

MEMORANDUM

**S-116-2019 & R-019-2019
(Consultant)**

TO: Bart Asher, P.E., P.L.S.
Director
Division of Structural Design

FROM: Michael Carpenter, P.E.
Geotechnical Branch Manager
Division of Structural Design

BY: Darrin Beckett, P.E. 
Geotechnical Branch

DATE: March 6, 2020

SUBJECT: **Livingston County
US 60 over Cumberland River
STP BRO 0601 (196); 8684701D
Item No. 01-1142.00
Combined Structure and Roadway Geotechnical Engineering Report
S-116-2019 and R-019-2019**

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American Engineers, Inc. (AEI)

The attached report has been completed by Stantec Consulting Services Inc. This report documents the geotechnical exploration performed for the proposed replacement of the US 60 Bridge over the Cumberland River and associated roadway approaches. Geotechnical design and construction recommendations have previously been communicated to the design team in an incremental fashion in order to expedite the transfer of information and facilitate interaction between the geotechnical and design teams throughout the design process. Information included in those previous communications is generally contained within this comprehensive report.

If there are any questions or if any additional information is needed, please contact this branch.

Attachment: Referenced Report dated March 6, 2020



**Combined Report of
Geotechnical Exploration**

US 60 Bridge Replacement over
Cumberland River and associated
Roadway

Item No. 1-1142.00

S-116-2019

R-019-2019

Livingston County, Kentucky

March 6, 2020

Prepared for:

Kentucky Transportation Cabinet
Frankfort, Kentucky

Prepared by:

Stantec Consulting Services Inc.





Stantec Consulting Services Inc.
10509 Timberwood Circle Suite 100, Louisville KY 40223-5308

March 6, 2020
File: 178565011

Attention: Darrin Beckett, P.E.
Kentucky Transportation Cabinet
Division of Structural Design
Geotechnical Branch
1236 Wilkinson Blvd.
Frankfort, KY 40601

Dear Mr. Beckett,

Reference: US 60 over Cumberland River at Smithland, KY

Stantec Consulting Services Inc. (Stantec) is submitting the geotechnical engineering report for the referenced project with this letter. This report contains information for both the roadway and bridge aspects of the project. The geotechnical exploration followed the revised final boring plans sent via email July 25, 2019. The KYTC Division of Structural Design – Geotechnical Branch reviewed and approved the boring plans.

This report presents the results of the field exploration along with recommendations for the design and construction of the project. Design recommendations were previously sent to the project's roadway and structural teams to expedite the completion of the plans and drawings. Plans for both aspects of the projects have been completed. Stantec appreciates being a part of this project. If further assistance is needed, please contact our office.

Regards,

Stantec Consulting Services Inc.

Will Modrall, P.E.

Project Engineer

Kurt Schaefer, P.E.

Principal

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COMBINED REPORT OF GEOTECHNICAL EXPLORATION

Location and Description
March 06, 2020

1.0 LOCATION AND DESCRIPTION

The Kentucky Transportation Cabinet (KYTC) is planning to replace the existing US 60 bridge over the Cumberland River and associated portions of roadway in Livingston County. This project encompasses roadway improvement, new roadway construction, and the construction of a new bridge over the Cumberland River. The project will begin near the KY 70/US 60 intersection and extend northward generally following the existing roadway alignment and grade. The new alignment deviates to the west and parallels the existing bridge at an offset of 100 to 150 feet. With a total length of 1,900 feet, the new bridge will be a ten-span structure with three spans south of the river and six spans on the north side of the river. The main span of the bridge will be a steel truss approximately 700 feet in length and will completely span the Cumberland River. No piers will be constructed within the normal pool of the river. Once on the north riverbank, the bridge continues approximately 840 feet to land on the new approach embankment at a height of 35 feet above the existing ground surface. The proposed roadway continues on a slight downgrade until it rejoins the existing US 60 alignment roughly 250 feet before the project terminus. This project end is 900 feet north of the KY 2610/US 60 intersection; KY 2160 is also known as Brumitte Road.

The project is located north of Smithland, Kentucky and approximately half a mile east of the confluence of the Cumberland and Ohio Rivers. The total length of the project is approximately 1.2 miles. The project alignment is illustrated on the map included in Appendix A. Select Bridge design drawings are presented in Appendix B.

2.0 TOPOGRAPHY AND DRAINAGE

The project corridor is located in the Mississippian Plateau (Pennyrile) physiographic region of Kentucky. Subsurface conditions are characteristic of Alluvium and Terrace deposits of the Pleistocene age underlain by Mississippian age bedrock, which typically consists of cyclic sequences of sandstones, siltstone, shale, and limestone beds.

The maximum natural topographic relief along the centerline of the proposed alignment is on the order of 155 feet, occurring between the lowest point in the Cumberland River at Station 123+00, at approximate elevation 255 feet, and a ridge near Station 111+00, at approximate elevation 410 feet. The maximum vertical relief along the proposed finished grade is approximately 57 feet with the lowest point at approximate Station 161+75 (elevation ± 347 feet) and the highest point being at approximate Station 114+00 (elevation ± 404 feet).

Surface drainage within the region is directed towards various named and unnamed ditches, streams, and creeks, which ultimately flow into the Cumberland and Ohio rivers.



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Geology
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3.0 GEOLOGY

The project is situated on the Smithland United States Geological Survey (USGS) Geologic Quadrangle map. Based on the USGS mapping, the underlying bedrock of the Tar Springs Formation can be described as follows: the sandstone is light gray to light brown in color, fine grained, and is thin to thick bedded with some ripple marks and crossbeds. The siltstone is light gray and yellowish-brown in color, thin bedded, with lenticular bedding being more common in the upper half of the unit. In the middle part of the unit, the siltstone can be slightly carbonaceous.

The shale in the upper part of the unit is described as light to medium gray with poorly developed fissility. The shale in the lower part of the unit is gray to dark gray in color, is commonly silty in the middle and near the base of the unit, with unconformity at the base of the unit.

Faults are depicted within the project corridor on the USGS quadrangle map. There is an unnamed fault oriented perpendicular to Existing US 60 near its intersection with KY 70. Near the northern terminus of the project corridor, the Latrobe Fault is shown to cross US 60 at its intersection with KY 2610 at a southwest-northeast orientation. There are multiple faults shown by the geologic mapping north of and within a five-mile radius of the project area. No other detrimental geologic features are noted by the available mapping within the immediate vicinity of the proposed roadway. The closest zone of known recent seismicity is the New Madrid Seismic zone, which is located approximately 77 miles west of the project area.

4.0 DRILLING AND SAMPLING

4.1 GENERAL

Stantec personnel developed roadway and structures boring plans for the proposed project alignment after a review of the available plans, profiles, and cross-sections provided by American Engineers, Inc. (AEI). The boring plans included 22 borings for the roadway, 29 borings for the structure, and 12 cone penetration testing (CPT) probes for the structure. The roadway and structure exploration plans were submitted on July 10, 2019 and were subsequently reviewed and approved by the KYTC Geotechnical Branch on July 18 and July 26, 2019, respectively.

The final boring plans were provided to BFW Engineers for field staking. Stantec performed the drilling and sampling operations for both the roadway and the structure. The field exploration was conducted from July 29, 2019 to October 22, 2019. During the exploration, some boring locations were adjusted as site conditions warranted.

The field exploration included soil profile borings, embankment stability borings with observation well installations, rockline soundings, and pavement core borings. For the structure, sample and core borings were performed. Additionally, ConeTec performed CPT at substructure element locations.



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Drilling and Sampling
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4.2 ROADWAY

4.2.1 Soil Profile Borings

As shown on the roadway profile sheets on Appendix B, seventeen soil profile borings were advanced on intervals of approximately 200 feet along the US 60 alignment. One soil profile boring was advanced on the KY 70 alignment. Borings in cut (C) areas were extended to the top of bedded material or to five feet below the proposed ditchline, whichever occurred first. Borings in fill (F) areas were drilled to the top of bedded material or to a depth equal to the maximum vertical fill thickness on the cross-section, whichever occurred first. In all soil profile borings, a moisture content sample was taken from auger cuttings of each five-foot interval. In addition to the moisture content samples, a bulk bag sample (30 pounds) was obtained from each soil horizon per 1,000 linear feet of roadway.

4.2.2 Embankment Stability Borings

One stability boring (R-11) was advanced at the toe of the proposed embankment at Station 134+00. Two undisturbed (Shelby) tube samples were taken in cohesive layers, and where granular soils were encountered, standard penetration tests (SPT) were performed. Appendix B contains graphical results on the embankment stability spill through section at Station 134+00.

4.2.2.1 Observation Wells

An observation well was installed in the stability boring at Station 134+00, 100 feet Lt, to better estimate the position of subsurface ground water. Stantec installed a traditional KYTC type observation well, at the maximum exploration depth of the stability boring. The observed water levels at the time of the exploration are indicated on the embankment stability spill through section in Appendix B. It should be noted that ground water levels may vary considerably, with time, according to the prevailing climate, rainfall, or other factors.

4.2.3 Rockline Soundings

In an area of anticipated cut, a rockline sounding (R-8) was advanced at Station 111+00, 32 feet Rt, to determine if rock removal would be required to achieve final grade. Refusal material was encountered at the approximate ditchline elevation. The rockline data is presented on the cut stability sheet in Appendix B.

4.2.4 Pavement Core Borings

Pavement Core samples of the existing pavement section were obtained in two locations (R-1, R-22). The pavement core samples were retained and logged for material types and thicknesses for use in pavement design for the new pavement section. Details of the existing pavement can be found on the appropriate sheets in Appendix B. An undisturbed (Shelby) tube was collected from the pavement subgrade in each location for determination of in-situ density and moisture content in order to support pavement design.



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Laboratory Testing and Results
March 06, 2020

4.3 STRUCTURE

4.3.1 Sample and Core Borings

A total of 29 borings were advanced for substructure elements of this ten-span structure and are depicted graphically on the boring layouts and subsurface data sheets presented in Appendix B. At each substructure element a minimum of two borings were advanced. In general, one boring included sampling of the overburden materials on intervals of approximately five feet. In the sample boring, once refusal material was reached, it was core sampled with NQ rock coring equipment to a scheduled depth. The other boring was a sounding to refusal material. In instances where refusal elevation was consistent (± 3 feet) on the same substructure element, the sounding was not core sampled.

4.3.2 Geophysical – Cone Penetration Testing (CPT)

ConeTec, under Stantec's direction, advanced twelve CPT probes. At Pier 1, shallow refusal was encountered twice. The two probes with shallow refusal, were not considered for analysis. A total of one conventional CPT and nine seismic CPT soundings were completed to evaluate subsurface soil conditions at the substructure element locations. The locations of the soundings are presented graphically on the boring layout sheets in Appendix B. A 20-ton track-mounted rig was used to advance the probes to refusal. Cone Penetration Testing returned a continuous soil profile at each testing location, and in cohesive soils, a plot of undrained shear strength vs. depth. A copy of the ConeTec Report is included in Appendix D of this report. The information contained in the report was used in the seismic evaluation of the project site and to develop the generalized subsurface profiles, as discussed in Section 6 – Summary of Encountered Subsurface Conditions.

5.0 LABORATORY TESTING AND RESULTS

5.1 GENERAL

Laboratory testing was completed on select soil and rock samples from both the roadway and structure portions of the project. All laboratory tests were performed by Stantec in accordance with applicable AASHTO or Kentucky Methods of soil and rock testing specifications. The results of the laboratory tests can be found in Appendix C. The test results were used to estimate material properties and were then utilized in subsequent engineering analyses.

5.2 ROADWAY

5.2.1 Disturbed Samples – Testing Results

Based on the roadway borings, soil thicknesses along the alignment vary from 9.9 feet to over 65 feet. The topsoil measured in the roadway borings varied from 0.1 feet to approximately 0.5 feet. Natural moisture contents were determined for grab samples of soils obtained from disturbed soil borings.



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Generally, these test results indicate that the soils can be categorized as damp to moist, based on a range of dry, damp, moist, wet, and saturated moisture conditions. In general, the moisture contents of the soil materials encountered were at or below the soil's corresponding plastic limit.

Soil classification tests, including particle size analyses, Atterberg limits, and specific gravities, were performed on disturbed bag samples representing the soils encountered within fill sections. In addition to soil classification testing, standard Proctor moisture-density relationships and California Bearing Ratios (CBR) were determined for bag samples representing the predominant soils encountered within cut intervals. A total of eighteen classifications were assigned to roadway soil samples and are summarized in Table 1.

Table 1. Summary of Roadway Soil Classification Testing

USCS Classification	Percentage of Samples Tested (%)
CL	61
CL-ML	11
CH	6
SP-SM	6
SM	17
AASHTO Classification	Percentage of Samples Tested (%)
A-2-4	11
A-4	22
A-6	50
A-7-6	17

CBR test results for the bag samples ranged from a low value of 3.7 from boring R-6, which classified as a CL material, to a high value of 10.0 from boring R-3, which classified as a CL material. A CBR design value of four (4) was recommended for this project based upon the lowest test result and experience with other roadways in the area.

5.2.2 Undisturbed Samples – Testing Results

Undisturbed (Shelby) tube samples were taken from the subgrade in each pavement core boring, as well as the cohesive strata in the embankment stability boring. Tube samples were returned to a Stantec geotechnical laboratory, and extruded from the tubes, trimmed into six-inch specimens, and described visually. Unit weights (wet and dry) and natural moisture contents were determined for each six-inch specimen. Selected specimens were subjected to engineering classification testing or unconfined compressive strength testing. Testing results can be found on the appropriate sheets in Appendix C.



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Laboratory Testing and Results
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5.3 BRIDGE

5.3.1 Disturbed Samples – Testing Results

During the field exploration, 140 Standard penetration test samples were collected. Representative samples of each strata were assigned engineering classification testing including particle size analyses, Atterberg limits, and specific gravities. Ninety-six samples were classified. Classification results were used to develop generalized subsurface profiles at each substructure location.

Table 2. Summary of Laboratory Classifications (Structure)

USCS Classification	Percentage of Samples Tested (%)
CL	81
CH	10
CL-ML	1
SM	3
SC	2
SW-SM	1
SP-SM	1

Select SPT samples that were field classified as granular were tested using a 200-wash gradation. Thirty-six samples were subjected to wash gradations. Thirty-five of returned gradations contained fines greater than 12% and therefore could not be conclusively classified by the USCS method using these test results.

Moisture content testing of SPT samples was limited, and samples below the water table, as noted on the boring logs, were not subjected to moisture content testing.

5.3.2 Undisturbed Samples – Testing Results

During the field exploration, 102 Shelby tube samples were collected. Tube samples were returned to a Stantec geotechnical laboratory, and extruded from the tubes, trimmed into six-inch specimens, and described visually. Unit weights (wet and dry) and natural moisture contents were determined for each six-inch specimen. Selected specimens were then subjected to shear strength testing as described below.

5.3.2.1 Unconfined Compressive Strength Testing (Soil)

Select Shelby tube samples were subject to unconfined compressive strength testing to establish total-stress shear strength parameters. These parameters were utilized in short-term stability analyses at the north and south riverbanks, as well as Abutment 2. Unconfined Compressive (UC) strength data was also used to evaluate lateral and axial resistances of driven pile foundations.



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Table 3. Summary of Unconfined Compressive Strength (Soil)

Boring	Station, Offset	Sample Depth (ft)	USCS Classification	Unconfined Compressive Strength (psf)	Undrained Shear Strength (psf)
1006	117+37, 20' LT	21.3-21.9	CL	620	310
1006	117+37, 20' LT	30.0-30.6	CL	280	140
1008	118+50, 25' LT	6.3 – 7.0	CL	7,200	3,600
1008	118+50, 25' LT	16.4-17.0	CL	6,240	3,120
1008	118+50, 25' LT	31.0-31.6	CL	1,320	660
1008	118+50, 25' LT	46.3-46.9	CL	1,400	700
1012	118+70, 25' RT	16.1-16.7	CL	1,500	750
1012	118+70, 25' RT	26.1-26.7	SM	480	240
1012	118+70, 25' RT	36.3-36.9	CL	1,300	650
1013	125+50, 25' LT	56.1-56.7	CL	680	340
1013	125+50, 25' LT	66.3-66.9	CH	2,180	1,090
1017	125+70, 25' RT	10.5-11.0	CL	440	220
1017	125+70, 25' RT	26.0-26.6	CL	600	300
1017	125+70, 25' RT	56.1-56.7	CH	1,120	560
1017	125+70, 25' RT	66.0-66.6	CL	1,680	840
1019	127+00, 25' RT	20.9 – 21.4	CL	940	470



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Boring	Station, Offset	Sample Depth (ft)	USCS Classification	Unconfined Compressive Strength (psf)	Undrained Shear Strength (psf)
1019	127+00, 25' RT	36.3 - 36.9	CL	780	390
1019	127+00, 25' RT	55.4 - 56.0	SP-SM	140	70
1019	127+00, 25' RT	71.3 - 71.9	CL	1,460	730
1020	128+40, 25' LT	21.3 - 21.9	CL	1,560	780
1020	128+40, 25' LT	31.0 - 31.6	CL	700	350
1020	128+40, 25' LT	55.5 - 56.0	CL	200	100
1020	128+40, 25' LT	76.3 - 76.9	CL	360	180
1020	128+40, 25' LT	101.2 - 101.8	CL	1,500	750
1023	129+00, 25' RT	41.3 - 41.9	CL	440	220
1023	129+00, 25' RT	51.3 - 51.9	CL	660	330
1023	129+00, 25' RT	61.3 - 61.9	CH	1,140	570
1023	129+00, 25' RT	70.7 - 71.3	CH	1,480	740
1023	129+00, 25' RT	106.3 - 106.9	CL	380	190
1024	131+50, 25' LT	11.0 - 11.6	CL	740	370
1024	131+50, 25' LT	41.3 - 41.9	CL	760	380
1024	131+50, 25' LT	50.0 - 50.7	CL	80	40
1024	131+50, 25' LT	106.0 - 106.6	CH	3,180	1,590



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Boring	Station, Offset	Sample Depth (ft)	USCS Classification	Unconfined Compressive Strength (psf)	Undrained Shear Strength (psf)
1027	132+60, 25' RT	11.3 - 11.9	CL	1,280	640
1027	132+60, 25' RT	46.3 - 46.9	CL	620	310
1027	132+60, 25' RT	107.1 - 108.3	CL	1,360	680
1028	134+00, 20' LT	10.5 - 11.1	CL	1,180	590
1028	134+00, 20' LT	42.6 - 43.2	CL	200	100
1028	134+00, 20' LT	50.4 - 51.0	CL	400	200
1028	134+00, 20' LT	105.3 - 105.9	CL	460	230

5.3.2.2 Consolidated-Undrained Triaxial Testing

Select Shelby tube samples from Station 134+00 (Abutment 2) were subject to consolidated undrained (CU) triaxial testing to establish effective stress shear strength parameters to be utilized in long-term stability analyses. The results of this specific test were found to be representative of similar alluvial soils across the site, and therefore were used to develop strength parameters at Abutment 2 as well as across the project site. The results of this specific test are given in the table below. Test results are also presented in Appendix C.

Table 4. Results of Consolidated-Undrained Triaxial Testing

Individual Samples Tested			Effective Stress Parameters	
Boring	Depth	USCS Classification	Phi' (deg)	C' (psf)
R-11	3.3' – 3.8'	CL	32.7	400
R-11	3.9' – 4.4'	CL		
R-11	5.8' – 6.3'	CL		

5.3.2.3 One-Dimensional Consolidation

One-dimensional consolidation testing was performed on Shelby tube samples taken from borings at Station 134+00. Station 134+00 represents the maximum fill height of Abutment 2 approach embankment. The resulting consolidation curves were reconstructed using the Casagrande and Schmertmann methods. The reconstructed data was then used to estimate the magnitude of settlements



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within cohesive layers, as well as the time rate of consolidation of the natural soils under embankment and structural loading. The Test results as well as the reconstructions are presented in Appendix C.

Table 5. Summary of One-Dimensional Consolidation Testing

Boring	Sample Depth (ft)	USCS Classification	Preconsolidation Pressure (tsf)	Compression Index (Cc)	Recompression Index (Cr)
R-11	4.2 - 4.3	CL	6.3	0.57	0.067
R-11	6.6 - 6.7	CL	6.6	0.39	0.041
1028	10.0 - 12.0	CL	4.5	0.40	0.055
1028	41.5 - 43.5	CL	4.9	0.75	0.130
1028	50.0 - 52.0	CL	3.4	0.90	0.138
1028	105.0 - 106.3	CL	8.8	0.90	0.085

5.3.3 Rock Core

During the field exploration, bedrock was core sampled at each substructure element location. In total, over 650 feet of NQ rock core was collected. The field geologist logged the rock for type, character, recovery, Standard and KY method Rock Quality Designation (RQD), and any major fractures or discontinuities. Representative specimens of the rock were selected for laboratory testing as detailed below.

5.3.3.1 Unconfined Compressive Strength Testing (Rock)

Select intervals of recovered rock core sample were selected for compressive strength testing. In total, 39 samples were tested. Results of the unconfined compressive strength data was used to develop nominal bearing resistance for Abutment 1 and Pier 1, and the drilled shaft axial resistance at Piers 3 and 4.

Table 6. Summary of Unconfined Compressive Strength Testing (Rock)

Boring	Station, Offset	Depth (ft)	Rock Type	UCR (psi)	UCR (tsf)
1001	114+90, 20' LT	15.0 - 15.3	Shale	150	11
1001	114+90, 20' LT	26.4 - 26.8	Sandstone	9,850	709
1003	114+90, 20' RT	10.1 - 10.5	Sandstone	11,110	800
1004	116+13, 20' LT	13.9 - 14.3	Shale	180	13
1004	116+13, 20' LT	20.6 - 21.0	Shale	410	30
1006	117+30, 20' LT	54.1 - 54.5	Shale	1,850	133
1007	117+37, 20' RT	38.0 - 38.4	Shale	840	60
1008	118+50, 25' LT	70.4 - 70.8	Shale	950	68
1008	118+50, 25' LT	81.9 - 82.3	Shale	1,430	103
1009	118+50, 25' RT	70.3 - 70.7	Shale	1,250	90



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Boring	Station, Offset	Depth (ft)	Rock Type	UCR (psi)	UCR (tsf)
1009	118+50, 25' RT	94.0 - 94.4	Shale	1,740	125
1010	118+60, CL	60.0 - 60.4	Shale	1,120	81
1010	118+60, CL	77.1 - 77.5	Shale	1,600	115
1011	118+70,25' LT	59.8 - 60.2	Shale	840	60
1011	118+70,25' LT	94.4 - 94.8	Shale	1580	114
1012	118+70, 25' RT	60.5 - 60.8	Shale	650	47
1012	118+70, 25' RT	96.8 - 97.2	Shale	1,680	121
1013	125+50, 25' LT	107.0 - 107.4	Sandstone	11,410	822
1013	125+50, 25' LT	120.7 - 121.1	Sandstone	19,130	1,377
1013	125+50, 25' LT	131.6 - 132.0	Sandstone	16,250	1,170
1014	125+50, 25' RT	95.6 - 96.0	Sandstone	23,270	1,675
1014	125+50, 25' RT	108.5 - 108.9	Sandstone	17,830	1,284
1014	125+50, 25' RT	120.6 - 121.0	Sandstone	21,710	1,563
1014	125+50, 25' RT	130.8 - 131.2	Sandstone	26,090	1,878
1015	125+60, CL	96.1 - 96.5	Sandstone	27,620	1,989
1015	125+60, CL	116.3 - 116.7	Sandstone	14,900	1,073
1015	125+60, CL	133.1 - 133.5	Sandstone	23,140	1,666
1016	125+70, 25' LT	121.4 - 121.8	Sandstone	22,510	1,621
1016	125+70, 25' LT	135.7 - 136.1	Sandstone	28,670	2,064
1017	125+70, 25' RT	111.7 - 112.1	Sandstone	15,600	1,123
1017	125+70, 25' RT	127.9 - 128.3	Sandstone	22,870	1,647
1019	127+00, 25' RT	120.7 - 121.1	Sandstone	21,000	1,512
1020	128+40, 25' LT	118.1 - 118.5	Sandstone	15,150	1,091
1023	129+00, 25' RT	125.0 - 125.4	Sandstone	28,010	2,017
1024	131+50, 25' LT	128.4 - 128.8	Sandstone	24,210	1,743
1024	131+50, 25' LT	142.5 - 142.8	Shale	990	71
1027	132+60, 25' RT	149.1 - 149.4	Shale	1,090	78
1028	134+00, 20' LT	129.9 - 130.2	Shale	960	69
1028	134+00, 20' LT	138.2 - 138.5	Shale	940	68

5.3.3.2 Slake Durability Index

The Slake Durability Index (SDI) tests provide indications of the affects weathering will have on the bedrock when exposed in foundation excavations. This test is performed on rock comprised primarily of shale. The Kentucky Transportation Cabinet separates shale into four categories for design purposes, as outlined in Table 7, depending on SDI and Jar Slake values. Jar Slake testing was not performed.



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Table 7. KYTC Shale Classification

Classification	SDI (%)
Durable	≥95
Non-Durable, Class I	80 to 94
Non-Durable, Class II	50 to 79
Non-Durable, Class III	≤49

A review of the test results indicates that SDI values range from a high of 61.6% to a low of 8.1%. One value returned was 99.6%; however, that value was on a sample of sandstone and therefore should not be considered for this analysis. Approximately 17% of samples tested classify as Non-Durable, Class II, and 83% classifies as Non-Durable, Class III according to the KYTC Shale Classification criteria. Specific sample locations with corresponding SDI values are depicted on the graphical logs presented on the Subsurface Data Sheets included in Appendix E.

6.0 SUMMARY OF ENCOUNTERED SUBSURFACE CONDITIONS

The geotechnical drawings in Appendix B depict graphical representations of specific boring locations, test results, materials encountered, and noted groundwater elevations. The following sections include discussion of the compiled results from traditional drilling and sampling, as well as the geophysical CPT and SCPT data. The compiled data was then analyzed to interpret the subsurface conditions at the project site. For substructure elements, the compiled data was developed into generalized subsurface profiles for use in engineering analyses including slope stability, seismic evaluation, pile resistance (static, down drag, uplift), and drilled shaft resistance. The generalized profiles are given in Appendix E. The subsurface conditions encountered during this exploration are typical for the area and correspond well with published geologic mapping.

6.1 ROADWAY

Roadway borings generally encountered lean clay (CL). The lean clay was generally soft to medium stiff and contained varying amounts of silt and sand. Non-plastic materials (SP and SP-SM) were encountered in Borings R-11 and R-12 at a depth greater than 5.0 feet. Non-plastic material was also encountered in borings R-16 through R-19, within the top 5.0 feet of the soil column.

6.2 BRIDGE

6.2.1 South Bank (Abutment 1, Piers 1, 2, and 3)

Overburden on the south riverbank consisted of lean clays with varying amounts of sand and gravel. No predominately granular layers were encountered in the borings advanced for the four substructure elements on the south bank. Depth to bedrock ranged from 5.6 feet to 62.1 feet. The bedrock core sampled at Piers 1 through 3 was shale, but the bedrock encountered at Abutment 1 alternates sandstone and shale. A sandstone talus boulder, approximately four feet thick, was encountered in boring 1004 advanced at Pier 1. Talus boulders were not encountered in borings advanced at other pier locations.



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6.2.2 North Bank (Piers 4 through Abutment 2)

Overburden thickness on the north side of the Cumberland River, is significantly thicker than the south bank. Depth to rock ranged from 97.3 feet to 128.7 feet. Bedrock material encountered was primarily sandstone, however, shale was encountered below sandstone at piers 8 and 9. Bedrock core samples at Abutment 2, show a thin sandstone cap above shale in boring 1029. This cap was not encountered in boring 1028. Soil materials encountered generally consisted of plastic and non-plastic layers alternating to the top of rock. A very dense gravel layer was present directly above bedrock at piers 4,5,7,9, and Abutment 2.

7.0 SETTLEMENT ANALYSIS

The replacement bridge will include construction of an approach embankment (fill), with a maximum height (36.3 feet) at roadway Station 134+00. Additional loading from this embankment fill may settle existing site soils. Two sample borings were advanced in the area of maximum embankment height. Data from borings were used with design methodologies from Federal Highway Administration (FHWA) to estimate settlement of existing site soils.

From the two sample borings at Station 134+00, a generalized subsurface profile was developed. The existing soil overburden was split into seven horizons: three cohesive and four granular. Within the cohesive strata, six one-dimensional consolidation tests were run on undisturbed Shelby tube samples. The returned consolidation curves were evaluated using the Casagrande and Schmertmann methods.

For the cohesionless strata, settlement was estimated using a bearing capacity index, determined from SPT N-counts within that layer. FHWA National Highway Institute (NHI) Course 13212, page 169, Figure 12 gives the bearing capacity index, based on existing over burden pressure.

Summing the settlements from individual strata, cumulative settlement at Station 134+00, is estimated to be on the order of a magnitude of 16 to 18 inches. Time rate of consolidation was calculated using Terzaghi's one-dimensional consolidation theory as described in Holtz and Kovacs 1981 Section 9.3. Table 9-1 was used to determine T90. The soil layers were assumed to be doubly drained. The resulting calculation indicated approximately three years for 90% of settlement to occur. Although the generalized subsurface profile contained three cohesive strata, field logs indicated small granular lenses within each of the larger cohesive layers. These smaller granular lenses may accelerate the settlement; however, this cannot be precisely quantified by engineering calculations.

8.0 SLOPE STABILITY ANALYSES

Selected critical slope sections were evaluated for slope stability. Stantec evaluated the global stability of the slopes utilizing the SLOPE/W software. KYTC Methodologies as given in the Geotechnical Manual sections GT-601-1 to GT-601-5 were followed. Embankment slopes were evaluated for short-term analyses, using total-stress shear-strength parameters. Long-term and rapid drawdown analyses were



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analyzed using effective-stress shear-strength parameters. Cut slopes were evaluated under the same loading conditions, but also intermediate term conditions. For all slope types, seismic slope stability was evaluated using pseudostatic loading conditions. Where there was liquefaction potential the slopes were evaluated using post-earthquake loading conditions. The Peak Ground Acceleration used in analyses was 0.2g in accordance with Figure 2.0 of KTC document KTC-07-07/SPR246-02-6F, Peak Ground Acceleration for the Maximum Credible Earthquake of Livingston County.

8.1 STATION 134+00 SIDE SLOPE

The cross-section coordinates at Station 134+00 showed an embankment with a 2H:1V slope to the west and a 4H:1V slope to the east. Therefore the 2H:1V slope was selected as the critical slope. The locations of borings R-11 and 1028 were added to the cross-section using top of boring survey data. Strata breaks were determined using the boring logs for borings R-11 and 1028. Straight-line interpolation was used between the two borings. Strata elevations were assumed to not change in the space outside of either boring. Boring 1028 was advanced significantly deeper than R-11, however, the analysis was truncated at elevation 267.3 feet to correspond with the bottom of hole elevation of R-11. This was found to be sufficiently deep that the failure circles did not extend to this elevation.

Groundwater data was taken from ConeTec's CPT probe at Station 134+00. An elevation of 325.5 feet was used. For Rapid-Drawdown, the 100-year flood elevation of 345 feet was used.

The 2H:1V side slope was analyzed under short-term, long-term, and rapid drawdown static loading conditions. In accordance with FHWA NHI Course 11-032, seismic stability was analyzed using a ground acceleration of 50% of the peak ground acceleration (PGA). For the seismic stability analyses at this slope 0.1g was used as the ground acceleration. Due to the presence of the potentially liquefiable strata post-earthquake seismic conditions were also evaluated.

Table 8. Abutment 2 Side Slope Stability Results

Location	Slope	Loading Condition	KYTC Target FS	Calculated FS
Station 134+00 Side slope	2:1	Short-Term	1.2 - 1.4	1.7
Station 134+00 Side slope	2:1	Long-Term	1.6 – 1.8	1.8
Station 134+00 Side slope	2:1	Rapid Drawdown	1.0 - 1.2	1.6
Station 134+00 Side slope	2:1	Pseudostatic	1.0 - 1.2	1.5
Station 134+00 Side slope	2:1	Post-Earthquake	1.0 - 1.2	1.6

8.2 STATION 134+00 SPILL THROUGH SLOPE

The centerline profile of Stations 132+60 to 135+00 shows an embankment with a 2H:1V spill through slopes and 25H:1V backslope. Therefore, the 2H:1V slope was selected as the critical slope. Locations for Borings 1027 and 1028 were added using top of boring survey data. Strata breaks were determined using the generalized subsurface profiles for Pier 9 and Abutment 2. Where an apparent discontinuity



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existed between strata, each strata was assumed to extend halfway between the two borings, and was terminated vertically. The bottom of the stability model geometry was set to elevation 238.3 feet to correspond with the bottom of the lower silty sand (SC-SM) layer. This was sufficiently deep that the failure circles did not extend to or below this elevation. Groundwater data was taken from ConeTec's CPT data. An elevation of 325.5 feet was used. For the rapid drawdown load case, the 100-year flood elevation was used to set the maximum groundwater table to an elevation of 345 feet.

The 2H:1V spill through slope was analyzed under short term, long-term, and rapid drawdown static loading conditions. Pseudostatic seismic conditions were also evaluated. A post-earthquake analysis was not completed for the spill through slope because the encountered soils presented low potential for liquefaction. A ground acceleration of 0.1g was used in the seismic modeling.

Table 9. Abutment 2 Spill Through Slope Stability Results

Location	Slope	Loading Condition	KYTC Target FS	Calculated FS
Station 134+00 Spill through slope	2:1	Short-Term	1.2 - 1.4	1.3
Station 134+00 Spill through slope	2:1	Long-Term	1.6 – 1.8	1.8
Station 134+00 Spill through slope	2:1	Rapid Drawdown	1.0 - 1.2	1.7
Station 134+00 Spill through slope	2:1	Pseudostatic	1.0 - 1.2	1.1

8.3 SOUTH RIVERBANK

The Slope/W file was constructed from coordinates of the centerline from Station 123+00 to Station 126+50. The existing riverbank is approximately a 1H:1V slope, 25 feet high. For stability purposes, it will be regraded to a 2H:1V. Locations for borings at Pier 2 and Pier 3 were added using top of boring survey data. Strata breaks were determined using the generalized subsurface profile for Pier 3. Rock line elevation was straight line interpolated between borings at Piers 2, 3, and 4.

Groundwater data was taken from borings at each pier location. Normal river level was set at Elevation 302 feet. For the intermediate term case, the maximum regulated flood elevation was 345 feet, therefore groundwater was set equal to the top of ground elevation.

The 2H:1V cut slope was analyzed under short-term, intermediate, and long-term static loading conditions. Pseudostatic seismic conditions were also evaluated to determine if post-earthquake analyses were necessary. A post-earthquake analysis was not completed for the cut slope because there was low potential for liquefaction. For conservatism, no reduction of the PGA was used at this location, as a slope failure at this location would impact a substructure element of the bridge. A ground acceleration of 0.2g was used in the seismic modeling.



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Table 10. South Riverbank Stability Results

Location	Slope	Loading Condition	KYTC Target FS	Calculated FS
Cumberland River South Bank	2:1	Short-Term	1.2 – 1.4	1.3
Cumberland River South Bank	2:1	Intermediate	1.2 – 1.4	1.5
Cumberland River South Bank	2:1	Long Term	1.4 – 1.6	1.4
Cumberland River South Bank	2:1	Pseudostatic	1.0 – 1.2	1.0

8.4 NORTH RIVERBANK

The slope stability file was constructed from coordinates of the centerline from Station 118+00 to Station 121+00. The coordinates show an existing riverbank on an approximate 4H:1V slope, approximately 60 feet high when measured from the bottom of the river channel to approximately 100 feet ahead station of Pier 4. Locations for borings at Pier 4 were incorporated using top of boring survey data, and strata breaks were determined using the generalized subsurface profiles for Pier 4 and Pier 5. Where adjacent strata did not agree between these piers, the strata in each profile was extended halfway between pier locations and truncated vertically. The generalized subsurface profile for Pier 4 showed a strata discrepancy between Borings 1013 and 1017. A layer of silty clayey sand was encountered in Boring 1013 from Elevation 299.9 to 279.9 feet but was not encountered in Boring 1017. This layer was encountered in CPT SP-05 and data showed that this layer was liquefiable from elevation 289.6 to 279.6 feet; therefore, this horizon was included in the stability file. The location of the rock line elevation for the stability section was determined by straight line interpolation between borings at Piers 3, 4, and 5. Groundwater elevations used in the model were taken from borings, a normal river pool elevation of 302 feet, or the maximum regulated flood elevation of 345 feet, as applicable.

The 4H:1V existing slope was analyzed under long-term, and rapid drawdown static loading conditions. A short-term static analysis was not evaluated for this slope, because it is existing, therefore assumed to be under long-term drained conditions.

Table 11. North Riverbank Static Slope Stability Results

Location	Slope	Loading Condition	KYTC Target FS	Calculated FS
Cumberland River North Bank	4:1	Long-Term	1.6 – 1.8	2.2
Cumberland River North Bank	4:1	Rapid Drawdown	1.0 – 1.2	1.4

8.4.1 Seismic Analyses

Pseudostatic and post-earthquake seismic conditions were evaluated. Because the pseudostatic analysis returned a FS less than 1.0, further analysis was warranted to determine the soil/structure interaction during earthquake loading. A ground acceleration of 0.2g was used in the seismic conditions, as a slope failure at this location would impact a substructure element of the bridge.

Slope stability analysis were performed for the slope of the riverbank at Pier 4 toward the Cumberland River to evaluate the seismic stability of the slope and whether the slope instability would affect the



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foundation of the new bridge. Seismic stability and deformation were assessed based on pseudostatic stability analysis and the Newmark displacement method, respectively.

Factor of safety (FOS), yield acceleration and Newmark displacement were determined using a two-dimensional limit equilibrium slope stability analysis program Slope/W (GeoStudio 2019), using Spencer's (1967) method of analysis. Newmark displacements were calculated using the earthquake time histories series developed by Wang et al (2008) that are available at the Kentucky Transportation Center (KTC) website.

The analysis section through Pier 4 foundation is taken at the centerline of the alignment of the new bridge. Assessment of potential foundation movement was undertaken using the concepts presented in the National Cooperative Highway Research Program (NCHRP) Report 475 (2002) and Caltrans MTD 20-15 (2017) to determine the expected displacement demand on the shafts. The pinning forces from the shafts were incorporated when assessing the failure surfaces extending through Pier 4 shafts. The computer program LPILE (Endsoft, 2019) was used to evaluate the typical shaft response due to lateral soil movement. Stability analysis incorporating shaft pinning forces and the resulting design plot indicated compatible ground movement and shear force mobilized. The pinning forces from the shafts were incorporated in the stability analysis as vertical elements with an equivalent shear resistance equal to the shear resistance by each shaft divided by the shaft spacing out-of-plane of the model.

The evaluation of the pinning effect procedure is summarized below:

1. Perform Slope/W analysis, incorporate shaft representative shear forces and determine k_y for equivalent pile shear force.
2. Perform Newmark sliding block analysis to calculate soil displacements for the values of k_y defined in Step 1.
3. Perform LPILE analysis to determine shaft shear forces for a range of soil displacements.
4. Plot results from steps 2 and 3. The intersection of these two curves represent the expected displacement and demand shear on the piles at Pier 4.

Using the procedure outlined above, analyses indicate that the pinning effect of the shaft will reduce the expected ground movement under seismic loading to the order of 0.5 foot. The movement of the shafts will be less than these ground movements. Resulting shaft forces due to the pinning effect were provided to the Structural Engineer for consideration in the structural design of the shafts.

Once the lateral resistance loads of the drilled shafts were added to the Slope/W file, the FS was increased to be within the target range; however, it is calculated that some lateral deformation may still occur at Pier 4 and the Pier 4 slope during a seismic event.



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9.0 FOUNDATION ANALYSIS

Based on subsurface conditions encountered, and on discussions with the Stantec structural designers' foundations for this bridge consist of shallow spread footings, end bearing driven piles, and drilled shafts socketed into bedrock. Foundation types selected and designed for the bridge are presented below:

Abutment 1 and Pier 1	-	Spread footings on bedrock
Pier 2 and Abutment 2	-	End-bearing 14X89 H-piles
Pier 5 through Pier 9	-	End-bearing 30-inch diameter pipe piles
Pier 3 and Pier 4	-	96-inch diameter cased drilled shafts with 90-inch sockets bearing in bedrock

The geotechnical evaluations and analyses, as presented in the following sections, are focused on these foundation types.

9.1 SHALLOW FOUNDATIONS

Abutment 1 and Pier 1 will be supported by shallow foundations bearing on bedrock. Nominal bearing resistance is based upon inspection of the rock core and the quality of the rock encountered. For Abutment 1 a nominal bearing resistance of 20,000 psf on unweathered bedrock will be recommended, with a maximum bearing elevation of 388.0 feet. For Pier 1 a nominal bearing resistance of 40,000 psf on unweathered bedrock will be recommended, with a maximum bearing elevation of 318.0 feet. It is understood that shallow foundations on rock will be designed based on the strength limit state. This results in a factored bearing resistance of 9,000 psf at Abutment 1 and 18,000 psf at Pier 1.

9.2 DRIVEN PILES

Based on information provided by the Designer, 14x89 steel H-piles driven to refusal on bedrock are being considered at the Pier 2 and Abutment 2 locations. Because these locations have distinctly different subsurface profiles, each location was evaluated for driving resistance and down drag potential. It is anticipated that open ended steel pipe piles with a diameter of 30 inches and a wall thickness of $\frac{3}{4}$ inches, driven to refusal on bedrock, will be used for support of Piers 5 through 9 which are situated on the alluvial plain north of the Cumberland River. Soils at the location of Pier 9 are the thickest of these substructure locations and were used to determine the largest resistance values for driving and down drag of the pipe piles. As both HP and pipe piles will be driven to refusal in/on bedrock, the bearing of the pile will be determined by the structural capacity of the pile reduced by the appropriate load reduction factor. Uplift resistance of a pile can be determined for the strength limit state and utilize a resistance factor of 0.25 for Clays (α – Method) and 0.35 for Sands (Nordlund Method) as found in AASHTO Table 10.5.5.2.3-1.



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9.2.1 Wave Equation Drivability Analysis

Static pile analyses were conducted to estimate the ultimate driving resistance that 14x89 steel H-piles and 30-inch steel pipe piles would experience during the installation process of piles driven to refusal on bedrock. Driveability analyses were performed at Pier 2, Pier 9, and Abutment 2 because of the soil profiles and depths to bedrock. The analyses were performed using guidelines presented in the FHWA "Soils and Foundations Workshop Manual".

The soil column contributing to driving resistance at Pier 2 includes approximately 27 feet of clay foundation soils below the anticipated pile cap and above shale bedrock. The soils beneath the Pier 9 pile cap consist of alternating layers of clays and sands extending 118 feet to shale bedrock. The soils beneath the Abutment 2 pile cap consist of approximately 22 feet of granular pile core material overlying 129 feet of alternating clays, sands, and gravels. The results of FHWA research and other literature regarding pile installation indicate that significant reductions in skin resistances occur during pile driving, primarily due to the dynamics of the installation process. Soils are remolded and pore water pressures apparently increase, causing reductions in shear strengths. The driving resistances were estimated under the condition that no interruptions, and therefore no pile "set" characteristics, would be experienced during the driving process.

The driveability analyses were conducted using the GRLWEAP (Version 2010) computer program for steel piles with an embedment length corresponding to the distance between the bottom of the pile cap and the bedrock surface. To perform the drivability analyses, two situations were modeled. The first one involved determining the minimum hammer energy which would drive the piles to refusal on bedrock, and which would achieve the maximum factored resistance. This condition would show the minimum hammer energy necessary to seat the piles on bedrock. The second part of the analyses would determine what the maximum hammer energy can be to drive the piles to refusal, and which would not damage the pile upon achieving refusal on bedrock. Because the soils at Pier 2 are significantly thinner than the Abutment 2 location, it was anticipated that two different pile hammers would be required to install the H-piles at these locations.

For the first part of the analyses it was determined that 14x89 piles can be driven by a Delmag D 6-32 pile hammer at Pier 2, which can provide a maximum energy of 13.5 foot-kips. The 14x89 piles at Abutment 2 can be driven by Delmag D30-32 hammer which delivers a maximum energy of 75.4 foot-kips. The 30-inch diameter pipe pile can be driven to bedrock at the Pier 9 location with a Delmag D36-13 hammer providing a maximum hammer energy of 83.8-foot kips. These hammers were selected from a listing of common hammer manufacturers presented in the hammer database of the GRLWEAP program. The GRLWEAP analysis indicates that these pile hammers can drive the piles to practical refusal on bedrock without developing damaging compressive or tensile stresses within the pile, and without resulting in an excessive number of hammer blows per foot of driving. The FHWA publication title "Soils and Foundations Workshop Manual-Second Edition" defines a reasonable range of hammer blows to be between 30 and 144 blows per foot for a steel pile.

The second part of the drivability analyses indicated that a hammer with a maximum energy of 27 foot-kips such as a Delmag D 15 would also drive the 14x89 H-piles to refusal at the Pier 2 location and would



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result in an allowable stress during driving of just less than 45 ksi. Multiple hammers of increasing energy were modeled at both the Pier 9 and Abutment 2 locations. The results indicated that hammers with energies less than 265 foot-kips can safely drive the piles to bedrock at these locations. Therefore, it will be recommended that the hammer energy be kept below 265 foot-kips at these locations.

Recommendations have been provided to the designer to use a hammer that falls within the minimum and maximum energy range for the respective pile size.

9.3 DRILLED SHAFTS

Designs indicate Piers 3 and 4 will be supported by 96-inch diameter drilled shafts in permanent steel casing from the bottom of the shaft cap to the top of bedrock. Below the bedrock surface the shaft socket will extend into bedrock as an uncased 90-inch diameter drilled shaft. Capacity i.e. resistance tables were developed to present the end bearing and the side resistance available from the shaft size at increasing depth into bedrock in order to allow the designer to select the appropriate embedment for the foundation design. These capacity (resistance) tables are presented in Appendix F.

Procedures outlined in AASHTO LRFD Bridge Design Specifications (Eighth Edition) were used to determine nominal end and side resistance for the drilled shafts. Strength and unit weight properties of bedrock were selected from unconfined compressive strength testing on rock core samples recovered at the pier locations. For both piers a total of 24 tests were completed. The laboratory test data was then averaged using the United States Army Corps of Engineers' (USACE's) 2/3rds higher rule. The averaged data was then used for analysis and is presented in Table 12 below.

Table 12. Summary of Bedrock Parameters used in Drilled Shaft Analysis

Location	Predominate Lithology	Average RQD (%)	Average Unit Weight (pcf)	Average Compressive Strength (tsf)	GSI
Pier 3	Shale	67	154	68	35
Pier 4	Sandstone	53	156	1,283	40

The averaged lab data presented in table 12 was used with AASHTO LRFD Bridge Design Specifications (Eighth Edition, 2017) equation 10.8.3.5.4c-2 to determine the nominal base resistance for the drilled shafts (q_p). Nominal side resistance (q_s) was calculated using equation 10.8.3.5.4b-1. The compressive strength of the shaft's concrete (4,000 psi) was compared to the compressive strength of the bedrock, and the smaller of the two compressive strengths was used as the limiting strength to determine nominal side resistance.

Nominal resistance was multiplied by the contact area of the shaft to determine preliminary shaft resistance i.e. capacity vs. depth tables. In hard rock, both side resistance and end resistance will not develop simultaneously, therefore, the preliminary total nominal resistance at a given embedment depth is chosen as the greater value of the end bearing resistance or the cumulative side resistance. The capacities were then factored according to LRFD process using AASHTO LRFD Bridge Design Specifications (Eighth Edition, 2017) Table 10.5.5.2.4-1 for the Service Limit, Strength Limit, and Extreme



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Limit States. Elevations shown on the capacity i.e. resistance tables use an average top of rock elevation from borings at each pier location. The top of rock varies across the site. Therefore, the elevation at each drilled shaft location shall be used to determine embedment depth.

9.3.1 Uplift

Uplift analyses were determined for the strength limit state and utilized a resistance factor of 0.55 for uplift resistance in rock. Uplift analysis was also determined for the extreme limit state and utilized a resistance factor of 0.8 (2017 Edition of the AASHTO LRFD Bridge Design Specifications, Section 10.5.5.3.2). Refer to Appendix F for tables showing the total factored uplift resistance at Piers 3 and 4.

9.4 SCOUR

The soils encountered at the substructure element locations are typically clays and sands with varying amounts of gravel, silt and clay with depth. A soil's susceptibility to scour is commonly determined by analyzing its particle size distribution. A soil's "D₅₀" and "D₉₅" values, defined as the grain diameter (in millimeters) below which 50 percent and 95 percent of the sample is smaller, are used in analyses to predict the amount of scour that could occur in that soil for a given flow condition. For pier foundations supported by deep foundations, the shaft or pile caps were placed below the scour depths. The top of Pier 1 spread footing was placed below the anticipated scour elevation. Values of D₅₀ and D₉₅ were presented previously to support the design team's scour analyses. They are also shown in this report adjacent to the boring logs on the Subsurface Data Sheets in Appendix B

10.0 SEISMIC EVALUATION

Due to the presence of soft, saturated alluvial granular materials in the foundation soils, faults on the geologic mapping, and the project site's proximity to the New Madrid Fault Seismic zone, there was concern of liquefaction of the soils during seismic events. Therefore, liquefaction triggering analyses were performed at substructure locations where saturated granular soils were encountered in the soil column.

Liquefaction refers to a condition where soil loses its usual strength and can move like a thick liquid. In the liquefaction analyses, materials are first assessed for clay-like or sand-like behavior. Determinations are made considering procedures from three references: Seed et al. (2003), Idriss and Boulanger (2008), and D'Appolonia Engineering (2010). Sand-like materials are then assessed for liquefaction. Liquefaction triggering analyses were performed using the simplified stress-based procedure prescribed by Idriss and Boulanger (2008), with updates by Boulanger and Idriss (2014).

Factors of safety against liquefaction (FS_{liq}) are computed for a particular earthquake event, for individual measurements of in-situ penetration resistance. For each data point, $FS_{liq} \leq 1.1$ indicates liquefaction, $FS_{liq} > 1.4$ indicates no liquefaction, and substantial softening without full liquefaction is indicated by $1.1 < FS_{liq} \leq 1.4$. However, whether or not a particular zone or soil deposit will liquefy in a given earthquake is judged based on the preponderance of the data, considering the factors of safety computed at points throughout the soil. Interpreting the calculated safety factors (FS_{liq}) delineating liquefiable units (or



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subunits), and then deciding whether or not a soil unit will liquefy sometimes requires significant judgment.

Liquefaction of a given soil is not expected where the bulk of the data indicates $FS_{liq} > 1.4$. A few random or sporadic data points with lower safety factors are not necessarily an indication of liquefaction throughout the deposit; liquefaction may occur in isolated lenses of loose soil without precipitating a larger failure. Residual strengths are not assigned in these cases.

Liquefaction is expected where much of the data indicates $FS_{liq} \leq 1.1$. During an earthquake, liquefaction may trigger in the weakest locations within a deposit, the resulting stress re-distribution may cause liquefaction in adjacent areas, and a liquefaction failure mechanism may develop progressively through the deposit. Hence, where the computed FS_{liq} is less than 1.1 in a significant part of the soil deposit, liquefaction is assumed, and residual strengths are assigned.

When the FS_{liq} is at a point between 1.1 and 1.4, the appropriate undrained strength would be an intermediate value: greater than a residual strength, but less than 80% of the static undrained strength. However, given the variability typically encountered in a liquefiable soil and the need to assess liquefaction for the entire deposit, there is usually no practical need to make this distinction. The FS_{liq} is quantitatively determined at point locations, but the collection of the data is considered in aggregate to arrive at an appropriate judgment regarding liquefaction and undrained strength within the overall soil deposit. That is, in most cases in practice, a saturated soil will be judged to either liquefy (residual strengths assigned) or not liquefy.

10.1 SEISMIC DEFORMATION ANALYSES

An earthquake may cause excessive embankment deformations, even if the slopes are otherwise stable. If an earth slope is seismically stable, the magnitude of earthquake-induced permanent deformations can be estimated using a Newmark sliding block analysis (Newmark 1965). Displacements accumulate over the time history to produce an estimate of the total permanent deformation due to the earthquake. Slope displacements are assumed to stop when the earthquake ends, consistent with the assumption of post-earthquake stability.

10.2 GROUND RESPONSE ANALYSIS

Input time histories for the ground response analysis were developed by Wang et al (2008) and are available at the KTC website. Modulus reduction and damping curves were selected from Darendeli (2001). The ground response software, Strata V. 0.6.3, was used to compute site-specific amplification. Shear wave velocities were selected using the available seismic CPT data. Selected shear wave velocities for calculation of stiffness parameters are detailed in Appendix F.



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10.3 RESULTS

10.3.1 Ground Response Analysis

The profiles considered in the ground response analysis are detailed in Appendix F. Peak acceleration values from the ground response analyses are provided in the liquefaction calculations in Appendix F. Ground response analyses were also used to calculate seismic loading for Newmark analyses.

10.3.2 Liquefaction Analyses

Liquefaction and cyclic softening potential were assessed for the foundation materials. First, CPT data was used to determine if each sample was clay-like (i.e., potentially susceptible to cyclic softening) or sand-like (potentially susceptible to classic liquefaction). Next, liquefaction (FS_{liq}) and cyclic softening ($FS_g=3\%$) triggering analyses were performed at each CPT sounding and SPT boring location. Where residual strengths were required for liquefied materials in the slope stability analyses, post-earthquake shear strengths were assigned as detailed in Appendix F. The results are summarized in Table 13 and the analysis and additional details are provided in Appendix F.

Table 13. Summary of Liquefaction Results

Boring/Sounding	Substructure Element Location	Total Samples	Samples with $FS_{liq} \leq 1.4$
SP04 (CPT-4)	Pier 3	303	6/303 (2%)
SP05 (CPT-5)	Pier 4	613	82/613 (13%)
SP06 (CPT-6)	Pier 5	576	53/576 (9%)
SP07 (CPT-7)	Pier 6	667	78/667 (12%)
SP08 (CPT-8)	Pier 7	706	62/706 (9%)
SP09 (CPT-9)	Pier 8	483	35/483 (7%)
SP10 (CPT-10)	Pier 9	771	88/771 (11%)
SP11 (CPT-11)	Abutment 2	568	52/568 (9%)
R11	Abutment 2	13	5/13 (38%)
1027	Pier 9	7	3/7 (43%)
1013	Pier 4	4	4/4 (100%)
1028	Abutment 2	19	3/19 (16%)



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11.0 GEOTECHNICAL NOTES FOR ROADWAY

1. Clearing and grubbing of embankment areas shall be completed in accordance with Section 202 of the current Kentucky Department of Highways Standard Specifications for Road and Bridge Construction.
2. Removal of existing structures and other obstructions shall be completed in accordance with Section 203 of the current Kentucky Department of Highways Standard Specifications for Road and Bridge Construction.
3. All water wells and/or cisterns within the limits of construction, whether shown on the plans or not, shall be plugged in accordance with Section 708 of the current Kentucky Department of Highways Standard Specifications for Road and Bridge Construction.
4. All catch basins and manholes shall be filled and capped and all septic tanks shall be filled in accordance with Section 708 of the current Kentucky Department of Highways Standard Specifications for Road and Bridge Construction.
5. All channel changes and special ditches shall be constructed prior to placement of any embankment materials adjacent to them in accordance with Section 206 of the current Kentucky Department of Highways Standard Specifications for Road and Bridge Construction. Materials excavated from these areas may be utilized in construction of the embankments but may require aeration to the proper moisture contents prior to compaction operations. No extra payment shall be permitted for re-handling, hauling, stockpiling, and/or manipulating these materials.
6. In accordance with Section 206 of the current Kentucky Department of Highways Standard Specifications for Road and Bridge Construction, the moisture content of embankment and subgrade materials shall not vary from the optimum moisture content, as determined by KM 64-511, by more than plus or minus two percent. This moisture content requirement shall have equal weight with the density requirement when determining the acceptability of embankment or subgrade construction. Refer to the family of curves for moisture-density relationships.
7. The Contractor shall conduct grading operations in such a manner that soil (free of rock larger than four inches and shale) from roadway excavation be stockpiled separately or otherwise manipulated so that ample quantities are available for a chemically stabilized roadbed meeting the requirements of Section 208 of the current Standard Specifications for Road and Bridge Construction. No direct payment will be allowed for such necessary manipulating as stockpiling, hauling, and/or handling the material.
8. All soils, whether from roadway excavation or borrow, may require manipulation to obtain proper moisture contents prior to compaction. Direct payment shall not be permitted for re-handling, hauling, stockpiling, and/or manipulating soils.



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9. The Contractor is responsible for conducting any operations necessary to excavate the cut areas to the required typical sections. The cost of these operations shall be incidental to the earthwork.
10. As directed by the Engineer, existing bituminous concrete at the following approximate locations that is positioned less than three feet from proposed subgrade level shall be undercut a minimum of two feet beneath proposed subgrade level and backfilled with suitable subgrade material. This work shall be in accordance with Section 206 of the current Kentucky Department of Highways Standard Specifications for Road and Bridge Construction.

Approximate Station Limits

Mainline	KY 70
100+00 to 107+60 155+50 to 161+75	51+50 to 54+00
US 60 Connector 1	KY 2610
51+50 to 53+00	50+70 to 51+70

11. In order to provide a working platform for embankment construction, place non-erodible Granular Embankment over all soft and/or saturated areas that may be detected during construction, as directed by the Engineer. The required thickness is estimated to be two feet, but the actual locations and thickness may depend on seasonal fluctuations in the water table. The Granular Embankment shall be underlain with Fabric-Geotextile Class 1 (for Stabilization) in accordance with Sections 214 and 843 of the current Standard Specifications. Any outdated references to fabric "Type" in Section 214 shall be ignored.
12. Perforated pipes for subgrade drainage shall be installed at vertical sags and at the upgrade ends of structures, in accordance with Kentucky Department of Highways Standard Drawing RDP-005 and/or as directed by the Engineer. These drainage features shall be installed at the following approximate locations:

Mainline	US 60 Connector 1
100+00 114+30 145+50 161+75	52+67
Conant Lane	Ky 70
49+76	50+20

13. Embankment foundation benches/slope serrations and perforated pipe underdrains shall be constructed at the following approximate locations in accordance with current Kentucky Department of Highways Standard Drawings RGX-010 and RDP-006, project cross-sections, and as directed by the Engineer. If water is encountered during benching, construct a one-foot drainage blanket as directed by the Engineer, or contact the Geotechnical Branch for guidance.



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The drainage blanket shall consist of Coarse Aggregate for Rock Drainage Blanket in accordance with Section 805, wrapped with Class 1 Geotextile Fabric in accordance with Section 214 and 843 of the current Standard Specifications. The benches shall be constructed one at a time beginning with the lowest bench. Each bench shall be backfilled prior to excavation of the next bench. This procedure should be followed to help maintain stability of the existing slopes in these areas.

Approximate Station Limits

Mainline	KY 70
157+25 to 158+75, Right 159+75 to 160+25, Right	51+75 to 52+25, Right
KY 2610	
50+75 to 51+25, Left	

14. Conventional transverse benches shall be constructed and perforated pipe underdrains installed at the following approximate locations in accordance with Kentucky Department of Highways Standard Drawings RDP-005 and RDP-006, project plans (as applicable), and as directed by the Engineer. Contrary to Standard Drawing RDP-006, transverse benches and perforated pipe underdrains shall be installed in both uphill and downhill transition areas between cuts and fills.

Approximate Station Limits

US 60 Connector 1
50+50

15. Construct a chemically stabilized soil subgrade with a CBR value of four for the underlying soil. The chemical stabilization shall consist of eight inches of cement stabilization. Apply the cement in accordance with Section 208 of the Kentucky Standard Specifications for Road and Bridge Construction. Where soft and or wet subgrade is encountered during construction, the thickness of the chemically stabilized layer may be increased to a thickness of up to 16 inches to also serve as a working platform for subgrade stabilization. These adjustments shall be as directed by the Engineer and may depend on seasonal conditions or fluctuations in the ground water table.
16. In areas where the chemical stabilization is not feasible (such as cross-overs, tie-ins, entrances, etc.) the top 12 inches of the subgrade shall be constructed with KY Coarse Aggregate No. 2, 3, or 23 in accordance with Section 805 of the Standard Specifications for Road and Bridge Construction, current edition. The aggregate shall be underlain with Fabric-Geotextile Class 1A meeting the requirements of AASHTO M 288 for Class 1A Fabric, and of the Special Note for Class 1A Geotextile Fabrics Used in Structural Pavement Designs. The aggregate shall be overlain with Fabric-Geotextile Class 1 in accordance with Sections 214 and 843 of the current Standard Specifications. Any outdated references to fabric "Type" in Section 214 shall be ignored. The lower layer of fabric may be omitted when the base of the rock roadbed is on bedrock. The aggregate shall daylight horizontally to the edge of embankment in fills and to the



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ditchline in cuts to ensure positive drainage. The actual locations will be determined by the Engineer during construction.

17. A pile core shall be constructed at the north bridge approach embankments in accordance with Kentucky Standard Drawings RGX-100 and RGX-105, meeting the material requirements of the current edition of Special Provision 69.
18. Slope protection meeting the requirements of Section 703 and 805 of the Standard Specifications for Road and Bridge Construction, current edition, will be required at the north approach to the bridge over the Cumberland River from the ground surface to elevation 345 feet. Place Fabric-Geotextile Class 1, in accordance with Sections 214 and 843 of the Standard Specifications between the embankment and the protection. Any outdated references to fabric "Type" in Section 214 shall be ignored.
19. Borrow material required to construct the project shall meet a minimum CBR value of four. The Contractor shall conduct grading operations in such a manner that soil (free of rock larger than four inches and shale) from roadway excavation be stockpiled separately or otherwise manipulated so that ample quantities are available for a chemically stabilized roadbed meeting the requirements of Section 208 of the current Standard Specifications for Road and Bridge Construction. No direct payment will be allowed for such necessary manipulating as stockpiling, hauling, and/or handling the material.
20. Upon identification of a borrow source for materials to construct the roadway embankment north of the river, the Contractor shall test the soils in terms of USCS classification testing and Standard Proctor Testing (Kentucky Method 64-511) to confirm suitability for use with cement stabilization. The testing shall be completed and submitted to the Department's Geotechnical Branch for approval prior to beginning construction of the top two feet of the subgrade.
21. Some of the soil horizons and slopes on the project, as well as potential borrow soils, may be subject to erosion due to being non-plastic or having Plasticity Indices lower than 12. Necessary procedures, in accordance with Section 212 and 213 of the current Kentucky Standard Specifications for Road and Bridge Construction shall be followed during construction.

12.0 DESIGN RECOMMENDATIONS FOR ROADWAY

1. The project shall be designed for a soil subgrade utilizing a CBR value of four (4).
2. Stantec understands that sufficient quantities of durable rock may not be available from roadway excavation to construct a rock subgrade for a pavement section. Therefore, construct a chemically stabilized soil subgrade with a CBR value of four for the underlying soil. The chemical stabilization shall consist of eight inches of cement stabilization. Apply the cement in accordance with Section 208 of the Kentucky Standard Specifications for Road and Bridge Construction. Where soft and or wet subgrade is encountered during construction, the thickness of the chemically stabilized layer may be increased to a thickness of up to 16 inches to also serve as a



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working platform for subgrade stabilization. These adjustments should be as directed by the Engineer and may depend on seasonal conditions or fluctuations in the ground water table.

3. An average soil shrinkage value of three percent is recommended for soil to be excavated on this project. This value is to be used in calculating an "apparent" shrinkage value in accordance with Section 61-03.0400 of the Kentucky Transportation Cabinet Division of Design Guidance Manual. This shrinkage value should be applied only to soil positioned above the top of rock. A shrink/swell value of zero should be applied to Rock Disintegration Zone (RDZ) material.

13.0 CONCLUSIONS AND RECOMMENDATIONS (BRIDGE)

Stantec developed the following recommendations based upon reviews of available data, information obtained during the field exploration, results of laboratory testing and engineering analyses, and discussions with KYTC personnel. The recommendations are also based on the structure configuration developed by Stantec in December 2019.

13.1 GENERAL

Based on a review of the existing subsurface conditions and anticipated structural loads, it is recommended that rock bearing foundation systems be used for all bridge substructure elements. The following table provides possible foundation alternates using the following notations:

1 = Spread Footings

2 = Point Bearing H-Piles

3 = Point Bearing Pipe-Piles

4 = Drilled Shafts Bearing in Bedrock

The foundation alternates shown below are those Stantec considers being most practical. However, other structural and/or economic considerations may dictate which option is most preferable.

13.1.1 Foundation excavations should be properly braced/shored to provide adequate safety to people working in or around the excavations. Bracing should be performed in accordance with applicable federal, state, and local guidelines.

13.1.2 **A plan note should be included by the Designer** that indicates that temporary shoring, sheeting, cofferdams, and/or dewatering methods may be required to facilitate foundation construction. It should be anticipated that groundwater will be encountered at foundation locations within the flood plain of the Cumberland River.

13.1.3 D50 and D95 soil grain sizes are shown on the Subsurface Data Sheets in Appendix C and were used by the designer in scour evaluations. It is recommended that the bottoms of the foundation systems be placed at or below the estimated scour depths, and that all foundations bear on bedrock.



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13.1.4 The seismic design procedures outlined in the current AASHTO LRFD Bridge Design Specifications indicate that structural design loads are to be based on site class definitions. Based on the results of the exploration and the geology of the area, a site class of D, as per AASHTO Table 3.10.3.1.1 – Site Class Definitions, was used for design purposes.



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Table 14. Recommended Foundation Alternates

Substructure Element and Boring No.	Station, Offset	Foundation Alternate	Top of Rock (ft)	Estimated Pile Tip Elevation (ft)	Spread Footing Bearing Elevation (ft)	Drilled Shaft Bearing Elevation (ft)
Abutment 1						
1001	114+90, 20' Lt.	1	395.7	N/A	388.0	N/A
1002	114+90, CL.	1	394.8	N/A	388.0	N/A
1003	114+90, 20' Rt.	1	393.8a	N/A	388.0	N/A
Pier 1						
1004	116+13, 20' Lt.	1	327.7	N/A	318.4	N/A
1005	116+19, 20' Rt.	1	322.7	N/A	318.4	N/A
Pier 2						
1006	117+22, 20' Lt.	2	300.0	298.5	N/A	N/A
1007	117+37, 20' Rt.	2	300.0	298.5	N/A	N/A
Pier 3						
1008	118+50, 25' Lt.	4	278.4	N/A	N/A	240.7*
1009	118+50, 25' Rt.	4	277.3	N/A	N/A	240.7*
1010	118+60, CL.	4	278.2	N/A	N/A	240.7*
1011	118+60, 25' Lt.	4	272.3	N/A	N/A	240.7*
1012	118+63, 25' Rt.	4	275.2	N/A	N/A	240.7*
Pier 4						
1013	125+50, 25' Lt.	4	214.5	N/A	N/A	192.0*
1014	125+50, 25' Rt.	4	211.5	N/A	N/A	192.0*
1015	125+60, CL.	4	214.7	N/A	N/A	192.0*
1016	125+70, 25' Lt.	4	211.3	N/A	N/A	192.0*
1017	125+70, 25' Rt.	4	211.0	N/A	N/A	192.0*
Pier 5						
1018	127+00, 25' Lt.	3	211.7 ^a	211.0	N/A	N/A
1019	127+00, 25' Rt.	3	211.9	211.0	N/A	N/A
Pier 6						
1020	128+40, 25' Lt.	3	212.6	211.5	N/A	N/A
1021	128+40, 25' Rt.	3	211.0 ^a	210.0	N/A	N/A
Pier 7						
1022	129+00, 10' Lt.	3	212.5 ^a	211.5	N/A	N/A
1023	129+00, 25' Rt.	3	210.8	210.0	N/A	N/A
Pier 8						
1024	131+50, 25' Lt.	3	212.0	211.0	N/A	N/A
1025	131+50, 25' Rt.	3	211.3 ^a	210.5	N/A	N/A
Pier 9						
1026	132+60, 25' Lt.	3	211.0	210.0	N/A	N/A
1027	132+60, 25' Rt.	3	211.2	210.0	N/A	N/A
Abutment 2						
1028	134+00, 20' Lt.	2	210.2	209.0	N/A	N/A
1029	134+00, 20' Rt.	2	211.9	210.5	N/A	N/A

a Top of rock in this case indicates rock-like resistance to augering. An exact determination cannot be made without performing rock coring.

* - Refer to the Capacity i.e. Resistance Tables in Appendix F



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13.2 APPROACH EMBANKMENT CONSTRUCTION

13.2.1 The bridge approach embankment shall include a “pile core” at the substructure element location to facilitate installation of the foundation systems. The pile core material shall be in accordance with KYTC Special Provision No. 69, and Section 206 of the current Kentucky Department of Highways Standard Specifications for Road and Bridge Construction.

13.2.2 Settlement on the order of 16 inches has been estimated to occur in existing site soils, due to the loading of the approach embankment fill. It is recommended that the ahead station embankment be constructed as one of the first construction activities (STA 133+50 to 142+00) to allow consolidation settlement to occur prior to pavement construction. Please refer to project “Special Note for Ahead Station Embankment Construction” for project requirements for settlement monitoring.

13.3 SPREAD FOOTING FOUNDATIONS

13.3.1 Rock-bearing spread footing options are being provided for the locations of Abutment 1 and Pier 1. Foundation excavations for footings at the structure locations should be level and free of loose, water softened material, etc. Additional rock excavation to achieve suitable bearing conditions may be required depending upon topography and bedrock weathering conditions.

13.3.2 **A plan note has been included by the Designer** that indicates that solid rock excavation will be required for installation of the substructure’s spread footings. The Contractor shall take care during blasting and other excavation methods to avoid over-breakage and damage to the bedrock beneath the footings. At the Abutment 1 and Pier 1 locations, the Designer may need to adjust the bearing elevations downward such that a minimum set back of 10 feet is maintained between the front face of the footing and the rock slope. This set back distance was recommended because of the presence of weathered shales and non-durable shales, and to reduce the potential for a perched foundation condition.

13.3.3 Prior to placement of any concrete or reinforcing steel in a foundation excavation, the excavation bottom should be clean, and all soft, wet or loose materials should be removed. In no case should concrete be placed upon compressible or water-softened materials.

13.3.4 **A plan note has been included by the Designer** indicating that footings should be placed as soon as practical after completion of the footing excavation. If the bedrock becomes softened at bearing elevation, the softened material should be undercut to unweathered material prior to placement of reinforcing steel and concrete. Seasonal groundwater fluctuations may cause groundwater infiltration into the footing excavation, and a dewatering method may be necessary.

13.3.5 Any clay seams or suspect weak materials at or near the bearing elevation will need to be undercut and replaced with mass concrete.



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13.4 STEEL PILE FOUNDATIONS

The following table provides estimated pile lengths applicable at the referenced substructure element locations. It is understood that 14X89 H-pile foundations will support Pier 2 and Abutment 2, and that 30-inch diameter open ended steel pipe piles will support Piers 5-9 of the new bridge substructure elements.

Table 15. Estimated Pile Lengths

Substructure Element	Estimated Bearing Elevation (ft) MSL	Estimated Pile Length ^b (ft)	Estimated Nominal Downdrag Load	Approximate Base of Pile Cap Elevation (ft) MSL
			(kips)	
Pier 2, Station 117+34				
14x89 H-Pile	298.5	28-29	N/A	326.6
Pier 5, Station 127+03				
30" Pipe-Pile	211.7-211.9 ^a	101-102	490	313.1
Pier 6, Station 128+43				
30" Pipe-Pile	212.6-211.0 ^a	104-106	490	316.2
Pier 7, Station 129+83				
30" Pipe-Pile	212.5-210.8 ^a	112-115	490	325.3
Pier 8, Station 131+23				
30" Pipe-Pile	212.0-211.3 ^a	114-115	490	326.0
Pier 9, Station 132+62				
30" Pipe-Pile	211.0-211.2 ^a	116-117	490	327.2
Abutment 2, Station 134+00				
14x89 H-Pile	210.2-211.9 ^a	149-151	166	361.0

^a Range from left to right.

^b Length as measured from the base of pile cap.

13.4.1 In the design of foundation elements, down drag/negative skin friction forces in areas of no fill placement were considered due to liquefaction potential of granular soils (Piers 5 through 9). Design of Abutment 2 considered negative skin friction due to consolidation settlement under embankment loading. The down drag loads presented in the table are unfactored loads, which were given to the Designer.

13.4.2 **A plan note has been included by the Designer** which states the following hammer criteria: A single acting diesel pile driving hammer with a rated energy between 13.5 foot-kips and 22.0 foot-kips will be required to drive 14x89 steel H-piles at the Pier 2 location and a diesel pile driving hammer with a rated energy between 75.4 foot-kips and 265 foot-kips will be required at the location of Abutment 2 to drive 14x89 steel H-piles to practical refusal without encountering excessive blow counts or damaging the piles. The Contractor shall submit the proposed pile driving system to the Engineer for approval prior to



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the installation of the first pile. Approval of the pile driving system by the Engineer will be subject to satisfactory field performance of the pile driving procedures.

13.4.3 Stantec understands that end bearing piles are being driven to a required nominal resistance. **A plan note should be included by the Designer** which indicates: HP piles installed to required nominal resistance at Pier 2 shall be in accordance with Section 604.03.07(C) Case 2 of the KYTC Standard Specifications for Roadway and Bridge Construction, and those installed at Abutment 2 shall be in accordance with Section 604.03.07(C) Case 1 of the KYTC Standard Specifications for Roadway and Bridge Construction. Pipe piles at the locations of Piers 5-9 shall be installed in accordance with the Special Note for Pile Dynamic Testing.

13.4.4 The design and installation of the pile foundations should conform to current AASHTO LRFD Bridge Design Specifications and Section 604 of the current edition of the Kentucky Department of Highways Standard Specifications for Road and Bridge Construction.

13.4.5 The Kentucky Transportation Cabinet recommends that protective pile points or shoes be used on end bearing piles to allow for embedment into the top of bedrock. Installation of pile points or shoes should be in accordance with Section 604 of the Kentucky Standard Specifications for Road and Bridge Construction, current edition.

13.4.6 The AASHTO LRFD Bridge Design Specifications recommend a resistance factor for horizontal geotechnical resistance of a single pile or pile group of 1.0 for lateral resistance analyses. Appendix E provides Idealized Soil Profiles that outline the recommended soil parameters for use in lateral load analyses.

13.4.7 The 2017 AASHTO LRFD Bridge Design Specifications recommends axial resistance factors based on pile driving conditions (good or severe driving conditions). Based on the general subsurface conditions encountered at this bridge site, it is recommended that the axial resistance of piles in compression (ϕ_c) used in design be 0.50. Further, the combined axial and flexural resistance factors for design should be $\phi_c = 0.70$ and $\phi_f = 1.00$ as noted in Section 6.5.4.2 of the referenced AASHTO specifications.

13.4.8 The pile foundation system for Abutment 2 has been designed to withstand applicable down drag forces from consolidation settlement of the foundation soils. Therefore, a waiting period is not required prior to pile installation at this location.

13.5 DRILLED SHAFT FOUNDATIONS

13.5.1 The Contractor shall use a permanent casing from the top of shaft to the top of unweathered bedrock and use an uncased rock socket which is six inches smaller than the inside diameter of the permanent casing. A plan note should be included by the Designer which indicates: Permanent casing shall be incidental to the unit bid price for Drilled Shaft - Common or Drilled Shaft - Solid Rock, as applicable.



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13.5.2 Construction methods and materials used for drilled shaft installations be in accordance with the current KYTC “Special Note for Drilled Shafts” and the “Special Note for Project Specific Drilled Shaft Requirements”

13.5.3 A minimum rebar cover of six inches is required in the uncased rock sockets.

13.5.4 For LRFD, evaluate the total factored axial resistances using the attached Drilled Shaft Axial Capacity Tables i.e. resistance tables considering the resistance developed in the uncased rock sockets. Note that the axial resistances provided ignore the upper one shaft diameter. The factored resistances must exceed the factored loads at the strength limit state. The shaft tips shall extend a minimum depth into the bedrock, which satisfies both axial and lateral load design criteria.

13.5.5 Design the shafts neglecting any lateral resistance above the upper one shaft diameter. Perform lateral load analysis using the geotechnical parameters provided in the attached Idealized Soil and Bedrock Profile. These parameters may be used to perform analyses using LPILE Plus or other similar software.

13.5.6 Additional drilling will be required at each drilled shaft location as noted in Section 3.5, Subsurface Exploration of the KYTC’s Special Note for Drilled Shafts. Estimates of the amount of Rockline Sounding were determined by using the average ground surface elevation at each pier minus the average top of rock elevation at each pier and multiplying by 8. Rock Coring estimated were determined using the average top of rock at each pier elevation minus the planed shaft tip elevation plus 22.5 ft. and multiplying the result by 8 was used. It is recommended that the subsurface exploration extend a minimum depth of three shaft diameters (but no less than 10 feet) below the bottom of the anticipated tip elevation of each drilled shaft.

13.5.7 **A plan note has been included by the Designer** that states The Contractor will be responsible for providing subsurface exploration drilling during construction to finalize the drilled shaft tip elevations. Additional drilling will be required at each drilled shaft location in accordance with the Special Note for Drilled Shafts, current edition.

14.0 CLOSING

14.0.1 General soil and rock descriptions and indicated boundaries are based on an engineering interpretation of all available subsurface information and may not necessarily reflect the actual variation in subsurface conditions between borings and samples. Collected data and field interpretation of conditions encountered in individual borings are shown on the Geotechnical Drawings.

14.0.2 The observed water levels and/or conditions indicated on the boring logs are as recorded at the time of exploration. These water levels and/or conditions may vary considerably, with time, according to the prevailing climate, rainfall, or other factors and are otherwise dependent on the duration of and methods used in the exploration program.



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March 06, 2020

14.0.3 Sound engineering judgment was exercised in preparing the subsurface information presented herein. This information was prepared and is intended for design and estimating purposes. Its presentation on the plans or elsewhere is for the purpose of providing intended users with access to the same information available to the KYTC. This subsurface information interpretation is presented in good faith and is not intended as a substitute for personal investigations, independent interpretations, or judgments of the Contractor.



COMBINED REPORT OF GEOTECHNICAL EXPLORATION

References

March 06, 2020

15.0 REFERENCES

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COMBINED REPORT OF GEOTECHNICAL EXPLORATION

References

March 06, 2020

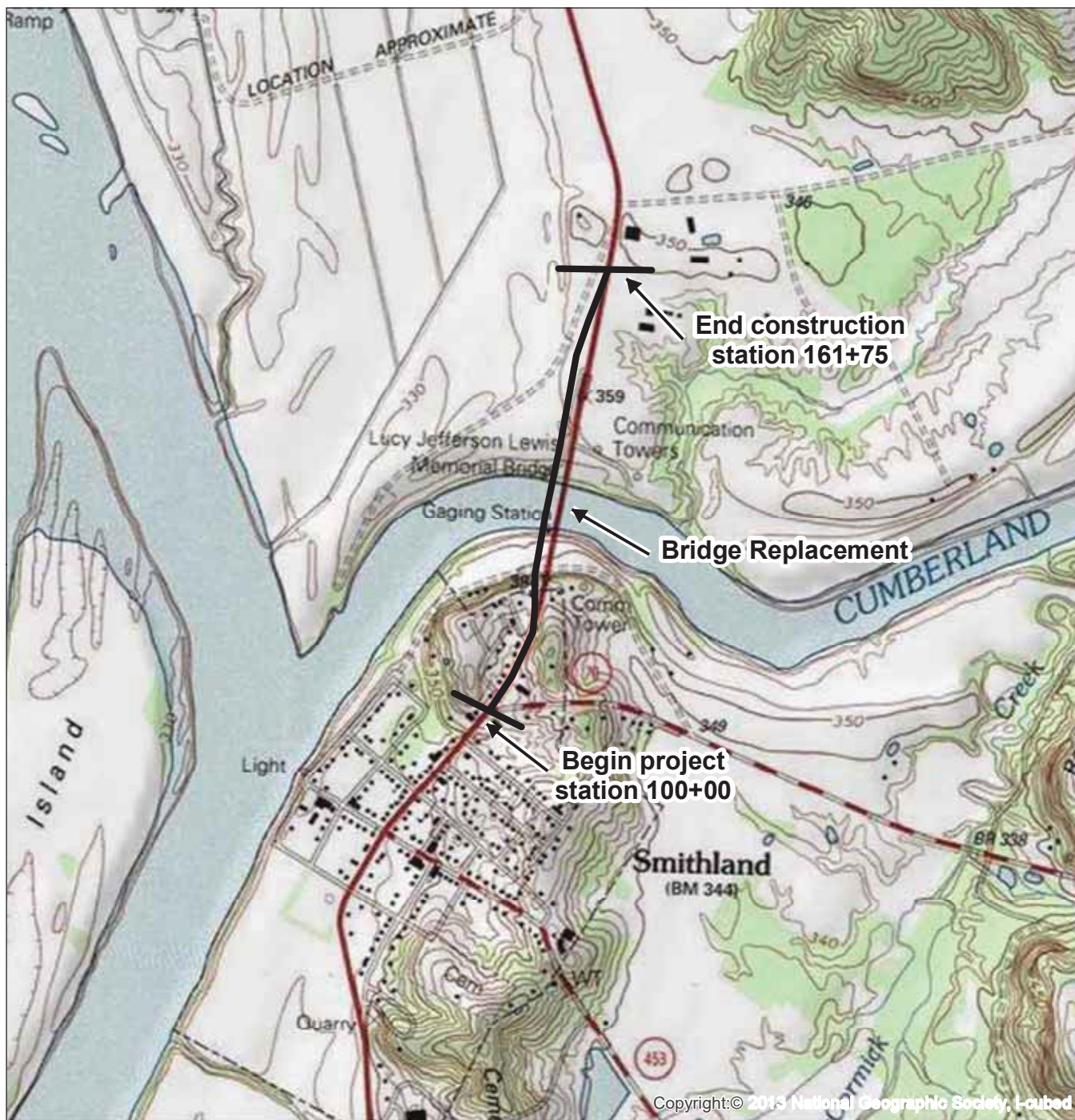
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https://uknowledge.uky.edu/ktc_researchreports/136



APPENDIX A

Location Map



Notes
 1. Coordinate System: NAD 1983 StatePlane
 Kentucky FIPS 1600 Feet
 2. Data Sources: ESRI Topographic basemap

0 800 1,600 Feet
 (At original document size of 8.5x11)
 1:18,000



Project Location Livingston Co, KY
 Prepared by SMH on 2020-02-19
 TR by TR on 2020-02-19
 IR Review by KS on 2020-02-19

Client/Project 178565011

Kentucky Transportation Cabinet
 US 60 Bridge over Cumberland River

Figure No.
Appendix A

Title
**US 60 Bridge over Cumberland
 River Topographic**

APPENDIX B

Drawings

Geotechnical Roadway Drawings

GEOTECHNICAL SYMBOLS

FILE NAME: V:\178510c1\178510c1\178510c1\geotechnical\drawing\sheet\178510c1\178510c1.dgn

USER: Rhyam

DATE PLOTTED: 11/20/2019

E-SHEET NAME:

POSITION: v8.11.829

E-SHEET NAME:

AASHTO Classification of Soils and Soil-Aggregate Mixtures

General Classification	Granular Materials (35% or less passing 0.075 mm)				Silt-Clay Materials (More than 35% passing 0.075 mm)				
Group Classification	A-1		A-3	A-2		A-4	A-5	A-6	A-7
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7		A-7-5 A-7-6
Sieve Analysis, Percent Passing	50 max	---	---	---	---	---	---	---	---
	30 max	50 max	51 min	---	---	---	---	---	---
	15 max	25 max	10 max	35 max	35 max	35 max	35 max	36 min	36 min
	0.075 mm (No. 200)								
Characteristics of Fraction Passing 0.425 mm (No. 40)									
	Liquid Limit	---	N.P.	40 max 10 max	41 min 10 max	40 max 11 min	41 min 10 max	40 max 11 min	41 min 11 min
Plasticity Index	6 max								

Unified Soil Classifications

MAJOR DIVISIONS	SYMBOL	NAME
GRAVEL AND GRAVELLY SOILS	GW	Well-graded gravels or gravel-sand mixtures, little or no fines.
	GP	Poorly graded gravels or gravel-sand mixtures, little or no fines.
	GM	Silty gravels, gravel-sand-silt mixtures.
	GC	Clayey gravels, gravel-sand-clay mixtures.
COARSE GRAINED SOILS	SW	Well graded sands or gravelly sands, little or no fines.
	SP	Poorly graded sands or gravelly sands, little or no fines.
	SM	Silty sands, sand-silt mixtures.
	SC	Clayey sands, sand-clay mixtures.
FINE GRAINED SOILS	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
	CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
	CH	Inorganic clays of high plasticity, fat clays.
UNCLASSIFIED MATERIAL	NONE	Non-classified material(i.e. overburden, pavement, slag, etc.) Include visual description.

AI

LI

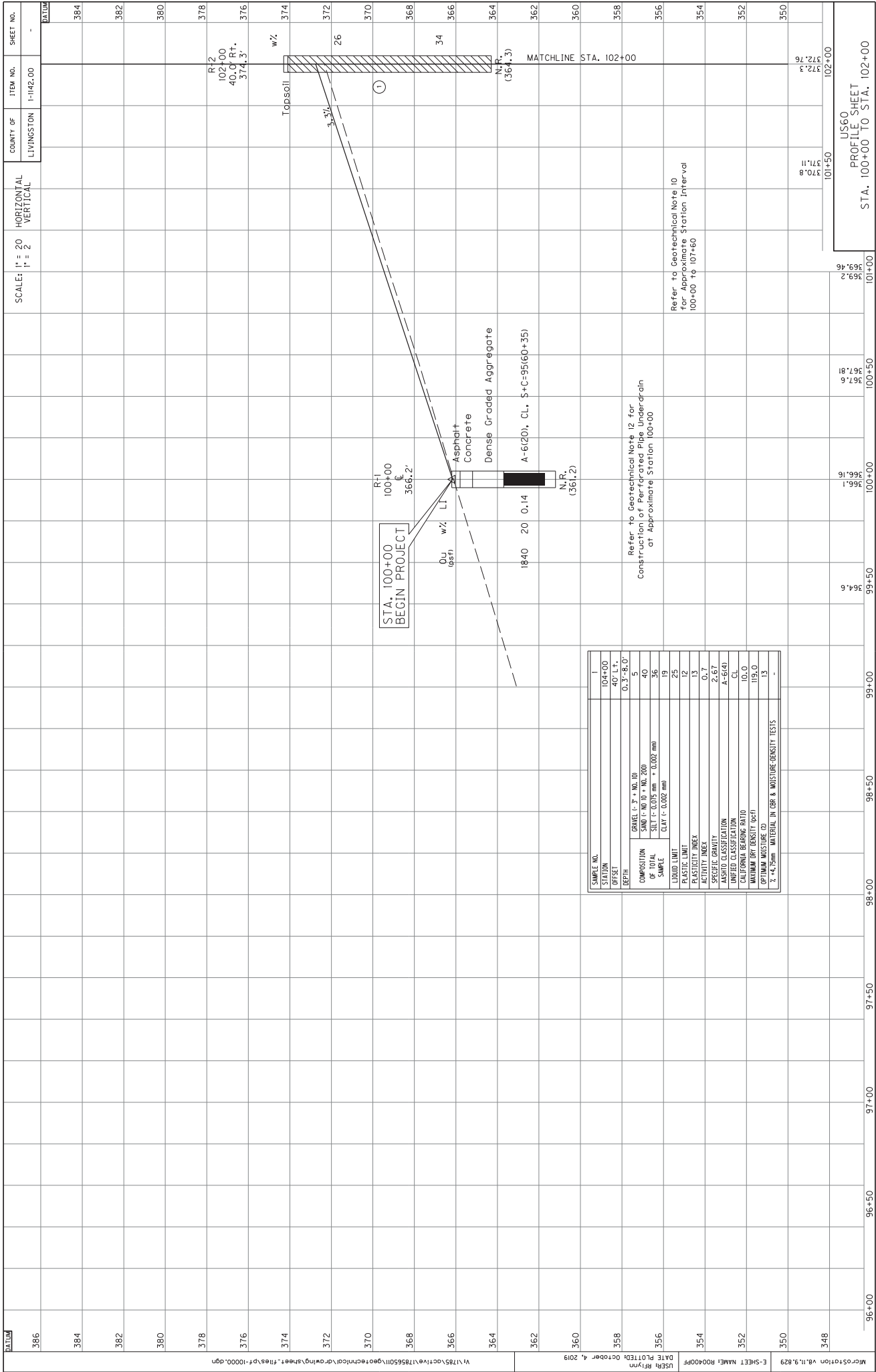
S+C

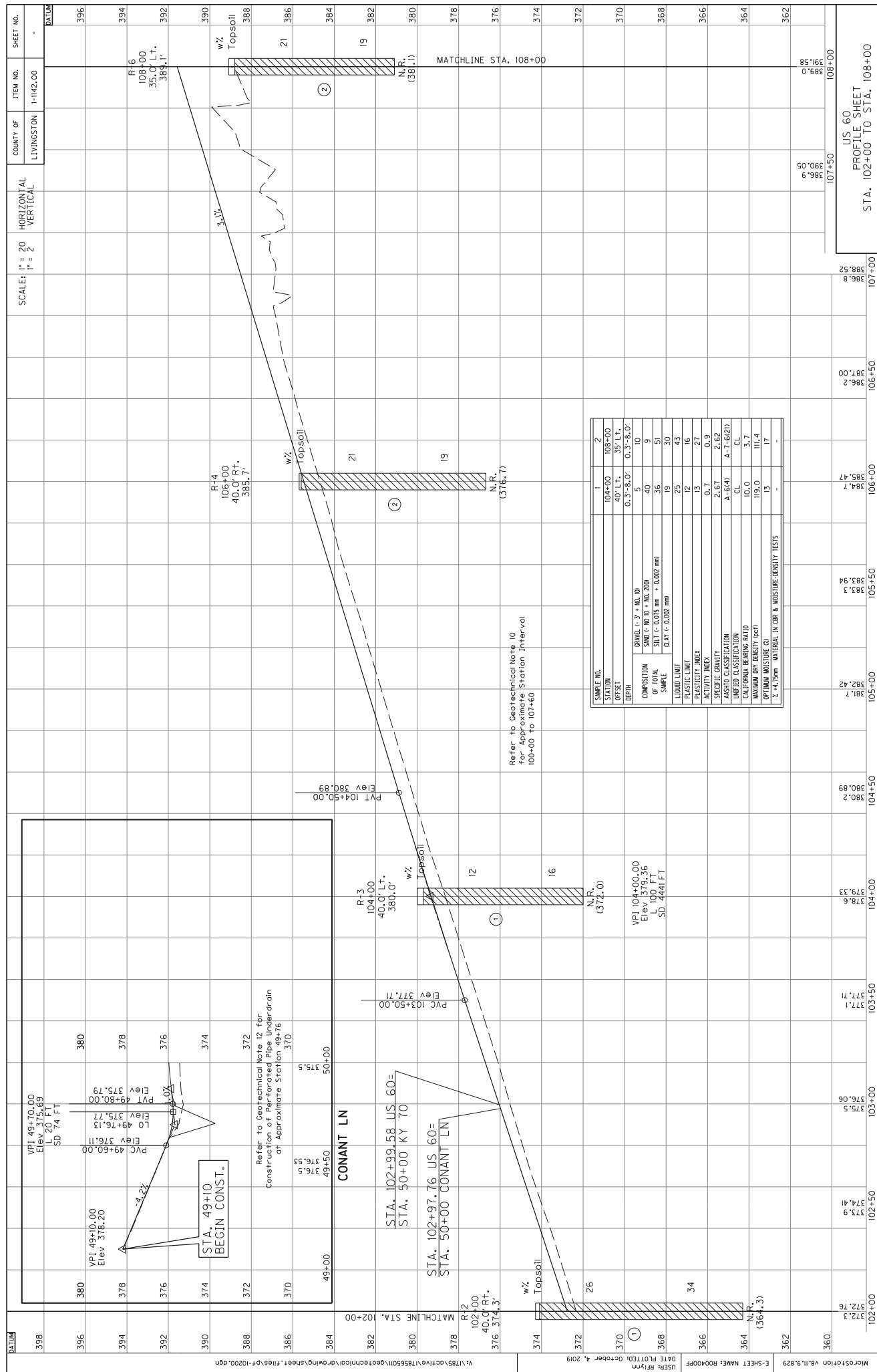
Slope inclinometer Installation

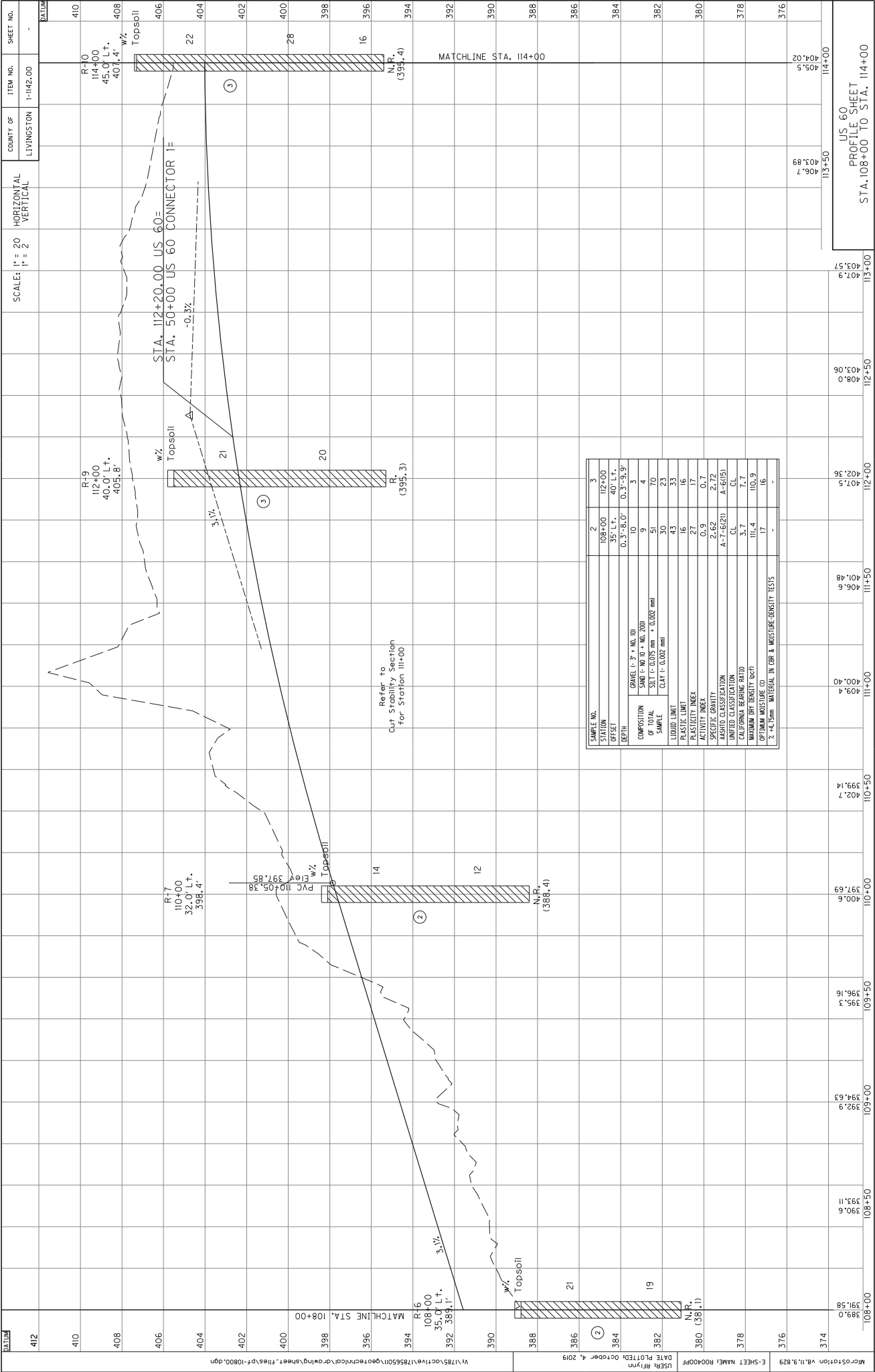
typical applications:

OW

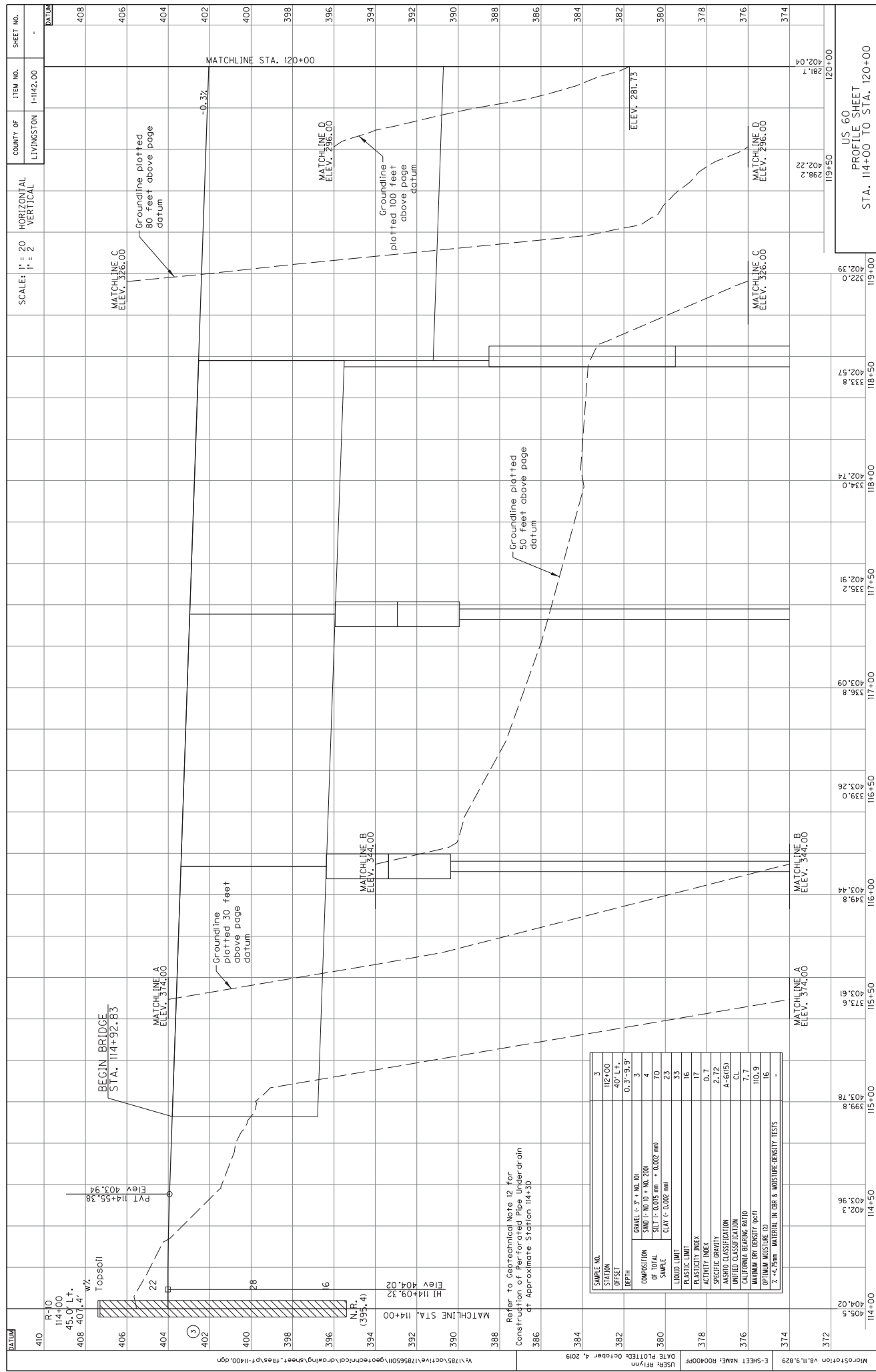
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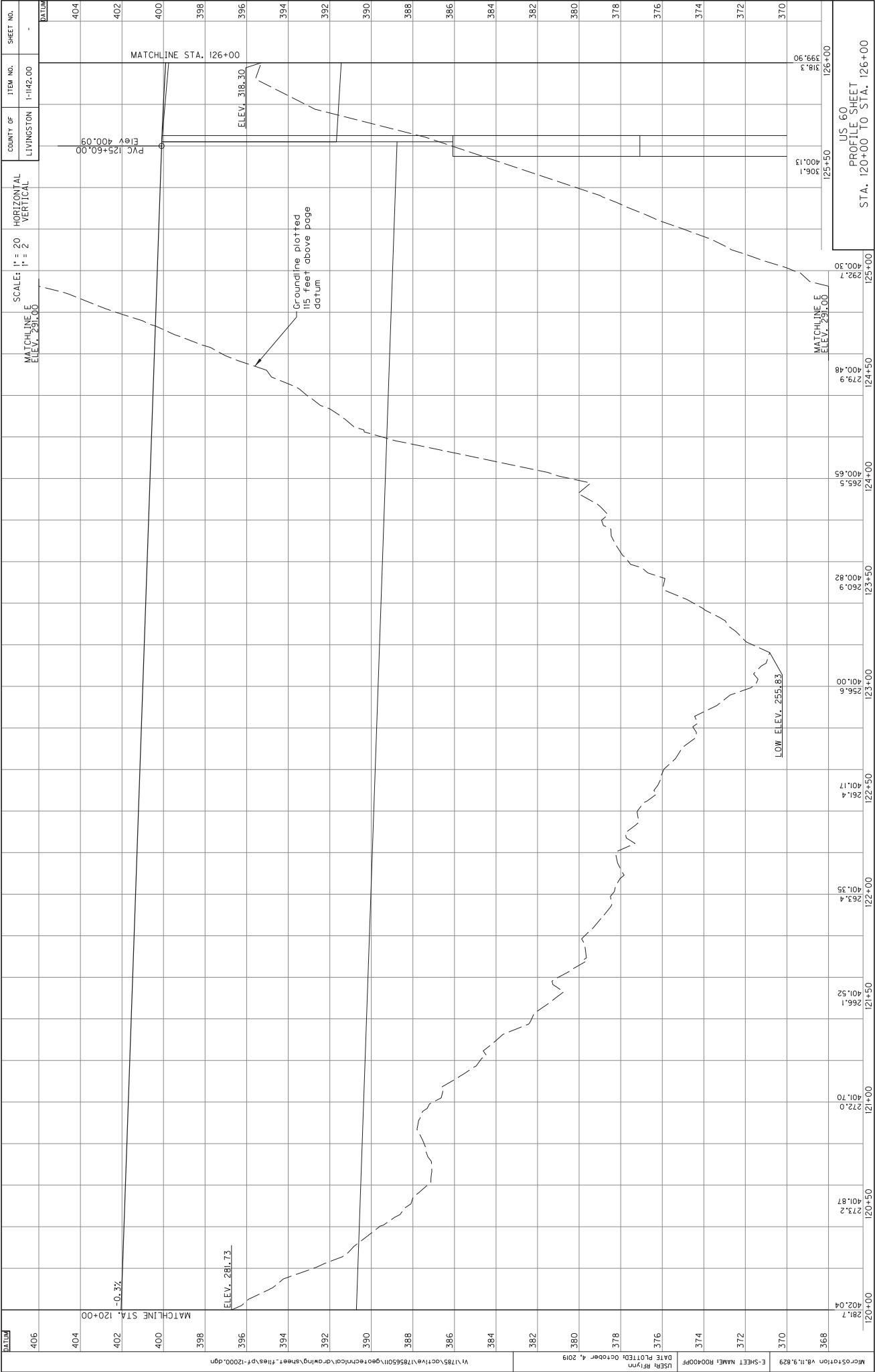


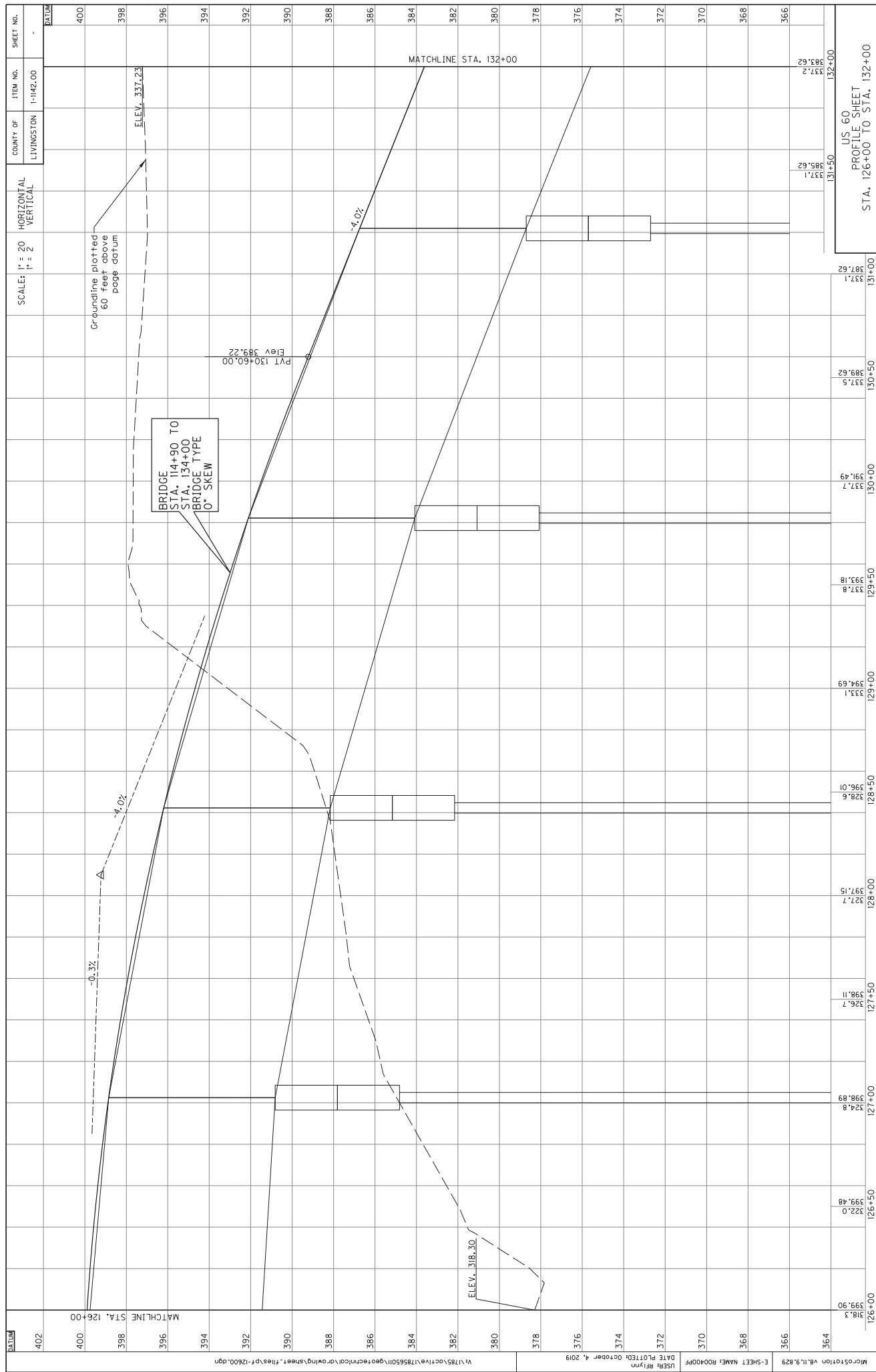




SAMPLE NO.	2	3
STATION	108+00	112+00
DEPTH	35' L.T.	40' L.T.
OFFSET	0.3'-6.0'	0.3'-9.9'
COMPOSITION	GRAVEL 1.3' + NO. 10	
OF TOTAL	GRAVEL 1.3' + NO. 10	
SAMPLE	CLAY 1.000 mm + 0.002 mm	
LIQUID LIMIT	43	33
PLASTIC LIMIT	16	16
PLASTICITY INDEX	27	17
SPECIFIC GRAVITY	2.62	2.72
ASHFORD CLASSIFICATION	A-7-6(2)	A-6(15)
UNIFIED CLASSIFICATION	CL	CL
CALIFORNIA BEARING RATIO	3.7	7.7
MAXIMUM DRY DENSITY (pcf)	111.4	110.9
OPTIMUM MOISTURE (%)	17	16
2. 14.75mm MATERIAL IN PER & MOISTURE DENSITY TESTS	-	-

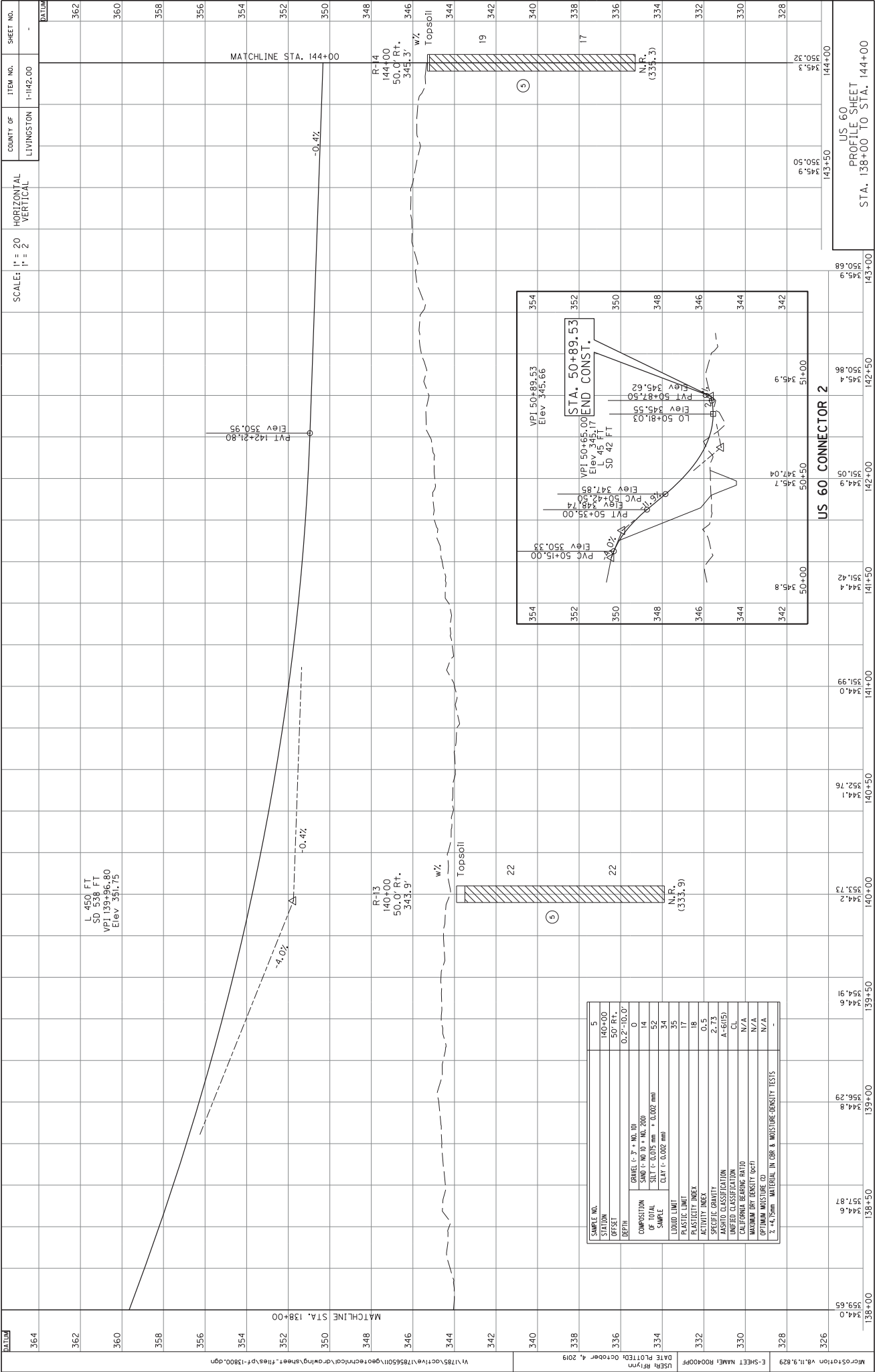






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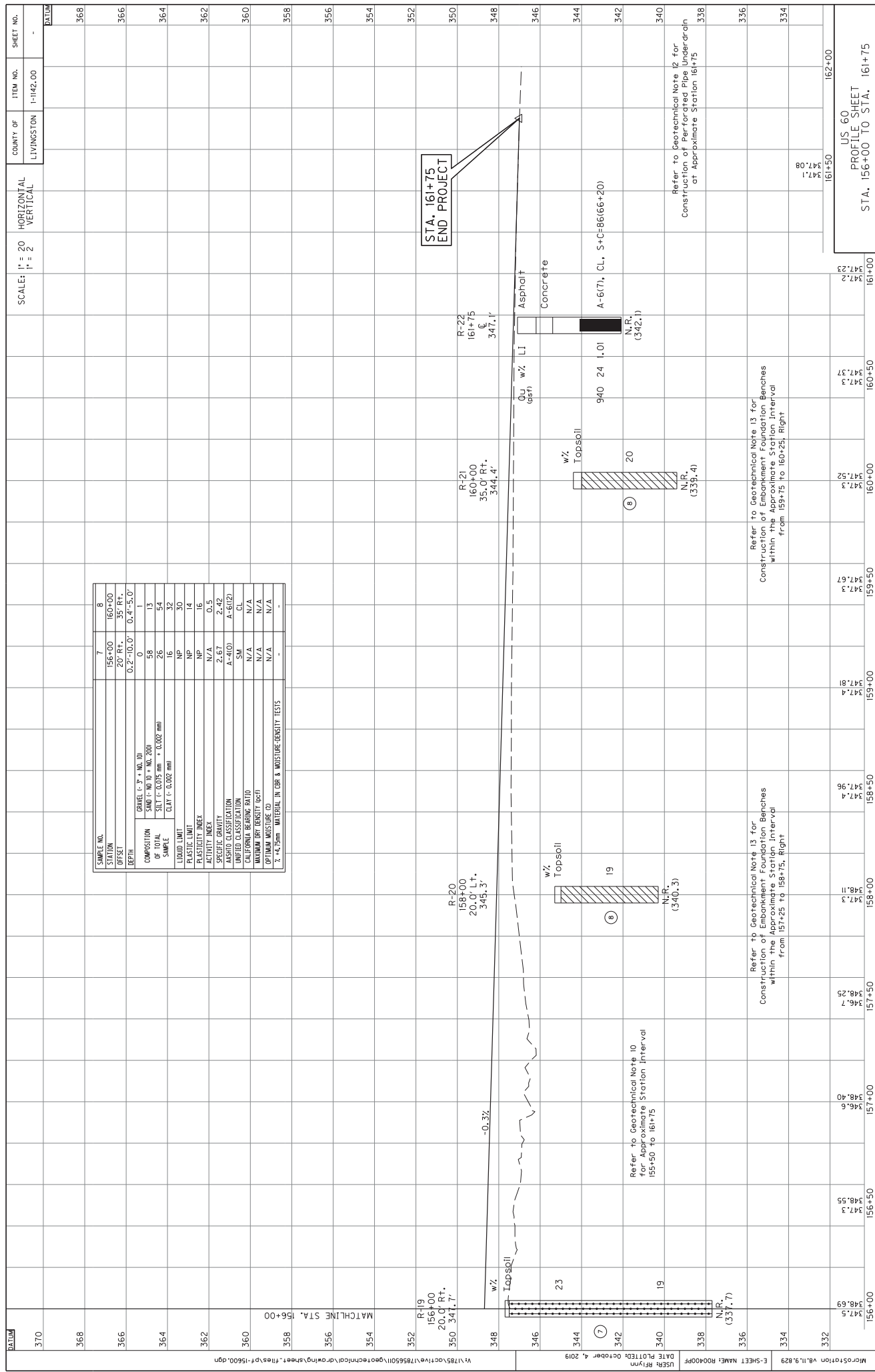
US 60
PROFILE SHEET
STA. 132+00 TO STA. 138+00

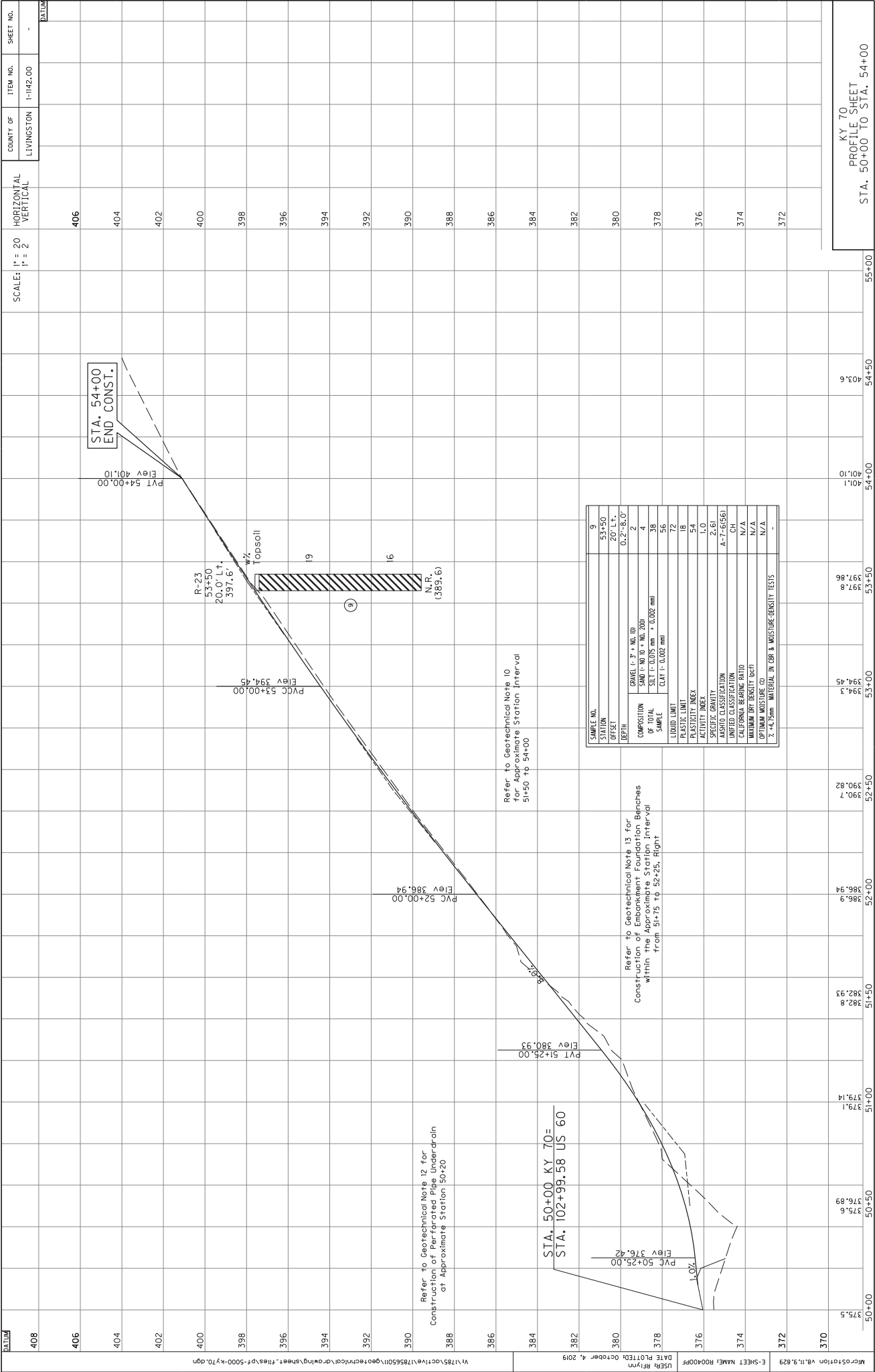


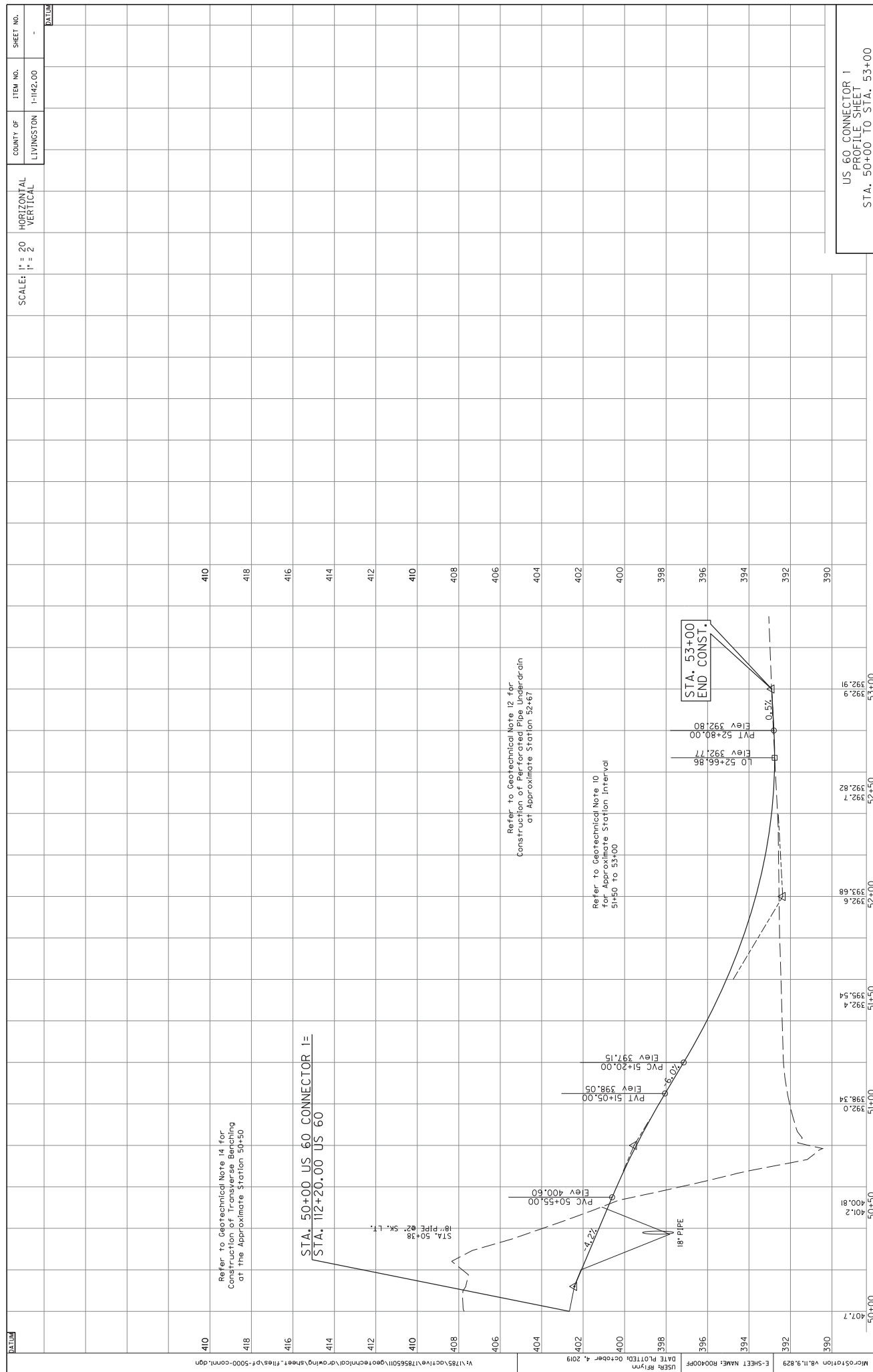
US 60
PROFILE SHEET
STA. 144+00 TO STA. 150+00

SAMPLE NO.	6	7
STATION	150+00	156+00
OFFSET	32' L.T.	20' R.T.
BENCH	0.5'-10.0'	0.2'-10.0'
COMPOSITION OF TOTAL SAMPLE	GRAVEL 5% + NO. 10 SAND 40% + NO. 20 SILL 1" 0.005 mm + 0.002 mm CLAY 1" 0.002 mm	0 58 26 16
LIQUID LIMIT	NP	NP
PLASTIC LIMIT	NP	NP
PLASTICITY INDEX	NP	NP
ACTIVITY INDEX	N/A	N/A
SPECIFIC GRAVITY	2.73	2.67
ASHFORD CLASSIFICATION	A-2-A(0)	A-4(0)
UNIFIED CLASSIFICATION	SP-SM	SM
CALIFORNIA BEARING RATIO	N/A	N/A
MAXIMUM DRY DENSITY (pcf)	N/A	N/A
OPTIMUM MOISTURE (%)	N/A	N/A
2 x 1/2" Sand MATERIAL IN COR & MOISTURE-DENSITY TESTS	-	-

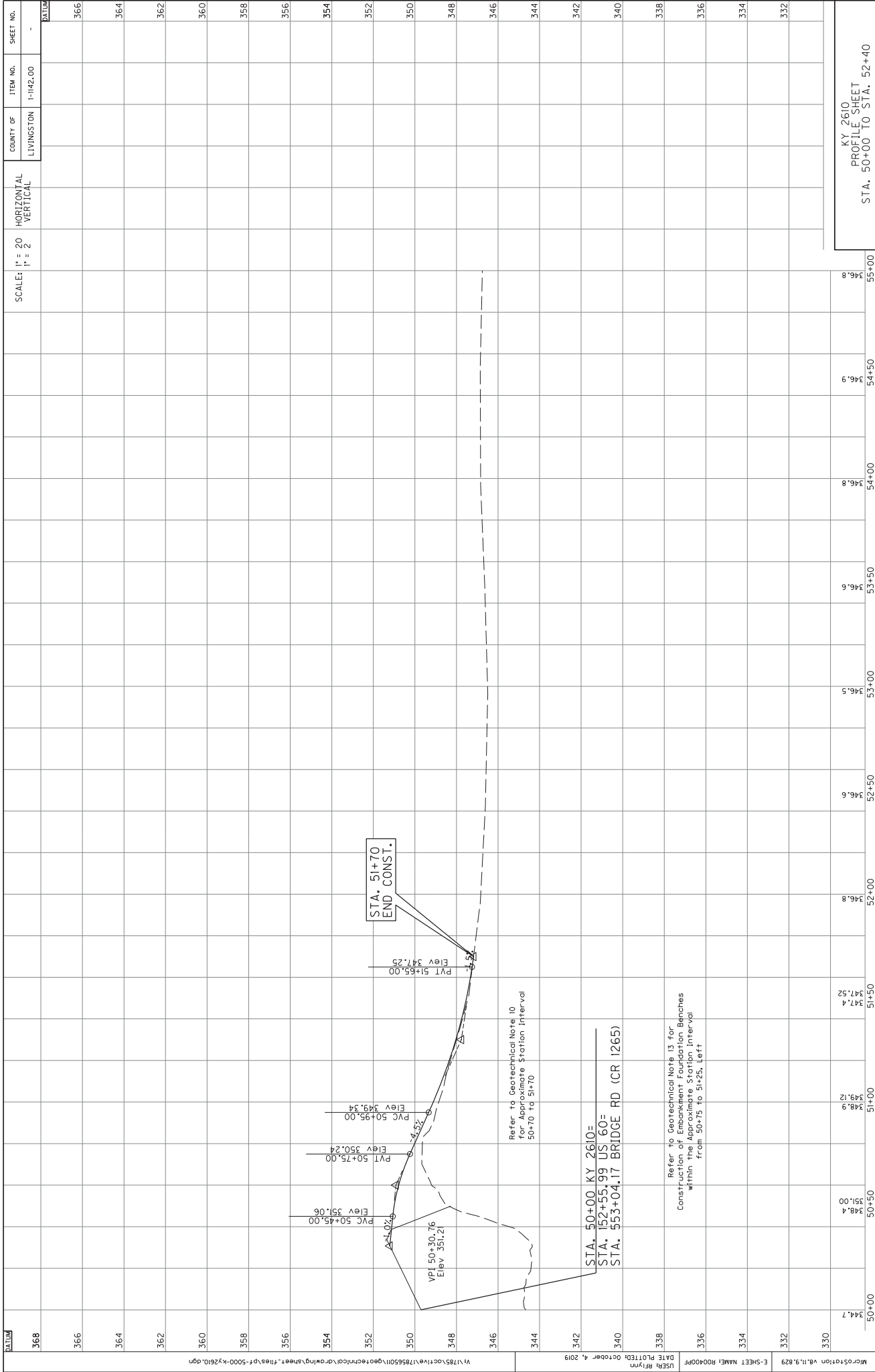
US 60
PROFILE SHEET
STA. 150+00 TO STA. 156+00







US 60 CONNECTOR 1
PROFILE SHEET
STA. 50+00 TO STA. 53+00



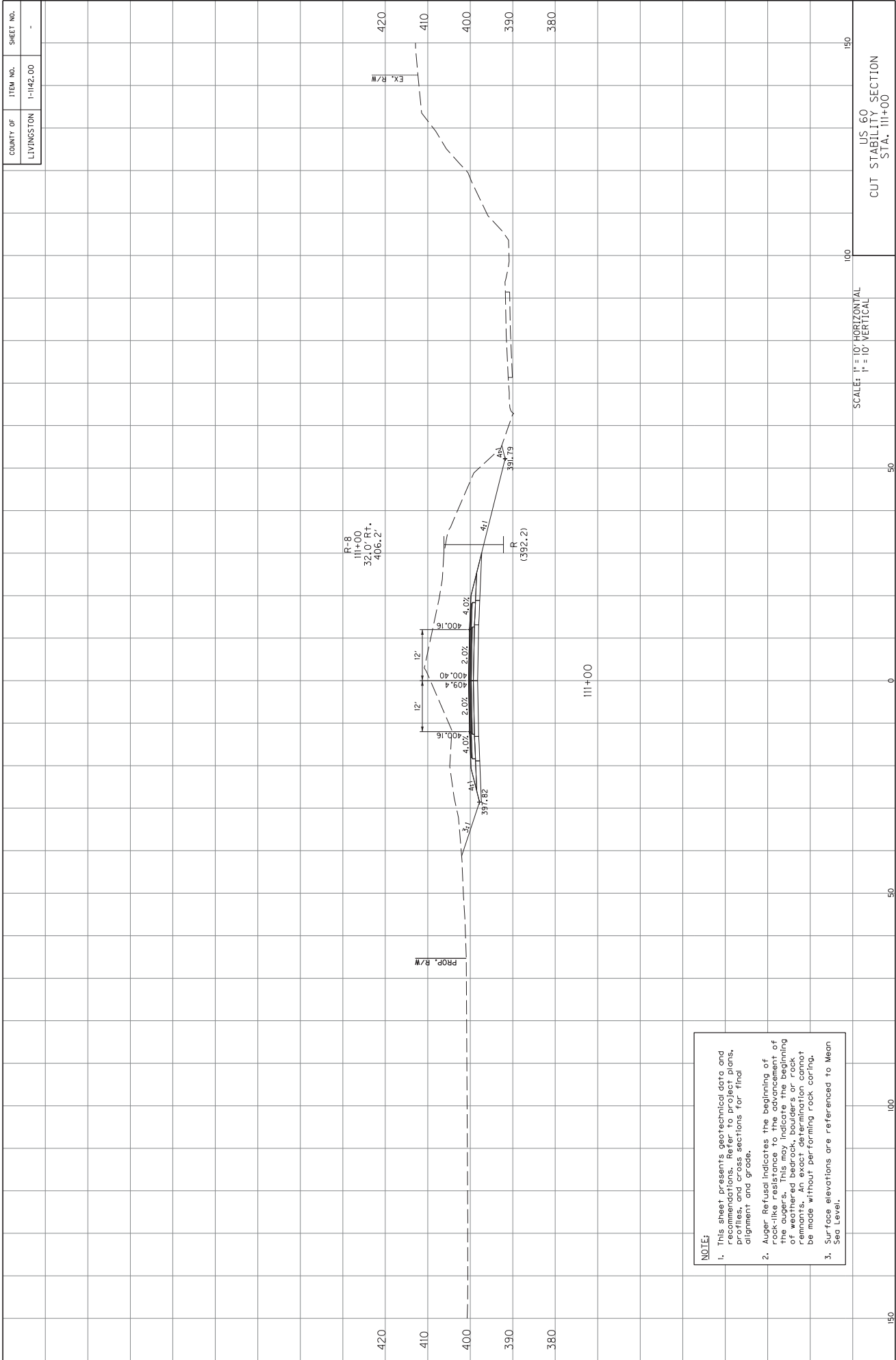
KY 2610
PROFILE SHEET
STA. 50+00 TO STA. 52+40

50+00	50+50	51+00	51+50	52+00	52+50	53+00	53+50	54+00	54+50	55+00
344.7	348.4	349.12	347.52	346.8	346.6	346.5	346.6	346.8	346.9	346.8

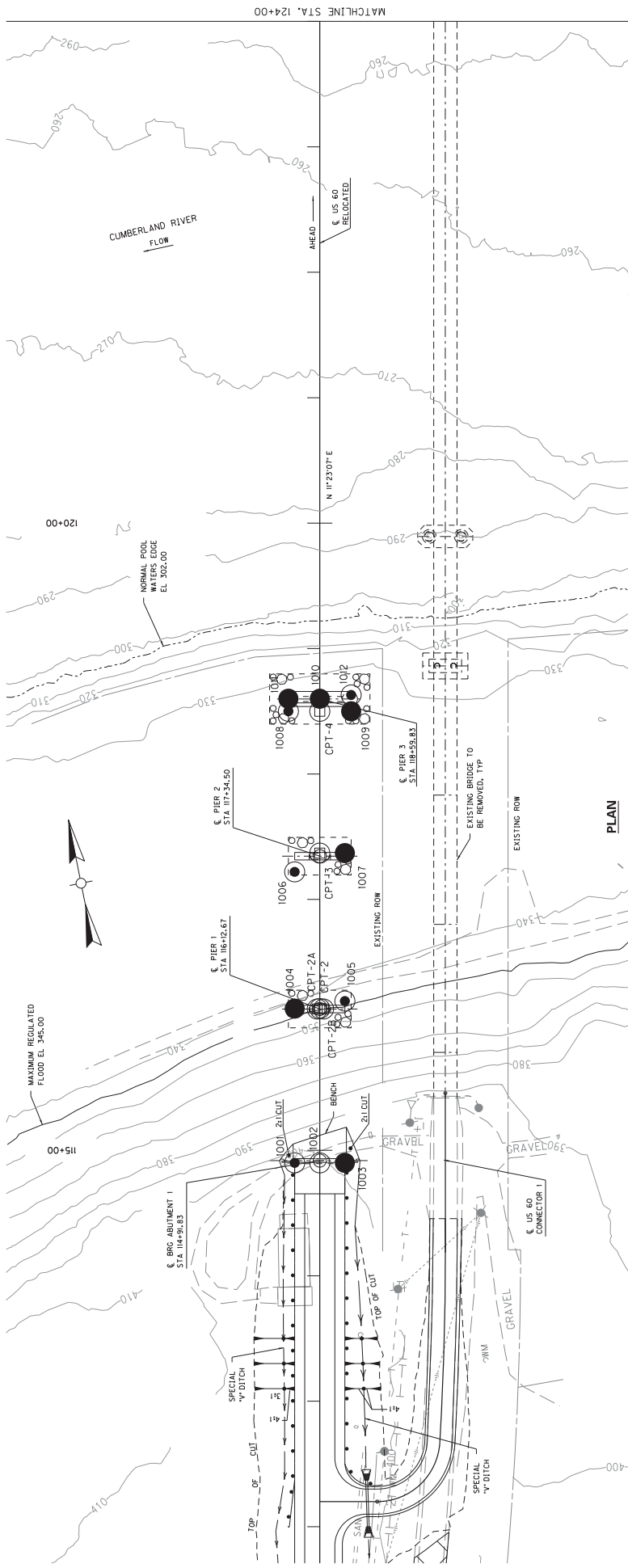
COUNTY OF	ITEM NO.	SHEET NO.
LIVINGSTON	I-1142.00	-

NOTE:

1. This sheet presents geotechnical data and recommendations. Refer to project plans, profiles, and cross sections for final alignment and grade.
2. Auger Refusal indicates the beginning of rock-like resistance to the advancement of the augers. This may indicate the beginning of weathered bedrock, boulders or rock remnants. An exact determination cannot be made without performing rock coring.
3. Surface elevations are referenced to Mean Sea Level.



Geotechnical Bridge Drawings



GEOTECHNICAL NOTE:

Pier arrangements and orientations are shown as at the time of the geotechnical exploration and analyses. Please refer to sheets SI through S10I for final substructure dimensions and orientations.

CONE PENETRATION TEST NOTE:

[illegible]



Pier arrangements and orientations are shown as at the time of the geotechnical exploration and analyses. Please refer to sheets SI through S10I for final substructure dimensions and orientations.

Cone Penetration Test soundings CPT-2 through CPT-11 were performed at the locations shown on the layout. Refer to special note for Cone Penetration Test Data for additional information.

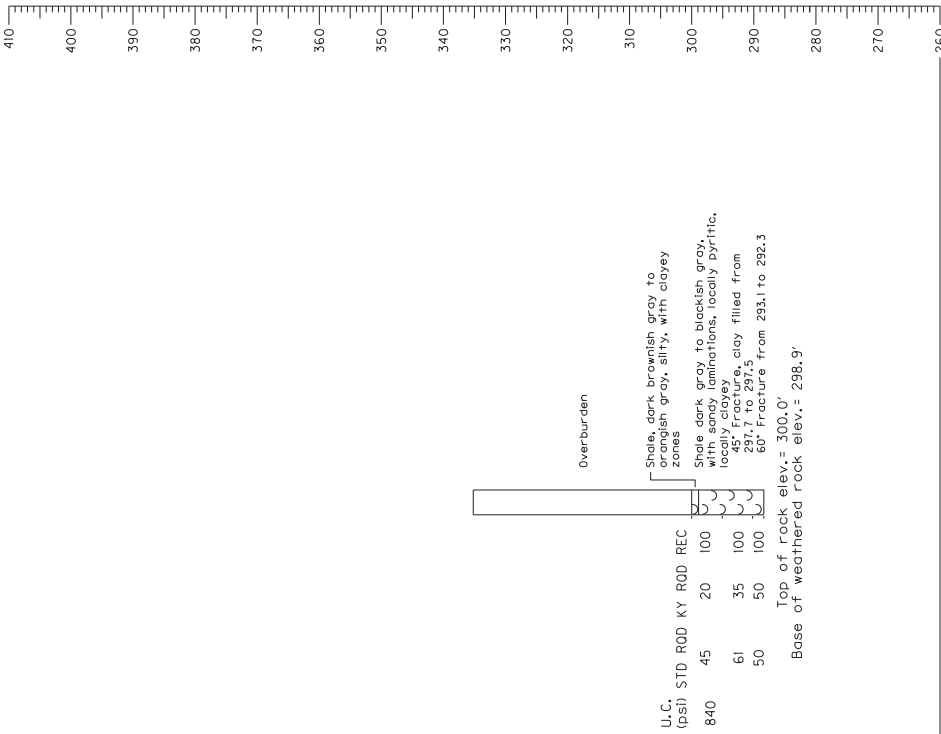
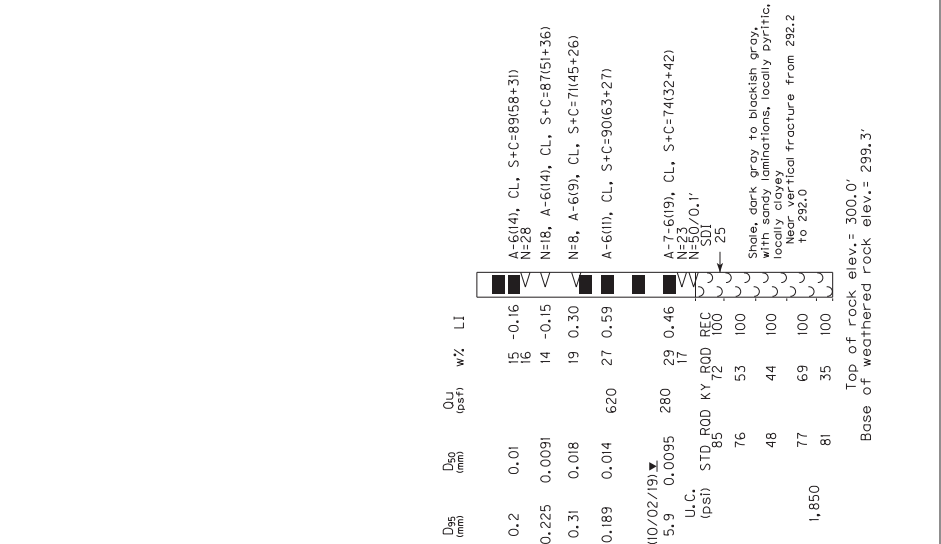
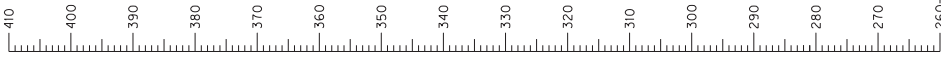
ITEM NUMBER
1-1142.00

SUBSURFACE DATA

Pier 2

Hole No.
1006
Location
Sta. 117+22
Offset
20' Lt.
Elev.
334.6'

Hole No.
1007
Location
Sta. 117+37
Offset
20' Rt.
Elev.
335.2'



- NOTES:
1. This sheet presents geotechnical data and recommendations. Refer to project plans, profiles, and cross sections for final alignment and grade.
 2. Surface elevations are referenced to Mean Sea Level.
 3. All standard penetration testing performed for structure borings depicted on this sheet were done utilizing an automatic hammer.
 4. The rockline soundings were drilled to auger refusal. Refusal, as used herein, refers to the depth to which the auger bit could not be advanced. This includes the presence of weathered bedrock, boulders or rock remnants. An exact determination cannot be made without performing rock coring.

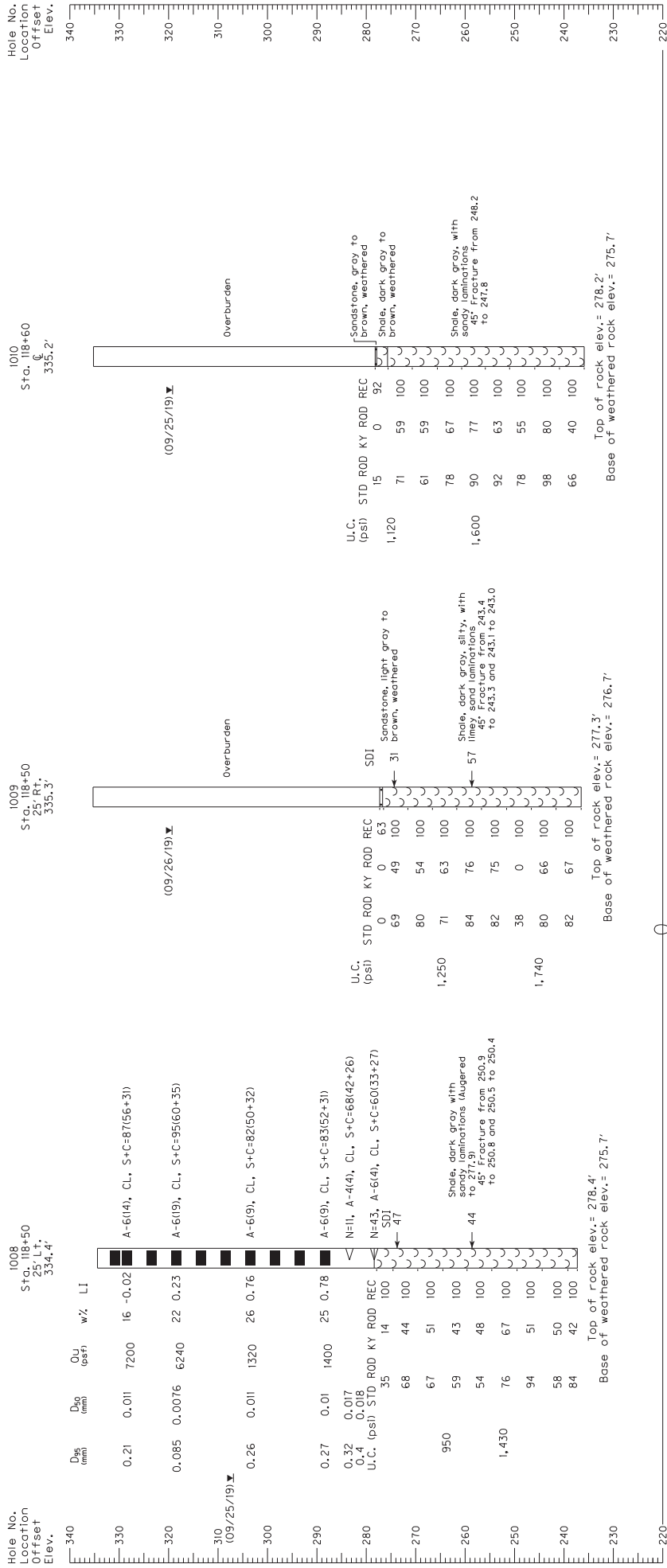
DATE: JANUARY, 2020	DESIGNED BY: WAM	CHECKED BY: KJS	DATE
DETAILED BY: RE, RF	KJS, WAM		
COMMUNICATED BY: KJS, WAM			
DEPARTMENT OF HIGHWAYS			
LIVINGSTON			
CUMBERLAND RIVER			
ROUTE US 60			
LOGS OF BORINGS			
PREPARED BY: Stantec			
SHEET NO. 27458			

SCALE: 1" = 10'
(Vertical Only)

ITEM NUMBER
1-1142.00

SUBSURFACE DATA

Pier 3



- NOTES:
- This sheet presents geotechnical data and recommendations. Refer to project plans, profiles, and cross sections for final alignment and grade.
 - Surface elevations are referenced to Mean Sea Level.
 - All standard penetration testing performed for structure borings depicted on this sheet were done utilizing an automatic hammer.
 - The rockline soundings were drilled to auger refusal. Refusal, as used herein, refers to the auger being unable to penetrate further. This does not indicate the presence of weathered bedrock, boulders or rock remnants. An exact determination cannot be made without performing rock coring.

DATE: JANUARY, 2020	DESIGNED BY: WAM	CHECKED BY: KJS	DATE
REVISION	RE: RF	KJS, WAM	
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS	ROUTE US 60	CUMBERLAND RIVER	
LIVINGSTON	PREPARED BY: LOGS OF BORINGS		
ITEM NUMBER 1-1142.00	SCALE: 1" = 10' (Vertical Only)		
SHEET NO. 27458			

Pier 3



1. This sheet presents geotechnical data and recommendations. Refer to project plans, profiles, and cross sections for final alignment and grade.

2. Surface elevations are referenced to Mean Sea Level.
3. All standard penetration testing performed for structure borings depicted on this sheet were done utilizing an automatic hammer.
4. The rockline soundings were drilled to auger refusal. Refusal, as used herein, refers to auger refusal using a carbide-tipped-tooth bit. This may indicate the presence of obstructions and/or voids. The sounding was terminated and the auger was removed without performing rock casing.

