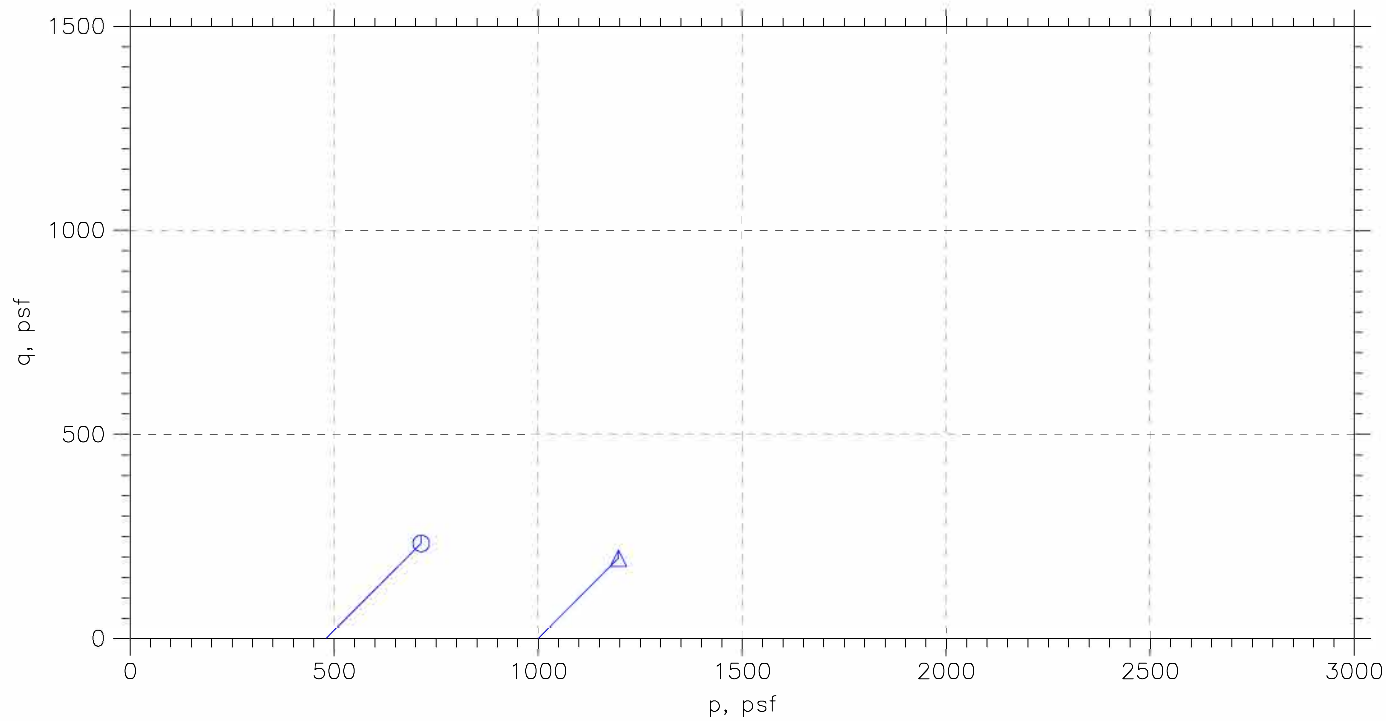


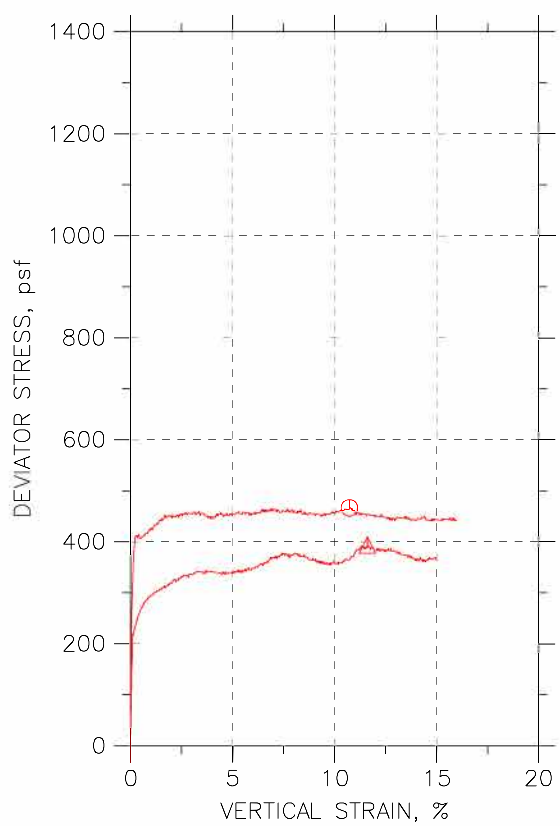
Phase calculations based on start and end of test.

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

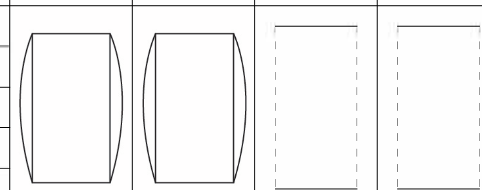
Project: San Jacinto Pre-Design

Location: ---

Project No.: GTX-309154

Boring No.: SJSB037

Sample Type: intact



Description: Wet, gray silty clay

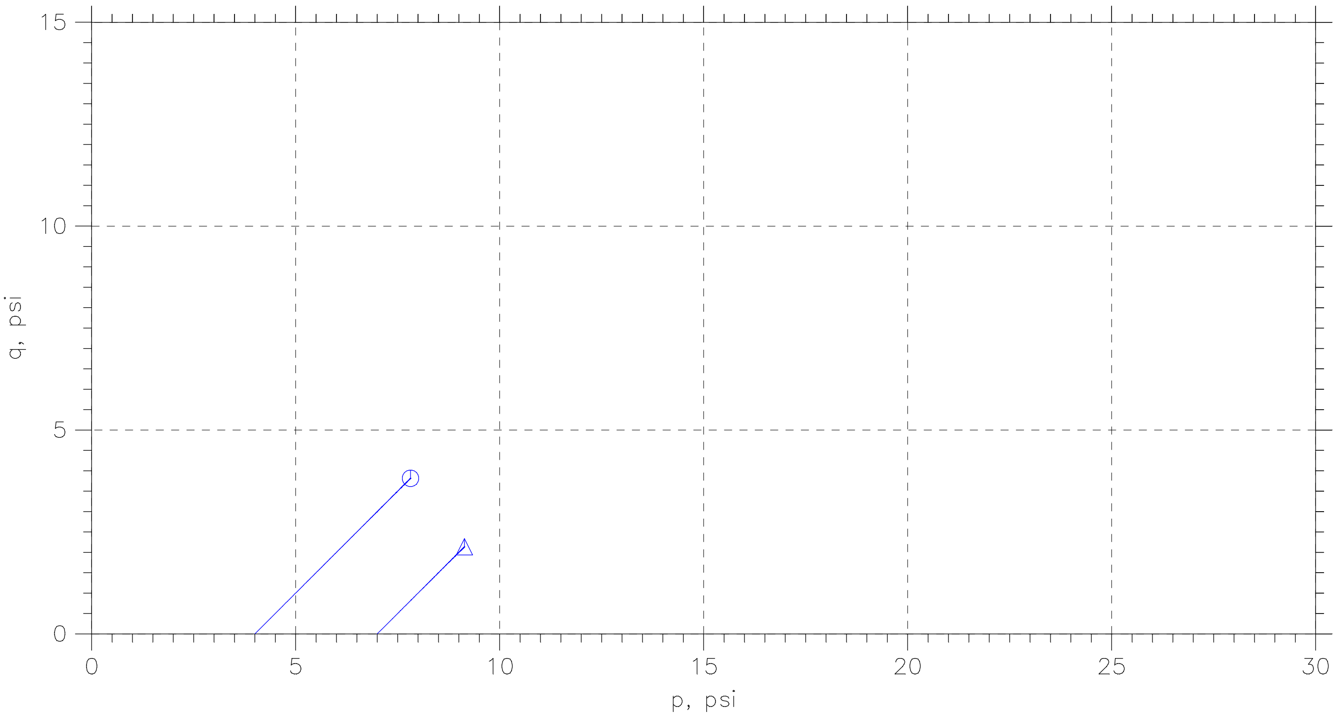
Remarks: System II

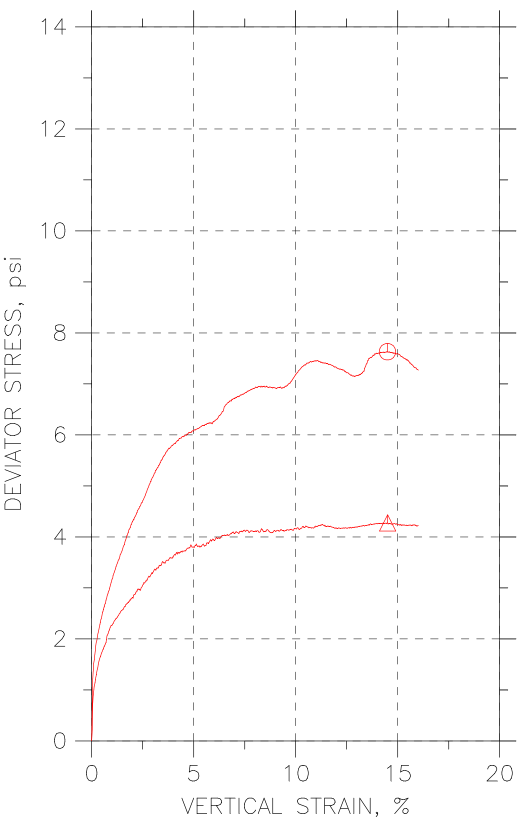
Phase calculations based on start and end of test.

Attachment Figure A.4-152

Thu, 14-MAR-2019 13:30:21

UNCONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D2850

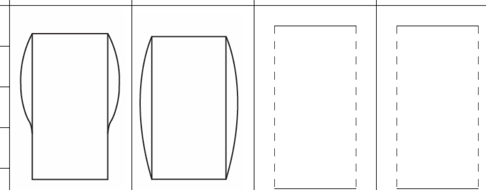




Symbol	⏀	△		
Sample No.	SL0663	SL0663		
Test No.	UU-3-1	UU-3-2		
Depth	8-10 ft	8-10 ft		
Tested by	trm	trm		
Test Date	12/26/18	12/26/18		
Checked by	njh	njh		
Check Date	2/28/19	2/28/19		
Diameter, in	2.83	2.84		
Height, in	5.75	5.95		
Water Content, %	25.9	24.1		
Dry Density, pcf	94.44	94.21		
Saturation, %	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



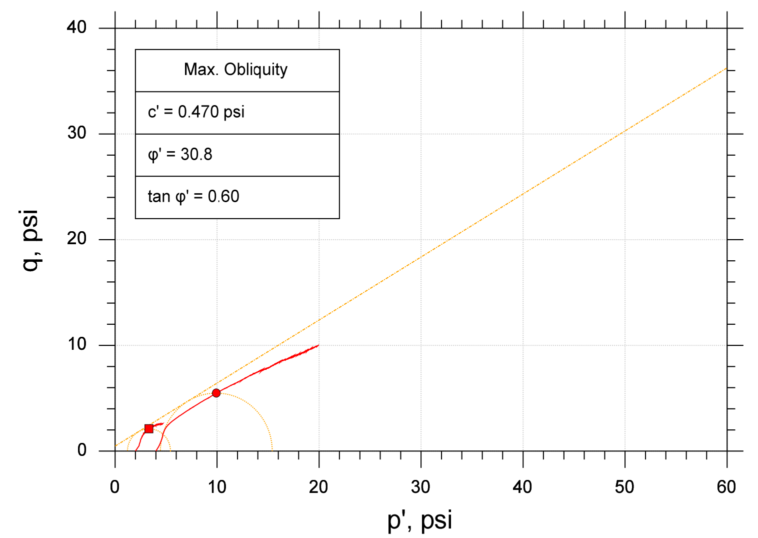
Phase calculations based on start and end of test.

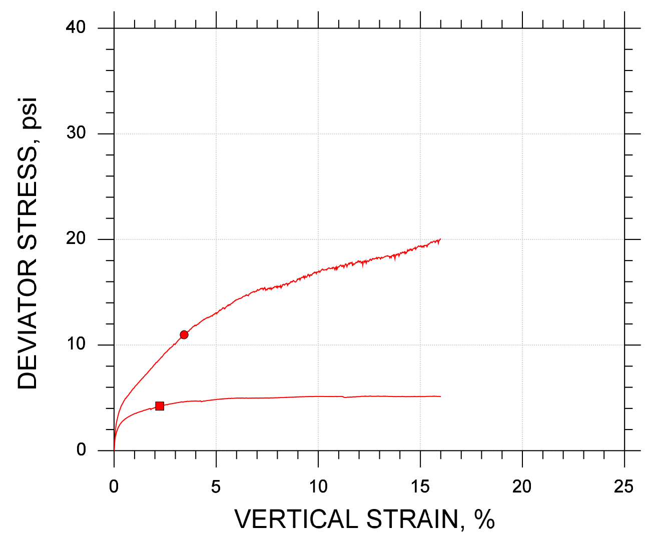
Attachment Figure A.4-153

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

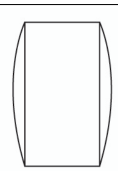
CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767

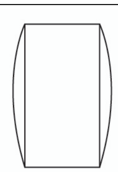




Symbol		■	●		
Sample ID		SL0863	SL0863		
Depth, ft		12-14	12-14		
Test Number		CU-7-1	CU-7-2		
Initial	Height, in	6.100	6.070		
	Diameter, in	2.870	2.880		
	Moisture Content (from Cuttings), %	13.6	10.6		
	Dry Density, pcf	104.	111.		
	Saturation (Wet Method), %	58.8	54.4		
	Void Ratio	0.623	0.524		
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.



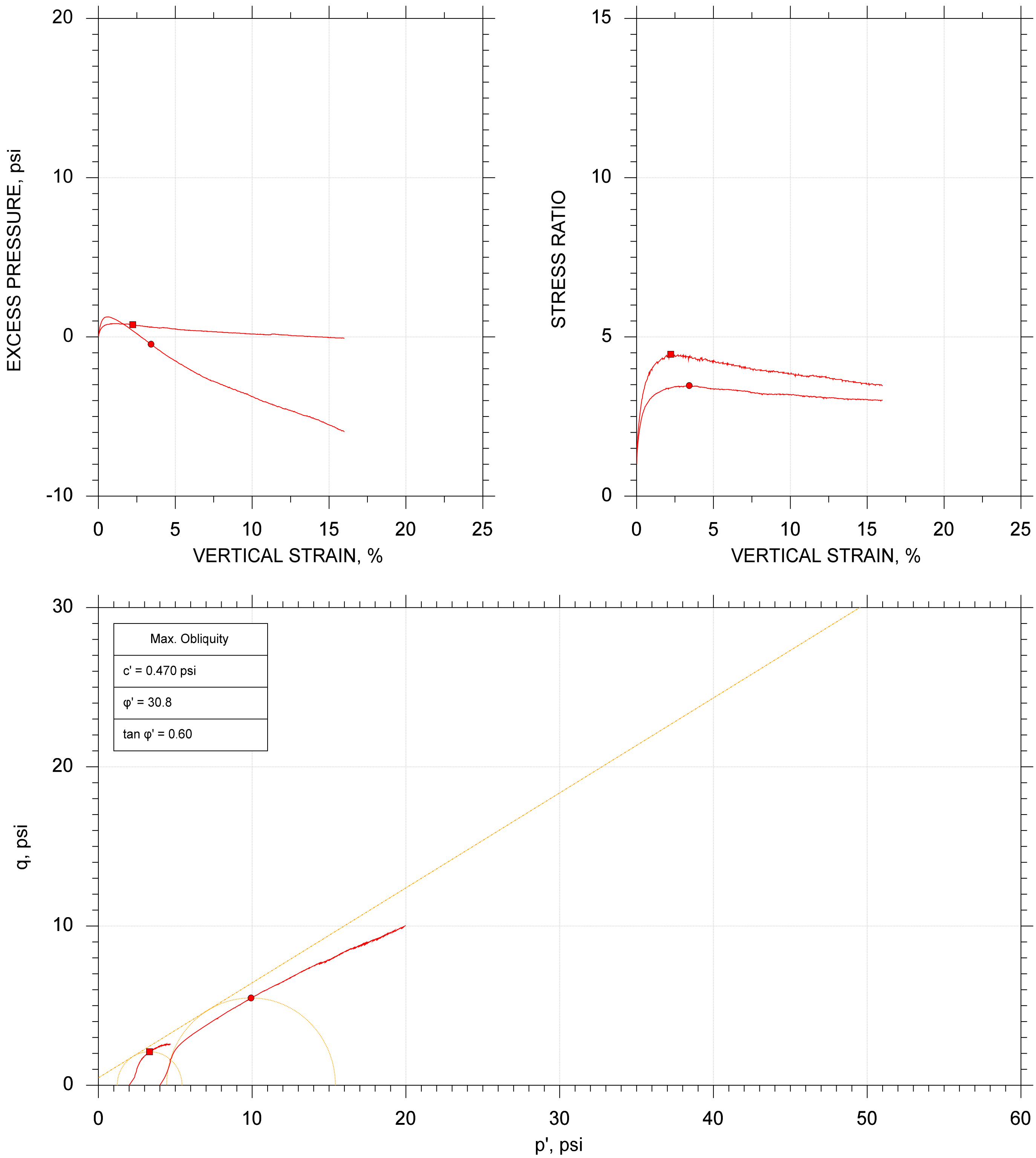


Remarks:

System T

Attachment Figure A.4-154

CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767



Max. Obliquity
c' = 0.470 psi
φ' = 30.8
tan φ' = 0.60

	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

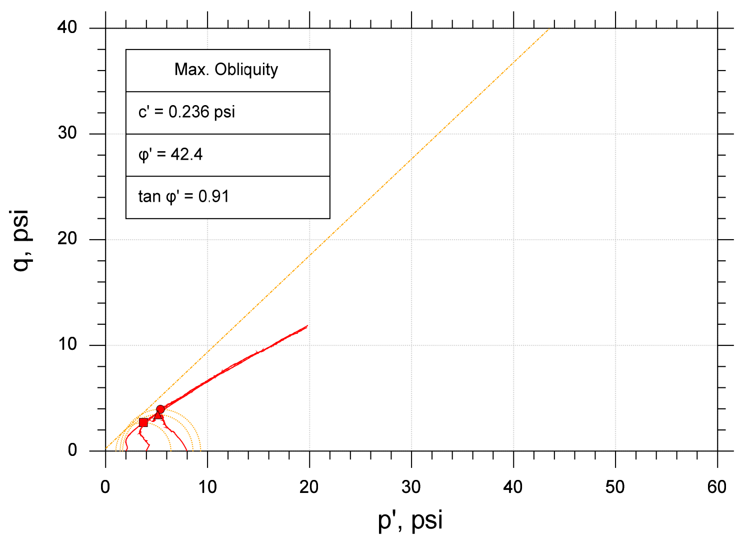
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB018	Sample Type: Intact	
Description: Moist, gray clay with sand		
Remarks: System T		

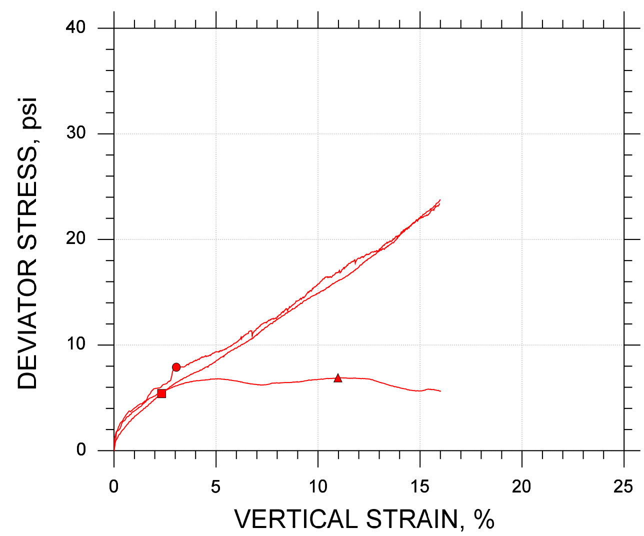
Attachment Figure A.4-155

GeoTesting EXPRESS

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

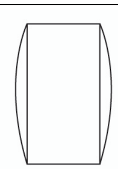
CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767

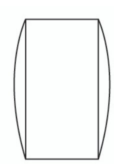


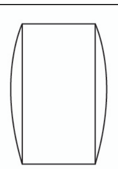


Symbol		■	●	▲	
Sample ID		SL0824	SL0824	SL0824	
Depth, ft		12-14	12-14	12-14	
Test Number		CU-6-1	CU-6-2	CU-6-3	
Initial	Height, in	3.000	3.310	2.820	
	Diameter, in	1.410	1.410	1.410	
	Moisture Content (from Cuttings), %	22.2	27.5	65.1	
	Dry Density, pcf	104.	95.0	60.7	
	Saturation (Wet Method), %	99.7	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.





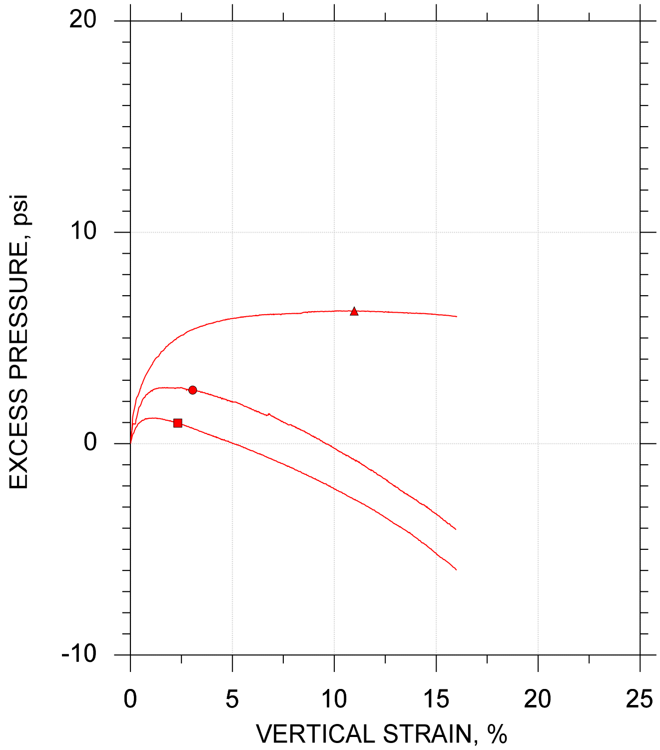


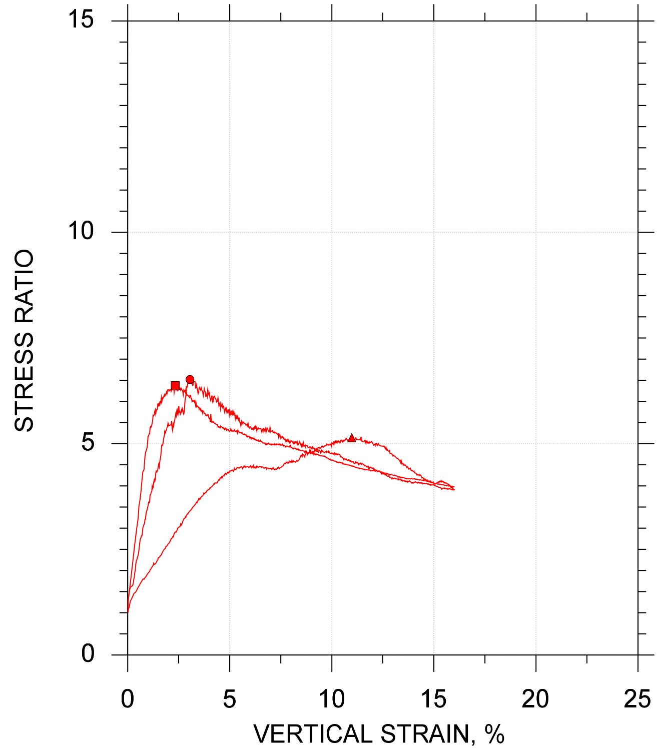
Remarks:

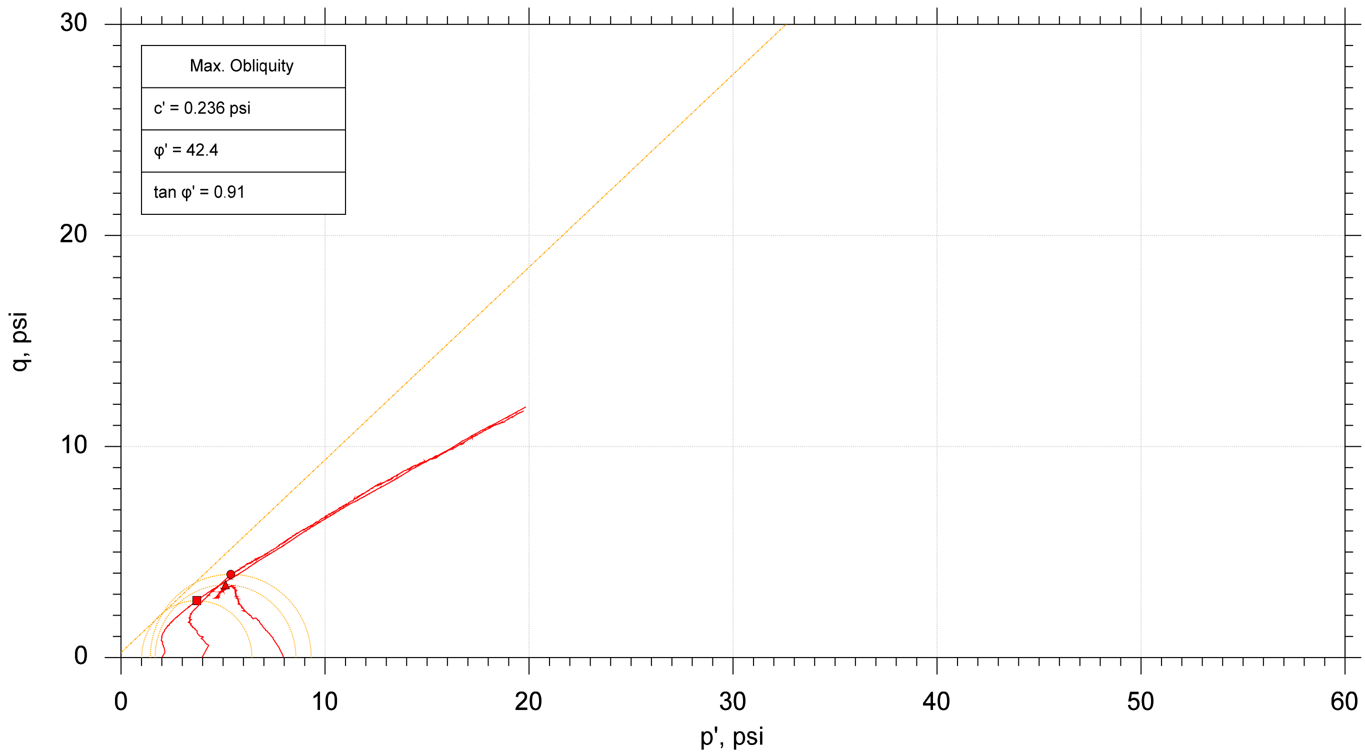
System E

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

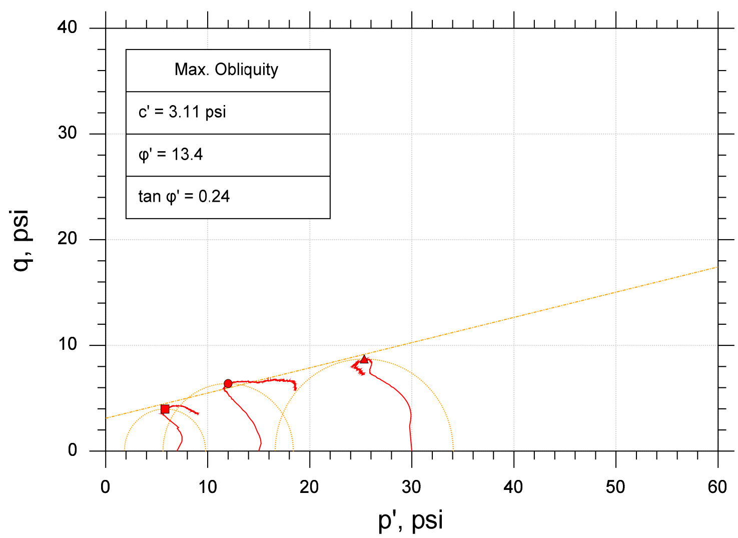
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB021	Sample Type: intact	
Description: Moist, gray clayey sand		
Remarks: System E		

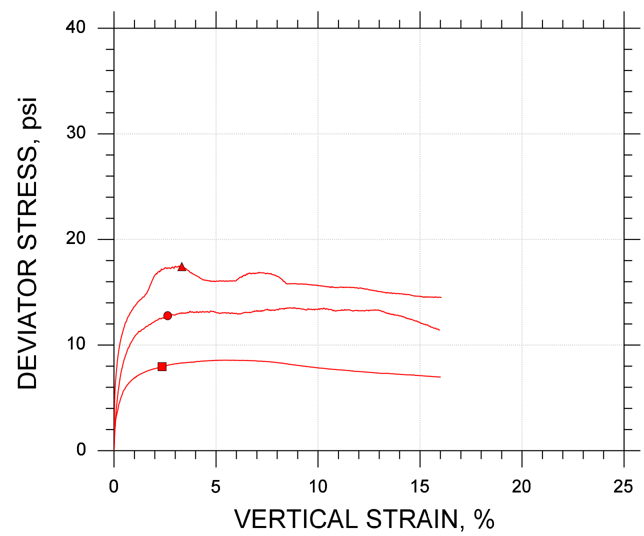
Attachment Figure A.4-157

GeoTesting EXPRESS

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

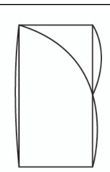
CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767

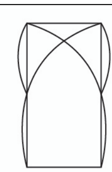




		CU-5-1	CU-5-2	CU-5-3	
Symbol		■	●	▲	
Sample ID		SL0829	SL0829	SL0829	
Depth, ft		39-41	39-41	39-41	
Test Number		CU-5-1	CU-5-2	CU-5-3	
Initial	Height, in	4.400	4.420	4.470	
	Diameter, in	2.030	2.020	1.990	
	Moisture Content (from Cuttings), %	36.7	35.0	36.0	
	Dry Density, pcf	84.1	81.2	80.2	
	Saturation (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.



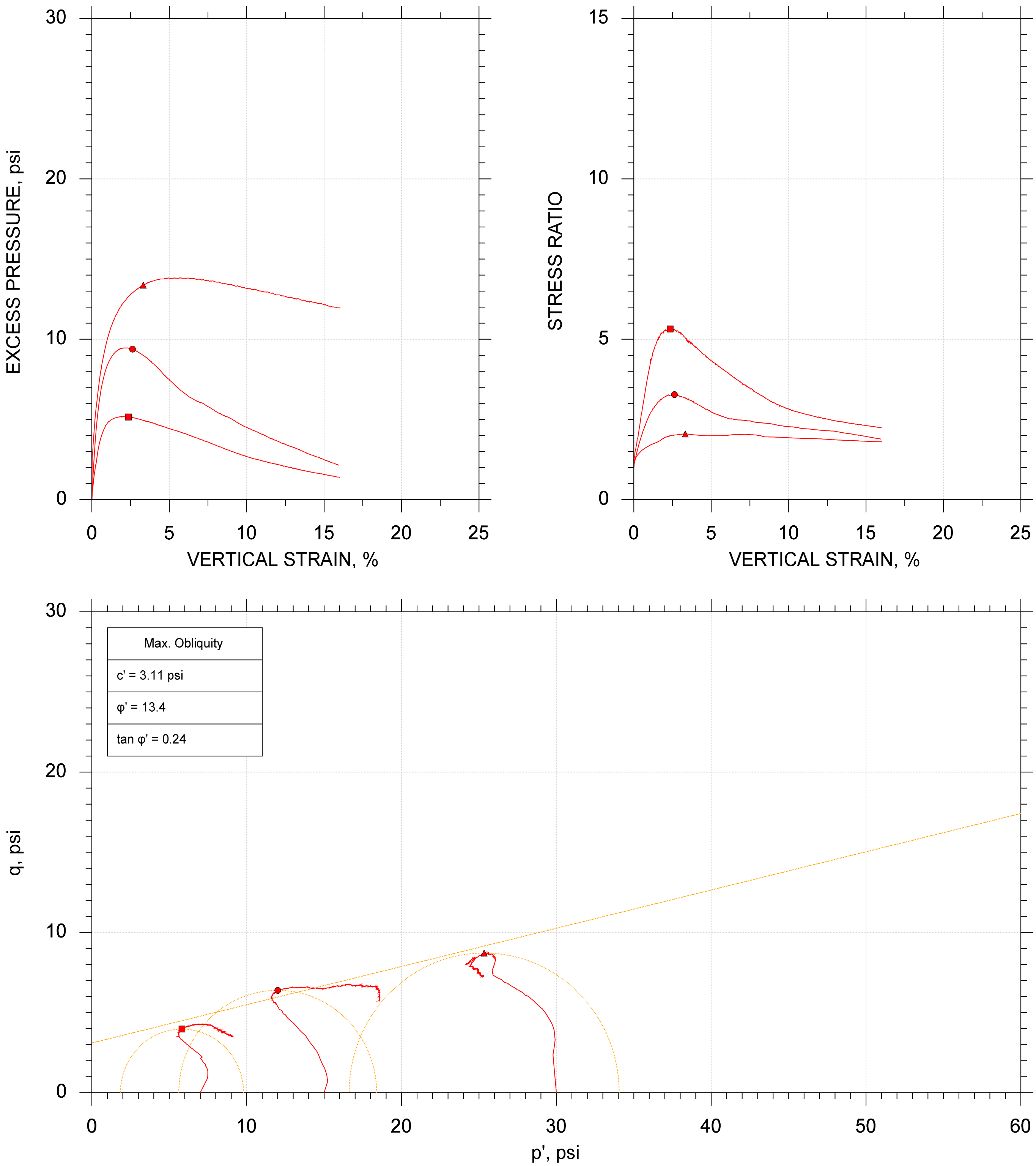


Remarks:

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

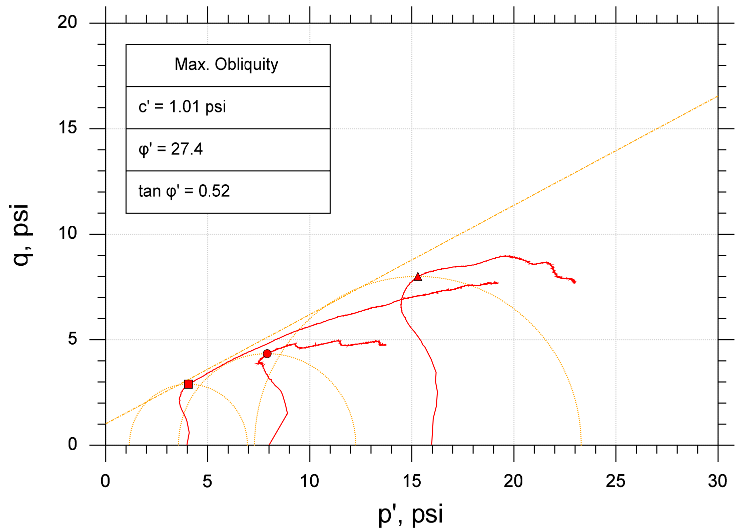
GeoTesting EXPRESS

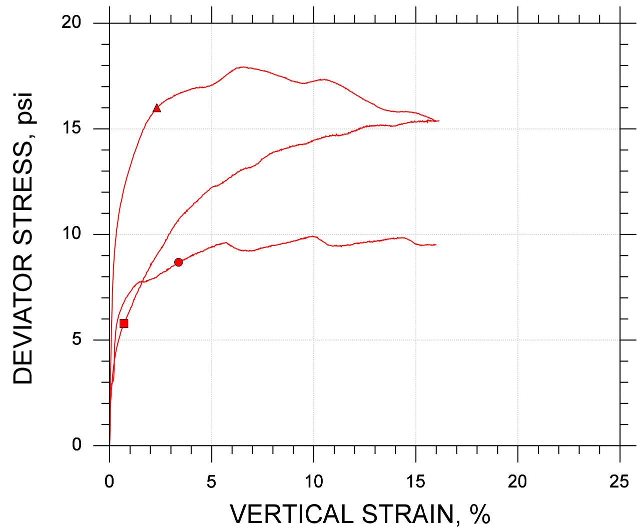
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB-021	Sample Type: intact	
Description: Moist , reddish brown and gray clay		
Remarks: System Q		

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

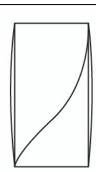
CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767

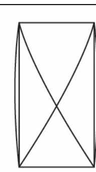




Symbol		■	●	▲	
Sample ID		SL0868	SL0868	SL0868	
Depth, ft		25-27	25-27	25-27	
Test Number		CU-4-1	CU-4-2	CU-4-3	
Initial	Height, in	4.500	4.520	4.600	
	Diameter, in	2.020	2.030	2.030	
	Moisture Content (from Cuttings), %	25.7	27.0	28.9	
	Dry Density, pcf	97.5	92.1	90.4	
	Saturation (Wet Method), %	95.0	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.

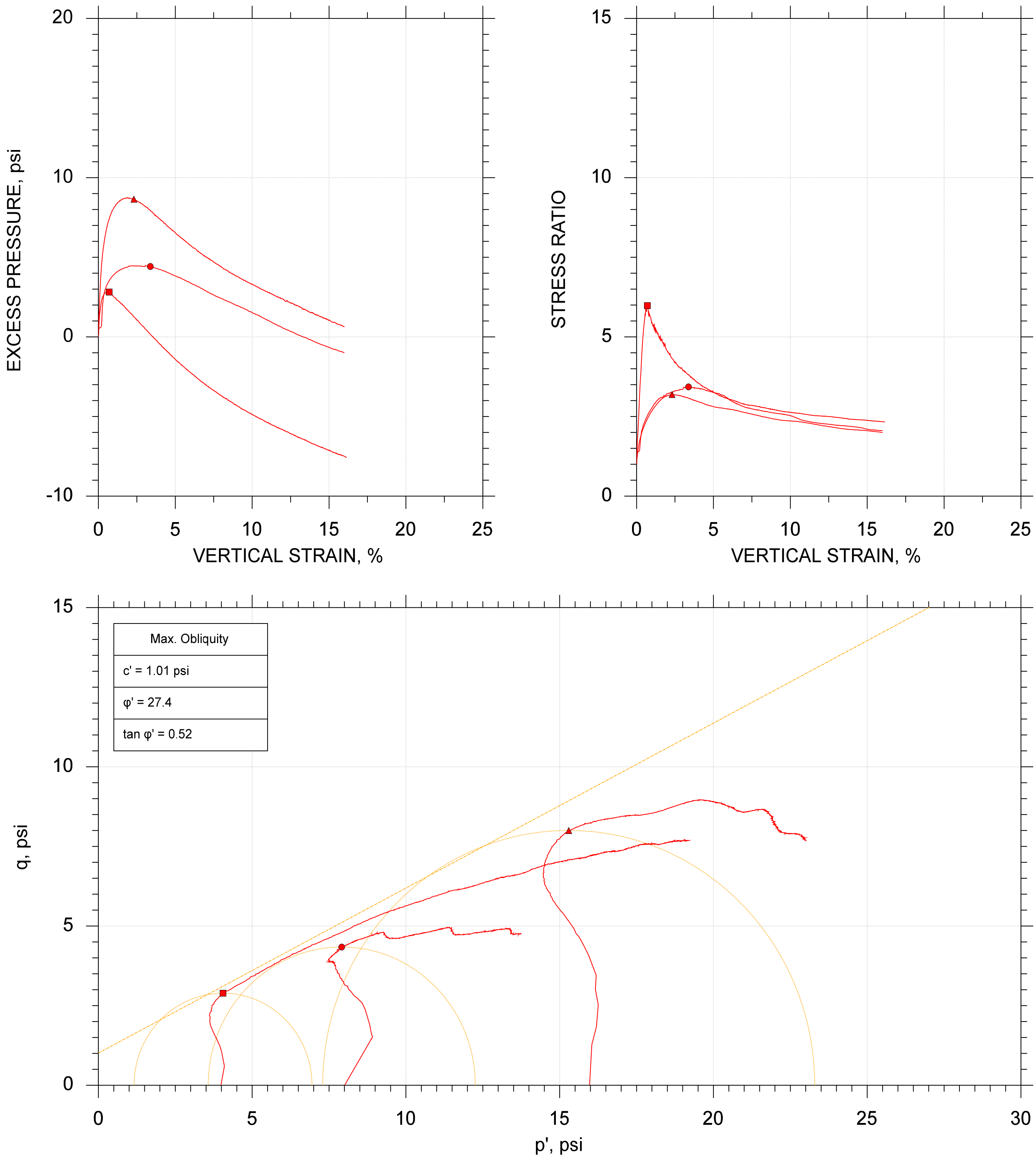




Remarks:

System LL

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

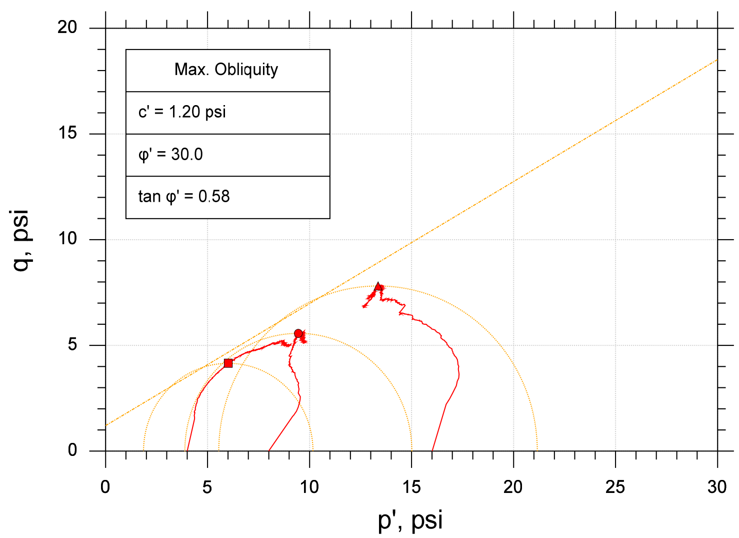
GeoTesting EXPRESS

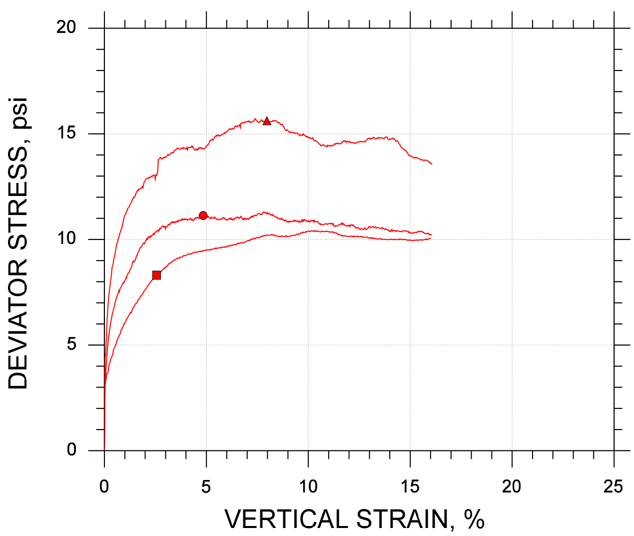
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB018	Sample Type: intact	
Description: Moist, reddish brown clay		
Remarks: System LL		

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

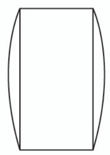
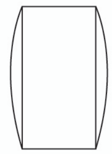
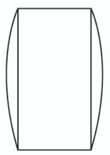
CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





	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	
Initial	Diameter, in	1.410	1.410	1.410	
Initial	Moisture Content (from Cuttings), %	39.7	37.3	38.4	
Initial	Dry Density, pcf	82.7	85.3	84.2	
Initial	Saturation (Wet Method), %	99.9	99.6	99.8	
Initial	Void Ratio	1.11	1.05	1.08	
Before Shear	Moisture Content, %	39.6	37.1	37.6	
Before Shear	Dry Density, pcf	82.9	85.8	85.2	
Before Shear	Cross-sectional Area (Method A), in²	1.560	1.560	1.552	
Before Shear	Saturation, %	100.0	100.0	100.0	
Before Shear	Void Ratio	1.11	1.04	1.05	
Before Shear	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.

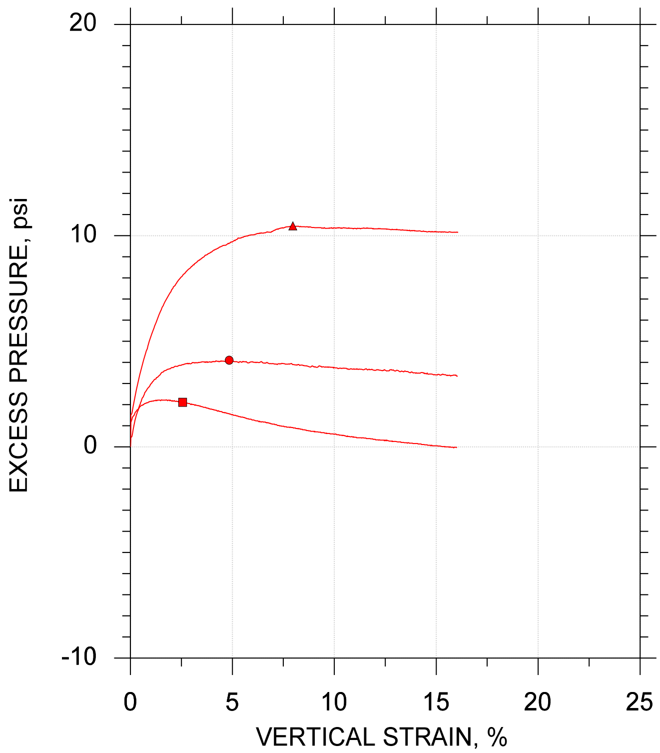




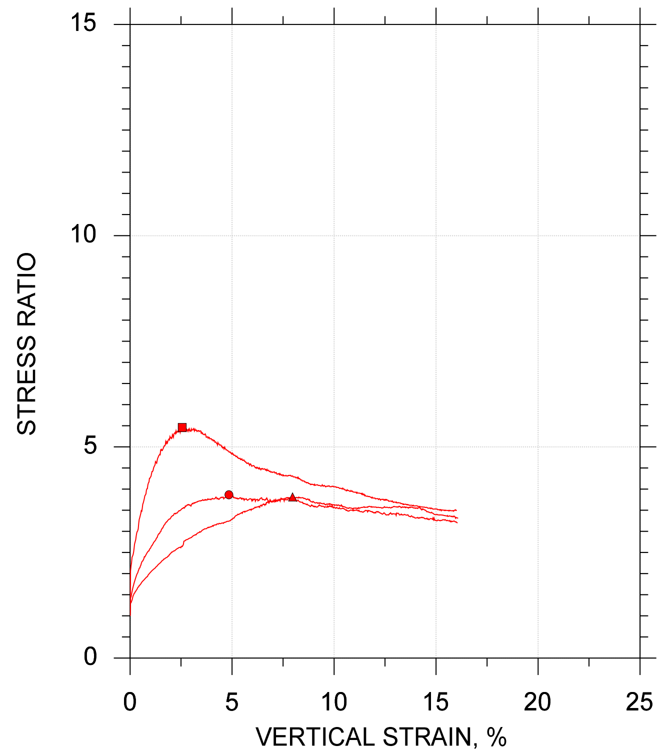
Remarks:

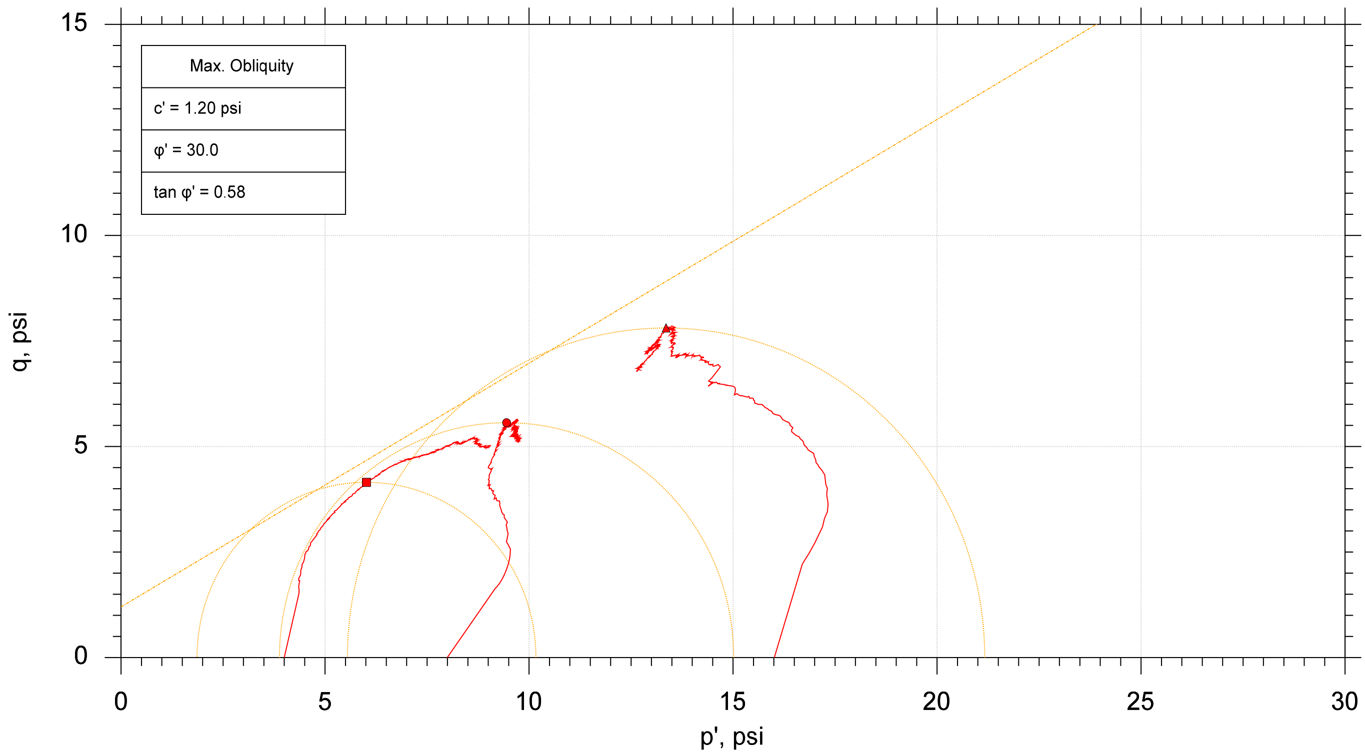
System K

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

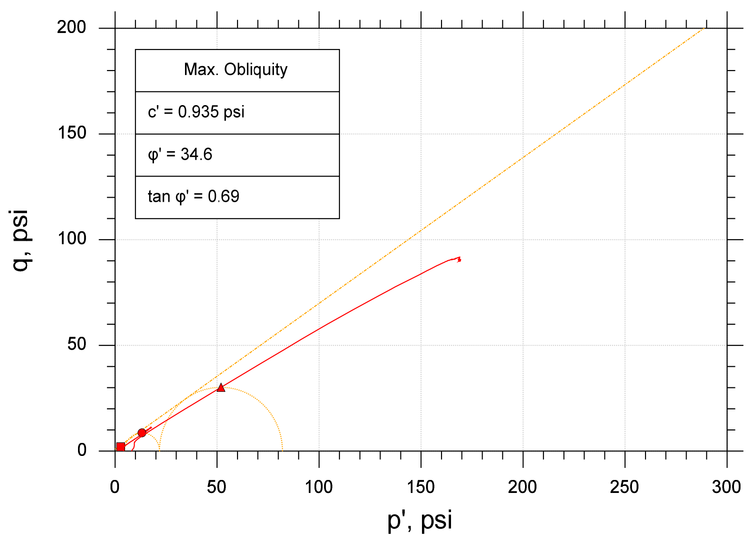
GeoTesting EXPRESS

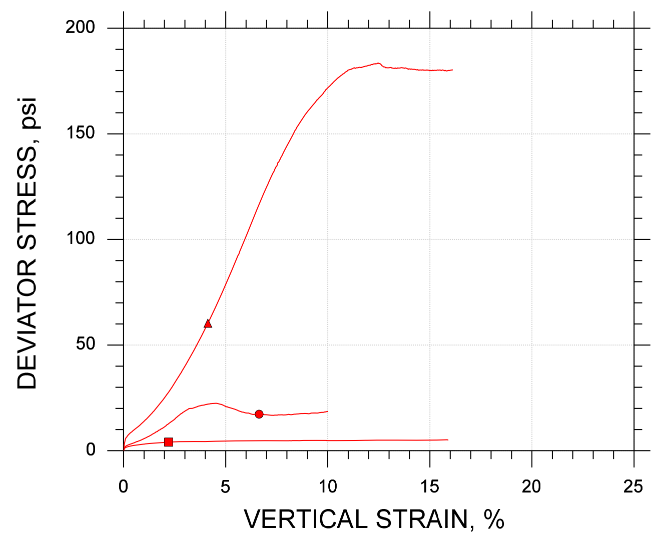
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB025	Sample Type: intact	
Description: Moist, black clay		
Remarks: System K		

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

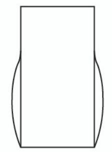
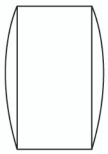
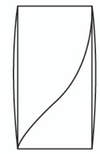
CONSOLIDATED UNDRAINED TRIAXIAL TEST by ASTM D4767





	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
Initial	Diameter, in	2.860	2.870	2.860
Initial	Moisture Content (from Cuttings), %	19.1	13.5	23.7
Initial	Dry Density, pcf	98.8	108.	103.
Initial	Saturation (Wet Method), %	73.0	64.8	99.9
Initial	Void Ratio	0.707	0.561	0.642
Before Shear	Moisture Content, %	25.7	23.0	23.5
Before Shear	Dry Density, pcf	99.5	104.	103.
Before Shear	Cross-sectional Area (Method A), in²	6.374	6.721	6.392
Before Shear	Saturation, %	100.0	100.0	100.0
Before Shear	Void Ratio	0.694	0.622	0.634
Before Shear	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.

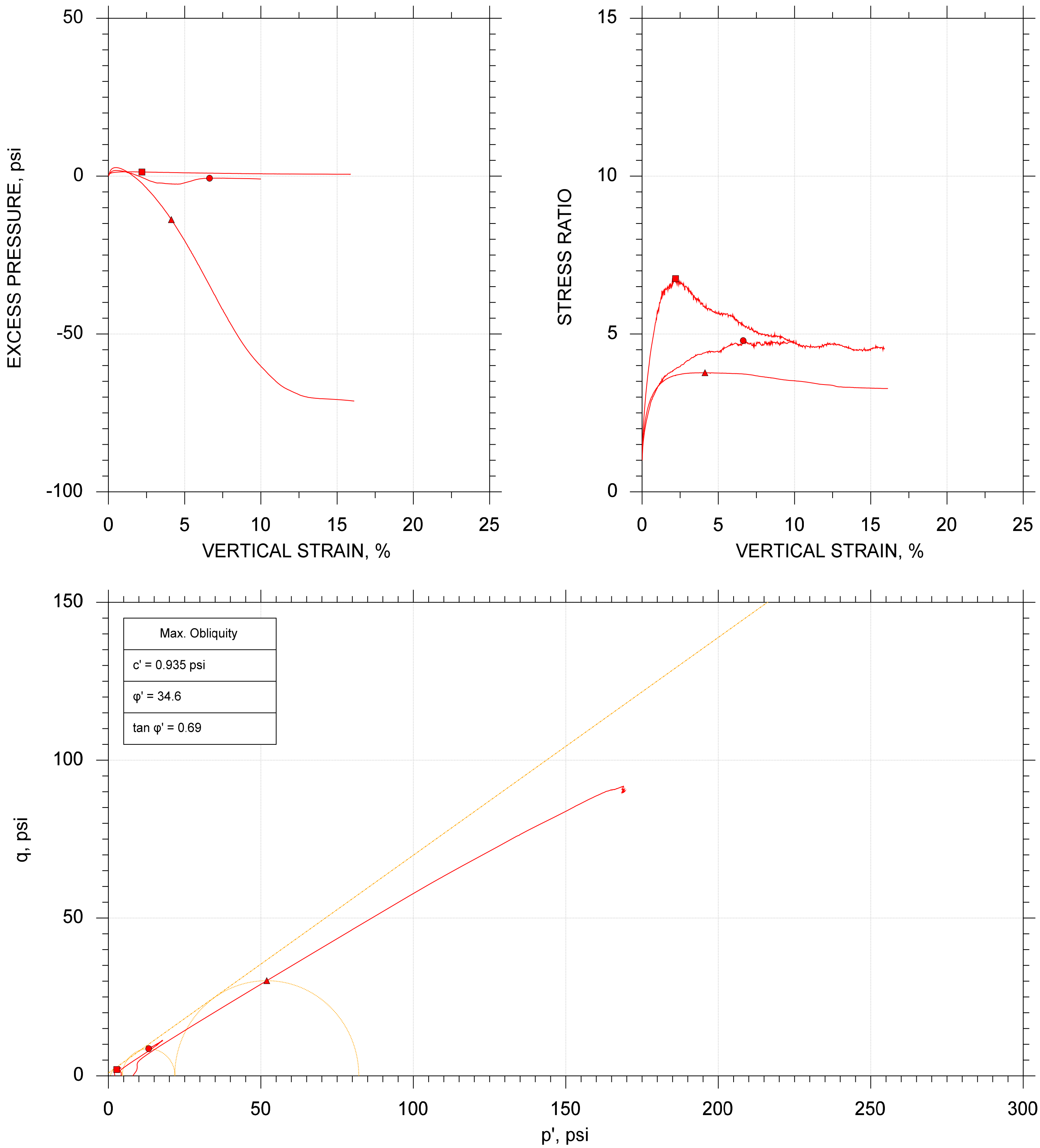




Remarks:

System Q

Attachment Figure A.4-164

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

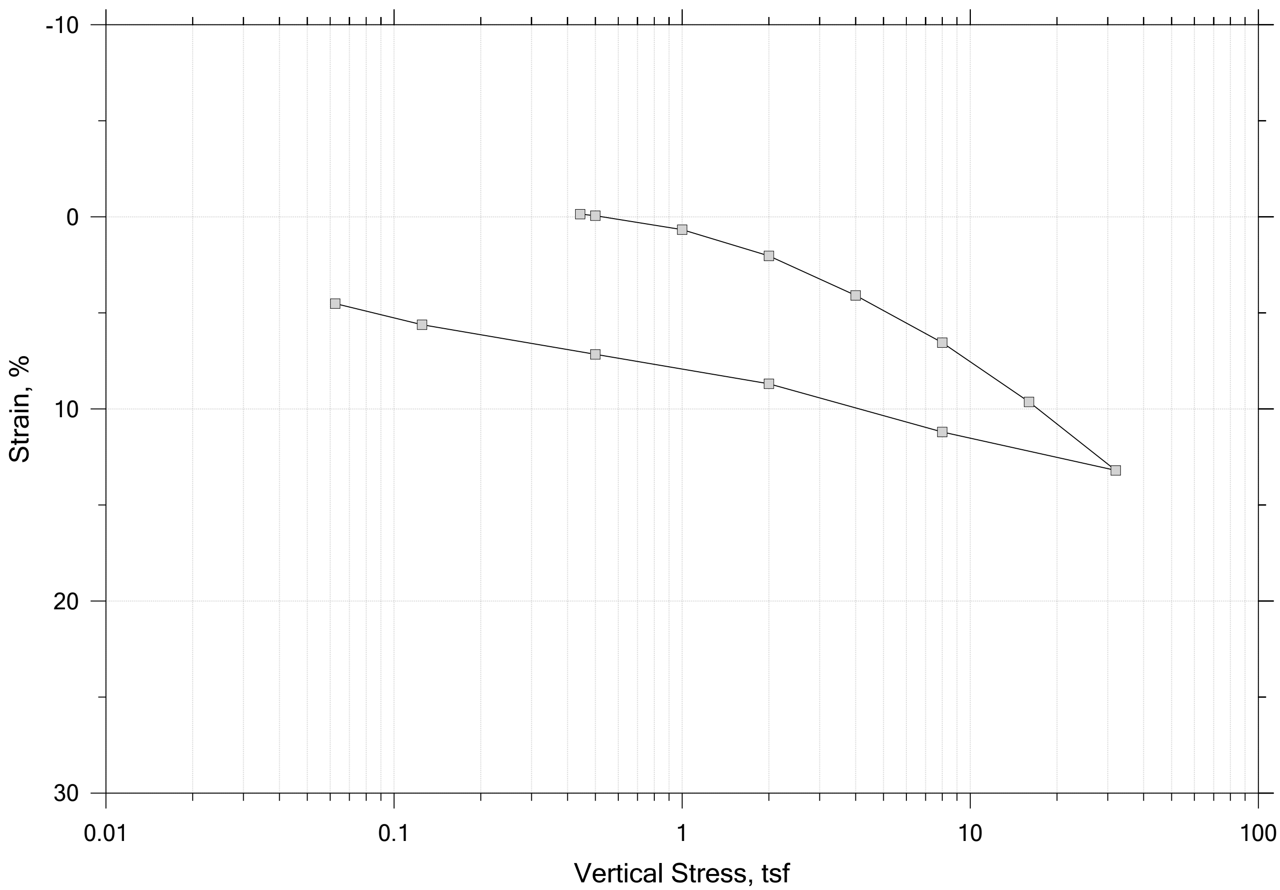
GeoTesting EXPRESS

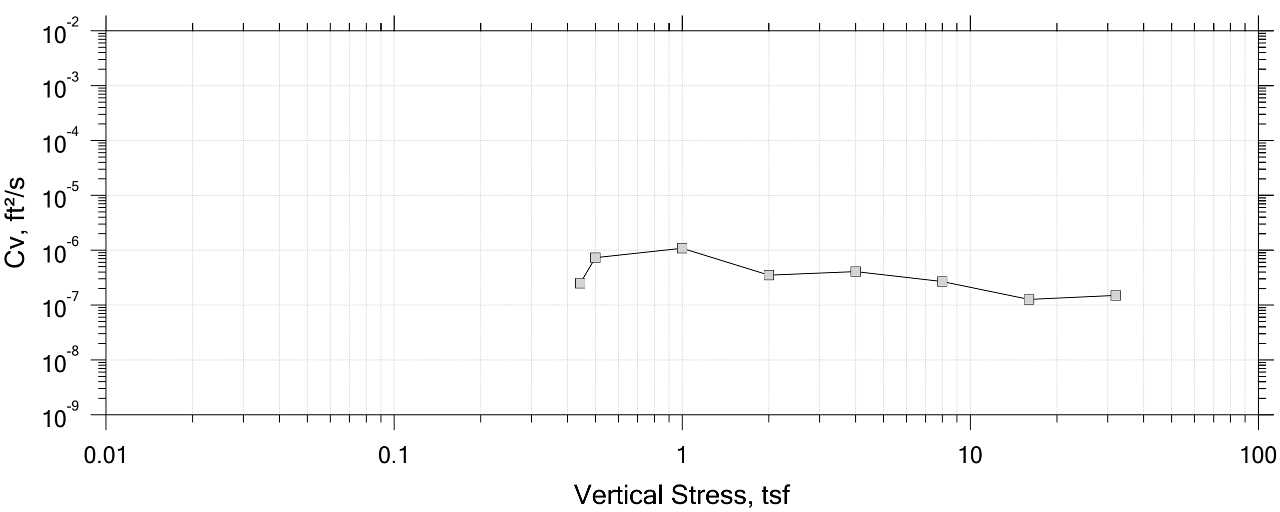
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB034	Sample Type: intact	
Description: Moist, gray sand with clay and shells		
Remarks: System Q		

Attachment Figure A.4-165

One-Dimensional Consolidation by ASTM D2435 - Method B

Summary Report





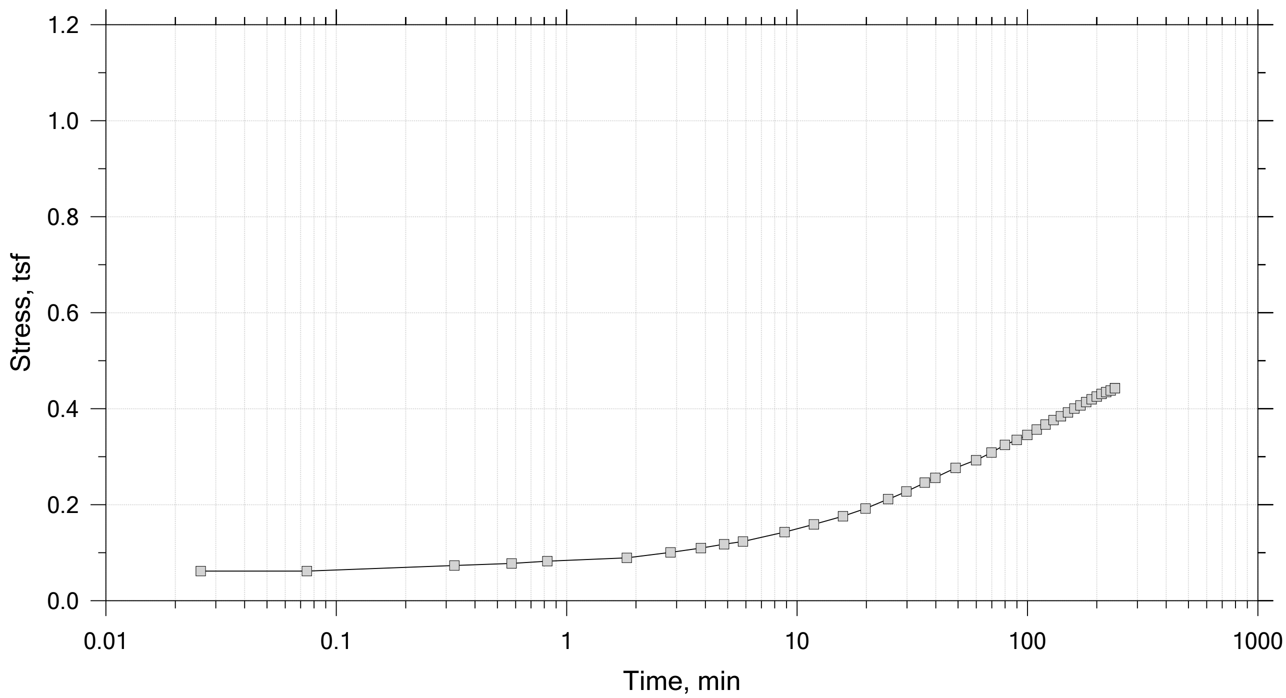
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB018	Tested By: md	Checked By: njh
	Sample No.: SL0868	Test Date: 01/09/19	Depth: 25-27 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, reddish brown clay		
	Remarks: System LTIII-A, Swell Pressure = 0.443 tsf		
	Displacement at End of Increment		

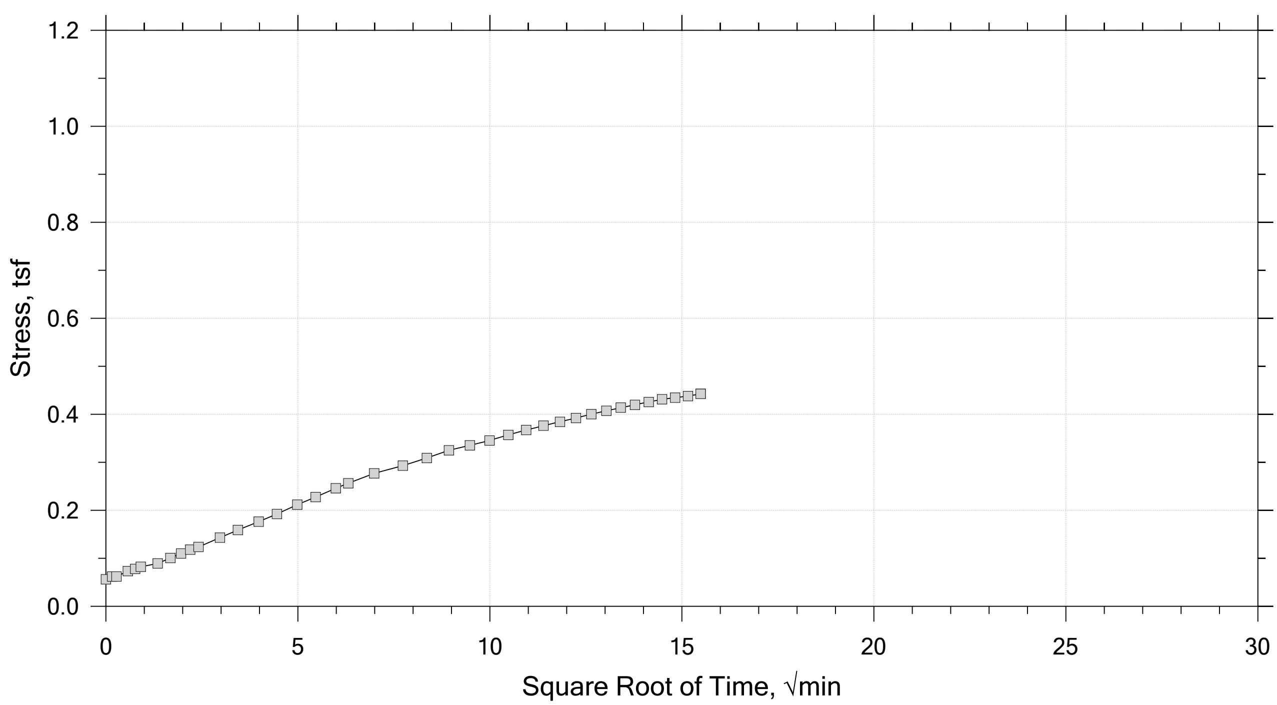
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 13

Constant Volume Step

Stress: 0.443 tsf

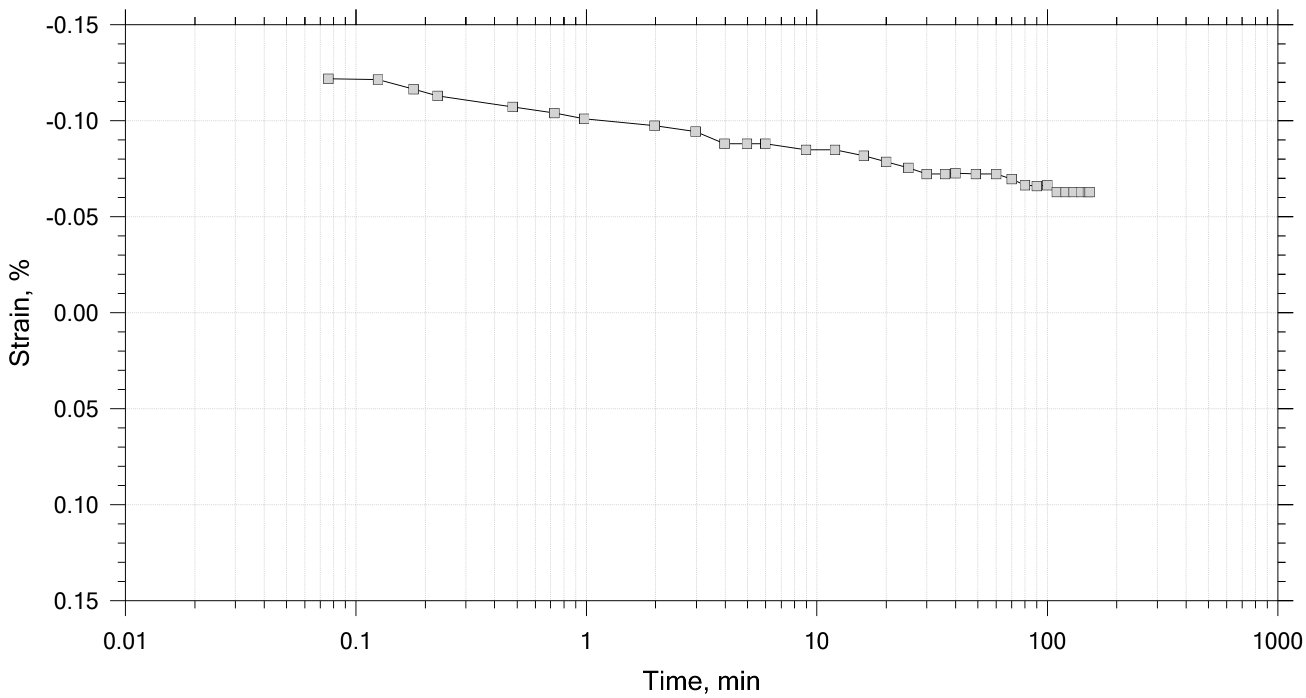


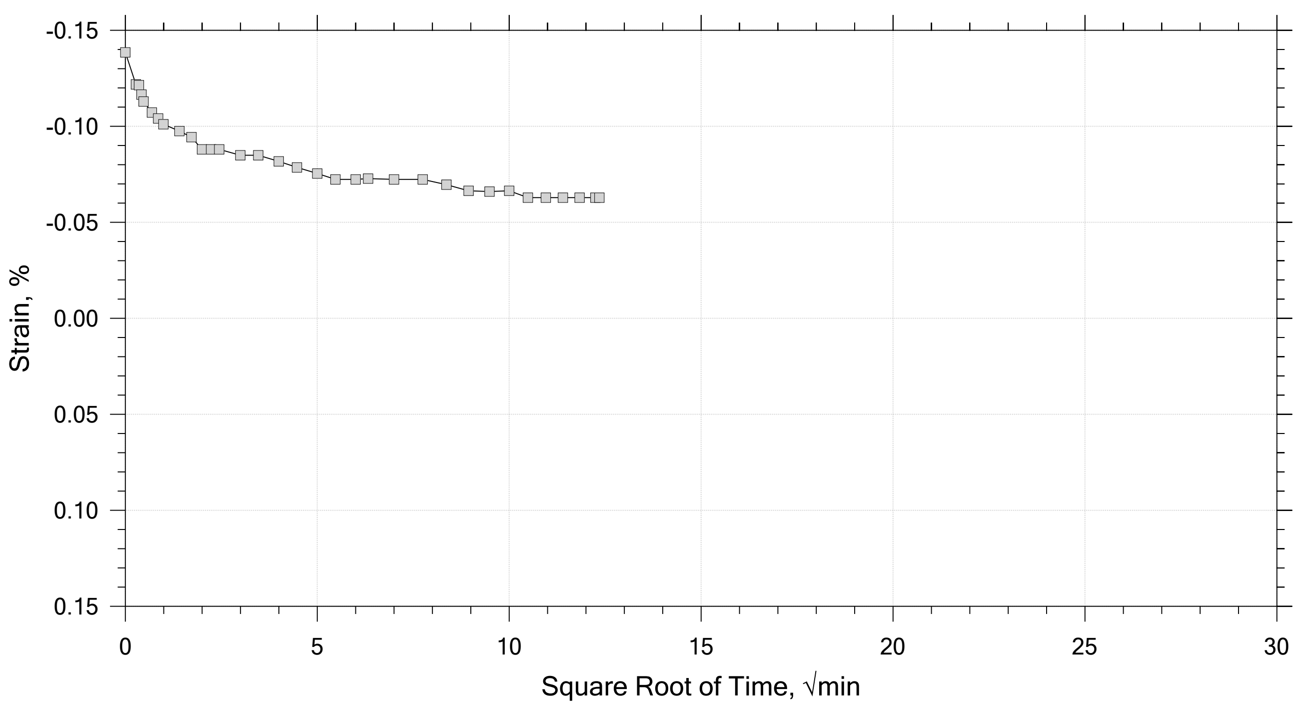


GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB018	Tested By: md	Checked By: njh
	Sample No.: SL0868	Test Date: 01/09/19	Depth: 25-27 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, reddish brown clay		
	Remarks: System LTIII-A, Swell Pressure = 0.443 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 13
Constant Load Step
Stress: 0.5 tsf





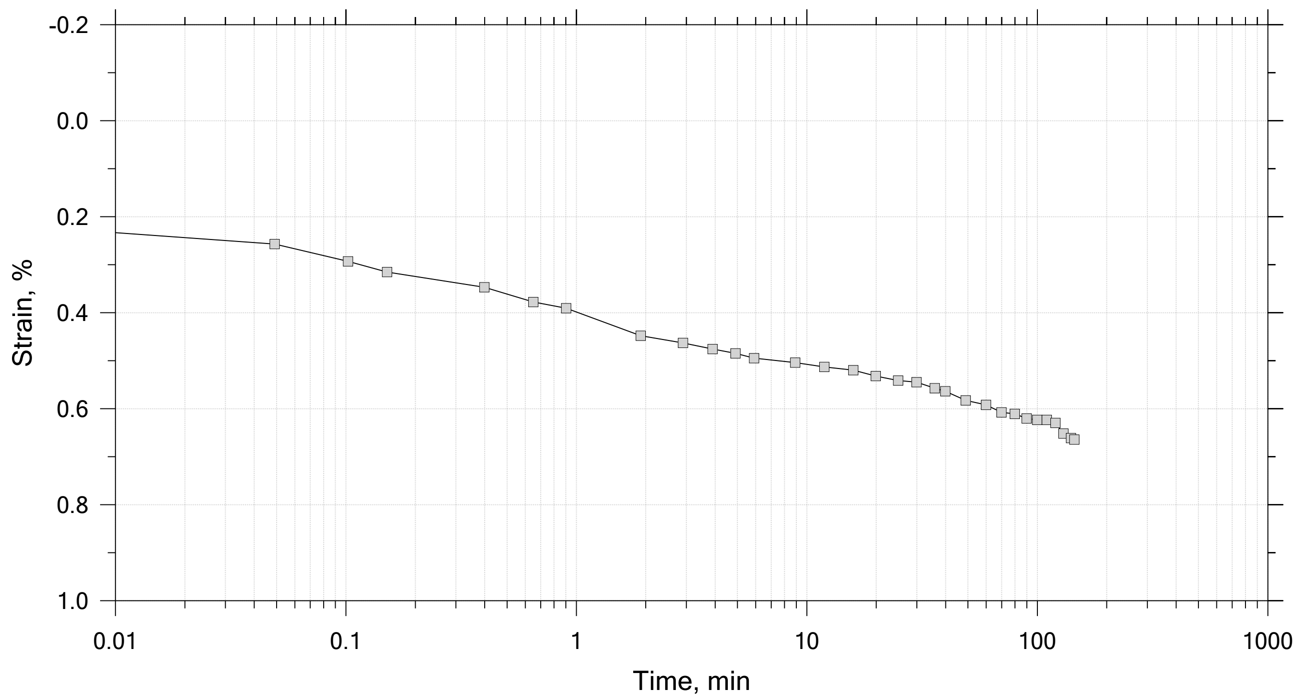
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB018	Tested By: md	Checked By: njh
	Sample No.: SL0868	Test Date: 01/09/19	Depth: 25-27 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, reddish brown clay		
	Remarks: System LTIII-A, Swell Pressure = 0.443 tsf		

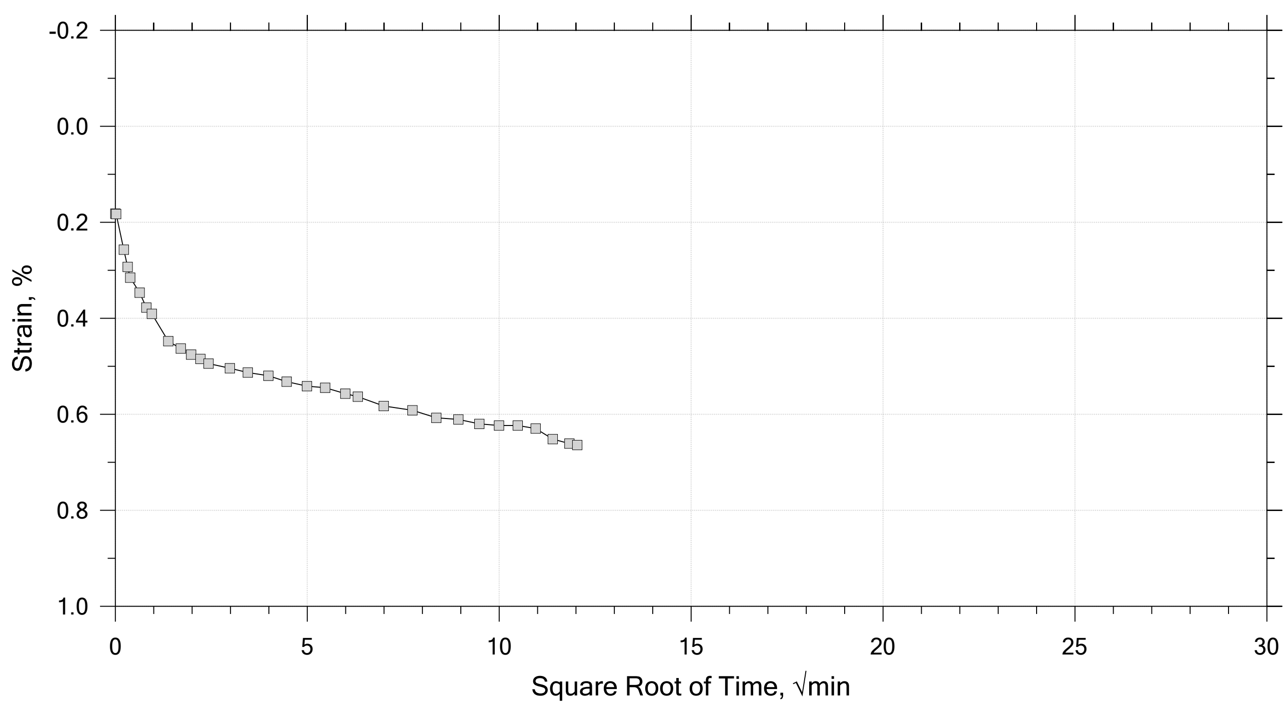
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 13

Constant Load Step

Stress: 1 tsf

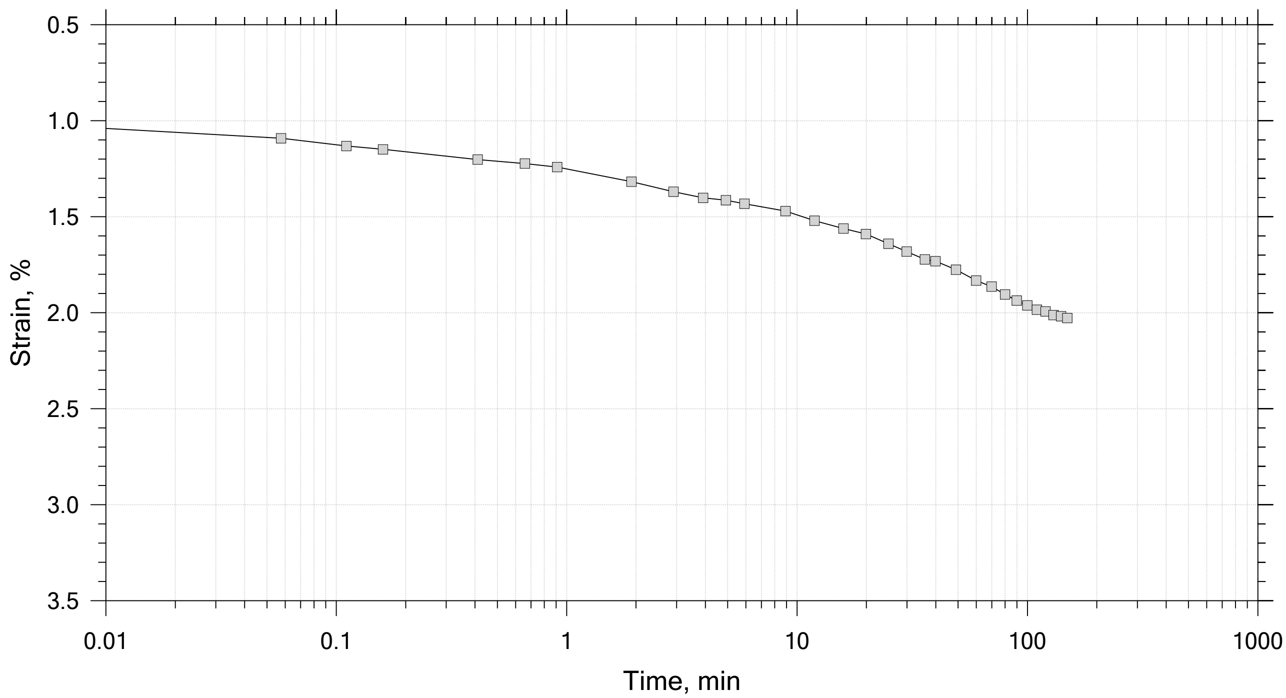


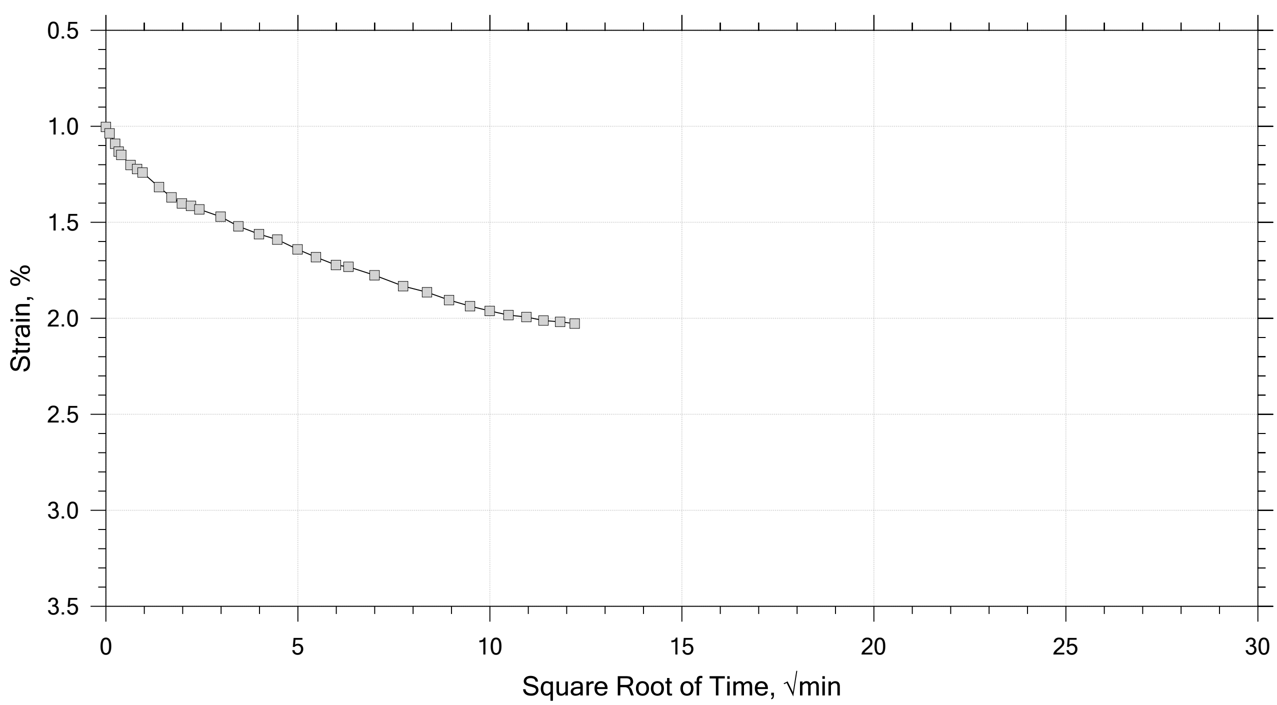


GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB018	Tested By: md	Checked By: njh
	Sample No.: SL0868	Test Date: 01/09/19	Depth: 25-27 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, reddish brown clay		
	Remarks: System LTIII-A, Swell Pressure = 0.443 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 13
Constant Load Step
Stress: 2 tsf

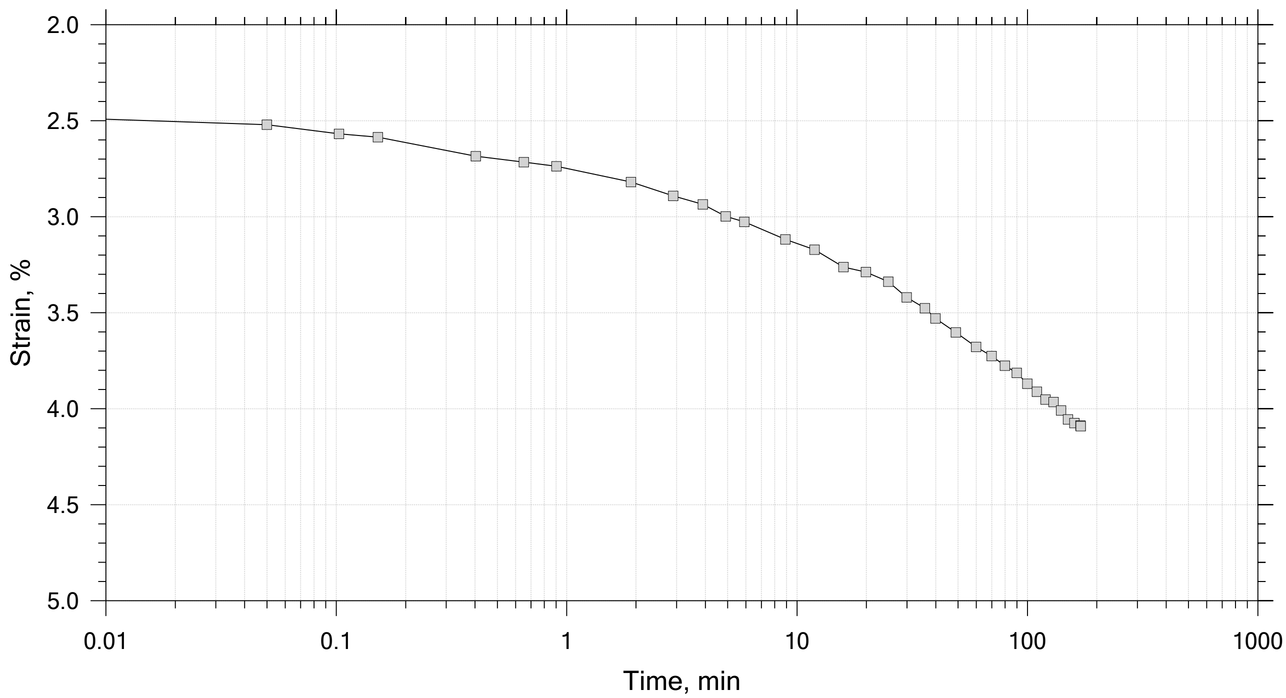


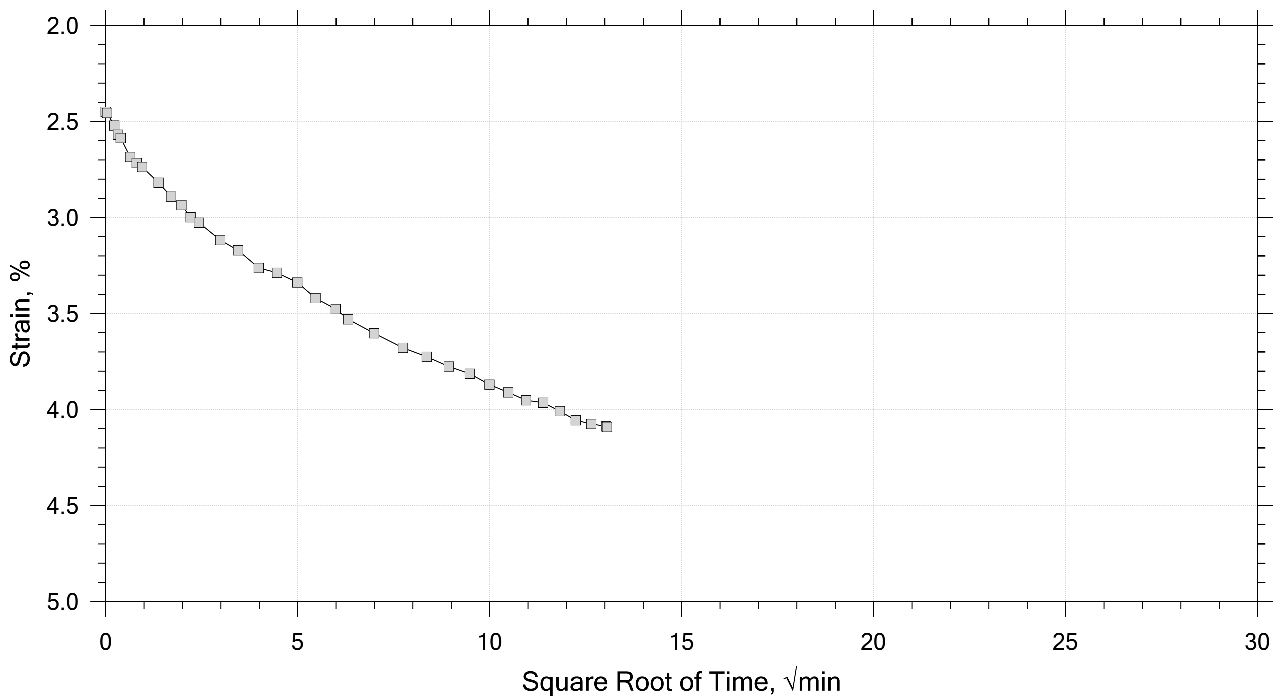


GeoTesting EXPRESS			
	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB018	Tested By: md	Checked By: njh
	Sample No.: SL0868	Test Date: 01/09/19	Depth: 25-27 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, reddish brown clay		
	Remarks: System LTIII-A, Swell Pressure = 0.443 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 13
Constant Load Step
Stress: 4 tsf





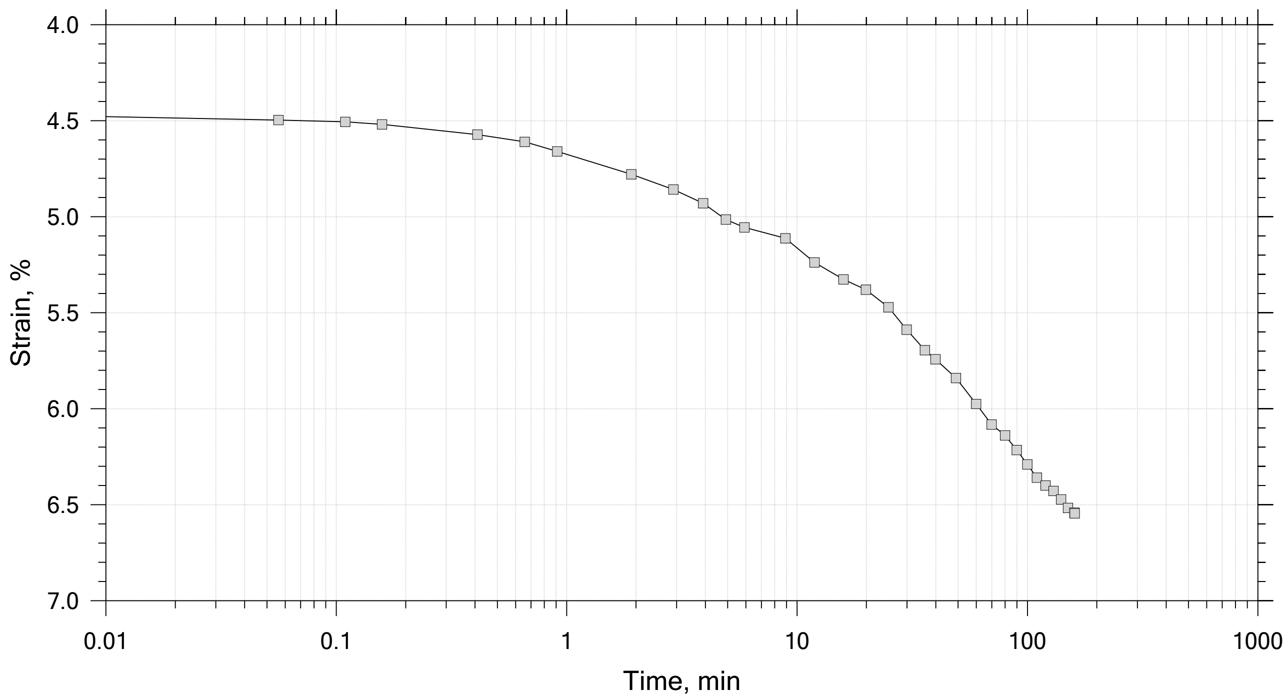
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB018	Tested By: md	Checked By: njh
	Sample No.: SL0868	Test Date: 01/09/19	Depth: 25-27 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, reddish brown clay		
	Remarks: System LTIII-A, Swell Pressure = 0.443 tsf		

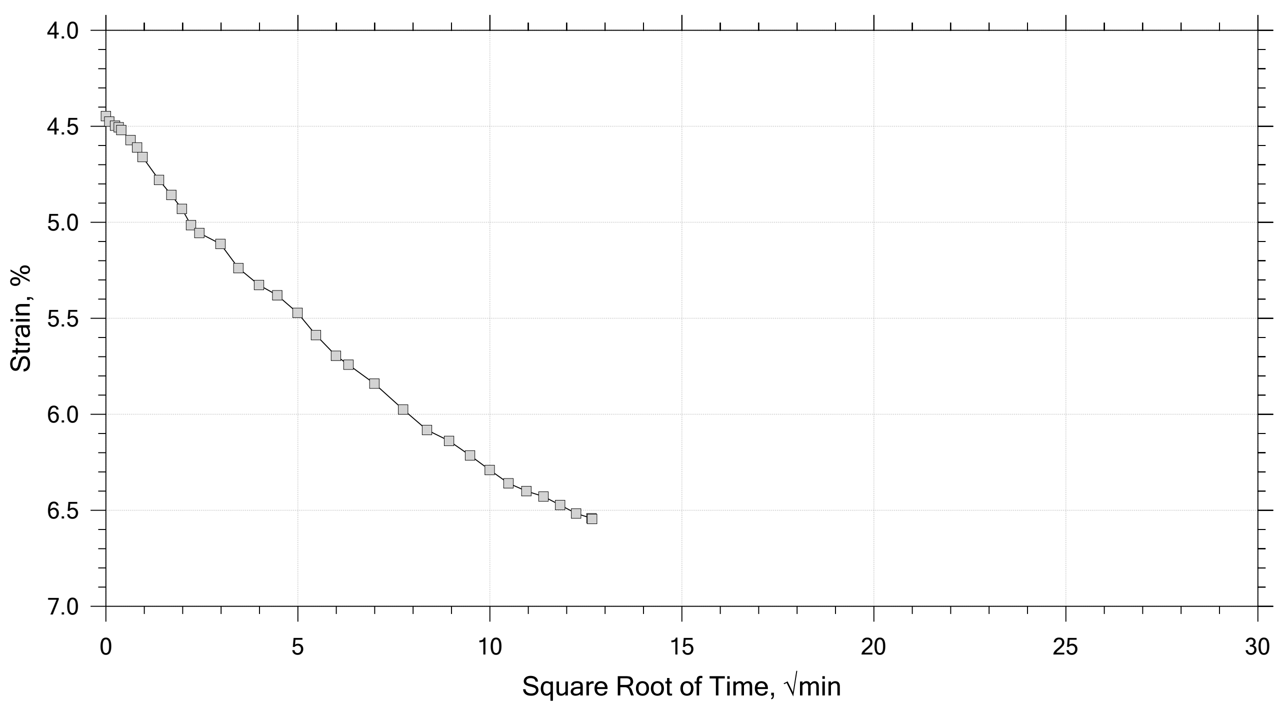
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 13

Constant Load Step

Stress: 8 tsf

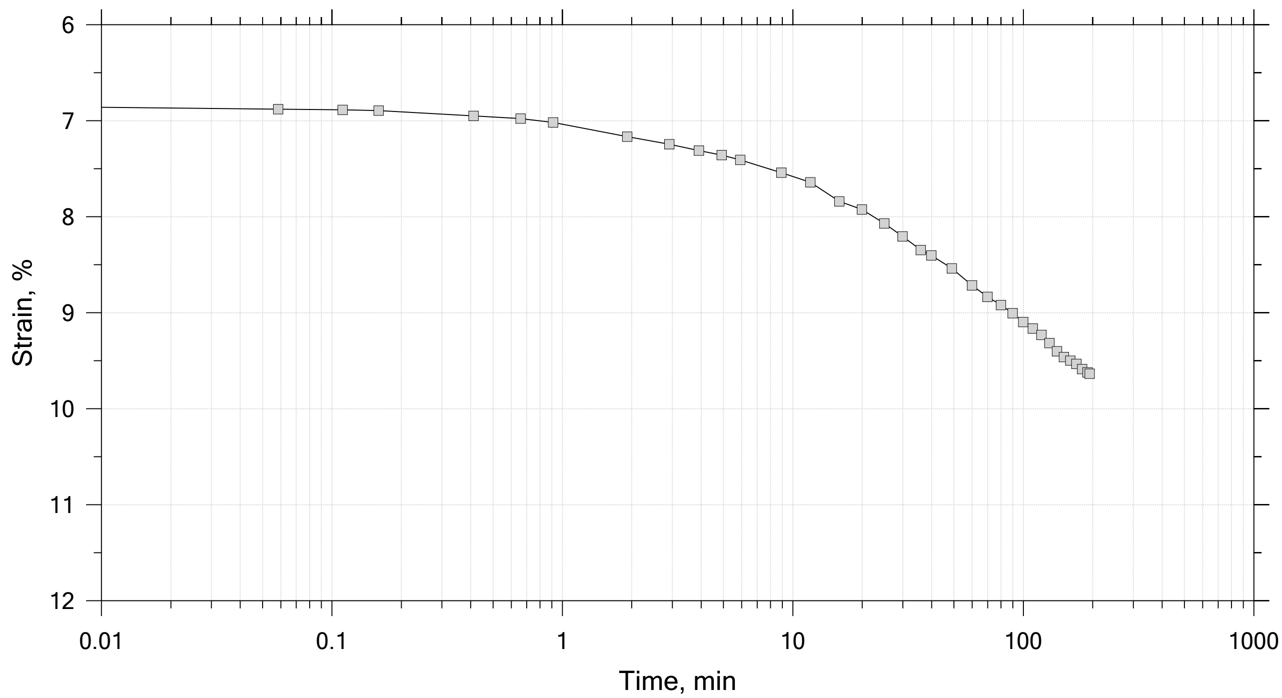


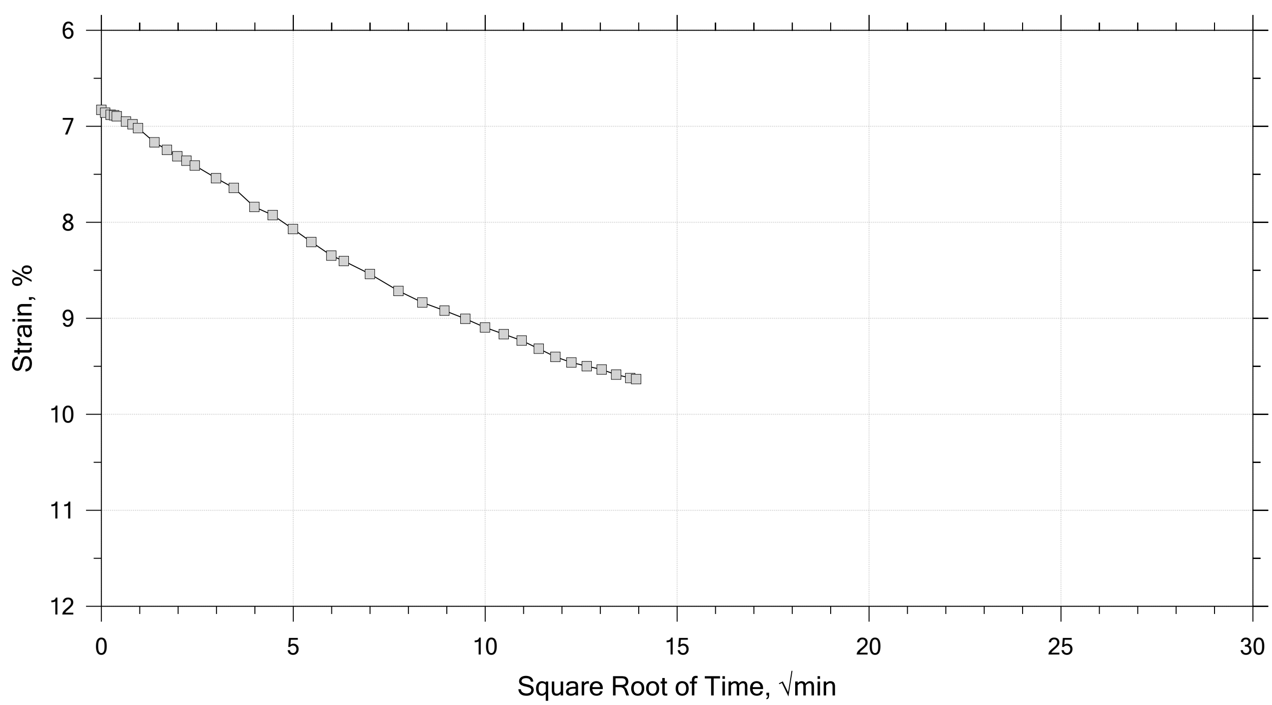


GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB018	Tested By: md	Checked By: njh
	Sample No.: SL0868	Test Date: 01/09/19	Depth: 25-27 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, reddish brown clay		
	Remarks: System LTIII-A, Swell Pressure = 0.443 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 13
Constant Load Step
Stress: 16 tsf

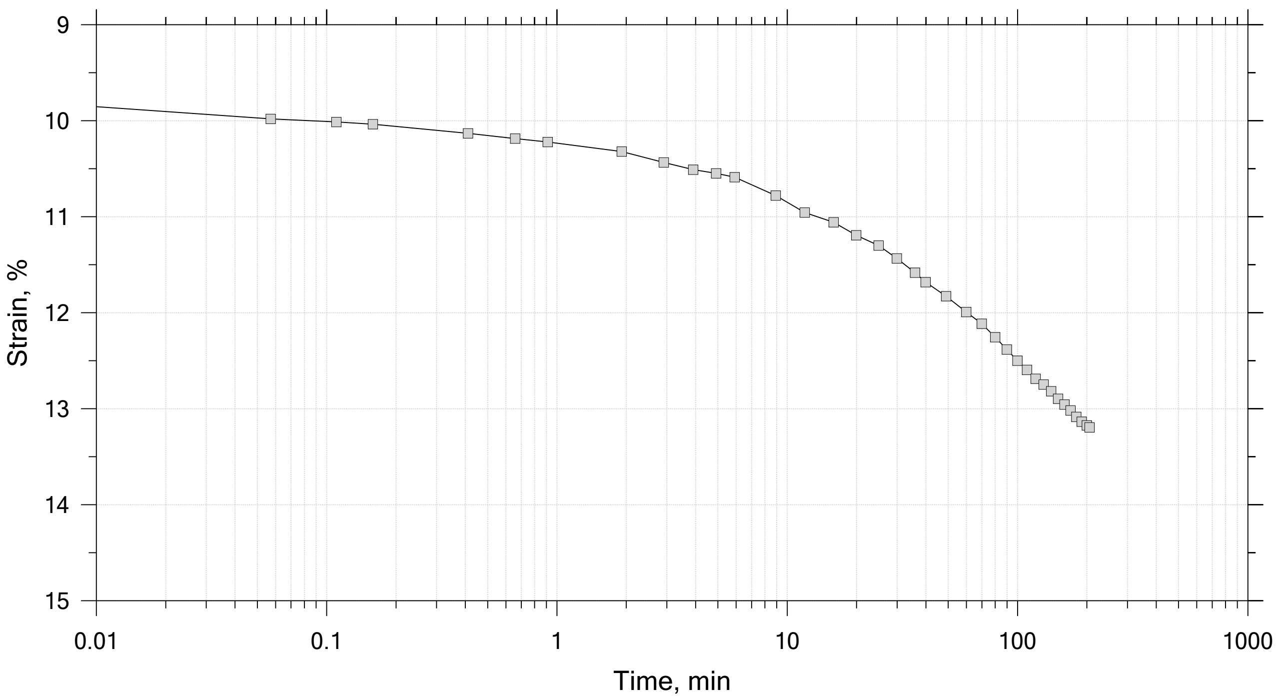


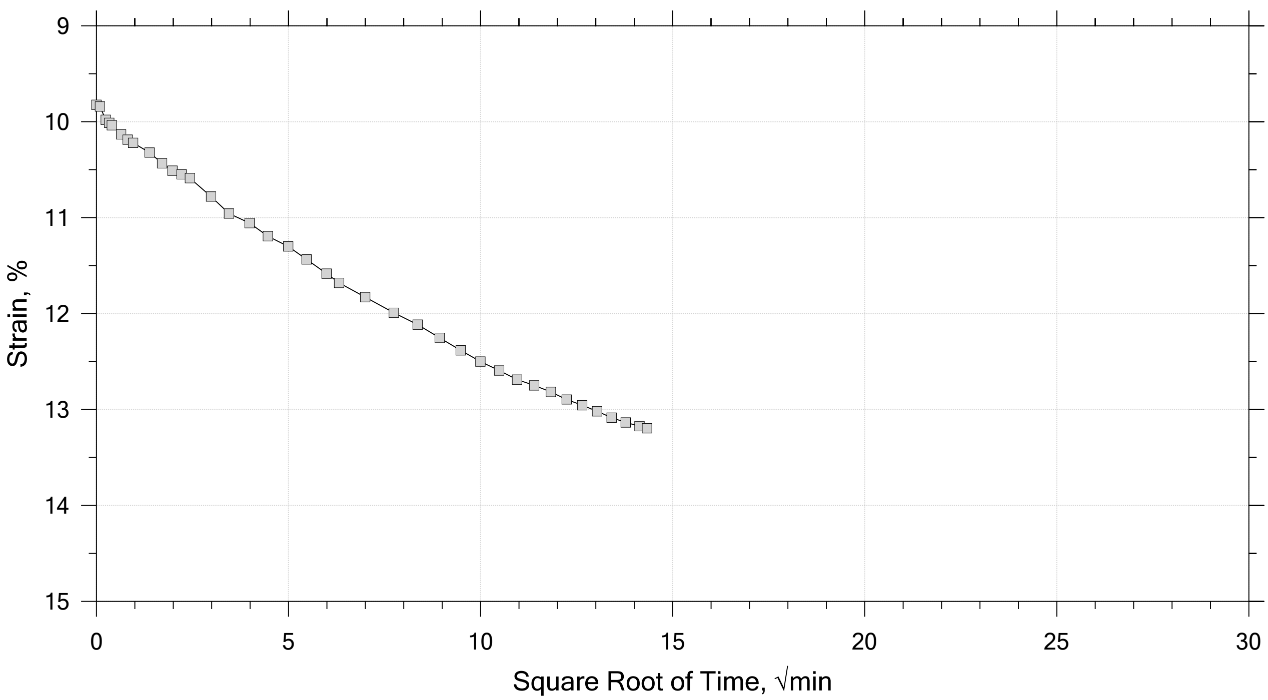


GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB018	Tested By: md	Checked By: njh
	Sample No.: SL0868	Test Date: 01/09/19	Depth: 25-27 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, reddish brown clay		
	Remarks: System LTIII-A, Swell Pressure = 0.443 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 13
Constant Load Step
Stress: 32 tsf





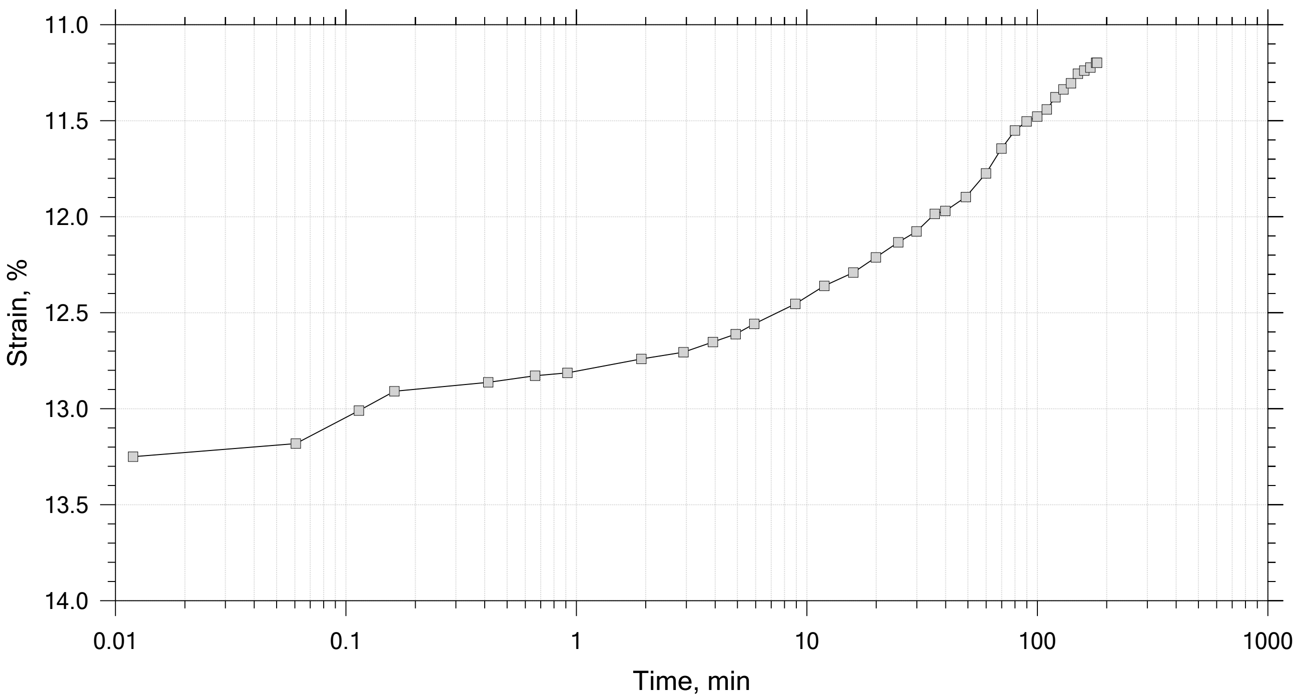
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB018	Tested By: md	Checked By: njh
	Sample No.: SL0868	Test Date: 01/09/19	Depth: 25-27 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, reddish brown clay		
	Remarks: System LTIII-A, Swell Pressure = 0.443 tsf		

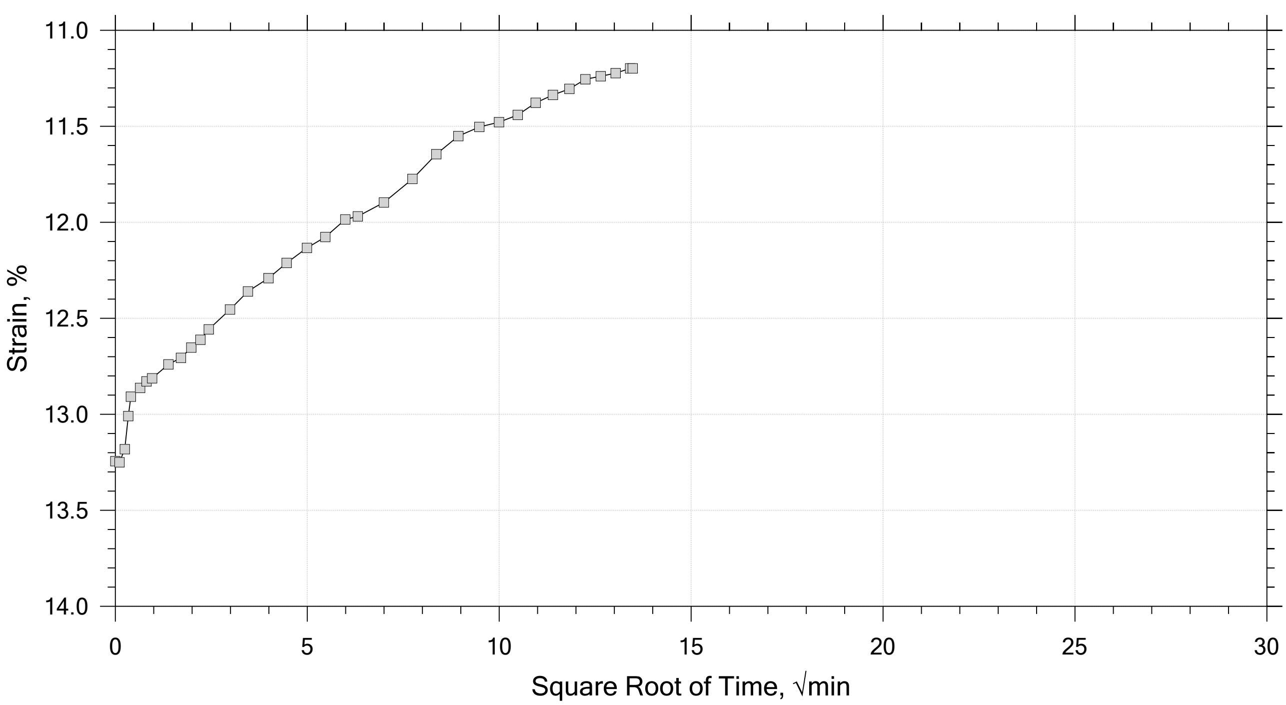
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 13

Constant Load Step

Stress: 8 tsf

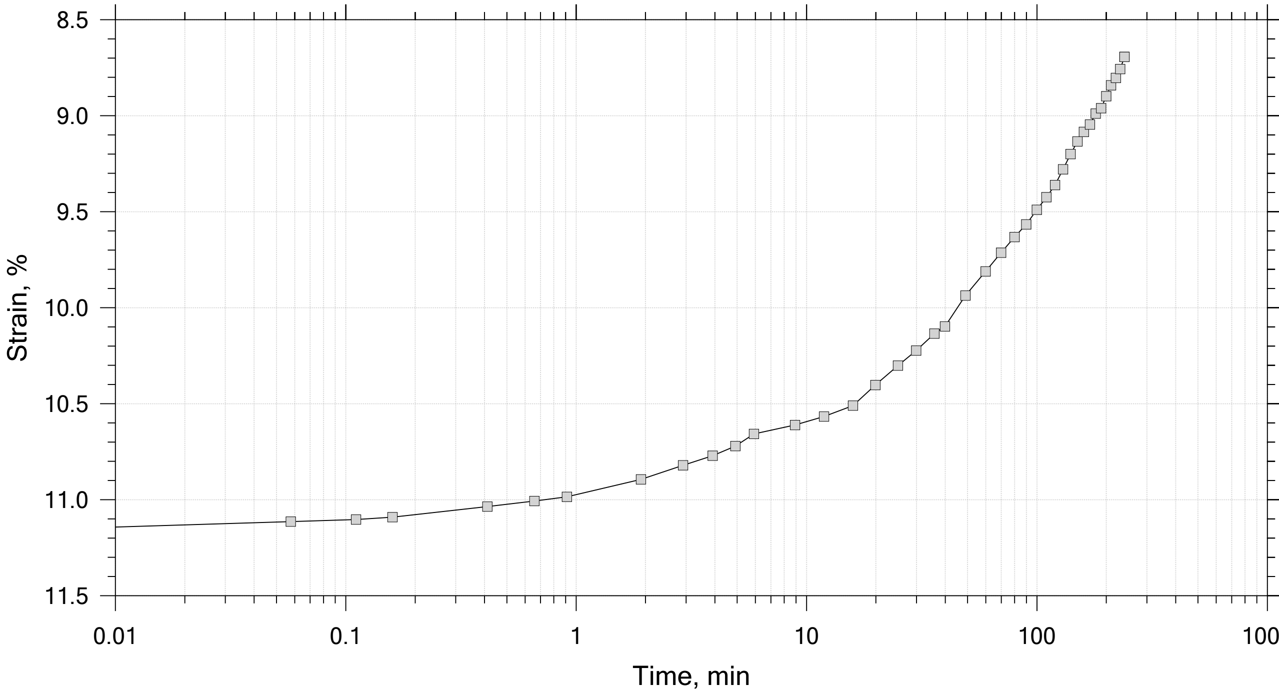


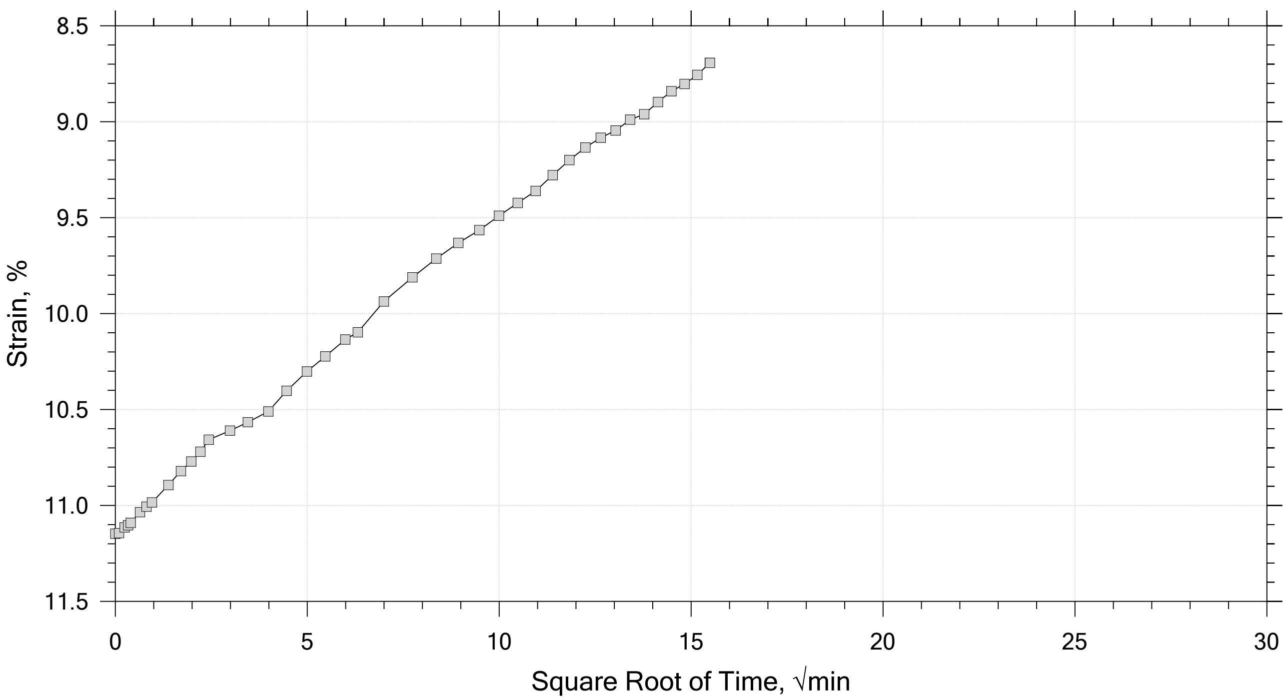


GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB018	Tested By: md	Checked By: njh
	Sample No.: SL0868	Test Date: 01/09/19	Depth: 25-27 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, reddish brown clay		
	Remarks: System LTIII-A, Swell Pressure = 0.443 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 13
Constant Load Step
Stress: 2 tsf





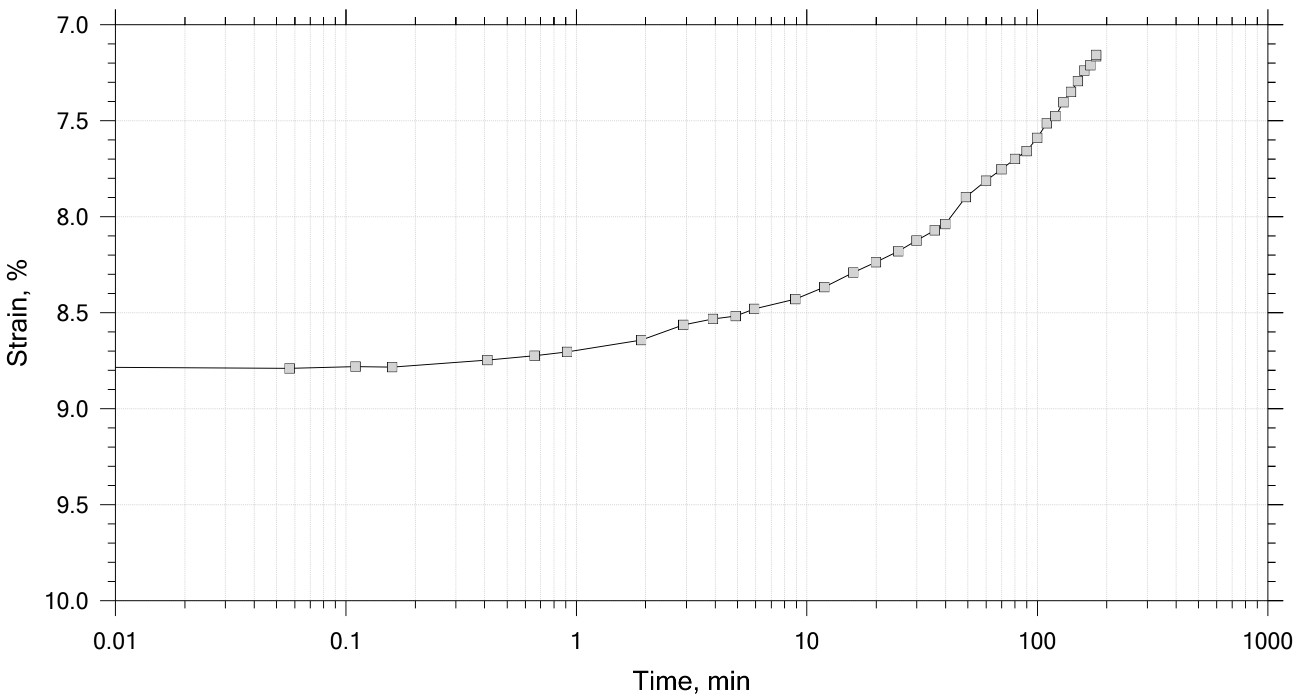
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB018	Tested By: md	Checked By: njh
	Sample No.: SL0868	Test Date: 01/09/19	Depth: 25-27 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, reddish brown clay		
	Remarks: System LTIII-A, Swell Pressure = 0.443 tsf		

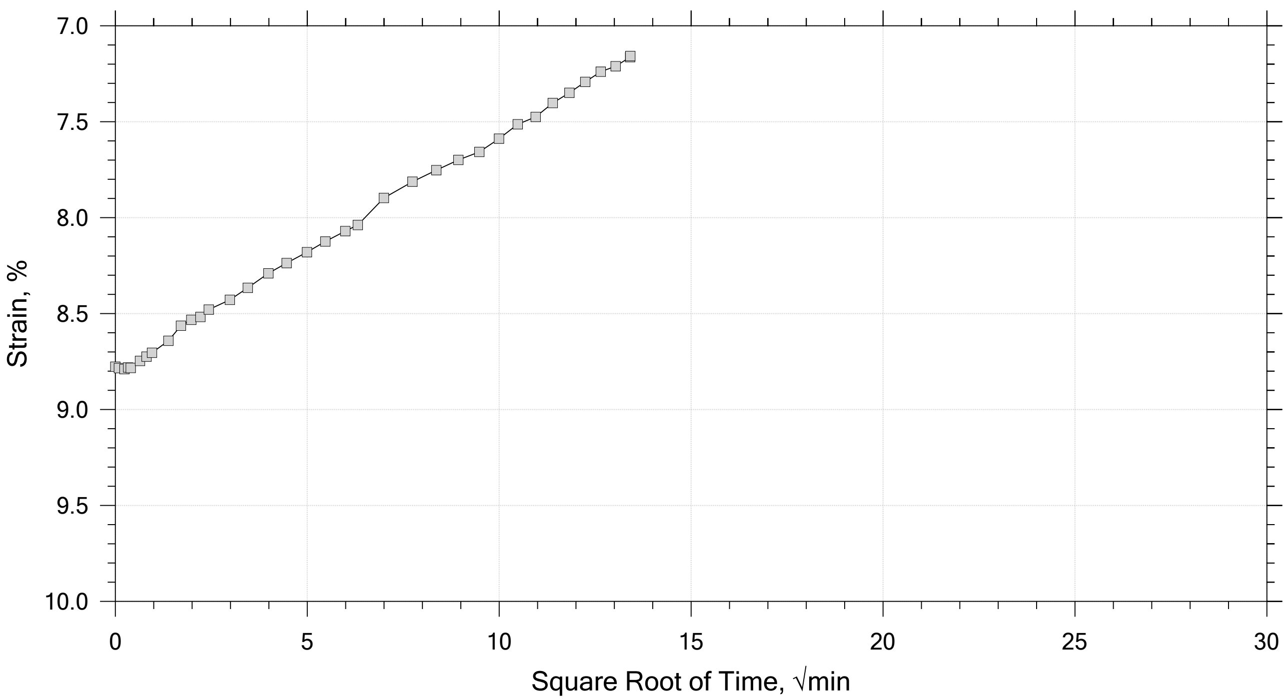
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 13

Constant Load Step

Stress: 0.5 tsf

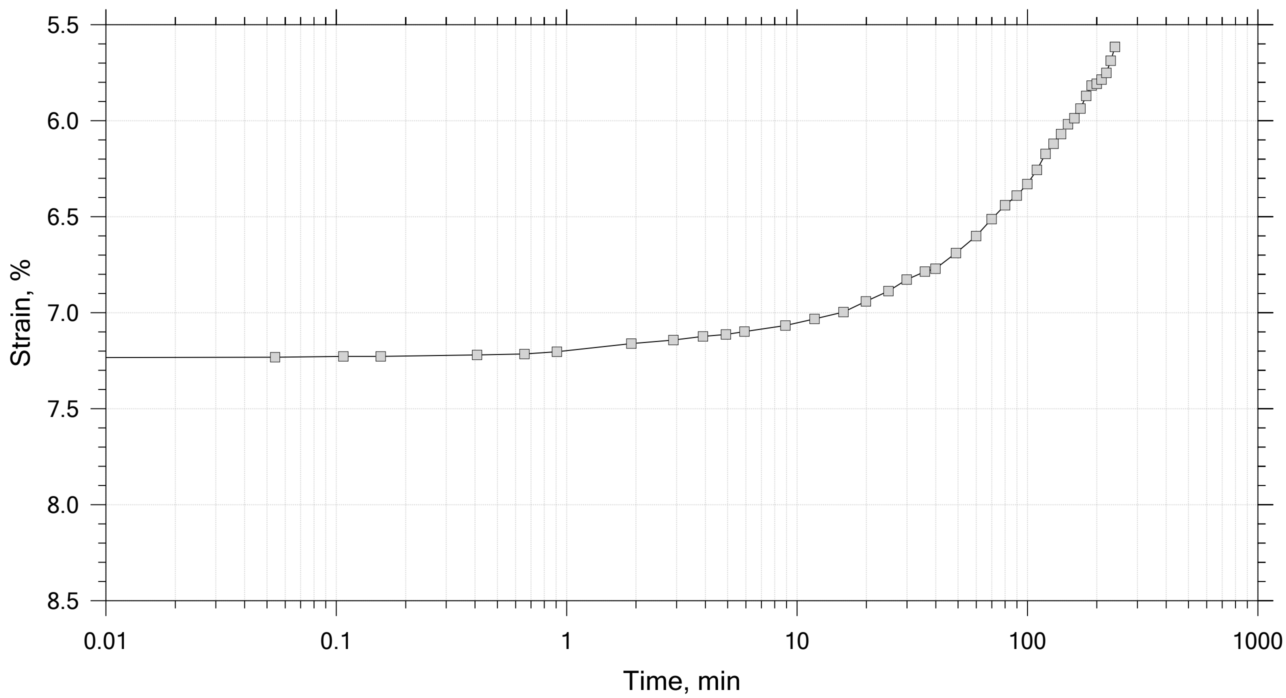


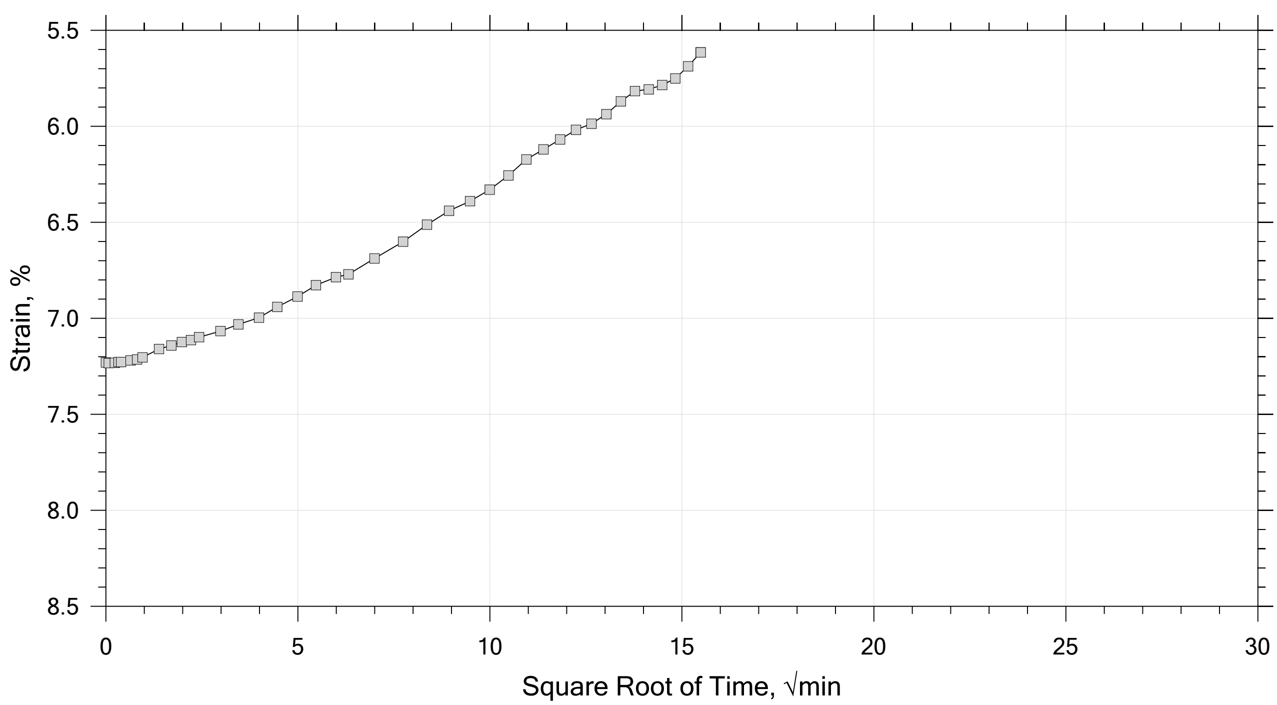


GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB018	Tested By: md	Checked By: njh
	Sample No.: SL0868	Test Date: 01/09/19	Depth: 25-27 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, reddish brown clay		
	Remarks: System LTIII-A, Swell Pressure = 0.443 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 13
Constant Load Step
Stress: 0.125 tsf





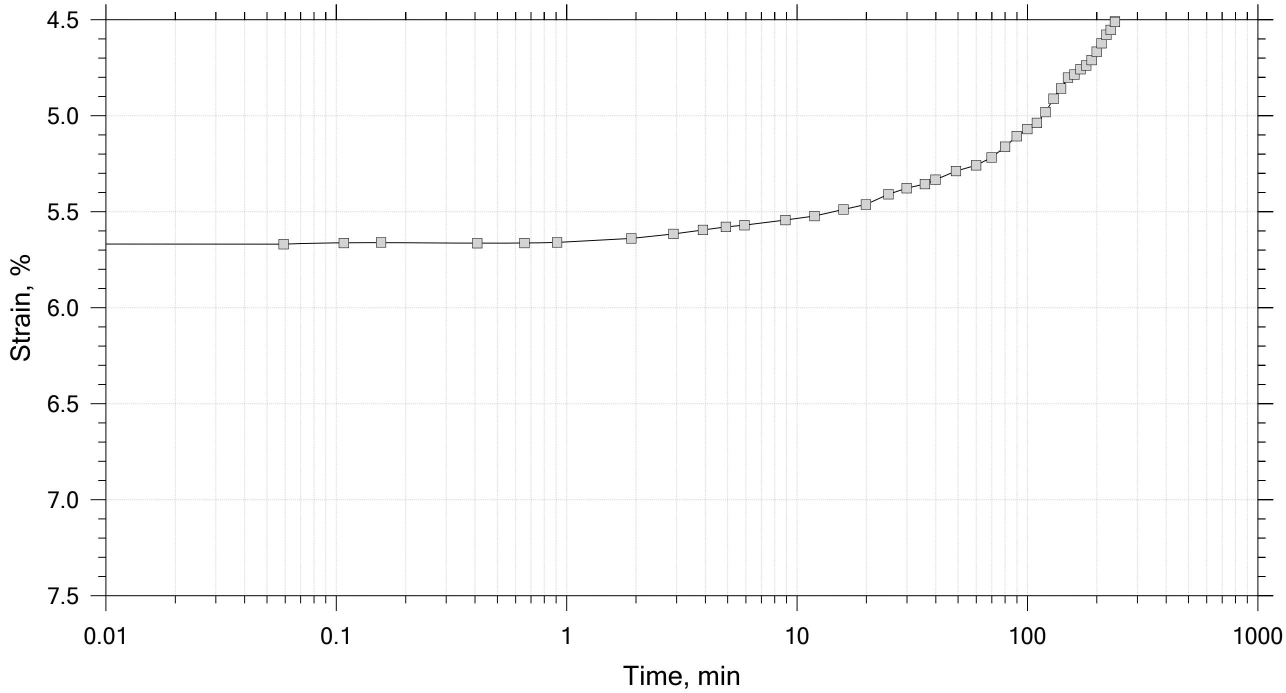
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB018	Tested By: md	Checked By: njh
	Sample No.: SL0868	Test Date: 01/09/19	Depth: 25-27 ft
	Test No.: IP-4	Sample Type: intact	Elevation: ---
	Description: Moist, reddish brown clay		
	Remarks: System LTIII-A, Swell Pressure = 0.443 tsf		

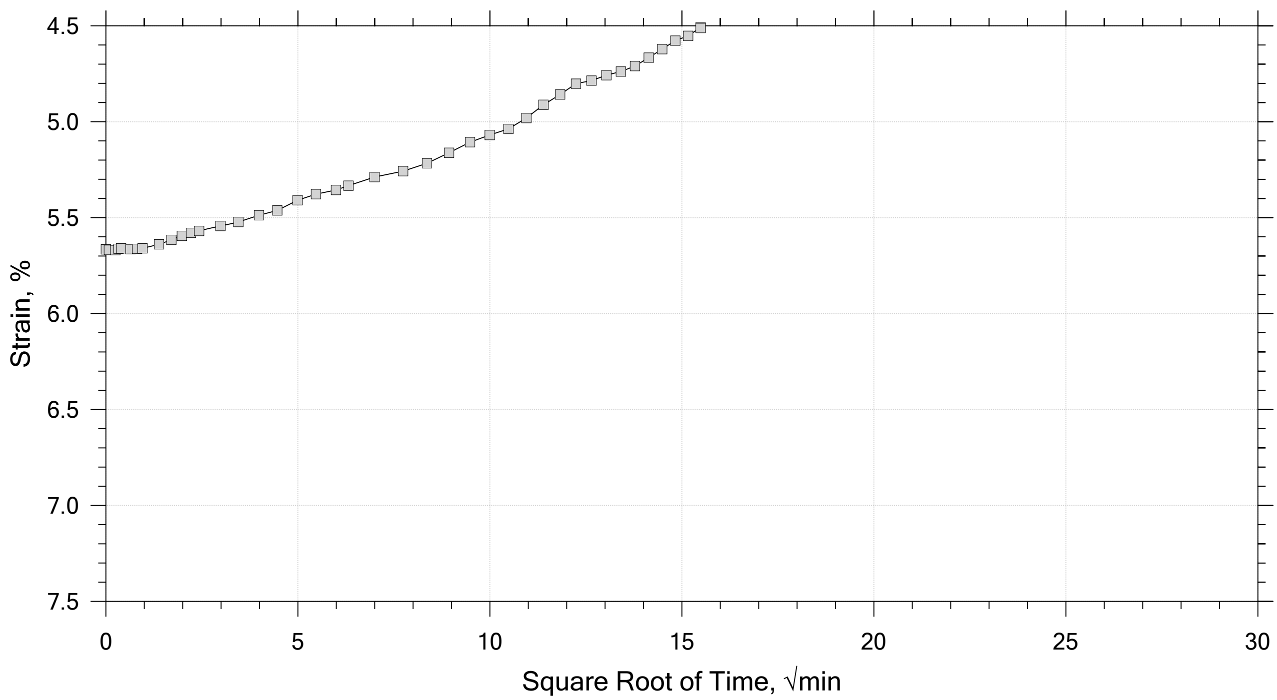
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 13

Constant Load Step

Stress: 0.0625 tsf





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		

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		

GeoTesting EXPRESS

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

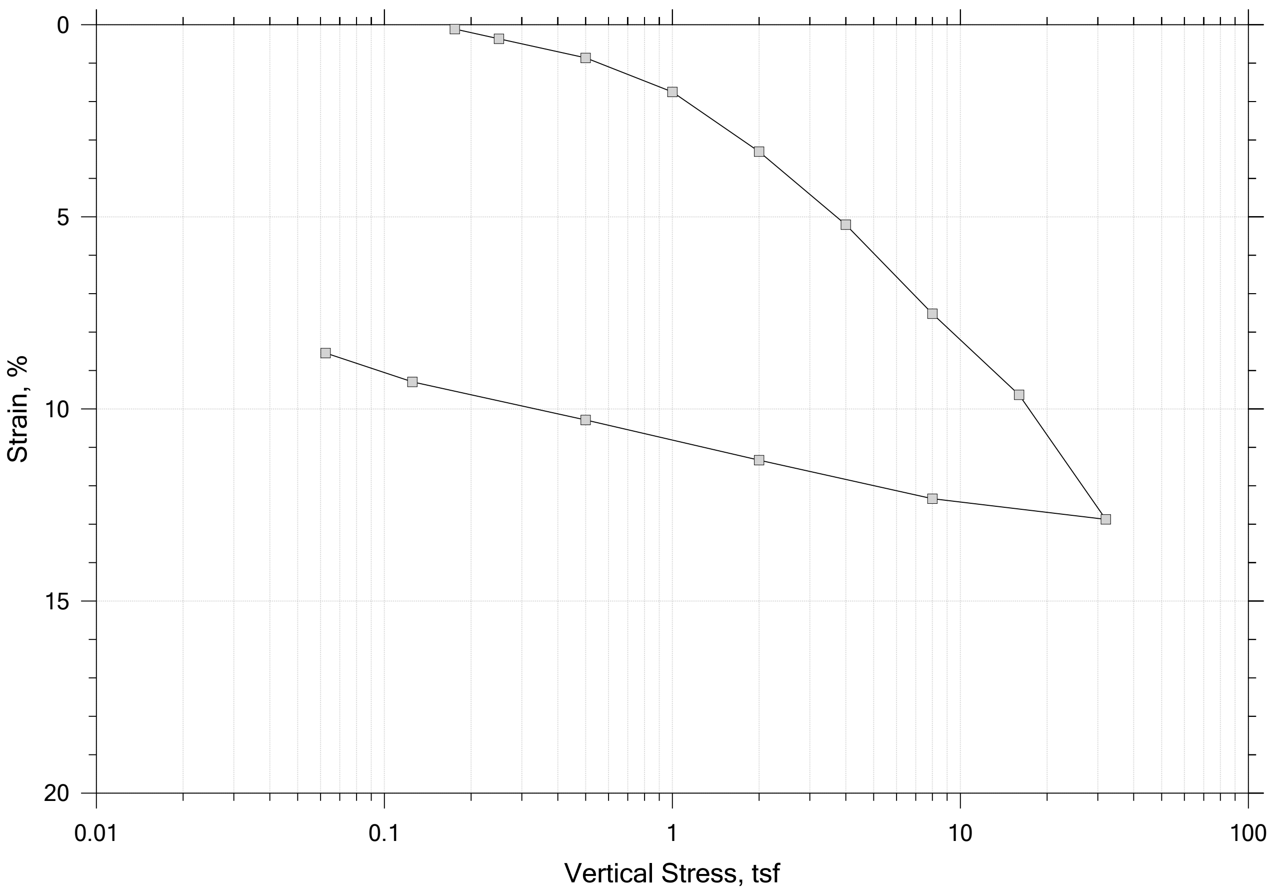
Square Root of Time Coefficients

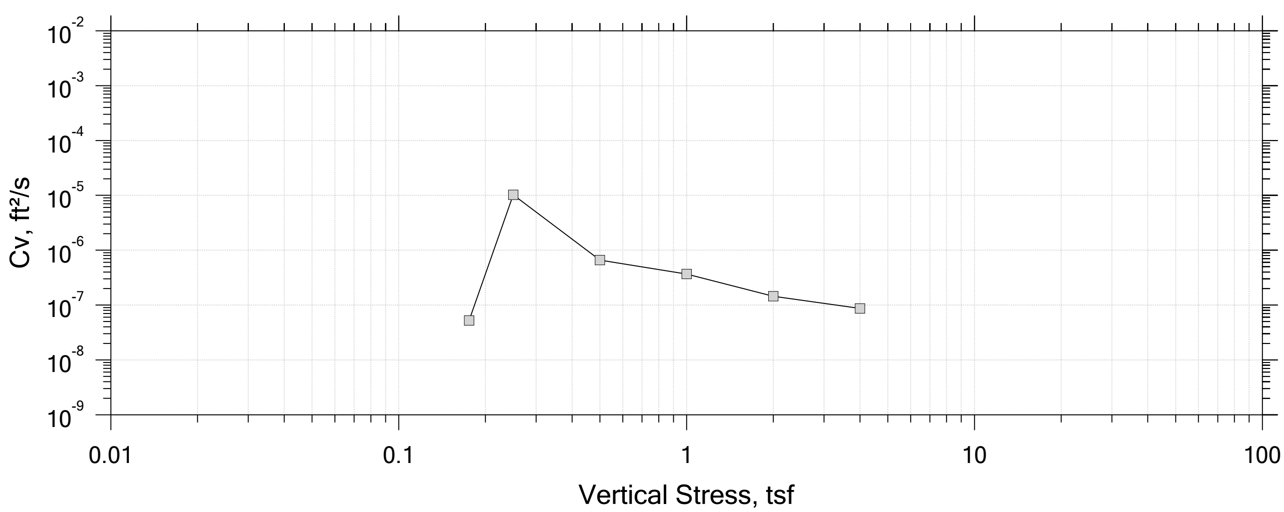
Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Sq.Rt. T90 min	Cv ft²/s	Mv 1/tsf	k ft/day
1	0.443	-0.001474	0.921	-0.147	89.042	2.76e-07	-3.33e-03	-2.48e-06
2	0.500	-0.0006285	0.919	-0.0628	29.471	8.34e-07	1.47e-02	3.31e-05
3	1.00	0.006642	0.905	0.664	25.071	9.73e-07	1.45e-02	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

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

Summary Report

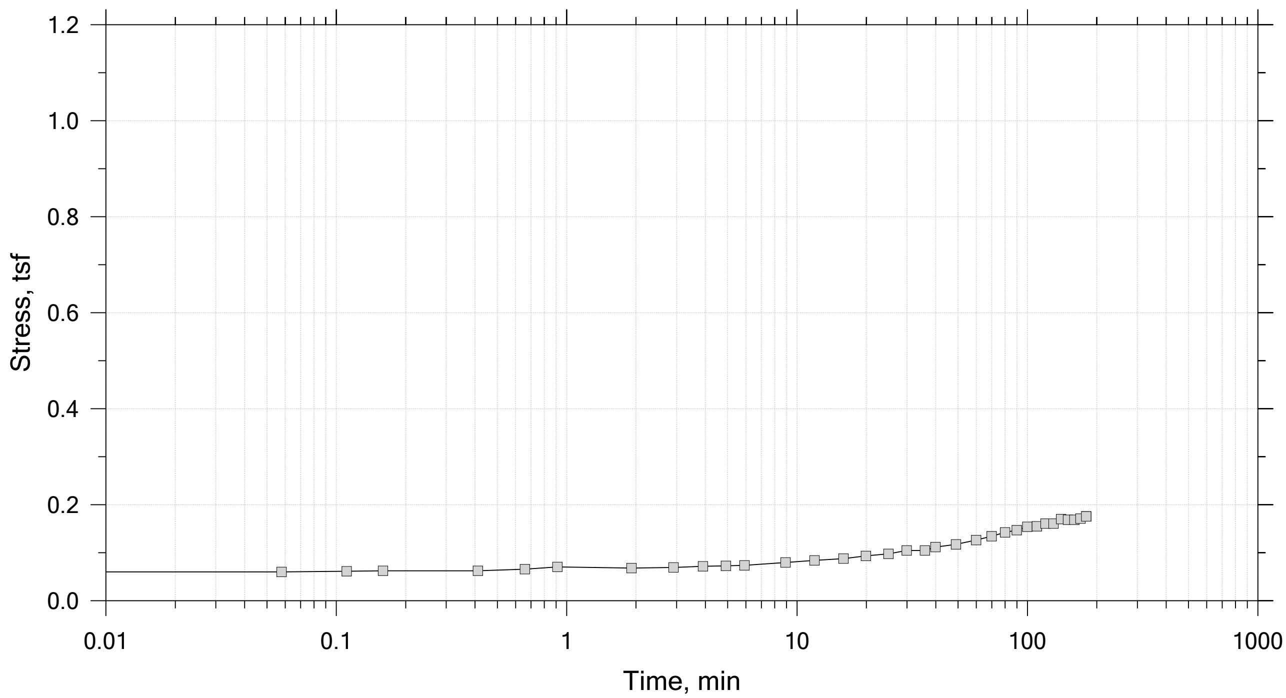


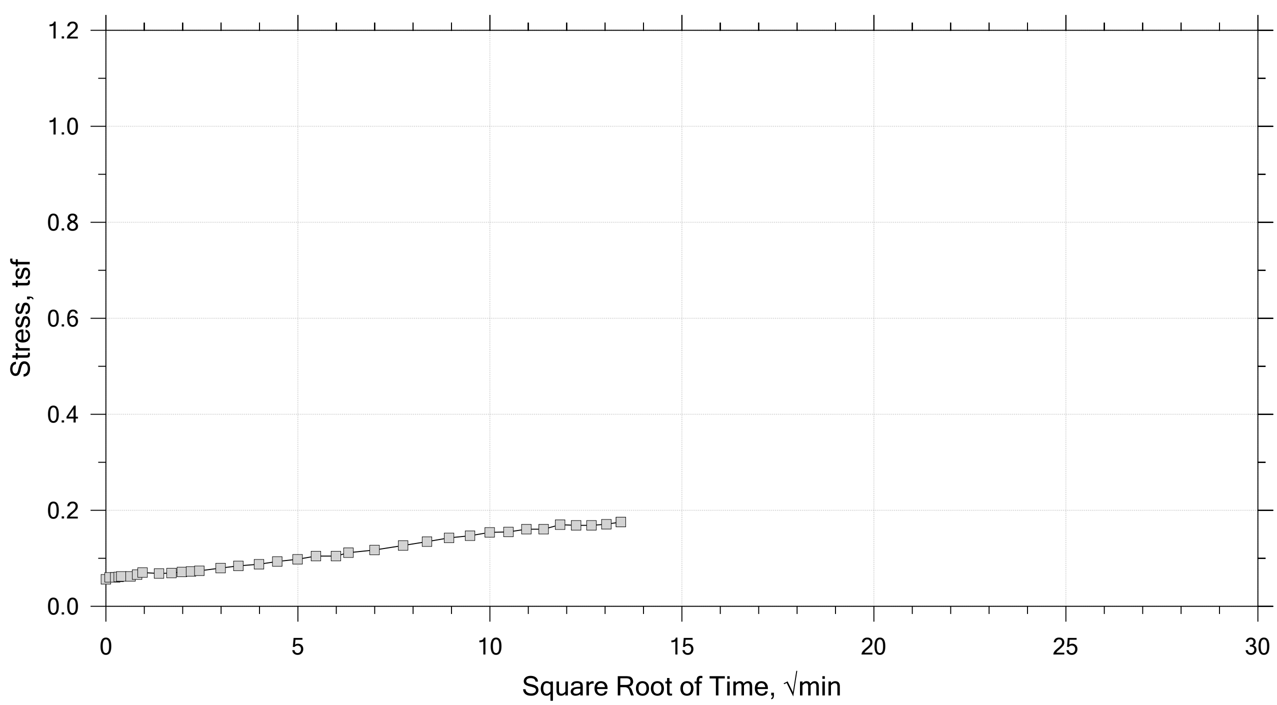


GeoTesting EXPRESS			
	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB021	Tested By: md	Checked By: njh
	Sample No.: SL0829	Test Date: 01/10/19	Depth: 39-41 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, light blueish gray clay		
	Remarks: System X, Swell Pressure = 0.176 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 14
Constant Volume Step
Stress: 0.176 tsf





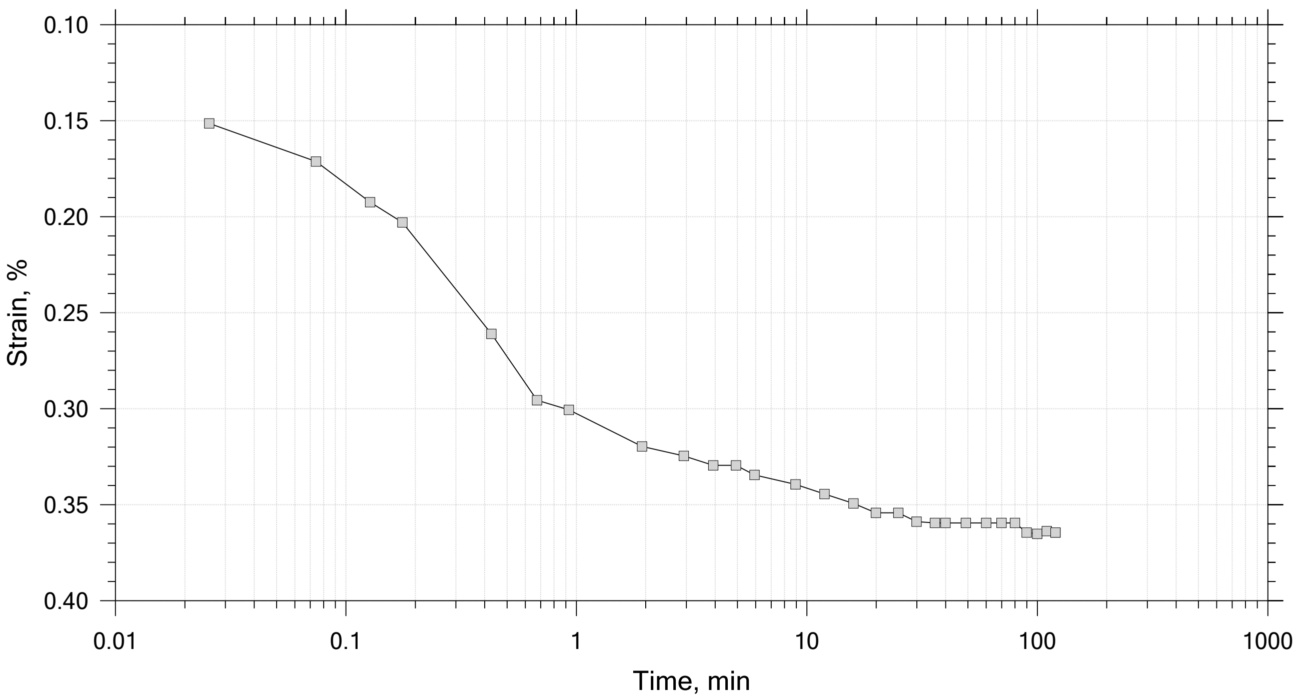
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB021	Tested By: md	Checked By: njh
	Sample No.: SL0829	Test Date: 01/10/19	Depth: 39-41 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, light blueish gray clay		
	Remarks: System X, Swell Pressure = 0.176 tsf		

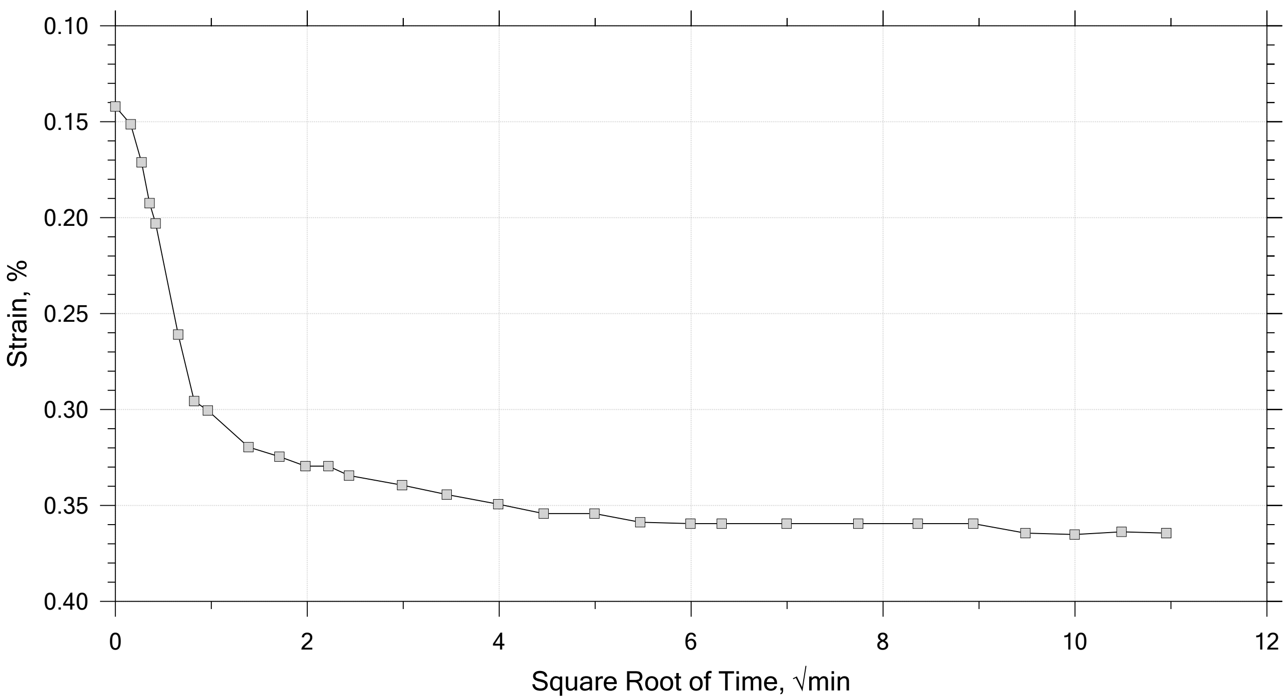
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 14

Constant Load Step

Stress: 0.25 tsf





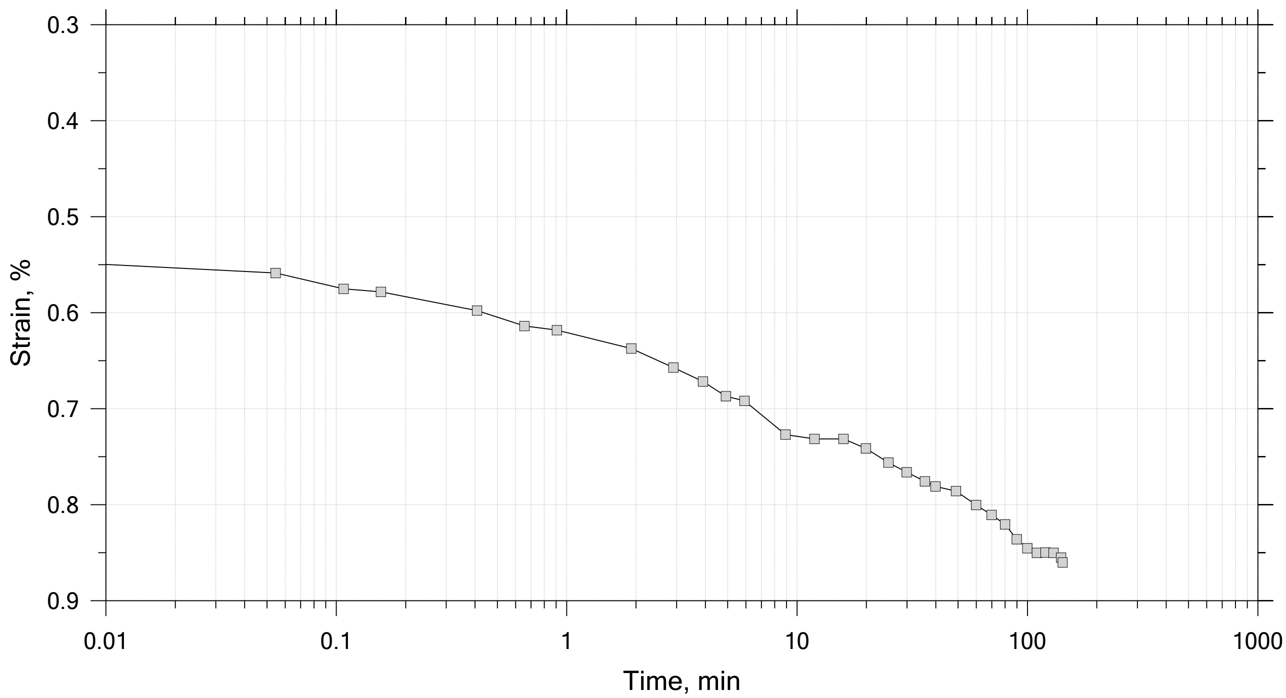
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB021	Tested By: md	Checked By: njh
Sample No.: SL0829	Test Date: 01/10/19	Depth: 39-41 ft
Test No.: IP-5	Sample Type: intact	Elevation: ---
Description: Moist, light blueish gray clay		
Remarks: System X, Swell Pressure = 0.176 tsf		

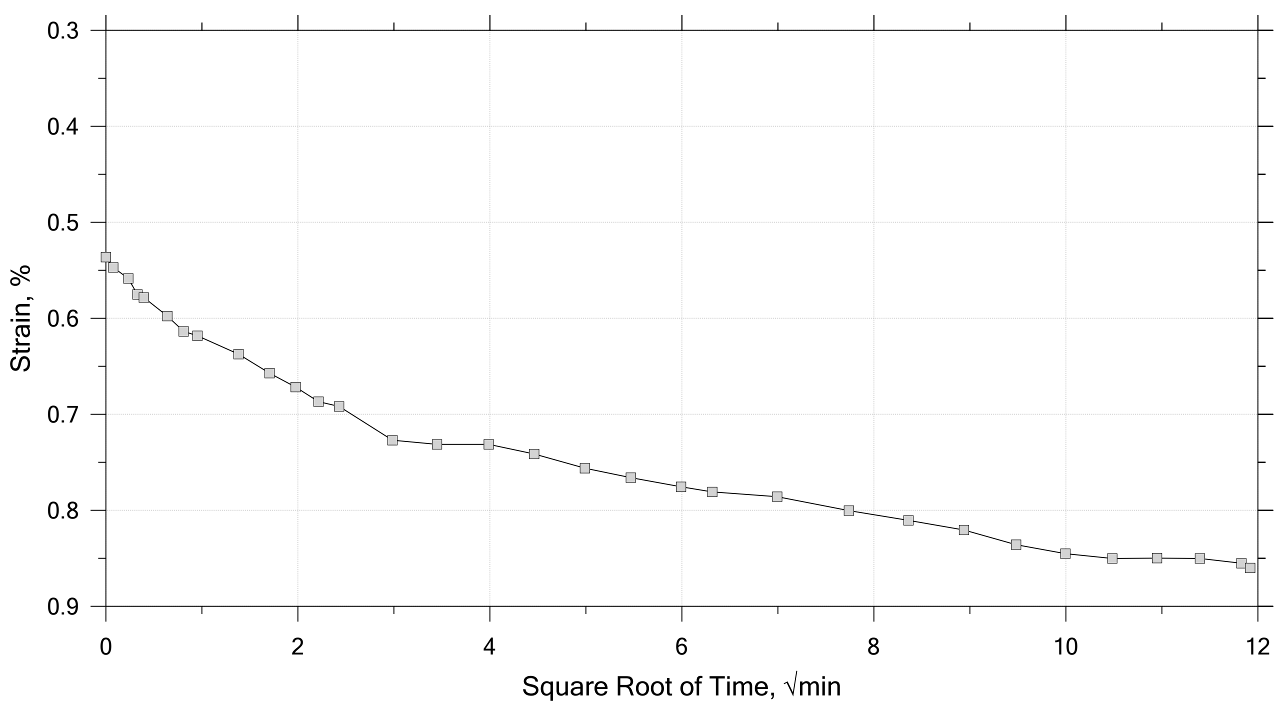
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 14

Constant Load Step

Stress: 0.5 tsf

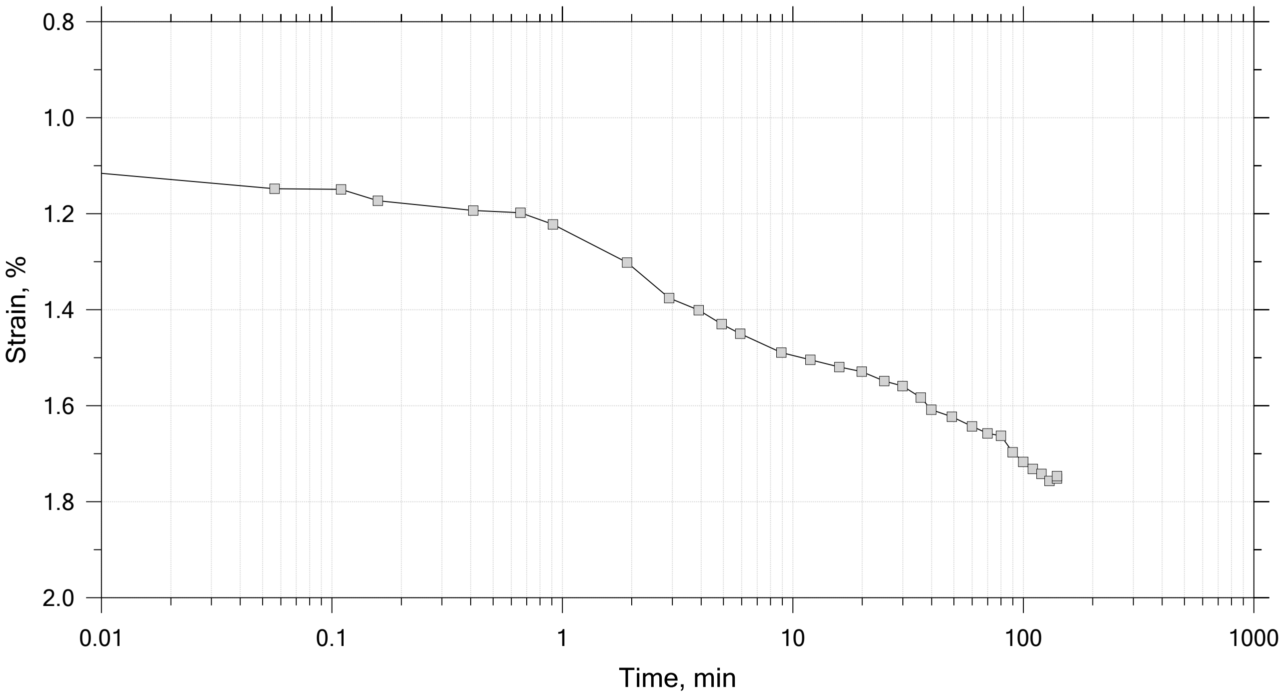


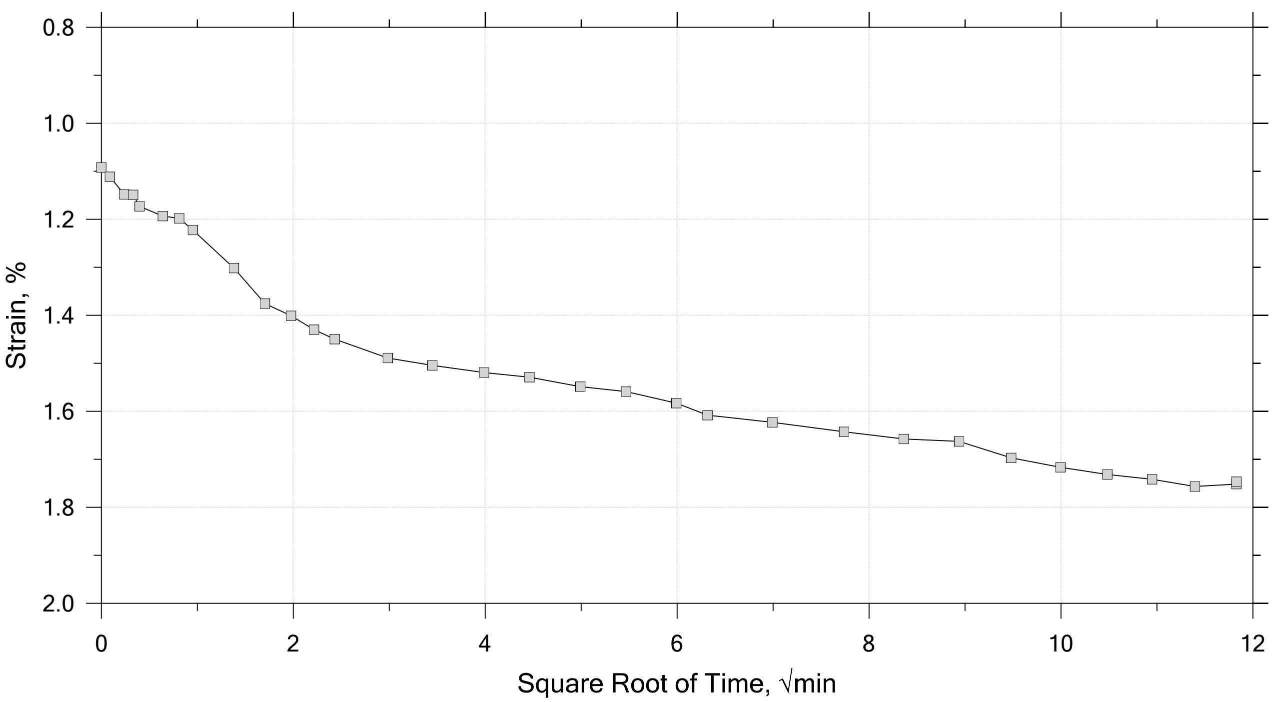


GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB021	Tested By: md	Checked By: njh
	Sample No.: SL0829	Test Date: 01/10/19	Depth: 39-41 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, light blueish gray clay		
	Remarks: System X, Swell Pressure = 0.176 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 14
Constant Load Step
Stress: 1 tsf





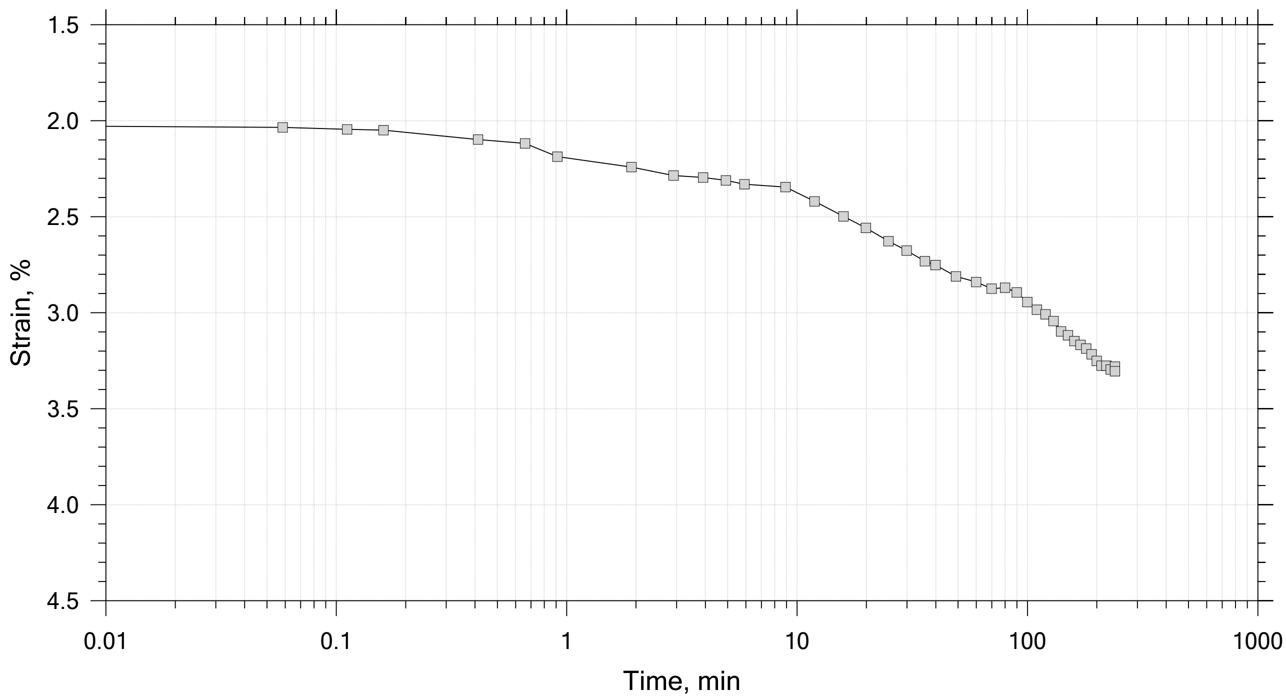
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB021	Tested By: md	Checked By: njh
Sample No.: SL0829	Test Date: 01/10/19	Depth: 39-41 ft
Test No.: IP-5	Sample Type: intact	Elevation: ---
Description: Moist, light blueish gray clay		
Remarks: System X, Swell Pressure = 0.176 tsf		

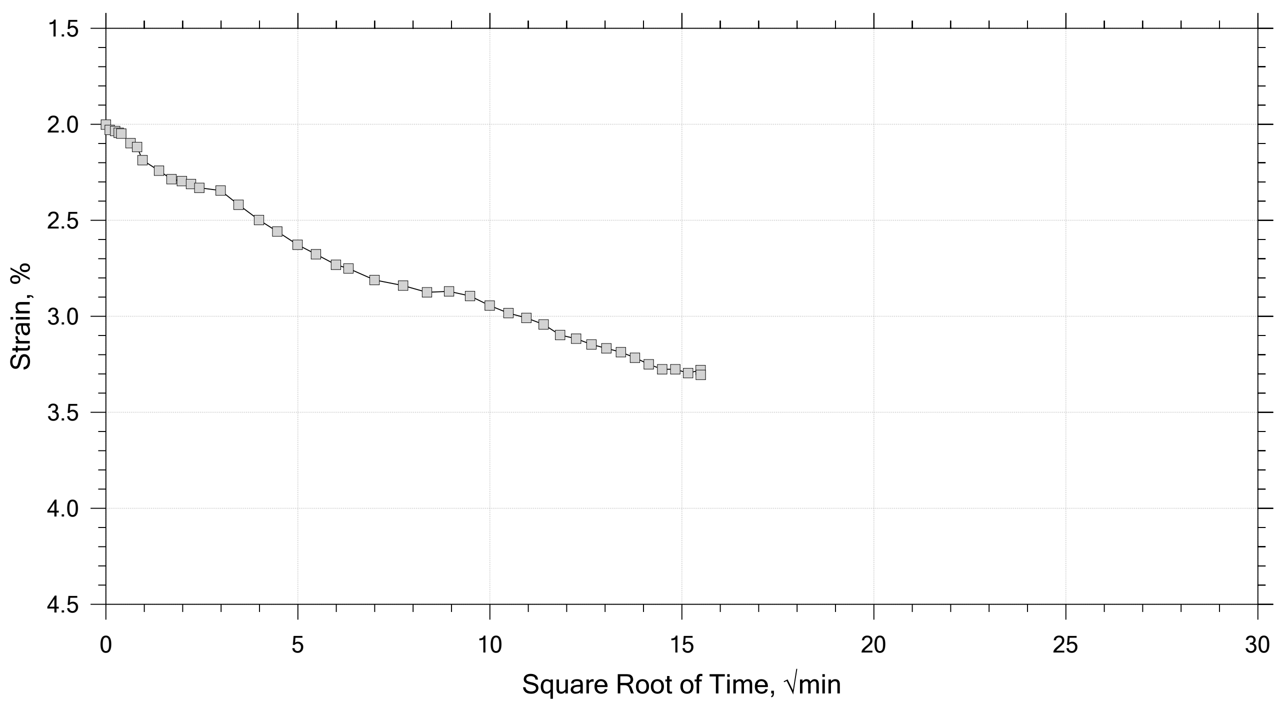
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 14

Constant Load Step

Stress: 2 tsf





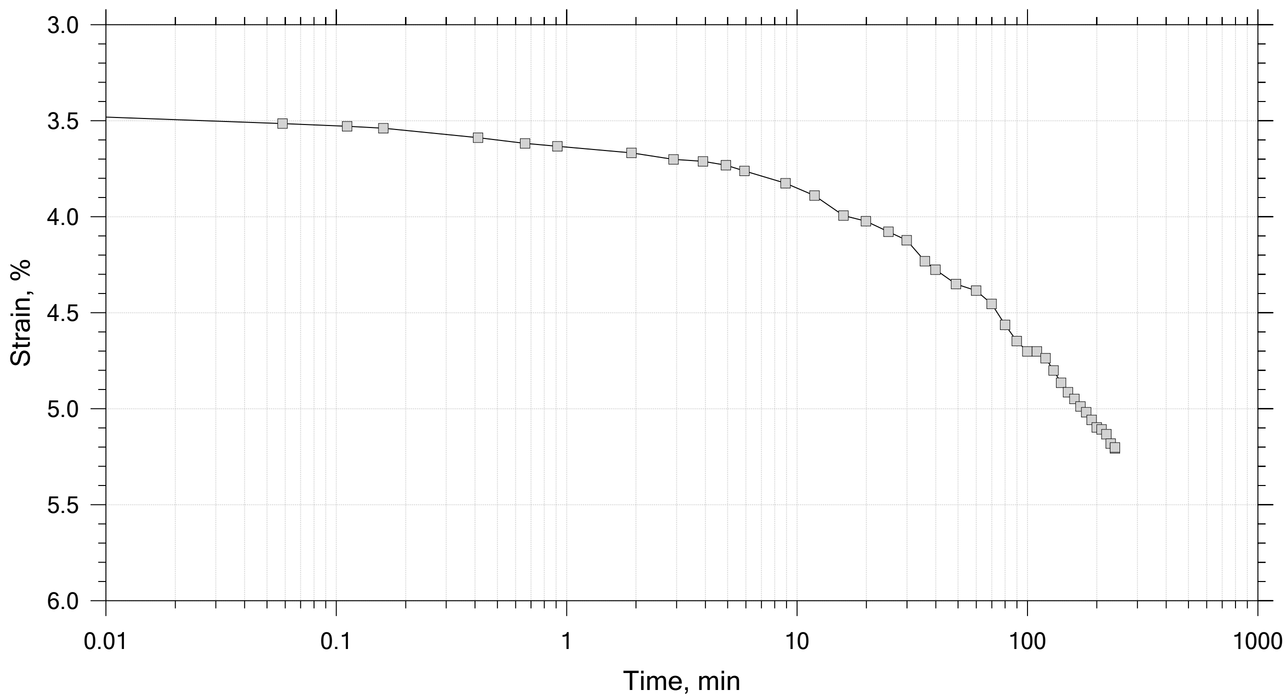
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB021	Tested By: md	Checked By: njh
	Sample No.: SL0829	Test Date: 01/10/19	Depth: 39-41 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, light blueish gray clay		
	Remarks: System X, Swell Pressure = 0.176 tsf		

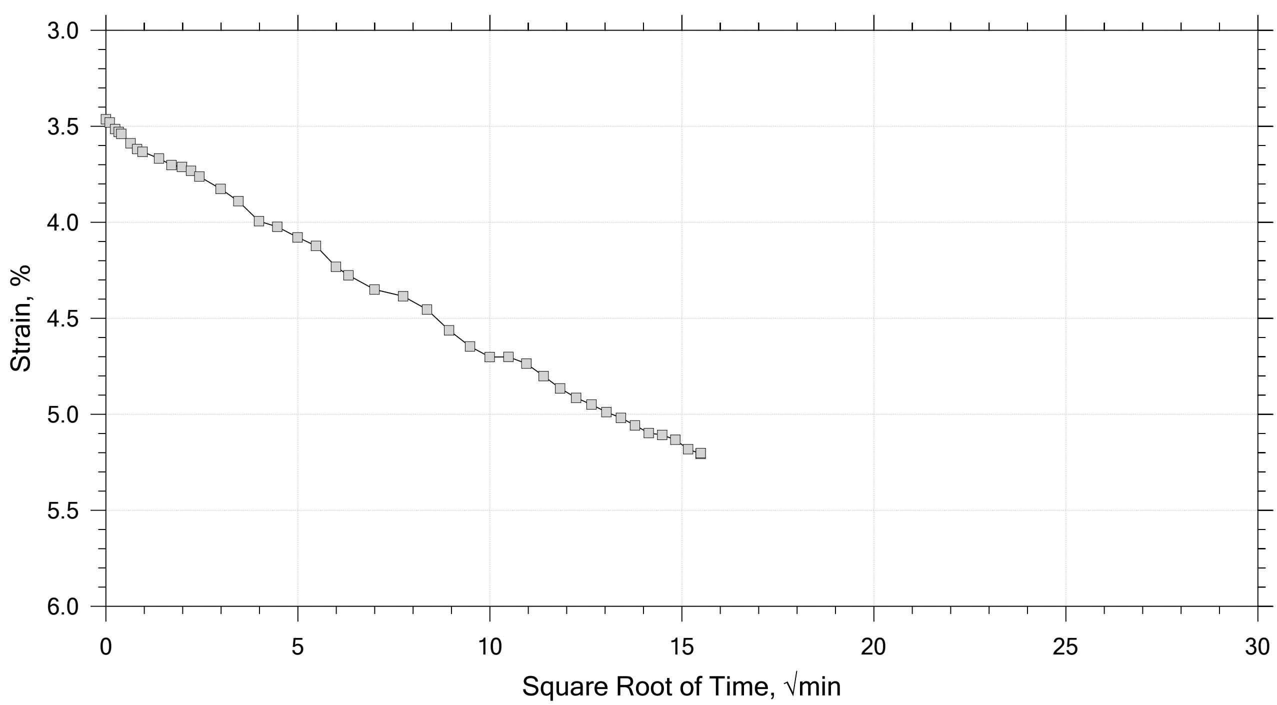
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 14

Constant Load Step

Stress: 4 tsf





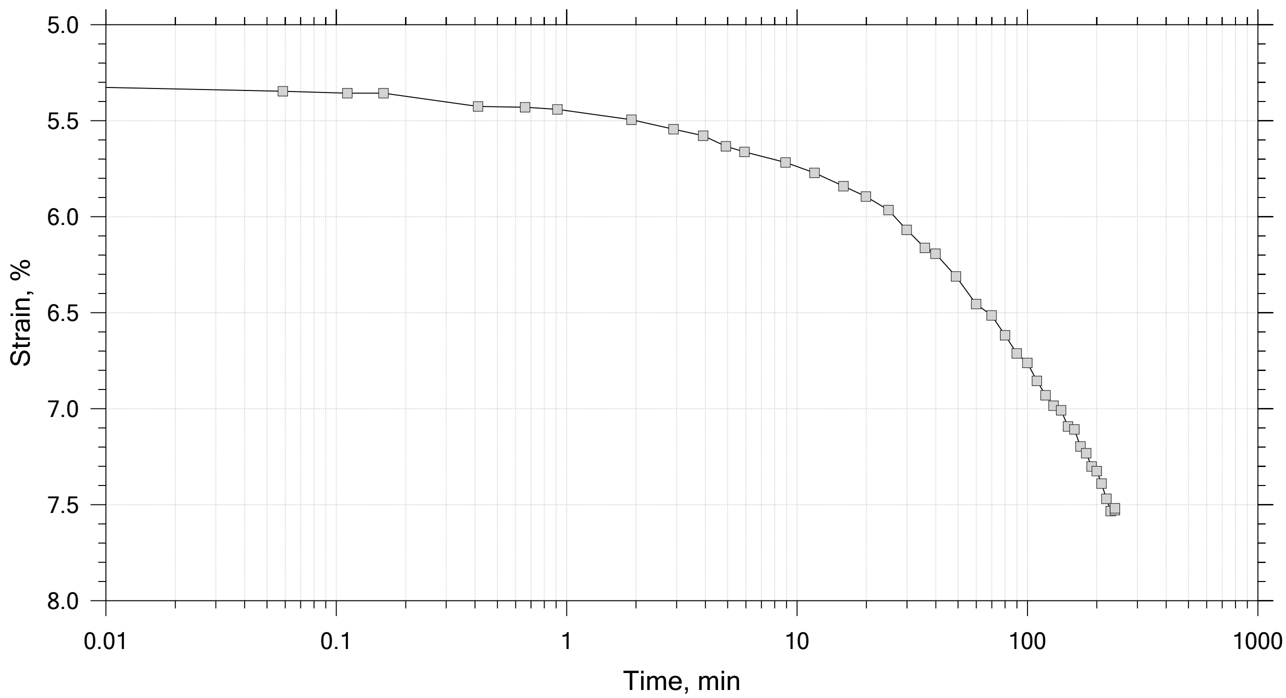
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB021	Tested By: md	Checked By: njh
Sample No.: SL0829	Test Date: 01/10/19	Depth: 39-41 ft
Test No.: IP-5	Sample Type: intact	Elevation: ---
Description: Moist, light blueish gray clay		
Remarks: System X, Swell Pressure = 0.176 tsf		

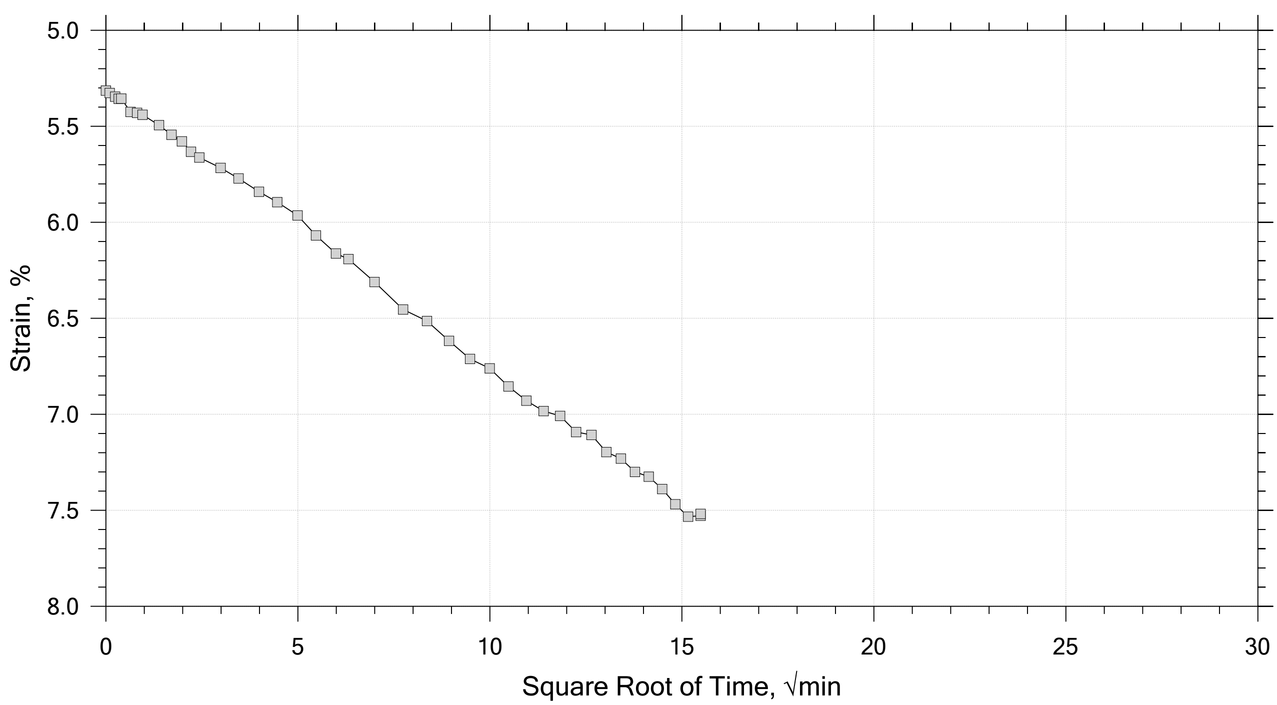
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 14

Constant Load Step

Stress: 8 tsf

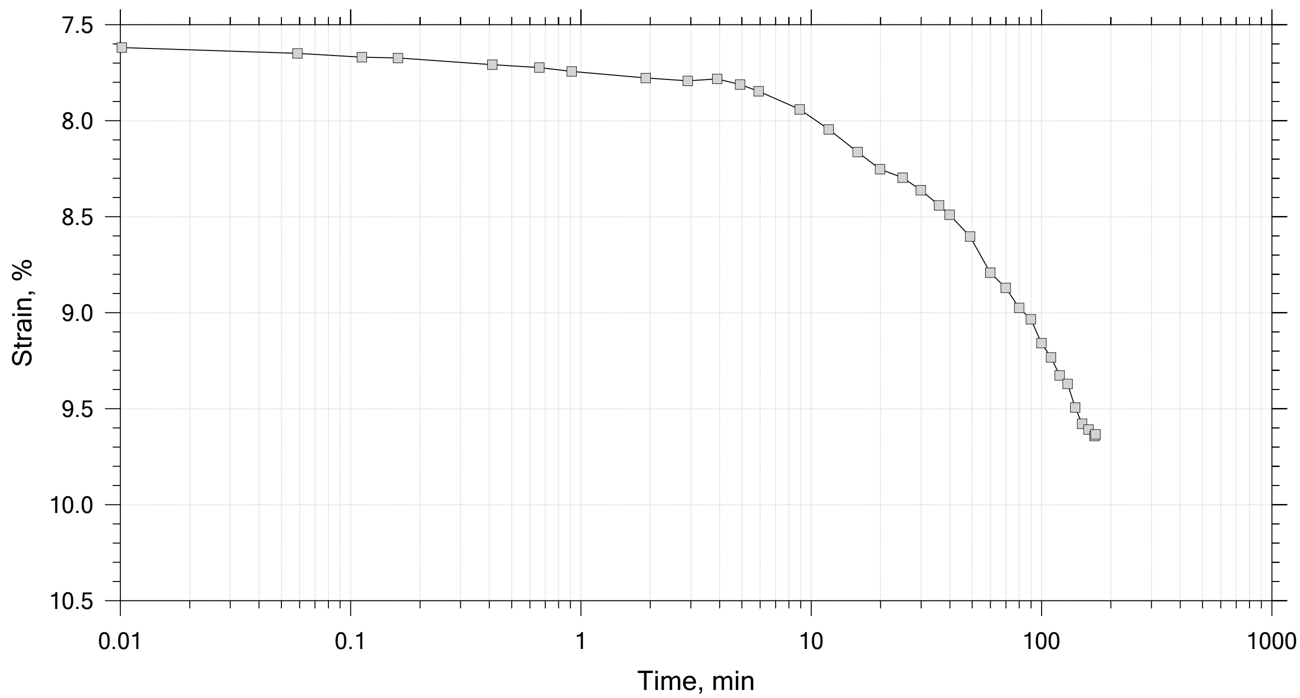


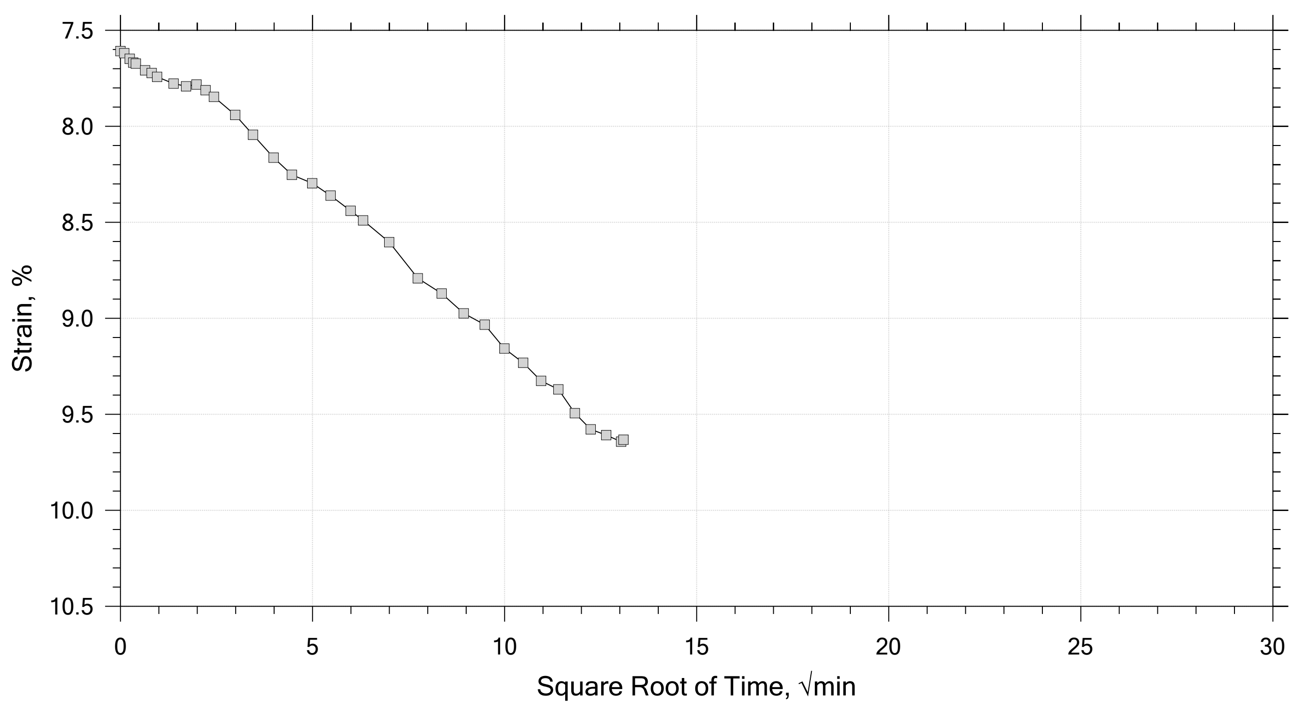


GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB021	Tested By: md	Checked By: njh
	Sample No.: SL0829	Test Date: 01/10/19	Depth: 39-41 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, light blueish gray clay		
	Remarks: System X, Swell Pressure = 0.176 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 14
Constant Load Step
Stress: 16 tsf





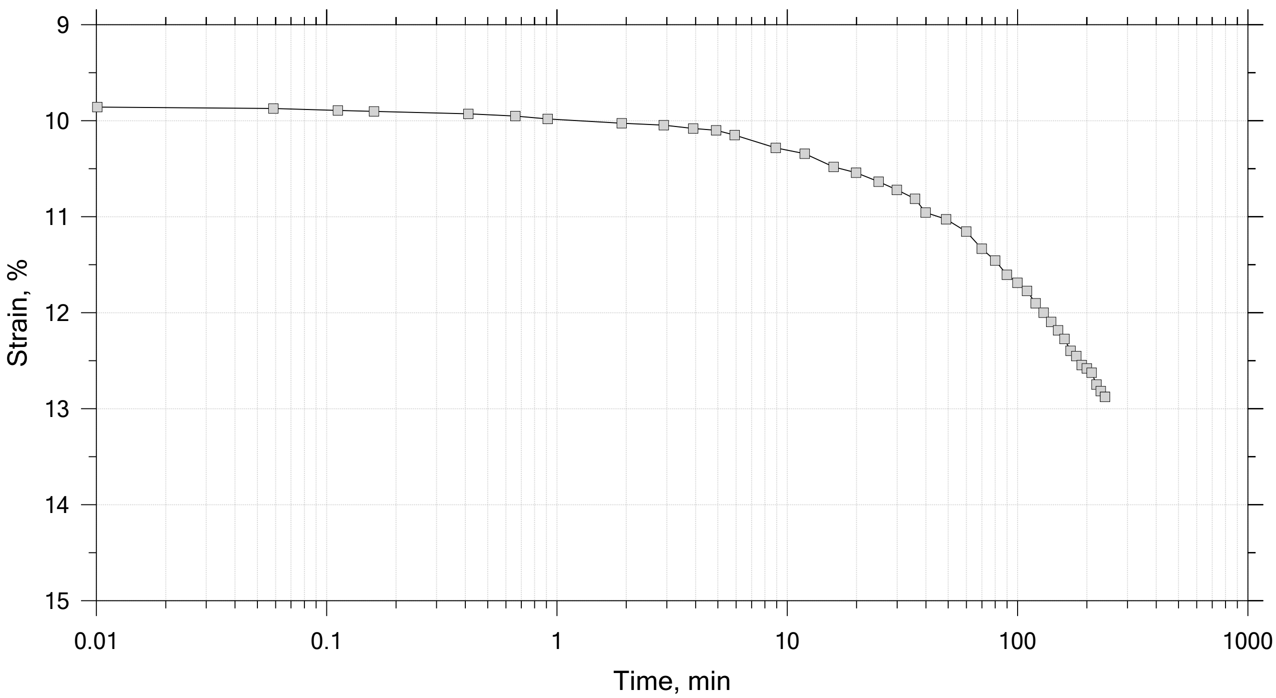
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB021	Tested By: md	Checked By: njh
	Sample No.: SL0829	Test Date: 01/10/19	Depth: 39-41 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, light blueish gray clay		
	Remarks: System X, Swell Pressure = 0.176 tsf		

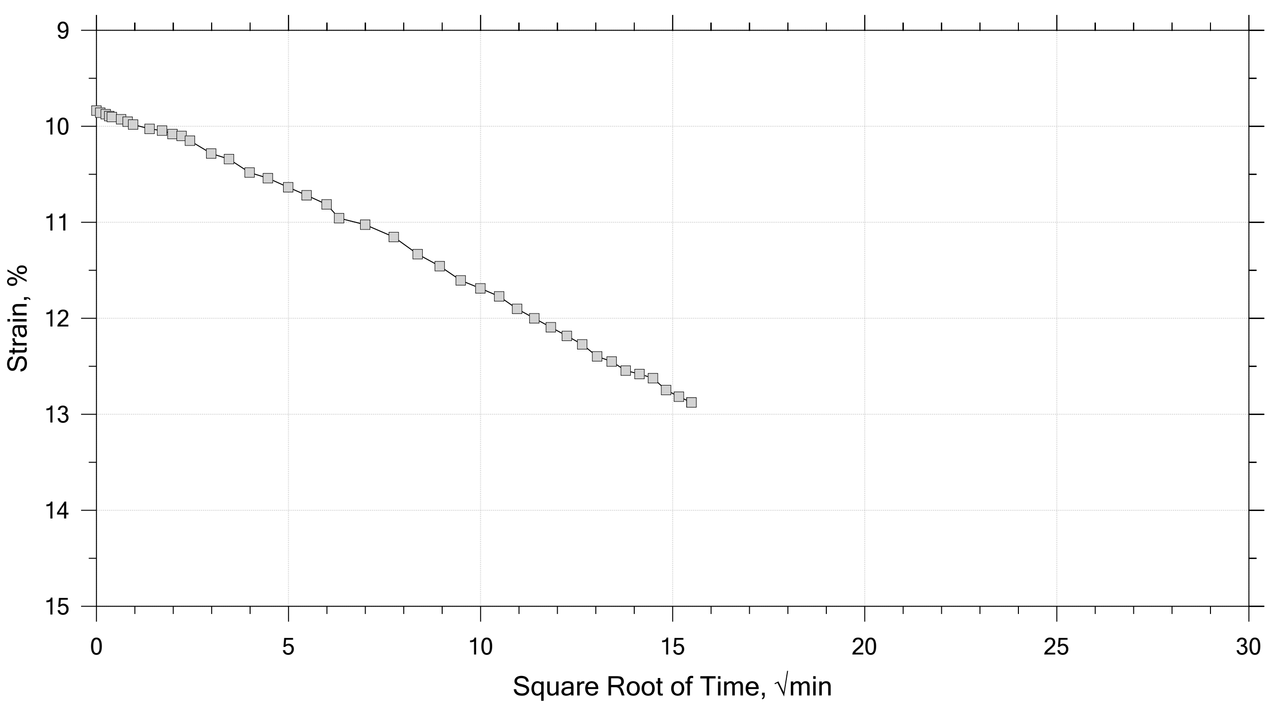
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 14

Constant Load Step

Stress: 32 tsf





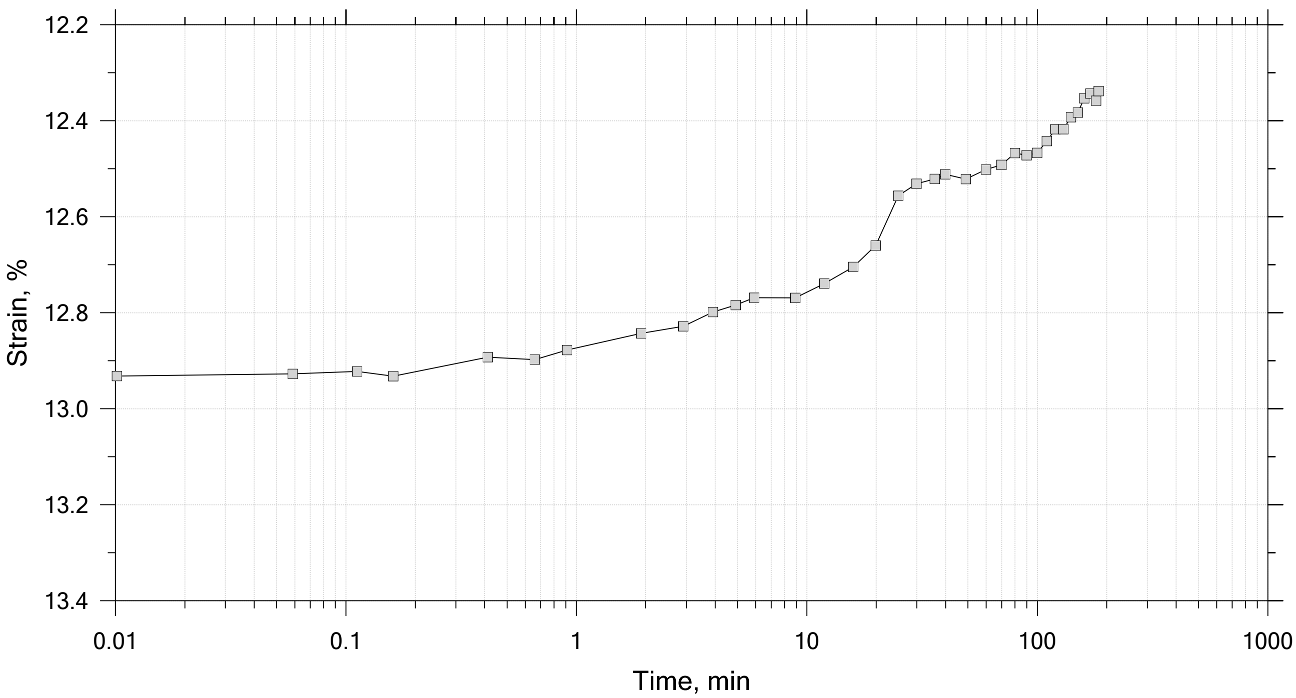
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB021	Tested By: md	Checked By: njh
	Sample No.: SL0829	Test Date: 01/10/19	Depth: 39-41 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, light blueish gray clay		
	Remarks: System X, Swell Pressure = 0.176 tsf		

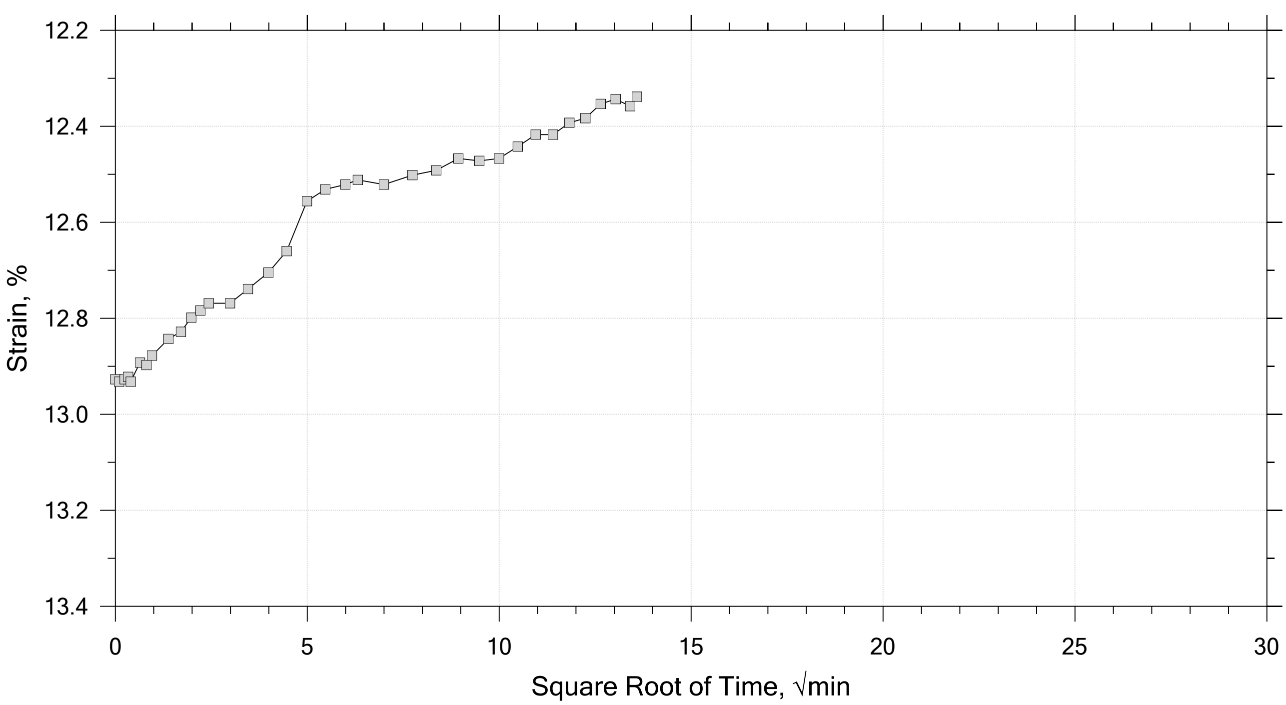
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 14

Constant Load Step

Stress: 8 tsf





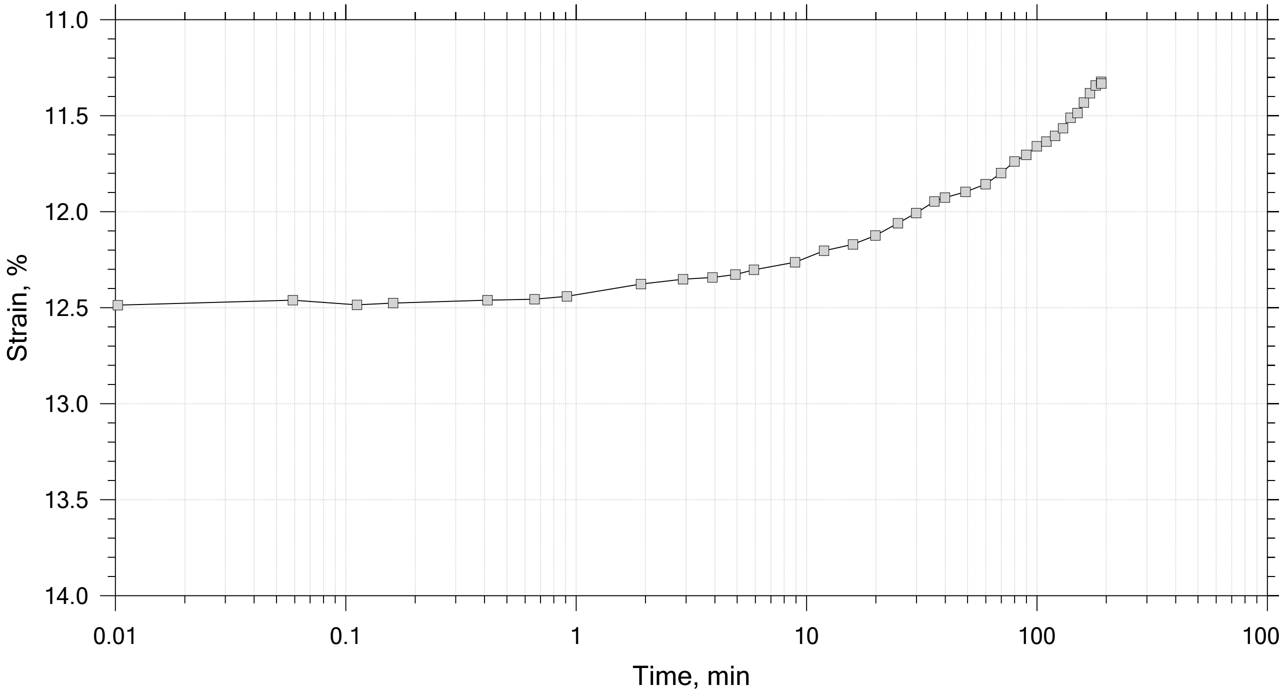
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB021	Tested By: md	Checked By: njh
	Sample No.: SL0829	Test Date: 01/10/19	Depth: 39-41 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, light blueish gray clay		
	Remarks: System X, Swell Pressure = 0.176 tsf		

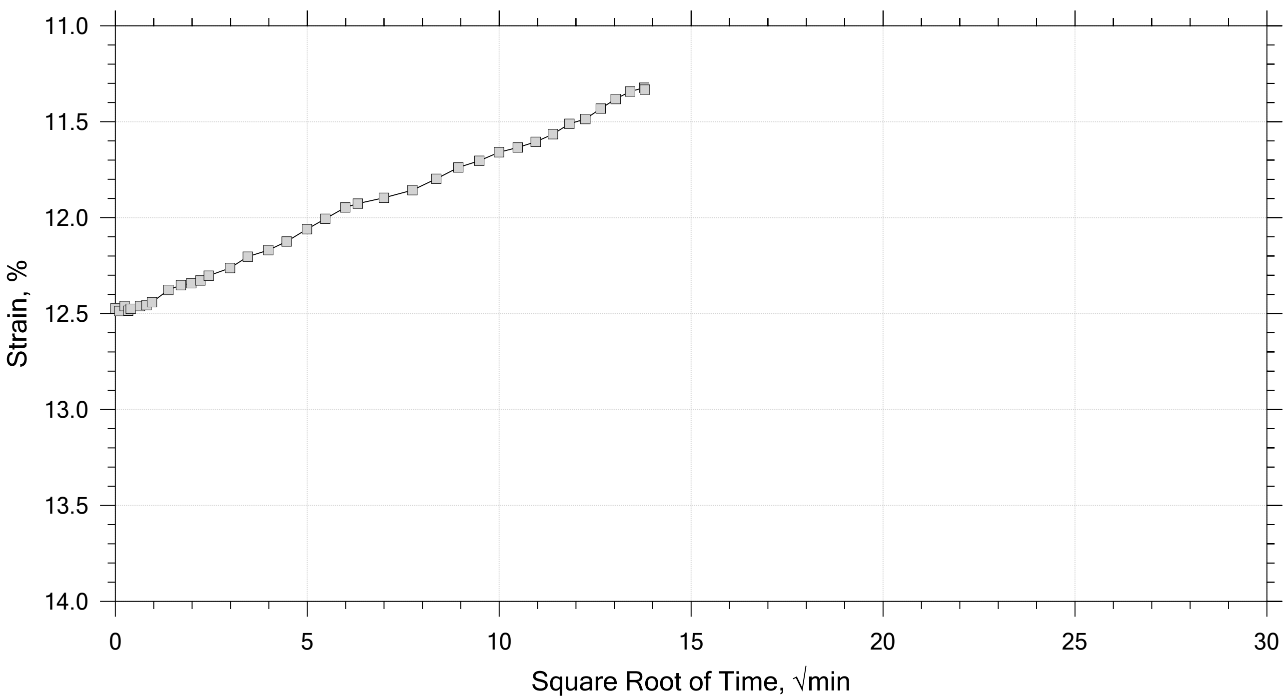
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 14

Constant Load Step

Stress: 2 tsf





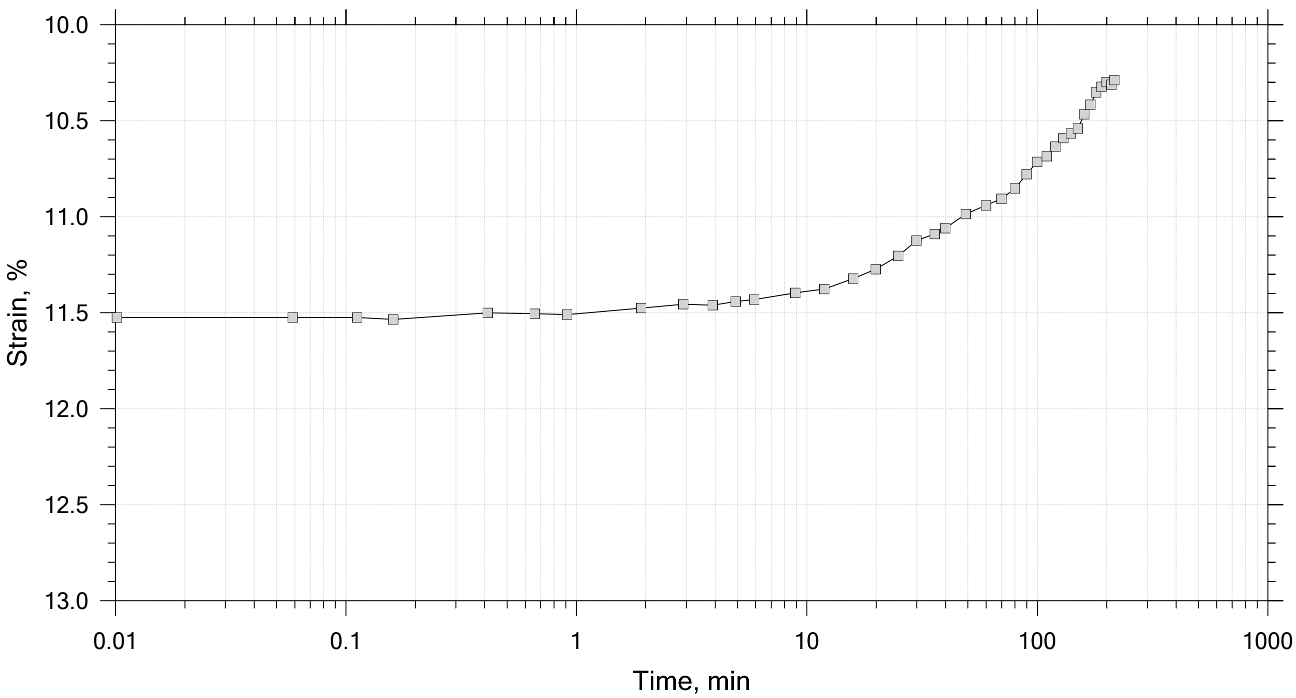
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB021	Tested By: md	Checked By: njh
	Sample No.: SL0829	Test Date: 01/10/19	Depth: 39-41 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, light blueish gray clay		
	Remarks: System X, Swell Pressure = 0.176 tsf		

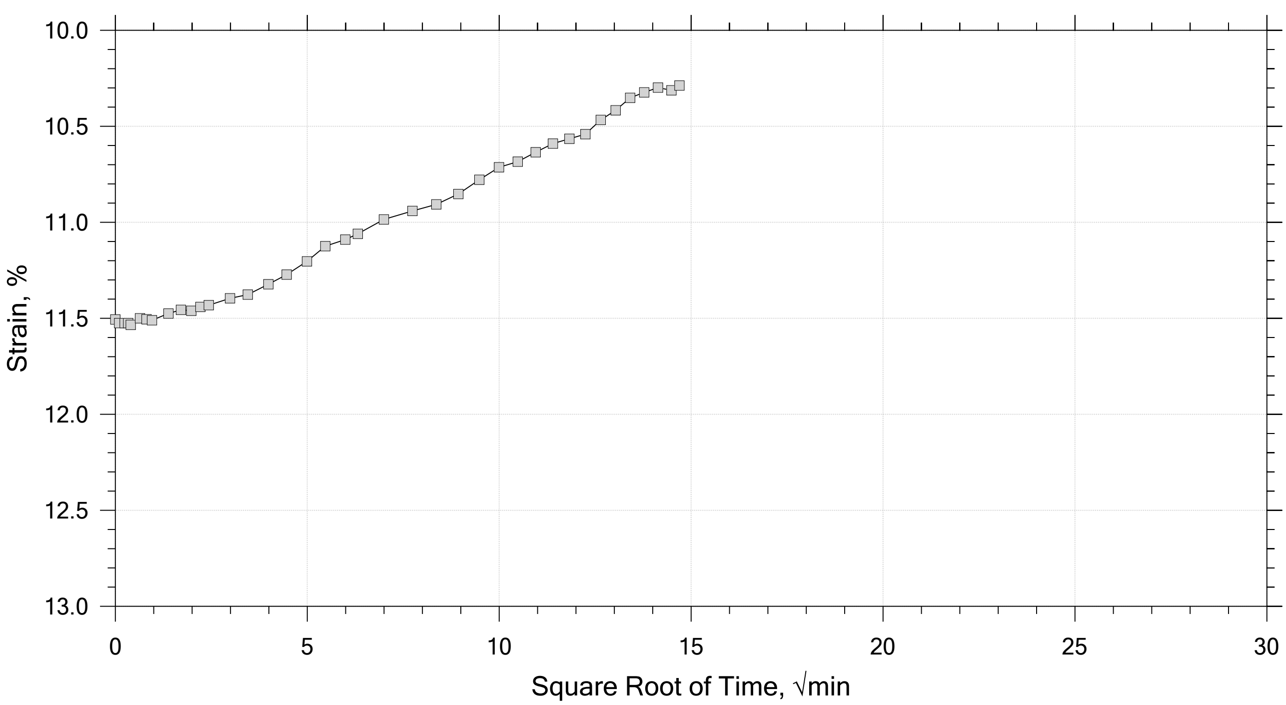
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 14

Constant Load Step

Stress: 0.5 tsf

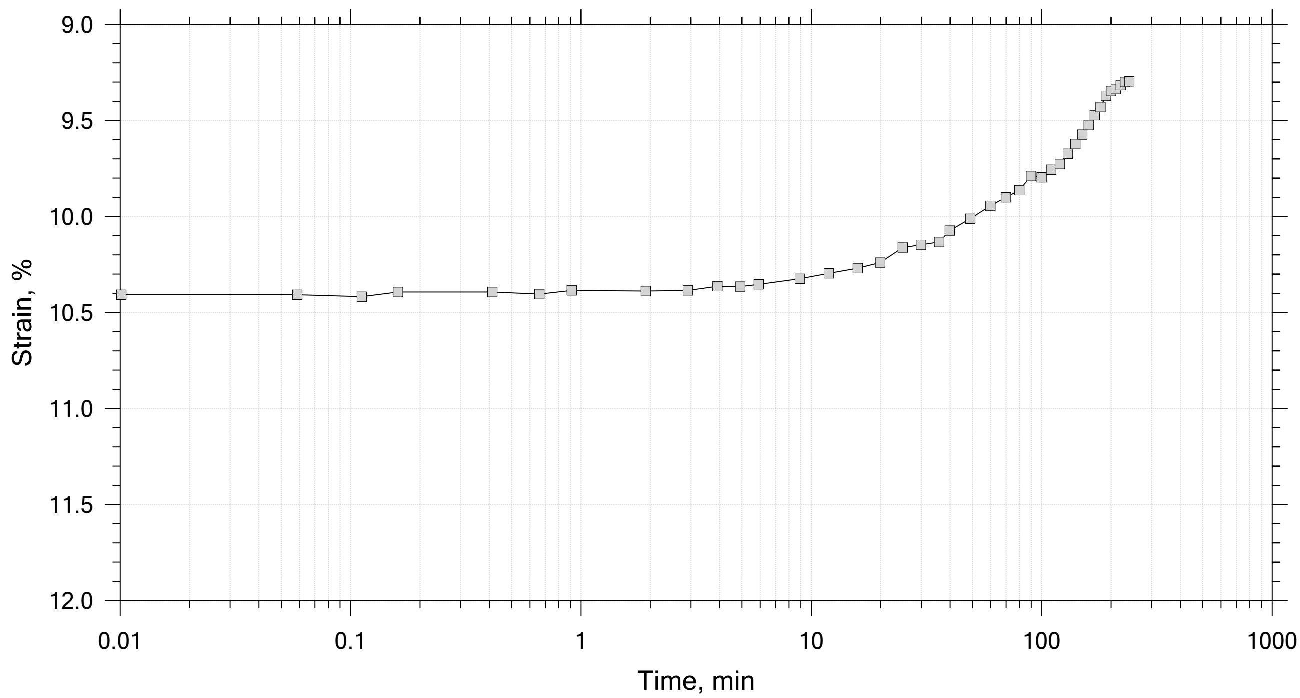


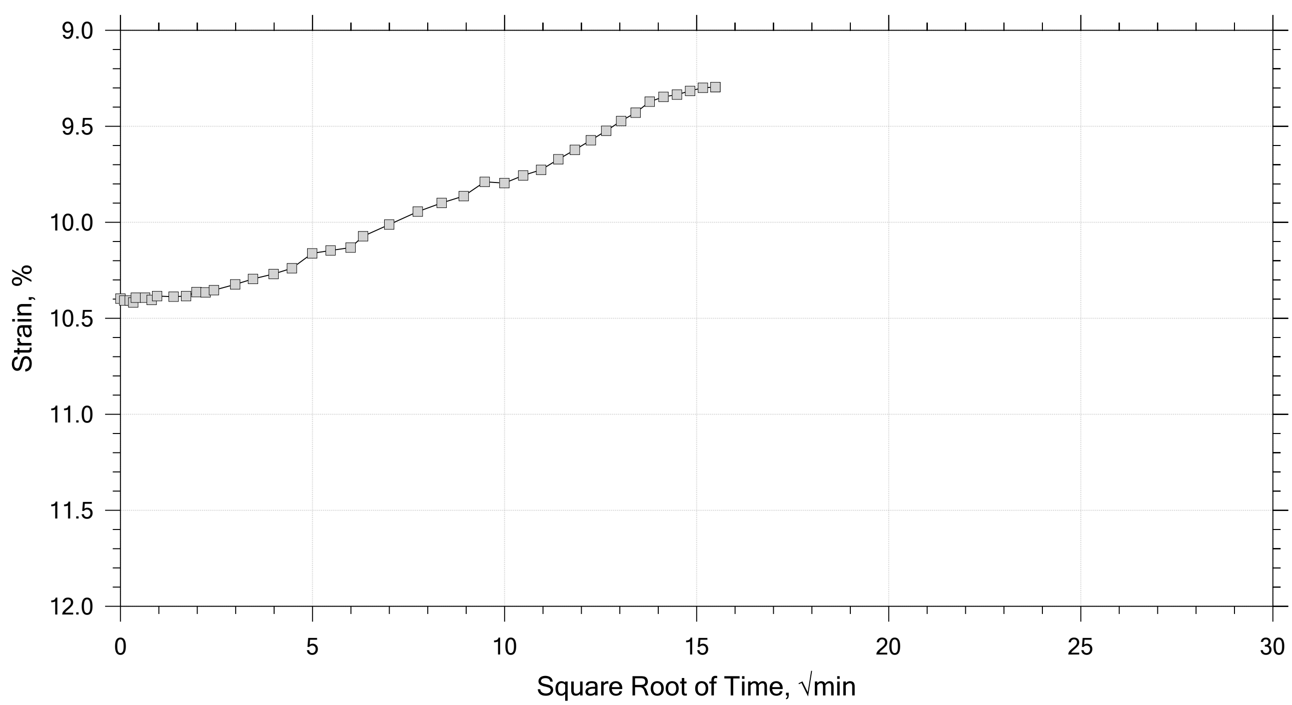


Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB021	Tested By: md	Checked By: njh
Sample No.: SL0829	Test Date: 01/10/19	Depth: 39-41 ft
Test No.: IP-5	Sample Type: intact	Elevation: ---
Description: Moist, light blueish gray clay		
Remarks: System X, Swell Pressure = 0.176 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 14
Constant Load Step
Stress: 0.125 tsf

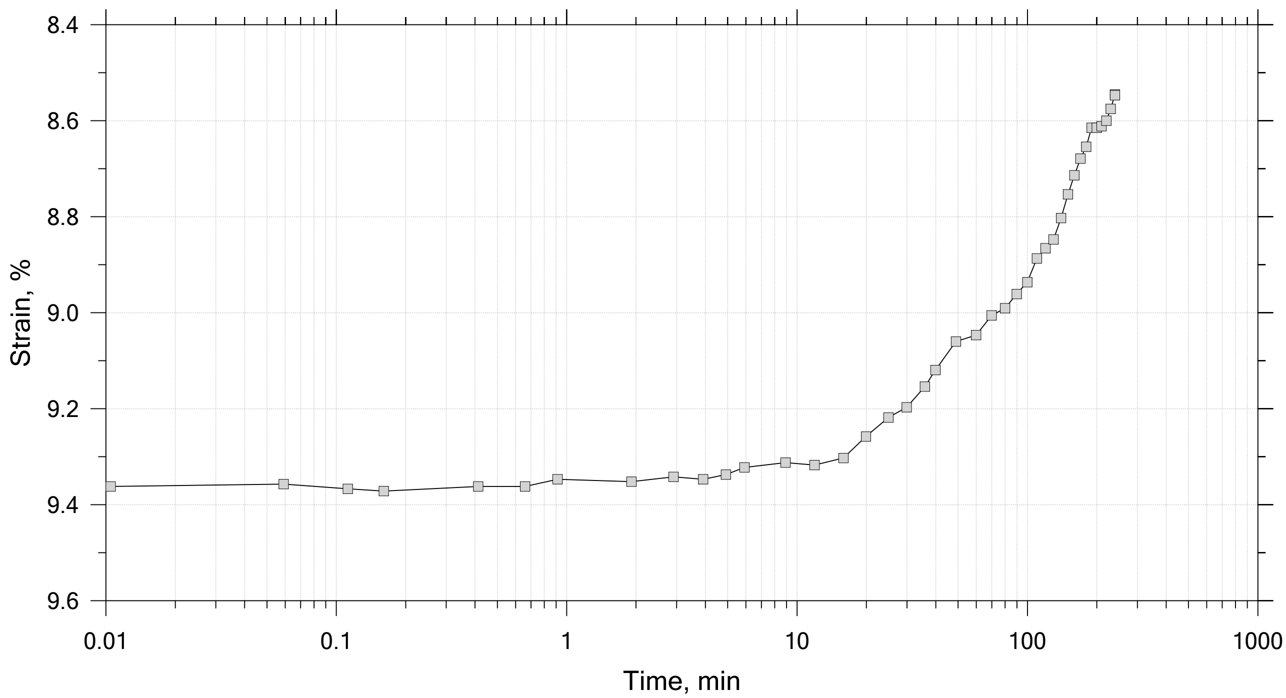


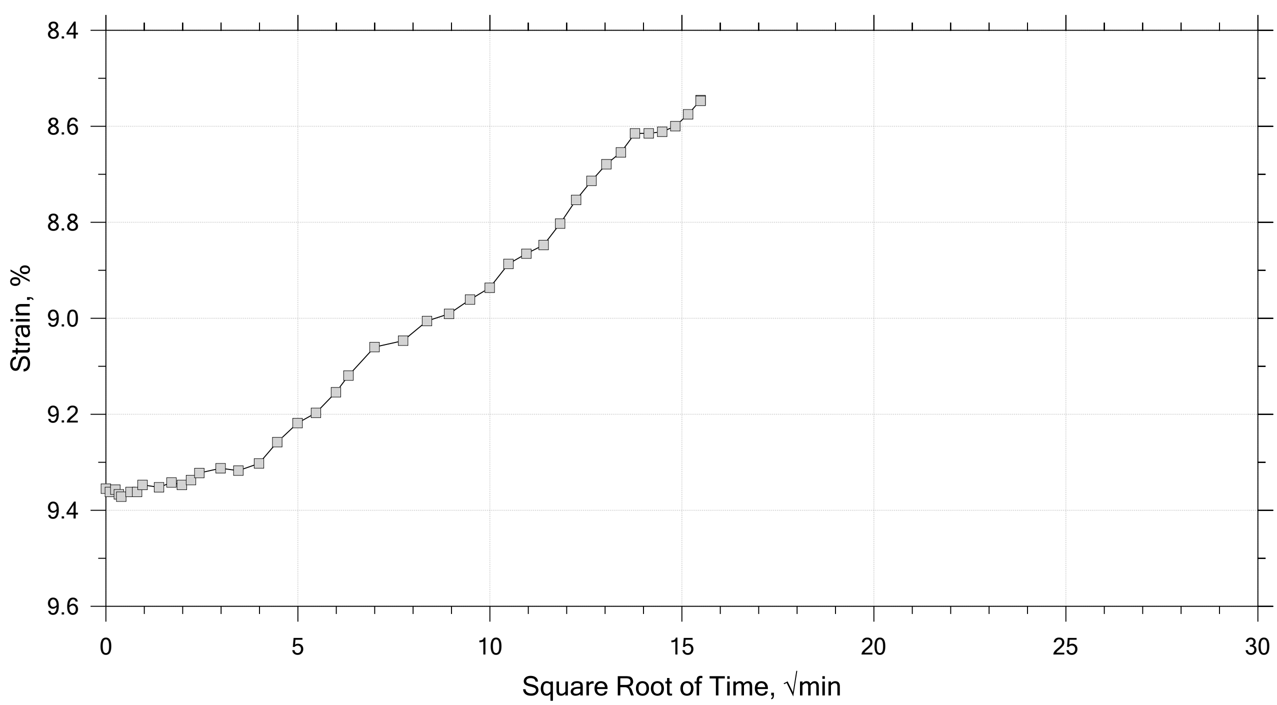


GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB021	Tested By: md	Checked By: njh
	Sample No.: SL0829	Test Date: 01/10/19	Depth: 39-41 ft
	Test No.: IP-5	Sample Type: intact	Elevation: ---
	Description: Moist, light blueish gray clay		
	Remarks: System X, Swell Pressure = 0.176 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 14
Constant Load Step
Stress: 0.0625 tsf





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		

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.

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		

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

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

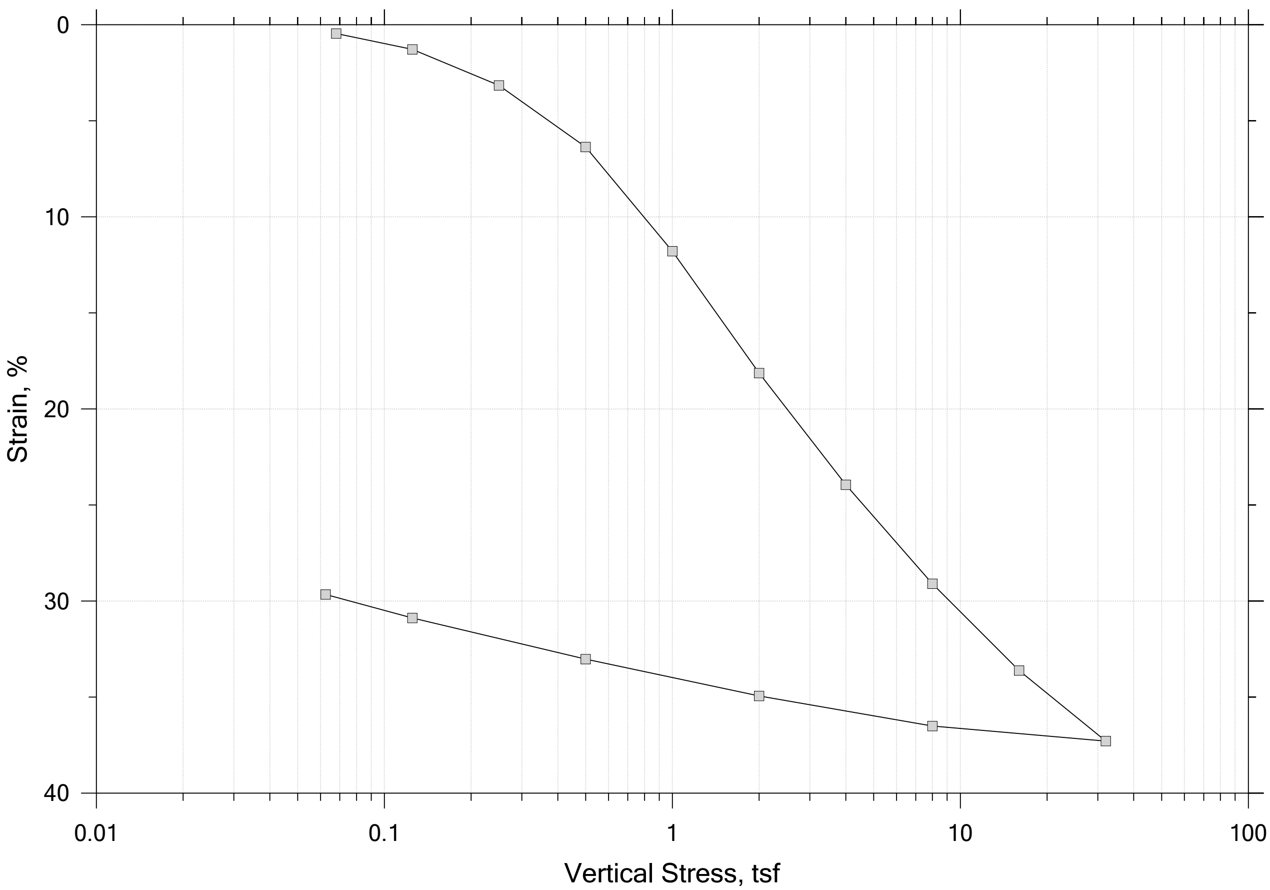
Square Root of Time Coefficients

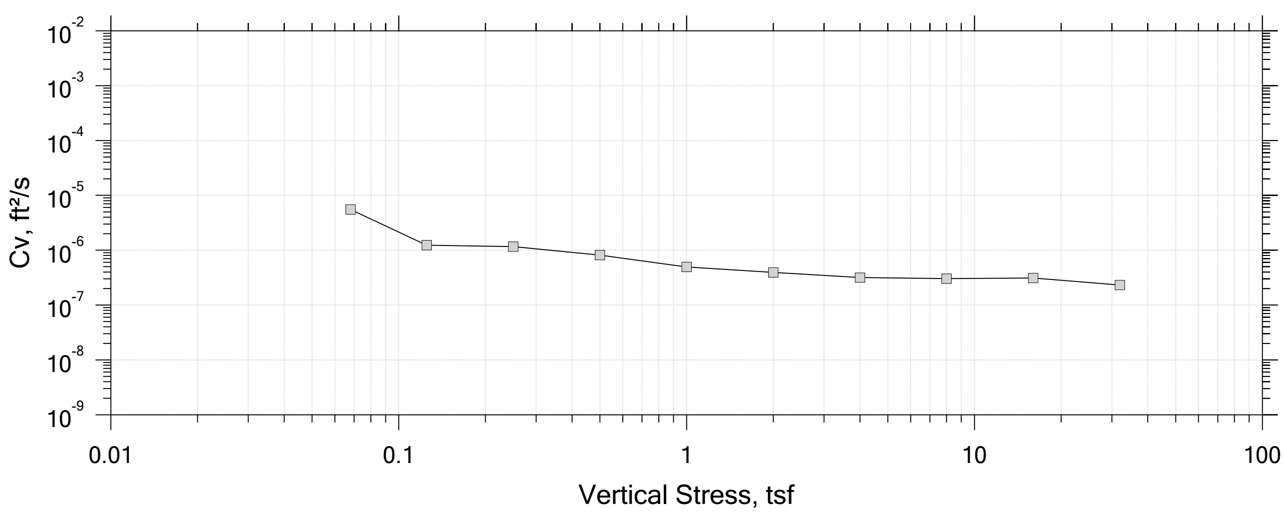
Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Sq.Rt. T90 min	Cv ft²/s	Mv 1/tsf	k ft/day
1	0.176	0.001093	0.612	0.109	134.307	1.82e-07	6.23e-03	3.06e-06
2	0.250	0.003645	0.608	0.364	2.424	1.01e-05	3.43e-02	9.32e-04
3	0.500	0.008601	0.600	0.860	51.117	4.74e-07	1.98e-02	2.54e-05
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

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

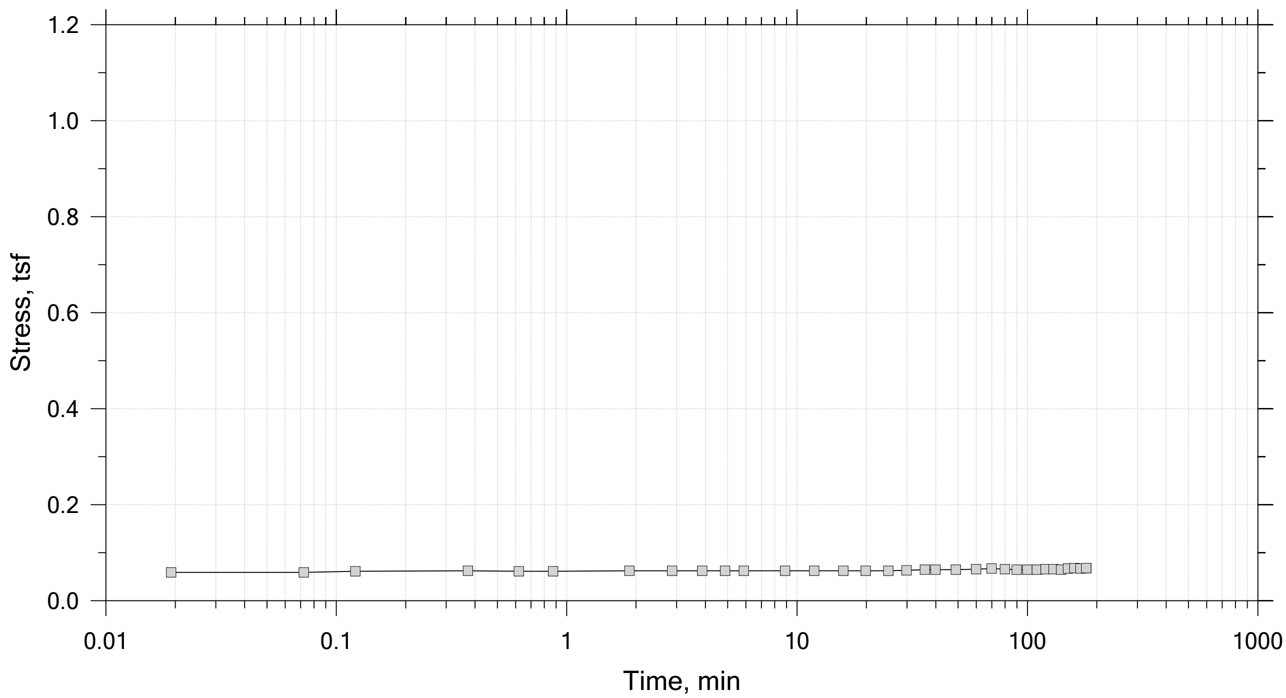


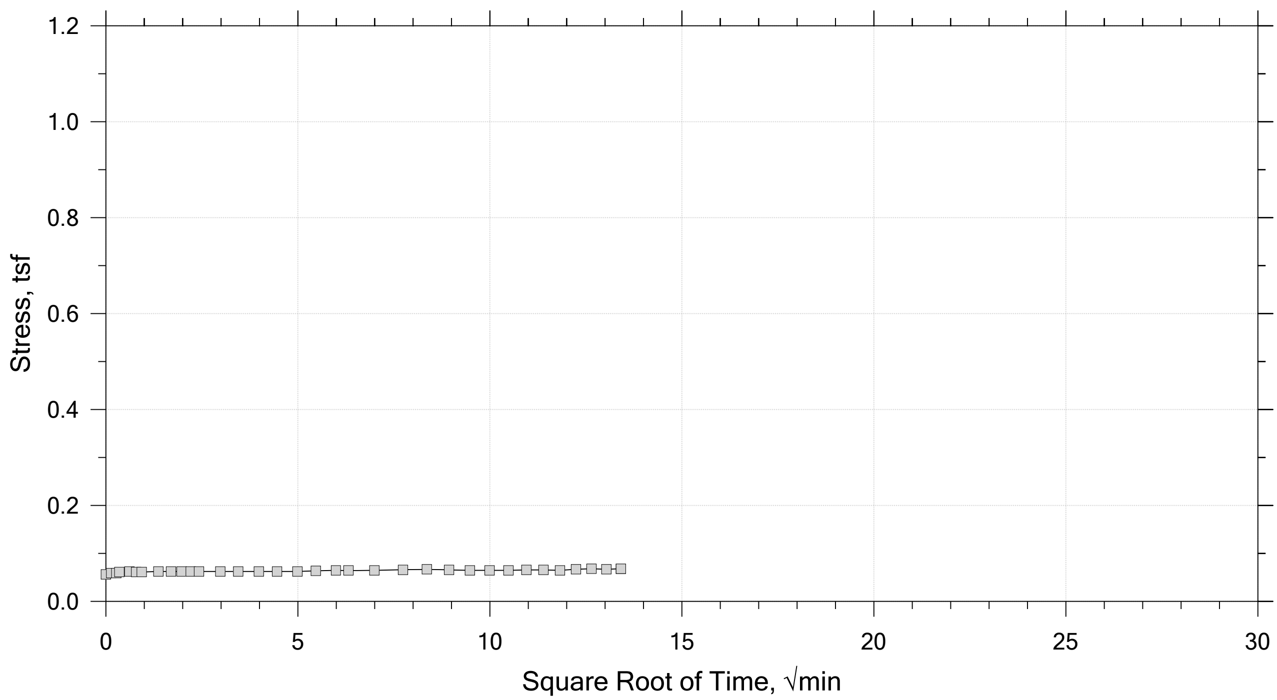


GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB022	Tested By: md	Checked By: njh
	Sample No.: SL0812	Test Date: 01/10/19	Depth: 7-9 ft
	Test No.: IP-6	Sample Type: intact	Elevation: ---
	Description: Moist, brown and gray clay		
	Remarks: System K, Swell Pressure = 0.068 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 15
Constant Volume Step
Stress: 0.068 tsf

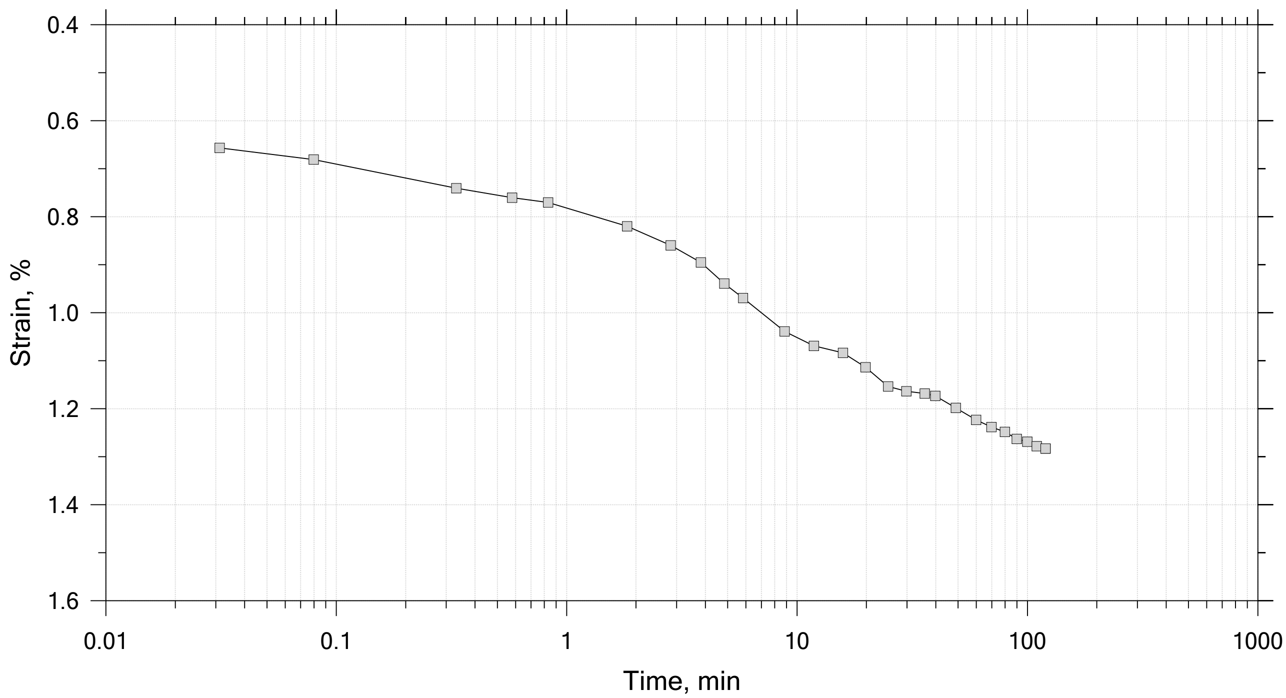


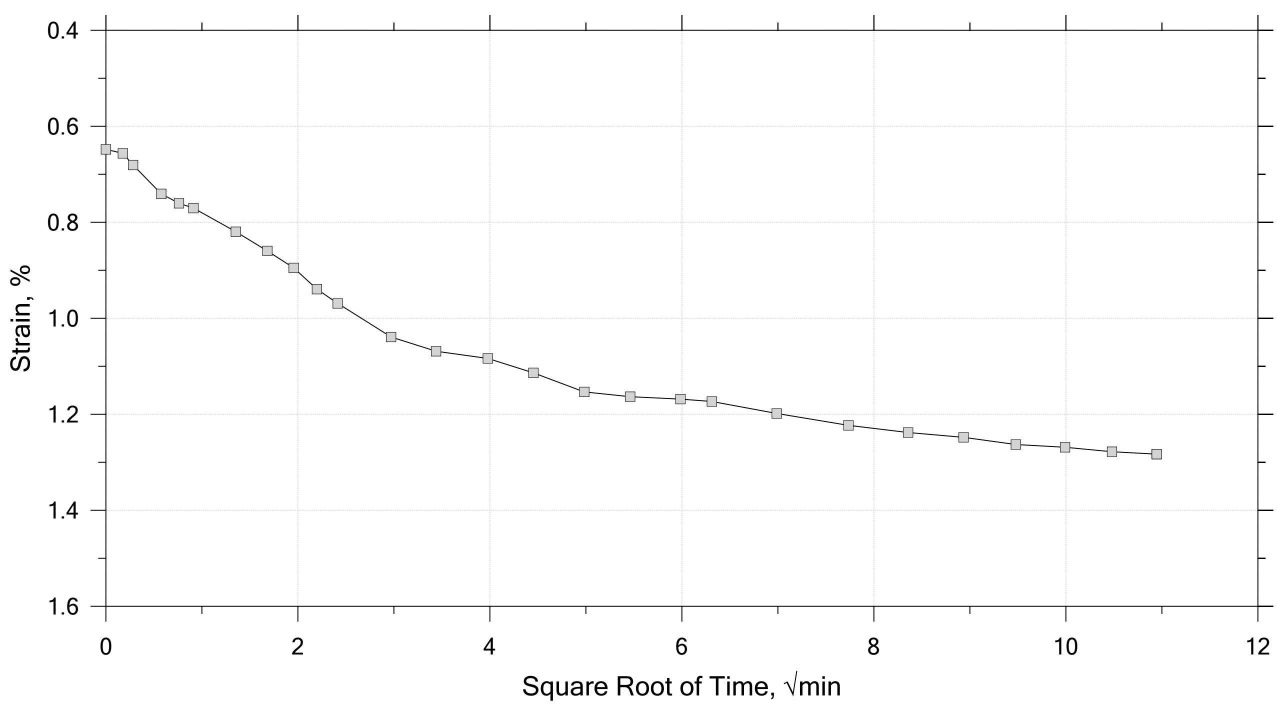


GeoTesting EXPRESS			
	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB022	Tested By: md	Checked By: njh
	Sample No.: SL0812	Test Date: 01/10/19	Depth: 7-9 ft
	Test No.: IP-6	Sample Type: intact	Elevation: ---
	Description: Moist, brown and gray clay		
	Remarks: System K, Swell Pressure = 0.068 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 15
Constant Load Step
Stress: 0.125 tsf

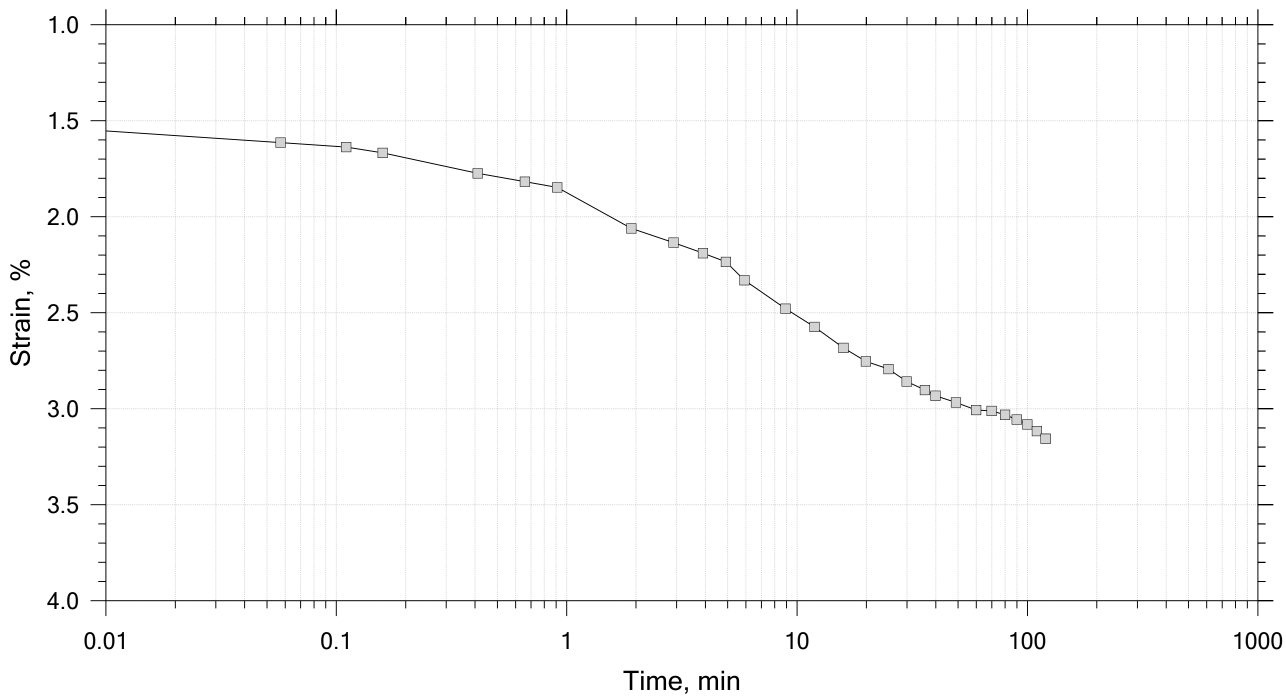


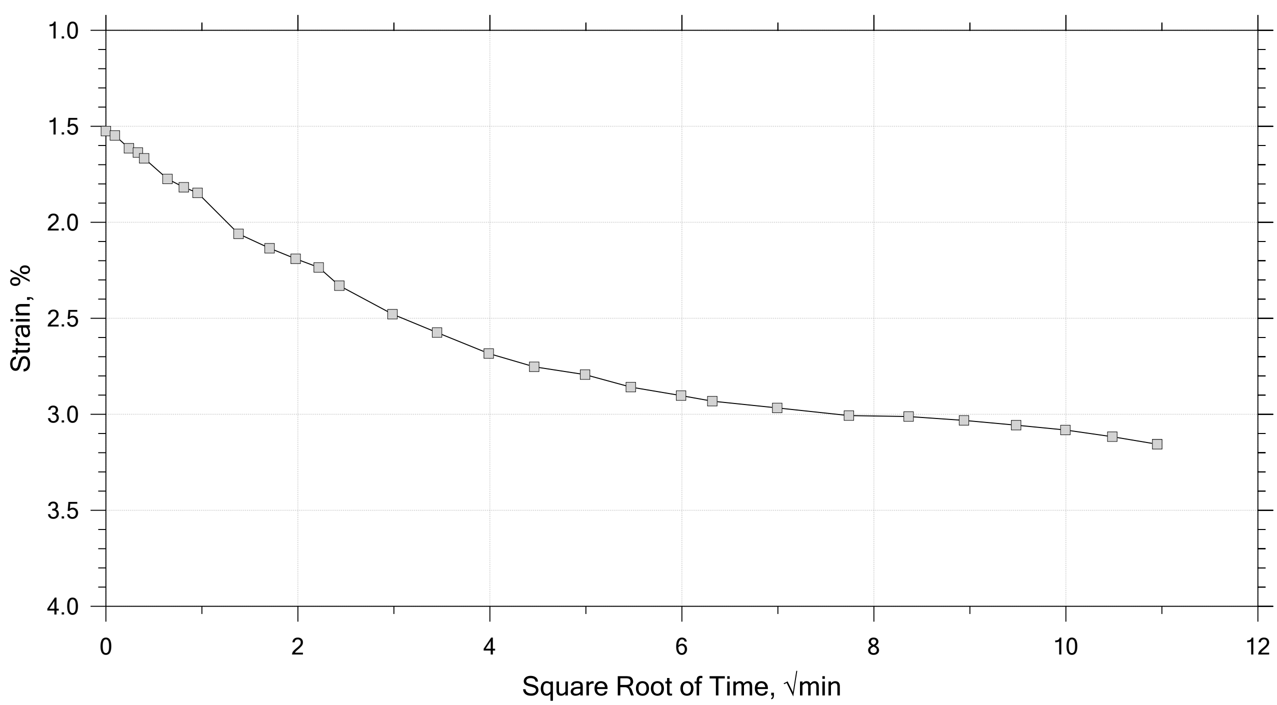


Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB022	Tested By: md	Checked By: njh
Sample No.: SL0812	Test Date: 01/10/19	Depth: 7-9 ft
Test No.: IP-6	Sample Type: intact	Elevation: ---
Description: Moist, brown and gray clay		
Remarks: System K, Swell Pressure = 0.068 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 15
Constant Load Step
Stress: 0.25 tsf





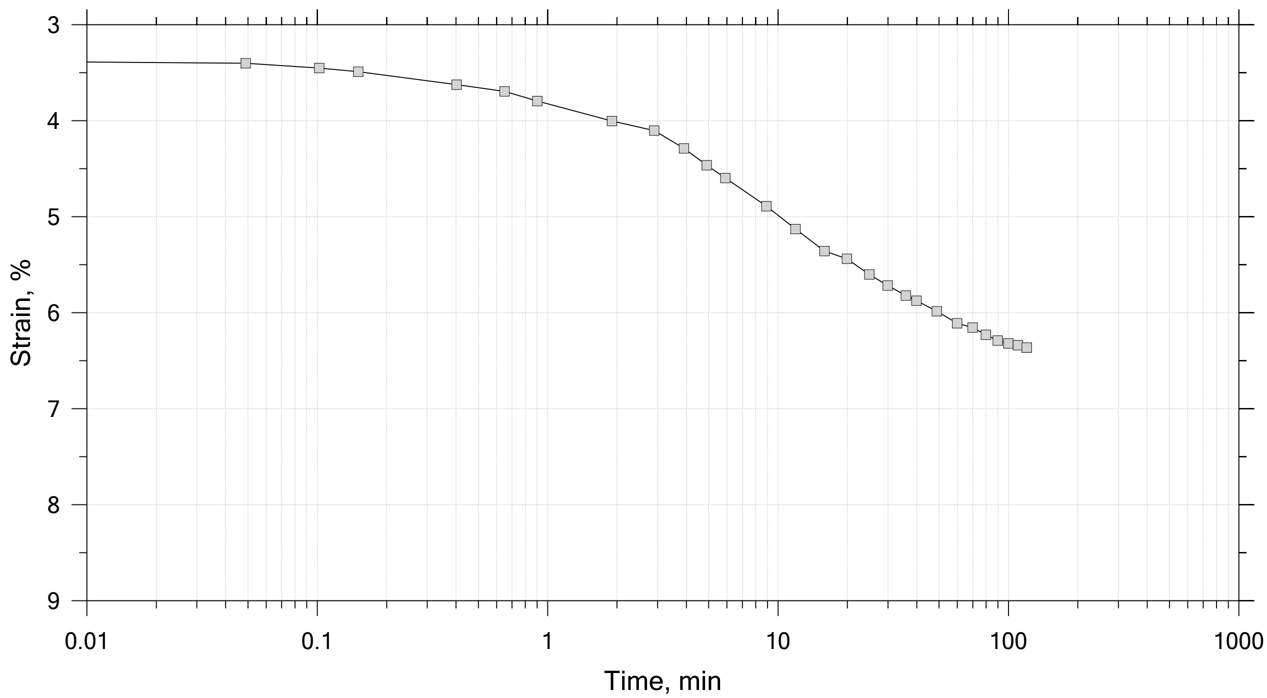
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB022	Tested By: md	Checked By: njh
	Sample No.: SL0812	Test Date: 01/10/19	Depth: 7-9 ft
	Test No.: IP-6	Sample Type: intact	Elevation: ---
	Description: Moist, brown and gray clay		
	Remarks: System K, Swell Pressure = 0.068 tsf		

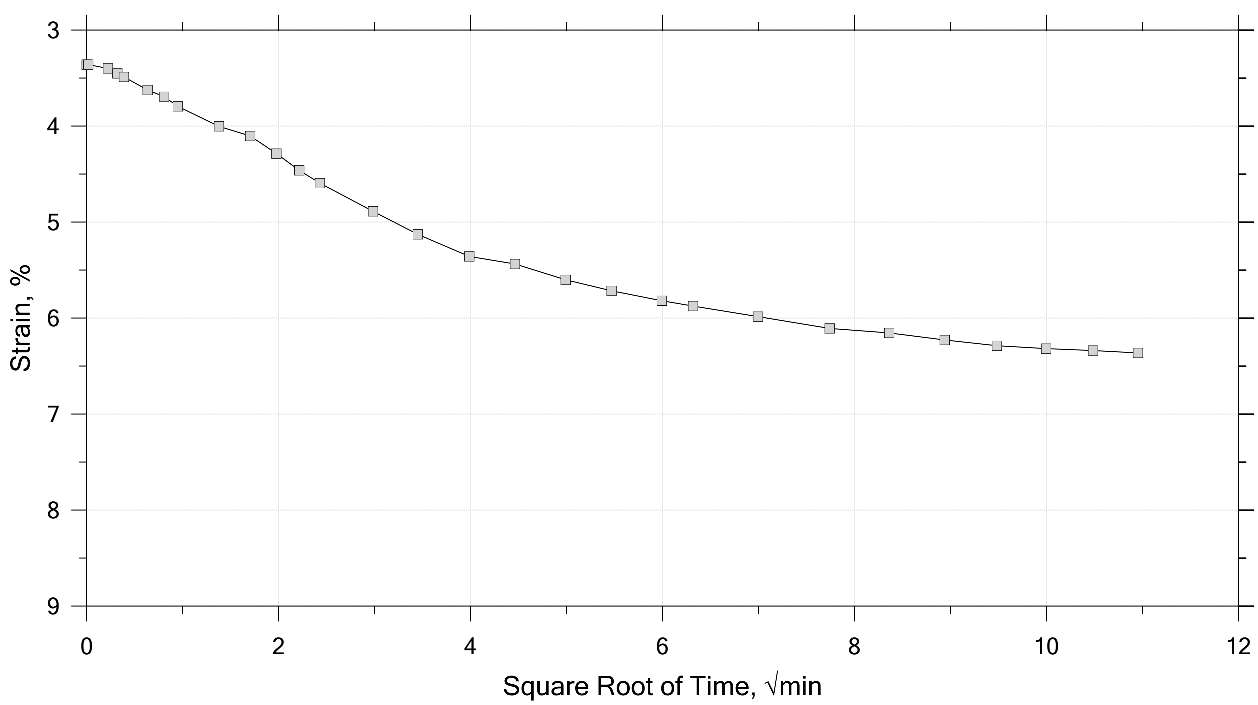
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 15

Constant Load Step

Stress: 0.5 tsf





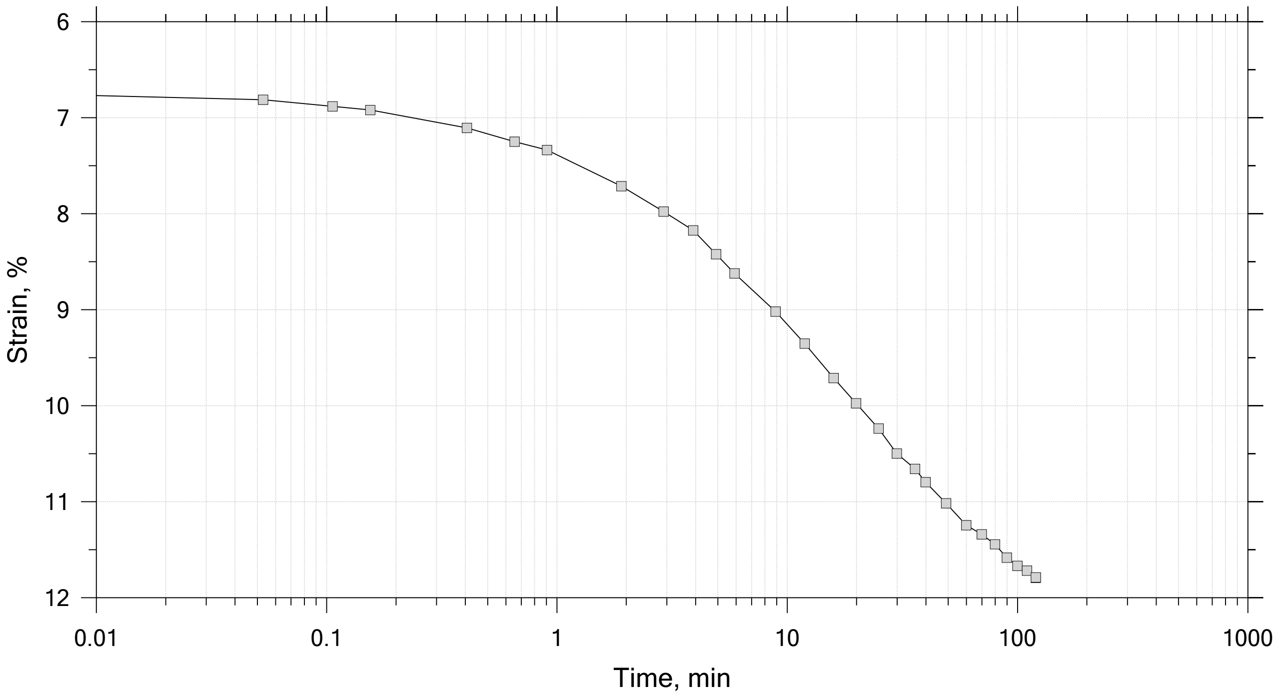
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB022	Tested By: md	Checked By: njh
	Sample No.: SL0812	Test Date: 01/10/19	Depth: 7-9 ft
	Test No.: IP-6	Sample Type: intact	Elevation: ---
	Description: Moist, brown and gray clay		
	Remarks: System K, Swell Pressure = 0.068 tsf		

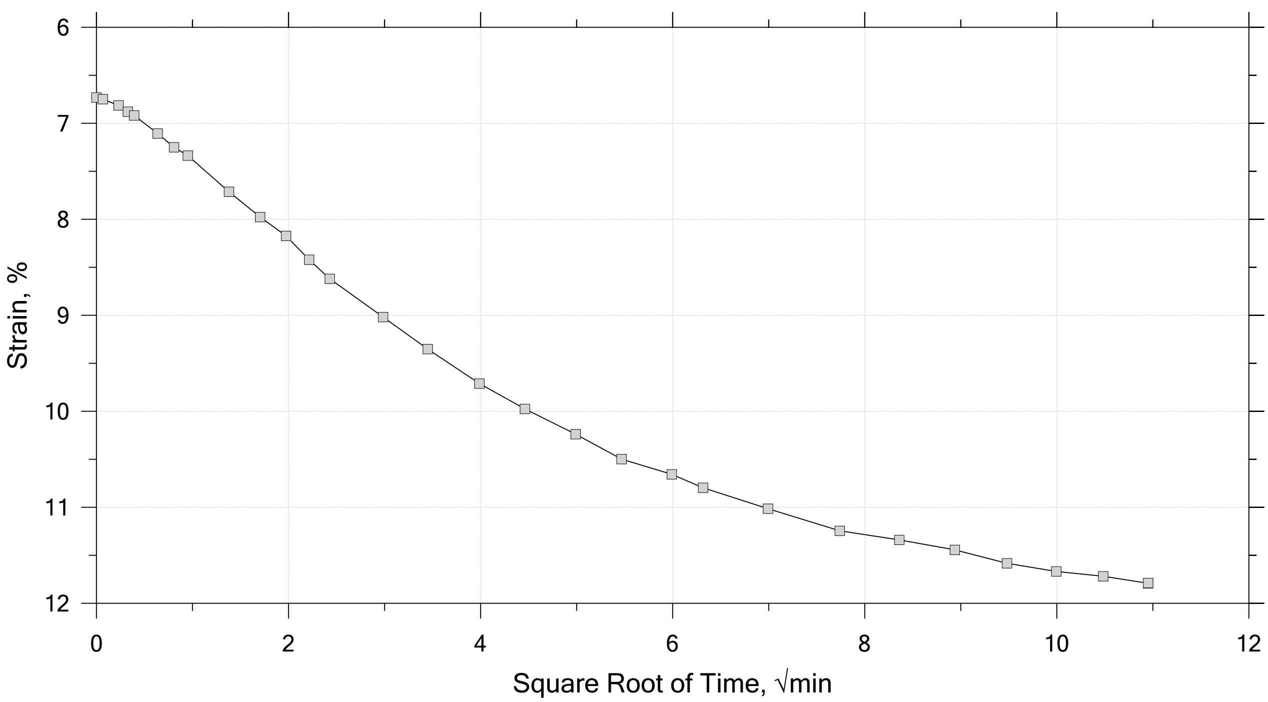
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 15

Constant Load Step

Stress: 1 tsf





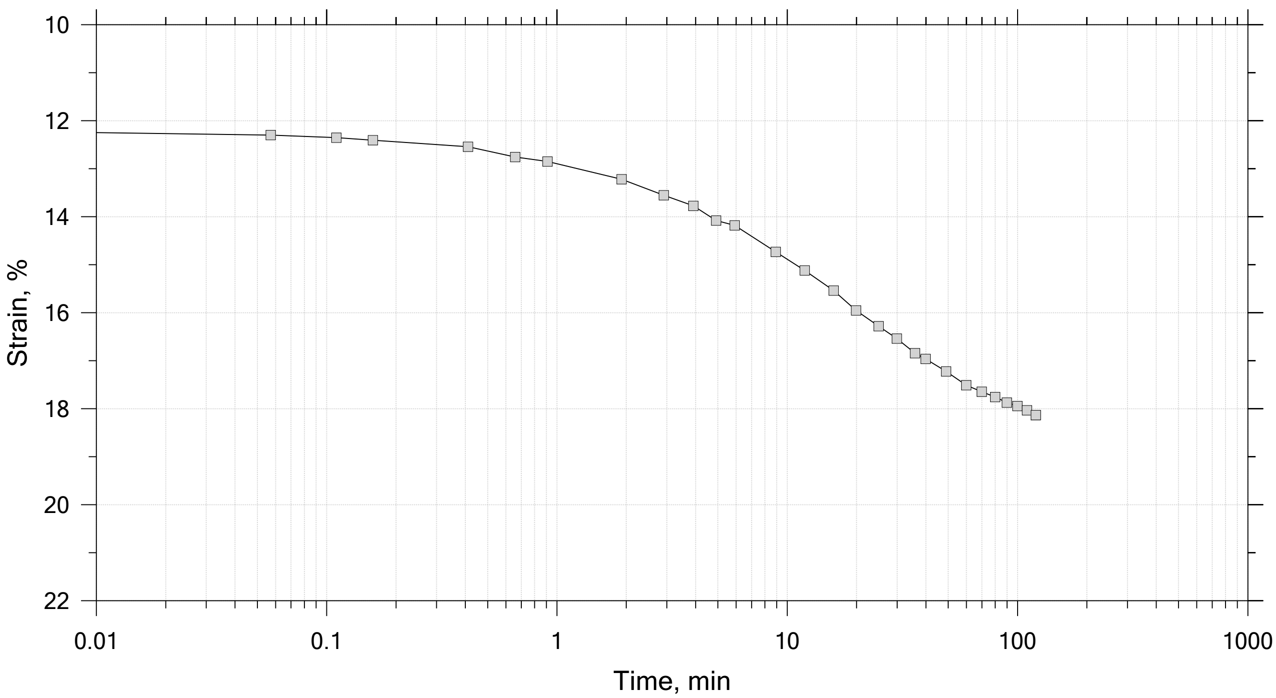
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB022	Tested By: md	Checked By: njh
	Sample No.: SL0812	Test Date: 01/10/19	Depth: 7-9 ft
	Test No.: IP-6	Sample Type: intact	Elevation: ---
	Description: Moist, brown and gray clay		
	Remarks: System K, Swell Pressure = 0.068 tsf		

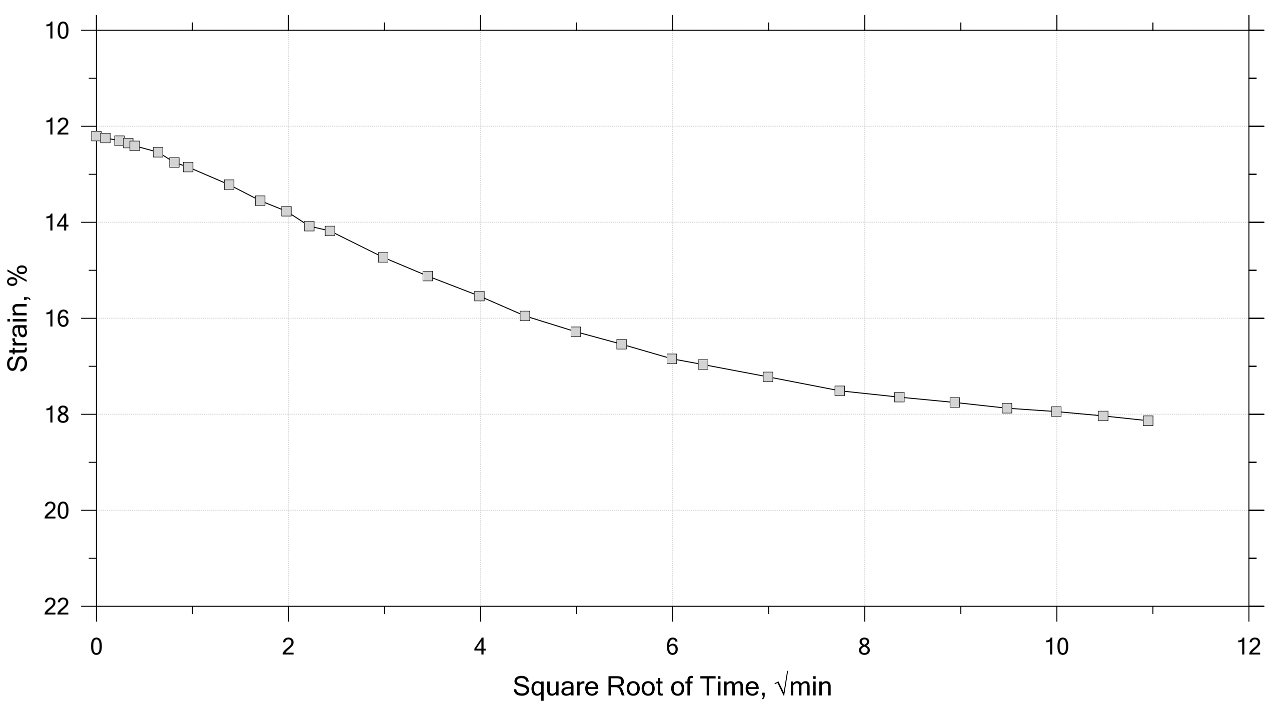
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 15

Constant Load Step

Stress: 2 tsf





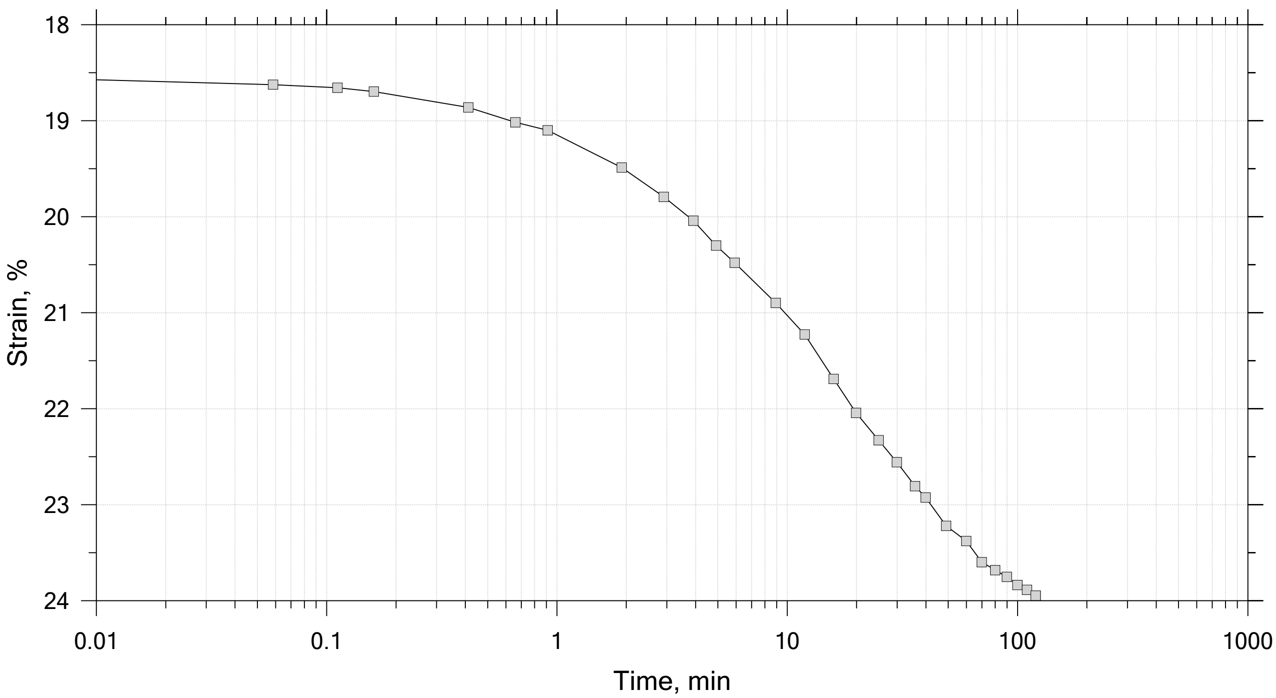
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB022	Tested By: md	Checked By: njh
Sample No.: SL0812	Test Date: 01/10/19	Depth: 7-9 ft
Test No.: IP-6	Sample Type: intact	Elevation: ---
Description: Moist, brown and gray clay		
Remarks: System K, Swell Pressure = 0.068 tsf		