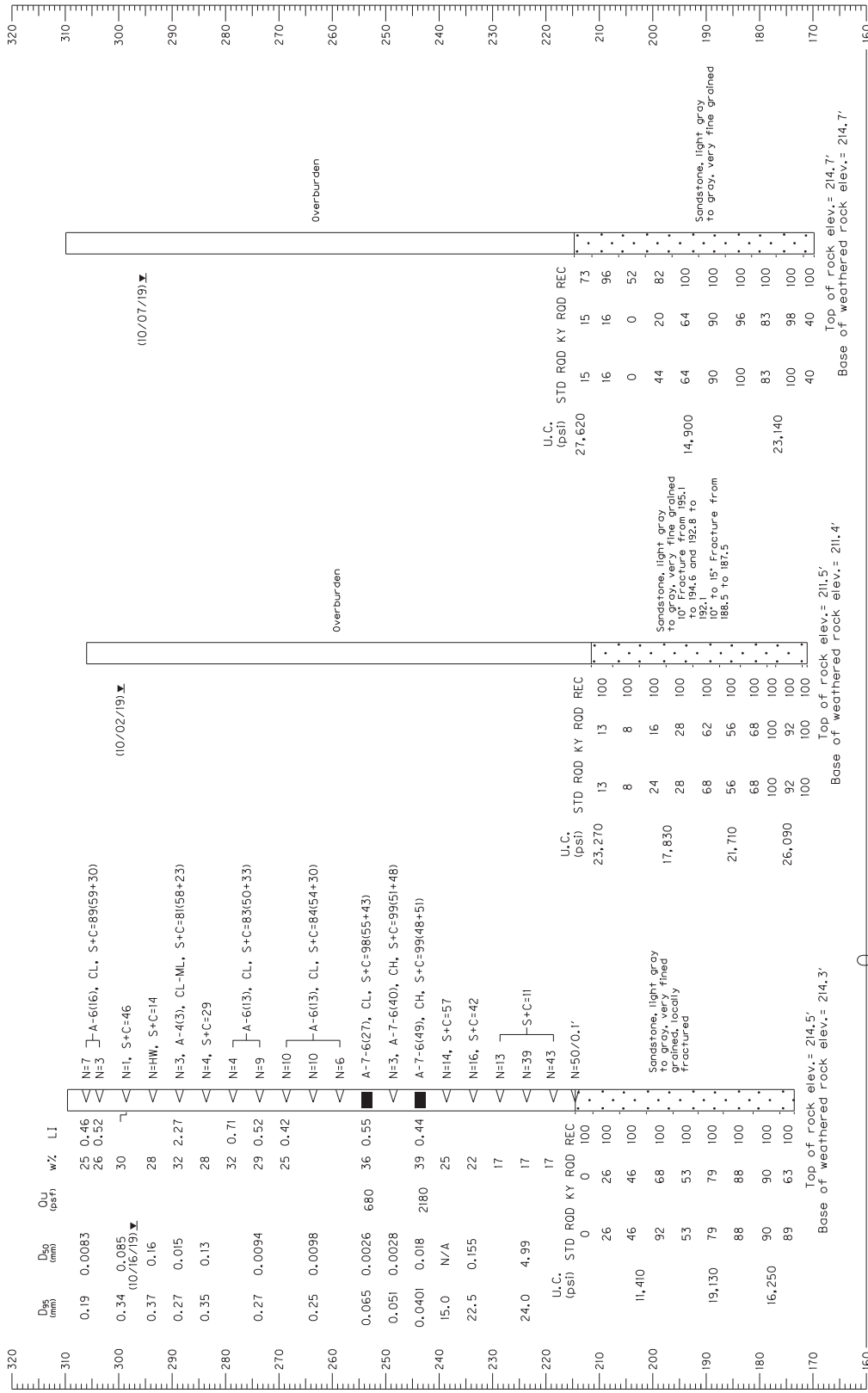
SCALE: 1" = 10'
(Vertical Only)

Pier 4

1013
Sta. 125+50
25' Lt.
309.6'

1014
Sta. 125+50
25' R+.
306.0'

Hole No.	Location	Offset	Elev.
1	100	100	100
2	100	100	100
3	100	100	100
4	100	100	100
5	100	100	100
6	100	100	100
7	100	100	100
8	100	100	100
9	100	100	100
10	100	100	100
11	100	100	100
12	100	100	100
13	100	100	100
14	100	100	100
15	100	100	100
16	100	100	100
17	100	100	100
18	100	100	100
19	100	100	100
20	100	100	100
21	100	100	100
22	100	100	100
23	100	100	100
24	100	100	100
25	100	100	100
26	100	100	100
27	100	100	100
28	100	100	100
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89	100	100	100
90	100	100	100
91	100	100	100
92	100	100	100
93	100	100	100
94	100	100	100
95	100	100	100
96	100	100	100
97	100		



Datum

SCALE: 1" = 10'
(Vertical Only)

ITEM NUMBER
1-1142.00


 PREPARED BY **Stantec**

SHEET NO.	S108
DRAWING NO.	27458

COUNTY OF LOS ANGELES

INGSION

ROUTE	CROSSING

CUMBERLAND RIVER

LOGS OF BORINGS

PREPARED BY	SHEET NO

S&P 500

Stanter **Stantec**



Seal of the City of Los Angeles

21430	

1019
Sta. 127+00
25' Rt.
324.9'

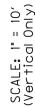


SCALE: 1" = 10'
(Vertical Only)

Pier 6

1020
a. 128+40
25' L+.
327.9'

1021
Sta. 128+40
25' Rt.
328.6'



Datum

Top of rock elev.= 212.6'
Base of weathered rock elev.= 212.3'

3.

1. This sheet presents geotechnical data and recommendations. Refer to project plans, profiles, and cross sections for final alignment and grade.
2. Surface elevations are referenced to Mean Sea Level.
3. All standard penetration testing performed for this project was deposited in this sheet where done utilizing an automatic hammer.
4. The rockline soundings were drilled to auger refusal. Refusal, as used herein, refers to auger refusal using a carbide-tipped-tooth bit, this may indicate the presence of rock. An exact determination cannot be made. Any remaining rock coring, be made without performing rock coring.

DATE: JANUARY, 2020		CHECKED BY: K.J.S.		DATE
DESIGNED BY: WAM		K.J.S. WAM		
DETAILED BY: RE. RF				
LIVINGSTON COUNTY Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS				
ROUTE US 60		ORDERING CUMBERLAND RIVER		
		LOGS OF BORINGS PREPARED BY		
		SHEET NO. 5111 DRAWING NO.		
				
		27458		


Stantec
 PREPARED BY
 SHEET NO. **S111**
 DRAWING NO. **27458**

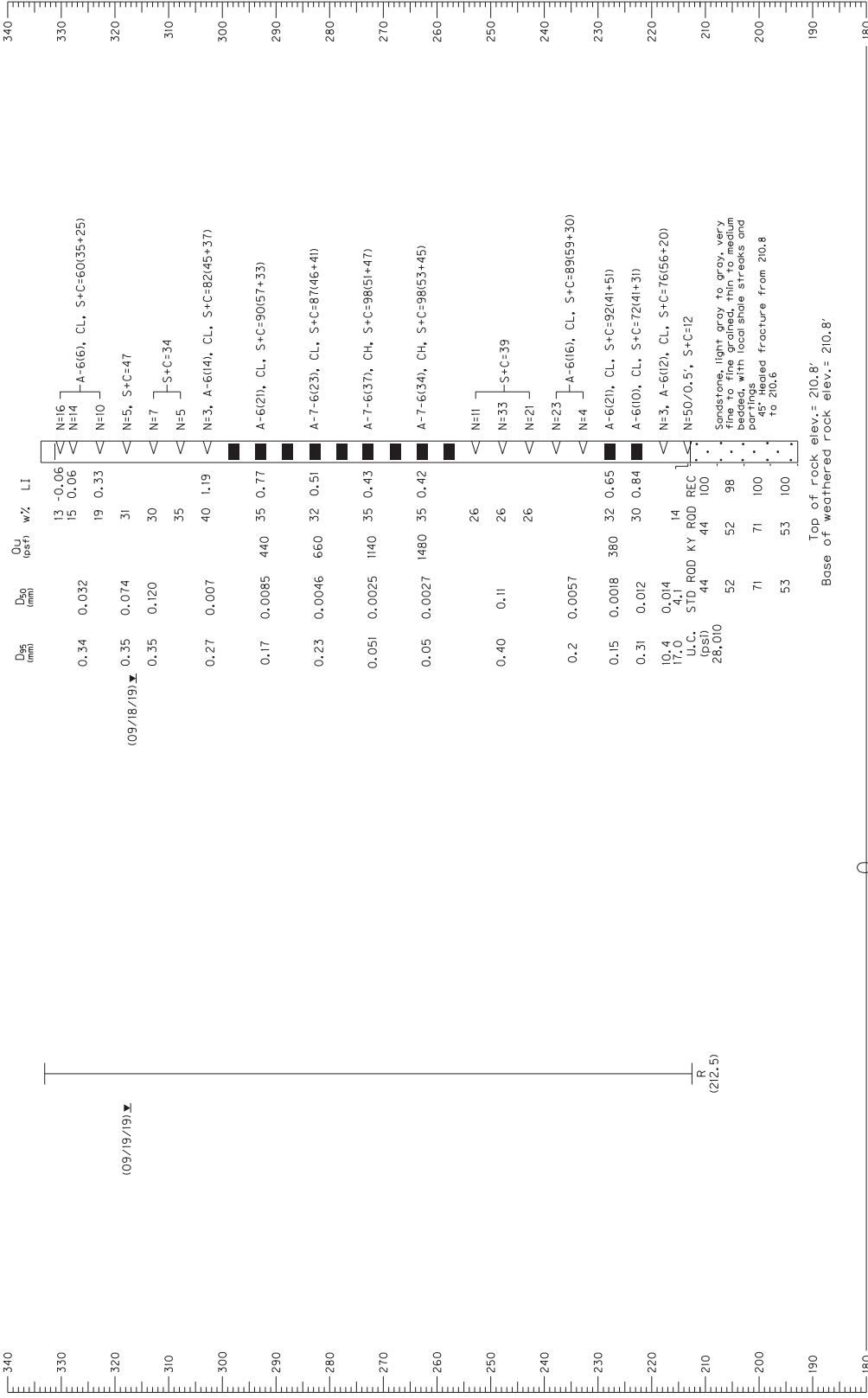
M NUMBER
1-1142.00

SUBSURFACE DATA

Pier 7

Hole No.
Location
Offset
Elev.
1022
Sta. 129+00
10' L.T.
333.1'

Hole No.
Location
Offset
Elev.
1023
Sta. 129+00
25' R.T.
331.8'



Top of rock elev. = 210.8'

Base of weathered rock elev. = 210.8'

Datum

SCALE: 1" = 10'
(Vertical Only)

ITEM NUMBER
1-1142.00

NOTES:

1. This sheet presents geotechnical data and recommendations. Refer to project plans, profiles, and cross sections for final alignment and grade.
2. Surface elevations are referenced to Mean Sea Level.
3. All standard penetration testing performed for structure borings depicted on this sheet were done utilizing an automatic hammer.
4. The rockline soundings were drilled to auger refusal. Refusal, as used herein, refers to the refusal of the auger to penetrate further. This indicates the presence of weathered bedrock, boulders or rock remnants. An exact determination cannot be made without performing rock coring.

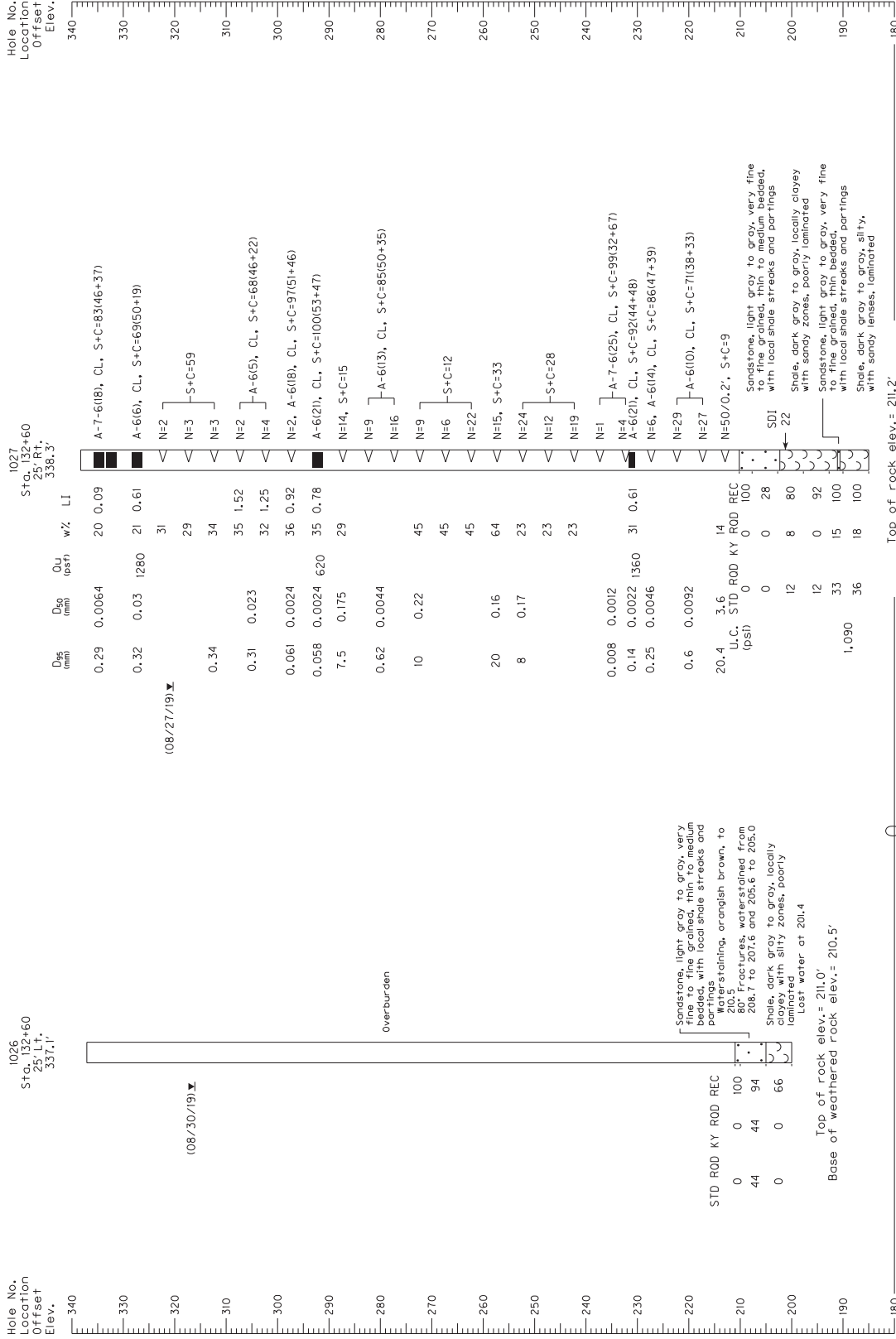
REVISION		DATE
DESIGNED BY:	WAM	KJS
CHECKED BY:	WAM	KJS
DATE:	JANUARY, 2020	
DETAILED BY:	RE, RF	KJS, WAM

Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS	
LIVINGSTON	
CUMBERLAND RIVER	
LOGS OF BORINGS	
PREPARED BY	
US 60	
ROUTE	

SHEET NO. S112	
27458	
Stantec	

SUBSURFACE DATA

Pier 9



NOTES:

1. This sheet presents geotechnical data and recommendations. Refer to project plans, profiles, and cross sections for final alignment and grade.
2. Surface elevations are referenced to Mean Sea Level.
3. All standard penetration testing performed for structure borings depicted on this sheet were done utilizing an automatic hammer.
4. The rockline soundings were drilled to auger refusal. Refusal, as used herein, refers to the refusal of the auger to penetrate the rock. This indicates the presence of weathered bedrock, boulders or rock remnants. An exact determination cannot be made without performing rock coring.

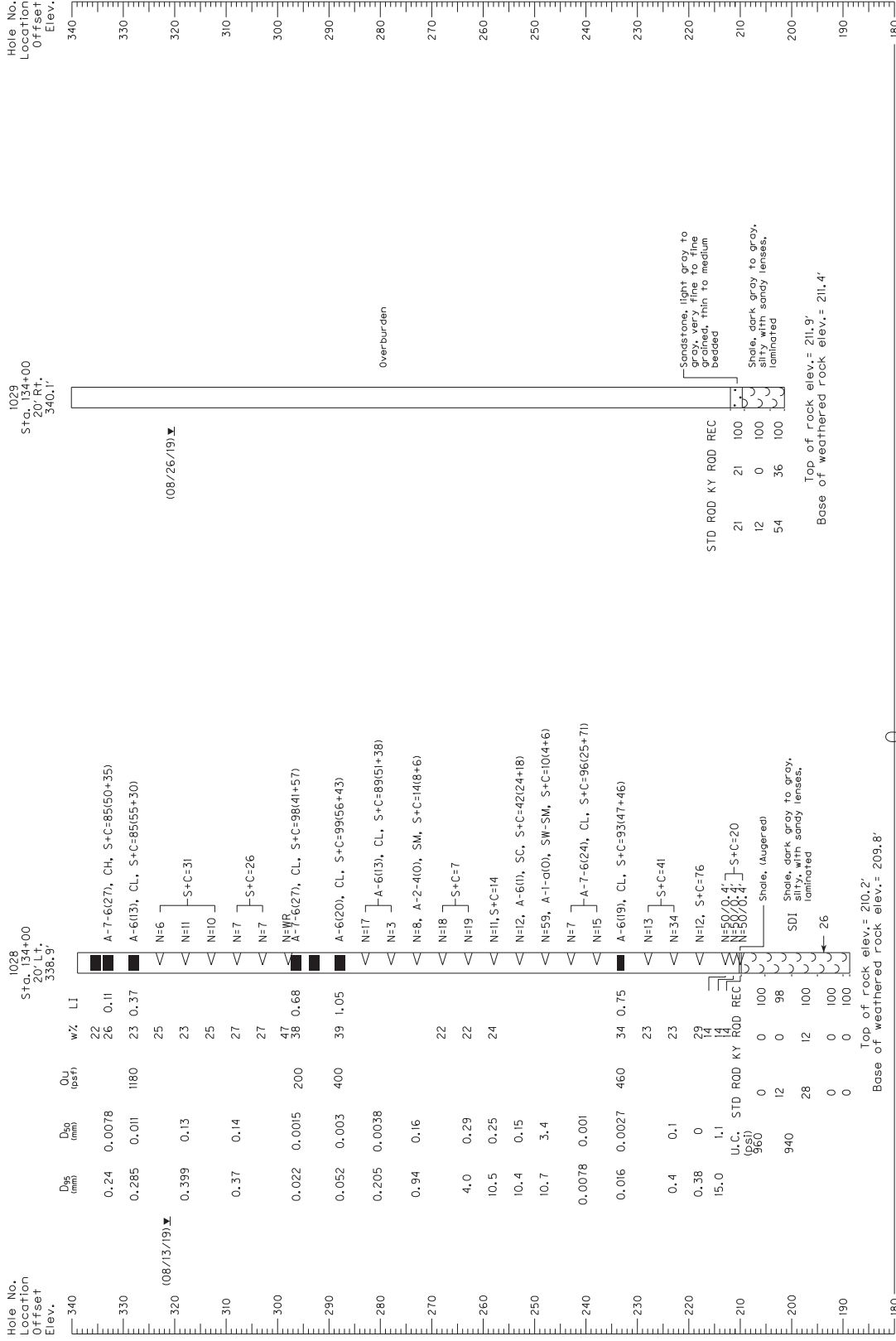
DATE: JANUARY, 2020	DESIGNED BY: WAM	REVISION	DATE
DETAILED BY: KJS, WAM	RE, RF	CHECKED BY: KJS, WAM	
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS			
LIVINGSTON			
CROSSING			
CUMBERLAND RIVER			
ROUTE US 60			
LOGS OF BORINGS			
PREPARED BY			
Stantec			
SHEET NO. S14			
TOTAL SHEETS 27458			

ITEM NUMBER
1-1142.00

SCALE: 1" = 10'
(Vertical Only)

SUBSURFACE DATA

Abutment 2



NOTES:

1. This sheet presents geotechnical data and recommendations. Refer to project plans, profiles, and cross sections for final alignment and grade.
2. Surface elevations are referenced to Mean Sea Level.
3. All standard penetration testing performed for structure borings depicted on this sheet were done utilizing an automatic hammer.
4. The rockline soundings were drilled to auger refusal. Refusal, as used herein, refers to the blow count of a sampler driven with bit*. This may indicate the presence of weathered bedrock, boulders or rock remnants. An exact determination cannot be made without performing rock coring.
5. WR - indicates the weight of the drilling rods was enough to advance the sampler at least 2, 6' intervals, without any energy from the hammer.

SCALE: 1" = 10'
(Vertical Only)

ITEM NUMBER
1-1142.00

SUMMARY OF TRIAXIAL TEST DATA	
STATION	134+00
OFFSET	100' L.R.
DEPTH	(3.3'-3.8') (3.9'-4.4')
DEPTH	(5.8'-6.3')
DEPTH	400 psf
DEPTH	32.7'

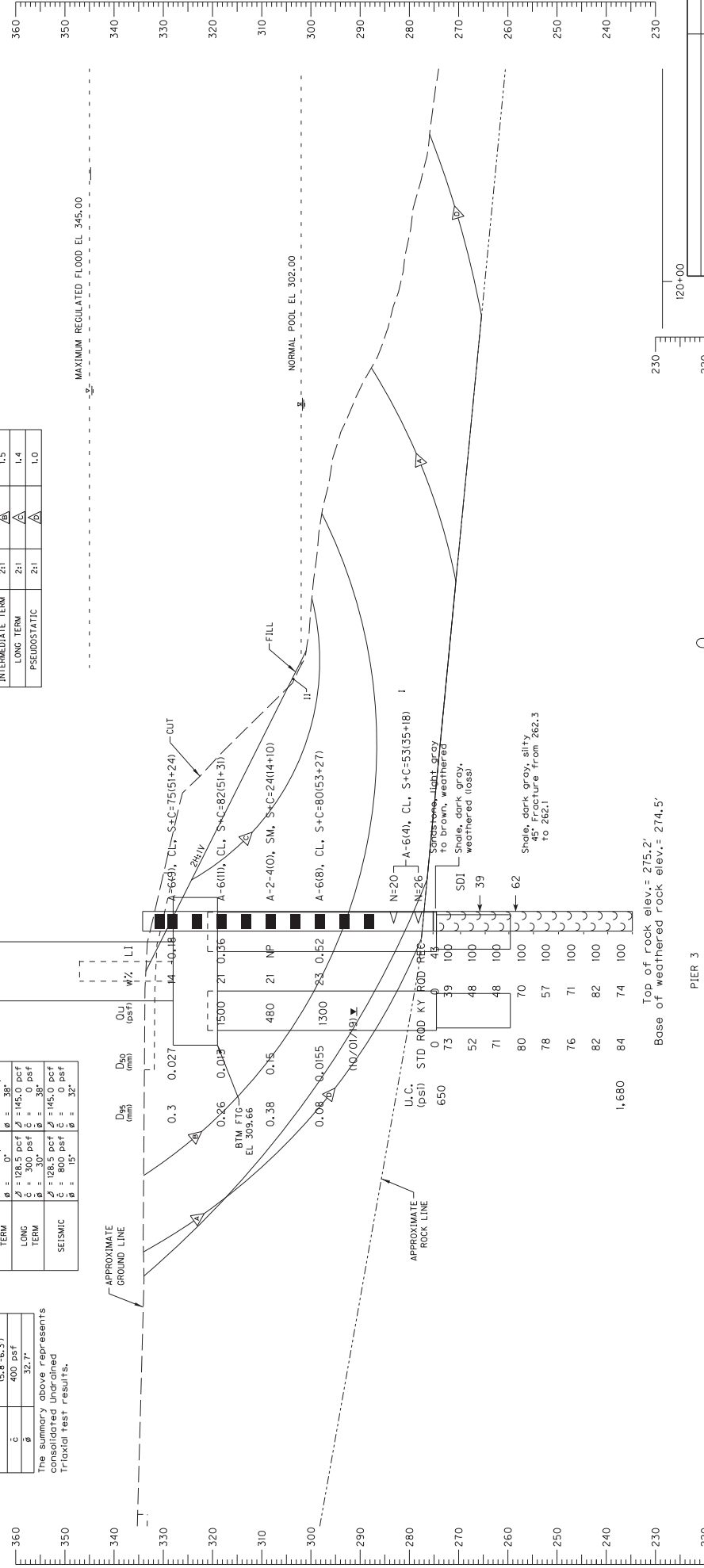
The summary above represents consolidated Undrained Triaxial test results.

ESTIMATED SOIL STRENGTH PARAMETERS	
SOIL	II
SHORT TERM	$\phi = 128.5$ pcf $\delta = 100$ psf $\phi = 30^\circ$
LONG TERM	$\phi = 128.5$ pcf $\delta = 145.0$ pcf $\phi = 30^\circ$
SEISMIC	$\phi = 128.5$ pcf $\delta = 145.0$ pcf $\phi = 30^\circ$

FACTORS OF SAFETY	
ANALYSIS CONDITION	FAILURE SURFACE
SHORT TERM	2:1
INTERMEDIATE TERM	2:1
LONG TERM	2:1
PSEUDOSTATIC	2:1

Hole No.
Location
Offset
Elev.

1012
SH-101
25' R.L.
334.2



NOTES:
1. This sheet presents geotechnical data and recommendations. Refer to project plans, profiles, and cross sections for final alignment and grade.
2. Surface elevations are referenced to Mean Sea Level.

GEOTECHNICAL NOTE:
Pier arrangements and orientations are shown as at the time of the geotechnical exploration and analysis. Please refer to the attached Site Investigation final substructure dimensions and orientations.

DATE: JANUARY, 2020	CHECKED BY: WAM	DESIGNED BY: KJS	DATE
DETAILED BY: RE, RF	KJS, WAM		
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS			
LIVINGSTON			
ROUTE US 60	CUMBERLAND RIVER	CROSSING	
SOUTH RIVER BANK STABILITY			
PREPARED BY: Stantec			
SHEET NO. 516			
TOTAL SHEETS 27458			

ITEM NUMBER
1-1142.00

SCALE: 1" = 10'

MAXIMUM REGULATED FLOOD EL. 345.00

FACTORS OF SAFETY		ANALYSIS CONDITION		SLOPE FAILURE SURFACE		FACTOR OF SAFETY	
LONG TERM		4:1		2.2		2.2	
RAPID DRAW DOWN		4:1		1.4		1.4	
WITHOUT PIER STRUCTURE		4:1		.83		.83	
WITH PIER STRUCTURE		4:1		1.0		1.0	

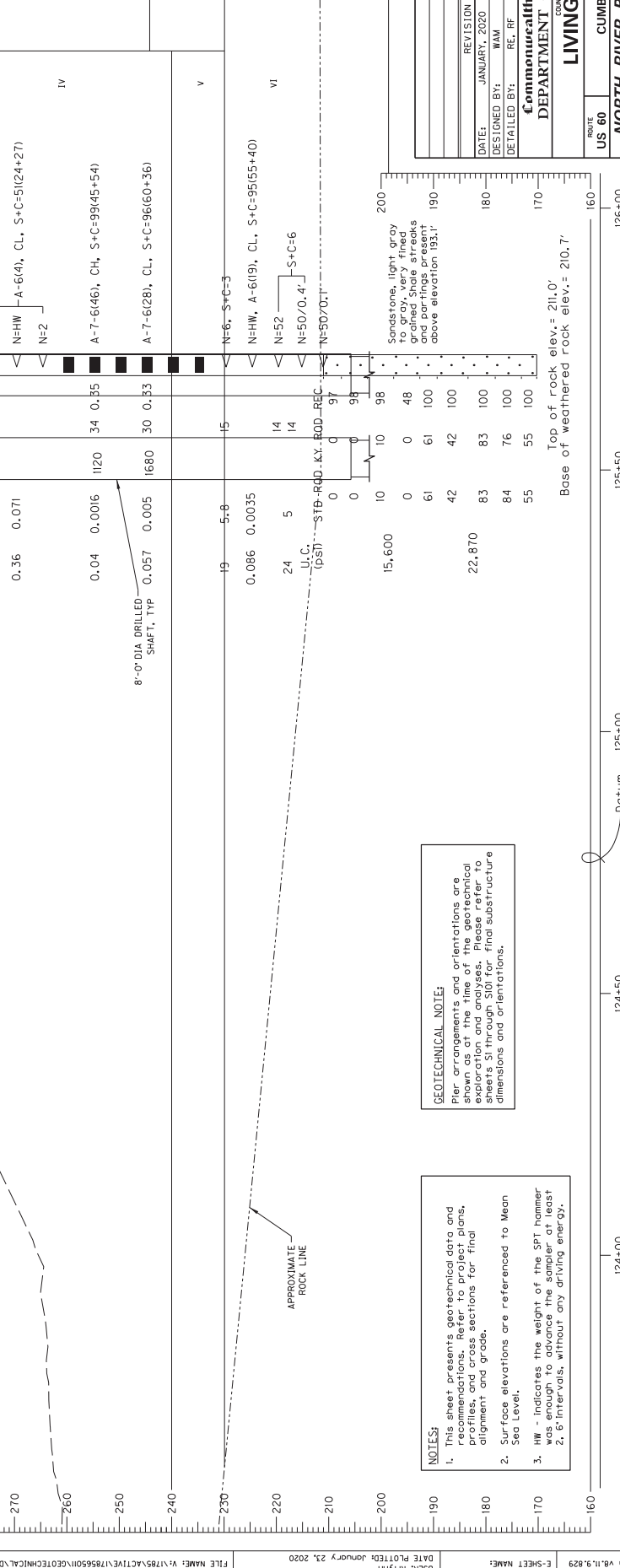
For seismic stability analyses, soil III was modeled using a c/p ratio of 0.1

ESTIMATED SOIL STRENGTH PARAMETERS		III*		IV		V		VI		VII		VIII	
LONG TERM		$\phi = 110.0$ pcf $c = 0$ psf $\theta = 30^\circ$		$\phi = 118.0$ pcf $c = 0$ psf $\theta = 27^\circ$		$\phi = 110.0$ pcf $c = 300$ psf $\theta = 28^\circ$		$\phi = 115.0$ pcf $c = 300$ psf $\theta = 36^\circ$		$\phi = 115.0$ pcf $c = 300$ psf $\theta = 30^\circ$		$\phi = 126.0$ pcf $c = 0$ psf $\theta = 30^\circ$	
SEISMIC		$\phi = 110.0$ pcf $c = 400$ psf $\theta = 15^\circ$		$\phi = 118.0$ pcf $c = 400$ psf $\theta = 22^\circ$		$\phi = 110.0$ pcf $c = 600$ psf $\theta = 15^\circ$		$\phi = 115.0$ pcf $c = 600$ psf $\theta = 30^\circ$		$\phi = 115.0$ pcf $c = 600$ psf $\theta = 15^\circ$		$\phi = 126.0$ pcf $c = 600$ psf $\theta = 25^\circ$	

The summary above represents consolidated undrained triaxial test results.

SUMMARY OF TRIAXIAL TEST DATA		STATION		134+00		100' L.T.		DEPTH		(3.3'-3.8') (3.9'-4.4') (5.8'-6.3')		c		400 psf		32.1'	

For seismic stability analyses, soil III was modeled using a c/p ratio of 0.1



NOTES:
1. This sheet presents geotechnical data and recommendations. Refer to project plans, profiles, and cross sections for final alignment and grade.
2. Surface elevations are referenced to Mean Sea Level.
3. HW - Indicates the weight of the SPT hammer was enough to advance the sampler at least 2, 6-intervals, without any driving energy.

GEOTECHNICAL NOTE:
Pier arrangements and orientations are shown as at the time of the geotechnical exploration and analyses. Please refer to final pier and substructure dimensions and orientations.

ITEM NUMBER		SCALE: 1" = 10'	
1-1142.00			

ROUTE 60
CUMBERLAND RIVER
CROSSING

PREPARED BY
Stantec

SHEET NO.
S117
TOTAL SHEETS
27458

DATE: JANUARY, 2020
DESIGNED BY: WAM
CHECKED BY: KJS, WAM
DETAILED BY: RE, RF

REVISION
DATE: JANUARY, 2020
CHECKED BY: KJS, WAM
DETAILED BY: RE, RF

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS
LIVINGSTON

ROUTE 60
CUMBERLAND RIVER
CROSSING

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Commonwealth of Kentucky
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CROSSING

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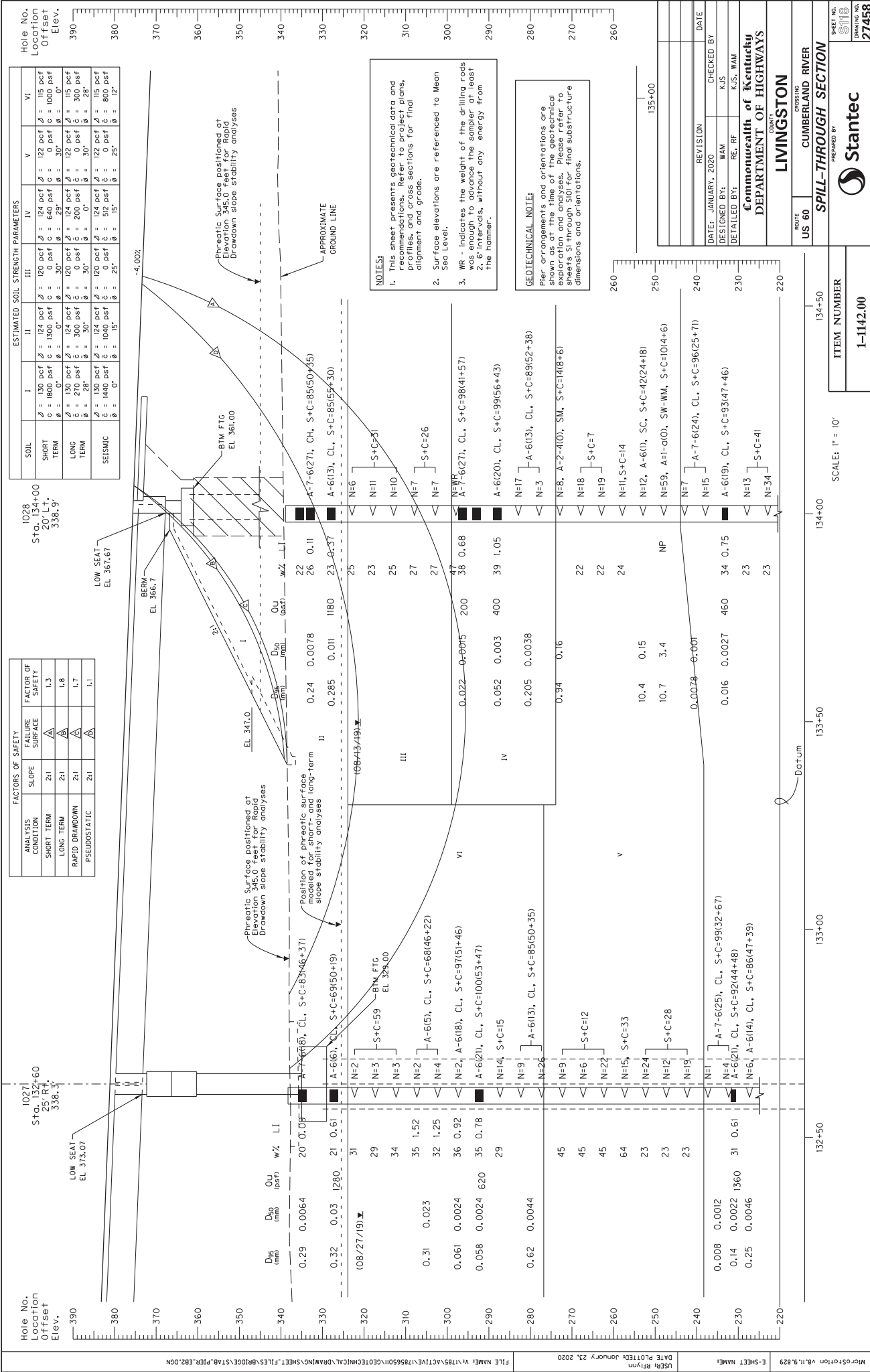
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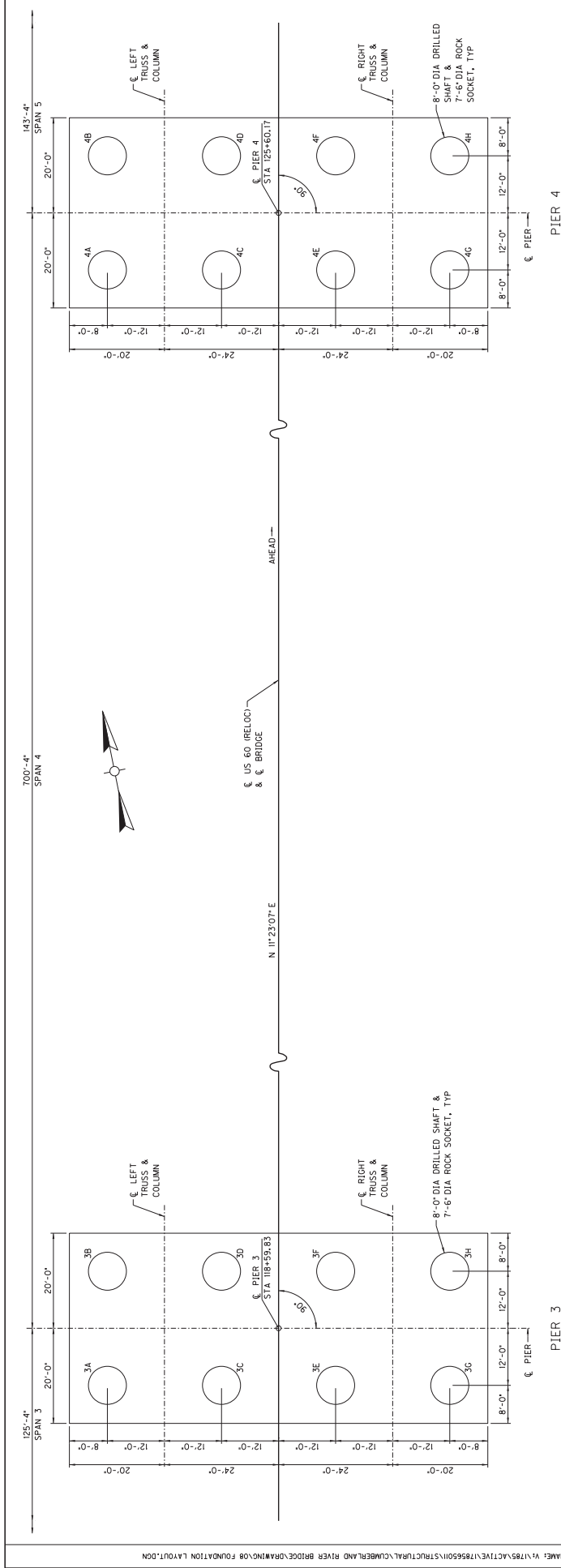
REVISION
DATE: JANUARY, 2020
CHECKED BY: KJS, WAM
DETAILED BY: RE, RF

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS
LIVINGSTON

ROUTE 60
CUMBERLAND RIVER
CROSSING



Select Structural Drawings



FOUNDATION PLAN - SPAN 4

SHAFT NUMBER	DESIGN LOAD		AS SHOWN ON PLANS										AS CONSTRUCTED						
	AXIAL LOAD (TONS)	HORIZONTAL LOAD (TONS)	TOP OF SHAFT ELEVATION	TOP OF ROCK ELEVATION	TOP OF ROCK SOCKET ELEVATION	BOTTOM OF ROCK SOCKET / SHAFT ELEVATION	LENGTH OF 96 COMMON DRILLED SHAFT, 90° ROCK	TOP OF ROCK ELEVATION	TOP OF ROCK SOCKET ELEVATION	LENGTH OF 96 COMMON DRILLED SHAFT, 90° ROCK	TOP OF ROCK ELEVATION	TOP OF ROCK SOCKET ELEVATION	BOTTOM OF ROCK SOCKET ELEVATION	LENGTH OF 96 COMMON DRILLED SHAFT, 90° ROCK					
PIER 3	3A	280.3KSTR 1/4-32X3EE I	310.0EE I	350.9	276.3	270.7	240.7	39	30										
	3B	280.3KSTR 1/4-32X3EE I	310.0EE I	350.66	276.3	270.7	240.7	39	30										
	3C	260.3KSTR 1/4-19X6EE I	287.0EE I	309.66	276.3	270.7	240.7	39	30										
	3D	260.3KSTR 1/4-19X6EE I	287.0EE I	309.66	276.3	270.7	240.7	39	30										
	3E	260.3KSTR 1/4-19X6EE I	287.0EE I	309.66	276.3	270.7	240.7	39	30										
	3F	260.3KSTR 1/4-19X6EE I	287.0EE I	309.66	276.3	270.7	240.7	39	30										
PIER 4	3G	280.3KSTR 1/4-32X3EE I	310.0EE I	350.66	276.3	270.7	240.7	39	30										
	3H	280.3KSTR 1/4-32X3EE I	310.0EE I	350.66	276.3	270.7	240.7	39	30										
	3I	316.3KSTR 1/4-27X3EE I	339.0EE I	288.03	276.3	270.7	240.7	77	19										
	3J	316.3KSTR 1/4-27X3EE I	339.0EE I	288.03	276.3	270.7	240.7	77	19										
	3K	316.3KSTR 1/4-16X4EE I	339.0EE I	288.03	276.3	270.7	240.7	77	19										
	3L	316.3KSTR 1/4-16X4EE I	339.0EE I	288.03	276.3	270.7	240.7	77	19										

NOTE:
FOR DRILLED SHAFT DETAILS SEE DRILLED SHAFT SHEET.

DATE: JANUARY 2020		REVISION	
DESIGNED BY: J. HUDSON		CHECKED BY	
C. GREENWELL			
DETAILED BY: A. FARMER		T. PERKINS	
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS			
COUNTY			
LIVINGSTON			
ROUTE		SECTION	
US 60		CUMBERLAND RIVER	
FOUNDATION LAYOUT (2)			
PREPARED BY		SHEET NO.	
		38	
		DRAWING NO.	
		27458	

ITEM NUMBER
1-1142.00

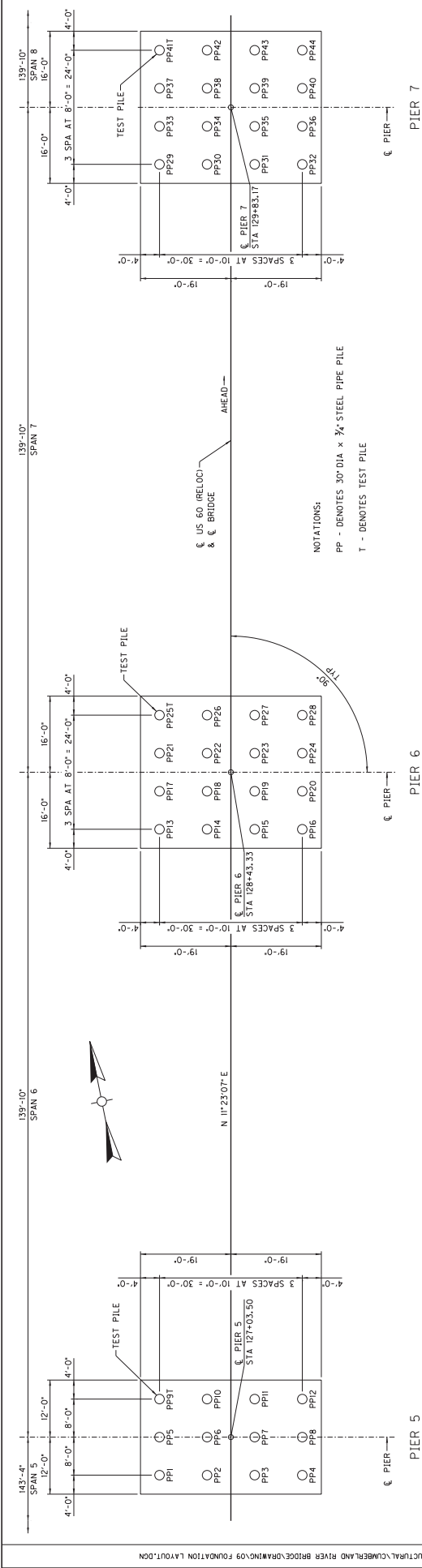
PREPARED BY
Stantec

SHEET NO.	58
DRAWING NO.	27458

PIER 3 AND PIER 4 DRILLED SHAFT RECORD NOTES

1. ELEVATIONS FOR TOP OF ROCK, TOP OF ROCK SOCKET, AND BOTTOM OF SHAFT SHALL BE DETERMINED IN THE FIELD BY THE ENGINEER TO ASSURE THE MINIMUM ROCK SOCKET LENGTH AND TO DETERMINE PAY LENGTHS.

TOP OF ROCK AND BOTTOM OF SHAFT PLAN ELEVATIONS ARE BASED ON BORINGS, AND ARE TO BE USED FOR LOCATIONS ONLY. FIELD ELEVATIONS AND PAY QUANTITIES MAY VARY FROM THESE PLAN VALUES.
2. TOP OF ROCK ELEVATIONS SHOWN IN DRILLED SHAFT RECORD DETERMINED BY AVERAGING TOP OF ROCK ELEVATIONS FROM ALL BORINGS AT EACH PIER.
3. AS-CONSTRUCTED BOTTOM OF SHAFT ELEVATION SHALL BE AT OR BELOW BOTTOM OF SHAFT ELEVATION AS SHOWN ON PLANS.
4. AFTER COMPLETING THE DRILLING OPERATIONS, THE RESIDENT ENGINEER SHALL COMPLETE THE DRILLED SHAFT RECORD. ONE COPY OF THE COMPLETED RECORD SHALL BE FORWARDED TO THE DIRECTOR, DIVISION OF STRUCTURAL DESIGN. THIS DRILLED SHAFT RECORD DOES NOT REPLACE THE RECORDS OF THE CONTRACTOR. THE CONTRACTOR SHALL USE THE SPECIAL NOTE FOR UNDRILLED SHAFTS FOR ADDITIONAL REQUIRED DRILLED SHAFT RECORDS.
5. SHAFT SIZES AND DEPTHS HAVE BEEN SELECTED ON THE BASIS OF FACTORED DESIGN LOADS, AS SHOWN IN THE TABLE. ADJUSTMENTS IN BOTTOM OF SHAFT ELEVATIONS SHALL BE MADE AS REQUIRED, BASED ON FIELD CONDITIONS. IN NO EVENT, HOWEVER, SHALL THE ROCK SOCKET LENGTH BE REDUCED FROM THE MINIMUM DIMENSION SPECIFIED IN THE TABLES.
6. REFER TO THE SPECIAL NOTE FOR PROJECT SPECIFIC DRILLED SHAFT REQUIREMENTS.



FOUNDATION PLAN - SPANS 6 & 7

PILE RECORD - PIER 5				PILE RECORD - PIER 6				PILE RECORD - PIER 7			
PILE NUMBER	PILE CUTOFF ELEVATION	PILE LENGTH IN PLACE FEET	POINT OF PILE ELEVATION AS DRIVEN	DESIGN LOAD TONS	PILE NUMBER	PILE CUTOFF ELEVATION	PILE LENGTH IN PLACE FEET	POINT OF PILE ELEVATION AS DRIVEN	DESIGN LOAD TONS	PILE NUMBER	PILE CUTOFF ELEVATION
PP1	344.08		697.00 (EE)	697.00 (EE)	PP13	317.18		806.00 (EE)	806.00 (EE)	PP29	326.28
PP2	344.08		697.00 (EE)	697.00 (EE)	PP14	317.18		806.00 (EE)	806.00 (EE)	PP30	326.28
PP3	344.08		697.00 (EE)	697.00 (EE)	PP15	317.18		806.00 (EE)	806.00 (EE)	PP31	326.28
PP4	344.08		697.00 (EE)	697.00 (EE)	PP16	317.18		806.00 (EE)	806.00 (EE)	PP32	326.28
PP5	344.08		697.00 (EE)	697.00 (EE)	PP17	317.18		806.00 (EE)	806.00 (EE)	PP33	326.28
PP6	344.08		697.00 (EE)	697.00 (EE)	PP18	317.18		806.00 (EE)	806.00 (EE)	PP34	326.28
PP7	344.08		697.00 (EE)	697.00 (EE)	PP19	317.18		806.00 (EE)	806.00 (EE)	PP35	326.28
PP8	344.08		697.00 (EE)	697.00 (EE)	PP20	317.18		806.00 (EE)	806.00 (EE)	PP36	326.28
PP9	344.08		697.00 (EE)	697.00 (EE)	PP21	317.18		806.00 (EE)	806.00 (EE)	PP37	326.28
PP10	344.08		697.00 (EE)	697.00 (EE)	PP22	317.18		806.00 (EE)	806.00 (EE)	PP38	326.28
PP11	344.08		697.00 (EE)	697.00 (EE)	PP23	317.18		806.00 (EE)	806.00 (EE)	PP39	326.28
PP12	344.08		697.00 (EE)	697.00 (EE)	PP24	317.18		806.00 (EE)	806.00 (EE)	PP40	326.28
(EE) - EXTREME EVENT LIMIT STATE				PP25	317.18			806.00 (EE)	806.00 (EE)	PP41	326.28
				PP26	317.18			806.00 (EE)	806.00 (EE)	PP42	326.28
				PP27	317.18			806.00 (EE)	806.00 (EE)	PP43	326.28
				PP28	317.18			806.00 (EE)	806.00 (EE)	PP44	326.28

PILE GENERAL NOTES

PROPOSED PILES SHALL BE DRIVEN AT THE LOCATIONS INDICATED IN ACCORDANCE WITH SECTION 604 OF THE STANDARD SPECIFICATIONS. TEST PILES ARE INDICATOR PILES AND SHALL BE DRIVEN WHERE DESIGNATED ON THE PLANS TO DETERMINE THE LENGTH OF PILE REQUIRED. NO DYNAMIC TESTING IS REQUIRED.

ALL TEST PILES SHALL BE ACCURATELY LOCATED SO THAT THEY MAY BE USED IN THE FINISHED STRUCTURE.

SELECTION OF THE PRODUCTION PILES TO BE USED AS TEST PILES MAY BE MODIFIED WITH THE APPROVAL OF THE ENGINEER. NO REDUCTION IN THE TOTAL NUMBER OF TEST PILES MAY BE MADE AND EACH SUBSTRUCTURE UNIT SHALL INCLUDE AT LEAST ONE TEST PILE.

PILE POINTS

ALL PILES REQUIRE PILE POINTS OR SHOES. THE PILE POINTS SHALL BE THE TYPE FOR WHICH THE PILE POINTS SHALL BE PLACED IN ACCORDANCE WITH SUBSECTION 604.03.04C OF THE STANDARD SPECIFICATIONS.

HAMMER CRITERIA

PIERS 5,6,7,8 & 9: REFER TO THE SPECIAL NOTE FOR DYNAMIC PILE TESTING.

PIER 2: A SINGLE-ACTING DIESEL HAMMER WITH A RATED ENERGY BETWEEN 13.5 ft-kip AND 22 ft-kip WILL BE REQUIRED TO DRIVE THE H-PILES TO PRACTICAL REFUSAL WITHOUT ENCOUNTERING EXCESSIVE BLOW COUNTS OR DAMAGE TO THE PILES. ABUTMENT 2: A SINGLE-ACTING DIESEL HAMMER WITH A RATED ENERGY BETWEEN 75.4 ft-kip AND 265 ft-kip WILL BE REQUIRED TO DRIVE THE H-PILES TO PRACTICAL REFUSAL WITHOUT ENCOUNTERING EXCESSIVE BLOW COUNTS OR DAMAGE TO THE PILES.

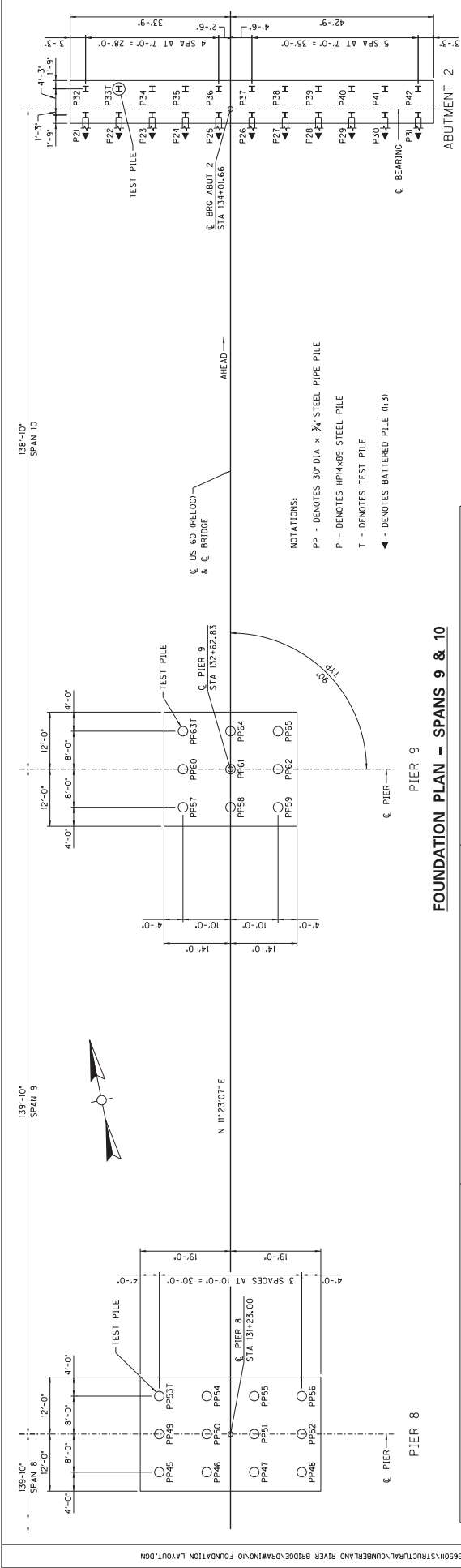
THE USE OF HAMMERS OTHER THAN SINGLE-ACTING DIESEL MAY REQUIRE DIFFERENT RATED ENERGIES.

THE CONTRACTOR SHALL SUBMIT THE PROPOSED PILE DRIVING SYSTEM TO THE DEPARTMENT FOR APPROVAL PRIOR TO THE INSTALLATION OF THE FIRST PILE. APPROVAL OF THE PILE DRIVING SYSTEM BY THE ENGINEER WILL BE SUBJECT TO SATISFACTORY FIELD PERFORMANCE OF THE PILE DRIVING PROCEDURES.

DRIVING CRITERIA - ABUT 2
POINT BEARING PILES SHALL BE DRIVEN TO PRACTICAL REFUSAL IN ACCORDANCE WITH SECTION 604.03.07C CASE 1 OF THE SPECIFICATIONS.

DRIVING CRITERIA - PIERS 5,6,7,8, & 9
REFER TO THE SPECIAL NOTE FOR DYNAMIC PILE TESTING.

USER: doreytor	DATE PLOTTED: January 24, 2020	C-SHEET NAME: V:\17856501\ACTIVE\17856501\STRUCTURAL\CUMBERLAND RIVER BRIDGE\DRAWING\09 FOUNDATION LAYOUT.DGN	
REVISION		DATE	
DESIGNED BY: TAYLOR		CHECKED BY: S. WILLIAMS	
DETAILED BY: A. FARMER		DATE: JANUARY 2020	
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS			
COUNTY: LIVINGSTON			
ROUTE: US 60	CROSSING: CUMBERLAND RIVER	FOUNDATION LAYOUT (3)	
PREPARED BY: Stantec			
SHEET NO. 27458			
ITEM NUMBER: 1-1142.00			



FOUNDATION PLAN - SPANS 9 & 10

PILE CORE

THE BRIDGE APPROACH EMBANKMENT SECTION AT ABUTMENT 2 SHALL INCLUDE A STRUCTURAL GRANULAR FILL PILE CORE, CONFORMING TO SECTION B05.11 OF THE SPECIFICATIONS, TO FACILITATE INSTALLATION OF THE PILES. THE CORE MATERIAL SHALL BE FREE OF ROCK FRAGMENTS LARGER THAN 4 INCHES IN SIZE AND ANY OTHER OBSTRUCTION THAT WOULD INTERFERE WITH PILE INSTALLATION. CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR HIGHWAYS, SECTION 206 OF THE STANDARD SPECIFICATIONS. THE PILE CORE SHALL BE PLACED IN THE PILE CORE PLACEMENT SHALL BE INCLUDED IN THE UNIT BID PRICE FOR EMBANKMENT IN-PLACE, SEE ROADWAY PLANS.

- NOTATIONS:
- PP - DENOTES 30" DIA x 3/4" STEEL PIPE PILE
 - P - DENOTES HP14x89 STEEL PILE
 - T - DENOTES TEST PILE
 - ◄ - DENOTES BATTERED PILE (1:3)

PILE RECORD - PIER 8				PILE RECORD - PIER 9				PILE RECORD - ABUTMENT 2			
PILE NUMBER	PILE CULF ELEVATION	PILE LENGTH PLACE	POINT OF PILE AS DRIVEN	PILE CULF ELEVATION	PILE LENGTH PLACE	POINT OF PILE AS DRIVEN	PILE CULF ELEVATION	PILE CULF ELEVATION	PILE LENGTH PLACE	POINT OF PILE AS DRIVEN	DESIGN LOAD
PP45	327.04	81.50 (EE)	81.50 (EE)	PP57	328.20	771.50 (EE)	771.50 (EE)	P21	363.00	231.70 (STR)	231.70 (STR)
PP46	327.04	81.50 (EE)	81.50 (EE)	PP58	328.20	771.50 (EE)	771.50 (EE)	P22	363.00	231.70 (STR)	231.70 (STR)
PP47	327.04	81.50 (EE)	81.50 (EE)	PP59	328.20	771.50 (EE)	771.50 (EE)	P23	363.00	231.70 (STR)	231.70 (STR)
PP48	327.04	81.50 (EE)	81.50 (EE)	PP60	328.20	771.50 (EE)	771.50 (EE)	P24	363.00	231.70 (STR)	231.70 (STR)
PP49	327.04	81.50 (EE)	81.50 (EE)	PP61	328.20	771.50 (EE)	771.50 (EE)	P25	363.00	231.70 (STR)	231.70 (STR)
PP50	327.04	81.50 (EE)	81.50 (EE)	PP62	328.20	771.50 (EE)	771.50 (EE)	P26	363.00	231.70 (STR)	231.70 (STR)
PP51	327.04	81.50 (EE)	81.50 (EE)	PP63	328.20	771.50 (EE)	771.50 (EE)	P27	363.00	231.70 (STR)	231.70 (STR)
PP52	327.04	81.50 (EE)	81.50 (EE)	PP64	328.20	771.50 (EE)	771.50 (EE)	P28	363.00	231.70 (STR)	231.70 (STR)
PP53	327.04	81.50 (EE)	81.50 (EE)	PP65	328.20	771.50 (EE)	771.50 (EE)	P29	363.00	231.70 (STR)	231.70 (STR)
PP54	327.04	81.50 (EE)	81.50 (EE)					P30	363.00	231.70 (STR)	231.70 (STR)
PP55	327.04	81.50 (EE)	81.50 (EE)					P31	363.00	231.70 (STR)	231.70 (STR)
PP56	327.04	81.50 (EE)	81.50 (EE)					P32	363.00	231.70 (STR)	231.70 (STR)
								P33	363.00	231.70 (STR)	231.70 (STR)
								P34	363.00	231.70 (STR)	231.70 (STR)
								P35	363.00	231.70 (STR)	231.70 (STR)
								P36	363.00	231.70 (STR)	231.70 (STR)
								P37	363.00	231.70 (STR)	231.70 (STR)
								P38	363.00	231.70 (STR)	231.70 (STR)
								P39	363.00	231.70 (STR)	231.70 (STR)
								P40	363.00	231.70 (STR)	231.70 (STR)
								P41	363.00	231.70 (STR)	231.70 (STR)
								P42	363.00	231.70 (STR)	231.70 (STR)

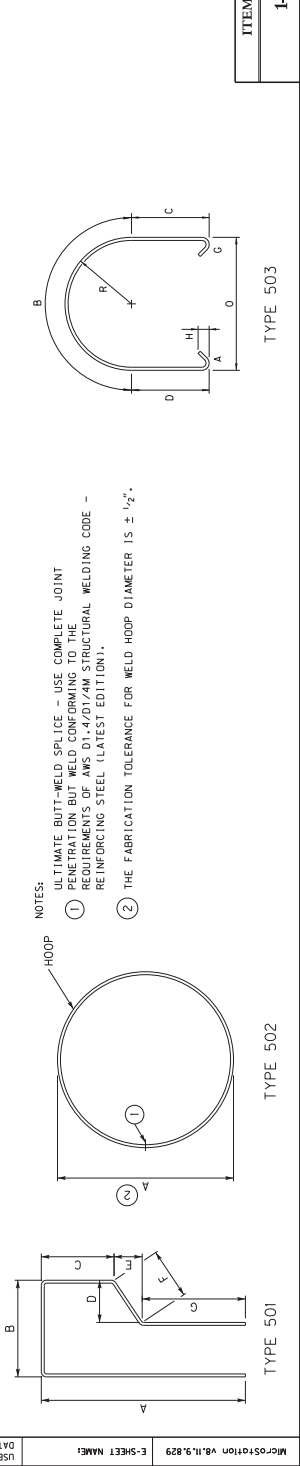
(EE) - EXTREME EVENT LIMIT STATE
(STR) - STRENGTH LIMIT STATE

USER: dorey
DATE PLOTTED: January 24, 2020

C-SHEET NAME: 1785501\ACTIVE\1785501\STRUCTURAL\CUMBERLAND RIVER BRIDGE\GRAPHIC\10 FOUNDATION LAYOUT.DWG

REVISION		DATE
DESIGNED BY: TAYLOR		CHECKED BY: S. WILLIAMS
DETAILED BY: FARMER		1: PERKINS
Commonwealth of Kentucky DEPARTMENT OF HIGHWAYS		
COUNTY: LIVINGSTON		
ROUTE: US 60	CROSSING: CUMBERLAND RIVER	
FOUNDATION LAYOUT (4)		
PREPARED BY: Stantec		
SHEET NO. S10		CONTRACT NO. 27458

ITEM NUMBER
1-1142.00



ITEM NUMBER	1-1142.00

DRILLED SHAFT FOUNDATIONS

THE CONTRACTOR SHALL USE A PERMANENT CASING FROM THE TOP OF SHAFT TO THE TOP OF UNWEATHERED BEDROCK. USE AN UNCASD ROCK SOCKET WHICH IS 6 INCHES SMALLER THAN THE INSIDE DIAMETER OF THE PERMANENT CASING. PERMANENT CASING IS INCIDENTAL TO THE UNIT BID PRICE FOR DRILLED SHAFT 96 INCH (COMMON).

DRILLED SHAFTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE SPECIAL NOTE FOR DRILLED SHAFTS, INCLUDE ALL COSTS (LABOR, EQUIPMENT, AND MATERIALS INCLUDING TRANSVERSE AND LONGITUDINAL REINFORCEMENT, REINFORCEMENT SPLICES, MECHANICAL COUPLERS, CONCRETE, AND TEMPORARY OR PERMANENT CASING) ASSOCIATED WITH DRILLED SHAFTS IN THE UNIT PRICE BID FOR DRILLED SHAFTS, COMMON OR SOLID ROCK, AS APPLICABLE.

THE CONTRACTOR WILL BE RESPONSIBLE FOR PROVIDING SUBSURFACE EXPLORATION DRILLING DURING CONSTRUCTION TO FINALIZE THE DRILLED SHAFT TIP ELEVATIONS. ADDITIONAL DRILLING WILL BE REQUIRED AT EACH DRILLED SHAFT LOCATION IN ACCORDANCE WITH THE SPECIAL NOTE FOR DRILLED SHAFTS, CURRENT EDITION.

NON-DESTRUCTIVE TESTING WILL BE REQUIRED AT EACH DRILLED SHAFT LOCATION IN ACCORDANCE WITH THE SPECIAL NOTE FOR NON-DESTRUCTIVE TESTING IN DRILLED SHAFTS.

HOOP SPLICE IN SUBSEQUENT HOOPS MUST BE ALTERNATING 180° (TYP).

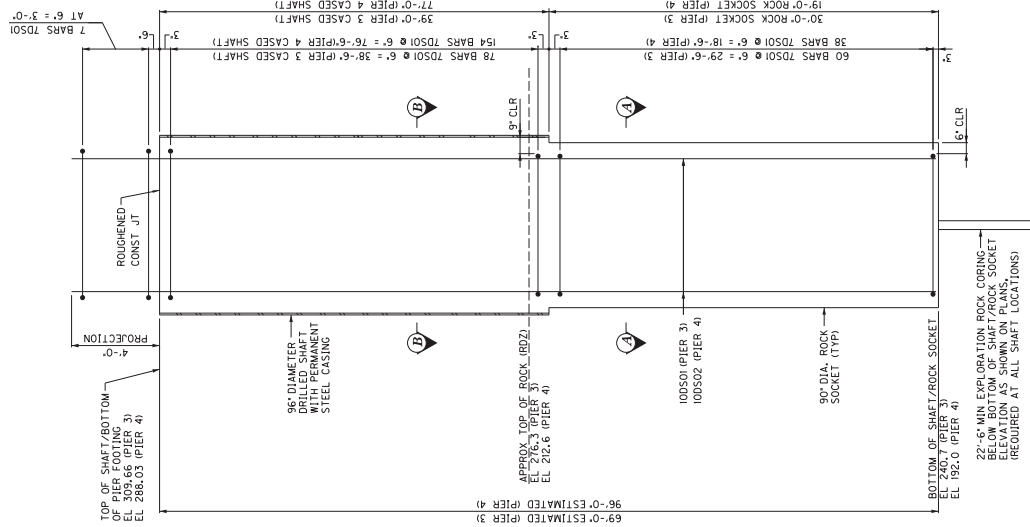
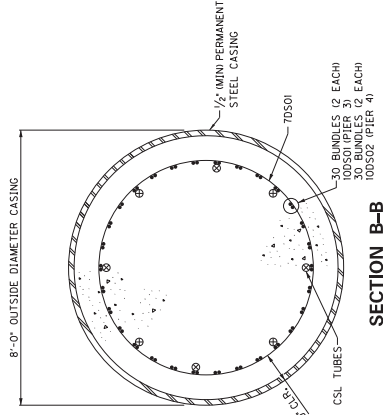
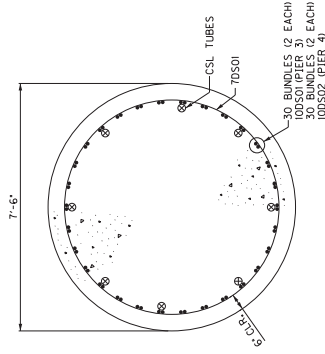
VERTICAL BARS MUST BE SUPPORTED AT LEAST EVERY 4'-0". VERTICAL BARS SHALL NOT BE SPliced WITHIN 24" OF DRILLED SHAFT, MORE THAN 50% OF THE SECTION SHALL BE REINFORCED WITH VERTICAL BARS. MECHANICAL COUPLERS ARE USED MECHANICAL OR WITHIN 3' OF THE SPICE LOCATION. IF MECHANICAL COUPLERS ARE USED MECHANICAL COUPLERS SHALL COMPLY WITH ASHTO BRIDGE DESIGN SPECIFICATIONS, 8TH EDITION, ARTICLE 5.10.8.4-2b. WHEN A DRILLED SHAFT IS LENGTHENED IN THE FIELD, 100% OF THE REINFORCEMENT MAY BE SPliced AT THE BOTTOM OF THE REINFORCEMENT CAGE.

FOR BILL OF REINFORCEMENT, SEE THIS SHEET. THIS IS FOR INFORMATION ONLY. THE COST OF STEEL REINFORCEMENT IN EACH SHAFT IS INCIDENTAL TO THE UNIT BID PRICE PER LINEAR FOOT FOR EACH SHAFT.

DRILLED SHAFT CONCRETE IS $f'c = 4,000$ PSI.

DRILLED SHAFT CONCRETE IS $f'_c = 4,000$
STEEL REINFORCEMENT $F_y = 75,000$ PSI.

FOR DRILLED SHAFT RECORD, SEE FOUNDATION LAYOUT (2).

[illegible][illegible]

APPENDIX C

Laboratory Soil Testing Data

Consolidated Undrained Triaxial Testing

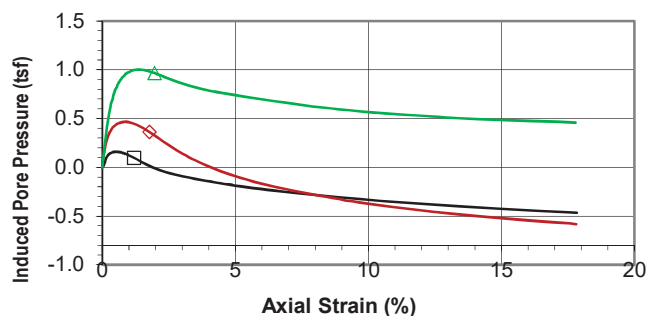
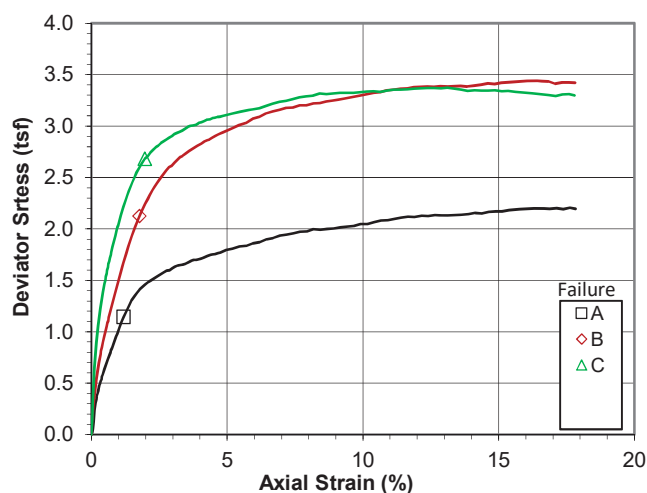


Consolidated Undrained Triaxial Compression

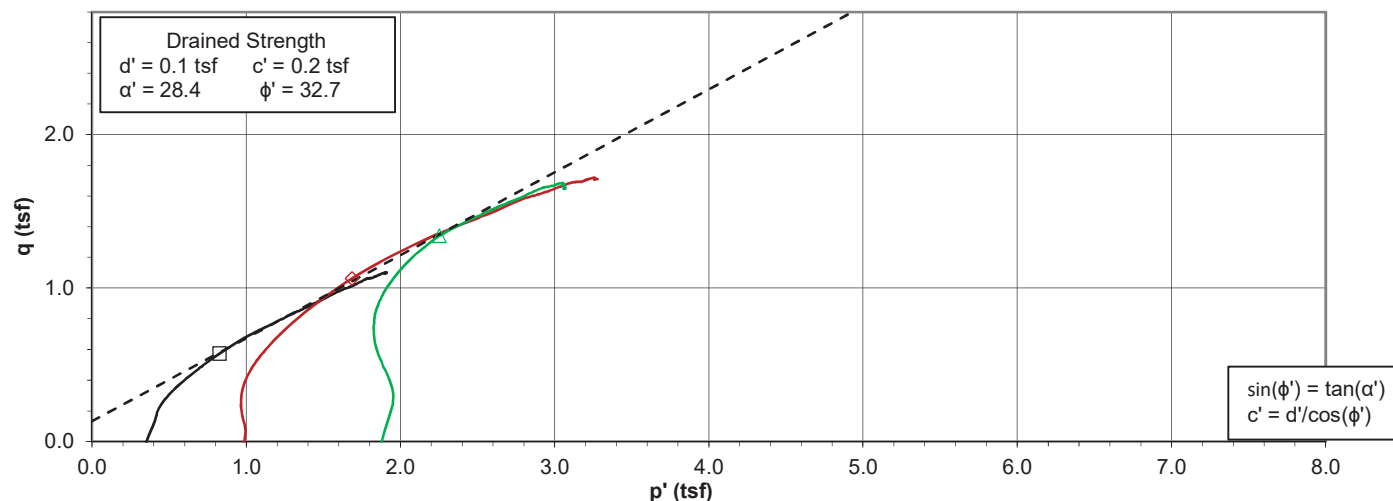
AASHTO T 297

Project Name US 60 over Cumberland RiverProject 178565011
Set ID Set 1

Test	Lab ID	Source	Description	Gs	LL	PL	PI
A	20B	R-11, 134+00, 100' Lt. (3.3'-3.8')	Lean Clay with Sand (CL), brown, moist, firm	2.83	33	19	14
B	20C	R-11, 134+00, 100' Lt. (3.9'-4.4')	Lean Clay with Sand (CL), brown, moist, firm	2.83	33	19	14
C	21B	R-11, 134+00, 100' Lt. (5.8'-6.3')	Lean Clay with Sand (CL), brown, moist, firm	2.70	30	19	11



Specimen	A	B	C		
Initial Specimen Conditions					
Average Height (in)	5.759	5.768	5.756		
Average Diameter (in)	2.840	2.873	2.866		
Moist Unit Weight (pcf)	126.4	124.6	123.7		
Moisture Content (%)	21.2	21.8	22.2		
Dry Unit Weight (pcf)	104.3	102.3	101.3		
Void Ratio	0.691	0.723	0.662		
Degree of Saturation (%)	86.8	85.3	90.5		
Consolidated Specimen Conditions					
Moist Unit Weight (pcf)	130.5	130.8	127.4		
Moisture Content (%)	23.7	23.5	23.3		
Dry Unit Weight (pcf)	105.5	105.9	103.3		
Void Ratio	0.672	0.665	0.628		
Degree of Saturation (%)	100.0	100.0	100.0		
Eff. Con. Stress, σ'_3 (tsf)	0.353	0.987	1.879		
At Drained Failure					
Max. Eff. Prin. Stress Ratio					
Failure Criterion					
Axial Strain (%)	1.189	1.771	1.963		
Deviator Stress (tsf)	1.146	2.124	2.682		
Induced Pore Press. (tsf)	0.098	0.363	0.967		
Minor Eff. Stress, σ'_3 (tsf)	0.254	0.623	0.912		
Major Eff. Stress, σ'_1 (tsf)	1.399	2.748	3.594		
Eff. Stress Ratio, σ'_1/σ'_3	5.517	4.408	3.939		
p' (tsf)	0.826	1.685	2.253		
q (tsf)	0.573	1.062	1.341		



Comments _____

Reviewed By KG

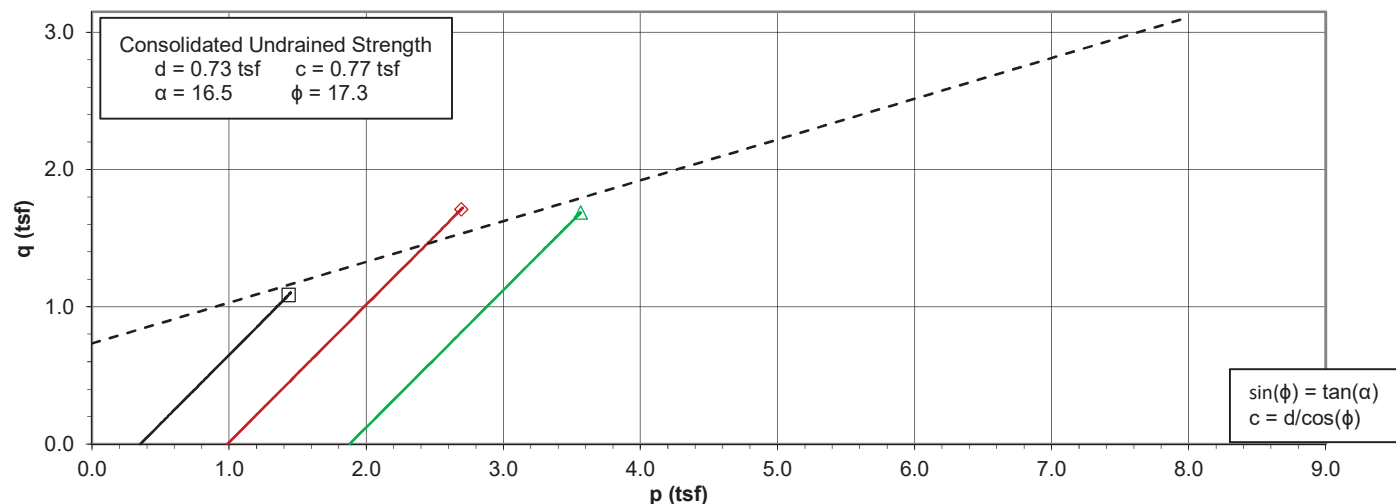
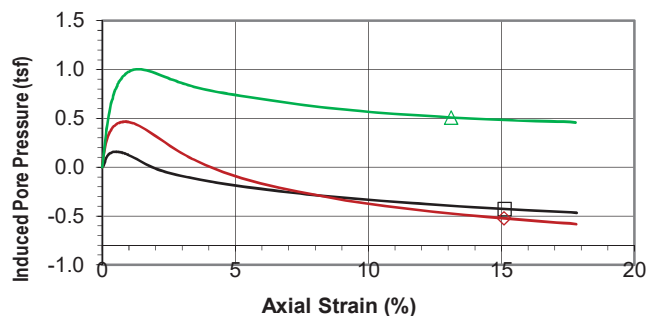
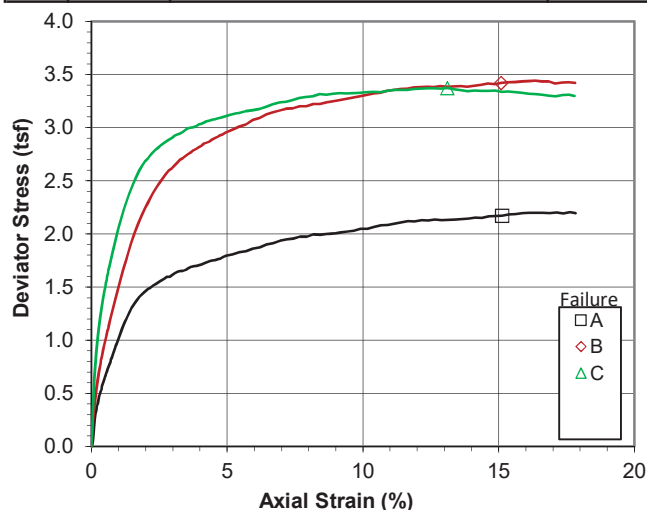


Consolidated Undrained Triaxial Compression

AASHTO T 297

Project Name US 60 over Cumberland RiverProject 178565011
Set ID Set 1

Test	Lab ID	Source	Description	Gs	LL	PL	PI
A	20B	R-11, 134+00, 100' Lt. (3.3'-3.8')	Lean Clay with Sand (CL), brown, moist, firm	2.83	33	19	14
B	20C	R-11, 134+00, 100' Lt. (3.9'-4.4')	Lean Clay with Sand (CL), brown, moist, firm	2.83	33	19	14
C	21B	R-11, 134+00, 100' Lt. (5.8'-6.3')	Lean Clay with Sand (CL), brown, moist, firm	2.70	30	19	11



Specimen	A	B	C		
Initial Specimen Conditions					
Average Height (in)	5.759	5.768	5.756		
Average Diameter (in)	2.840	2.873	2.866		
Moist Unit Weight (pcf)	126.4	124.6	123.7		
Moisture Content (%)	21.2	21.8	22.2		
Dry Unit Weight (pcf)	104.3	102.3	101.3		
Void Ratio	0.691	0.723	0.662		
Degree of Saturation (%)	86.8	85.3	90.5		
Consolidated Specimen Conditions					
Moist Unit Weight (pcf)	130.5	130.8	127.4		
Moisture Content (%)	23.7	23.5	23.3		
Dry Unit Weight (pcf)	105.5	105.9	103.3		
Void Ratio	0.672	0.665	0.628		
Degree of Saturation (%)	100.0	100.0	100.0		
Eff. Con. Stress, σ'_3 (tsf)	0.353	0.987	1.879		
At Consolidated Undrained Failure					
Max. σ_D or 15% Strain					
Failure Criterion					
Axial Strain (%)	15.125	15.094	13.107		
Deviator Stress (tsf)	2.172	3.420	3.373		
Min. Prin. Stress, σ_3 (tsf)	0.348	0.983	1.877		
Maj. Prin. Stress, σ_1 (tsf)	2.520	4.403	5.250		
p (tsf)	1.434	2.693	3.564		
q (tsf)	1.086	1.710	1.687		

Comments _____



Consolidated Undrained Triaxial Compression

AASHTO T 297

Project Name US 60 over Cumberland River
 Source R-11, 134+00, 100' Lt. (3.3'-3.8')
 Description Lean Clay with Sand (CL), brown, moist, firm
 Specimen Type Intact
 Preparation Wet Mounting

Project No. 178565011
 Lab ID 20B
 Test ID Set 1-A

Date Received 08/27/2019
 Date Tested 09/26/2019

Specific Gravity 2.83
 ASTM D 854, Dry

Liquid Limit 33
 Plastic Limit 19
 Plasticity Index 14
 ASTM D 4318

Target Test Parameters

Nominal Chamber Pressure (psi) 90
 Nominal Back Pressure (psi) 85
 Nominal Consolidation Pressure (psi) 5

Saturation / Consolidation Results

Pore Pressure Parameter B .98
 Measured Effective Consol. Stress (tsf) 0.350
 Time to 50% Consolidation (min) 1.00
 Actual Axial Strain Rate of Test (%/min) 0.099

Consolidated Specimen Conditions

Moist Unit Weight (pcf) 130.5
 Moisture Content (%) 23.7
 Dry Unit Weight (pcf) 105.5
 Void Ratio 0.672
 Degree of Saturation (%) 100.0

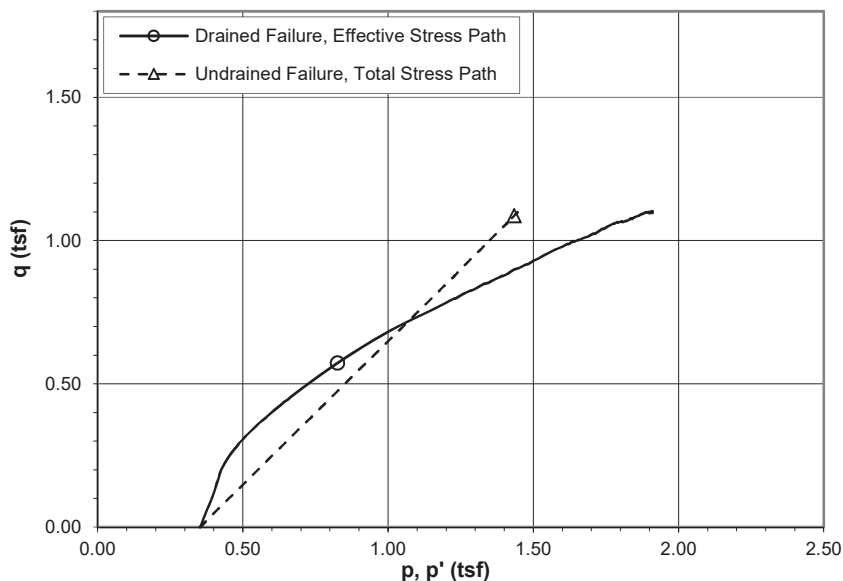
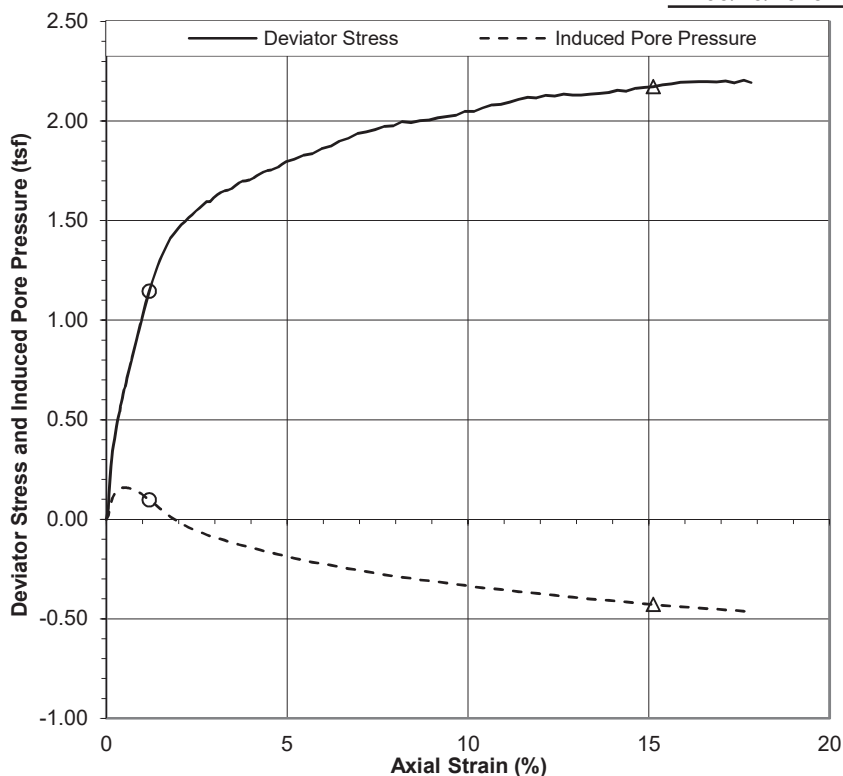
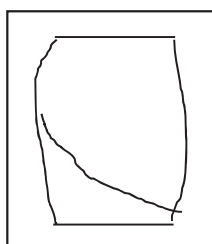
At Drained Failure

Failure Criterion: Max. Eff. Prin. Stress Ratio
 Axial Strain (%) 1.189
 Deviator Stress (tsf) 1.146
 Induced Pore Pressure (tsf) 0.098
 Minor Effective Stress, σ_3' (tsf) 0.254
 Major Effective Stress, σ_1' (tsf) 1.399
 Eff. Principal Stress Ratio, σ_1'/σ_3' 5.517
 p' (tsf) 0.826
 q (tsf) 0.573

At Consolidated Undrained Failure

Failure Criterion: 15% Axial Strain
 Axial Strain (%) 15.125
 Deviator Stress (tsf) 2.172
 Minor Principal Stress, σ_3 (tsf) 0.348
 Major Principal Stress, σ_1 (tsf) 2.520
 p (tsf) 1.434
 q (tsf) 1.086

Failure Sketch



Comments _____

Reviewed KG



Consolidated Undrained Triaxial Compression

ASTM D 4767

Project Name US 60 over Cumberland River
 Source R-11, 134+00, 100' Lt. (3.3'-3.8')
 Description Lean Clay with Sand (CL), brown, moist, firm

Project No. 178565011
 Lab ID 20B
 Test ID Set 1-A

Initial Specimen Conditions
 Average Height (in) 5.759
 Average Diameter (in) 2.840
 Calculated Area (in²) 6.335
 Moist Weight (lb) 2.668
 Moist Unit Weight (pcf) 126.4
 Moisture Content (%) 21.2
 Dry Weight (lb) 2.202
 Dry Unit Weight (pcf) 104.3
 Void Ratio 0.691
 Degree of Saturation (%) 86.8

Consolidated Specimen Conditions
 Calculated Height (in) 5.731
 Calculated Diameter (in) 2.831
 Calculated Area (in²) 6.294
 Moist Weight (lb) 2.724
 Moist Unit Weight (pcf) 130.5
 Moisture Content (%) 23.7
 Dry Weight (lb) 2.202
 Dry Unit Weight (pcf) 105.5
 Void Ratio 0.672
 Degree of Saturation (%) 100.0

Specific Gravity 2.83
 ASTM D 854, Dry
 Liquid Limit 33
 Plastic Limit 19
 Plasticity Index 14
 ASTM D 4318
 Confining Stress
 σ_3 (tsf) 0.353

Effective Consolidation Stress
 σ_3' (tsf) 0.353

Moisture contents obtained using whole specimen.

Specimen consolidated cross-sectional area determined using method B.

Membrane corrections have been applied, where $E_m = 200$ lbf/in and $t = 0.012$ in.

All other tests performed in association with this specimen are reported separately.

Project: 178565011			Source: R-11, 134+00, 100' Lt. (3.3'-3.8')								Lab ID: 20B			Test ID		
Test Time (min)	Corr. Axial Load (lbf)	Axial Deform. (in)	Axial Strain (%)	Corr. Area (in ²)	Deviator Stress (tsf)	Corr. Deviator Stress (tsf)	Pore Pressure (tsf)	Induced Pore Pressure (tsf)	σ ₁ (tsf)	σ ₁ ' (tsf)	σ ₃ ' (tsf)	p (tsf)	p' (tsf)	q (tsf)	Eff. Princ. Stress Ratio σ ₁ '/σ ₃ '	
0.0	0.0	0.000	0.00	6.476	0.000	0.000	6.132	0.000	0.353	0.353	0.353	0.353	0.353	0.000	1.000	
0.2	1.5	0.001	0.02	6.477	0.016	0.016	6.136	0.005	0.369	0.364	0.348	0.361	0.356	0.008	1.047	
0.5	4.8	0.003	0.05	6.479	0.054	0.053	6.148	0.016	0.406	0.390	0.336	0.379	0.363	0.027	1.159	
0.7	10.8	0.004	0.07	6.480	0.120	0.120	6.167	0.036	0.472	0.437	0.317	0.412	0.377	0.060	1.379	
1.0	17.9	0.006	0.10	6.482	0.199	0.199	6.190	0.059	0.551	0.492	0.294	0.452	0.393	0.099	1.676	
1.3	23.6	0.007	0.12	6.484	0.263	0.262	6.210	0.079	0.615	0.536	0.273	0.483	0.405	0.131	1.959	
1.5	27.7	0.009	0.15	6.485	0.307	0.307	6.226	0.095	0.659	0.564	0.258	0.506	0.411	0.153	2.190	
1.8	31.0	0.010	0.17	6.487	0.344	0.344	6.239	0.107	0.697	0.589	0.245	0.525	0.417	0.172	2.403	
2.0	33.6	0.011	0.20	6.488	0.373	0.372	6.249	0.117	0.724	0.607	0.235	0.538	0.421	0.186	2.584	
2.3	36.0	0.013	0.22	6.490	0.399	0.398	6.257	0.126	0.750	0.624	0.226	0.551	0.425	0.199	2.761	
2.5	38.6	0.014	0.25	6.492	0.428	0.427	6.264	0.132	0.779	0.647	0.220	0.566	0.433	0.214	2.945	
2.8	40.8	0.015	0.27	6.493	0.452	0.452	6.270	0.139	0.804	0.665	0.214	0.578	0.439	0.226	3.114	
3.0	43.1	0.017	0.29	6.495	0.478	0.478	6.275	0.143	0.829	0.686	0.209	0.591	0.447	0.239	3.290	
3.3	44.9	0.018	0.32	6.496	0.498	0.497	6.279	0.147	0.849	0.702	0.205	0.600	0.454	0.249	3.426	
3.5	46.9	0.020	0.34	6.498	0.520	0.519	6.282	0.150	0.871	0.721	0.202	0.612	0.462	0.259	3.564	
3.8	49.0	0.022	0.38	6.500	0.542	0.541	6.285	0.153	0.893	0.740	0.199	0.623	0.469	0.271	3.726	
4.1	51.3	0.023	0.39	6.501	0.568	0.567	6.286	0.155	0.919	0.764	0.197	0.635	0.481	0.284	3.876	
4.3	52.9	0.024	0.42	6.503	0.586	0.585	6.288	0.157	0.936	0.779	0.195	0.644	0.487	0.292	4.001	
4.5	55.1	0.025	0.44	6.505	0.610	0.609	6.290	0.158	0.961	0.803	0.194	0.656	0.498	0.305	4.145	
4.8	56.8	0.027	0.47	6.506	0.629	0.628	6.290	0.159	0.979	0.821	0.193	0.666	0.507	0.314	4.249	
5.1	58.8	0.028	0.49	6.508	0.651	0.650	6.291	0.159	1.001	0.842	0.193	0.676	0.517	0.325	4.374	
5.3	60.4	0.030	0.52	6.510	0.668	0.667	6.291	0.159	1.018	0.859	0.193	0.685	0.526	0.333	4.459	
5.6	62.2	0.031	0.55	6.511	0.688	0.687	6.290	0.159	1.039	0.880	0.193	0.695	0.537	0.343	4.557	
5.8	64.0	0.033	0.57	6.513	0.708	0.706	6.290	0.159	1.058	0.899	0.193	0.705	0.546	0.353	4.660	
6.1	65.9	0.034	0.59	6.514	0.728	0.727	6.289	0.158	1.079	0.921	0.194	0.715	0.558	0.363	4.744	
6.3	67.6	0.035	0.62	6.516	0.746	0.745	6.288	0.156	1.097	0.941	0.196	0.725	0.568	0.372	4.803	
6.6	69.1	0.037	0.65	6.518	0.763	0.762	6.287	0.155	1.114	0.959	0.197	0.733	0.578	0.381	4.858	
6.8	71.1	0.039	0.68	6.520	0.785	0.783	6.286	0.154	1.135	0.981	0.198	0.744	0.589	0.392	4.960	
7.1	72.5	0.040	0.70	6.521	0.800	0.798	6.285	0.153	1.151	0.998	0.199	0.751	0.599	0.399	5.004	
7.3	74.3	0.041	0.72	6.522	0.820	0.818	6.283	0.151	1.170	1.018	0.200	0.761	0.609	0.409	5.083	
7.6	76.0	0.043	0.75	6.524	0.838	0.836	6.281	0.149	1.188	1.039	0.203	0.770	0.621	0.418	5.127	
7.9	77.4	0.044	0.77	6.526	0.854	0.852	6.279	0.147	1.204	1.057	0.205	0.778	0.631	0.426	5.162	
8.1	79.4	0.046	0.80	6.528	0.876	0.874	6.277	0.145	1.226	1.081	0.206	0.789	0.644	0.437	5.236	
8.4	80.9	0.047	0.82	6.529	0.892	0.890	6.275	0.143	1.242	1.099	0.209	0.797	0.654	0.445	5.256	
8.6	82.6	0.048	0.84	6.531	0.910	0.908	6.272	0.140	1.260	1.119	0.211	0.806	0.665	0.454	5.295	
8.9	84.1	0.050	0.87	6.532	0.926	0.924	6.270	0.138	1.276	1.138	0.213	0.814	0.675	0.462	5.335	
9.1	86.0	0.051	0.89	6.534	0.947	0.945	6.267	0.135	1.297	1.161	0.216	0.824	0.689	0.472	5.366	
9.4	87.3	0.053	0.92	6.536	0.962	0.959	6.265	0.134	1.311	1.178	0.218	0.832	0.698	0.480	5.395	
9.6	89.1	0.054	0.94	6.537	0.981	0.979	6.262	0.131	1.331	1.200	0.221	0.841	0.711	0.489	5.423	

Project: 178565011			Source: R-11, 134+00, 100' Lt. (3.3'-3.8')									Lab ID: 20B			Test ID	
Test Time (min)	Corr. Axial Load (lbf)	Axial Deform. (in)	Axial Strain (%)	Corr. Area (in ²)	Deviator Stress (tsf)	Corr. Deviator Stress (tsf)	Pore Pressure (tsf)	Induced Pore Pressure (tsf)	σ ₁ (tsf)	σ ₁ ' (tsf)	σ ₃ ' (tsf)	p (tsf)	p' (tsf)	q (tsf)	Eff. Princ. Stress Ratio σ ₁ '/σ ₃ '	
9.9	90.7	0.056	0.97	6.539	0.999	0.997	6.260	0.129	1.348	1.220	0.223	0.850	0.721	0.498	5.466	
10.1	92.3	0.057	0.99	6.541	1.016	1.013	6.256	0.124	1.365	1.241	0.228	0.858	0.734	0.507	5.450	
11.1	99.1	0.063	1.09	6.547	1.089	1.087	6.243	0.111	1.438	1.327	0.241	0.895	0.784	0.543	5.516	
12.1	104.5	0.068	1.19	6.554	1.148	1.146	6.230	0.098	1.497	1.399	0.254	0.924	0.826	0.573	5.517	
13.1	110.0	0.074	1.30	6.561	1.208	1.205	6.216	0.084	1.556	1.472	0.268	0.954	0.870	0.602	5.503	
14.1	115.0	0.080	1.39	6.567	1.261	1.258	6.201	0.069	1.609	1.541	0.283	0.981	0.912	0.629	5.446	
15.1	119.3	0.085	1.48	6.573	1.307	1.303	6.186	0.054	1.655	1.601	0.298	1.003	0.949	0.652	5.380	
16.1	123.5	0.091	1.59	6.580	1.351	1.347	6.171	0.039	1.698	1.659	0.312	1.025	0.985	0.673	5.319	
17.1	126.6	0.097	1.69	6.587	1.384	1.380	6.157	0.026	1.731	1.706	0.326	1.041	1.016	0.690	5.239	
18.1	129.7	0.102	1.77	6.593	1.417	1.412	6.145	0.013	1.764	1.751	0.339	1.058	1.045	0.706	5.172	
19.1	132.3	0.108	1.89	6.600	1.443	1.439	6.131	0.000	1.790	1.791	0.352	1.071	1.071	0.719	5.087	
20.1	134.5	0.114	1.98	6.607	1.466	1.461	6.120	-0.012	1.813	1.825	0.363	1.082	1.094	0.731	5.021	
21.1	136.4	0.119	2.07	6.613	1.485	1.480	6.110	-0.022	1.831	1.853	0.374	1.092	1.113	0.740	4.960	
22.1	138.0	0.125	2.18	6.620	1.501	1.495	6.100	-0.032	1.847	1.879	0.383	1.099	1.131	0.748	4.903	
23.1	139.9	0.131	2.28	6.627	1.520	1.514	6.091	-0.041	1.866	1.907	0.393	1.109	1.150	0.757	4.856	
24.1	141.4	0.136	2.37	6.633	1.535	1.530	6.083	-0.049	1.881	1.930	0.400	1.116	1.165	0.765	4.821	
25.2	143.4	0.142	2.48	6.640	1.554	1.549	6.075	-0.056	1.900	1.956	0.408	1.126	1.182	0.774	4.796	
26.2	144.9	0.147	2.57	6.647	1.569	1.563	6.068	-0.063	1.915	1.978	0.415	1.133	1.197	0.782	4.765	
27.1	146.5	0.153	2.68	6.654	1.586	1.579	6.062	-0.070	1.931	2.001	0.422	1.141	1.211	0.790	4.746	
28.2	148.2	0.159	2.77	6.660	1.602	1.595	6.054	-0.077	1.947	2.024	0.429	1.149	1.227	0.798	4.718	
29.2	148.5	0.165	2.87	6.667	1.603	1.596	6.048	-0.084	1.948	2.032	0.436	1.150	1.234	0.798	4.664	
30.1	150.4	0.170	2.97	6.674	1.622	1.615	6.043	-0.089	1.966	2.055	0.440	1.159	1.247	0.807	4.671	
31.1	152.0	0.176	3.07	6.681	1.638	1.630	6.037	-0.095	1.982	2.076	0.446	1.166	1.261	0.815	4.655	
32.2	153.3	0.182	3.17	6.688	1.650	1.642	6.031	-0.101	1.994	2.094	0.452	1.172	1.273	0.821	4.633	
33.2	154.2	0.188	3.28	6.695	1.659	1.651	6.026	-0.106	2.002	2.108	0.457	1.177	1.283	0.825	4.610	
34.2	154.7	0.193	3.37	6.701	1.662	1.654	6.021	-0.111	2.005	2.116	0.462	1.178	1.289	0.827	4.577	
35.2	155.6	0.199	3.47	6.708	1.670	1.661	6.015	-0.117	2.013	2.129	0.468	1.182	1.299	0.831	4.549	
36.2	157.1	0.205	3.57	6.715	1.685	1.676	6.010	-0.122	2.027	2.149	0.473	1.189	1.311	0.838	4.542	
37.2	158.7	0.210	3.67	6.723	1.700	1.691	6.004	-0.127	2.042	2.170	0.479	1.197	1.324	0.846	4.532	
38.2	159.6	0.216	3.77	6.729	1.708	1.699	6.000	-0.132	2.049	2.181	0.483	1.200	1.332	0.849	4.520	
39.2	159.9	0.221	3.86	6.736	1.710	1.700	5.995	-0.136	2.051	2.187	0.487	1.201	1.337	0.850	4.490	
40.2	160.6	0.227	3.96	6.743	1.714	1.705	5.990	-0.142	2.056	2.198	0.493	1.203	1.345	0.852	4.460	
41.2	161.7	0.233	4.07	6.750	1.725	1.715	5.987	-0.145	2.066	2.211	0.496	1.208	1.353	0.857	4.457	
42.2	162.8	0.238	4.16	6.757	1.735	1.725	5.981	-0.151	2.076	2.227	0.502	1.214	1.364	0.863	4.438	
43.2	164.0	0.244	4.26	6.764	1.745	1.735	5.976	-0.155	2.086	2.241	0.506	1.219	1.374	0.868	4.427	
44.2	165.1	0.250	4.36	6.771	1.756	1.745	5.972	-0.160	2.097	2.257	0.512	1.224	1.384	0.873	4.410	
45.2	165.9	0.255	4.45	6.777	1.763	1.752	5.968	-0.164	2.103	2.267	0.515	1.227	1.391	0.876	4.400	
46.2	166.3	0.261	4.56	6.785	1.765	1.754	5.963	-0.168	2.106	2.274	0.520	1.229	1.397	0.877	4.373	
47.2	167.4	0.267	4.66	6.792	1.774	1.763	5.959	-0.173	2.114	2.287	0.524	1.233	1.406	0.881	4.363	
48.2	168.2	0.272	4.75	6.799	1.781	1.770	5.955	-0.177	2.121	2.297	0.528	1.236	1.413	0.885	4.354	
49.2	169.7	0.279	4.86	6.807	1.795	1.784	5.951	-0.181	2.134	2.315	0.531	1.243	1.423	0.892	4.356	
50.2	170.9	0.284	4.96	6.814	1.806	1.794	5.947	-0.185	2.144	2.329	0.535	1.247	1.432	0.897	4.356	
52.7	172.7	0.298	5.20	6.831	1.820	1.807	5.935	-0.197	2.157	2.354	0.546	1.253	1.450	0.904	4.309	
55.2	175.1	0.313	5.46	6.849	1.841	1.828	5.926	-0.205	2.177	2.382	0.554	1.263	1.468	0.914	4.299	
57.8	176.4	0.327	5.70	6.867	1.850	1.836	5.916	-0.215	2.185	2.401	0.565	1.267	1.483	0.918	4.252	
60.3	179.3	0.341	5.95	6.885	1.875	1.861	5.910	-0.222	2.210	2.432	0.571	1.279	1.501	0.930	4.260	
62.8	181.0	0.355	6.20	6.904	1.888	1.873	5.901	-0.231	2.222	2.453	0.580	1.286	1.517	0.936	4.227	
65.3	184.0	0.369	6.45	6.922	1.914	1.899	5.893	-0.239	2.248	2.487	0.589	1.299	1.538	0.949	4.226	
67.8	186.0	0.383	6.69	6.940	1.929	1.913	5.884	-0.247	2.262	2.510	0.597	1.306	1.553	0.957	4.206	
70.3	188.8	0.398	6.95	6.959	1.954	1.937	5.876	-0.255	2.287	2.542	0.605	1.318	1.574	0.969	4.200	
72.8	190.3	0.412	7.19	6.977	1.963	1.946	5.869	-0.263	2.296	2.559	0.613	1.323	1.586	0.973	4.177	
75.3	191.9	0.426	7.44	6.996	1.975	1.957	5.860	-0.271	2.306	2.578	0.620	1.328	1.599	0.979	4.155	
77.8	194.0	0.440	7.68	7.015	1.992	1.973	5.854	-0.278	2.323	2.601	0.628	1.336	1.614	0.987	4.143	
80.3	194.9	0.455	7.94	7.034	1.995	1.976	5.847	-0.285	2.325	2.610	0.634	1.337	1.622	0.988	4.114	
82.8	197.5	0.469	8.18	7.052	2.016	1.997	5.841	-0.291	2.345	2.637	0.640	1.347	1.638	0.998	4.119	
85.3	197.7	0.483	8.43	7.072	2.013	1.992	5.835	-0.297	2.341	2.637	0.645	1.345	1.641	0.996	4.088	
87.8	199.2	0.497	8.68	7.091	2.023	2.002	5.827	-0.304	2.350	2.655	0.652	1.349	1.653	1.001	4.068	
90.3	200.1	0.512	8.93	7.111	2.027	2.005	5.822	-0.309	2.354	2.663	0.658	1.351	1.660	1.003	4.048	
92.8	201.8	0.526	9.17	7.130	2.038	2.016	5.817	-0.315	2.364	2.679	0.663	1.356	1.671	1.008	4.039	
95.3	203.1	0.540	9.42	7.149	2.046	2.023	5.811	-0.321	2.371	2.692	0.669	1.360	1.681	1.011	4.023	
97.8	204.4	0.554	9.67	7.169	2.053	2.030	5.804	-0.327	2.379	2.706	0.676	1.364	1.691	1.015	4.003	
100.3	206.9	0.568	9.91	7.188	2.073	2.049	5.									

Project: 178565011			Source: R-11, 134+00, 100' Lt. (3.3'-3.8')								Lab ID: 20B			Test ID		
Test Time (min)	Corr. Axial Load (lbf)	Axial Deform. (in)	Axial Strain (%)	Corr. Area (in ²)	Deviator Stress (tsf)	Corr. Deviator Stress (tsf)	Pore Pressure (tsf)	Induced Pore Pressure (tsf)	σ ₁ (tsf)	σ ₁ ' (tsf)	σ ₃ ' (tsf)	p (tsf)	p' (tsf)	q (tsf)	Eff. Princ. Stress Ratio σ ₁ '/σ ₃ '	
120.3	218.9	0.682	11.90	7.350	2.145	2.116	5.760	-0.372	2.465	2.837	0.721	1.407	1.779	1.058	3.936	
122.8	220.9	0.697	12.16	7.372	2.158	2.129	5.755	-0.376	2.477	2.853	0.725	1.413	1.789	1.064	3.936	
125.3	221.3	0.711	12.40	7.392	2.155	2.125	5.750	-0.382	2.474	2.856	0.731	1.411	1.793	1.063	3.909	
127.8	222.9	0.725	12.65	7.413	2.165	2.135	5.744	-0.388	2.483	2.871	0.736	1.416	1.804	1.067	3.899	
130.3	223.2	0.739	12.90	7.435	2.162	2.131	5.740	-0.391	2.479	2.870	0.740	1.414	1.805	1.065	3.881	
132.9	223.9	0.753	13.14	7.455	2.163	2.131	5.735	-0.397	2.480	2.877	0.746	1.415	1.811	1.066	3.858	
135.3	225.0	0.767	13.39	7.477	2.167	2.135	5.732	-0.400	2.483	2.883	0.748	1.415	1.815	1.067	3.854	
137.8	226.1	0.781	13.63	7.498	2.171	2.138	5.727	-0.405	2.486	2.891	0.753	1.417	1.822	1.069	3.839	
140.4	227.4	0.796	13.89	7.521	2.177	2.144	5.724	-0.408	2.492	2.900	0.756	1.420	1.828	1.072	3.835	
142.9	229.2	0.810	14.14	7.542	2.188	2.154	5.720	-0.412	2.501	2.913	0.759	1.424	1.836	1.077	3.837	
145.3	229.5	0.824	14.38	7.564	2.185	2.150	5.716	-0.416	2.498	2.914	0.764	1.423	1.839	1.075	3.816	
147.8	231.7	0.839	14.64	7.586	2.199	2.164	5.712	-0.420	2.511	2.931	0.767	1.429	1.849	1.082	3.820	
150.4	233.0	0.853	14.89	7.609	2.205	2.169	5.707	-0.424	2.517	2.941	0.772	1.432	1.856	1.085	3.812	
152.9	234.0	0.867	15.13	7.630	2.208	2.172	5.703	-0.429	2.520	2.948	0.776	1.434	1.862	1.086	3.799	
155.4	236.0	0.881	15.38	7.653	2.220	2.183	5.699	-0.433	2.530	2.963	0.780	1.439	1.872	1.091	3.798	
157.9	237.1	0.896	15.63	7.675	2.225	2.187	5.696	-0.435	2.535	2.970	0.783	1.441	1.876	1.094	3.793	
160.4	238.8	0.910	15.87	7.698	2.233	2.195	5.693	-0.439	2.543	2.982	0.787	1.445	1.884	1.098	3.790	
162.9	239.8	0.924	16.13	7.721	2.236	2.197	5.689	-0.443	2.544	2.987	0.790	1.446	1.889	1.099	3.780	
165.4	240.7	0.939	16.39	7.745	2.238	2.198	5.686	-0.446	2.545	2.991	0.793	1.446	1.892	1.099	3.772	
167.9	241.5	0.953	16.62	7.767	2.239	2.199	5.682	-0.450	2.546	2.996	0.797	1.446	1.896	1.099	3.760	
170.4	242.0	0.967	16.88	7.791	2.236	2.196	5.680	-0.451	2.542	2.993	0.798	1.444	1.895	1.098	3.753	
172.9	243.4	0.982	17.13	7.814	2.243	2.202	5.677	-0.455	2.549	3.004	0.802	1.448	1.903	1.101	3.746	
175.4	243.1	0.996	17.37	7.837	2.233	2.192	5.674	-0.458	2.538	2.996	0.804	1.442	1.900	1.096	3.726	
177.9	245.4	1.010	17.63	7.861	2.247	2.205	5.670	-0.461	2.551	3.013	0.808	1.449	1.910	1.103	3.730	
180.1	244.8	1.022	17.83	7.881	2.237	2.194	5.665	-0.467	2.540	3.007	0.813	1.443	1.910	1.097	3.698	



Consolidated Undrained Triaxial Compression

AASHTO T 297

Project Name US 60 over Cumberland River
 Source R-11, 134+00, 100' Lt. (3.9'-4.4')
 Description Lean Clay with Sand (CL), brown, moist, firm
 Specimen Type Intact
 Preparation Wet Mounting

Project No. 178565011
 Lab ID 20C
 Test ID Set 1-B

Date Received 08/27/2019
 Date Tested 09/25/2019

Specific Gravity 2.83
 ASTM D 854, Dry

Liquid Limit 33
 Plastic Limit 19
 Plasticity Index 14
 ASTM D 4318

Target Test Parameters

Nominal Chamber Pressure (psi) 90
 Nominal Back Pressure (psi) 75
 Nominal Consolidation Pressure (psi) 15

Saturation / Consolidation Results

Pore Pressure Parameter B 0.98
 Measured Effective Consol. Stress (tsf) 0.985
 Time to 50% Consolidation (min) 1.44
 Actual Axial Strain Rate of Test (%/min) 0.099

Consolidated Specimen Conditions

Moist Unit Weight (pcf) 130.8
 Moisture Content (%) 23.5
 Dry Unit Weight (pcf) 105.9
 Void Ratio 0.665
 Degree of Saturation (%) 100.0

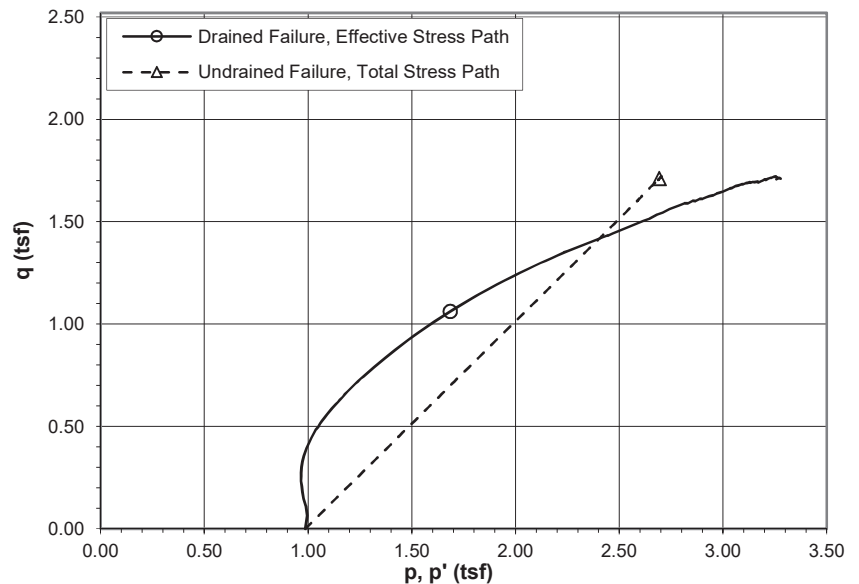
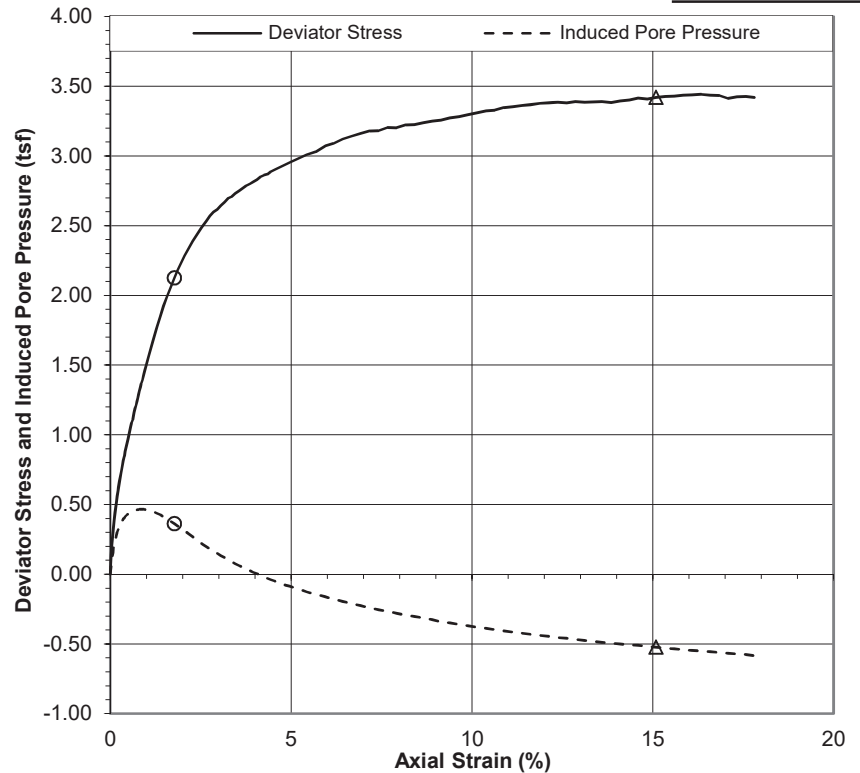
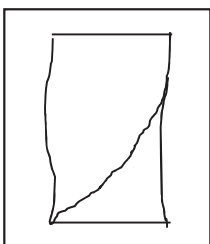
At Drained Failure

Failure Criteria: Max. Eff. Prin. Stress Ratio
 Axial Strain (%) 1.771
 Deviator Stress (tsf) 2.124
 Induced Pore Pressure (tsf) 0.363
 Minor Effective Stress, σ_3' (tsf) 0.623
 Major Effective Stress, σ_1' (tsf) 2.748
 Eff. Principal Stress Ratio, σ_1'/σ_3' 4.408
 p' (tsf) 1.685
 q (tsf) 1.062

At Consolidated Undrained Failure

Failure Criterion: 15% Axial Strain
 Axial Strain (%) 15.094
 Deviator Stress (tsf) 3.420
 Minor Principal Stress, σ_3 (tsf) 0.983
 Major Principal Stress, σ_1 (tsf) 4.403
 p (tsf) 2.693
 q (tsf) 1.710

Failure Sketch



Comments _____

Reviewed KG



Consolidated Undrained Triaxial Compression

ASTM D 4767

Project Name US 60 over Cumberland River
 Source R-11, 134+00, 100' Lt. (3.9'-4.4')
 Description Lean Clay with Sand (CL), brown, moist, firm

Project No. 178565011
 Lab ID 20C
 Test ID Set 1-B

Initial Specimen Conditions
 Height (in) 5.768
 Diameter (in) 2.873
 Area (in²) 6.481
 Moist Weight (lb) 2.696
 Moist Unit Weight (pcf) 124.6
 Moisture Content (%) 21.8
 Dry Weight (lb) 2.214
 Dry Unit Weight (pcf) 102.3
 Void Ratio 0.723
 Degree of Saturation (%) 85.3

Consolidated Specimen Conditions
 Height (in) 5.740
 Calculated Diameter (in) 2.830
 Calculated Area (in²) 6.292
 Moist Weight (lb) 2.734
 Moist Unit Weight (pcf) 130.8
 Moisture Content (%) 23.5
 Dry Weight (lb) 2.214
 Dry Unit Weight (pcf) 105.9
 Void Ratio 0.665
 Degree of Saturation (%) 100.0

Specific Gravity 2.83
 ASTM D 854, Dry
 Liquid Limit 33
 Plastic Limit 19
 Plasticity Index 14
 ASTM D 4318
 Confining Stress
 σ_3 (tsf) 0.987

Effective Consolidation Stress
 σ_3' (tsf) 0.987

Moisture contents obtained using partial specimen.

Specimen consolidated cross-sectional area determined using method B.

Membrane corrections have been applied, where $E_m = 200$ lbf/in and $t = 0.012$ in.

All other tests performed in association with this specimen are reported separately.

Project: 178565011			Source: R-11, 134+00, 100' Lt. (3.9'-4.4')									Lab ID: 20C			Test ID	
Test Time (min)	Corr. Axial Load (lbf)	Axial Deform. (in)	Axial Strain (%)	Corr. Area (in ²)	Deviator Stress (tsf)	Corr. Deviator Stress (tsf)	Pore Pressure (tsf)	Induced Pore Pressure (tsf)	σ ₁ (tsf)	σ ₁ ' (tsf)	σ ₃ ' (tsf)	p (tsf)	p' (tsf)	q (tsf)	Eff. Princ. Stress Ratio σ ₁ '/σ ₃ '	
0.0	0.0	0.000	0.00	6.579	0.000	0.000	5.495	0.000	0.987	0.987	0.987	0.987	0.987	0.000	1.000	
0.3	11.8	0.001	0.02	6.580	0.129	0.129	5.550	0.055	1.116	1.061	0.931	1.052	0.996	0.065	1.139	
0.5	20.3	0.003	0.05	6.582	0.223	0.222	5.604	0.109	1.210	1.101	0.878	1.098	0.990	0.111	1.253	
0.8	26.8	0.004	0.07	6.584	0.293	0.293	5.649	0.154	1.280	1.126	0.833	1.133	0.979	0.147	1.352	
1.0	32.8	0.005	0.09	6.585	0.359	0.359	5.688	0.193	1.346	1.153	0.794	1.166	0.973	0.179	1.452	
1.3	38.1	0.007	0.12	6.587	0.417	0.416	5.721	0.226	1.403	1.177	0.761	1.195	0.969	0.208	1.547	
1.5	42.7	0.008	0.14	6.588	0.466	0.466	5.749	0.254	1.453	1.199	0.732	1.220	0.965	0.233	1.636	
1.8	47.3	0.010	0.17	6.590	0.517	0.516	5.773	0.279	1.503	1.225	0.708	1.245	0.967	0.258	1.729	
2.0	51.3	0.011	0.19	6.592	0.561	0.560	5.795	0.300	1.546	1.246	0.686	1.266	0.966	0.280	1.816	
2.3	55.0	0.012	0.22	6.593	0.601	0.600	5.813	0.319	1.587	1.268	0.668	1.287	0.968	0.300	1.898	
2.5	58.5	0.014	0.24	6.594	0.639	0.638	5.830	0.335	1.625	1.290	0.652	1.306	0.971	0.319	1.980	
2.8	61.9	0.015	0.26	6.596	0.676	0.675	5.844	0.349	1.662	1.313	0.638	1.324	0.975	0.338	2.058	
3.1	65.4	0.016	0.28	6.598	0.714	0.713	5.858	0.363	1.700	1.337	0.624	1.344	0.980	0.357	2.143	
3.3	68.6	0.018	0.32	6.600	0.748	0.747	5.870	0.375	1.734	1.359	0.612	1.360	0.986	0.374	2.221	
3.5	71.8	0.019	0.34	6.601	0.783	0.782	5.881	0.387	1.769	1.383	0.600	1.378	0.991	0.391	2.304	
3.8	74.9	0.020	0.35	6.602	0.816	0.816	5.891	0.396	1.802	1.407	0.591	1.395	0.999	0.408	2.380	
4.1	77.9	0.022	0.39	6.604	0.849	0.848	5.899	0.404	1.835	1.430	0.583	1.411	1.007	0.424	2.455	
4.3	80.9	0.023	0.41	6.606	0.882	0.881	5.907	0.412	1.867	1.455	0.574	1.427	1.015	0.440	2.534	
4.6	83.7	0.025	0.44	6.608	0.912	0.910	5.915	0.420	1.897	1.477	0.567	1.442	1.022	0.455	2.606	
4.8	86.4	0.026	0.46	6.609	0.941	0.940	5.921	0.426	1.926	1.500	0.560	1.456	1.030	0.470	2.677	
5.1	89.0	0.028	0.49	6.611	0.969	0.968	5.927	0.432	1.954	1.522	0.554	1.470	1.038	0.484	2.747	
5.3	91.8	0.029	0.51	6.613	1.000	0.998	5.931	0.437	1.985	1.549	0.550	1.486	1.049	0.499	2.815	
5.6	94.4	0.031	0.54	6.614	1.027	1.026	5.936	0.441	2.012	1.571	0.545	1.499	1.058	0.513	2.881	
5.8	97.0	0.032	0.56	6.616	1.056	1.055	5.941	0.446	2.041	1.594	0.540	1.513	1.067	0.527	2.954	
6.1	100.0	0.034	0.59	6.618	1.088	1.086	5.944	0.449	2.072	1.623	0.537	1.529	1.080	0.543	3.024	
6.3	102.1	0.035	0.62	6.620	1.110	1.109	5.947	0.452	2.095	1.642	0.534	1.540	1.088	0.554	3.076	
6.6	104.7	0.037	0.64	6.621	1.139	1.137	5.950	0.455	2.123	1.668	0.531	1.554	1.099	0.568	3.141	
6.8	106.9	0.038	0.66	6.623	1.162	1.161	5.952	0.457	2.146	1.690	0.529	1.566	1.109	0.580	3.194	
7.1	109.5	0.039	0.68	6.624	1.190	1.189	5.953	0.459	2.174	1.716	0.527	1.580	1.122	0.594	3.254	
7.3	111.4	0.041	0.71	6.626	1.211	1.209	5.955	0.460	2.195	1.735	0.526	1.591	1.130	0.604	3.298	
7.6	114.2	0.042	0.74	6.628	1.241	1.239	5.957	0.462	2.225	1.763	0.524	1.605	1.144	0.620	3.364	
7.8	116.3	0.044	0.76	6.629	1.263	1.261	5.959	0.464	2.247	1.783	0.522	1.617	1.153	0.631	3.416	
8.1	118.9	0.045	0.78	6.631	1.291	1.289	5.959	0.464	2.275	1.811	0.522	1.631	1.167	0.645	3.468	
8.4	121.4	0.046	0.81	6.633	1.318	1.316	5.961	0.466	2.302	1.836	0.520	1.644	1.178	0.658	3.530	
8.6	123.9	0.048	0.83	6.634	1.344	1.342	5.961	0.466	2.328	1.862	0.520	1.657	1.191	0.671	3.584	
8.9	126.1	0.049	0.86	6.636	1.368	1.366	5.961	0.466	2.352	1.886	0.520	1.669	1.203	0.683	3.624	
9.1	128.5	0.051	0.88	6.637	1.394	1.392	5.961	0.466	2.378	1.911	0.520	1.682	1.216	0.696	3.679	
9.4	130.8	0.052	0.91	6.640	1.418	1.416	5.961	0.466	2.402	1.936	0.520	1.694	1.228	0.708	3.724	
9.6	132.9	0.054	0.93	6.641	1.441	1.439	5.960	0.465	2.424	1.960	0.521	1.705	1.240	0.719	3.763	

Project: 178565011			Source: R-11, 134+00, 100' Lt. (3.9'-4.4')								Lab ID: 20C		Test ID		
Test Time (min)	Corr. Axial Load (lbf)	Axial Deform. (in)	Axial Strain (%)	Corr. Area (in ²)	Deviator Stress (tsf)	Corr. Deviator Stress (tsf)	Pore Pressure (tsf)	Induced Pore Pressure (tsf)	σ_1 (tsf)	σ_1' (tsf)	σ_3' (tsf)	p (tsf)	p' (tsf)	q (tsf)	Eff. Princ. Stress Ratio σ_1'/σ_3'
9.9	135.4	0.055	0.96	6.643	1.468	1.465	5.959	0.464	2.450	1.986	0.521	1.718	1.253	0.733	3.815
10.1	137.4	0.057	0.99	6.644	1.489	1.487	5.957	0.462	2.473	2.010	0.523	1.729	1.267	0.743	3.842
11.1	146.2	0.062	1.08	6.651	1.582	1.580	5.952	0.457	2.566	2.109	0.529	1.776	1.319	0.790	3.987
12.1	154.7	0.067	1.18	6.657	1.673	1.670	5.944	0.449	2.656	2.207	0.537	1.821	1.372	0.835	4.112
13.1	163.0	0.073	1.28	6.664	1.761	1.758	5.933	0.439	2.744	2.305	0.547	1.865	1.426	0.879	4.213
14.1	171.4	0.079	1.38	6.671	1.849	1.846	5.921	0.426	2.832	2.406	0.560	1.909	1.483	0.923	4.297
15.2	178.6	0.084	1.47	6.677	1.926	1.922	5.906	0.412	2.909	2.497	0.575	1.947	1.536	0.961	4.346
16.1	185.2	0.090	1.57	6.684	1.996	1.992	5.891	0.396	2.978	2.582	0.590	1.982	1.586	0.996	4.377
17.1	191.9	0.096	1.68	6.691	2.065	2.061	5.874	0.379	3.047	2.668	0.606	2.017	1.637	1.031	4.399
18.2	198.0	0.102	1.77	6.697	2.129	2.124	5.857	0.363	3.110	2.748	0.623	2.048	1.685	1.062	4.408
19.2	204.0	0.107	1.87	6.704	2.191	2.187	5.839	0.344	3.173	2.829	0.642	2.079	1.736	1.093	4.405
20.2	209.7	0.113	1.97	6.711	2.250	2.245	5.820	0.325	3.231	2.906	0.661	2.109	1.783	1.123	4.398
21.2	214.6	0.119	2.08	6.719	2.299	2.295	5.802	0.307	3.281	2.973	0.679	2.133	1.826	1.147	4.380
22.2	219.0	0.125	2.17	6.725	2.345	2.339	5.783	0.288	3.325	3.037	0.698	2.156	1.867	1.170	4.353
23.2	223.5	0.130	2.26	6.731	2.391	2.385	5.765	0.270	3.371	3.101	0.716	2.179	1.908	1.193	4.333
24.2	227.6	0.136	2.37	6.738	2.432	2.427	5.746	0.251	3.413	3.162	0.735	2.199	1.948	1.213	4.302
25.2	231.3	0.142	2.47	6.745	2.469	2.463	5.727	0.232	3.449	3.217	0.754	2.218	1.986	1.231	4.265
26.2	235.0	0.147	2.56	6.752	2.506	2.500	5.709	0.214	3.486	3.272	0.772	2.236	2.022	1.250	4.239
27.2	238.5	0.152	2.66	6.758	2.541	2.534	5.692	0.197	3.521	3.324	0.789	2.253	2.056	1.267	4.212
28.2	242.2	0.158	2.76	6.765	2.577	2.571	5.675	0.180	3.557	3.377	0.806	2.272	2.091	1.285	4.190
29.2	245.0	0.164	2.85	6.772	2.605	2.598	5.659	0.164	3.584	3.420	0.822	2.285	2.121	1.299	4.160
30.2	246.9	0.170	2.96	6.779	2.623	2.616	5.643	0.148	3.602	3.453	0.838	2.294	2.146	1.308	4.123
31.2	249.9	0.175	3.06	6.786	2.651	2.644	5.627	0.132	3.630	3.498	0.854	2.308	2.176	1.322	4.098
32.2	252.6	0.181	3.16	6.794	2.677	2.669	5.613	0.119	3.655	3.536	0.867	2.320	2.201	1.335	4.080
33.2	255.5	0.187	3.26	6.800	2.705	2.698	5.598	0.103	3.683	3.580	0.883	2.334	2.232	1.349	4.056
34.2	256.9	0.192	3.35	6.807	2.717	2.709	5.583	0.088	3.695	3.607	0.897	2.340	2.252	1.355	4.019
35.2	259.2	0.198	3.46	6.814	2.738	2.730	5.571	0.076	3.716	3.640	0.909	2.350	2.275	1.365	4.002
36.2	261.4	0.204	3.56	6.821	2.759	2.750	5.558	0.063	3.736	3.673	0.923	2.361	2.298	1.375	3.980
37.2	263.4	0.210	3.66	6.829	2.777	2.768	5.545	0.050	3.754	3.704	0.936	2.370	2.320	1.384	3.958
38.2	265.4	0.216	3.76	6.836	2.796	2.787	5.533	0.038	3.772	3.734	0.947	2.379	2.340	1.393	3.943
39.2	267.0	0.221	3.86	6.843	2.810	2.801	5.520	0.025	3.786	3.761	0.960	2.386	2.361	1.400	3.916
40.3	268.7	0.227	3.95	6.849	2.824	2.815	5.509	0.014	3.800	3.786	0.972	2.393	2.379	1.407	3.897
41.3	270.5	0.233	4.05	6.857	2.841	2.831	5.498	0.003	3.817	3.813	0.982	2.401	2.398	1.415	3.882
42.3	272.6	0.238	4.15	6.864	2.859	2.850	5.486	-0.008	3.836	3.844	0.995	2.411	2.419	1.425	3.865
43.3	274.0	0.244	4.25	6.871	2.871	2.861	5.475	-0.019	3.847	3.866	1.006	2.417	2.436	1.430	3.845
44.3	275.0	0.250	4.35	6.878	2.879	2.868	5.465	-0.029	3.854	3.883	1.015	2.420	2.449	1.434	3.827
45.3	277.0	0.255	4.44	6.885	2.897	2.886	5.455	-0.040	3.872	3.912	1.026	2.429	2.469	1.443	3.814
46.3	278.8	0.261	4.54	6.892	2.913	2.902	5.446	-0.049	3.888	3.937	1.035	2.437	2.486	1.451	3.804
47.3	280.4	0.267	4.65	6.899	2.926	2.915	5.435	-0.059	3.901	3.960	1.045	2.443	2.503	1.457	3.788
48.3	281.9	0.272	4.74	6.907	2.938	2.927	5.426	-0.068	3.913	3.981	1.054	2.449	2.518	1.464	3.777
49.3	283.2	0.278	4.84	6.913	2.950	2.938	5.417	-0.078	3.923	4.001	1.063	2.454	2.532	1.469	3.764
50.3	284.9	0.284	4.94	6.921	2.963	2.951	5.409	-0.086	3.937	4.023	1.072	2.462	2.547	1.476	3.754
52.8	288.5	0.298	5.20	6.940	2.993	2.981	5.388	-0.107	3.966	4.073	1.093	2.476	2.583	1.490	3.728
55.3	291.9	0.312	5.43	6.957	3.022	3.009	5.369	-0.126	3.994	4.119	1.111	2.489	2.615	1.504	3.709
57.8	294.9	0.326	5.69	6.976	3.044	3.030	5.349	-0.145	4.015	4.161	1.131	2.500	2.646	1.515	3.679
60.3	299.7	0.341	5.94	6.994	3.085	3.071	5.333	-0.162	4.056	4.218	1.147	2.521	2.682	1.536	3.678
62.8	302.3	0.354	6.17	7.012	3.104	3.090	5.316	-0.179	4.075	4.254	1.164	2.530	2.709	1.545	3.654
65.3	306.4	0.369	6.43	7.031	3.138	3.122	5.299	-0.195	4.107	4.302	1.180	2.546	2.741	1.561	3.646
67.8	309.2	0.383	6.67	7.049	3.159	3.143	5.284	-0.211	4.127	4.338	1.196	2.556	2.767	1.571	3.628
70.3	311.9	0.397	6.92	7.068	3.177	3.161	5.269	-0.226	4.145	4.372	1.211	2.565	2.791	1.580	3.610
72.8	314.6	0.411	7.17	7.087	3.196	3.179	5.255	-0.240	4.164	4.404	1.225	2.574	2.814	1.589	3.595
75.3	315.7	0.426	7.42	7.106	3.198	3.181	5.240	-0.255	4.166	4.421	1.240	2.575	2.830	1.590	3.565
77.8	318.9	0.440	7.67	7.125	3.222	3.204	5.228	-0.267	4.189	4.456	1.252	2.587	2.854	1.602	3.558
80.3	319.7	0.454	7.92	7.144	3.222	3.203	5.215	-0.280	4.188	4.467	1.265	2.587	2.866	1.601	3.533
82.8	322.6	0.469	8.17	7.164	3.242	3.222	5.202	-0.293	4.207	4.500	1.278	2.596	2.889	1.611	3.522
85.4	323.6	0.483	8.41	7.183	3.244	3.224	5.192	-0.303	4.209	4.512	1.288	2.597	2.900	1.612	3.502
87.9	326.1	0.497	8.66	7.202	3.260	3.239	5.180	-0.315	4.224	4.539	1.300	2.605	2.919	1.620	3.492
90.4	328.1	0.511	8.90	7.222	3.271	3.250	5.168	-0.327	4.233	4.560	1.310	2.608	2.935	1.625	3.480
92.9	329.8	0.525	9.15	7.241	3.280	3.258	5.154	-0.341	4.240	4.581	1.323	2.611	2.952	1.629	3.462
95.4	332.2	0.539	9.39	7.261	3.295	3.272	5.145	-0.350	4.255	4.605	1.333	2.619	2.969	1.636	3.456
97.9	334.4	0.554	9.65	7.281	3.306	3.283	5.134	-0.361	4.265	4.626	1.343	2.624	2.985	1.642	3.445
100.4	336.6	0.567	9.88	7.300	3.320	3.296	5.124	-0.370	4.279	4.649	1.354	2.631	3.002	1.648	3.435
102.9	339.1	0.582	10.14	7.322	3.335	3.311	5.115	-0.380	4.293	4.673	1.363	2.638	3.018	1.655	3.429
105.4	341.4	0.597	10.39	7.342	3.348	3.323	5.107	-0.387	4.306	4.693	1.370	2.645	3.032	1.662	3.425
107.9	342.9	0.610	10.63	7.361	3.353	3.328	5.098	-0.397	4.311	4.708	1.380	2.647	3.044	1.664	3.412
110.4	345.8	0.625	10.88	7.382	3.373	3.347	5.089	-0.405	4.329	4.735	1.388	2.656	3.061	1.673	3.411
112.9	347.5	0.639	11.14	7.403	3.380	3.353	5.080	-0.415	4.337	4.752	1.399	2.660	3.075	1.677	3.398
115.4	349.6	0.653	11.38	7.424	3.390	3.363	5.072	-0.423	4.346	4.769	1.406	2.664	3.087	1.682	3.393
117.9	351.0	0.667	11.62	7.444	3.395	3.367	5.064	-0.431	4.350	4.781	1.414	2.667	3.098	1.684	3.381

Project: 178565011			Source: R-11, 134+00, 100' Lt. (3.9'-4.4')								Lab ID: 20C		Test ID		
Test Time (min)	Corr. Axial Load (lbf)	Axial Deform. (in)	Axial Strain (%)	Corr. Area (in ²)	Deviator Stress (tsf)	Corr. Deviator Stress (tsf)	Pore Pressure (tsf)	Induced Pore Pressure (tsf)	σ_1 (tsf)	σ_1' (tsf)	σ_3' (tsf)	p (tsf)	p' (tsf)	q (tsf)	Eff. Princ. Stress Ratio σ_1'/σ_3'
120.4	353.1	0.681	11.87	7.465	3.406	3.377	5.056	-0.439	4.360	4.799	1.421	2.671	3.110	1.689	3.376
122.9	354.5	0.696	12.12	7.487	3.409	3.380	5.049	-0.446	4.364	4.809	1.429	2.673	3.119	1.690	3.365
125.4	356.1	0.710	12.37	7.508	3.415	3.385	5.041	-0.454	4.368	4.823	1.437	2.676	3.130	1.693	3.355
127.9	356.7	0.724	12.62	7.529	3.411	3.381	5.036	-0.459	4.363	4.823	1.442	2.673	3.132	1.691	3.345
130.4	358.6	0.738	12.86	7.550	3.420	3.389	5.027	-0.467	4.372	4.839	1.451	2.678	3.145	1.694	3.336
132.9	359.3	0.753	13.12	7.572	3.416	3.385	5.020	-0.475	4.367	4.842	1.457	2.675	3.150	1.693	3.323
135.4	360.7	0.766	13.35	7.593	3.420	3.388	5.013	-0.482	4.372	4.854	1.466	2.678	3.160	1.694	3.312
137.9	362.0	0.780	13.60	7.614	3.423	3.391	5.006	-0.488	4.375	4.863	1.472	2.680	3.168	1.695	3.303
140.4	362.3	0.795	13.85	7.636	3.416	3.383	5.000	-0.495	4.367	4.861	1.478	2.675	3.170	1.691	3.288
142.9	364.7	0.809	14.10	7.659	3.428	3.394	4.993	-0.502	4.378	4.880	1.485	2.681	3.182	1.697	3.285
145.4	366.6	0.824	14.35	7.682	3.436	3.402	4.988	-0.507	4.386	4.892	1.490	2.685	3.191	1.701	3.283
147.9	369.1	0.838	14.60	7.703	3.450	3.415	4.984	-0.511	4.398	4.908	1.494	2.690	3.201	1.707	3.286
150.4	369.6	0.852	14.85	7.726	3.444	3.409	4.977	-0.518	4.392	4.910	1.501	2.688	3.206	1.704	3.270
152.9	372.0	0.866	15.09	7.748	3.456	3.420	4.971	-0.524	4.403	4.927	1.507	2.693	3.217	1.710	3.269
155.4	373.8	0.881	15.34	7.771	3.463	3.426	4.964	-0.530	4.410	4.940	1.513	2.696	3.227	1.713	3.264
157.9	375.3	0.895	15.59	7.794	3.467	3.429	4.959	-0.536	4.413	4.949	1.520	2.698	3.234	1.715	3.257
160.4	377.1	0.909	15.84	7.817	3.473	3.435	4.954	-0.541	4.418	4.959	1.524	2.701	3.241	1.718	3.255
162.9	378.6	0.923	16.08	7.840	3.477	3.438	4.949	-0.546	4.421	4.967	1.529	2.702	3.248	1.719	3.249
165.4	380.3	0.938	16.35	7.865	3.481	3.442	4.943	-0.552	4.425	4.977	1.535	2.704	3.256	1.721	3.243
167.9	380.7	0.952	16.59	7.887	3.475	3.436	4.939	-0.555	4.419	4.974	1.538	2.701	3.256	1.718	3.233
170.4	381.7	0.966	16.84	7.911	3.474	3.434	4.933	-0.562	4.416	4.978	1.545	2.700	3.261	1.717	3.223
172.9	380.6	0.980	17.08	7.934	3.454	3.413	4.927	-0.568	4.396	4.963	1.551	2.689	3.257	1.706	3.201
175.5	383.0	0.995	17.33	7.958	3.465	3.424	4.923	-0.572	4.407	4.979	1.555	2.695	3.267	1.712	3.202
178.0	384.4	1.009	17.58	7.982	3.468	3.426	4.919	-0.576	4.409	4.985	1.559	2.696	3.272	1.713	3.197
180.2	384.9	1.022	17.81	8.005	3.462	3.420	4.910	-0.585	4.403	4.987	1.568	2.693	3.278	1.710	3.182



Consolidated Undrained Triaxial Compression

AASHTO T 297

Project Name US 60 over Cumberland River
 Source R-11, 134+00, 100' Lt. (5.8'-6.3')
 Description Lean Clay with Sand (CL), brown, moist, firm
 Specimen Type Intact
 Preparation Wet Mounting

Project No. 178565011
 Lab ID 21B
 Test ID Set 1-C

Date Received 08/27/2019
 Date Tested 09/25/2019

Specific Gravity 2.70
 ASTM D 854, Dry

Liquid Limit 30
 Plastic Limit 19
 Plasticity Index 11
 ASTM D 4318

Target Test Parameters

Nominal Chamber Pressure (psi) 90
 Nominal Back Pressure (psi) 60
 Nominal Consolidation Pressure (psi) 30

Saturation / Consolidation Results

Pore Pressure Parameter B 1.00
 Measured Effective Consol. Stress (tsf) 1.878
 Time to 50% Consolidation (min) 1.85
 Actual Axial Strain Rate of Test (%/min) 0.099

Consolidated Specimen Conditions

Moist Unit Weight (pcf) 127.4
 Moisture Content (%) 23.3
 Dry Unit Weight (pcf) 103.3
 Void Ratio 0.628
 Degree of Saturation (%) 100.0

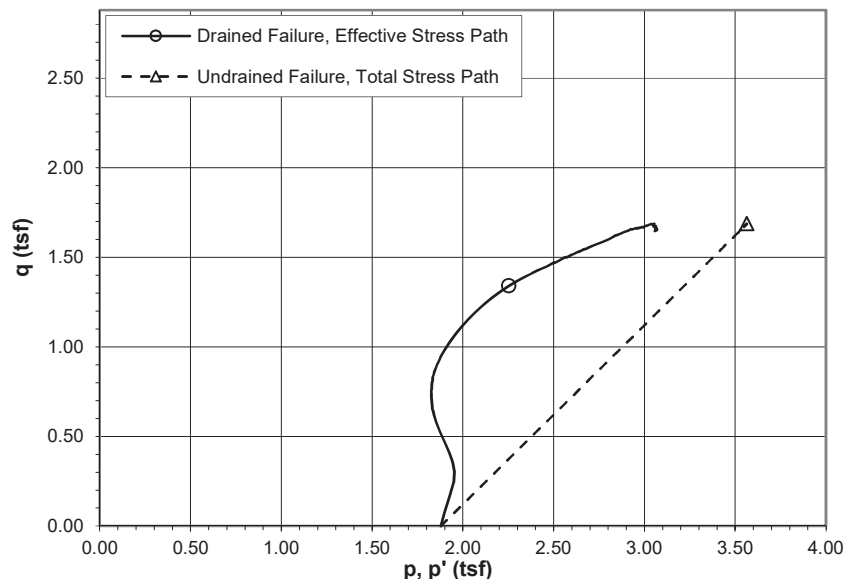
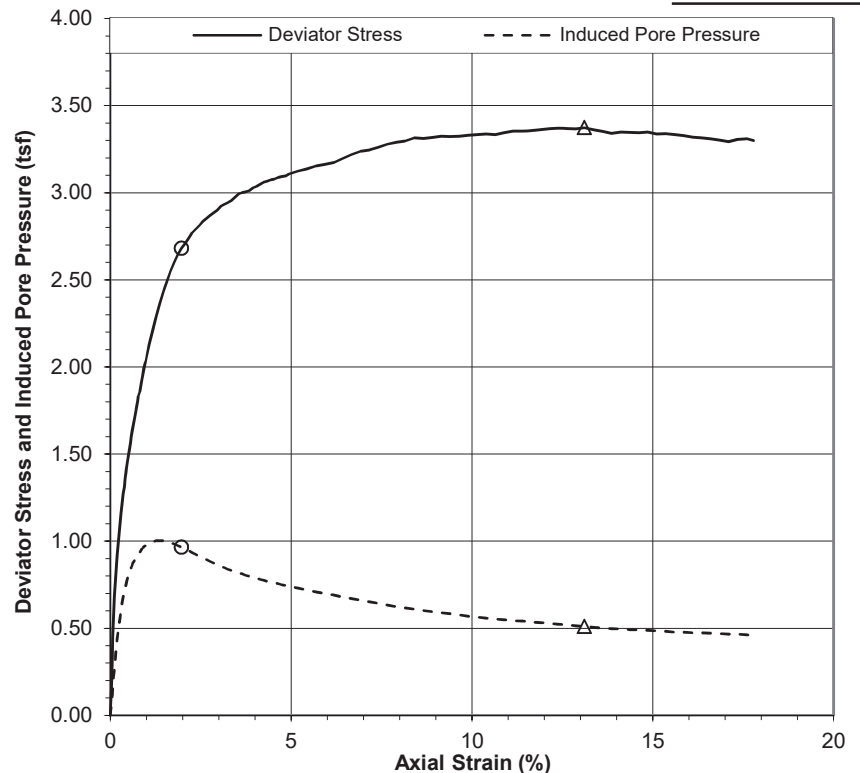
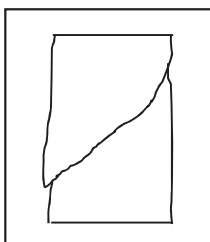
At Drained Failure

Failure Criteria: Max. Eff. Prin. Stress Ratio
 Axial Strain (%) 1.963
 Deviator Stress (tsf) 2.682
 Induced Pore Pressure (tsf) 0.967
 Minor Effective Stress, σ_3' (tsf) 0.912
 Major Effective Stress, σ_1' (tsf) 3.594
 Eff. Principal Stress Ratio, σ_1'/σ_3' 3.939
 p' (tsf) 2.253
 q (tsf) 1.341

At Consolidated Undrained Failure

Failure Criterion: Peak Deviator Stress
 Axial Strain (%) 13.107
 Deviator Stress (tsf) 3.373
 Minor Principal Stress, σ_3 (tsf) 1.877
 Major Principal Stress, σ_1 (tsf) 5.250
 p (tsf) 3.564
 q (tsf) 1.687

Failure Sketch



Comments _____

Reviewed KG



Consolidated Undrained Triaxial Compression

ASTM D 4767

Project Name US 60 over Cumberland River
 Source R-11, 134+00, 100' Lt. (5.8'-6.3')
 Description Lean Clay with Sand (CL), brown, moist, firm

Project No. 178565011
 Lab ID 21B
 Test ID Set 1-C

Initial Specimen Conditions
 Height (in) 5.756
 Diameter (in) 2.866
 Area (in²) 6.453
 Moist Weight (lb) 2.659
 Moist Unit Weight (pcf) 123.7
 Moisture Content (%) 22.2
 Dry Weight (lb) 2.177
 Dry Unit Weight (pcf) 101.3
 Void Ratio 0.662
 Degree of Saturation (%) 90.5

Consolidated Specimen Conditions
 Height (in) 5.697
 Calculated Diameter (in) 2.852
 Calculated Area (in²) 6.388
 Moist Weight (lb) 2.683
 Moist Unit Weight (pcf) 127.4
 Moisture Content (%) 23.3
 Dry Weight (lb) 2.177
 Dry Unit Weight (pcf) 103.3
 Void Ratio 0.628
 Degree of Saturation (%) 100.0

Specific Gravity 2.70
 ASTM D 854, Dry
 Liquid Limit 30
 Plastic Limit 19
 Plasticity Index 11
 ASTM D 4318
 Confining Stress
 σ_3 (tsf) 1.879
 Effective Consolidation Stress
 σ_3' (tsf) 1.879

Moisture contents obtained using partial specimen.

Specimen consolidated cross-sectional area determined using method B.

Membrane corrections have been applied, where $E_m = 200$ lbf/in and $t = 0.012$ in.

All other tests performed in association with this specimen are reported separately.