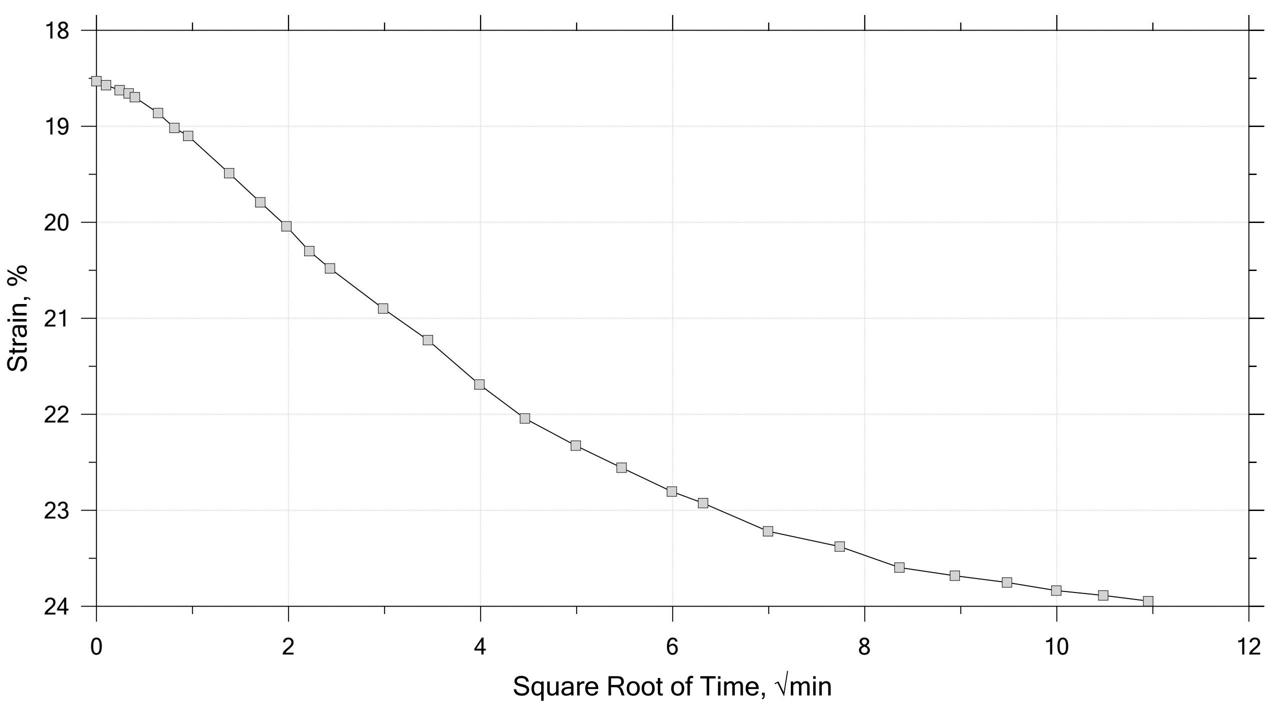
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 15

Constant Load Step

Stress: 4 tsf





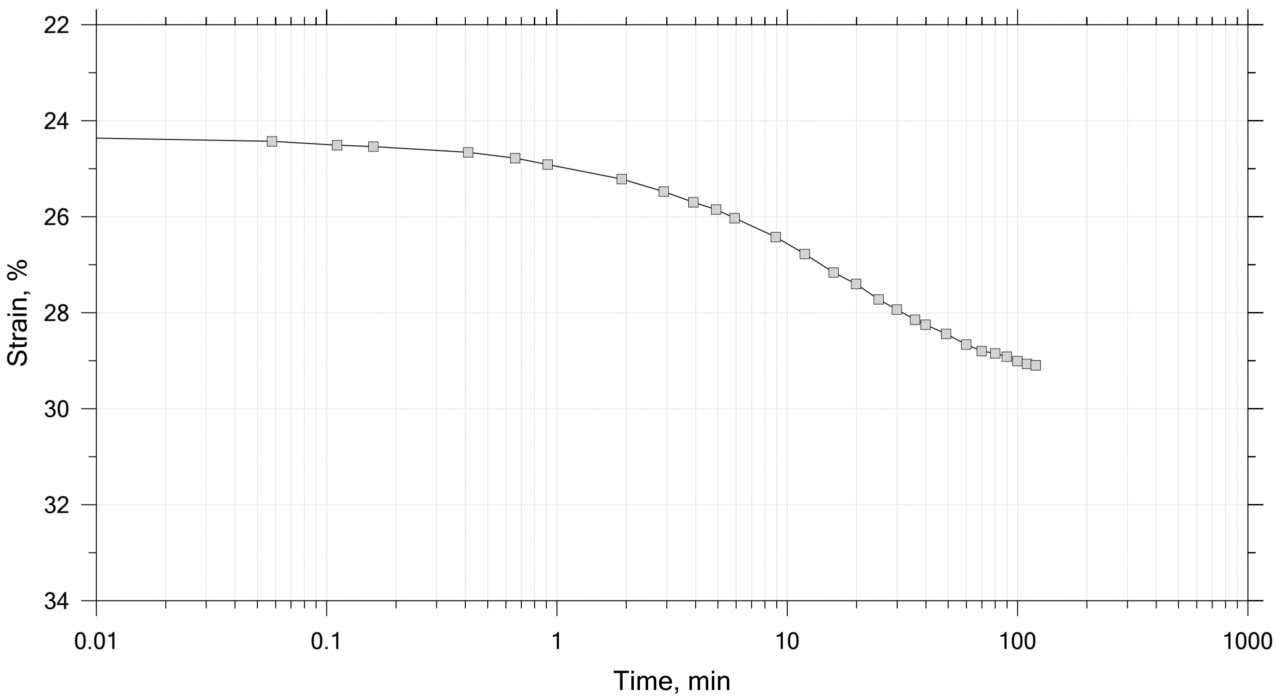
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB022	Tested By: md	Checked By: njh
	Sample No.: SL0812	Test Date: 01/10/19	Depth: 7-9 ft
	Test No.: IP-6	Sample Type: intact	Elevation: ---
	Description: Moist, brown and gray clay		
	Remarks: System K, Swell Pressure = 0.068 tsf		

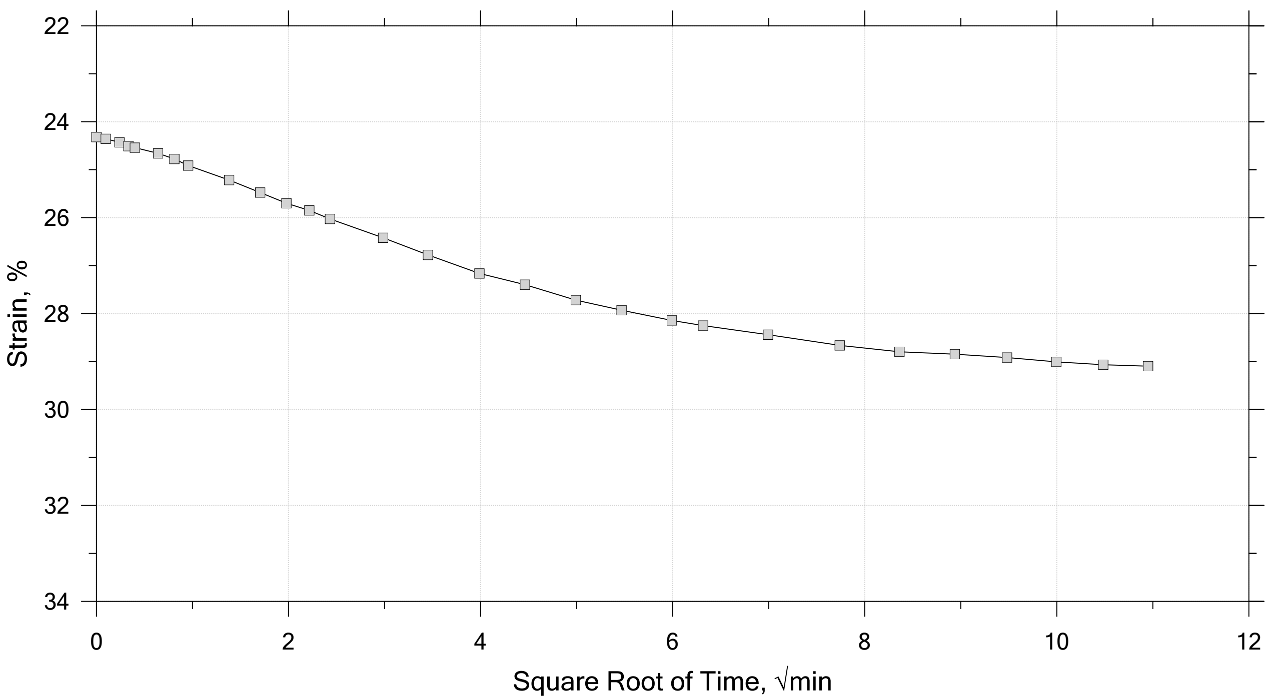
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 15

Constant Load Step

Stress: 8 tsf

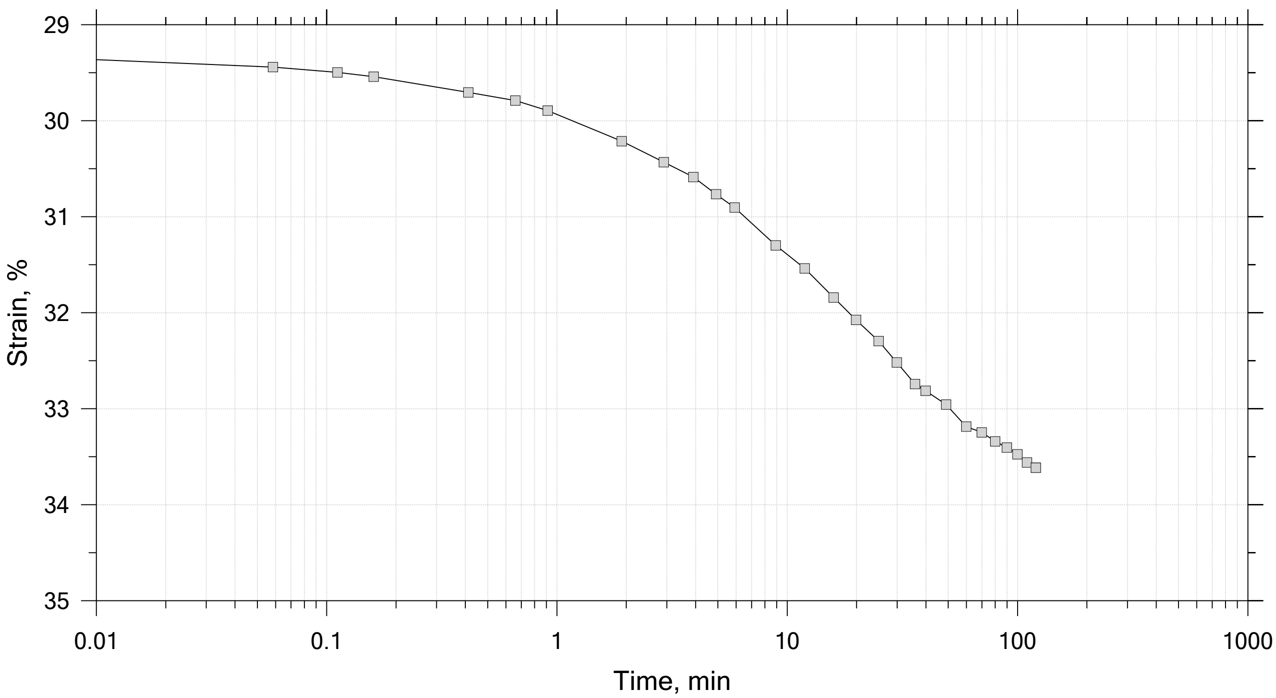


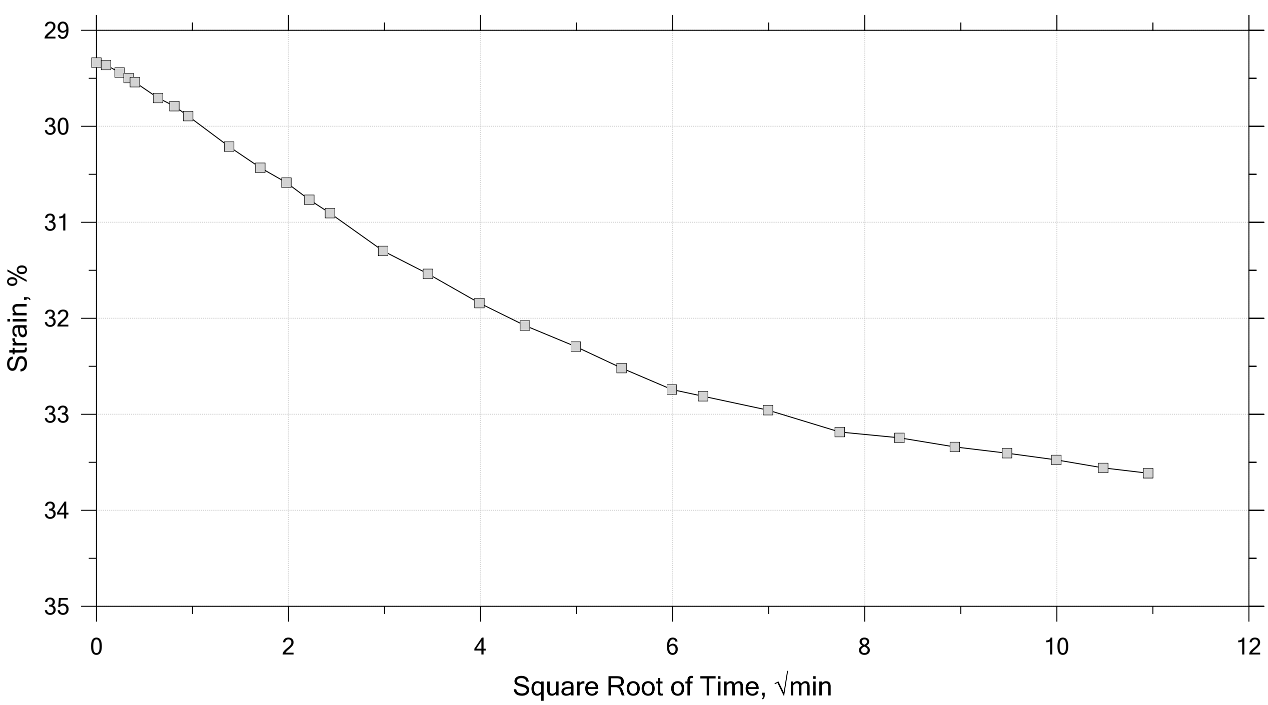


Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB022	Tested By: md	Checked By: njh
Sample No.: SL0812	Test Date: 01/10/19	Depth: 7-9 ft
Test No.: IP-6	Sample Type: intact	Elevation: ---
Description: Moist, brown and gray clay		
Remarks: System K, Swell Pressure = 0.068 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 15
Constant Load Step
Stress: 16 tsf





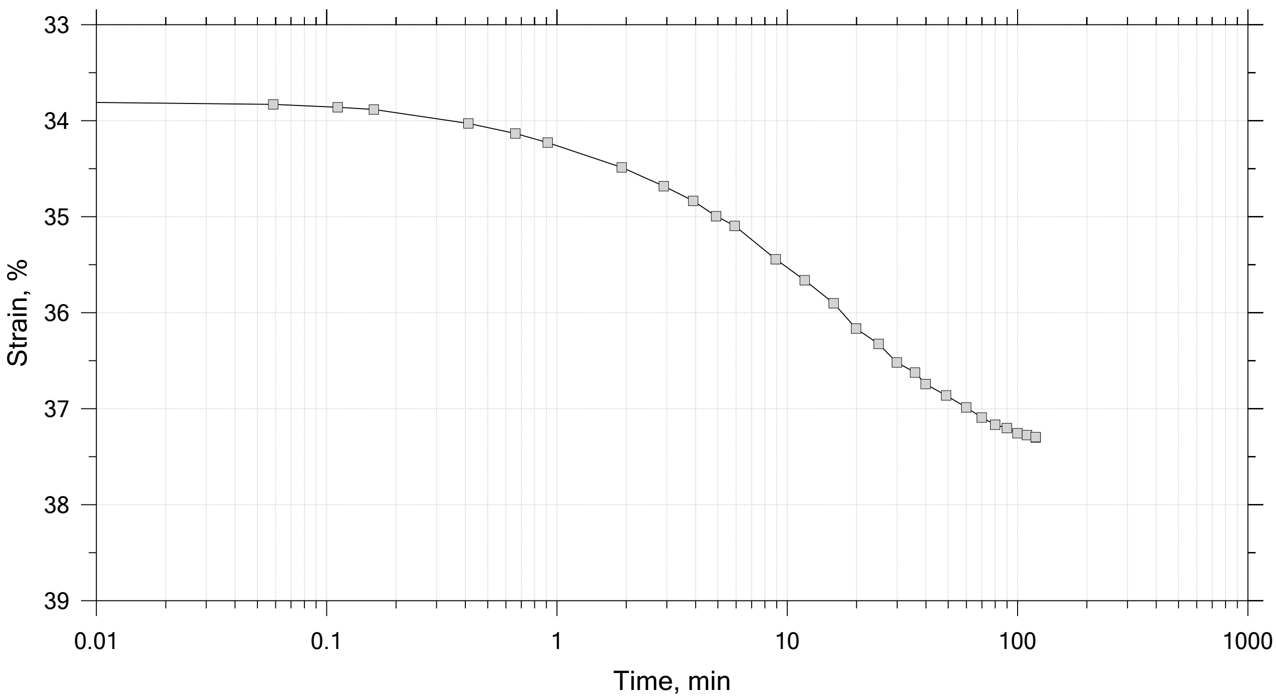
GeoTesting EXPRESS			
	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB022	Tested By: md	Checked By: njh
	Sample No.: SL0812	Test Date: 01/10/19	Depth: 7-9 ft
	Test No.: IP-6	Sample Type: intact	Elevation: ---
	Description: Moist, brown and gray clay		
	Remarks: System K, Swell Pressure = 0.068 tsf		

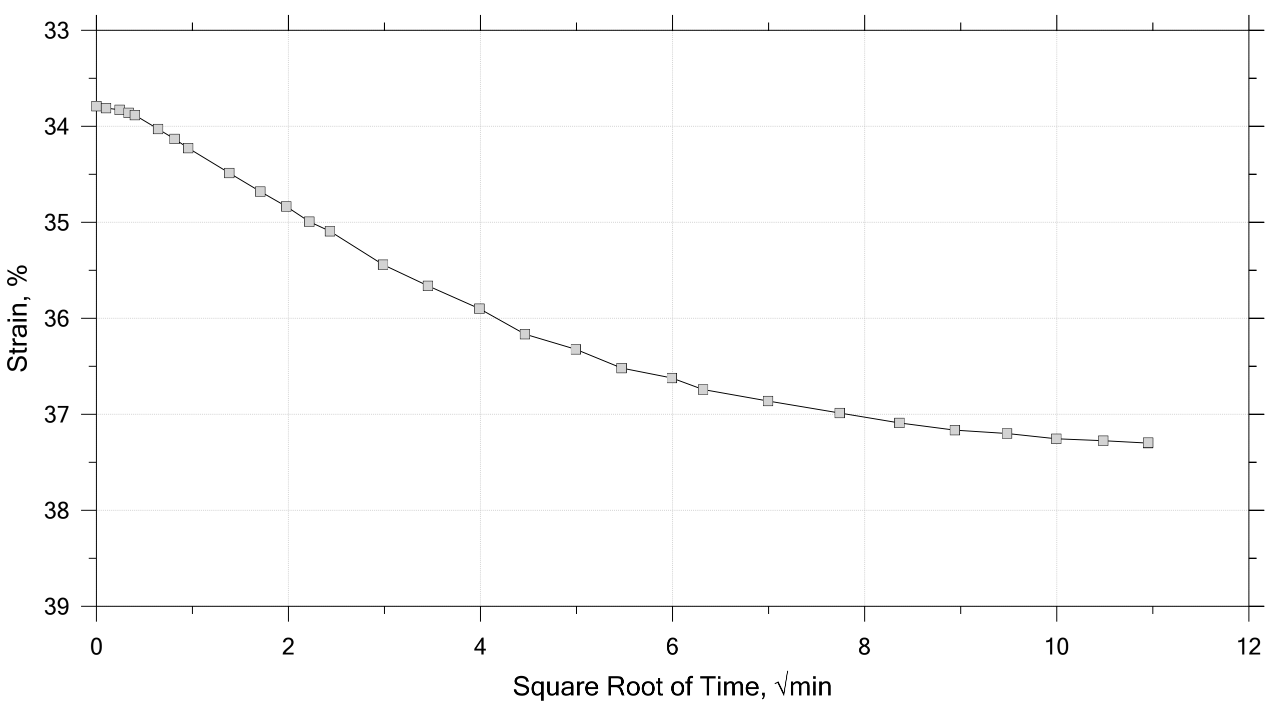
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 15

Constant Load Step

Stress: 32 tsf

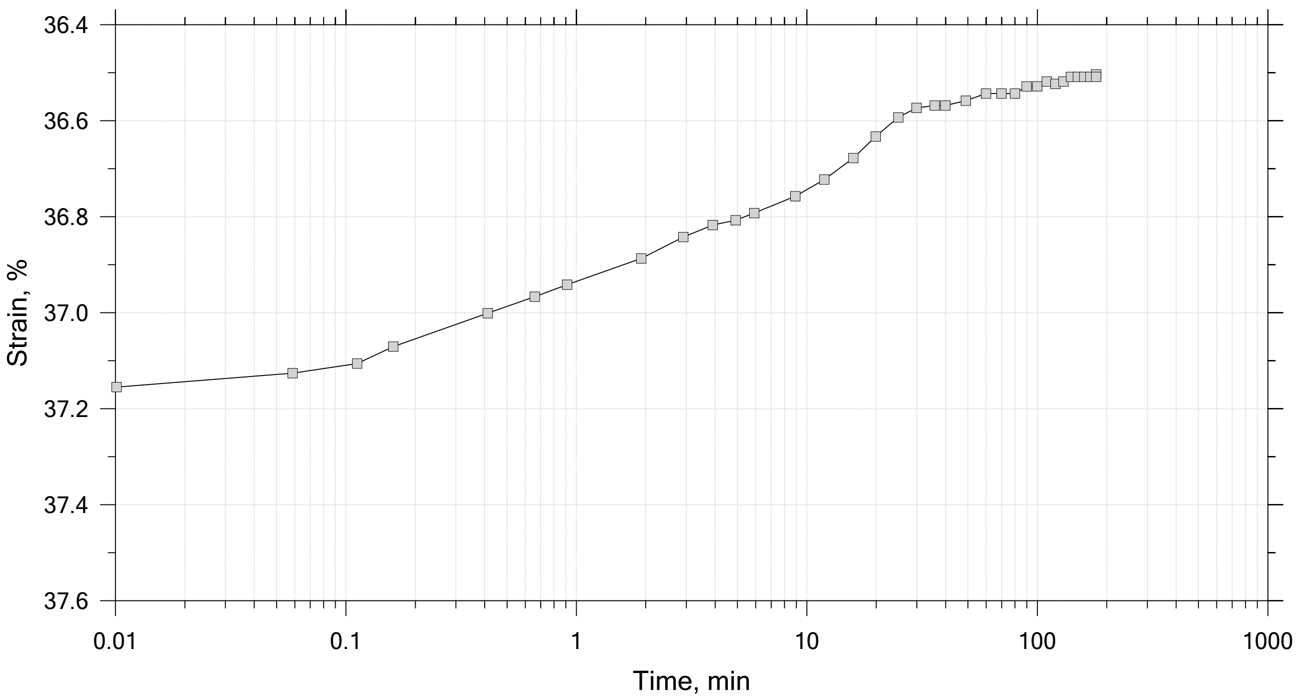


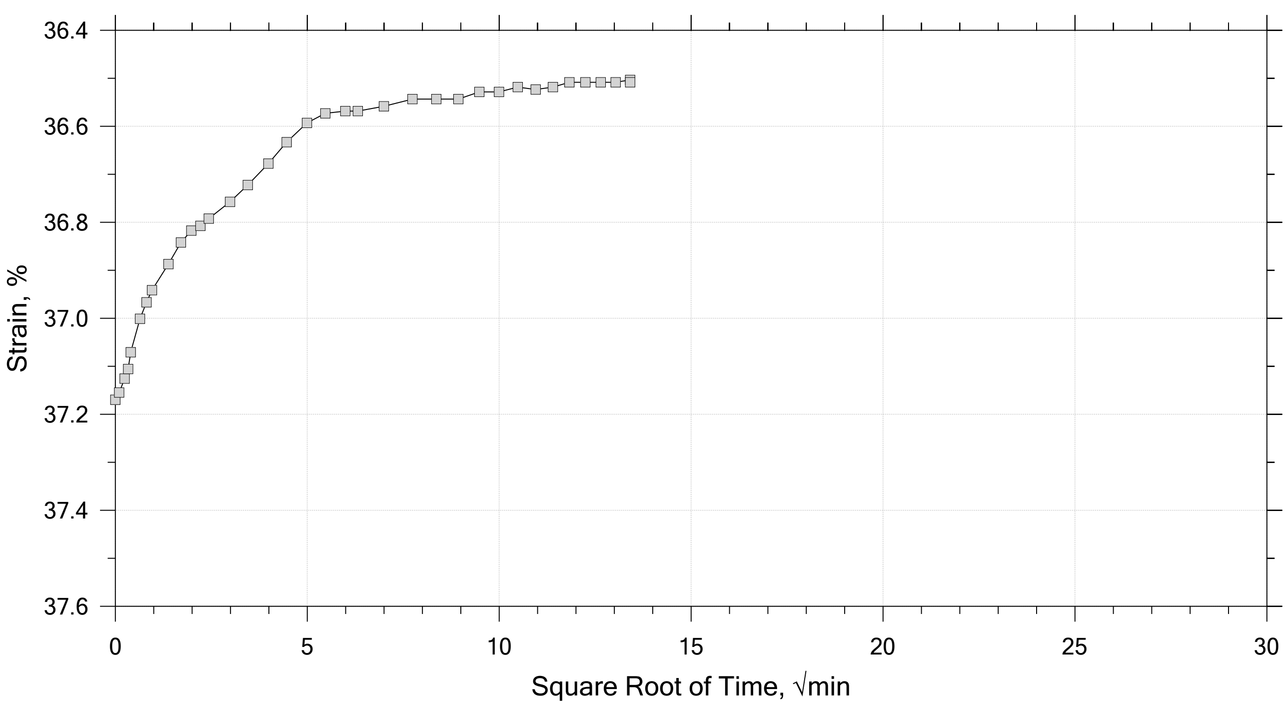


Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB022	Tested By: md	Checked By: njh
Sample No.: SL0812	Test Date: 01/10/19	Depth: 7-9 ft
Test No.: IP-6	Sample Type: intact	Elevation: ---
Description: Moist, brown and gray clay		
Remarks: System K, Swell Pressure = 0.068 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 15
Constant Load Step
Stress: 8 tsf

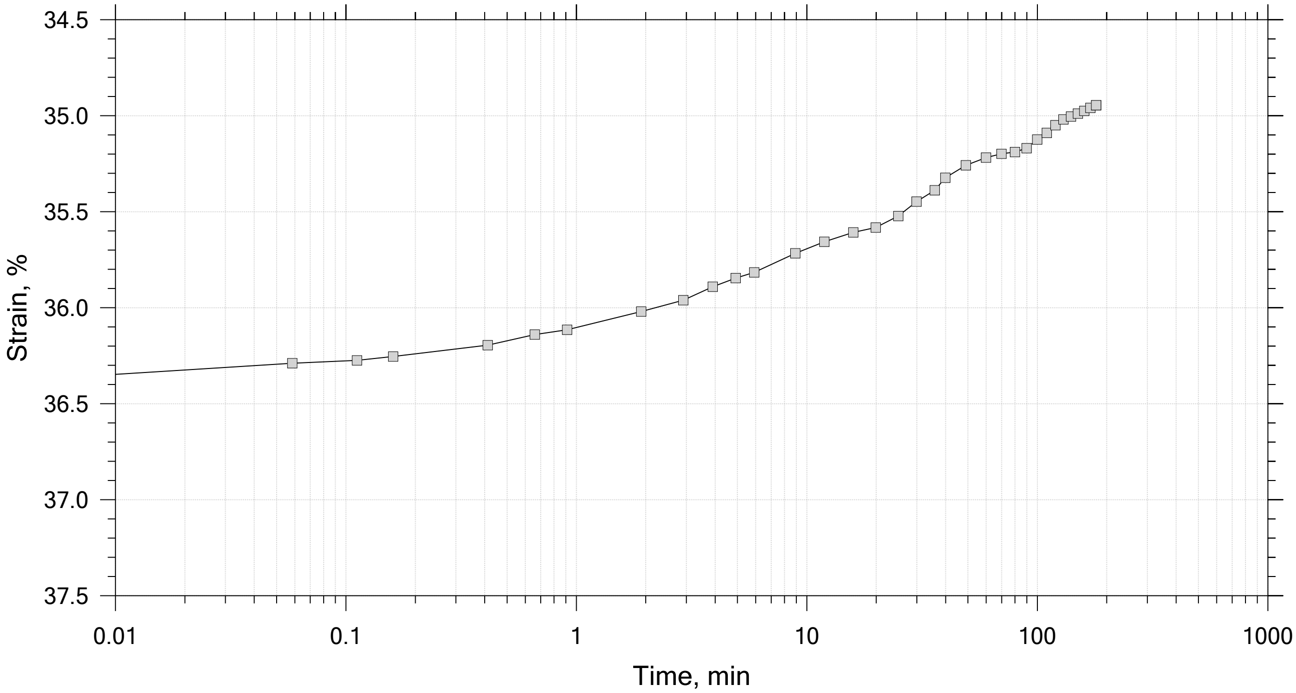


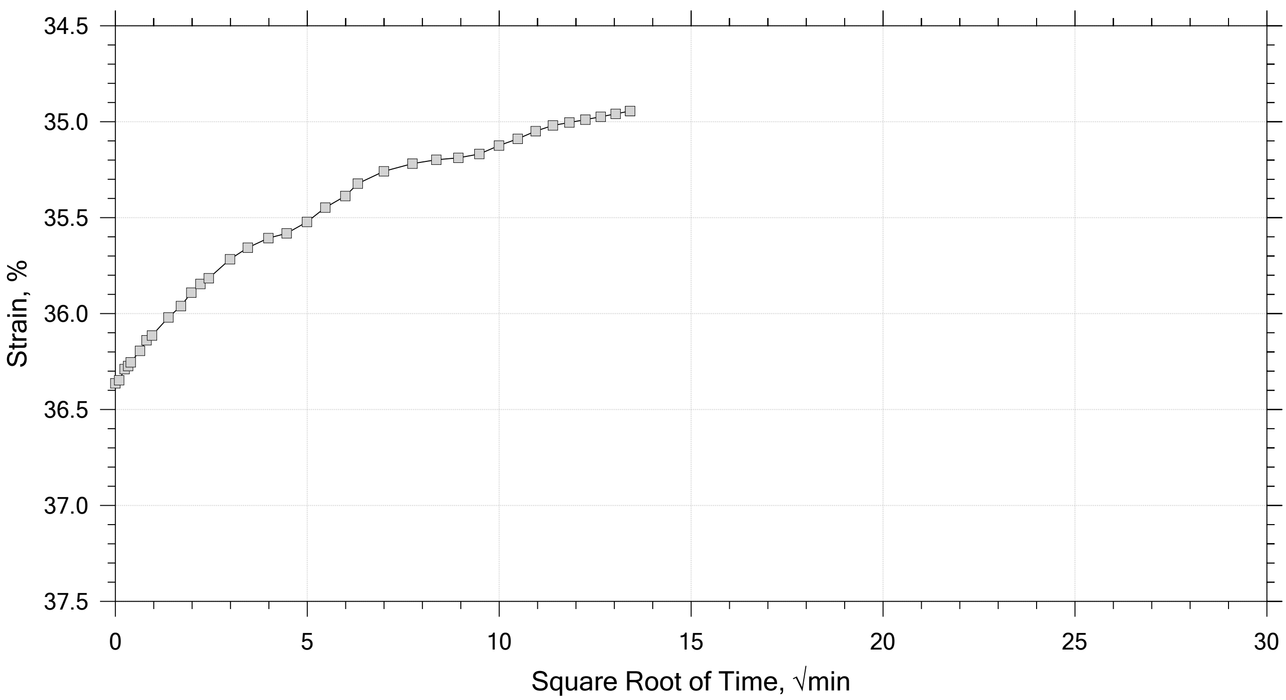


GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB022	Tested By: md	Checked By: njh
	Sample No.: SL0812	Test Date: 01/10/19	Depth: 7-9 ft
	Test No.: IP-6	Sample Type: intact	Elevation: ---
	Description: Moist, brown and gray clay		
	Remarks: System K, Swell Pressure = 0.068 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 15
Constant Load Step
Stress: 2 tsf

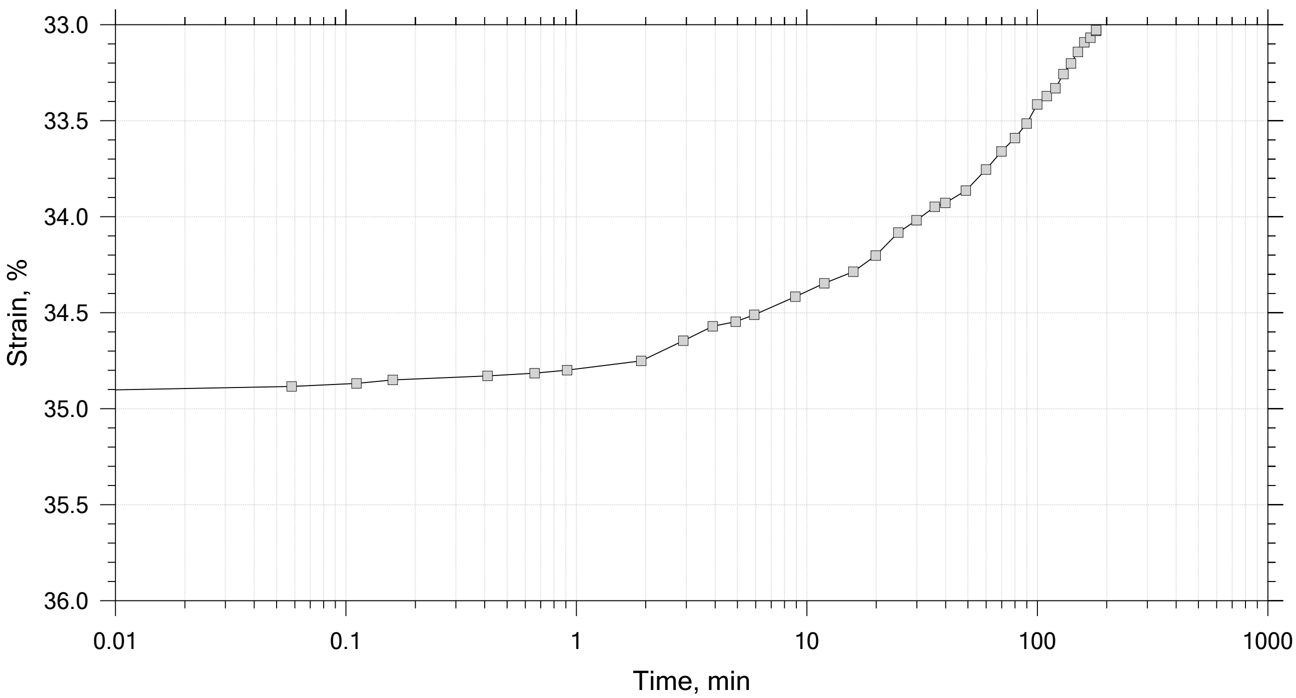


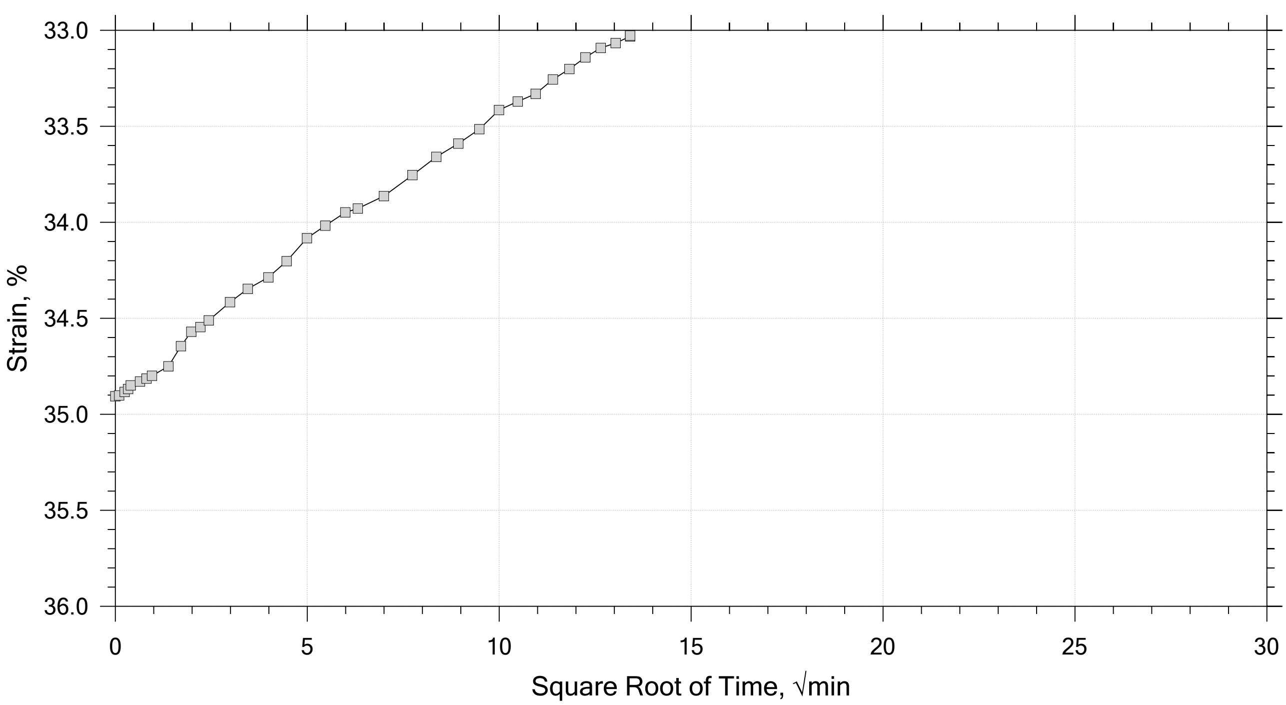


GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB022	Tested By: md	Checked By: njh
	Sample No.: SL0812	Test Date: 01/10/19	Depth: 7-9 ft
	Test No.: IP-6	Sample Type: intact	Elevation: ---
	Description: Moist, brown and gray clay		
	Remarks: System K, Swell Pressure = 0.068 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 15
Constant Load Step
Stress: 0.5 tsf





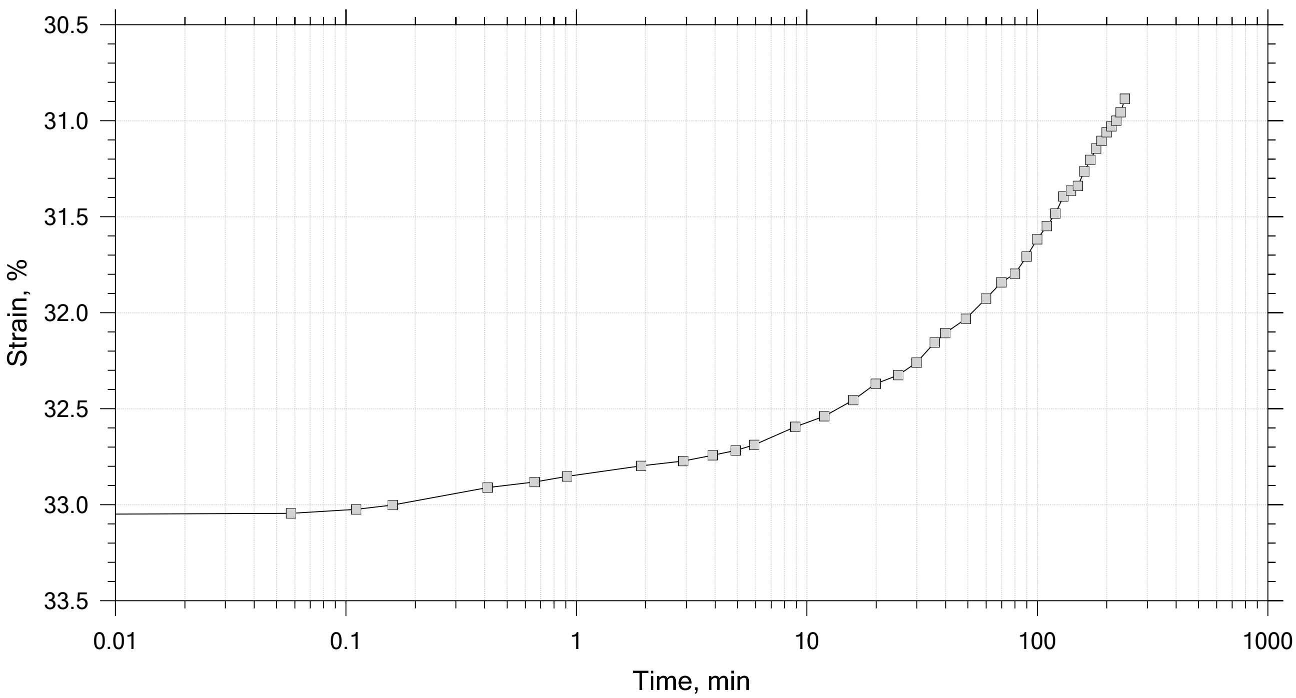
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB022	Tested By: md	Checked By: njh
	Sample No.: SL0812	Test Date: 01/10/19	Depth: 7-9 ft
	Test No.: IP-6	Sample Type: intact	Elevation: ---
	Description: Moist, brown and gray clay		
	Remarks: System K, Swell Pressure = 0.068 tsf		

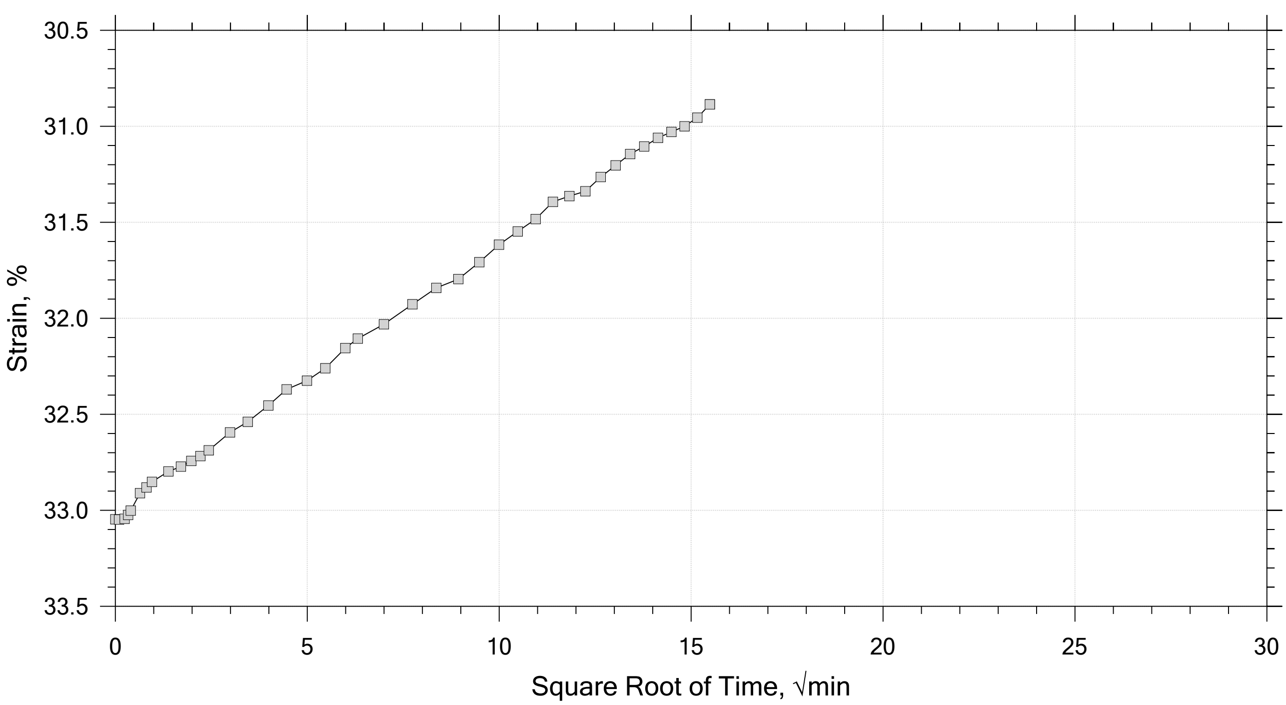
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 15

Constant Load Step

Stress: 0.125 tsf





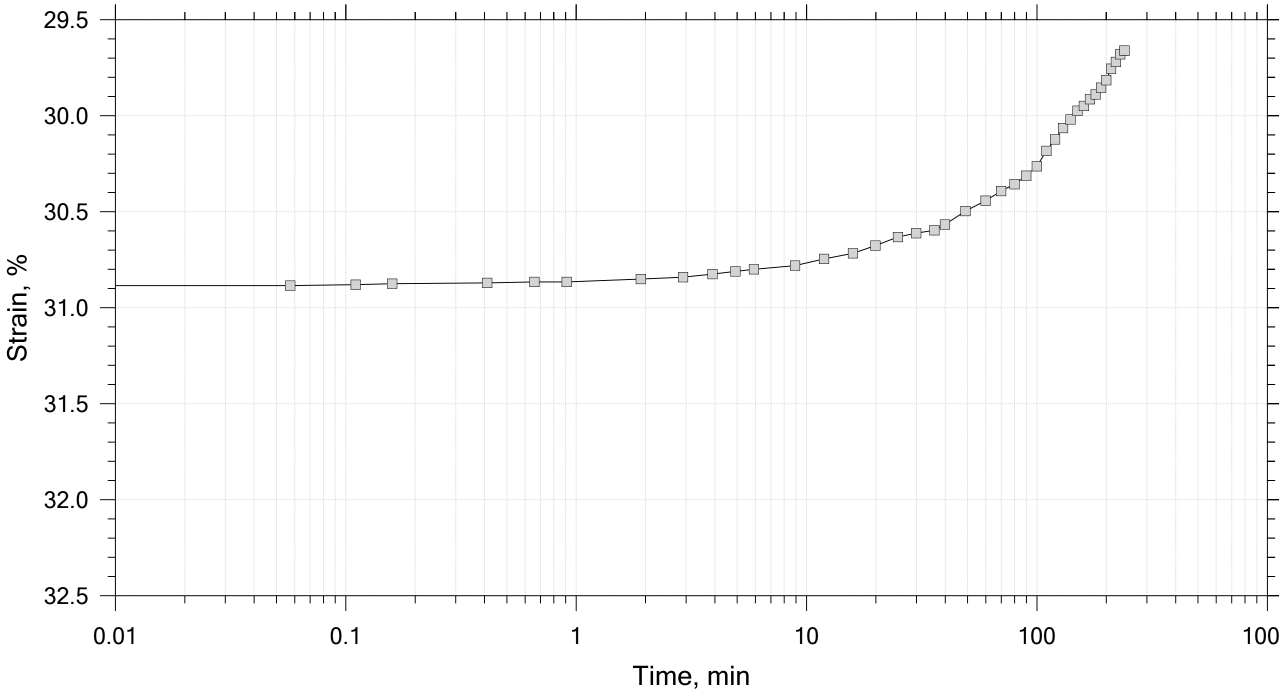
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB022	Tested By: md	Checked By: njh
	Sample No.: SL0812	Test Date: 01/10/19	Depth: 7-9 ft
	Test No.: IP-6	Sample Type: intact	Elevation: ---
	Description: Moist, brown and gray clay		
	Remarks: System K, Swell Pressure = 0.068 tsf		

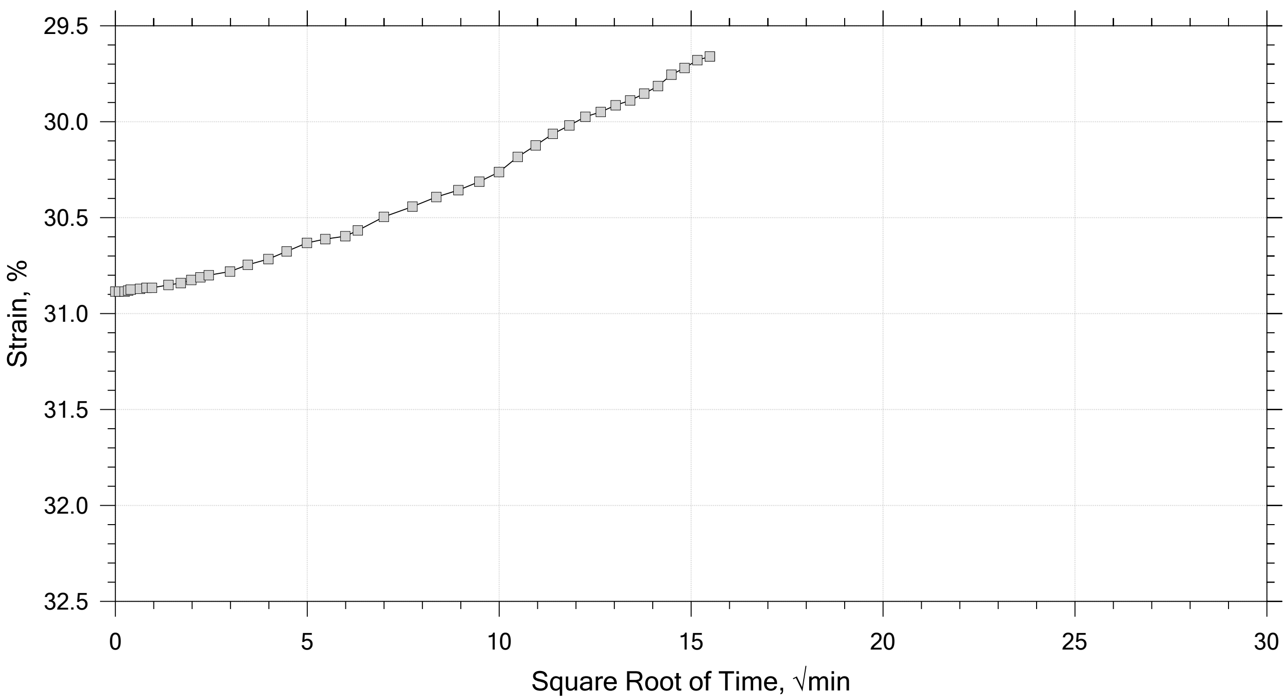
One-Dimensional Consolidation by ASTM D2435 - Method B

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.: 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

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

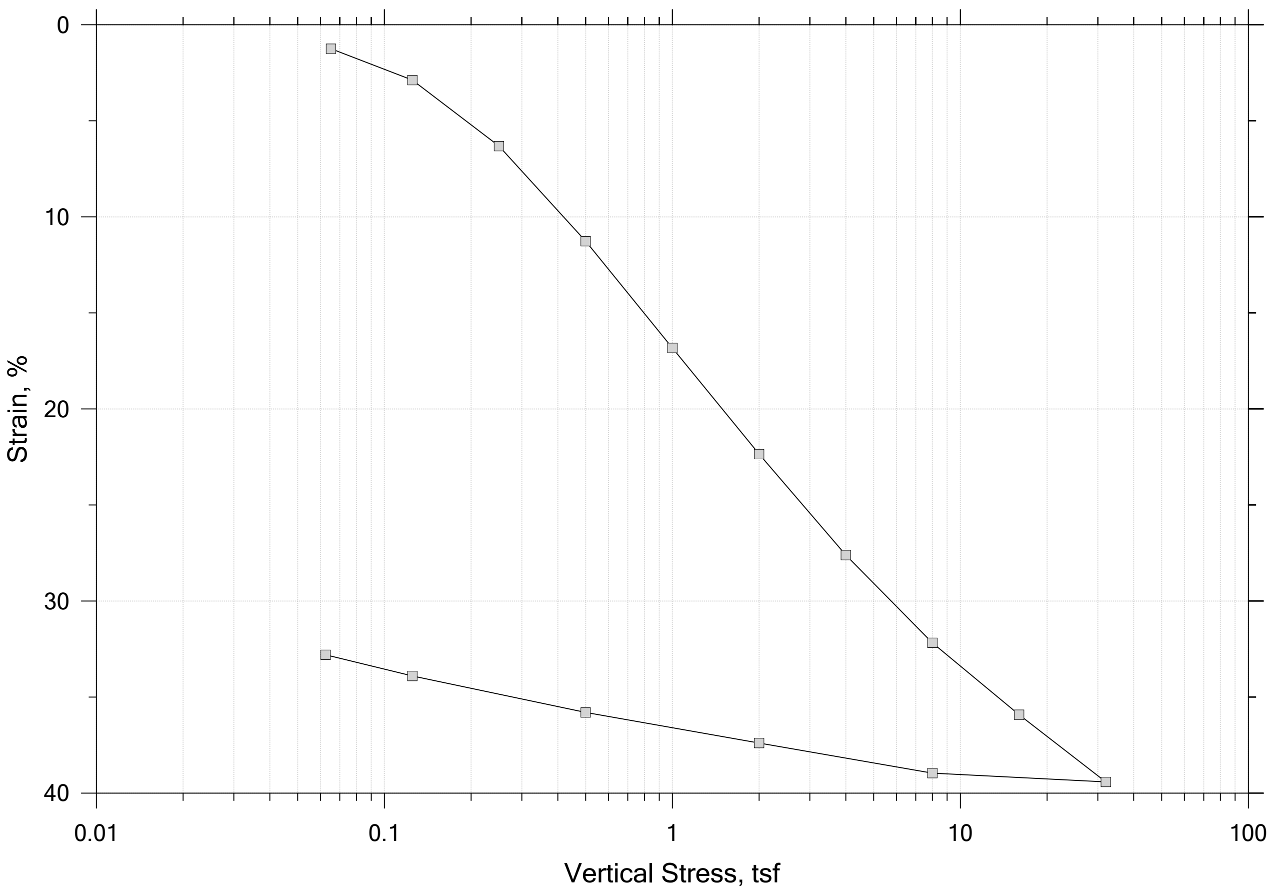
Square Root of Time Coefficients

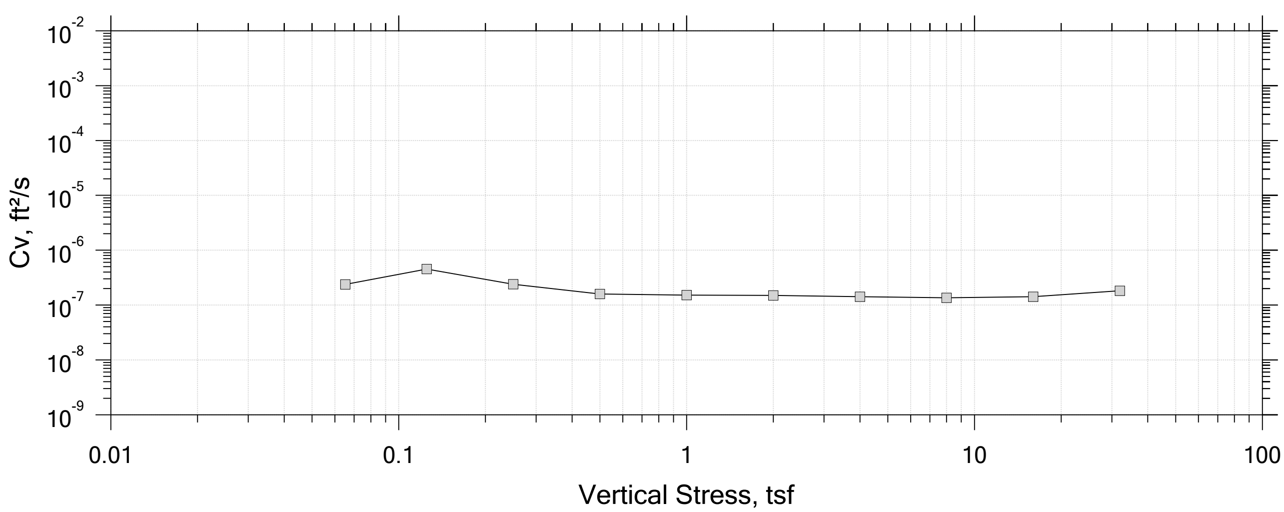
Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Sq.Rt. T90 min	Cv ft²/s	Mv 1/tsf	k ft/day
1	0.0680	0.004598	1.37	0.460	4.741	5.15e-06	6.76e-02	9.40e-04
2	0.125	0.01283	1.35	1.28	17.245	1.40e-06	1.44e-01	5.45e-04
3	0.250	0.03156	1.30	3.16	20.331	1.15e-06	1.50e-01	4.66e-04
4	0.500	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

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

Summary Report

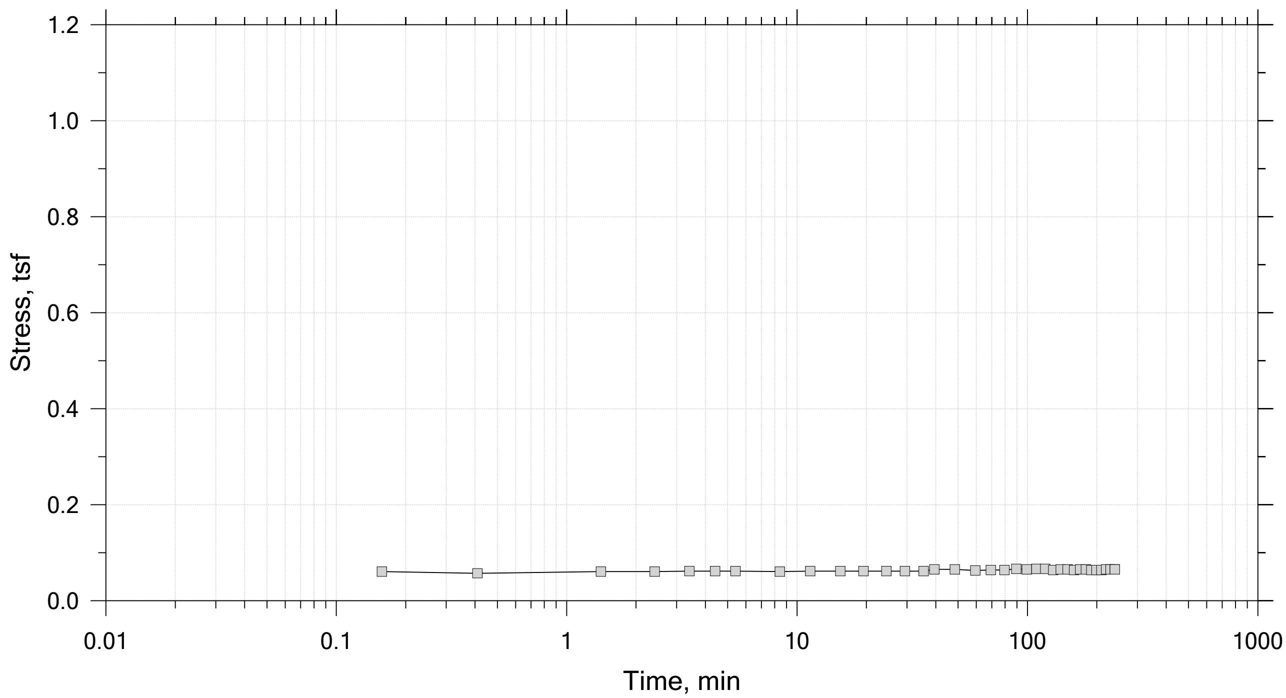


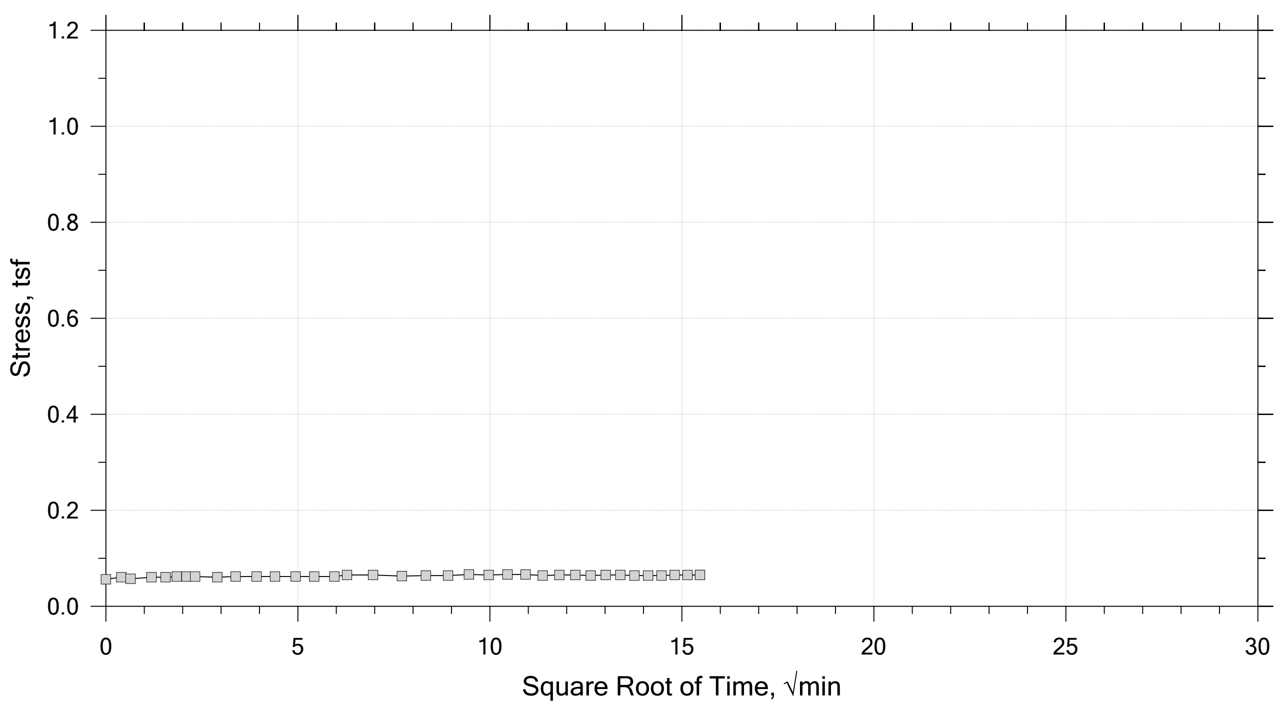


GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB038	Tested By: md	Checked By: njh
	Sample No.: SL0896	Test Date: 02/14/19	Depth: 11-13 ft
	Test No.: IP-7	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 15
Constant Volume Step
Stress: 0.0652 tsf





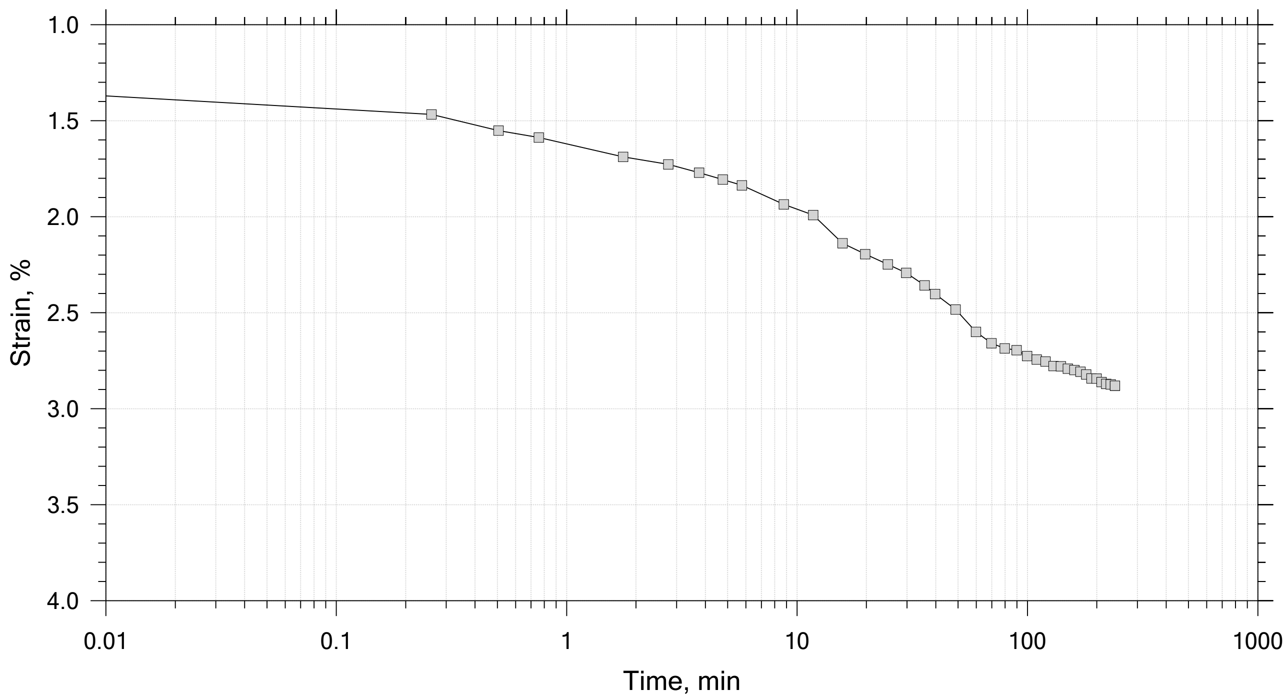
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB038	Tested By: md	Checked By: njh
	Sample No.: SL0896	Test Date: 02/14/19	Depth: 11-13 ft
	Test No.: IP-7	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

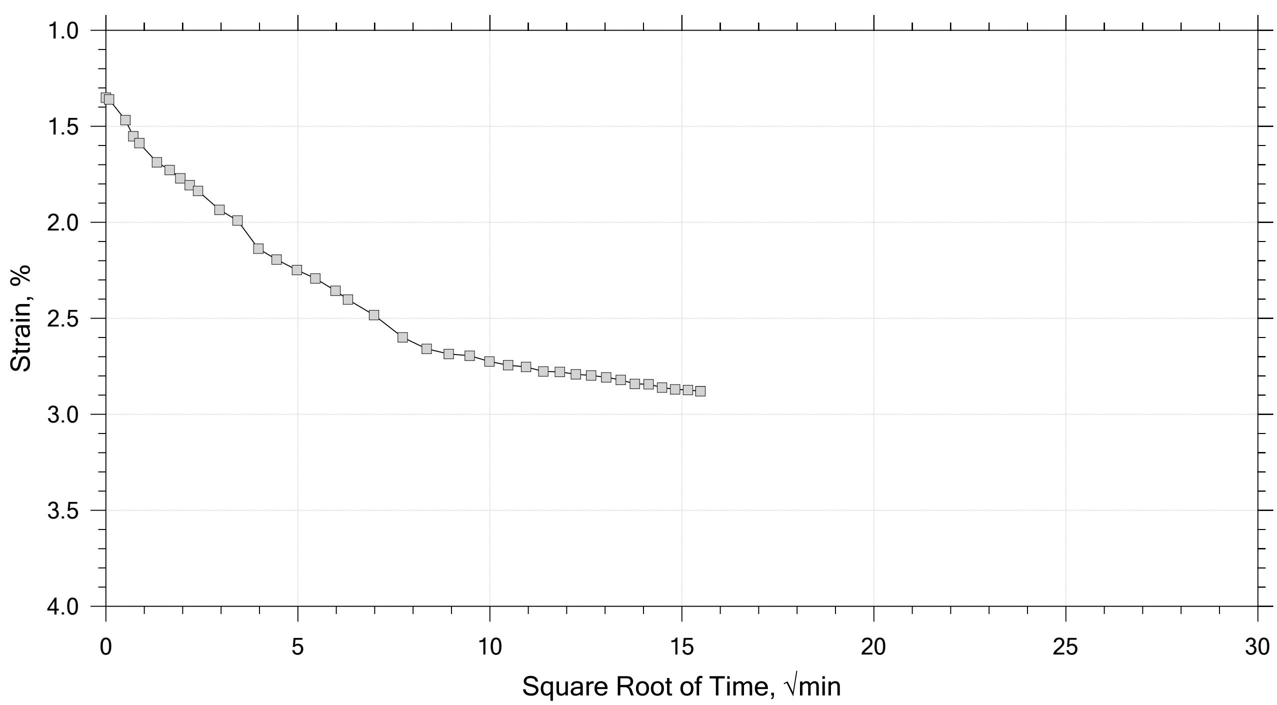
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 15

Constant Load Step

Stress: 0.125 tsf





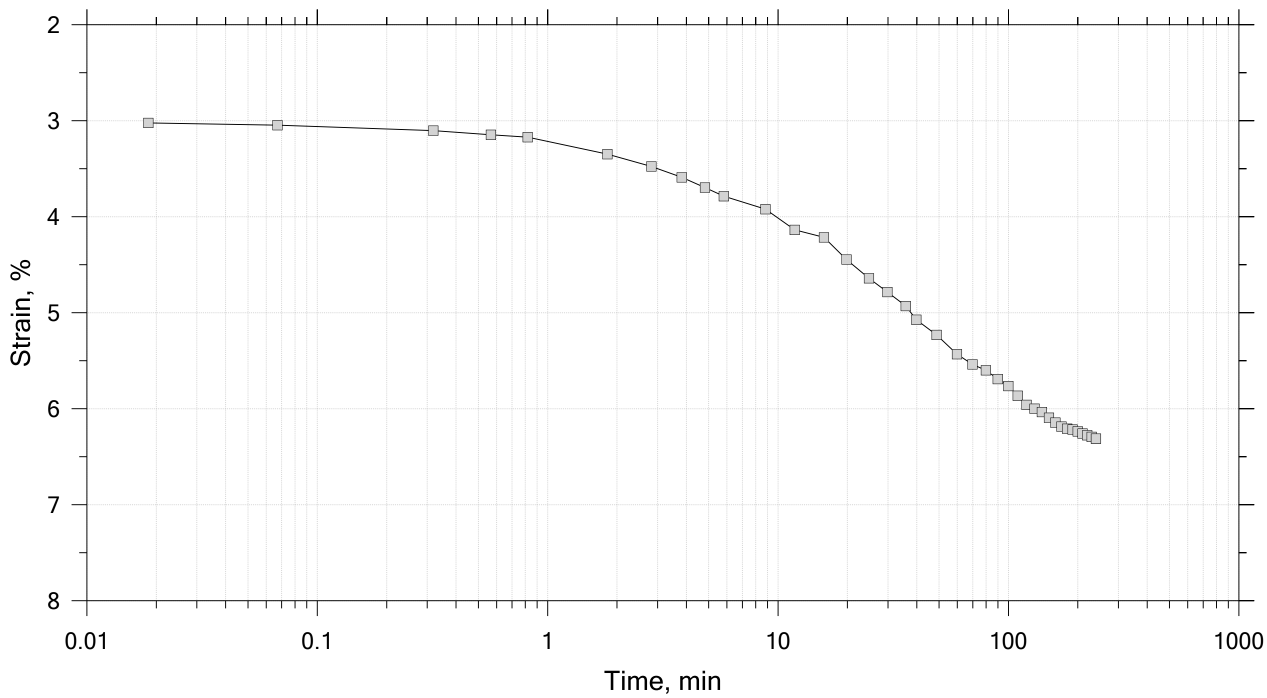
GeoTesting EXPRESS			
	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB038	Tested By: md	Checked By: njh
	Sample No.: SL0896	Test Date: 02/14/19	Depth: 11-13 ft
	Test No.: IP-7	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

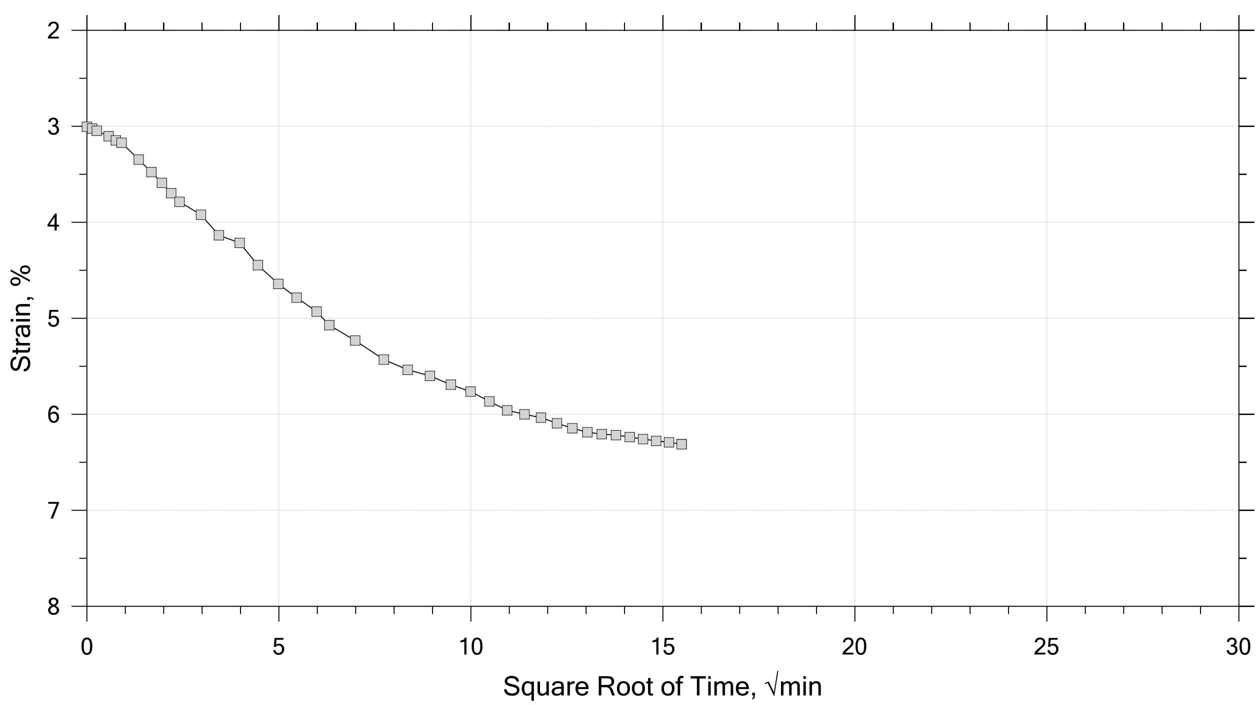
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 15

Constant Load Step

Stress: 0.25 tsf





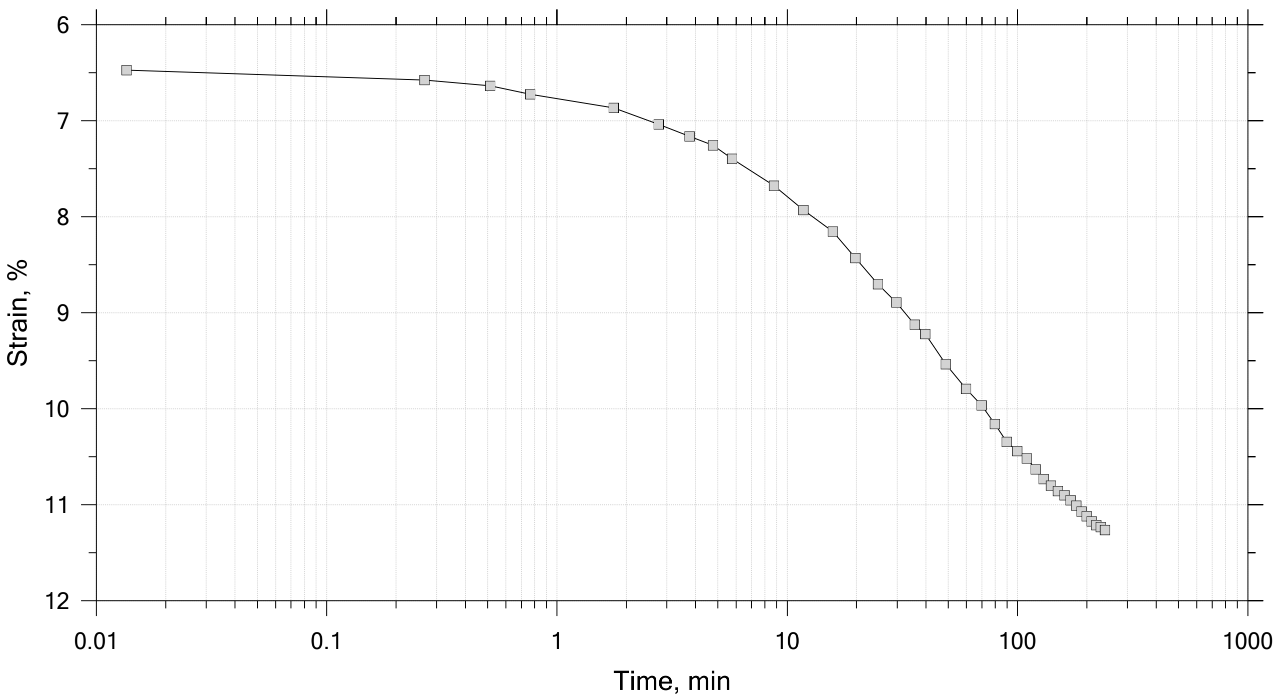
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB038	Tested By: md	Checked By: njh
	Sample No.: SL0896	Test Date: 02/14/19	Depth: 11-13 ft
	Test No.: IP-7	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

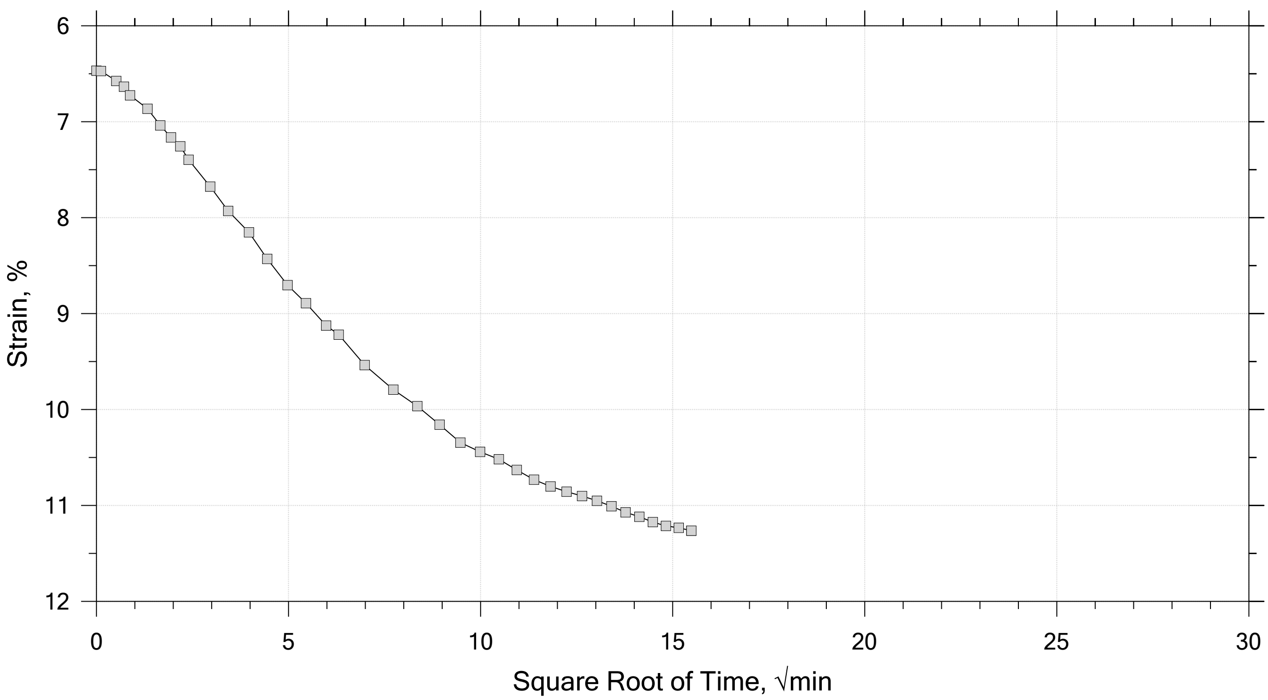
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 15

Constant Load Step

Stress: 0.5 tsf

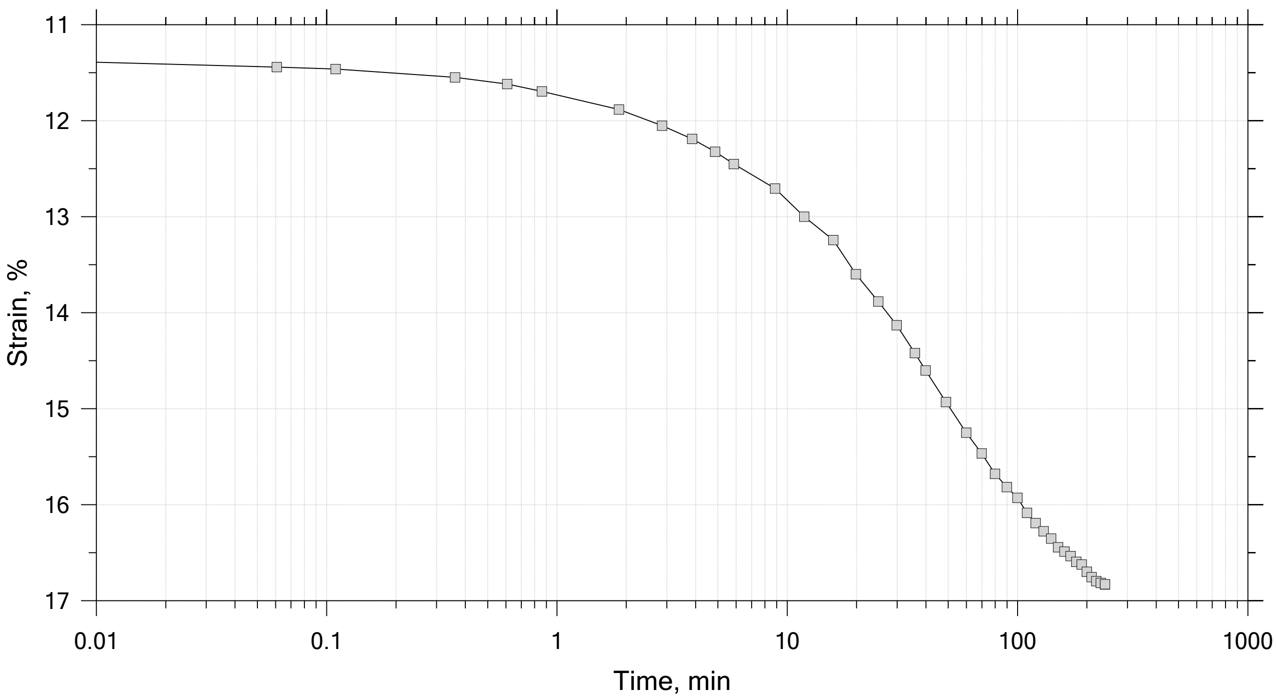


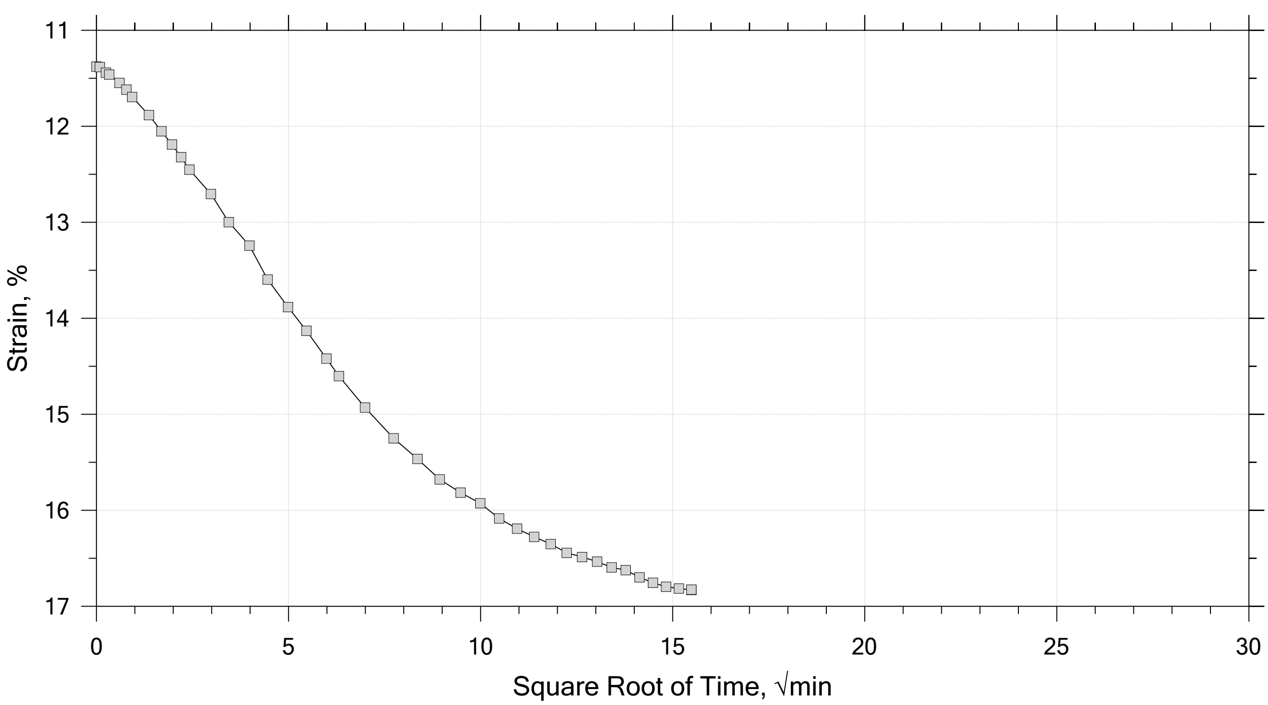


Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB038	Tested By: md	Checked By: njh
Sample No.: SL0896	Test Date: 02/14/19	Depth: 11-13 ft
Test No.: IP-7	Sample Type: intact	Elevation: ---
Description: Moist, dark gray clay		
Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 15
Constant Load Step
Stress: 1 tsf





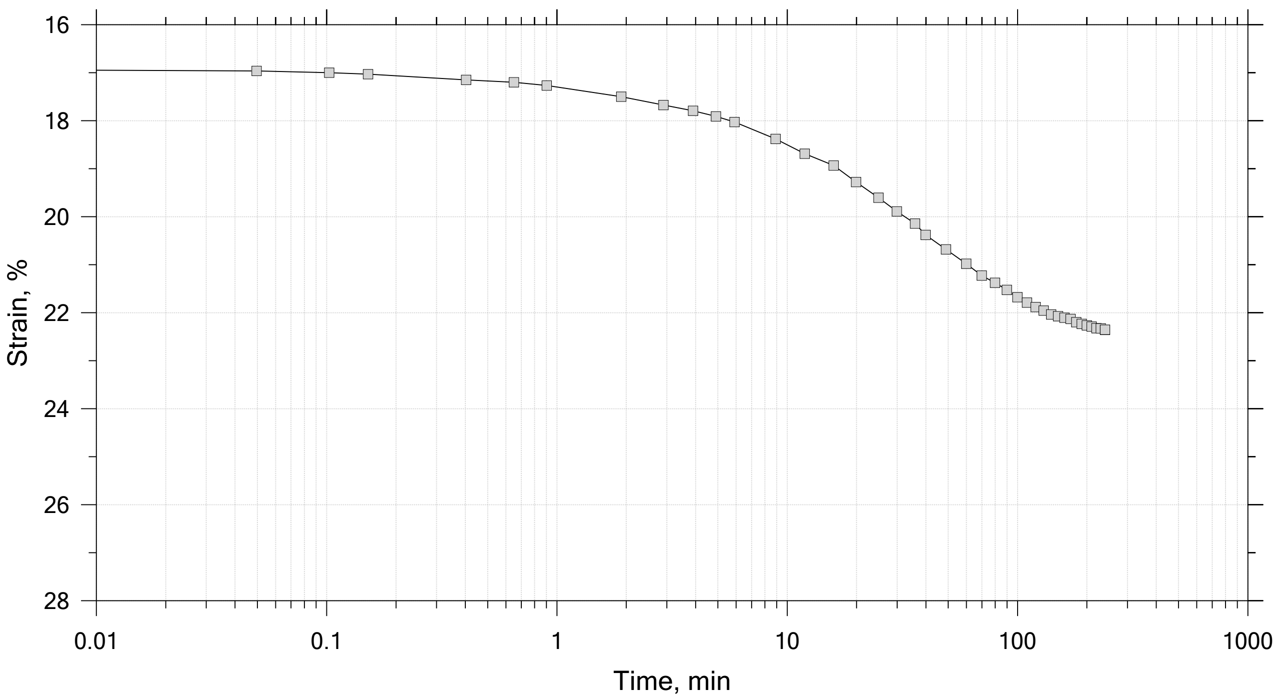
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB038	Tested By: md	Checked By: njh
	Sample No.: SL0896	Test Date: 02/14/19	Depth: 11-13 ft
	Test No.: IP-7	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

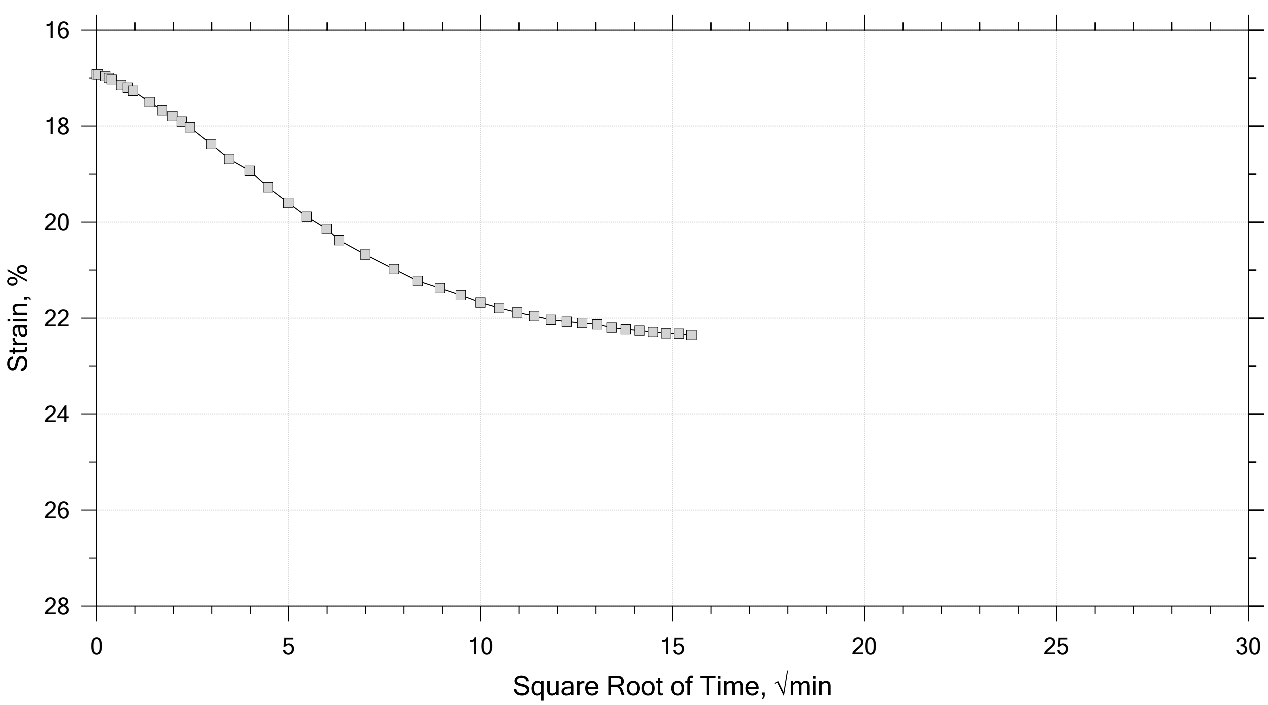
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 15

Constant Load Step

Stress: 2 tsf





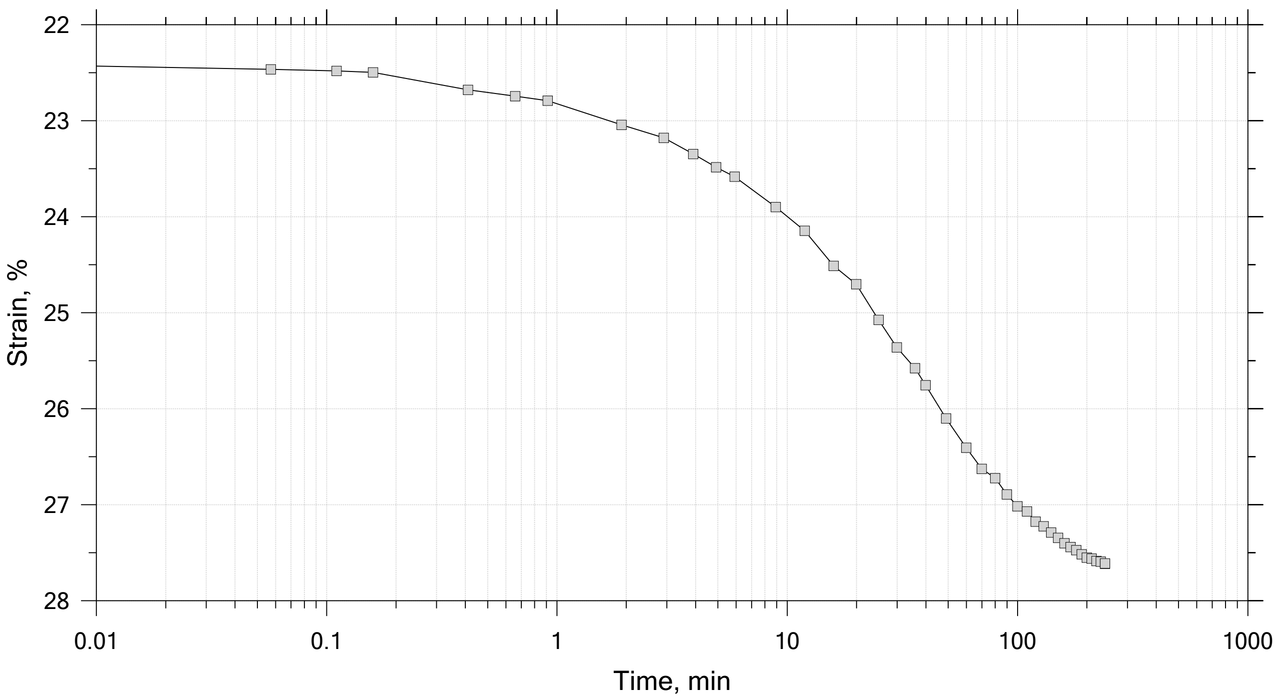
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB038	Tested By: md	Checked By: njh
	Sample No.: SL0896	Test Date: 02/14/19	Depth: 11-13 ft
	Test No.: IP-7	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

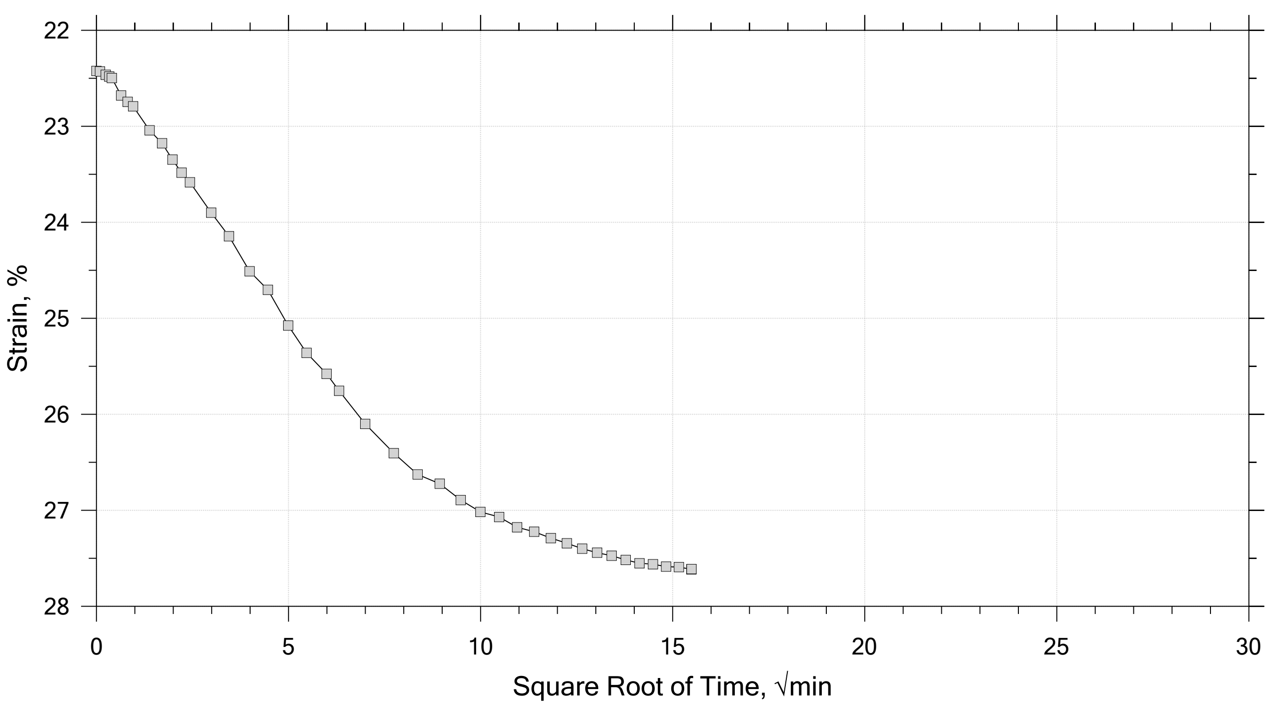
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 15

Constant Load Step

Stress: 4 tsf





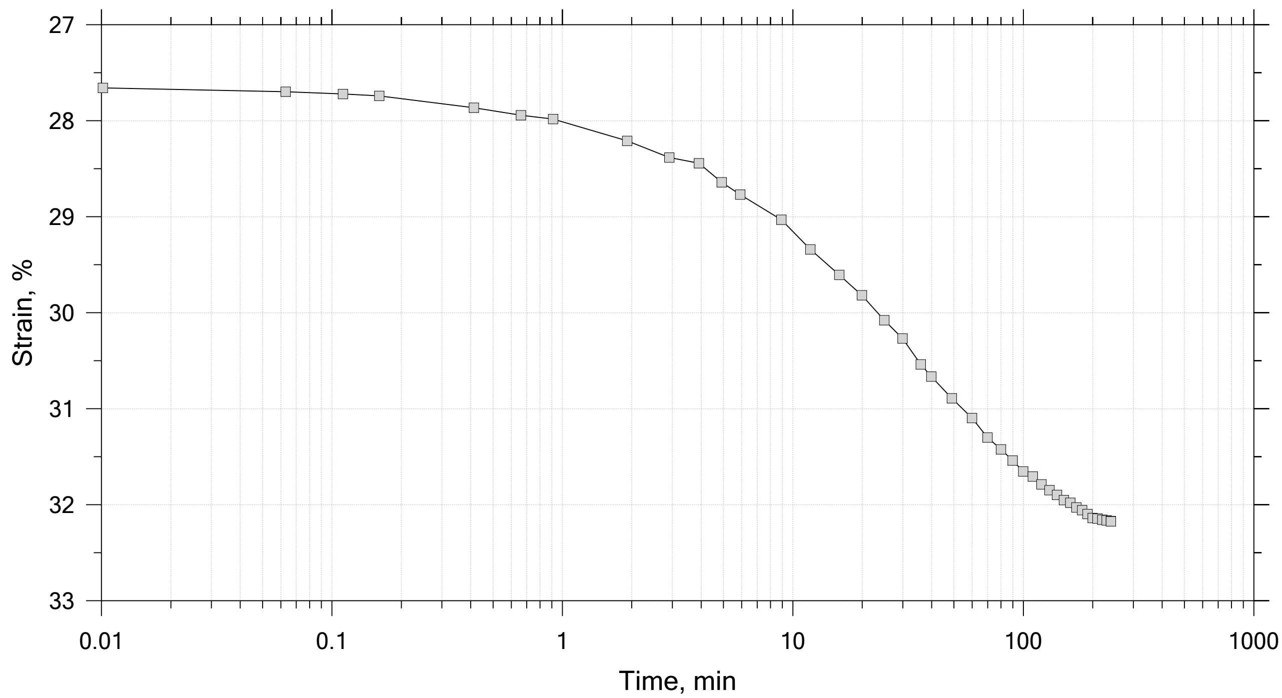
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB038	Tested By: md	Checked By: njh
	Sample No.: SL0896	Test Date: 02/14/19	Depth: 11-13 ft
	Test No.: IP-7	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

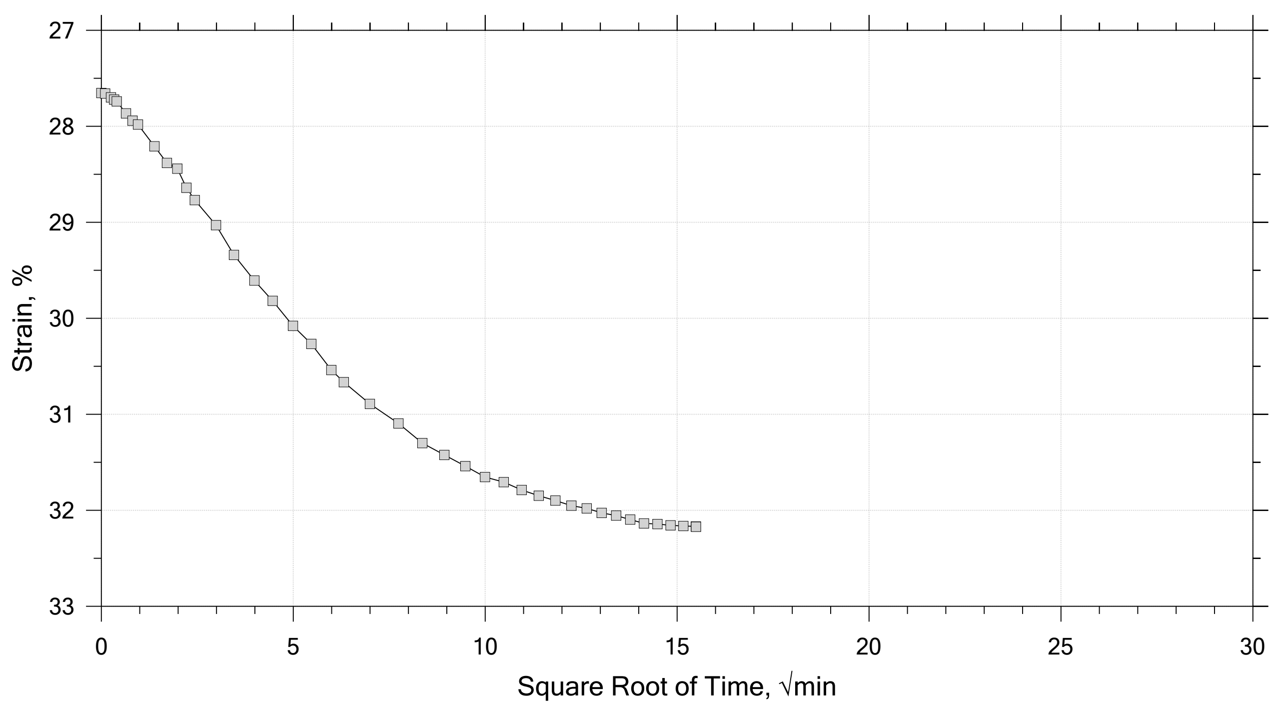
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 15

Constant Load Step

Stress: 8 tsf





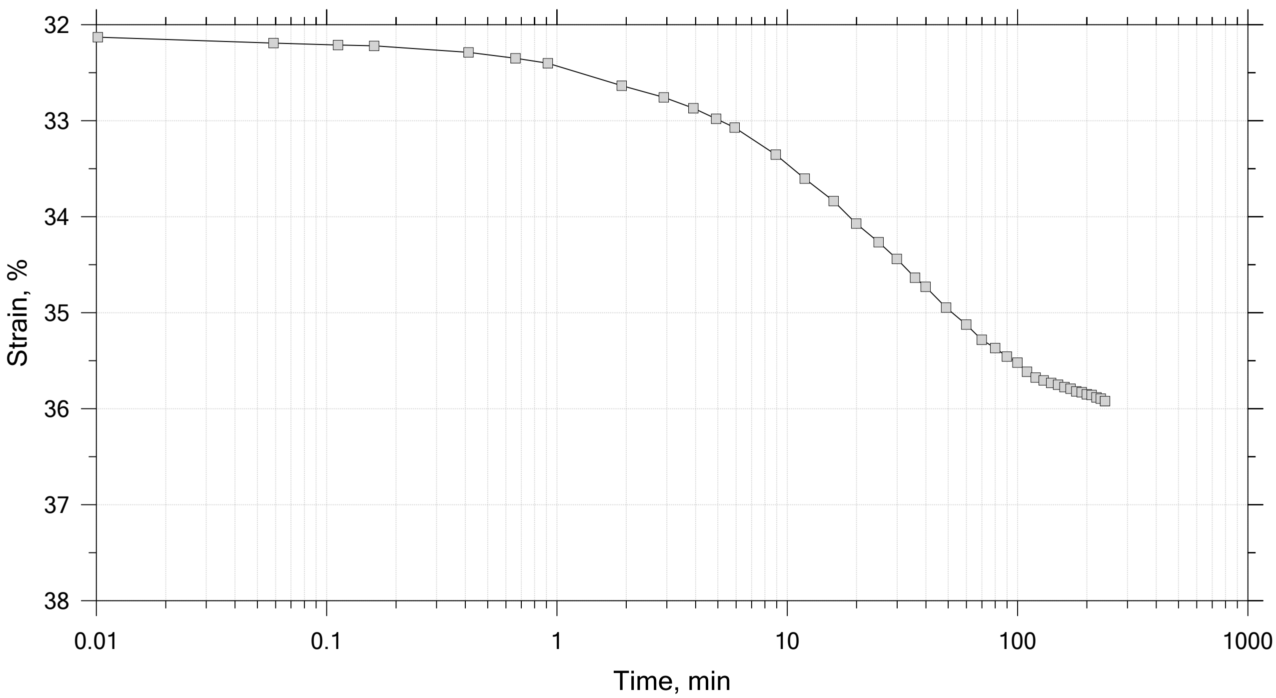
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB038	Tested By: md	Checked By: njh
	Sample No.: SL0896	Test Date: 02/14/19	Depth: 11-13 ft
	Test No.: IP-7	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

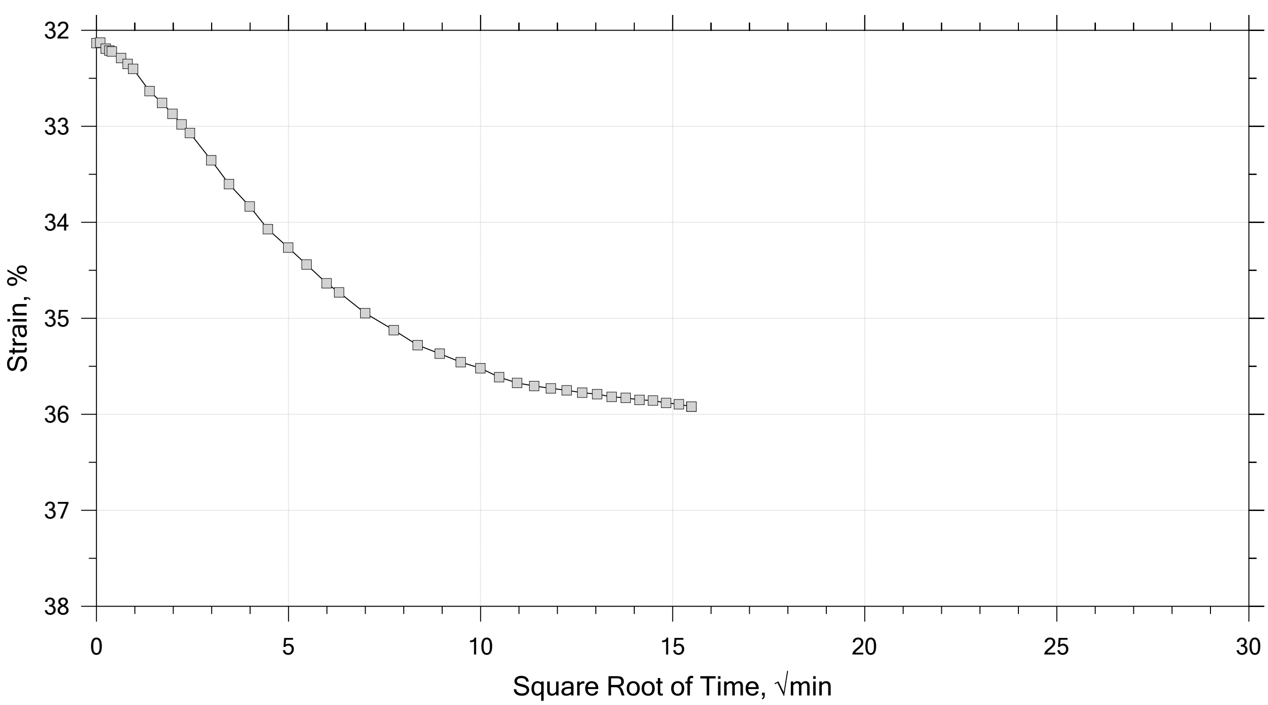
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 15

Constant Load Step

Stress: 16 tsf

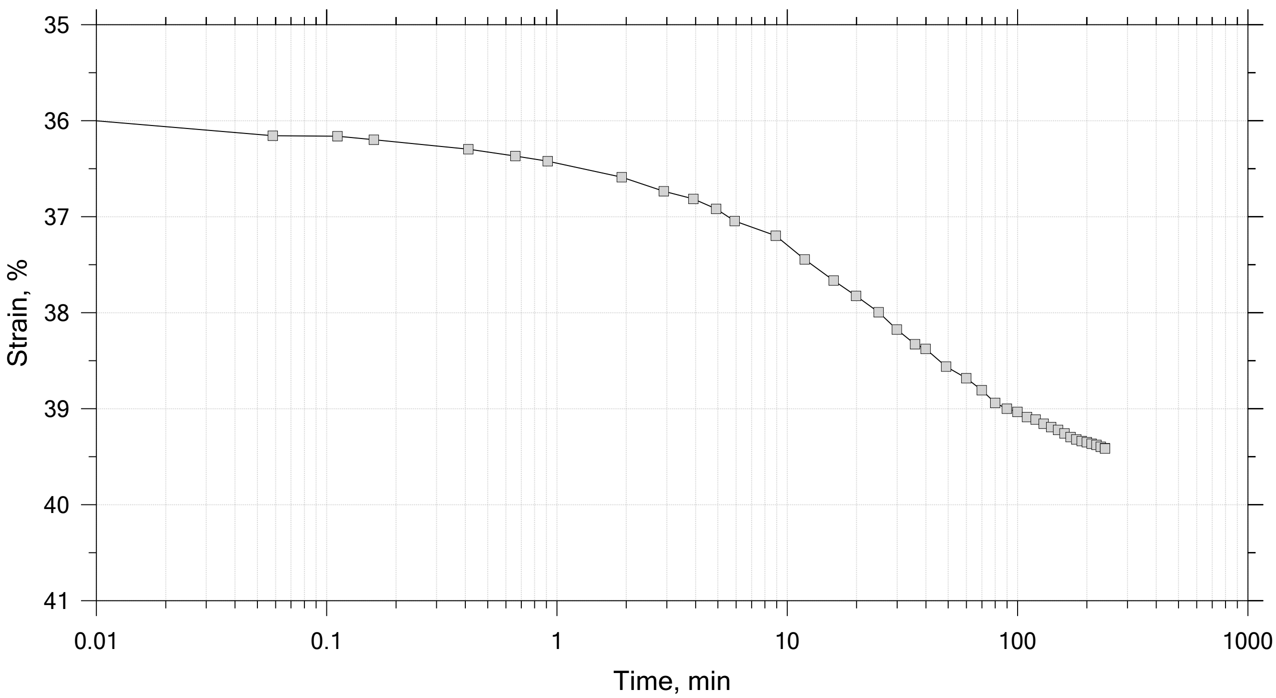


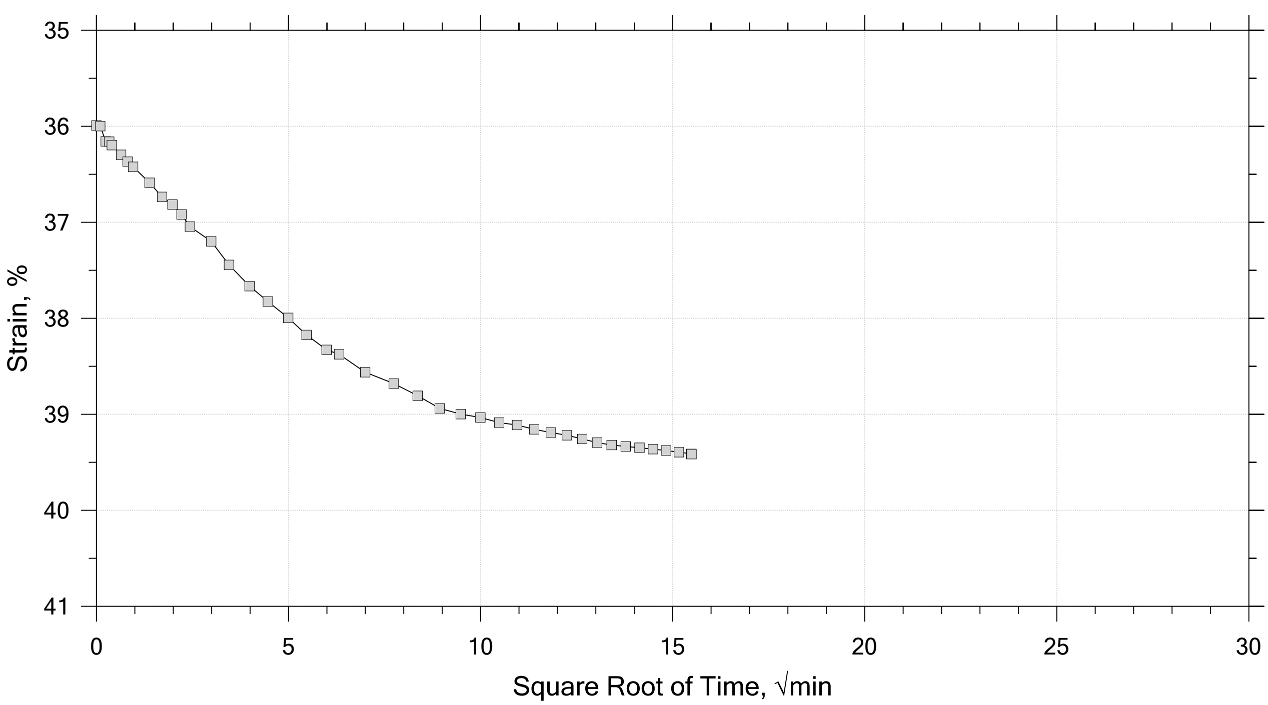


GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB038	Tested By: md	Checked By: njh
	Sample No.: SL0896	Test Date: 02/14/19	Depth: 11-13 ft
	Test No.: IP-7	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 15
Constant Load Step
Stress: 32 tsf

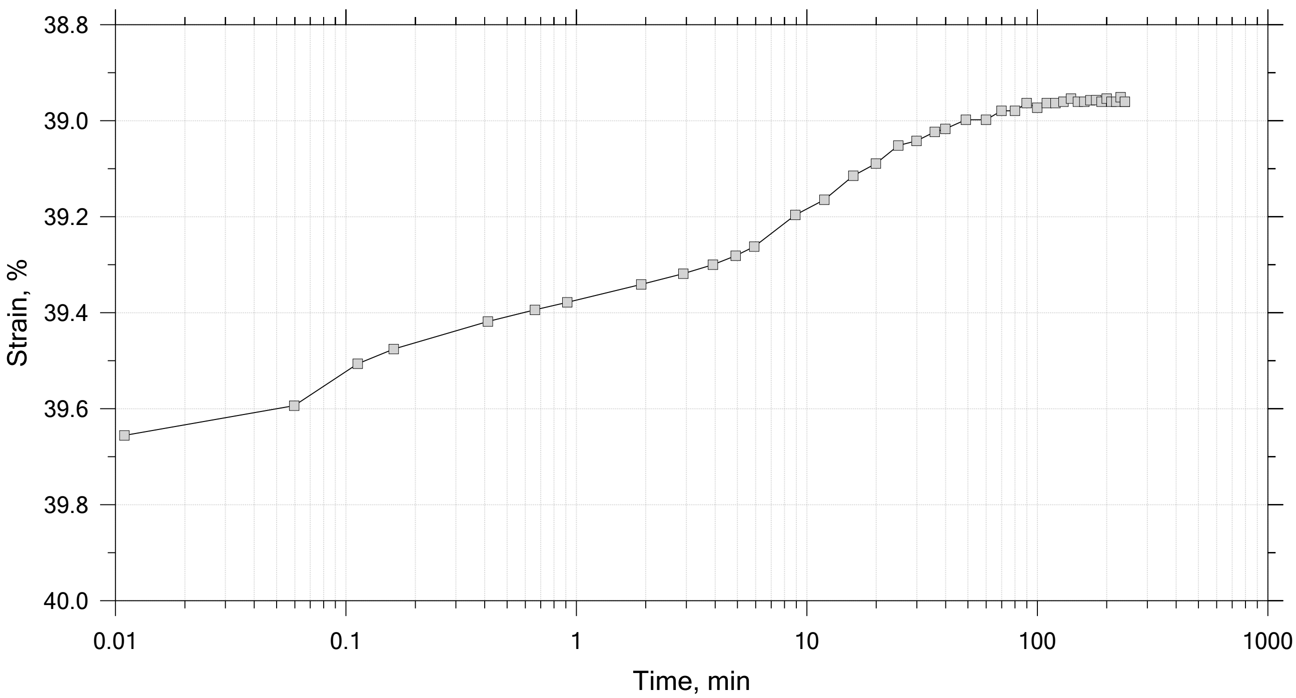


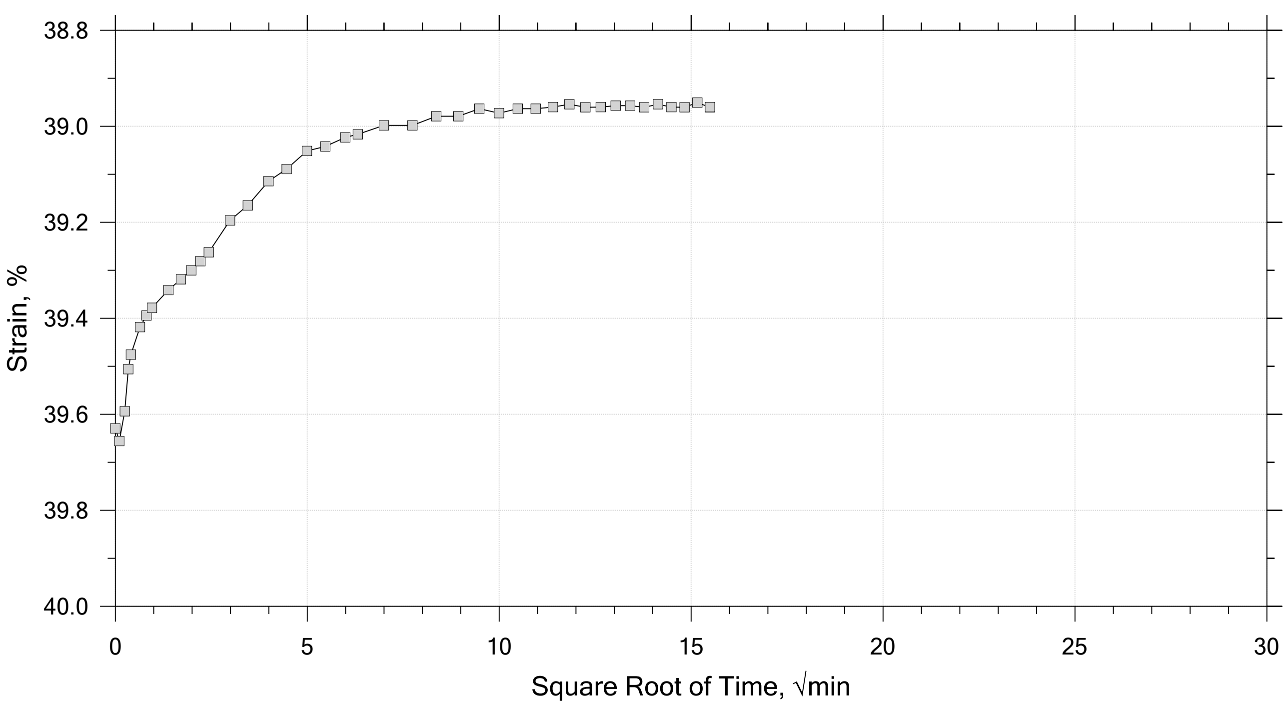


GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB038	Tested By: md	Checked By: njh
	Sample No.: SL0896	Test Date: 02/14/19	Depth: 11-13 ft
	Test No.: IP-7	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 15
Constant Load Step
Stress: 8 tsf

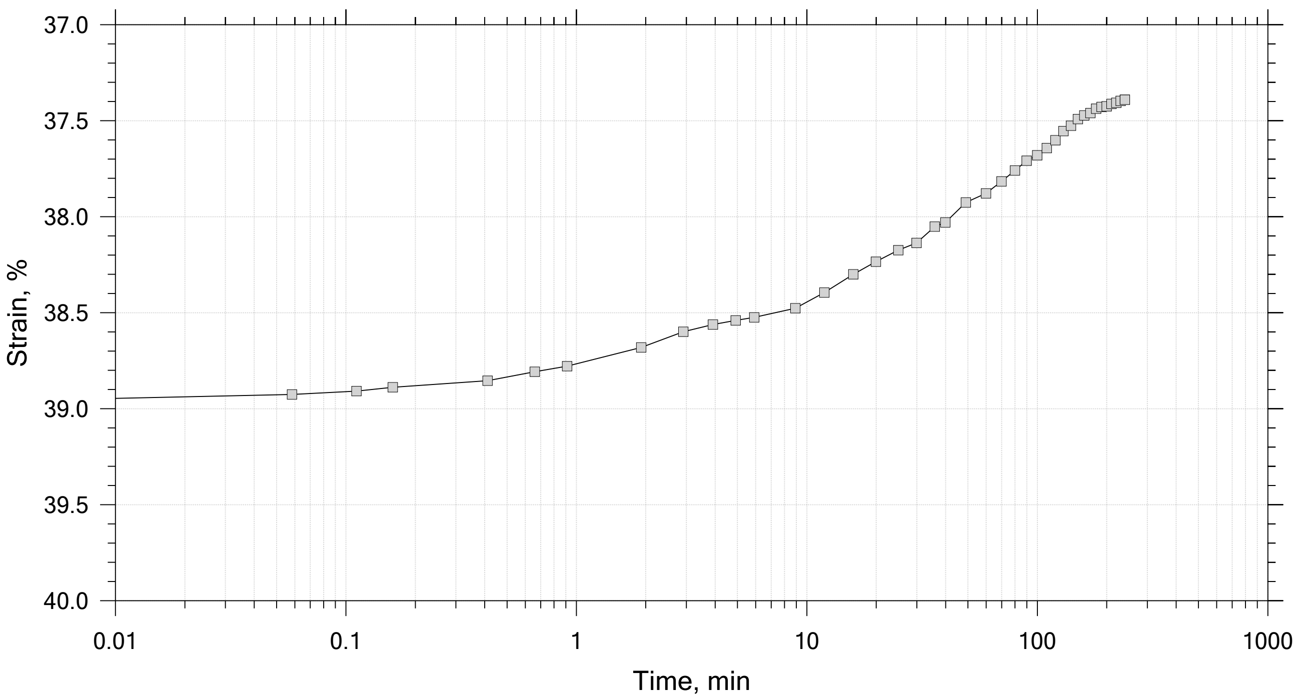


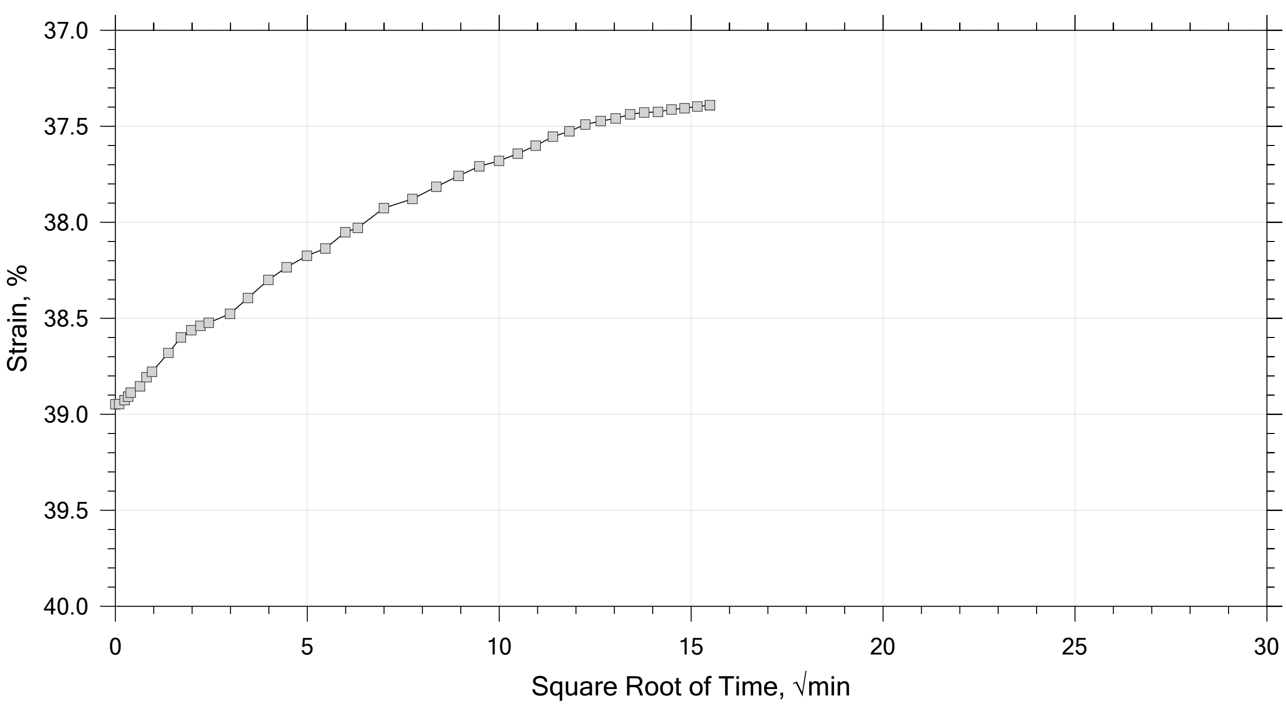


GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB038	Tested By: md	Checked By: njh
	Sample No.: SL0896	Test Date: 02/14/19	Depth: 11-13 ft
	Test No.: IP-7	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 15
Constant Load Step
Stress: 2 tsf

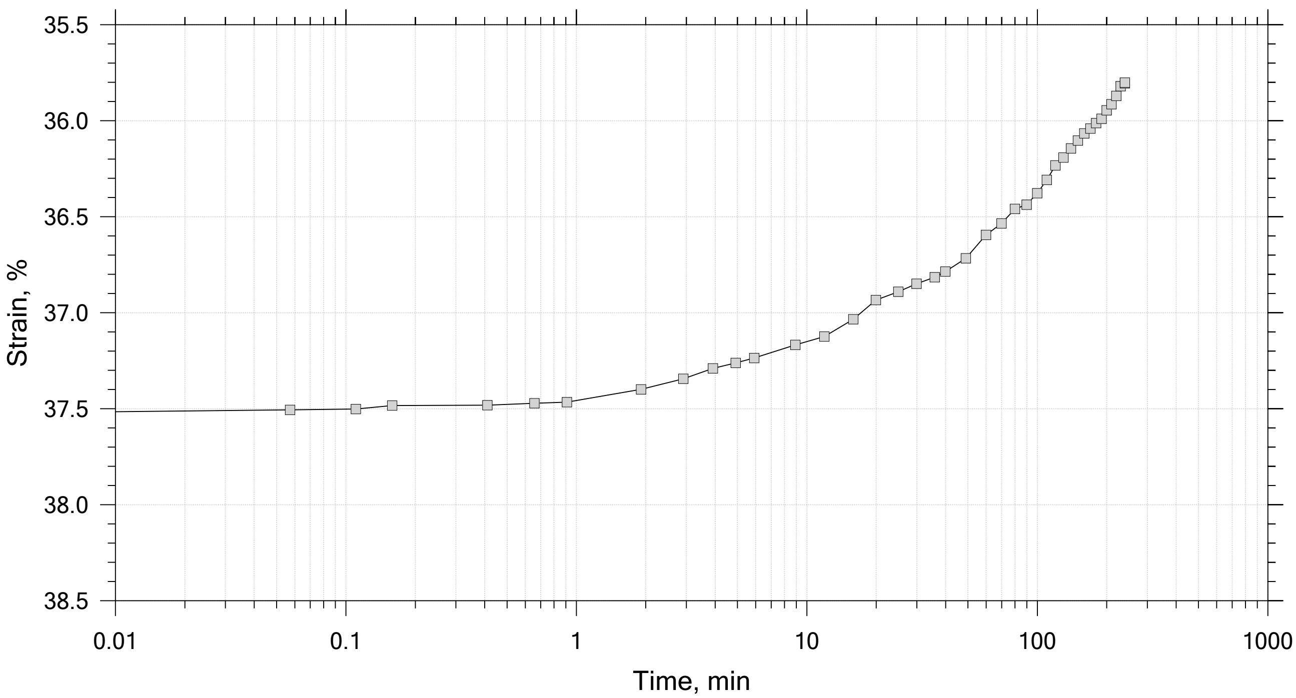


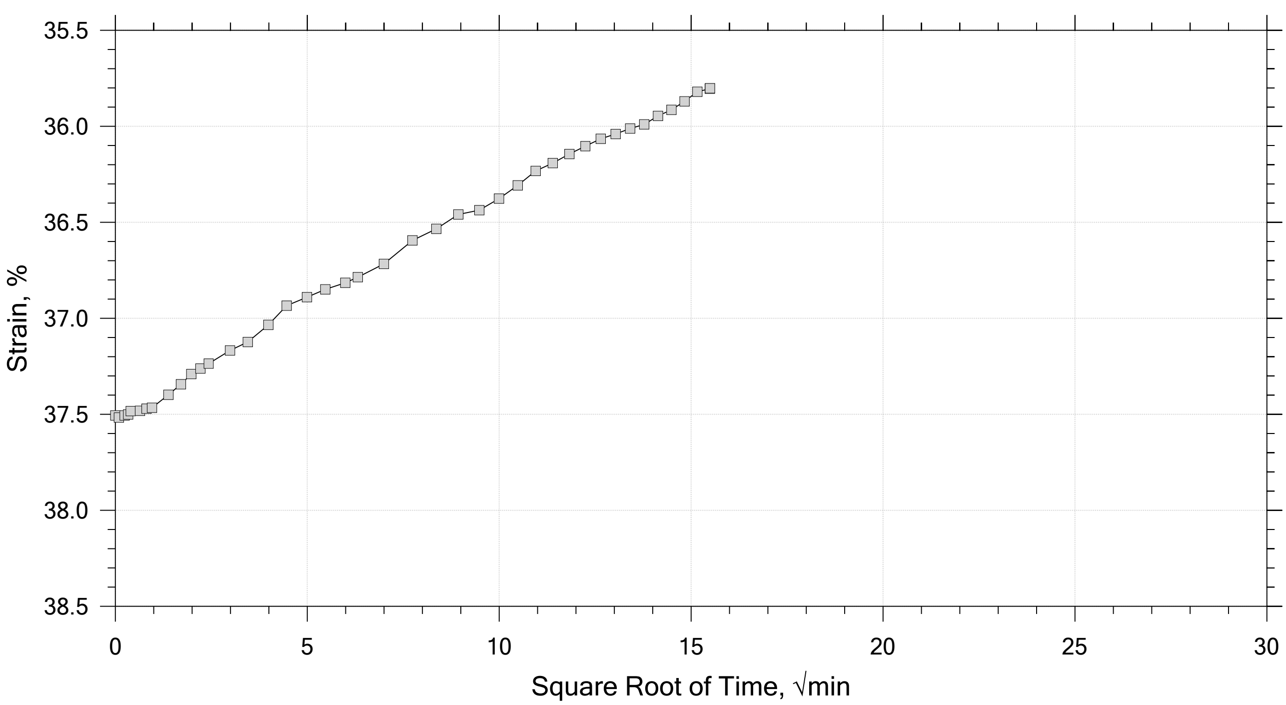


GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB038	Tested By: md	Checked By: njh
	Sample No.: SL0896	Test Date: 02/14/19	Depth: 11-13 ft
	Test No.: IP-7	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 15
Constant Load Step
Stress: 0.5 tsf





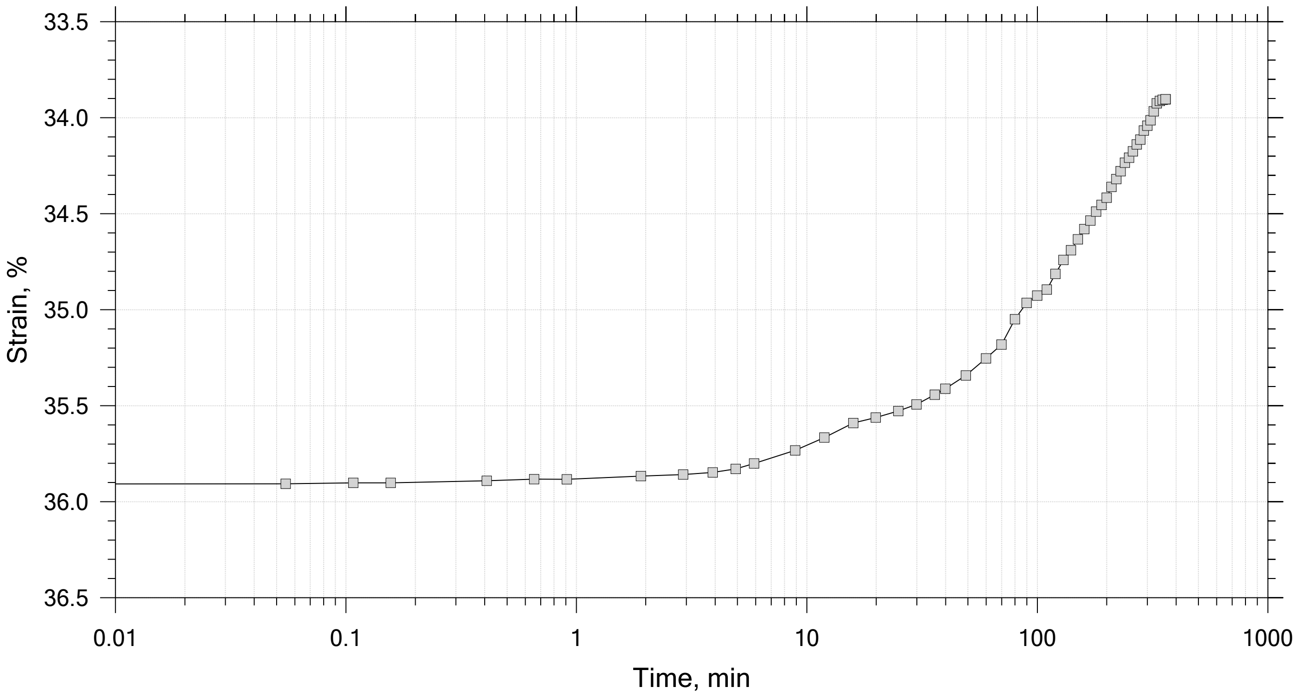
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB038	Tested By: md	Checked By: njh
	Sample No.: SL0896	Test Date: 02/14/19	Depth: 11-13 ft
	Test No.: IP-7	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

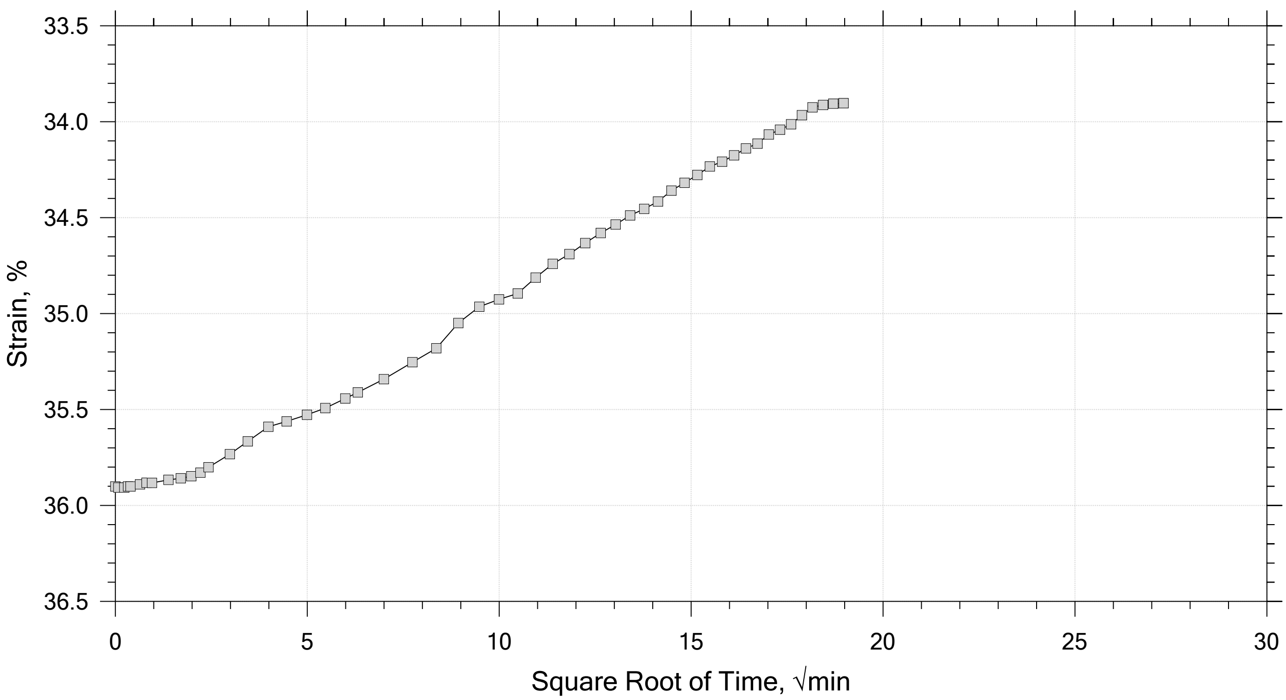
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 14 of 15

Constant Load Step

Stress: 0.125 tsf





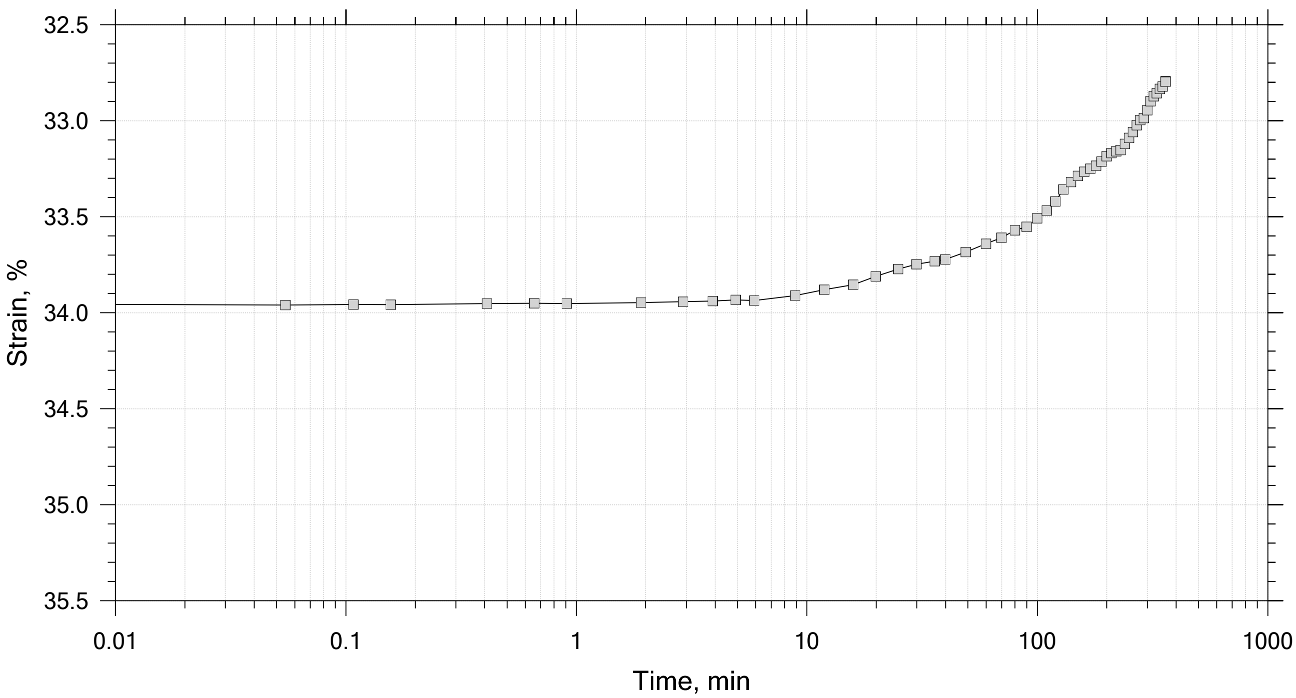
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB038	Tested By: md	Checked By: njh
	Sample No.: SL0896	Test Date: 02/14/19	Depth: 11-13 ft
	Test No.: IP-7	Sample Type: intact	Elevation: ---
	Description: Moist, dark gray clay		
	Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

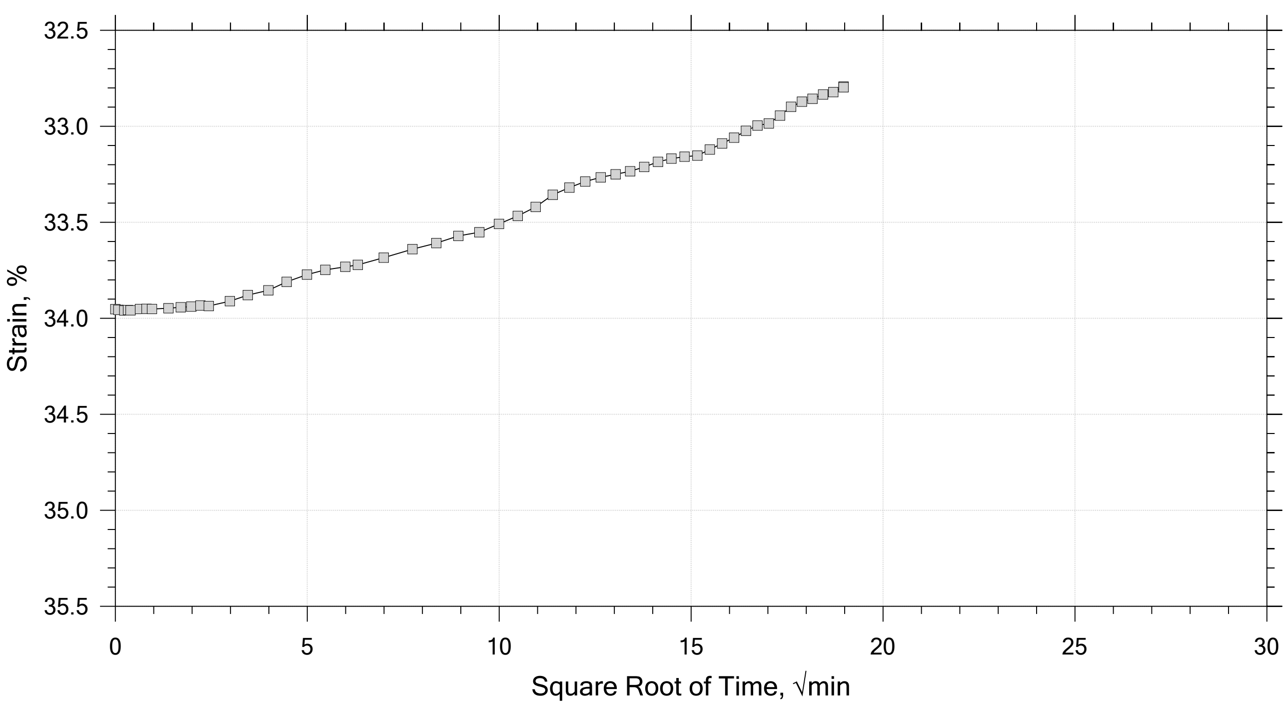
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 15

Constant Load Step

Stress: 0.0625 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

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

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

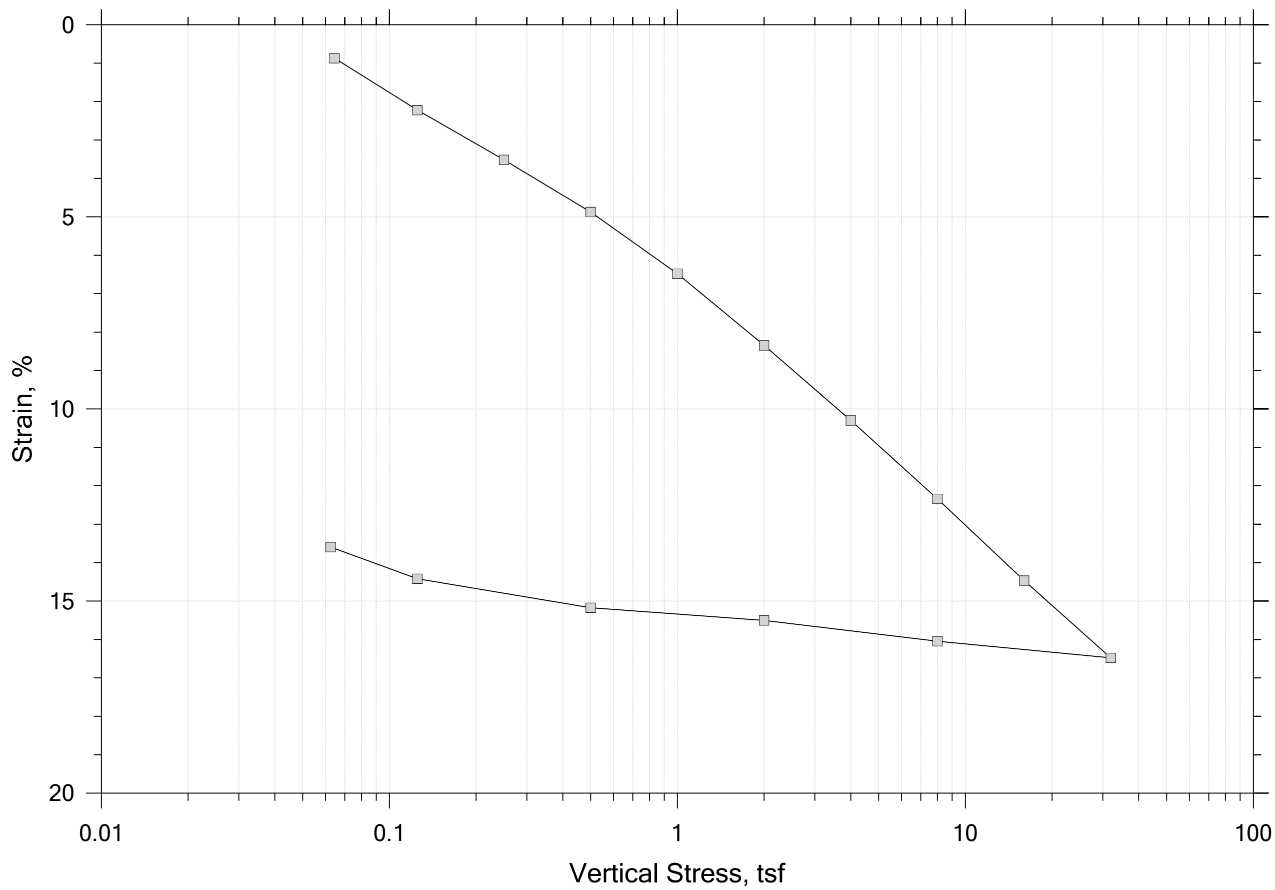
Square Root of Time Coefficients

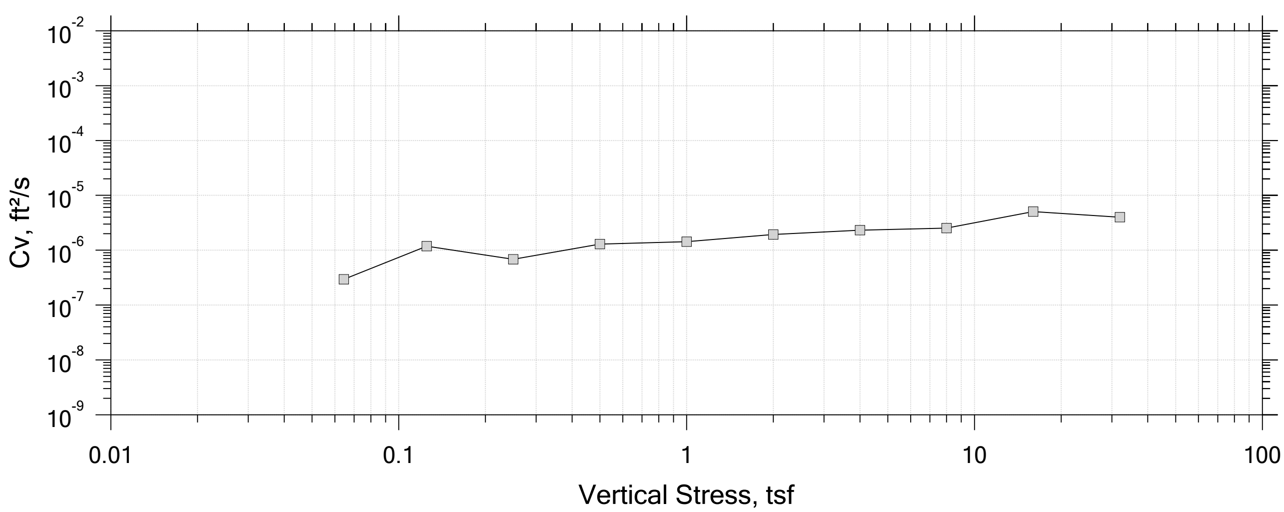
Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Sq.Rt. T90 min	Cv ft²/s	Mv 1/tsf	k ft/day
1	0.0652	0.01249	1.48	1.25	96.629	2.51e-07	1.92e-01	1.30e-04
2	0.125	0.02880	1.44	2.88	47.949	4.91e-07	2.73e-01	3.61e-04
3	0.250	0.06312	1.35	6.31	97.171	2.30e-07	2.75e-01	1.70e-04
4	0.500	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

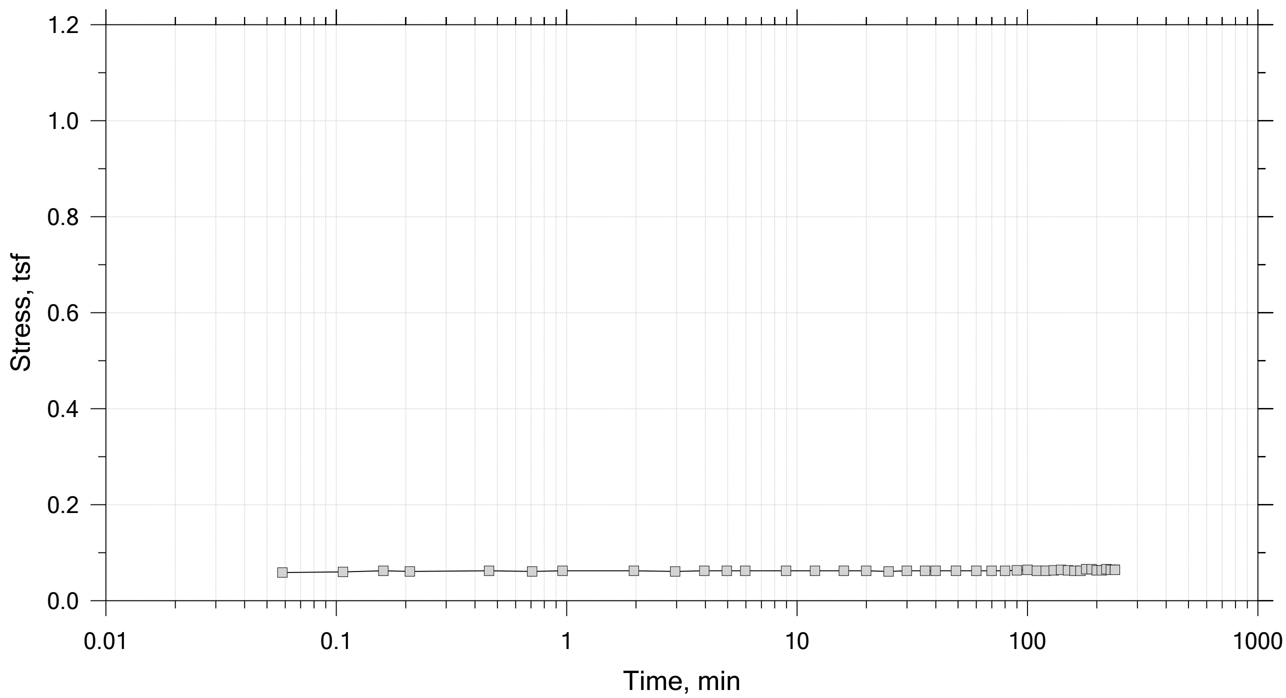


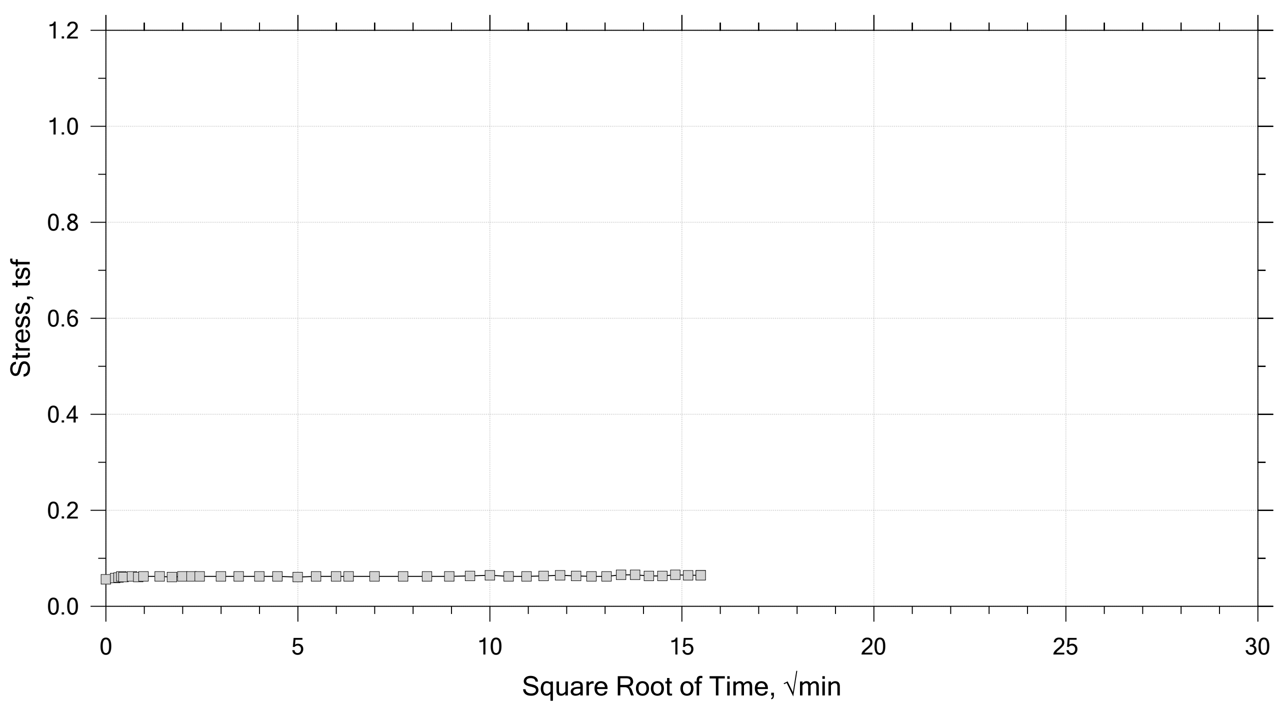


GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB012	Tested By: md	Checked By: njh
	Sample No.: SL1049	Test Date: 12/21/18	Depth: 13-15 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Wet, gray sandy clay		
	Remarks: System F, Swell Pressure = 0.0644 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 15
Constant Volume Step
Stress: 0.0644 tsf

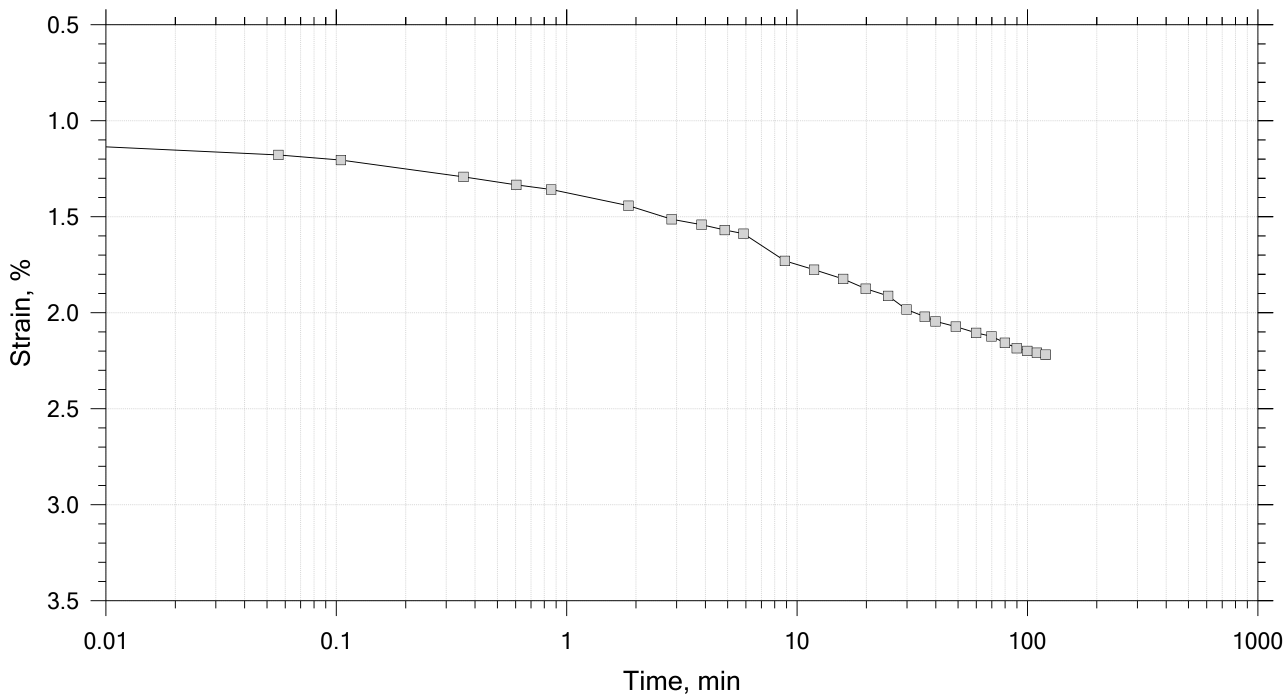


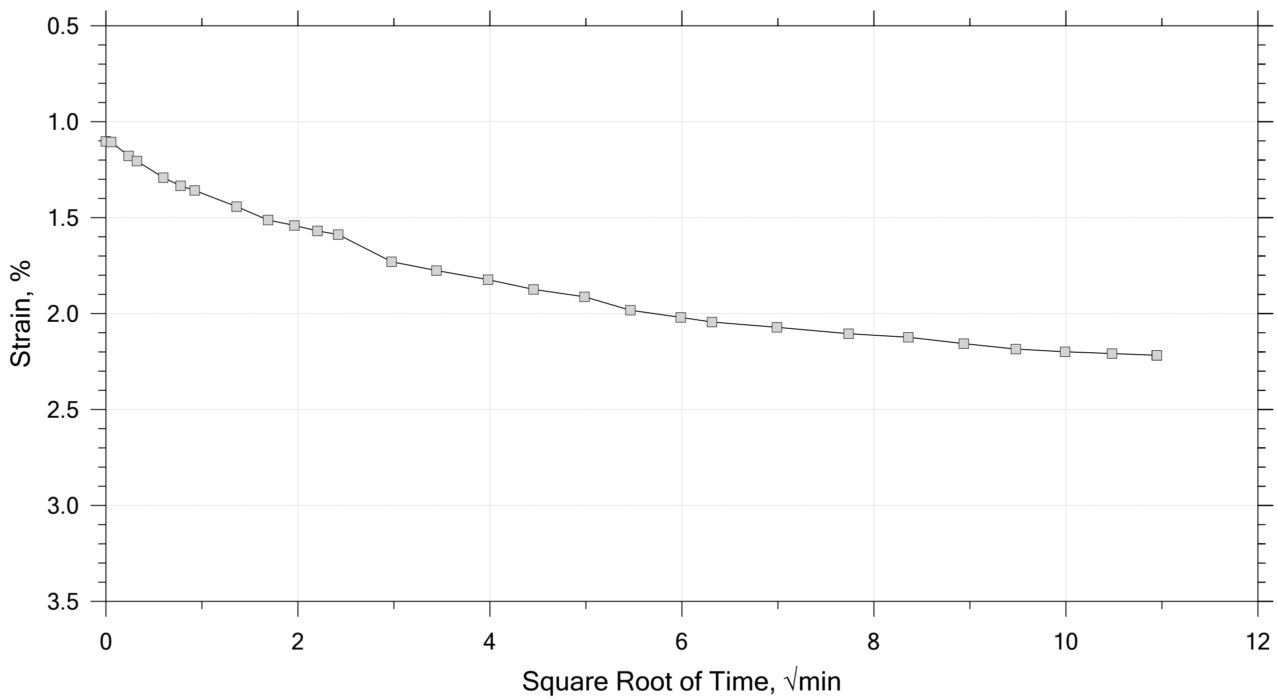


GeoTesting EXPRESS			
	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB012	Tested By: md	Checked By: njh
	Sample No.: SL1049	Test Date: 12/21/18	Depth: 13-15 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Wet, gray sandy clay		
	Remarks: System F, Swell Pressure = 0.0644 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 15
Constant Load Step
Stress: 0.125 tsf

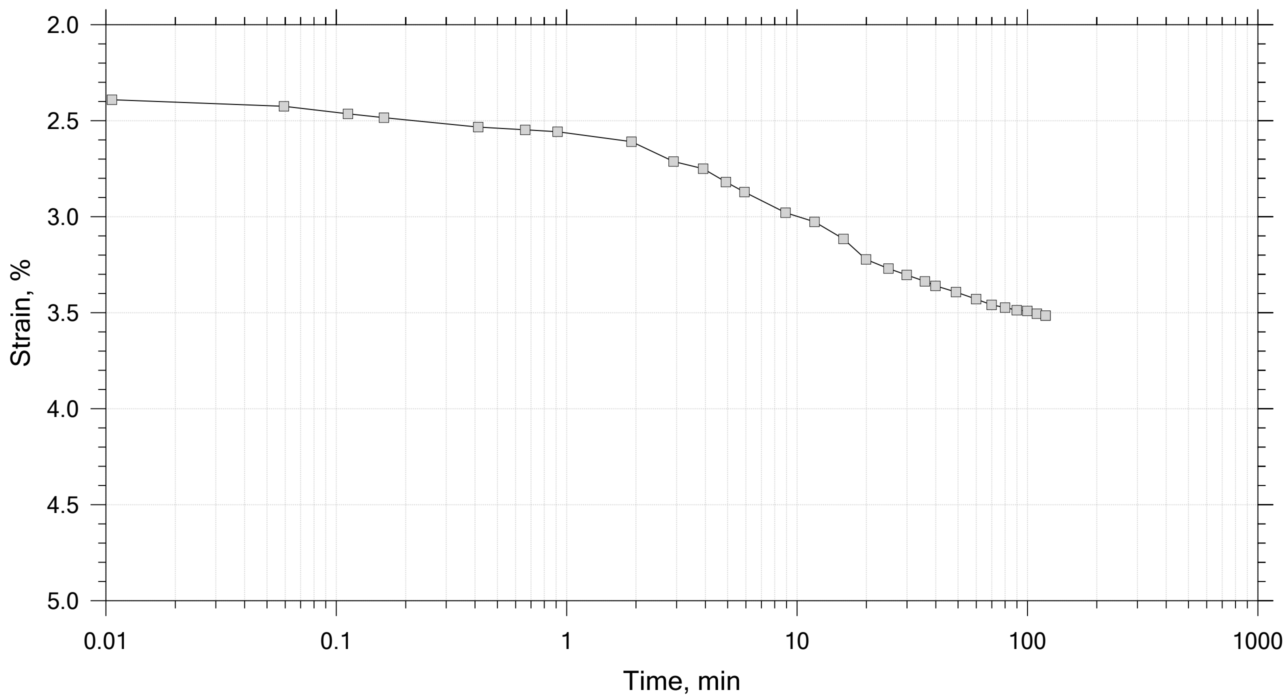


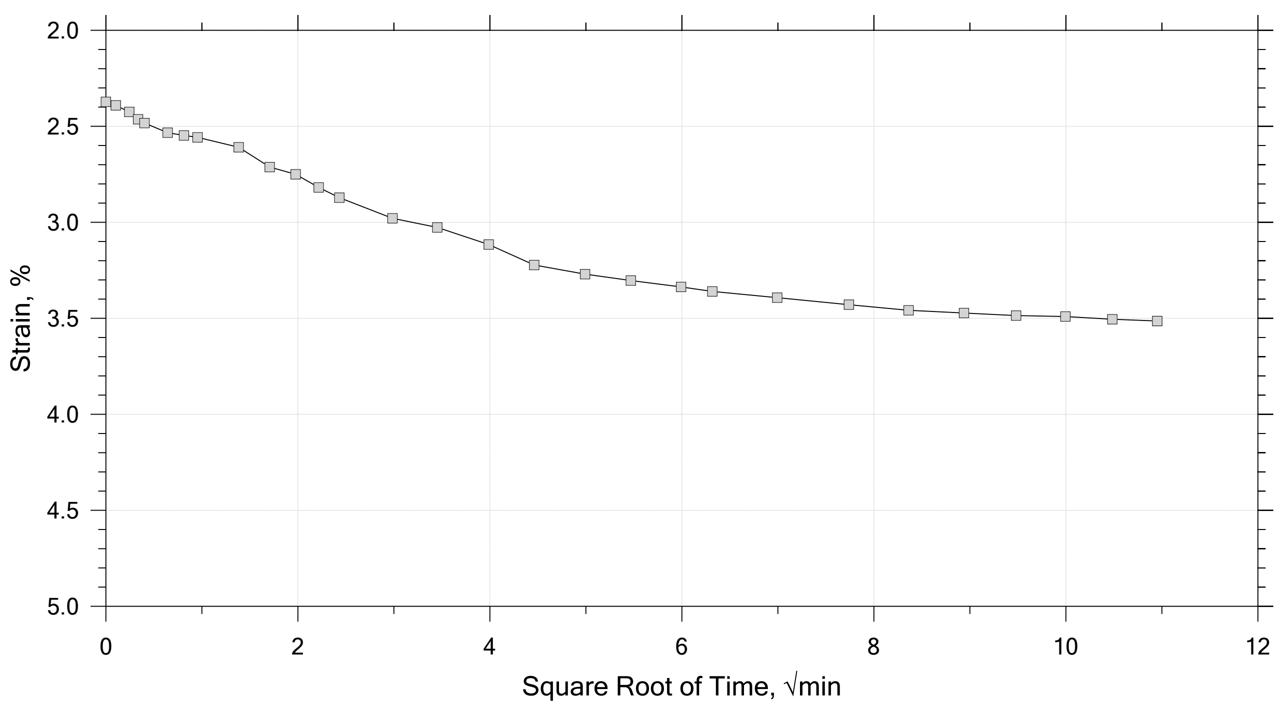


Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB012	Tested By: md	Checked By: njh
Sample No.: SL1049	Test Date: 12/21/18	Depth: 13-15 ft
Test No.: IP-2	Sample Type: intact	Elevation: ---
Description: Wet, gray sandy clay		
Remarks: System F, Swell Pressure = 0.0644 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 15
Constant Load Step
Stress: 0.25 tsf





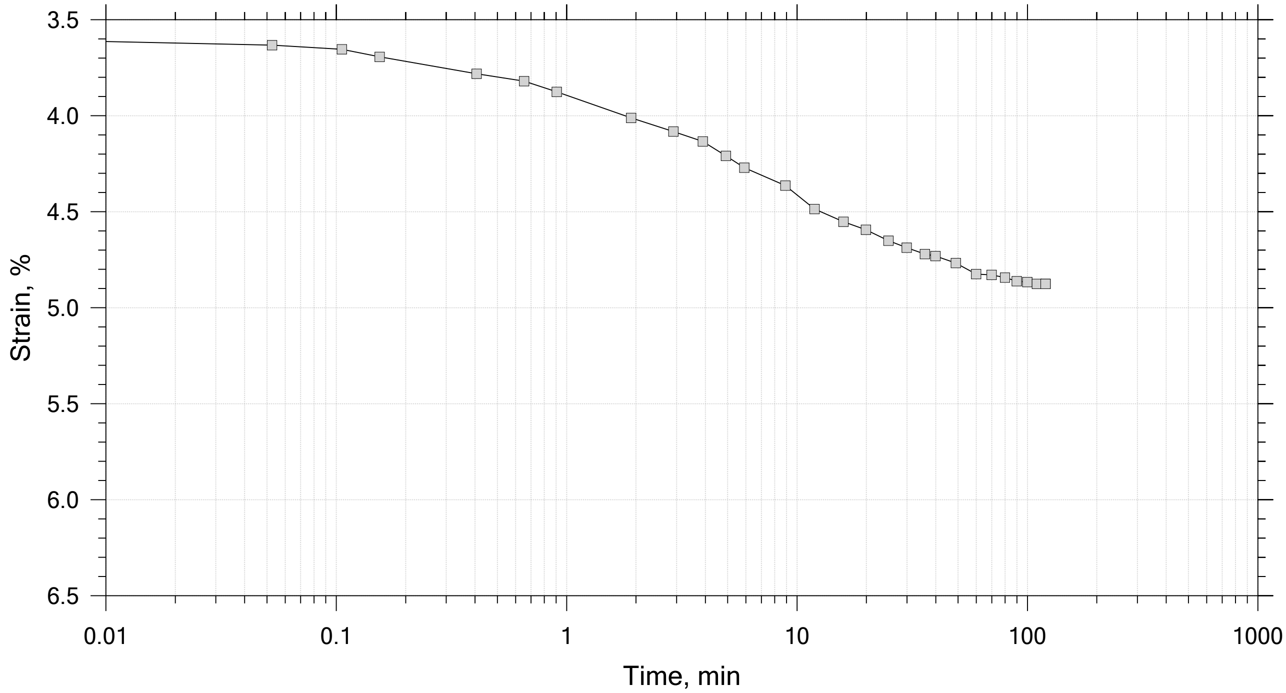
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB012	Tested By: md	Checked By: njh
	Sample No.: SL1049	Test Date: 12/21/18	Depth: 13-15 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Wet, gray sandy clay		
	Remarks: System F, Swell Pressure = 0.0644 tsf		

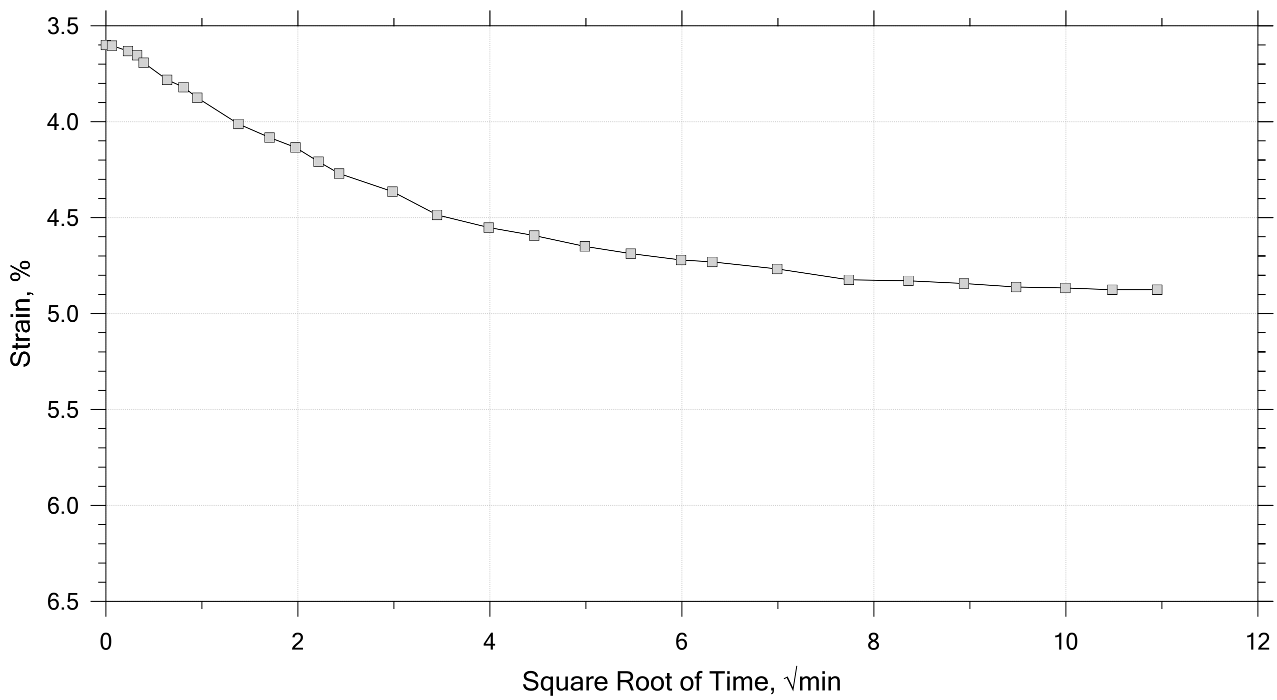
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 15

Constant Load Step

Stress: 0.5 tsf





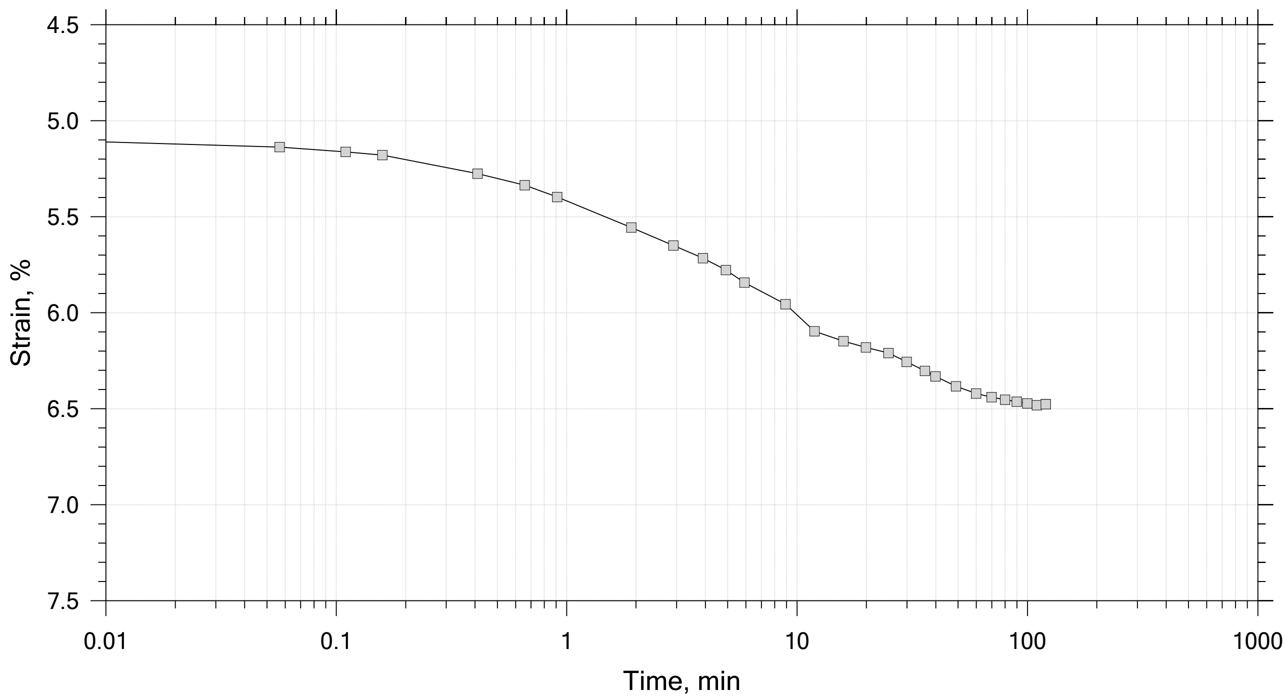
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB012	Tested By: md	Checked By: njh
	Sample No.: SL1049	Test Date: 12/21/18	Depth: 13-15 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Wet, gray sandy clay		
	Remarks: System F, Swell Pressure = 0.0644 tsf		

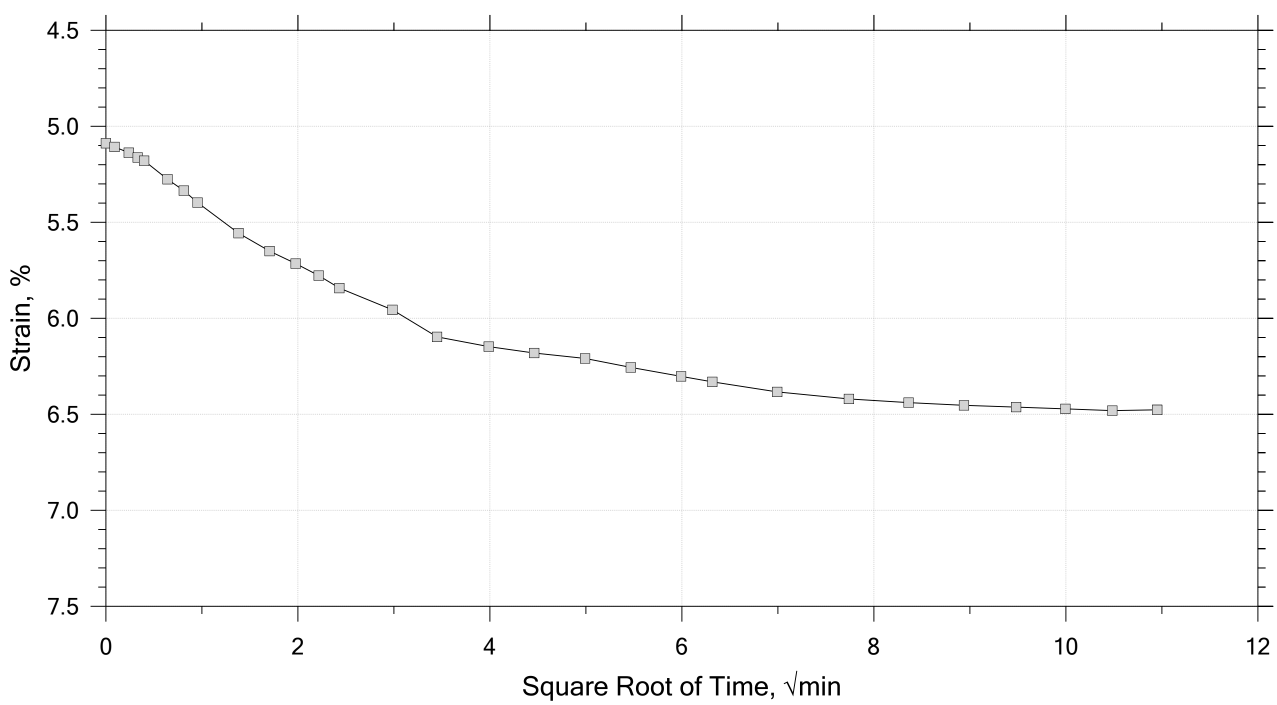
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 15

Constant Load Step

Stress: 1 tsf





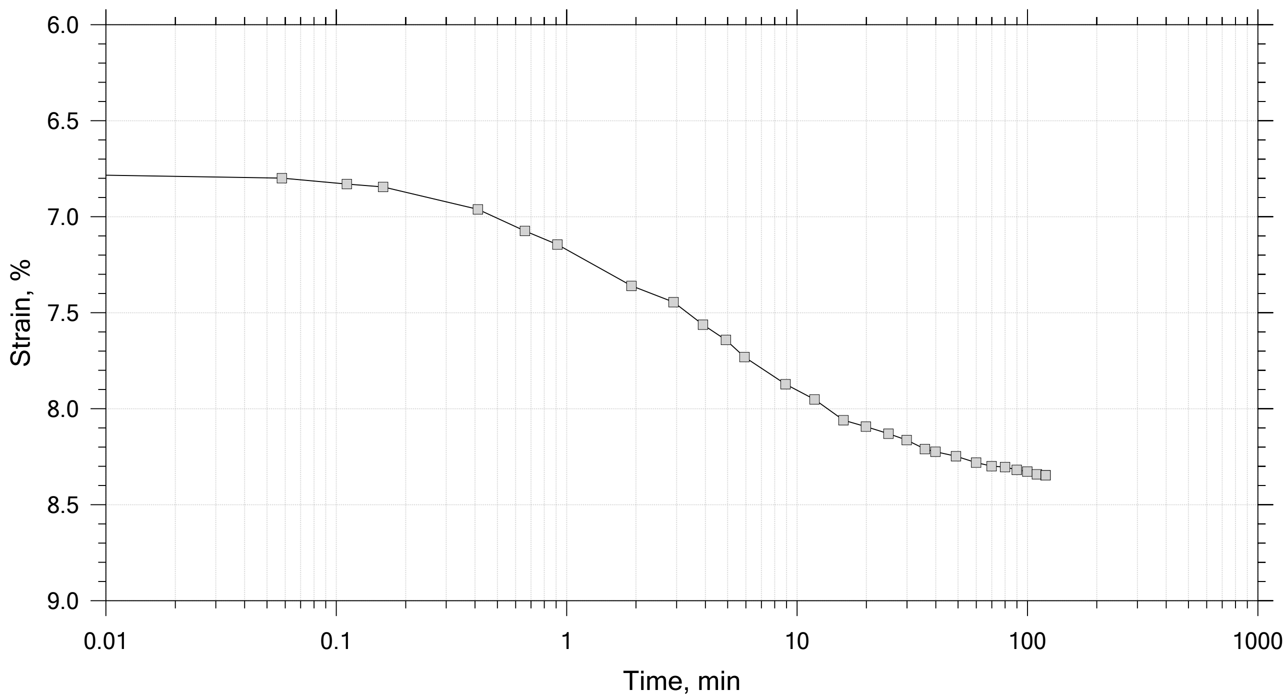
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB012	Tested By: md	Checked By: njh
	Sample No.: SL1049	Test Date: 12/21/18	Depth: 13-15 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Wet, gray sandy clay		
	Remarks: System F, Swell Pressure = 0.0644 tsf		

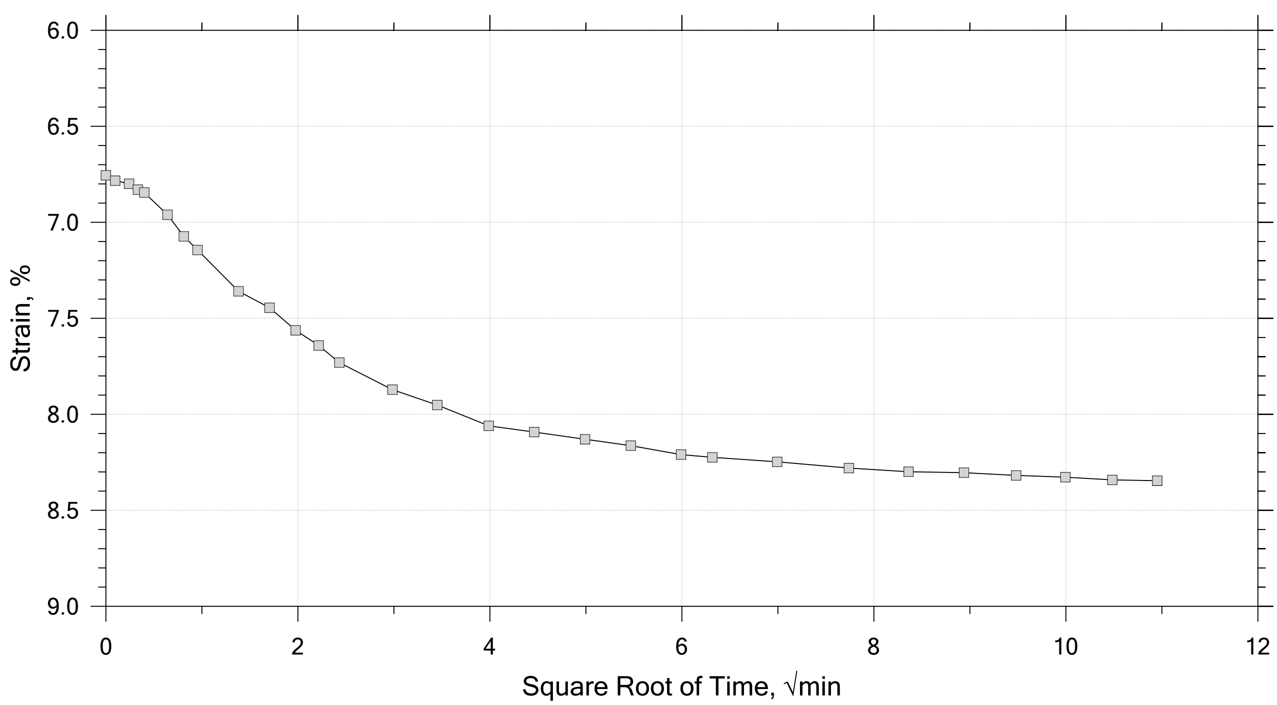
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 15

Constant Load Step

Stress: 2 tsf

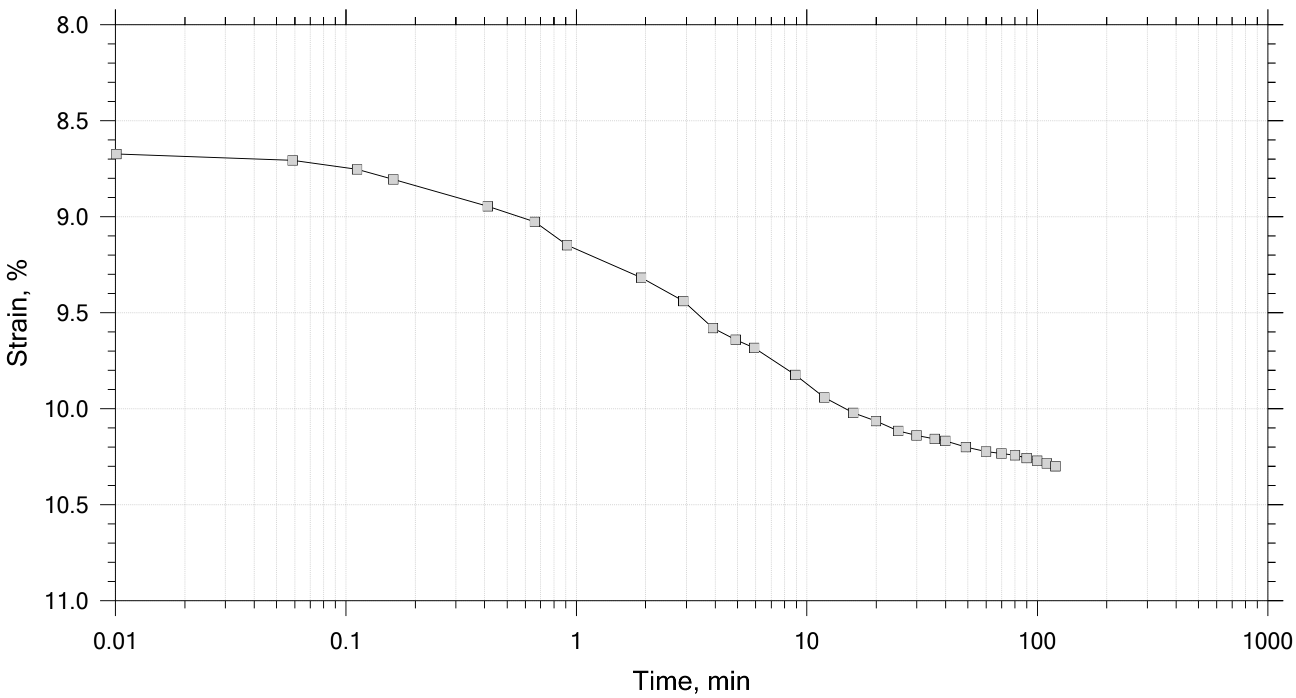


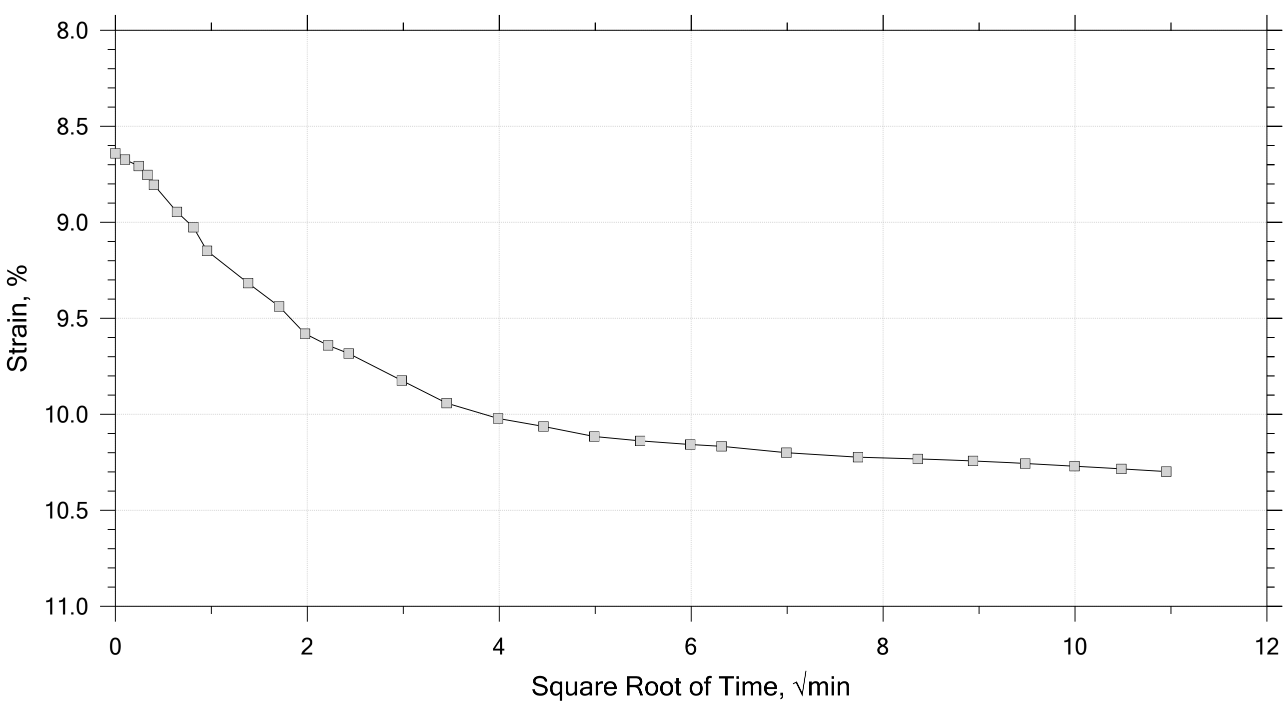


GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB012	Tested By: md	Checked By: njh
	Sample No.: SL1049	Test Date: 12/21/18	Depth: 13-15 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Wet, gray sandy clay		
	Remarks: System F, Swell Pressure = 0.0644 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 15
Constant Load Step
Stress: 4 tsf

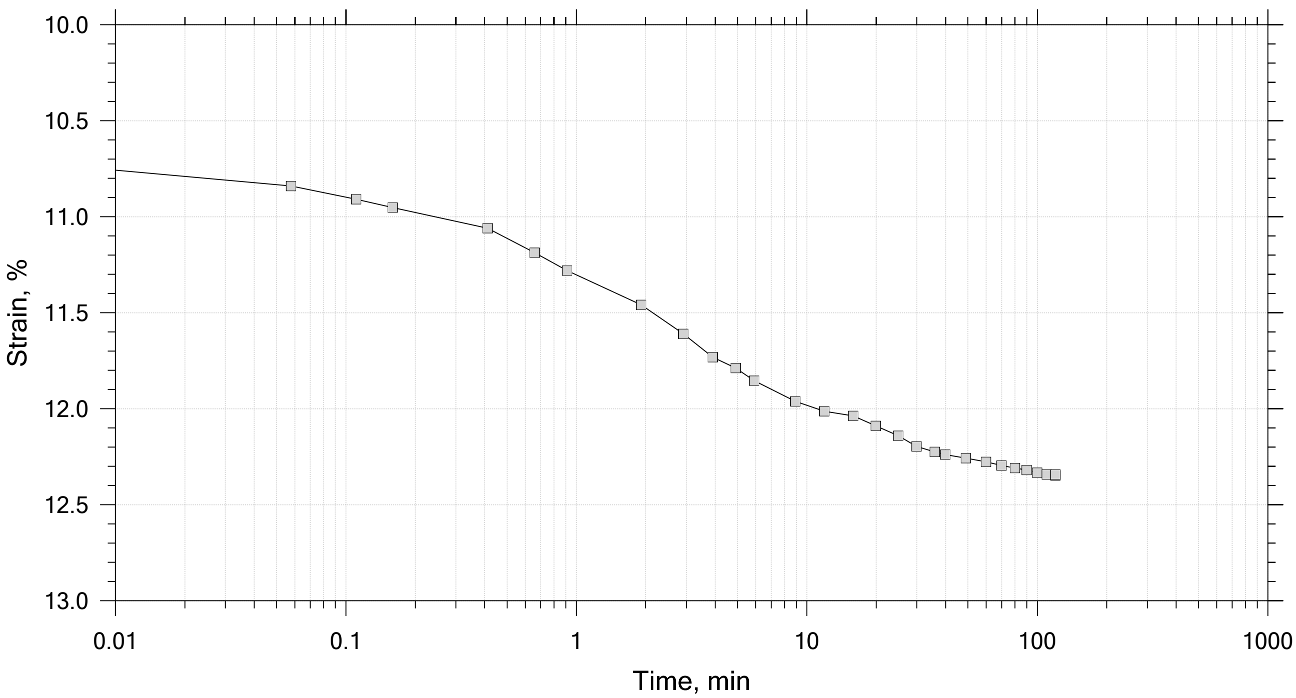


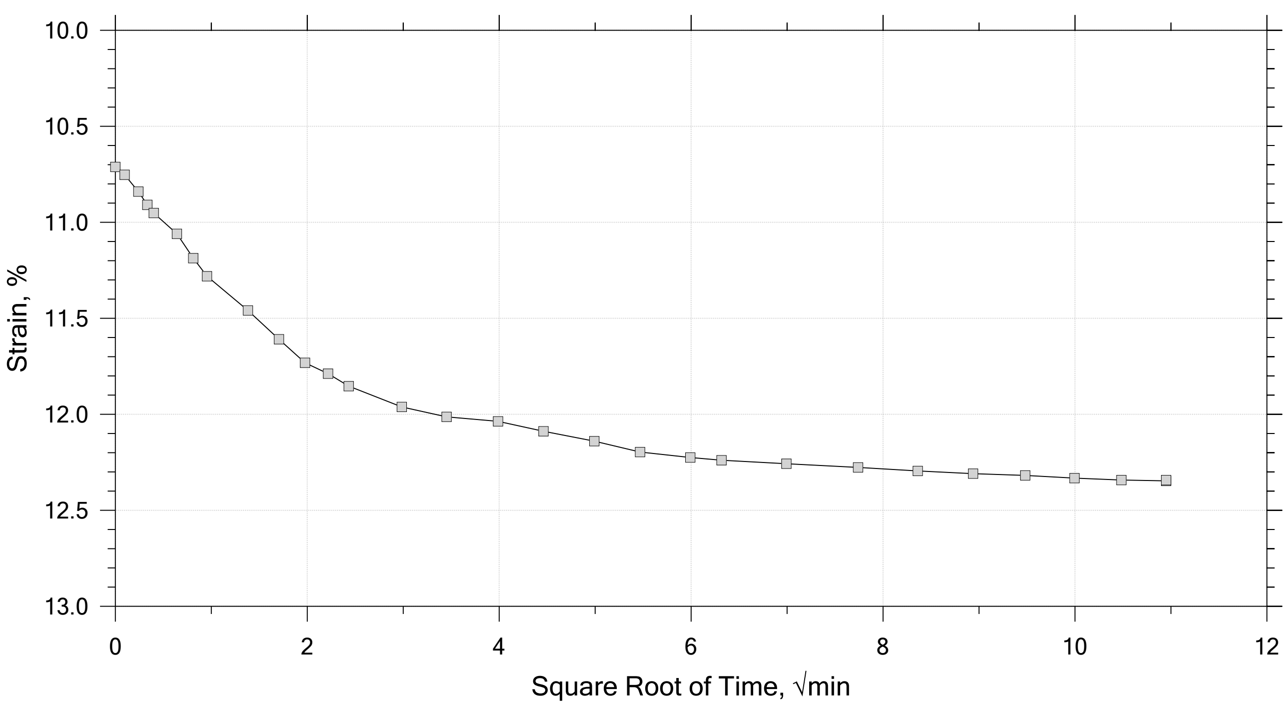


GeoTesting EXPRESS			
	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB012	Tested By: md	Checked By: njh
	Sample No.: SL1049	Test Date: 12/21/18	Depth: 13-15 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Wet, gray sandy clay		
	Remarks: System 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

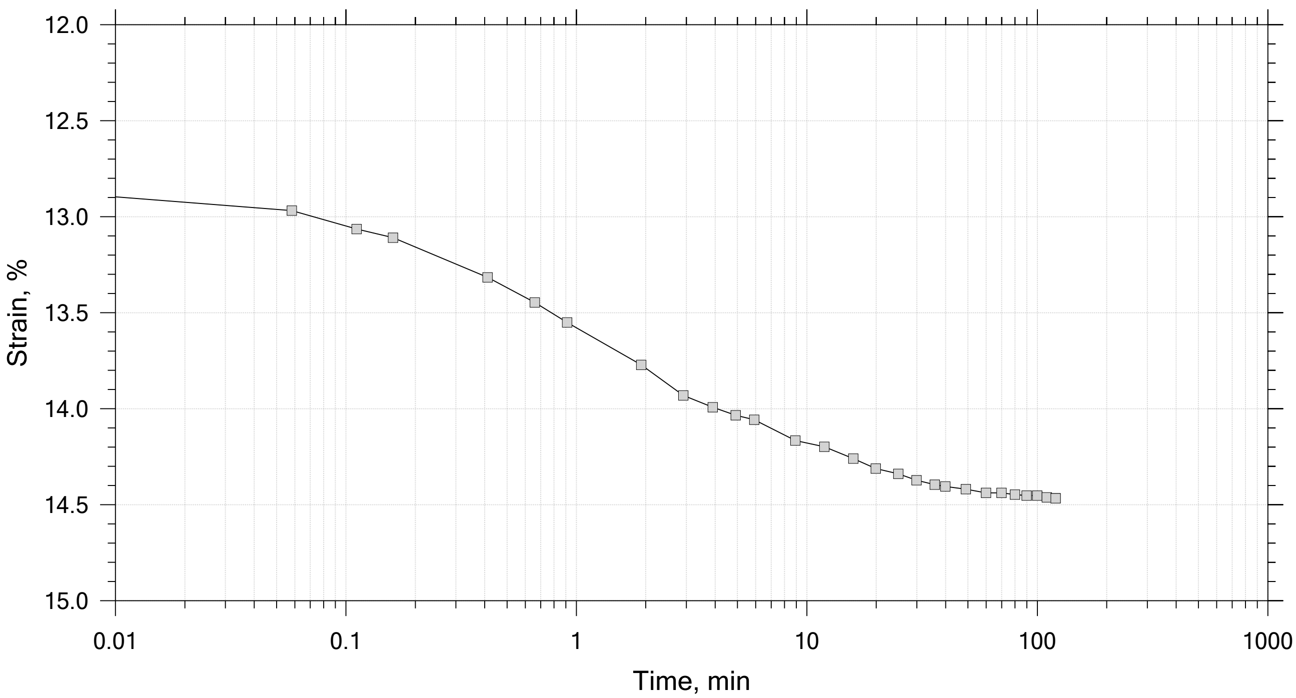


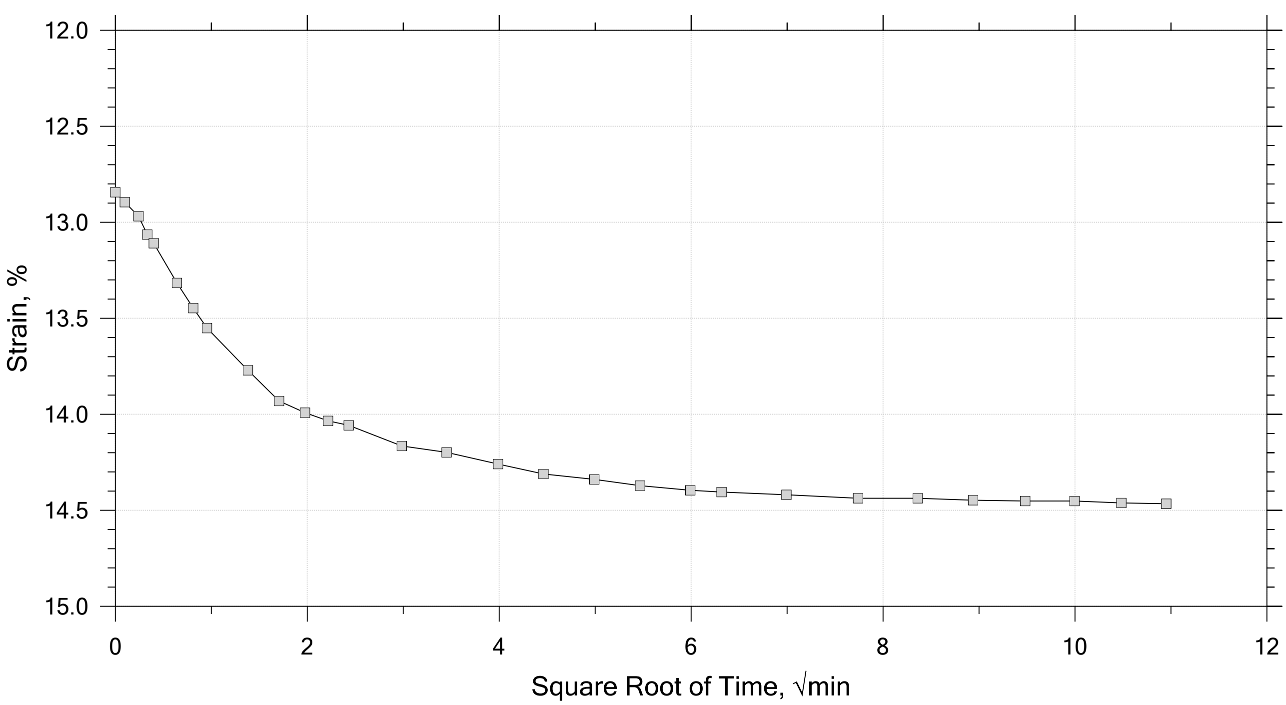


Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB012	Tested By: md	Checked By: njh
Sample No.: SL1049	Test Date: 12/21/18	Depth: 13-15 ft
Test No.: IP-2	Sample Type: intact	Elevation: ---
Description: Wet, gray sandy clay		
Remarks: System F, Swell Pressure = 0.0644 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 15
Constant Load Step
Stress: 16 tsf

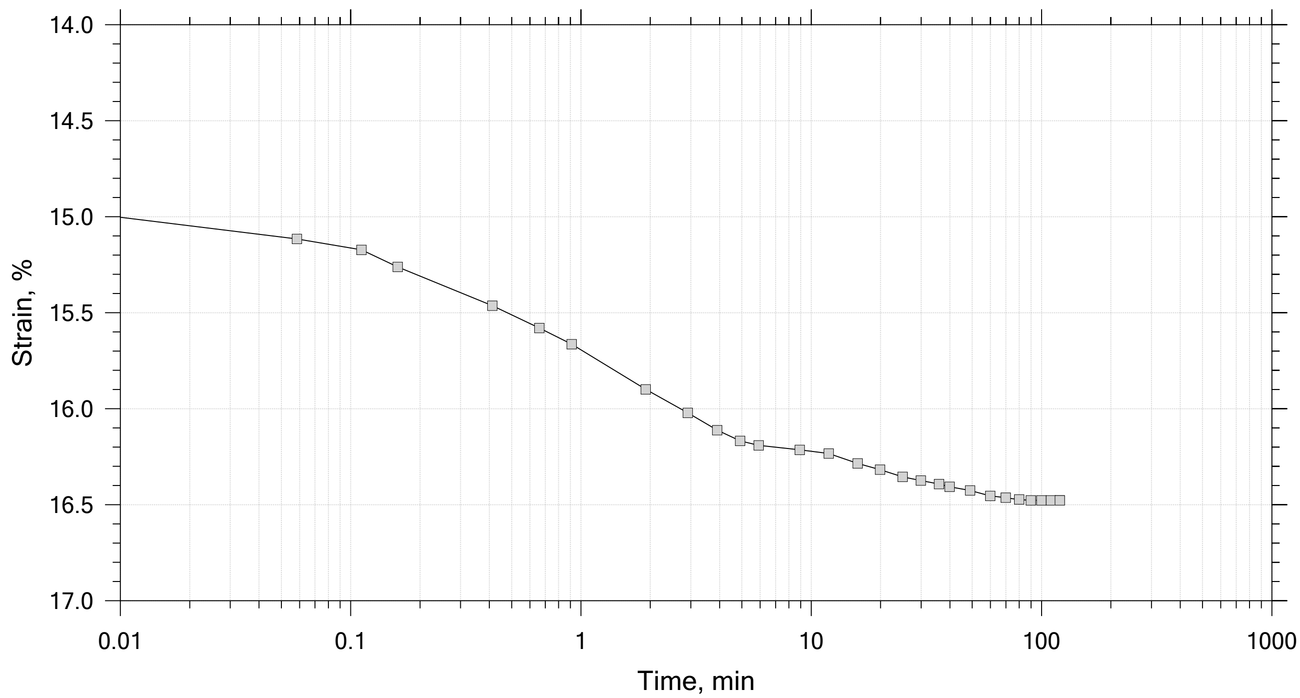


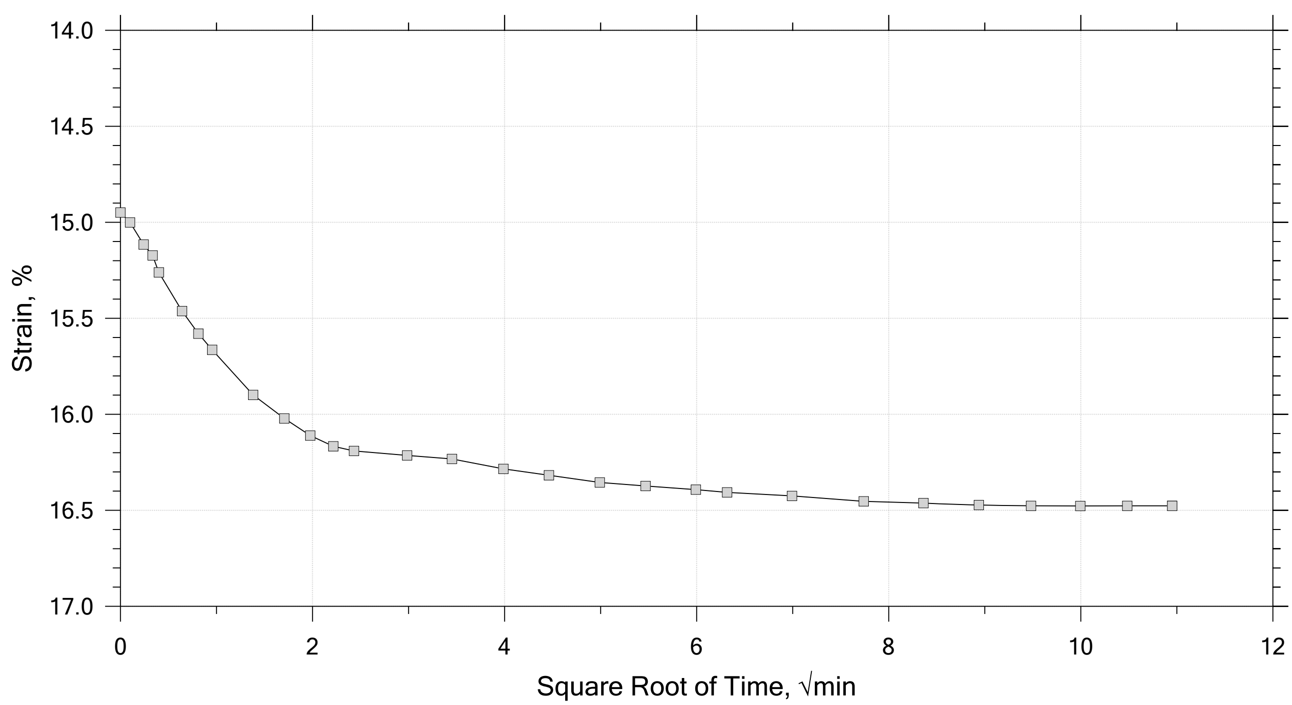


GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB012	Tested By: md	Checked By: njh
	Sample No.: SL1049	Test Date: 12/21/18	Depth: 13-15 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Wet, gray sandy clay		
	Remarks: System F, Swell Pressure = 0.0644 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 15
Constant Load Step
Stress: 32 tsf





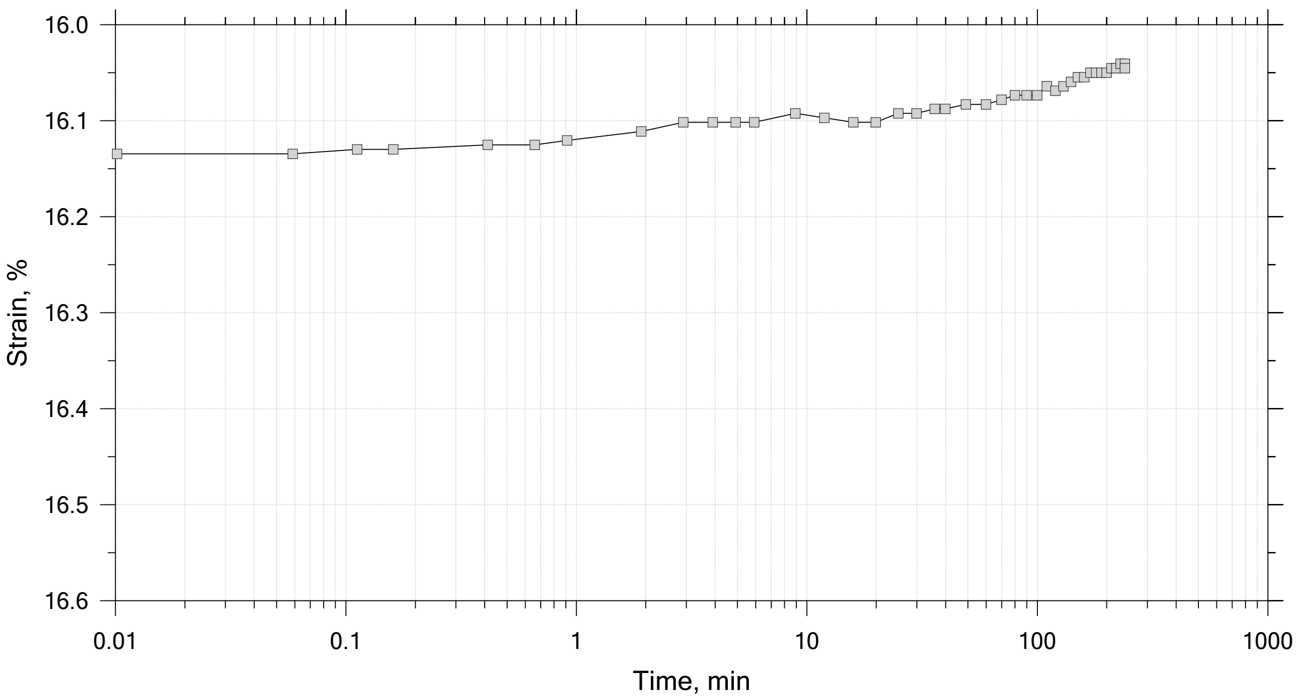
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB012	Tested By: md	Checked By: njh
	Sample No.: SL1049	Test Date: 12/21/18	Depth: 13-15 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Wet, gray sandy clay		
	Remarks: System F, Swell Pressure = 0.0644 tsf		

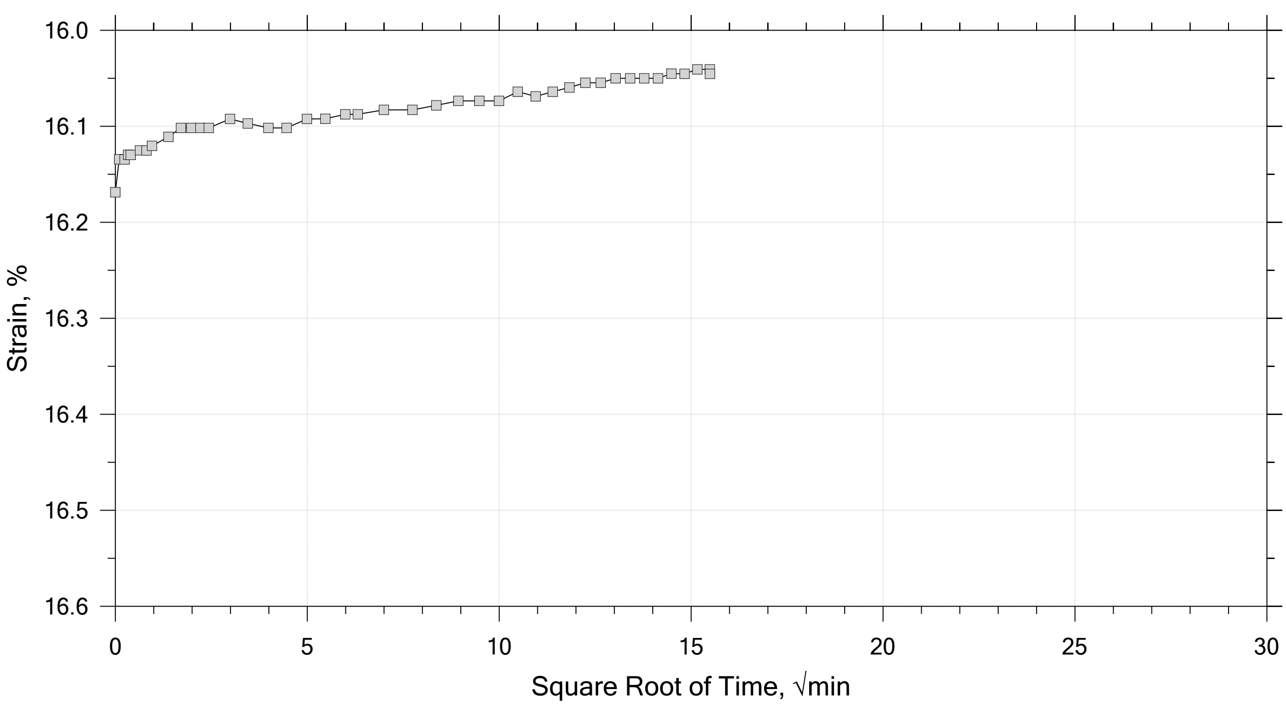
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 15

Constant Load Step

Stress: 8 tsf





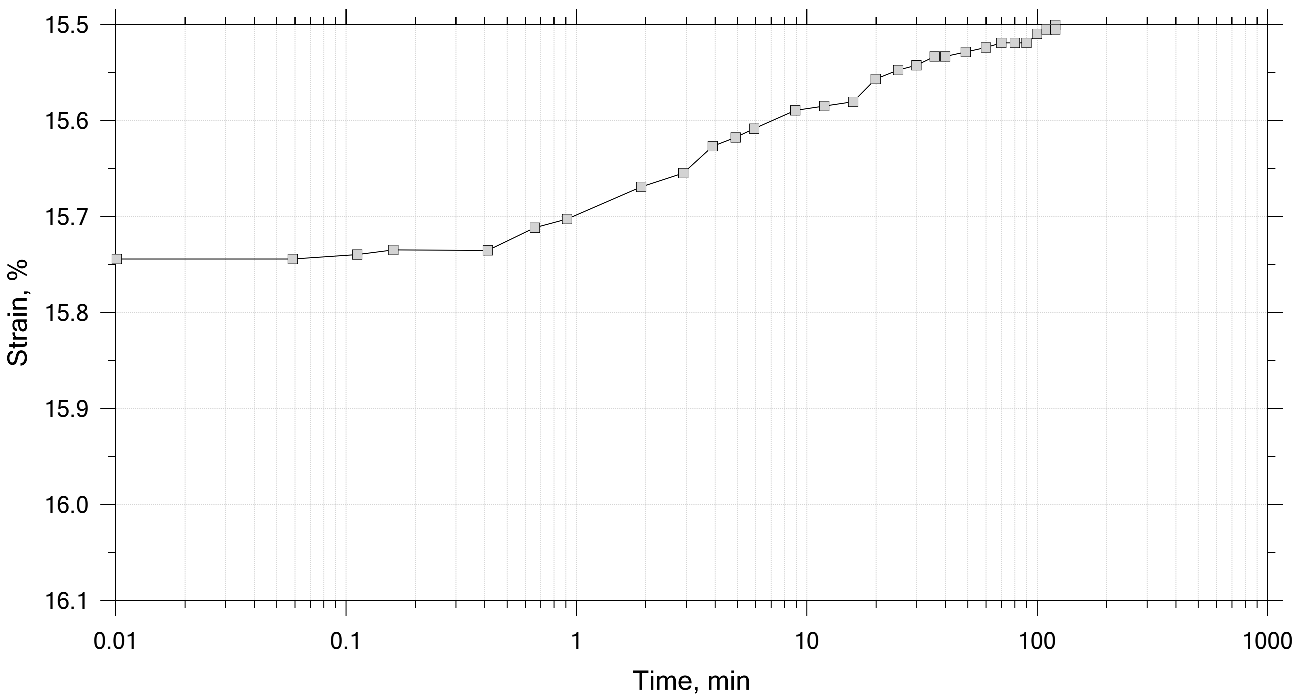
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB012	Tested By: md	Checked By: njh
	Sample No.: SL1049	Test Date: 12/21/18	Depth: 13-15 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Wet, gray sandy clay		
	Remarks: System F, Swell Pressure = 0.0644 tsf		

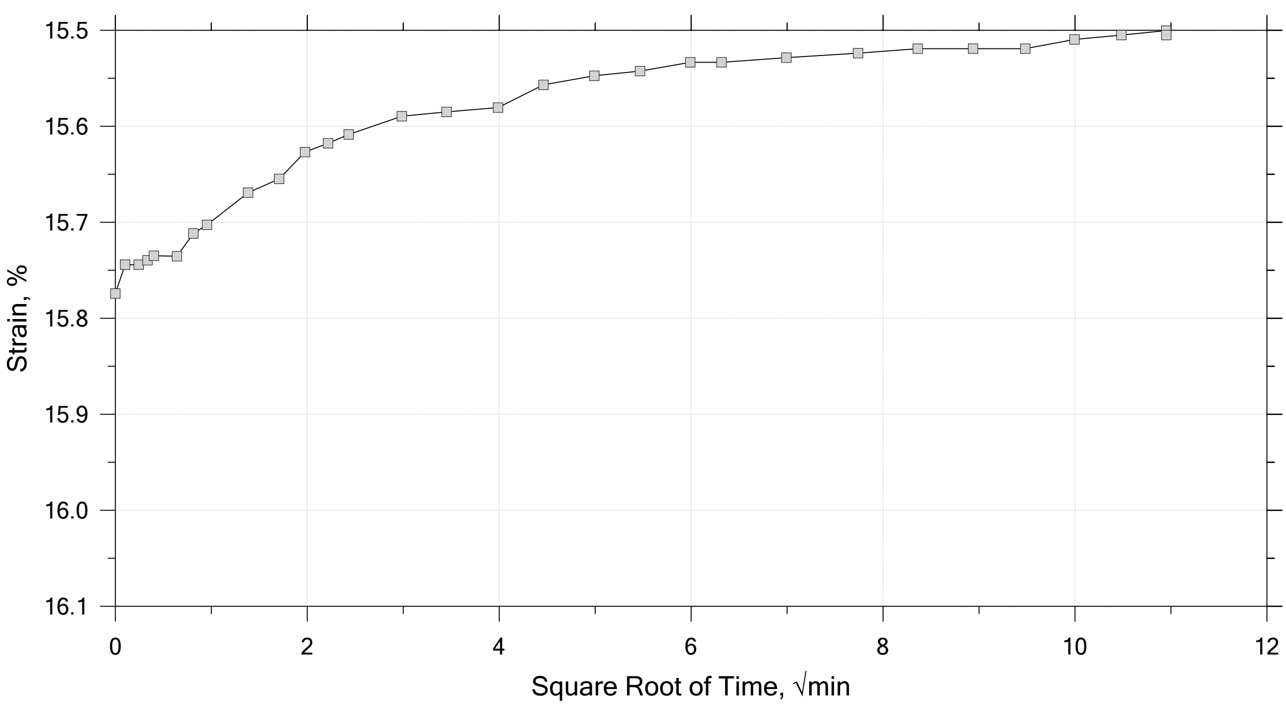
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 15

Constant Load Step

Stress: 2 tsf





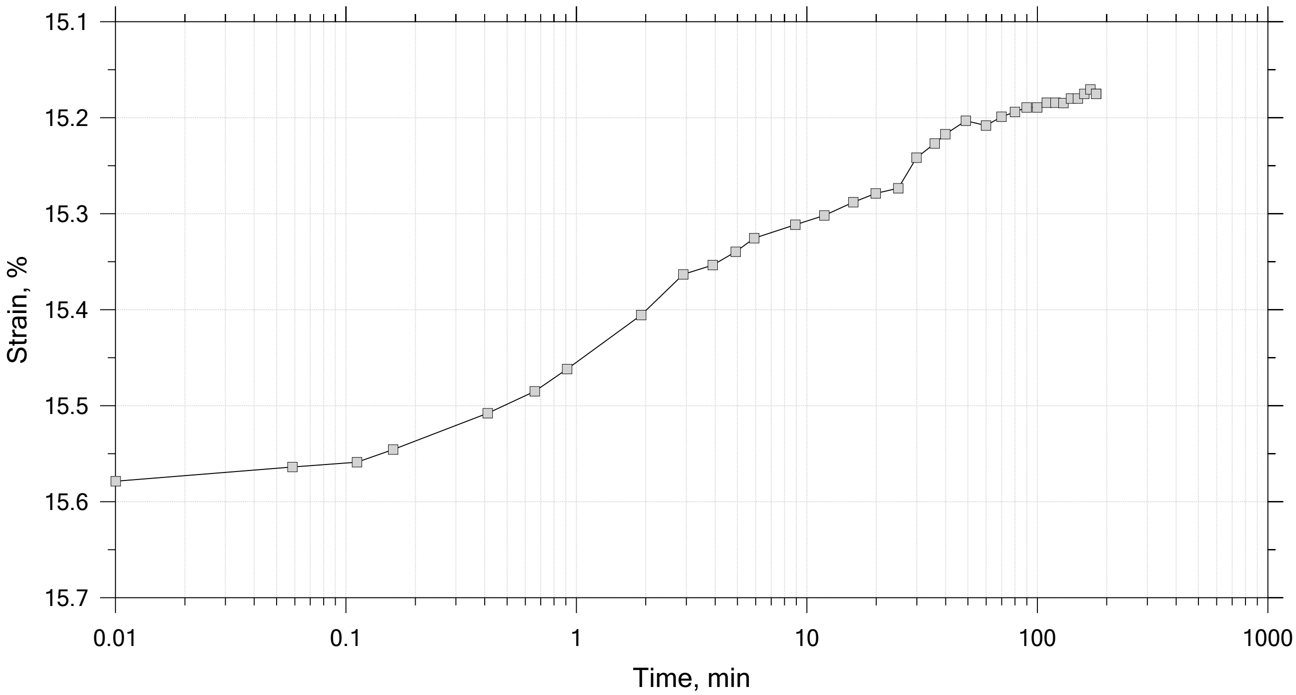
GeoTesting EXPRESS			
	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB012	Tested By: md	Checked By: njh
	Sample No.: SL1049	Test Date: 12/21/18	Depth: 13-15 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Wet, gray sandy clay		
	Remarks: System F, Swell Pressure = 0.0644 tsf		

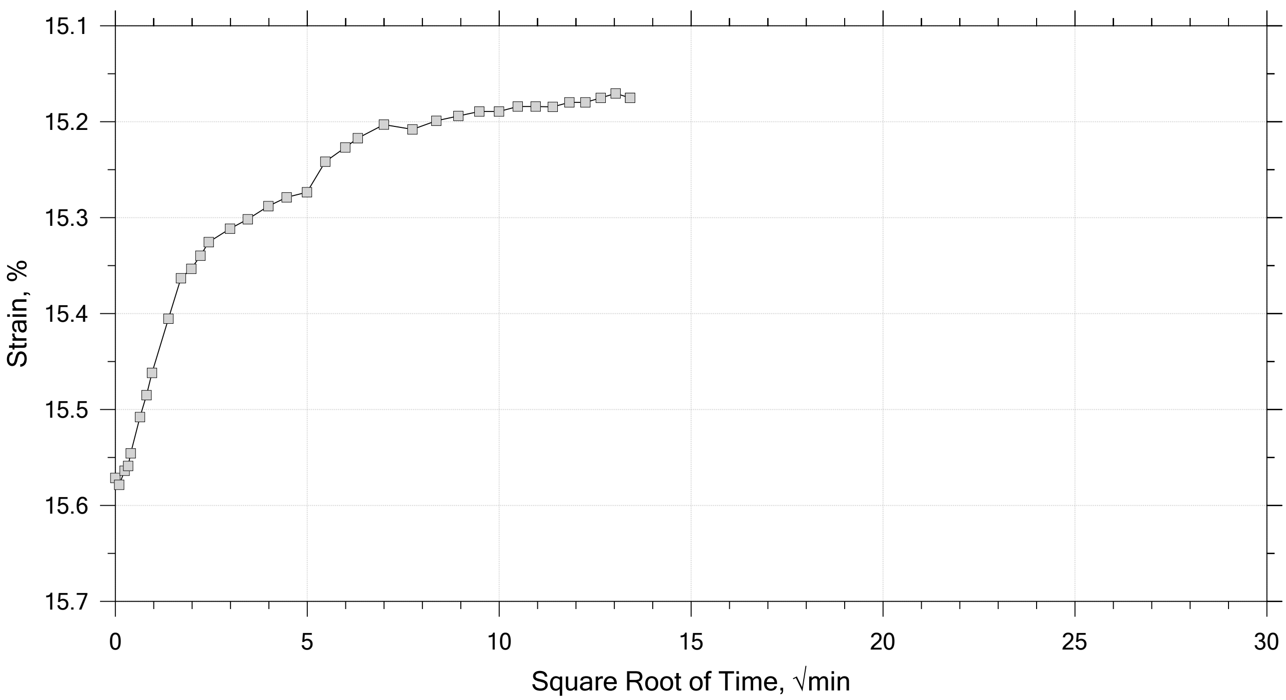
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 15

Constant Load Step

Stress: 0.5 tsf

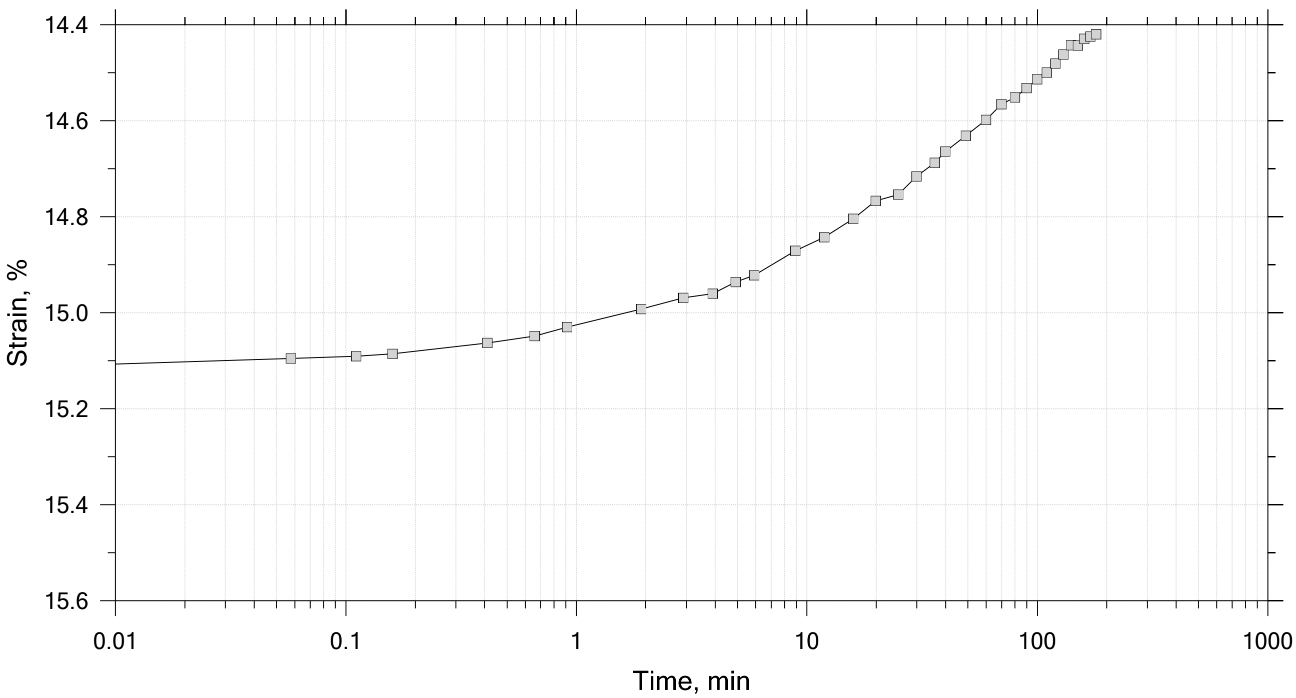


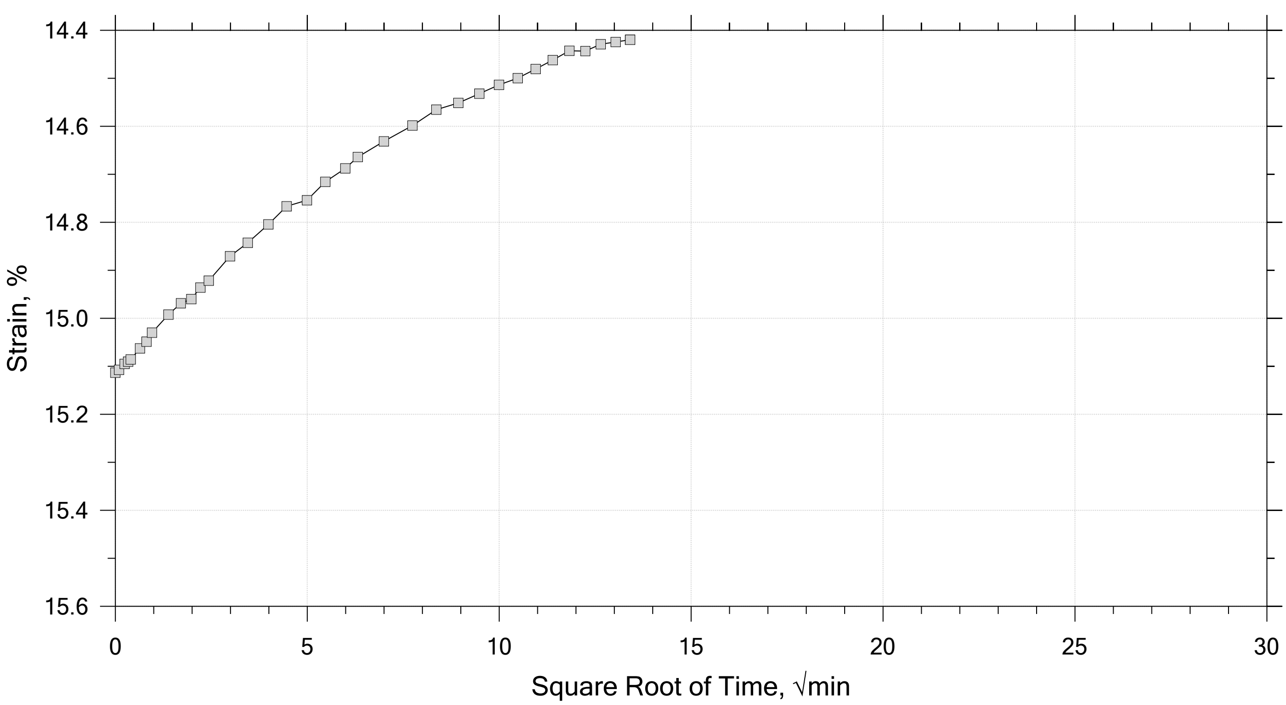


GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB012	Tested By: md	Checked By: njh
	Sample No.: SL1049	Test Date: 12/21/18	Depth: 13-15 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Wet, gray sandy clay		
	Remarks: System 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

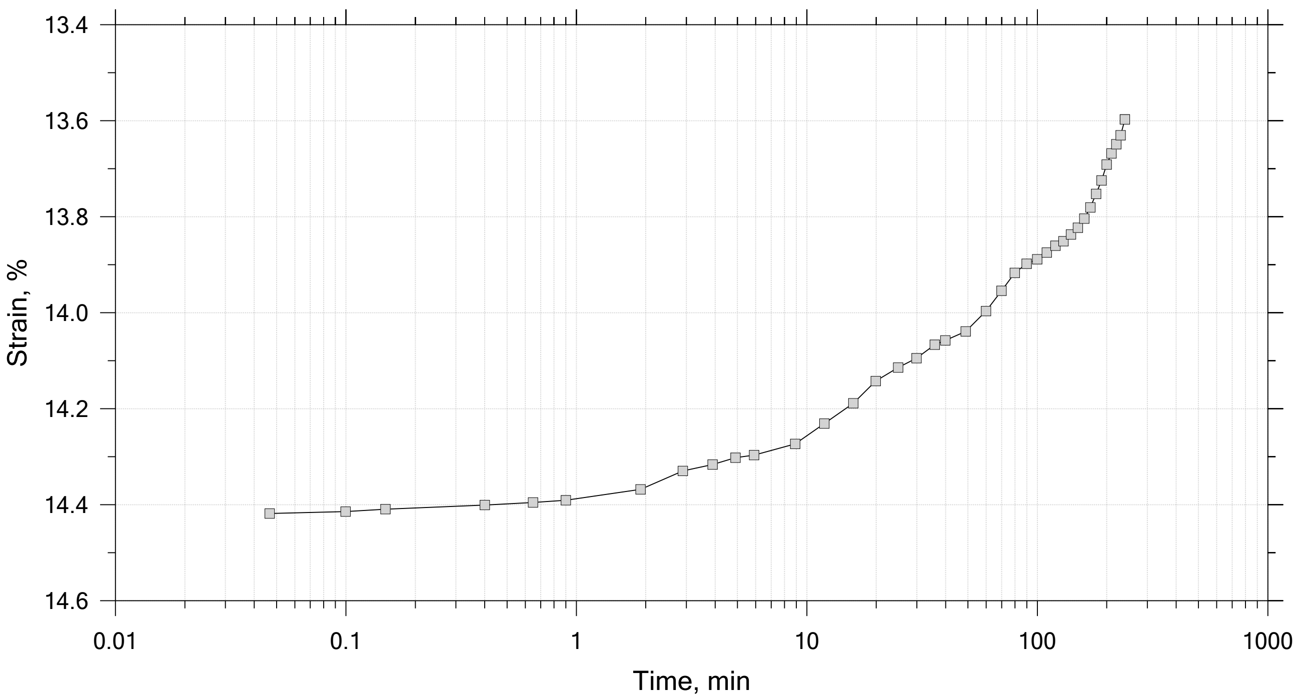


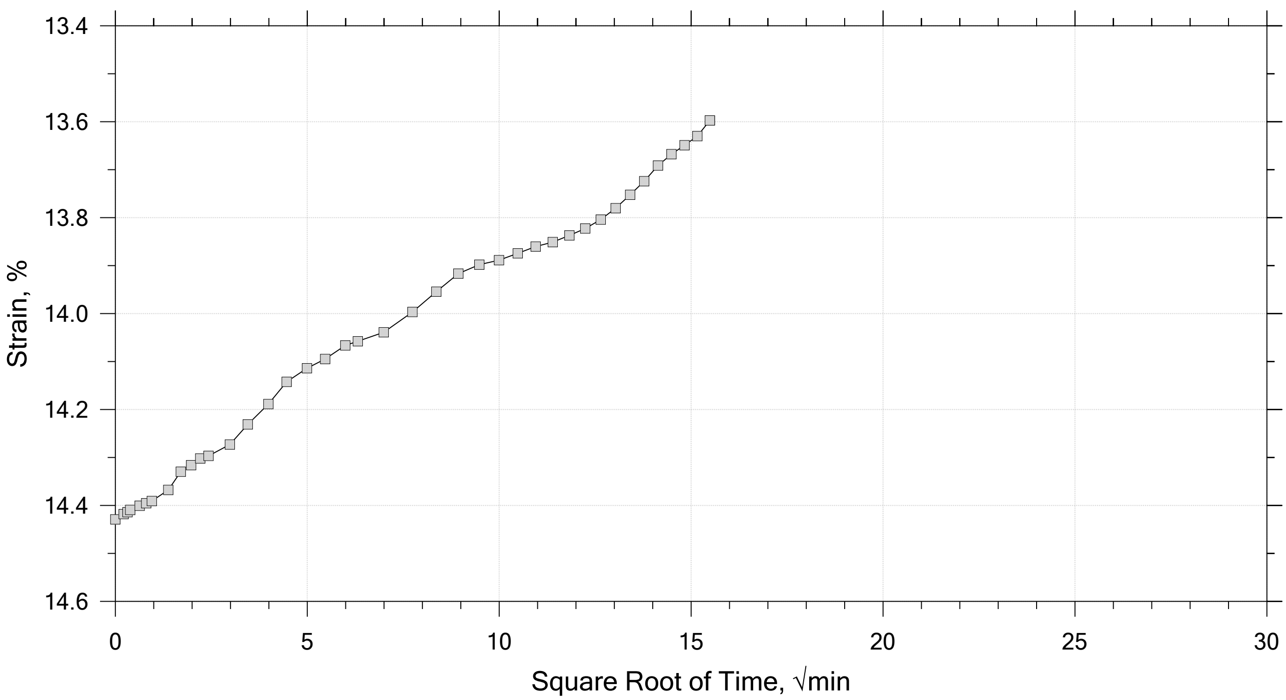


GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB012	Tested By: md	Checked By: njh
	Sample No.: SL1049	Test Date: 12/21/18	Depth: 13-15 ft
	Test No.: IP-2	Sample Type: intact	Elevation: ---
	Description: Wet, gray sandy clay		
	Remarks: System F, Swell Pressure = 0.0644 tsf		

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.: 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.