Project: 178565011			Source: R-11, 134+00, 100' Lt. (5.8'-6.3')								Lab ID: 21B		Test ID		
Test Time (min)	Corr. Axial Load (lbf)	Axial Deform. (in)	Axial Strain (%)	Corr. Area (in ²)	Deviator Stress (tsf)	Corr. Deviator Stress (tsf)	Pore Pressure (tsf)	Induced Pore Pressure (tsf)	σ ₁ (tsf)	σ ₁ ' (tsf)	σ ₃ ' (tsf)	p (tsf)	p' (tsf)	q (tsf)	Eff. Princ. Stress Ratio σ ₁ '/σ ₃ '
0.0	0.0	0.000	0.00	6.493	0.000	0.000	4.578	0.000	1.879	1.879	1.879	1.879	1.879	0.000	1.000
0.2	13.1	0.002	0.03	6.495	0.145	0.145	4.631	0.054	2.025	1.971	1.826	1.952	1.898	0.073	1.080
0.5	29.6	0.003	0.05	6.496	0.328	0.328	4.694	0.116	2.207	2.091	1.763	2.043	1.927	0.164	1.186
0.8	44.0	0.004	0.08	6.498	0.488	0.487	4.751	0.173	2.367	2.194	1.706	2.123	1.950	0.244	1.286
1.0	54.8	0.005	0.09	6.499	0.607	0.607	4.806	0.229	2.486	2.257	1.650	2.183	1.954	0.304	1.368
1.3	63.3	0.007	0.12	6.501	0.701	0.700	4.862	0.284	2.580	2.296	1.595	2.230	1.945	0.350	1.439
1.5	71.0	0.008	0.15	6.502	0.786	0.786	4.918	0.340	2.665	2.325	1.539	2.272	1.932	0.393	1.511
1.8	77.5	0.009	0.16	6.503	0.858	0.858	4.968	0.391	2.737	2.346	1.488	2.308	1.917	0.429	1.576
2.0	83.4	0.011	0.19	6.505	0.923	0.923	5.016	0.438	2.802	2.364	1.441	2.341	1.902	0.461	1.640
2.3	88.7	0.012	0.21	6.507	0.981	0.981	5.059	0.482	2.860	2.378	1.397	2.370	1.888	0.490	1.702
2.5	94.1	0.014	0.24	6.508	1.041	1.041	5.099	0.522	2.920	2.398	1.358	2.400	1.878	0.520	1.767
2.8	98.6	0.015	0.26	6.510	1.091	1.090	5.136	0.559	2.969	2.410	1.320	2.424	1.865	0.545	1.826
3.0	102.9	0.016	0.29	6.511	1.138	1.138	5.170	0.592	3.017	2.424	1.287	2.448	1.856	0.569	1.884
3.3	107.4	0.018	0.31	6.513	1.188	1.187	5.202	0.624	3.066	2.442	1.255	2.473	1.849	0.593	1.945
3.5	111.4	0.019	0.33	6.514	1.232	1.231	5.230	0.652	3.110	2.458	1.227	2.495	1.842	0.615	2.003
3.8	115.4	0.020	0.36	6.516	1.275	1.274	5.258	0.680	3.154	2.474	1.199	2.517	1.836	0.637	2.063
4.0	119.0	0.022	0.39	6.518	1.315	1.314	5.282	0.705	3.193	2.488	1.174	2.536	1.831	0.657	2.119
4.3	123.2	0.023	0.41	6.519	1.361	1.360	5.307	0.729	3.239	2.510	1.150	2.559	1.830	0.680	2.183
4.5	126.6	0.025	0.44	6.521	1.398	1.397	5.328	0.750	3.277	2.526	1.129	2.578	1.828	0.699	2.237
4.8	130.1	0.026	0.45	6.522	1.436	1.435	5.348	0.770	3.314	2.544	1.109	2.597	1.826	0.717	2.293
5.1	133.2	0.027	0.48	6.524	1.469	1.468	5.365	0.788	3.348	2.560	1.092	2.614	1.826	0.734	2.345
5.3	136.3	0.029	0.51	6.526	1.504	1.502	5.382	0.805	3.382	2.577	1.074	2.630	1.826	0.751	2.398
5.6	139.5	0.030	0.53	6.528	1.538	1.537	5.397	0.820	3.417	2.597	1.060	2.648	1.828	0.769	2.450
5.8	142.2	0.032	0.56	6.529	1.568	1.566	5.412	0.834	3.446	2.612	1.045	2.663	1.829	0.783	2.498
6.1	145.2	0.033	0.57	6.530	1.600	1.599	5.426	0.849	3.478	2.630	1.031	2.679	1.830	0.800	2.551
6.3	148.0	0.034	0.61	6.532	1.631	1.630	5.439	0.861	3.509	2.648	1.018	2.694	1.833	0.815	2.601
6.6	150.6	0.036	0.63	6.534	1.660	1.658	5.452	0.875	3.537	2.663	1.004	2.708	1.834	0.829	2.651
6.8	153.3	0.037	0.65	6.536	1.689	1.687	5.462	0.884	3.566	2.682	0.995	2.723	1.838	0.844	2.696
7.1	156.1	0.039	0.68	6.538	1.719	1.718	5.473	0.895	3.597	2.701	0.984	2.738	1.843	0.859	2.746
7.3	159.0	0.041	0.71	6.539	1.750	1.749	5.483	0.905	3.628	2.723	0.974	2.754	1.848	0.874	2.795
7.6	161.4	0.042	0.73	6.541	1.776	1.774	5.491	0.913	3.654	2.741	0.966	2.766	1.853	0.887	2.837
7.8	163.9	0.043	0.75	6.542	1.804	1.802	5.499	0.921	3.681	2.760	0.958	2.780	1.859	0.901	2.882
8.1	166.5	0.044	0.77	6.544	1.833	1.831	5.507	0.929	3.710	2.780	0.950	2.794	1.865	0.915	2.927
8.3	169.1	0.046	0.81	6.546	1.860	1.858	5.515	0.937	3.738	2.801	0.942	2.809	1.872	0.929	2.972
8.6	171.1	0.047	0.83	6.547	1.882	1.880	5.520	0.943	3.759	2.816	0.937	2.819	1.877	0.940	3.006
8.9	174.1	0.049	0.86	6.549	1.914	1.912	5.529	0.951	3.791	2.840	0.928	2.835	1.884	0.956	3.059
9.1	176.2	0.050	0.88	6.550	1.937	1.935	5.535	0.957	3.814	2.857	0.922	2.846	1.889	0.967	3.098
9.4	178.7	0.052	0.90	6.552	1.963	1.961	5.540	0.962	3.840	2.878	0.917	2.860	1.897	0.981	3.140
9.6	181.2	0.053	0.93	6.554	1.990	1.988	5.544	0.967	3.867	2.900	0.912	2.873	1.906	0.994	3.179

Project: 178565011			Source: R-11, 134+00, 100' Lt. (5.8'-6.3')									Lab ID: 21B		Test ID		
Test Time (min)	Corr. Axial Load (lbf)	Axial Deform. (in)	Axial Strain (%)	Corr. Area (in ²)	Deviator Stress (tsf)	Corr. Deviator Stress (tsf)	Pore Pressure (tsf)	Induced Pore Pressure (tsf)	σ ₁ (tsf)	σ ₁ ' (tsf)	σ ₃ ' (tsf)	p (tsf)	p' (tsf)	q (tsf)	Eff. Princ. Stress Ratio σ ₁ '/σ ₃ '	
9.9	183.5	0.054	0.95	6.555	2.016	2.013	5.549	0.972	3.893	2.921	0.907	2.886	1.914	1.007	3.219	
10.1	185.6	0.056	0.98	6.557	2.038	2.036	5.553	0.975	3.915	2.939	0.903	2.897	1.921	1.018	3.253	
11.1	194.3	0.061	1.07	6.563	2.132	2.129	5.566	0.989	4.008	3.020	0.891	2.944	1.955	1.065	3.391	
12.1	202.4	0.067	1.18	6.570	2.218	2.215	5.575	0.998	4.094	3.097	0.882	2.987	1.989	1.108	3.512	
13.1	209.6	0.073	1.28	6.577	2.295	2.292	5.579	1.002	4.171	3.169	0.877	3.025	2.023	1.146	3.613	
14.1	216.7	0.078	1.37	6.583	2.370	2.366	5.580	1.003	4.246	3.243	0.877	3.063	2.060	1.183	3.699	
15.1	223.0	0.084	1.47	6.590	2.437	2.433	5.579	1.002	4.313	3.311	0.878	3.096	2.094	1.217	3.772	
16.1	228.6	0.089	1.57	6.596	2.495	2.491	5.574	0.996	4.370	3.374	0.883	3.125	2.128	1.245	3.821	
17.1	234.0	0.095	1.66	6.602	2.552	2.548	5.569	0.991	4.427	3.436	0.888	3.153	2.162	1.274	3.870	
18.2	239.0	0.101	1.77	6.610	2.604	2.600	5.561	0.984	4.479	3.495	0.895	3.179	2.195	1.300	3.903	
19.2	243.2	0.106	1.86	6.616	2.647	2.642	5.553	0.976	4.521	3.546	0.903	3.200	2.224	1.321	3.925	
20.2	247.1	0.112	1.96	6.623	2.686	2.682	5.544	0.967	4.561	3.594	0.912	3.220	2.253	1.341	3.939	
21.2	249.8	0.118	2.07	6.630	2.713	2.708	5.534	0.957	4.587	3.630	0.922	3.233	2.276	1.354	3.936	
22.2	253.0	0.124	2.17	6.637	2.745	2.739	5.522	0.945	4.618	3.673	0.934	3.249	2.304	1.370	3.933	
23.2	256.0	0.129	2.26	6.643	2.775	2.769	5.511	0.934	4.648	3.714	0.945	3.263	2.329	1.385	3.932	
24.2	258.4	0.135	2.36	6.650	2.797	2.791	5.502	0.924	4.671	3.747	0.955	3.275	2.351	1.396	3.922	
25.2	260.5	0.140	2.46	6.657	2.818	2.812	5.491	0.913	4.690	3.777	0.965	3.284	2.371	1.406	3.912	
26.2	263.1	0.146	2.56	6.663	2.843	2.837	5.480	0.903	4.715	3.813	0.976	3.297	2.395	1.418	3.906	
27.2	264.8	0.151	2.66	6.670	2.859	2.852	5.472	0.895	4.731	3.836	0.984	3.305	2.410	1.426	3.900	
28.2	266.8	0.157	2.76	6.677	2.877	2.871	5.461	0.883	4.749	3.866	0.995	3.314	2.430	1.435	3.885	
29.2	268.5	0.163	2.86	6.684	2.892	2.885	5.451	0.874	4.764	3.891	1.005	3.322	2.448	1.443	3.870	
30.2	270.2	0.169	2.96	6.691	2.908	2.900	5.443	0.865	4.779	3.914	1.014	3.329	2.464	1.450	3.862	
31.2	272.4	0.174	3.05	6.697	2.929	2.921	5.433	0.856	4.800	3.945	1.023	3.340	2.484	1.461	3.855	
32.2	273.9	0.180	3.15	6.704	2.942	2.934	5.426	0.848	4.813	3.964	1.030	3.346	2.497	1.467	3.848	
33.2	275.0	0.185	3.24	6.711	2.950	2.943	5.417	0.840	4.821	3.981	1.039	3.349	2.510	1.471	3.833	
34.2	276.5	0.191	3.35	6.718	2.964	2.956	5.410	0.832	4.834	4.002	1.046	3.356	2.524	1.478	3.827	
35.2	278.6	0.196	3.44	6.724	2.983	2.974	5.402	0.825	4.853	4.028	1.054	3.366	2.541	1.487	3.823	
36.2	280.8	0.202	3.55	6.732	3.003	2.994	5.395	0.817	4.873	4.056	1.061	3.376	2.559	1.497	3.821	
37.2	281.7	0.208	3.64	6.738	3.010	3.001	5.389	0.812	4.880	4.068	1.067	3.379	2.567	1.501	3.813	
38.2	282.3	0.213	3.74	6.745	3.013	3.004	5.381	0.804	4.883	4.079	1.075	3.381	2.577	1.502	3.794	
39.2	283.4	0.219	3.84	6.752	3.022	3.013	5.377	0.799	4.891	4.092	1.080	3.385	2.586	1.506	3.791	
40.2	285.2	0.225	3.95	6.760	3.038	3.029	5.372	0.794	4.908	4.114	1.085	3.393	2.599	1.514	3.791	
41.2	286.3	0.230	4.04	6.766	3.046	3.037	5.365	0.787	4.915	4.128	1.091	3.397	2.610	1.518	3.783	
42.2	287.7	0.236	4.14	6.774	3.058	3.048	5.358	0.780	4.927	4.147	1.098	3.403	2.622	1.524	3.775	
43.2	289.2	0.242	4.24	6.780	3.071	3.061	5.352	0.775	4.940	4.165	1.104	3.409	2.635	1.530	3.771	
44.2	290.0	0.247	4.34	6.787	3.076	3.065	5.347	0.770	4.944	4.174	1.109	3.411	2.642	1.533	3.764	
45.2	291.3	0.253	4.45	6.795	3.086	3.075	5.343	0.765	4.954	4.189	1.114	3.417	2.651	1.538	3.762	
46.2	291.8	0.258	4.53	6.801	3.089	3.078	5.338	0.760	4.957	4.197	1.118	3.418	2.657	1.539	3.753	
47.2	293.0	0.264	4.64	6.809	3.098	3.087	5.333	0.756	4.966	4.210	1.123	3.422	2.666	1.544	3.750	
48.2	293.9	0.270	4.74	6.816	3.104	3.093	5.327	0.750	4.972	4.222	1.129	3.425	2.675	1.546	3.739	
49.2	294.6	0.276	4.85	6.824	3.109	3.097	5.324	0.746	4.976	4.230	1.133	3.427	2.681	1.549	3.734	
50.2	295.9	0.281	4.94	6.830	3.119	3.107	5.320	0.743	4.985	4.243	1.136	3.432	2.689	1.553	3.735	
52.7	298.3	0.296	5.19	6.848	3.136	3.124	5.308	0.730	5.002	4.271	1.148	3.440	2.710	1.562	3.721	
55.3	300.5	0.310	5.44	6.866	3.151	3.138	5.296	0.719	5.016	4.297	1.160	3.447	2.728	1.569	3.706	
57.8	302.9	0.324	5.68	6.884	3.168	3.154	5.287	0.709	5.033	4.324	1.170	3.456	2.747	1.577	3.697	
60.3	304.6	0.338	5.93	6.902	3.177	3.163	5.278	0.700	5.041	4.341	1.178	3.459	2.759	1.582	3.686	
62.8	306.6	0.352	6.18	6.921	3.189	3.174	5.268	0.690	5.052	4.362	1.188	3.465	2.775	1.587	3.672	
65.3	309.5	0.366	6.42	6.938	3.212	3.197	5.257	0.680	5.075	4.395	1.199	3.477	2.797	1.598	3.667	
67.8	312.6	0.380	6.67	6.957	3.235	3.219	5.247	0.669	5.098	4.429	1.210	3.488	2.819	1.610	3.661	
70.3	315.3	0.394	6.92	6.976	3.254	3.238	5.238	0.661	5.116	4.455	1.217	3.497	2.836	1.619	3.660	
72.8	316.9	0.408	7.17	6.994	3.262	3.245	5.230	0.653	5.123	4.471	1.226	3.501	2.848	1.622	3.647	
75.3	319.3	0.422	7.41	7.012	3.278	3.260	5.221	0.643	5.139	4.496	1.235	3.509	2.865	1.630	3.640	
77.8	322.0	0.436	7.66	7.031	3.297	3.279	5.211	0.633	5.157	4.524	1.245	3.518	2.885	1.640	3.633	
80.3	323.9	0.450	7.90	7.050	3.308	3.289	5.202	0.625	5.168	4.543	1.254	3.523	2.898	1.644	3.623	
82.8	325.5	0.464	8.15	7.069	3.316	3.296	5.194	0.616	5.175	4.558	1.262	3.527	2.910	1.648	3.611	
85.3	328.4	0.479	8.41	7.089	3.336	3.316	5.187	0.610	5.194	4.584	1.269	3.536	2.927	1.658	3.613	
87.8	328.9	0.493	8.66	7.108	3.332	3.311	5.180	0.602	5.189	4.587	1.276	3.533	2.931	1.655	3.596	
90.3	330.5	0.507	8.90	7.127	3.339	3.317	5.173	0.595	5.195	4.600	1.283	3.536	2.941	1.659	3.586	
92.8	332.1	0.522	9.15	7.147	3.346	3.324	5.166	0.589	5.202	4.613	1.289	3.540	2.951	1.662	3.578	
95.3	332.9	0.535	9.39	7.166	3.345	3.323	5.160	0.583	5.200	4.617	1.295	3.539	2.956	1.661	3.566	
97.8	334.1	0.550	9.65	7.187	3.347	3.324	5.154	0.576	5.202	4.626	1.302	3.540	2.964	1.662	3.553	
100.3	335.6	0.564	9.90	7.206	3.353	3.329</										

Project: 178565011			Source: R-11, 134+00, 100' Lt. (5.8'-6.3')								Lab ID: 21B			Test ID		
Test Time (min)	Corr. Axial Load (lbf)	Axial Deform. (in)	Axial Strain (%)	Corr. Area (in ²)	Deviator Stress (tsf)	Corr. Deviator Stress (tsf)	Pore Pressure (tsf)	Induced Pore Pressure (tsf)	σ ₁ (tsf)	σ ₁ ' (tsf)	σ ₃ ' (tsf)	p (tsf)	p' (tsf)	q (tsf)	Eff. Princ. Stress Ratio σ ₁ '/σ ₃ '	
120.4	347.1	0.677	11.89	7.369	3.392	3.363	5.110	0.532	5.241	4.709	1.345	3.559	3.027	1.682	3.500	
122.9	348.5	0.691	12.12	7.388	3.396	3.367	5.105	0.528	5.244	4.716	1.349	3.561	3.033	1.684	3.495	
125.4	349.9	0.705	12.38	7.410	3.399	3.370	5.101	0.524	5.247	4.723	1.353	3.562	3.038	1.685	3.490	
127.9	350.7	0.719	12.62	7.430	3.398	3.368	5.096	0.519	5.245	4.727	1.359	3.561	3.043	1.684	3.479	
130.4	351.6	0.733	12.87	7.452	3.398	3.367	5.092	0.514	5.244	4.729	1.363	3.560	3.046	1.683	3.470	
132.9	353.3	0.747	13.11	7.472	3.405	3.373	5.087	0.509	5.250	4.741	1.368	3.564	3.054	1.687	3.466	
135.4	353.3	0.762	13.37	7.495	3.394	3.362	5.082	0.505	5.239	4.734	1.373	3.558	3.054	1.681	3.449	
137.9	353.4	0.776	13.62	7.516	3.385	3.353	5.078	0.501	5.230	4.729	1.376	3.554	3.053	1.676	3.436	
140.4	353.3	0.790	13.86	7.537	3.375	3.342	5.075	0.498	5.219	4.721	1.380	3.548	3.050	1.671	3.422	
142.9	355.1	0.804	14.12	7.560	3.382	3.348	5.074	0.496	5.225	4.729	1.381	3.551	3.055	1.674	3.425	
145.4	355.9	0.818	14.36	7.582	3.380	3.346	5.070	0.492	5.223	4.730	1.385	3.550	3.057	1.673	3.416	
147.9	357.0	0.833	14.62	7.604	3.380	3.345	5.068	0.491	5.223	4.732	1.387	3.550	3.059	1.673	3.413	
150.4	358.4	0.847	14.86	7.626	3.383	3.348	5.066	0.488	5.224	4.736	1.389	3.551	3.062	1.674	3.411	
152.9	358.4	0.861	15.11	7.648	3.374	3.338	5.063	0.485	5.214	4.729	1.392	3.546	3.061	1.669	3.398	
155.4	359.7	0.875	15.35	7.670	3.377	3.340	5.060	0.482	5.217	4.734	1.395	3.547	3.065	1.670	3.395	
157.9	360.2	0.890	15.62	7.695	3.371	3.333	5.055	0.478	5.210	4.732	1.399	3.543	3.066	1.667	3.382	
160.4	360.7	0.903	15.85	7.716	3.366	3.328	5.055	0.477	5.205	4.727	1.399	3.541	3.063	1.664	3.378	
162.9	360.9	0.917	16.10	7.739	3.358	3.319	5.051	0.473	5.196	4.723	1.404	3.536	3.063	1.659	3.365	
165.4	361.5	0.931	16.35	7.762	3.354	3.314	5.051	0.473	5.191	4.718	1.404	3.534	3.061	1.657	3.361	
167.9	362.1	0.945	16.59	7.785	3.349	3.309	5.049	0.471	5.186	4.715	1.406	3.531	3.060	1.655	3.354	
170.4	362.4	0.960	16.84	7.808	3.342	3.302	5.046	0.469	5.178	4.709	1.408	3.528	3.059	1.651	3.345	
172.9	362.7	0.974	17.10	7.832	3.335	3.293	5.044	0.466	5.170	4.704	1.410	3.523	3.057	1.647	3.335	
175.4	365.3	0.988	17.34	7.855	3.348	3.306	5.043	0.465	5.183	4.718	1.411	3.530	3.065	1.653	3.343	
177.9	366.8	1.002	17.59	7.879	3.352	3.310	5.039	0.462	5.186	4.725	1.415	3.531	3.070	1.655	3.339	
180.0	366.4	1.013	17.79	7.898	3.341	3.298	5.035	0.458	5.175	4.717	1.419	3.526	3.068	1.649	3.324	

One-Dimensional Consolidation Testing with Reconstructions



One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name US 60 over Cumberland River
 Source R-11, 134+00, 100' Lt, 2.5'-4.5' (4.2'-4.3')
 Description Lean Clay with Sand (CL), brown, moist, firm
 Specimen Type Undisturbed

Project No. 178565011
 Lab ID 20
 Date Received 08/27/2019

LL 33 Specific Gravity 2.83 ASTM D 854, Dry
 PL 19
 PI 14

Prepared Using Cutting Ring
 Test Method A (24 hr.)
 Test Condition Inundated at 0.05 tsf

Initial Specimen Conditions

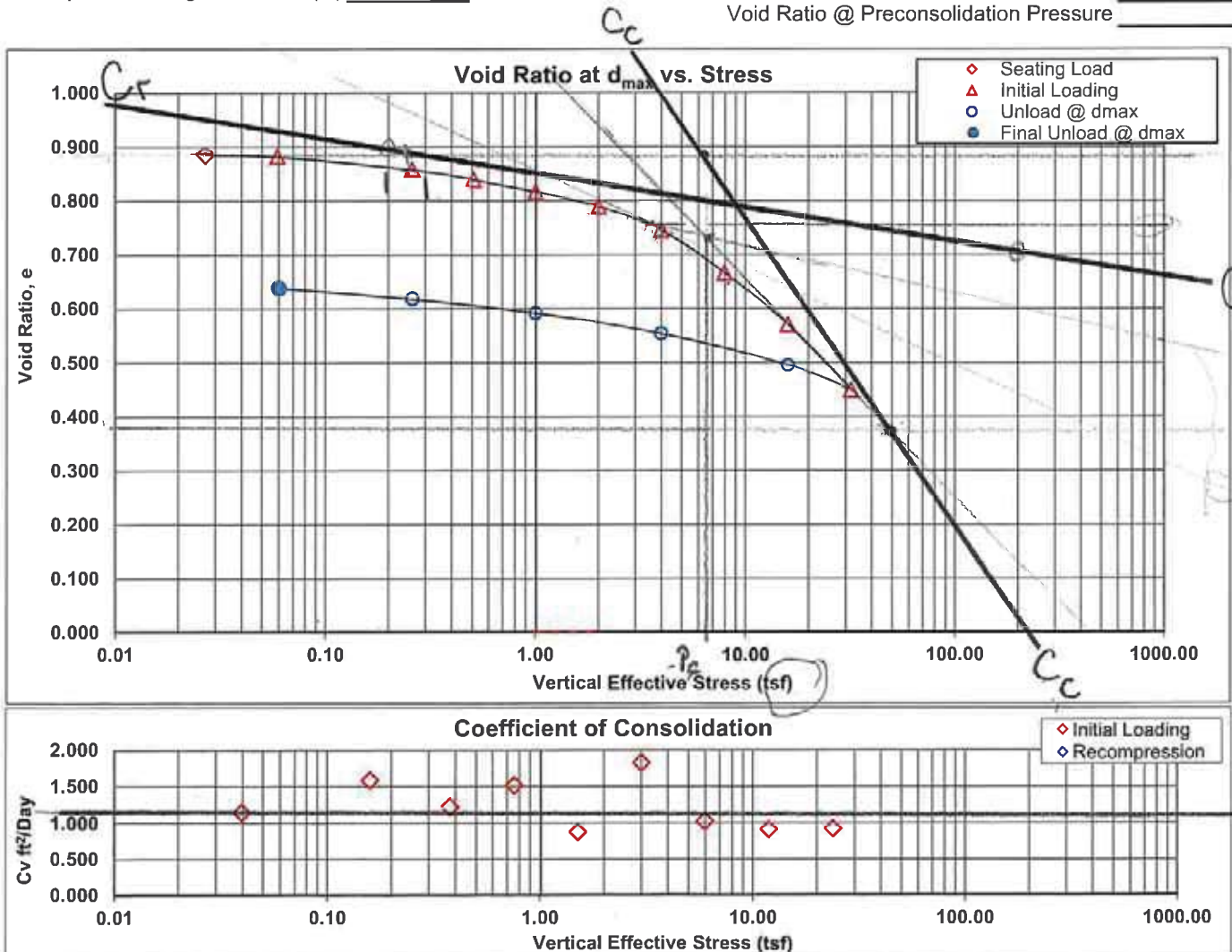
Moisture Content (%) 23.4
 Dry Unit Weight (pcf) 93.5
 Void Ratio 0.885
 Degree of Saturation (%) 74.9
 Initial Specimen Height (in) 1.0073

Final Specimen Conditions

Moisture Content (%) 21.4
 Dry Unit Weight (pcf) 107.6
 Void Ratio 0.638
 Degree of Saturation (%) 94.8
 Final Specimen Height (in) 0.8757

Equivalent Height of Solids (in) 0.534

Preconsolidation Pressure* (tsf) _____
 Void Ratio @ Preconsolidation Pressure _____



Comments _____

Reviewed By RHB



One Dimensional Consolidation of Soils Using Incremental Loading ASTM D 2435

Project Name US 60 over Cumberland River
 Source R-11, 134+00, 100' Lt, 5.0'-7.0' (6.6'-6.7')
 Description Lean Clay with Sand (CL), brown, moist, firm
 Specimen Type Undisturbed

Project No. 178565011
 Lab ID 21
 Date Received 08/27/2019

LL 30 Specific Gravity 2.72 ASTM D 854, Dry
 PL 19
 PI 11

Prepared Using Cutting Ring
 Test Method A (24 hr.)
 Test Condition Inundated at 0.05 tsf

Initial Specimen Conditions

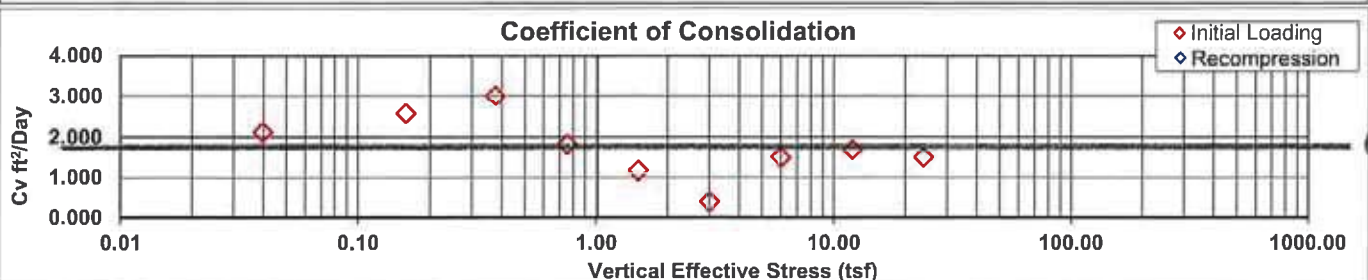
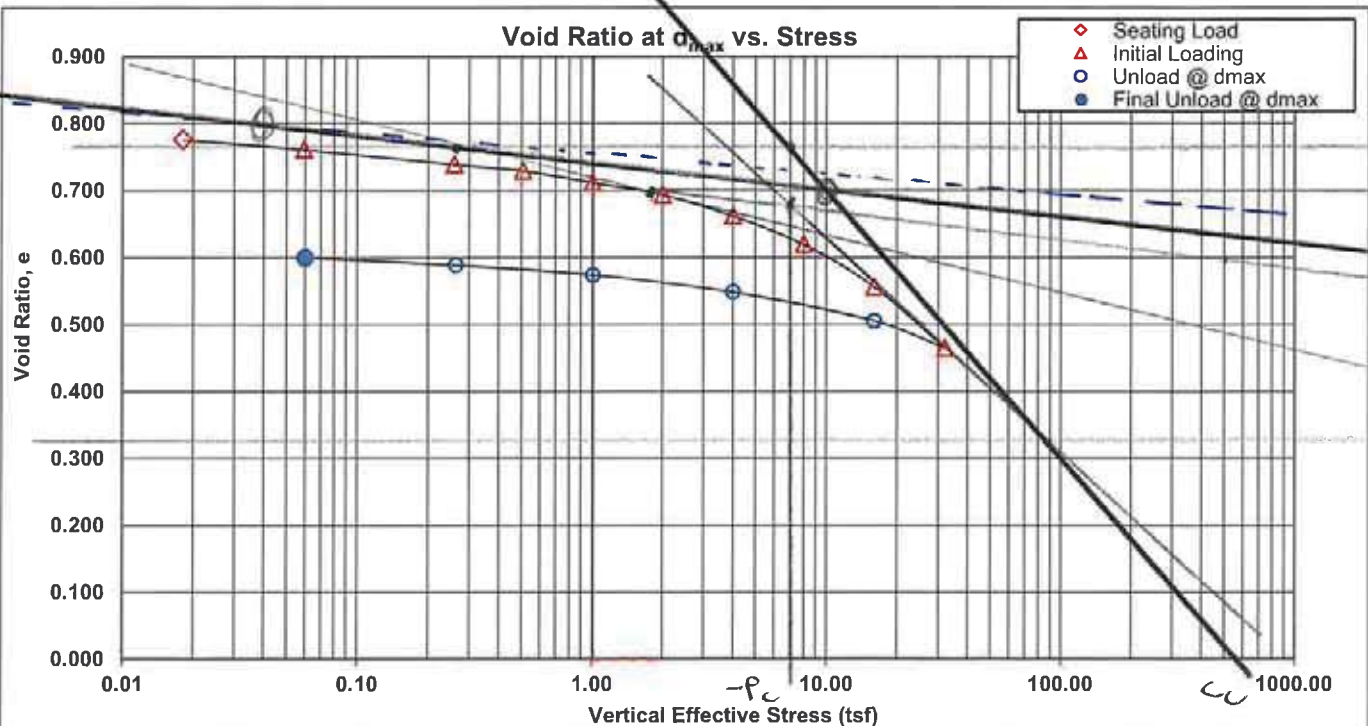
Moisture Content (%) 20.9
 Dry Unit Weight (pcf) 95.4
 Void Ratio 0.776
 Degree of Saturation (%) 73.1
 Initial Specimen Height (in) 1.0063

Final Specimen Conditions

Moisture Content (%) 20.2
 Dry Unit Weight (pcf) 105.9
 Void Ratio 0.600
 Degree of Saturation (%) 91.6
 Final Specimen Height (in) 0.9066

Equivalent Height of Solids (in) 0.567

Preconsolidation Pressure* (tsf) _____
 Void Ratio @ Preconsolidation Pressure _____



Comments _____

Reviewed By RHB



One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name US 60 over Cumberland River
 Source 1028, 134+00, 20' LT, 10.0'-12.0'
 Description Sandy Clay(CL) sand, brown, moist, soft
 Specimen Type Undisturbed

Project No. 178565011
 Lab ID 209B
 Date Received 10/03/2019

LL 34 Specific Gravity 2.79 ASTM D 854, Dry
 PL 17
 PI 17

Prepared Using Cutting Ring
 Test Method A (24 hr.)
 Test Condition Inundated at 0.05 tsf

Initial Specimen Conditions

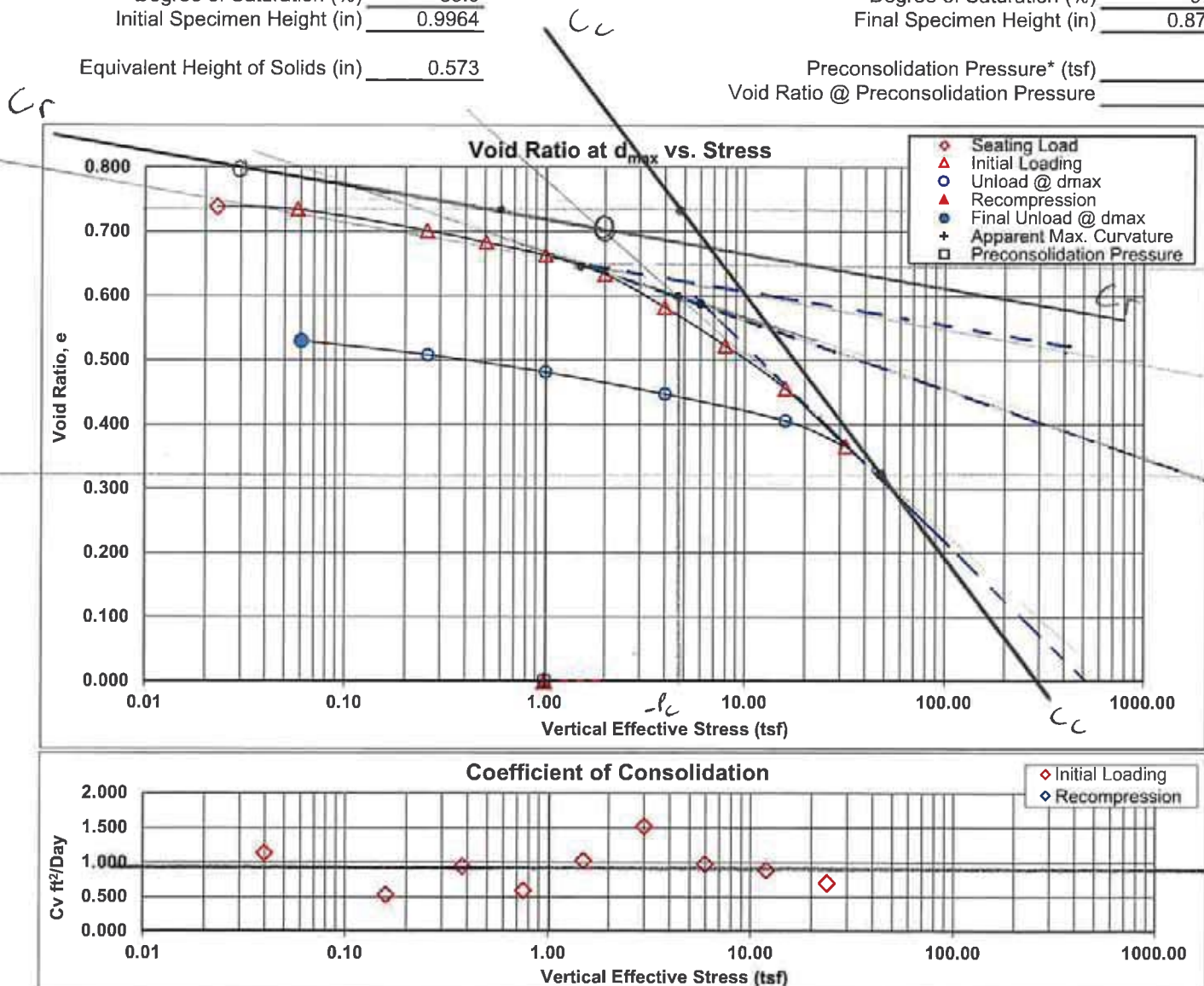
Moisture Content (%) 23.6
 Dry Unit Weight (pcf) 100.0
 Void Ratio 0.739
 Degree of Saturation (%) 89.0
 Initial Specimen Height (in) 0.9964

Final Specimen Conditions

Moisture Content (%) 18.5
 Dry Unit Weight (pcf) 113.6
 Void Ratio 0.530
 Degree of Saturation (%) 97.2
 Final Specimen Height (in) 0.8770

Equivalent Height of Solids (in) 0.573

Preconsolidation Pressure* (tsf) _____
 Void Ratio @ Preconsolidation Pressure _____



Comments _____

Reviewed By RHB



One Dimensional Consolidation of Soils Using Incremental Loading ASTM D 2435

Project Name US 60 over Cumberland River
 Source 1028, 134+00, 20' LT, 41.5'-43.5'
 Description Lean Clay (CL), gray, moist, soft
 Specimen Type Undisturbed

Project No. 178565011
 Lab ID 218C
 Date Received 10/03/2019

LL 46 Specific Gravity 2.77 ASTM D 854, Dry
 PL 21
 PI 25

Prepared Using Cutting Ring
 Test Method A (24 hr.)
 Test Condition Inundated at 0.05 tsf

Initial Specimen Conditions

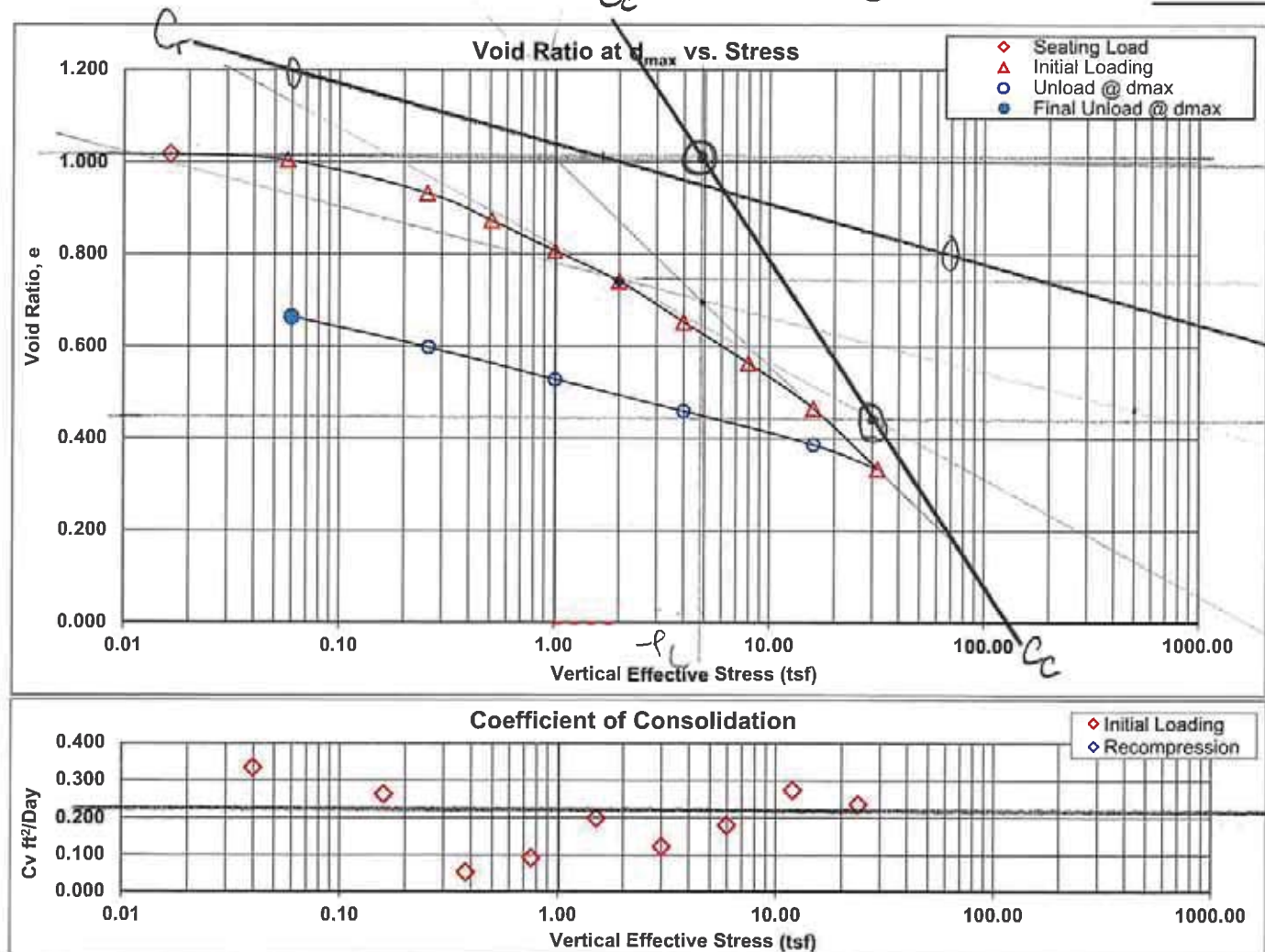
Moisture Content (%) 40.0
 Dry Unit Weight (pcf) 85.5
 Void Ratio 1.018
 Degree of Saturation (%) 108.9
 Initial Specimen Height (in) 0.9743

Final Specimen Conditions

Moisture Content (%) 28.8
 Dry Unit Weight (pcf) 103.7
 Void Ratio 0.664
 Degree of Saturation (%) 120.0
 Final Specimen Height (in) 0.8037

Equivalent Height of Solids (in) 0.483

Preconsolidation Pressure* (tsf) _____
 Void Ratio @ Preconsolidation Pressure _____



Comments _____

Reviewed By RHB



One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name US 60 over Cumberland River
 Source 1028, 134+00, 20' LT, 50.0'-52.0'
 Description Lean Clay (CL), gray, moist, soft
 Specimen Type Undisturbed

Project No. 178565011
 Lab ID 220
 Date Received 10/03/2019

LL 38 Specific Gravity 2.79 ASTM D 854, Dry
 PL 18
 PI 20

Prepared Using Cutting Ring
 Test Method A (24 hr.)
 Test Condition Inundated at 0.05 tsf

Initial Specimen Conditions

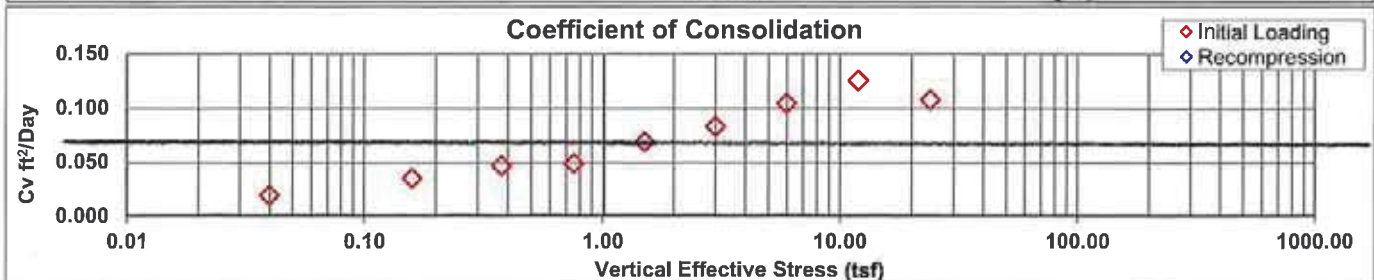
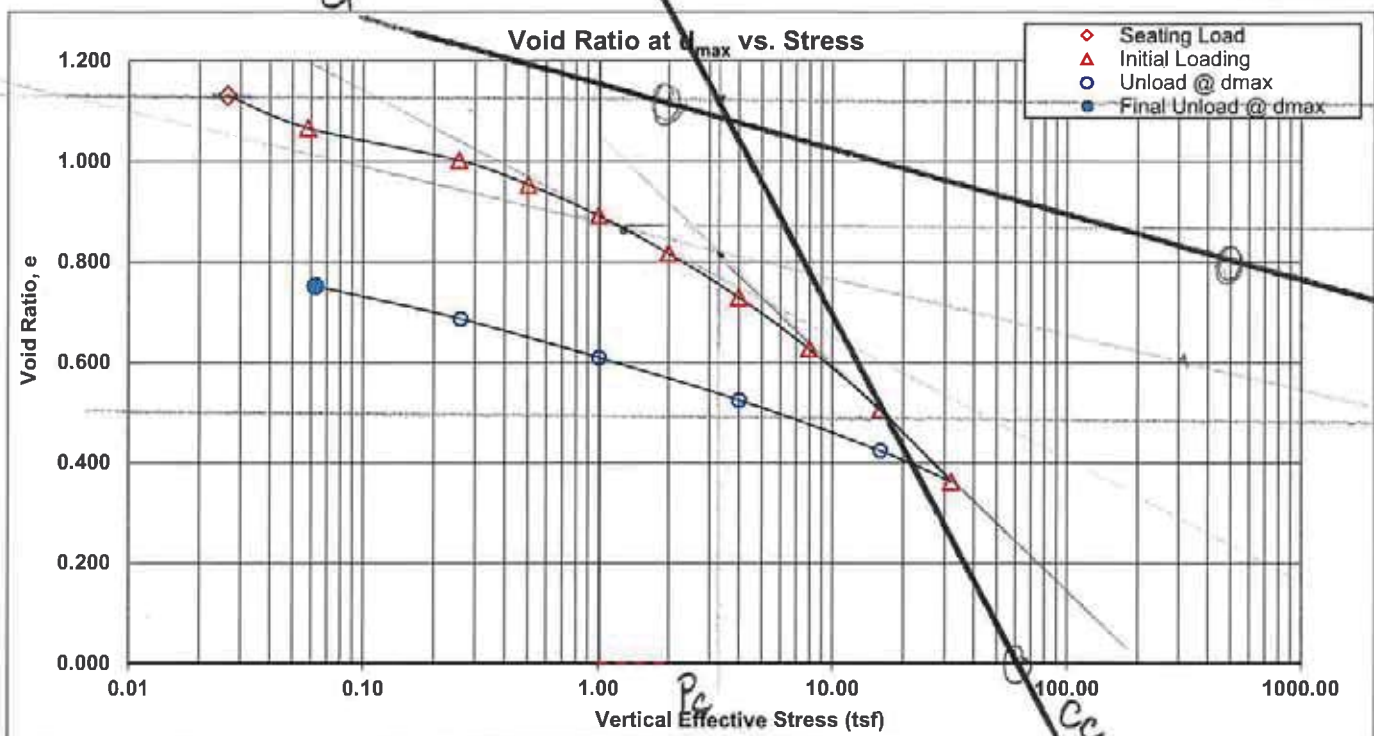
Moisture Content (%) 39.6
 Dry Unit Weight (pcf) 81.6
 Void Ratio 1.131
 Degree of Saturation (%) 97.7
 Initial Specimen Height (in) 1.0007

Final Specimen Conditions

Moisture Content (%) 30.3
 Dry Unit Weight (pcf) 99.2
 Void Ratio 0.752
 Degree of Saturation (%) 112.6
 Final Specimen Height (in) 0.8229

Equivalent Height of Solids (in) 0.470

Preconsolidation Pressure* (tsf) _____
 Void Ratio @ Preconsolidation Pressure _____



Comments _____

Reviewed By RHB



One Dimensional Consolidation of Soils Using Incremental Loading

ASTM D 2435

Project Name US 60 over Cumberland River
 Source 1028, 134+00, 20' LT, 105.0'-106.3'
 Description Lean Clay (CL), gray, moist, soft, sand
 Specimen Type Undisturbed

Project No. 178565011
 Lab ID 234B
 Date Received 10/03/2019

LL 39 Specific Gravity 2.7 ASTM D 854, Dry
 PL 18
 PI 21

Prepared Using Cutting Ring
 Test Method A (24 hr.)
 Test Condition Inundated at 0.05 tsf

Initial Specimen Conditions

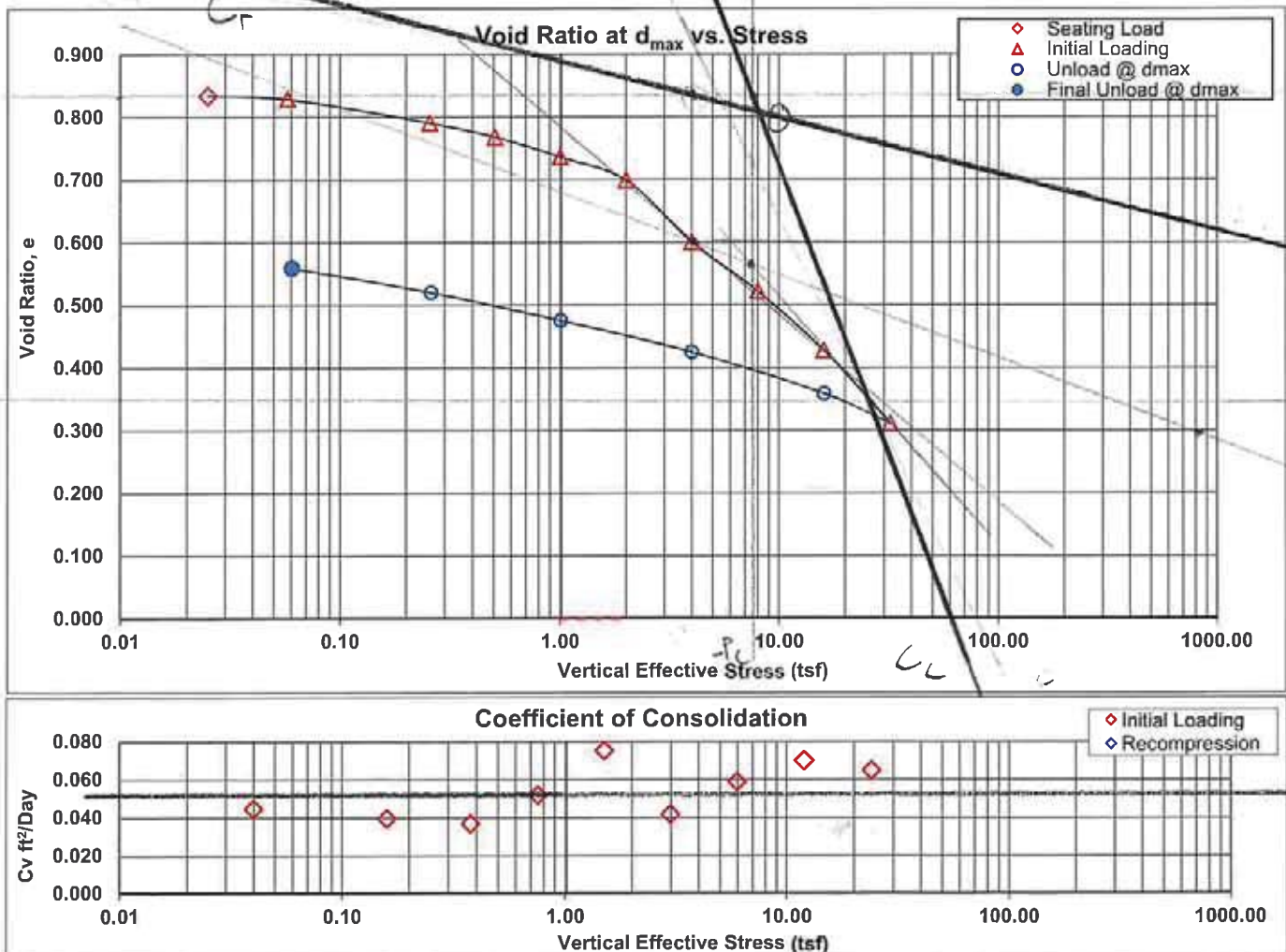
Moisture Content (%) 30.5
 Dry Unit Weight (pcf) 91.7
 Void Ratio 0.834
 Degree of Saturation (%) 98.8
 Initial Specimen Height (in) 1.0007

Final Specimen Conditions

Moisture Content (%) 22.6
 Dry Unit Weight (pcf) 107.9
 Void Ratio 0.559
 Degree of Saturation (%) 108.9
 Final Specimen Height (in) 0.8509

Equivalent Height of Solids (in) 0.546

Preconsolidation Pressure* (tsf) _____
 Void Ratio @ Preconsolidation Pressure _____



Comments _____

Reviewed By RHB

APPENDIX D

Cone Penetration Data Report

PRESENTATION OF SITE INVESTIGATION RESULTS

US60 Bridge Livingston County, Kentucky

Prepared for:

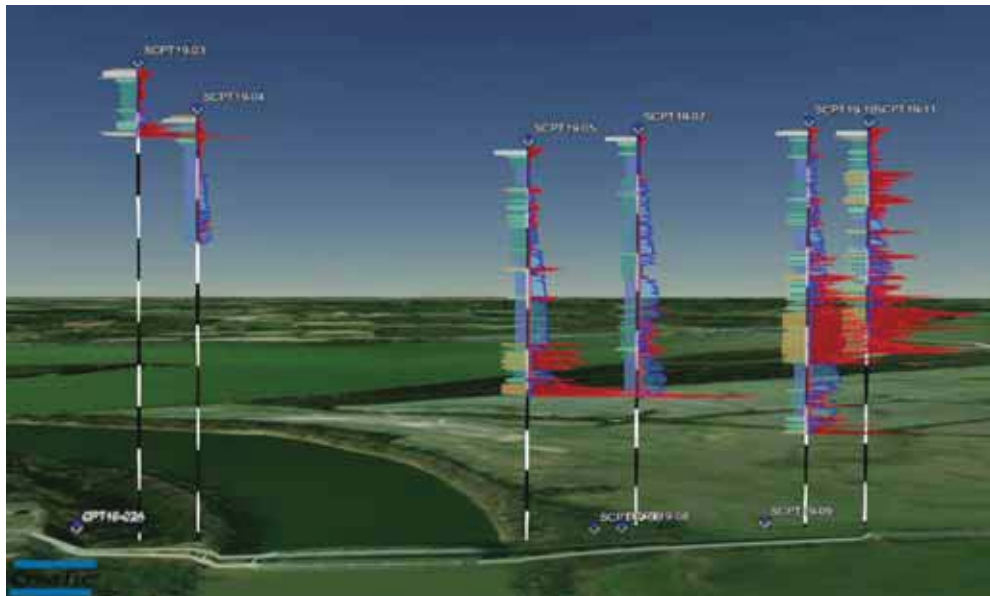
Stantec

ConeTec Job No: 19-61032

Project Start Date: 20-Aug-2019

Project End Date: 23-Aug-2019

Report Date: 12-Sep-2019



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Introduction

The enclosed report presents the results of a piezocone penetration testing (CPTu or CPT) and seismic piezocone penetration testing (SCPTu or SCPT) program carried out at the US60 Bridge site located in Livingston County, Kentucky. The site investigation program was conducted by ConeTec Inc. (ConeTec), under contract to Stantec of Louisville, Kentucky.

A total of 1 cone penetration tests and 9 seismic cone penetration tests were completed at 12 locations (one location had three attempts but kept hitting shallow refusals). The CPT and SCPT program was performed to evaluate the subsurface soil conditions. CPT and SCPT sounding locations were selected and numbered under supervision of Stantec personnel (Mr. Kurt Schaefer).

Project Information

Project	
Client	Stantec
Project	US60 Bridge, Livingston County, KY
ConeTec project number	19-61032

A map from CESIUM including the CPT test locations is presented below.



Rig Description	Deployment System	Test Type
CPT Track Rig	20 ton track mounted (twin cylinders)	CPT and SCPT

Coordinates		
Test Type	Collection Method	EPSG Number
CPT and SCPT	GPS (GlobalSat MR-350)	32616 (WGS 84 / UTM North)

Cone Penetration Test (CPT)	
Depth reference	Ground surface at the time of the investigation.
Tip and sleeve data offset	0.1 meter. This has been accounted for in the CPT data files.
Pore pressure dissipation (PPD) tests	Four pore pressure dissipation tests were completed primarily to determine the phreatic surface.
Additional Comments	Shear wave velocity tests were conducted at fifteen-foot depth intervals at nine locations.
Additional plots	Advanced, seismic and Soil Behavior Type (SBT) scatter plots are included in the data release package.

Cone Description	Cone Number	Cross Sectional Area (cm ²)	Sleeve Area (cm ²)	Tip Capacity (bar)	Sleeve Capacity (bar)	Pore Pressure Capacity (psi)
513:T1500F15U500	513	15	225	1500	15	500

CPT Calculated Parameters	
Additional information	The Normalized Soil Behavior Type Chart based on Q_{tn} (SBT Q_{tn}) (Robertson, 2009) was used to classify the soil for this project. A detailed set of calculated CPT parameters have been generated and are provided in Excel format files in the release folder. The CPT parameter calculations are based on values of corrected tip resistance (q_t) sleeve friction (f_s) and pore pressure (u_2). Effective stresses are calculated based on unit weights that have been assigned to the individual soil behavior type zones and the assumed equilibrium pore pressure profile. Soils were classified as either drained or undrained based on the Q_{tn} Normalized Soil Behavior Type Chart (Robertson, 2009). Calculations for both drained and undrained parameters were included for materials that classified as silt mixtures – clayey silt to silty clay (zone 4).

Limitations

This report has been prepared for the exclusive use of Stantec (Client) for the project titled "US60 Bridge, Livingston County, KY". The report's contents may not be relied upon by any other party without the express written permission of ConeTec. ConeTec has provided site investigation services, prepared the factual data reporting, and provided geotechnical parameter calculations consistent with current best practices. No other warranty, expressed or implied, is made.

The information presented in the report document and the accompanying data set pertain to the specific project, site conditions and objectives described to ConeTec by the Client. In order to properly understand the factual data, assumptions and calculations, reference must be made to the documents provided and their accompanying data sets, in their entirety.



Cone penetration tests (CPTu) are conducted using an integrated electronic piezocone penetrometer and data acquisition system manufactured by Adara Systems Ltd., a subsidiary of ConeTec.

ConeTec's piezocone penetrometers are compression type designs in which the tip and friction sleeve load cells are independent and have separate load capacities. The piezocones use strain gauged load cells for tip and sleeve friction and a strain gauged diaphragm type transducer for recording pore pressure. The piezocones also have a platinum resistive temperature device (RTD) for monitoring the temperature of the sensors, an accelerometer type dual axis inclinometer and a geophone sensor for recording seismic signals. All signals are amplified down hole within the cone body and the analog signals are sent to the surface through a shielded cable.

ConeTec penetrometers are manufactured with various tip, friction and pore pressure capacities in both 10 cm² and 15 cm² tip base area configurations in order to maximize signal resolution for various soil conditions. The specific piezocone used for each test is described in the CPT summary table presented in the first appendix. The 15 cm² penetrometers do not require friction reducers as they have a diameter larger than the deployment rods. The 10 cm² piezocones use a friction reducer consisting of a rod adapter extension behind the main cone body with an enlarged cross sectional area (typically 44 mm diameter over a length of 32 mm with tapered leading and trailing edges) located at a distance of 585 mm above the cone tip.

The penetrometers are designed with equal end area friction sleeves, a net end area ratio of 0.8 and cone tips with a 60 degree apex angle.

All ConeTec piezocones can record pore pressure at various locations. Unless otherwise noted, the pore pressure filter is located directly behind the cone tip in the "u₂" position (ASTM Type 2). The filter is 6 mm thick, made of porous plastic (polyethylene) having an average pore size of 125 microns (90-160 microns). The function of the filter is to allow rapid movements of extremely small volumes of water needed to activate the pressure transducer while preventing soil ingress or blockage.

The piezocone penetrometers are manufactured with dimensions, tolerances and sensor characteristics that are in general accordance with the current ASTM D5778 standard. ConeTec's calibration criteria also meet or exceed those of the current ASTM D5778 standard. An illustration of the piezocone penetrometer is presented in Figure CPTu.

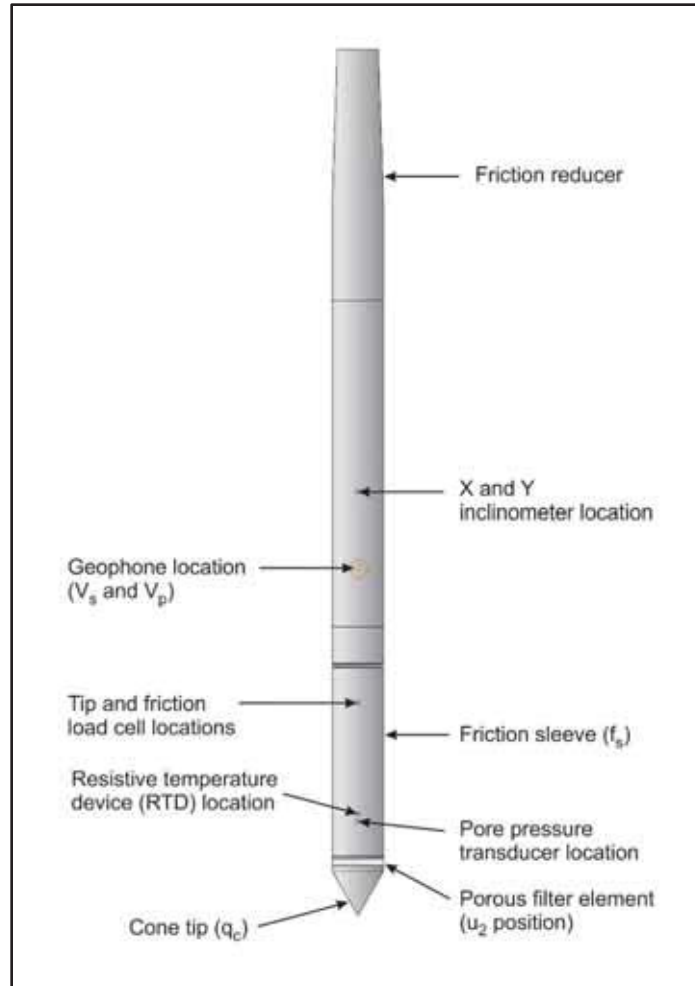


Figure CPTu. Piezocone Penetrometer (15 cm²)

The ConeTec data acquisition systems consist of a Windows based computer and a signal conditioner and power supply interface box with a 16 bit (or greater) analog to digital (A/D) converter. The data is recorded at fixed depth increments using a depth wheel attached to the push cylinders or by using a spring loaded rubber depth wheel that is held against the cone rods. The typical recording interval is 2.5 cm; custom recording intervals are possible. The system displays the CPTu data in real time and records the following parameters to a storage media during penetration:

- Depth
- Uncorrected tip resistance (q_c)
- Sleeve friction (f_s)
- Dynamic pore pressure (u)
- Additional sensors such as resistivity, passive gamma, ultra violet induced fluorescence, if applicable

All testing is performed in accordance to ConeTec's CPT operating procedures which are in general accordance with the current ASTM D5778 standard.

Prior to the start of a CPTu sounding a suitable cone is selected, the cone and data acquisition system are powered on, the pore pressure system is saturated with either glycerin or silicone oil and the baseline readings are recorded with the cone hanging freely in a vertical position.

The CPTu is conducted at a steady rate of 2 cm/s, within acceptable tolerances. Typically one meter length rods with an outer diameter of 1.5 inches are added to advance the cone to the sounding termination depth. After cone retraction final baselines are recorded.

Additional information pertaining to ConeTec's cone penetration testing procedures:

- Each filter is saturated in silicone oil under vacuum pressure prior to use
- Recorded baselines are checked with an independent multi-meter
- Baseline readings are compared to previous readings
- Soundings are terminated at the client's target depth or at a depth where an obstruction is encountered, excessive rod flex occurs, excessive inclination occurs, equipment damage is likely to take place, or a dangerous working environment arises
- Differences between initial and final baselines are calculated to ensure zero load offsets have not occurred and to ensure compliance with ASTM standards

The interpretation of piezocone data for this report is based on the corrected tip resistance (q_t), sleeve friction (f_s) and pore water pressure (u). The interpretation of soil type is based on the correlations developed by Robertson et al. (1986) and Robertson (1990, 2009). It should be noted that it is not always possible to accurately identify a soil behavior based on these parameters. In these situations, experience, judgment and an assessment of other parameters may be used to infer soil behavior type.

The recorded tip resistance (q_c) is the total force acting on the piezocone tip divided by its base area. The tip resistance is corrected for pore pressure effects and termed corrected tip resistance (q_t) according to the following expression presented in Robertson et al. (1986):

$$q_t = q_c + (1-a) \cdot u_2$$

where: q_t is the corrected tip resistance

q_c is the recorded tip resistance

u_2 is the recorded dynamic pore pressure behind the tip (u_2 position)

a is the Net Area Ratio for the piezocone (0.8 for ConeTec probes)

The sleeve friction (f_s) is the frictional force on the sleeve divided by its surface area. As all ConeTec piezocones have equal end area friction sleeves, pore pressure corrections to the sleeve data are not required.

The dynamic pore pressure (u) is a measure of the pore pressures generated during cone penetration. To record equilibrium pore pressure, the penetration must be stopped to allow the dynamic pore pressures to stabilize. The rate at which this occurs is predominantly a function of the permeability of the soil and the diameter of the cone.

The friction ratio (R_f) is a calculated parameter. It is defined as the ratio of sleeve friction to the tip resistance expressed as a percentage. Generally, saturated cohesive soils have low tip resistance, high friction ratios and generate large excess pore water pressures. Cohesionless soils have higher tip resistances, lower friction ratios and do not generate significant excess pore water pressure.

A summary of the CPTu soundings along with test details and individual plots are provided in the appendices. A set of files with calculated geotechnical parameters were generated for each sounding based on published correlations and are provided in Excel format in the data release folder. Information regarding the methods used is also included in the data release folder.

For additional information on CPTu interpretations and calculated geotechnical parameters, refer to Robertson et al. (1986), Lunne et al. (1997), Robertson (2009), Mayne (2013, 2014) and Mayne and Peuchen (2012).

References

ASTM D5778-12, 2012, "Standard Test Method for Performing Electronic Friction Cone and Piezocone Penetration Testing of Soils", ASTM, West Conshohocken, US.

Lunne, T., Robertson, P.K. and Powell, J. J. M., 1997, "Cone Penetration Testing in Geotechnical Practice", Blackie Academic and Professional.

Mayne, P.W., 2013, "Evaluating yield stress of soils from laboratory consolidation and in-situ cone penetration tests", Sound Geotechnical Research to Practice (Holtz Volume) GSP 230, ASCE, Reston/VA: 406-420.

Mayne, P.W. and Peuchen, J., 2012, "Unit weight trends with cone resistance in soft to firm clays", Geotechnical and Geophysical Site Characterization 4, Vol. 1 (Proc. ISC-4, Pernambuco), CRC Press, London: 903-910.

Mayne, P.W., 2014, "Interpretation of geotechnical parameters from seismic piezocone tests", CPT'14 Keynote Address, Las Vegas, NV, May 2014.

Robertson, P.K., Campanella, R.G., Gillespie, D. and Greig, J., 1986, "Use of Piezometer Cone Data", Proceedings of InSitu 86, ASCE Specialty Conference, Blacksburg, Virginia.

Robertson, P.K., 1990, "Soil Classification Using the Cone Penetration Test", Canadian Geotechnical Journal, Volume 27: 151-158.

Robertson, P.K., 2009, "Interpretation of cone penetration tests – a unified approach", Canadian Geotechnical Journal, Volume 46: 1337-1355.

Shear wave velocity (V_s) testing is performed in conjunction with the piezocone penetration test (SCPTu) in order to collect interval velocities. For some projects seismic compression wave velocity (V_p) testing is also performed.

ConeTec's piezocone penetrometers are manufactured with a horizontally active geophone (28 hertz) that is rigidly mounted in the body of the cone penetrometer, 0.2 meters behind the cone tip.

Shear waves are typically generated by using an impact hammer horizontally striking a beam that is held in place by a normal load. In some instances an auger source or an imbedded impulsive source maybe used for both shear waves and compression waves. The hammer and beam act as a contact trigger that initiates the recording of the seismic wave traces. For impulsive devices an accelerometer trigger may be used. The traces are recorded using an up-hole integrated digital oscilloscope which is part of the SCPTu data acquisition system. An illustration of the shear wave testing configuration is presented in Figure SCPTu-1.

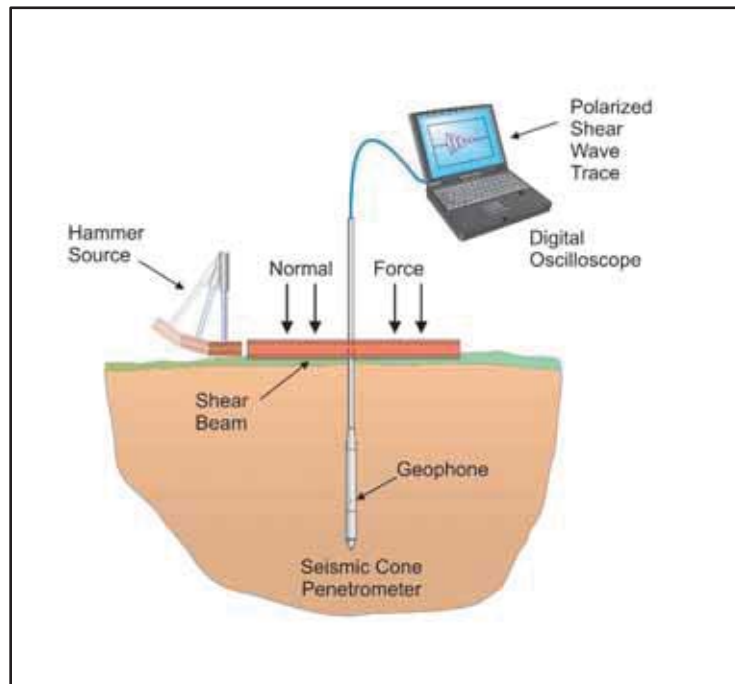


Figure SCPTu-1. Illustration of the SCPTu system

All testing is performed in accordance to ConeTec's SCPTu operating procedures which are in general accordance with the current ASTM 5778 and ASTM D7400 standards.

Prior to the start of a SCPTu sounding, the procedures described in the Cone Penetration Test section are followed. In addition, the active axis of the geophone is aligned parallel to the beam (or source) and the horizontal offset between the cone and the source is measured and recorded.

Prior to recording seismic waves at each test depth, cone penetration is stopped and the rods are decoupled from the rig to avoid transmission of rig energy down the rods. Typically, five wave traces for each orientation are recorded for quality control purposes and uncertainty analysis. After reviewing wave traces for consistency the cone is pushed to the next test depth (typically one meter intervals or as requested by the client). Figure SCPTu-2 presents an illustration of a SCPTu test.

For additional information on seismic cone penetration testing refer to Robertson et. al. (1986).

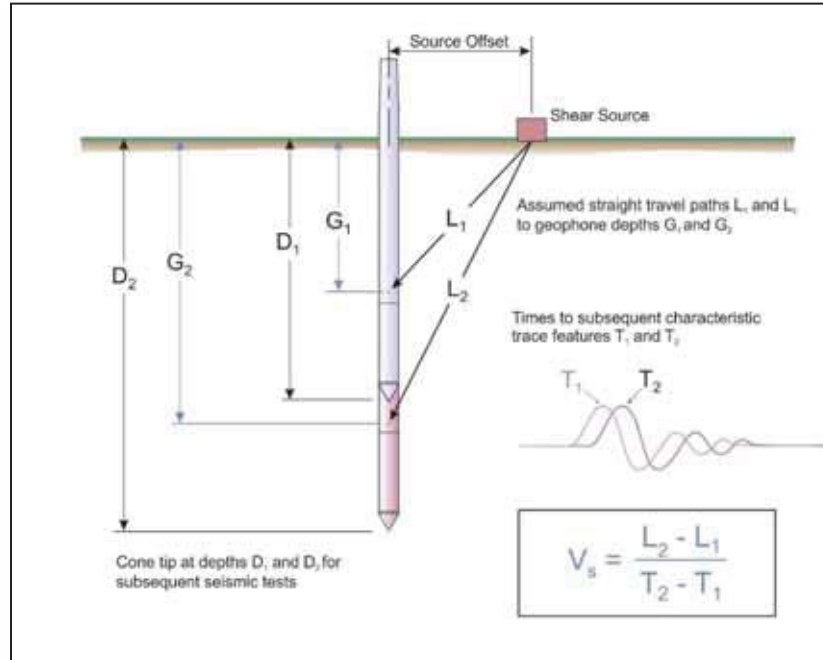


Figure SCPTu-2. Illustration of a seismic cone penetration test

Calculation of the interval velocities are performed by visually picking a common feature (e.g. the first characteristic peak, trough, or crossover) on all of the recorded wave sets and taking the difference in ray path divided by the time difference between subsequent features. Ray path is defined as the straight line distance from the seismic source to the geophone, accounting for beam offset, source depth and geophone offset from the cone tip.

The average shear wave velocity to a depth of 100 feet (30 meters) ($\bar{v}_s$) has been calculated and provided for all applicable soundings using the following equation presented in ASCE (2010).

$$\bar{v}_s = \frac{\sum_{i=1}^n d_i}{\sum_{i=1}^n \frac{d_i}{v_{si}}}$$

where: $\bar{v}_s$ = average shear wave velocity ft/s (m/s)
 d_i = the thickness of any layer between 0 and 100 ft (30 m)
 v_{si} = the shear wave velocity in ft/s (m/s)
 $\sum_{i=1}^n d_i = 100 \text{ ft (30 m)}$

Average shear wave velocity, $\bar{v}_s$ is also referenced to V_{s100} or V_{s30} .

The layer travel times refers to the travel times propagating in the vertical direction, not the measured travel times from an offset source.

Tabular results and SCPTu plots are presented in the relevant appendix.

References

American Society of Civil Engineers (ASCE), 2010, "Minimum Design Loads for Buildings and Other Structures", Standard ASCE/SEI 7-10, American Society of Civil Engineers, ISBN 978-0-7844-1085-1, Reston, Virginia.

ASTM D5778-12, 2012, "Standard Test Method for Performing Electronic Friction Cone and Piezocone Penetration Testing of Soils", ASTM, West Conshohocken, US.

ASTM D7400-14, 2014, "Standard Test Methods for Downhole Seismic Testing", ASTM, West Conshohocken, US.

Robertson, P.K., Campanella, R.G., Gillespie D and Rice, A., 1986, "Seismic CPT to Measure In-Situ Shear Wave Velocity", Journal of Geotechnical Engineering ASCE, Vol. 112, No. 8: 791-803.

The cone penetration test is halted at specific depths to carry out pore pressure dissipation (PPD) tests, shown in Figure PPD-1. For each dissipation test the cone and rods are decoupled from the rig and the data acquisition system measures and records the variation of the pore pressure (u) with time (t).

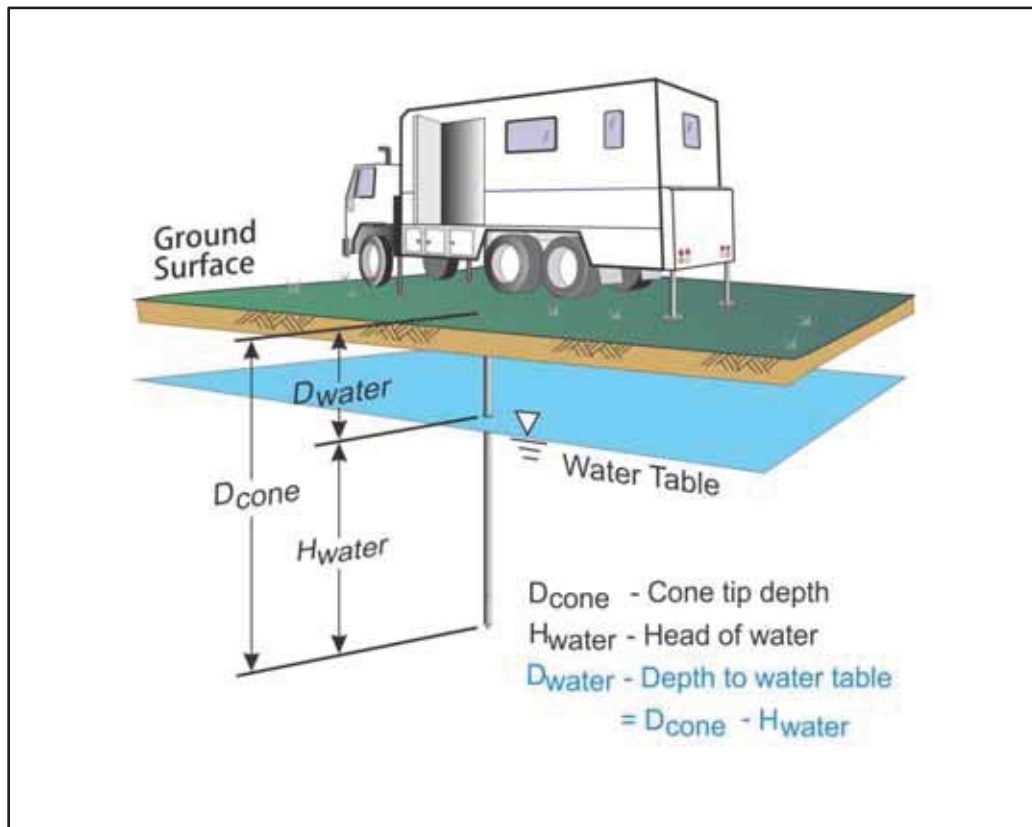


Figure PPD-1. Pore pressure dissipation test setup

Pore pressure dissipation data can be interpreted to provide estimates of ground water conditions, permeability, consolidation characteristics and soil behavior.

The typical shapes of dissipation curves shown in Figure PPD-2 are very useful in assessing soil type, drainage, in situ pore pressure and soil properties. A flat curve that stabilizes quickly is typical of a freely draining sand. Undrained soils such as clays will typically show positive excess pore pressure and have long dissipation times. Dilative soils will often exhibit dynamic pore pressures below equilibrium that then rise over time. Overconsolidated fine-grained soils will often exhibit an initial dilatory response where there is an initial rise in pore pressure before reaching a peak and dissipating.

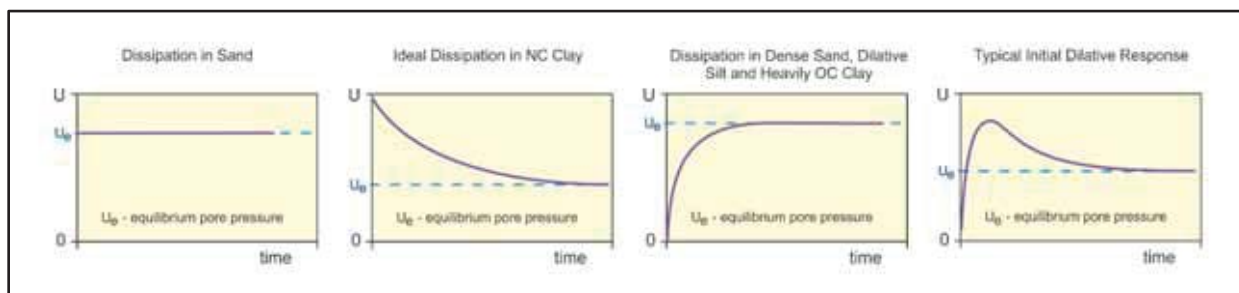


Figure PPD-2. Pore pressure dissipation curve examples

In order to interpret the equilibrium pore pressure (u_{eq}) and the apparent phreatic surface, the pore pressure should be monitored until such time as there is no variation in pore pressure with time as shown for each curve in Figure PPD-2.

In fine grained deposits the point at which 100% of the excess pore pressure has dissipated is known as t_{100} . In some cases this can take an excessive amount of time and it may be impractical to take the dissipation to t_{100} . A theoretical analysis of pore pressure dissipations by Teh and Houlsby (1991) showed that a single curve relating degree of dissipation versus theoretical time factor (T^*) may be used to calculate the coefficient of consolidation (c_h) at various degrees of dissipation resulting in the expression for c_h shown below.

$$c_h = \frac{T^* \cdot a^2 \cdot \sqrt{I_r}}{t}$$

Where:

- T^* is the dimensionless time factor (Table Time Factor)
 a is the radius of the cone
 I_r is the rigidity index
 t is the time at the degree of consolidation

Table Time Factor. T^* versus degree of dissipation (Teh and Houlsby (1991))

Degree of Dissipation (%)	20	30	40	50	60	70	80
$T^* (u_2)$	0.038	0.078	0.142	0.245	0.439	0.804	1.60

The coefficient of consolidation is typically analyzed using the time (t_{50}) corresponding to a degree of dissipation of 50% (u_{50}). In order to determine t_{50} , dissipation tests must be taken to a pressure less than u_{50} . The u_{50} value is half way between the initial maximum pore pressure and the equilibrium pore pressure value, known as u_{100} . To estimate u_{50} , both the initial maximum pore pressure and u_{100} must be known or estimated. Other degrees of dissipations may be considered, particularly for extremely long dissipations.

At any specific degree of dissipation the equilibrium pore pressure (u at t_{100}) must be estimated at the depth of interest. The equilibrium value may be determined from one or more sources such as measuring the value directly (u_{100}), estimating it from other dissipations in the same profile, estimating the phreatic surface and assuming hydrostatic conditions, from nearby soundings, from client provided information, from site observations and/or past experience, or from other site instrumentation.

For calculations of c_h (Teh and Houlsby (1991)), t_{50} values are estimated from the corresponding pore pressure dissipation curve and a rigidity index (I_r) is assumed. For curves having an initial dilatory response in which an initial rise in pore pressure occurs before reaching a peak, the relative time from the peak value is used in determining t_{50} . In cases where the time to peak is excessive, t_{50} values are not calculated.

Due to possible inherent uncertainties in estimating I_r , the equilibrium pore pressure and the effect of an initial dilatory response on calculating t_{50} , other methods should be applied to confirm the results for c_h .

Additional published methods for estimating the coefficient of consolidation from a piezocone test are described in Burns and Mayne (1998, 2002), Jones and Van Zyl (1981), Robertson et al. (1992) and Sully et al. (1999).

A summary of the pore pressure dissipation tests and dissipation plots are presented in the relevant appendix.

References

Burns, S.E. and Mayne, P.W., 1998, "Monotonic and dilatory pore pressure decay during piezocone tests", Canadian Geotechnical Journal 26 (4): 1063-1073.

Burns, S.E. and Mayne, P.W., 2002, "Analytical cavity expansion-critical state model cone dissipation in fine-grained soils", Soils & Foundations, Vol. 42(2): 131-137.

Jones, G.A. and Van Zyl, D.J.A., 1981, "The piezometer probe: a useful investigation tool", Proceedings, 10th International Conference on Soil Mechanics and Foundation Engineering, Vol. 3, Stockholm: 489-495.

Robertson, P.K., Sully, J.P., Woeller, D.J., Lunne, T., Powell, J.J.M. and Gillespie, D.G., 1992, "Estimating coefficient of consolidation from piezocone tests", Canadian Geotechnical Journal, 29(4): 551-557.

Sully, J.P., Robertson, P.K., Campanella, R.G. and Woeller, D.J., 1999, "An approach to evaluation of field CPTU dissipation data in overconsolidated fine-grained soils", Canadian Geotechnical Journal, 36(2): 369-381.

Teh, C.I., and Houlsby, G.T., 1991, "An analytical study of the cone penetration test in clay", Geotechnique, 41(1): 17-34.

The appendices listed below are included in the report:

- Cone Penetration Test Summary and Standard Cone Penetration Test Plots
- Advanced Cone Penetration Test Plots
- Soil Behavior Type (SBT) Scatter Plots
- Seismic Cone Penetration Test Plots
- Seismic Cone Penetration Test Time Domain Traces
- Seismic Cone Penetration Test Tabular Results
- Pore Pressure Dissipation Summary and Pore Pressure Dissipation Plots

Cone Penetration Test Summary and Standard Cone Penetration Test Plots



Job No: 19-61032
Client: Stantec
Project: US60 Bridge, Livingston County, KY
Start Date: 20-Aug-2019
End Date: 23-Aug-2019

CONE PENETRATION TEST SUMMARY

Sounding ID	File Name	Date	Cone	Assumed Phreatic Surface ¹ (ft)	Final Depth (ft)	Shear Wave Velocity Tests	Northing ² (m)	Easting ² (m)	Refer to Notation Number
CPT19-02	19-61032_CP02	22-Aug-2019	513:T1500F15U500	31.0	5.58		4112078	375659	4
CPT19-02A	19-61032_CP02A	22-Aug-2019	513:T1500F15U500	31.0	7.05		4112078	375656	4
CPT19-02B	19-61032_CP02B	22-Aug-2019	513:T1500F15U500	31.0	14.60		4112078	375661	4
SCPT19-03	19-61032_SP03	23-Aug-2019	513:T1500F15U500	31.0	26.25	2	4112118	375665	4
SCPT19-04	19-61032_SP04	23-Aug-2019	513:T1500F15U500	31.0	50.03	4	4112156	375670	
SCPT19-05	19-61032_SP05	20-Aug-2019	513:T1500F15U500	13.8	100.89	7	4112378	375709	3
SCPT19-06	19-61032_SP06	20-Aug-2019	513:T1500F15U500	8.2	94.82	7	4112426	375716	
SCPT19-07	19-61032_SP07	21-Aug-2019	513:T1500F15U500	3.7	109.74	8	4112461	375709	3
SCPT19-08	19-61032_SP08	21-Aug-2019	513:T1500F15U500	9.3	116.14	8	4112444	375723	
SCPT19-09	19-61032_SP09	21-Aug-2019	513:T1500F15U500	9.6	79.56	6	4112545	375744	
SCPT19-10	19-61032_SP10	21-Aug-2019	513:T1500F15U500	13.5	126.80	9	4112576	375747	3
SCPT19-11	19-61032_SP11	22-Aug-2019	513:T1500F15U500	14.5	93.50	7	4112619	375756	
Totals	12 soundings				824.96	58			

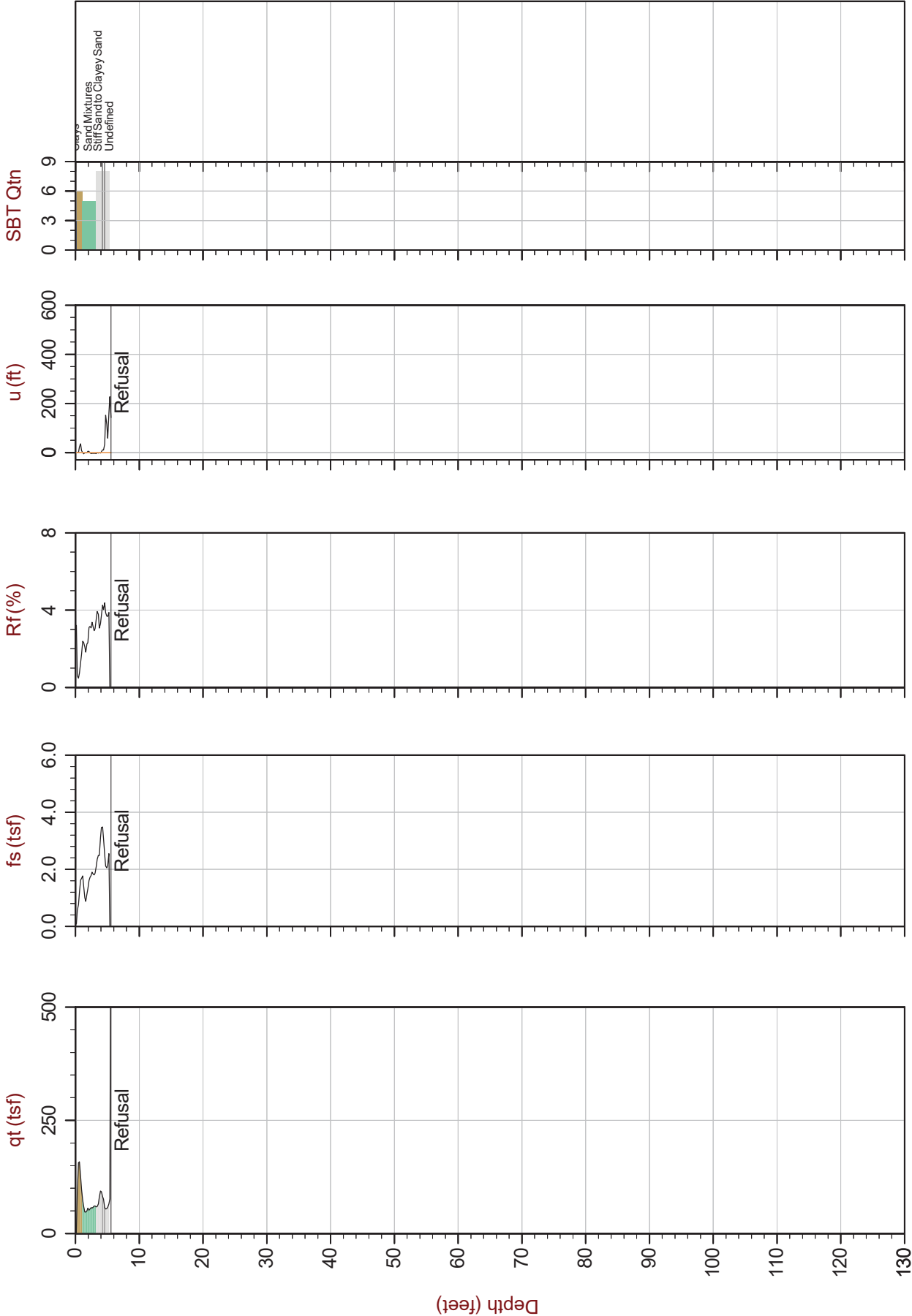
1. The assumed phreatic surface was based on pore pressure dissipation tests. Equilibrium pore pressure profiles were assumed for the calculated parameters.
2. Coordinates were acquired using a MR-350 GlobalSat GPS Receiver in datum: WGS84 / UTM Zone 16 North.
3. Assumed phreatic surface depth was based on a single static pore pressure dissipation test.
4. No phreatic surface detected



Stantec

Job No: 19-61032
Date: 2019-08-22 16:47
Site: US60 Bridge, Livingston County, KY

Sounding: CPT19-02
Cone: 513:T1500F15U500



Max Depth: 1.700 m / 5.58 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 19-61032_CP02.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112078 E: 375659

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq not achieved

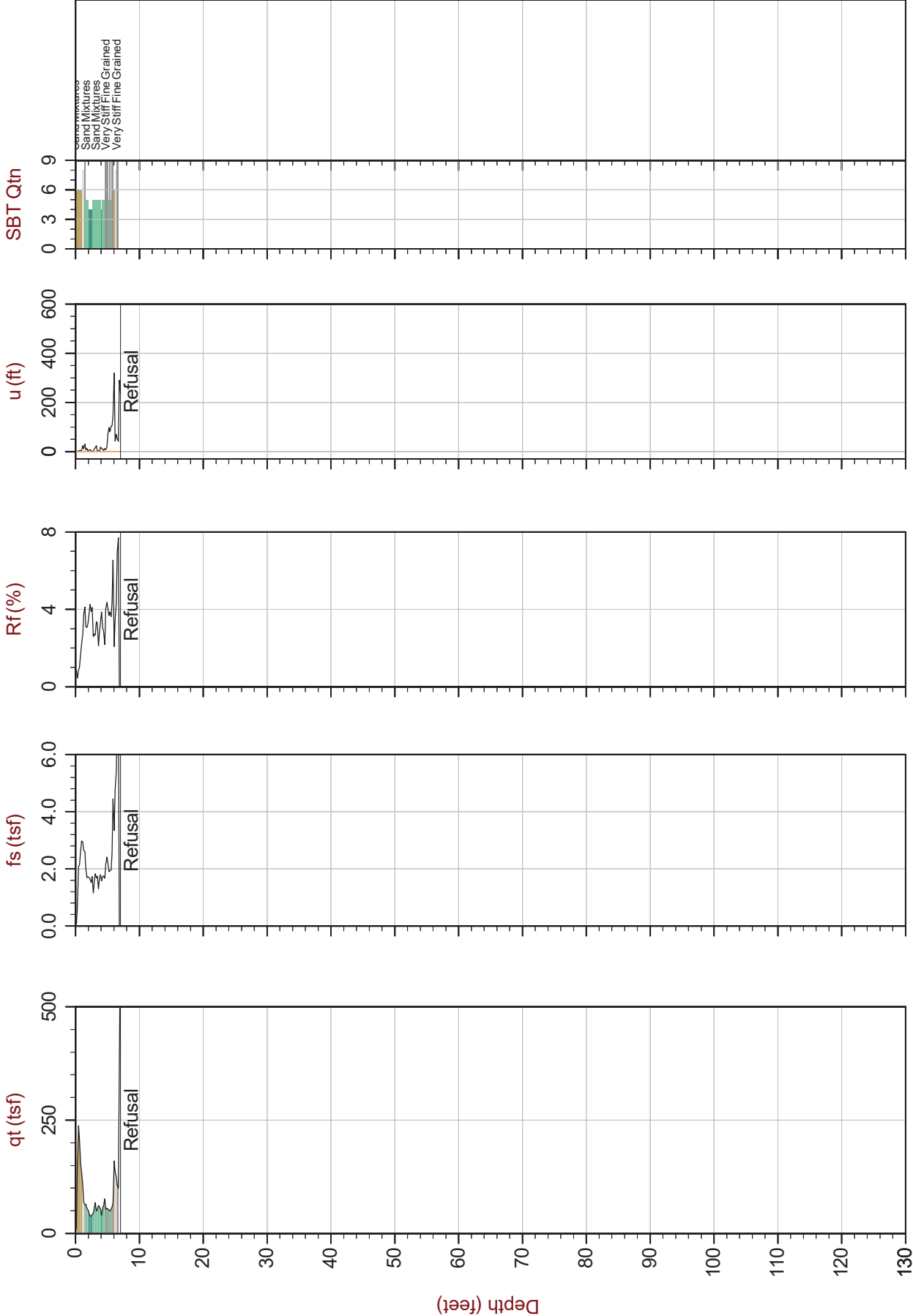
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Stantec

Job No: 19-61032
Date: 2019-08-22 17:07
Site: US60 Bridge, Livingston County, KY

Sounding: CPT19-02A
Cone: 513:T1500F15U500



Max Depth: 2.150 m / 7.05 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 19-61032_CP02A.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112078 E: 375656

Hydrostatic Line ● Ueq ● Assumed Ueq ◀ PPD, Ueq achieved ◀ PPD, Ueq not achieved

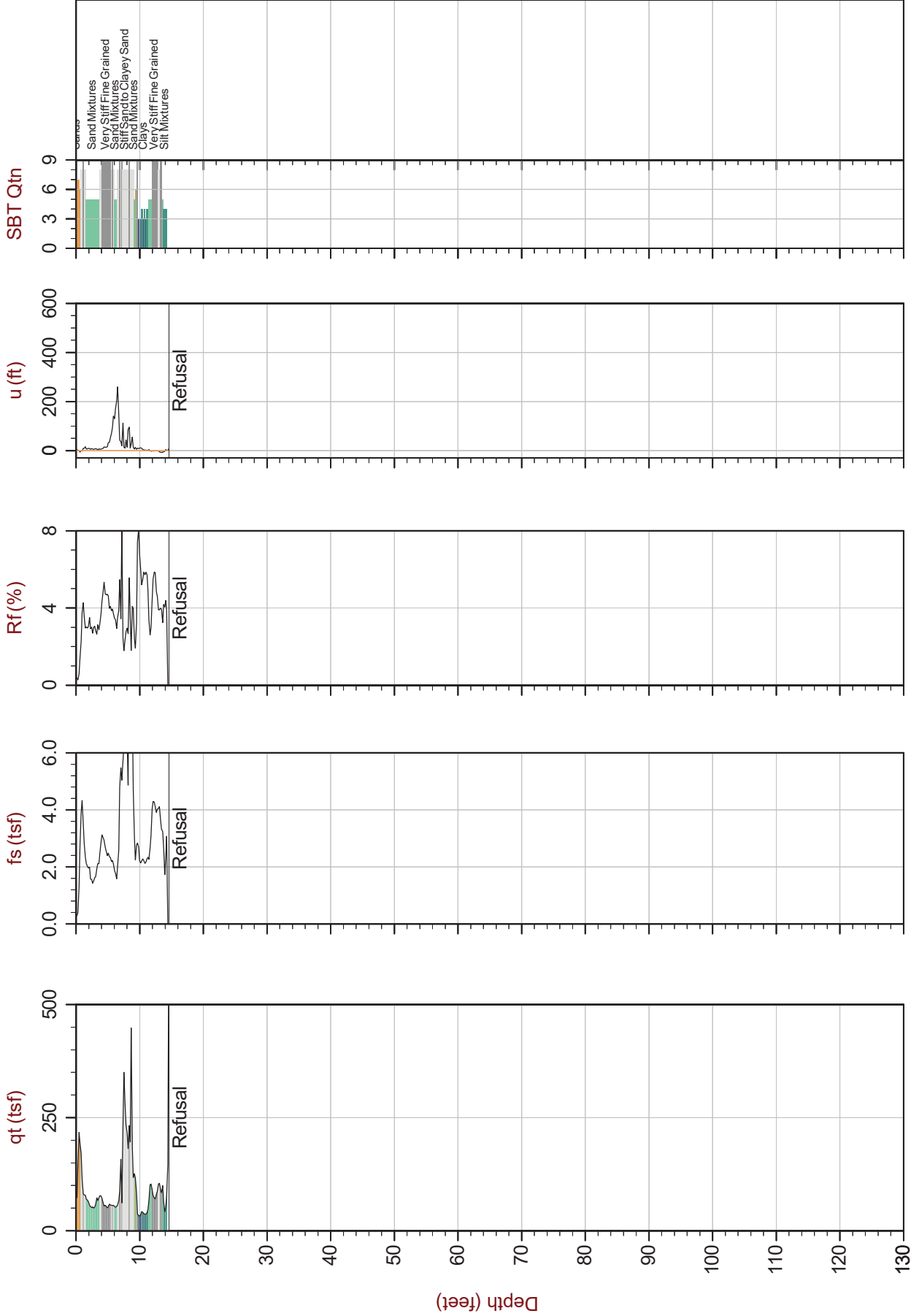
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Stantec

Job No: 19-61032
Date: 2019-08-22 17:31
Site: US60 Bridge, Livingston County, KY

Sounding: CPT19-02B
Cone: 513:T1500F15U500



Max Depth: 4.450 m / 14.60 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 19-61032_CP02B.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112078 E: 375661

Hydrostatic Line ● Ueq ● Assumed Ueq ◀ PPD, Ueq not achieved

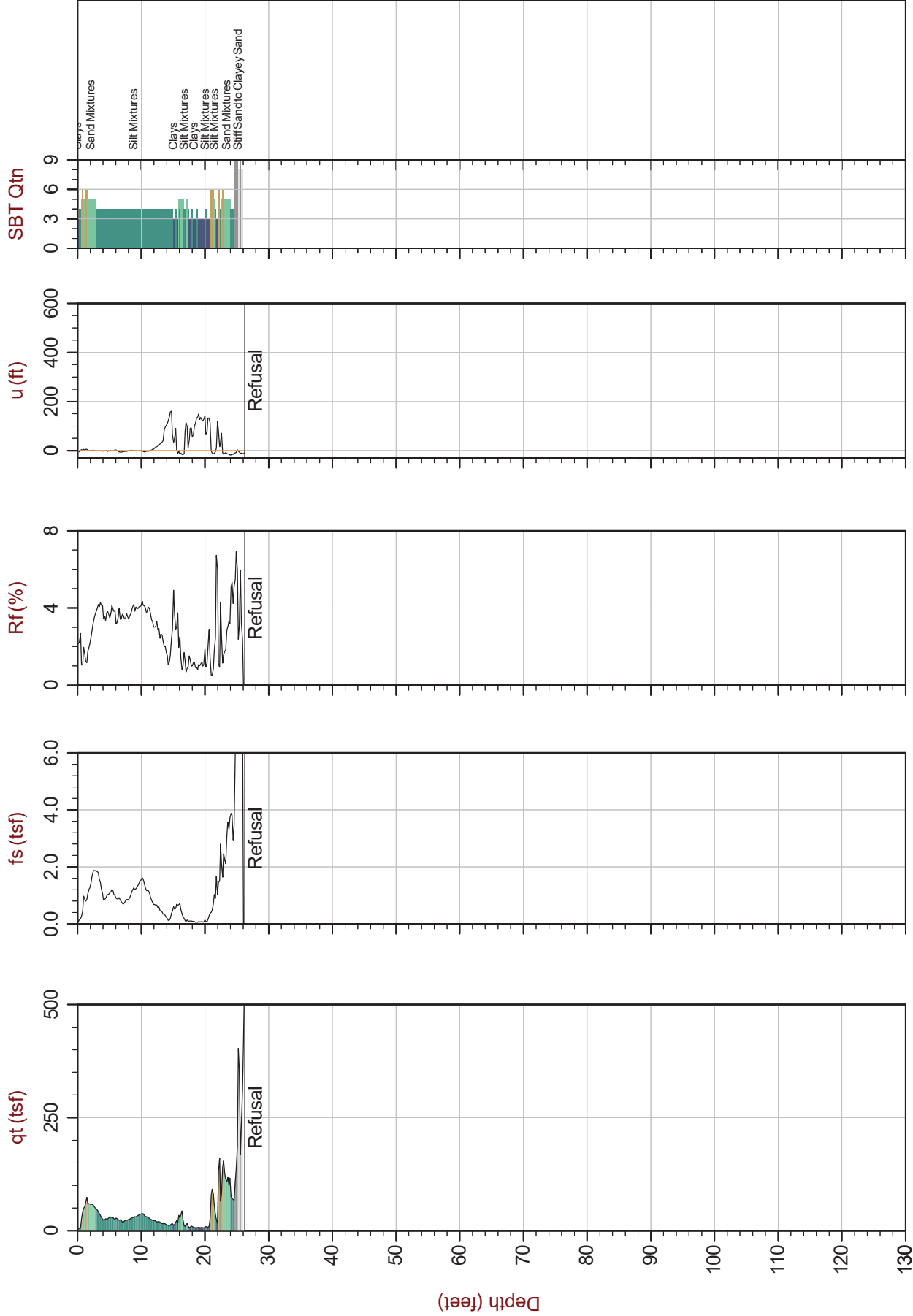
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Stantec

Job No: 19-61032
Date: 2019-08-23 08:28
Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-03
Cone: 513:T1500F15U500



Max Depth: 8.000 m / 26.25 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 19-61032_SP03.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112118 E: 375665

Hydrostatic Line ● Ueq ▲ Assumed Ueq ▼ PPD, Ueq achieved ▲ PPD, Ueq not achieved

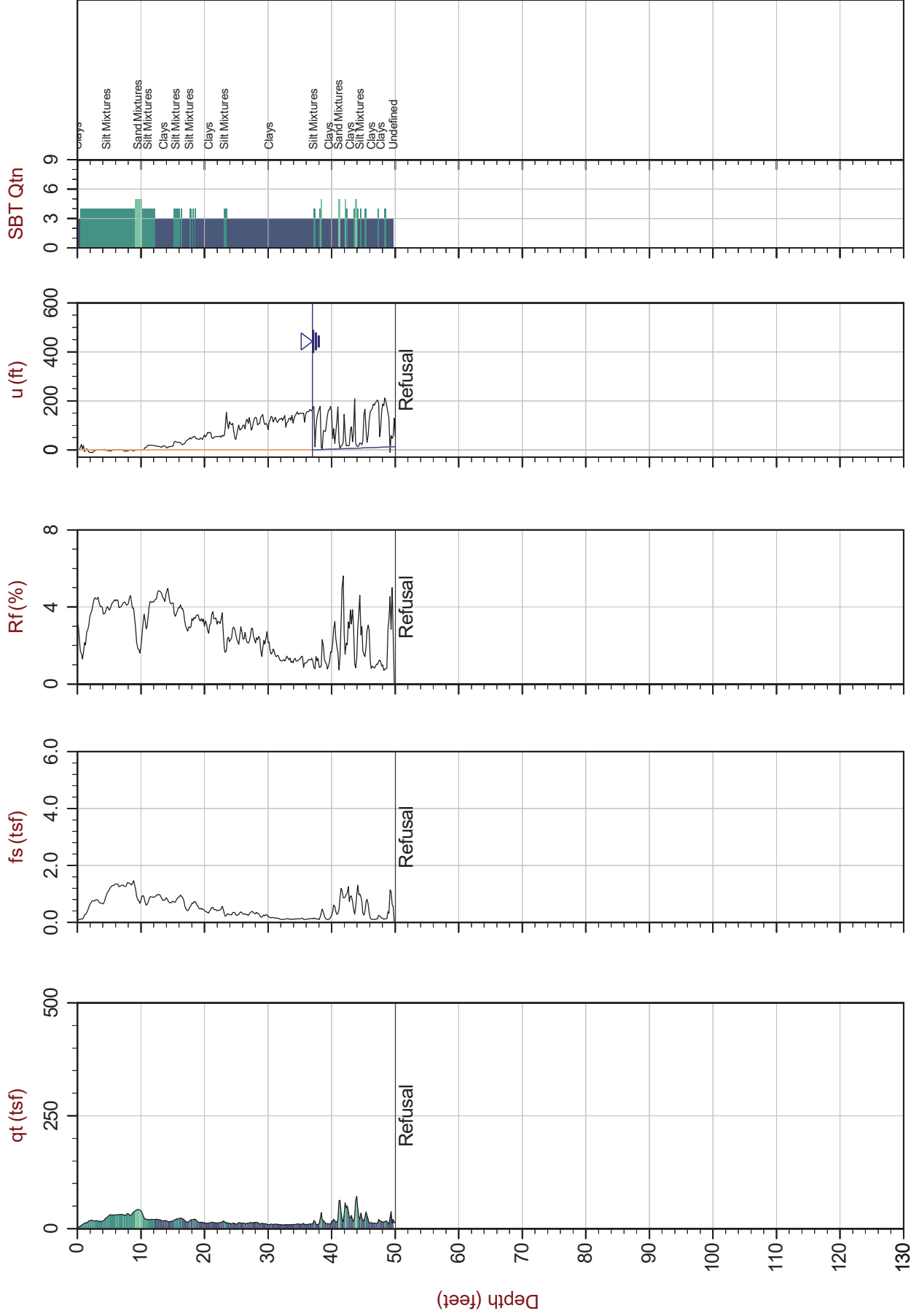
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Stantec

Job No: 19-61032
Date: 2019-08-23 09:16
Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-04
Cone: 513:T1500F15U500



Max Depth: 15.250 m / 50.03 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 19-61032_SP04.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: N: 4112156.000 E: 375670.000

Hydrostatic Line ● Ueq ▲ Assumed Ueq ▼ PPD, Ueq not achieved

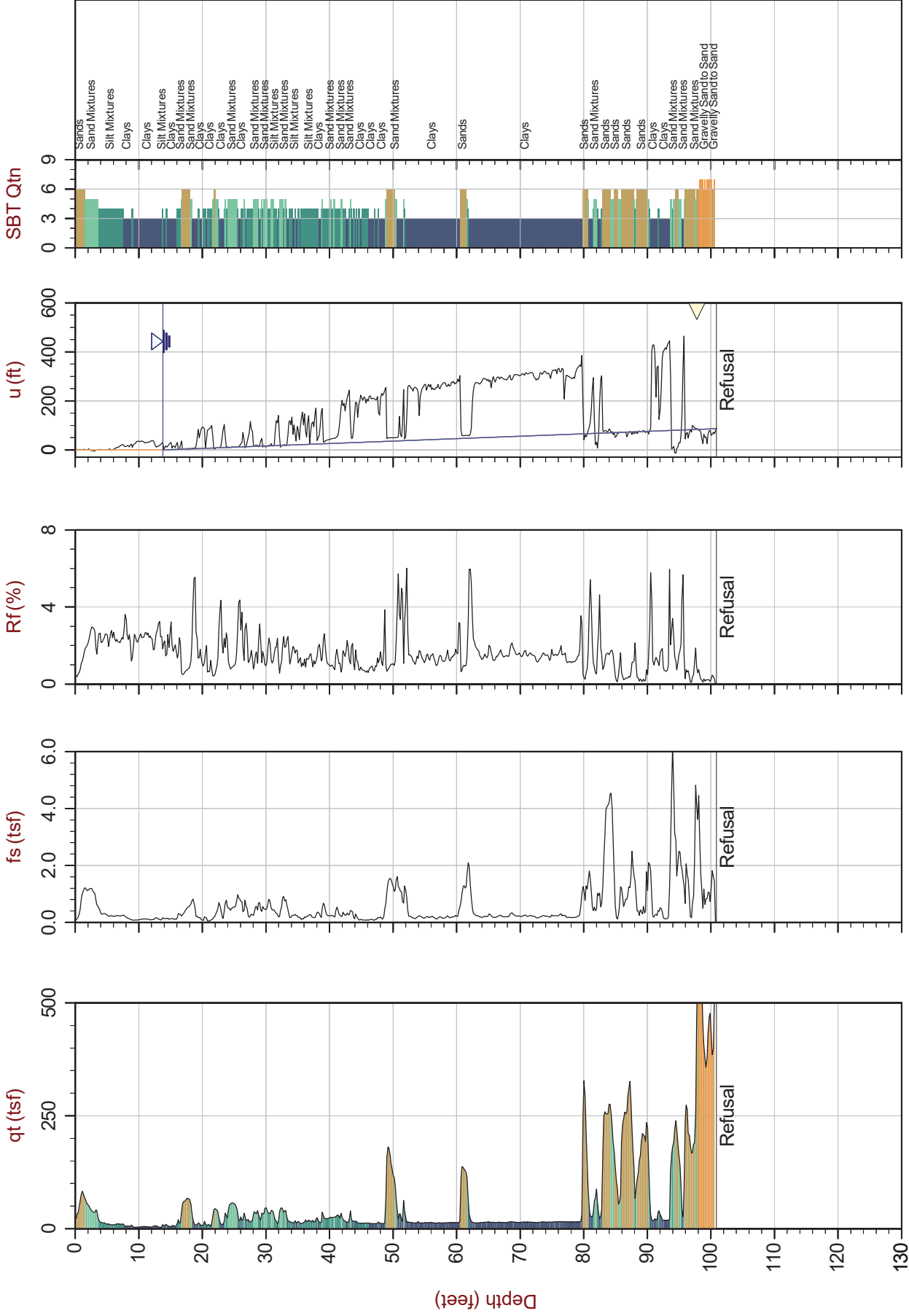
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Stantec

Job No: 19-61032
Date: 2019-08-20 09:56
Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-05
Cone: 513:T1500F15U500



Max Depth: 30.750 m / 100.88 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 19-61032_SP05.COR
Unit Wt: SBTQtn (PKR2009)

Hydrostatic Line
Ueq
Assumed Ueq
PPD, Ueq achieved
PPD, Ueq not achieved

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112378 E: 375709

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Stantec

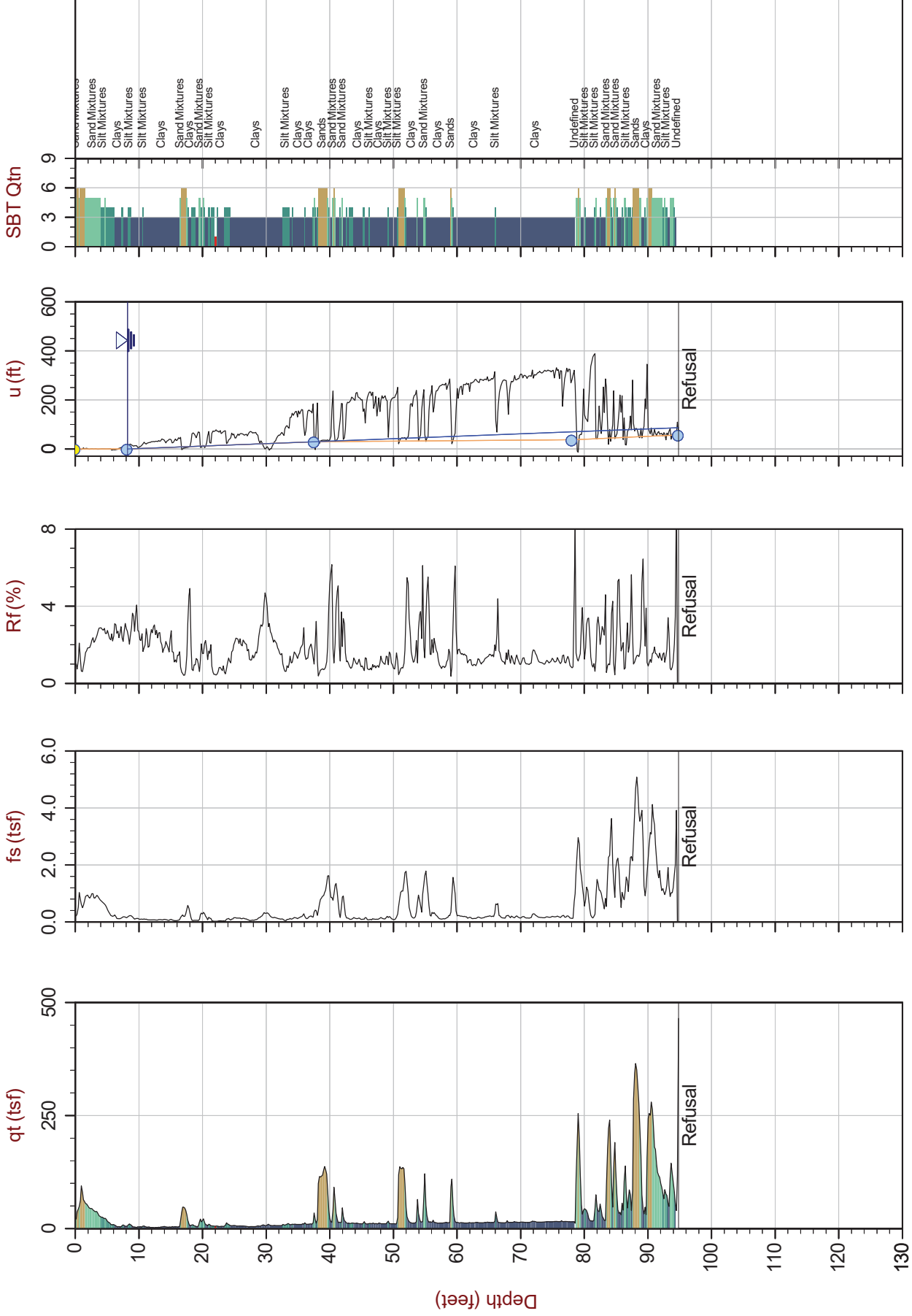
Job No: 19-61032

Date: 2019-08-20 14:15

Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-06

Cone: 513:T1500F15U500



Max Depth: 28.900 m / 94.82 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 19-61032_SP06.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112426 E: 375716

Hydrostatic Line ● Ueq ▲ Assumed Ueq ▼ PPD, Ueq not achieved

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Site: US60 Bridge, Livingston County, KY



 Hydrostatic Line
 Ueq
 Assumed Ueq
 PPD, Ueq achieved
 PPD, Ueq not achieved

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Stantec

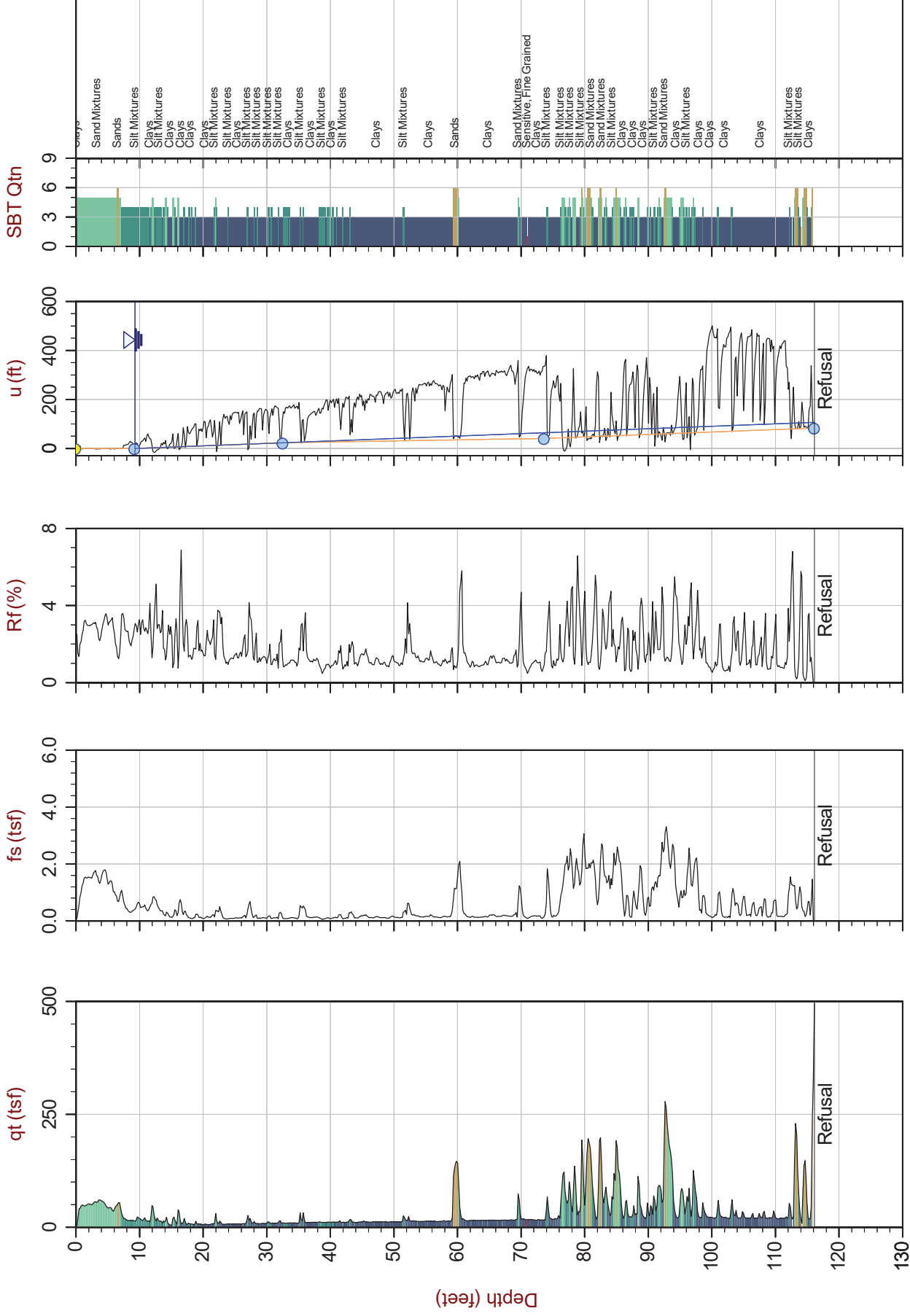
Job No: 19-61032

Date: 2019-08-21 11:15

Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-08

Cone: 513:T1500F15U500



Max Depth: 35.400 m / 116.14 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 19-61032_SP08.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112444 E: 375723

Hydrostatic Line — Ueq ● Assumed Ueq ▲ PPD, Ueq not achieved
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Site: US60 Bridge, Livingston County, KY





Site: US60 Bridge, Livingston County, KY

SBT Qtn





Stantec

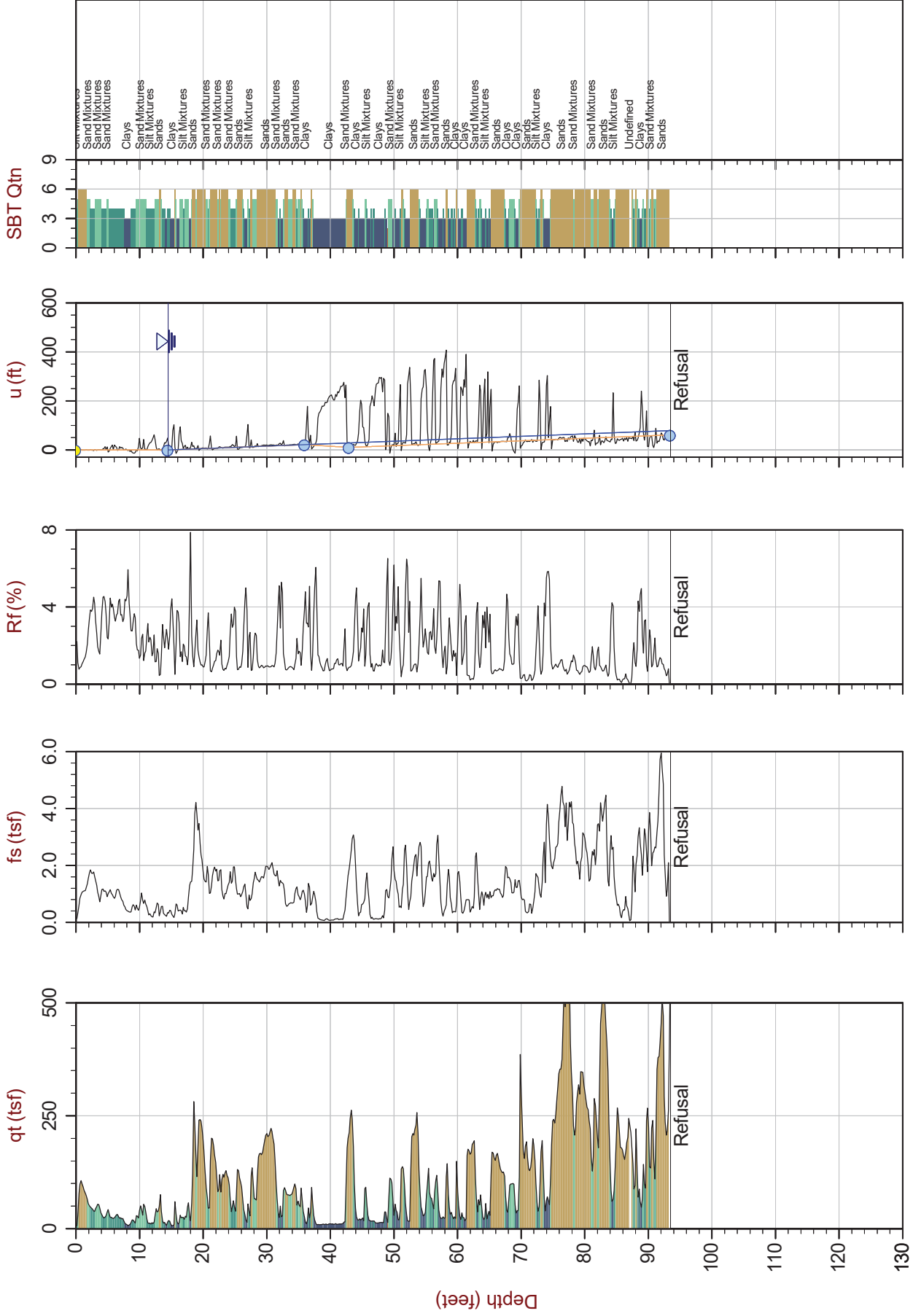
Job No: 19-61032

Date: 2019-08-22 10:33

Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-11

Cone: 513:T1500F15U500



Max Depth: 28.500 m / 93.50 ft

Depth Inc: 0.050 m / 0.164 ft

Avg Int: Every Point

File: 19-61032_SP11.COR

Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010

Coords: UTM Zone 16N N: 4112619 E: 375756

Hydrostatic Line — Ueq ● Assumed Ueq ◀ PPD, Ueq achieved ◀ PPD, Ueq not achieved

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

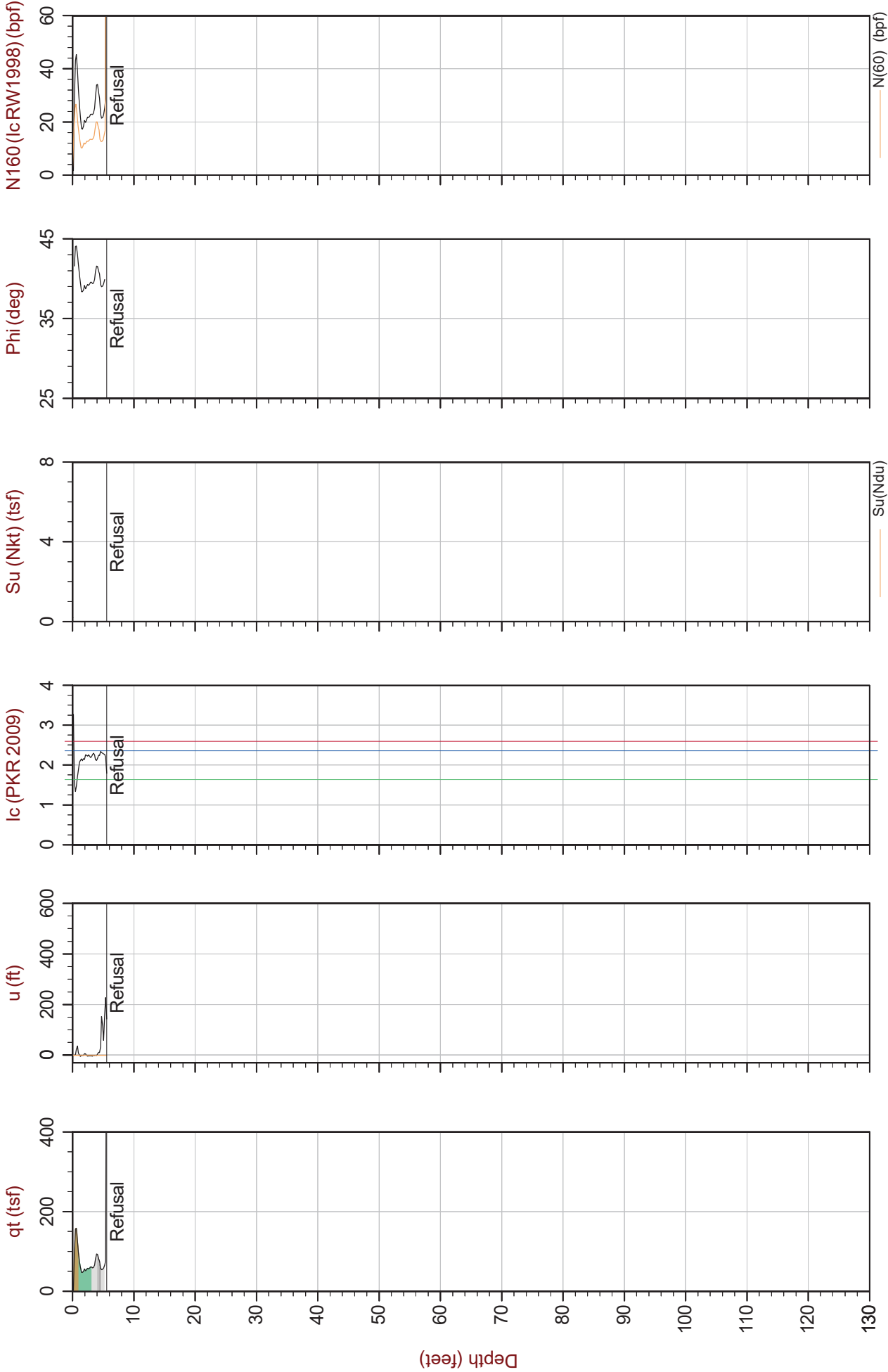
Advanced Cone Penetration Test Plots



Stantec

Job No: 19-61032
Date: 2019-08-22 16:47
Site: US60 Bridge, Livingston County, KY

Sounding: CPT19-02
Cone: 513:T1500F15U500



Max Depth: 1.700 m / 5.58 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point
File: 19-61032_CP02.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt/Ndu: 12.5 / 6.0
SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112078 E: 375659

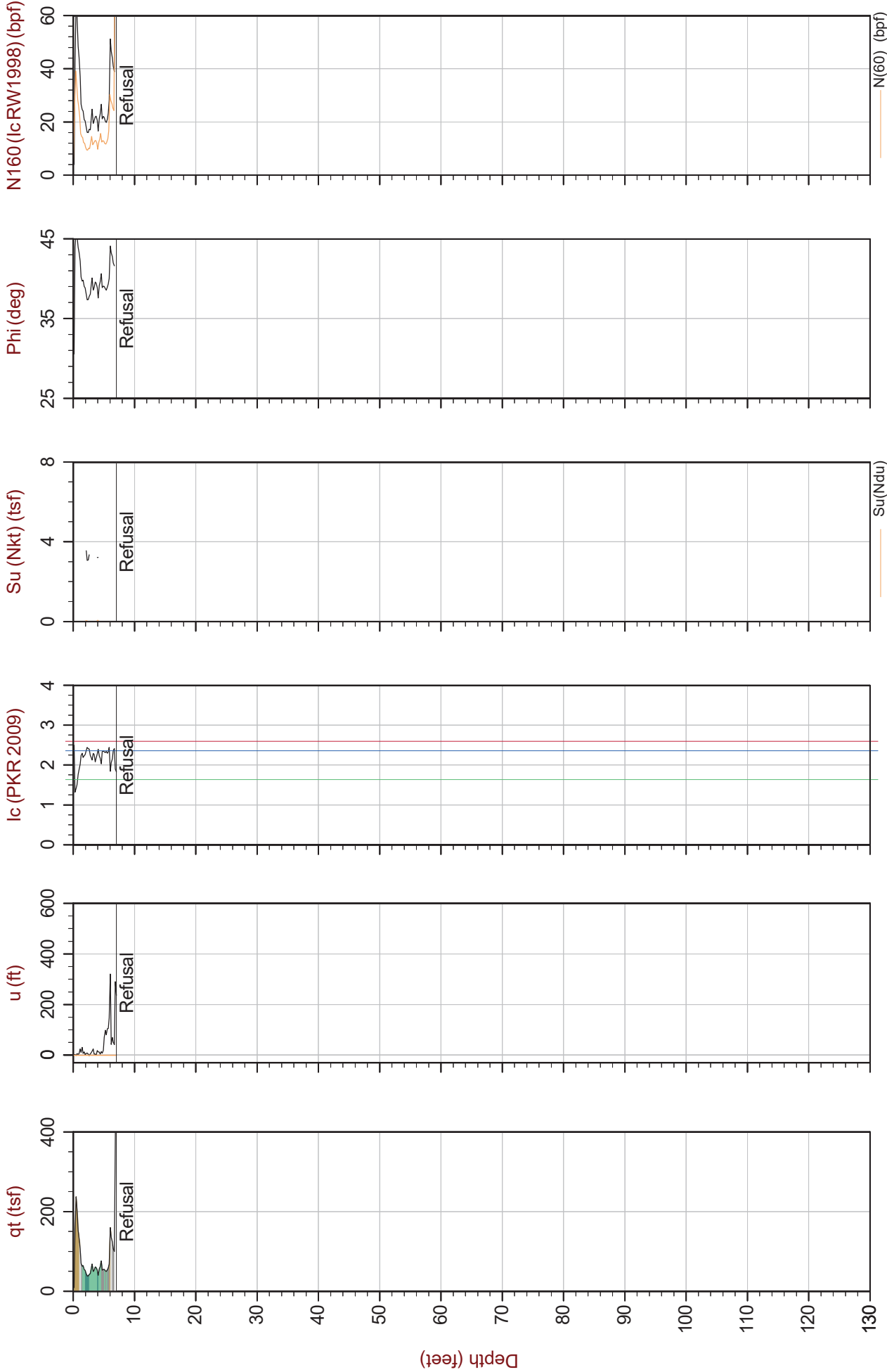
Hydrostatic Line (blue line) Ueq (yellow dot) Assumed Ueq (green triangle) PPD, Ueq achieved (purple triangle) PPD, Ueq not achieved (orange triangle)
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Stantec

Job No: 19-61032
Date: 2019-08-22 17:07
Site: US60 Bridge, Livingston County, KY

Sounding: CPT19-02A
Cone: 513:T1500F15U500



Max Depth: 2.150 m / 7.05 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point
File: 19-61032_CP02A.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt/Ndu: 12.5 / 6.0
SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112078 E: 375656

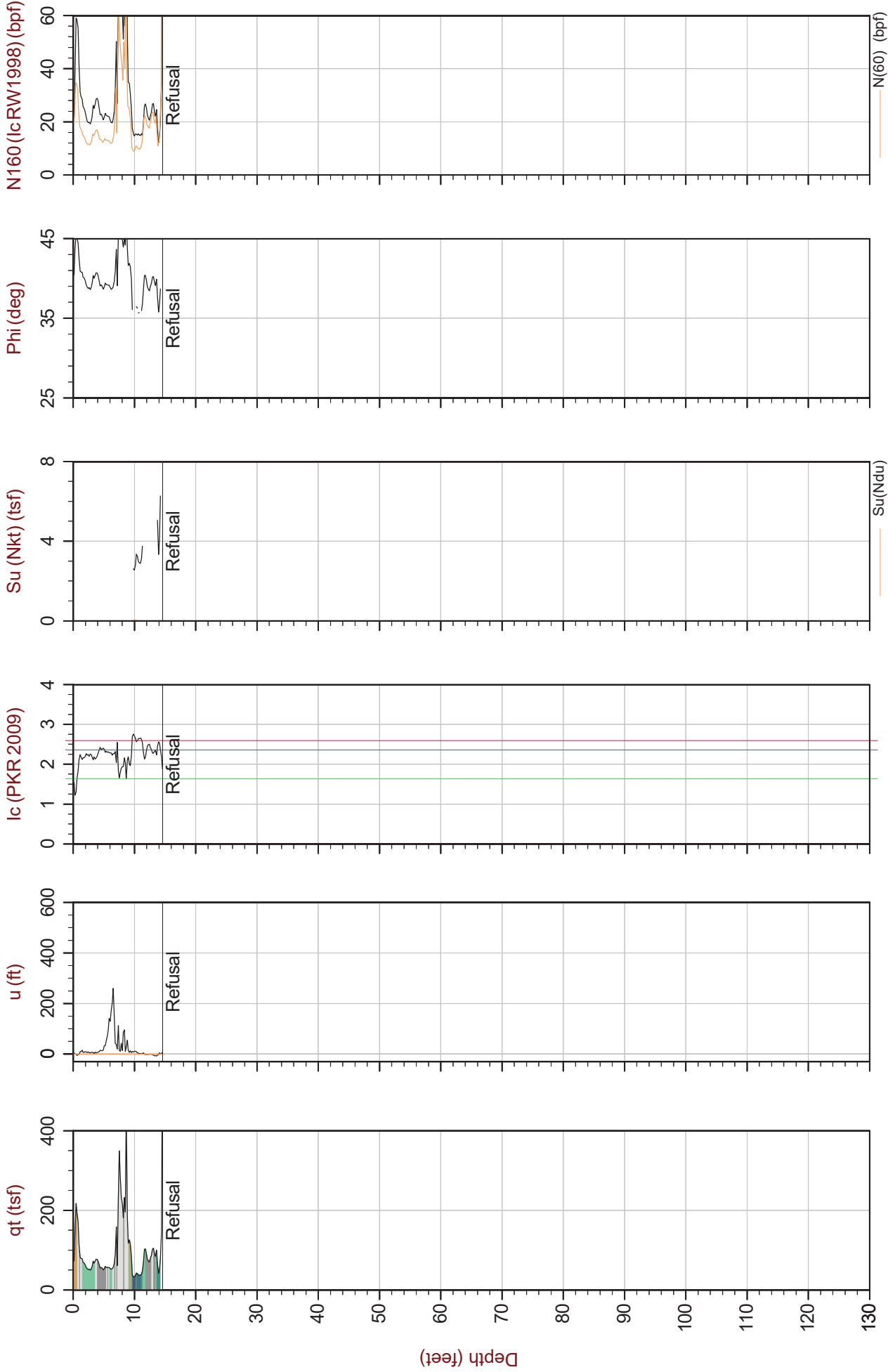
Hydrostatic Line (blue line) Ueq (yellow dot) Assumed Ueq (green triangle) PPD, Ueq achieved (blue triangle) PPD, Ueq not achieved (red triangle)
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Stantec

Job No: 19-61032
Date: 2019-08-22 17:31
Site: US60 Bridge, Livingston County, KY

Sounding: CPT19-02B
Cone: 513.T1500F15U500



Max Depth: 4.450 m / 14.60 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point
File: 19-61032_CP02B.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt/Ndu: 12.5 / 6.0
Hydrostatic Line
Ueq
Assumed Ueq
PPD, Ueq achieved
PPD, Ueq not achieved
SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112078 E: 375661

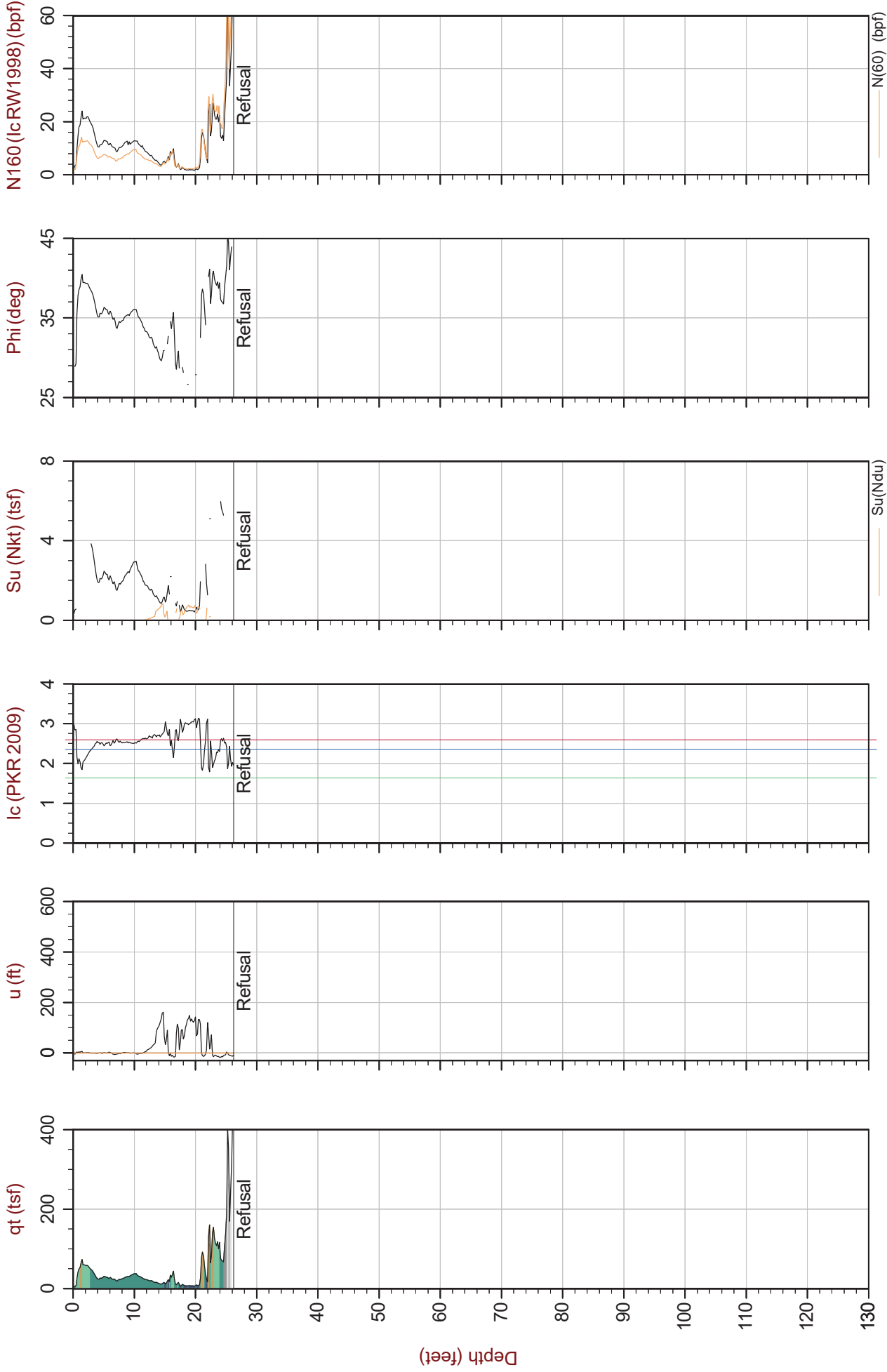
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Stantec

Job No: 19-61032
Date: 2019-08-23 08:28
Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-03
Cone: 513:T1500F15U500



Max Depth: 8.000 m / 26.25 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point
File: 19-61032_SP03.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt/Ndu: 12.5 / 6.0
SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112118 E: 375665

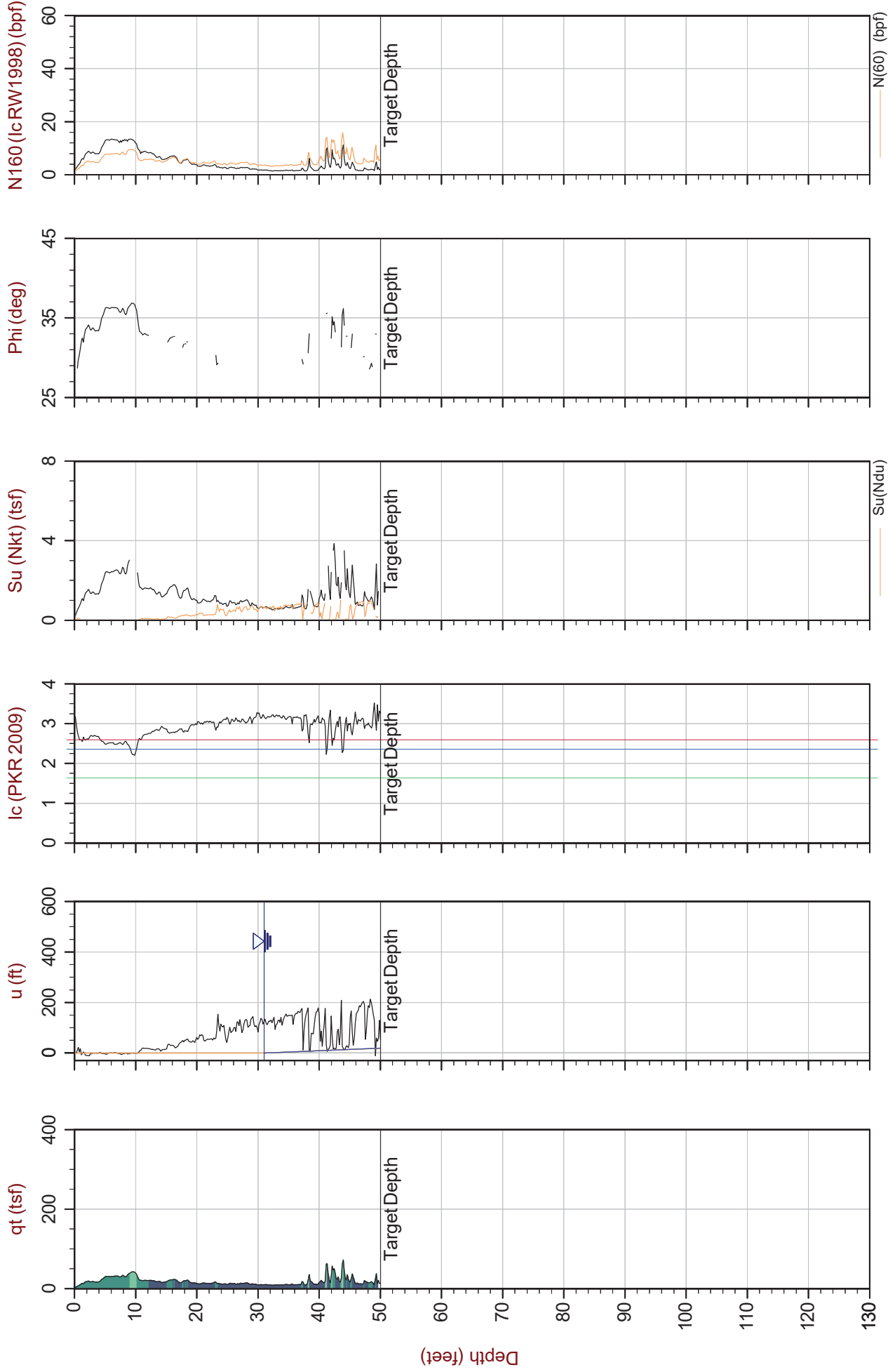
Hydrostatic Line (blue line) Ueq (yellow circle) Assumed Ueq (green triangle) PPD, Ueq achieved (black triangle) PPD, Ueq not achieved (red triangle)
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Stantec

Job No: 19-61032
Date: 2019-08-23 09:16
Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-04
Cone: 513:T1500F15U500



Max Depth: 15.250 m / 50.03 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 19-61032_SP04.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt/Ndu: 12.5 / 6.0

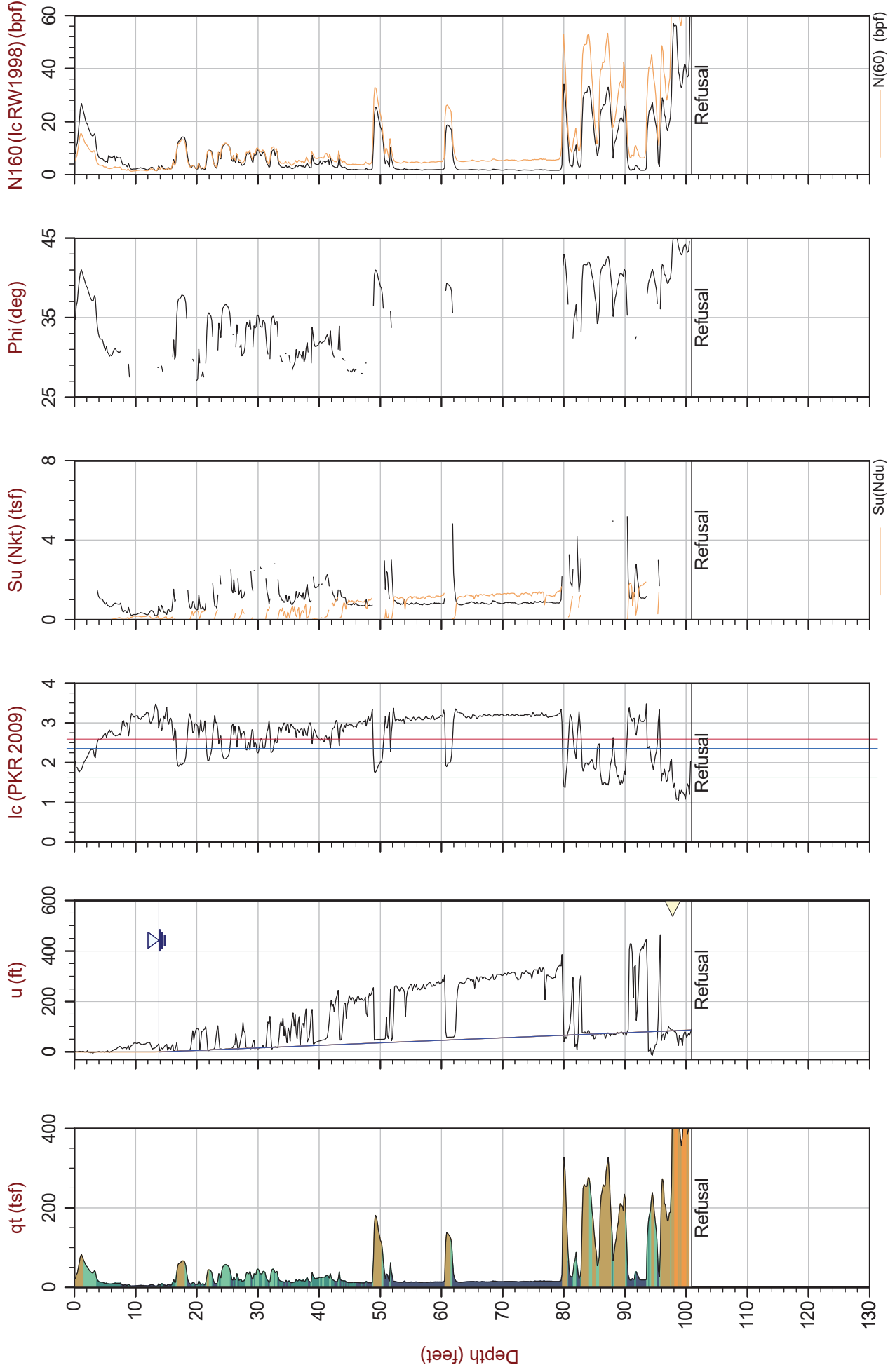
SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112156 E: 375670



Stantec

Job No: 19-61032
Date: 2019-08-20 09:56
Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-05
Cone: 513:T1500F15U500



Max Depth: 30.750 m / 100.88 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point
File: 19-61032_SP05.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt/Ndu: 12.5 / 6.0
SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112378 E: 375709

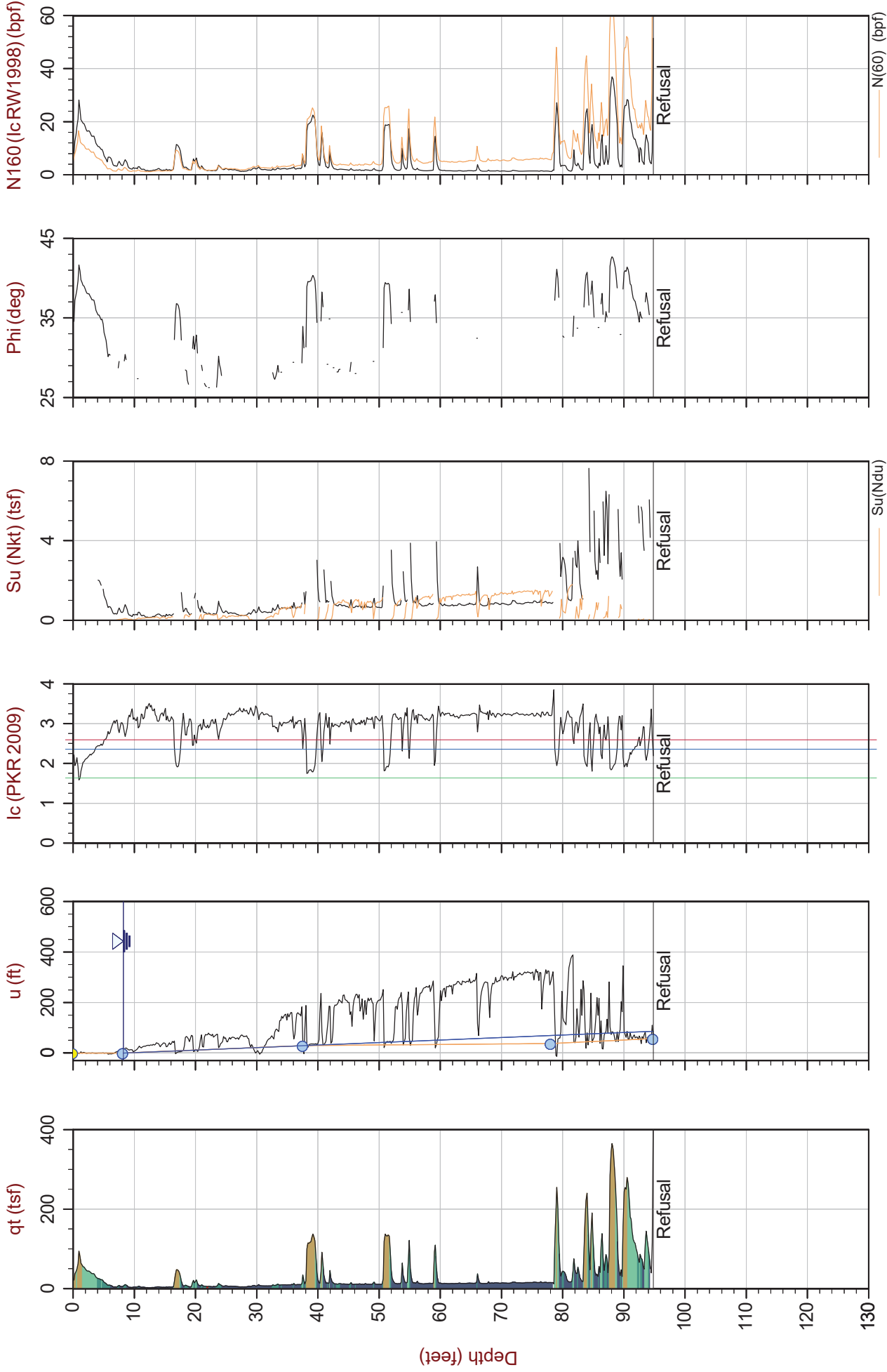
Hydrostatic Line
Ueq
Assumed Ueq
PPD, Ueq achieved
PPD, Ueq not achieved
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Stantec

Job No: 19-61032
Date: 2019-08-20 14:15
Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-06
Cone: 513:T1500F15U500



Max Depth: 28.900 m / 94.82 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point
File: 19-61032_SP06.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt/Ndu: 12.5 / 6.0
SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112426 E: 375716

Hydrostatic Line — Ueq ● Assumed Ueq ▲ PPD, Ueq achieved ▼ PPD, Ueq not achieved
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Stantec

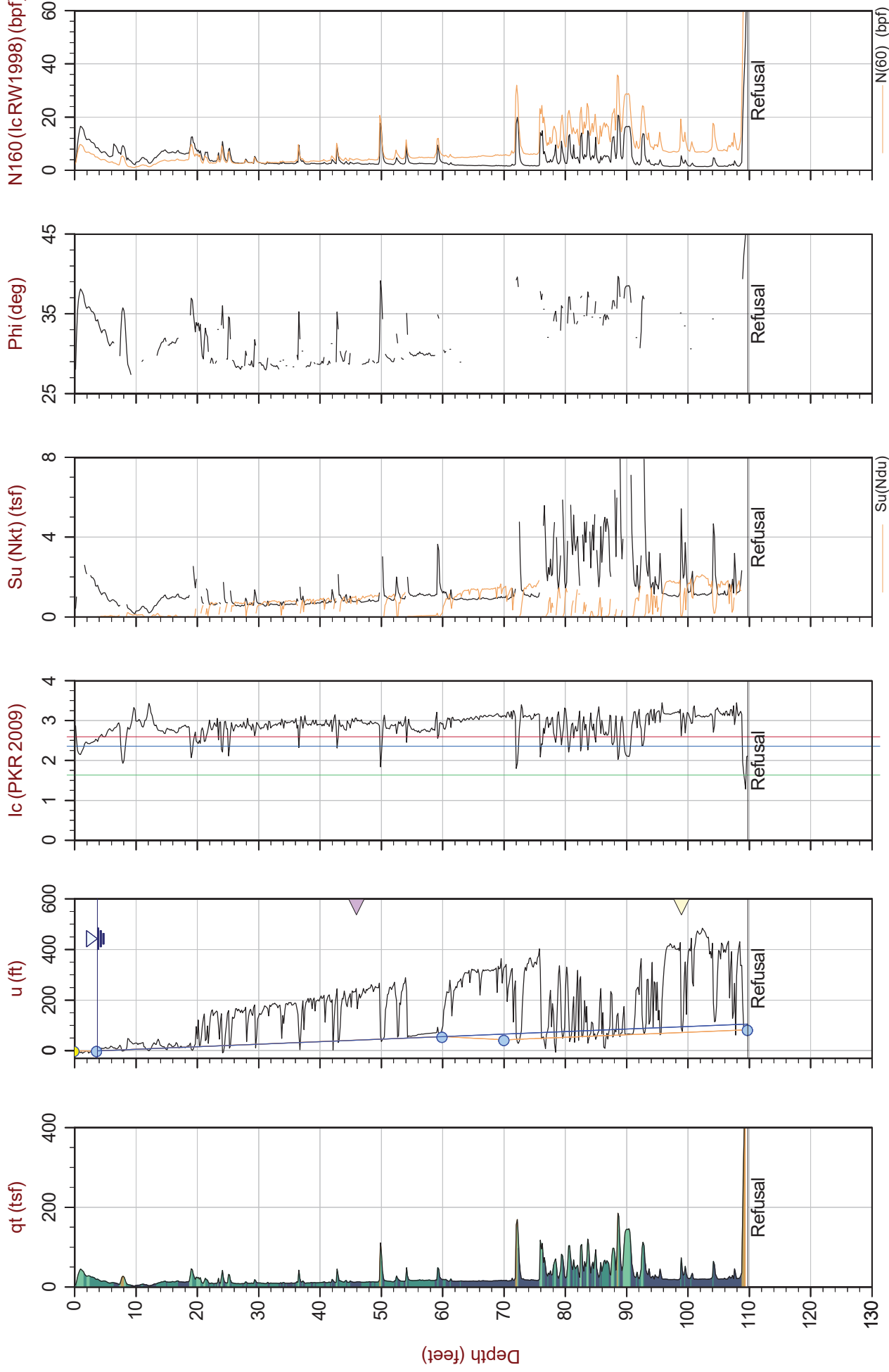
Job No: 19-61032

Date: 2019-08-21 08:35

Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-07

Cone: 513:T1500F15U500



Max Depth: 33.450 m / 109.74 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 19-61032_SP07.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt/Ndu: 12.5 / 6.0

SBT: Robertson, 2009 and 2010

Coords: UTM Zone 16N N: 4112461 E: 375709

Hydrostatic Line (blue line) Ueq (blue circle) Assumed Ueq (blue triangle) PPD, Ueq achieved (blue diamond) Ueq not achieved (blue square)

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Stantec

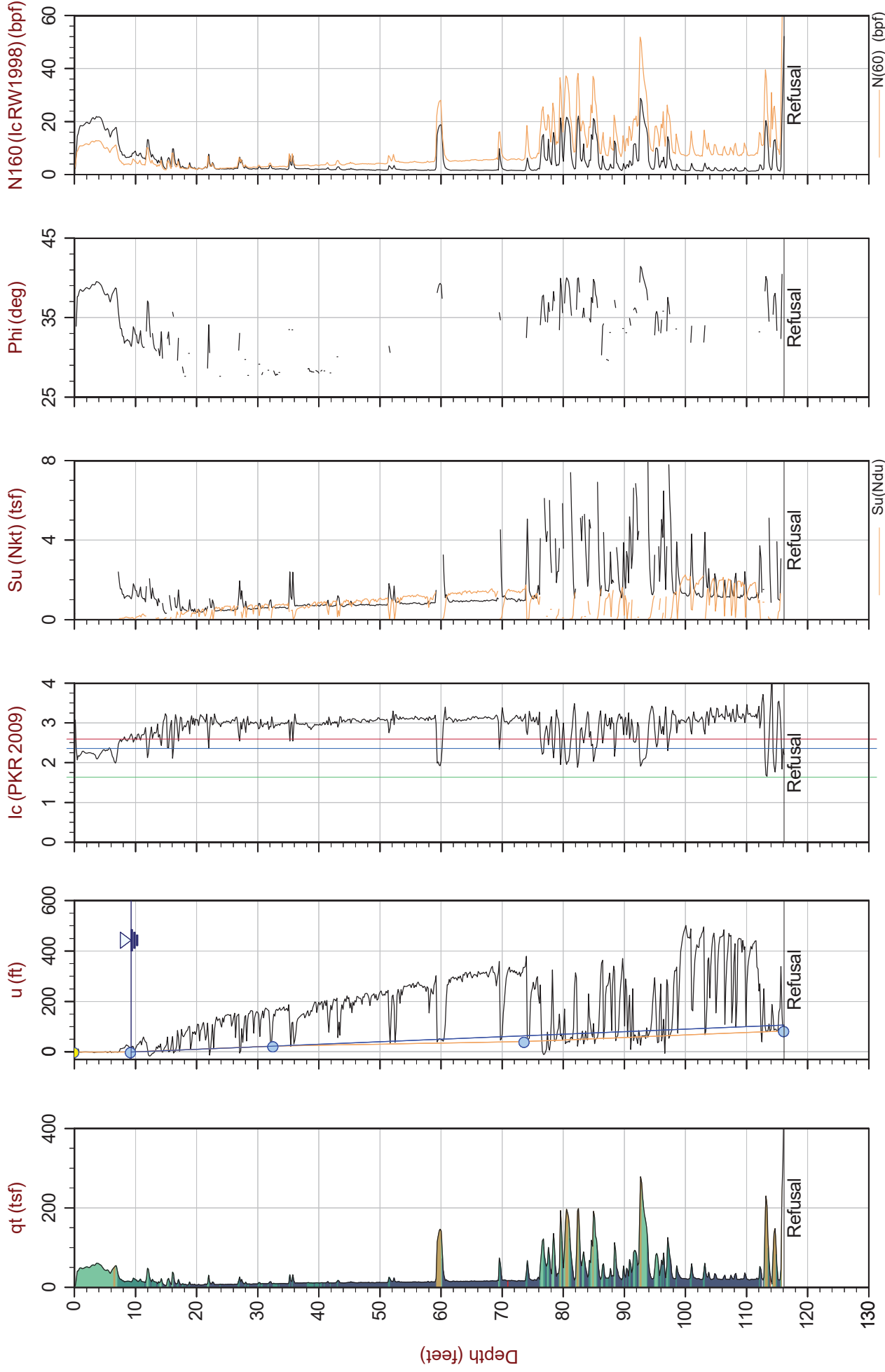
Job No: 19-61032

Date: 2019-08-21 11:15

Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-08

Cone: 513:T1500F15U500

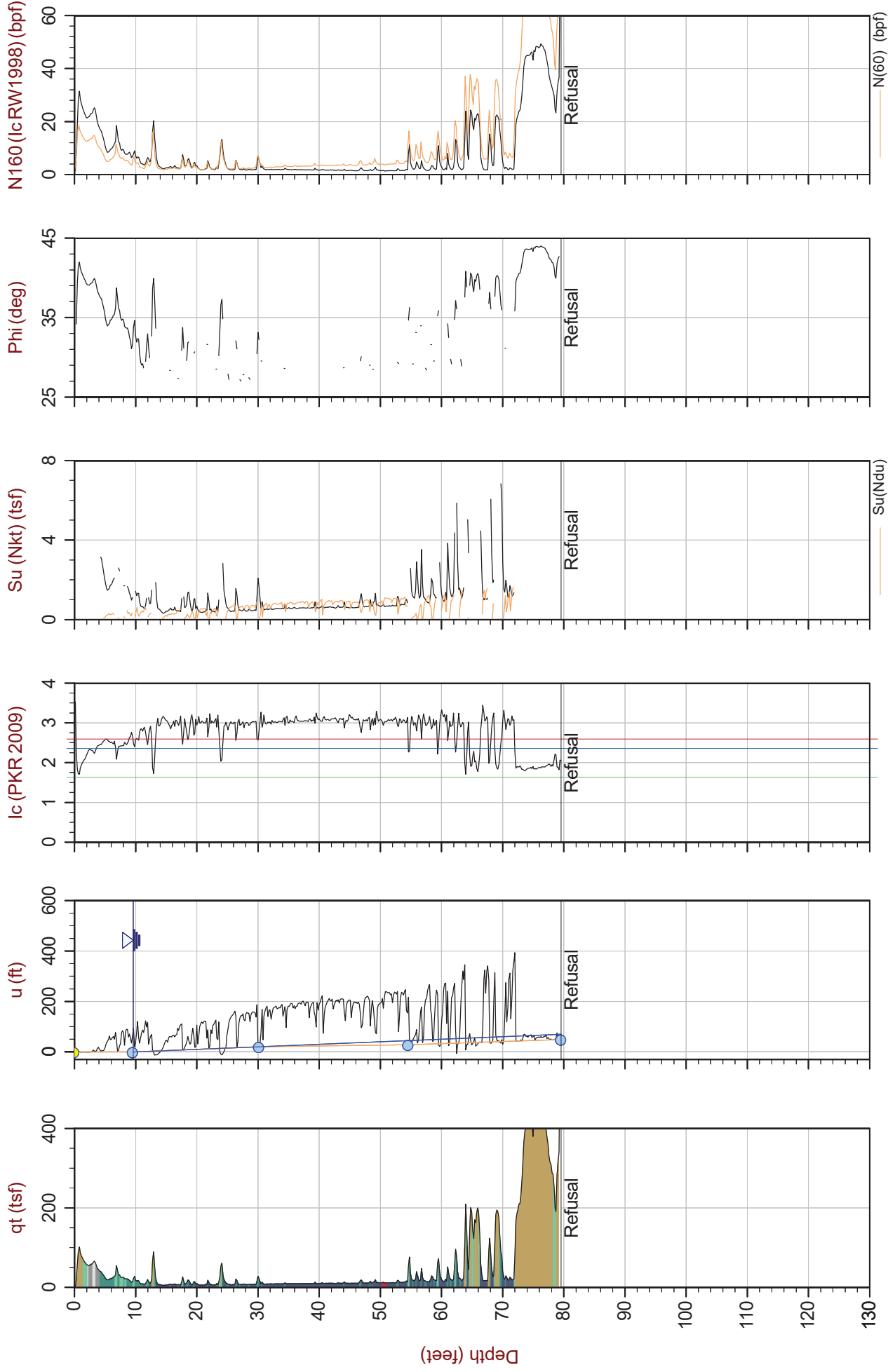


Max Depth: 35.400 m / 116.14 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 19-61032_SP08.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt/Ndu: 12.5 / 6.0

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112444 E: 375723

Hydrostatic Line — Ueq ● Assumed Ueq ▲ PPD, Ueq achieved ▼ PPD, Ueq not achieved
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Max Depth: 24.250 m / 79.56 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point
File: 19-61032_SP09.COR
Unit Wt: SBTQTn(PKR2009)
Su Nkt/Ndu: 12.5 / 6.0

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112545 E: 375744

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Stantec

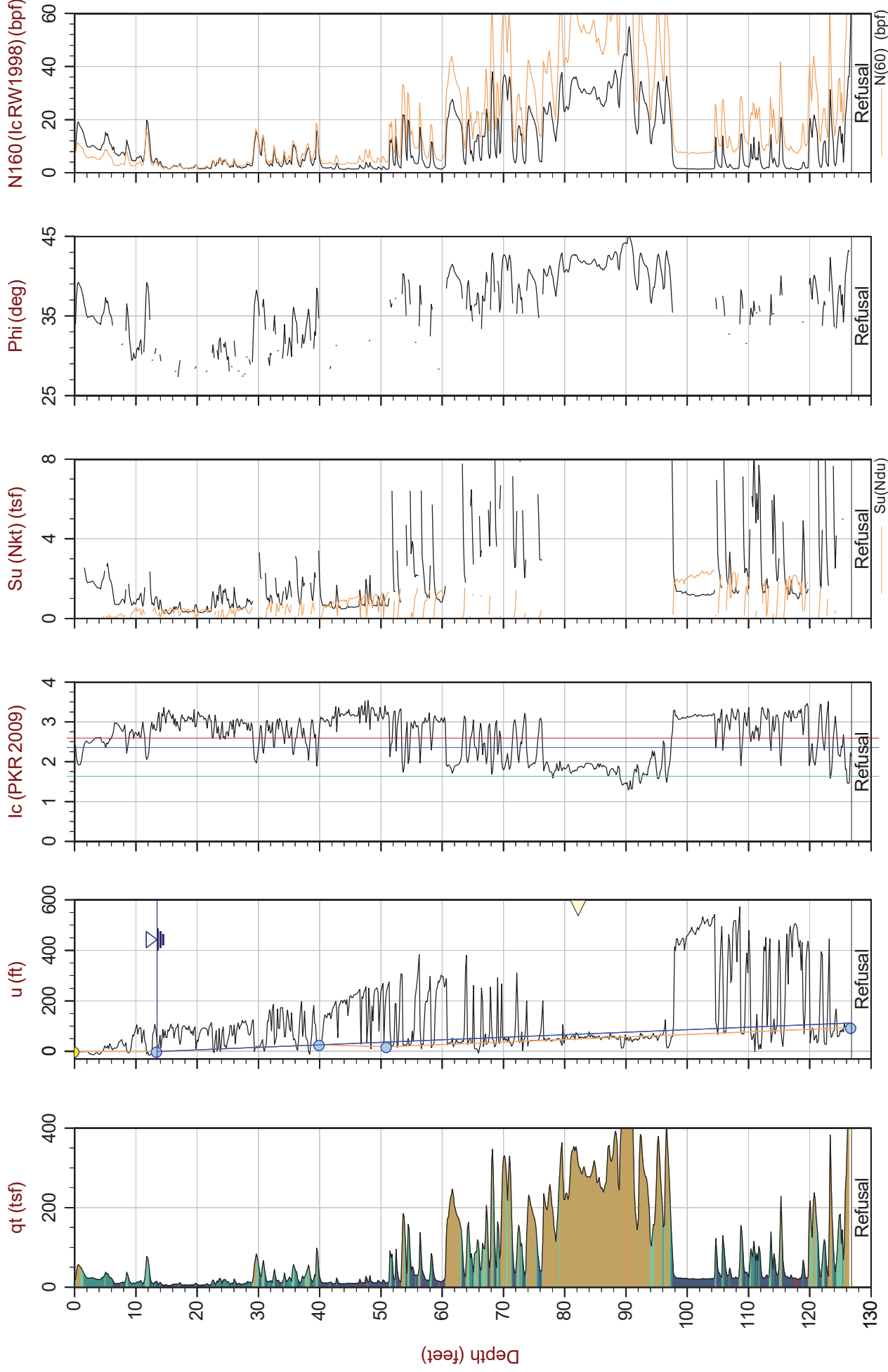
Job No: 19-61032

Date: 2019-08-21 15:43

Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-10

Cone: 513:T1500F15U500



Max Depth: 38.650 m / 126.80 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 19-61032_SP10.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt/Ndu: 12.5 / 6.0

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved Ueq Ueq not achieved
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

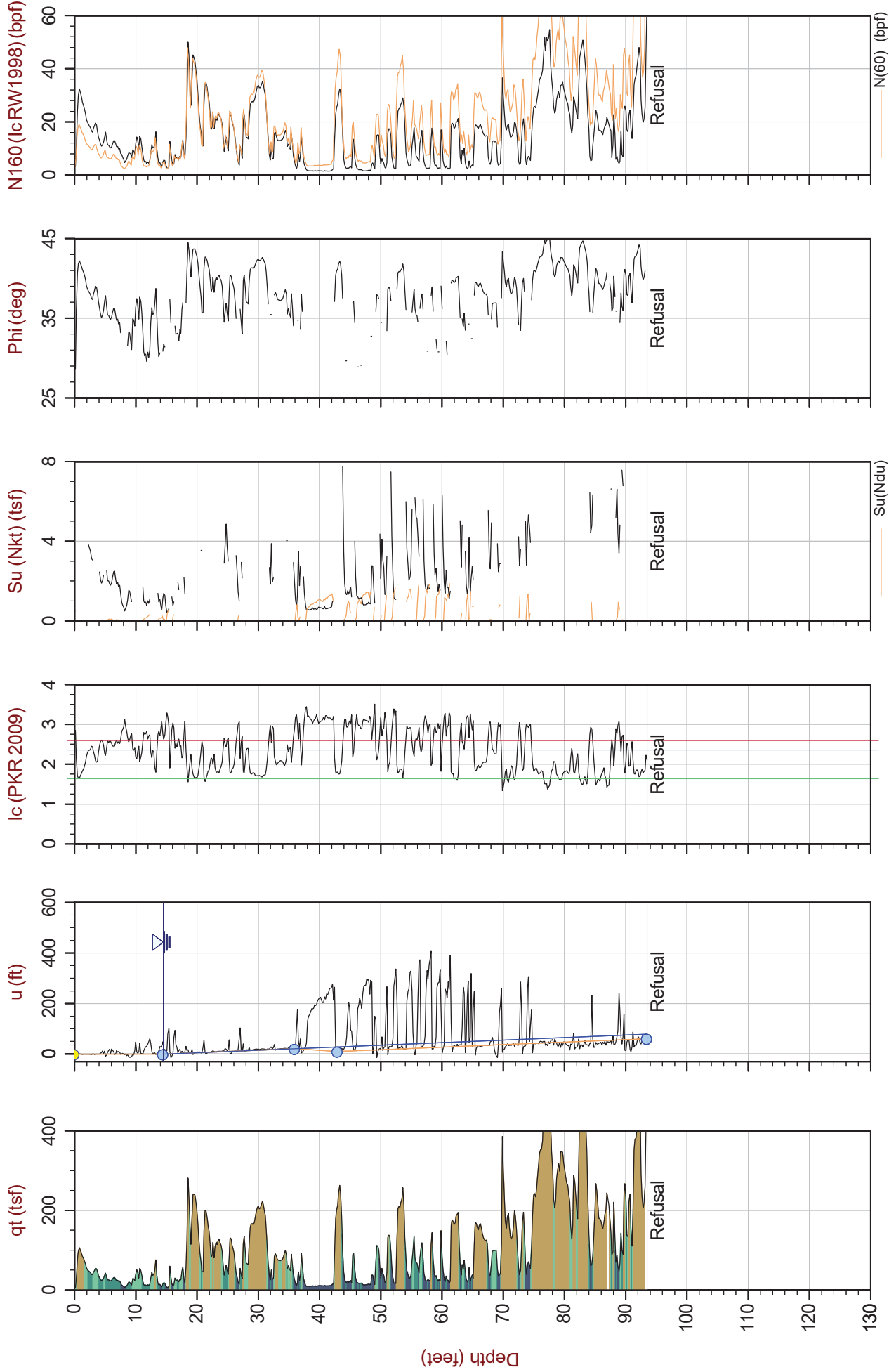
SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112576 E: 375747



Stantec

Job No: 19-61032
Date: 2019-08-22 10:33
Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-11
Cone: 513:T1500F15U500



Max Depth: 28.500 m / 93.50 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point
File: 19-61032_SP11.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt/Ndu: 12.5 / 6.0

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112619E: 375756

Hydrostatic Line — Ueq ● Assumed Ueq ▲ PPD, Ueq achieved ▼ PPD, Ueq not achieved
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

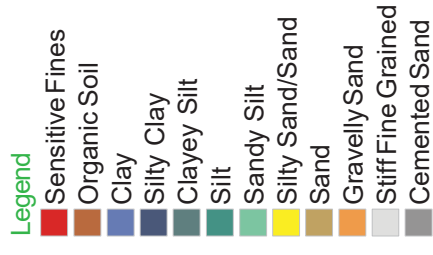
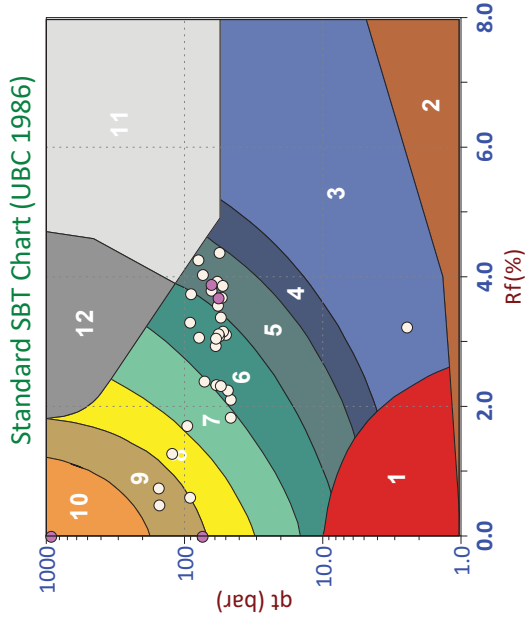
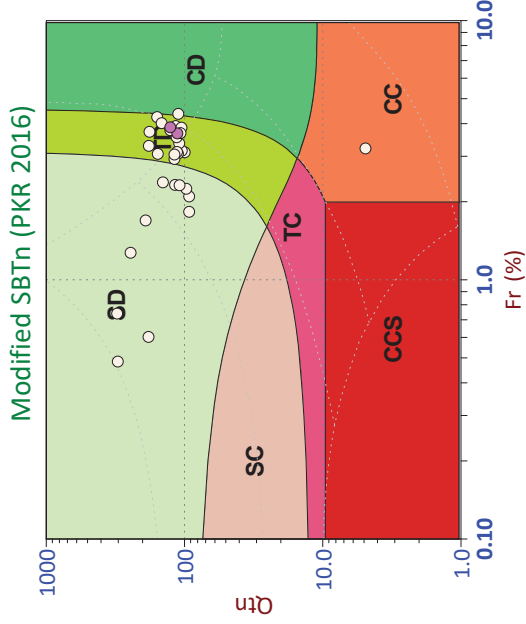
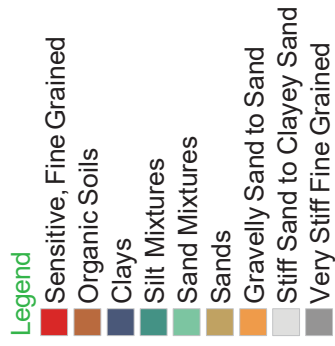
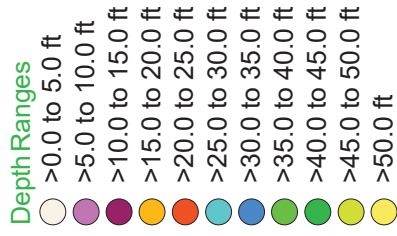
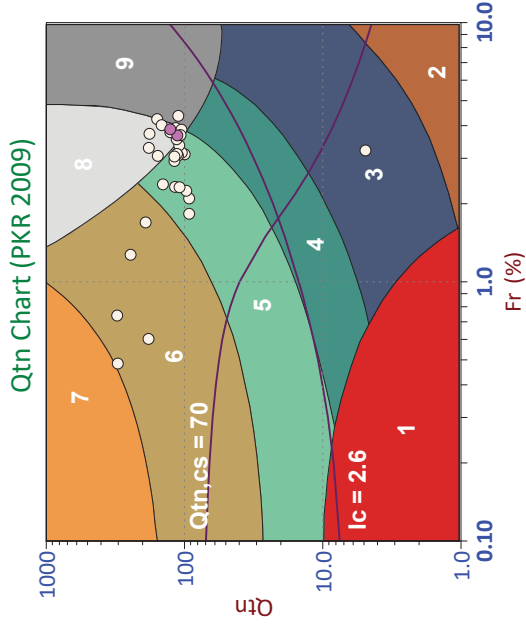
Soil Behavior Type (SBT) Scatter Plots



Stantec

Job No: 19-61032
Date: 2019-08-22 16:47
Site: US60 Bridge, Livingston County, KY

Sounding: CPT19-02
Cone: 513:T1500F15U500

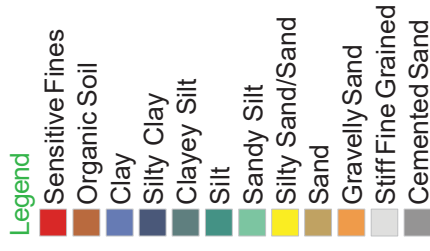
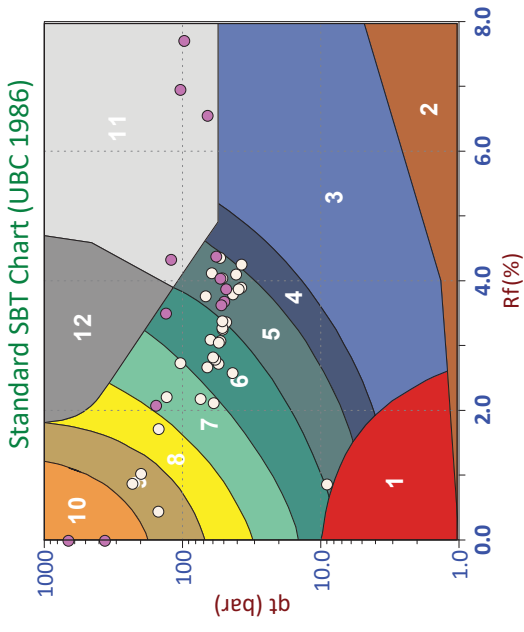
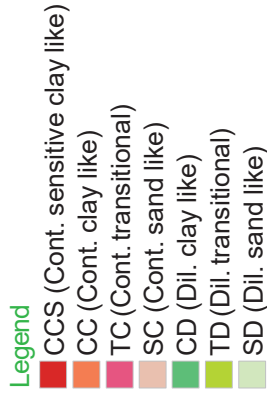
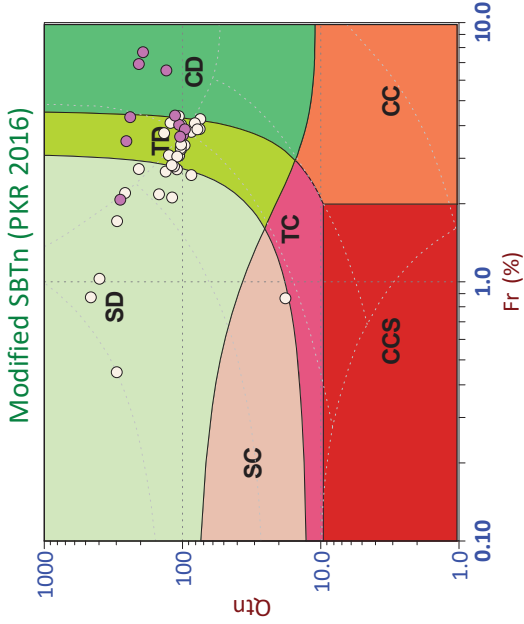
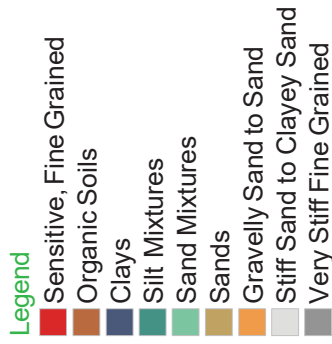
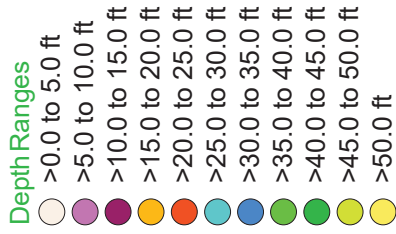
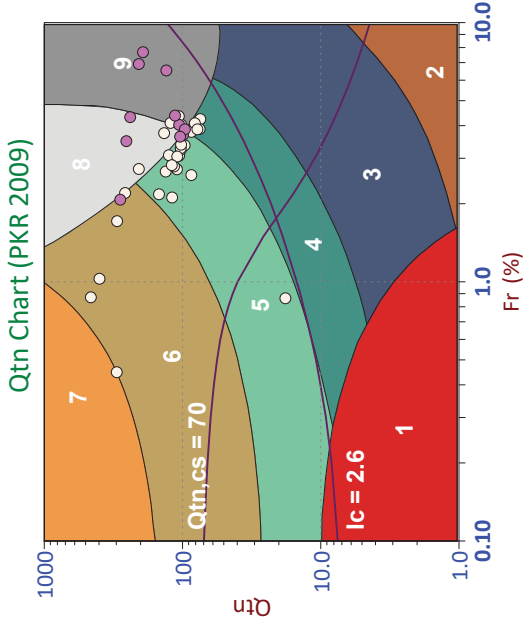




Stantec

Job No: 19-61032
Date: 2019-08-22 17:07
Site: US60 Bridge, Livingston County, KY

Sounding: CPT19-02A
Cone: 513:T1500F15U500

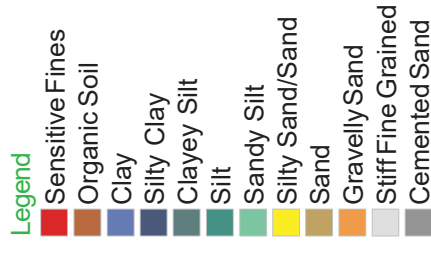
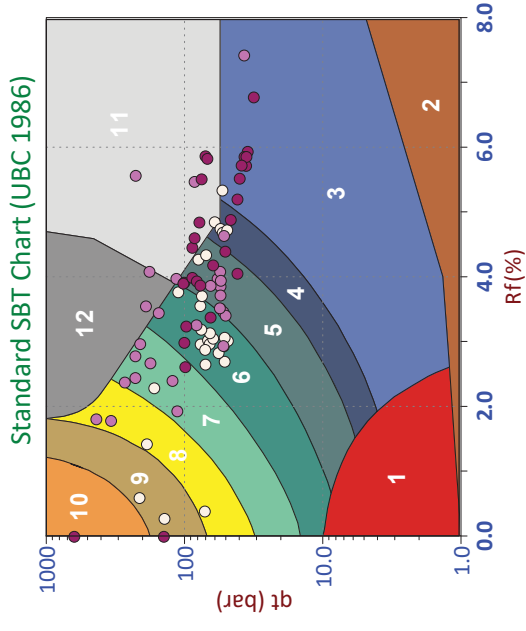
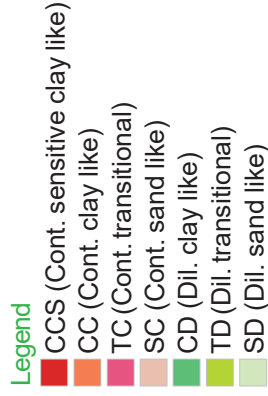
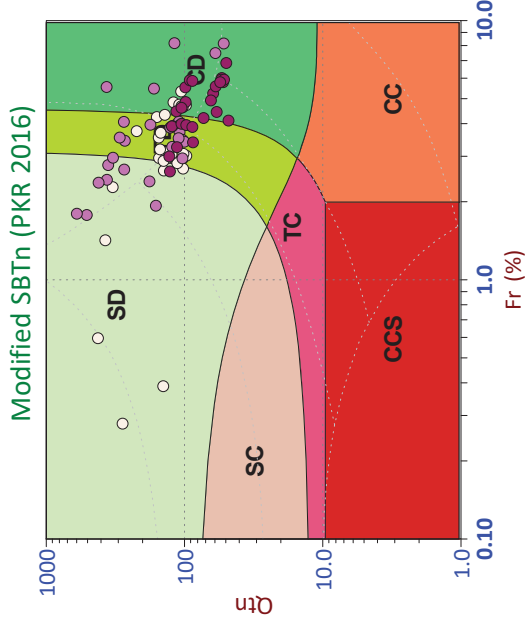
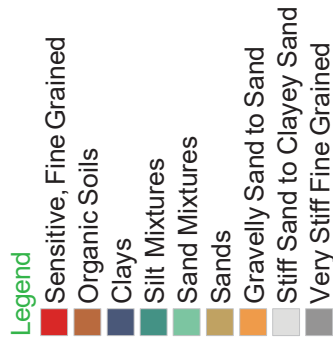
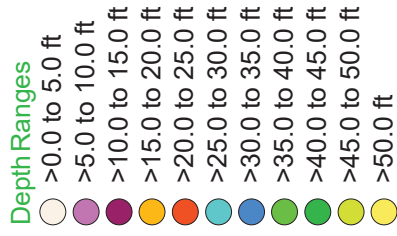
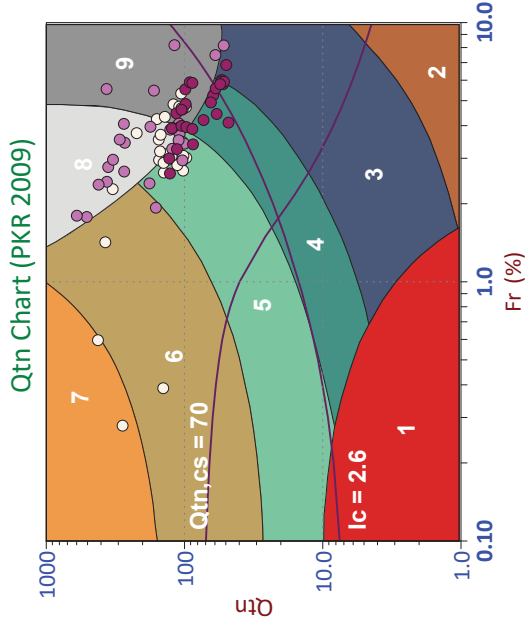




Stantec

Job No: 19-61032
Date: 2019-08-22 17:31
Site: US60 Bridge, Livingston County, KY

Sounding: CPT19-02B
Cone: 513:T1500F15U500

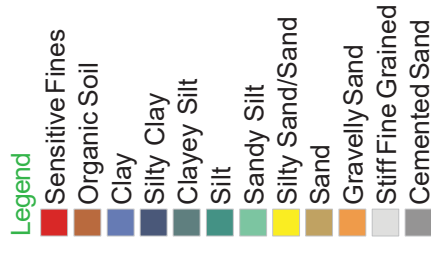
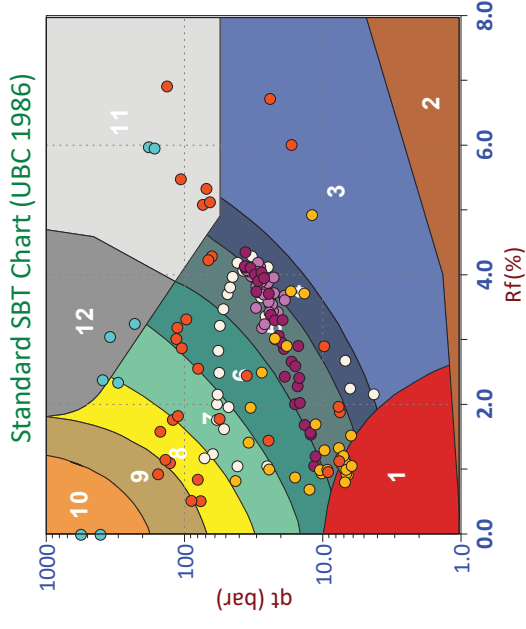
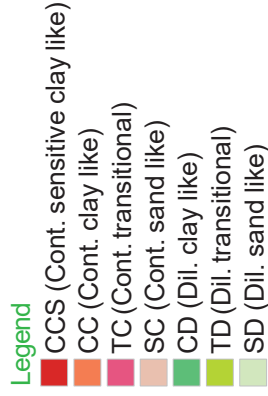
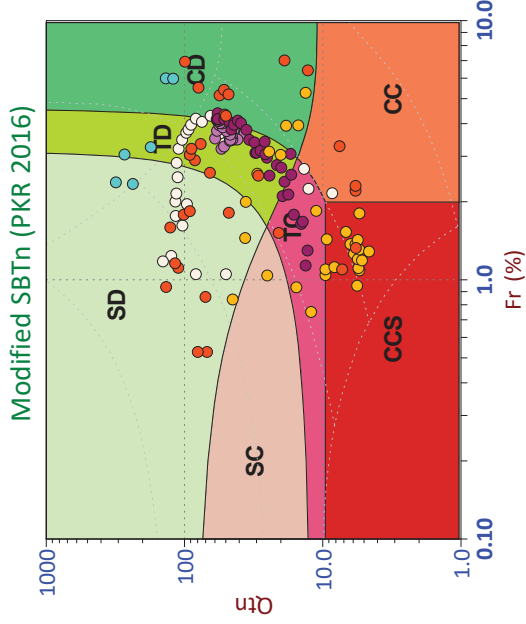
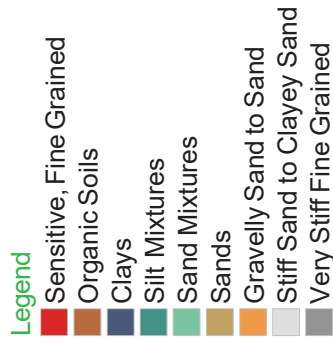
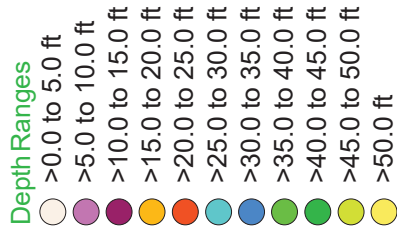
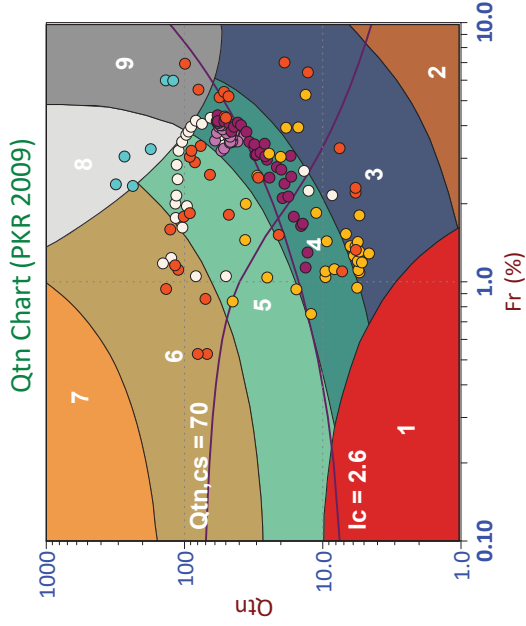




Stantec

Job No: 19-61032
Date: 2019-08-23 08:28
Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-03
Cone: 513:T1500F15U500

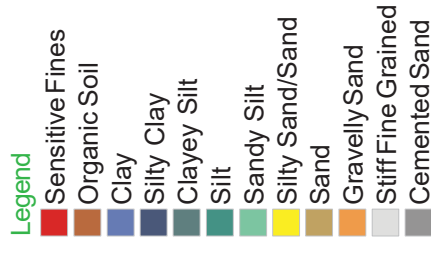
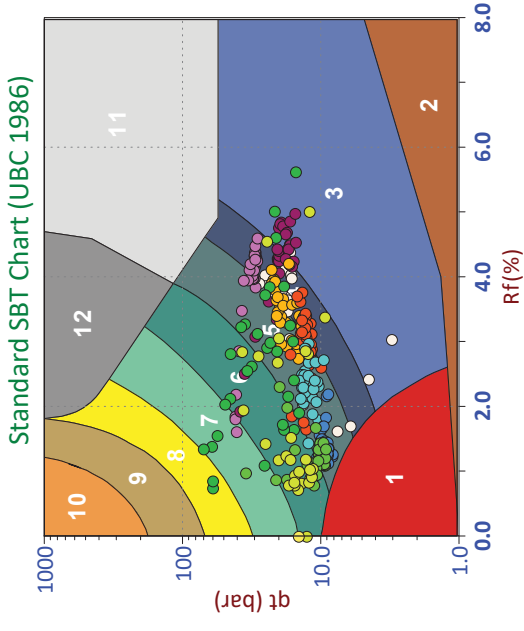
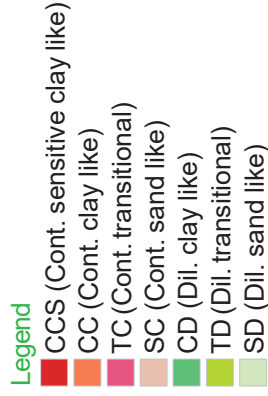
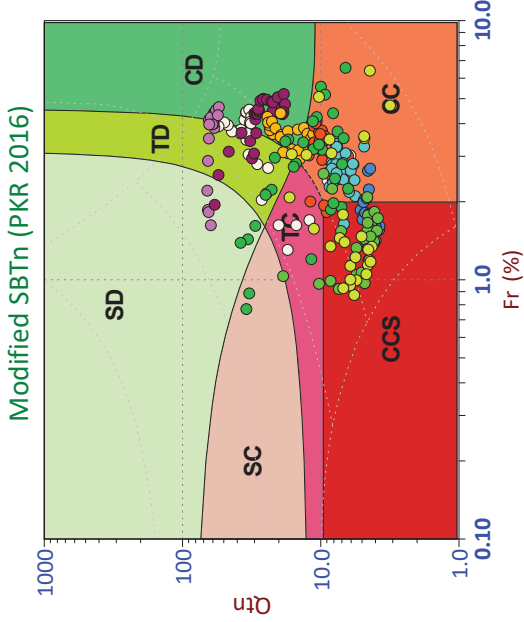
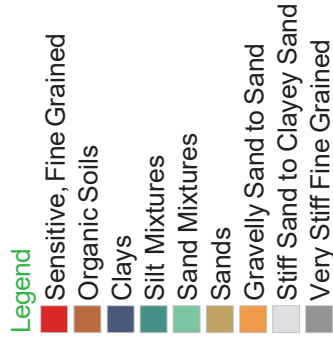
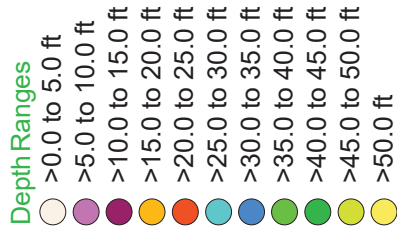
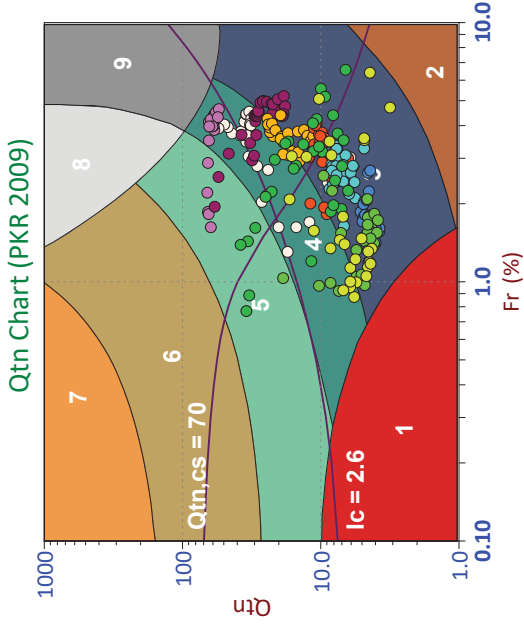




Stantec

Job No: 19-61032
Date: 2019-08-23 09:16
Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-04
Cone: 513:T1500F15U500

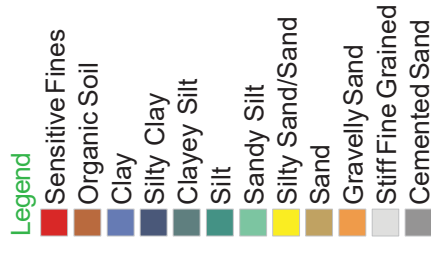
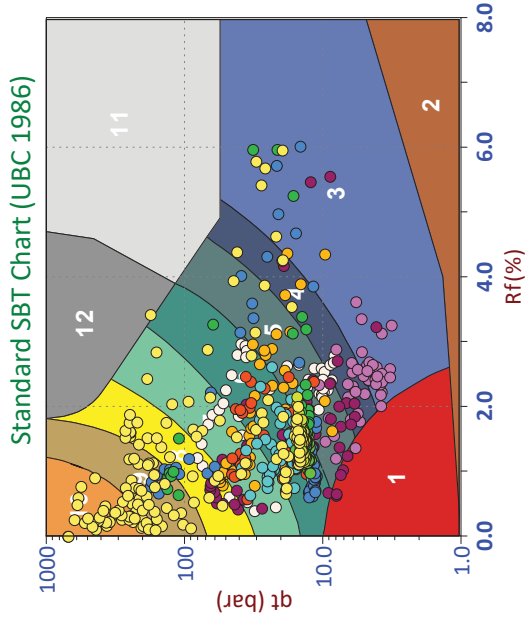
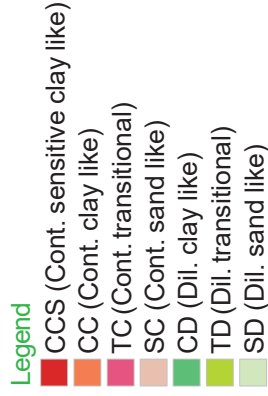
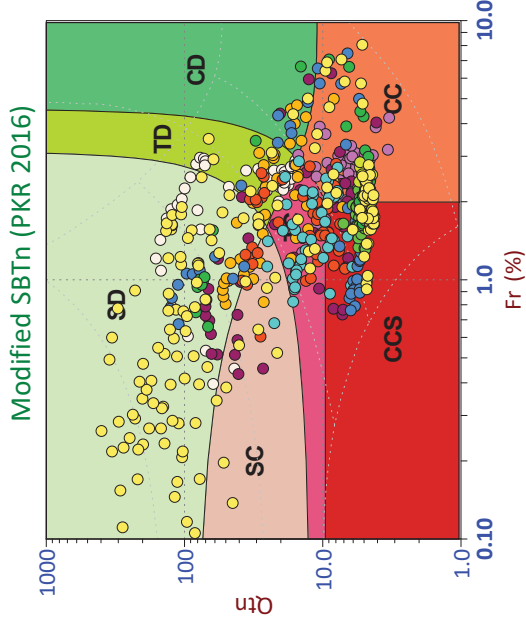
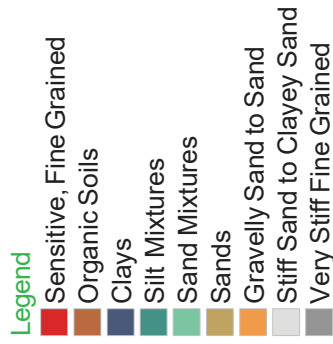
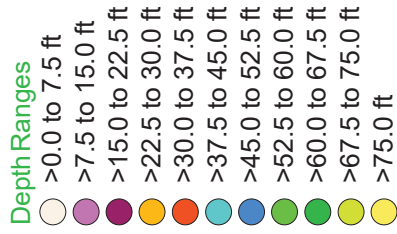
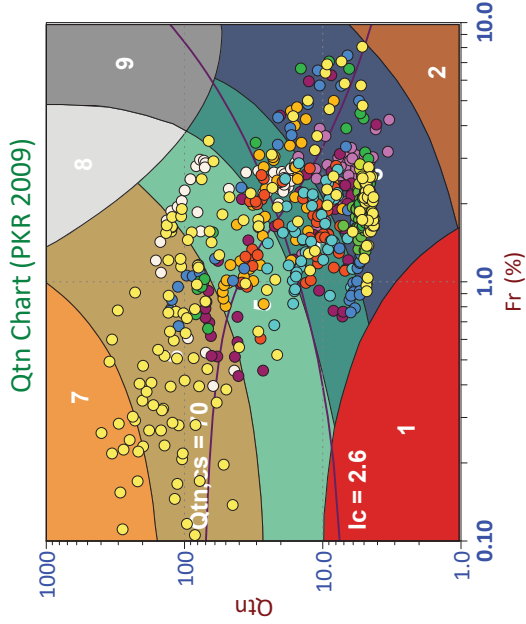




Stantec

Job No: 19-61032
Date: 2019-08-20 09:56
Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-05
Cone: 513:T1500F15U500

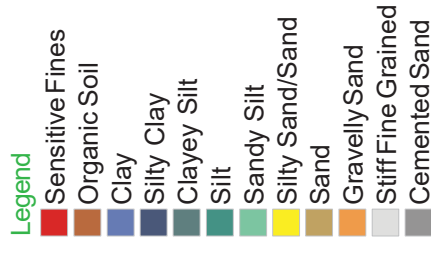
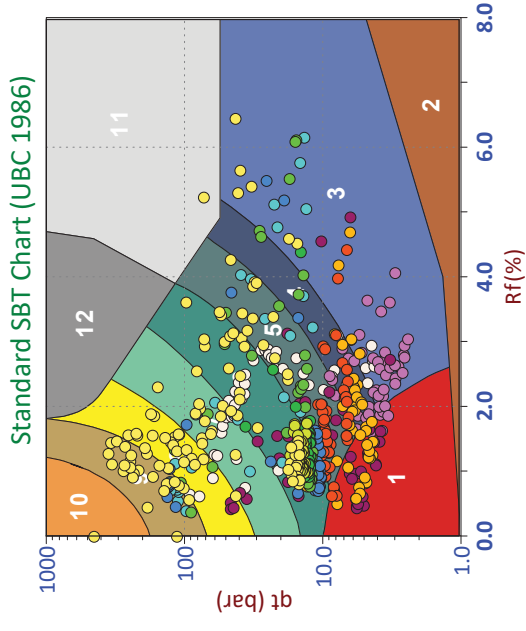
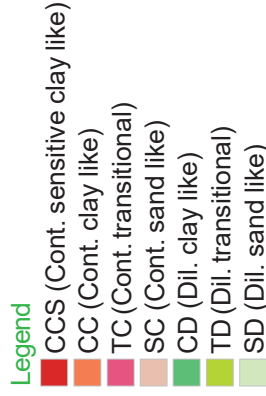
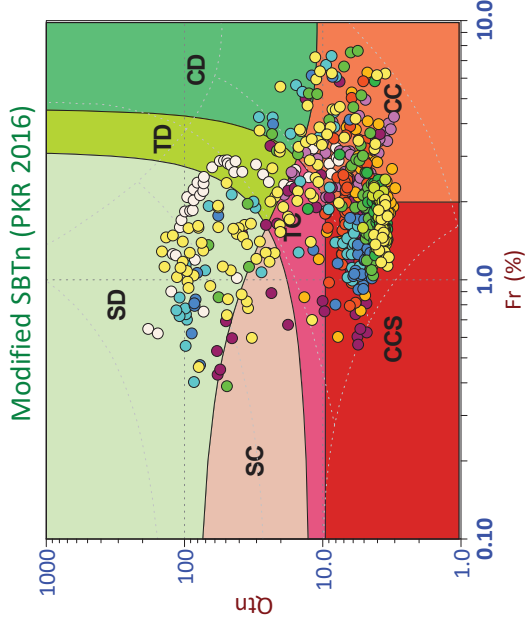
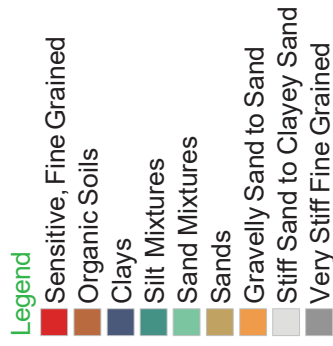
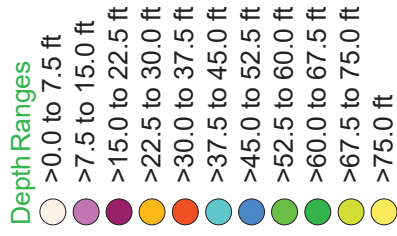
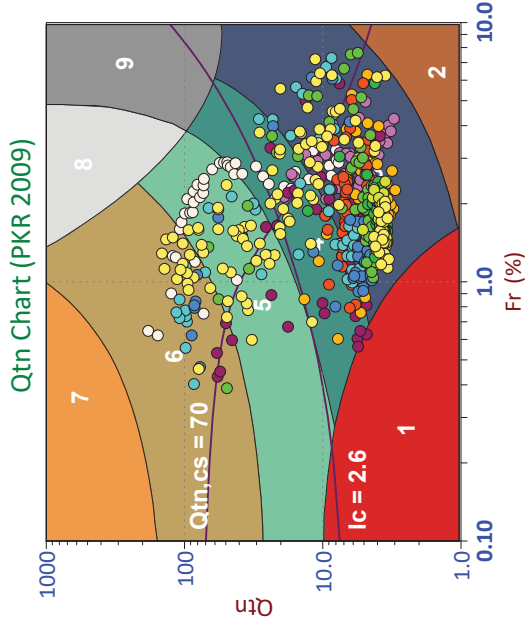




Stantec

Job No: 19-61032
Date: 2019-08-20 14:15
Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-06
Cone: 513:T1500F15U500

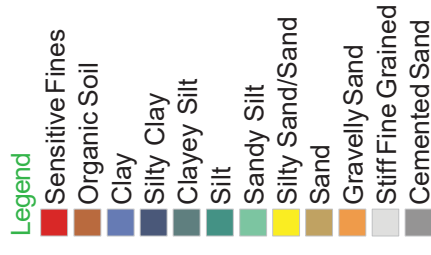
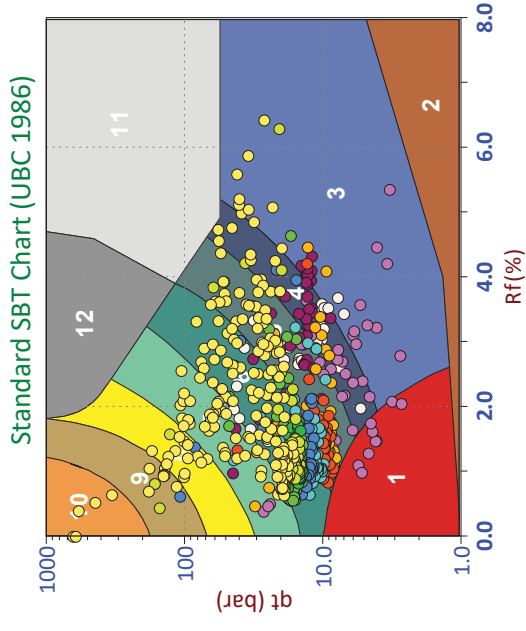
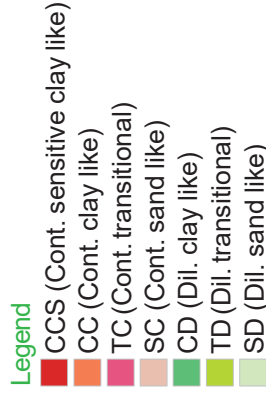
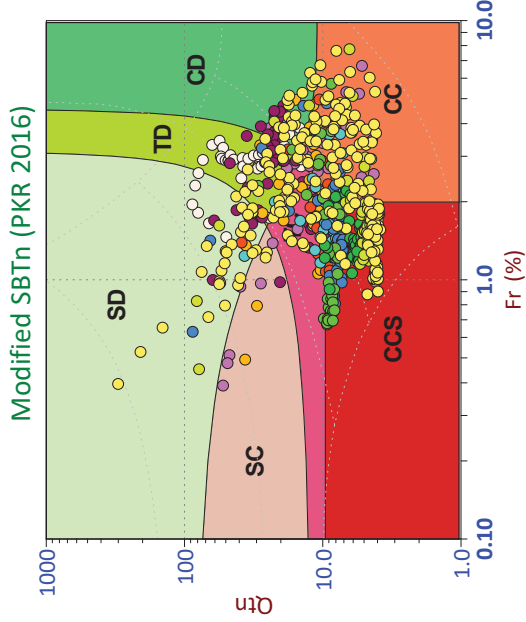
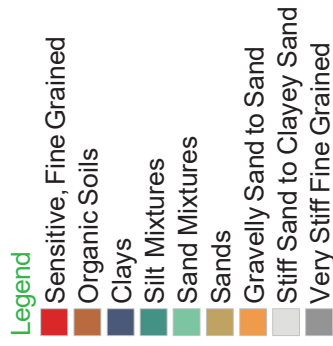
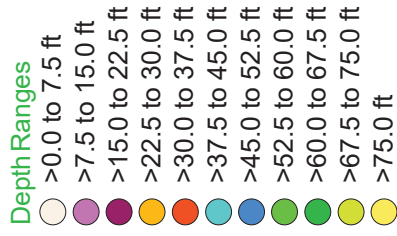
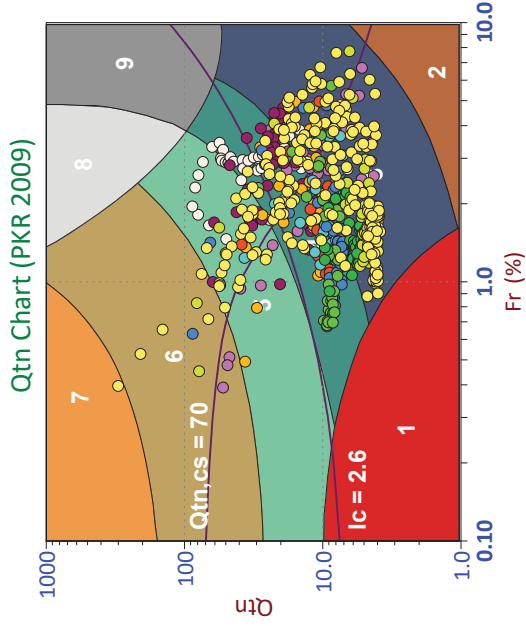




Stantec

Job No: 19-61032
Date: 2019-08-21 08:35
Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-07
Cone: 513:T1500F15U500

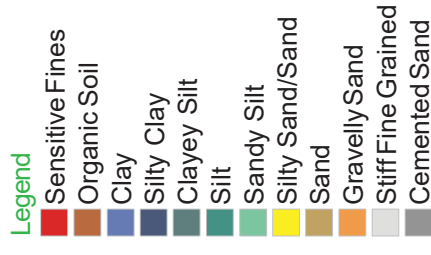
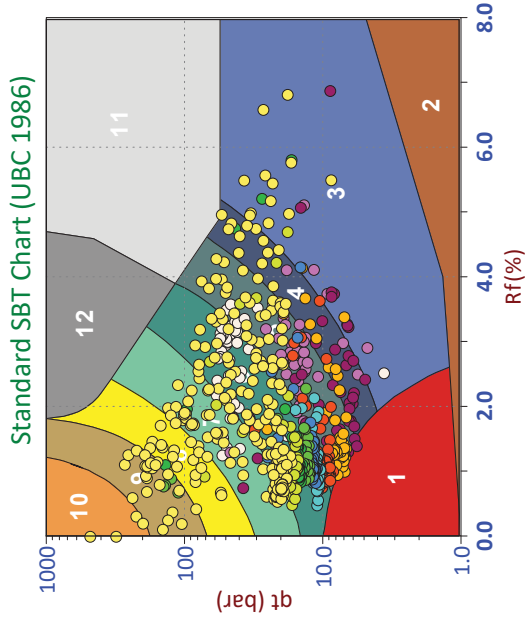
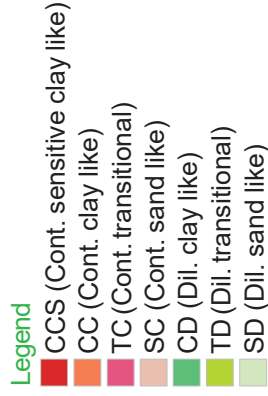
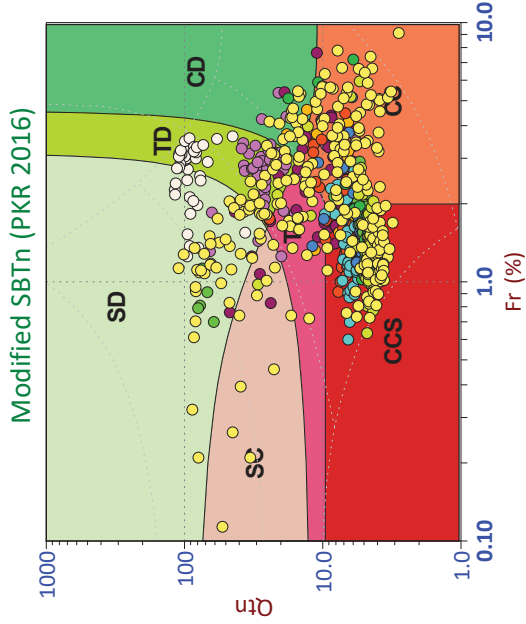
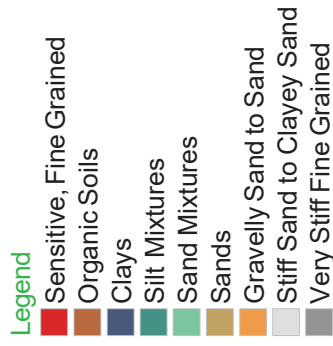
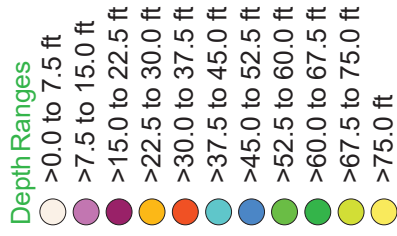
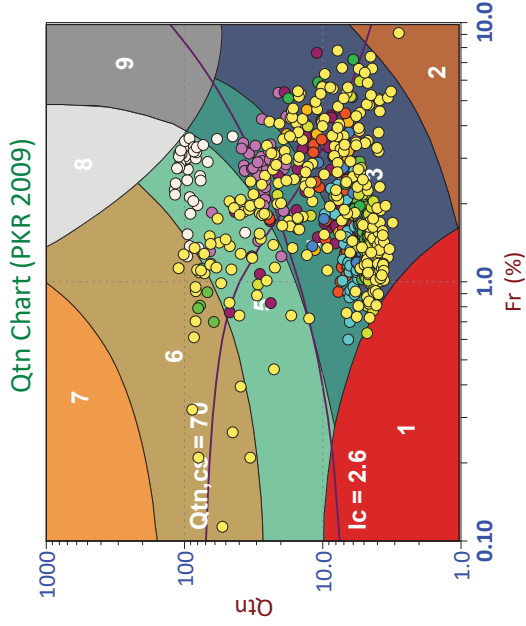




Stantec

Job No: 19-61032
Date: 2019-08-21 11:15
Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-08
Cone: 513:T1500F15U500

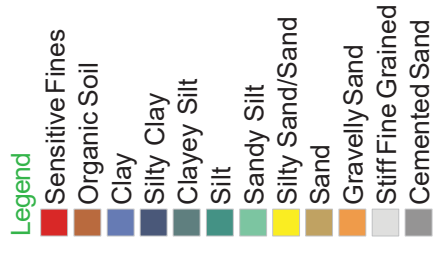
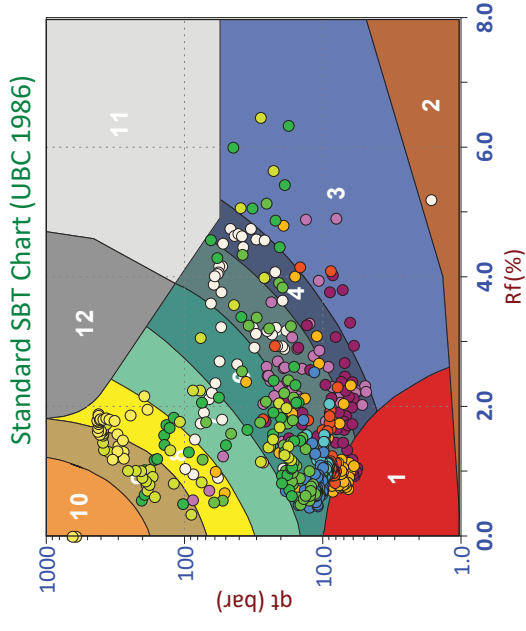
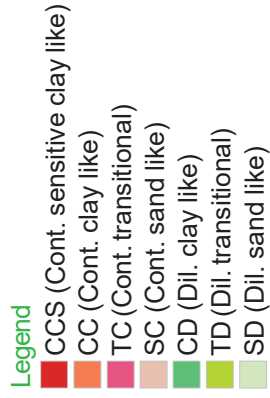
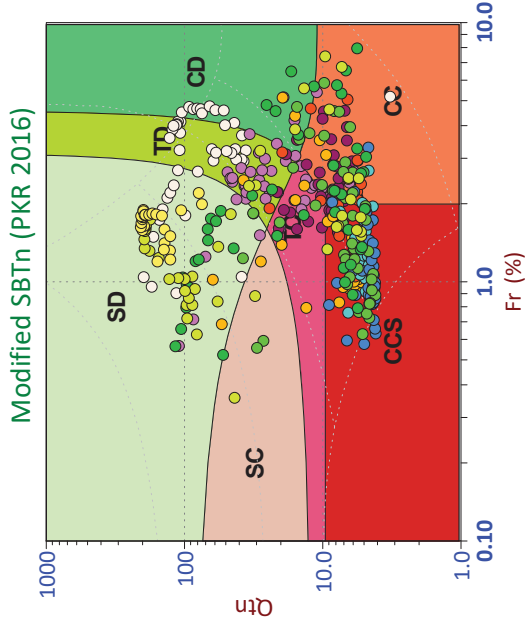
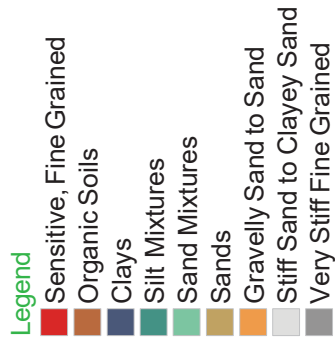
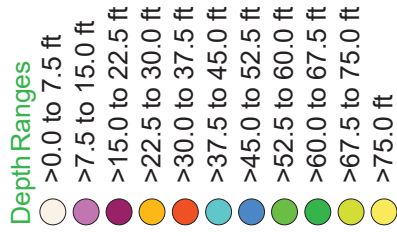
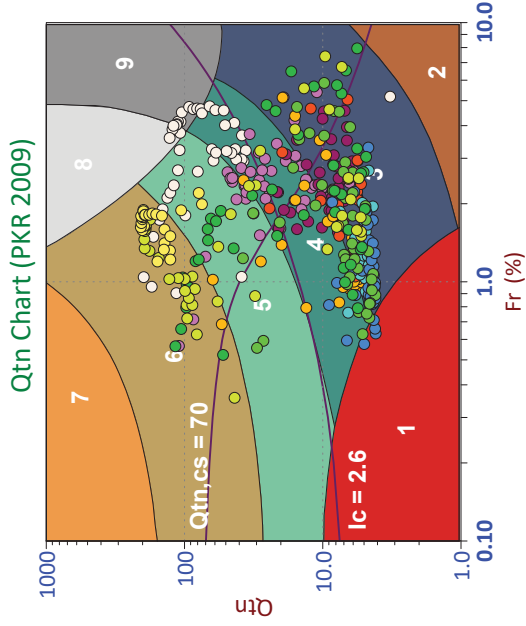




Stantec

Job No: 19-61032
Date: 2019-08-21 13:39
Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-09
Cone: 513:T1500F15U500

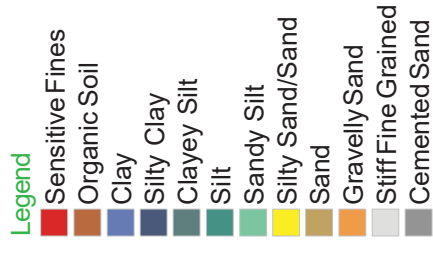
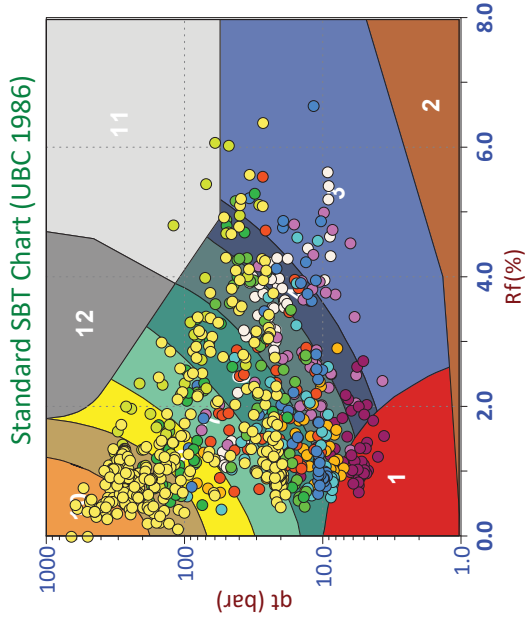
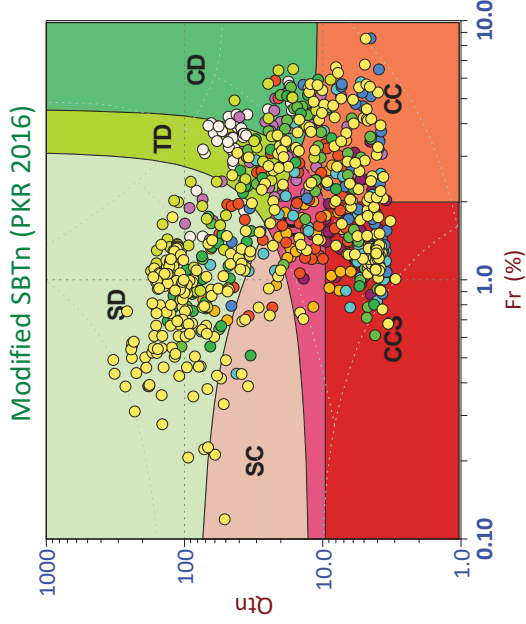
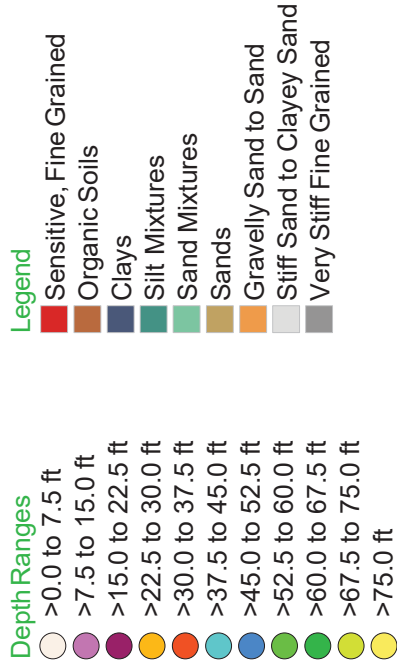
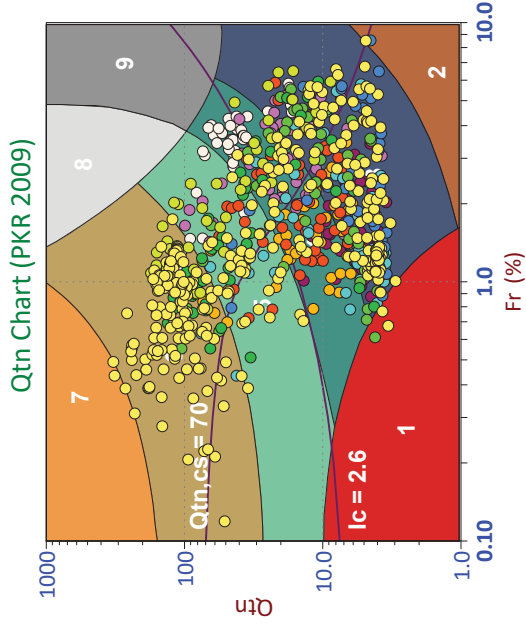




Stantec

Job No: 19-61032
Date: 2019-08-21 15:43
Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-10
Cone: 513:T1500F15U500

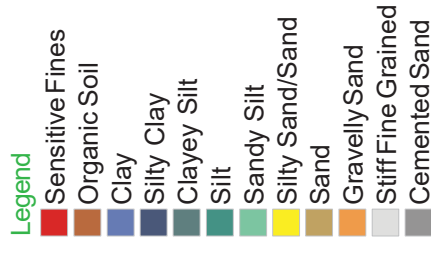
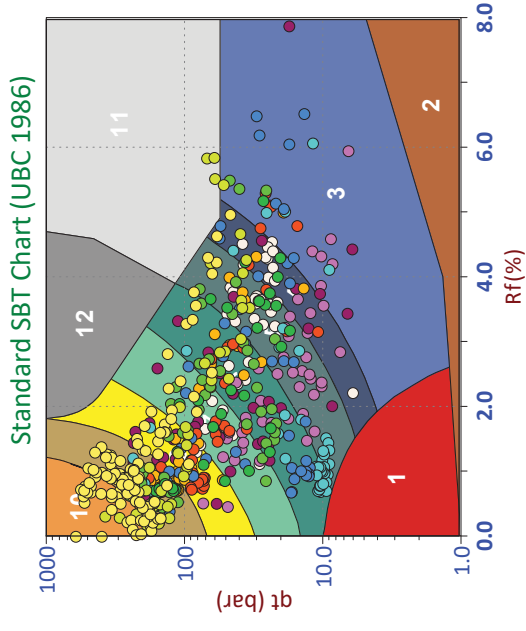
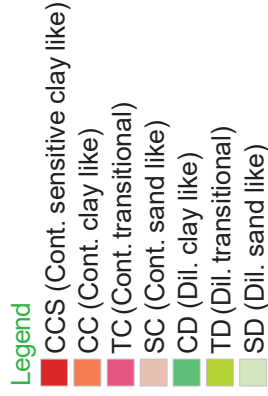
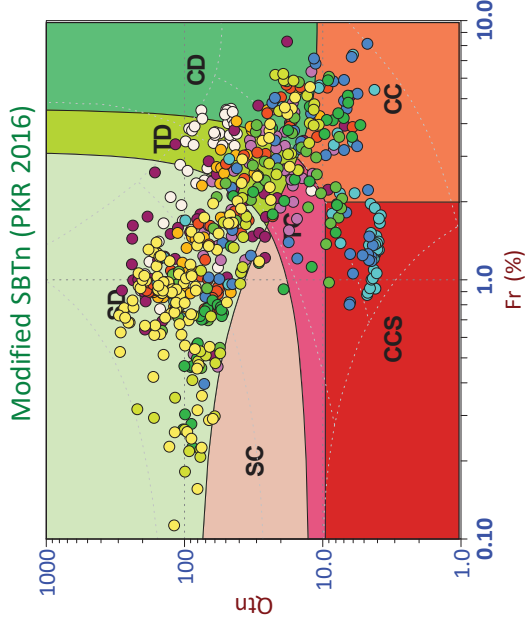
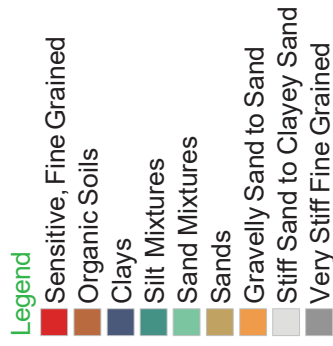
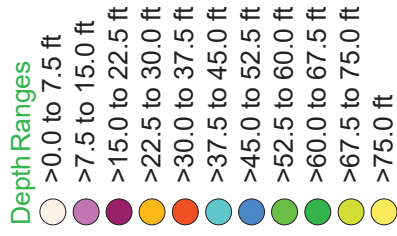
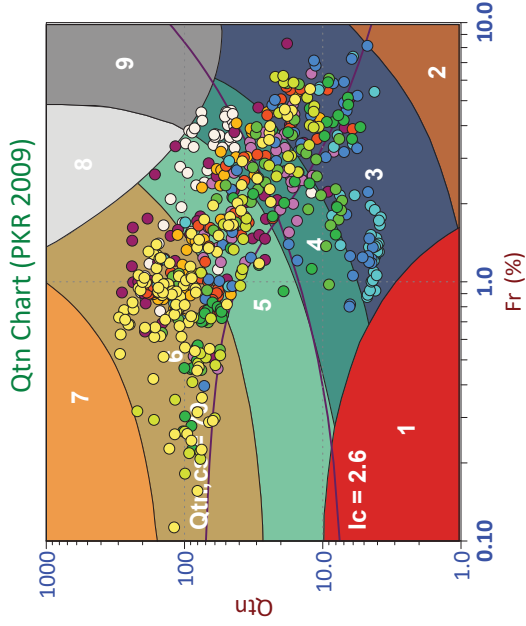




Stantec

Job No: 19-61032
Date: 2019-08-22 10:33
Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-11
Cone: 513:T1500F15U500



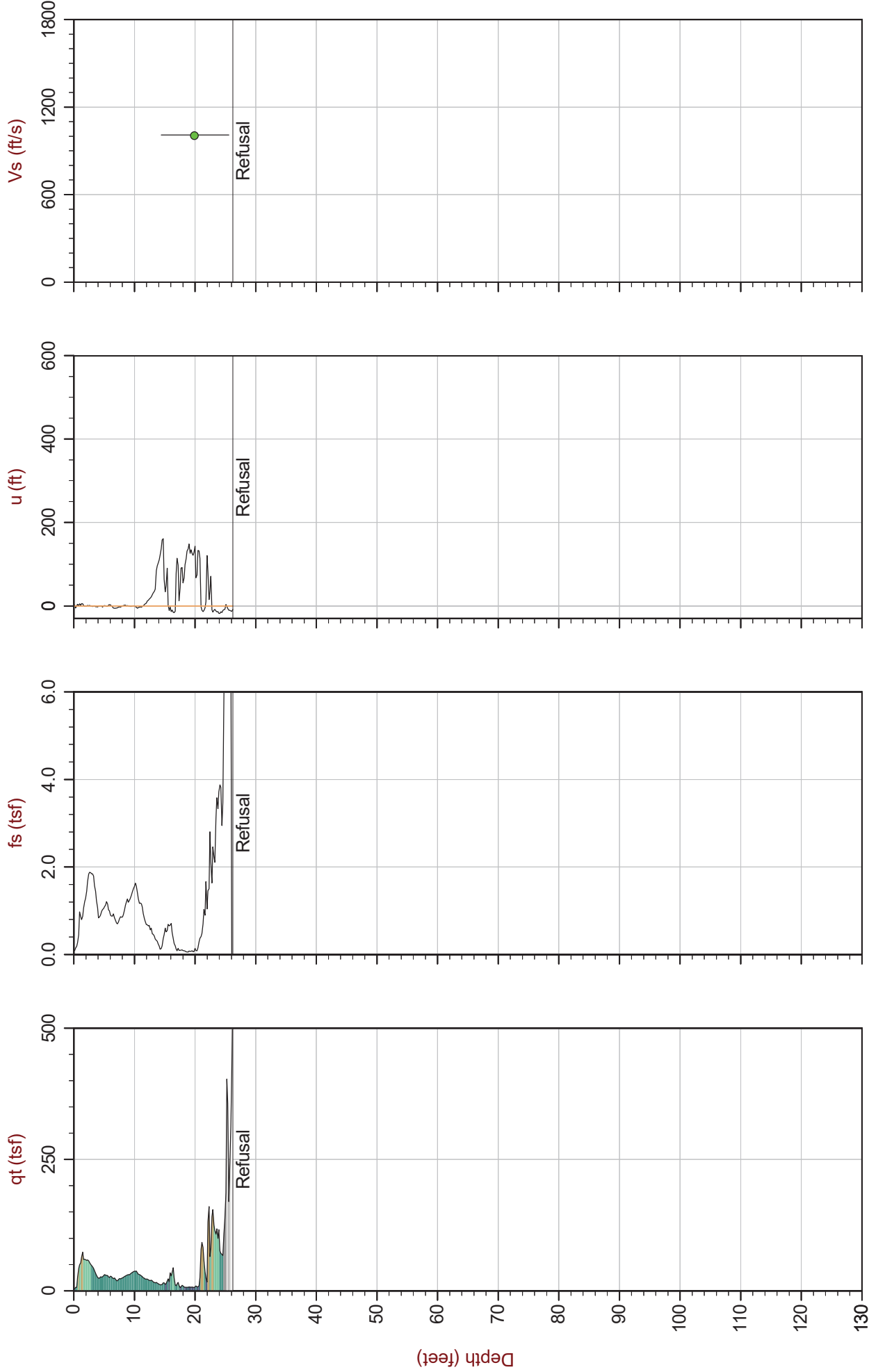
Seismic Cone Penetration Test Plots



Stantec

Job No: 19-61032
Date: 2019-08-23 08:28
Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-03
Cone: 513:T1500F15U500



Max Depth: 8.000 m / 26.25 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 19-61032_SP03.COR
Unit Wt: SBTQtn (PKR2009)

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq not achieved

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112118 E: 375665

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Stantec

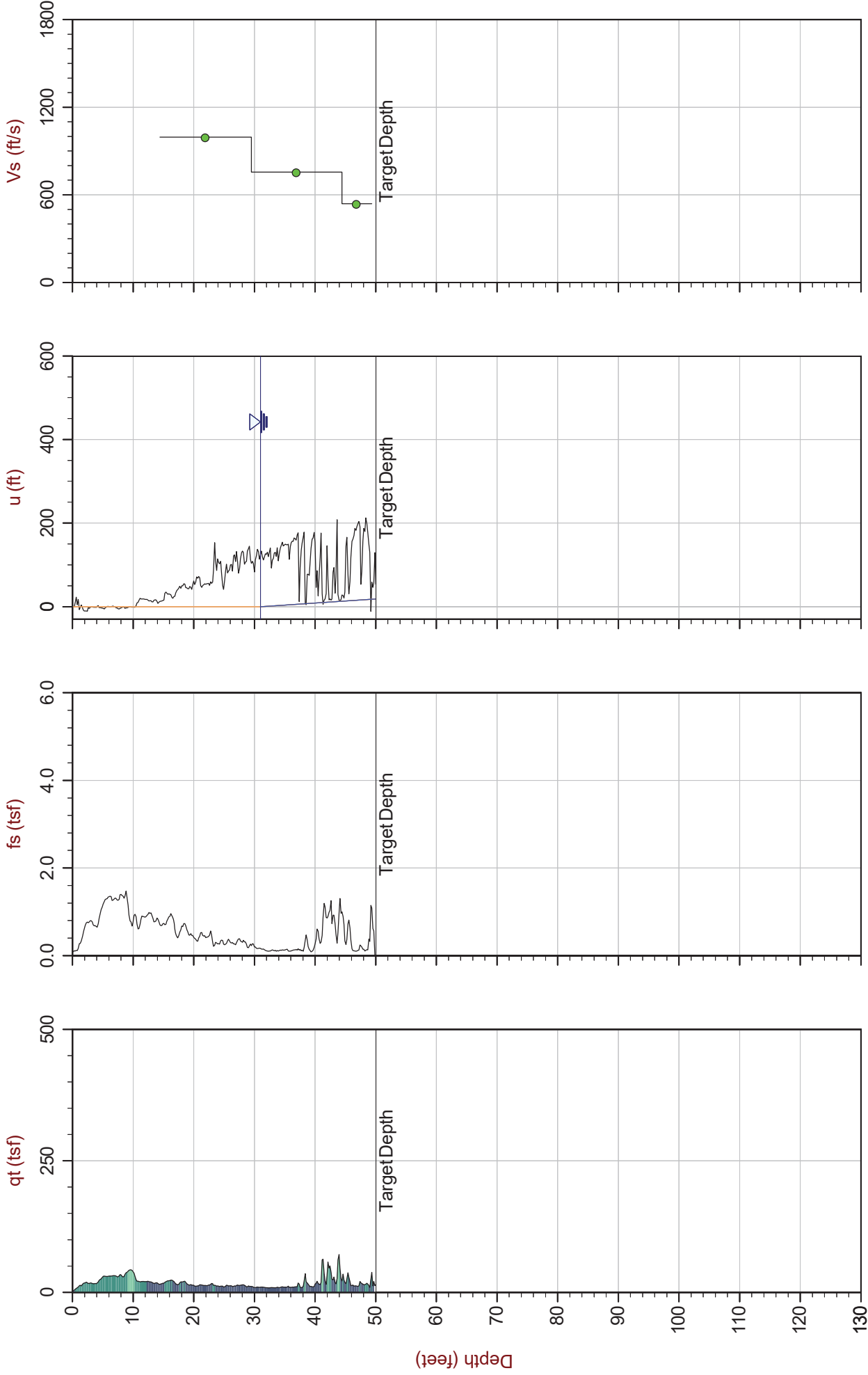
Job No: 19-61032

Date: 2019-08-23 09:16

Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-04

Cone: 513:T1500F15U500



Max Depth: 15.250 m / 50.03 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 19-61032_SP04.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112156 E: 375670

Hydrostatic Line — Ueq ● Assumed Ueq ▲ PPD, Ueq achieved ▼ PPD, Ueq not achieved

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Stantec

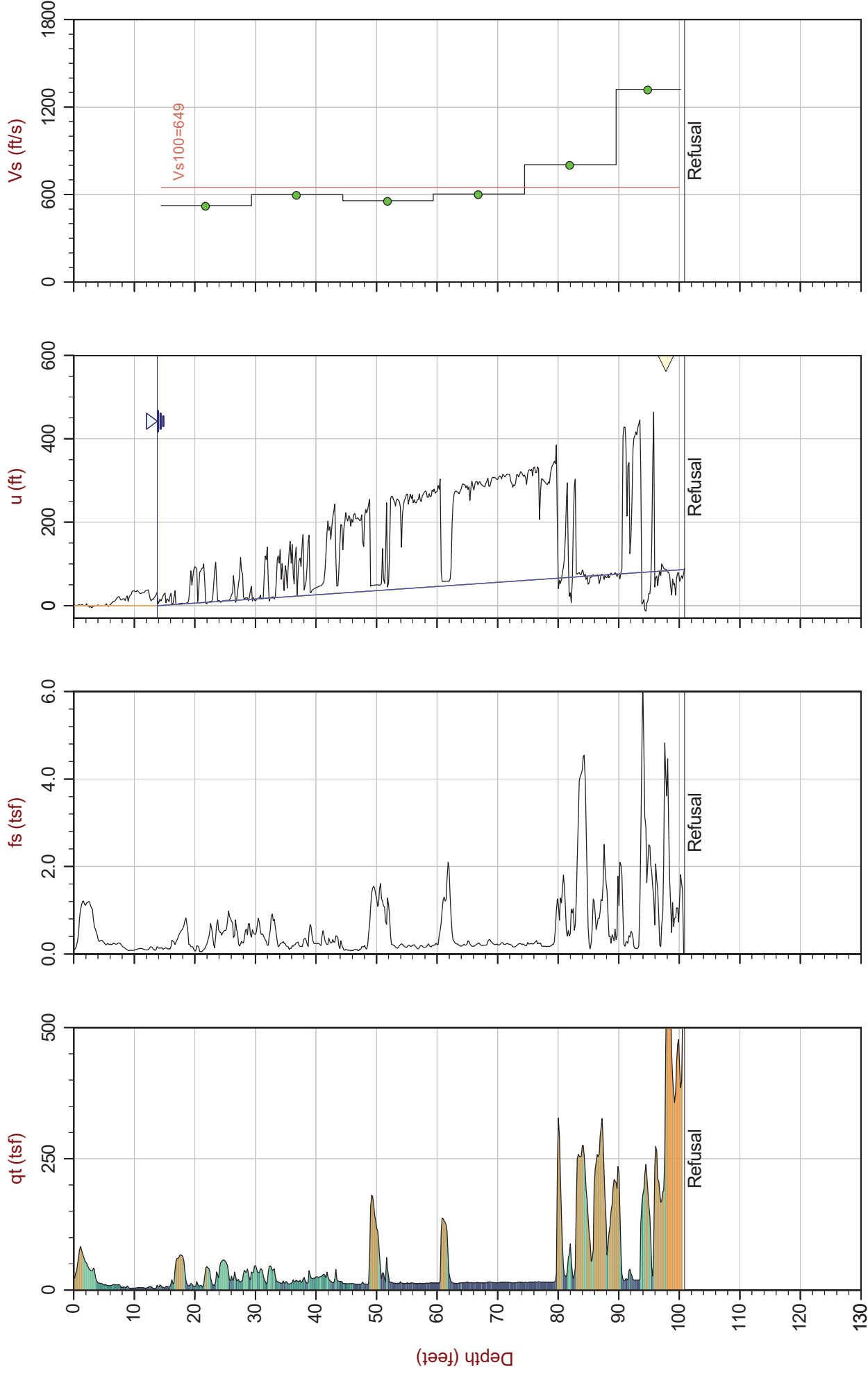
Job No: 19-61032

Date: 2019-08-20 09:56

Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-05

Cone: 513:T1500F15U500



Max Depth: 30.750 m / 100.88 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112378 E: 375709

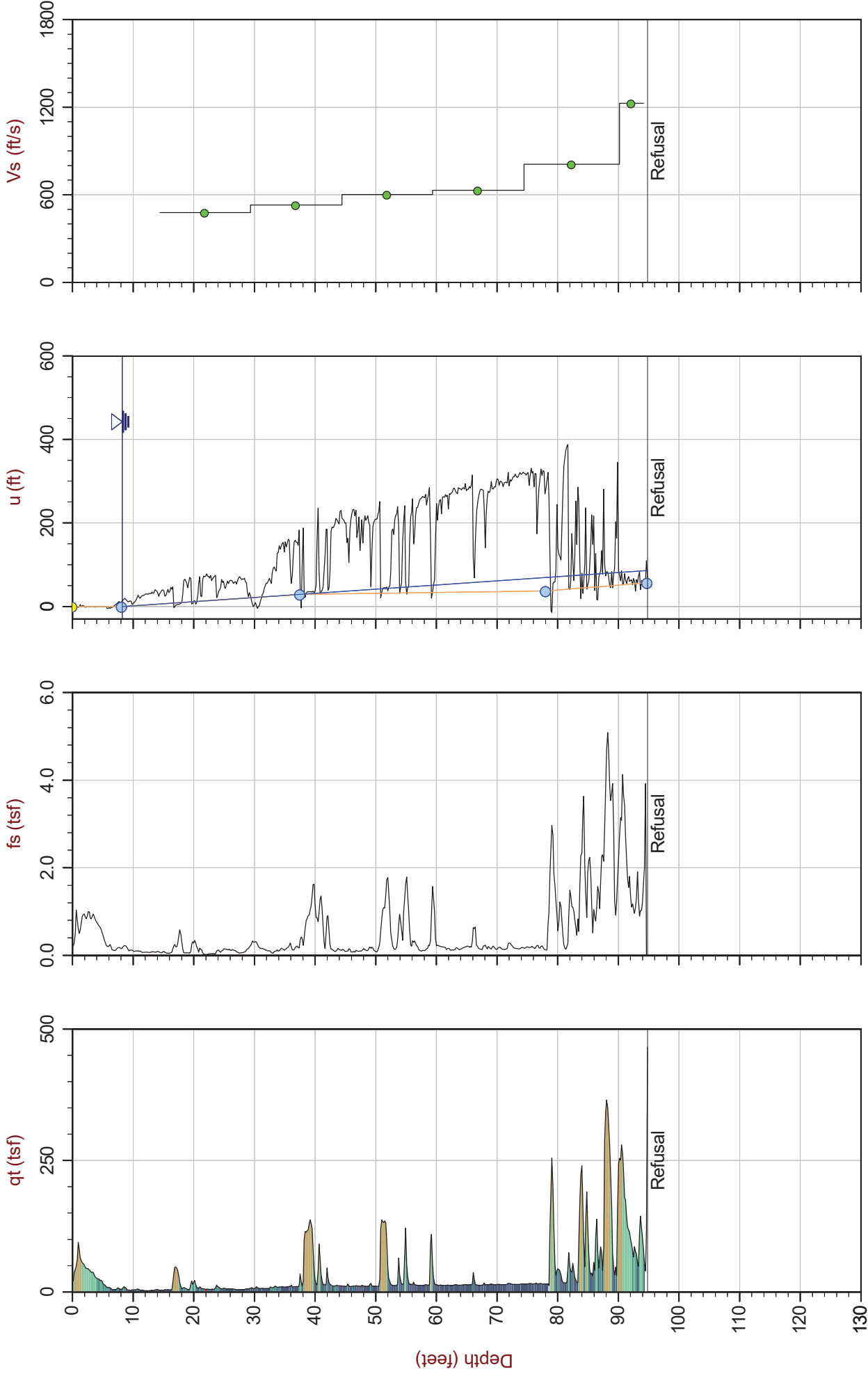
Hydrostatic Line — Ueq ● Assumed Ueq ▲ PPD, Ueq achieved ▼ PPD, Ueq not achieved
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Stantec

Job No: 19-61032
Date: 2019-08-20 14:15
Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-06
Cone: 513:T1500F15U500



Max Depth: 28.900 m / 94.82 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 19-61032_SP06.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112426 E: 375716

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Stantec

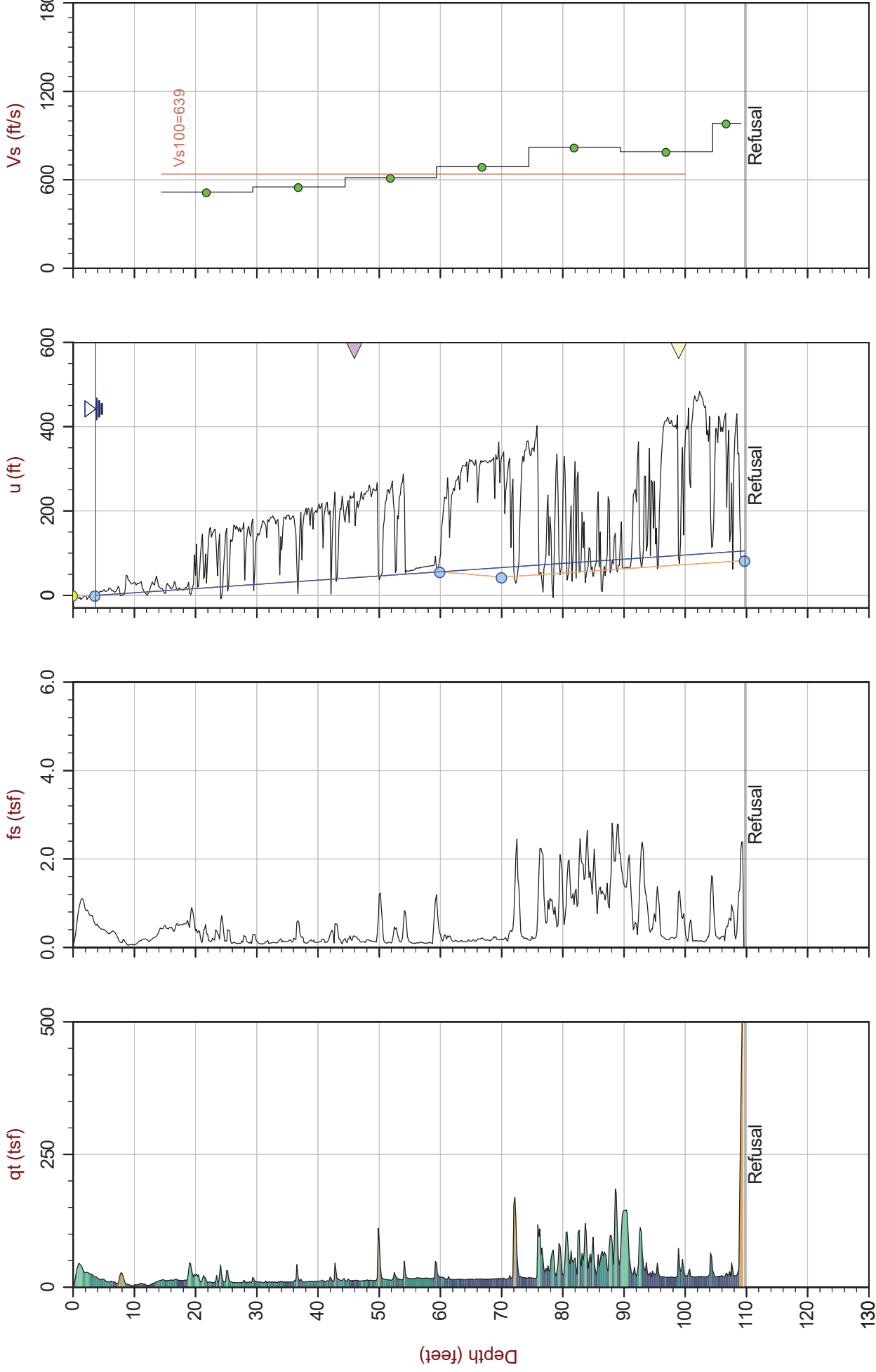
Job No: 19-61032

Date: 2019-08-21 08:35

Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-07

Cone: 513:T1500F15U500



Max Depth: 33.450 m / 109.74 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 19-61032_SP07.COR

Unit Wt: SBTQtn (PKR2009)

Hydrostatic Line — u_{eq} ● Assumed u_{eq} ▲ PPD, u_{eq} achieved ▼ PPD, u_{eq} not achieved

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112461 E: 375709

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Stantec

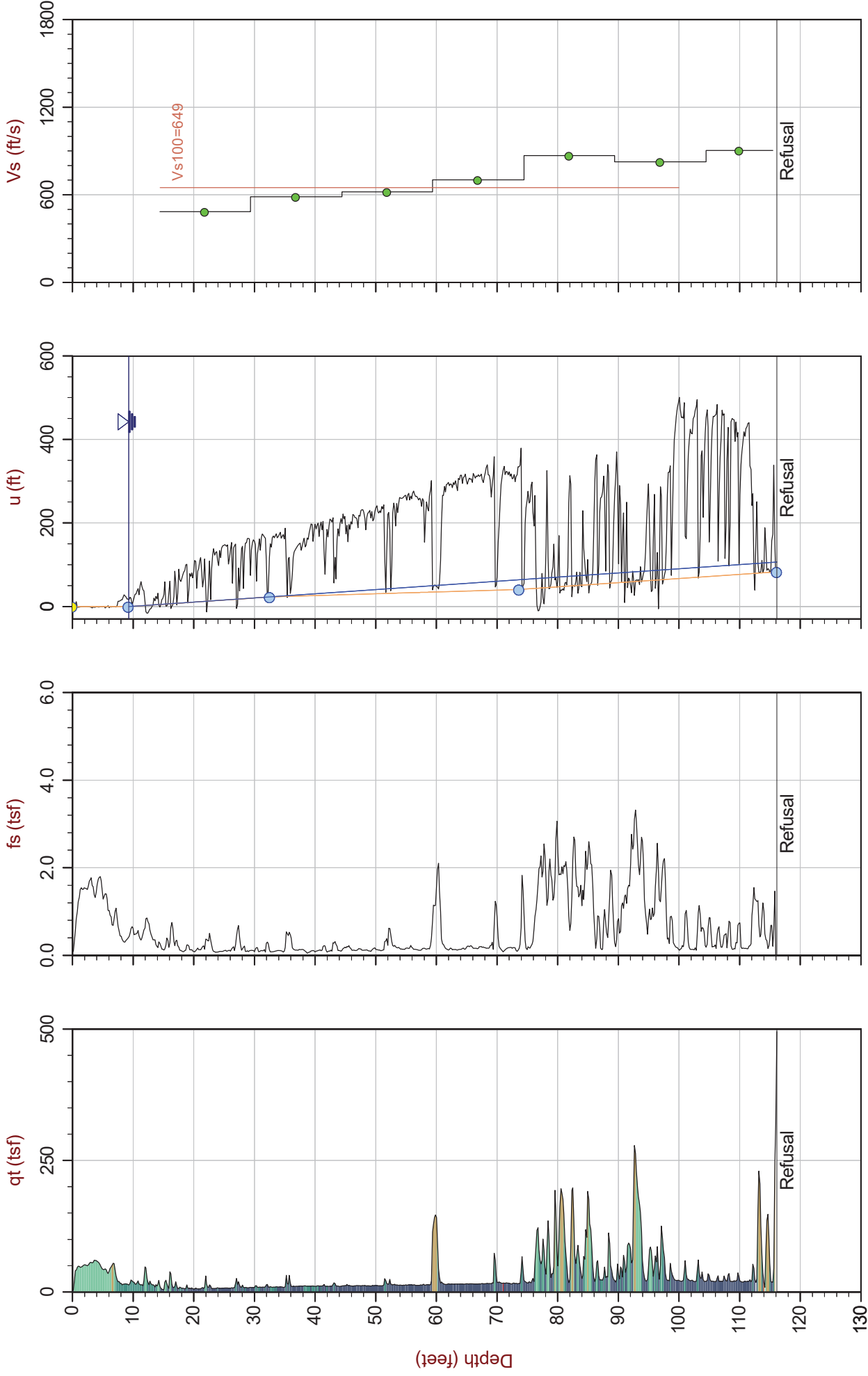
Job No: 19-61032

Sounding: SCPT19-08

Date: 2019-08-21 11:15

Cone: 513:T1500F15U500

Site: US60 Bridge, Livingston County, KY



Max Depth: 35.400 m / 116.14 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112444 E: 375723

Hydrostatic Line — Ueq ● Assumed Ueq ▲ PPD, Ueq not achieved
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Stantec

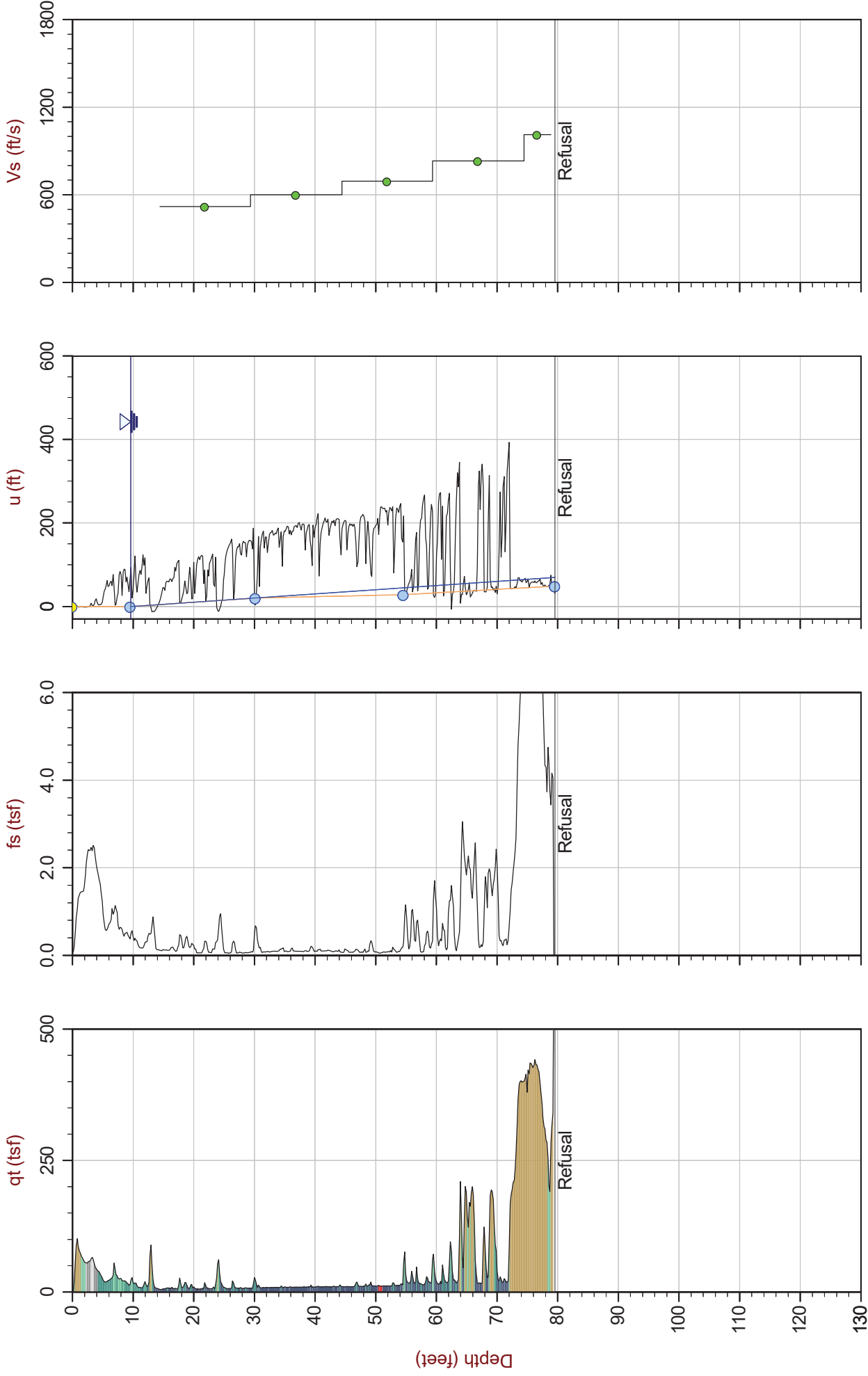
Job No: 19-61032

Sounding: SCPT19-09

Date: 2019-08-21 13:39

Cone: 513:T1500F15U500

Site: US60 Bridge, Livingston County, KY



Max Depth: 24.250 m / 79.56 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 19-61032_SP09.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112545 E: 375744

Hydrostatic Line — Ueq ● Assumed Ueq ▲ PPD, Ueq achieved ▼ PPD, Ueq not achieved

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Stantec

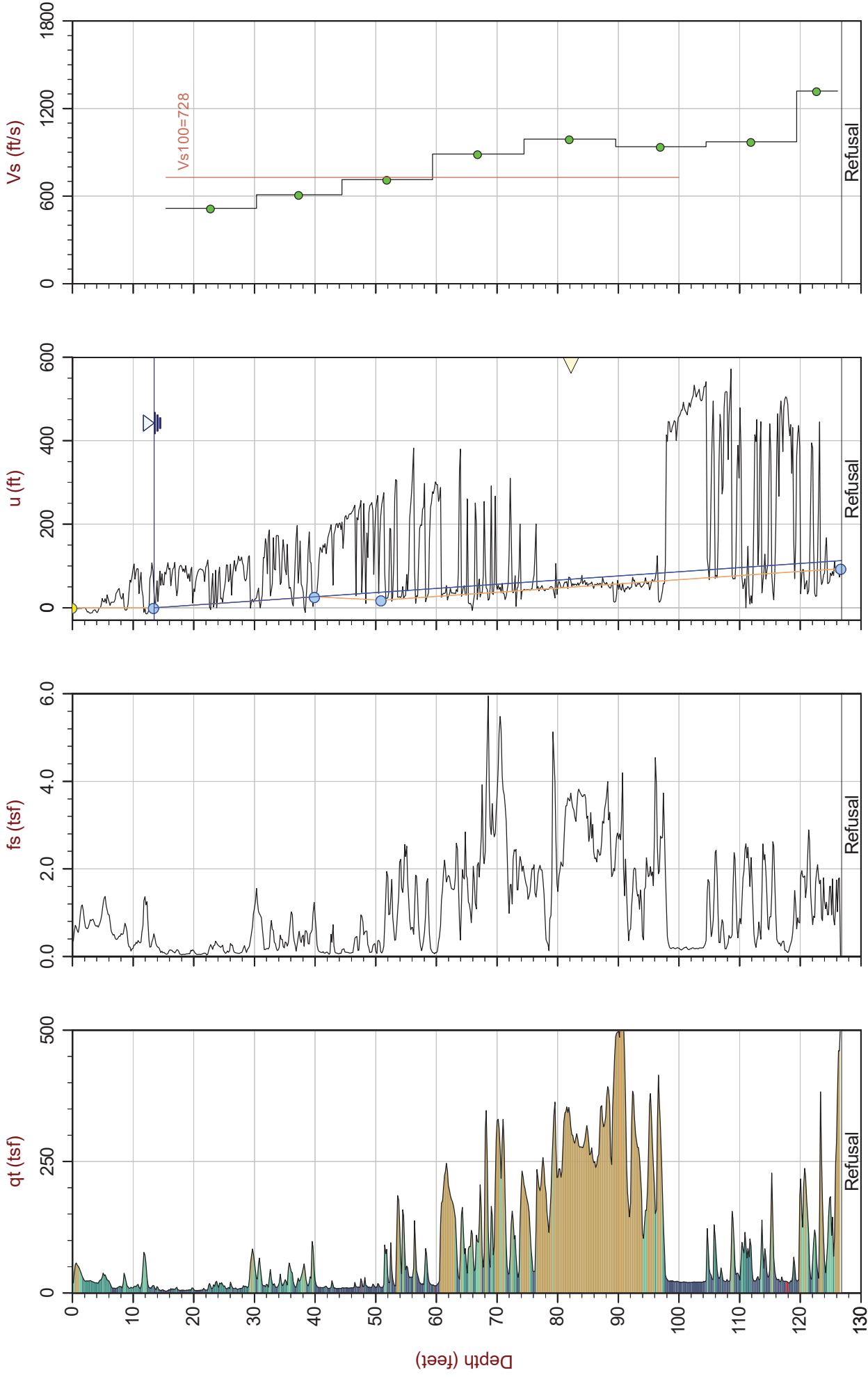
Job No: 19-61032

Date: 2019-08-21 15:43

Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-10

Cone: 513:T1500F15U500



Max Depth: 38.650 m / 126.80 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112576 E: 375747

Hydrostatic Line — Ueq — Assumed Ueq — PPD, Ueq achieved — PPD, Ueq not achieved
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Stantec

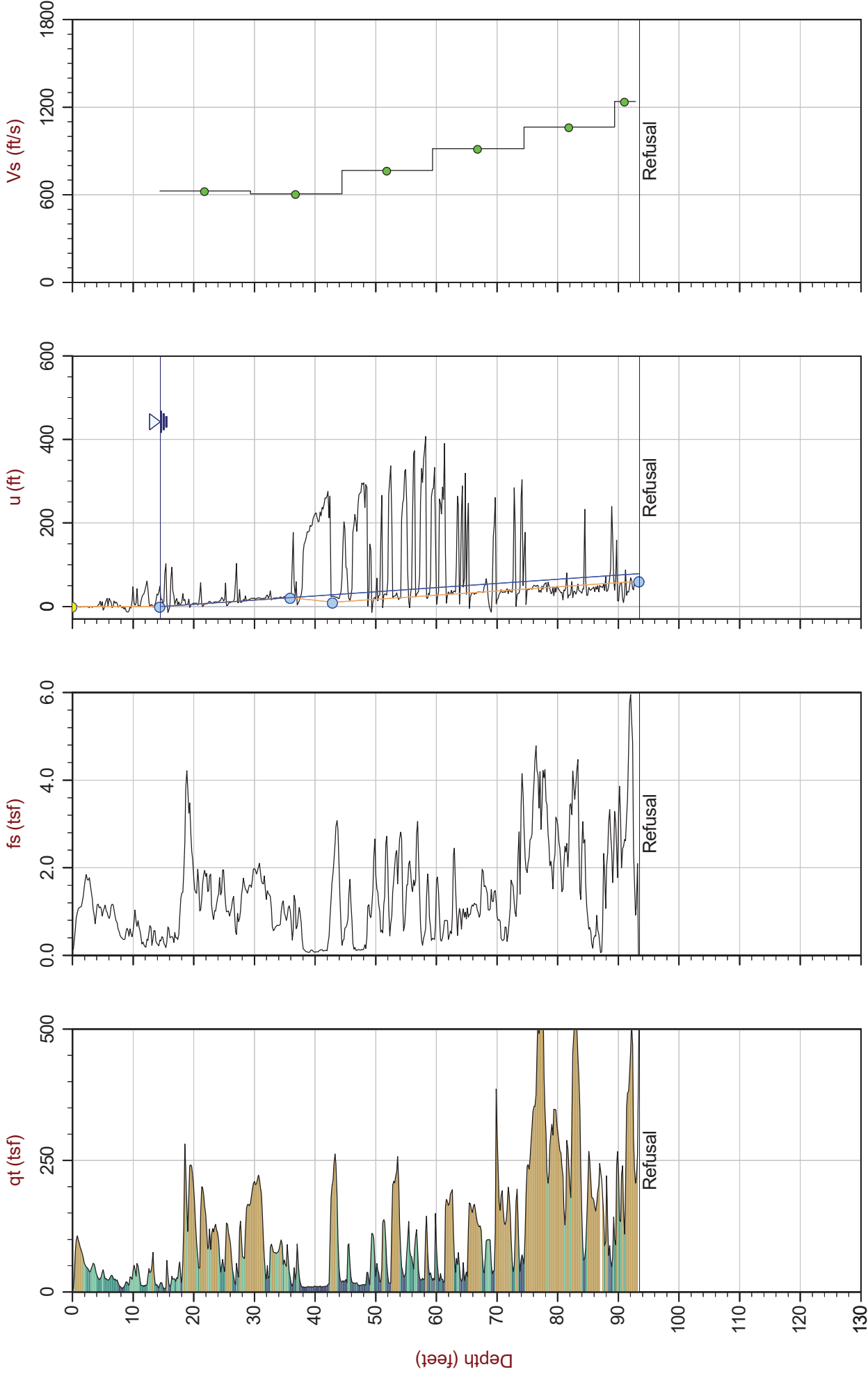
Job No: 19-61032

Date: 2019-08-22 10:33

Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-11

Cone: 513:T1500F15U500



Max Depth: 28.500 m / 93.50 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

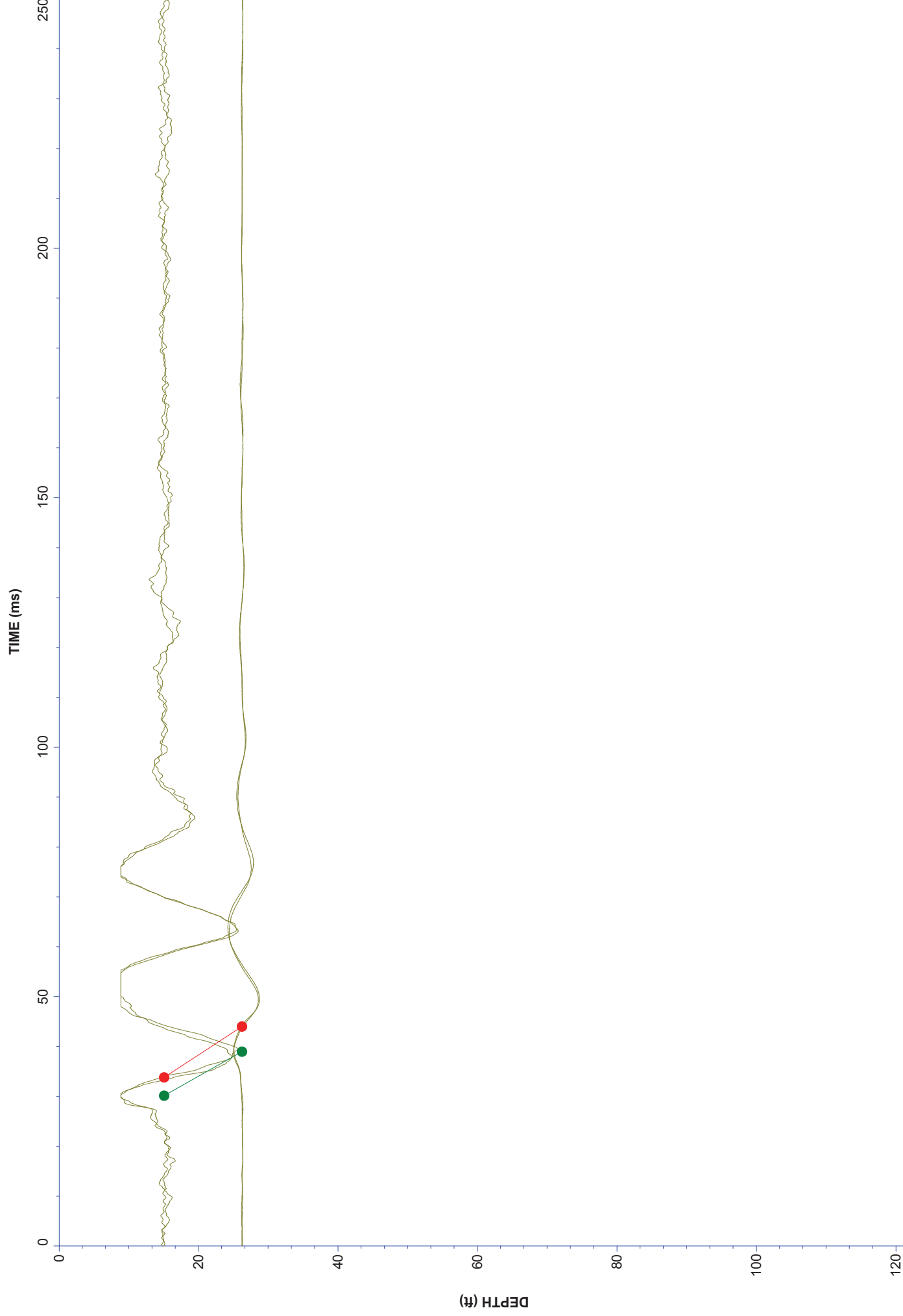
File: 19-61032_SP11.COR
Unit Wt: SBTQtn (PKR2009)

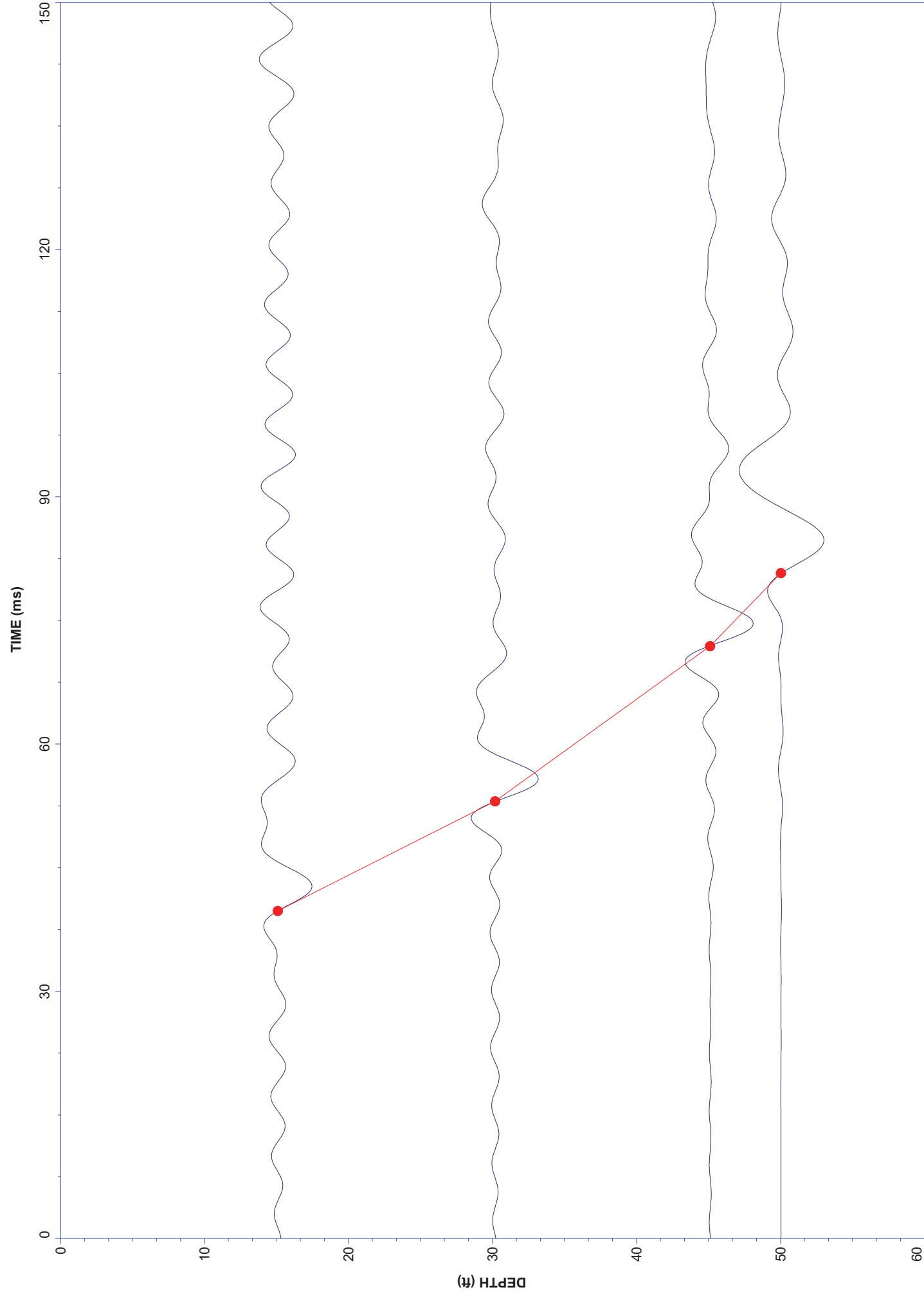
Hydrostatic Line — Ueq ● Assumed Ueq ▲ PPD, Ueq achieved ▼ PPD, Ueq not achieved

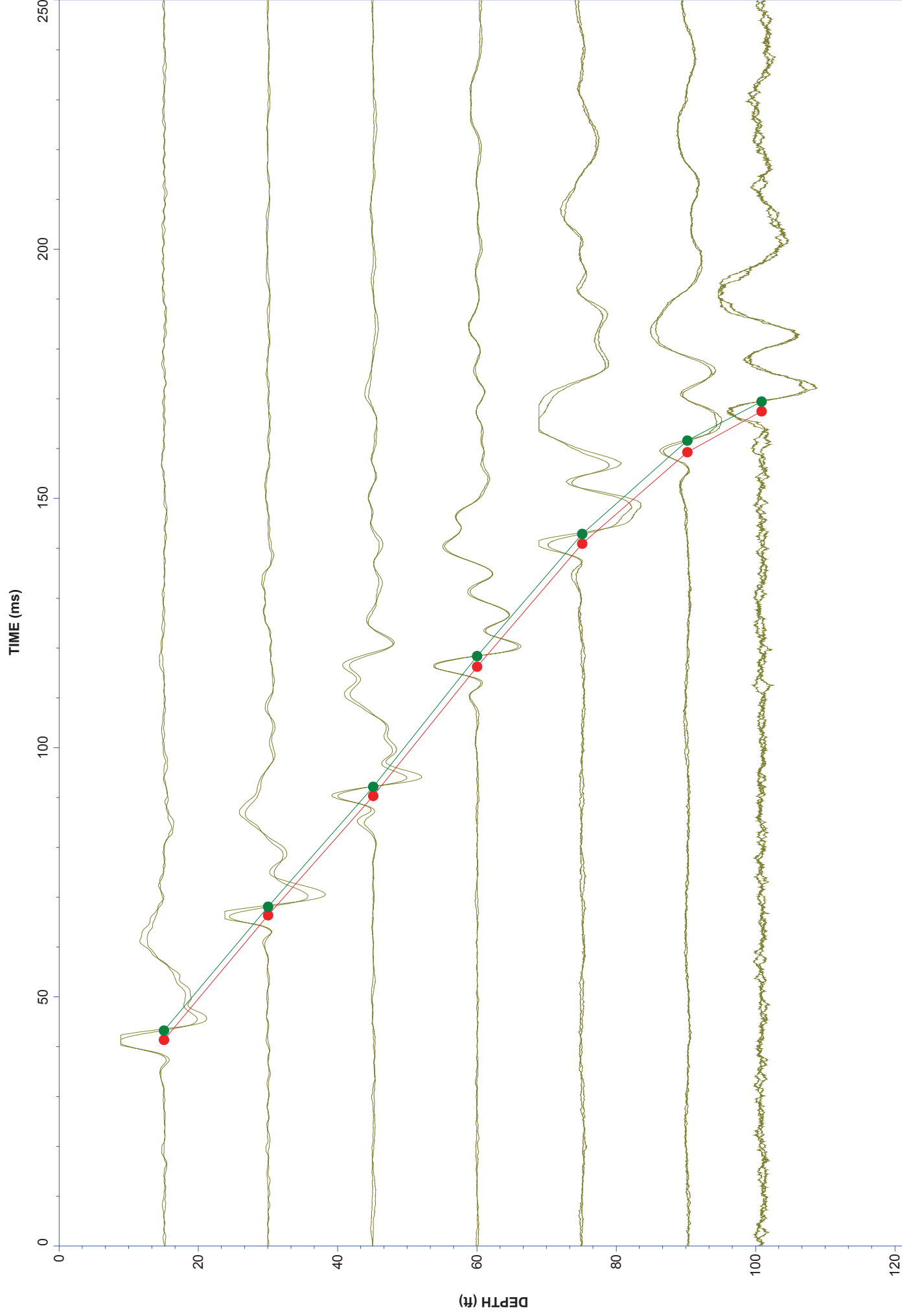
SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N: 4112619E: 375756

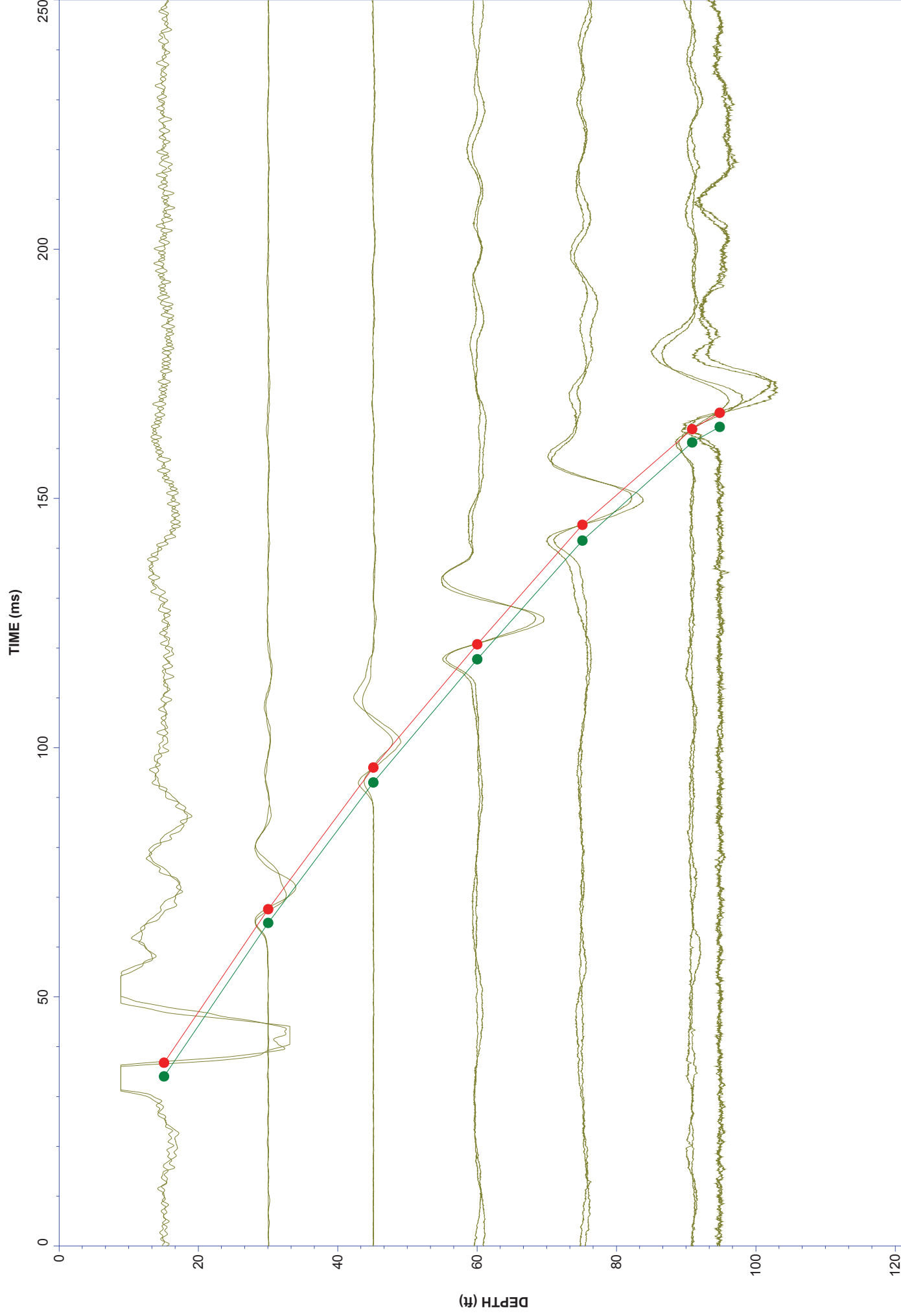
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

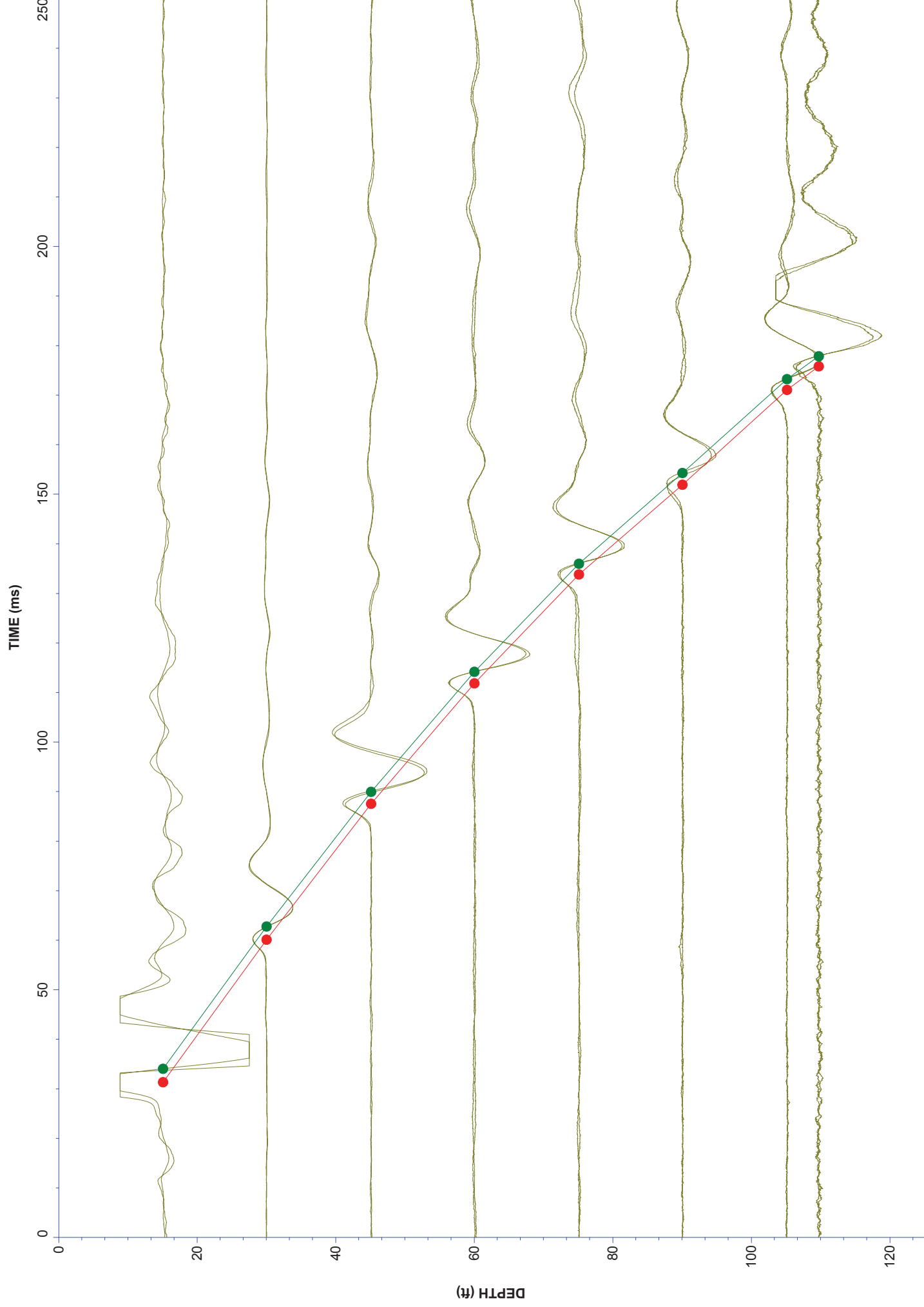
Seismic Cone Penetration Wave Traces

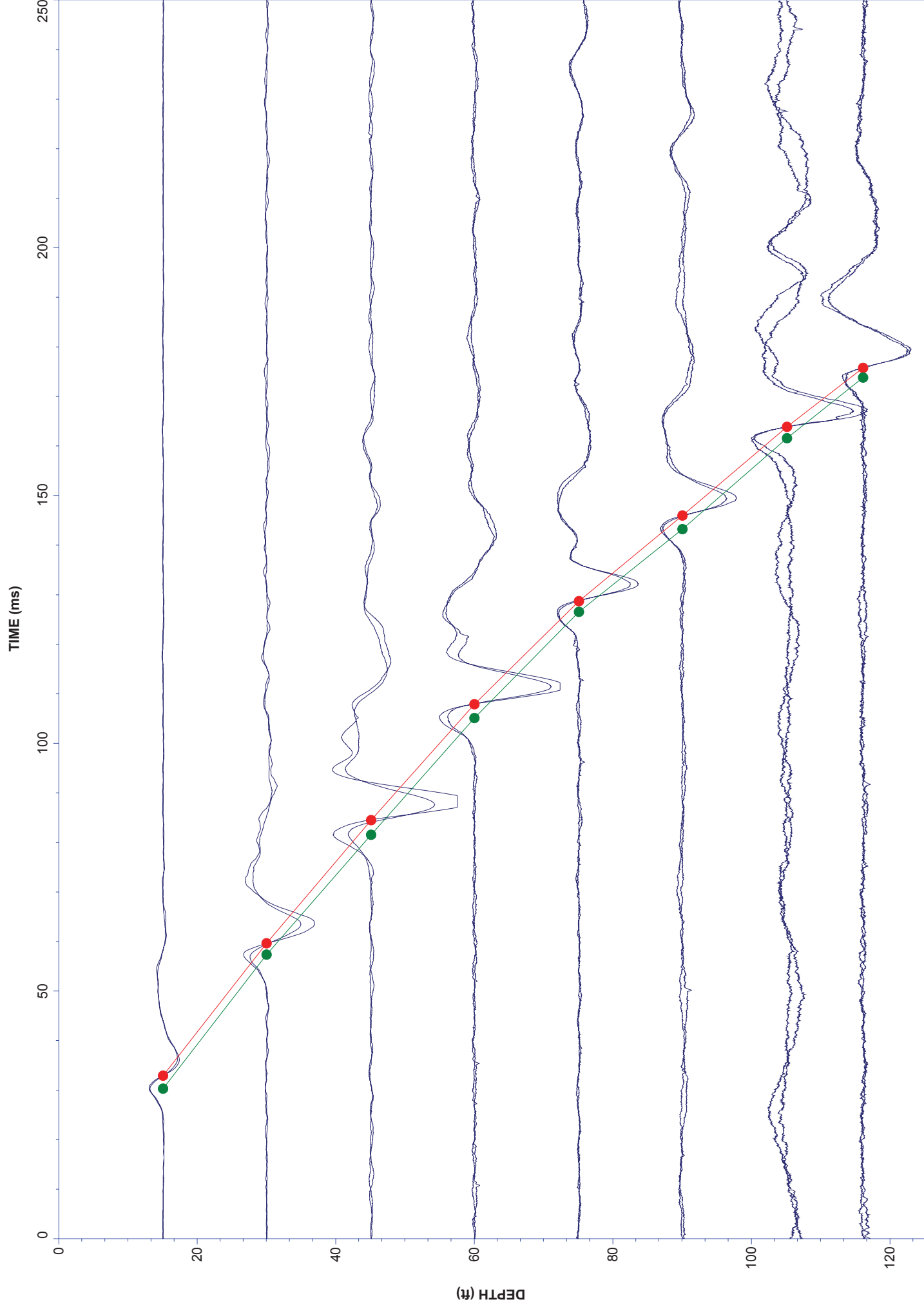


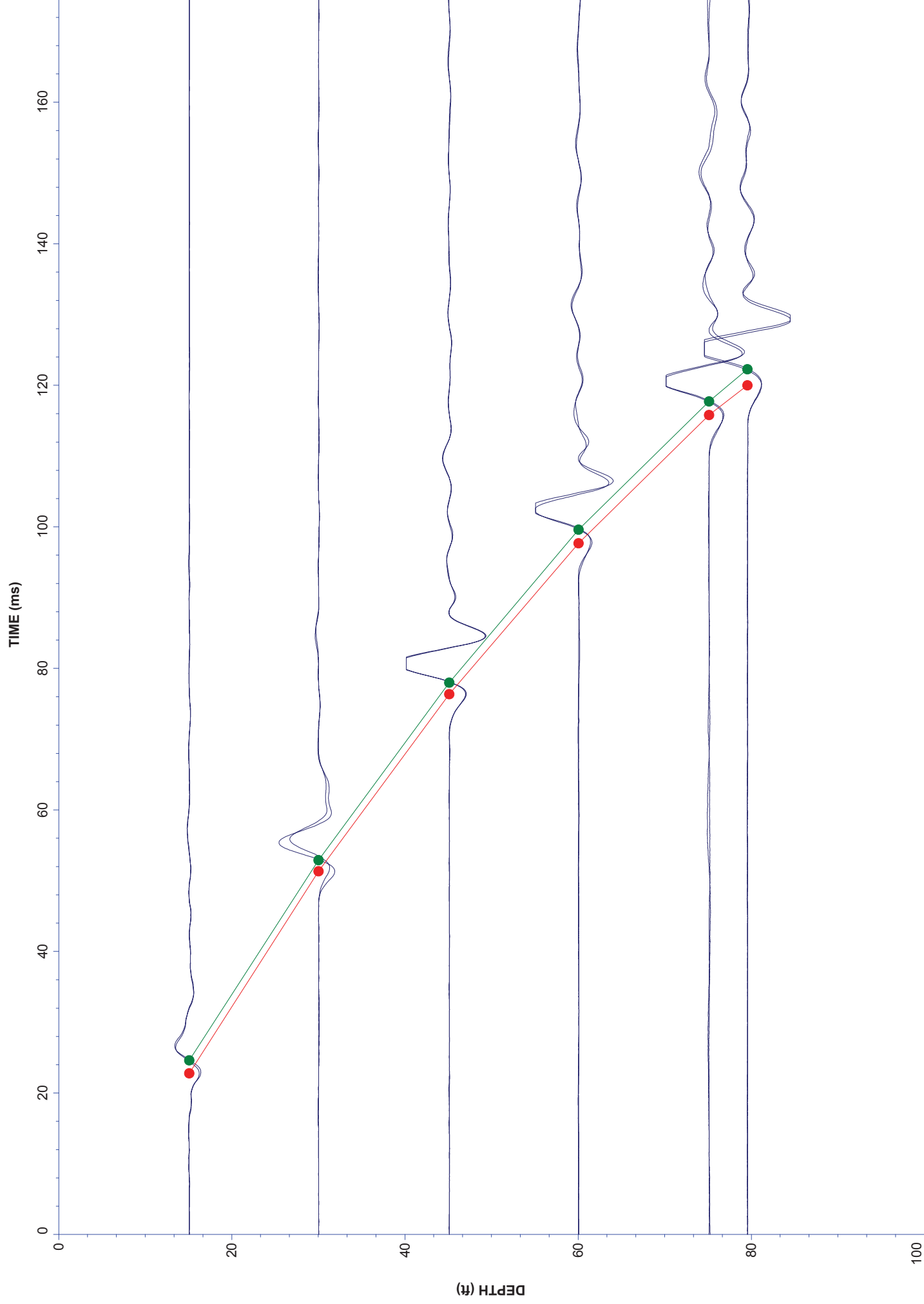


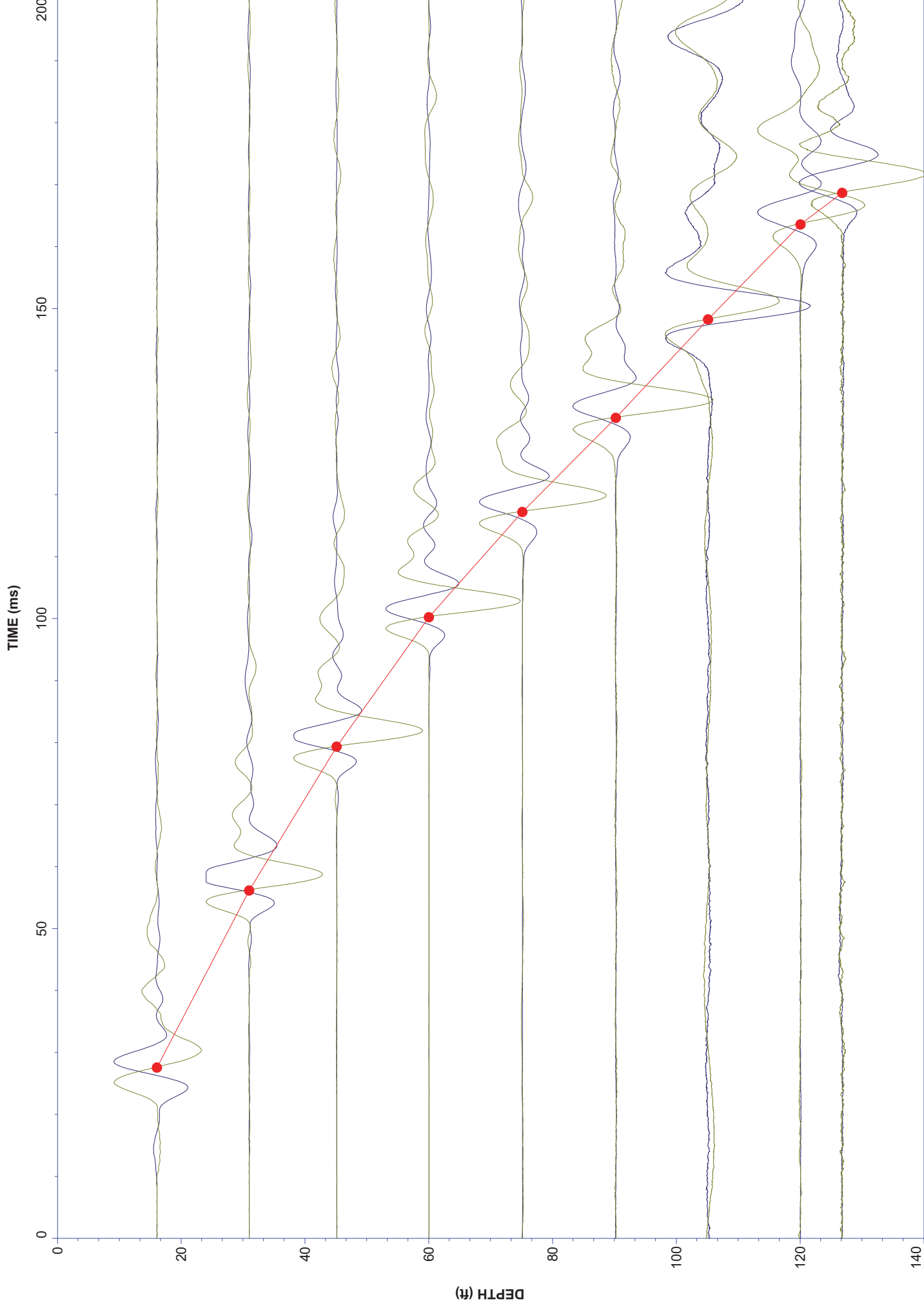


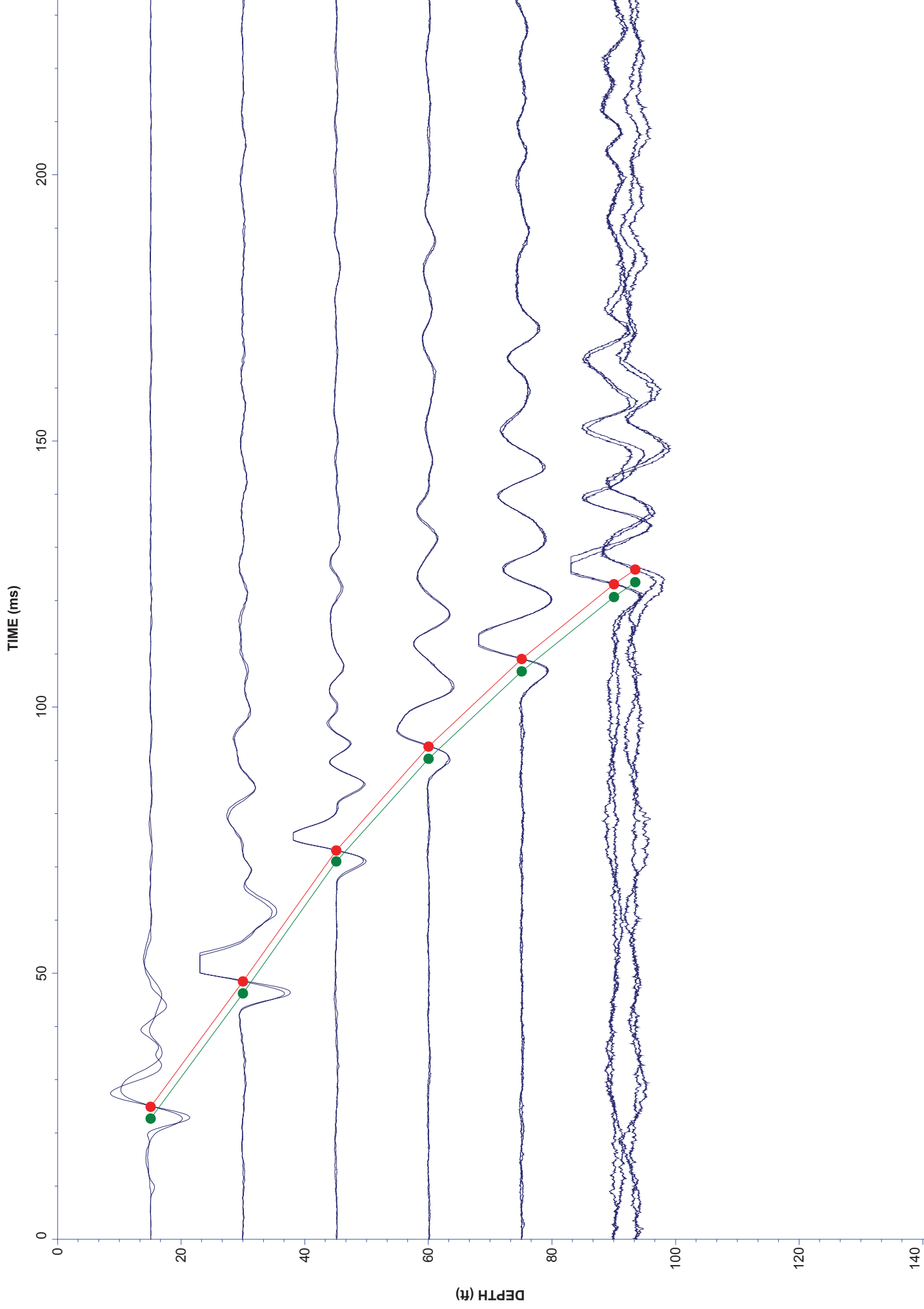












Seismic Cone Penetration Test Tabular Results (Vs)



Job No: 19-61032
Client: Stantec
Project: US60 Bridge, Livingston County, KY
Sounding ID: SCPT19-03
Date: 23-Aug-2019

Seismic Source: Beam
Source Offset (ft): 11.48
Source Depth (ft): 0.00
Geophone Offset (ft): 0.66

SCPT_u SHEAR WAVE VELOCITY TEST RESULTS - V_s

Tip Depth (ft)	Geophone Depth (ft)	Ray Path (ft)	Ray Path Difference (ft)	Travel Time Interval (ms)	Interval Velocity (ft/s)
15.09	14.44	18.45			
26.25	25.59	28.05	9.60	9.51	1010



Job No: 19-61032
Client: Stantec
Project: US60 Bridge, Livingston County, KY
Sounding ID: SCPT19-04
Date: 23-Aug-2019

Seismic Source: Beam
Source Offset (ft): 11.48
Source Depth (ft): 0.00
Geophone Offset (ft): 0.66

SCPT_u SHEAR WAVE VELOCITY TEST RESULTS - V_s

Tip Depth (ft)	Geophone Depth (ft)	Ray Path (ft)	Ray Path Difference (ft)	Travel Time Interval (ms)	Interval Velocity (ft/s)
15.09	14.44	18.44			
30.18	29.53	31.68	13.24	13.29	996
45.11	44.46	45.91	14.23	18.83	756
50.03	49.38	50.69	4.78	8.86	540



Job No: 19-61032
Client: Stantec
Project: US60 Bridge, Livingston County, KY
Sounding ID: SCPT19-05
Date: 20-Aug-2019

Seismic Source: Beam
Source Offset (ft): 11.48
Source Depth (ft): 0.00
Geophone Offset (ft): 0.66

SCPT_u SHEAR WAVE VELOCITY TEST RESULTS - V_s

Tip Depth (ft)	Geophone Depth (ft)	Ray Path (ft)	Ray Path Difference (ft)	Travel Time Interval (ms)	Interval Velocity (ft/s)
15.09	14.44	18.45			
30.02	29.36	31.53	13.08	24.92	525
45.11	44.46	45.91	14.39	23.99	600
60.04	59.38	60.48	14.57	26.09	558
75.13	74.47	75.35	14.87	24.58	605
90.22	89.57	90.30	14.95	18.55	806
100.89	100.23	100.89	10.59	8.01	1322



Job No: 19-61032
Client: Stantec
Project: US60 Bridge, Livingston County, KY
Sounding ID: SCPT19-06
Date: 20-Aug-2019

Seismic Source: Beam
Source Offset (ft): . 8
Source Depth (ft): 0.00
Geophone Offset (ft): 0.66

SCPT_u SHEAR WAVE VELOCITY TEST RESULTS - V_s

Tip Depth (ft)	Geophone Depth (ft)	Ray Path (ft)	Ray Path Difference (ft)	Travel Time Interval (ms)	Interval Velocity (ft/s)
15.09	14.44	14.80			
30.02	29.36	29.55	14.74	30.79	479
45.11	44.46	44.58	15.03	28.29	531
60.04	59.38	59.47	14.90	24.72	603
75.13	74.47	74.55	15.07	23.89	631
90.88	90.22	90.28	15.74	19.43	810
94.82	94.16	94.22	3.93	3.20	1228



Job No: 19-61032
Client: Stantec
Project: US60 Bridge, Livingston County, KY
Sounding ID: SCPT19-07
Date: 21-Aug-2019

Seismic Source: Beam
Source Offset (ft): 1. 4
Source Depth (ft): 0.00
Geophone Offset (ft): 0.66

SCPT_u SHEAR WAVE VELOCITY TEST RESULTS - V_s

Tip Depth (ft)	Geophone Depth (ft)	Ray Path (ft)	Ray Path Difference (ft)	Travel Time Interval (ms)	Interval Velocity (ft/s)
15.09	14.44	14.53			
30.02	29.36	29.41	14.88	28.75	518
45.11	44.46	44.49	15.08	27.28	553
60.04	59.38	59.41	14.92	24.27	615
75.13	74.47	74.49	15.09	21.90	689
90.06	89.40	89.42	14.93	18.20	820
105.15	104.49	104.51	15.09	19.05	792
109.74	109.09	109.10	4.59	4.67	984



Job No: 19-61032
Client: Stantec
Project: US60 Bridge, Livingston County, KY
Sounding ID: SCPT19-08
Date: 21-Aug-2019

Seismic Source: Beam
Source Offset (ft): 11.48
Source Depth (ft): 0.00
Geophone Offset (ft): 0.66

SCPT_u SHEAR WAVE VELOCITY TEST RESULTS - V_s

Tip Depth (ft)	Geophone Depth (ft)	Ray Path (ft)	Ray Path Difference (ft)	Travel Time Interval (ms)	Interval Velocity (ft/s)
15.09	14.44	18.45			
30.02	29.36	31.53	13.08	26.90	486
45.11	44.46	45.91	14.39	24.51	587
60.04	59.38	60.48	14.57	23.47	621
75.13	74.47	75.35	14.87	21.13	704
90.06	89.40	90.14	14.78	16.99	870
105.15	104.49	105.12	14.99	18.11	827
116.14	115.49	116.06	10.93	12.07	905



Job No: 19-61032
Client: Stantec
Project: US60 Bridge, Livingston County, KY
Sounding ID: SCPT19-09
Date: 21-Aug-2019

Seismic Source: Beam
Source Offset (ft): 2.46
Source Depth (ft): 0.00
Geophone Offset (ft): 0.66

SCPT_u SHEAR WAVE VELOCITY TEST RESULTS - V_s

Tip Depth (ft)	Geophone Depth (ft)	Ray Path (ft)	Ray Path Difference (ft)	Travel Time Interval (ms)	Interval Velocity (ft/s)
15.09	14.44	14.64			
30.02	29.36	29.47	14.82	28.42	521
45.11	44.46	44.52	15.06	25.05	601
60.04	59.38	59.43	14.91	21.47	694
75.13	74.47	74.52	15.08	18.11	833
79.56	78.90	78.94	4.43	4.37	1013



Job No: 19-61032
Client: Stantec
Project: US60 Bridge, Livingston County, KY
Sounding ID: SCPT19-10
Date: 21-Aug-2019

Seismic Source: Beam
Source Offset (ft): 2.46
Source Depth (ft): 0.00
Geophone Offset (ft): 0.66

SCPT_u SHEAR WAVE VELOCITY TEST RESULTS - V_s

Tip Depth (ft)	Geophone Depth (ft)	Ray Path (ft)	Ray Path Difference (ft)	Travel Time Interval (ms)	Interval Velocity (ft/s)
16.08	15.42	15.61			
31.00	30.35	30.45	14.83	28.64	518
45.11	44.46	44.52	14.08	23.06	611
60.04	59.38	59.43	14.91	20.89	714
75.13	74.47	74.52	15.08	16.96	889
90.22	89.57	89.60	15.09	15.22	991
105.15	104.49	104.52	14.92	15.88	940
120.08	119.42	119.45	14.92	15.34	973
126.80	126.15	126.17	6.72	5.09	1321



Job No: 19-61032
Client: Stantec
Project: US60 Bridge, Livingston County, KY
Sounding ID: SCPT19-11
Date: 22-Aug-2019

Seismic Source: Beam
Source Offset (ft): 3.28
Source Depth (ft): 0.00
Geophone Offset (ft): 0.66

SCPT_u SHEAR WAVE VELOCITY TEST RESULTS - V_s

Tip Depth (ft)	Geophone Depth (ft)	Ray Path (ft)	Ray Path Difference (ft)	Travel Time Interval (ms)	Interval Velocity (ft/s)
15.09	14.44	14.80			
30.02	29.36	29.55	14.74	23.52	627
45.11	44.46	44.58	15.03	24.70	608
60.04	59.38	59.47	14.90	19.41	768
75.13	74.47	74.55	15.07	16.43	917
90.06	89.40	89.46	14.92	14.00	1065
93.50	92.85	92.91	3.44	2.78	1240

Pore Pressure Dissipation Summary and
Pore Pressure Dissipation Plots



Job No: 19-61032
Client: Stantec
Project: US60 Bridge, Livingston County, KY
Start Date: 20-Aug-2019
End Date: 23-Aug-2019

CPTu PORE PRESSURE DISSIPATION SUMMARY

Sounding ID	File Name	Cone Area (cm ²)	Duration (s)	Test Depth (ft)	Estimated Equilibrium Pore Pressure U _{eq} (ft)	Calculated Phreatic Surface (ft)	Estimated Phreatic Surface (ft)	t ₅₀ ^a (s)	Assumed Rigidity Index (I _r)	c _n ^b (cm ² /min)
SCPT19-05	19-61032_SP05.PPD	15	160	97.77	83.9	13.8				
SCPT19-07	19-61032_SP07.PPD	15	1515	45.93	42.3		3.6	904	100	0.8
SCPT19-07	19-61032_SP07.PPD	15	180	98.92	75.4	23.5				
SCPT19-10	19-61032_SP10.PPD	15	300	82.18	49.7	32.5				
Total Duration			35,9 min							

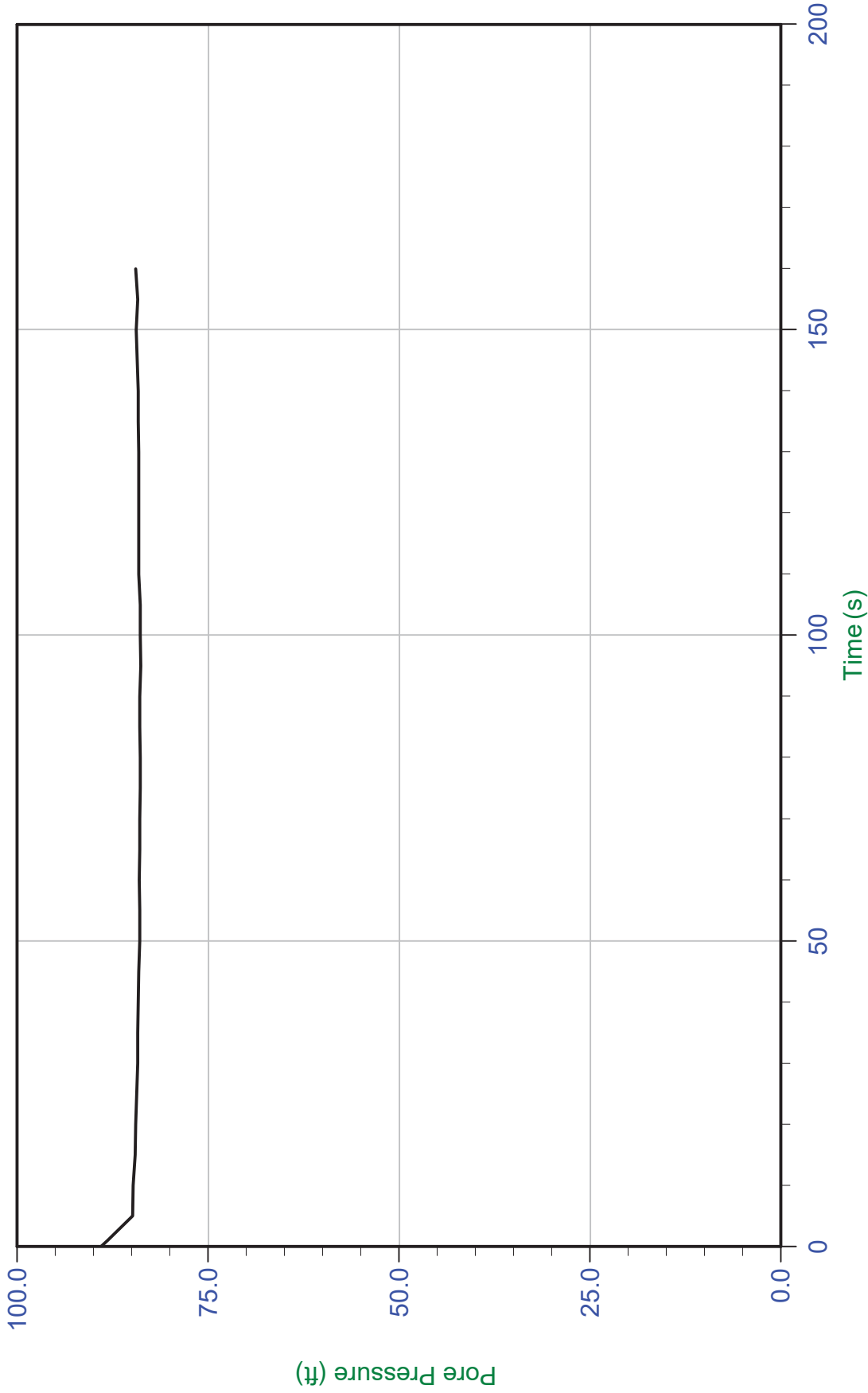
a. Time is relative to where umax occurred.

b. Holsby and Teh, 1991.