GeoTesting 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		

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

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

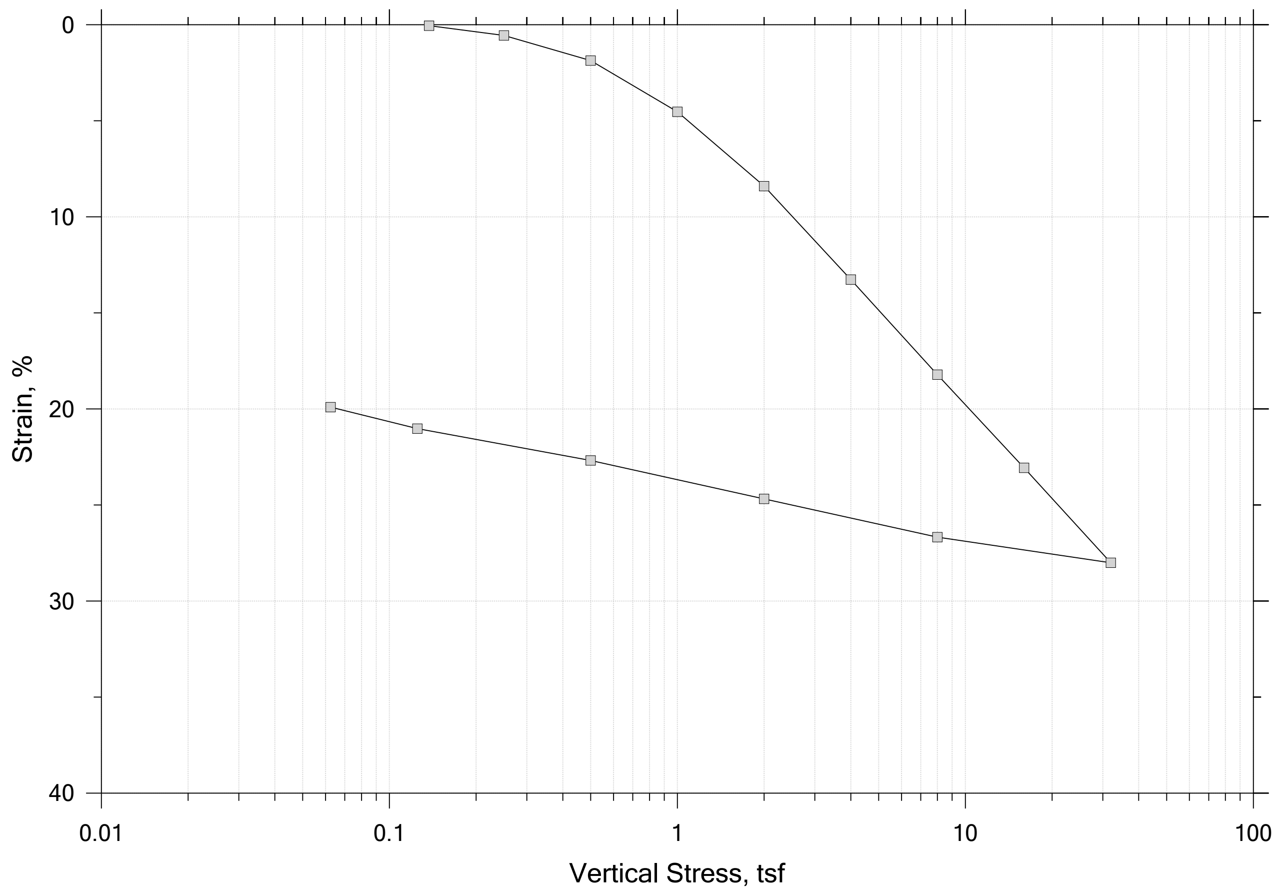
Square Root of Time Coefficients

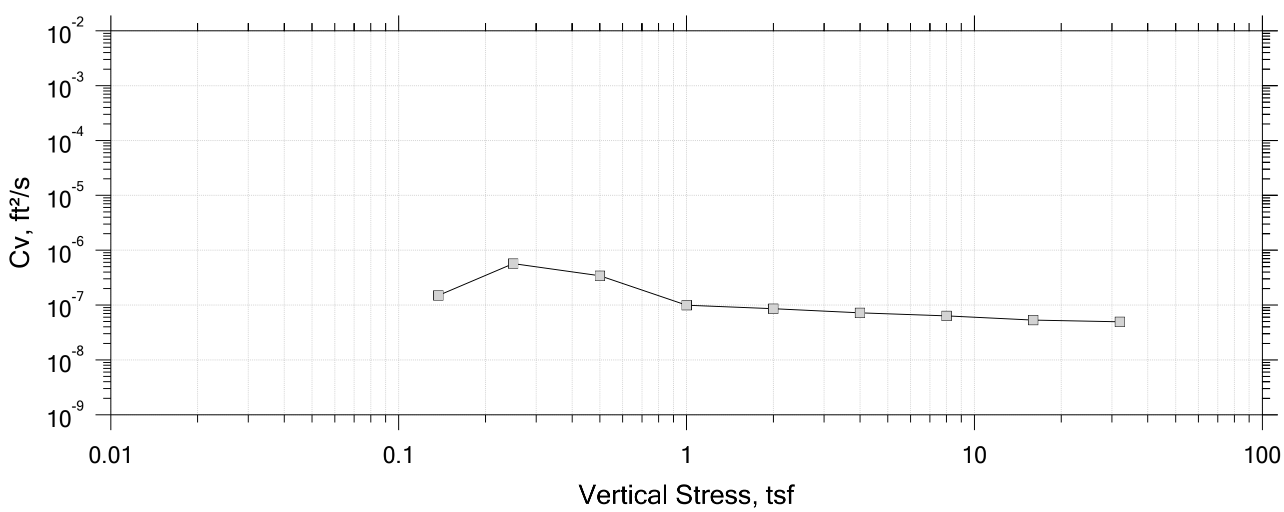
Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Sq.Rt. T90 min	Cv ft²/s	Mv 1/tsf	k ft/day
1	0.0644	0.008683	0.613	0.868	101.978	2.39e-07	1.35e-01	8.67e-05
2	0.125	0.02218	0.591	2.22	20.692	1.15e-06	2.23e-01	6.91e-04
3	0.250	0.03515	0.570	3.51	35.822	6.46e-07	1.04e-01	1.81e-04
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

GeoTesting 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

Summary Report

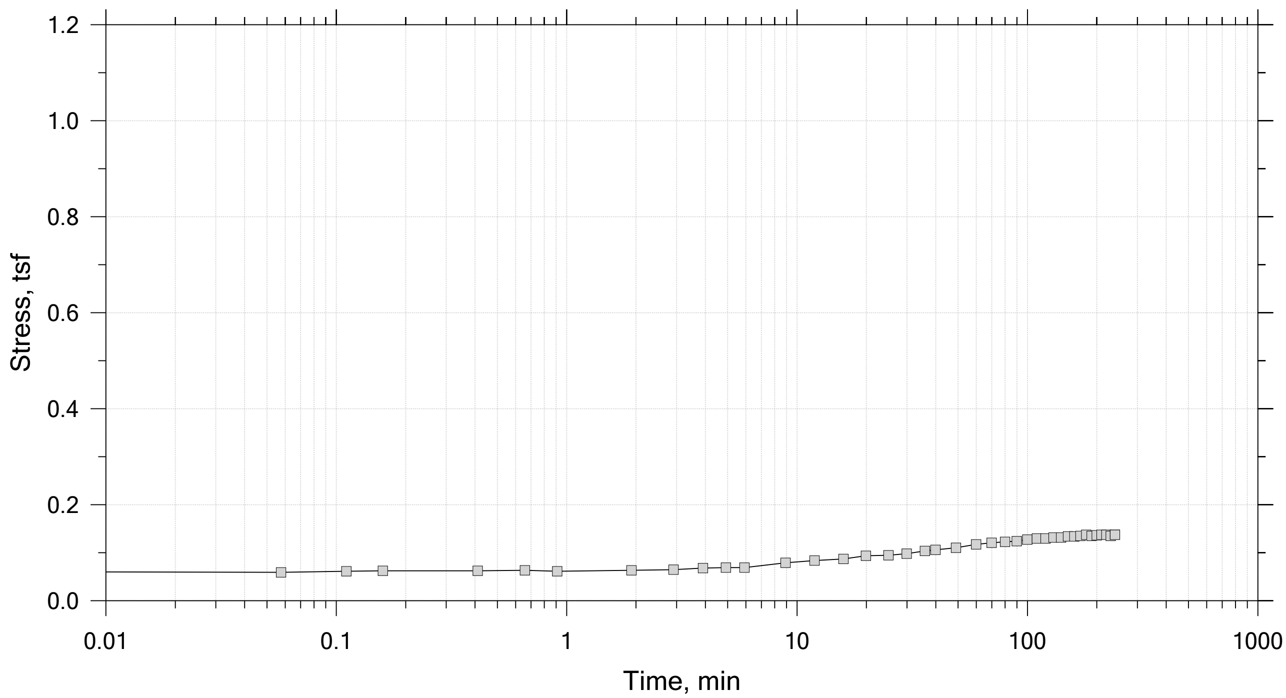


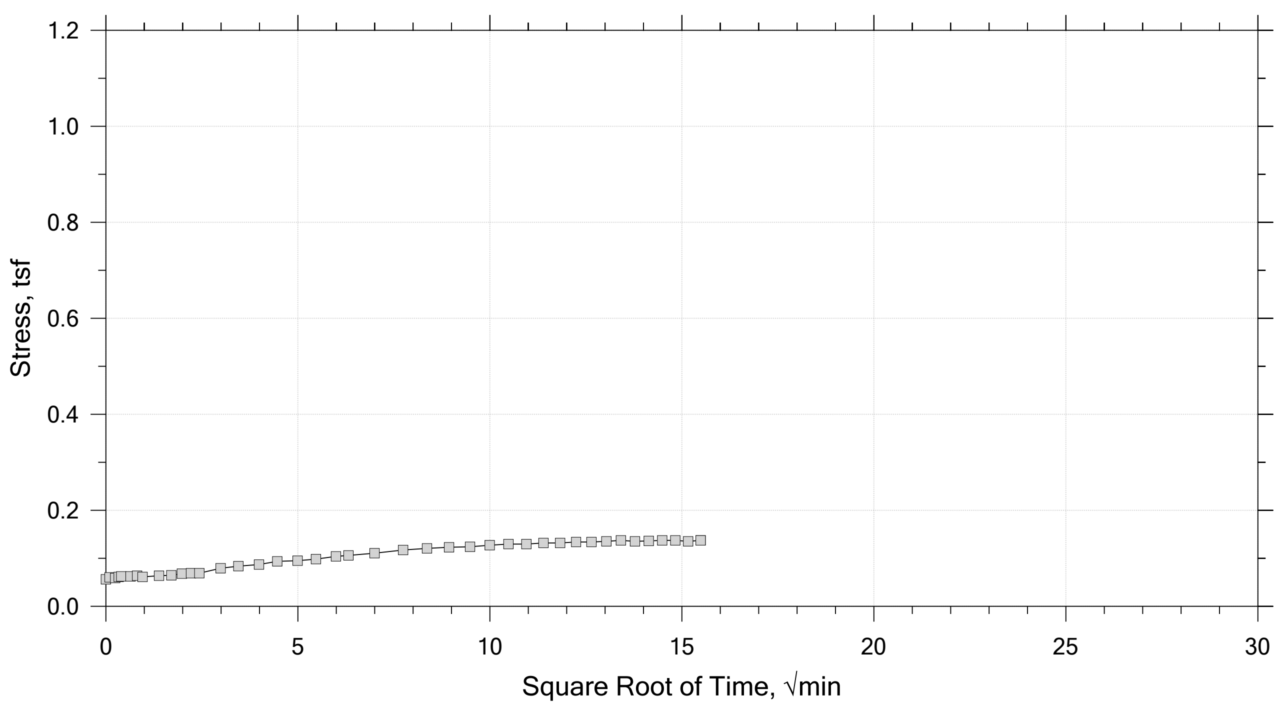


GeoTesting EXPRESS			
	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB025	Tested By: md	Checked By: njh
	Sample No.: SL1042	Test Date: 12/21/18	Depth: 16-18 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, black clay		
	Remarks: System E, Swell Pressure = 0.137 tsf		
	Displacement at End of Increment		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 14
Constant Volume Step
Stress: 0.137 tsf

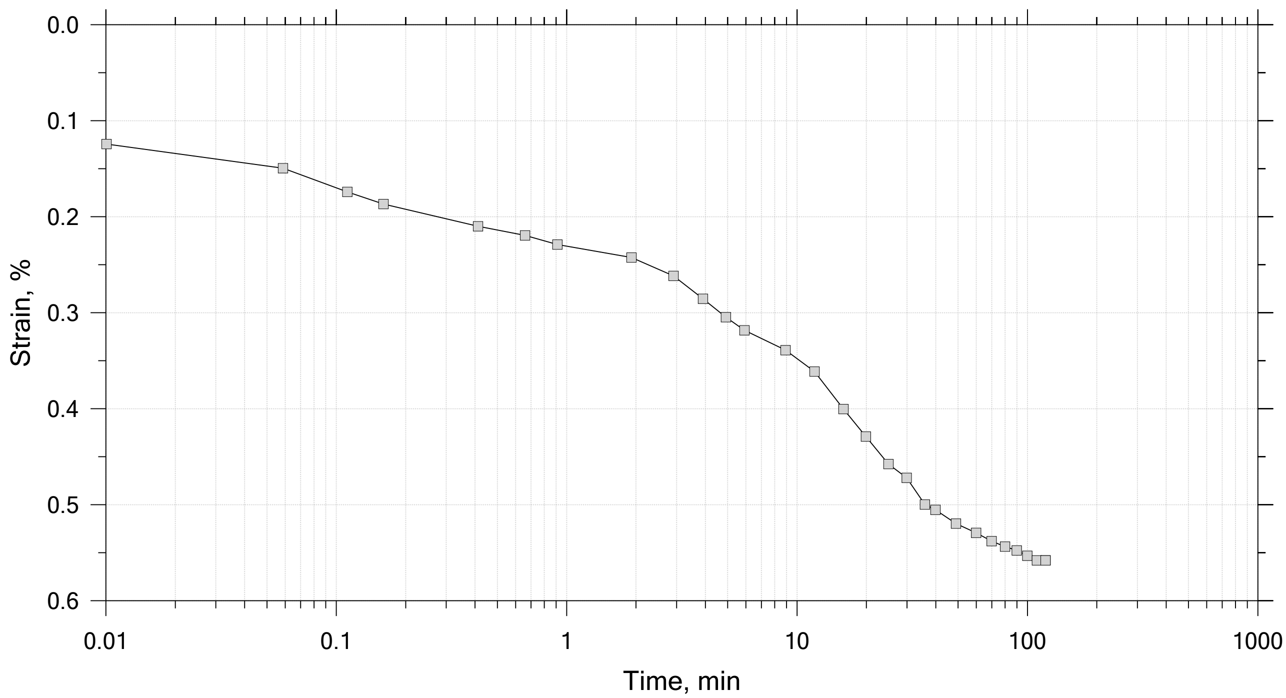


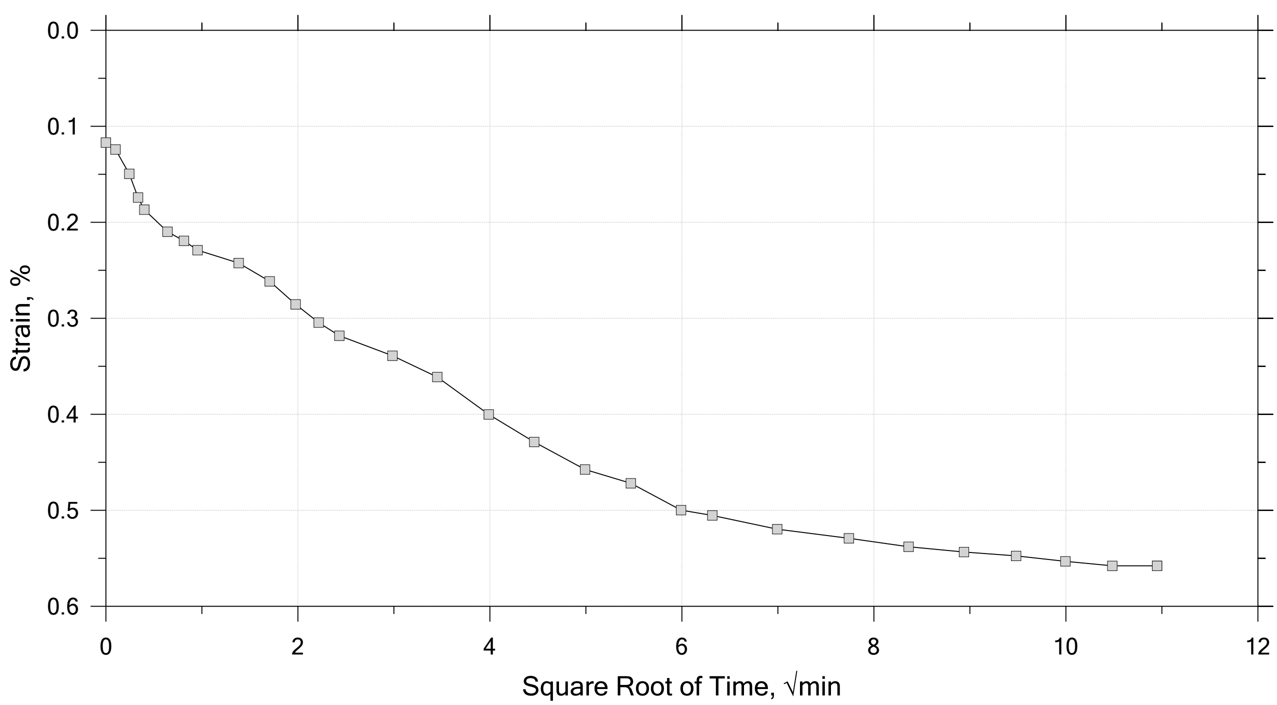


GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB025	Tested By: md	Checked By: njh
	Sample No.: SL1042	Test Date: 12/21/18	Depth: 16-18 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, black clay		
	Remarks: System E, Swell Pressure = 0.137 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 14
Constant Load Step
Stress: 0.25 tsf

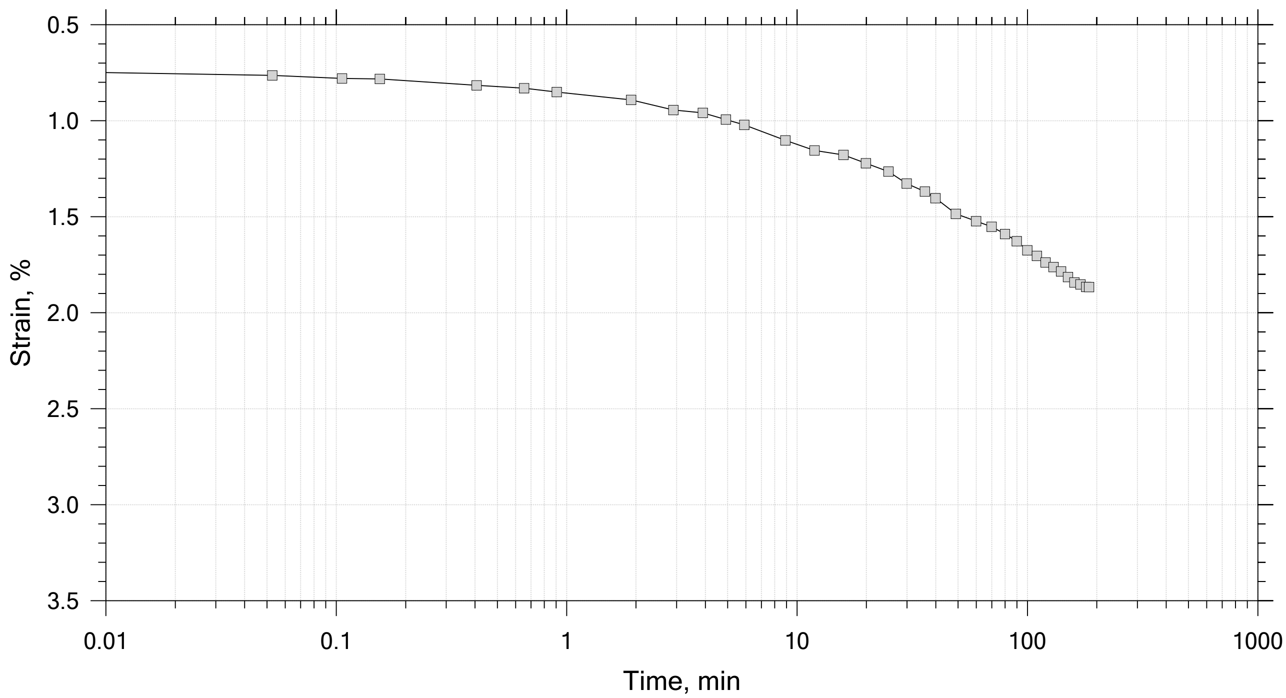


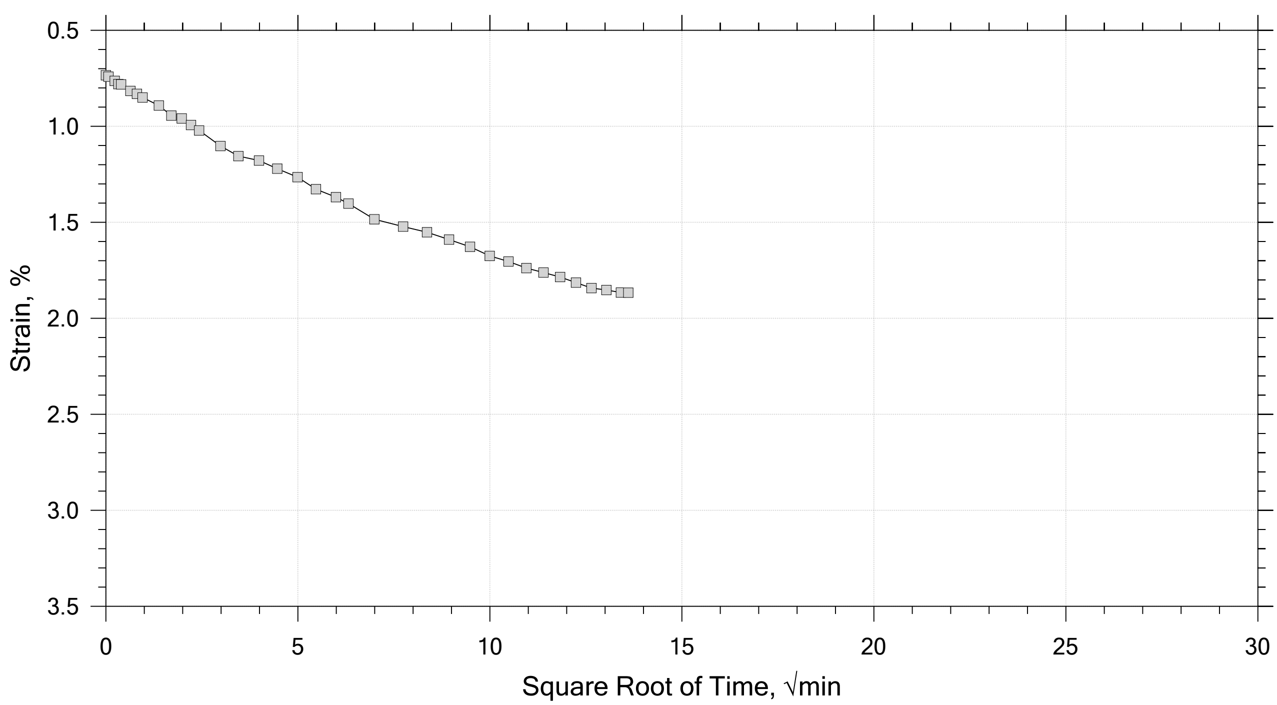


GeoTesting EXPRESS			
	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB025	Tested By: md	Checked By: njh
	Sample No.: SL1042	Test Date: 12/21/18	Depth: 16-18 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, black clay		
	Remarks: System E, Swell Pressure = 0.137 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 14
Constant Load Step
Stress: 0.5 tsf





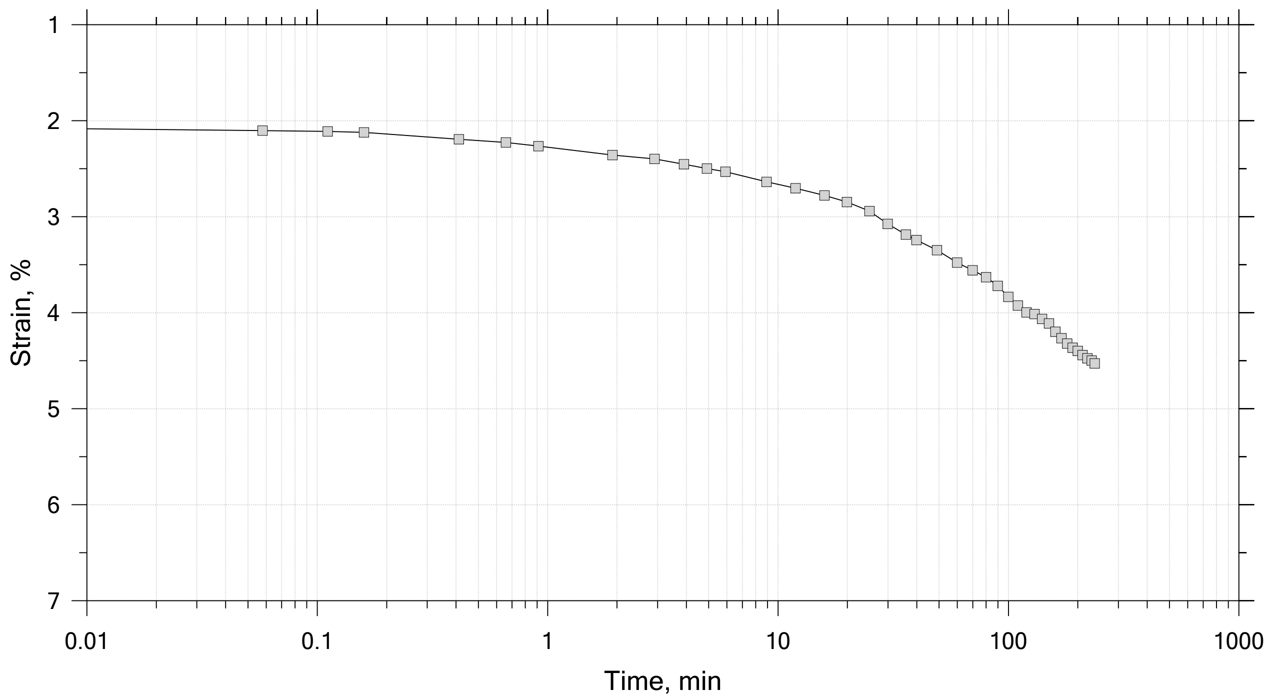
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB025	Tested By: md	Checked By: njh
	Sample No.: SL1042	Test Date: 12/21/18	Depth: 16-18 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, black clay		
	Remarks: System E, Swell Pressure = 0.137 tsf		

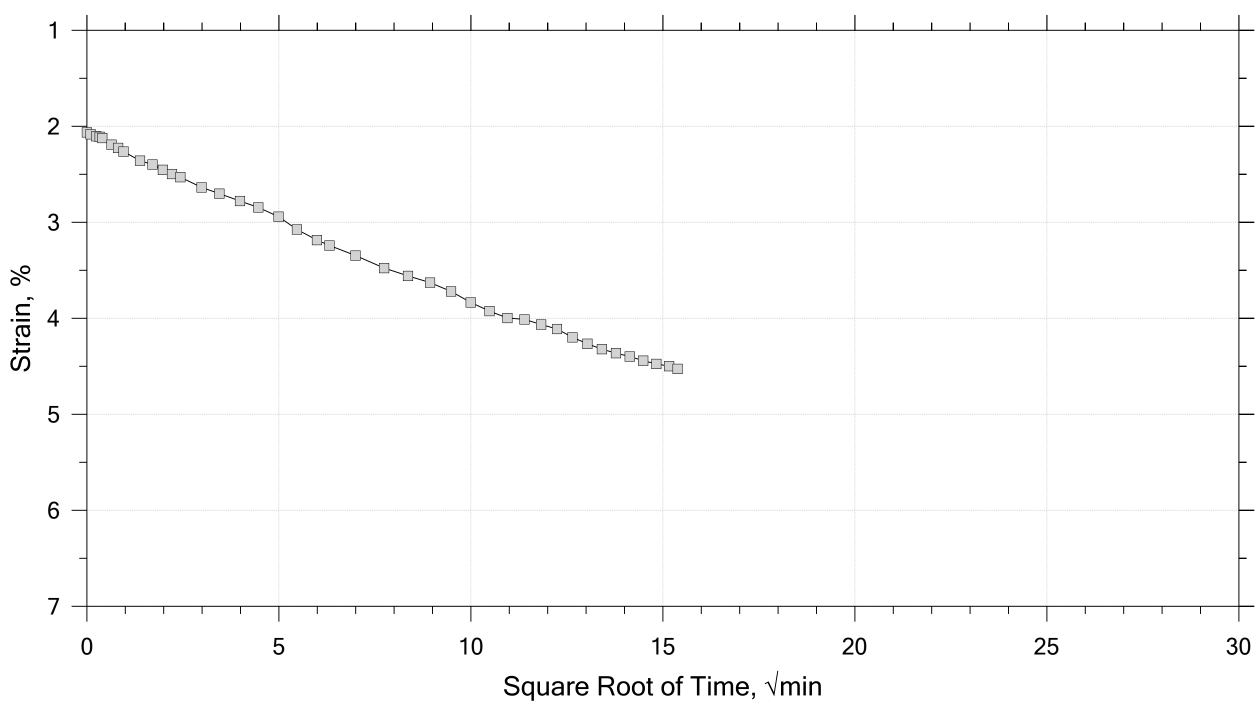
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 14

Constant Load Step

Stress: 1 tsf





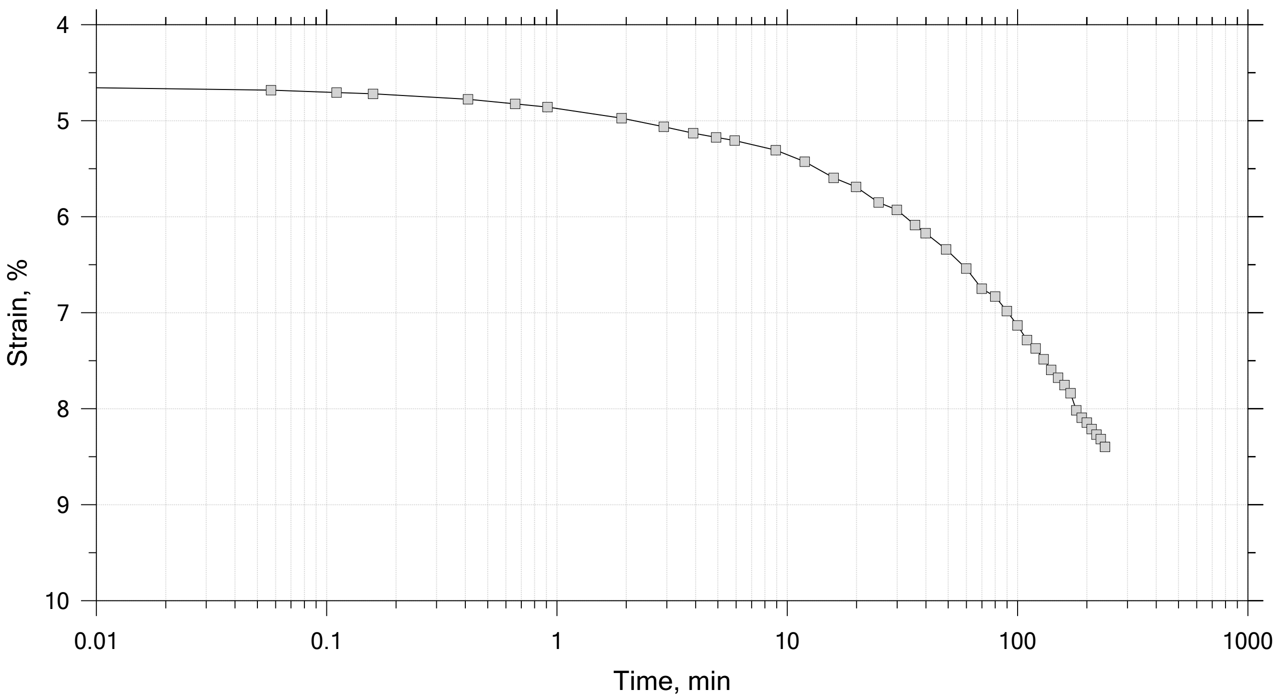
GeoTesting EXPRESS			
	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB025	Tested By: md	Checked By: njh
	Sample No.: SL1042	Test Date: 12/21/18	Depth: 16-18 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, black clay		
	Remarks: System E, Swell Pressure = 0.137 tsf		

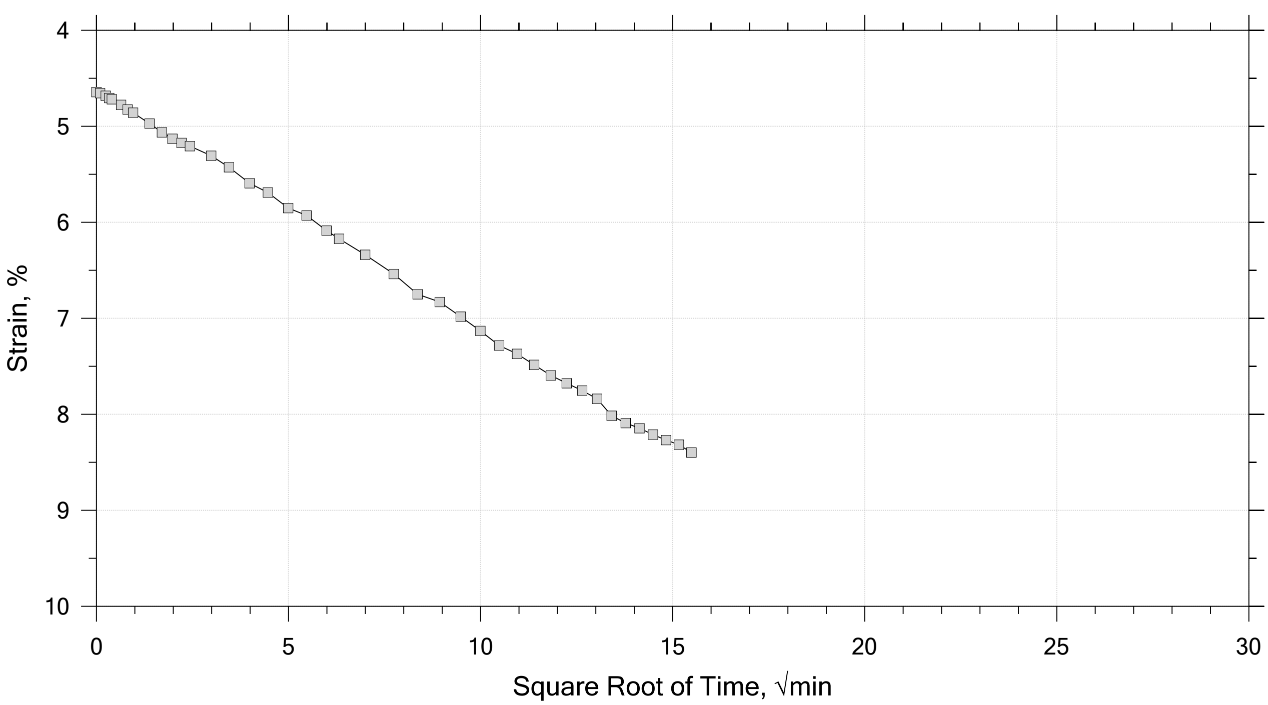
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 14

Constant Load Step

Stress: 2 tsf





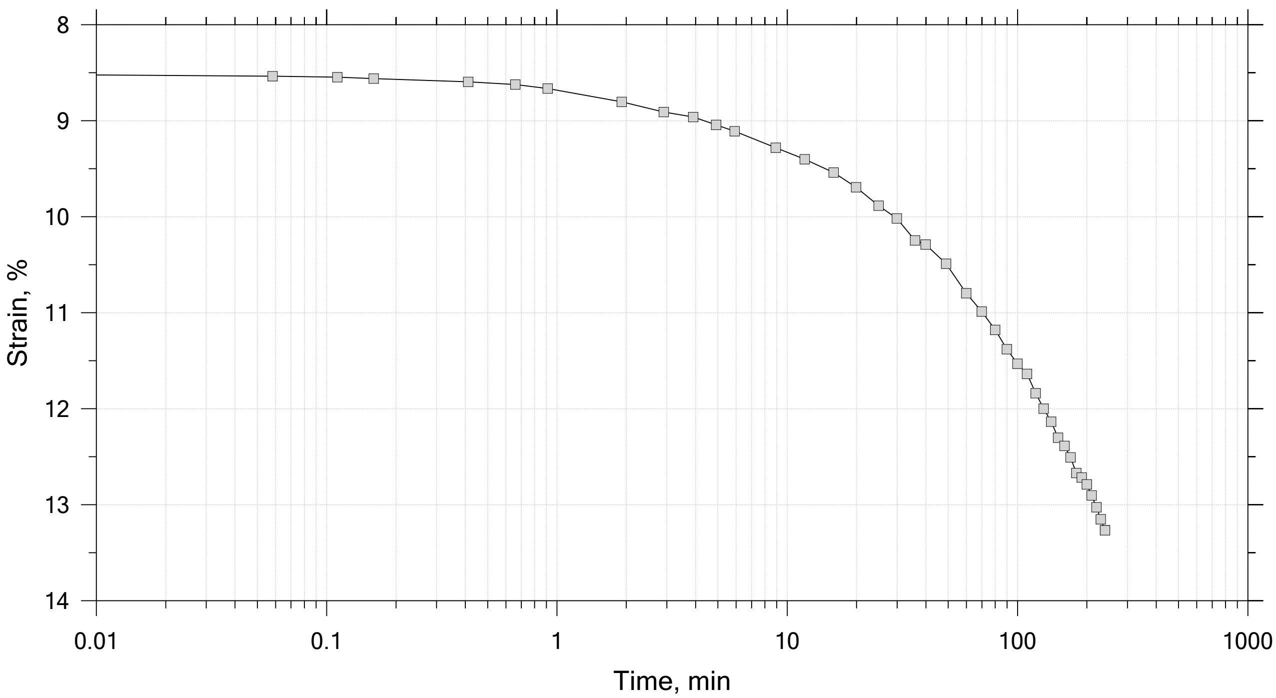
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB025	Tested By: md	Checked By: njh
	Sample No.: SL1042	Test Date: 12/21/18	Depth: 16-18 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, black clay		
	Remarks: System E, Swell Pressure = 0.137 tsf		

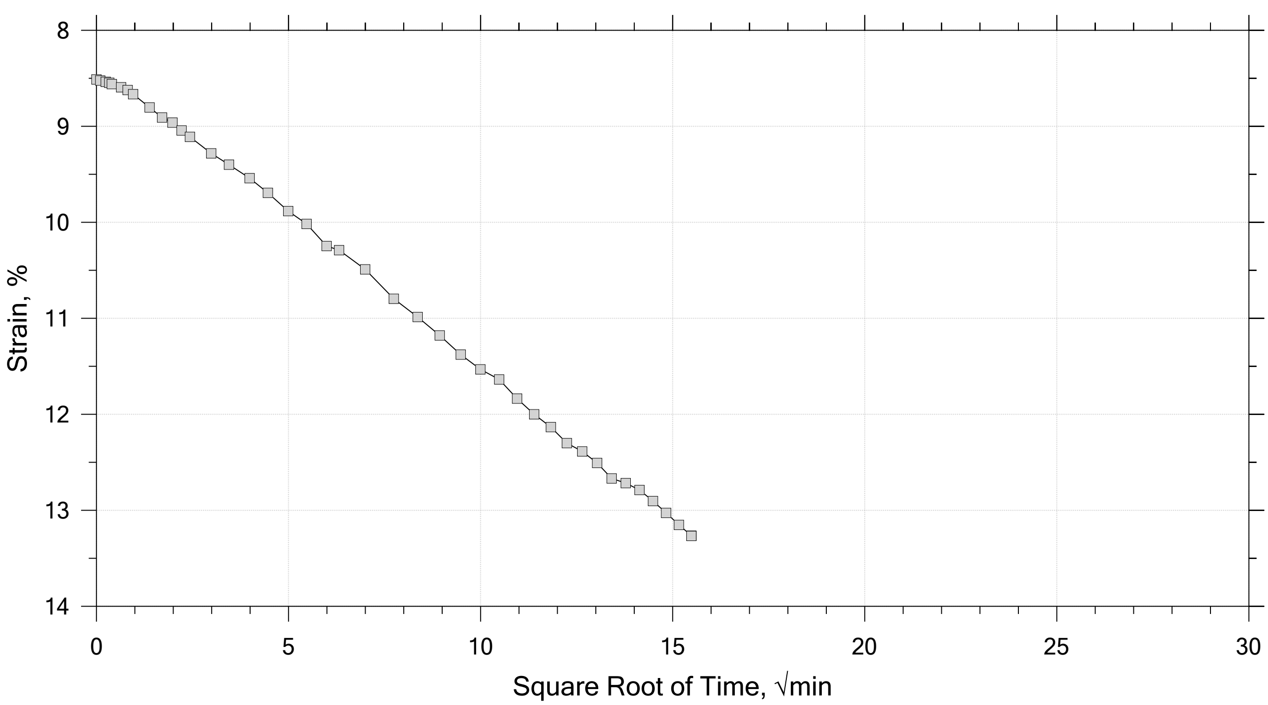
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 14

Constant Load Step

Stress: 4 tsf

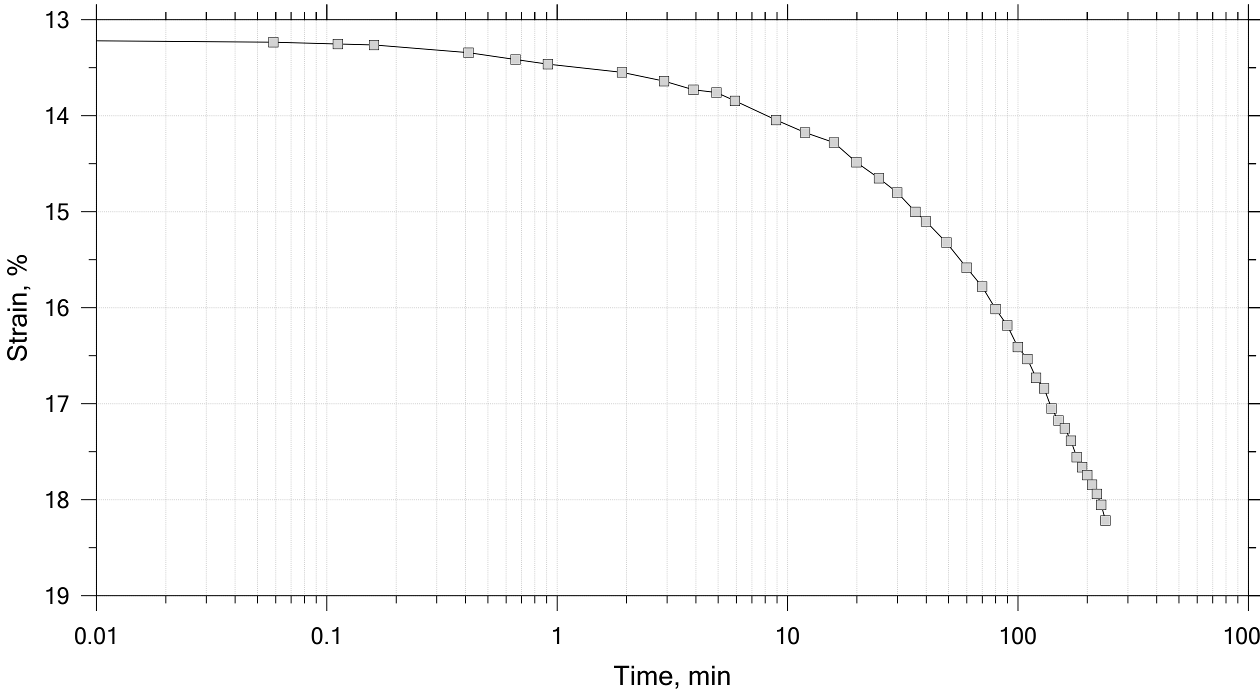


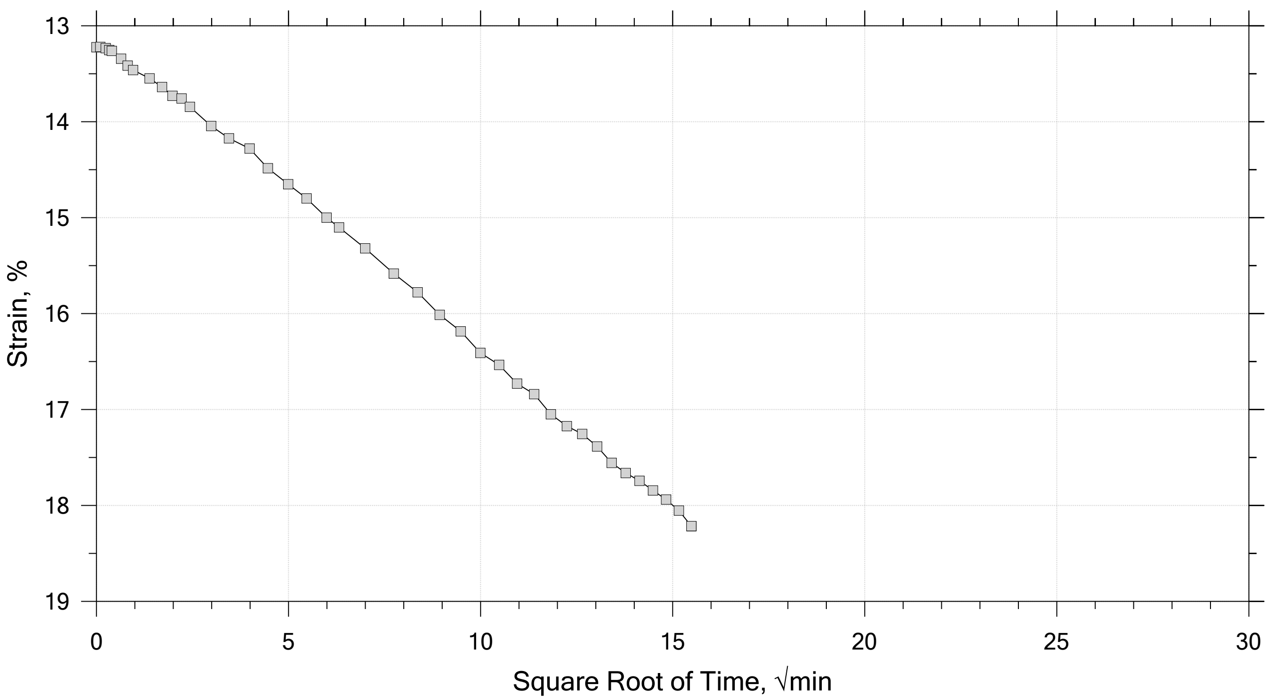


GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB025	Tested By: md	Checked By: njh
	Sample No.: SL1042	Test Date: 12/21/18	Depth: 16-18 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, black clay		
	Remarks: System E, Swell Pressure = 0.137 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 14
Constant Load Step
Stress: 8 tsf

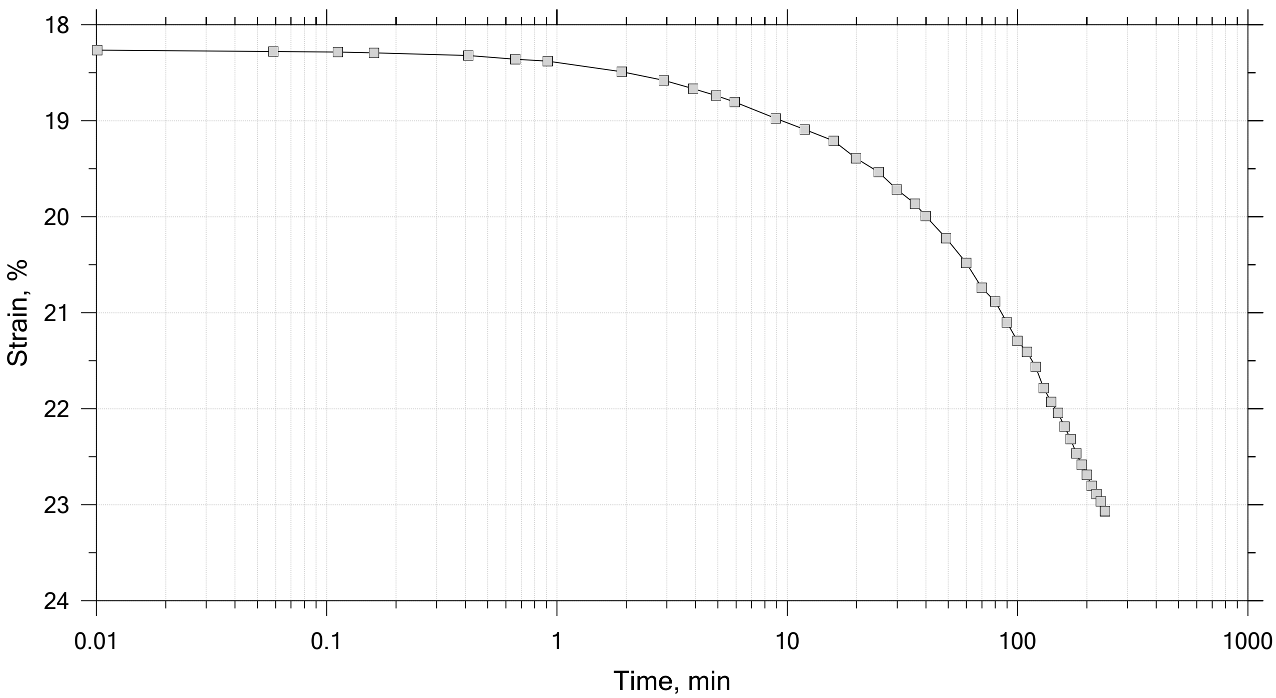


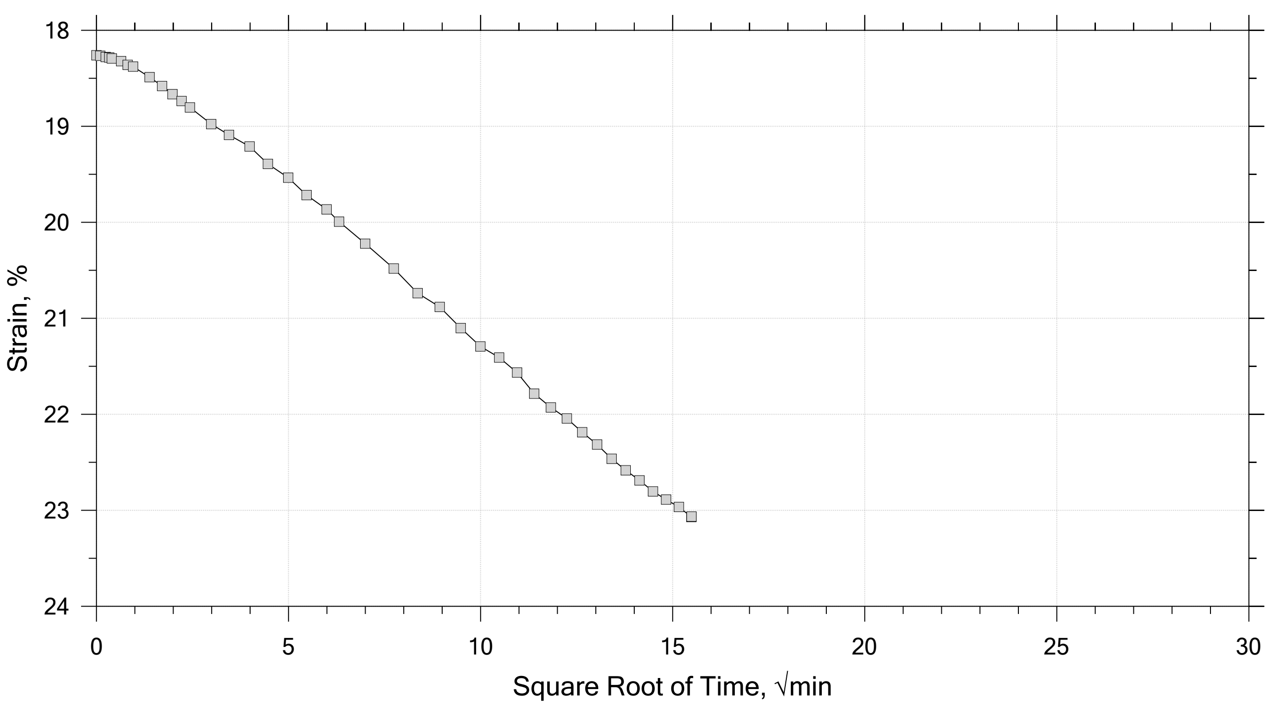


GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB025	Tested By: md	Checked By: njh
	Sample No.: SL1042	Test Date: 12/21/18	Depth: 16-18 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, black clay		
	Remarks: System E, Swell Pressure = 0.137 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 14
Constant Load Step
Stress: 16 tsf





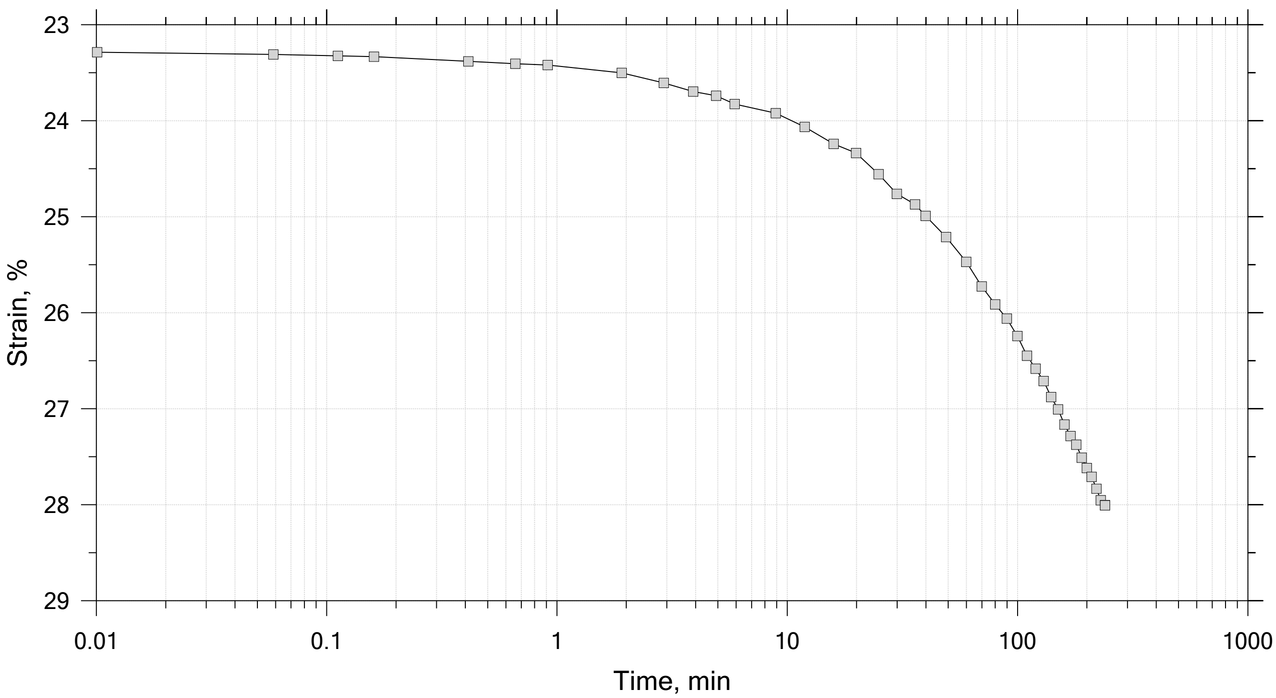
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB025	Tested By: md	Checked By: njh
	Sample No.: SL1042	Test Date: 12/21/18	Depth: 16-18 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, black clay		
	Remarks: System E, Swell Pressure = 0.137 tsf		

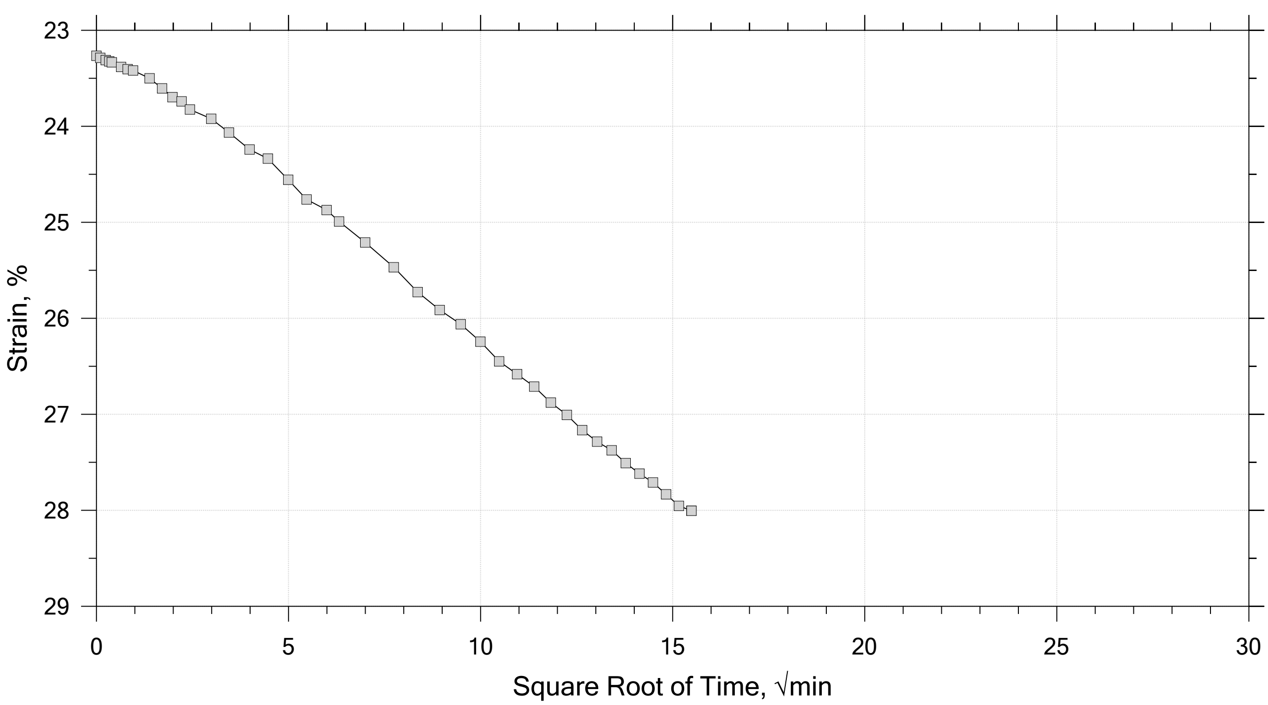
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 14

Constant Load Step

Stress: 32 tsf





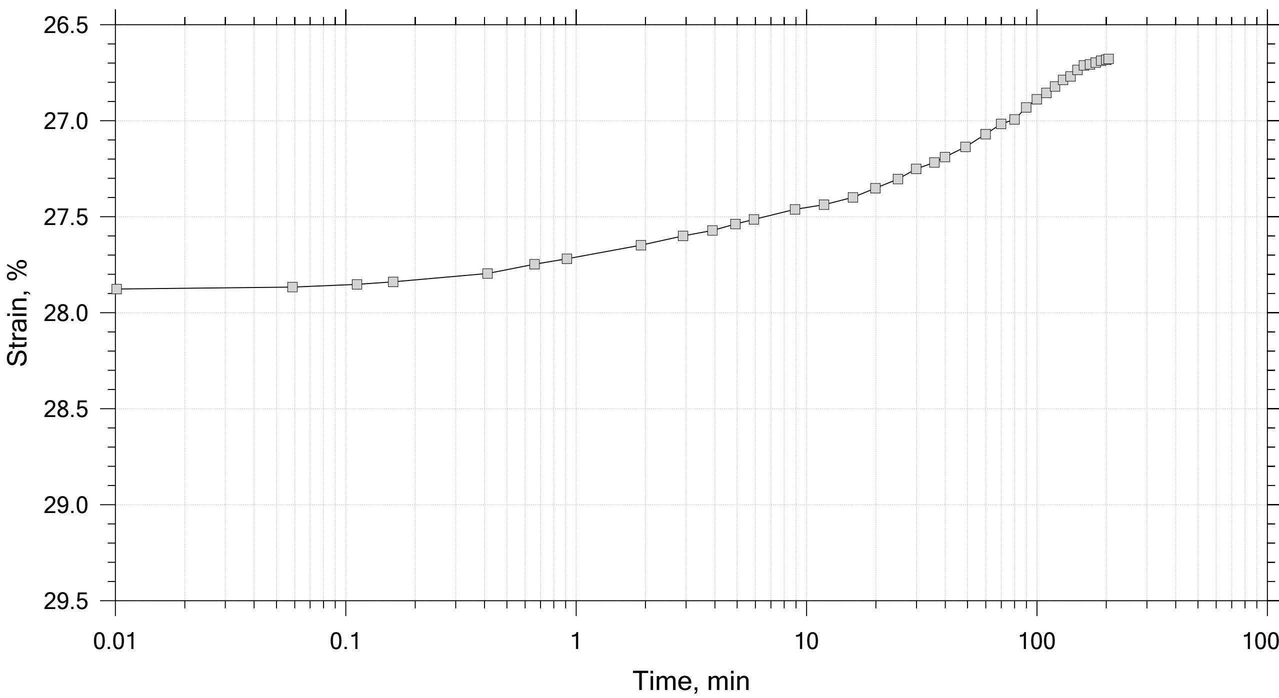
GeoTesting EXPRESS			
	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB025	Tested By: md	Checked By: njh
	Sample No.: SL1042	Test Date: 12/21/18	Depth: 16-18 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, black clay		
	Remarks: System E, Swell Pressure = 0.137 tsf		

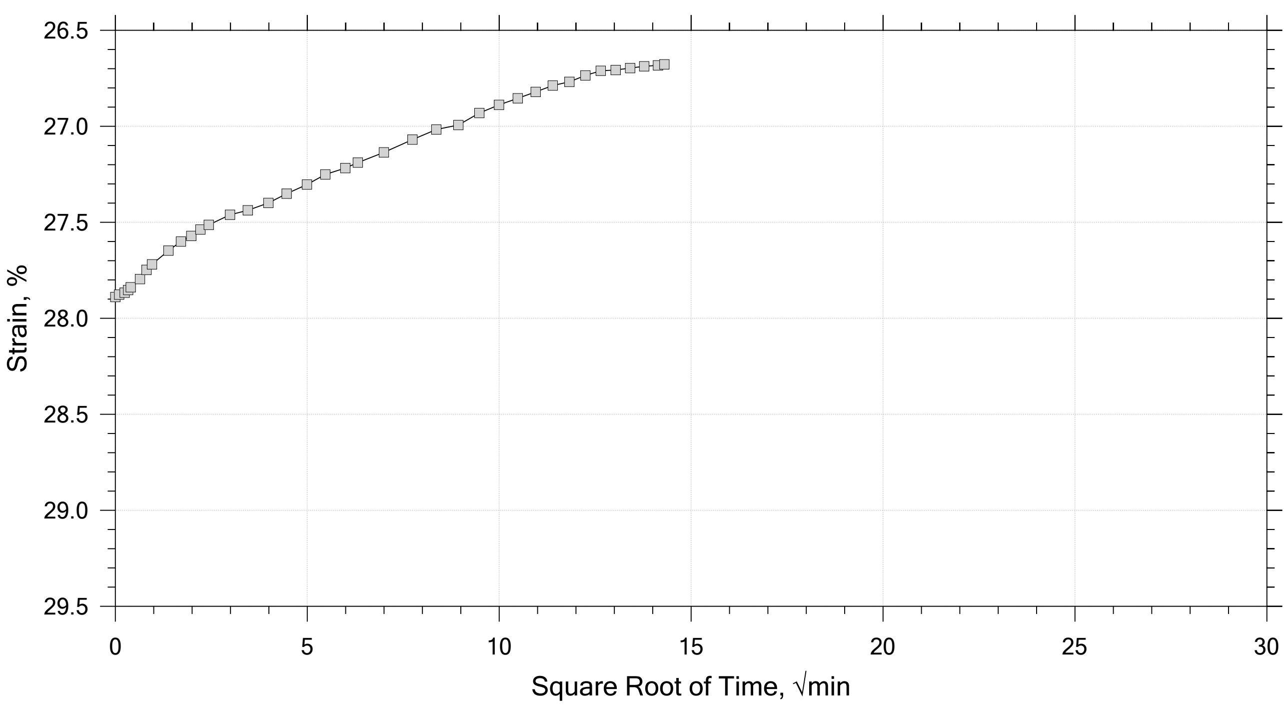
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 14

Constant Load Step

Stress: 8 tsf

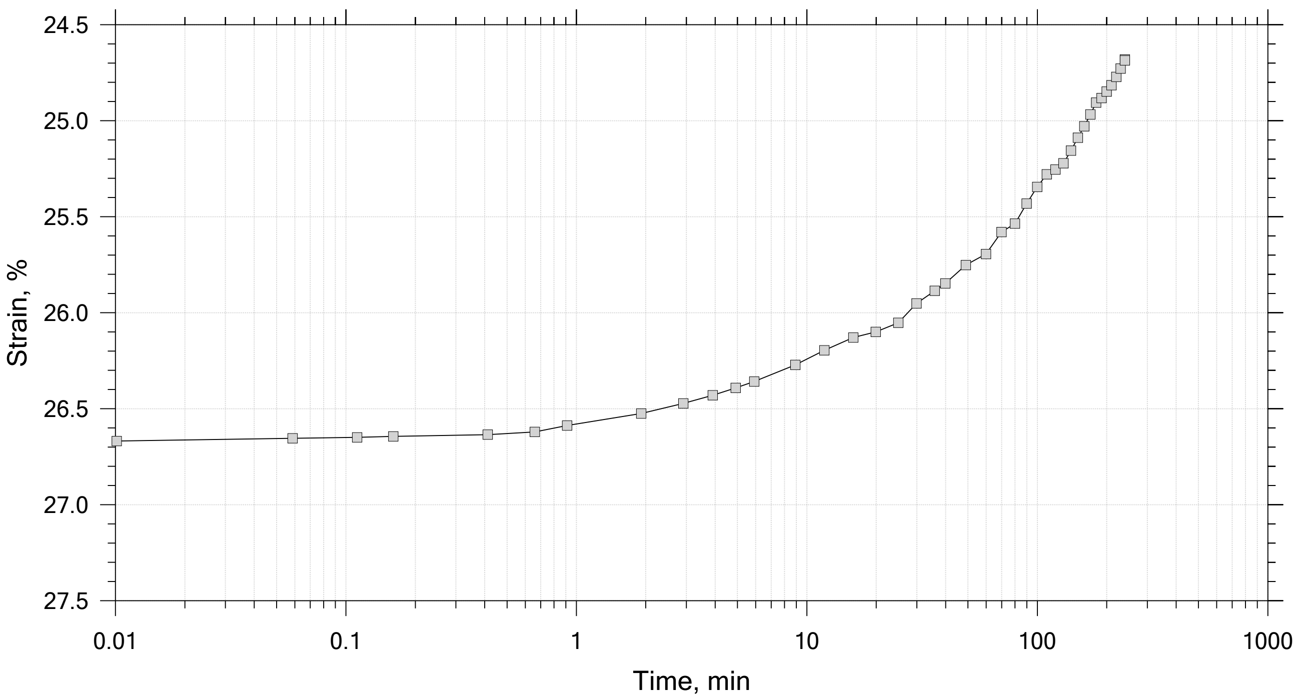


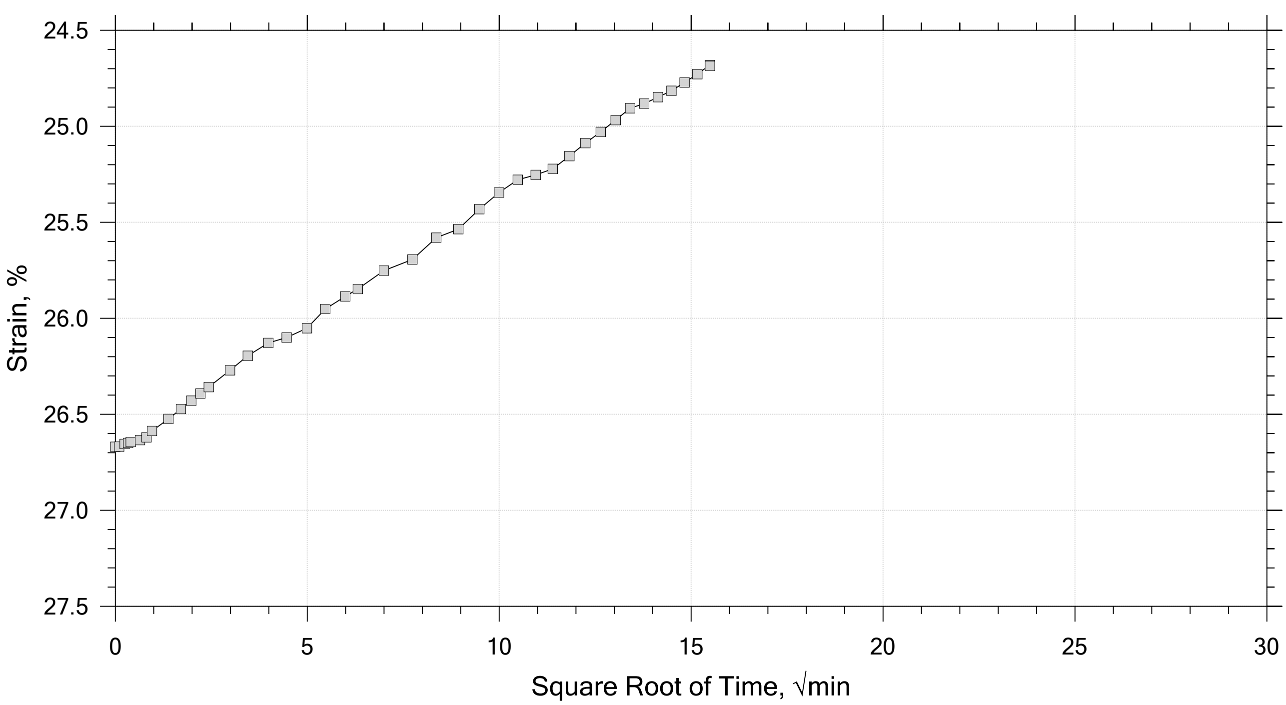


GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB025	Tested By: md	Checked By: njh
	Sample No.: SL1042	Test Date: 12/21/18	Depth: 16-18 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, black clay		
	Remarks: System E, Swell Pressure = 0.137 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 14
Constant Load Step
Stress: 2 tsf





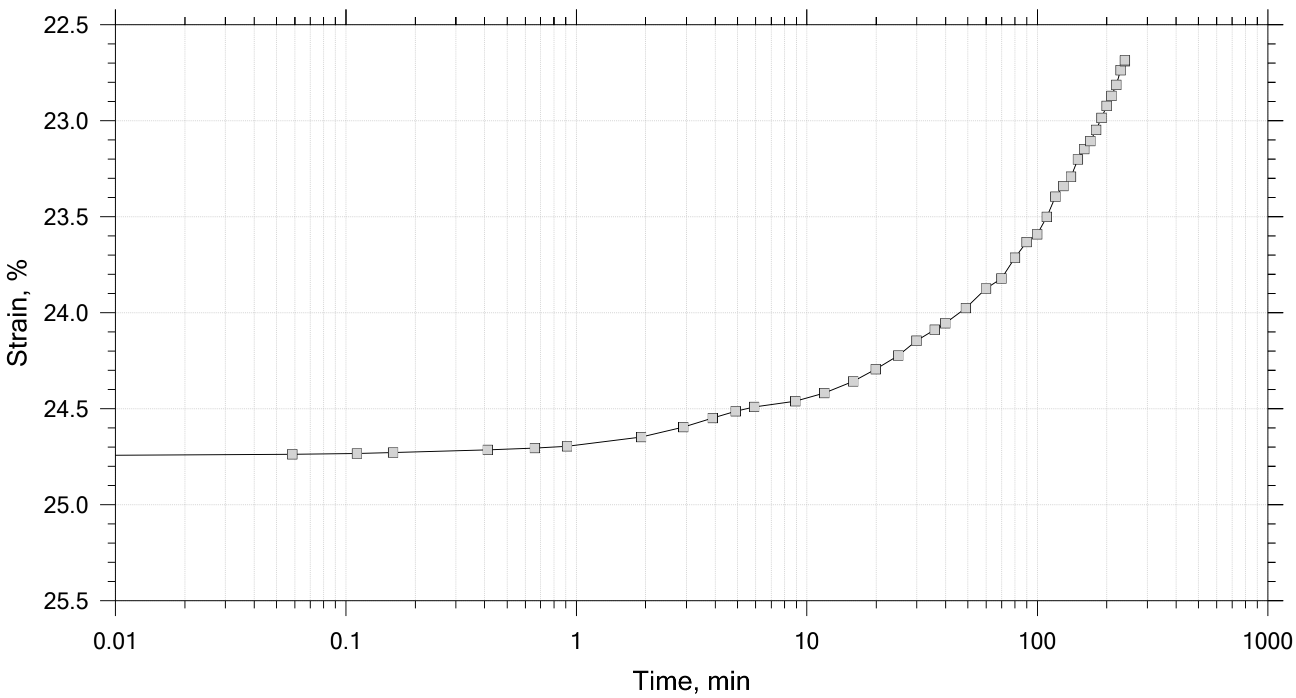
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB025	Tested By: md	Checked By: njh
	Sample No.: SL1042	Test Date: 12/21/18	Depth: 16-18 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, black clay		
	Remarks: System E, Swell Pressure = 0.137 tsf		

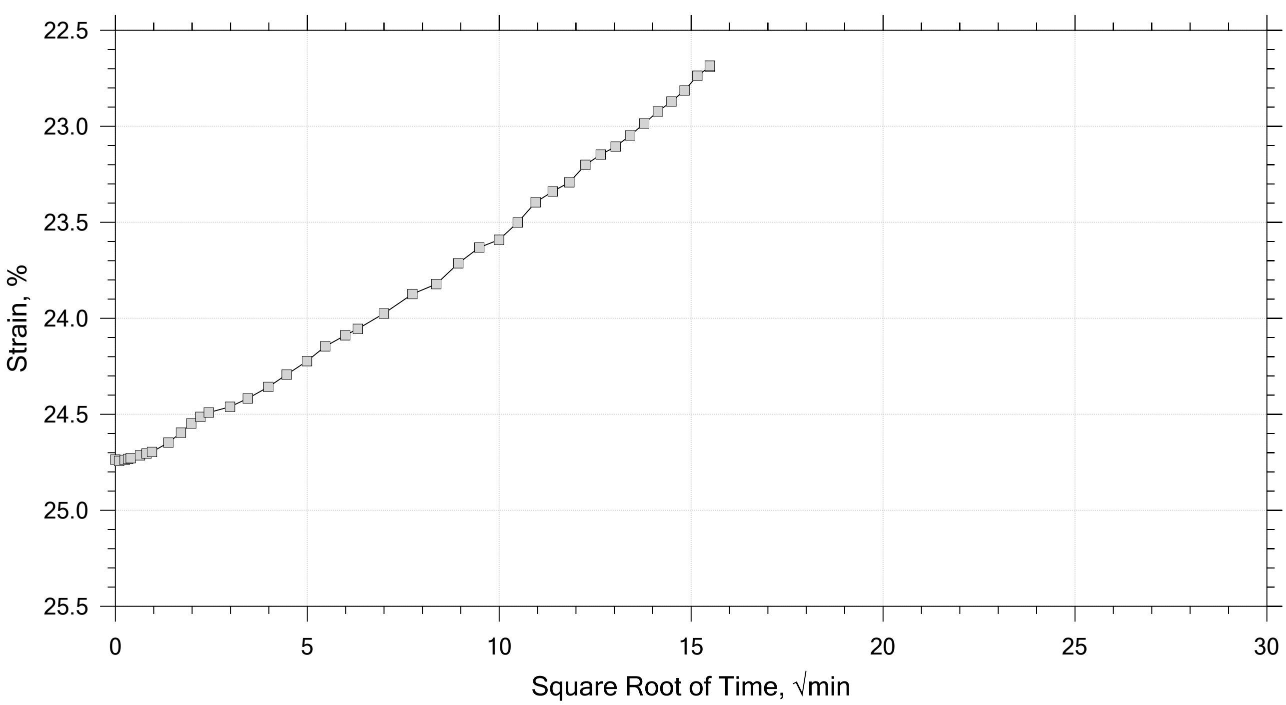
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 14

Constant Load Step

Stress: 0.5 tsf





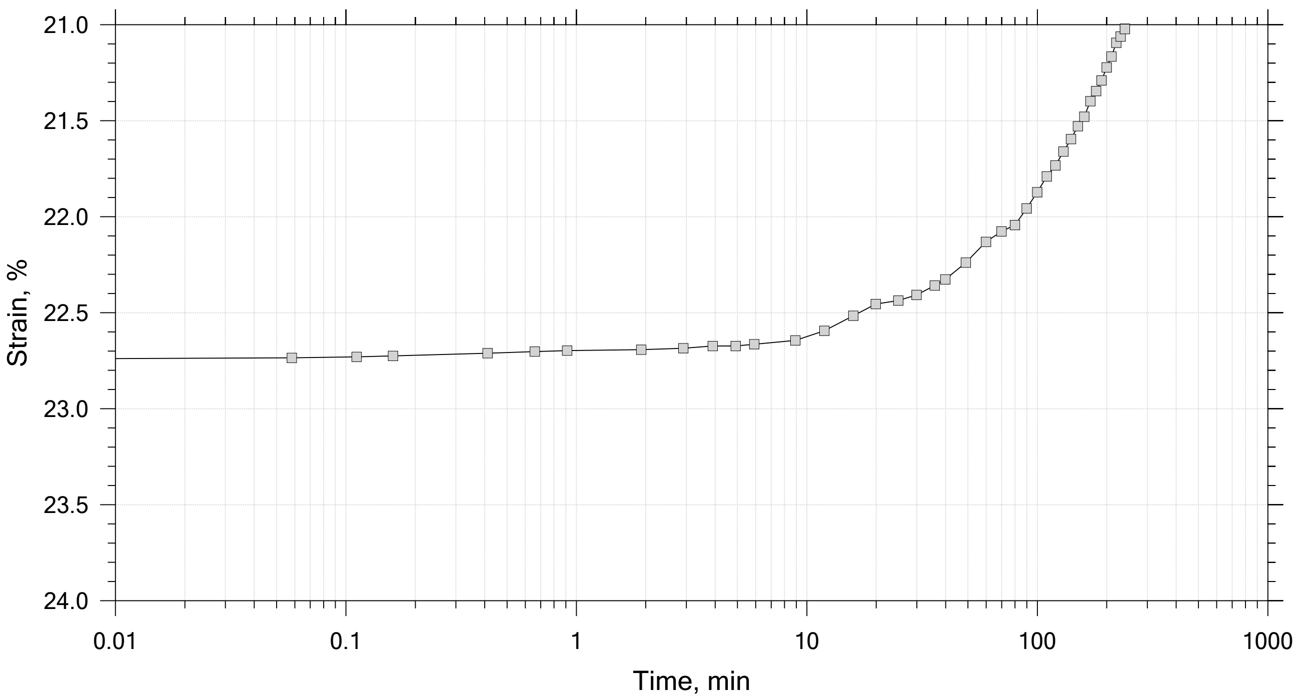
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB025	Tested By: md	Checked By: njh
	Sample No.: SL1042	Test Date: 12/21/18	Depth: 16-18 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, black clay		
	Remarks: System E, Swell Pressure = 0.137 tsf		

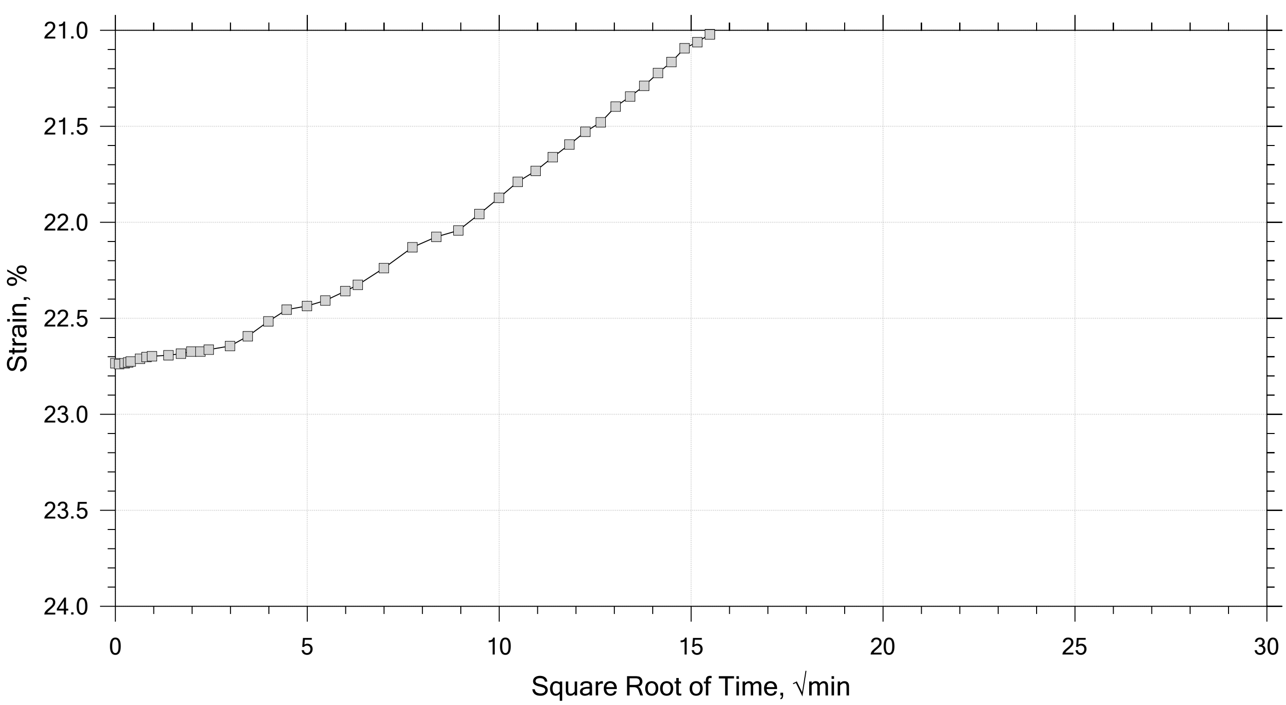
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 14

Constant Load Step

Stress: 0.125 tsf

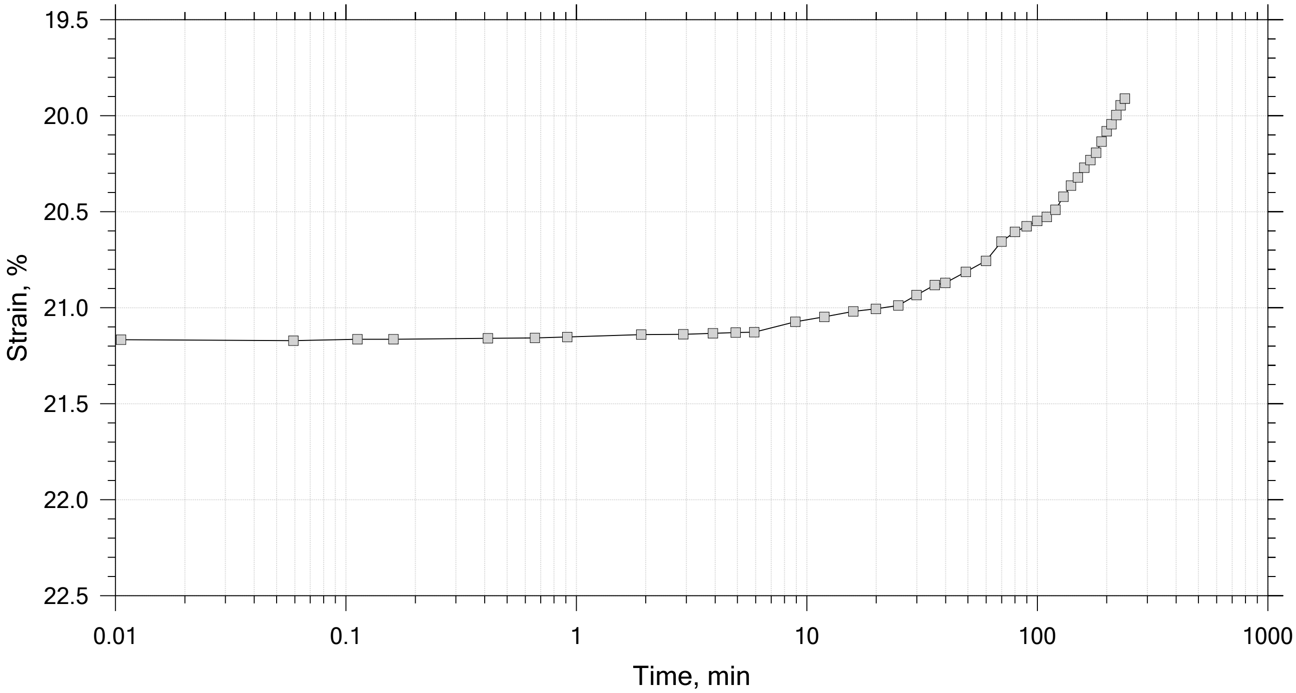


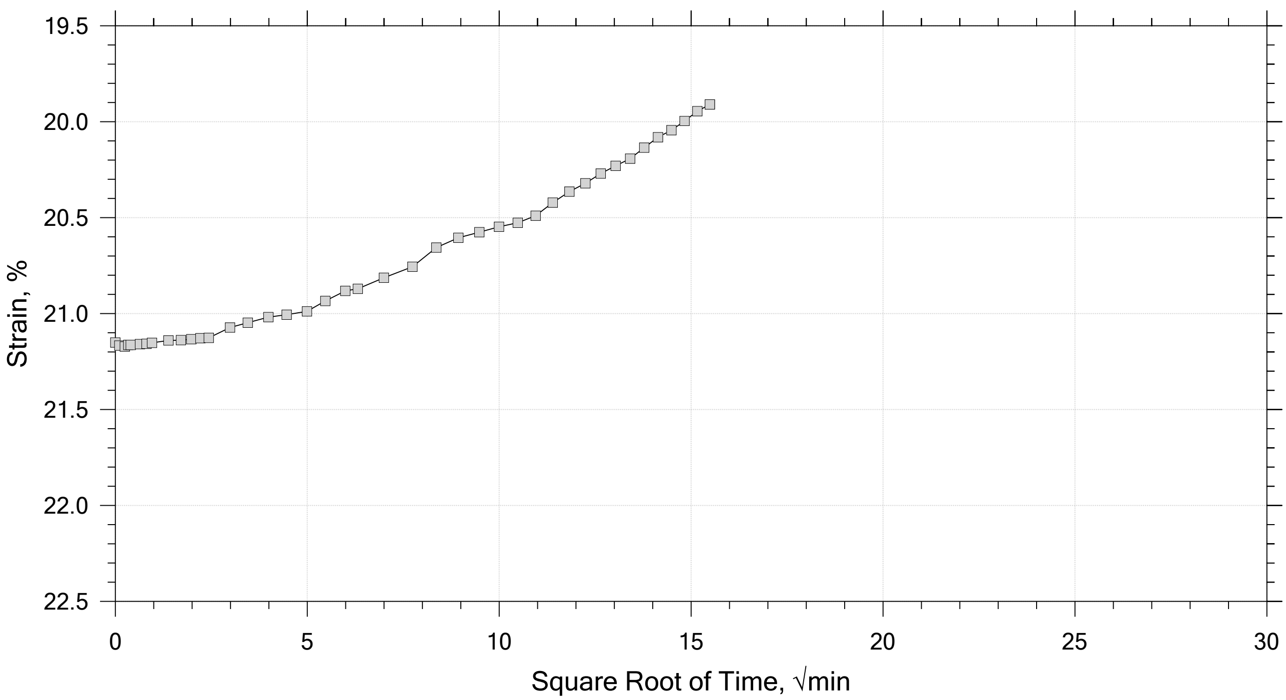


GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB025	Tested By: md	Checked By: njh
	Sample No.: SL1042	Test Date: 12/21/18	Depth: 16-18 ft
	Test No.: IP-3	Sample Type: intact	Elevation: ---
	Description: Moist, black clay		
	Remarks: System E, Swell Pressure = 0.137 tsf		

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.

GeoTesting 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		

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

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

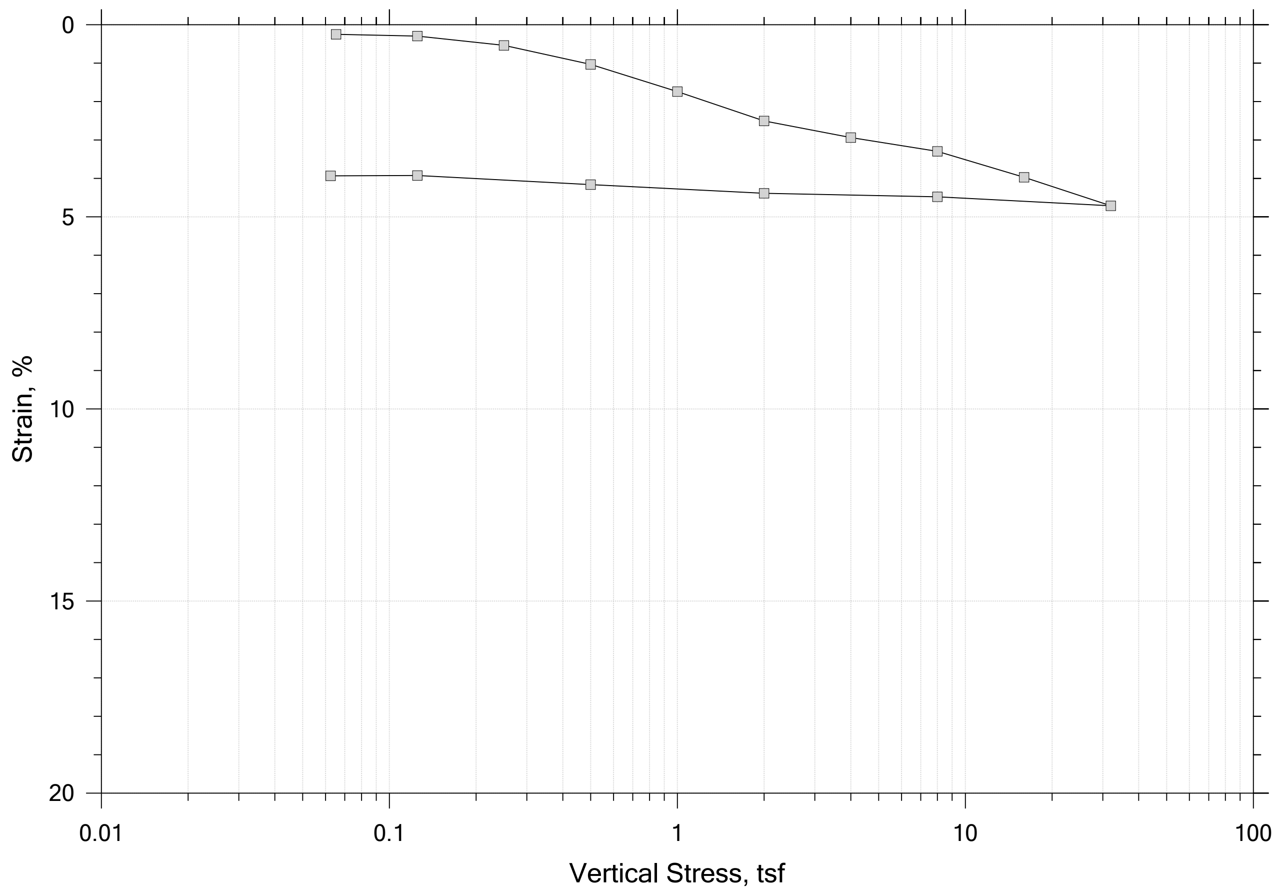
Square Root of Time Coefficients

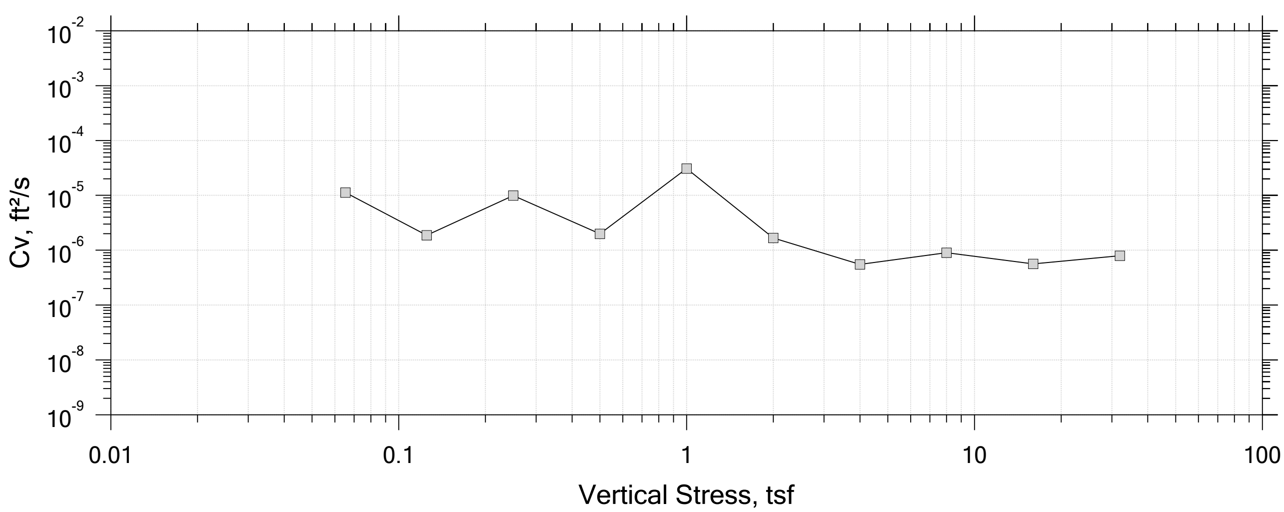
Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Sq.Rt. T90 min	Cv ft²/s	Mv 1/tsf	k ft/day
1	0.137	0.0005068	1.21	0.0507	97.980	2.50e-07	3.69e-03	2.49e-06
2	0.250	0.005579	1.20	0.558	45.482	5.36e-07	4.50e-02	6.51e-05
3	0.500	0.01867	1.17	1.87	63.155	3.79e-07	5.24e-02	5.35e-05
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

GeoTesting 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





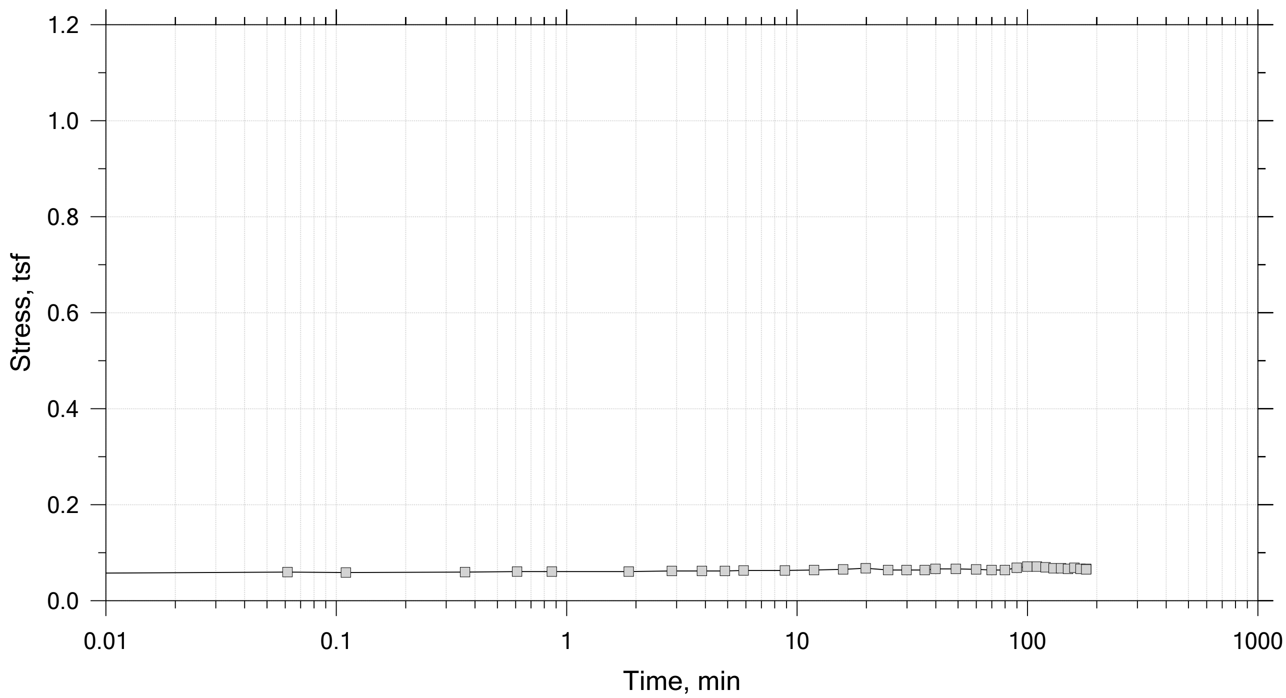
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB033	Tested By: md	Checked By: njh
	Sample No.: SL0650	Test Date: 12/21/18	Depth: 5-7 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, light brown sandy clay		
	Remarks: System Y, Swell Pressure = 0.0653 tsf		
	Displacement at End of Increment		

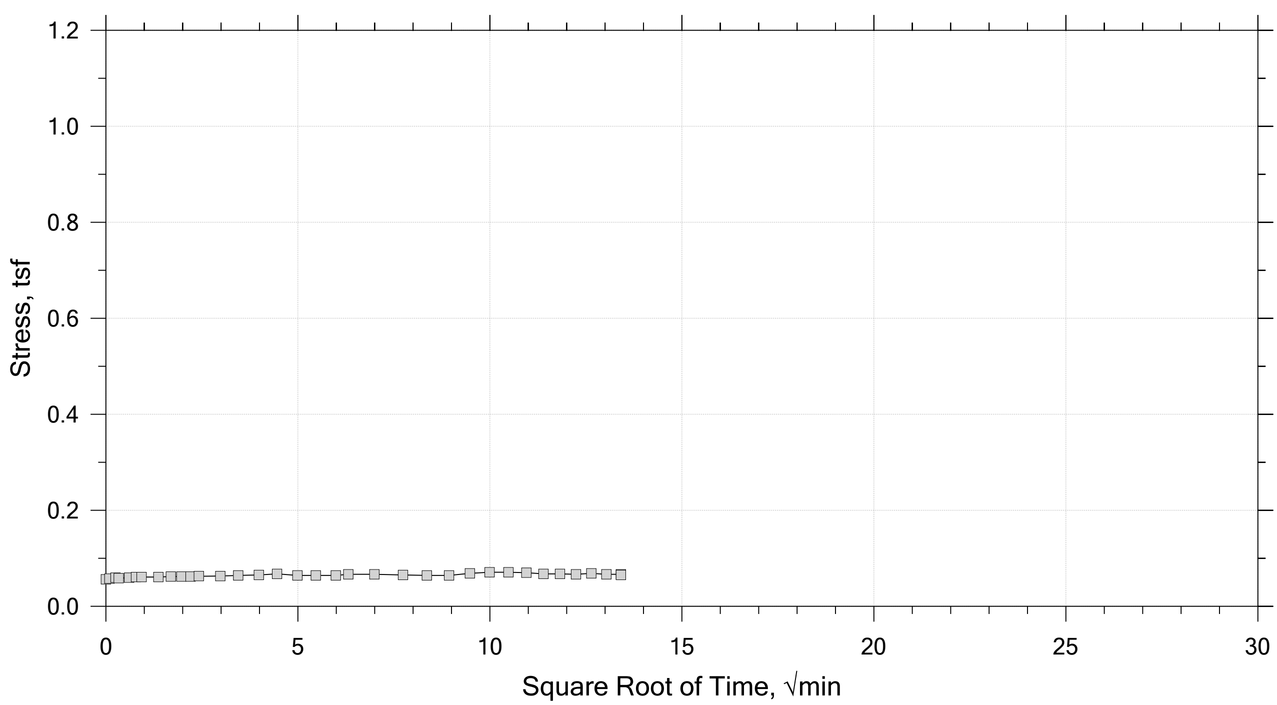
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 15

Constant Volume Step

Stress: 0.0653 tsf





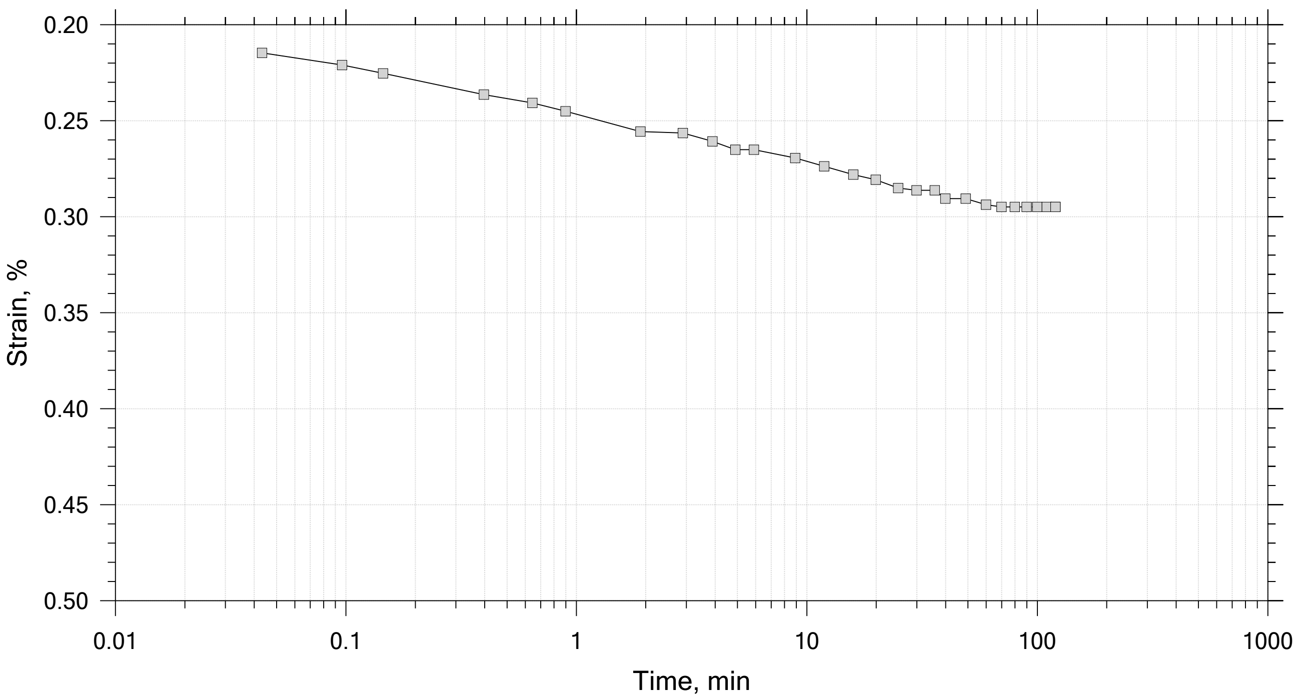
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB033	Tested By: md	Checked By: njh
	Sample No.: SL0650	Test Date: 12/21/18	Depth: 5-7 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, light brown sandy clay		
	Remarks: System Y, Swell Pressure = 0.0653 tsf		

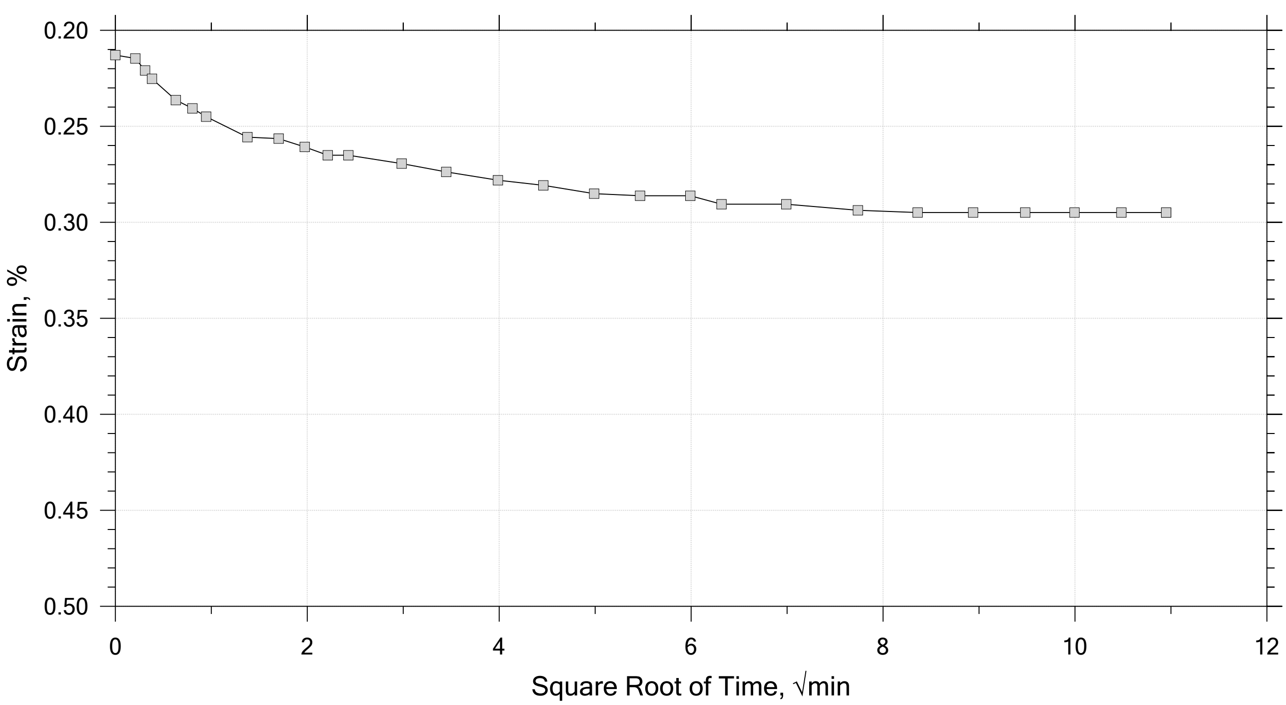
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 15

Constant Load Step

Stress: 0.125 tsf

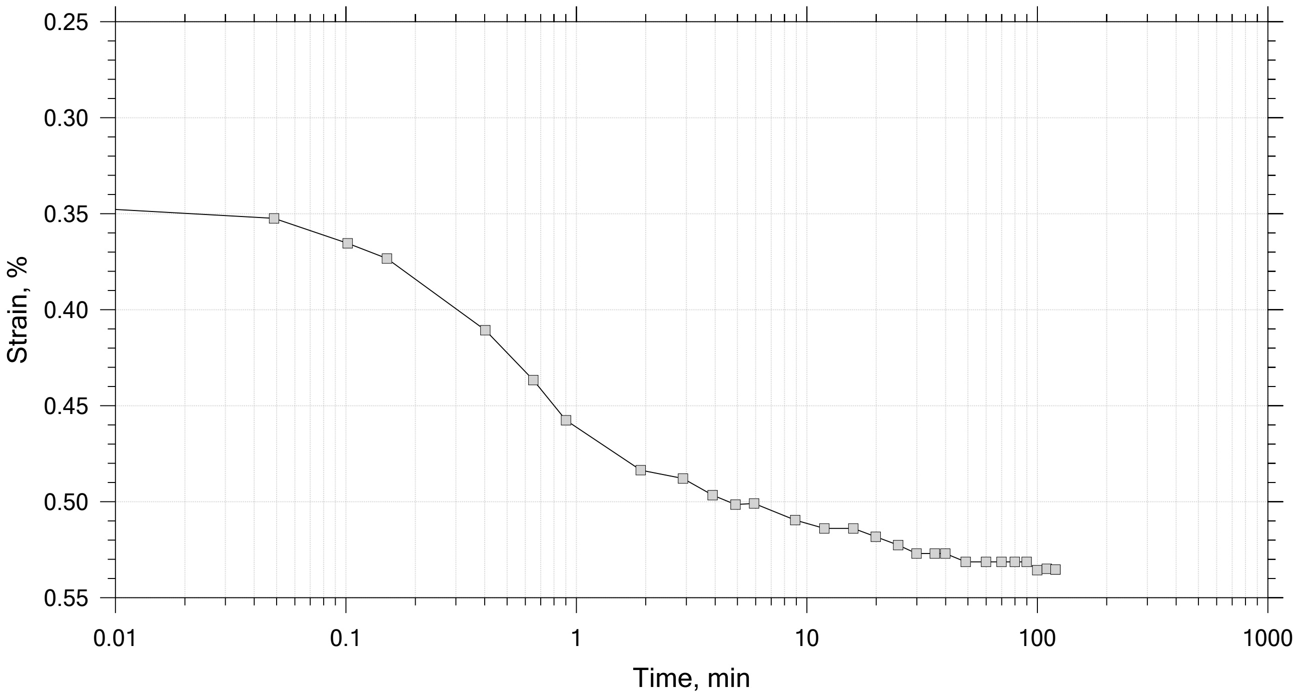


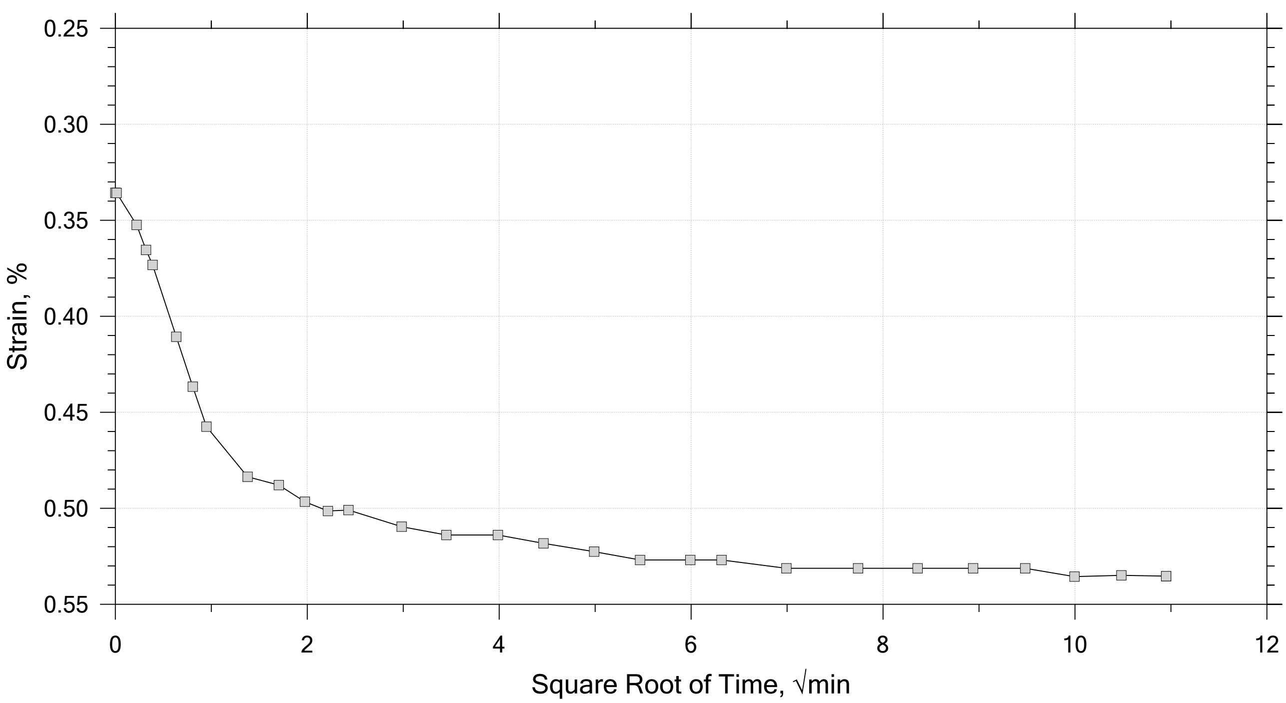


GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB033	Tested By: md	Checked By: njh
	Sample No.: SL0650	Test Date: 12/21/18	Depth: 5-7 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, light brown sandy clay		
	Remarks: 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

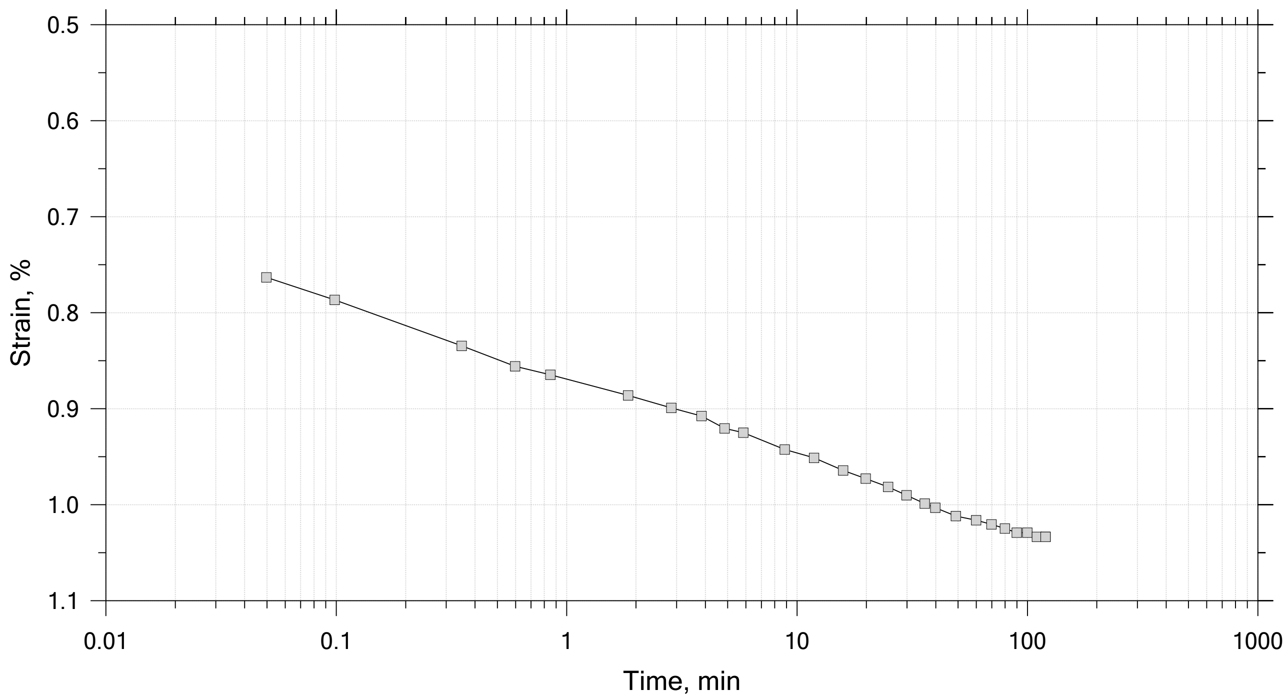


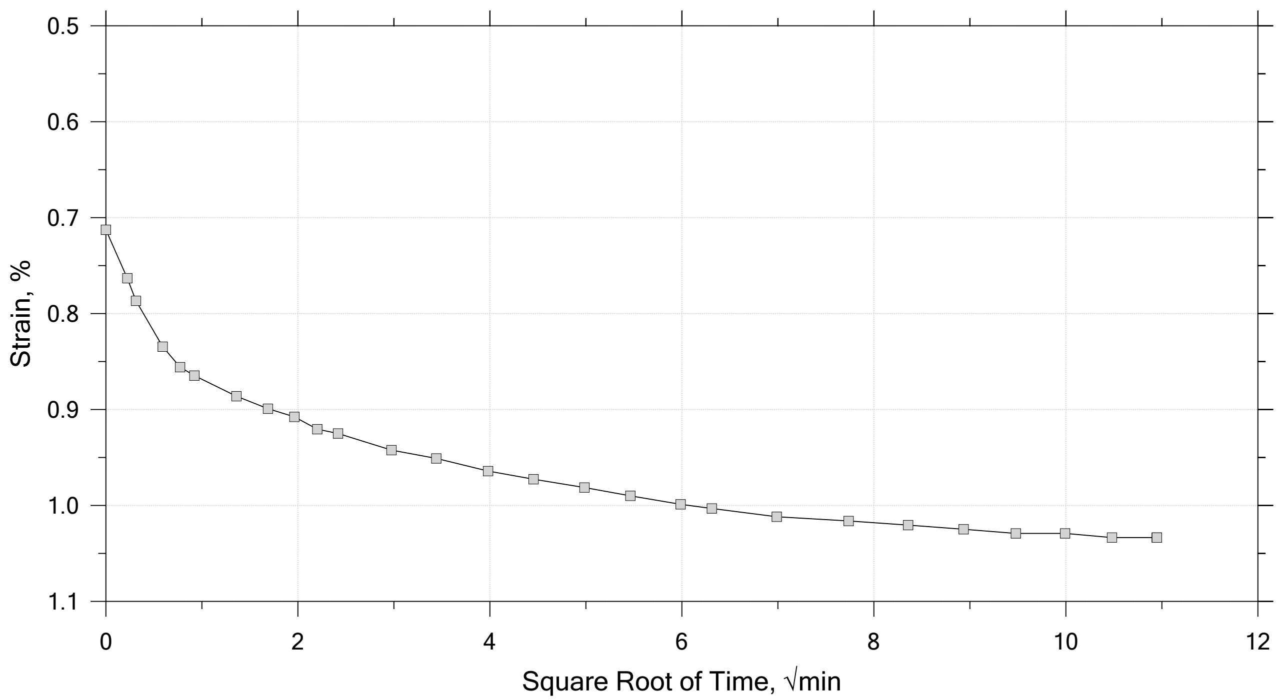


GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB033	Tested By: md	Checked By: njh
	Sample No.: SL0650	Test Date: 12/21/18	Depth: 5-7 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, light brown sandy clay		
	Remarks: 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





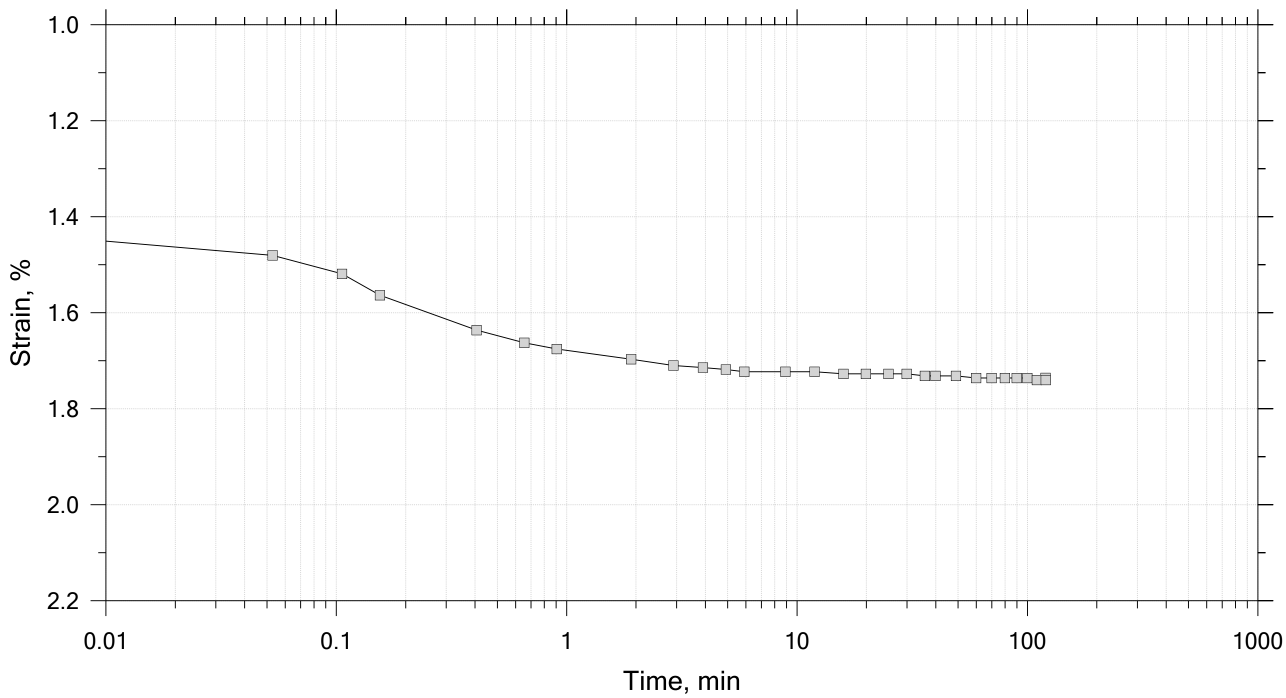
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB033	Tested By: md	Checked By: njh
	Sample No.: SL0650	Test Date: 12/21/18	Depth: 5-7 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, light brown sandy clay		
	Remarks: System Y, Swell Pressure = 0.0653 tsf		

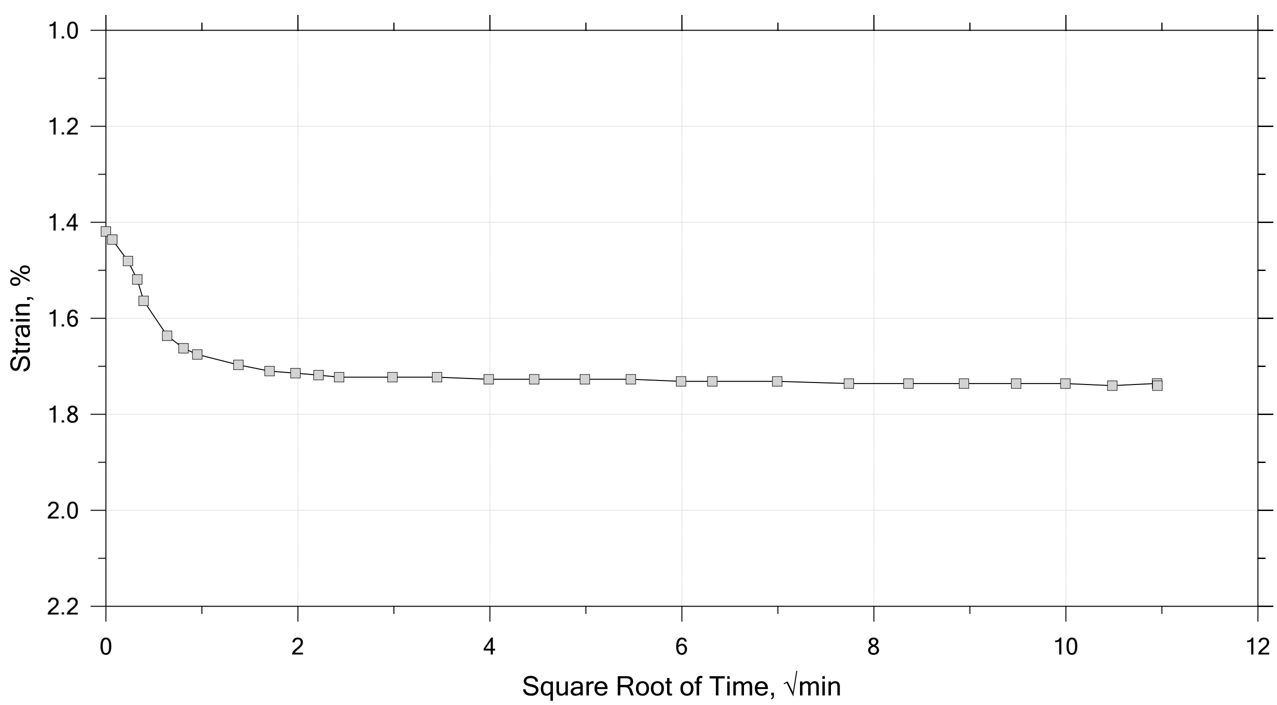
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 15

Constant Load Step

Stress: 1 tsf





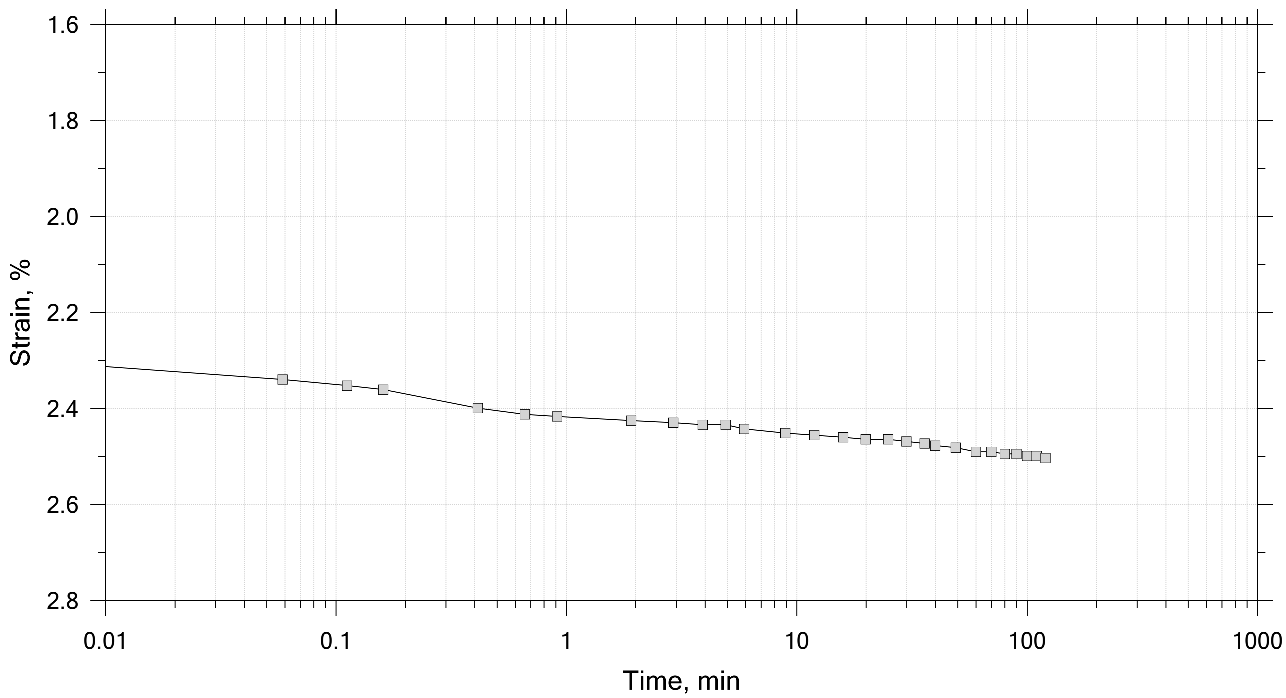
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB033	Tested By: md	Checked By: njh
	Sample No.: SL0650	Test Date: 12/21/18	Depth: 5-7 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, light brown sandy clay		
	Remarks: System Y, Swell Pressure = 0.0653 tsf		

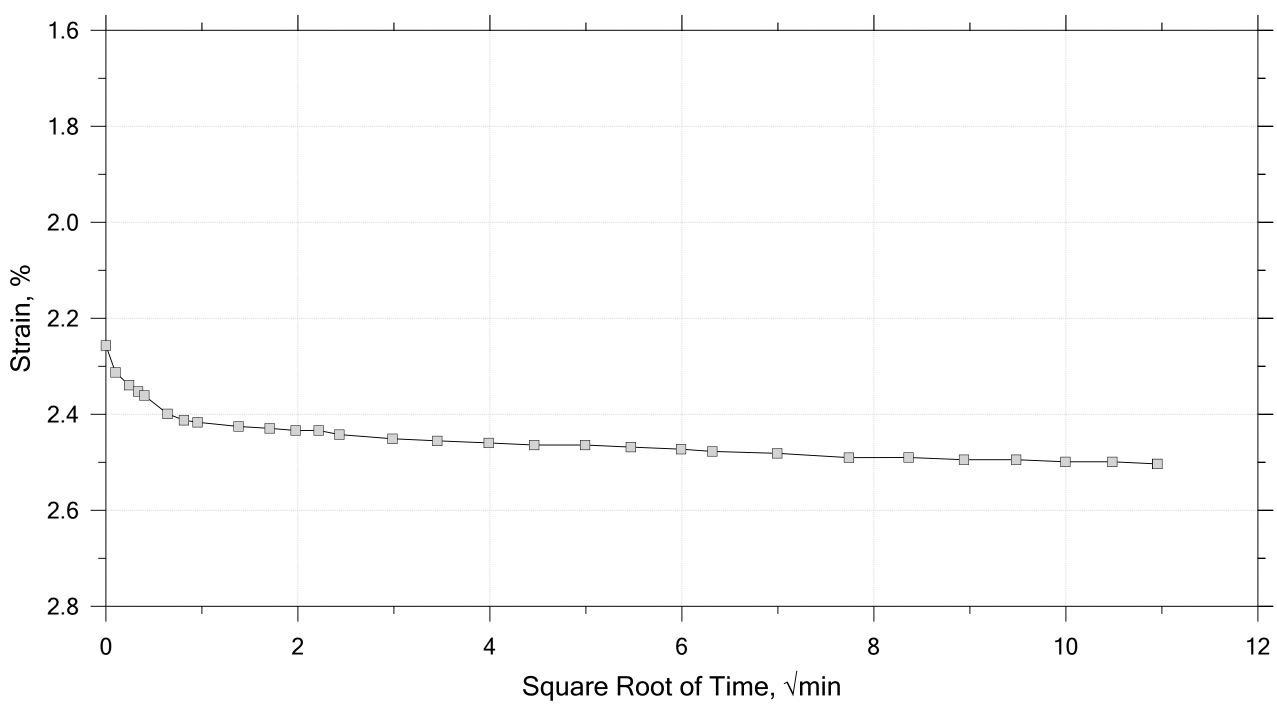
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 15

Constant Load Step

Stress: 2 tsf





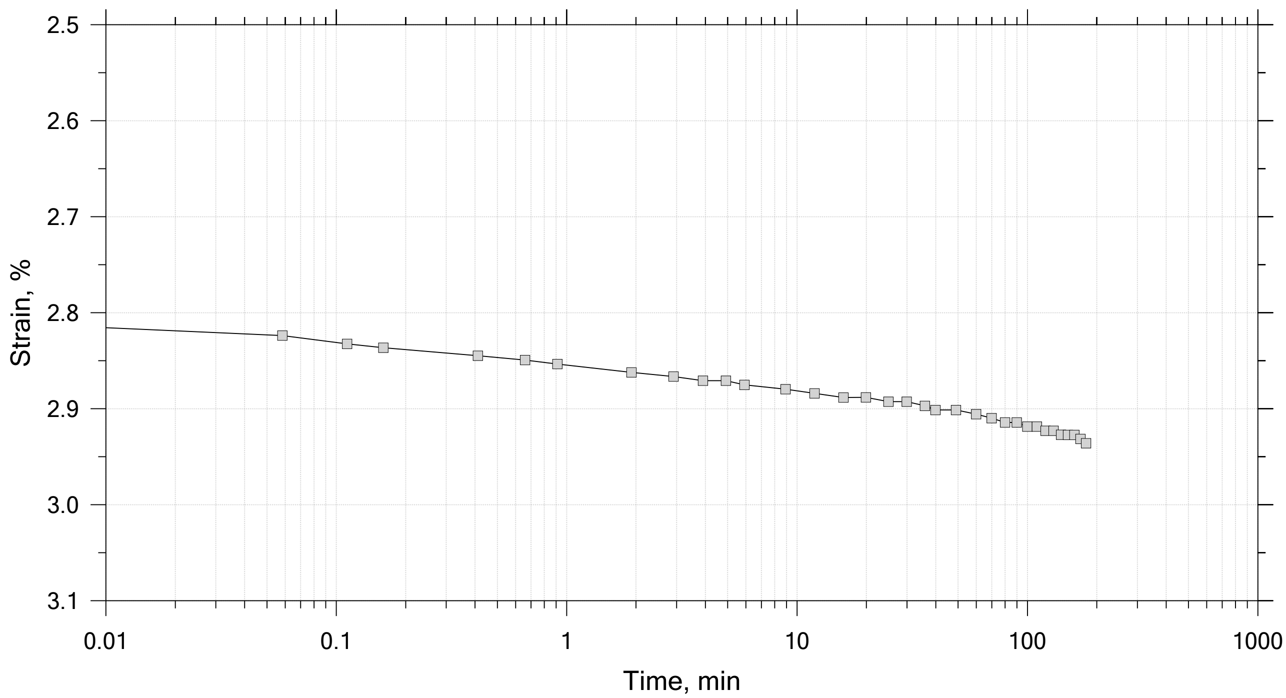
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB033	Tested By: md	Checked By: njh
	Sample No.: SL0650	Test Date: 12/21/18	Depth: 5-7 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, light brown sandy clay		
	Remarks: System Y, Swell Pressure = 0.0653 tsf		

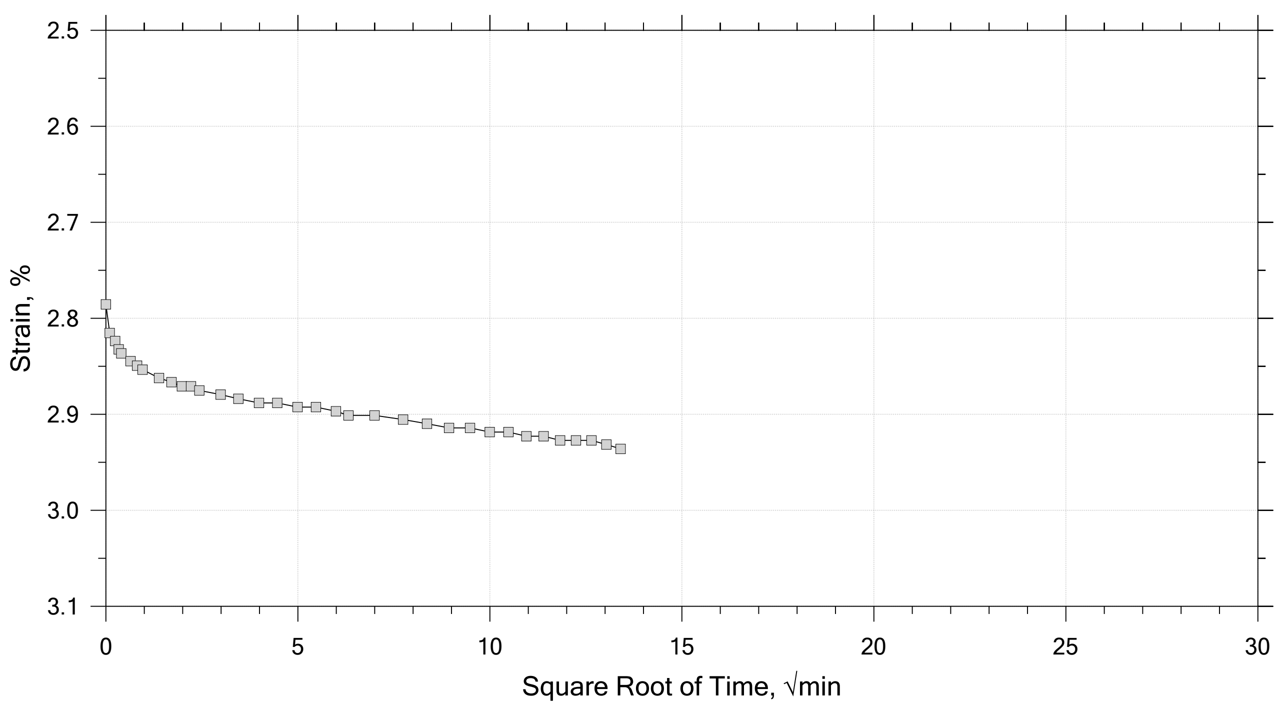
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 15

Constant Load Step

Stress: 4 tsf





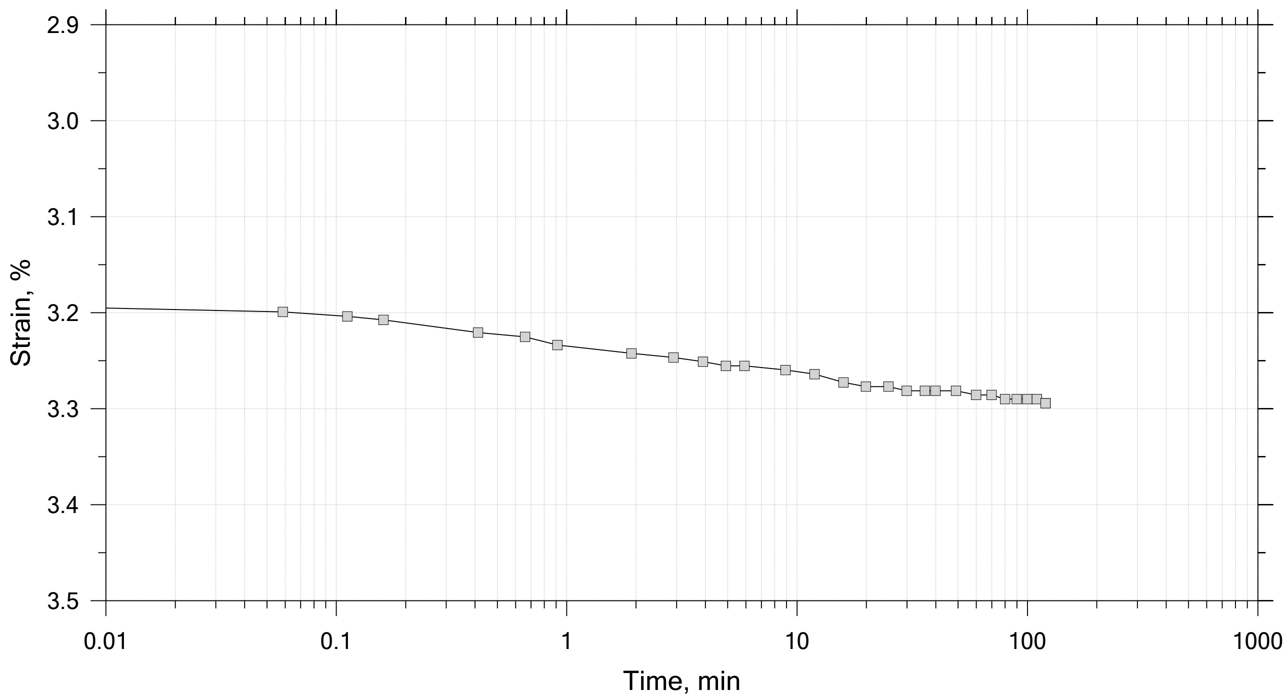
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB033	Tested By: md	Checked By: njh
	Sample No.: SL0650	Test Date: 12/21/18	Depth: 5-7 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, light brown sandy clay		
	Remarks: System Y, Swell Pressure = 0.0653 tsf		

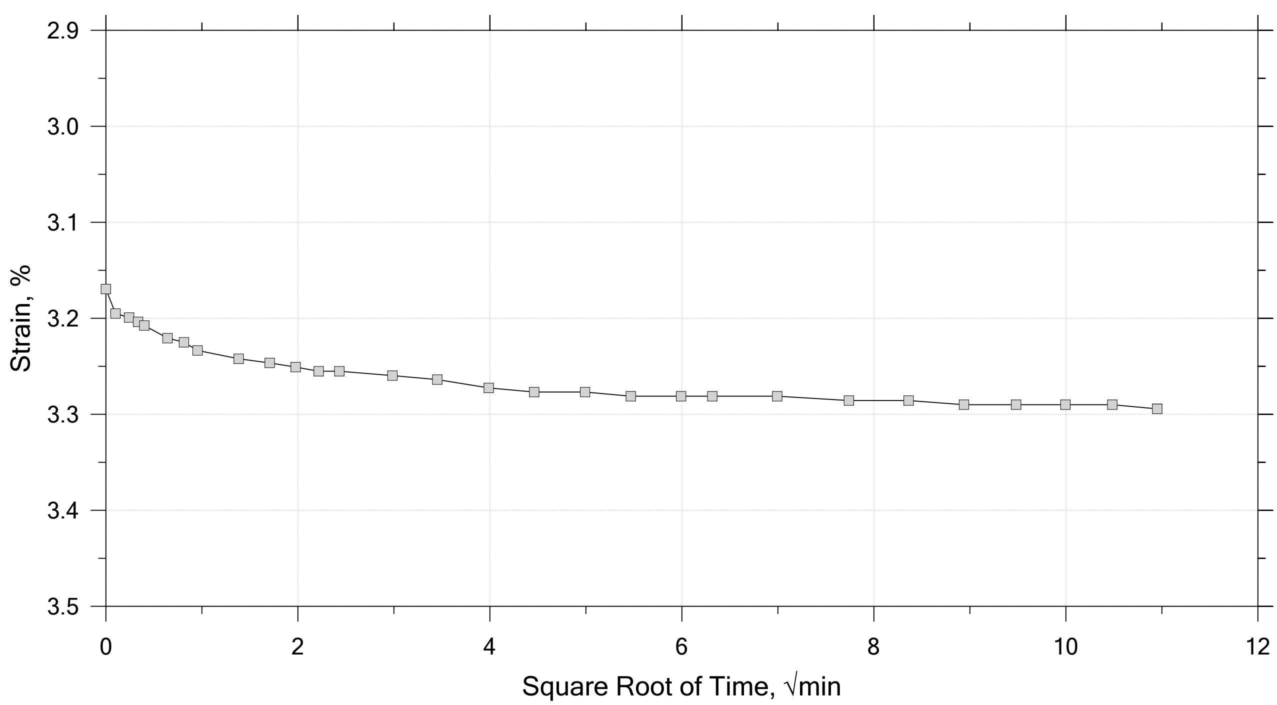
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 15

Constant Load Step

Stress: 8 tsf





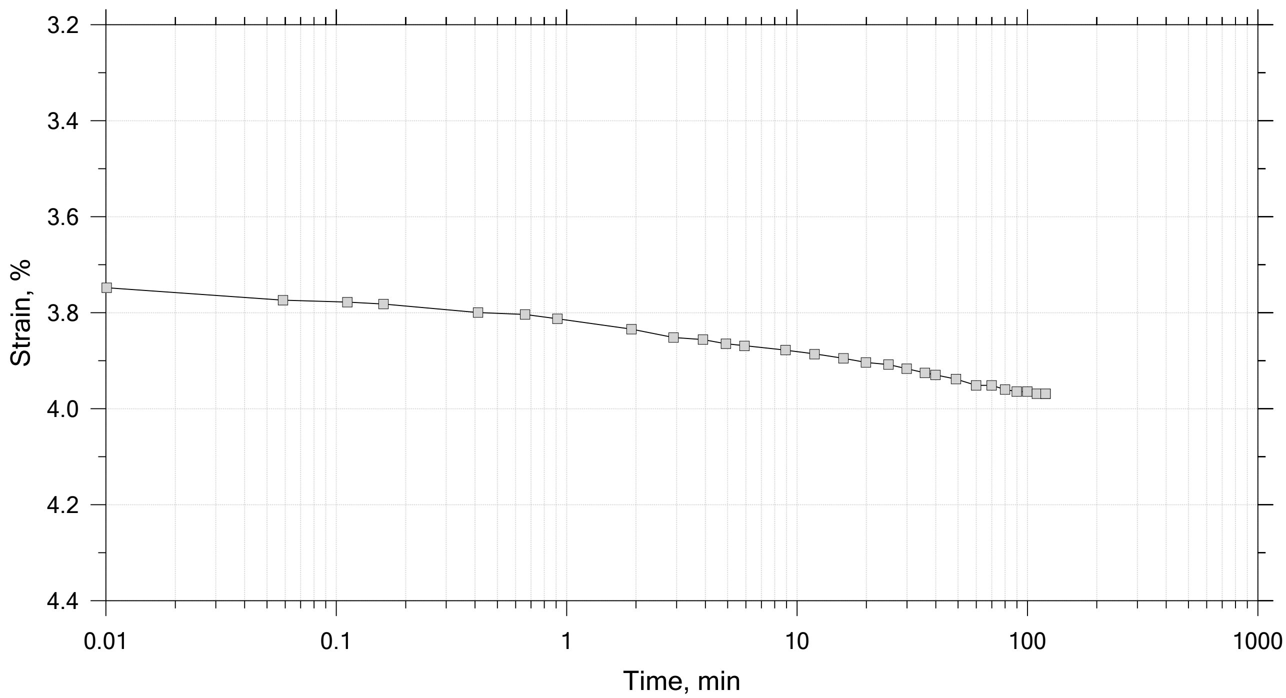
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB033	Tested By: md	Checked By: njh
	Sample No.: SL0650	Test Date: 12/21/18	Depth: 5-7 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, light brown sandy clay		
	Remarks: System Y, Swell Pressure = 0.0653 tsf		

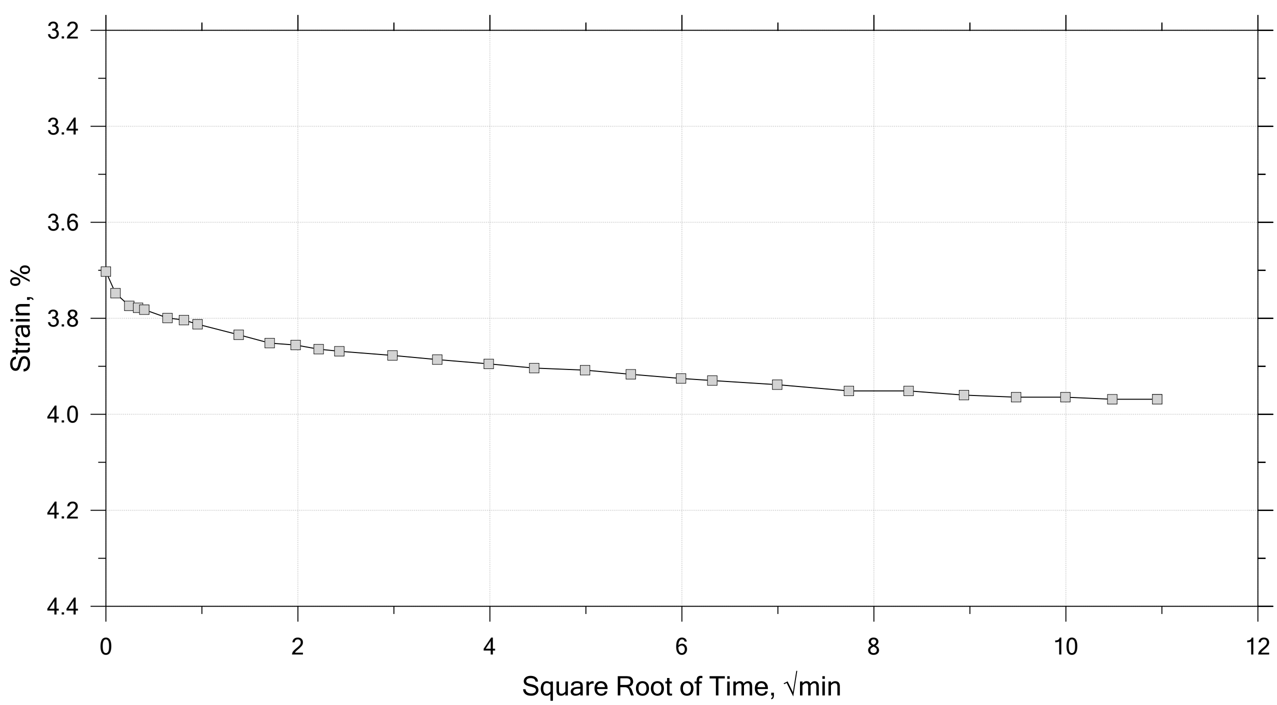
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 15

Constant Load Step

Stress: 16 tsf





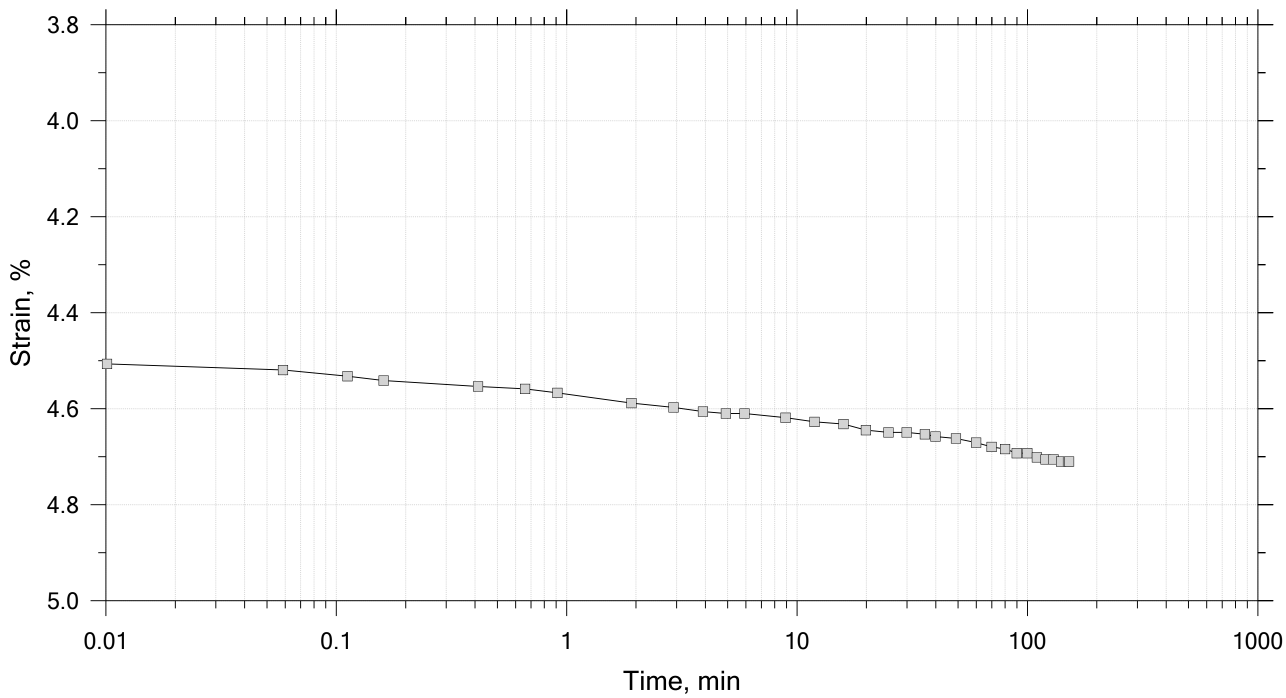
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB033	Tested By: md	Checked By: njh
	Sample No.: SL0650	Test Date: 12/21/18	Depth: 5-7 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, light brown sandy clay		
	Remarks: System Y, Swell Pressure = 0.0653 tsf		

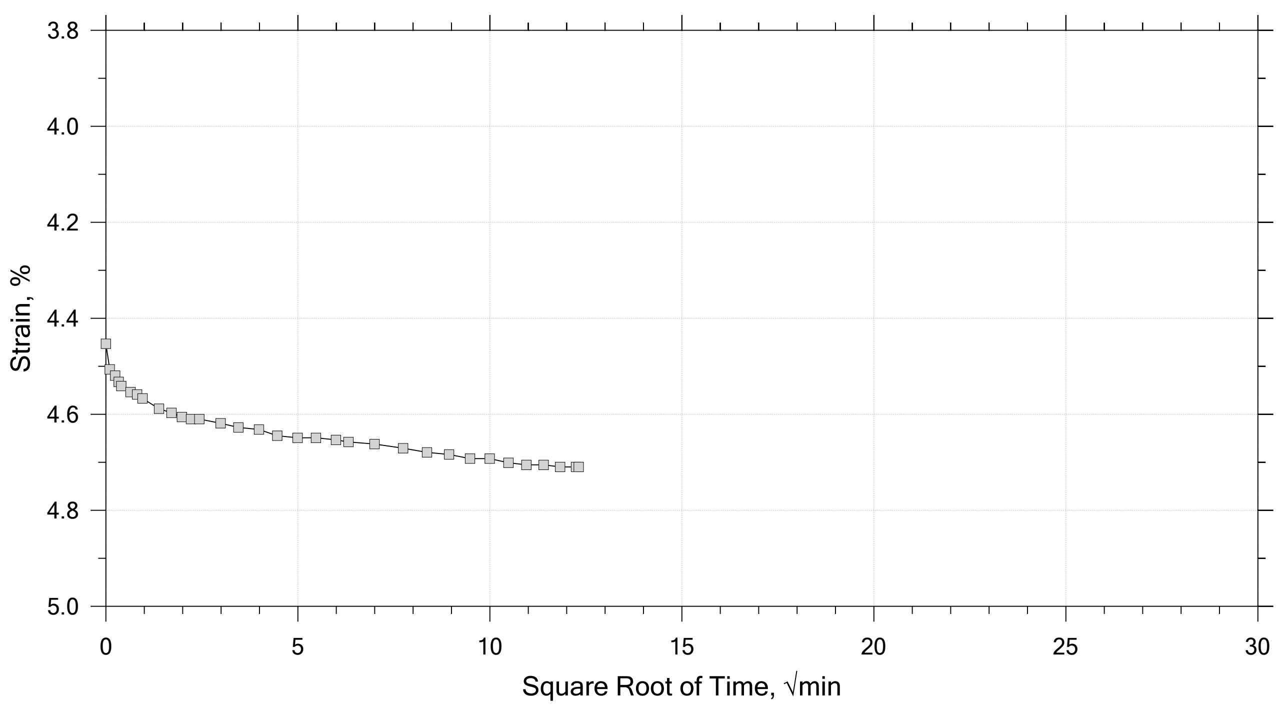
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 15

Constant Load Step

Stress: 32 tsf

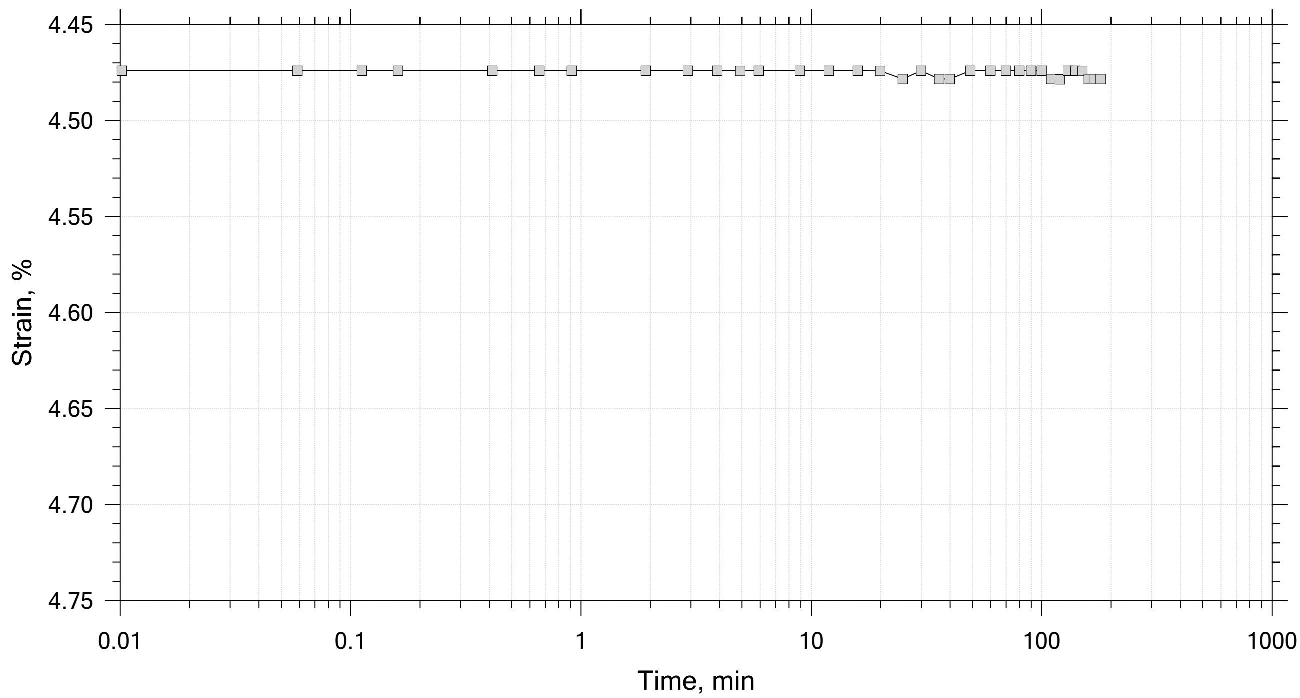


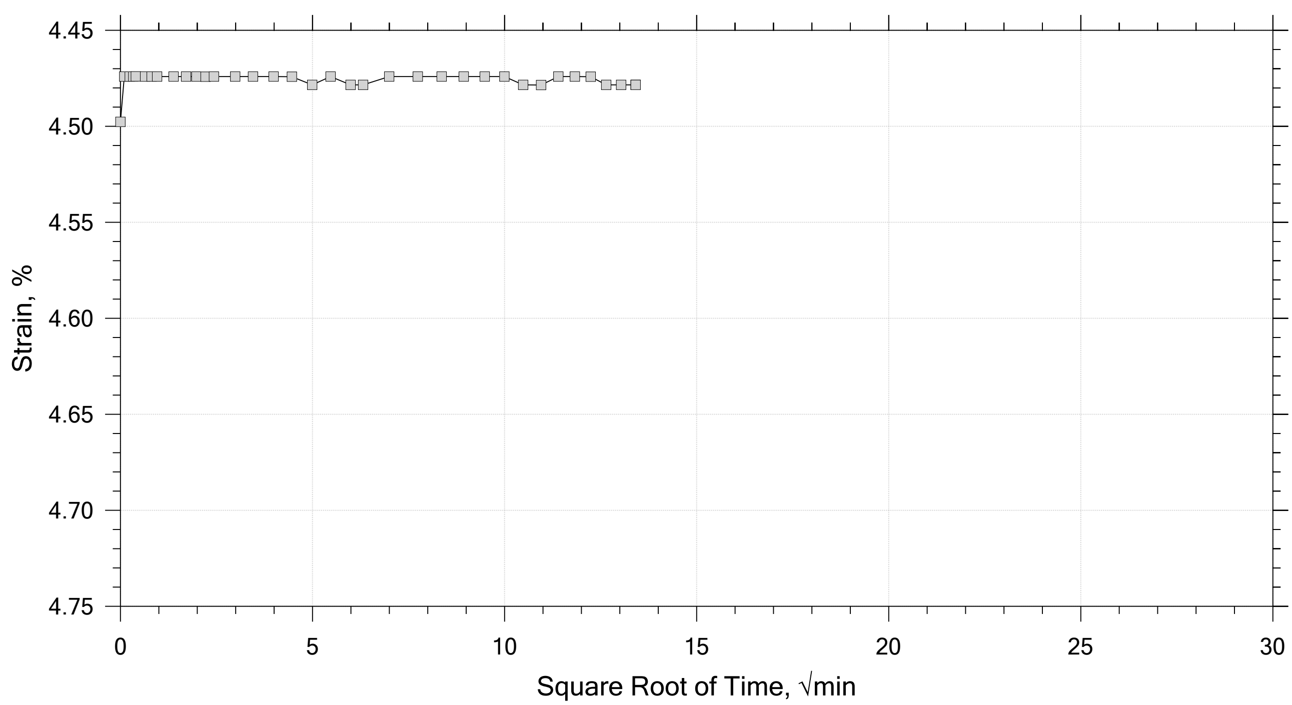


GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB033	Tested By: md	Checked By: njh
	Sample No.: SL0650	Test Date: 12/21/18	Depth: 5-7 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, light brown sandy clay		
	Remarks: 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

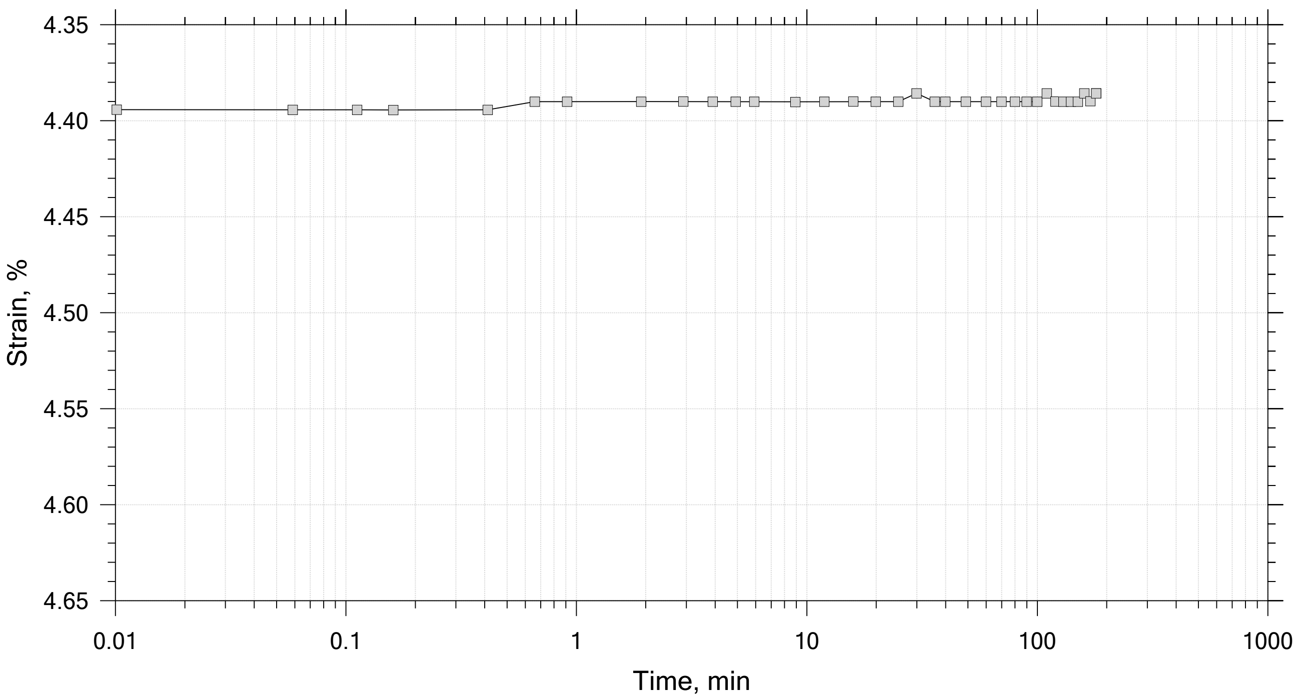


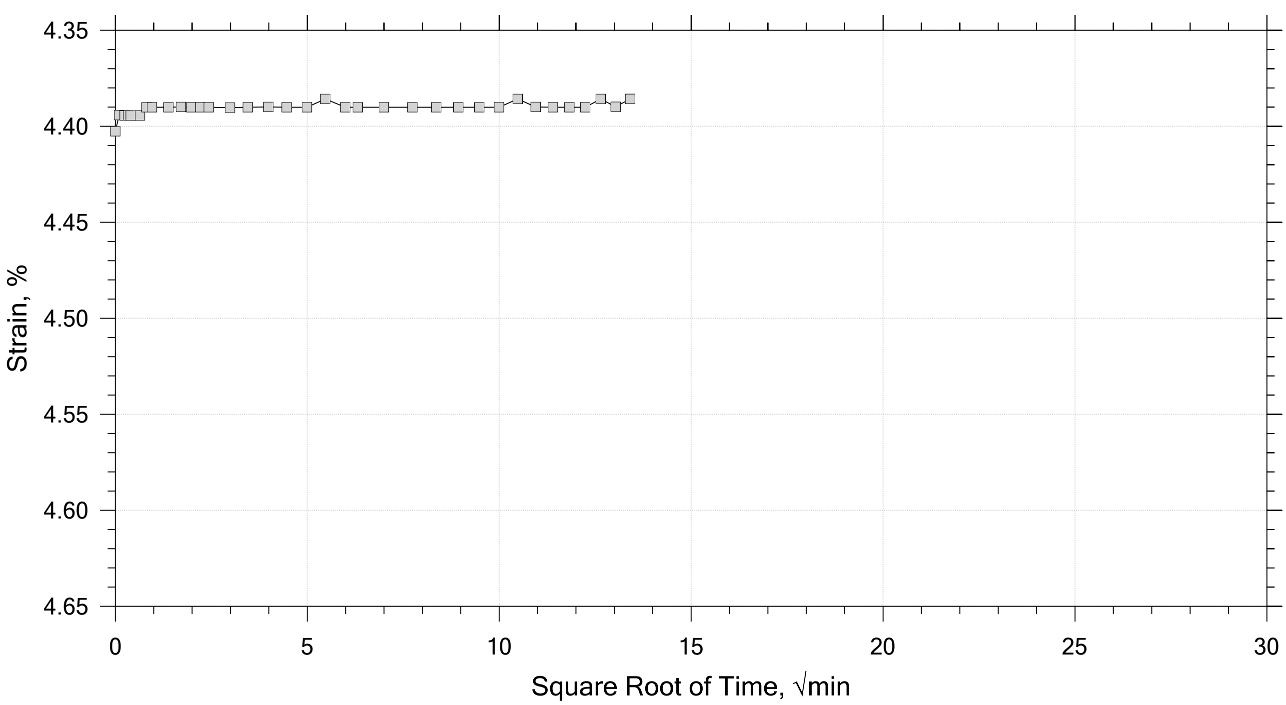


GeoTesting EXPRESS			
	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB033	Tested By: md	Checked By: njh
	Sample No.: SL0650	Test Date: 12/21/18	Depth: 5-7 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, light brown sandy clay		
	Remarks: 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





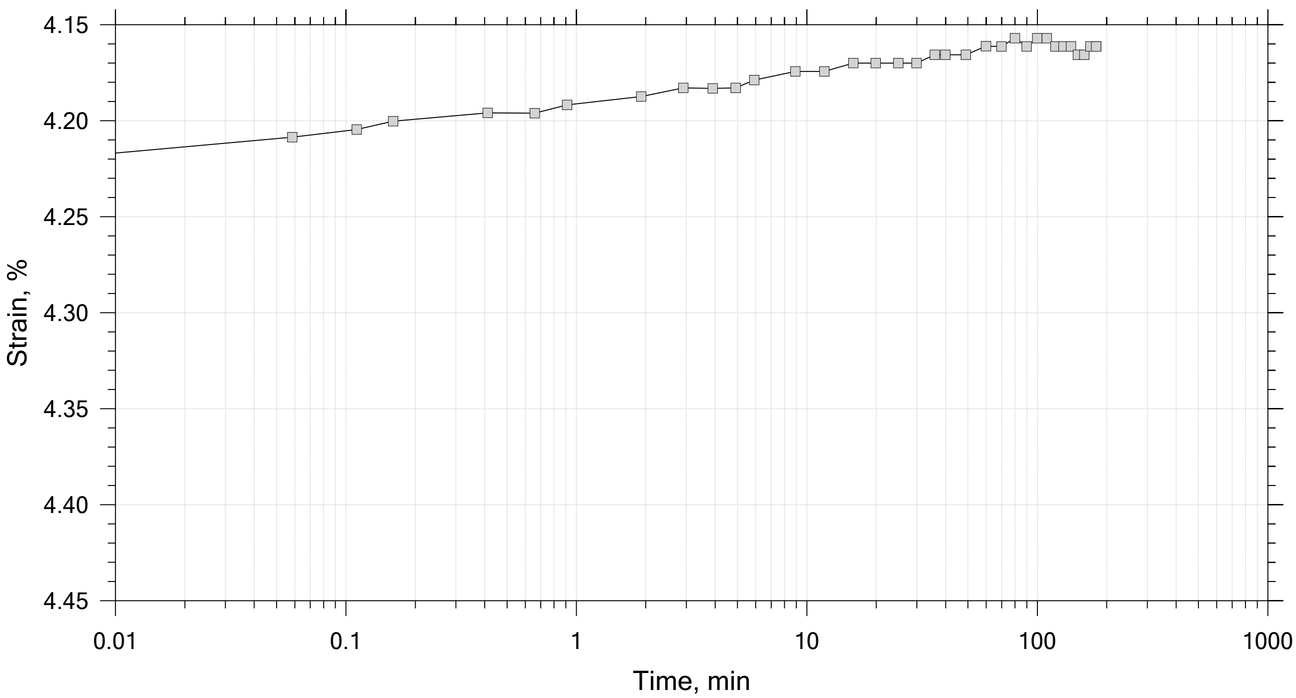
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB033	Tested By: md	Checked By: njh
	Sample No.: SL0650	Test Date: 12/21/18	Depth: 5-7 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, light brown sandy clay		
	Remarks: System Y, Swell Pressure = 0.0653 tsf		

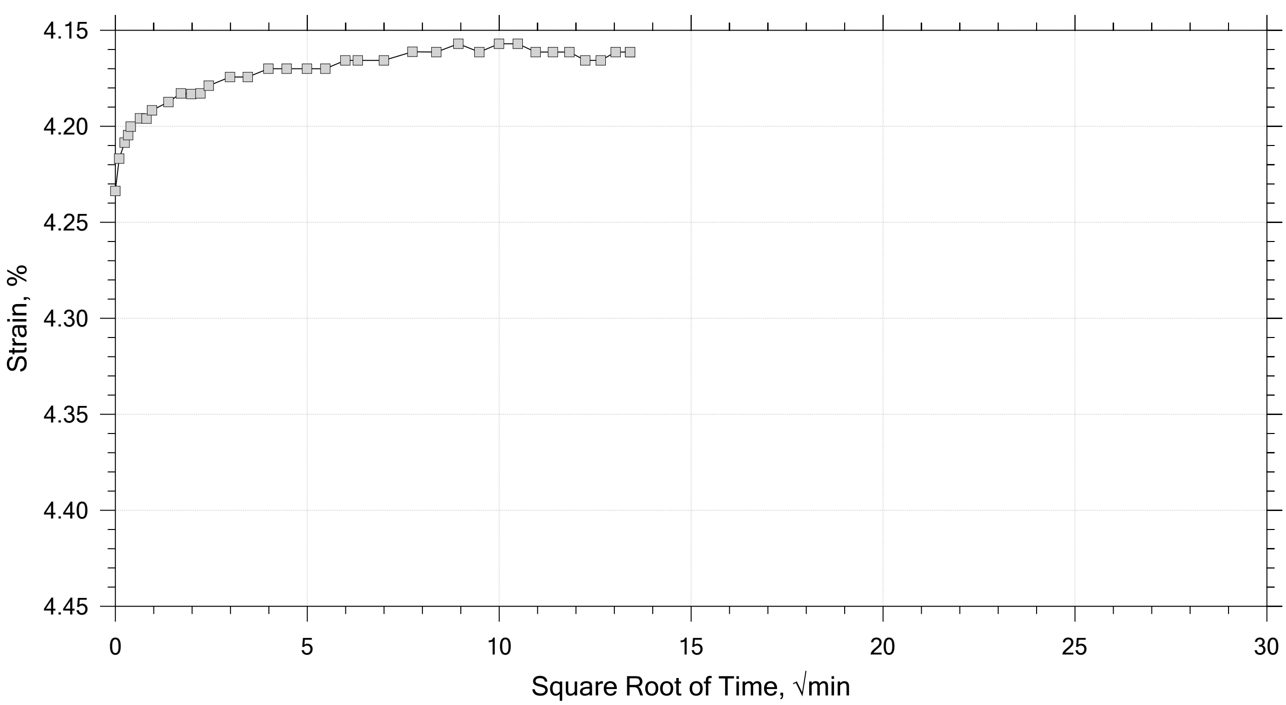
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 15

Constant Load Step

Stress: 0.5 tsf

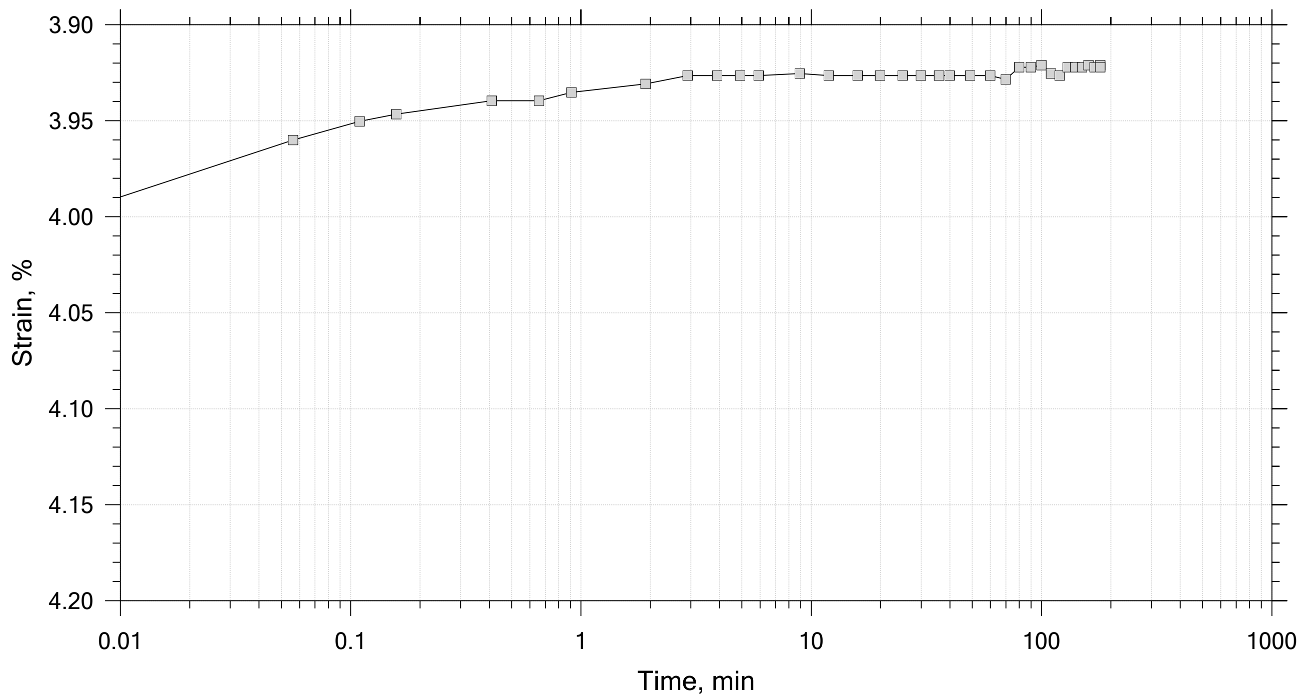


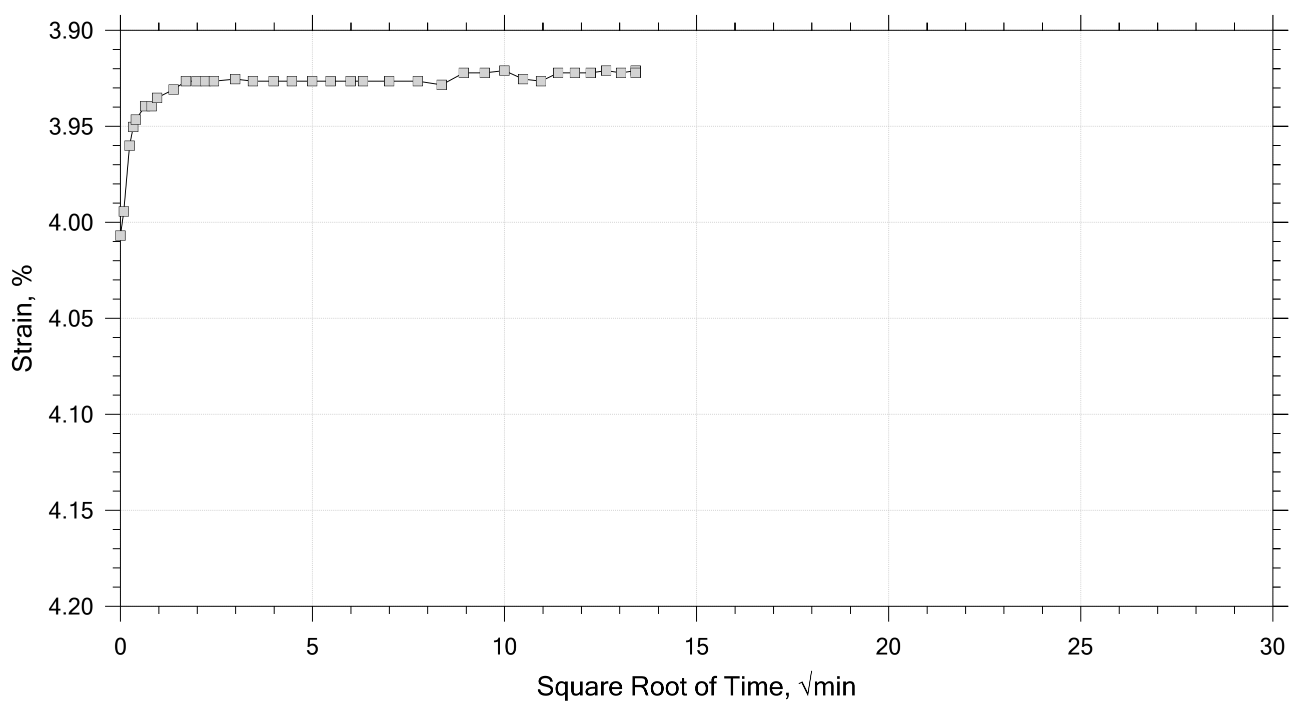


GeoTesting EXPRESS			
	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB033	Tested By: md	Checked By: njh
	Sample No.: SL0650	Test Date: 12/21/18	Depth: 5-7 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, light brown sandy clay		
	Remarks: 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

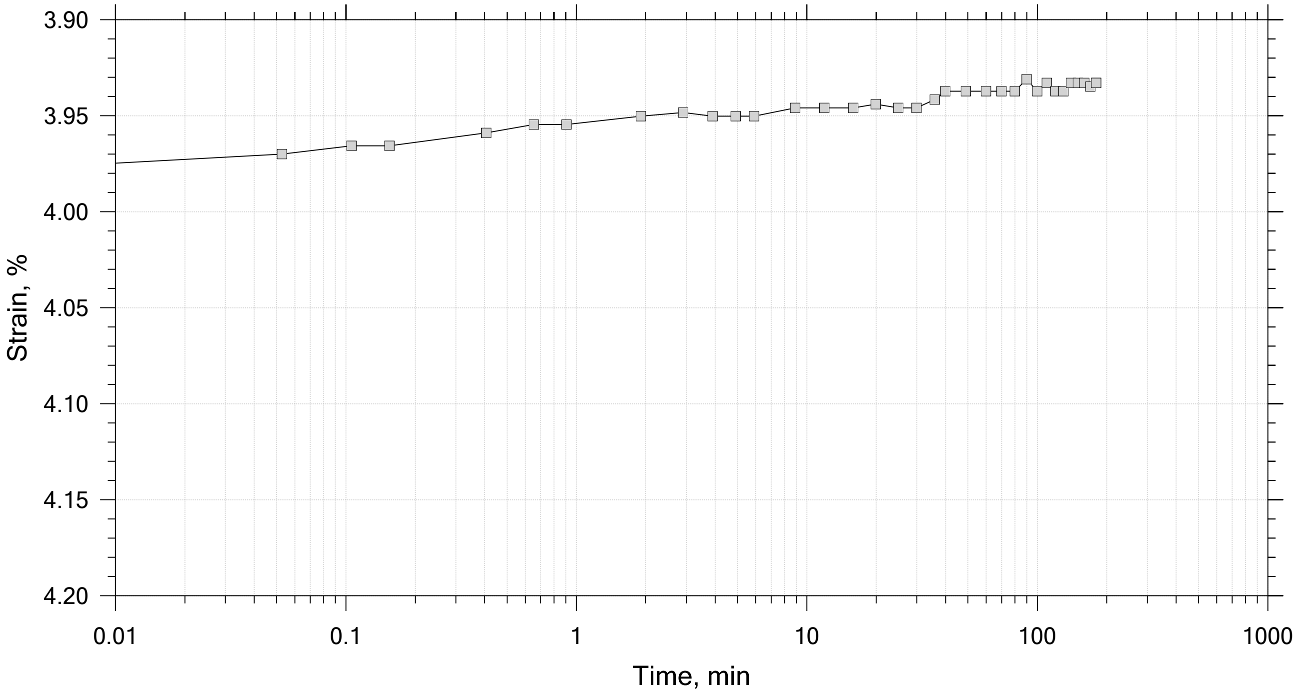


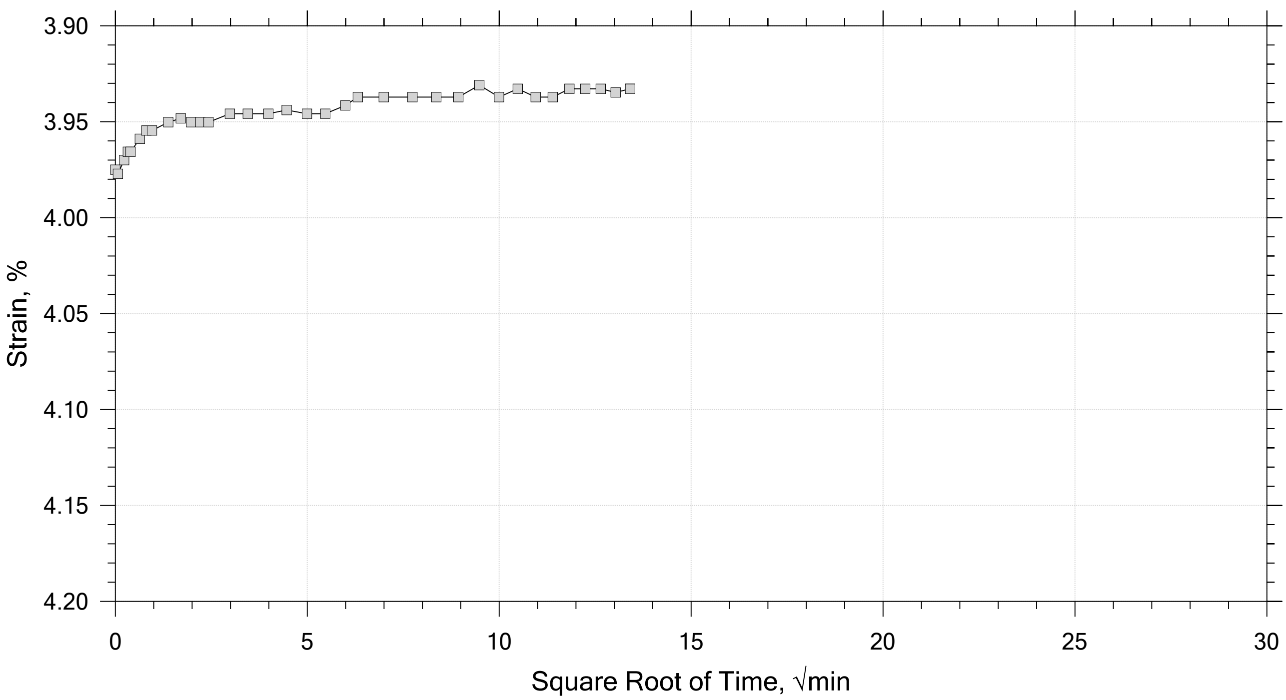


GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB033	Tested By: md	Checked By: njh
	Sample No.: SL0650	Test Date: 12/21/18	Depth: 5-7 ft
	Test No.: IP-1	Sample Type: intact	Elevation: ---
	Description: Moist, light brown sandy clay		
	Remarks: 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





GeoTesting EXPRESS	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.

GeoTesting EXPRESS	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

GeoTesting EXPRESS

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

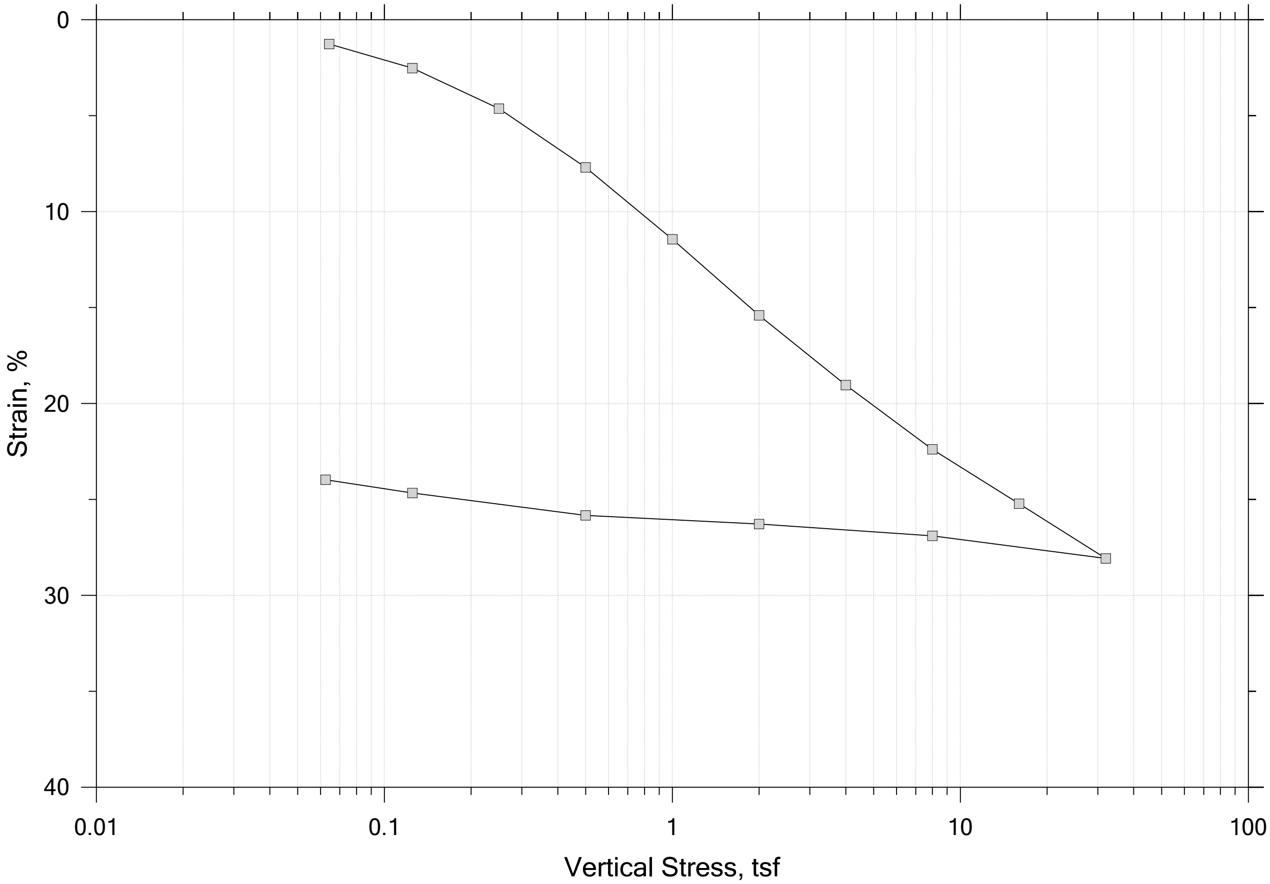
Square Root of Time Coefficients

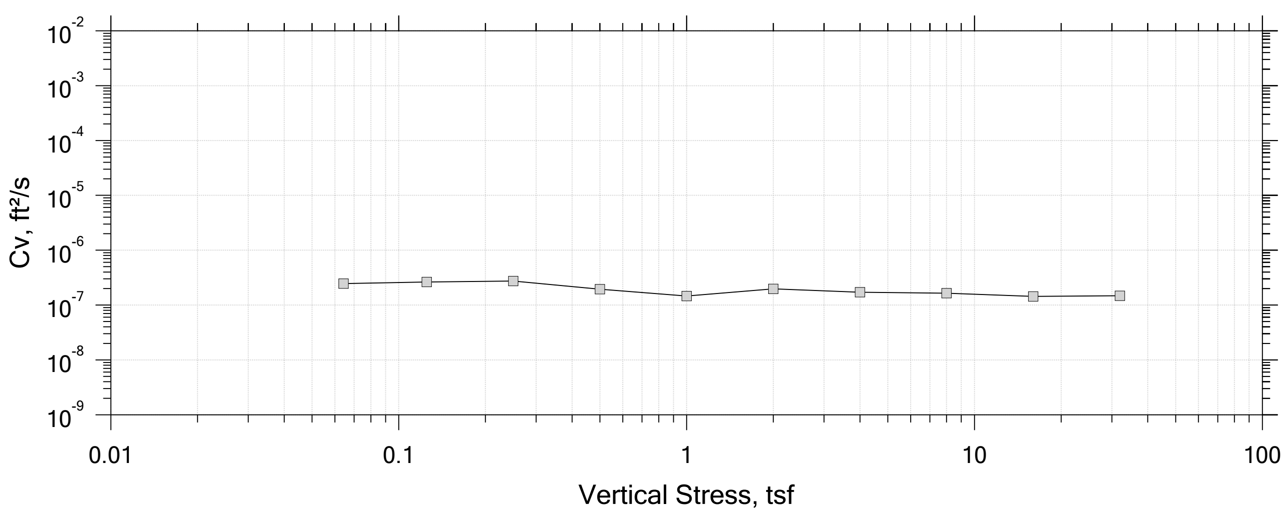
Step	Applied Stress tsf	Final Displacement in	Void Ratio	Strain at End %	Sq.Rt. T90 min	Cv ft²/s	Mv 1/tsf	k ft/day
1	0.0653	0.002490	0.557	0.249	3.227	7.59e-06	3.81e-02	7.80e-04
2	0.125	0.002949	0.556	0.295	12.428	1.96e-06	7.68e-03	4.07e-05
3	0.250	0.005354	0.553	0.535	2.426	1.00e-05	1.92e-02	5.20e-04
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

GeoTesting EXPRESS			
	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



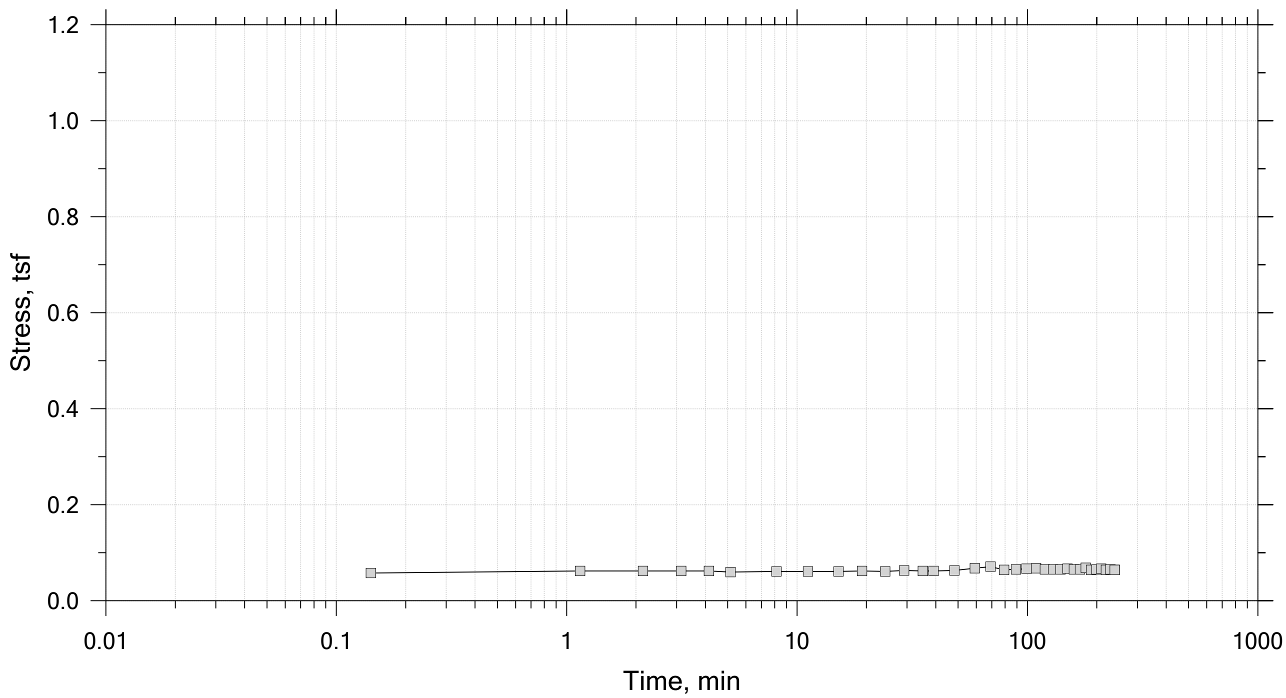


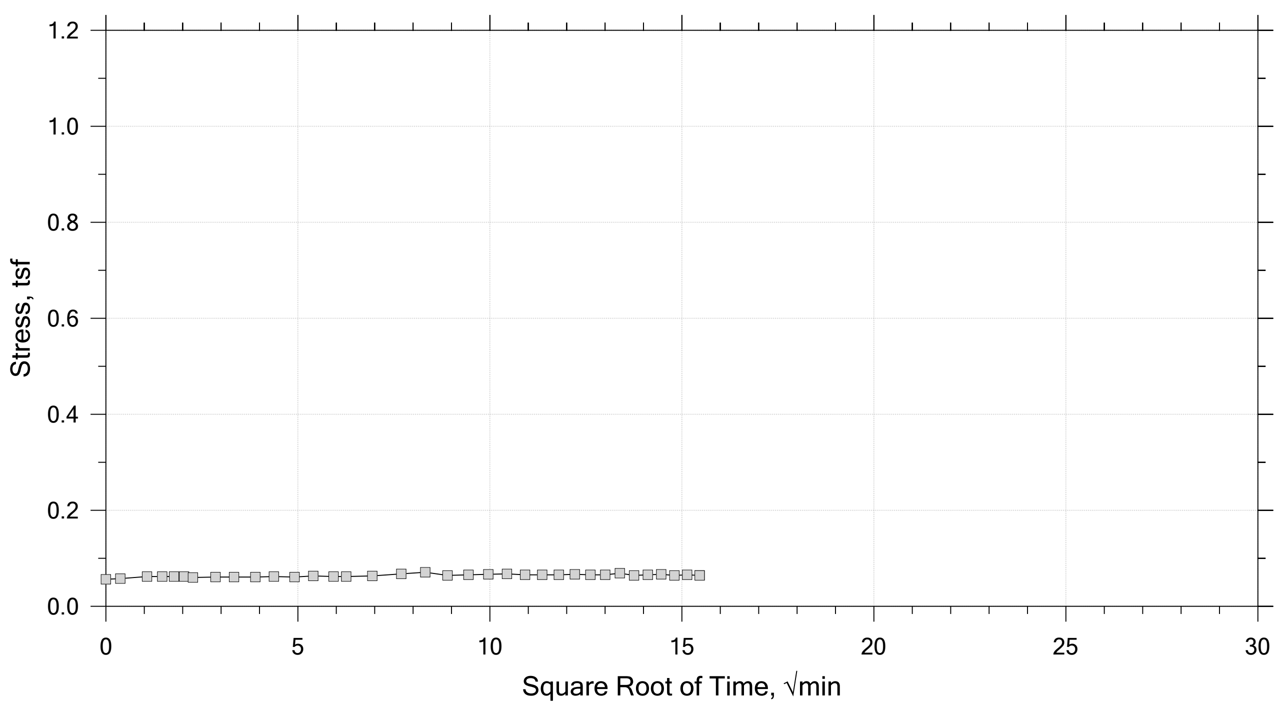
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB036	Tested By: trm	Checked By: njh
	Sample No.: SL0674	Test Date: 2/25/19	Depth: 8-10 ft
	Test No.: IP-8	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with sand		
	Remarks: System LTIII-B, Swell Pressure = 0.0643 tsf		
	Displacement at End of Increment		

Attachment Figure A.4-295

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 1 of 15
Constant Volume Step
Stress: 0.0643 tsf

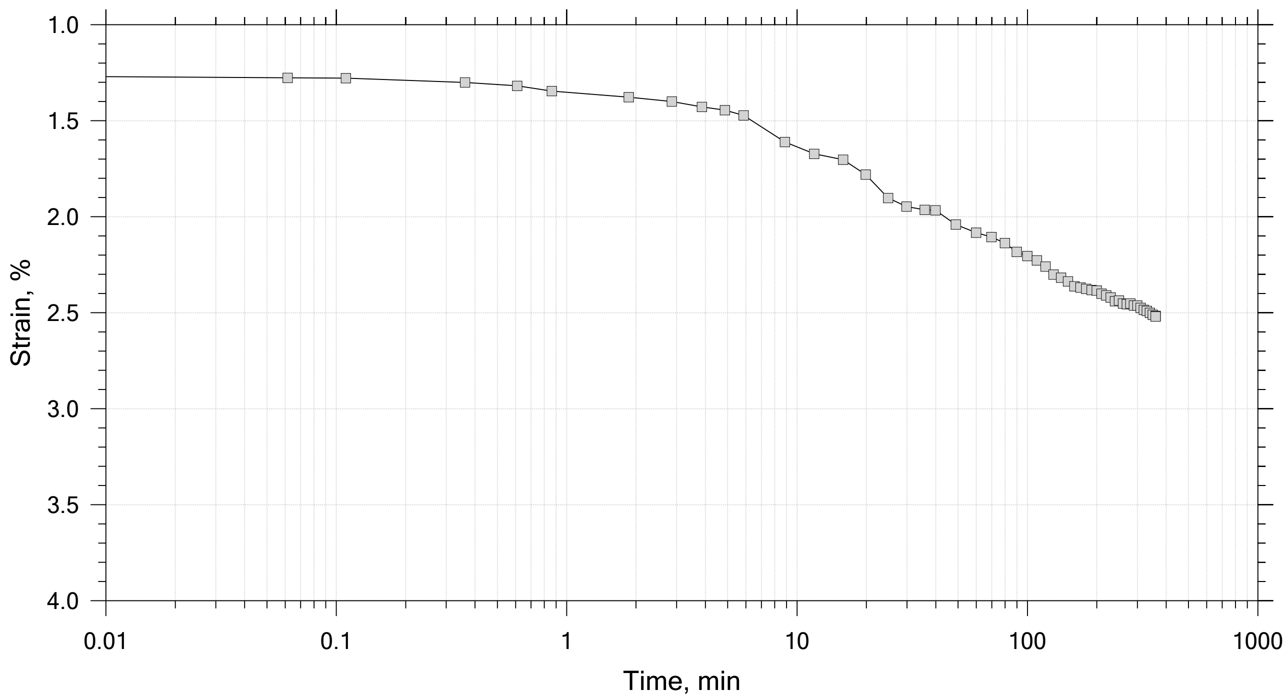


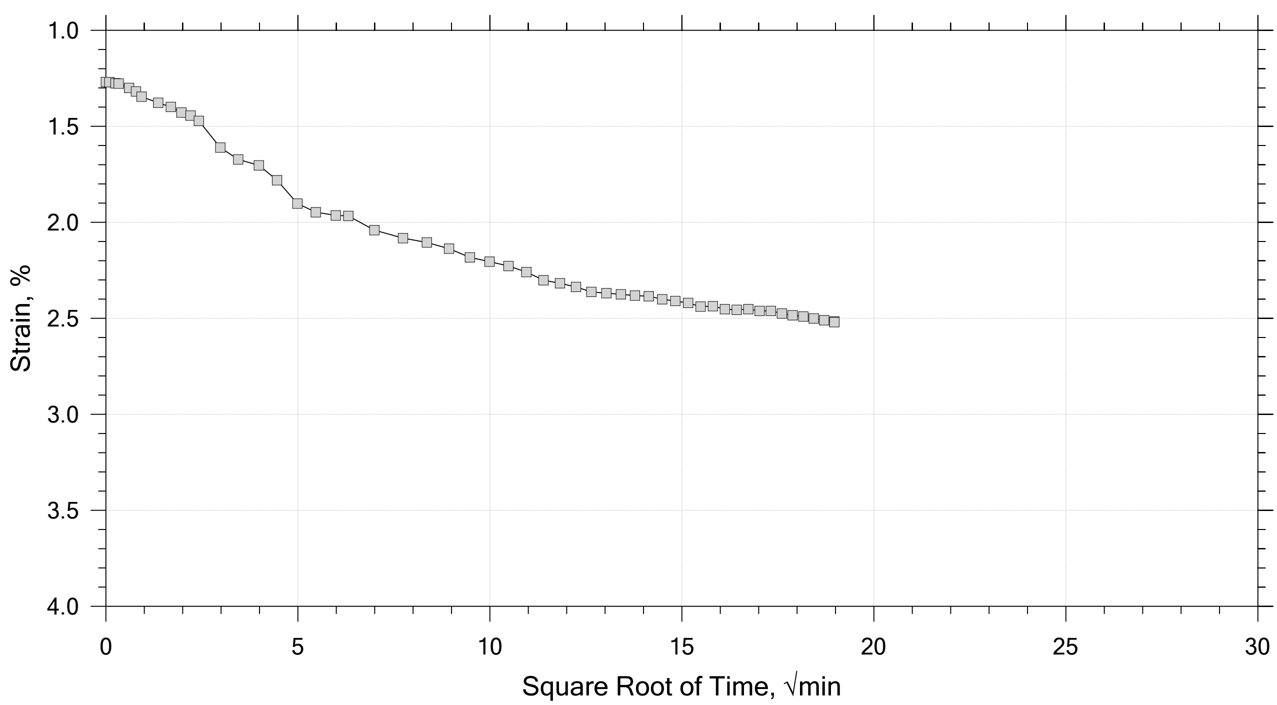


GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB036	Tested By: trm	Checked By: njh
	Sample No.: SL0674	Test Date: 2/25/19	Depth: 8-10 ft
	Test No.: IP-8	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with sand		
	Remarks: System 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





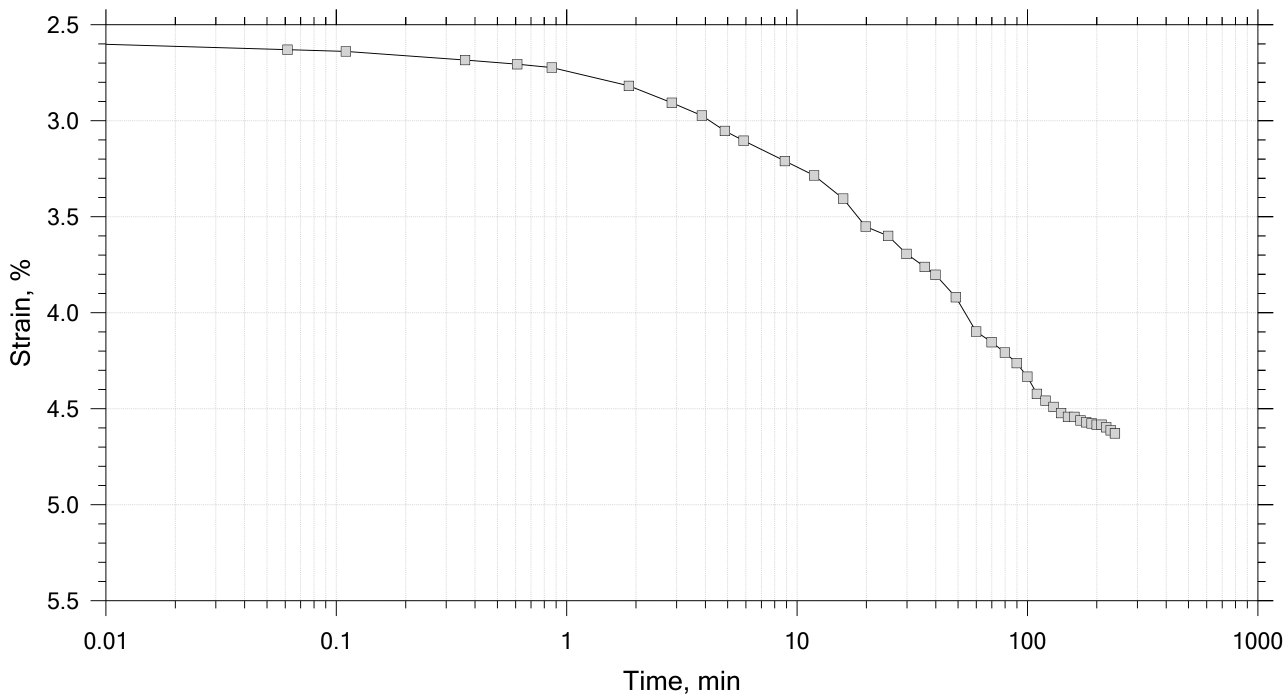
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB036	Tested By: trm	Checked By: njh
	Sample No.: SL0674	Test Date: 2/25/19	Depth: 8-10 ft
	Test No.: IP-8	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with sand		
	Remarks: System LTIII-B, Swell Pressure = 0.0643 tsf		

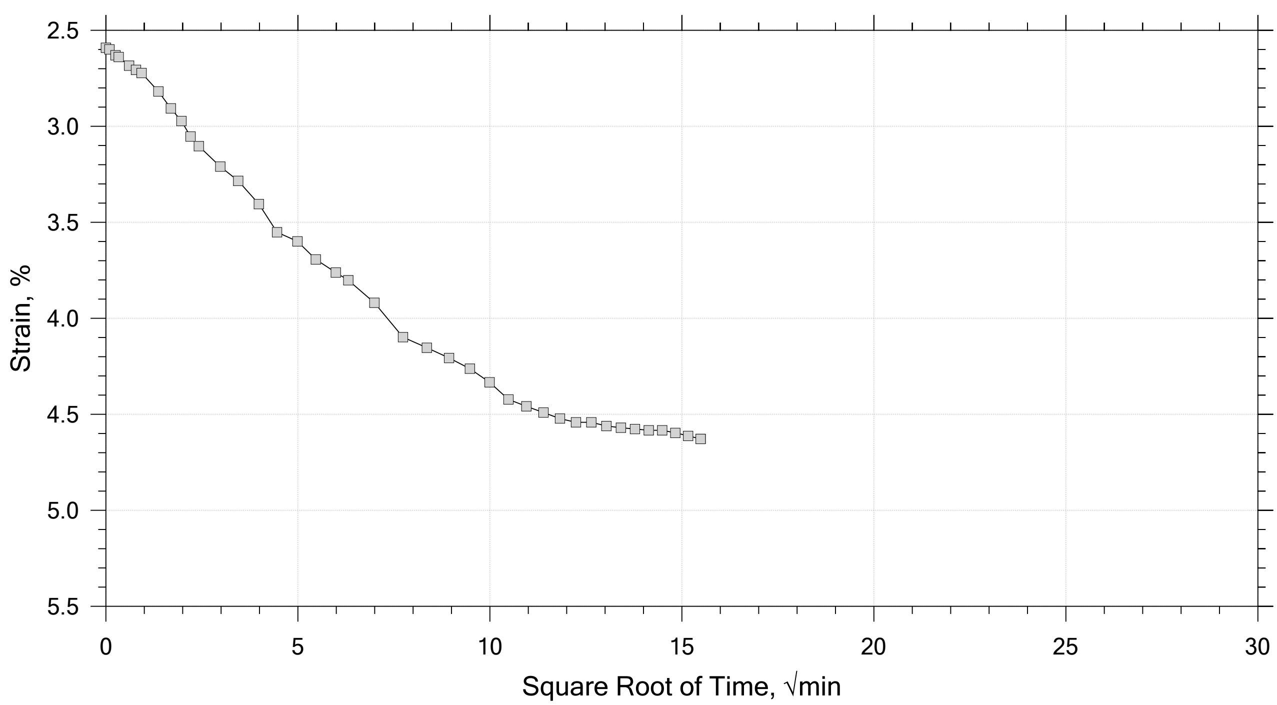
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 15

Constant Load Step

Stress: 0.25 tsf

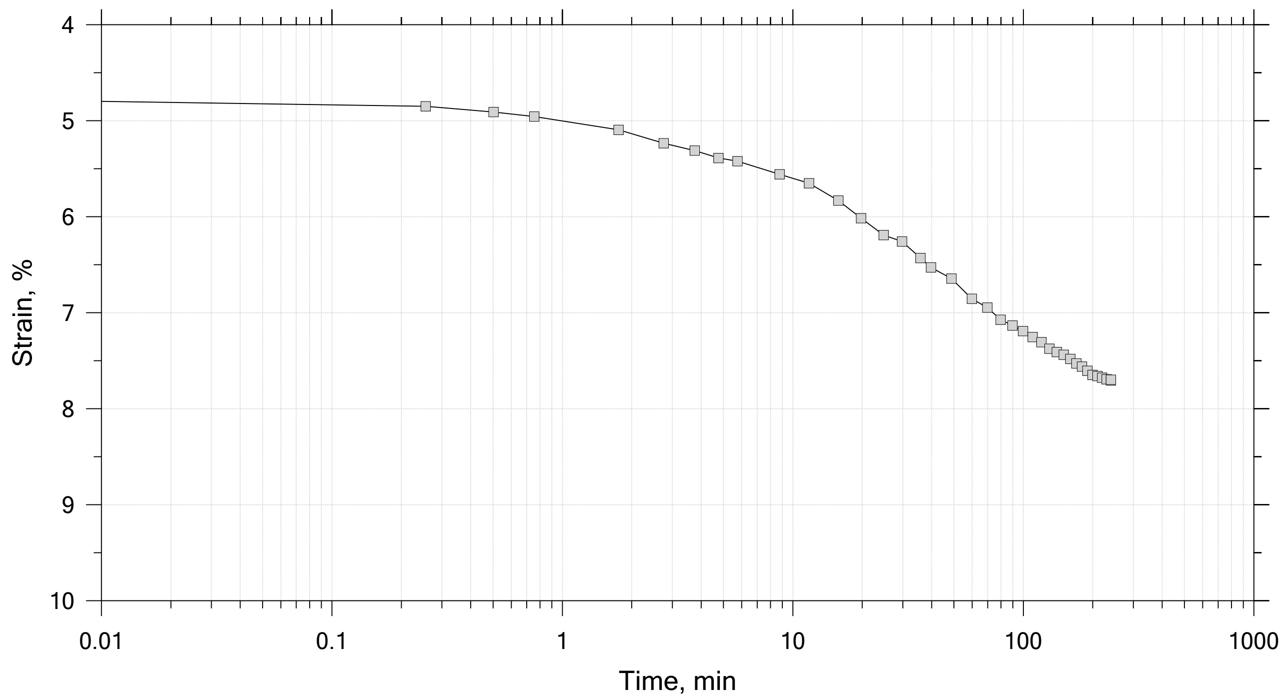


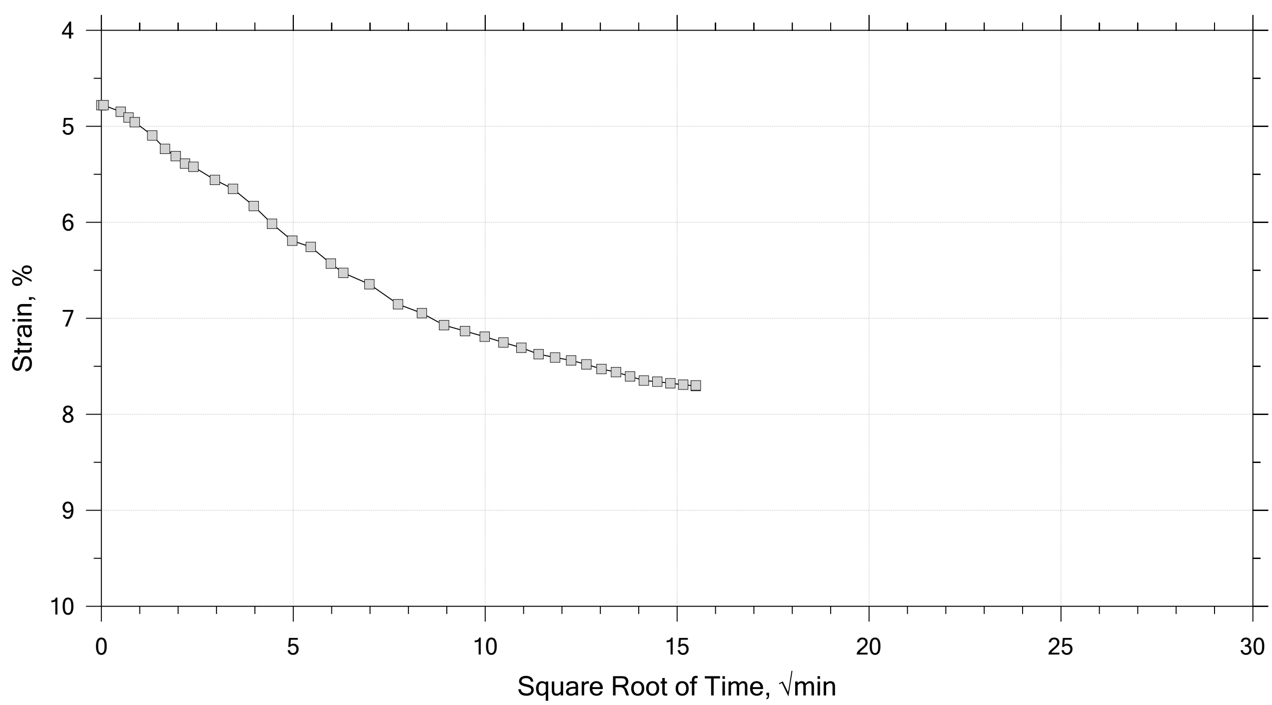


GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB036	Tested By: trm	Checked By: njh
	Sample No.: SL0674	Test Date: 2/25/19	Depth: 8-10 ft
	Test No.: IP-8	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with sand		
	Remarks: System LTIII-B, Swell Pressure = 0.0643 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 15
Constant Load Step
Stress: 0.5 tsf





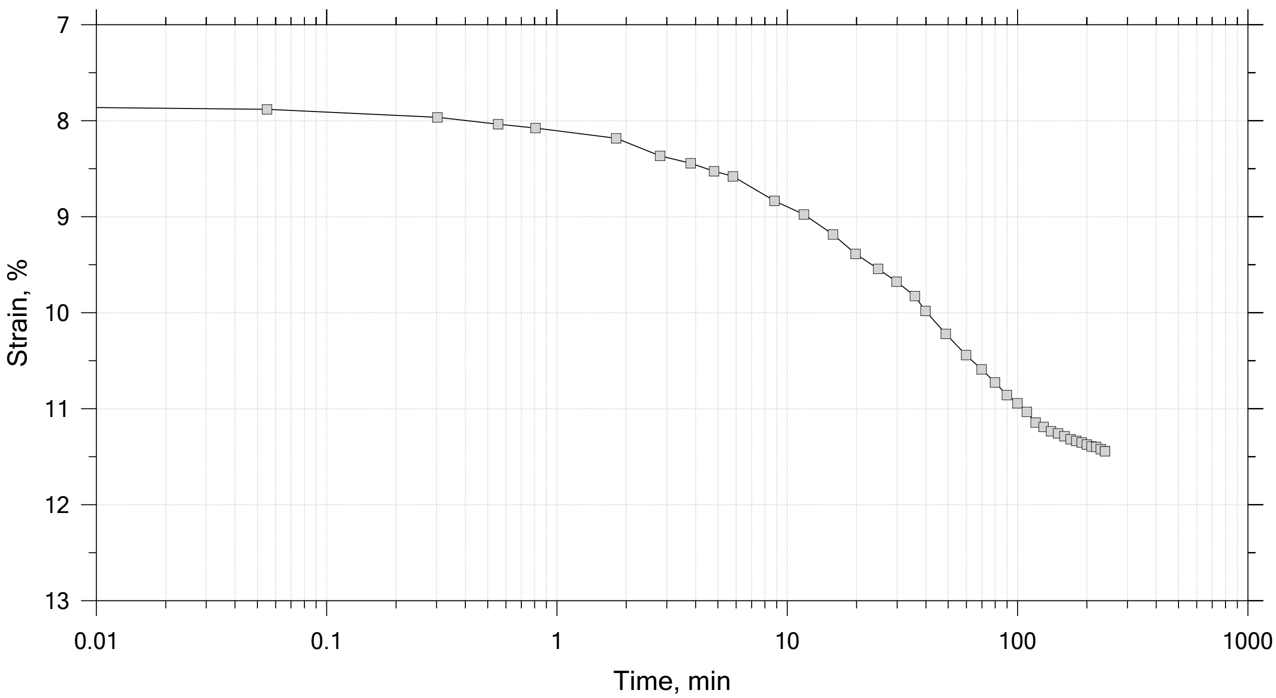
Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJSB036	Tested By: trm	Checked By: njh
Sample No.: SL0674	Test Date: 2/25/19	Depth: 8-10 ft
Test No.: IP-8	Sample Type: intact	Elevation: ---
Description: Moist, gray clay with sand		
Remarks: System LTIII-B, Swell Pressure = 0.0643 tsf		

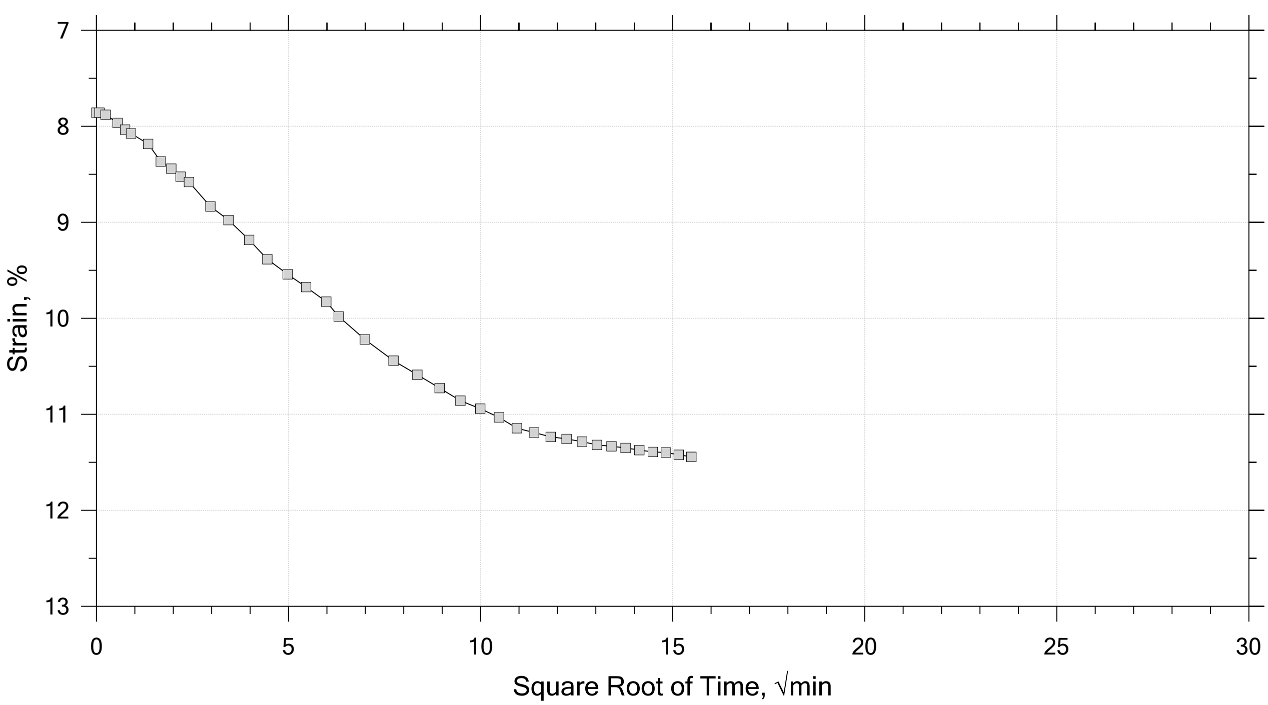
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 15

Constant Load Step

Stress: 1 tsf





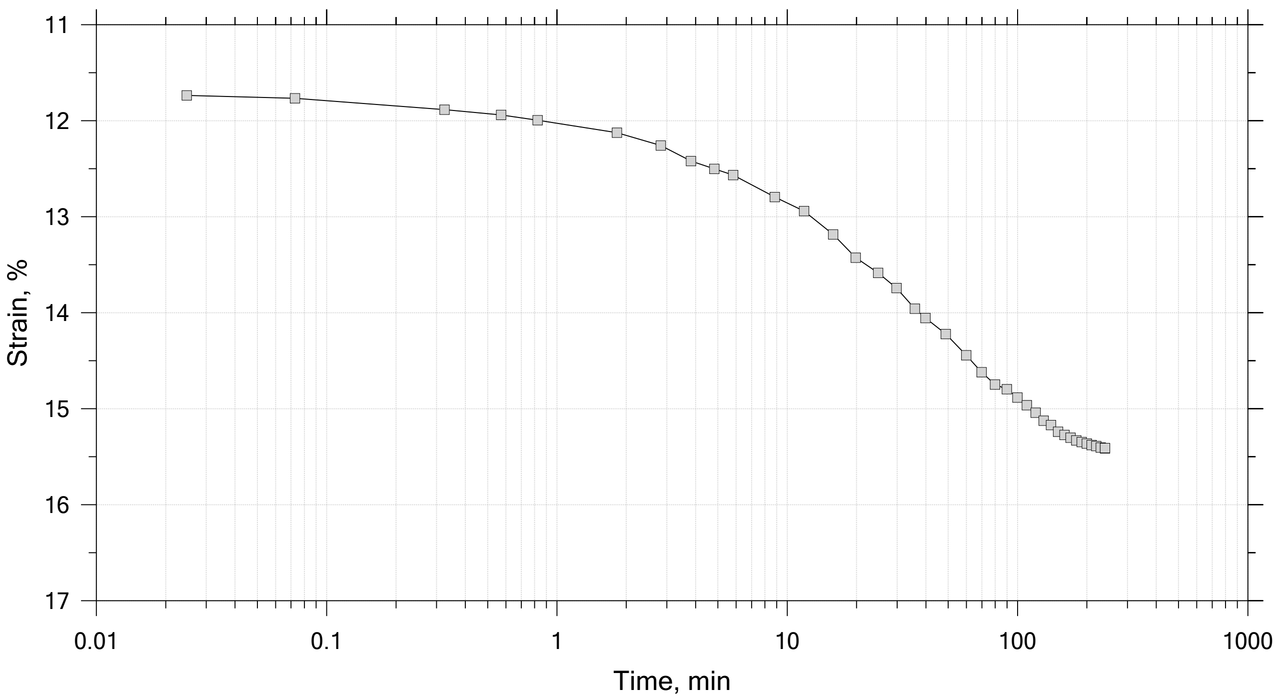
GeoTesting EXPRESS			
	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB036	Tested By: trm	Checked By: njh
	Sample No.: SL0674	Test Date: 2/25/19	Depth: 8-10 ft
	Test No.: IP-8	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with sand		
	Remarks: System LTIII-B, Swell Pressure = 0.0643 tsf		

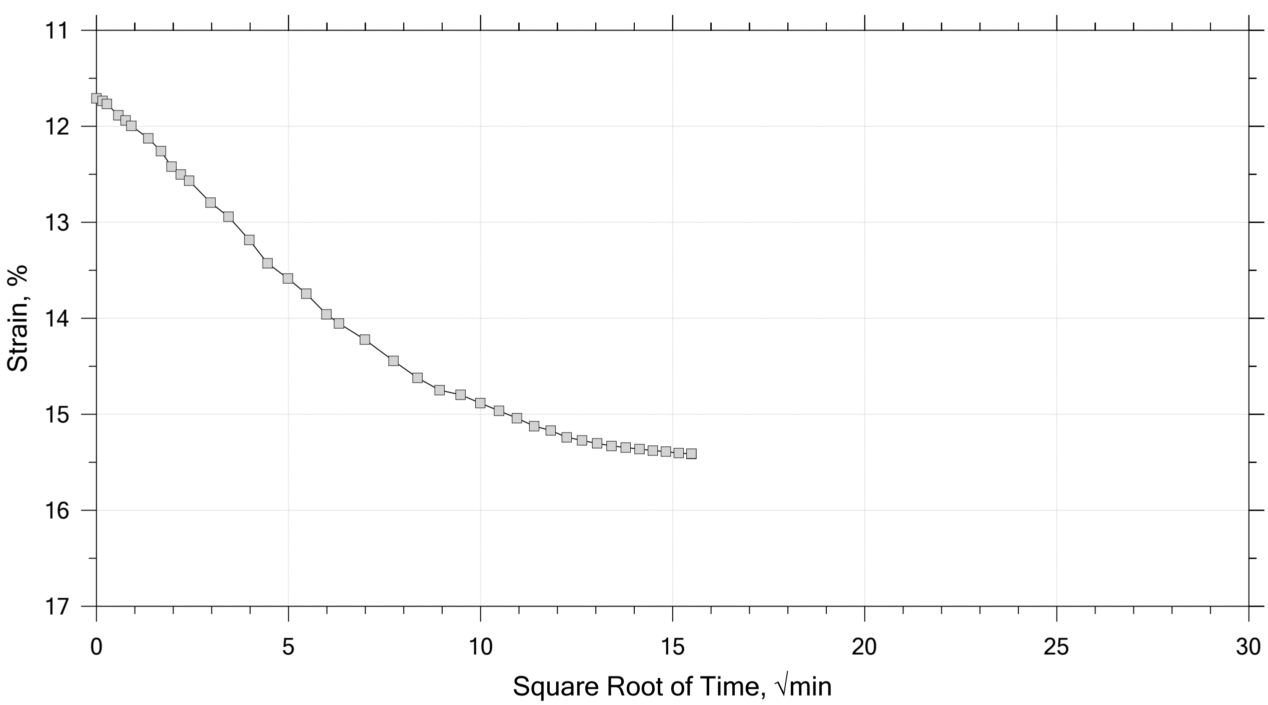
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 15

Constant Load Step

Stress: 2 tsf





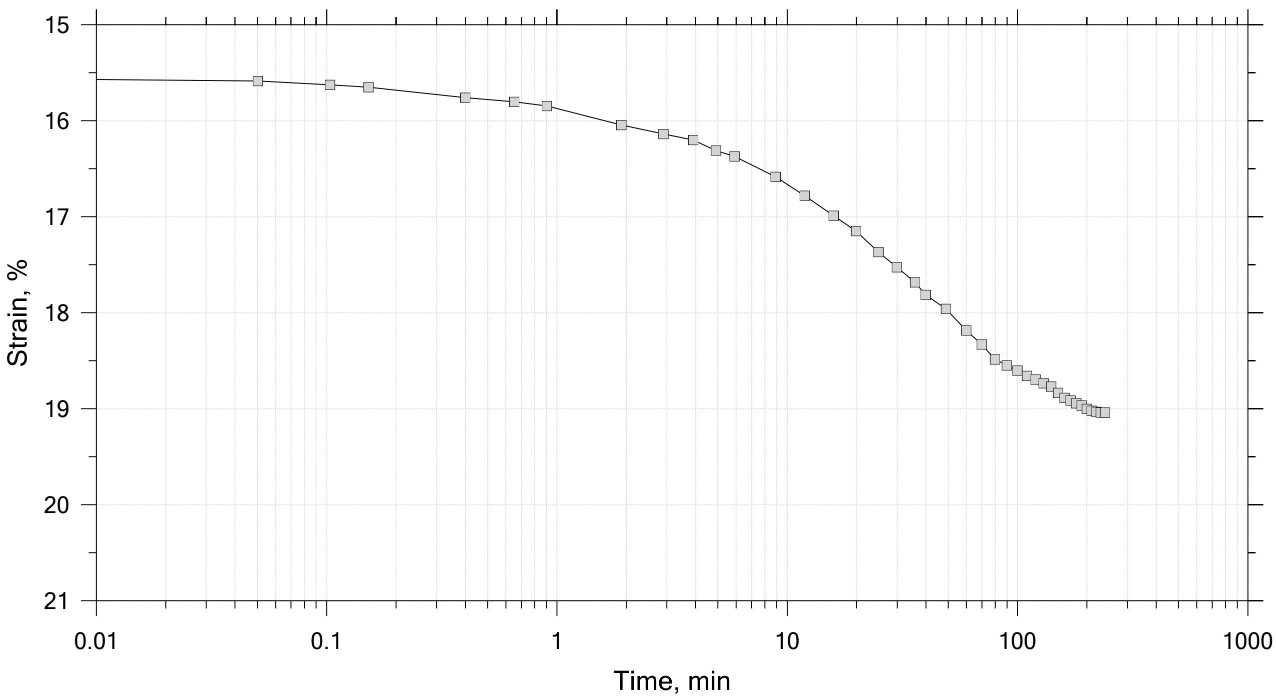
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB036	Tested By: trm	Checked By: njh
	Sample No.: SL0674	Test Date: 2/25/19	Depth: 8-10 ft
	Test No.: IP-8	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with sand		
	Remarks: System LTIII-B, Swell Pressure = 0.0643 tsf		

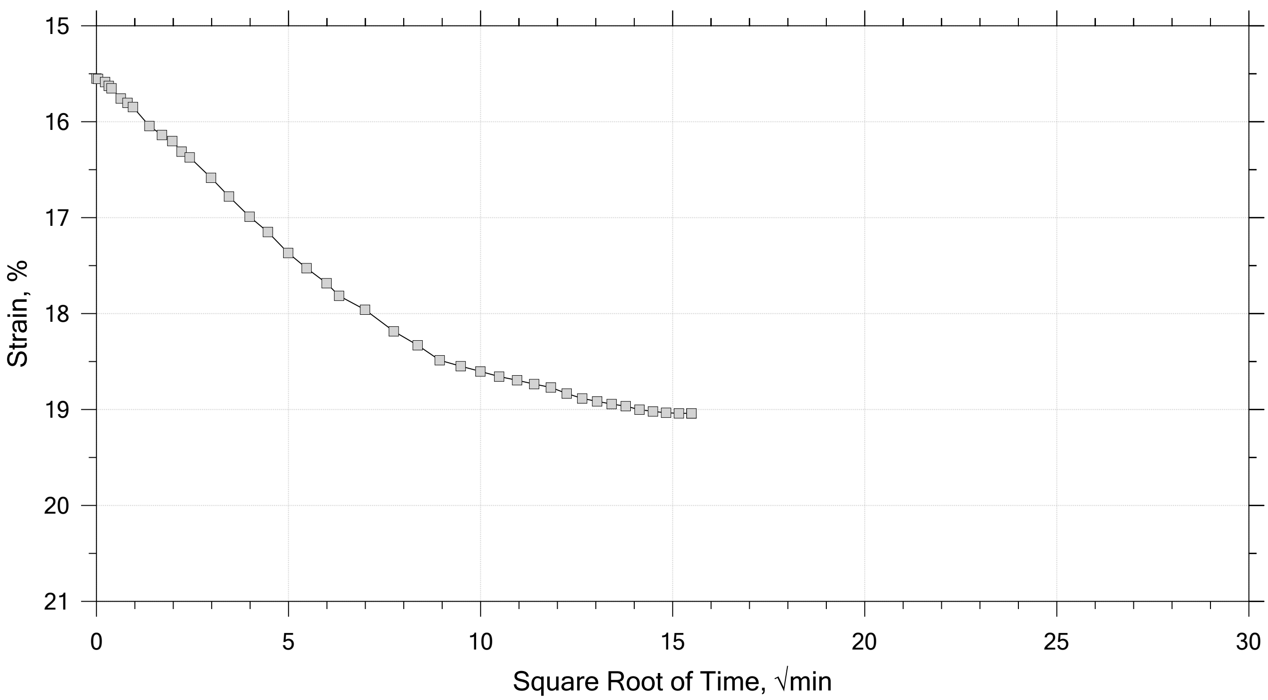
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 7 of 15

Constant Load Step

Stress: 4 tsf





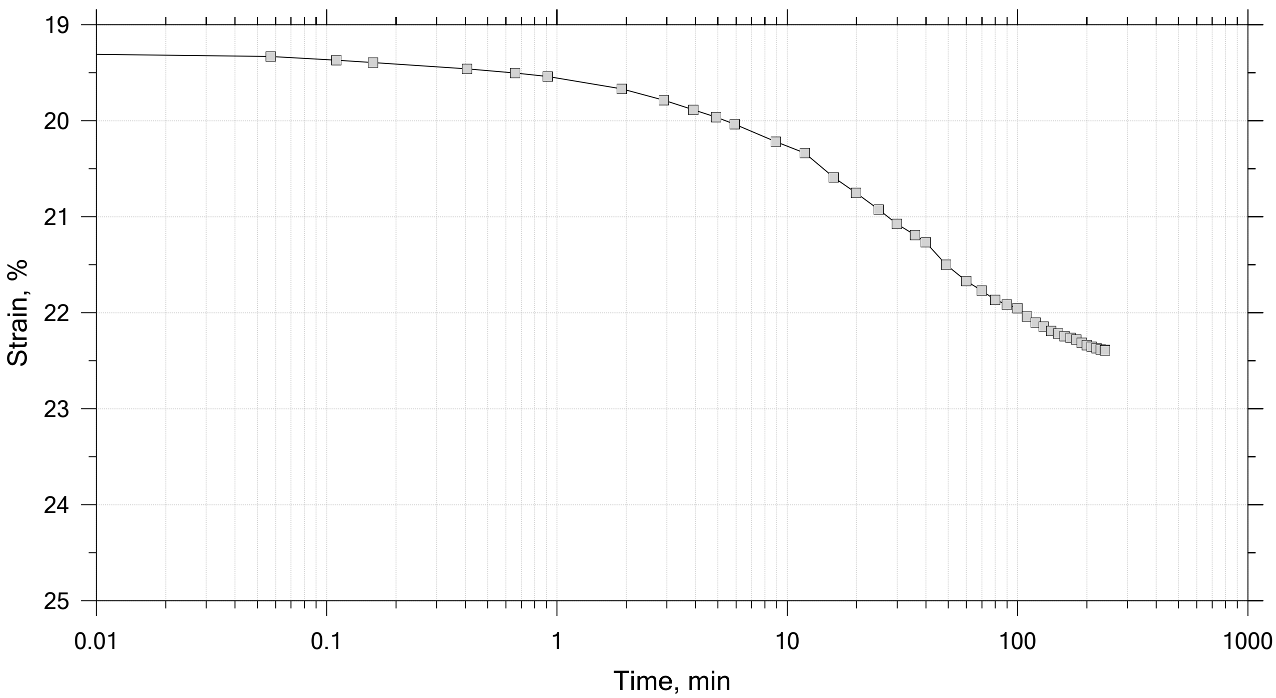
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB036	Tested By: trm	Checked By: njh
	Sample No.: SL0674	Test Date: 2/25/19	Depth: 8-10 ft
	Test No.: IP-8	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with sand		
	Remarks: System LTIII-B, Swell Pressure = 0.0643 tsf		

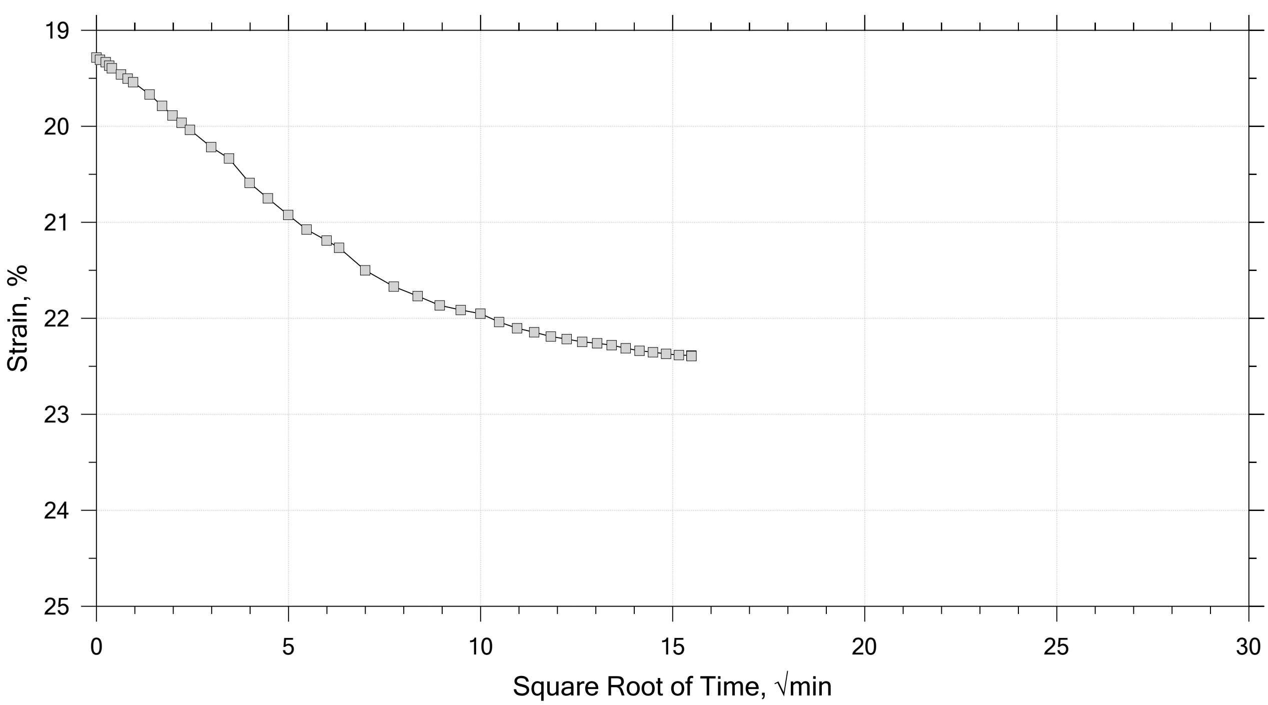
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 8 of 15

Constant Load Step

Stress: 8 tsf





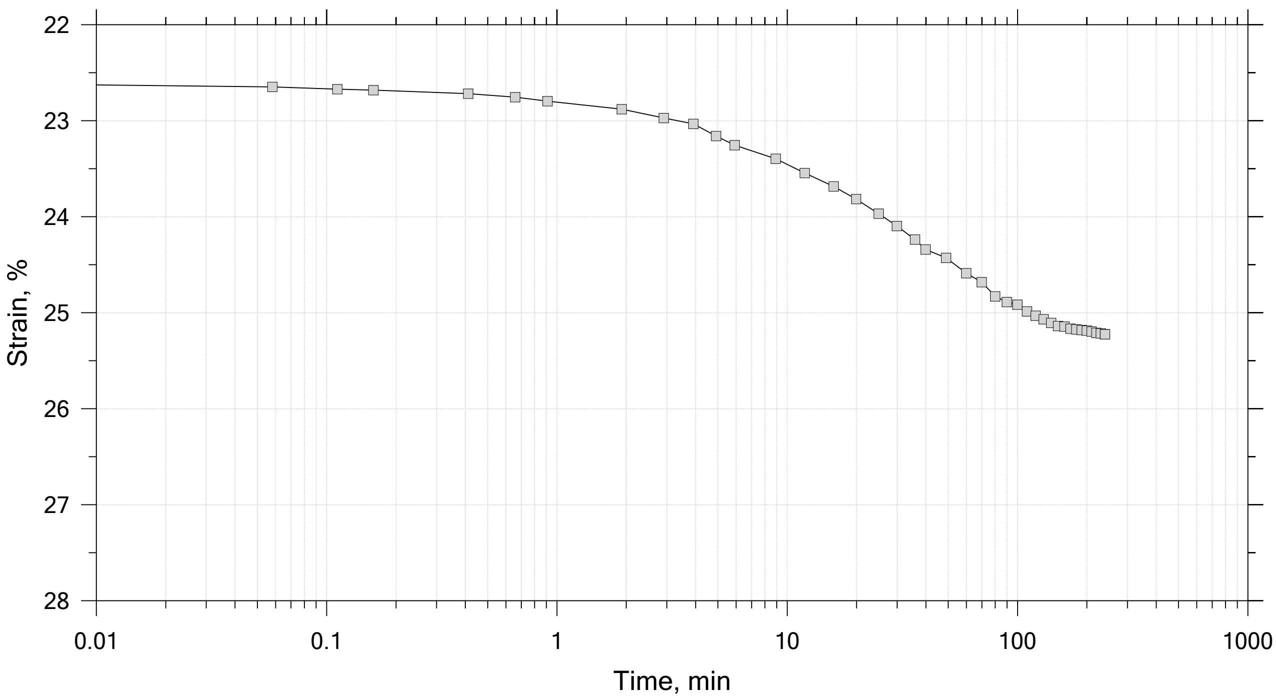
GeoTesting EXPRESS			
	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB036	Tested By: trm	Checked By: njh
	Sample No.: SL0674	Test Date: 2/25/19	Depth: 8-10 ft
	Test No.: IP-8	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with sand		
	Remarks: System LTIII-B, Swell Pressure = 0.0643 tsf		

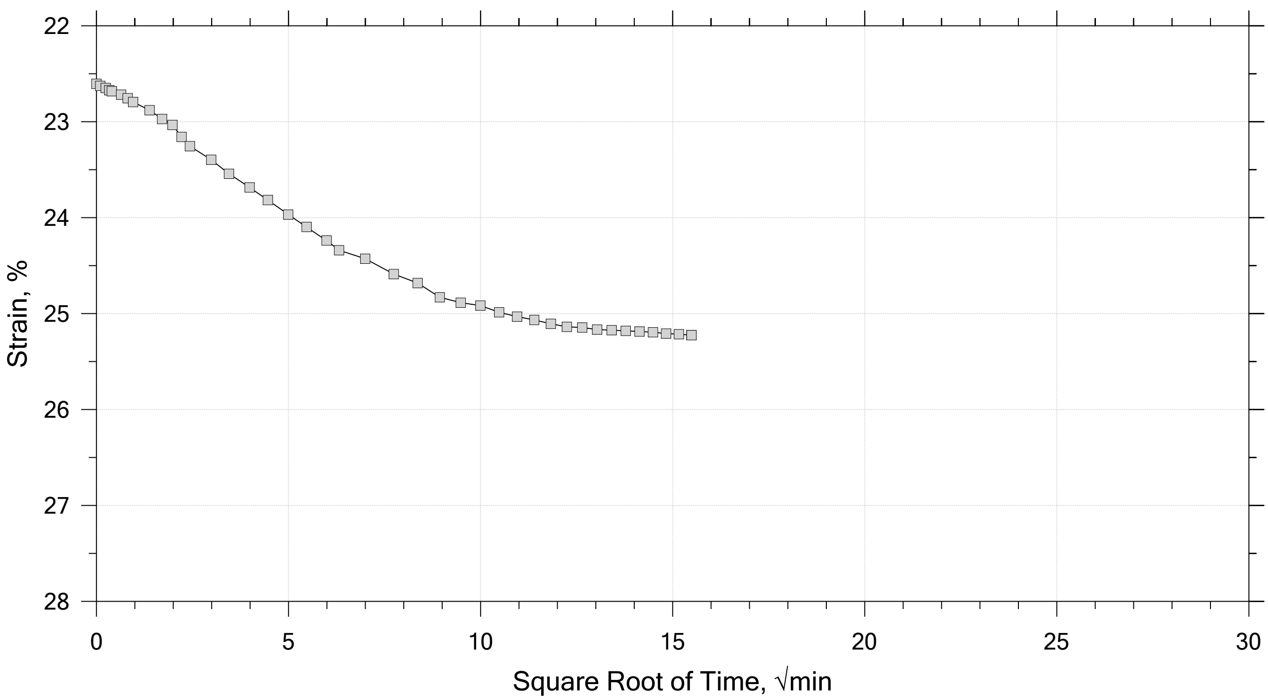
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 15

Constant Load Step

Stress: 16 tsf





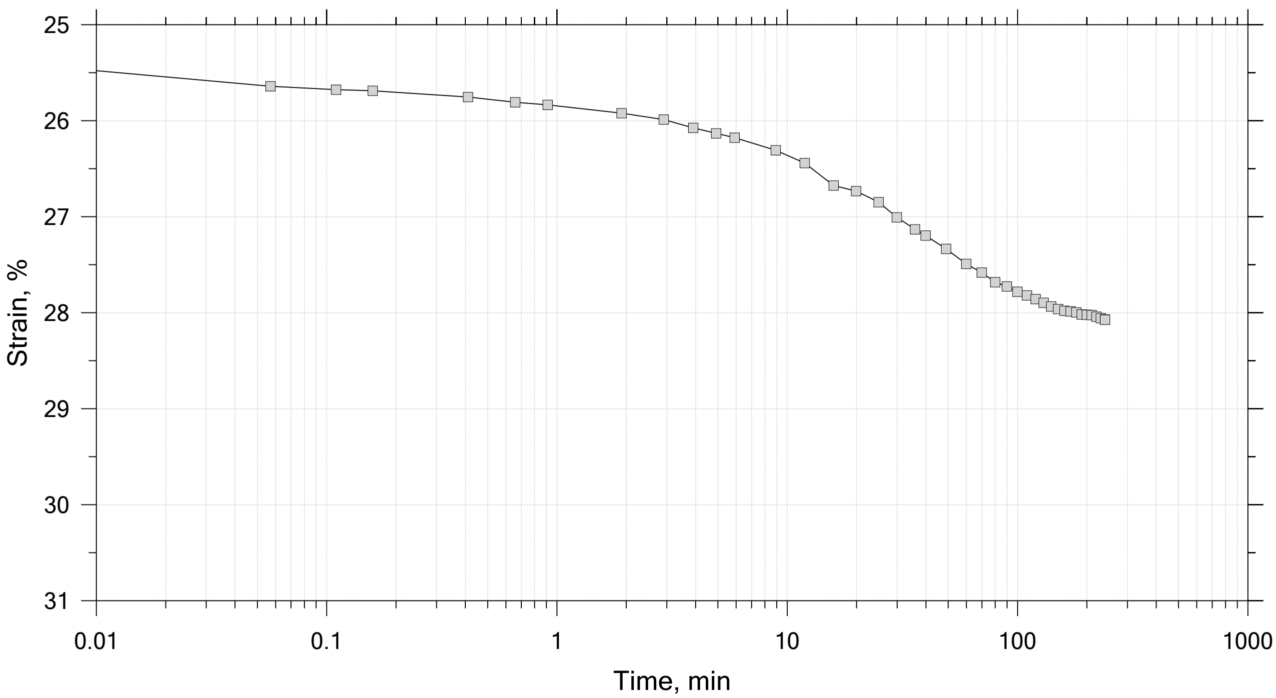
GeoTesting EXPRESS			
	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB036	Tested By: trm	Checked By: njh
	Sample No.: SL0674	Test Date: 2/25/19	Depth: 8-10 ft
	Test No.: IP-8	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with sand		
	Remarks: System LTIII-B, Swell Pressure = 0.0643 tsf		

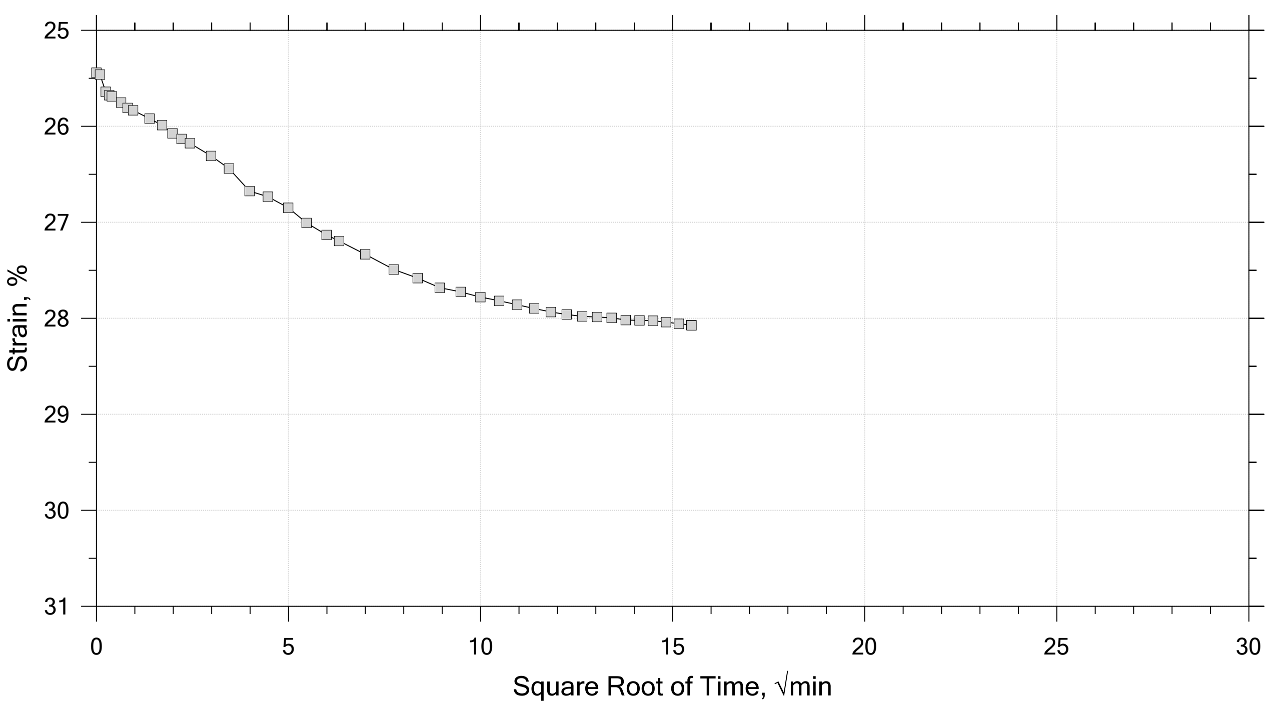
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 15

Constant Load Step

Stress: 32 tsf

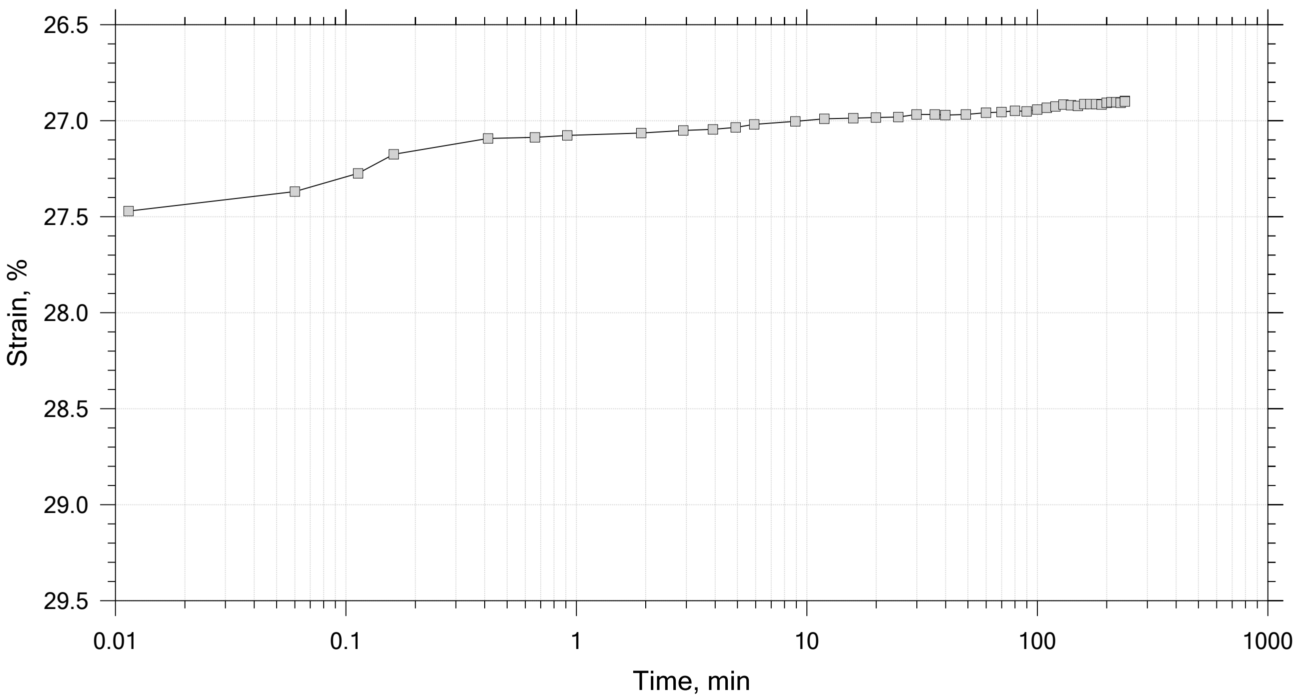


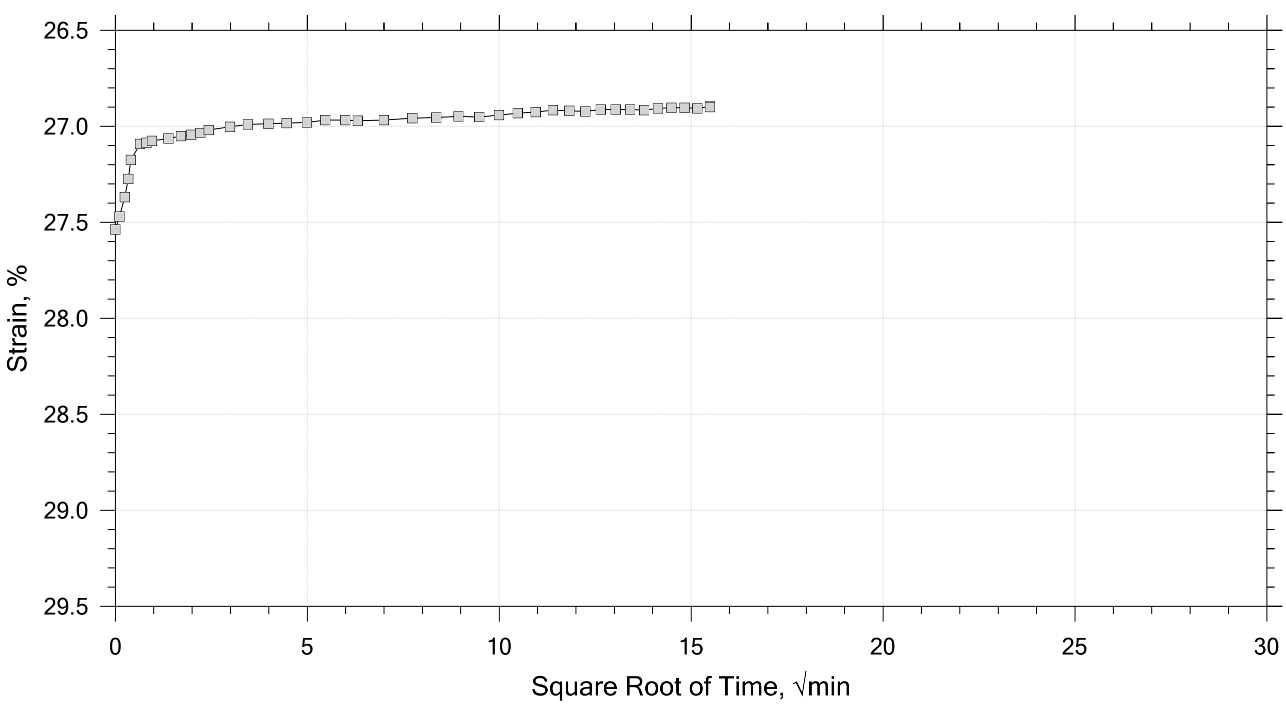


GeoTesting EXPRESS			
	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB036	Tested By: trm	Checked By: njh
	Sample No.: SL0674	Test Date: 2/25/19	Depth: 8-10 ft
	Test No.: IP-8	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with sand		
	Remarks: System LTIII-B, Swell Pressure = 0.0643 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 15
Constant Load Step
Stress: 8 tsf

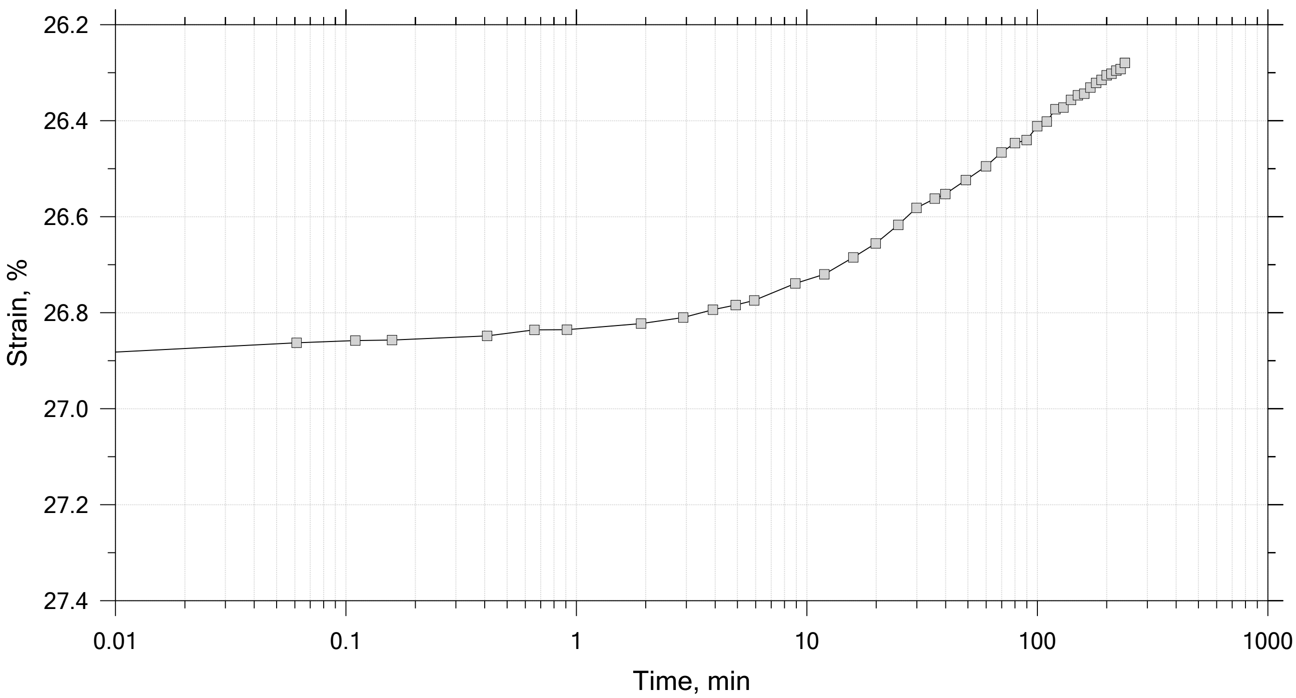


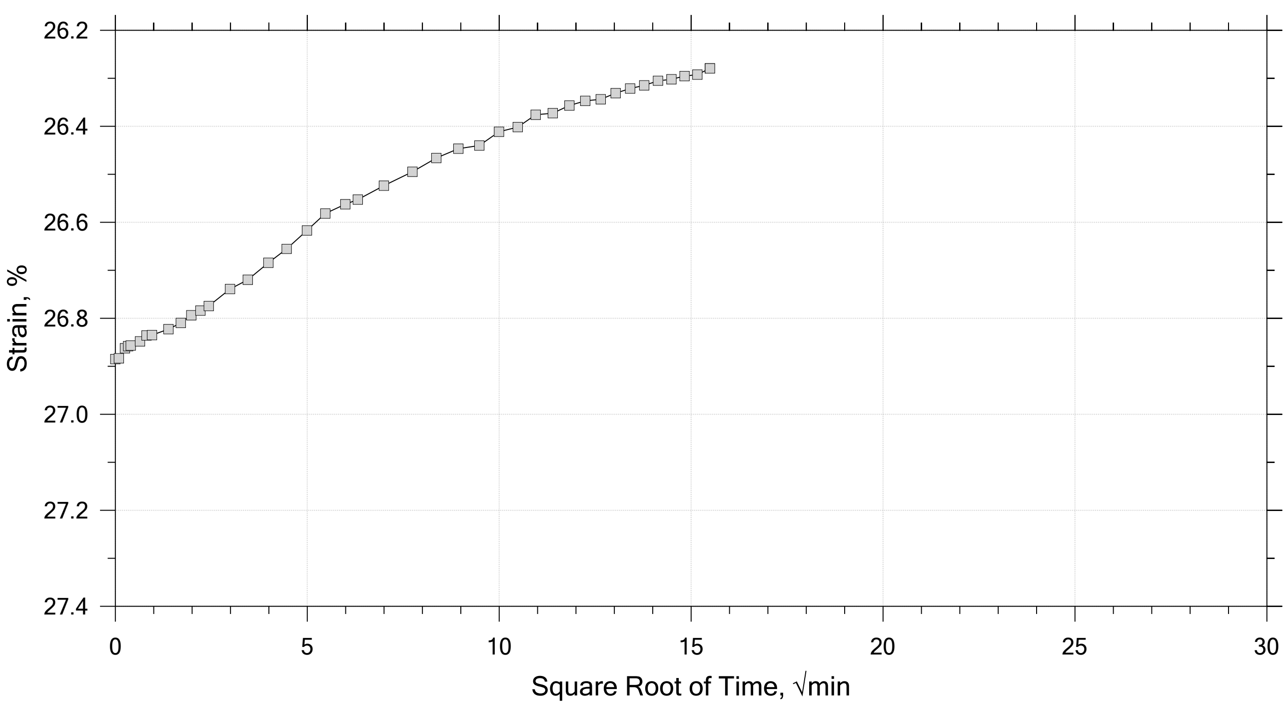


GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB036	Tested By: trm	Checked By: njh
	Sample No.: SL0674	Test Date: 2/25/19	Depth: 8-10 ft
	Test No.: IP-8	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with sand		
	Remarks: System LTIII-B, Swell Pressure = 0.0643 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 15
Constant Load Step
Stress: 2 tsf





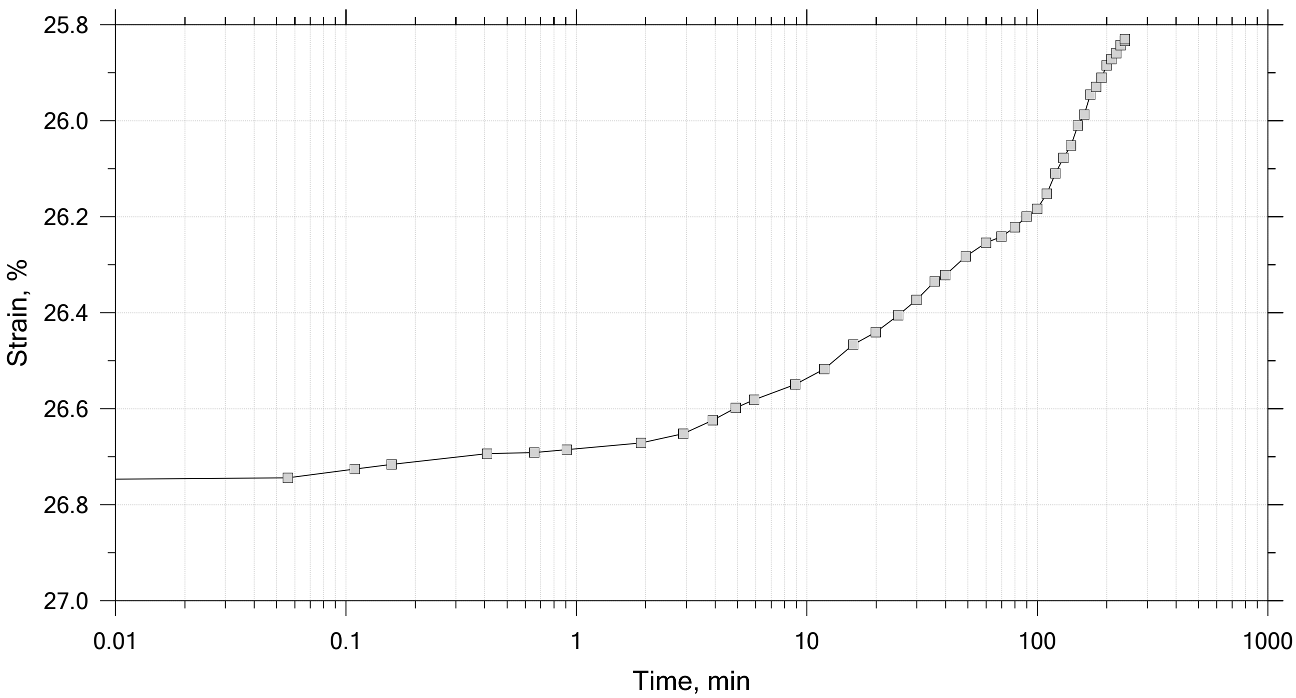
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB036	Tested By: trm	Checked By: njh
	Sample No.: SL0674	Test Date: 2/25/19	Depth: 8-10 ft
	Test No.: IP-8	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with sand		
	Remarks: System LTIII-B, Swell Pressure = 0.0643 tsf		

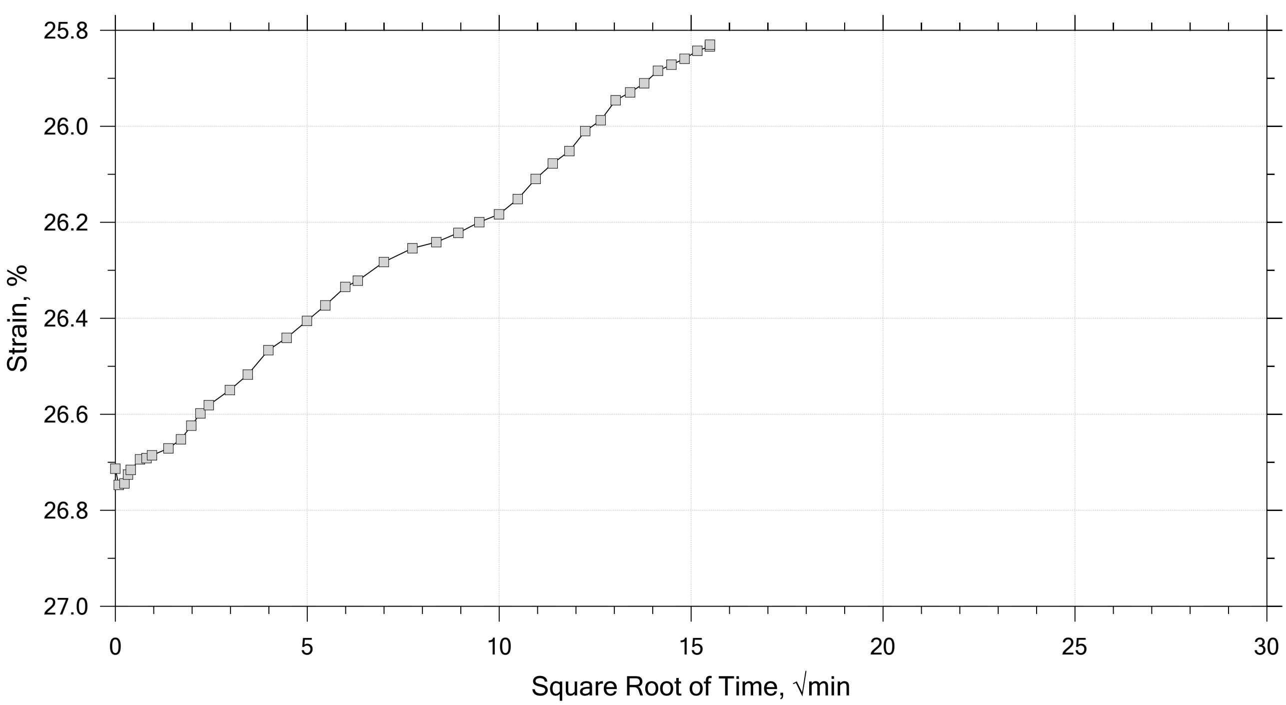
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 15

Constant Load Step

Stress: 0.5 tsf

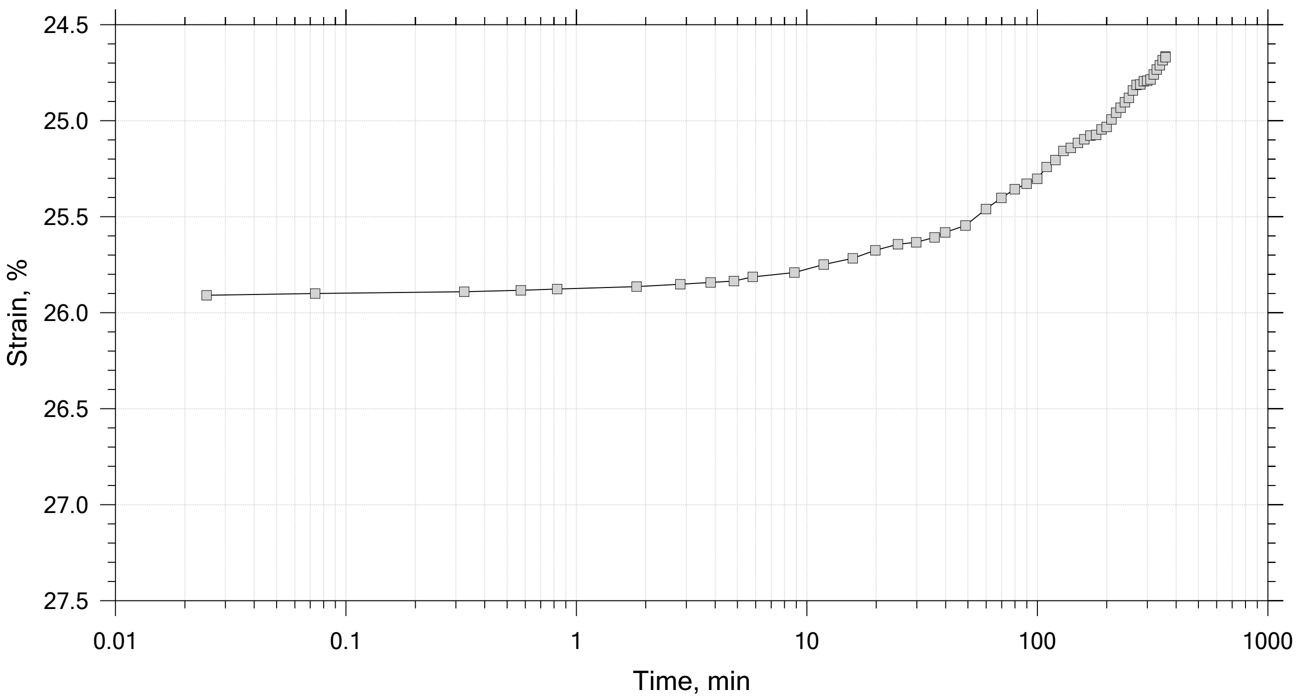


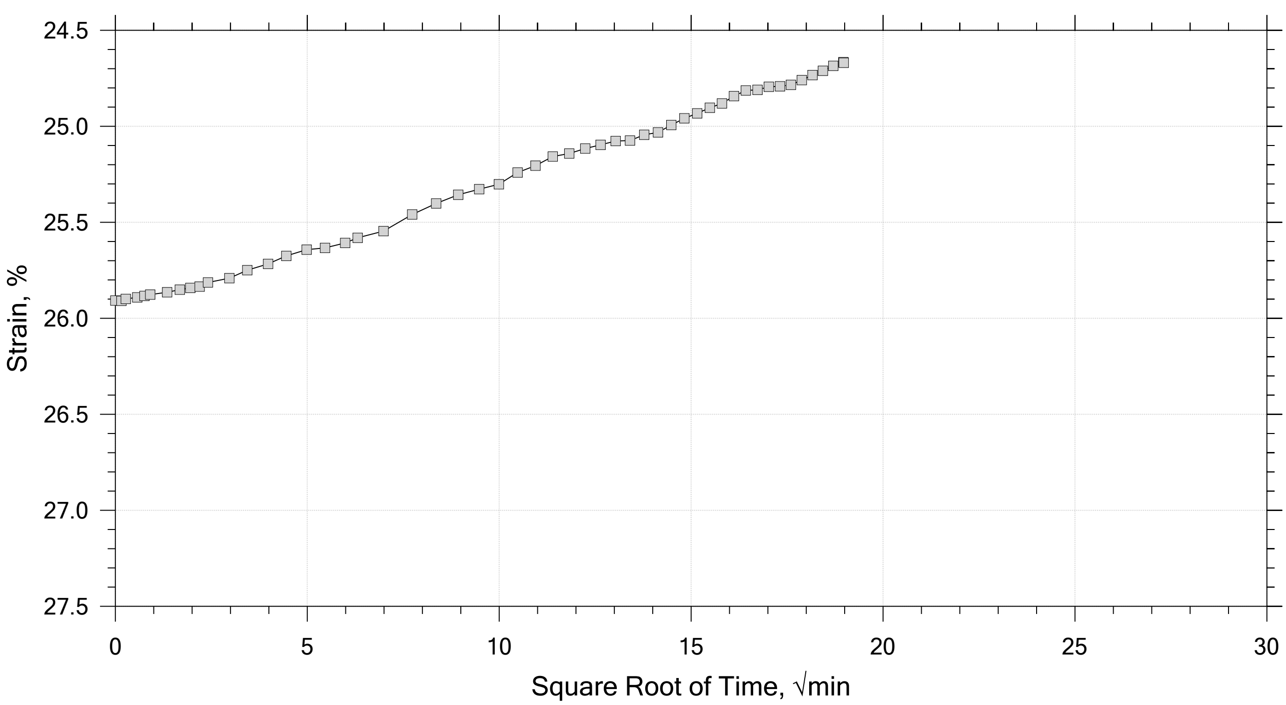


GeoTesting EXPRESS			
	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB036	Tested By: trm	Checked By: njh
	Sample No.: SL0674	Test Date: 2/25/19	Depth: 8-10 ft
	Test No.: IP-8	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with sand		
	Remarks: 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

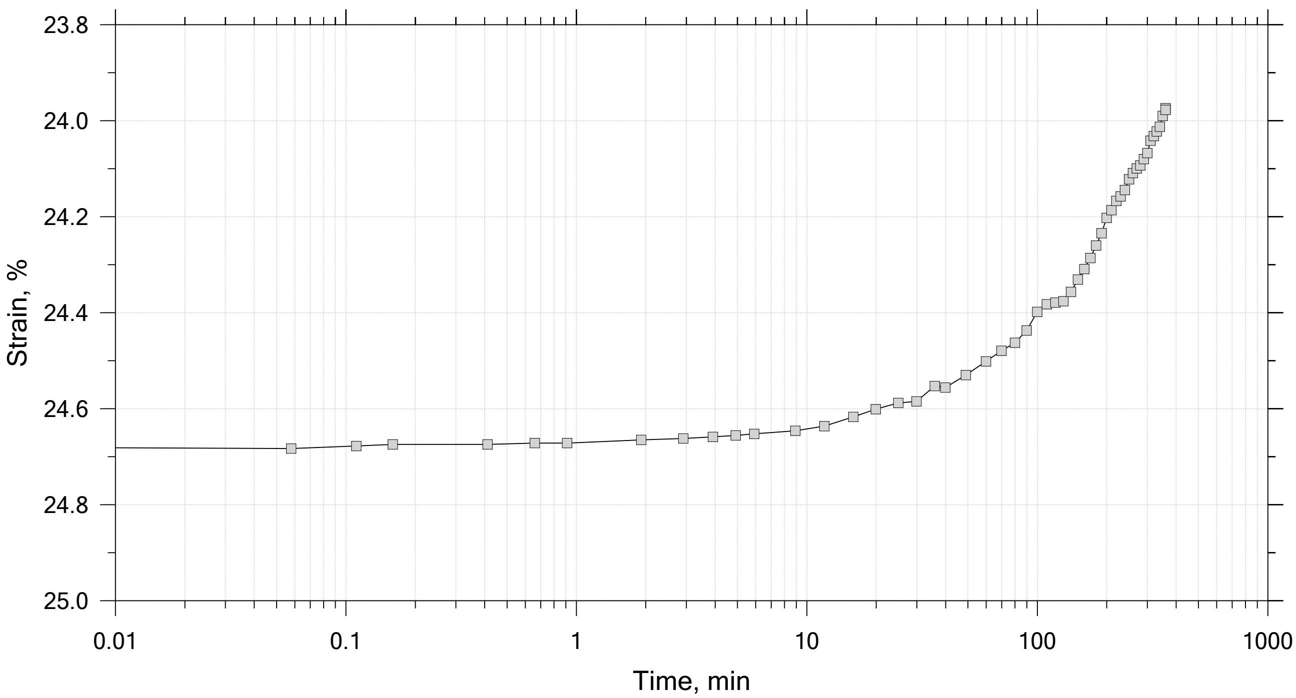


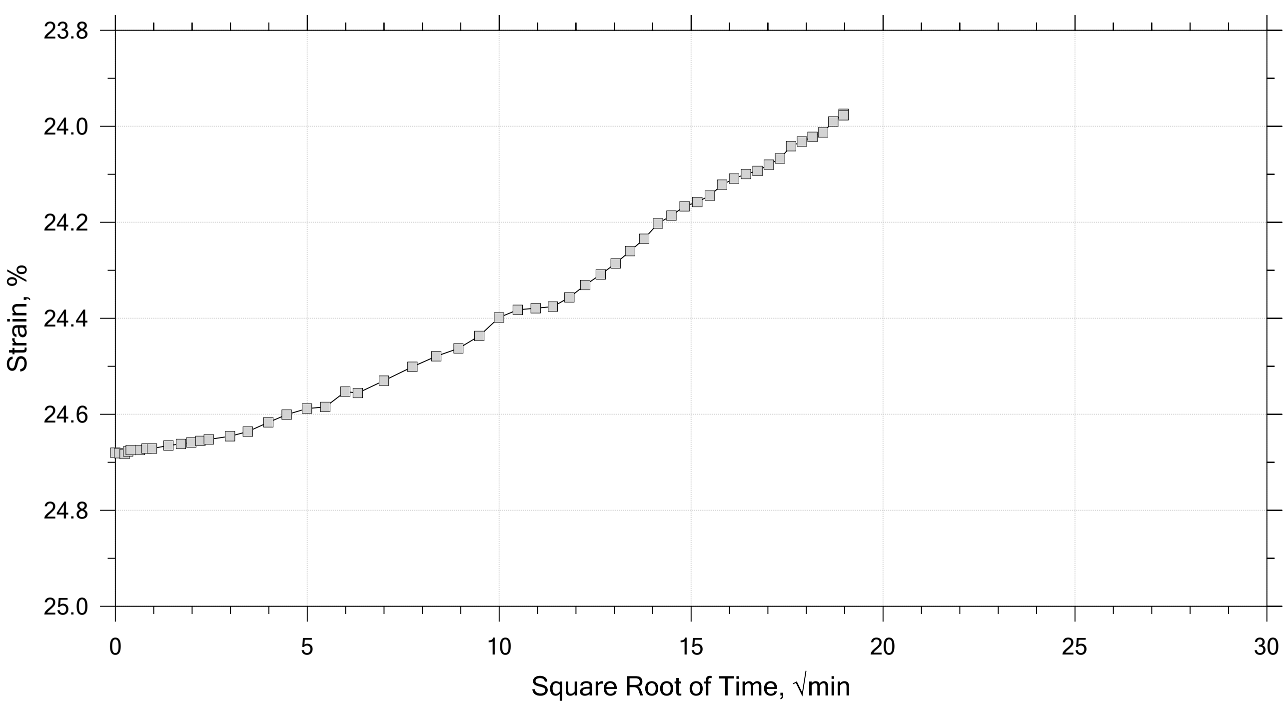


GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJSB036	Tested By: trm	Checked By: njh
	Sample No.: SL0674	Test Date: 2/25/19	Depth: 8-10 ft
	Test No.: IP-8	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with sand		
	Remarks: System LTIII-B, Swell Pressure = 0.0643 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 15 of 15
Constant Load Step
Stress: 0.0625 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

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		

One-Dimensional Consolidation by ASTM D2435 - Method B

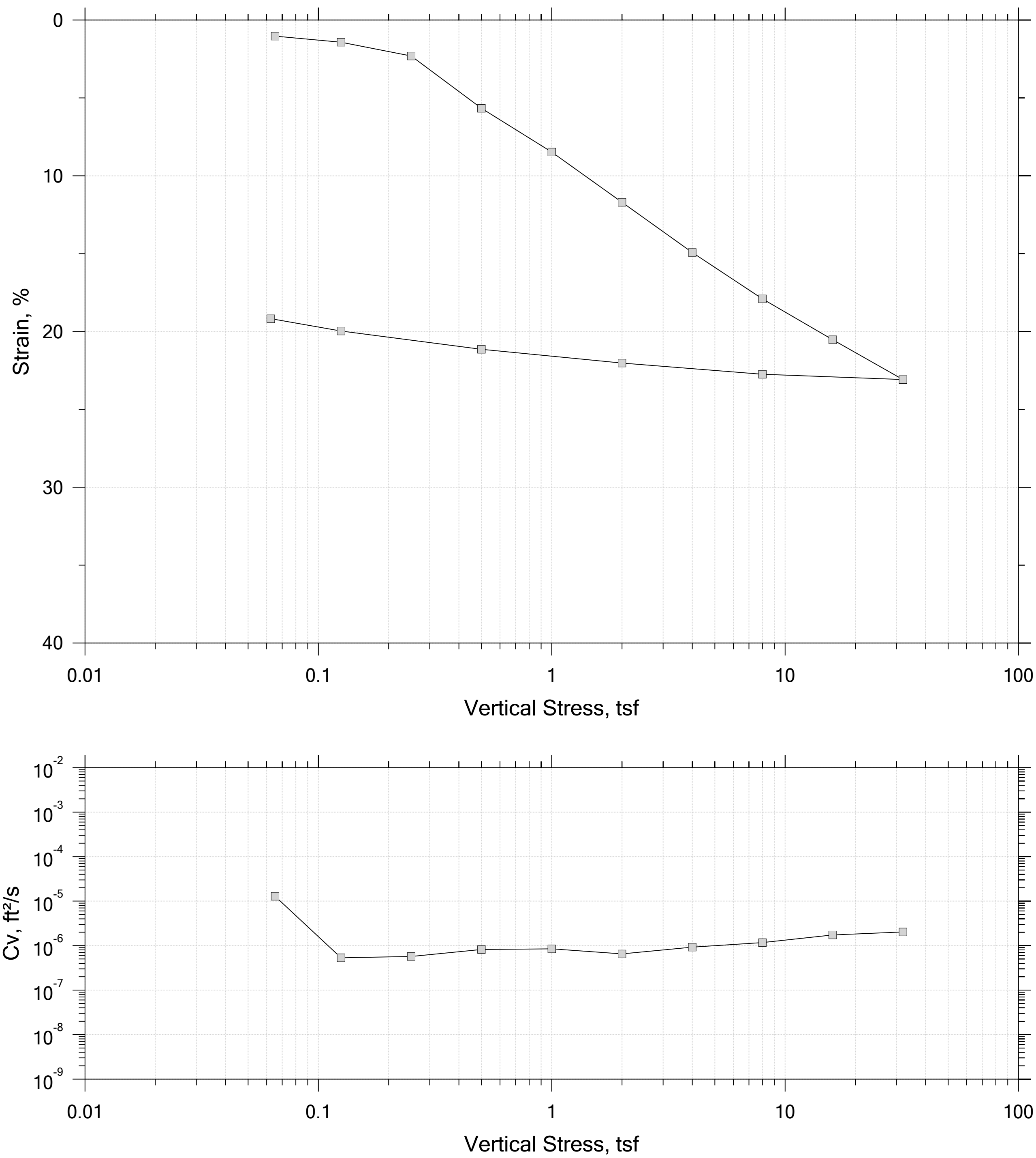
Square Root of Time Coefficients

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

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

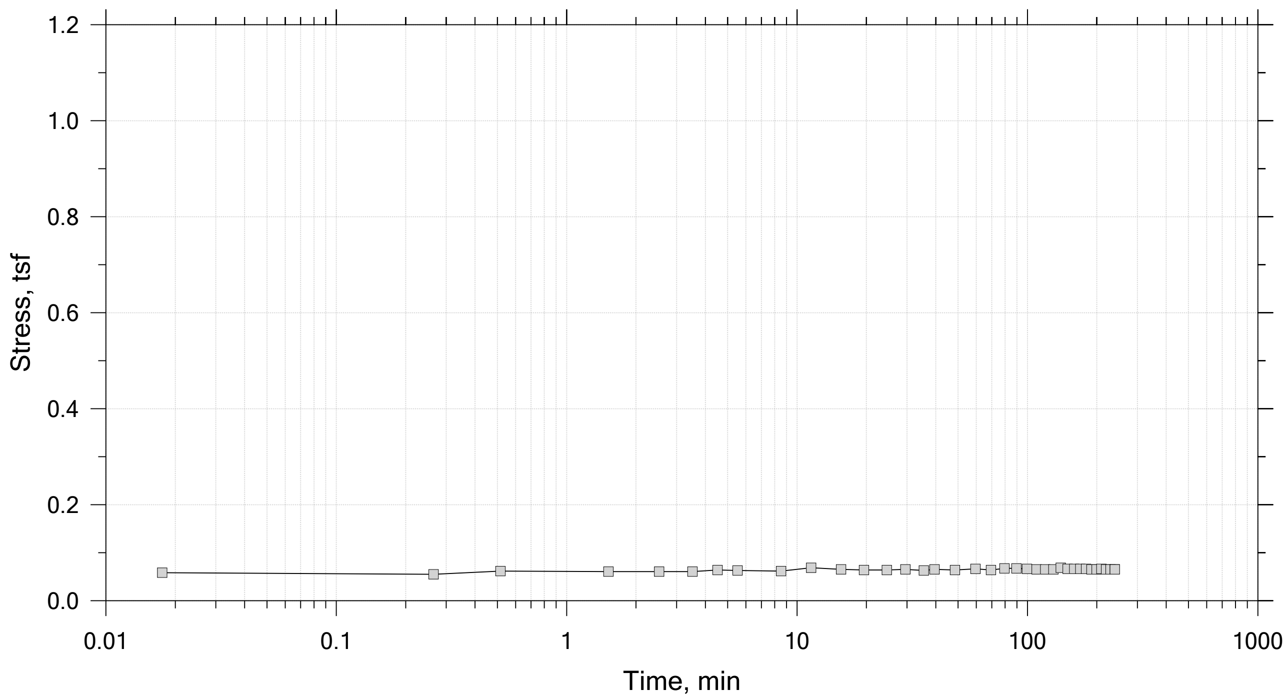
Summary Report

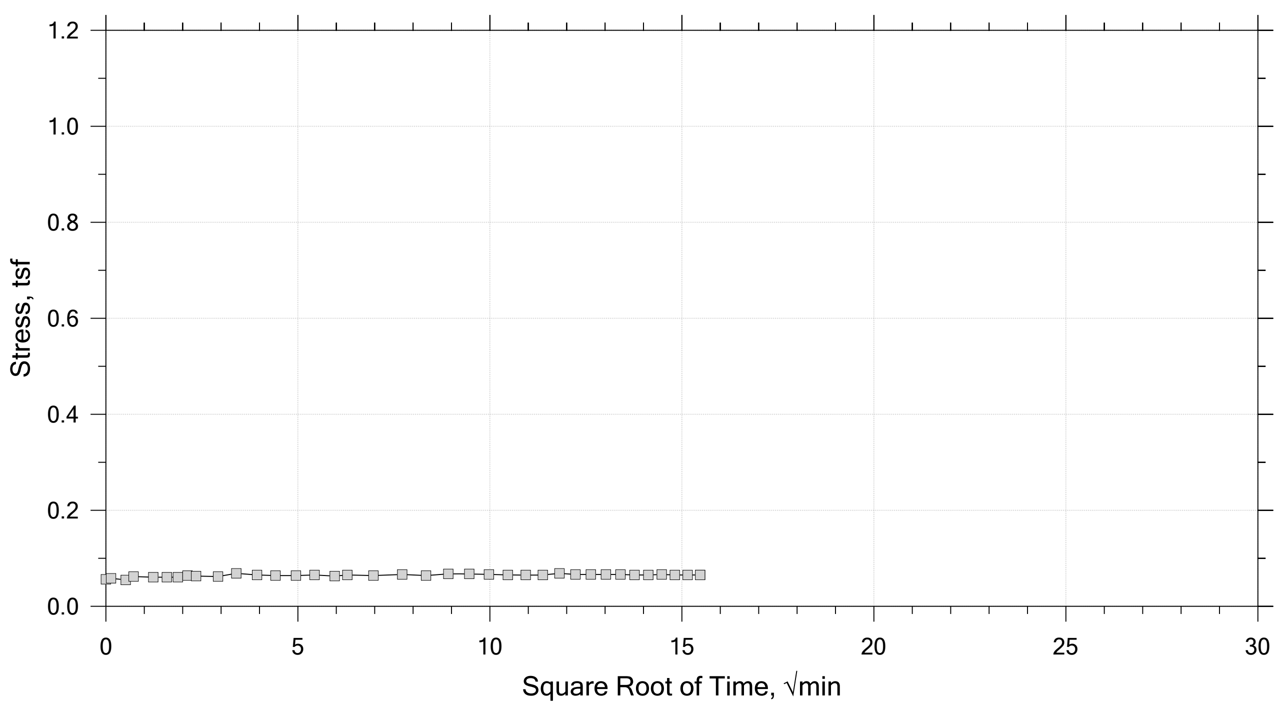


GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB037	Tested By: md	Checked By: njh
	Sample No.: SL0657	Test Date: 2/19/19	Depth: 15-17 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with sand		
	Remarks: System 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





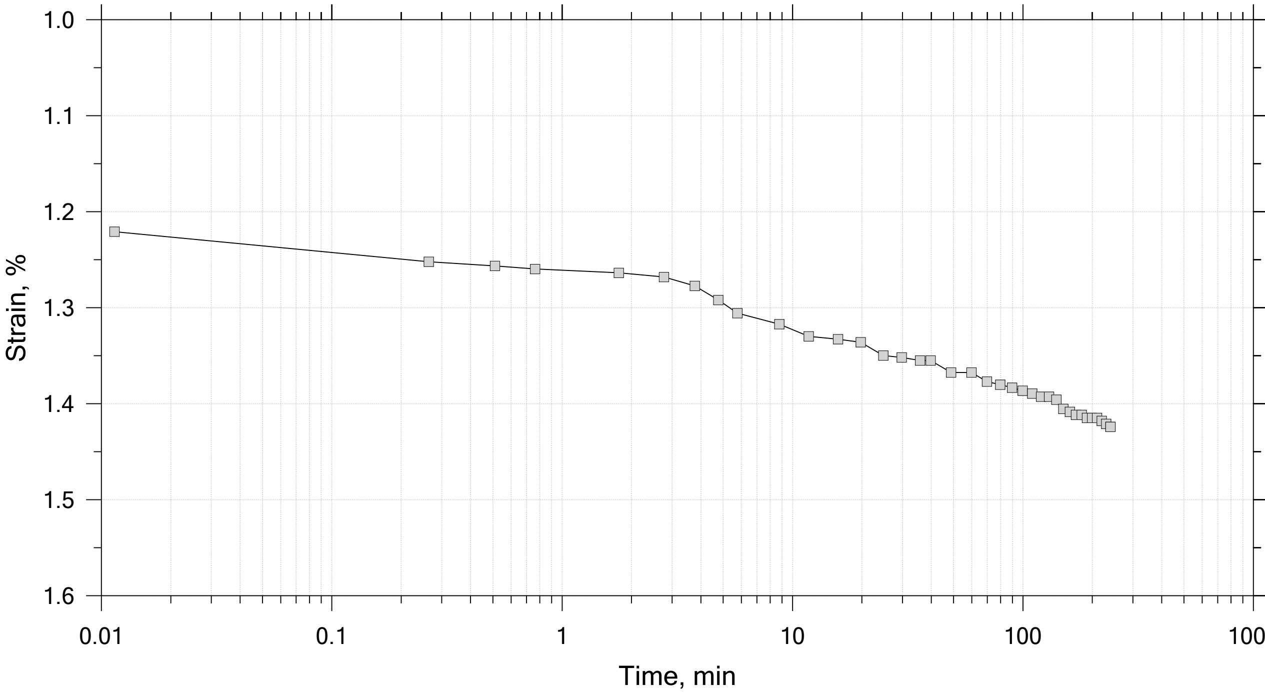
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB037	Tested By: md	Checked By: njh
	Sample No.: SL0657	Test Date: 2/19/19	Depth: 15-17 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with sand		
	Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

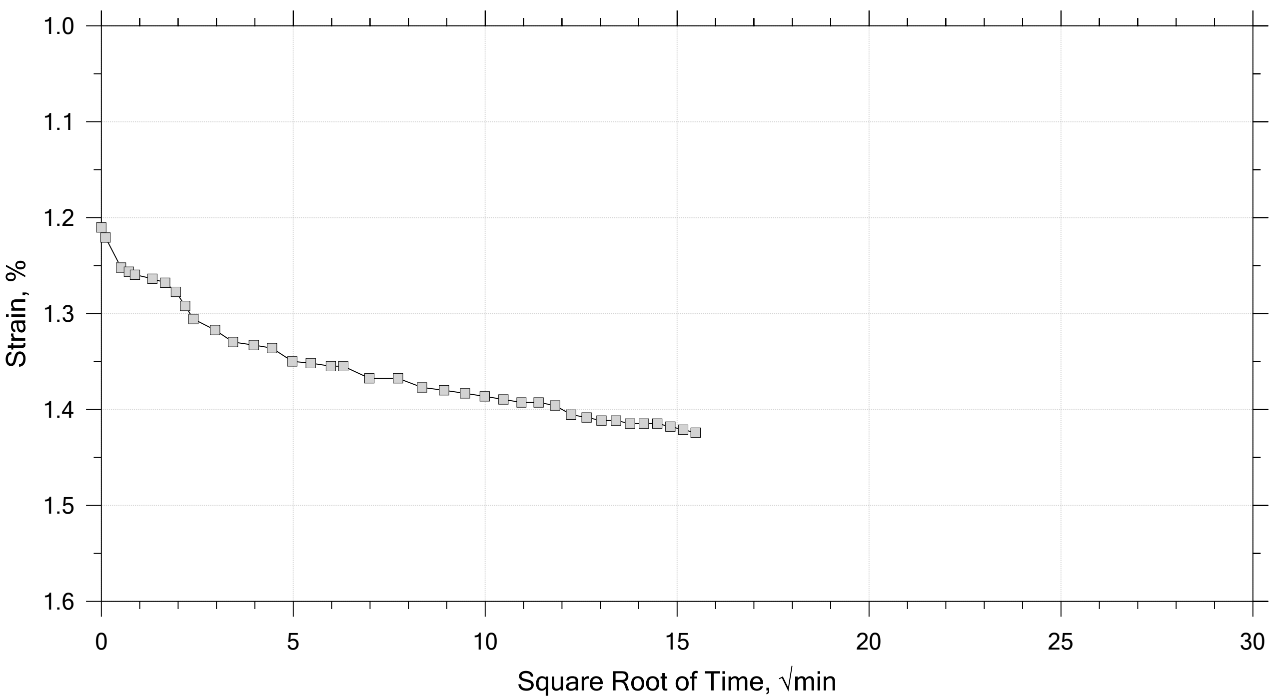
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 2 of 15

Constant Load Step

Stress: 0.125 tsf





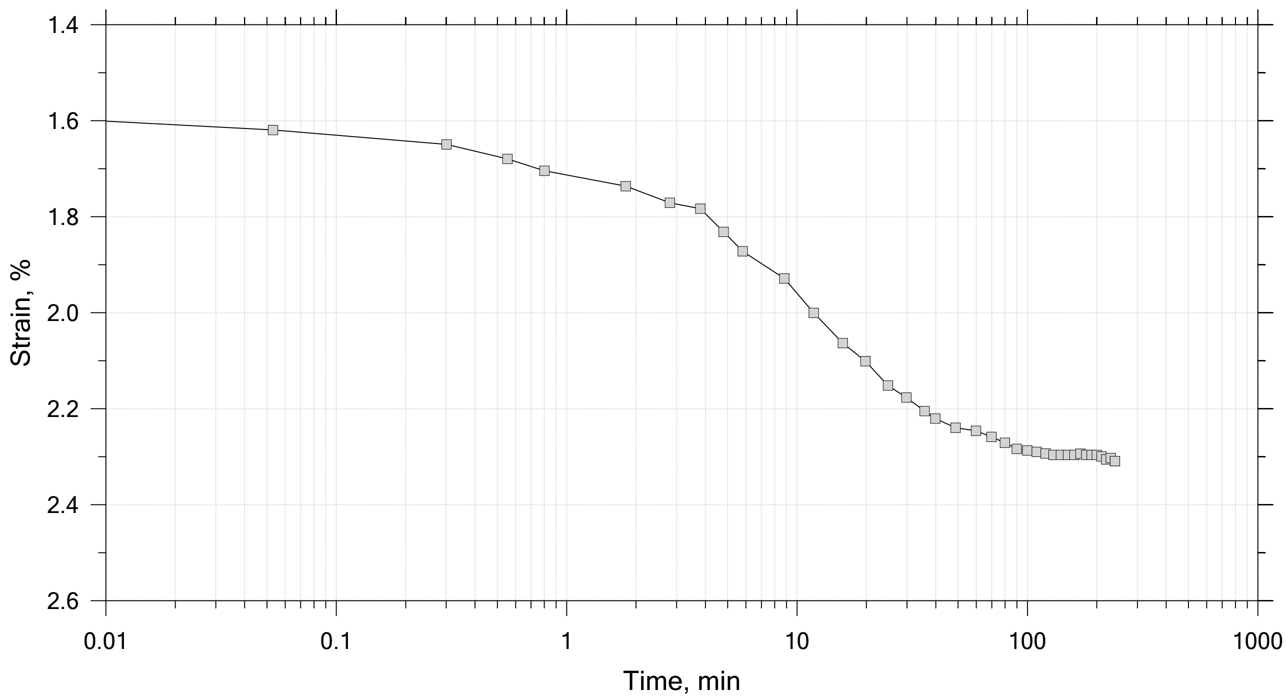
GeoTesting EXPRESS			
	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB037	Tested By: md	Checked By: njh
	Sample No.: SL0657	Test Date: 2/19/19	Depth: 15-17 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with sand		
	Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

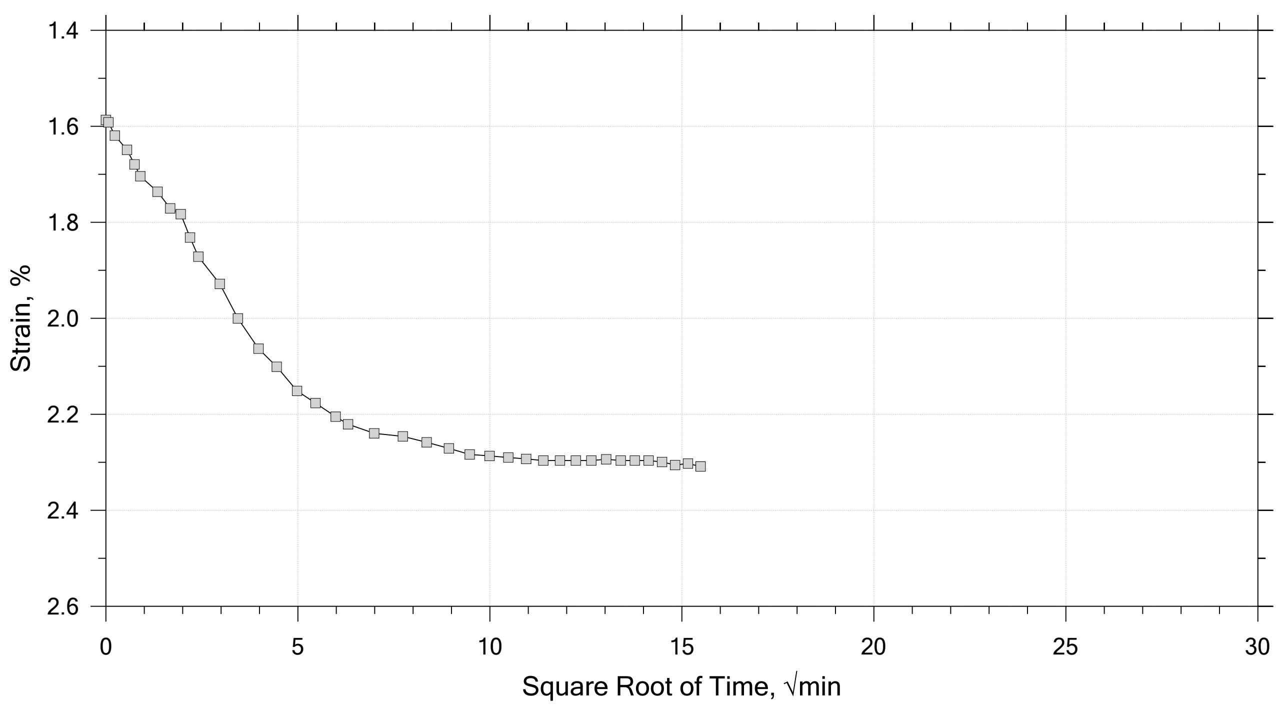
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 3 of 15

Constant Load Step

Stress: 0.25 tsf

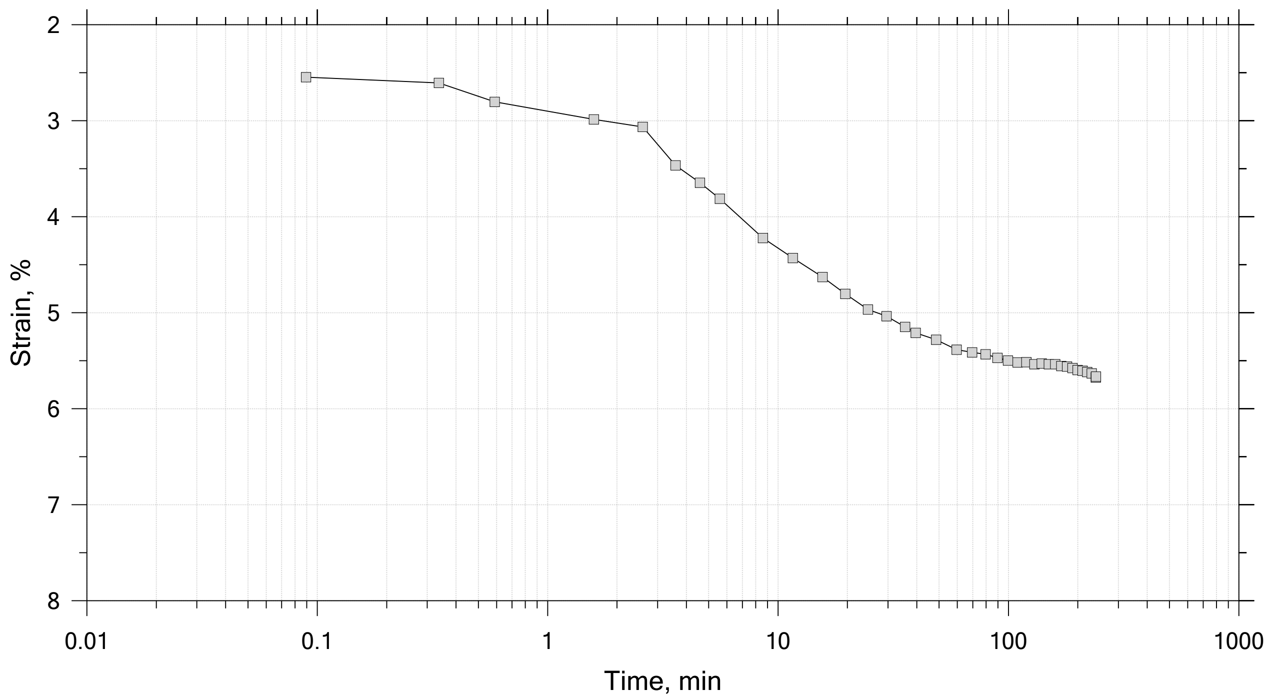


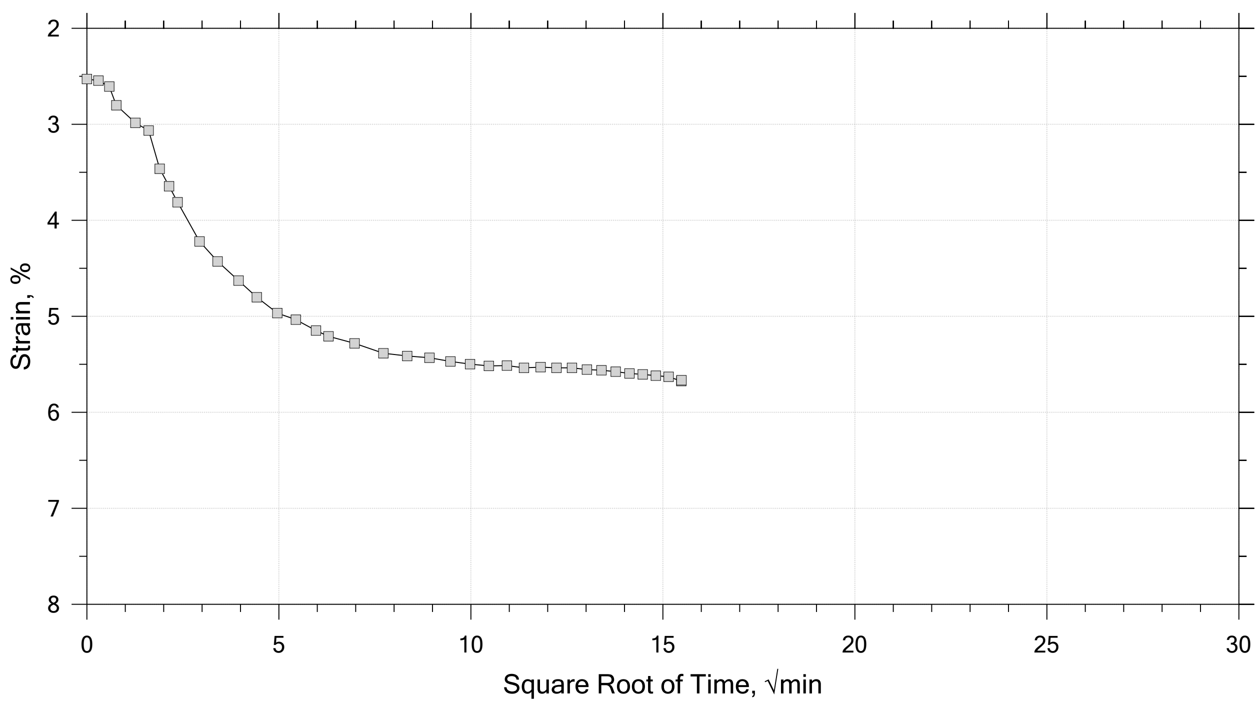


GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB037	Tested By: md	Checked By: njh
	Sample No.: SL0657	Test Date: 2/19/19	Depth: 15-17 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with sand		
	Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 4 of 15
Constant Load Step
Stress: 0.5 tsf

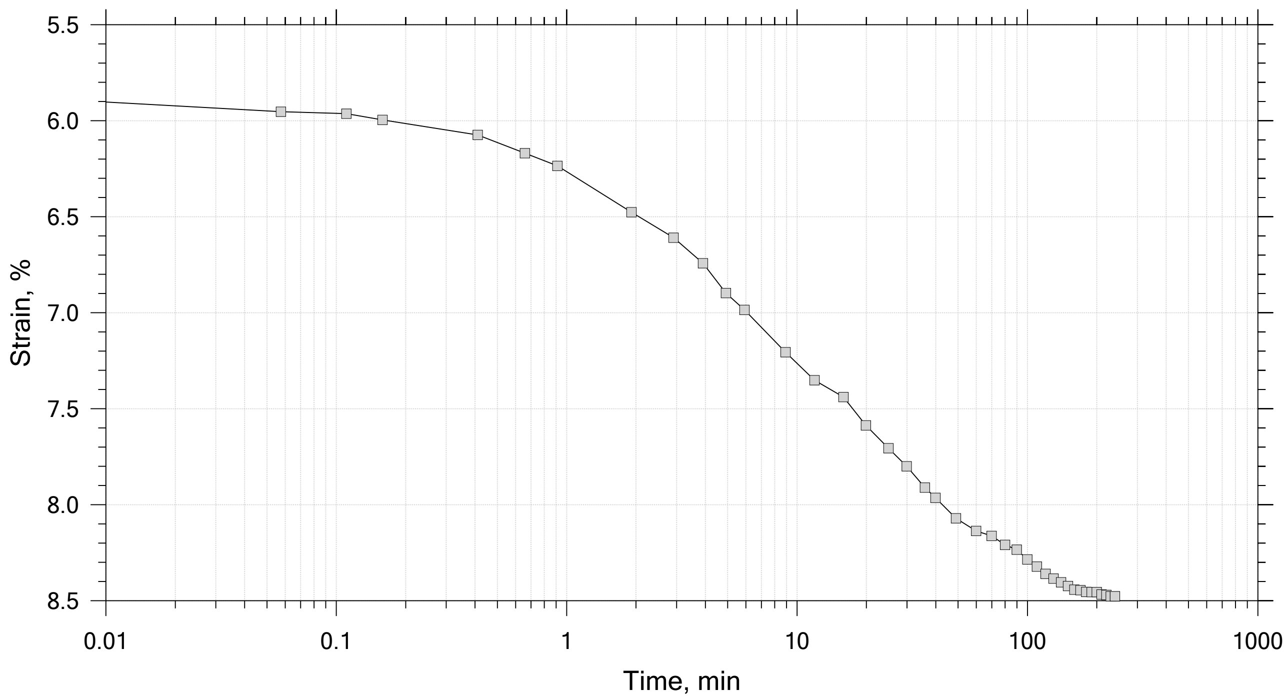


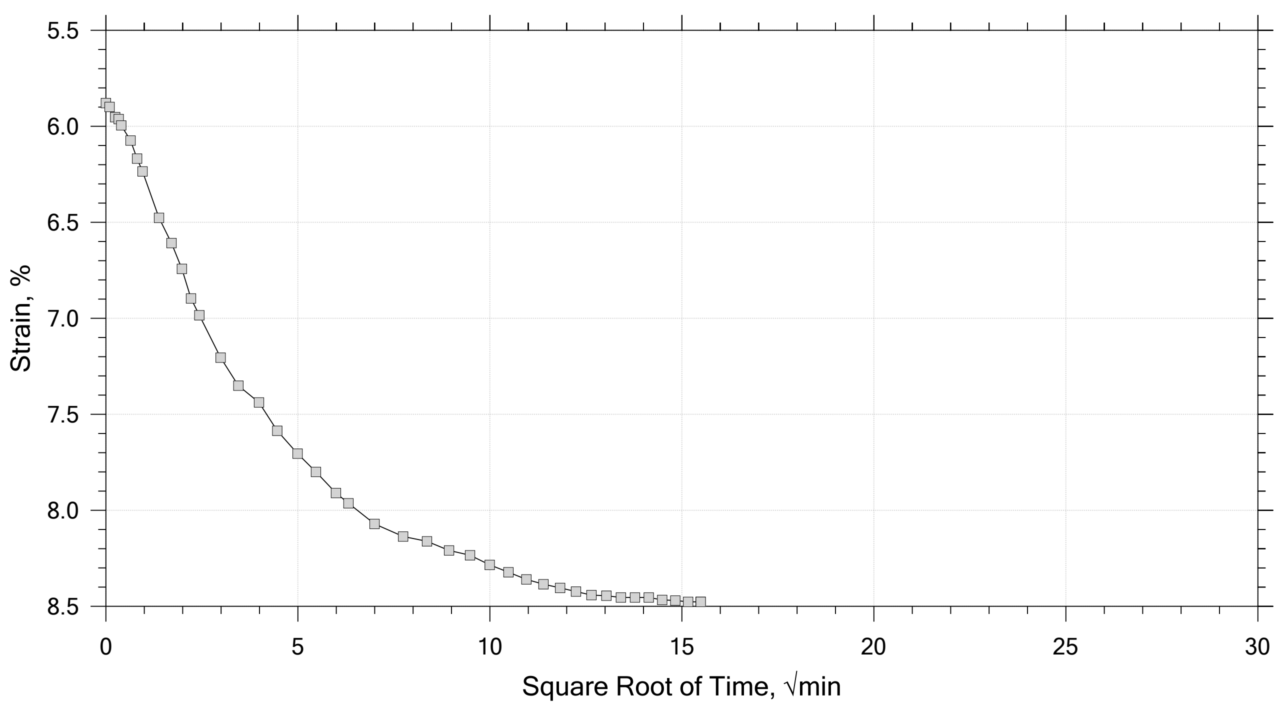


GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB037	Tested By: md	Checked By: njh
	Sample No.: SL0657	Test Date: 2/19/19	Depth: 15-17 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with sand		
	Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 5 of 15
Constant Load Step
Stress: 1 tsf





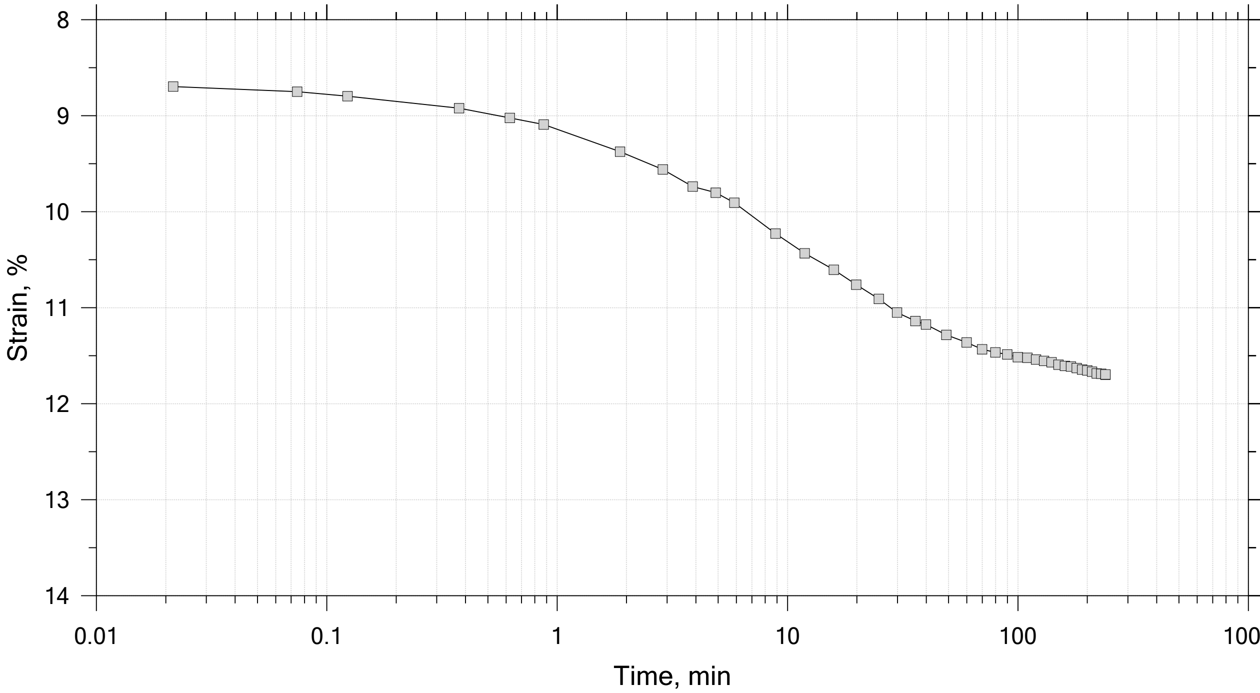
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB037	Tested By: md	Checked By: njh
	Sample No.: SL0657	Test Date: 2/19/19	Depth: 15-17 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with sand		
	Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

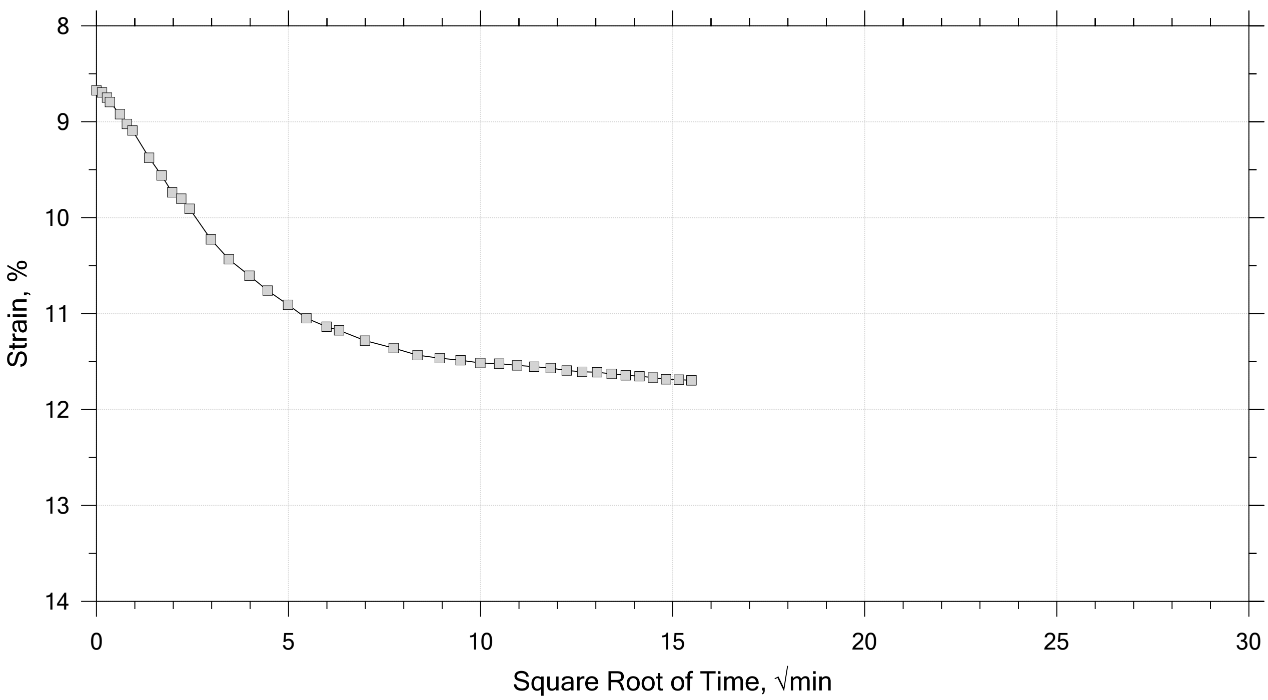
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 6 of 15

Constant Load Step

Stress: 2 tsf

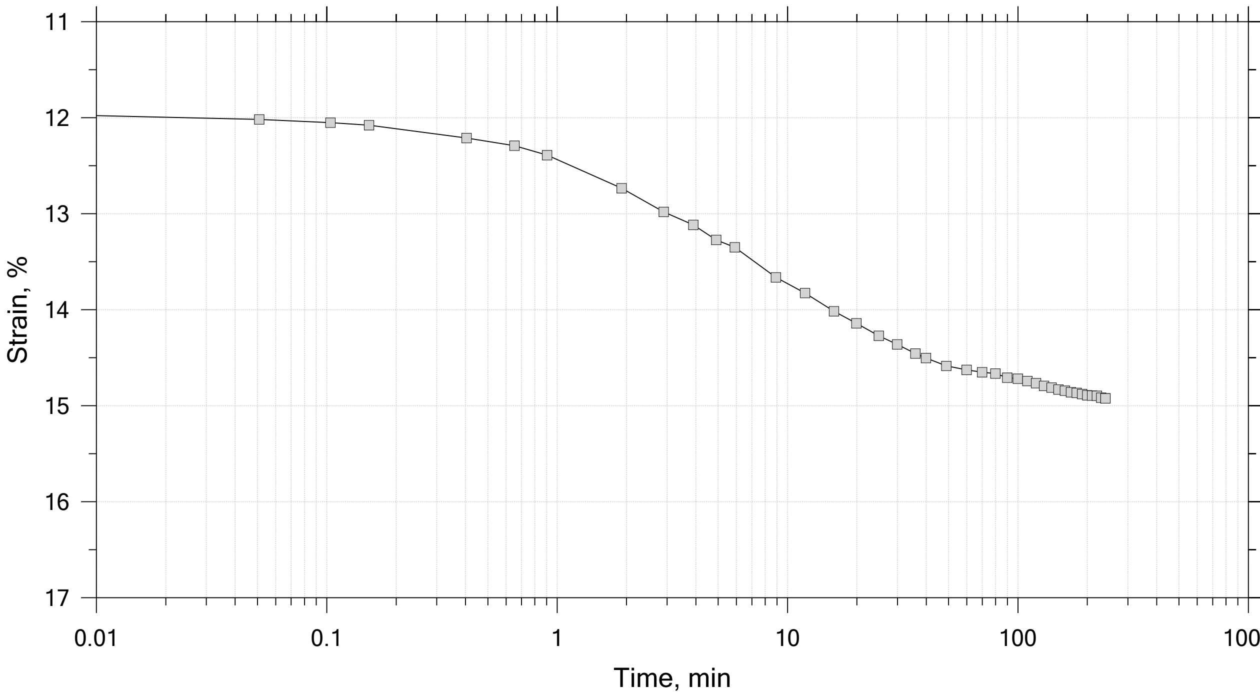


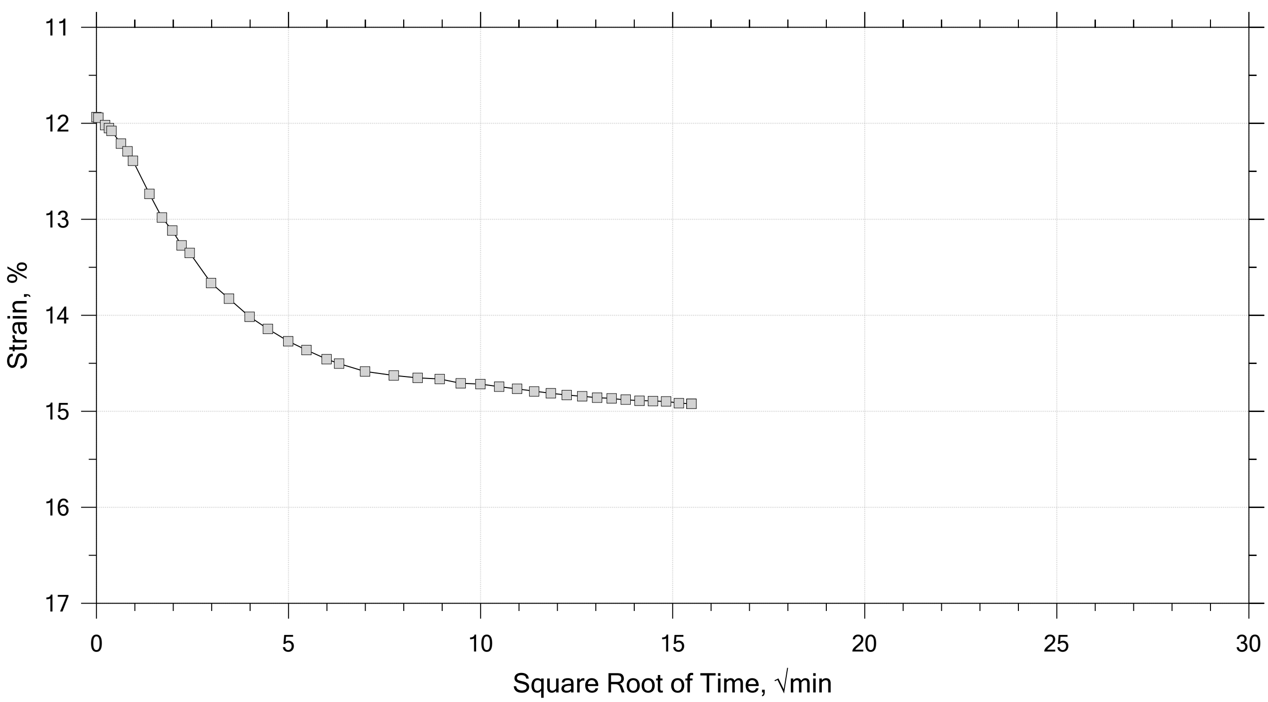


GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB037	Tested By: md	Checked By: njh
	Sample No.: SL0657	Test Date: 2/19/19	Depth: 15-17 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with sand		
	Remarks: System 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





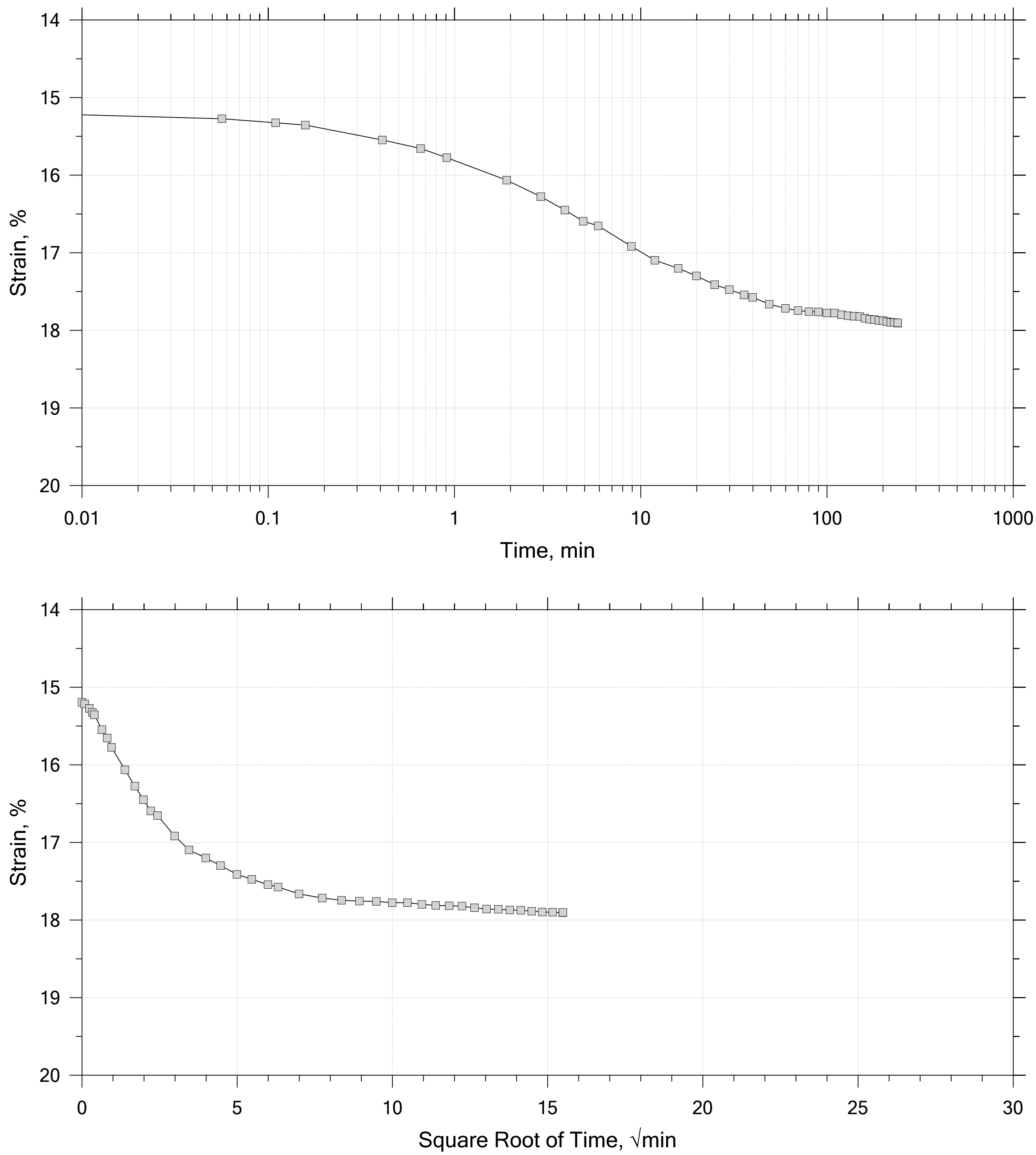
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB037	Tested By: md	Checked By: njh
	Sample No.: SL0657	Test Date: 2/19/19	Depth: 15-17 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with sand		
	Remarks: System 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



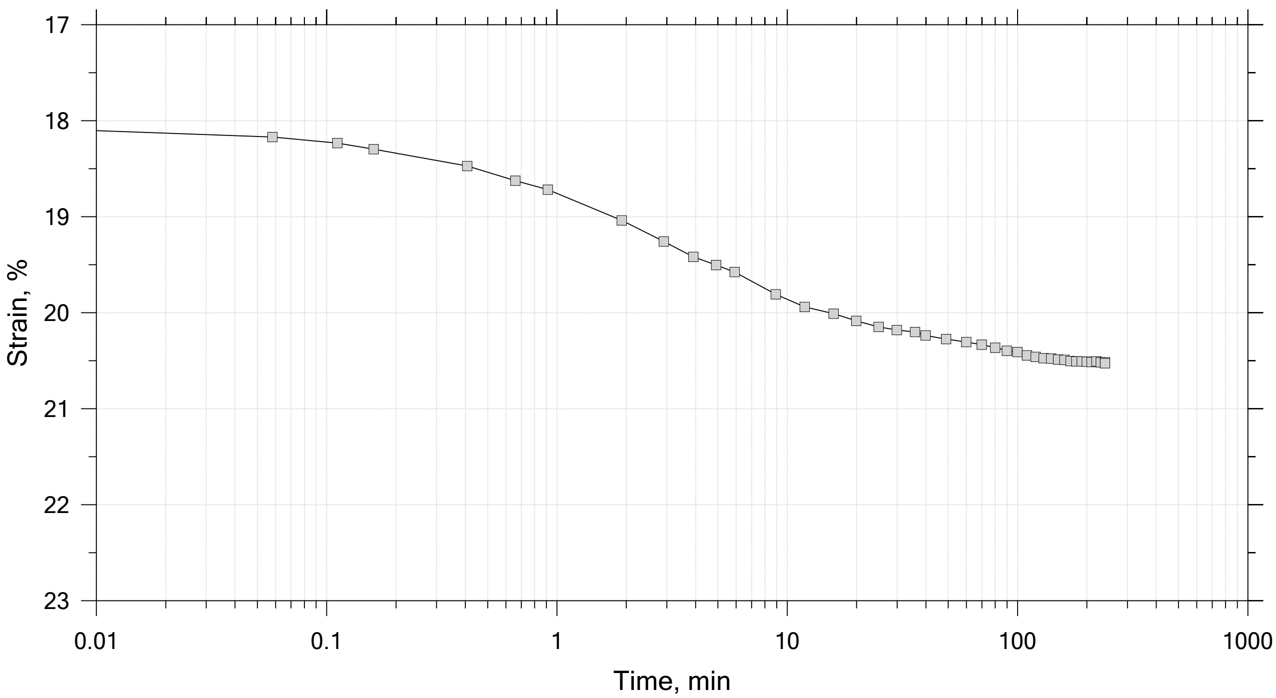
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB037	Tested By: md	Checked By: njh
	Sample No.: SL0657	Test Date: 2/19/19	Depth: 15-17 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with sand		
	Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

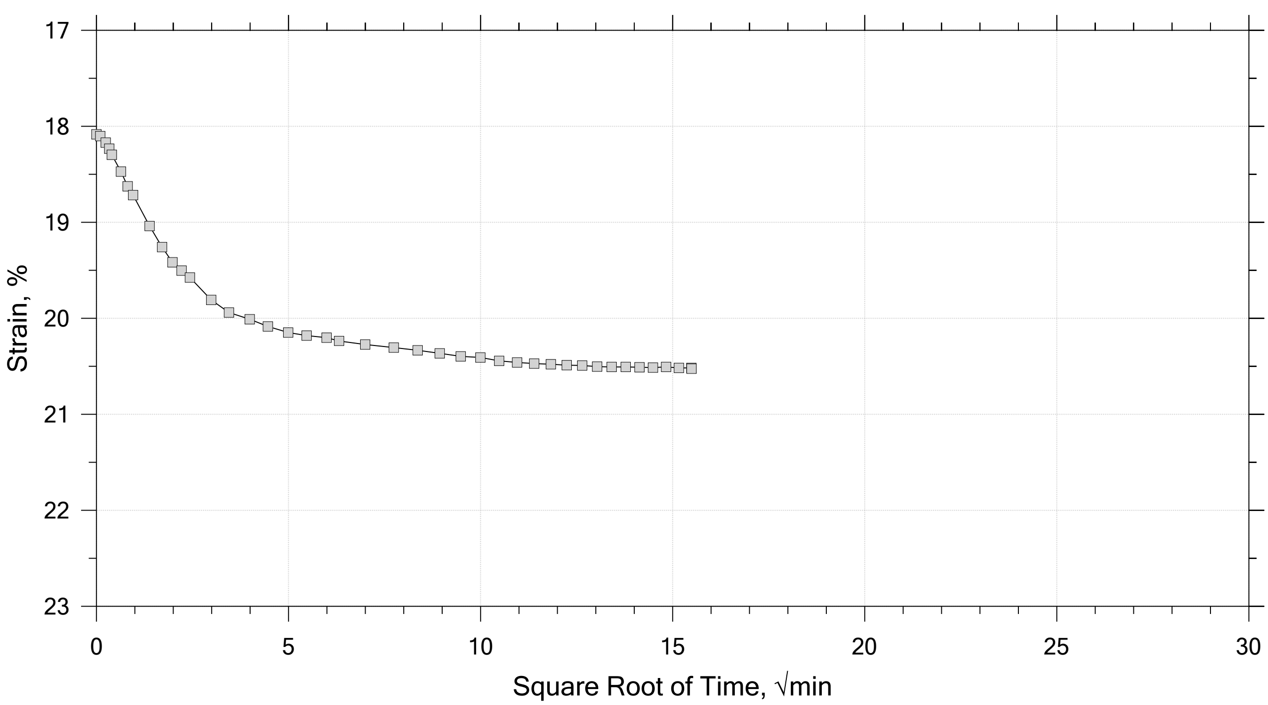
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 9 of 15

Constant Load Step

Stress: 16 tsf





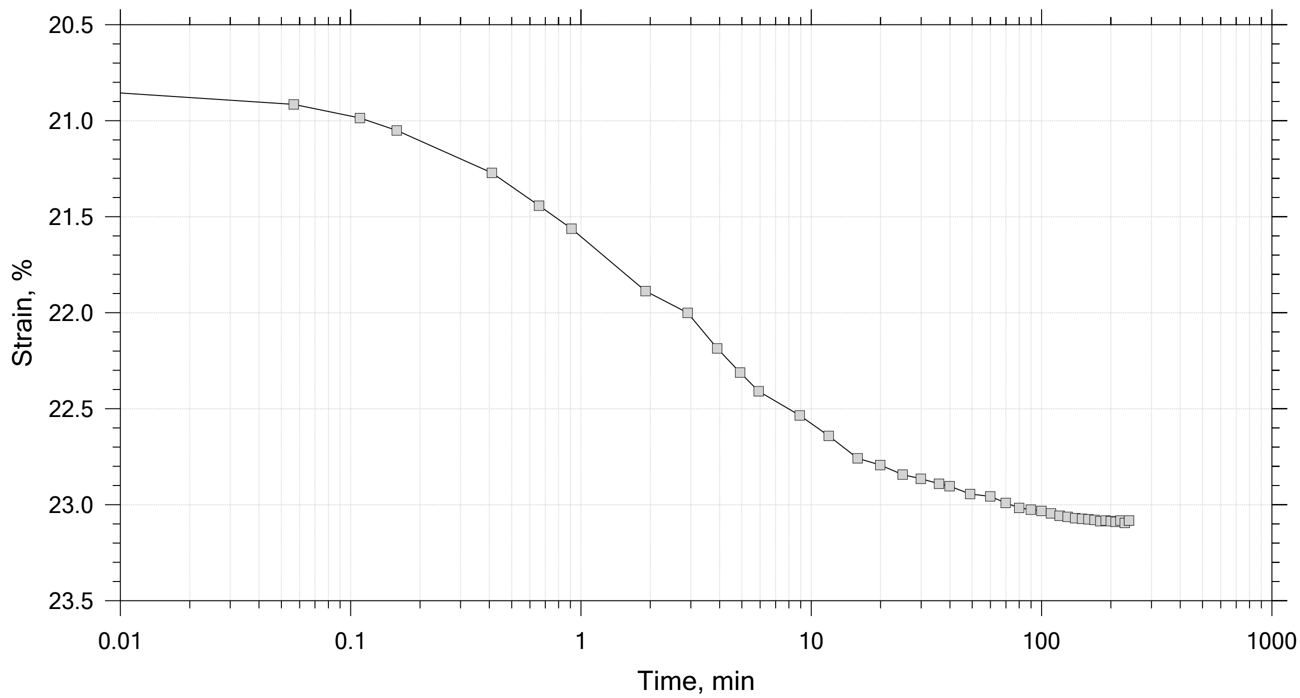
GeoTesting EXPRESS			
	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB037	Tested By: md	Checked By: njh
	Sample No.: SL0657	Test Date: 2/19/19	Depth: 15-17 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with sand		
	Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

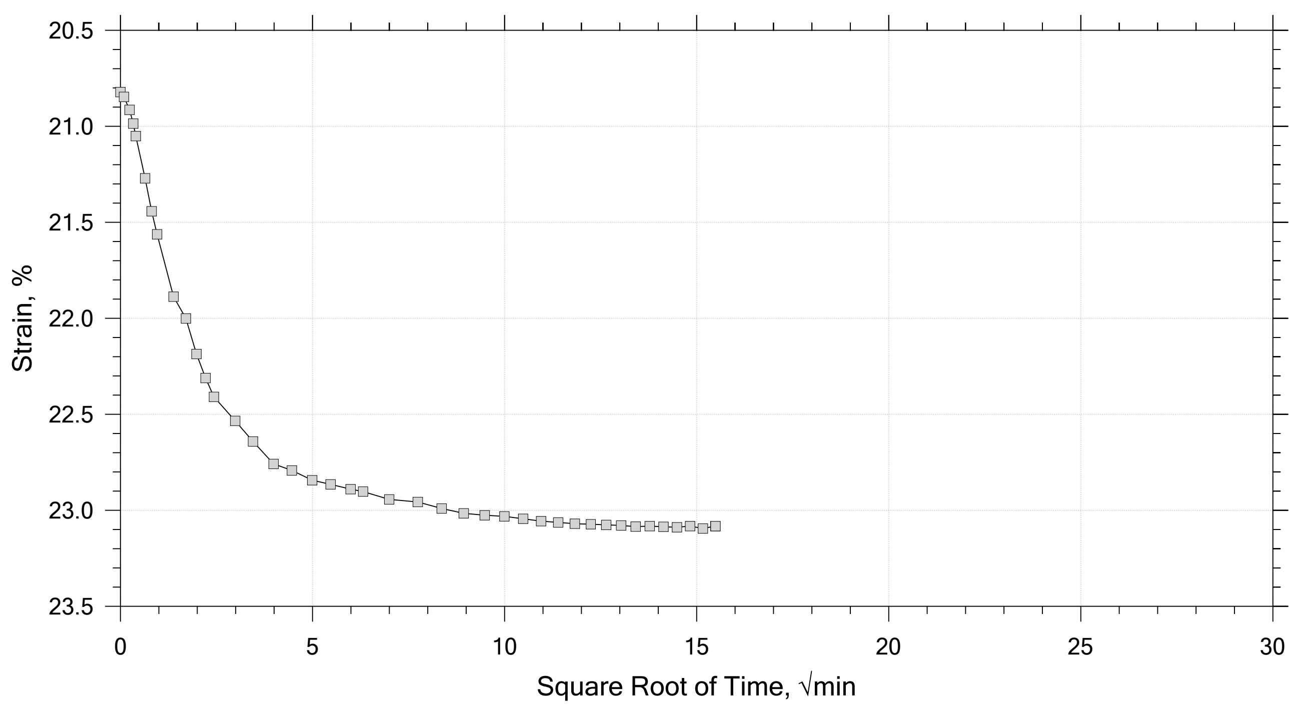
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 10 of 15

Constant Load Step

Stress: 32 tsf





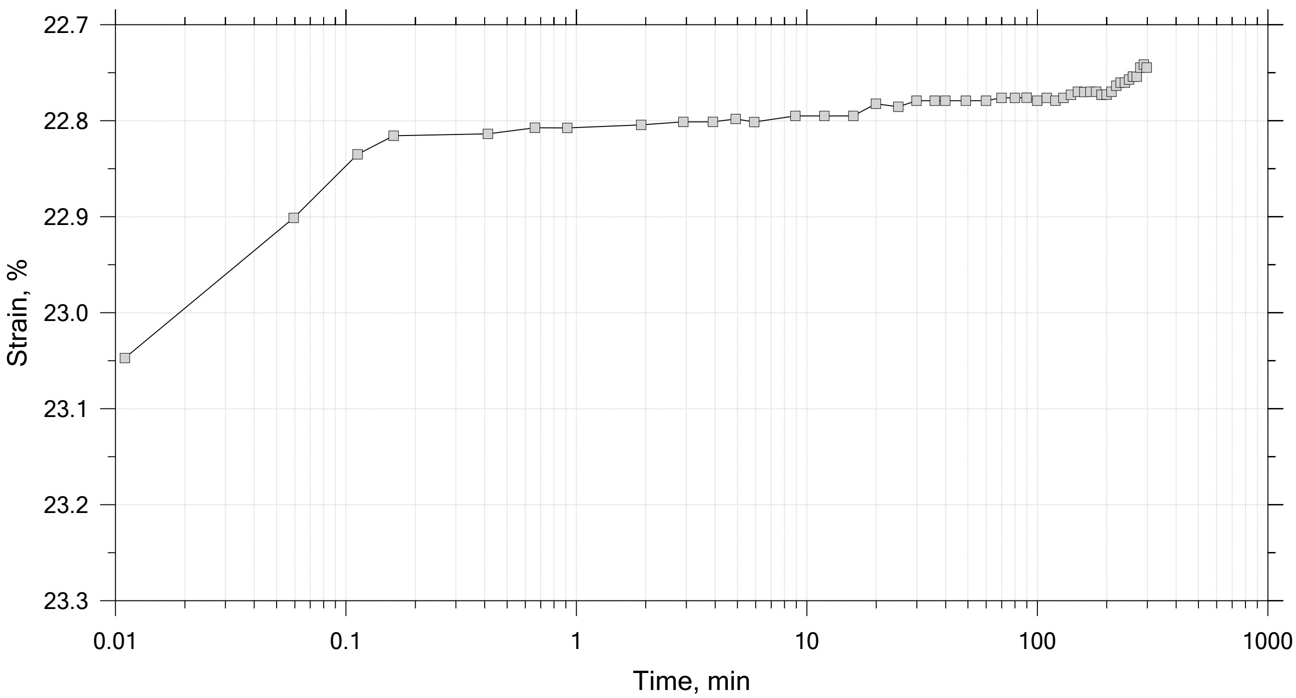
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB037	Tested By: md	Checked By: njh
	Sample No.: SL0657	Test Date: 2/19/19	Depth: 15-17 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with sand		
	Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

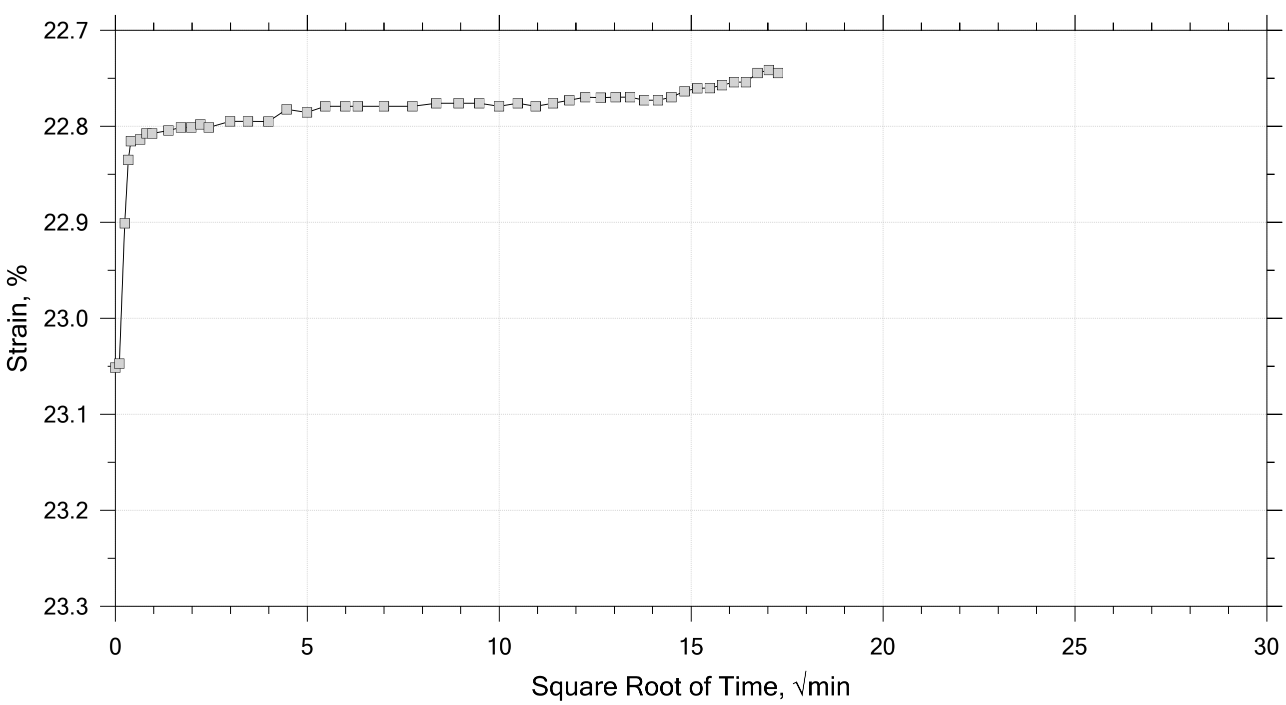
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 11 of 15

Constant Load Step

Stress: 8 tsf





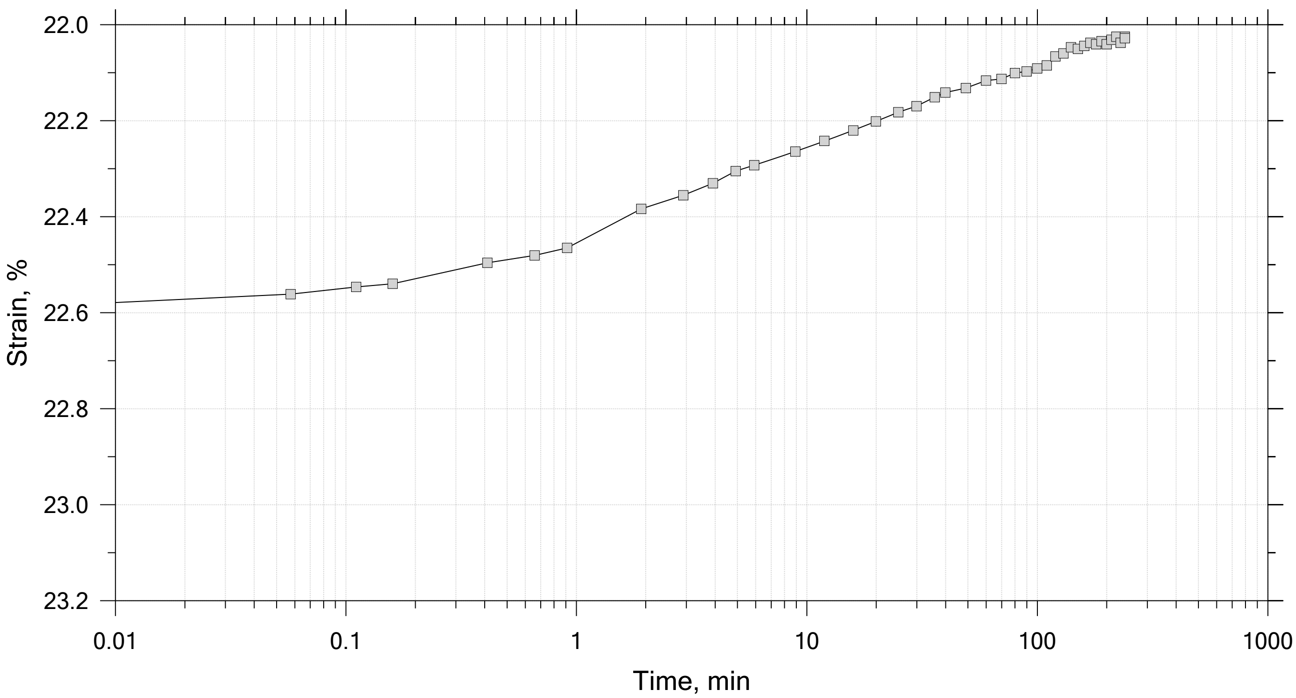
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB037	Tested By: md	Checked By: njh
	Sample No.: SL0657	Test Date: 2/19/19	Depth: 15-17 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with sand		
	Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

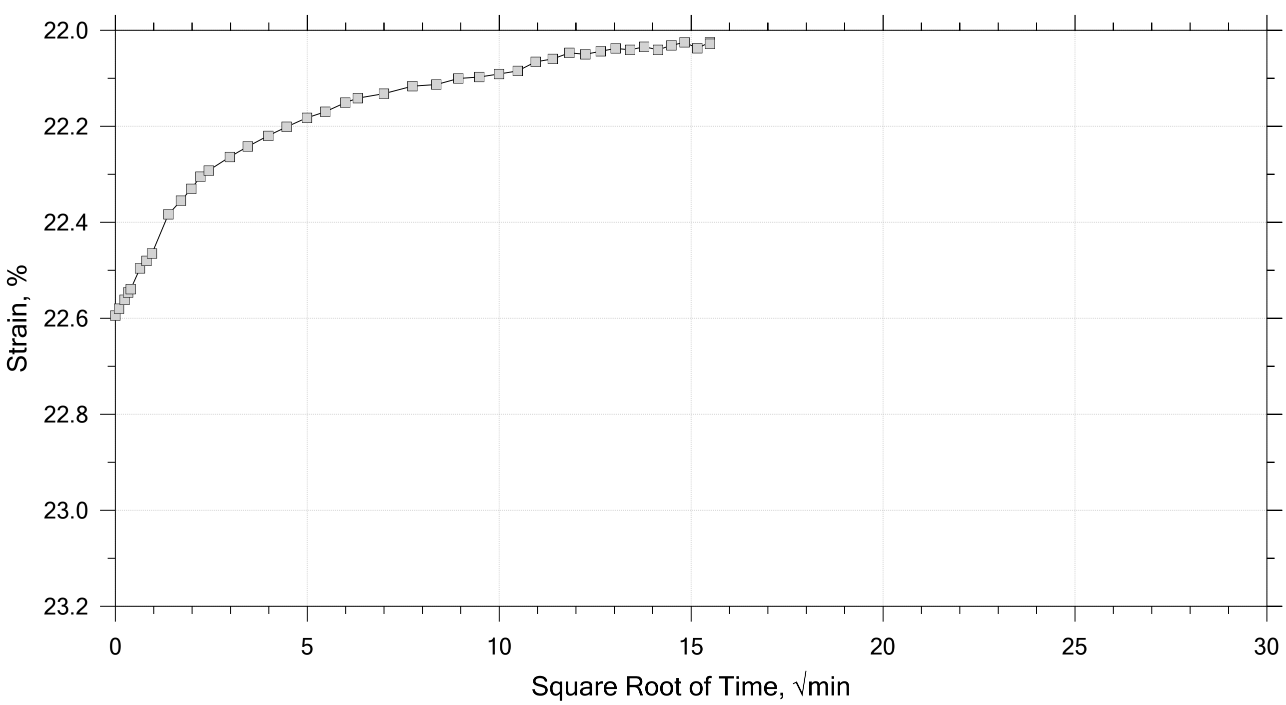
One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 12 of 15

Constant Load Step

Stress: 2 tsf

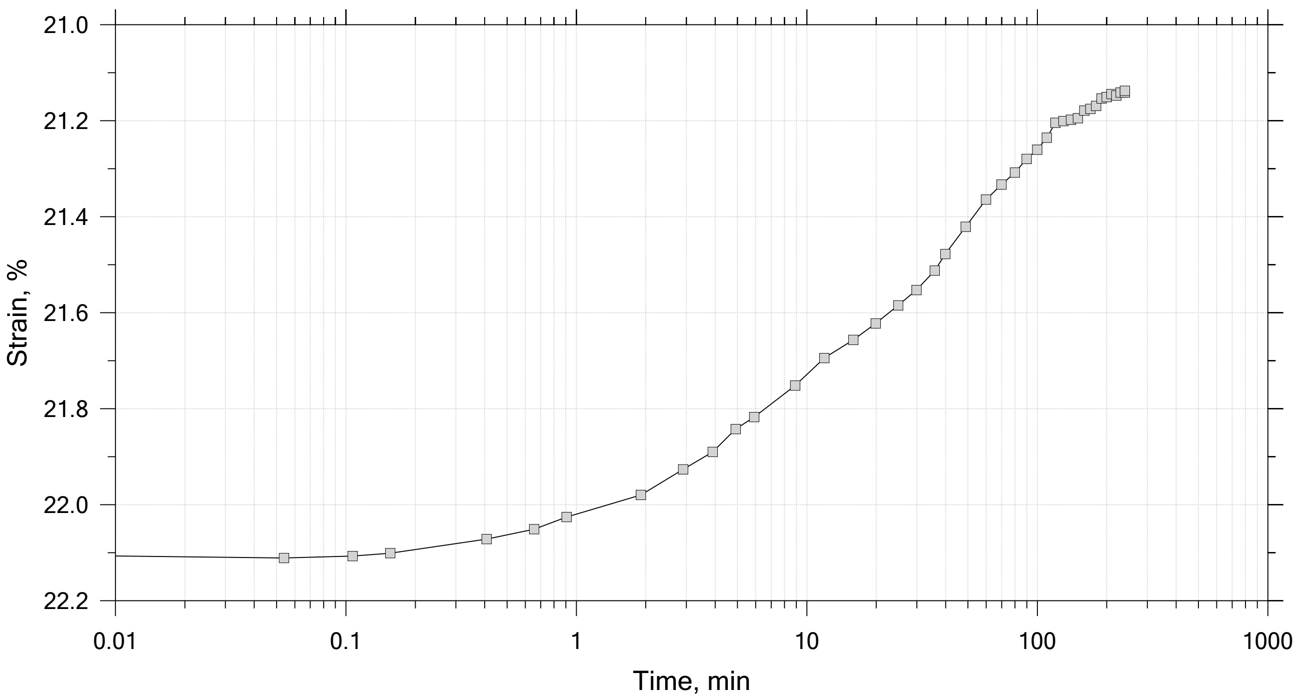


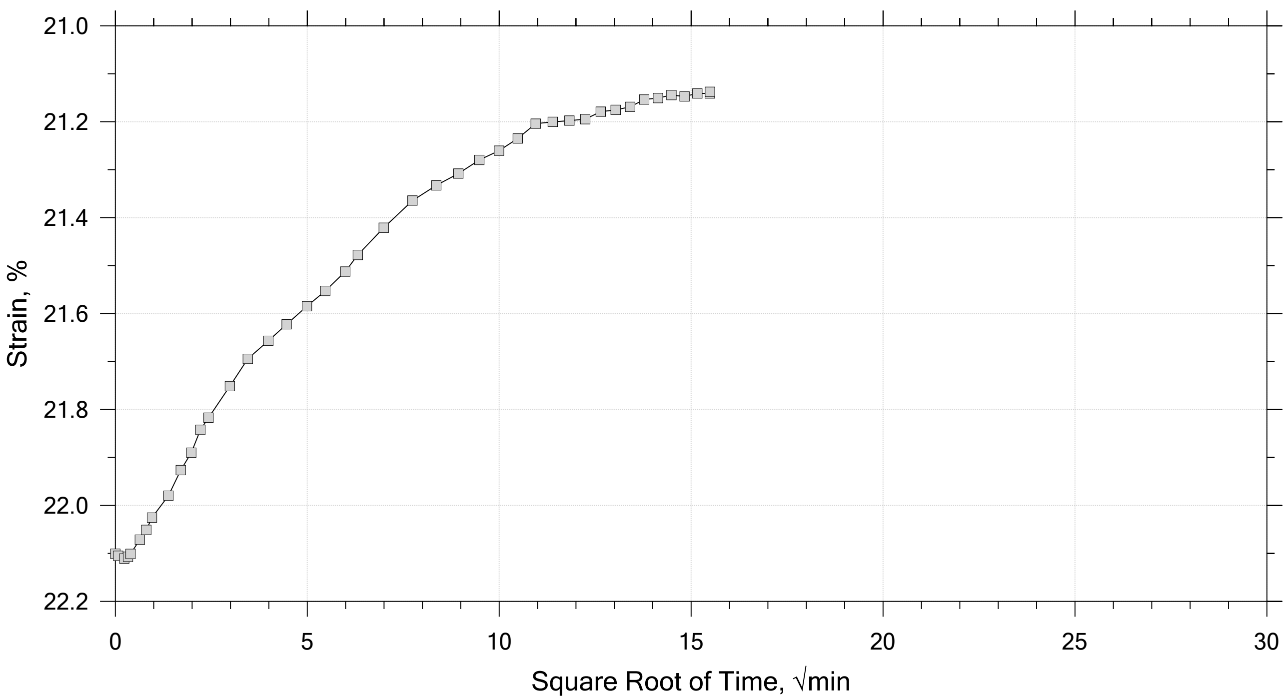


Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
Boring No.: SJGB037	Tested By: md	Checked By: njh
Sample No.: SL0657	Test Date: 2/19/19	Depth: 15-17 ft
Test No.: IP-9	Sample Type: intact	Elevation: ---
Description: Moist, gray clay with sand		
Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

One-Dimensional Consolidation by ASTM D2435 - Method B

Time Curve 13 of 15
Constant Load Step
Stress: 0.5 tsf

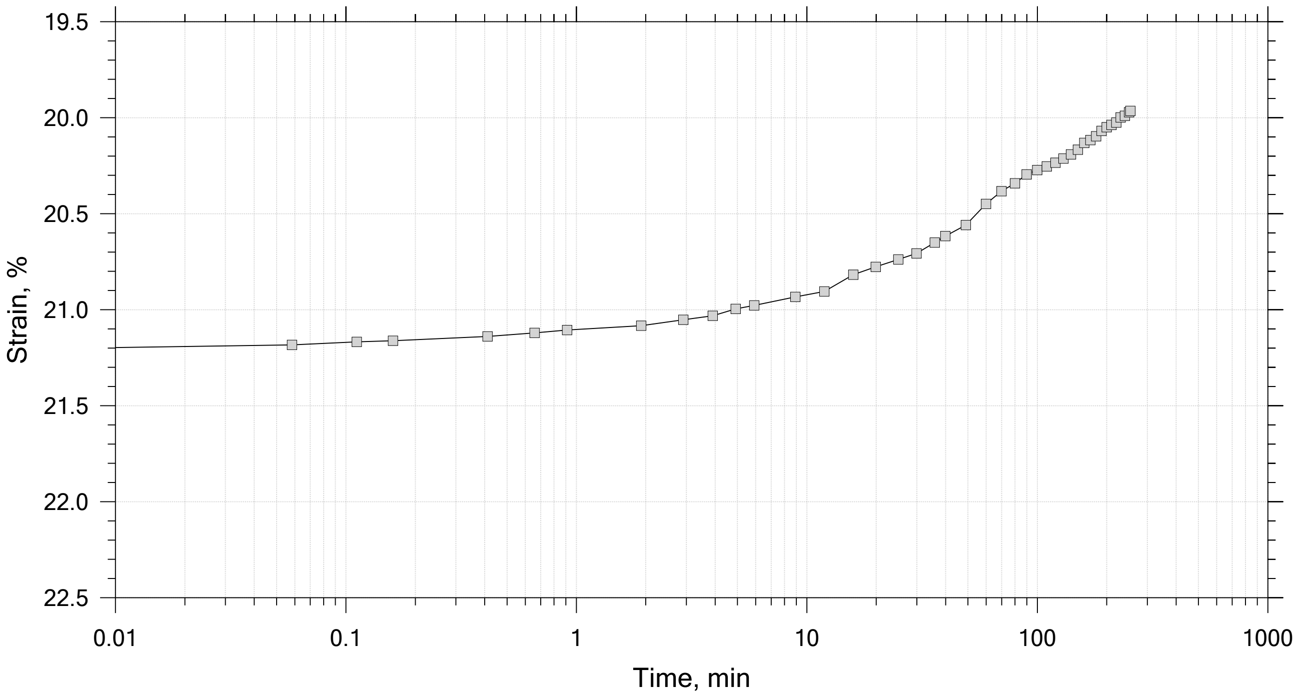


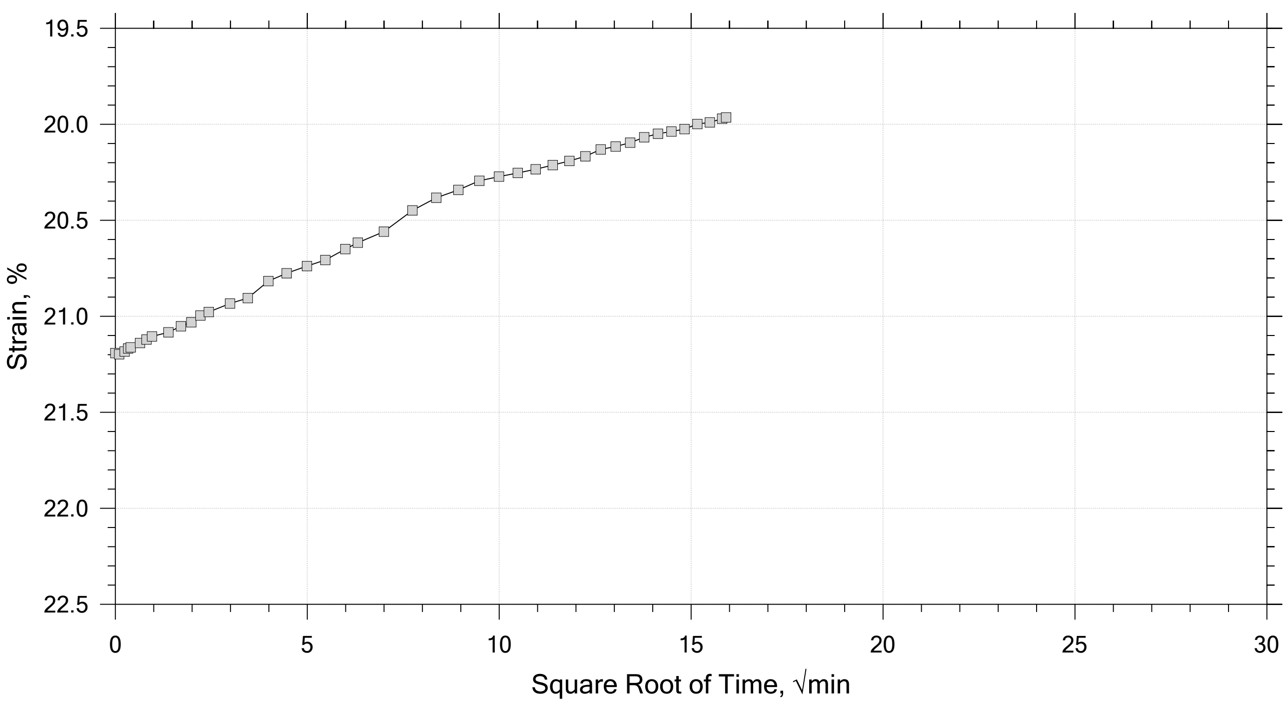


GeoTesting EXPRESS			
	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB037	Tested By: md	Checked By: njh
	Sample No.: SL0657	Test Date: 2/19/19	Depth: 15-17 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with sand		
	Remarks: 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





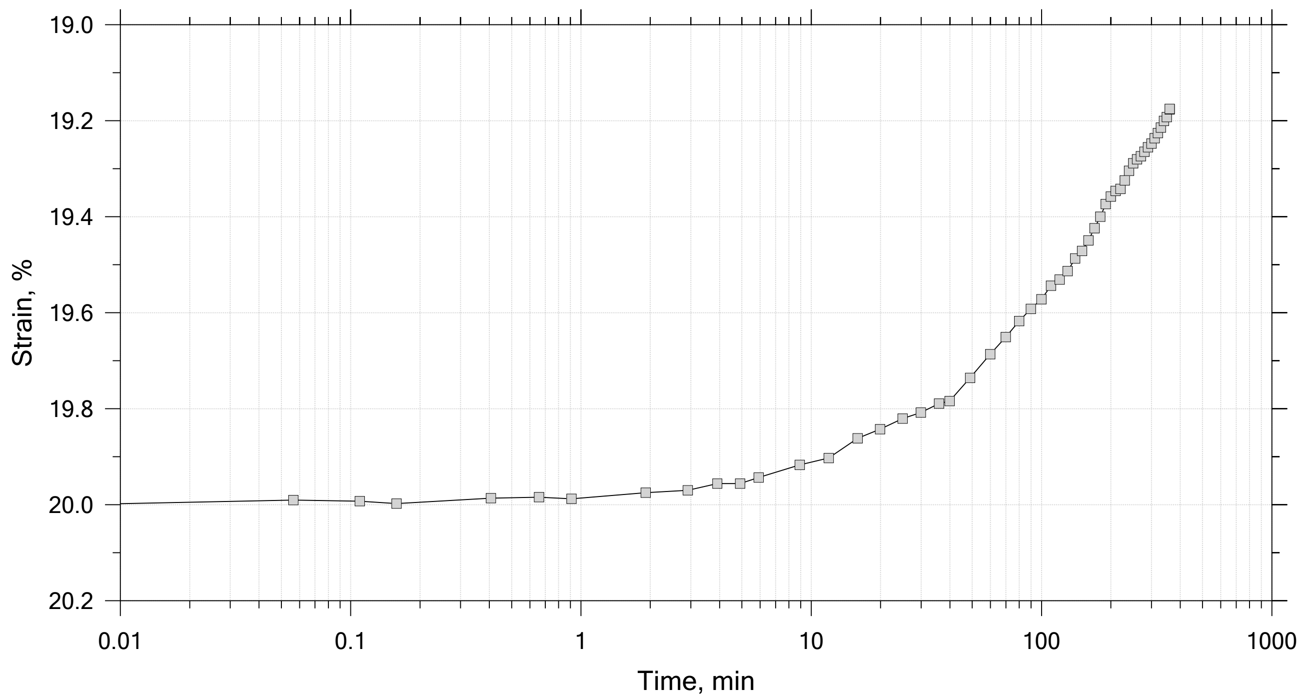
GeoTesting EXPRESS	Project: San Jacinto Pre-Design	Location: ---	Project No.: GTX-309154
	Boring No.: SJGB037	Tested By: md	Checked By: njh
	Sample No.: SL0657	Test Date: 2/19/19	Depth: 15-17 ft
	Test No.: IP-9	Sample Type: intact	Elevation: ---
	Description: Moist, gray clay with sand		
	Remarks: System LTIII-A, Swell Pressure = 0.0652 tsf		

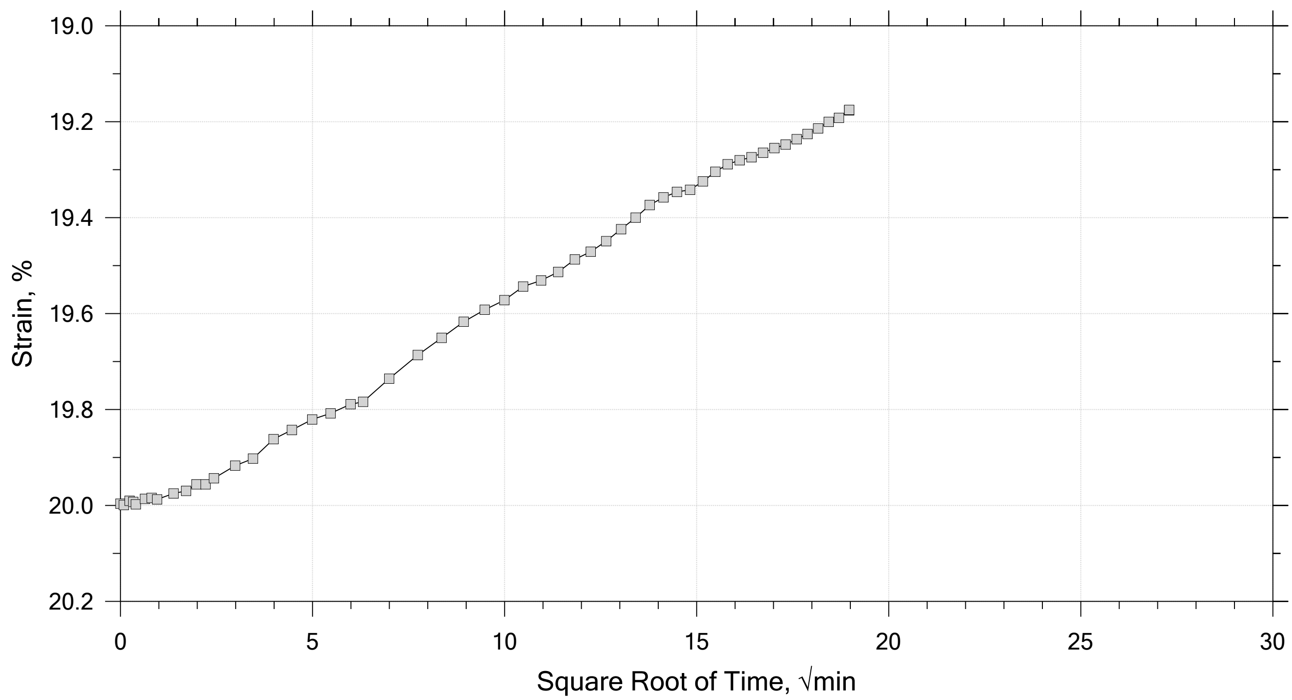
One-Dimensional Consolidation by ASTM D2435 - Method B

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 Soil Boring Logs (Northern Impoundment) - Ardaman

B.2 Lab Testing Data (Northern Impoundment) - TWE

San Jacinto Waste Pits
San Jacinto, TX

LOG OF SOIL BORING SJGB024

Ardaman & Associates, Inc.

File: 18-2876
Date: 9/7/19
Logged by: Breanna North
Driller: TWE
Rig: Tracked Geoprobe

GHD Services, Inc.
5551 Corporate Blvd. Suite 200
Baton Rouge, LA 70808

Location: Lat. 29° 47' 36.74" Long. 95° 3' 44.65"
Ground Surface Elevation: 2.64 (ft., NAVD 88)

Depth (feet)	Field Test Results	Compressive Strength (tsf)	Water Content (%)	Wet Unit Weight (pcf)	LL	PL	PI	Percent Passing #200 Sieve	Elev. (ft.)	Description
0–2	No (P)	1.31 t=0.3	19	123					2.6	Medium Stiff to Stiff brown and black FAT CLAY (CH) w/ sand
2–4	No (P)	0.91 t=1.0	28	114						
4–6	No (P)	0.56 t=1.7	29	116	86	31	55		-2.4	
6–8	No (P)		31		78	23	55	94		
8–10	No (P)	0.21 t=3.1	29	115				43		Loose gray and brown CLAYEY SAND (SC)
10–12	No (P)	3.34 t=3.8	75	94	133	51	82	91	-7.4	Very Stiff brown FAT CLAY (CH)
12–14	No (P)	0.22 t=4.5	32	109				76		Very Soft black and brown LEAN CLAY (CL) w/ sand
14–16	No (P)	0.44 t=5.2	27	116	32	19	13	44	-12.4	Loose gray and brown CLAYEY SAND (SC)
18–20	No (P)	0.94 t=6.6	25	123				26	-17.4	Soft brown FAT CLAY (CH)
23–25	No (P)	0.39 t=8.3	50	99				92	-22.4	
28–30	No (P)	0.28 t=10.1	61	95	122	58	64		-27.4	Boring completed at 30 ft.

Depth scale: 5, 10, 15, 20, 25, 30, 35, 40, 45, 50; Elev. scale: 2.6, -2.4, -7.4, -12.4, -17.4, -22.4, -27.4, -32.4, -37.4, -42.4, -47.4

Ground Water Level Data
Free Water not Reported

Boring Advancement Method
Hollowstem Auger
0 to 30 ft.

Boring Abandonment Method
Not Reported

Notes
t = Lateral Confining Pressure (psi).

Attachment Figure B.3-1

Strata Boundaries May Not Be Exact

San Jacinto Waste Pits
San Jacinto, TX

LOG OF SOIL BORING SJGB025

Ardaman & Associates, Inc.

Sheet 1 of 1

File: 18-2876
Date: 9/10/19
Logged by: Breanna North
Driller: TWE
Rig: Tracked Geoprobe

GHD Services, Inc.
5551 Corporate Blvd. Suite 200
Baton Rouge, LA 70808

Location: Lat. 29° 47' 38.65" Long. 95° 3' 48.91"
Ground Surface Elevation: 4.98 (ft., NAVD 88)

Depth (feet)	Field Test Results	Compressive Strength (tsf)	Water Content (%)	Wet Unit Weight (pcf)	LL	PL	PI	Percent Passing #200 Sieve	Elev. (ft.)	Description
0	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	34 b/f 6-14-20		22					22	-15.0	Dense gray SILTY SAND (SM)
	6 b/f 2-2-4		34					44		Loose gray SILTY SAND (SC)
25	5 b/f 1-2-3		34		NP	NP	NP		-20.0	
	18 b/f 5-7-11		23					31		Medium Dense gray CLAYEY SAND (SC)
30									-25.0	Boring completed at 29.5 ft.

Depth scale to 50 ft; Elev. scale to -45.0 ft.

Ground Water Level Data
Free Water not Reported

Boring Advancement Method
Hollowstem Auger
0 to 30 ft.

Boring Abandonment Method
Not Reported

Notes
t = Lateral Confining Pressure (psi).

Attachment Figure B.3-2

Strata Boundaries May Not Be Exact

San Jacinto Waste Pits
San Jacinto, TX

GHD Services, Inc.
5551 Corporate Blvd. Suite 200
Baton Rouge, LA 70808

LOG OF SOIL BORING SJGB026

Ardaman & Associates, Inc.

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			Atterberg Limits						
Ground Water Level	Depth (feet)	Samples	Field Test Results	Compressive Strength (tsf)	Water Content (%)	Wet Unit Weight (pcf)	LL	PL	PI	Percent Passing #200 Sieve	Elev. (ft.)	Soil Type	Description
☒			No (P)		13		NP	NP	NP	81	5.3		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		No (P)		23					50	-4.7		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		6 b/f 4-3-3		26					55	-14.7		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

☒ Free Water not Reported

Boring Advancement Method

Hollowstem Auger
0 to 22 ft.

Boring Abandonment Method

Not Reported

Notes

t = Lateral Confining Pressure (psi).

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

GHD Services, Inc.
5551 Corporate Blvd. Suite 200
Baton Rouge, LA 70808

LOG OF SOIL BORING SJGB027

Ardaman & Associates, Inc.

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)

Depth (feet)	Field Test Results	Compressive Strength (tsf)	Water Content (%)	Wet Unit Weight (pcf)	LL	PL	PI	Percent Passing #200 Sieve	Description
0–1			11						Loose tan SILTY GRAVEL (GM)
2	0.50 (P)	0.17 t=2.0	140	78	151	44	107	81	Very Soft dark gray ORGANIC CLAY (OH) w/ sand
4	1.75 (P)	0.18 t=3.5	23	128	41	21	20	44	
6	1.25 (P)	1.15 t=4.0	20	129	37	17	20	56	Loose gray CLAYEY SAND (SC)
8	1.25 (P)	0.73 t=5.0	18	131	39	18	21		Medium Stiff dark gray SANDY LEAN CLAY (CLs)
10			23	131	30	17	13	81	
12	0 b/f		32		49	19	30	31	Very Loose dark gray CLAYEY SAND (SC)
14	0 b/f		27		24	16	8	27	
18	4 b/f 0-2-2		28		NP	NP	NP	40	Very Loose to Loose dark gray SILTY SAND (SM)
23	2 b/f 1-1-1		21		NP	NP	NP	8	Very Loose gray Sand (SP-SM) w/ silt
28	9 b/f 2-3-6		22		26	16	10	11	Loose gray SAND (SP-SC) w/ clay
33	9 b/f 3-4-5		16		32	17	15	36	Loose gray CLAYEY SAND (SC)
38	1.75 (P)		20	128	40	18	22	79	Stiff reddish brown SANDY LEAN CLAY (CLs)
43	2.50 (P)		41		49	19	30		
48	2.75 (P)	1.95 t=21.0	31	121	59	21	38		Stiff reddish brown FAT CLAY (CH)
50									Boring completed at 50 ft.

Depth (feet)	Elev. (ft.)
0	3.9
5	-1.1
10	-6.1
15	-11.1
20	-16.1
25	-21.1
30	-26.1
35	-31.1
40	-36.1
45	-41.1
50	-46.1
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

San Jacinto Waste Pits
San Jacinto, TX

GHD Services, Inc.
5551 Corporate Blvd. Suite 200
Baton Rouge, LA 70808

LOG OF SOIL BORING SJSB047-G

Ardaman & Associates, Inc.

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

Field Test Results	Compressive Strength (tsf)	Water Content (%)	Wet Unit Weight (pcf)	LL	PL	PI	Percent Passing #200 Sieve
0 b/f		31					97
0 b/f		37					
0 b/f		43					94
0 b/f							
0 b/f		30					70
0 b/f		39		39	20	19	74
0 b/f		64					
1 b/f 0-0-1		58					97
0.25 (P)	0.29 t=6.6	38	99	79	24	55	56
2.50 (P)	1.44 t=8.3	20	136	42	18	24	73
1.75 (P)		16		27	21	6	60
3.25 (P)	1.00 t=11.8	29	124	59	39	20	98
3.00 (P)	1.73 t=13.5	31	126	74	34	40	100
1.50 (P)	3.36 t=15.3	19	138	42	18	24	84
3.50 (P)		18		30	19	11	76
14 b/f 8-8-6		20					93
33 b/f 12-16-17		23					92
2 b/f 3-1-1		27		NP	NP	NP	93
29 b/f 4-8-21		26					98
51 b/f 15-21-30		23					82
75 b/f 25-31-44		22					68
50 b/f 17-23-27		19		NP	NP	NP	46
53 b/f 16-23-30		18					39
65 b/f 25-35-30		18		NP	NP	NP	26
2.00 (P)	0.33 t=35.0	21	119	73	23	50	

Depth (feet): 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100, 105

Elev. (ft.): -3.4, -8.4, -13.4, -18.4, -23.4, -28.4, -33.4, -38.4, -43.4, -48.4, -53.4, -58.4, -63.4, -68.4, -73.4, -78.4, -83.4, -88.4, -93.4, -98.4, -103.4, -108.4

Description

- Loose brown SILT (ML)
- Soft brown SANDY LEAN CLAY (CLs)
- Soft brown FAT CLAY (CH)
- Soft gray SANDY FAT CLAY (CHs)
- Stiff gray LEAN CLAY (CL) w/ sand
- Stiff reddish brown SANDY SILTY CLAY (CL-ML)
- Stiff reddish brown SILT (MH)
- Stiff reddish brown FAT CLAY (CH)
- Very Stiff reddish brown LEAN CLAY (CL)
- Medium Dense to Dense gray SILT (ML)
- Very Loose gray SILT (ML)
- Medium Dense gray SILT (ML)
- Very Dense gray SILT (ML) w/ sand
- Very Dense gray SANDY SILT (MLs)
- Very Dense gray SILTY SAND (SM)
- Stiff tan and gray FAT CLAY (CH)
- Boring completed at 100 ft.

Ground Water Level Data

Boring Advancement Method

4" Dia. Rotary Wash:
to 100 ft.

Boring Abandonment Method

Not Reported

Notes

t = Lateral Confining Pressure (psi).

Attachment Figure B.3-5

Strata Boundaries May Not Be Exact

San Jacinto Waste Pits
San Jacinto, TX

GHD Services, Inc.
5551 Corporate Blvd. Suite 200
Baton Rouge, LA 70808

LOG OF SOIL BORING SJSB050-G

Ardaman & Associates, Inc.

Sheet 1 of 1

File: 18-2876
Date: 11/20/19
Logged by: Stephen Saller
Driller: TWE
Rig: CME Truck

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	Atterberg Limits PL	Atterberg Limits PI	Percent Passing #200 Sieve	Elev. (ft.)	Soil Type	Description
☒		☒	0 b/f		100					98	-3.6		Very Soft brown FAT CLAY (CH)
		☒	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)
		☒	0 b/f		56					86			Very Soft to Soft gray LEAN CLAY (CL)
	10	☒	0 b/f		49		41	18	23	83	-13.6		
		☒	1 b/f 0-0-1		47					70			Very Soft to Soft brown LEAN CLAY (CL) w/ sand
	15	☒	10 b/f 3-5-5		23					52	-18.6		Loose gray SANDY SILTY (MLs)
		☒	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

San Jacinto Waste Pits
San Jacinto, TX

GHD Services, Inc.
5551 Corporate Blvd. Suite 200
Baton Rouge, LA 70808

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

Location: Lat. 29° 47' 43.62" Long. 95° 3' 42.93"
Ground Surface Elevation: -9.7 (ft., NAVD 88)

FIELD DATA / LABORATORY DATA

Field Test Results	Compressive Strength (tsf)	Water Content (%)	Wet Unit Weight (pcf)	Atterberg Limits LL	PL	PI	Percent Passing #200 Sieve
0 b/f		31					41
0 b/f		57					
0 b/f		66					
0 b/f		61		55	22	33	60
12 b/f 2-6-6		44		36	20	16	
0 b/f 1-0-0		42					
1 b/f 0-0-1		71					78
1 b/f 0-0-1		31					47
3.50 (P)	3.27 t=6.6	17	136	45	22	23	
3.50 (P)	3.32 t=8.3	17	136	46	21	25	
2.50 (P)		16					
3.50 (P)	1.43 t=11.8	28	123	70	37	33	
3.50 (P)		24		69	24	45	100
2.00 (P)	1.87 t=15.3	27	123	71	35	36	
1.50 (P)	1.87 t=16.9	21	129	47	21	26	
2.00 (P)		18					
18 b/f 10-11-7		24					42
65 b/f 19-18-47		24					34
67 b/f 19-28-39		21					15
27 b/f 10-11-16		24					47
80 b/f 12-30-50		18					43
26 b/f 8-12-14		18					35
15 b/f 10-7-8		25		64	24	40	62
2.00 (P)	3.33 t=32.6	112	88	144	78	66	90
2.50 (P)	2.59 t=34.4	24	126	71	23	48	

Depth (feet): 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100, 105

Elev. (ft.): -9.7, -14.7, -19.7, -24.7, -29.7, -34.7, -39.7, -44.7, -49.7, -54.7, -59.7, -64.7, -69.7, -74.7, -79.7, -84.7, -89.7, -94.7, -99.7, -104.7, -109.7, -114.7

Description

- Very Loose brown CLAYEY SAND (SC)
- Very Soft brown SANDY FAT CLAY (CHs)
- Medium Dense gray SANDY LEAN CLAY (CLs)
- Very Soft to Soft brown and gray SANDY LEAN CLAY (CLs)
- Very Loose brown and gray CLAYEY SAND (SC)
- Very Stiff gray LEAN CLAY (CL) w/ sand
- Very Stiff tan LEAN CLAY (CL) w/ sand
- Medium Dense reddish brown SILT (MH)
- Medium Stiff reddish brown FAT CLAY (CH)
- Medium Dense gray SILT (MH)
- Stiff gray LEAN CLAY (CL)
- Medium Dense tan CLAYEY SAND (SC)
- Very Dense tan CLAYEY SAND (SC)
- Medium Dense to Very Dense gray CLAYEY SAND (SC)
- Stiff to Very Stiff gray SANDY FAT CLAY (CHs)
- Medium Dense brown and black SILT (MH) w/ wood & organics
- Very Stiff gray FAT CLAY (CH)
- Boring completed at 100 ft.

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

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

GHD Services, Inc.
5551 Corporate Blvd. Suite 200
Baton Rouge, LA 70808

Sheet 1 of 1

Rig: CME Truck on Barge

Location: Lat. 29° 47' 45.29"
Long. 95° 3' 46.74"

Ground Surface Elevation: -17.1 (ft., NAVD 88)

FIELD DATA / LABORATORY DATA

Field Test Results	Compressive Strength (tsf)	Water Content (%)	Wet Unit Weight (pcf)	Atterberg Limits LL	PL	PI	Percent Passing #200 Sieve
0 b/f		109		102	64	38	46
2 b/f 2-1-1		94		51	24	27	28
1 b/f 0-0-1		60					18
2 b/f 1-1-1		37		66	21	45	19
1 b/f 0-0-1		89					
10 b/f 3-4-6		23					49
0.50 (P)	2.29 t=3.8	20	134	66	23	43	85
1.25 (P)		12	122				
3.00 (P)	2.27 t=6.6	19	134	45	16	29	68
2.50 (P)		18	135				
3.50 (P)		28					
3.00 (P)	2.31 t=10.8	27	125	65	22	43	100
3.00 (P)		26	127				
2.50 (P)	3.70 t=13.6	21	127	56	19	37	98
1.50 (P)	1.67 t=15.0	36	125	52	19	33	98
1.50 (P)		27					
1.00 (P)	1.49 t=20.5	24	132	52	20	32	84
77 b/f 14-21-56		19					25
65 b/f 15-21-44		23					35
13 b/f 4-6-7		22		23	18	5	65
97 b/f 15-55-42		20					54
88 b/f 15-33-55		20					71
26 b/f 4-11-15		95		169	92	77	44
1.50 (P)	1.67 t=32.6	26	126	41	18	23	98
No (P)		22					99

Depth (feet): 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100, 105

Elev. (ft.): -17.1, -22.1, -27.1, -32.1, -37.1, -42.1, -47.1, -52.1, -57.1, -62.1, -67.1, -72.1, -77.1, -82.1, -87.1, -92.1, -97.1, -102.1, -107.1, -112.1, -117.1, -122.1

Description

- Very Loose dark brown CLAYEY SAND (SC)
- Very Loose brown CLAYEY SAND (SC)
- Very Loose gray CLAYEY SAND (SC) w/ shell fragments
- Medium Dense gray SILTY SAND (SM) w/ gravel
- Very Stiff gray and brown FAT CLAY (CH) w/ sand
- Very Stiff tan SANDY LEAN CLAY (CLs)
- Very Stiff reddish brown FAT CLAY (CH)
- Stiff to Very Stiff gray FAT CLAY (CH)
  - w/ sand
- Very Dense brown and gray SILTY SAND (SM)
- Very Dense brown and gray CLAYEY SAND (SC)
- Stiff gray SANDY SILTY CLAY (CL-ML)
- Very Stiff to Hard gray SANDY LEAN CLAY (CLs)
- Dense gray CLAYEY SAND (SC)
- Stiff gray LEAN CLAY (CL)
- Boring completed at 100 ft.

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

Location: Lat. 29° 47' 42.79" Long. 95° 3' 48.02"
Ground Surface Elevation: 0.62 (ft., NAVD 88)

Ground Water Level	Depth (feet)	Field Test Results	Compressive Strength (tsf)	Water Content (%)	Wet Unit Weight (pcf)	Atterberg Limits LL	PL	PI	Percent Passing #200 Sieve	Elev. (ft.)	Description
		No (P)		15						0.6	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	No (P)		33		44	17	27	93	-9.4	
		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
Free Water not Reported

Boring Advancement Method
Hollowstem Auger
0 to 20 ft.

Boring Abandonment Method
Not Reported

Notes
t = Lateral Confining Pressure (psi).

Attachment Figure B.3-9

Strata Boundaries May Not Be Exact

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						

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						

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

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

TOLUNAY-WONG ENGINEERS, INC.

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	Slickensli
		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	Slickensli
		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	Slickensli
		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	Slickensli
		48	2.25		Gray FAT CLAY	CH	35.6	92.5	52	19	33	98.2			1.67	5.1	15.0	Slickensli
		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						

TOLUNAY-WONG ENGINEERS, INC.

Attachment Figure B.2-5

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-																		

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

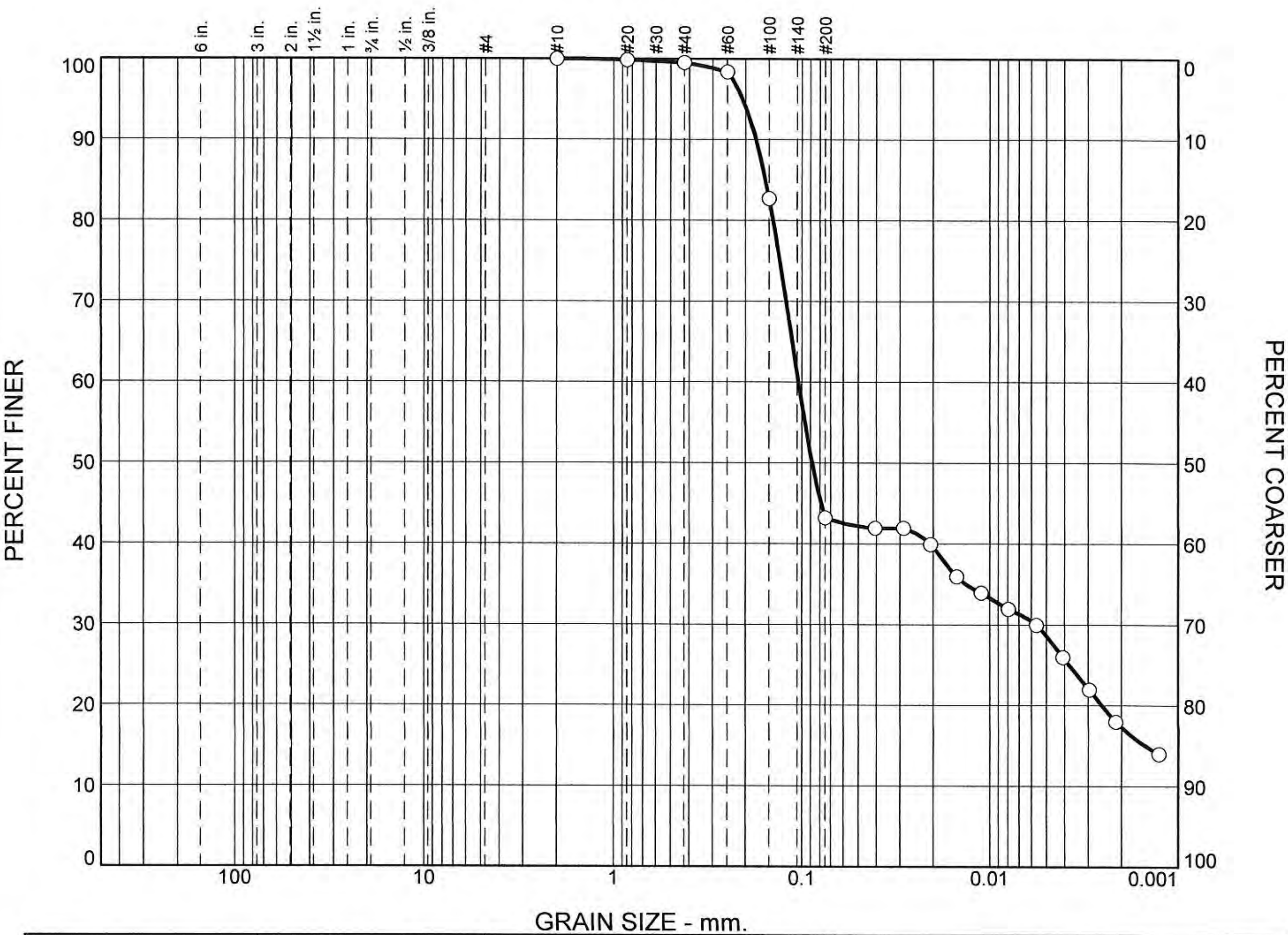
Project Name: San Jacinto River Waste Pit Superfund Site

	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				

10710 S. Sam Houston Parkway W., Suite 100 - Houston, Texas 77031 - (713) 722-7064

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

Tolunay-Wong Engineers, Inc. Houston, Texas

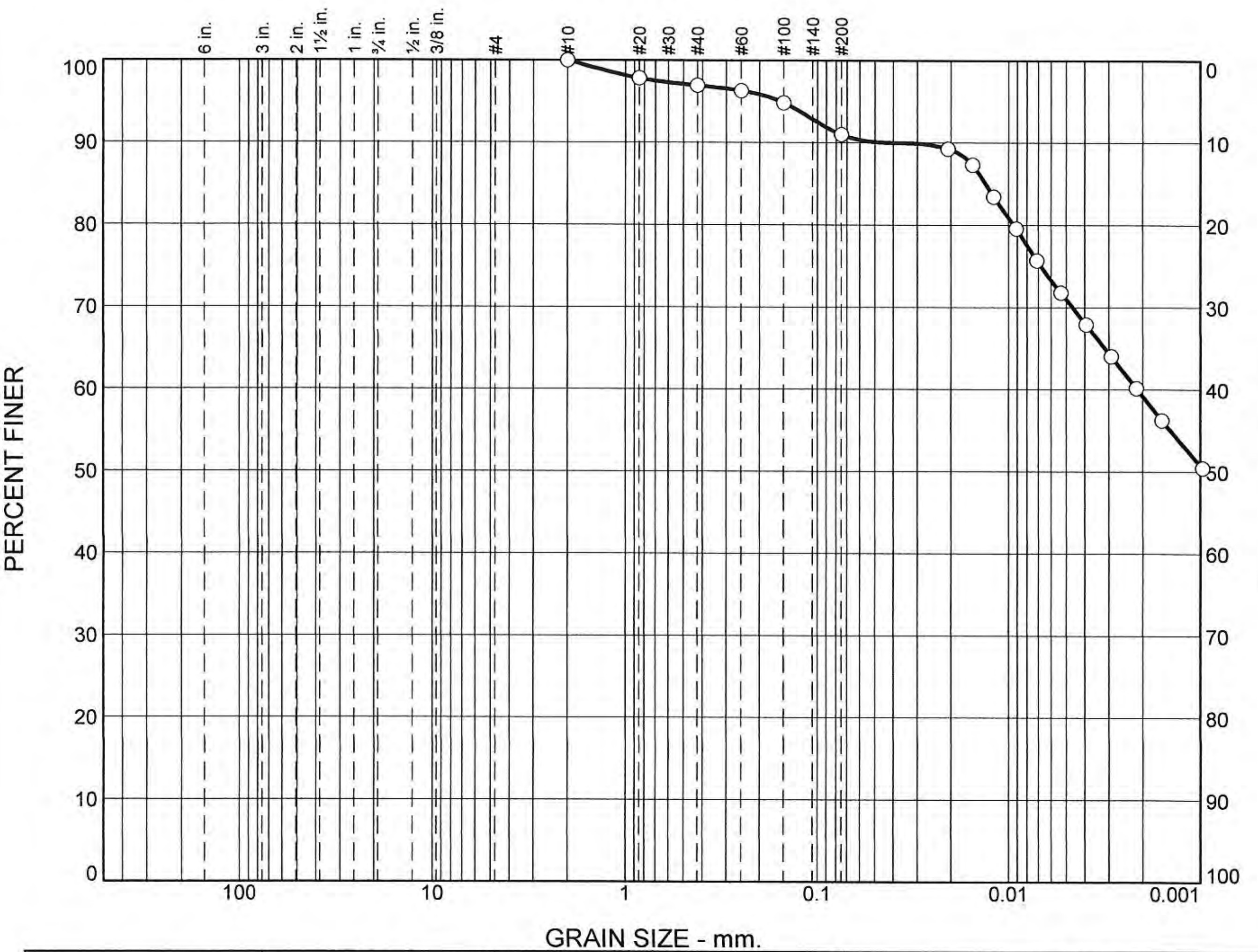
Client:

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

Tolunay-Wong Engineers, Inc.
Houston, Texas

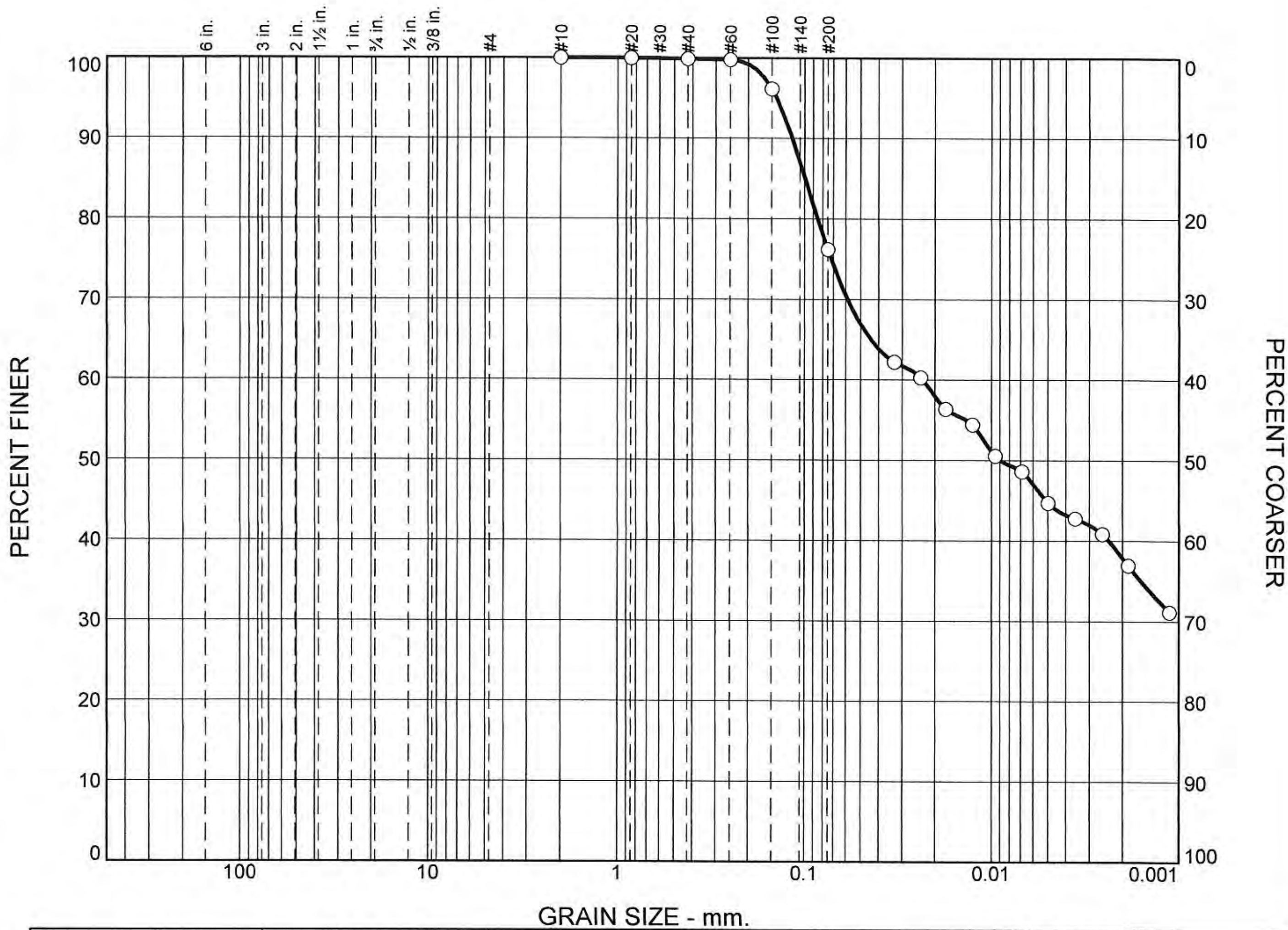
Client:

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	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

Tolunay-Wong Engineers, Inc.
Houston, Texas

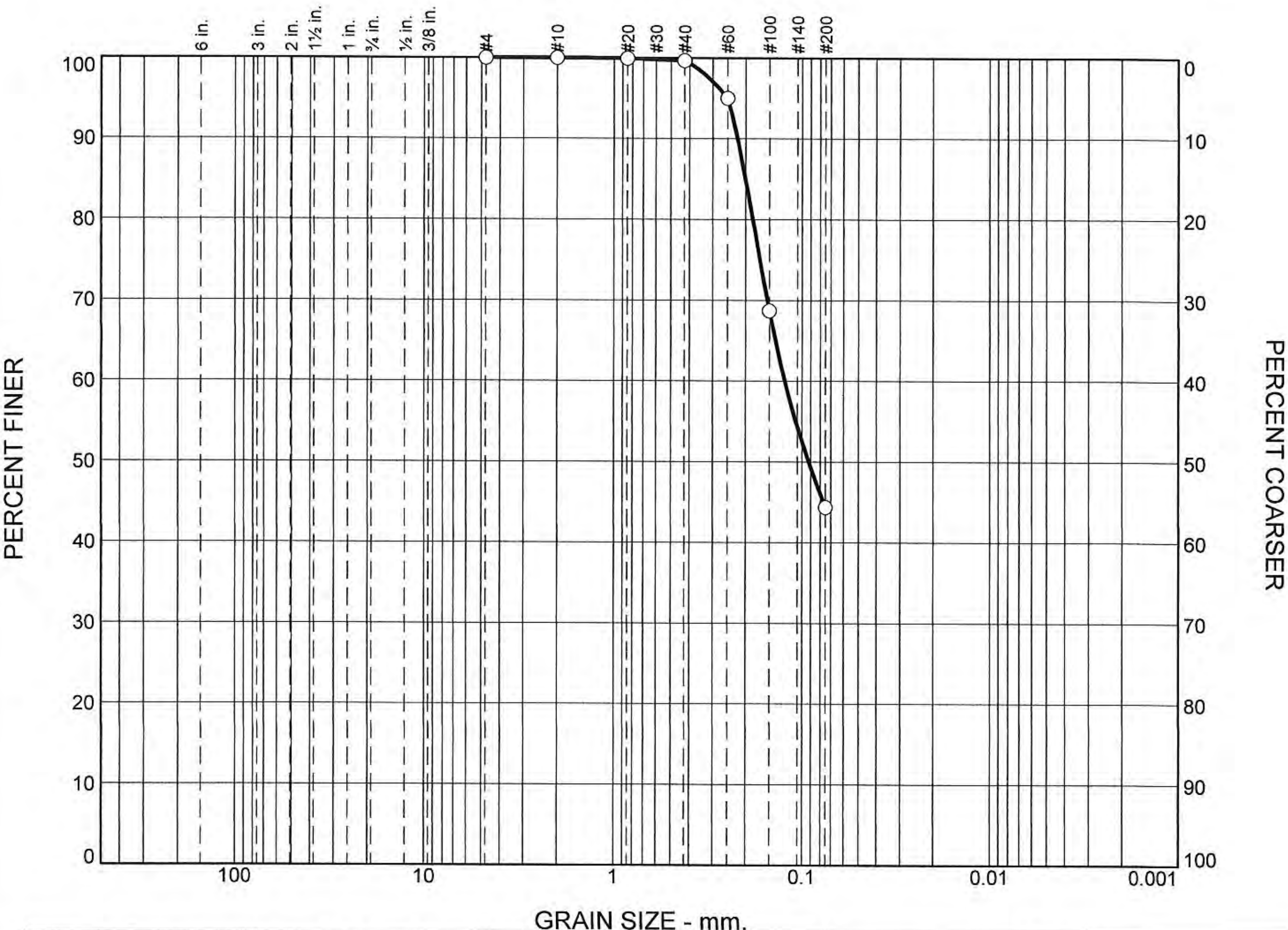
Client:

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

Tolunay-Wong Engineers, Inc. Houston, Texas

Client:

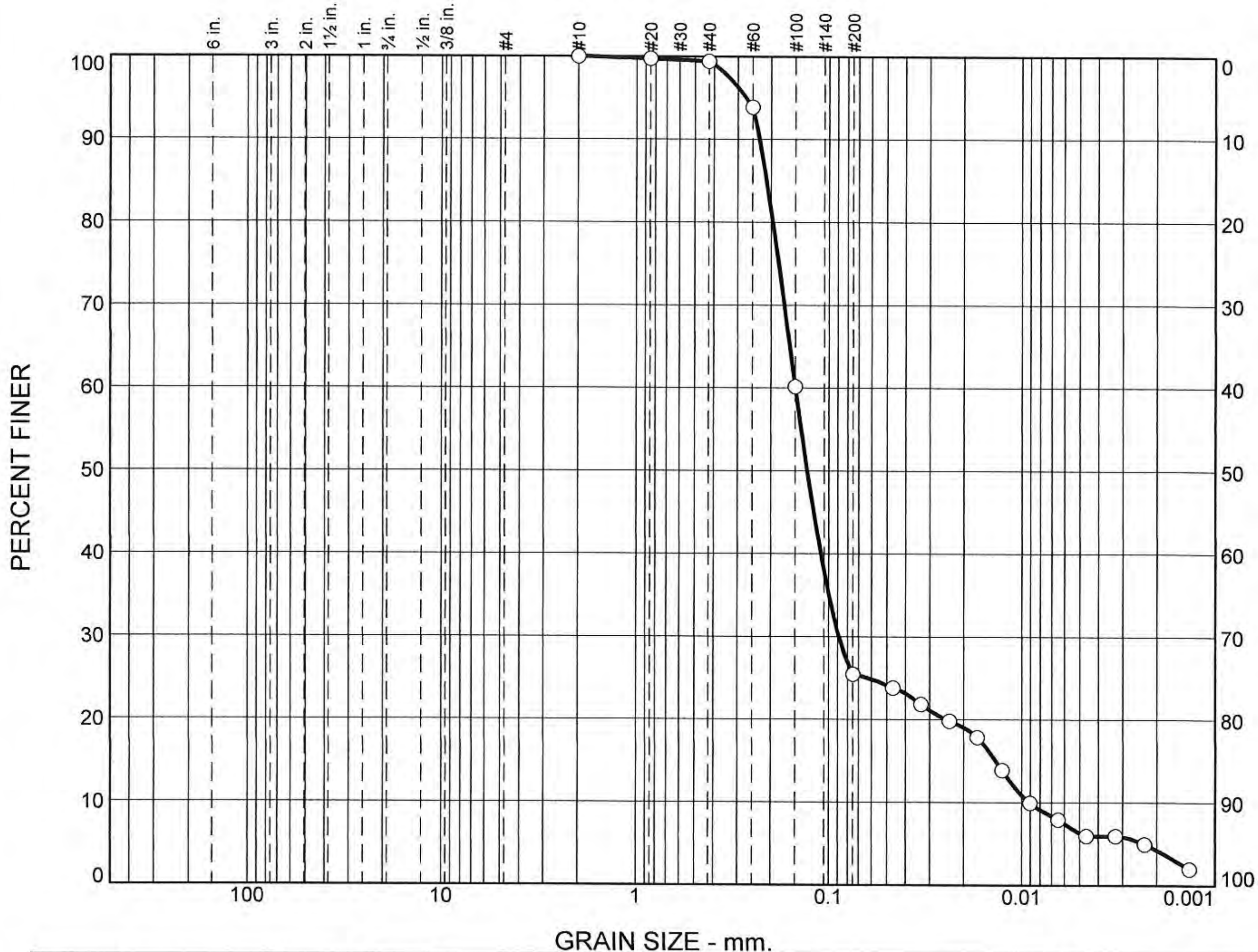
Project: San Jacinto River Waste Pit Superfund Site

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

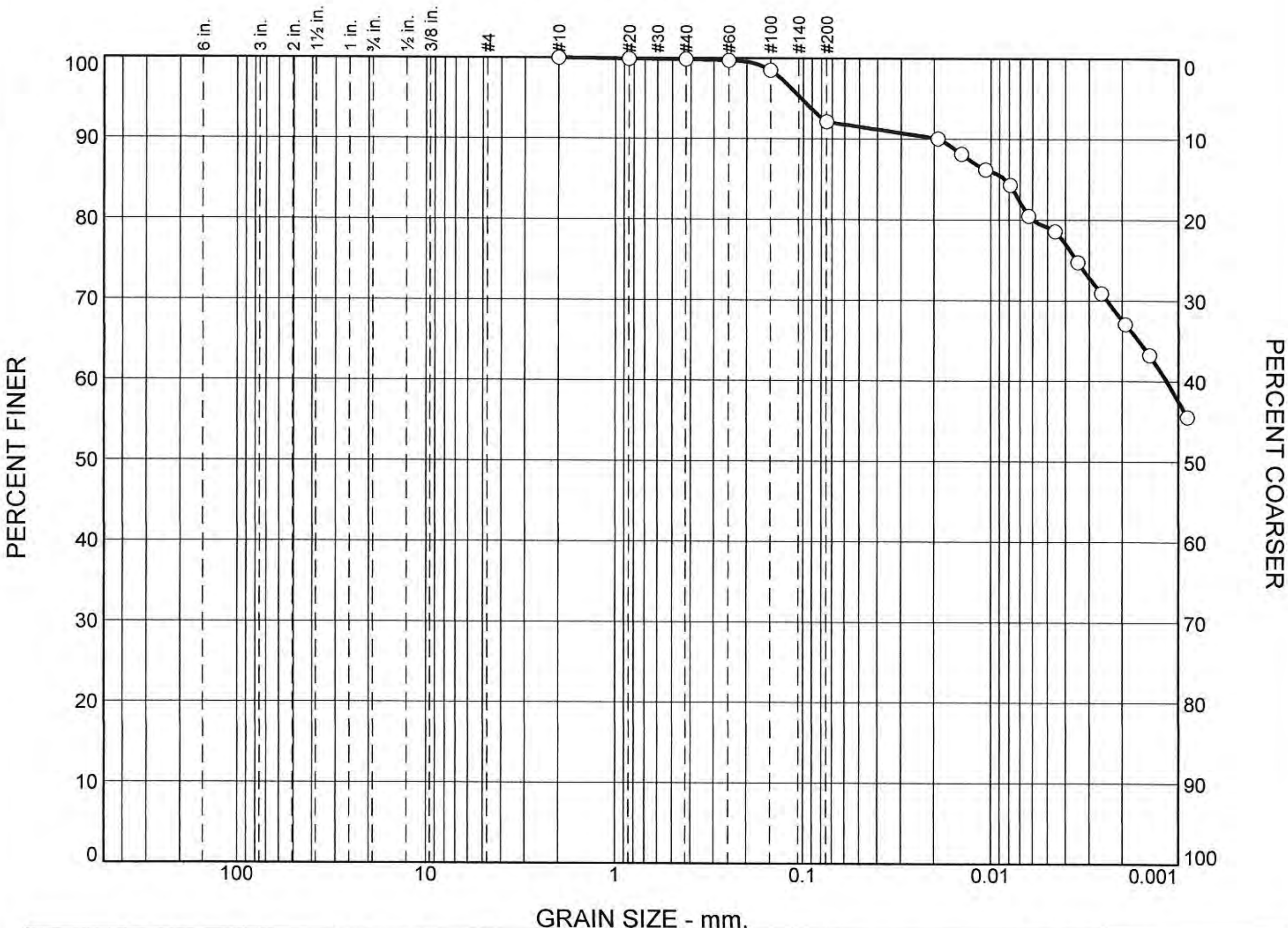
Tolunay-Wong Engineers, Inc. Houston, Texas

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	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

Tolunay-Wong Engineers, Inc. Houston, Texas

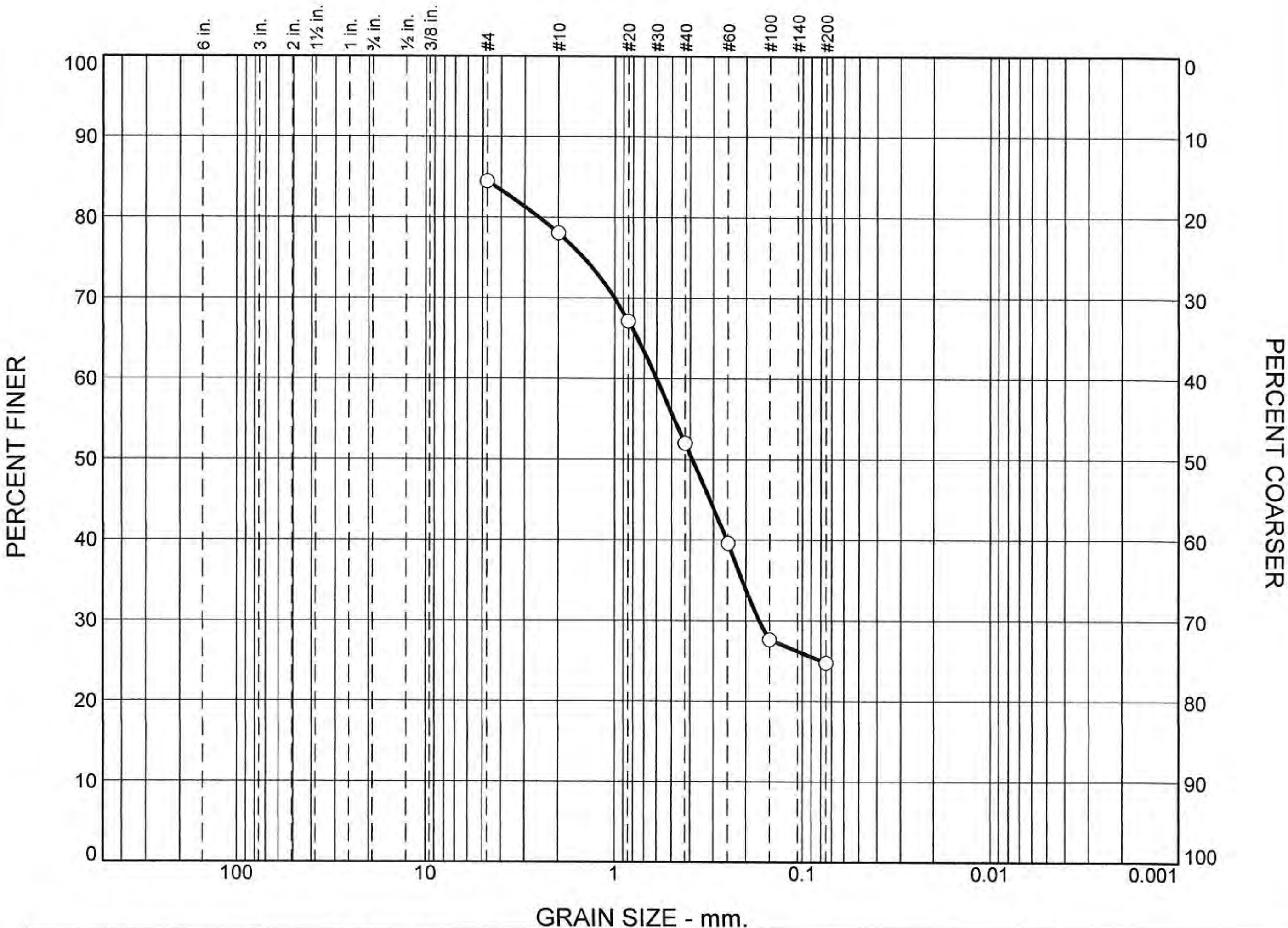
Client:

Project: San Jacinto River Waste Pit Superfund Site

Project No.: 19.15.131 **Figure**

Attachment Figure B.2-13

ASTM D 422



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○				6.5	26.0	27.2	24.8	

SOIL DATA

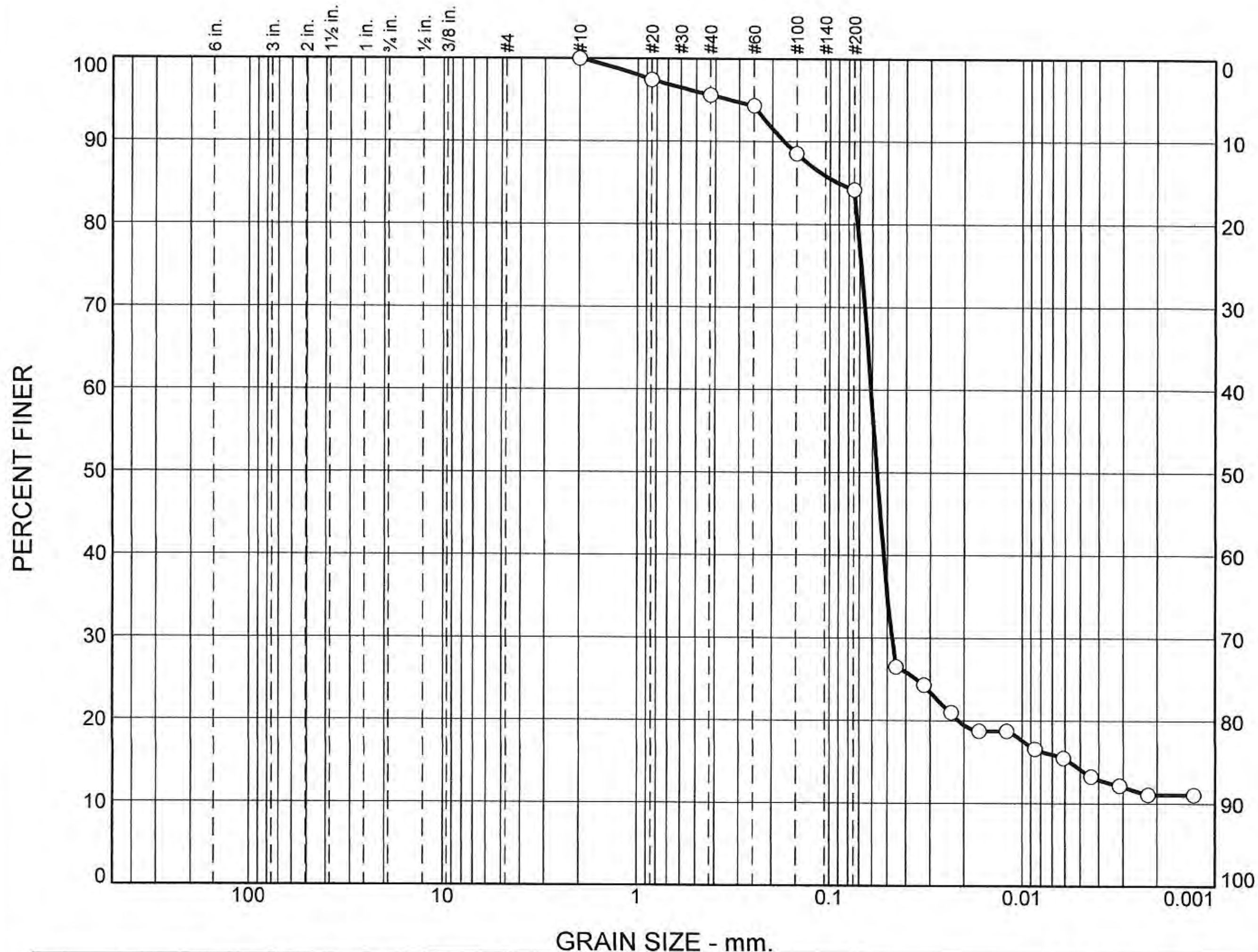
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB025		0-2		SM

Tolunay-Wong Engineers, Inc.
Houston, Texas

Client:
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

Tolunay-Wong Engineers, Inc.
Houston, Texas

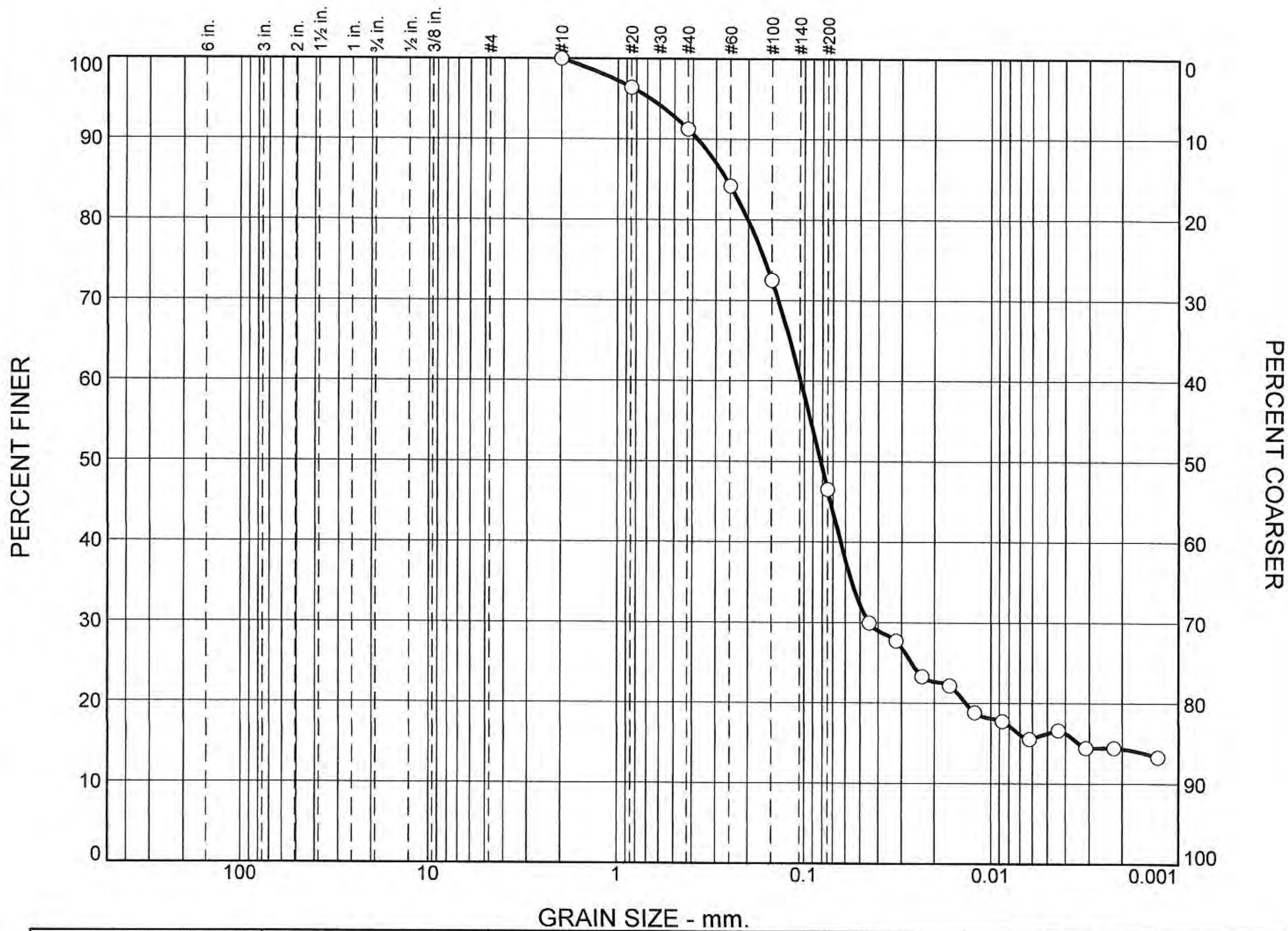
Client:

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

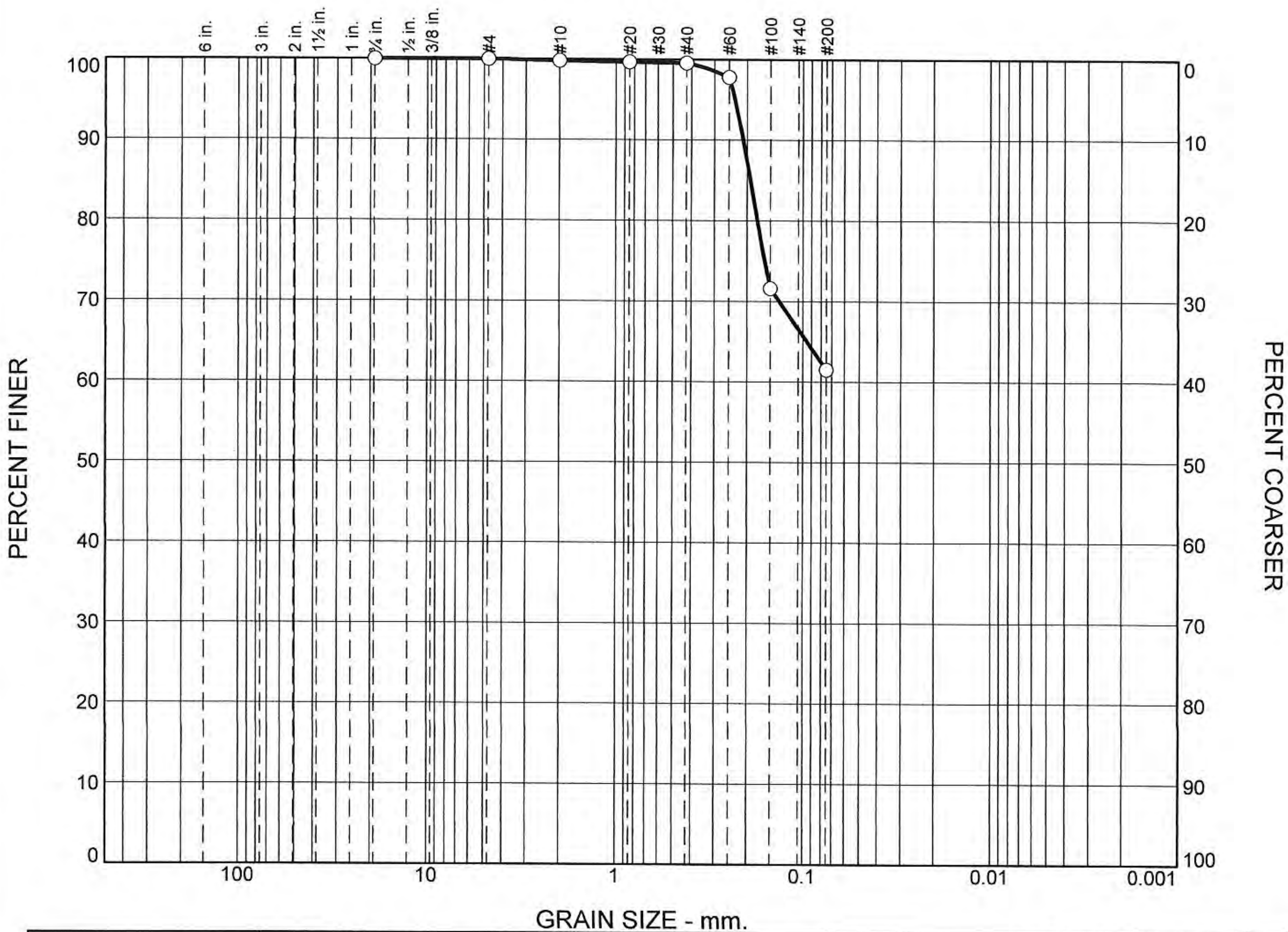
Tolunay-Wong Engineers, Inc. Houston, Texas

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	0.2	0.3	38.0	61.5	

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB025		14-16		ML

Tolunay-Wong Engineers, Inc. Houston, Texas

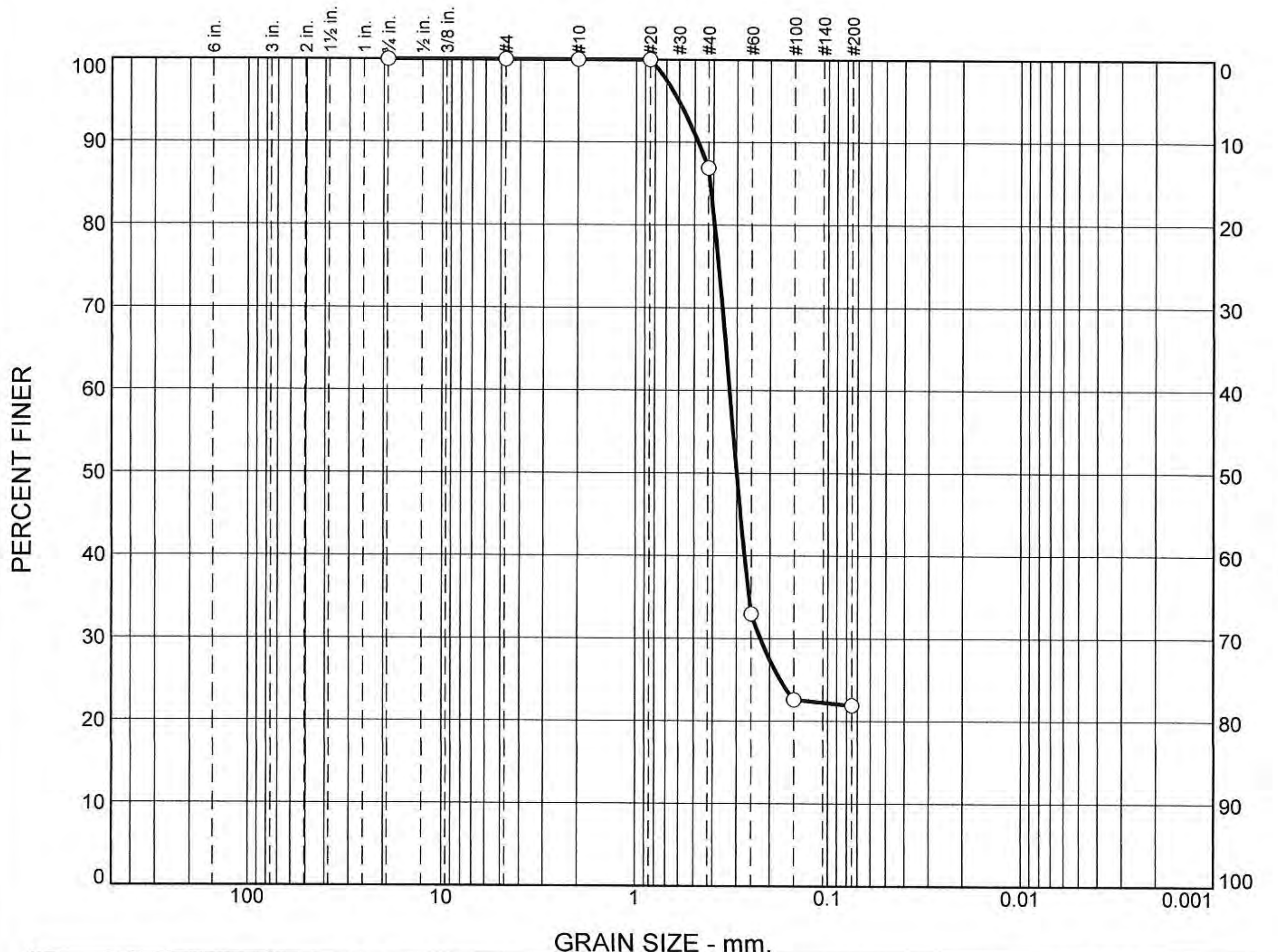
Client:

Project: San Jacinto River Waste Pit Superfund Site

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

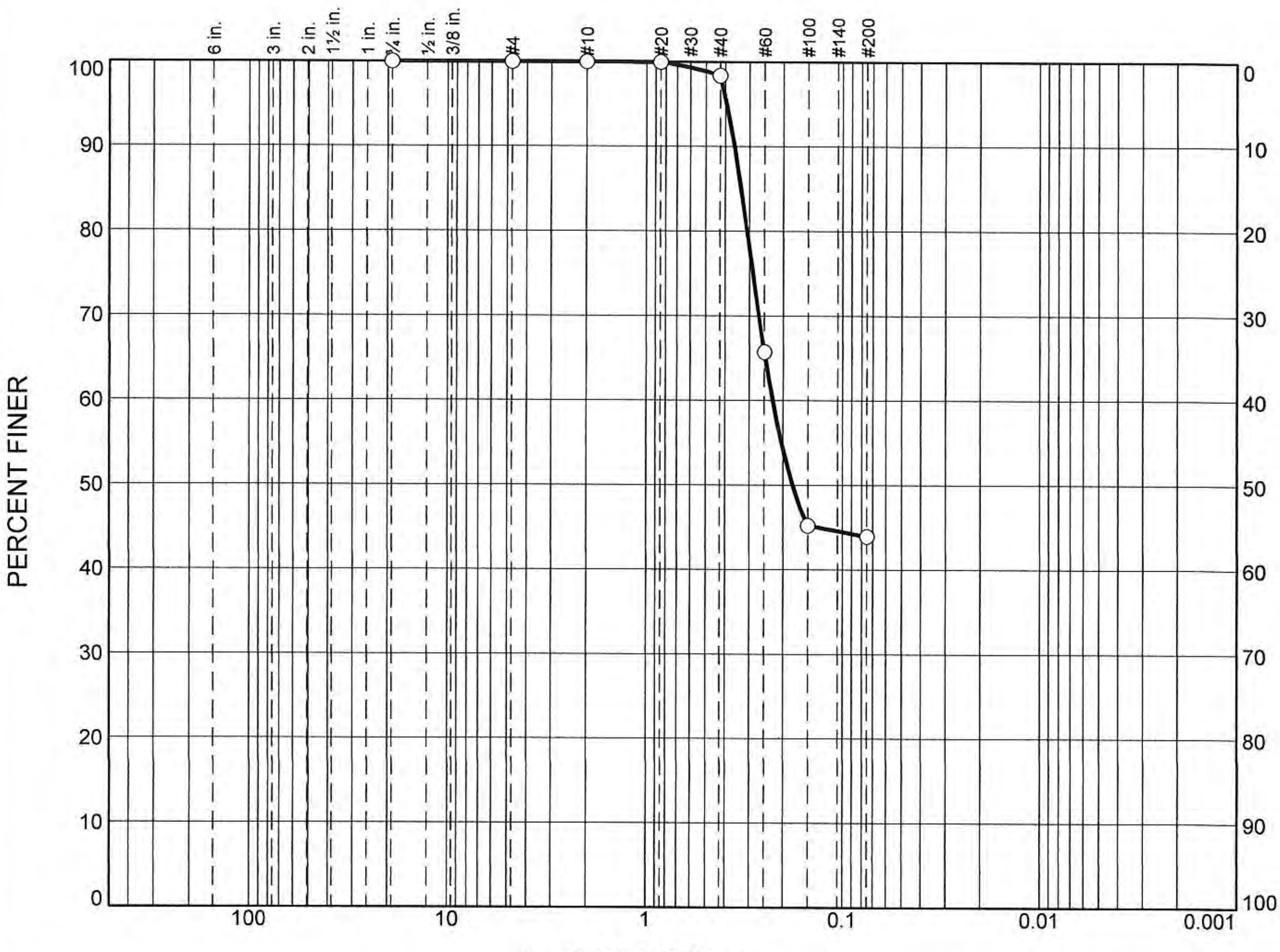
Tolunay-Wong Engineers, Inc. Houston, Texas

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	0.0	1.6	54.5	43.9	

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB025		22-24		SM

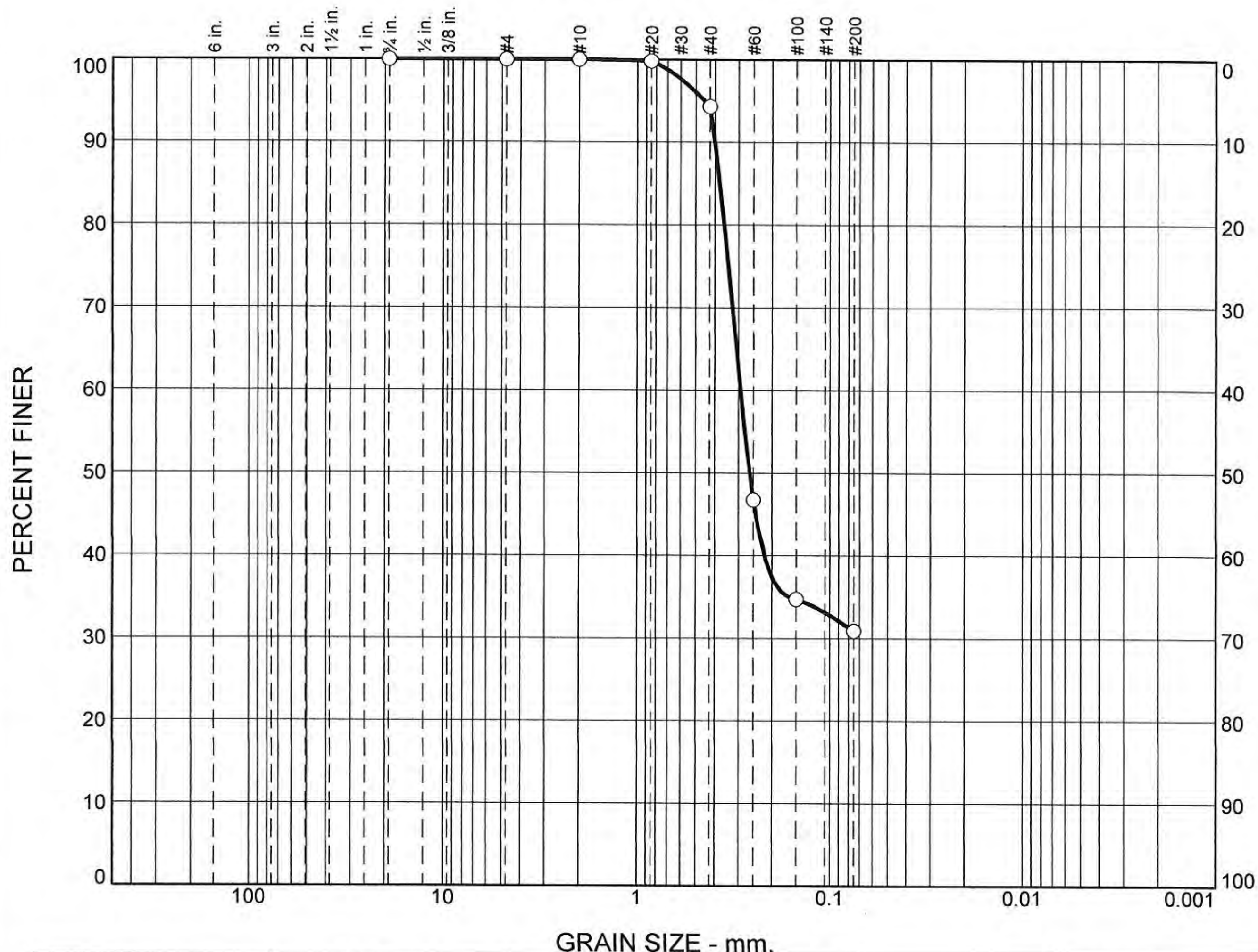
Tolunay-Wong Engineers, Inc.
Houston, Texas

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	0.0	5.7	63.4	30.9	

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB025		28-30		SM

Tolunay-Wong Engineers, Inc. Houston, Texas

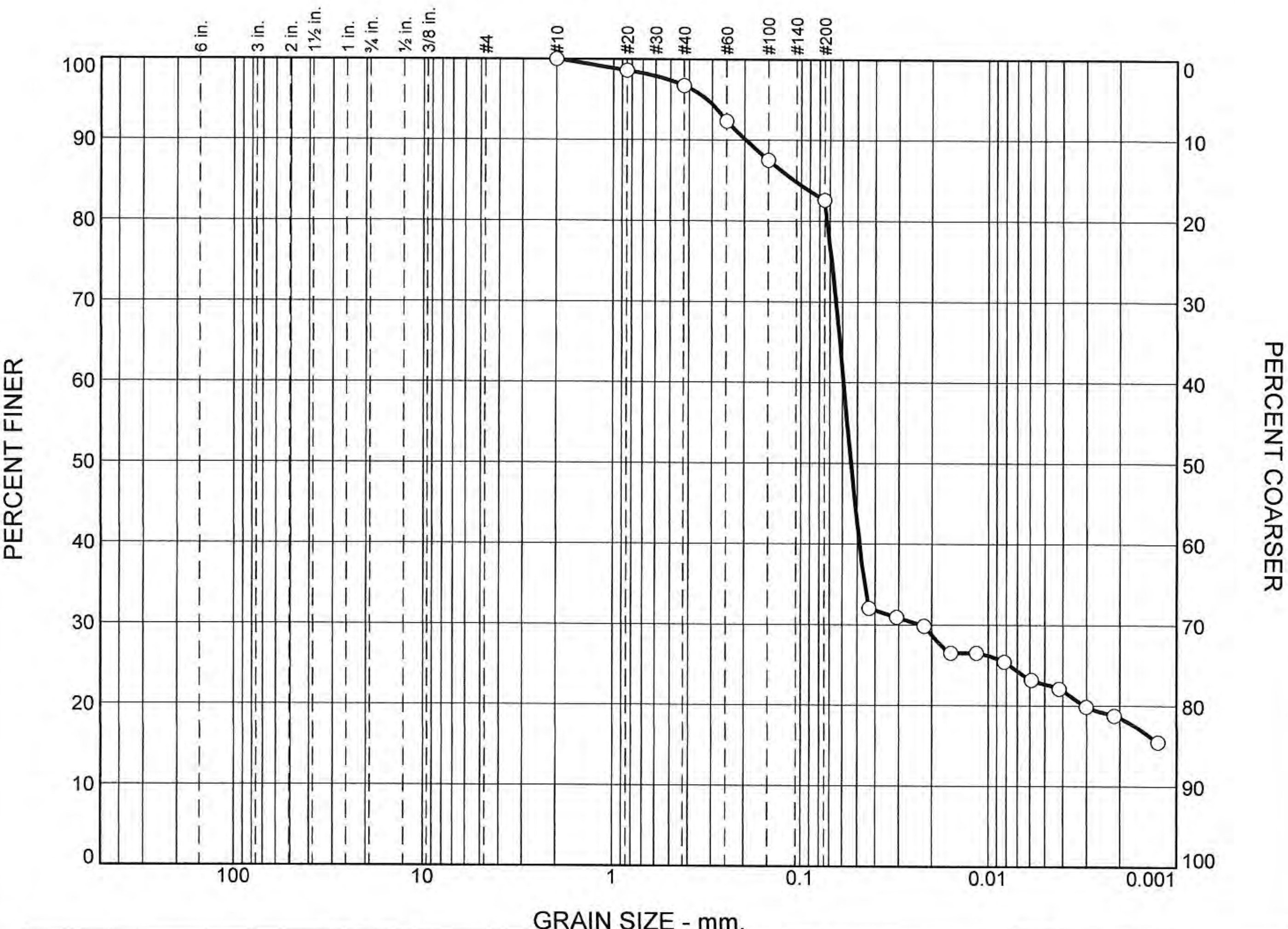
Client:

Project: San Jacinto River Waste Pit Superfund Site

Project No.: 19.15.131 **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

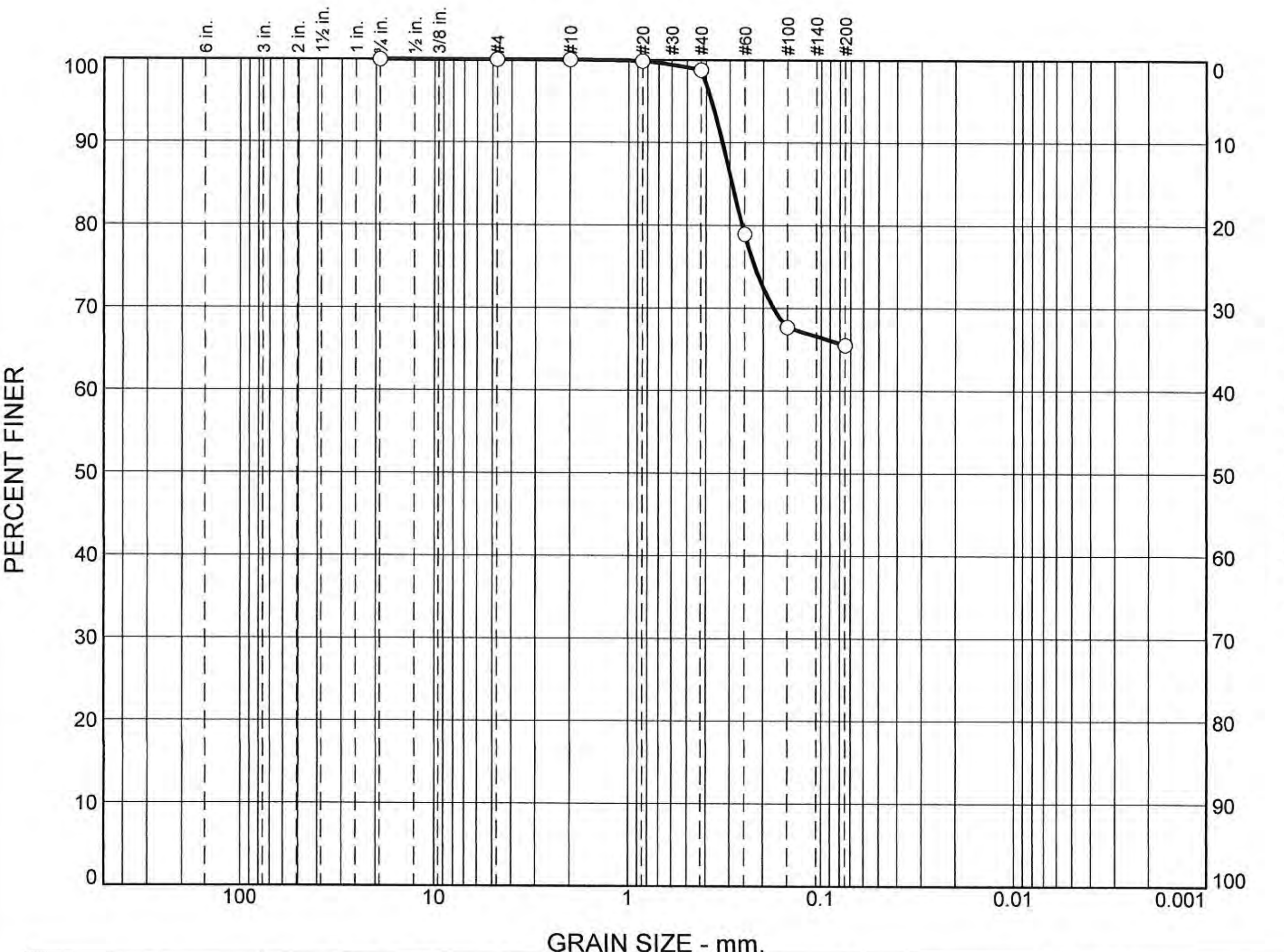
SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB026		8-10	Gray and brown LEAN CLAY with SAND	CL

Tolunay-Wong Engineers, Inc. Houston, Texas	**Client:** **Project:** San Jacinto River Waste Pit Superfund Site **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

Tolunay-Wong Engineers, Inc.
Houston, Texas

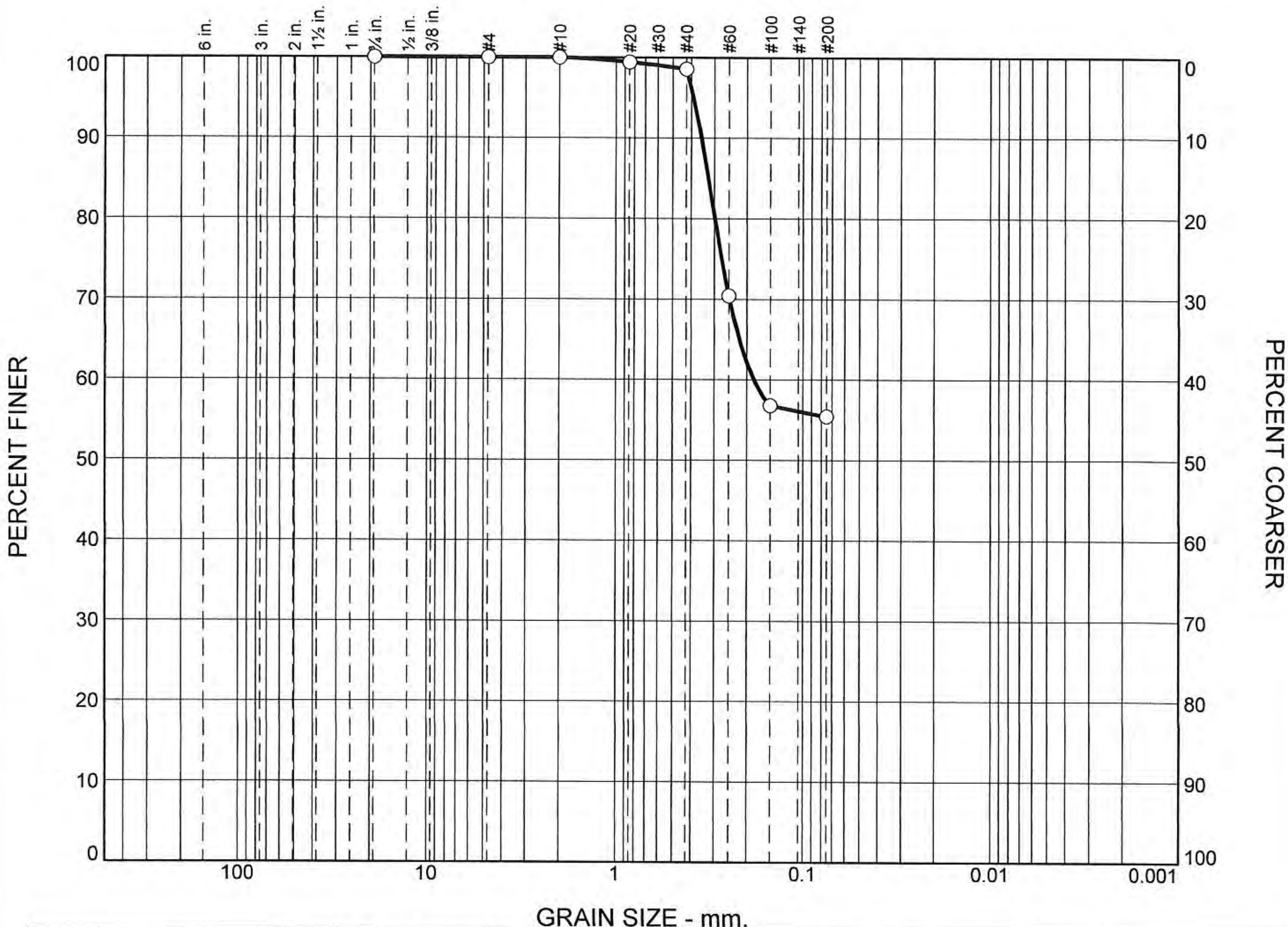
Client:

Project: San Jacinto River Waste Pit Superfund Site

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

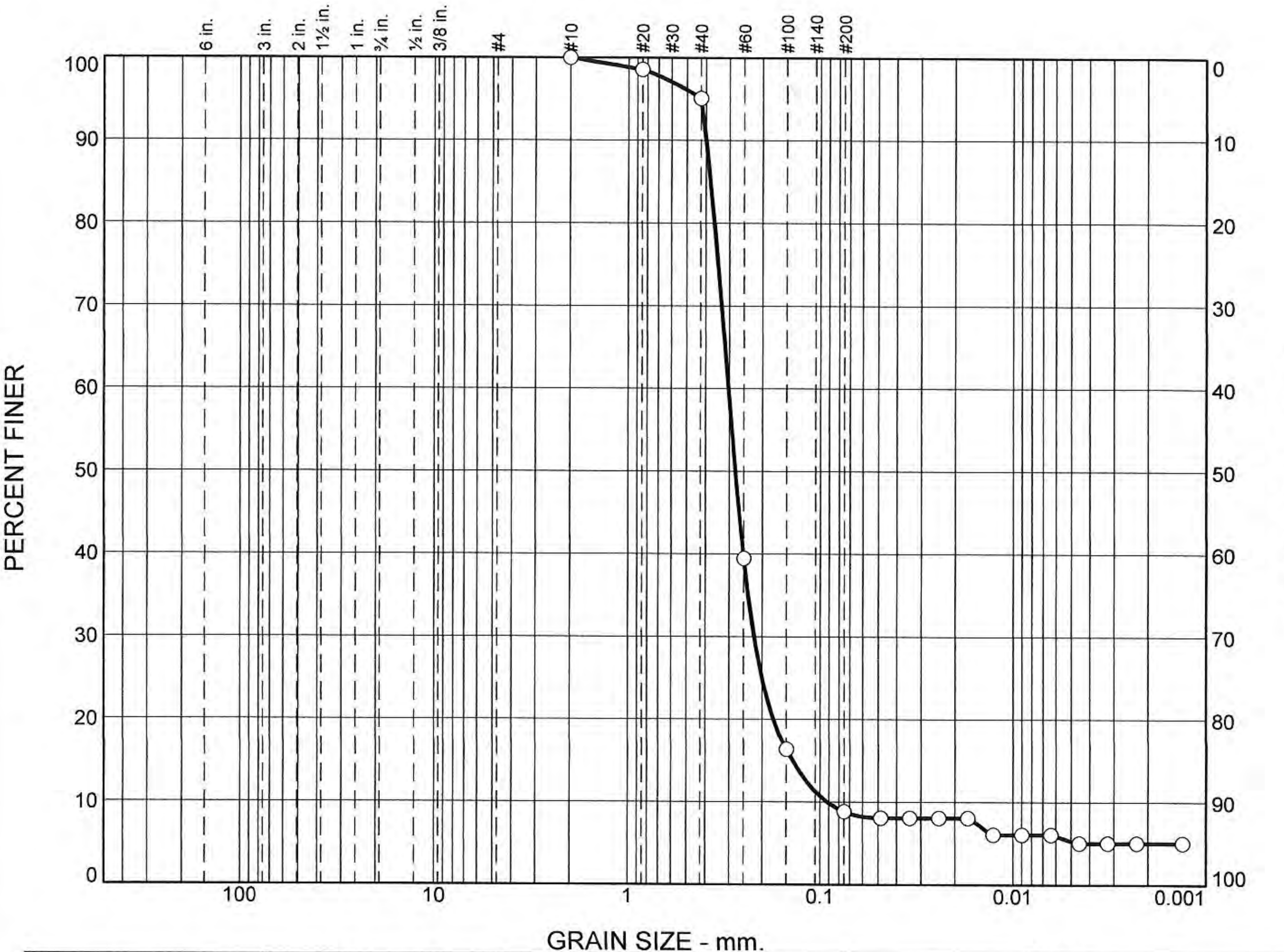
Tolunay-Wong Engineers, Inc. Houston, Texas

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	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

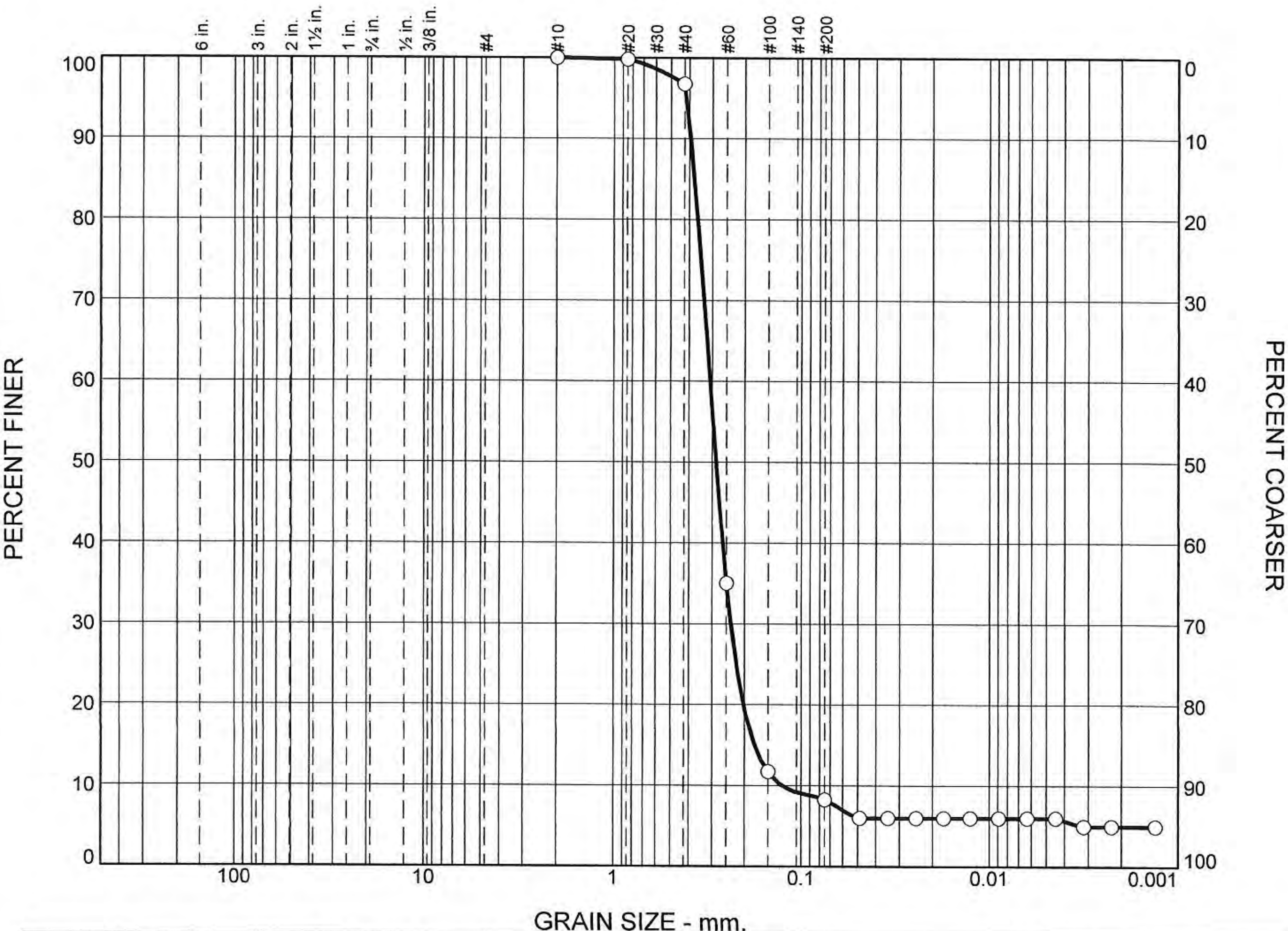
Tolunay-Wong Engineers, Inc. Houston, Texas

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	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

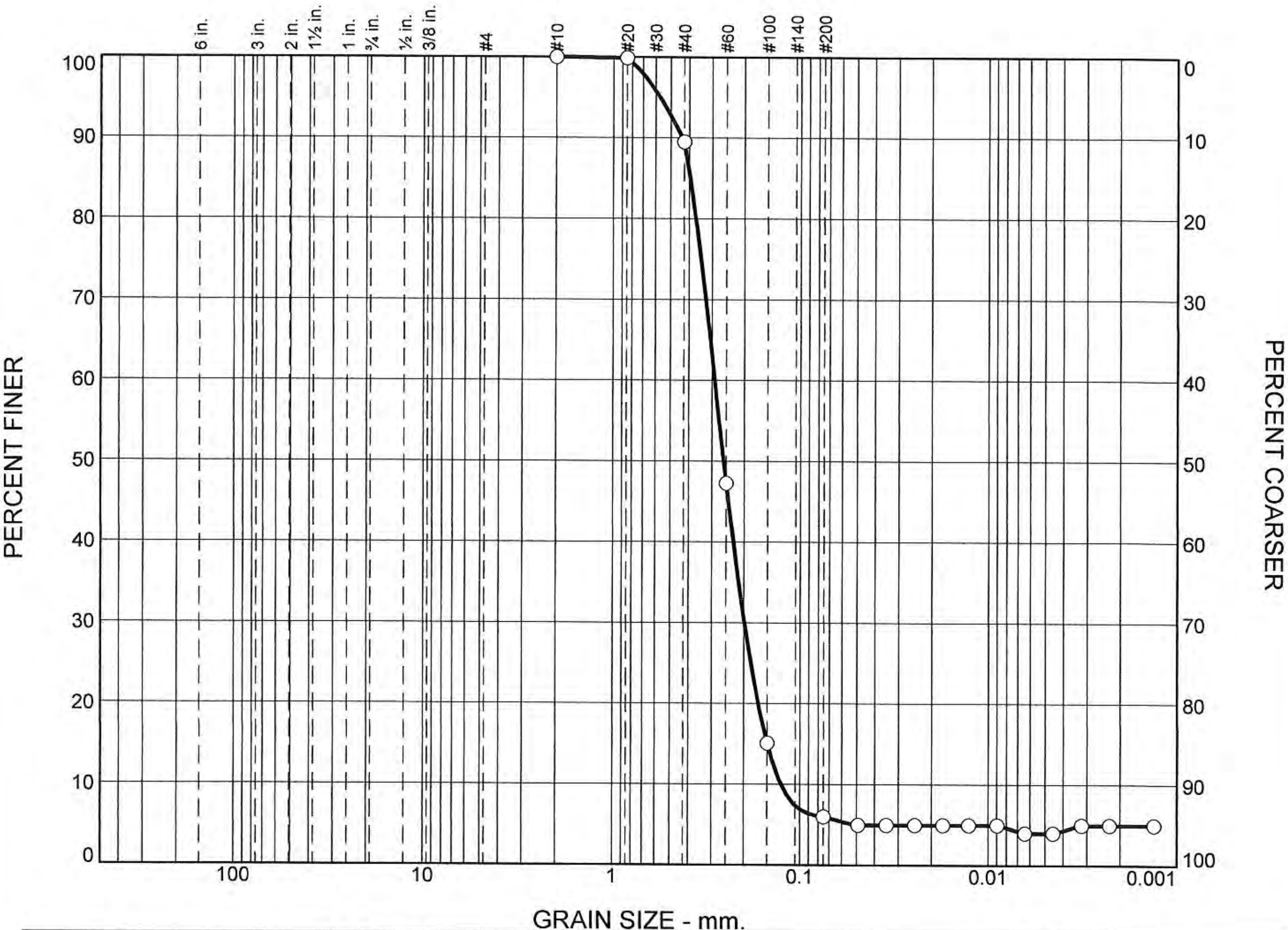
Tolunay-Wong Engineers, Inc. Houston, Texas

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	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

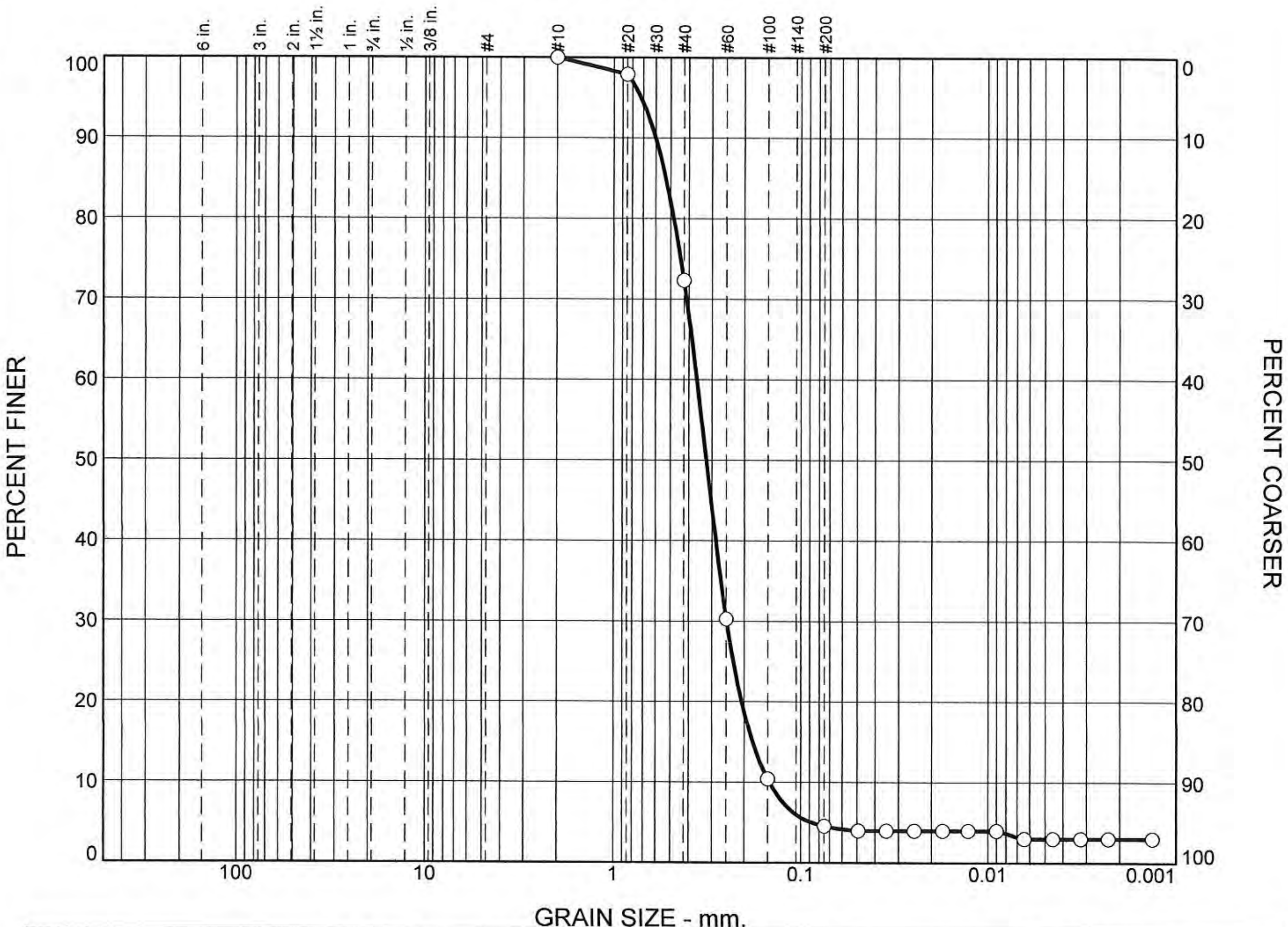
Tolunay-Wong Engineers, Inc. Houston, Texas

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	0.0	27.7	67.7	1.6	3.0

SOIL DATA

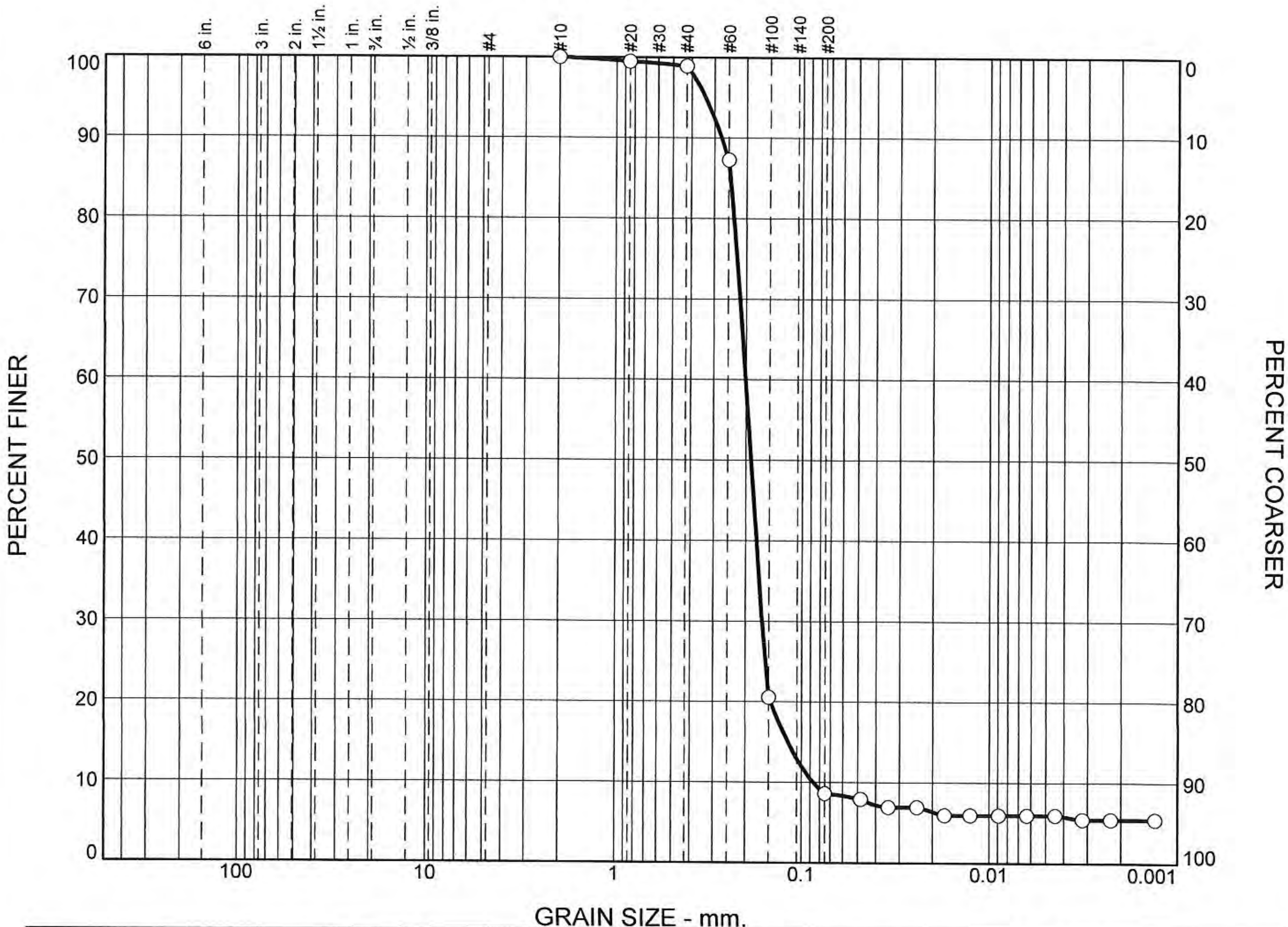
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB028		43	Gray poorly graded SAND	SP

Tolunay-Wong Engineers, Inc.
Houston, Texas

Client:
Project: San Jacinto River Waste Pit Superfund Site
Project No.: 19.15.131 **Figure**

Attachment Figure B.2-27

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

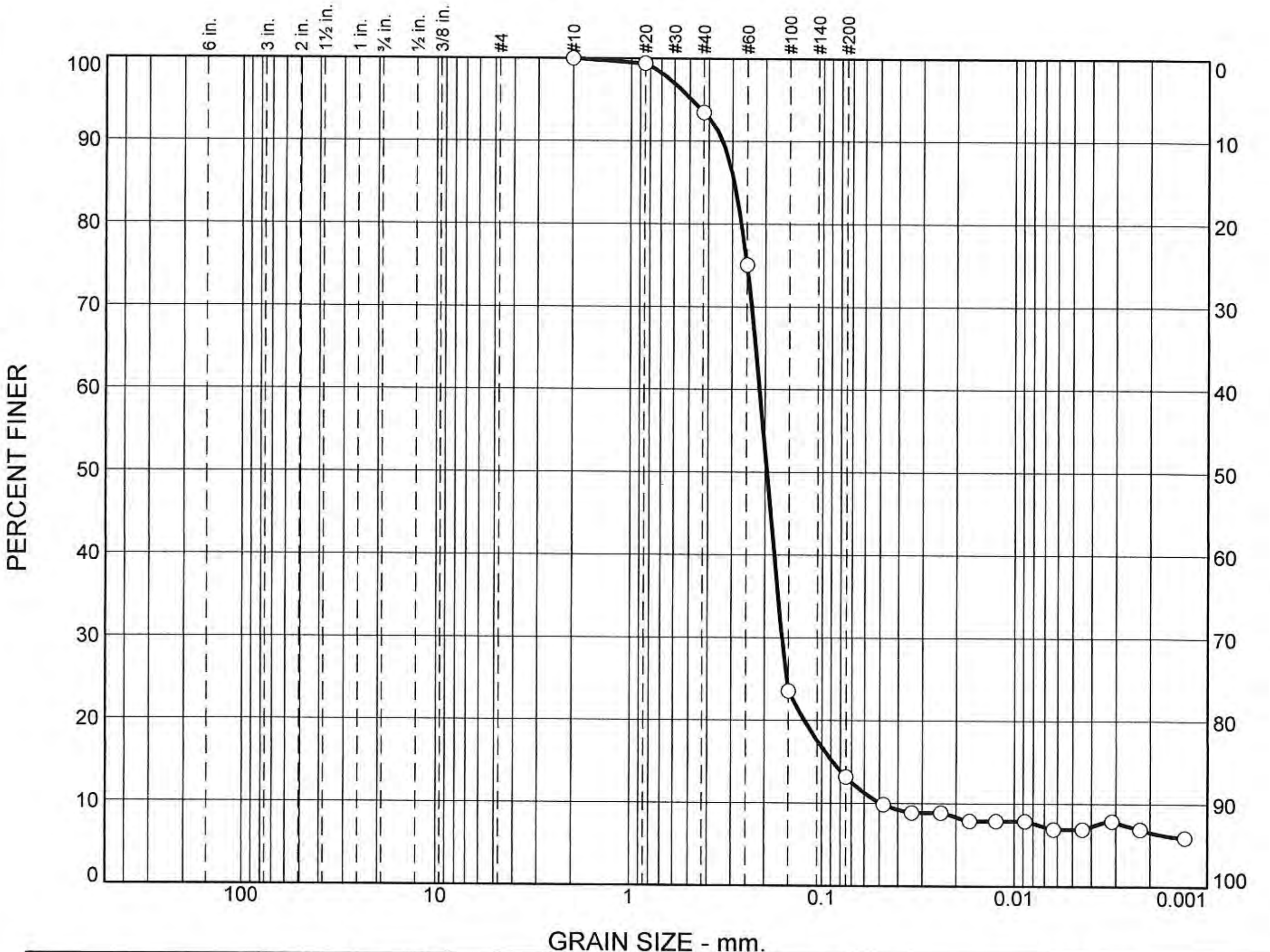
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB029		23	Gray poorly graded SAND with SILT	SP-SM

Tolunay-Wong Engineers, Inc.
Houston, Texas

Client:
Project: San Jacinto River Waste Pit Superfund Site

Project No.: 19.15.131 **Figure**

ASTM D 422



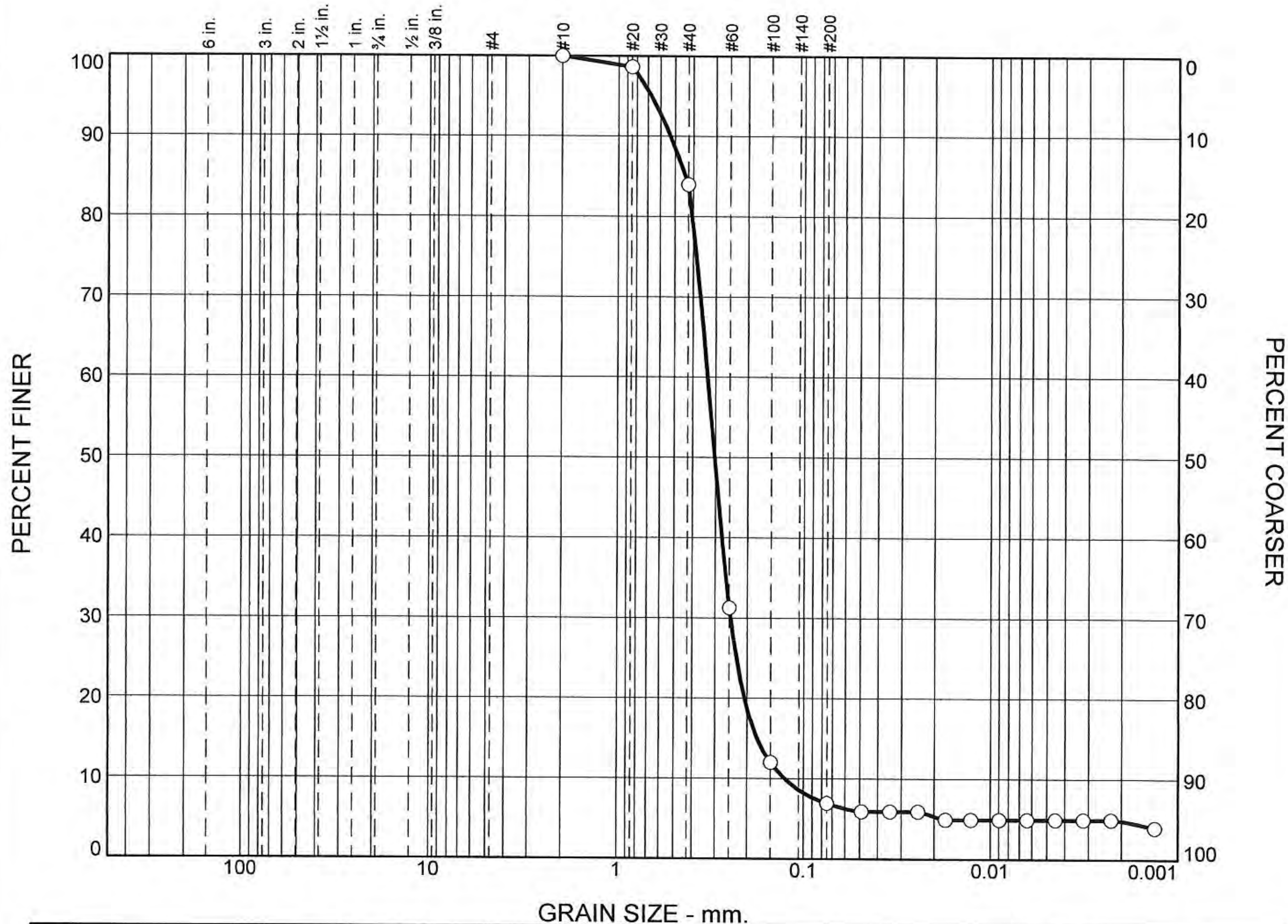
	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	6.5	80.3	6.7	6.5

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB029		28	Gray SILTY SAND	SM

Tolunay-Wong Engineers, Inc. Houston, Texas	**Client:** **Project:** San Jacinto River Waste Pit Superfund Site **Project No.:** 19.15.131 **Figure**

ASTM D 422



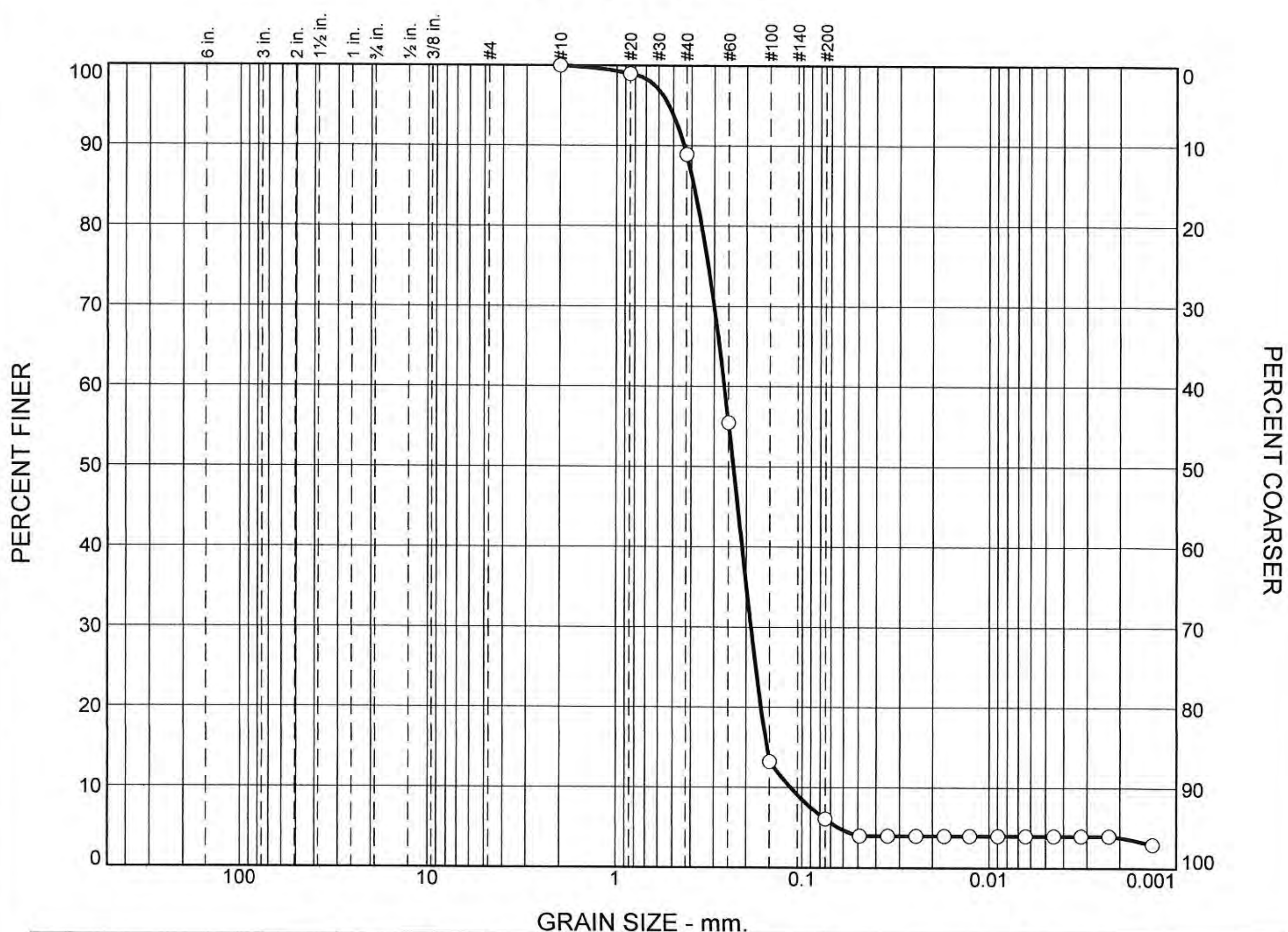
	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	16.0	77.1	2.1	4.8

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB029		33	Gray poorly graded SAND with SILT	SP-SM

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	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

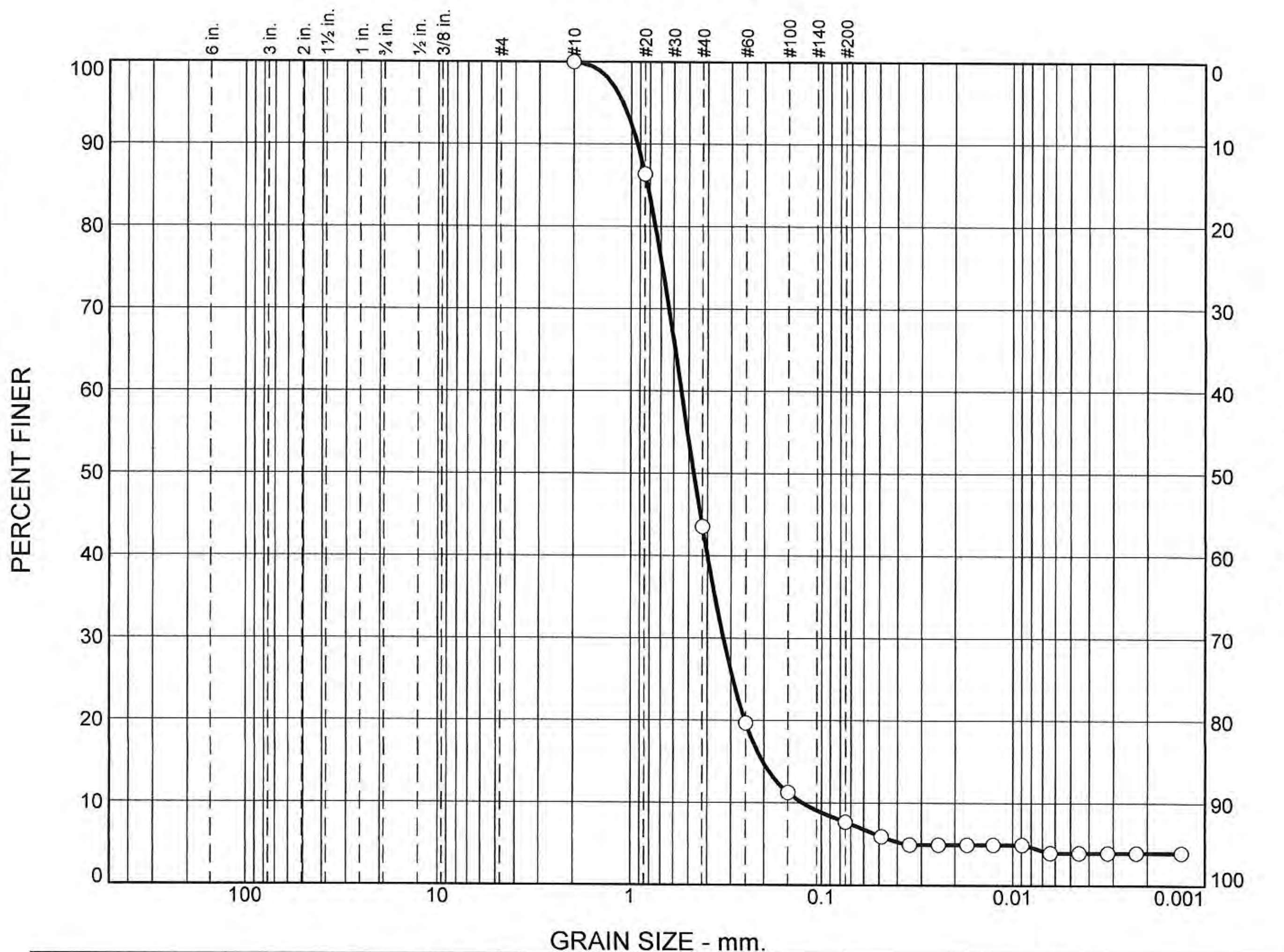
Tolunay-Wong Engineers, Inc. Houston, Texas

Client:

Project: San Jacinto River Waste Pit Superfund Site

Project No.: 19.15.131 **Figure**

ASTM D 422



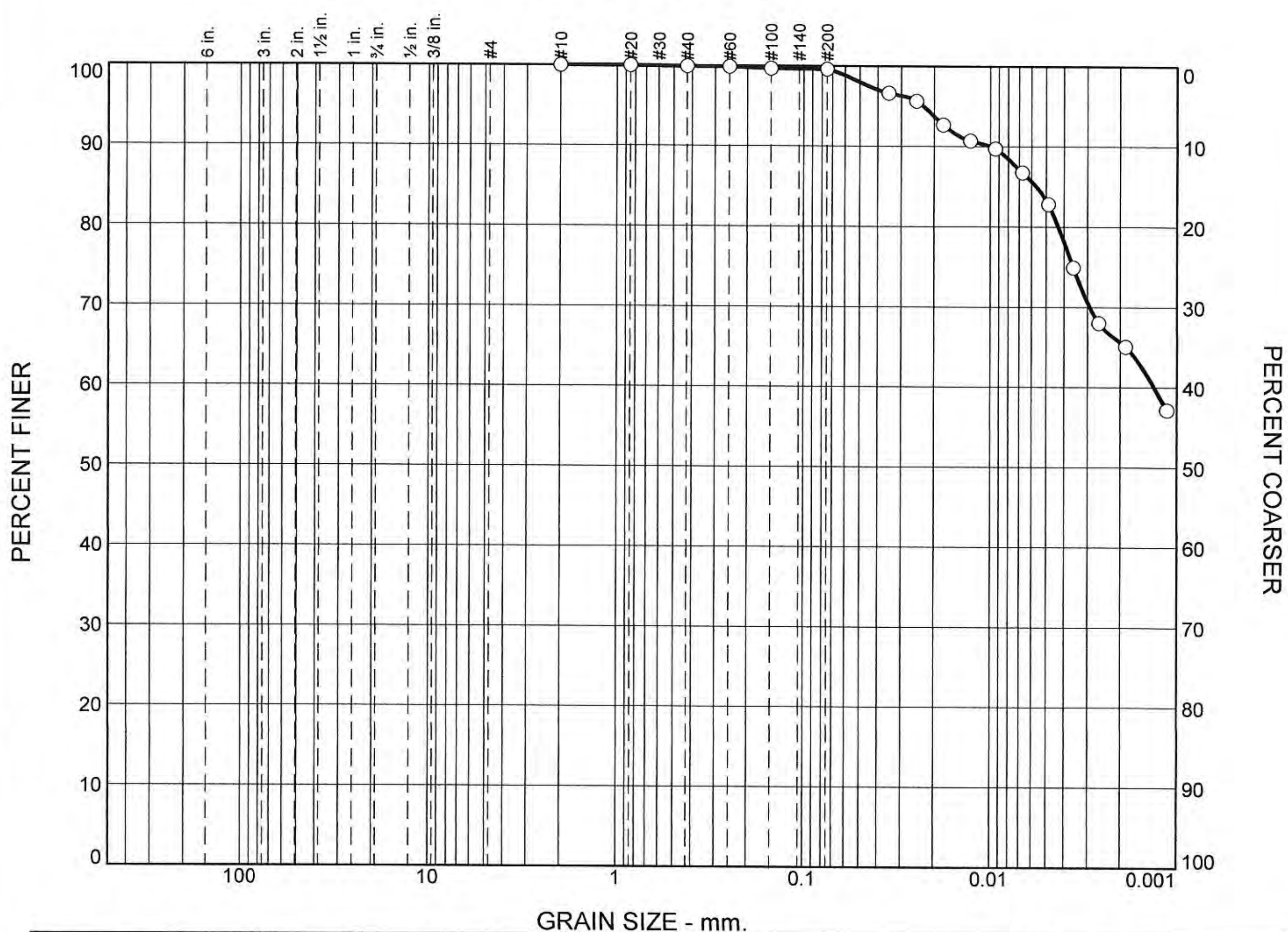
	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	0.0	56.5	35.8	3.8	3.9

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB029		43	Gray poorly graded SAND with SILT	SP-SM

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	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

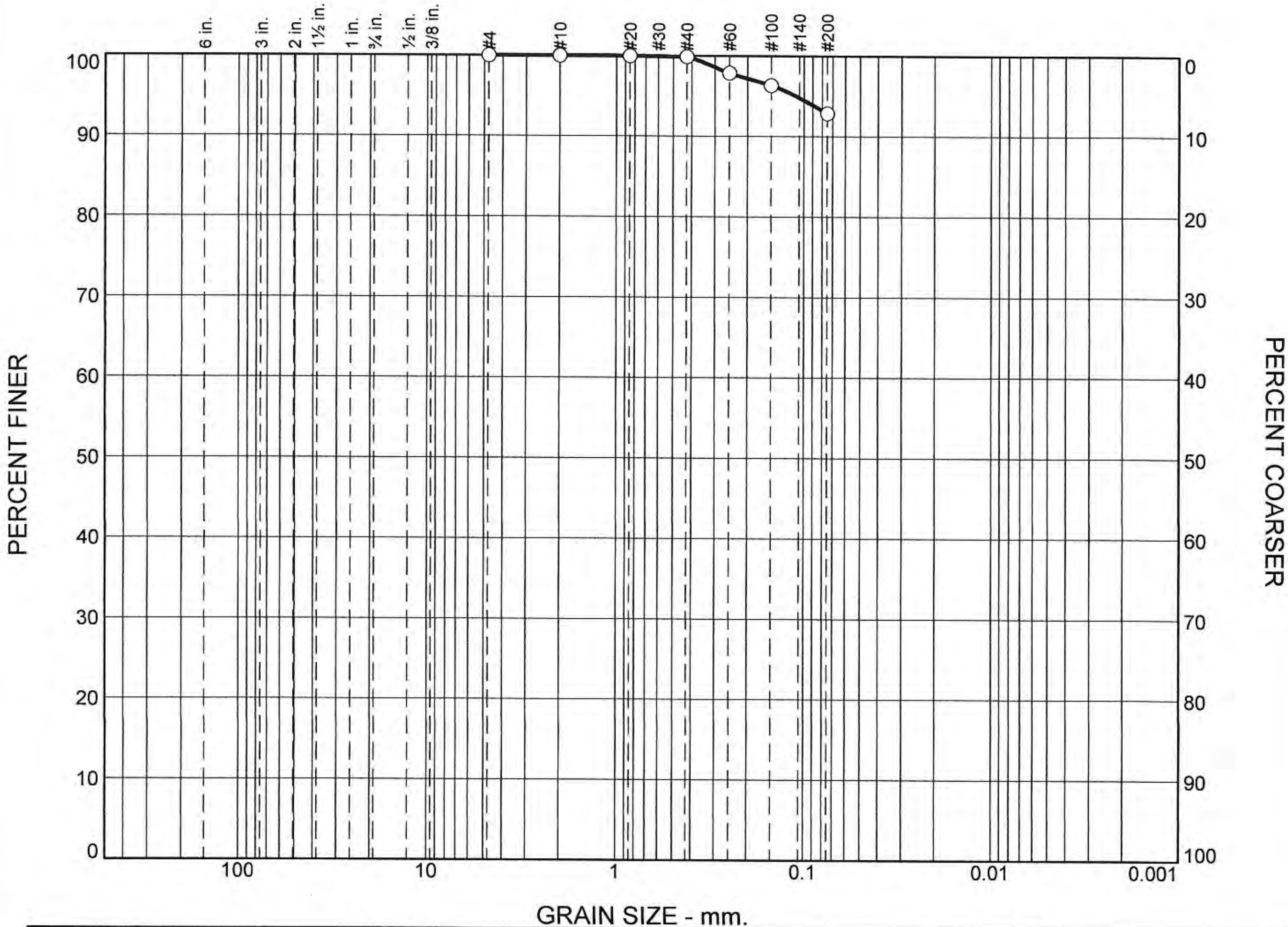
Tolunay-Wong Engineers, Inc. Houston, Texas

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	0.0	0.1	7.0	92.9	

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB047		53		ML

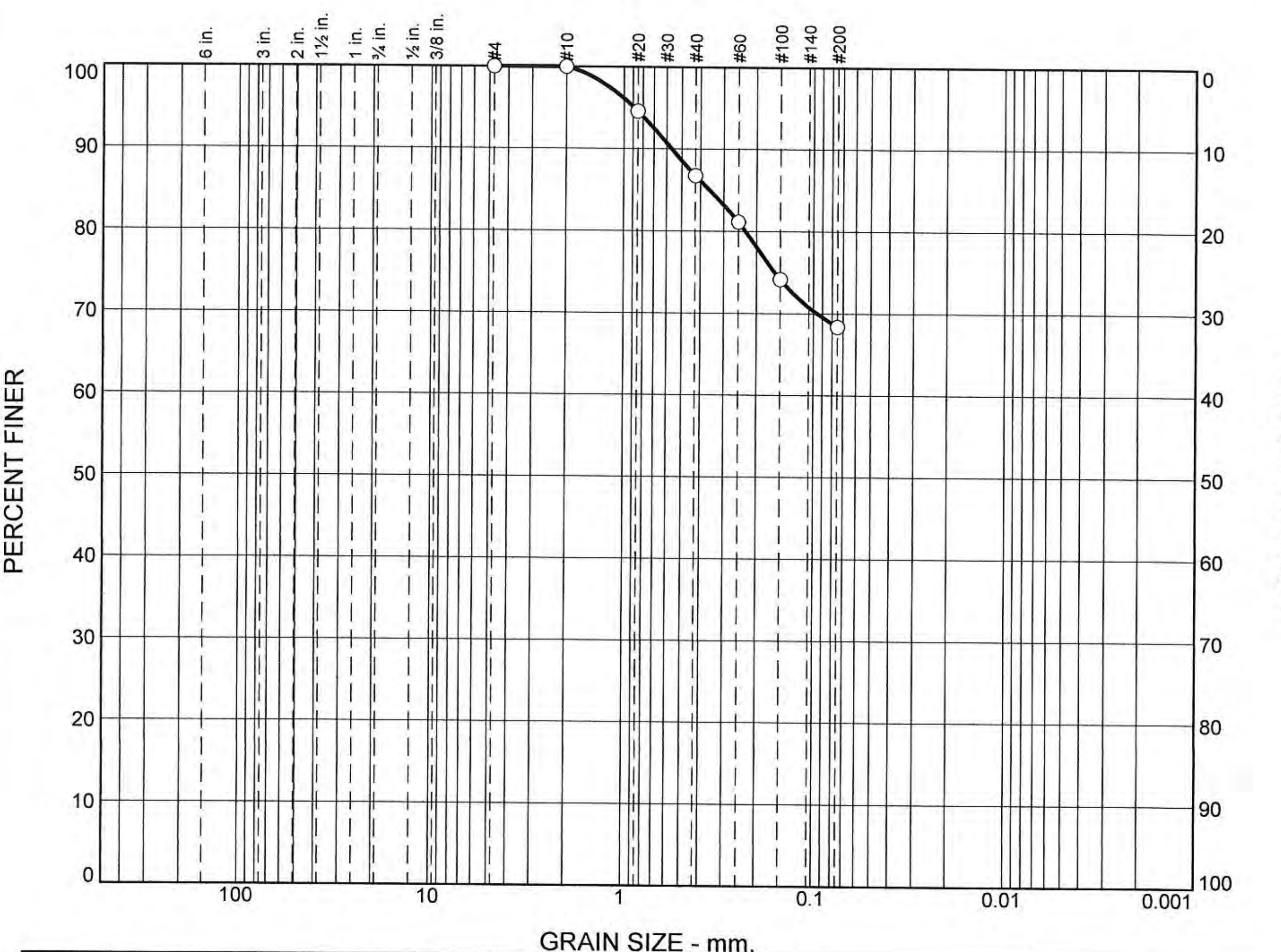
Tolunay-Wong Engineers, Inc. Houston, Texas

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	0.0	13.2	18.4	68.4	

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB047		78		ML

Tolunay-Wong Engineers, Inc. Houston, Texas

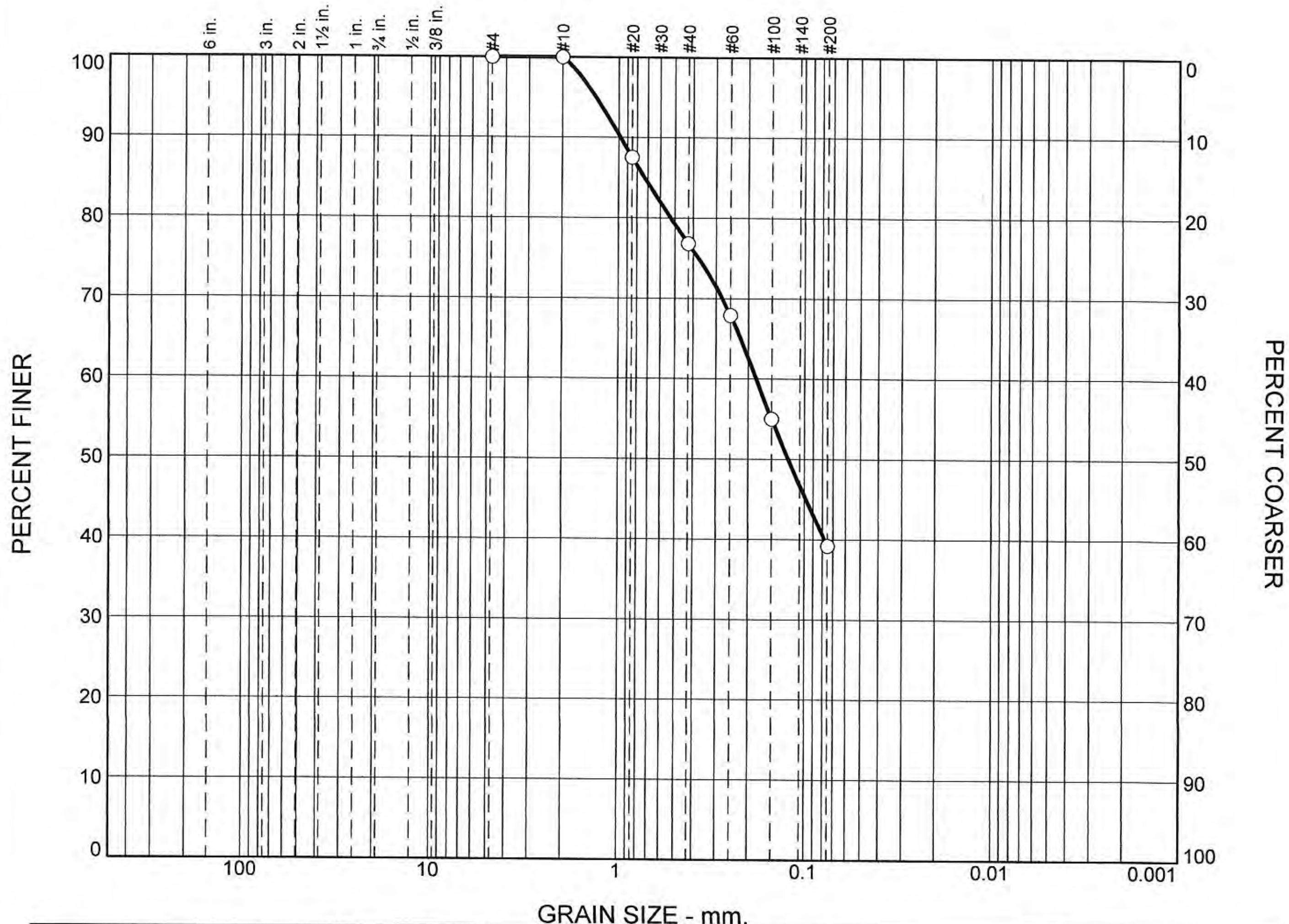
Client:

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	0.0	23.2	37.6	39.2	

SOIL DATA

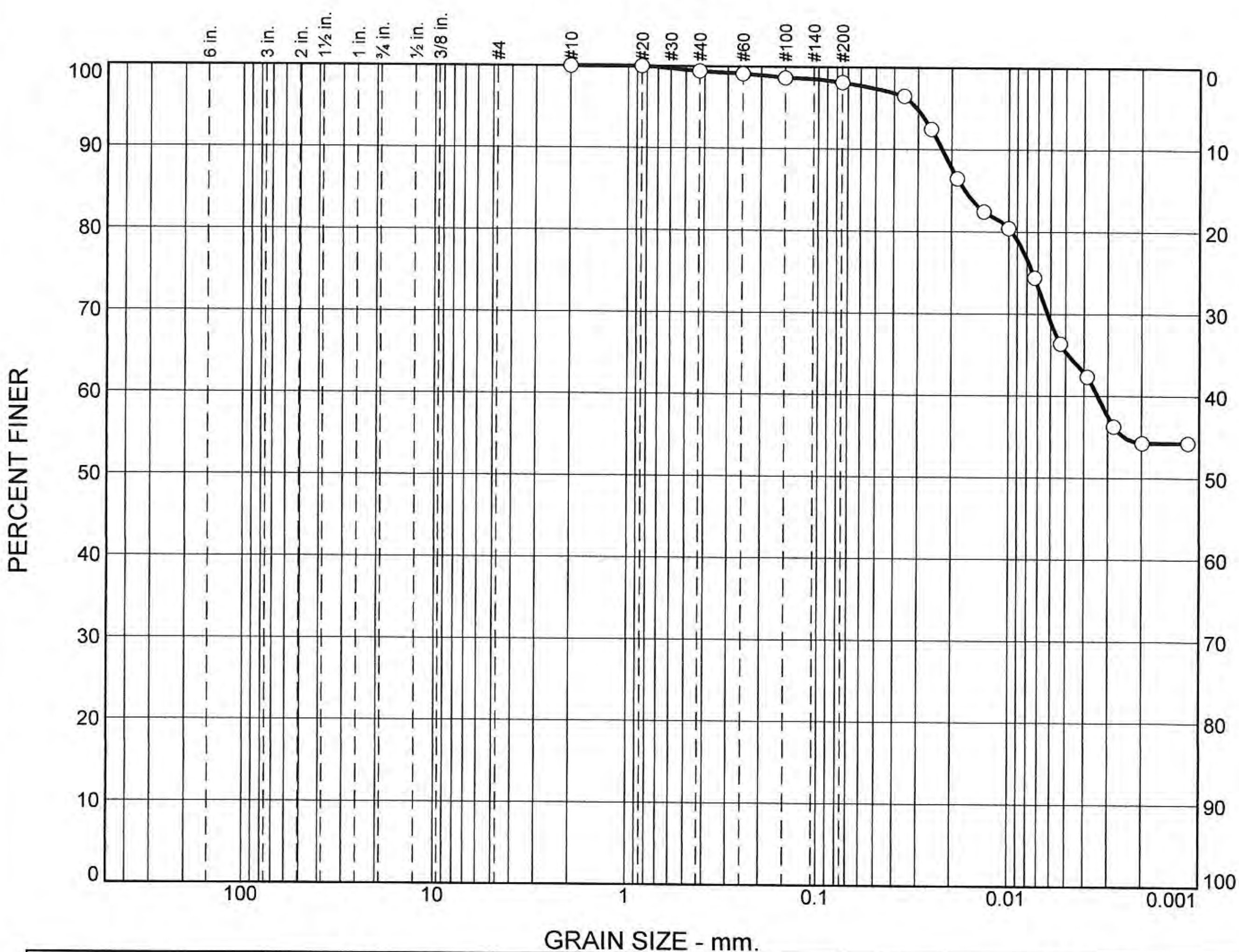
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB047		88		SM

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	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

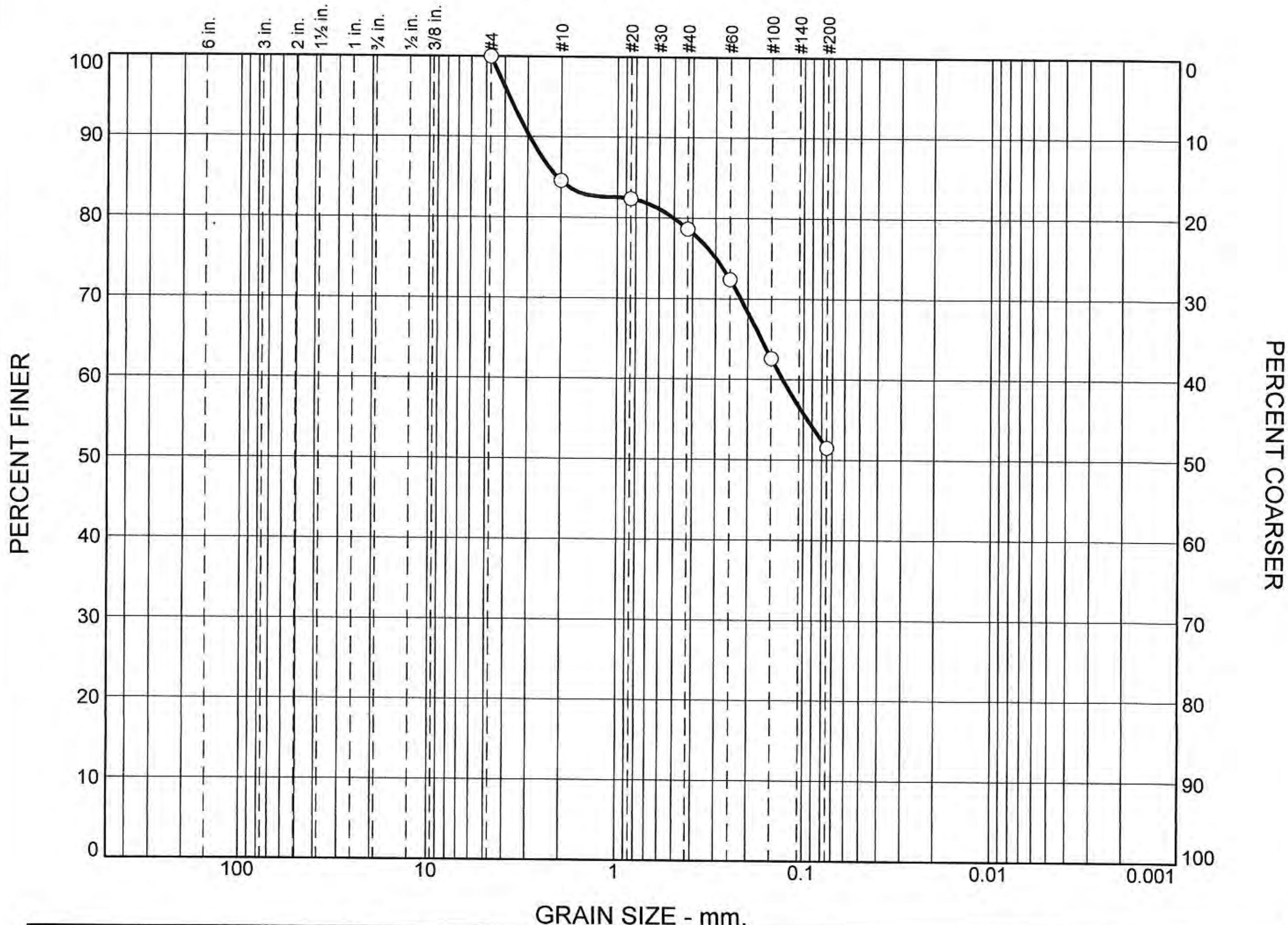
Tolunay-Wong Engineers, Inc. Houston, Texas

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	15.4	5.9	27.2	51.5	

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB050		14-16		ML

Tolunay-Wong Engineers, Inc. Houston, Texas

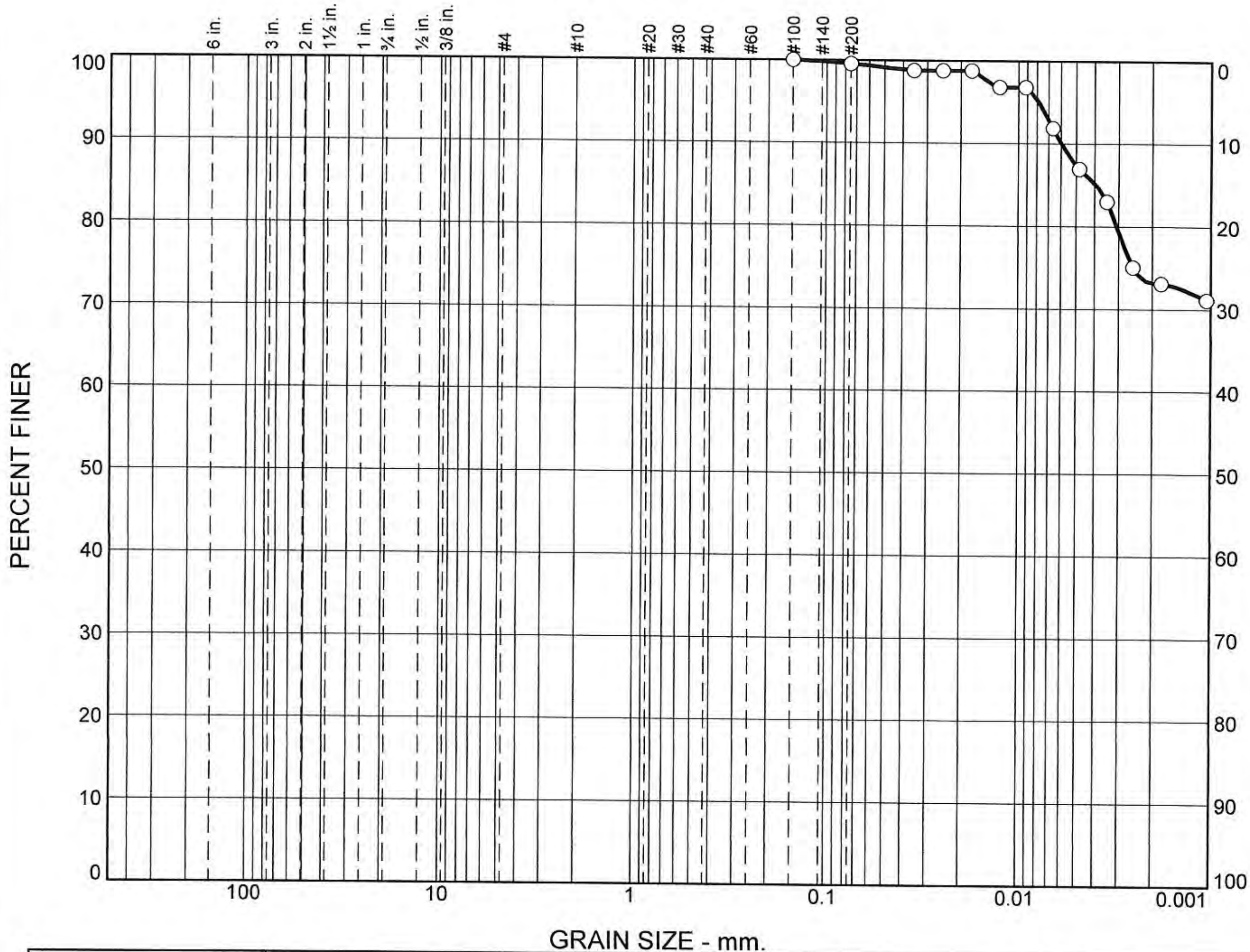
Client:

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	0.0	0.0	0.4	26.4	73.2

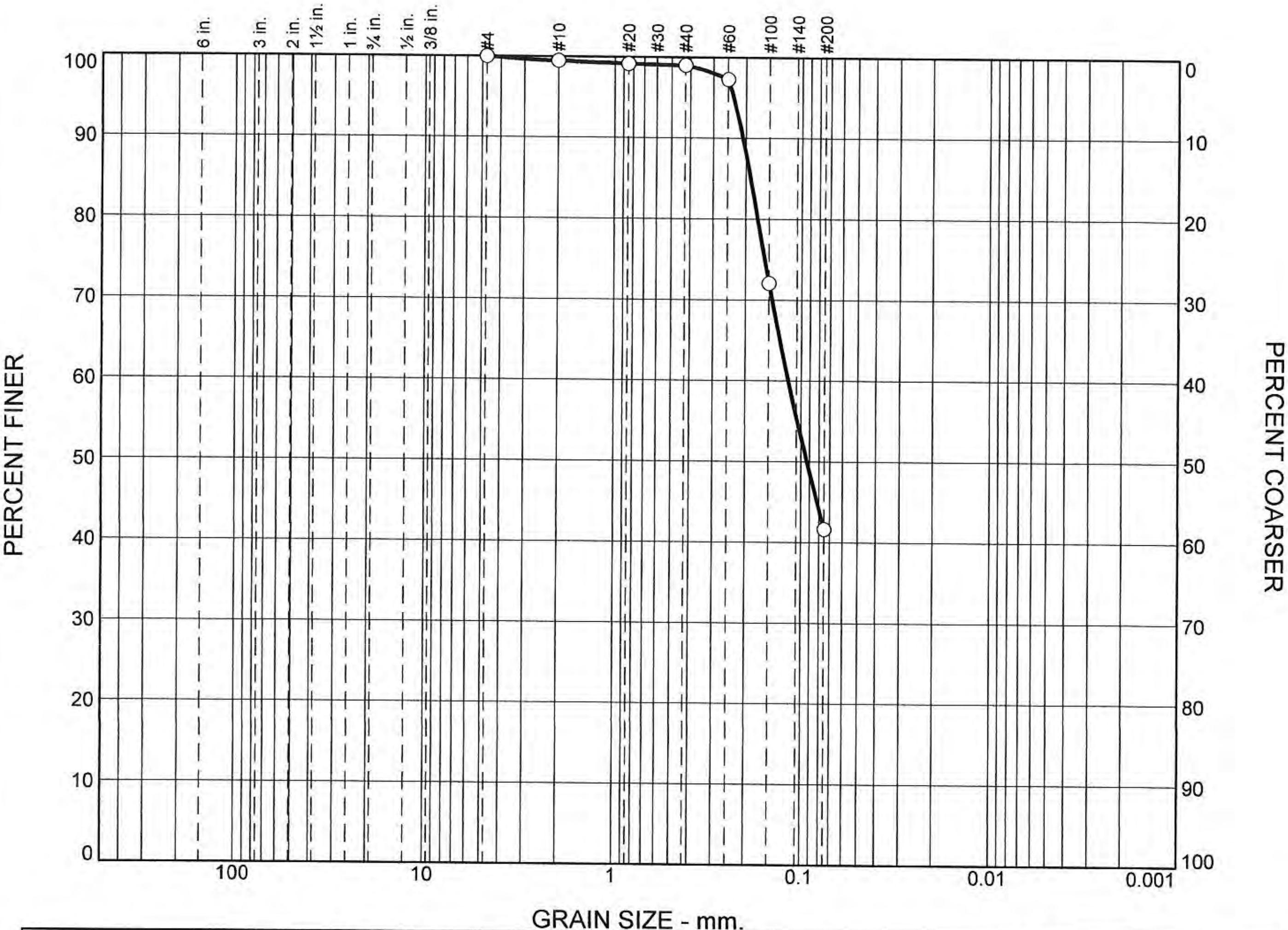
SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB053		38	Tan FAT CLAY	CH

Tolunay-Wong Engineers, Inc. Houston, Texas	**Client:** **Project:** San Jacinto River Waste Pit Superfund Site **Project No.:** 19.15.131 **Figure**

Attachment Figure B.2-39

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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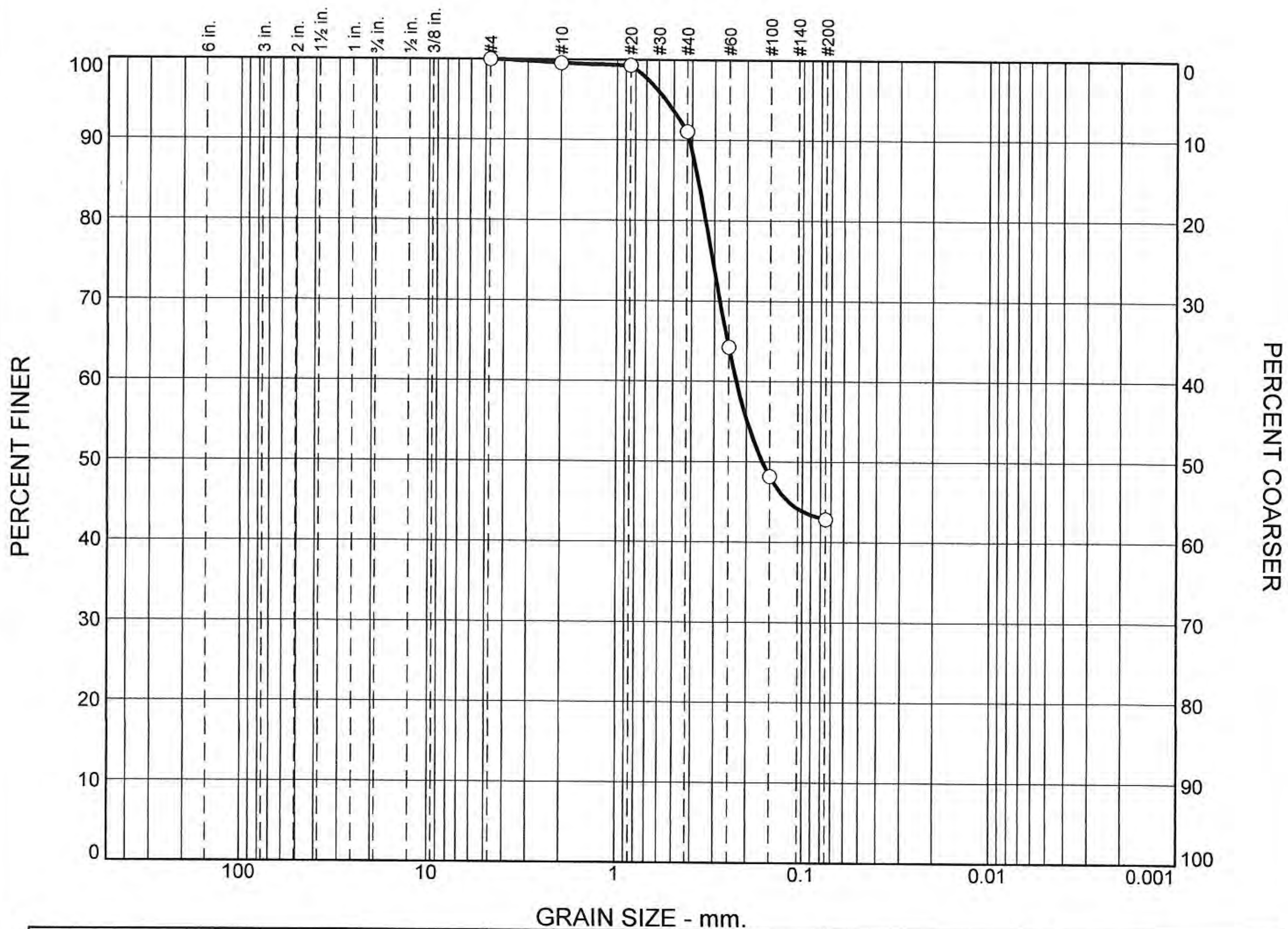
Houston, Texas

Client:
Project: San Jacinto River Waste Pit Superfund Site
Project No.: 19.15.131 **Figure**

Attachment Figure B.2-40

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

Tolunay-Wong Engineers, Inc. Houston, Texas

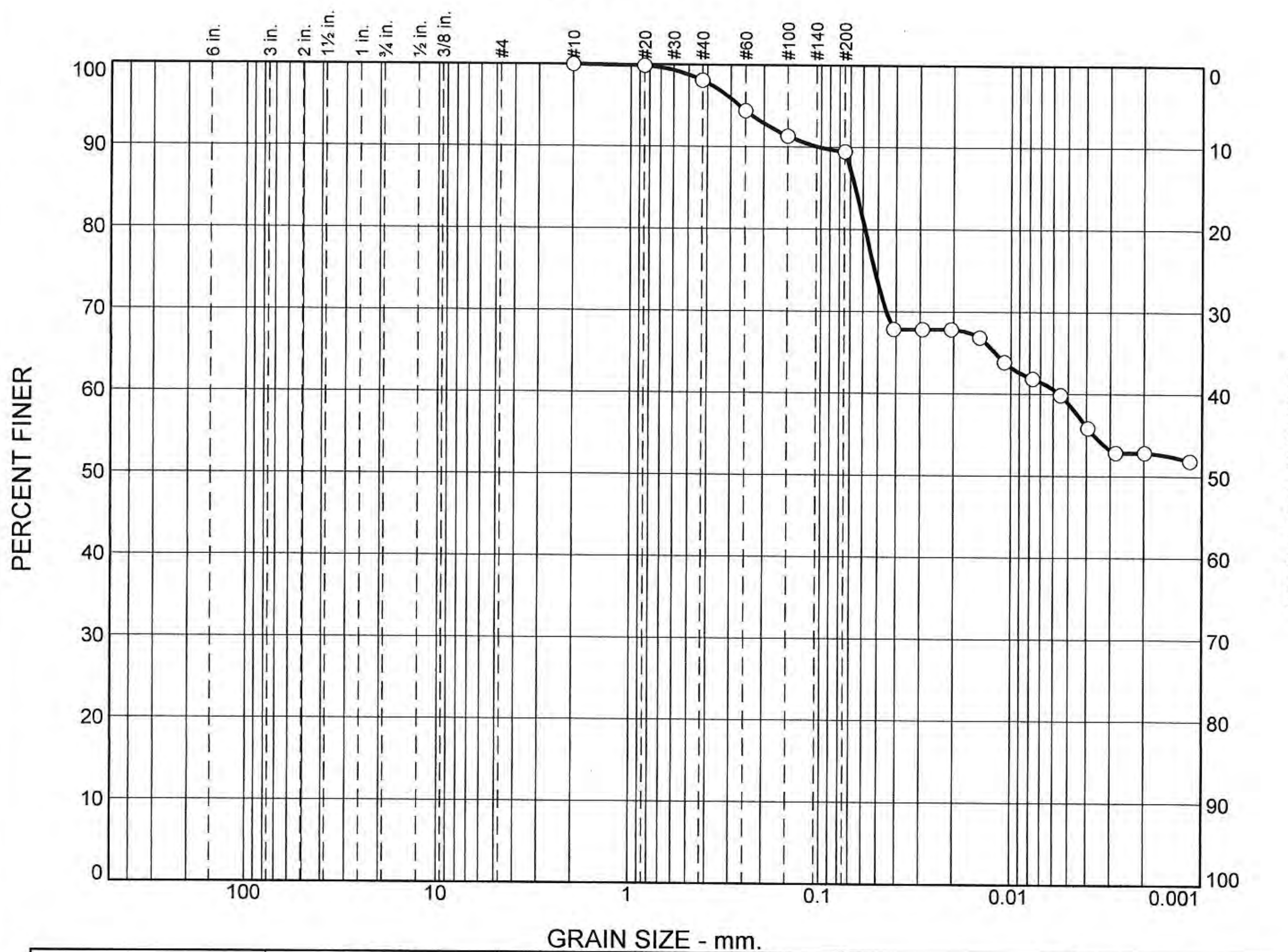
Client:

Project: San Jacinto River Waste Pit Superfund Site

Project No.: 19.15.131 **Figure**

Attachment Figure B.2-41

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

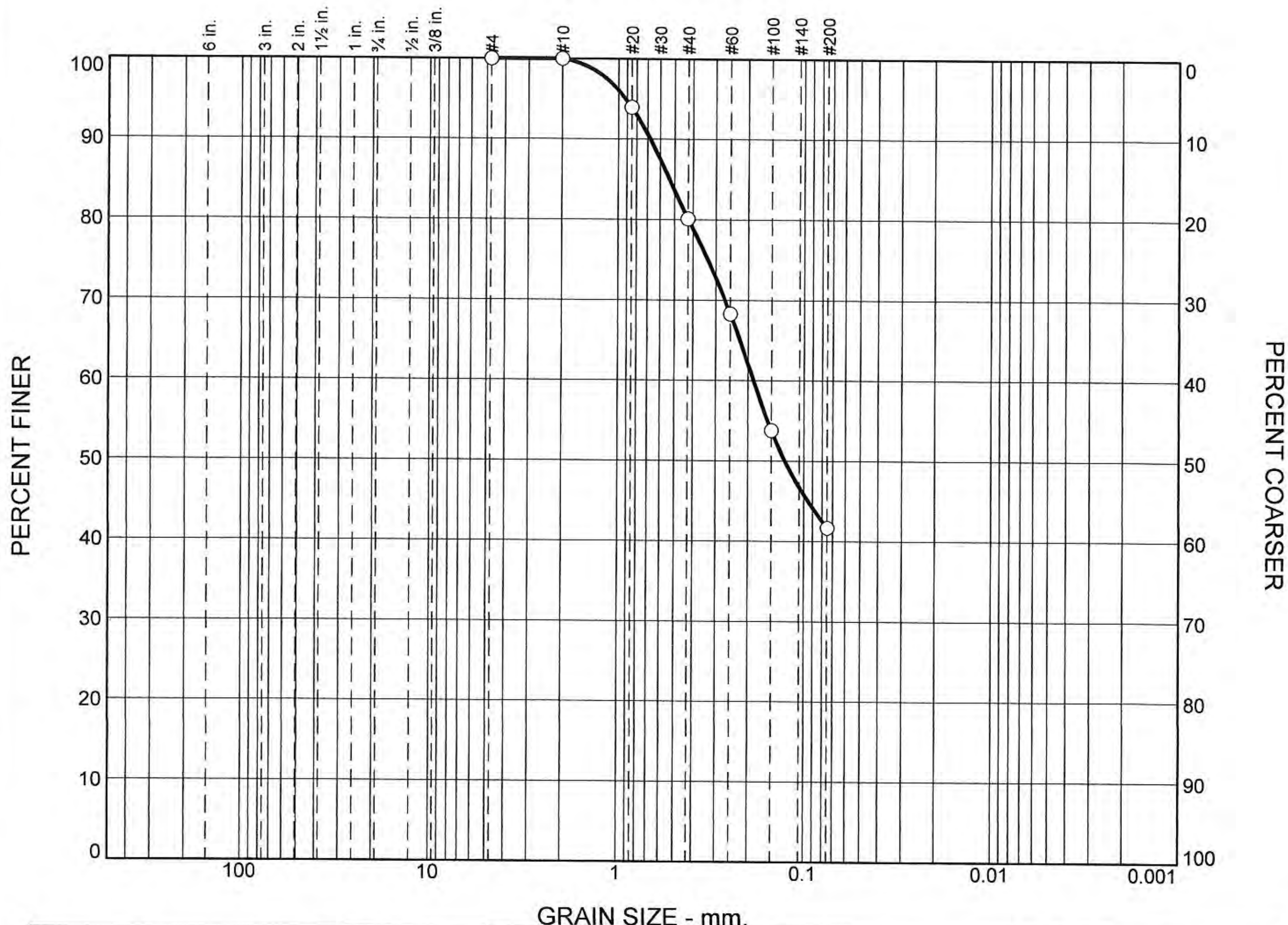
Tolunay-Wong Engineers, Inc.
Houston, Texas

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	0.0	19.9	38.4	41.7	

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJGB058		12-14		SM

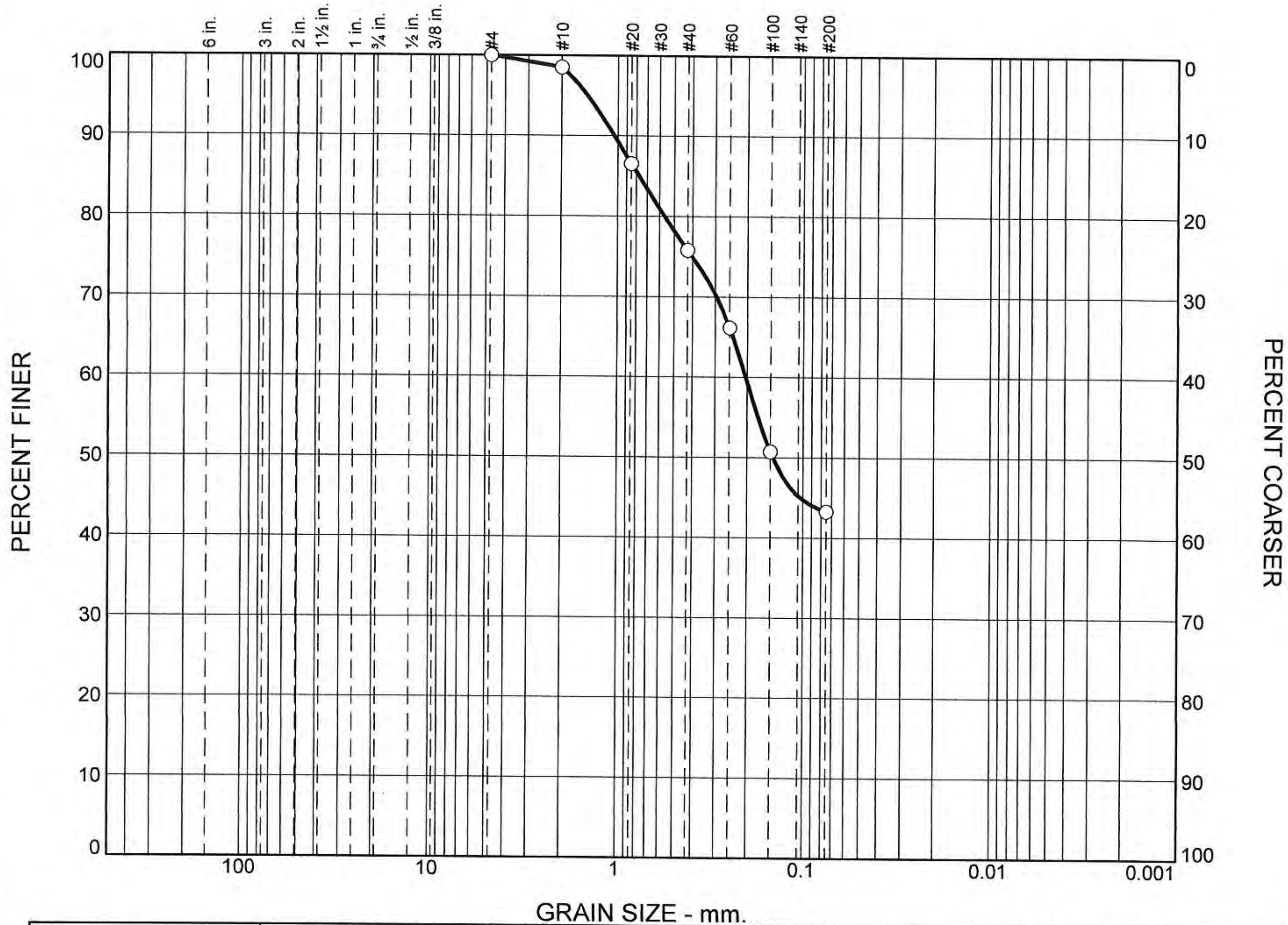
Tolunay-Wong Engineers, Inc. Houston, Texas

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

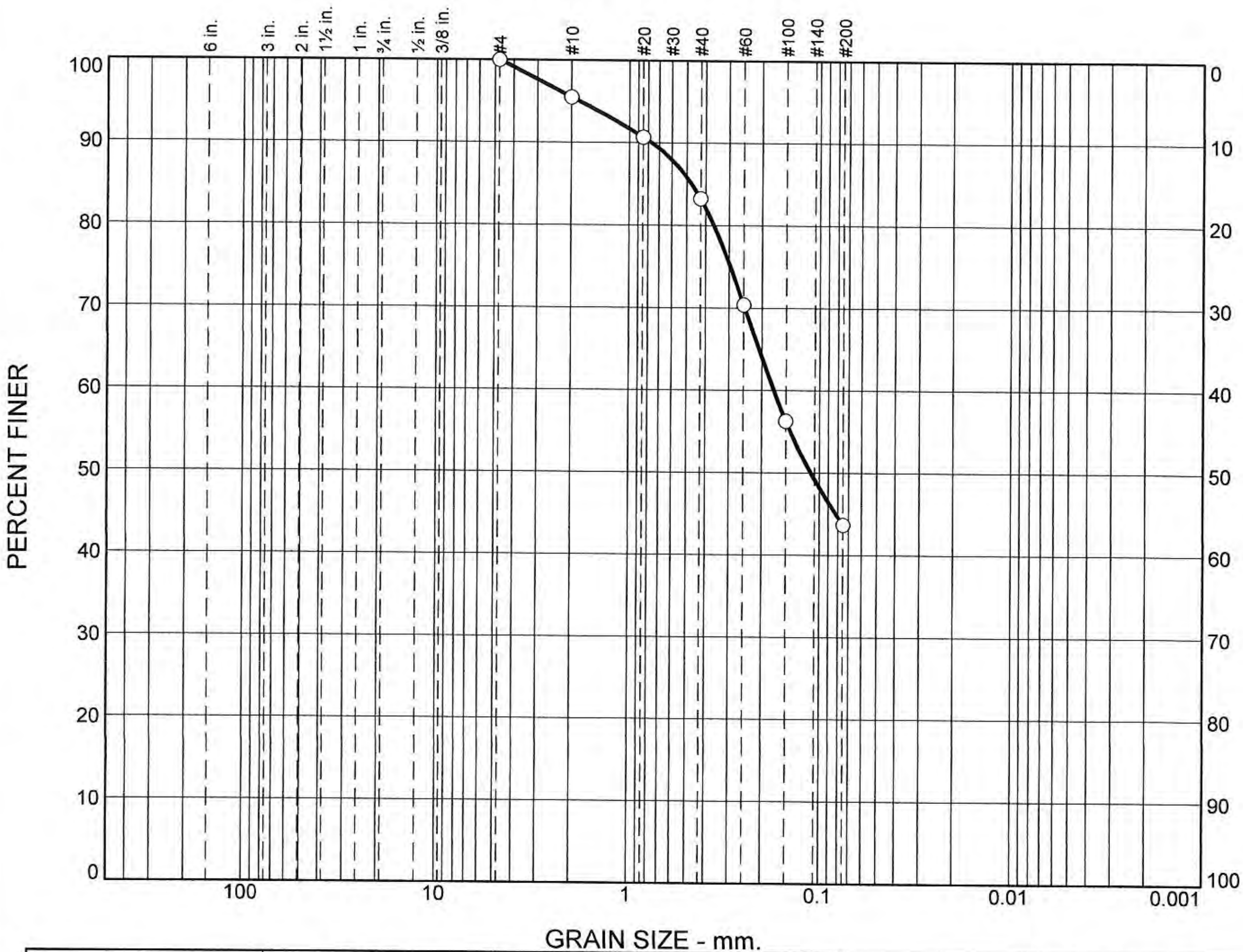
Tolunay-Wong Engineers, Inc.
Houston, Texas

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:

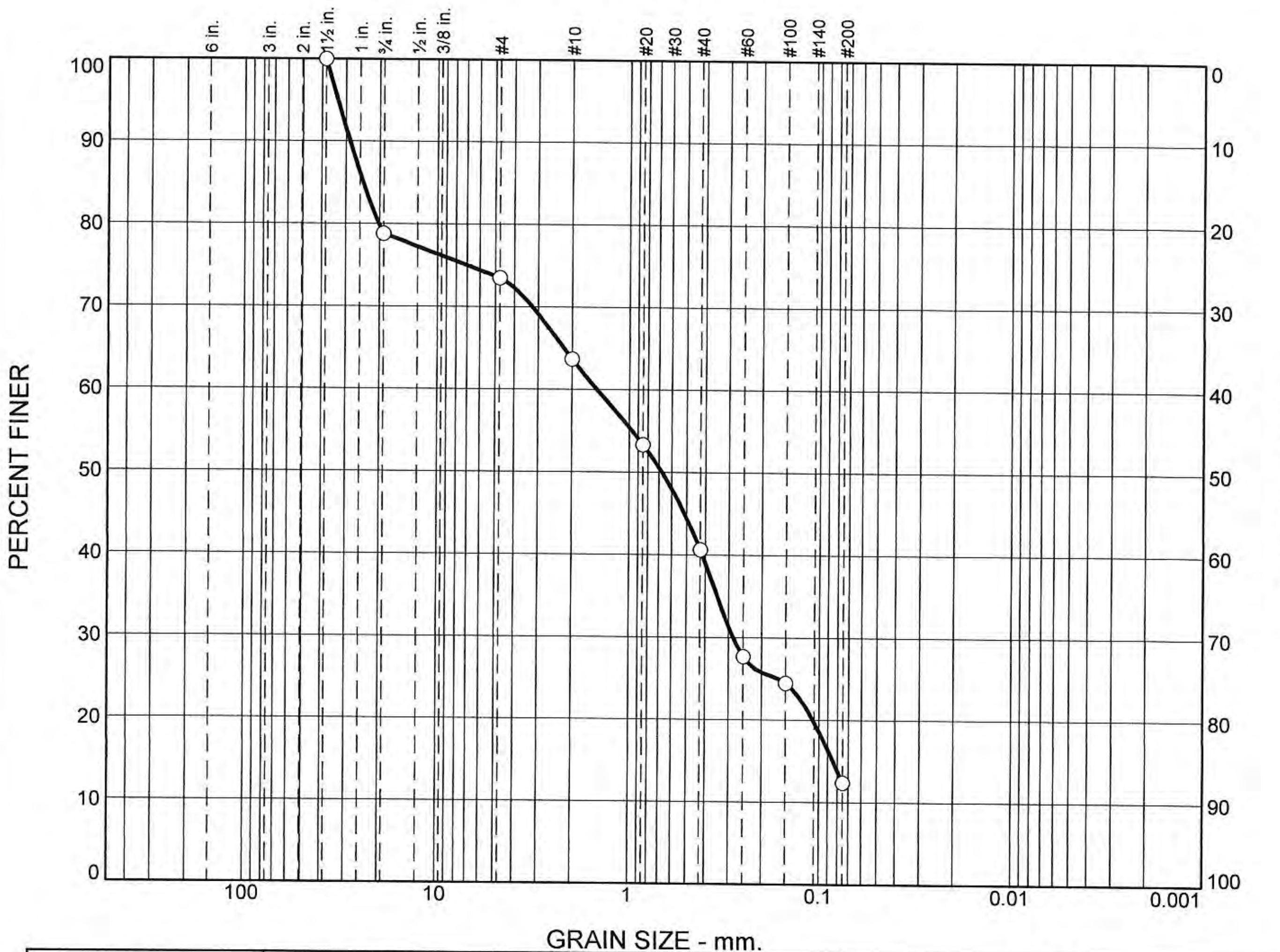
Project: San Jacinto River Waste Pit Superfund Site

Project No.: 19.15.131

Figure

Attachment Figure B.2-45

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

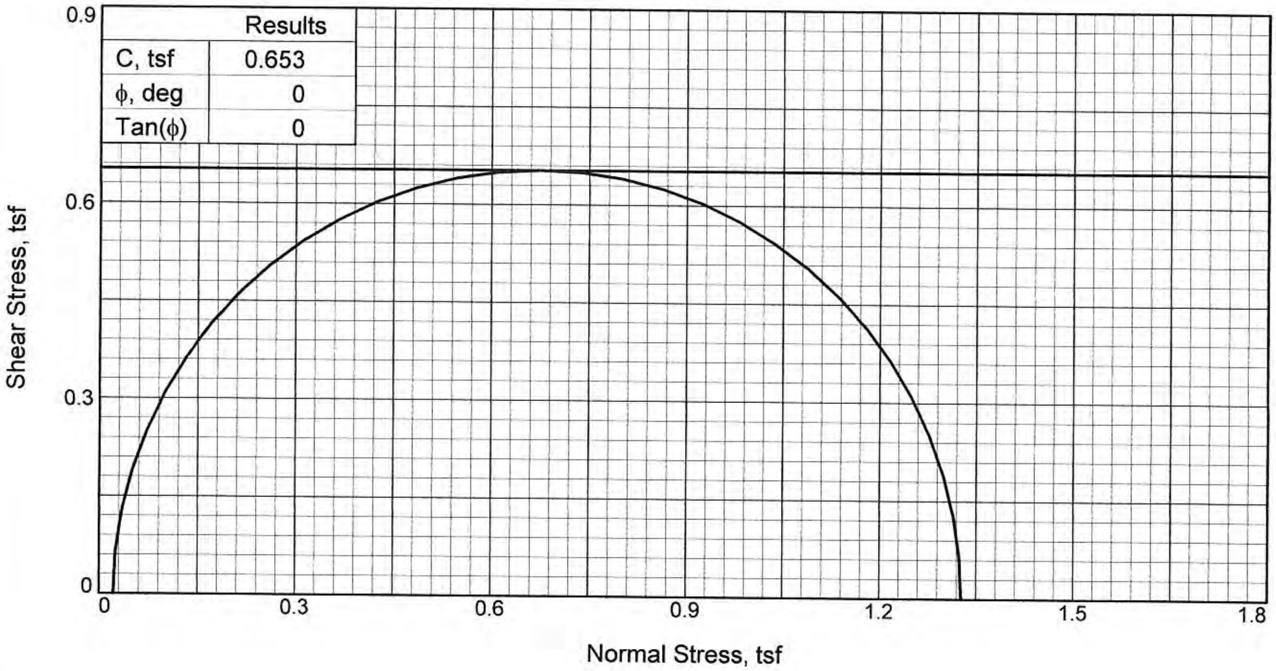
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	SJRF-04		0-2		SM

Tolunay-Wong Engineers, Inc. Houston, Texas

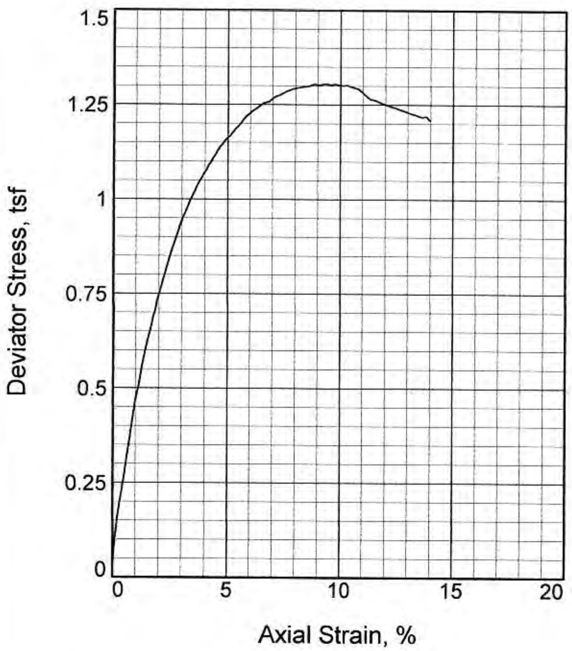
Client:

Project: San Jacinto River Waste Pit Superfund Site

Project No.: 19.15.131 **Figure**



Results	
C, tsf	0.653
ϕ, deg	0
Tan(ϕ)	0



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 ________

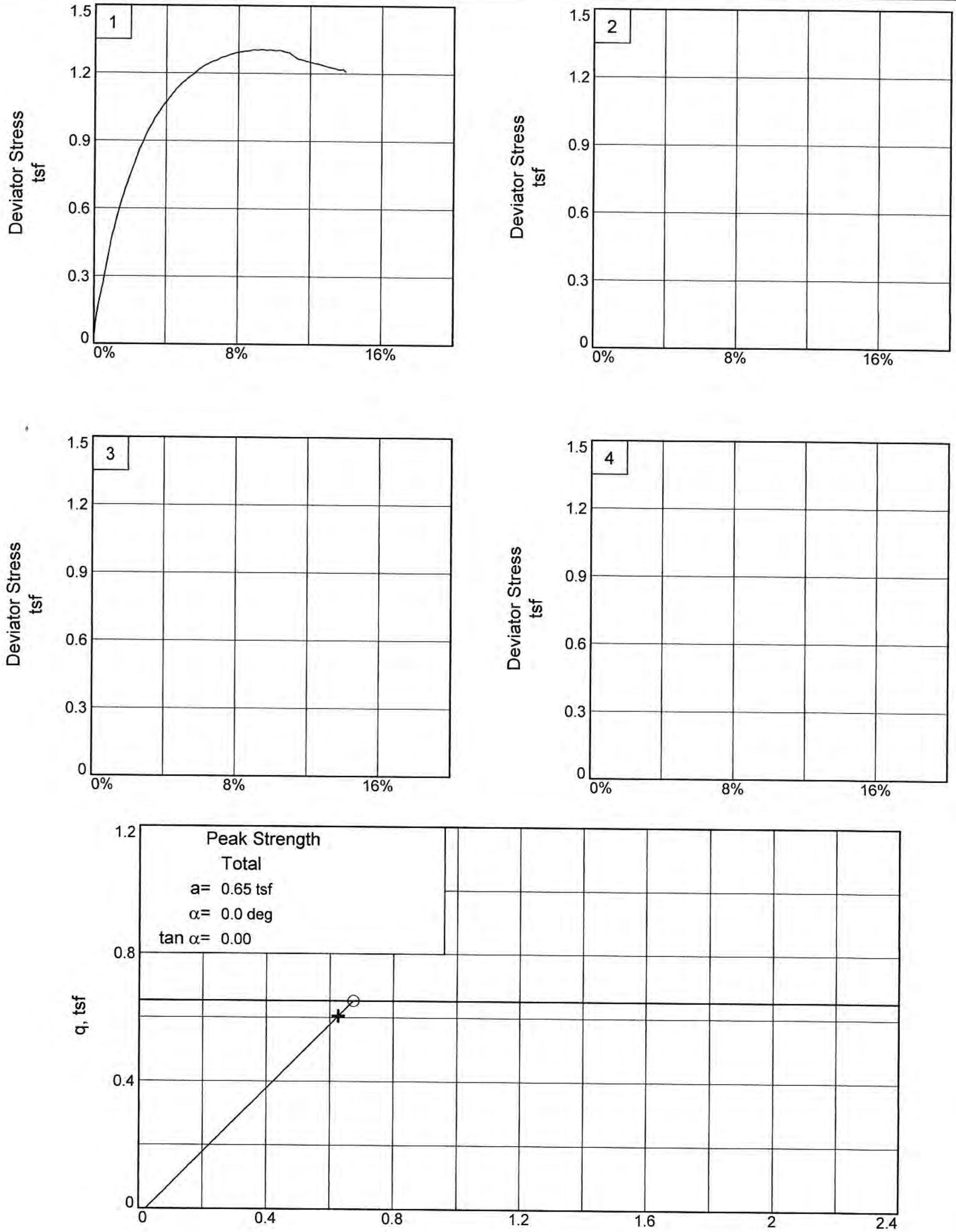
Client:

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



Stress Paths: o indicates peak + indicates end

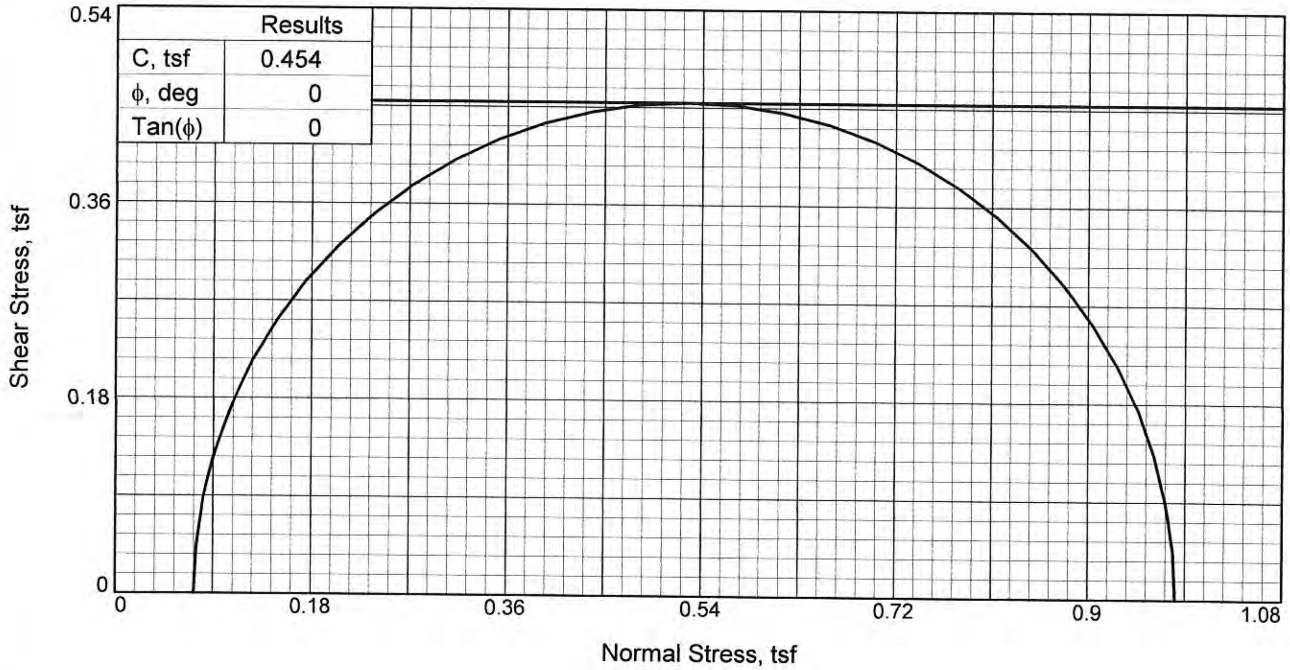
Client:

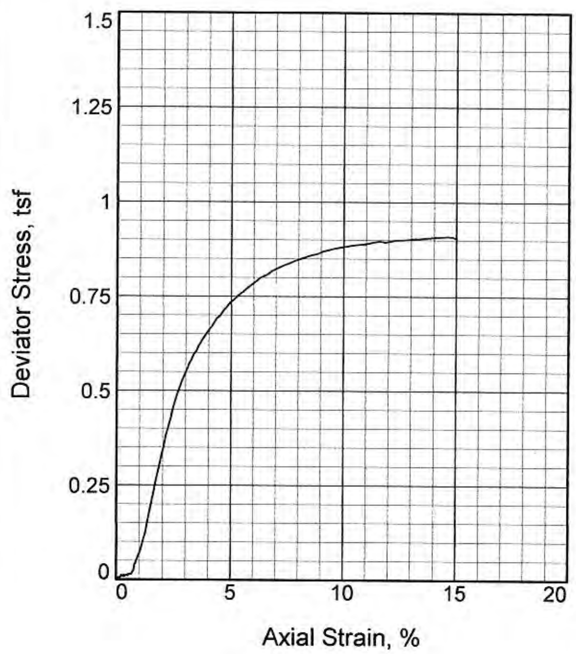
Project: San Jacinto River Waste Pit Superfund Site

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 ________

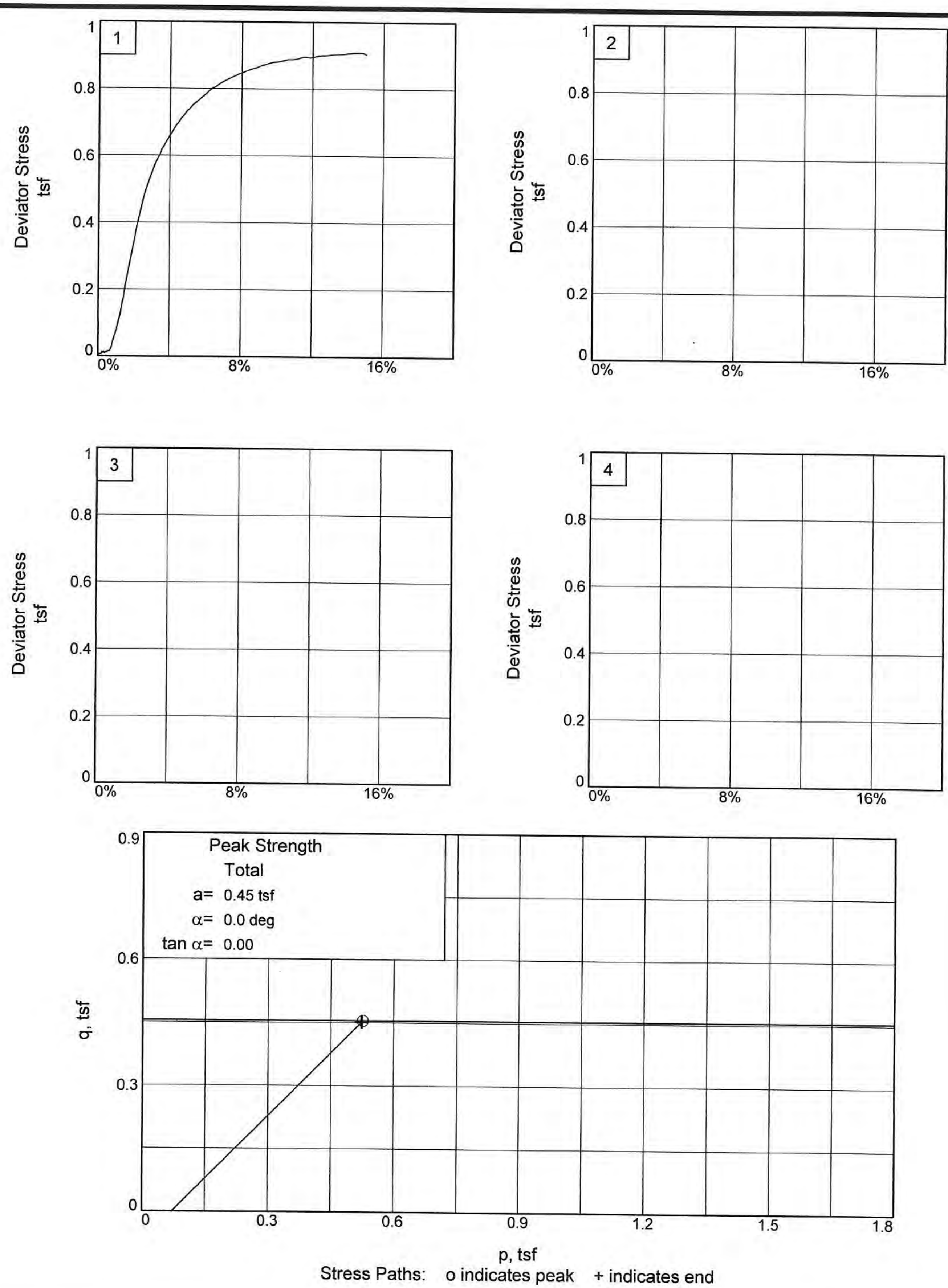
Client:

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

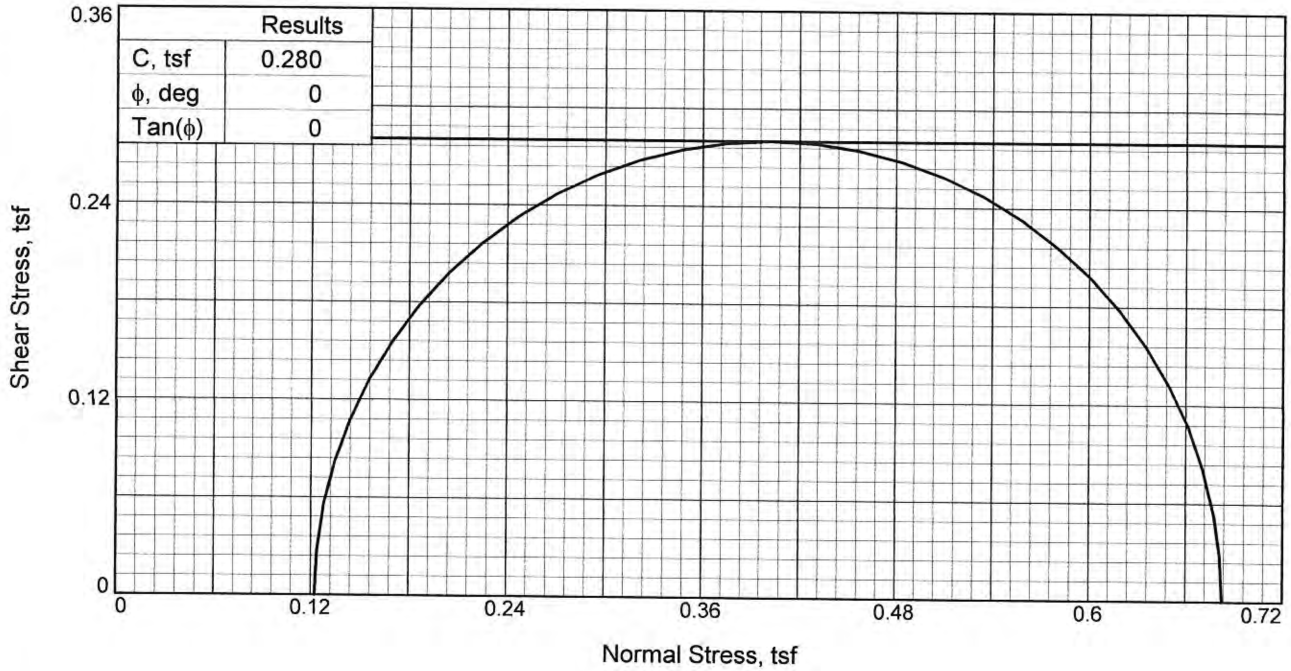
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas

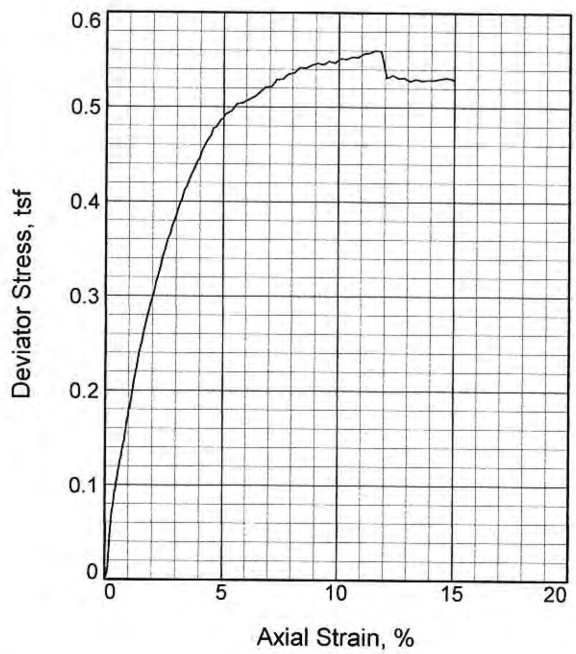


Client:
Project: San Jacinto River Waste Pit Superfund Site
Source of Sample: SJGB024 **Depth:** 2-4
Project No.: 19.15.131 **Figure** _______

TOLUNAY-WONG ENGINEERS, INC.

Attachment Figure B.2-50





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 ________

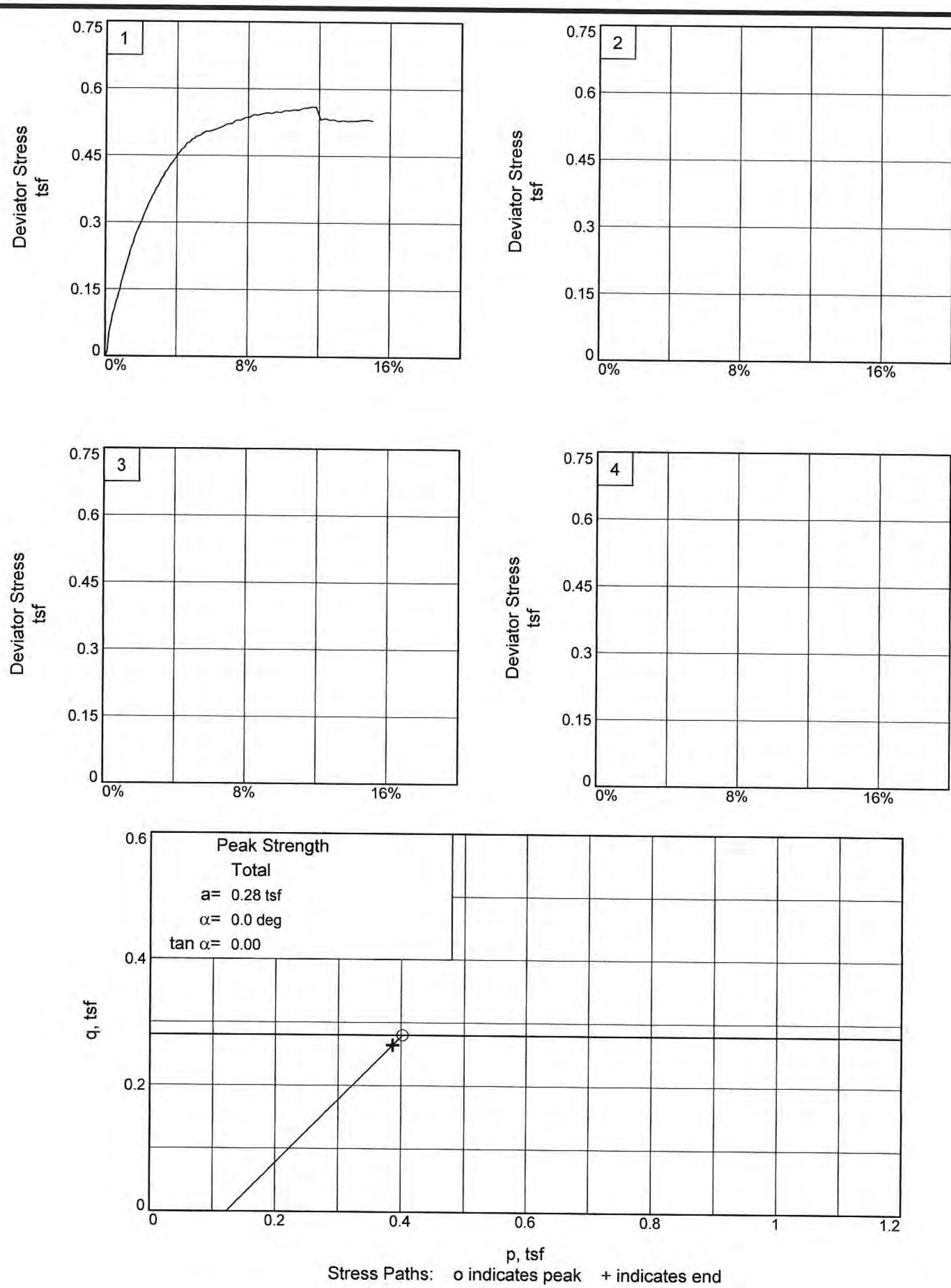
Client:

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



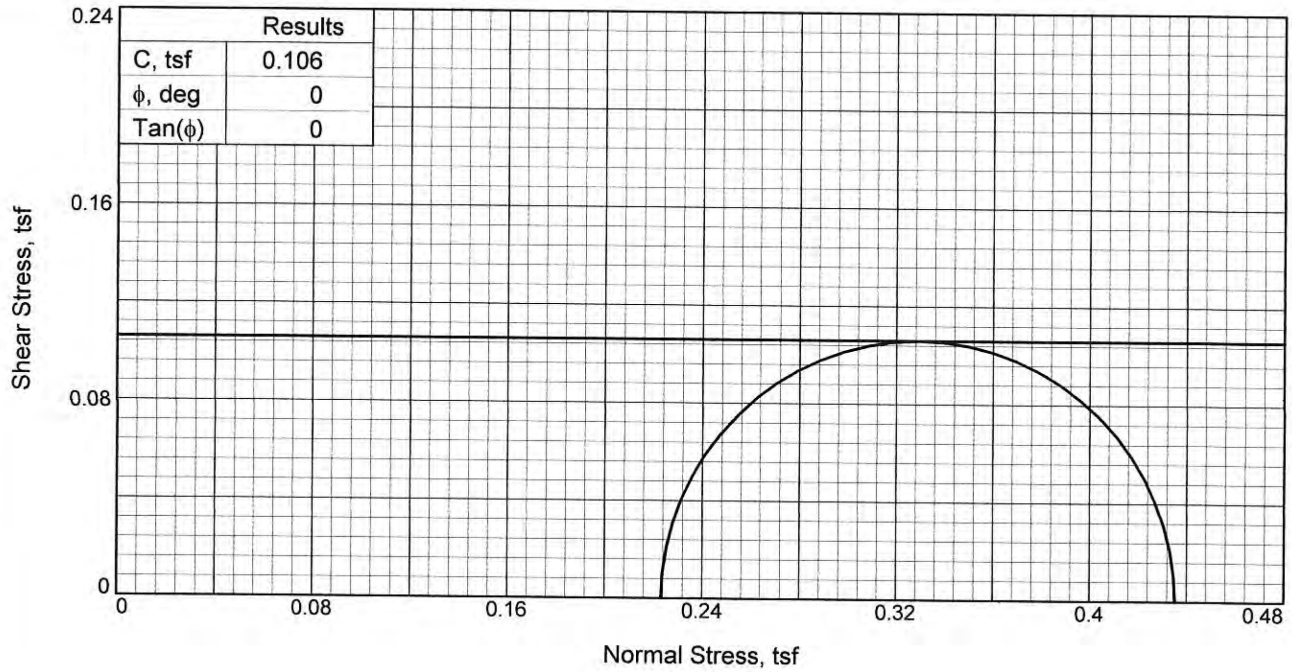
Client:

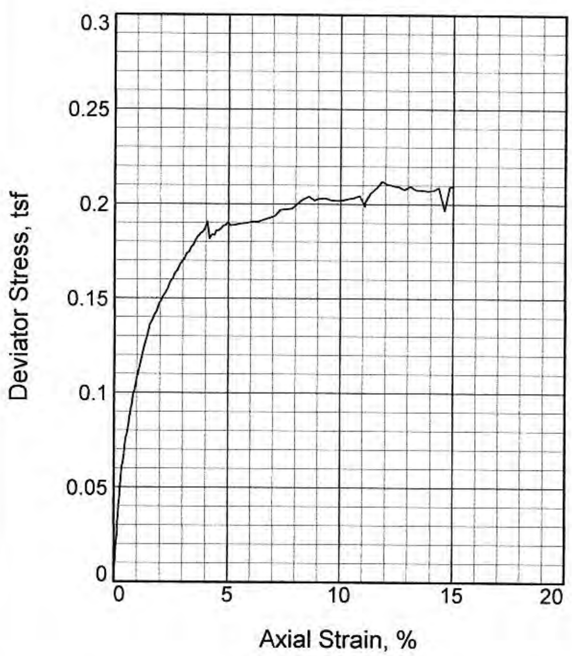
Project: San Jacinto River Waste Pit Superfund Site

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
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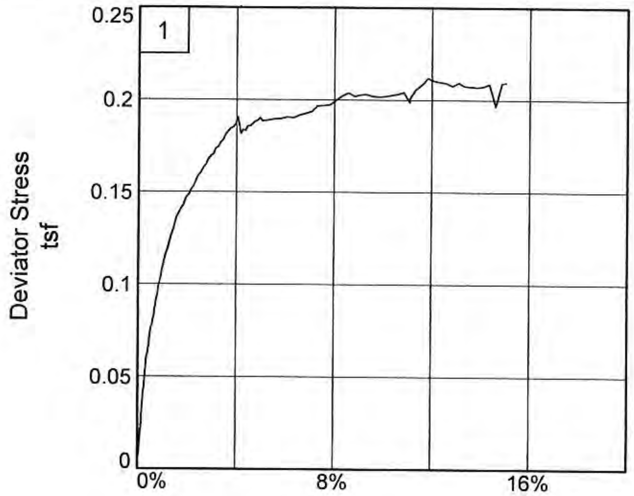
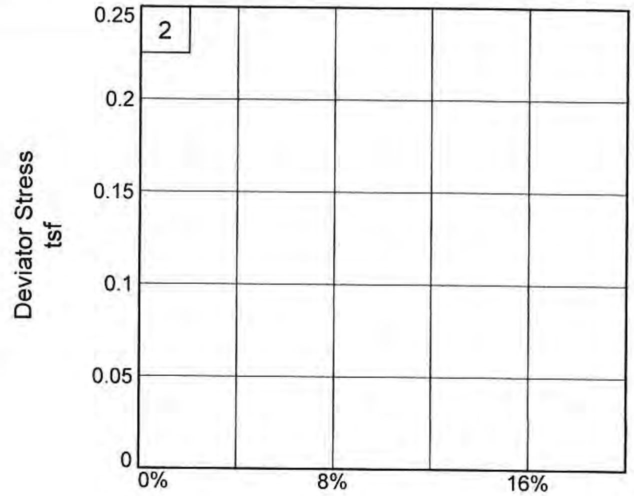
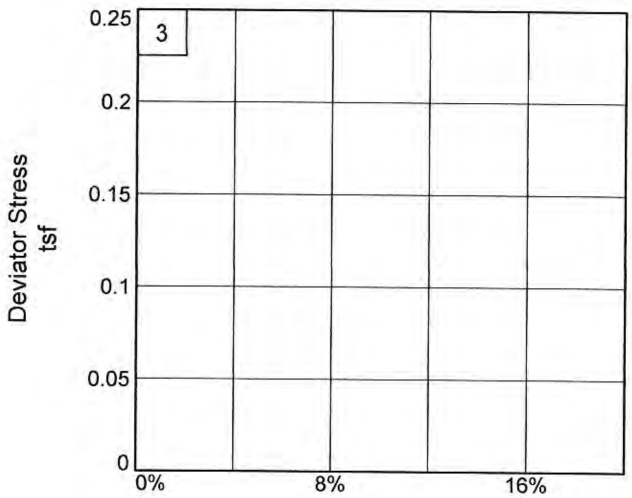
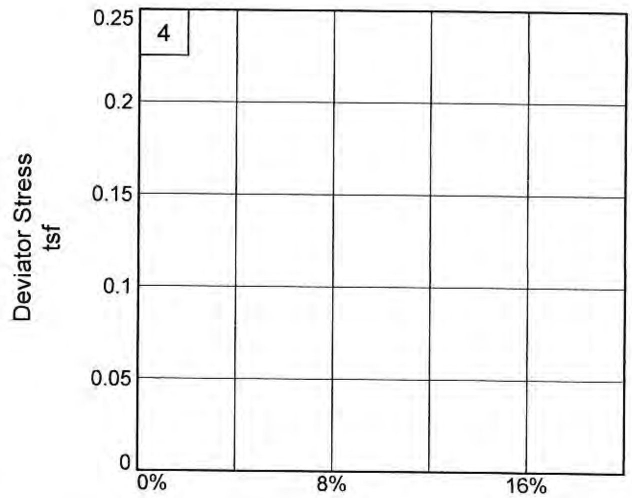
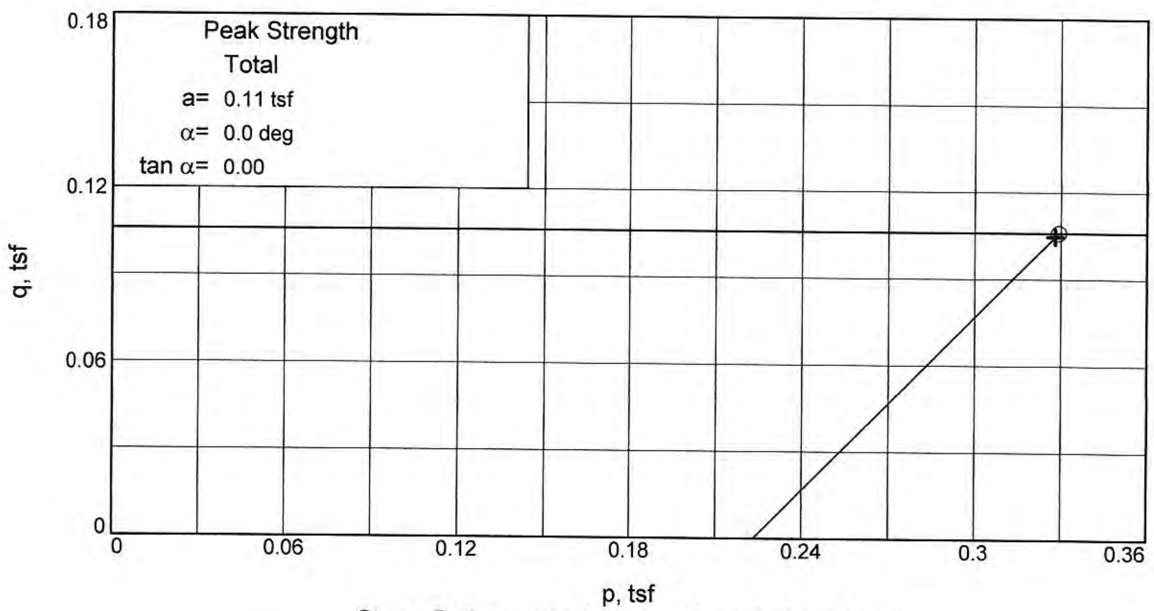
Houston, Texas











Stress Paths: o indicates peak + indicates end

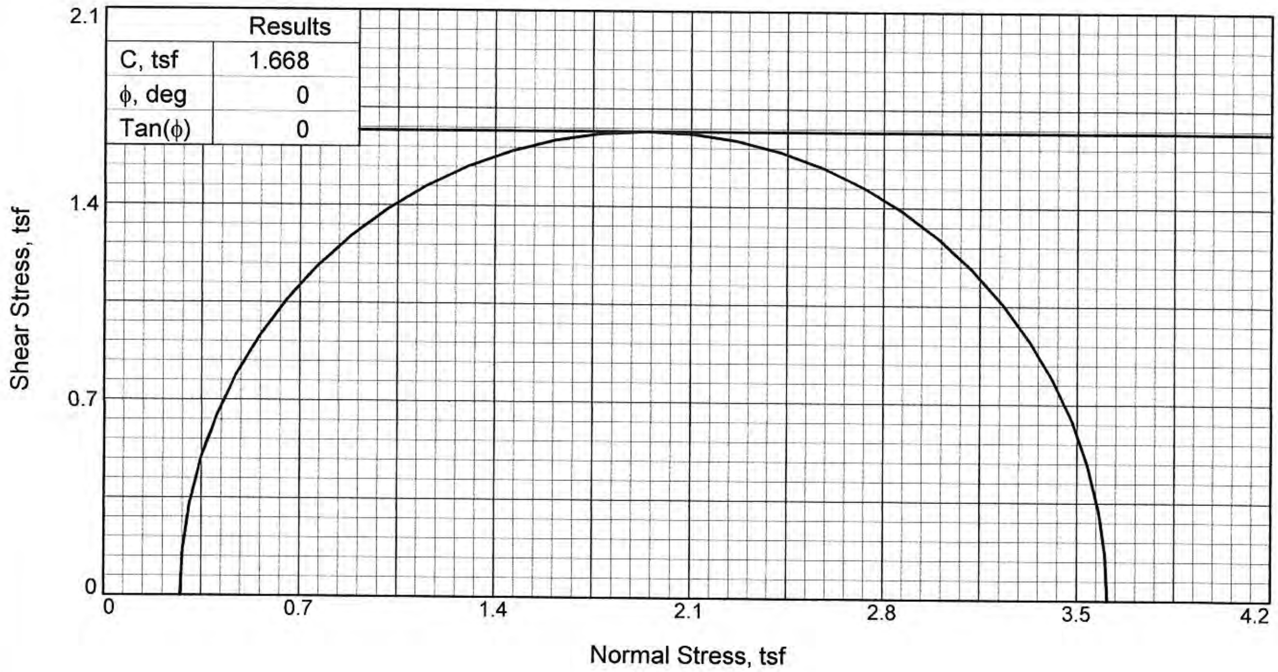
Client:

Project: San Jacinto River Waste Pit Superfund Site

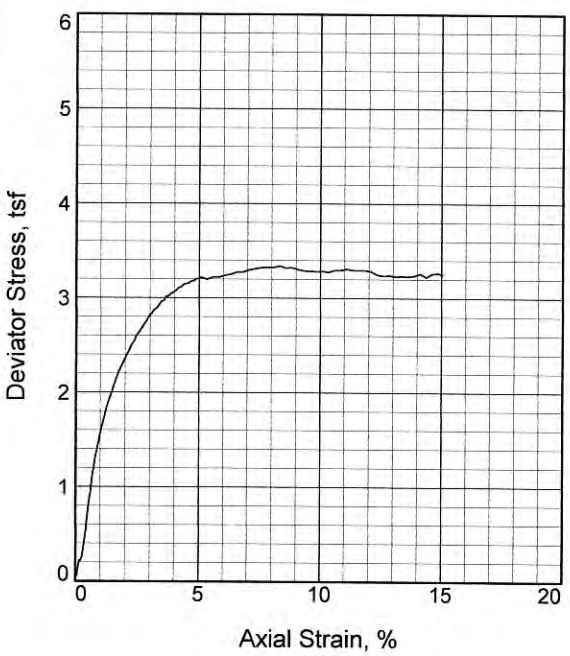
Source of Sample: SJGB024 **Depth:** 8-10

Project No.: 19.15.131 **Figure** _______

TOLUNAY-WONG ENGINEERS, INC.



	Results
C, tsf	1.668
ϕ, deg	0
Tan(ϕ)	0



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 ________

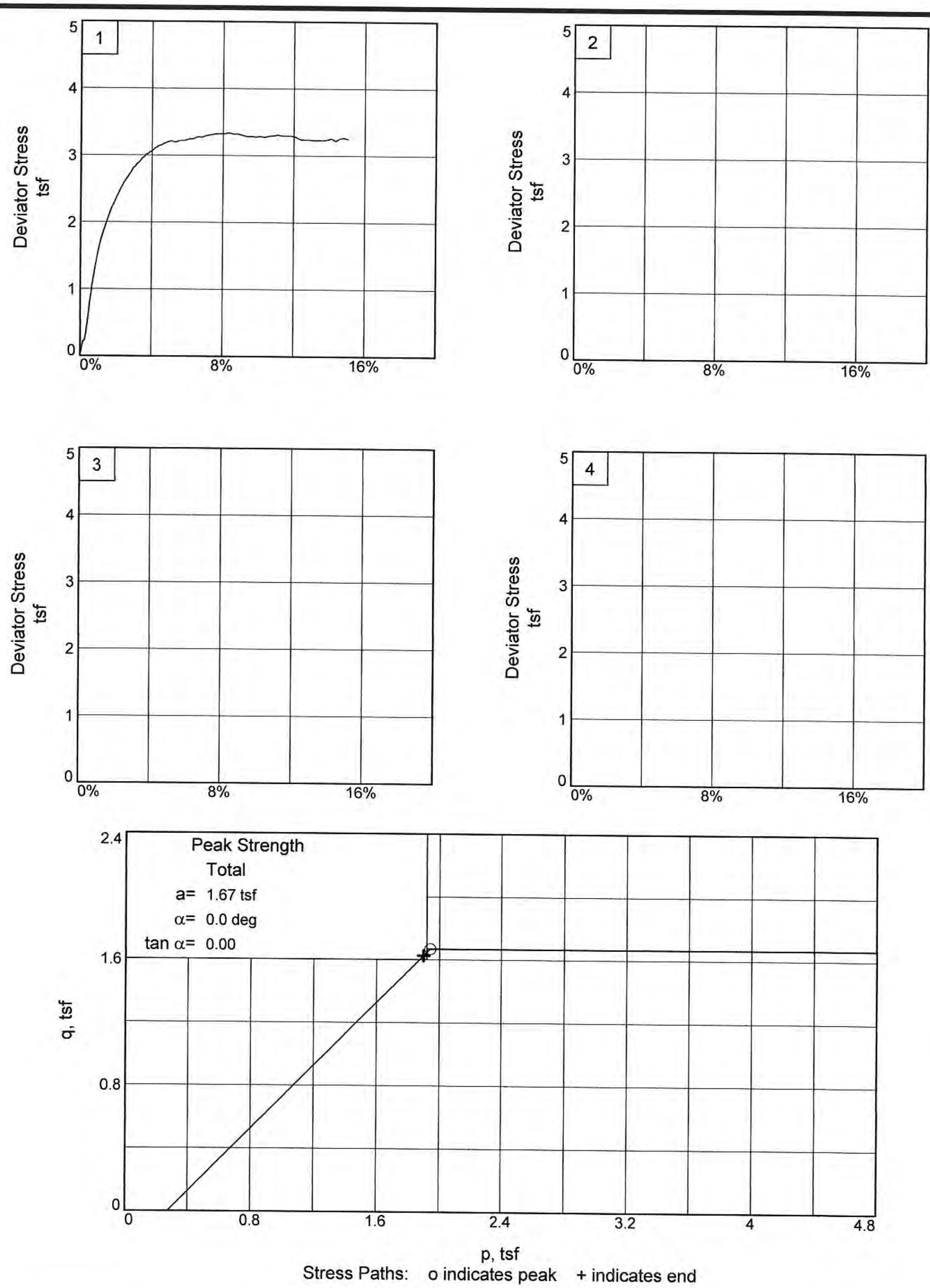
Client:

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



Client:

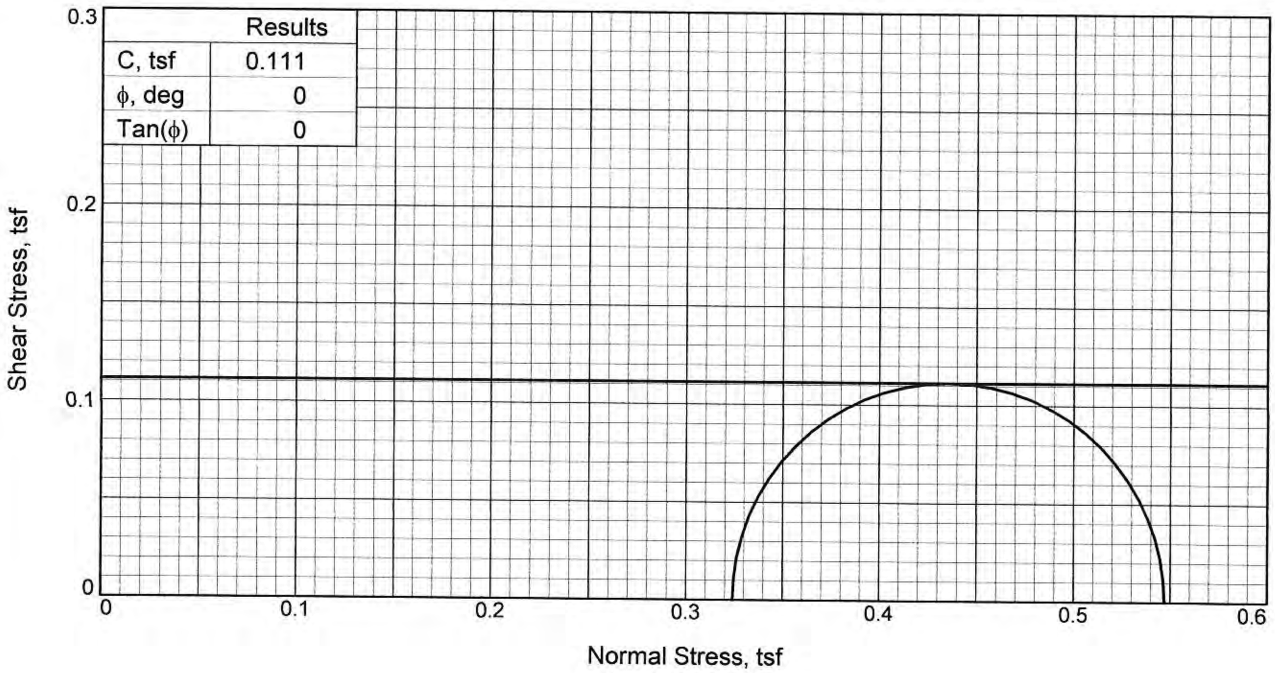
Project: San Jacinto River Waste Pit Superfund Site

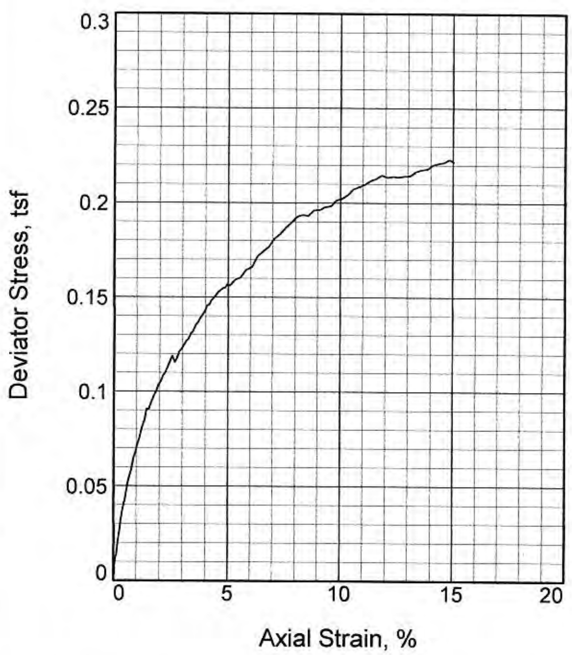
Source of Sample: SJGB024 **Depth:** 10-12

Project No.: 19.15.131 **Figure** _______

TOLUNAY-WONG ENGINEERS, INC.