Stantec

Job No: 19-61032
Date: 20-Aug-2019 09:56:23
Site: US60 Bridge, Livingston County, KY
Sounding: SCPT19-05
Cone: AD513 Area=15 cm²

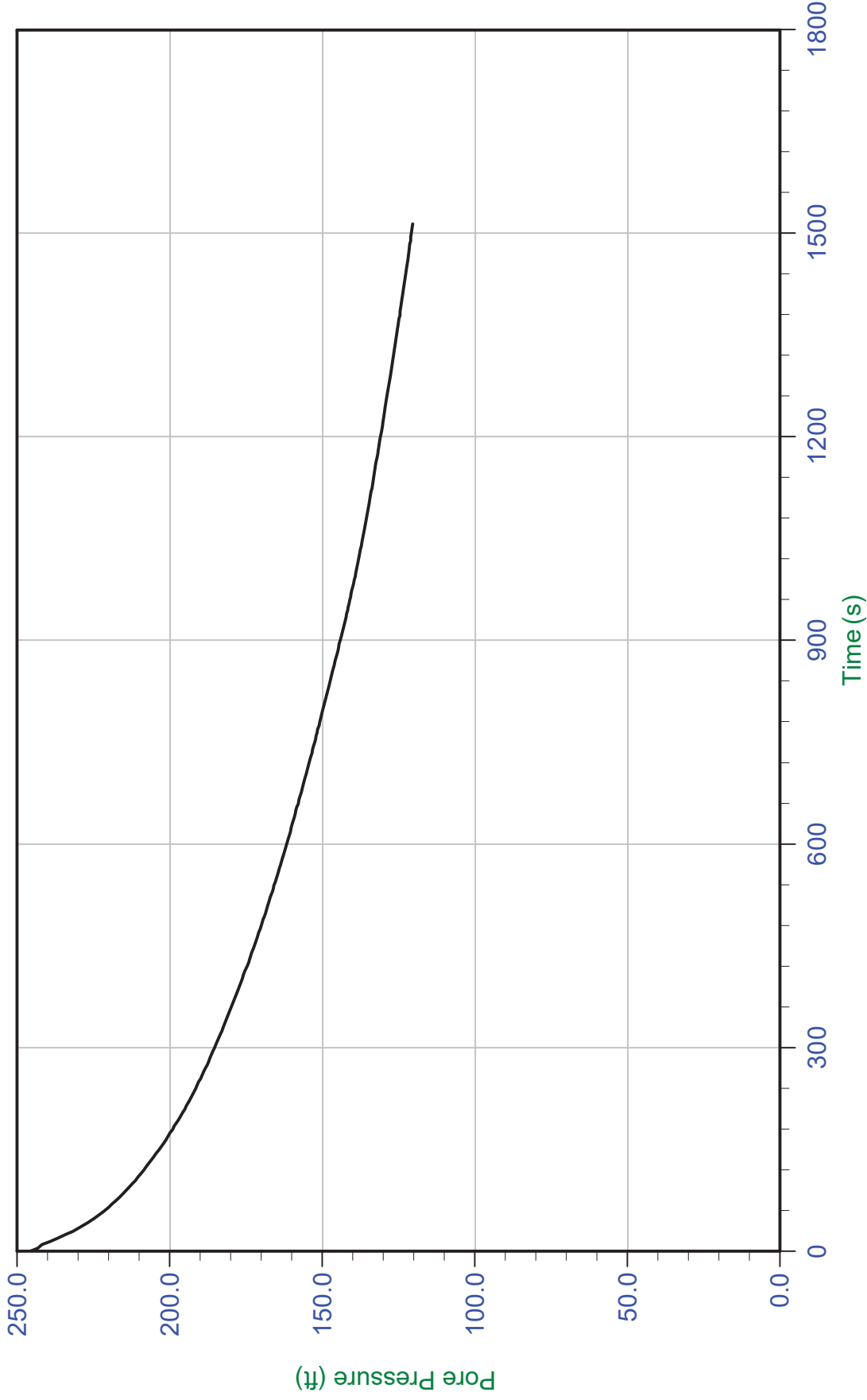


Trace Summary: Filename: 19-61032_SP05.PPD
Depth: 29.800 m / 97.768 ft
Duration: 160.0 s
U Min: 83.9 ft
U Max: 89.0 ft
WT: 4.219 m / 13.842 ft
Ueq: 83.9 ft



Stantec

Job No: 19-61032
Date: 21-Aug-2019 08:35:20
Site: US60 Bridge, Livingston County, KY
Sounding: SCPT19-07
Cone: AD513 Area=15 cm²

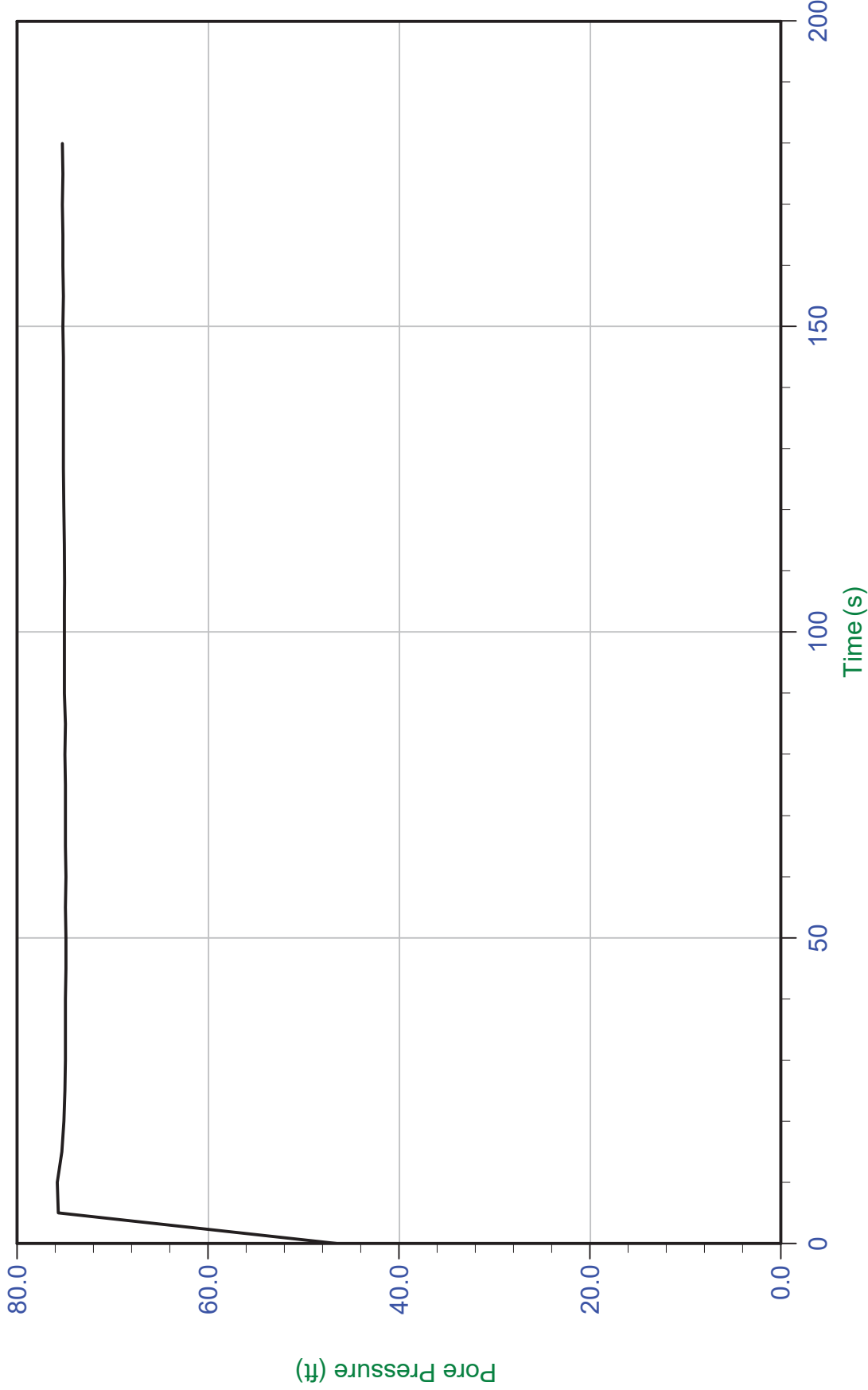


Trace Summary: Filename: 19-61032_SP07.PPD
Depth: 14.000 m / 45.931 ft
Duration: 1515.0 s
WT: 1.097 m / 3.599 ft
Ueq: 42.3 ft
U(50): 144.00 ft
T(50): 903.6 s
Ir: 100
Ch: 0.8 cm²/min



Stantec

Job No: 19-61032
Date: 21-Aug-2019 08:35:20
Site: US60 Bridge, Livingston County, KY
Sounding: SCPT19-07
Cone: AD513 Area=15 cm²

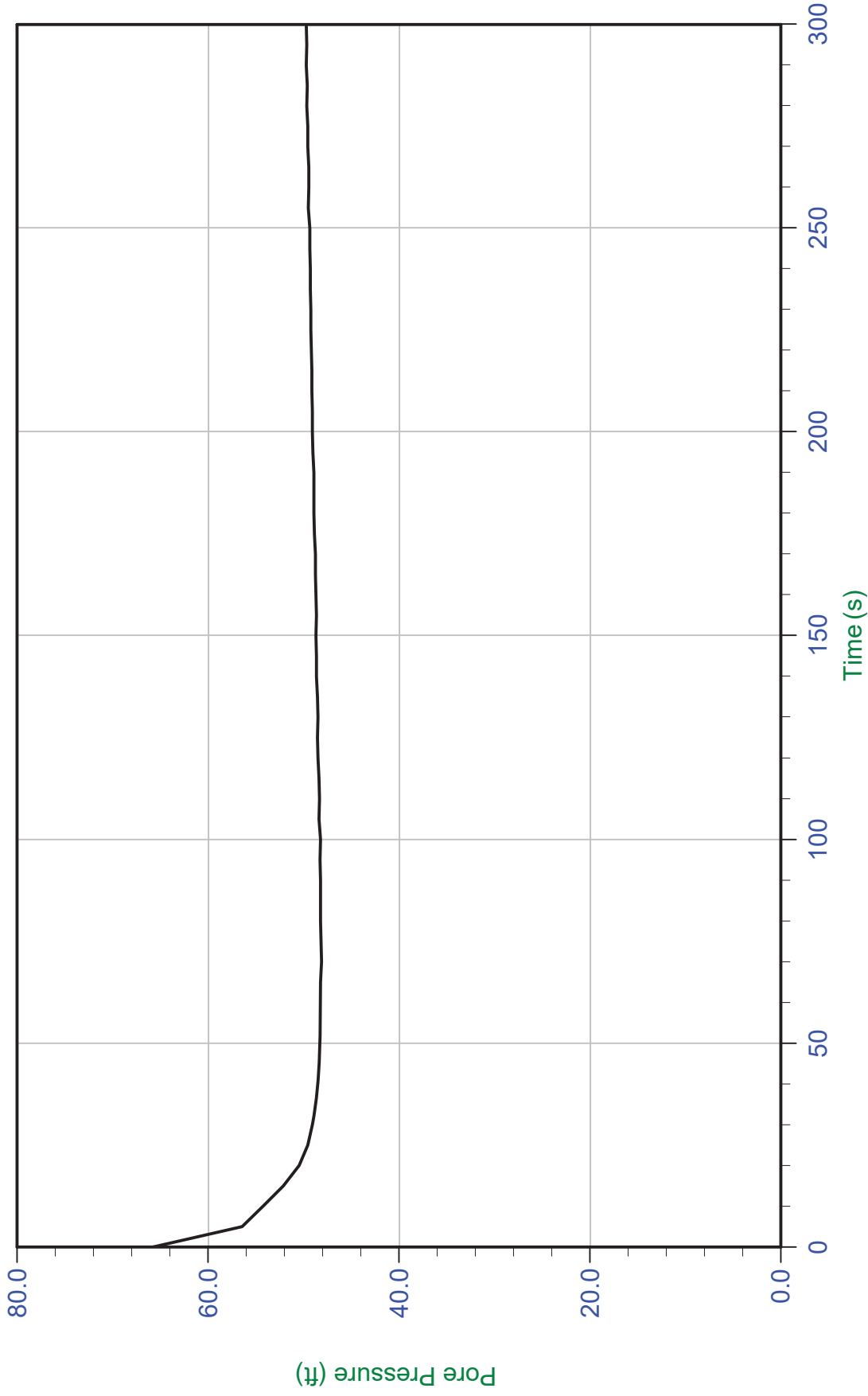


Trace Summary: Filename: 19-61032_SP07.PPD
Depth: 30.150 m / 98.916 ft
Duration: 180.0 s
U Min: 46.6 ft
U Max: 75.8 ft
WT: 7.159 m / 23.487 ft
Ueq: 75.4 ft



Stantec

Job No: 19-61032
Date: 21-Aug-2019 15:43:06
Site: US60 Bridge, Livingston County, KY
Sounding: SCPT19-10
Cone: AD513 Area=15 cm²



Trace Summary: Filename: 19-61032_SP10.PPD
Depth: 25.050 m / 82.184 ft
Duration: 300.0 s
U Min: 48.1 ft
U Max: 65.8 ft
WT: 9.897 m / 32.470 ft
Ueq: 49.7 ft

Cone Penetration Test Summary and Standard Cone Penetration Test Plots



Job No: 19-61032
Client: Stantec
Project: US60 Bridge, Livingston County, KY
Start Date: 20-Aug-2019
End Date: 23-Aug-2019

CONE PENETRATION TEST SUMMARY

Sounding ID	File Name	Date	Cone	Assumed Phreatic Surface ¹ (ft)	Final Depth (ft)	Shear Wave Velocity Tests	Northing ² (m)	Easting ² (m)	Refer to Notation Number
CPT19-02	19-61032_CP02	22-Aug-2019	513:T1500F15U500	31.0	5.58		4112078	375659	4
CPT19-02A	19-61032_CP02A	22-Aug-2019	513:T1500F15U500	31.0	7.05		4112078	375656	4
CPT19-02B	19-61032_CP02B	22-Aug-2019	513:T1500F15U500	31.0	14.60		4112078	375661	4
SCPT19-03	19-61032_SP03	23-Aug-2019	513:T1500F15U500	31.0	26.25	2	4112118	375665	4
SCPT19-04	19-61032_SP04	23-Aug-2019	513:T1500F15U500	31.0	50.03	4	4112156	375670	
SCPT19-05	19-61032_SP05	20-Aug-2019	513:T1500F15U500	13.8	100.89	7	4112378	375709	3
SCPT19-06	19-61032_SP06	20-Aug-2019	513:T1500F15U500	8.2	94.82	7	4112426	375716	
SCPT19-07	19-61032_SP07	21-Aug-2019	513:T1500F15U500	3.7	109.74	8	4112461	375709	3
SCPT19-08	19-61032_SP08	21-Aug-2019	513:T1500F15U500	9.3	116.14	8	4112444	375723	
SCPT19-09	19-61032_SP09	21-Aug-2019	513:T1500F15U500	9.6	79.56	6	4112545	375744	
SCPT19-10	19-61032_SP10	21-Aug-2019	513:T1500F15U500	13.5	126.80	9	4112576	375747	3
SCPT19-11	19-61032_SP11	22-Aug-2019	513:T1500F15U500	14.5	93.50	7	4112619	375756	
Totals	12 soundings				824.96	58			

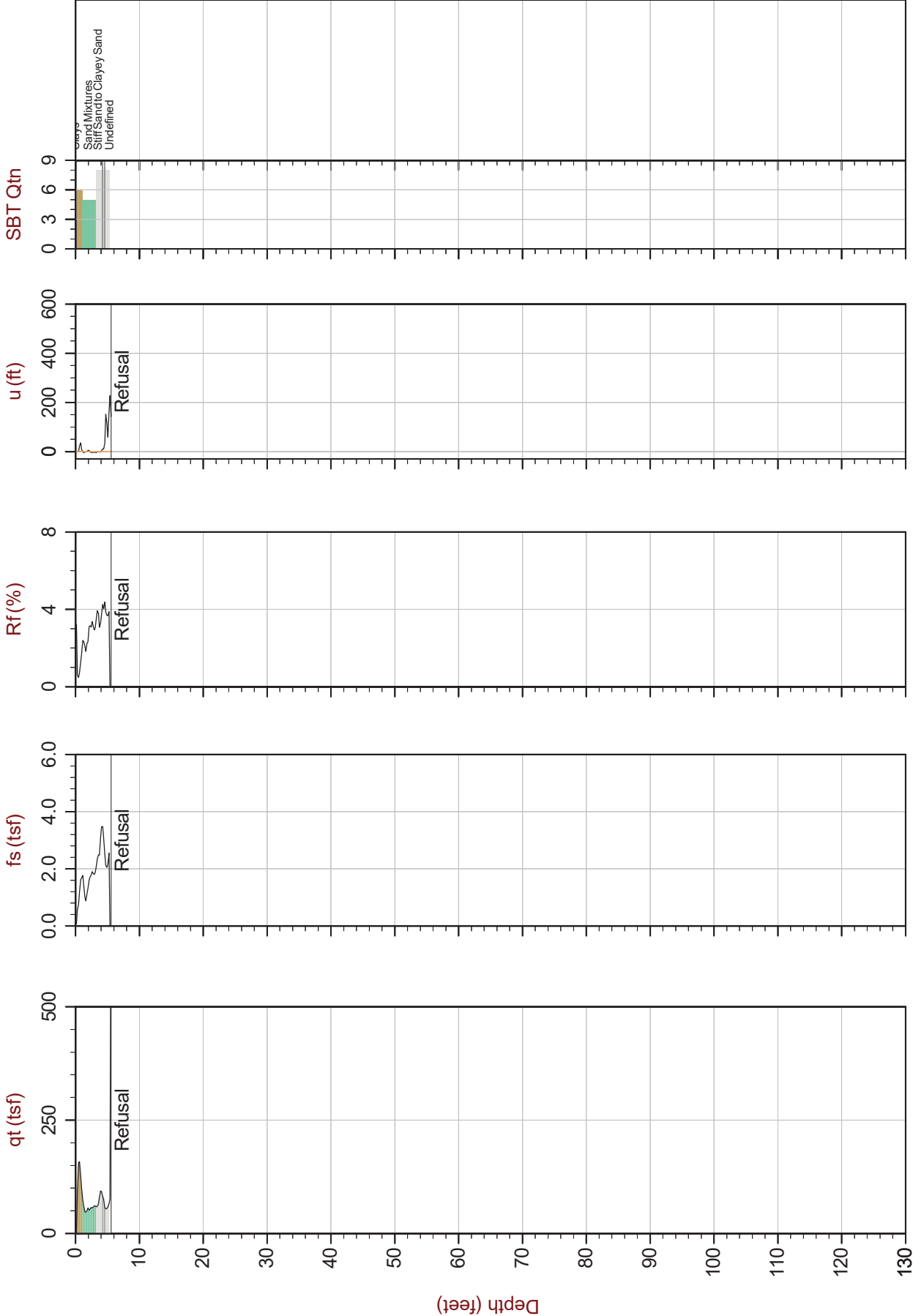
1. The assumed phreatic surface was based on pore pressure dissipation tests. Equilibrium pore pressure profiles were assumed for the calculated parameters.
2. Coordinates were acquired using a MR-350 GlobalSat GPS Receiver in datum: WGS84 / UTM Zone 16 North.
3. Assumed phreatic surface depth was based on a single static pore pressure dissipation test.
4. No phreatic surface detected



Stantec

Job No: 19-61032
Date: 2019-08-22 16:47
Site: US60 Bridge, Livingston County, KY

Sounding: CPT19-02
Cone: 513:T1500F15U500



Max Depth: 1.700 m / 5.58 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 19-61032_CP02.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112078 E: 375659

Hydrostatic Line ● Ueq ● Assumed Ueq ◀ PPD, Ueq achieved ◀ PPD, Ueq not achieved

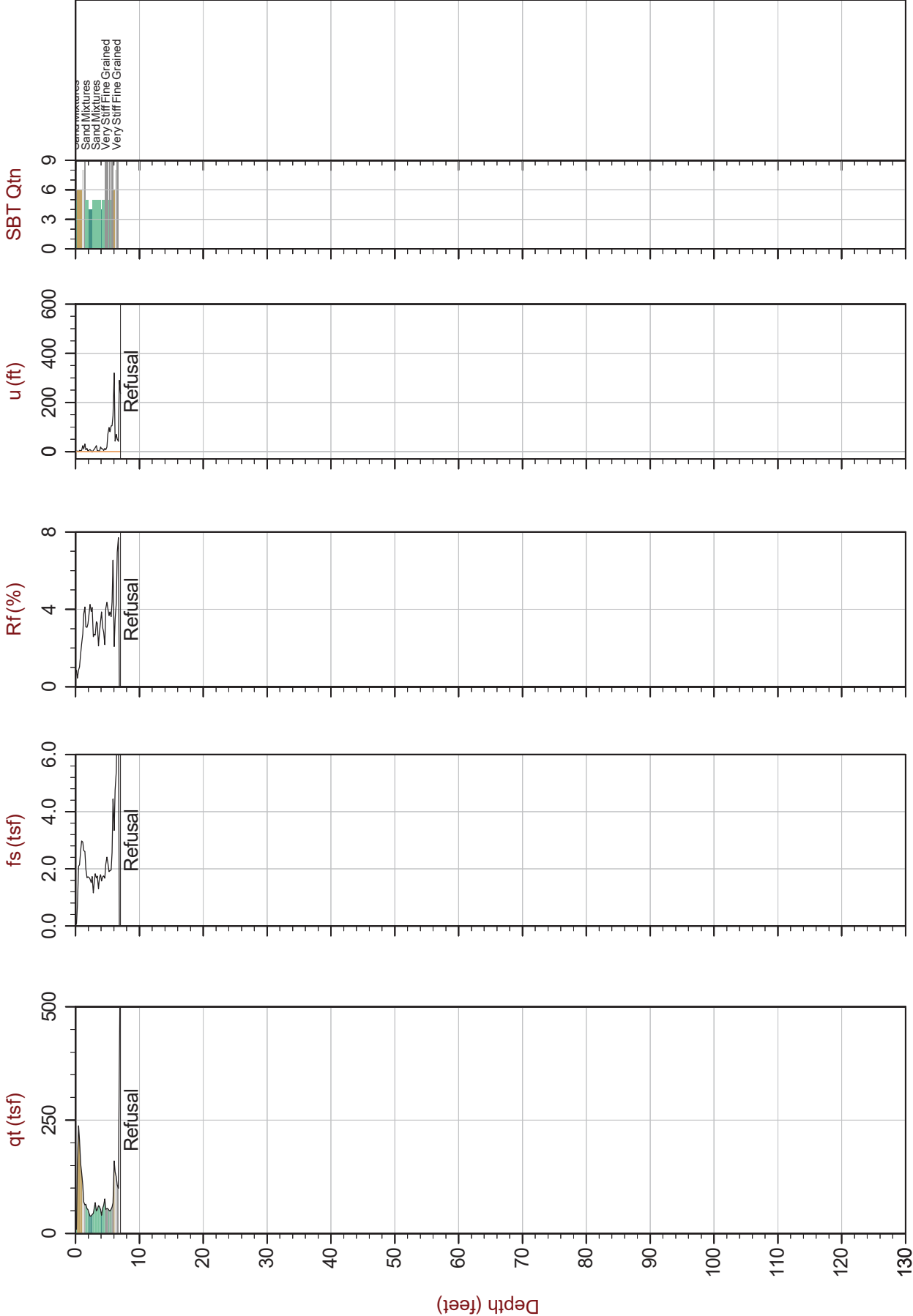
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Stantec

Job No: 19-61032
Date: 2019-08-22 17:07
Site: US60 Bridge, Livingston County, KY

Sounding: CPT19-02A
Cone: 513:T1500F15U500



Max Depth: 2.150 m / 7.05 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 19-61032_CP02A.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112078 E: 375656

Hydrostatic Line ● Ueq ● Assumed Ueq ▲ PPD, Ueq not achieved

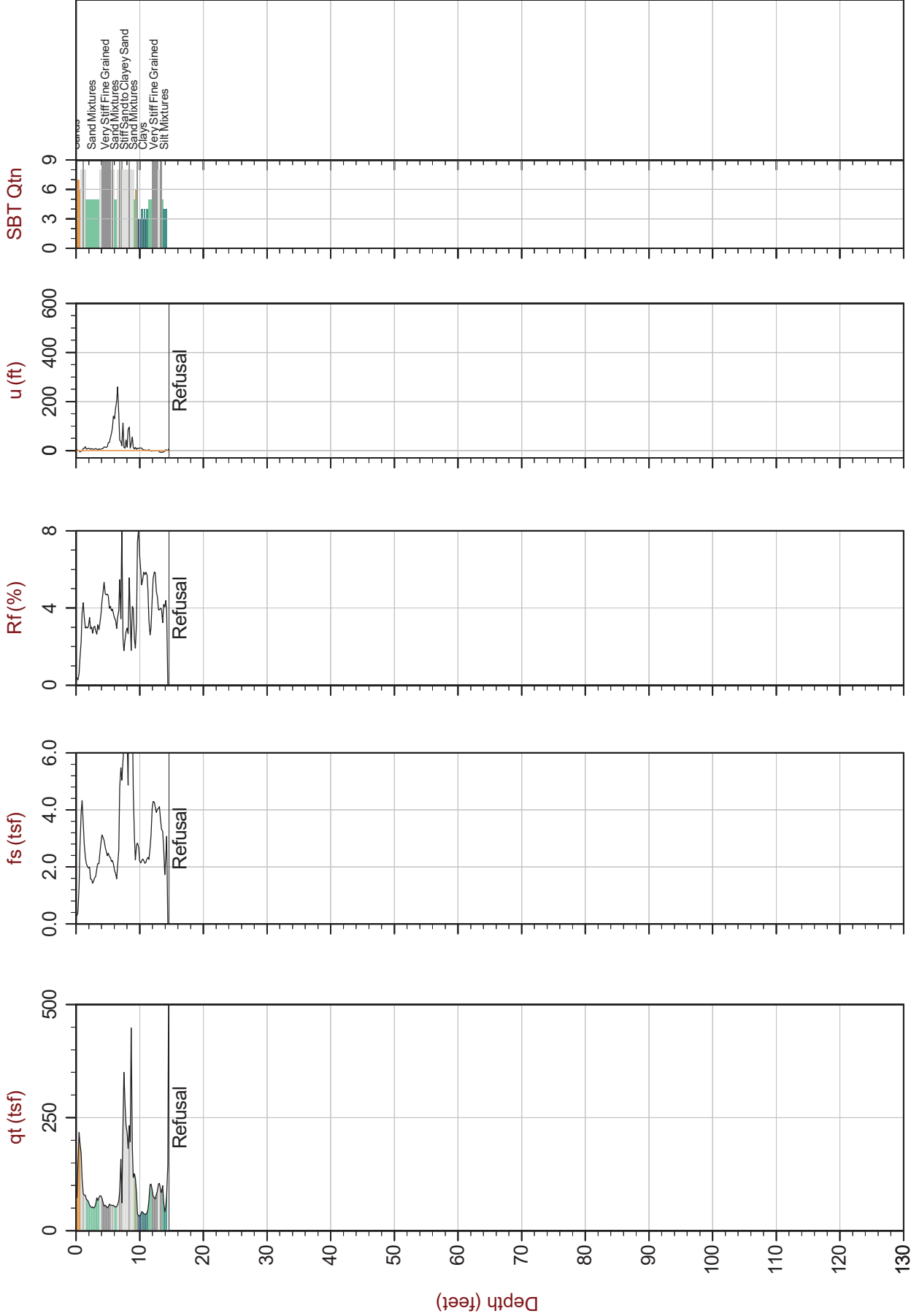
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Stantec

Job No: 19-61032
Date: 2019-08-22 17:31
Site: US60 Bridge, Livingston County, KY

Sounding: CPT19-02B
Cone: 513:T1500F15U500



Max Depth: 4.450 m / 14.60 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 19-61032_CP02B.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112078 E: 375661

Hydrostatic Line ● Ueq ● Assumed Ueq ◀ PPD, Ueq achieved ◀ PPD, Ueq not achieved

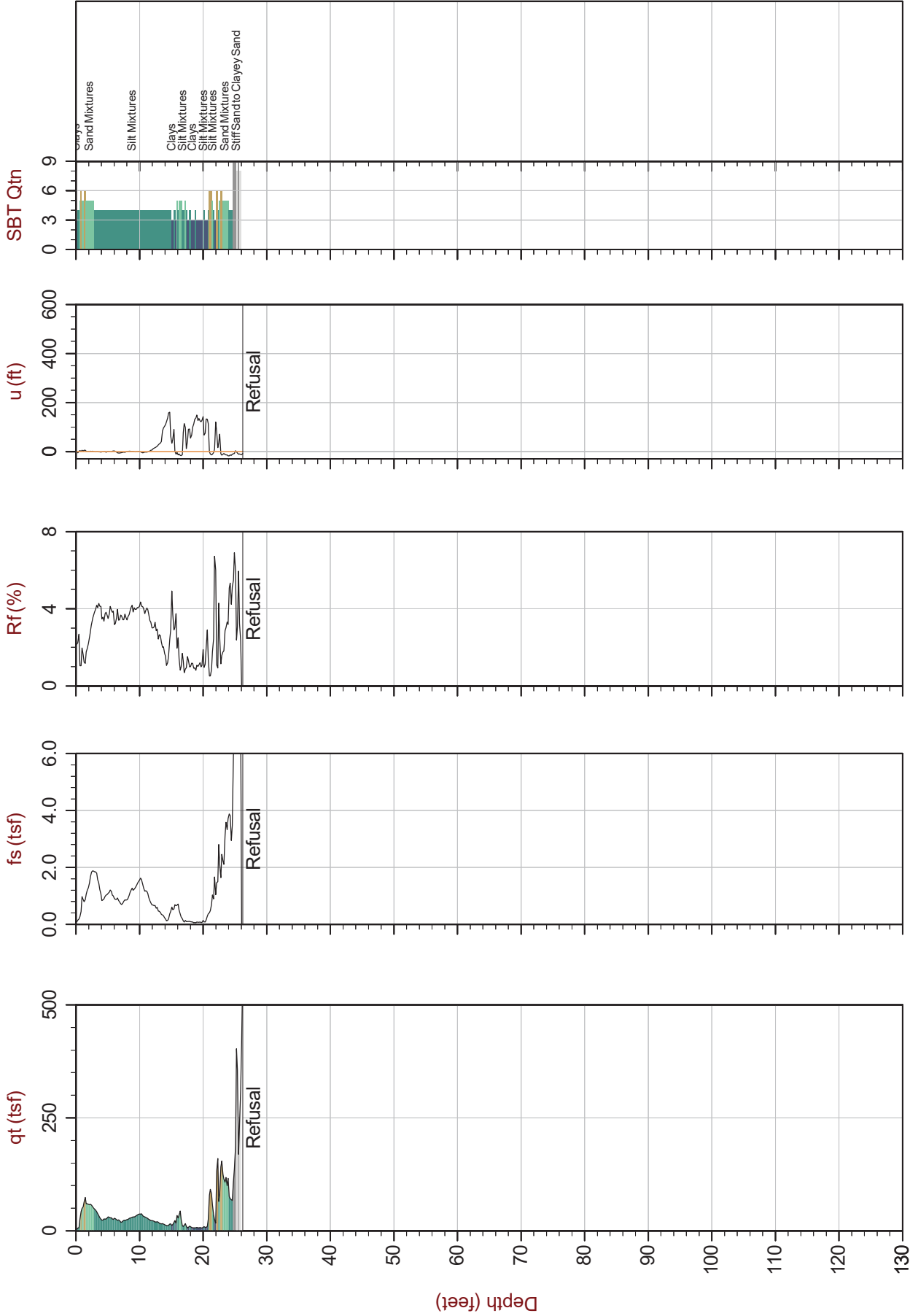
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Stantec

Job No: 19-61032
Date: 2019-08-23 08:28
Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-03
Cone: 513:T1500F15U500



Max Depth: 8.000 m / 26.25 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 19-61032_SP03.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112118 E: 375665

Hydrostatic Line ● Ueq ▲ Assumed Ueq ▼ PPD, Ueq achieved ▲ PPD, Ueq not achieved

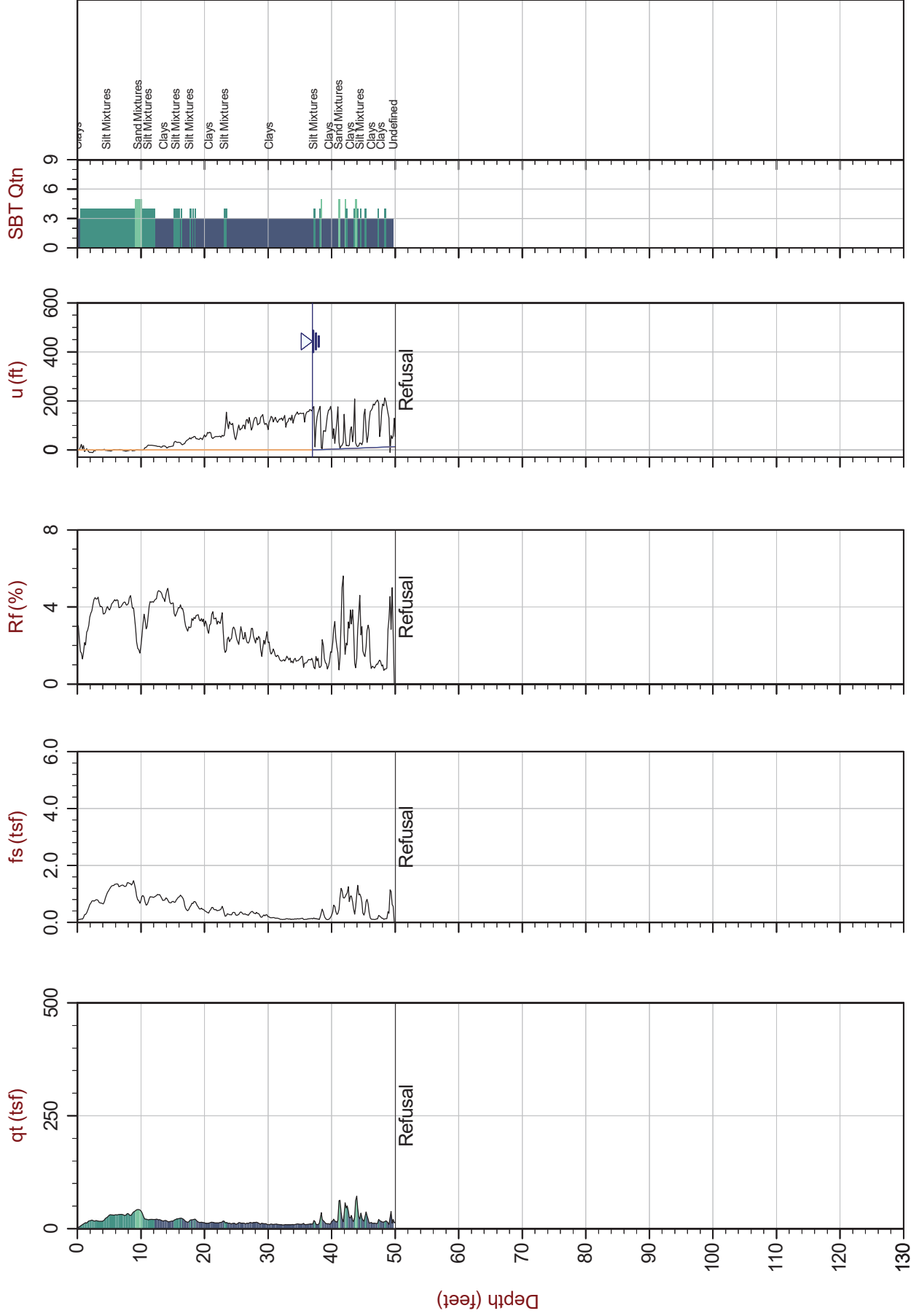
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Stantec

Job No: 19-61032
Date: 2019-08-23 09:16
Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-04
Cone: 513:T1500F15U500



Max Depth: 15.250 m / 50.03 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 19-61032_SP04.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: N: 4112156.000 E: 375670.000

Hydrostatic Line ● Ueq ▲ Assumed Ueq ▼ PPD, Ueq not achieved

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Stantec

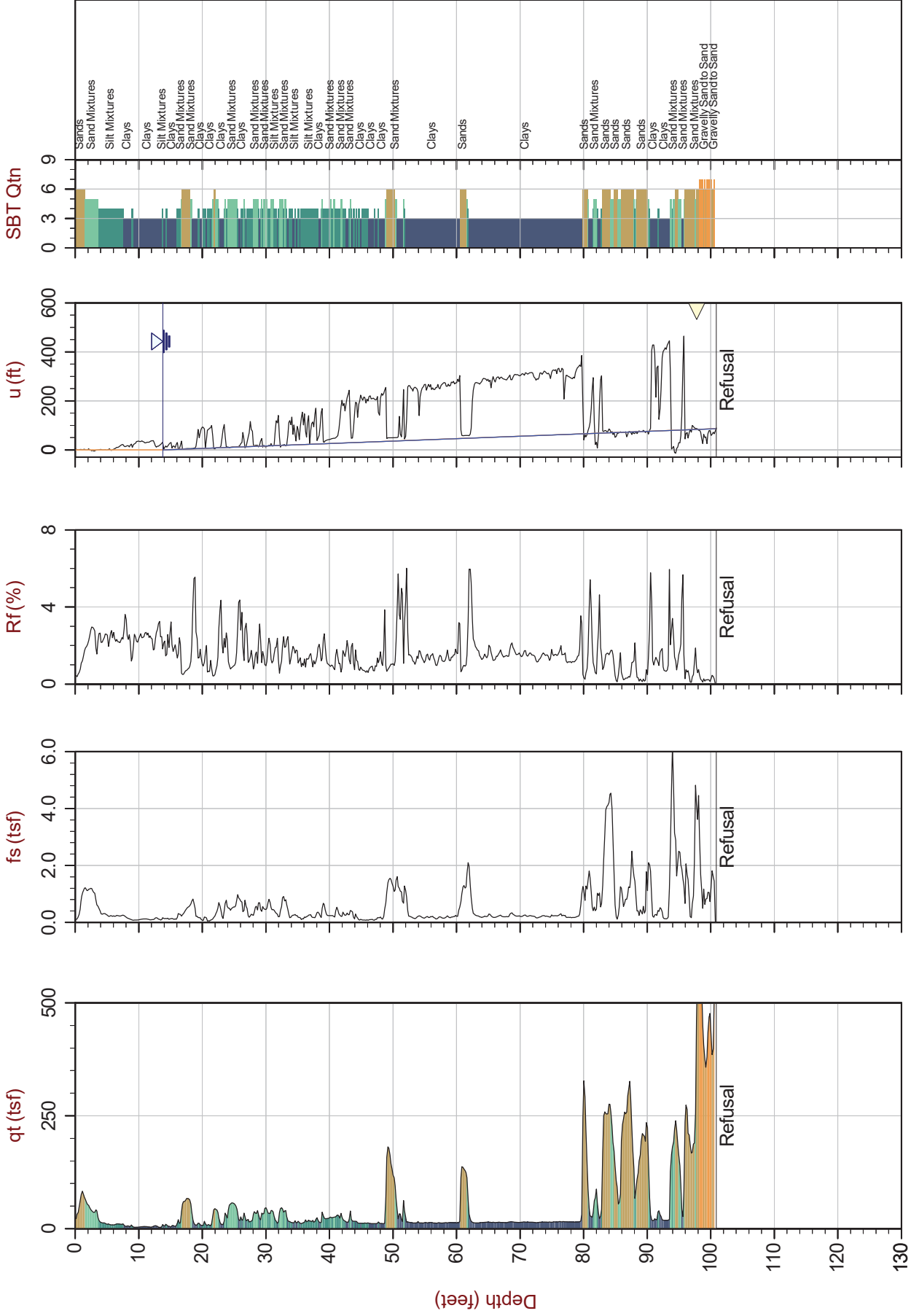
Job No: 19-61032

Date: 2019-08-20 09:56

Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-05

Cone: 513:T1500F15U500



Max Depth: 30.750 m / 100.88 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 19-61032_SP05.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112378 E: 375709

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Stantec

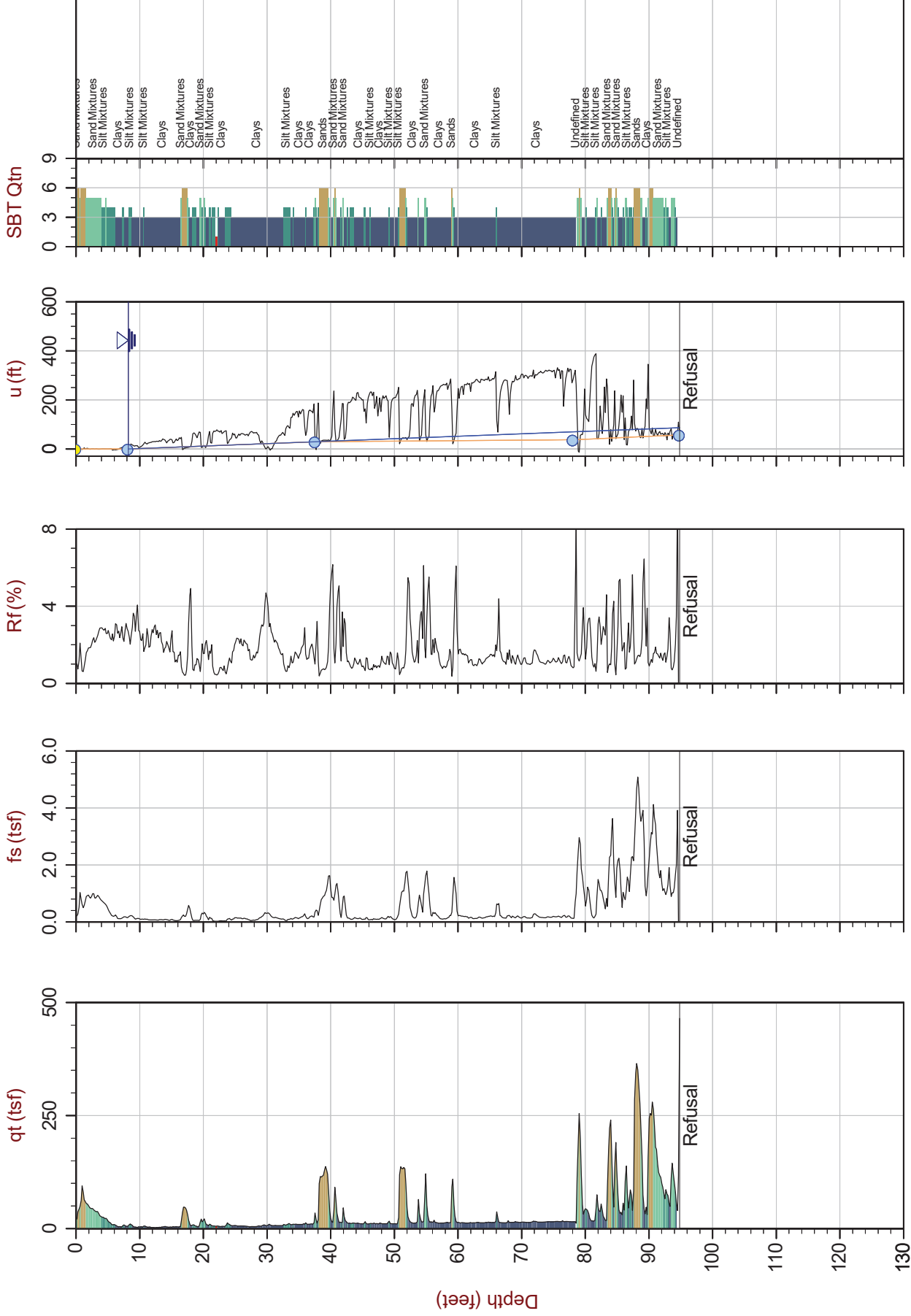
Job No: 19-61032

Date: 2019-08-20 14:15

Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-06

Cone: 513:T1500F15U500



Max Depth: 28.900 m / 94.82 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 19-61032_SP06.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112426 E: 375716

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Stantec

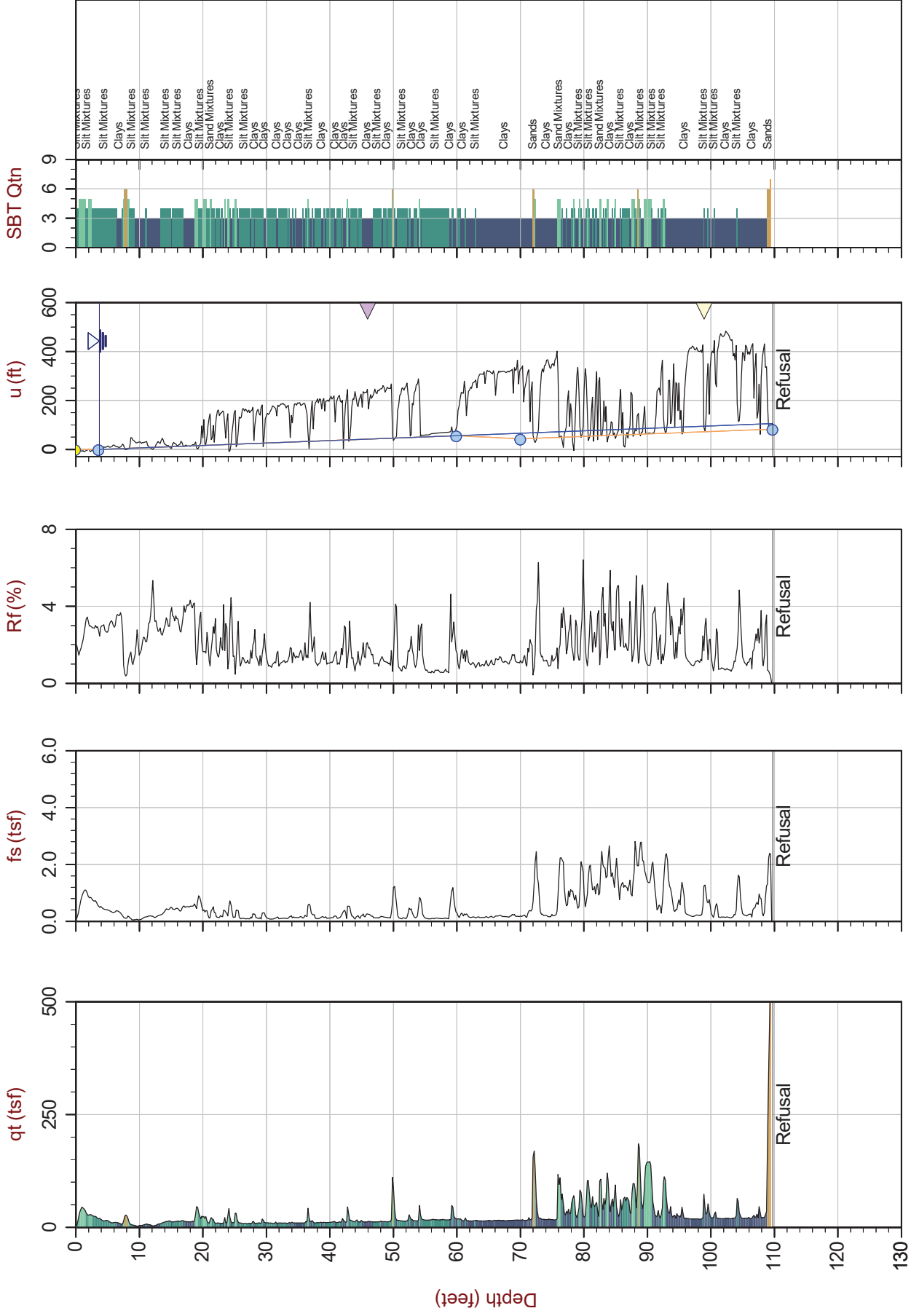
Job No: 19-61032

Date: 2019-08-21 08:35

Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-07

Cone: 513:T1500F15U500



Max Depth: 33.450 m / 109.74 ft

Depth Inc: 0.050 m / 0.164 ft

Avg Int: Every Point

File: 19-61032_SP07.COR

Unit Wt: SBTQtn (PKR2009)

Hydrostatic Line

Ueq

Assumed Ueq

PPD, Ueq achieved

Ueq not achieved

SBT: Robertson, 2009 and 2010

Coords: UTM Zone 16N N: 4112461 E: 375709

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Stantec

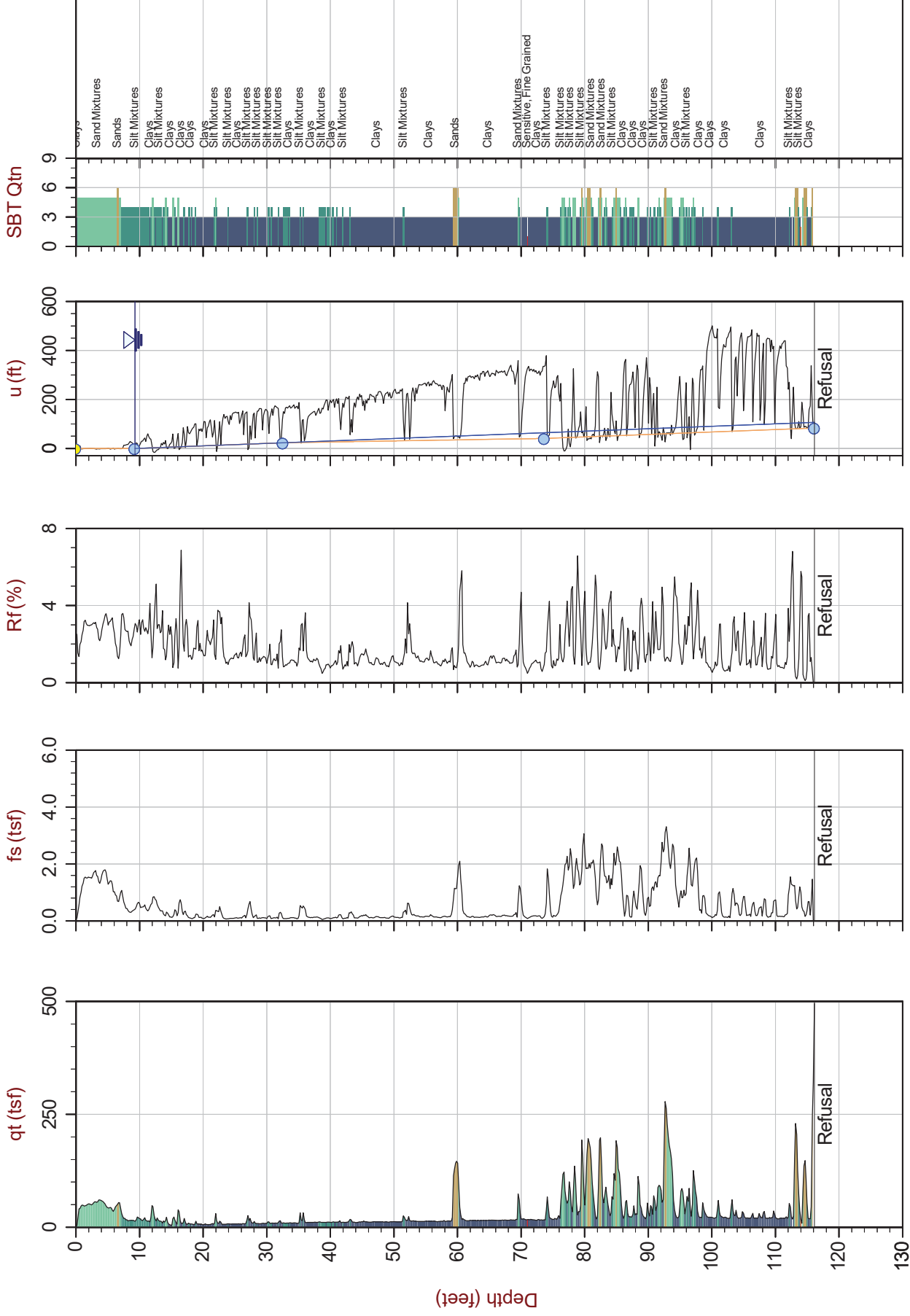
Job No: 19-61032

Date: 2019-08-21 11:15

Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-08

Cone: 513:T1500F15U500



Max Depth: 35.400 m / 116.14 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 19-61032_SP08.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112444 E: 375723

Hydrostatic Line — Ueq ● Assumed Ueq ◀ PPD, Ueq not achieved

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Site: US60 Bridge, Livingston County, KY





Stantec

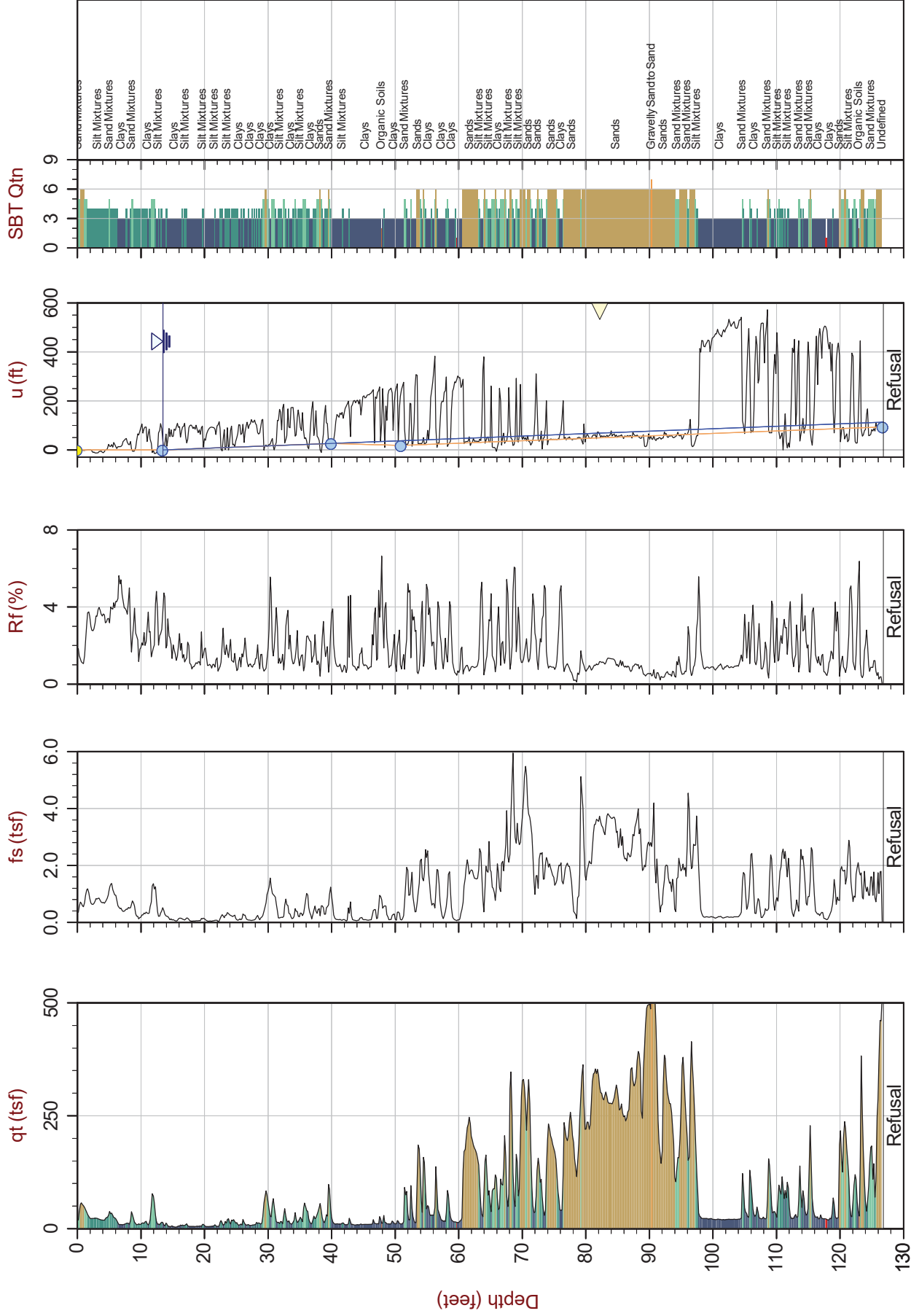
Job No: 19-61032

Date: 2019-08-21 15:43

Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-10

Cone: 513:T1500F15U500



Max Depth: 38.650 m / 126.80 ft

Depth Inc: 0.050 m / 0.164 ft

Avg Int: Every Point

File: 19-61032_SP10.COR

Unit Wt: SBTQtn (PKR2009)

Hydrostatic Line — Ueq ● Assumed Ueq ▲ PPD, Ueq achieved ▼ PPD, Ueq not achieved

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112576 E: 375747

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Stantec

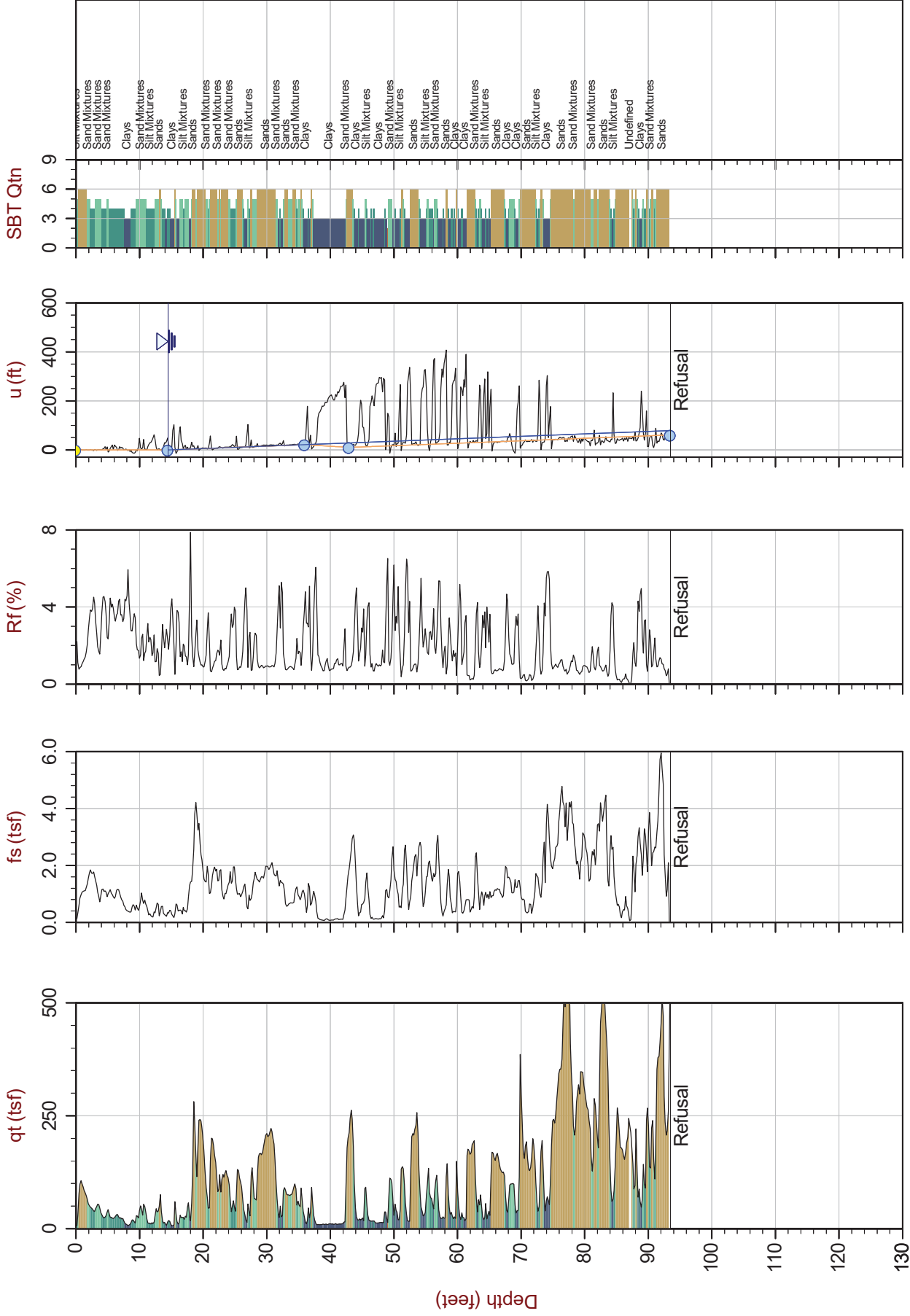
Job No: 19-61032

Date: 2019-08-22 10:33

Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-11

Cone: 513:T1500F15U500



Max Depth: 28.500 m / 93.50 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 19-61032_SP11.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112619 E: 375756

Hydrostatic Line — Ueq ● Assumed Ueq △ PPD, Ueq achieved ▽ PPD, Ueq not achieved

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

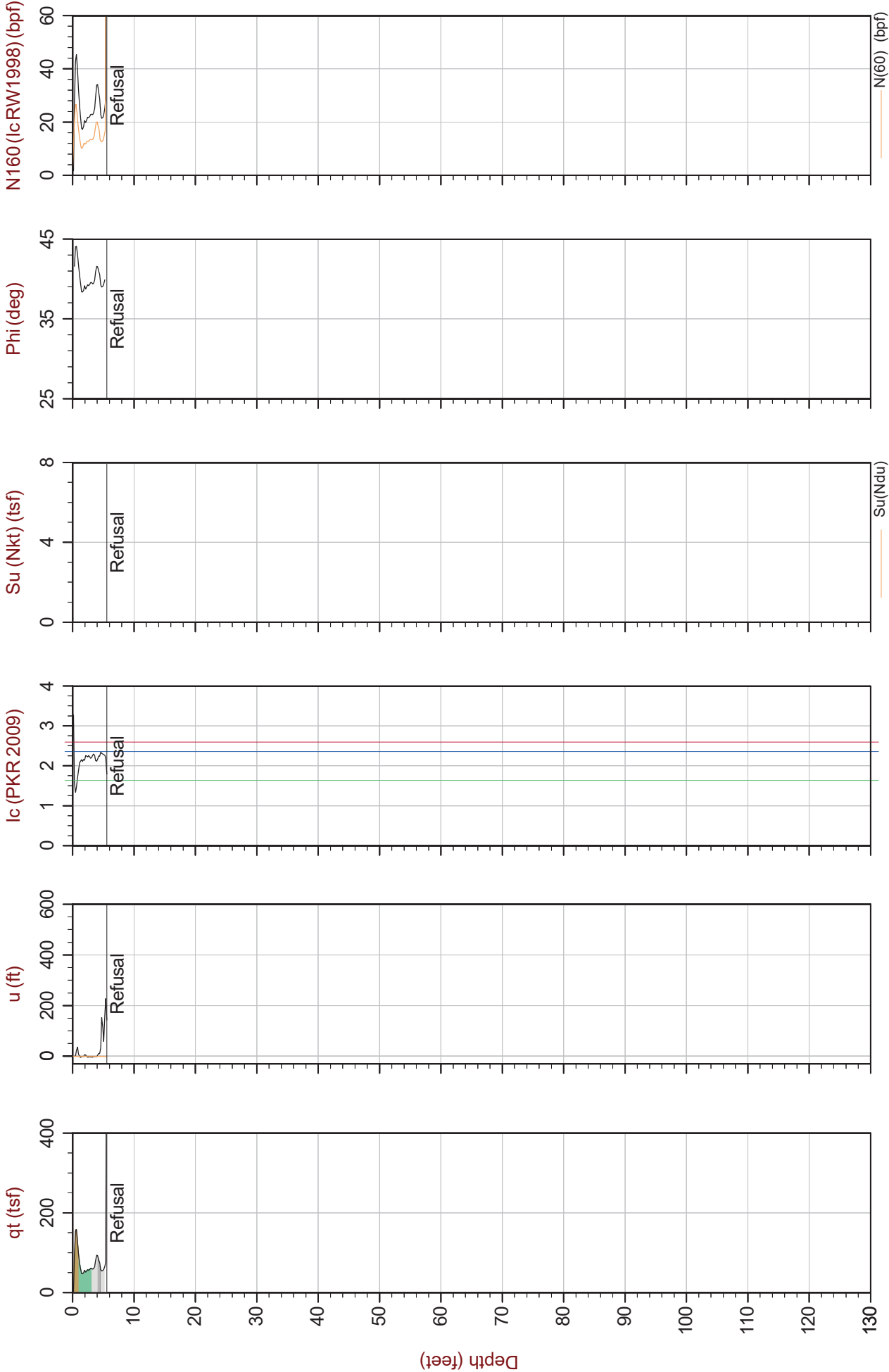
Advanced Cone Penetration Test Plots



Stantec

Job No: 19-61032
Date: 2019-08-22 16:47
Site: US60 Bridge, Livingston County, KY

Sounding: CPT19-02
Cone: 513:T1500F15U500



Max Depth: 1.700 m / 5.58 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point
File: 19-61032_CP02.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt/Ndu: 12.5 / 6.0
SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112078 E: 375659

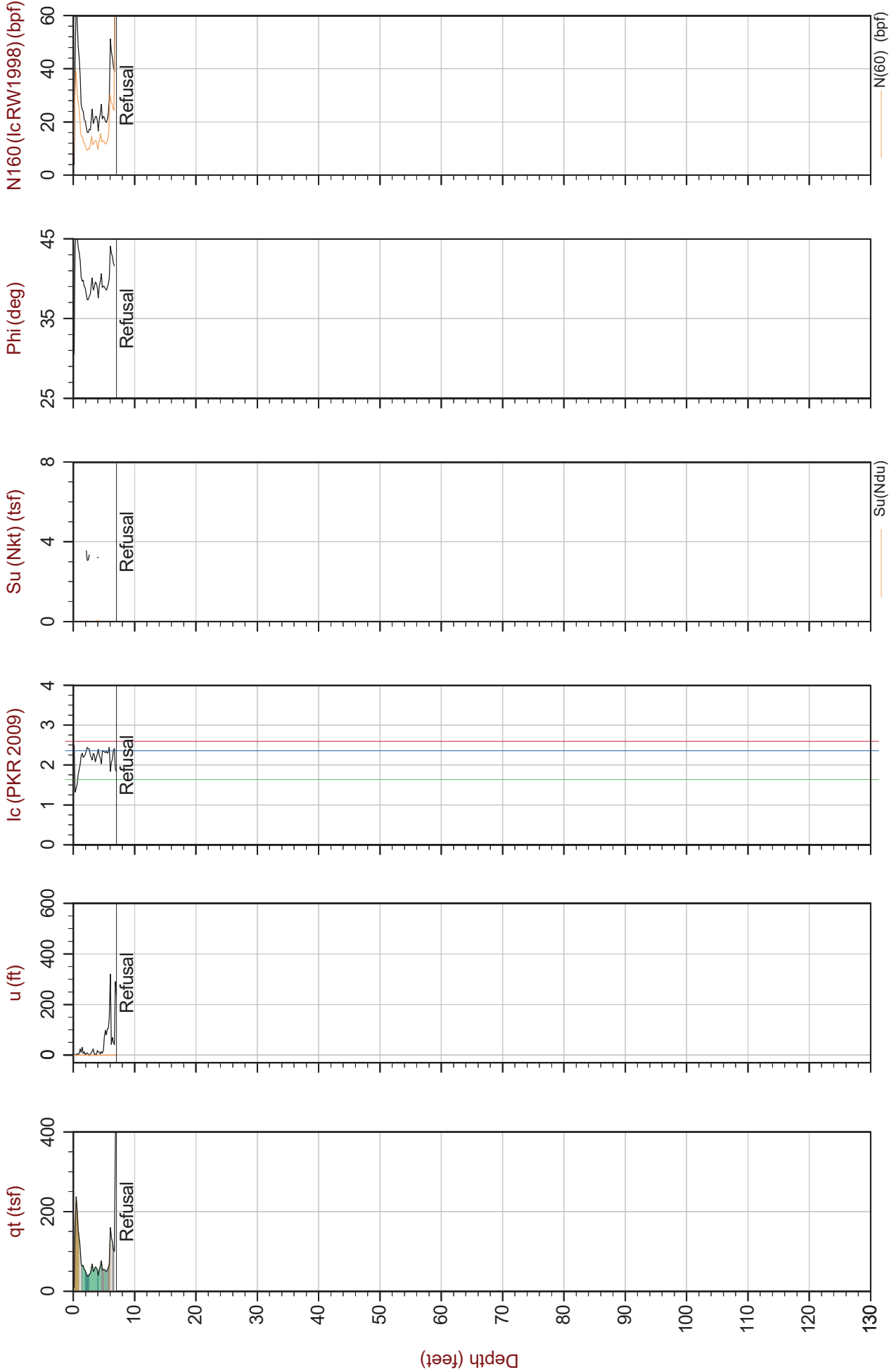
Hydrostatic Line (blue line) Ueq (yellow dot) Assumed Ueq (green triangle) PPD, Ueq achieved (blue triangle) PPD, Ueq not achieved (red triangle)
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Stantec

Job No: 19-61032
Date: 2019-08-22 17:07
Site: US60 Bridge, Livingston County, KY

Sounding: CPT19-02A
Cone: 513:T1500F15U500



Max Depth: 2.150 m / 7.05 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point
File: 19-61032_CP02A.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt/Ndu: 12.5 / 6.0
SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112078 E: 375656

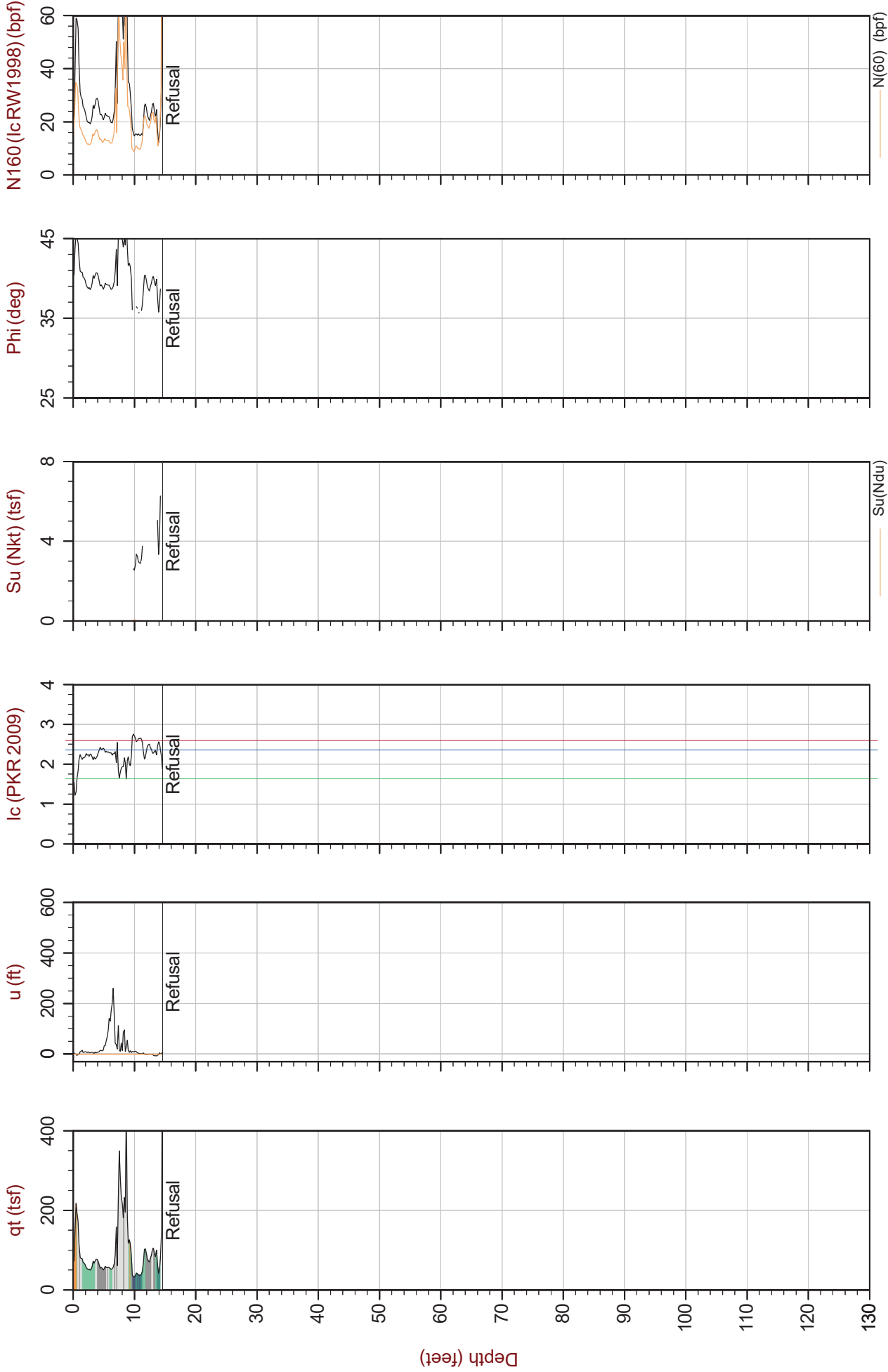
Hydrostatic Line (blue line) Ueq (yellow dot) Assumed Ueq (green triangle) PPD, Ueq achieved (blue triangle) PPD, Ueq not achieved (red triangle)
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Stantec

Job No: 19-61032
Date: 2019-08-22 17:31
Site: US60 Bridge, Livingston County, KY

Sounding: CPT19-02B
Cone: 513.T1500F15U500



Max Depth: 4.450 m / 14.60 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point
File: 19-61032_CP02B.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt/Ndu: 12.5 / 6.0
Hydrostatic Line
Ueq
Assumed Ueq
PPD, Ueq achieved
PPD, Ueq not achieved
SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112078 E: 375661

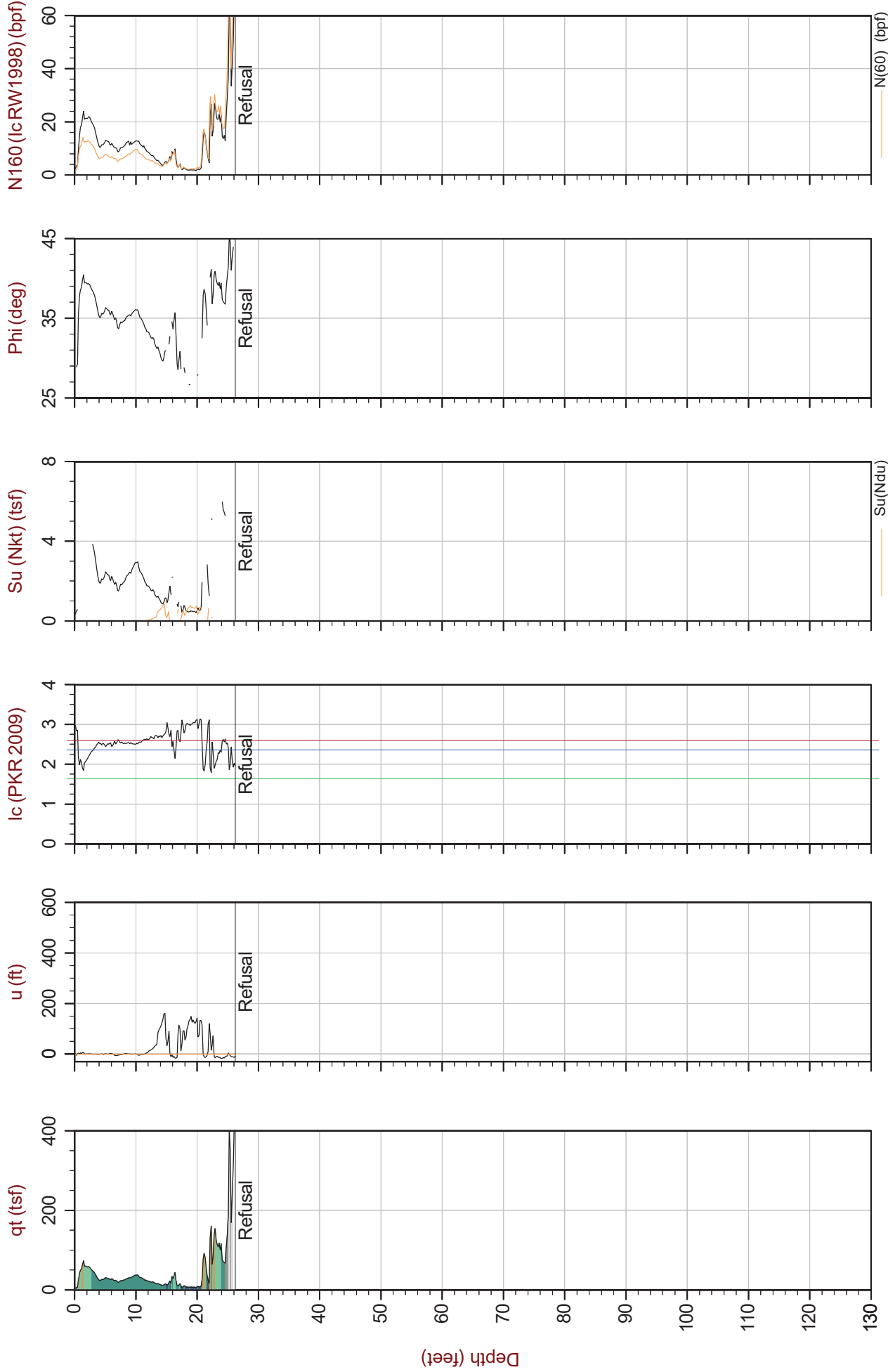
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Stantec

Job No: 19-61032
Date: 2019-08-23 08:28
Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-03
Cone: 513:T1500F15U500



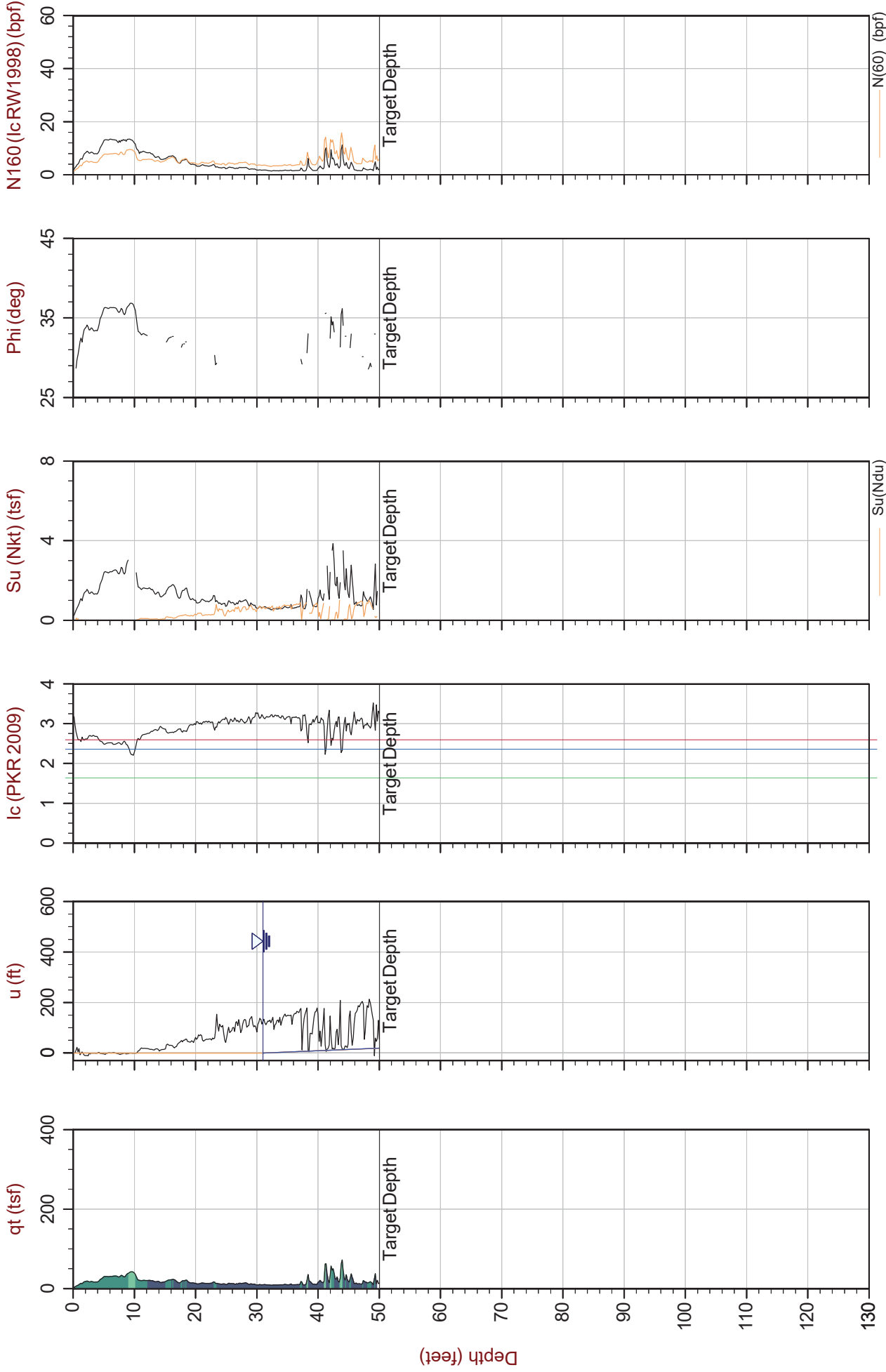
Max Depth: 8.000 m / 26.25 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point
File: 19-61032_SP03.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt/Ndu: 12.5 / 6.0
SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112118 E: 375665
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Stantec

Job No: 19-61032
Date: 2019-08-23 09:16
Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-04
Cone: 513:T1500F15U500



Max Depth: 15.250 m / 50.03 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 19-61032_SP04.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt/Ndu: 12.5 / 6.0

SBT: Robertson, 2009 and 2010

Coords: UTM Zone 16N N: 4112156 E: 375670

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Stantec

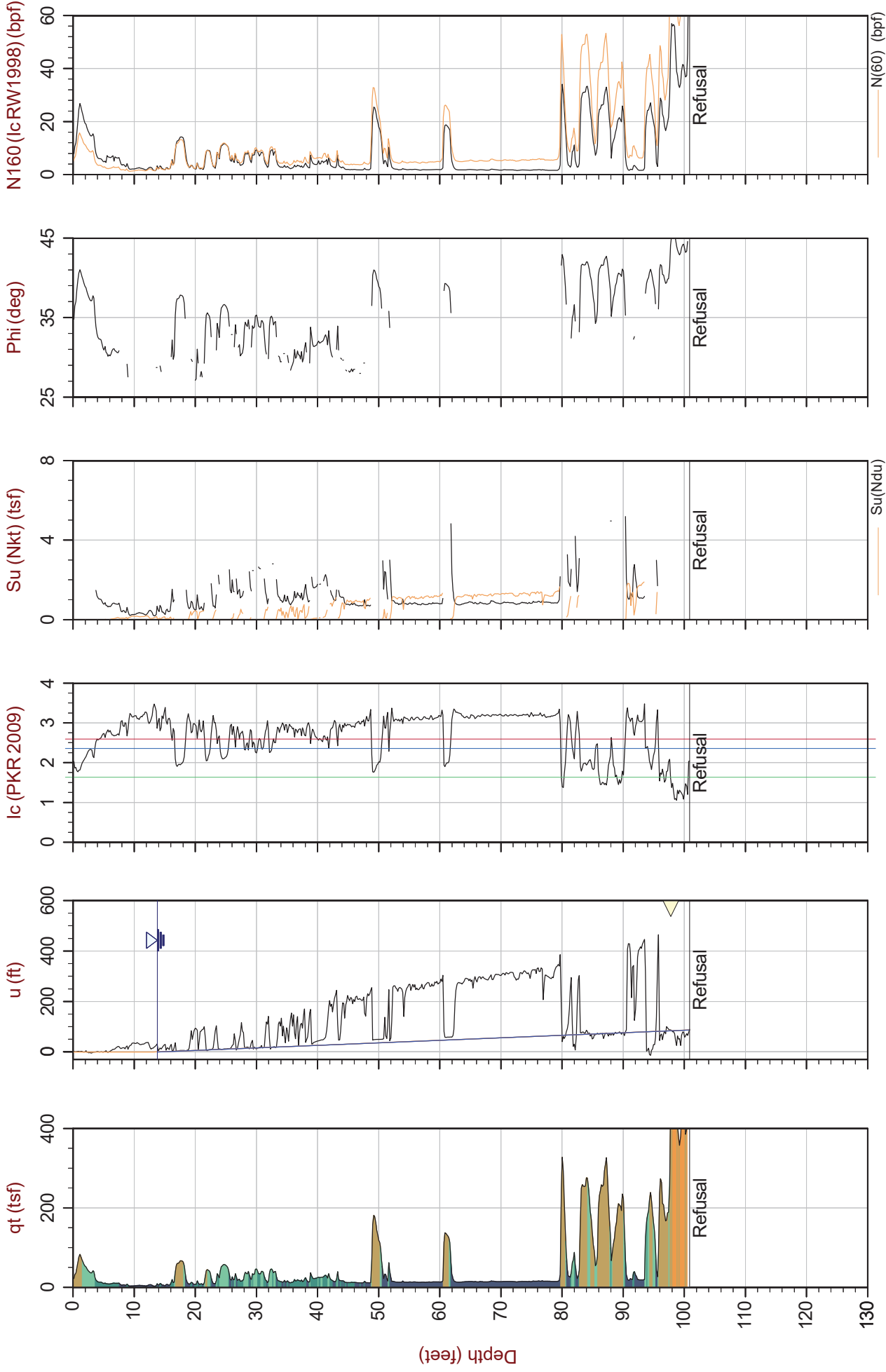
Job No: 19-61032

Date: 2019-08-20 09:56

Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-05

Cone: 513:T1500F15U500



Max Depth: 30.750 m / 100.88 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 19-61032_SP05.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt/Ndu: 12.5 / 6.0

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112378 E: 375709

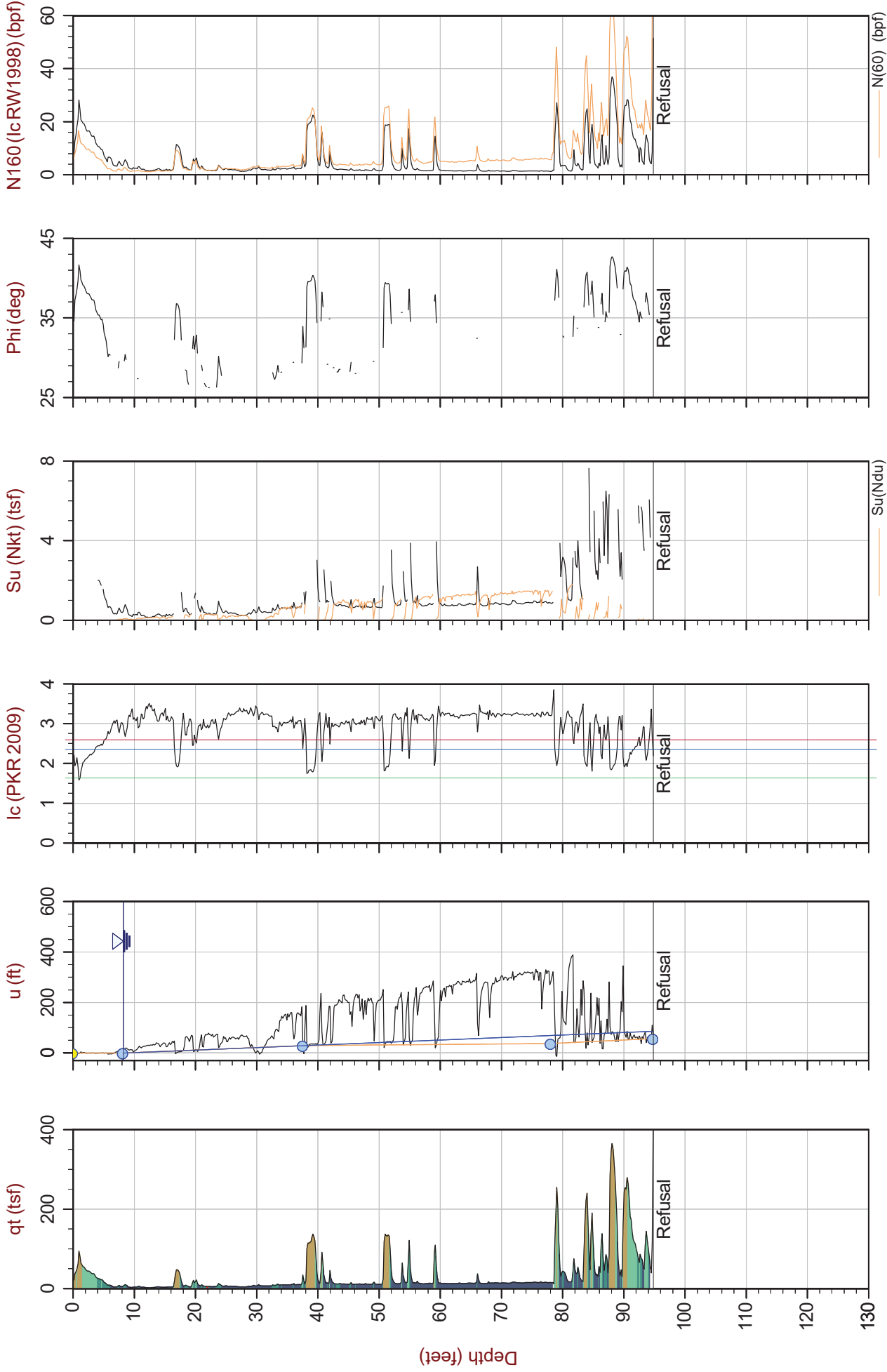
Hydrostatic Line — Ueq ● Assumed Ueq ▲ PPD, Ueq achieved ▼ PPD, Ueq not achieved
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Stantec

Job No: 19-61032
Date: 2019-08-20 14:15
Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-06
Cone: 513:T1500F15U500



Max Depth: 28.900 m / 94.82 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point
Hydrostatic Line
Ueq
Assumed Ueq
PPD, Ueq achieved
PPD, Ueq not achieved

File: 19-61032_SP06.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt/Ndu: 12.5 / 6.0
SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112426 E: 375716

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Stantec

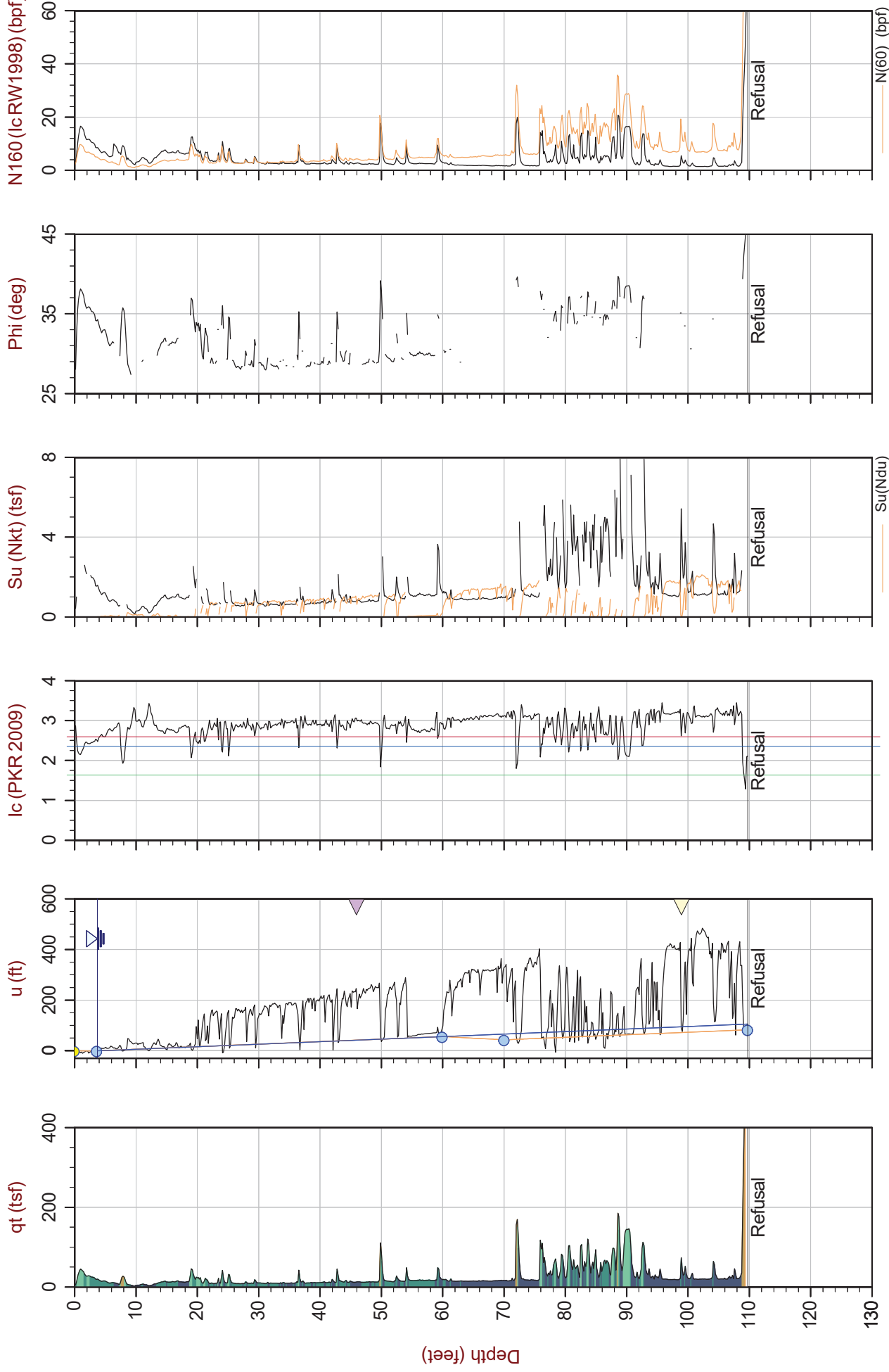
Job No: 19-61032

Date: 2019-08-21 08:35

Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-07

Cone: 513:T1500F15U500



Max Depth: 33.450 m / 109.74 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 19-61032_SP07.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt/Ndu: 12.5 / 6.0

SBT: Robertson, 2009 and 2010

Coords: UTM Zone 16N N: 4112461 E: 375709

Hydrostatic Line (blue line) Ueq (blue circle) Assumed Ueq (blue triangle) PPD, Ueq achieved (blue diamond) Ueq not achieved (blue square)
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Stantec

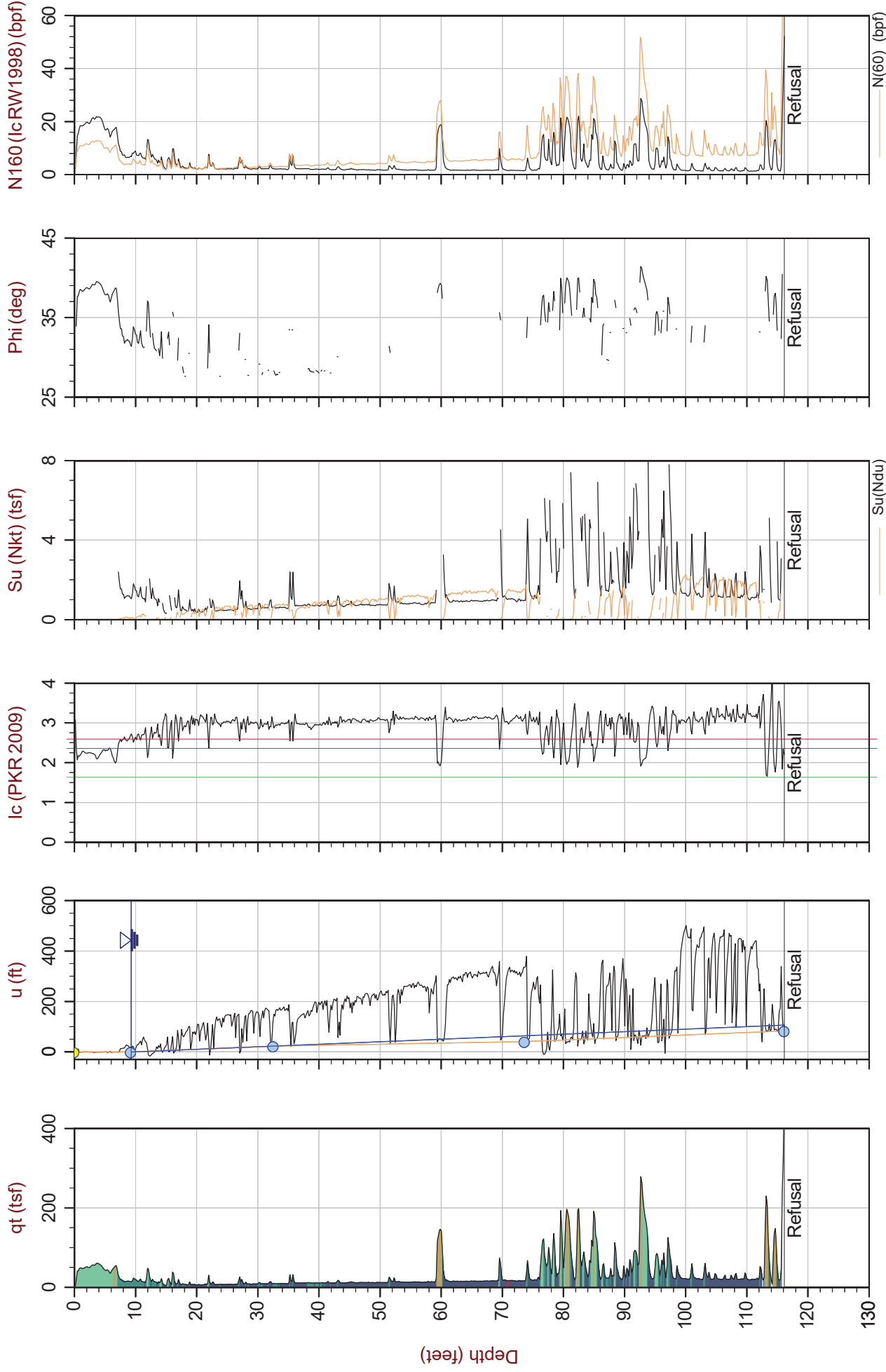
Job No: 19-61032

Date: 2019-08-21 11:15

Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-08

Cone: 513:T1500F15U500



Max Depth: 35.400 m / 116.14 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 19-61032_SP08.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt/Ndu: 12.5 / 6.0

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112444 E: 375723

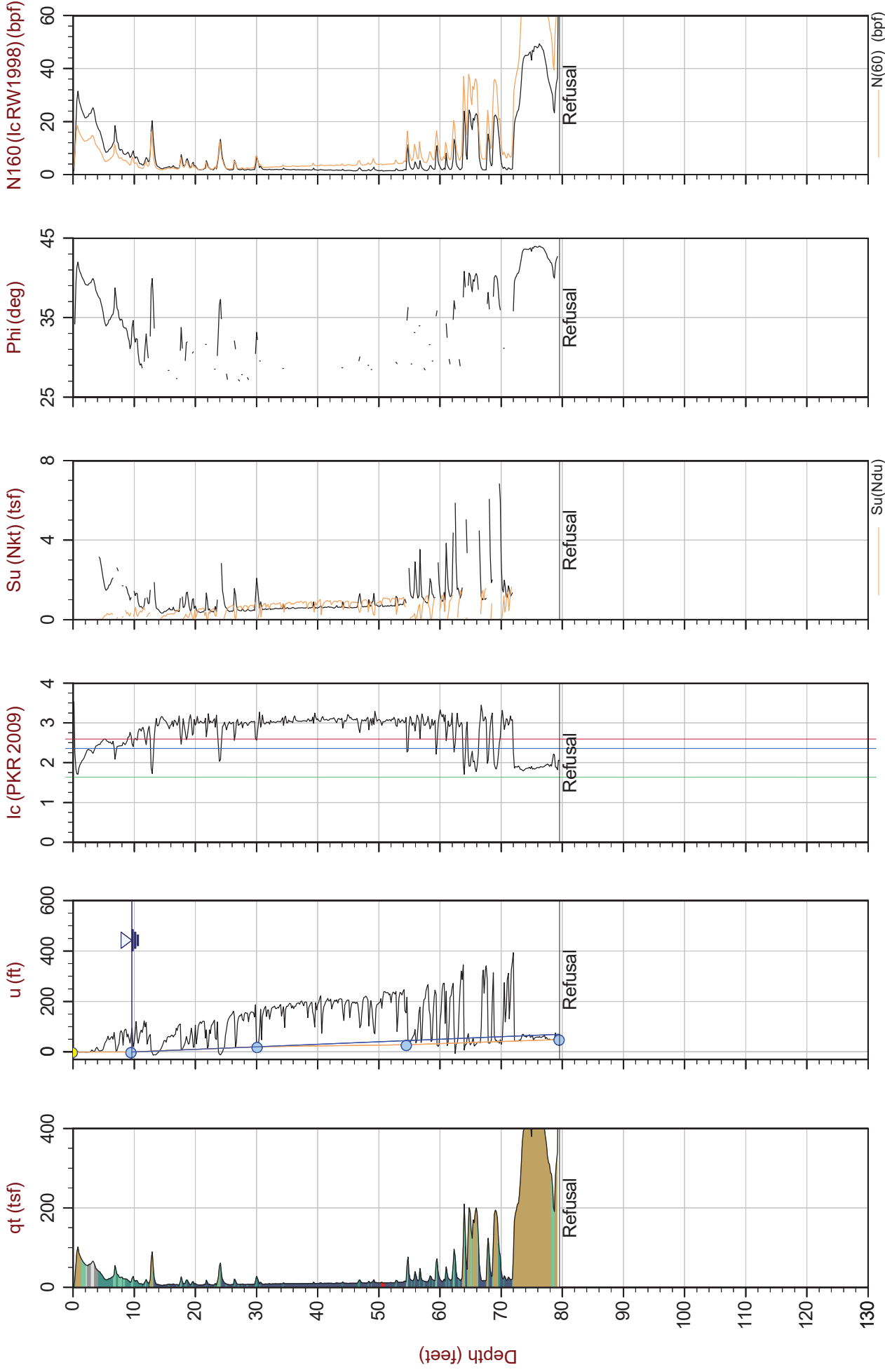
Hydrostatic Line — Ueq — Assumed Ueq — PPD, Ueq achieved — PPD, Ueq not achieved
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Stantec

Job No: 19-61032
Date: 2019-08-21 13:39
Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-09
Cone: 513:T1500F15U500



Max Depth: 24.250 m / 79.56 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point
File: 19-61032_SP09.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt/Ndu: 12.5 / 6.0

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112545 E: 375744

Hydrostatic Line — Ueq ● Assumed Ueq ▲ PPD, Ueq achieved ▼ PPD, Ueq not achieved
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Stantec

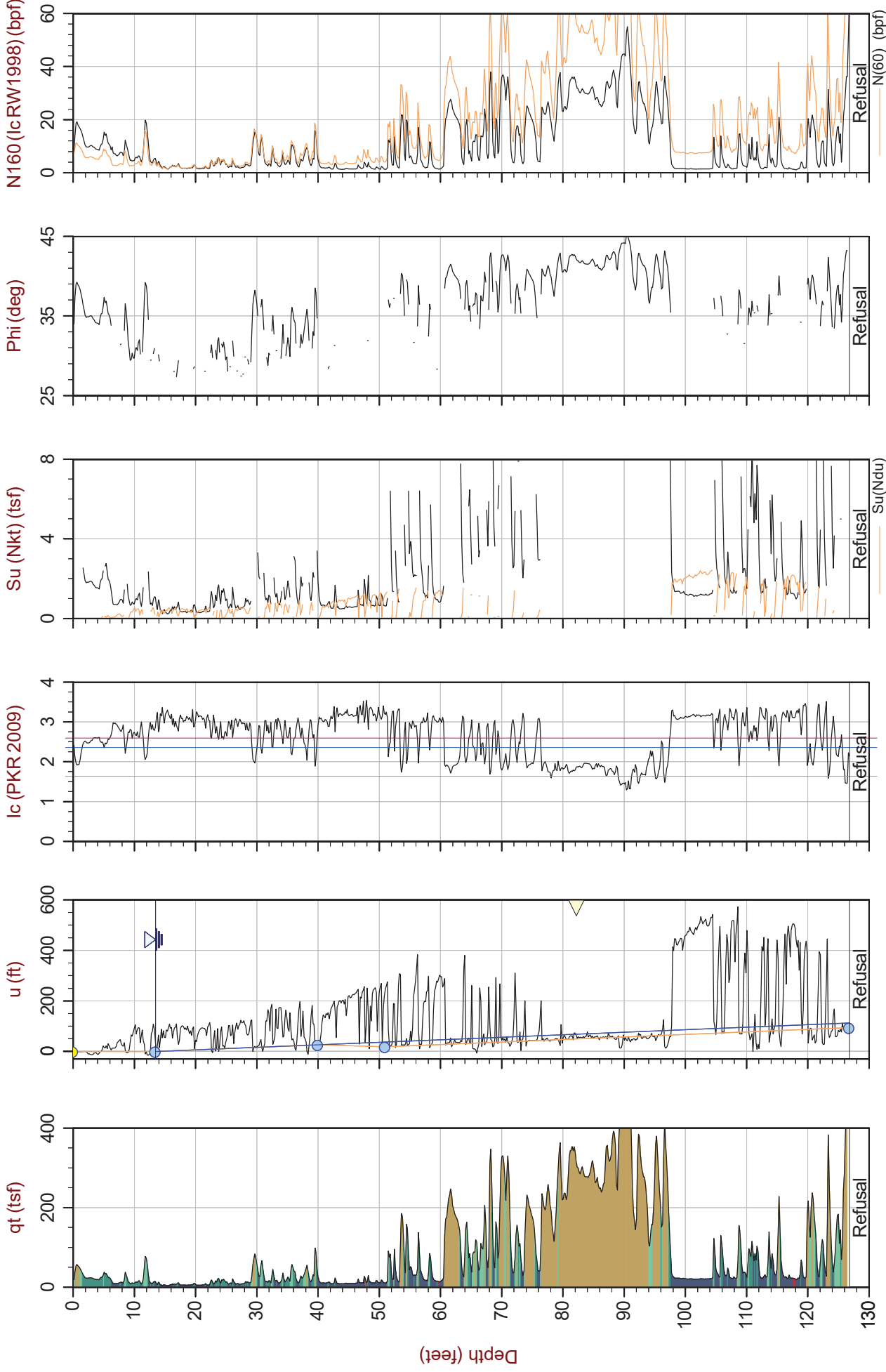
Job No: 19-61032

Date: 2019-08-21 15:43

Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-10

Cone: 513:T1500F15U500



Max Depth: 38.650 m / 126.80 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 19-61032_SP10.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt/Ndu: 12.5 / 6.0

SBT: Robertson, 2009 and 2010

Coords: UTM Zone 16N N: 4112576 E: 375747

Hydrostatic Line

Ueq

Assumed Ueq

PPD, Ueq achieved

Ueq not achieved

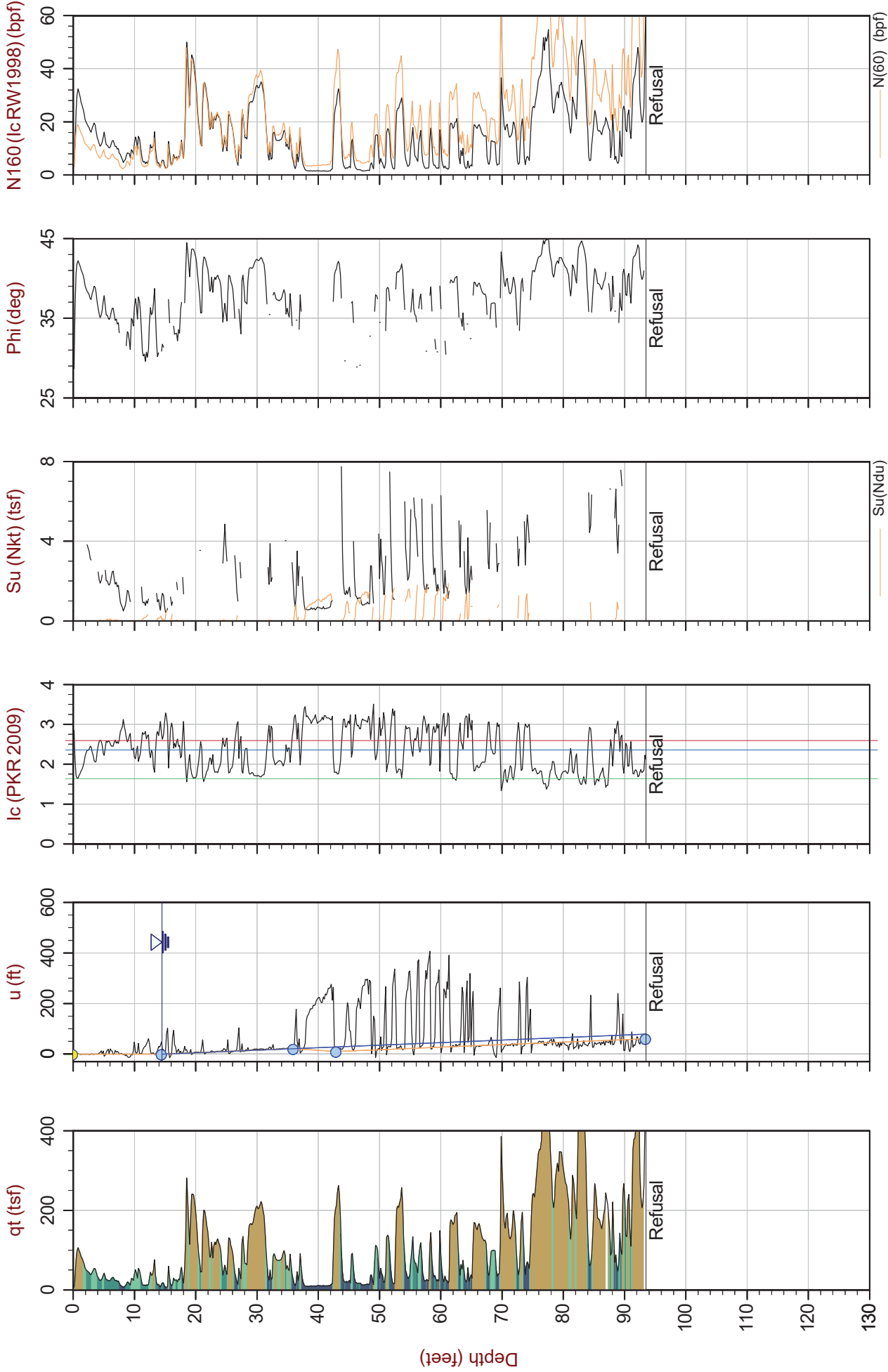
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Stantec

Job No: 19-61032
Date: 2019-08-22 10:33
Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-11
Cone: 513:T1500F15U500



Max Depth: 28.500 m / 93.50 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point
File: 19-61032_SP11.COR
Unit Wt: SBTQtn (PKR2009)
Su Nkt/Ndu: 12.5 / 6.0
SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112619E: 375756

Hydrostatic Line — Ueq ● Assumed Ueq ▲ PPD, Ueq achieved ▼ PPD, Ueq not achieved
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

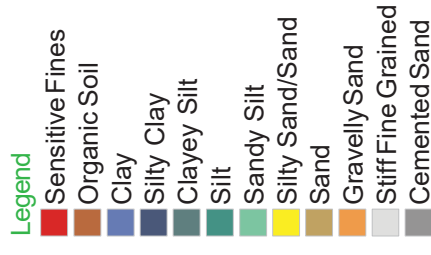
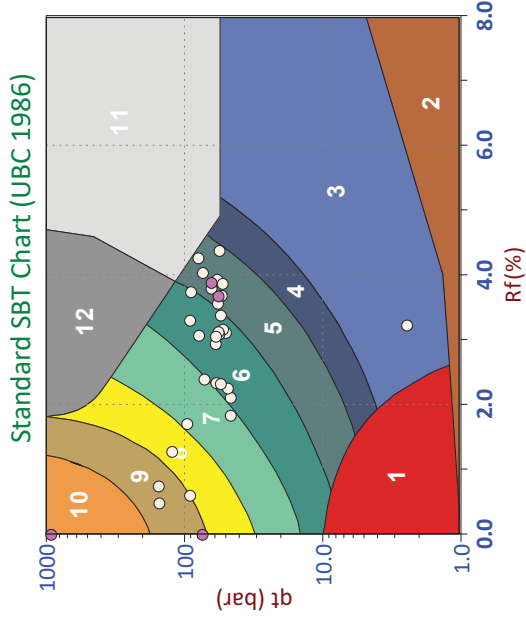
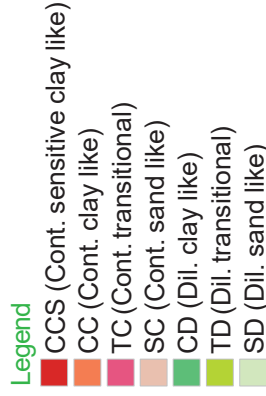
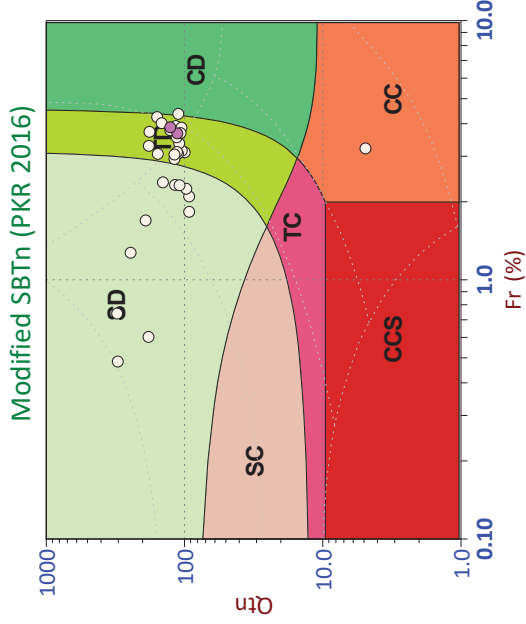
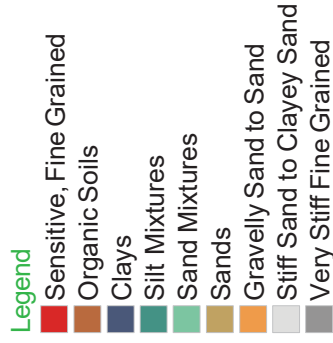
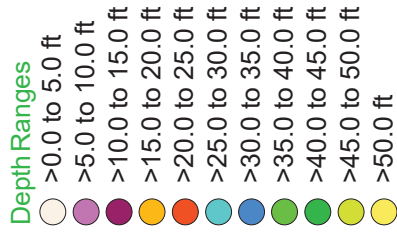
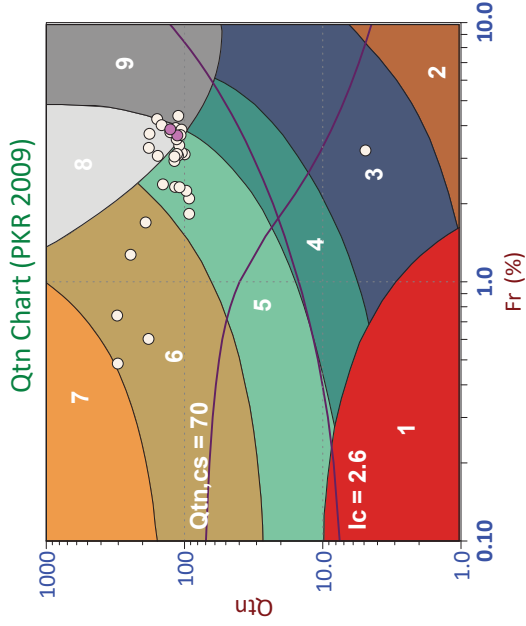
Soil Behavior Type (SBT) Scatter Plots



Stantec

Job No: 19-61032
Date: 2019-08-22 16:47
Site: US60 Bridge, Livingston County, KY

Sounding: CPT19-02
Cone: 513:T1500F15U500

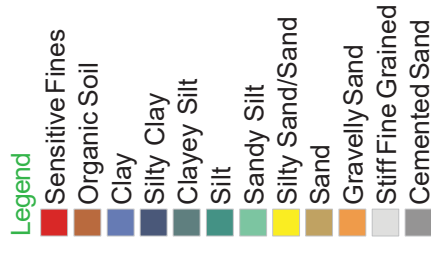
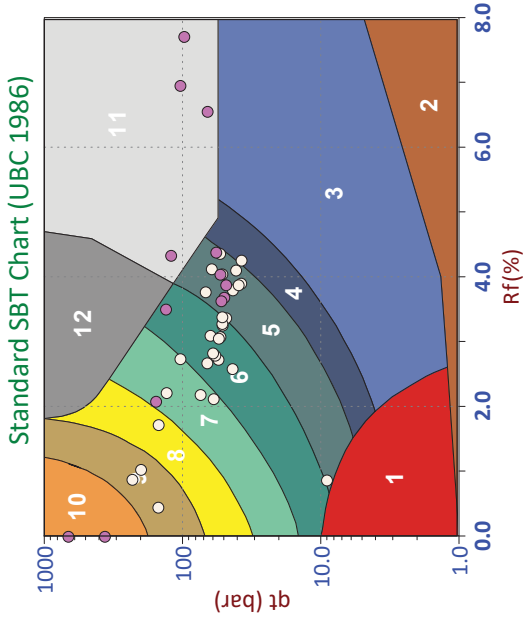
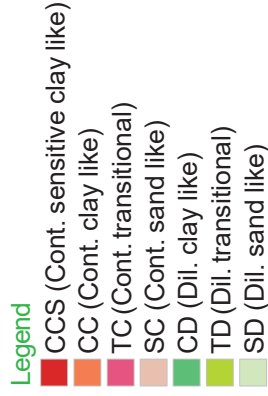
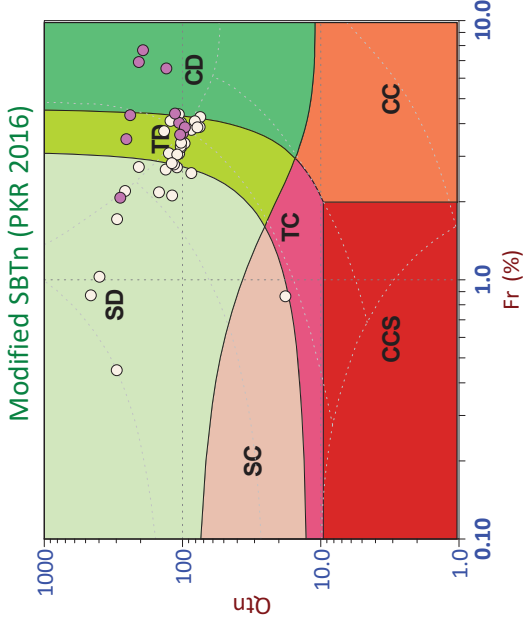
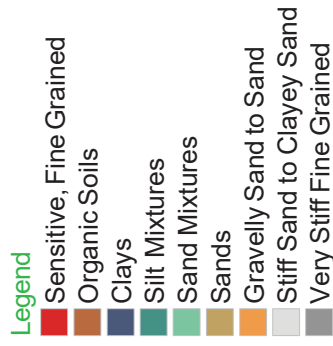
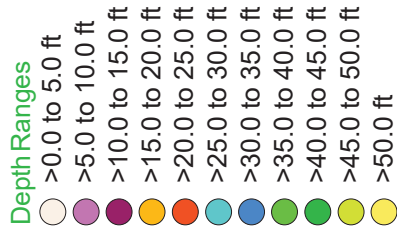
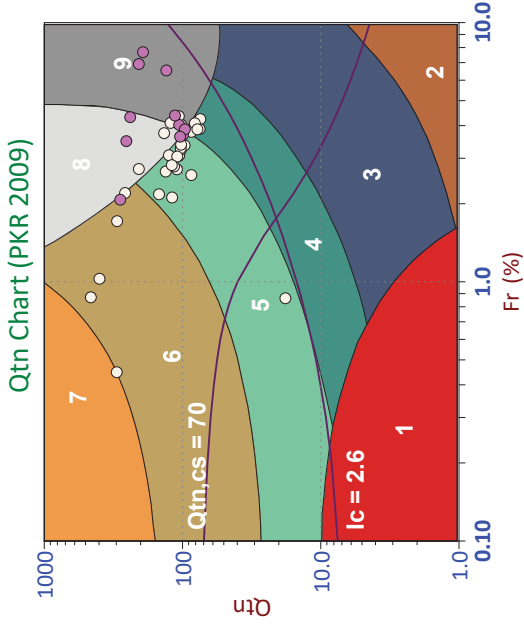




Stantec

Job No: 19-61032
Date: 2019-08-22 17:07
Site: US60 Bridge, Livingston County, KY

Sounding: CPT19-02A
Cone: 513:T1500F15U500

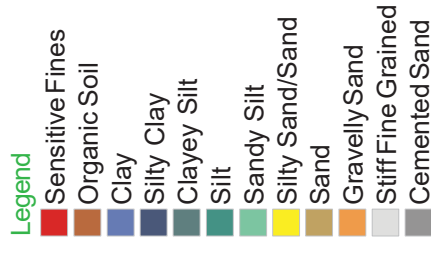
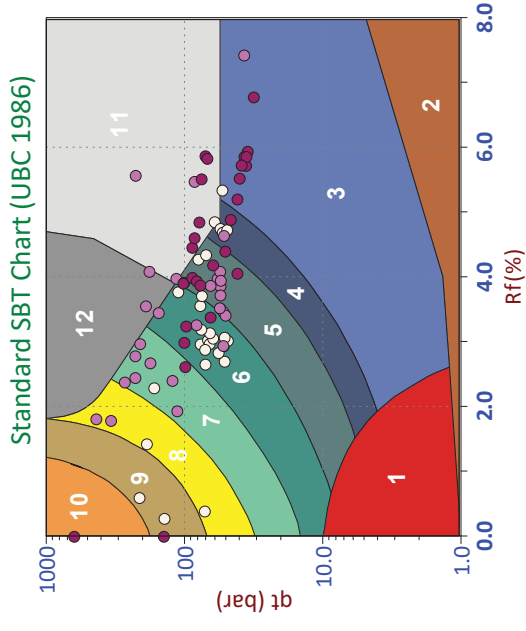
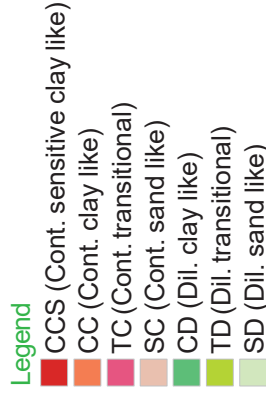
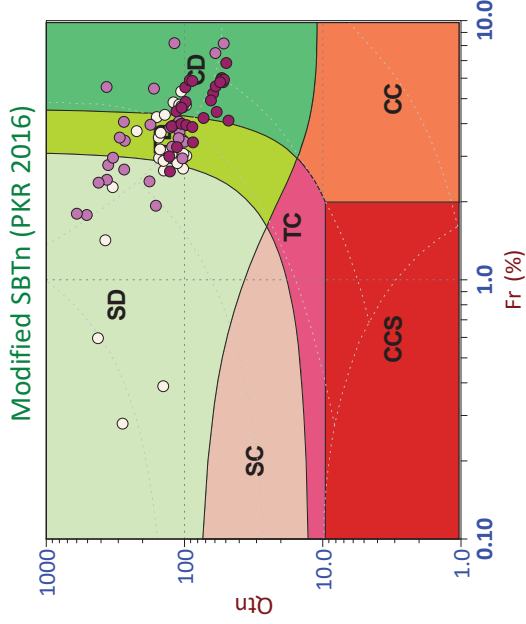
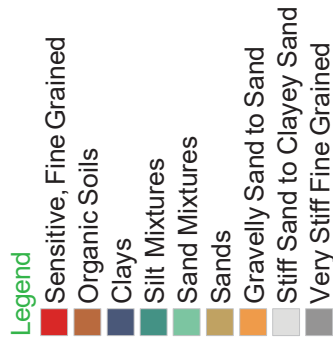
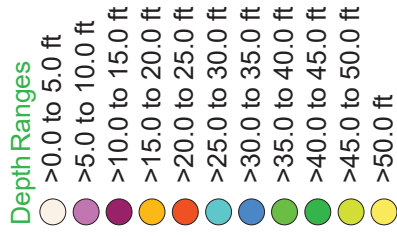
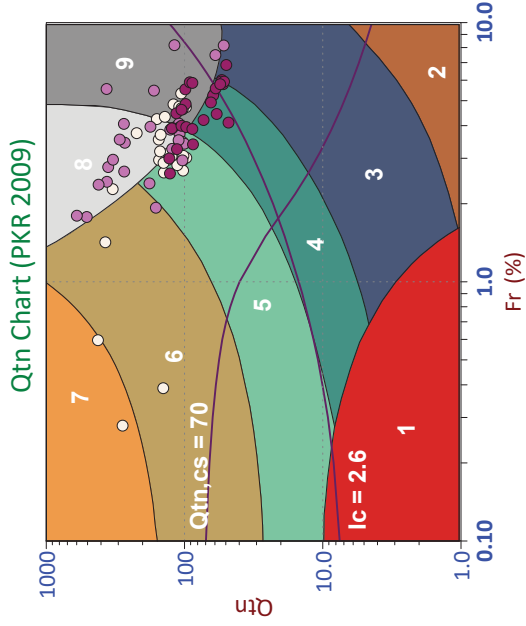




Stantec

Job No: 19-61032
Date: 2019-08-22 17:31
Site: US60 Bridge, Livingston County, KY

Sounding: CPT19-02B
Cone: 513:T1500F15U500

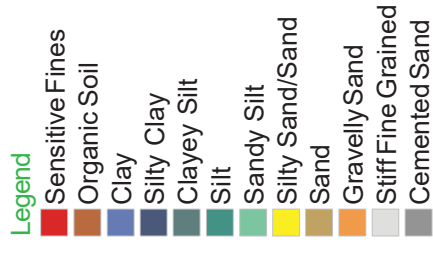
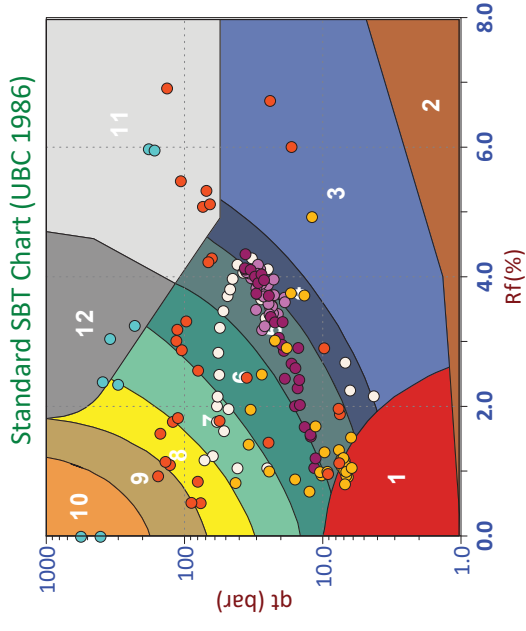
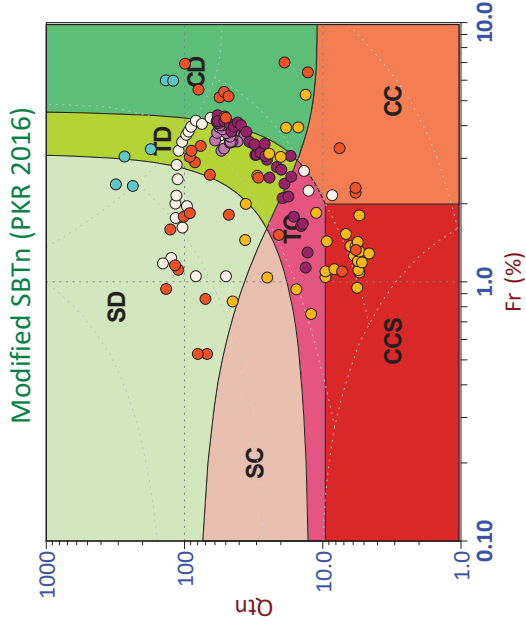
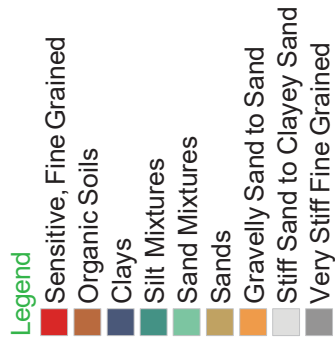
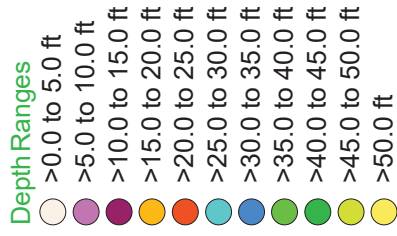
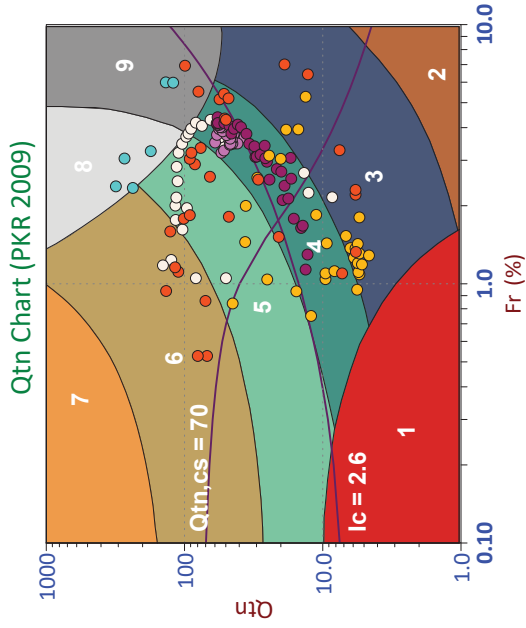




Stantec

Job No: 19-61032
Date: 2019-08-23 08:28
Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-03
Cone: 513:T1500F15U500

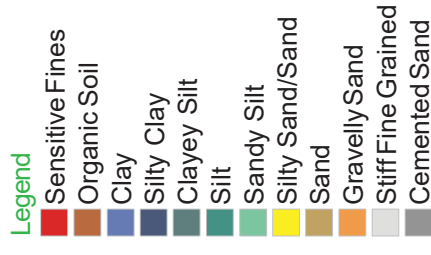
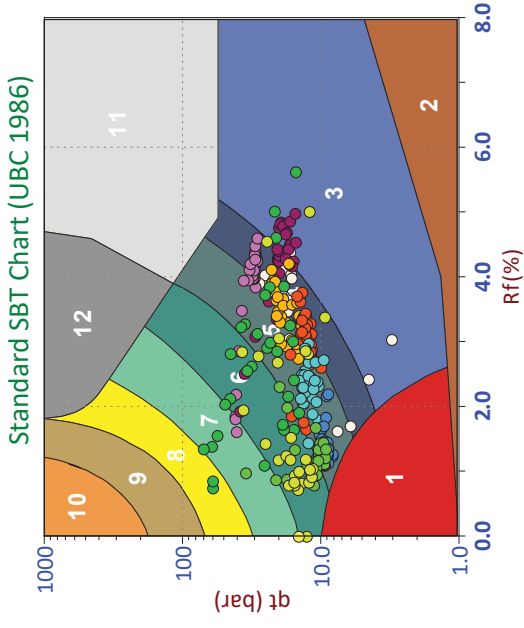
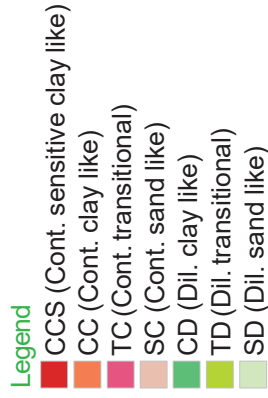
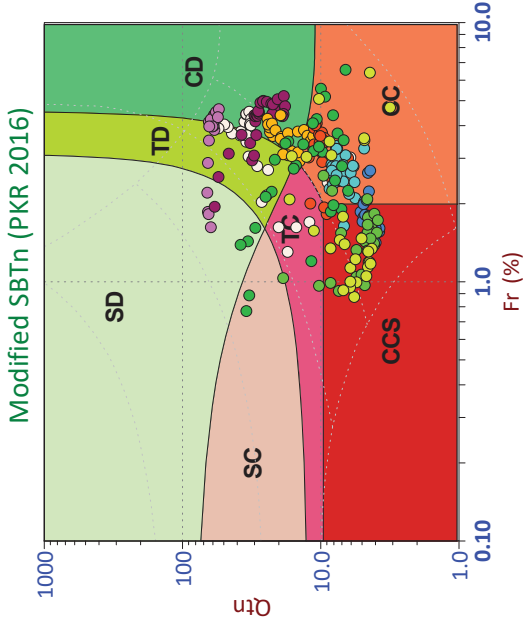
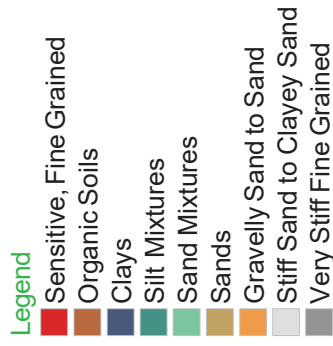
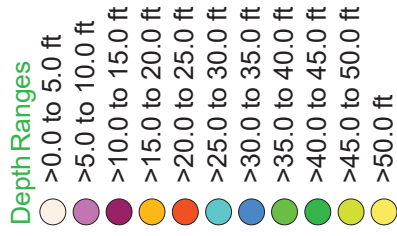
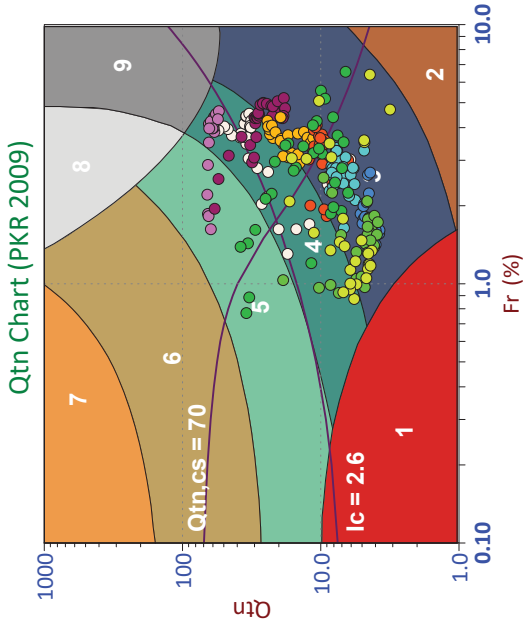




Stantec

Job No: 19-61032
Date: 2019-08-23 09:16
Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-04
Cone: 513:T1500F15U500

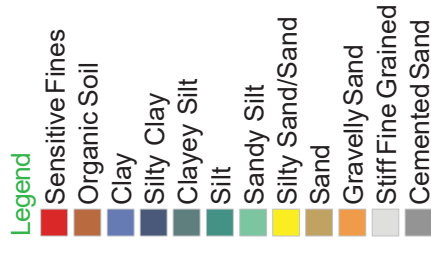
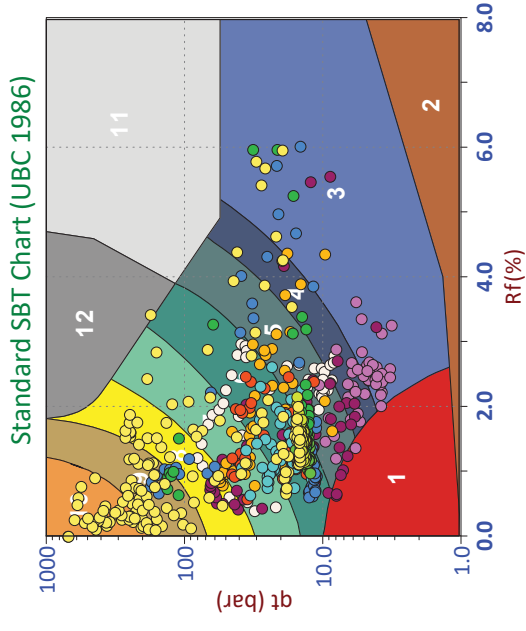
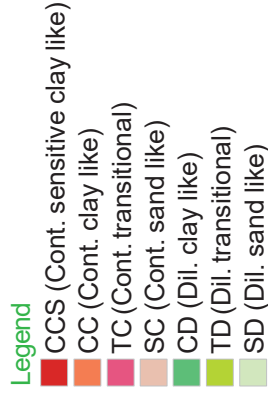
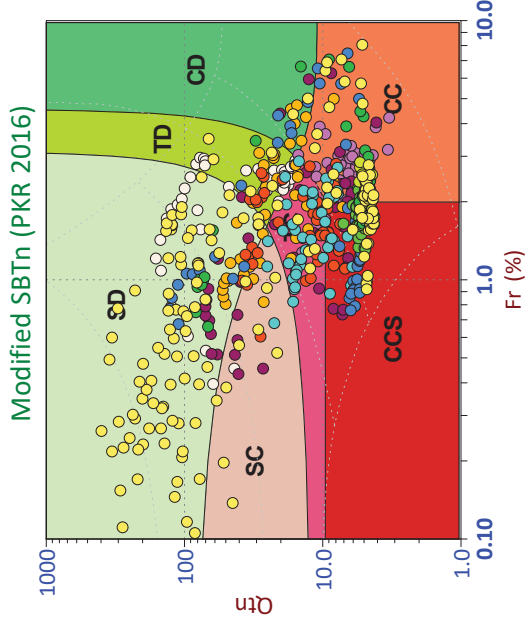
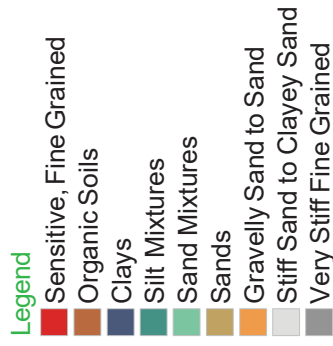
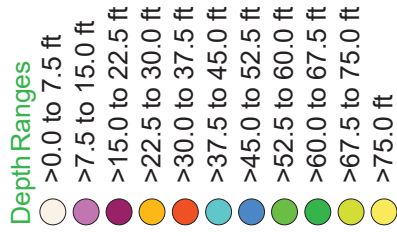
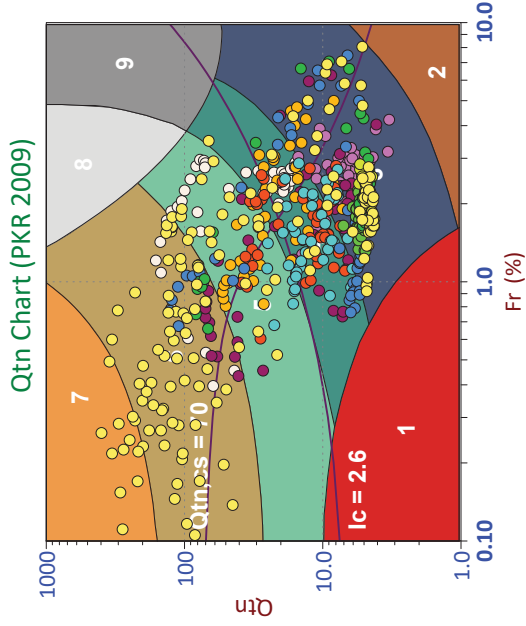




Stantec

Job No: 19-61032
Date: 2019-08-20 09:56
Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-05
Cone: 513:T1500F15U500

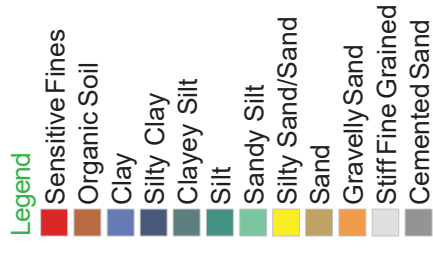
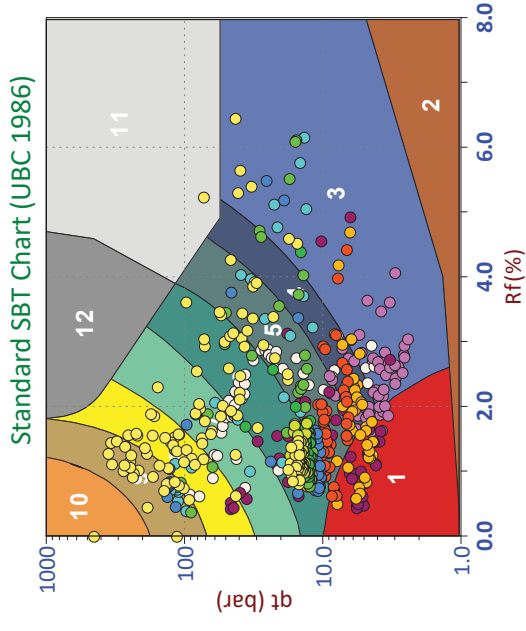
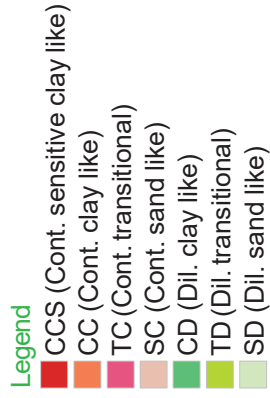
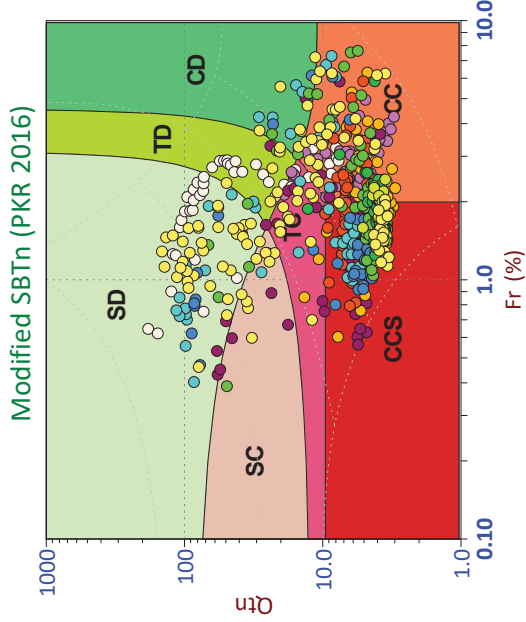
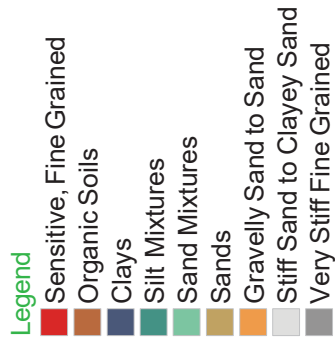
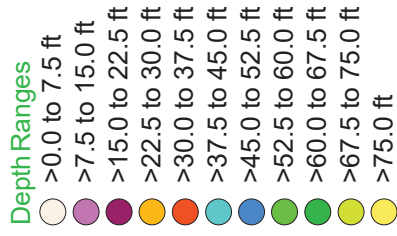
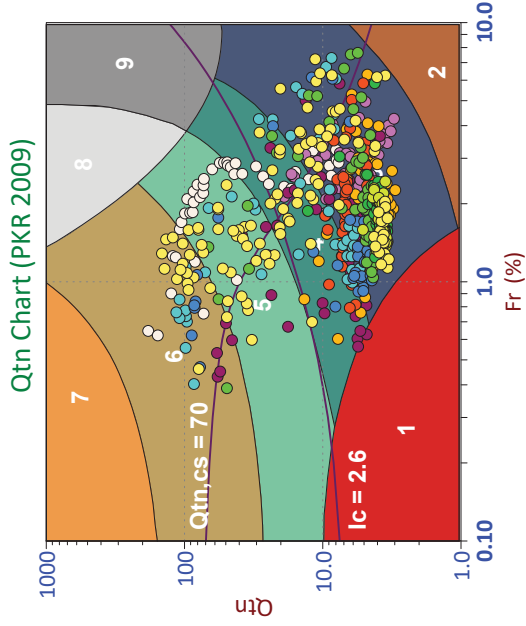




Stantec

Job No: 19-61032
Date: 2019-08-20 14:15
Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-06
Cone: 513:T1500F15U500

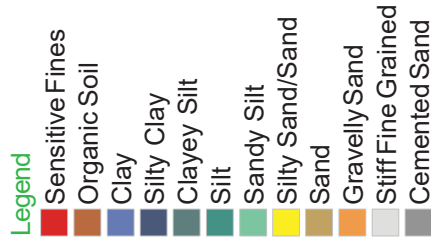
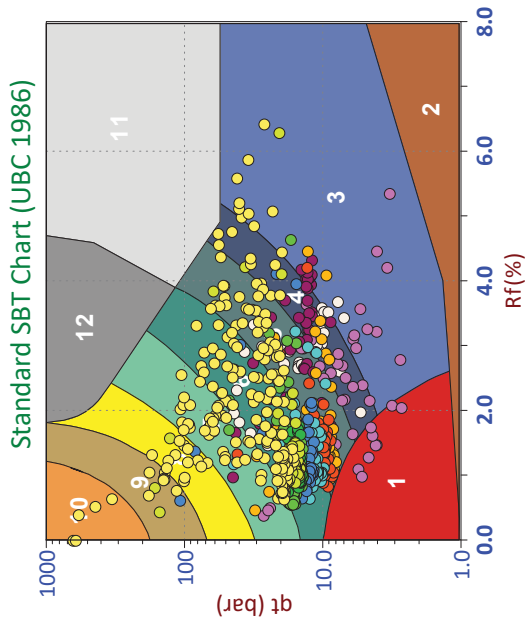
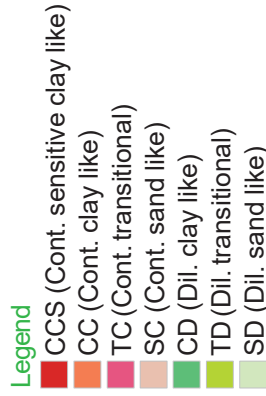
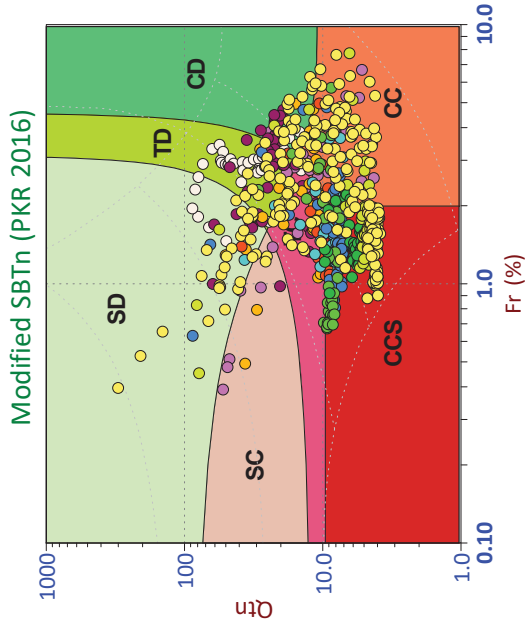
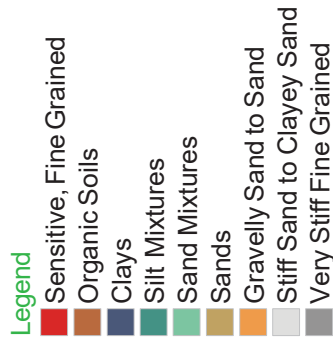
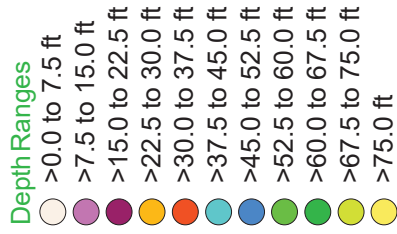
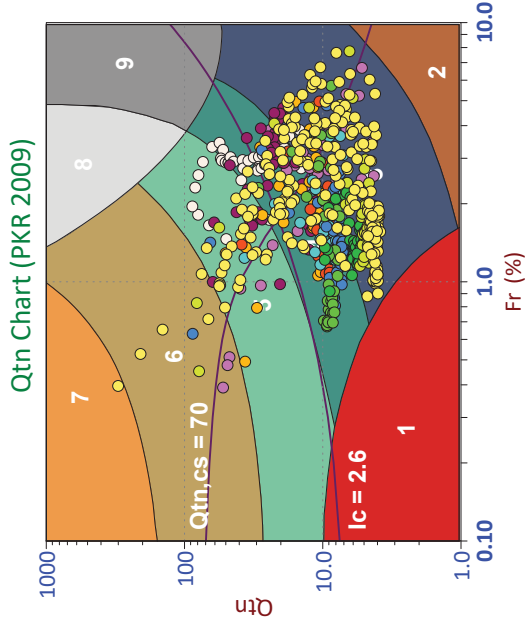




Stantec

Job No: 19-61032
Date: 2019-08-21 08:35
Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-07
Cone: 513:T1500F15U500

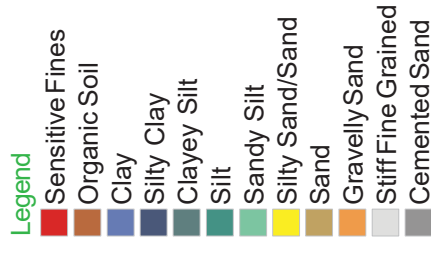
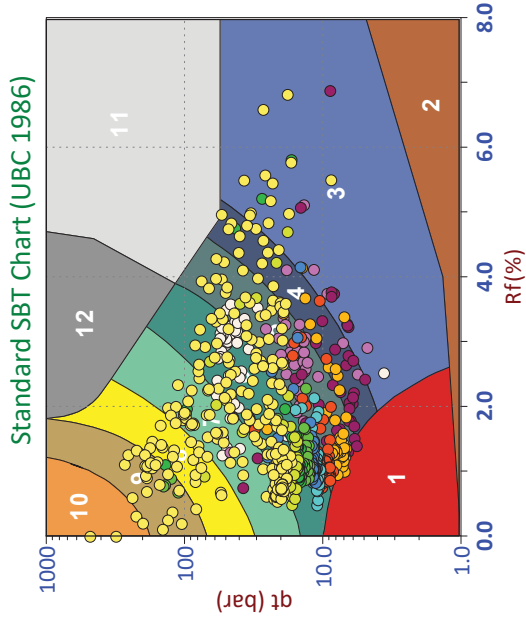
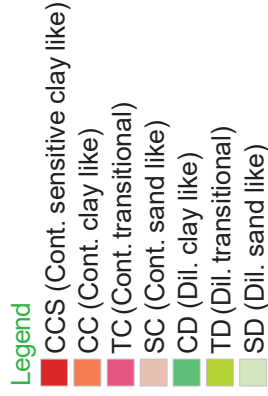
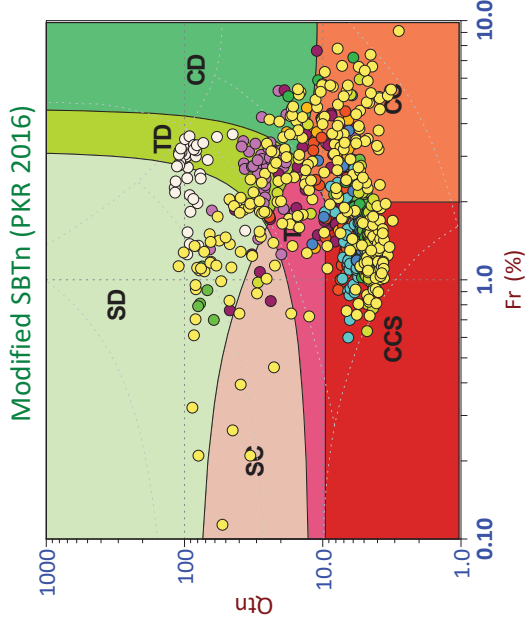
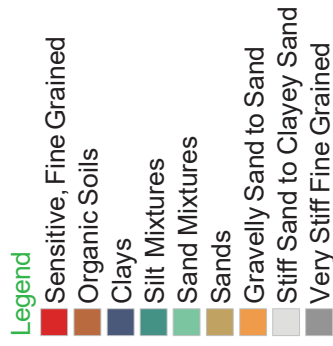
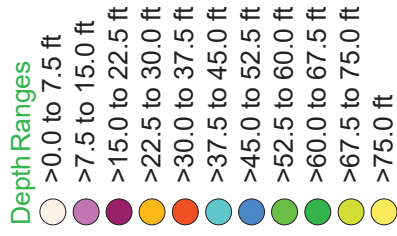
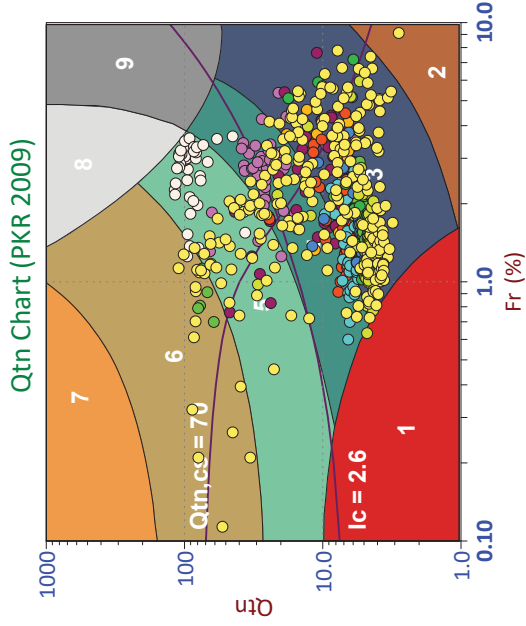




Stantec

Job No: 19-61032
Date: 2019-08-21 11:15
Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-08
Cone: 513:T1500F15U500

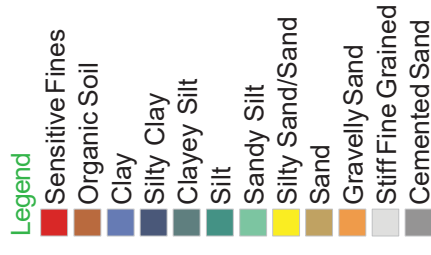
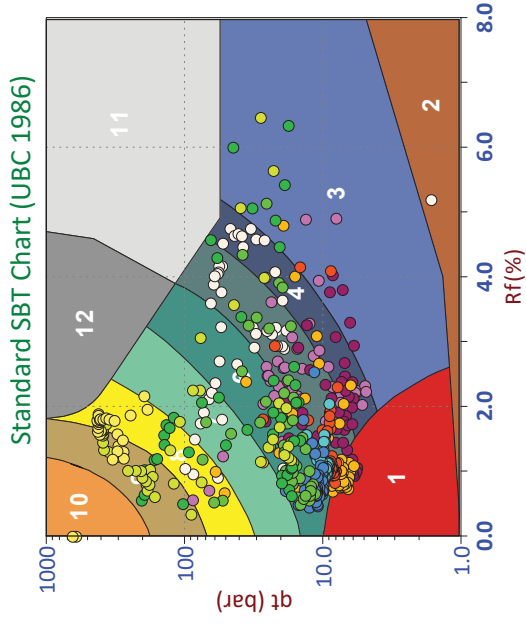
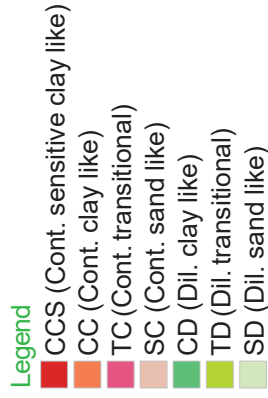
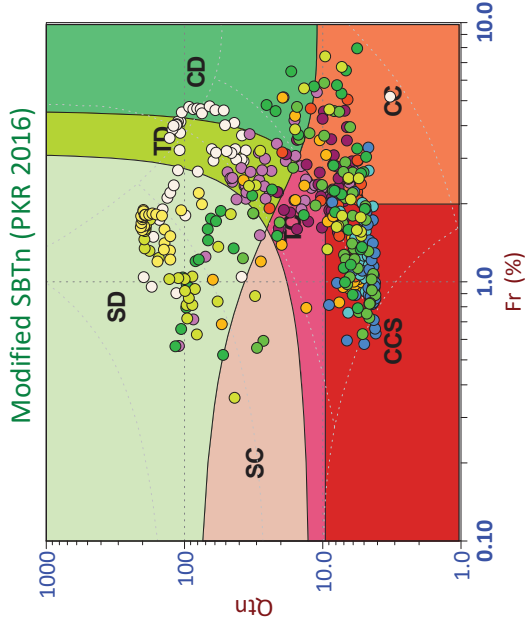
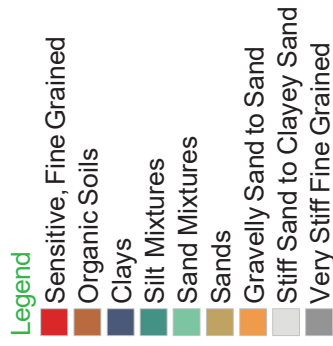
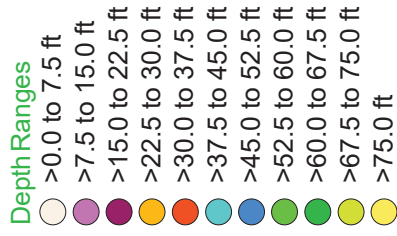
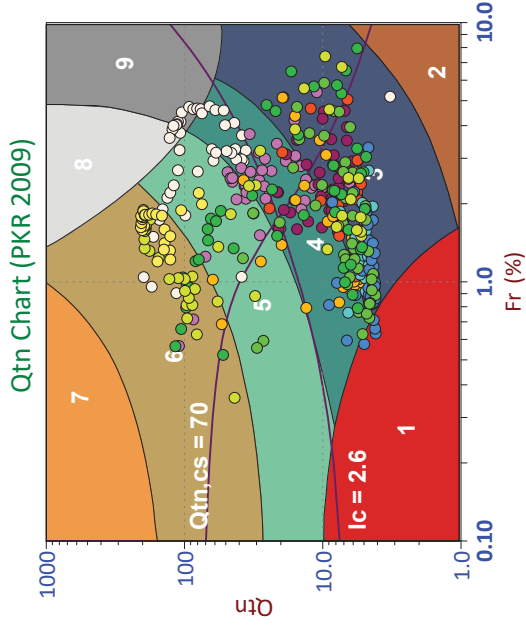




Stantec

Job No: 19-61032
Date: 2019-08-21 13:39
Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-09
Cone: 513:T1500F15U500

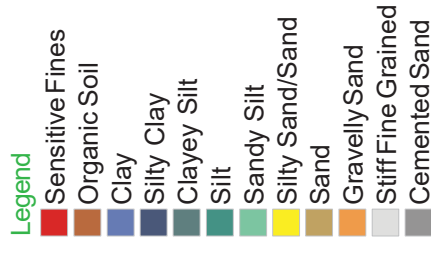
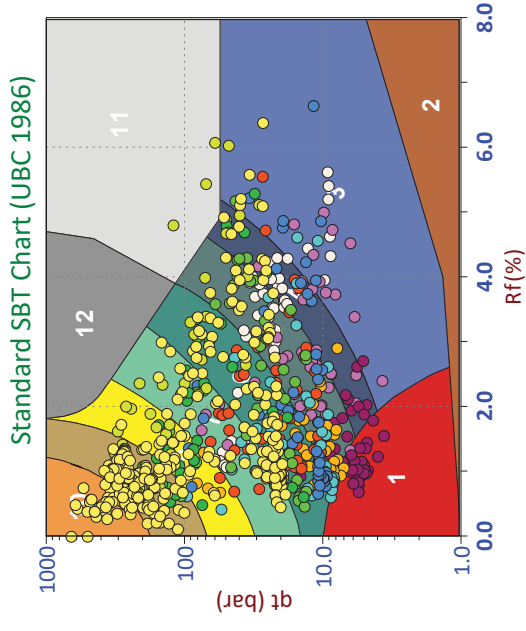
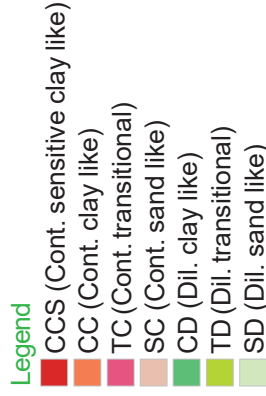
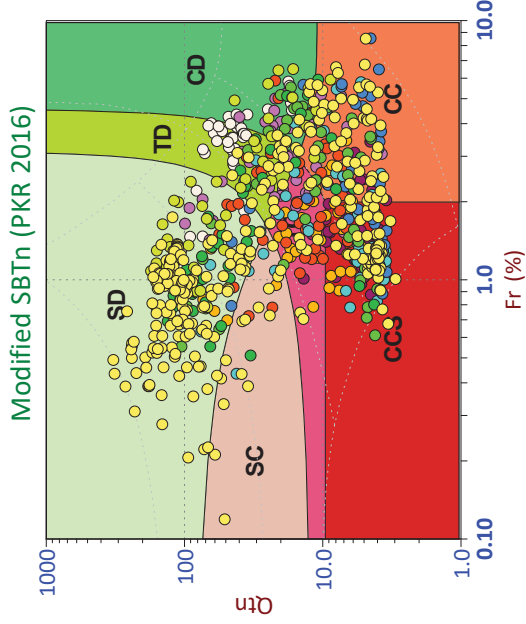
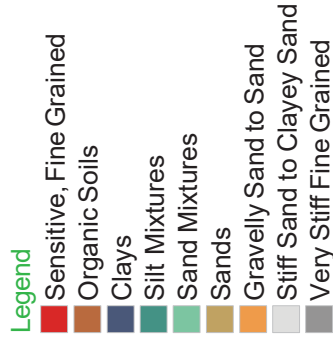
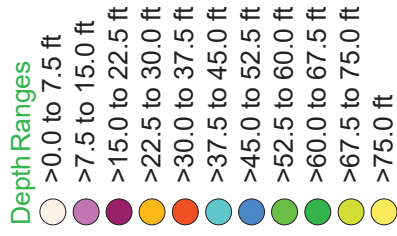
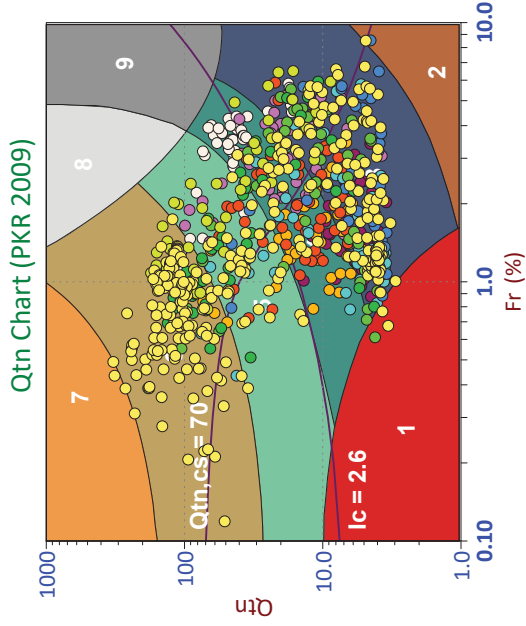


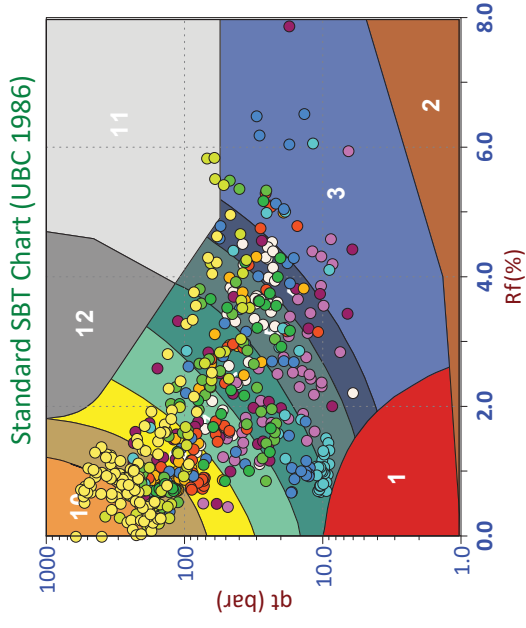
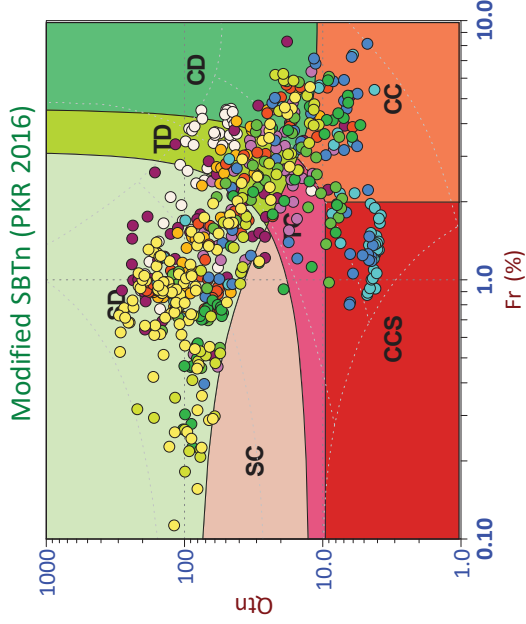
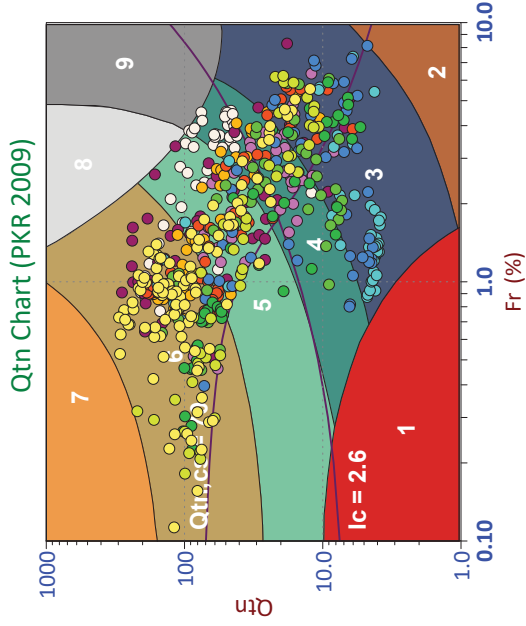


Stantec

Job No: 19-61032
Date: 2019-08-21 15:43
Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-10
Cone: 513:T1500F15U500





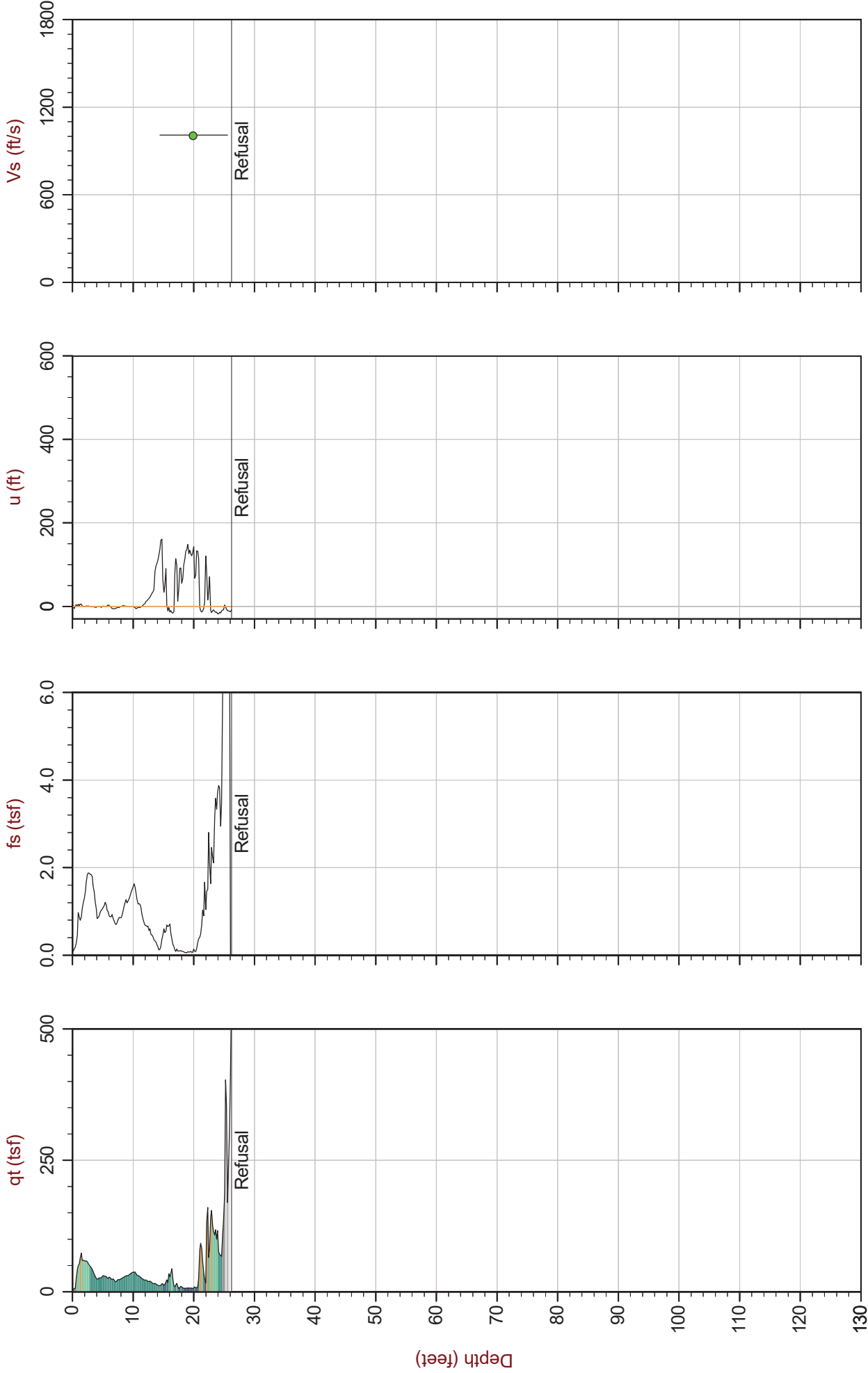
Seismic Cone Penetration Test Plots



Stantec

Job No: 19-61032
Date: 2019-08-23 08:28
Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-03
Cone: 513:T1500F15U500





Stantec

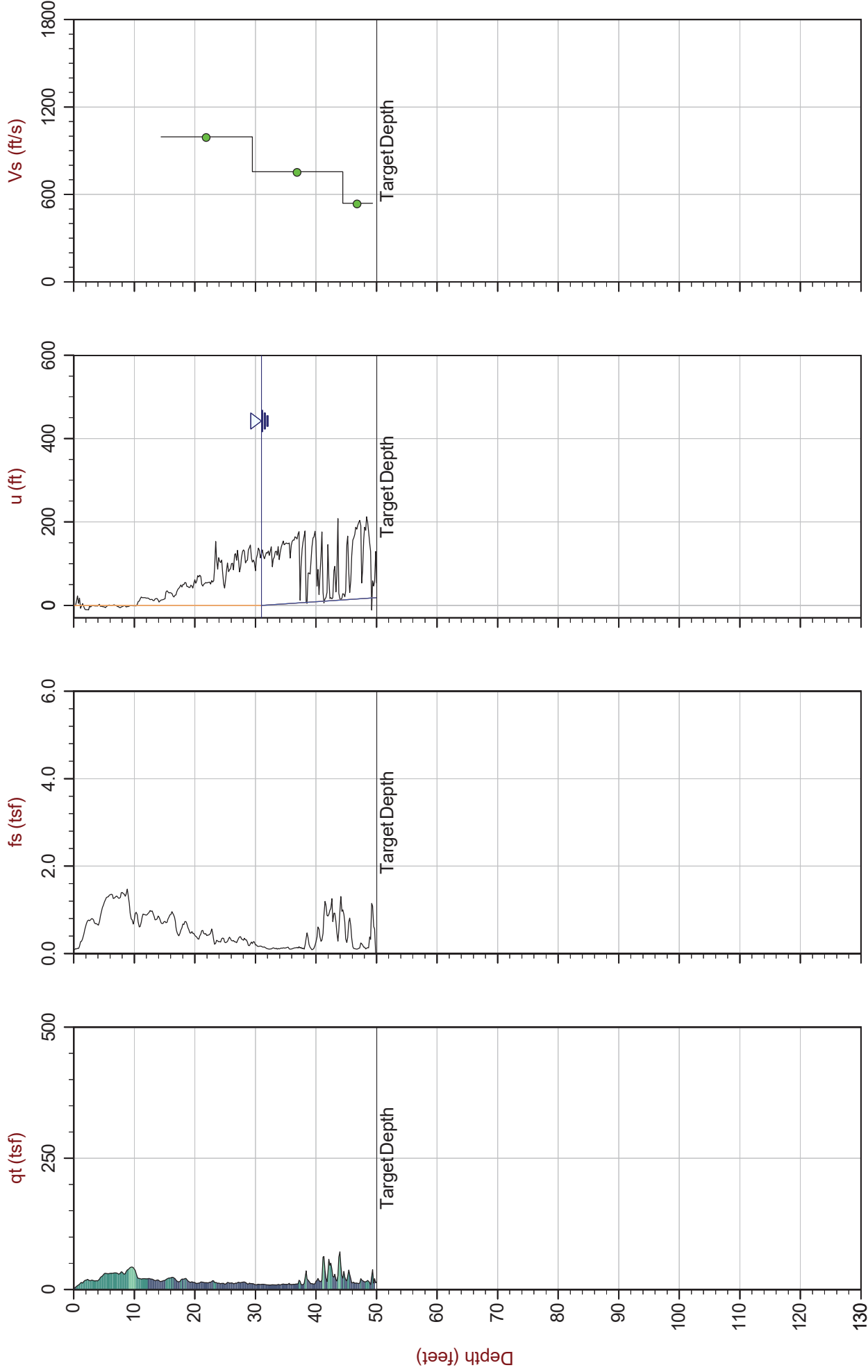
Job No: 19-61032

Date: 2019-08-23 09:16

Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-04

Cone: 513:T1500F15U500



Max Depth: 15.250 m / 50.03 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 19-61032_SP04.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112156 E: 375670

Hydrostatic Line — Ueq ● Assumed Ueq ▲ PPD, Ueq achieved ▼ PPD, Ueq not achieved

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Stantec

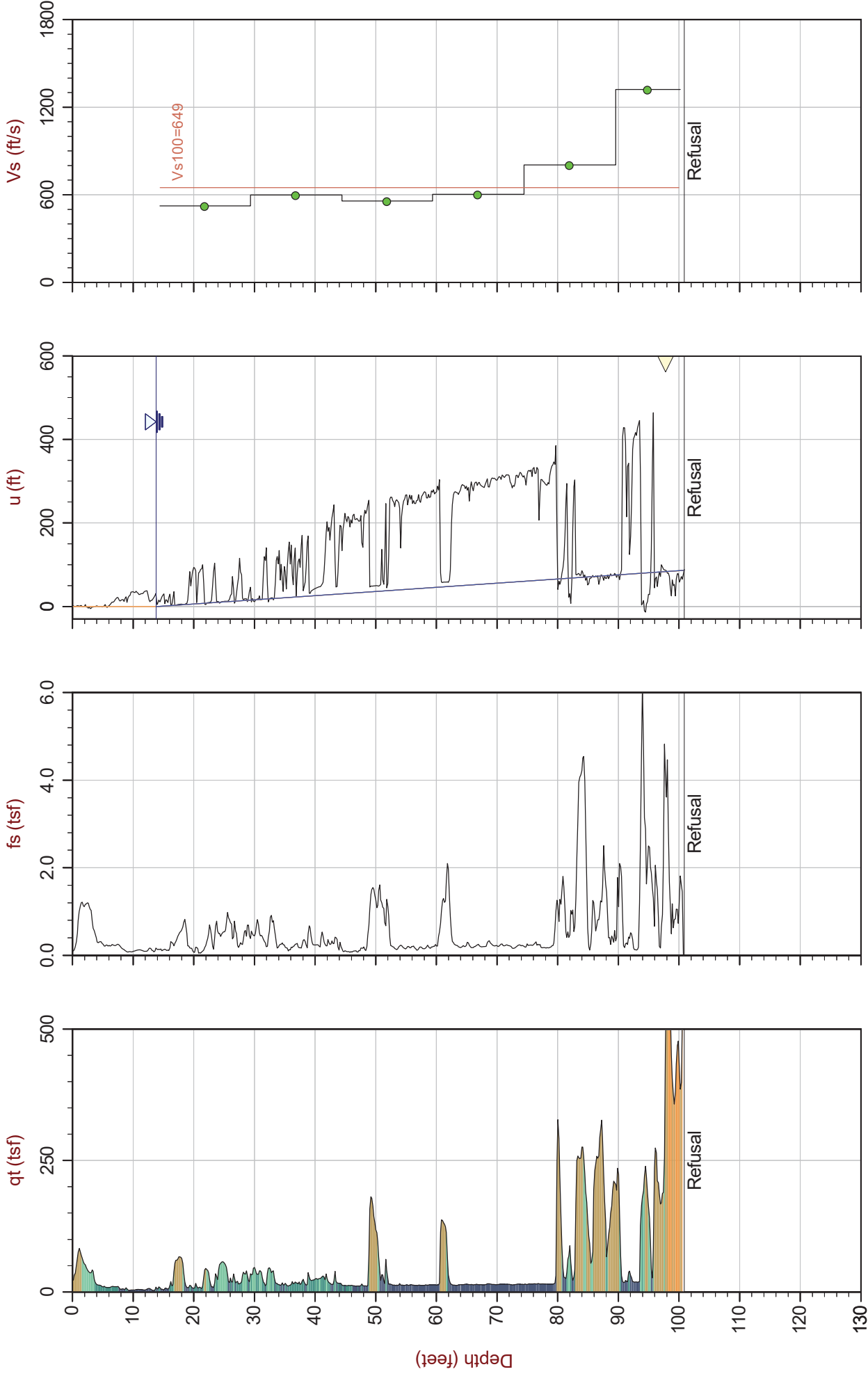
Job No: 19-61032

Date: 2019-08-20 09:56

Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-05

Cone: 513:T1500F15U500



Max Depth: 30.750 m / 100.88 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112378 E: 375709

Hydrostatic Line — Ueq — Assumed Ueq — PPD, Ueq achieved — PPD, Ueq not achieved

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Stantec

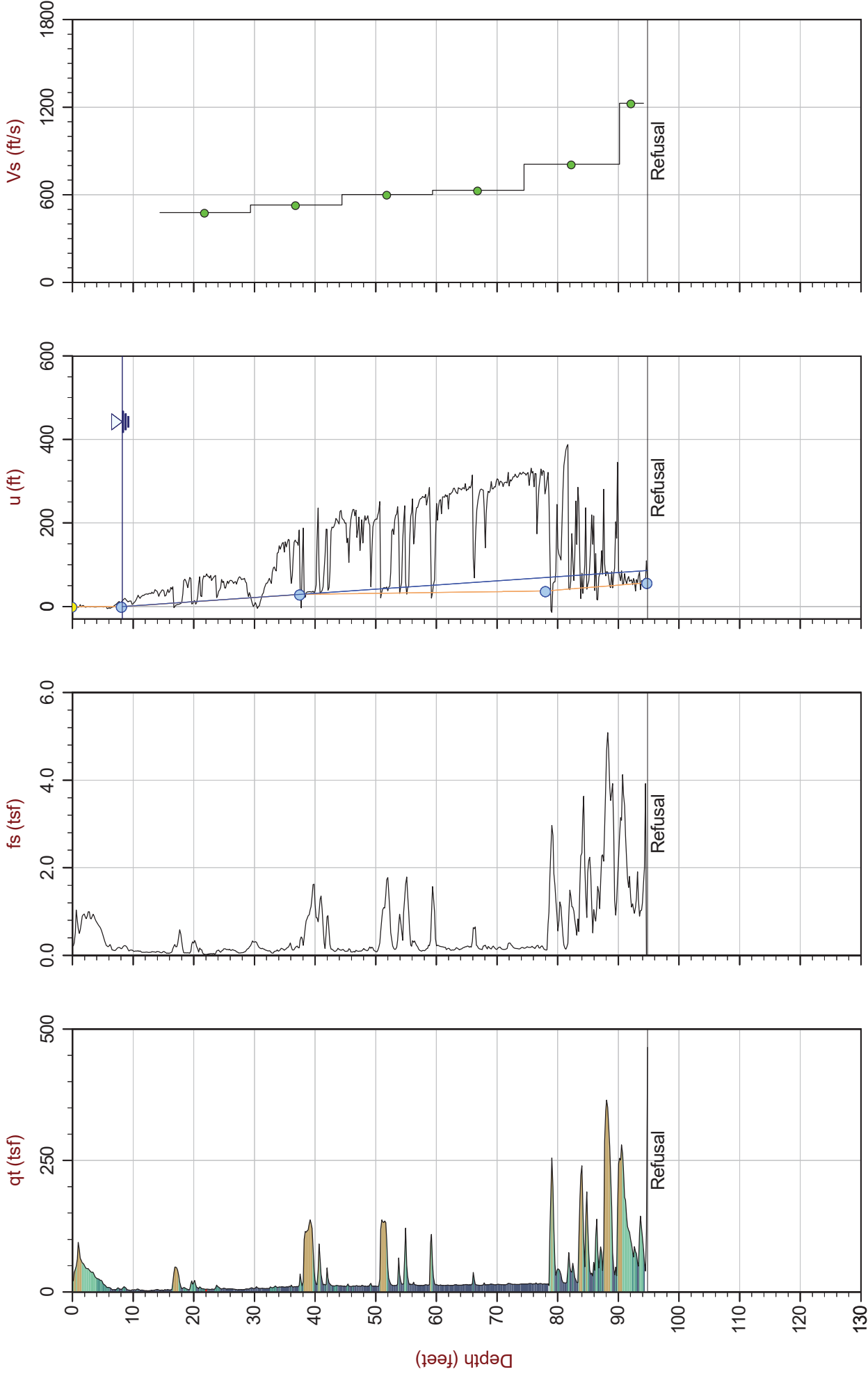
Job No: 19-61032

Date: 2019-08-20 14:15

Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-06

Cone: 513:T1500F15U500



Max Depth: 28.900 m / 94.82 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112426 E: 375716

Hydrostatic Line — Ueq ● Assumed Ueq ◀ PPD, Ueq achieved ◀ PPD, Ueq not achieved

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Stantec

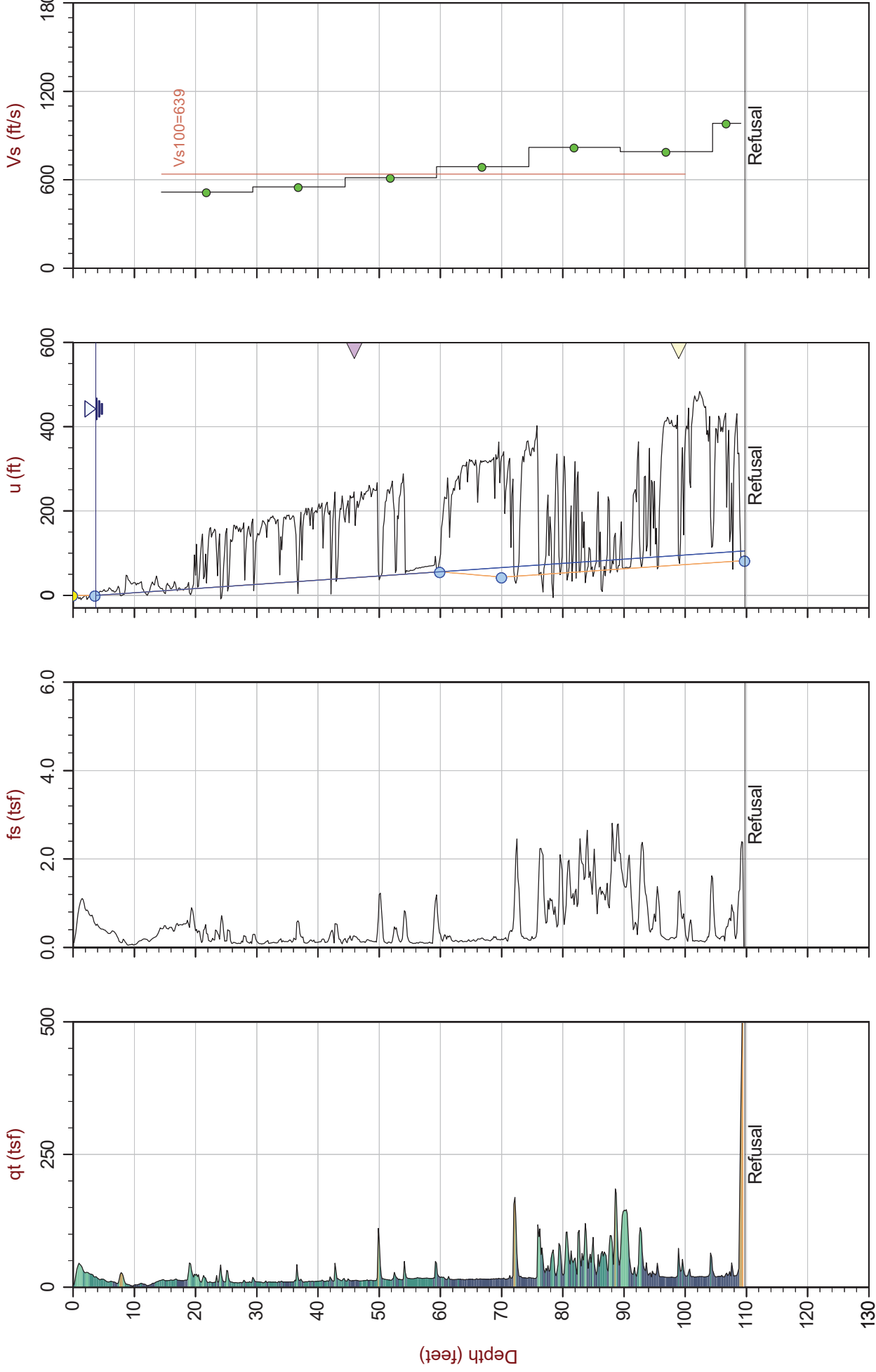
Job No: 19-61032

Date: 2019-08-21 08:35

Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-07

Cone: 513:T1500F15U500



Max Depth: 33.450 m / 109.74 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 19-61032_SP07.COR

Unit Wt: SBTQtn (PKR2009)

Hydrostatic Line — Ueq ● Assumed Ueq ▲ PPD, Ueq achieved ▼ PPD, Ueq not achieved

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112461 E: 375709

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Stantec

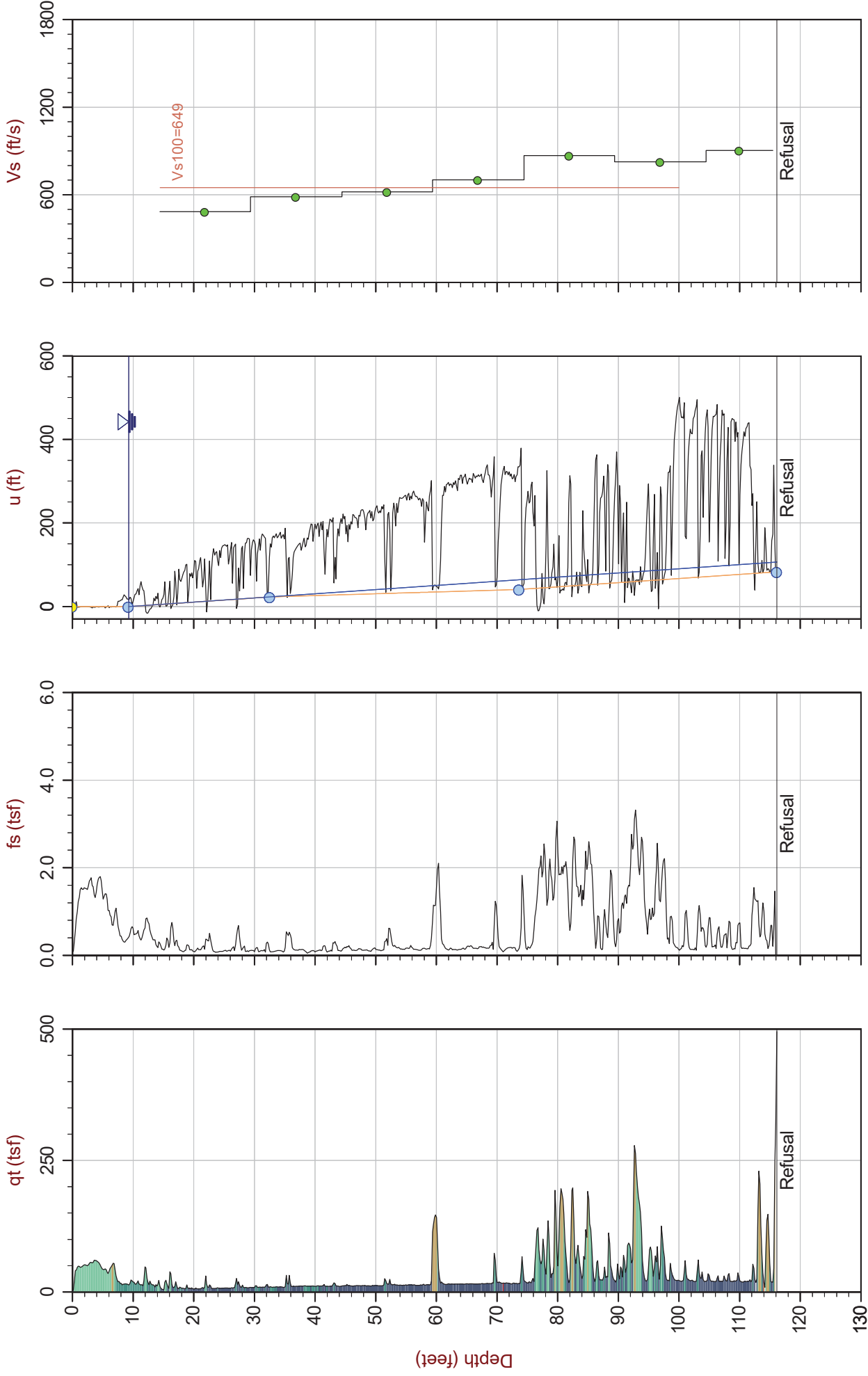
Job No: 19-61032

Sounding: SCPT19-08

Date: 2019-08-21 11:15

Cone: 513:T1500F15U500

Site: US60 Bridge, Livingston County, KY



Max Depth: 35.400 m / 116.14 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112444 E: 375723

Hydrostatic Line — Ueq ● Assumed Ueq ▲ PPD, Ueq not achieved
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Stantec

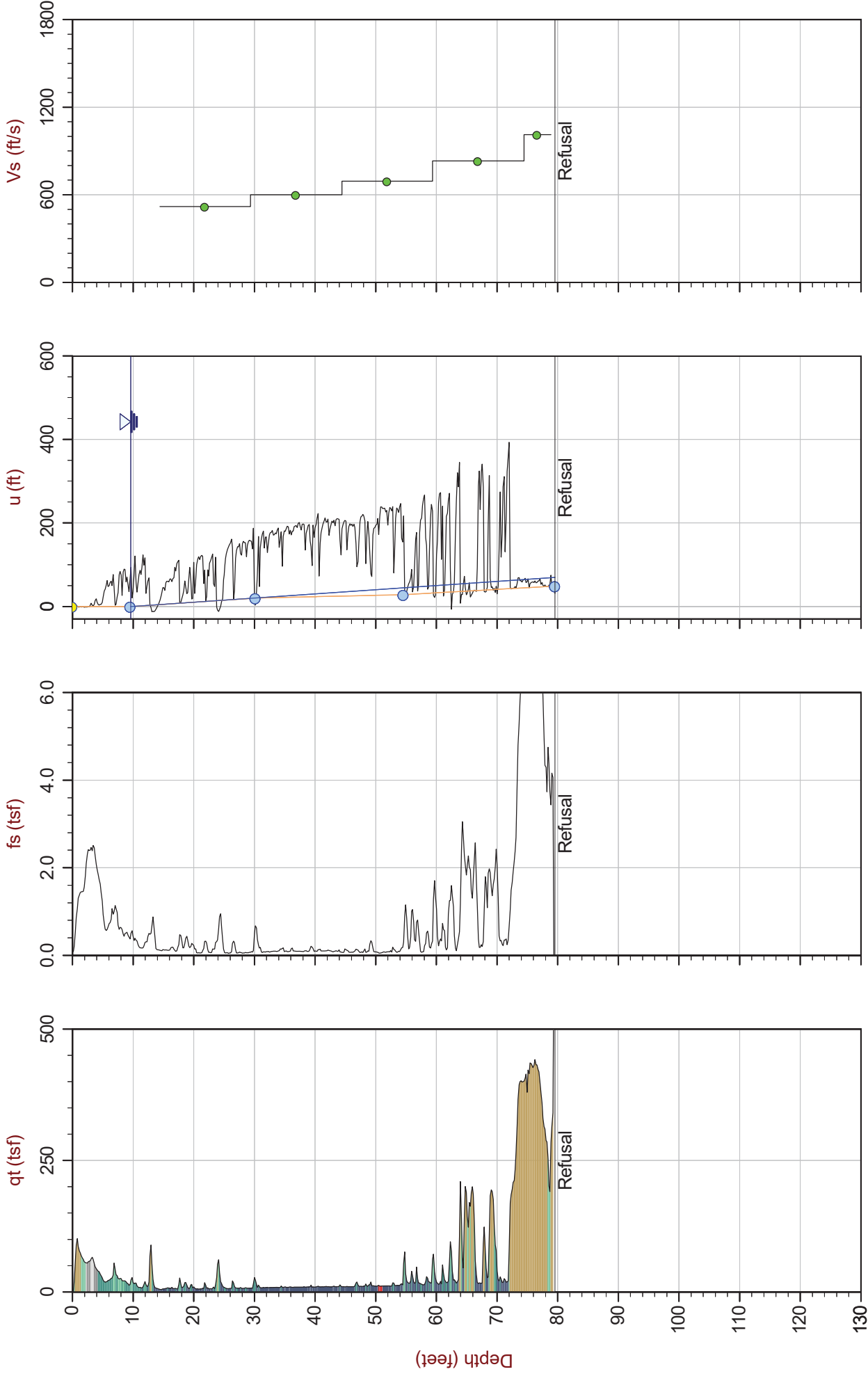
Job No: 19-61032

Sounding: SCPT19-09

Date: 2019-08-21 13:39

Cone: 513:T1500F15U500

Site: US60 Bridge, Livingston County, KY



Max Depth: 24.250 m / 79.56 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

File: 19-61032_SP09.COR
Unit Wt: SBTQtn (PKR2009)

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112545 E: 375744

Hydrostatic Line — Ueq ● Assumed Ueq ▲ PPD, Ueq achieved ▼ PPD, Ueq not achieved

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Stantec

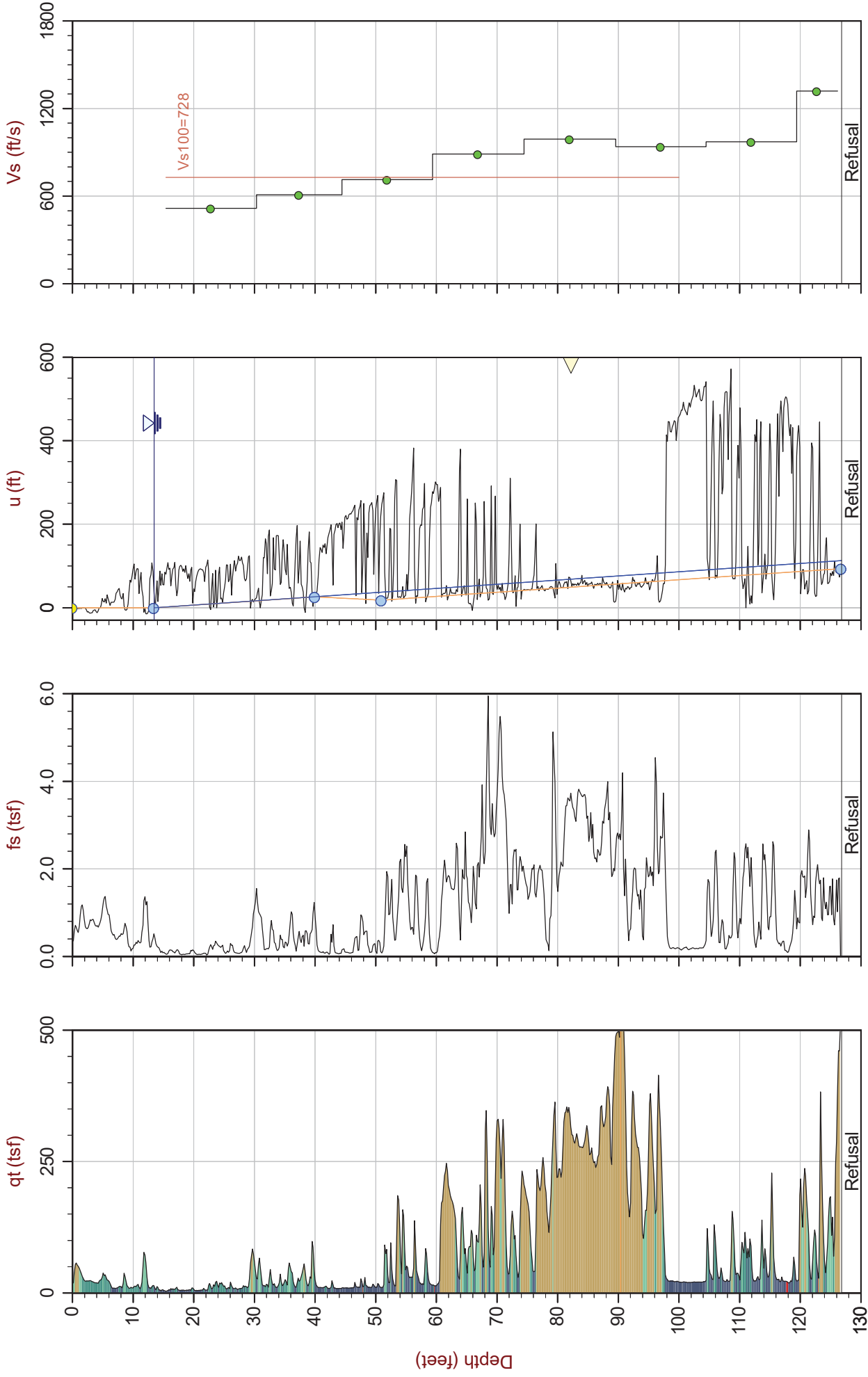
Job No: 19-61032

Date: 2019-08-21 15:43

Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-10

Cone: 513:T1500F15U500



Max Depth: 38.650 m / 126.80 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112576 E: 375747

Hydrostatic Line Ueq Assumed Ueq PPD, Ueq achieved PPD, Ueq not achieved

The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.



Stantec

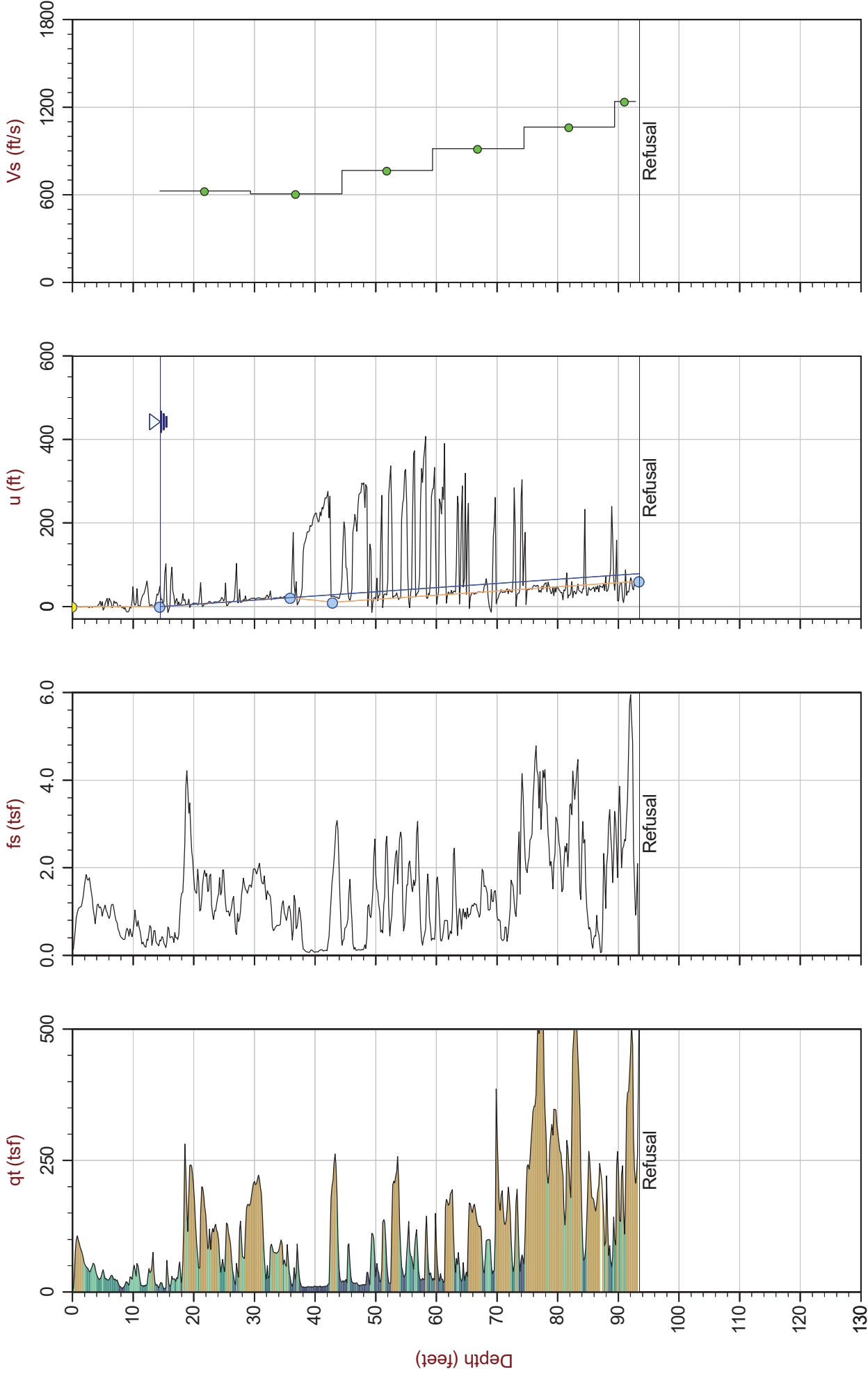
Job No: 19-61032

Date: 2019-08-22 10:33

Site: US60 Bridge, Livingston County, KY

Sounding: SCPT19-11

Cone: 513:T1500F15U500



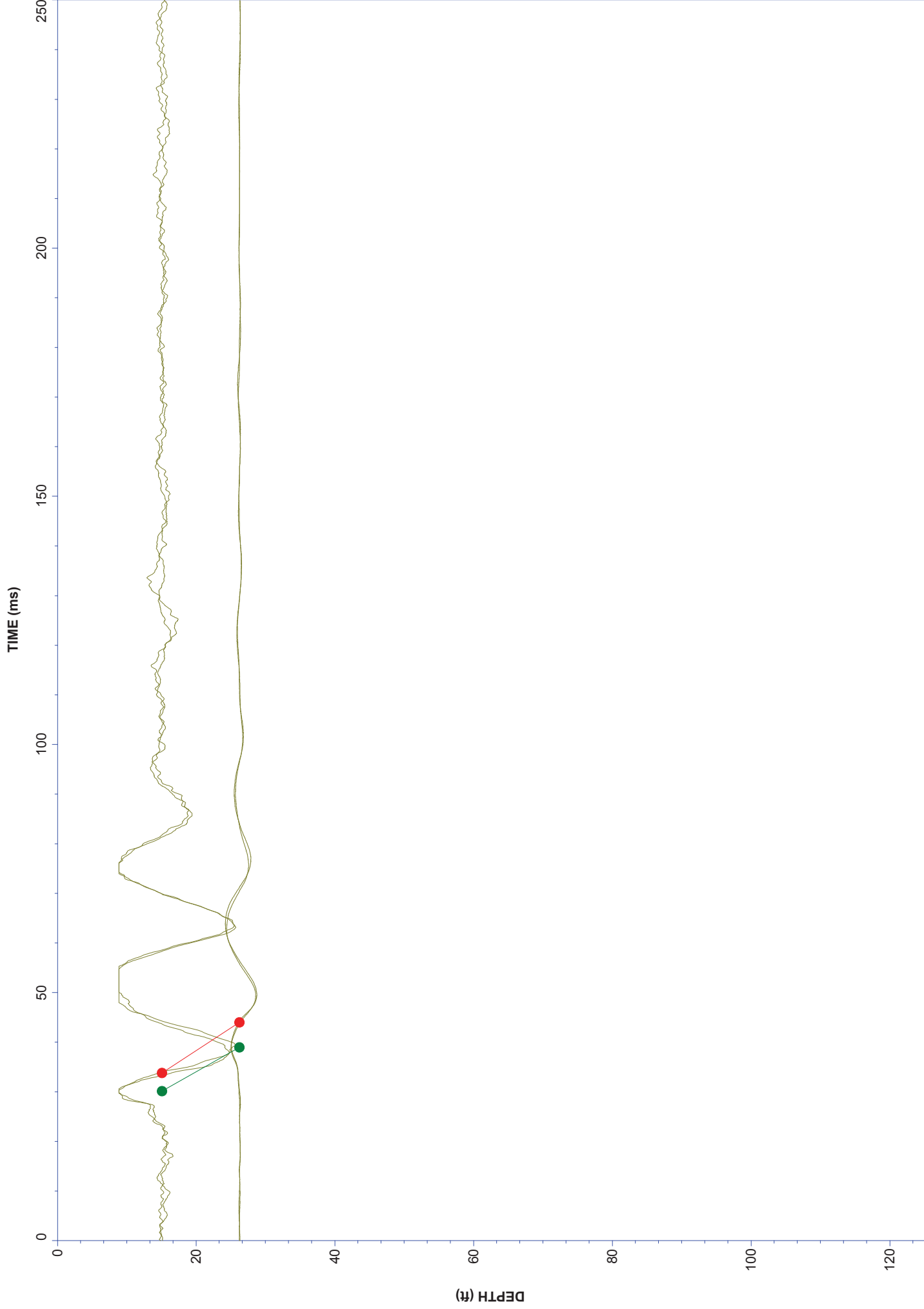
Max Depth: 28.500 m / 93.50 ft
Depth Inc: 0.050 m / 0.164 ft
Avg Int: Every Point

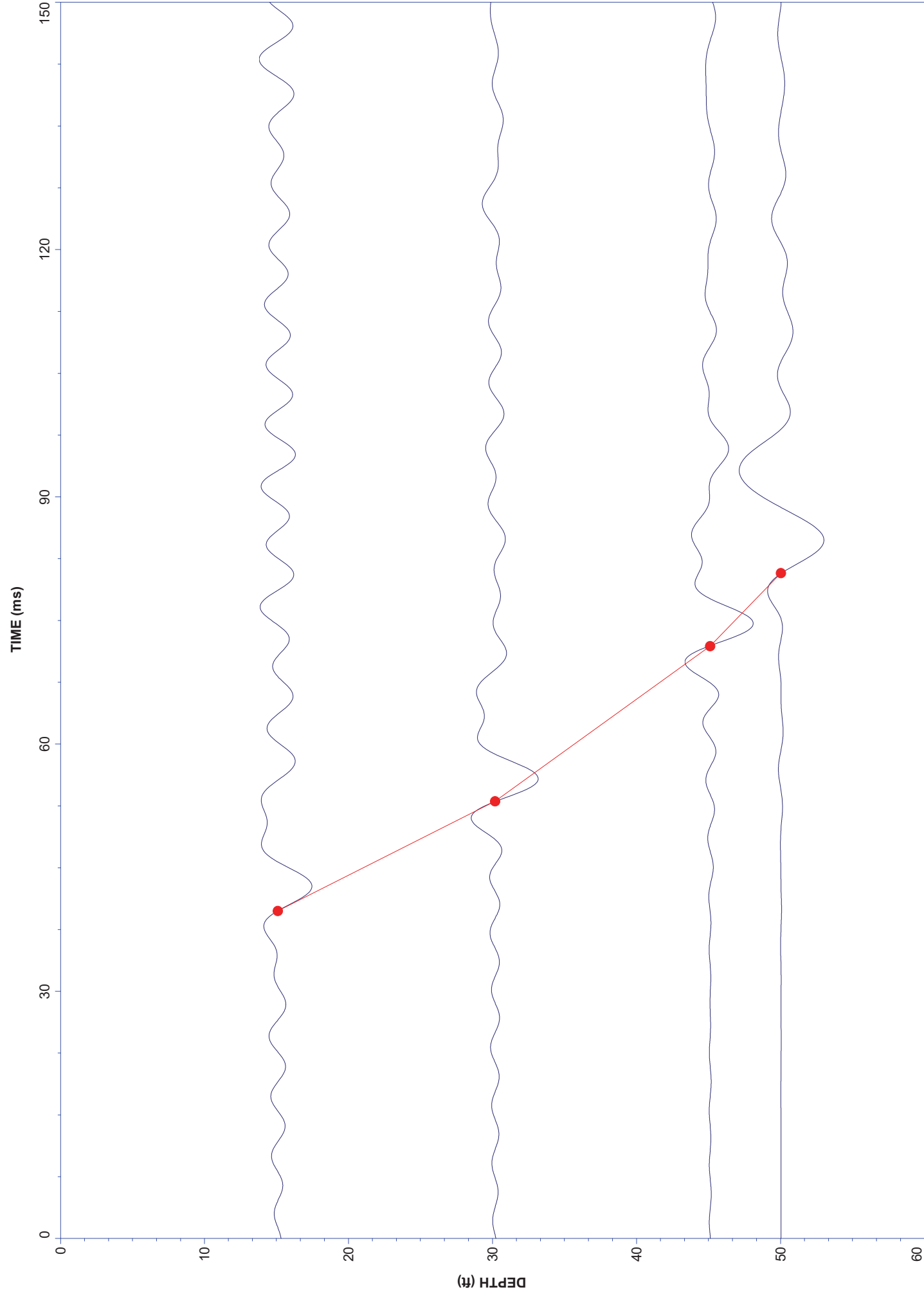
SBT: Robertson, 2009 and 2010
Coords: UTM Zone 16N N: 4112619 E: 375756

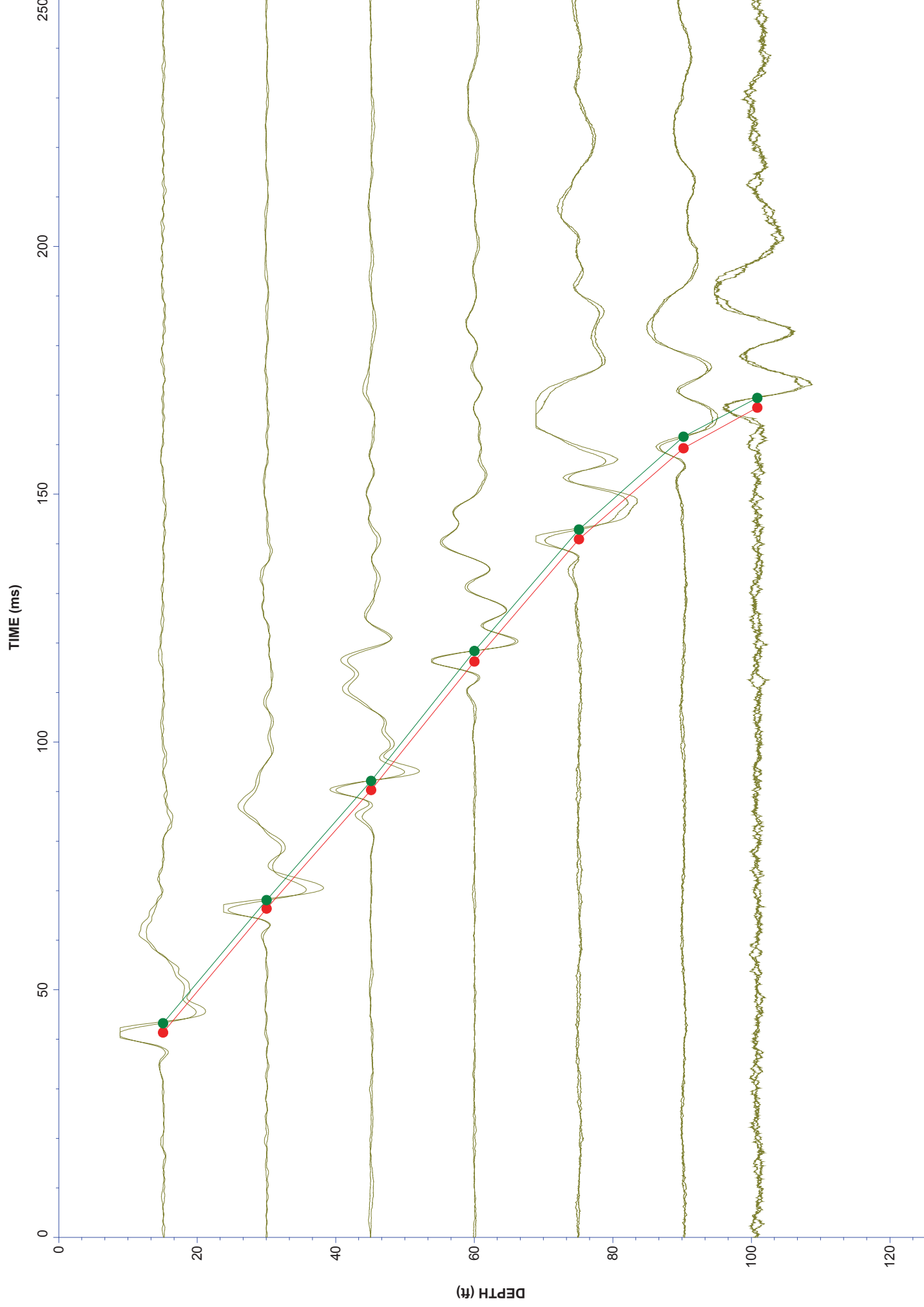
Hydrostatic Line — Ueq ● Assumed Ueq ▲ PPD, Ueq achieved ▼ PPD, Ueq not achieved

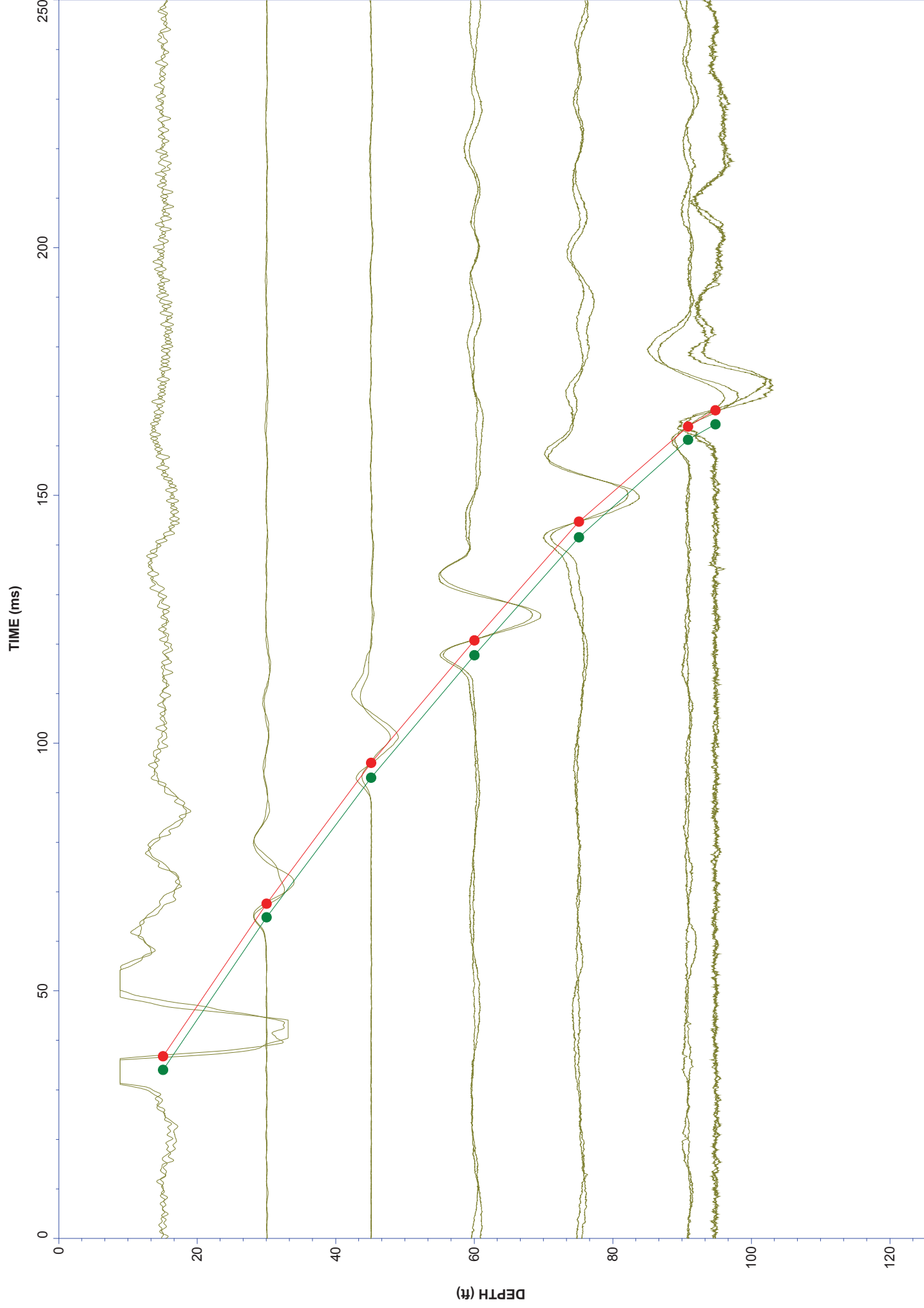
The reported coordinates were acquired from consumer-grade GPS equipment and are only approximate locations. The coordinates should not be used for design purposes.

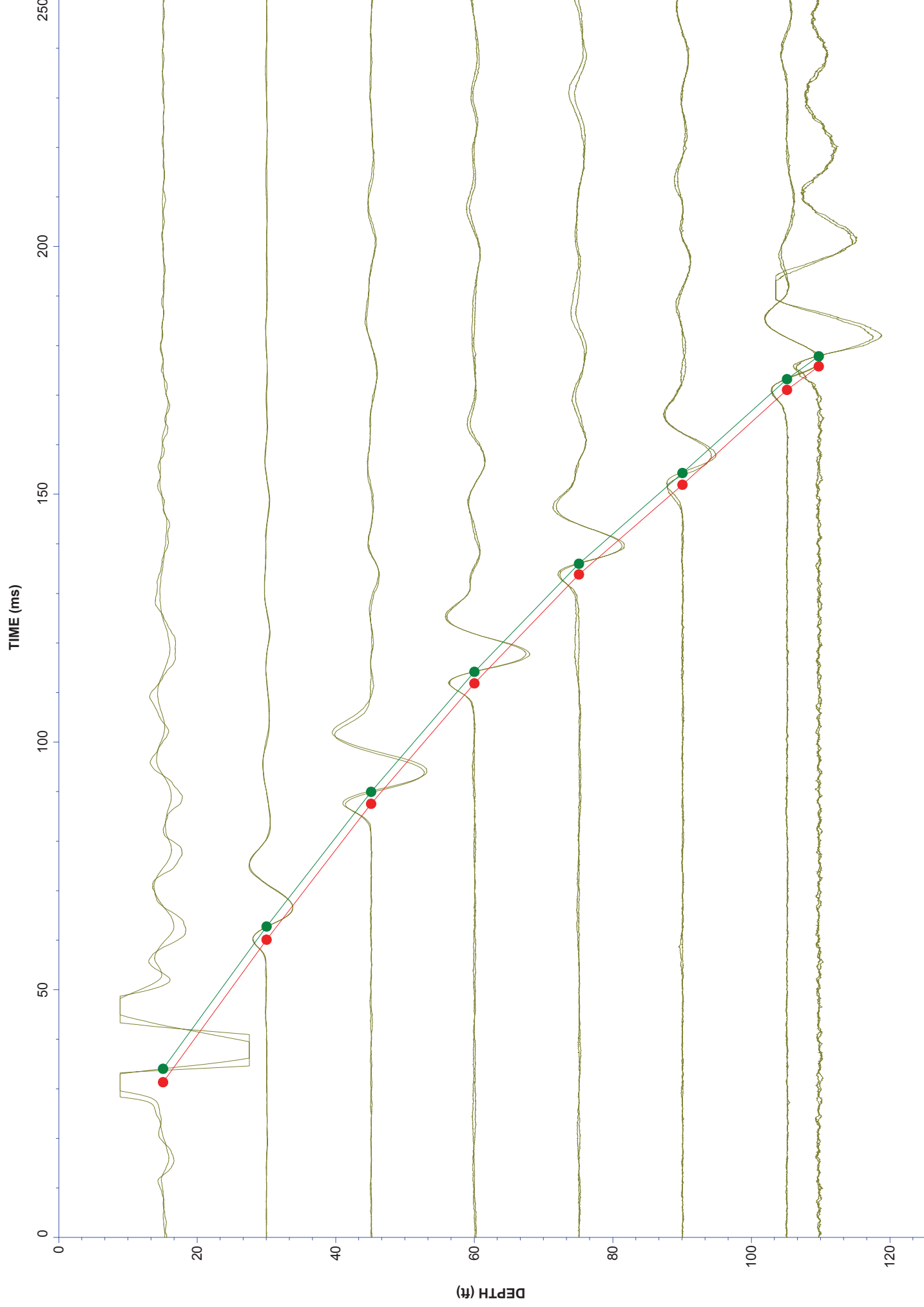
Seismic Cone Penetration Wave Traces

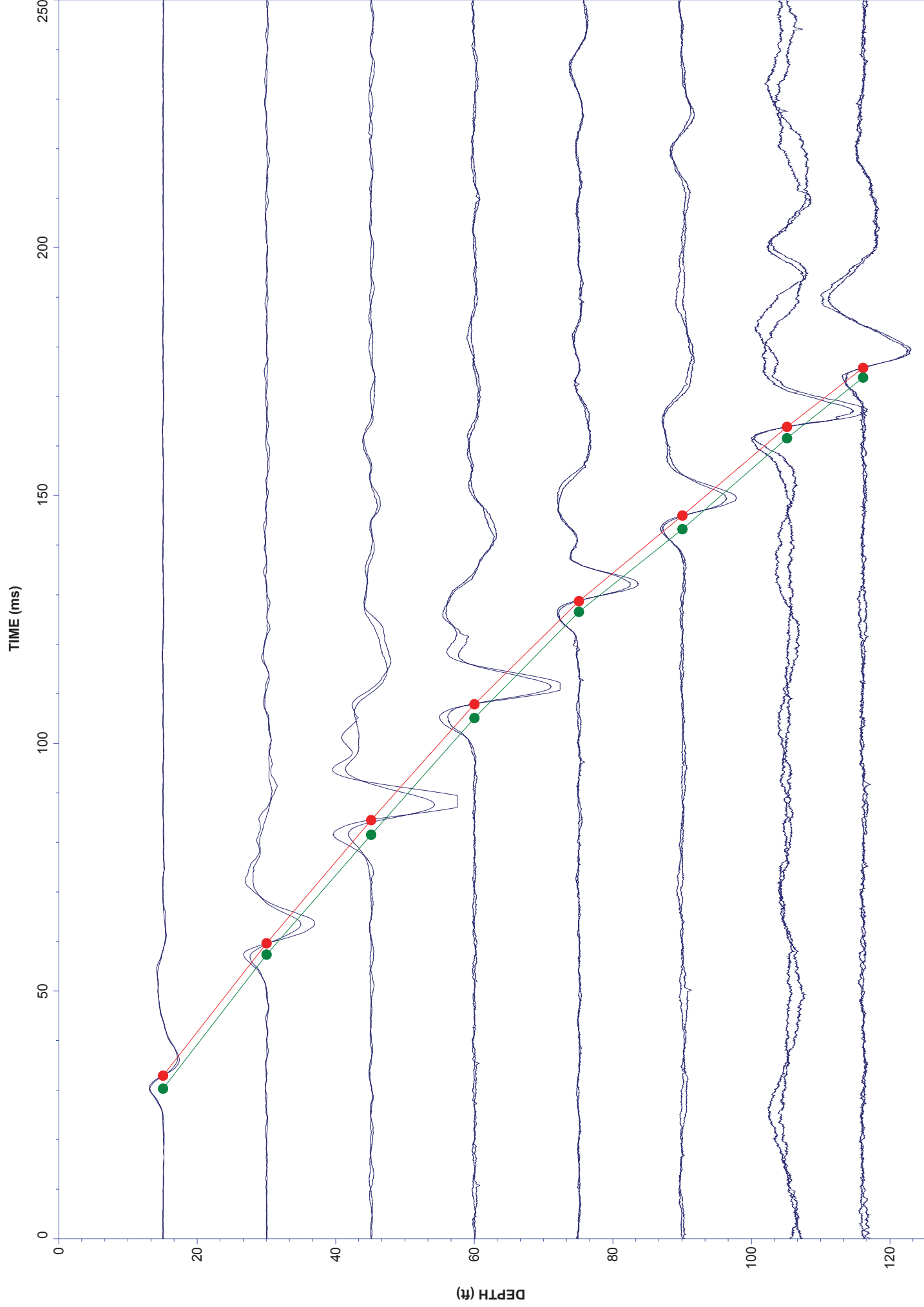


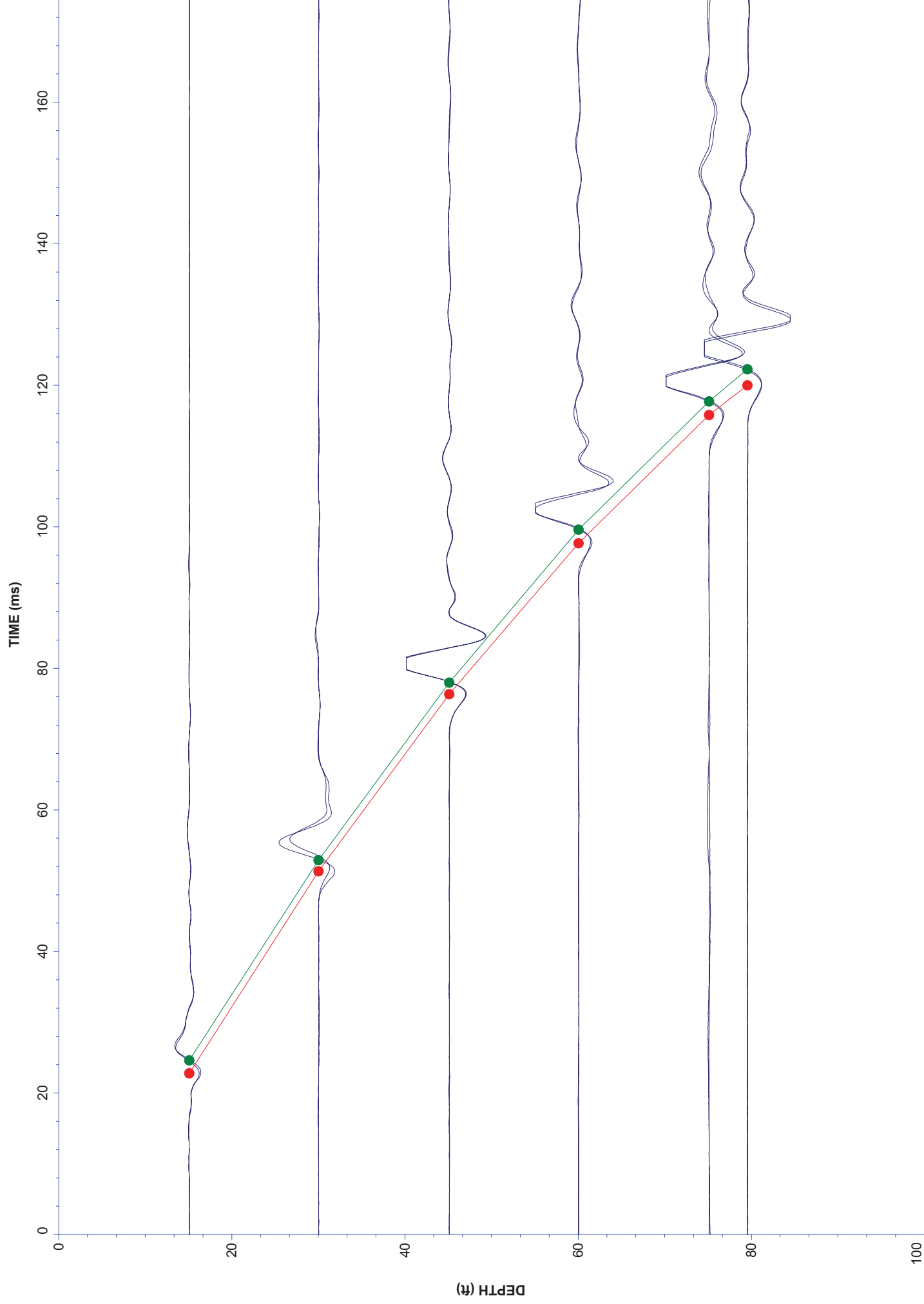


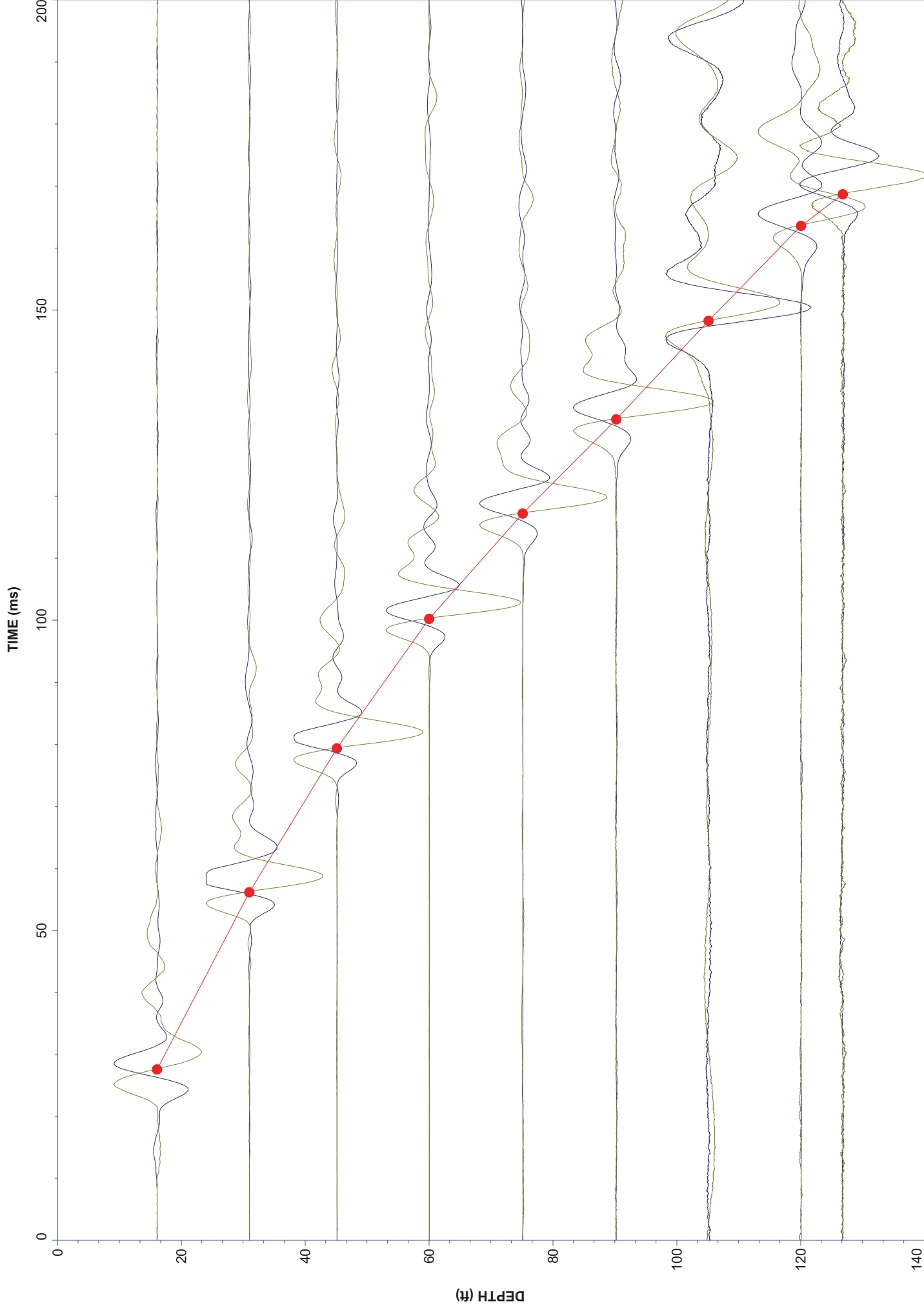


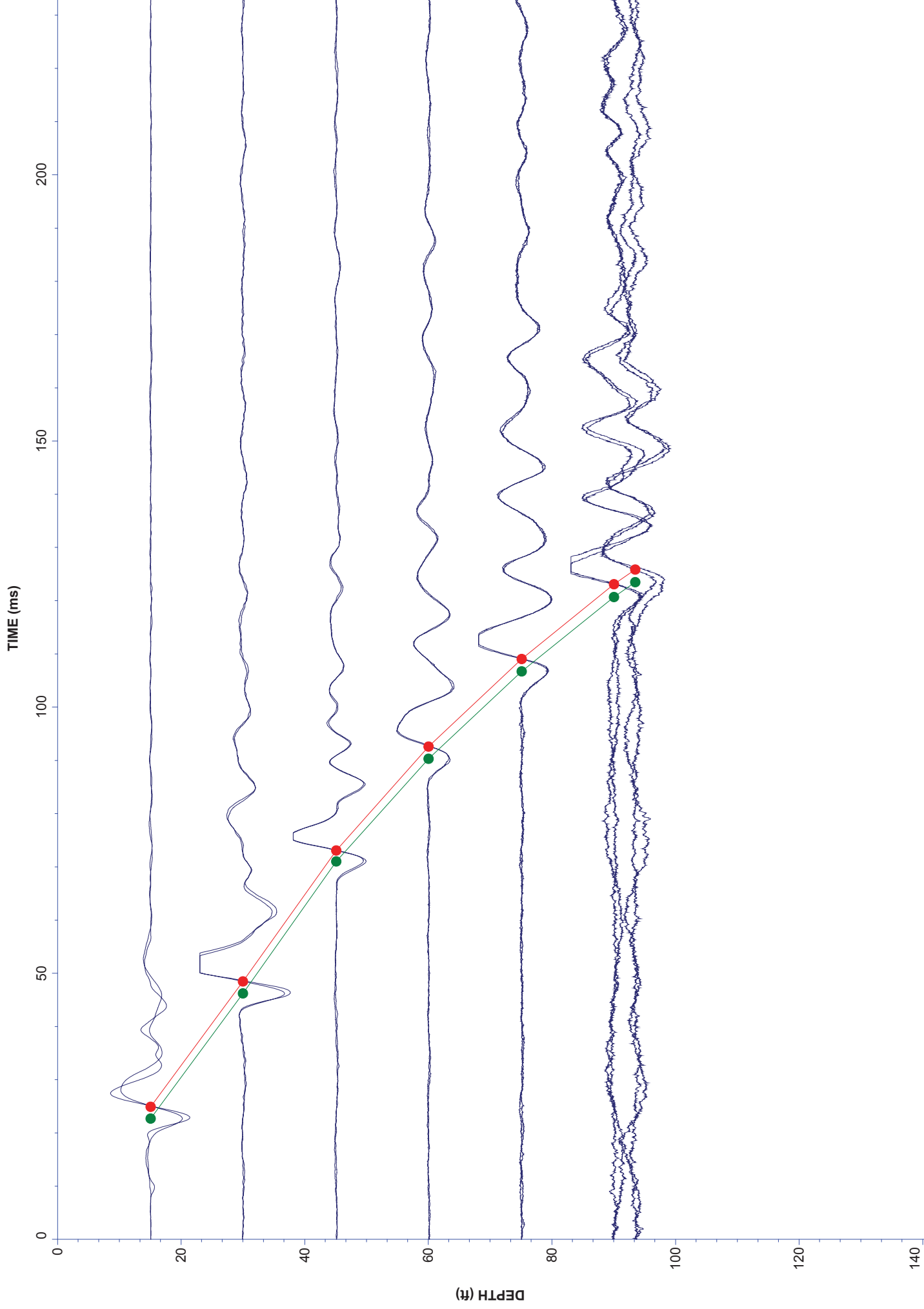












Seismic Cone Penetration Test Tabular Results (Vs)



Job No: 19-61032
Client: Stantec
Project: US60 Bridge, Livingston County, KY
Sounding ID: SCPT19-03
Date: 23-Aug-2019

Seismic Source: Beam
Source Offset (ft): 11.48
Source Depth (ft): 0.00
Geophone Offset (ft): 0.66

SCPT_u SHEAR WAVE VELOCITY TEST RESULTS - V_s

Tip Depth (ft)	Geophone Depth (ft)	Ray Path (ft)	Ray Path Difference (ft)	Travel Time Interval (ms)	Interval Velocity (ft/s)
15.09	14.44	18.45			
26.25	25.59	28.05	9.60	9.51	1010



Job No: 19-61032
Client: Stantec
Project: US60 Bridge, Livingston County, KY
Sounding ID: SCPT19-04
Date: 23-Aug-2019

Seismic Source: Beam
Source Offset (ft): 11.48
Source Depth (ft): 0.00
Geophone Offset (ft): 0.66

SCPT_u SHEAR WAVE VELOCITY TEST RESULTS - V_s

Tip Depth (ft)	Geophone Depth (ft)	Ray Path (ft)	Ray Path Difference (ft)	Travel Time Interval (ms)	Interval Velocity (ft/s)
15.09	14.44	18.44			
30.18	29.53	31.68	13.24	13.29	996
45.11	44.46	45.91	14.23	18.83	756
50.03	49.38	50.69	4.78	8.86	540



Job No: 19-61032
Client: Stantec
Project: US60 Bridge, Livingston County, KY
Sounding ID: SCPT19-05
Date: 20-Aug-2019

Seismic Source: Beam
Source Offset (ft): 11.48
Source Depth (ft): 0.00
Geophone Offset (ft): 0.66

SCPT_u SHEAR WAVE VELOCITY TEST RESULTS - V_s

Tip Depth (ft)	Geophone Depth (ft)	Ray Path (ft)	Ray Path Difference (ft)	Travel Time Interval (ms)	Interval Velocity (ft/s)
15.09	14.44	18.45			
30.02	29.36	31.53	13.08	24.92	525
45.11	44.46	45.91	14.39	23.99	600
60.04	59.38	60.48	14.57	26.09	558
75.13	74.47	75.35	14.87	24.58	605
90.22	89.57	90.30	14.95	18.55	806
100.89	100.23	100.89	10.59	8.01	1322



Job No: 19-61032
Client: Stantec
Project: US60 Bridge, Livingston County, KY
Sounding ID: SCPT19-06
Date: 20-Aug-2019

Seismic Source: Beam
Source Offset (ft): . 8
Source Depth (ft): 0.00
Geophone Offset (ft): 0.66

SCPT_u SHEAR WAVE VELOCITY TEST RESULTS - V_s

Tip Depth (ft)	Geophone Depth (ft)	Ray Path (ft)	Ray Path Difference (ft)	Travel Time Interval (ms)	Interval Velocity (ft/s)
15.09	14.44	14.80			
30.02	29.36	29.55	14.74	30.79	479
45.11	44.46	44.58	15.03	28.29	531
60.04	59.38	59.47	14.90	24.72	603
75.13	74.47	74.55	15.07	23.89	631
90.88	90.22	90.28	15.74	19.43	810
94.82	94.16	94.22	3.93	3.20	1228



Job No: 19-61032
Client: Stantec
Project: US60 Bridge, Livingston County, KY
Sounding ID: SCPT19-07
Date: 21-Aug-2019

Seismic Source: Beam
Source Offset (ft): 1. 4
Source Depth (ft): 0.00
Geophone Offset (ft): 0.66

SCPT_u SHEAR WAVE VELOCITY TEST RESULTS - V_s

Tip Depth (ft)	Geophone Depth (ft)	Ray Path (ft)	Ray Path Difference (ft)	Travel Time Interval (ms)	Interval Velocity (ft/s)
15.09	14.44	14.53			
30.02	29.36	29.41	14.88	28.75	518
45.11	44.46	44.49	15.08	27.28	553
60.04	59.38	59.41	14.92	24.27	615
75.13	74.47	74.49	15.09	21.90	689
90.06	89.40	89.42	14.93	18.20	820
105.15	104.49	104.51	15.09	19.05	792
109.74	109.09	109.10	4.59	4.67	984



Job No: 19-61032
Client: Stantec
Project: US60 Bridge, Livingston County, KY
Sounding ID: SCPT19-08
Date: 21-Aug-2019

Seismic Source: Beam
Source Offset (ft): 11.48
Source Depth (ft): 0.00
Geophone Offset (ft): 0.66

SCPT_u SHEAR WAVE VELOCITY TEST RESULTS - V_s

Tip Depth (ft)	Geophone Depth (ft)	Ray Path (ft)	Ray Path Difference (ft)	Travel Time Interval (ms)	Interval Velocity (ft/s)
15.09	14.44	18.45			
30.02	29.36	31.53	13.08	26.90	486
45.11	44.46	45.91	14.39	24.51	587
60.04	59.38	60.48	14.57	23.47	621
75.13	74.47	75.35	14.87	21.13	704
90.06	89.40	90.14	14.78	16.99	870
105.15	104.49	105.12	14.99	18.11	827
116.14	115.49	116.06	10.93	12.07	905



Job No: 19-61032
Client: Stantec
Project: US60 Bridge, Livingston County, KY
Sounding ID: SCPT19-09
Date: 21-Aug-2019

Seismic Source: Beam
Source Offset (ft): 2.46
Source Depth (ft): 0.00
Geophone Offset (ft): 0.66

SCPT_u SHEAR WAVE VELOCITY TEST RESULTS - V_s

Tip Depth (ft)	Geophone Depth (ft)	Ray Path (ft)	Ray Path Difference (ft)	Travel Time Interval (ms)	Interval Velocity (ft/s)
15.09	14.44	14.64			
30.02	29.36	29.47	14.82	28.42	521
45.11	44.46	44.52	15.06	25.05	601
60.04	59.38	59.43	14.91	21.47	694
75.13	74.47	74.52	15.08	18.11	833
79.56	78.90	78.94	4.43	4.37	1013



Job No: 19-61032
Client: Stantec
Project: US60 Bridge, Livingston County, KY
Sounding ID: SCPT19-10
Date: 21-Aug-2019

Seismic Source: Beam
Source Offset (ft): 2.46
Source Depth (ft): 0.00
Geophone Offset (ft): 0.66

SCPT_u SHEAR WAVE VELOCITY TEST RESULTS - V_s

Tip Depth (ft)	Geophone Depth (ft)	Ray Path (ft)	Ray Path Difference (ft)	Travel Time Interval (ms)	Interval Velocity (ft/s)
16.08	15.42	15.61			
31.00	30.35	30.45	14.83	28.64	518
45.11	44.46	44.52	14.08	23.06	611
60.04	59.38	59.43	14.91	20.89	714
75.13	74.47	74.52	15.08	16.96	889
90.22	89.57	89.60	15.09	15.22	991
105.15	104.49	104.52	14.92	15.88	940
120.08	119.42	119.45	14.92	15.34	973
126.80	126.15	126.17	6.72	5.09	1321



Job No: 19-61032
Client: Stantec
Project: US60 Bridge, Livingston County, KY
Sounding ID: SCPT19-11
Date: 22-Aug-2019

Seismic Source: Beam
Source Offset (ft): 3.28
Source Depth (ft): 0.00
Geophone Offset (ft): 0.66

SCPT_u SHEAR WAVE VELOCITY TEST RESULTS - V_s

Tip Depth (ft)	Geophone Depth (ft)	Ray Path (ft)	Ray Path Difference (ft)	Travel Time Interval (ms)	Interval Velocity (ft/s)
15.09	14.44	14.80			
30.02	29.36	29.55	14.74	23.52	627
45.11	44.46	44.58	15.03	24.70	608
60.04	59.38	59.47	14.90	19.41	768
75.13	74.47	74.55	15.07	16.43	917
90.06	89.40	89.46	14.92	14.00	1065
93.50	92.85	92.91	3.44	2.78	1240

Pore Pressure Dissipation Summary and
Pore Pressure Dissipation Plots



Job No: 19-61032
Client: Stantec
Project: US60 Bridge, Livingston County, KY
Start Date: 20-Aug-2019
End Date: 23-Aug-2019

CPTu PORE PRESSURE DISSIPATION SUMMARY

Sounding ID	File Name	Cone Area (cm ²)	Duration (s)	Test Depth (ft)	Estimated Equilibrium Pore Pressure U _{eq} (ft)	Calculated Phreatic Surface (ft)	Estimated Phreatic Surface (ft)	t ₅₀ ^a (s)	Assumed Rigidity Index (I _r)	c _n ^b (cm ² /min)
SCPT19-05	19-61032_SP05.PPD	15	160	97.77	83.9	13.8				
SCPT19-07	19-61032_SP07.PPD	15	1515	45.93	42.3		3.6	904	100	0.8
SCPT19-07	19-61032_SP07.PPD	15	180	98.92	75.4	23.5				
SCPT19-10	19-61032_SP10.PPD	15	300	82.18	49.7	32.5				
Total Duration			35,9 min							

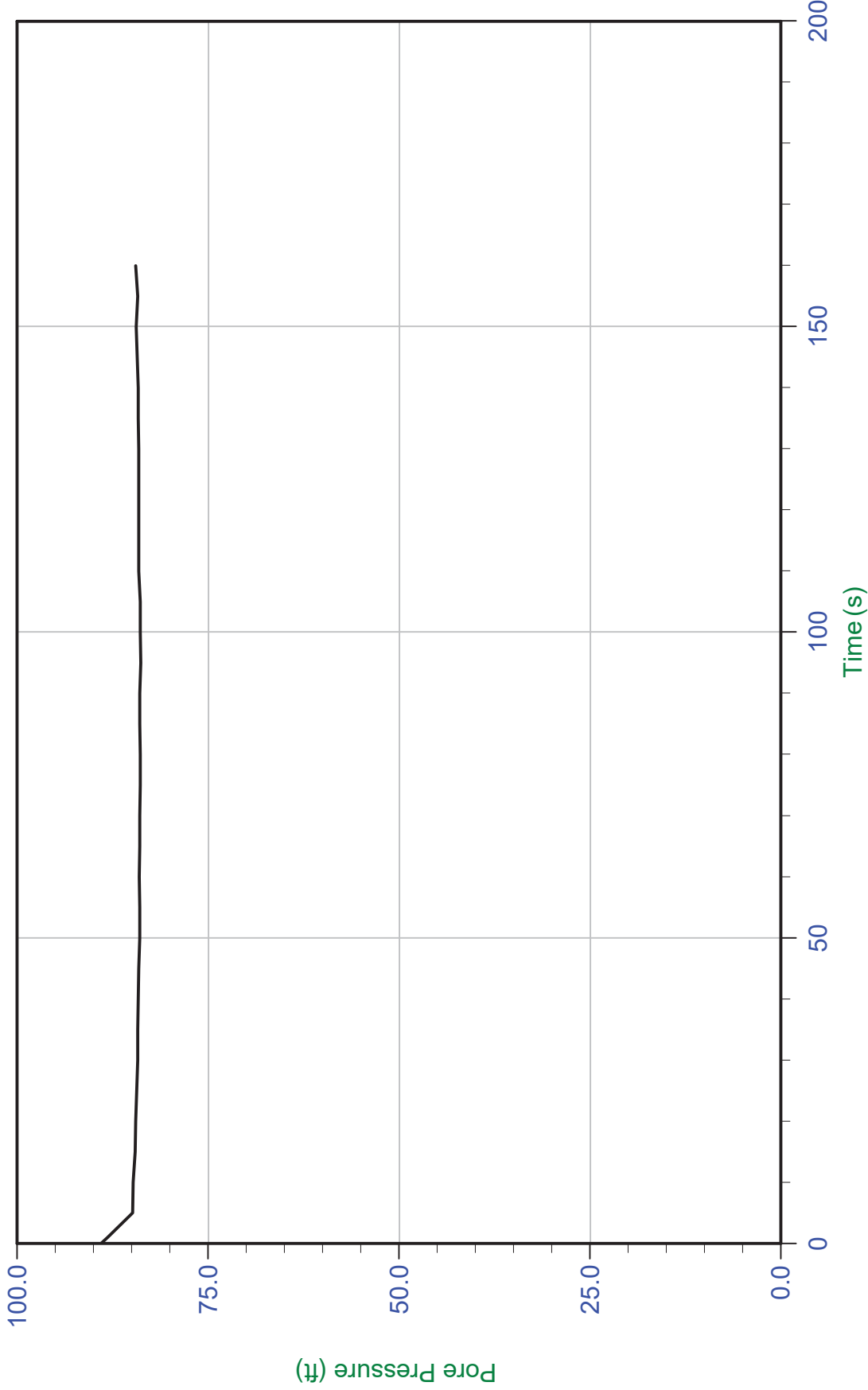
a. Time is relative to where umax occurred.

b. Houslsby and Teh, 1991.



Stantec

Job No: 19-61032
Date: 20-Aug-2019 09:56:23
Site: US60 Bridge, Livingston County, KY
Sounding: SCPT19-05
Cone: AD513 Area=15 cm²

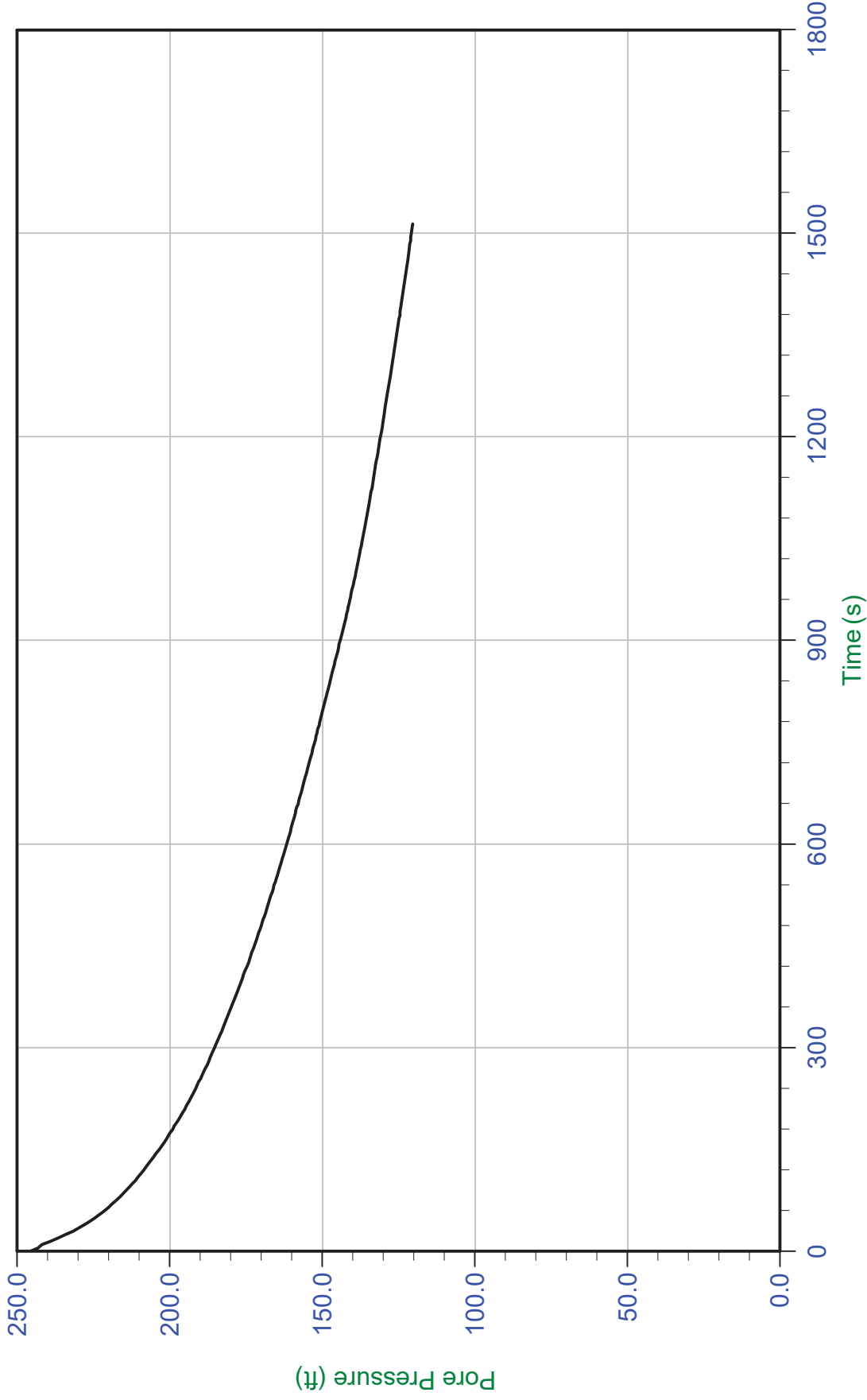


Trace Summary: Filename: 19-61032_SP05.PPD
Depth: 29.800 m / 97.768 ft
Duration: 160.0 s
U Min: 83.9 ft
U Max: 89.0 ft
WT: 4.219 m / 13.842 ft
Ueq: 83.9 ft



Stantec

Job No: 19-61032
Date: 21-Aug-2019 08:35:20
Site: US60 Bridge, Livingston County, KY
Sounding: SCPT19-07
Cone: AD513 Area=15 cm²

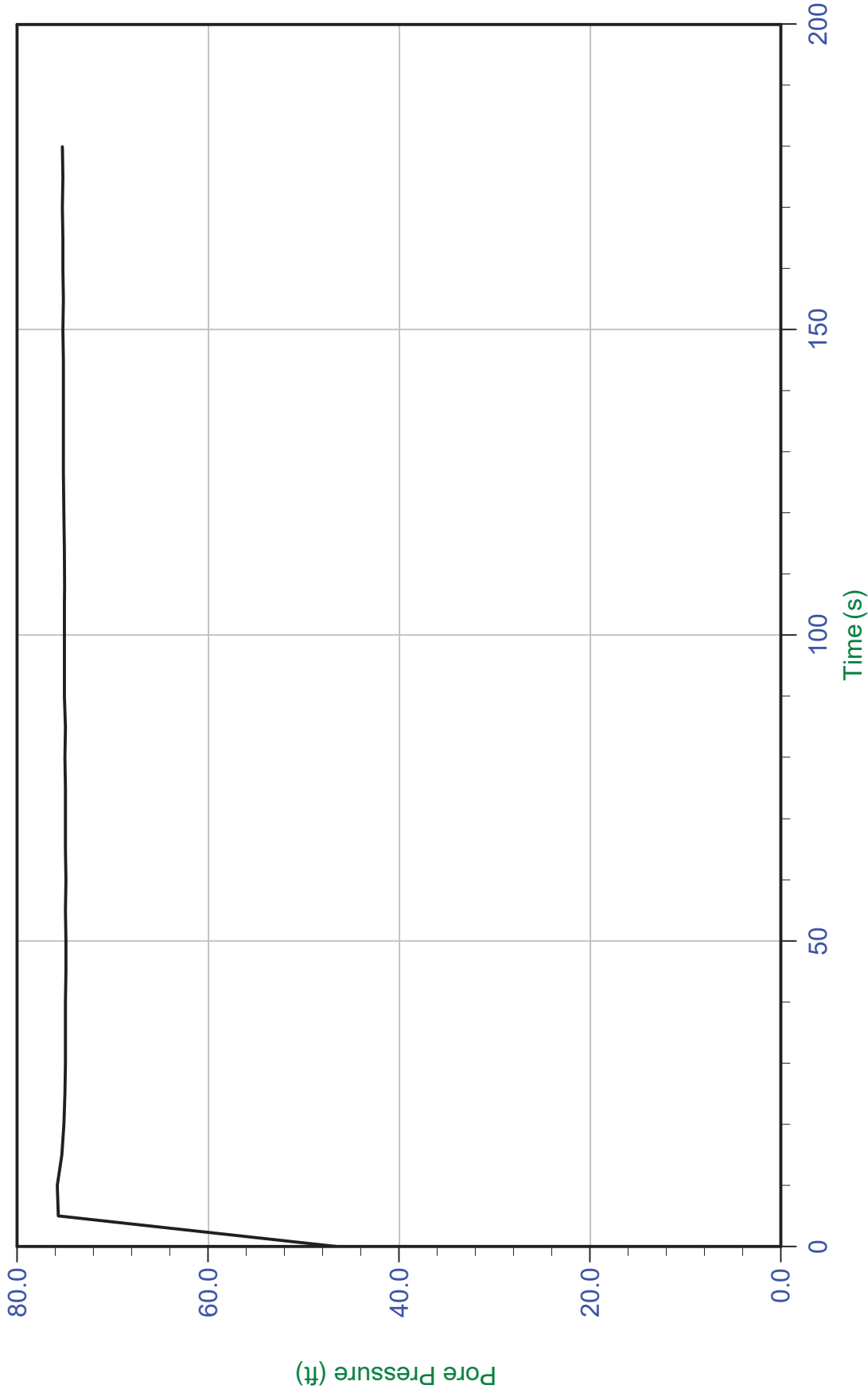


Trace Summary: Filename: 19-61032_SP07.PPD
Depth: 14.000 m / 45.931 ft
Duration: 1515.0 s
WT: 1.097 m / 3.599 ft
Ueq: 42.3 ft
U(50): 144.00 ft
T(50): 903.6 s
Ir: 100
Ch: 0.8 cm²/min



Stantec

Job No: 19-61032
Date: 21-Aug-2019 08:35:20
Site: US60 Bridge, Livingston County, KY
Sounding: SCPT19-07
Cone: AD513 Area=15 cm²

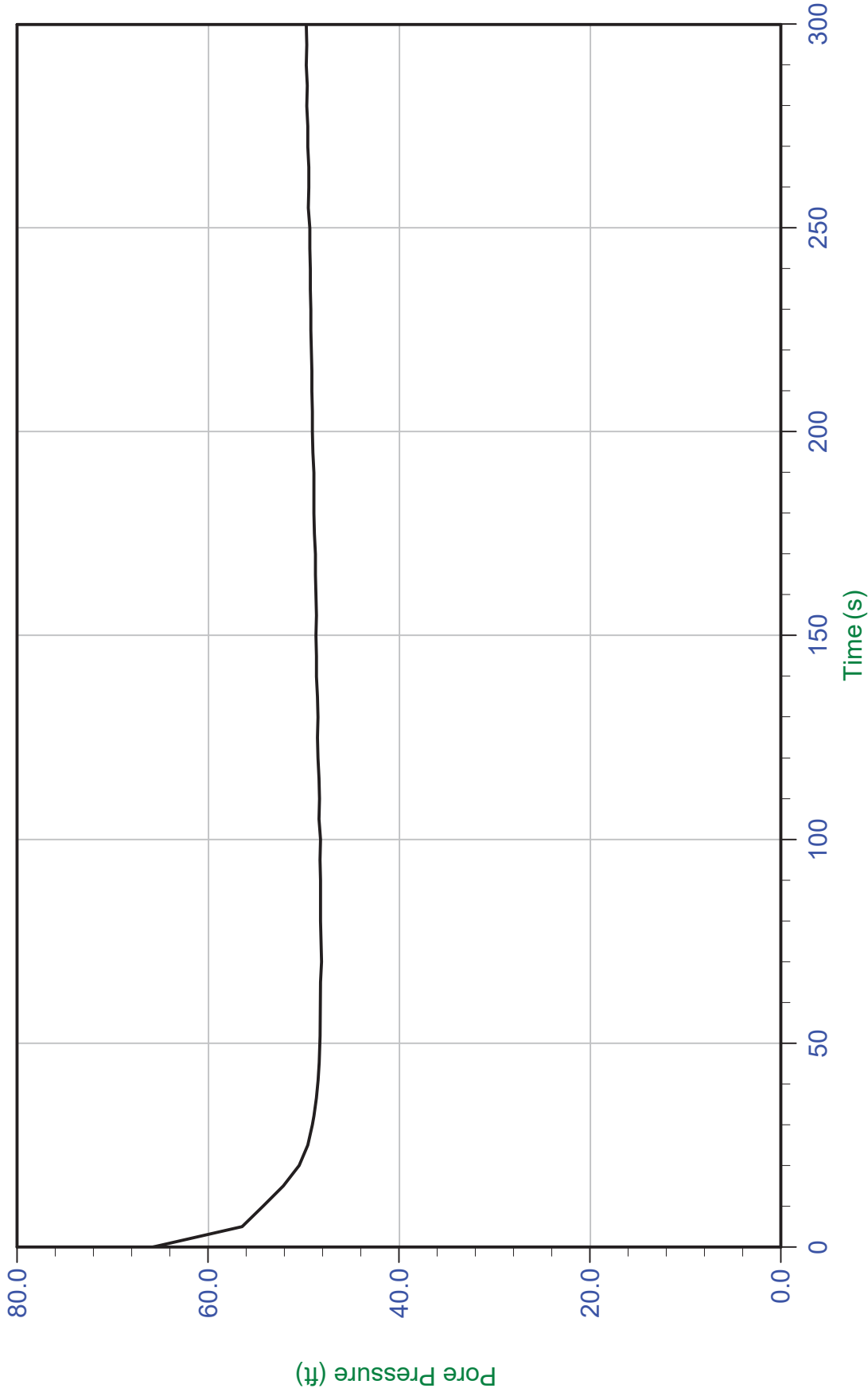


Trace Summary: Filename: 19-61032_SP07.PPD
Depth: 30.150 m / 98.916 ft
Duration: 180.0 s
U Min: 46.6 ft
U Max: 75.8 ft
WT: 7.159 m / 23.487 ft
Ueq: 75.4 ft



Stantec

Job No: 19-61032
Date: 21-Aug-2019 15:43:06
Site: US60 Bridge, Livingston County, KY
Sounding: SCPT19-10
Cone: AD513 Area=15 cm²



Trace Summary: Filename: 19-61032_SP10.PPD
Depth: 25.050 m / 82.184 ft
Duration: 300.0 s
U Min: 48.1 ft
U Max: 65.8 ft
WT: 9.897 m / 32.470 ft
Ueq: 49.7 ft

APPENDIX E

Generalized Subsurface Profile

GENERAL SOIL AND BEDROCK PROFILE LEGEND SHEET

US60 Bridge over the Cumberland River

SUMMARY OF PARAMETERS DEVELOPED FOR SOIL PROFILES

Parameter	Units	Description
γ_t	lb/ft ³	Total Unit Weight
γ_e	lb/ft ³	Effective Unit Weight
q_u	lbs/ft ²	Uniaxial Compressive Strength (soil)
c_u	lbs/ft ²	Cohesion - undrained (soil)
ϕ	(°)	Angle of Internal Friction
K_s	lb/in ³	Soil Secant Modulus - Static (LPILE ^{PLUS} 4.0) ¹
K_c	lb/in ³	Soil Secant Modulus - Cyclic (LPILE ^{PLUS} 4.0)
q_u	ton/ft ²	Uniaxial Compressive Strength (rock)
SDI	%	Slake Durability Index

¹ Where strata was split by the groundwater table, values are given for above and below the ground water table

GENERAL SOIL AND BEDROCK PROFILE

US60 Bridge over the Cumberland River Abutment 1 - STA 114+90, CL Borings 1001, 1002, 1003

Approximate		Description STRATA	
Elevation (ft)	Depth (ft)	Description (USCS Classification)	Parameters
400.7	0.0	Lean Clay (CL)	$\gamma_t (\text{lb/ft}^3) = 115.0$ $\gamma_e (\text{lb/ft}^3) = 52.6$ $q_u (\text{lbs/ft}^2) = 1000$ $c_u (\text{lbs/ft}^2) = 500$
395.1	5.6	Top of Rock Sandstone with clay lenses, brownish gray to light gray, medium to fine grained, thinly bedded.	$\gamma_t (\text{lb/ft}^3) = 149.9$ $q_u (\text{ton/ft}^2) = 800$
390.9	9.8	Shale (with interbedded siltstone) gray to dark gray, clayey, fine to coarsely laminated.	$\gamma_t (\text{lb/ft}^3) = 139.8$ SDI (%) = 10.9 $q_u (\text{ton/ft}^2) = 11.0$
383.8	16.9	Sandstone (90%) with clayey shale lenses (10%), brownish gray to gray, fine to medium grained, thin to very thinly bedded, moderately to highly	$\gamma_t (\text{lb/ft}^3) = 145.9$ $q_u (\text{ton/ft}^2) = 709$
373.2	27.5	Bottom of Boring	

GENERAL SOIL AND BEDROCK PROFILE

US60 Bridge over the Cumberland River Pier 1 - STA 116+13, CL Borings 1004, 1005

Approximate		Description STRATA	
Elevation (ft)	Depth (ft)	Description (USCS Description)	Parameters
340.0	0.0	Clayey Sand with Gravel (SC)	$\gamma_t (\text{lb/ft}^3) = 115.0$ $\gamma_e (\text{lb/ft}^3) = 52.6$ $\phi' (^{\circ}) = 34.0$ $K_s (\text{lb/in}^3) = 225.0$
337.0	3.0	Begin Core	
		Talus Boulders - Sandstone. Encountered in Boring 1004. Shallow refusal also encountered in CPT probes SCPT-02, and SCPT-02A. Boring 1005 encountered (SC) to top of rock.	
327.7	12.3	Top of Rock*	
		Shale, dark brownish gray to orange brown, silty, coarsely laminated	
		$\gamma_t (\text{lb/ft}^3) = 144.8$ $q_u (\text{ton/ft}^2) = 13.0$	
320.6	19.4		
		Shale, dark gray, silty with sandy lenses, clayey zones, coarsely laminated	
		$\gamma_t (\text{lb/ft}^3) = 148.6$ SDI (%) = 16% $q_u (\text{ton/ft}^2) = 29.0$	
300.9	39.1	Bottom of Boring	

*Top of rock at location of Pier 1 is sloping due to location at the base of a steep slope.

GENERAL SOIL AND BEDROCK PROFILE

US60 Bridge over the Cumberland River Pier 2 - STA 117+37, CL Borings 1006, 1007

Approximate		Description STRATA	
Elevation (ft)	Depth (ft)	Description (USCS Description)	Parameters
334.6	0.0	Lean Clay with Sand (CL)	γ_t (lb/ft ³) = 125.5 γ_e (lb/ft ³) = 63.1 q_u (lbs/ft ²) = 6000.0 c_u (lbs/ft ²) = 3000
324.6	10.0	Lean Clay with Sand (CL)	γ_t (lb/ft ³) = 125.5 γ_e (lb/ft ³) = 63.1 q_u (lbs/ft ²) = 2000.0 c_u (lbs/ft ²) = 1000
305.6	29.0	<u>∇</u>	
299.4	35.2	Top of Rock	
		Shale, dark gray to blackish gray, with sandy laminations, locally pyritic,	γ_t (lb/ft ³) = 154.0 SDI (%) = 24.8% q_u (ton/ft ²) = 61.0
277.3	57.3	Bottom of Boring	

GENERAL SOIL AND BEDROCK PROFILE

US60 Bridge over the Cumberland River

Pier 3 - STA 118+60, CL

Borings 1008, 1009, 1010, 1011, 1012

Approximate		Description STRATA	
Elevation (ft)	Depth (ft)	Description (USCS Description)	Parameters
334.4	0.0		
		Lean Clay (CL)	$\gamma_t (\text{lb/ft}^3) = 128.5$ $\gamma_e (\text{lb/ft}^3) = 66.1$ $K_s (\text{lb/in}^3) = 100$
307.4	27.0	$\frac{\nabla}{=}$	$q_u (\text{lbs/ft}^2) = 2000$ $c_u (\text{lbs/ft}^2) = 1000$
272.3	62.1	Top of Rock Shale, dark gray to blackish gray, with sandy laminations	
			$\gamma_t (\text{lb/ft}^3) = 154.1$ $\text{SDI (\%)} = 39\%$ $q_u (\text{ton/ft}^2) = 68.0$
231.3	103.1	Bottom of Boring	

GENERAL SOIL AND BEDROCK PROFILE

US60 Bridge over the Cumberland River Pier 4 - STA 125+60, CL Borings 1013, 1014, 1015, 1016, 1017

Approximate Elevation (ft)	Depth (ft)	Description STRATA	
		Description (USCS Description)	Parameters
309.9	0.0		
		Lean Clay (CL)	γ_t (lb/ft ³) = 110.0 γ_e (lb/ft ³) = 47.6 q_u (lbs/ft ²) = 1200.0 c_u (lbs/ft ²) = 600.0 K_s (lb/in ³) = 100
299.9	10.0		
		Silty Clayey Sand	γ_t (lb/ft ³) = 118.0 K_s (lb/in ³) = 25
296.9	13.0	$\frac{V}{L}$ (SC-SM)*	γ_e (lb/ft ³) = 55.6 ϕ' (°) = 27.0 K_s (lb/in ³) = 20
279.9	30.0		
		Lean Clay (CL)	γ_t (lb/ft ³) = 110.0 γ_e (lb/ft ³) = 47.6 q_u (lbs/ft ²) = 2000.0 c_u (lbs/ft ²) = 1000.0 K_s (lb/in ³) = 500 K_c (lb/in ³) = 200
249.9	60.0		
		Lean Clay (CL)	γ_t (lb/ft ³) = 115.0 γ_e (lb/ft ³) = 52.6 q_u (lbs/ft ²) = 2160.0 c_u (lbs/ft ²) = 1080.0 K_s (lb/in ³) = 500 K_c (lb/in ³) = 200
229.9	80.0		
		Gravel (GW)	γ_t (lb/ft ³) = 150.0 γ_e (lb/ft ³) = 87.6 ϕ' (°) = 36.0 K_s (lb/in ³) = 125
212.6	97.3	Top of Rock	
		Sandstone, light gray with local shale stringers and partings, very fine to fine grained, thin to medium bedded	γ_t (lb/ft ³) = 156 q_u (ton/ft ²) = 1283
170.3	139.6	Bottom of Boring	

* (SC-SM) encountered in Boring 1013. Strata was not encountered in Boring 1017, which showed (CL) continuous to the top of the gravel layer.

GENERAL SOIL AND BEDROCK PROFILE

US60 Bridge over the Cumberland River Pier 5 - STA 127+00, CL Borings 1018, 1019

Approximate		Description STRATA		
Elevation (ft)	Depth (ft)	Description (USCS Description)	Parameters	
324.9	0.0			
		Lean Clay	γ_t (lb/ft ³) = 114.7	K_s (lb/in ³) = 30
308.9	16.0	$\frac{\nabla}{=}$ (CL)	γ_e (lb/ft ³) = 52.3	
			q_u (lbs/ft ²) = 760	
			c_u (lbs/ft ²) = 380	
284.9	40.0			
		Lean Clay	γ_t (lb/ft ³) = 114.7	K_s (lb/in ³) = 500
		(CL)	γ_e (lb/ft ³) = 52.3	K_c (lb/in ³) = 200
			q_u (lbs/ft ²) = 2800	
			c_u (lbs/ft ²) = 1400	
244.2	80.7			
		Silty Clayey Sand (SC-SM)	γ_t (lb/ft ³) = 126.0	K_s (lb/in ³) = 60
			γ_e (lb/ft ³) = 63.6	
			ϕ' (°) = 30	
229.9	95.0			
		Poorly graded gravel with silt and clay (GP-GM/C)	γ_t (lb/ft ³) = 150.0	K_s (lb/in ³) = 125
			γ_e (lb/ft ³) = 87.6	
			ϕ' (°) = 38	
211.7	113.2	Top of Rock		
		Sandstone, light gray with local shale stringers and partings, very fine to fine grained, thin to medium bedded	γ_t (lb/ft ³) = 154	
			q_u (ton/ft ²) = 1512	
190.3	134.6	Bottom of Boring		

Note: 'Sand' or 'Gravel' is the description of the major component or the character of the horizon.

GENERAL SOIL AND BEDROCK PROFILE

US60 Bridge over the Cumberland River Pier 6 - STA 128+40, CL Borings 1020, 1021

Approximate		Description STRATA	
Elevation (ft)	Depth (ft)	Description (USCS Description)	Parameters
327.9	0.0		
		Lean Clay	γ_t (lb/ft ³) = 128.1 K_s (lb/in ³) = 100
310.9	17.0	$\frac{\nabla}{\equiv}$ (CL)	γ_e (lb/ft ³)* = 65.7 q_u (lbs/ft ²) = 1600 c_u (lbs/ft ²) = 800
292.9	35.0		
		Lean Clay (CL)	γ_t (lb/ft ³) = 115.6 K_s (lb/in ³) = 100 γ_e (lb/ft ³)* = 53.2 q_u (lbs/ft ²) = 2000 c_u (lbs/ft ²) = 1000
212.6	115.3	Top of Rock	
		Sandstone, light gray to gray, very fine to fine grained, thin to medium bedded, with local shale streaks and partings	γ_t (lb/ft ³) = 156 q_u (ton/ft ²) = 1091
192.4	135.5	Bottom of Boring	

Note: 'Sand' or 'Gravel' is the description of the major component or the character of the horizon.

GENERAL SOIL AND BEDROCK PROFILE

US60 Bridge over the Cumberland River Pier 7 - Offset - STA 129+00, CL Borings 1022, 1023

Approximate		Description	
Elevation (ft)	Depth (ft)	STRATA	
		Description (USCS Description)	Parameters
331.8	0.0	Sandy Lean Clay (CL)	γ_t (lb/ft ³) = 127.0 γ_e (lb/ft ³)* = 64.6 q_u (lbs/ft ²) = 2000 c_u (lbs/ft ²) = 1000 K_s (lb/in ³) = 100
316.8	15.0	Silty Clayey Sand	γ_t (lb/ft ³) = 125.0 K_s (lb/in ³) = 25
314.8	17.0	$\frac{V}{L}$ (SC-SM)	γ_e (lb/ft ³)* = 62.6 ϕ' (°) = 30 K_s (lb/in ³) = 20
301.8	30.0	Lean Clay with Sand (CL)	γ_t (lb/ft ³) = 115.3 γ_e (lb/ft ³)* = 52.9 q_u (lbs/ft ²) = 1600 c_u (lbs/ft ²) = 800 K_s (lb/in ³) = 100
271.8	60.0	Fat Clay (CH)	γ_t (lb/ft ³) = 115.3 γ_e (lb/ft ³)* = 52.9 q_u (lbs/ft ²) = 2400 c_u (lbs/ft ²) = 1200 K_s (lb/in ³) = 500 K_c (lb/in ³) = 200
251.8	80.0	Silty Clayey Sand (SC-SM)	γ_t (lb/ft ³) = 132.0 γ_e (lb/ft ³)* = 69.6 ϕ' (°) = 32 K_s (lb/in ³) = 60
236.8	95.0	Lean Clay (CL)	γ_t (lb/ft ³) = 122.5 γ_e (lb/ft ³)* = 60.1 q_u (lbs/ft ²) = 3200 c_u (lbs/ft ²) = 1600 K_s (lb/in ³) = 500 K_c (lb/in ³) = 200
211.8	120.0	Poorly graded gravel with silt and clay (GP-GC/M)	γ_t (lb/ft ³) = 150 γ_e (lb/ft ³)* = 88 ϕ' (°) = 36 K_s (lb/in ³) = 125
210.8	121.0	Top of Rock Sandstone, light gray to gray, very fine to fine grained, thin to medium bedded, with local shale streaks and partings	γ_t (lb/ft ³) = 157 q_u (ton/ft ²) = 2017
190.8	141.0	Bottom of Boring	

Note: 'Sand' or 'Gravel' is the description of the major component or the character of the horizon.

GENERAL SOIL AND BEDROCK PROFILE

US60 Bridge over the Cumberland River Pier 8 - Offset - STA 131+50, CL Borings 1024, 1025

Approximate		Description	
Elevation (ft)	Depth (ft)	STRATA	
		Description (USCS Description)	Parameters
337.1	0.0		
		Sandy Lean Clay (CL)	γ_t (lb/ft ³) = 127.4 γ_e (lb/ft ³)* = 65.0 q_u (lbs/ft ²) = 3000 c_u (lbs/ft ²) = 1500 K_s (lb/in ³) = 500 K_c (lb/in ³) = 200
323.1	14.0		
318.1	19.0	Sandy Lean Clay (CL)	γ_t (lb/ft ³) = 117.0 γ_e (lb/ft ³)* = 54.6 q_u (lbs/ft ²) = 1200 c_u (lbs/ft ²) = 600 K_s (lb/in ³) = 100
272.1	65.0		
		Silty Clayey Sand SC-SM	γ_t (lb/ft ³) = 136.0 γ_e (lb/ft ³)* = 73.6 ϕ' (°) = 34.0 K_s (lb/in ³) = 60
237.1	100.0		
		Lean Clay (CL)	γ_t (lb/ft ³) = 123.3 γ_e (lb/ft ³)* = 60.9 q_u (lbs/ft ²) = 3000 c_u (lbs/ft ²) = 1500 K_s (lb/in ³) = 500 K_c (lb/in ³) = 200
212.0	125.1	Top of Rock	
		Sandstone, light gray to gray, very fine to fine grained, thin to medium bedded, with local shale streaks and partings	γ_t (lb/ft ³) = 156 SDI (%) = 99.6% q_u (ton/ft ²) = 1743
199.9	137.2		
		Shale, dark gray to gray, locally clayey with silty zones, poorly laminated	γ_t (lb/ft ³) = 157 q_u (ton/ft ²) = 71
191.0	146.1	Bottom of Boring	

Note: 'Sand' or 'Gravel' is the description of the major component or the character of the horizon.

GENERAL SOIL AND BEDROCK PROFILE

US60 Bridge over the Cumberland River Pier 9 - STA 132+60, CL Borings 1026, 1027

Approximate		Description STRATA	
Elevation (ft)	Depth (ft)	Description (USCS Description)	Parameters
338.3	0.0	Sandy Lean Clay (CL)	γ_t (lb/ft ³) = 124.0 γ_e (lb/ft ³) = 61.6 q_u (lbs/ft ²) = 2600 c_u (lbs/ft ²) = 1300 K_s (lb/in ³) = 500 K_c (lb/in ³) = 200
323.3	15.0	Sandy Lean Clay (CL)	γ_t (lb/ft ³) = 124.0 γ_e (lb/ft ³) = 61.6 q_u (lbs/ft ²) = 1280 c_u (lbs/ft ²) = 640 K_s (lb/in ³) = 100
320.3	18.0	<u> </u> <u> </u> (CL)	
276.8	61.5	Sand (SC-SM)	γ_t (lb/ft ³) = 130 γ_e (lb/ft ³) = 68 ϕ' (°) = 30 K_s (lb/in ³) = 60
238.3	100.0	Lean Clay (CL)	γ_t (lb/ft ³) = 119.6 γ_e (lb/ft ³) = 57.2 q_u (lbs/ft ²) = 3000 c_u (lbs/ft ²) = 1500 K_s (lb/in ³) = 500 K_c (lb/in ³) = 200
213.3	125.0	gravel with silty (GW-GM/C)	γ_t (lb/ft ³) = 150.0 γ_e (lb/ft ³) = 87.6 ϕ' (°) = 38 K_s (lb/in ³) = 125
211.2	127.1	Top of Rock	
		Sandstone, light gray to gray, very fine to fine grained, thin to medium bedded, with local shale streaks and partings	
202.3	136.0	Shale, dark gray to gray, locally clayey with silty zones, poorly laminated	SDI (%) = 21.8%
190.0	148.3	Shale, dark gray to gray, silty with sandy lenses, laminated	γ_t (lb/ft ³) = 156.1 q_u (ton/ft ²) = 78.0
185.0	153.3	Bottom of Boring	

Note: 'Sand' or 'Gravel' is the description of the major component or the character of the horizon.

GENERAL SOIL AND BEDROCK PROFILE

US60 Bridge over the Cumberland River End Bent 2 - STA 134+00, CL Borings 1028, 1029

Approximate		Description STRATA	
Elevation (ft)	Depth (ft)	Description (USCS Description)	Parameters
338.9	0.0	Fat/Lean Clay (CH)/(CL)	γ_t (lb/ft ³) = 124.0 γ_e (lb/ft ³)* = 61.6 q_u (lbs/ft ²) = 2600 c_u (lbs/ft ²) = 1300 K_s (lb/in ³) = 500 K_c (lb/in ³) = 200
323.9	15.0	Silty Clayey Sand	γ_t (lb/ft ³) = 120.0 K_s (lb/in ³) = 25
320.9	18.0	<u>SC</u> (SC-SM)	γ_e (lb/ft ³)* = 57.6 ϕ (°) = 30.0 K_s (lb/in ³) = 20
298.9	40.0	Lean Clay (CL)	γ_t (lb/ft ³) = 114.9 γ_e (lb/ft ³)* = 52.5 q_u (lbs/ft ²) = 2000 c_u (lbs/ft ²) = 1000 K_s (lb/in ³) = 100
273.9	65.0	Silty Sand (SM)	γ_t (lb/ft ³) = 122.0 γ_e (lb/ft ³)* = 59.6 ϕ (°) = 32 K_s (lb/in ³) = 60
243.9	95.0	Lean Clay (CL)	γ_t (lb/ft ³) = 129.9 γ_e (lb/ft ³)* = 67.5 q_u (lbs/ft ²) = 2000 c_u (lbs/ft ²) = 1000 K_s (lb/in ³) = 100
228.9	110.0	Silty Clayey Sand (SC-SM)	γ_t (lb/ft ³) = 120 γ_e (lb/ft ³)* = 58 ϕ (°) = 32 K_s (lb/in ³) = 60
213.9	125.0	Silty Clayey Gravel (GC-GM)	γ_t (lb/ft ³) = 140.0 γ_e (lb/ft ³)* = 77.6 ϕ (°) = 36 K_s (lb/in ³) = 125
210.2	128.7	Top of Rock Shale, dark gray to gray, silty, laminated	
209.8	129.1	Shale, dark gray to gray, silty with sandy lenses, laminated	γ_t (lb/ft ³) = 156 SDI = 25.5% q_u (ton/ft ²) = 69
188.7	150.2	Bottom of Boring	

Sandstone encountered at elevation 211.6' to 209.6' in boring 1029 only

APPENDIX F

Project Analyses Support Data

Slope Stability Parameter Derivations

Abutment 2 – Derivation of Parameters

Drained and undrained strengths were derived for each material, and are presented in Table 1.0 below. KYTC Manual GT-601-2 provides guidance for selecting embankment strength parameters. “It is a generally reasonable assumption that the embankment material will be similar to, but slightly better than, the foundation soils”. NAVFAC 7.2-39 Table 1 “Typical properties of compacted soils” was used to select the drained and undrained strengths for the embankment material (assumed CL)

Unit weights for the Upper Clay were averaged from unit weights taken from ST samples in borings 1028 and 1027. The ST samples taken in R-11 were reviewed and were generally similar to the 1028 profile. Undrained cohesion was averaged from unconfined compressive strength data, and compared to undrained strengths derived from CPT tip resistance. CPT data generally showed higher undrained strengths than Unconfined Lab testing. So a conservative average of the two was taken for the design envelope. Effective stress parameters for the upper clay were selected based triaxial testing at the project site and with Stantec’s experience in the region, with similar alluvial soils.