Attachment Figure B.2-56





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 ________

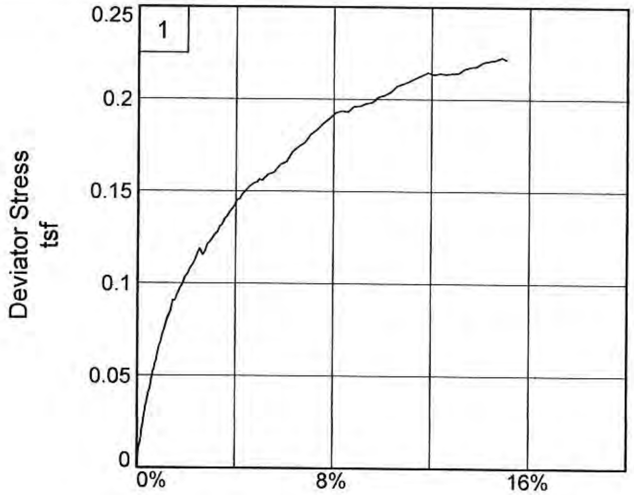
Client:

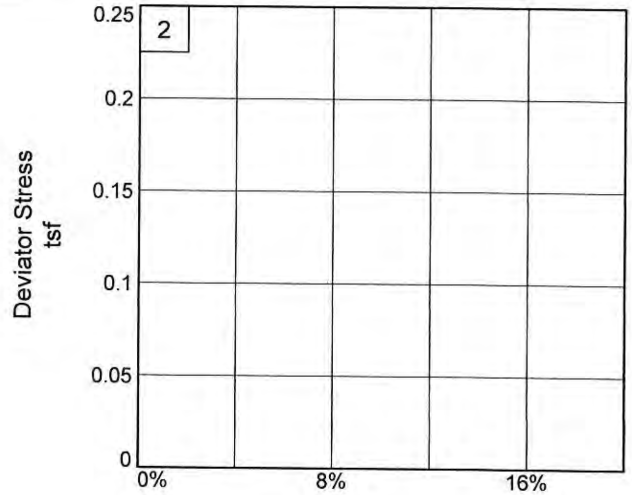
Project: San Jacinto River Waste Pit Superfund Site

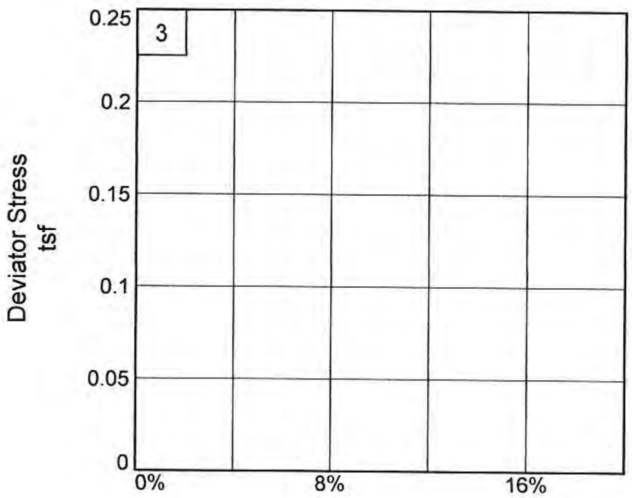
Source of Sample: SJGB024 **Depth:** 12-14

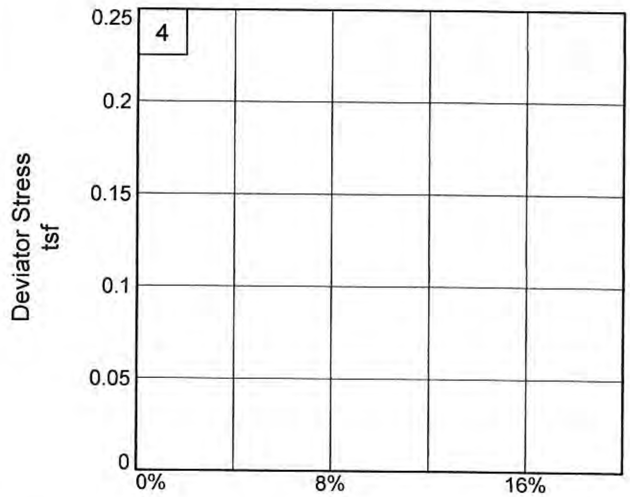
Proj. No.: 19.15.131 **Date Sampled:** 9/18/19

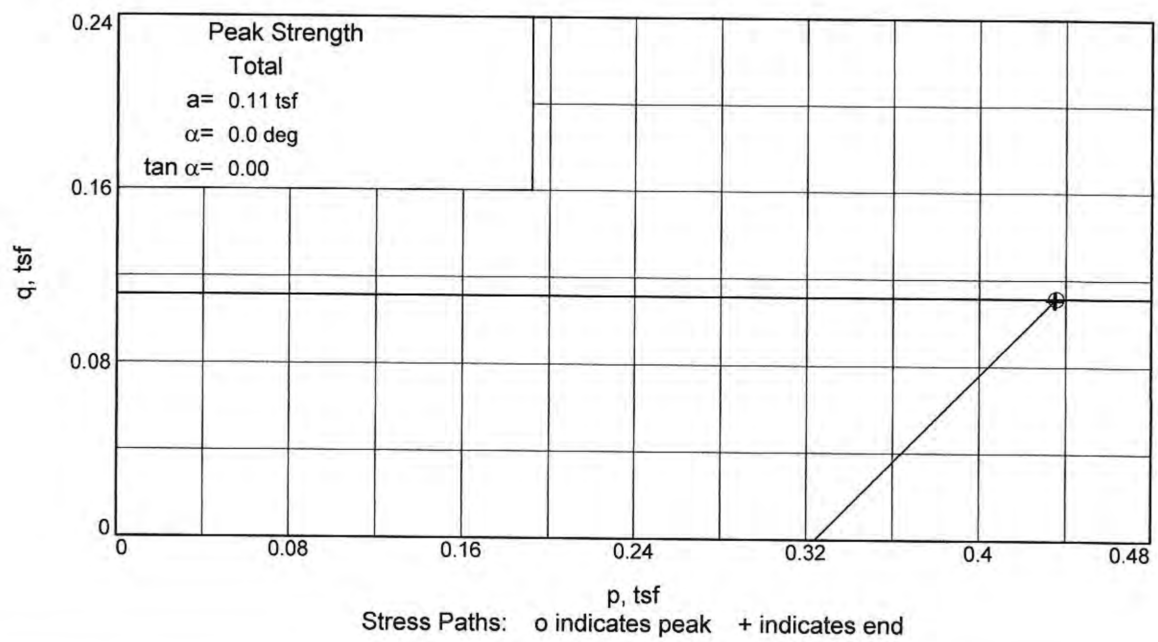
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Client:

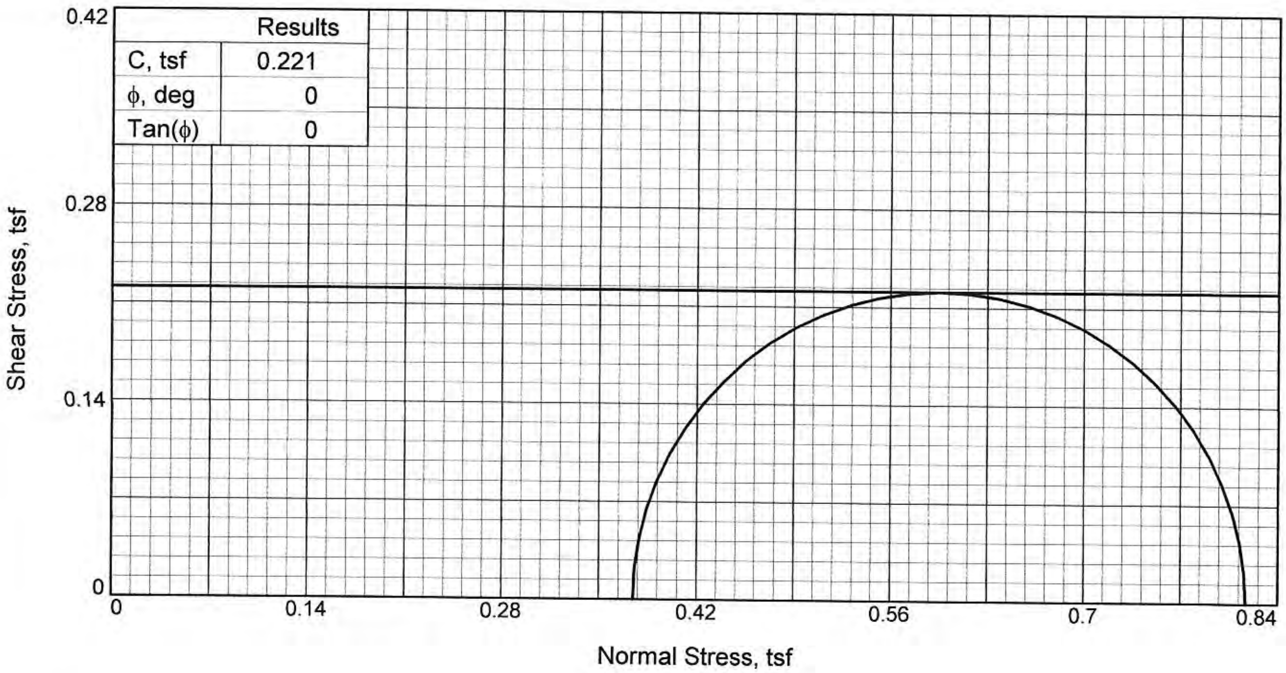
Project: San Jacinto River Waste Pit Superfund Site

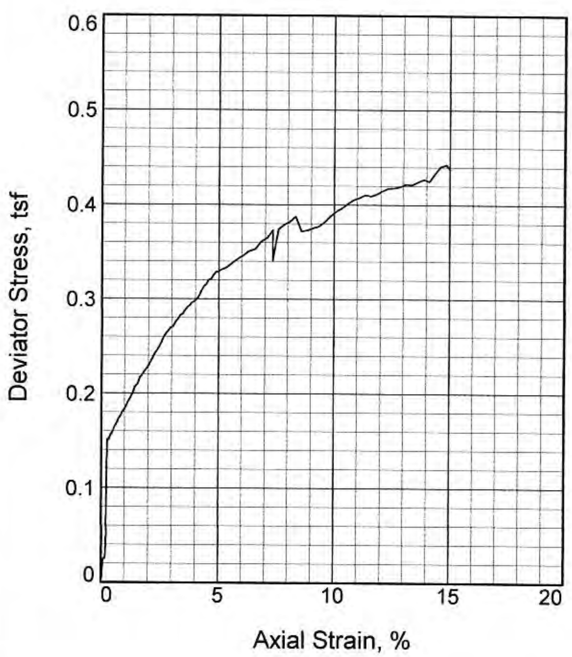
Source of Sample: SJGB024 **Depth:** 12-14

Project No.: 19.15.131 **Figure** _______

TOLUNAY-WONG ENGINEERS, INC.

Attachment Figure B.2-58





	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 ________

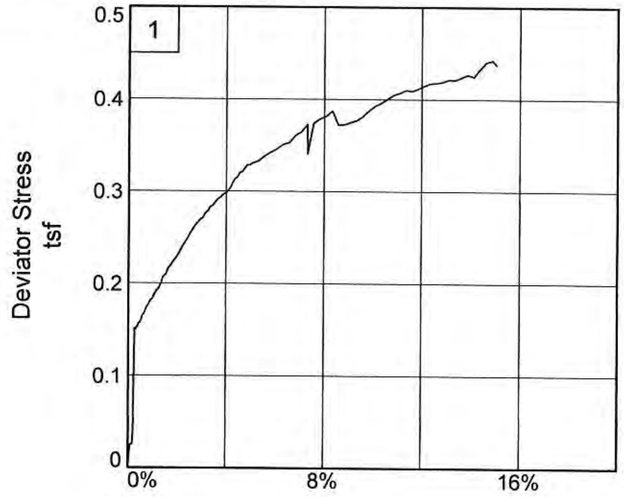
Client:

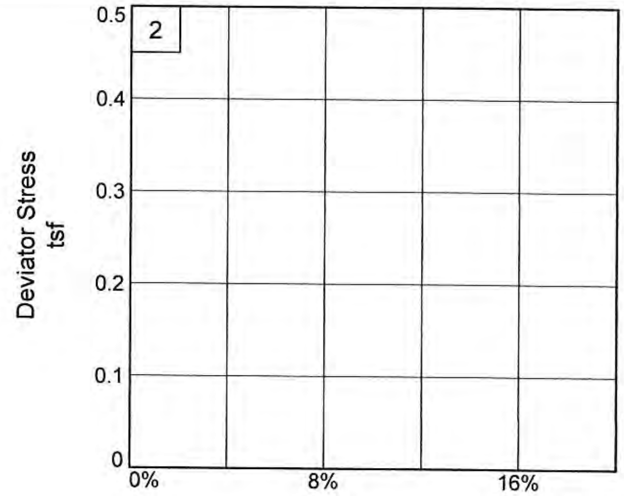
Project: San Jacinto River Waste Pit Superfund Site

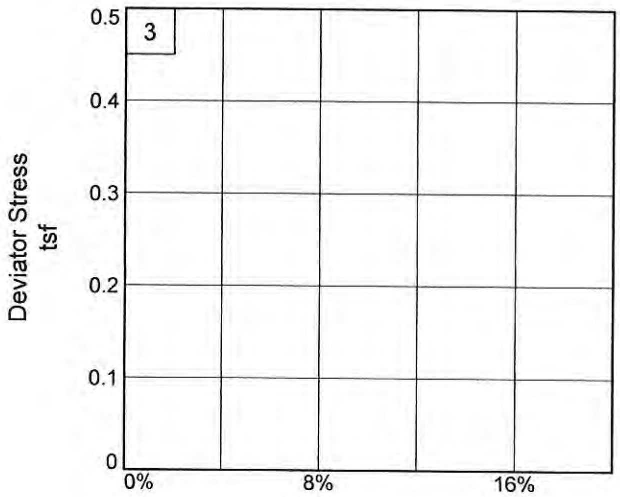
Source of Sample: SJGB024 **Depth:** 14-16

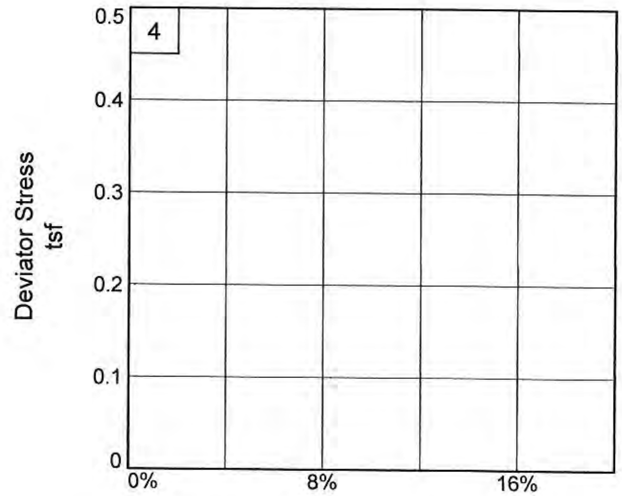
Proj. No.: 19.15.131 **Date Sampled:** 9/18/19

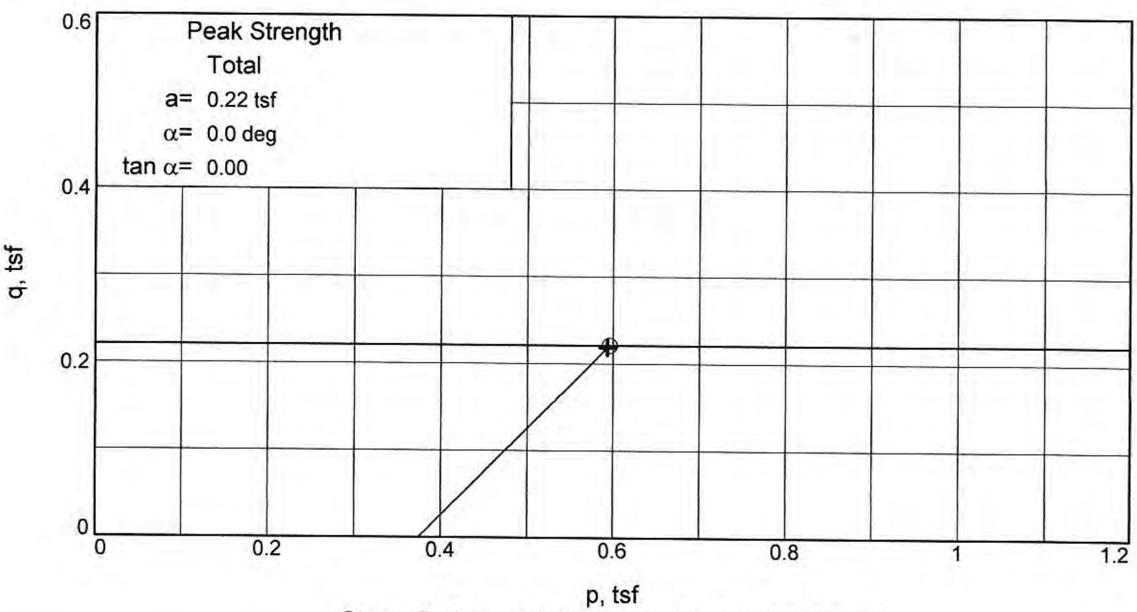
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

Client:

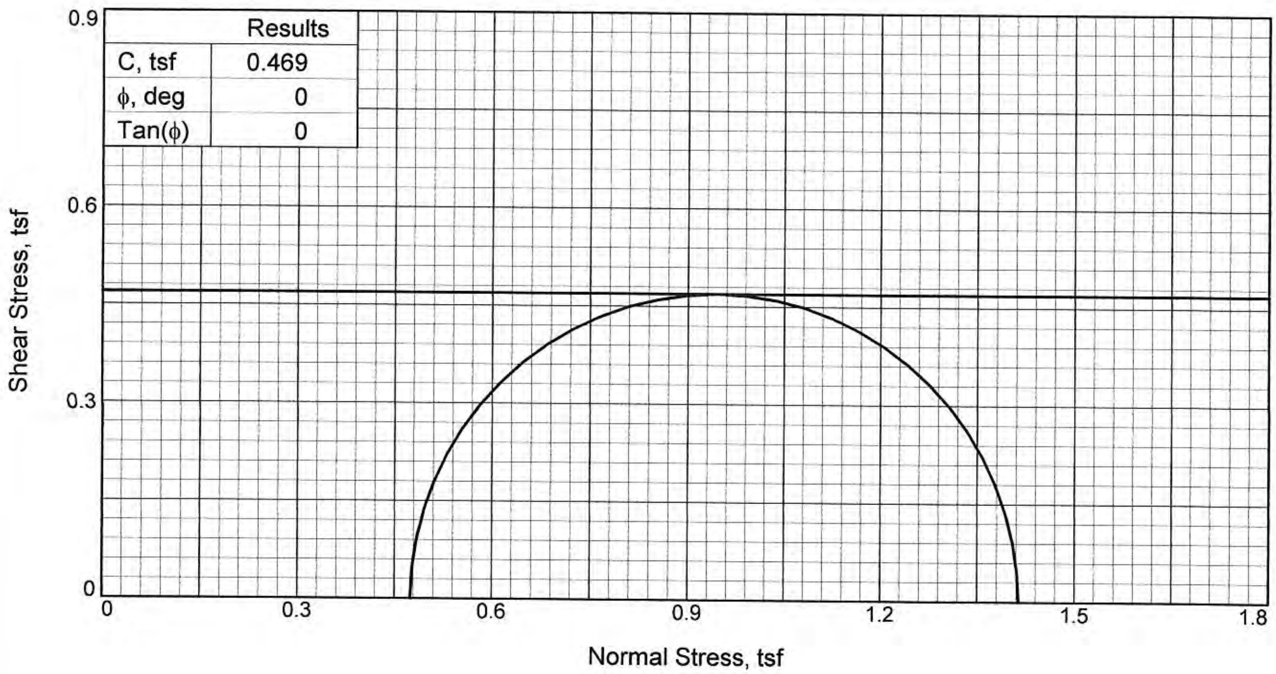
Project: San Jacinto River Waste Pit Superfund Site

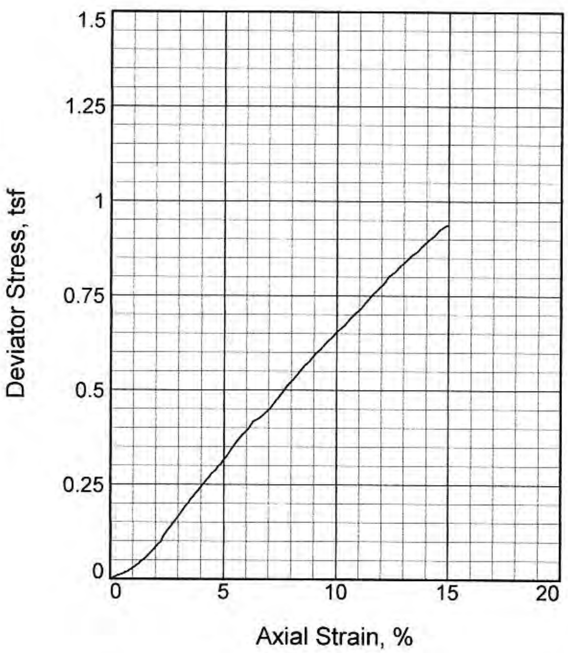
Source of Sample: SJGB024 **Depth:** 14-16

Project No.: 19.15.131 **Figure** _______

TOLUNAY-WONG ENGINEERS, INC.

Attachment Figure B.2-60





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

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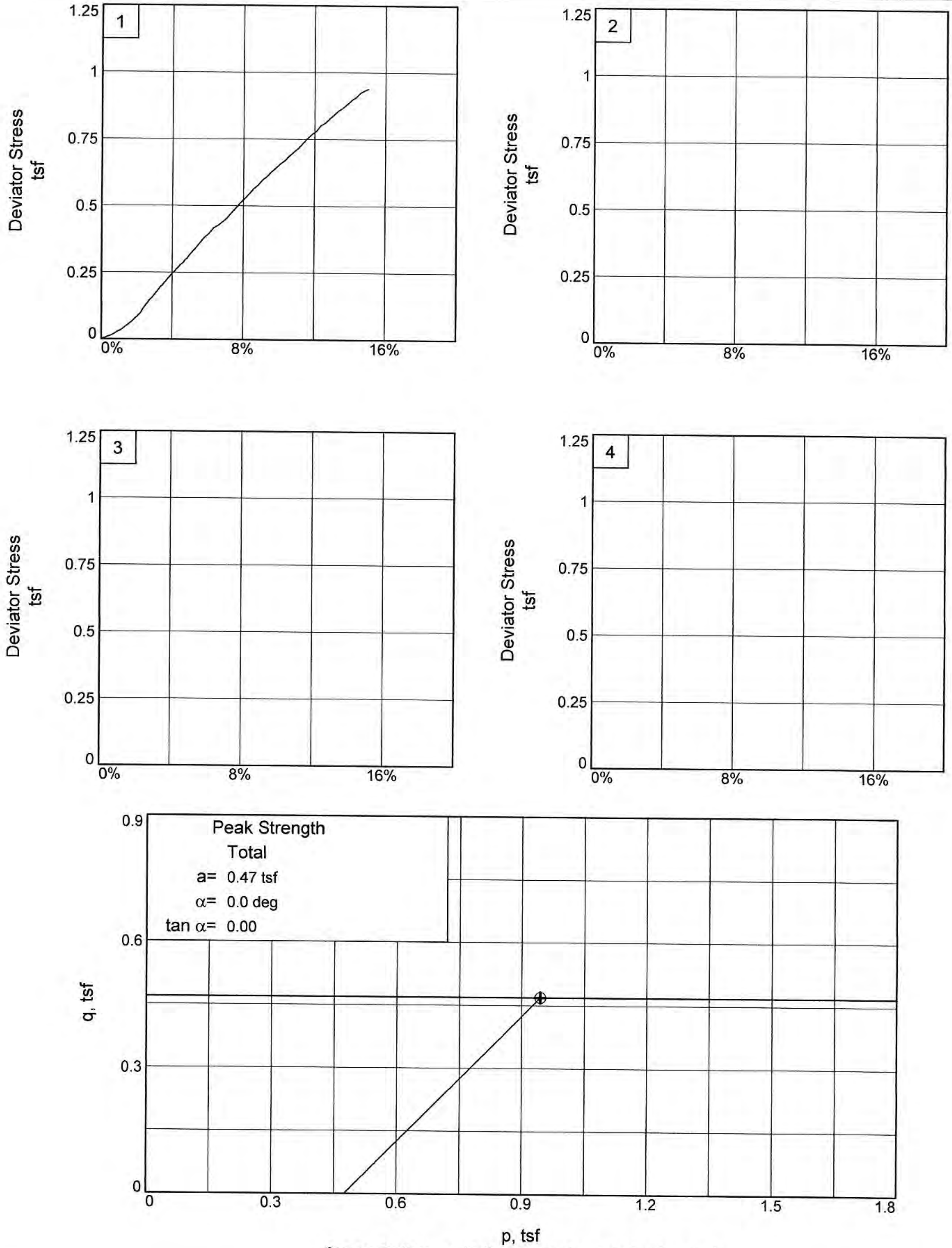
Houston, Texas



Stress Paths: o indicates peak + indicates end

Client:

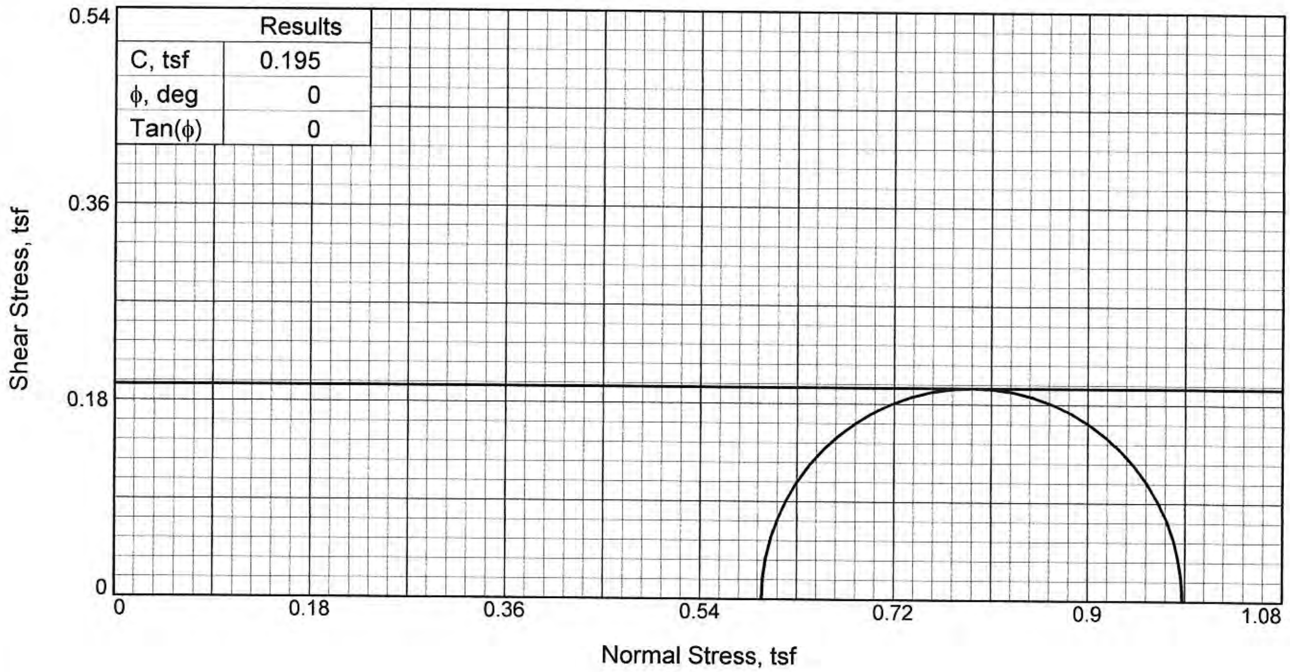
Project: San Jacinto River Waste Pit Superfund Site

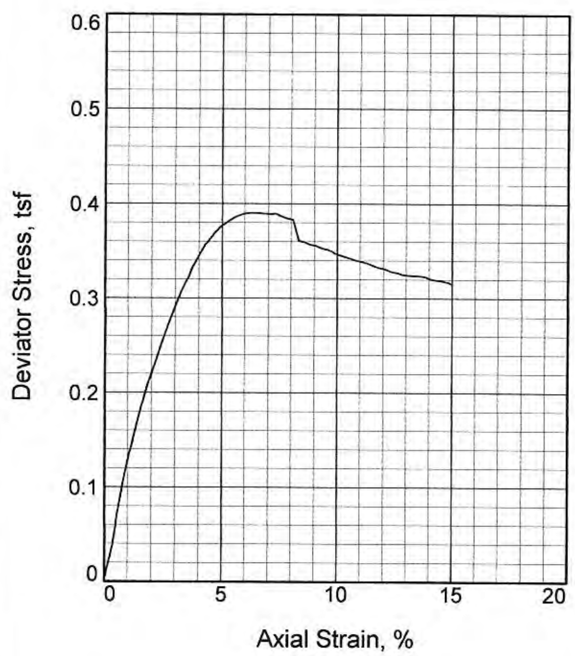
Source of Sample: SJGB024 **Depth:** 18-20

Project No.: 19.15.131 **Figure** _______

TOLUNAY-WONG ENGINEERS, INC.

Attachment Figure B.2-62





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

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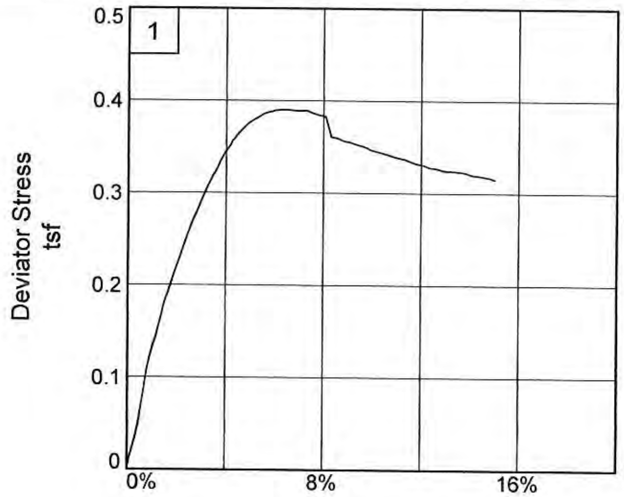
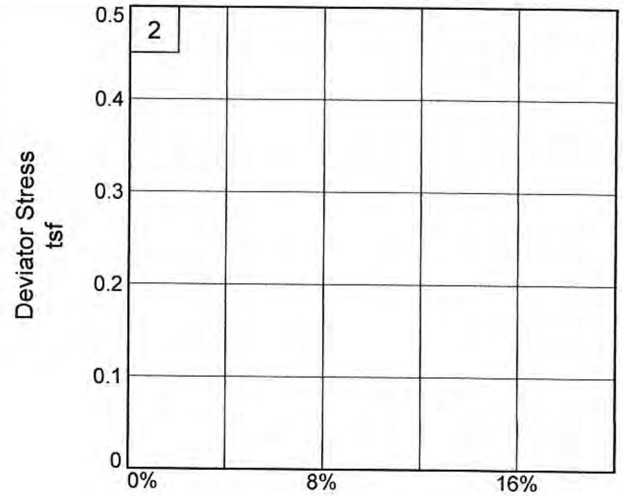
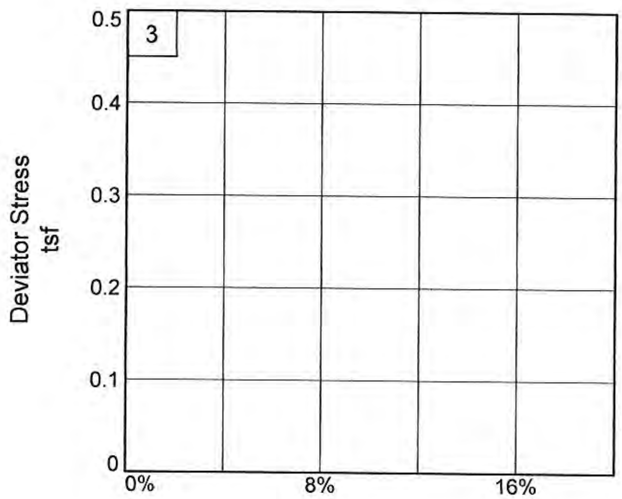
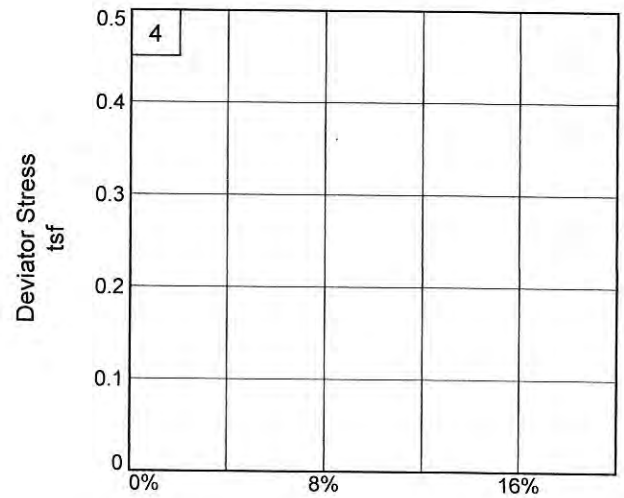
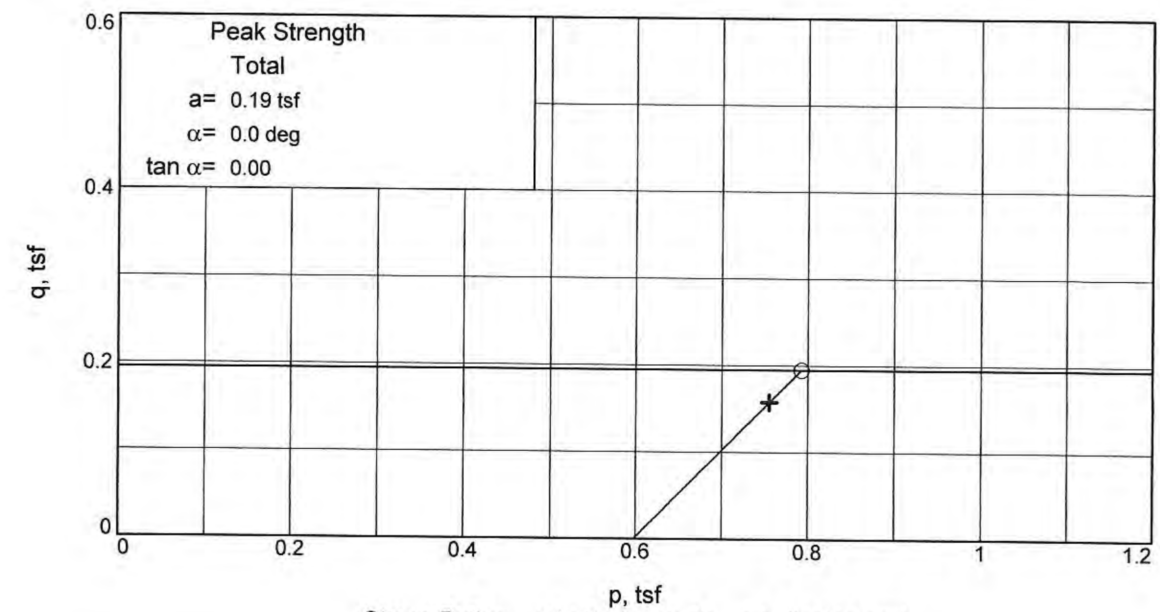
Houston, Texas











Stress Paths: o indicates peak + indicates end

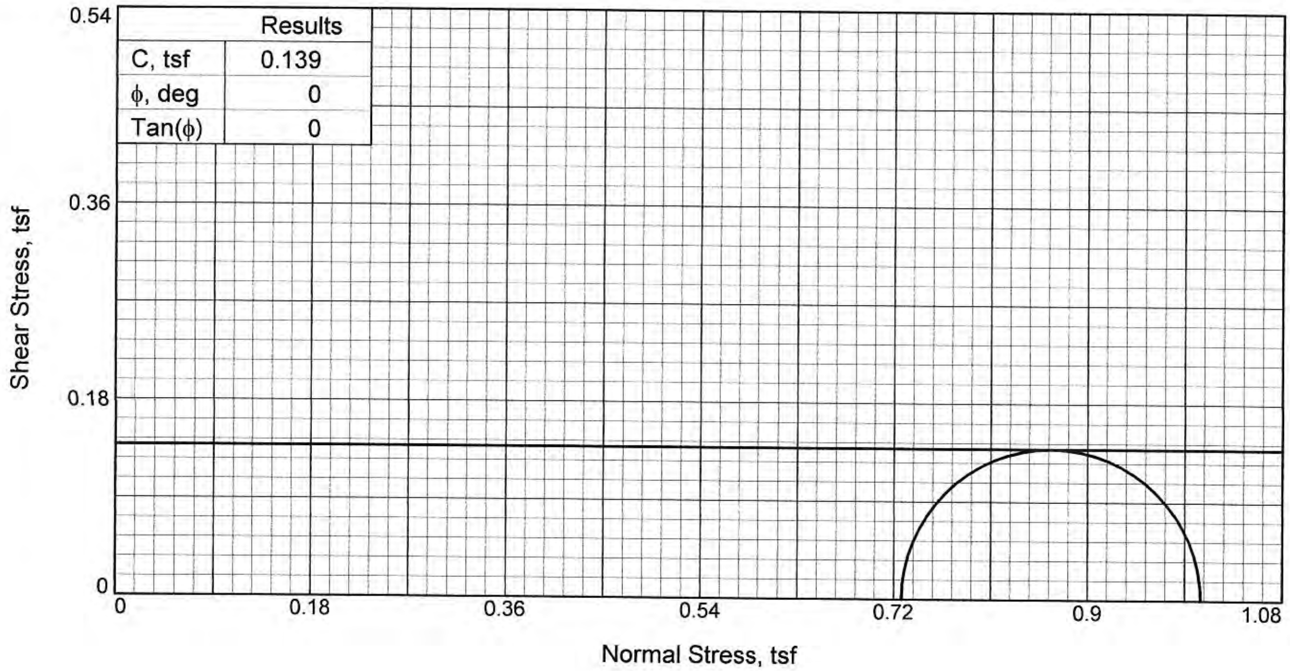
Client:

Project: San Jacinto River Waste Pit Superfund Site

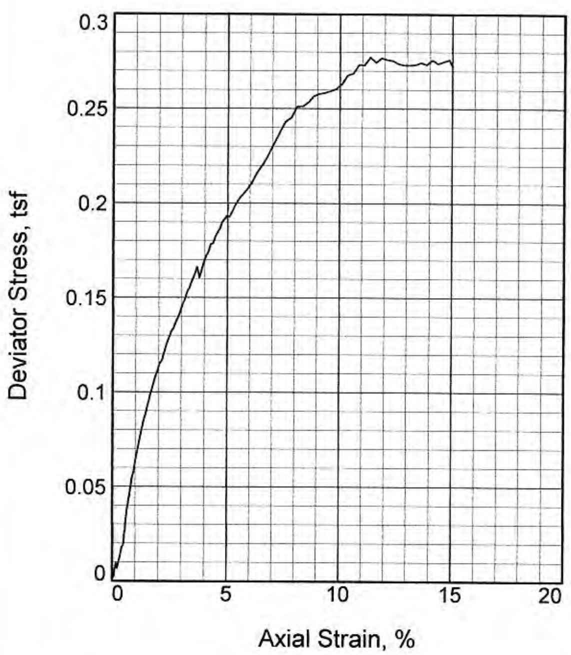
Source of Sample: SJGB024 **Depth:** 23-25

Project No.: 19.15.131 **Figure** _______

TOLUNAY-WONG ENGINEERS, INC.



	Results
C, tsf	0.139
ϕ, deg	0
Tan(ϕ)	0



	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

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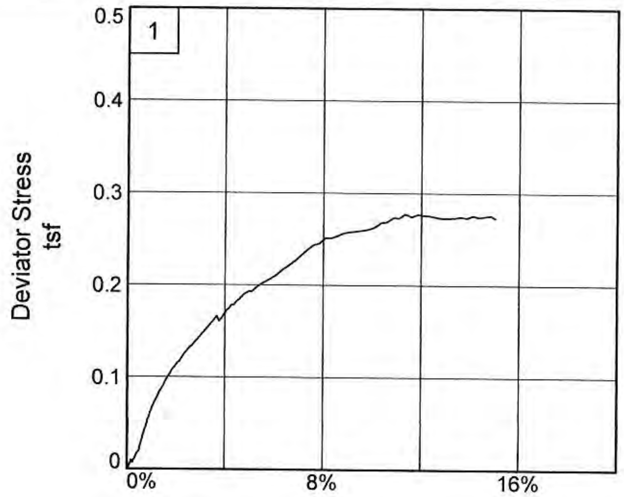
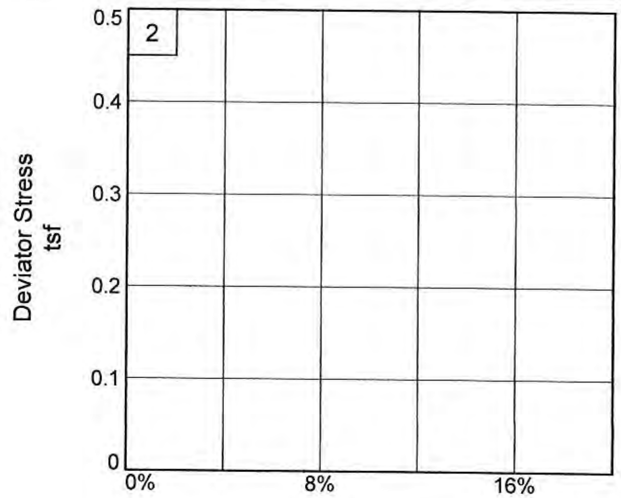
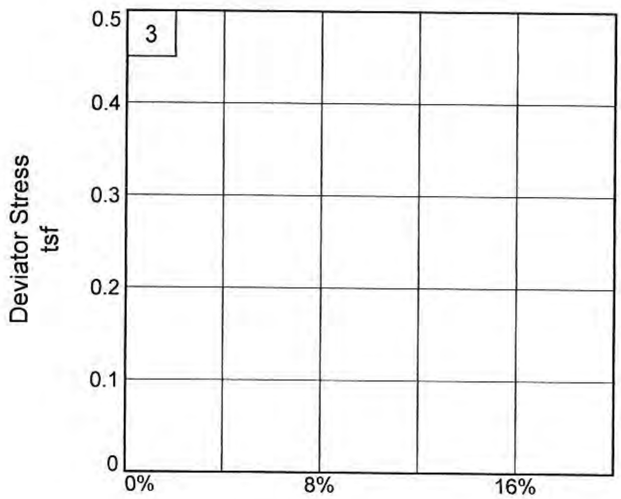
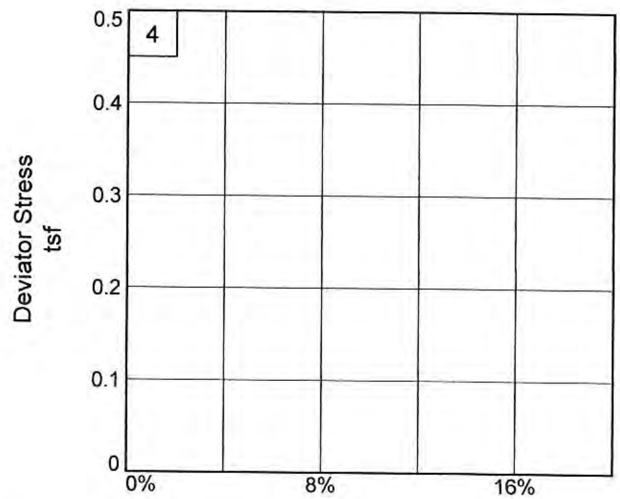
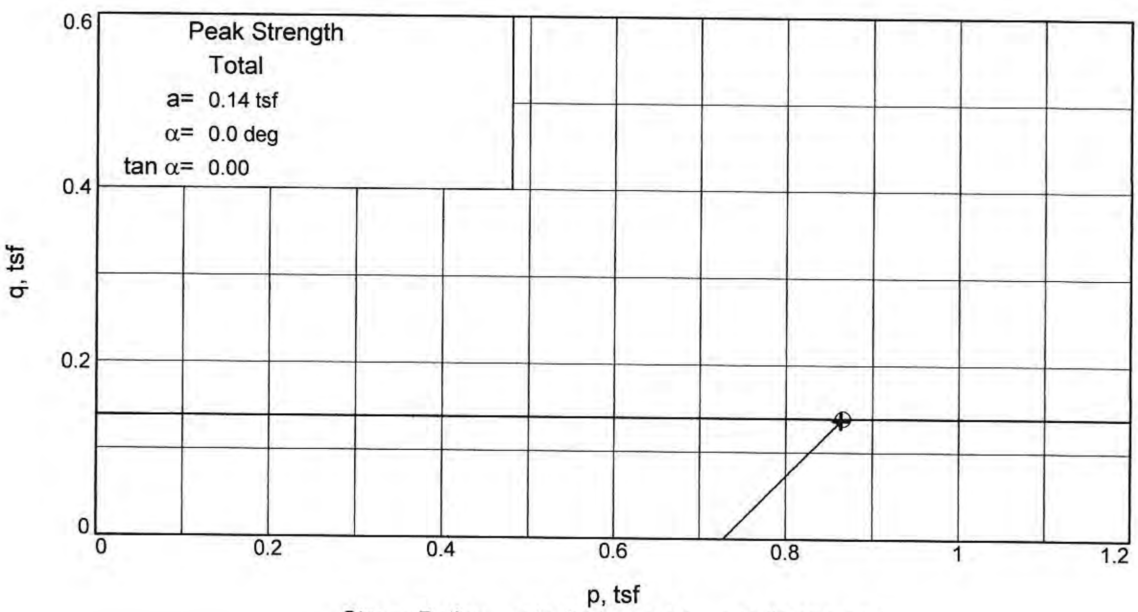










Stress Paths: o indicates peak + indicates end

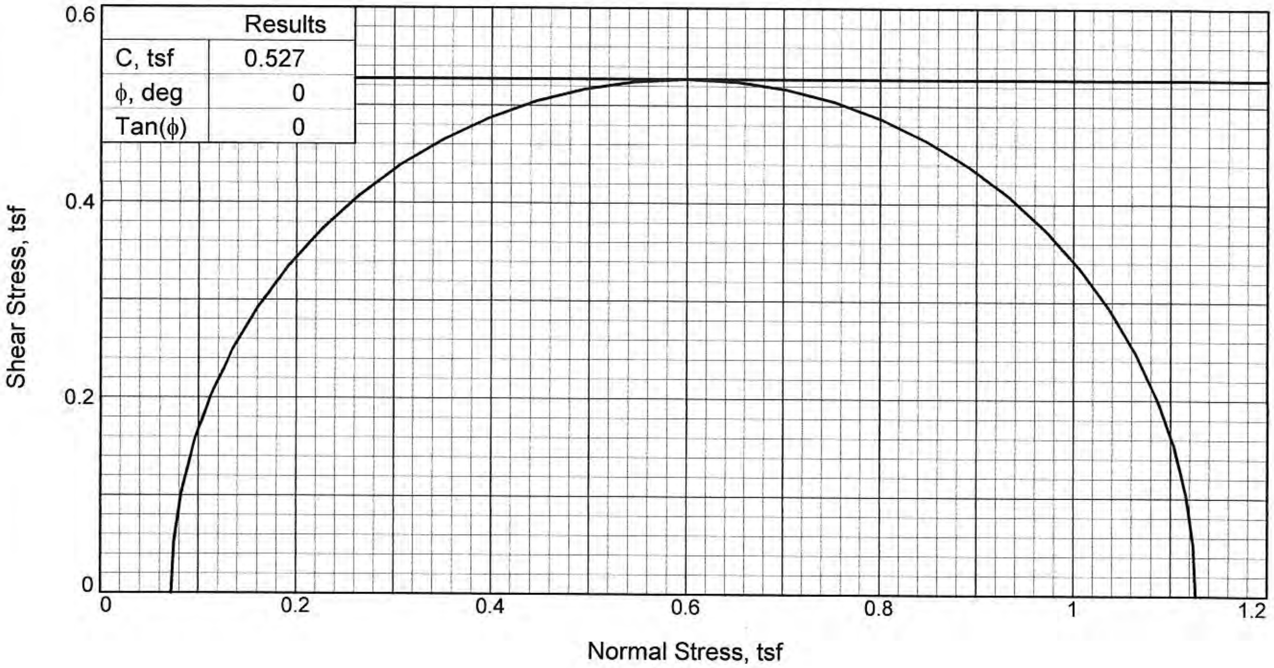
Client:

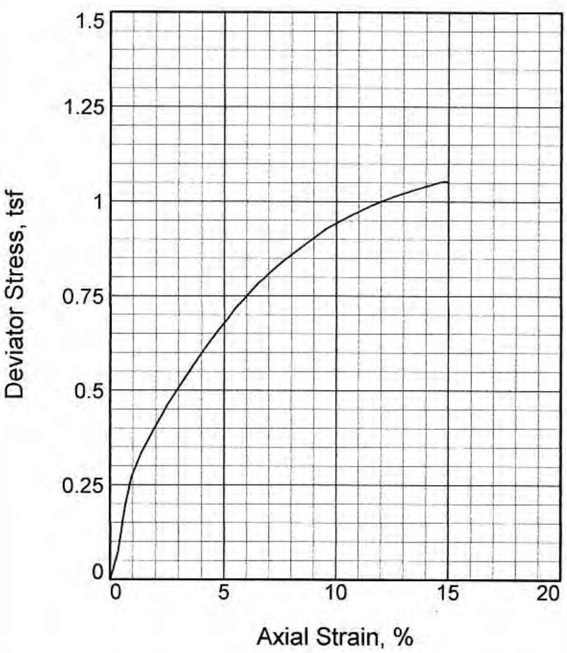
Project: San Jacinto River Waste Pit Superfund Site

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
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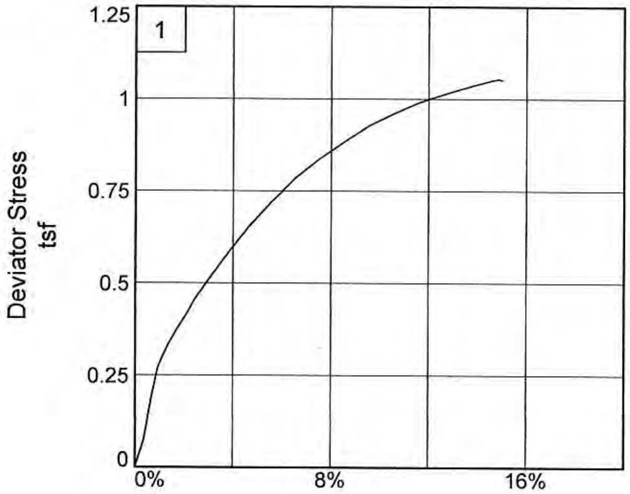
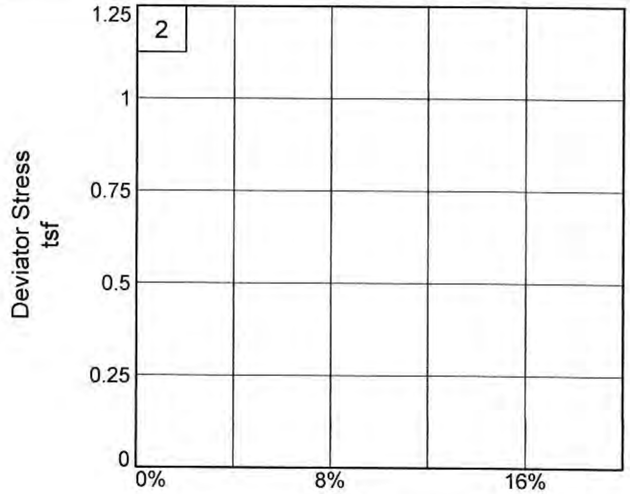
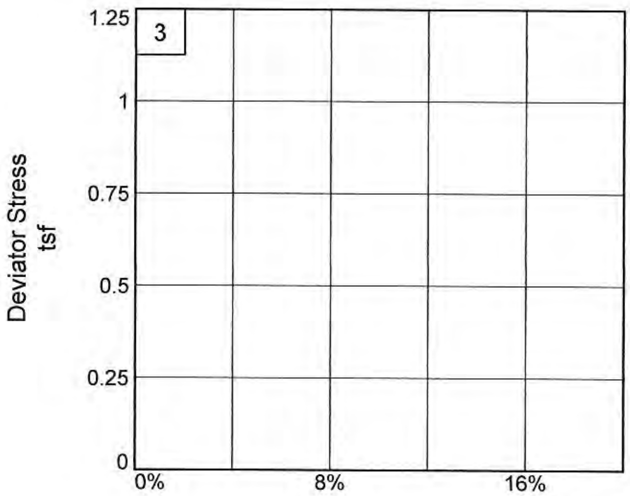
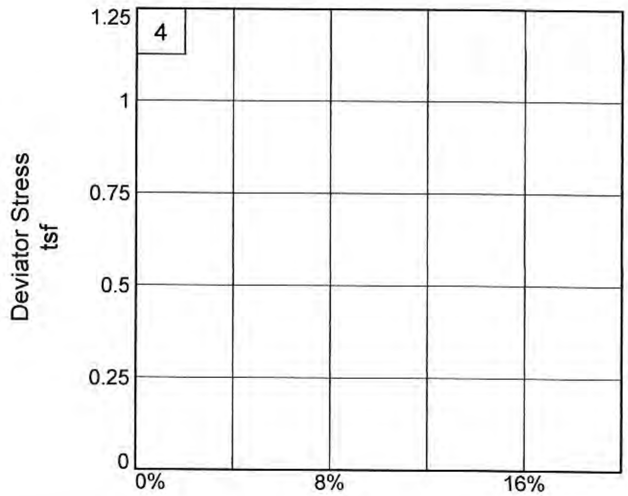
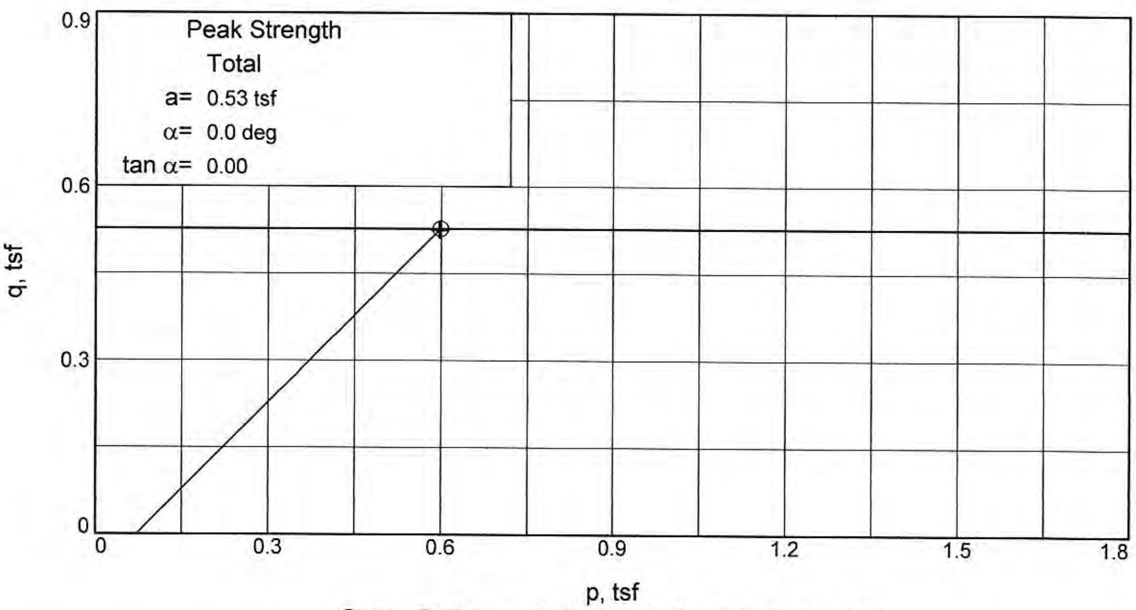
Houston, Texas











Stress Paths: o indicates peak + indicates end

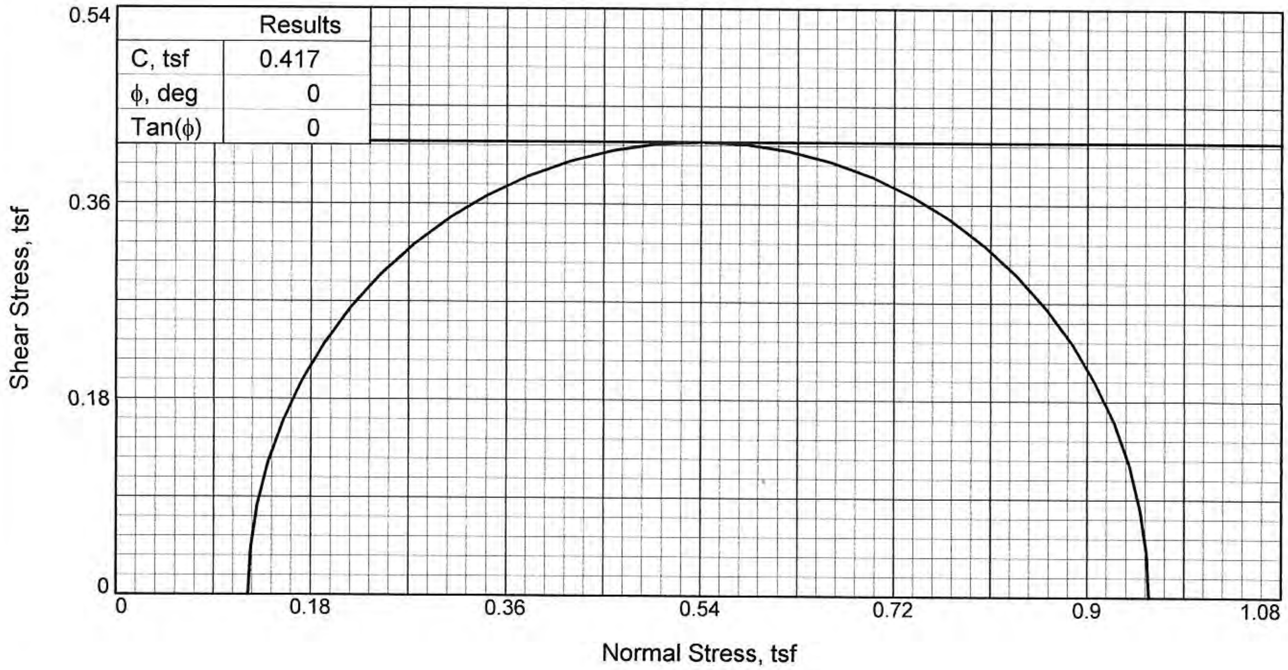
Client:

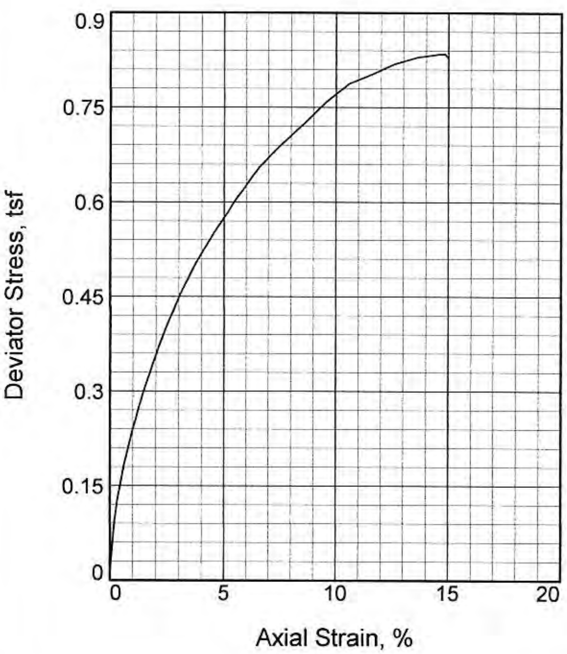
Project: San Jacinto River Waste Pit Superfund Site

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 ________

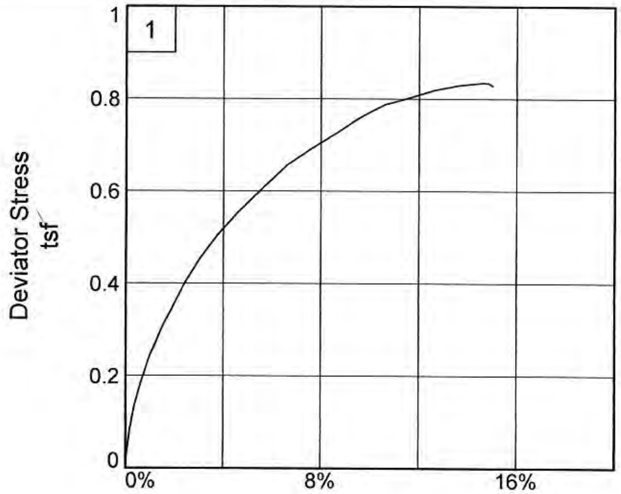
Client:

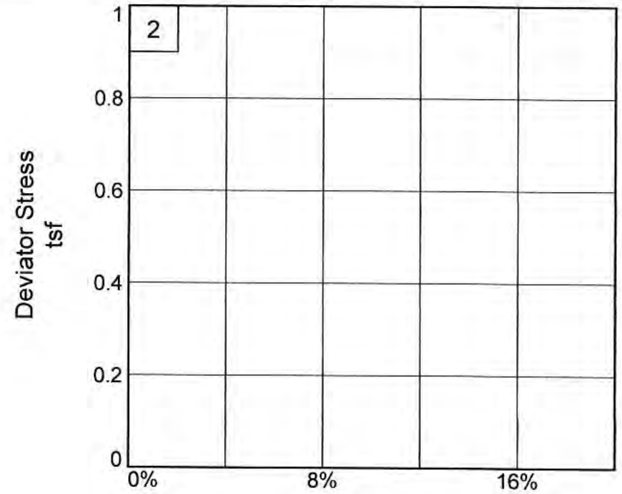
Project: San Jacinto River Waste Pit Superfund Site

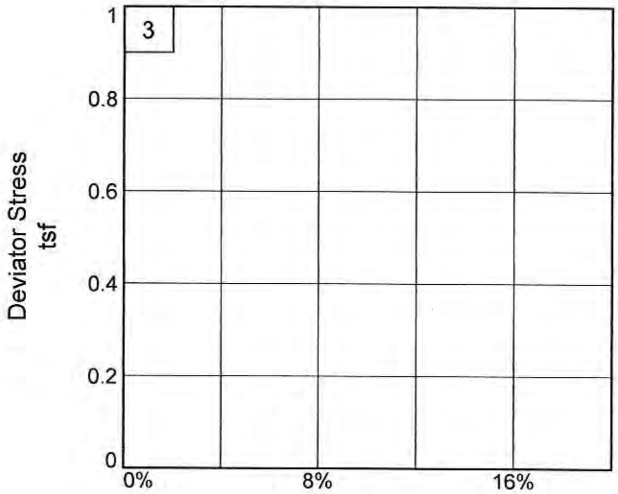
Source of Sample: SJGB025 **Depth:** 4-6

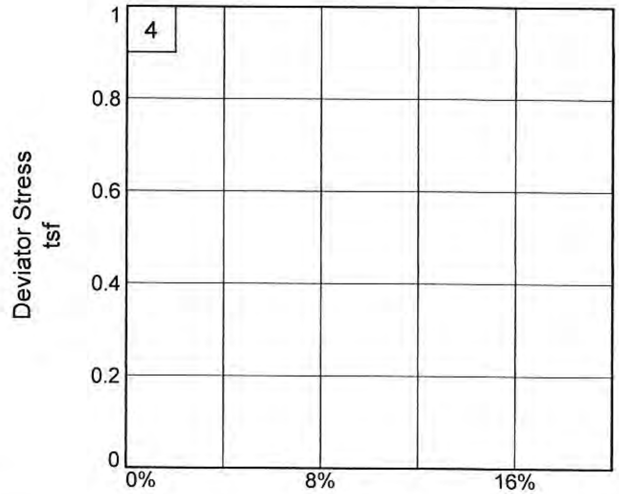
Proj. No.: 19.15.131 **Date Sampled:** 9/19/19

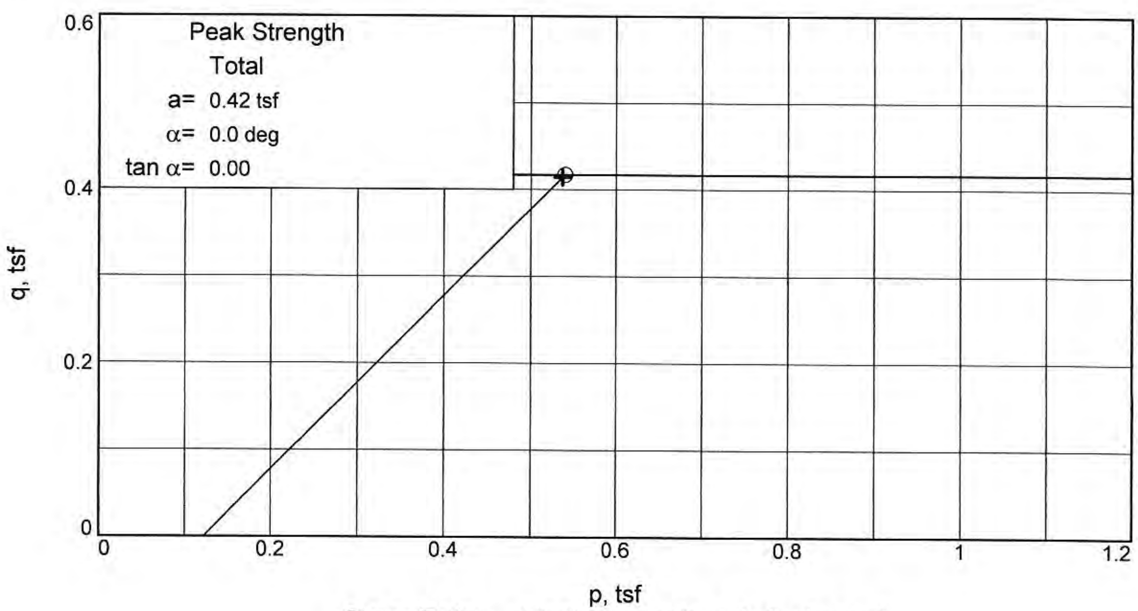
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

Client:

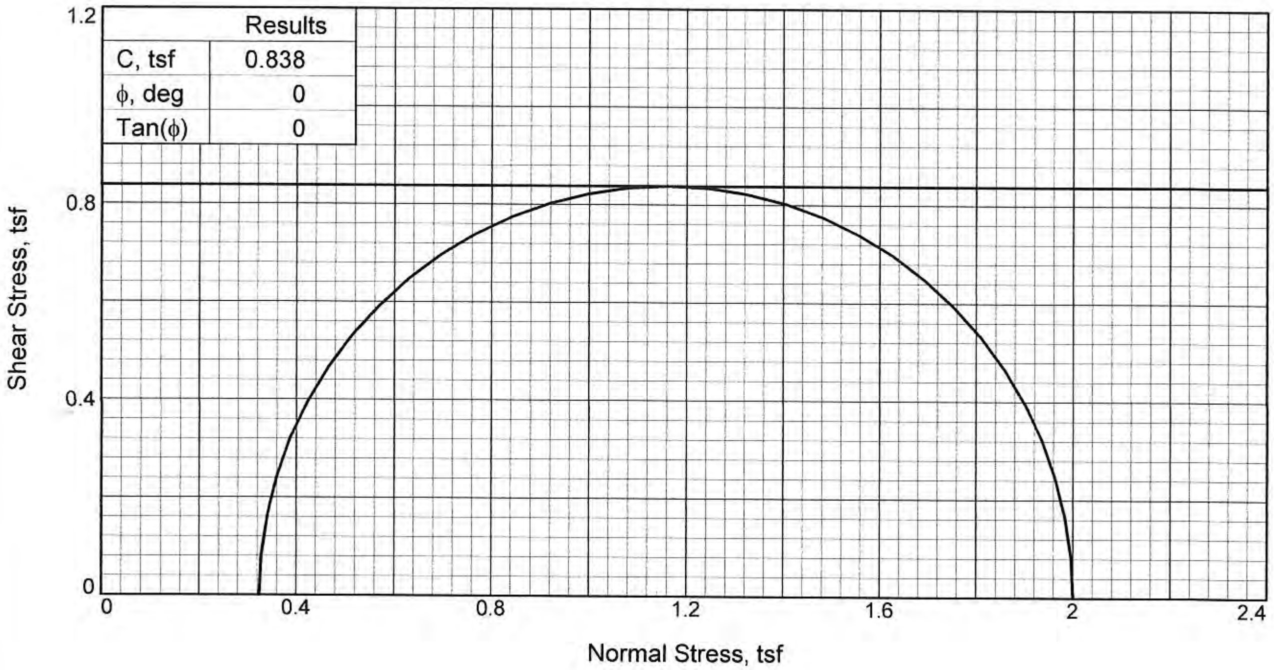
Project: San Jacinto River Waste Pit Superfund Site

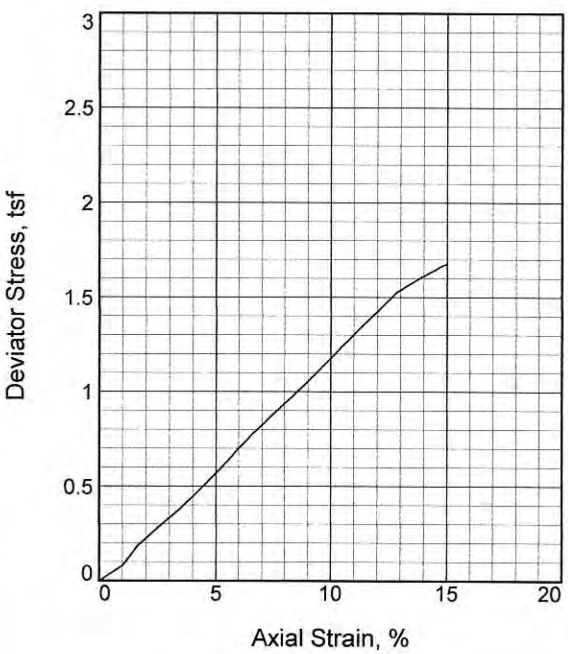
Source of Sample: SJGB025 **Depth:** 4-6

Project No.: 19.15.131 **Figure** _______

TOLUNAY-WONG ENGINEERS, INC.

Attachment Figure B.2-70





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 ________

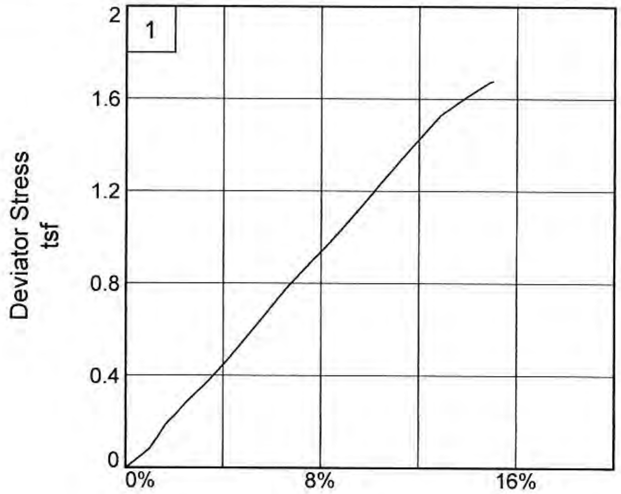
Client:

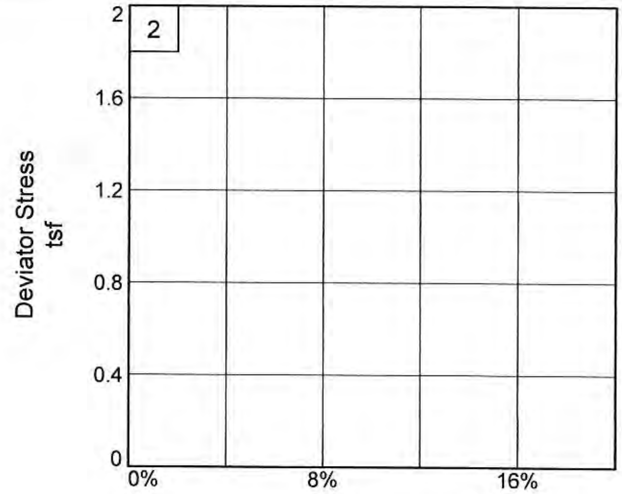
Project: San Jacinto River Waste Pit Superfund Site

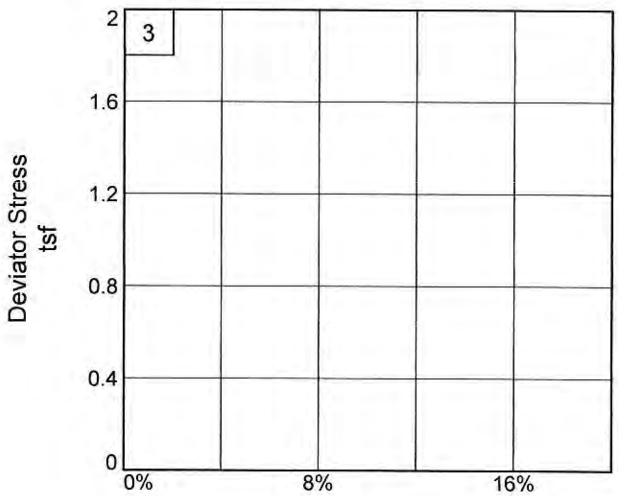
Source of Sample: SJGB025 **Depth:** 12-14

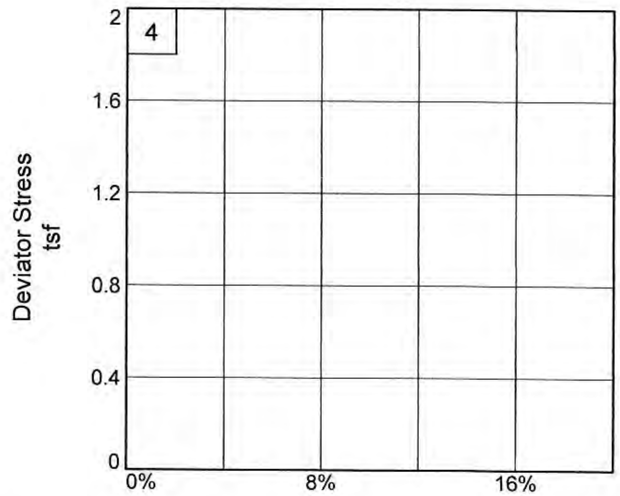
Proj. No.: 19.15.131 **Date Sampled:** 9/19/19

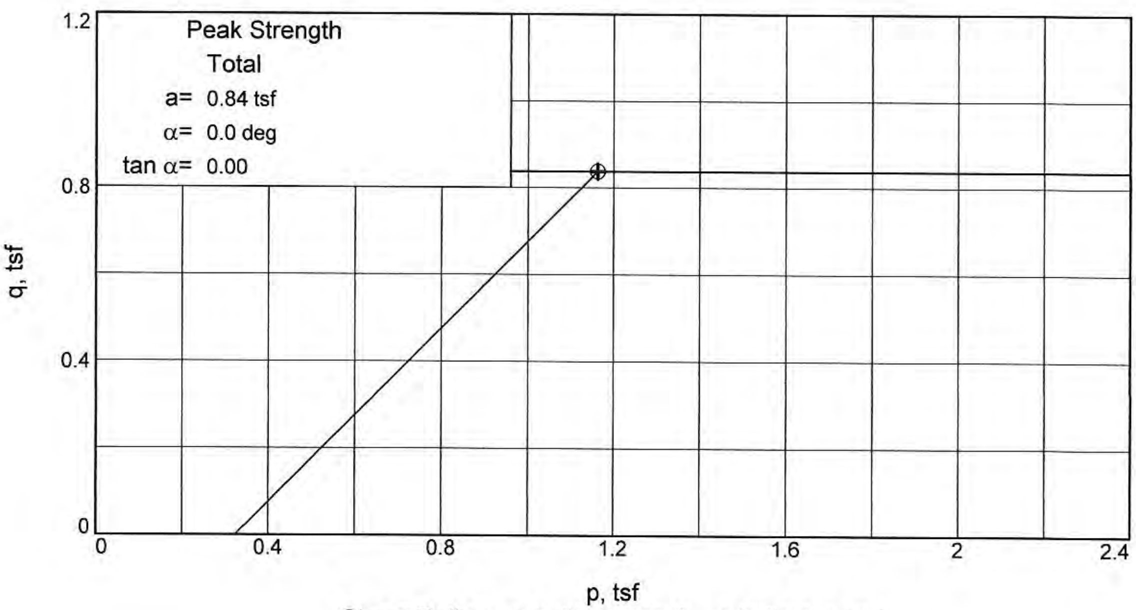
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

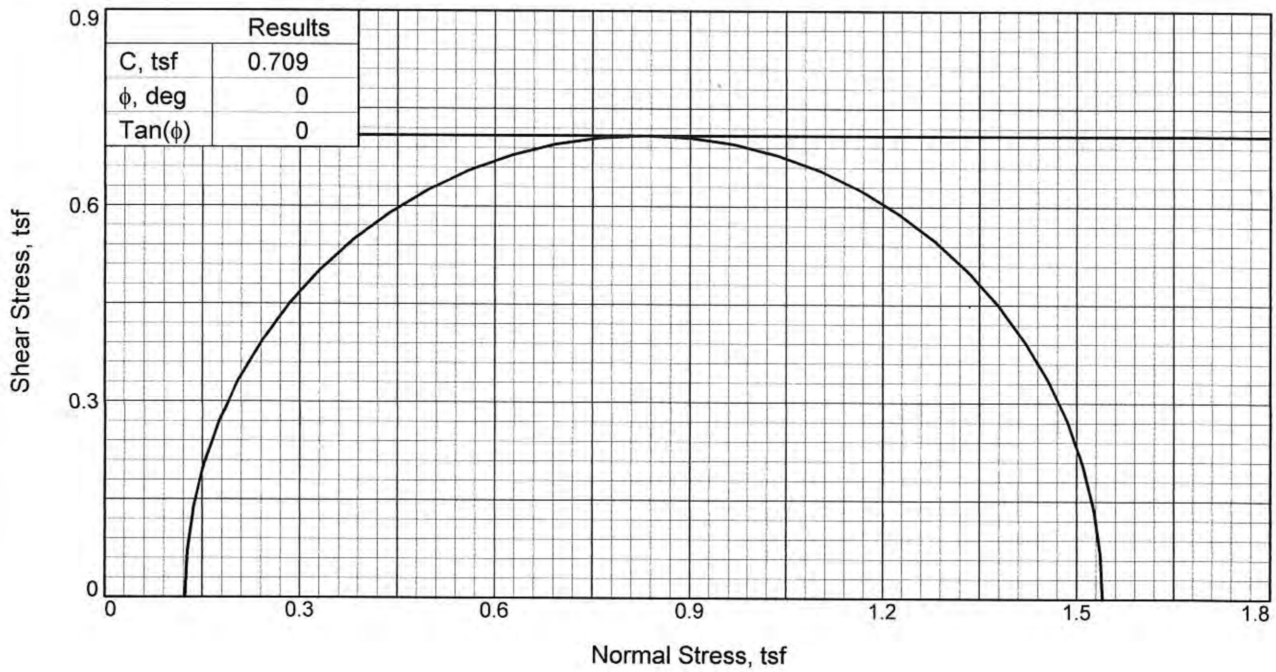
Client:

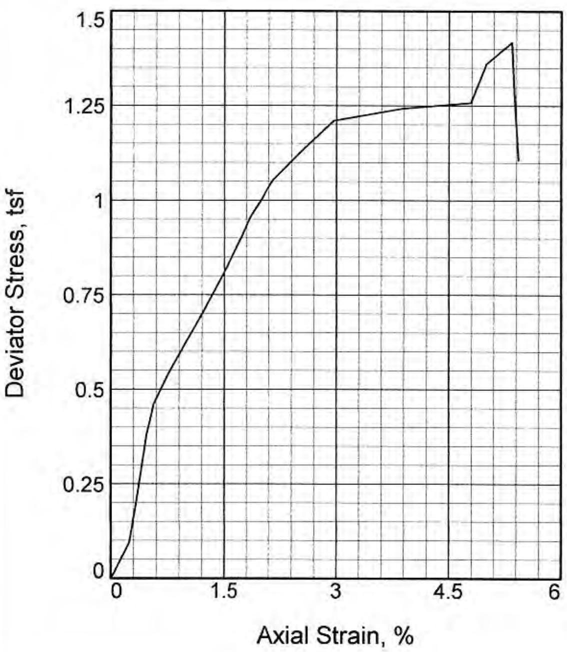
Project: San Jacinto River Waste Pit Superfund Site

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 ________

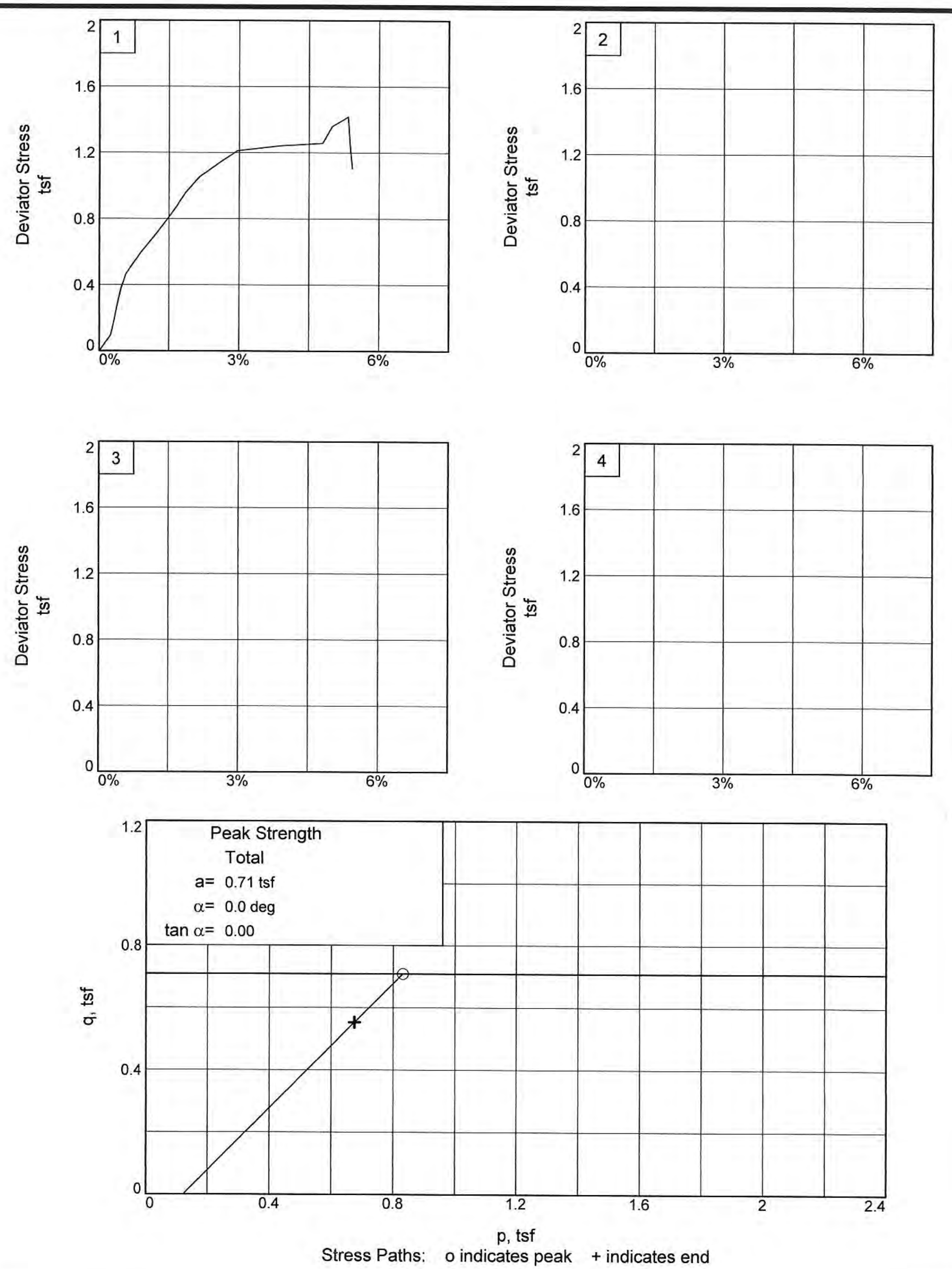
Client:

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



Client:

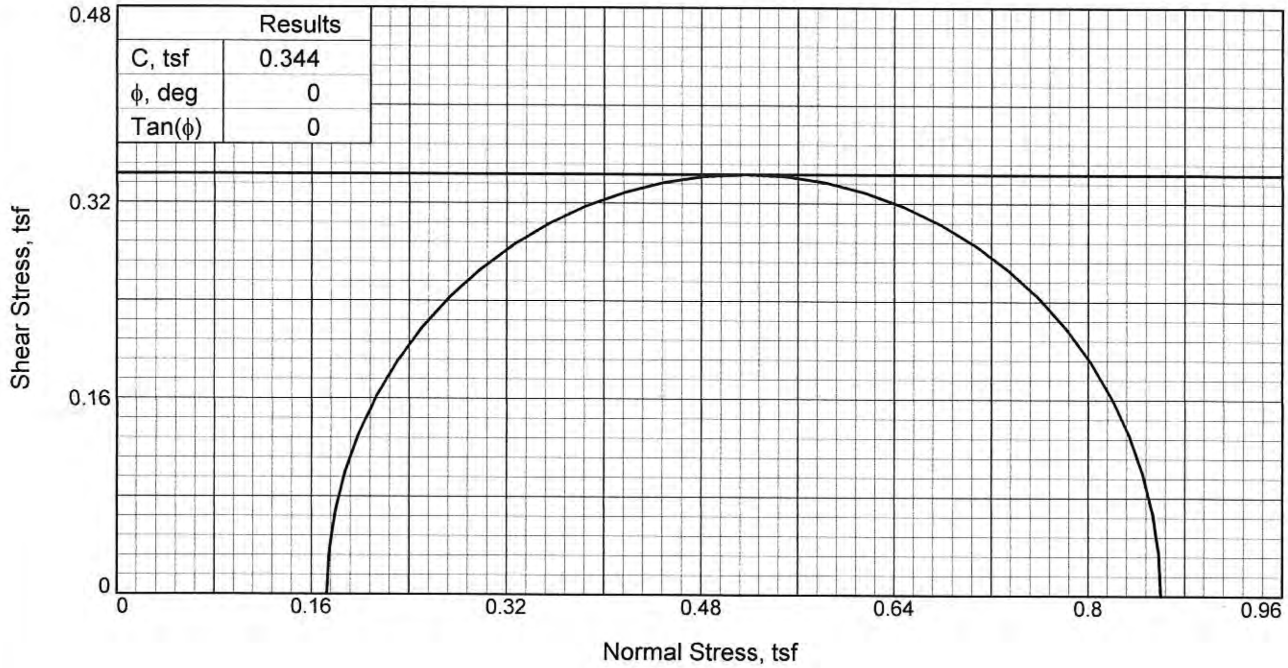
Project: San Jacinto River Waste Pit Superfund Site

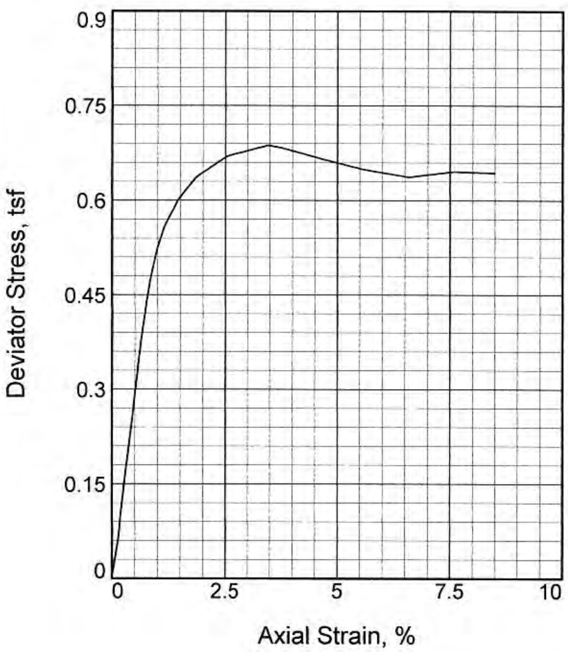
Source of Sample: SJGB026 **Depth:** 4-6

Project No.: 19.15.131 **Figure** _______

TOLUNAY-WONG ENGINEERS, INC.

Attachment Figure B.2-74





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 ________

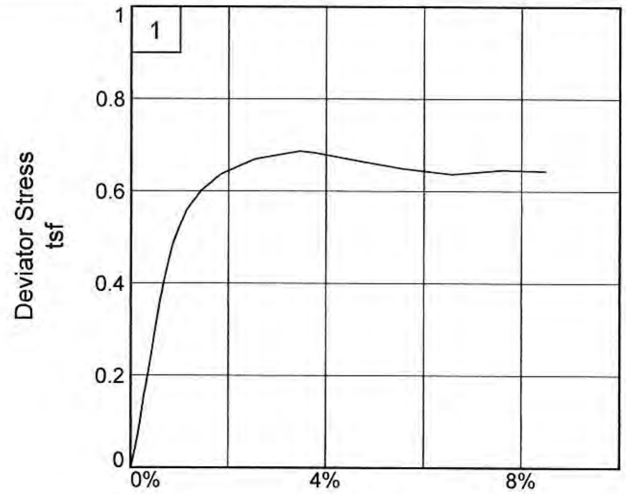
Client:

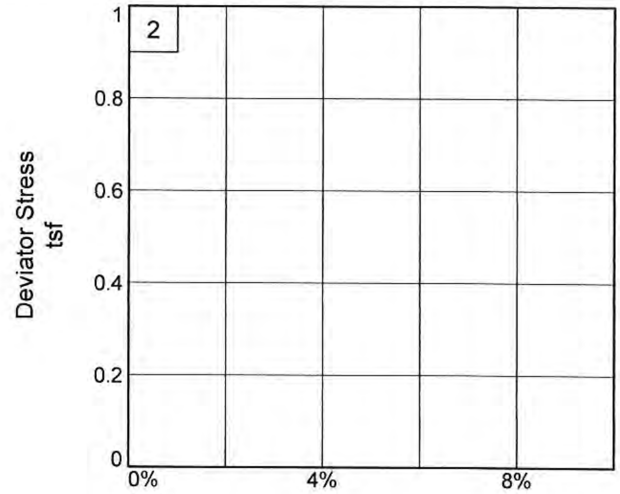
Project: San Jacinto River Waste Pit Superfund Site

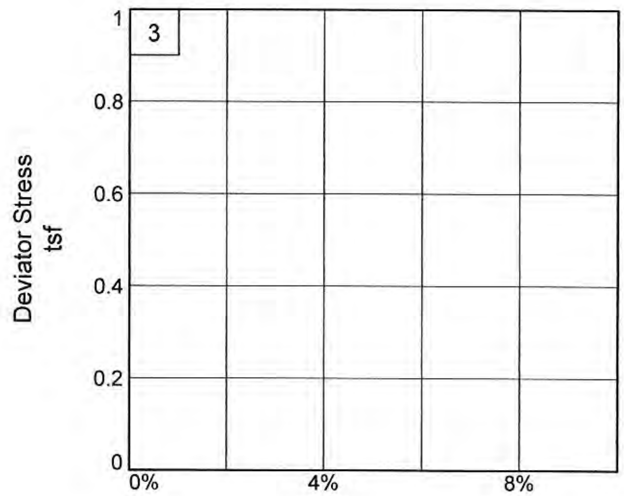
Source of Sample: SJGB026 **Depth:** 6-8

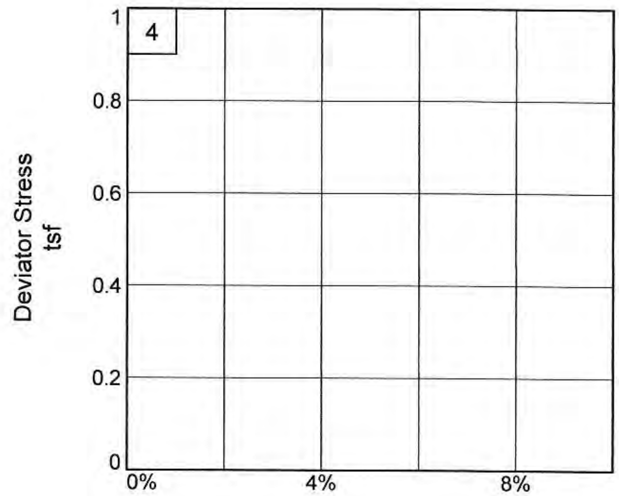
Proj. No.: 19.15.131 **Date Sampled:**

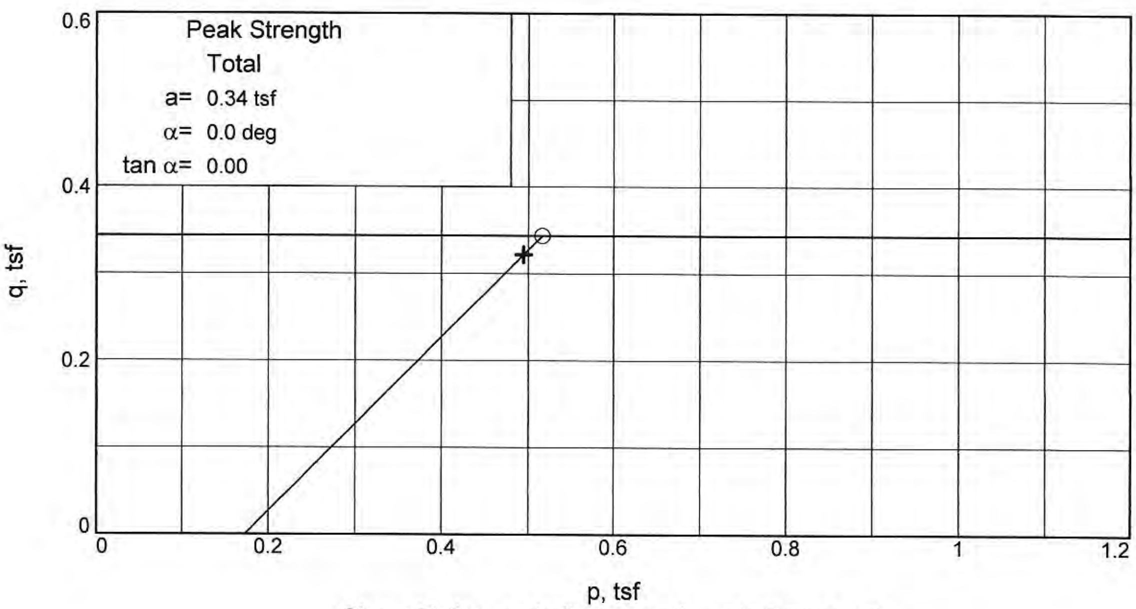
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

Client:

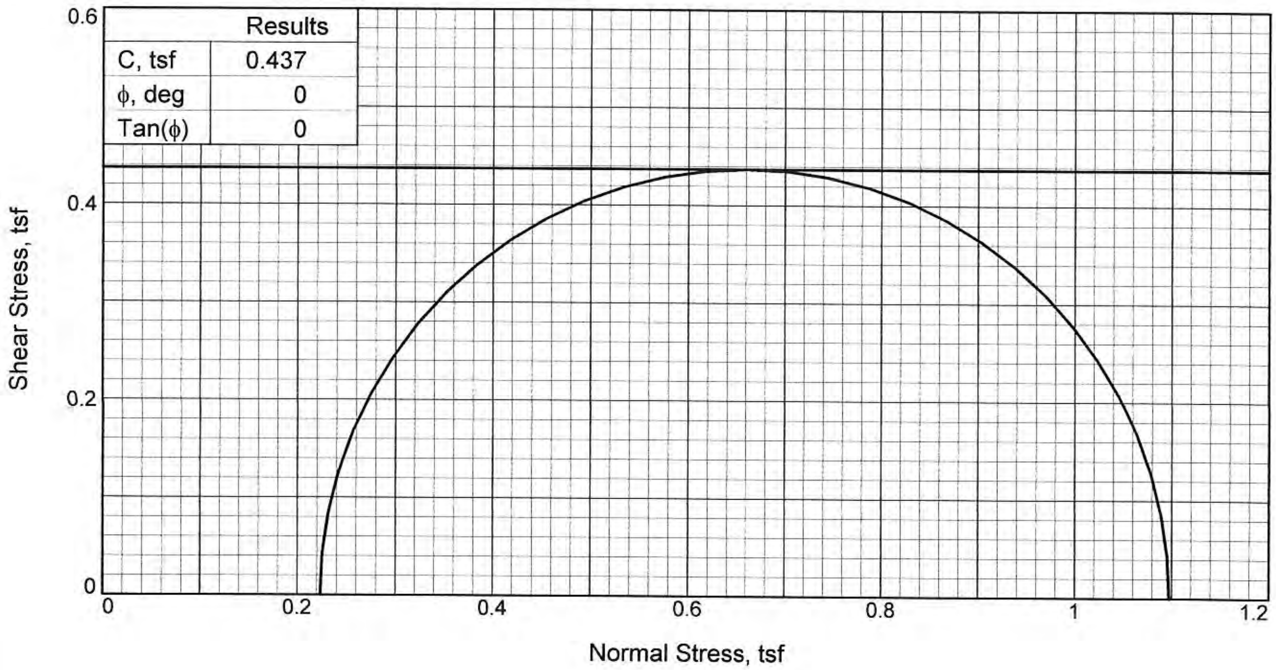
Project: San Jacinto River Waste Pit Superfund Site

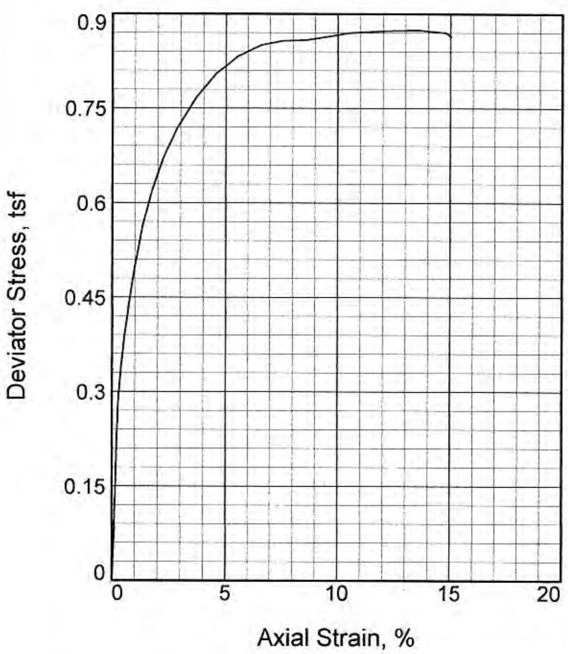
Source of Sample: SJGB026 **Depth:** 6-8

Project No.: 19.15.131 **Figure** _______

TOLUNAY-WONG ENGINEERS, INC.

Attachment Figure B.2-76





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:**

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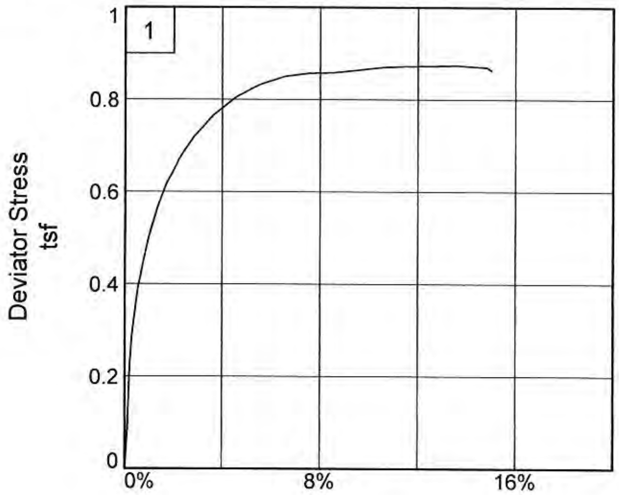
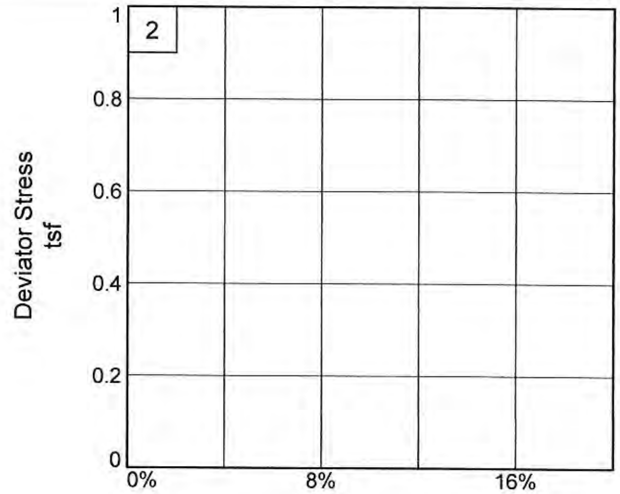
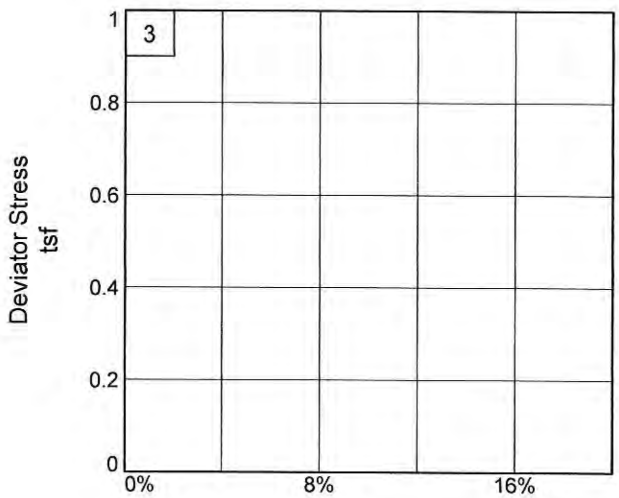
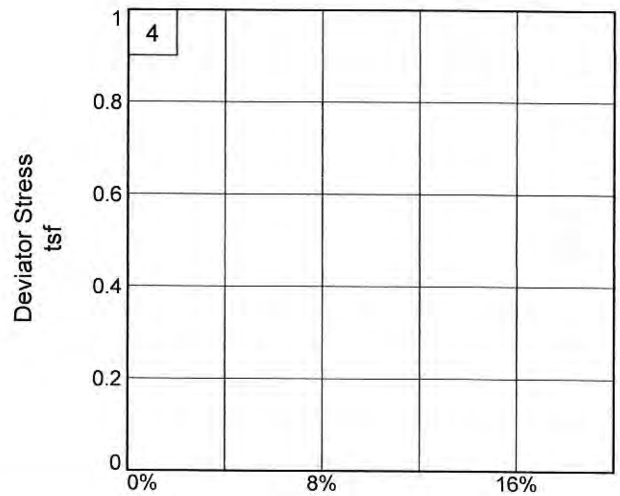
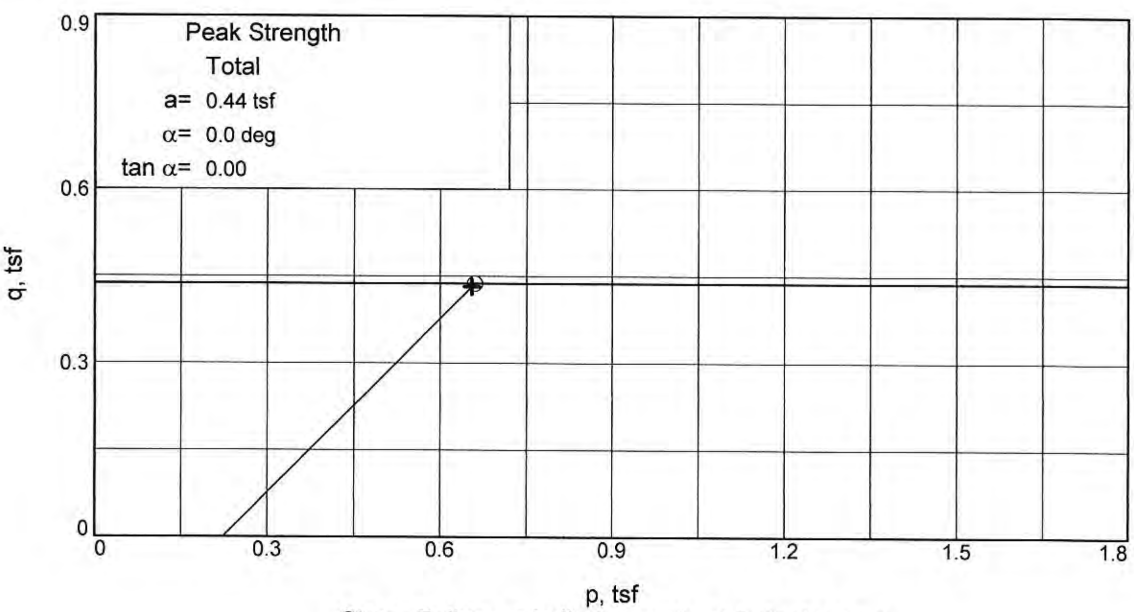
Houston, Texas











Stress Paths: o indicates peak + indicates end

Client:

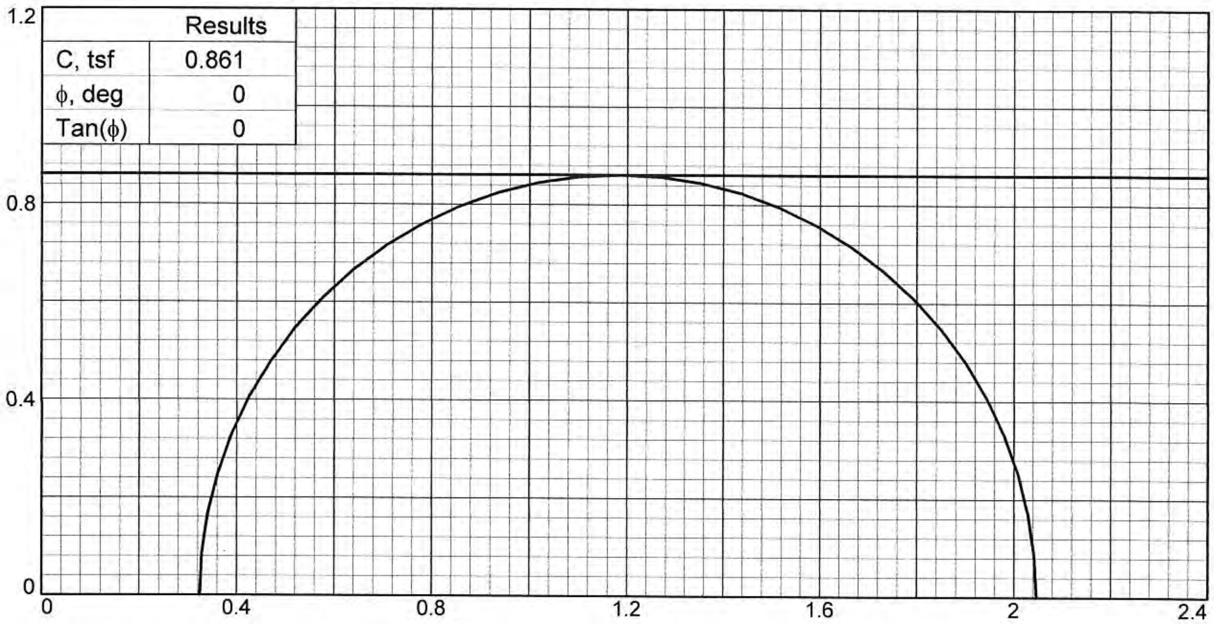
Project: San Jacinto River Waste Pit Superfund Site

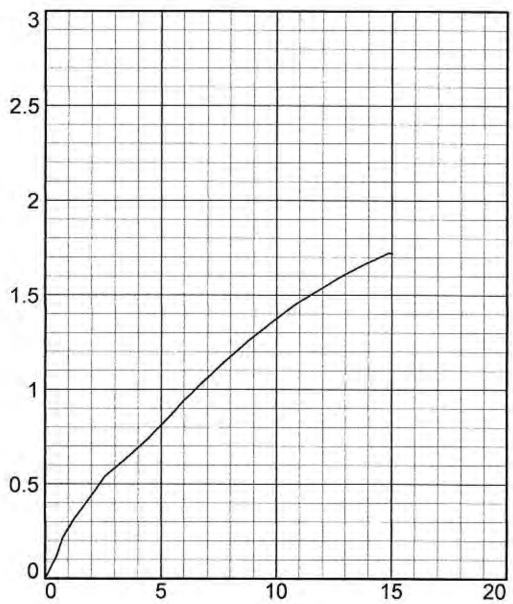
Source of Sample: SJGB026 **Depth:** 8-10

Project No.: 19.15.131 **Figure** _______

TOLUNAY-WONG ENGINEERS, INC.

Attachment Figure B.2-78





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 ________

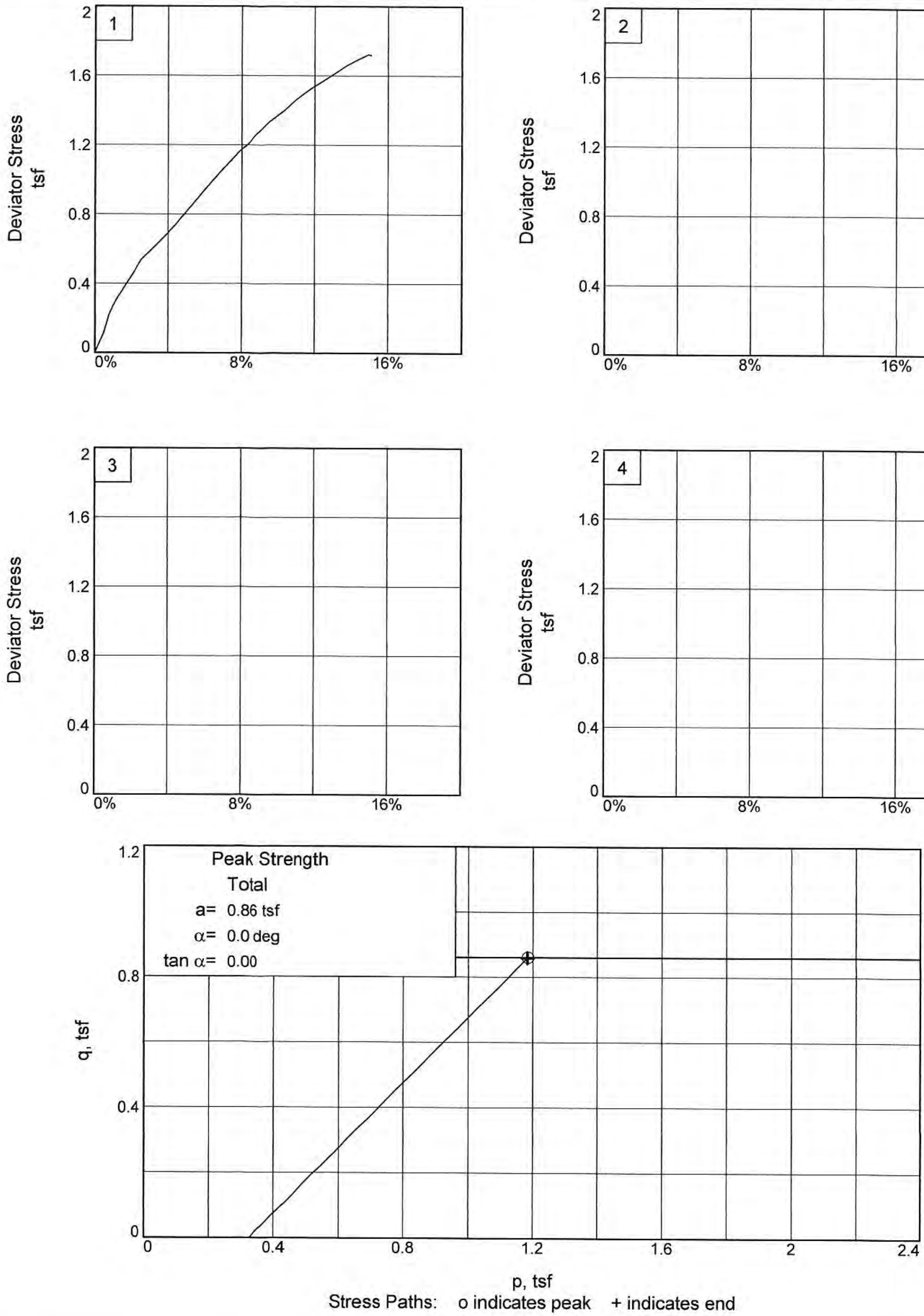
Client:

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



Client:

Project: San Jacinto River Waste Pit Superfund Site

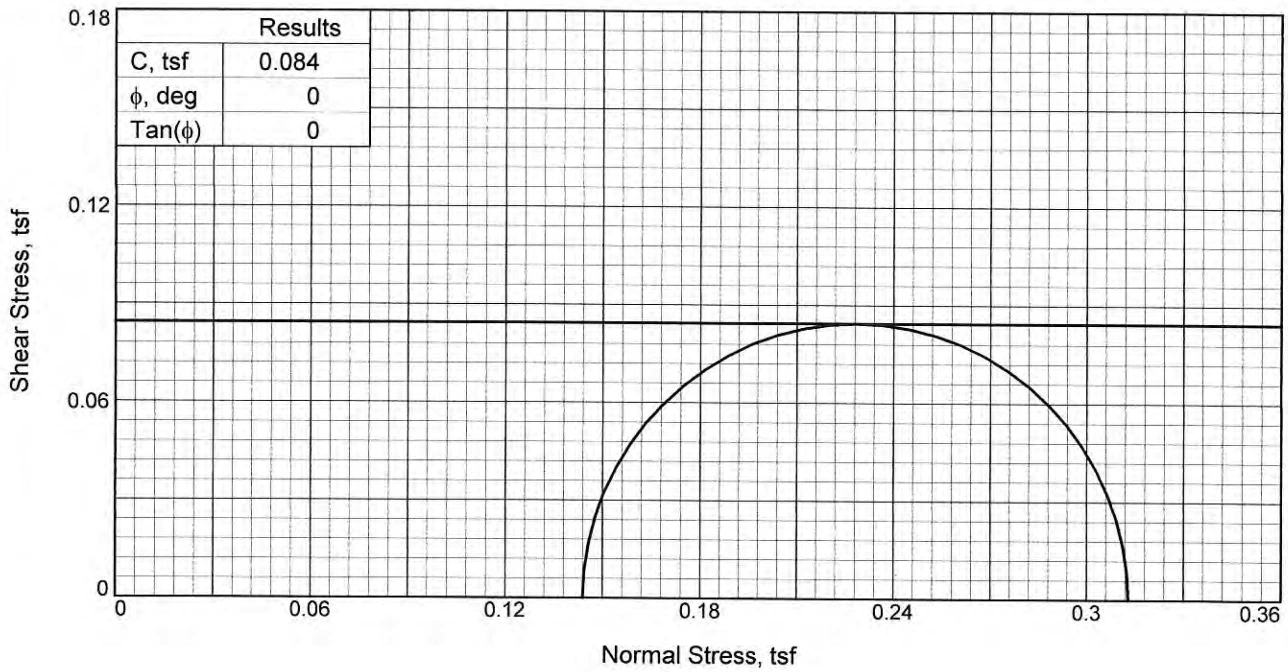
Source of Sample: SJGB026 **Depth:** 12-14

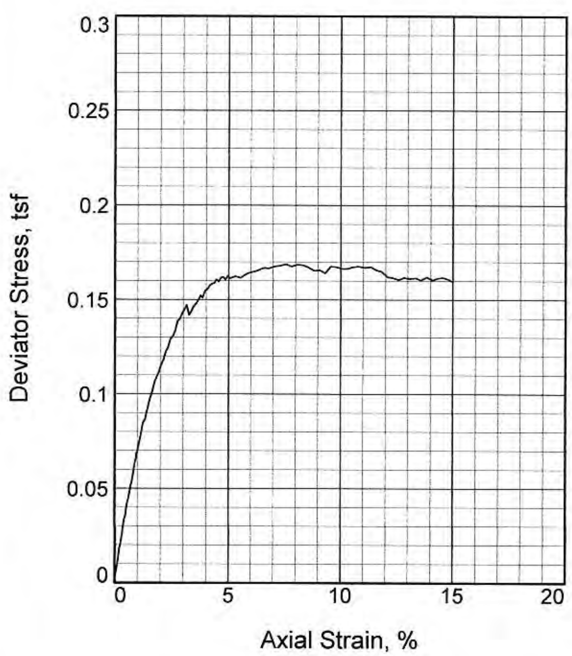
Project No.: 19.15.131 **Figure** _______

TOLUNAY-WONG ENGINEERS, INC.

Attachment Figure B.2-80

	Results
C, tsf	0.084
ϕ, deg	0
Tan(ϕ)	0





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 ________

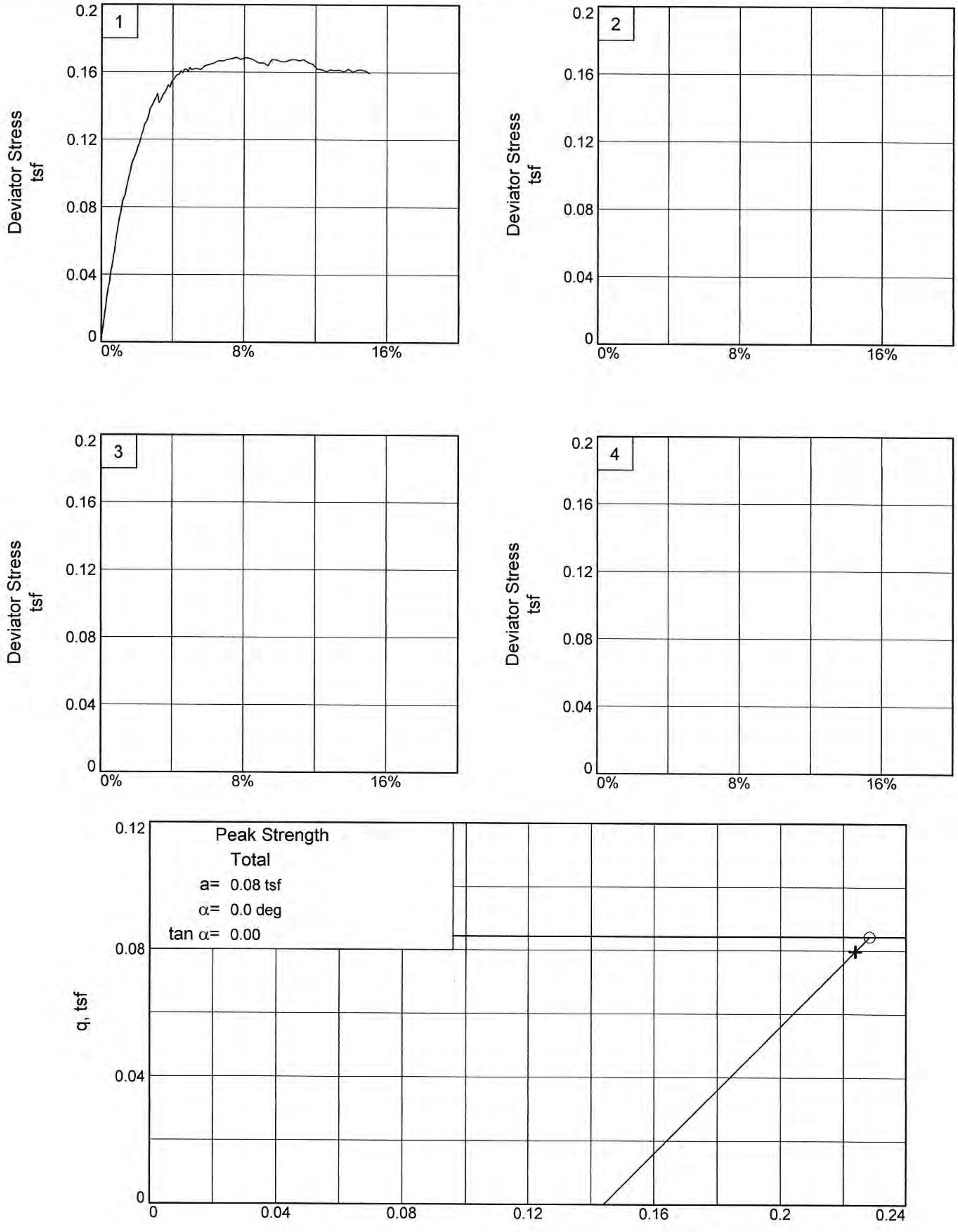
Client:

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

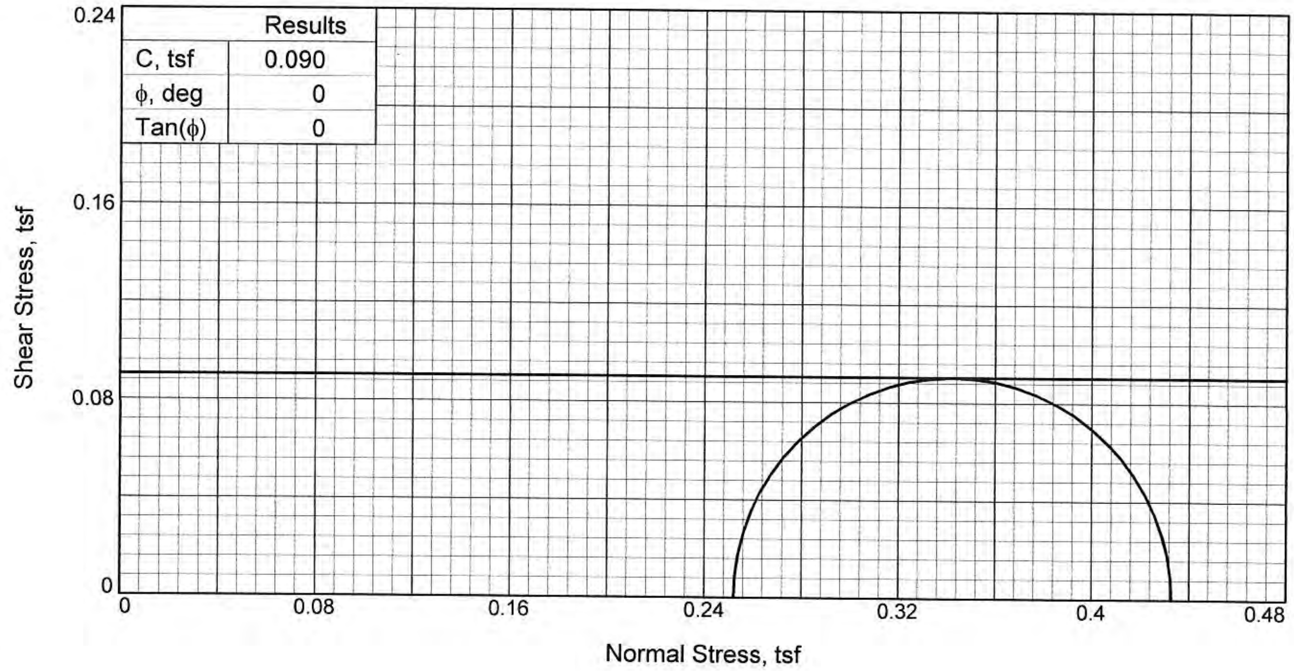
Client:

Project: San Jacinto River Waste Pit Superfund Site

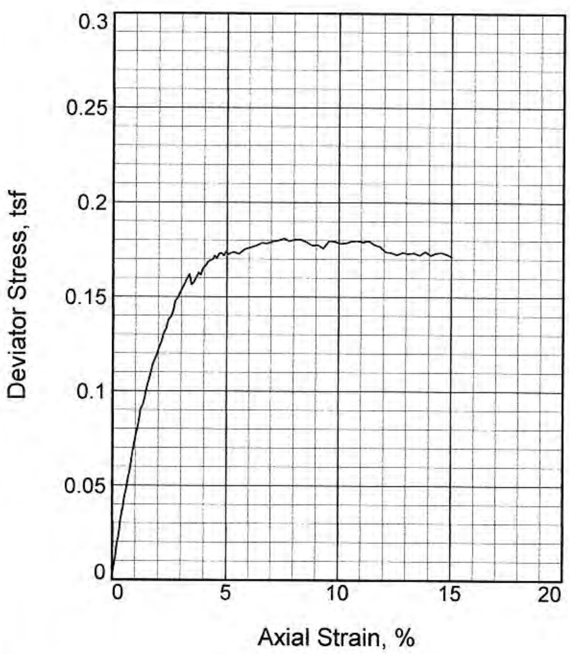
Source of Sample: SJGB027 **Depth:** 2

Project No.: 19.15.131 **Figure** _______

TOLUNAY-WONG ENGINEERS, INC.



Results	
C, tsf	0.090
ϕ, deg	0
Tan(ϕ)	0



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 ________

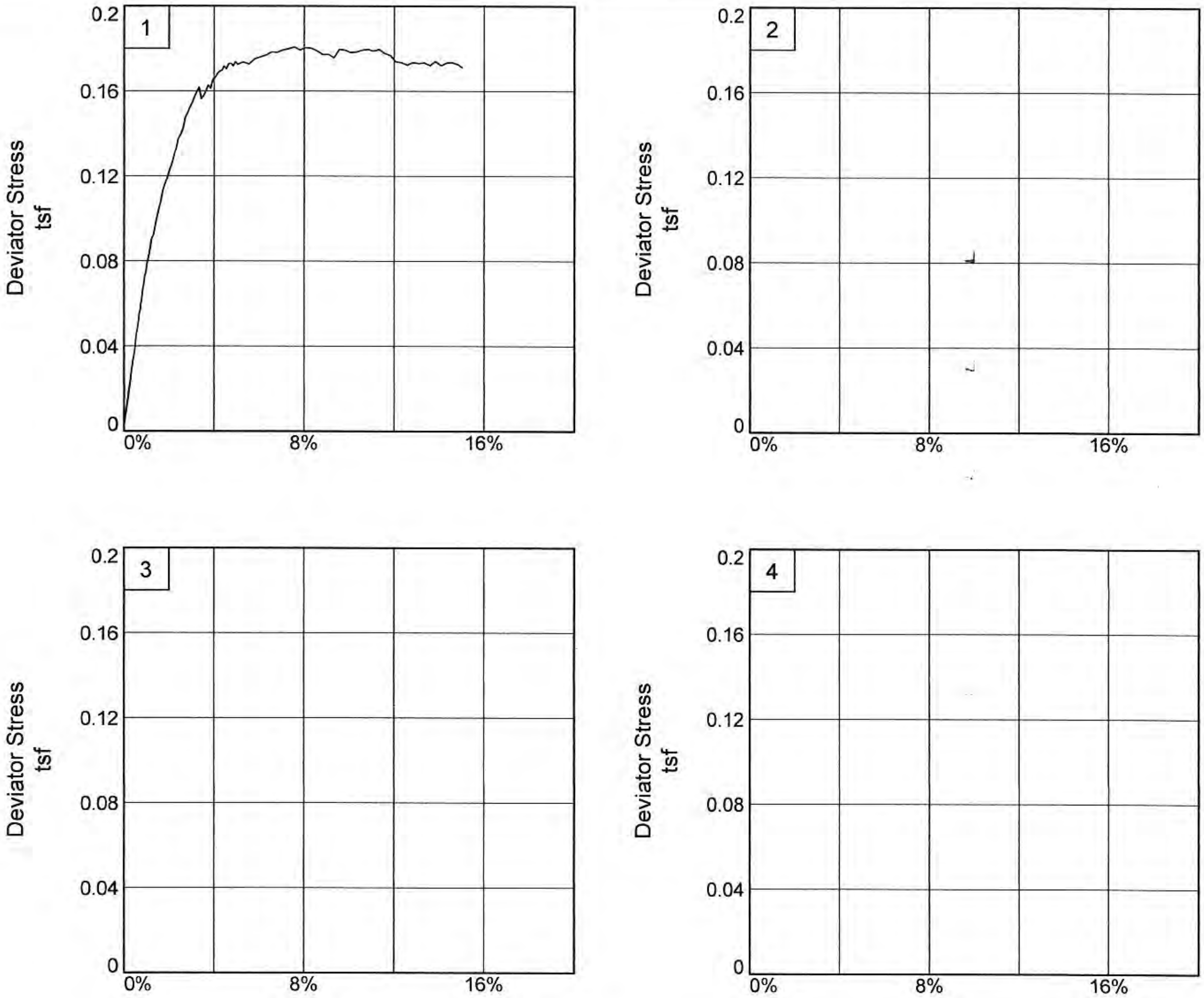
Client:

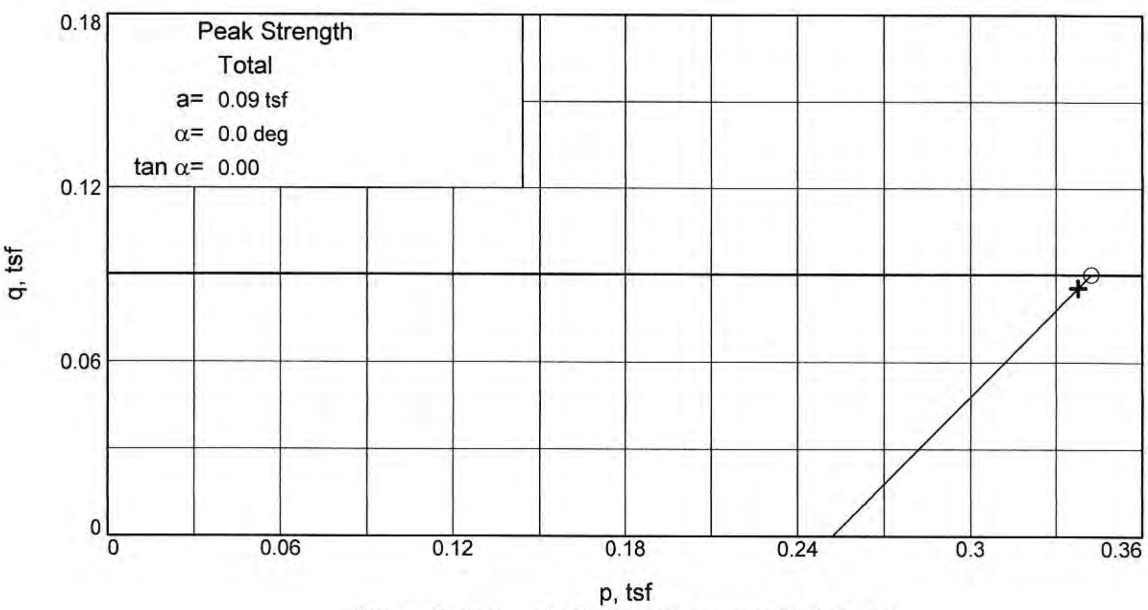
Project: San Jacinto River Waste Pit Superfund Site

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





Stress Paths: o indicates peak + indicates end

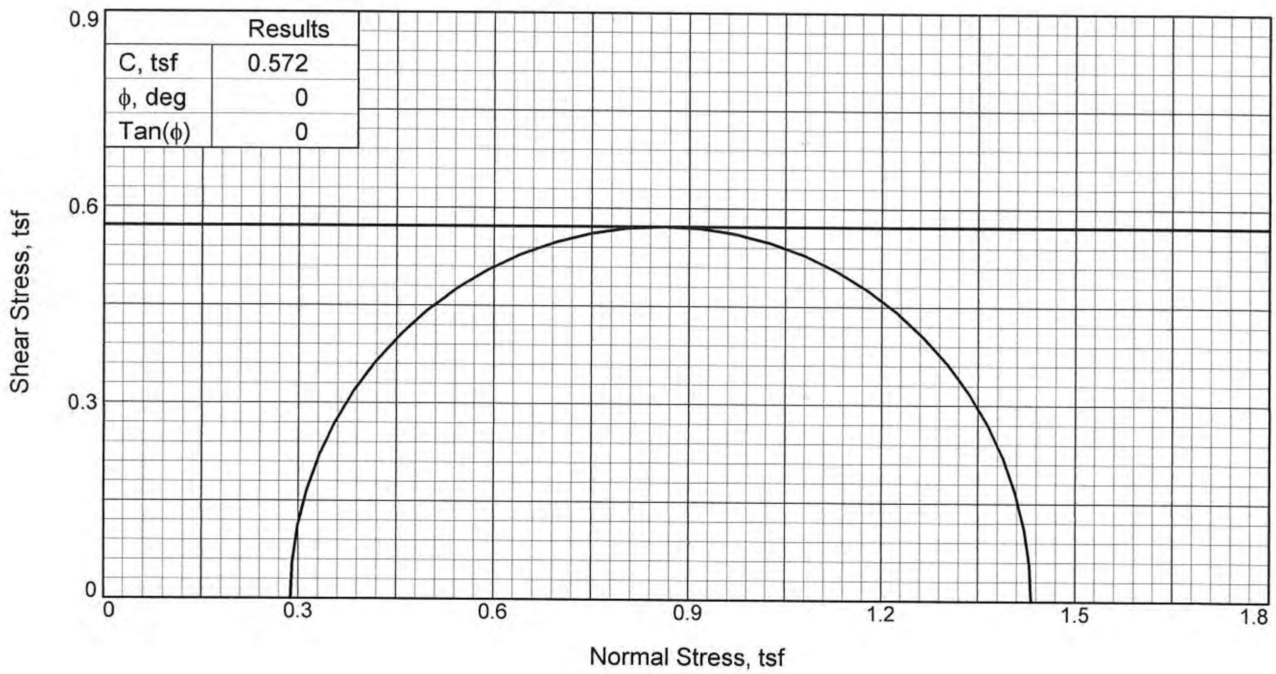
Client:

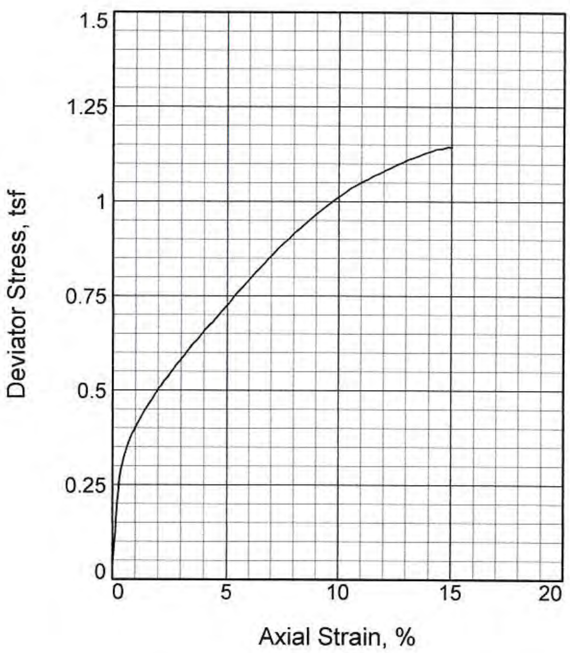
Project: San Jacinto River Waste Pit Superfund Site

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 ________

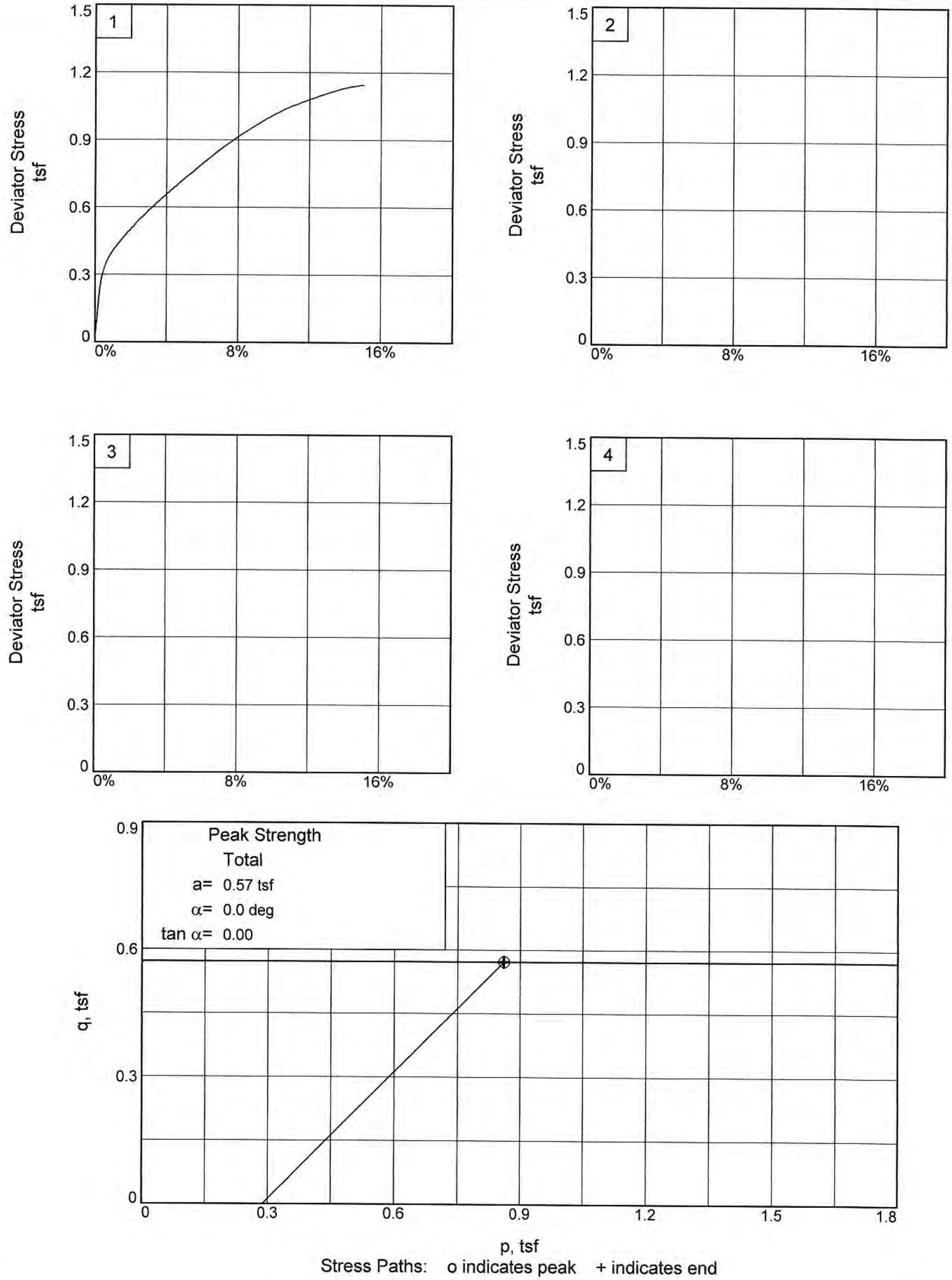
Client:

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



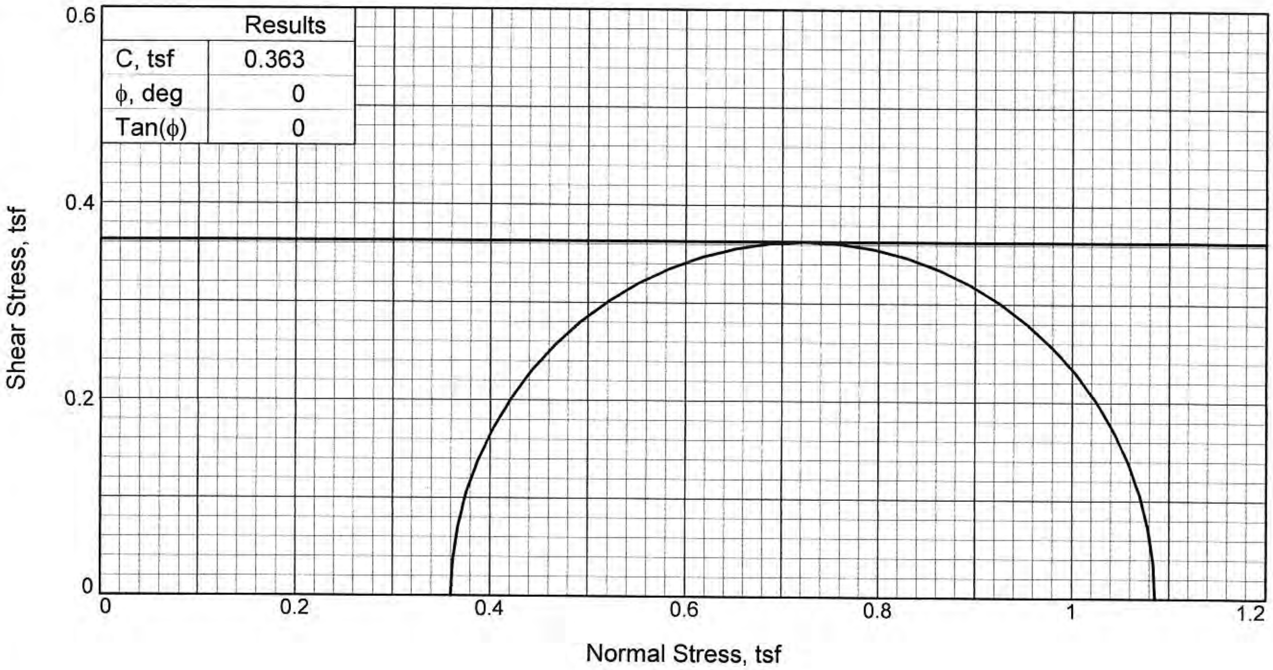
Client:

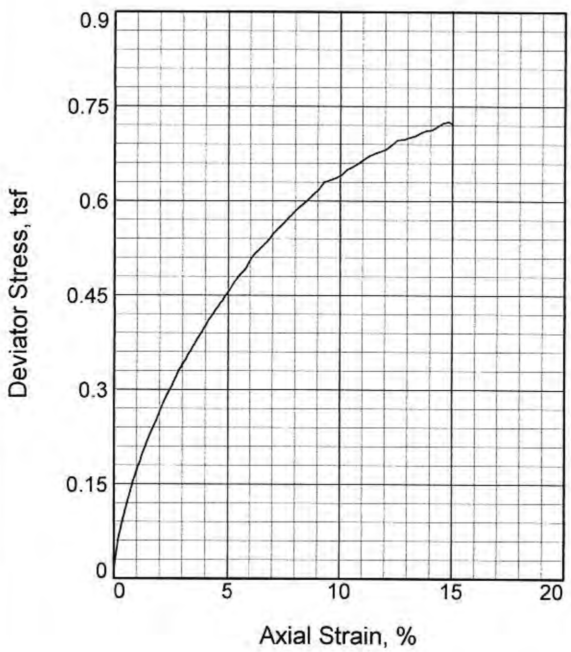
Project: San Jacinto River Waste Pit Superfund Site

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 ________

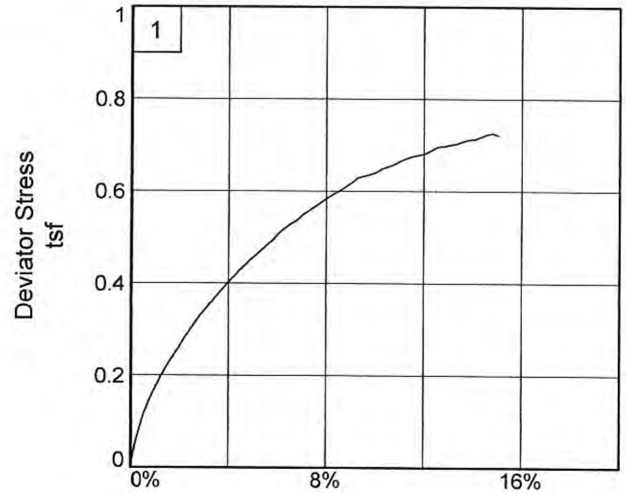
Client:

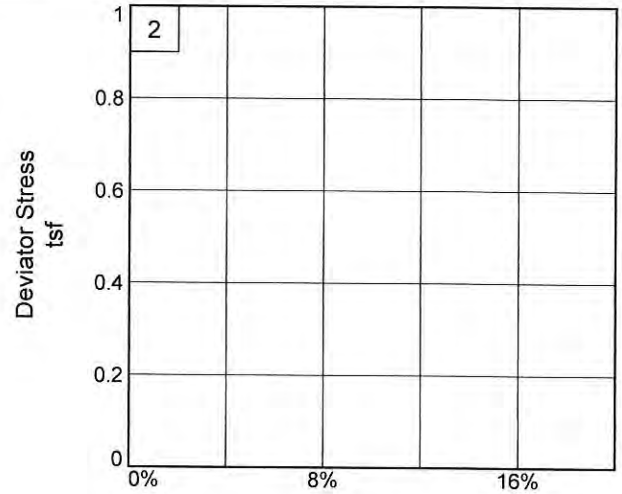
Project: San Jacinto River Waste Pit Superfund Site

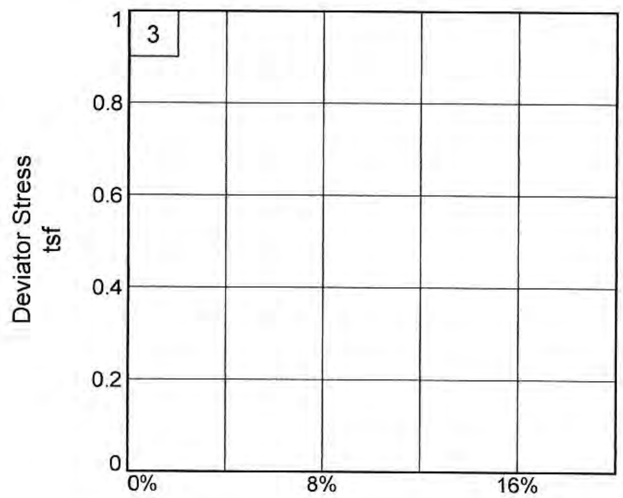
Source of Sample: SJGB027 **Depth:** 8

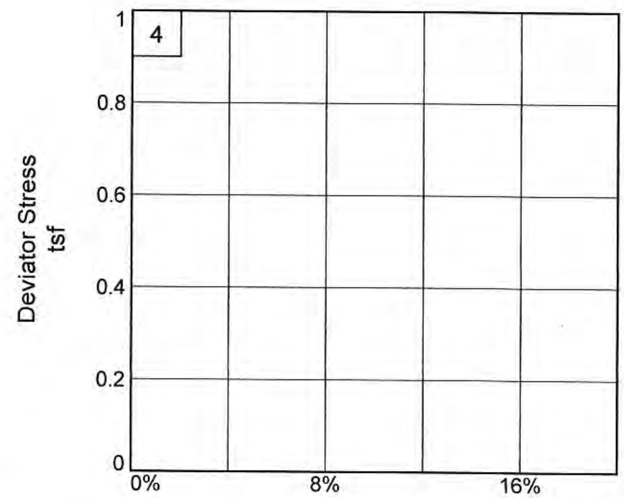
Proj. No.: 19.15.131 **Date Sampled:** 1/21/20

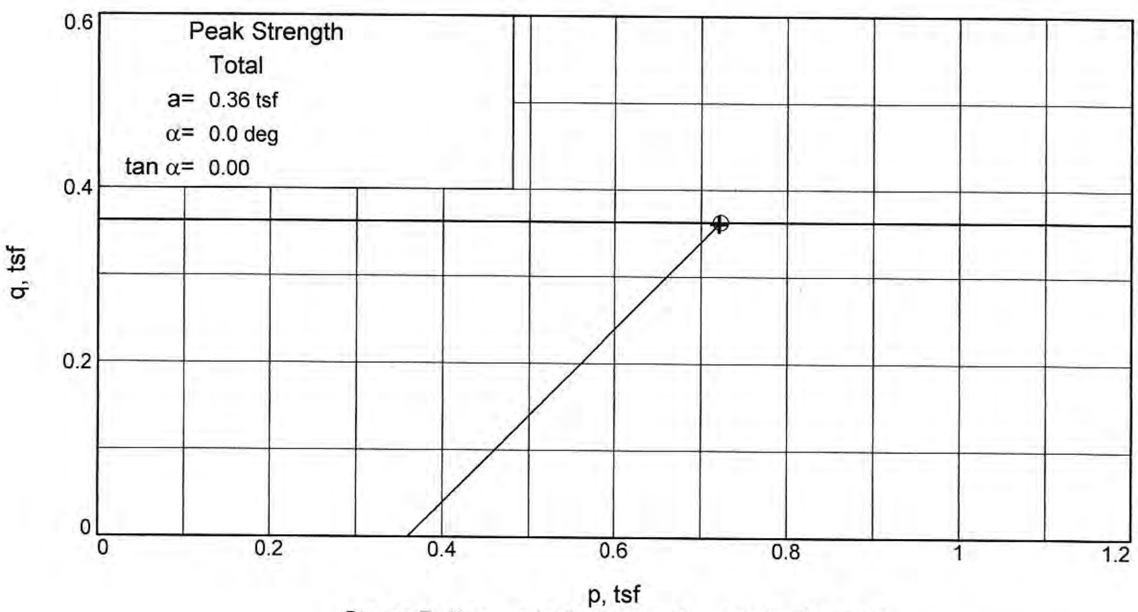
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

Client:

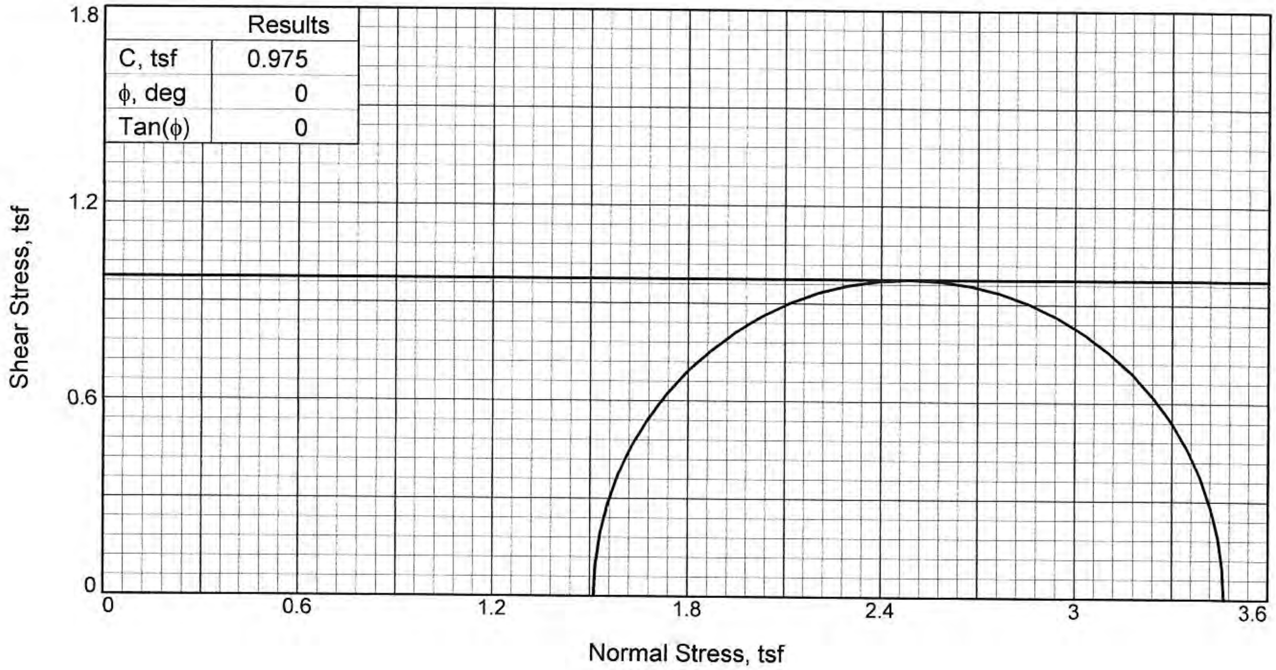
Project: San Jacinto River Waste Pit Superfund Site

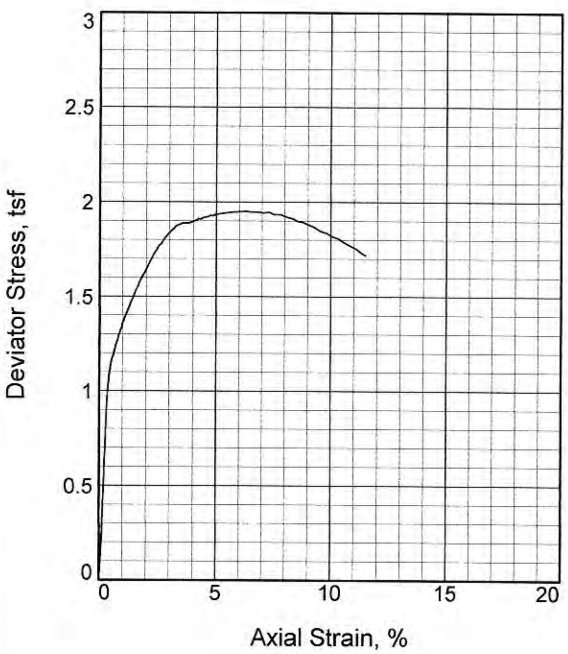
Source of Sample: SJGB027 **Depth:** 8

Project No.: 19.15.131 **Figure** _______

TOLUNAY-WONG ENGINEERS, INC.

Attachment Figure B.2-88





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 ________

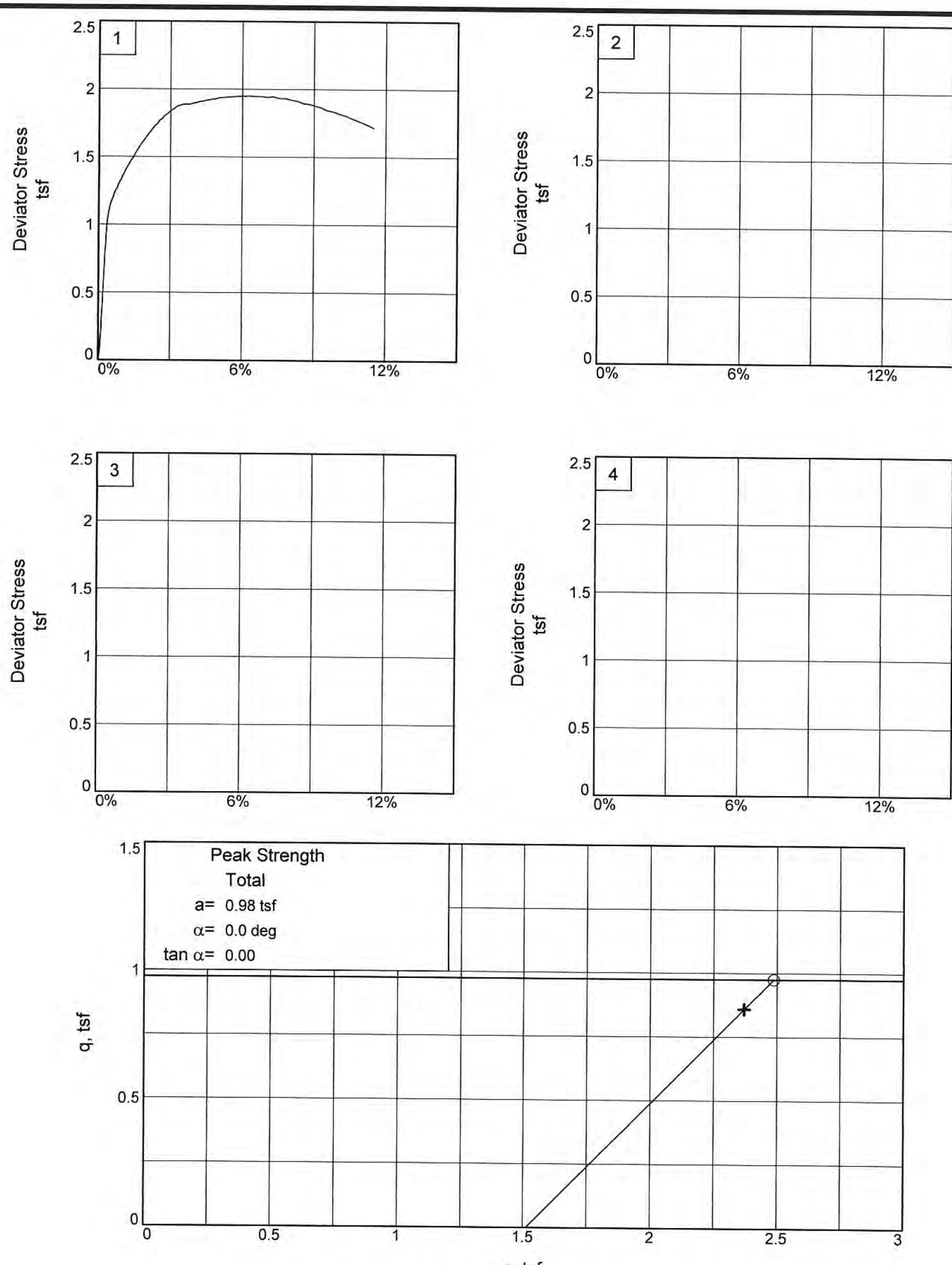
Client:

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



Stress Paths: o indicates peak + indicates end

Client:

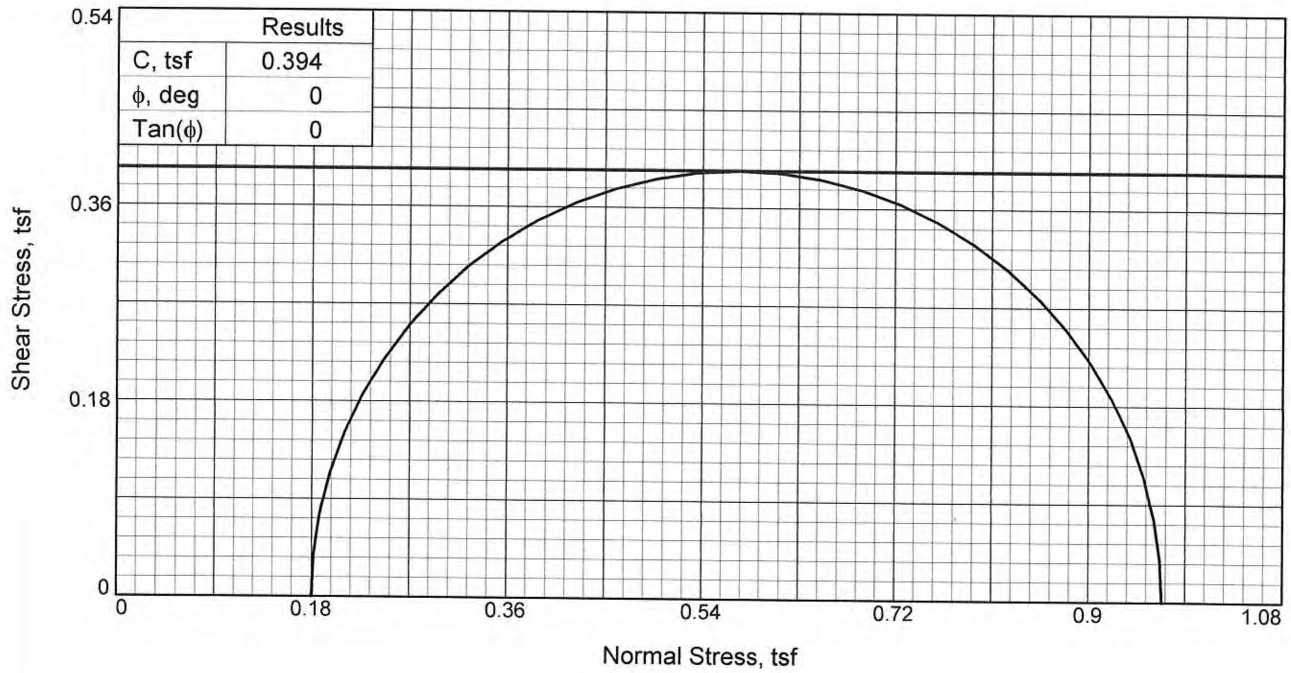
Project: San Jacinto River Waste Pit Superfund Site

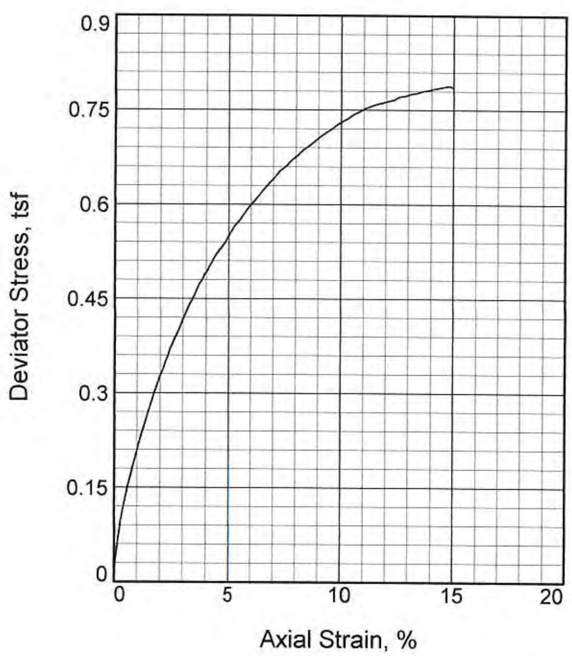
Source of Sample: SJGB027 **Depth:** 48

Project No.: 19.15.131 **Figure** _______

TOLUNAY-WONG ENGINEERS, INC.

Attachment Figure B.2-90





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 ________

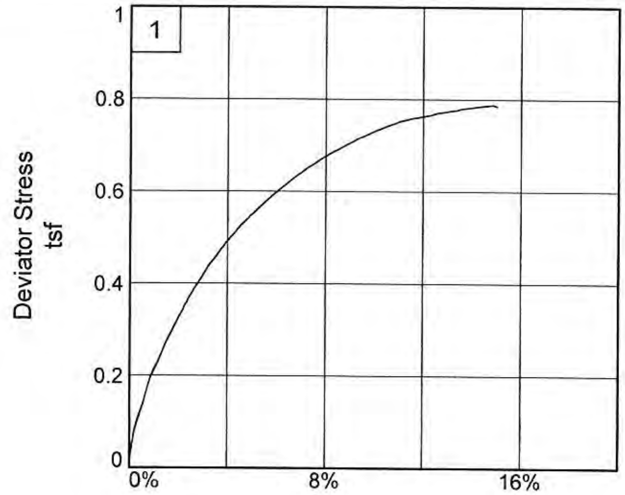
Client:

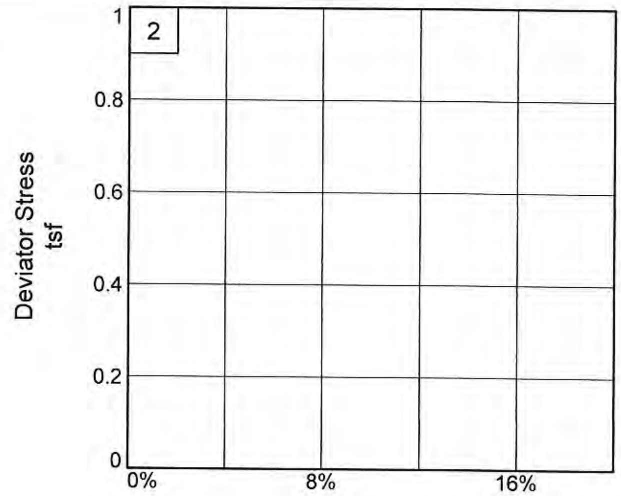
Project: San Jacinto River Waste Pit Superfund Site

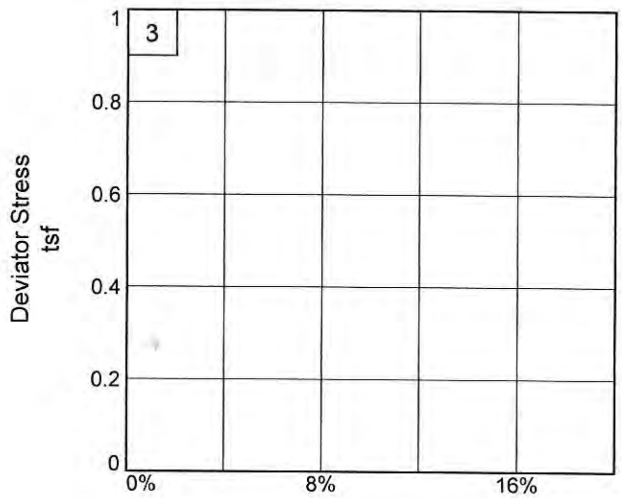
Source of Sample: SJGB028 **Depth:** 4

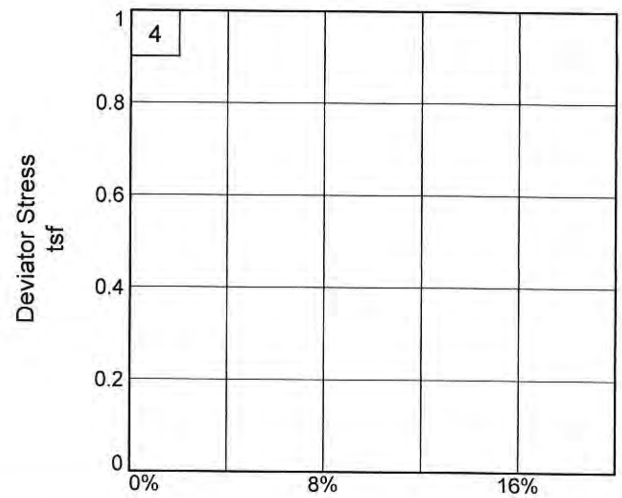
Proj. No.: 19.15.131 **Date Sampled:** 1/21/20

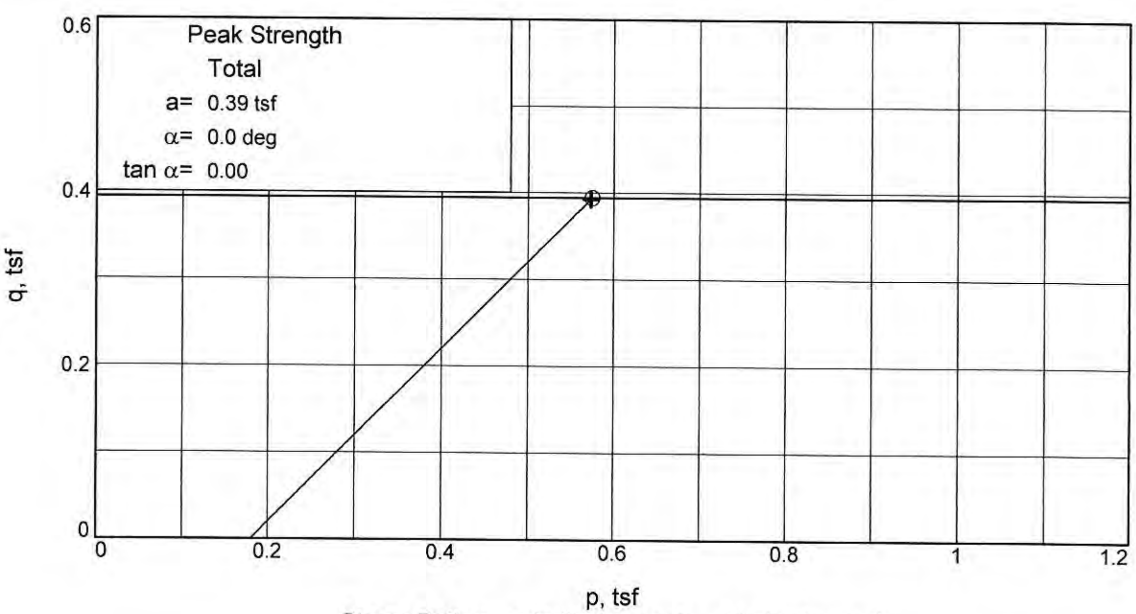
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

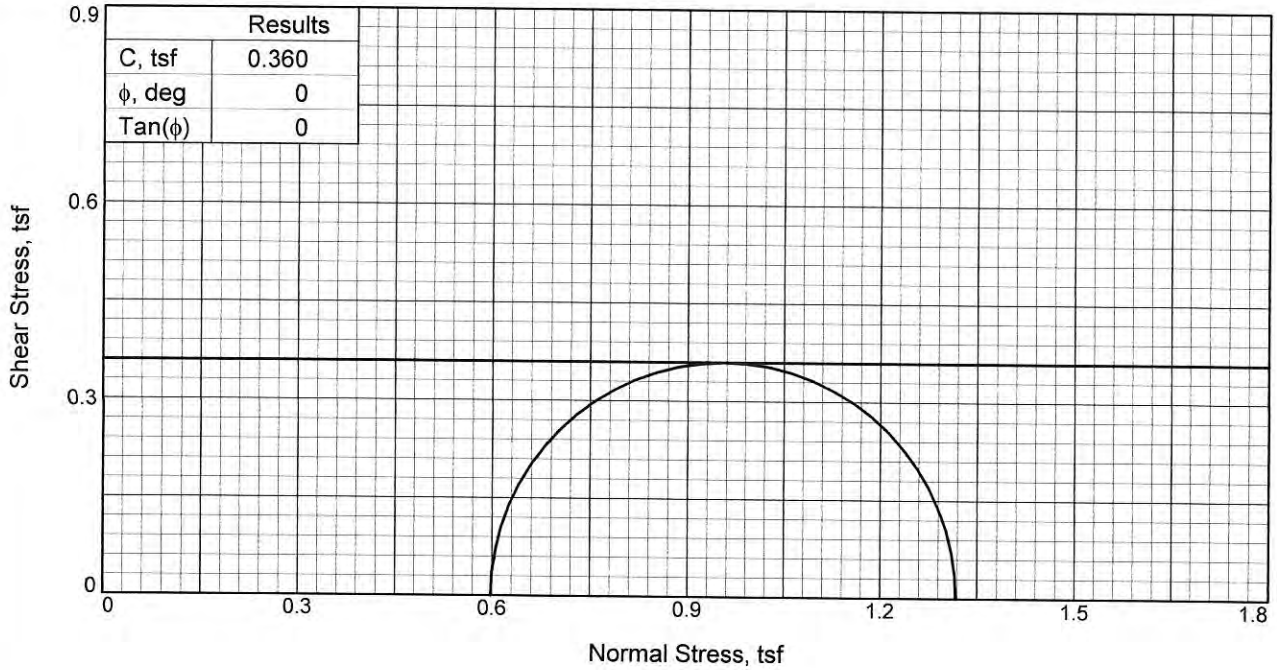
Client:

Project: San Jacinto River Waste Pit Superfund Site

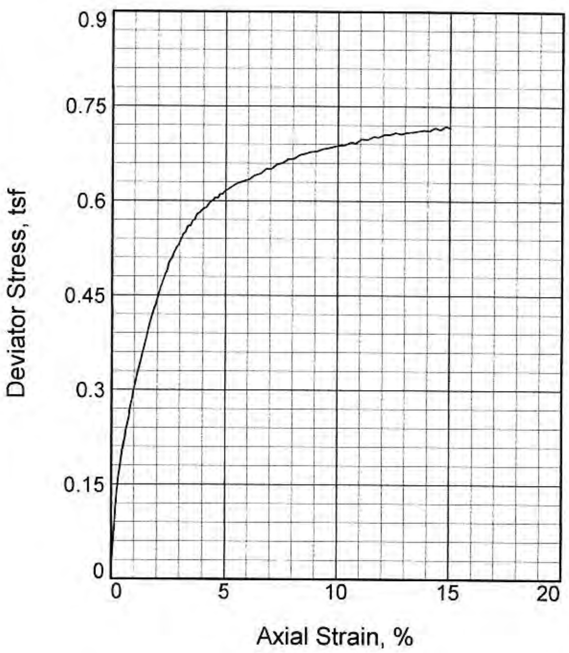
Source of Sample: SJGB028 **Depth:** 4

Project No.: 19.15.131 **Figure** _______

TOLUNAY-WONG ENGINEERS, INC.



Results	
C, tsf	0.360
ϕ, deg	0
Tan(ϕ)	0



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 ________

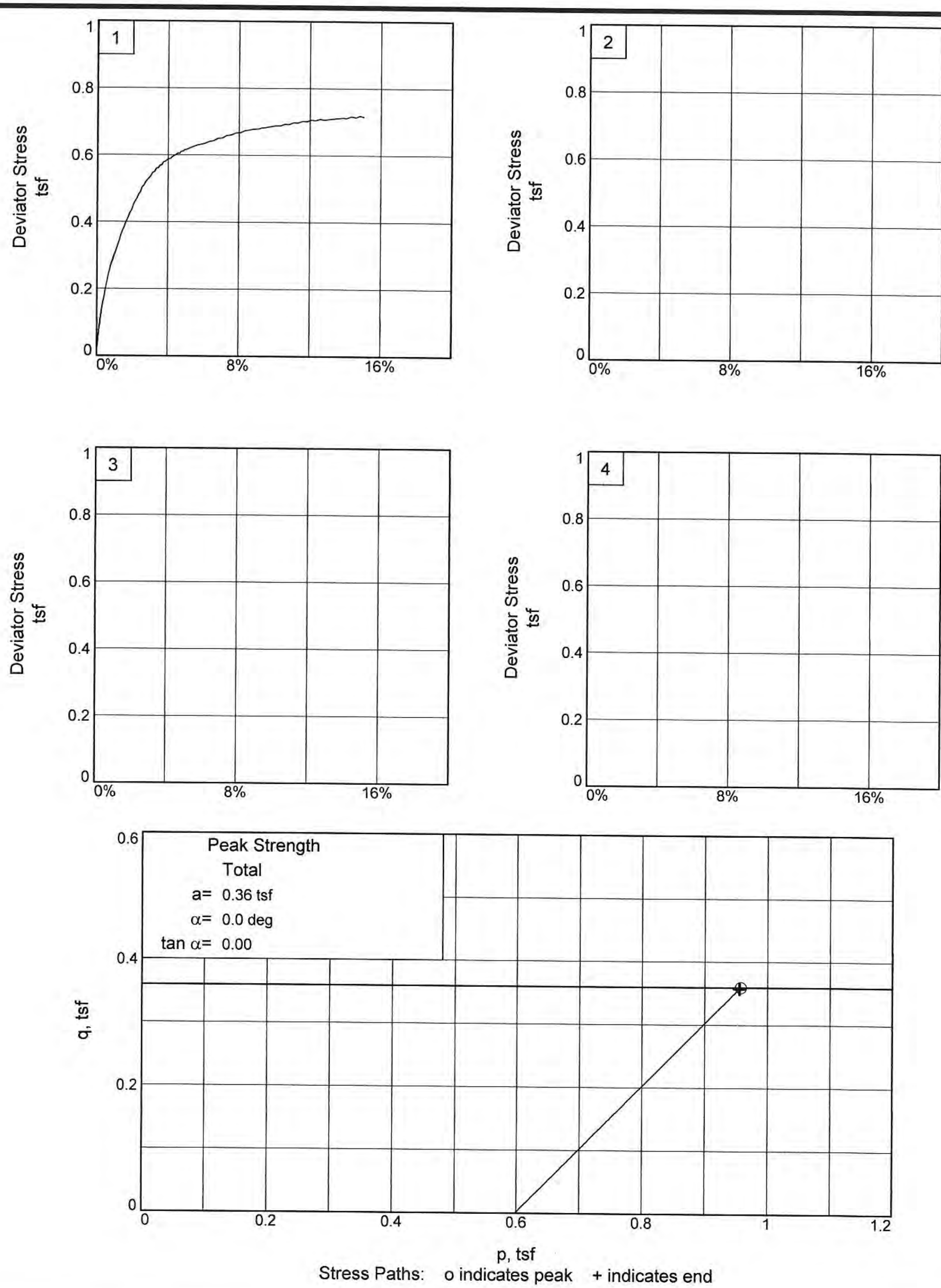
Client:

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



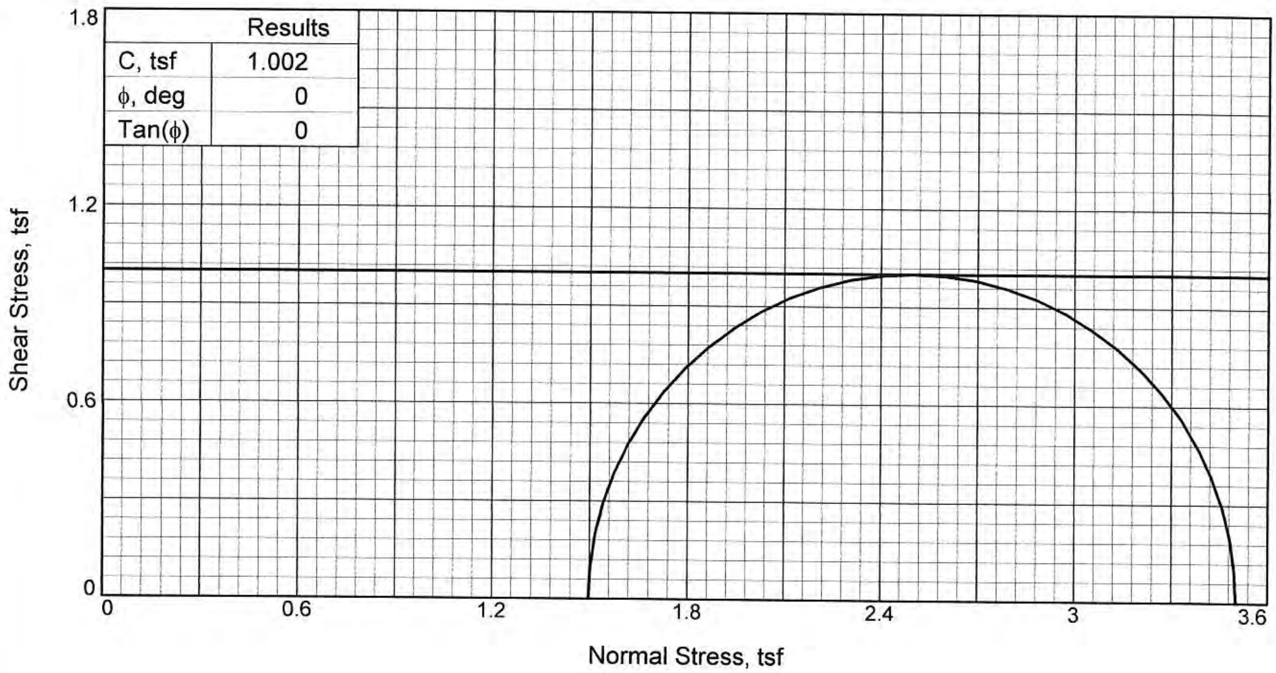
Client:

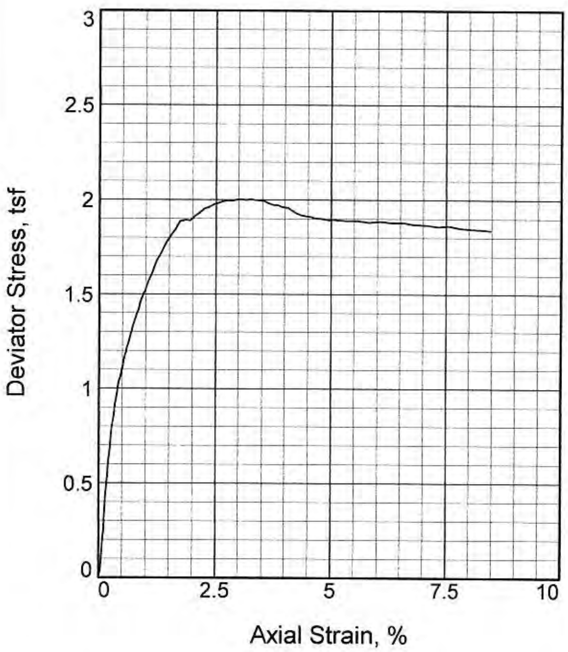
Project: San Jacinto River Waste Pit Superfund Site

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 ________

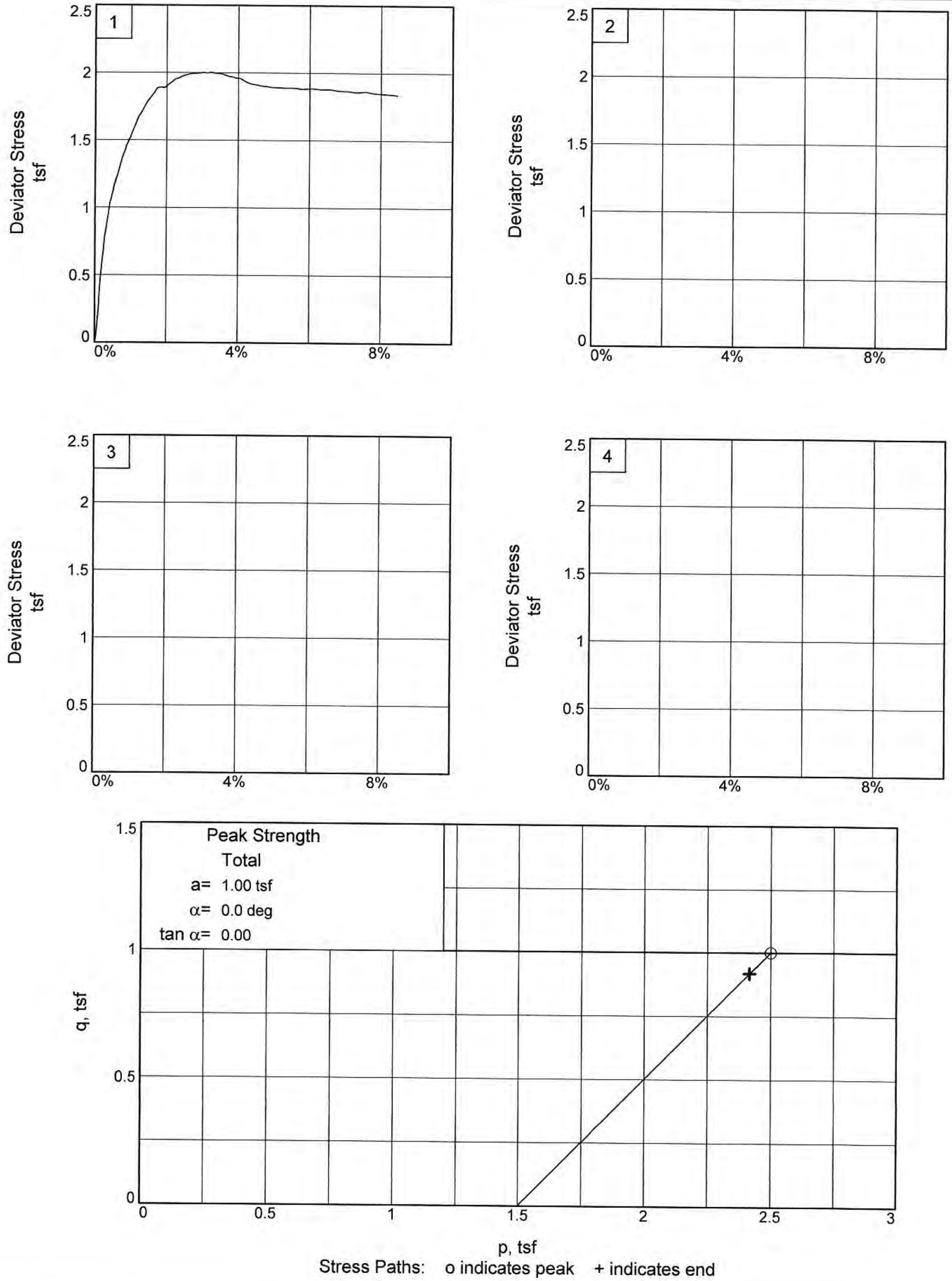
Client:

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:

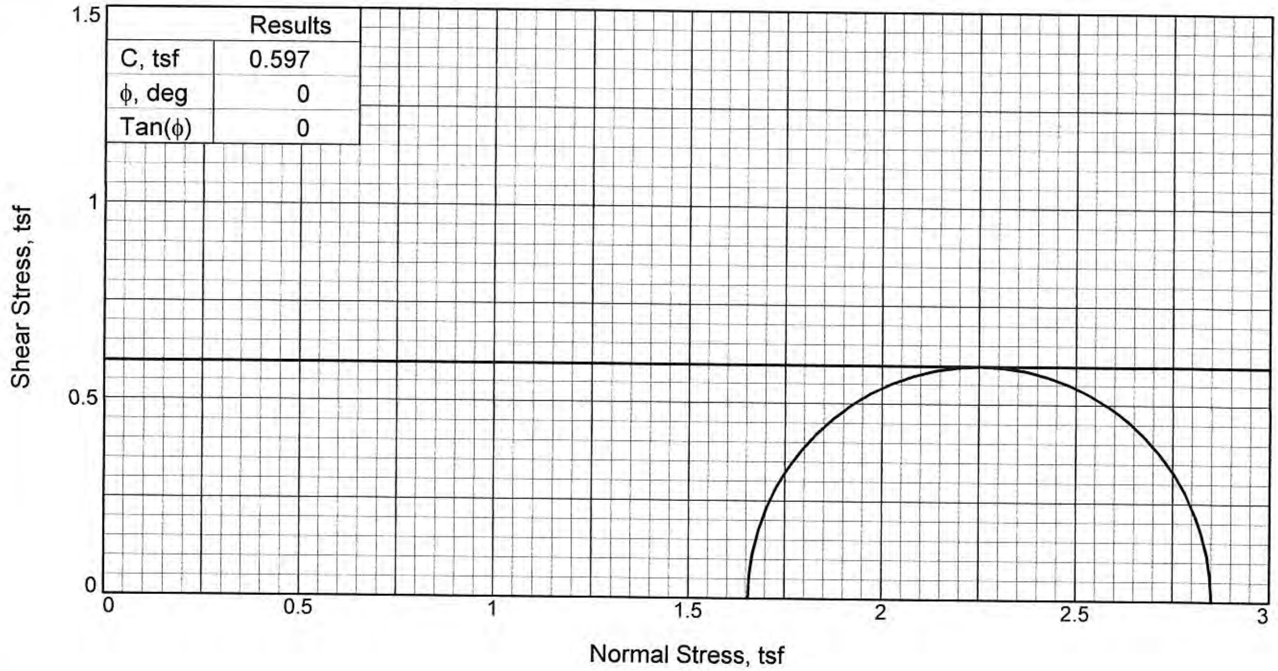
Project: San Jacinto River Waste Pit Superfund Site

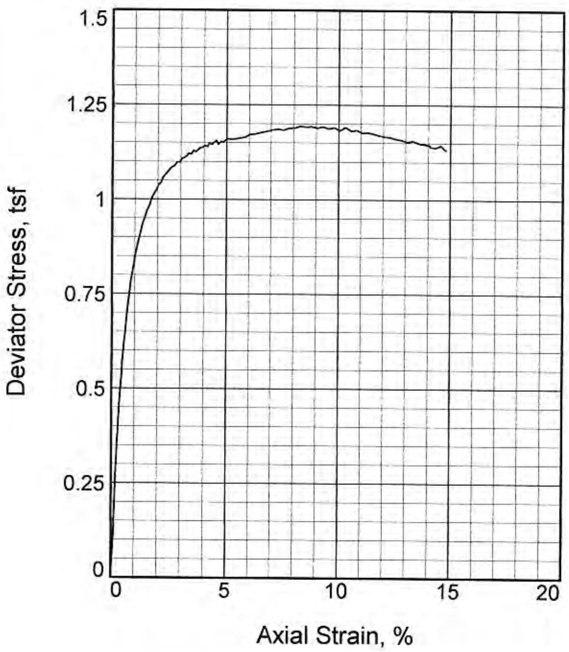
Source of Sample: SJGB028 **Depth:** 48

Project No.: 19.15.131 **Figure** _______

TOLUNAY-WONG ENGINEERS, INC.

Attachment Figure B.2-96





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 ________

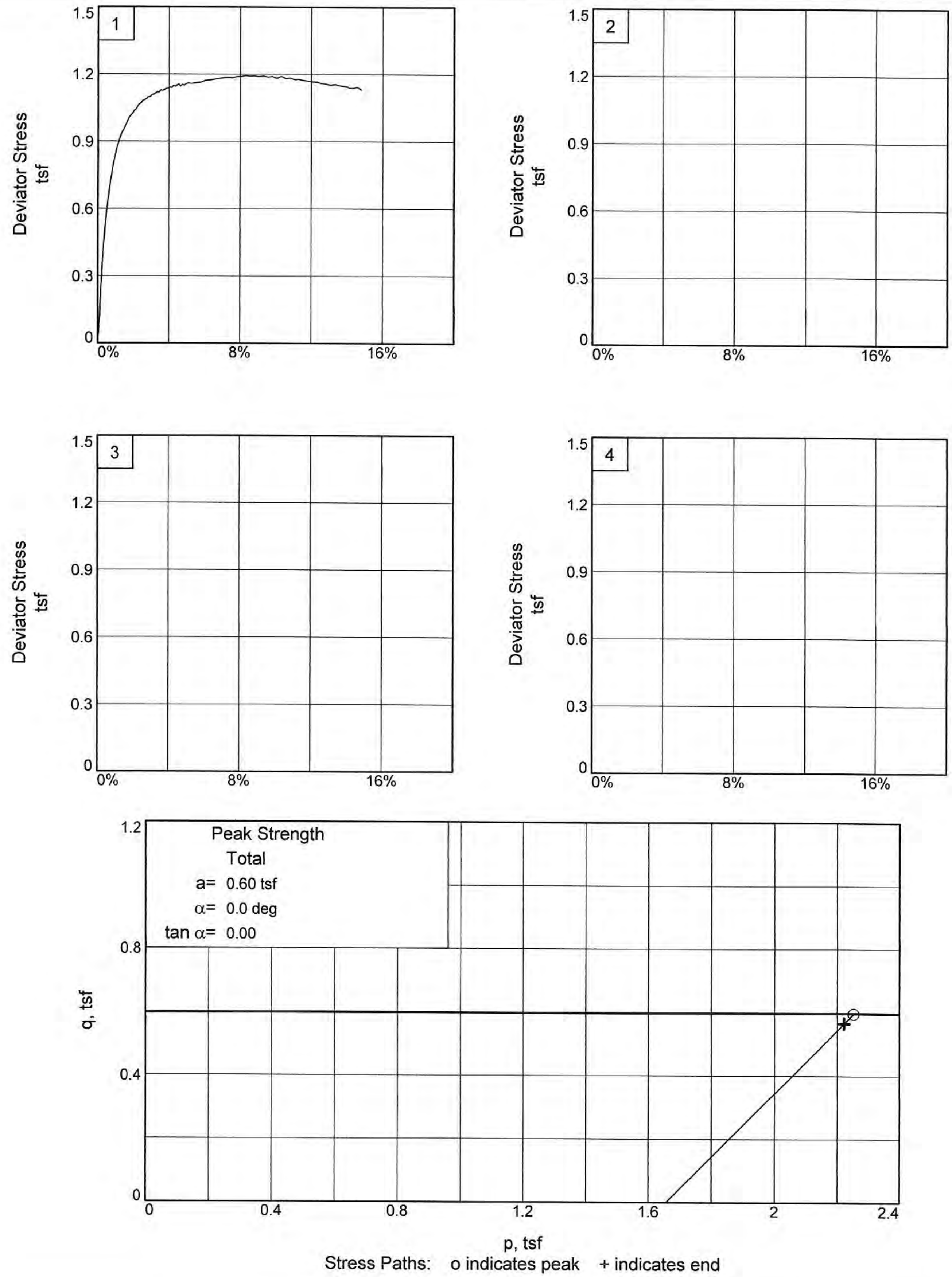
Client:

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



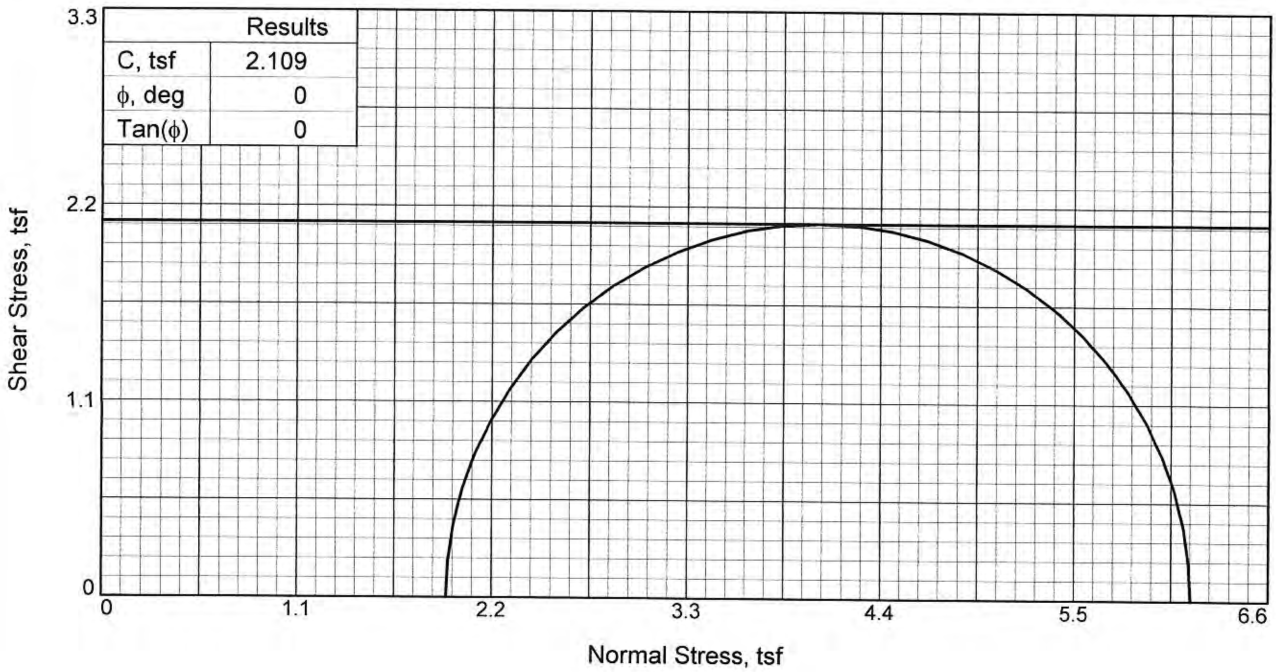
Client:

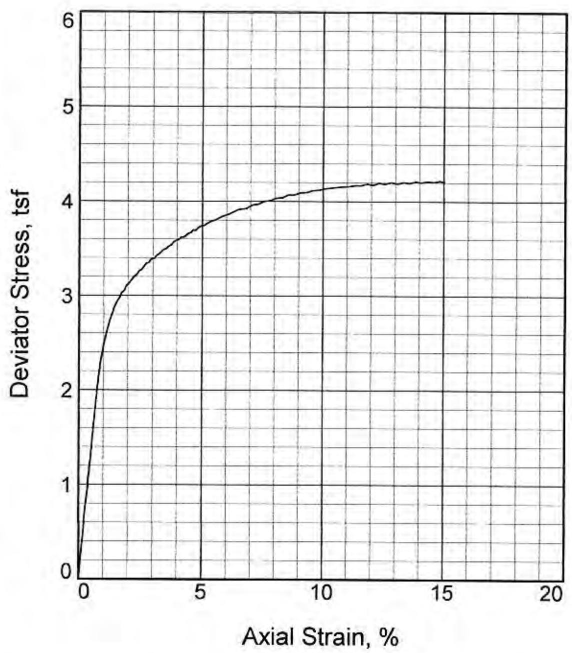
Project: San Jacinto River Waste Pit Superfund Site

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 ________

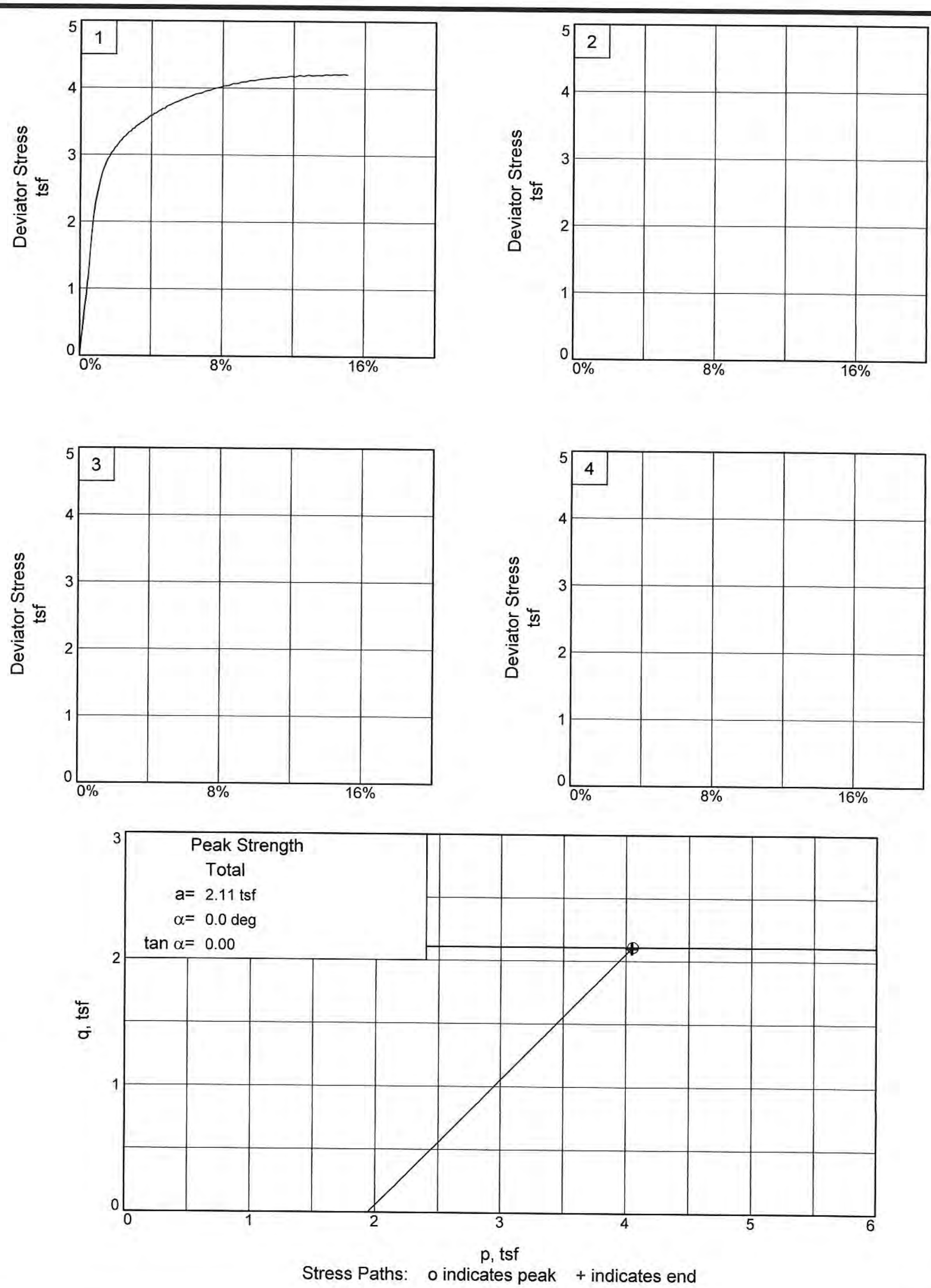
Client:

Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB028 **Depth:** 63

Proj. No.: 19.15.131 **Date Sampled:** 1/15/2020

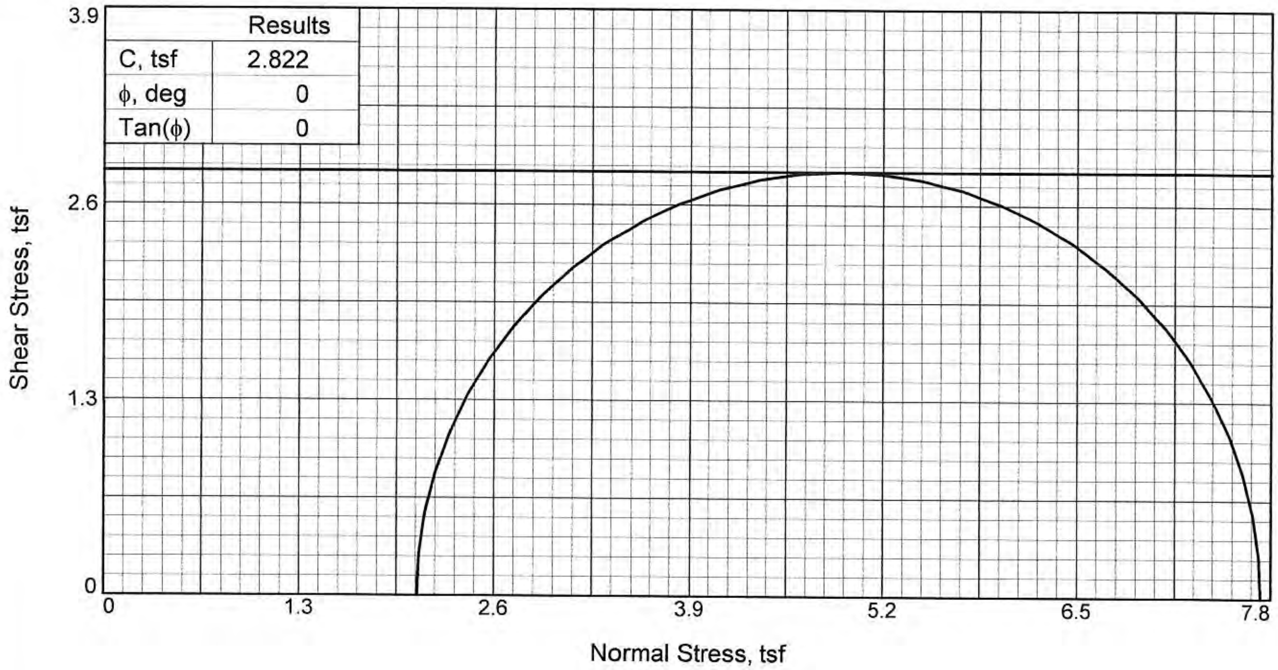
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas

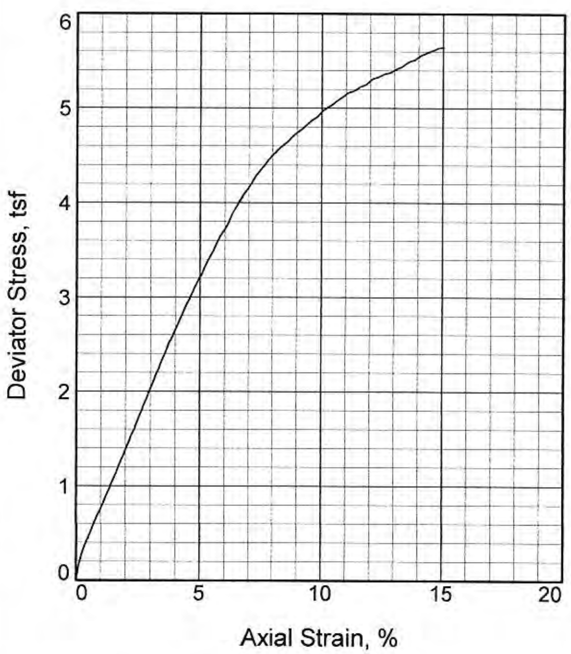


Client:
Project: San Jacinto River Waste Pit Superfund Site
Source of Sample: SJGB028 **Depth:** 63
Project No.: 19.15.131 **Figure** _______

TOLUNAY-WONG ENGINEERS, INC.

Attachment Figure B.2-100





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 ________

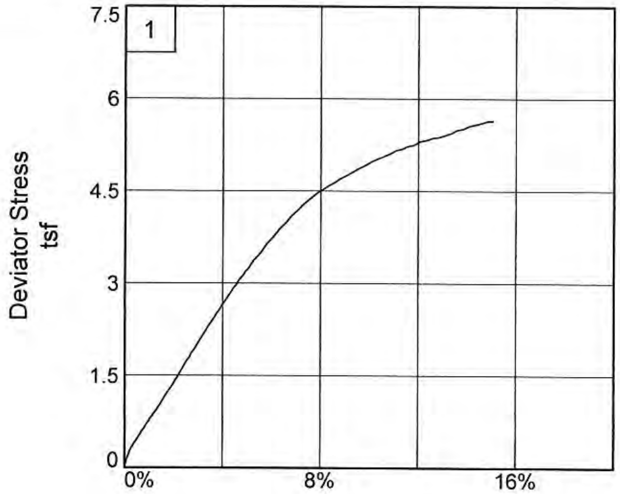
Client:

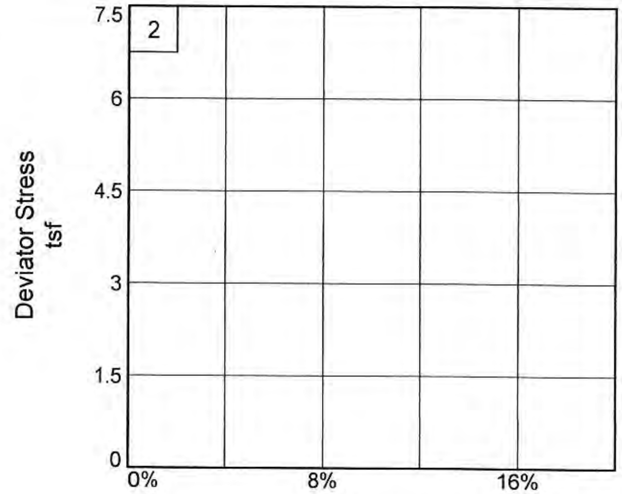
Project: San Jacinto River Waste Pit Superfund Site

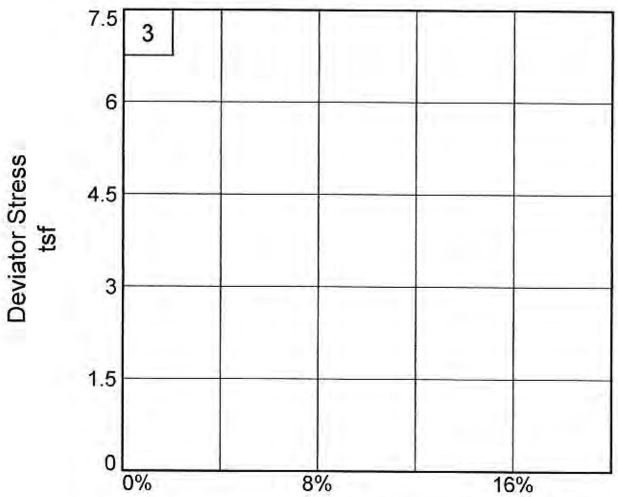
Source of Sample: SJGB028 **Depth:** 68

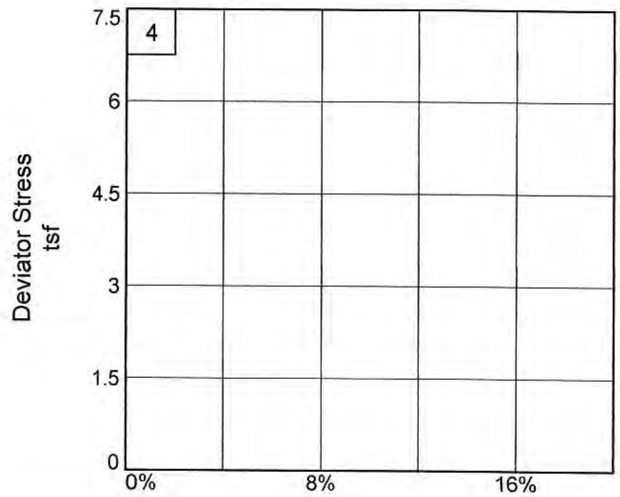
Proj. No.: 19.15.131 **Date Sampled:** 1/16/2020

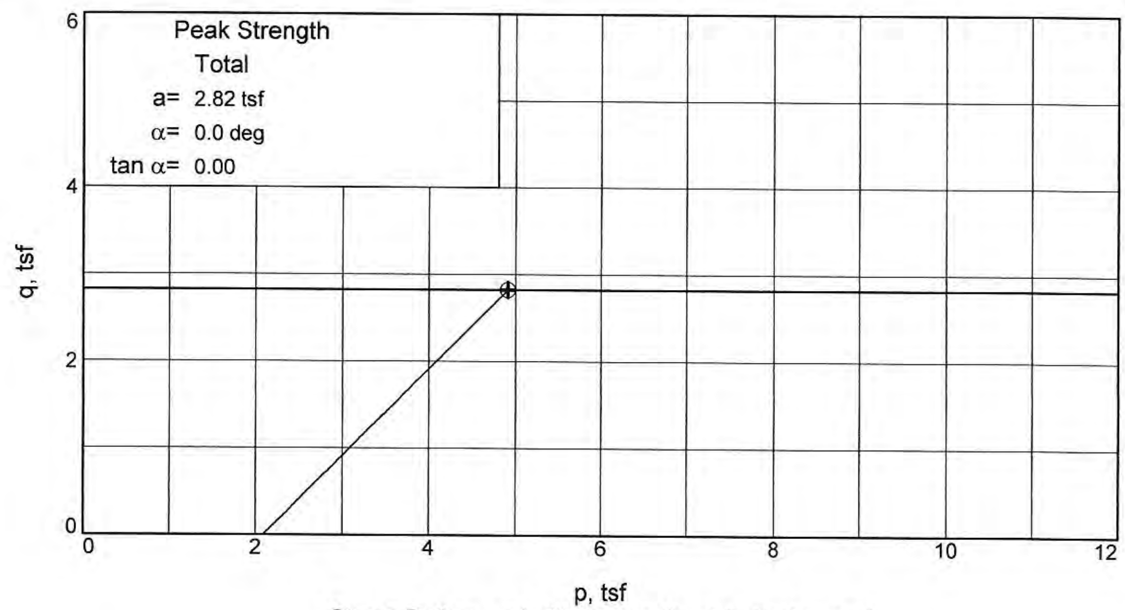
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

Client:

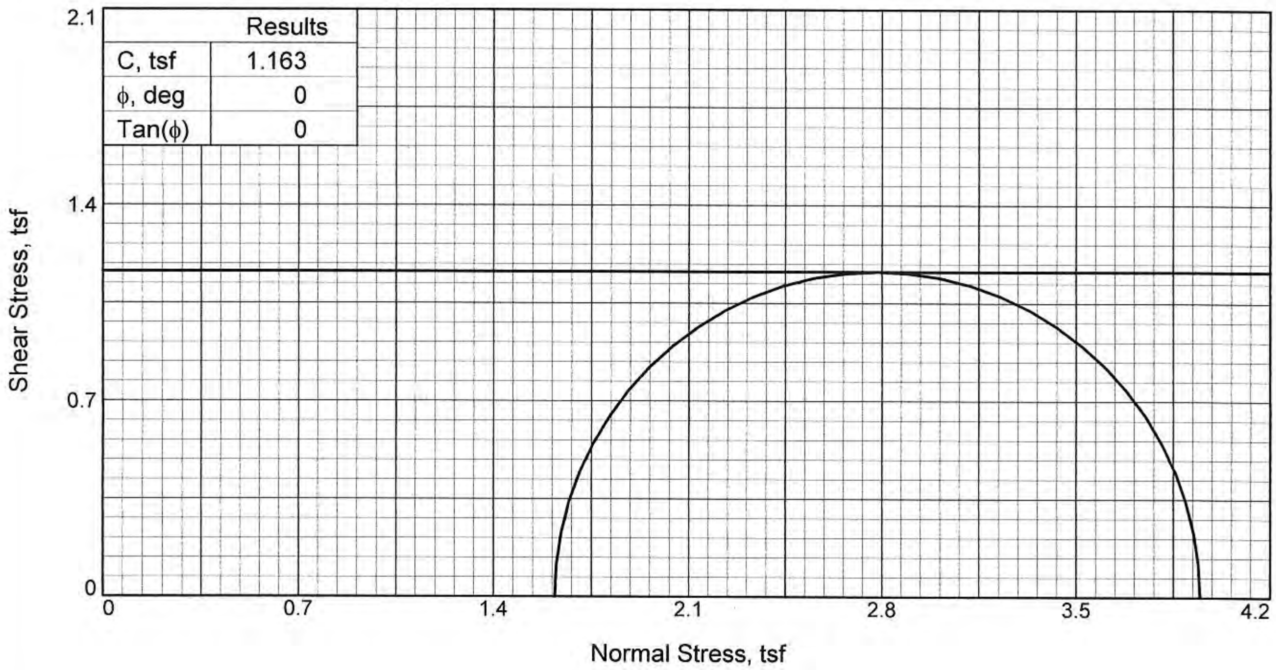
Project: San Jacinto River Waste Pit Superfund Site

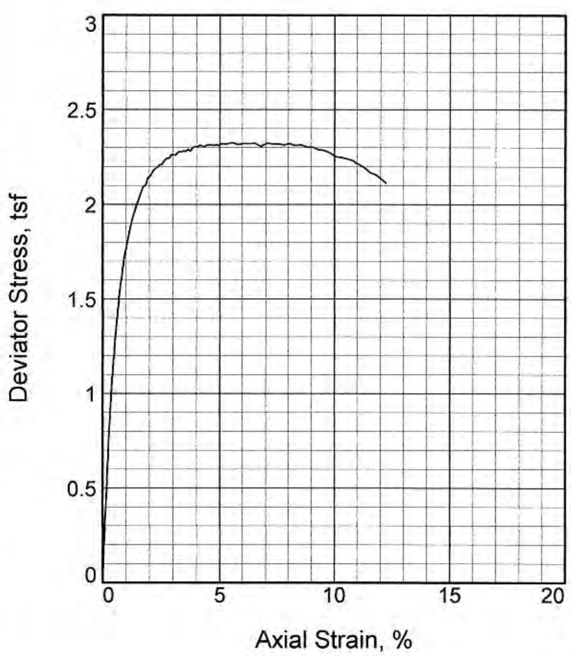
Source of Sample: SJGB028 **Depth:** 68

Project No.: 19.15.131 **Figure** _______

TOLUNAY-WONG ENGINEERS, INC.

Attachment Figure B.2-102





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 ________

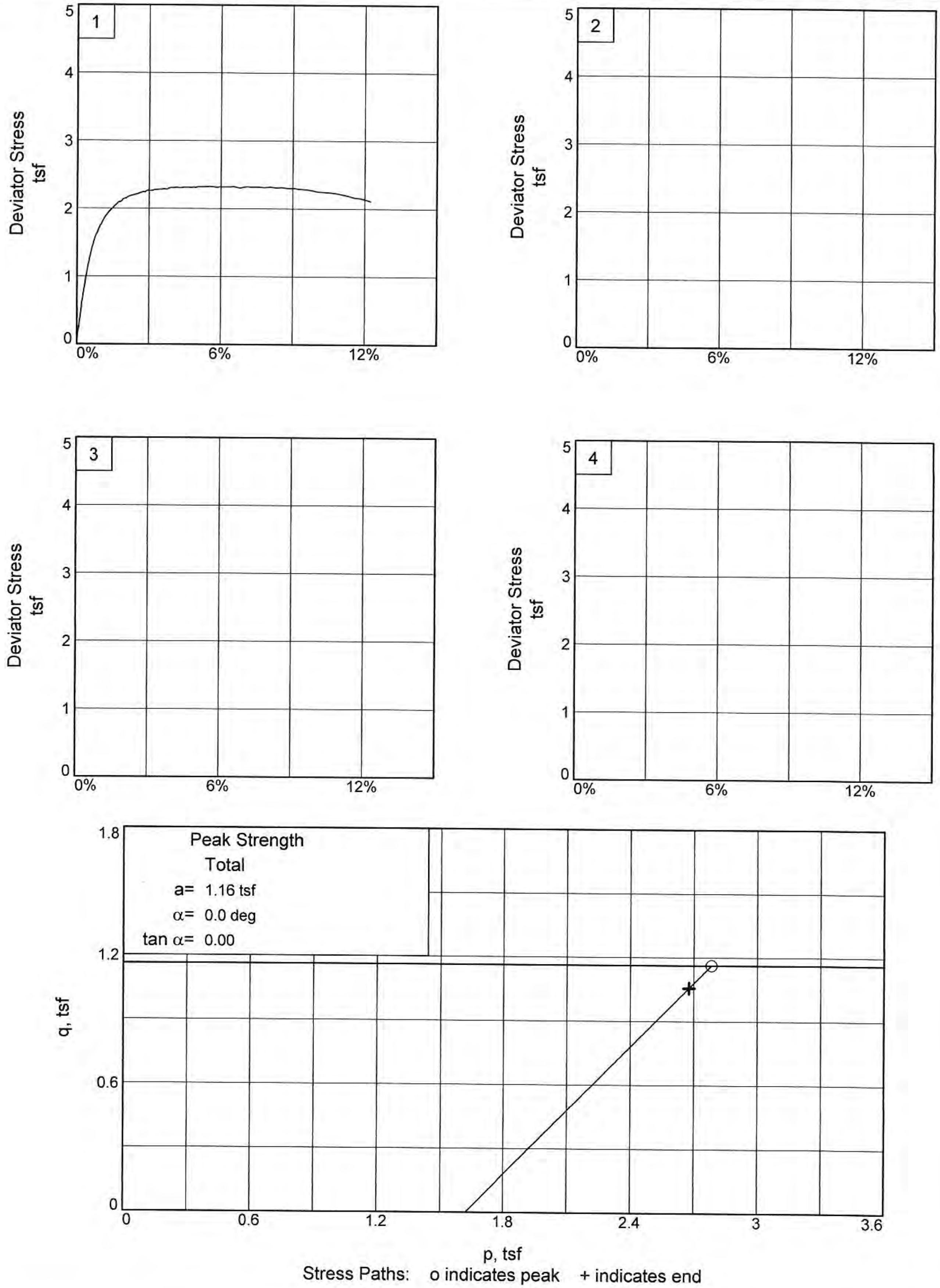
Client:

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:

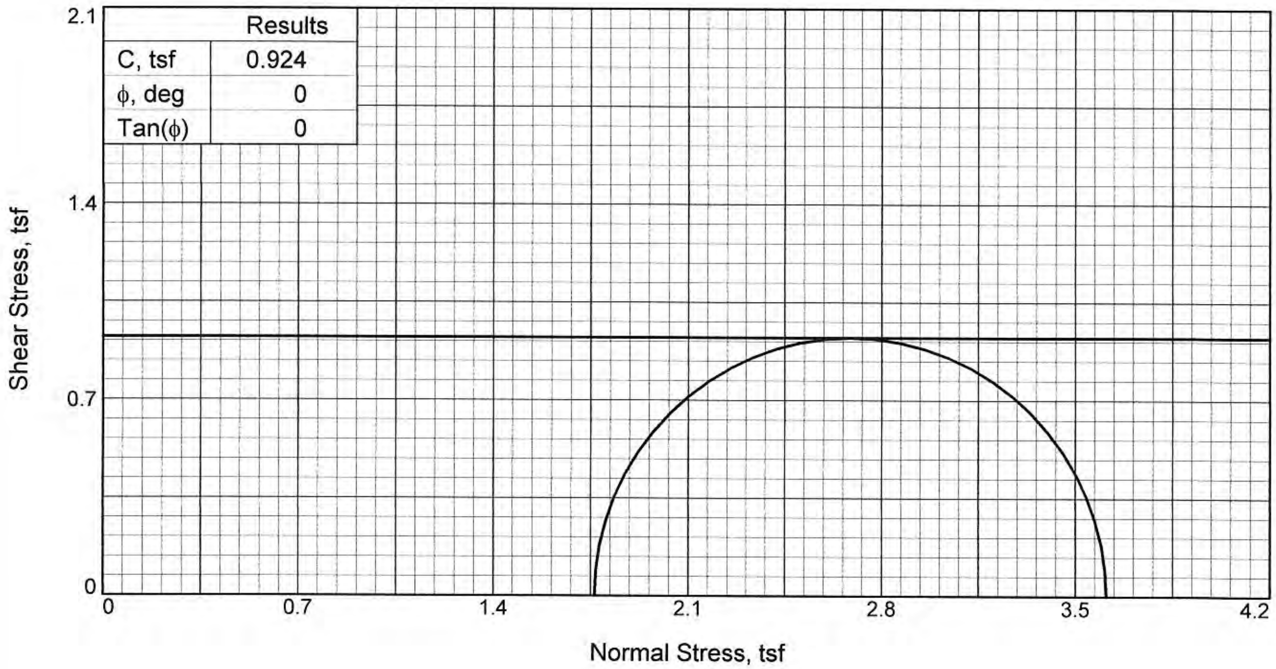
Project: San Jacinto River Waste Pit Superfund Site

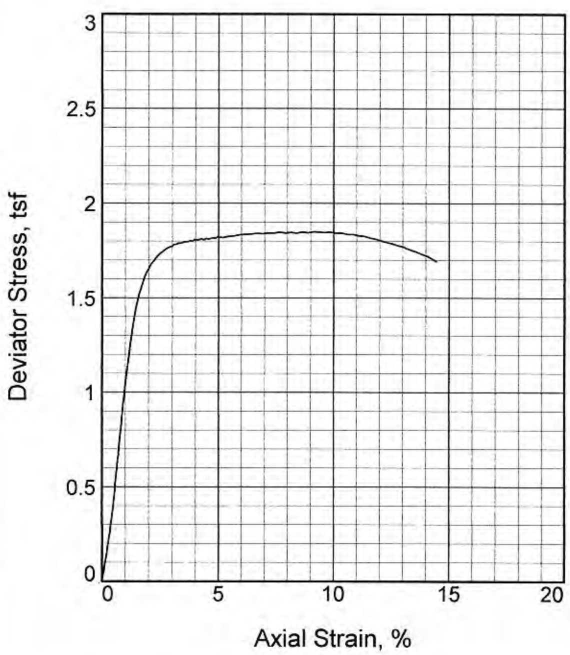
Source of Sample: SJGB029 **Depth:** 53

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 ________

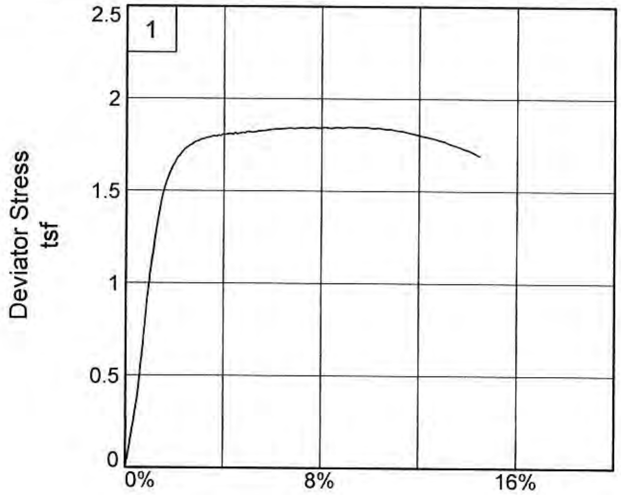
Client:

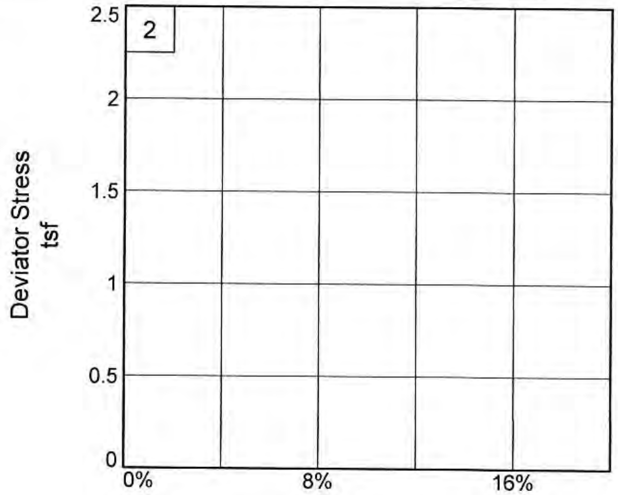
Project: San Jacinto River Waste Pit Superfund Site

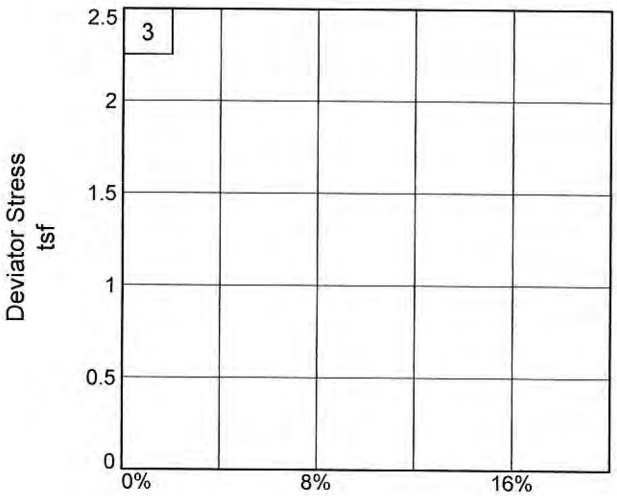
Source of Sample: SJGB029 **Depth:** 58

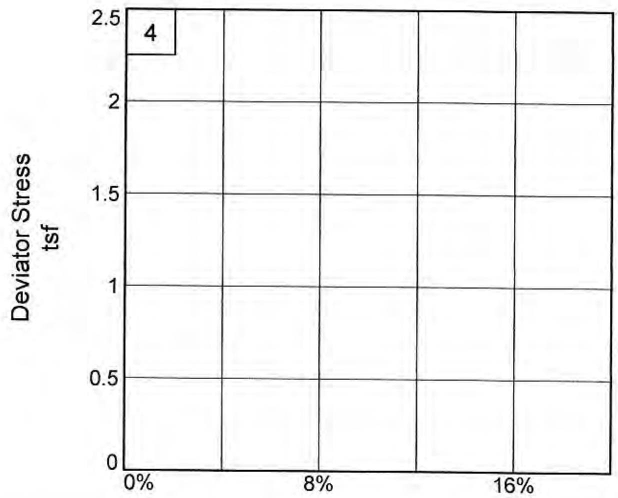
Proj. No.: 19.15.131 **Date Sampled:** 1/15/2020

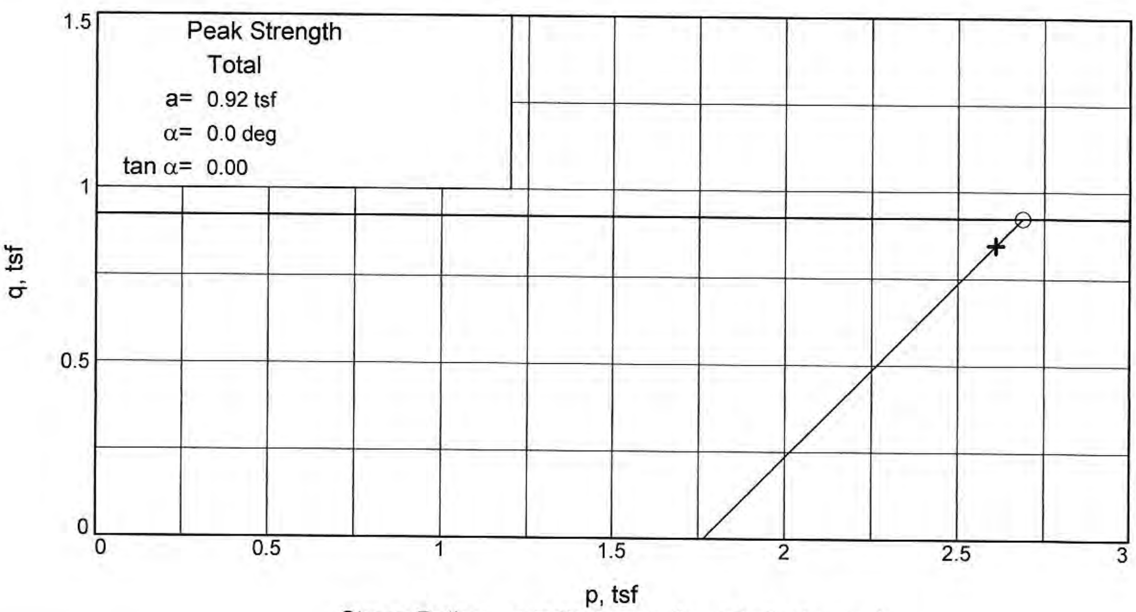
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

Client:

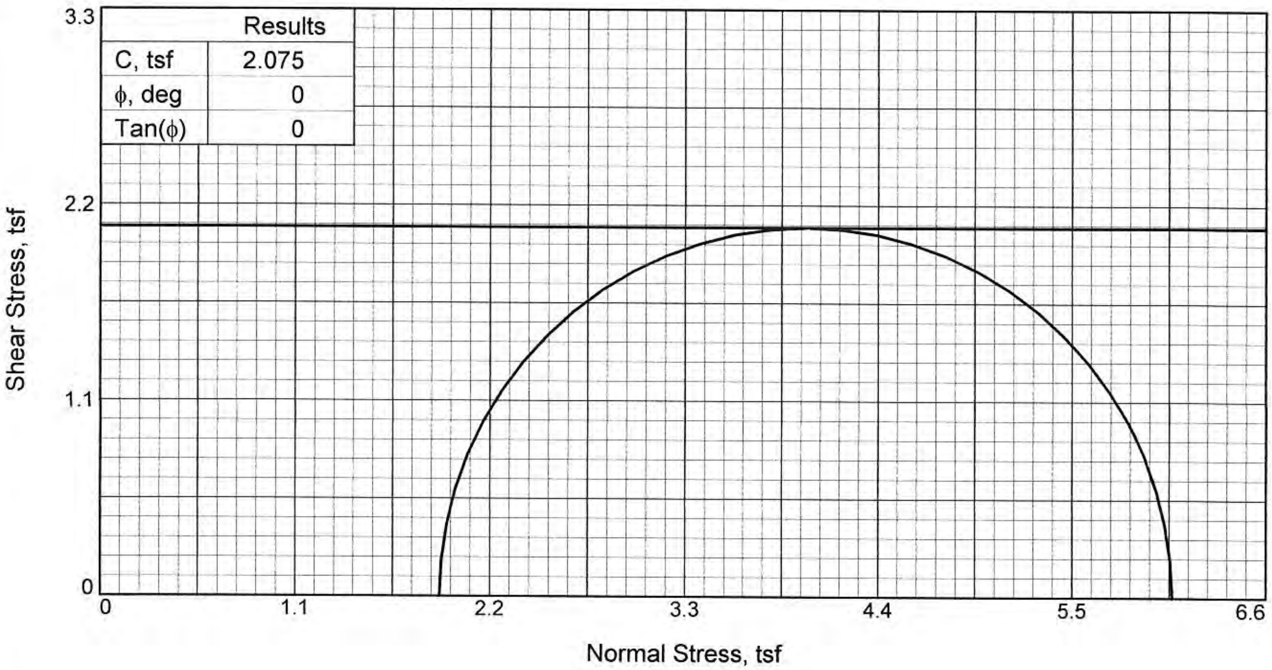
Project: San Jacinto River Waste Pit Superfund Site

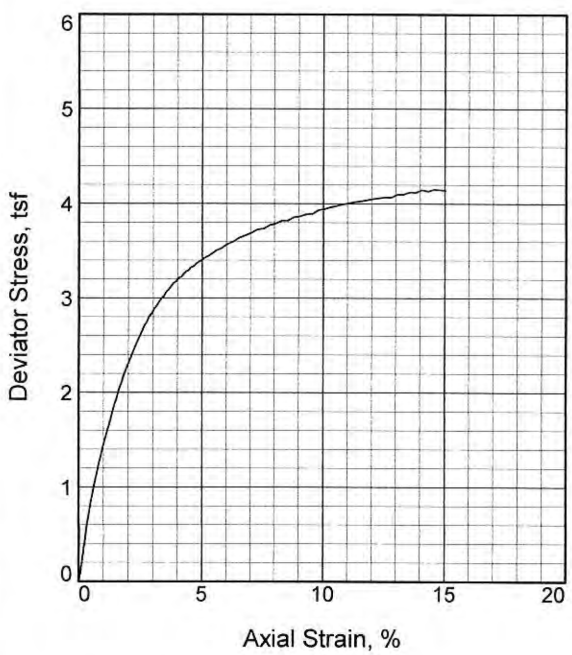
Source of Sample: SJGB029 **Depth:** 58

Project No.: 19.15.131 **Figure** _______

TOLUNAY-WONG ENGINEERS, INC.

Attachment Figure B.2-106





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 ________

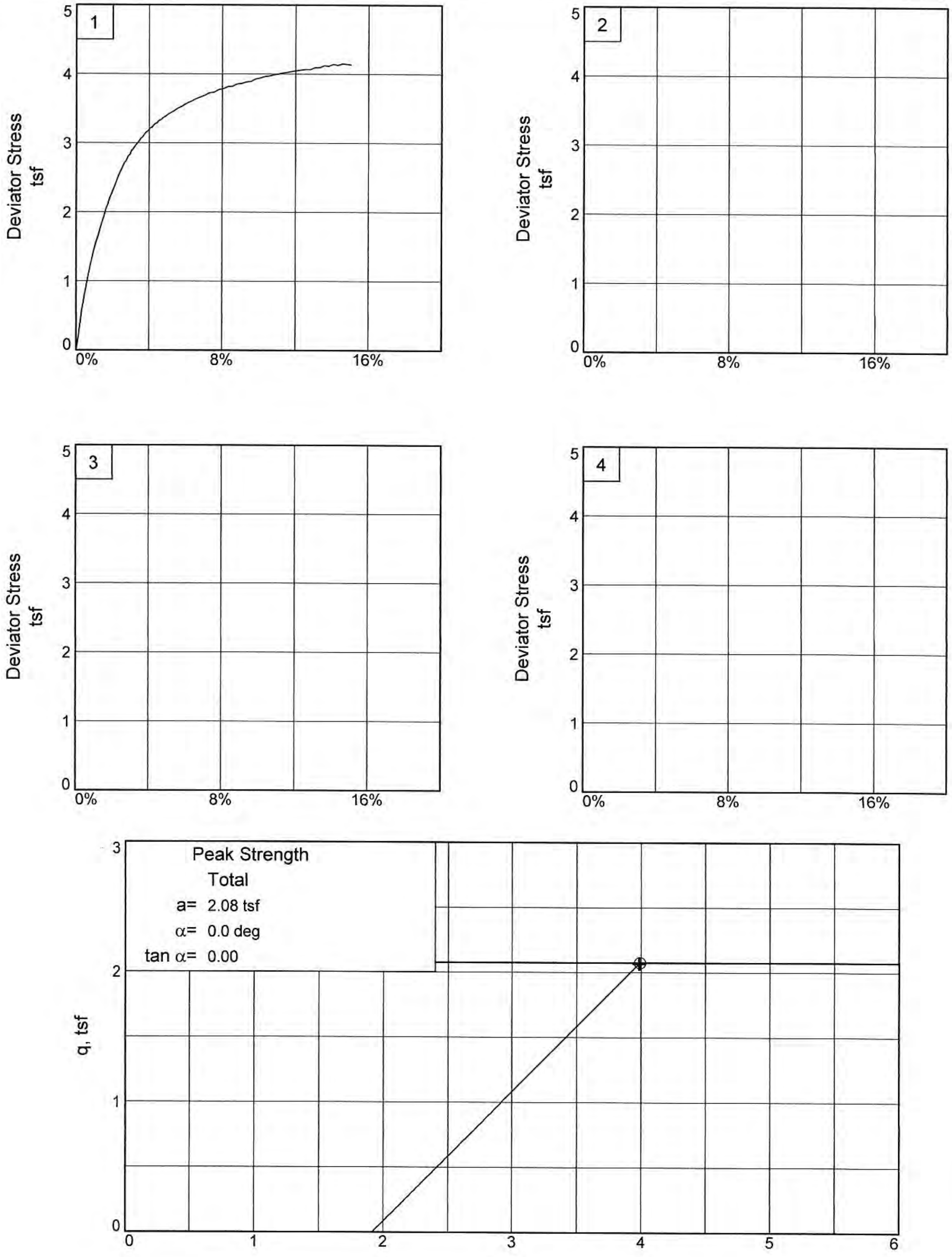
Client:

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:

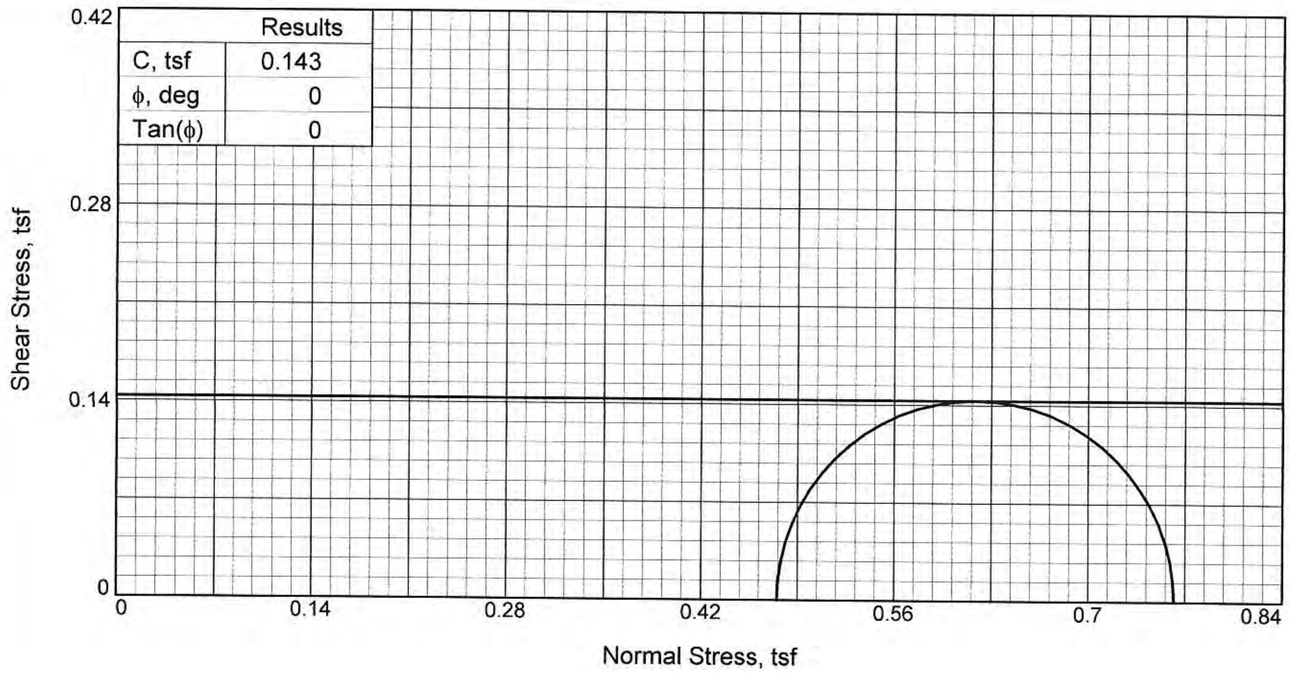
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB029 **Depth:** 63

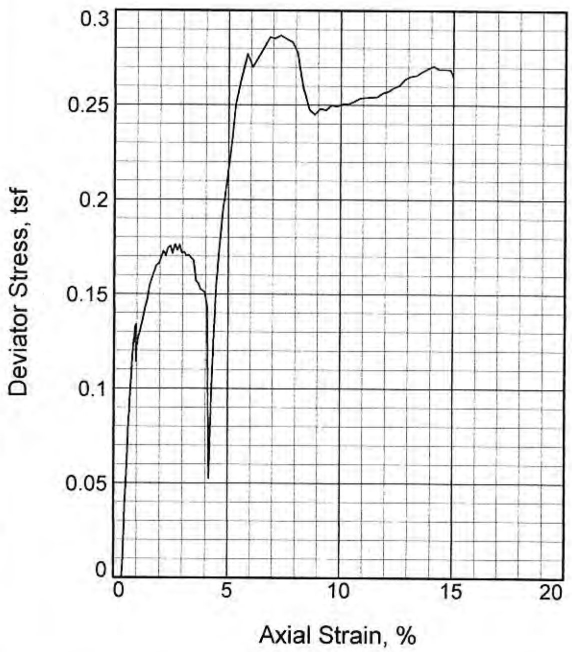
Project No.: 19.15.131 **Figure** _______

TOLUNAY-WONG ENGINEERS, INC.

Attachment Figure B.2-108



Results	
C, tsf	0.143
ϕ, deg	0
Tan(ϕ)	0



	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 ________

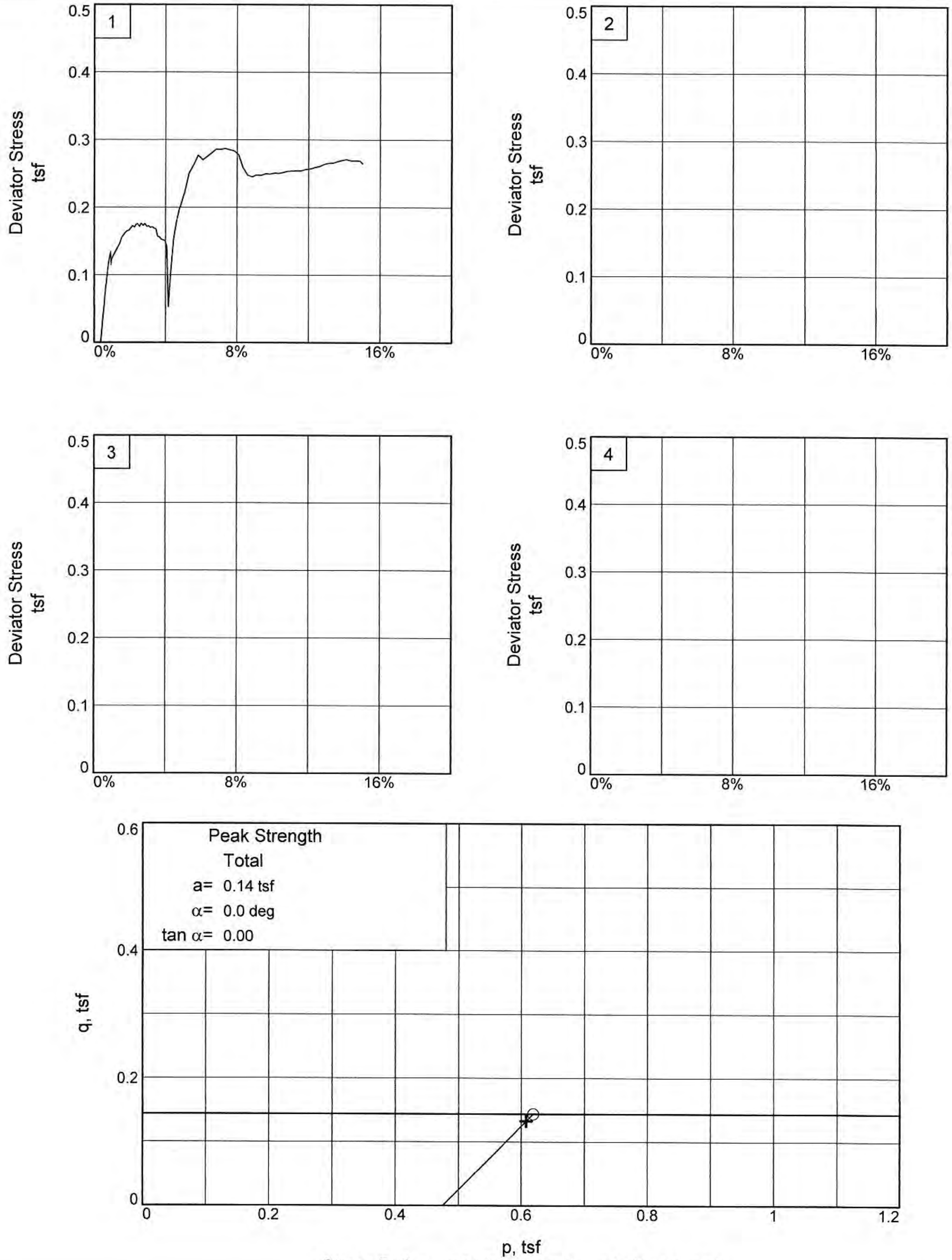
Client:

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

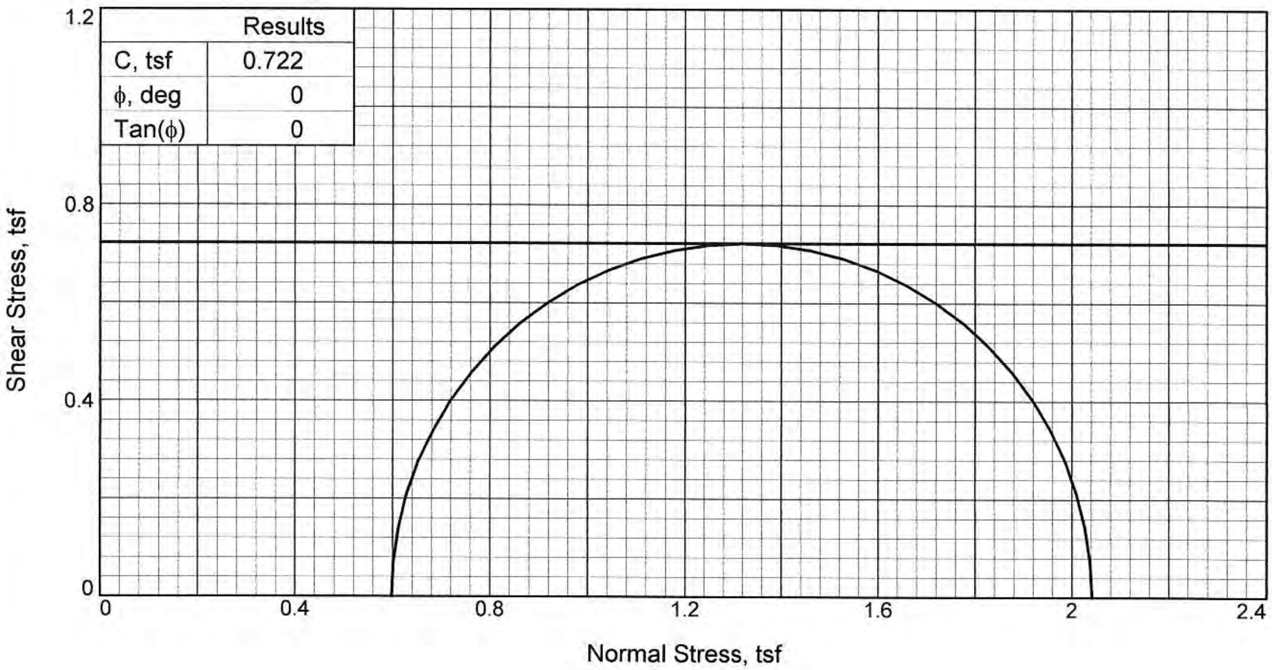
Client:

Project: San Jacinto River Waste Pit Superfund Site

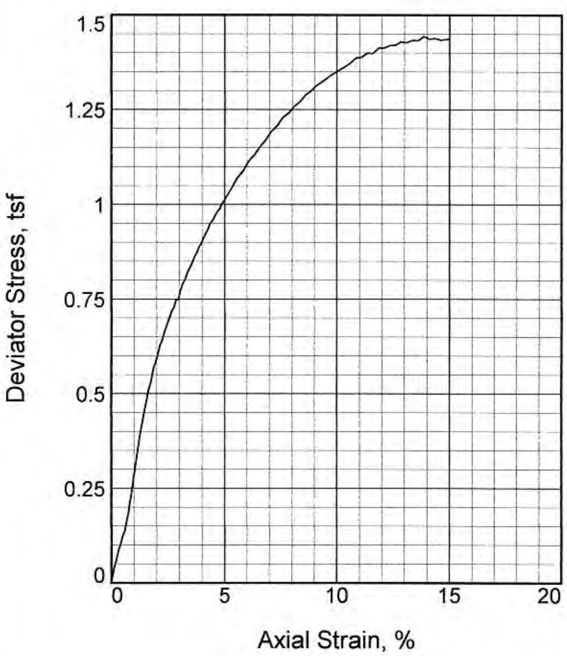
Source of Sample: SJGB047 **Depth:** 18

Project No.: 19.15.131 **Figure** _______

TOLUNAY-WONG ENGINEERS, INC.



	Results
C, tsf	0.722
ϕ, deg	0
Tan(ϕ)	0



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 ________

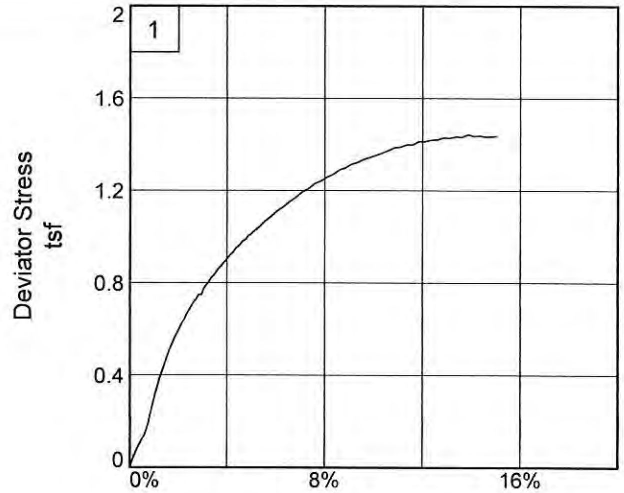
Client:

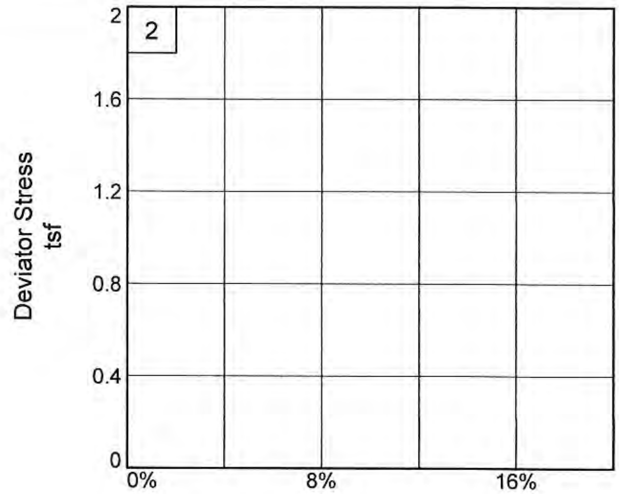
Project: San Jacinto River Waste Pit Superfund Site

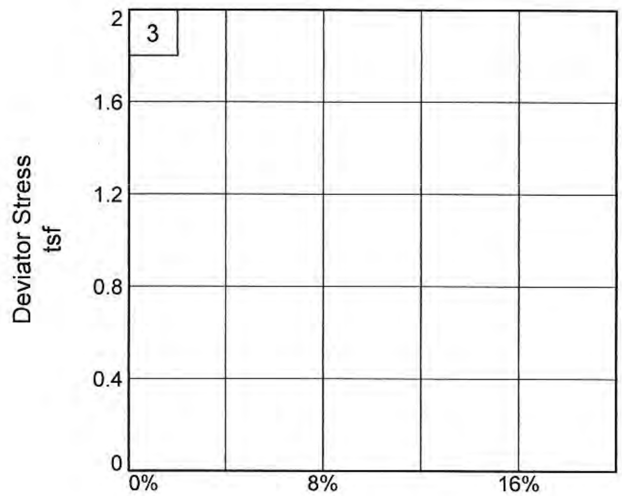
Source of Sample: SJGB047 **Depth:** 23

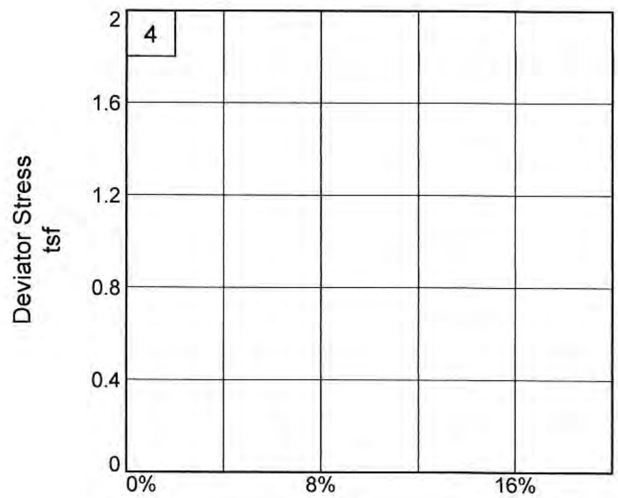
Proj. No.: 19.15.131 **Date Sampled:** 2-8-2020

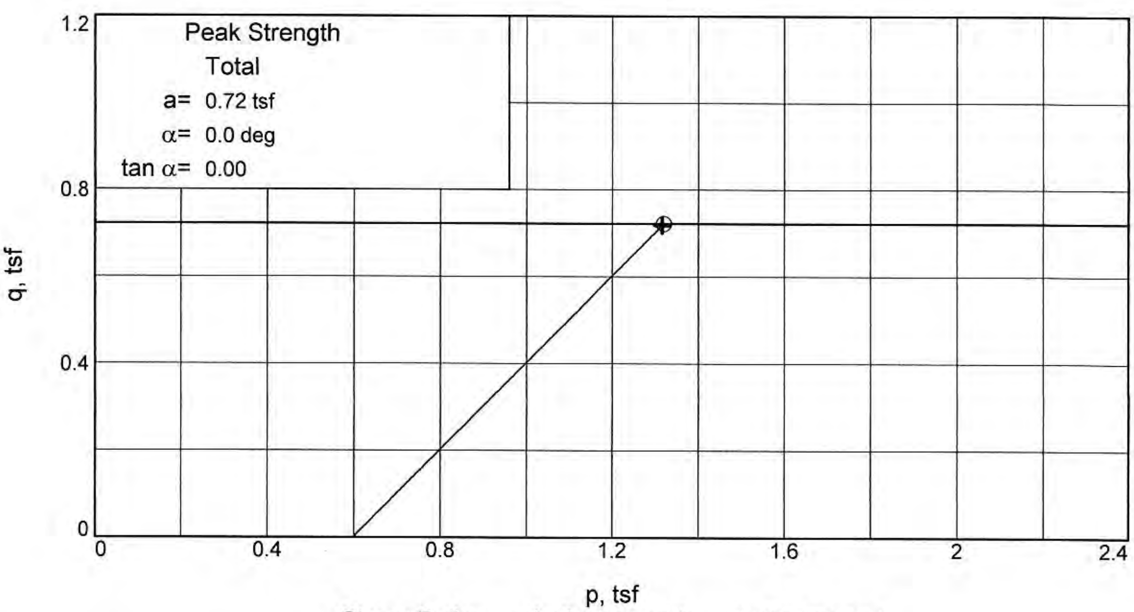
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

Client:

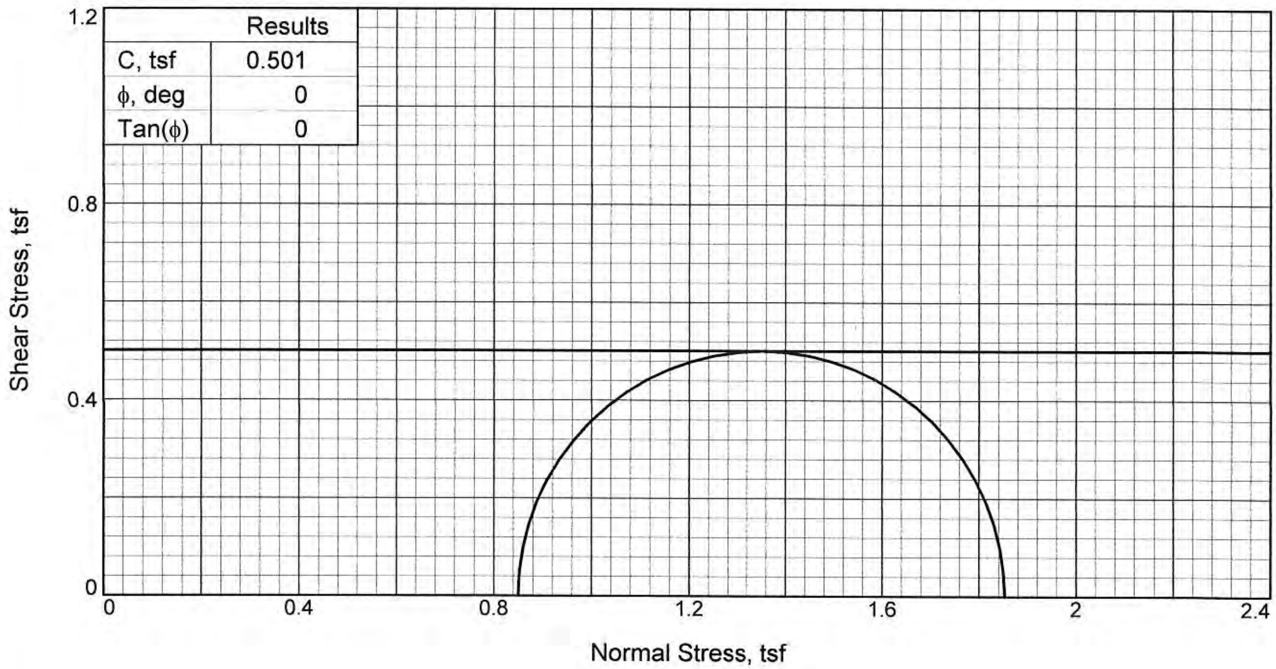
Project: San Jacinto River Waste Pit Superfund Site

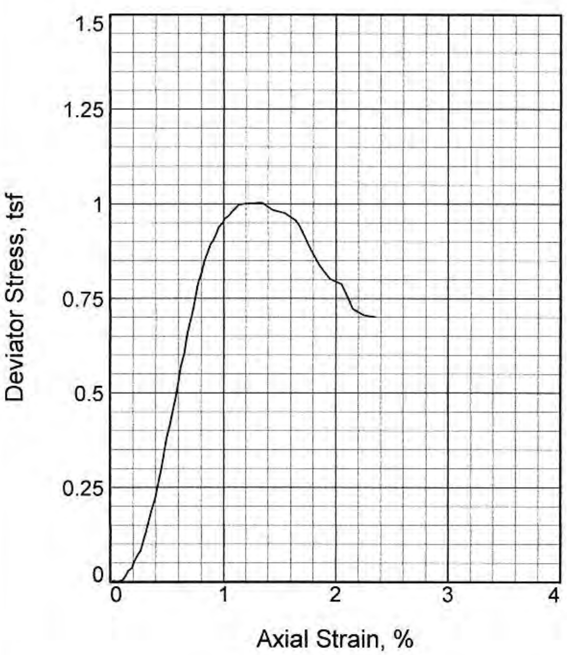
Source of Sample: SJGB047 **Depth:** 23

Project No.: 19.15.131 **Figure** _______

TOLUNAY-WONG ENGINEERS, INC.

Attachment Figure B.2-112





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 ________

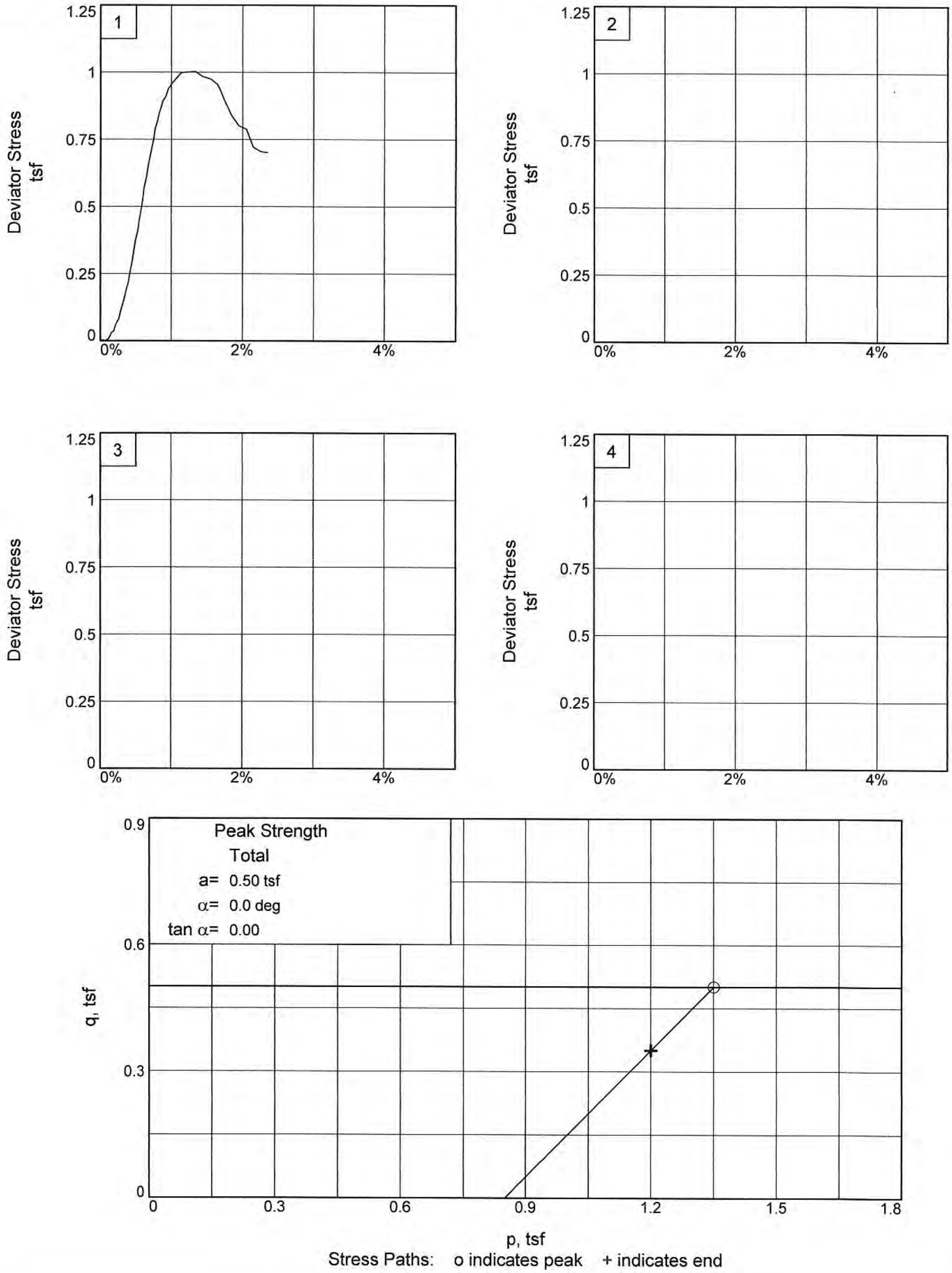
Client:

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:

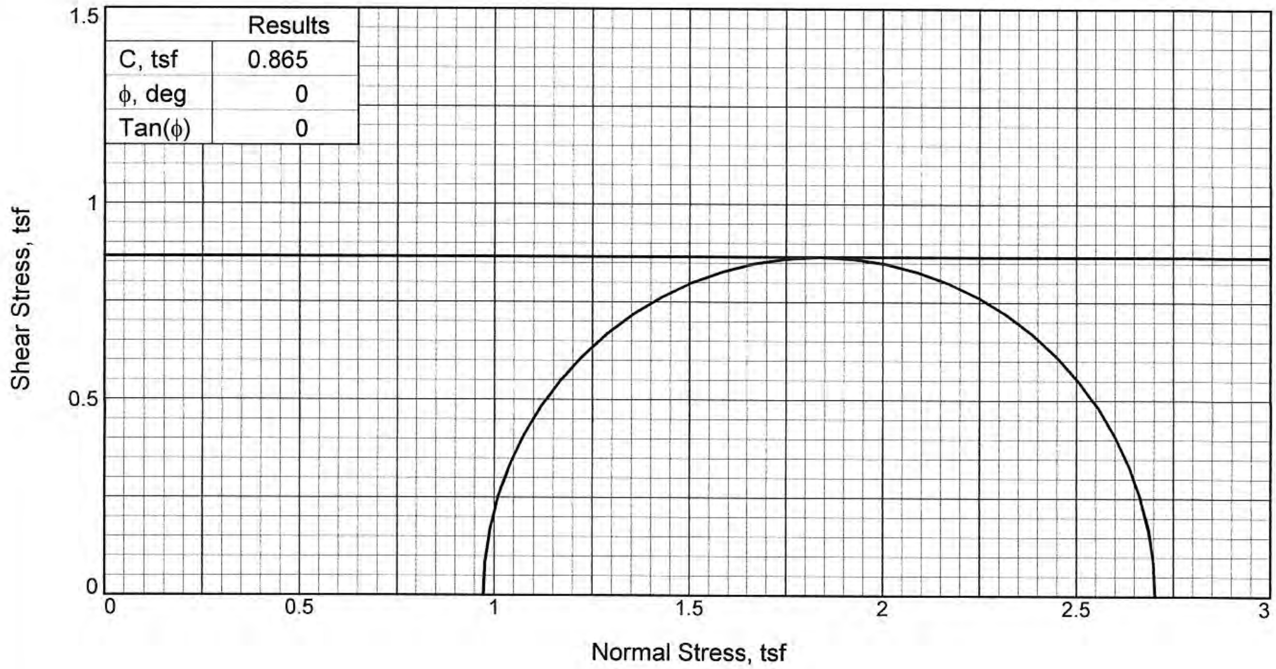
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB047 **Depth:** 33

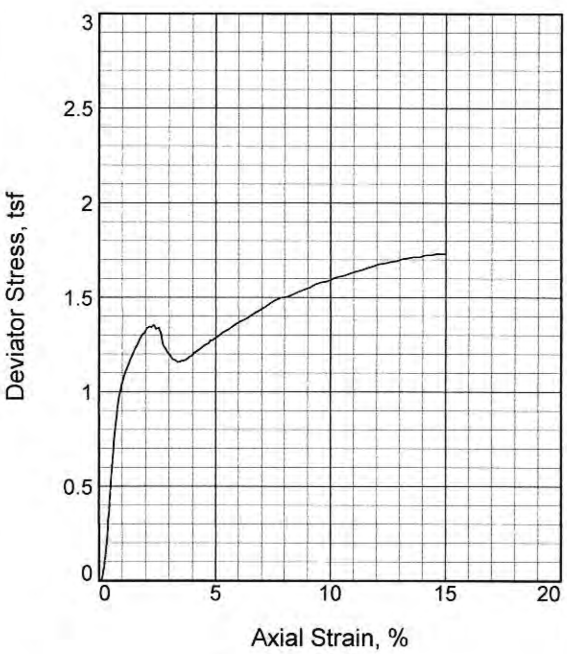
Project No.: 19.15.131 **Figure** _______

TOLUNAY-WONG ENGINEERS, INC.

Attachment Figure B.2-114



Results	
C, tsf	0.865
ϕ, deg	0
Tan(ϕ)	0



	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 ________

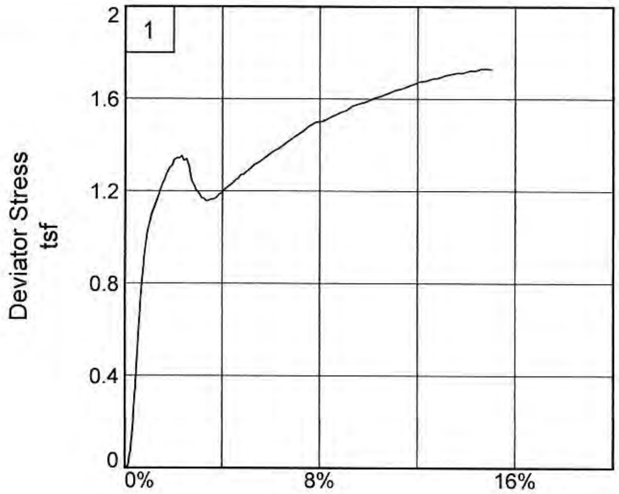
Client:

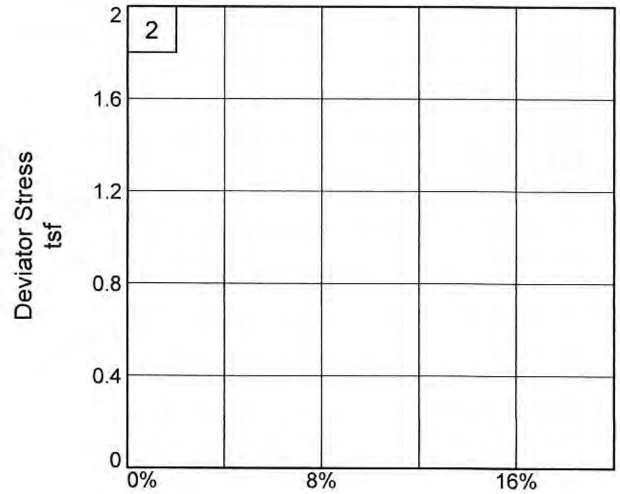
Project: San Jacinto River Waste Pit Superfund Site

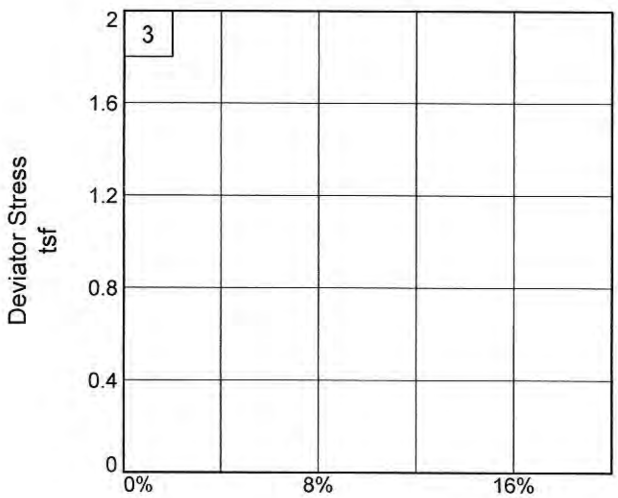
Source of Sample: SJGB047 **Depth:** 38

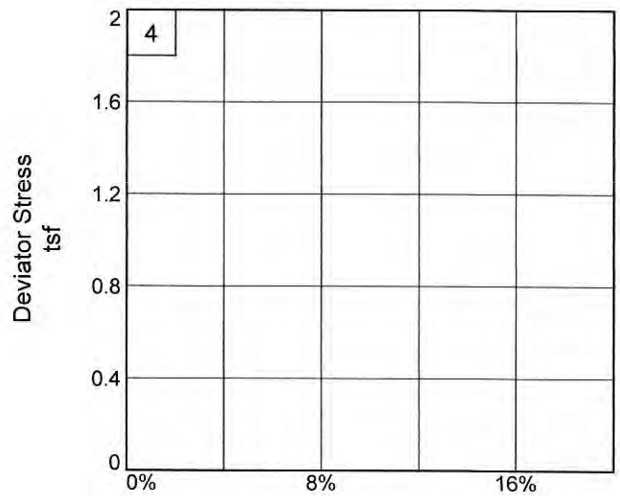
Proj. No.: 19.15.131 **Date Sampled:** 2-9-2020

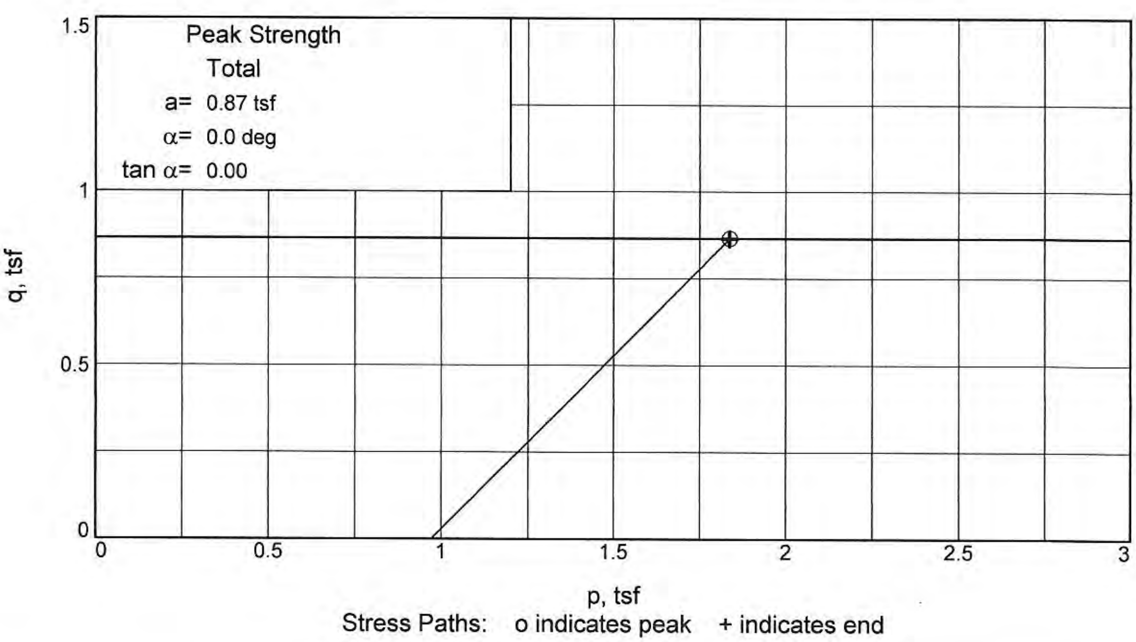
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











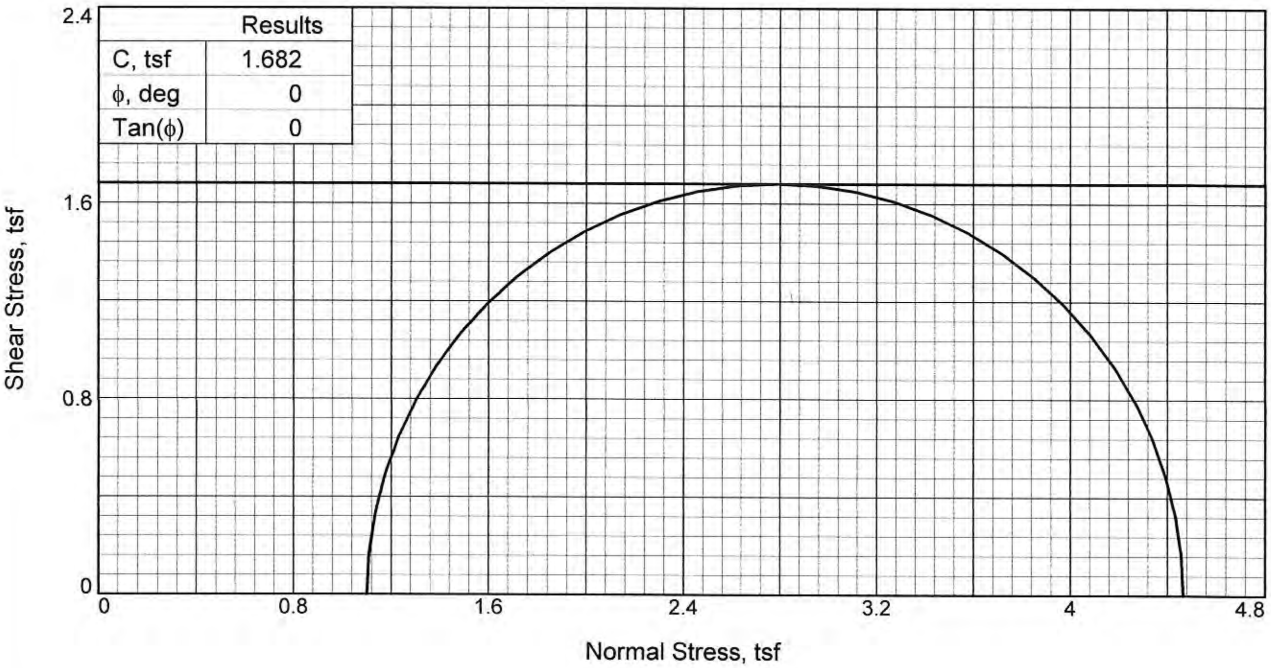
Client:

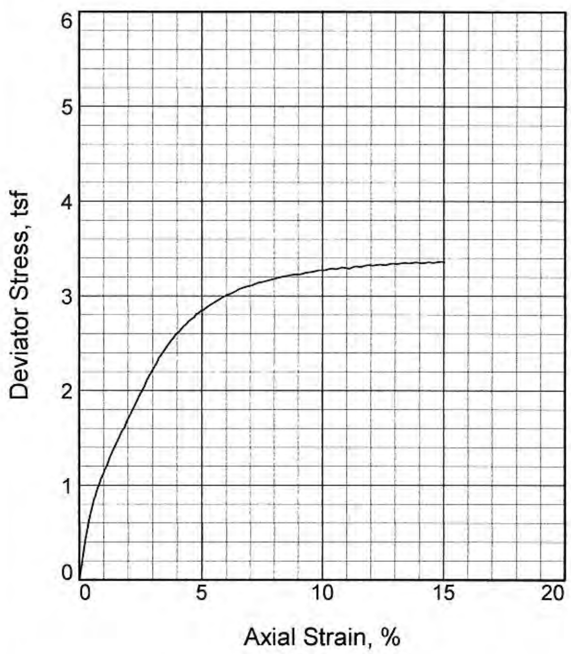
Project: San Jacinto River Waste Pit Superfund Site

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 ________

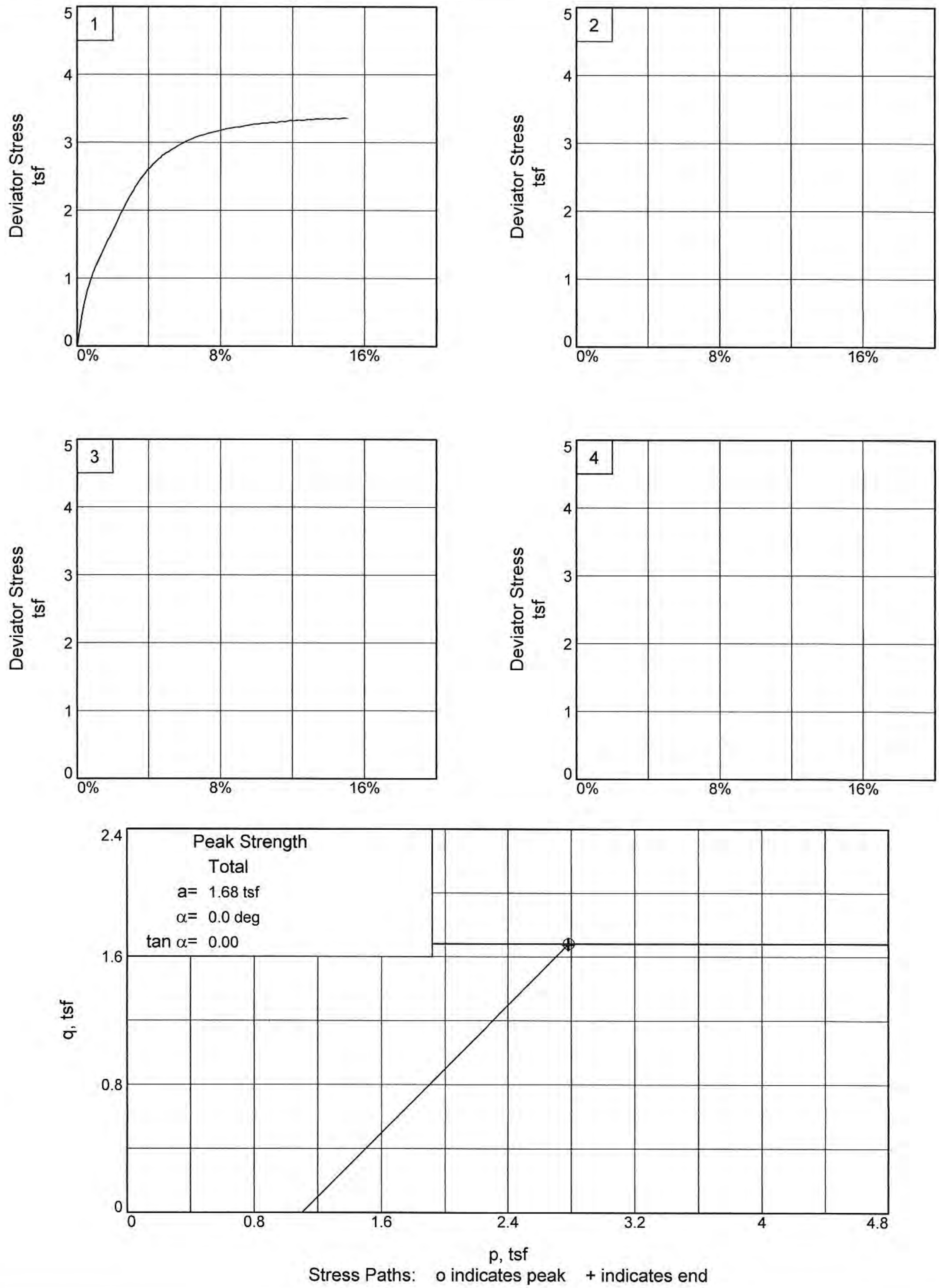
Client:

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



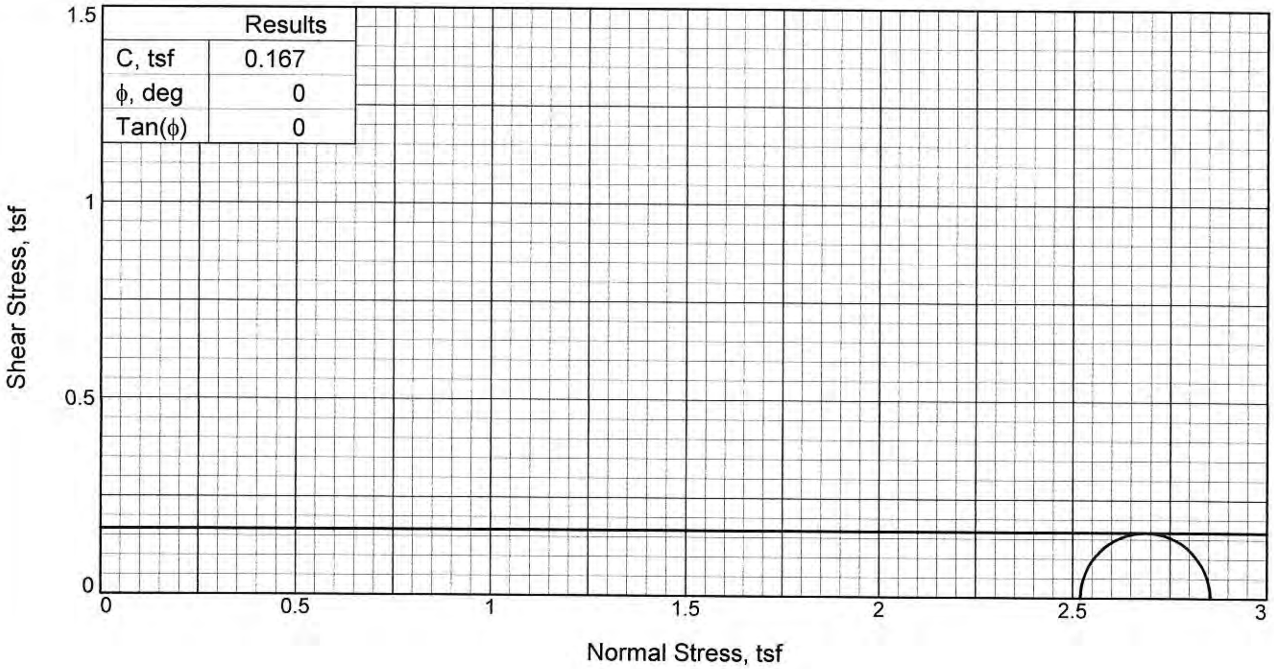
Client:

Project: San Jacinto River Waste Pit Superfund Site

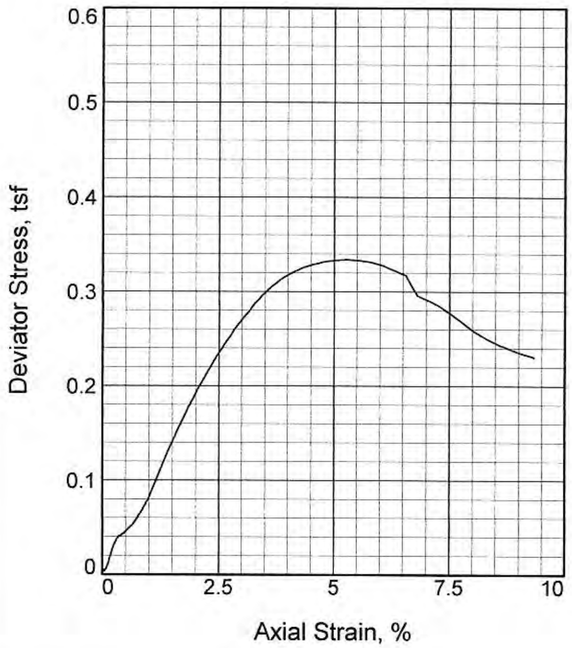
Source of Sample: SJGB047 **Depth:** 43

Project No.: 19.15.131 **Figure** _______

TOLUNAY-WONG ENGINEERS, INC.



Results	
C, tsf	0.167
ϕ, deg	0
Tan(ϕ)	0



	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 ________

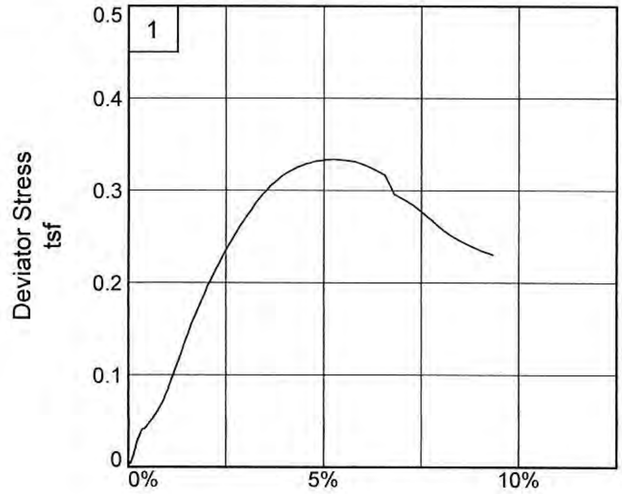
Client:

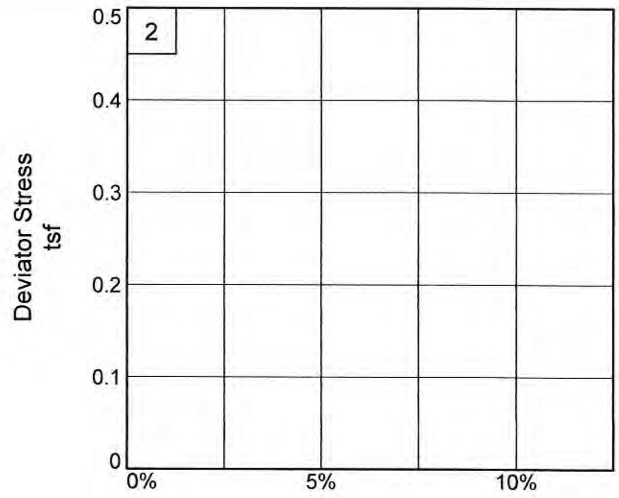
Project: San Jacinto River Waste Pit Superfund Site

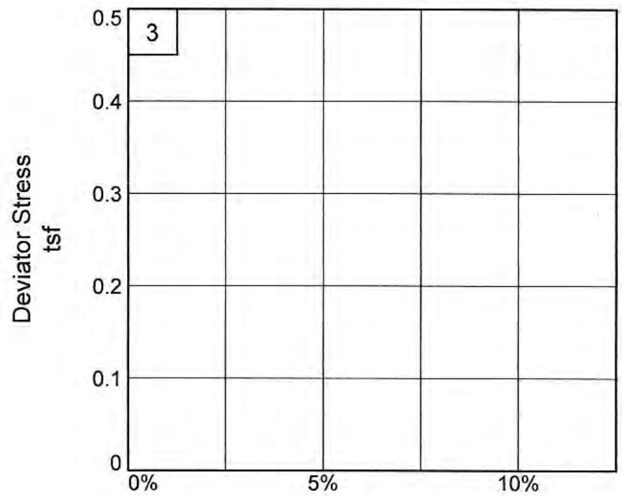
Source of Sample: SJGB047 **Depth:** 98

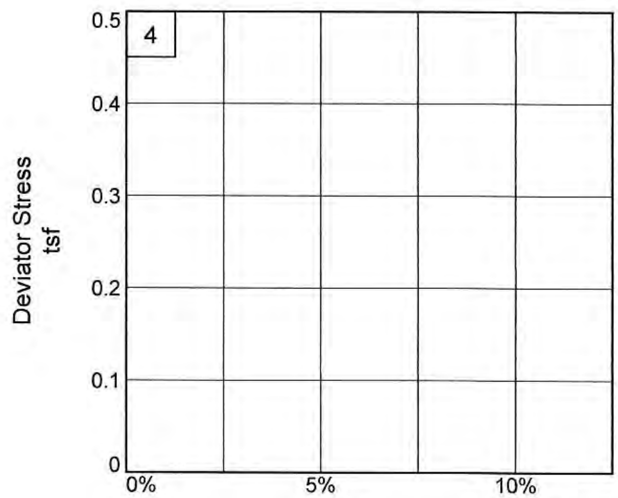
Proj. No.: 19.15.131 **Date Sampled:** 3/3/20

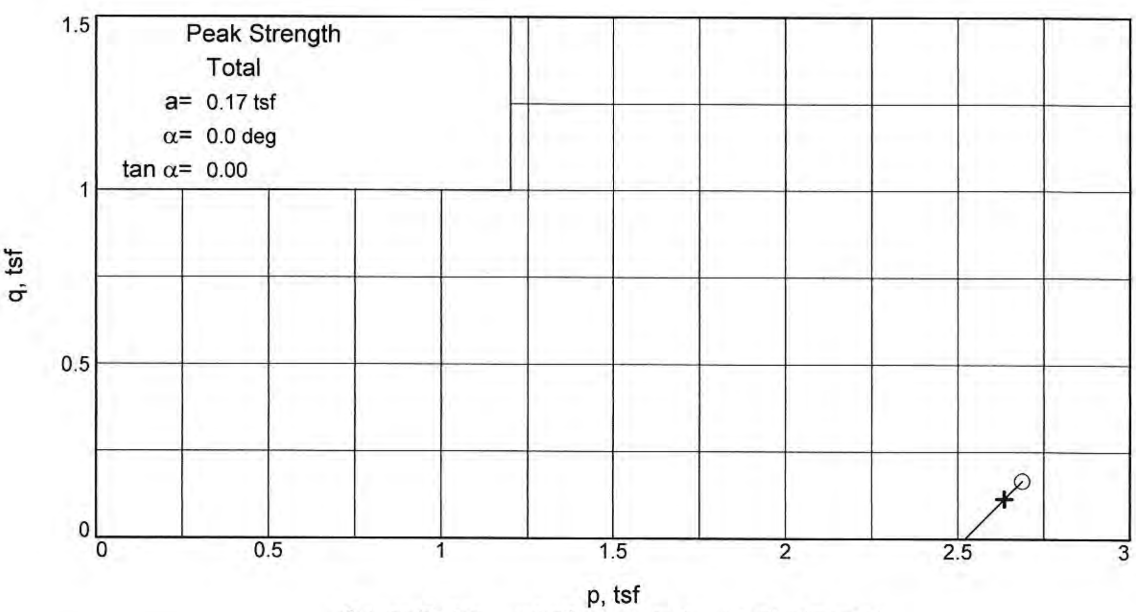
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

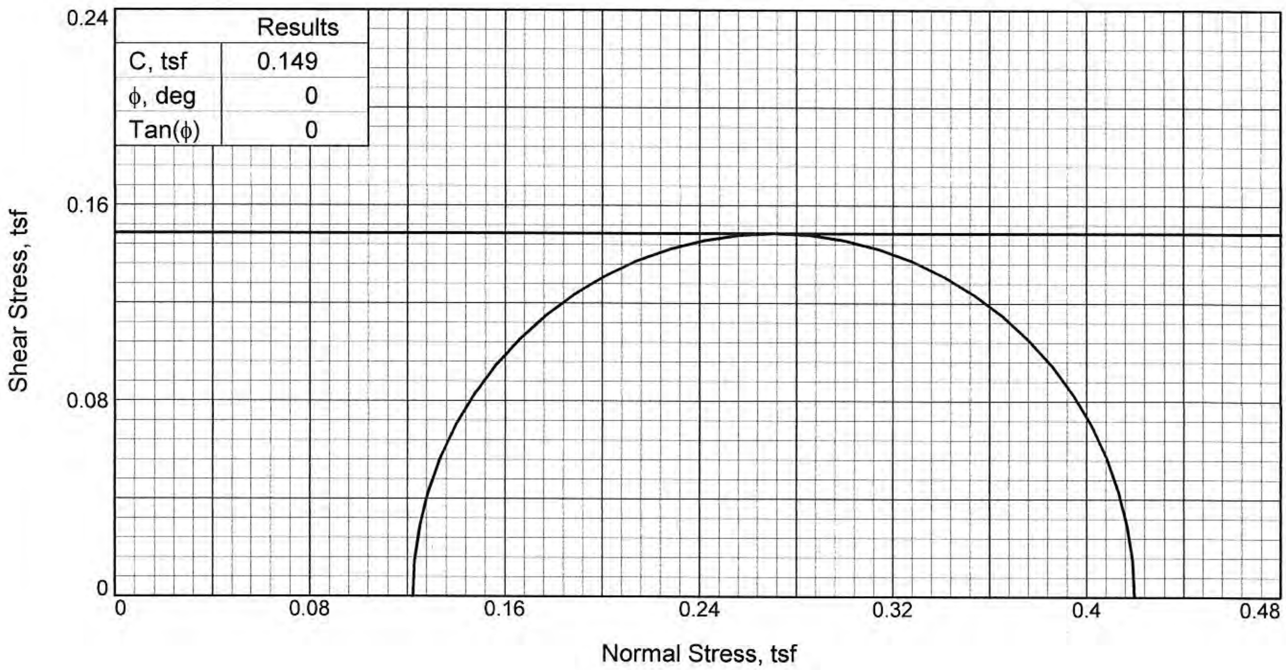
Client:

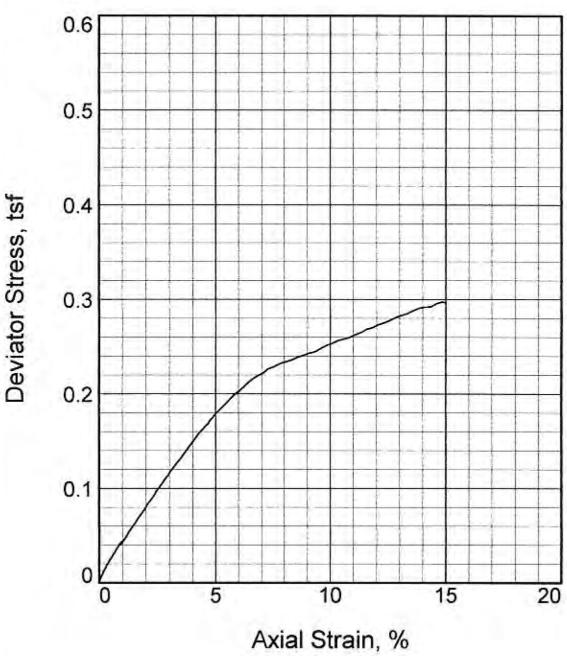
Project: San Jacinto River Waste Pit Superfund Site

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 ________

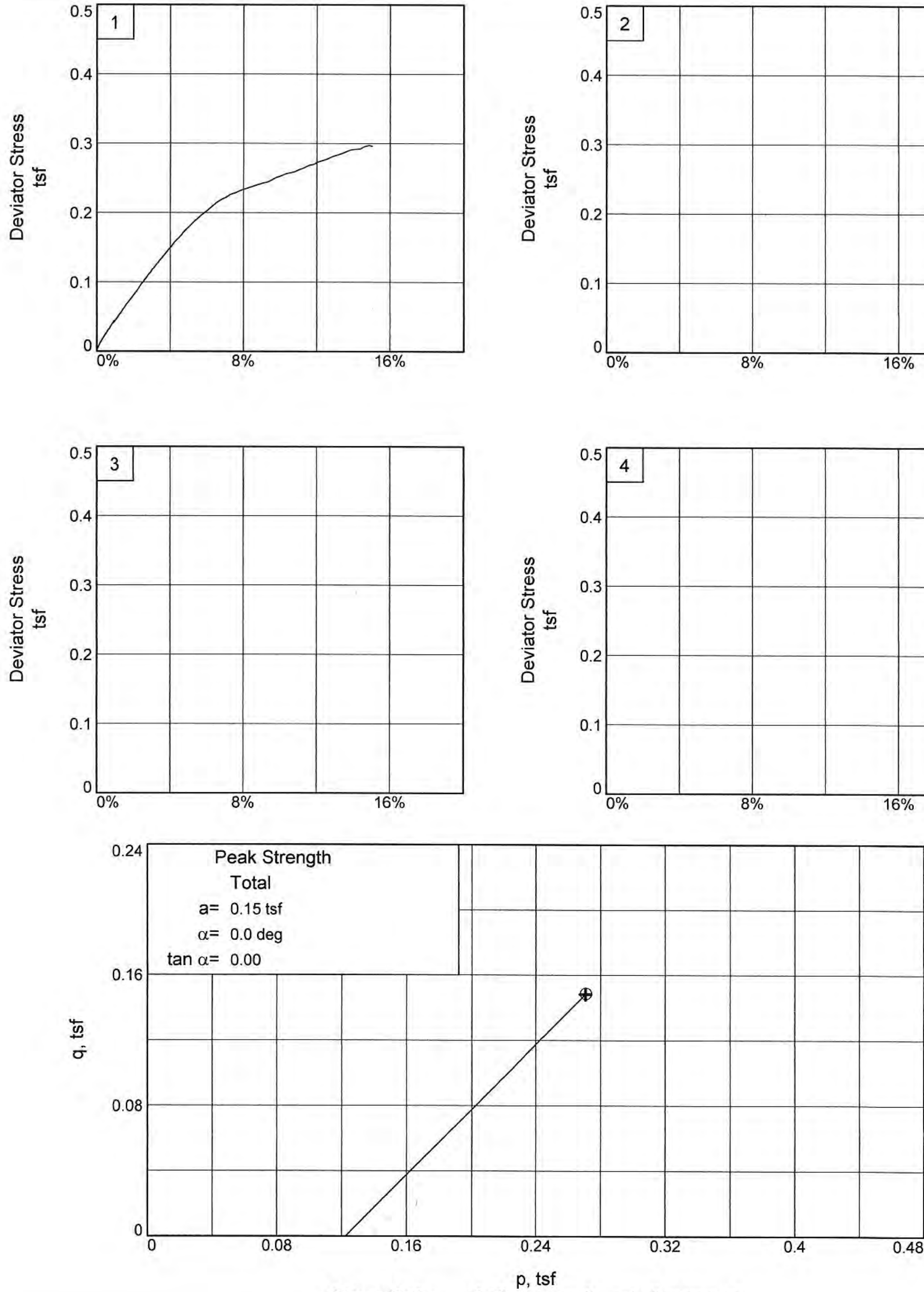
Client:

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

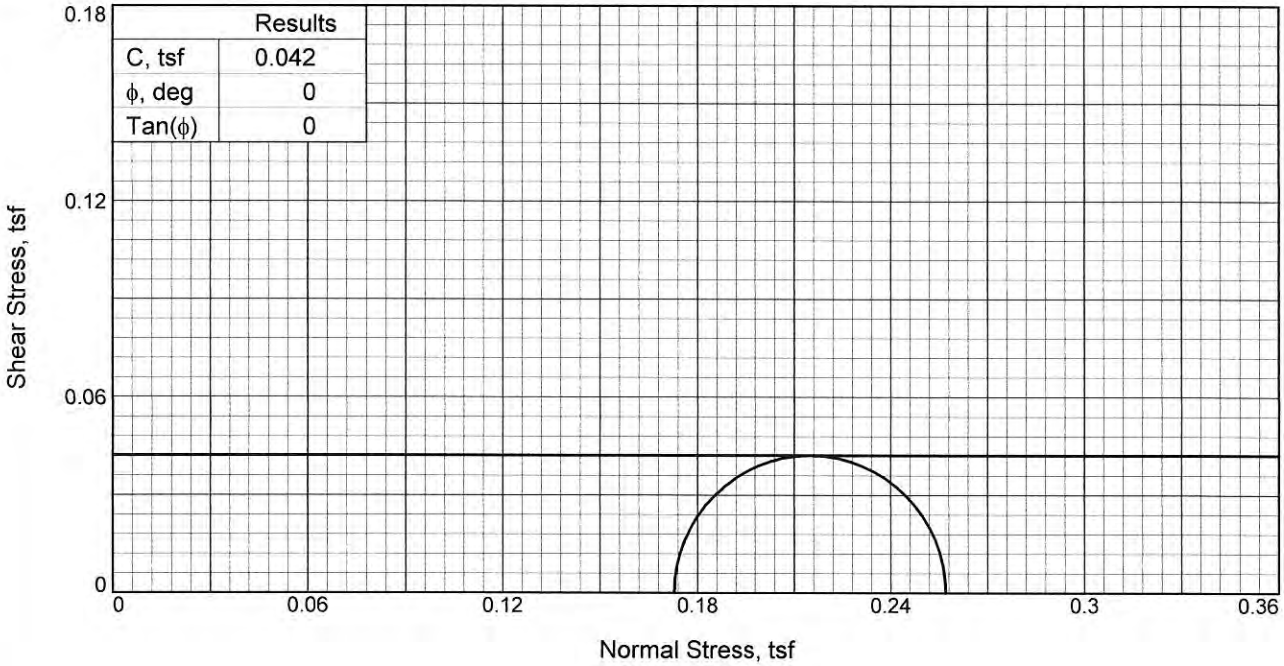
Client:

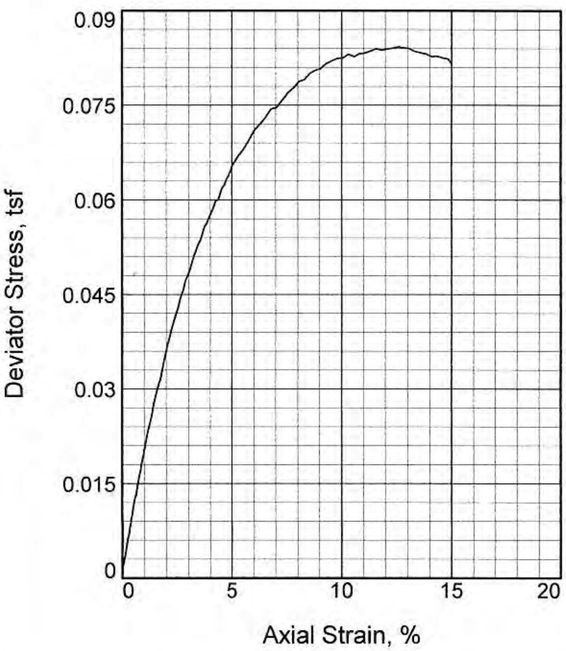
Project: San Jacinto River Waste Pit Superfund Site

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 ________

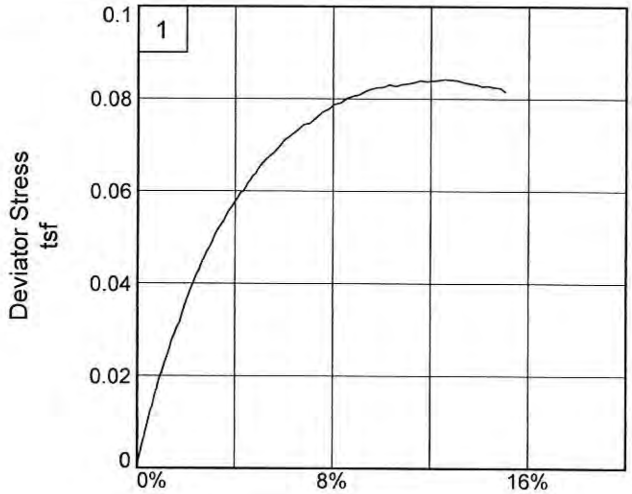
Client:

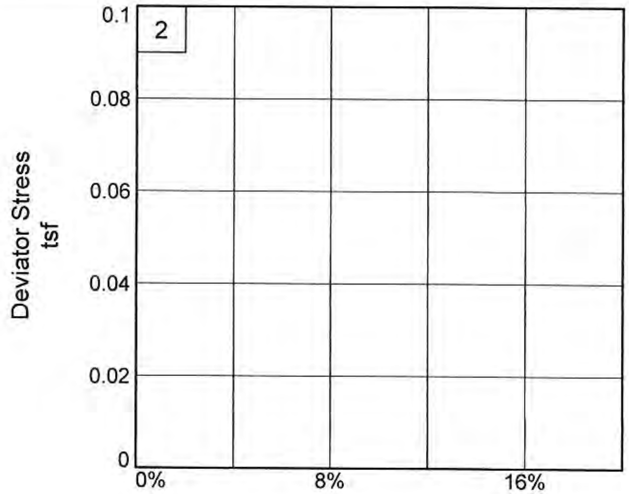
Project: San Jacinto River Waste Pit Superfund Site

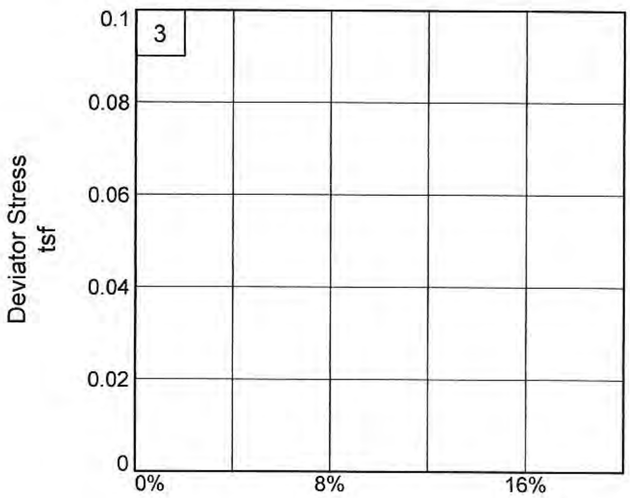
Source of Sample: SJGB050 **Depth:** 6-8

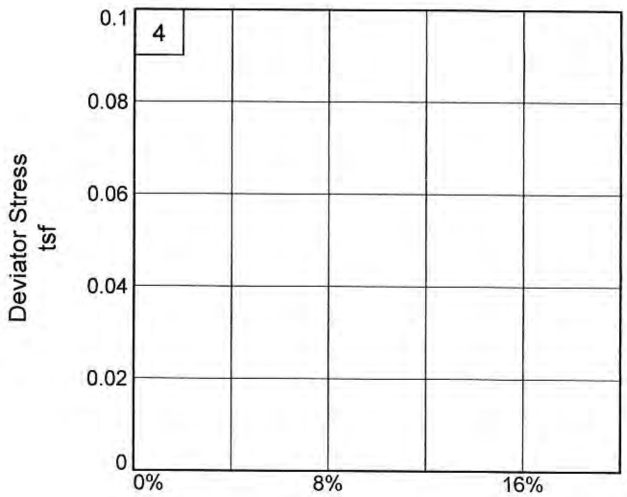
Proj. No.: 19.15.131 **Date Sampled:** 2/20/20

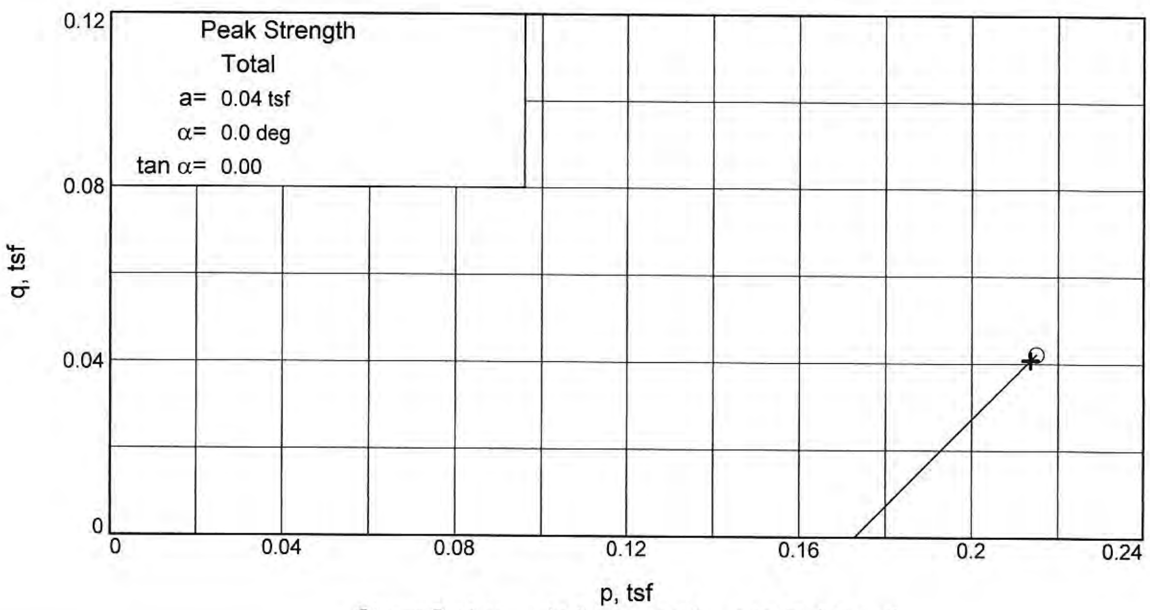
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

Client:

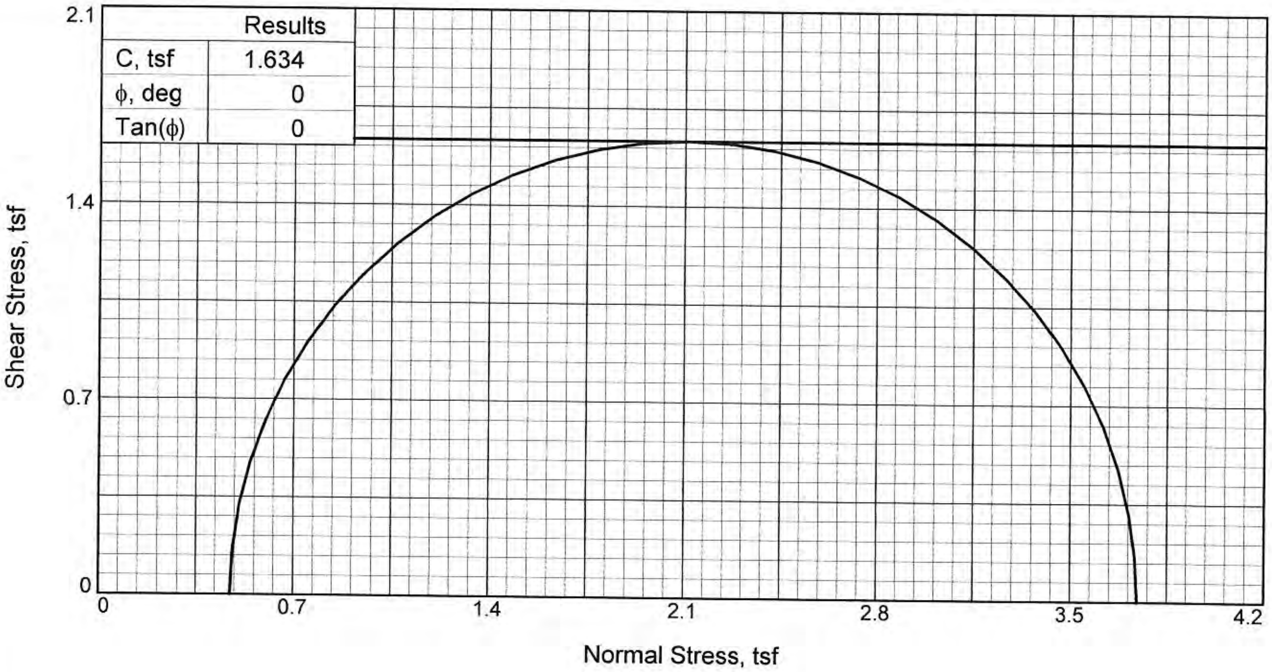
Project: San Jacinto River Waste Pit Superfund Site

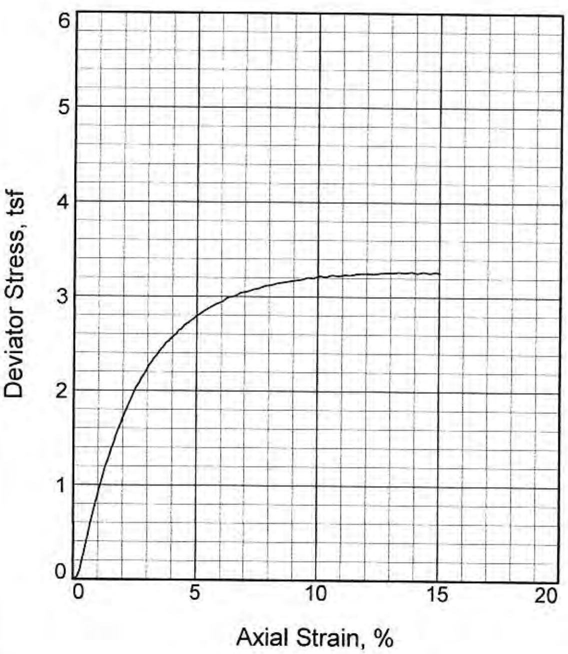
Source of Sample: SJGB050 **Depth:** 6-8

Project No.: 19.15.131 **Figure** _______

TOLUNAY-WONG ENGINEERS, INC.

Attachment Figure B.2-124





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 ________

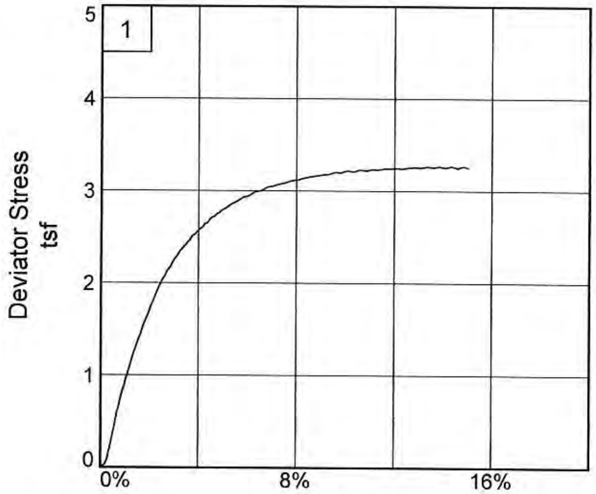
Client:

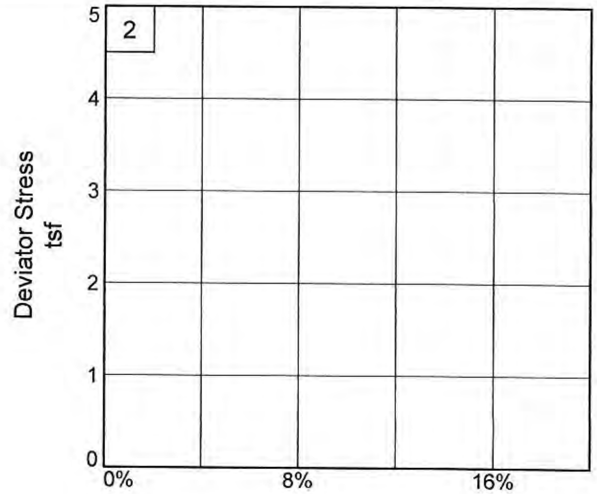
Project: San Jacinto River Waste Pit Superfund Site

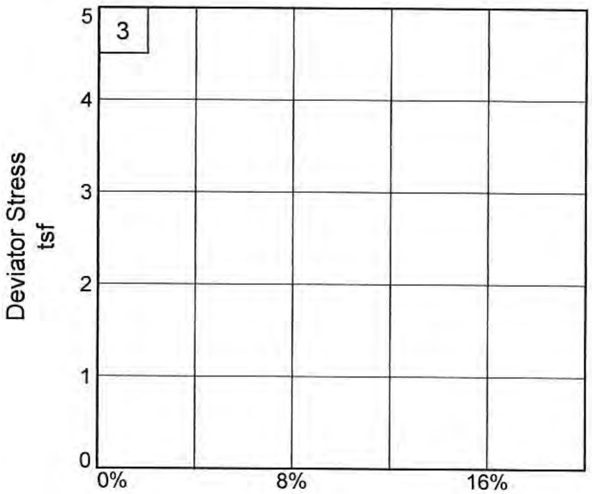
Source of Sample: SJGB053 **Depth:** 18

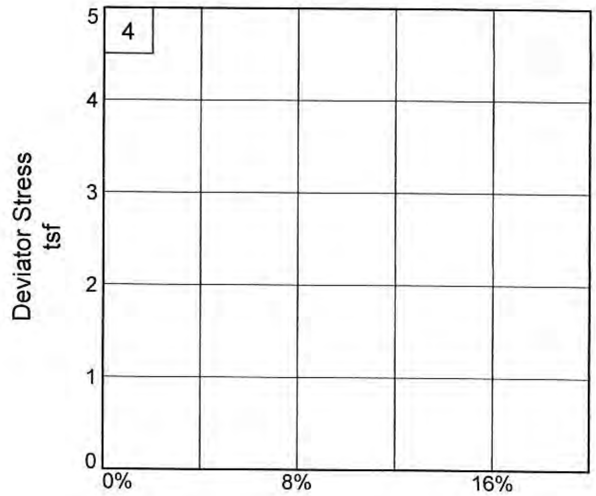
Proj. No.: 19.15.131 **Date Sampled:** 2-9-2020

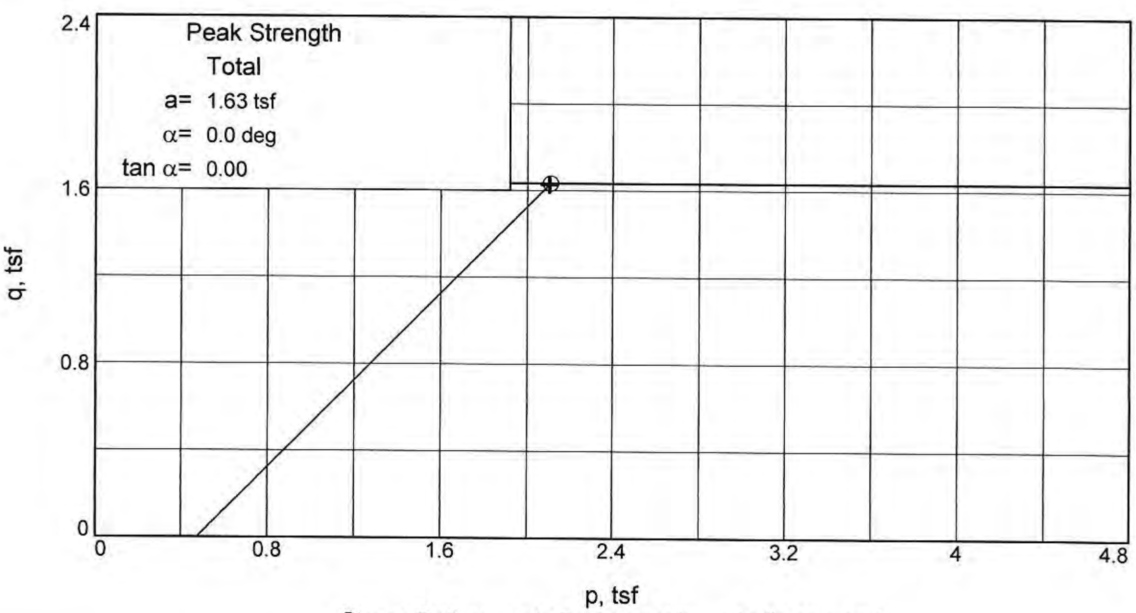
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

Client:

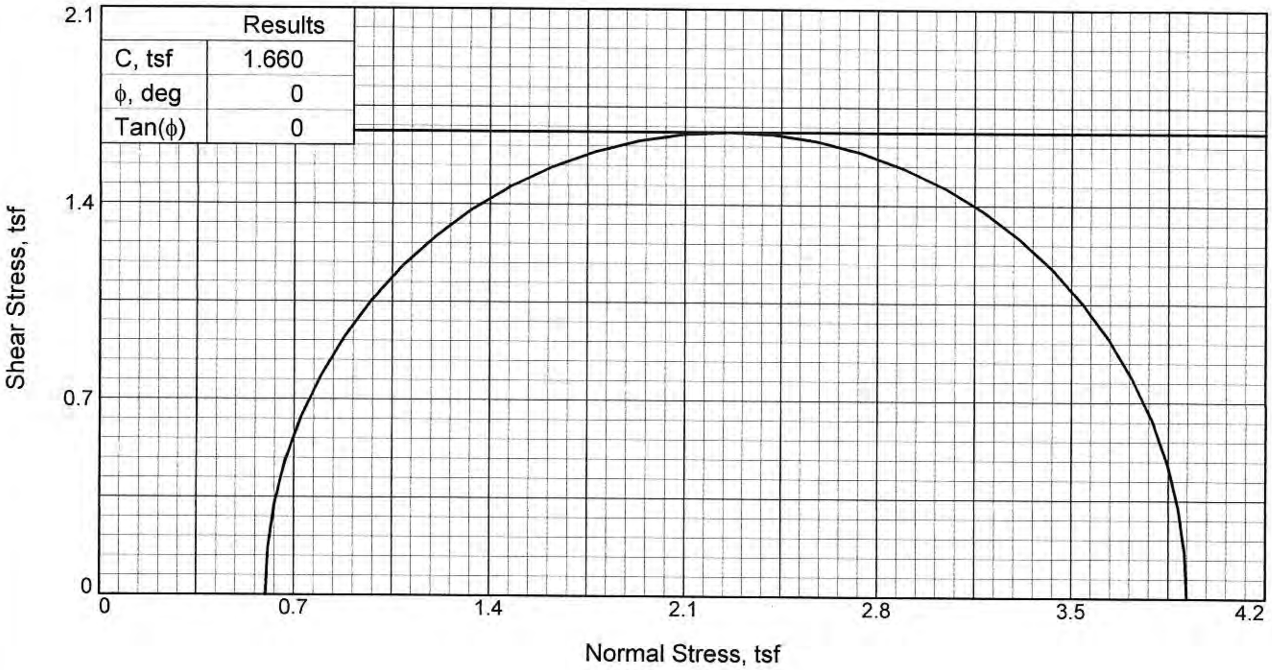
Project: San Jacinto River Waste Pit Superfund Site

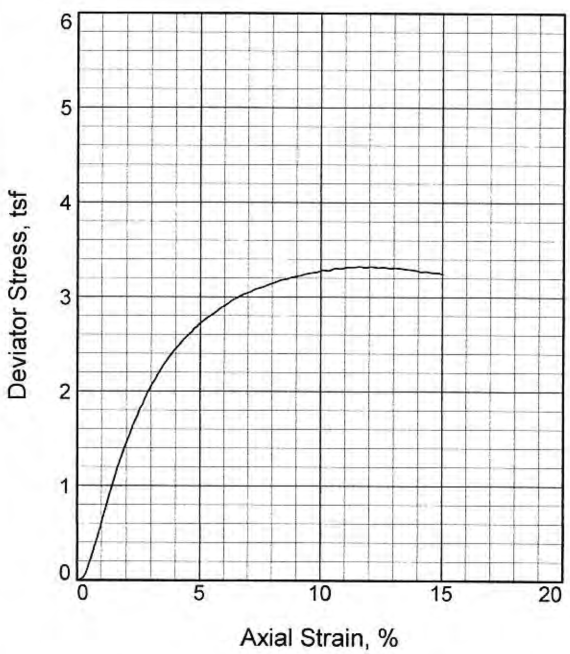
Source of Sample: SJGB053 **Depth:** 18

Project No.: 19.15.131 **Figure** _______

TOLUNAY-WONG ENGINEERS, INC.

Attachment Figure B.2-126





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 ________

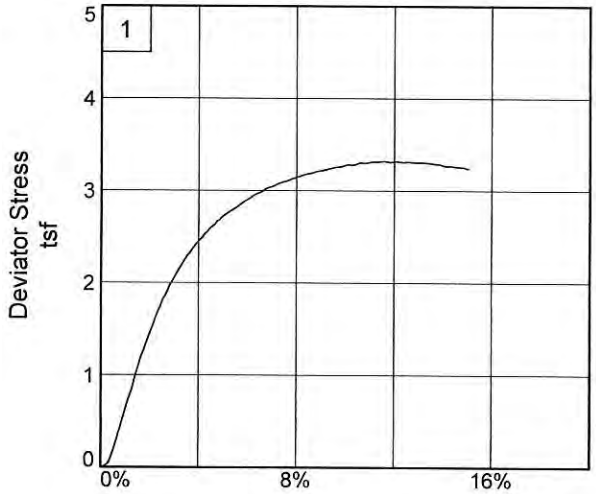
Client:

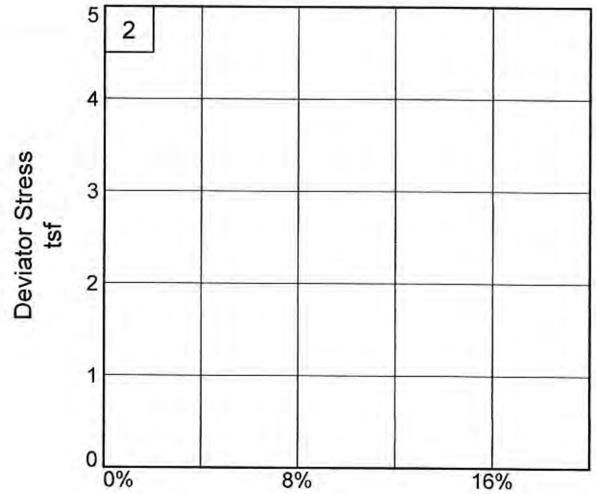
Project: San Jacinto River Waste Pit Superfund Site

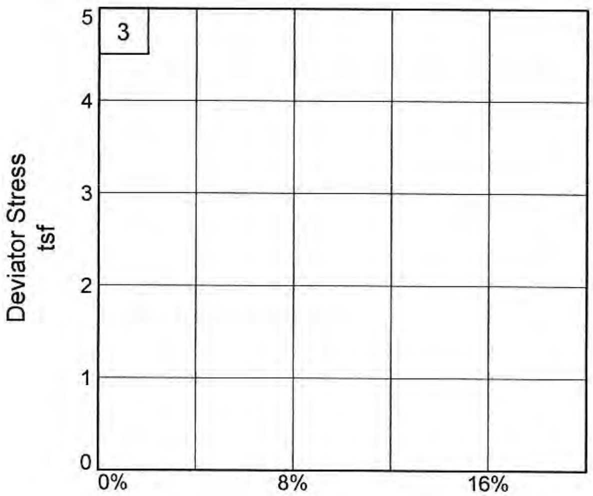
Source of Sample: SJGB053 **Depth:** 23

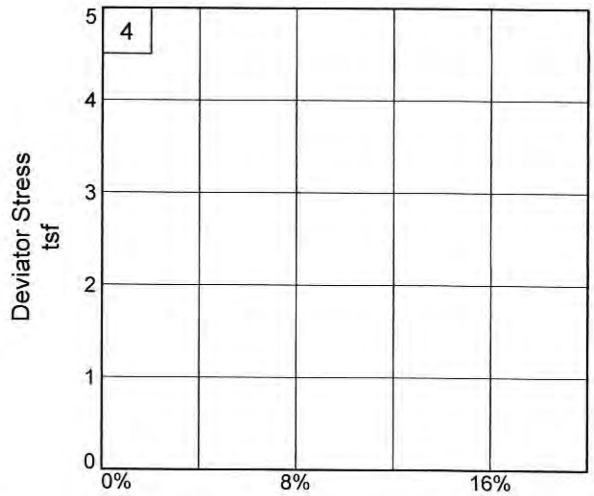
Proj. No.: 19.15.131 **Date Sampled:** 2-8-2020

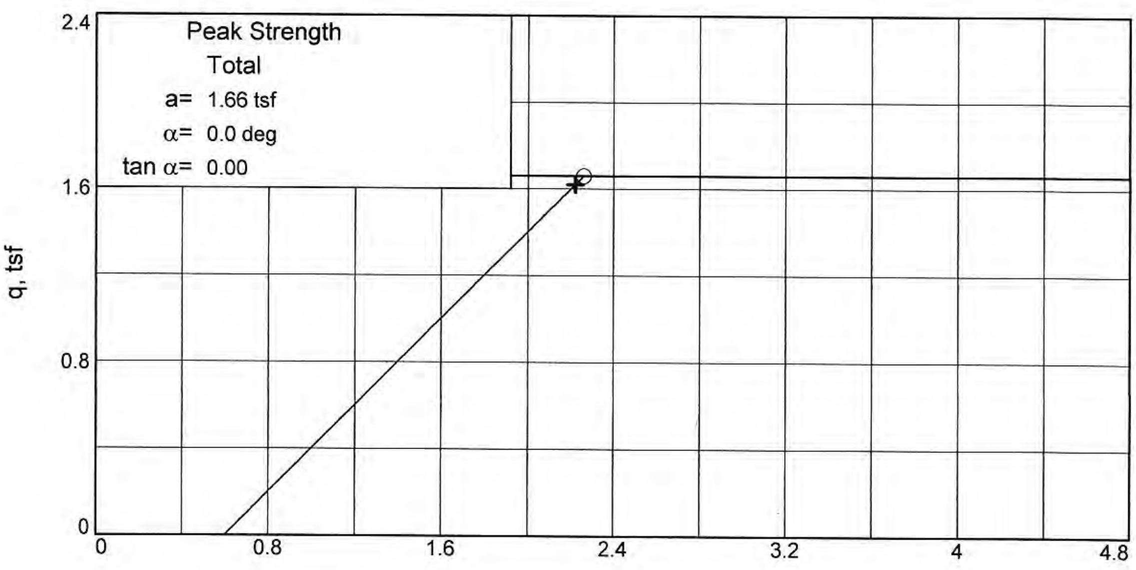
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

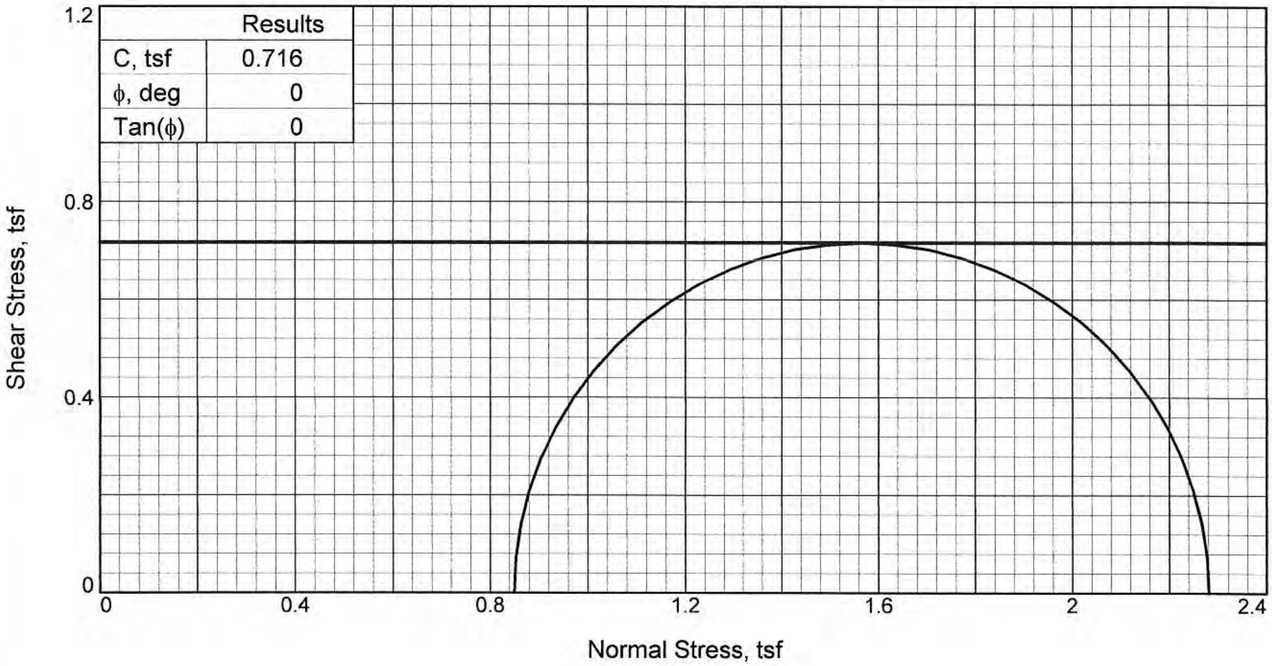
Client:

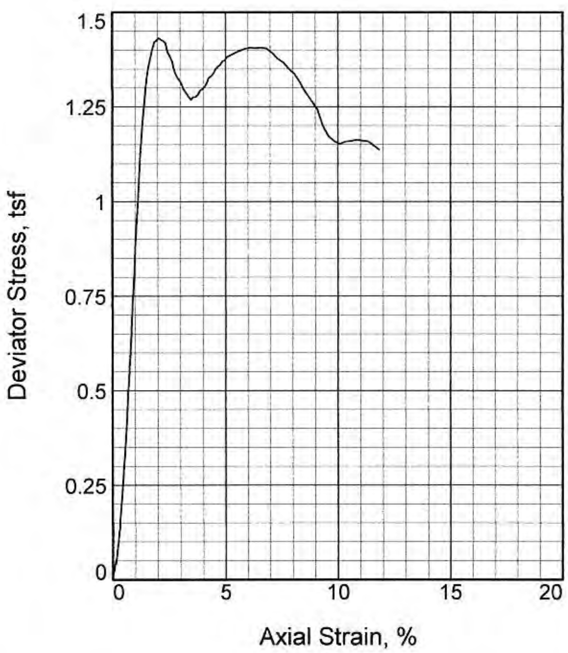
Project: San Jacinto River Waste Pit Superfund Site

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 ________

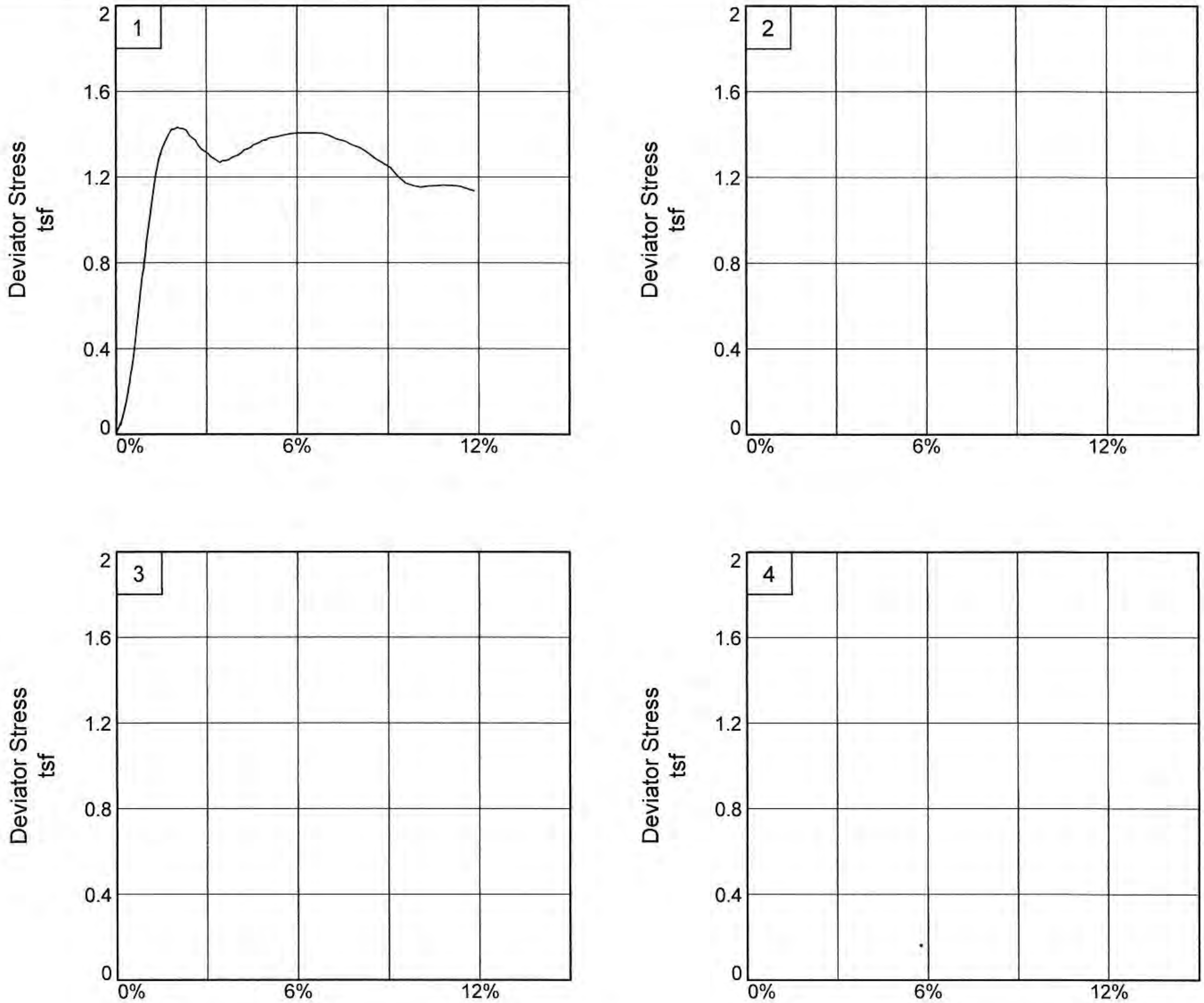
Client:

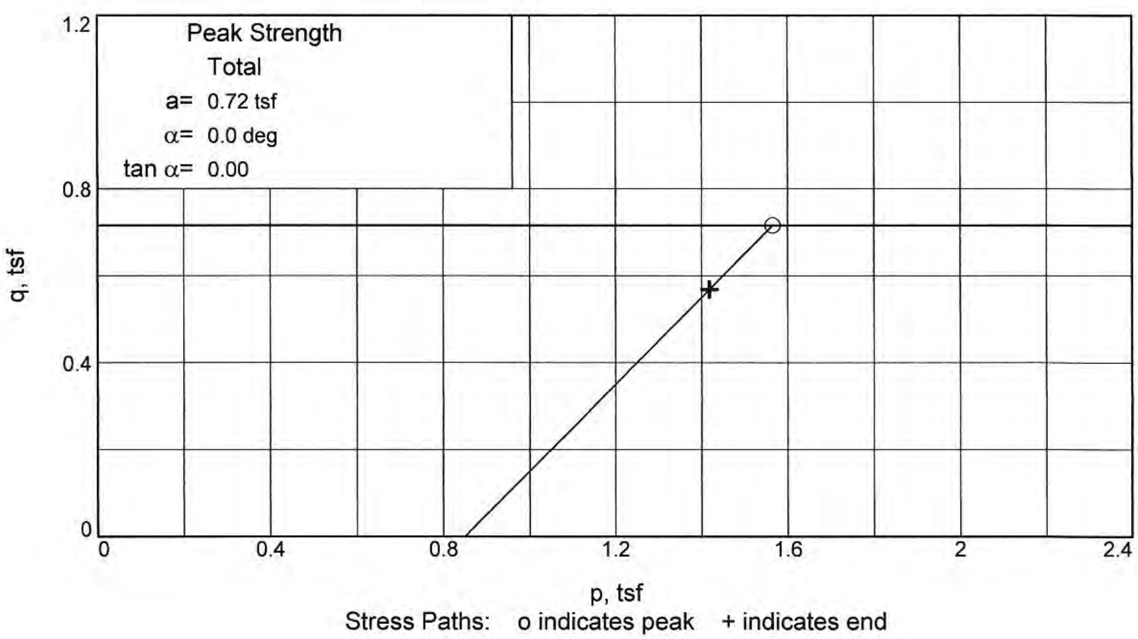
Project: San Jacinto River Waste Pit Superfund Site

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





Client:

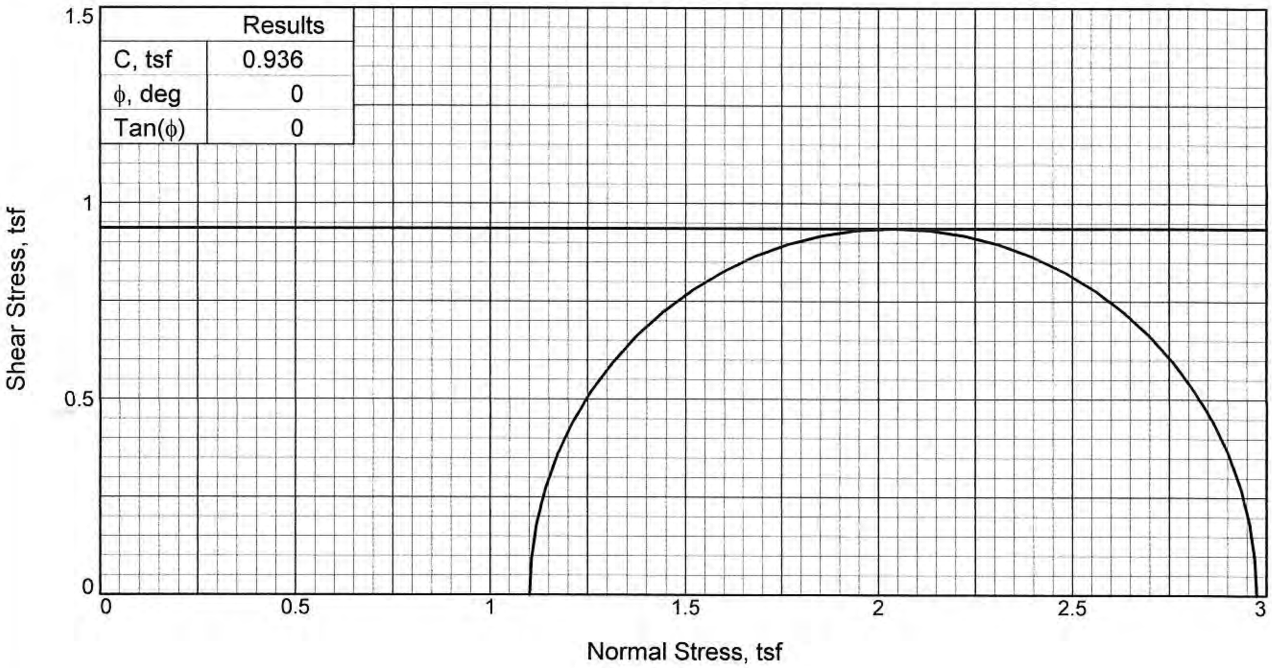
Project: San Jacinto River Waste Pit Superfund Site

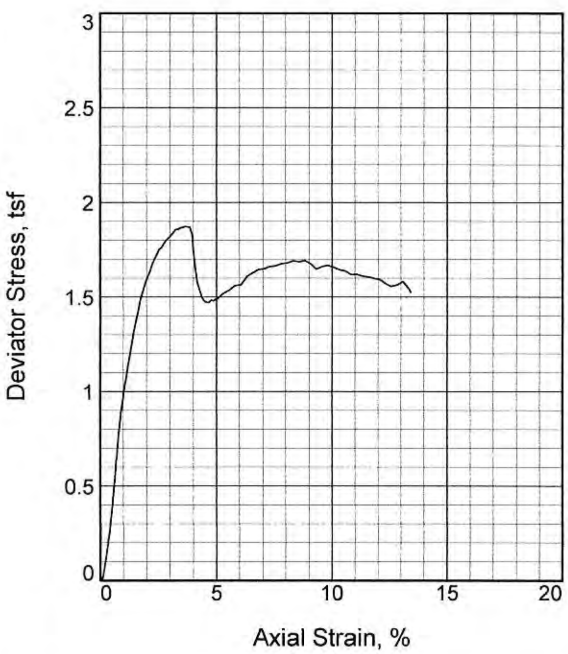
Source of Sample: SJGB053 **Depth:** 33

Project No.: 19.15.131 **Figure** _______

TOLUNAY-WONG ENGINEERS, INC.

Attachment Figure B.2-130





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 ________

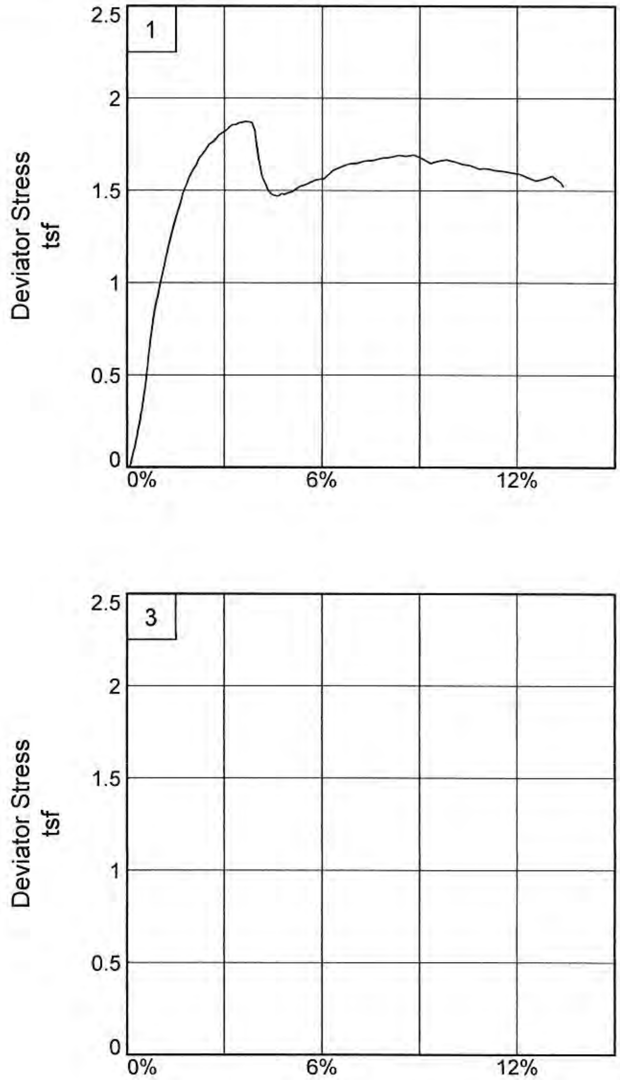
Client:

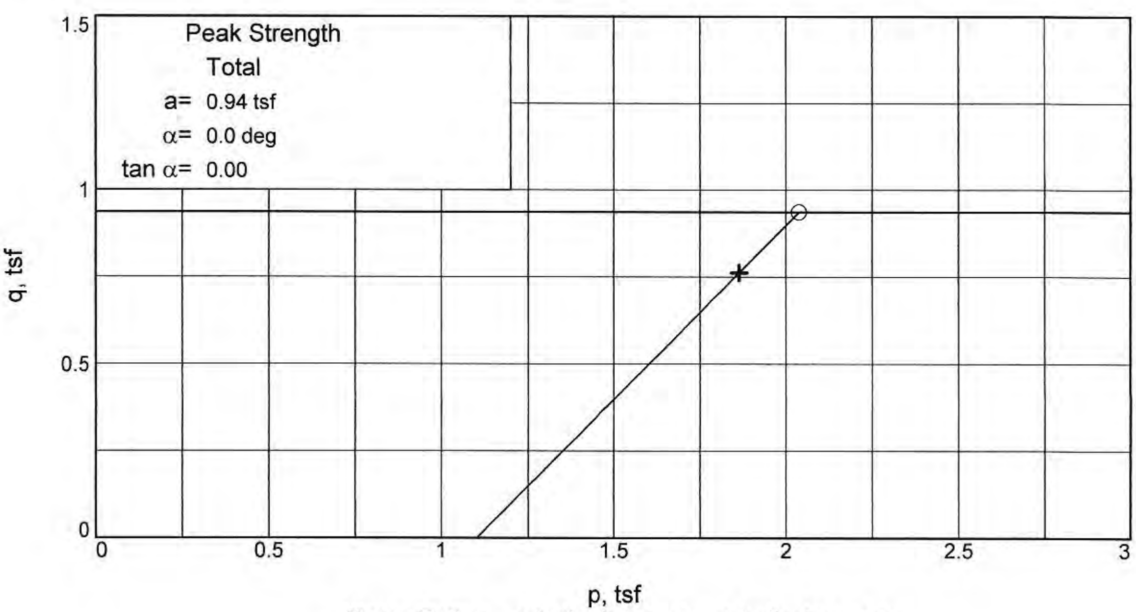
Project: San Jacinto River Waste Pit Superfund Site

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

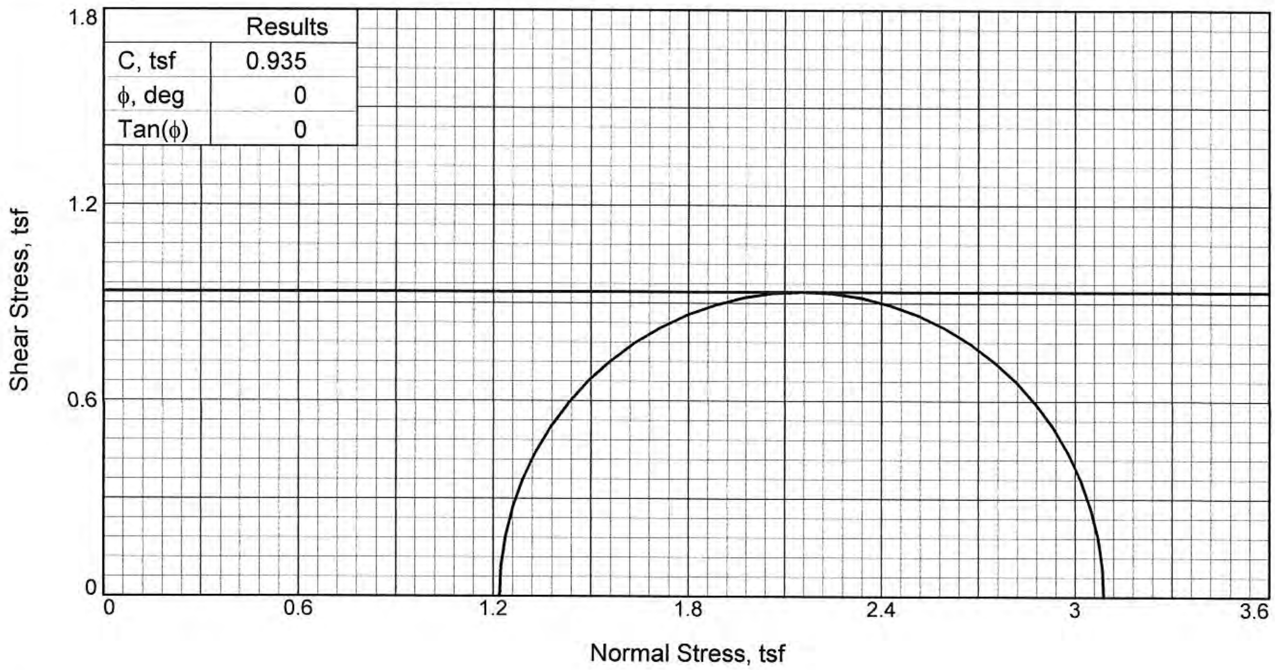
Client:

Project: San Jacinto River Waste Pit Superfund Site

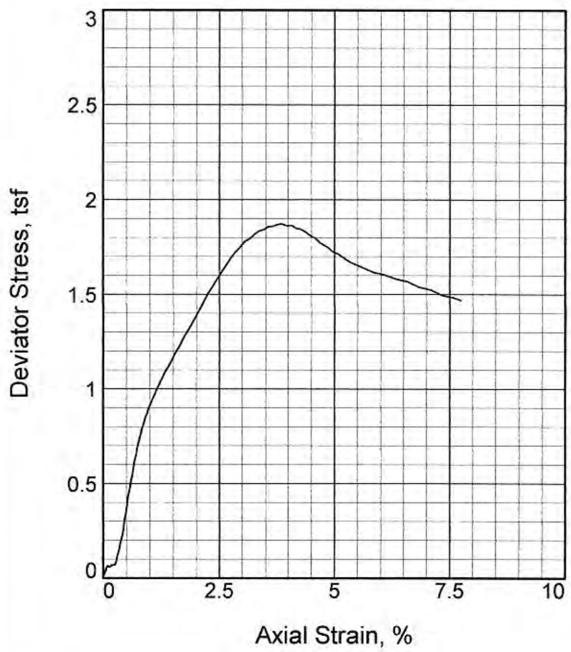
Source of Sample: SJGB053 **Depth:** 43

Project No.: 19.15.131 **Figure** _______

TOLUNAY-WONG ENGINEERS, INC.



	Results
C, tsf	0.935
ϕ, deg	0
Tan(ϕ)	0



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 ________

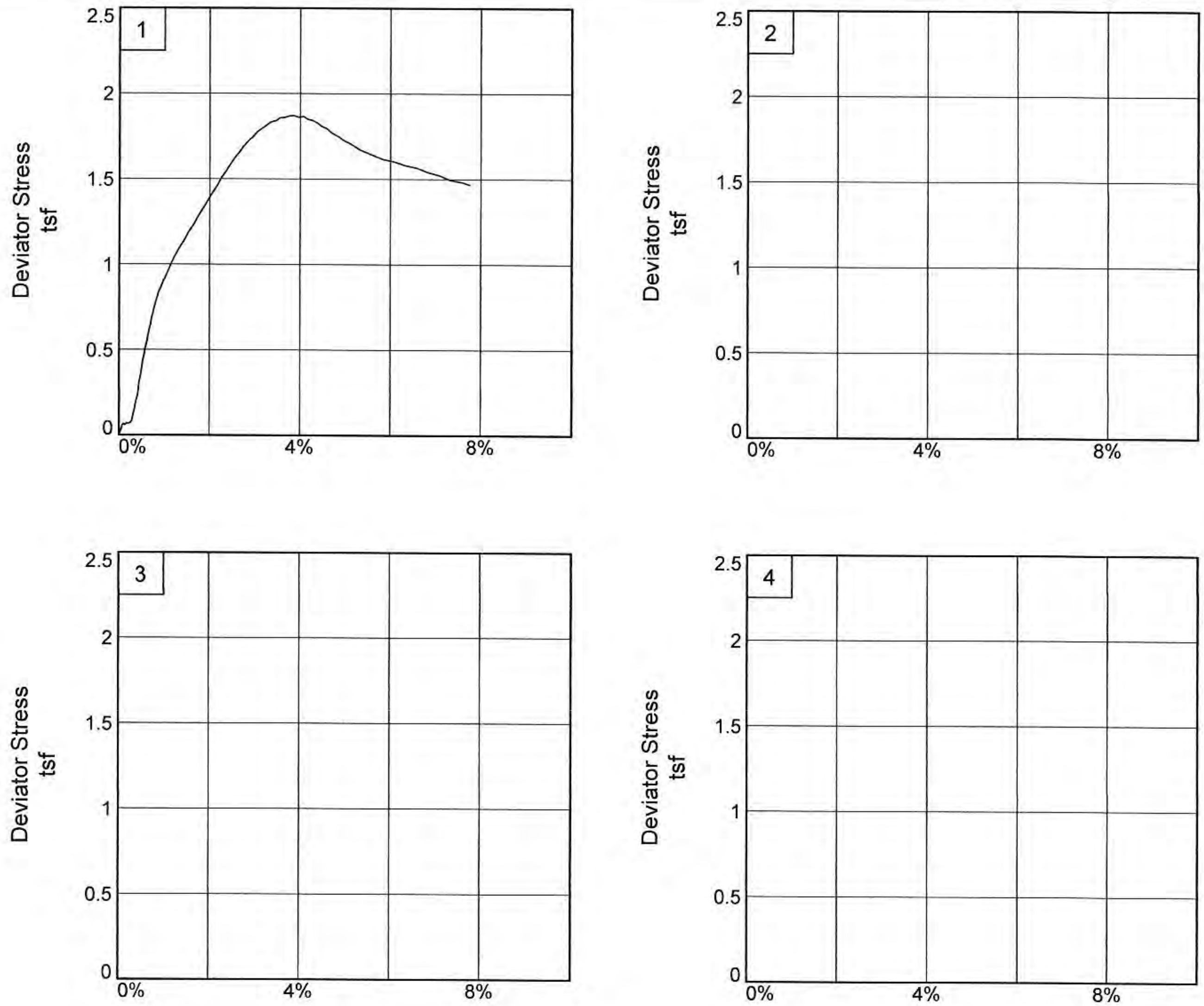
Client:

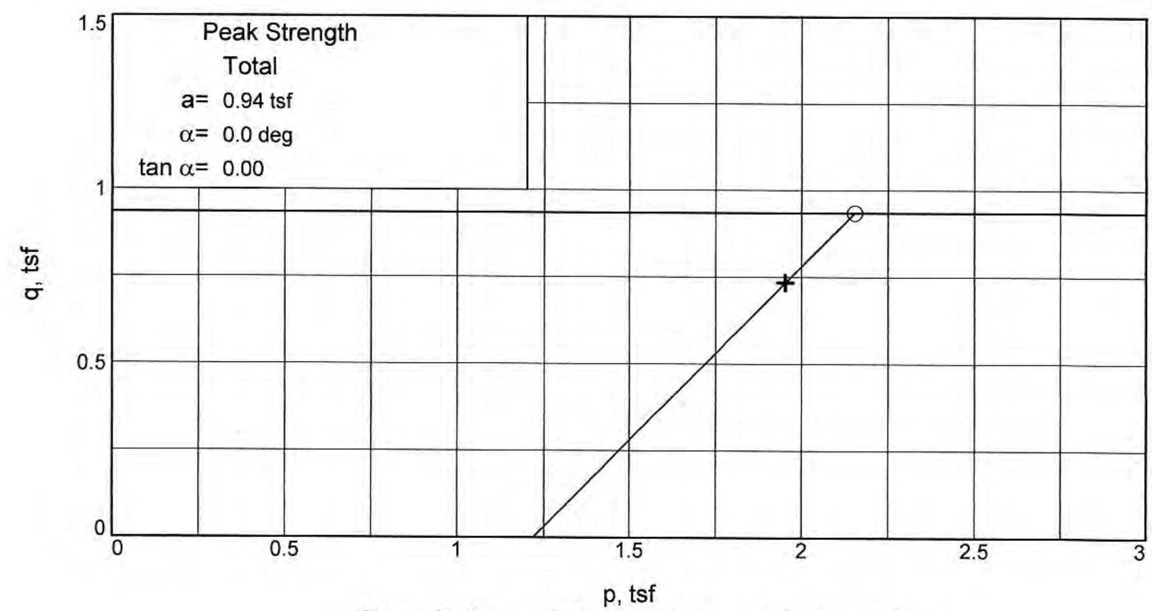
Project: San Jacinto River Waste Pit Superfund Site

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:

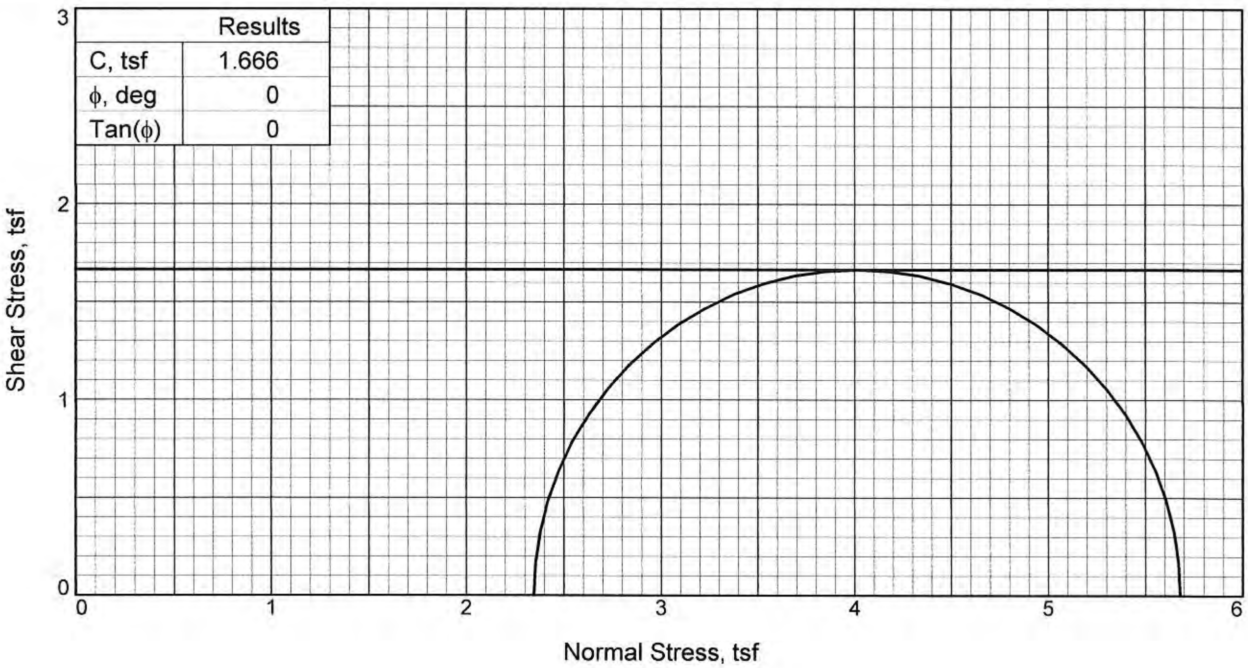
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB053 **Depth:** 48

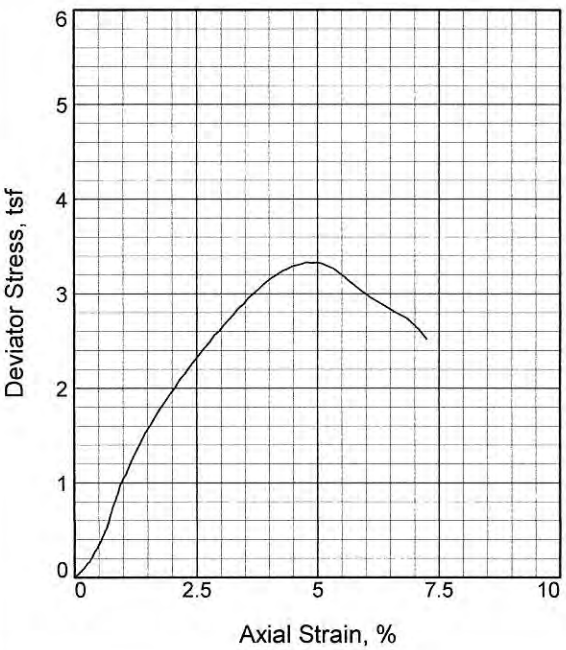
Project No.: 19.15.131 **Figure** _______

TOLUNAY-WONG ENGINEERS, INC.

Attachment Figure B.2-134



Results	
C, tsf	1.666
ϕ, deg	0
Tan(ϕ)	0



	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 ________

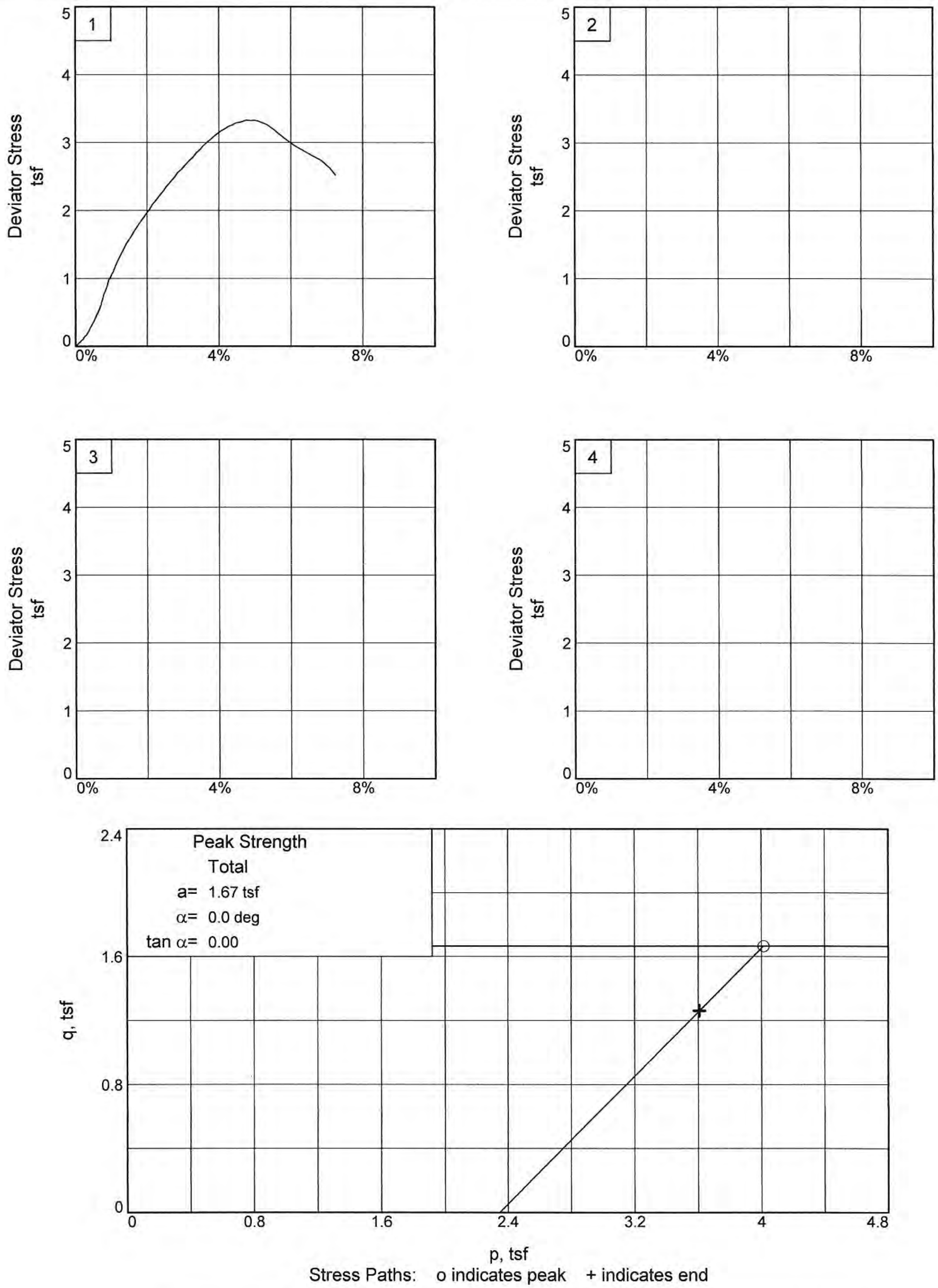
Client:

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



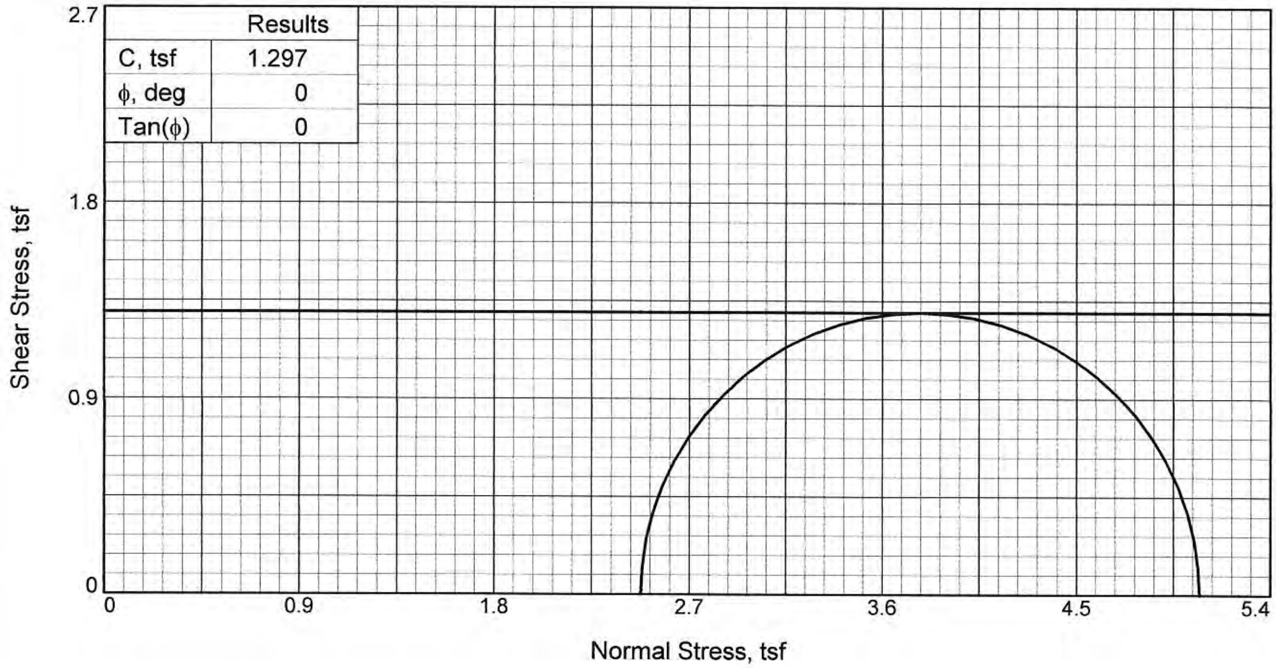
Client:

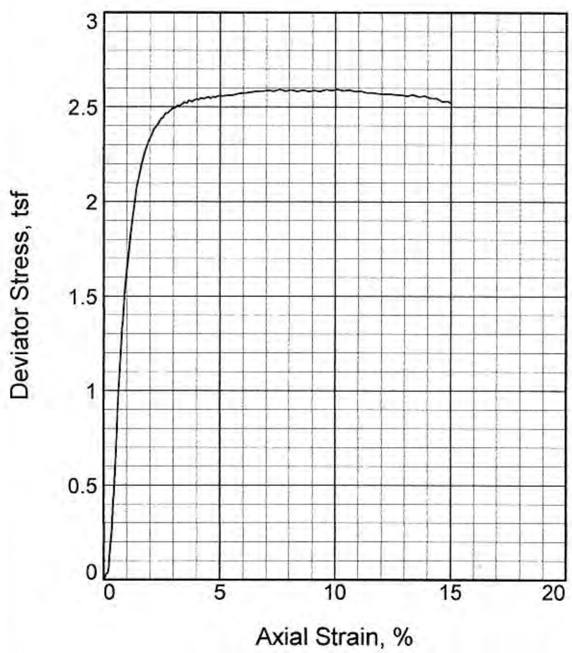
Project: San Jacinto River Waste Pit Superfund Site

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 ________

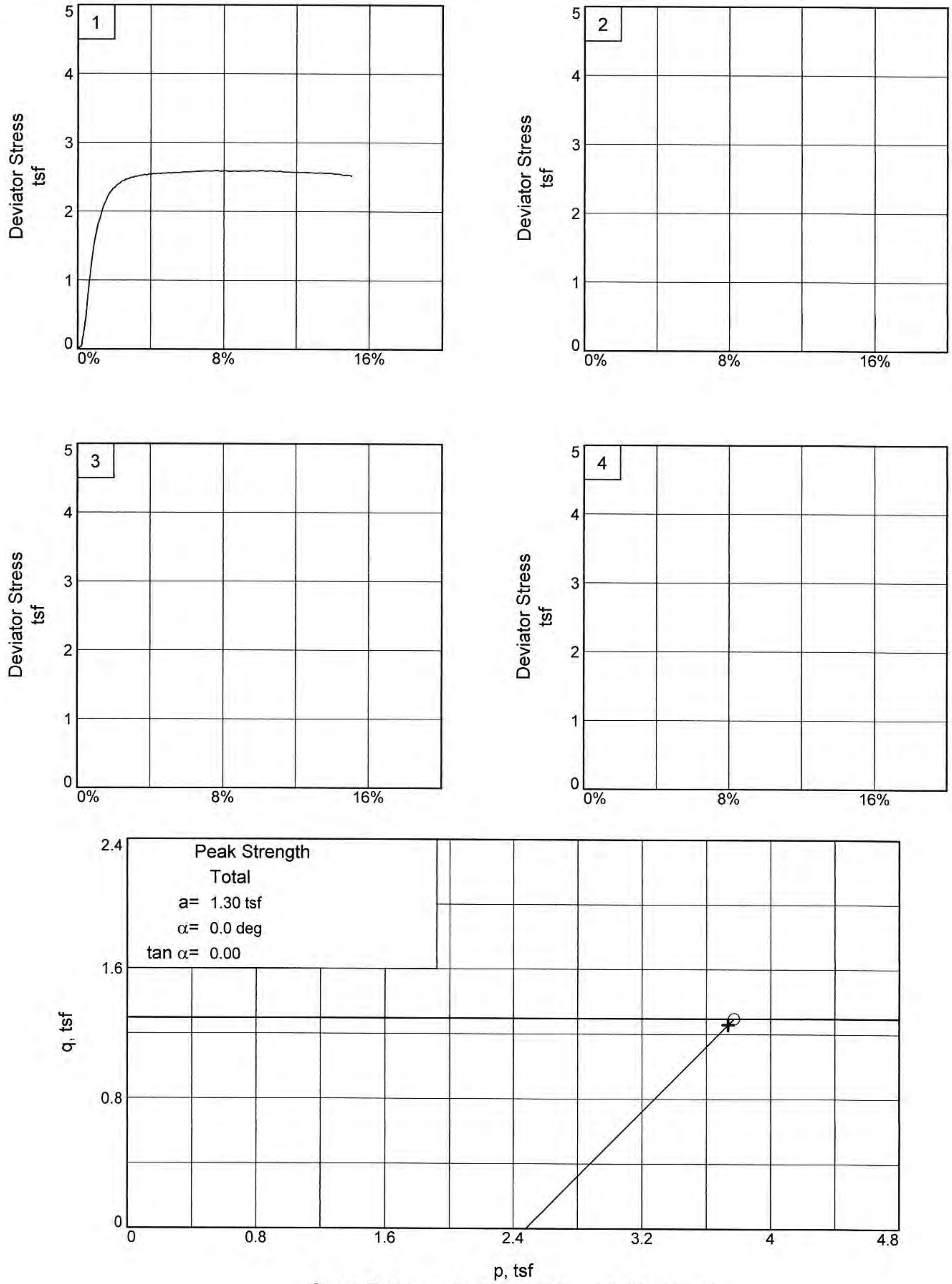
Client:

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

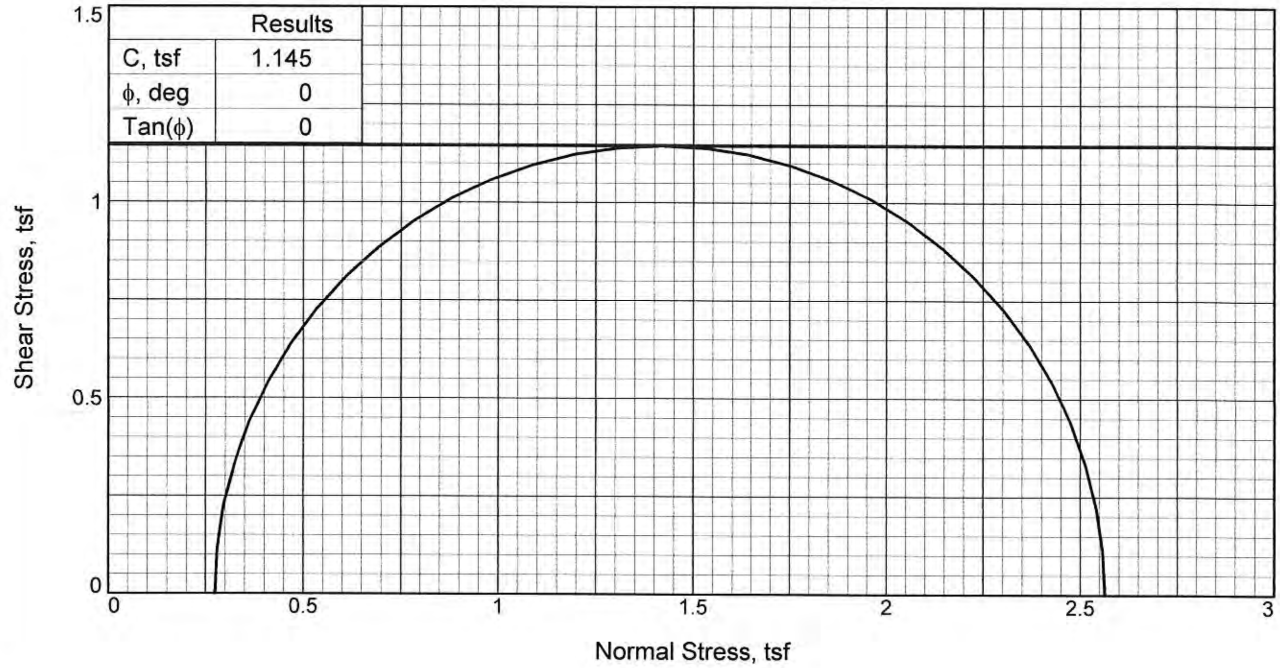
Client:

Project: San Jacinto River Waste Pit Superfund Site

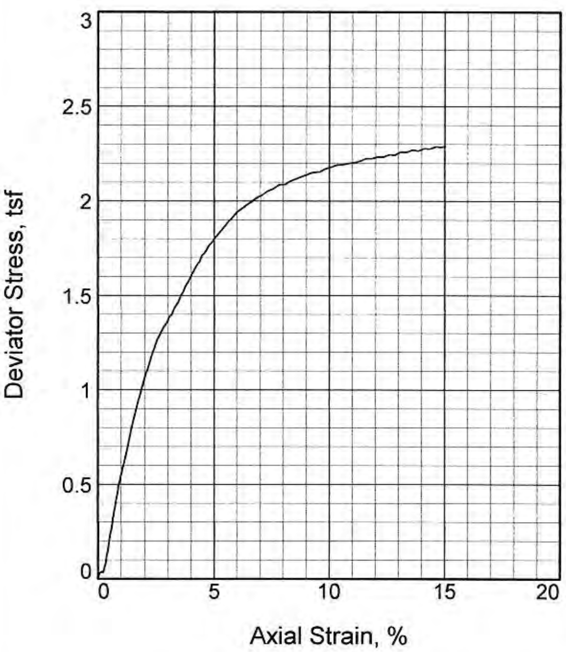
Source of Sample: SJGB053 **Depth:** 98

Project No.: 19.15.131 **Figure** _______

TOLUNAY-WONG ENGINEERS, INC.



	Results
C, tsf	1.145
ϕ, deg	0
Tan(ϕ)	0



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 ________

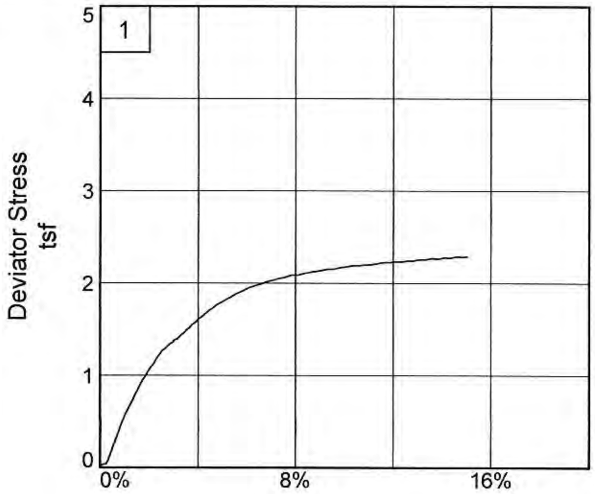
Client:

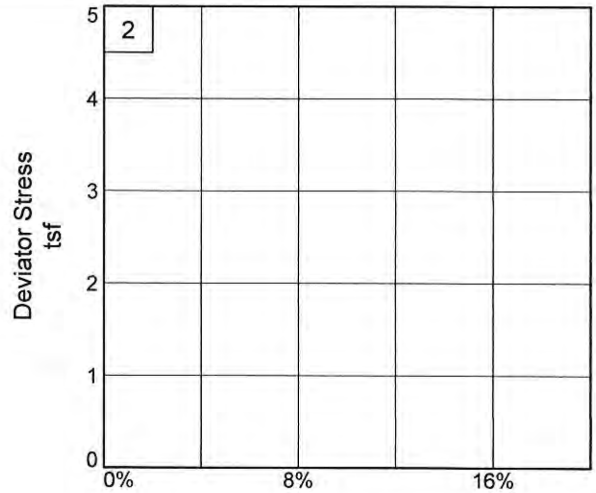
Project: San Jacinto River Waste Pit Superfund Site

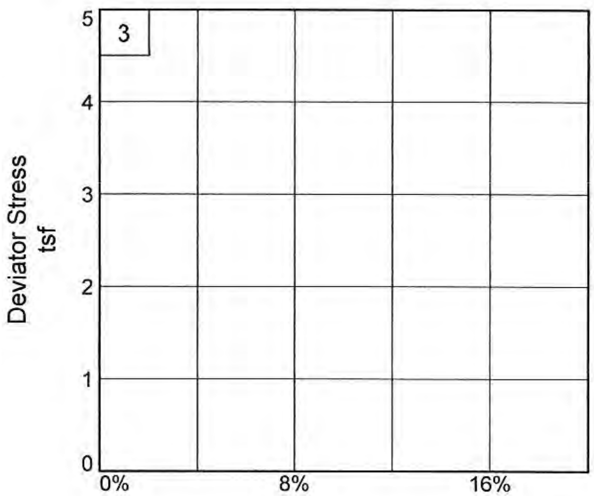
Source of Sample: SJGB057 **Depth:** 12

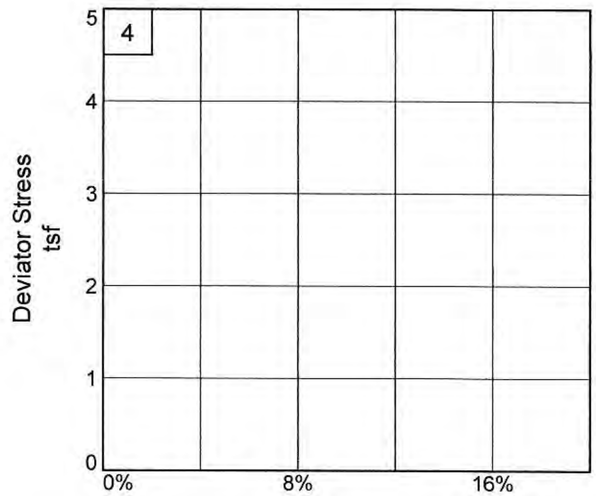
Proj. No.: 19.15.131 **Date Sampled:** 2-9-2020

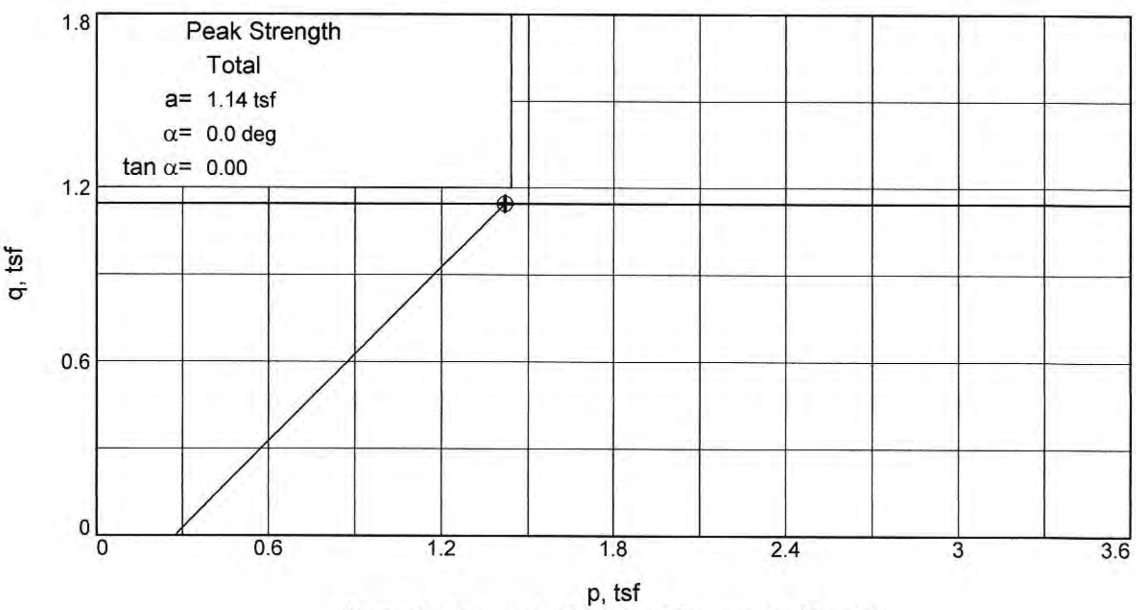
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

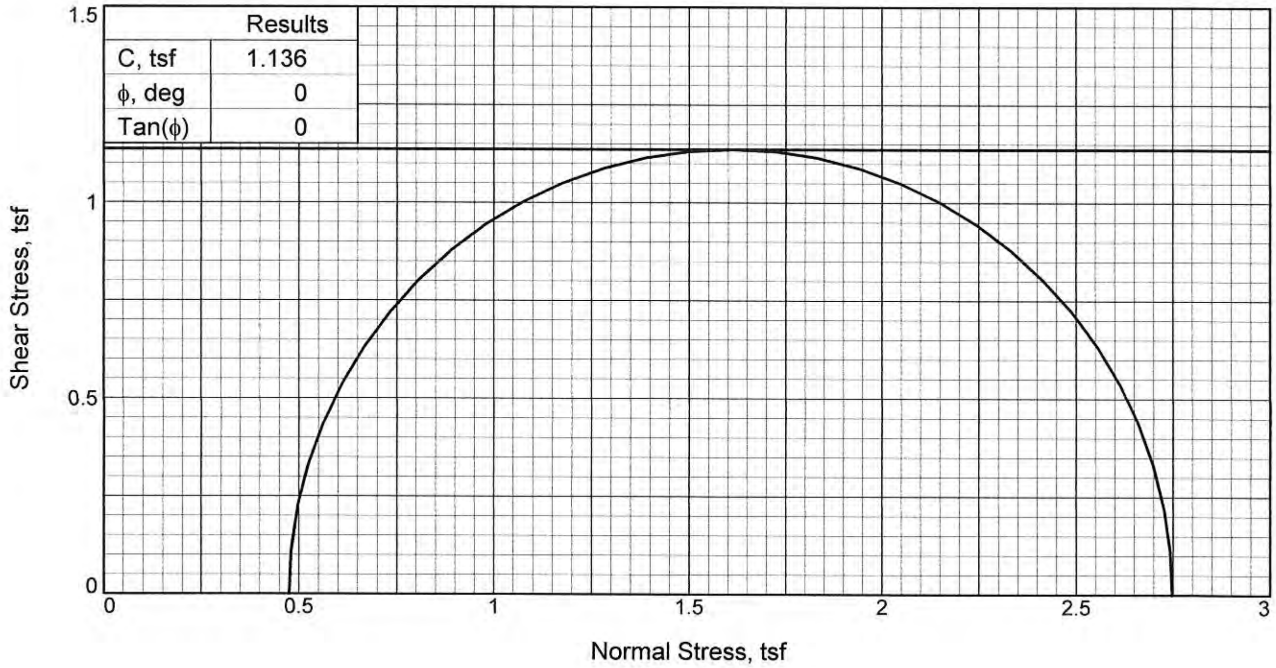
Client:

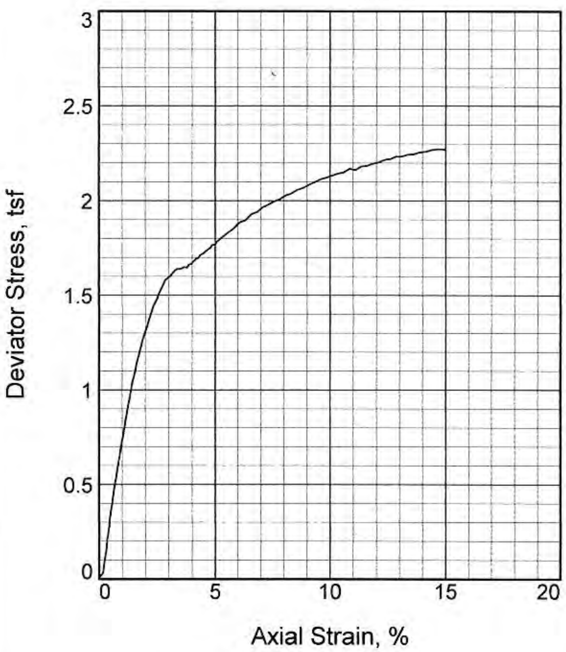
Project: San Jacinto River Waste Pit Superfund Site

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 ________

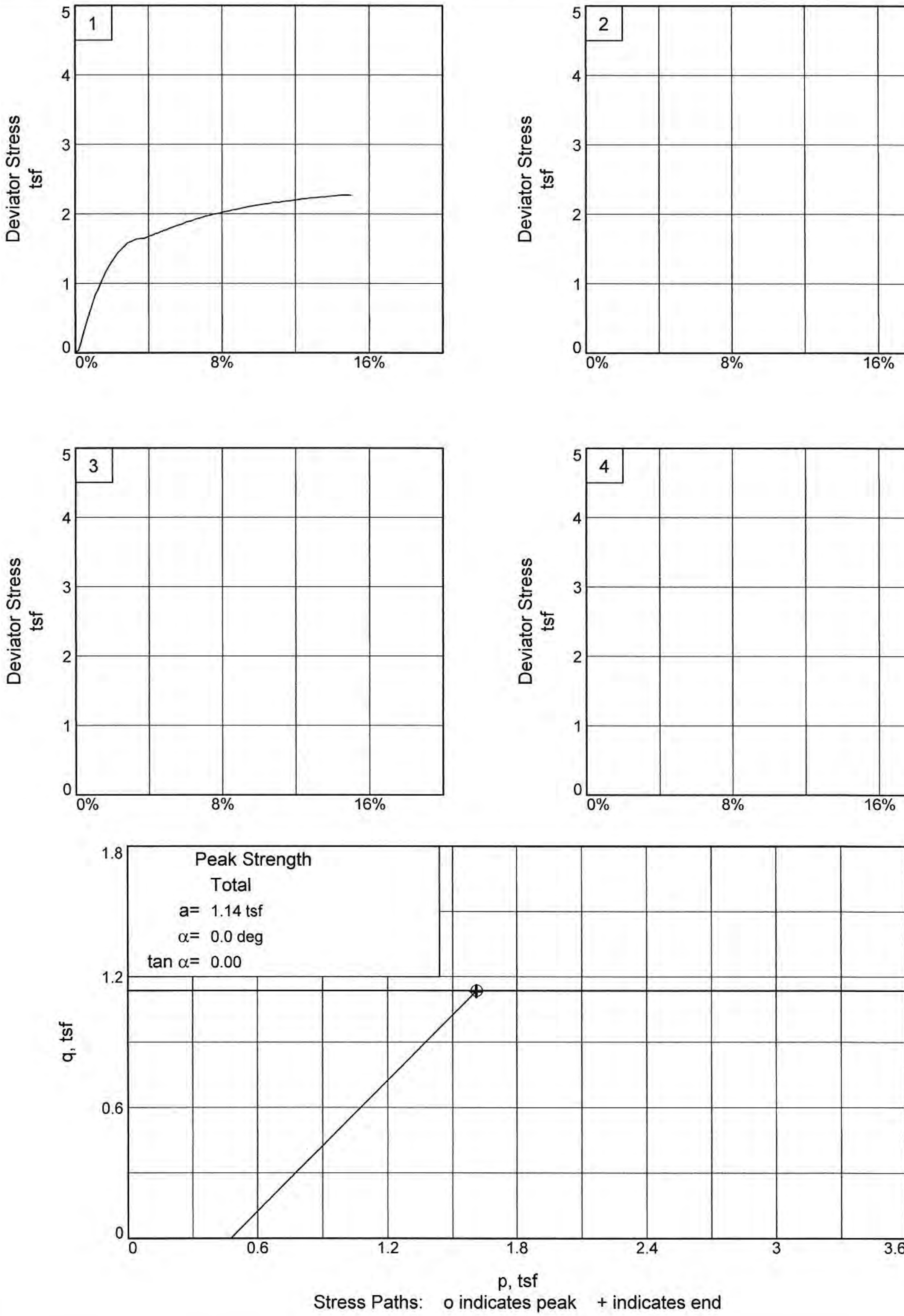
Client:

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



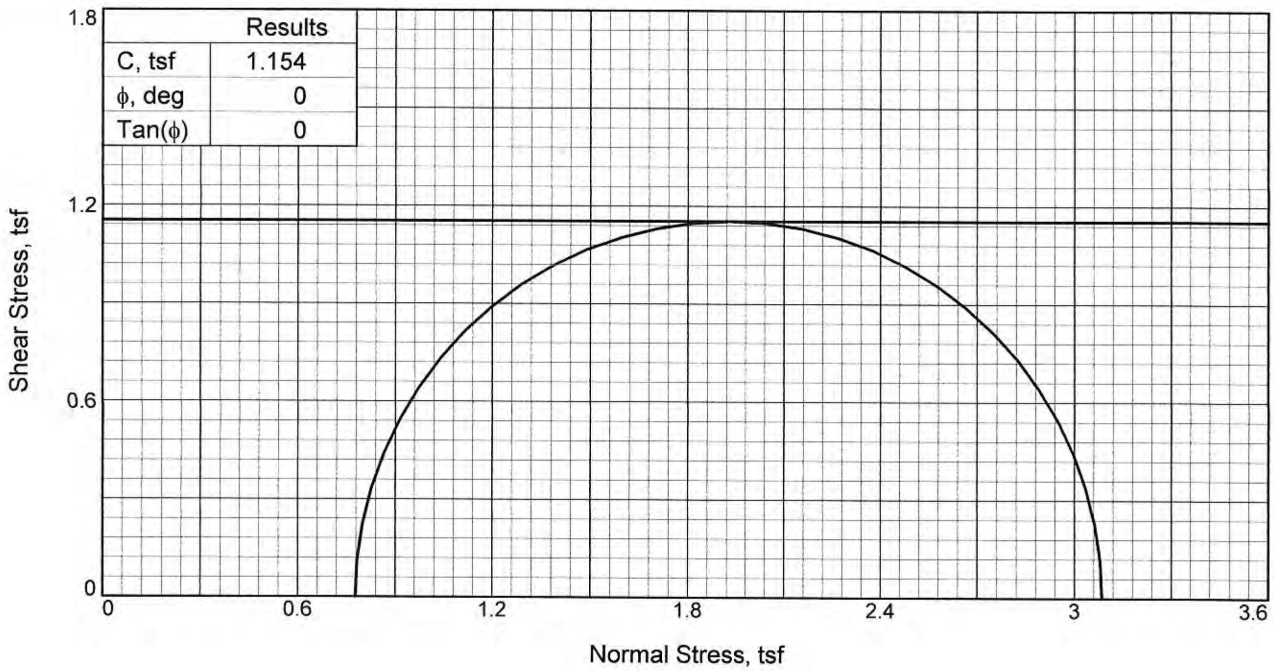
Client:

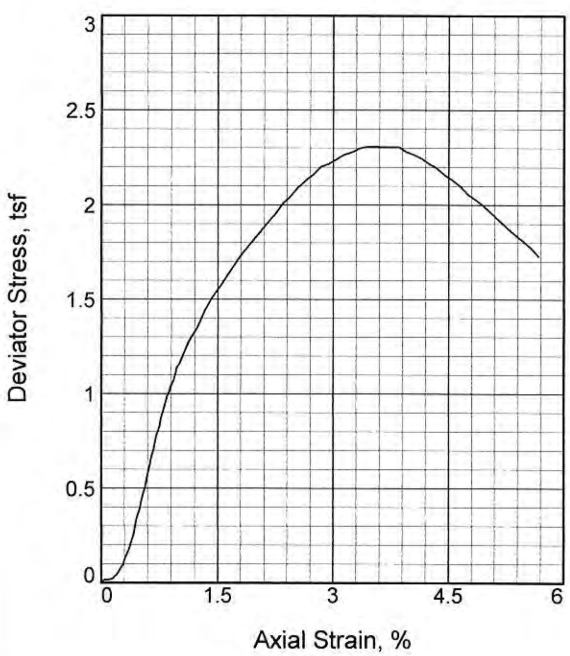
Project: San Jacinto River Waste Pit Superfund Site

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 ________

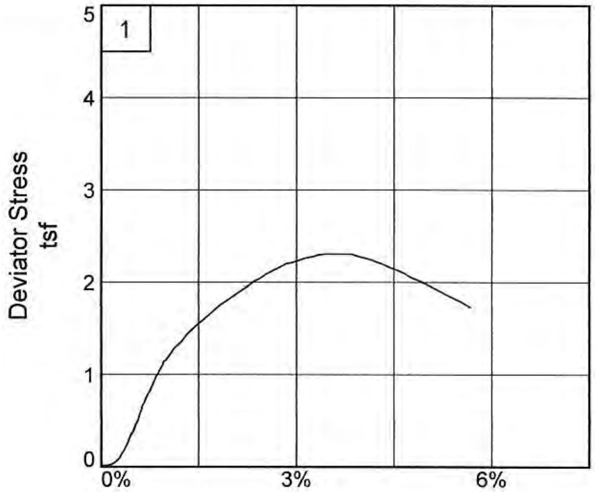
Client:

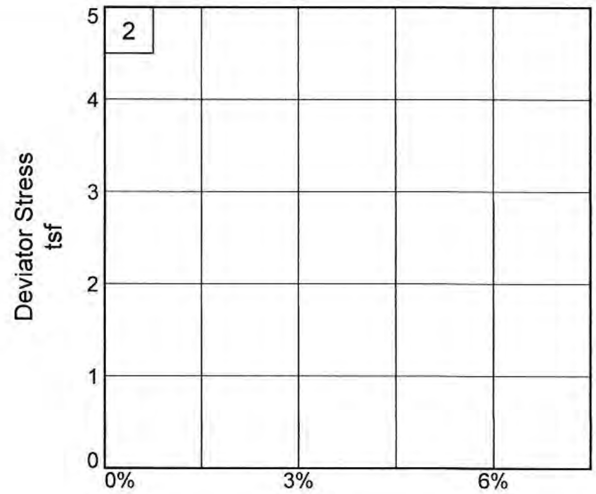
Project: San Jacinto River Waste Pit Superfund Site

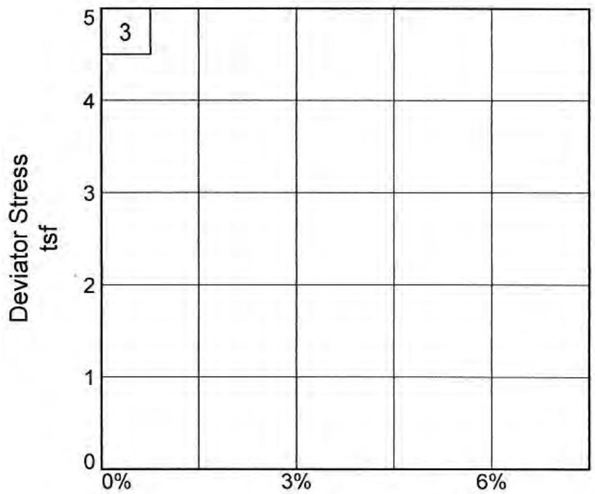
Source of Sample: SJGB057 **Depth:** 33

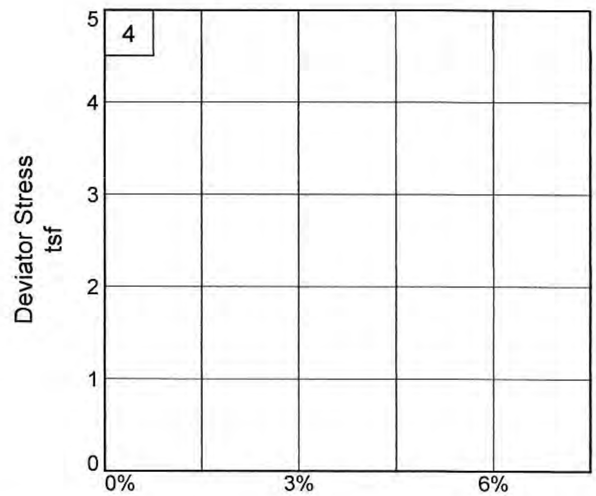
Proj. No.: 19.15.131 **Date Sampled:** 2-9-2020

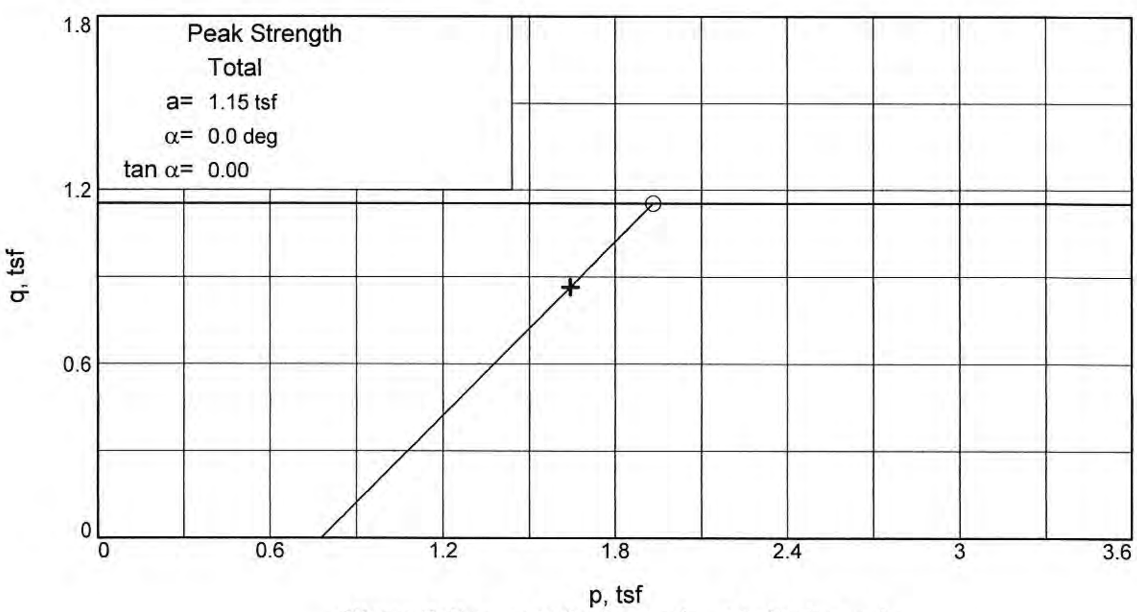
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Client:

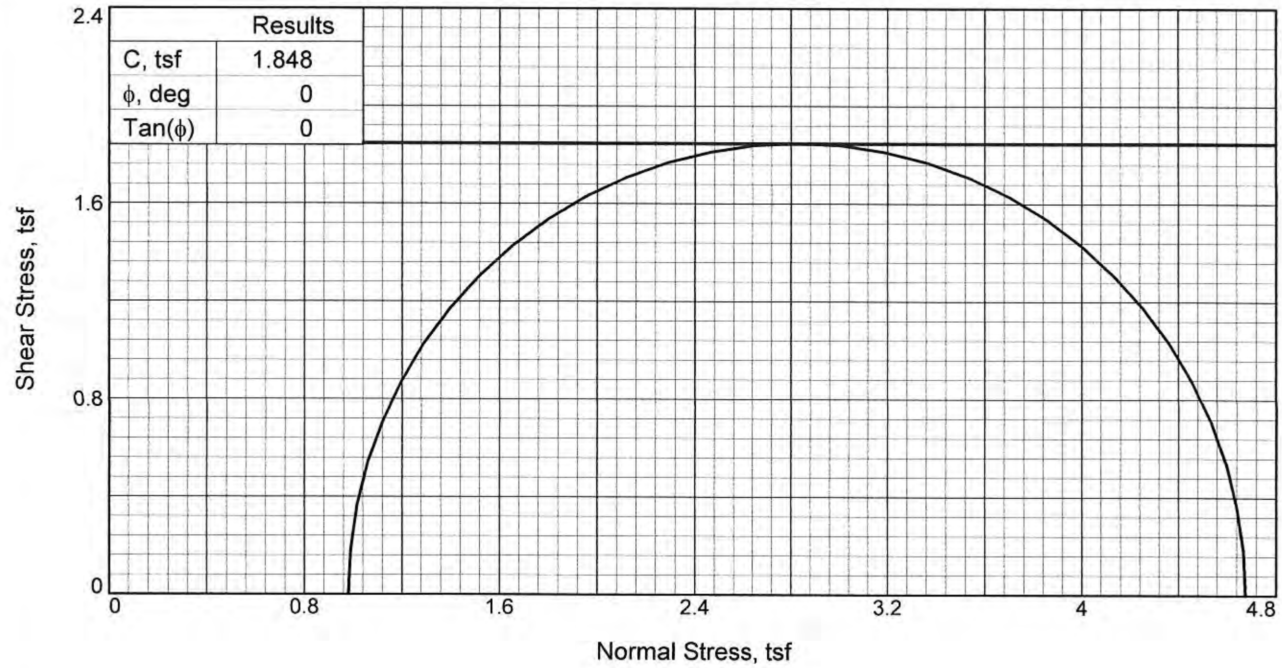
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB057 **Depth:** 33

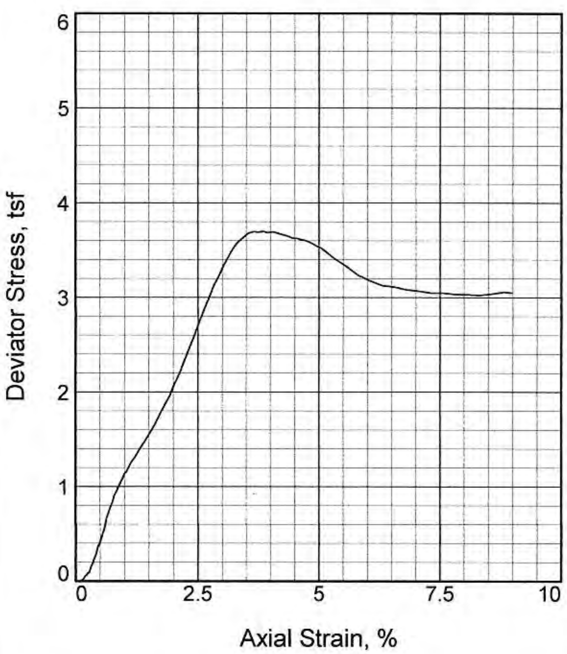
Project No.: 19.15.131 **Figure** _______

TOLUNAY-WONG ENGINEERS, INC.

Attachment Figure B.2-144



Results	
C, tsf	1.848
ϕ, deg	0
Tan(ϕ)	0



	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 ________

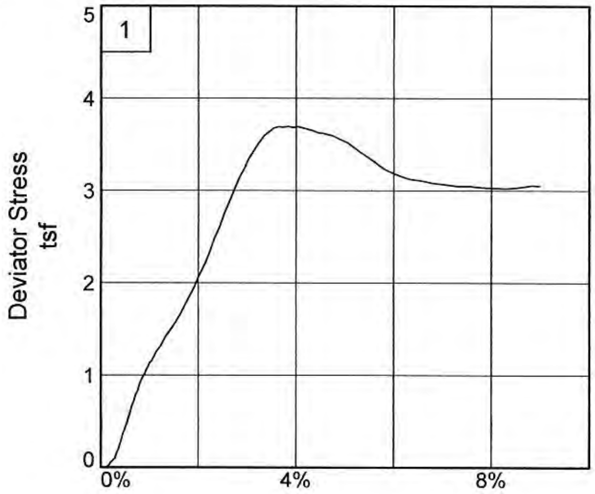
Client:

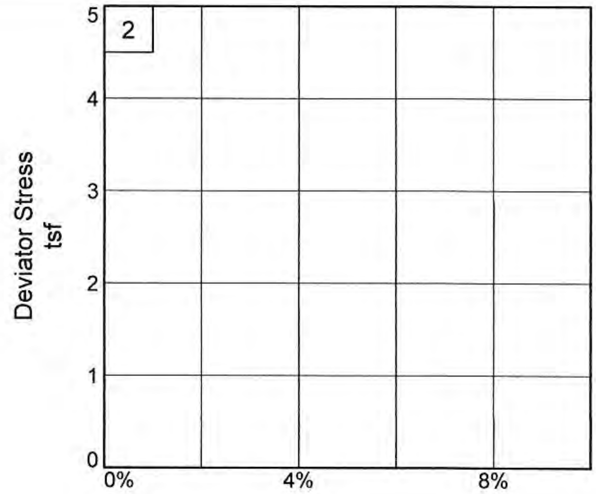
Project: San Jacinto River Waste Pit Superfund Site

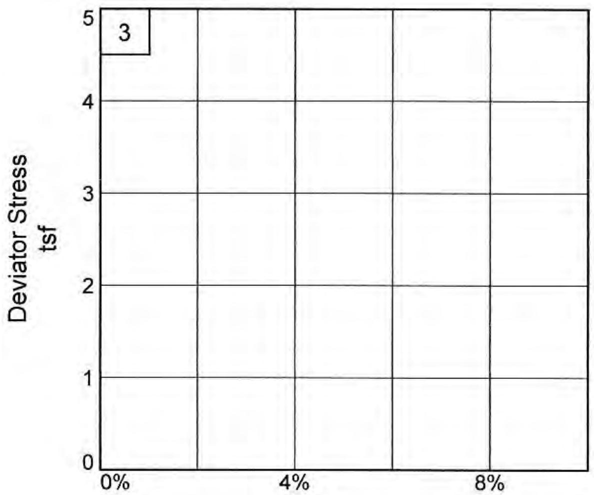
Source of Sample: SJGB057 **Depth:** 43

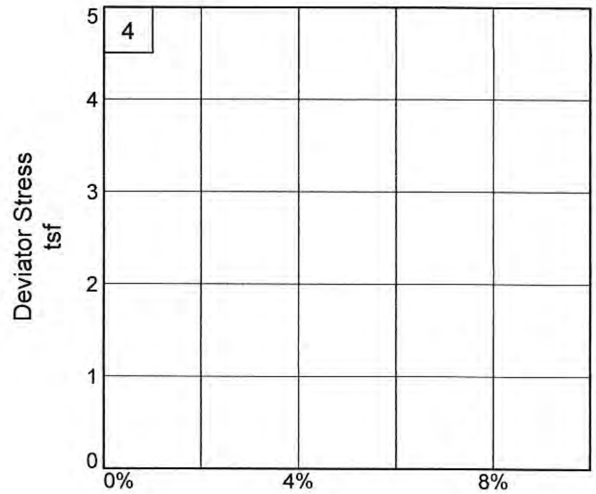
Proj. No.: 19.15.131 **Date Sampled:** 2-9-2020

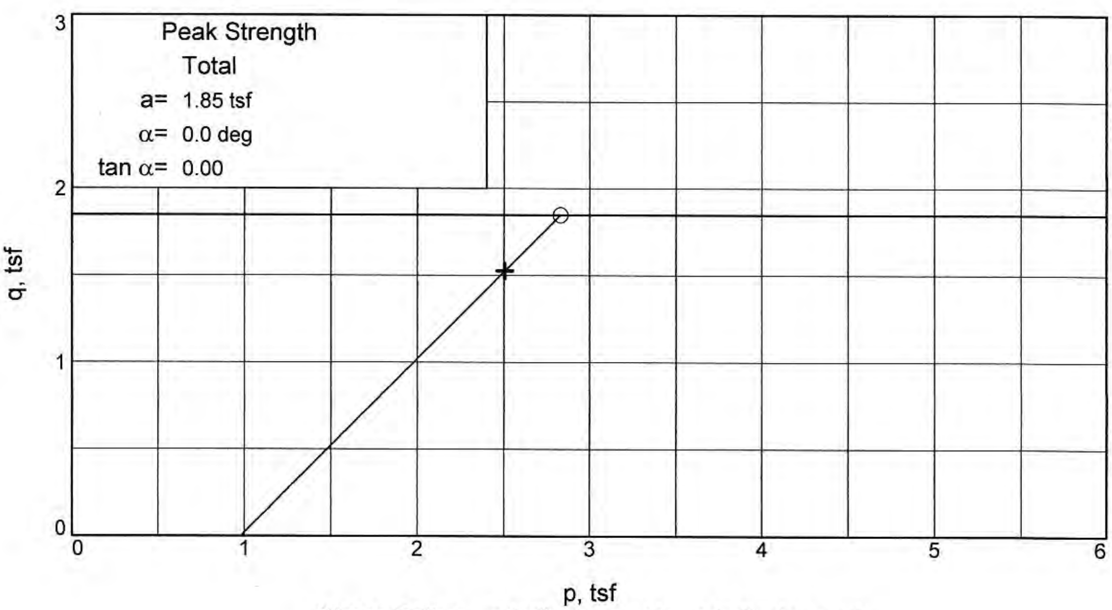
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

Client:

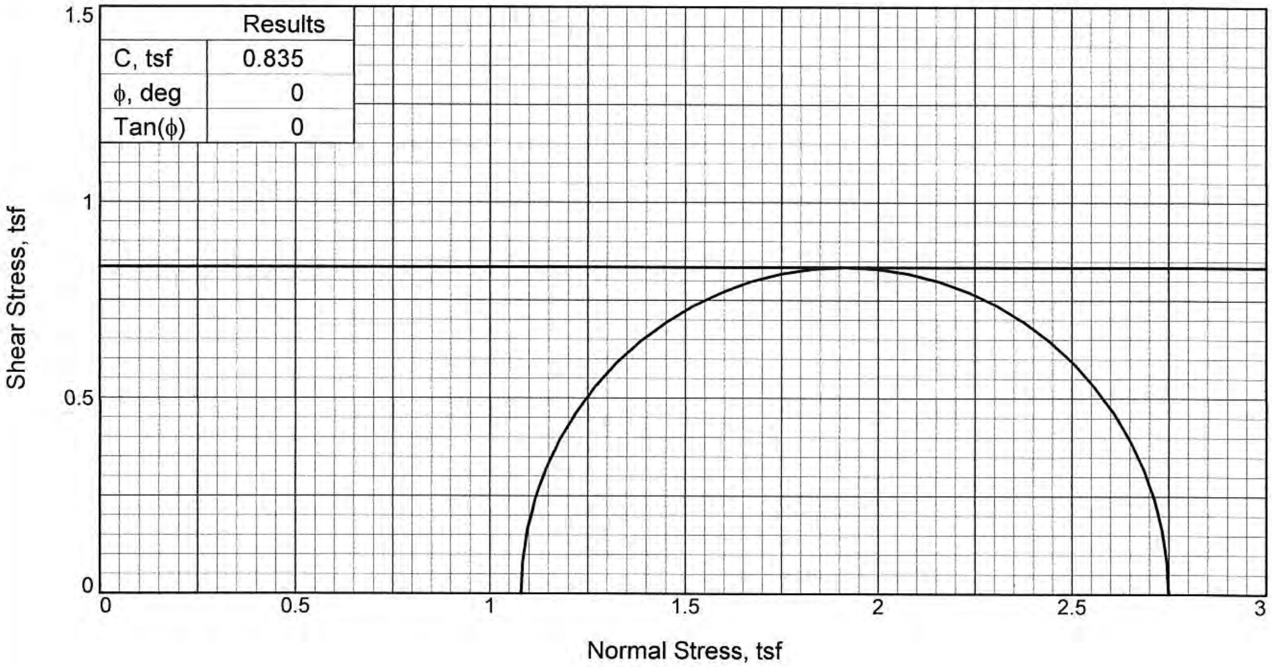
Project: San Jacinto River Waste Pit Superfund Site

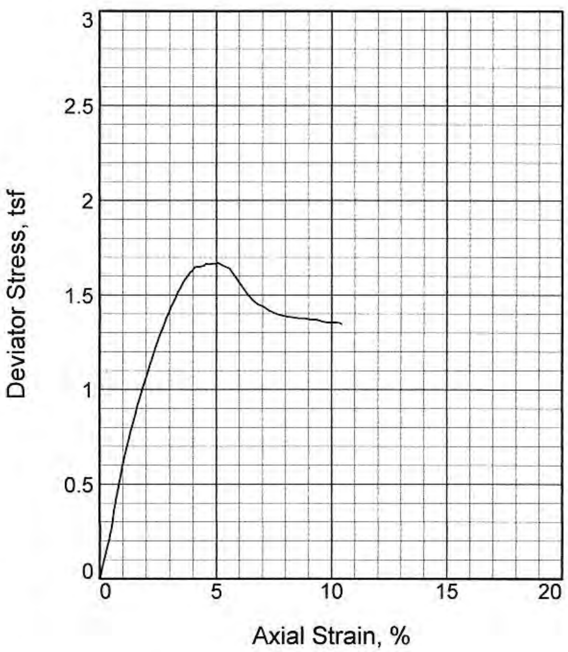
Source of Sample: SJGB057 **Depth:** 43

Project No.: 19.15.131 **Figure** _______

TOLUNAY-WONG ENGINEERS, INC.

Attachment Figure B.2-146





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 ________

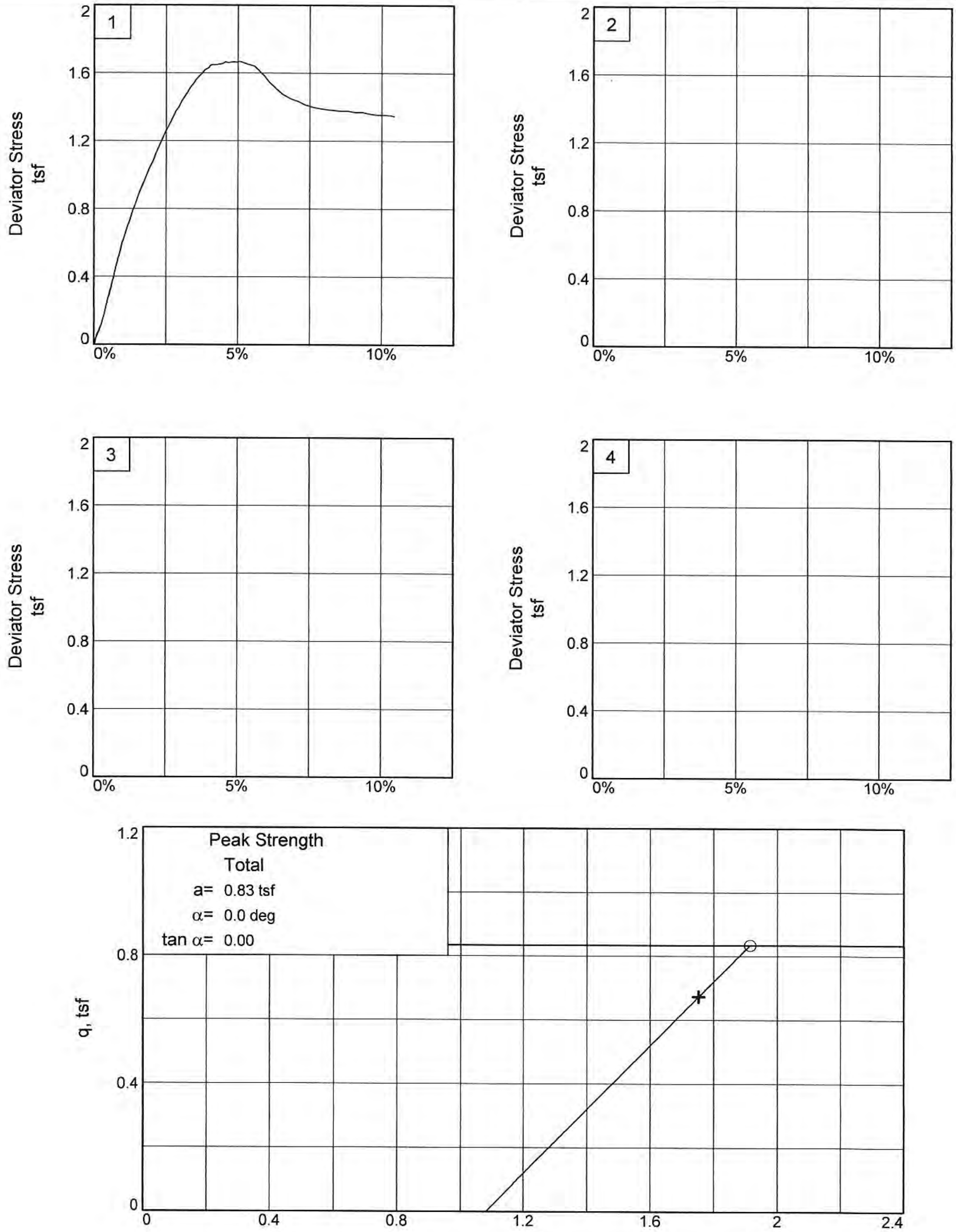
Client:

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:

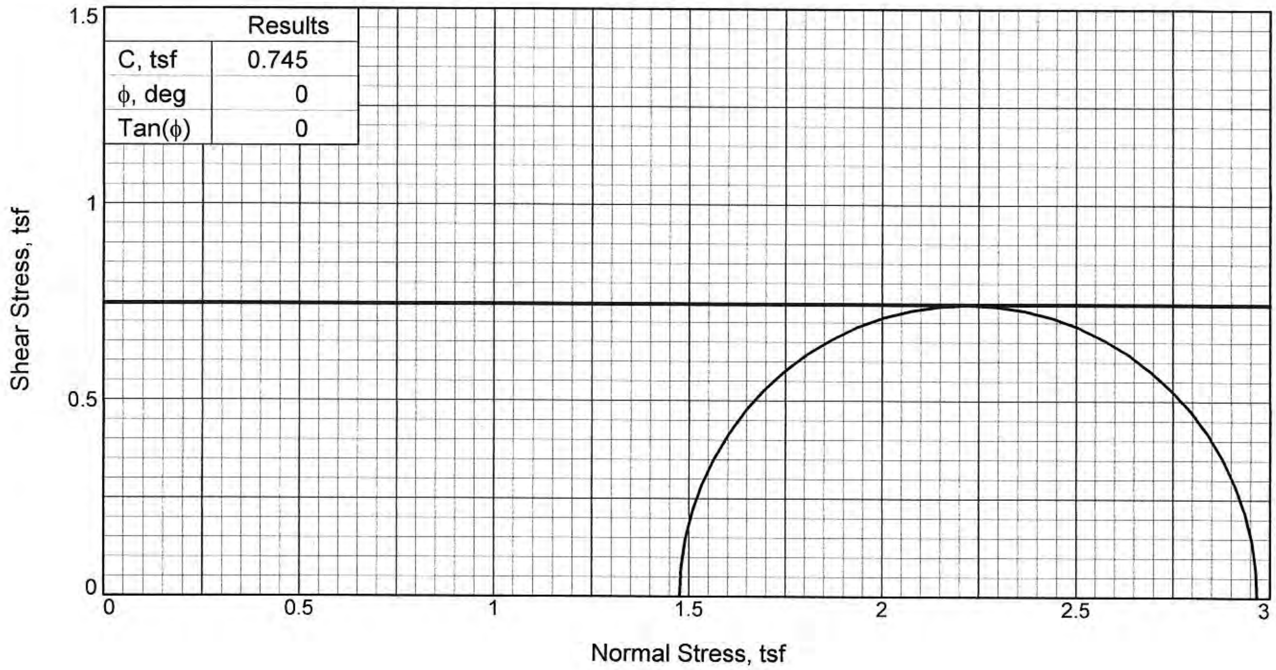
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB057 **Depth:** 48

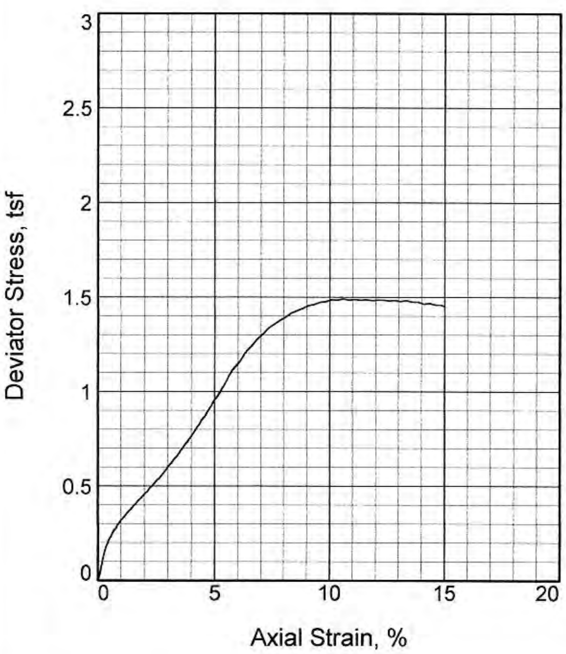
Project No.: 19.15.131 **Figure** _______

TOLUNAY-WONG ENGINEERS, INC.

Attachment Figure B.2-148



	Results
C, tsf	0.745
ϕ, deg	0
Tan(ϕ)	0



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 ________

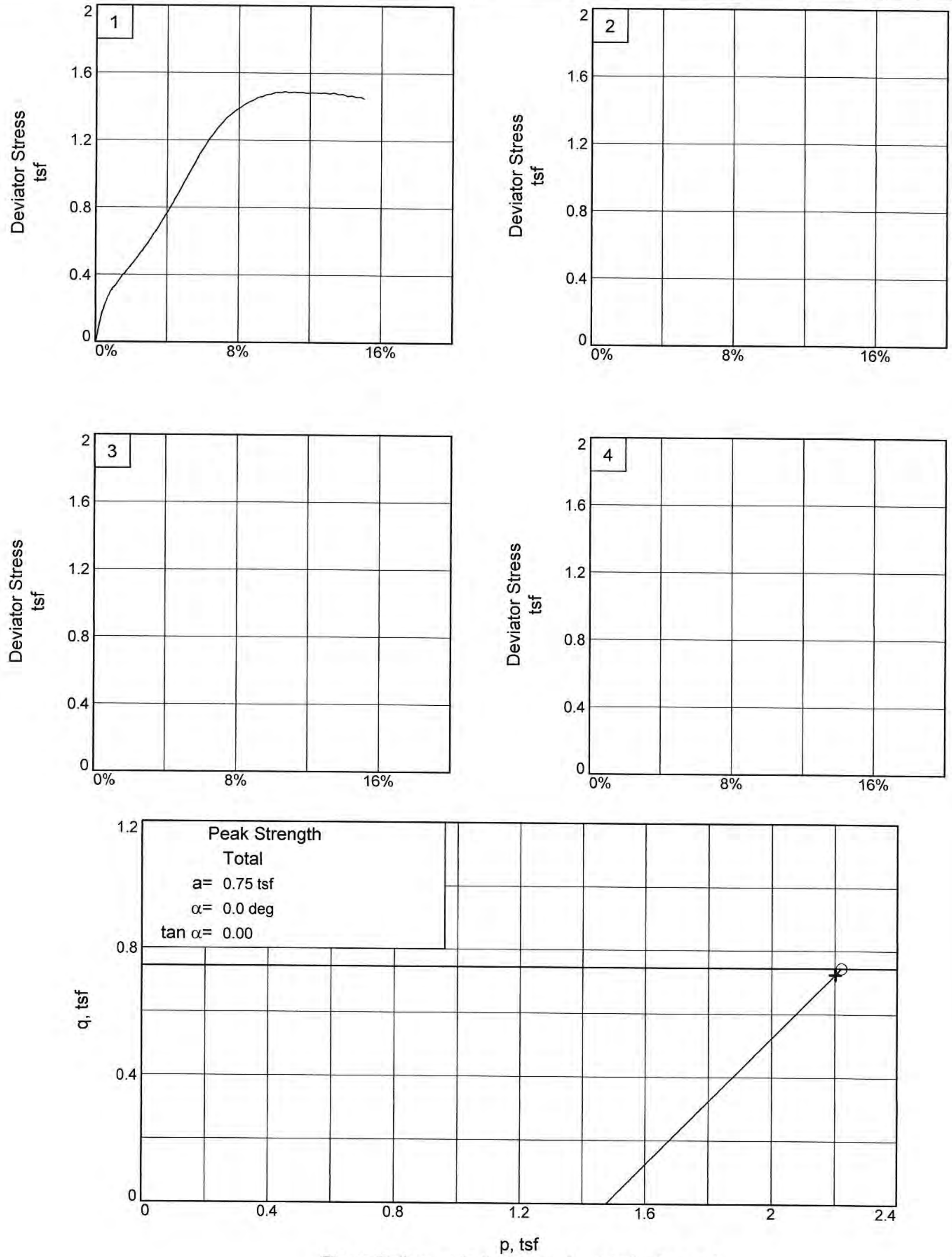
Client:

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



Stress Paths: o indicates peak + indicates end

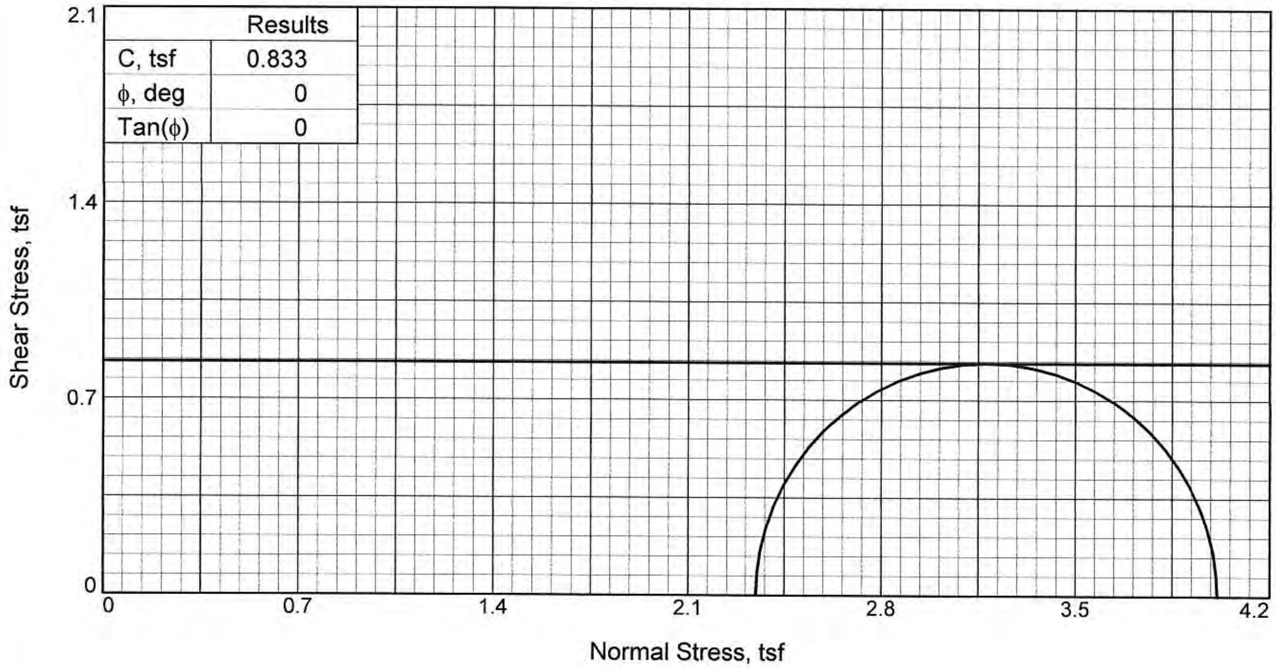
Client:

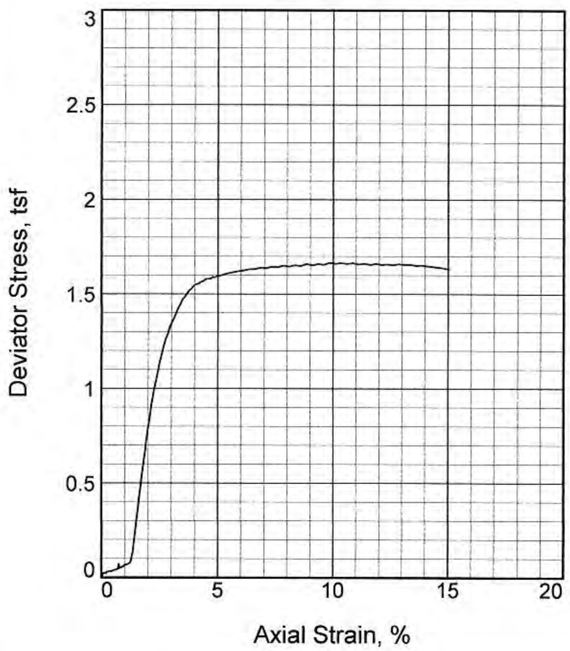
Project: San Jacinto River Waste Pit Superfund Site

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 ________

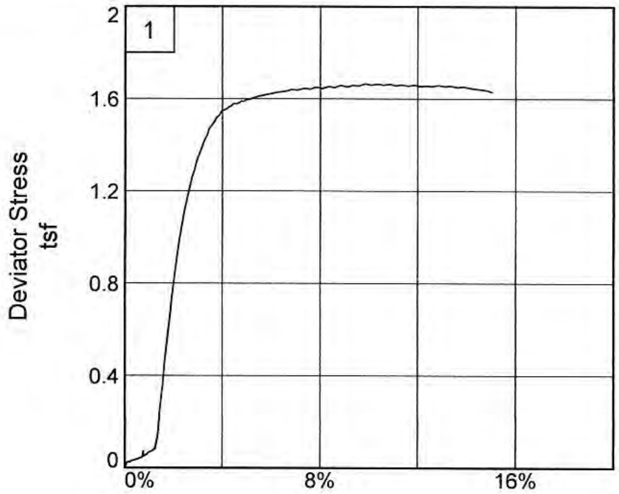
Client:

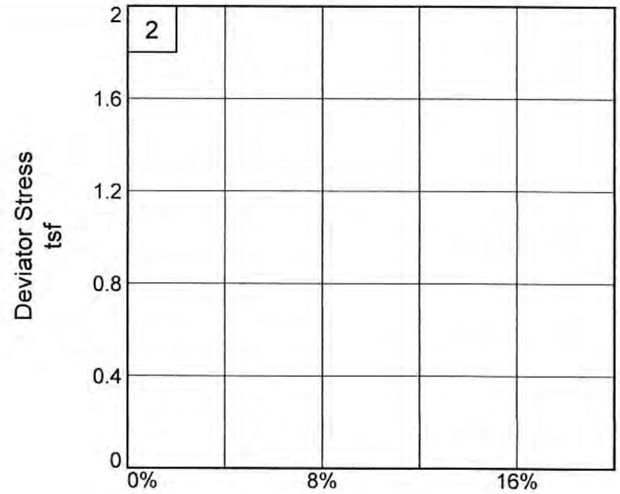
Project: San Jacinto River Waste Pit Superfund Site

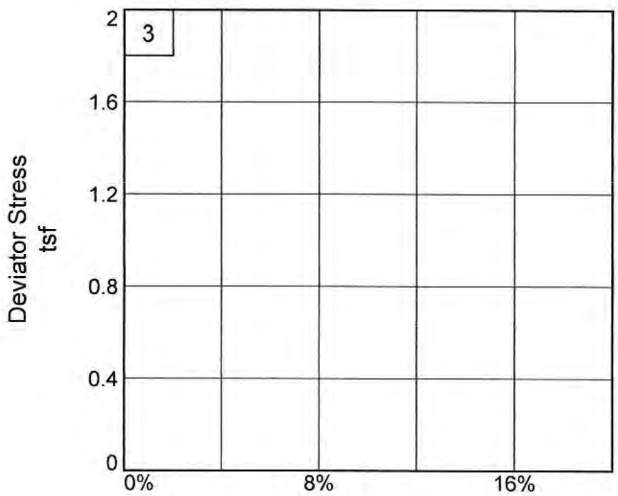
Source of Sample: SJGB057 **Depth:** 93

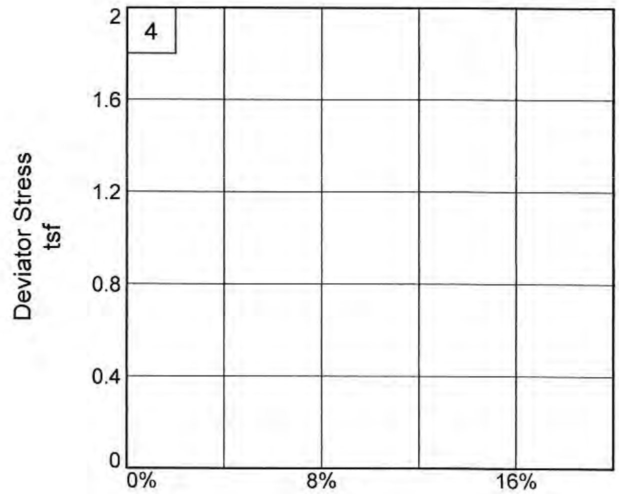
Proj. No.: 19.15.131 **Date Sampled:** 2-8-2020

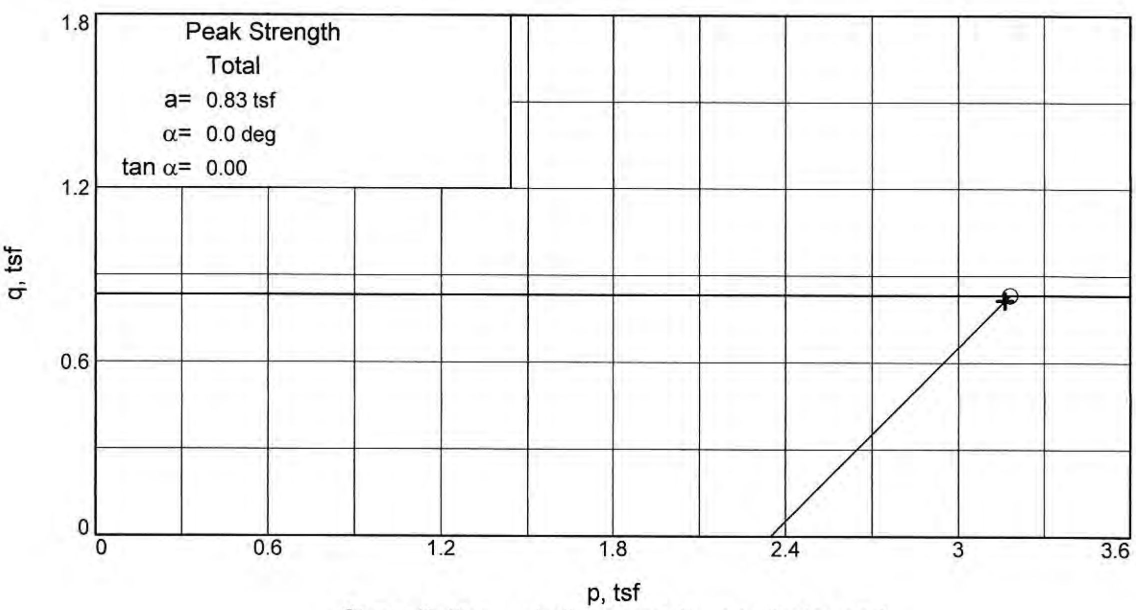
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Stress Paths: o indicates peak + indicates end

Client:

Project: San Jacinto River Waste Pit Superfund Site

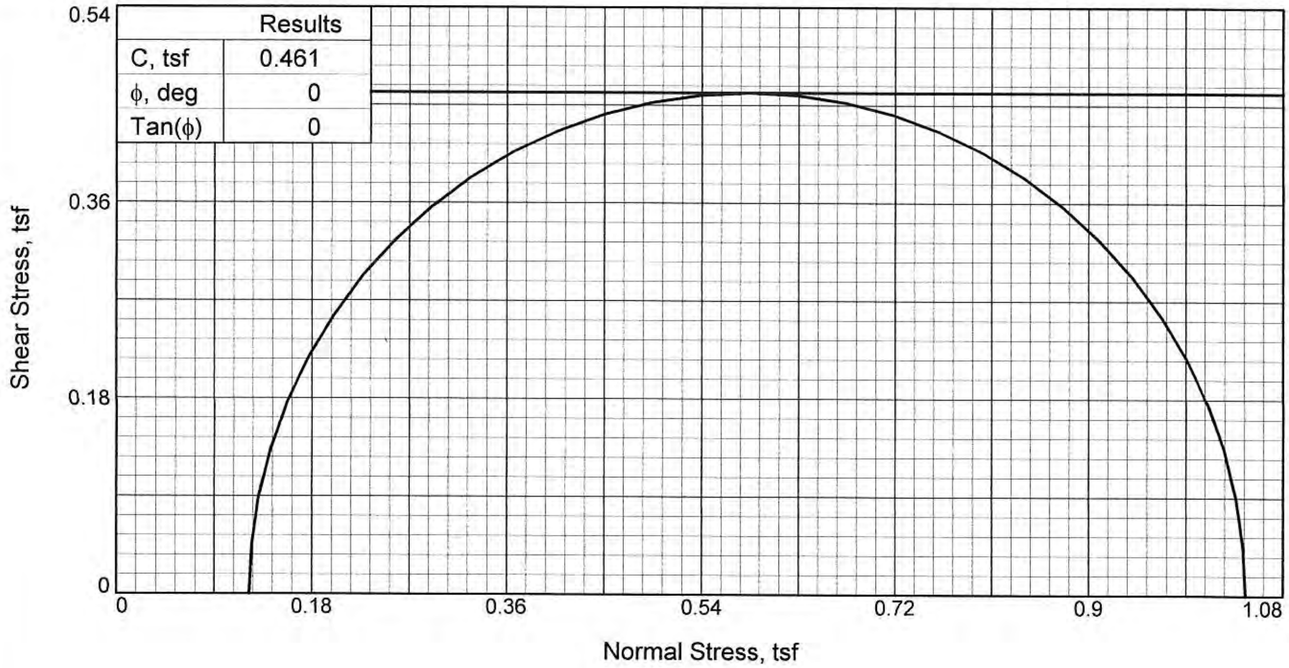
Source of Sample: SJGB057 **Depth:** 93

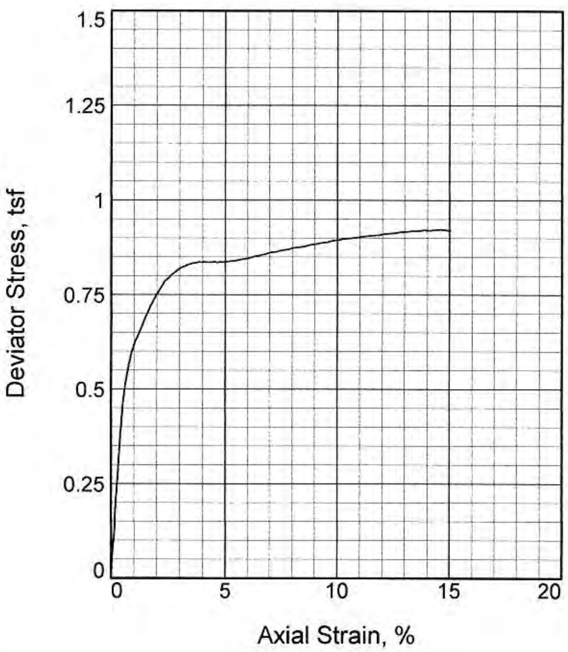
Project No.: 19.15.131 **Figure** _______

TOLUNAY-WONG ENGINEERS, INC.

Attachment Figure B.2-152

	Results
C, tsf	0.461
ϕ, deg	0
Tan(ϕ)	0





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 ________

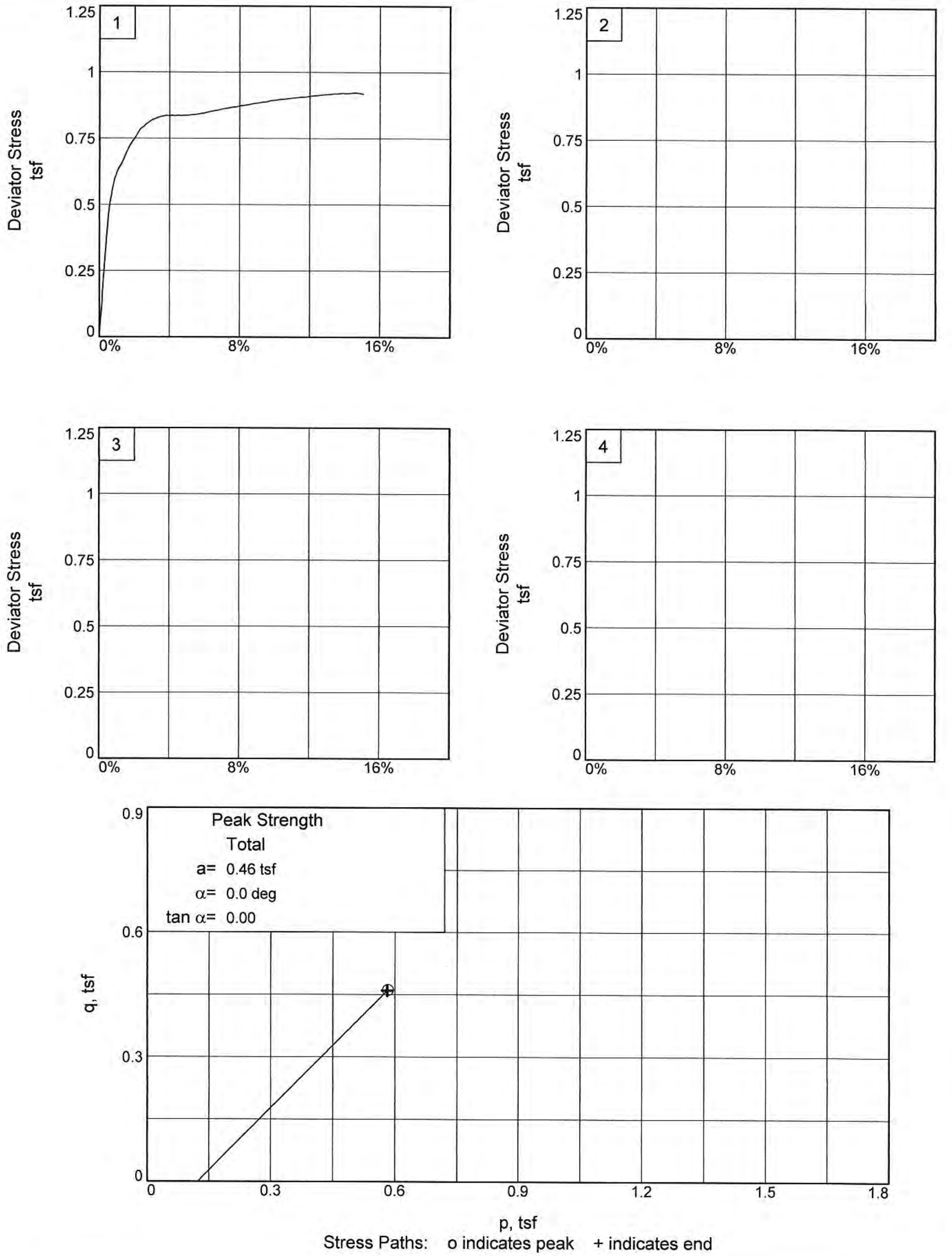
Client:

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



Client:

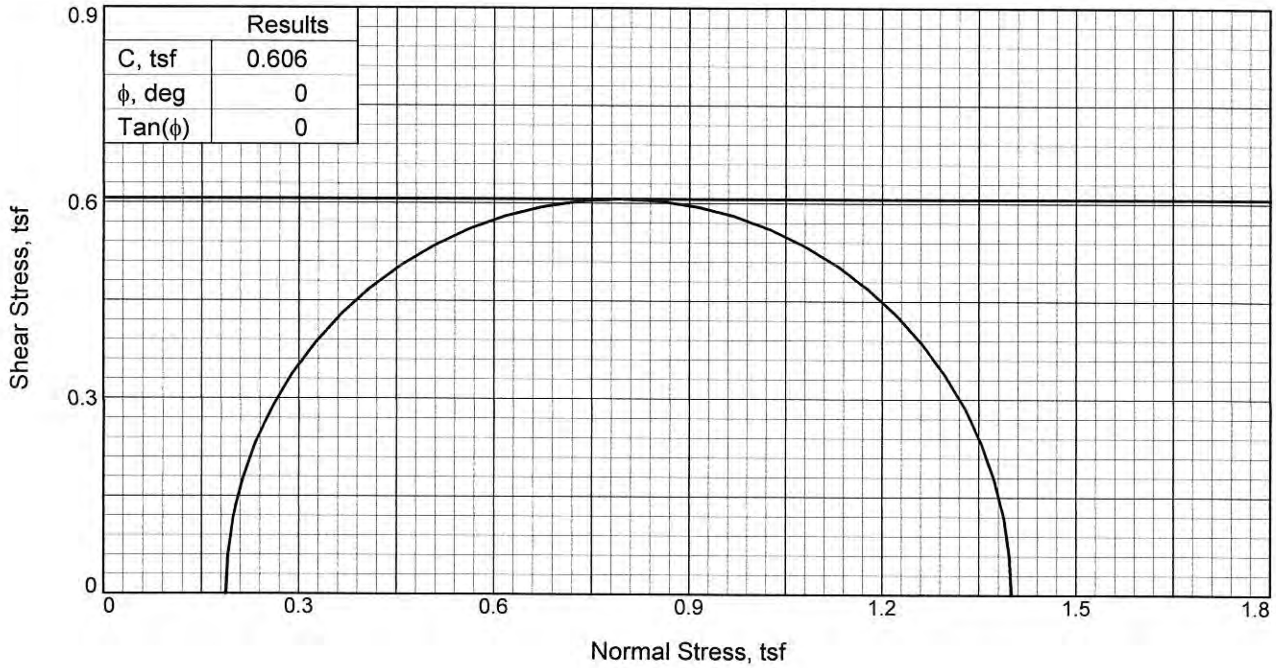
Project: San Jacinto River Waste Pit Superfund Site

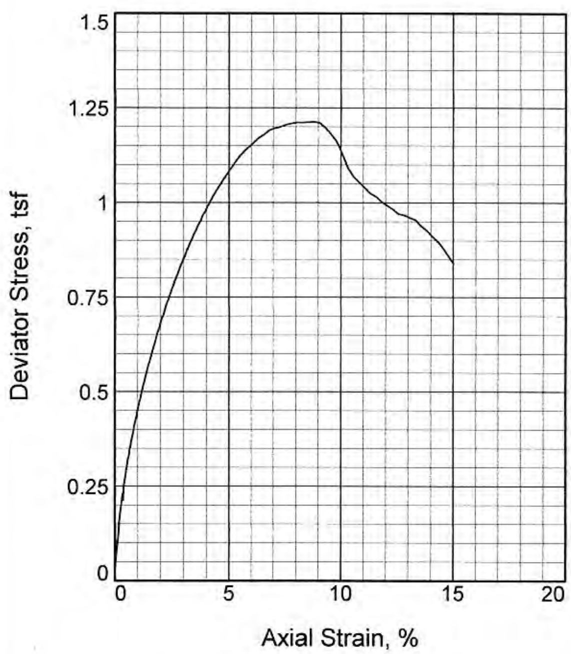
Source of Sample: SJGB058 **Depth:** 4-6

Project No.: 19.15.131 **Figure** _______

TOLUNAY-WONG ENGINEERS, INC.

Attachment Figure B.2-154





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 ________

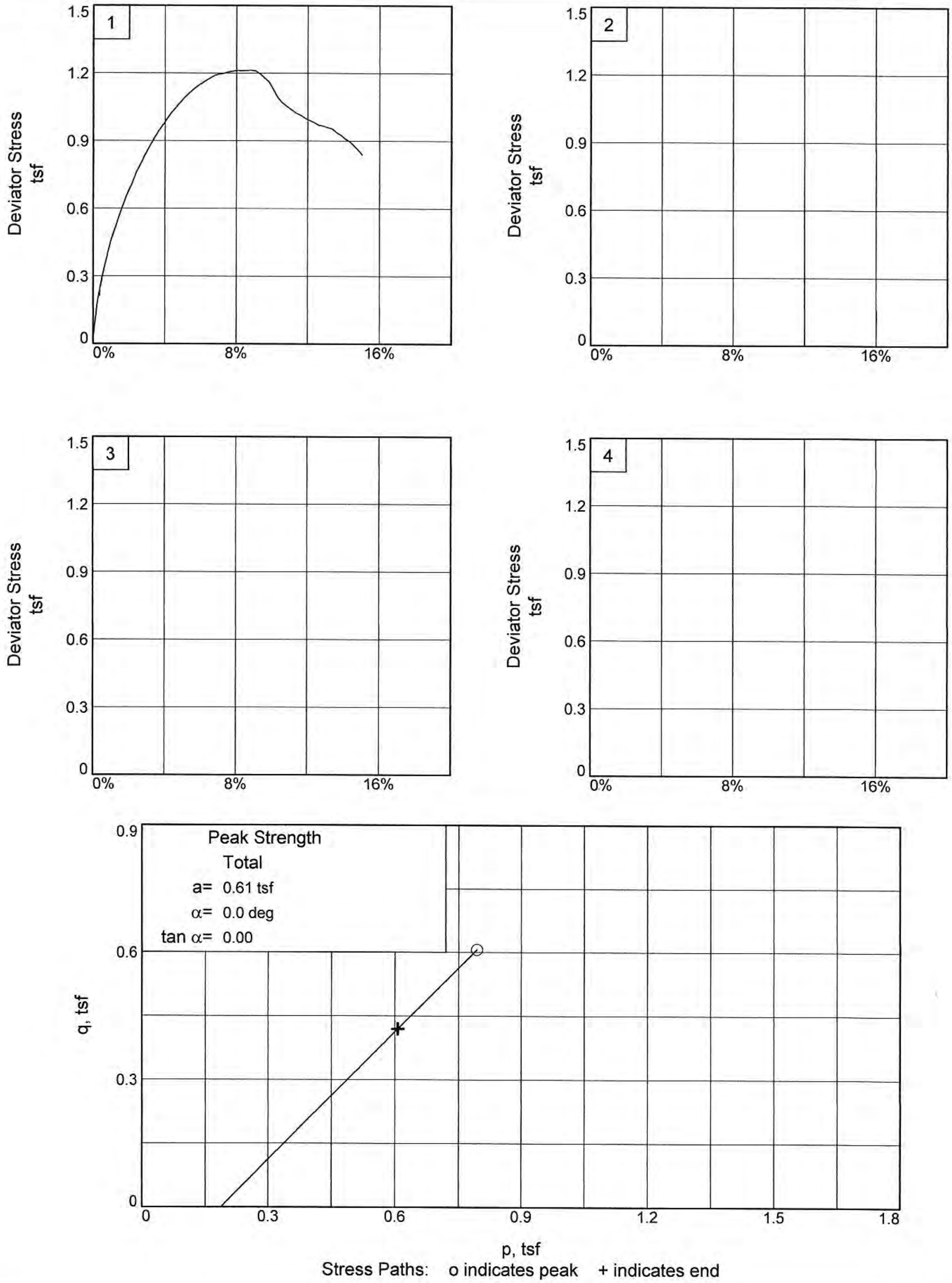
Client:

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



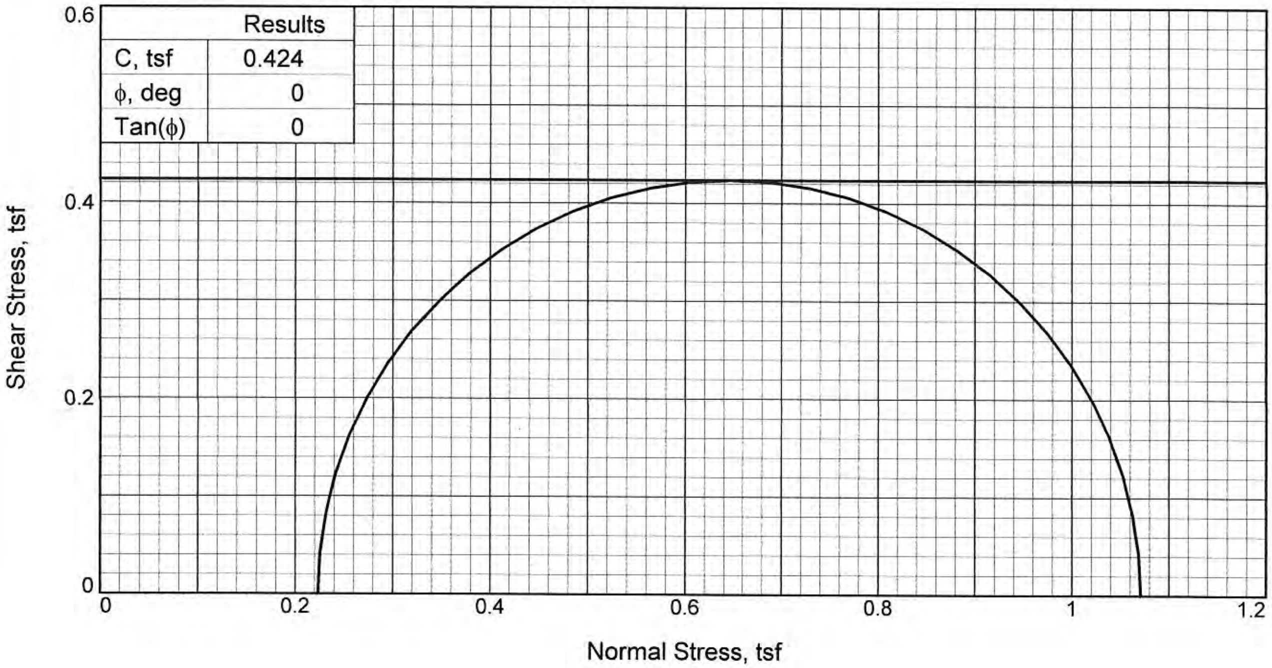
Client:

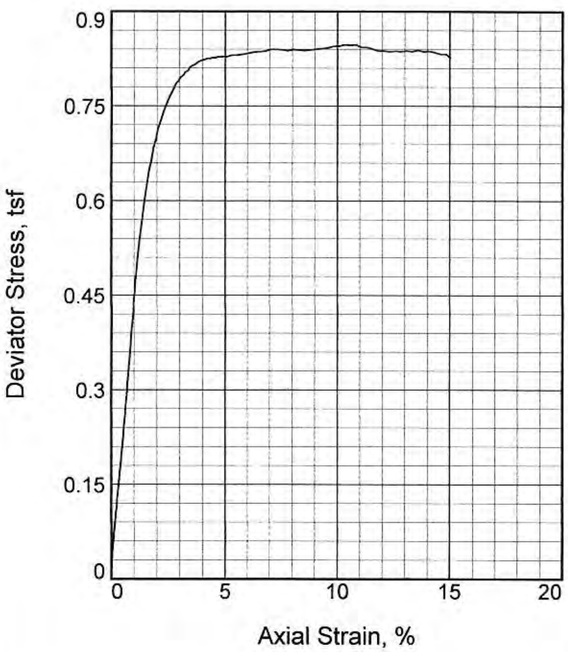
Project: San Jacinto River Waste Pit Superfund Site

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 ________

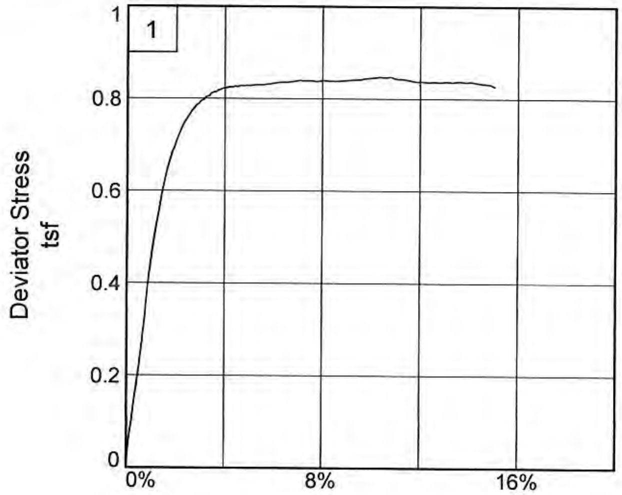
Client:

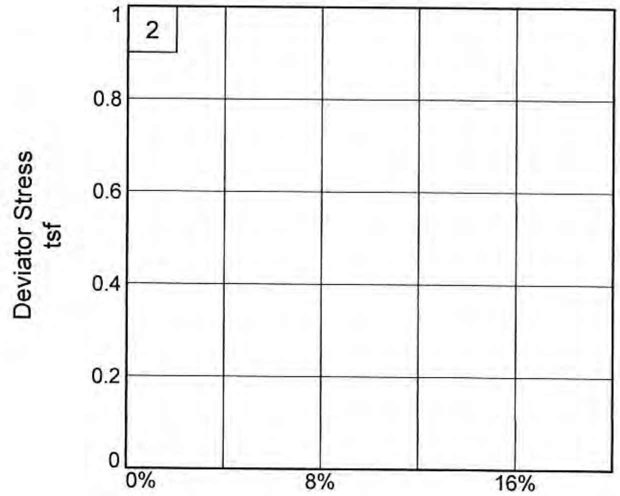
Project: San Jacinto River Waste Pit Superfund Site

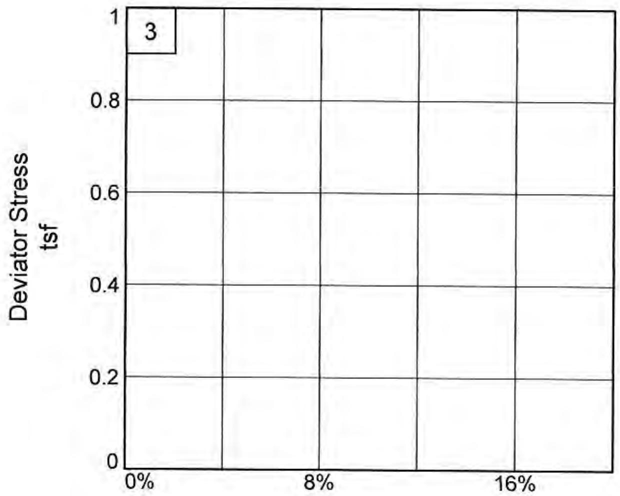
Source of Sample: SJGB058 **Depth:** 8-10

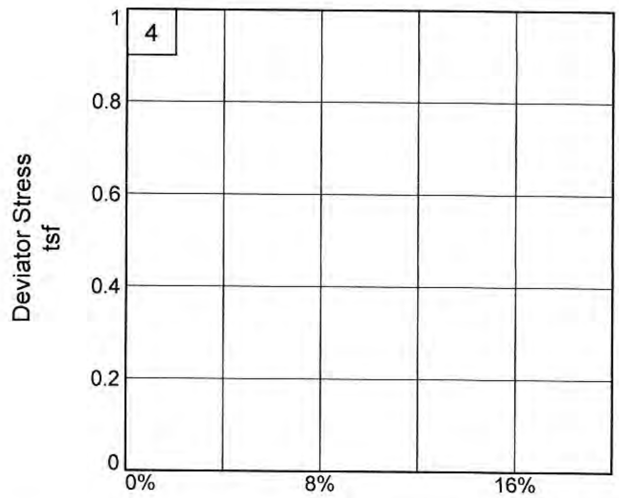
Proj. No.: 19.15.131 **Date Sampled:** 2/20/20

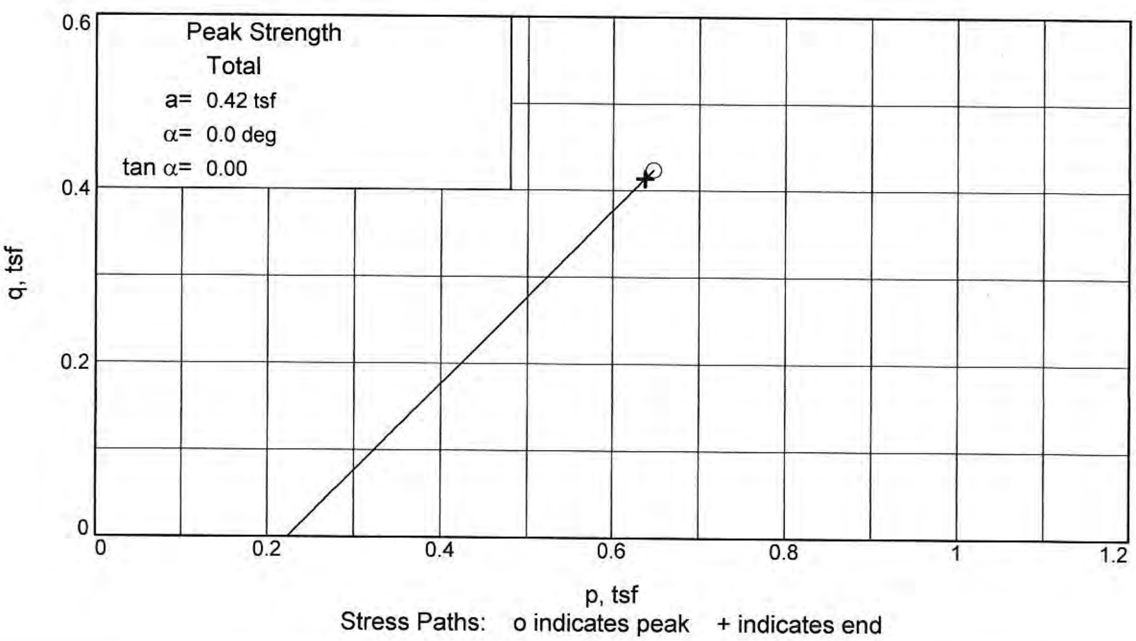
TRIAXIAL SHEAR TEST REPORT
Tolunay-Wong Engineers, Inc.
Houston, Texas











Client:

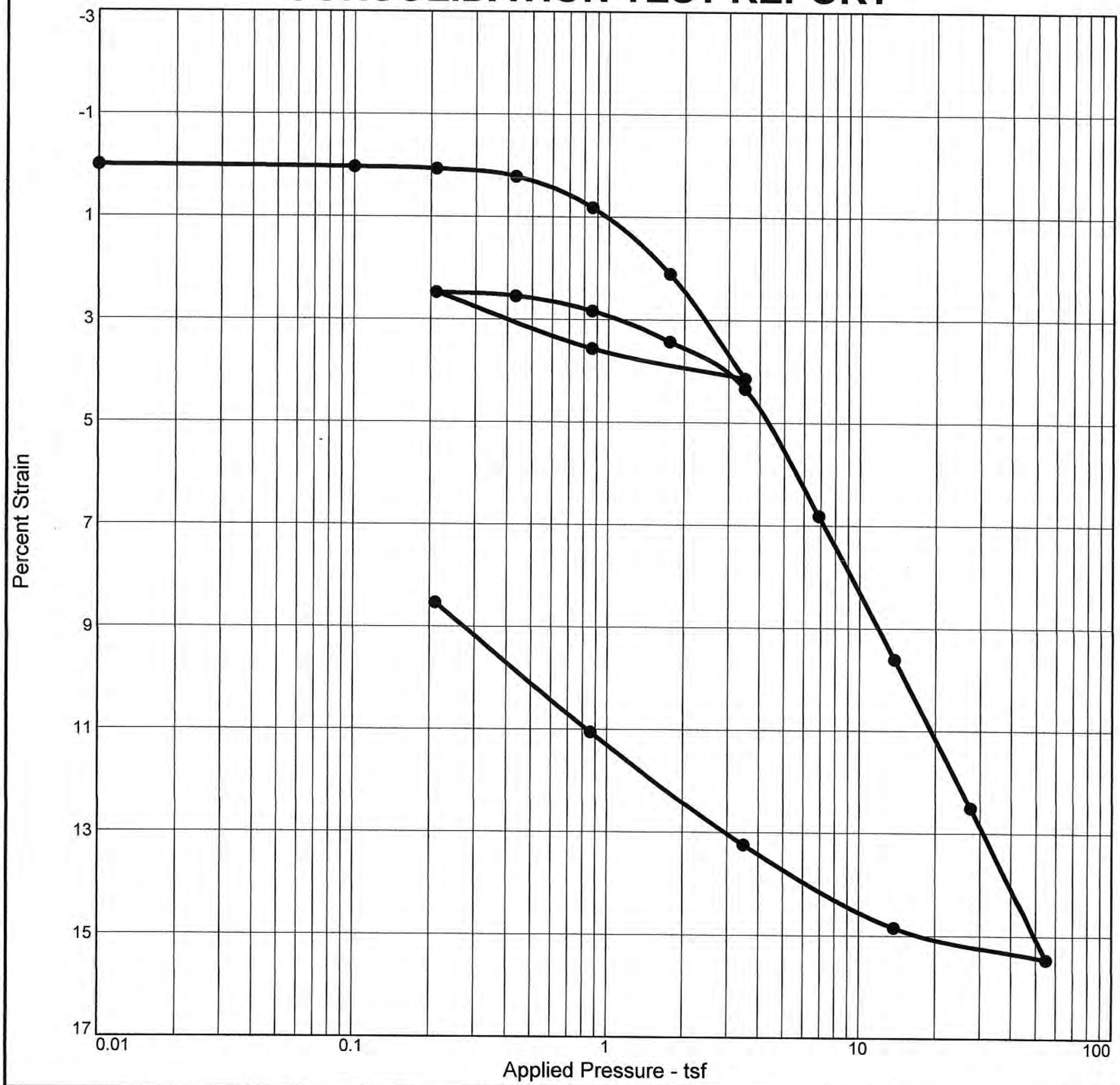
Project: San Jacinto River Waste Pit Superfund Site

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

Tolunay-Wong Engineers, Inc.

Houston, Texas

Remarks:

Test method: ASTM D2435

Specific gravity: Assumed

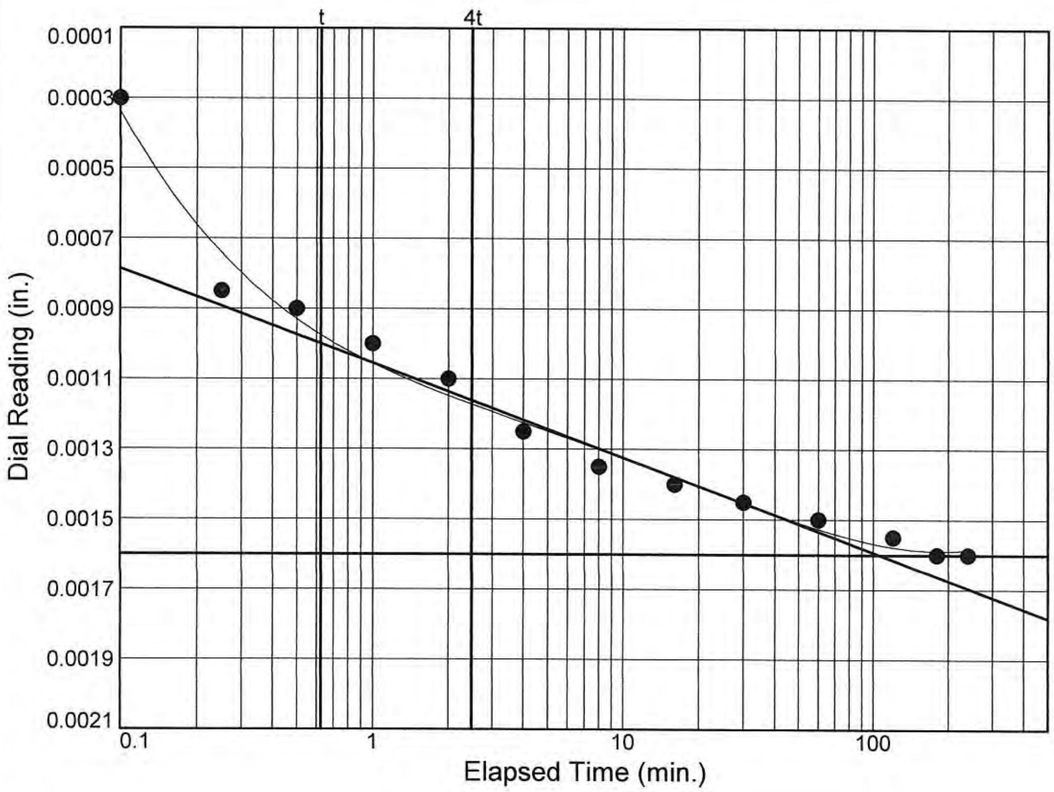
Figure

Attachment Figure B.2-159

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

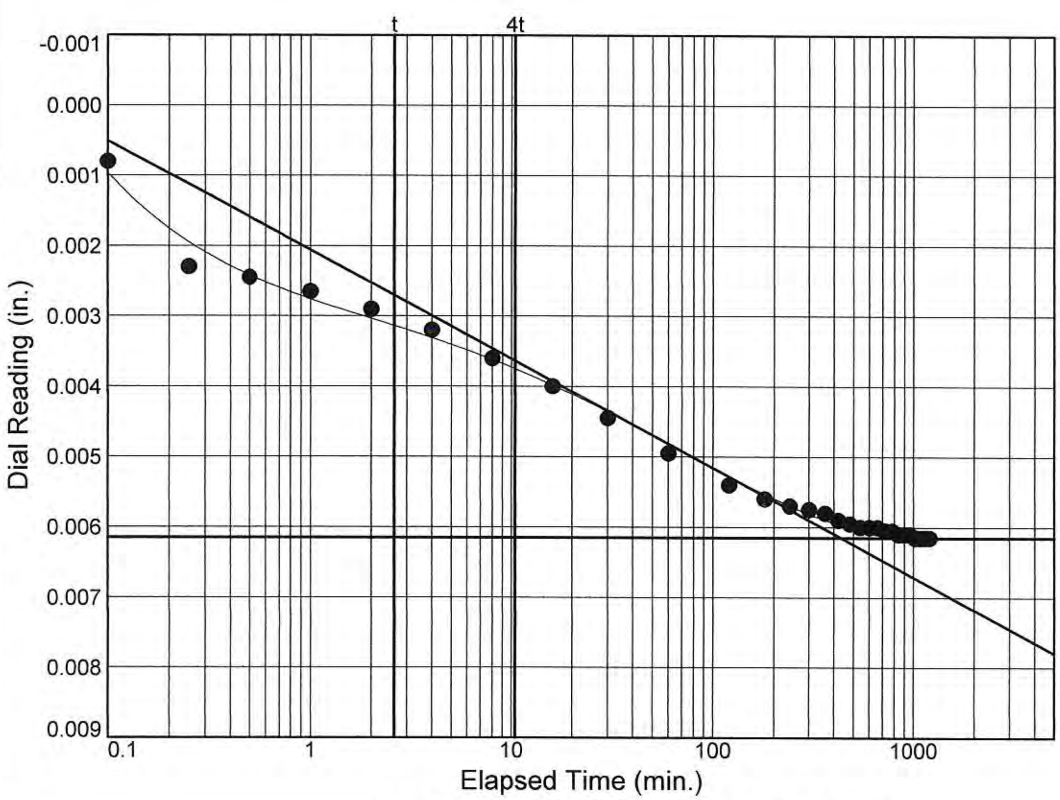
Source of Sample: SJGB027 Depth: 6



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

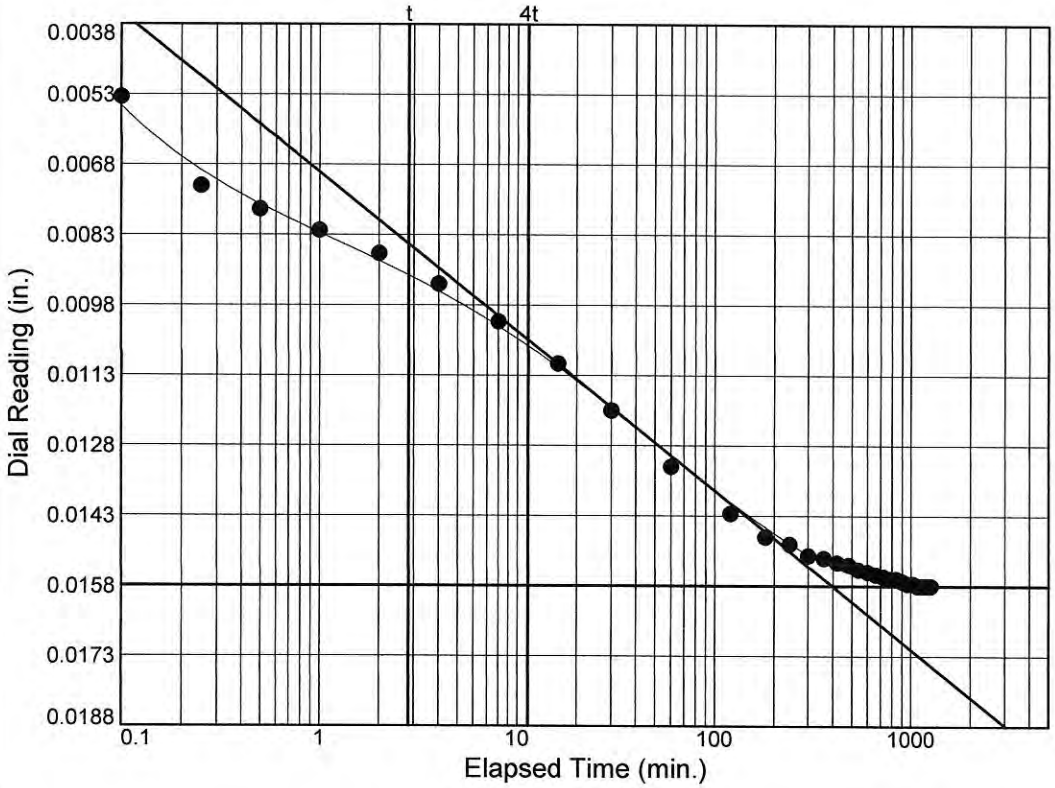
TOLUNAY-WONG ENGINEERS, INC.

Attachment Figure B.2-160

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

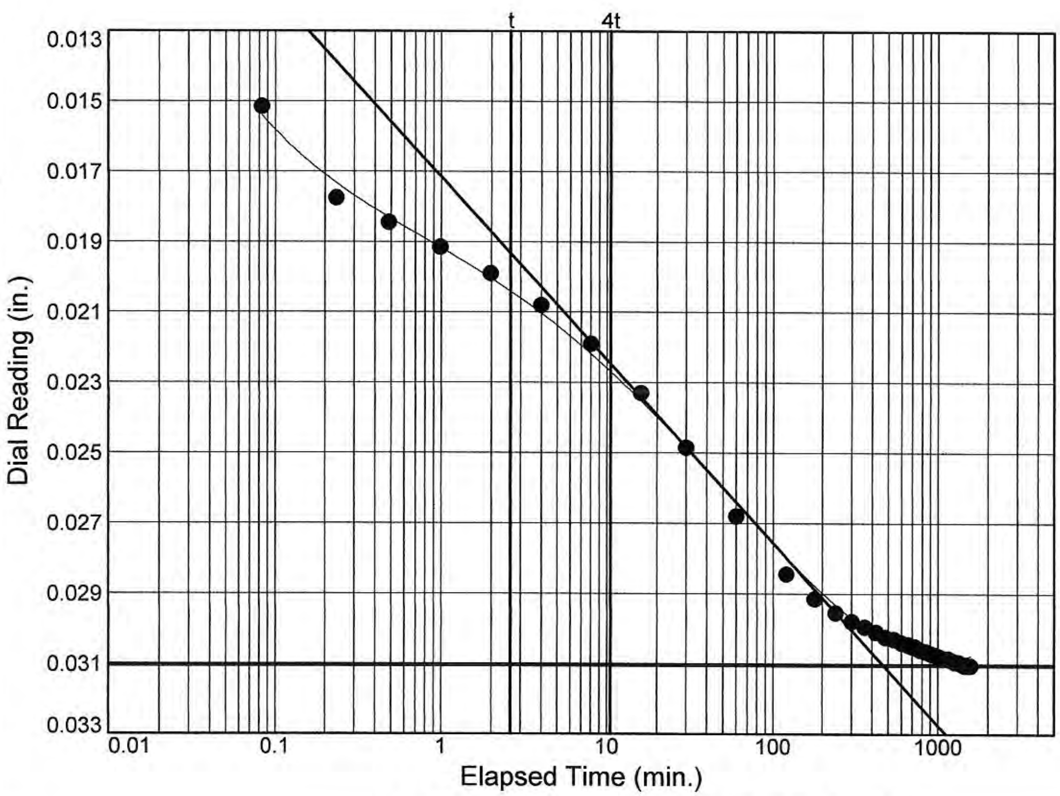
Source of Sample: SJGB027 Depth: 6



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.

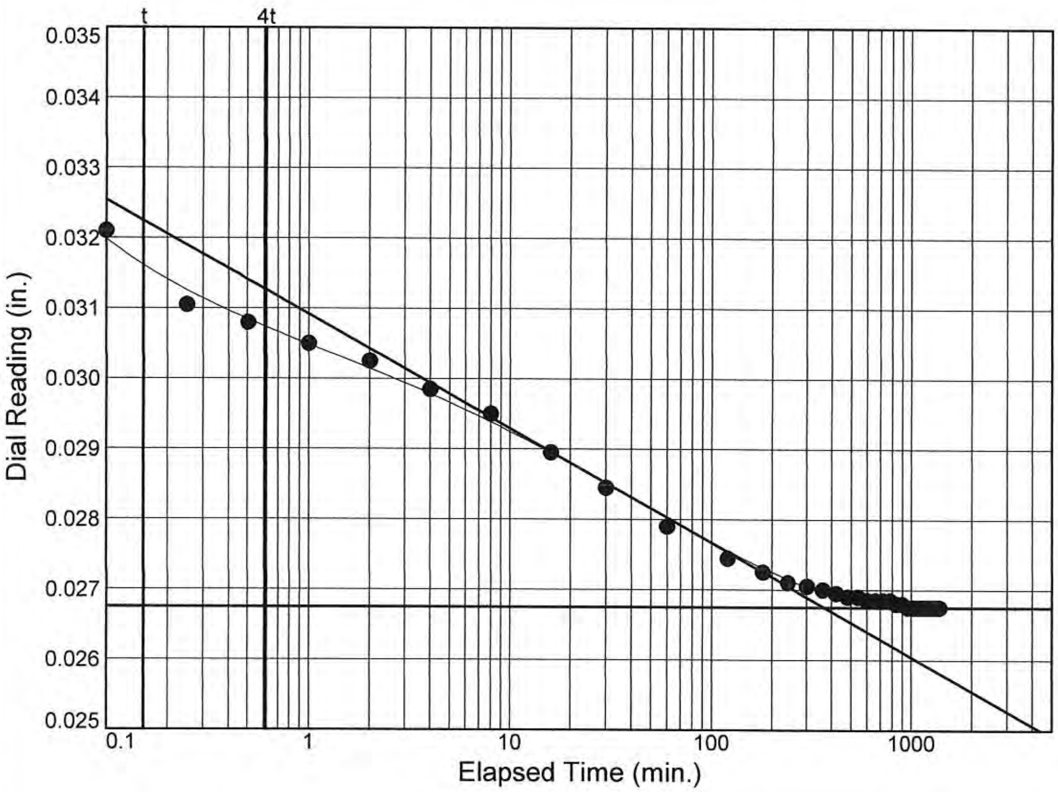
C_v @ T_{50}
3.6 ft.^{2}/yr.

C_α = 0.000

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

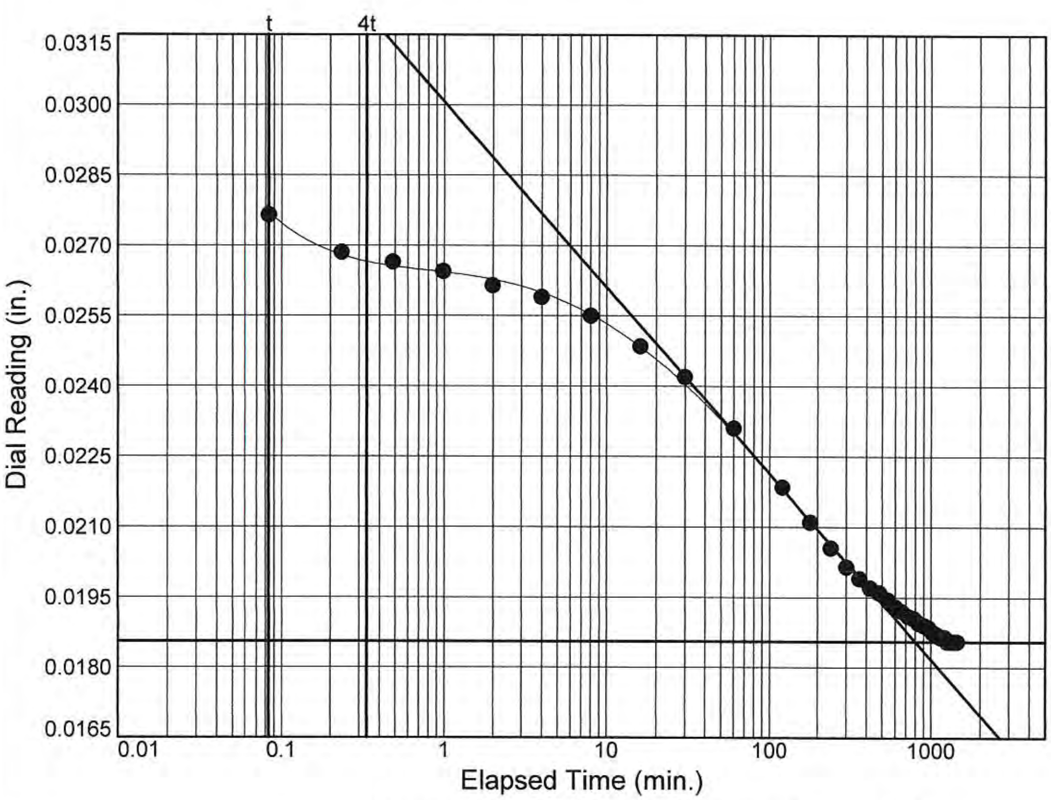
D_{100} = 0.0267

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

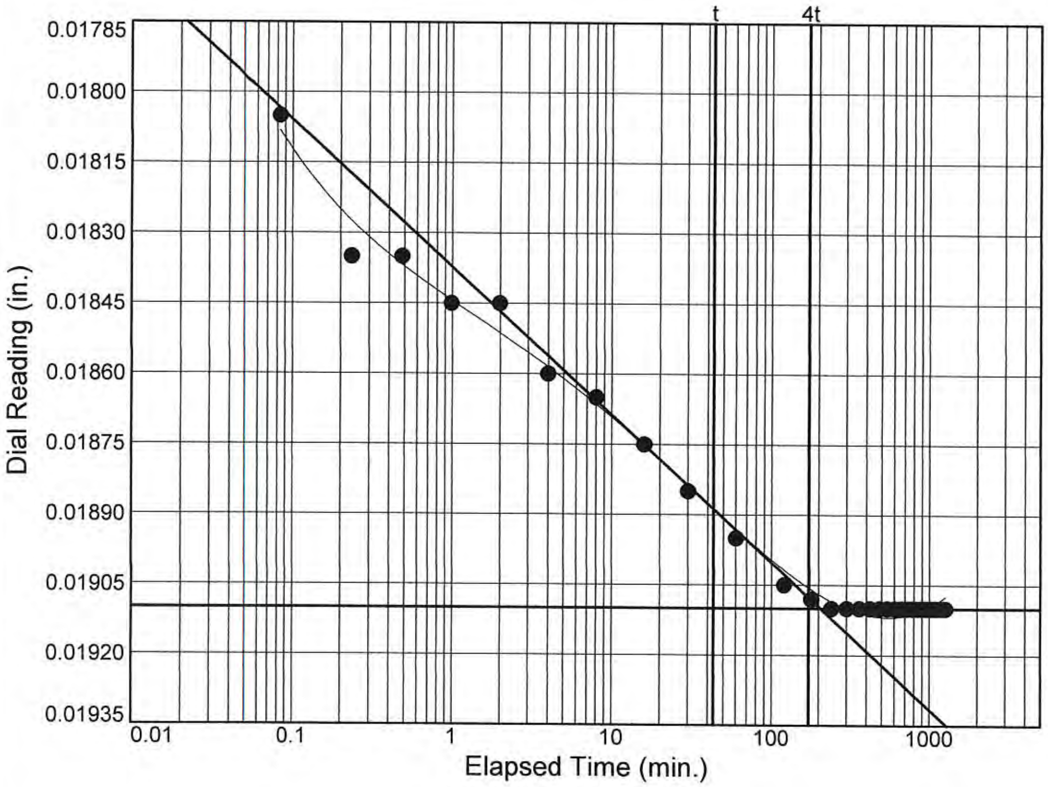
Figure

TOLUNAY-WONG ENGINEERS, INC.

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

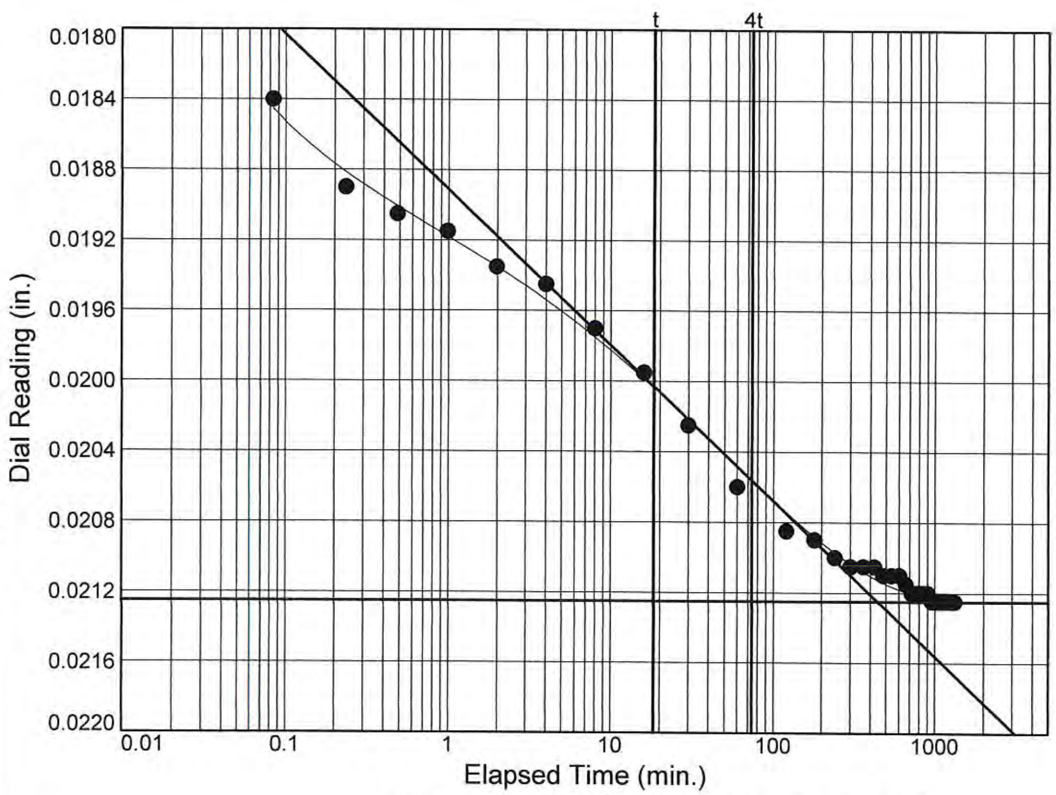
Source of Sample: SJGB027 Depth: 6



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

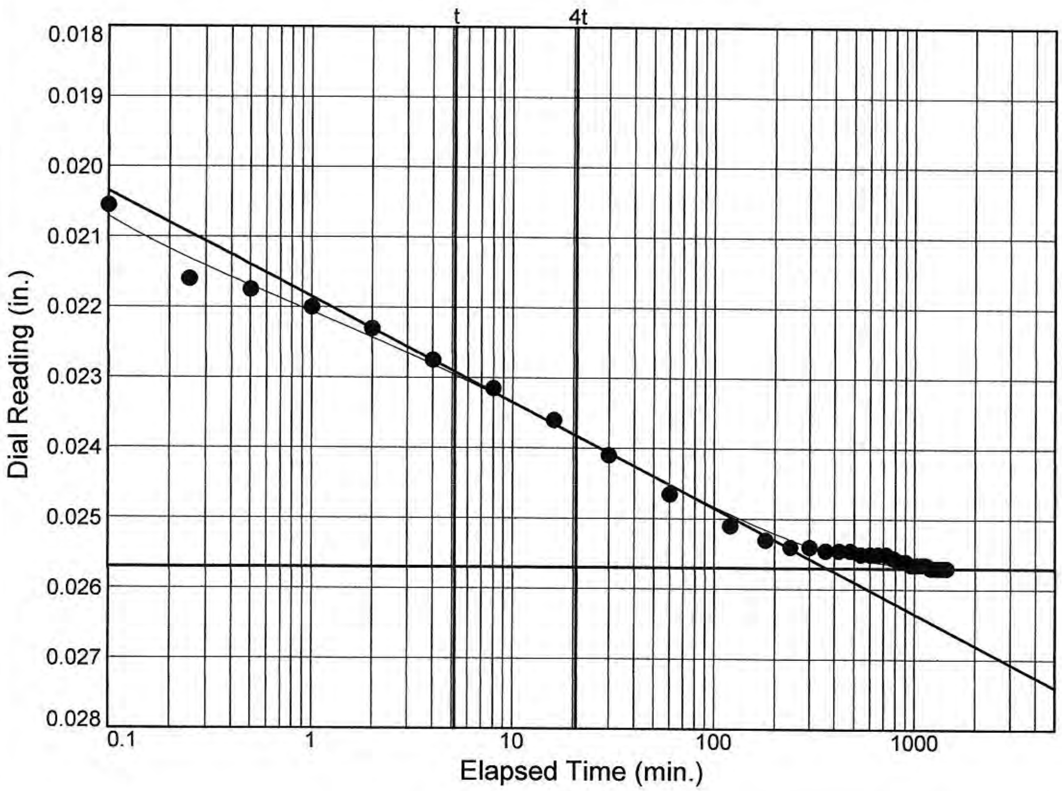
TOLUNAY-WONG ENGINEERS, INC.

Figure

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

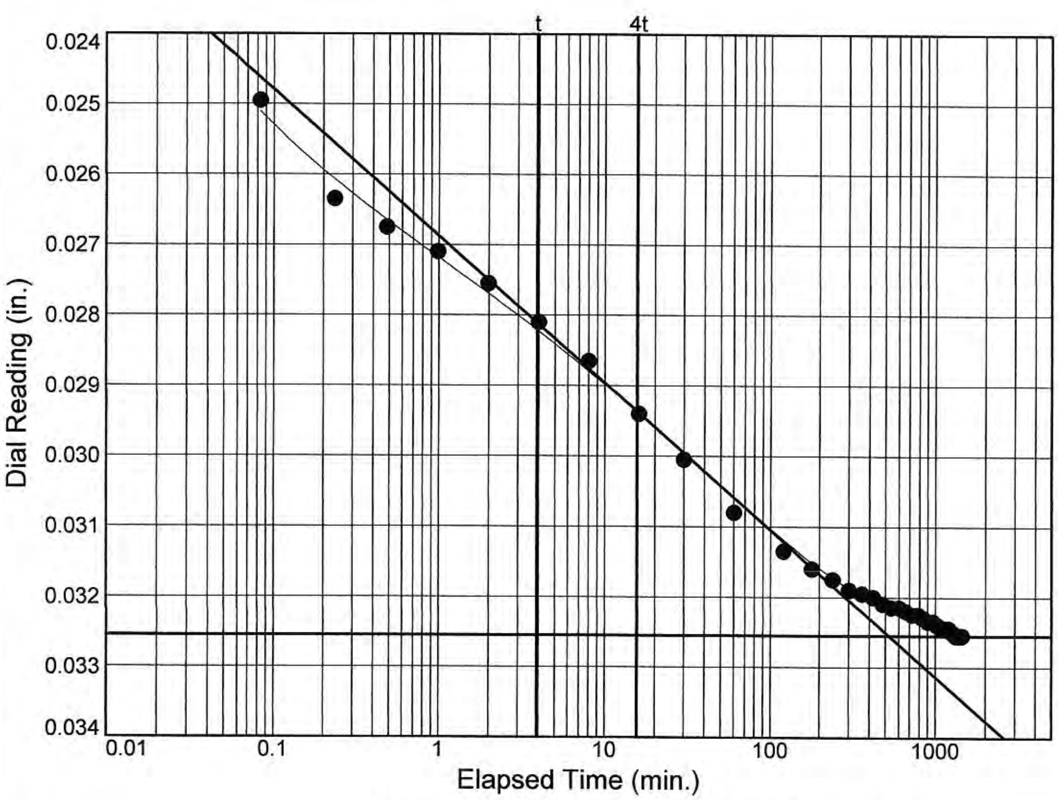
Source of Sample: SJGB027 Depth: 6



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

TOLUNAY-WONG ENGINEERS, INC.

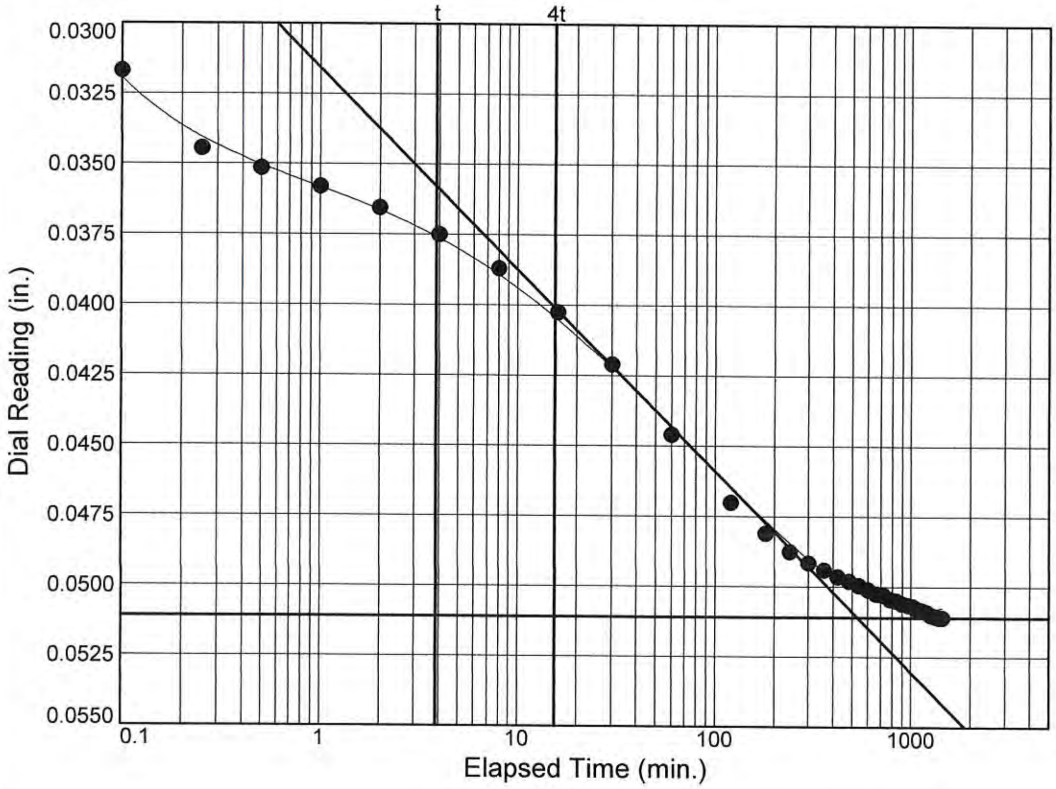
Figure

Attachment Figure B.2-164

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

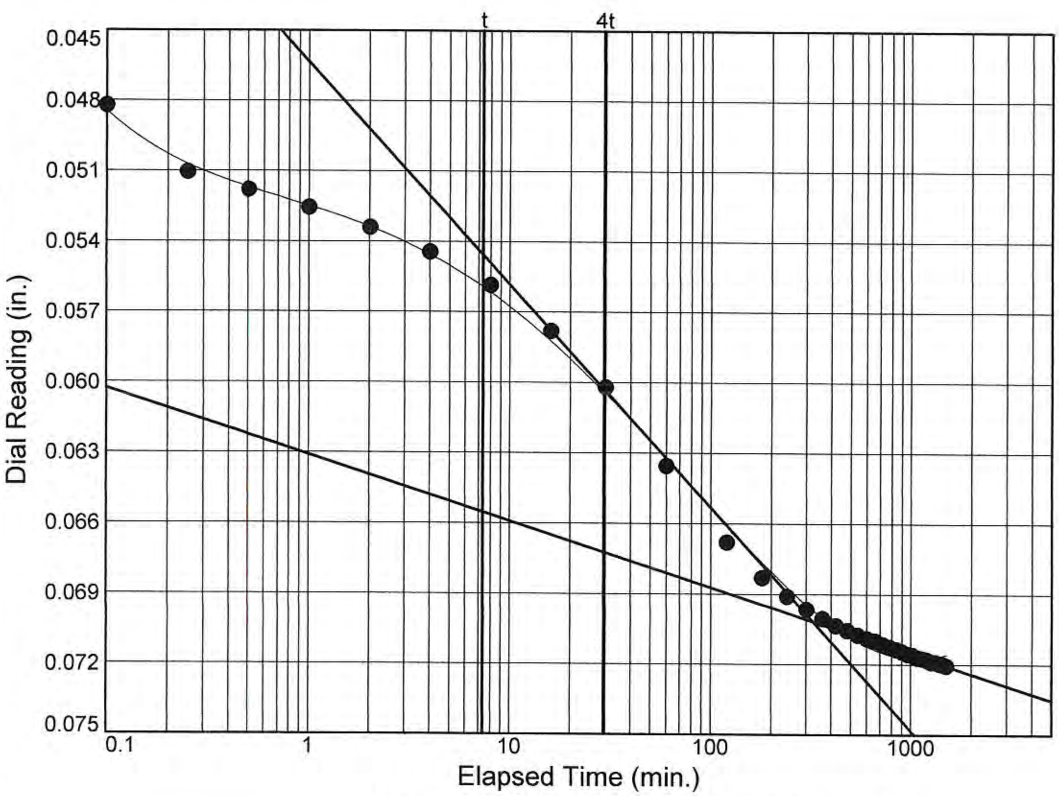
D_{50} = 0.0429

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.

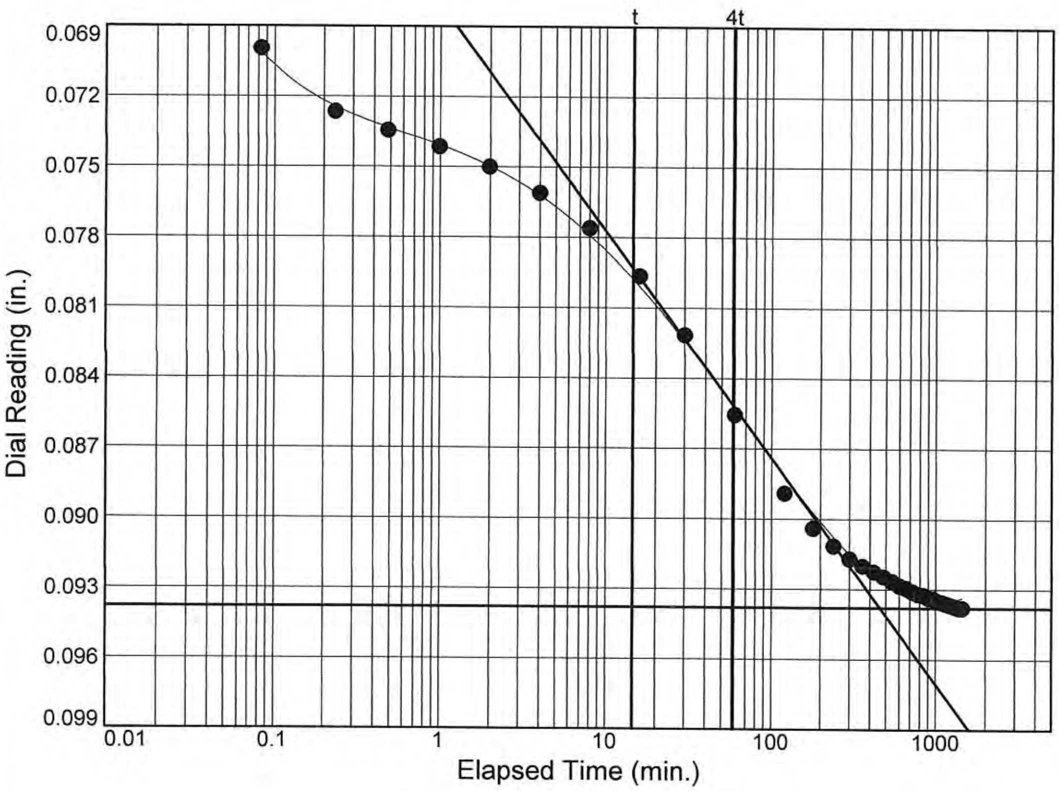
Figure

Attachment Figure B.2-165

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

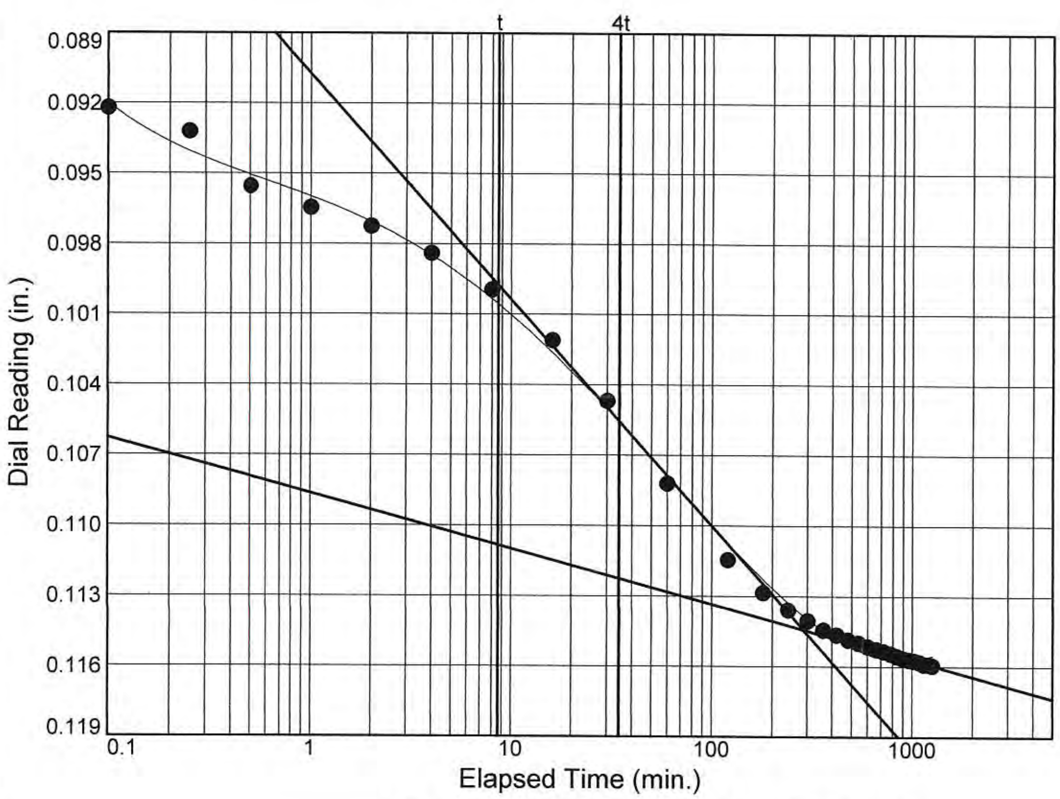
Source of Sample: SJGB027 Depth: 6



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

Figure

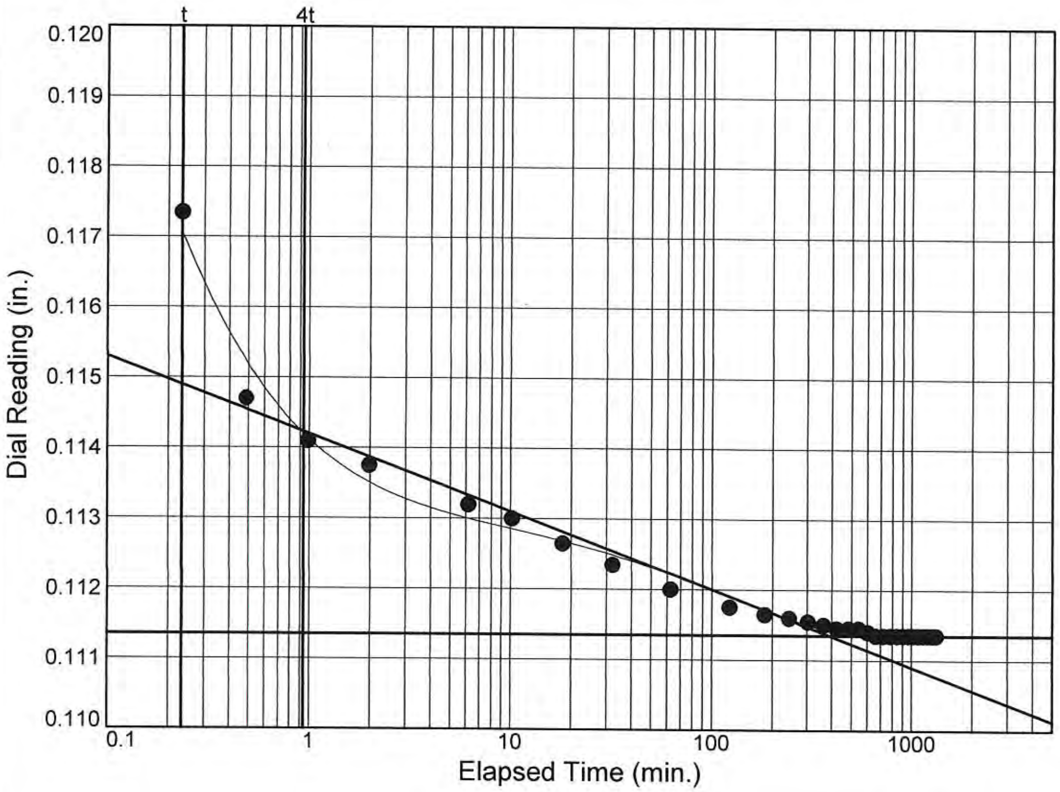
TOLUNAY-WONG ENGINEERS, INC.

Attachment Figure B.2-166

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

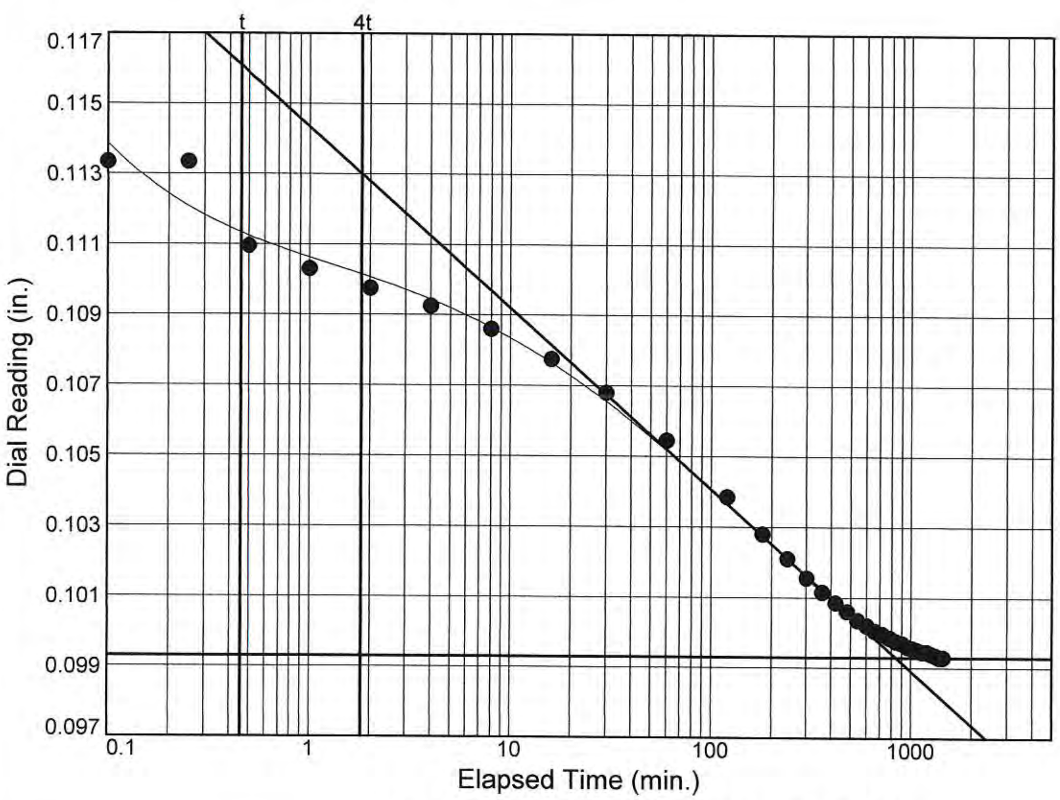
Source of Sample: SJGB027 Depth: 6



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

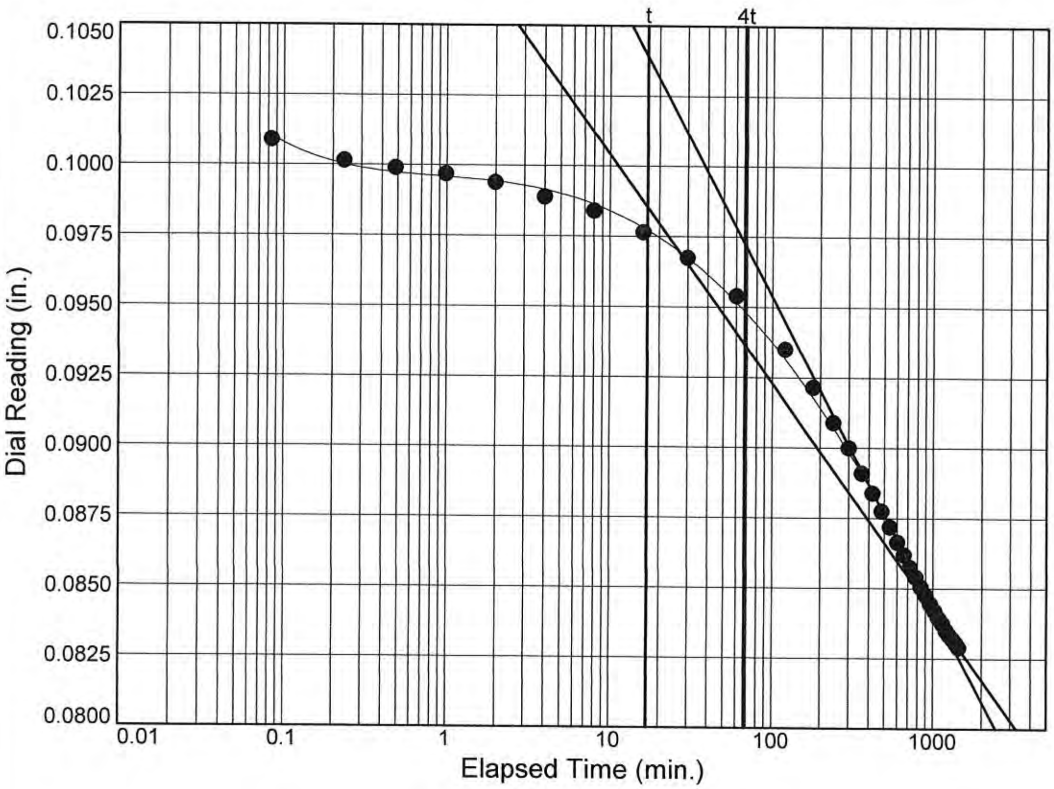
TOLUNAY-WONG ENGINEERS, INC.

Figure

Dial Reading vs. Time

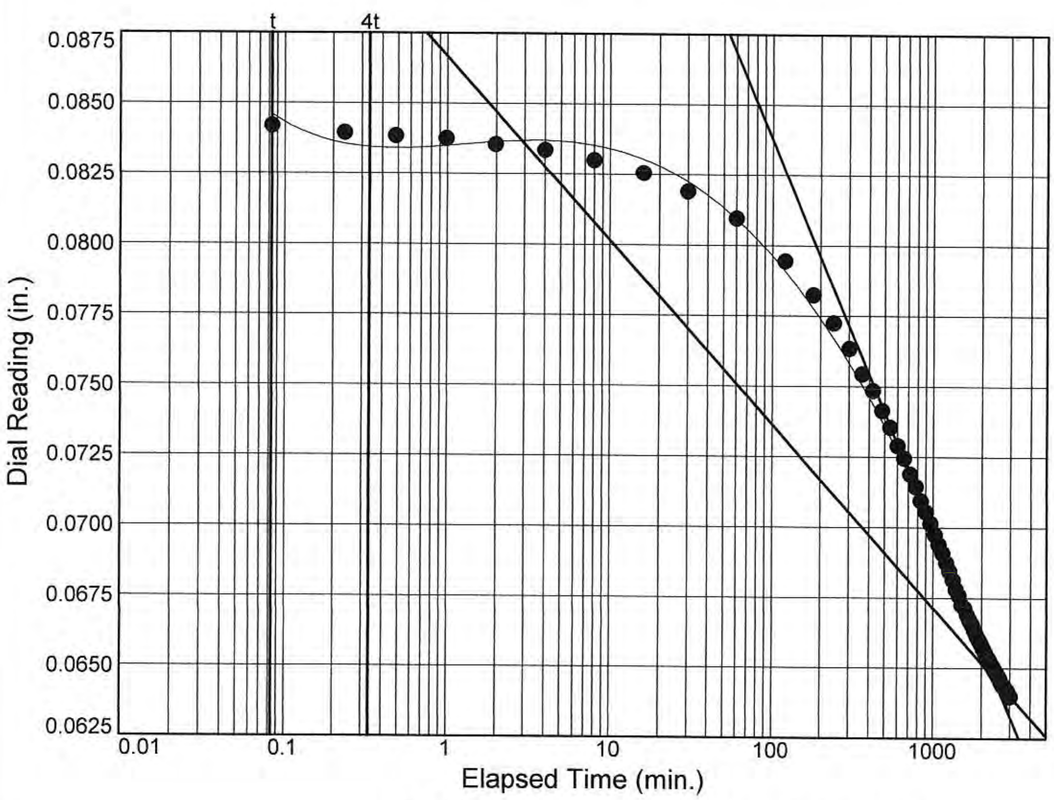
Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

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.



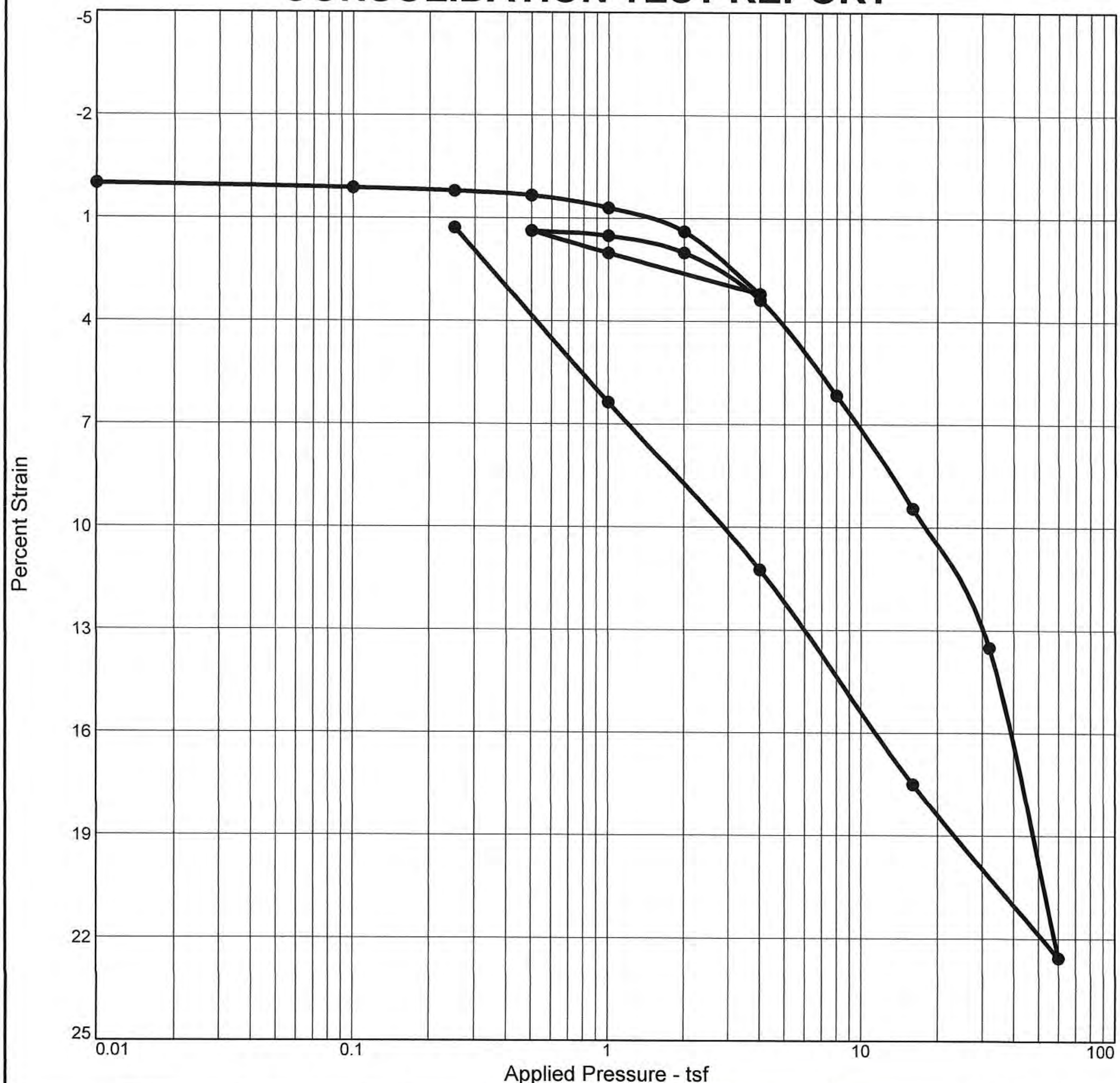
Load No.= 21
Load= 0.21 tsf
D_0 = 0.0858
D_{50} = 0.0752
D_{100} = 0.0647
T_{50} = 346.90 min.

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

Tolunay-Wong Engineers, Inc.

Houston, Texas

Remarks:

Test method: ASTM D2435

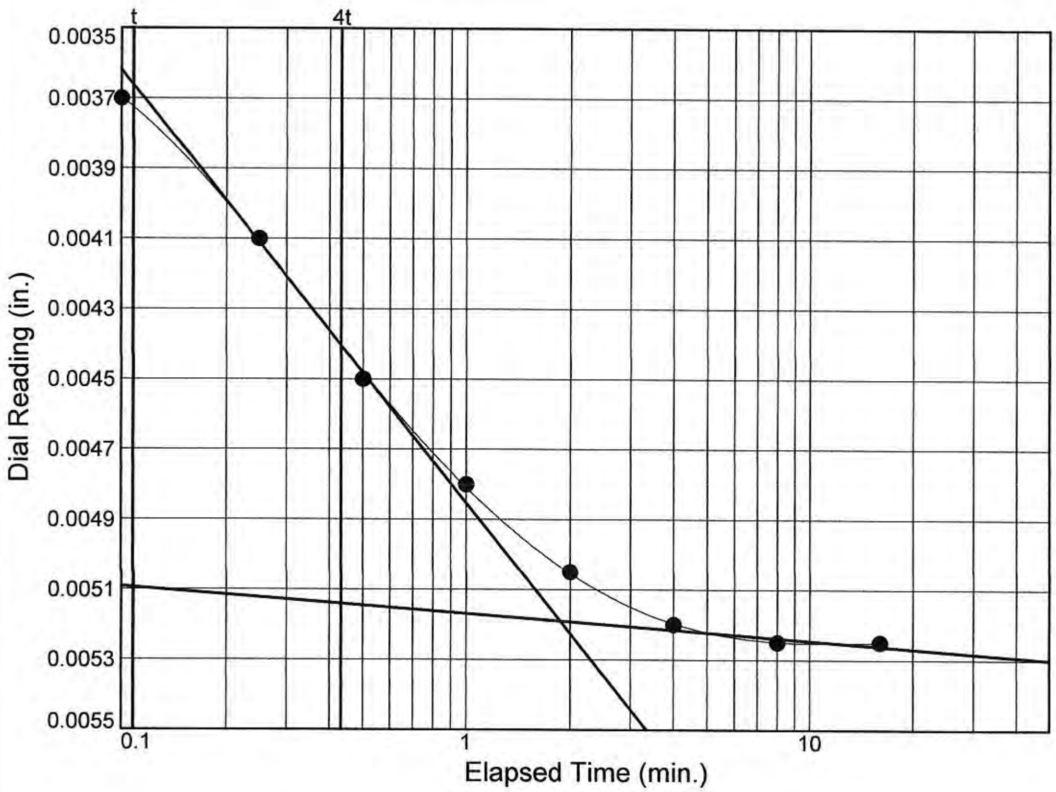
Specific gravity: Assumed

Figure

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

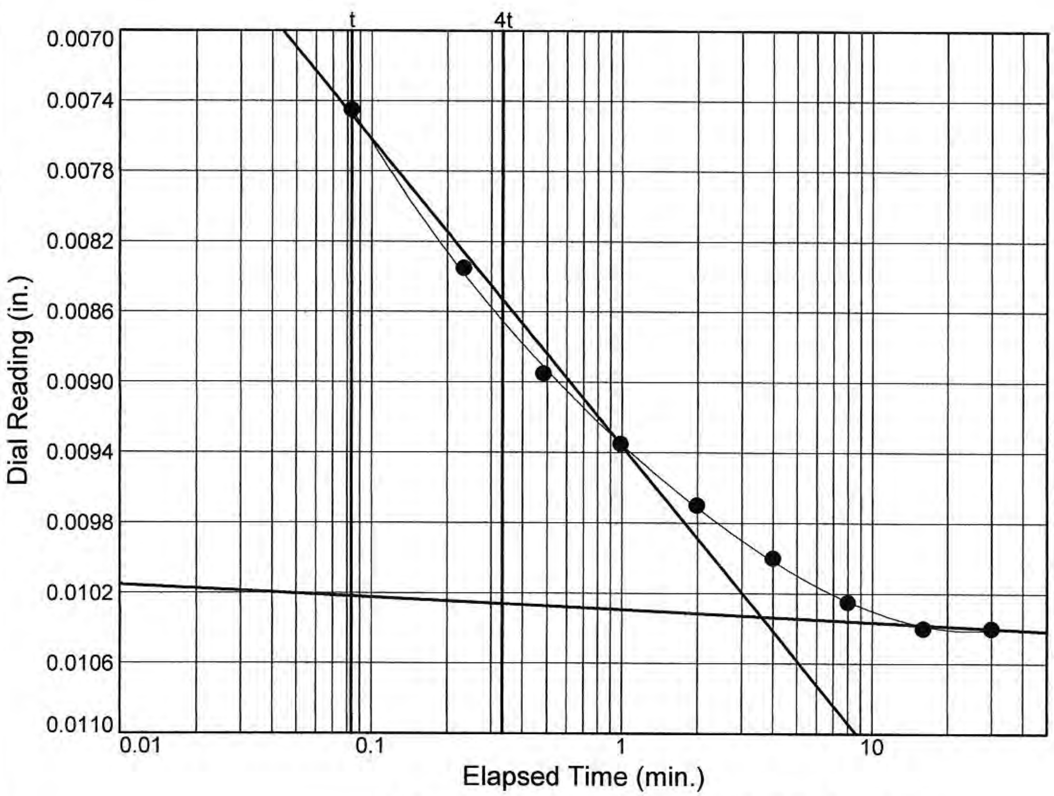
Source of Sample: SJGB027 Depth: 43



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

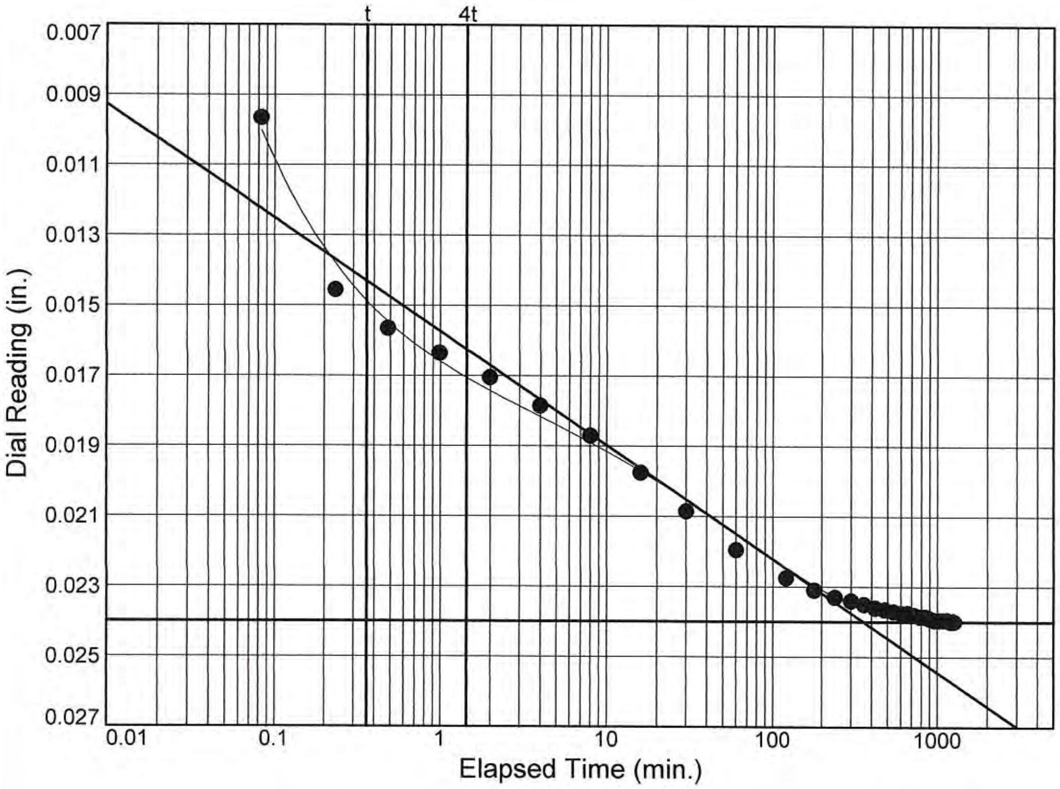
Figure

TOLUNAY-WONG ENGINEERS, INC.

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

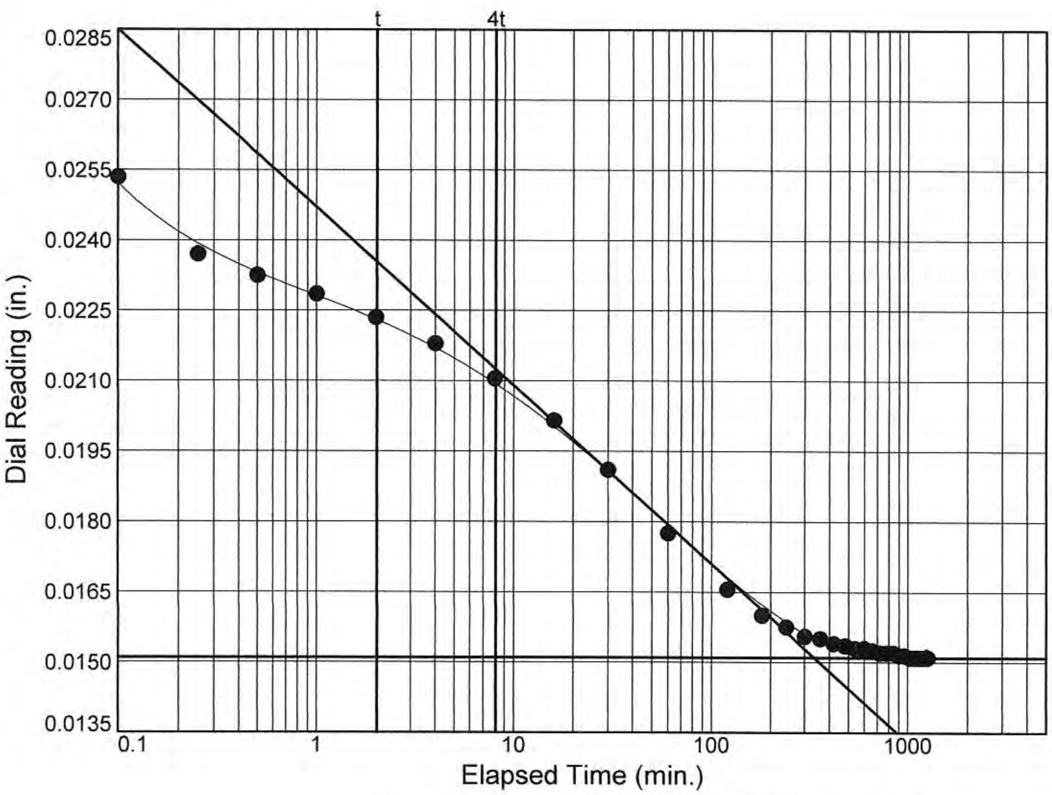
Source of Sample: SJGB027 Depth: 43



Load No.= 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

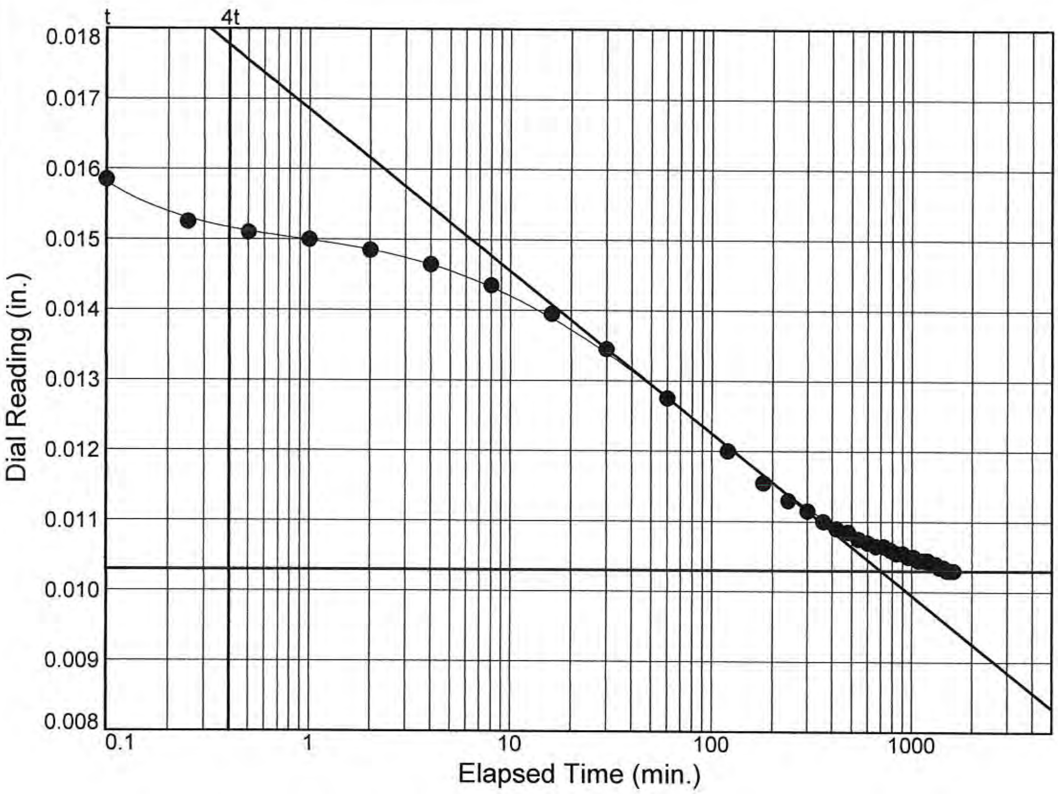
Figure

TOLUNAY-WONG ENGINEERS, INC.

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

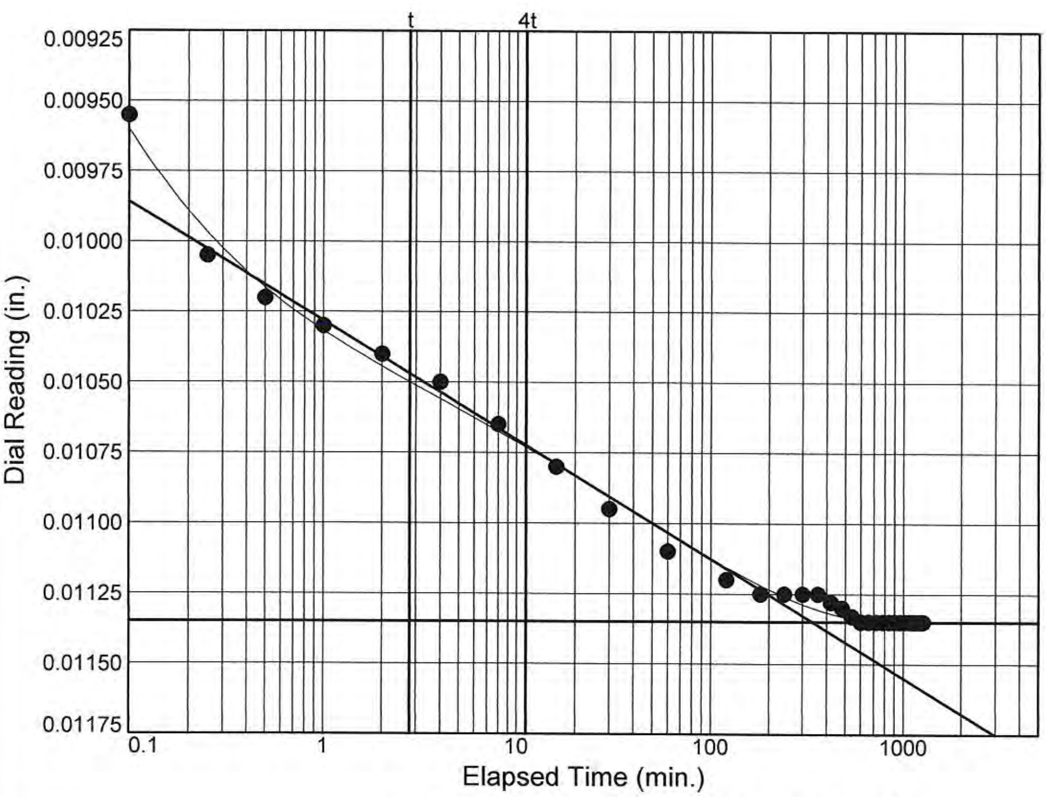
Source of Sample: SJGB027 Depth: 43



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

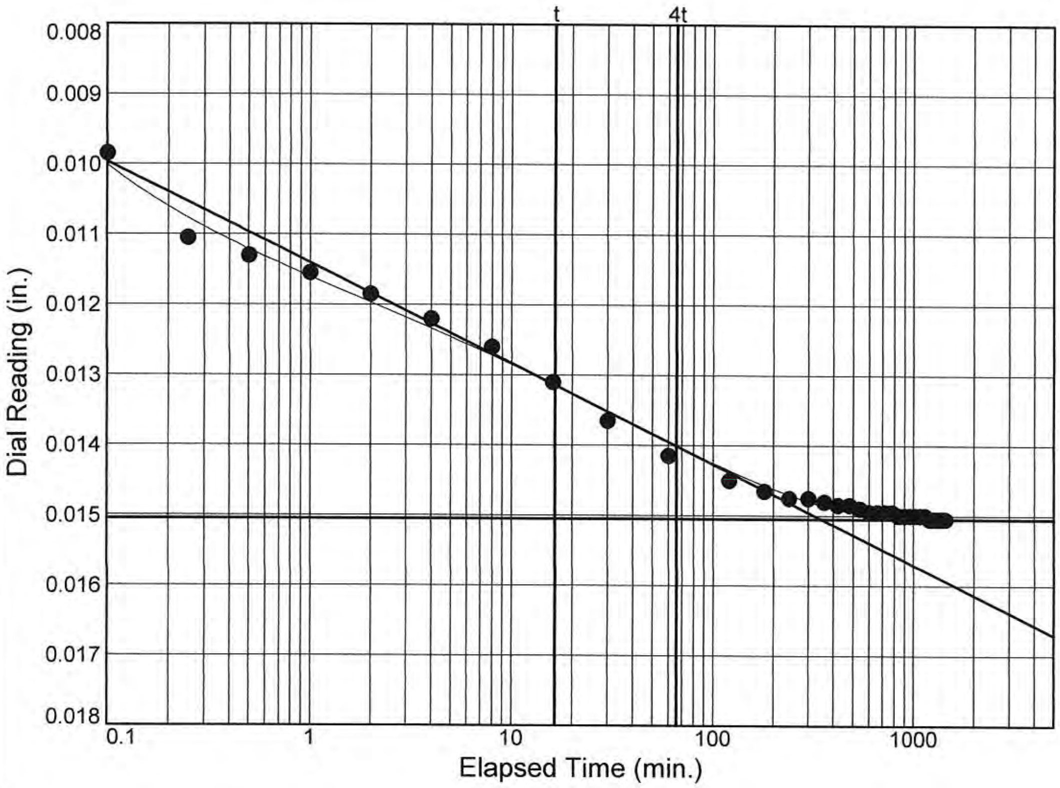
TOLUNAY-WONG ENGINEERS, INC.

Figure

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

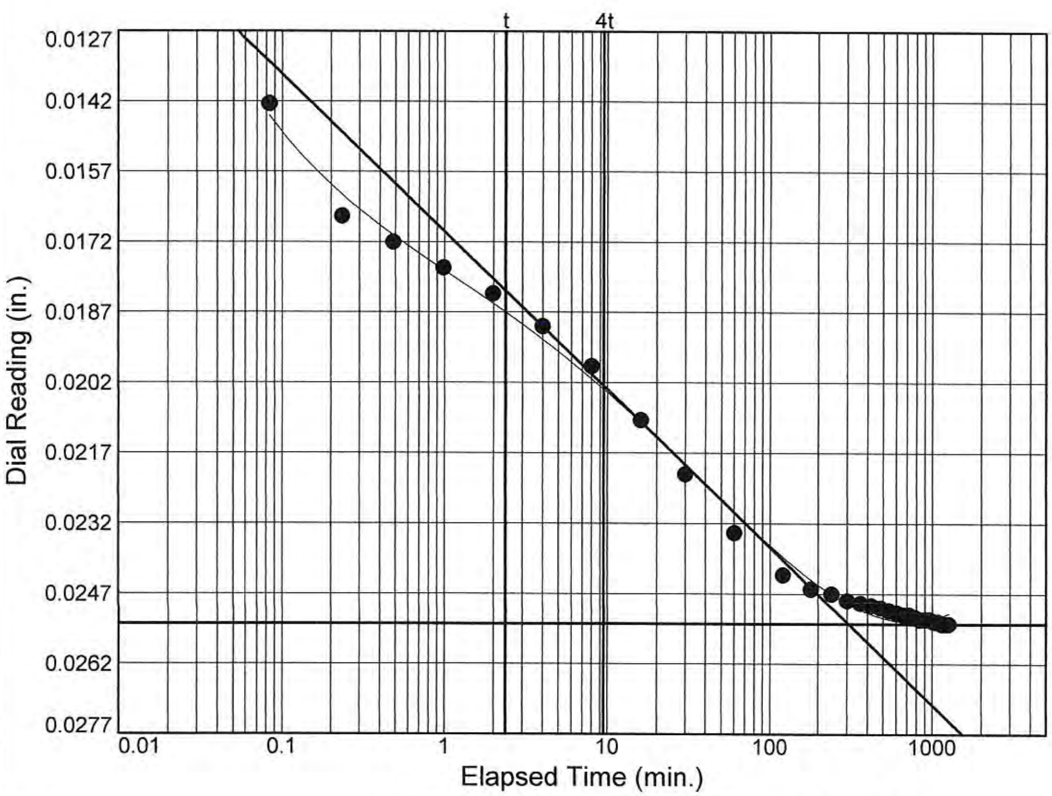
Source of Sample: SJGB027 Depth: 43



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

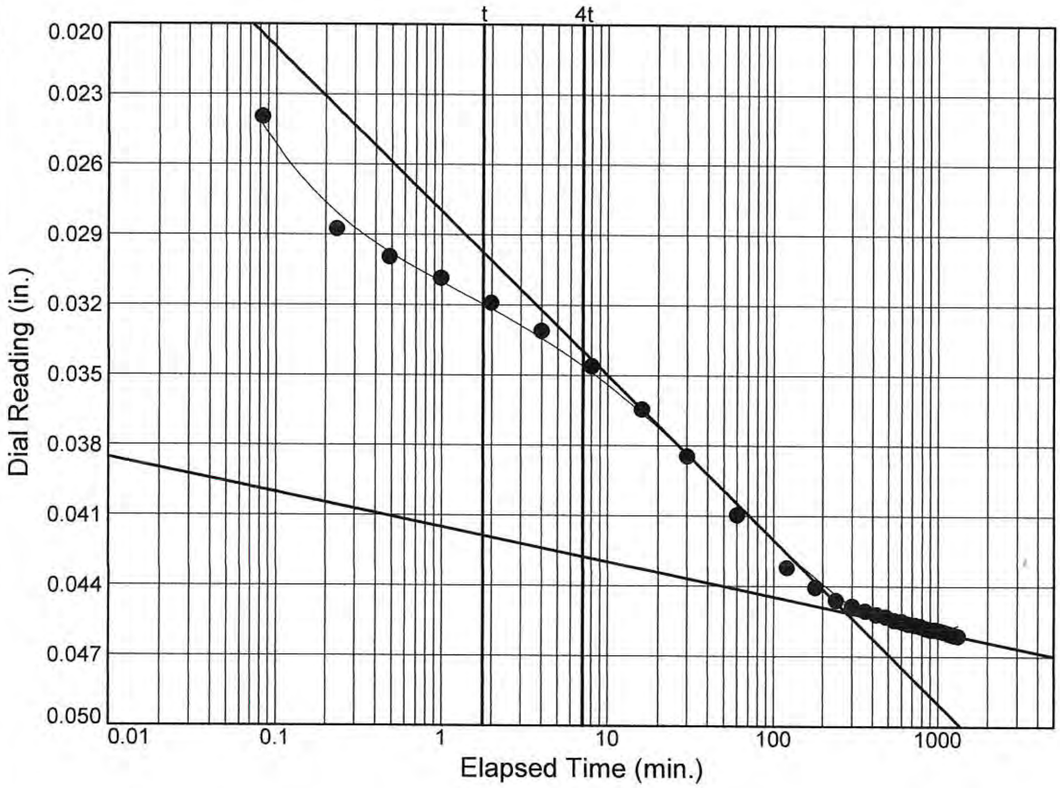
Figure

TOLUNAY-WONG ENGINEERS, INC.

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

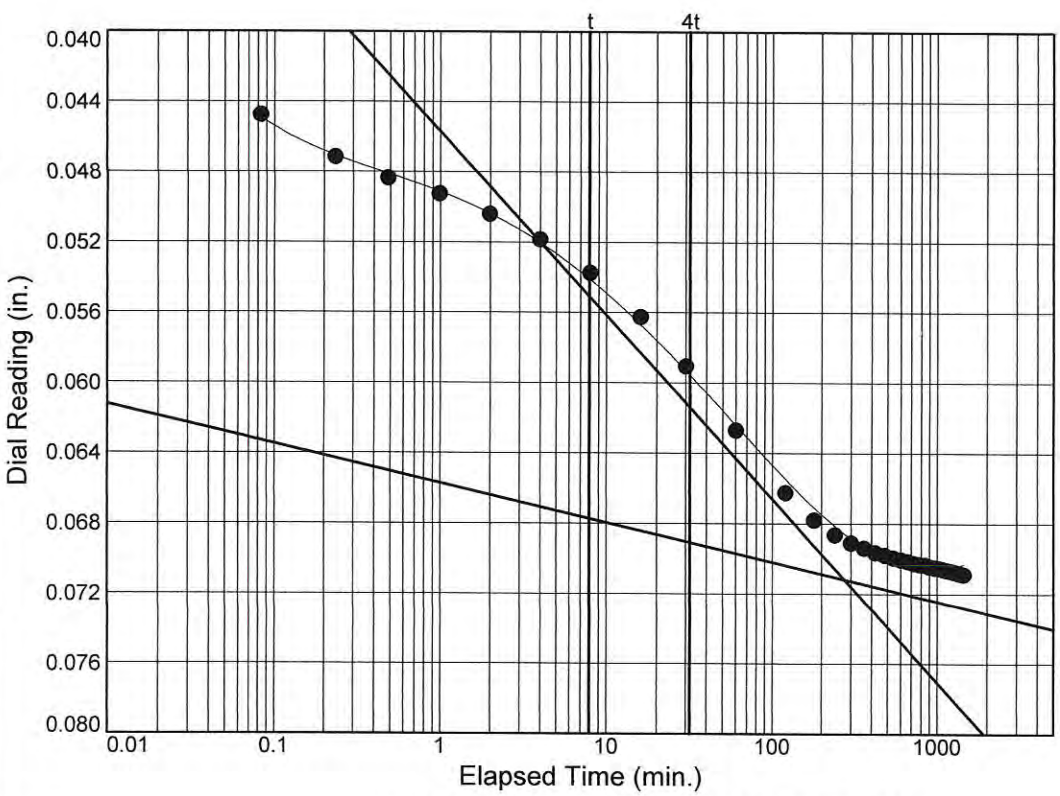
Source of Sample: SJGB027 Depth: 43



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.