Unit weights and phi angles for both upper and lower silty sands (SC-SM) were calculated using an N60 correlation spreadsheet, derived from N-count data, and moisture contents. As collecting these soils with an ST was difficult, it was assumed that SC-SM soils had negligible cohesion in both drained and undrained conditions. For the spill through slope analysis, the lower sand in boring 1027 has a higher unit weight than the same strata in 1028, for conservatism the lower unit weight was used.

Unit weights for the lower clay encountered in 1028 were averaged from unit weights taken from ST samples that boring. Undrained cohesion was averaged from unconfined compressive strength data, and compared to undrained strengths derived from CPT tip resistance. CPT data generally showed higher undrained strengths than Unconfined Lab testing. So a conservative average of the two was taken for the design envelope. Effective Stress parameters for the Lower clay were selected based on Stantec’s experience in the region, with similar alluvial soils.

Abutment 2 – Derivation of Seismic Parameters

In most soils, the application of seismic shear generates excess pore water pressures faster than they can dissipate. Therefore, undrained strength parameters are used for seismic analyses. Cyclic shearing during an earthquake will generate additional pore pressures in a soil, leading to reduced shearing resistance. Makdisi and Seed (1977-78) recommend using 80% of undrained strengths for seismic modeling. Others have since used similar strength reductions, including USACE Hynes-Griffin and Franklin (1984). Therefore a 20% reduction of undrained parameters to obtain seismic parameters. For the liquefied foundation materials an empirical correlation from Idriss and Boulanger (2008) was used to calculate the residual strength of liquefied materials. Median blow counts of the liquefied zone were used for input in the empirical correlation.

Table 1.0 Abutment 2 Strength Parameters

Material	Unit Weight (pcf)	Effective Stress		Total Stress		Seismic	
		Phi' (deg)	C' (psf)	Phi (deg)	C (psf)	Phi (deg)	C (psf)
Embankment Fill	130	28	270	0	1800	0	1440
Upper Clay	124	30	300	0	1300	15	1040
Upper Silty Sand-1028	120	30	0	30	0	25	0
Upper Silty Sand-1028 – Liquefied	120	--	--	--	--	c/p = 0.13	
Lower Clays - 1027	124	29	200	0	640	15	512
Lower Clays- 1028	115	28	300	0	1000	12	800
Lower Silty Sands	122	30	0	30	0	25	0

South River Bank – Derivation of Parameters

Unit weights for the clay were averaged from unit weights taken from ST samples in borings 1008 and 1012. Undrained cohesion was averaged from unconfined compressive strength data in these sample borings, and compared to undrained strengths derived from CPT tip resistance. CPT data generally showed higher undrained strengths than Unconfined Lab testing. So a conservative average of the two was taken for the design envelope. Undrained phi angle was selected based on Stantec's experience in the region, with similar alluvial soils. Soils on the south bank were compared in particle size, liquid and plastic limits, and USCS soil classification to soils in Boring R-11, and were found to be generally similar; therefore the triaxial test in R-11 was used as an upper bound for effective stress parameters for the clay. Stantec's experience in the region, with similar alluvial soils was used as the lower bound. A conservative average of the two was used to select final effective stress parameters.

South River Bank – Derivation of Seismic Parameters

In most soils, the application of seismic shear generates excess pore water pressures faster than they can dissipate. Therefore, undrained strength parameters are used for seismic analyses. Cyclic shearing during an earthquake will generate additional pore pressures in a soil, leading to reduced shearing resistance. Makdisi and Seed (1977-78) recommend using 80% of undrained strengths for seismic modeling. Others have since used similar strength reductions, including USACE Hynes-Griffin and Franklin (1984). Therefore a 20% reduction of undrained parameters to obtain seismic parameters.

Table 2.0 – South River Bank Strength Parameters

Material	Unit Weight (pcf)	Effective Stress		Total Stress		Seismic	
		Phi' (deg)	C' (psf)	Phi (deg)	C (psf)	Phi (deg)	C (psf)
Pier 3 – Lean Clay	128.5	30	300	0	1000	15	800
Rip-Rap Fill	145	38	0	38	0	32	0

North River Bank – Derivation of Parameters

Unit weights for the clay layers were averaged from unit weights taken from ST samples in borings for Pier 4 and Pier 5. Cohesive soils on the north bank were compared in particle size, liquid and plastic limits, and USCS soil classification to soils in Boring R-11, and were found to be generally similar; therefore the triaxial test in R-11 was used as an upper bound for effective stress parameters for the clay. Stantec's experience in the region, with similar alluvial soils was used as the lower bound. A conservative average of the two was used to select final effective stress parameters.

Unit weights and phi angles for the non-cohesive layers were calculated using an N60 correlation spreadsheet, derived from N-count data, and moisture contents. As collecting these soils with an ST was difficult, it was assumed that these soils had negligible cohesion in both drained and undrained conditions.

North River Bank – Derivation of Seismic Parameters

Undrained cohesion was averaged from unconfined compressive strength data in these sample borings, and compared to undrained strengths derived from CPT tip resistance. CPT data generally showed higher undrained strengths than Unconfined Lab testing. So a conservative average of the two was taken for the design envelope. Undrained phi angle was selected based on Stantec's experience in the region, with similar alluvial soils. In most soils, the application of seismic shear generates excess pore water pressures faster than they can dissipate. Therefore, undrained strength parameters are used for seismic analyses. Cyclic shearing during an earthquake will generate additional pore pressures in a soil, leading to reduced shearing resistance. Makdisi and Seed (1977-78) recommend using 80% of undrained strengths for seismic modeling. Others have since used similar strength reductions, including USACE Hynes-Griffin and Franklin (1984). Therefore a 20% reduction of undrained parameters to obtain seismic parameters.

The potentially liquefiable layer identified from elevation 289.6 to 279.6 feet at Pier 4, was modeled using an empirical correlation from Idriss and Boulanger (2008) to calculate the residual strength of liquefied materials. Median blow counts of the liquefied zone were used for input in the empirical correlation, a c/p ratio of 0.1 for seismic load cases.

Table 3.0 – North River Bank Strength Parameters

Material	Unit Weight (pcf)	Effective Stress		Seismic	
		Phi' (deg)	C' (psf)	Phi (deg)	C (psf)
Upper Lean Clay	110.0	30	300	15	480
Silty Clayey Sand	118.0	27	0	22	0
Silty Clayey Sand - Liquefied	118.0	--	--	c/p = 0.1	
Lower Lean Clay	110.0	30	300	15	800
Lower Lean Clay (2)	115.0	28	28	12	640
Well Graded Gravel	150.0	36	36	30	0
Pier 5 - Lean Clay	115.0	30	30	15	300
Pier 5 – Silty Clayey Sand	126.0	30	30	25	0

Driven Pile Analysis

Pier 2_14x89.ap7o

=====

APILE for Windows, Version 2015.7.7

Serial Number : 297187656

A Program for Analyzing the Axial Capacity
and Short-term Settlement of Driven Piles
under Axial Loading.
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This program is licensed to :

Stantec Consulting Services Inc.
Lexington, KY

Path to file locations :

V:\1785\active\178565011\geotechnical\analysis\APILE\14x89HP\
Name of input data file : Pier 2_14x89.ap7d
Name of output file : Pier 2_14x89.ap7o
Name of plot output file : Pier 2_14x89.ap7p

Time and Date of Analysis

Date: January 10, 2020 Time: 13:45:10

1

* INPUT INFORMATION *

US60_Pier 2

DESIGNER : DJG

JOB NUMBER : 178565011

Pier 2_14x89.ap7o

METHOD FOR UNIT LOAD TRANSFERS :

- API RP 2A (American Petroleum Institute)
Unfactored Unit Side Friction and Unit Side Resistance are used.

COMPUTATION METHOD(S) FOR PILE CAPACITY :

- API RP 2A (American Petroleum Institute)

TYPE OF LOADING :

- COMPRESSION

PILE TYPE :

H-Pile/Steel Pile

DATA FOR AXIAL STIFFNESS :

- MODULUS OF ELASTICITY = 0.290E+08 PSI
- CROSS SECTION AREA = 26.10 IN²

NONCIRCULAR PILE PROPERTIES :

- TOTAL PILE LENGTH, TL = 27.00 FT.
- PILE STICKUP LENGTH, PSL = 0.00 FT.
- ZERO FRICTION LENGTH, ZFL = 0.00 FT.
- PERIMETER OF PILE = 57.10 IN.
- TIP AREA OF PILE = 26.10 IN²
- INCREMENT OF PILE LENGTH
USED IN COMPUTATION = 1.29 FT.

Base of Pile Cap: 326.0'
Water Table: 305.6'
Top of Rock: 299.4'

SOIL INFORMATIONS :

DEPTH FT.	SOIL TYPE	LATERAL EARTH PRESSURE	EFFECTIVE UNIT WEIGHT LB/CF	FRICTION ANGLE DEGREES	BEARING CAPACITY FACTOR
0.00	CLAY	0.00	125.50	0.00	0.00

Pier 2_14x89.ap7o

1.40	CLAY	0.00	125.50	0.00	0.00
1.40	CLAY	0.00	125.50	0.00	0.00
20.40	CLAY	0.00	125.50	0.00	0.00
20.40	CLAY	0.00	63.10	0.00	0.00
26.60	CLAY	0.00	63.10	0.00	0.00
26.60	CLAY	0.00	150.00	0.00	0.00
35.00	CLAY	0.00	150.00	0.00	0.00

MAXIMUM UNIT FRICTION KSF	MAXIMUM UNIT BEARING KSF	UNDISTURB SHEAR STRENGTH KSF	REMOLDED SHEAR STRENGTH KSF	BLOW COUNT	UNIT SKIN FRICTION KSF	UNIT END BEARING KSF
0.16E+01	0.10E+08*	3.00	0.00	0.00	0.00	0.00
0.16E+01	0.10E+08*	3.00	0.00	0.00	0.00	0.00
0.55E+00	0.10E+08*	1.00	0.00	0.00	0.00	0.00
0.55E+00	0.10E+08*	1.00	0.00	0.00	0.00	0.00
0.55E+00	0.10E+08*	1.00	0.00	0.00	0.00	0.00
0.55E+00	0.10E+08*	1.00	0.00	0.00	0.00	0.00
0.10E+08*	0.10E+08*	4320.00	0.00	0.00	0.00	0.00
0.10E+08*	0.10E+08*	4320.00	0.00	0.00	0.00	0.00

* MAXIMUM UNIT FRICTION AND/OR MAXIMUM UNIT BEARING
WERE SET TO BE 0.10E+08 BECAUSE THE USER DOES NOT
PLAN TO LIMIT THE COMPUTED DATA.

DEPTH FT.	LRFD FACTOR ON UNIT FRICTION	LRFD FACTOR ON UNIT BEARING
0.00	1.000	1.000
1.40	1.000	1.000
1.40	1.000	1.000
20.40	1.000	1.000
20.40	1.000	1.000
26.60	1.000	1.000
26.60	1.000	1.000
35.00	1.000	1.000

* COMPUTATION RESULT *

Pier 2_14x89.ap7o

 * API RP-2A (1994) *

PILE PENETRATION FT.	TOTAL SKIN FRICTION KIP	END BEARING KIP	ULTIMATE CAPACITY KIP
0.00	0.0	2.4	2.4
1.29	4.4	1.7	6.2
2.57	9.3	3.3	12.5
3.86	12.6	2.3	15.0
5.14	15.3	1.6	16.9
6.43	18.1	1.6	19.7
7.71	21.1	1.6	22.7
9.00	24.2	1.6	25.8
10.29	27.6	1.6	29.2
11.57	30.9	1.6	32.6
12.86	34.3	1.6	35.9
14.14	37.7	1.6	39.3
15.43	41.0	1.6	42.7
16.71	44.4	1.6	46.0
18.00	47.7	1.6	49.4
19.29	51.1	1.6	52.7
20.57	54.5	1.6	56.1
21.86	57.8	1.6	59.5
23.14	61.2	1.6	62.8
24.43	64.6	1.6	66.2
25.71	67.9	1530.8	1598.7
27.00	73.2	3524.3	3597.5

NOTES:

- AN ASTERISK IS PLACED IN THE END-BEARING COLUMN
IF THE TIP RESISTANCE IS CONTROLLED BY THE FRICTION
OF SOIL PLUG INSIDE AN OPEN-ENDED PIPE PILE.

 * COMPUTE LOAD-DISTRIBUTION AND LOAD-SETTLEMENT *
 * CURVES FOR AXIAL LOADING *

T-Z CURVE NO. OF DEPTH TO CURVE LOAD TRANSFER PILE MOVEMENT

Pier 2_14x89.ap7o				
NO.	POINTS	FT.	PSI	IN.
1	10	0.0000E+00	0.0000E+00	0.0000E+00
			0.1647E+01	0.2908E-01
			0.2745E+01	0.5634E-01
			0.4118E+01	0.1036E+00
			0.4942E+01	0.1454E+00
			0.5491E+01	0.1818E+00
			0.4942E+01	0.3635E+00
			0.4942E+01	0.5453E+00
			0.4942E+01	0.9088E+00
			0.4942E+01	0.3635E+01
2	10	0.7250E+00	0.0000E+00	0.0000E+00
			0.1647E+01	0.2908E-01
			0.2745E+01	0.5634E-01
			0.4118E+01	0.1036E+00
			0.4942E+01	0.1454E+00
			0.5491E+01	0.1818E+00
			0.4942E+01	0.3635E+00
			0.4942E+01	0.5453E+00
			0.4942E+01	0.9088E+00
			0.4942E+01	0.3635E+01
3	10	0.1358E+01	0.0000E+00	0.0000E+00
			0.1397E+01	0.2908E-01
			0.2328E+01	0.5634E-01
			0.3491E+01	0.1036E+00
			0.4190E+01	0.1454E+00
			0.4655E+01	0.1818E+00
			0.4190E+01	0.3635E+00
			0.4190E+01	0.5453E+00
			0.4190E+01	0.9088E+00
			0.4190E+01	0.3635E+01
4	10	0.1400E+01	0.0000E+00	0.0000E+00
			0.1397E+01	0.2908E-01
			0.2328E+01	0.5634E-01
			0.3491E+01	0.1036E+00
			0.4190E+01	0.1454E+00
			0.4655E+01	0.1818E+00
			0.4190E+01	0.3635E+00
			0.4190E+01	0.5453E+00
			0.4190E+01	0.9088E+00
			0.4190E+01	0.3635E+01
5	10	0.1093E+02	0.0000E+00	0.0000E+00
			0.0000E+00	0.0000E+00

Pier 2_14x89.ap7o

6	10	0.2036E+02	0.1146E+01	0.2908E-01
			0.1910E+01	0.5634E-01
			0.2865E+01	0.1036E+00
			0.3437E+01	0.1454E+00
			0.3819E+01	0.1818E+00
			0.3437E+01	0.3635E+00
			0.3437E+01	0.5453E+00
			0.3437E+01	0.9088E+00
			0.3437E+01	0.3635E+01
			0.0000E+00	0.0000E+00
7	10	0.2040E+02	0.1146E+01	0.2908E-01
			0.1910E+01	0.5634E-01
			0.2865E+01	0.1036E+00
			0.3437E+01	0.1454E+00
			0.3819E+01	0.1818E+00
			0.3437E+01	0.3635E+00
			0.3437E+01	0.5453E+00
			0.3437E+01	0.9088E+00
			0.3437E+01	0.3635E+01
			0.0000E+00	0.0000E+00
8	10	0.2353E+02	0.1146E+01	0.2908E-01
			0.1910E+01	0.5634E-01
			0.2865E+01	0.1036E+00
			0.3437E+01	0.1454E+00
			0.3819E+01	0.1818E+00
			0.3437E+01	0.3635E+00
			0.3437E+01	0.5453E+00
			0.3437E+01	0.9088E+00
			0.3437E+01	0.3635E+01
			0.0000E+00	0.0000E+00
9	10	0.2656E+02	0.1146E+01	0.2908E-01
			0.1910E+01	0.5634E-01
			0.2865E+01	0.1036E+00
			0.3437E+01	0.1454E+00
			0.3819E+01	0.1818E+00
			0.3437E+01	0.3635E+00
			0.3437E+01	0.5453E+00
			0.3437E+01	0.9088E+00
			0.3437E+01	0.3635E+01
			0.0000E+00	0.0000E+00
			0.1788E+01	0.2908E-01
			0.2980E+01	0.5634E-01
			0.4470E+01	0.1036E+00
			0.5364E+01	0.1454E+00

Pier 2_14x89.ap7o				
10	10	0.2660E+02	0.5960E+01	0.1818E+00
			0.5364E+01	0.3635E+00
			0.5364E+01	0.5453E+00
			0.5364E+01	0.9088E+00
			0.5364E+01	0.3635E+01
11	10	0.3083E+02	0.0000E+00	0.0000E+00
			0.1788E+01	0.2908E-01
			0.2980E+01	0.5634E-01
			0.4470E+01	0.1036E+00
			0.5364E+01	0.1454E+00
			0.5960E+01	0.1818E+00
			0.5364E+01	0.3635E+00
			0.5364E+01	0.5453E+00
			0.5364E+01	0.9088E+00
			0.5364E+01	0.3635E+01
12	10	0.3496E+02	0.0000E+00	0.0000E+00
			0.1788E+01	0.2908E-01
			0.2980E+01	0.5634E-01
			0.4470E+01	0.1036E+00
			0.5364E+01	0.1454E+00
			0.5960E+01	0.1818E+00
			0.5364E+01	0.3635E+00
			0.5364E+01	0.5453E+00
			0.5364E+01	0.9088E+00
			0.5364E+01	0.3635E+01

TIP LOAD KIP	TIP MOVEMENT IN.
0.0000E+00	0.0000E+00
0.2203E+03	0.9088E-02
0.4405E+03	0.1818E-01
0.8811E+03	0.3635E-01

	Pier 2_14x89.ap7o
0.1762E+04	0.2363E+00
0.2643E+04	0.7634E+00
0.3172E+04	0.1327E+01
0.3524E+04	0.1818E+01
0.3524E+04	0.2726E+01
0.3524E+04	0.3635E+01

LOAD VERSUS SETTLEMENT CURVE

TOP LOAD KIP	TOP MOVEMENT IN.	TIP LOAD KIP	TIP MOVEMENT IN.
0.2919E+01	0.1208E-02	0.2424E+01	0.1000E-03
0.2941E+02	0.1212E-01	0.2424E+02	0.1000E-02
0.1449E+03	0.6047E-01	0.1212E+03	0.5000E-02
0.2821E+03	0.1201E+00	0.2424E+03	0.1000E-01
0.1009E+04	0.4665E+00	0.9412E+03	0.5000E-01
0.1232E+04	0.6123E+00	0.1162E+04	0.1000E+00
0.2273E+04	0.1458E+01	0.2203E+04	0.5000E+00
0.2935E+04	0.2241E+01	0.2865E+04	0.1000E+01
0.3594E+04	0.3523E+01	0.3524E+04	0.2000E+01

Pier 9_30PP.ap7o

APILE for Windows, Version 2015.7.7

Serial Number : 297187656

A Program for Analyzing the Axial Capacity
and Short-term Settlement of Driven Piles
under Axial Loading.
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This program is licensed to :

Stantec Consulting Services Inc.
Lexington, KY

Path to file locations :
V:\1785\active\178565011\geotechnical\analysis\APILE\Pier 9 Pipe Piles\
Name of input data file : Pier 9_30PP.ap7d
Name of output file : Pier 9_30PP.ap7o
Name of plot output file : Pier 9_30PP.ap7p

Time and Date of Analysis

Date: December 12, 2019 Time: 13:44:40

1

* INPUT INFORMATION *

Pier 9_30PP

DESIGNER : DJG

JOB NUMBER : 178565011

30" Pipe-pile
3/4" wall Thickness
BPC: 329.0'
TOR: 211.2'

METHOD FOR UNIT LOAD TRANSFERS :

- API RP 2A (American Petroleum Institute)
Unfactored Unit Side Friction and Unit Side Resistance are used.

COMPUTATION METHOD(S) FOR PILE CAPACITY :

- API RP 2A (American Petroleum Institute)

TYPE OF LOADING :

- COMPRESSION

PILE TYPE :

Steel pipe pile or non-tapered portion of monotube pile

- Open-Ended Pile

DATA FOR AXIAL STIFFNESS :

- MODULUS OF ELASTICITY = 0.290E+08 PSI
- CROSS SECTION AREA = 68.92 IN²

CIRCULAR PILE PROPERTIES :

- OUTSIDE DIAMETER, OD = 30.00 IN.
- INTERNAL DIAMETER, ID = 28.50 IN.
- TOTAL PILE LENGTH, TL = 118.00 FT.
- PILE STICKUP LENGTH, PSL = 0.00 FT.
- ZERO FRICTION LENGTH, ZFL = 0.00 FT.
- INCREMENT OF PILE LENGTH
USED IN COMPUTATION = 5.62 FT.
- LENGTH OF ENHANCED
END SECTION = 118.00 FT.
- INTERNAL DIAMETER OF
ENHANCED END SECTION = 28.50 IN.

PLUGGED/UNPLUGGED CONDITIONS :

Internal Pile Plug Calculated by Program

SOIL INFORMATIONS :

DEPTH FT.	SOIL TYPE	LATERAL EARTH PRESSURE	EFFECTIVE UNIT WEIGHT LB/CF	FRICTION ANGLE DEGREES	BEARING CAPACITY FACTOR
0.00	CLAY	0.00	124.00	0.00	0.00
5.70	CLAY	0.00	124.00	0.00	0.00
5.70	CLAY	0.00	124.00	0.00	0.00
8.70	CLAY	0.00	124.00	0.00	0.00
8.70	CLAY	0.00	61.60	0.00	0.00
52.20	CLAY	0.00	61.60	0.00	0.00
52.20	SAND	0.80	68.00	30.00	30.00
90.70	SAND	0.80	68.00	30.00	30.00
90.70	CLAY	0.00	57.20	0.00	0.00
115.70	CLAY	0.00	57.20	0.00	0.00
115.70	SAND	0.80	87.60	38.00	100.00
117.80	SAND	0.80	87.60	38.00	100.00
117.80	CLAY	0.00	150.00	0.00	0.00
125.00	CLAY	0.00	150.00	0.00	0.00

MAXIMUM UNIT FRICTION KSF	MAXIMUM UNIT BEARING KSF	UNDISTURB SHEAR STRENGTH KSF	REMOLDED SHEAR STRENGTH KSF	BLOW COUNT	UNIT SKIN FRICTION KSF	UNIT END BEARING KSF
0.71E+00	0.10E+08*	1.30	0.00	0.00	0.00	0.00
0.71E+00	0.10E+08*	1.30	0.00	0.00	0.00	0.00
0.35E+00	0.10E+08*	0.64	0.00	0.00	0.00	0.00
0.35E+00	0.10E+08*	0.64	0.00	0.00	0.00	0.00
0.35E+00	0.10E+08*	0.64	0.00	0.00	0.00	0.00
0.35E+00	0.10E+08*	0.64	0.00	0.00	0.00	0.00
0.43E+00	0.10E+08*	0.00	0.00	0.00	0.00	0.00
0.43E+00	0.10E+08*	0.00	0.00	0.00	0.00	0.00
0.82E+00	0.10E+08*	1.50	0.00	0.00	0.00	0.00
0.82E+00	0.10E+08*	1.50	0.00	0.00	0.00	0.00
0.43E+00	0.10E+08*	0.00	0.00	0.00	0.00	0.00
0.43E+00	0.10E+08*	0.00	0.00	0.00	0.00	0.00
0.10E+08*	0.10E+08*	4320.00	0.00	0.00	0.00	0.00
0.10E+08*	0.10E+08*	4320.00	0.00	0.00	0.00	0.00

* MAXIMUM UNIT FRICTION AND/OR MAXIMUM UNIT BEARING WERE SET TO BE 0.10E+08 BECAUSE THE USER DOES NOT PLAN TO LIMIT THE COMPUTED DATA.

Pier 9_30PP.ap7o

DEPTH FT.	LRFD FACTOR ON UNIT FRICTION	LRFD FACTOR ON UNIT BEARING
0.00	1.000	1.000
5.70	1.000	1.000
5.70	1.000	1.000
8.70	1.000	1.000
8.70	1.000	1.000
52.20	1.000	1.000
52.20	1.000	1.000
90.70	1.000	1.000
90.70	1.000	1.000
115.70	1.000	1.000
115.70	1.000	1.000
117.80	1.000	1.000
117.80	1.000	1.000
125.00	1.000	1.000

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 * COMPUTATION RESULT *

 * API RP-2A (1994) *

PILE PENETRATION FT.	TOTAL SKIN FRICTION KIP	END BEARING KIP	ULTIMATE CAPACITY KIP
0.00	0.0	5.6*	5.6
5.62	24.5	5.6*	30.1
11.24	48.1	5.6*	53.7
16.86	63.6	2.8*	66.4
22.48	79.2	2.8*	81.9
28.09	94.7	2.8*	97.4
33.71	110.2	2.8*	113.0
39.33	125.8	2.8*	128.5
44.95	141.3	2.8*	144.1
50.57	156.8	2.8*	159.6
56.19	174.2	2.8*	177.0

Pier 9_30PP.ap7o

61.81	193.4	121.4*	314.8
67.43	212.6	201.0*	413.6
73.05	231.8	286.5*	518.3
78.67	251.0	378.0*	629.0
84.28	270.2	475.5*	745.7
89.90	289.4	490.9	780.3
95.52	317.2	278.6	595.8
101.14	353.6	66.3	419.9
106.76	390.0	66.3	456.3
112.38	426.4	66.3	492.7
118.00	492.6	647.0*	1139.6

NOTES:

- AN ASTERISK IS PLACED IN THE END-BEARING COLUMN IF THE TIP RESISTANCE IS CONTROLLED BY THE FRICTION OF SOIL PLUG INSIDE AN OPEN-ENDED PIPE PILE.

 * COMPUTE LOAD-DISTRIBUTION AND LOAD-SETTLEMENT *
 * CURVES FOR AXIAL LOADING *

T-Z CURVE NO.	NO. OF POINTS	DEPTH TO CURVE FT.	LOAD TRANSFER PSI	PILE MOVEMENT IN.
1	10	0.0000E+00	0.0000E+00	0.0000E+00
			0.1111E+01	0.4800E-01
			0.1852E+01	0.9300E-01
			0.2779E+01	0.1710E+00
			0.3334E+01	0.2400E+00
			0.3705E+01	0.3000E+00
			0.3334E+01	0.6000E+00
			0.3334E+01	0.9000E+00
			0.3334E+01	0.1500E+01
			0.3334E+01	0.6000E+01
2	10	0.2875E+01	0.0000E+00	0.0000E+00
			0.1111E+01	0.4800E-01
			0.1852E+01	0.9300E-01
			0.2779E+01	0.1710E+00
			0.3334E+01	0.2400E+00
			0.3705E+01	0.3000E+00
			0.3334E+01	0.6000E+00
			0.3334E+01	0.6000E+00

Pier 9_30PP.ap7o							
3	10	0.5658E+01	0.3334E+01	0.9000E+00			
			0.3334E+01	0.1500E+01			
			0.3334E+01	0.6000E+01			
			0.0000E+00	0.0000E+00			
			0.9224E+00	0.4800E-01			
			0.1537E+01	0.9300E-01			
			0.2306E+01	0.1710E+00			
			0.2767E+01	0.2400E+00			
			0.3075E+01	0.3000E+00			
			0.2767E+01	0.6000E+00			
			0.2767E+01	0.9000E+00			
			0.2767E+01	0.1500E+01			
			0.2767E+01	0.6000E+01			
4	10	0.5700E+01	0.0000E+00	0.0000E+00			
			0.9224E+00	0.4800E-01			
			0.1537E+01	0.9300E-01			
			0.2306E+01	0.1710E+00			
			0.2767E+01	0.2400E+00			
			0.3075E+01	0.3000E+00			
			0.2767E+01	0.6000E+00			
			0.2767E+01	0.9000E+00			
			0.2767E+01	0.1500E+01			
			0.2767E+01	0.6000E+01			
			5	10	0.8535E+01	0.0000E+00	0.0000E+00
						0.9224E+00	0.4800E-01
						0.1537E+01	0.9300E-01
0.2306E+01	0.1710E+00						
0.2767E+01	0.2400E+00						
0.3075E+01	0.3000E+00						
0.2767E+01	0.6000E+00						
0.2767E+01	0.9000E+00						
0.2767E+01	0.1500E+01						
0.2767E+01	0.6000E+01						
6	10	0.1128E+02				0.0000E+00	0.0000E+00
						0.7333E+00	0.4800E-01
						0.1222E+01	0.9300E-01
			0.1833E+01	0.1710E+00			
			0.2200E+01	0.2400E+00			
			0.2444E+01	0.3000E+00			
			0.2200E+01	0.6000E+00			
			0.2200E+01	0.9000E+00			
			0.2200E+01	0.1500E+01			
			0.2200E+01	0.6000E+01			
			7	10	0.1132E+02	0.0000E+00	0.0000E+00
						0.7333E+00	0.4800E-01
						0.1222E+01	0.9300E-01
0.1833E+01	0.1710E+00						
0.2200E+01	0.2400E+00						
0.2444E+01	0.3000E+00						
0.2200E+01	0.6000E+00						
0.2200E+01	0.9000E+00						
0.2200E+01	0.1500E+01						
0.2200E+01	0.6000E+01						

Pier 9_30PP.ap7o

			0.0000E+00	0.0000E+00
			0.7333E+00	0.4800E-01
			0.1222E+01	0.9300E-01
			0.1833E+01	0.1710E+00
			0.2200E+01	0.2400E+00
			0.2444E+01	0.3000E+00
			0.2200E+01	0.6000E+00
			0.2200E+01	0.9000E+00
			0.2200E+01	0.1500E+01
			0.2200E+01	0.6000E+01
8	10	0.3178E+02		
			0.0000E+00	0.0000E+00
			0.7333E+00	0.4800E-01
			0.1222E+01	0.9300E-01
			0.1833E+01	0.1710E+00
			0.2200E+01	0.2400E+00
			0.2444E+01	0.3000E+00
			0.2200E+01	0.6000E+00
			0.2200E+01	0.9000E+00
			0.2200E+01	0.1500E+01
			0.2200E+01	0.6000E+01
9	10	0.5216E+02		
			0.0000E+00	0.0000E+00
			0.8630E+00	0.4800E-01
			0.1438E+01	0.9300E-01
			0.2158E+01	0.1710E+00
			0.2589E+01	0.2400E+00
			0.2877E+01	0.3000E+00
			0.2589E+01	0.6000E+00
			0.2589E+01	0.9000E+00
			0.2589E+01	0.1500E+01
			0.2589E+01	0.6000E+01
10	10	0.5220E+02		
			0.0000E+00	0.0000E+00
			0.2877E+00	0.1000E-01
			0.5753E+00	0.2000E-01
			0.1151E+01	0.4000E-01
			0.1726E+01	0.6000E-01
			0.2301E+01	0.8000E-01
			0.2589E+01	0.9000E-01
			0.2877E+01	0.1000E+00
			0.2877E+01	0.5000E+00
			0.2877E+01	0.2000E+01
11	10	0.7148E+02		
			0.0000E+00	0.0000E+00
			0.3021E+00	0.1000E-01
			0.6042E+00	0.2000E-01
			0.1208E+01	0.4000E-01

Pier 9_30PP.ap7o

12	10	0.9066E+02	0.1812E+01	0.6000E-01
			0.2417E+01	0.8000E-01
			0.2719E+01	0.9000E-01
			0.3021E+01	0.1000E+00
			0.3021E+01	0.5000E+00
			0.3021E+01	0.2000E+01
			0.0000E+00	0.0000E+00
			0.5052E+00	0.1000E-01
			0.1010E+01	0.2000E-01
			0.2021E+01	0.4000E-01
13	10	0.9070E+02	0.3031E+01	0.6000E-01
			0.4042E+01	0.8000E-01
			0.4547E+01	0.9000E-01
			0.5052E+01	0.1000E+00
			0.5052E+01	0.5000E+00
			0.5052E+01	0.2000E+01
			0.0000E+00	0.0000E+00
			0.1516E+01	0.4800E-01
			0.2526E+01	0.9300E-01
			0.3789E+01	0.1710E+00
14	10	0.1032E+03	0.4547E+01	0.2400E+00
			0.5052E+01	0.3000E+00
			0.4547E+01	0.6000E+00
			0.4547E+01	0.9000E+00
			0.4547E+01	0.1500E+01
			0.4547E+01	0.6000E+01
			0.0000E+00	0.0000E+00
			0.1719E+01	0.4800E-01
			0.2865E+01	0.9300E-01
			0.4297E+01	0.1710E+00
15	10	0.1157E+03	0.5156E+01	0.2400E+00
			0.5729E+01	0.3000E+00
			0.5156E+01	0.6000E+00
			0.5156E+01	0.9000E+00
			0.5156E+01	0.1500E+01
			0.5156E+01	0.6000E+01
			0.0000E+00	0.0000E+00
			0.3125E+01	0.4800E-01
			0.5208E+01	0.9300E-01
			0.7812E+01	0.1710E+00
			0.9375E+01	0.2400E+00
			0.1042E+02	0.3000E+00
			0.9375E+01	0.6000E+00
			0.9375E+01	0.9000E+00

Pier 9_30PP.ap7o

			0.9375E+01	0.1500E+01
			0.9375E+01	0.6000E+01
16	10	0.1157E+03		
			0.0000E+00	0.0000E+00
			0.3125E+01	0.4800E-01
			0.5208E+01	0.9300E-01
			0.7812E+01	0.1710E+00
			0.9375E+01	0.2400E+00
			0.1042E+02	0.3000E+00
			0.9375E+01	0.6000E+00
			0.9375E+01	0.9000E+00
			0.9375E+01	0.1500E+01
			0.9375E+01	0.6000E+01
17	10	0.1204E+03		
			0.0000E+00	0.0000E+00
			0.3125E+01	0.4800E-01
			0.5208E+01	0.9300E-01
			0.7812E+01	0.1710E+00
			0.9375E+01	0.2400E+00
			0.1042E+02	0.3000E+00
			0.9375E+01	0.6000E+00
			0.9375E+01	0.9000E+00
			0.9375E+01	0.1500E+01
			0.9375E+01	0.6000E+01
18	10	0.1250E+03		
			0.0000E+00	0.0000E+00
			0.3125E+01	0.4800E-01
			0.5208E+01	0.9300E-01
			0.7812E+01	0.1710E+00
			0.9375E+01	0.2400E+00
			0.1042E+02	0.3000E+00
			0.9375E+01	0.6000E+00
			0.9375E+01	0.9000E+00
			0.9375E+01	0.1500E+01
			0.9375E+01	0.6000E+01

TIP LOAD KIP	TIP MOVEMENT IN.
0.0000E+00	0.0000E+00
0.4044E+02	0.1500E-01
0.8087E+02	0.3000E-01
0.1617E+03	0.6000E-01
0.3235E+03	0.3900E+00
0.4852E+03	0.1260E+01
0.5823E+03	0.2190E+01

Pier 9_30PP.ap7o

0.6470E+03	0.3000E+01
0.6470E+03	0.4500E+01
0.6470E+03	0.6000E+01

LOAD VERSUS SETTLEMENT CURVE

TOP LOAD KIP	TOP MOVEMENT IN.	TIP LOAD KIP	TIP MOVEMENT IN.
0.1156E+01	0.5799E-03	0.2696E+00	0.1000E-03
0.1177E+02	0.5836E-02	0.2696E+01	0.1000E-02
0.6022E+02	0.2975E-01	0.1348E+02	0.5000E-02
0.1198E+03	0.5947E-01	0.2696E+02	0.1000E-01
0.4904E+03	0.2771E+00	0.1348E+03	0.5000E-01
0.6139E+03	0.3984E+00	0.1813E+03	0.1000E+00
0.8420E+03	0.9613E+00	0.3439E+03	0.5000E+00
0.9298E+03	0.1524E+01	0.4369E+03	0.1000E+01
0.1055E+04	0.2613E+01	0.5624E+03	0.2000E+01

End Bent 2_14x89_claypc.ap7o

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APILE for Windows, Version 2015.7.7

Serial Number : 297187656

A Program for Analyzing the Axial Capacity
and Short-term Settlement of Driven Piles
under Axial Loading.
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Path to file locations :

V:\1785\active\178565011\geotechnical\analysis\APILE\14x89HP\
Name of input data file : End Bent 2_14x89_claypc.ap7d
Name of output file : End Bent 2_14x89_claypc.ap7o
Name of plot output file : End Bent 2_14x89_claypc.ap7p

Time and Date of Analysis

Date: March 04, 2020 Time: 09:59:48

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* INPUT INFORMATION *

US60_End Bent 2

DESIGNER : DJG

JOB NUMBER : 178565011

End Bent 2_14x89_claypc.ap7o

METHOD FOR UNIT LOAD TRANSFERS :

- API RP 2A (American Petroleum Institute)
Unfactored Unit Side Friction and Unit Side Resistance are used.

COMPUTATION METHOD(S) FOR PILE CAPACITY :

- API RP 2A (American Petroleum Institute)

TYPE OF LOADING :

- COMPRESSION

14x89HP
BPC: 361.0'
Water Table: 320.9'
TOR: 210.2'

PILE TYPE :

H-Pile/Steel Pile

DATA FOR AXIAL STIFFNESS :

- MODULUS OF ELASTICITY = 0.290E+08 PSI
- CROSS SECTION AREA = 26.10 IN²

NONCIRCULAR PILE PROPERTIES :

- TOTAL PILE LENGTH, TL = 151.30 FT.
- PILE STICKUP LENGTH, PSL = 0.00 FT.
- ZERO FRICTION LENGTH, ZFL = 0.00 FT.
- PERIMETER OF PILE = 57.10 IN.
- TIP AREA OF PILE = 26.10 IN²
- INCREMENT OF PILE LENGTH
USED IN COMPUTATION = 7.20 FT.

SOIL INFORMATIONS :

DEPTH FT.	SOIL TYPE	LATERAL EARTH PRESSURE	EFFECTIVE UNIT WEIGHT LB/CF	FRICTION ANGLE DEGREES	BEARING CAPACITY FACTOR
0.00	CLAY	0.00	125.00	0.00	0.00

End Bent 2_14x89_claypc.ap7o

22.10	CLAY	0.00	125.00	0.00	0.00
22.10	CLAY	0.00	124.00	0.00	0.00
37.10	CLAY	0.00	124.00	0.00	0.00
37.10	SAND	0.50	120.00	30.00	30.00
40.10	SAND	0.50	120.00	30.00	30.00
40.10	SAND	0.50	57.60	30.00	30.00
62.10	SAND	0.50	57.60	30.00	30.00
62.10	CLAY	0.00	52.50	0.00	0.00
87.10	CLAY	0.00	52.50	0.00	0.00
87.10	SAND	0.50	59.60	32.00	40.00
117.10	SAND	0.50	59.60	32.00	40.00
117.10	CLAY	0.00	67.50	0.00	0.00
132.10	CLAY	0.00	67.50	0.00	0.00
132.10	SAND	0.50	57.60	32.00	40.00
147.10	SAND	0.50	57.60	32.00	40.00
147.10	SAND	0.50	77.60	36.00	75.00
150.80	SAND	0.50	77.60	36.00	75.00
150.80	CLAY	0.00	150.00	0.00	0.00
160.00	CLAY	0.00	150.00	0.00	0.00

MAXIMUM UNIT FRICTION KSF	MAXIMUM UNIT BEARING KSF	UNDISTURB SHEAR STRENGTH KSF	REMOLDED SHEAR STRENGTH KSF	BLOW COUNT	UNIT SKIN FRICTION KSF	UNIT END BEARING KSF
0.66E+00	0.10E+08*	1.20	0.00	0.00	0.00	0.00
0.66E+00	0.10E+08*	1.20	0.00	0.00	0.00	0.00
0.30E+00	0.10E+08*	1.30	0.00	0.00	0.00	0.00
0.30E+00	0.10E+08*	1.30	0.00	0.00	0.00	0.00
0.43E+00	0.10E+08*	0.00	0.00	0.00	0.00	0.00
0.43E+00	0.10E+08*	0.00	0.00	0.00	0.00	0.00
0.43E+00	0.10E+08*	0.00	0.00	0.00	0.00	0.00
0.43E+00	0.10E+08*	0.00	0.00	0.00	0.00	0.00
0.83E-01	0.10E+08*	1.00	0.00	0.00	0.00	0.00
0.83E-01	0.10E+08*	1.00	0.00	0.00	0.00	0.00
0.43E+00	0.10E+08*	0.00	0.00	0.00	0.00	0.00
0.43E+00	0.10E+08*	0.00	0.00	0.00	0.00	0.00
0.11E+00	0.10E+08*	1.00	0.00	0.00	0.00	0.00
0.11E+00	0.10E+08*	1.00	0.00	0.00	0.00	0.00
0.43E+00	0.10E+08*	0.00	0.00	0.00	0.00	0.00
0.43E+00	0.10E+08*	0.00	0.00	0.00	0.00	0.00
0.43E+00	0.10E+08*	0.00	0.00	0.00	0.00	0.00
0.43E+00	0.10E+08*	0.00	0.00	0.00	0.00	0.00
0.10E+08*	0.10E+08*	4320.00	0.00	0.00	0.00	0.00
0.10E+08*	0.10E+08*	4320.00	0.00	0.00	0.00	0.00

* MAXIMUM UNIT FRICTION AND/OR MAXIMUM UNIT BEARING

End Bent 2_14x89_claypc.ap7o
 WERE SET TO BE 0.10E+08 BECAUSE THE USER DOES NOT
 PLAN TO LIMIT THE COMPUTED DATA.

DEPTH FT.	LRFD FACTOR ON UNIT FRICTION	LRFD FACTOR ON UNIT BEARING
0.00	1.000	1.000
22.10	1.000	1.000
22.10	1.000	1.000
37.10	1.000	1.000
37.10	1.000	1.000
40.10	1.000	1.000
40.10	1.000	1.000
62.10	1.000	1.000
62.10	1.000	1.000
87.10	1.000	1.000
87.10	1.000	1.000
117.10	1.000	1.000
117.10	1.000	1.000
132.10	1.000	1.000
132.10	1.000	1.000
147.10	1.000	1.000
147.10	1.000	1.000
150.80	1.000	1.000
150.80	1.000	1.000
160.00	1.000	1.000

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 * COMPUTATION RESULT *

 * API RP-2A (1994) *

PILE PENETRATION FT.	TOTAL SKIN FRICTION KIP	END BEARING KIP	ULTIMATE CAPACITY KIP
0.00	0.0	1.0	1.0
7.20	19.1	1.0	20.1

End Bent 2_14x89_claypc.ap7o

14.41	41.3	2.0	43.3
21.61	63.9	2.0	65.9
28.82	80.4	2.0	82.5
36.02	90.8	2.1	92.9
43.23	103.5	10.1	113.6
50.43	118.4	18.1	136.5
57.64	133.3	18.1	151.4
64.84	142.2	9.9	152.0
72.05	145.0	1.6	146.6
79.25	147.8	1.6	149.4
86.46	150.6	1.6	152.3
93.66	159.5	13.5	173.0
100.87	174.4	25.4	199.8
108.07	189.3	25.4	214.7
115.28	204.2	25.4	229.6
122.48	213.6	13.5	227.1
129.68	217.4	1.6	219.0
136.89	226.7	13.5	240.2
144.09	241.6	25.4	267.0
151.30	256.5	31.7	288.2

NOTES:

- AN ASTERISK IS PLACED IN THE END-BEARING COLUMN
IF THE TIP RESISTANCE IS CONTROLLED BY THE FRICTION
OF SOIL PLUG INSIDE AN OPEN-ENDED PIPE PILE.

 * COMPUTE LOAD-DISTRIBUTION AND LOAD-SETTLEMENT *
 * CURVES FOR AXIAL LOADING *

T-Z CURVE NO.	NO. OF POINTS	DEPTH TO CURVE FT.	LOAD TRANSFER PSI	PILE MOVEMENT IN.
1	10	0.0000E+00	0.0000E+00	0.0000E+00
			0.1347E+01	0.2908E-01
			0.2246E+01	0.5634E-01
			0.3369E+01	0.1036E+00
			0.4042E+01	0.1454E+00
			0.4491E+01	0.1818E+00
			0.4042E+01	0.3635E+00
			0.4042E+01	0.5453E+00
			0.4042E+01	0.9088E+00

End Bent 2_14x89_claypc.ap7o

			0.4042E+01	0.3635E+01
2	10	0.1108E+02	0.0000E+00	0.0000E+00
			0.1361E+01	0.2908E-01
			0.2269E+01	0.5634E-01
			0.3403E+01	0.1036E+00
			0.4084E+01	0.1454E+00
			0.4537E+01	0.1818E+00
			0.4084E+01	0.3635E+00
			0.4084E+01	0.5453E+00
			0.4084E+01	0.9088E+00
			0.4084E+01	0.3635E+01
3	10	0.2206E+02	0.0000E+00	0.0000E+00
			0.8164E+00	0.2908E-01
			0.1361E+01	0.5634E-01
			0.2041E+01	0.1036E+00
			0.2449E+01	0.1454E+00
			0.2721E+01	0.1818E+00
			0.2449E+01	0.3635E+00
			0.2449E+01	0.5453E+00
			0.2449E+01	0.9088E+00
			0.2449E+01	0.3635E+01
4	10	0.2210E+02	0.0000E+00	0.0000E+00
			0.8164E+00	0.2908E-01
			0.1361E+01	0.5634E-01
			0.2041E+01	0.1036E+00
			0.2449E+01	0.1454E+00
			0.2721E+01	0.1818E+00
			0.2449E+01	0.3635E+00
			0.2449E+01	0.5453E+00
			0.2449E+01	0.9088E+00
			0.2449E+01	0.3635E+01
5	10	0.2963E+02	0.0000E+00	0.0000E+00
			0.6992E+00	0.2908E-01
			0.1165E+01	0.5634E-01
			0.1748E+01	0.1036E+00
			0.2098E+01	0.1454E+00
			0.2331E+01	0.1818E+00
			0.2098E+01	0.3635E+00
			0.2098E+01	0.5453E+00
			0.2098E+01	0.9088E+00
			0.2098E+01	0.3635E+01
6	10	0.3706E+02	0.0000E+00	0.0000E+00
			0.8372E+00	0.2908E-01

		End Bent 2_14x89_claypc.ap7o		
			0.1395E+01	0.5634E-01
			0.2093E+01	0.1036E+00
			0.2512E+01	0.1454E+00
			0.2791E+01	0.1818E+00
			0.2512E+01	0.3635E+00
			0.2512E+01	0.5453E+00
			0.2512E+01	0.9088E+00
			0.2512E+01	0.3635E+01
7	10	0.3710E+02		
			0.0000E+00	0.0000E+00
			0.2791E+00	0.1000E-01
			0.5582E+00	0.2000E-01
			0.1116E+01	0.4000E-01
			0.1674E+01	0.6000E-01
			0.2233E+01	0.8000E-01
			0.2512E+01	0.9000E-01
			0.2791E+01	0.1000E+00
			0.2791E+01	0.5000E+00
			0.2791E+01	0.2000E+01
8	10	0.4963E+02		
			0.0000E+00	0.0000E+00
			0.3021E+00	0.1000E-01
			0.6042E+00	0.2000E-01
			0.1208E+01	0.4000E-01
			0.1812E+01	0.6000E-01
			0.2417E+01	0.8000E-01
			0.2719E+01	0.9000E-01
			0.3021E+01	0.1000E+00
			0.3021E+01	0.5000E+00
			0.3021E+01	0.2000E+01
9	10	0.6206E+02		
			0.0000E+00	0.0000E+00
			0.1185E+00	0.1000E-01
			0.2370E+00	0.2000E-01
			0.4740E+00	0.4000E-01
			0.7109E+00	0.6000E-01
			0.9479E+00	0.8000E-01
			0.1066E+01	0.9000E-01
			0.1185E+01	0.1000E+00
			0.1185E+01	0.5000E+00
			0.1185E+01	0.2000E+01
10	10	0.6210E+02		
			0.0000E+00	0.0000E+00
			0.3555E+00	0.2908E-01
			0.5924E+00	0.5634E-01
			0.8887E+00	0.1036E+00
			0.1066E+01	0.1454E+00
			0.1185E+01	0.1818E+00

End Bent 2_14x89_claypc.ap7o				
11	10	0.7463E+02	0.1066E+01	0.3635E+00
			0.1066E+01	0.5453E+00
			0.1066E+01	0.9088E+00
			0.1066E+01	0.3635E+01
			0.0000E+00	0.0000E+00
			0.1719E+00	0.2908E-01
			0.2865E+00	0.5634E-01
			0.4297E+00	0.1036E+00
			0.5156E+00	0.1454E+00
			0.5729E+00	0.1818E+00
12	10	0.8706E+02	0.5156E+00	0.3635E+00
			0.5156E+00	0.5453E+00
			0.5156E+00	0.9088E+00
			0.5156E+00	0.3635E+01
			0.0000E+00	0.0000E+00
			0.7227E+00	0.2908E-01
			0.1204E+01	0.5634E-01
			0.1807E+01	0.1036E+00
			0.2168E+01	0.1454E+00
			0.2409E+01	0.1818E+00
13	10	0.8710E+02	0.2168E+01	0.3635E+00
			0.2168E+01	0.5453E+00
			0.2168E+01	0.9088E+00
			0.2168E+01	0.3635E+01
			0.0000E+00	0.0000E+00
			0.2409E+00	0.1000E-01
			0.4818E+00	0.2000E-01
			0.9635E+00	0.4000E-01
			0.1445E+01	0.6000E-01
			0.1927E+01	0.8000E-01
14	10	0.1021E+03	0.2168E+01	0.9000E-01
			0.2409E+01	0.1000E+00
			0.2409E+01	0.5000E+00
			0.2409E+01	0.2000E+01
			0.0000E+00	0.0000E+00
			0.3021E+00	0.1000E-01
			0.6042E+00	0.2000E-01
			0.1208E+01	0.4000E-01
			0.1812E+01	0.6000E-01
			0.2417E+01	0.8000E-01
			0.2719E+01	0.9000E-01
			0.3021E+01	0.1000E+00
			0.3021E+01	0.5000E+00
			0.3021E+01	0.2000E+01
			0.3021E+01	0.2000E+01

		End Bent 2_14x89_claypc.ap7o		
15	10	0.1171E+03		
			0.0000E+00	0.0000E+00
			0.1328E+00	0.1000E-01
			0.2656E+00	0.2000E-01
			0.5312E+00	0.4000E-01
			0.7969E+00	0.6000E-01
			0.1062E+01	0.8000E-01
			0.1195E+01	0.9000E-01
			0.1328E+01	0.1000E+00
			0.1328E+01	0.5000E+00
			0.1328E+01	0.2000E+01
16	10	0.1171E+03		
			0.0000E+00	0.0000E+00
			0.3984E+00	0.2908E-01
			0.6641E+00	0.5634E-01
			0.9961E+00	0.1036E+00
			0.1195E+01	0.1454E+00
			0.1328E+01	0.1818E+00
			0.1195E+01	0.3635E+00
			0.1195E+01	0.5453E+00
			0.1195E+01	0.9088E+00
			0.1195E+01	0.3635E+01
17	10	0.1246E+03		
			0.0000E+00	0.0000E+00
			0.3984E+00	0.2908E-01
			0.6641E+00	0.5634E-01
			0.9961E+00	0.1036E+00
			0.1195E+01	0.1454E+00
			0.1328E+01	0.1818E+00
			0.1195E+01	0.3635E+00
			0.1195E+01	0.5453E+00
			0.1195E+01	0.9088E+00
			0.1195E+01	0.3635E+01
18	10	0.1321E+03		
			0.0000E+00	0.0000E+00
			0.7370E+00	0.2908E-01
			0.1228E+01	0.5634E-01
			0.1842E+01	0.1036E+00
			0.2211E+01	0.1454E+00
			0.2457E+01	0.1818E+00
			0.2211E+01	0.3635E+00
			0.2211E+01	0.5453E+00
			0.2211E+01	0.9088E+00
			0.2211E+01	0.3635E+01
19	10	0.1321E+03		
			0.0000E+00	0.0000E+00
			0.2457E+00	0.1000E-01
			0.4913E+00	0.2000E-01

		End Bent 2_14x89_claypc.ap7o		
			0.9826E+00	0.4000E-01
			0.1474E+01	0.6000E-01
			0.1965E+01	0.8000E-01
			0.2211E+01	0.9000E-01
			0.2457E+01	0.1000E+00
			0.2457E+01	0.5000E+00
			0.2457E+01	0.2000E+01
20	10	0.1396E+03		
			0.0000E+00	0.0000E+00
			0.3021E+00	0.1000E-01
			0.6042E+00	0.2000E-01
			0.1208E+01	0.4000E-01
			0.1812E+01	0.6000E-01
			0.2417E+01	0.8000E-01
			0.2719E+01	0.9000E-01
			0.3021E+01	0.1000E+00
			0.3021E+01	0.5000E+00
			0.3021E+01	0.2000E+01
21	10	0.1471E+03		
			0.0000E+00	0.0000E+00
			0.3021E+00	0.1000E-01
			0.6042E+00	0.2000E-01
			0.1208E+01	0.4000E-01
			0.1812E+01	0.6000E-01
			0.2417E+01	0.8000E-01
			0.2719E+01	0.9000E-01
			0.3021E+01	0.1000E+00
			0.3021E+01	0.5000E+00
			0.3021E+01	0.2000E+01
22	10	0.1471E+03		
			0.0000E+00	0.0000E+00
			0.3021E+00	0.1000E-01
			0.6042E+00	0.2000E-01
			0.1208E+01	0.4000E-01
			0.1812E+01	0.6000E-01
			0.2417E+01	0.8000E-01
			0.2719E+01	0.9000E-01
			0.3021E+01	0.1000E+00
			0.3021E+01	0.5000E+00
			0.3021E+01	0.2000E+01
23	10	0.1507E+03		
			0.0000E+00	0.0000E+00
			0.3021E+00	0.1000E-01
			0.6042E+00	0.2000E-01
			0.1208E+01	0.4000E-01
			0.1812E+01	0.6000E-01
			0.2417E+01	0.8000E-01
			0.2719E+01	0.9000E-01

End Bent 2_14x89_claypc.ap7o				
24	10	0.1543E+03	0.3021E+01	0.1000E+00
			0.3021E+01	0.5000E+00
			0.3021E+01	0.2000E+01
			0.0000E+00	0.0000E+00
			0.3021E+00	0.1000E-01
			0.6042E+00	0.2000E-01
			0.1208E+01	0.4000E-01
			0.1812E+01	0.6000E-01
			0.2417E+01	0.8000E-01
			0.2719E+01	0.9000E-01
			0.3021E+01	0.1000E+00
			0.3021E+01	0.5000E+00
25	10	0.1543E+03	0.3021E+01	0.2000E+01
			0.0000E+00	0.0000E+00
			0.9062E+00	0.2908E-01
			0.1510E+01	0.5634E-01
			0.2266E+01	0.1036E+00
			0.2719E+01	0.1454E+00
			0.3021E+01	0.1818E+00
			0.2719E+01	0.3635E+00
			0.2719E+01	0.5453E+00
			0.2719E+01	0.9088E+00
			0.2719E+01	0.3635E+01
26	10	0.1579E+03	0.0000E+00	0.0000E+00
			0.9062E+00	0.2908E-01
			0.1510E+01	0.5634E-01
			0.2266E+01	0.1036E+00
			0.2719E+01	0.1454E+00
			0.3021E+01	0.1818E+00
			0.2719E+01	0.3635E+00
			0.2719E+01	0.5453E+00
			0.2719E+01	0.9088E+00
			0.2719E+01	0.3635E+01
27	10	0.1615E+03	0.0000E+00	0.0000E+00
			0.9062E+00	0.2908E-01
			0.1510E+01	0.5634E-01
			0.2266E+01	0.1036E+00
			0.2719E+01	0.1454E+00
			0.3021E+01	0.1818E+00
			0.2719E+01	0.3635E+00
			0.2719E+01	0.5453E+00
			0.2719E+01	0.9088E+00
			0.2719E+01	0.3635E+01

End Bent 2_14x89_claypc.ap7o

TIP LOAD KIP	TIP MOVEMENT IN.
0.0000E+00	0.0000E+00
0.1982E+01	0.9088E-02
0.3965E+01	0.1818E-01
0.7930E+01	0.3635E-01
0.1586E+02	0.2363E+00
0.2379E+02	0.7634E+00
0.2855E+02	0.1327E+01
0.3172E+02	0.1818E+01
0.3172E+02	0.2726E+01
0.3172E+02	0.3635E+01

LOAD VERSUS SETTLEMENT CURVE

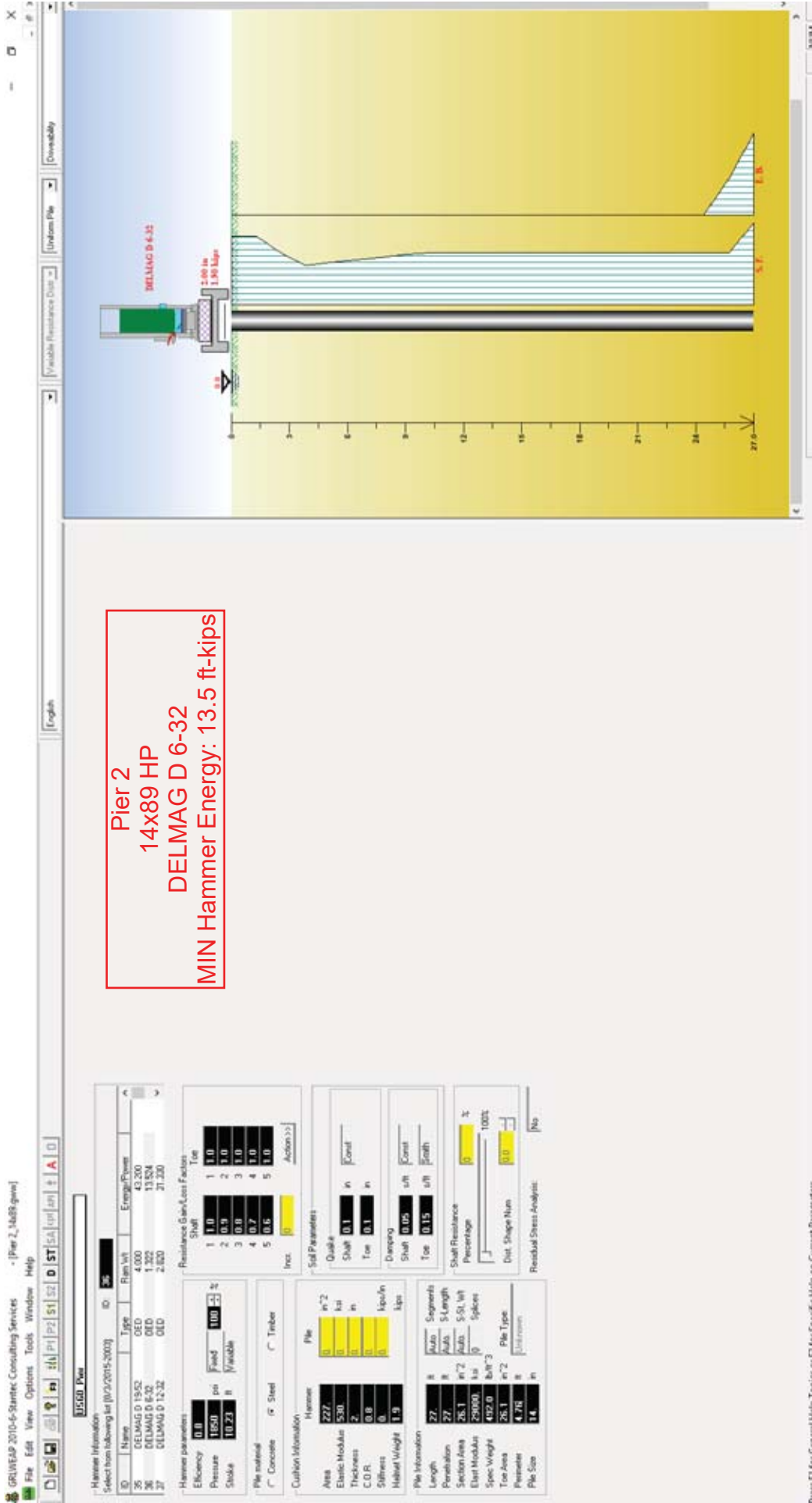
TOP LOAD KIP	TOP MOVEMENT IN.	TIP LOAD KIP	TIP MOVEMENT IN.
0.7535E+00	0.6453E-03	0.2181E-01	0.1000E-03
0.7897E+01	0.6565E-02	0.2181E+00	0.1000E-02
0.4028E+02	0.3355E-01	0.1091E+01	0.5000E-02
0.7474E+02	0.6611E-01	0.2181E+01	0.1000E-01
0.2186E+03	0.2652E+00	0.8471E+01	0.5000E-01
0.2565E+03	0.3971E+00	0.1045E+02	0.1000E+00
0.2644E+03	0.8199E+00	0.1983E+02	0.5000E+00
0.2704E+03	0.1334E+01	0.2579E+02	0.1000E+01
0.2763E+03	0.2348E+01	0.3172E+02	0.2000E+01

Gain/Loss 1 at Shaft and Toe 1.000 / 1.000

Depth ft	Ultimate Capacity kips	Friction kips	End Bearing kips	Blow Count blows/ft	Comp. Stress ksi	Tension Stress ksi	Stroke ft	ENTHRU kips-ft
4.0	13.8	11.6	2.2	4.2	10.018	-3.226	5.30	6.4
8.0	22.0	20.4	1.6	6.9	10.606	-2.835	5.53	6.1
12.0	32.2	30.6	1.6	11.3	11.189	-2.279	5.78	5.7
16.0	42.7	41.1	1.6	15.9	11.872	-2.464	6.02	5.5
20.0	53.2	51.6	1.6	21.3	12.401	-2.526	6.24	5.2
24.0	63.7	62.1	1.6	26.7	12.750	-2.739	6.44	5.0
27.0	3590.0	70.9	3519.1	9999.0	28.859	-3.288	10.23	6.1

Refusal occurred; no driving time output possible

Pier 2
14x89 HP
DELMAG D 6-32
MIN Hammer Energy: 13.5 ft-kips



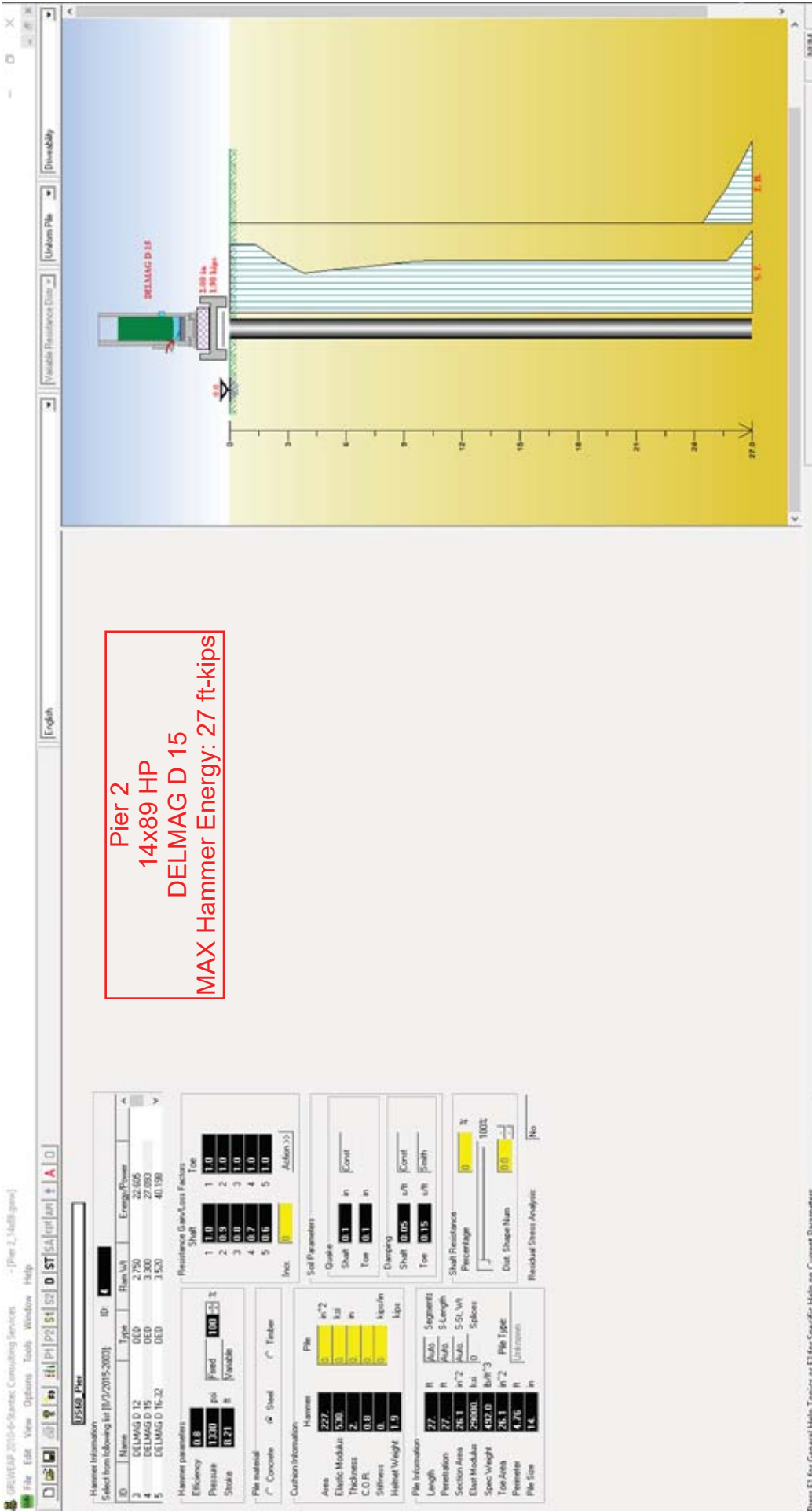
Press F1 for General Help, Topics or F3 for Specific Help on Current Parameters

Gain/Loss 1 at Shaft and Toe 1.000 / 1.000

Depth ft	Ultimate Capacity kips	Friction kips	End Bearing kips	Blow Count blows/ft	Comp. Stress ksi	Tension Stress ksi	Stroke ft	ENTHRU kips-ft
4.0	13.8	11.6	2.2	2.0	7.830	-0.673	3.22	15.9
8.0	22.0	20.4	1.6	3.1	10.740	-1.615	3.59	15.1
12.0	32.2	30.6	1.6	4.9	13.146	-2.078	4.02	14.0
16.0	42.7	41.1	1.6	6.9	14.770	-2.248	4.33	13.2
20.0	53.2	51.6	1.6	9.1	15.830	-2.512	4.57	12.5
24.0	63.7	62.1	1.6	11.4	16.644	-2.840	4.82	11.9
27.0	3590.0	70.9	3519.1	9999.0	44.036	-1.972	9.57	15.0

Refusal occurred; no driving time output possible

Pier 2
14x89 HP
DELMAG D 15
MAX Hammer Energy: 27 ft-kips

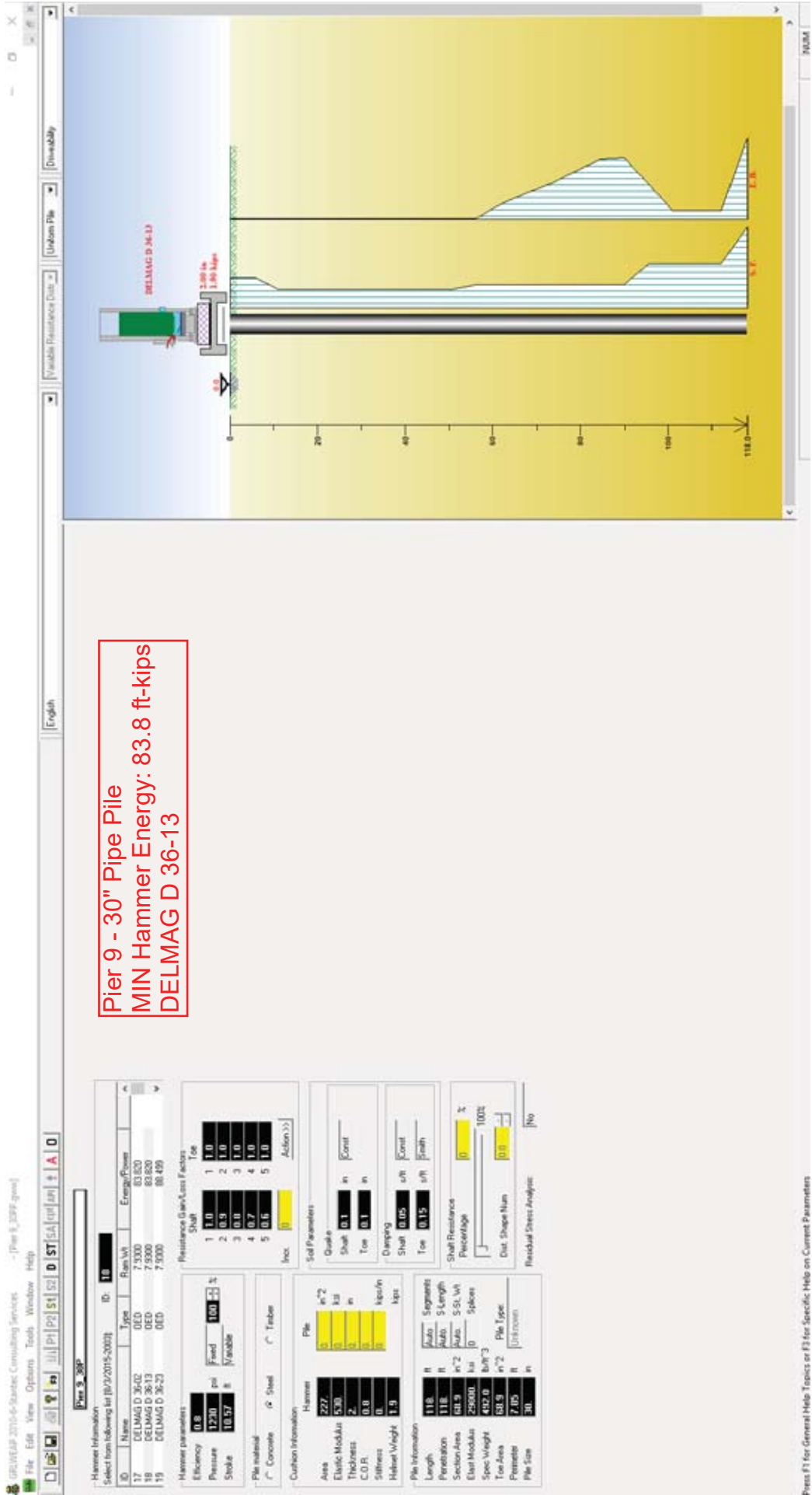


Gain/Loss 1 at Shaft and Toe 1.000 / 1.000

Depth ft	Ultimate Capacity kips	Friction kips	End Bearing kips	Blow Count blows/ft	Comp. Stress ksi	Tension Stress ksi	Stroke ft	ENTHRU kips-ft
10.0	46.5	40.9	5.6	2.6	19.471	-8.363	6.00	40.6
20.0	71.5	68.7	2.8	3.4	20.993	-8.583	6.34	39.3
30.0	99.2	96.4	2.8	4.9	21.931	-8.367	6.61	37.6
40.0	126.8	124.0	2.8	6.9	22.701	-8.217	6.83	36.2
50.0	154.4	151.6	2.8	8.9	23.444	-7.990	7.05	35.2
60.0	266.6	183.6	83.1	16.8	25.066	-5.371	7.57	33.7
70.0	458.2	217.7	240.5	38.0	26.702	-1.596	8.12	32.9
80.0	653.0	251.9	401.1	65.6	27.876	-1.272	8.51	33.2
90.0	773.7	286.0	487.7	87.3	28.510	-1.001	8.72	33.5
100.0	447.6	342.5	105.1	37.6	27.273	-4.785	8.24	32.0
110.0	473.6	407.3	66.4	41.4	27.710	-5.145	8.36	31.4
118.0	1122.6	475.0	647.6	296.4	29.788	-1.042	9.05	33.1

Total Continuous Driving Time 105.00 minutes; Total Number of Blows 4265

Pier 9 - 30" Pipe Pile
MIN Hammer Energy: 83.8 ft-kips
DELMAG D 36-13



Pier 9 - 30" Pipe Pile
MIN Hammer Energy: 83.8 ft-kips
DELMAG D 36-13

Gain/Loss 1 at Shaft and Toe 1.000 / 1.000

Depth ft	Ultimate Capacity kips	Friction kips	End Bearing kips	Blow Count blows/ft	Comp. Stress ksi	Tension Stress ksi	Stroke ft	ENTHRU kips-ft
10.0	46.5	40.9	5.6	-1.0	0.000	0.000	0.00	0.0
20.0	71.5	68.7	2.8	-1.0	0.000	0.000	0.00	0.0
30.0	99.2	96.4	2.8	-1.0	0.000	0.000	0.00	0.0
40.0	126.8	124.0	2.8	-1.0	0.000	0.000	0.00	0.0
50.0	154.4	151.6	2.8	2.2	24.335	-5.214	5.73	163.4
60.0	266.6	183.6	83.1	3.9	28.390	-3.012	6.69	149.9
70.0	458.2	217.7	240.5	7.3	32.337	0.000	7.82	137.1
80.0	653.0	251.9	401.1	11.7	34.935	0.000	8.62	130.5
90.0	773.7	286.0	487.7	15.2	36.264	0.000	9.07	130.1
100.0	447.6	342.5	105.1	6.8	32.116	-1.950	7.65	137.6
110.0	473.6	407.3	66.4	7.5	33.038	-2.265	7.84	135.2
118.0	1122.6	475.0	647.6	29.8	39.455	0.000	9.78	132.0

Total Continuous Driving Time 16.00 minutes; Total Number of Blows 657

Pier 9 - 30" Pipe Pile
MAX Hammer Energy: 300 ft-kips
DELMAG D 120-42
Maximum stress is not reached in the
pile, but a larger hammer is not feasible.

Pier 9_KOP9

Hammer Information
 Select from following list [8/2/2015-2021] ID: 43

ID	Name	Type	Run Vt	Energy/Power
42	DELMAG D120-42	OEO	44.0000	432.044
43	DELMAG D120-42	OEO	26.6500	301.794
44	DELMAG D150-42	OEO	23.0700	377.329

Resistance Gain/Loss Factors

Resistance Gain/Loss Factors	Shall	Toe
1	1.0	1.0
2	0.9	2.0
3	0.8	3.0
4	0.7	4.0
5	0.6	5.0

Inc: 0.0

Hammer parameters

Efficiency: 0.8
 Pressure: 15.35 psi
 Stroke: 11.41 in

Fixed: 100 %
 Variable: %

Pile material: Concrete Steel Timber

Custom Information

Hammer

Area: 227 in²
 Elastic Modulus: 5.30 ksi
 Thickness: 2 in
 C.O.R.: 0.8
 Stiffness: 0.0 kips/in
 Helical Weight: 1.9 kips

Pile

Area: 0 in²
 Elastic Modulus: 0 ksi
 Thickness: 0 in
 C.O.R.: 0
 Stiffness: 0 kips/in
 Helical Weight: 0 kips

Soil Parameters

Shaft

Guide: 0.1 in
 Toe: 0.1 in

Drilling

Shaft: 0.05 u/h
 Toe: 0.15 u/h

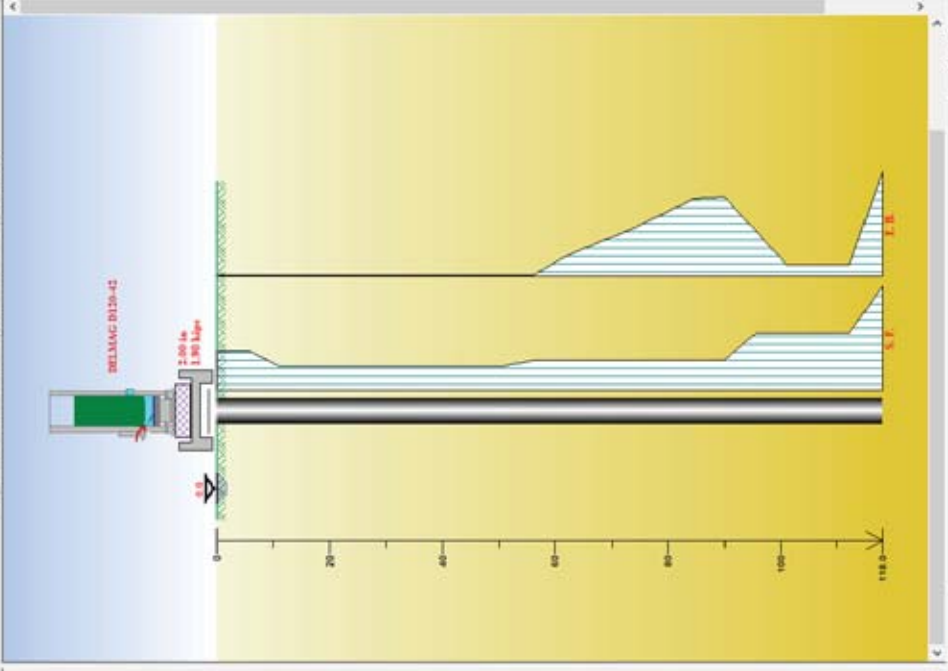
Shaft Resistance

Percentage: 0 %
 100%

Dist. Shape Num: 0.33

Residual Stress Analysis: No

Pier 9 - 30" Pipe Pile
 MAX Hammer Energy: 300 ft-kips
 DELMAG D 120-42



Gain/Loss 1 at Shaft and Toe 1.000 / 1.000

Depth ft	Ultimate Capacity kips	Friction kips	End Bearing kips	Blow Count blows/ft	Comp. Stress ksi	Tension Stress ksi	Stroke ft	ENTHRU kips-ft
10.0	26.5	9.0	17.6	1.6	18.385	-7.331	5.06	40.8
20.0	67.4	28.7	38.7	2.8	22.161	-6.828	5.72	39.5
30.0	64.9	46.3	18.6	2.6	22.002	-7.429	5.68	39.7
40.0	68.0	61.4	6.5	2.8	22.376	-7.429	5.76	39.3
50.0	99.3	81.7	17.7	4.5	23.775	-6.347	6.12	37.2
60.0	117.1	101.7	15.4	5.4	24.380	-6.421	6.28	36.5
70.0	112.3	108.3	4.0	5.1	24.425	-7.611	6.28	36.5
80.0	113.9	112.3	1.6	5.2	24.766	-7.992	6.35	36.4
90.0	125.1	117.7	7.4	6.0	25.471	-7.326	6.51	35.8
100.0	160.6	136.8	23.8	8.1	26.849	-5.462	6.90	35.5
110.0	182.9	157.5	25.4	9.5	27.506	-4.775	7.08	35.1
120.0	192.3	175.4	16.9	10.0	28.017	-5.466	7.18	34.9
130.0	182.7	181.1	1.6	9.2	28.151	-8.160	7.18	34.7
140.0	215.0	196.4	18.6	12.1	29.099	-6.625	7.43	33.9
151.0	250.9	219.2	31.7	14.9	29.931	-5.168	7.64	32.8

Total Continuous Driving Time 21.00 minutes; Total Number of Blows 928

14x89 HP
MIN Hammer Energy: 75.4 ft-kips
DELMAG D 30-32

Gain/Loss 1 at Shaft and Toe 1.000 / 1.000

Depth ft	Ultimate Capacity kips	Friction kips	End Bearing kips	Blow Count blows/ft	Comp. Stress ksi	Tension Stress ksi	Stroke ft	ENTHRU kips-ft
10.0	26.5	9.0	17.6	-1.0	0.000	0.000	0.00	0.0
20.0	67.4	28.7	38.7	-1.0	0.000	0.000	0.00	0.0
30.0	64.9	46.3	18.6	-1.0	0.000	0.000	0.00	0.0
40.0	68.0	61.4	6.5	-1.0	0.000	0.000	0.00	0.0
50.0	99.3	81.7	17.7	-1.0	0.000	0.000	0.00	0.0
60.0	117.1	101.7	15.4	-1.0	0.000	0.000	0.00	0.0
70.0	112.3	108.3	4.0	-1.0	0.000	0.000	0.00	0.0
80.0	113.9	112.3	1.6	-1.0	0.000	0.000	0.00	0.0
90.0	125.1	117.7	7.4	-1.0	0.000	0.000	0.00	0.0
100.0	160.6	136.8	23.8	-1.0	0.000	0.000	0.00	0.0
110.0	182.9	157.5	25.4	2.3	29.607	-1.799	5.36	149.2
120.0	192.3	175.4	16.9	2.4	30.032	-2.275	5.37	147.3
130.0	182.7	181.1	1.6	2.2	30.142	-3.450	5.35	149.9
140.0	215.0	196.4	18.6	2.8	32.019	-3.550	5.62	142.0
151.0	250.9	219.2	31.7	3.3	33.895	-2.693	5.93	138.5

Total Continuous Driving Time 2.00 minutes; Total Number of Blows 115

14x89 HP
DELMAG D 100-13
Energy: 265 ft-kips
Does not reach maximum stress in the
pile, but a larger hammer is not logical

15169 End Bent

Hammer Information

ID	Name	Type	Run/Vh	Energy/Power
32	DELMAG D 80-23	OEO	17.0200	212.637
33	DELMAG D100-13	OEO	22.6680	265.676
35	DELMAG D 19-52	OEO	4.0000	43.200

Hammer parameters

Efficiency: 0.8

Pressure: 1520 psi

Stroke: 12.04 ft

Resistance Gain/Loss Factors

Shall	Toe
1 1.0	1 1.0
2 0.9	2 1.0
3 0.8	3 1.0
4 0.7	4 1.0
5 0.6	5 1.0

Pile material

Concrete Steel Timber

Custom Information

Area: 227 in²

Elastic Modulus: 5.30 ksi

Thickness: 2 in

C.O.R.: 0.8

Stiffness: 0 kips/in

Helical Weight: 1.3 kips

Soil Parameters

Shaft

Quake

Shall: 0.1 in

Toe: 0.1 in

Damping

Shall: 0.05 s/ft

Toe: 0.15 s/ft

Shall Resistance

Percentage: 0 %

Percentage: 100%

Dist. Shape Hum: 0.0

Residual Stress Analysis: No

Pile Information

Length: 151 ft

Perforation: 151 ft

Section Area: 26.3 in²

Elast Modulus: 298800 ksi

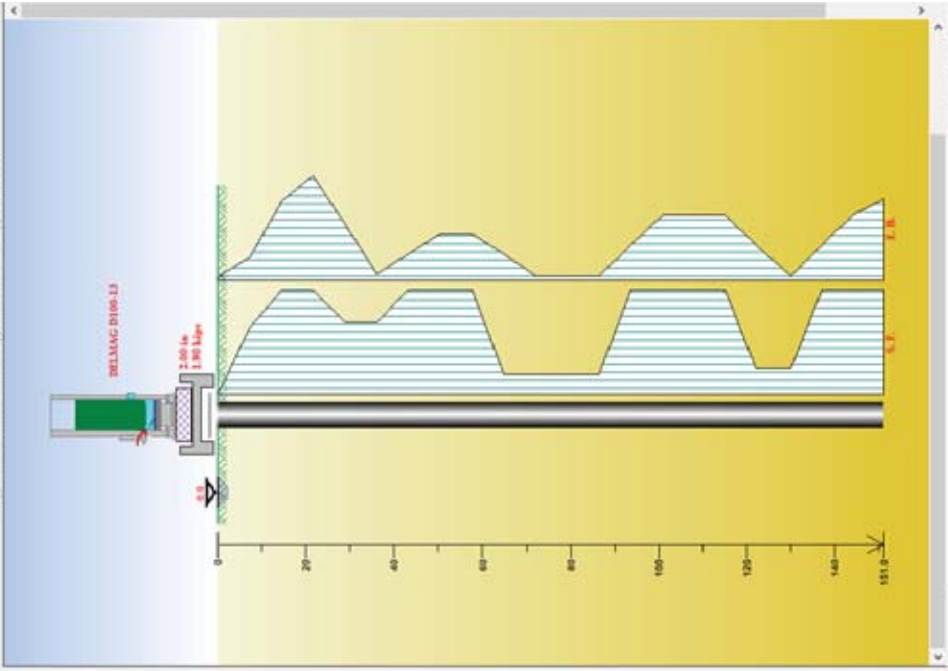
Spec Weight: 402.0 lb/ft³

Toe Area: 26.3 in²

Perimeter: 4.76 ft

Pile Size: 1.6 ft

14x89 HP
DELMAG D 100-13
Energy: 265 ft-kips



Drilled Shaft Capacity vs. Depth Tables

178565011 US60 over Cumberland River at Smithland, KY			Calculated By : WAM
Calculate Base Resistance - 90" Drilled Shafts - Pier 3			Checked by: EF, KJS
Inputs	Dimension	Reference	
GSI	35.0	--	AASHTO 2017 Figure 10.4.6.4-1
m _i	4.0	--	AASHTO 2017 Table 10.4.6.4-1
D (Disturbance Factor)	0.4	--	AASHTO 2017 (Full Faced Roller Bit)
q _u	136.8	ksf	USACE 2/3rd Higher Value of 10 UCRs at Pier 3
Unit Weight of Rock	154.0	pcf	Mean value of 10 Unit Weights at Pier 3
Existing Ground Elevation	334.4	ft.	Generalized soil profile - Pier 3
Groundwater Elevation	307.4	ft.	Generalized soil profile - Pier 3
Refusal Elevation	272.3	ft.	Generalized soil profile - Pier 3
Tip Elevation	252.3	ft.	Depth to refusal - Assumed rock socket
σ _{vb}	8.8	ksf	Effective Stress at Tip Elevation - Assumed 20' Sockets
Outputs	Dimension	Reference	
a	0.5159	--	AASHTO 2017 Eqn. 10.4.6.4-3
s	0.0002	--	AASHTO 2017 Eqn. 10.4.6.4-2
m _b	0.2197	--	AASHTO 2017 Eqn. 10.4.6.4-4
A	24.1965	ksf	AASHTO 2017 Eqn. 10.8.3.5.4c-3
q _{bn}	49.9	ksf	AASHTO 2017 Eqn. 10.8.3.5.4c-2

178565011 US60 over Cumberland River at Smithland, KY			Calculated By : WAM
Calculate Side Resistance - 90" Drilled Shafts - Pier 3			Checked by: EF, KJS
Inputs	Dimension	Reference	
P _a	2.1	ksf	AASHTO 2017 Eqn. 10.8.3.5.4b-1
C	1.0	--	AASHTO 2017 Eqn. 10.8.3.5.4b-1
q _u - rock	136.8	ksf	USACE 2/3rd Higher Value of 10 UCRs at Pier 3
q _u - concrete	576.0	ksf	4000psi concrete
Outputs	Dimension	Reference	
q _s	17.0	ksf	AASHTO 2017 Eqn. 10.8.3.5.4b-1

DRILLED SHAFT CAPACITY TABLE (Single Shaft Only)

US60 over Cumberland River at Smithland, KY

Rock Socket Diameter (in) = 90

Rock Socket Diameter (ft) = 7.5

d_b

1/21/2020

Calculated By: WAIM

Checked By: EF, KJS

Pier 3 Tip Elevation (ft)	Nominal Unit Side Strength q _{as} (ksf)	Nominal Unit End Bearing q _{ab} (ksf)	Nominal Side Resistance R _s (kips)	Nominal End Resistance R _{eb} (kips)	Total Nominal Axial Capacity ^{1,2,3} Q _u (kips)	Service Limit State		Strength Limit State		Extreme Limit State	
						Total Allowable Bearing Capacity FS = 2 (kips)	Total Allowable Bearing Capacity FS = 3 (kips)	Total Factored Axial Resistance φR _s (kips)	Total Factored Uplift Resistance φR _u (kips)	Total Factored Axial Resistance φR _s (kips)	Total Factored Uplift Resistance φR _u (kips)
Top of Rock >>>	272.3	0.0	0	0	0	0	0	0	0	0	0
L _b	271.3	0.0	0	0	0	0	0	0	0	0	0
	270.3	0.0	0	0	0	0	0	0	0	0	0
	269.3	0.0	0	0	0	0	0	0	0	0	0
	268.3	0.0	0	0	0	0	0	0	0	0	0
	267.3	0.0	0	0	0	0	0	0	0	0	0
	266.3	0.0	0	0	0	0	0	0	0	0	0
	265.3	0.0	0	0	0	0	0	0	0	0	0
	264.3	17.0	50	401	2204	1102	735	1102	221	2204	321
	263.3	17.0	50	803	2204	1102	735	1102	441	2204	642
	262.3	17.0	50	1204	2204	1102	735	1102	662	2204	963
	261.3	17.0	50	1605	2204	1102	735	1102	883	2204	1284
	260.3	17.0	50	2006	2204	1102	735	1102	1103	2204	1605
	259.3	17.0	50	2408	2204	1204	803	1324	1324	2408	1926
	258.3	17.0	50	2809	2204	1404	936	1545	1545	2809	2247
	257.3	17.0	50	3210	2204	1605	1070	1766	1766	3210	2568
	256.3	17.0	50	3611	2204	1806	1204	1986	1986	3611	2889
	255.3	17.0	50	4013	2204	2006	1338	2207	2207	4013	3210
	254.3	17.0	50	4414	2204	2207	1471	2428	2428	4414	3531
	253.3	17.0	50	4815	2204	2408	1605	2648	2648	4815	3852
	252.3	17.0	50	5216	2204	2608	1739	2869	2869	5216	4173
	251.3	17.0	50	5618	2204	2809	1873	3090	3090	5618	4494
	250.3	17.0	50	6019	2204	3009	2006	3310	3310	6019	4815
	249.3	17.0	50	6420	2204	3210	2140	3531	3531	6420	5136
	248.3	17.0	50	6821	2204	3411	2274	3752	3752	6821	5457
	247.3	17.0	50	7223	2204	3611	2408	3972	3972	7223	5778
	246.3	17.0	50	7624	2204	3812	2541	4193	4193	7624	6099
	245.3	17.0	50	8025	2204	4013	2675	4414	4414	8025	6420
	244.3	17.0	50	8426	2204	4213	2809	4635	4635	8426	6741
	243.3	17.0	50	8828	2204	4414	2943	4855	4855	8828	7062
	242.3	17.0	50	9229	2204	4614	3076	5076	5076	9229	7383
	241.3	17.0	50	9630	2204	4815	3210	5297	5297	9630	7704
	240.3	17.0	50	10031	2204	5016	3344	5517	5517	10031	8025
	239.3	17.0	50	10433	2204	5216	3478	5738	5738	10433	8346
	238.3	17.0	50	10834	2204	5417	3611	5959	5959	10834	8667
	237.3	17.0	50	11235	2204	5618	3745	6179	6179	11235	8988
	236.3	17.0	50	11636	2204	5818	3879	6400	6400	11636	9309
	235.3	17.0	50	12038	2204	6019	4013	6621	6621	12038	9630
	234.3	17.0	50	12439	2204	6219	4146	6841	6841	12439	9951
	233.3	17.0	50	12840	2204	6420	4280	7062	7062	12840	10272
	232.3	17.0	50	13241	2204	6621	4414	7283	7283	13241	10593
	231.3	17.0	50	13643	2204	6821	4548	7503	7503	13643	10914

NOTES:

- Top 1 shaft diameters of rock are neglected for resistance due to weathering
- Sampled bedrock at Pier 3 is soft to moderate/very soft. Therefore end bearing only governs to approximate elevation 260.3ft. Below that elevation, side resistance will govern. It is assumed that, both side and end resistance will not develop simultaneously.
- Estimated final grade will require no fill, therefore downdrag on shafts is not included in these calculations

D (ft.) =
Side Resistance in Rock = 7.5
Tip Resistance in Rock = 0.55
Uplift Resistance in Rock = 0.55
Extreme Limit Side & Tip Resistance = 1.00
Extreme Limit Uplift Resistance = 0.80

178565011 US60 over Cumberland River at Smithland, KY			Calculated By : WAM
Calculate Base Resistance - 90" Drilled Shafts - Pier 4			Checked by: EF, KJS
Inputs	Dimension	Reference	
GSI	40.0	--	AASHTO 2017 Figure 10.4.6.4-1
m _i	13.0	--	AASHTO 2017 Table 10.4.6.4-1
D (Disturbance Factor)	0.4	--	AASHTO 2017 (Full Faced Roller Bit)
q _u	2,567.0	ksf	USACE 2/3rd Higher Value of 14 UCRs at Pier 4
Unit Weight of Rock	156.0	pcf	Mean value of 14 unit weights at Pier 4
Existing Ground Elevation	309.9	ft.	Generalized soil profile - Pier 4
Groundwater Elevation	296.9	ft.	Generalized soil profile - Pier 4
Refusal Elevation	212.6	ft.	Generalized soil profile - Pier 4
Tip Elevation	192.0	ft.	Depth to refusal - Assumed rock socket
σ _{vb}	9.4	ksf	Effective Stress at Tip Elevation - 19' Sockets
Outputs	Dimension	Reference	
a	0.5114	--	AASHTO 2017 Eqn. 10.4.6.4-3
s	0.0005	--	AASHTO 2017 Eqn. 10.4.6.4-2
m _b	0.8926	--	AASHTO 2017 Eqn. 10.4.6.4-4
A	156.0861	ksf	AASHTO 2017 Eqn. 10.8.3.5.4c-3
q _{bn}	737.1	ksf	AASHTO 2017 Eqn. 10.8.3.5.4c-2

178565011 US60 over Cumberland River at Smithland, KY			Calculated By : WAM
Calculate Side Resistance - 90" Drilled Shafts - Pier 4			Checked by: EF, KJS
Inputs	Dimension	Reference	
P _a	2.1	ksf	AASHTO 2017 Eqn. 10.8.3.5.4b-1
C	1.0	--	AASHTO 2017 Eqn. 10.8.3.5.4b-1
q _u - rock	2,567.0	ksf	USACE 2/3rd Higher Value of 14 UCRs at Pier 4
q _u - concrete	576.0	ksf	4000psi concrete
Outputs	Dimension	Reference	
q _s	34.9	ksf	AASHTO 2017 Eqn. 10.8.3.5.4b-1

DRILLED SHAFT CAPACITY TABLE (Single Shaft Only)

Rock Socket Diameter (in) = 90
US60 over Cumberland River at Smithland, KY
Rock Socket Diameter (ft) = 7.5
1/21/2020
Calculated By: WAM
Checked By: EF, KJS

Pier 4 Tip Elevation (ft)	Nominal Unit Side Strength q _{ts} (ksf)	Nominal Unit End Bearing q _{ub} (ksf)	Nominal Side Resistance R _s (kips)	Nominal End Resistance R _{eb} (kips)	Total Nominal Axial Capacity ^{1,2,3} Q _u (kips)	Service Limit State		Strength Limit State		Extreme Limit State	
						Total Allowable Bearing Capacity FS = 2 (kips)	Total Allowable Bearing Capacity FS = 3 (kips)	Total Factored Axial Resistance φR _s (kips)	Total Factored Uplift Resistance φR _u (kips)	Total Factored Axial Resistance φR _t (kips)	Total Factored Uplift Resistance φR _u (kips)
						FS = 2 (kips)	FS = 3 (kips)	φR _s (kips)	φR _u (kips)	φR _t (kips)	φR _u (kips)
Top of Rock >>>	212.6	0.0	0	0	0	0	0	0	0	0	0
L _b	211.6	0.0	0	0	0	0	0	0	0	0	0
	210.6	0.0	0	0	0	0	0	0	0	0	0
	209.6	0.0	0	0	0	0	0	0	0	0	0
	208.6	0.0	0	0	0	0	0	0	0	0	0
	207.6	0.0	0	0	0	0	0	0	0	0	0
	206.6	0.0	0	0	0	0	0	0	0	0	0
	205.6	0.0	0	0	0	0	0	0	0	0	0
	204.6	34.9	737	823	32565	16282	10855	16282	453	32565	659
	203.6	34.9	737	1647	32565	16282	10855	16282	906	32565	1317
	202.6	34.9	737	2470	32565	16282	10855	16282	1359	32565	1976
	201.6	34.9	737	3293	32565	16282	10855	16282	1811	32565	2635
	200.6	34.9	737	4117	32565	16282	10855	16282	2264	32565	3293
	199.6	34.9	737	4940	32565	16282	10855	16282	2717	32565	3952
	198.6	34.9	737	5764	32565	16282	10855	16282	3170	32565	4611
	197.6	34.9	737	6587	32565	16282	10855	16282	3623	32565	5270
	196.6	34.9	737	7410	32565	16282	10855	16282	4076	32565	5928
	195.6	34.9	737	8234	32565	16282	10855	16282	4528	32565	6587
	194.6	34.9	737	9057	32565	16282	10855	16282	4981	32565	7246
	193.6	34.9	737	9880	32565	16282	10855	16282	5434	32565	7904
	192.6	34.9	737	10704	32565	16282	10855	16282	5887	32565	8563
	191.6	34.9	737	11527	32565	16282	10855	16282	6340	32565	9222
	190.6	34.9	737	12350	32565	16282	10855	16282	6793	32565	9880
	189.6	34.9	737	13174	32565	16282	10855	16282	7246	32565	10539
	188.6	34.9	737	13997	32565	16282	10855	16282	7698	32565	11198
	187.6	34.9	737	14820	32565	16282	10855	16282	8151	32565	11856
	186.6	34.9	737	15644	32565	16282	10855	16282	8604	32565	12515
	185.6	34.9	737	16467	32565	16282	10855	16282	9057	32565	13174
	184.6	34.9	737	17291	32565	16282	10855	16282	9510	32565	13832
	183.6	34.9	737	18114	32565	16282	10855	16282	9963	32565	14491
	182.6	34.9	737	18937	32565	16282	10855	16282	10416	32565	15150
	181.6	34.9	737	19761	32565	16282	10855	16282	10868	32565	15809
	180.6	34.9	737	20584	32565	16282	10855	16282	11321	32565	16467
	179.6	34.9	737	21407	32565	16282	10855	16282	11774	32565	17126
	178.6	34.9	737	22231	32565	16282	10855	16282	12227	32565	17785
	177.6	34.9	737	23054	32565	16282	10855	16282	12680	32565	18443
	176.6	34.9	737	23877	32565	16282	10855	16282	13133	32565	19102
	175.6	34.9	737	24701	32565	16282	10855	16282	13585	32565	19761
	174.6	34.9	737	25524	32565	16282	10855	16282	14038	32565	20419
	173.6	34.9	737	26348	32565	16282	10855	16282	14491	32565	21078
	172.6	34.9	737	27171	32565	16282	10855	16282	14944	32565	21737
	171.6	34.9	737	27994	32565	16282	10855	16282	15397	32565	22395
	170.6	34.9	737	28818	32565	16282	10855	16282	15850	32565	23054

NOTES:

- Top 1 shaft diameters of rock are neglected for resistance due to weathering
- Sampled bedrock at Pier 4 is hard to very hard. Therefore end bearing governs to approximate elevation 170.6ft.. It is assumed that both side and end resistance will not develop simultaneously.
- Estimated final grade will require no fill, therefore downdrag on shafts is not included in these calculations

D (ft.) = 7.5
Side Resistance in Rock = 0.55
Tip Resistance in Rock = 0.50
Uplift Resistance in Rock = 0.55
Extreme Limit Side & Tip Resistance = 1.00
Extreme Limit Uplift Resistance = 0.80

Seismic Analysis

Facility	US60
Section/Group	Borings
Profile Name	sp04_nor
Top of Profile Elevation	334.4 ft
Depth to water table during EQ	27.5 ft
Surcharge Pressure	psf

Strata Profile														
Non-input Information					Strata "Soil Types" Input					Strata "Soil Profile" Input				
Top Depth (ft)	Bottom Depth (ft)	Layer Name	Layer Type	G _{max} (psf)	K ₀	Mean Effective Stress at midpoint (psf)	Plasticity Index	Name (for Strata)	Unit Weight (pcf)	Modulus Reduction (G/Gmax) Model	Damping Model	Thickness (ft)	Soil Type (for Strata)	Shear Wave Velocity (fps)
0	2.36	Upper Clay	Soil	3.46E+06	0.5	97.9	5	Upper Clay 1	124.5	D8.5, p'=400, Pl=0-10	D8.5, p'=0-400, Pl=0-10	2.36	Upper Clay 1	946
2.36	4.72	Upper Clay	Soil	3.46E+06	0.5	293.8	5	Upper Clay 2	124.5	D8.5, p'=400, Pl=0-10	D8.5, p'=0-400, Pl=0-10	2.36	Upper Clay 2	946
4.72	7.08	Upper Clay	Soil	3.46E+06	0.5	489.7	5	Upper Clay 3	124.5	D8.5, p'=400-800, Pl=0-10	D8.5, p'=400-800, Pl=0-10	2.36	Upper Clay 3	946
7.08	9.44	Upper Clay	Soil	3.46E+06	0.5	685.6	5	Upper Clay 4	124.5	D8.5, p'=400-800, Pl=0-10	D8.5, p'=400-800, Pl=0-10	2.36	Upper Clay 4	946
9.44	11.8	Upper Clay	Soil	3.46E+06	0.5	881.5	5	Upper Clay 5	124.5	D8.5, p'=800-1600, Pl=0-10	D8.5, p'=800-1600, Pl=0-10	2.36	Upper Clay 5	946
11.8	14.16	Upper Clay	Soil	3.46E+06	0.5	1077.3	5	Upper Clay 6	124.5	D8.5, p'=800-1600, Pl=0-10	D8.5, p'=800-1600, Pl=0-10	2.36	Upper Clay 6	946
14.16	16.52	Upper Clay	Soil	3.46E+06	0.5	1273.2	5	Upper Clay 7	124.5	D8.5, p'=800-1600, Pl=0-10	D8.5, p'=800-1600, Pl=0-10	2.36	Upper Clay 7	946
16.52	18.88	Upper Clay	Soil	3.46E+06	0.5	1469.1	5	Upper Clay 8	124.5	D8.5, p'=800-1600, Pl=0-10	D8.5, p'=800-1600, Pl=0-10	2.36	Upper Clay 8	946
18.88	21.24	Upper Clay	Soil	3.46E+06	0.5	1665.0	5	Upper Clay 9	124.5	D8.5, p'=1600-2500, Pl=0-10	D8.5, p'=1600-2500, Pl=0-10	2.36	Upper Clay 9	946
21.24	23.6	Upper Clay	Soil	3.46E+06	0.5	1860.9	5	Upper Clay 10	124.5	D8.5, p'=1600-2500, Pl=0-10	D8.5, p'=1600-2500, Pl=0-10	2.36	Upper Clay 10	946
23.6	25.96	Upper Clay	Soil	3.46E+06	0.5	2056.7	5	Upper Clay 11	124.5	D8.5, p'=1600-2500, Pl=0-10	D8.5, p'=1600-2500, Pl=0-10	2.36	Upper Clay 11	946
25.96	27.5	Upper Clay	Soil	3.46E+06	0.5	2218.6	5	Upper Clay 12	124.5	D8.5, p'=1600-2500, Pl=0-10	D8.5, p'=1600-2500, Pl=0-10	1.54	Upper Clay 12	946
27.5	29.86	Upper Clay	Soil	3.46E+06	0.5	2331.4	5	Upper Clay 13	124.5	D8.5, p'=1600-2500, Pl=0-10	D8.5, p'=1600-2500, Pl=0-10	2.36	Upper Clay 13	946
29.86	32.22	Upper Clay	Soil	3.46E+06	0.5	2429.1	5	Upper Clay 14	124.5	D8.5, p'=1600-2500, Pl=0-10	D8.5, p'=1600-2500, Pl=0-10	2.36	Upper Clay 14	946
32.22	34.58	Upper Clay	Soil	3.46E+06	0.5	2526.8	5	Upper Clay 15	124.5	D8.5, p'=2500-5000, Pl=0-10	D8.5, p'=2500-5000, Pl=0-10	2.36	Upper Clay 15	946
34.58	36.94	Upper Clay	Soil	3.46E+06	0.5	2624.5	5	Upper Clay 16	124.5	D8.5, p'=2500-5000, Pl=0-10	D8.5, p'=2500-5000, Pl=0-10	2.36	Upper Clay 16	946
36.94	39.3	Upper Clay	Soil	3.46E+06	0.5	2722.2	5	Upper Clay 17	124.5	D8.5, p'=2500-5000, Pl=0-10	D8.5, p'=2500-5000, Pl=0-10	2.36	Upper Clay 17	946
39.3	41.66	Upper Clay	Soil	3.46E+06	0.5	2819.9	5	Upper Clay 18	124.5	D8.5, p'=2500-5000, Pl=0-10	D8.5, p'=2500-5000, Pl=0-10	2.36	Upper Clay 18	946
41.66	44.02	Upper Clay	Soil	3.46E+06	0.5	2917.6	5	Upper Clay 19	124.5	D8.5, p'=2500-5000, Pl=0-10	D8.5, p'=2500-5000, Pl=0-10	2.36	Upper Clay 19	946
44.02	46.38	Upper Clay	Soil	3.46E+06	0.5	3015.3	5	Upper Clay 20	124.5	D8.5, p'=2500-5000, Pl=0-10	D8.5, p'=2500-5000, Pl=0-10	2.36	Upper Clay 20	946
46.38	48.7	Upper Clay	Soil	3.46E+06	0.5	3072.8	5	Upper Clay 21	124.5	D8.5, p'=2500-5000, Pl=0-10	D8.5, p'=2500-5000, Pl=0-10	0.42	Upper Clay 21	946
48.7	51.06	Upper Silty Sand	Soil	1.88E+06	0.5	3119.8	0	Upper Silty Sand 22	130	D8.5, p'=2500-5000, Pl=0	D8.5, p'=2500-5000, Pl=0	1.7	Upper Silty Sand 22	682
51.06	53.42	Upper Silty Sand	Soil	1.88E+06	0.5	3196.4	0	Upper Silty Sand 23	130	D8.5, p'=2500-5000, Pl=0	D8.5, p'=2500-5000, Pl=0	1.7	Upper Silty Sand 23	682
53.42	55.78	Upper Silty Sand	Soil	1.88E+06	0.5	3273.1	0	Upper Silty Sand 24	130	D8.5, p'=2500-5000, Pl=0	D8.5, p'=2500-5000, Pl=0	1.7	Upper Silty Sand 24	682
55.78	58.14	Upper Silty Sand	Soil	1.88E+06	0.5	3349.7	0	Upper Silty Sand 25	130	D8.5, p'=2500-5000, Pl=0	D8.5, p'=2500-5000, Pl=0	1.7	Upper Silty Sand 25	682
58.14	60.5	Upper Silty Sand	Soil	1.88E+06	0.5	3426.3	0	Upper Silty Sand 26	130	D8.5, p'=2500-5000, Pl=0	D8.5, p'=2500-5000, Pl=0	1.7	Upper Silty Sand 26	682
60.5	62.86	Upper Silty Sand	Soil	1.88E+06	0.5	3502.9	0	Upper Silty Sand 27	130	D8.5, p'=2500-5000, Pl=0	D8.5, p'=2500-5000, Pl=0	1.7	Upper Silty Sand 27	682
62.86	65.22	Upper Silty Sand	Soil	1.88E+06	0.5	3552.5	0	Upper Silty Sand 28	130	D8.5, p'=2500-5000, Pl=0	D8.5, p'=2500-5000, Pl=0	0.5	Upper Silty Sand 28	682
65.22	67.58	Bedrock	Half-Space	1.28E+08	0.5	Half-Space	0	Bedrock	165	NA, Half-Space	Damping = 0.5%	Half Space	Bedrock	5000

Facility	US60
Section/Group	Borings
Profile Name	sp05_nor
Top of Profile Elevation	309.9
Depth to water table during EQ	15
Surcharge Pressure	psf

Strata Profile									
Non-input information					Strata "Soil Types" Input				
Top Depth (ft)	Bottom Depth (ft)	Layer Name	Layer Type	G _{max} (psf)	K _s	Mean Effective Stress at midpoint (psf)	Plasticity Index	Name (for Strata)	Unit Weight (pcf)
Strata "Soil Types" Input									
					Modulus Reduction (G/G _{max}) Model	Damping Model	Thickness (ft)	Soil Type (for Strata)	Shear Wave Velocity (fps)
0	2.36	Upper Clay	Soil	346E+06	0.5	97.9	5	Upper Clay 1	124.5
2.36	4.72	Upper Clay	Soil	346E+06	0.5	293.8	5	Upper Clay 2	124.5
4.72	7.08	Upper Clay	Soil	346E+06	0.5	489.7	5	Upper Clay 3	124.5
7.08	9.44	Upper Clay	Soil	346E+06	0.5	685.6	5	Upper Clay 4	124.5
9.44	11.8	Upper Clay	Soil	346E+06	0.5	881.5	5	Upper Clay 5	124.5
11.8	14.16	Upper Clay	Soil	346E+06	0.5	1077.3	5	Upper Clay 6	124.5
14.16	15	Upper Clay	Soil	346E+06	0.5	1210.1	5	Upper Clay 7	124.5
15	17.36	Upper Clay	Soil	346E+06	0.5	1293.9	5	Upper Clay 8	124.5
17.36	18	Upper Clay	Soil	346E+06	0.5	1356.0	5	Upper Clay 9	124.5
18	19.52	Upper Silty Sand	Soil	151E+06	0.5	1403.5	0	Upper Silty Sand 10	130
19.52	21.04	Upper Silty Sand	Soil	151E+06	0.5	1472.0	0	Upper Silty Sand 11	130
21.04	22.56	Upper Silty Sand	Soil	151E+06	0.5	1540.5	0	Upper Silty Sand 12	130
22.56	24.08	Upper Silty Sand	Soil	151E+06	0.5	1609.0	0	Upper Silty Sand 13	130
24.08	25.6	Upper Silty Sand	Soil	151E+06	0.5	1677.5	0	Upper Silty Sand 14	130
25.6	27.12	Upper Silty Sand	Soil	151E+06	0.5	1746.0	0	Upper Silty Sand 15	130
27.12	28.64	Upper Silty Sand	Soil	151E+06	0.5	1814.5	0	Upper Silty Sand 16	130
28.64	30.16	Upper Silty Sand	Soil	151E+06	0.5	1883.0	0	Upper Silty Sand 17	130
30.16	31.68	Upper Silty Sand	Soil	151E+06	0.5	1951.5	0	Upper Silty Sand 18	130
31.68	33.2	Upper Silty Sand	Soil	151E+06	0.5	2020.0	0	Upper Silty Sand 19	130
33.2	34.72	Upper Silty Sand	Soil	151E+06	0.5	2088.5	0	Upper Silty Sand 20	130
34.72	36.24	Upper Silty Sand	Soil	151E+06	0.5	2157.0	0	Upper Silty Sand 21	130
36.24	37.76	Upper Silty Sand	Soil	151E+06	0.5	2225.5	0	Upper Silty Sand 22	130
37.76	39.28	Upper Silty Sand	Soil	151E+06	0.5	2294.0	0	Upper Silty Sand 23	130
39.28	40.8	Upper Silty Sand	Soil	151E+06	0.5	2362.5	0	Upper Silty Sand 24	130
40.8	42.32	Upper Silty Sand	Soil	151E+06	0.5	2431.0	0	Upper Silty Sand 25	130
42.32	43.84	Upper Silty Sand	Soil	151E+06	0.5	2499.5	0	Upper Silty Sand 26	130
43.84	45.36	Upper Silty Sand	Soil	151E+06	0.5	2568.0	0	Upper Silty Sand 27	130
45.36	46.88	Upper Silty Sand	Soil	151E+06	0.5	2636.5	0	Upper Silty Sand 28	130
46.88	48.4	Upper Silty Sand	Soil	151E+06	0.5	2705.0	0	Upper Silty Sand 29	130
48.4	49.92	Upper Silty Sand	Soil	151E+06	0.5	2773.5	0	Upper Silty Sand 30	130
49.92	51.44	Upper Silty Sand	Soil	151E+06	0.5	2842.0	0	Upper Silty Sand 31	130
51.44	52	Upper Silty Sand	Soil	151E+06	0.5	2888.8	0	Upper Silty Sand 32	130
52	53.75	Lower Clays	Soil	191E+06	0.5	2937.7	22	Lower Clays 33	124.5
53.75	55.5	Lower Clays	Soil	191E+06	0.5	3010.1	22	Lower Clays 34	124.5
55.5	57.25	Lower Clays	Soil	191E+06	0.5	3082.6	22	Lower Clays 35	124.5
57.25	59	Lower Clays	Soil	191E+06	0.5	3155.0	22	Lower Clays 36	124.5
59	60.75	Lower Clays	Soil	191E+06	0.5	3227.5	22	Lower Clays 37	124.5
60.75	62.5	Lower Clays	Soil	191E+06	0.5	3299.9	22	Lower Clays 38	124.5
62.5	64.25	Lower Clays	Soil	191E+06	0.5	3372.4	22	Lower Clays 39	124.5
64.25	66	Lower Clays	Soil	191E+06	0.5	3444.8	22	Lower Clays 40	124.5
66	67.75	Lower Clays	Soil	191E+06	0.5	3517.3	22	Lower Clays 41	124.5
67.75	69.5	Lower Clays	Soil	191E+06	0.5	3589.7	22	Lower Clays 42	124.5
69.5	71.25	Lower Clays	Soil	191E+06	0.5	3662.2	22	Lower Clays 43	124.5
71.25	73	Lower Clays	Soil	191E+06	0.5	3734.6	22	Lower Clays 44	124.5
73	74.75	Lower Clays	Soil	191E+06	0.5	3807.1	22	Lower Clays 45	124.5
74.75	76.5	Lower Clays	Soil	191E+06	0.5	3879.5	22	Lower Clays 46	124.5
76.5	78	Lower Clays	Soil	191E+06	0.5	3946.8	22	Lower Clays 47	124.5
78	80.43	Lower Silty Sands	Soil	383E+06	0.5	4032.6	0	Lower Silty Sands 48	130
80.43	82.86	Lower Silty Sands	Soil	383E+06	0.5	4142.1	0	Lower Silty Sands 49	130

Strata Profile														
Non-input Information						Strata "Soil Types" Input					Strata "Soil Profile" Input			
Top Depth (ft)	Bottom Depth (ft)	Layer Name	Layer Type	G _{max} (psf)	K _c	Mean Effective Stress at midpoint (psf)	Plasticity Index	Name (for Strata)	Unit Weight (pcf)	Modulus Reduction (G/G _{max}) Model	Damping Model	Thickness (ft)	Soil Type (for Strata)	Shear Wave Velocity (fps)
82.86	85.29	Lower Silty Sands	Soil	3.83E+06	0.5	4251.6	0	Lower Silty Sands 50	130	D&S, p'=2500-5000, PI=0	D&S, p'=2500-5000, PI=0	2.43	Lower Silty Sands 50	974
85.29	87.72	Lower Silty Sands	Soil	3.83E+06	0.5	4361.2	0	Lower Silty Sands 51	130	D&S, p'=2500-5000, PI=0	D&S, p'=2500-5000, PI=0	2.43	Lower Silty Sands 51	974
87.72	90.15	Lower Silty Sands	Soil	3.83E+06	0.5	4470.7	0	Lower Silty Sands 52	130	D&S, p'=2500-5000, PI=0	D&S, p'=2500-5000, PI=0	2.43	Lower Silty Sands 52	974
90.15	92.58	Lower Silty Sands	Soil	3.83E+06	0.5	4580.2	0	Lower Silty Sands 53	130	D&S, p'=2500-5000, PI=0	D&S, p'=2500-5000, PI=0	2.43	Lower Silty Sands 53	974
92.58	95.01	Lower Silty Sands	Soil	3.83E+06	0.5	4689.7	0	Lower Silty Sands 54	130	D&S, p'=2500-5000, PI=0	D&S, p'=2500-5000, PI=0	2.43	Lower Silty Sands 54	974
95.01	97.44	Lower Silty Sands	Soil	3.83E+06	0.5	4799.2	0	Lower Silty Sands 55	130	D&S, p'=2500-5000, PI=0	D&S, p'=2500-5000, PI=0	2.43	Lower Silty Sands 55	974
97.44	99.87	Lower Silty Sands	Soil	3.83E+06	0.5	4908.7	0	Lower Silty Sands 56	130	D&S, p'=2500-5000, PI=0	D&S, p'=2500-5000, PI=0	2.43	Lower Silty Sands 56	974
99.87	102.3	Lower Silty Sands	Soil	3.83E+06	0.5	5018.2	0	Lower Silty Sands 57	130	D&S, p'=5000-7500, PI=0	D&S, p'=5000-7500, PI=0	2.43	Lower Silty Sands 57	974
102.3	104.73	Lower Silty Sands	Soil	3.83E+06	0.5	5127.7	0	Lower Silty Sands 58	130	D&S, p'=5000-7500, PI=0	D&S, p'=5000-7500, PI=0	2.43	Lower Silty Sands 58	974
104.73	105	Lower Silty Sands	Soil	3.83E+06	0.5	5188.6	0	Lower Silty Sands 59	130	D&S, p'=5000-7500, PI=0	D&S, p'=5000-7500, PI=0	0.27	Lower Silty Sands 59	974
105	Half-Space	Bedrock	Half-Space	1.28E+08	0.5	Half-Space	0	Bedrock	165	NA, Half-Space	Damping = 0.5%	Half-Space	Bedrock	5000

Facility	US60
Section/Group	Borings
Profile Name	sp06_nor
Top of Profile Elevation	324.9
Depth to water table during EQ	11.8
Surcharge Pressure	psf

Strata Profile														
Non-input Information						Strata "Soil Types" Input				Strata "Soil Profile" Input				
Top Depth (ft)	Bottom Depth (ft)	Layer Name	Layer Type	G _{max} (psf)	K _o	Mean Effective Stress at midpoint (psf)	Plasticity Index	Name (for Strata)	Unit Weight (pcf)	Modulus Reduction (G/G _{max}) Model	Damping Model	Thickness (ft)	Soil Type (for Strata)	Shear Wave Velocity (fps)
0	2.36	Upper Clay	Soil	3.46E+06	0.5	97.9	5	Upper Clay 1	124.5	D&S, p=0-400, Pi=0-10	D&S, p=0-400, Pi=0-10	2.36	Upper Clay 1	946
2.36	4.72	Upper Clay	Soil	3.46E+06	0.5	293.8	5	Upper Clay 2	124.5	D&S, p=0-400, Pi=0-10	D&S, p=0-400, Pi=0-10	2.36	Upper Clay 2	946
4.72	7.08	Upper Clay	Soil	3.46E+06	0.5	489.7	5	Upper Clay 3	124.5	D&S, p=400-800, Pi=0-10	D&S, p=400-800, Pi=0-10	2.36	Upper Clay 3	946
7.08	9.44	Upper Clay	Soil	3.46E+06	0.5	685.6	5	Upper Clay 4	124.5	D&S, p=400-800, Pi=0-10	D&S, p=400-800, Pi=0-10	2.36	Upper Clay 4	946
9.44	11.8	Upper Clay	Soil	3.46E+06	0.5	881.5	5	Upper Clay 5	124.5	D&S, p=800-1600, Pi=0-10	D&S, p=800-1600, Pi=0-10	2.36	Upper Clay 5	946
11.8	14.16	Upper Clay	Soil	3.46E+06	0.5	1028.3	5	Upper Clay 6	124.5	D&S, p=800-1600, Pi=0-10	D&S, p=800-1600, Pi=0-10	2.36	Upper Clay 6	946
14.16	16.52	Upper Clay	Soil	3.46E+06	0.5	1126.0	5	Upper Clay 7	124.5	D&S, p=800-1600, Pi=0-10	D&S, p=800-1600, Pi=0-10	2.36	Upper Clay 7	946
16.52	18.88	Upper Clay	Soil	3.46E+06	0.5	1223.7	5	Upper Clay 8	124.5	D&S, p=800-1600, Pi=0-10	D&S, p=800-1600, Pi=0-10	2.36	Upper Clay 8	946
18.88	20	Upper Clay	Soil	3.46E+06	0.5	1295.7	5	Upper Clay 9	124.5	D&S, p=800-1600, Pi=0-10	D&S, p=800-1600, Pi=0-10	1.12	Upper Clay 9	946
20	21.38	Upper Silty Sand	Soil	1.23E+06	0.5	1350.0	0	Upper Silty Sand 10	130	D&S, p=800-1600, Pi=0	D&S, p=800-1600, Pi=0	1.38	Upper Silty Sand 10	553
21.38	22.76	Upper Silty Sand	Soil	1.23E+06	0.5	1412.2	0	Upper Silty Sand 11	130	D&S, p=800-1600, Pi=0	D&S, p=800-1600, Pi=0	1.38	Upper Silty Sand 11	553
22.76	24.14	Upper Silty Sand	Soil	1.23E+06	0.5	1474.4	0	Upper Silty Sand 12	130	D&S, p=800-1600, Pi=0	D&S, p=800-1600, Pi=0	1.38	Upper Silty Sand 12	553
24.14	25	Upper Silty Sand	Soil	1.23E+06	0.5	1524.8	0	Upper Silty Sand 13	130	D&S, p=800-1600, Pi=0	D&S, p=800-1600, Pi=0	0.86	Upper Silty Sand 13	553
25	26.65	Lower Clays	Soil	1.69E+06	0.5	1578.4	22	Lower Clays 14	124.5	D&S, p=800-1600, Pi=20-25	D&S, p=800-1600, Pi=20-25	1.65	Lower Clays 14	661
26.65	28.3	Lower Clays	Soil	1.69E+06	0.5	1646.7	22	Lower Clays 15	124.5	D&S, p=1600-2500, Pi=20-25	D&S, p=1600-2500, Pi=20-25	1.65	Lower Clays 15	661
28.3	29.95	Lower Clays	Soil	1.69E+06	0.5	1715.0	22	Lower Clays 16	124.5	D&S, p=1600-2500, Pi=20-25	D&S, p=1600-2500, Pi=20-25	1.65	Lower Clays 16	661
29.95	31.6	Lower Clays	Soil	1.69E+06	0.5	1783.3	22	Lower Clays 17	124.5	D&S, p=1600-2500, Pi=20-25	D&S, p=1600-2500, Pi=20-25	1.65	Lower Clays 17	661
31.6	33.25	Lower Clays	Soil	1.69E+06	0.5	1851.6	22	Lower Clays 18	124.5	D&S, p=1600-2500, Pi=20-25	D&S, p=1600-2500, Pi=20-25	1.65	Lower Clays 18	661
33.25	34.9	Lower Clays	Soil	1.69E+06	0.5	1919.9	22	Lower Clays 19	124.5	D&S, p=1600-2500, Pi=20-25	D&S, p=1600-2500, Pi=20-25	1.65	Lower Clays 19	661
34.9	36.55	Lower Clays	Soil	1.69E+06	0.5	1988.2	22	Lower Clays 20	124.5	D&S, p=1600-2500, Pi=20-25	D&S, p=1600-2500, Pi=20-25	1.65	Lower Clays 20	661
36.55	38.2	Lower Clays	Soil	1.69E+06	0.5	2056.5	22	Lower Clays 21	124.5	D&S, p=1600-2500, Pi=20-25	D&S, p=1600-2500, Pi=20-25	1.65	Lower Clays 21	661
38.2	39.85	Lower Clays	Soil	1.69E+06	0.5	2124.8	22	Lower Clays 22	124.5	D&S, p=1600-2500, Pi=20-25	D&S, p=1600-2500, Pi=20-25	1.65	Lower Clays 22	661
39.85	41.5	Lower Clays	Soil	1.69E+06	0.5	2193.2	22	Lower Clays 23	124.5	D&S, p=1600-2500, Pi=20-25	D&S, p=1600-2500, Pi=20-25	1.65	Lower Clays 23	661
41.5	43.15	Lower Clays	Soil	1.69E+06	0.5	2261.5	22	Lower Clays 24	124.5	D&S, p=1600-2500, Pi=20-25	D&S, p=1600-2500, Pi=20-25	1.65	Lower Clays 24	661
43.15	44.8	Lower Clays	Soil	1.69E+06	0.5	2329.8	22	Lower Clays 25	124.5	D&S, p=1600-2500, Pi=20-25	D&S, p=1600-2500, Pi=20-25	1.65	Lower Clays 25	661
44.8	46.45	Lower Clays	Soil	1.69E+06	0.5	2398.1	22	Lower Clays 26	124.5	D&S, p=1600-2500, Pi=20-25	D&S, p=1600-2500, Pi=20-25	1.65	Lower Clays 26	661
46.45	48.1	Lower Clays	Soil	1.69E+06	0.5	2466.4	22	Lower Clays 27	124.5	D&S, p=1600-2500, Pi=20-25	D&S, p=1600-2500, Pi=20-25	1.65	Lower Clays 27	661
48.1	49.75	Lower Clays	Soil	1.69E+06	0.5	2534.7	22	Lower Clays 28	124.5	D&S, p=2500-5000, Pi=20-25	D&S, p=2500-5000, Pi=20-25	1.65	Lower Clays 28	661
49.75	51.4	Lower Clays	Soil	1.69E+06	0.5	2603.0	22	Lower Clays 29	124.5	D&S, p=2500-5000, Pi=20-25	D&S, p=2500-5000, Pi=20-25	1.65	Lower Clays 29	661
51.4	53.05	Lower Clays	Soil	1.69E+06	0.5	2671.3	22	Lower Clays 30	124.5	D&S, p=2500-5000, Pi=20-25	D&S, p=2500-5000, Pi=20-25	1.65	Lower Clays 30	661
53.05	54.7	Lower Clays	Soil	1.69E+06	0.5	2739.6	22	Lower Clays 31	124.5	D&S, p=2500-5000, Pi=20-25	D&S, p=2500-5000, Pi=20-25	1.65	Lower Clays 31	661
54.7	56.35	Lower Clays	Soil	1.69E+06	0.5	2807.9	22	Lower Clays 32	124.5	D&S, p=2500-5000, Pi=20-25	D&S, p=2500-5000, Pi=20-25	1.65	Lower Clays 32	661
56.35	58	Lower Clays	Soil	1.69E+06	0.5	2876.3	22	Lower Clays 33	124.5	D&S, p=2500-5000, Pi=20-25	D&S, p=2500-5000, Pi=20-25	1.65	Lower Clays 33	661
58	59.65	Lower Clays	Soil	1.69E+06	0.5	2944.6	22	Lower Clays 34	124.5	D&S, p=2500-5000, Pi=20-25	D&S, p=2500-5000, Pi=20-25	1.65	Lower Clays 34	661
59.65	61.3	Lower Clays	Soil	1.69E+06	0.5	3012.9	22	Lower Clays 35	124.5	D&S, p=2500-5000, Pi=20-25	D&S, p=2500-5000, Pi=20-25	1.65	Lower Clays 35	661
61.3	62.95	Lower Clays	Soil	1.69E+06	0.5	3081.2	22	Lower Clays 36	124.5	D&S, p=2500-5000, Pi=20-25	D&S, p=2500-5000, Pi=20-25	1.65	Lower Clays 36	661
62.95	64.6	Lower Clays	Soil	1.69E+06	0.5	3149.5	22	Lower Clays 37	124.5	D&S, p=2500-5000, Pi=20-25	D&S, p=2500-5000, Pi=20-25	1.65	Lower Clays 37	661
64.6	66.25	Lower Clays	Soil	1.69E+06	0.5	3217.8	22	Lower Clays 38	124.5	D&S, p=2500-5000, Pi=20-25	D&S, p=2500-5000, Pi=20-25	1.65	Lower Clays 38	661
66.25	67.9	Lower Clays	Soil	1.69E+06	0.5	3286.1	22	Lower Clays 39	124.5	D&S, p=2500-5000, Pi=20-25	D&S, p=2500-5000, Pi=20-25	1.65	Lower Clays 39	661
67.9	69.55	Lower Clays	Soil	1.69E+06	0.5	3354.4	22	Lower Clays 40	124.5	D&S, p=2500-5000, Pi=20-25	D&S, p=2500-5000, Pi=20-25	1.65	Lower Clays 40	661
69.55	71.2	Lower Clays	Soil	1.69E+06	0.5	3422.7	22	Lower Clays 41	124.5	D&S, p=2500-5000, Pi=20-25	D&S, p=2500-5000, Pi=20-25	1.65	Lower Clays 41	661
71.2	72.85	Lower Clays	Soil	1.69E+06	0.5	3491.0	22	Lower Clays 42	124.5	D&S, p=2500-5000, Pi=20-25	D&S, p=2500-5000, Pi=20-25	1.65	Lower Clays 42	661
72.85	74.5	Lower Clays	Soil	1.69E+06	0.5	3559.4	22	Lower Clays 43	124.5	D&S, p=2500-5000, Pi=20-25	D&S, p=2500-5000, Pi=20-25	1.65	Lower Clays 43	661
74.5	76.15	Lower Clays	Soil	1.69E+06	0.5	3627.7	22	Lower Clays 44	124.5	D&S, p=2500-5000, Pi=20-25	D&S, p=2500-5000, Pi=20-25	1.65	Lower Clays 44	661
76.15	77.8	Lower Clays	Soil	1.69E+06	0.5	3696.0	22	Lower Clays 45	124.5	D&S, p=2500-5000, Pi=20-25	D&S, p=2500-5000, Pi=20-25	1.65	Lower Clays 45	661
77.8	79.45	Lower Clays	Soil	1.69E+06	0.5	3764.3	22	Lower Clays 46	124.5	D&S, p=2500-5000, Pi=20-25	D&S, p=2500-5000, Pi=20-25	1.65	Lower Clays 46	661
79.45	80	Lower Clays	Soil	1.69E+06	0.5	3809.8	22	Lower Clays 47	124.5	D&S, p=2500-5000, Pi=20-25	D&S, p=2500-5000, Pi=20-25	0.55	Lower Clays 47	661
80	82.43	Lower Silty Sands	Soil	3.82E+06	0.5	3876.0	0	Lower Silty Sands 48	130	D&S, p=2500-5000, Pi=0	D&S, p=2500-5000, Pi=0	2.43	Lower Silty Sands 48	973
82.43	84.86	Lower Silty Sands	Soil	3.82E+06	0.5	3985.5	0	Lower Silty Sands 49	130	D&S, p=2500-5000, Pi=0	D&S, p=2500-5000, Pi=0	2.43	Lower Silty Sands 49	973

Strata Profile														
Non-input Information						Strata "Soil Types" Input					Strata "Soil Profile" Input			
Top Depth (ft)	Bottom Depth (ft)	Layer Name	Layer Type	G _{max} (psf)	K _o	Mean Effective Stress at midpoint (psf)	Plasticity Index	Name (for Strata)	Unit Weight (pcf)	Modulus Reduction (G/G _{max}) Model	Damping Model	Thickness (ft)	Soil Type (for Strata)	Shear Wave Velocity (fps)
84.86	87.29	Lower Silty Sands	Soil	3.82E+06	0.5	4095.0	0	Lower Silty Sands 50	130	D8.5, p'=2500-5000, Pi=0	D8.5, p'=2500-5000, Pi=0	2.43	Lower Silty Sands 50	973
87.29	89.72	Lower Silty Sands	Soil	3.82E+06	0.5	4204.5	0	Lower Silty Sands 51	130	D8.5, p'=2500-5000, Pi=0	D8.5, p'=2500-5000, Pi=0	2.43	Lower Silty Sands 51	973
89.72	92.15	Lower Silty Sands	Soil	3.82E+06	0.5	4314.0	0	Lower Silty Sands 52	130	D8.5, p'=2500-5000, Pi=0	D8.5, p'=2500-5000, Pi=0	2.43	Lower Silty Sands 52	973
92.15	94.58	Lower Silty Sands	Soil	3.82E+06	0.5	4423.5	0	Lower Silty Sands 53	130	D8.5, p'=2500-5000, Pi=0	D8.5, p'=2500-5000, Pi=0	2.43	Lower Silty Sands 53	973
94.58	97.01	Lower Silty Sands	Soil	3.82E+06	0.5	4533.0	0	Lower Silty Sands 54	130	D8.5, p'=2500-5000, Pi=0	D8.5, p'=2500-5000, Pi=0	2.43	Lower Silty Sands 54	973
97.01	99.44	Lower Silty Sands	Soil	3.82E+06	0.5	4642.6	0	Lower Silty Sands 55	130	D8.5, p'=2500-5000, Pi=0	D8.5, p'=2500-5000, Pi=0	2.43	Lower Silty Sands 55	973
99.44	101.87	Lower Silty Sands	Soil	3.82E+06	0.5	4752.1	0	Lower Silty Sands 56	130	D8.5, p'=2500-5000, Pi=0	D8.5, p'=2500-5000, Pi=0	2.43	Lower Silty Sands 56	973
101.87	104.3	Lower Silty Sands	Soil	3.82E+06	0.5	4861.6	0	Lower Silty Sands 57	130	D8.5, p'=2500-5000, Pi=0	D8.5, p'=2500-5000, Pi=0	2.43	Lower Silty Sands 57	973
104.3	106.73	Lower Silty Sands	Soil	3.82E+06	0.5	4971.1	0	Lower Silty Sands 58	130	D8.5, p'=2500-5000, Pi=0	D8.5, p'=2500-5000, Pi=0	2.43	Lower Silty Sands 58	973
106.73	109.16	Lower Silty Sands	Soil	3.82E+06	0.5	5080.6	0	Lower Silty Sands 59	130	D8.5, p'=5000-7500, Pi=0	D8.5, p'=5000-7500, Pi=0	2.43	Lower Silty Sands 59	973
109.16	111.59	Lower Silty Sands	Soil	3.82E+06	0.5	5190.1	0	Lower Silty Sands 60	130	D8.5, p'=5000-7500, Pi=0	D8.5, p'=5000-7500, Pi=0	2.43	Lower Silty Sands 60	973
111.59	113	Lower Silty Sands	Soil	3.82E+06	0.5	5276.6	0	Lower Silty Sands 61	130	D8.5, p'=5000-7500, Pi=0	D8.5, p'=5000-7500, Pi=0	1.41	Lower Silty Sands 61	973
113	Half-Space	Bedrock	Half-Space	1.28E+08	0.5	Half-Space	0	Bedrock	165	NA, Half-Space	Damping = 0.5%	Half-Space	Bedrock	5000

Facility	US60
Section/Group	Borings
Profile Name	sp07_nor
Top of Profile Elevation	327.9
Depth to water table during EQ	3.6
Surcharge Pressure	psf

Strata Profile														
Non-input Information						Strata "Soil Types" Input					Strata "Soil Profile" Input			
Top Depth (ft)	Bottom Depth (ft)	Layer Name	Layer Type	G _{max} (psf)	K _s	Mean Effective Stress at midpoint (psf)	Plasticity Index	Name (for Strata)	Unit Weight (pcf)	Modulus Reduction (G/G _{max}) Model	Damping Model	Thickness (ft)	Soil Type (for Strata)	Shear Wave Velocity (fps)
0	2.36	Upper Clay	Soil	3.46E+06	0.5	97.9	5	Upper Clay 1	124.5	D&S, p'=0-400, Pi=0-10	D&S, p'=0-400, Pi=0-10	2.36	Upper Clay 1	946
2.36	3.6	Upper Clay	Soil	3.46E+06	0.5	247.3	5	Upper Clay 2	124.5	D&S, p'=0-400, Pi=0-10	D&S, p'=0-400, Pi=0-10	1.24	Upper Clay 2	946
3.6	5.96	Upper Clay	Soil	3.46E+06	0.5	347.7	5	Upper Clay 3	124.5	D&S, p'=0-400, Pi=0-10	D&S, p'=0-400, Pi=0-10	2.36	Upper Clay 3	946
5.96	8.32	Upper Clay	Soil	3.46E+06	0.5	445.4	5	Upper Clay 4	124.5	D&S, p'=400-800, Pi=0-10	D&S, p'=400-800, Pi=0-10	2.36	Upper Clay 4	946
8.32	10.68	Upper Clay	Soil	3.46E+06	0.5	543.1	5	Upper Clay 5	124.5	D&S, p'=400-800, Pi=0-10	D&S, p'=400-800, Pi=0-10	2.36	Upper Clay 5	946
10.68	13.04	Upper Clay	Soil	3.46E+06	0.5	640.8	5	Upper Clay 6	124.5	D&S, p'=400-800, Pi=0-10	D&S, p'=400-800, Pi=0-10	2.36	Upper Clay 6	946
13.04	15.4	Upper Clay	Soil	3.46E+06	0.5	738.5	5	Upper Clay 7	124.5	D&S, p'=400-800, Pi=0-10	D&S, p'=400-800, Pi=0-10	2.36	Upper Clay 7	946
15.4	17.76	Upper Clay	Soil	3.46E+06	0.5	836.2	5	Upper Clay 8	124.5	D&S, p'=800-1600, Pi=0-10	D&S, p'=800-1600, Pi=0-10	2.36	Upper Clay 8	946
17.76	20	Upper Clay	Soil	3.46E+06	0.5	931.4	5	Upper Clay 9	124.5	D&S, p'=800-1600, Pi=0-10	D&S, p'=800-1600, Pi=0-10	2.24	Upper Clay 9	946
20	21.29	Upper Silty Sand	Soil	1.08E+06	0.5	1006.8	0	Upper Silty Sand 10	130	D&S, p'=800-1600, Pi=0	D&S, p'=800-1600, Pi=0	1.29	Upper Silty Sand 10	516
21.29	22.58	Upper Silty Sand	Soil	1.08E+06	0.5	1065.0	0	Upper Silty Sand 11	130	D&S, p'=800-1600, Pi=0	D&S, p'=800-1600, Pi=0	1.29	Upper Silty Sand 11	516
22.58	23.87	Upper Silty Sand	Soil	1.08E+06	0.5	1123.1	0	Upper Silty Sand 12	130	D&S, p'=800-1600, Pi=0	D&S, p'=800-1600, Pi=0	1.29	Upper Silty Sand 12	516
23.87	25	Upper Silty Sand	Soil	1.08E+06	0.5	1177.6	0	Upper Silty Sand 13	130	D&S, p'=800-1600, Pi=0	D&S, p'=800-1600, Pi=0	1.13	Upper Silty Sand 13	516
25	26.54	Lower Clays	Soil	1.48E+06	0.5	1235.0	22	Lower Clays 14	124.5	D&S, p'=800-1600, Pi=20-25	D&S, p'=800-1600, Pi=20-25	1.54	Lower Clays 14	619
26.54	28.08	Lower Clays	Soil	1.48E+06	0.5	1298.7	22	Lower Clays 15	124.5	D&S, p'=800-1600, Pi=20-25	D&S, p'=800-1600, Pi=20-25	1.54	Lower Clays 15	619
28.08	29.62	Lower Clays	Soil	1.48E+06	0.5	1362.5	22	Lower Clays 16	124.5	D&S, p'=800-1600, Pi=20-25	D&S, p'=800-1600, Pi=20-25	1.54	Lower Clays 16	619
29.62	31.16	Lower Clays	Soil	1.48E+06	0.5	1426.2	22	Lower Clays 17	124.5	D&S, p'=800-1600, Pi=20-25	D&S, p'=800-1600, Pi=20-25	1.54	Lower Clays 17	619
31.16	32.7	Lower Clays	Soil	1.48E+06	0.5	1490.0	22	Lower Clays 18	124.5	D&S, p'=800-1600, Pi=20-25	D&S, p'=800-1600, Pi=20-25	1.54	Lower Clays 18	619
32.7	34.24	Lower Clays	Soil	1.48E+06	0.5	1553.8	22	Lower Clays 19	124.5	D&S, p'=800-1600, Pi=20-25	D&S, p'=800-1600, Pi=20-25	1.54	Lower Clays 19	619
34.24	35.78	Lower Clays	Soil	1.48E+06	0.5	1617.5	22	Lower Clays 20	124.5	D&S, p'=1600-2500, Pi=20-25	D&S, p'=1600-2500, Pi=20-25	1.54	Lower Clays 20	619
35.78	37.32	Lower Clays	Soil	1.48E+06	0.5	1681.3	22	Lower Clays 21	124.5	D&S, p'=1600-2500, Pi=20-25	D&S, p'=1600-2500, Pi=20-25	1.54	Lower Clays 21	619
37.32	38.86	Lower Clays	Soil	1.48E+06	0.5	1745.0	22	Lower Clays 22	124.5	D&S, p'=1600-2500, Pi=20-25	D&S, p'=1600-2500, Pi=20-25	1.54	Lower Clays 22	619
38.86	40.4	Lower Clays	Soil	1.48E+06	0.5	1808.8	22	Lower Clays 23	124.5	D&S, p'=1600-2500, Pi=20-25	D&S, p'=1600-2500, Pi=20-25	1.54	Lower Clays 23	619
40.4	41.94	Lower Clays	Soil	1.48E+06	0.5	1872.5	22	Lower Clays 24	124.5	D&S, p'=1600-2500, Pi=20-25	D&S, p'=1600-2500, Pi=20-25	1.54	Lower Clays 24	619
41.94	43.48	Lower Clays	Soil	1.48E+06	0.5	1936.3	22	Lower Clays 25	124.5	D&S, p'=1600-2500, Pi=20-25	D&S, p'=1600-2500, Pi=20-25	1.54	Lower Clays 25	619
43.48	45.02	Lower Clays	Soil	1.48E+06	0.5	2000.0	22	Lower Clays 26	124.5	D&S, p'=1600-2500, Pi=20-25	D&S, p'=1600-2500, Pi=20-25	1.54	Lower Clays 26	619
45.02	46.56	Lower Clays	Soil	1.48E+06	0.5	2063.8	22	Lower Clays 27	124.5	D&S, p'=1600-2500, Pi=20-25	D&S, p'=1600-2500, Pi=20-25	1.54	Lower Clays 27	619
46.56	48.1	Lower Clays	Soil	1.48E+06	0.5	2127.6	22	Lower Clays 28	124.5	D&S, p'=1600-2500, Pi=20-25	D&S, p'=1600-2500, Pi=20-25	1.54	Lower Clays 28	619
48.1	49.64	Lower Clays	Soil	1.48E+06	0.5	2191.3	22	Lower Clays 29	124.5	D&S, p'=1600-2500, Pi=20-25	D&S, p'=1600-2500, Pi=20-25	1.54	Lower Clays 29	619
49.64	51.18	Lower Clays	Soil	1.48E+06	0.5	2255.1	22	Lower Clays 30	124.5	D&S, p'=1600-2500, Pi=20-25	D&S, p'=1600-2500, Pi=20-25	1.54	Lower Clays 30	619
51.18	52.72	Lower Clays	Soil	1.48E+06	0.5	2318.8	22	Lower Clays 31	124.5	D&S, p'=1600-2500, Pi=20-25	D&S, p'=1600-2500, Pi=20-25	1.54	Lower Clays 31	619
52.72	54.26	Lower Clays	Soil	1.48E+06	0.5	2382.6	22	Lower Clays 32	124.5	D&S, p'=1600-2500, Pi=20-25	D&S, p'=1600-2500, Pi=20-25	1.54	Lower Clays 32	619
54.26	55.8	Lower Clays	Soil	1.48E+06	0.5	2446.3	22	Lower Clays 33	124.5	D&S, p'=1600-2500, Pi=20-25	D&S, p'=1600-2500, Pi=20-25	1.54	Lower Clays 33	619
55.8	57.34	Lower Clays	Soil	1.48E+06	0.5	2510.1	22	Lower Clays 34	124.5	D&S, p'=2500-5000, Pi=20-25	D&S, p'=2500-5000, Pi=20-25	1.54	Lower Clays 34	619
57.34	58.88	Lower Clays	Soil	1.48E+06	0.5	2573.8	22	Lower Clays 35	124.5	D&S, p'=2500-5000, Pi=20-25	D&S, p'=2500-5000, Pi=20-25	1.54	Lower Clays 35	619
58.88	60.42	Lower Clays	Soil	1.48E+06	0.5	2637.6	22	Lower Clays 36	124.5	D&S, p'=2500-5000, Pi=20-25	D&S, p'=2500-5000, Pi=20-25	1.54	Lower Clays 36	619
60.42	61.96	Lower Clays	Soil	1.48E+06	0.5	2701.4	22	Lower Clays 37	124.5	D&S, p'=2500-5000, Pi=20-25	D&S, p'=2500-5000, Pi=20-25	1.54	Lower Clays 37	619
61.96	63.5	Lower Clays	Soil	1.48E+06	0.5	2765.1	22	Lower Clays 38	124.5	D&S, p'=2500-5000, Pi=20-25	D&S, p'=2500-5000, Pi=20-25	1.54	Lower Clays 38	619
63.5	65.04	Lower Clays	Soil	1.48E+06	0.5	2828.9	22	Lower Clays 39	124.5	D&S, p'=2500-5000, Pi=20-25	D&S, p'=2500-5000, Pi=20-25	1.54	Lower Clays 39	619
65.04	66.58	Lower Clays	Soil	1.48E+06	0.5	2892.6	22	Lower Clays 40	124.5	D&S, p'=2500-5000, Pi=20-25	D&S, p'=2500-5000, Pi=20-25	1.54	Lower Clays 40	619
66.58	68.1	Lower Clays	Soil	1.48E+06	0.5	2956.1	22	Lower Clays 41	124.5	D&S, p'=2500-5000, Pi=20-25	D&S, p'=2500-5000, Pi=20-25	0.22	Lower Clays 41	619
68.1	69.65	Lower Silty Sands	Soil	3.59E+06	0.5	2986.6	0	Lower Silty Sands 42	130	D&S, p'=2500-5000, Pi=0	D&S, p'=2500-5000, Pi=0	2.35	Lower Silty Sands 42	943
69.65	71.15	Lower Silty Sands	Soil	3.59E+06	0.5	3092.5	0	Lower Silty Sands 43	130	D&S, p'=2500-5000, Pi=0	D&S, p'=2500-5000, Pi=0	2.35	Lower Silty Sands 43	943
71.15	73.85	Lower Silty Sands	Soil	3.59E+06	0.5	3198.4	0	Lower Silty Sands 44	130	D&S, p'=2500-5000, Pi=0	D&S, p'=2500-5000, Pi=0	2.35	Lower Silty Sands 44	943
73.85	76.2	Lower Silty Sands	Soil	3.59E+06	0.5	3304.3	0	Lower Silty Sands 45	130	D&S, p'=2500-5000, Pi=0	D&S, p'=2500-5000, Pi=0	2.35	Lower Silty Sands 45	943
76.2	78.55	Lower Silty Sands	Soil	3.59E+06	0.5	3410.2	0	Lower Silty Sands 46	130	D&S, p'=2500-5000, Pi=0	D&S, p'=2500-5000, Pi=0	2.35	Lower Silty Sands 46	943
78.55	80.9	Lower Silty Sands	Soil	3.59E+06	0.5	3516.1	0	Lower Silty Sands 47	130	D&S, p'=2500-5000, Pi=0	D&S, p'=2500-5000, Pi=0	2.35	Lower Silty Sands 47	943
80.9	83.25	Lower Silty Sands	Soil	3.59E+06	0.5	3622.0	0	Lower Silty Sands 48	130	D&S, p'=2500-5000, Pi=0	D&S, p'=2500-5000, Pi=0	2.35	Lower Silty Sands 48	943
83.25	85.6	Lower Silty Sands	Soil	3.59E+06	0.5	3727.9	0	Lower Silty Sands 49	130	D&S, p'=2500-5000, Pi=0	D&S, p'=2500-5000, Pi=0	2.35	Lower Silty Sands 49	943