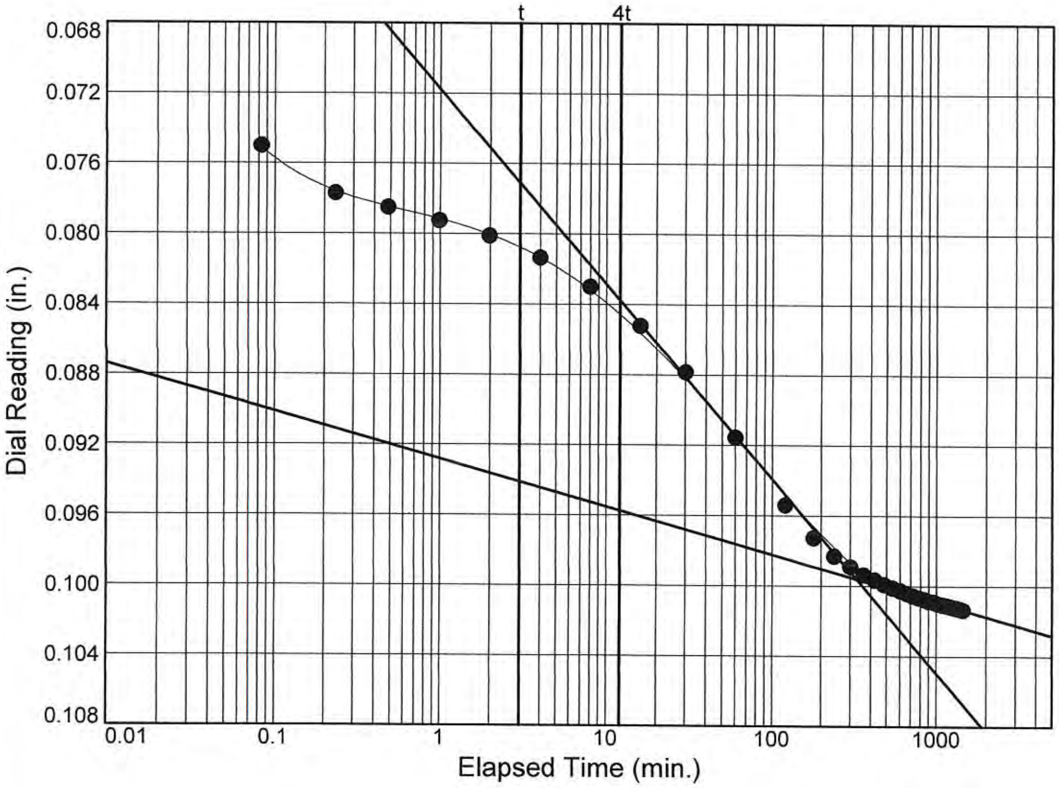
C_α = 0.006

Figure

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

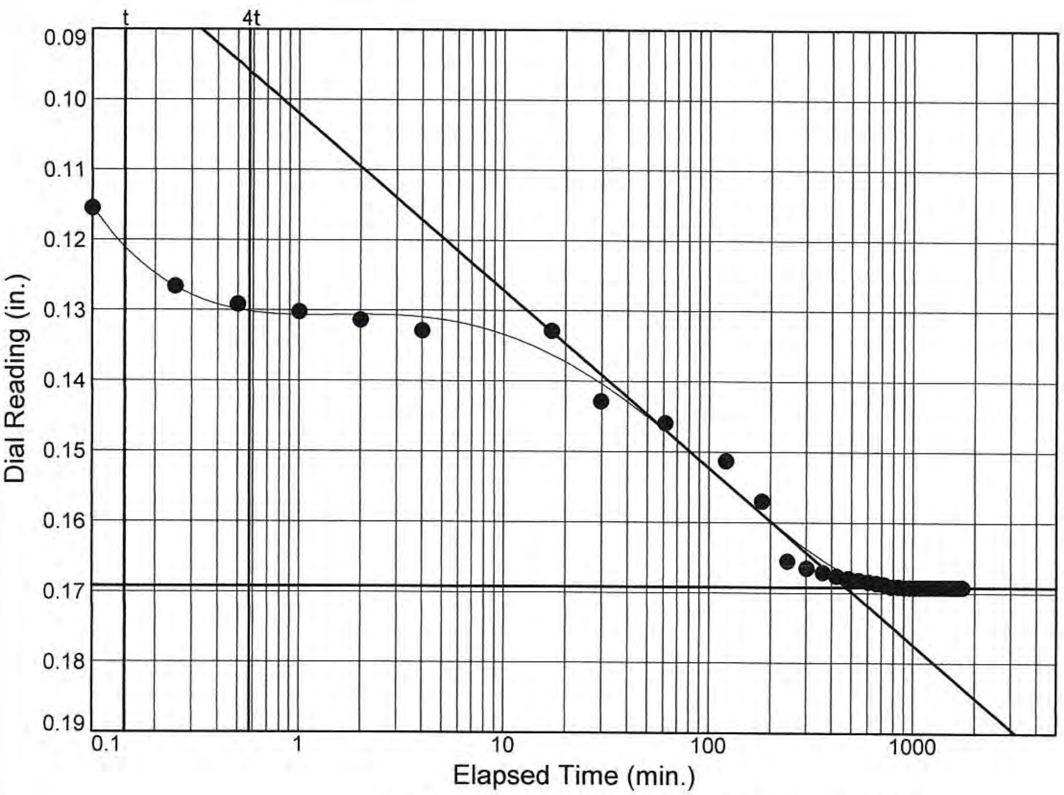
Source of Sample: SJGB027 Depth: 43



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.

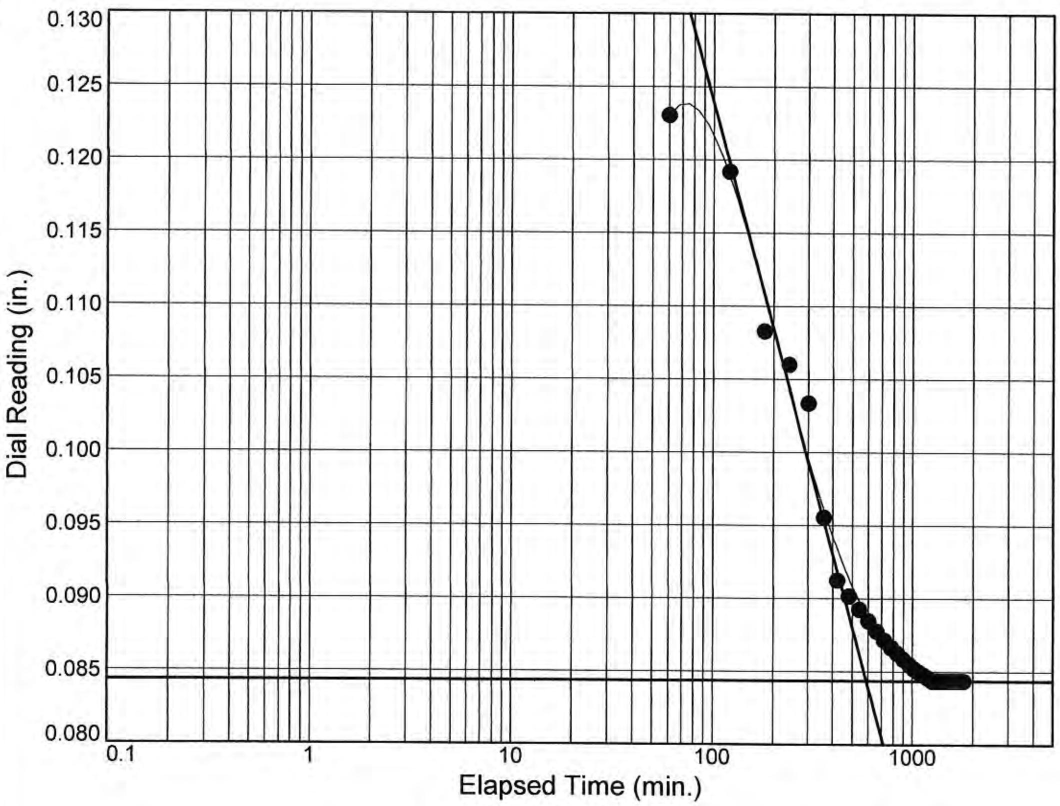
C_v @ T_{50}
2.2 ft.^{2}/yr.

C_α = 0.000

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB027 Depth: 43

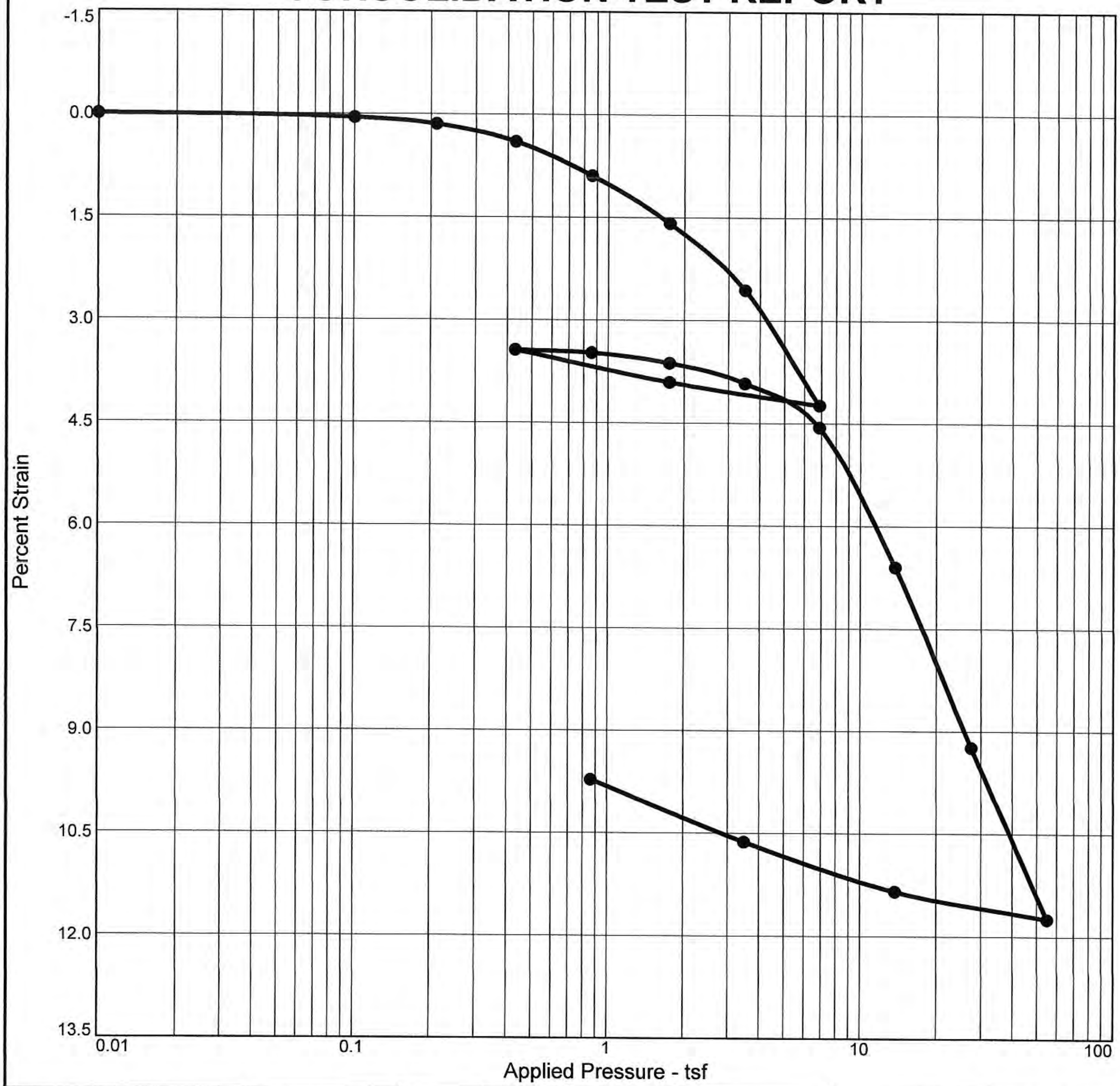


Load No.= 18
Load= 4.00 tsf
D_0 = 0.1313
D_{50} = 0.1078
D_{100} = 0.0844
T_{50} = 205.70 min.

C_v @ T_{50}
0.4 ft.^{2}/yr.

C_α = 0.000

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

Tolunay-Wong Engineers, Inc.

Houston, Texas

Remarks:

Test method: ASTM D2435

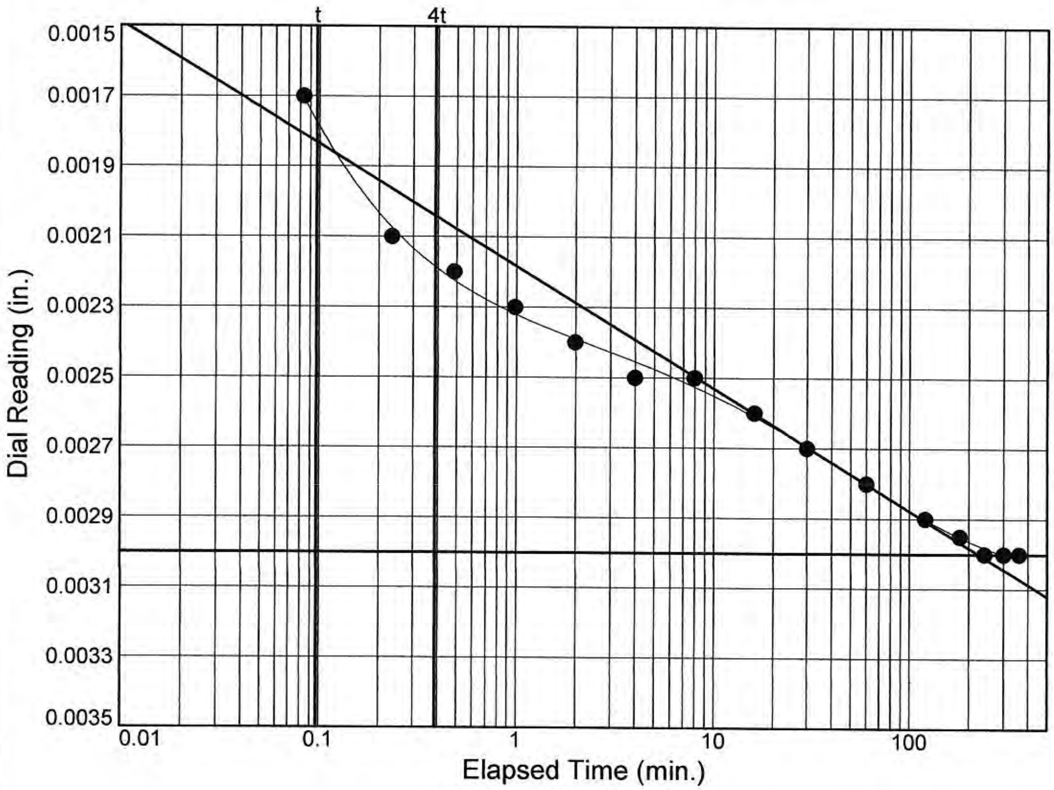
Specific gravity: Assumed

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

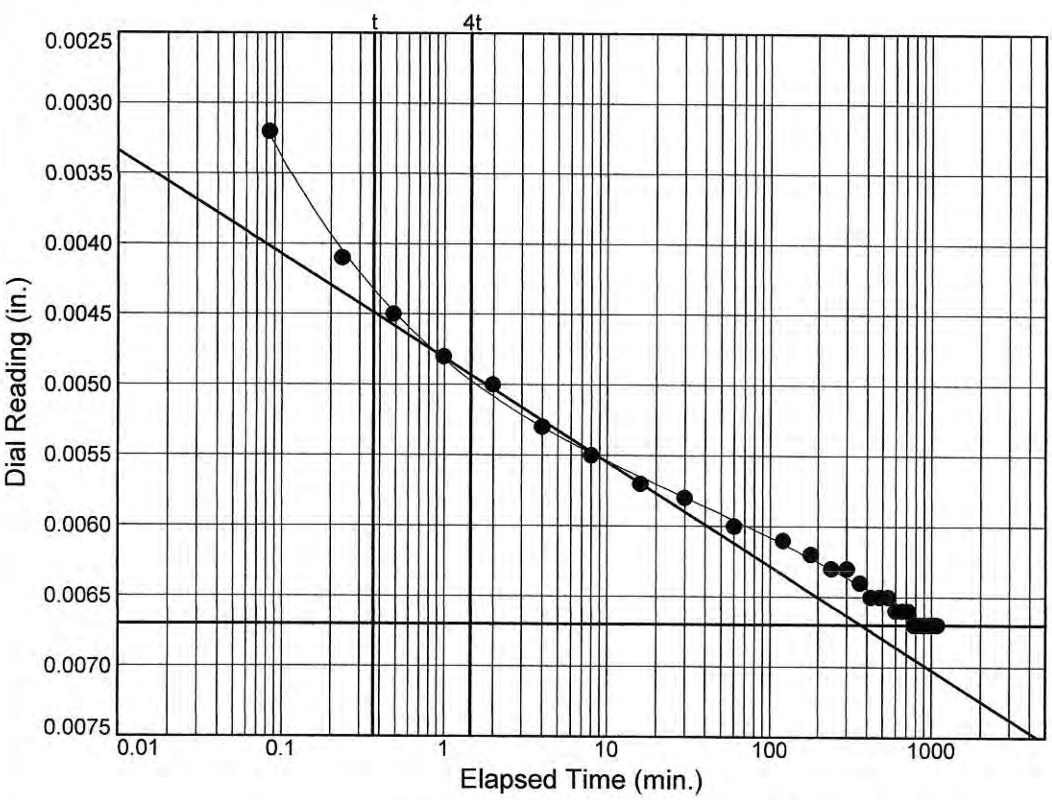
D_{100} = 0.0030

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

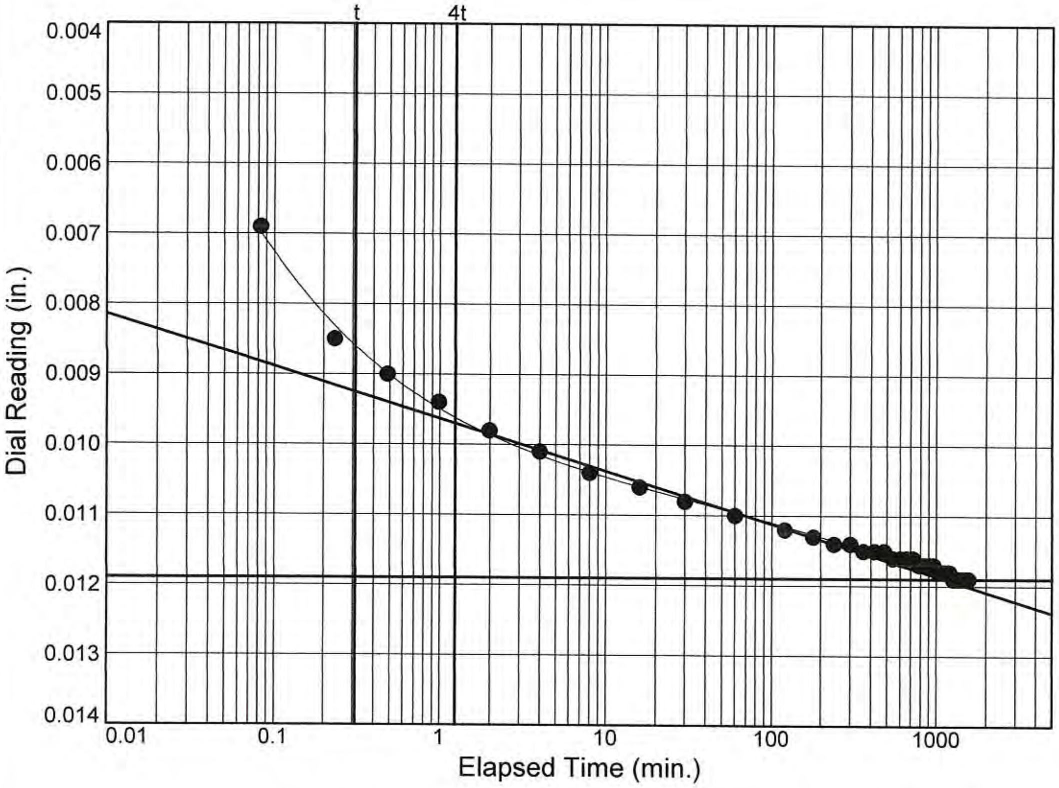
TOLUNAY-WONG ENGINEERS, INC.

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.= 6

Load= 1.75 tsf

D_0 = 0.0076

D_{50} = 0.0097

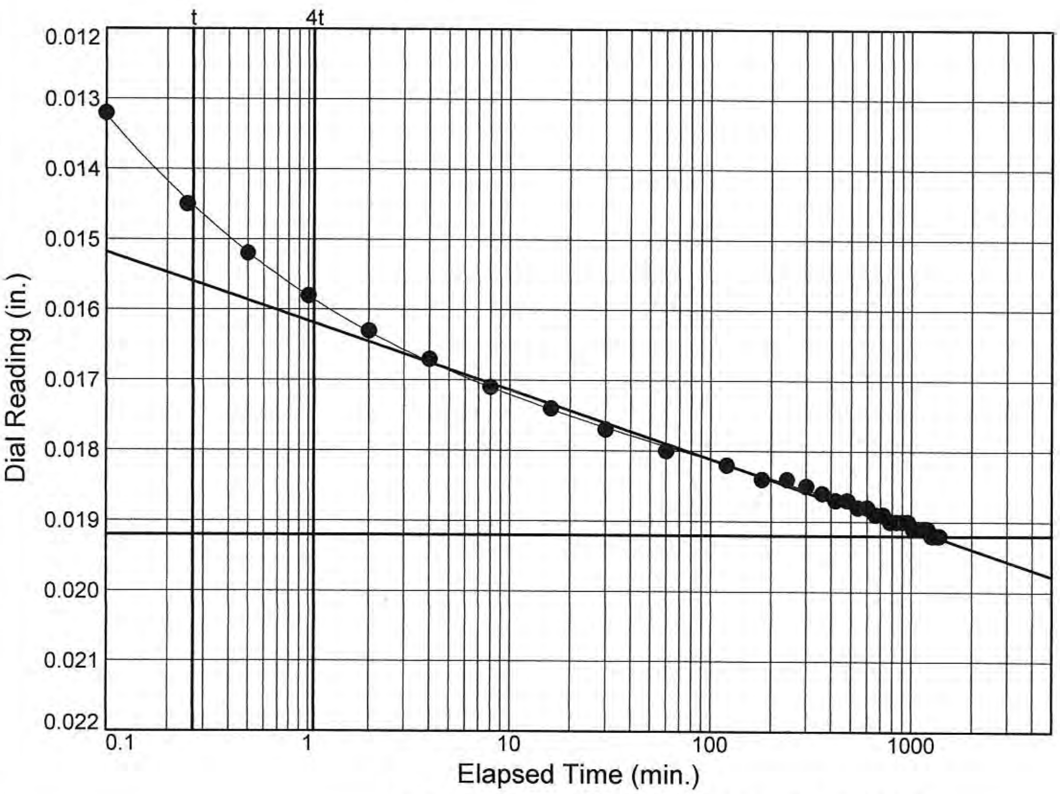
D_{100} = 0.0119

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.

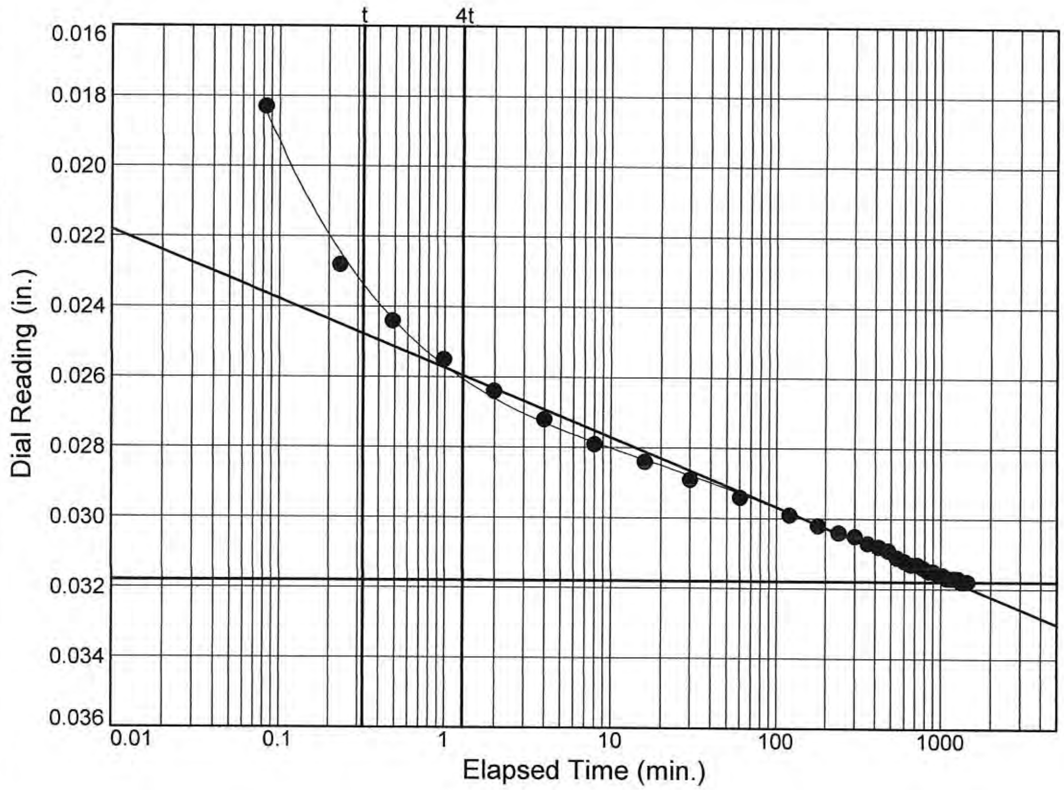
Figure

Attachment Figure B.2-179

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

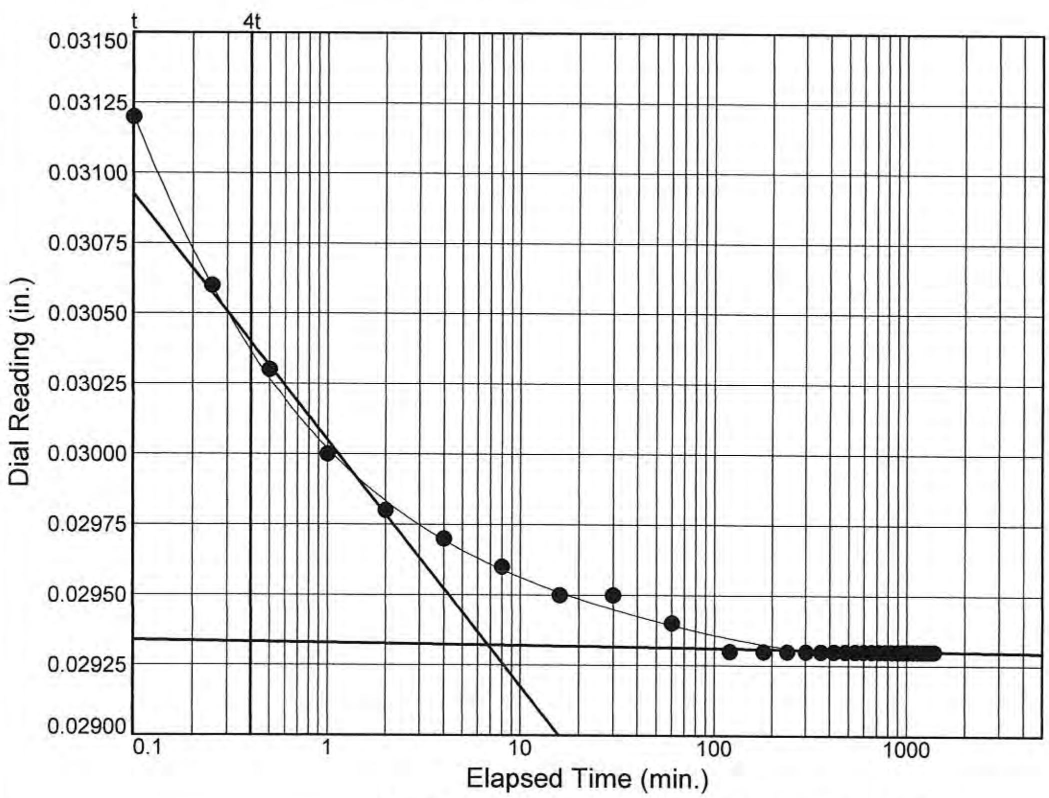
Source of Sample: SJGB028 Depth: 58



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.

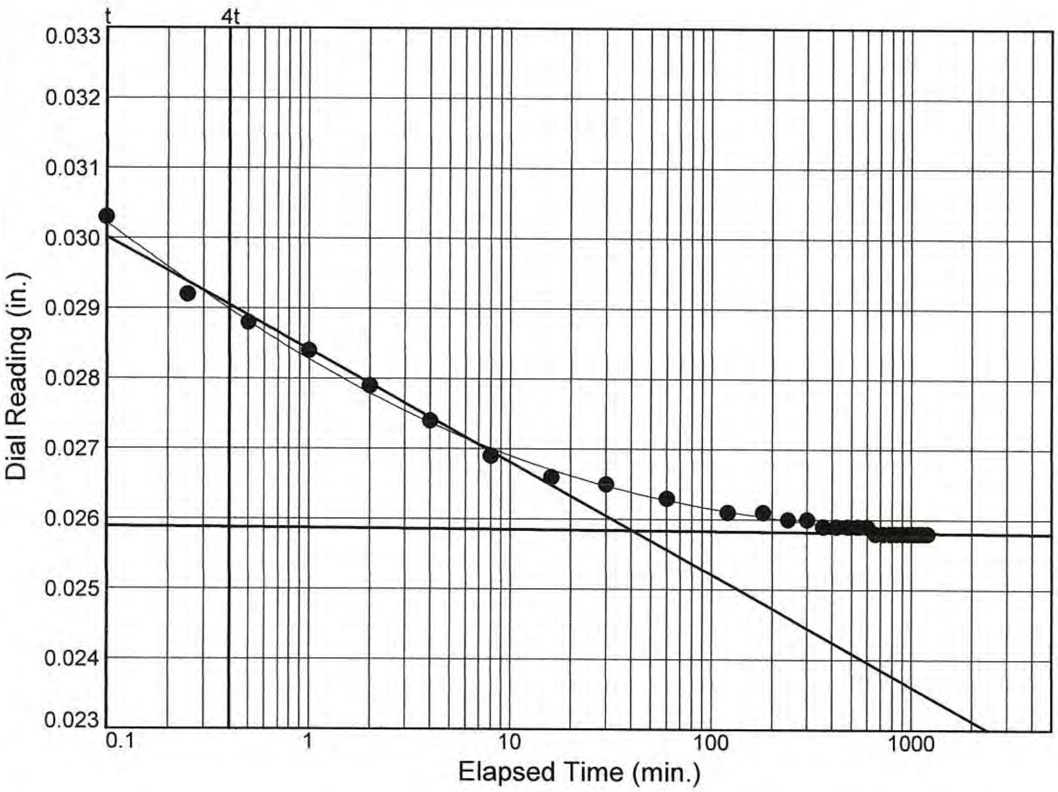
TOLUNAY-WONG ENGINEERS, INC.

Figure

Dial Reading vs. Time

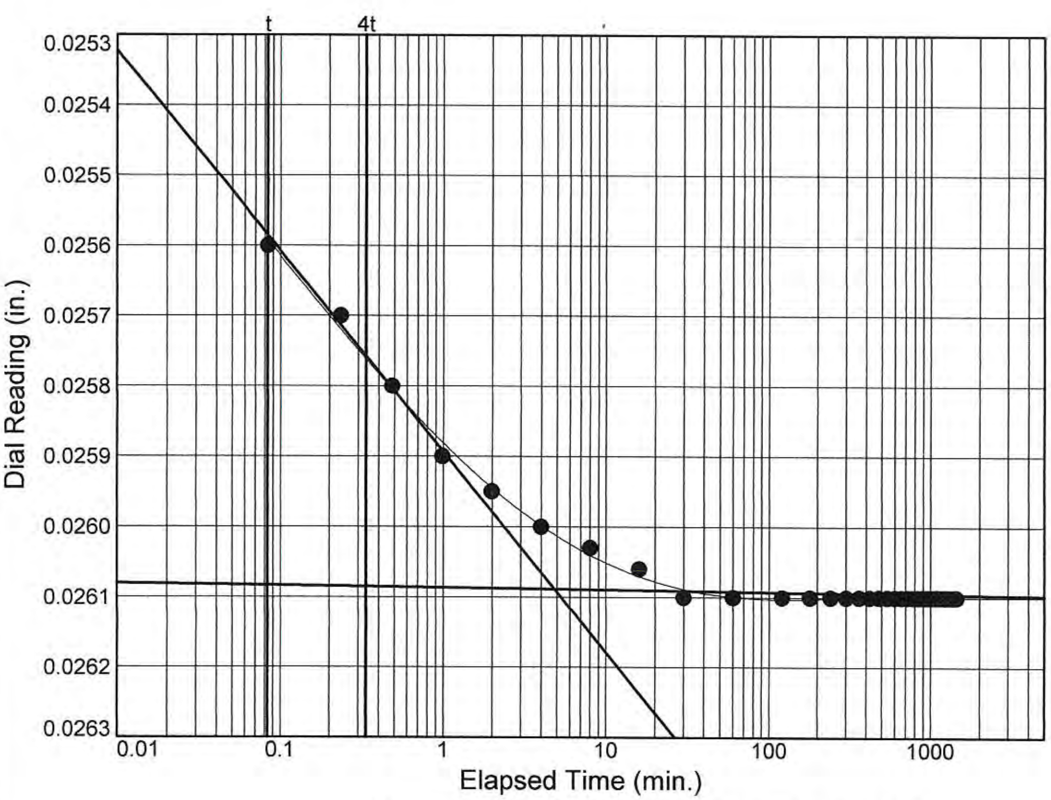
Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

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.

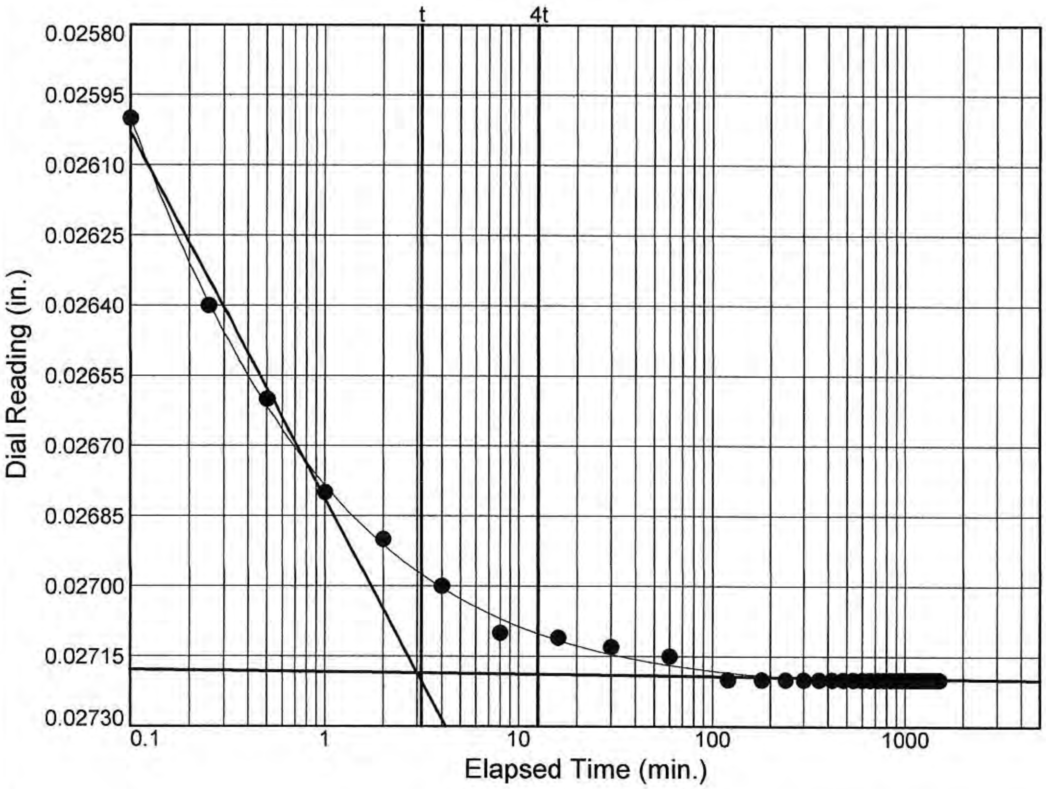
Figure

Attachment Figure B.2-181

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

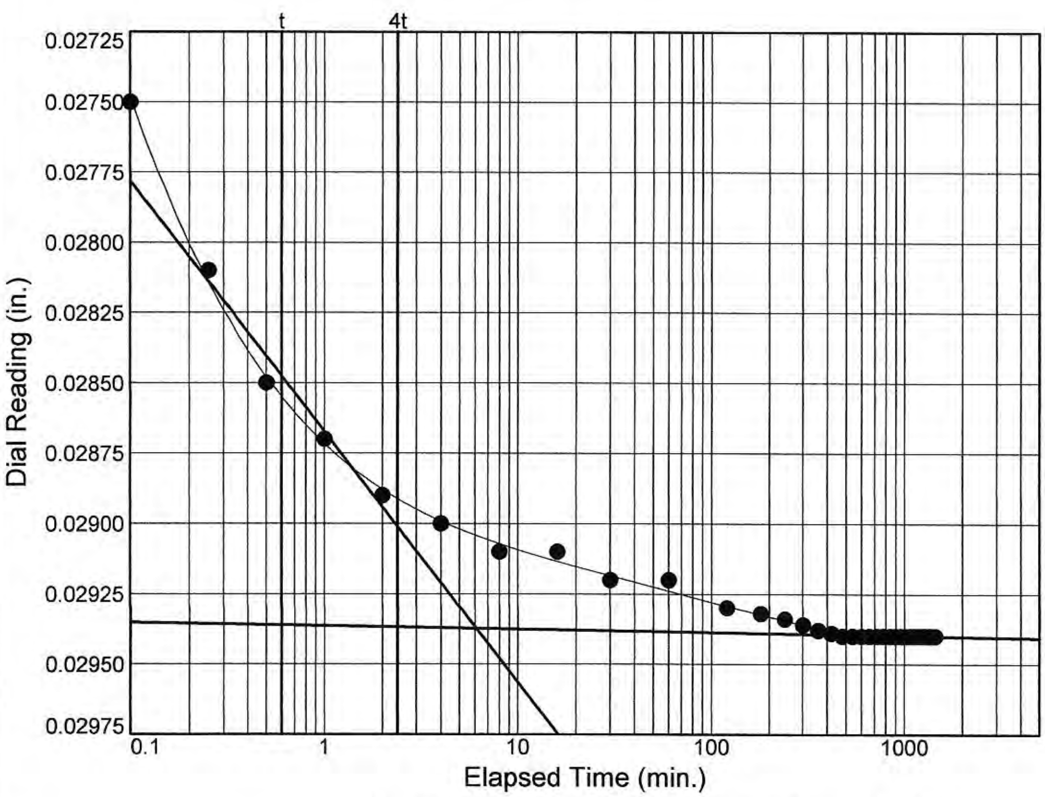
Source of Sample: SJGB028 Depth: 58



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

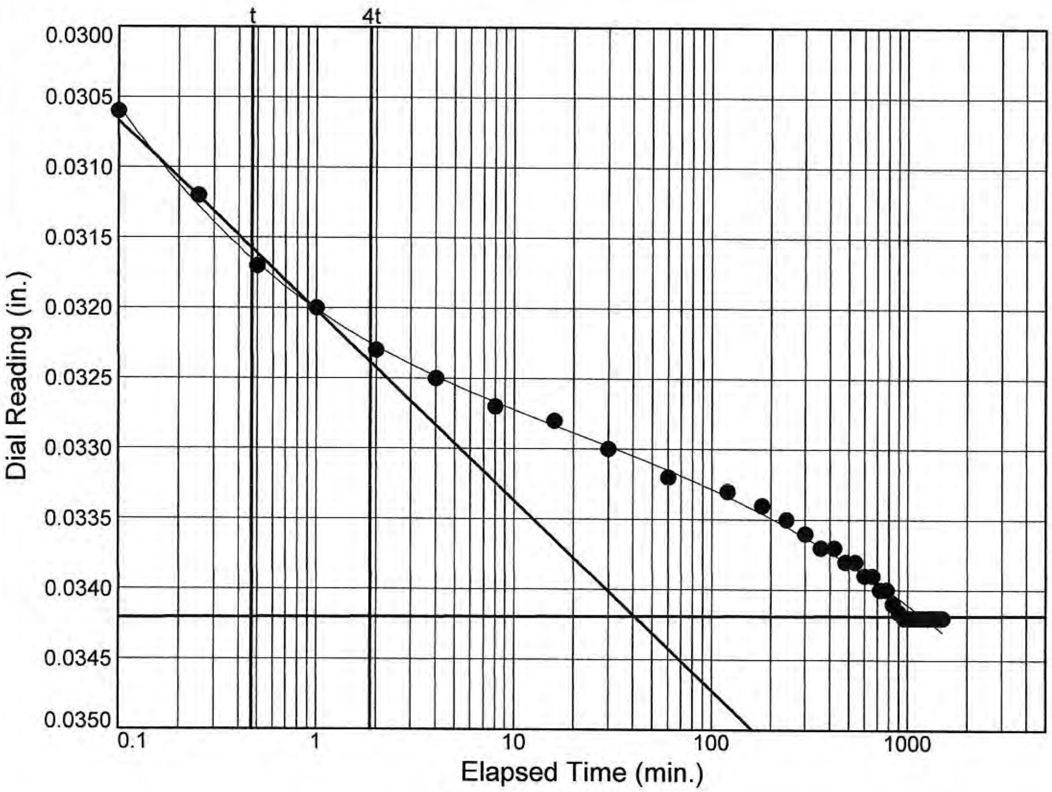
Figure

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.= 14

Load= 6.87 tsf

D_0 = 0.0310

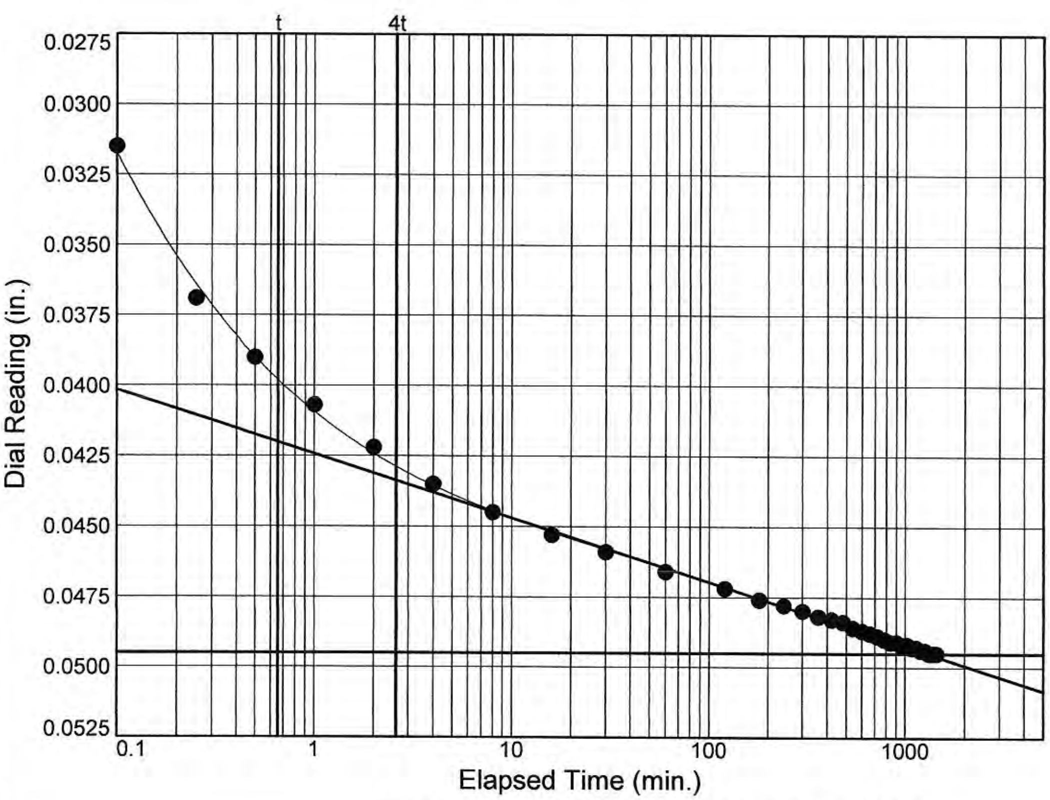
D_{50} = 0.0326

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.

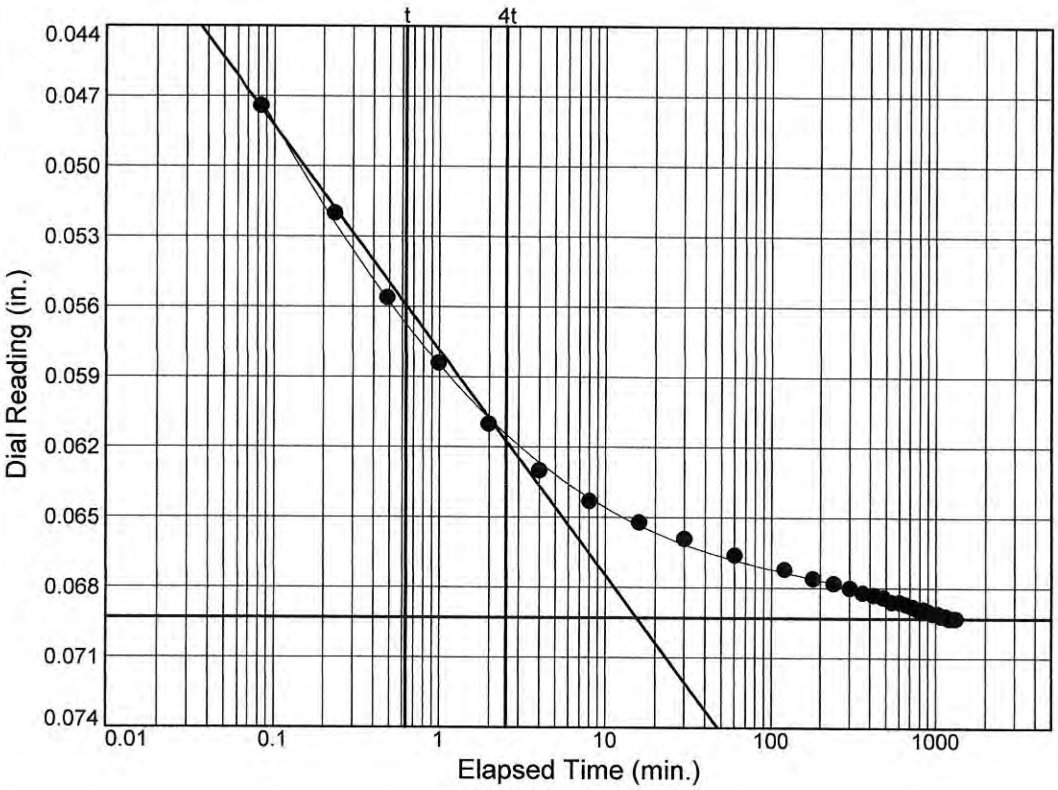
Figure

Attachment Figure B.2-183

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

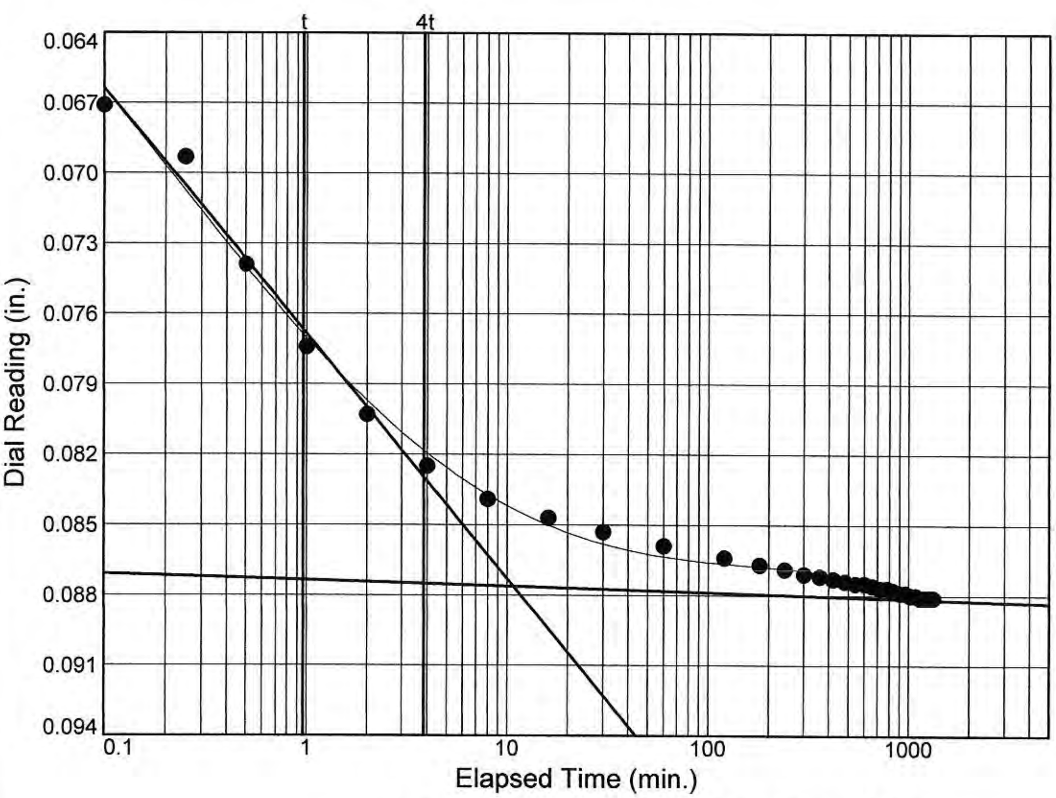
Source of Sample: SJGB028 Depth: 58



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

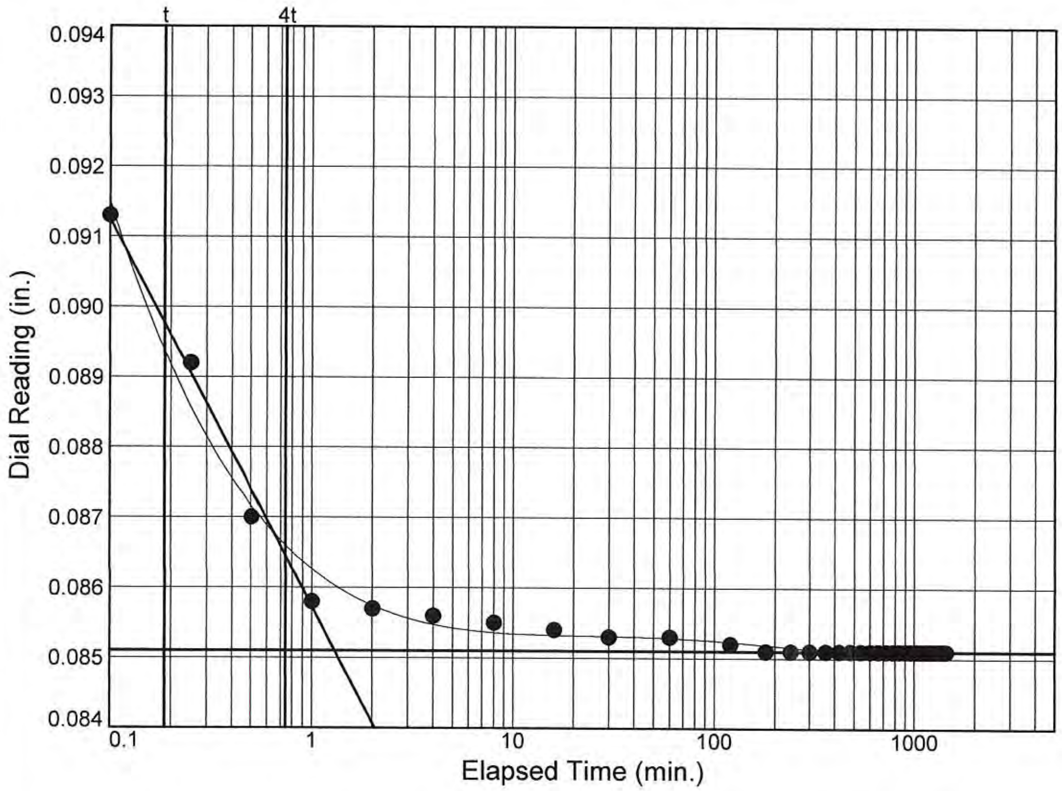
TOLUNAY-WONG ENGINEERS, INC.

Figure

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

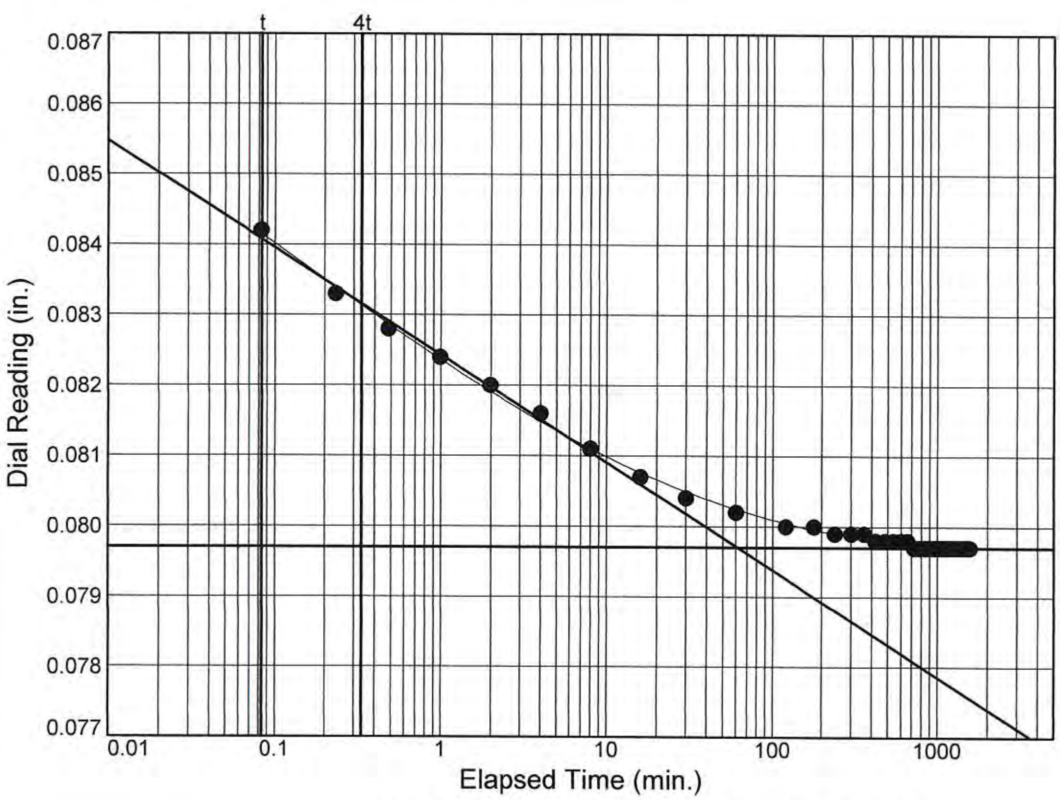
Source of Sample: SJGB028 Depth: 58



Load No.= 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

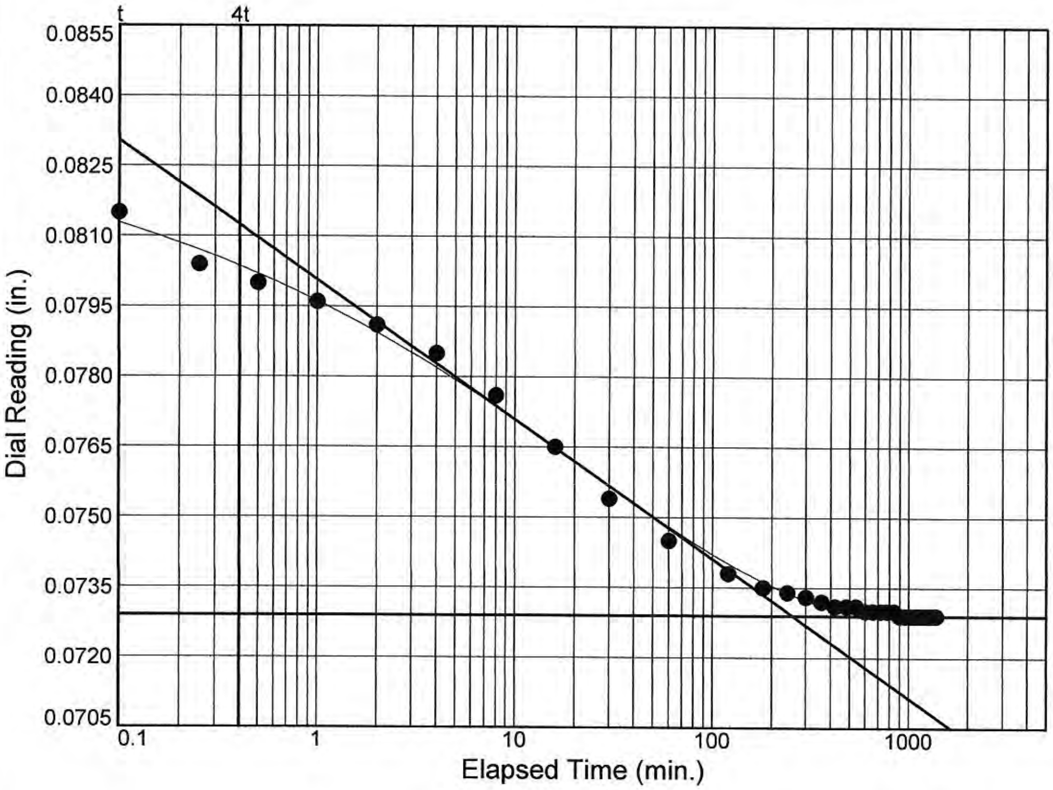
Figure

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.= 20

Load= 0.86 tsf

D_0 = 0.0822

D_{50} = 0.0776

D_{100} = 0.0729

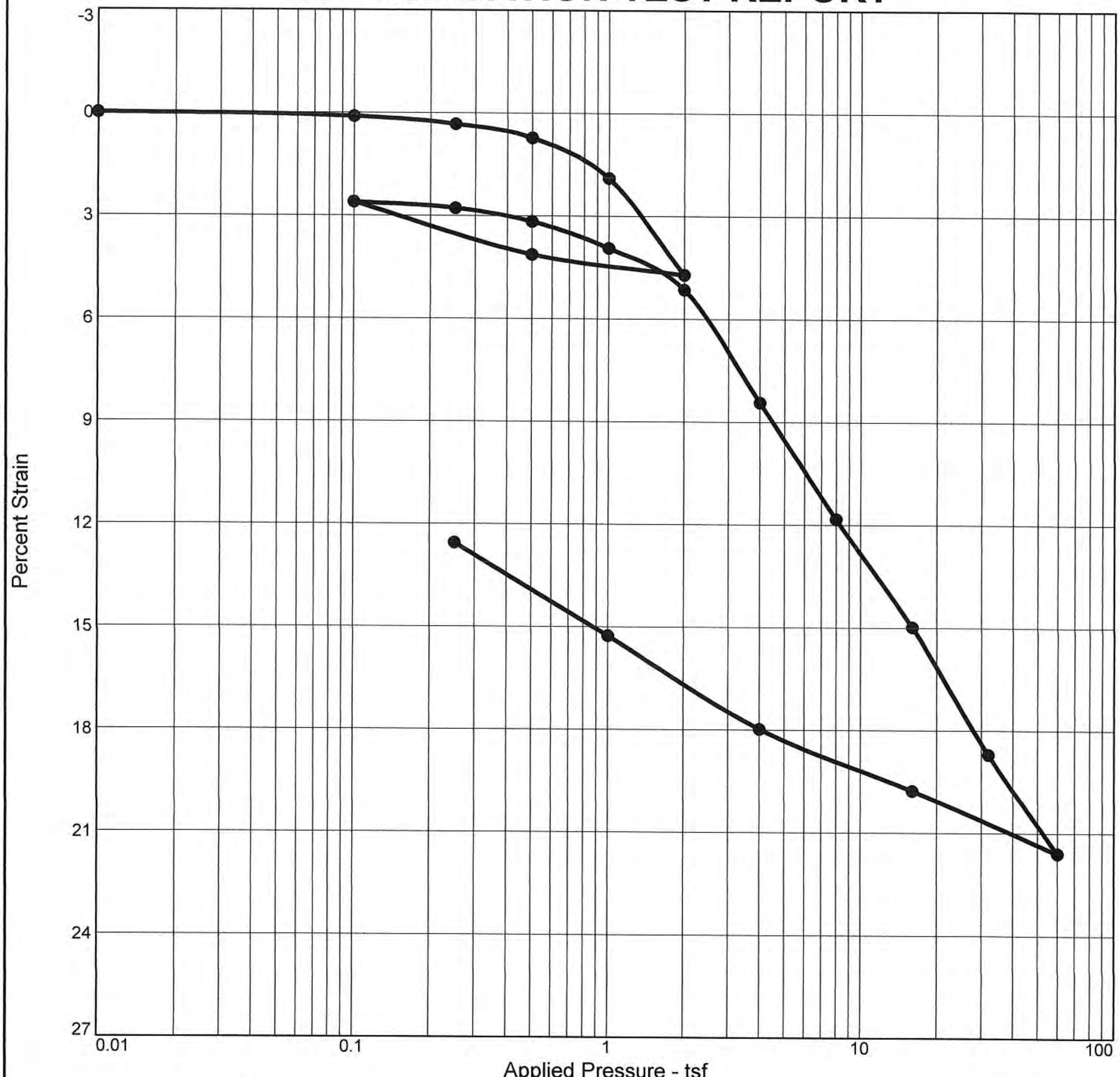
T_{50} = 6.81 min.

C_v @ T_{50}

12.0 $ft.^2/yr.$

C_α = 0.000

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

Tolunay-Wong Engineers, Inc.

Houston, Texas

Remarks:

Test method: ASTM D2435

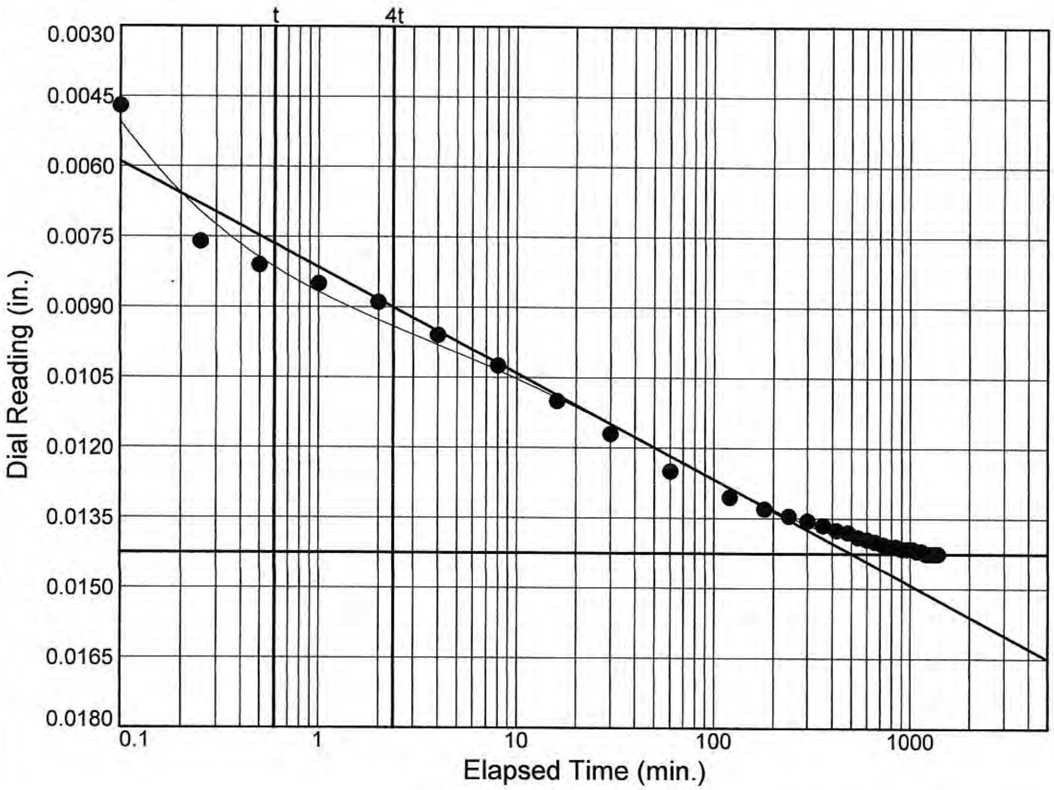
Specific gravity: Assumed

Figure

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

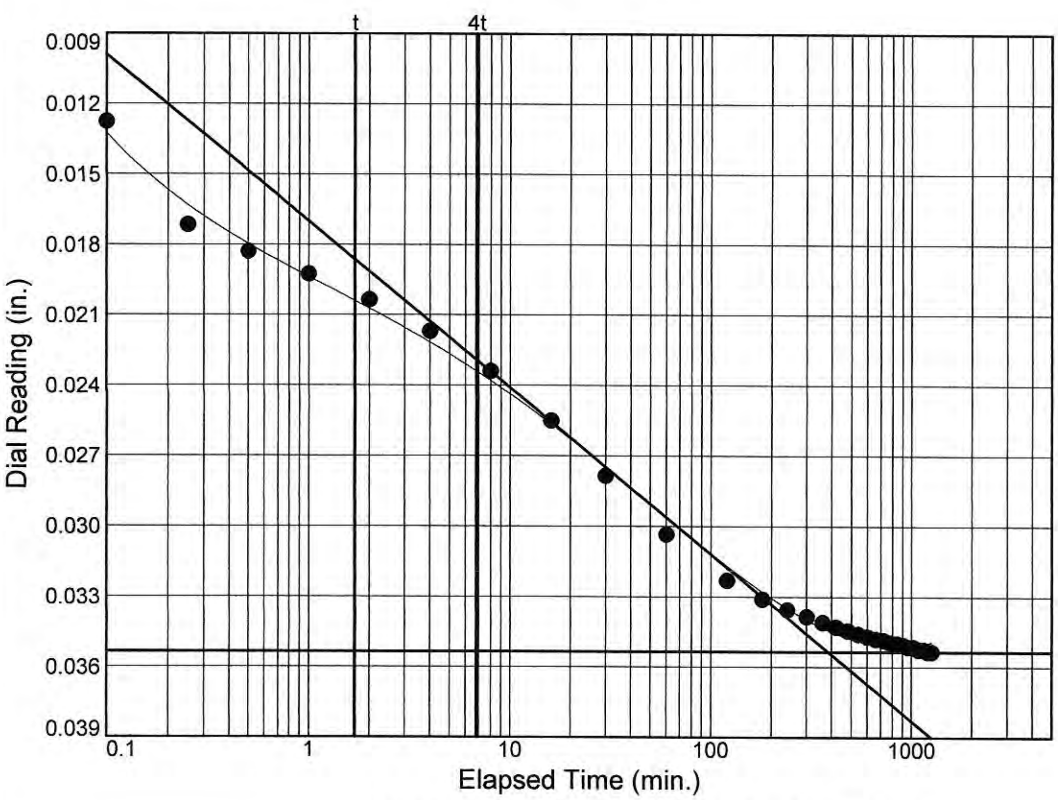
Source of Sample: SJGB029 Depth: 14



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

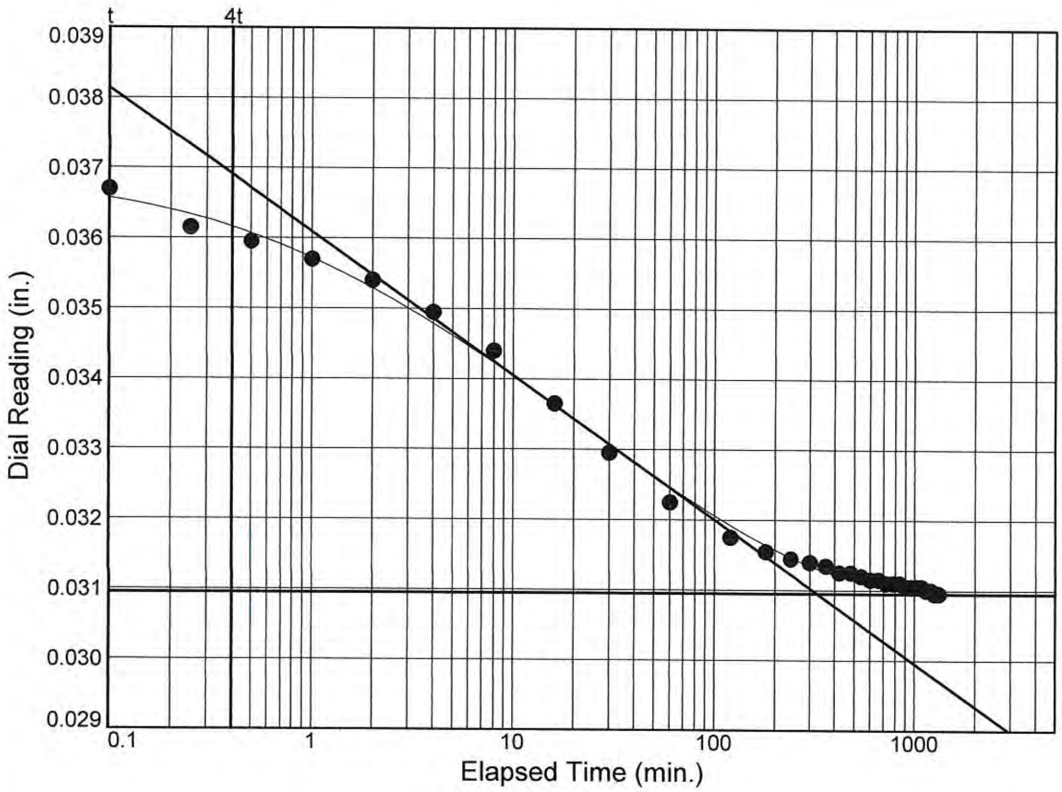
Figure

TOLUNAY-WONG ENGINEERS, INC.

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

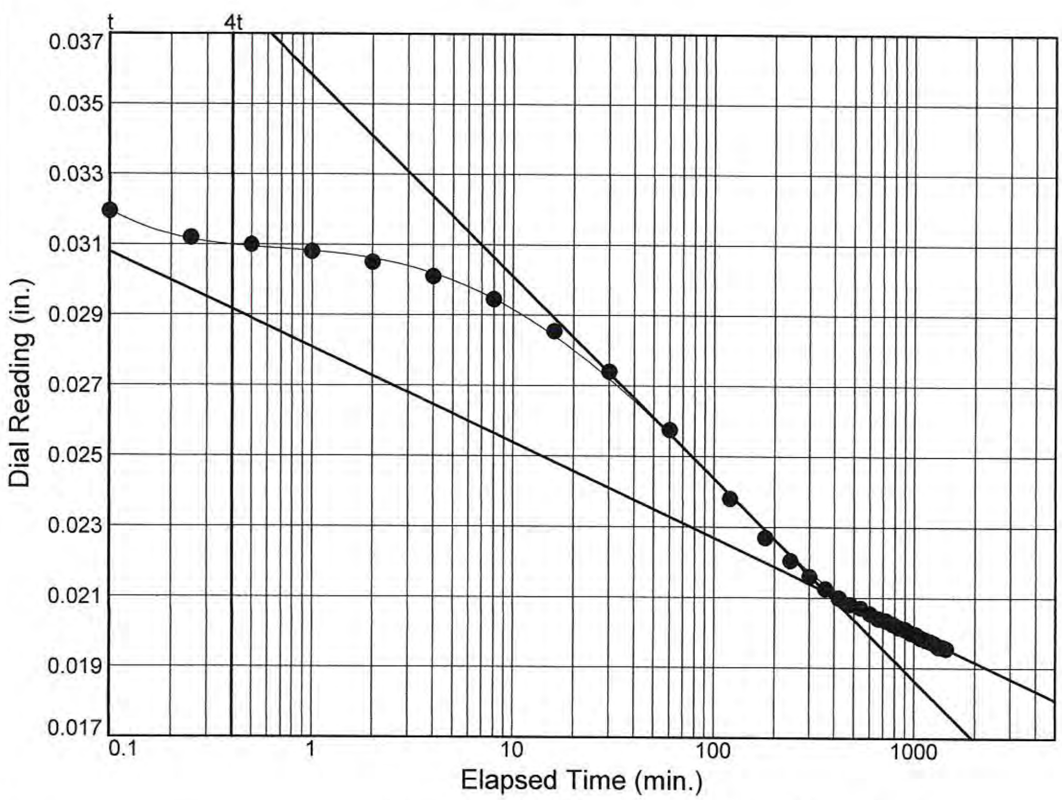
Source of Sample: SJGB029 Depth: 14



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



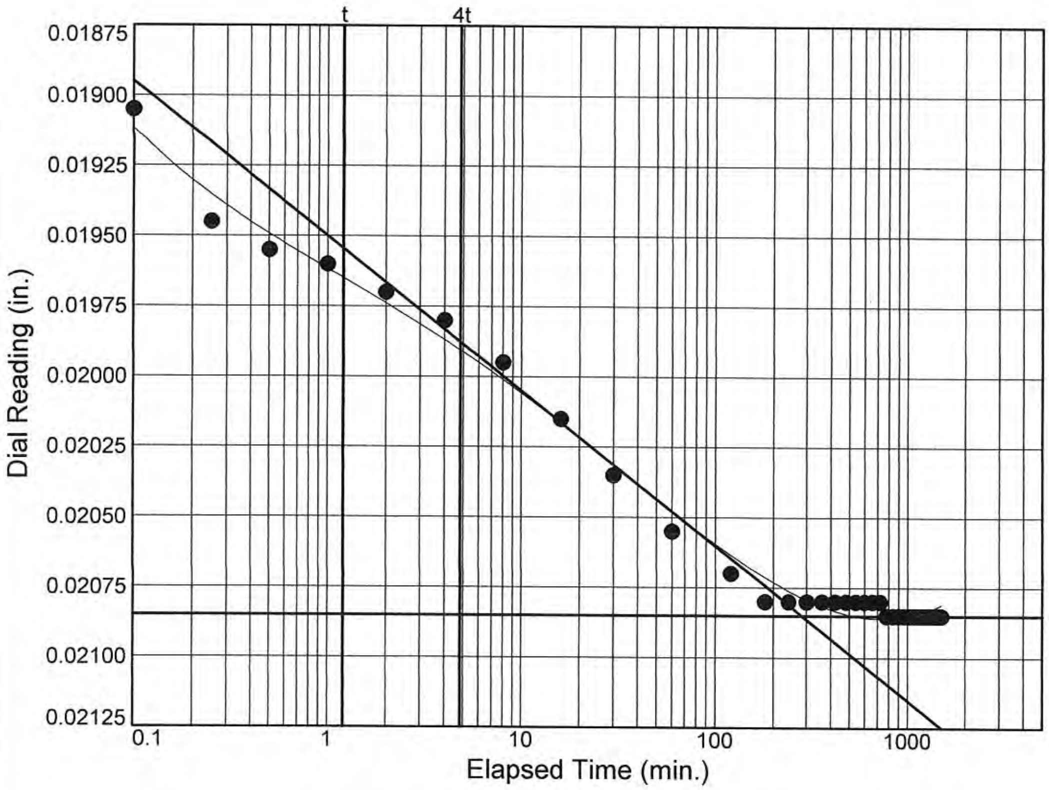
Load No.= 8
Load= 0.10 tsf
D_0 = 0.0330
D_{50} = 0.0271
D_{100} = 0.0212
T_{50} = 31.91 min.

C_v @ T_{50}
3.0 ft.^{2}/yr.

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

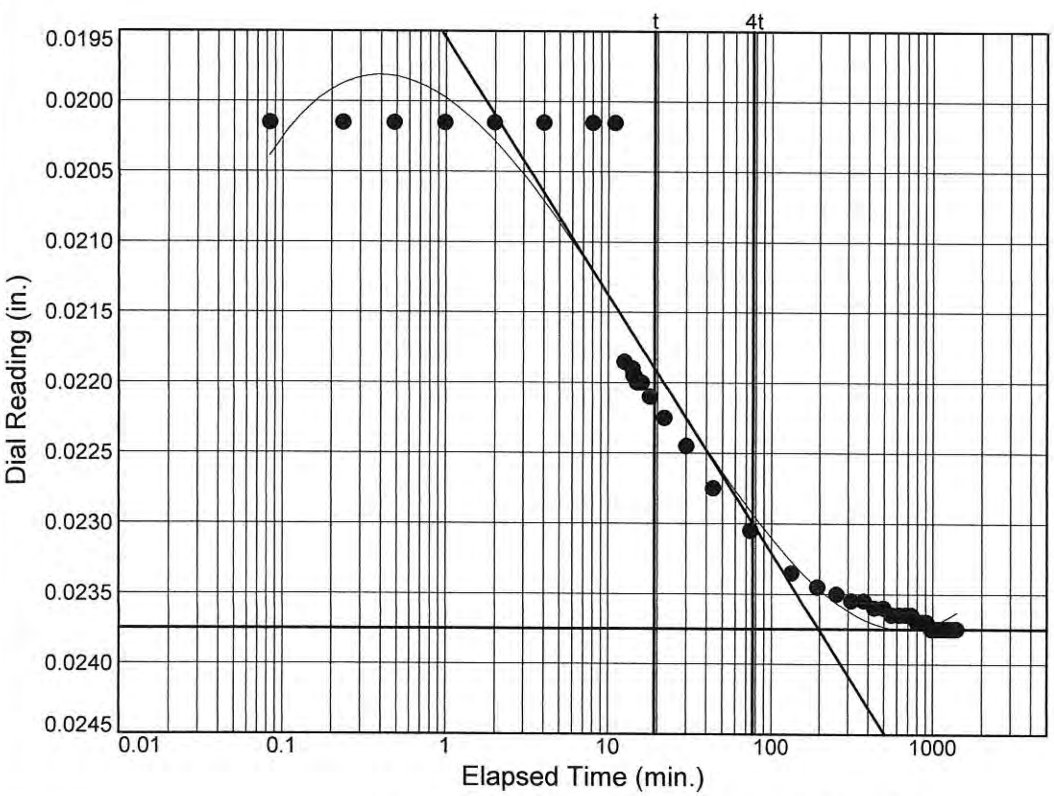
Source of Sample: SJGB029 Depth: 14



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

Figure

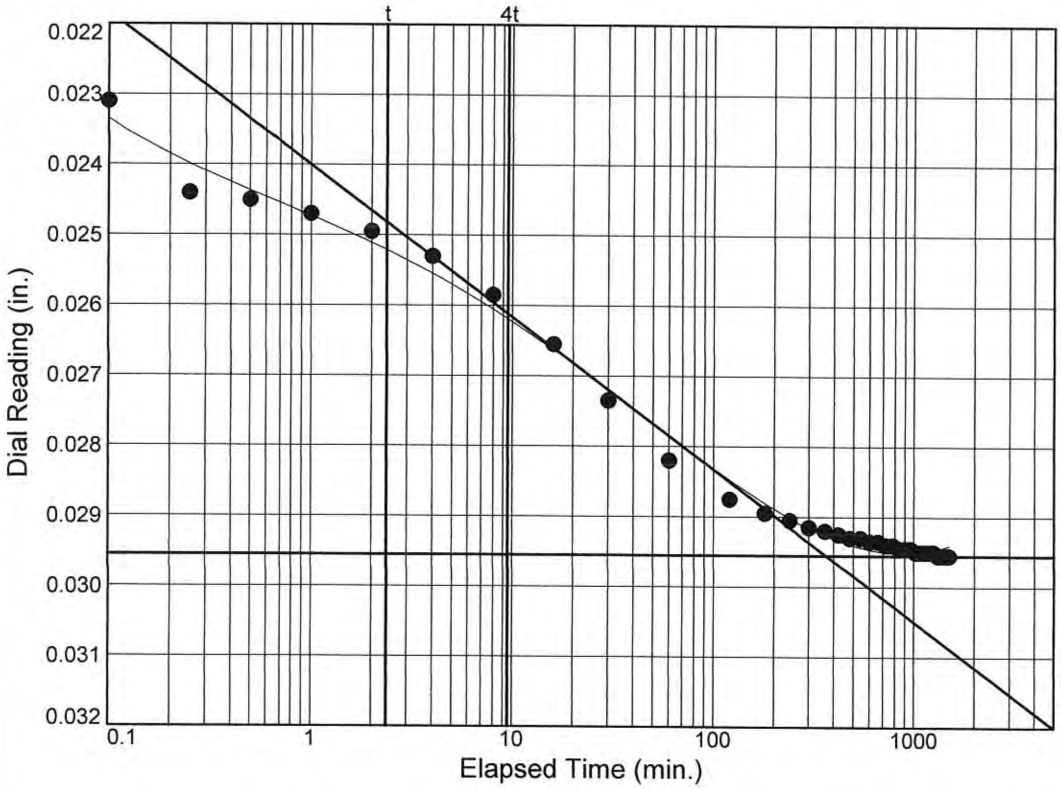
TOLUNAY-WONG ENGINEERS, INC.

Attachment Figure B.2-190

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

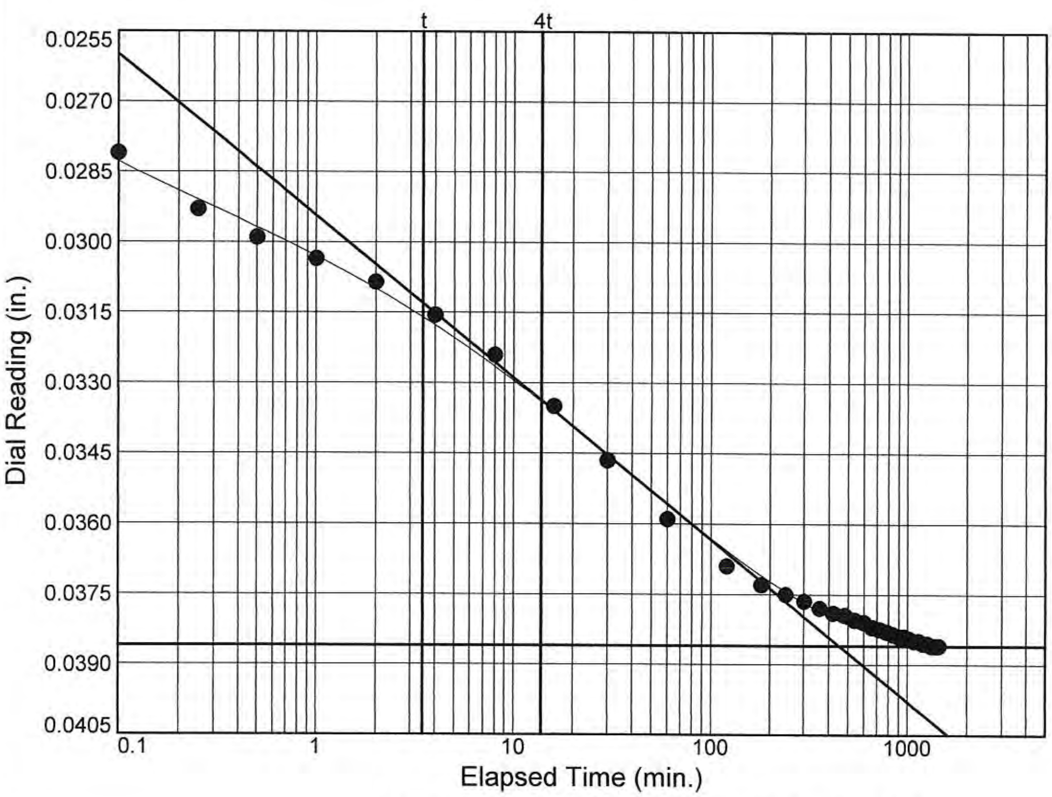
D_{100} = 0.0295

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

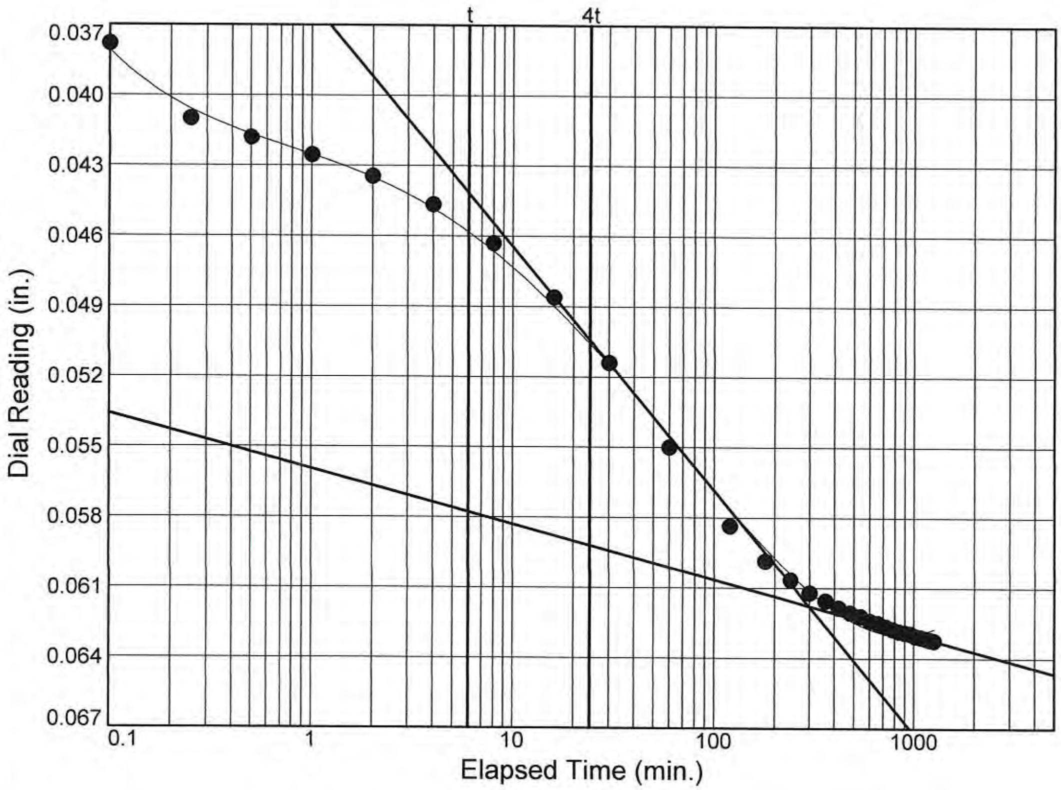
Figure

TOLUNAY-WONG ENGINEERS, INC.

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

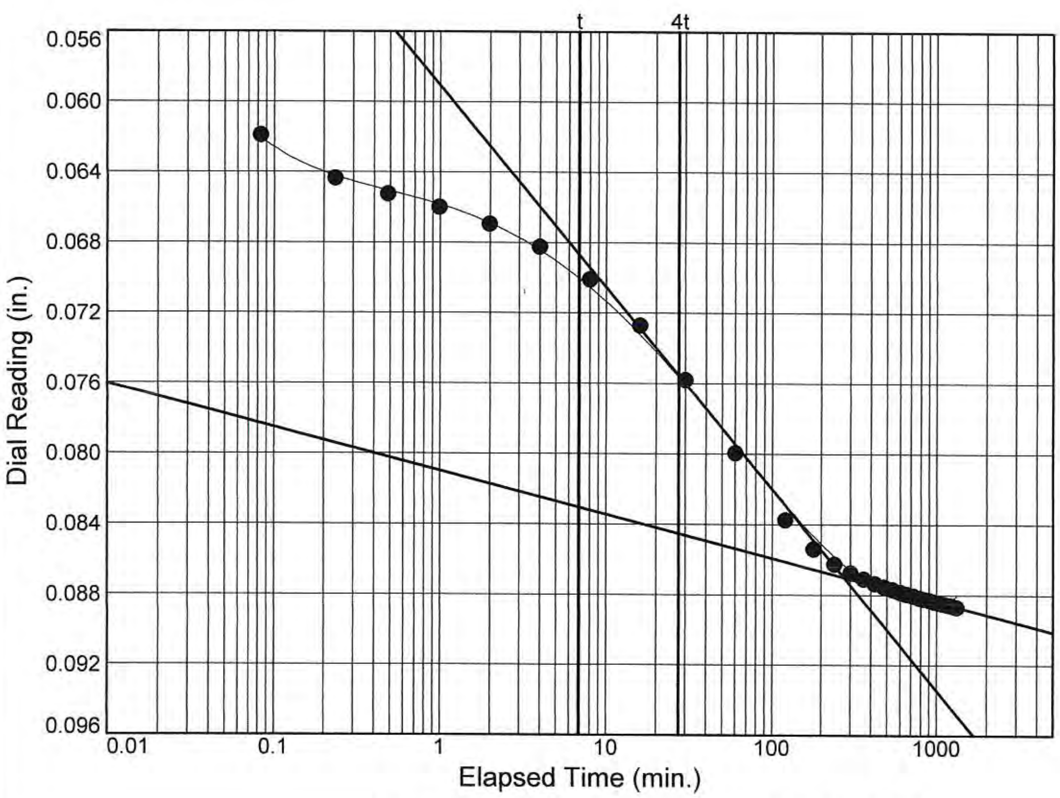
Source of Sample: SJGB029 Depth: 14



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.

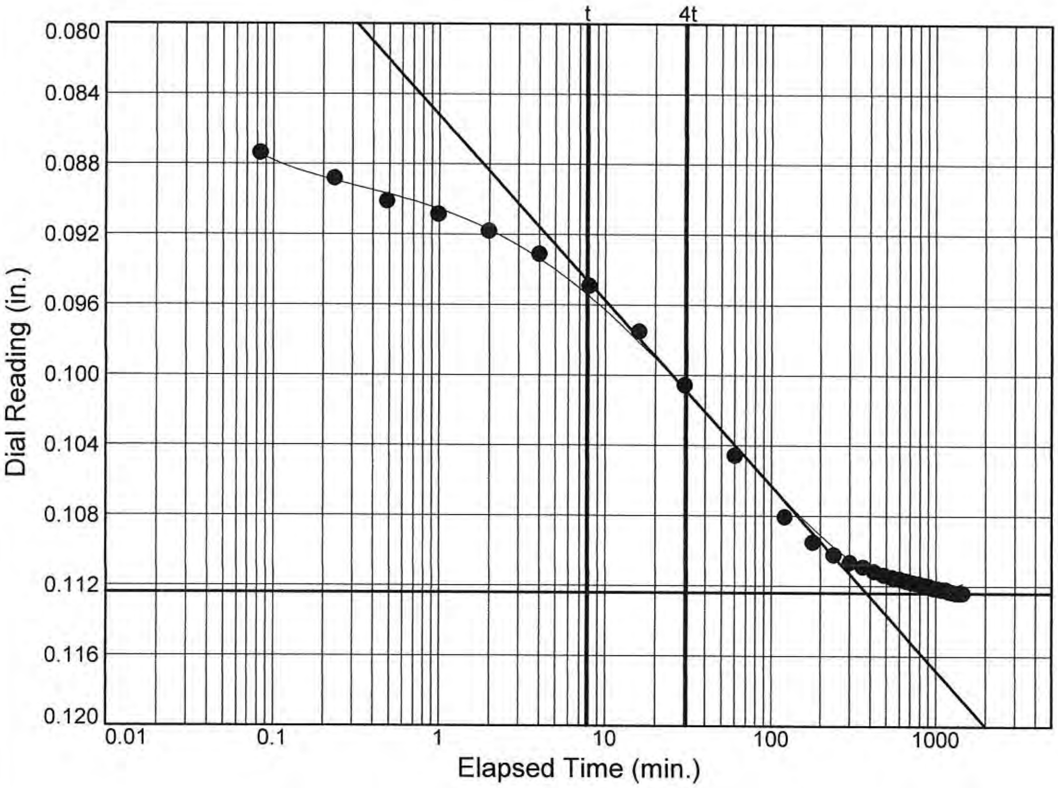
Figure

Attachment Figure B.2-192

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

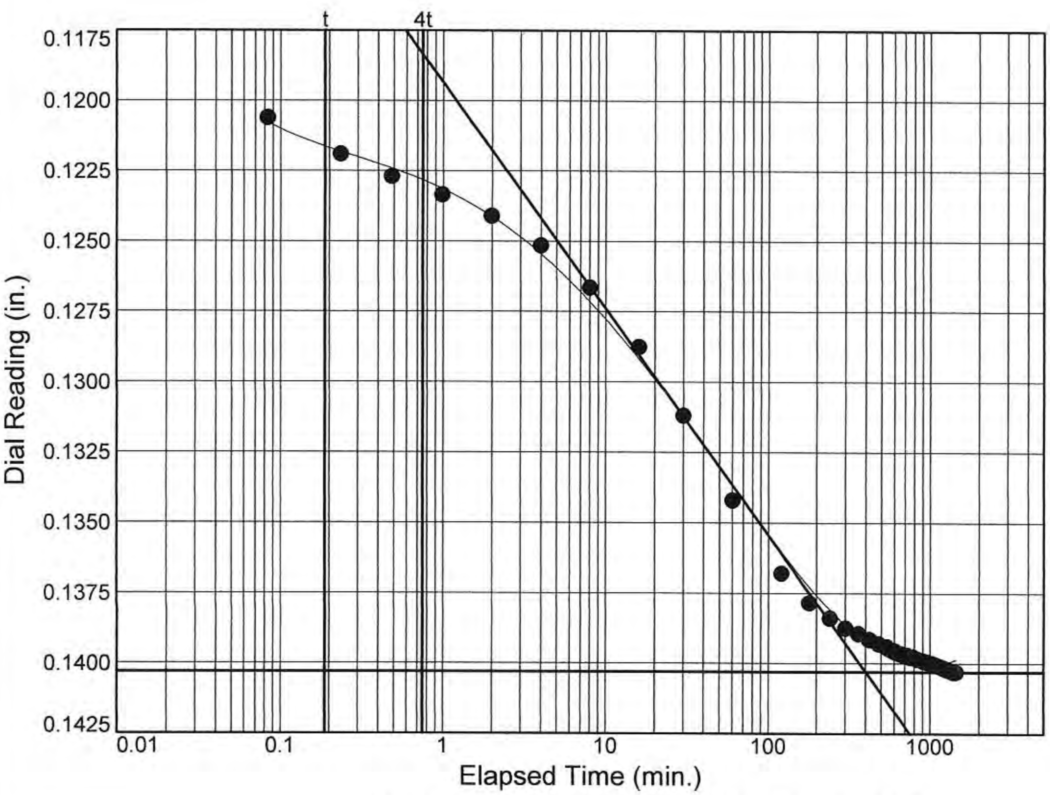
Source of Sample: SJGB029 Depth: 14



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

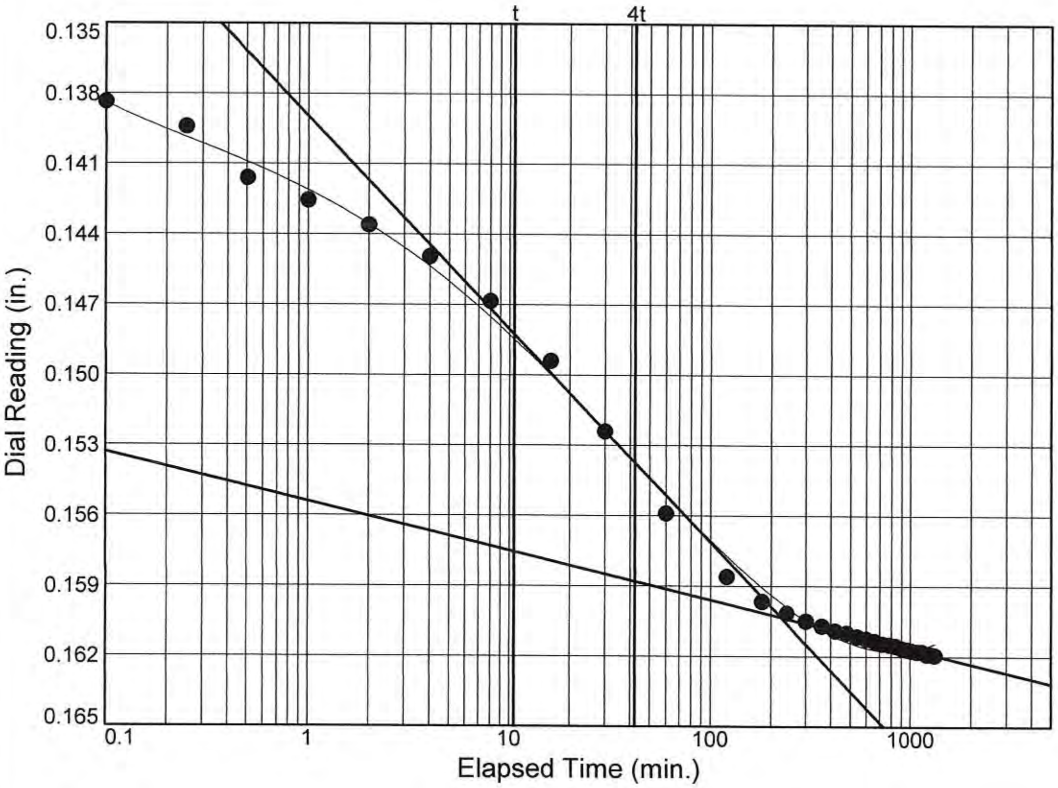
TOLUNAY-WONG ENGINEERS, INC.

Figure

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

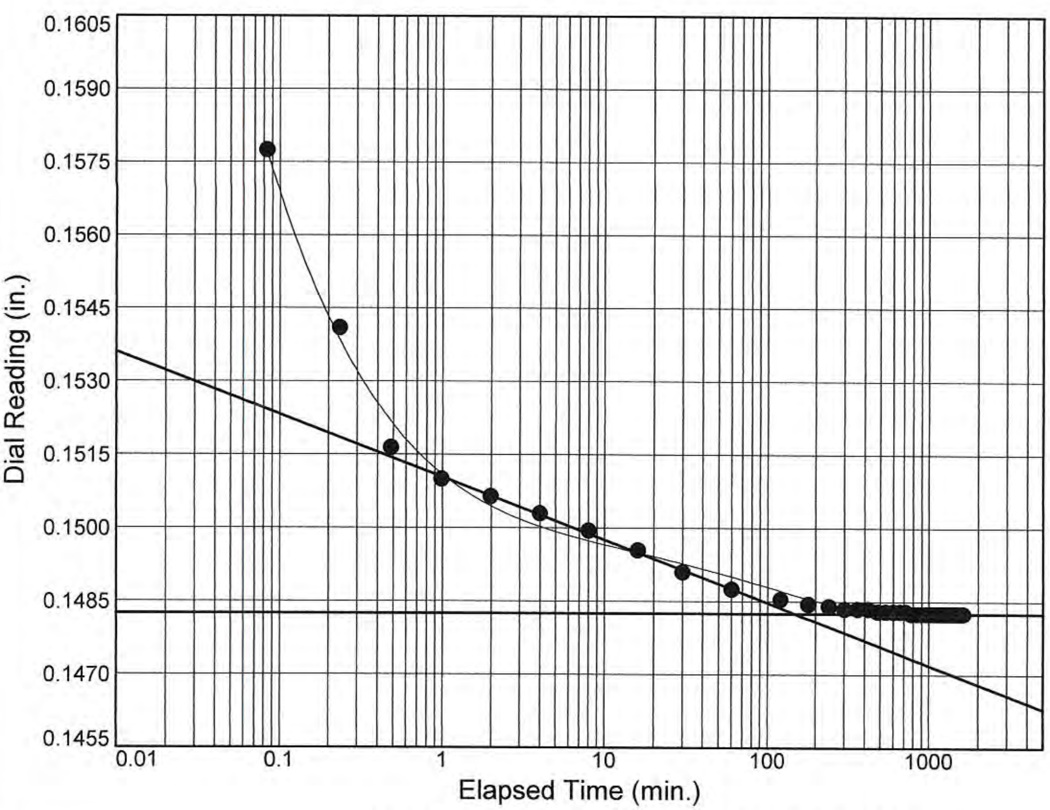
Source of Sample: SJGB029 Depth: 14



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.

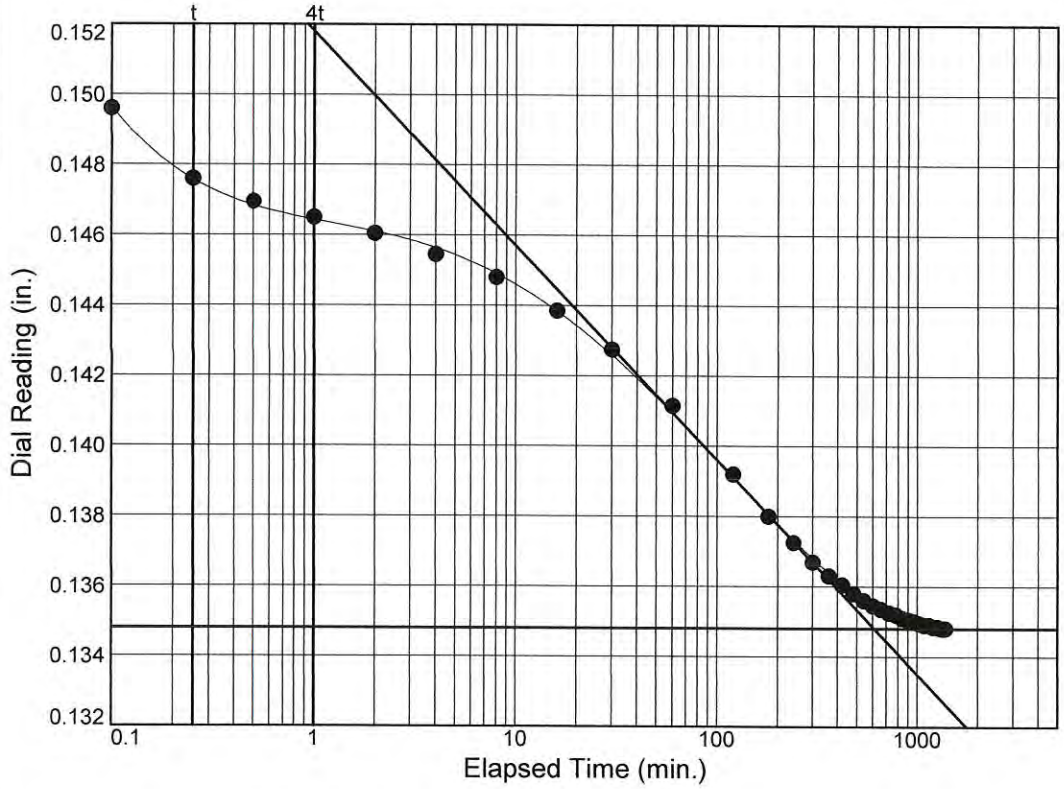
C_v @ T_{50}
404.0 ft.^{2}/yr.

C_α = 0.000

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

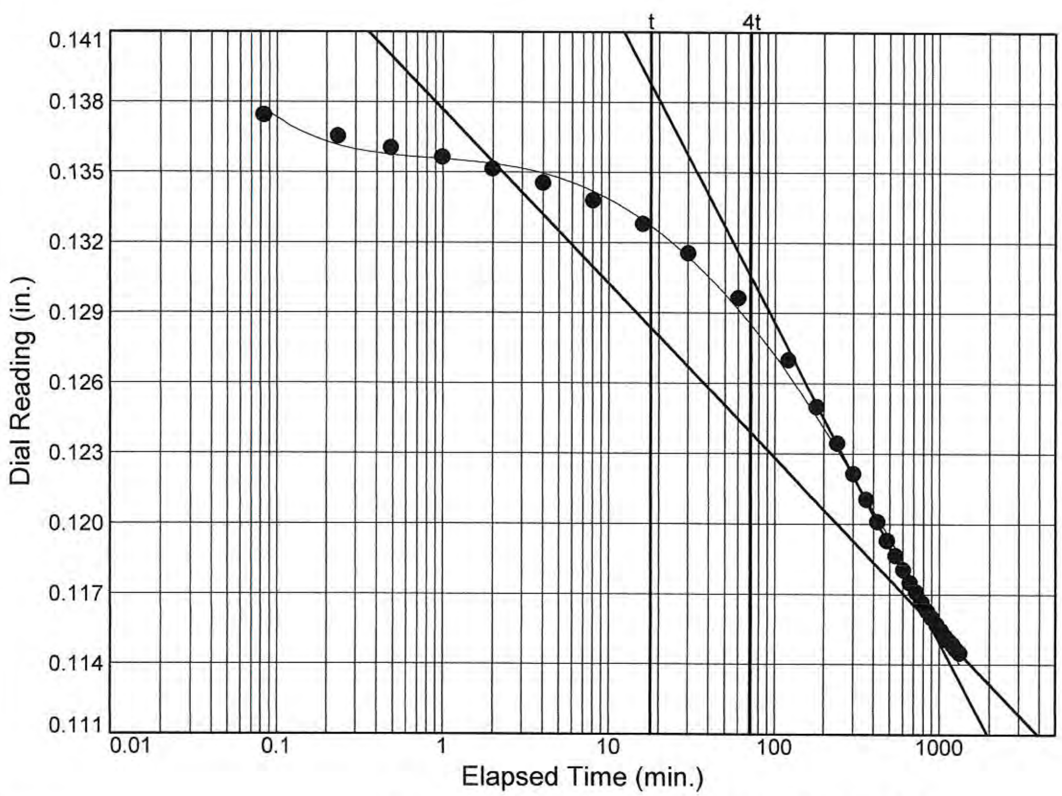
Source of Sample: SJGB029 Depth: 14



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

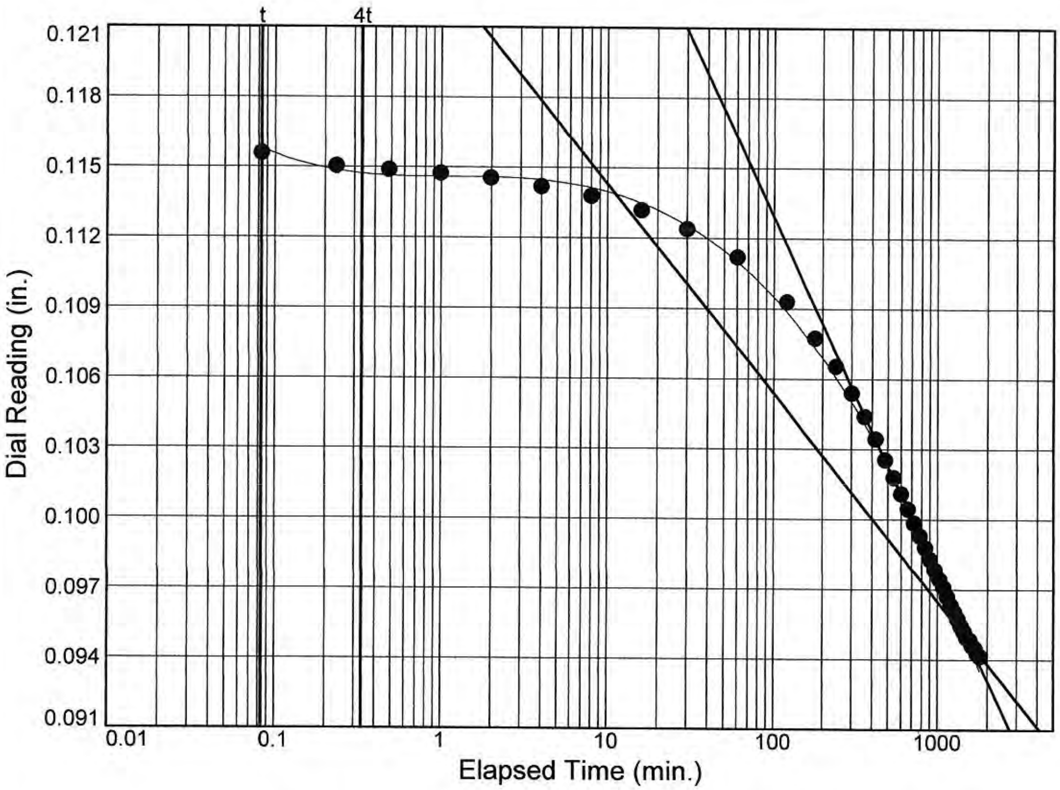
TOLUNAY-WONG ENGINEERS, INC.

Attachment Figure B.2-195

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}

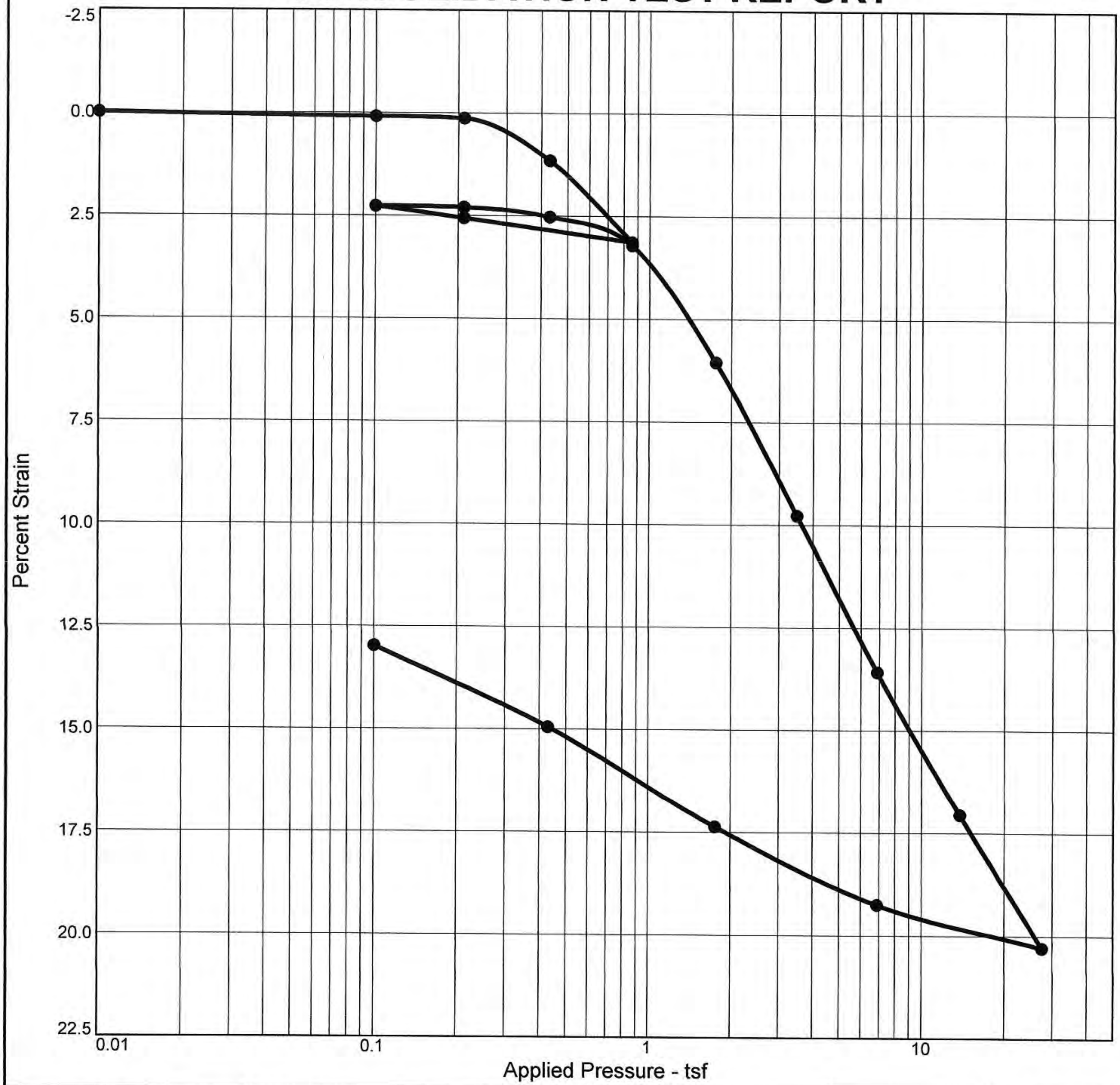
0.3 ft.^{2}/yr.

TOLUNAY-WONG ENGINEERS, INC.

Figure

Attachment Figure B.2-196

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

Tolunay-Wong Engineers, Inc.

Houston, Texas

Remarks:

Test method: ASTM D2435
Specific gravity: Assumed

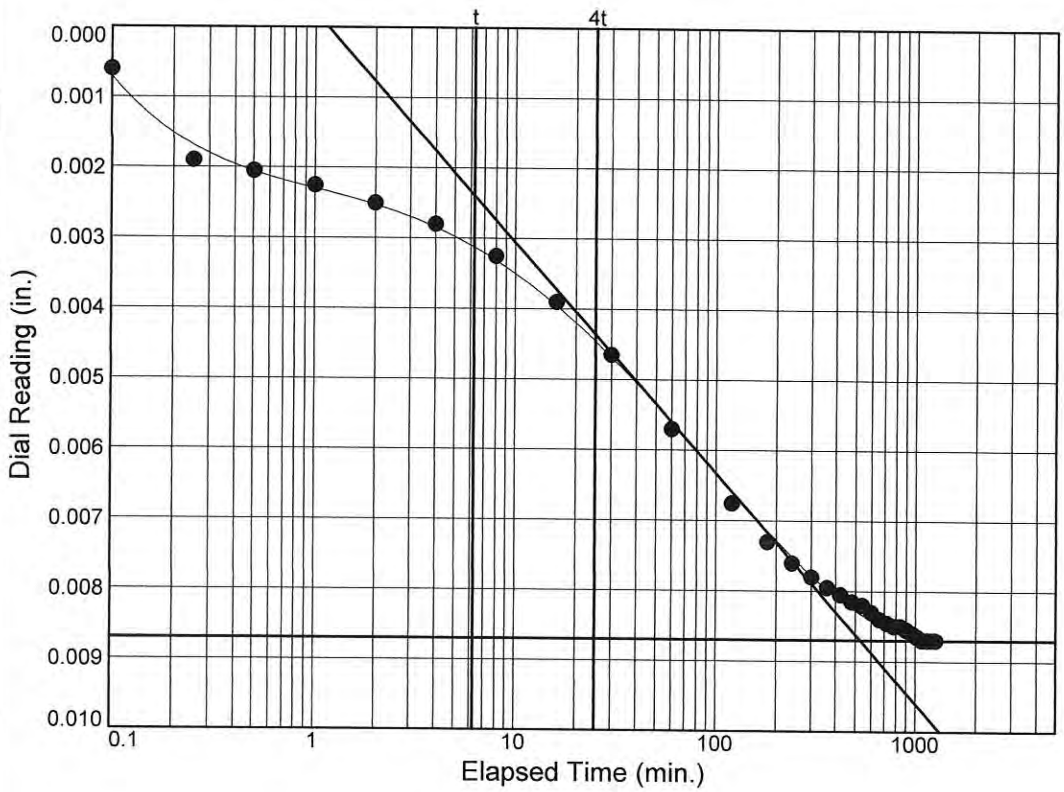
Figure

Attachment Figure B.2-197

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

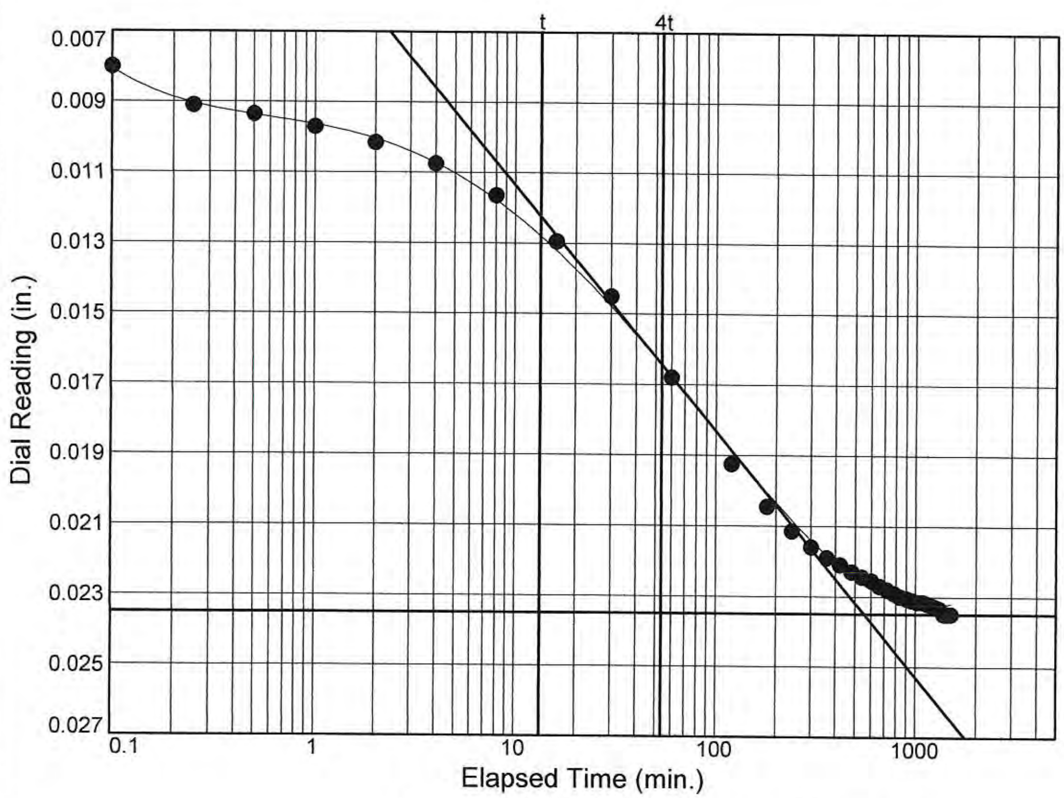
Source of Sample: SJGB047 Depth: 28



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

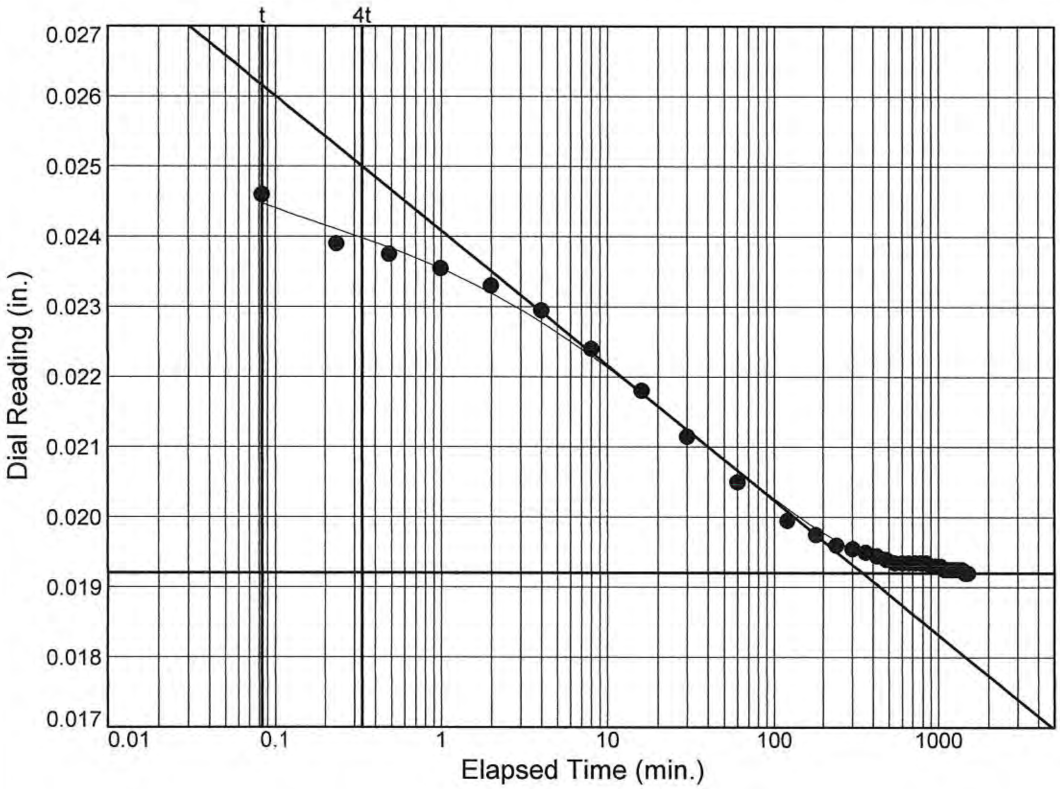
TOLUNAY-WONG ENGINEERS, INC.

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

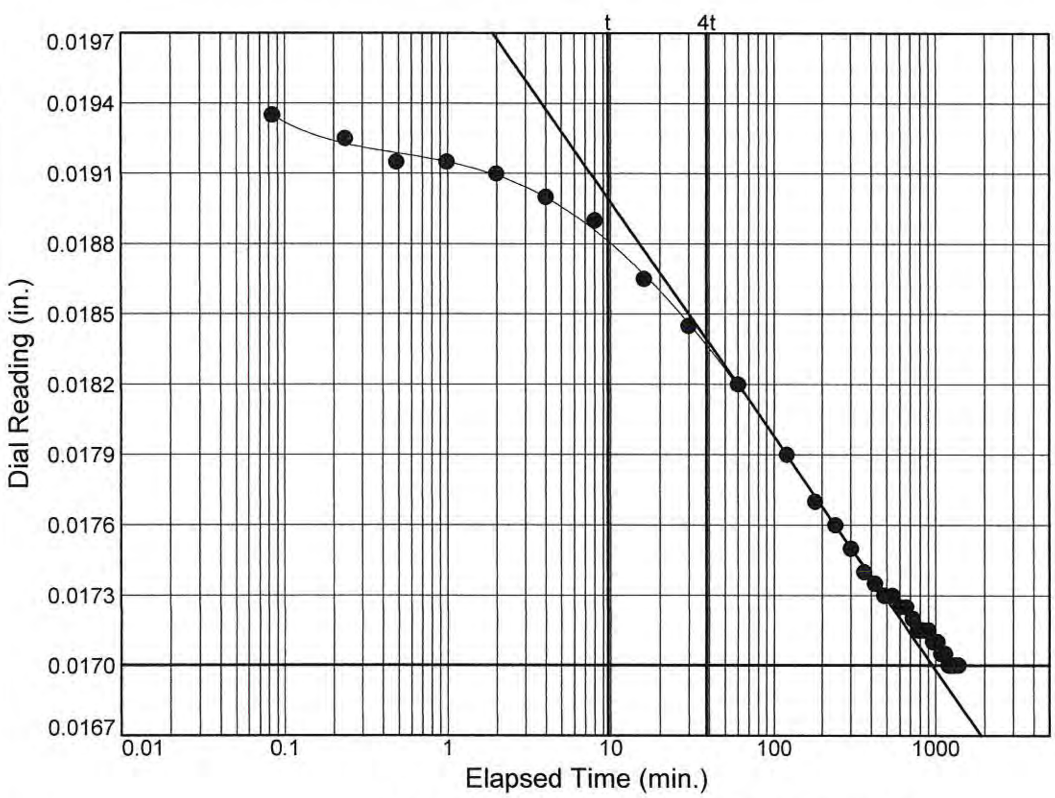
D_{100} = 0.0192

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

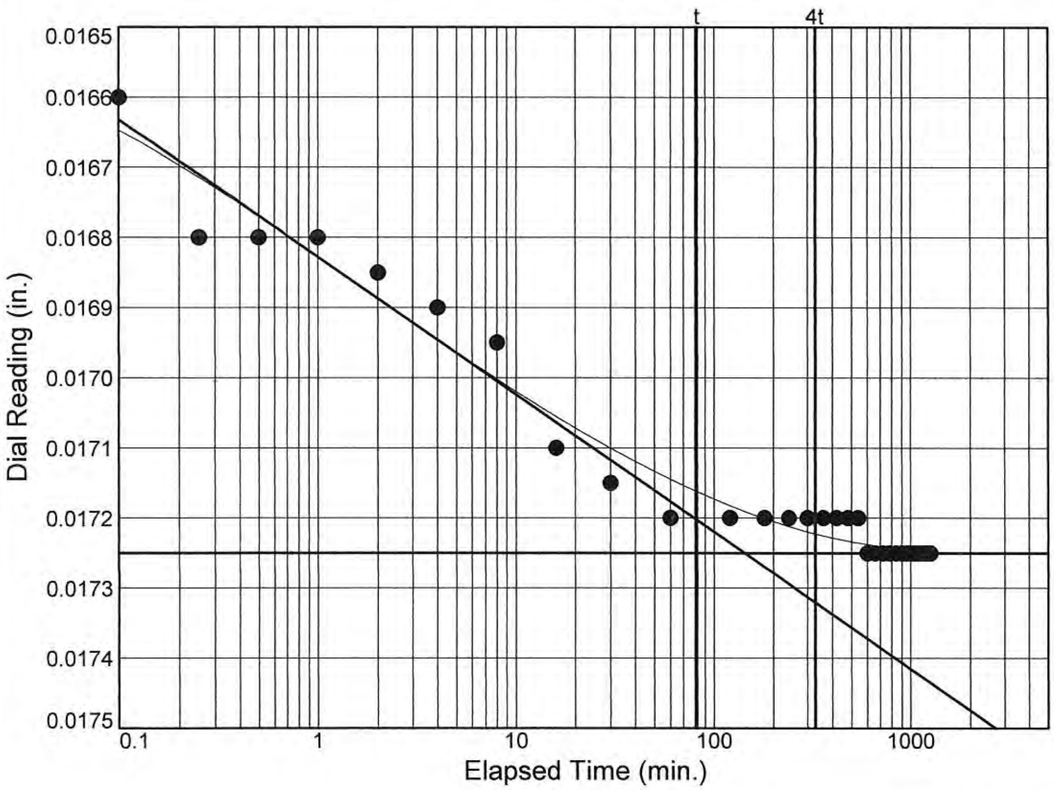
TOLUNAY-WONG ENGINEERS, INC.

Attachment Figure B.2-199

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

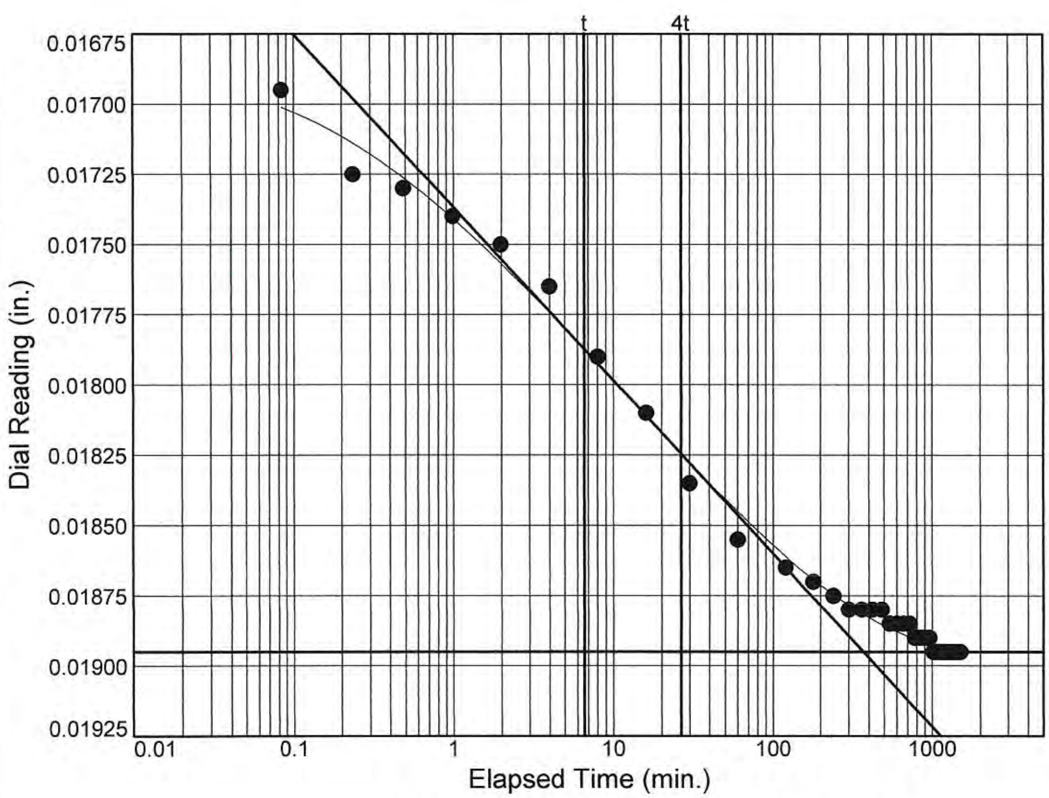
D_{100} = 0.0172

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

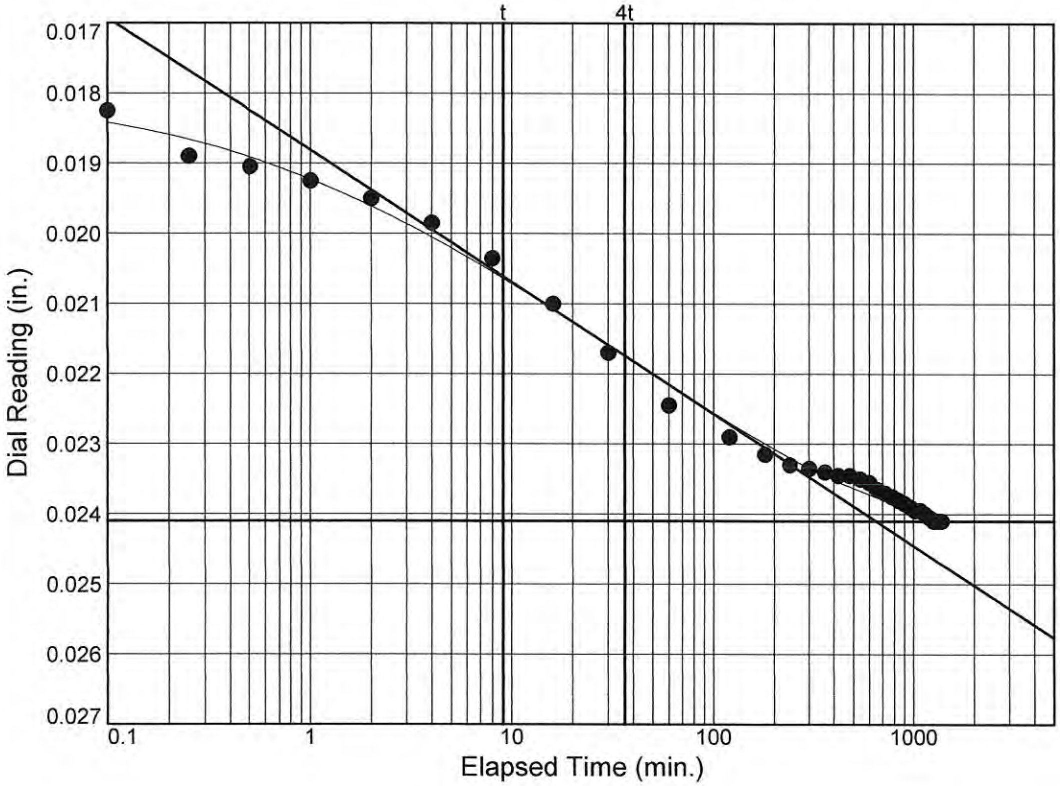
TOLUNAY-WONG ENGINEERS, INC.

Attachment Figure B.2-200

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

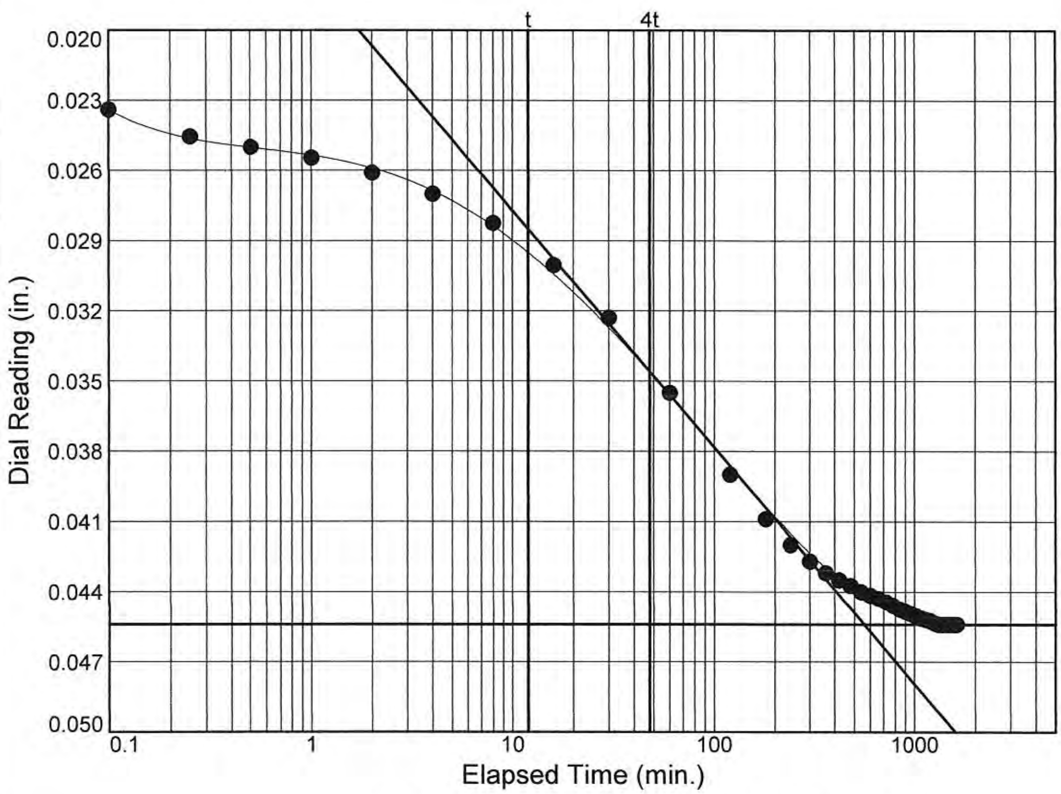
D_{100} = 0.0241

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

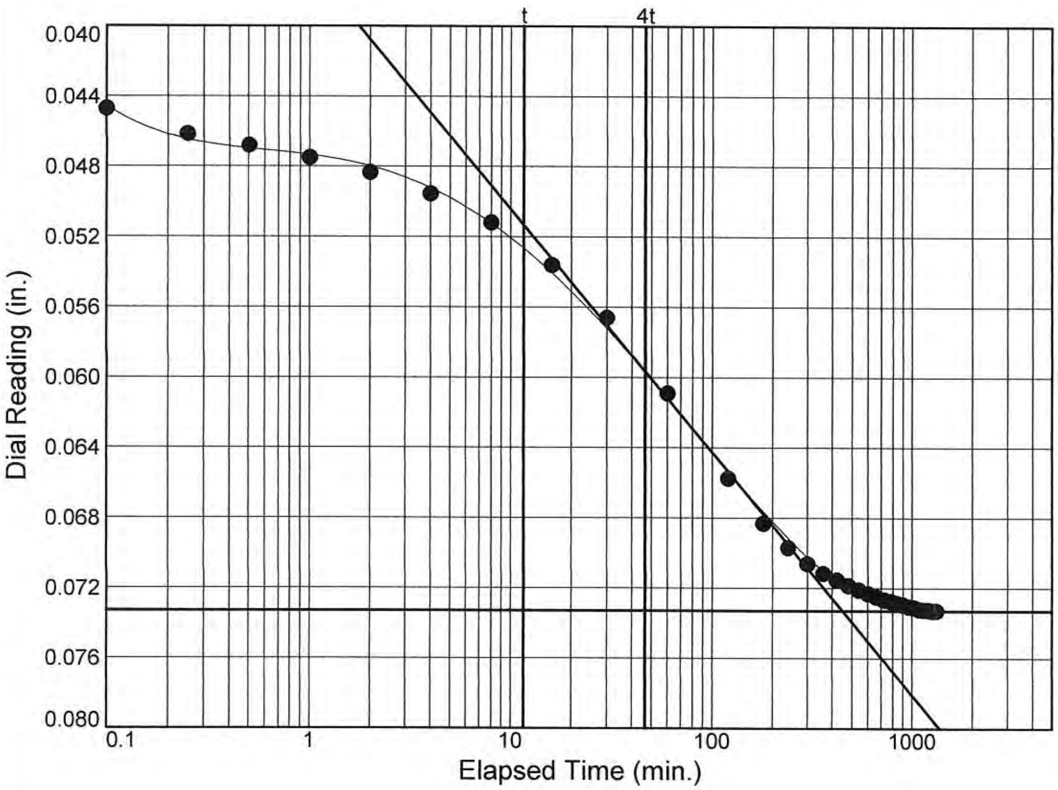
Figure

TOLUNAY-WONG ENGINEERS, INC.

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

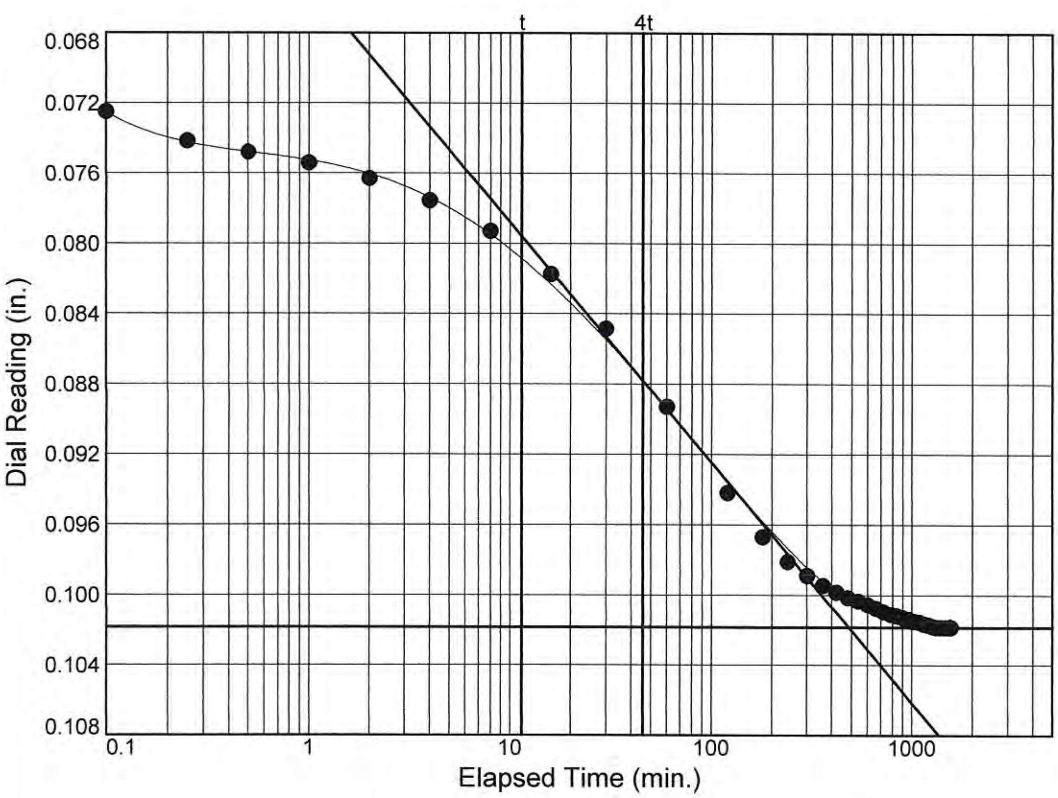
Source of Sample: SJGB047 Depth: 28



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

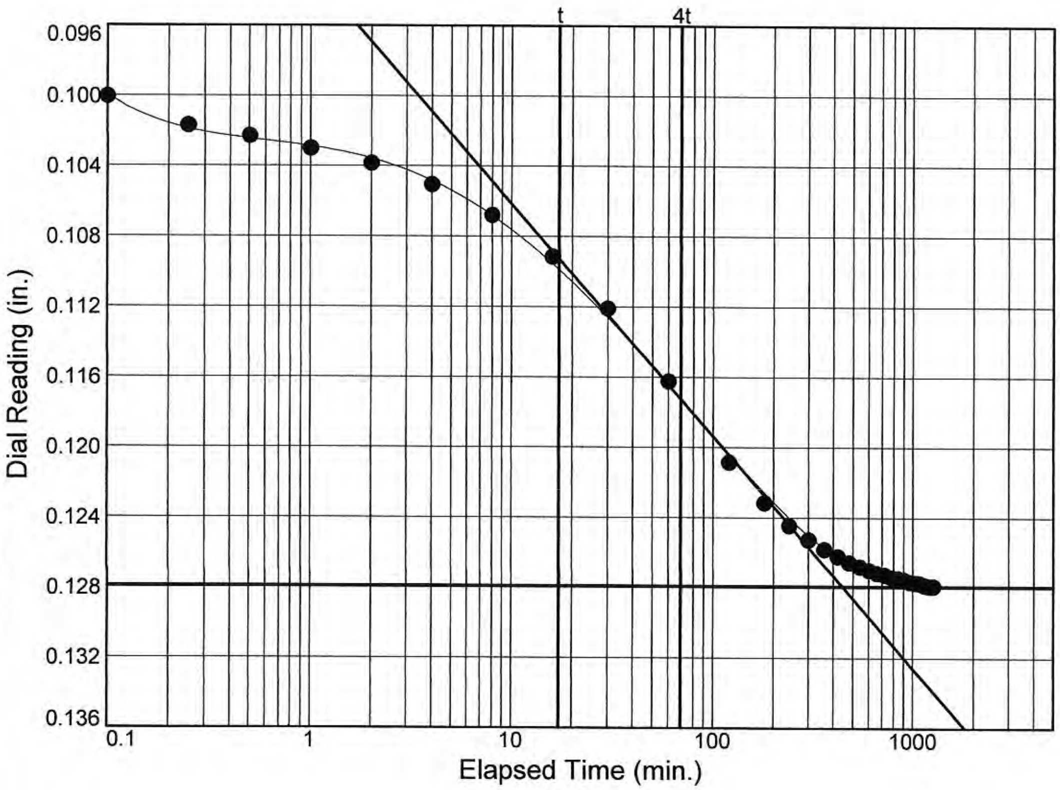
Figure

TOLUNAY-WONG ENGINEERS, INC.

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

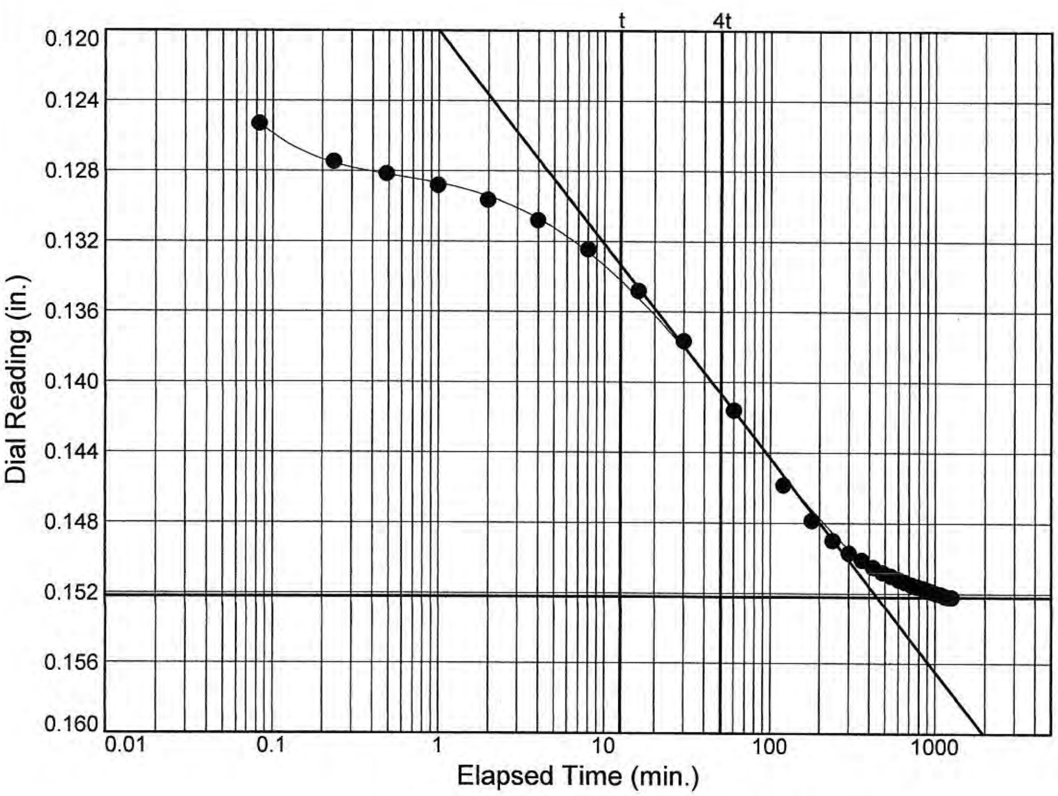
Source of Sample: SJGB047 Depth: 28



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

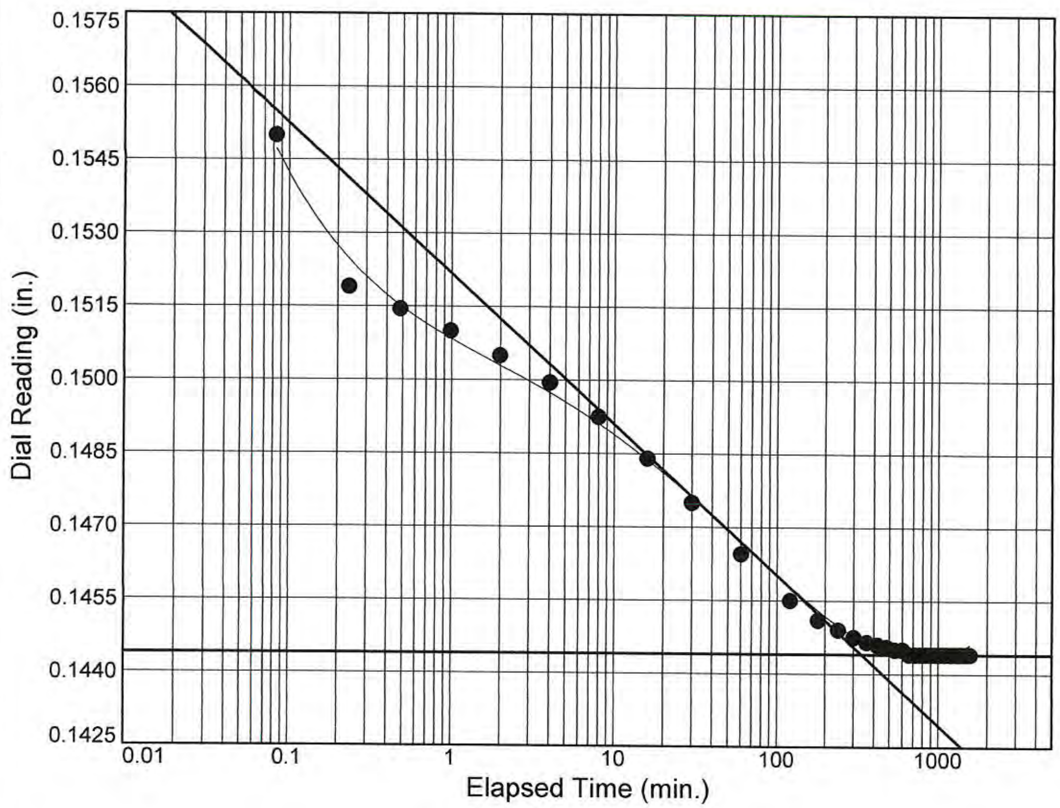
TOLUNAY-WONG ENGINEERS, INC.

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.= 16

Load= 6.87 tsf

D_0 = 0.1550

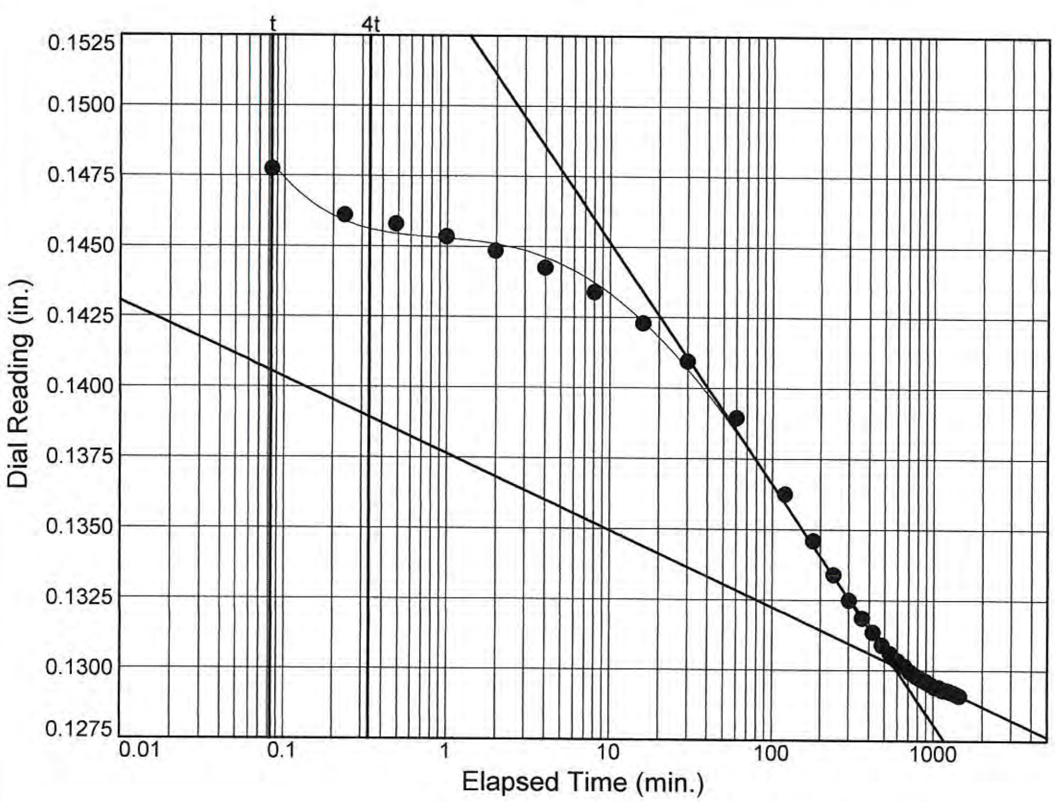
D_{50} = 0.1497

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.

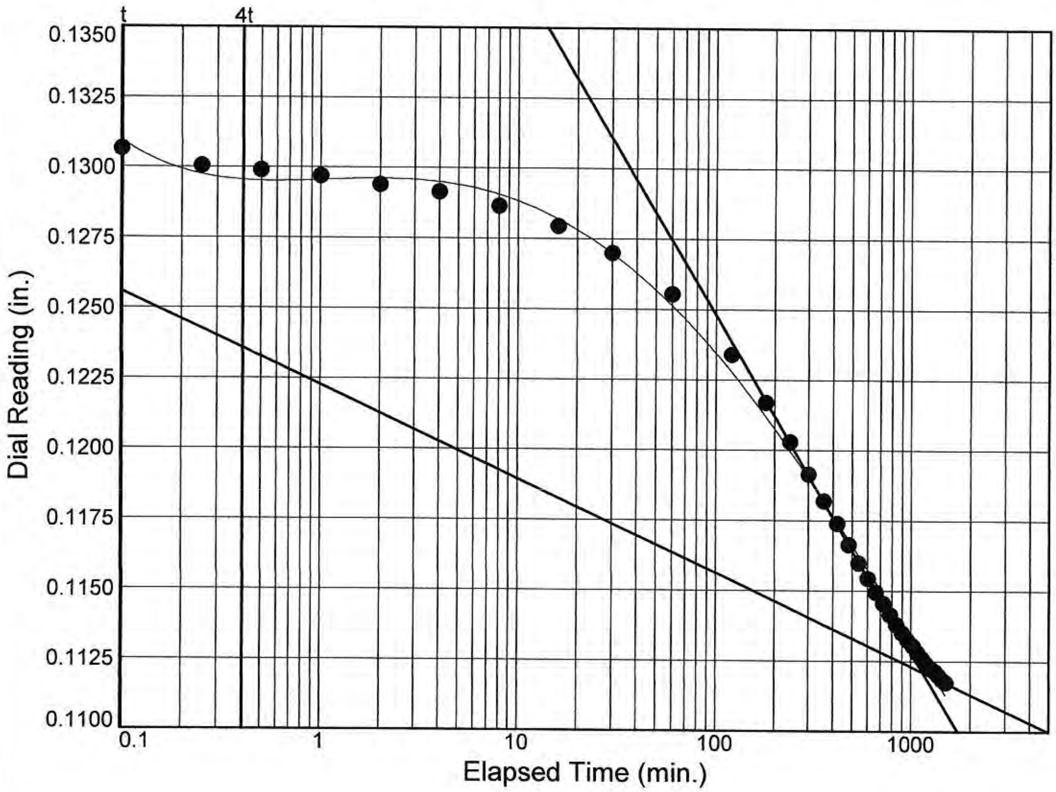
Figure

Attachment Figure B.2-204

Dial Reading vs. Time

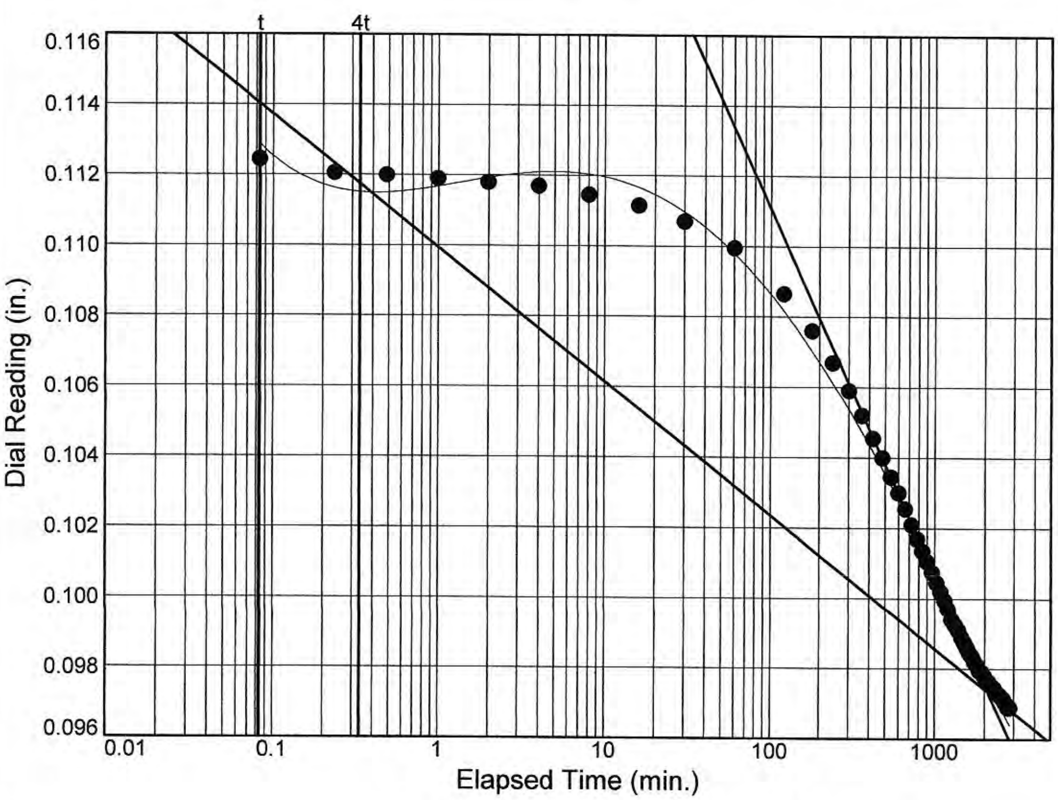
Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

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.

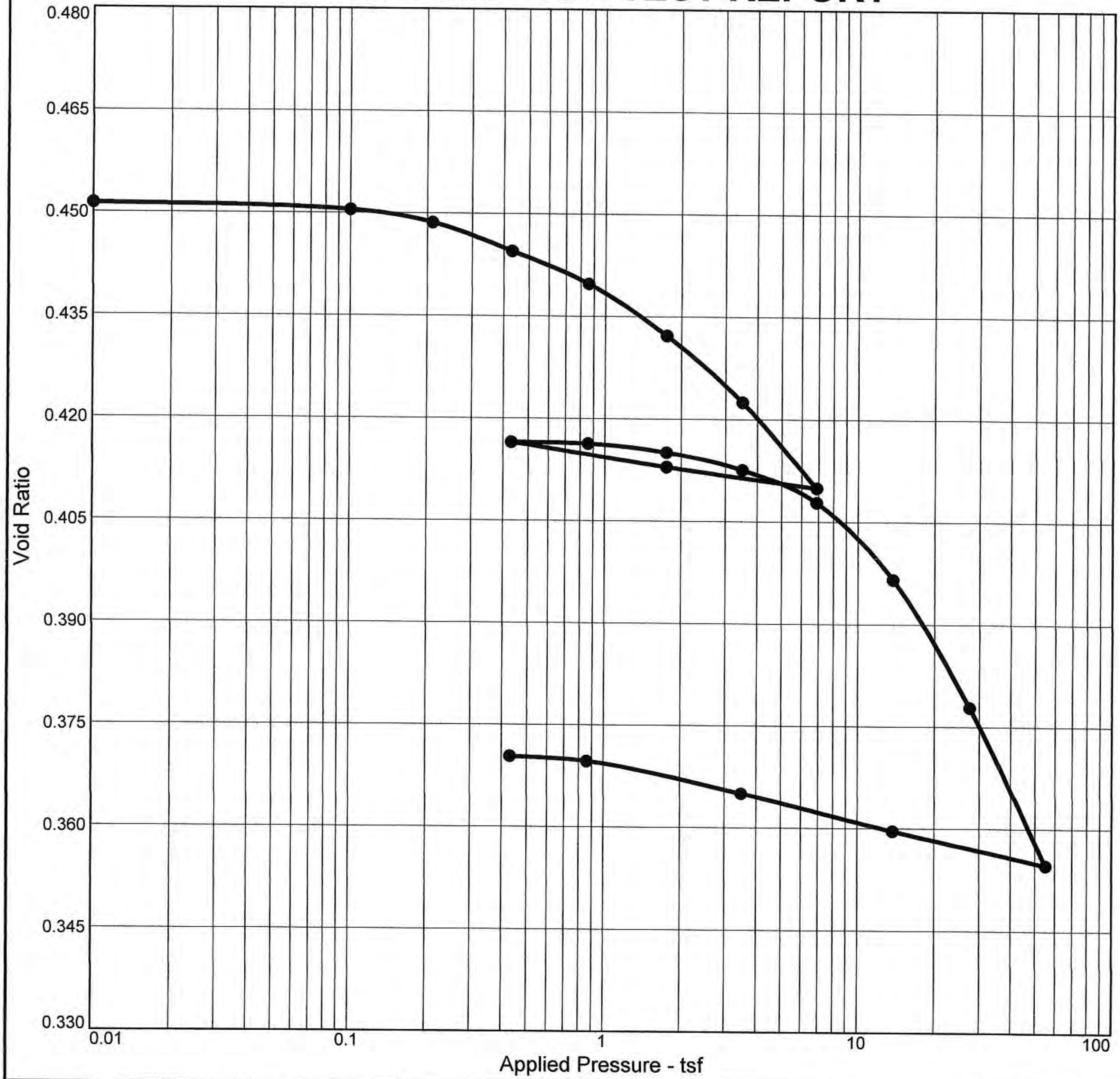
C_v @ T_{50}
0.3 ft.^{2}/yr.

TOLUNAY-WONG ENGINEERS, INC.

Figure

Attachment Figure B.2-205

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

Tolunay-Wong Engineers, Inc.

Houston, Texas

Remarks:

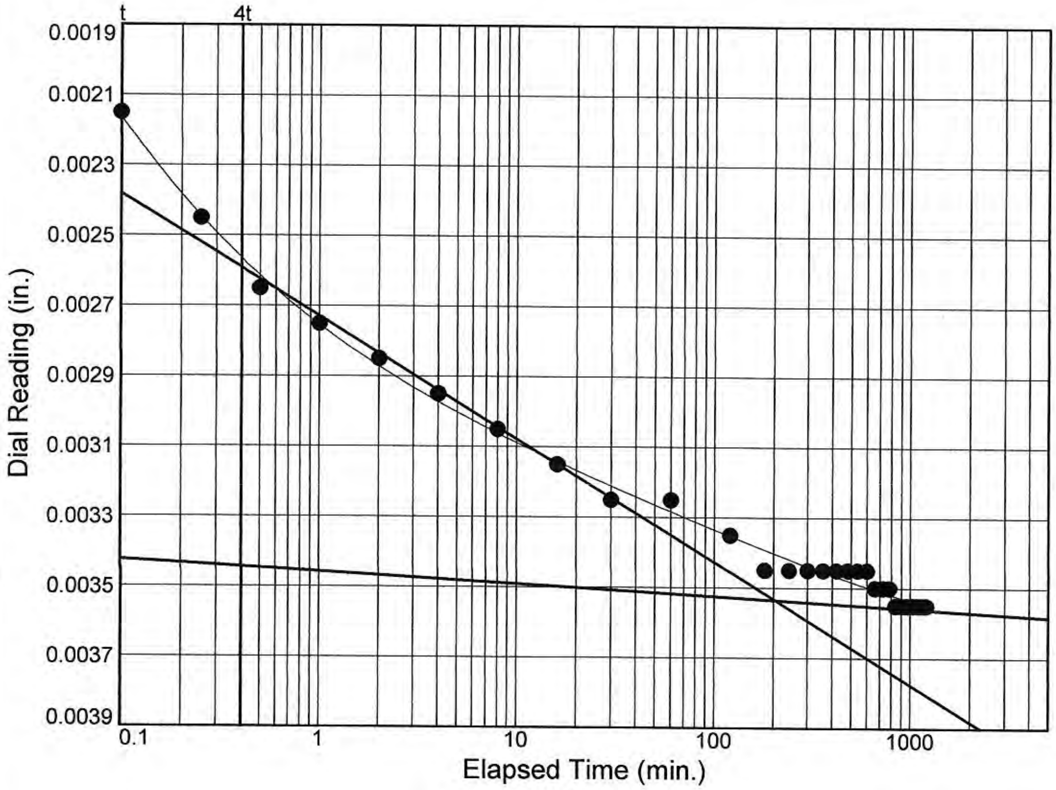
Test method: ASTM D2435
Specific gravity: Assumed

Figure

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

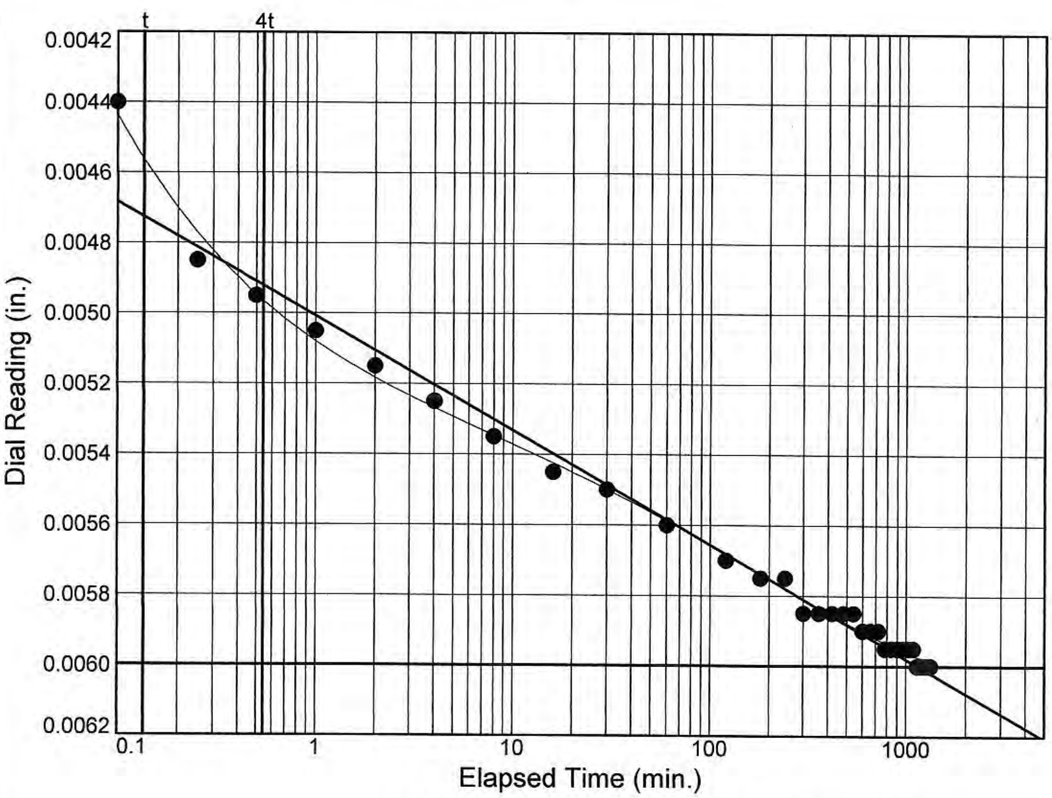
Source of Sample: SJGB047 Depth: 48



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.

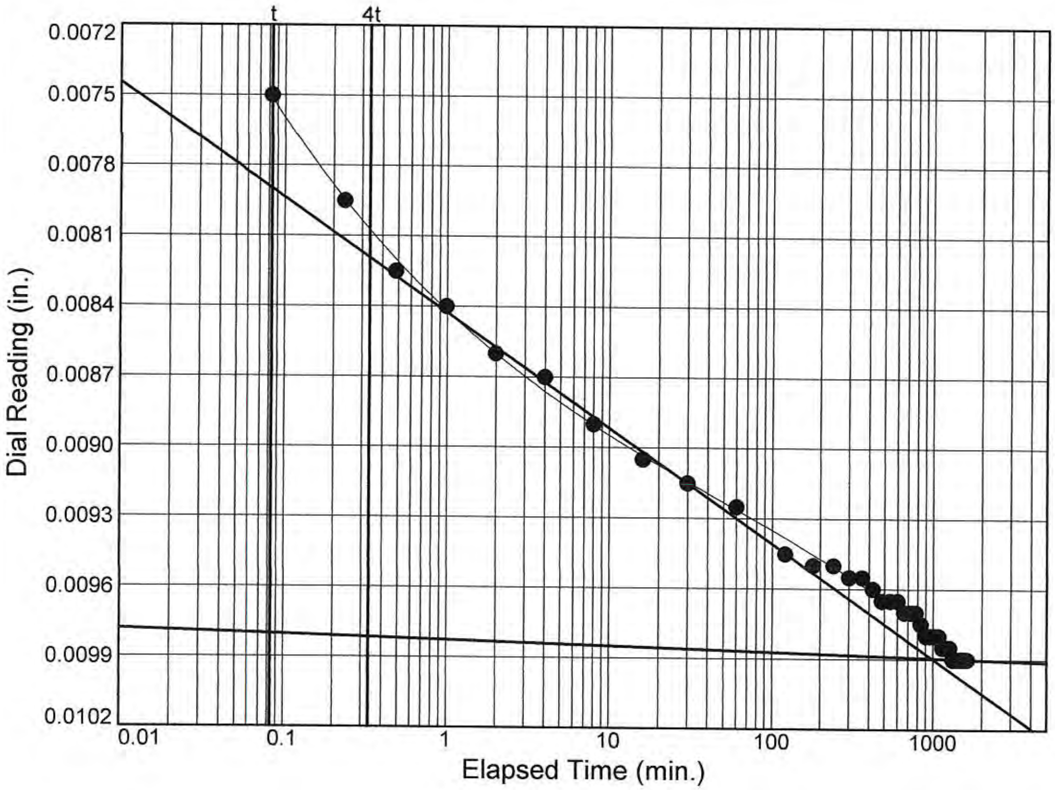
Figure

Attachment Figure B.2-207

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

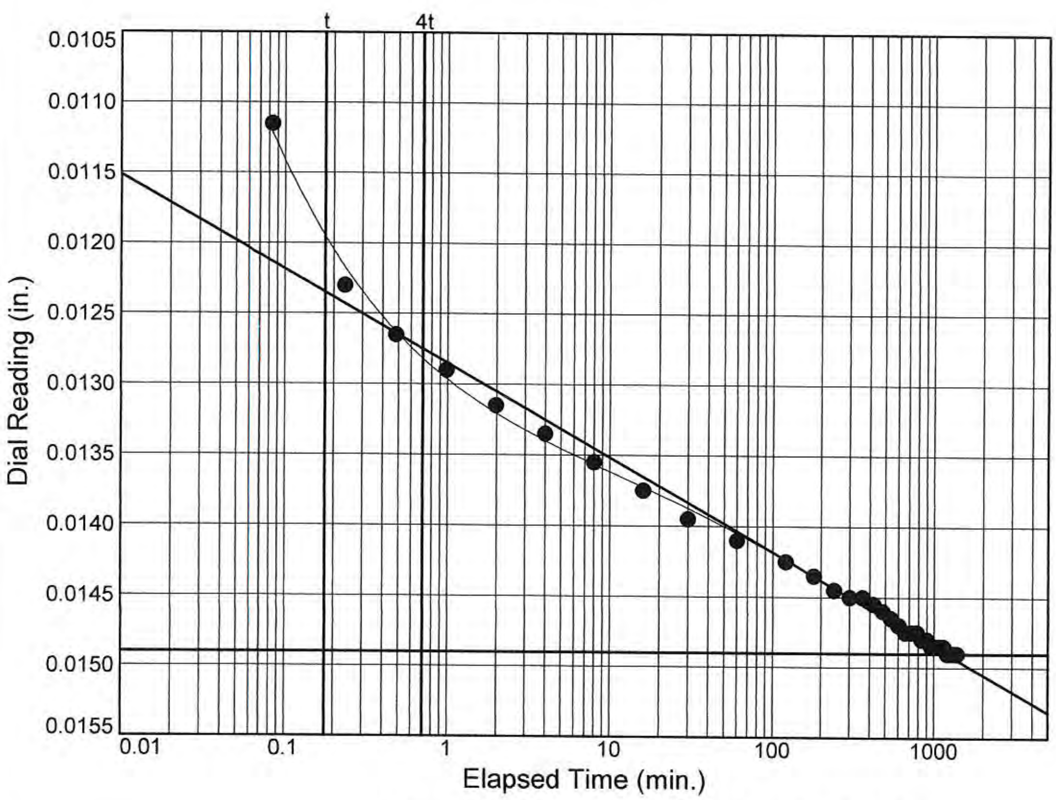
Source of Sample: SJGB047 Depth: 48



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

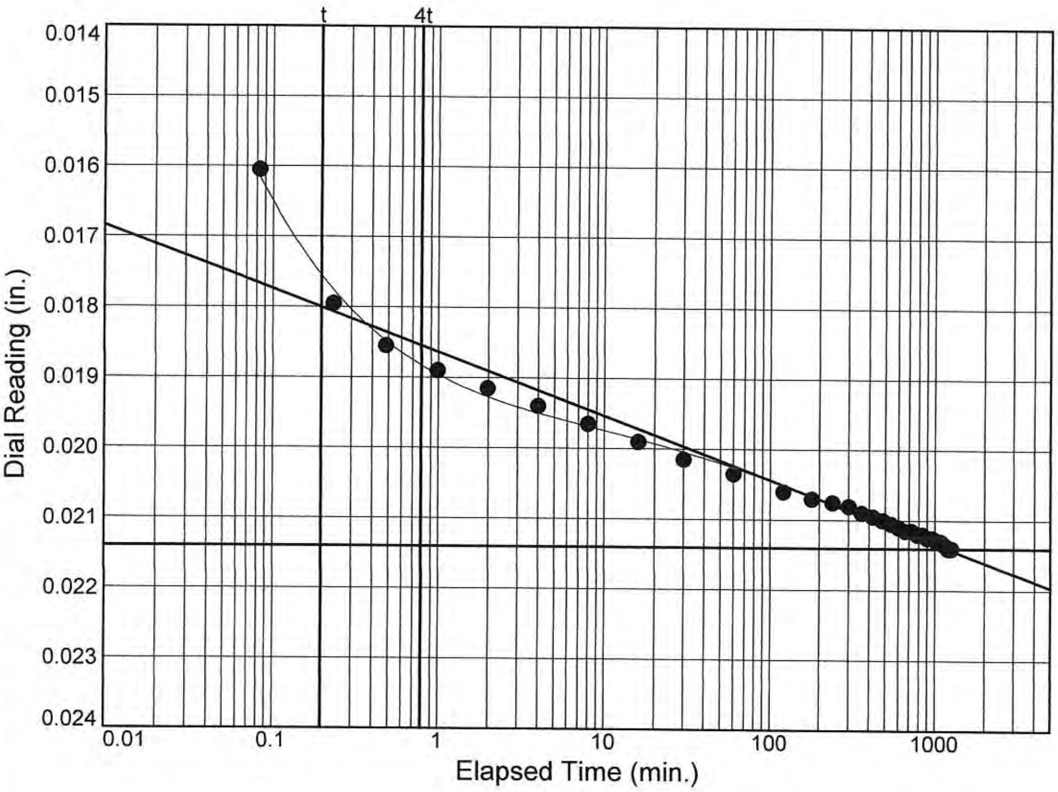
TOLUNAY-WONG ENGINEERS, INC.

Figure

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

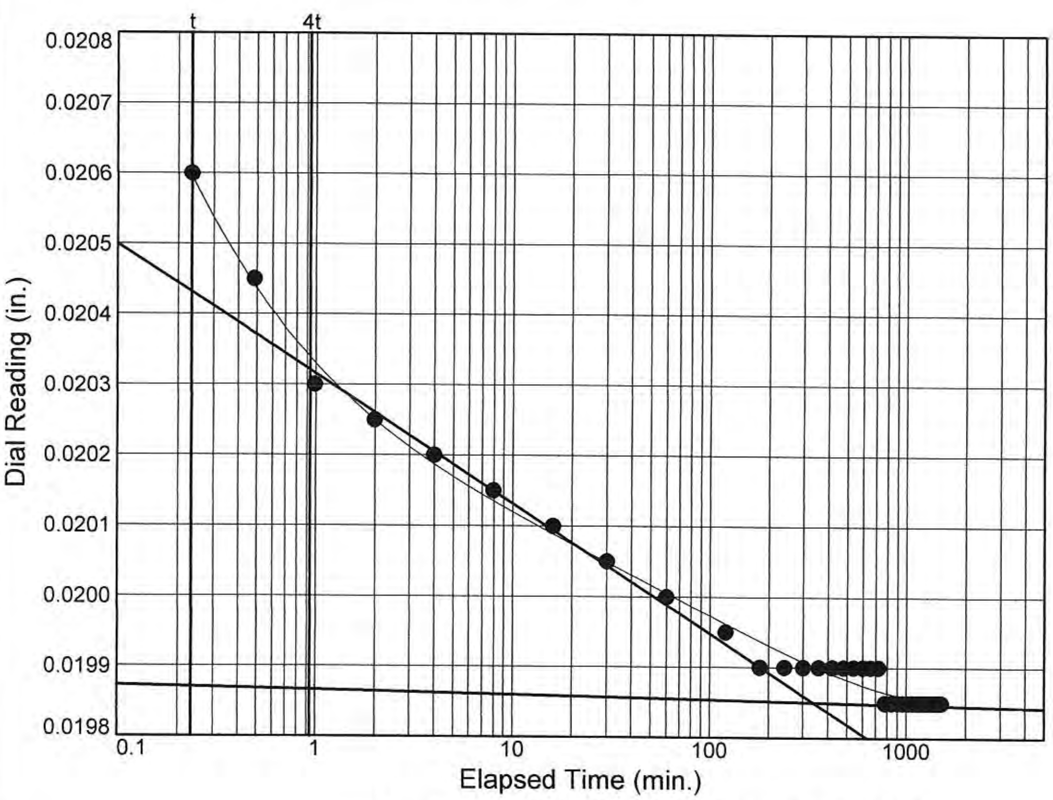
Source of Sample: SJGB047 Depth: 48



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 $ft.^2/yr.$

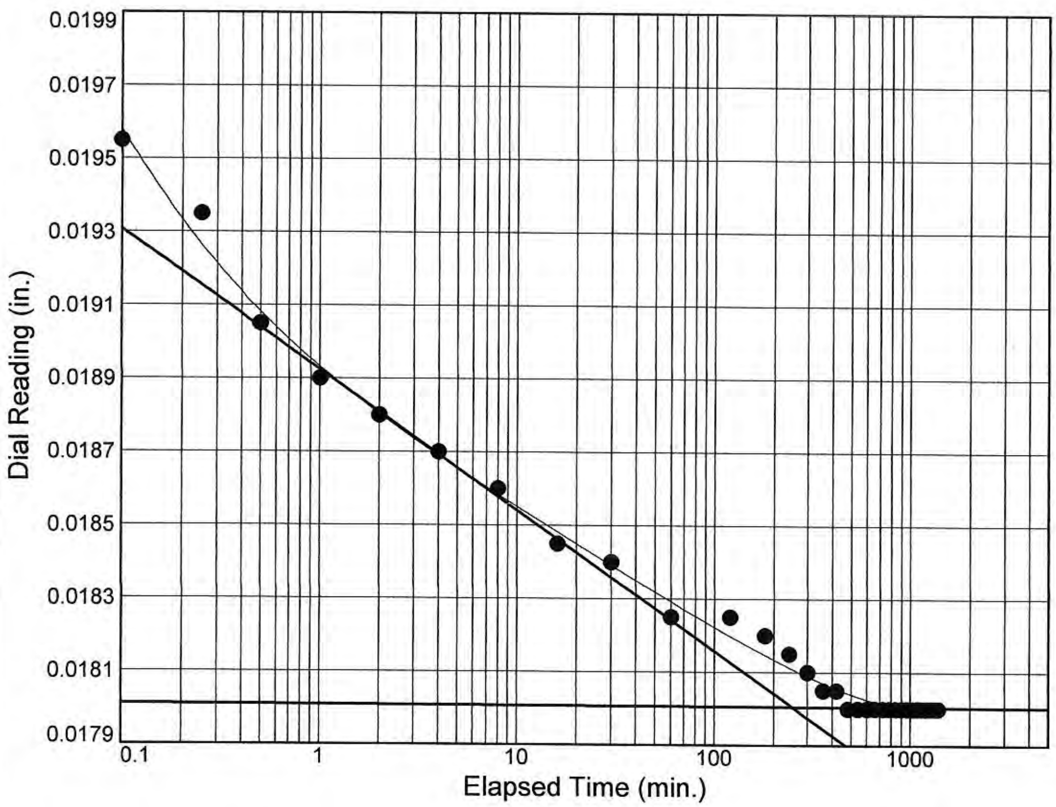
Figure

TOLUNAY-WONG ENGINEERS, INC.

Dial Reading vs. Time

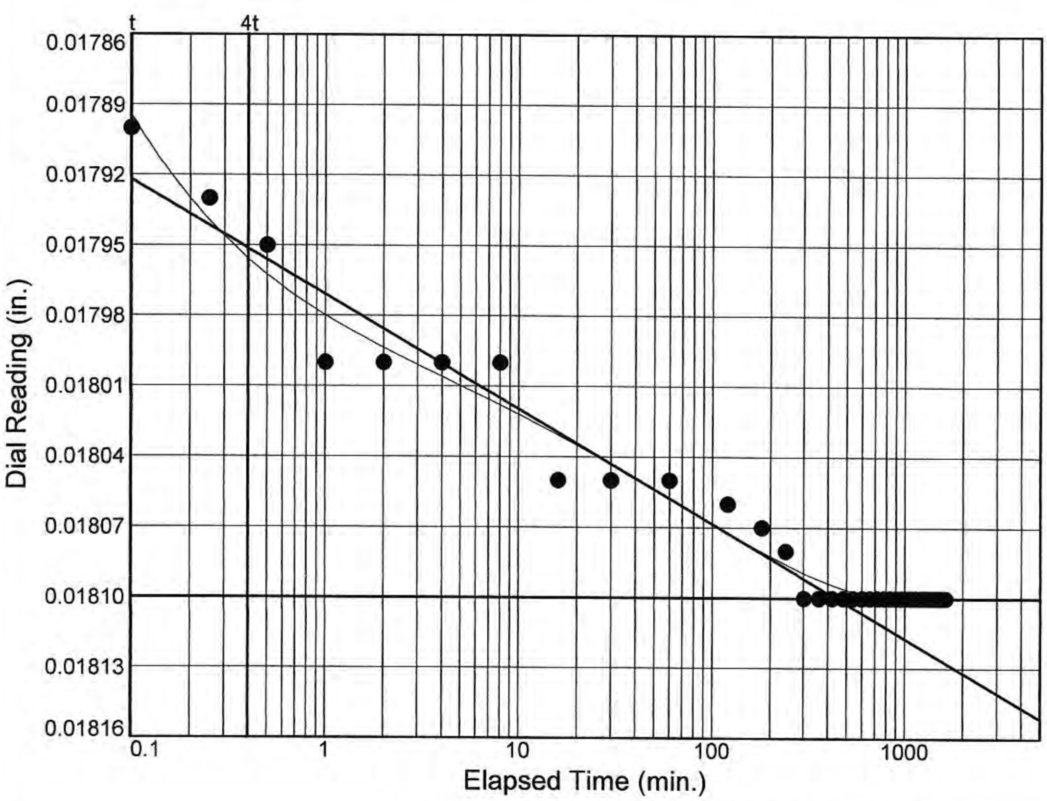
Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

Source of Sample: SJGB047 Depth: 48



Load No.= 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

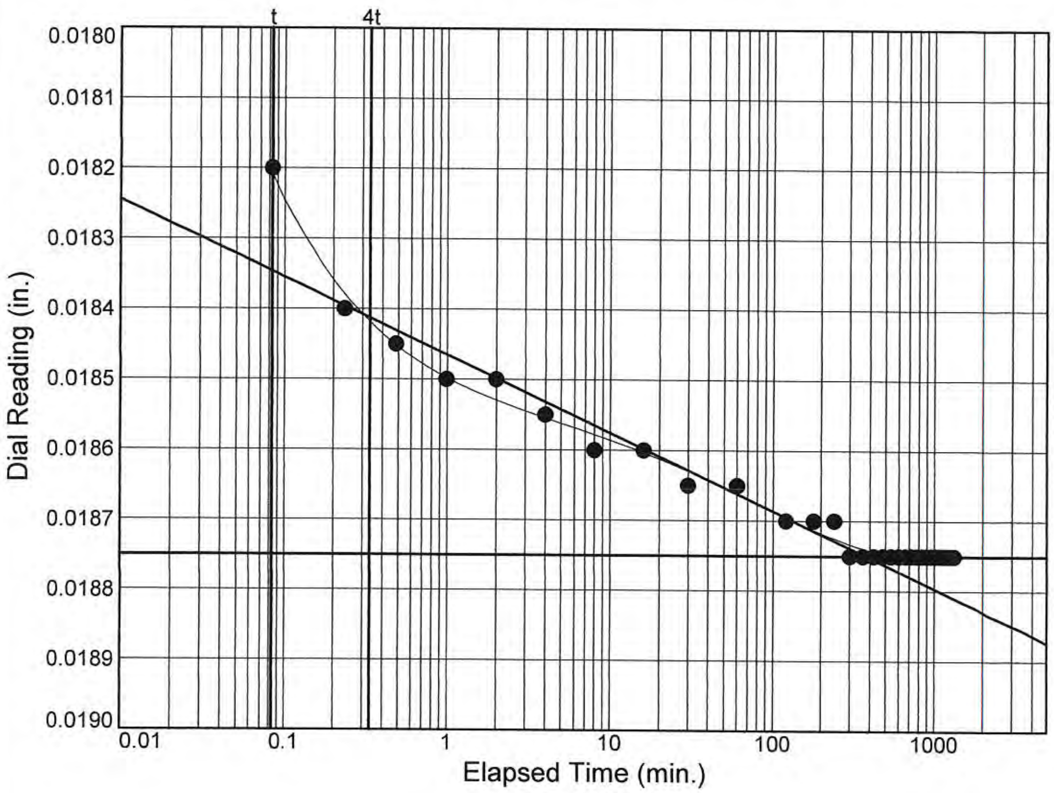
Figure

TOLUNAY-WONG ENGINEERS, INC.

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

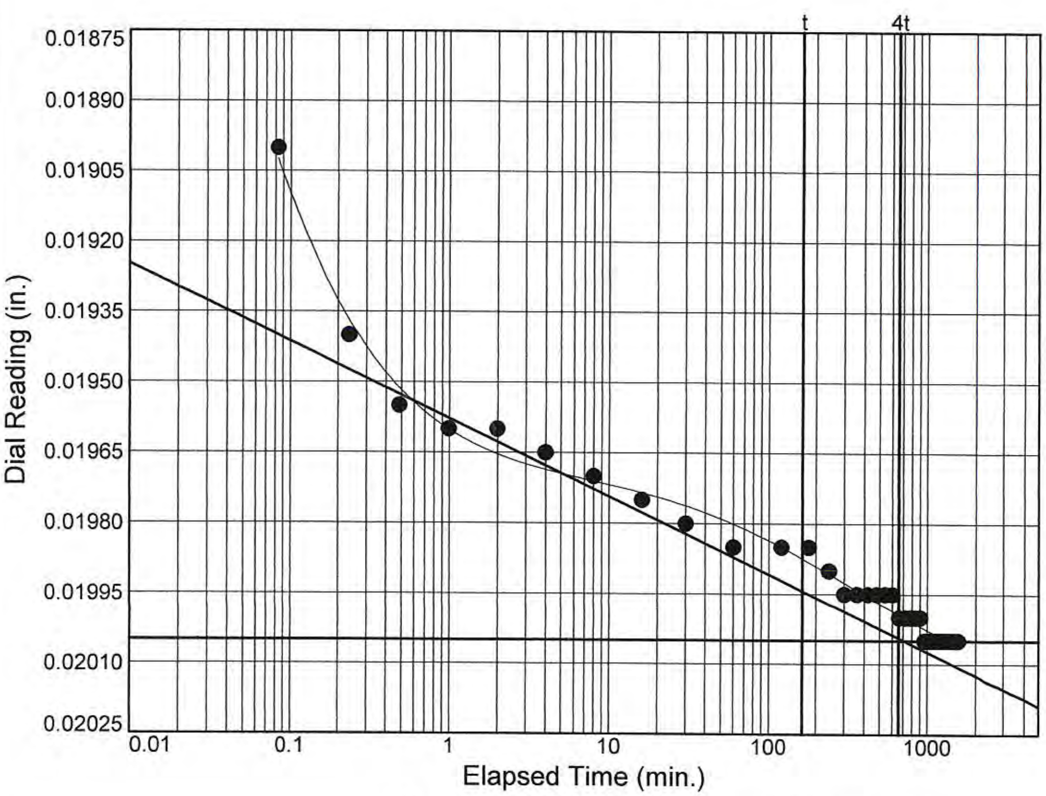
Source of Sample: SJGB047 Depth: 48



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

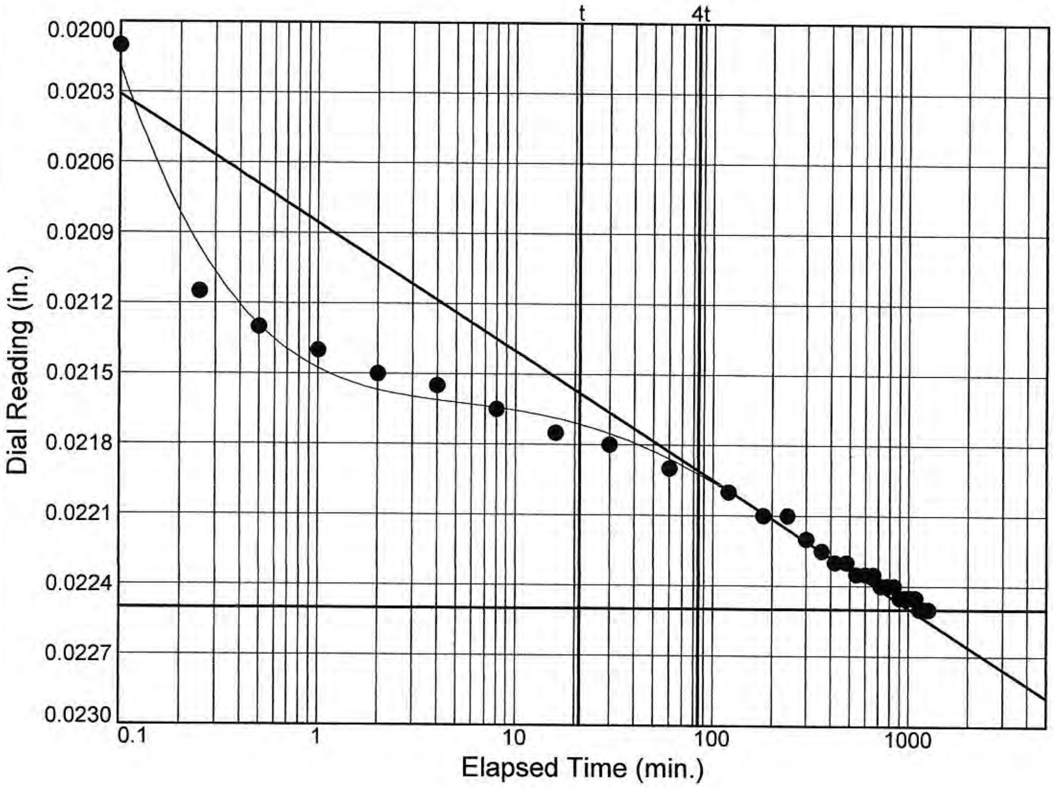
TOLUNAY-WONG ENGINEERS, INC.

Figure

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

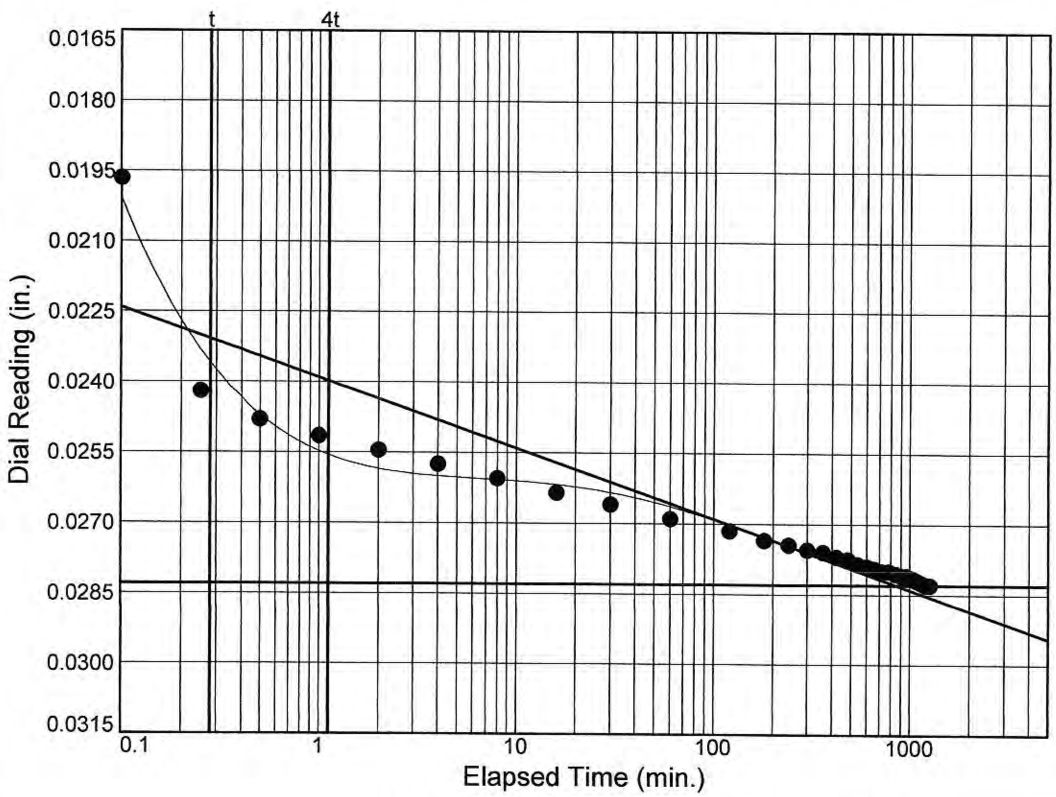
Source of Sample: SJGB047 Depth: 48



Load No.= 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.

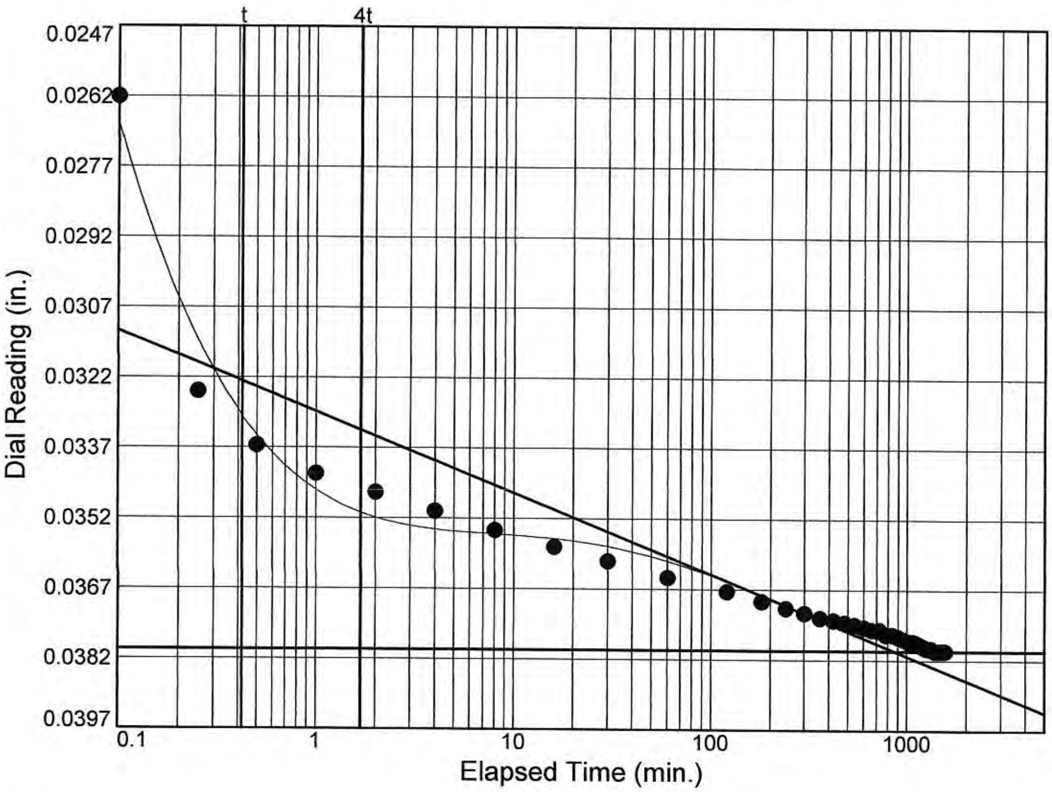
Figure

Attachment Figure B.2-212

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

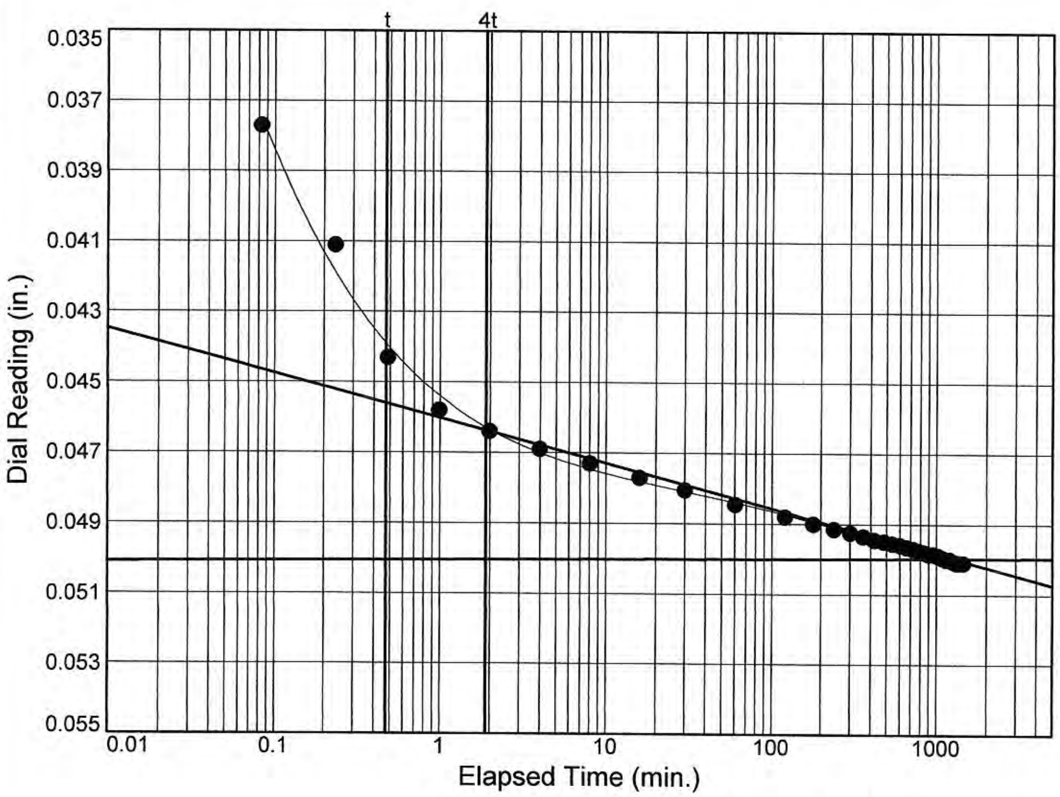
D_{100} = 0.0380

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.

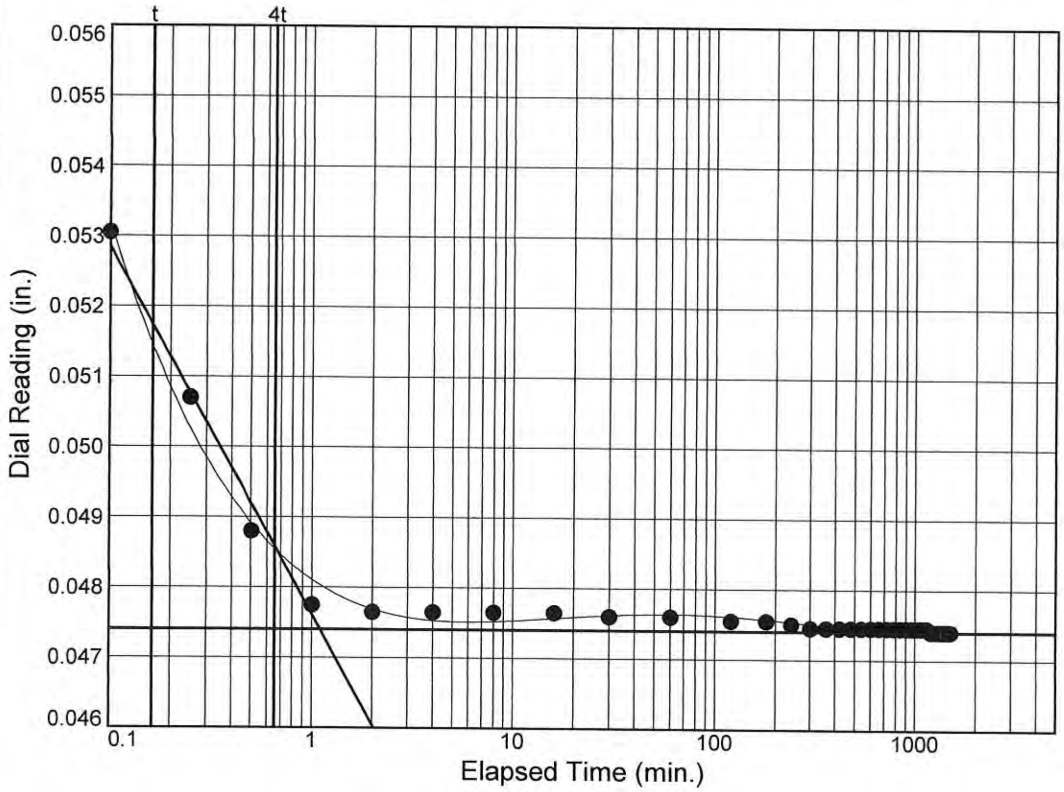
Figure

TOLUNAY-WONG ENGINEERS, INC.

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

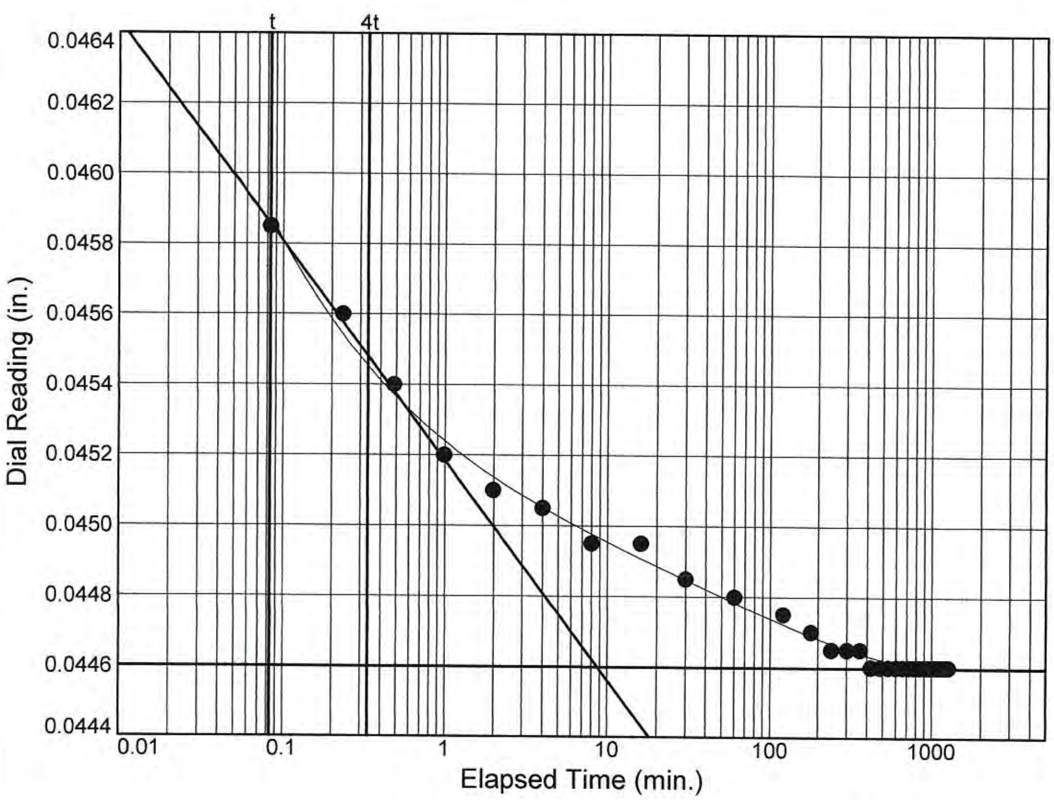
Source of Sample: SJGB047 Depth: 48



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.

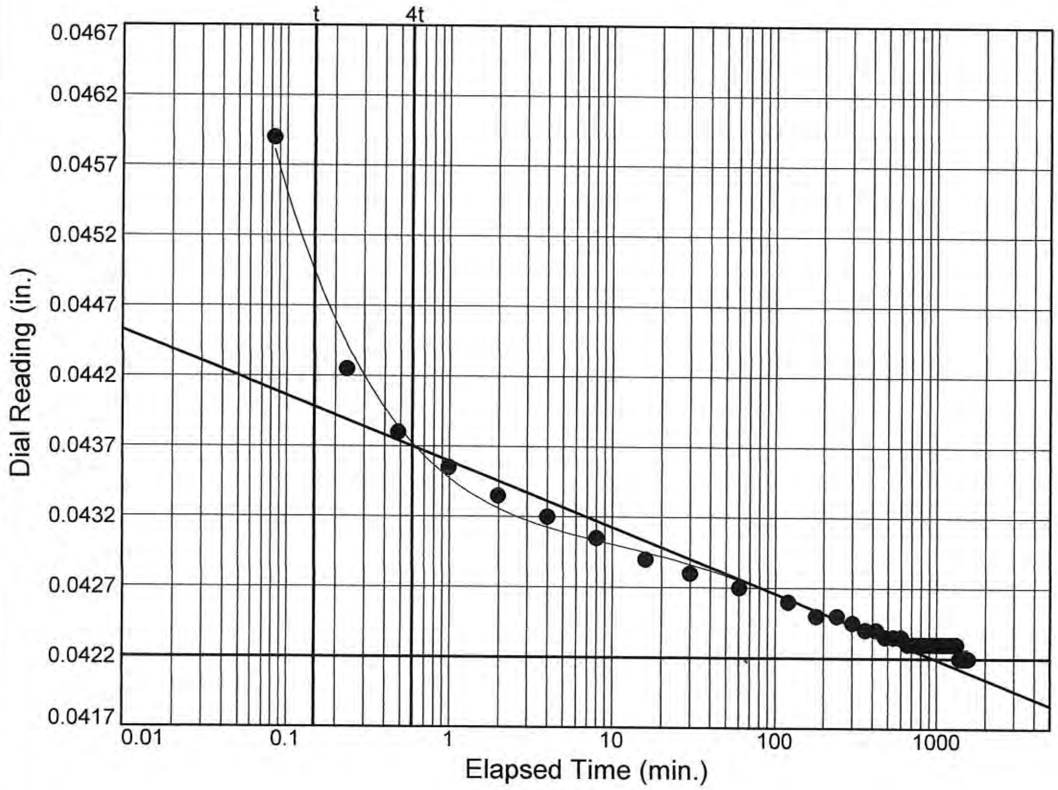
Figure

Attachment Figure B.2-214

Dial Reading vs. Time

Project No.: 19.15.131
Project: San Jacinto River Waste Pit Superfund Site

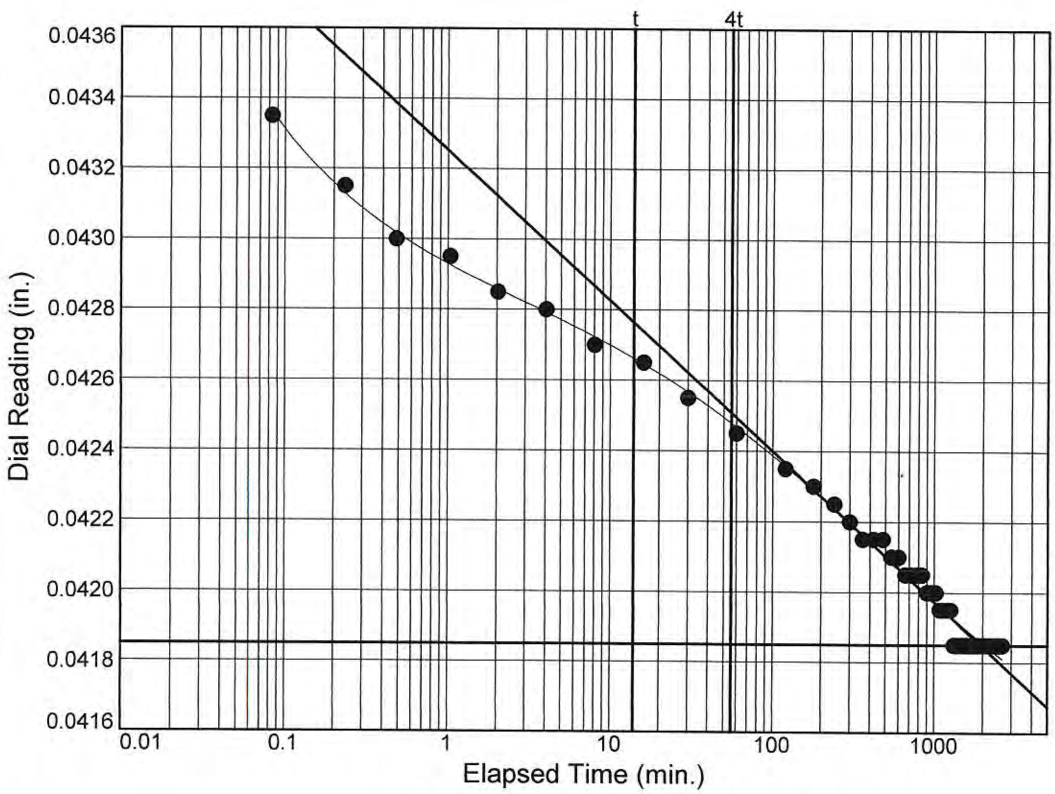
Source of Sample: SJGB047 Depth: 48



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

Attachment Figure B.2-215

Attachment C Supplemental Design Investigation (SDI) Geotechnical Data Report

Attachment C - 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

July 17, 2024

The Power of Commitment

Contents

Table index

Figure index

Appendices

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 lmpoundment 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 3.1 provides a summary of the geotechnical boring and CPT sounding coordinates, depths, and elevations.

Table 3.1 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 1 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 3.2.

Table 3.2 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 Appendix D. Results of the laboratory testing were used 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 4.1 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 4.1, below.

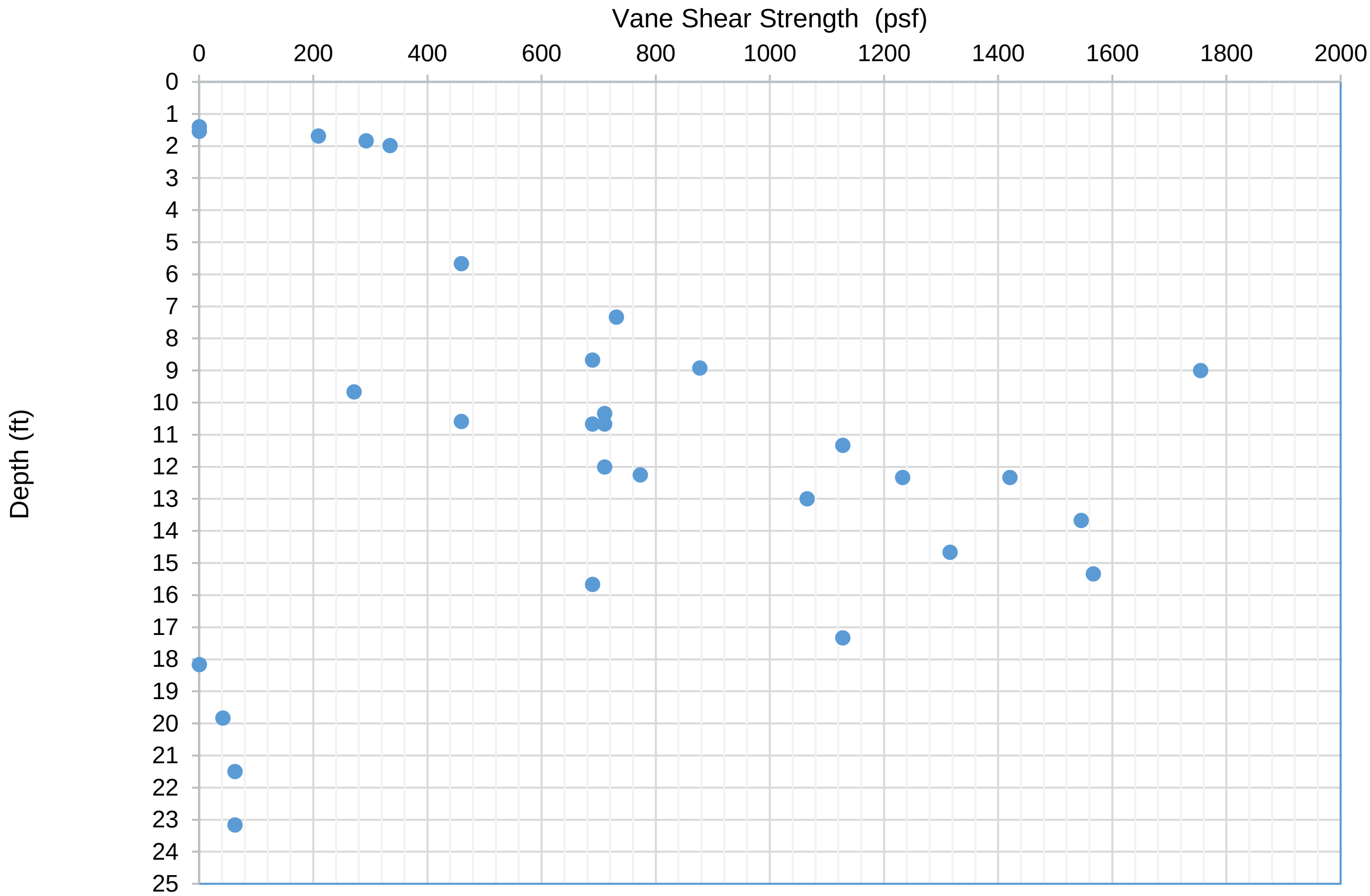


Figure 4.1 ***Vane Shear Strength Values in Surficial Alluvions***

The shear strength of the surficial alluvions were also obtained from one UU triaxial compression test. The measured value is presented in Table 4.1.

Table 4.1 ***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 4.2, and the detailed results are presented in Appendix D. The grain size analyses show 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 4.2 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 4.3 and presented in Appendix D. Atterberg limit results show a liquid limit in the range 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 4.3 and range from about 1,300 to 3,400 psf. The clay deposit can be characterized as stiff to very stiff.

Table 4.3 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 5.1 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.

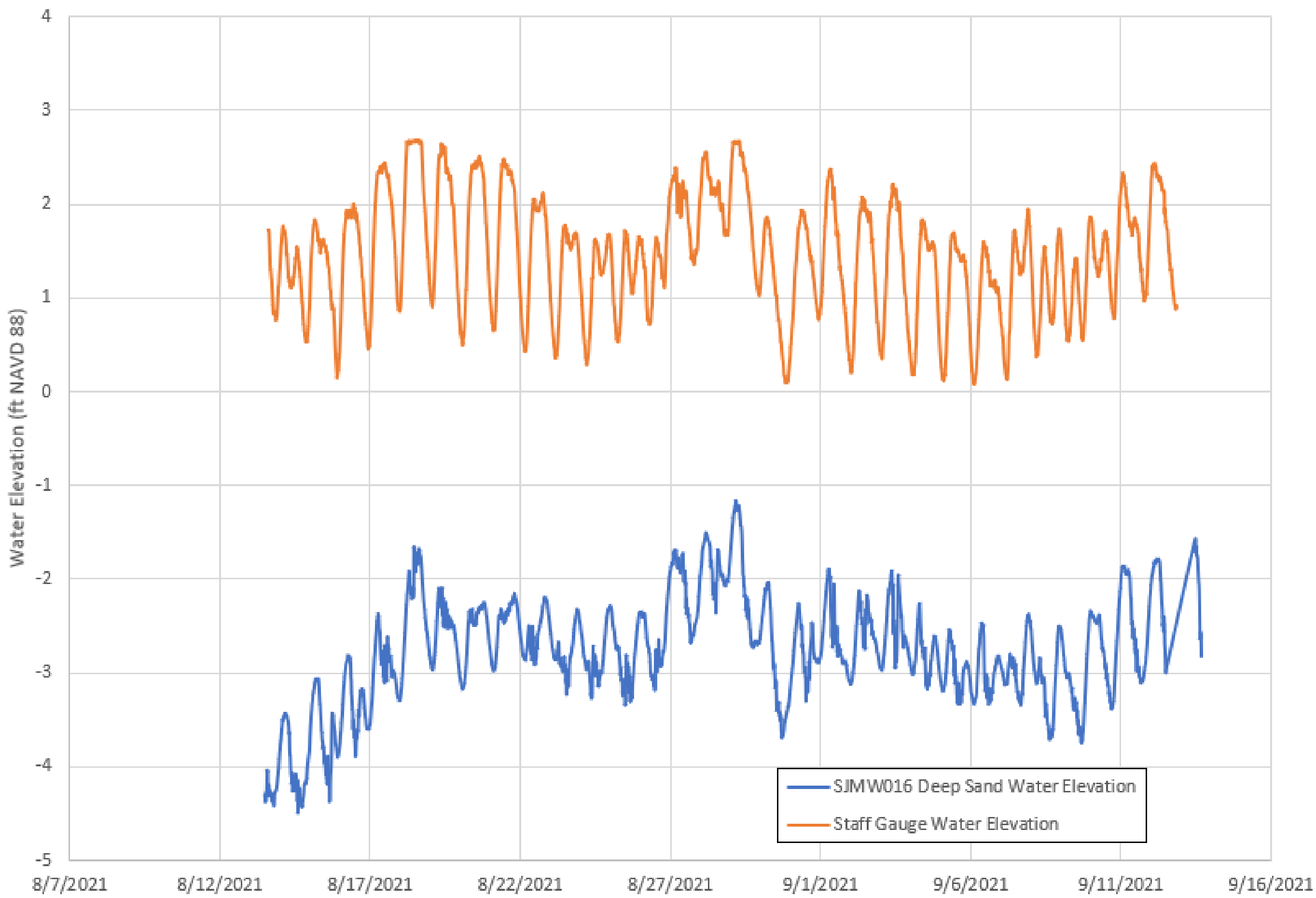


Figure 5.1 ***Variation of the Water Levels in the Beaumont Sand Formation and the San Jacinto River***

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.

The detailed hydraulic heave evaluation was detailed in the Updated Hydraulic Heave Analysis Report and is included as Attachment E to the 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.

Legend

- CPT Boring
- SDI Geotechnical Boring and Deep Piezometer Location
- SDI Geotechnical Boring and Deep Piezometer with SPT and Shelby Tubes
- BMP Alignment
- 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 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

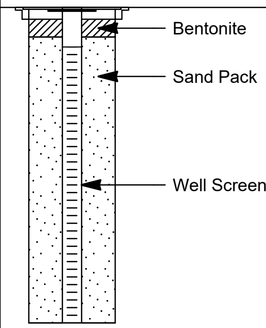
Appendix A

SDI Geotechnical Boring Logs

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
HOLE DESIGNATION: SJMW-14
PROJECT NUMBER: 11215702
DATE COMPLETED: 23 July 2021
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
DRILLING METHOD: Hollow Stem Auger
FIELD PERSONNEL: S. Saller
LOCATION: Channelview, TX
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	1.00					
2	ML-CLAYEY SILT, grey, wet						
4							
6		7.00					
	CL-SILTY CLAY, grey, moist	8.00					
8	END OF BOREHOLE @ 8.00ft BGS						
10							
12							
14							
16							
18							
20							
22							
24							
26							
28							
30							
32							
34							



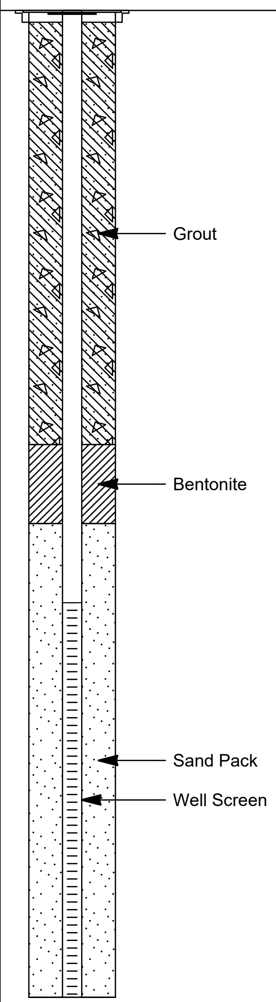
WELL DETAILS
Screened interval:
1.00 to 8.00ft BGS
Length: 7ft
Diameter: 2in
Slot Size: 0.01 in
Material: PVC
Sand Pack:
0.75 to 8.00ft BGS
Material: 20/40

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STRATIGRAPHIC AND INSTRUMENTATION LOG
(OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
HOLE DESIGNATION: SJMW-15
PROJECT NUMBER: 11215702
DATE COMPLETED: 24 July 2021
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
DRILLING METHOD: Hollow Stem Auger
FIELD PERSONNEL: S. Saller
LOCATION: Channelview, TX
DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	MONITOR INSTALLATION	SAMPLE NUMBER	SAMPLE INTERVAL	REC (%)	'N' Value
	ML-SANDY SILT, with gravel, grey, saturated	1.00					
2	ML-CLAYEY SILT, grey, wet - brown at 2.00ft BGS					65	
4	- wood at 4.50ft BGS						
6		7.00	Grout				
8	CL-SILTY CLAY, grey, moist - silty zone at 8.50ft BGS					70	
10		11.50					
12	SP-SAND, with clay, grey, saturated, few gravelly sand, clay in interbedded layers		Bentonite			70	
14		15.00					
16	CL-SILTY CLAY, grey, moist	17.50					
18	SP-SAND, with clay, grey, saturated, fine grained sand, clay in interbedded layers		Sand Pack			80	
20			Well Screen				
22							
24		25.00					
26	END OF BOREHOLE @ 25.00ft BGS						
28							
30							
32							
34							



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

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits	HOLE DESIGNATION: SJMW-16
PROJECT NUMBER: 11215702	DATE COMPLETED: 10 August 2021
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.	DRILLING METHOD: Mud Rotary
	FIELD PERSONNEL: S. Saller
LOCATION: Channelview, TX	DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	MONITOR INSTALLATION	SAMPLE NUMBER	INTERVAL	REC (%)	'N' Value
0–17	Not Sampled		Grout				
17–29	SC-CLAYEY SAND, grey, wet	17.00		ST-1			
				PMT-1			
				ST-2			
29–35	SP-SAND, grey, saturated	29.00		PMT-2			
35–	CL-SILTY CLAY, grey	35.00		ST-3 PMT-3			

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

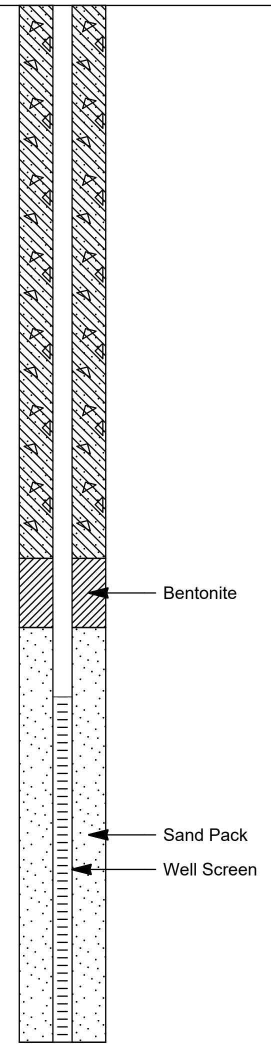
STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

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	SAMPLE NUMBER	'N' Value
40	CH-CLAY, grey, moist	40.00	ST-4	
			ST-5 PMT-4	
			ST-6 PMT-5	
			ST-7	
56	CL-CLAY, with sand, grey, moist	56.00	ST-8 PMT-6	
60	SM-SILTY SAND, grey, saturated	60.00	SPT-1	11/13/23
			SPT-2	8/11/15
70	END OF BOREHOLE @ 70.00ft BGS	70.00		

MONITOR INSTALLATION



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

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	INTERVAL	REC (%)	'N' Value
0	Not Sampled						
15	SP-SAND, grey, wet	15.00		PMT-1			
23	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

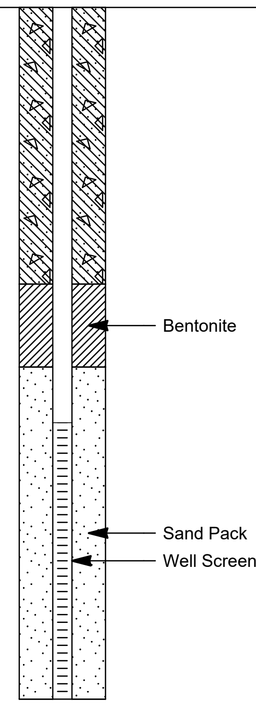
STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

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	SAMPLE NUMBER	INTERVAL	REC (%)	'N' Value
52			ST-4 PMT-5			
60	CH-CLAY, blue-grey, moist	60.00	ST-5 PMT-6			
65	SC-CLAYEY SAND, grey, wet	65.00	SPT-1			4/5/10
70			SPT-2 PMT-7			11/11/15
75	END OF BOREHOLE @ 75.00ft BGS	75.00				

MONITOR INSTALLATION



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

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STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
HOLE DESIGNATION: SJSB072
PROJECT NUMBER: 11215702
DATE COMPLETED: 20 July 2021
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
DRILLING METHOD: Direct Push
FIELD PERSONNEL: S. Saller
LOCATION: Channelview, TX
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

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	SAMPLE INTERVAL	REC (%)	'N' Value
0–2	SM-SILTY SAND, with gravel, brown, saturated	2.00	0-2ft	0–4	40	
2–10	ML-CLAYEY SILT, grey, wet, slight wood debris and gravel - glossy black silt, wet at 7.00ft BGS	10.00	2-4ft 4-6ft 6-8ft 8-10ft	4–10	80	
10–12	CL-SANDY CLAY, dark grey, wet	12.00	10-12ft	10–15	50	
12–18	SM-SILTY SAND, with clay, grey, saturated	18.00	12-14ft 14-16ft 16-18ft	15–20	90	
18–19	CL-SANDY CLAY, grey, wet	19.00	18-20ft			
19–24	SP-SAND, fine to medium grained, grey, saturated - 2-inch clay zone at 21.50ft BGS	24.00	20-22ft 22-24ft	20–24	80	
24	END OF BOREHOLE @ 24.00ft BGS					

Depth scale: 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

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
HOLE DESIGNATION: SJSB074
PROJECT NUMBER: 11215702
DATE COMPLETED: 22 July 2021
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
DRILLING METHOD: Direct Push
FIELD PERSONNEL: S. Saller
LOCATION: Channelview, TX
DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	SAMPLE NUMBER	INTERVAL	REC (%)	'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

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
HOLE DESIGNATION: SJSB075
PROJECT NUMBER: 11215702
DATE COMPLETED: 20 July 2021
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
DRILLING METHOD: Direct Push
FIELD PERSONNEL: S. Saller
LOCATION: Channelview, TX
DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	SAMPLE NUMBER	SAMPLE INTERVAL	REC (%)	'N' Value
0	ML-CLAYEY SILT, grey, wet, shells		0-2ft	0-5	50	
			2-4ft			
			4-6ft	5-10	70	
7	CL-SILTY CLAY, light grey, moist	7.00	6-8ft			
			8-10ft			
			10-12ft	10-15	60	
12	SM-SILTY SAND, slight clay, grey, wet	12.00	12-14ft			
	- sand zone, fine grained, saturated from 14.50 to 15.00ft BGS		14-16ft	15-20	80	
	- clayey zone from 15.50 to 16.00ft BGS		16-18ft			
	- medium grained sand zone, saturated from 19.00 to 19.50ft BGS		18-20ft			
	- saturated sands with some interbedded clay at 20.00ft BGS		20-22ft	20-24	75	
	- medium grained sand zone, saturated from 23.00 to 23.50ft BGS		22-24ft			
24	END OF BOREHOLE @ 24.00ft BGS	24.00				

Depth scale: 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

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	REC (%)	'N' Value
0–1	SM-GRAVELLY SILTY SAND, brown, saturated, shells	1.00	0-2ft	0-4	60	
1–6	ML-CLAYEY SILT, grey, wet	6.00	2-4ft, 4-6ft			
6–10	CL-SILTY CLAY, grey, moist, sparse shells	10.00	6-8ft, 8-10ft	4-10	40	
10–14.5	CL-SANDY CLAY, grey, moist, thin interbedded sand lenses	14.50	10-12ft, 12-14ft	10-15	60	
14.5–24	SP-SAND, with clay, fine grained sand, grey, saturated - 3-inch clay zone at 17.00ft BGS - 6-inch clay zone at 18.00ft BGS	24.00	14-16ft, 16-18ft, 18-20ft, 20-22ft, 22-24ft	15-20, 20-24	75, 100	
24	END OF BOREHOLE @ 24.00ft BGS					

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

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
0–2	SM-SILTY SAND, with gravel, brown, saturated, shells, rootlets	2.00
2–5	ML-SANDY SILT, brown, saturated, slight odor	5.00
5–12	ML-CLAYEY SILT, dark brown, saturated to wet - shift to dark grey at 8.00ft BGS	12.00
12–17	SM-SILTY SAND, grey, saturated	17.00
17–24	SP-SAND, fine grained, grey, saturated, with clay layers interbedded - 3-inch clay layer at 21.00ft BGS - 2-inch clay layer at 23.00ft BGS	24.00
24	END OF BOREHOLE @ 24.00ft BGS	

SAMPLE

NUMBER	INTERVAL (ft BGS)	REC (%)	'N' Value
0-2ft, 2-4ft	0–5	40	
4-6ft, 6-8ft, 8-10ft	5–10	70	
10-12ft, 12-14ft, 14-16ft	10–15	30	
16-18ft, 18-20ft	15–20	50	
20-22ft, 22-24ft	20–24	80	

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

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
0	ML-CLAYEY SILT, with sand, grey, saturated		0-2ft			
2	- sandy silt zone from 3.00 to 4.00ft BGS		2-4ft	0-5	50	
4			4-6ft			
6.5	CL-SILTY CLAY, grey, moist	6.50	6-8ft	5-10	80	
8			8-10ft			
11	SM-SILTY SAND, with clay, grey, saturated	11.00	10-12ft	10-15	80	
12			12-14ft			
14	- fine grained sand, saturated from 14.50 to 15.00ft BGS		14-16ft			
16	SP-SAND, with clay, grey, saturated	16.00	16-18ft	15-20	50	
18	- 2-inch clay zone at 18.50ft BGS		18-20ft			
20	- 2-inch clay zone at 20.00ft BGS		20-22ft	20-24	100	
22			22-24ft			
24	END OF BOREHOLE @ 24.00ft BGS	24.00				

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ◯

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
HOLE DESIGNATION: SJSB079
PROJECT NUMBER: 11215702
DATE COMPLETED: 25 July 2021
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
DRILLING METHOD: Direct Push
FIELD PERSONNEL: S. Saller
LOCATION: Channelview, TX
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					40	
			2-4ft			
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						
					40	
			12-14ft			
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			
22					60	
			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

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
HOLE DESIGNATION: SJSB080
PROJECT NUMBER: 11215702
DATE COMPLETED: 22 July 2021
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
DRILLING METHOD: Direct Push
FIELD PERSONNEL: S. Saller
LOCATION: Channelview, TX
DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	SAMPLE NUMBER	INTERVAL	REC (%)	'N' Value
0-2	ML-CLAYEY SILT, with shell gravel, brown, saturated	2.00	0-2ft		55	
2-5	SC-CLAYEY SAND, grey, wet, with wood debris and gravel	5.00	2-4ft			
			4-6ft			
5-11	SM-SILTY SAND, with shells, brown, saturated	11.00	6-8ft		15	
			8-10ft			
11-24	SP-SAND, with clay, fine grained sand, grey, saturated, interbedded clay zones	24.00	10-12ft			
	- 2-inch clay zone at 13.50ft BGS		12-14ft		45	
	- medium to fine grained sand zone at 14.50ft BGS		14-16ft			
	- 3-inch clay zone at 16.00ft BGS		16-18ft		70	
	- 1-inch clay zone at 19.50ft BGS		18-20ft			
	- 2-inch clay zone at 21.00ft BGS		20-22ft		70	
			22-24ft			
24	END OF BOREHOLE @ 24.00ft BGS					

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

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

STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS
CL-SILTY CLAY, cohesive, grey, wet, odor	3.00
CL-SILTY CLAY, cohesive, dark grey, dry -4-inch very thin layer of tan/grey fine to medium sand, loose, damp at 3ft BGS	5.00
SP-SAND, fine to medium grained, loose, grey/tan, damp, some organics	7.50
CL-SILTY CLAY, some fine to medium sand, grey, wet	10.50
SC-CLAYEY SAND, fine to coarse grained, slightly cohesive, grey, damp	16.00
SP-SAND, medium to coarse grained, loose, tan/grey, wet	22.50
CH-CLAY, very cohesive, slight plasticity, grey, dry	23.50
SP-SAND, medium to coarse grained, loose, tan/grey, damp	24.00
END OF BOREHOLE @ 24.00ft BGS	

SAMPLE NUMBER	INTERVAL	REC (%)	'N' Value
0-2ft	0-4	90	
2-4ft			
4-6ft	4-8	90	
6-8ft			
8-10ft	8-12	100	
10-12ft			
12-14ft	12-16	80	
14-16ft			
16-18ft	16-20	50	
18-20ft			
20-22ft	20-24	60	
22-24ft			

DEPTH ft BGS: 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

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					100	
			2-4ft			
4	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					100	
	SC-CLAYEY SAND, silty, fine grained, loose, grey, damp	7.00	6-8ft			
8						
			8-10ft			
10	CL-SILTY CLAY, with thin interbedded sand layers, grey, damp	10.00			100	
			10-12ft			
12	SC-CLAYEY SAND, medium to coarse grained, loose, grey, damp	12.00				
			12-14ft			
14	CL-SANDY CLAY, silty, medium grained, cohesive, low plasticity, grey, damp	14.00			100	
			14-16ft			
16						
			16-18ft			
18					80	
			18-20ft			
20	SP-SAND, fine to coarse grained, some clay, grey/tan, wet	19.50				
			20-22ft			
22					80	
			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

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
0	SW-SAND, medium to coarse grained, some silt, loose, grey, wet, odor	1.00
1	SP-SAND, fine to medium grained, loose, grey	2.00
2	CL-SILTY SANDY CLAY, fine grained, slightly cohesive, grey/brown, damp, odor	6.00
6	CL-SILTY CLAY, some medium gravel, slightly cohesive, grey, wet, odor	10.00
10	SC-CLAYEY SAND, medium to coarse grained, very low cohesiveness, grey, damp	17.00
17	SP-SAND, fine to coarse grained, loose, tan/grey, damp - shells observed in sand at 23.00ft BGS	24.00
24	END OF BOREHOLE @ 24.00ft BGS	

SAMPLE NUMBER	INTERVAL	REC (%)	'N' Value
0-2ft	0-4 ft	60	
2-4ft			
4-6ft	4-8 ft	45	
6-8ft			
8-10ft	8-12 ft	100	
10-12ft			
12-14ft	12-16 ft	70	
14-16ft			
16-18ft	16-20 ft	60	
18-20ft			
20-22ft	20-24 ft	50	
22-24ft			

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS (oval symbol)

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	SAMPLE INTERVAL	REC (%)	'N' Value
	CL-SILTY CLAY, loose, grey, wet, some cohesiveness, odor		0-2ft			
2					60	
			2-4ft			
4	SC-CLAYEY SAND, loose, grey, wet	3.50				
	CL-SANDY CLAY, silty, fine grained sand, grey, damp, some cohesiveness	5.00	4-6ft			
6					100	
			6-8ft			
8						
			8-10ft			
10					60	
	- very thin interbedded layers of fine to medium tan sand at 11.00ft BGS		10-12ft			
12						
			12-14ft			
14	- very thin interbedded layers of fine to medium tan sand at 14.00ft BGS				80	
			14-16ft			
16						
			16-18ft			
18	- light brown/tan medium sand at 18.00ft BGS				100	
	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			
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

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	SAMPLE INTERVAL	REC (%)	'N' Value
0–4	CL-SILTY CLAY, loose, slightly cohesive, dark grey, wet, odor - some organics at 3.50ft BGS	4.00	0-2ft 2-4ft	0–4	50	
4–7	SP-SAND, fine to medium grained, grey, damp	7.00	4-6ft 6-8ft	4–8	90	
7–8	SC-SANDY CLAY, silty, fine grained, grey, damp	8.00				
8–11	SP-SAND, fine grained, grey	11.00	8-10ft 10-12ft	8–12	55	
11–19	CL-SILTY CLAY, cohesive, grey, damp, very thin interbedded tan fine sand layers	19.00	12-14ft 14-16ft 16-18ft 18-20ft	12–16 16–20	60 80	
19–24	CL-SANDY CLAY, compact, slightly cohesive, low plasticity, very fine sand, grey/tan	24.00	20-22ft 22-24ft	20–24	90	
24	END OF BOREHOLE @ 24.00ft BGS					

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS (oval symbol)

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
HOLE DESIGNATION: SJSB086
PROJECT NUMBER: 11215702
DATE COMPLETED: 4 August 2021
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
DRILLING METHOD: Direct Push
FIELD PERSONNEL: B. North
LOCATION: Channelview, TX
DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS
0–2.00	CL-SILTY CLAY, with some medium sand-gravel, cohesive, grey, damp, odor	2.00
2.00–4.50	SC-CLAYEY SAND, fine to medium grained, slightly loose, grey/tan, damp, some organics	4.50
4.50–6.00	CL-SILTY CLAY, cohesive, low plasticity, grey, damp	6.00
6.00–11.00	SC-CLAYEY SAND, fine to medium grained, slightly loose, grey/tan, damp	11.00
11.00–16.00	CL-SANDY CLAY, silty, fine grained, dense, cohesive, some plasticity, grey, dry	16.00
16.00–19.50	CL-SILTY CLAY, cohesive, loose, grey, damp - hard from 19.00 to 19.50ft BGS	19.50
19.50–23.00	SP-SAND, medium to coarse grained, loose, tan/brown, damp	23.00
23.00–24.00	CH-CLAY, hard, cohesive, very low plasticity, grey, dry	24.00
24.00	END OF BOREHOLE @ 24.00ft BGS	

SAMPLE NUMBER	INTERVAL	REC (%)	'N' Value
0-2ft	0–4	60	
2-4ft			
4-6ft	4–8	60	
6-8ft			
8-10ft	8–12	80	
10-12ft			
12-14ft	12–16	100	
14-16ft			
16-18ft	16–20	80	
18-20ft			
20-22ft	20–24	60	
22-24ft			

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

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
0–0.20	GW-SAND AND GRAVEL, loose, tan/brown, damp	0.20
0.20–9.50	CL-SILTY CLAY, cohesive, some plasticity, grey, damp - odor from 1.00 to 4.00ft BGS - grey, fine to coarse sand, loose at 7.50ft BGS	9.50
9.50–11.00	SC-CLAYEY SAND, fine to medium grained, slightly cohesive to loose, grey, damp	11.00
11.00–12.50	CL-SILTY CLAY, cohesive, grey, damp	12.50
12.50–15.50	SC-CLAYEY SAND, grey, damp	15.50
15.50–16.00	CL-SILTY CLAY, cohesive, grey, damp	16.00
16.00–21.00	SC-CLAYEY SAND, fine to medium grained, slightly cohesive, grey, damp, some shells	21.00
21.00–24.00	SW-SAND, medium to coarse grained, loose, grey/tan, wet, some shells	24.00
24.00	END OF BOREHOLE @ 24.00ft BGS	

SAMPLE

NUMBER	INTERVAL	REC (%)	'N' Value
0-2ft, 2-4ft	0–4	70	
4-6ft, 6-8ft	4–8	60	
8-10ft, 10-12ft	8–12	100	
12-14ft, 14-16ft	12–16	100	
16-18ft, 18-20ft	16–20	80	
20-22ft, 22-24ft	20–24	100	

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

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			
2	CL-SANDY CLAY, silty, fine grained, cohesive, grey, damp	1.50	2-4ft		70	
4			4-6ft			
6			6-8ft		80	
8	SC-CLAYEY SAND, fine to coarse grained, grey/tan, damp	7.50				
	CL-SANDY CLAY, fine to medium grained, grey, damp	8.00	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

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
HOLE DESIGNATION: SJSB089
PROJECT NUMBER: 11215702
DATE COMPLETED: 7 August 2021
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
DRILLING METHOD: Direct Push
FIELD PERSONNEL: B. North
LOCATION: Channelview, TX
DRILLING COMPANY: WHE

STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS
CL-SANDY CLAY, silty, fine grained sand, cohesive, some gravel and organics, grey, damp, odor	3.50
SP-SAND, fine to medium grained, grey, damp	4.00
SC-CLAYEY SAND, medium to coarse grained,d slightly cohesive, grey, damp	10.50
CL-SILTY CLAY, slightly cohesive, grey, damp	11.00
SW-SAND, medium to coarse grained, loose, some clay, grey/tan, damp	15.50
CL-SILTY CLAY, cohesive, grey, dry	16.00
SP-SAND, medium to coarse grained, loose, grey/tan, wet	18.00
SW-SAND, coarse sand, with gravel, tan/grey, damp	18.50
CH-CLAY, hard, cohesive, very low plasticity, grey, dry - Refusal at 20.00ft BGS	20.00
END OF BOREHOLE @ 20.00ft BGS	

DEPTH ft BGS: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34

SAMPLE

NUMBER	INTERVAL	REC (%)	'N' Value
0-2ft	0-4	60	
2-4ft			
4-6ft	4-8	90	
6-8ft			
8-10ft	8-12	100	
10-12ft			
12-14ft	12-16	50	
14-16ft			
16-18ft	16-20	50	
18-20ft			

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

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	SAMPLE REC (%)	SAMPLE 'N' Value
	SW-SAND, fine to medium grained, some gravel, organics, grey/tan, damp					
	CL-SANDY CLAY, fine to medium grained sand, slightly cohesive, grey-tan, damp, odor	1.00	0-2ft			
2					60	
			2-4ft			
4						
			4-6ft			
6					65	
	SC-CLAYEY SAND, fine to medium grained, some organics, grey/tan, damp	6.50	6-8ft			
8	CL-SANDY CLAY, silty, fine grained sand, slightly cohesive, grey, damp	8.00				
			8-10ft			
	SP-SAND, some clay, fine to medium grained, loose, grey, damp	9.50				
10					80	
			10-12ft			
	CL-SILTY CLAY, cohesive, low plasticity, grey	11.50				
12						
			12-14ft			
	- interbedded thin grey/tan fine to medium sand layers at 13.50ft BGS					
14					100	
			14-16ft			
	- interbedded thin grey/tan fine to medium sand layers at 15.50ft BGS					
16						
	- interbedded thin grey/tan fine to medium sand layers at 17.00ft BGS		16-18ft			
18					60	
			18-20ft			
20						
	- interbedded thin grey/tan fine to medium sand layers at 20.50ft BGS		20-22ft			
22					50	
			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

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits | HOLE DESIGNATION: SJSB091
PROJECT NUMBER: 11215702 | DATE COMPLETED: 3 August 2021
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp. | DRILLING METHOD: Direct Push
FIELD PERSONNEL: B. North
LOCATION: Channelview, TX | DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' Value
	CL-SILTY CLAY, cohesive, low plasticity, grey, damp, some broken shells, organics		0-2ft			
2					60	
	SP-SAND, fine to medium grained, grey/tan/brown	3.00	2-4ft			
4						
	CL-SILTY CLAY, cohesive, low plasticity, grey, damp	5.00	4-6ft			
6					80	
			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

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
HOLE DESIGNATION: SJSB092
PROJECT NUMBER: 11215702
DATE COMPLETED: 25 July 2021
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
DRILLING METHOD: Direct Push
FIELD PERSONNEL: B. North
LOCATION: Channelview, TX
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					40	
			2-4ft			
4	CL-SANDY CLAY, fine to medium grained sand, silty, slightly cohesive, low plasticity, grey/brown, wet	4.00	4-6ft			
6					80	
			6-8ft			
8			8-10ft			
10					100	
	- very thin interbedded grey/tan medium sand layers, wet at 11.00ft BGS		10-12ft			
12			12-14ft			
14					100	
	SP-SAND, medium to coarse grained, loose, grey/tan, wet	14.50	14-16ft			
16			16-18ft			
18					80	
	CH-CLAY, hard, cohesive, some plasticity, grey-reddish brown, damp	19.00	18-20ft			
20			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

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
HOLE DESIGNATION: SJSB093
PROJECT NUMBER: 11215702
DATE COMPLETED: 24 August 2021
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
DRILLING METHOD: Direct Push
FIELD PERSONNEL: B. North
LOCATION: Channelview, TX
DRILLING COMPANY: WHE

STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS
SM-SILTY SAND, medium to coarse grained, grey, wet, odor	1.00
CL-SILTY CLAY, cohesive, low plasticity, grey, damp	3.50
SC-CLAYEY SAND, fine to medium grained, some cohesiveness, grey, damp	7.00
CL-SILTY CLAY, soft, some cohesiveness, grey, damp	15.50
SC-CLAYEY SAND, silty, fine to medium grained, grey, damp, with some shells	17.00
SW-SAND, tan and grey, wet, with shells and gravel	24.00
END OF BOREHOLE @ 24.00ft BGS	

SAMPLE NUMBER	INTERVAL	REC (%)	'N' Value
0-2ft	0-4 ft	100	
2-4ft			
4-6ft	4-8 ft	90	
6-8ft			
8-10ft	8-12 ft	100	
10-12ft			
12-14ft	12-16 ft	100	
14-16ft			
16-18ft	16-20 ft	50	
18-20ft			
20-22ft	20-24 ft	50	
22-24ft			

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

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	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' Value
0	CL-SANDY CLAY, silty, fine grained, loose, slightly cohesive, dark grey, wet, odor		0-2ft		90	
2			2-4ft			
4			4-6ft		100	
6			6-8ft			
8.50	SP-SAND, loose, grey/tan, wet	8.50	8-10ft		100	
10.50	CL-SANDY CLAY, silty, medium grained, cohesive, low plasticity, grey, damp	10.50	10-12ft			
12			12-14ft		50	
14			14-16ft			
16.00	SP-SAND, loose, grey/tan, wet	16.00				
16.50	CH-CLAY, hard, cohesive, some plasticity, grey-reddish brown, dry	16.50	16-18ft		60	
18			18-20ft			
20			20-22ft		60	
22			22-24ft			
24.00	END OF BOREHOLE @ 24.00ft BGS	24.00				

Depth scale (ft BGS): 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

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
HOLE DESIGNATION: SJSB095
PROJECT NUMBER: 11215702
DATE COMPLETED: 28 July 2021
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
DRILLING METHOD: Direct Push
FIELD PERSONNEL: B. North
LOCATION: Channelview, TX
DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	SAMPLE NUMBER	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' Value
	CL-SANDY CLAY, silty, fine grained, cohesive, low plasticity, dark grey, damp, odor		0-2ft			
2					100	
	SC-CLAYEY SAND, fine to medium grained, slightly cohesive to loose, grey, damp	3.00	2-4ft			
4			4-6ft			
6					90	
			6-8ft			
8	CL-SILTY CLAY, slightly cohesive to loose, grey, wet	8.50				
	SC-CLAYEY SAND, fine to medium grained, slightly cohesive to loose, grey, damp	9.50	8-10ft			
10					100	
			10-12ft			
12			12-14ft			
14					85	
	SP-SAND, medium to coarse grained, loose, grey, wet	15.00	14-16ft			
16			16-18ft			
18					100	
			18-20ft			
20	CH-CLAY, hard, grey-reddish brown, dry, some shells	21.00	20-22ft			
22					80	
			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

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
0–4	CL-SANDY CLAY, silty, fine grained, cohesive, loose, grey, wet, odor	4.00	0-2ft, 2-4ft		70	
4–7.5	SC-CLAYEY SAND, fine to medium grained, some cohesiveness, loose, grey, damp	7.50	4-6ft, 6-8ft		70	
7.5–12	CL-SANDY CLAY, silty, fine grained, cohesive, loose, grey, damp	12.00	8-10ft, 10-12ft		100	
12–18	SP-SAND, fine to coarse grained, some clay, slightly cohesive, loose, grey, wet	18.00	12-14ft, 14-16ft		75	
18–24	CH-CLAY, some medium to coarse gravel, low plasticity, hard, cohesive, light grey	24.00	16-18ft, 18-20ft		80	
			20-22ft, 22-24ft		60	
24	END OF BOREHOLE @ 24.00ft BGS					

Depth scale: 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

STRATIGRAPHIC LOG (OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
HOLE DESIGNATION: SJSB097
PROJECT NUMBER: 11215702
DATE COMPLETED: 22 August 2021
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
DRILLING METHOD: Direct Push
FIELD PERSONNEL: B. North
LOCATION: Channelview, TX
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

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

STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS (top)	DEPTH BGS (bottom)
CL-SILTY CLAY, with some large coarse gravel, loose, dark grey, wet		1.00
GW-GRAVEL, coarse grained, with some medium sand, tan/brown, wet	1.00	3.00
CL-SILTY CLAY, with some coarse gravel, dark grey, wet - soupy from 4.00 to 8.00ft BGS - cohesive, soft from 8.00 to 10.00ft BGS	3.00	10.00
SC-CLAYEY SAND, fine to medium grained, slightly cohesive, grey, damp	10.00	12.00
CL-SANDY CLAY, silty, fine grained, slightly cohesive, grey, damp	12.00	15.50
SC-CLAYEY SAND, medium to coarse grained, loose, grey, damp	15.50	16.00
SW-SAND, with coarse gravel, fine to medium grained sand, loose, tan/grey, damp to wet	16.00	24.00
END OF BOREHOLE @ 24.00ft BGS	24.00	

SAMPLE NUMBER	INTERVAL (ft BGS)	REC (%)	'N' Value
0-2ft, 2-4ft	0-4	60	
4-6ft, 6-8ft	4-8	25	
8-10ft, 10-12ft	8-12	25	
12-14ft, 14-16ft	12-16	25	
16-18ft, 18-20ft	16-20	45	
20-22ft, 22-24ft	20-24	15	

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ◯

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
HOLE DESIGNATION: SJSB099
PROJECT NUMBER: 11215702
DATE COMPLETED: 24 July 2021
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
DRILLING METHOD: Direct Push
FIELD PERSONNEL: S. Saller
LOCATION: Channelview, TX
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	1.00	0-2ft			
2	ML-CLAYEY SILT, dark grey, saturated, shells		2-4ft		30	
4		5.00				
	CL-SILTY CLAY, with shells, grey, moist	6.00	4-6ft			
6	CL-SANDY CLAY, grey, wet to moist, sand in interbedded layers		6-8ft		50	
8			8-10ft			
10		12.00	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		12-14ft		90	
14			14-16ft			
16		18.00	16-18ft		80	
18	SP-SAND, with clay, fien grained sand, grey, saturated, clay in interbedded layers		18-20ft			
20	- clay less with depth, saturated sand at 21.00ft BGS		20-22ft			
22		24.00	22-24ft		80	
24	END OF BOREHOLE @ 24.00ft BGS					
26						
28						
30						
32						
34						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

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
0	CL-SILTY CLAY, very slight cohesiveness, loose, grey, wet		0-2ft		30	
3.00	SC-CLAYEY SAND, silty, very fine grained, grey, damp	3.00	2-4ft, 4-6ft, 6-8ft		40	
9.50	SP-SAND, medium to coarse grained, loose, grey/tan, damp, with some shells	9.50	8-10ft, 10-12ft		75	
11.50	CH-CLAY, hard, cohesive, with some gravel, reddish-brown, dry	11.50				
12.50	CH-CLAY, cohesive, very hard, low plasticity, grey, dry	12.50	12-14ft, 14-16ft		90	
16.00	- Refusal at 16.00ft BGS END OF BOREHOLE @ 16.00ft BGS	16.00				

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

STRATIGRAPHIC LOG (OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits	HOLE DESIGNATION: SJSB101
PROJECT NUMBER: 11215702	DATE COMPLETED: 25 July 2021
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.	DRILLING METHOD: Direct Push
	FIELD PERSONNEL: S. Saller
LOCATION: Channelview, TX	DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	SAMPLE NUMBER	INTERVAL	REC (%)	'N' Value
0	SW-GRAVELLY SAND, brown, saturated, shells	0.50	0-2ft			
	ML-CLAYEY SILT, dark grey, saturated		2-4ft		40	
			4-6ft			
6	CL-SILTY CLAY, grey, moist	6.00	6-8ft			
7	SC-CLAYEY SAND, grey to light brown, saturated	7.00	8-10ft		70	
			10-12ft			
11	CL-SANDY CLAY, grey, wet	11.00	12-14ft		70	
13	SP-SAND, with clay, grey, saturated, clay interbedded in small layers	13.00	14-16ft			
			16-18ft		80	
18	- 1-inch clay zone at 18.00ft BGS		18-20ft			
			20-22ft			
22	- 1-inch clay zone at 22.00ft BGS		22-24ft		40	
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: 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	SAMPLE 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		0-2ft			
2	- thin tan interbedded fine to medium sand at 2.00ft BGS				90	
	- thin tan interbedded fine to medium sand at 3.50ft BGS		2-4ft			
4			4-6ft			
6	SP-SAND, fine to medium grained, some clay, some organics, tan/grey	6.00	6-8ft		60	
8	CL-SANDY CLAY, silty, fine grained, slightly cohesive, soft, low plasticity, grey, wet	8.50	8-10ft			
10			10-12ft		100	
12			12-14ft			
14			14-16ft		100	
16	- loose from 16.00 to 19.00ft BGS		16-18ft			
18			18-20ft		90	
20	- cohesive, hard, slightly plastic, dry at 20.00ft BGS		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

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							10
			2-4ft				
4							
			4-6ft				
6							20
			6-8ft				
8	SW-SAND, with some gravel, medium to very coarse grained, loose, tan, wet, some shells	8.00					
			8-10ft				
10							30
			10-12ft				
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

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
HOLE DESIGNATION: SJSB104
PROJECT NUMBER: 11215702
DATE COMPLETED: 24 July 2021
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
DRILLING METHOD: Direct Push
FIELD PERSONNEL: B. North
LOCATION: Channelview, TX
DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	SAMPLE NUMBER	SAMPLE INTERVAL	REC (%)	'N' Value
	CL-SILTY CLAY, with some gravel, slightly cohesive, dark grey, wet		0-2ft			
2			2-4ft		90	
	SP-SAND, fine to medium grained, with some clay, loose, grey, wet	3.50				
4	CL-SANDY CLAY, silty, fine grained, slightly cohesive, low plasticity, grey, damp	4.00	4-6ft			
6			6-8ft		100	
8			8-10ft			
10			10-12ft		100	
12	SP-SAND, medium to coarse grained, loose, light grey/tan, damp	12.00	12-14ft			
14			14-16ft		45	
16	CL-SANDY CLAY, fine grained sand, hard, cohesive, some plasticity, grey/brown, dry	16.00	16-18ft			
18			18-20ft		55	
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

STRATIGRAPHIC LOG
(OVERBURDEN)

PROJECT NAME: San Jacinto River Waste Pits
HOLE DESIGNATION: SJSB105
PROJECT NUMBER: 11215702
DATE COMPLETED: 23 July 2021
CLIENT: International Paper Co. & McGinnis Industrial Maintenance Corp.
DRILLING METHOD: Direct Push
FIELD PERSONNEL: B. North
LOCATION: Channelview, TX
DRILLING COMPANY: WHE

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH BGS	SAMPLE NUMBER	SAMPLE INTERVAL	REC (%)	'N' Value
0–5	CL-SANDY CLAY, silty, fine grained sand, slightly cohesive, grey, wet		0-2ft, 2-4ft	0–4	60	
5–6.5	SP-SAND, some clay, fine to medium gtrained, loose, slightly cohesive, grey, damp	5.00	4-6ft, 6-8ft	4–8	100	
6.5–11	CL-SANDY CLAY, silty, fine grained sand, slightly cohesive, grey, wet	6.50	8-10ft, 10-12ft	8–12	80	
11–15	SC-CLAYEY SAND, fine to medium grained, loose, grey, damp	11.00	12-14ft, 14-16ft	12–16	100	
15–17	CL-SILTY CLAY, cohesive, low plasticity, grey, damp	15.00				
17–19	SP-SAND, fine to very fine, compact, with some clay, grey, damp	17.00	16-18ft, 18-20ft	16–20	90	
19–24	CH-CLAY, hard, cohesive, low plasticity, some medium to coarse gravel, grey/tan, dry	19.00	20-22ft, 22-24ft	20–24	60	
24	END OF BOREHOLE @ 24.00ft BGS	24.00				

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS (oval symbol)

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	SAMPLE INTERVAL	SAMPLE REC (%)	SAMPLE 'N' Value
0–2	CL-SILTY CLAY, some fine sand, cohesive, brown, wet, some organics	2.00	0-2ft, 2-4ft	0–4	60	
2–6	CL-SILTY CLAY, cohesive, dark grey, damp, odor	6.00	4-6ft, 6-8ft	4–8	60	
6–8	SC-CLAYEY SAND, fine to medium grained, loose, grey, damp	8.00				
8–9.5	CL-SILTY CLAY, cohesive, dark grey, damp, odor	9.50	8-10ft, 10-12ft	8–12	95	
9.5–19	CL-SANDY CLAY, silty, fine grained, cohesive, some plasticity, grey/brown, damp	19.00	12-14ft, 14-16ft, 16-18ft, 18-20ft	12–16, 16–20	100, 100	
19–20	SP-SAND, medium to coarse grained, loose, grey/tan, damp	20.00				
20–24	CH-CLAY, hard, cohesive, low plasticity, with some gravel, grey, dry, interbedded reddish brown	24.00	20-22ft, 22-24ft	20–24	100	
24	END OF BOREHOLE @ 24.00ft BGS					

Depth scale: 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

Appendix B

SDI Cone Penetration Test (CPT) Results

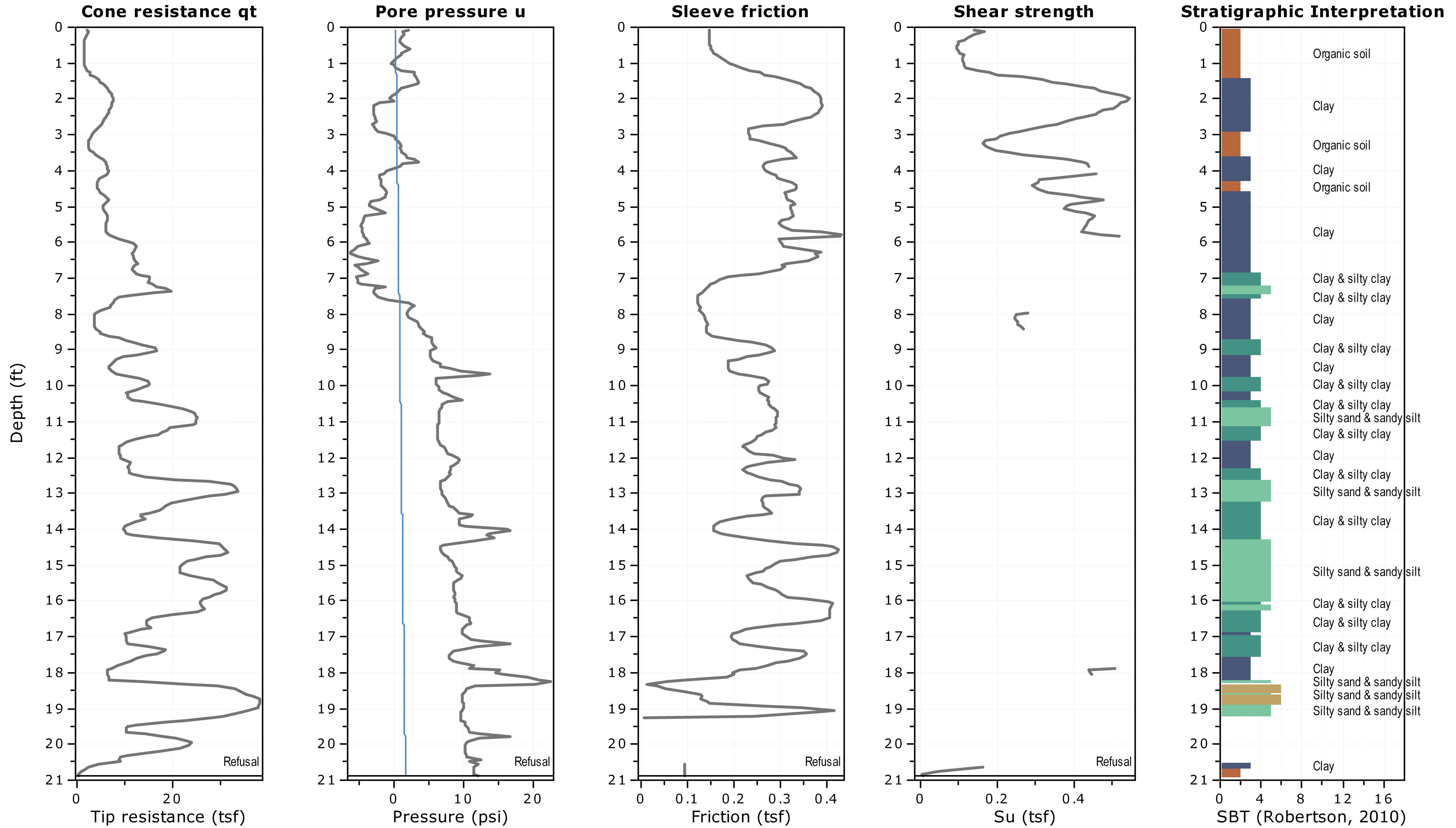
Project: 11215702

Location: San Jacinto River

CPT: SJSCPT-01B

Total depth: 20.89 ft, Date: 9/8/2021

Cone Operator: Tolunay-Wong Engineers, Inc.



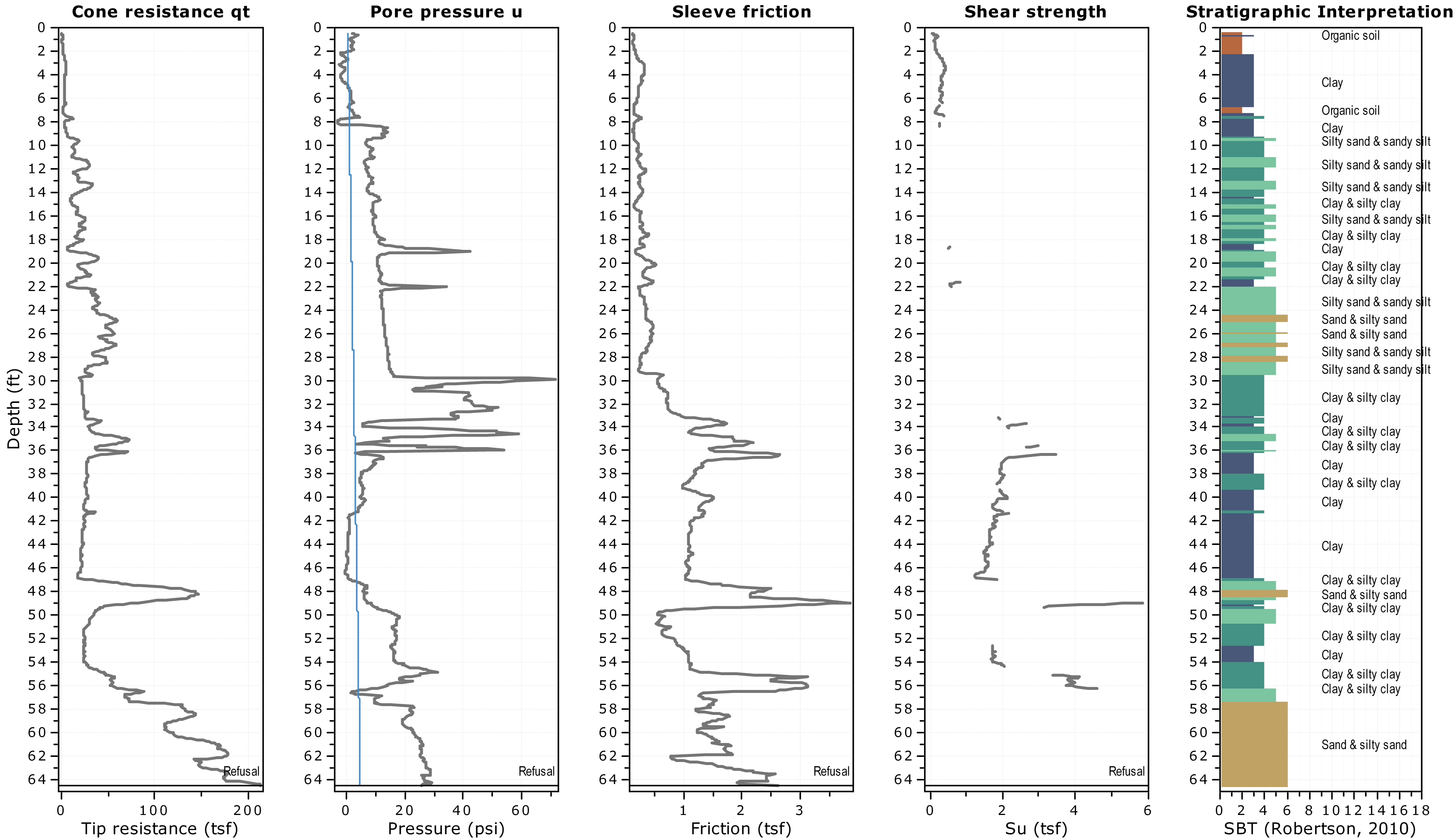
CPT: SJSCPT-01D

Project: 11215702

Location: San Jacinto River

Total depth: 64.45 ft, Date: 9/9/2021

Cone Operator: Tolunay-Wong Engineers, Inc.



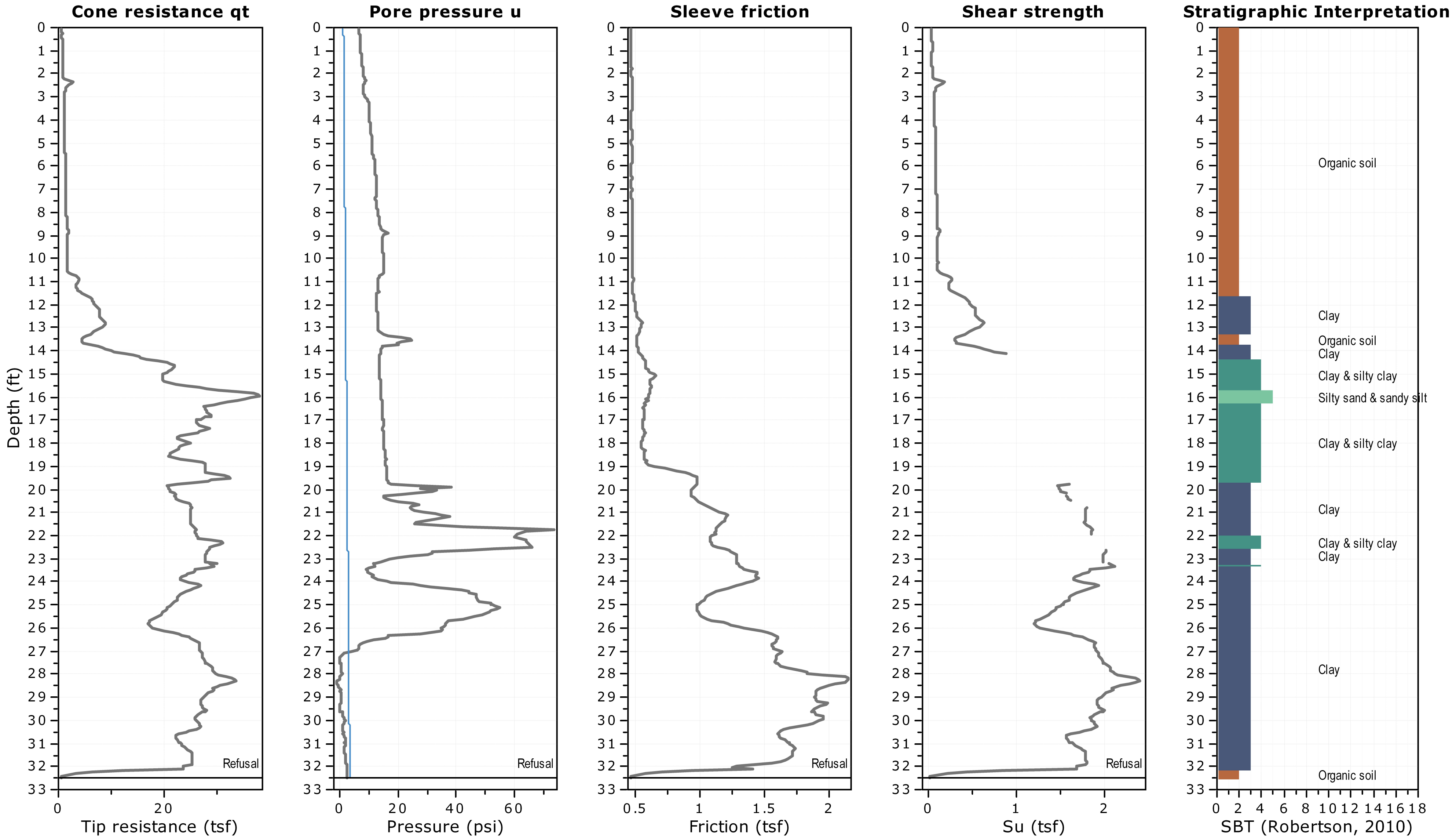
CPT: SJSCPT-02

Project: 11215702

Location: San Jacinto River

Total depth: 32.50 ft, Date: 9/10/2021

Cone Operator: Tolunay-Wong Engineers, Inc.



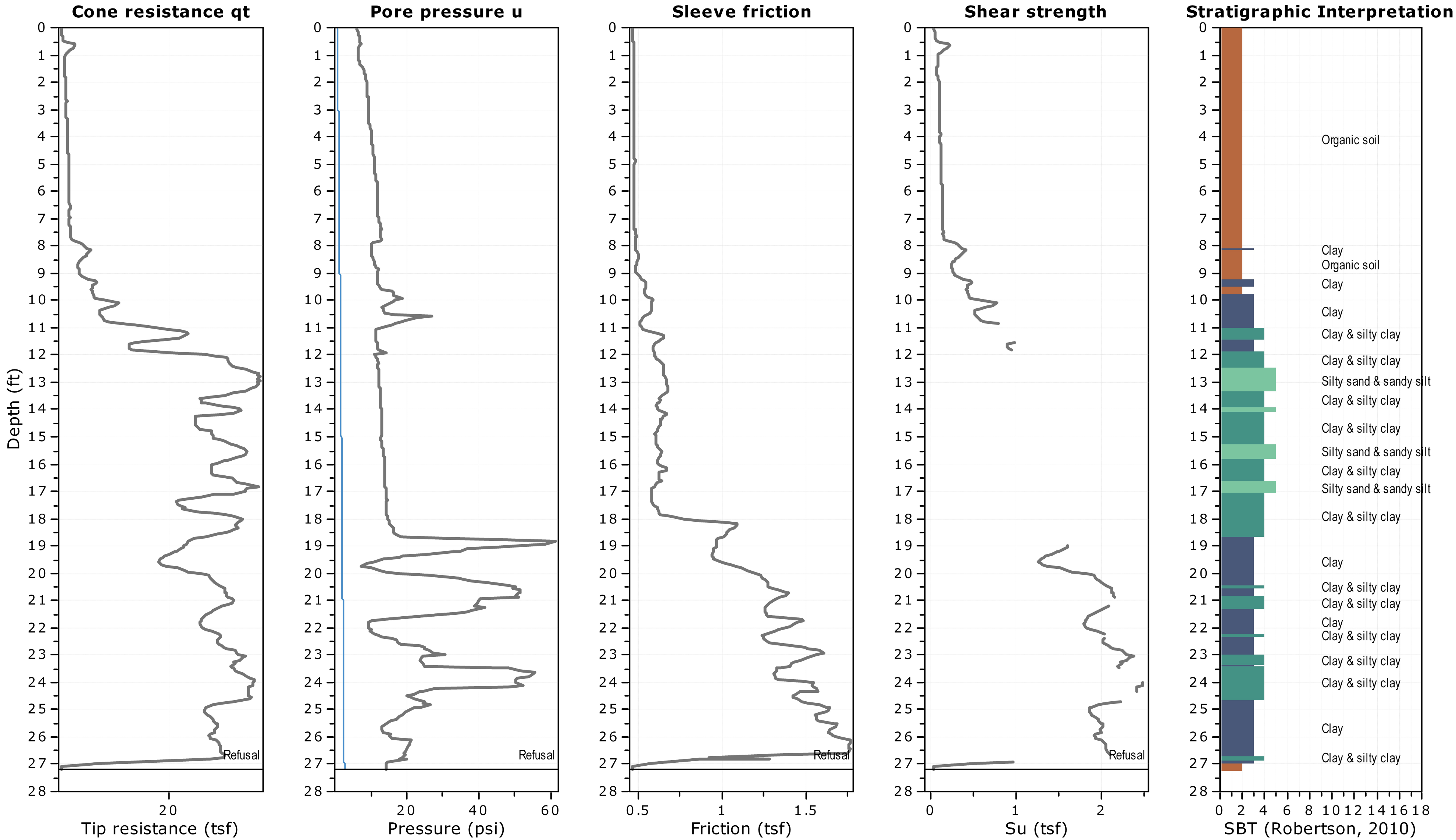
Project: 11215702

Location: San Jacinto River

CPT: SJSCPT-02A

Total depth: 27.17 ft, Date: 9/10/2021

Cone Operator: Tolunay-Wong Engineers, Inc.



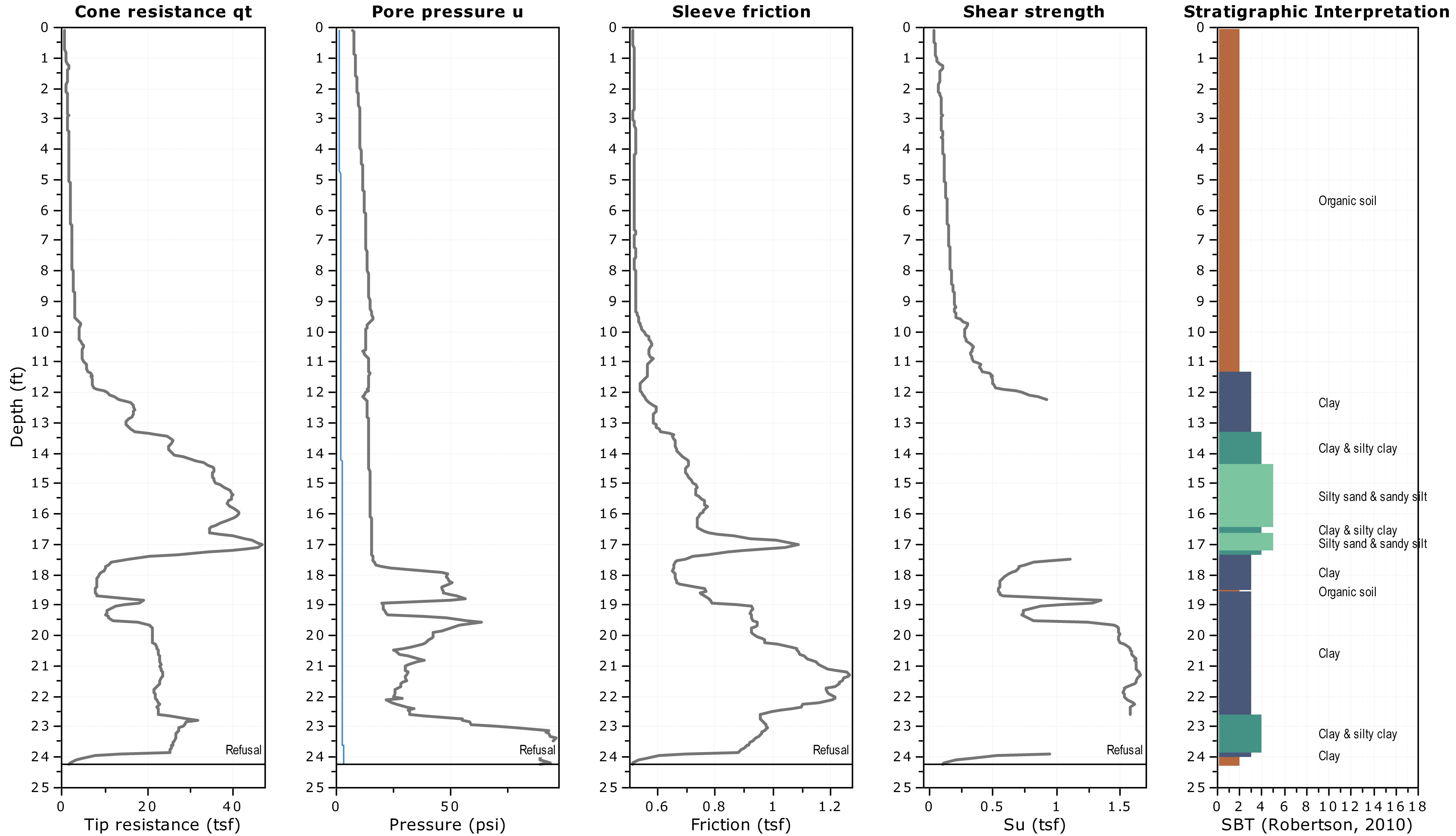
Project: 11215702

Location: San Jacinto River

CPT: SJSCPT-03

Total depth: 24.24 ft, Date: 9/12/2021

Cone Operator: Tolunay-Wong Engineers, Inc.



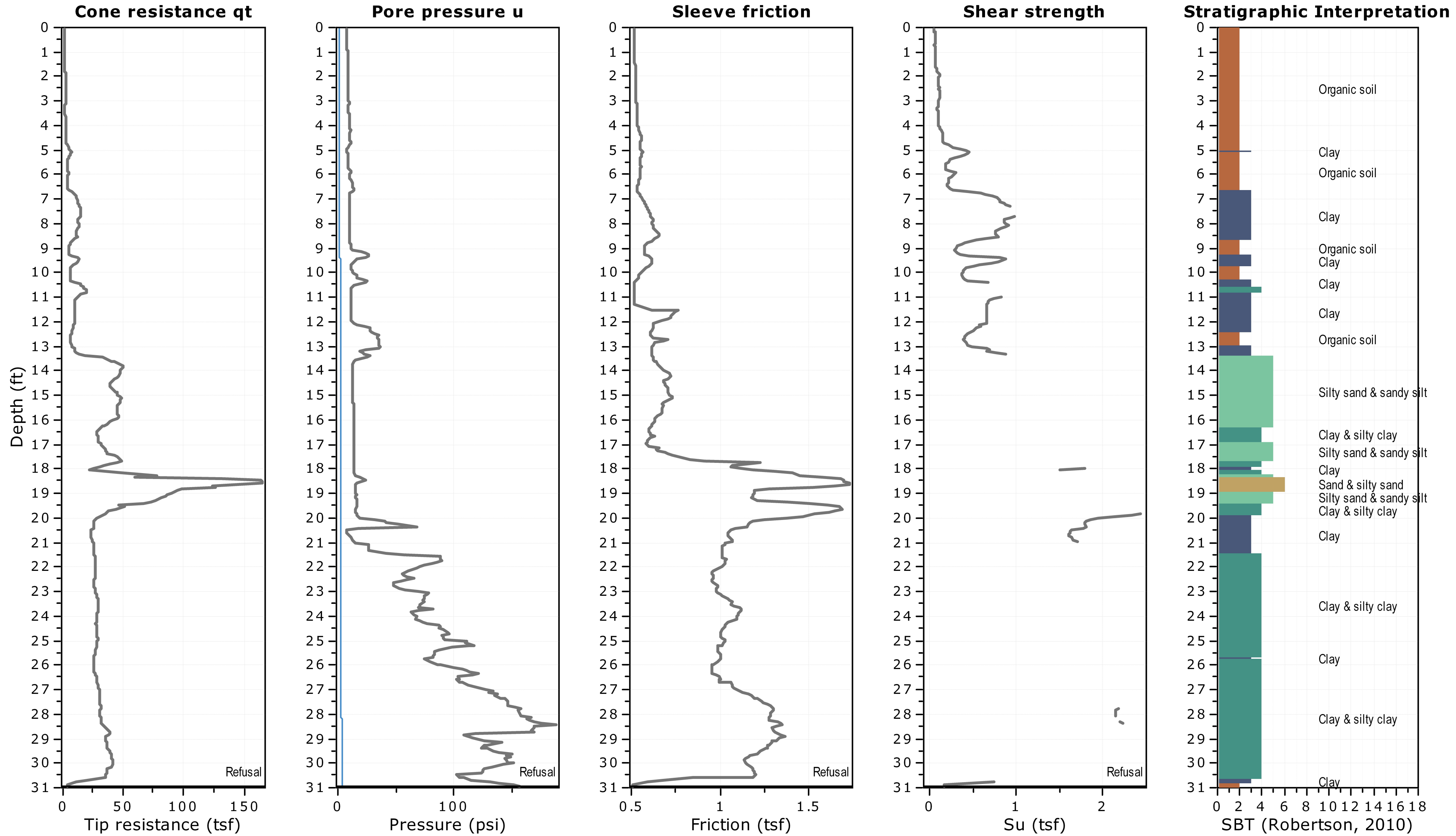
Project: 11215702

Location: San Jacinto River

CPT: SJSCPT-04

Total depth: 30.93 ft, Date: 9/12/2021

Cone Operator: Tolunay-Wong Engineers, Inc.



GHD

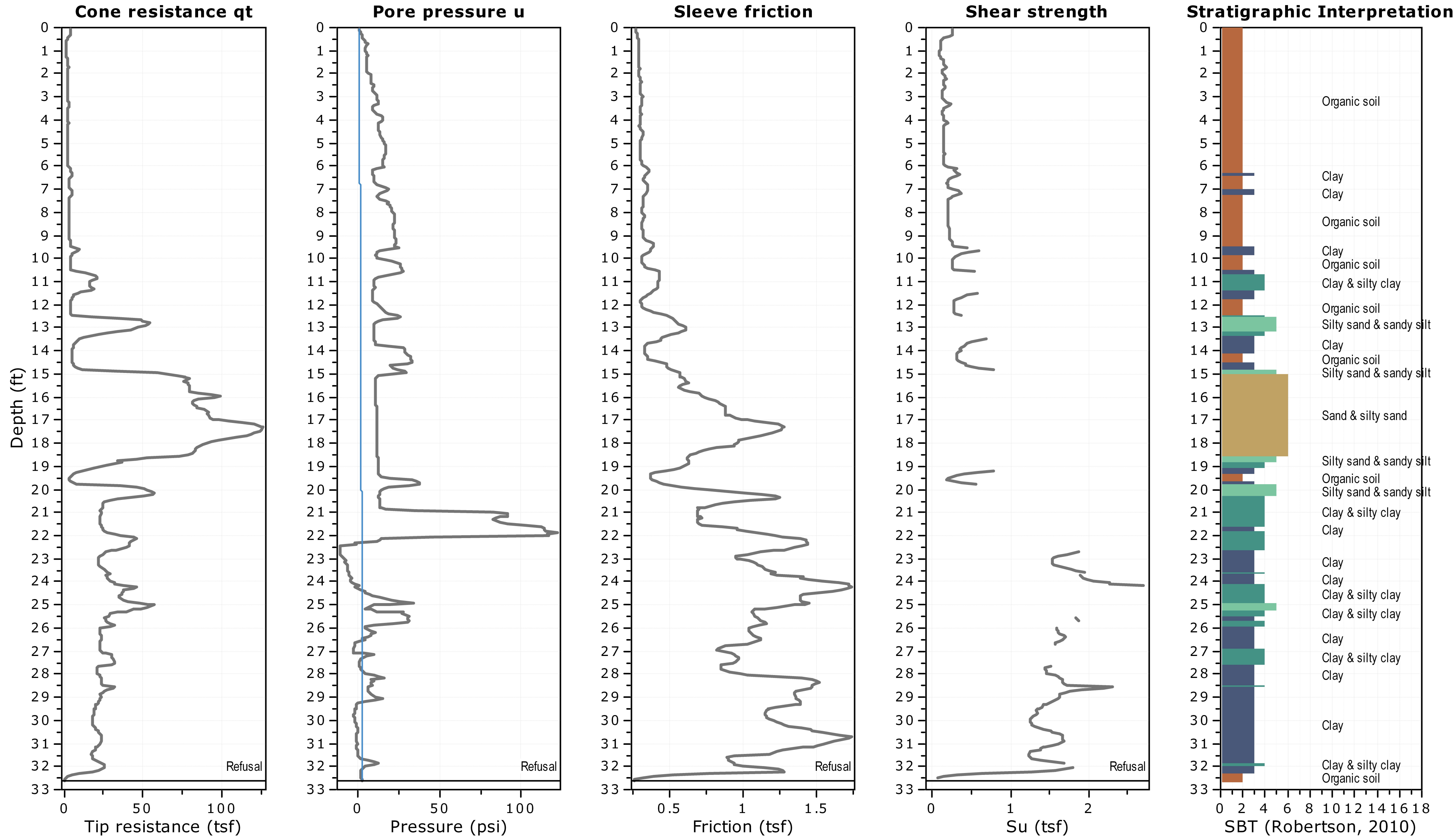
Project: 11215702

Location: San Jacinto River

CPT: SJSCPT-08

Total depth: 32.62 ft, Date: 9/11/2021

Cone Operator: Tolunay-Wong Engineers, Inc.



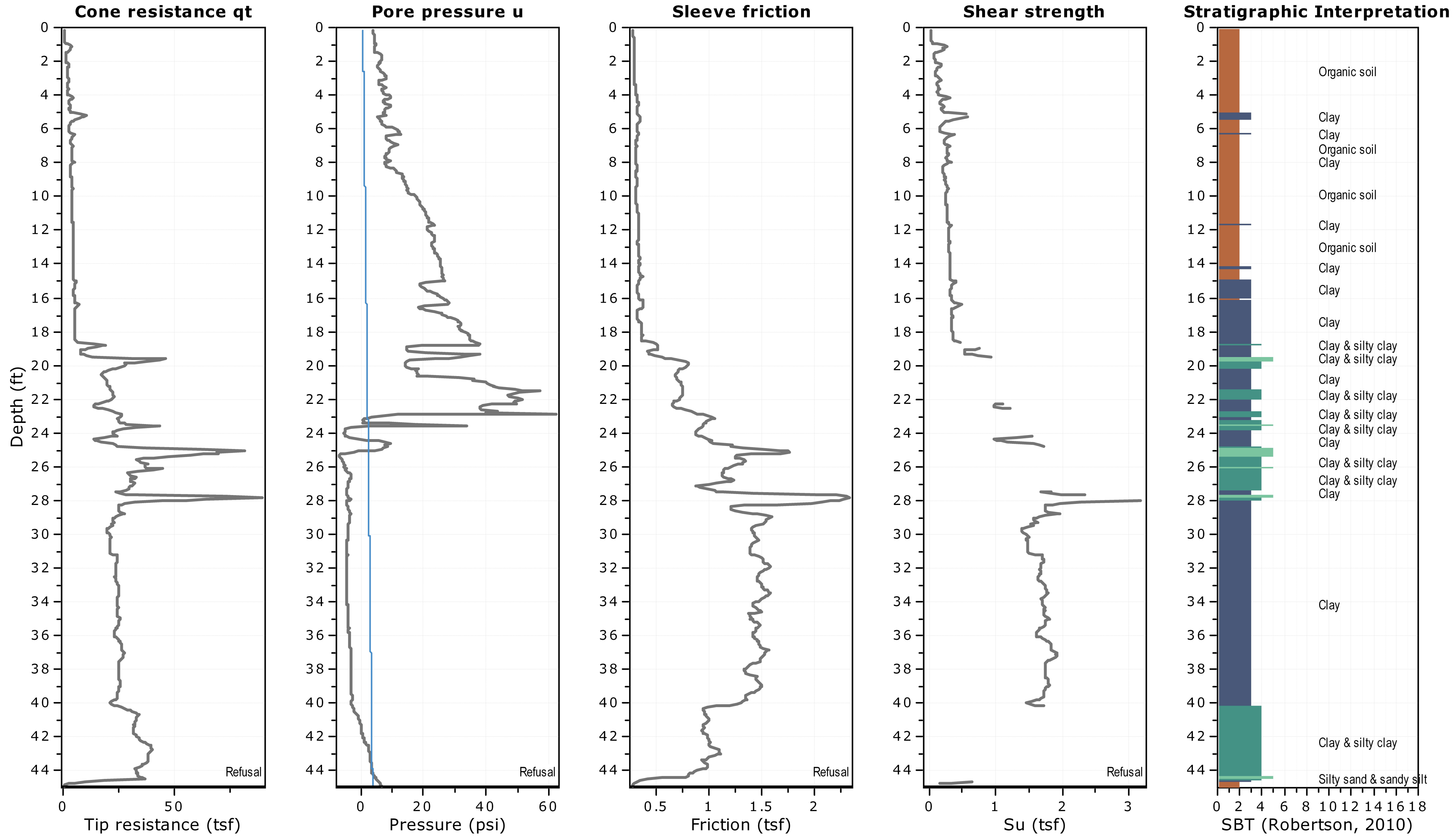
CPT: SJSCPT-09

Project: 11215702

Location: San Jacinto River

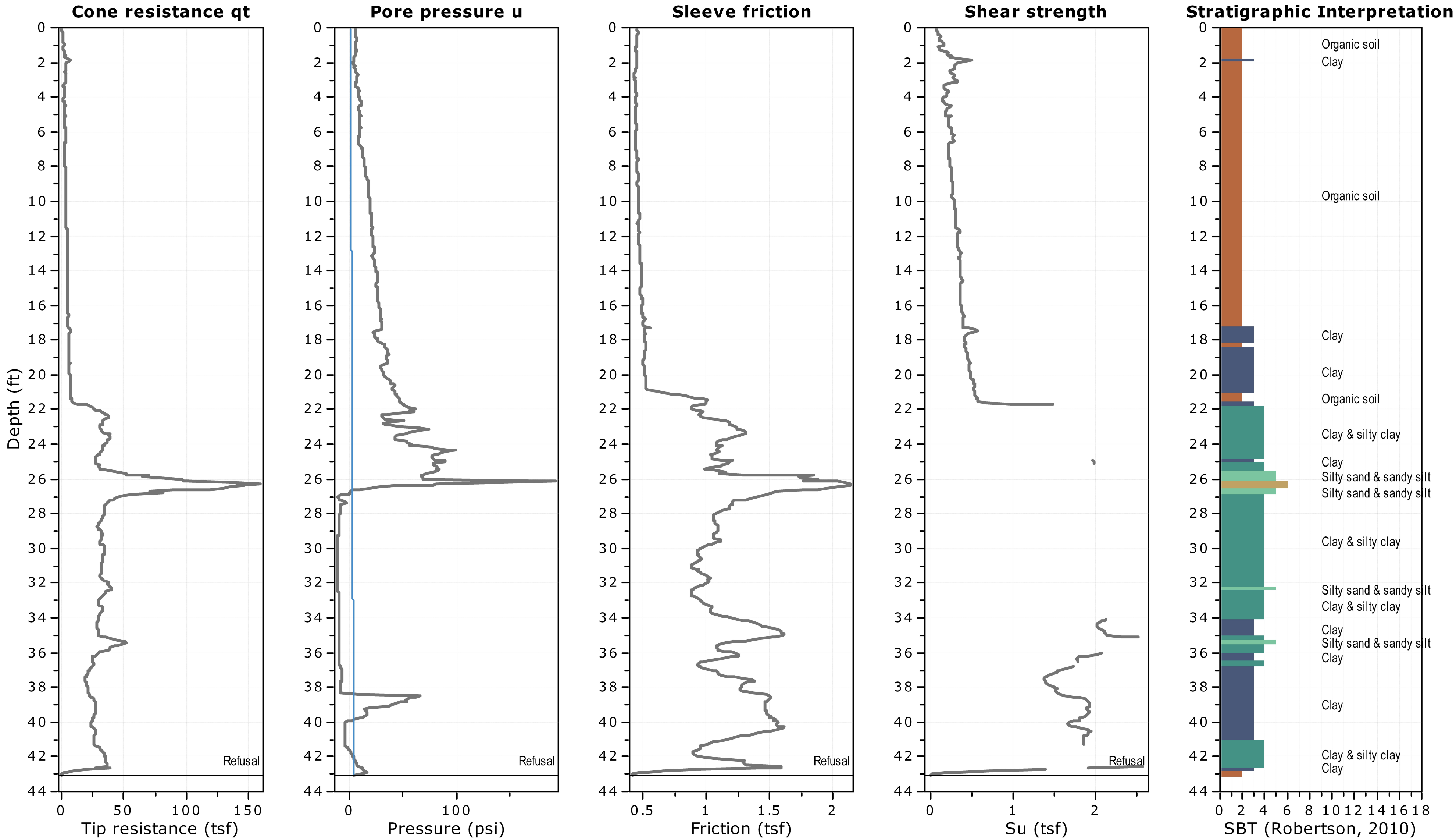
Total depth: 44.91 ft, Date: 9/11/2021

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.



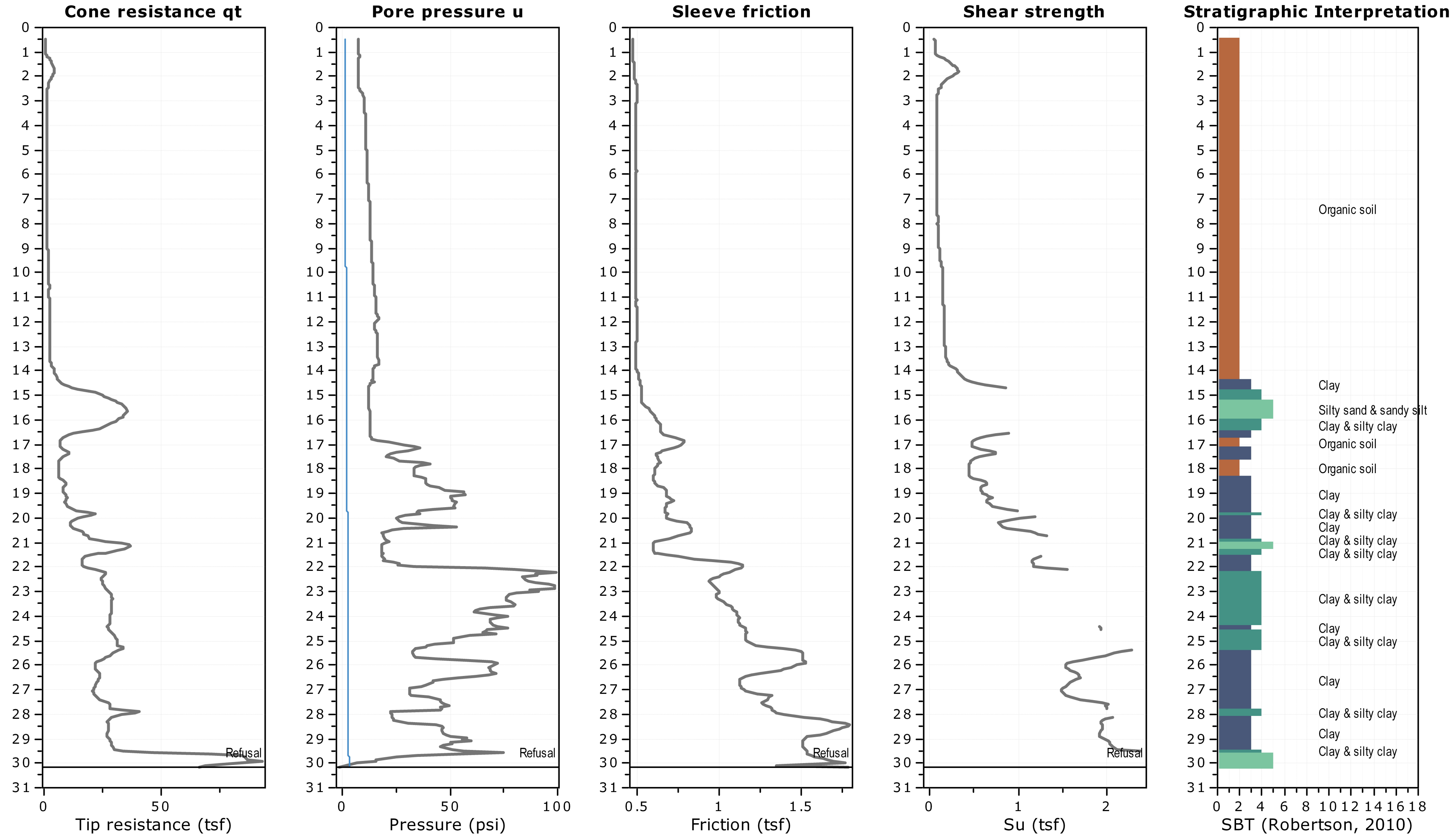
Project: 11215702

Location: San Jacinto River

CPT: SJSCPT-02A-002

Total depth: 30.19 ft, Date: 9/16/2021

Cone Operator: Tolunay-Wong Engineers, Inc.



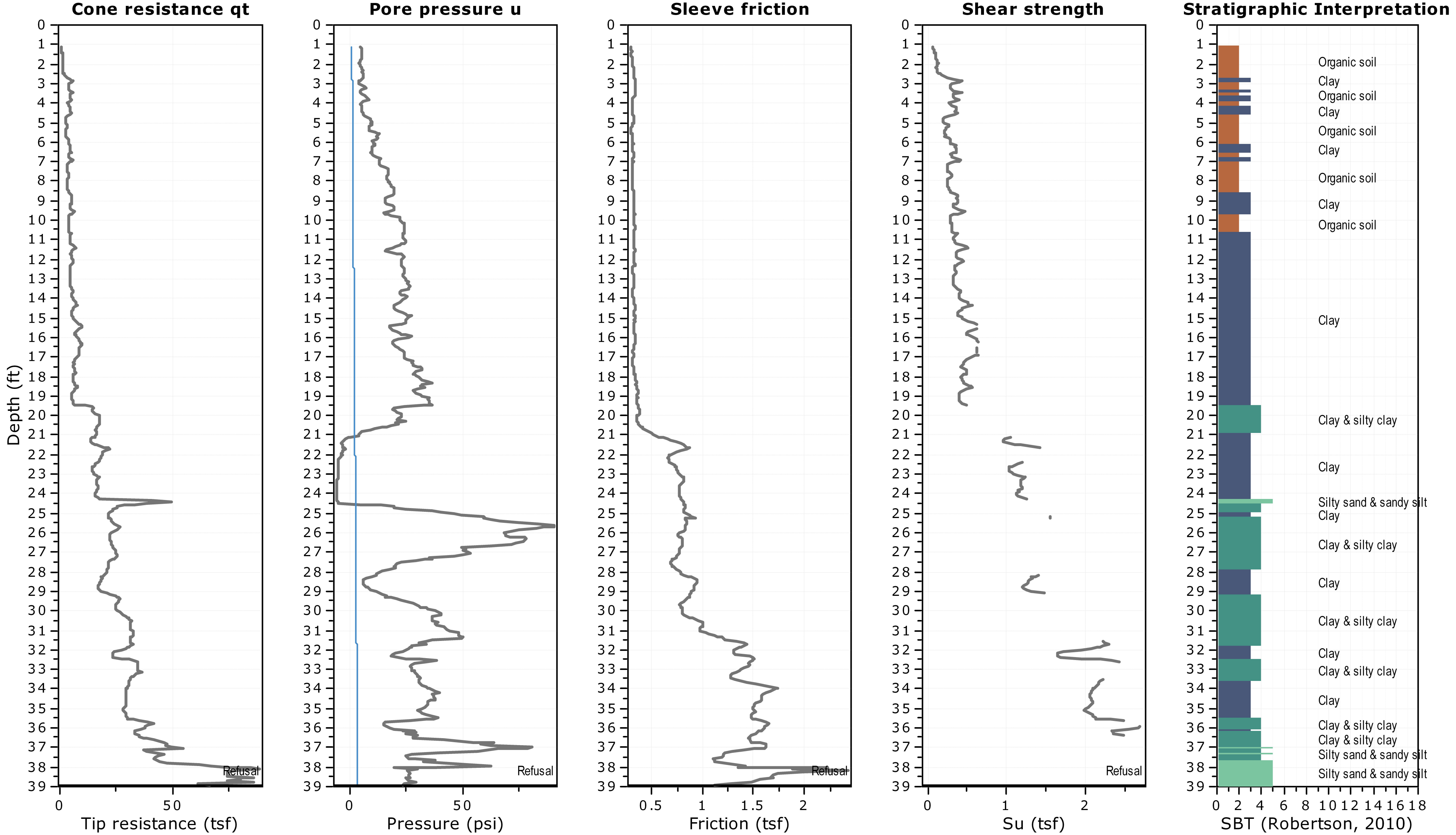
Project: 11215702

Location: San Jacinto River

CPT: SJSCPT-05

Total depth: 38.92 ft, Date: 9/10/2021

Cone Operator: Tolunay-Wong Engineers, Inc.



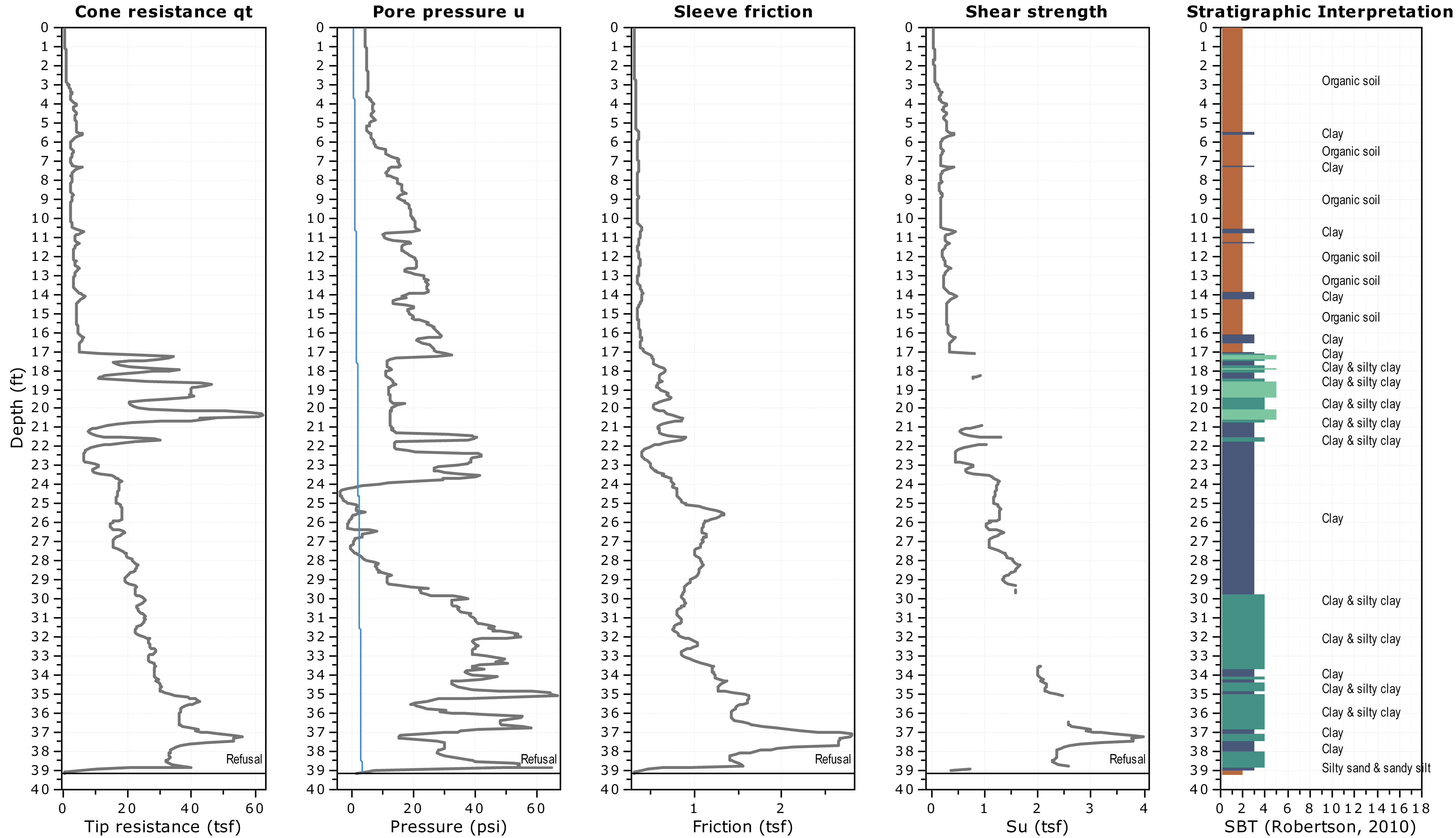
Project: 11215702

Location: San Jacinto River

CPT: SJSCPT-06

Total depth: 39.13 ft, Date: 9/15/2021

Cone Operator: Tolunay-Wong Engineers, Inc.



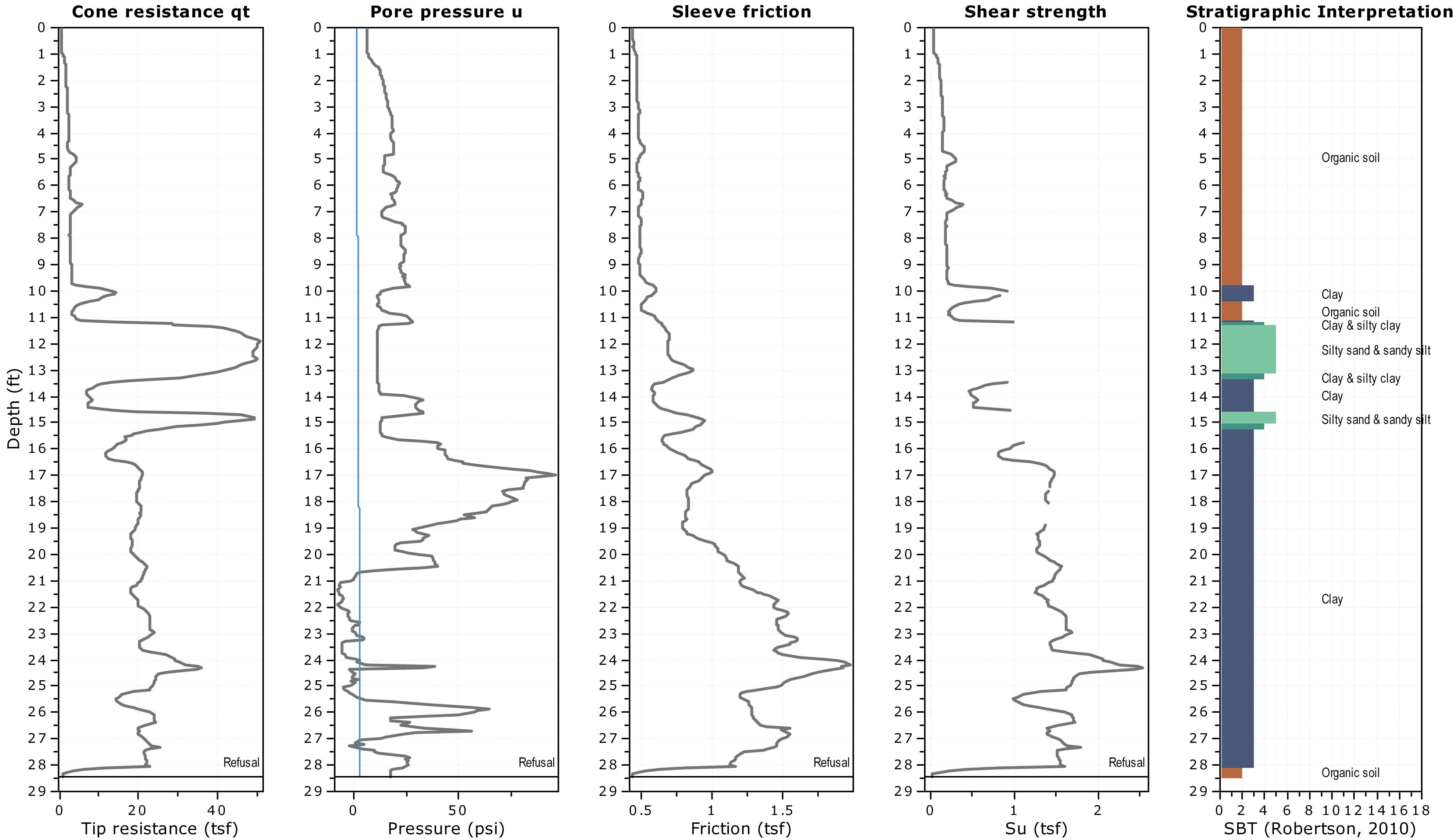
CPT: SJSCPT-07A

Project: 11215702

Location: San Jacinto River

Total depth: 28.41 ft, Date: 9/15/2021

Cone Operator: Tolunay-Wong Engineers, Inc.



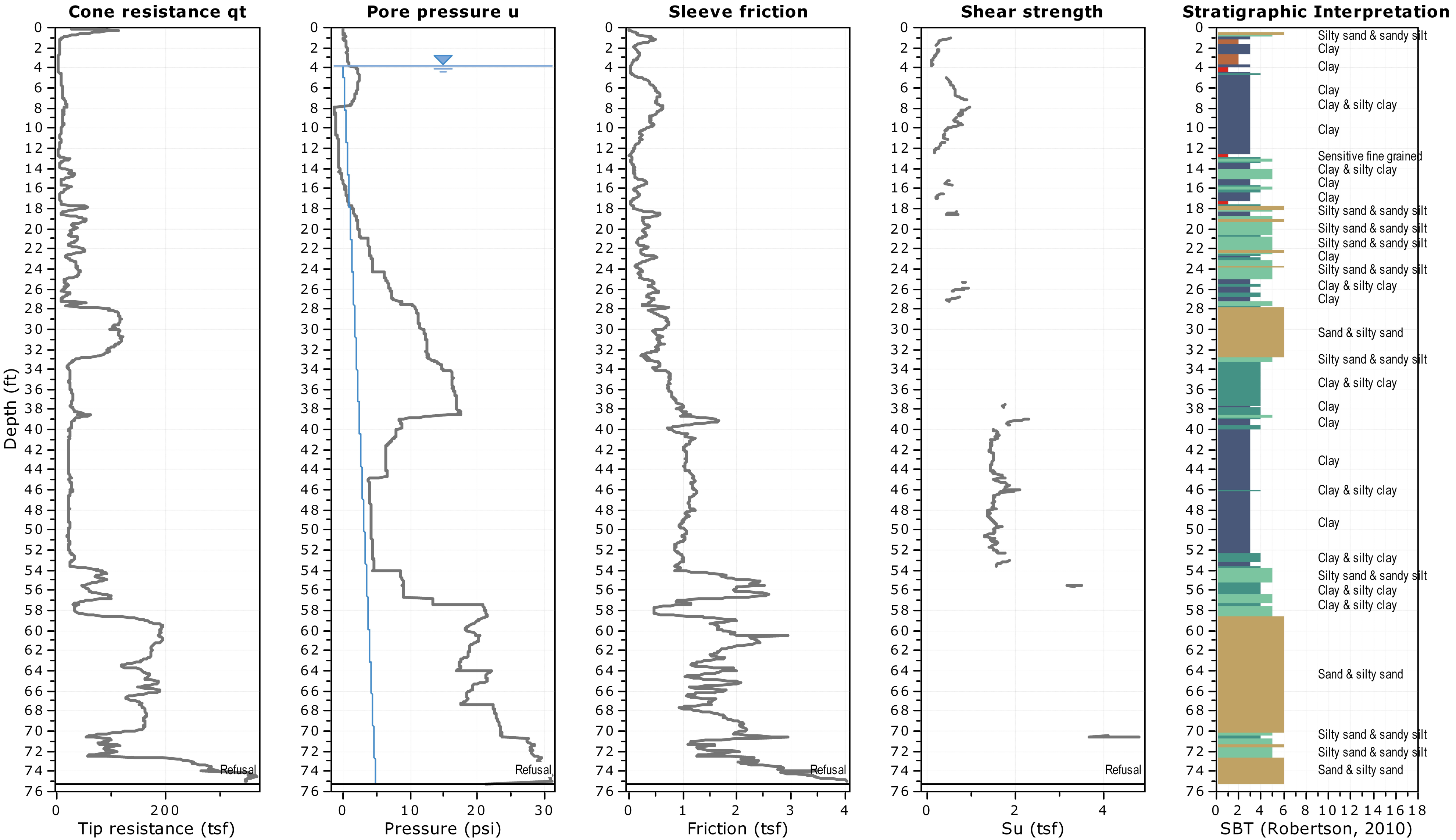
Project: 11215702

Location: San Jacinto River

CPT: SJSCPT-11

Total depth: 75.24 ft, Date: 8/3/2021

Cone Operator: Walker-Hill Environmental



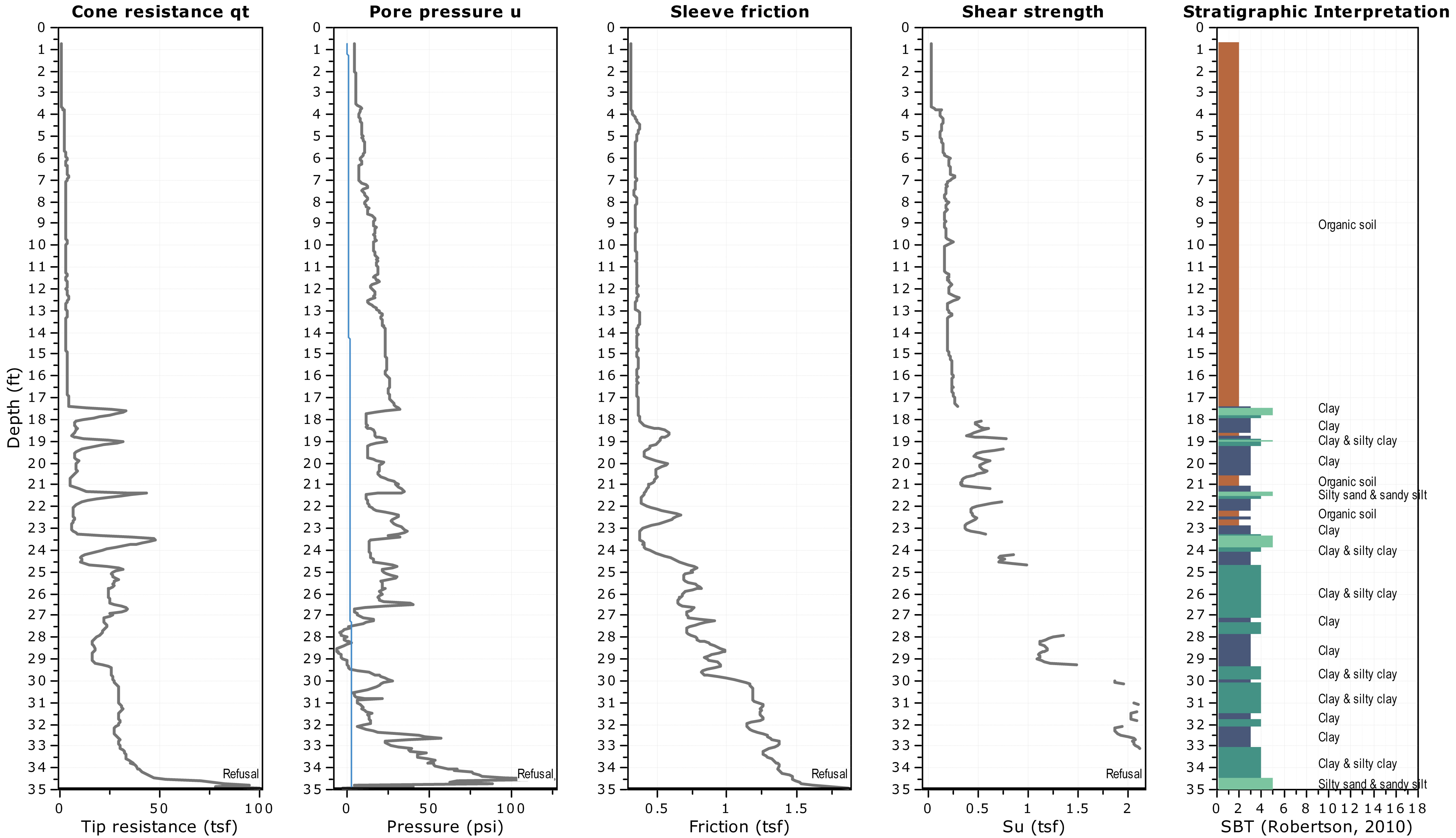
Project: 11215702

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

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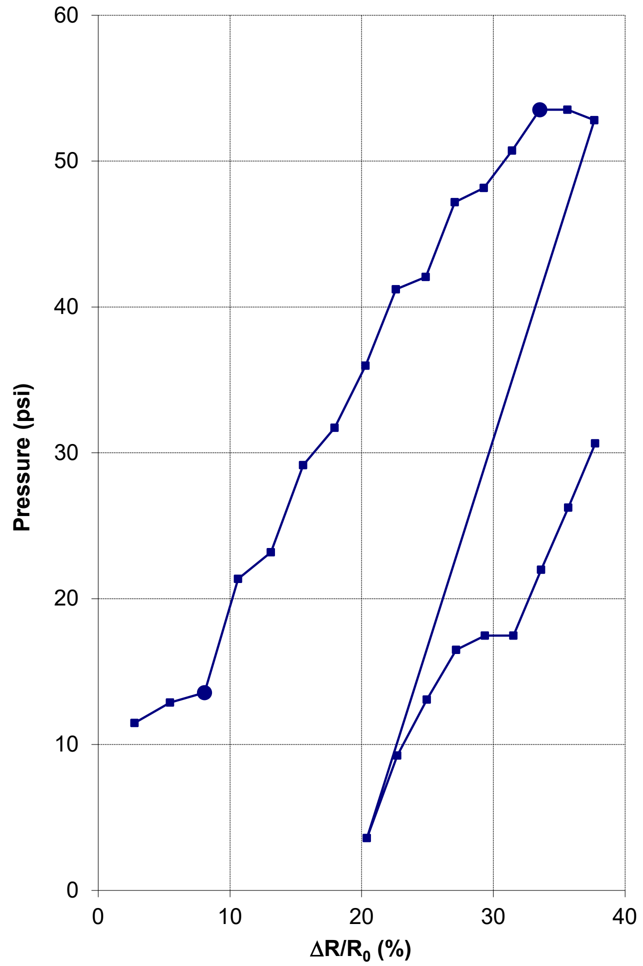
Project name:	**San Jacinto Pressuremeter Testing**	Drilling Method:	Mud Rotary Drilling	
Borehole name:	**SJMW16**	Test depth:	22	ft
Test date: (dd/mm/yyyy)	09/08/2021	Poisson's ratio:	0.33	
Test number:	PMT1	Probe initial volume:	87	in^3
Probe Designation	N Probe (3 in. OD)	Time between borhole & test	15	min

Raw Readings		Corrected Readings			
Pressure psi	**Volume in^3**	**Pressure psi**	**Volume in^3**	**$\Delta R/R_0$ %**	
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

Pressuremeter Test - Corrected Curve



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

BRAUN INTERTEC
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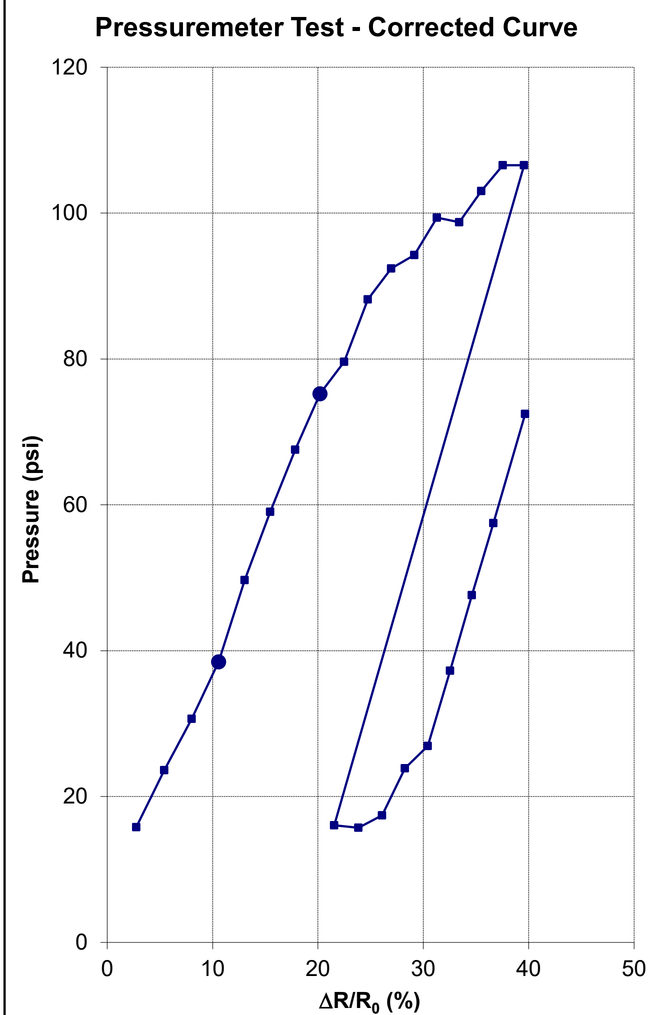
Project name:	**San Jacinto Pressuremeter Testing**	Drilling Method:	Mud Rotary Drilling
Borehole name:	**SJMW16**	Test depth:	32.00 ft
Test date: (dd/mm/yyyy)	09/08/2021	Poisson's ratio:	0.33
Test number:	PMT2	Probe initial volume:	87 in^3
Probe Designation	N Probe (3 in. OD)	Time between borhole & 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.

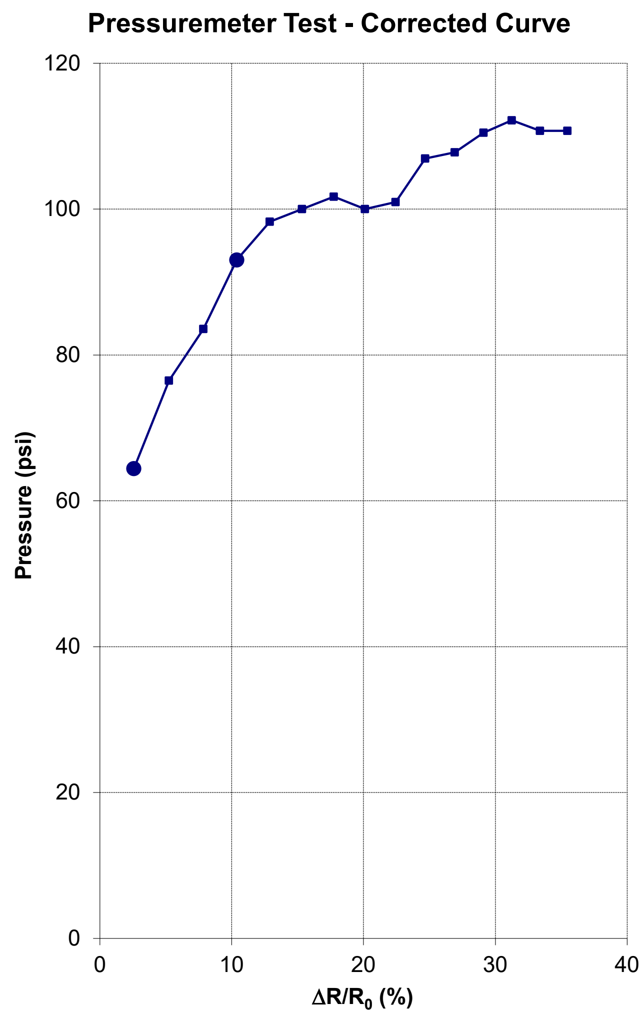
TEXAM COMPANION V.3.4.25

TEXAM Pressuremeter Test Results

Project name: **San Jacinto Pressuremeter Testing**
Borehole name: **SJMW16**
Test date: (dd/mm/yyyy) 09/08/2021
Test number: PMT3
Probe Designation N Probe (3 in. OD)

Drilling Method: Mud Rotary Drilling
Test depth: 36 ft
Poisson's ratio: 0.33
Probe initial volume: 87 in^3
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

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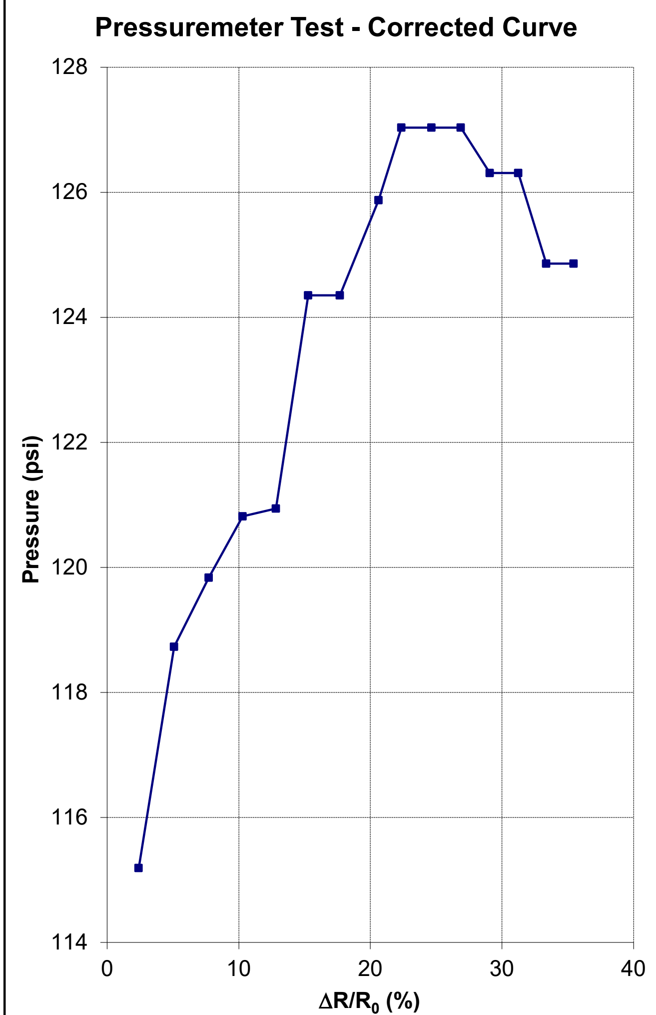
Project name:	**San Jacinto Pressuremeter Testing**	Drilling Method:	Mud Rotary Drilling	
Borehole name:	**SJMW16**	Test depth:	45	ft
Test date: (dd/mm/yyyy)	10/08/2021	Poisson's ratio:	0.33	
Test number:	PMT4	Probe initial volume:	1423	cm^3
Probe Designation	N Probe (3 in. OD)	Time between borhole & 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.**
PI	**130 psi**
E / PI:	**n.a.**
Py	**n.a.**
Poh	**n.a.**
Er	**n.a.**

Time before recording readings : 30 sec.

Method for estimating PI : 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

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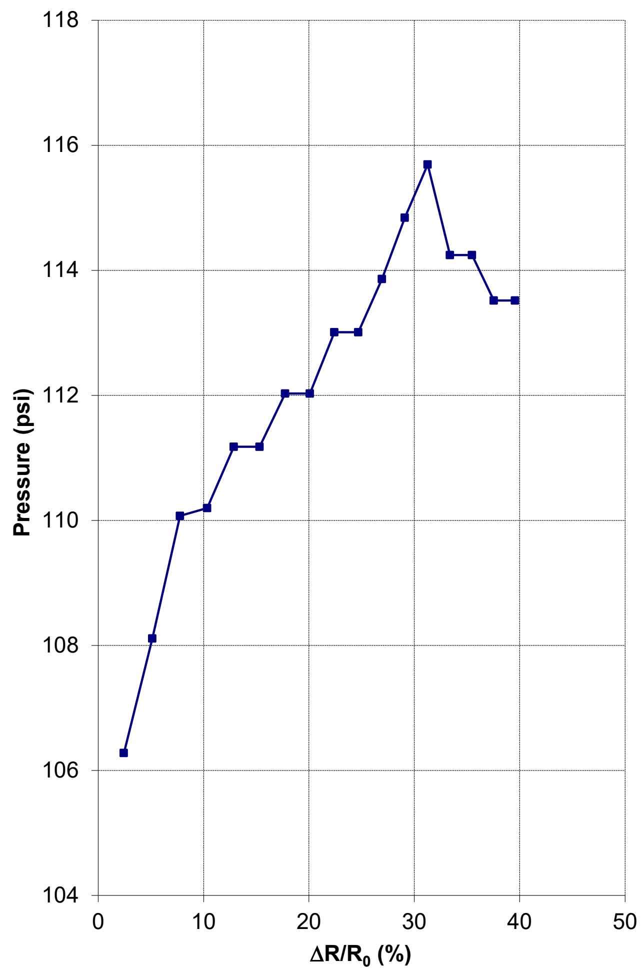
Project name:	**San Jacinto Pressuremeter Testing**	Drilling Method:	Mud Rotary Drilling	
Borehole name:	**SJMW16**	Test depth:	50	ft
Test date: (dd/mm/yyyy)	10/08/2021	Poisson's ratio:	0.33	
Test number:	PMT5	Probe initial volume:	87	in^3
Probe Designation	N Probe (3 in. OD)	Time between borhole & test:	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

Pressuremeter Test - Corrected Curve



Interpreted Test Results

Ep	**n.a.**
Pl	**118 psi**
E / Pl:	**n.a.**
Py	**n.a.**
Poh	**n.a.**
Er	**n.a.**

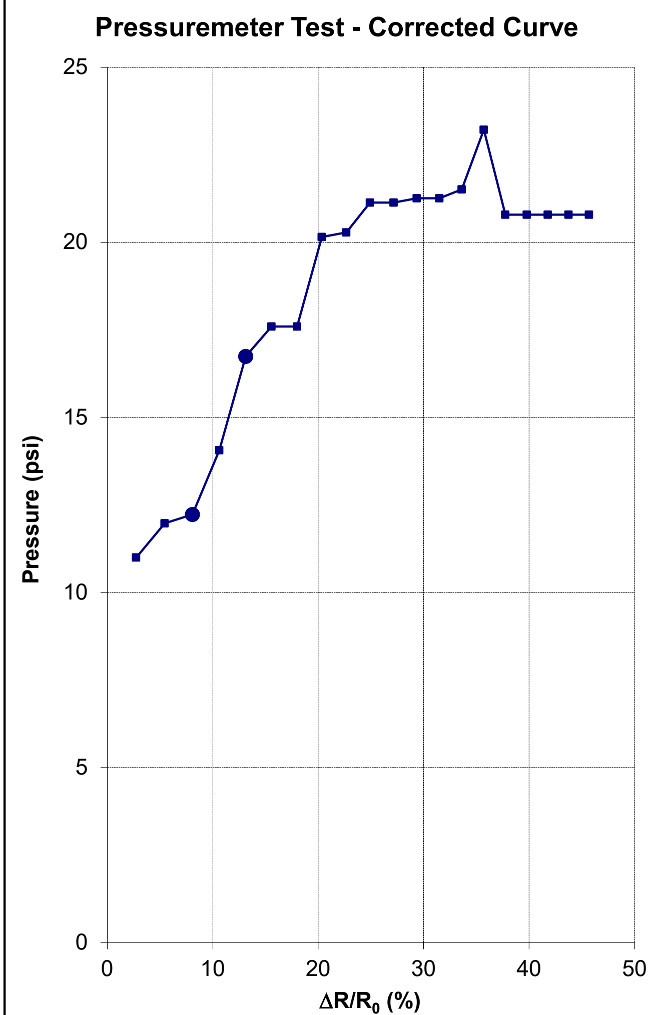
Time before recording readings : 30 sec.
Method for estimating PI : 1/V vs P as per ASTM D4719
Note: Membrane stiffness calibration was not performed. Membrane resistance values assumed.

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

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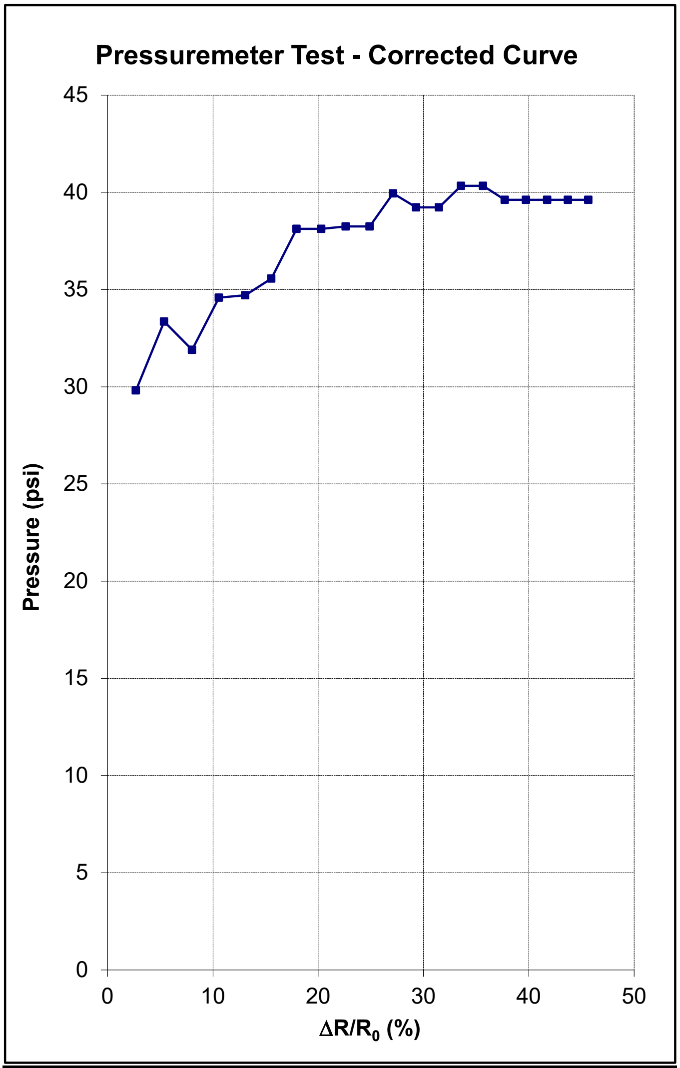
TEXAM Pressuremeter Test Results

Project name: **San Jacinto Pressuremeter Testing**
Borehole name: **SJMW17**
Test date: (dd/mm/yyyy) 11/08/2021
Test number: PMT2
Probe Designation N Probe (3 in. OD)

Drilling Method: Mud Rotary Drilling
Test depth: 25 ft
Poisson's ratio: 0.33
Probe initial volume: 87 in^3
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.**
PI	**40 psi**
E / PI:	**n.a.**
Py	**n.a.**
Poh	**n.a.**
Er	**n.a.**

Time before recording readings : 30 sec.
Method for estimating PI : 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

BRAUN INTERTEC
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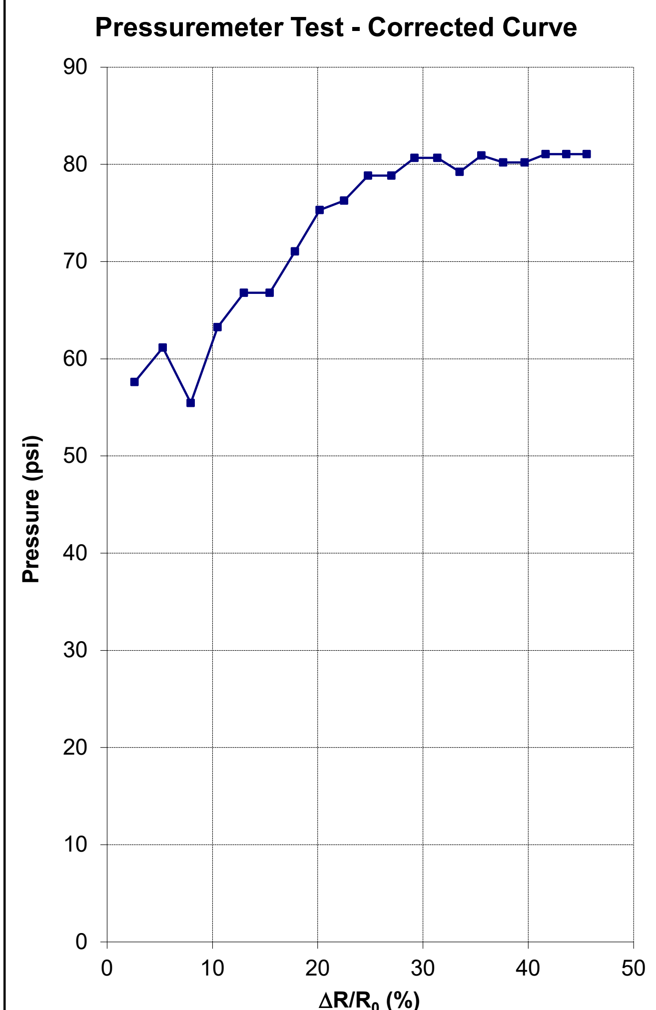
TEXAM Pressuremeter Test Results

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

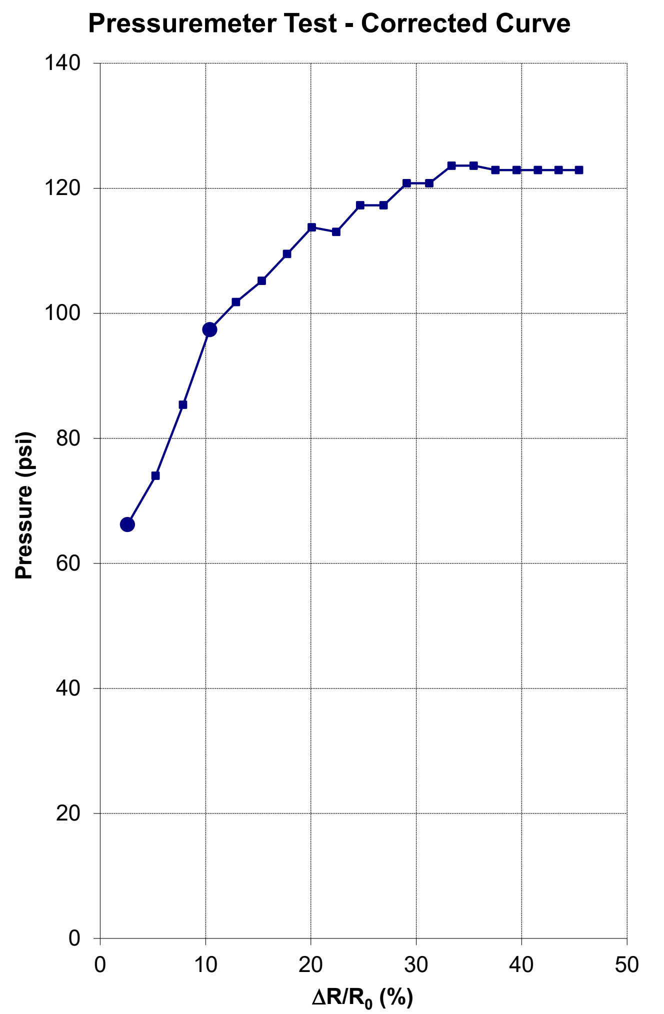
TEXAM Pressuremeter Test Results

BRAUN INTERTEC
The Science You Build On.

Project name: **San Jacinto Pressuremeter Testing**
Borehole name: **SJMW17**
Test date: (dd/mm/yyyy) 12/08/2021
Test number: PMT5
Probe Designation N Probe (3 in. OD)

Drilling Method: Mud Rotary Drilling
Test depth: 50 ft
Poisson's ratio: 0.33
Probe initial volume: 87 in^3
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.

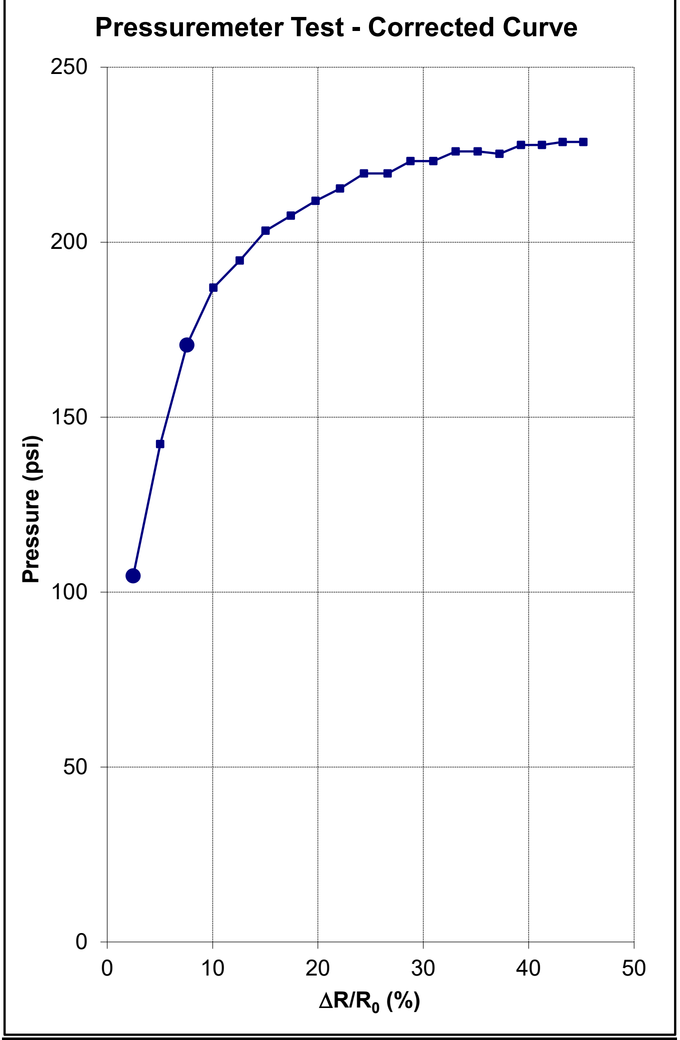
TEXAM COMPANION V.3.4.25

TEXAM Pressuremeter Test Results

Project name: San Jacinto Pressuremeter Testing
Borehole name: SJMW17
Test date: (dd/mm/yyyy) 12/08/2021
Test number: PMT6
Probe Designation N Probe (3 in. OD)

Drilling Method: Mud Rotary Drilling
Test depth: 60 ft
Poisson's ratio: 0.33
Probe initial volume: 87 in^3
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**

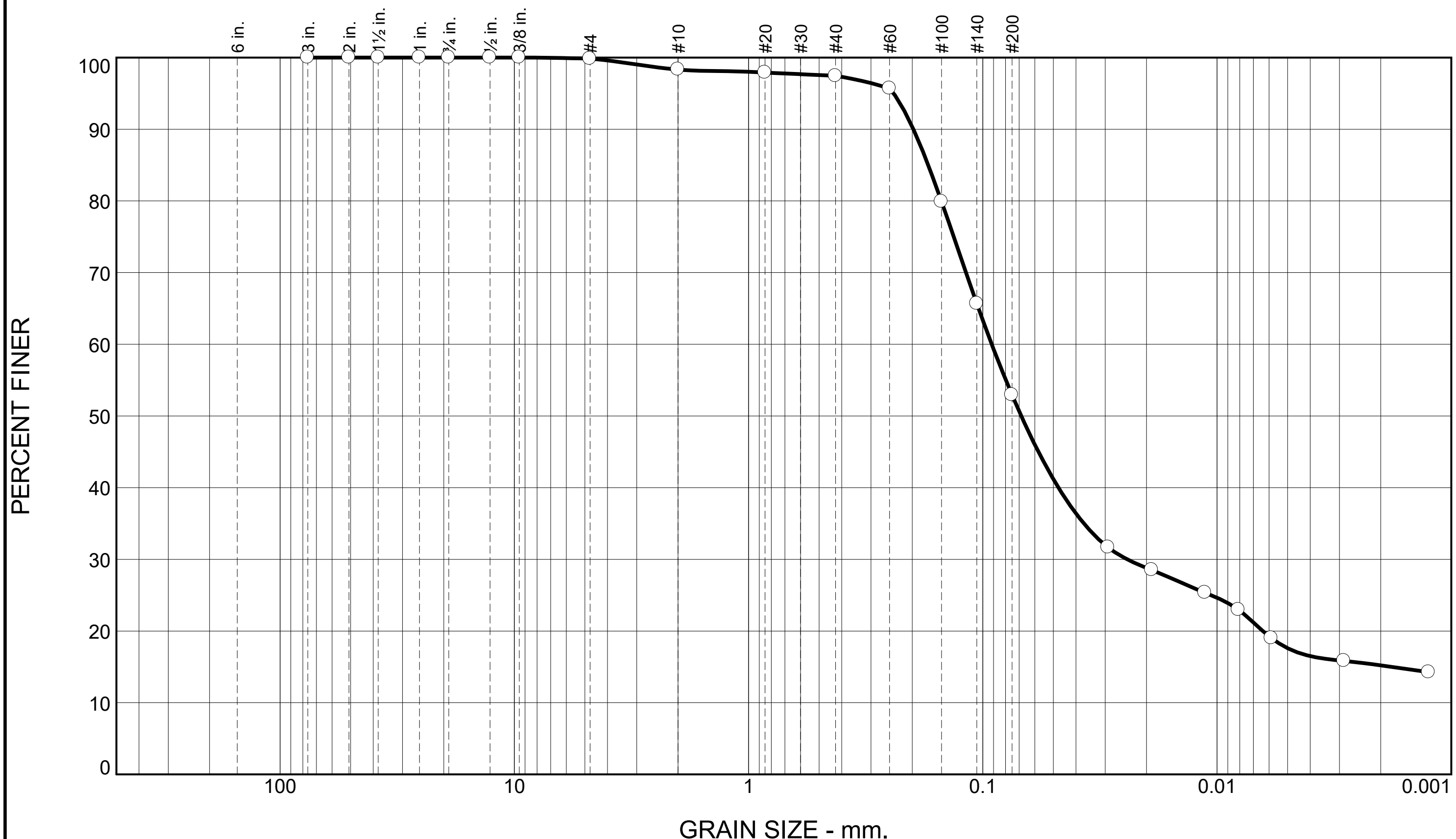
Time before recording readings : 15 sec.
Method for estimating Pl : 1/V vs P as per ASTM D4719
Note: Membrane stiffness calibration was not performed. Membrane resistance values assumed.

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

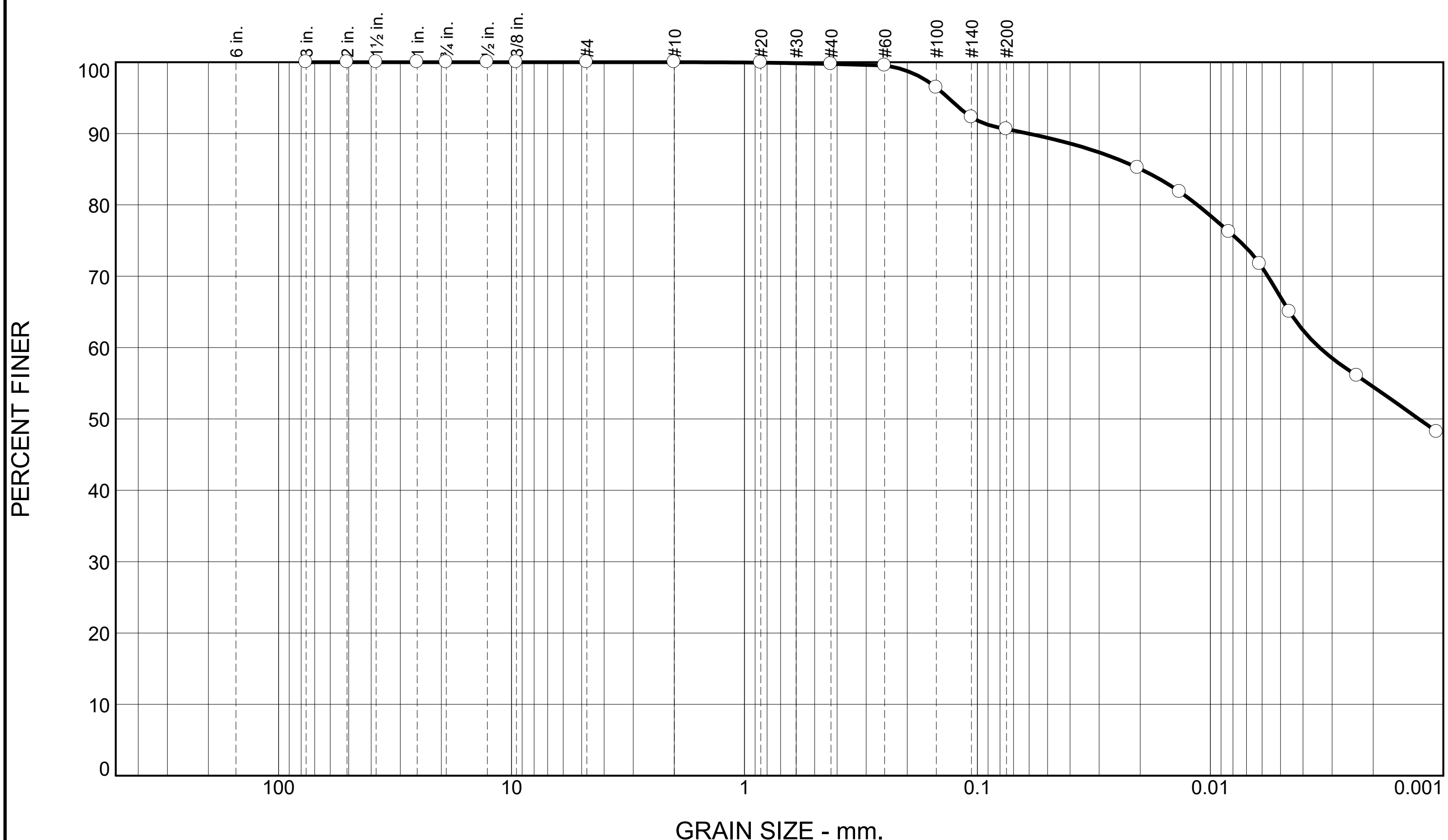
Thompson Engineering

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

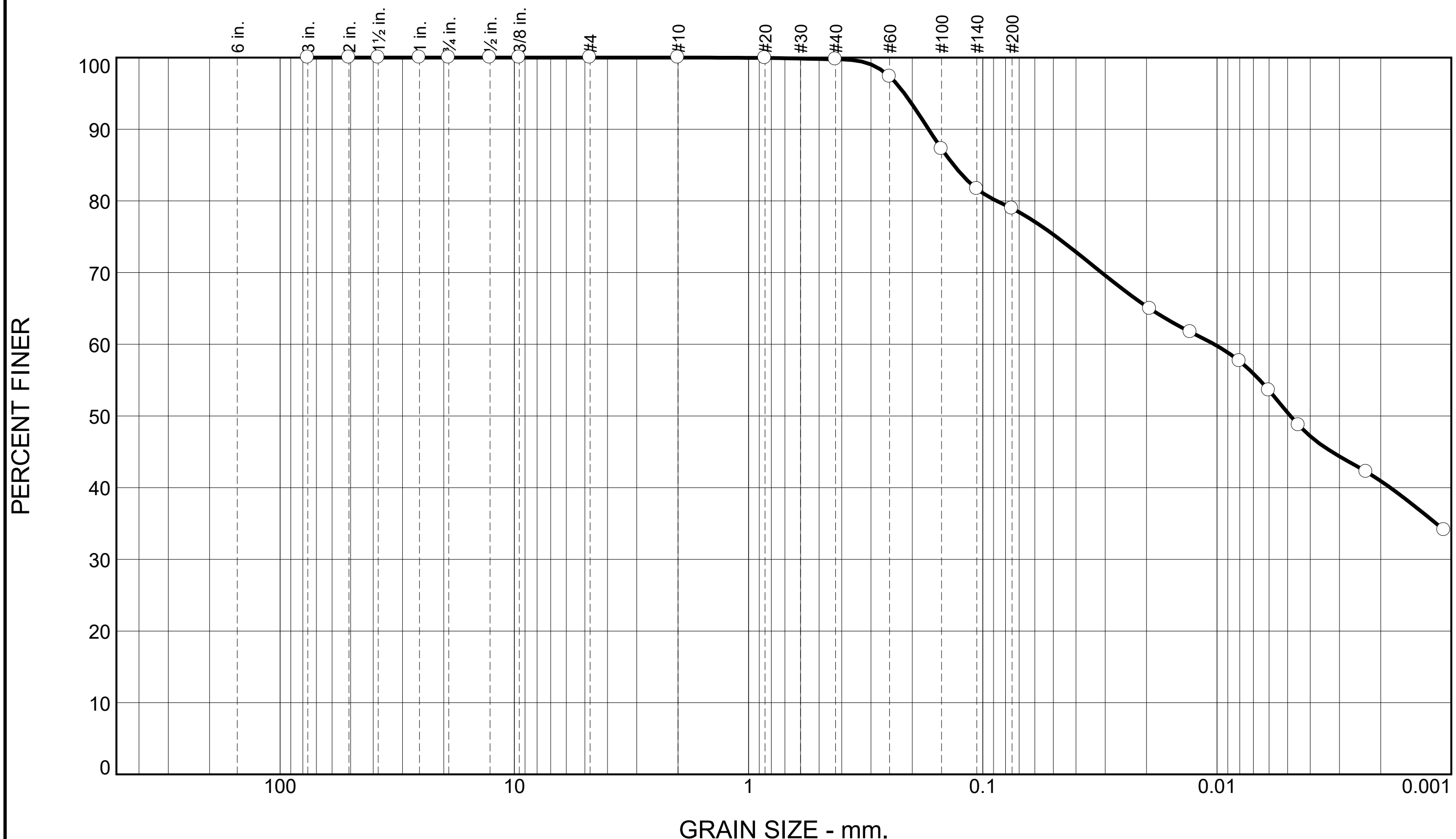
Thompson Engineering

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

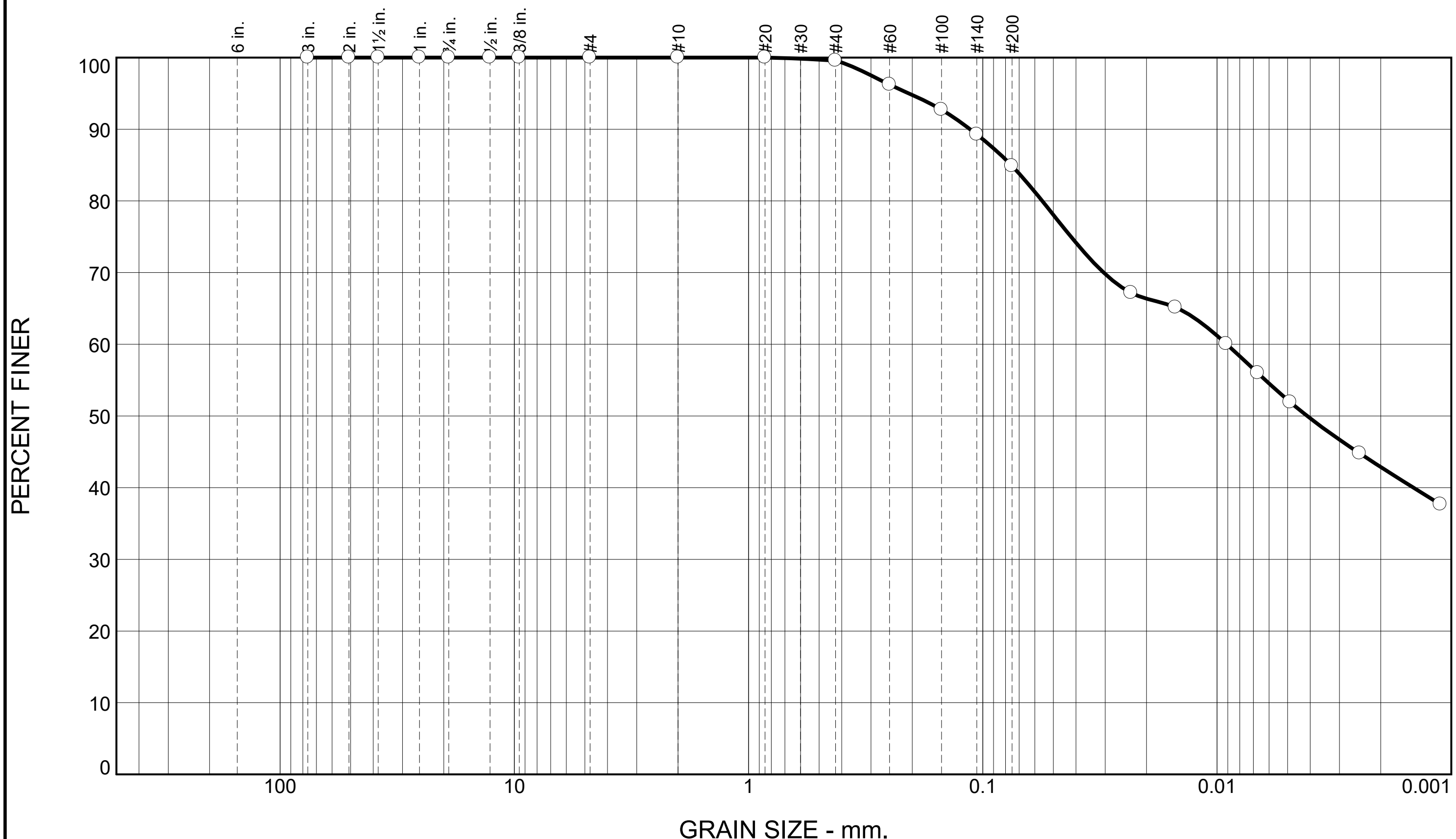
Thompson Engineering

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

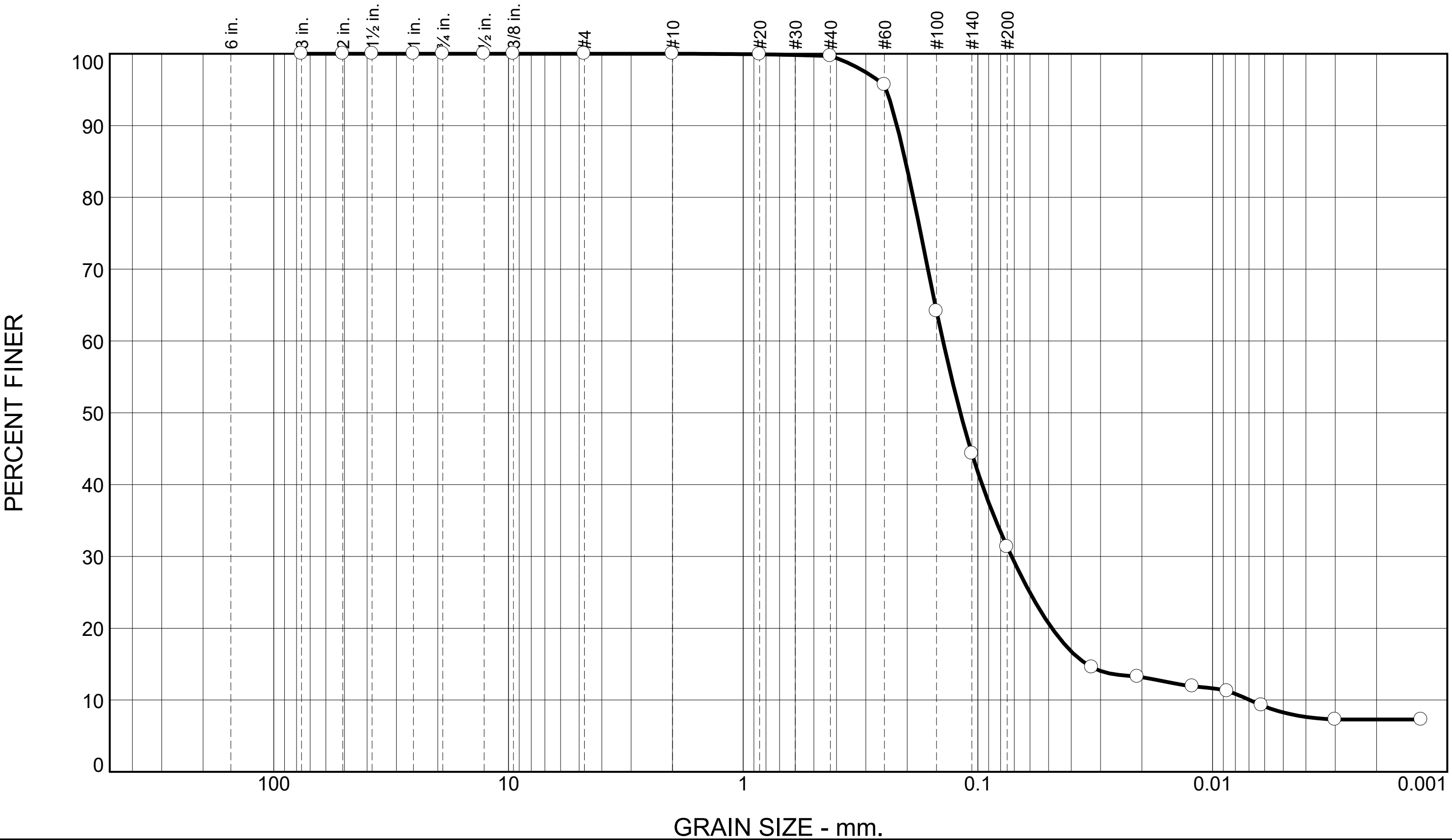
Thompson Engineering

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

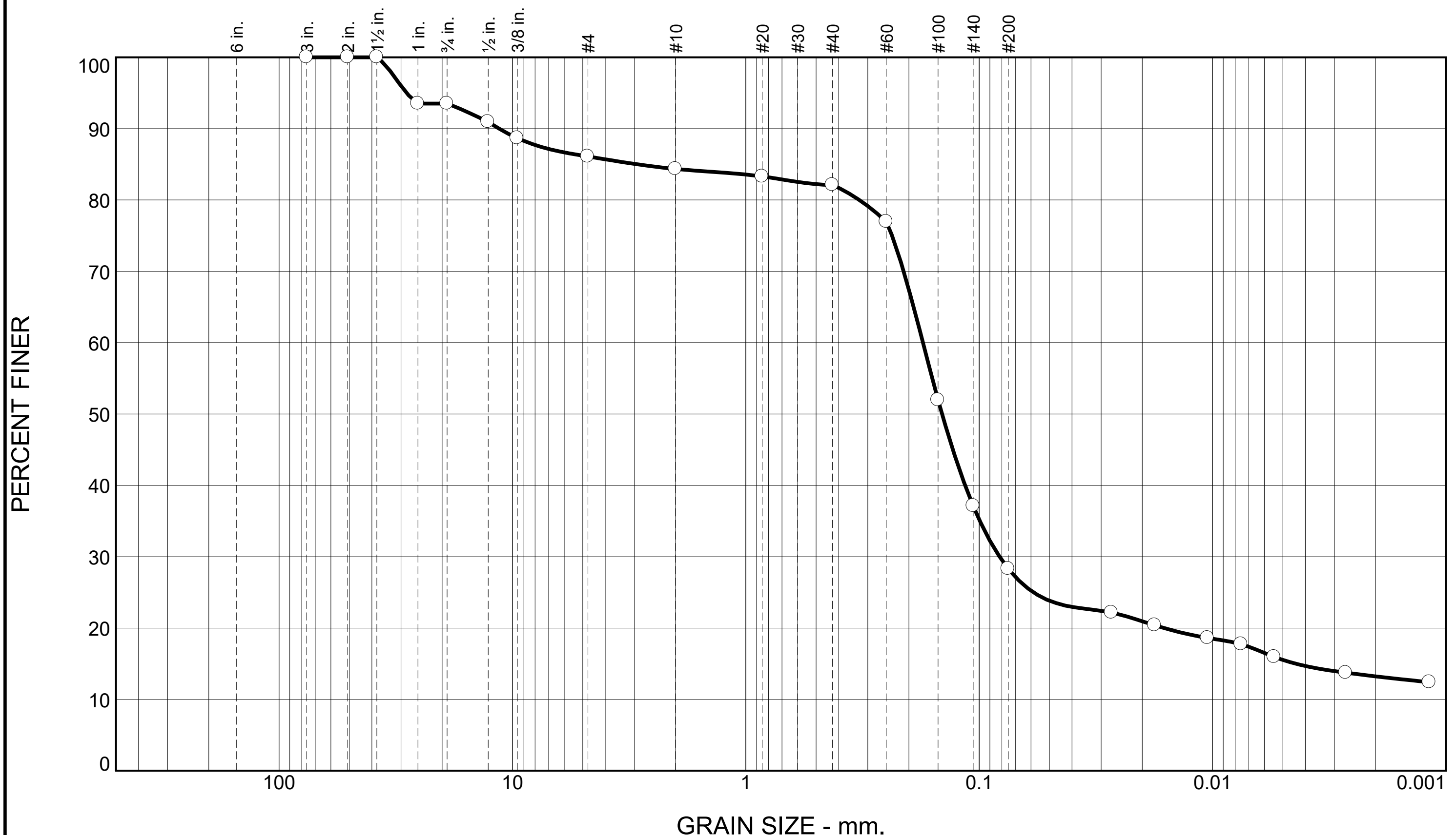
Mobile, Alabama

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

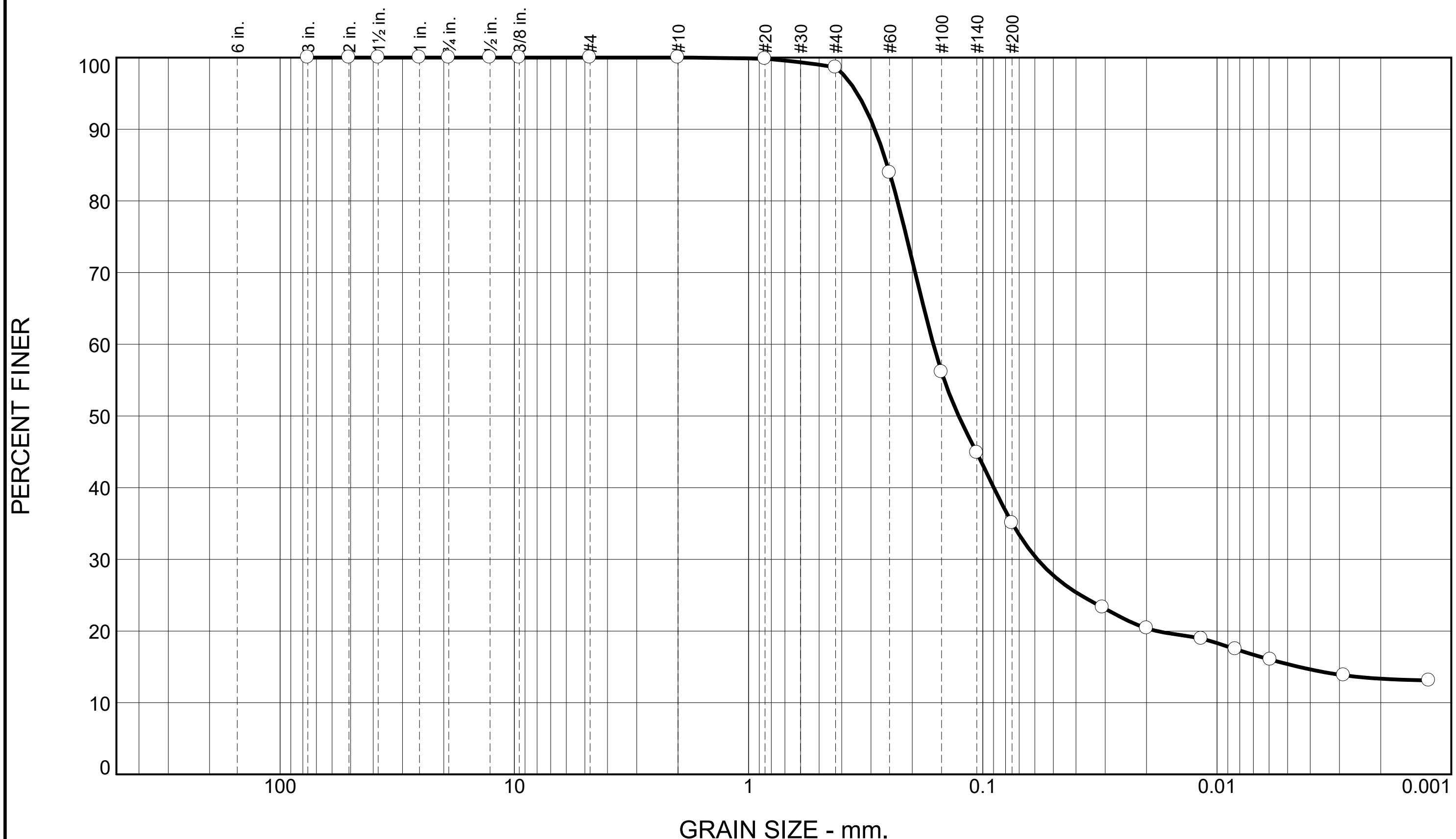
Thompson Engineering

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

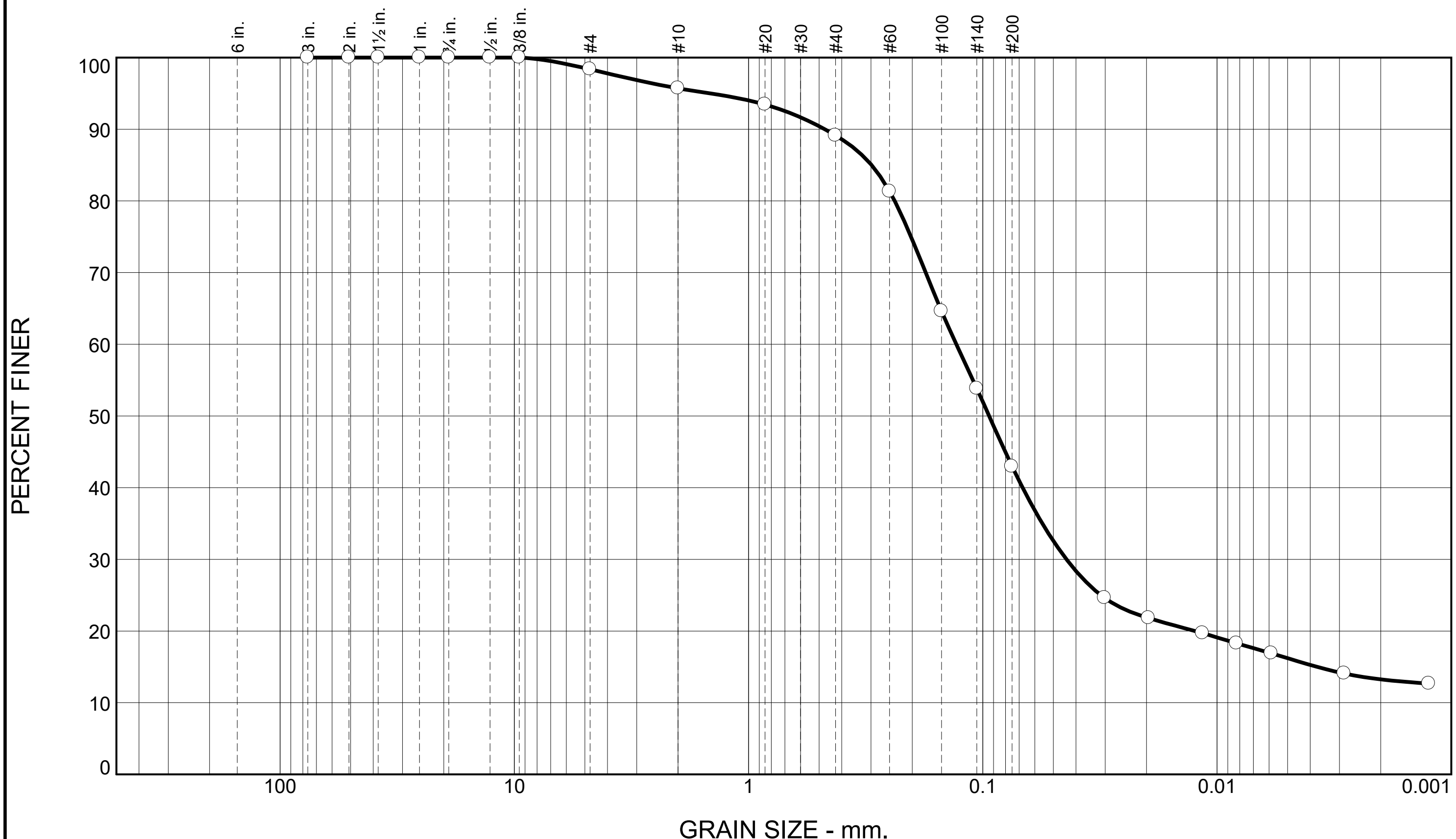
Thompson Engineering

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

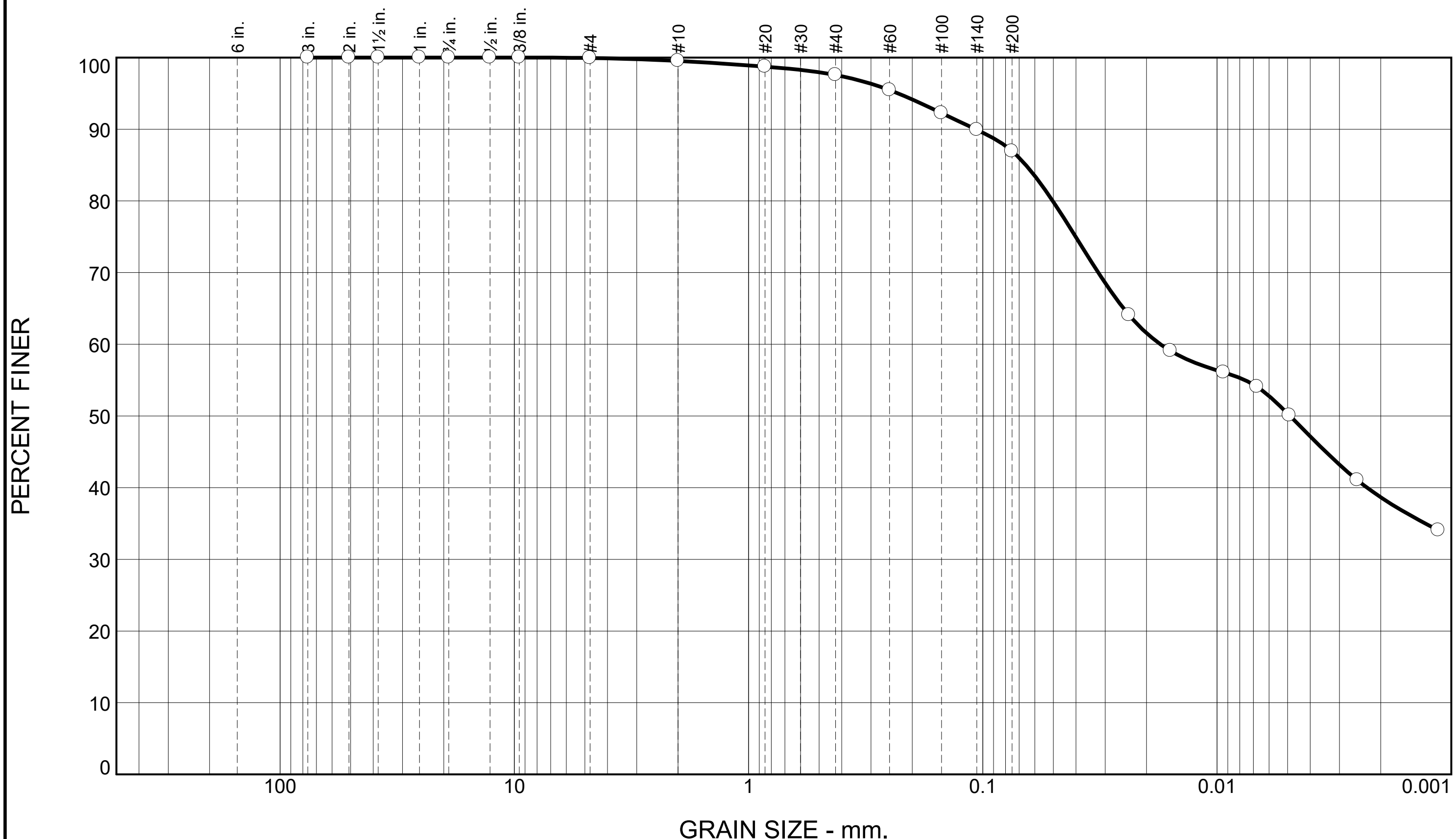
Thompson Engineering

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

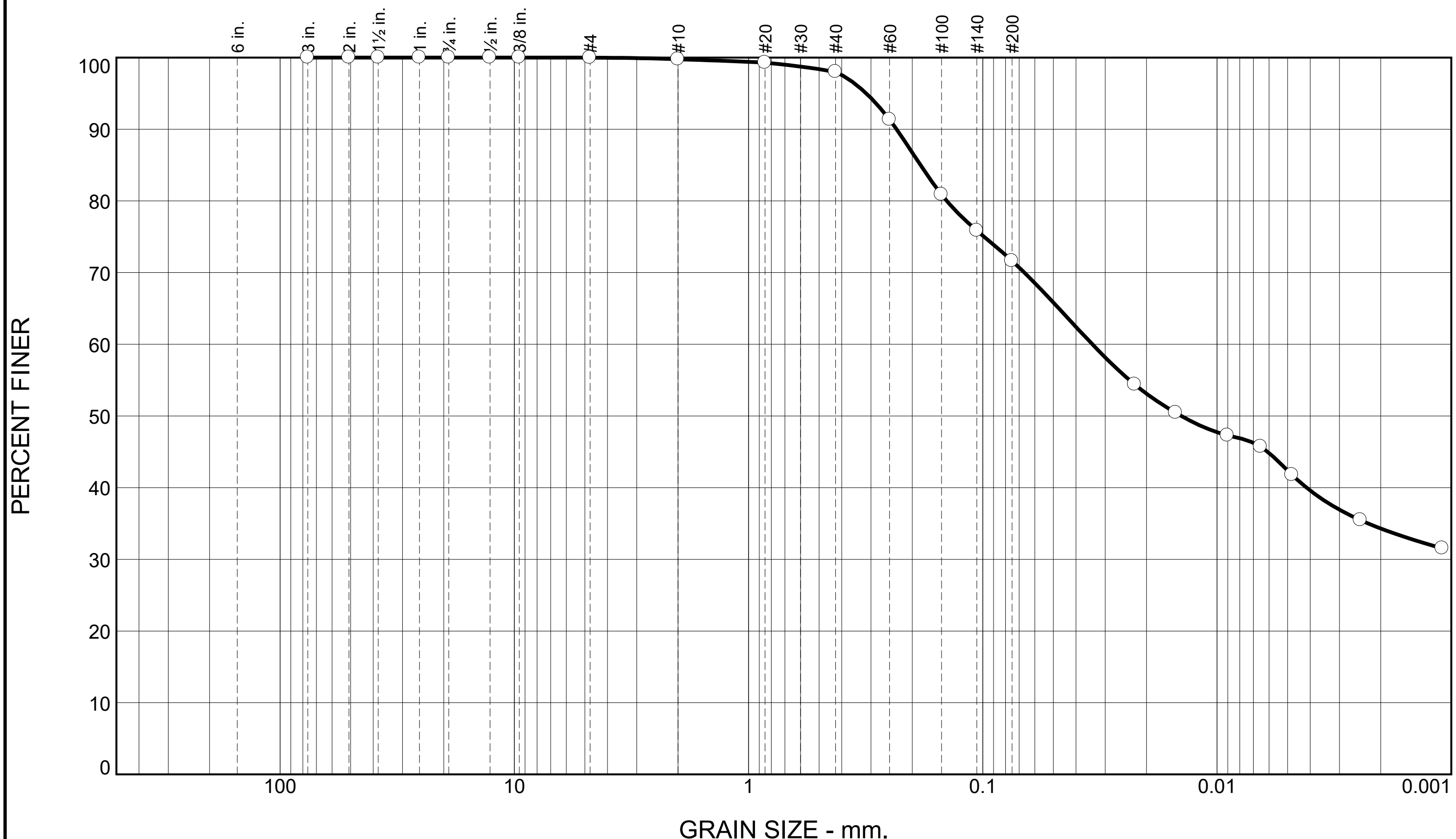
Thompson Engineering

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

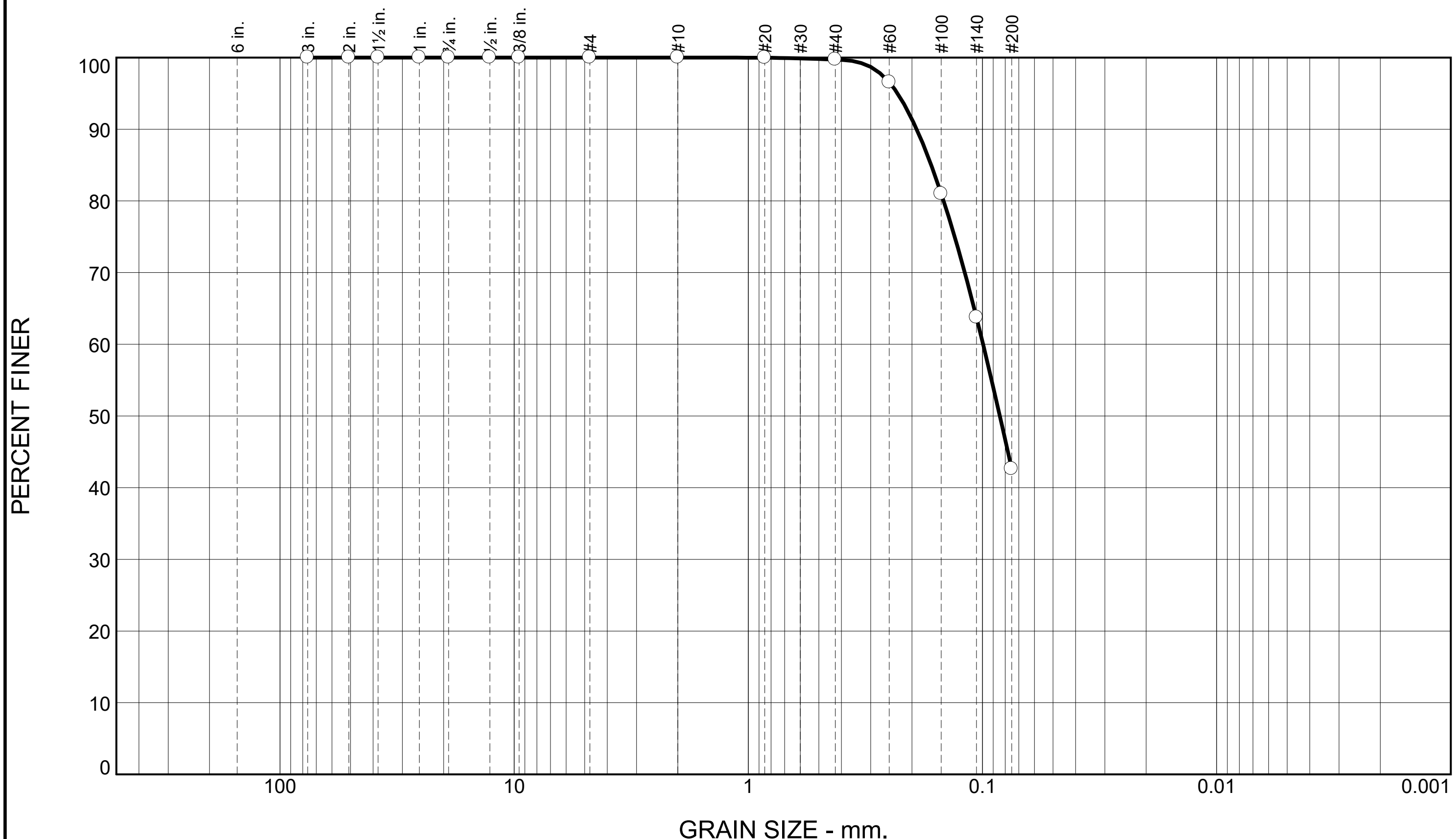
Thompson Engineering

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

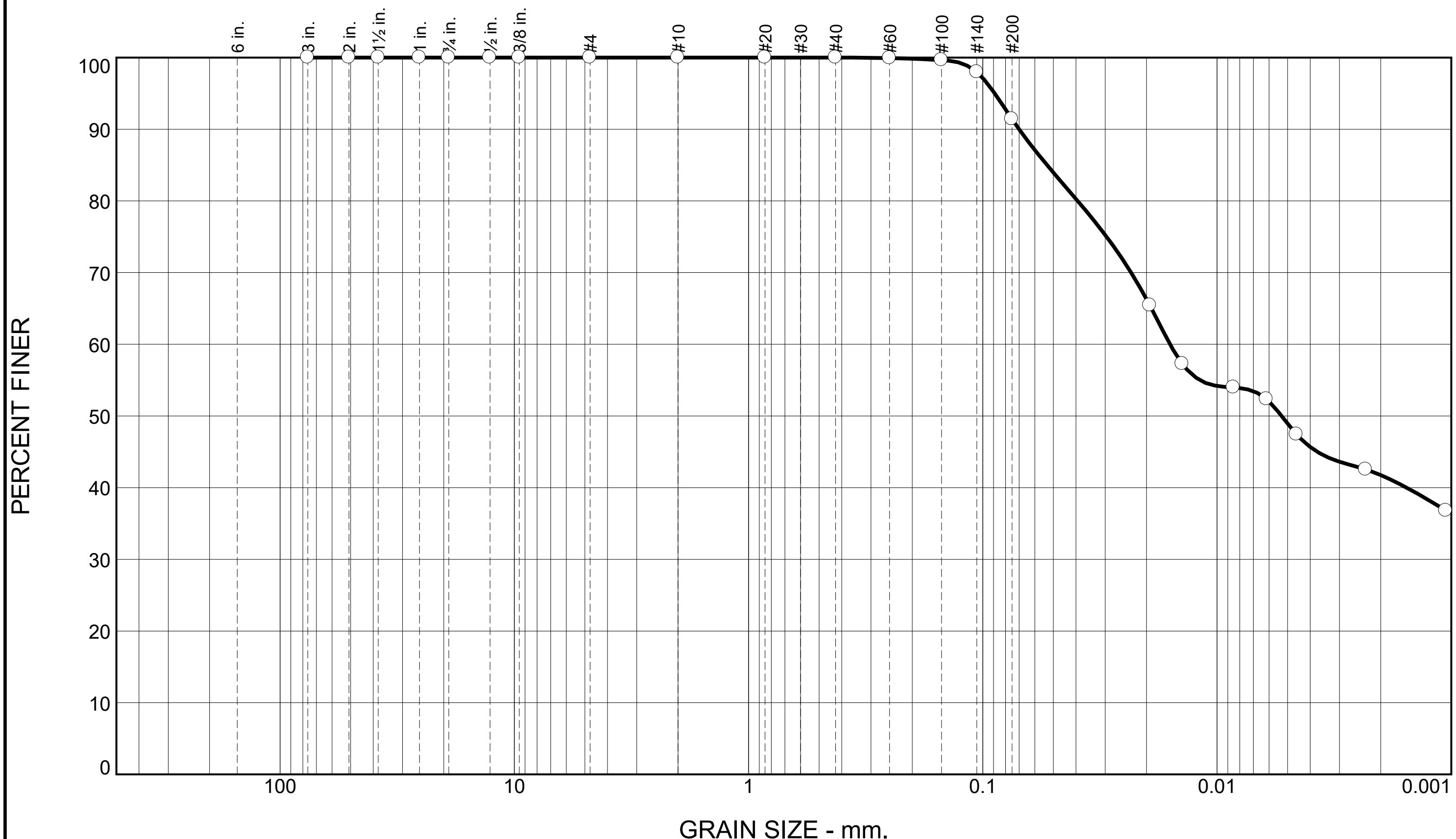
Mobile, Alabama

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

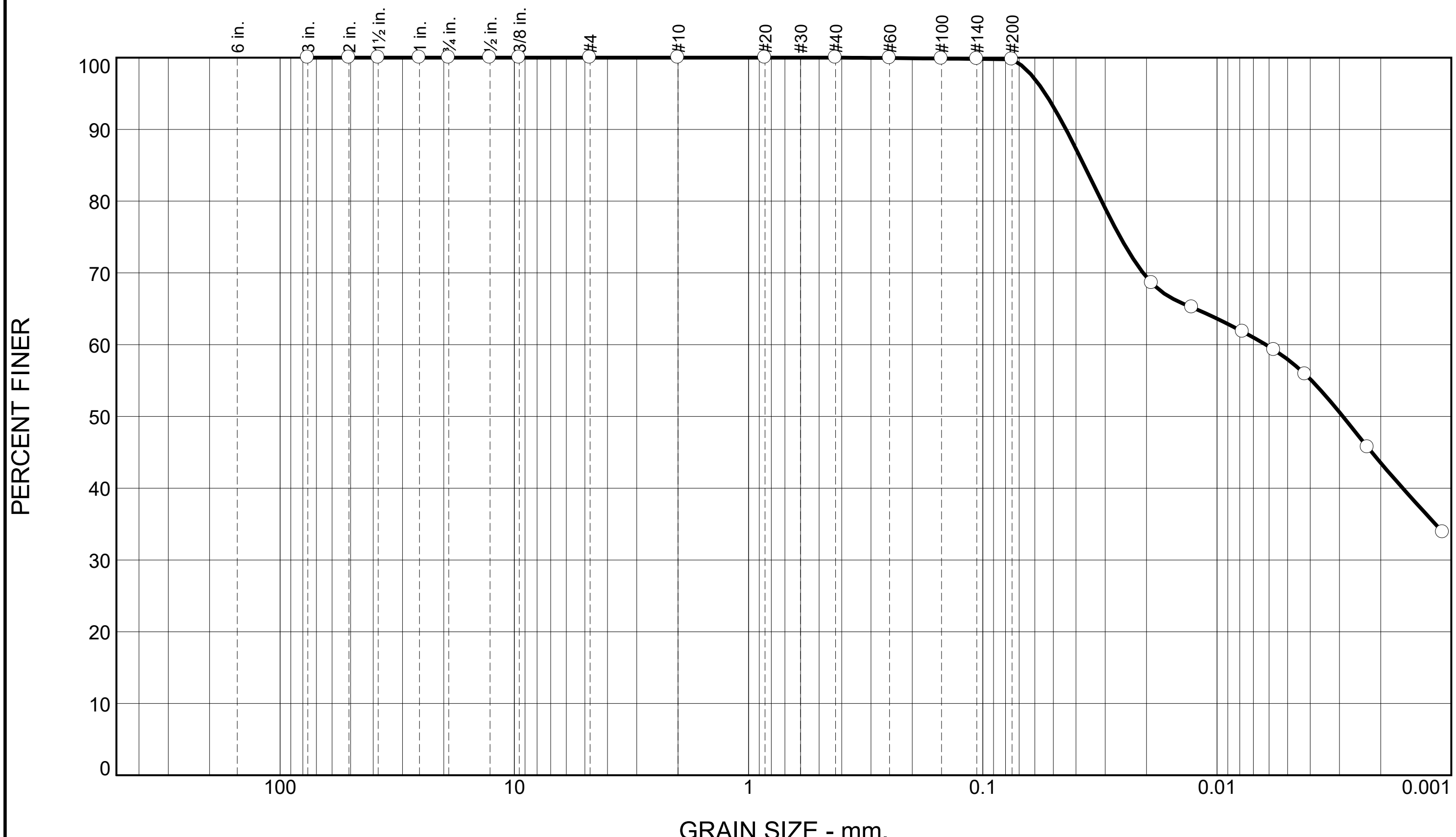
Thompson Engineering

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

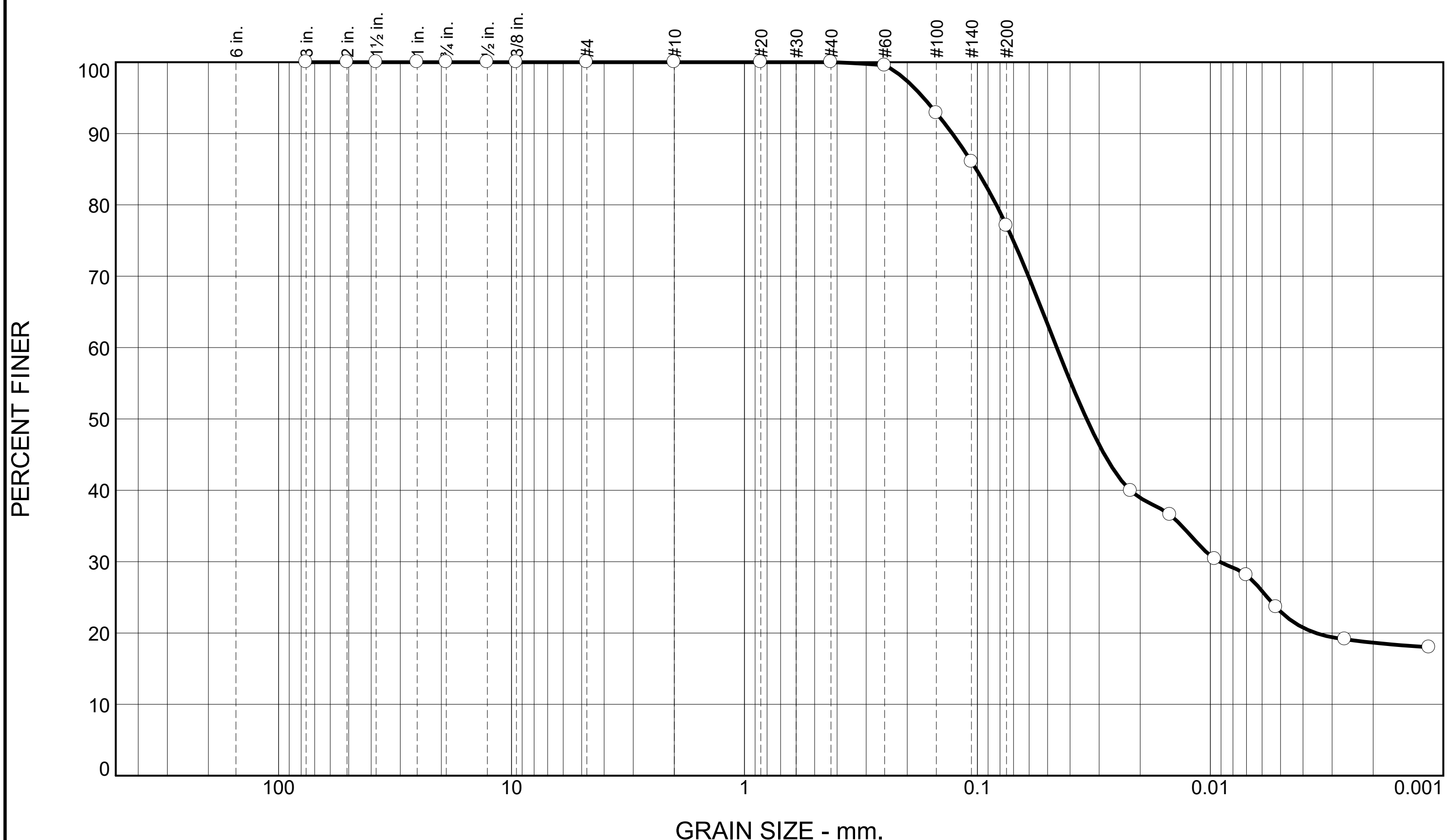
Thompson Engineering

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

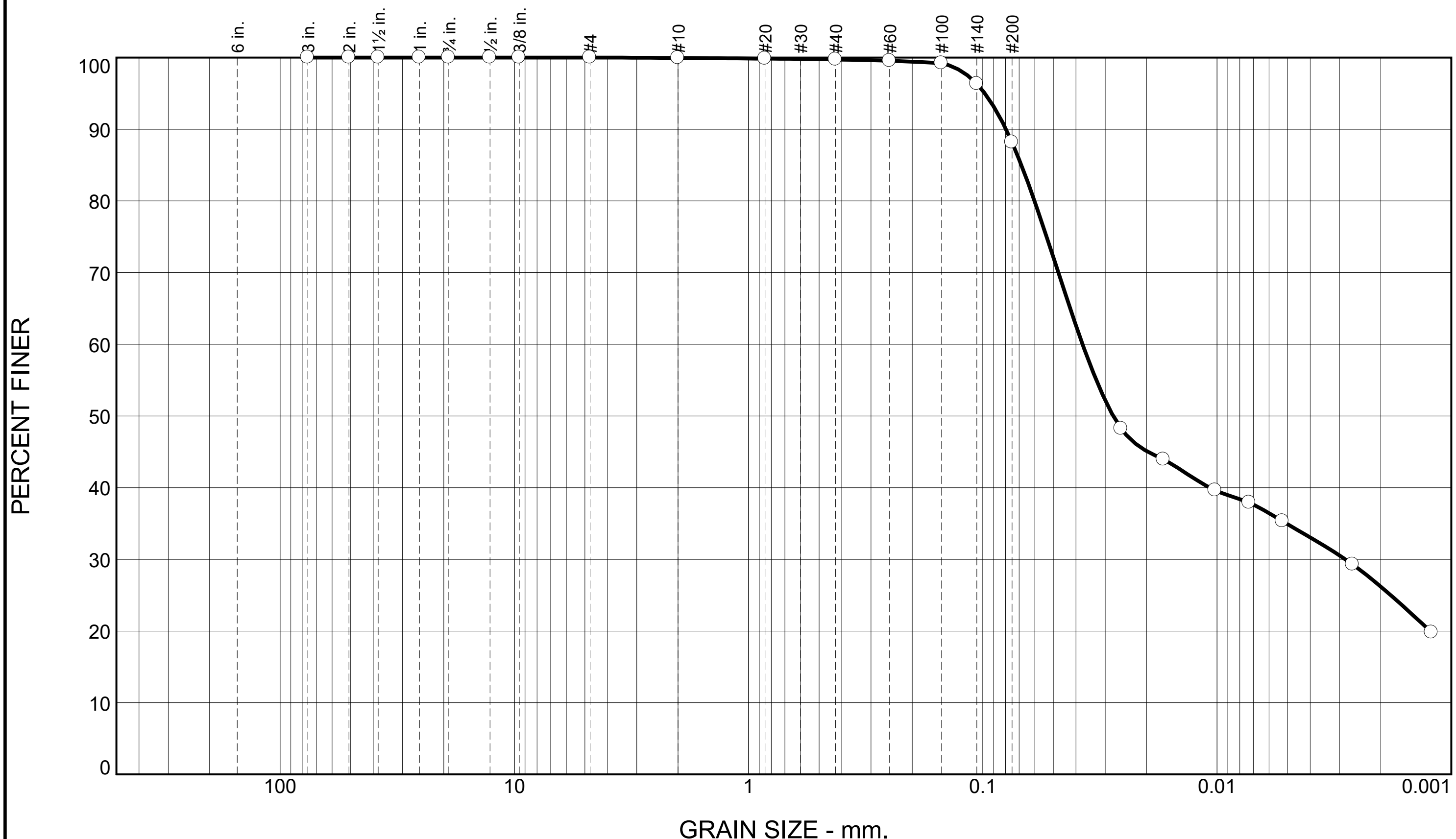
Thompson Engineering

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

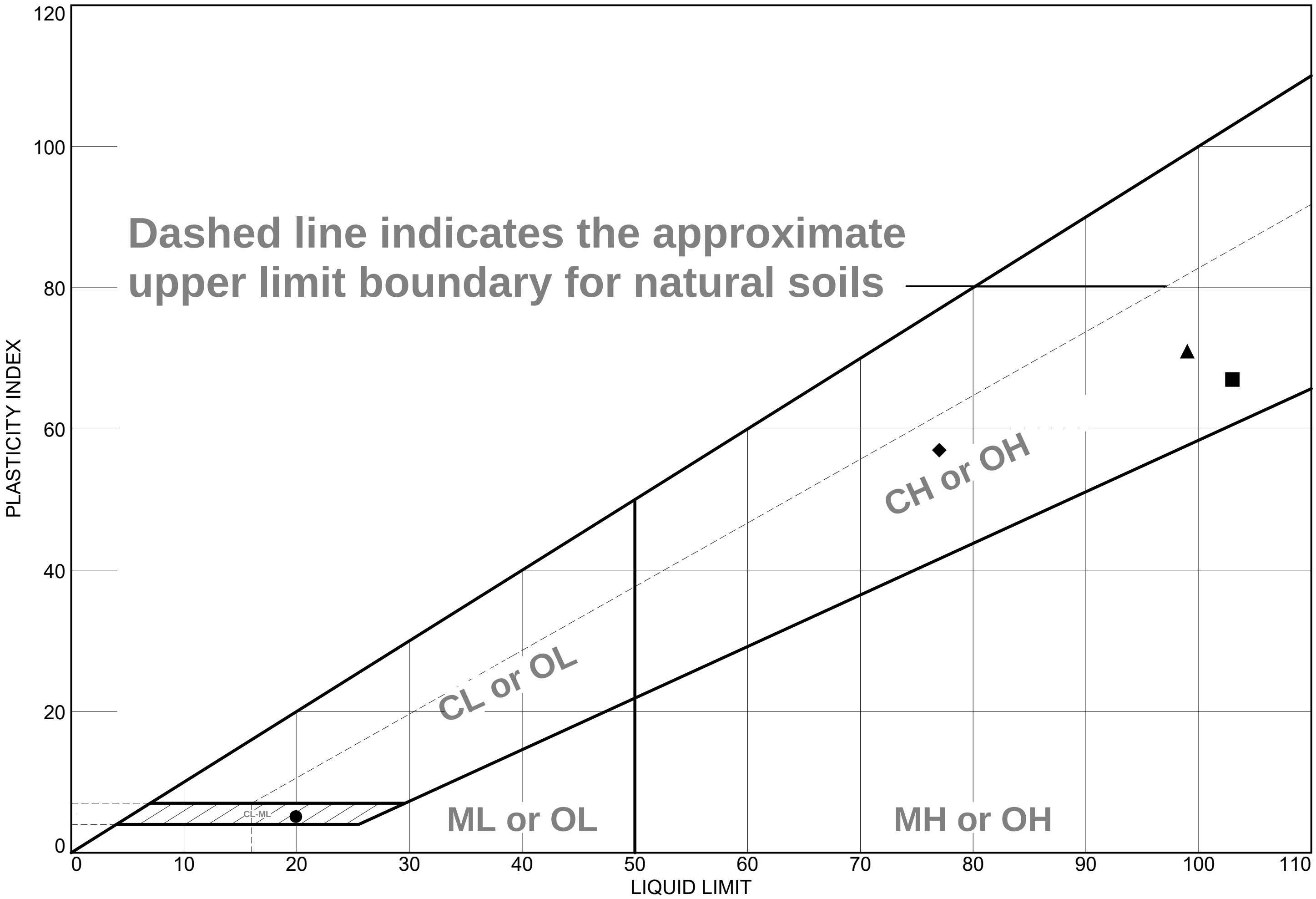
Thompson Engineering

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

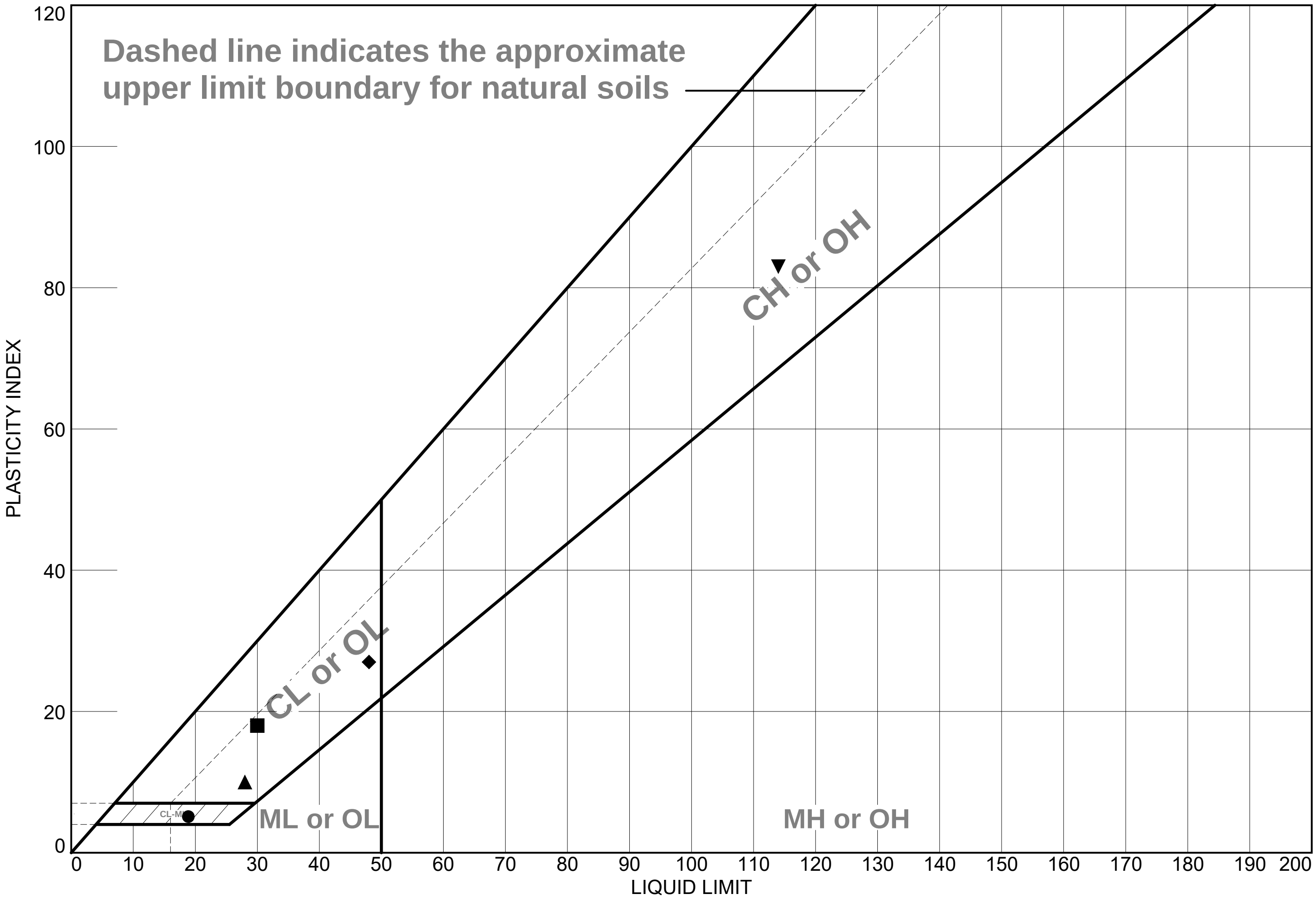
Thompson Engineering

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

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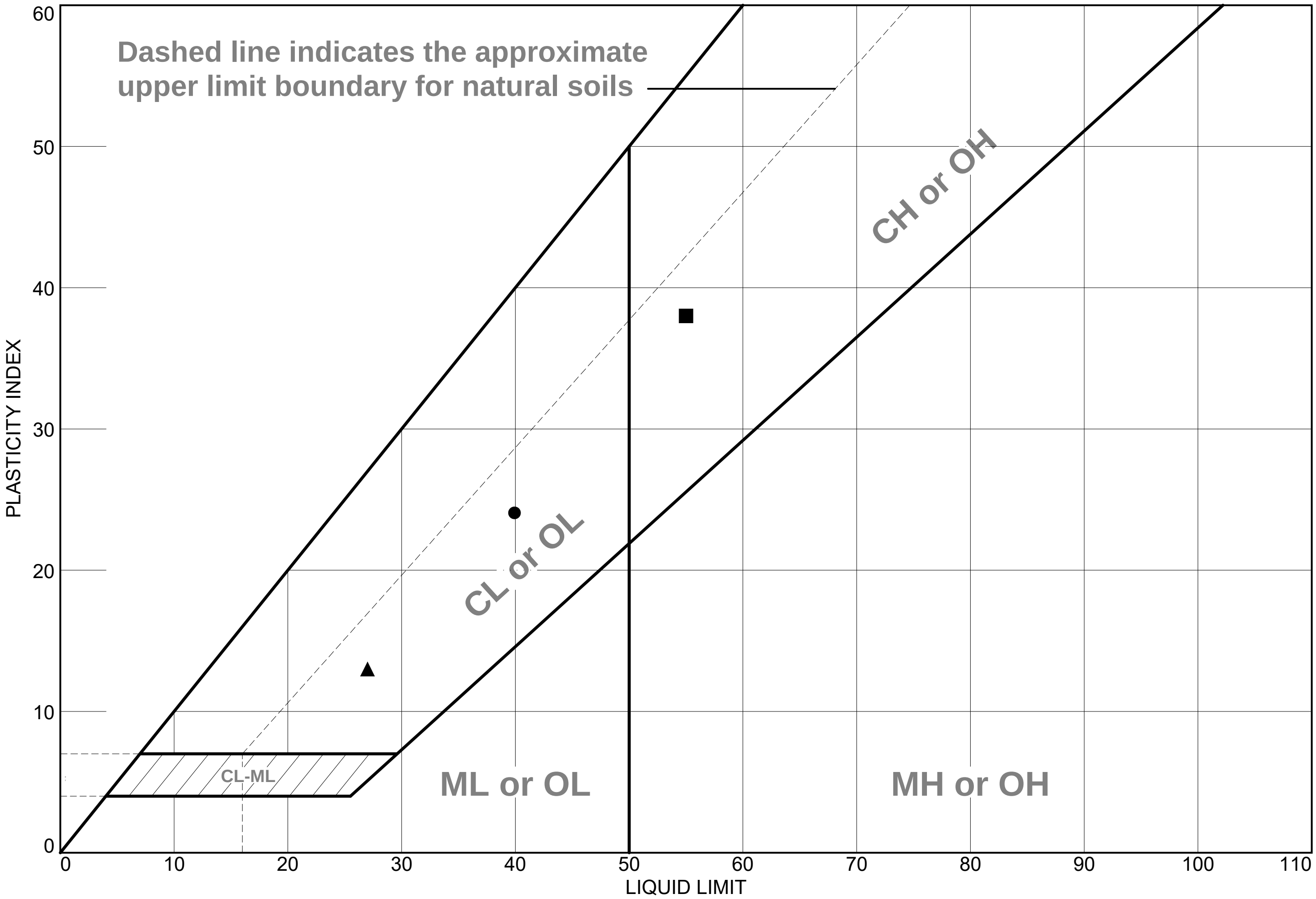
Figure

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

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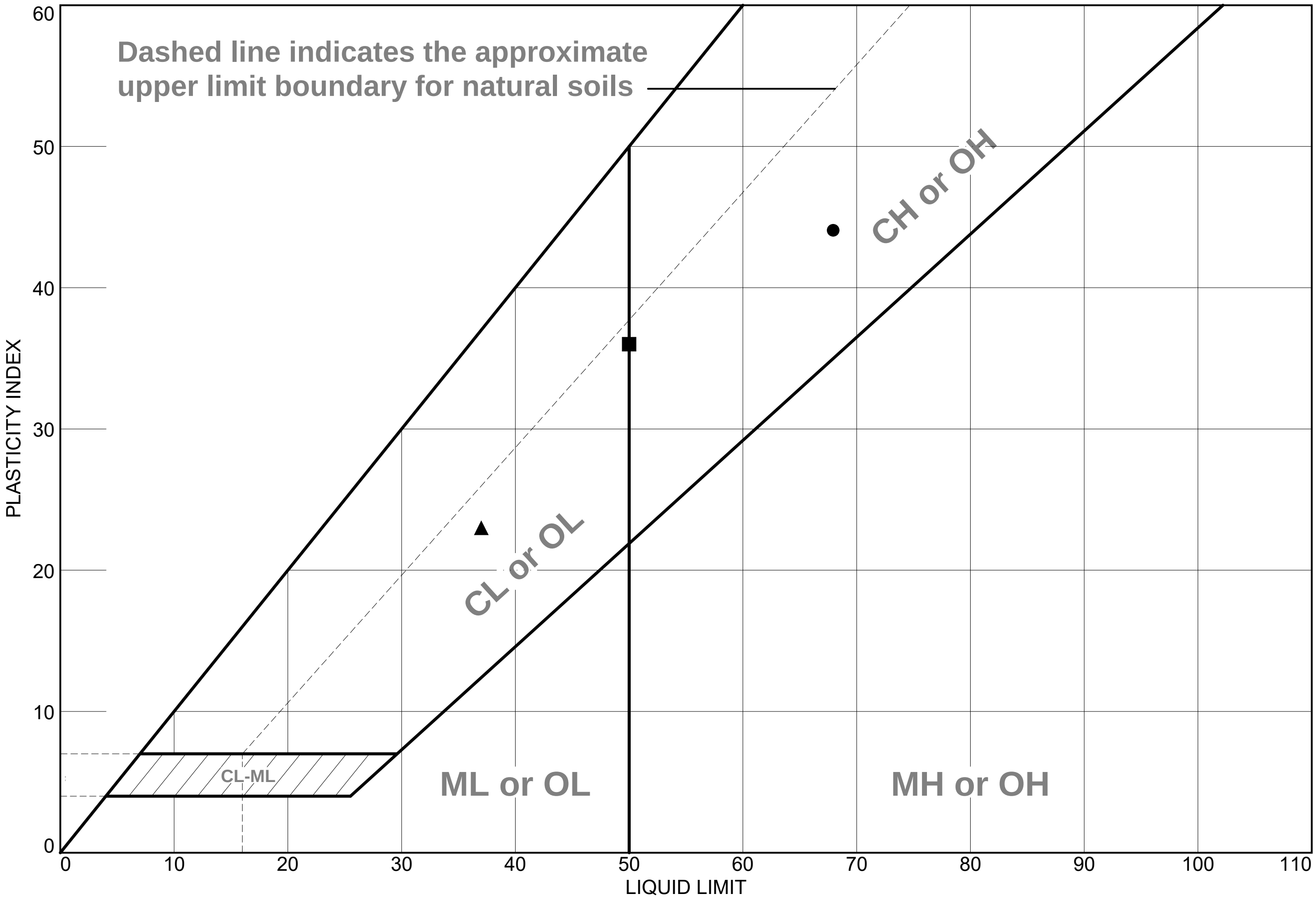
Figure

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

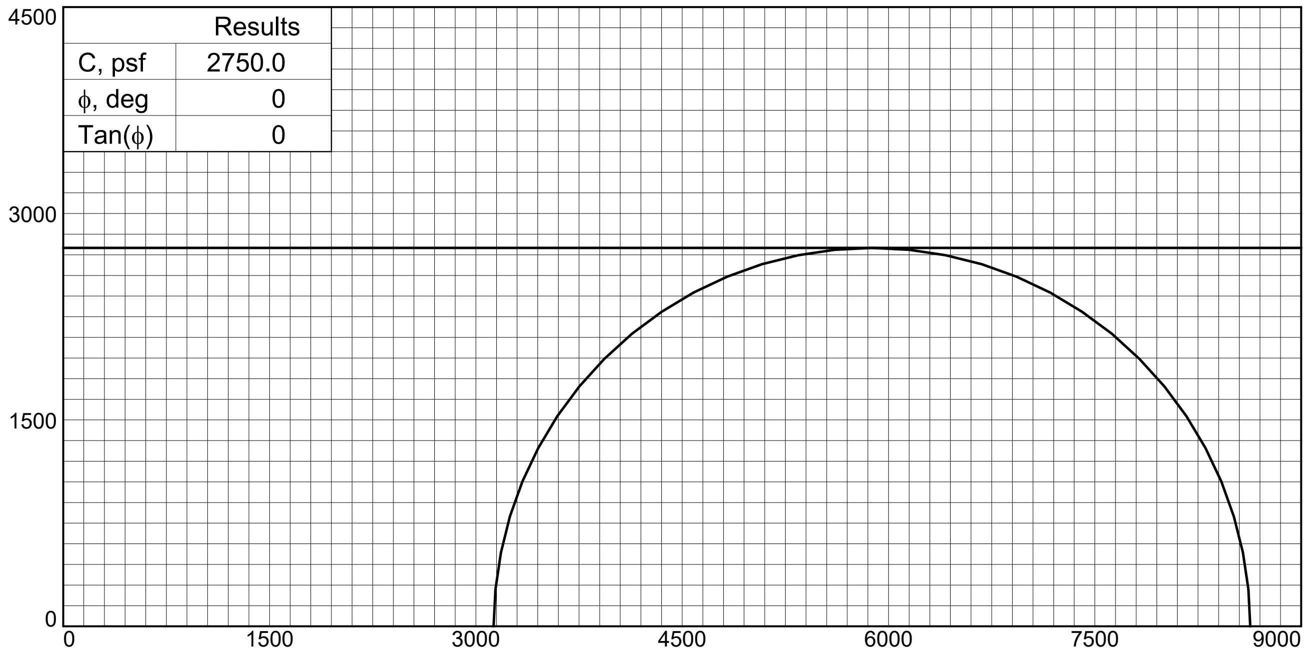
Remarks:
●Date: 8/26/2021
■Date: 8/21/2021
▲Date: 8/21/2021

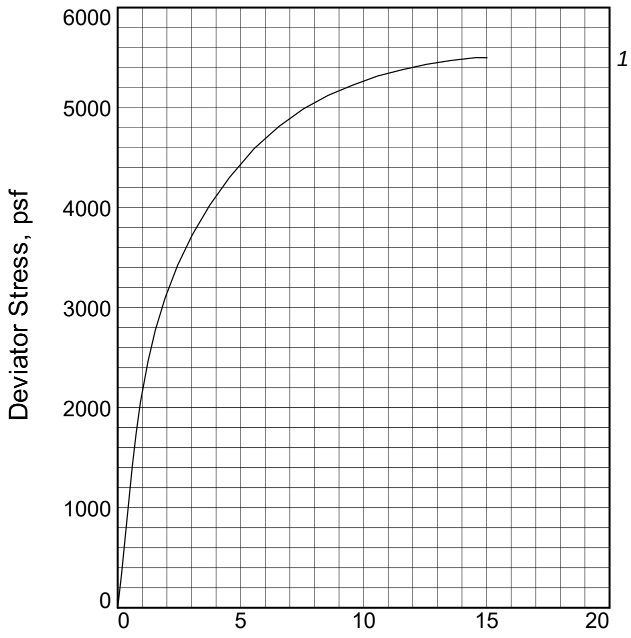
Thompson Engineering

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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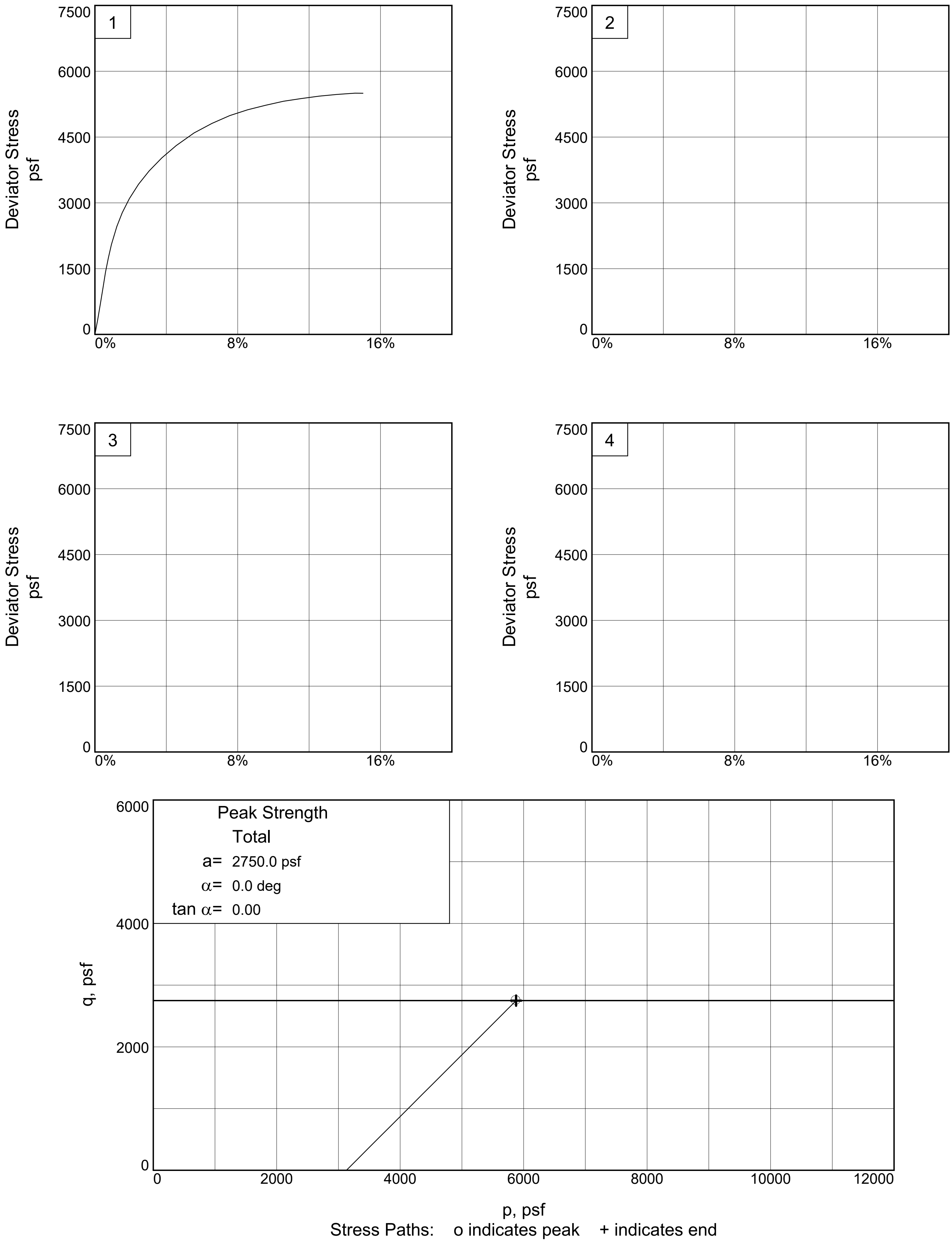
Thompson Engineering
Mobile, Alabama



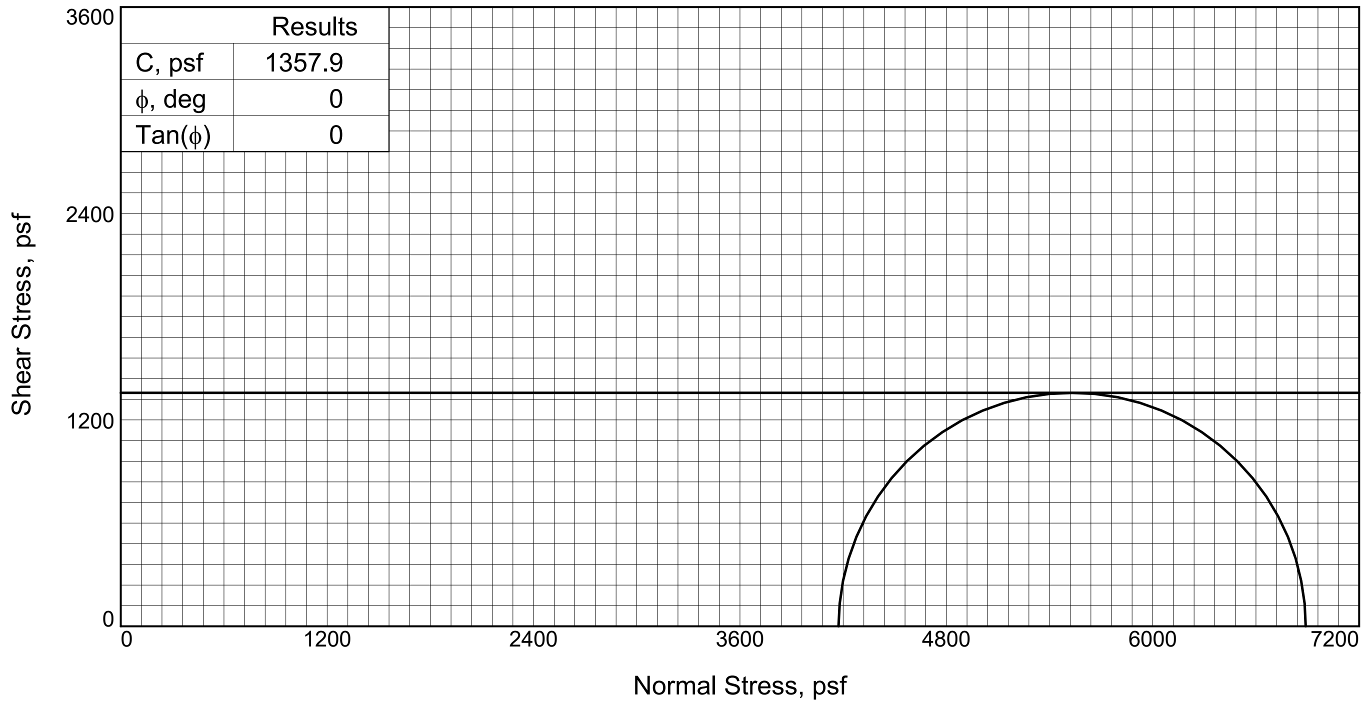
Client: GHD

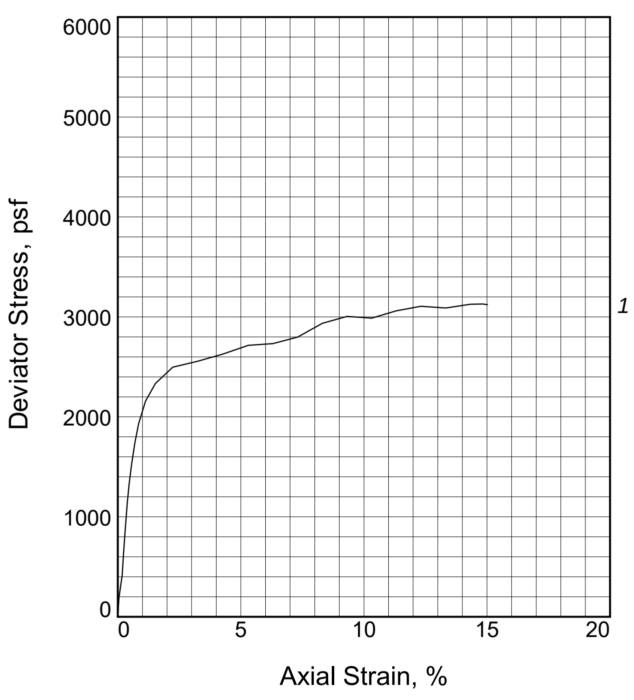
Project: San Jacinto Waste Piles

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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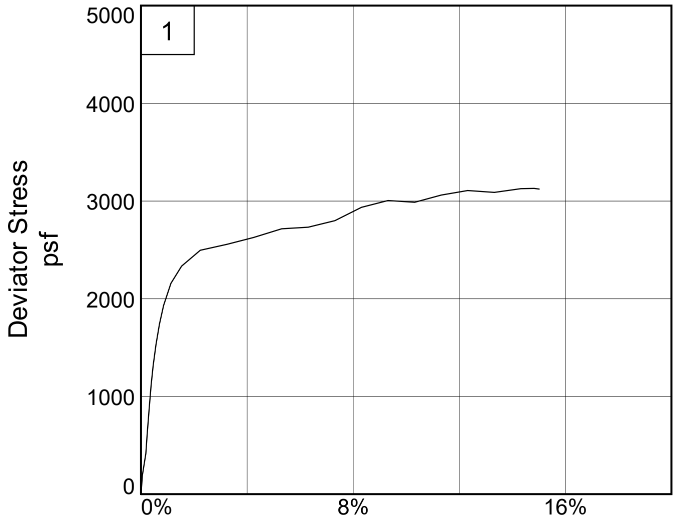
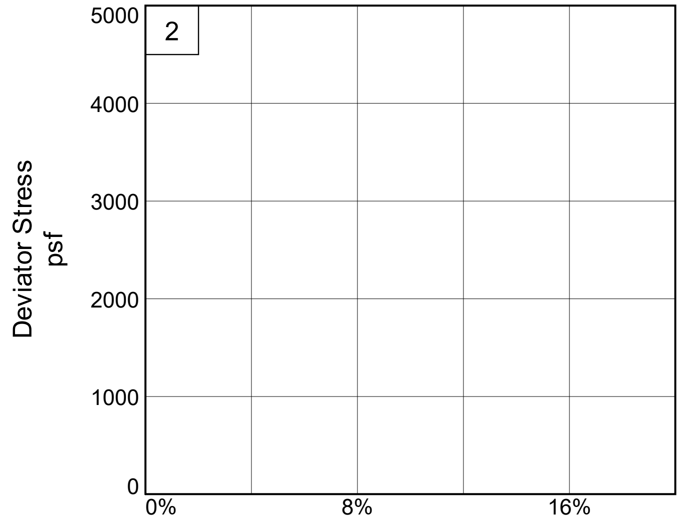
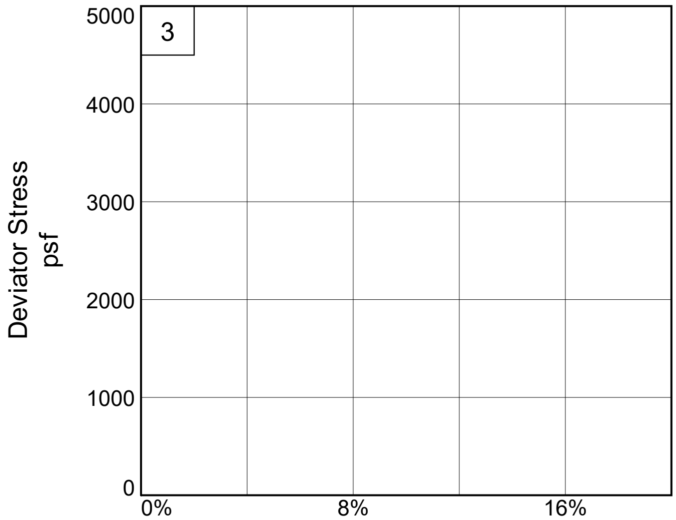
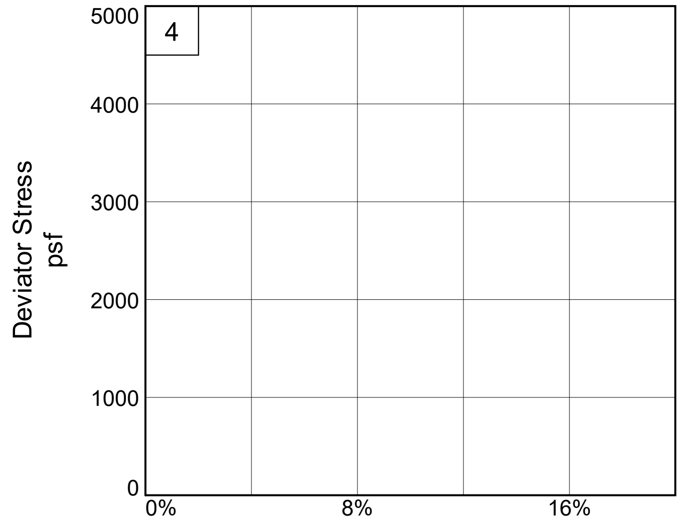
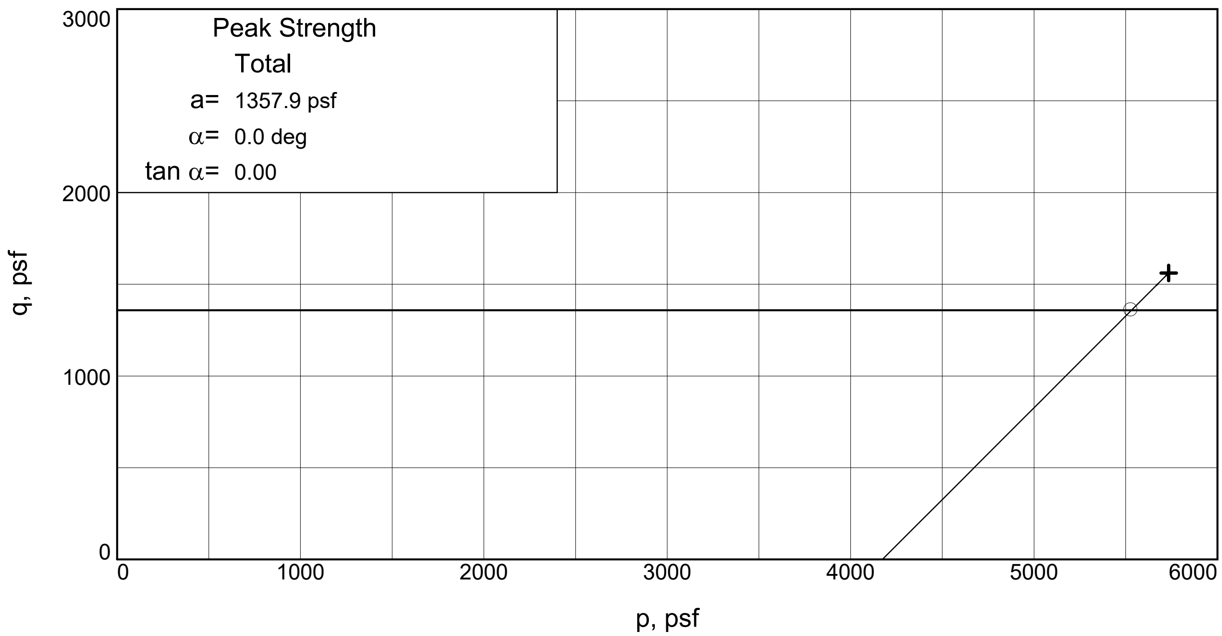
Mobile, Alabama











Stress Paths: o indicates peak + indicates end

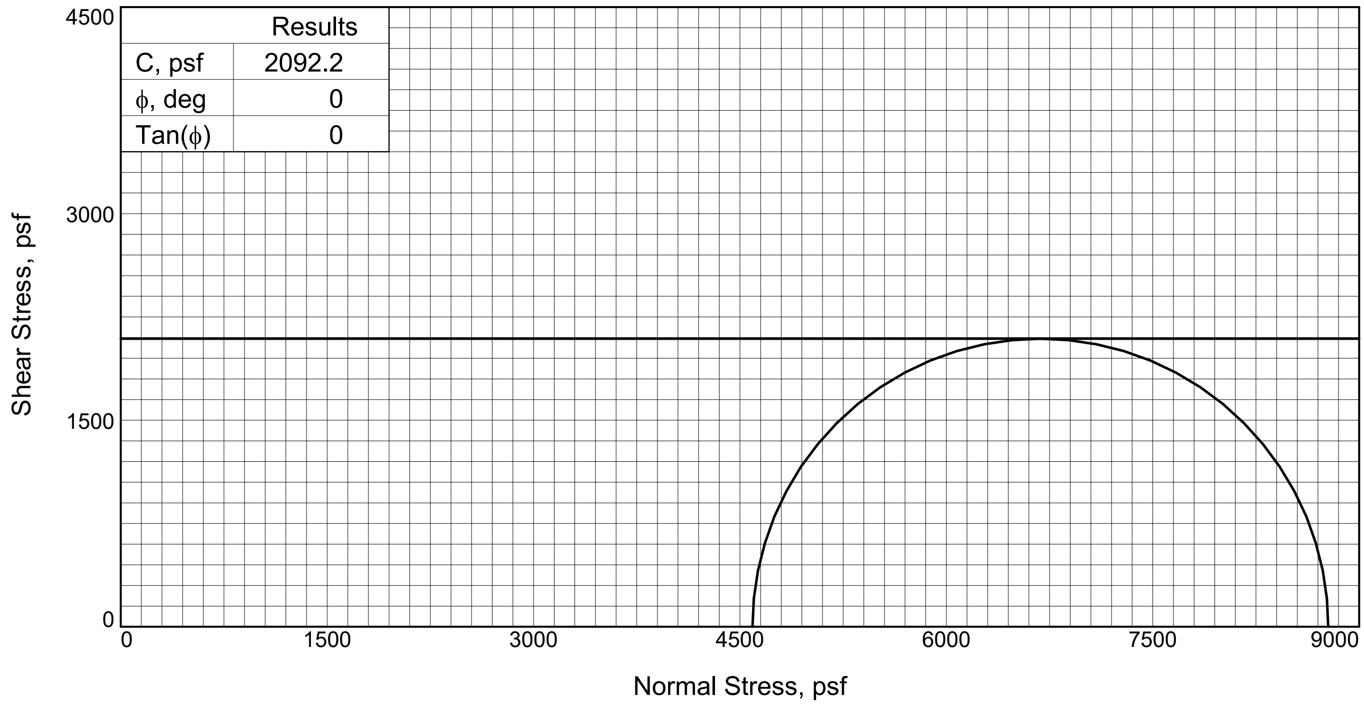
Client: GHD

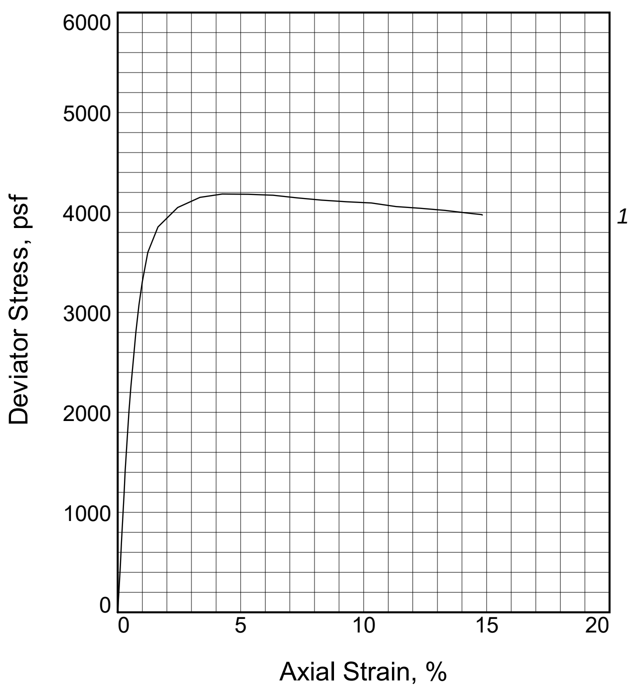
Project: San Jacinto Waste Piles

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

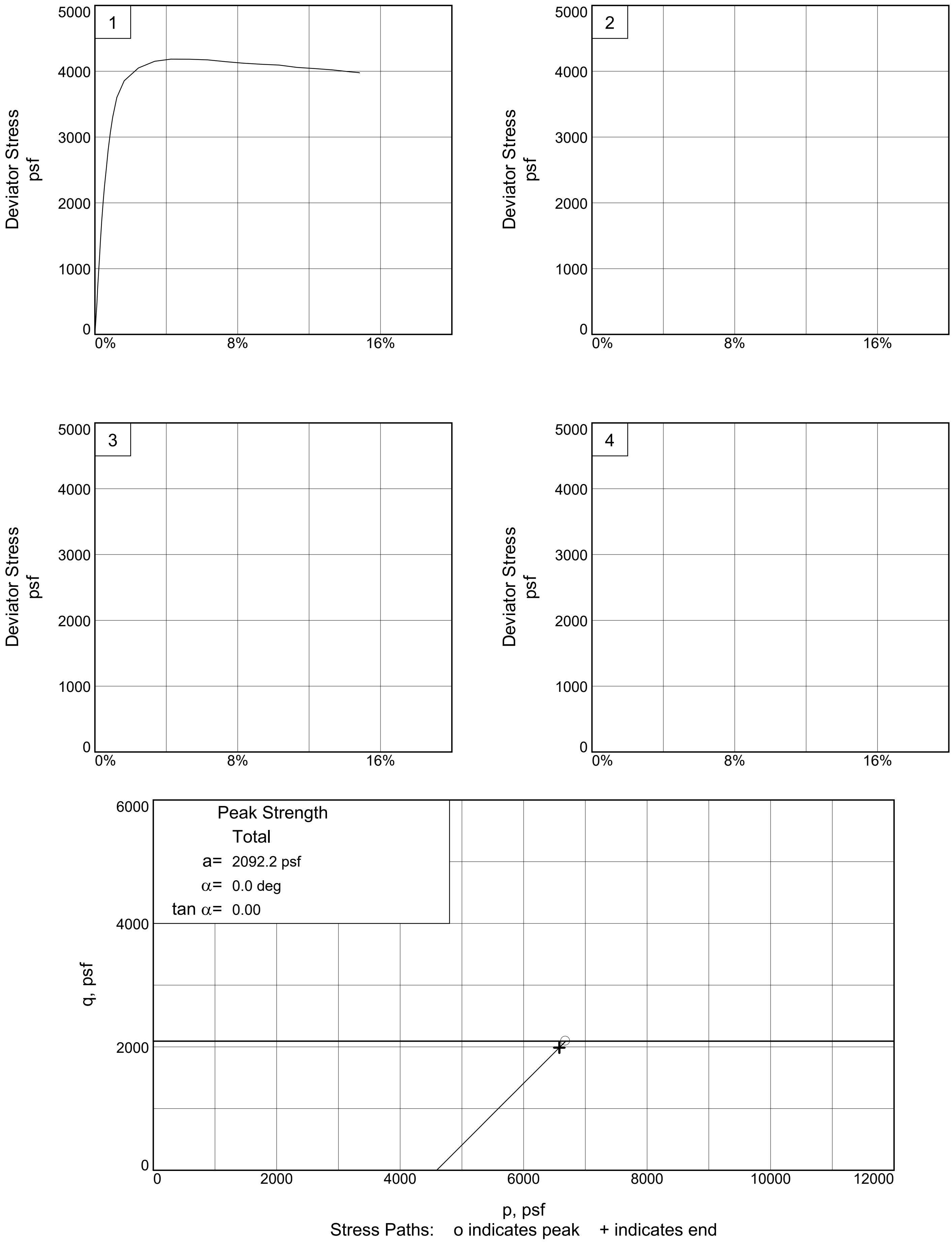
Project: San Jacinto Waste Piles

Source of Sample: Lab #9143 (SJMW-16)

Sample Number: SJMW-16-ST-6

Proj. No.: 2111020111 **Date Sampled:** 8/26/2021

TRIAXIAL SHEAR TEST REPORT
Thompson Engineering
Mobile, Alabama



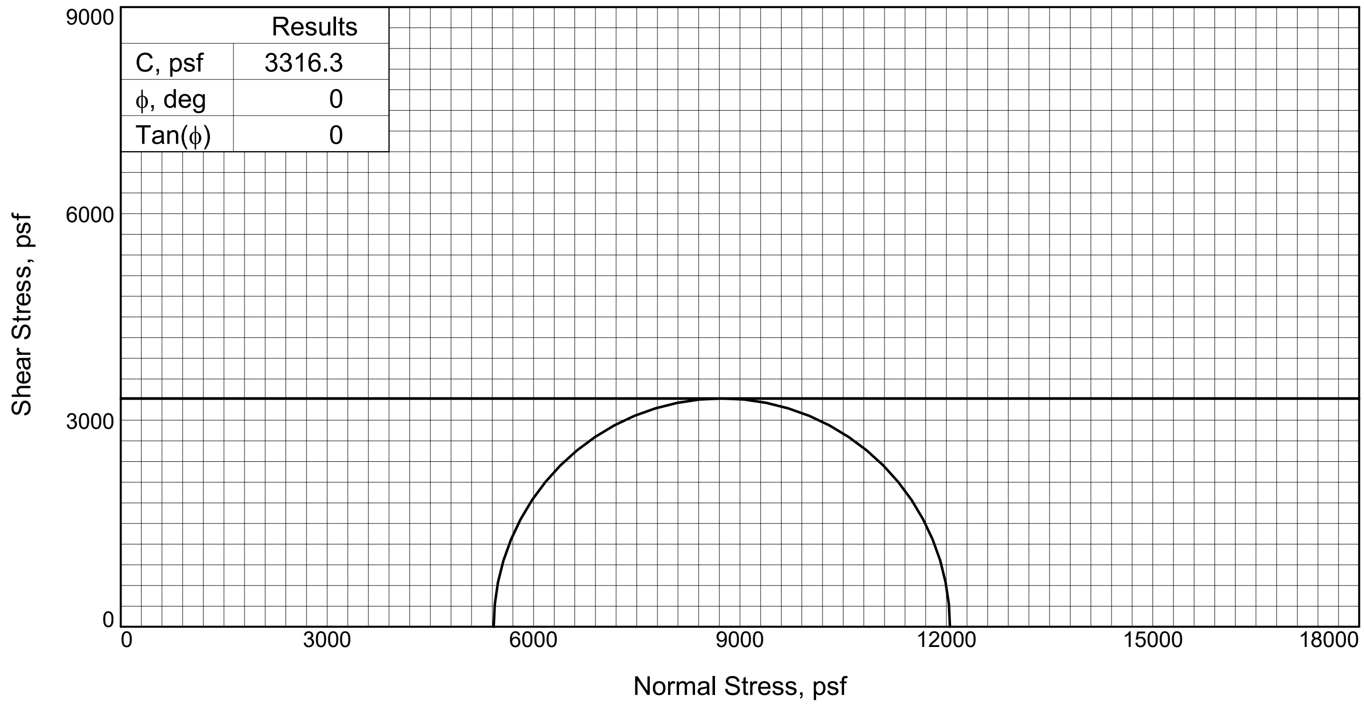
Client: GHD

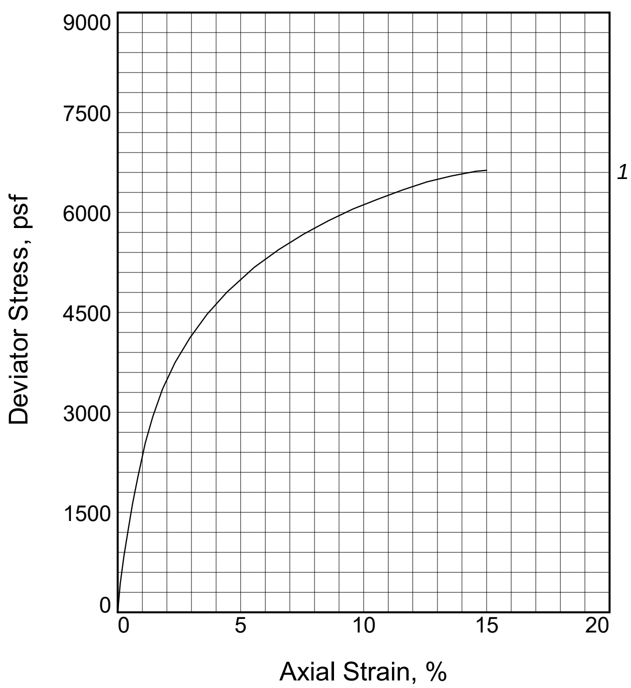
Project: San Jacinto Waste Piles

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

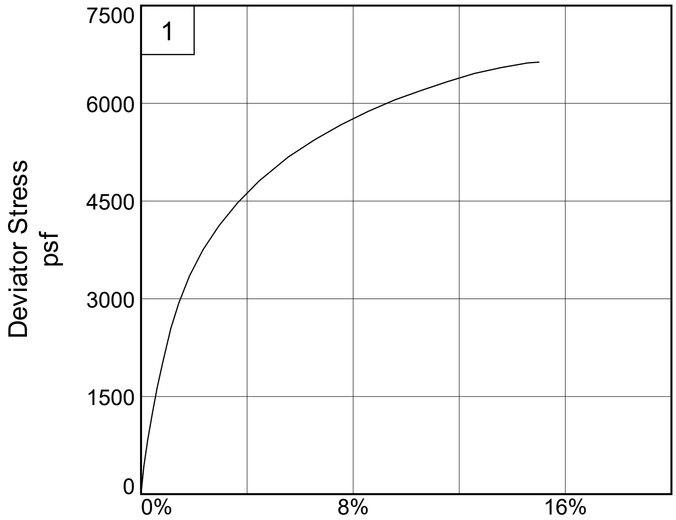
Project: San Jacinto Waste Piles

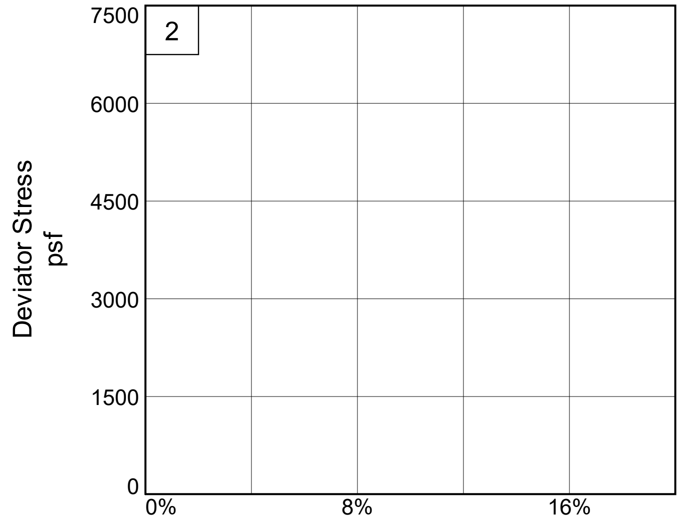
Source of Sample: Lab #9143 (SJMW-16)

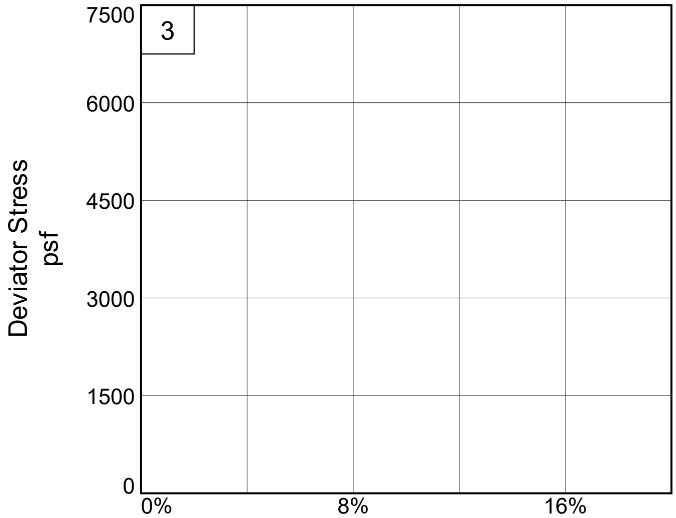
Sample Number: SJMW-16-ST-8

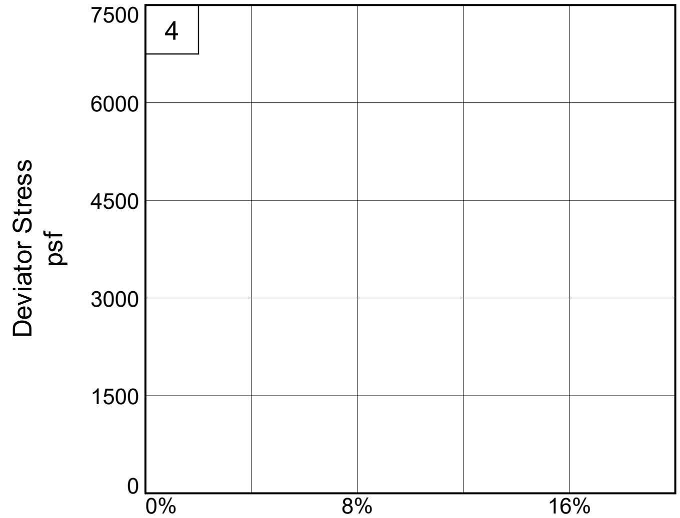
Proj. No.: 2111020111 **Date Sampled:** 8/26/2021

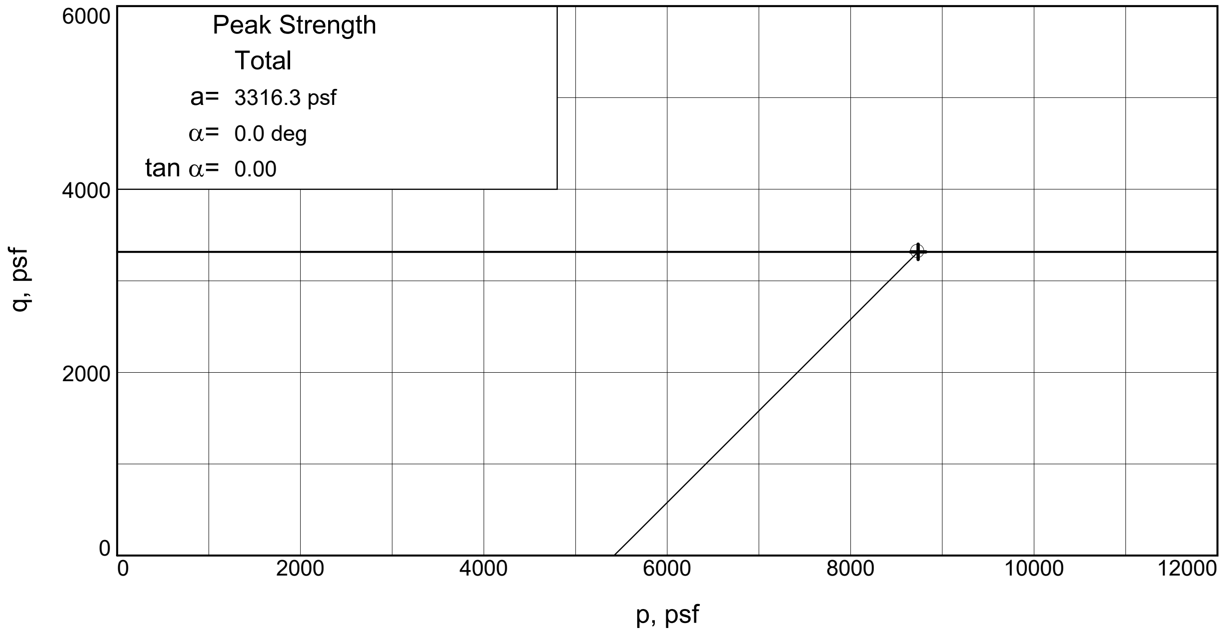
TRIAXIAL SHEAR TEST REPORT
Thompson Engineering
Mobile, Alabama











Stress Paths: o indicates peak + indicates end

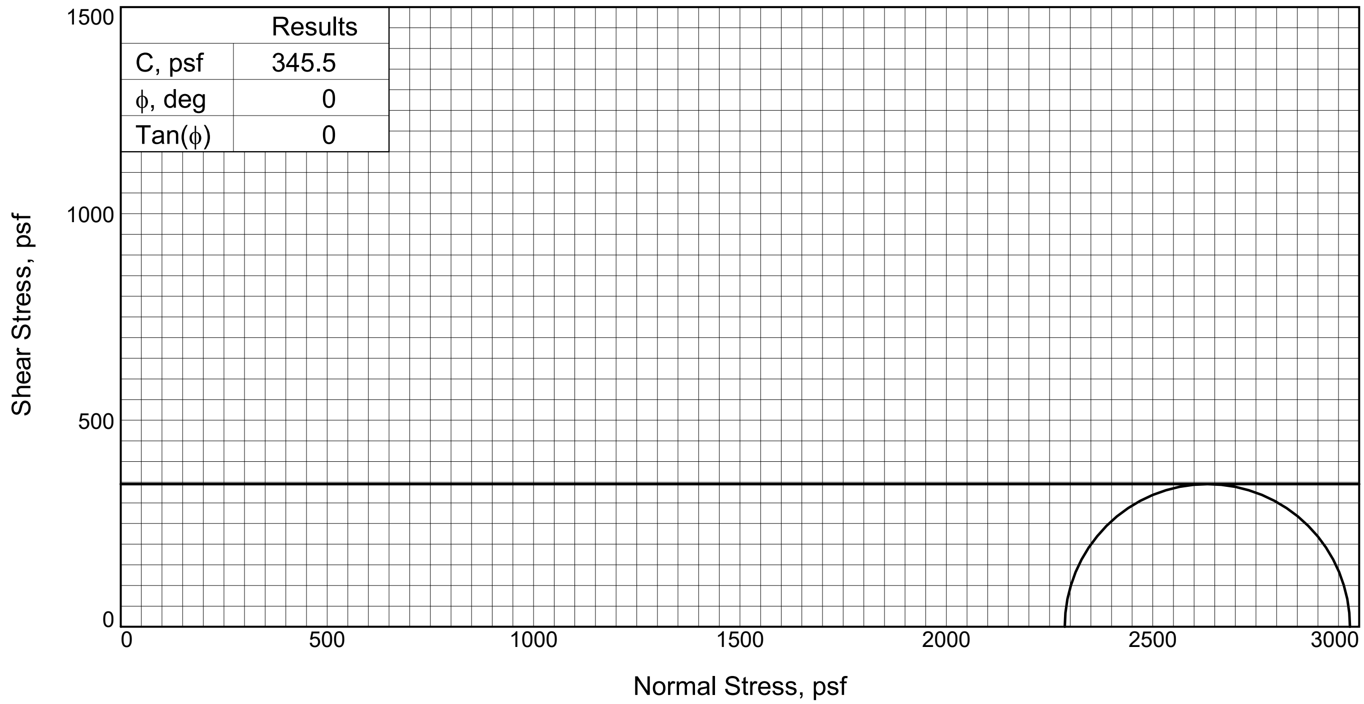
Client: GHD

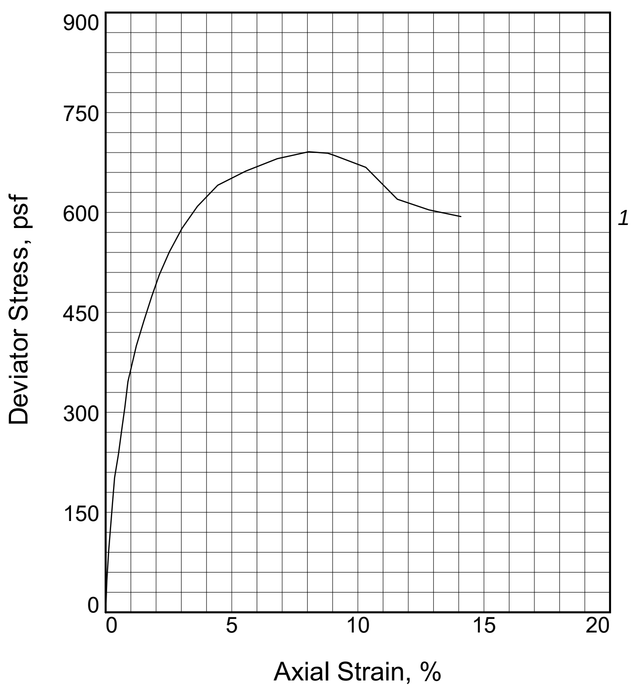
Project: San Jacinto Waste Piles

Source of Sample: Lab #9143 (SJMW-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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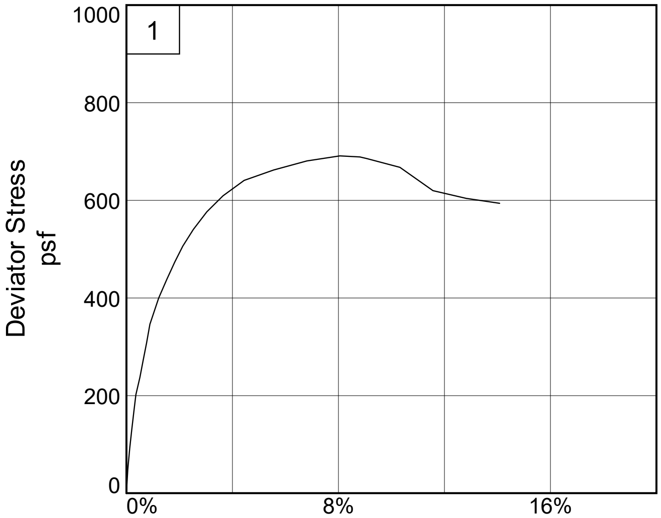
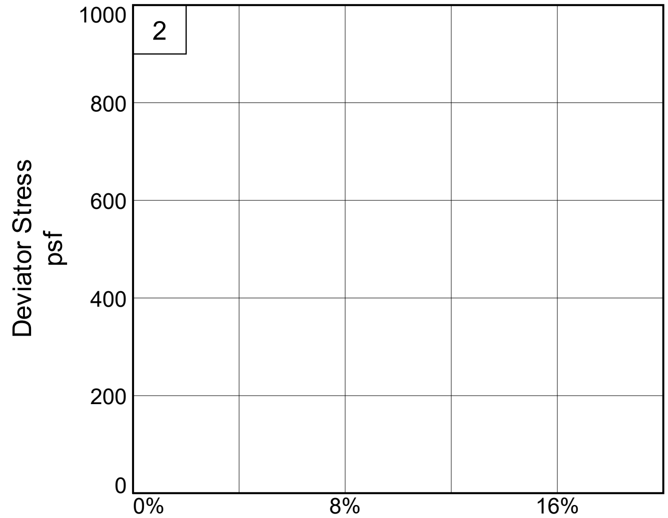
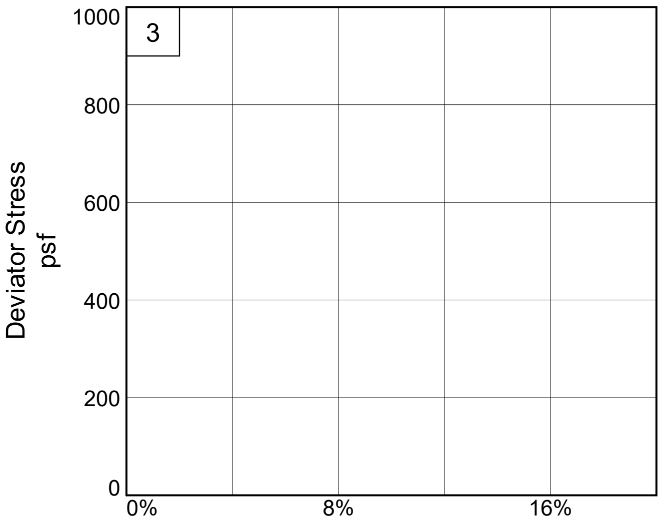
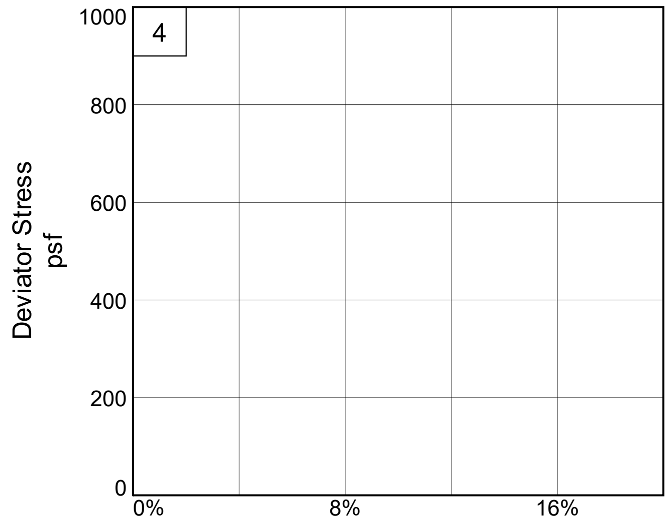
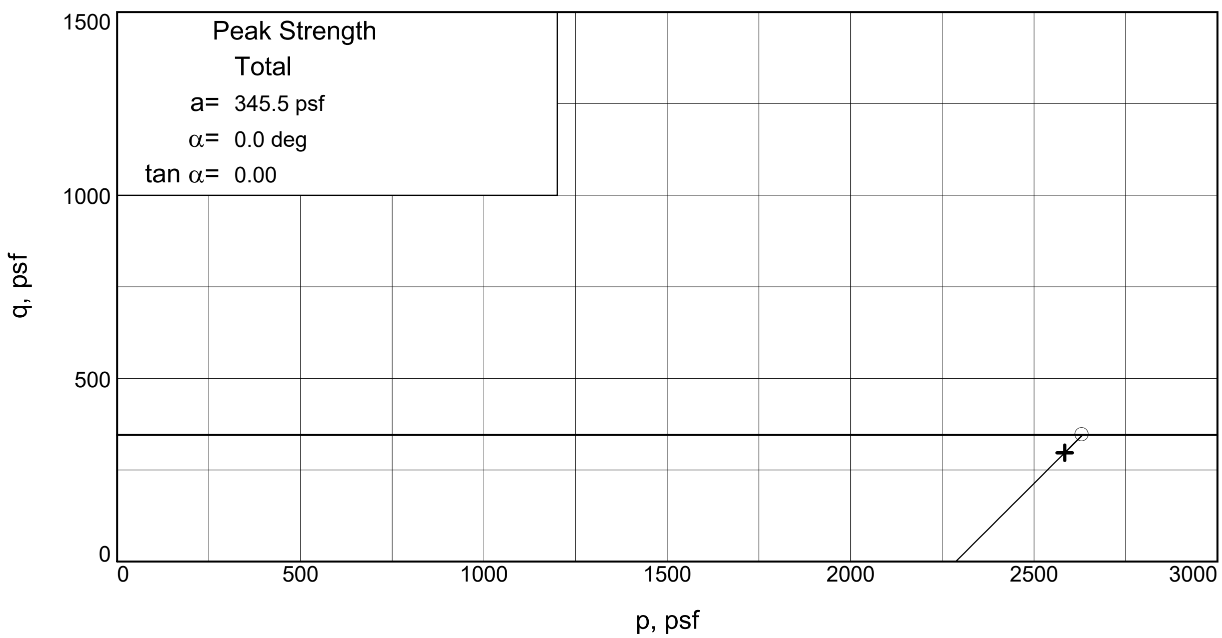
Thompson Engineering
Mobile, Alabama











Stress Paths: o indicates peak + indicates end

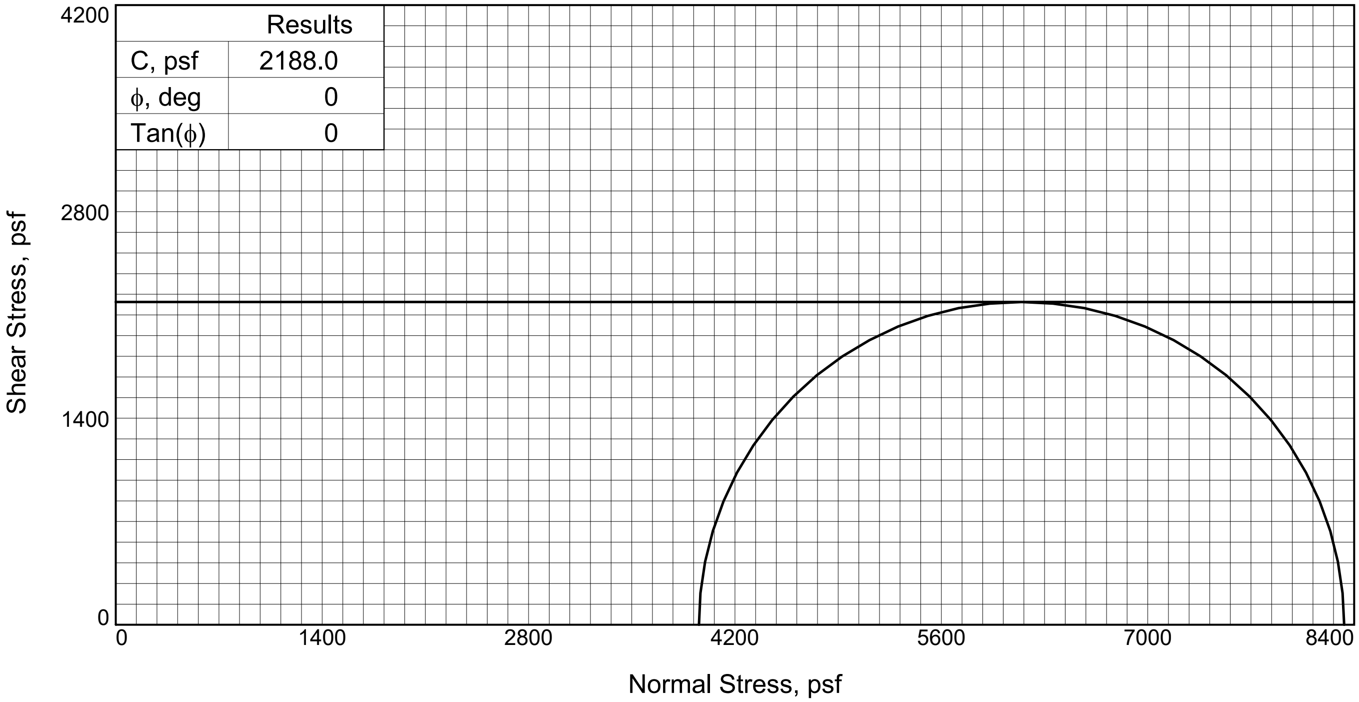
Client: GHD

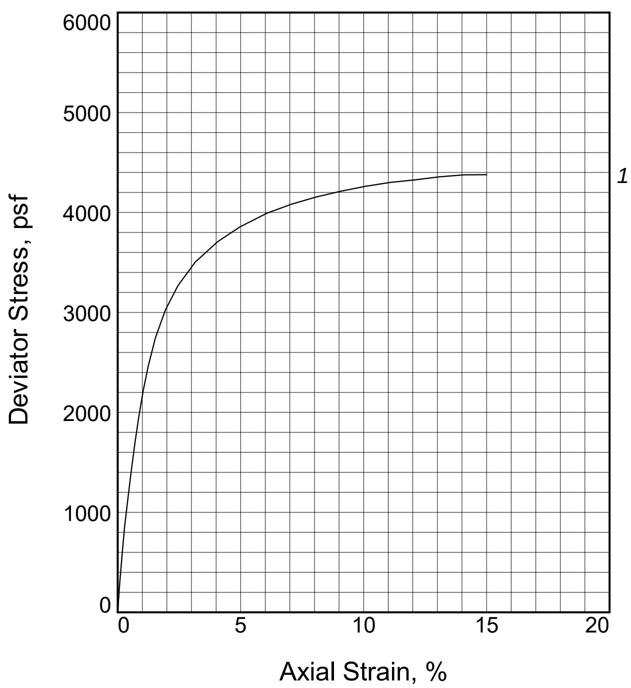
Project: San Jacinto Waste Piles

Source of Sample: Lab #9143 (SJMW-17) **Sample Number:** SJMW-17-ST-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

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Thompson Engineering

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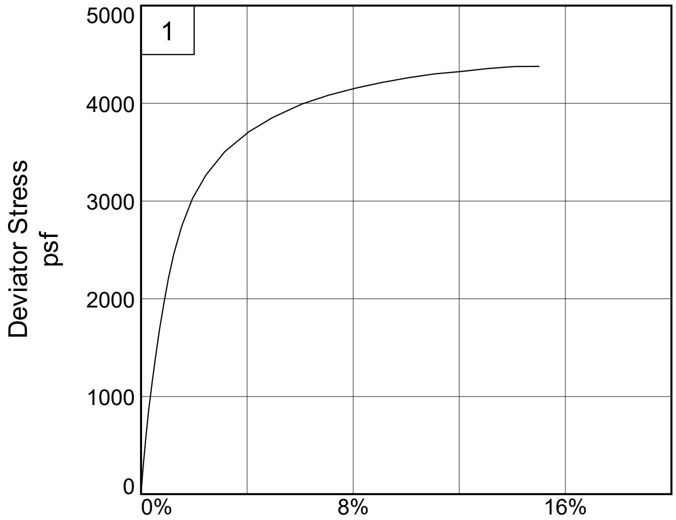
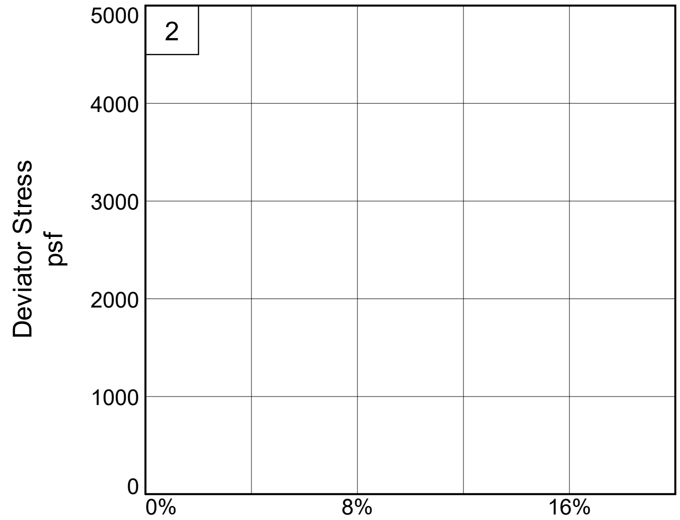
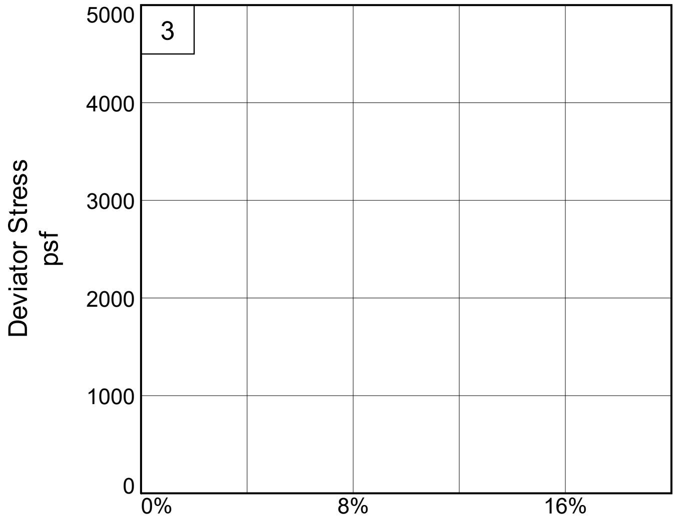
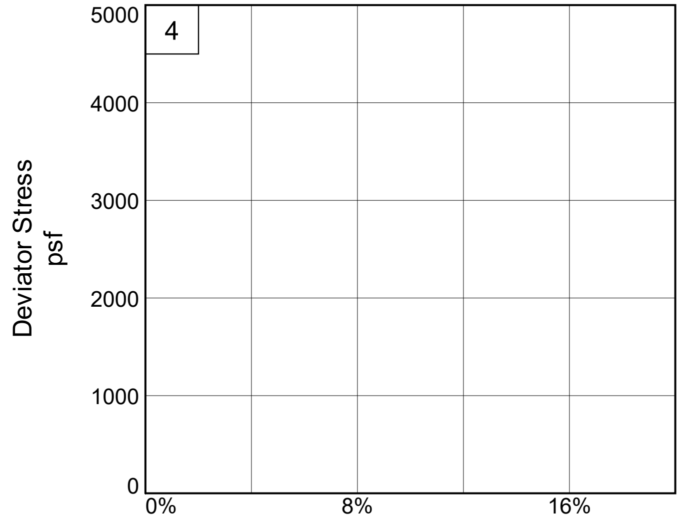
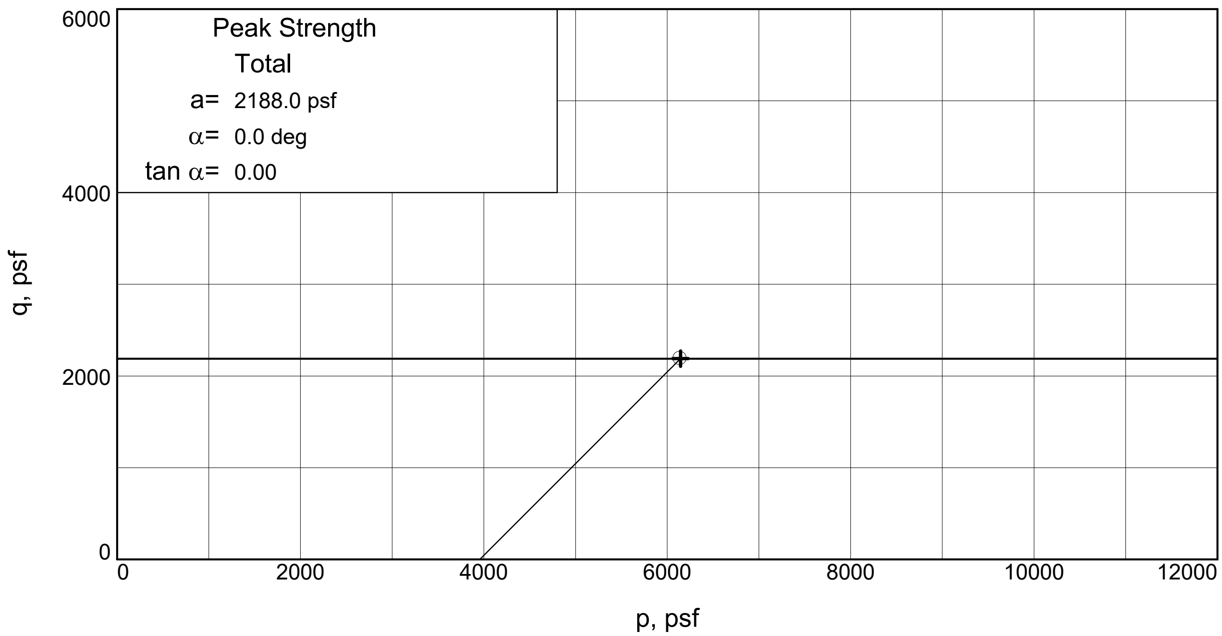










Stress Paths: o indicates peak + indicates end

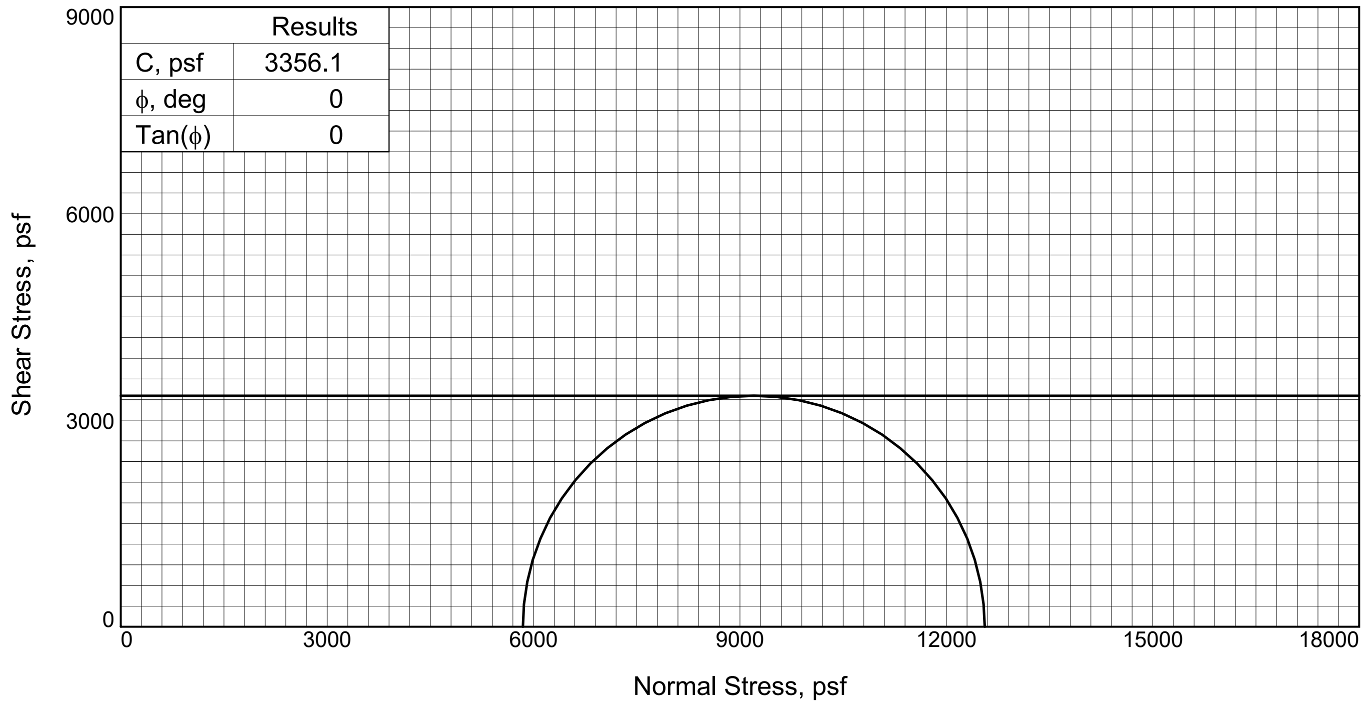
Client: GHD

Project: San Jacinto Waste Piles

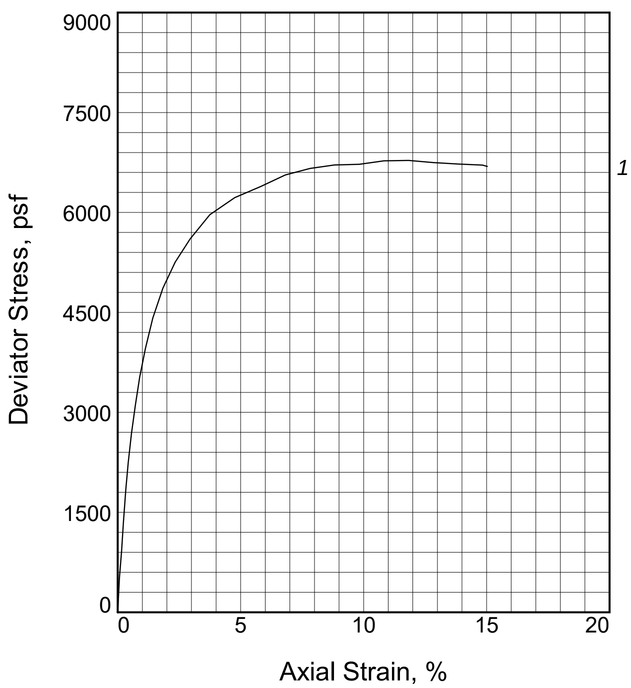
Source of Sample: Lab #9143 (SJMW-17) **Sample Number:** SJMW-17-ST-3

Project No.: 2111020111 **Figure** ________

Thompson Engineering



Results	
C, psf	3356.1
ϕ, deg	0
Tan(ϕ)	0



	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

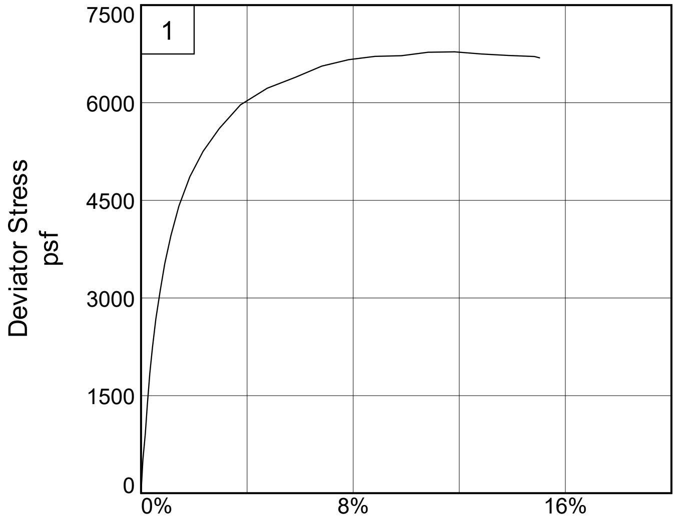
Project: San Jacinto Waste Piles

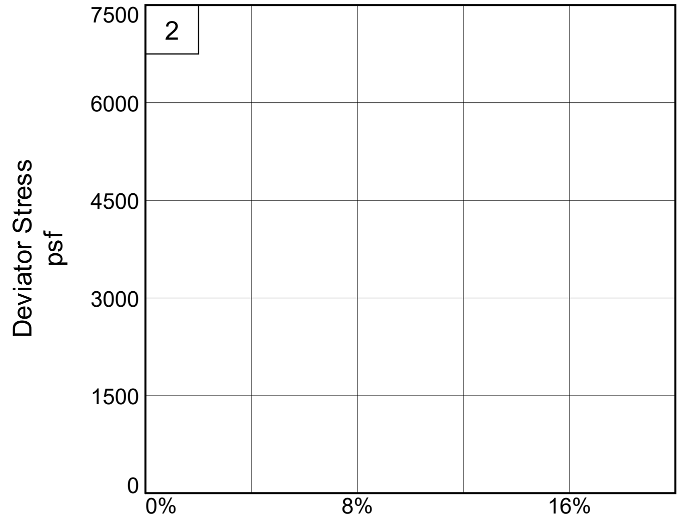
Source of Sample: Lab #9143 (SJMW-17)

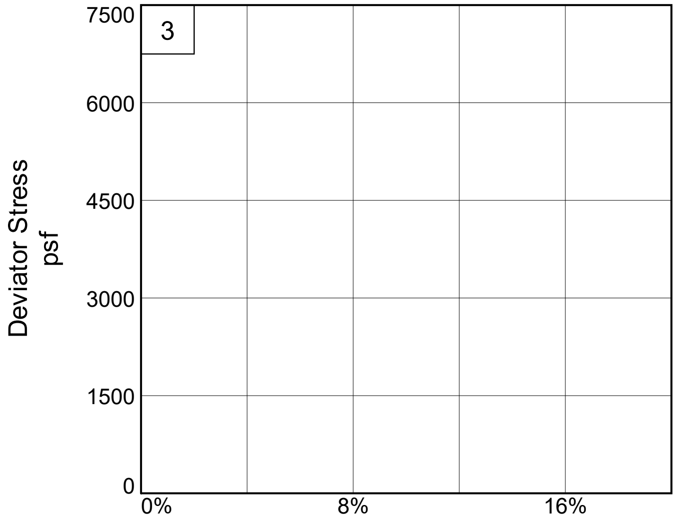
Sample Number: SJMW-17-ST-5

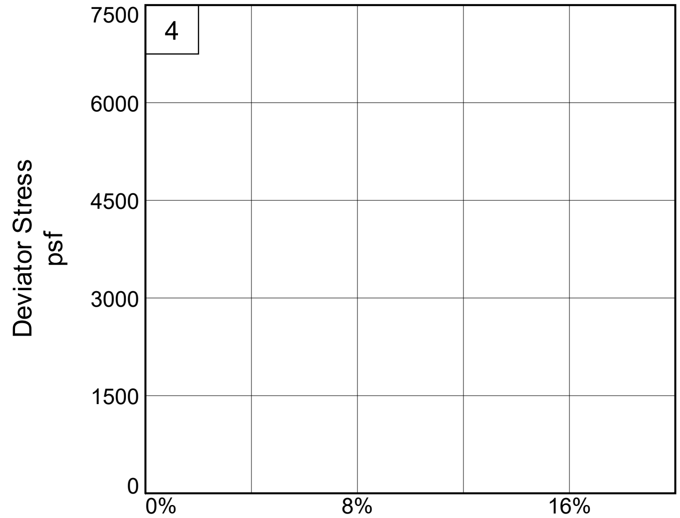
Proj. No.: 2111020111 **Date Sampled:**

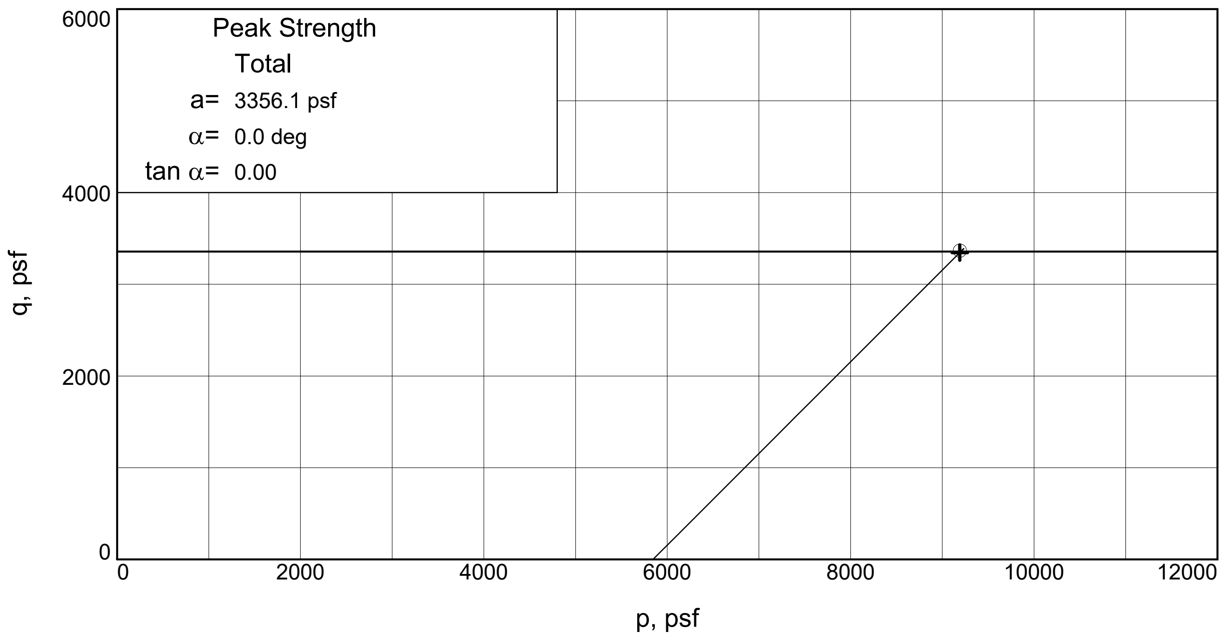
TRIAXIAL SHEAR TEST REPORT
Thompson Engineering
Mobile, Alabama











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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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-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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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-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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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-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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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-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	JOB #: 21-1102-0111
PROJECT: San Jacinto Waste Piles	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**

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-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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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-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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September 9, 2021

CLIENT: GHD	JOB #: 21-1102-0111
PROJECT: San Jacinto Waste Piles	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**

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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**

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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**

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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**

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The Power of Commitment

Attachment D Pile Drivability Analysis

This Attachment contains the following:

***** 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

***** 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

Attachment Figure D.2-1

***** 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	G-Ls G-Lt	Rult	Set	BlCt	TopFx	MxCS	MxTS	ENTHRU	ActRes	Stroke
ft		kips	inch	Bl/ft	kips	ksi	ksi	kip-ft	kips	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 Figure D2.-2

Attachment E Hydraulic Heave Analysis Report

Updated Hydraulic Heave Analysis

Northern Impoundment
San Jacinto River Waste Pits Superfund Site
Harris County, Texas

International Paper Company and McGinnes Industrial Maintenance Corporation

May 20, 2024

→ **The Power of Commitment**

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Appendices

1. Background

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 *Updated Hydraulic Heave Analysis* performed for the Northern Impoundment as part of the Final 100% (100%) Remedial Design -Northern Impoundment (RD) for the San Jacinto River Waste Pits Superfund Site in Harris County, Texas. This document is a revised version of a draft updated heave analysis that was submitted to EPA on January 25, 2024 (January 2024 Report), and addresses the comments received from EPA on April 18, 2024.

The Northern Impoundment 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) TEQ_{DF} for dioxins/furans. Data from the Supplemental Design Investigation (SDI) conducted as part of the RD in September and October 2021 found impacts above the clean-up level at much deeper elevations than had been previously understood, prompting concern around the risk of hydraulic heave associated with the resulting deeper excavation work.

Section 2.0 provides a summary of the reports containing hydraulic heave assessments for the Northern Impoundment submitted as part of the Northern Impoundment RD. Subsequent sections describe the geological conditions at the Northern Impoundment and the methodology and the results of the updated heave analysis presented herein.

2. Previously-Submitted Hydraulic Heave Assessment Reports

As part of the 90% RD, two hydraulic heave assessment reports were submitted (in December 2021 and November 2022) to support the design for waste removal to address and control the potential for hydraulic heave risk. In addition, a preliminary version of this Updated Heave Analysis report was submitted in January 2024. The references, assumptions and conclusions of each report are briefly described below:

1. 90% RD Hydraulic Heave Assessment Report dated December 9, 2021.

   The main assumptions used in preparing this report were as follows:

   – The San Jacinto River stage is at +2 feet (ft) North American Vertical Datum of 1988 (NAVD88).
   – The Beaumont Sand is hydraulically connected to the San Jacinto River.
   – The piezometric head in the Beaumont Sand unit is at -2 ft NAVD88.
   – Sand lenses detected in the Beaumont Clay layer are hydraulically connected to the Beaumont Sand.
   – The top of the Beaumont Sand elevation and Beaumont clay thickness were based on the closest geotechnical borehole.
   – The factor of safety (FS) was evaluated by analyzing both effective stress and total stress.

   The results of this heave analysis indicated a hydraulic heave risk in the area of the Northern Impoundment referred to as the Northwest Corner (Northwest Corner) and at certain other locations outside of the Northwest Corner.

2. 90% RD - Northwest Corner Component (NCC) Hydraulic Heave Assessment Report dated November 8, 2022.

   The hydraulic heave assessment in this report assessed only the risk and addressed mitigation alternatives for the Northwest Corner of the Northern Impoundment. The following assumptions were used in this report.

- The San Jacinto River stage is at +5 ft NAVD88.
- The Beaumont Sand is hydraulically connected to the San Jacinto River.
- Sand lenses detected in the Beaumont Clay layer are hydraulically connected to the Beaumont Sand.
- Piezometric head in the Beaumont Sand is assumed to be the San Jacinto River stage dampened by 1.7 ft (head loss).
- The FS was evaluated by analyzing total stress.

3. Updated Hydraulic Heave Analysis, Northern Impoundment, dated January 25, 2024

   The January 2024 Report was a draft version of this report, prepared to support a design for waste removal to 30 ng/kg TEQ_{DF} across the Northern Impoundment based on the hydraulic heave analysis assumptions from the 90% RD- submittal (November 8, 2022) and Site-wide stratigraphic model. The following assumptions were used in this report.

   - The San Jacinto River stage is at +5 ft NAVD88.
   - The Beaumont Sand is hydraulically connected to the San Jacinto River.
   - Sand lenses detected in the Beaumont Clay layer are hydraulically connected to the Beaumont Sand.
   - Piezometric head in the Beaumont Sand is assumed to be the San Jacinto River stage dampened by 1.7 ft (head loss).
   - The FS was evaluated by analyzing total stress.

3. 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.

As discussed in the Geotechnical Engineering Report included as Appendix B in the 100% RD, 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), 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, 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. Refer to the Geotechnical Engineering Report for a complete description of the Northern Impoundment's geology.

4. Geotechnical Conditions

4.1 Geotechnical Soundings

In order to define the geotechnical conditions of the Northern Impoundment, four geotechnical investigations were carried out and are listed below:

- Remedial 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 most recent investigation (SDI), four piezometers were installed, and cone penetration tests (CPT) were also performed at 13 locations in the Northern Impoundment. Figure 1 shows the locations of the geotechnical soundings.

Table 4.1 below presents the list of the geotechnical soundings in which the Beaumont Sand was reached.

Table 4.1 Geotechnical Soundings Considered in the Hydraulic Heave Analysis

Geotechnical Investigation	Sounding Identification	Termination Depth (feet below ground surface [ft bgs])	Coordinates (NAD83)		Ground Surface Elevation (ft NAVD88)
			Easting	Northing	
RI (2011)	SJGB-001	60	3216751.14	13857514.92	3.50
	SJGB-002	59.5	3216860.61	13857743.81	0.75
	SJGB-003	119.5	3217161.01	13857865.43	-10.67
	SJGB-004	59.5	3217397.81	13857774.85	-3.25
	SJGB-005	61.5	3217542.37	13857614.08	-4.50
	SJGB-007	119.5	3217417.80	13857330.12	-3.25
	SJGB-008	59.5	3217332.71	13857191.39	-3.0
PDI-1 (2018)	SJGB-018	52	3216809.99	13857802.24	-13.43
	SJGB-019	59	3216887.24	13857986.27	-14.82
	SJGB-020	62	3217105.99	13858004.5	-8.17
	SJGB-021	56	3217609.93	13857456.24	-5.15
	SJGB-022	47	3217485.03	13857183.95	-9.39
	SJGB-023	60	3216651.13	13857586.97	-1.86
PDI-2 (2019)	SJGB-047	100	3217421.37	13857278.32	-3.40
	SJGB-053	100	3217301.20	13857799.52	-9.70
	SJGB-057	100	3216960.20	13857956.45	-17.1
SDI (2021)	SJMW-16	70	3216869.54	13857581.37	5.0
	SJMW-17	72	3217204.37	13857083.84	5.0
	SJCPT-11	76	3216891.12	13857566.47	3.0

4.2 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:*** 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:*** generally encountered at elevations ranging between -20 to -30 ft NAVD88), this unit 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 (Appendix A). The lateral extents of these particular features remain unknown.

– ***Beaumont Sand:*** encountered at elevations globally ranging between -50 to -80 ft NAVD88, this 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.

4.3 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 4.1 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 versus the water level in the San Jacinto River (blue line).

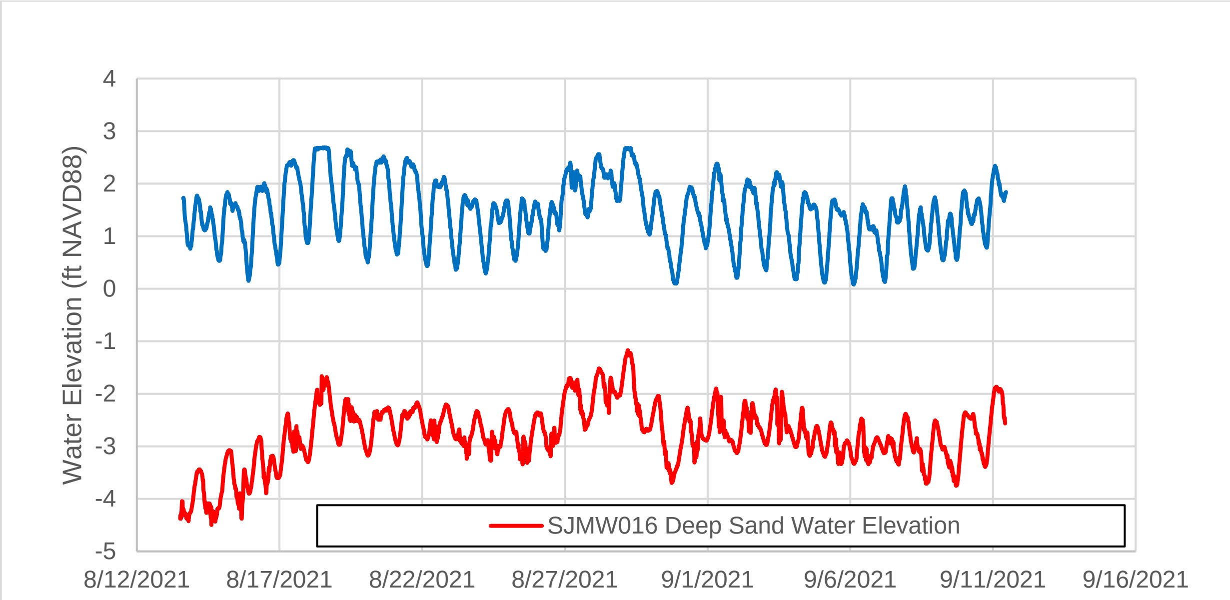


Figure 4.1 ***Variation of the Water Levels in the Beaumont Sand Formation and the San Jacinto River***

Figure 4.1 shows that there is a direct correlation between the Beaumont Sand and the water level in the river, with the river elevation being approximately 4.2 ft higher than the piezometer elevation. This difference in piezometric level (between the San Jacinto River and Beaumont Sand) indicates the presence of a dampening effect (head loss) in the Beaumont Clay. Assuming that the dampening is proportional to the clay thickness, the piezometric head gradient between the river and the uppermost sand lens of the Beaumont Sand was calculated to be approximately 0.11 foot per foot (ft/ft) of clay at this monitoring well location.

When this unit dampening is applied to the upper sand lens where there are approximately 16 ft of clay (in the Northwest Corner), the estimated piezometric head in the sand lens would be 1.7 ft lower than the river elevation. The 1.7-ft dampening effect was conservatively assumed for the entire Northern Impoundment to account for uncertainty as to the occurrence and elevation of sand lenses within the Beaumont Clay.

4.4 Stratigraphic Model

A stratigraphic model of the Northern Impoundment area based on a triangulation process was developed to define both the bottom of Beaumont Clay and the top of Beaumont Sand topographic surfaces. The model was developed based on information from both geotechnical borings (for sediments, Beaumont Clay, and Beaumont Sand deposits - see Table 4.1 for available geotechnical borings) and on the analytical borings (for sediments and Beaumont Clay deposits).

5. Required Excavation Depths

The compiled analytical results show the presence of dioxins/furans above the clean-up level (30 ng/kg TEQ_{DF}) 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 (Borehole SJSB098).

Removal of the impacted material will require excavation down to an elevation of -28.4 ft NAVD88, and potentially deeper depending on the results of confirmation sampling.

The assessment of the hydraulic heave risk considering removal of all impacted soils above the clean-up level has been performed at an assumed high river stage of +5 ft NAVD88. The FS used in this evaluation is discussed in Section 6.2.

6. Hydraulic Heave Assessment

6.1 Hydraulic Heave Mechanism

When excavating into a clay deposit underlain by a pervious stratum under artesian pressure, instability of the excavation may result. The above-mentioned conditions are illustrated for the Northern Impoundment on Figure 6.1. The hydrostatic head in the Beaumont Sand below the impervious Beaumont Clay is higher than the bottom of the excavation. If the pressure at point A, shown on Figure 6.1 below, exceeds the weight of the overlying materials, the situation becomes unstable and hydraulic heave may occur in the bottom of the excavation.

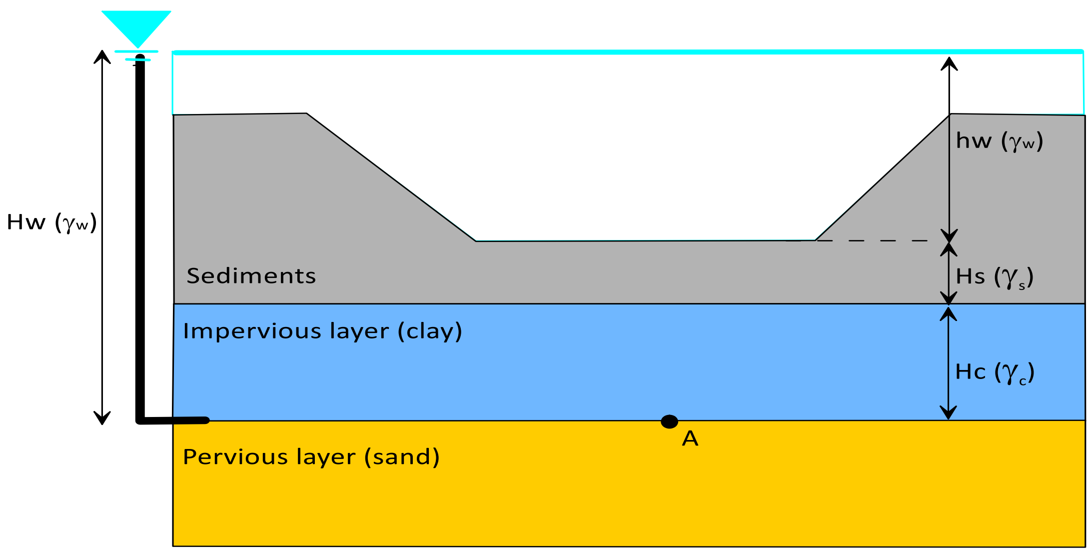


Figure 6.1 Artesian Groundwater Conditions Below Excavation

There are two methods to evaluate uplift pressures, which could result in a heave situation: the total stress approach and the effective stress approach. For conditions at the Northern Impoundment, the total stress approach is more appropriate by calculating the total weight of soil and water within a column to balance the head pressure for FS determination.

6.2 Safety Factor Evaluation

The hydraulic heave assessment is based on the ratio of total stresses and uplift pore pressures.

The FS value protective of hydraulic heave is expressed using the following equation:

$$FS = (Hs.\ \gamma_s + Hc.\ \gamma_c)/\ Hw.\ \gamma_w$$

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 FS value of 1.25.

6.3 Assessment Methodology

The evaluation of hydraulic heave FS using the above equation requires the knowledge of (1) the thickness and unit weight of each stratigraphic unit and (2) uplift pore pressures (water head) in the underlying pervious sandy unit (Beaumont Sand).

The methodology and the assumptions used for the determination of the required parameters are described in the following sections.

6.4 Stratigraphic Units (Depth and Thickness)

A total of 85 stratigraphic boreholes (both geotechnical and analytical) were evaluated for the hydraulic heave analysis at the Northern Impoundment. The occurrence and thickness of the stratigraphic units were identified based on inspection of the boring logs from these boreholes.

6.4.1 Surficial Sediments Layer

The surficial sediment layer thickness was identified in all geotechnical and analytical boreholes. The actual measured thickness was thus considered for the hydraulic heave assessment.

6.4.2 Beaumont Clay

The total Beaumont Clay thickness was determined from the deeper geotechnical boreholes listed in Table 4.1. Some of the analytical boreholes were terminated into the Beaumont Clay deposit without reaching the underlaying Beaumont Sand. At these analytical boreholes, the clay deposit thickness was estimated from the stratigraphic model described in Section 4.4.

6.4.3 Beaumont Sand and Sand Seams/Lenses

The Beaumont Sand depth (where the hydraulic uplift pressure acts) was identified in the geotechnical boreholes listed in Table 4.1. At the analytical borehole locations, the Beaumont Sand depth was identified based on the stratigraphic model.

For the Northwest Corner, sand seams/lenses ranging from a few inches to a few feet thick were encountered interspersed in the Beaumont Clay at depths ranging between 35 to 60 ft corresponding to elevations globally ranging from -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. Photographs of these features are presented in Appendix A. The occurrence of these sand seams/lenses and the associated piezometric heads have a major impact on the hydraulic heave analysis. As discussed in Section 4.3, the piezometric head in these sand seams/lenses is assumed to be 1.7 feet lower than that of the assumed San Jacinto River stage.

6.4.4 Geotechnical/Hydraulic Parameters

6.4.4.1 Unit Weights

The unit weights were evaluated for samples recovered from the surficial sediments and Beaumont Clay. Figure 6.2 shows the variation of unit weight values with elevation for both deposits. The unit weight values shown on Figure 6.2 are based on either laboratory direct measurements or estimated from the natural water content and specific gravity values provided by laboratory testing.

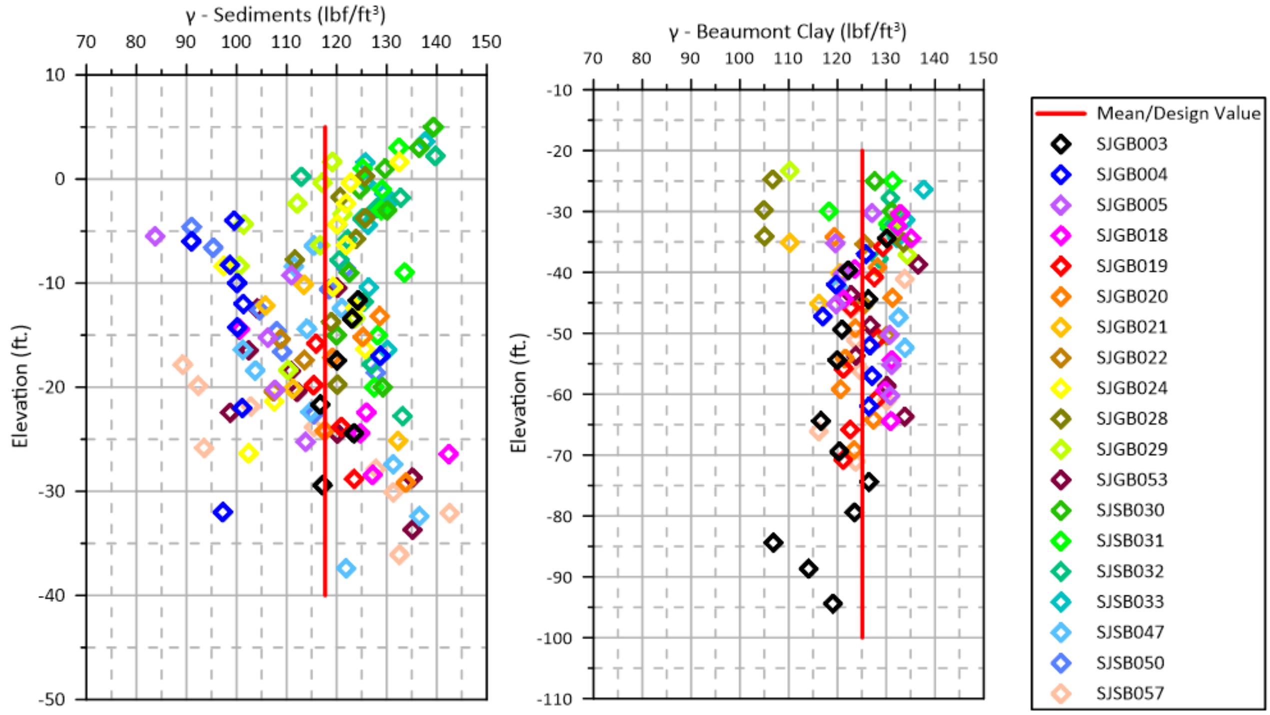


Figure 6.2 Variation of Unit Weights with Elevation

Table 6.1 below summarizes the mean values considered for the hydraulic heave analysis (red vertical line on Figure 6.2).

Table 6.1 Mean Total Unit Weights

Stratigraphic Unit	Total Unit Weight, γ (pounds per cubic feet [pcf])
Surficial alluvium	118
Beaumont Clay	125

6.4.5 Uplift Pore Pressures

As discussed in Section 4.3, a river stage elevation of +5 ft NAVD88 was considered for the hydraulic heave analysis. At a river stage above +5 ft NAVD88, there would not be access to the Northern Impoundment so excavation would not be occurring. The piezometric head of +3.3 ft NAVD88 was assumed for the uplift pressure in the sand seams/lenses within the Beaumont Clay based on a dampening of 1.7 ft between the river stage and these sand seams/lenses, as discussed in Section 4.3.

6.5 Assessment Results

6.5.1 Complete Removal of Impacted Material

The FS values for excavation down to the elevations of impacted material are presented in the attached Table 1. Refer to Figure 5 for an isopach map showing hydraulic heave risk at various parts of the impoundment. The results are summarized below:

– Outside the limits of the Northwest Corner, the FS values are generally larger than the target value (1.25) except at four locations (SJSB048-C1, SJSB071, SJSB072, and SJSB078). At these locations, the proposed excavation is just below the protective depths, and removal of impacted material could be done safely if appropriate mitigation procedures are followed, based on the current understanding of geotechnical conditions. These mitigation procedures are discussed in Section 7.0.

- In the Northwest Corner area, where interspersed sand seams/lenses were observed within the Beaumont Clay, FS values less than the target value were calculated for locations SJGB-057 and SJSB-098.
- Considering the calculated risk of hydraulic heave in the Northwest Corner, mitigation procedures should be followed when removing all impacted materials to the targeted depths. These procedures are described in Section 7.0.

6.5.2 Protective Hydraulic Heave Excavation Surface

Surface excavation elevations protective of hydraulic heave at a FS value of 1.25 for the boreholes that were evaluated are presented in Table 1.

7. Conclusions and Mitigation

7.1 Conclusions

The hydraulic heave analysis indicates that there are areas of the Northern Impoundment where excavation to the target elevations could result in a risk of hydraulic heave.

While there are some local areas across the Northern Impoundment that show FS values below the target value, the risk is most pronounced in the Northwest Corner where FS values are less than/close to 1.0. In this area, approximately 12 ft of waste material could not be removed in the dry based upon the elevations calculated to be protective against hydraulic heave at boreholes SJGB-057 and SJSB098, as shown in Table 1.

While the Northwest Corner presents the most pronounced risk of hydraulic heave, localized areas in the rest of the Northern Impoundment are on the threshold of triggering the risk of hydraulic heave.

This potential risk was considered in the excavation approach and post-confirmation sampling for both the Northwest Corner and other localized areas in the Northern Impoundment.

7.2 Monitoring and Mitigation Procedures

As described in the Design Specifications (Appendix H), the Remedial Contractor (RC) will be required to complete stratigraphic borings in the areas identified as having potential hydraulic heave risk and install piezometers in any sand seams/lenses that are identified that could potentially produce hydraulic heave. Based on the data from these borings/piezometers, the hydraulic heave calculations will be adjusted as appropriate to define the mitigation measures that would be appropriate prior to starting the excavation.

7.2.1 Northwest Corner

Considering the planned removal depths in the Northwest Corner, the excavation will be done through a water column by mechanical dredging. With mechanical dredging, the water above the excavation floor is anticipated to counter the uplift pressures from the underlying sands as the waste material is removed.

7.2.2 Outside the Northwest Corner

According to Table 1, the proposed excavation elevations at the location of boreholes SJSB048-C1, SJSB071, SJSB072, and SJSB078 are slightly lower than the elevation that provides an FS value of 1.25. Considering the limited depth of excavation required below these elevations, mitigation procedures to potentially allow excavation safely to reach the target depth are planned. Examples of mitigation methods include: excavation through a water column by mechanical dredging, excavating in sequences of limited width, backfilling the excavated area before starting the excavation in an adjacent area, or conducting excavation during a low river stage. The Design Specifications (Appendix H) provide additional details for the RC to utilize in mitigating the potential for heave.

8. Scope and Limitations

The conclusions and recommendations made in this report are provided in accordance with GHD's present understanding of the project, the ground surface elevations and current conditions at the Northern Impoundment and are based on the analysis 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.

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 1

Hydraulic Heave Safety Factors For Total Removal of Exceedances of Clean-Up Level
Hydraulic Heave Analysis
Northern Impoundment - San Jacinto River Waste Pits Superfund Site

Location	Northing (NAD83)	Easting (NAD83)	Surface/Riverbed Elevation	Aquifer Piezometric Elevation at 5 ft River Stage	BC Depth (ft)	BC Elevation (ft)	BS Depth (ft)	BS Elevation (ft)	Sediment Thickness (ft)	BC Thickness (ft)	Water Head (ft)	Uplift Pore Pressure (psf)	Total Vertical Stress Due to Clay Above Sand (psf)	Type of Excavated Soils	Elevation at Sounding Location for FS =1.25	Proposed Deepest Excavation Surface Elevation (ft)	Downward Force Above BS (psf)	Factor of Safety for Proposed Excavation Surface	Status Against Hydraulic Heave
SJGB010	13857411.2	3216753.59	0.88	3.3	32.57	-31.69	58.11	-57.23	32.57	25.54	60.53	3777	3193	Sediments only	-18.73	-15.21	5137.14	1.36	OK
SJGB011	13857474.59	3216925.73	0.41	3.3	31.90	-31.49	58.76	-58.35	31.90	26.86	61.65	3847	3358	Sediments only	-19.19	-9.59	5941.70	1.54	OK
SJGB012	13857611.31	3216819.46	0.43	3.3	32.76	-32.33	56.70	-56.27	32.76	23.94	59.57	3717	2993	Sediments only	-18.31	-17.62	4728.28	1.27	OK
SJGB013	13857852.44	3216918.90	-8.04	3.3	24.51	-32.55	56.76	-64.80	24.51	32.25	68.1	4249	4031	Sediments only	-21.70	-16.04	5979.43	1.41	OK
SJGB014	13857716.96	3217158.78	-1.22	3.3	23.72	-24.940	74.57	-75.79	23.72	50.85	79.09	4935	6356	Sediments and clay	-26.44	-9.22	8321.25	1.69	OK
SJGB015	13857549.79	3217384.37	-5.94	3.3	16.67	-22.61	60.23	-66.17	16.67	43.56	69.47	4335	5445	Sediments and clay	-22.82	-9.57	7075.00	1.63	OK
SJGB016	13857551.03	3217162.51	-2.07	3.3	30.71	-32.78	65.63	-67.70	30.71	34.92	71	4430	4365	Sediments only	-22.84	-14.16	6562.16	1.48	OK
SJGB017	13857352.16	3217191.72	-1.85	3.3	22.37	-24.22	62.51	-64.36	22.37	40.14	67.66	4222	5018	Sediments only	-22.02	-17.04	5864.74	1.39	OK
SJSB028	13857067.13	3217256.40	4.48	3.3	36.48	-32	63.64	-59.16	36.48	27.16	62.46	3898	3395	Sediments only	-19.48	-1.52	6991.64	1.79	OK
SJSB029	13857119.31	3217153.09	2.68	3.3	34.40	-31.72	62.98	-60.30	34.40	28.58	63.6	3969	3573	Sediments only	-19.95	2.68	7631.70	1.92	OK
SJSB030	13857220.52	3216971.01	4.33	3.3	37.79	-33.46	64.11	-59.78	37.79	26.32	63.08	3936	3290	Sediments only	-19.64	4.33	7749.22	1.97	OK
SJSB031	13857295.05	3216774.91	5.12	3.3	39.45	-34.33	63.15	-58.03	39.45	23.7	61.33	3827	2963	Sediments only	-18.90	5.12	7617.60	1.99	OK
SJSB032	13857444.8	3216651.50	1.71	3.3	37.72	-36.01	60.30	-58.59	37.72	22.58	61.89	3862	2823	Sediments only	-19.02	-8.29	6093.46	1.58	OK
SJSB033	13857624.83	3216746.67	3.12	3.3	37.12	-34	60.55	-57.43	37.12	23.43	60.73	3790	2929	Sediments only	-18.68	-8.88	5892.91	1.56	OK
SJSB034	13857689.49	3217045.98	6.99	3.3	40.55	-33.56	77.70	-70.71	40.55	37.15	74.01	4618	4644	Sediments only	-23.99	-9.55	7476.93	1.62	OK
SJSB035	13857460.9	3217021.62	6.64	3.3	38.41	-31.77	68.42	-61.78	38.41	30.01	65.08	4061	3751	Sediments only	-20.54	-14.71	5764.33	1.42	OK
SJSB036	13857475.11	3216859.93	2.25	3.3	32.25	-30	58.99	-56.74	32.25	26.74	60.04	3746	3343	Sediments only	-18.64	-10.75	5614.00	1.50	OK
SJSB037	13857687.4	3216908.32	1.43	3.3	36.43	-35	62.37	-60.94	36.43	25.94	64.24	4009	3243	Sediments only	-20.02	-9.57	6243.24	1.56	OK
SJSB038	13857563.08	3217138.46	-1.98	3.3	33.02	-35	65.70	-67.68	33.02	32.68	70.98	4429	4085	Sediments only	-22.70	-15.60	6374.20	1.44	OK
SJSB045	13857135.81	3217343.07	-2.10	3.3	26.51	-28.61	56.97	-59.07	26.51	30.46	62.37	3892	3808	Sediments only	-19.65	-2.10	6935.68	1.78	OK
SJSB045-C1	13857149.35	3217285.35	-1.30	3.3	25.55	-26.85	59.32	-60.62	25.55	33.77	63.92	3989	4221	Sediments only	-20.37	-13.30	5820.15	1.46	OK
SJSB046	13857183.75	3217236.02	-2.00	3.3	21.93	-23.93	59.52	-61.52	21.93	37.59	64.82	4045	4699	Sediments only	-20.90	-20.00	5162.49	1.28	OK
SJSB046-C1	13857229	3217174.00	-2.39	3.3	21.60	-23.99	59.70	-62.09	21.60	38.1	65.39	4080	4763	Sediments only	-21.13	-20.39	5187.30	1.27	OK
SJSB047	13857278.32	3217421.37	-2.10	3.3	23.73	-25.83	49.30	-51.40	23.73	25.57	54.7	3413	3196	Sediments only	-16.76	-4.28	5739.15	1.68	OK
SJSB047-C1	13857302.55	3217340.99	-4.00	3.3	20.58	-24.58	58.73	-62.73	20.58	38.15	66.03	4120	4769	Sediments only	-21.35	-20.00	5309.19	1.29	OK
SJSB048	13857396.53	3217503.37	-2.40	3.3	24.77	-27.17	56.58	-58.98	24.77	31.81	62.28	3886	3976	Sediments only	-19.70	-3.20	6804.71	1.75	OK
SJSB048-C1	13857398.78	3217445.30	-4.00	3.3	21.53	-25.53	60.19	-64.19	21.53	38.66	67.49	4211	4833	Sediments only	-21.87	-22.00	5249.04	1.25	Risk of heave
SJSB049	13857406.39	3217395.26	-5.10	3.3	19.33	-24.43	61.42	-66.52	19.33	42.09	69.82	4357	5261	Sediments only	-22.86	-19.10	5890.19	1.35	OK
SJSB050	13857546.33	3217527.88	-3.40	3.3	24.78	-28.18	57.95	-61.35	24.78	33.17	64.65	4034	4146	Sediments only	-20.58	-3.40	7070.29	1.75	OK
SJSB050-C1	13857558.16	3217389.12	-6.30	3.3	16.22	-22.52	59.79	-66.09	16.22	43.57	69.39	4330	5446	Sediments and clay	-22.79	-6.30	7473.75	1.73	OK
SJSB051	13857682.02	3217424.68	-2.70	3.3	23.44	-26.14	61.94	-64.64	23.44	38.5	67.94	4239	4813	Sediments only	-22.01	-2.70	7578.42	1.79	OK
SJSB052	13857661.47	3217319.77	-5.70	3.3	17.64	-23.34	61.51	-67.21	17.64	43.87	70.51	4400	5484	Sediments only	-23.20	-5.70	7565.27	1.72	OK
SJSB052-C1	13857626.75	3217222.47	-2.20	3.3	23.36	-25.56	67.61	-69.81	23.36	44.25	73.11	4562	5531	Sediments only	-24.11	-16.91	6551.95	1.44	OK
SJSB053	13857799.52	3217301.20	-9.70	3.3	17.94	-27.64	56.00	-65.70	17.94	38.06	69	4306	4758	Sediments only	-22.35	-9.70	6874.42	1.60	OK
SJSB053-C1	13857775.27	3217268.41	-7.40	3.3	17.89	-25.29	63.03	-70.43	17.89	45.14	73.73	4601	5643	Sediments only	-24.37	-11.93	7218.98	1.57	OK
SJSB054	13857745.96	3217282.89	-7.40	3.3	17.00	-24.4	61.28	-68.68	17.00	44.28	71.98	4492	5535	Sediments only	-23.73	-23.40	5653.00	1.26	OK
SJSB055	13857915.36	3217183.42	-4.90	3.3	26.96	-31.86	63.78	-68.68	26.96	36.82	71.98	4492	4603	Sediments only	-23.28	-4.90	7783.78	1.73	OK
SJSB055-C1	13857843.36	3217150.48	-9.54	3.3	20.78	-30.32	80.61	-90.15	20.78	59.83	93.45	5831	7479	Sediments and clay	-31.84	-13.54	9576.25	1.64	OK
SJSB056	13857942.46	3217077.15	-12.40	3.3	16.52	-28.92	65.84	-78.24	16.52	49.32	81.54	5088	6165	Sediments only	-27.27	-12.40	8114.36	1.59	OK
SJSB056-C1	13857851.61	3217058.12	-4.29	3.3	28.14	-32.43	76.92	-81.21	28.14	48.78	84.51	5273	6098	Sediments only	-28.24	-21.92	7337.68	1.39	OK
SJGB057	13857956.45	3216960.20	-18.39	3.3	15.61	-34.00	31.43	-49.82	15.61	15.82	53.12	3315	1978	Sediments only	-15.65	-28.39	2875.48	0.87	Risk of heave
SJSB058	13857700.16	3216855.51	0.62	3.3	34.20	-33.58	58.86	-58.24	34.20	24.66	61.54	3840	3083	Sediments only	-19.02	-17.38	4994.10	1.30	OK
SJSB070	13857778.07	3216886.19	-1.17	3.3	31.44	-32.61	59.54	-60.71	31.44	28.1	64.01	3994	3513	Sediments only	-20.07	-15.17	5570.42	1.39	OK
SJSB071	13857719.19	3216821.13	-0.8	3.3	31.93	-32.73	55.95	-56.75	31.93	24.02	60.05	3747	3003	Sediments only	-18.48	-18.80	4646.24	1.24	Risk of heave
SJSB072	13857614.25	3216842.65	1.42	3.3	33.84	-32.42	57.80	-56.38	33.84	23.96	59.68	3724	2995	Sediments only	-18.35	-20.58	4392.12	1.18	Risk of heave
SJSB073	13857593.16	3216960.04	1.29	3.3	35.30	-34.01	62.04	-60.75	35.30	26.74	64.05	3997	3343	Sediments only	-20.00	-10.71	6091.90	1.52	OK
SJSB074	13857543.71	3216728.11	3.34	3.3	32.34	-29.00	60.77	-57.43	32.34	28.43	60.73	3790	3554	Sediments only	-18.97	-4.66	6425.87	1.70	OK
SJSB075	13857486.82	3216843.80	2.28	3.3	31.82	-29.54	58.65	-56.37	31.82	26.83	59.67	3723	3354	Sediments only	-18.52	-9.82	5680.71	1.53	OK
SJSB076	13857508.77	3216910.81	2.26	3.3	33.82	-31.56	59.79	-57.53	33.82	25.97	60.83	3796	3246	Sediments only	-18.86	-9.74	5821.01	1.53	OK
SJSB077	13857411.88	3216736.67	1.42	3.3	33.64	-32.22	58.79	-57.37	33.64	25.15	60.67	3786	3144	Sediments only	-18.76	-14.58	5225.27	1.38	OK
SJSB078	13857430.03	3216823.14	1.82	3.3	32.13	-30.31	58.80	-56.98	32.13	26.67	60.28	3761	3334	Sediments only	-18.72	-20.18	4529.09	1.20	Risk of heave
SJSB079	13857381.90	3216888.27	1.05	3.3	32.56	-31.51	59.33	-58.28	32.56	26.77	61.58	3843	3346	Sediments only	-19.16	-10.95	5772.33	1.50	OK
SJSB080	13857320.22	3216827.05	1.77	3.3	34.89	-33.12	59.87	-58.10	34.89	24.98	61.40	3831	3123	Sediments only	-19.00	-8.23	6059.52	1.58	OK
SJSB081	13857276.46	3217054.34	-2.26	3.3	27.11	-29.37	58.98	-61.24	27.11	31.87	64.54	4027	3984	Sediments only	-20.47	-14.26	5766.73	1.43	OK
SJSB082	13857216.12	3217091.82	-1.75	3.3	26.73	-28.48	59.41	-61.16	26.73	32.68	64.46	4022	4085	Sediments only	-20.49	-11.75	6059.14	1.51	OK
SJSB083	13857242.26	3217187.50	-2.93	3.3	21.00	-23.93	59.46	-62.39	21.00	38.46	65.69	4099	4808	Sediments only	-21.25	-19.07	5380.98	1.31	OK
SJSB084	13857243.09	3217292.26	-3.86	3.3	20.13	-23.99	58.16	-62.02	20.13	38.03	65.32	4076	4754	Sediments only	-21.10	-9.86	6421.09	1.58	OK
SJSB085	13857350.67	3217370.89	-5.67	3.3	22.05	-27.72	60.56	-66.23	22.05	38.51	69.53	4339	4814	Sediments only	-22.55	-13.67	6471.65	1.49	OK
SJSB086	13857292.63	3217249.90	-2.72	3.3	22.28	-25.00	60.83	-63.55	22.28	38.55	66.85	4171	4819	Sediments only	-21.65	-13.09	6224.13	1.49	OK
SJSB087	13857311.47	3217114.94	-3.01	3.3	23.75	-26.76	59.57	-62.58	23.75	35.82	65.88	4111	4478	Sediments only	-21.16	-19.01	5392.00	1.31	OK
SJSB088	13857488.39	3217119.28	-2.12	3.3	28.94	-31.06	63.17	-65.29	28.94	34.23	68.59	4280	4279	Sediments only	-21.98	-20.12	5569.67	1.30	OK
SJSB089	13857426.02	3217214.58	-2.88	3.3	19.12	-22.00	63.06	-65.94	19.12	43.94	69.24	4321	5493	Sediments and clay	-22.73	-14.88	6382.50	1.48	OK
SJSB090	13857506.13	3217218.41	-1.50	3.3	24.71	-26.21	65.74	-67.24	24.71	41.03	70.54	4402	5129	Sediments only	-23.05	-11.50	6864.53	1.56	OK
SJSB091	13857487.24	3217383.27	-3.58	3.3	19.83	-23.41	62.59	-66.17	19.83	42.76	69.47	4335	5345	Sediments only	-22.79	-18.10	5971.58	1.38	OK
SJSB092	13857618.60	3217303.61	-4.93	3.3	18.81	-23.74	62.84	-67.77	18.81	44.03	71.07	4435	5504	Sediments only	-23.40	-18.93	6071.33	1.37	OK
SJSB093	13857582.78	3217129.48	-1.53	3.3	33.27	-34.80	66.66	-68.19	33.27	33.39	71.49	4461	4174	Sediments only	-22.91	-15.53	6447.61	1.45	OK
SJSB094	13857691.55	3217241.22	-4.22	3.3	16.78	-21.00	66.76	-70.98	16.78	49.98	74.28	4635	6248	Sediments and clay	-24.63	-16.22	6845.00	1.48	OK
SJSB095	13857790.23	3217133.85	-2.07	3.3	21.91	-23.98	81.03	-83.10	21.91	59.12	86.40	5391	7390	Sediments and clay	-29.19	-18.07	8128.75	1.51	OK
SJSB096	13857798.66	3217196.29	-6.55	3.3	18.17	-24.72	74.85	-81.40	18.17	56.68	84.70	5285	7085	Sediments and clay	-28.55	-18.55	7856.25	1.49	OK
SJSB097	13857955.96	3217030.74	-15.64	3.3	10.36	-26.00	59.51	-75.15	10.36	49.15	78.45	4895	6144	Sediments and clay	-26.20	-15.64	7438.75	1.52	OK
SJSB098	13857874.76	3216977.36	-14.36	3.3	24.64	-39.00	58.50	-72.86	24.64	33.86	76.16	4752	4233	Sediments only	-24.53	-28.36	5488.02	1.15	Risk of heave
SJSB099	13857764.25	3216947.21	-0.61	3.3	33.45	-34.06	65.85	-66.46	33.45	32.40	69.76	4353	4050	Sediments only	-22.27	-12.61	6581.10	1.51	OK
SJSB100	13857919.31	3216899.69	-13.36	3.3	11.64	-25.00	47.09	-60.45	11.64	35.45	63.75	3978	4431	Sediments only	-20.41	-15.36	5568.77	1.40	OK
SJSB101	13857709.58	3216809.88	-0.15	3.3	32.77	-32.92	56.38	-56.53	32.77	23.61	59.83	3733	2951	Sediments only	-18.38	-17.65	4753.11	1.27	OK
SJSB102	13857180.23	3217192.14	-2.05	3.3	20.95	-23.00	59.35	-61.40	20.95	38.40	64.70	4037	4800	Sediments only	-20.91	-20.05	5148.10	1.28	OK
SJSB103	13857998.43	3216974.84	-15.36	3.3	12.62	-27.98	52.37	-67.73	12.62	39.75	71.03	4432	4969	Sediments only	-23.14	-16.99	6265.57	1.41	OK
SJSB104	13857613.24	3217397.90	-5.49	3.3	16.51	-22.00	60.37	-65.86	16.51	43.86	69.16	4316	5483	Sediments and clay	-22.70	-5.49	7546.25	1.75	OK
SJSB105	13857485.55	3217440.44	-4.36	3.3	19.52	-23.88	59.78	-64.14	19.52	40.26	67.44	4208	5033	Sediments only	-21.95	-20.36	5447.86	1.29	OK
SJSB106	13857469.99	3217311.02	-3.10	3.3	19.91	-23.01	63.91	-67.01	19.91	44.00	70.31	4387	5500	Sediments and clay	-23.14	-15.38	6453.75	1.47	OK

Total Beaumont clay Unit Weight (pcf)	125.0
Total Beaumont sand Unit Weight (pcf)	130.0
Total Sediment Unit Weight (pcf)	118.0
Water Unit Weight (pcf)	62.4
Target FS (Normal River Elevation = 5 ft)	1.25

Notes:
ft = feet
NAD83 = North American Datum of 1983
piezo = piezometer; psf = pounds per square foot
BC = Beaumont Clay; pcf = pounds per cubic foot
BS = Beaumont Sand; FS = Factor of Safety

SAN JACINTO RIVER WASTE PITS SITE
HARRIS COUNTY, TEXAS

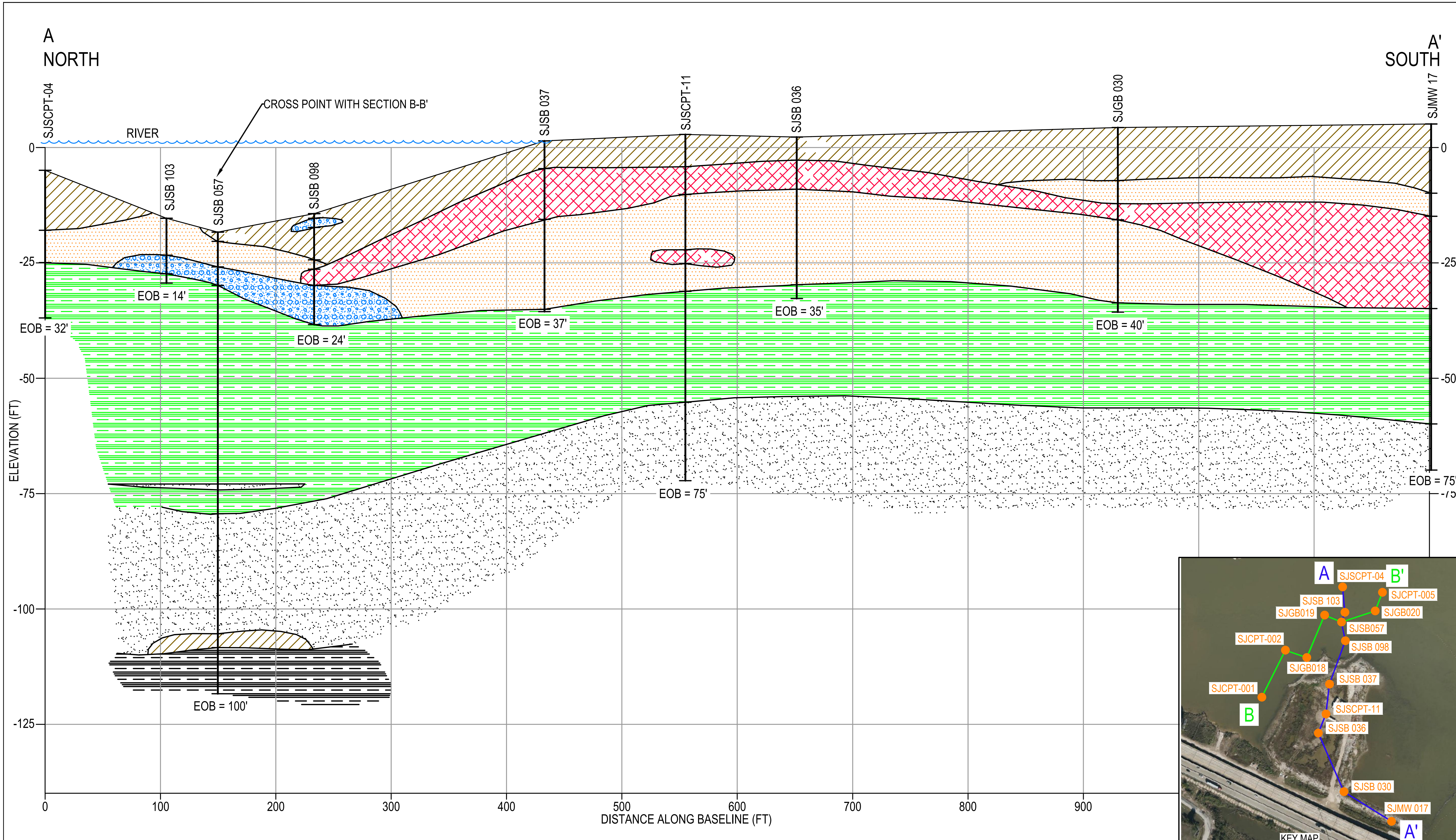
SITE LOCATIONS PLAN - SOUNDING LOCATIONS

Project No. 11215702
Revision No. -
Date May 13, 2024

FIGURE 1

Q:\GIS\PROJECTS\11215000s\11215702\RPT012\11215702_202405_RPT012_GIS006.mxd
Print date: 13 May 2024 - 09:42

Data source: Image ©2024 Google, Imagery Date 2/9/2023



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

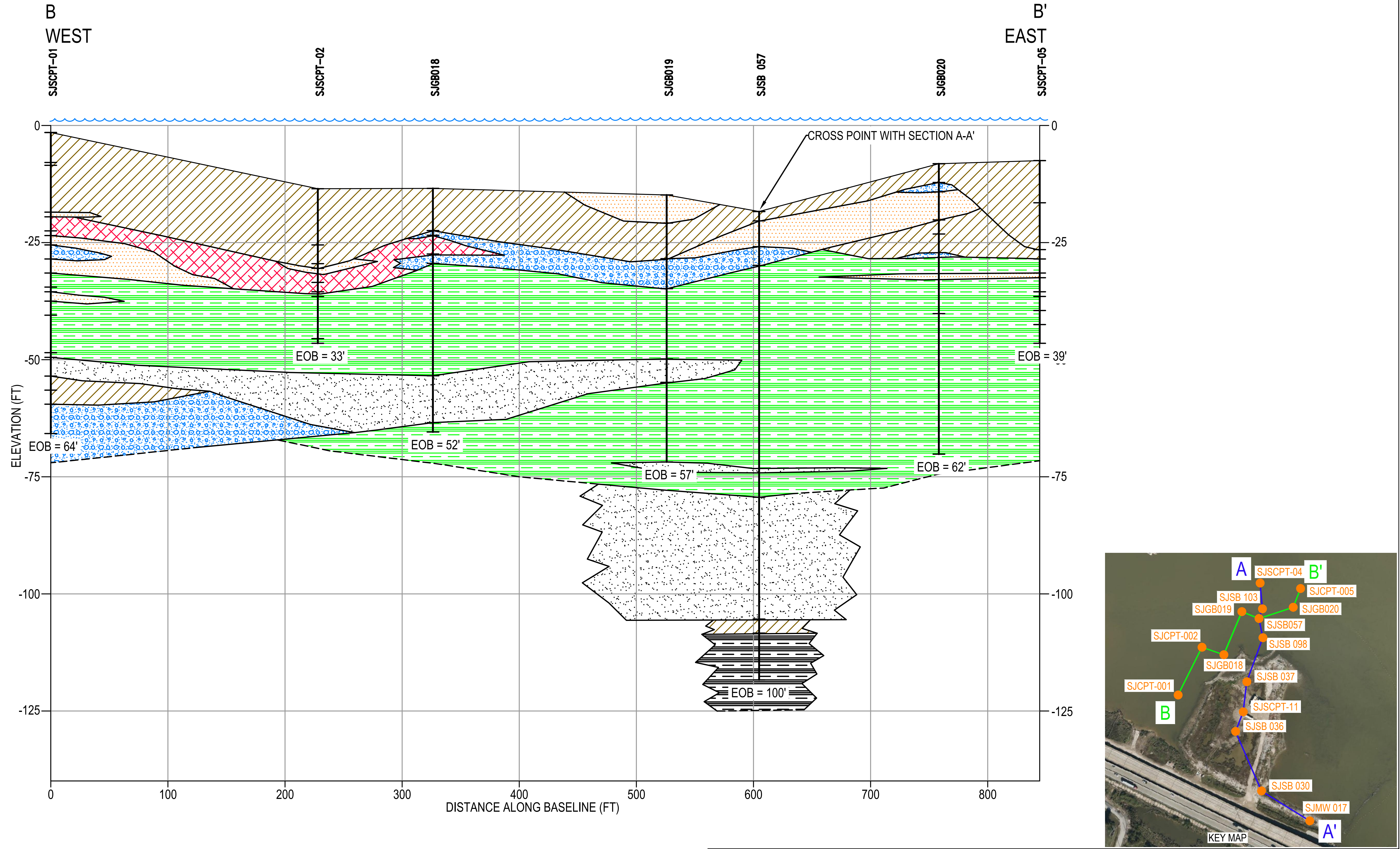
SAN JACINTO RIVER WASTE PITS SITE
HARRIS COUNTY, TEXAS

GEOLOGIC CROSS-SECTION A-A'

Project No. 11215702
Date December 2021

FIGURE 2

Filename: N:\US\Baton Rouge\Projects\562\11215702\Digital_Design\ACAD 2019\Figures\MISC-001\11215702-GHD-0000-MISC-0101_DE-001.dwg
Plot Date: 07 December 2021 9:52 AM



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

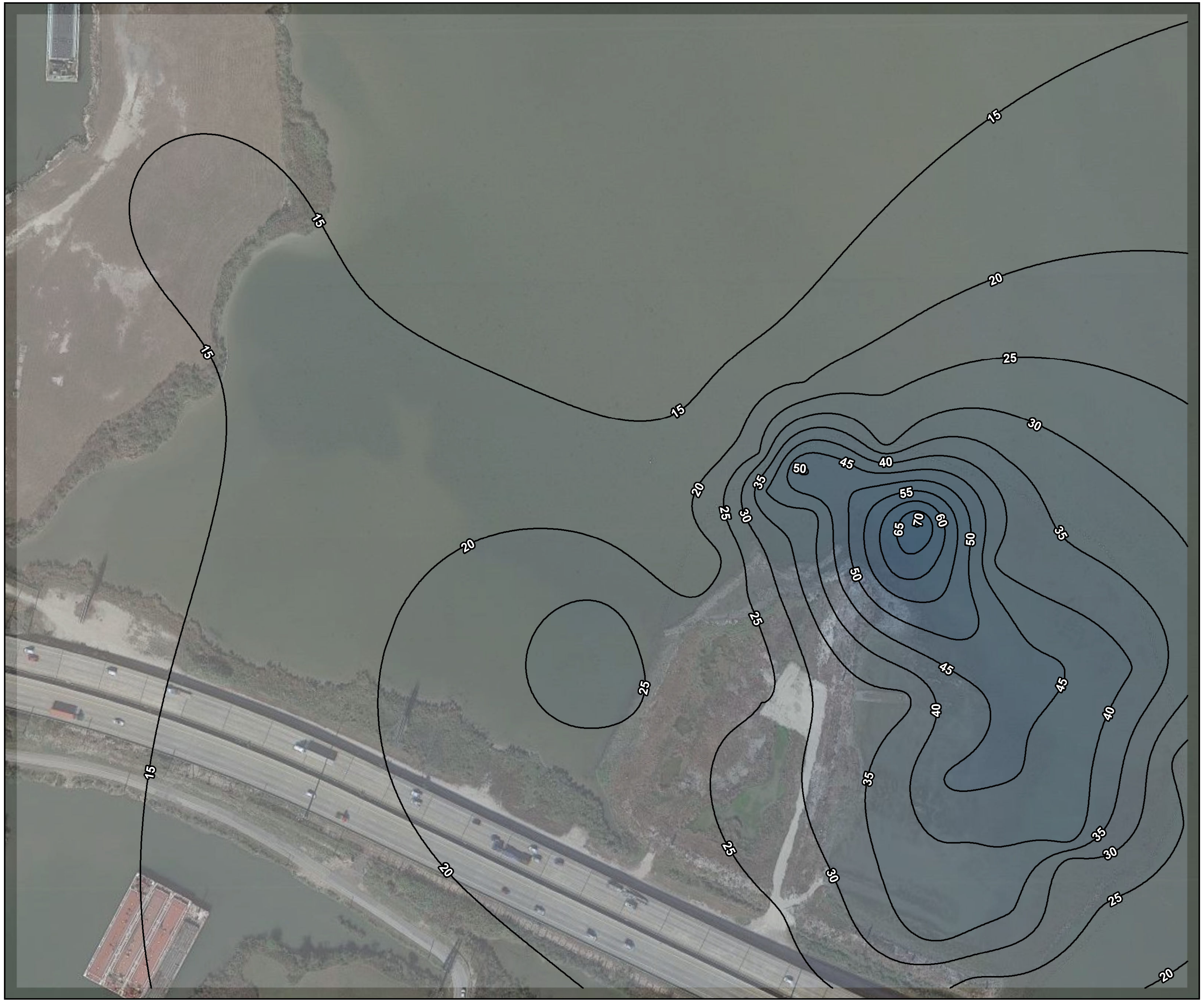
SAN JACINTO RIVER WASTE PITS SITE
HARRIS COUNTY, TEXAS

Project No. **11215702**
Date **December 2021**

GEOLOGIC CROSS-SECTION B-B'

FIGURE 3

Filename: N:\US\Baton Rouge\Projects\562\11215702\Digital_Design\ACAD 2019\Figures\MISC-001\11215702-GHD-0000-MISC-0101_DE-001.dwg
Plot Date: 07 December 2021 9:53 AM



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

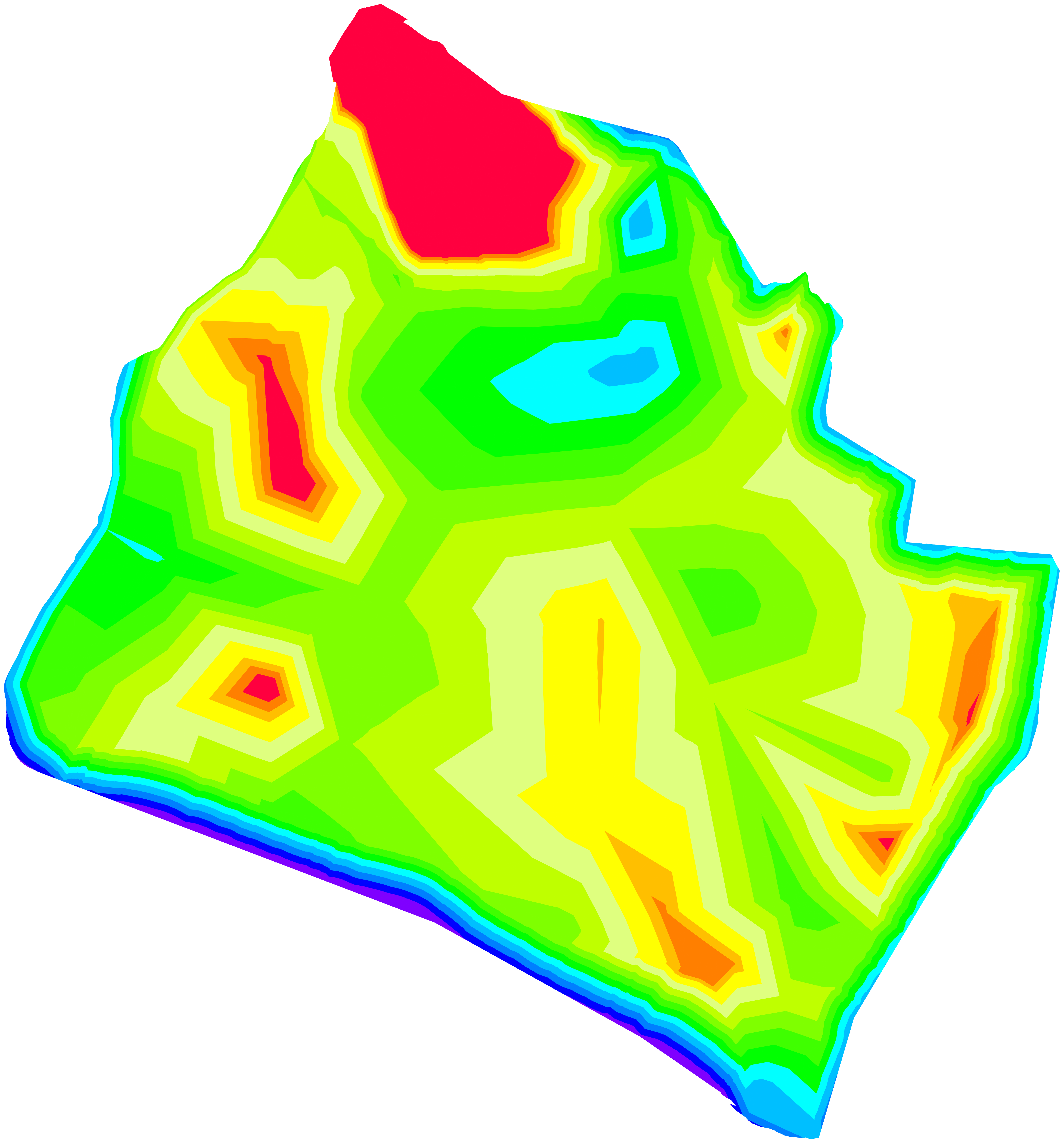
BEAUMONT CLAY
THICKNESS CONTOUR

Project No. **11215702**
Revision No. **-**
Date **Dec 6, 2021**

FIGURE 4

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

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



Elevations			
Number	Min Thickness	Max Thickness	Color
1	−26	−22	
2	−22	−20	
3	−20	−18	
4	−18	−16	
5	−16	−14	
6	−14	−12	
7	−12	−10	
8	−10	−8	
9	−8	−6	
10	−6	−4	
11	−4	−2	
12	−2	−1	
13	−1	0	
14	0	15	

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Client
SAN JACINTO RIVER WASTE PITS

Project
UPDATED HYDRAULIC HEAVE REPORT

No.	Issue	Drawn	Approved	Date

Drawn -
Designer -
Drafting Check -
Design Check -
Project Coordinator CM
Date Jan 24, 2024
This document shall not be used for construction unless signed and sealed for construction.
Scale 1" = 50'
Original Size **Arch D**
Bar is one inch on original size drawing
0 1"

Project No. **11215702**

Title
HYDRAULIC HEAVE RISK POTENTIAL

Sheet No.
FIGURE 5

Sheet - of -

Appendices

Appendix A

Beaumont Clay Sample Photographs

Site Photographs

Photo 1 ***Figure D.1: Sample G11 (40 to 42 feet (ft) deep in borehole SJGB-018).***

Photo 2 ***Figure D.2: Sample G07 (30 to 32 ft deep in borehole SLGB-019).***

Photo 3 ***Figure D.3: Sample G14 (40 to 42 ft deep) in borehole SJGB-020.***

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