Strata Profile														
Non-input Information						Strata "Soil Types" Input					Strata "Soil Profile" Input			
Top Depth (ft)	Bottom Depth (ft)	Layer Name	Layer Type	G _{max} (psf)	K _c	Mean Effective Stress at midpoint (psf)	Plasticity Index	Name (for Strata)	Unit Weight (pcf)	Modulus Reduction (G/G _{max}) Model	Damping Model	Thickness (ft)	Soil Type (for Strata)	Shear Wave Velocity (fps)
85.6	87.95	Lower Silty Sands	Soil	3.59E+06	0.5	3833.8	0	Lower Silty Sands 50	130	D&S, p'=2500-5000, PI=0	D&S, p'=2500-5000, PI=0	2.35	Lower Silty Sands 50	943
87.95	90.3	Lower Silty Sands	Soil	3.59E+06	0.5	3939.7	0	Lower Silty Sands 51	130	D&S, p'=2500-5000, PI=0	D&S, p'=2500-5000, PI=0	2.35	Lower Silty Sands 51	943
90.3	92.65	Lower Silty Sands	Soil	3.59E+06	0.5	4045.6	0	Lower Silty Sands 52	130	D&S, p'=2500-5000, PI=0	D&S, p'=2500-5000, PI=0	2.35	Lower Silty Sands 52	943
92.65	95	Lower Silty Sands	Soil	3.59E+06	0.5	4151.5	0	Lower Silty Sands 53	130	D&S, p'=2500-5000, PI=0	D&S, p'=2500-5000, PI=0	2.35	Lower Silty Sands 53	943
95	97.35	Lower Silty Sands	Soil	3.59E+06	0.5	4257.4	0	Lower Silty Sands 54	130	D&S, p'=2500-5000, PI=0	D&S, p'=2500-5000, PI=0	2.35	Lower Silty Sands 54	943
97.35	99.7	Lower Silty Sands	Soil	3.59E+06	0.5	4363.4	0	Lower Silty Sands 55	130	D&S, p'=2500-5000, PI=0	D&S, p'=2500-5000, PI=0	2.35	Lower Silty Sands 55	943
99.7	102.05	Lower Silty Sands	Soil	3.59E+06	0.5	4469.3	0	Lower Silty Sands 56	130	D&S, p'=2500-5000, PI=0	D&S, p'=2500-5000, PI=0	2.35	Lower Silty Sands 56	943
102.05	104.4	Lower Silty Sands	Soil	3.59E+06	0.5	4575.2	0	Lower Silty Sands 57	130	D&S, p'=2500-5000, PI=0	D&S, p'=2500-5000, PI=0	2.35	Lower Silty Sands 57	943
104.4	106.75	Lower Silty Sands	Soil	3.59E+06	0.5	4681.1	0	Lower Silty Sands 58	130	D&S, p'=2500-5000, PI=0	D&S, p'=2500-5000, PI=0	2.35	Lower Silty Sands 58	943
106.75	109.1	Lower Silty Sands	Soil	3.59E+06	0.5	4787.0	0	Lower Silty Sands 59	130	D&S, p'=2500-5000, PI=0	D&S, p'=2500-5000, PI=0	2.35	Lower Silty Sands 59	943
109.1	111.45	Lower Silty Sands	Soil	3.59E+06	0.5	4892.9	0	Lower Silty Sands 60	130	D&S, p'=2500-5000, PI=0	D&S, p'=2500-5000, PI=0	2.35	Lower Silty Sands 60	943
111.45	113.8	Lower Silty Sands	Soil	3.59E+06	0.5	4998.8	0	Lower Silty Sands 61	130	D&S, p'=2500-5000, PI=0	D&S, p'=2500-5000, PI=0	2.35	Lower Silty Sands 61	943
113.8	116	Lower Silty Sands	Soil	3.59E+06	0.5	5101.3	0	Lower Silty Sands 62	130	D&S, p'=5000-7500, PI=0	D&S, p'=5000-7500, PI=0	2.2	Lower Silty Sands 62	943
116	Half-Space	Bedrock	Half-Space	1.28E+08	0.5	Half-Space	0	Bedrock	165	NA, Half-Space	Damping = 0.5%	Half Space	Bedrock	5000

Facility	US60
Section/Group	Borings
Profile Name	sp08_nor
Top of Profile Elevation	331.8
Depth to water table during EQ	8.7
Surcharge Pressure	psf

Strata Profile														
Non-input Information						Strata "Soil Types" Input				Strata "Soil Profile" Input				
Top Depth (ft)	Bottom Depth (ft)	Layer Name	Layer Type	G _{max} (psf)	K _s	Mean Effective Stress at midpoint (psf)	Plasticity Index	Name (for Strata)	Unit Weight (pcf)	Modulus Reduction (G/G _{max}) Model	Damping Model	Thickness (ft)	Soil Type (for Strata)	Shear Wave Velocity (fps)
0	2.36	Upper Clay	Soil	3.46E+06	0.5	97.9	5	Upper Clay 1	124.5	D8.5, p=0-400, Pi=0-10	D8.5, p=0-400, Pi=0-10	2.36	Upper Clay 1	946
2.36	4.72	Upper Clay	Soil	3.46E+06	0.5	293.8	5	Upper Clay 2	124.5	D8.5, p=0-400, Pi=0-10	D8.5, p=0-400, Pi=0-10	2.36	Upper Clay 2	946
4.72	7.08	Upper Clay	Soil	3.46E+06	0.5	489.7	5	Upper Clay 3	124.5	D8.5, p=400-800, Pi=0-10	D8.5, p=400-800, Pi=0-10	2.36	Upper Clay 3	946
7.08	8.7	Upper Clay	Soil	3.46E+06	0.5	654.9	5	Upper Clay 4	124.5	D8.5, p=400-800, Pi=0-10	D8.5, p=400-800, Pi=0-10	1.62	Upper Clay 4	946
8.7	11.06	Upper Clay	Soil	3.46E+06	0.5	771.0	5	Upper Clay 5	124.5	D8.5, p=400-800, Pi=0-10	D8.5, p=400-800, Pi=0-10	2.36	Upper Clay 5	946
11.06	13.42	Upper Clay	Soil	3.46E+06	0.5	868.7	5	Upper Clay 6	124.5	D8.5, p=800-1600, Pi=0-10	D8.5, p=800-1600, Pi=0-10	2.36	Upper Clay 6	946
13.42	15.78	Upper Clay	Soil	3.46E+06	0.5	966.4	5	Upper Clay 7	124.5	D8.5, p=800-1600, Pi=0-10	D8.5, p=800-1600, Pi=0-10	2.36	Upper Clay 7	946
15.78	18.14	Upper Clay	Soil	3.46E+06	0.5	1064.1	5	Upper Clay 8	124.5	D8.5, p=800-1600, Pi=0-10	D8.5, p=800-1600, Pi=0-10	2.36	Upper Clay 8	946
18.14	20	Upper Clay	Soil	3.46E+06	0.5	1151.4	5	Upper Clay 9	124.5	D8.5, p=800-1600, Pi=0-10	D8.5, p=800-1600, Pi=0-10	1.86	Upper Clay 9	946
20	21.37	Upper Silty Sand	Soil	1.23E+06	0.5	1220.8	0	Upper Silty Sand 10	130	D8.5, p=800-1600, Pi=0	D8.5, p=800-1600, Pi=0	1.37	Upper Silty Sand 10	551
21.37	22.74	Upper Silty Sand	Soil	1.23E+06	0.5	1282.5	0	Upper Silty Sand 11	130	D8.5, p=800-1600, Pi=0	D8.5, p=800-1600, Pi=0	1.37	Upper Silty Sand 11	551
22.74	24.11	Upper Silty Sand	Soil	1.23E+06	0.5	1344.3	0	Upper Silty Sand 12	130	D8.5, p=800-1600, Pi=0	D8.5, p=800-1600, Pi=0	1.37	Upper Silty Sand 12	551
24.11	25.48	Upper Silty Sand	Soil	1.23E+06	0.5	1406.0	0	Upper Silty Sand 13	130	D8.5, p=800-1600, Pi=0	D8.5, p=800-1600, Pi=0	1.37	Upper Silty Sand 13	551
25.48	26.85	Upper Silty Sand	Soil	1.23E+06	0.5	1467.8	0	Upper Silty Sand 14	130	D8.5, p=800-1600, Pi=0	D8.5, p=800-1600, Pi=0	1.37	Upper Silty Sand 14	551
26.85	28.22	Upper Silty Sand	Soil	1.23E+06	0.5	1529.5	0	Upper Silty Sand 15	130	D8.5, p=800-1600, Pi=0	D8.5, p=800-1600, Pi=0	1.37	Upper Silty Sand 15	551
28.22	29.59	Upper Silty Sand	Soil	1.23E+06	0.5	1591.2	0	Upper Silty Sand 16	130	D8.5, p=800-1600, Pi=0	D8.5, p=800-1600, Pi=0	1.37	Upper Silty Sand 16	551
29.59	30	Upper Silty Sand	Soil	1.23E+06	0.5	1631.3	0	Upper Silty Sand 17	130	D8.5, p=1600-2500, Pi=0	D8.5, p=1600-2500, Pi=0	0.41	Upper Silty Sand 17	551
30	31.65	Lower Clays	Soil	1.69E+06	0.5	1674.7	22	Lower Clays 18	124.5	D8.5, p=1600-2500, Pi=20-25	D8.5, p=1600-2500, Pi=20-25	1.65	Lower Clays 18	660
31.65	33.3	Lower Clays	Soil	1.69E+06	0.5	1743.1	22	Lower Clays 19	124.5	D8.5, p=1600-2500, Pi=20-25	D8.5, p=1600-2500, Pi=20-25	1.65	Lower Clays 19	660
33.3	34.95	Lower Clays	Soil	1.69E+06	0.5	1811.4	22	Lower Clays 20	124.5	D8.5, p=1600-2500, Pi=20-25	D8.5, p=1600-2500, Pi=20-25	1.65	Lower Clays 20	660
34.95	36.6	Lower Clays	Soil	1.69E+06	0.5	1879.7	22	Lower Clays 21	124.5	D8.5, p=1600-2500, Pi=20-25	D8.5, p=1600-2500, Pi=20-25	1.65	Lower Clays 21	660
36.6	38.25	Lower Clays	Soil	1.69E+06	0.5	1948.0	22	Lower Clays 22	124.5	D8.5, p=1600-2500, Pi=20-25	D8.5, p=1600-2500, Pi=20-25	1.65	Lower Clays 22	660
38.25	39.9	Lower Clays	Soil	1.69E+06	0.5	2016.3	22	Lower Clays 23	124.5	D8.5, p=1600-2500, Pi=20-25	D8.5, p=1600-2500, Pi=20-25	1.65	Lower Clays 23	660
39.9	41.55	Lower Clays	Soil	1.69E+06	0.5	2084.6	22	Lower Clays 24	124.5	D8.5, p=1600-2500, Pi=20-25	D8.5, p=1600-2500, Pi=20-25	1.65	Lower Clays 24	660
41.55	43.2	Lower Clays	Soil	1.69E+06	0.5	2152.9	22	Lower Clays 25	124.5	D8.5, p=1600-2500, Pi=20-25	D8.5, p=1600-2500, Pi=20-25	1.65	Lower Clays 25	660
43.2	44.85	Lower Clays	Soil	1.69E+06	0.5	2221.2	22	Lower Clays 26	124.5	D8.5, p=1600-2500, Pi=20-25	D8.5, p=1600-2500, Pi=20-25	1.65	Lower Clays 26	660
44.85	46.5	Lower Clays	Soil	1.69E+06	0.5	2289.5	22	Lower Clays 27	124.5	D8.5, p=1600-2500, Pi=20-25	D8.5, p=1600-2500, Pi=20-25	1.65	Lower Clays 27	660
46.5	48.15	Lower Clays	Soil	1.69E+06	0.5	2357.8	22	Lower Clays 28	124.5	D8.5, p=1600-2500, Pi=20-25	D8.5, p=1600-2500, Pi=20-25	1.65	Lower Clays 28	660
48.15	49.8	Lower Clays	Soil	1.69E+06	0.5	2426.2	22	Lower Clays 29	124.5	D8.5, p=1600-2500, Pi=20-25	D8.5, p=1600-2500, Pi=20-25	1.65	Lower Clays 29	660
49.8	51.45	Lower Clays	Soil	1.69E+06	0.5	2494.5	22	Lower Clays 30	124.5	D8.5, p=1600-2500, Pi=20-25	D8.5, p=1600-2500, Pi=20-25	1.65	Lower Clays 30	660
51.45	53.1	Lower Clays	Soil	1.69E+06	0.5	2562.8	22	Lower Clays 31	124.5	D8.5, p=2500-5000, Pi=20-25	D8.5, p=2500-5000, Pi=20-25	1.65	Lower Clays 31	660
53.1	54.75	Lower Clays	Soil	1.69E+06	0.5	2631.1	22	Lower Clays 32	124.5	D8.5, p=2500-5000, Pi=20-25	D8.5, p=2500-5000, Pi=20-25	1.65	Lower Clays 32	660
54.75	56.4	Lower Clays	Soil	1.69E+06	0.5	2699.4	22	Lower Clays 33	124.5	D8.5, p=2500-5000, Pi=20-25	D8.5, p=2500-5000, Pi=20-25	1.65	Lower Clays 33	660
56.4	58.05	Lower Clays	Soil	1.69E+06	0.5	2767.7	22	Lower Clays 34	124.5	D8.5, p=2500-5000, Pi=20-25	D8.5, p=2500-5000, Pi=20-25	1.65	Lower Clays 34	660
58.05	59.7	Lower Clays	Soil	1.69E+06	0.5	2836.0	22	Lower Clays 35	124.5	D8.5, p=2500-5000, Pi=20-25	D8.5, p=2500-5000, Pi=20-25	1.65	Lower Clays 35	660
59.7	61.35	Lower Clays	Soil	1.69E+06	0.5	2904.3	22	Lower Clays 36	124.5	D8.5, p=2500-5000, Pi=20-25	D8.5, p=2500-5000, Pi=20-25	1.65	Lower Clays 36	660
61.35	63	Lower Clays	Soil	1.69E+06	0.5	2972.6	22	Lower Clays 37	124.5	D8.5, p=2500-5000, Pi=20-25	D8.5, p=2500-5000, Pi=20-25	1.65	Lower Clays 37	660
63	64.65	Lower Clays	Soil	1.69E+06	0.5	3040.9	22	Lower Clays 38	124.5	D8.5, p=2500-5000, Pi=20-25	D8.5, p=2500-5000, Pi=20-25	1.65	Lower Clays 38	660
64.65	66.3	Lower Clays	Soil	1.69E+06	0.5	3109.3	22	Lower Clays 39	124.5	D8.5, p=2500-5000, Pi=20-25	D8.5, p=2500-5000, Pi=20-25	1.65	Lower Clays 39	660
66.3	67.95	Lower Clays	Soil	1.69E+06	0.5	3177.6	22	Lower Clays 40	124.5	D8.5, p=2500-5000, Pi=20-25	D8.5, p=2500-5000, Pi=20-25	1.65	Lower Clays 40	660
67.95	69.6	Lower Clays	Soil	1.69E+06	0.5	3245.9	22	Lower Clays 41	124.5	D8.5, p=2500-5000, Pi=20-25	D8.5, p=2500-5000, Pi=20-25	1.65	Lower Clays 41	660
69.6	71.25	Lower Clays	Soil	1.69E+06	0.5	3314.2	22	Lower Clays 42	124.5	D8.5, p=2500-5000, Pi=20-25	D8.5, p=2500-5000, Pi=20-25	1.65	Lower Clays 42	660
71.25	72.9	Lower Clays	Soil	1.69E+06	0.5	3382.5	22	Lower Clays 43	124.5	D8.5, p=2500-5000, Pi=20-25	D8.5, p=2500-5000, Pi=20-25	1.65	Lower Clays 43	660
72.9	74.55	Lower Clays	Soil	1.69E+06	0.5	3450.8	22	Lower Clays 44	124.5	D8.5, p=2500-5000, Pi=20-25	D8.5, p=2500-5000, Pi=20-25	1.65	Lower Clays 44	660
74.55	76.2	Lower Clays	Soil	1.69E+06	0.5	3519.1	22	Lower Clays 45	124.5	D8.5, p=2500-5000, Pi=20-25	D8.5, p=2500-5000, Pi=20-25	1.65	Lower Clays 45	660
76.2	77.85	Lower Clays	Soil	1.69E+06	0.5	3587.4	22	Lower Clays 46	124.5	D8.5, p=2500-5000, Pi=20-25	D8.5, p=2500-5000, Pi=20-25	1.65	Lower Clays 46	660
77.85	79.5	Lower Clays	Soil	1.69E+06	0.5	3655.7	22	Lower Clays 47	124.5	D8.5, p=2500-5000, Pi=20-25	D8.5, p=2500-5000, Pi=20-25	1.65	Lower Clays 47	660
79.5	80	Lower Clays	Soil	1.69E+06	0.5	3700.2	22	Lower Clays 48	124.5	D8.5, p=2500-5000, Pi=20-25	D8.5, p=2500-5000, Pi=20-25	0.5	Lower Clays 48	660
80	82.43	Lower Silty Sands	Soil	3.83E+06	0.5	3765.3	0	Lower Silty Sands 49	130	D8.5, p=2500-5000, Pi=0	D8.5, p=2500-5000, Pi=0	2.43	Lower Silty Sands 49	974

Strata Profile														
Non-input Information						Strata "Soil Types" Input				Strata "Soil Profile" Input				
Top Depth (ft)	Bottom Depth (ft)	Layer Name	Layer Type	G _{max} (psf)	K _c	Mean Effective Stress at midpoint (psf)	Plasticity Index	Name (for Strata)	Unit Weight (pcf)	Modulus Reduction (G/Gmax) Model	Damping Model	Thickness (ft)	Soil Type (for Strata)	Shear Wave Velocity (fps)
82.43	84.86	Lower Silty Sands	Soil	3.83E+06	0.5	3874.9	0	Lower Silty Sands 50	130	D&S, p'=2500-5000, Pl=0	D&S, p'=2500-5000, Pl=0	2.43	Lower Silty Sands 50	974
84.86	87.29	Lower Silty Sands	Soil	3.83E+06	0.5	3984.4	0	Lower Silty Sands 51	130	D&S, p'=2500-5000, Pl=0	D&S, p'=2500-5000, Pl=0	2.43	Lower Silty Sands 51	974
87.29	89.72	Lower Silty Sands	Soil	3.83E+06	0.5	4093.9	0	Lower Silty Sands 52	130	D&S, p'=2500-5000, Pl=0	D&S, p'=2500-5000, Pl=0	2.43	Lower Silty Sands 52	974
89.72	92.15	Lower Silty Sands	Soil	3.83E+06	0.5	4203.4	0	Lower Silty Sands 53	130	D&S, p'=2500-5000, Pl=0	D&S, p'=2500-5000, Pl=0	2.43	Lower Silty Sands 53	974
92.15	94.58	Lower Silty Sands	Soil	3.83E+06	0.5	4312.9	0	Lower Silty Sands 54	130	D&S, p'=2500-5000, Pl=0	D&S, p'=2500-5000, Pl=0	2.43	Lower Silty Sands 54	974
94.58	97.01	Lower Silty Sands	Soil	3.83E+06	0.5	4422.4	0	Lower Silty Sands 55	130	D&S, p'=2500-5000, Pl=0	D&S, p'=2500-5000, Pl=0	2.43	Lower Silty Sands 55	974
97.01	99.44	Lower Silty Sands	Soil	3.83E+06	0.5	4531.9	0	Lower Silty Sands 56	130	D&S, p'=2500-5000, Pl=0	D&S, p'=2500-5000, Pl=0	2.43	Lower Silty Sands 56	974
99.44	101.87	Lower Silty Sands	Soil	3.83E+06	0.5	4641.4	0	Lower Silty Sands 57	130	D&S, p'=2500-5000, Pl=0	D&S, p'=2500-5000, Pl=0	2.43	Lower Silty Sands 57	974
101.87	104.3	Lower Silty Sands	Soil	3.83E+06	0.5	4751.0	0	Lower Silty Sands 58	130	D&S, p'=2500-5000, Pl=0	D&S, p'=2500-5000, Pl=0	2.43	Lower Silty Sands 58	974
104.3	106.73	Lower Silty Sands	Soil	3.83E+06	0.5	4860.5	0	Lower Silty Sands 59	130	D&S, p'=2500-5000, Pl=0	D&S, p'=2500-5000, Pl=0	2.43	Lower Silty Sands 59	974
106.73	109.16	Lower Silty Sands	Soil	3.83E+06	0.5	4970.0	0	Lower Silty Sands 60	130	D&S, p'=2500-5000, Pl=0	D&S, p'=2500-5000, Pl=0	2.43	Lower Silty Sands 60	974
109.16	111.59	Lower Silty Sands	Soil	3.83E+06	0.5	5079.5	0	Lower Silty Sands 61	130	D&S, p'=5000-7500, Pl=0	D&S, p'=5000-7500, Pl=0	2.43	Lower Silty Sands 61	974
111.59	114.02	Lower Silty Sands	Soil	3.83E+06	0.5	5189.0	0	Lower Silty Sands 62	130	D&S, p'=5000-7500, Pl=0	D&S, p'=5000-7500, Pl=0	2.43	Lower Silty Sands 62	974
114.02	116.45	Lower Silty Sands	Soil	3.83E+06	0.5	5298.5	0	Lower Silty Sands 63	130	D&S, p'=5000-7500, Pl=0	D&S, p'=5000-7500, Pl=0	2.43	Lower Silty Sands 63	974
116.45	118.88	Lower Silty Sands	Soil	3.83E+06	0.5	5408.0	0	Lower Silty Sands 64	130	D&S, p'=5000-7500, Pl=0	D&S, p'=5000-7500, Pl=0	2.43	Lower Silty Sands 64	974
118.88	119.2	Lower Silty Sands	Soil	3.83E+06	0.5	5470.0	0	Lower Silty Sands 65	130	D&S, p'=5000-7500, Pl=0	D&S, p'=5000-7500, Pl=0	0.32	Lower Silty Sands 65	974
119.2	Half-Space	Bedrock	Half-Space	1.28E+08	0.5	Half-Space	0	Bedrock	165	NA, Half-Space	Damping = 0.5%	Half-Space	Bedrock	5000

Facility	US60
Section/Group	Borings
Profile Name	sp09_nor
Top of Profile Elevation	337.1
Depth to water table during EQ	9.3
Surcharge Pressure	psf

Strata Profile									
Non-input information					Strata "Soil Types" Input				
Top Depth (ft)	Bottom Depth (ft)	Layer Name	Layer Type	G _{max} (psf)	K _s	Mean Effective Stress at midpoint (psf)	Plasticity Index	Name (for Strata)	Unit Weight (pcf)
Strata "Soil Types" Input									
					Modulus Reduction (G/G _{max}) Model	Damping Model	Thickness (ft)	Soil Type (for Strata)	Shear Wave Velocity (fps)
0	2.36	Upper Clay	Soil	3.46E+06	0.5	97.9	5	Upper Clay 1	124.5
2.36	4.72	Upper Clay	Soil	3.46E+06	0.5	293.8	5	Upper Clay 2	124.5
4.72	7.08	Upper Clay	Soil	3.46E+06	0.5	489.7	5	Upper Clay 3	124.5
7.08	9.3	Upper Clay	Soil	3.46E+06	0.5	679.8	5	Upper Clay 4	124.5
9.3	11.66	Upper Clay	Soil	3.46E+06	0.5	820.8	5	Upper Clay 5	124.5
11.66	14.02	Upper Clay	Soil	3.46E+06	0.5	918.5	5	Upper Clay 6	124.5
14.02	15.1	Upper Clay	Soil	3.46E+06	0.5	989.7	5	Upper Clay 7	124.5
15.1	16.48	Upper Silty Sand	Soil	1.25E+06	0.5	1043.1	0	Upper Silty Sand 8	130
16.48	17.86	Upper Silty Sand	Soil	1.25E+06	0.5	1105.3	0	Upper Silty Sand 9	130
17.86	19.24	Upper Silty Sand	Soil	1.25E+06	0.5	1167.5	0	Upper Silty Sand 10	130
19.24	20.62	Upper Silty Sand	Soil	1.25E+06	0.5	1229.7	0	Upper Silty Sand 11	130
20.62	22	Upper Silty Sand	Soil	1.25E+06	0.5	1291.9	0	Upper Silty Sand 12	130
22	23.38	Upper Silty Sand	Soil	1.25E+06	0.5	1354.1	0	Upper Silty Sand 13	130
23.38	24.76	Upper Silty Sand	Soil	1.25E+06	0.5	1416.3	0	Upper Silty Sand 14	130
24.76	26.14	Upper Silty Sand	Soil	1.25E+06	0.5	1478.5	0	Upper Silty Sand 15	130
26.14	27.52	Upper Silty Sand	Soil	1.25E+06	0.5	1540.7	0	Upper Silty Sand 16	130
27.52	28.9	Upper Silty Sand	Soil	1.25E+06	0.5	1602.8	0	Upper Silty Sand 17	130
28.9	30.28	Upper Silty Sand	Soil	1.25E+06	0.5	1665.0	0	Upper Silty Sand 18	130
30.28	31.66	Upper Silty Sand	Soil	1.25E+06	0.5	1727.2	0	Upper Silty Sand 19	130
31.66	33.04	Upper Silty Sand	Soil	1.25E+06	0.5	1789.4	0	Upper Silty Sand 20	130
33.04	34.42	Upper Silty Sand	Soil	1.25E+06	0.5	1851.6	0	Upper Silty Sand 21	130
34.42	35	Upper Silty Sand	Soil	1.25E+06	0.5	1895.8	0	Upper Silty Sand 22	130
35	36.62	Lower Clays	Soil	1.64E+06	0.5	1942.4	22	Lower Clays 23	124.5
36.62	38.24	Lower Clays	Soil	1.64E+06	0.5	2009.4	22	Lower Clays 24	124.5
38.24	39.86	Lower Clays	Soil	1.64E+06	0.5	2076.5	22	Lower Clays 25	124.5
39.86	41.48	Lower Clays	Soil	1.64E+06	0.5	2143.6	22	Lower Clays 26	124.5
41.48	43.1	Lower Clays	Soil	1.64E+06	0.5	2210.7	22	Lower Clays 27	124.5
43.1	44.72	Lower Clays	Soil	1.64E+06	0.5	2277.7	22	Lower Clays 28	124.5
44.72	46.34	Lower Clays	Soil	1.64E+06	0.5	2344.8	22	Lower Clays 29	124.5
46.34	47.96	Lower Clays	Soil	1.64E+06	0.5	2411.9	22	Lower Clays 30	124.5
47.96	49.58	Lower Clays	Soil	1.64E+06	0.5	2478.9	22	Lower Clays 31	124.5
49.58	51.2	Lower Clays	Soil	1.64E+06	0.5	2546.0	22	Lower Clays 32	124.5
51.2	52.82	Lower Clays	Soil	1.64E+06	0.5	2613.1	22	Lower Clays 33	124.5
52.82	54.44	Lower Clays	Soil	1.64E+06	0.5	2680.1	22	Lower Clays 34	124.5
54.44	56.06	Lower Clays	Soil	1.64E+06	0.5	2747.2	22	Lower Clays 35	124.5
56.06	57.68	Lower Clays	Soil	1.64E+06	0.5	2814.3	22	Lower Clays 36	124.5
57.68	59.3	Lower Clays	Soil	1.64E+06	0.5	2881.3	22	Lower Clays 37	124.5
59.3	60.92	Lower Clays	Soil	1.64E+06	0.5	2948.4	22	Lower Clays 38	124.5
60.92	62.54	Lower Clays	Soil	1.64E+06	0.5	3015.5	22	Lower Clays 39	124.5
62.54	64.16	Lower Clays	Soil	1.64E+06	0.5	3082.5	22	Lower Clays 40	124.5
64.16	65	Lower Clays	Soil	1.64E+06	0.5	3133.5	22	Lower Clays 41	124.5
65	67.42	Lower Silty Sands	Soil	3.79E+06	0.5	3205.4	0	Lower Silty Sands 42	130
67.42	69.84	Lower Silty Sands	Soil	3.79E+06	0.5	3314.4	0	Lower Silty Sands 43	130
69.84	72.26	Lower Silty Sands	Soil	3.79E+06	0.5	3423.5	0	Lower Silty Sands 44	130
72.26	74.68	Lower Silty Sands	Soil	3.79E+06	0.5	3532.6	0	Lower Silty Sands 45	130
74.68	77.1	Lower Silty Sands	Soil	3.79E+06	0.5	3641.6	0	Lower Silty Sands 46	130
77.1	79.52	Lower Silty Sands	Soil	3.79E+06	0.5	3750.7	0	Lower Silty Sands 47	130
79.52	81.94	Lower Silty Sands	Soil	3.79E+06	0.5	3859.7	0	Lower Silty Sands 48	130
81.94	84.36	Lower Silty Sands	Soil	3.79E+06	0.5	3968.8	0	Lower Silty Sands 49	130

Strata Profile														
Non-input Information						Strata "Soil Types" Input				Strata "Soil Profile" Input				
Top Depth (ft)	Bottom Depth (ft)	Layer Name	Layer Type	G _{max} (psf)	k _c	Mean Effective Stress at midpoint (psf)	Plasticity Index	Name (for Strata)	Unit Weight (pcf)	Modulus Reduction (G/Gmax) Model	Damping Model	Thickness (ft)	Soil Type (for Strata)	Shear Wave Velocity (fps)
84.36	86.78	Lower Silty Sands	Soil	3.79E+06	0.5	4077.9	0	Lower Silty Sands 50	130	D8.5, p'=2500-5000, Pl=0	D8.5, p'=2500-5000, Pl=0	2.42	Lower Silty Sands 50	969
86.78	89.2	Lower Silty Sands	Soil	3.79E+06	0.5	4186.9	0	Lower Silty Sands 51	130	D8.5, p'=2500-5000, Pl=0	D8.5, p'=2500-5000, Pl=0	2.42	Lower Silty Sands 51	969
89.2	91.62	Lower Silty Sands	Soil	3.79E+06	0.5	4296.0	0	Lower Silty Sands 52	130	D8.5, p'=2500-5000, Pl=0	D8.5, p'=2500-5000, Pl=0	2.42	Lower Silty Sands 52	969
91.62	94.04	Lower Silty Sands	Soil	3.79E+06	0.5	4405.1	0	Lower Silty Sands 53	130	D8.5, p'=2500-5000, Pl=0	D8.5, p'=2500-5000, Pl=0	2.42	Lower Silty Sands 53	969
94.04	96.46	Lower Silty Sands	Soil	3.79E+06	0.5	4514.1	0	Lower Silty Sands 54	130	D8.5, p'=2500-5000, Pl=0	D8.5, p'=2500-5000, Pl=0	2.42	Lower Silty Sands 54	969
96.46	98.88	Lower Silty Sands	Soil	3.79E+06	0.5	4623.2	0	Lower Silty Sands 55	130	D8.5, p'=2500-5000, Pl=0	D8.5, p'=2500-5000, Pl=0	2.42	Lower Silty Sands 55	969
98.88	101.3	Lower Silty Sands	Soil	3.79E+06	0.5	4732.2	0	Lower Silty Sands 56	130	D8.5, p'=2500-5000, Pl=0	D8.5, p'=2500-5000, Pl=0	2.42	Lower Silty Sands 56	969
101.3	103.72	Lower Silty Sands	Soil	3.79E+06	0.5	4841.3	0	Lower Silty Sands 57	130	D8.5, p'=2500-5000, Pl=0	D8.5, p'=2500-5000, Pl=0	2.42	Lower Silty Sands 57	969
103.72	106.14	Lower Silty Sands	Soil	3.79E+06	0.5	4950.4	0	Lower Silty Sands 58	130	D8.5, p'=2500-5000, Pl=0	D8.5, p'=2500-5000, Pl=0	2.42	Lower Silty Sands 58	969
106.14	108.56	Lower Silty Sands	Soil	3.79E+06	0.5	5059.4	0	Lower Silty Sands 59	130	D8.5, p'=5000-7500, Pl=0	D8.5, p'=5000-7500, Pl=0	2.42	Lower Silty Sands 59	969
108.56	110.98	Lower Silty Sands	Soil	3.79E+06	0.5	5168.5	0	Lower Silty Sands 60	130	D8.5, p'=5000-7500, Pl=0	D8.5, p'=5000-7500, Pl=0	2.42	Lower Silty Sands 60	969
110.98	113.4	Lower Silty Sands	Soil	3.79E+06	0.5	5277.5	0	Lower Silty Sands 61	130	D8.5, p'=5000-7500, Pl=0	D8.5, p'=5000-7500, Pl=0	2.42	Lower Silty Sands 61	969
113.4	115.82	Lower Silty Sands	Soil	3.79E+06	0.5	5386.6	0	Lower Silty Sands 62	130	D8.5, p'=5000-7500, Pl=0	D8.5, p'=5000-7500, Pl=0	2.42	Lower Silty Sands 62	969
115.82	118.24	Lower Silty Sands	Soil	3.79E+06	0.5	5495.7	0	Lower Silty Sands 63	130	D8.5, p'=5000-7500, Pl=0	D8.5, p'=5000-7500, Pl=0	2.42	Lower Silty Sands 63	969
118.24	120.66	Lower Silty Sands	Soil	3.79E+06	0.5	5604.7	0	Lower Silty Sands 64	130	D8.5, p'=5000-7500, Pl=0	D8.5, p'=5000-7500, Pl=0	2.42	Lower Silty Sands 64	969
120.66	123.08	Lower Silty Sands	Soil	3.79E+06	0.5	5713.8	0	Lower Silty Sands 65	130	D8.5, p'=5000-7500, Pl=0	D8.5, p'=5000-7500, Pl=0	2.42	Lower Silty Sands 65	969
123.08	125.1	Lower Silty Sands	Soil	3.79E+06	0.5	5813.8	0	Lower Silty Sands 66	130	D8.5, p'=5000-7500, Pl=0	D8.5, p'=5000-7500, Pl=0	2.02	Lower Silty Sands 66	969
125.1	Half-Space	Bedrock	Half-Space	1.28E+08	0.5	Half-Space	0	Bedrock	165	NA, Half-Space	Damping = 0.5%	Half-Space	Bedrock	5000

Strata Profile														
Non-input Information							Strata "Soil Types" Input				Strata "Soil Profile" Input			
Top Depth (ft)	Bottom Depth (ft)	Layer Name	Layer Type	G _{max} (psf)	K ₀	Mean Effective Stress at midpoint (psf)	Plasticity Index	Name (for Strata)	Unit Weight (pcf)	Modulus Reduction (G/G _{max}) Model	Damping Model	Thickness (ft)	Soil Type (for Strata)	Shear Wave Velocity (fps)
82.15	84.6	Lower Silty Sands	Soil	3.91E+06	0.5	4203.2	0	Lower Silty Sands 50	130	D&S, p'=2500-5000, Pl=0	D&S, p'=2500-5000, Pl=0	2.45	Lower Silty Sands 50	984
84.6	87.05	Lower Silty Sands	Soil	3.91E+06	0.5	4313.6	0	Lower Silty Sands 51	130	D&S, p'=2500-5000, Pl=0	D&S, p'=2500-5000, Pl=0	2.45	Lower Silty Sands 51	984
87.05	89.5	Lower Silty Sands	Soil	3.91E+06	0.5	4424.0	0	Lower Silty Sands 52	130	D&S, p'=2500-5000, Pl=0	D&S, p'=2500-5000, Pl=0	2.45	Lower Silty Sands 52	984
89.5	91.95	Lower Silty Sands	Soil	3.91E+06	0.5	4534.4	0	Lower Silty Sands 53	130	D&S, p'=2500-5000, Pl=0	D&S, p'=2500-5000, Pl=0	2.45	Lower Silty Sands 53	984
91.95	94.4	Lower Silty Sands	Soil	3.91E+06	0.5	4644.8	0	Lower Silty Sands 54	130	D&S, p'=2500-5000, Pl=0	D&S, p'=2500-5000, Pl=0	2.45	Lower Silty Sands 54	984
94.4	96.85	Lower Silty Sands	Soil	3.91E+06	0.5	4755.2	0	Lower Silty Sands 55	130	D&S, p'=2500-5000, Pl=0	D&S, p'=2500-5000, Pl=0	2.45	Lower Silty Sands 55	984
96.85	99.3	Lower Silty Sands	Soil	3.91E+06	0.5	4865.7	0	Lower Silty Sands 56	130	D&S, p'=2500-5000, Pl=0	D&S, p'=2500-5000, Pl=0	2.45	Lower Silty Sands 56	984
99.3	101.75	Lower Silty Sands	Soil	3.91E+06	0.5	4976.1	0	Lower Silty Sands 57	130	D&S, p'=2500-5000, Pl=0	D&S, p'=2500-5000, Pl=0	2.45	Lower Silty Sands 57	984
101.75	104.2	Lower Silty Sands	Soil	3.91E+06	0.5	5086.5	0	Lower Silty Sands 58	130	D&S, p'=5000-7500, Pl=0	D&S, p'=5000-7500, Pl=0	2.45	Lower Silty Sands 58	984
104.2	106.65	Lower Silty Sands	Soil	3.91E+06	0.5	5196.9	0	Lower Silty Sands 59	130	D&S, p'=5000-7500, Pl=0	D&S, p'=5000-7500, Pl=0	2.45	Lower Silty Sands 59	984
106.65	109.1	Lower Silty Sands	Soil	3.91E+06	0.5	5307.3	0	Lower Silty Sands 60	130	D&S, p'=5000-7500, Pl=0	D&S, p'=5000-7500, Pl=0	2.45	Lower Silty Sands 60	984
109.1	111.55	Lower Silty Sands	Soil	3.91E+06	0.5	5417.7	0	Lower Silty Sands 61	130	D&S, p'=5000-7500, Pl=0	D&S, p'=5000-7500, Pl=0	2.45	Lower Silty Sands 61	984
111.55	114	Lower Silty Sands	Soil	3.91E+06	0.5	5528.1	0	Lower Silty Sands 62	130	D&S, p'=5000-7500, Pl=0	D&S, p'=5000-7500, Pl=0	2.45	Lower Silty Sands 62	984
114	116.45	Lower Silty Sands	Soil	3.91E+06	0.5	5638.6	0	Lower Silty Sands 63	130	D&S, p'=5000-7500, Pl=0	D&S, p'=5000-7500, Pl=0	2.45	Lower Silty Sands 63	984
116.45	118.9	Lower Silty Sands	Soil	3.91E+06	0.5	5749.0	0	Lower Silty Sands 64	130	D&S, p'=5000-7500, Pl=0	D&S, p'=5000-7500, Pl=0	2.45	Lower Silty Sands 64	984
118.9	121.35	Lower Silty Sands	Soil	3.91E+06	0.5	5859.4	0	Lower Silty Sands 65	130	D&S, p'=5000-7500, Pl=0	D&S, p'=5000-7500, Pl=0	2.45	Lower Silty Sands 65	984
121.35	123.8	Lower Silty Sands	Soil	3.91E+06	0.5	5969.8	0	Lower Silty Sands 66	130	D&S, p'=5000-7500, Pl=0	D&S, p'=5000-7500, Pl=0	2.45	Lower Silty Sands 66	984
123.8	126.25	Lower Silty Sands	Soil	3.91E+06	0.5	6080.2	0	Lower Silty Sands 67	130	D&S, p'=5000-7500, Pl=0	D&S, p'=5000-7500, Pl=0	2.45	Lower Silty Sands 67	984
126.25	127.1	Lower Silty Sands	Soil	3.91E+06	0.5	6154.6	0	Lower Silty Sands 68	130	D&S, p'=5000-7500, Pl=0	D&S, p'=5000-7500, Pl=0	0.85	Lower Silty Sands 68	984
127.1	Half-Space	Bedrock	Half-Space	1.28E+08	0.5	Half-Space	0	Bedrock	165	NA, Half-Space	Damping = 0.5%	Half-Space	Bedrock	5000

Facility	US60
Section/Group	Borings
Profile Name	sp11_nor
Top of Profile Elevation	376
Depth to water table during EQ	50.9
Surcharge Pressure	psf

Strata Profile														
Non-input Information						Strata "Soil Types" Input				Strata "Soil Profile" Input				
Top Depth (ft)	Bottom Depth (ft)	Layer Name	Layer Type	G _{max} (psf)	K _o	Mean Effective Stress at midpoint (psf)	Plasticity Index	Name (for Strata)	Unit Weight (pcf)	Modulus Reduction (G/G _{max}) Model	Damping Model	Thickness (ft)	Soil Type (for Strata)	Shear-Wave Velocity (fps)
0	2.5	Embankment	Soil	3.73E+06	0.5	100.0	10	Embankment_1	120	D&S, p=0-400, Pi=0-10	D&S, p=0-400, Pi=0-10	2.5	Embankment_1	1000
2.5	5	Embankment	Soil	3.73E+06	0.5	300.0	10	Embankment_2	120	D&S, p=0-400, Pi=0-10	D&S, p=0-400, Pi=0-10	2.5	Embankment_2	1000
5	7.5	Embankment	Soil	3.73E+06	0.5	500.0	10	Embankment_3	120	D&S, p=400-800, Pi=0-10	D&S, p=400-800, Pi=0-10	2.5	Embankment_3	1000
7.5	10	Embankment	Soil	3.73E+06	0.5	700.0	10	Embankment_4	120	D&S, p=400-800, Pi=0-10	D&S, p=400-800, Pi=0-10	2.5	Embankment_4	1000
10	12.5	Embankment	Soil	3.73E+06	0.5	900.0	10	Embankment_5	120	D&S, p=800-1600, Pi=0-10	D&S, p=800-1600, Pi=0-10	2.5	Embankment_5	1000
12.5	15	Embankment	Soil	3.73E+06	0.5	1100.0	10	Embankment_6	120	D&S, p=800-1600, Pi=0-10	D&S, p=800-1600, Pi=0-10	2.5	Embankment_6	1000
15	17.5	Embankment	Soil	3.73E+06	0.5	1300.0	10	Embankment_7	120	D&S, p=800-1600, Pi=0-10	D&S, p=800-1600, Pi=0-10	2.5	Embankment_7	1000
17.5	20	Embankment	Soil	3.73E+06	0.5	1500.0	10	Embankment_8	120	D&S, p=800-1600, Pi=0-10	D&S, p=800-1600, Pi=0-10	2.5	Embankment_8	1000
20	22.5	Embankment	Soil	3.73E+06	0.5	1700.0	10	Embankment_9	120	D&S, p=1600-2500, Pi=0-10	D&S, p=1600-2500, Pi=0-10	2.5	Embankment_9	1000
22.5	25	Embankment	Soil	3.73E+06	0.5	1900.0	10	Embankment_10	120	D&S, p=1600-2500, Pi=0-10	D&S, p=1600-2500, Pi=0-10	2.5	Embankment_10	1000
25	27.5	Embankment	Soil	3.73E+06	0.5	2100.0	10	Embankment_11	120	D&S, p=1600-2500, Pi=0-10	D&S, p=1600-2500, Pi=0-10	2.5	Embankment_11	1000
27.5	30	Embankment	Soil	3.73E+06	0.5	2300.0	10	Embankment_12	120	D&S, p=1600-2500, Pi=0-10	D&S, p=1600-2500, Pi=0-10	2.5	Embankment_12	1000
30	32.5	Embankment	Soil	3.73E+06	0.5	2500.0	10	Embankment_13	120	D&S, p=1600-2500, Pi=0-10	D&S, p=1600-2500, Pi=0-10	2.5	Embankment_13	1000
32.5	35	Embankment	Soil	3.73E+06	0.5	2700.0	10	Embankment_14	120	D&S, p=2500-5000, Pi=0-10	D&S, p=2500-5000, Pi=0-10	2.5	Embankment_14	1000
35	37.1	Embankment	Soil	3.73E+06	0.5	2884.0	10	Embankment_15	120	D&S, p=2500-5000, Pi=0-10	D&S, p=2500-5000, Pi=0-10	2.1	Embankment_15	1000
37.1	39.46	Upper Clay	Soil	3.46E+06	0.5	3065.9	5	Upper Clay_16	124.5	D&S, p=2500-5000, Pi=0-10	D&S, p=2500-5000, Pi=0-10	2.36	Upper Clay_16	946
39.46	41.82	Upper Clay	Soil	3.46E+06	0.5	3261.8	5	Upper Clay_17	124.5	D&S, p=2500-5000, Pi=0-10	D&S, p=2500-5000, Pi=0-10	2.36	Upper Clay_17	946
41.82	44.18	Upper Clay	Soil	3.46E+06	0.5	3457.7	5	Upper Clay_18	124.5	D&S, p=2500-5000, Pi=0-10	D&S, p=2500-5000, Pi=0-10	2.36	Upper Clay_18	946
44.18	46.54	Upper Clay	Soil	3.46E+06	0.5	3653.6	5	Upper Clay_19	124.5	D&S, p=2500-5000, Pi=0-10	D&S, p=2500-5000, Pi=0-10	2.36	Upper Clay_19	946
46.54	47.1	Upper Clay	Soil	3.46E+06	0.5	3774.8	5	Upper Clay_20	124.5	D&S, p=2500-5000, Pi=0-10	D&S, p=2500-5000, Pi=0-10	0.56	Upper Clay_20	946
47.1	48.78	Lower Clays	Soil	1.76E+06	0.5	3867.7	22	Lower Clays_21	124.5	D&S, p=2500-5000, Pi=20-25	D&S, p=2500-5000, Pi=20-25	1.68	Lower Clays_21	675
48.78	50.46	Lower Clays	Soil	1.76E+06	0.5	4007.2	22	Lower Clays_22	124.5	D&S, p=2500-5000, Pi=20-25	D&S, p=2500-5000, Pi=20-25	1.68	Lower Clays_22	675
50.46	50.9	Lower Clays	Soil	1.76E+06	0.5	4095.1	22	Lower Clays_23	124.5	D&S, p=2500-5000, Pi=20-25	D&S, p=2500-5000, Pi=20-25	0.44	Lower Clays_23	675
50.9	52.58	Lower Clays	Soil	1.76E+06	0.5	4148.2	22	Lower Clays_24	124.5	D&S, p=2500-5000, Pi=20-25	D&S, p=2500-5000, Pi=20-25	1.68	Lower Clays_24	675
52.58	54.26	Lower Clays	Soil	1.76E+06	0.5	4217.7	22	Lower Clays_25	124.5	D&S, p=2500-5000, Pi=20-25	D&S, p=2500-5000, Pi=20-25	1.68	Lower Clays_25	675
54.26	55.94	Lower Clays	Soil	1.76E+06	0.5	4287.3	22	Lower Clays_26	124.5	D&S, p=2500-5000, Pi=20-25	D&S, p=2500-5000, Pi=20-25	1.68	Lower Clays_26	675
55.94	57.62	Lower Clays	Soil	1.76E+06	0.5	4356.8	22	Lower Clays_27	124.5	D&S, p=2500-5000, Pi=20-25	D&S, p=2500-5000, Pi=20-25	1.68	Lower Clays_27	675
57.62	59.3	Lower Clays	Soil	1.76E+06	0.5	4426.4	22	Lower Clays_28	124.5	D&S, p=2500-5000, Pi=20-25	D&S, p=2500-5000, Pi=20-25	1.68	Lower Clays_28	675
59.3	60.98	Lower Clays	Soil	1.76E+06	0.5	4495.9	22	Lower Clays_29	124.5	D&S, p=2500-5000, Pi=20-25	D&S, p=2500-5000, Pi=20-25	1.68	Lower Clays_29	675
60.98	62.66	Lower Clays	Soil	1.76E+06	0.5	4565.5	22	Lower Clays_30	124.5	D&S, p=2500-5000, Pi=20-25	D&S, p=2500-5000, Pi=20-25	1.68	Lower Clays_30	675
62.66	64.34	Lower Clays	Soil	1.76E+06	0.5	4635.0	22	Lower Clays_31	124.5	D&S, p=2500-5000, Pi=20-25	D&S, p=2500-5000, Pi=20-25	1.68	Lower Clays_31	675
64.34	66.02	Lower Clays	Soil	1.76E+06	0.5	4704.6	22	Lower Clays_32	124.5	D&S, p=2500-5000, Pi=20-25	D&S, p=2500-5000, Pi=20-25	1.68	Lower Clays_32	675
66.02	67.7	Lower Clays	Soil	1.76E+06	0.5	4774.1	22	Lower Clays_33	124.5	D&S, p=2500-5000, Pi=20-25	D&S, p=2500-5000, Pi=20-25	1.68	Lower Clays_33	675
67.7	69.38	Lower Clays	Soil	1.76E+06	0.5	4843.7	22	Lower Clays_34	124.5	D&S, p=2500-5000, Pi=20-25	D&S, p=2500-5000, Pi=20-25	1.68	Lower Clays_34	675
69.38	71.06	Lower Clays	Soil	1.76E+06	0.5	4913.2	22	Lower Clays_35	124.5	D&S, p=2500-5000, Pi=20-25	D&S, p=2500-5000, Pi=20-25	1.68	Lower Clays_35	675
71.06	72.74	Lower Clays	Soil	1.76E+06	0.5	4982.8	22	Lower Clays_36	124.5	D&S, p=2500-5000, Pi=20-25	D&S, p=2500-5000, Pi=20-25	1.68	Lower Clays_36	675
72.74	74.42	Lower Clays	Soil	1.76E+06	0.5	5052.4	22	Lower Clays_37	124.5	D&S, p=5000-7500, Pi=20-25	D&S, p=5000-7500, Pi=20-25	1.68	Lower Clays_37	675
74.42	76.1	Lower Clays	Soil	1.76E+06	0.5	5121.9	22	Lower Clays_38	124.5	D&S, p=5000-7500, Pi=20-25	D&S, p=5000-7500, Pi=20-25	1.68	Lower Clays_38	675
76.1	77.78	Lower Clays	Soil	1.76E+06	0.5	5191.5	22	Lower Clays_39	124.5	D&S, p=5000-7500, Pi=20-25	D&S, p=5000-7500, Pi=20-25	1.68	Lower Clays_39	675
77.78	79.46	Lower Clays	Soil	1.76E+06	0.5	5261.0	22	Lower Clays_40	124.5	D&S, p=5000-7500, Pi=20-25	D&S, p=5000-7500, Pi=20-25	1.68	Lower Clays_40	675
79.46	81.14	Lower Clays	Soil	1.76E+06	0.5	5330.6	22	Lower Clays_41	124.5	D&S, p=5000-7500, Pi=20-25	D&S, p=5000-7500, Pi=20-25	1.68	Lower Clays_41	675
81.14	82.82	Lower Clays	Soil	1.76E+06	0.5	5400.1	22	Lower Clays_42	124.5	D&S, p=5000-7500, Pi=20-25	D&S, p=5000-7500, Pi=20-25	1.68	Lower Clays_42	675
82.82	84.5	Lower Clays	Soil	1.76E+06	0.5	5469.7	22	Lower Clays_43	124.5	D&S, p=5000-7500, Pi=20-25	D&S, p=5000-7500, Pi=20-25	1.68	Lower Clays_43	675
84.5	86.18	Lower Clays	Soil	1.76E+06	0.5	5539.2	22	Lower Clays_44	124.5	D&S, p=5000-7500, Pi=20-25	D&S, p=5000-7500, Pi=20-25	1.68	Lower Clays_44	675
86.18	87.86	Lower Clays	Soil	1.76E+06	0.5	5608.8	22	Lower Clays_45	124.5	D&S, p=5000-7500, Pi=20-25	D&S, p=5000-7500, Pi=20-25	1.68	Lower Clays_45	675
87.86	89.54	Lower Clays	Soil	1.76E+06	0.5	5678.3	22	Lower Clays_46	124.5	D&S, p=5000-7500, Pi=20-25	D&S, p=5000-7500, Pi=20-25	1.68	Lower Clays_46	675
89.54	91.22	Lower Clays	Soil	1.76E+06	0.5	5747.9	22	Lower Clays_47	124.5	D&S, p=5000-7500, Pi=20-25	D&S, p=5000-7500, Pi=20-25	1.68	Lower Clays_47	675
91.22	92.9	Lower Clays	Soil	1.76E+06	0.5	5817.4	22	Lower Clays_48	124.5	D&S, p=5000-7500, Pi=20-25	D&S, p=5000-7500, Pi=20-25	1.68	Lower Clays_48	675
92.9	94.58	Lower Clays	Soil	1.76E+06	0.5	5887.0	22	Lower Clays_49	124.5	D&S, p=5000-7500, Pi=20-25	D&S, p=5000-7500, Pi=20-25	1.68	Lower Clays_49	675

Strata Profile										Strata "Soil Types" Input		Strata "Soil Profile" Input		
Non-input Information														
Top Depth (ft)	Bottom Depth (ft)	Layer Name	Layer Type	G _{max} (psf)	K _s	Mean Effective Stress at midpoint (psf)	Plasticity Index	Name (for Strata)	Unit Weight (pcf)	Modulus Reduction (G/G _{max}) Model	Damping Model	Thickness (ft)	Soil Type (for Strata)	Shear Wave Velocity (fps)
94.58	96.26	Lower Clays	Soil	1.76E+06	0.5	5956.5	22	Lower Clays 50	124.5	D8.5, p=5000-7500, Pi=20-25	D8.5, p=5000-7500, Pi=20-25	1.68	Lower Clays 50	675
96.26	97.94	Lower Clays	Soil	1.76E+06	0.5	6026.1	22	Lower Clays 51	124.5	D8.5, p=5000-7500, Pi=20-25	D8.5, p=5000-7500, Pi=20-25	1.68	Lower Clays 51	675
97.94	99.62	Lower Clays	Soil	1.76E+06	0.5	6095.6	22	Lower Clays 52	124.5	D8.5, p=5000-7500, Pi=20-25	D8.5, p=5000-7500, Pi=20-25	1.68	Lower Clays 52	675
99.62	101.3	Lower Clays	Soil	1.76E+06	0.5	6165.2	22	Lower Clays 53	124.5	D8.5, p=5000-7500, Pi=20-25	D8.5, p=5000-7500, Pi=20-25	1.68	Lower Clays 53	675
101.3	102.98	Lower Clays	Soil	1.76E+06	0.5	6234.7	22	Lower Clays 54	124.5	D8.5, p=5000-7500, Pi=20-25	D8.5, p=5000-7500, Pi=20-25	1.68	Lower Clays 54	675
102.98	104.66	Lower Clays	Soil	1.76E+06	0.5	6304.3	22	Lower Clays 55	124.5	D8.5, p=5000-7500, Pi=20-25	D8.5, p=5000-7500, Pi=20-25	1.68	Lower Clays 55	675
104.66	106.34	Lower Clays	Soil	1.76E+06	0.5	6373.8	22	Lower Clays 56	124.5	D8.5, p=5000-7500, Pi=20-25	D8.5, p=5000-7500, Pi=20-25	1.68	Lower Clays 56	675
106.34	108.02	Lower Clays	Soil	1.76E+06	0.5	6443.4	22	Lower Clays 57	124.5	D8.5, p=5000-7500, Pi=20-25	D8.5, p=5000-7500, Pi=20-25	1.68	Lower Clays 57	675
108.02	109.7	Lower Clays	Soil	1.76E+06	0.5	6512.9	22	Lower Clays 58	124.5	D8.5, p=5000-7500, Pi=20-25	D8.5, p=5000-7500, Pi=20-25	1.68	Lower Clays 58	675
109.7	111.38	Lower Clays	Soil	1.76E+06	0.5	6582.5	22	Lower Clays 59	124.5	D8.5, p=5000-7500, Pi=20-25	D8.5, p=5000-7500, Pi=20-25	1.68	Lower Clays 59	675
111.38	113.06	Lower Clays	Soil	1.76E+06	0.5	6652.0	22	Lower Clays 60	124.5	D8.5, p=5000-7500, Pi=20-25	D8.5, p=5000-7500, Pi=20-25	1.68	Lower Clays 60	675
113.06	114.74	Lower Clays	Soil	1.76E+06	0.5	6721.6	22	Lower Clays 61	124.5	D8.5, p=5000-7500, Pi=20-25	D8.5, p=5000-7500, Pi=20-25	1.68	Lower Clays 61	675
114.74	116.42	Lower Clays	Soil	1.76E+06	0.5	6791.2	22	Lower Clays 62	124.5	D8.5, p=5000-7500, Pi=20-25	D8.5, p=5000-7500, Pi=20-25	1.68	Lower Clays 62	675
116.42	118.1	Lower Clays	Soil	1.76E+06	0.5	6860.7	22	Lower Clays 63	124.5	D8.5, p=5000-7500, Pi=20-25	D8.5, p=5000-7500, Pi=20-25	1.68	Lower Clays 63	675
118.1	119.78	Lower Clays	Soil	1.76E+06	0.5	6930.3	22	Lower Clays 64	124.5	D8.5, p=5000-7500, Pi=20-25	D8.5, p=5000-7500, Pi=20-25	1.68	Lower Clays 64	675
119.78	121.46	Lower Clays	Soil	1.76E+06	0.5	6999.8	22	Lower Clays 65	124.5	D8.5, p=5000-7500, Pi=20-25	D8.5, p=5000-7500, Pi=20-25	1.68	Lower Clays 65	675
121.46	123.14	Lower Clays	Soil	1.76E+06	0.5	7069.4	22	Lower Clays 66	124.5	D8.5, p=5000-7500, Pi=20-25	D8.5, p=5000-7500, Pi=20-25	1.68	Lower Clays 66	675
123.14	124.82	Lower Clays	Soil	1.76E+06	0.5	7138.9	22	Lower Clays 67	124.5	D8.5, p=5000-7500, Pi=20-25	D8.5, p=5000-7500, Pi=20-25	1.68	Lower Clays 67	675
124.82	126.5	Lower Clays	Soil	1.76E+06	0.5	7208.5	22	Lower Clays 68	124.5	D8.5, p=5000-7500, Pi=20-25	D8.5, p=5000-7500, Pi=20-25	1.68	Lower Clays 68	675
126.5	128.18	Lower Clays	Soil	1.76E+06	0.5	7278.0	22	Lower Clays 69	124.5	D8.5, p=5000-7500, Pi=20-25	D8.5, p=5000-7500, Pi=20-25	1.68	Lower Clays 69	675
128.18	129.86	Lower Clays	Soil	1.76E+06	0.5	7347.6	22	Lower Clays 70	124.5	D8.5, p=5000-7500, Pi=20-25	D8.5, p=5000-7500, Pi=20-25	1.68	Lower Clays 70	675
129.86	131.54	Lower Clays	Soil	1.76E+06	0.5	7417.1	22	Lower Clays 71	124.5	D8.5, p=5000-7500, Pi=20-25	D8.5, p=5000-7500, Pi=20-25	1.68	Lower Clays 71	675
131.54	133.22	Lower Clays	Soil	1.76E+06	0.5	7486.7	22	Lower Clays 72	124.5	D8.5, p=5000-7500, Pi=20-25	D8.5, p=5000-7500, Pi=20-25	1.68	Lower Clays 72	675
133.22	134.9	Lower Clays	Soil	1.76E+06	0.5	7556.2	22	Lower Clays 73	124.5	D8.5, p=7500-10000, Pi=20-25	D8.5, p=7500-10000, Pi=20-25	1.68	Lower Clays 73	675
134.9	136.58	Lower Clays	Soil	1.76E+06	0.5	7625.8	22	Lower Clays 74	124.5	D8.5, p=7500-10000, Pi=20-25	D8.5, p=7500-10000, Pi=20-25	1.68	Lower Clays 74	675
136.58	138.26	Lower Clays	Soil	1.76E+06	0.5	7695.3	22	Lower Clays 75	124.5	D8.5, p=7500-10000, Pi=20-25	D8.5, p=7500-10000, Pi=20-25	1.68	Lower Clays 75	675
138.26	139.94	Lower Clays	Soil	1.76E+06	0.5	7764.9	22	Lower Clays 76	124.5	D8.5, p=7500-10000, Pi=20-25	D8.5, p=7500-10000, Pi=20-25	1.68	Lower Clays 76	675
139.94	141.62	Lower Clays	Soil	1.76E+06	0.5	7834.4	22	Lower Clays 77	124.5	D8.5, p=7500-10000, Pi=20-25	D8.5, p=7500-10000, Pi=20-25	1.68	Lower Clays 77	675
141.62	143.3	Lower Clays	Soil	1.76E+06	0.5	7904.0	22	Lower Clays 78	124.5	D8.5, p=7500-10000, Pi=20-25	D8.5, p=7500-10000, Pi=20-25	1.68	Lower Clays 78	675
143.3	144.98	Lower Clays	Soil	1.76E+06	0.5	7973.5	22	Lower Clays 79	124.5	D8.5, p=7500-10000, Pi=20-25	D8.5, p=7500-10000, Pi=20-25	1.68	Lower Clays 79	675
144.98	146.66	Lower Clays	Soil	1.76E+06	0.5	8043.1	22	Lower Clays 80	124.5	D8.5, p=7500-10000, Pi=20-25	D8.5, p=7500-10000, Pi=20-25	1.68	Lower Clays 80	675
146.66	148.34	Lower Clays	Soil	1.76E+06	0.5	8112.6	22	Lower Clays 81	124.5	D8.5, p=7500-10000, Pi=20-25	D8.5, p=7500-10000, Pi=20-25	1.68	Lower Clays 81	675
148.34	150.02	Lower Clays	Soil	1.76E+06	0.5	8182.2	22	Lower Clays 82	124.5	D8.5, p=7500-10000, Pi=20-25	D8.5, p=7500-10000, Pi=20-25	1.68	Lower Clays 82	675
150.02	151.7	Lower Clays	Soil	1.76E+06	0.5	8251.7	22	Lower Clays 83	124.5	D8.5, p=7500-10000, Pi=20-25	D8.5, p=7500-10000, Pi=20-25	1.68	Lower Clays 83	675
151.7	153.38	Lower Clays	Soil	1.76E+06	0.5	8321.3	22	Lower Clays 84	124.5	D8.5, p=7500-10000, Pi=20-25	D8.5, p=7500-10000, Pi=20-25	1.68	Lower Clays 84	675
153.38	155.06	Lower Clays	Soil	1.76E+06	0.5	8390.8	22	Lower Clays 85	124.5	D8.5, p=7500-10000, Pi=20-25	D8.5, p=7500-10000, Pi=20-25	1.68	Lower Clays 85	675
155.06	156.74	Lower Clays	Soil	1.76E+06	0.5	8460.4	22	Lower Clays 86	124.5	D8.5, p=7500-10000, Pi=20-25	D8.5, p=7500-10000, Pi=20-25	1.68	Lower Clays 86	675
156.74	158.42	Lower Clays	Soil	1.76E+06	0.5	8530.0	22	Lower Clays 87	124.5	D8.5, p=7500-10000, Pi=20-25	D8.5, p=7500-10000, Pi=20-25	1.68	Lower Clays 87	675
158.42	160.1	Lower Clays	Soil	1.76E+06	0.5	8599.5	22	Lower Clays 88	124.5	D8.5, p=7500-10000, Pi=20-25	D8.5, p=7500-10000, Pi=20-25	1.68	Lower Clays 88	675
160.1	161.78	Lower Clays	Soil	1.76E+06	0.5	8669.1	22	Lower Clays 89	124.5	D8.5, p=7500-10000, Pi=20-25	D8.5, p=7500-10000, Pi=20-25	1.68	Lower Clays 89	675
161.78	163.46	Lower Clays	Soil	1.76E+06	0.5	8738.6	22	Lower Clays 90	124.5	D8.5, p=7500-10000, Pi=20-25	D8.5, p=7500-10000, Pi=20-25	1.68	Lower Clays 90	675
163.46	165.14	Lower Clays	Soil	1.76E+06	0.5	8808.2	22	Lower Clays 91	124.5	D8.5, p=7500-10000, Pi=20-25	D8.5, p=7500-10000, Pi=20-25	1.68	Lower Clays 91	675
165.14	166.82	Lower Clays	Soil	1.76E+06	0.5	8877.7	22	Lower Clays 92	124.5	D8.5, p=7500-10000, Pi=20-25	D8.5, p=7500-10000, Pi=20-25	1.68	Lower Clays 92	675
166.82	168.5	Lower Clays	Soil	1.76E+06	0.5	8947.3	22	Lower Clays 93	124.5	D8.5, p=7500-10000, Pi=20-25	D8.5, p=7500-10000, Pi=20-25	1.68	Lower Clays 93	675
168.5	170.18	Lower Clays	Soil	1.76E+06	0.5	9016.8	22	Lower Clays 94	124.5	D8.5, p=7500-10000, Pi=20-25	D8.5, p=7500-10000, Pi=20-25	1.68	Lower Clays 94	675
170.18	171.86	Lower Clays	Soil	1.76E+06	0.5	9086.4	22	Lower Clays 95	124.5	D8.5, p=7500-10000, Pi=20-25	D8.5, p=7500-10000, Pi=20-25	1.68	Lower Clays 95	675
171.86	173.54	Lower Clays	Soil	1.76E+06	0.5	9156.1	22	Lower Clays 96	124.5	D8.5, p=7500-10000, Pi=20-25	D8.5, p=7500-10000, Pi=20-25	0.24	Lower Clays 96	675
173.54	175.22	Lower Silty Sands	Soil	4.87E+06	0.5	9192.8	0	Lower Silty Sands 97	130	D8.5, p=7500-10000, Pi=0	D8.5, p=7500-10000, Pi=0	2.74	Lower Silty Sands 97	1098
175.22	176.9	Lower Silty Sands	Soil	4.87E+06	0.5	9262.3	0	Lower Silty Sands 98	130	D8.5, p=7500-10000, Pi=0	D8.5, p=7500-10000, Pi=0	2.74	Lower Silty Sands 98	1098
176.9	178.58	Lower Silty Sands	Soil	4.87E+06	0.5	9331.8	0	Lower Silty Sands 99	130	D8.5, p=7500-10000, Pi=0	D8.5, p=7500-10000, Pi=0	2.74	Lower Silty Sands 99	1098
178.58	180.26	Lower Silty Sands	Soil	4.87E+06	0.5	9401.3	0	Lower Silty Sands 100	130	D8.5, p=7500-10000, Pi=0	D8.5, p=7500-10000, Pi=0	2.74	Lower Silty Sands 100	1098
180.26	181.94	Lower Silty Sands	Soil	4.87E+06	0.5	9470.8	0	Lower Silty Sands 101	130	D8.5, p=7500-10000, Pi=0	D8.5, p=7500-10000, Pi=0	2.74	Lower Silty Sands 101	1098
181.94	183.62	Lower Silty Sands	Soil	4.87E+06	0.5	9540.3	0	Lower Silty Sands 102	130	D8.5, p=7500-10000, Pi=0	D8.5, p=7500-10000, Pi=0	2.74	Lower Silty Sands 102	1098
183.62	185.3	Lower Silty Sands	Soil	4.87E+06	0.5	9609.8	0	Lower Silty Sands 103	130	D8.5, p=7500-10000, Pi=0	D8.5, p=7500-10			

Strata Profile														
Non-input Information						Strata "Soil Types" Input					Strata "Soil Profile" Input			
Top Depth (ft)	Bottom Depth (ft)	Layer Name	Layer Type	G _{max} (psf)	K _c	Mean Effective Stress at midpoint (psf)	Plasticity Index	Name (for Strata)	Unit Weight (pcf)	Modulus Reduction (G/G _{max}) Model	Damping Model	Thickness (ft)	Soil Type (for Strata)	Shear Wave Velocity (fps)
207.72	210.46	Lower Silty Sands	Soil	4.87E+06	0.5	10798.1	0	Lower Silty Sands_110	130	D8.5, p=10000-17000, PI=0	D8.5, p=10000-17000, PI=0	2.74	Lower Silty Sands_110	1098
210.46	213.2	Lower Silty Sands	Soil	4.87E+06	0.5	10921.6	0	Lower Silty Sands_111	130	D8.5, p=10000-17000, PI=0	D8.5, p=10000-17000, PI=0	2.74	Lower Silty Sands_111	1098
213.2	215.94	Lower Silty Sands	Soil	4.87E+06	0.5	11045.1	0	Lower Silty Sands_112	130	D8.5, p=10000-17000, PI=0	D8.5, p=10000-17000, PI=0	2.74	Lower Silty Sands_112	1098
215.94	218.68	Lower Silty Sands	Soil	4.87E+06	0.5	11168.5	0	Lower Silty Sands_113	130	D8.5, p=10000-17000, PI=0	D8.5, p=10000-17000, PI=0	2.74	Lower Silty Sands_113	1098
218.68	221.42	Lower Silty Sands	Soil	4.87E+06	0.5	11292.0	0	Lower Silty Sands_114	130	D8.5, p=10000-17000, PI=0	D8.5, p=10000-17000, PI=0	2.74	Lower Silty Sands_114	1098
221.42	224.16	Lower Silty Sands	Soil	4.87E+06	0.5	11415.5	0	Lower Silty Sands_115	130	D8.5, p=10000-17000, PI=0	D8.5, p=10000-17000, PI=0	2.74	Lower Silty Sands_115	1098
224.16	226.9	Lower Silty Sands	Soil	4.87E+06	0.5	11539.0	0	Lower Silty Sands_116	130	D8.5, p=10000-17000, PI=0	D8.5, p=10000-17000, PI=0	2.74	Lower Silty Sands_116	1098
226.9	229.64	Lower Silty Sands	Soil	4.87E+06	0.5	11662.5	0	Lower Silty Sands_117	130	D8.5, p=10000-17000, PI=0	D8.5, p=10000-17000, PI=0	2.74	Lower Silty Sands_117	1098
229.64	232.38	Lower Silty Sands	Soil	4.87E+06	0.5	11786.0	0	Lower Silty Sands_118	130	D8.5, p=10000-17000, PI=0	D8.5, p=10000-17000, PI=0	2.74	Lower Silty Sands_118	1098
232.38	235.12	Lower Silty Sands	Soil	4.87E+06	0.5	11909.4	0	Lower Silty Sands_119	130	D8.5, p=10000-17000, PI=0	D8.5, p=10000-17000, PI=0	2.74	Lower Silty Sands_119	1098
235.12	235.8	Lower Silty Sands	Soil	4.87E+06	0.5	11986.5	0	Lower Silty Sands_120	130	D8.5, p=10000-17000, PI=0	D8.5, p=10000-17000, PI=0	0.68	Lower Silty Sands_120	1098
235.8	Half-Space	Bedrock	Half-Space	1.28E+08	0.5	Half-Space	0	Bedrock	165	NA, Half-Space	Damping = 0.5%	Half-Space	Bedrock	5000

Facility	US60
Section/Group	Northbank
Profile Name	d122_nor
Top of Profile Elevation	294 ft
Depth to water table during EQ	0 ft
Surcharge Pressure	psf

Strata Profile														
Non-input Information					Strata "Soil Types" Input									
Top Depth (ft)	Bottom Depth (ft)	Layer Name	Layer Type	G _{max} (psf)	k _o	Mean Effective Stress at midpoint (psf)	Plasticity Index	Name (for Strata)	Unit Weight (pcf)	Modulus Reduction (G/G _{max}) Model	Damping Model	Thickness (ft)	Soil Type (for Strata)	Shear Wave Velocity (fps)
0	0.7	P4 Silty Clayey Sands	Soil	2.94E+05	0.5	13.0	0	P4 Silty Clayey Sands_1	118	D8.5, p=0-400, Pl=0	D8.5, p=0-400, Pl=0	0.7	P4 Silty Clayey Sands_1	283
0.7	1.4	P4 Silty Clayey Sands	Soil	2.94E+05	0.5	38.9	0	P4 Silty Clayey Sands_2	118	D8.5, p=0-400, Pl=0	D8.5, p=0-400, Pl=0	0.7	P4 Silty Clayey Sands_2	283
1.4	2.1	P4 Silty Clayey Sands	Soil	2.94E+05	0.5	64.9	0	P4 Silty Clayey Sands_3	118	D8.5, p=0-400, Pl=0	D8.5, p=0-400, Pl=0	0.7	P4 Silty Clayey Sands_3	283
2.1	2.8	P4 Silty Clayey Sands	Soil	2.94E+05	0.5	90.8	0	P4 Silty Clayey Sands_4	118	D8.5, p=0-400, Pl=0	D8.5, p=0-400, Pl=0	0.7	P4 Silty Clayey Sands_4	283
2.8	3.5	P4 Silty Clayey Sands	Soil	2.94E+05	0.5	116.8	0	P4 Silty Clayey Sands_5	118	D8.5, p=0-400, Pl=0	D8.5, p=0-400, Pl=0	0.7	P4 Silty Clayey Sands_5	283
3.5	4.2	P4 Silty Clayey Sands	Soil	2.94E+05	0.5	142.7	0	P4 Silty Clayey Sands_6	118	D8.5, p=0-400, Pl=0	D8.5, p=0-400, Pl=0	0.7	P4 Silty Clayey Sands_6	283
4.2	4.4	P4 Silty Clayey Sands	Soil	2.94E+05	0.5	159.4	0	P4 Silty Clayey Sands_7	118	D8.5, p=0-400, Pl=0	D8.5, p=0-400, Pl=0	0.2	P4 Silty Clayey Sands_7	283
4.4	5.74	P4 Liquid	Soil	1.06E+06	0.5	187.9	0	P4 Liquid_8	118	D8.5, p=0-400, Pl=0	D8.5, p=0-400, Pl=0	1.34	P4 Liquid_8	537
5.74	7.08	P4 Liquid	Soil	1.06E+06	0.5	237.6	0	P4 Liquid_9	118	D8.5, p=0-400, Pl=0	D8.5, p=0-400, Pl=0	1.34	P4 Liquid_9	537
7.08	8.42	P4 Liquid	Soil	1.06E+06	0.5	287.3	0	P4 Liquid_10	118	D8.5, p=0-400, Pl=0	D8.5, p=0-400, Pl=0	1.34	P4 Liquid_10	537
8.42	9.76	P4 Liquid	Soil	1.06E+06	0.5	336.9	0	P4 Liquid_11	118	D8.5, p=0-400, Pl=0	D8.5, p=0-400, Pl=0	1.34	P4 Liquid_11	537
9.76	11.1	P4 Liquid	Soil	1.06E+06	0.5	386.6	0	P4 Liquid_12	118	D8.5, p=0-400, Pl=0	D8.5, p=0-400, Pl=0	1.34	P4 Liquid_12	537
11.1	12.44	P4 Liquid	Soil	1.06E+06	0.5	436.3	0	P4 Liquid_13	118	D8.5, p=400-800, Pl=0	D8.5, p=400-800, Pl=0	1.34	P4 Liquid_13	537
12.44	13.78	P4 Liquid	Soil	1.06E+06	0.5	485.9	0	P4 Liquid_14	118	D8.5, p=400-800, Pl=0	D8.5, p=400-800, Pl=0	1.34	P4 Liquid_14	537
13.78	14.4	P4 Liquid	Soil	1.06E+06	0.5	522.3	0	P4 Liquid_15	118	D8.5, p=400-800, Pl=0	D8.5, p=400-800, Pl=0	0.62	P4 Liquid_15	537
14.4	16.91	Upper Clay	Soil	3.46E+06	0.5	573.6	5	Upper Clay_16	110	D8.5, p=400-800, Pl=0-10	D8.5, p=400-800, Pl=0-10	2.51	Upper Clay_16	1007
16.91	19.42	Upper Clay	Soil	3.46E+06	0.5	653.2	5	Upper Clay_17	110	D8.5, p=400-800, Pl=0-10	D8.5, p=400-800, Pl=0-10	2.51	Upper Clay_17	1007
19.42	21.93	Upper Clay	Soil	3.46E+06	0.5	732.9	5	Upper Clay_18	110	D8.5, p=400-800, Pl=0-10	D8.5, p=400-800, Pl=0-10	2.51	Upper Clay_18	1007
21.93	24.44	Upper Clay	Soil	3.46E+06	0.5	812.5	5	Upper Clay_19	110	D8.5, p=800-1600, Pl=0-10	D8.5, p=800-1600, Pl=0-10	2.51	Upper Clay_19	1007
24.44	26.95	Upper Clay	Soil	3.46E+06	0.5	892.2	5	Upper Clay_20	110	D8.5, p=800-1600, Pl=0-10	D8.5, p=800-1600, Pl=0-10	2.51	Upper Clay_20	1007
26.95	29.46	Upper Clay	Soil	3.46E+06	0.5	971.8	5	Upper Clay_21	110	D8.5, p=800-1600, Pl=0-10	D8.5, p=800-1600, Pl=0-10	2.51	Upper Clay_21	1007
29.46	31.97	Upper Clay	Soil	3.46E+06	0.5	1051.5	5	Upper Clay_22	110	D8.5, p=800-1600, Pl=0-10	D8.5, p=800-1600, Pl=0-10	2.51	Upper Clay_22	1007
31.97	34.48	Upper Clay	Soil	3.46E+06	0.5	1131.1	5	Upper Clay_23	110	D8.5, p=800-1600, Pl=0-10	D8.5, p=800-1600, Pl=0-10	2.51	Upper Clay_23	1007
34.48	36.99	Upper Clay	Soil	3.46E+06	0.5	1210.8	5	Upper Clay_24	110	D8.5, p=800-1600, Pl=0-10	D8.5, p=800-1600, Pl=0-10	2.51	Upper Clay_24	1007
36.99	39.5	Upper Clay	Soil	3.46E+06	0.5	1290.4	5	Upper Clay_25	110	D8.5, p=800-1600, Pl=0-10	D8.5, p=800-1600, Pl=0-10	2.51	Upper Clay_25	1007
39.5	42.01	Upper Clay	Soil	3.46E+06	0.5	1370.1	5	Upper Clay_26	110	D8.5, p=800-1600, Pl=0-10	D8.5, p=800-1600, Pl=0-10	2.51	Upper Clay_26	1007
42.01	44.1	Upper Clay	Soil	3.46E+06	0.5	1443.1	5	Upper Clay_27	110	D8.5, p=800-1600, Pl=0-10	D8.5, p=800-1600, Pl=0-10	2.09	Upper Clay_27	1007
44.1	45.66	Lower Clays	Soil	1.39E+06	0.5	1503.6	22	Lower Clays_28	115	D8.5, p=800-1600, Pl=20-25	D8.5, p=1600-2500, Pl=20-25	1.56	Lower Clays_28	625
45.66	47.22	Lower Clays	Soil	1.39E+06	0.5	1558.3	22	Lower Clays_29	115	D8.5, p=800-1600, Pl=20-25	D8.5, p=800-1600, Pl=20-25	1.56	Lower Clays_29	625
47.22	48.78	Lower Clays	Soil	1.39E+06	0.5	1613.0	22	Lower Clays_30	115	D8.5, p=1600-2500, Pl=20-25	D8.5, p=1600-2500, Pl=20-25	1.56	Lower Clays_30	625
48.78	50.34	Lower Clays	Soil	1.39E+06	0.5	1667.7	22	Lower Clays_31	115	D8.5, p=1600-2500, Pl=20-25	D8.5, p=1600-2500, Pl=20-25	1.56	Lower Clays_31	625
50.34	51.9	Lower Clays	Soil	1.39E+06	0.5	1722.4	22	Lower Clays_32	115	D8.5, p=1600-2500, Pl=20-25	D8.5, p=1600-2500, Pl=20-25	1.56	Lower Clays_32	625
51.9	53.46	Lower Clays	Soil	1.39E+06	0.5	1777.1	22	Lower Clays_33	115	D8.5, p=1600-2500, Pl=20-25	D8.5, p=1600-2500, Pl=20-25	1.56	Lower Clays_33	625
53.46	55.02	Lower Clays	Soil	1.39E+06	0.5	1831.8	22	Lower Clays_34	115	D8.5, p=1600-2500, Pl=20-25	D8.5, p=1600-2500, Pl=20-25	1.56	Lower Clays_34	625
55.02	56.58	Lower Clays	Soil	1.39E+06	0.5	1886.5	22	Lower Clays_35	115	D8.5, p=1600-2500, Pl=20-25	D8.5, p=1600-2500, Pl=20-25	1.56	Lower Clays_35	625
56.58	58.14	Lower Clays	Soil	1.39E+06	0.5	1941.2	22	Lower Clays_36	115	D8.5, p=1600-2500, Pl=20-25	D8.5, p=1600-2500, Pl=20-25	1.56	Lower Clays_36	625
58.14	59.7	Lower Clays	Soil	1.39E+06	0.5	1995.9	22	Lower Clays_37	115	D8.5, p=1600-2500, Pl=20-25	D8.5, p=1600-2500, Pl=20-25	1.56	Lower Clays_37	625
59.7	61.26	Lower Clays	Soil	1.39E+06	0.5	2050.6	22	Lower Clays_38	115	D8.5, p=1600-2500, Pl=20-25	D8.5, p=1600-2500, Pl=20-25	1.56	Lower Clays_38	625
61.26	62.82	Lower Clays	Soil	1.39E+06	0.5	2105.3	22	Lower Clays_39	115	D8.5, p=1600-2500, Pl=20-25	D8.5, p=1600-2500, Pl=20-25	1.56	Lower Clays_39	625
62.82	64.1	Lower Clays	Soil	1.39E+06	0.5	2155.1	22	Lower Clays_40	115	D8.5, p=1600-2500, Pl=20-25	D8.5, p=1600-2500, Pl=20-25	1.28	Lower Clays_40	625
64.1	66.08	GW	Soil	2.93E+06	0.5	2235.4	0	GW_41	150	D8.5, p=1600-2500, Pl=0	D8.5, p=1600-2500, Pl=0	1.98	GW_41	793
66.08	68.06	GW	Soil	2.93E+06	0.5	2351.0	0	GW_42	150	D8.5, p=1600-2500, Pl=0	D8.5, p=1600-2500, Pl=0	1.98	GW_42	793
68.06	70.04	GW	Soil	2.93E+06	0.5	2466.7	0	GW_43	150	D8.5, p=1600-2500, Pl=0	D8.5, p=1600-2500, Pl=0	1.98	GW_43	793
70.04	72.02	GW	Soil	2.93E+06	0.5	2582.3	0	GW_44	150	D8.5, p=2500-5000, Pl=0	D8.5, p=2500-5000, Pl=0	1.98	GW_44	793
72.02	74	GW	Soil	2.93E+06	0.5	2697.9	0	GW_45	150	D8.5, p=2500-5000, Pl=0	D8.5, p=2500-5000, Pl=0	1.98	GW_45	793
74	75.98	GW	Soil	2.93E+06	0.5	2813.5	0	GW_46	150	D8.5, p=2500-5000, Pl=0	D8.5, p=2500-5000, Pl=0	1.98	GW_46	793
75.98	77.96	GW	Soil	2.93E+06	0.5	2929.2	0	GW_47	150	D8.5, p=2500-5000, Pl=0	D8.5, p=2500-5000, Pl=0	1.98	GW_47	793
77.96	79.94	GW	Soil	2.93E+06	0.5	3044.8	0	GW_48	150	D8.5, p=2500-5000, Pl=0	D8.5, p=2500-5000, Pl=0	1.98	GW_48	793
79.94	81.4	GW	Soil	2.93E+06	0.5	3145.3	0	GW_49	150	D8.5, p=2500-5000, Pl=0	D8.5, p=2500-5000, Pl=0	1.46	GW_49	793

Strata Profile														
Non-input Information							Strata "Soil Types" Input					Strata "Soil Profile" Input		
Top Depth (ft)	Bottom Depth (ft)	Layer Name	Layer Type	G _{max} (psf)	K _o	Mean Effective Stress at midpoint (psf)	Plasticity Index	Name (for Strata)	Unit Weight (pcf)	Modulus Reduction (G/gmax) Model	Damping Model	Thickness (ft)	Soil Type (for Strata)	Shear Wave Velocity (fps)
81.4	Half-Space	Bedrock	Half-Space	1.21E+08	0.5	Half-Space	0	Bedrock	156	NA, Half-Space	Damping = 0.5%	Half Space	Bedrock	5000

Facility	US60
Section/Group	NorthBank
Profile Name	d57_nor
Top of Profile Elevation	310
Depth to water table during EQ	13
Surcharge Pressure	

Strata Profile														
Non-input Information						Strata "Soil Types" Input				Strata "Soil Profile" Input				
Top Depth (ft)	Bottom Depth (ft)	Layer Name	Layer Type	G _{max} (psf)	K _o	Mean Effective Stress at midpoint (psf)	Plasticity Index	Name (for Strata)	Unit Weight (pcf)	Modulus Reduction (G/G _{max}) Model	Damping Model	Thickness (ft)	Soil Type (for Strata)	Shear Wave Velocity (fps)
0	2.51	Upper Clay	Soil	3.46E+06	0.5	92.0	5	Upper Clay 1	110	D85, p=0-400, Pi=0-10	D85, p=0-400, Pi=0-10	2.51	Upper Clay 1	1007
2.51	5.02	Upper Clay	Soil	3.46E+06	0.5	276.1	5	Upper Clay 2	110	D85, p=0-400, Pi=0-10	D85, p=0-400, Pi=0-10	2.51	Upper Clay 2	1007
5.02	7.53	Upper Clay	Soil	3.46E+06	0.5	460.2	5	Upper Clay 3	110	D85, p=400-800, Pi=0-10	D85, p=400-800, Pi=0-10	2.51	Upper Clay 3	1007
7.53	10.04	Upper Clay	Soil	3.46E+06	0.5	644.2	5	Upper Clay 4	110	D85, p=400-800, Pi=0-10	D85, p=400-800, Pi=0-10	2.51	Upper Clay 4	1007
10.04	10.1	Upper Clay	Soil	3.46E+06	0.5	738.5	5	Upper Clay 5	110	D85, p=400-800, Pi=0-10	D85, p=400-800, Pi=0-10	0.06	Upper Clay 5	1007
10.1	11.44	P4 Silty Clayey Sands	Soil	1.06E+06	0.5	793.4	0	P4 Silty Clayey Sands 6	118	D85, p=400-800, Pi=0	D85, p=400-800, Pi=0	1.34	P4 Silty Clayey Sands 6	537
11.44	12.78	P4 Silty Clayey Sands	Soil	1.06E+06	0.5	898.8	0	P4 Silty Clayey Sands 7	118	D85, p=800-1600, Pi=0	D85, p=800-1600, Pi=0	1.34	P4 Silty Clayey Sands 7	537
12.78	13	P4 Silty Clayey Sands	Soil	1.06E+06	0.5	960.1	0	P4 Silty Clayey Sands 8	118	D85, p=800-1600, Pi=0	D85, p=800-1600, Pi=0	0.22	P4 Silty Clayey Sands 8	537
13	14.34	P4 Silty Clayey Sands	Soil	1.06E+06	0.5	993.6	0	P4 Silty Clayey Sands 9	118	D85, p=800-1600, Pi=0	D85, p=800-1600, Pi=0	1.34	P4 Silty Clayey Sands 9	537
14.34	15.68	P4 Silty Clayey Sands	Soil	1.06E+06	0.5	1043.3	0	P4 Silty Clayey Sands 10	118	D85, p=800-1600, Pi=0	D85, p=800-1600, Pi=0	1.34	P4 Silty Clayey Sands 10	537
15.68	17.02	P4 Silty Clayey Sands	Soil	1.06E+06	0.5	1093.0	0	P4 Silty Clayey Sands 11	118	D85, p=800-1600, Pi=0	D85, p=800-1600, Pi=0	1.34	P4 Silty Clayey Sands 11	537
17.02	18.36	P4 Silty Clayey Sands	Soil	1.06E+06	0.5	1142.6	0	P4 Silty Clayey Sands 12	118	D85, p=800-1600, Pi=0	D85, p=800-1600, Pi=0	1.34	P4 Silty Clayey Sands 12	537
18.36	19.7	P4 Silty Clayey Sands	Soil	1.06E+06	0.5	1192.3	0	P4 Silty Clayey Sands 13	118	D85, p=800-1600, Pi=0	D85, p=800-1600, Pi=0	1.34	P4 Silty Clayey Sands 13	537
19.7	20.4	P4 Silty Clayey Sands	Soil	1.06E+06	0.5	1230.1	0	P4 Silty Clayey Sands 14	118	D85, p=800-1600, Pi=0	D85, p=800-1600, Pi=0	0.7	P4 Silty Clayey Sands 14	537
20.4	22.3	P4 Liquid	Soil	2.14E+06	0.5	1278.3	0	P4 Liquid 15	118	D85, p=800-1600, Pi=0	D85, p=800-1600, Pi=0	1.9	P4 Liquid 15	764
22.3	24.2	P4 Liquid	Soil	2.14E+06	0.5	1348.7	0	P4 Liquid 16	118	D85, p=800-1600, Pi=0	D85, p=800-1600, Pi=0	1.9	P4 Liquid 16	764
24.2	26.1	P4 Liquid	Soil	2.14E+06	0.5	1419.2	0	P4 Liquid 17	118	D85, p=800-1600, Pi=0	D85, p=800-1600, Pi=0	1.9	P4 Liquid 17	764
26.1	28	P4 Liquid	Soil	2.14E+06	0.5	1489.6	0	P4 Liquid 18	118	D85, p=800-1600, Pi=0	D85, p=800-1600, Pi=0	1.9	P4 Liquid 18	764
28	29.9	P4 Liquid	Soil	2.14E+06	0.5	1560.0	0	P4 Liquid 19	118	D85, p=800-1600, Pi=0	D85, p=800-1600, Pi=0	1.9	P4 Liquid 19	764
29.9	30.4	P4 Liquid	Soil	2.14E+06	0.5	1604.5	0	P4 Liquid 20	118	D85, p=1600-2500, Pi=0	D85, p=1600-2500, Pi=0	0.5	P4 Liquid 20	764
30.4	32.91	Upper Clay	Soil	3.46E+06	0.5	1653.6	5	Upper Clay 21	110	D85, p=1600-2500, Pi=0-10	D85, p=1600-2500, Pi=0-10	2.51	Upper Clay 21	1007
32.91	35.42	Upper Clay	Soil	3.46E+06	0.5	1733.2	5	Upper Clay 22	110	D85, p=1600-2500, Pi=0-10	D85, p=1600-2500, Pi=0-10	2.51	Upper Clay 22	1007
35.42	37.93	Upper Clay	Soil	3.46E+06	0.5	1812.9	5	Upper Clay 23	110	D85, p=1600-2500, Pi=0-10	D85, p=1600-2500, Pi=0-10	2.51	Upper Clay 23	1007
37.93	40.44	Upper Clay	Soil	3.46E+06	0.5	1892.5	5	Upper Clay 24	110	D85, p=1600-2500, Pi=0-10	D85, p=1600-2500, Pi=0-10	2.51	Upper Clay 24	1007
40.44	42.95	Upper Clay	Soil	3.46E+06	0.5	1972.2	5	Upper Clay 25	110	D85, p=1600-2500, Pi=0-10	D85, p=1600-2500, Pi=0-10	2.51	Upper Clay 25	1007
42.95	45.46	Upper Clay	Soil	3.46E+06	0.5	2051.8	5	Upper Clay 26	110	D85, p=1600-2500, Pi=0-10	D85, p=1600-2500, Pi=0-10	2.51	Upper Clay 26	1007
45.46	47.97	Upper Clay	Soil	3.46E+06	0.5	2131.5	5	Upper Clay 27	110	D85, p=1600-2500, Pi=0-10	D85, p=1600-2500, Pi=0-10	2.51	Upper Clay 27	1007
47.97	50.48	Upper Clay	Soil	3.46E+06	0.5	2211.1	5	Upper Clay 28	110	D85, p=1600-2500, Pi=0-10	D85, p=1600-2500, Pi=0-10	2.51	Upper Clay 28	1007
50.48	52.99	Upper Clay	Soil	3.46E+06	0.5	2290.8	5	Upper Clay 29	110	D85, p=1600-2500, Pi=0-10	D85, p=1600-2500, Pi=0-10	2.51	Upper Clay 29	1007
52.99	55.5	Upper Clay	Soil	3.46E+06	0.5	2370.4	5	Upper Clay 30	110	D85, p=1600-2500, Pi=0-10	D85, p=1600-2500, Pi=0-10	2.51	Upper Clay 30	1007
55.5	58.01	Upper Clay	Soil	3.46E+06	0.5	2450.1	5	Upper Clay 31	110	D85, p=1600-2500, Pi=0-10	D85, p=1600-2500, Pi=0-10	2.51	Upper Clay 31	1007
58.01	60.1	Upper Clay	Soil	3.46E+06	0.5	2523.1	5	Upper Clay 32	110	D85, p=2500-5000, Pi=0-10	D85, p=2500-5000, Pi=0-10	2.09	Upper Clay 32	1007
60.1	61.85	Lower Clays	Soil	1.76E+06	0.5	2586.9	22	Lower Clays 33	115	D85, p=2500-5000, Pi=20-25	D85, p=2500-5000, Pi=20-25	1.75	Lower Clays 33	702
61.85	63.6	Lower Clays	Soil	1.76E+06	0.5	2648.3	22	Lower Clays 34	115	D85, p=2500-5000, Pi=20-25	D85, p=2500-5000, Pi=20-25	1.75	Lower Clays 34	702
63.6	65.35	Lower Clays	Soil	1.76E+06	0.5	2709.7	22	Lower Clays 35	115	D85, p=2500-5000, Pi=20-25	D85, p=2500-5000, Pi=20-25	1.75	Lower Clays 35	702
65.35	67.1	Lower Clays	Soil	1.76E+06	0.5	2771.0	22	Lower Clays 36	115	D85, p=2500-5000, Pi=20-25	D85, p=2500-5000, Pi=20-25	1.75	Lower Clays 36	702
67.1	68.85	Lower Clays	Soil	1.76E+06	0.5	2832.4	22	Lower Clays 37	115	D85, p=2500-5000, Pi=20-25	D85, p=2500-5000, Pi=20-25	1.75	Lower Clays 37	702
68.85	70.6	Lower Clays	Soil	1.76E+06	0.5	2893.8	22	Lower Clays 38	115	D85, p=2500-5000, Pi=20-25	D85, p=2500-5000, Pi=20-25	1.75	Lower Clays 38	702
70.6	72.35	Lower Clays	Soil	1.76E+06	0.5	2955.1	22	Lower Clays 39	115	D85, p=2500-5000, Pi=20-25	D85, p=2500-5000, Pi=20-25	1.75	Lower Clays 39	702
72.35	74.1	Lower Clays	Soil	1.76E+06	0.5	3016.5	22	Lower Clays 40	115	D85, p=2500-5000, Pi=20-25	D85, p=2500-5000, Pi=20-25	1.75	Lower Clays 40	702
74.1	75.85	Lower Clays	Soil	1.76E+06	0.5	3077.9	22	Lower Clays 41	115	D85, p=2500-5000, Pi=20-25	D85, p=2500-5000, Pi=20-25	1.75	Lower Clays 41	702
75.85	77.6	Lower Clays	Soil	1.76E+06	0.5	3139.2	22	Lower Clays 42	115	D85, p=2500-5000, Pi=20-25	D85, p=2500-5000, Pi=20-25	1.75	Lower Clays 42	702
77.6	79.35	Lower Clays	Soil	1.76E+06	0.5	3200.6	22	Lower Clays 43	115	D85, p=2500-5000, Pi=20-25	D85, p=2500-5000, Pi=20-25	1.75	Lower Clays 43	702
79.35	80.1	Lower Clays	Soil	1.76E+06	0.5	3244.4	22	Lower Clays 44	115	D85, p=2500-5000, Pi=20-25	D85, p=2500-5000, Pi=20-25	0.75	Lower Clays 44	702
80.1	82.25	GW	Soil	3.47E+06	0.5	3320.4	0	GW 45	150	D85, p=2500-5000, Pi=0	D85, p=2500-5000, Pi=0	2.15	GW 45	863
82.25	84.4	GW	Soil	3.47E+06	0.5	3445.9	0	GW 46	150	D85, p=2500-5000, Pi=0	D85, p=2500-5000, Pi=0	2.15	GW 46	863
84.4	86.55	GW	Soil	3.47E+06	0.5	3571.5	0	GW 47	150	D85, p=2500-5000, Pi=0	D85, p=2500-5000, Pi=0	2.15	GW 47	863
86.55	88.7	GW	Soil	3.47E+06	0.5	3697.0	0	GW 48	150	D85, p=2500-5000, Pi=0	D85, p=2500-5000, Pi=0	2.15	GW 48	863
88.7	90.85	GW	Soil	3.47E+06	0.5	3822.6	0	GW 49	150	D85, p=2500-5000, Pi=0	D85, p=2500-5000, Pi=0	2.15	GW 49	863

Strata Profile														
Non-input Information						Strata "Soil Types" Input					Strata "Soil Profile" Input			
Top Depth (ft)	Bottom Depth (ft)	Layer Name	Layer Type	G _{max} (psf)	K _o	Mean Effective Stress at midpoint (psf)	Plasticity Index	Name (for Strata)	Unit Weight (pcf)	Modulus Reduction (G/G _{max}) Model	Damping Model	Thickness (ft)	Soil Type (for Strata)	Shear Wave Velocity (fps)
90.85	93	GW	Soil	3.47E+06	0.5	3948.2	0	GW_50	150	D&S, p=2500-5000, Pl=0	D&S, p=2500-5000, Pl=0	2.15	GW_50	863
93	95.15	GW	Soil	3.47E+06	0.5	4073.7	0	GW_51	150	D&S, p=2500-5000, Pl=0	D&S, p=2500-5000, Pl=0	2.15	GW_51	863
95.15	97.3	GW	Soil	3.47E+06	0.5	4199.3	0	GW_52	150	D&S, p=2500-5000, Pl=0	D&S, p=2500-5000, Pl=0	2.15	GW_52	863
97.3	97.4	GW	Soil	3.47E+06	0.5	4265.0	0	GW_53	150	D&S, p=2500-5000, Pl=0	D&S, p=2500-5000, Pl=0	0.1	GW_53	863
97.4	Half-Space	Bedrock	Half-Space	1.21E+08	0.5	Half-Space	0	Bedrock	156	NA, Half-Space	Damping = 0.5%	Half Space	Bedrock	5000

Facility	US60
Section/Group	NorthBank
Profile Name	d27_nor
Top of Profile Elevation	319
Depth to water table during EQ	20
Surcharge Pressure	psf

Strata Profile														
Non-input Information						Strata "Soil Types" Input					Strata "Soil Profile" Input			
Top Depth (ft)	Bottom Depth (ft)	Layer Name	Layer Type	G _{max}	K _o	Mean Effective Stress at midpoint (psf)	Plasticity Index	Name (for Strata)	Unit Weight (pcf)	Modulus Reduction (G/G _{max}) Model	Damping Model	Thickness (ft)	Soil Type (for Strata)	Shear Wave Velocity (fps)
0	2.51	Upper Clay	Soil	3.46E+06	0.5	92.0	5	Upper Clay 1	110	D8.5, p=0-400, Pi=0-10	D8.5, p=0-400, Pi=0-10	2.51	Upper Clay 1	1007
2.51	5.02	Upper Clay	Soil	3.46E+06	0.5	276.1	5	Upper Clay 2	110	D8.5, p=0-400, Pi=0-10	D8.5, p=0-400, Pi=0-10	2.51	Upper Clay 2	1007
5.02	7.53	Upper Clay	Soil	3.46E+06	0.5	460.2	5	Upper Clay 3	110	D8.5, p=400-800, Pi=0-10	D8.5, p=400-800, Pi=0-10	2.51	Upper Clay 3	1007
7.53	10.04	Upper Clay	Soil	3.46E+06	0.5	644.2	5	Upper Clay 4	110	D8.5, p=400-800, Pi=0-10	D8.5, p=400-800, Pi=0-10	2.51	Upper Clay 4	1007
10.04	12.55	Upper Clay	Soil	3.46E+06	0.5	828.3	5	Upper Clay 5	110	D8.5, p=800-1600, Pi=0-10	D8.5, p=800-1600, Pi=0-10	2.51	Upper Clay 5	1007
12.55	15.06	Upper Clay	Soil	3.46E+06	0.5	1012.4	5	Upper Clay 6	110	D8.5, p=800-1600, Pi=0-10	D8.5, p=800-1600, Pi=0-10	2.51	Upper Clay 6	1007
15.06	17.57	Upper Clay	Soil	3.46E+06	0.5	1196.4	5	Upper Clay 7	110	D8.5, p=800-1600, Pi=0-10	D8.5, p=800-1600, Pi=0-10	2.51	Upper Clay 7	1007
17.57	19.1	Upper Clay	Soil	3.46E+06	0.5	1344.6	5	Upper Clay 8	110	D8.5, p=800-1600, Pi=0-10	D8.5, p=800-1600, Pi=0-10	1.53	Upper Clay 8	1007
19.1	20	P4 Silty Clayey Sands	Soil	1.32E+06	0.5	1436.1	0	P4 Silty Clayey Sands 9	118	D8.5, p=800-1600, Pi=0	D8.5, p=800-1600, Pi=0	0.9	P4 Silty Clayey Sands 9	599
20	21.49	P4 Silty Clayey Sands	Soil	1.32E+06	0.5	1499.1	0	P4 Silty Clayey Sands 10	118	D8.5, p=800-1600, Pi=0	D8.5, p=800-1600, Pi=0	1.49	P4 Silty Clayey Sands 10	599
21.49	22.98	P4 Silty Clayey Sands	Soil	1.32E+06	0.5	1554.3	0	P4 Silty Clayey Sands 11	118	D8.5, p=800-1600, Pi=0	D8.5, p=800-1600, Pi=0	1.49	P4 Silty Clayey Sands 11	599
22.98	24.47	P4 Silty Clayey Sands	Soil	1.32E+06	0.5	1609.5	0	P4 Silty Clayey Sands 12	118	D8.5, p=1600-2500, Pi=0	D8.5, p=1600-2500, Pi=0	1.49	P4 Silty Clayey Sands 12	599
24.47	25.96	P4 Silty Clayey Sands	Soil	1.32E+06	0.5	1664.8	0	P4 Silty Clayey Sands 13	118	D8.5, p=1600-2500, Pi=0	D8.5, p=1600-2500, Pi=0	1.49	P4 Silty Clayey Sands 13	599
25.96	27.45	P4 Silty Clayey Sands	Soil	1.32E+06	0.5	1720.0	0	P4 Silty Clayey Sands 14	118	D8.5, p=1600-2500, Pi=0	D8.5, p=1600-2500, Pi=0	1.49	P4 Silty Clayey Sands 14	599
27.45	28.94	P4 Silty Clayey Sands	Soil	1.32E+06	0.5	1775.2	0	P4 Silty Clayey Sands 15	118	D8.5, p=1600-2500, Pi=0	D8.5, p=1600-2500, Pi=0	1.49	P4 Silty Clayey Sands 15	599
28.94	29.4	P4 Silty Clayey Sands	Soil	1.32E+06	0.5	1811.4	0	P4 Silty Clayey Sands 16	118	D8.5, p=1600-2500, Pi=0	D8.5, p=1600-2500, Pi=0	0.46	P4 Silty Clayey Sands 16	599
29.4	31.47	P4 Liquid	Soil	2.53E+06	0.5	1858.3	0	P4 Liquid 17	118	D8.5, p=1600-2500, Pi=0	D8.5, p=1600-2500, Pi=0	2.07	P4 Liquid 17	831
31.47	33.54	P4 Liquid	Soil	2.53E+06	0.5	1935.0	0	P4 Liquid 18	118	D8.5, p=1600-2500, Pi=0	D8.5, p=1600-2500, Pi=0	2.07	P4 Liquid 18	831
33.54	35.61	P4 Liquid	Soil	2.53E+06	0.5	2011.7	0	P4 Liquid 19	118	D8.5, p=1600-2500, Pi=0	D8.5, p=1600-2500, Pi=0	2.07	P4 Liquid 19	831
35.61	37.68	P4 Liquid	Soil	2.53E+06	0.5	2088.4	0	P4 Liquid 20	118	D8.5, p=1600-2500, Pi=0	D8.5, p=1600-2500, Pi=0	2.07	P4 Liquid 20	831
37.68	39.4	P4 Liquid	Soil	2.53E+06	0.5	2158.7	0	P4 Liquid 21	118	D8.5, p=1600-2500, Pi=0	D8.5, p=1600-2500, Pi=0	1.72	P4 Liquid 21	831
39.4	41.91	Upper Clay	Soil	3.46E+06	0.5	2230.4	5	Upper Clay 22	110	D8.5, p=1600-2500, Pi=0-10	D8.5, p=1600-2500, Pi=0-10	2.51	Upper Clay 22	1007
41.91	44.42	Upper Clay	Soil	3.46E+06	0.5	2310.0	5	Upper Clay 23	110	D8.5, p=1600-2500, Pi=0-10	D8.5, p=1600-2500, Pi=0-10	2.51	Upper Clay 23	1007
44.42	46.93	Upper Clay	Soil	3.46E+06	0.5	2387.9	5	Upper Clay 24	110	D8.5, p=1600-2500, Pi=0-10	D8.5, p=1600-2500, Pi=0-10	2.51	Upper Clay 24	1007
46.93	49.44	Upper Clay	Soil	3.46E+06	0.5	2469.3	5	Upper Clay 25	110	D8.5, p=1600-2500, Pi=0-10	D8.5, p=1600-2500, Pi=0-10	2.51	Upper Clay 25	1007
49.44	51.95	Upper Clay	Soil	3.46E+06	0.5	2549.0	5	Upper Clay 26	110	D8.5, p=2500-5000, Pi=0-10	D8.5, p=2500-5000, Pi=0-10	2.51	Upper Clay 26	1007
51.95	54.46	Upper Clay	Soil	3.46E+06	0.5	2628.6	5	Upper Clay 27	110	D8.5, p=2500-5000, Pi=0-10	D8.5, p=2500-5000, Pi=0-10	2.51	Upper Clay 27	1007
54.46	56.97	Upper Clay	Soil	3.46E+06	0.5	2708.3	5	Upper Clay 28	110	D8.5, p=2500-5000, Pi=0-10	D8.5, p=2500-5000, Pi=0-10	2.51	Upper Clay 28	1007
56.97	59.48	Upper Clay	Soil	3.46E+06	0.5	2787.9	5	Upper Clay 29	110	D8.5, p=2500-5000, Pi=0-10	D8.5, p=2500-5000, Pi=0-10	2.51	Upper Clay 29	1007
59.48	61.99	Upper Clay	Soil	3.46E+06	0.5	2867.6	5	Upper Clay 30	110	D8.5, p=2500-5000, Pi=0-10	D8.5, p=2500-5000, Pi=0-10	2.51	Upper Clay 30	1007
61.99	64.5	Upper Clay	Soil	3.46E+06	0.5	2947.2	5	Upper Clay 31	110	D8.5, p=2500-5000, Pi=0-10	D8.5, p=2500-5000, Pi=0-10	2.51	Upper Clay 31	1007
64.5	67.01	Upper Clay	Soil	3.46E+06	0.5	3026.9	5	Upper Clay 32	110	D8.5, p=2500-5000, Pi=0-10	D8.5, p=2500-5000, Pi=0-10	2.51	Upper Clay 32	1007
67.01	69.1	Upper Clay	Soil	3.46E+06	0.5	3099.9	5	Upper Clay 33	110	D8.5, p=2500-5000, Pi=0-10	D8.5, p=2500-5000, Pi=0-10	2.09	Upper Clay 33	1007
69.1	70.93	Lower Clays	Soil	1.92E+06	0.5	3165.1	22	Lower Clays 34	115	D8.5, p=2500-5000, Pi=20-25	D8.5, p=2500-5000, Pi=20-25	1.83	Lower Clays 34	734
70.93	72.76	Lower Clays	Soil	1.92E+06	0.5	3229.3	22	Lower Clays 35	115	D8.5, p=2500-5000, Pi=20-25	D8.5, p=2500-5000, Pi=20-25	1.83	Lower Clays 35	734
72.76	74.59	Lower Clays	Soil	1.92E+06	0.5	3293.5	22	Lower Clays 36	115	D8.5, p=2500-5000, Pi=20-25	D8.5, p=2500-5000, Pi=20-25	1.83	Lower Clays 36	734
74.59	76.42	Lower Clays	Soil	1.92E+06	0.5	3357.6	22	Lower Clays 37	115	D8.5, p=2500-5000, Pi=20-25	D8.5, p=2500-5000, Pi=20-25	1.83	Lower Clays 37	734
76.42	78.25	Lower Clays	Soil	1.92E+06	0.5	3421.8	22	Lower Clays 38	115	D8.5, p=2500-5000, Pi=20-25	D8.5, p=2500-5000, Pi=20-25	1.83	Lower Clays 38	734
78.25	80.08	Lower Clays	Soil	1.92E+06	0.5	3486.0	22	Lower Clays 39	115	D8.5, p=2500-5000, Pi=20-25	D8.5, p=2500-5000, Pi=20-25	1.83	Lower Clays 39	734
80.08	81.91	Lower Clays	Soil	1.92E+06	0.5	3550.2	22	Lower Clays 40	115	D8.5, p=2500-5000, Pi=20-25	D8.5, p=2500-5000, Pi=20-25	1.83	Lower Clays 40	734
81.91	83.74	Lower Clays	Soil	1.92E+06	0.5	3614.3	22	Lower Clays 41	115	D8.5, p=2500-5000, Pi=20-25	D8.5, p=2500-5000, Pi=20-25	1.83	Lower Clays 41	734
83.74	85.57	Lower Clays	Soil	1.92E+06	0.5	3678.5	22	Lower Clays 42	115	D8.5, p=2500-5000, Pi=20-25	D8.5, p=2500-5000, Pi=20-25	1.83	Lower Clays 42	734
85.57	87.4	Lower Clays	Soil	1.92E+06	0.5	3742.7	22	Lower Clays 43	115	D8.5, p=2500-5000, Pi=20-25	D8.5, p=2500-5000, Pi=20-25	1.83	Lower Clays 43	734
87.4	89.1	Lower Clays	Soil	1.92E+06	0.5	3804.6	22	Lower Clays 44	115	D8.5, p=2500-5000, Pi=20-25	D8.5, p=2500-5000, Pi=20-25	1.7	Lower Clays 44	734
89.1	91.33	GW	Soil	3.72E+06	0.5	3899.5	0	GW 45	150	D8.5, p=2500-5000, Pi=0	D8.5, p=2500-5000, Pi=0	2.23	GW 45	894
91.33	93.56	GW	Soil	3.72E+06	0.5	4029.7	0	GW 46	150	D8.5, p=2500-5000, Pi=0	D8.5, p=2500-5000, Pi=0	2.23	GW 46	894
93.56	95.79	GW	Soil	3.72E+06	0.5	4160.0	0	GW 47	150	D8.5, p=2500-5000, Pi=0	D8.5, p=2500-5000, Pi=0	2.23	GW 47	894
95.79	98.02	GW	Soil	3.72E+06	0.5	4290.2	0	GW 48	150	D8.5, p=2500-5000, Pi=0	D8.5, p=2500-5000, Pi=0	2.23	GW 48	894
98.02	100.25	GW	Soil	3.72E+06	0.5	4420.4	0	GW 49	150	D8.5, p=2500-5000, Pi=0	D8.5, p=2500-5000, Pi=0	2.23	GW 49	894

Strata Profile														
Non-input Information							Strata "Soil Types" Input				Strata "Soil Profile" Input			
Top Depth (ft)	Bottom Depth (ft)	Layer Name	Layer Type	G _{max} (psf)	K _o	Mean Effective Stress at midpoint (psf)	Plasticity Index	Name (for Strata)	Unit Weight (pcf)	Modulus Reduction (G/G _{max}) Model	Damping Model	Thickness (ft)	Soil Type (for Strata)	Shear Wave Velocity (fps)
100.25	102.48	GW	Soil	3.72E+06	0.5	4550.6	0	GW_50	150	D&S, p'=2500-5000, Pl=0	D&S, p'=2500-5000, Pl=0	2.23	GW_50	894
102.48	104.71	GW	Soil	3.72E+06	0.5	4680.9	0	GW_51	150	D&S, p'=2500-5000, Pl=0	D&S, p'=2500-5000, Pl=0	2.23	GW_51	894
104.71	106.4	GW	Soil	3.72E+06	0.5	4795.3	0	GW_52	150	D&S, p'=2500-5000, Pl=0	D&S, p'=2500-5000, Pl=0	1.69	GW_52	894
106.4	Half-Space	Bedrock	Half-Space	1.21E+08	0.5	Half-Space	0	Bedrock	156	NA, Half-Space	Damping = 0.5%	Half Space	Bedrock	5000

Facility	US60
Section/Group	SpillSlope
Profile Name	d140_nor
Top of Profile Elevation	338.3 ft
Depth to water table during EQ	12.8 ft
Surcharge Pressure	psf

Strata Profile														
Non-input Information					Strata "Soil Types" Input					Strata "Soil Profile" Input				
Top Depth (ft)	Bottom Depth (ft)	Layer Name	Layer Type	G _{max} (psf)	k _s	Mean Effective Stress at midpoint (psf)	Plasticity Index	Name (for Strata)	Unit Weight (pcf)	Modulus Reduction (G/G _{max}) Model	Damping Model	Thickness (ft)	Soil Type (for Strata)	Shear Wave Velocity (fps)
0	2.37	Upper Clay	Soil	3.46E+06	0.5	98.0	5	Upper Clay 1	124	D85, p=0-400, PI=0-10	D85, p=0-400, PI=0-10	2.37	Upper Clay 1	948
2.37	4.74	Upper Clay	Soil	3.46E+06	0.5	293.9	5	Upper Clay 2	124	D85, p=0-400, PI=0-10	D85, p=0-400, PI=0-10	2.37	Upper Clay 2	948
4.74	7.11	Upper Clay	Soil	3.46E+06	0.5	489.8	5	Upper Clay 3	124	D85, p=400-800, PI=0-10	D85, p=400-800, PI=0-10	2.37	Upper Clay 3	948
7.11	9.48	Upper Clay	Soil	3.46E+06	0.5	685.7	5	Upper Clay 4	124	D85, p=400-800, PI=0-10	D85, p=400-800, PI=0-10	2.37	Upper Clay 4	948
9.48	11.85	Upper Clay	Soil	3.46E+06	0.5	881.6	5	Upper Clay 5	124	D85, p=800-1600, PI=0-10	D85, p=800-1600, PI=0-10	2.37	Upper Clay 5	948
11.85	12.8	Upper Clay	Soil	3.46E+06	0.5	1018.9	5	Upper Clay 6	124	D85, p=800-1600, PI=0-10	D85, p=800-1600, PI=0-10	0.95	Upper Clay 6	948
12.8	15.17	Upper Clay	Soil	3.46E+06	0.5	1106.8	5	Upper Clay 7	124	D85, p=800-1600, PI=0-10	D85, p=800-1600, PI=0-10	2.37	Upper Clay 7	948
15.17	17.54	Upper Clay	Soil	3.46E+06	0.5	1204.1	5	Upper Clay 8	124	D85, p=800-1600, PI=0-10	D85, p=800-1600, PI=0-10	2.37	Upper Clay 8	948
17.54	19.91	Upper Clay	Soil	3.46E+06	0.5	1301.5	5	Upper Clay 9	124	D85, p=800-1600, PI=0-10	D85, p=800-1600, PI=0-10	2.37	Upper Clay 9	948
19.91	22.28	Upper Clay	Soil	3.46E+06	0.5	1398.8	5	Upper Clay 10	124	D85, p=800-1600, PI=0-10	D85, p=800-1600, PI=0-10	2.37	Upper Clay 10	948
22.28	24.65	Upper Clay	Soil	3.46E+06	0.5	1496.1	5	Upper Clay 11	124	D85, p=800-1600, PI=0-10	D85, p=800-1600, PI=0-10	2.37	Upper Clay 11	948
24.65	27.02	Upper Clay	Soil	3.46E+06	0.5	1593.4	5	Upper Clay 12	124	D85, p=800-1600, PI=0-10	D85, p=800-1600, PI=0-10	2.37	Upper Clay 12	948
27.02	29.39	Upper Clay	Soil	3.46E+06	0.5	1690.8	5	Upper Clay 13	124	D85, p=1600-2500, PI=0-10	D85, p=1600-2500, PI=0-10	2.37	Upper Clay 13	948
29.39	31.76	Upper Clay	Soil	3.46E+06	0.5	1788.1	5	Upper Clay 14	124	D85, p=1600-2500, PI=0-10	D85, p=1600-2500, PI=0-10	2.37	Upper Clay 14	948
31.76	34.13	Upper Clay	Soil	3.46E+06	0.5	1885.4	5	Upper Clay 15	124	D85, p=1600-2500, PI=0-10	D85, p=1600-2500, PI=0-10	2.37	Upper Clay 15	948
34.13	36.5	Upper Clay	Soil	3.46E+06	0.5	1982.7	5	Upper Clay 16	124	D85, p=1600-2500, PI=0-10	D85, p=1600-2500, PI=0-10	2.37	Upper Clay 16	948
36.5	38.87	Upper Clay	Soil	3.46E+06	0.5	2080.1	5	Upper Clay 17	124	D85, p=1600-2500, PI=0-10	D85, p=1600-2500, PI=0-10	2.37	Upper Clay 17	948
38.87	41.24	Upper Clay	Soil	3.46E+06	0.5	2177.4	5	Upper Clay 18	124	D85, p=1600-2500, PI=0-10	D85, p=1600-2500, PI=0-10	2.37	Upper Clay 18	948
41.24	43.61	Upper Clay	Soil	3.46E+06	0.5	2274.7	5	Upper Clay 19	124	D85, p=1600-2500, PI=0-10	D85, p=1600-2500, PI=0-10	2.37	Upper Clay 19	948
43.61	45.98	Upper Clay	Soil	3.46E+06	0.5	2372.1	5	Upper Clay 20	124	D85, p=1600-2500, PI=0-10	D85, p=1600-2500, PI=0-10	2.37	Upper Clay 20	948
45.98	48.35	Upper Clay	Soil	3.46E+06	0.5	2469.4	5	Upper Clay 21	124	D85, p=1600-2500, PI=0-10	D85, p=1600-2500, PI=0-10	2.37	Upper Clay 21	948
48.35	50.72	Upper Clay	Soil	3.46E+06	0.5	2566.7	5	Upper Clay 22	124	D85, p=2500-5000, PI=0-10	D85, p=2500-5000, PI=0-10	2.37	Upper Clay 22	948
50.72	53.09	Upper Clay	Soil	3.46E+06	0.5	2664.0	5	Upper Clay 23	124	D85, p=2500-5000, PI=0-10	D85, p=2500-5000, PI=0-10	2.37	Upper Clay 23	948
53.09	55.46	Upper Clay	Soil	3.46E+06	0.5	2761.4	5	Upper Clay 24	124	D85, p=2500-5000, PI=0-10	D85, p=2500-5000, PI=0-10	2.37	Upper Clay 24	948
55.46	57.83	Upper Clay	Soil	3.46E+06	0.5	2858.7	5	Upper Clay 25	124	D85, p=2500-5000, PI=0-10	D85, p=2500-5000, PI=0-10	2.37	Upper Clay 25	948
57.83	60.2	Upper Clay	Soil	3.46E+06	0.5	2956.0	5	Upper Clay 26	124	D85, p=2500-5000, PI=0-10	D85, p=2500-5000, PI=0-10	2.37	Upper Clay 26	948
60.2	61.5	Upper Clay	Soil	3.46E+06	0.5	3031.4	5	Upper Clay 27	124	D85, p=2500-5000, PI=0-10	D85, p=2500-5000, PI=0-10	1.3	Upper Clay 27	948
61.5	63.27	Upper Silty Sand	Soil	2.04E+06	0.5	3098.0	0	Upper Silty Sand 28	130	D85, p=2500-5000, PI=0	D85, p=2500-5000, PI=0	1.77	Upper Silty Sand 28	711
63.27	65.04	Upper Silty Sand	Soil	2.04E+06	0.5	3177.7	0	Upper Silty Sand 29	130	D85, p=2500-5000, PI=0	D85, p=2500-5000, PI=0	1.77	Upper Silty Sand 29	711
65.04	66.81	Upper Silty Sand	Soil	2.04E+06	0.5	3257.5	0	Upper Silty Sand 30	130	D85, p=2500-5000, PI=0	D85, p=2500-5000, PI=0	1.77	Upper Silty Sand 30	711
66.81	68.58	Upper Silty Sand	Soil	2.04E+06	0.5	3337.3	0	Upper Silty Sand 31	130	D85, p=2500-5000, PI=0	D85, p=2500-5000, PI=0	1.77	Upper Silty Sand 31	711
68.58	70.35	Upper Silty Sand	Soil	2.04E+06	0.5	3417.0	0	Upper Silty Sand 32	130	D85, p=2500-5000, PI=0	D85, p=2500-5000, PI=0	1.77	Upper Silty Sand 32	711
70.35	72.12	Upper Silty Sand	Soil	2.04E+06	0.5	3496.8	0	Upper Silty Sand 33	130	D85, p=2500-5000, PI=0	D85, p=2500-5000, PI=0	1.77	Upper Silty Sand 33	711
72.12	73.89	Upper Silty Sand	Soil	2.04E+06	0.5	3576.6	0	Upper Silty Sand 34	130	D85, p=2500-5000, PI=0	D85, p=2500-5000, PI=0	1.77	Upper Silty Sand 34	711
73.89	75.66	Upper Silty Sand	Soil	2.04E+06	0.5	3656.3	0	Upper Silty Sand 35	130	D85, p=2500-5000, PI=0	D85, p=2500-5000, PI=0	1.77	Upper Silty Sand 35	711
75.66	77.43	Upper Silty Sand	Soil	2.04E+06	0.5	3736.1	0	Upper Silty Sand 36	130	D85, p=2500-5000, PI=0	D85, p=2500-5000, PI=0	1.77	Upper Silty Sand 36	711
77.43	79.2	Upper Silty Sand	Soil	2.04E+06	0.5	3815.9	0	Upper Silty Sand 37	130	D85, p=2500-5000, PI=0	D85, p=2500-5000, PI=0	1.77	Upper Silty Sand 37	711
79.2	80.97	Upper Silty Sand	Soil	2.04E+06	0.5	3895.6	0	Upper Silty Sand 38	130	D85, p=2500-5000, PI=0	D85, p=2500-5000, PI=0	1.77	Upper Silty Sand 38	711
80.97	82.74	Upper Silty Sand	Soil	2.04E+06	0.5	3975.4	0	Upper Silty Sand 39	130	D85, p=2500-5000, PI=0	D85, p=2500-5000, PI=0	1.77	Upper Silty Sand 39	711
82.74	84.51	Upper Silty Sand	Soil	2.04E+06	0.5	4055.2	0	Upper Silty Sand 40	130	D85, p=2500-5000, PI=0	D85, p=2500-5000, PI=0	1.77	Upper Silty Sand 40	711
84.51	86.28	Upper Silty Sand	Soil	2.04E+06	0.5	4134.9	0	Upper Silty Sand 41	130	D85, p=2500-5000, PI=0	D85, p=2500-5000, PI=0	1.77	Upper Silty Sand 41	711
86.28	88.05	Upper Silty Sand	Soil	2.04E+06	0.5	4214.7	0	Upper Silty Sand 42	130	D85, p=2500-5000, PI=0	D85, p=2500-5000, PI=0	1.77	Upper Silty Sand 42	711
88.05	89.82	Upper Silty Sand	Soil	2.04E+06	0.5	4294.5	0	Upper Silty Sand 43	130	D85, p=2500-5000, PI=0	D85, p=2500-5000, PI=0	1.77	Upper Silty Sand 43	711
89.82	91.59	Upper Silty Sand	Soil	2.04E+06	0.5	4374.3	0	Upper Silty Sand 44	130	D85, p=2500-5000, PI=0	D85, p=2500-5000, PI=0	1.77	Upper Silty Sand 44	711
91.59	93.36	Upper Silty Sand	Soil	2.04E+06	0.5	4454.0	0	Upper Silty Sand 45	130	D85, p=2500-5000, PI=0	D85, p=2500-5000, PI=0	1.77	Upper Silty Sand 45	711
93.36	95.13	Upper Silty Sand	Soil	2.04E+06	0.5	4533.8	0	Upper Silty Sand 46	130	D85, p=2500-5000, PI=0	D85, p=2500-5000, PI=0	1.77	Upper Silty Sand 46	711
95.13	96.9	Upper Silty Sand	Soil	2.04E+06	0.5	4613.6	0	Upper Silty Sand 47	130	D85, p=2500-5000, PI=0	D85, p=2500-5000, PI=0	1.77	Upper Silty Sand 47	711
96.9	98.67	Upper Silty Sand	Soil	2.04E+06	0.5	4693.3	0	Upper Silty Sand 48	130	D85, p=2500-5000, PI=0	D85, p=2500-5000, PI=0	1.77	Upper Silty Sand 48	711
98.67	100	Upper Silty Sand	Soil	2.04E+06	0.5	4773.2	0	Upper Silty Sand 49	130	D85, p=2500-5000, PI=0	D85, p=2500-5000, PI=0	1.33	Upper Silty Sand 49	711

Strata Profile										
Non-input Information						Strata "Soil Types" Input				
Top Depth (ft)	Bottom Depth (ft)	Layer Name	Layer Type	G _{max} (psf)	K _s	Mean Effective Stress at midpoint (psf)	Plasticity Index	Name (for Strata)	Unit Weight (pcf)	Modulus Reduction (G/Gmax) Model
						Damping Model		Thickness (ft)	Strata "Soil Profile" Input	
									Soil Type (for Strata)	Shear Wave Velocity (fps)
100	101.99	Lower Clays	Soil	2.37E+06	0.5	4831.4	22	Lower Clays_50	Lower Clays_50	797
101.99	103.98	Lower Clays	Soil	2.37E+06	0.5	4907.8	22	Lower Clays_51	Lower Clays_51	797
103.98	105.97	Lower Clays	Soil	2.37E+06	0.5	4984.2	22	Lower Clays_52	Lower Clays_52	797
105.97	107.96	Lower Clays	Soil	2.37E+06	0.5	5060.6	22	Lower Clays_53	Lower Clays_53	797
107.96	109.95	Lower Clays	Soil	2.37E+06	0.5	5137.0	22	Lower Clays_54	Lower Clays_54	797
109.95	111.94	Lower Clays	Soil	2.37E+06	0.5	5213.4	22	Lower Clays_55	Lower Clays_55	797
111.94	113.93	Lower Clays	Soil	2.37E+06	0.5	5289.9	22	Lower Clays_56	Lower Clays_56	797
113.93	115.92	Lower Clays	Soil	2.37E+06	0.5	5366.3	22	Lower Clays_57	Lower Clays_57	797
115.92	117.91	Lower Clays	Soil	2.37E+06	0.5	5442.7	22	Lower Clays_58	Lower Clays_58	797
117.91	119.9	Lower Clays	Soil	2.37E+06	0.5	5519.1	22	Lower Clays_59	Lower Clays_59	797
119.9	121.89	Lower Clays	Soil	2.37E+06	0.5	5595.5	22	Lower Clays_60	Lower Clays_60	797
121.89	123.88	Lower Clays	Soil	2.37E+06	0.5	5671.9	22	Lower Clays_61	Lower Clays_61	797
123.88	125	Lower Clays	Soil	2.37E+06	0.5	5731.6	22	Lower Clays_62	Lower Clays_62	797
125	127.43	Lower Silty Sands	Soil	4.41E+06	0.5	5824.1	0	Lower Silty Sands_63	Lower Silty Sands_63	972
127.43	129.86	Lower Silty Sands	Soil	4.41E+06	0.5	5966.0	0	Lower Silty Sands_64	Lower Silty Sands_64	972
129.86	132.29	Lower Silty Sands	Soil	4.41E+06	0.5	6107.9	0	Lower Silty Sands_65	Lower Silty Sands_65	972
132.29	134.72	Lower Silty Sands	Soil	4.41E+06	0.5	6249.8	0	Lower Silty Sands_66	Lower Silty Sands_66	972
134.72	136	Lower Silty Sands	Soil	4.41E+06	0.5	6358.2	0	Lower Silty Sands_67	Lower Silty Sands_67	972
136	Half-Space	Bedrock	Half-Space	1.21E+08	0.5	Half-Space	0	Bedrock	Bedrock	5000
						Damping = 0.5%		Half-Space		

Facility	US60
Section/Group	SpillSlope
Profile Name	d40_nor
Top of Profile Elevation	355.2 ft
Depth to water table during EQ	16.9 ft
Surcharge Pressure	psf

Non-input Information										Strata Profile				Strata "Soil Types" Input				Strata "Soil Profile" Input	
Top Depth (ft)	Bottom Depth (ft)	Layer Name	Layer Type	G _{max} (psf)	k _s	Mean Effective Stress at midpoint (psf)	Plasticity Index	Name (for Strata)	Unit Weight (pcf)	Modulus Reduction (G/G _{max}) Model	Damping Model	Thickness (ft)	Soil Type (for Strata)	Shear Wave Velocity (fps)					
0	2.5	Embankment	Soil	4.04E+06	0.5	108.3	10	Embankment 1	130	D8.5, p=0-400, Pi=0-10	D8.5, p=0-400, Pi=0-10	2.5	Embankment 1	1000					
2.5	5	Embankment	Soil	4.04E+06	0.5	325.0	10	Embankment 2	130	D8.5, p=0-400, Pi=0-10	D8.5, p=0-400, Pi=0-10	2.5	Embankment 2	1000					
5	7.5	Embankment	Soil	4.04E+06	0.5	541.7	10	Embankment 3	130	D8.5, p=400-800, Pi=0-10	D8.5, p=400-800, Pi=0-10	2.5	Embankment 3	1000					
7.5	10	Embankment	Soil	4.04E+06	0.5	758.3	10	Embankment 4	130	D8.5, p=400-800, Pi=0-10	D8.5, p=400-800, Pi=0-10	2.5	Embankment 4	1000					
10	12.5	Embankment	Soil	4.04E+06	0.5	975.0	10	Embankment 5	130	D8.5, p=800-1600, Pi=0-10	D8.5, p=800-1600, Pi=0-10	2.5	Embankment 5	1000					
12.5	15	Embankment	Soil	4.04E+06	0.5	1191.7	10	Embankment 6	130	D8.5, p=800-1600, Pi=0-10	D8.5, p=800-1600, Pi=0-10	2.5	Embankment 6	1000					
15	16.8	Embankment	Soil	4.04E+06	0.5	1378.0	10	Embankment 7	130	D8.5, p=800-1600, Pi=0-10	D8.5, p=800-1600, Pi=0-10	1.8	Embankment 7	1000					
16.8	16.9	Upper Clay	Soil	3.46E+06	0.5	1460.1	5	Upper Clay 8	124	D8.5, p=800-1600, Pi=0-10	D8.5, p=800-1600, Pi=0-10	0.1	Upper Clay 8	948					
16.9	19.27	Upper Clay	Soil	3.46E+06	0.5	1512.9	5	Upper Clay 9	124	D8.5, p=800-1600, Pi=0-10	D8.5, p=800-1600, Pi=0-10	2.37	Upper Clay 9	948					
19.27	21.64	Upper Clay	Soil	3.46E+06	0.5	1610.3	5	Upper Clay 10	124	D8.5, p=1600-2500, Pi=0-10	D8.5, p=1600-2500, Pi=0-10	2.37	Upper Clay 10	948					
21.64	24.01	Upper Clay	Soil	3.46E+06	0.5	1707.6	5	Upper Clay 11	124	D8.5, p=1600-2500, Pi=0-10	D8.5, p=1600-2500, Pi=0-10	2.37	Upper Clay 11	948					
24.01	26.38	Upper Clay	Soil	3.46E+06	0.5	1804.9	5	Upper Clay 12	124	D8.5, p=1600-2500, Pi=0-10	D8.5, p=1600-2500, Pi=0-10	2.37	Upper Clay 12	948					
26.38	28.75	Upper Clay	Soil	3.46E+06	0.5	1902.2	5	Upper Clay 13	124	D8.5, p=1600-2500, Pi=0-10	D8.5, p=1600-2500, Pi=0-10	2.37	Upper Clay 13	948					
28.75	31.12	Upper Clay	Soil	3.46E+06	0.5	1999.6	5	Upper Clay 14	124	D8.5, p=1600-2500, Pi=0-10	D8.5, p=1600-2500, Pi=0-10	2.37	Upper Clay 14	948					
31.12	31.3	Upper Clay	Soil	3.46E+06	0.5	2051.9	5	Upper Clay 15	124	D8.5, p=1600-2500, Pi=0-10	D8.5, p=1600-2500, Pi=0-10	0.18	Upper Clay 15	948					
31.3	32.95	Upper Silty Sand	Soil	1.64E+06	0.5	2087.3	0	Upper Silty Sand 16	120	D8.5, p=1600-2500, Pi=0	D8.5, p=1600-2500, Pi=0	1.65	Upper Silty Sand 16	664					
32.95	34.6	Upper Silty Sand	Soil	1.64E+06	0.5	2150.7	0	Upper Silty Sand 17	120	D8.5, p=1600-2500, Pi=0	D8.5, p=1600-2500, Pi=0	1.65	Upper Silty Sand 17	664					
34.6	36.25	Upper Silty Sand	Soil	1.64E+06	0.5	2214.0	0	Upper Silty Sand 18	120	D8.5, p=1600-2500, Pi=0	D8.5, p=1600-2500, Pi=0	1.65	Upper Silty Sand 18	664					
36.25	37.9	Upper Silty Sand	Soil	1.64E+06	0.5	2277.4	0	Upper Silty Sand 19	120	D8.5, p=1600-2500, Pi=0	D8.5, p=1600-2500, Pi=0	1.65	Upper Silty Sand 19	664					
37.9	39.55	Upper Silty Sand	Soil	1.64E+06	0.5	2340.7	0	Upper Silty Sand 20	120	D8.5, p=1600-2500, Pi=0	D8.5, p=1600-2500, Pi=0	1.65	Upper Silty Sand 20	664					
39.55	41.2	Upper Silty Sand	Soil	1.64E+06	0.5	2404.1	0	Upper Silty Sand 21	120	D8.5, p=1600-2500, Pi=0	D8.5, p=1600-2500, Pi=0	1.65	Upper Silty Sand 21	664					
41.2	42.85	Upper Silty Sand	Soil	1.64E+06	0.5	2467.5	0	Upper Silty Sand 22	120	D8.5, p=1600-2500, Pi=0	D8.5, p=1600-2500, Pi=0	1.65	Upper Silty Sand 22	664					
42.85	44.5	Upper Silty Sand	Soil	1.64E+06	0.5	2530.8	0	Upper Silty Sand 23	120	D8.5, p=2500-5000, Pi=0	D8.5, p=2500-5000, Pi=0	1.65	Upper Silty Sand 23	664					
44.5	46.15	Upper Silty Sand	Soil	1.64E+06	0.5	2594.2	0	Upper Silty Sand 24	120	D8.5, p=2500-5000, Pi=0	D8.5, p=2500-5000, Pi=0	1.65	Upper Silty Sand 24	664					
46.15	47.8	Upper Silty Sand	Soil	1.64E+06	0.5	2657.5	0	Upper Silty Sand 25	120	D8.5, p=2500-5000, Pi=0	D8.5, p=2500-5000, Pi=0	1.65	Upper Silty Sand 25	664					
47.8	49.45	Upper Silty Sand	Soil	1.64E+06	0.5	2720.9	0	Upper Silty Sand 26	120	D8.5, p=2500-5000, Pi=0	D8.5, p=2500-5000, Pi=0	1.65	Upper Silty Sand 26	664					
49.45	51.1	Upper Silty Sand	Soil	1.64E+06	0.5	2784.3	0	Upper Silty Sand 27	120	D8.5, p=2500-5000, Pi=0	D8.5, p=2500-5000, Pi=0	1.65	Upper Silty Sand 27	664					
51.1	52.75	Upper Silty Sand	Soil	1.64E+06	0.5	2847.6	0	Upper Silty Sand 28	120	D8.5, p=2500-5000, Pi=0	D8.5, p=2500-5000, Pi=0	1.65	Upper Silty Sand 28	664					
52.75	54.4	Upper Silty Sand	Soil	1.64E+06	0.5	2911.0	0	Upper Silty Sand 29	120	D8.5, p=2500-5000, Pi=0	D8.5, p=2500-5000, Pi=0	1.65	Upper Silty Sand 29	664					
54.4	56.05	Upper Silty Sand	Soil	1.64E+06	0.5	2974.3	0	Upper Silty Sand 30	120	D8.5, p=2500-5000, Pi=0	D8.5, p=2500-5000, Pi=0	1.65	Upper Silty Sand 30	664					
56.05	56.3	Upper Silty Sand	Soil	1.64E+06	0.5	3010.8	0	Upper Silty Sand 31	120	D8.5, p=2500-5000, Pi=0	D8.5, p=2500-5000, Pi=0	0.25	Upper Silty Sand 31	664					
56.3	58.13	Lower Clays	Soil	1.92E+06	0.5	3047.7	22	Lower Clays 32	115	D8.5, p=2500-5000, Pi=20-25	D8.5, p=2500-5000, Pi=20-25	1.83	Lower Clays 32	733					
58.13	59.96	Lower Clays	Soil	1.92E+06	0.5	3111.9	22	Lower Clays 33	115	D8.5, p=2500-5000, Pi=20-25	D8.5, p=2500-5000, Pi=20-25	1.83	Lower Clays 33	733					
59.96	61.79	Lower Clays	Soil	1.92E+06	0.5	3176.1	22	Lower Clays 34	115	D8.5, p=2500-5000, Pi=20-25	D8.5, p=2500-5000, Pi=20-25	1.83	Lower Clays 34	733					
61.79	63.62	Lower Clays	Soil	1.92E+06	0.5	3240.2	22	Lower Clays 35	115	D8.5, p=2500-5000, Pi=20-25	D8.5, p=2500-5000, Pi=20-25	1.83	Lower Clays 35	733					
63.62	65.45	Lower Clays	Soil	1.92E+06	0.5	3304.4	22	Lower Clays 36	115	D8.5, p=2500-5000, Pi=20-25	D8.5, p=2500-5000, Pi=20-25	1.83	Lower Clays 36	733					
65.45	67.28	Lower Clays	Soil	1.92E+06	0.5	3368.6	22	Lower Clays 37	115	D8.5, p=2500-5000, Pi=20-25	D8.5, p=2500-5000, Pi=20-25	1.83	Lower Clays 37	733					
67.28	69.11	Lower Clays	Soil	1.92E+06	0.5	3432.7	22	Lower Clays 38	115	D8.5, p=2500-5000, Pi=20-25	D8.5, p=2500-5000, Pi=20-25	1.83	Lower Clays 38	733					
69.11	70.94	Lower Clays	Soil	1.92E+06	0.5	3496.9	22	Lower Clays 39	115	D8.5, p=2500-5000, Pi=20-25	D8.5, p=2500-5000, Pi=20-25	1.83	Lower Clays 39	733					
70.94	72.77	Lower Clays	Soil	1.92E+06	0.5	3561.1	22	Lower Clays 40	115	D8.5, p=2500-5000, Pi=20-25	D8.5, p=2500-5000, Pi=20-25	1.83	Lower Clays 40	733					
72.77	74.6	Lower Clays	Soil	1.92E+06	0.5	3625.3	22	Lower Clays 41	115	D8.5, p=2500-5000, Pi=20-25	D8.5, p=2500-5000, Pi=20-25	1.83	Lower Clays 41	733					
74.6	76.43	Lower Clays	Soil	1.92E+06	0.5	3689.4	22	Lower Clays 42	115	D8.5, p=2500-5000, Pi=20-25	D8.5, p=2500-5000, Pi=20-25	1.83	Lower Clays 42	733					
76.43	78.26	Lower Clays	Soil	1.92E+06	0.5	3753.6	22	Lower Clays 43	115	D8.5, p=2500-5000, Pi=20-25	D8.5, p=2500-5000, Pi=20-25	1.83	Lower Clays 43	733					
78.26	80.09	Lower Clays	Soil	1.92E+06	0.5	3817.8	22	Lower Clays 44	115	D8.5, p=2500-5000, Pi=20-25	D8.5, p=2500-5000, Pi=20-25	1.83	Lower Clays 44	733					
80.09	81.3	Lower Silty Sands	Soil	3.79E+06	0.5	3871.1	22	Lower Silty Sands 45	122	D8.5, p=2500-5000, Pi=0	D8.5, p=2500-5000, Pi=0	2.49	Lower Silty Sands 45	1000					
81.3	83.79	Lower Silty Sands	Soil	3.79E+06	0.5	3941.8	0	Lower Silty Sands 46	122	D8.5, p=2500-5000, Pi=0	D8.5, p=2500-5000, Pi=0	2.49	Lower Silty Sands 46	1000					
83.79	86.28	Lower Silty Sands	Soil	3.79E+06	0.5	4040.7	0	Lower Silty Sands 47	122	D8.5, p=2500-5000, Pi=0	D8.5, p=2500-5000, Pi=0	2.49	Lower Silty Sands 47	1000					
86.28	88.77	Lower Silty Sands	Soil	3.79E+06	0.5	4139.6	0	Lower Silty Sands 48	122	D8.5, p=2500-5000, Pi=0	D8.5, p=2500-5000, Pi=0	2.49	Lower Silty Sands 48	1000					
88.77	91.26	Lower Silty Sands	Soil	3.79E+06	0.5	4238.6	0	Lower Silty Sands 49	122	D8.5, p=2500-5000, Pi=0	D8.5, p=2500-5000, Pi=0	2.49	Lower Silty Sands 49	1000					

Strata Profile														
Non-input Information							Strata "Soil Types" Input							
Top Depth (ft)	Bottom Depth (ft)	Layer Name	Layer Type	G _{max} (psf)	K _s	Mean Effective Stress at midpoint (psf)	Plasticity Index	Name (for Strata)	Unit Weight (pcf)	Modulus Reduction (G/G _{max}) Model	Damping Model	Thickness (ft)	Soil Type (for Strata)	Shear Wave Velocity (fps)
91.26	93.75	Lower Silty Sands	Soil	3.79E+06	0.5	4337.5	0	Lower Silty Sands 50	122	D8.5, p'=2500-5000, PI=0	D8.5, p'=2500-5000, PI=0	2.49	Lower Silty Sands 50	1000
93.75	96.24	Lower Silty Sands	Soil	3.79E+06	0.5	4436.4	0	Lower Silty Sands 51	122	D8.5, p'=2500-5000, PI=0	D8.5, p'=2500-5000, PI=0	2.49	Lower Silty Sands 51	1000
96.24	98.73	Lower Silty Sands	Soil	3.79E+06	0.5	4535.4	0	Lower Silty Sands 52	122	D8.5, p'=2500-5000, PI=0	D8.5, p'=2500-5000, PI=0	2.49	Lower Silty Sands 52	1000
98.73	101.22	Lower Silty Sands	Soil	3.79E+06	0.5	4634.3	0	Lower Silty Sands 53	122	D8.5, p'=2500-5000, PI=0	D8.5, p'=2500-5000, PI=0	2.49	Lower Silty Sands 53	1000
101.22	103.71	Lower Silty Sands	Soil	3.79E+06	0.5	4733.2	0	Lower Silty Sands 54	122	D8.5, p'=2500-5000, PI=0	D8.5, p'=2500-5000, PI=0	2.49	Lower Silty Sands 54	1000
103.71	106.2	Lower Silty Sands	Soil	3.79E+06	0.5	4832.2	0	Lower Silty Sands 55	122	D8.5, p'=2500-5000, PI=0	D8.5, p'=2500-5000, PI=0	2.49	Lower Silty Sands 55	1000
106.2	108.69	Lower Silty Sands	Soil	3.79E+06	0.5	4931.1	0	Lower Silty Sands 56	122	D8.5, p'=2500-5000, PI=0	D8.5, p'=2500-5000, PI=0	2.49	Lower Silty Sands 56	1000
108.69	111.18	Lower Silty Sands	Soil	3.79E+06	0.5	5030.1	0	Lower Silty Sands 57	122	D8.5, p'=5000-7500, PI=0	D8.5, p'=5000-7500, PI=0	2.49	Lower Silty Sands 57	1000
111.18	113.22	Lower Silty Sands	Soil	3.79E+06	0.5	5081.9	0	Lower Silty Sands 58	122	D8.5, p'=5000-7500, PI=0	D8.5, p'=5000-7500, PI=0	0.12	Lower Silty Sands 58	1000
113.22	115.14	Clay 3	Soil	2.40E+06	0.5	5127.6	22	Clay 3 59	130	D8.5, p'=5000-7500, PI=20-25	D8.5, p'=5000-7500, PI=20-25	1.92	Clay 3 59	771
115.14	117.06	Clay 3	Soil	2.40E+06	0.5	5214.1	22	Clay 3 60	130	D8.5, p'=5000-7500, PI=20-25	D8.5, p'=5000-7500, PI=20-25	1.92	Clay 3 60	771
117.06	118.98	Clay 3	Soil	2.40E+06	0.5	5300.6	22	Clay 3 61	130	D8.5, p'=5000-7500, PI=20-25	D8.5, p'=5000-7500, PI=20-25	1.92	Clay 3 61	771
118.98	120.9	Clay 3	Soil	2.40E+06	0.5	5387.1	22	Clay 3 62	130	D8.5, p'=5000-7500, PI=20-25	D8.5, p'=5000-7500, PI=20-25	1.92	Clay 3 62	771
120.9	122.82	Clay 3	Soil	2.40E+06	0.5	5473.7	22	Clay 3 63	130	D8.5, p'=5000-7500, PI=20-25	D8.5, p'=5000-7500, PI=20-25	1.92	Clay 3 63	771
122.82	124.74	Clay 3	Soil	2.40E+06	0.5	5560.2	22	Clay 3 64	130	D8.5, p'=5000-7500, PI=20-25	D8.5, p'=5000-7500, PI=20-25	1.92	Clay 3 64	771
124.74	126.3	Clay 3	Soil	2.40E+06	0.5	5646.7	22	Clay 3 65	130	D8.5, p'=5000-7500, PI=20-25	D8.5, p'=5000-7500, PI=20-25	1.92	Clay 3 65	771
126.3	128.92	SC-SM 4	Soil	4.44E+06	0.5	5725.1	22	Clay 3 66	130	D8.5, p'=5000-7500, PI=20-25	D8.5, p'=5000-7500, PI=20-25	1.56	Clay 3 66	771
128.92	131.54	SC-SM 4	Soil	4.44E+06	0.5	5819.3	0	SC-SM 4 67	130	D8.5, p'=5000-7500, PI=0	D8.5, p'=5000-7500, PI=0	2.62	SC-SM 4 67	1049
131.54	134.16	SC-SM 4	Soil	4.44E+06	0.5	5937.4	0	SC-SM 4 68	130	D8.5, p'=5000-7500, PI=0	D8.5, p'=5000-7500, PI=0	2.62	SC-SM 4 68	1049
134.16	136.78	SC-SM 4	Soil	4.44E+06	0.5	6055.5	0	SC-SM 4 69	130	D8.5, p'=5000-7500, PI=0	D8.5, p'=5000-7500, PI=0	2.62	SC-SM 4 69	1049
136.78	139.4	SC-SM 4	Soil	4.44E+06	0.5	6173.6	0	SC-SM 4 70	130	D8.5, p'=5000-7500, PI=0	D8.5, p'=5000-7500, PI=0	2.62	SC-SM 4 70	1049
139.4	142.02	SC-SM 4	Soil	4.44E+06	0.5	6291.6	0	SC-SM 4 71	130	D8.5, p'=5000-7500, PI=0	D8.5, p'=5000-7500, PI=0	2.62	SC-SM 4 71	1049
142.02	144.64	SC-SM 4	Soil	4.44E+06	0.5	6409.7	0	SC-SM 4 72	130	D8.5, p'=5000-7500, PI=0	D8.5, p'=5000-7500, PI=0	2.62	SC-SM 4 72	1049
144.64	145	SC-SM 4	Soil	4.44E+06	0.5	6527.8	0	SC-SM 4 73	130	D8.5, p'=5000-7500, PI=0	D8.5, p'=5000-7500, PI=0	2.62	SC-SM 4 73	1049
145	Half-Space	Bedrock	Half-Space	1.21E+08	0.5	6594.9	0	SC-SM 4 74	130	D8.5, p'=5000-7500, PI=0	D8.5, p'=5000-7500, PI=0	0.36	SC-SM 4 74	1049
145	Half-Space	Bedrock	Half-Space	1.21E+08	0.5	Half-Space	0	Bedrock	156	NA, Half-Space	Damping = 0.5%	Half Space	Bedrock	5000

Facility	US60
Section/Group	SpillSlope
Profile Name	d0_nor
Top of Profile Elevation	375.6
Depth to water table during EQ	50.1
Surcharge Pressure	psf

Strata Profile														
Non-input Information						Strata "Soil Types" Input				Strata "Soil Profile" Input				
Top Depth (ft)	Bottom Depth (ft)	Layer Name	Layer Type	G _{max} (psf)	k _s	Mean Effective Stress at midpoint (psf)	Plasticity Index	Name (for Strata)	Unit Weight (pcf)	Modulus Reduction (G/G _{max}) Model	Damping Model	Thickness (ft)	Soil Type (for Strata)	Shear Wave Velocity (fps)
0	2.5	Embankment	Soil	4.04E+06	0.5	108.3	10	Embankment 1	130	D85, p=0.400, Pi=0.10	D85, p=0.400, Pi=0.10	2.5	Embankment 1	1000
2.5	5	Embankment	Soil	4.04E+06	0.5	325.0	10	Embankment 2	130	D85, p=0.400, Pi=0.10	D85, p=0.400, Pi=0.10	2.5	Embankment 2	1000
5	7.5	Embankment	Soil	4.04E+06	0.5	541.7	10	Embankment 3	130	D85, p=400-800, Pi=0.10	D85, p=400-800, Pi=0.10	2.5	Embankment 3	1000
7.5	10	Embankment	Soil	4.04E+06	0.5	758.3	10	Embankment 4	130	D85, p=400-800, Pi=0.10	D85, p=400-800, Pi=0.10	2.5	Embankment 4	1000
10	12.5	Embankment	Soil	4.04E+06	0.5	975.0	10	Embankment 5	130	D85, p=800-1600, Pi=0.10	D85, p=800-1600, Pi=0.10	2.5	Embankment 5	1000
12.5	15	Embankment	Soil	4.04E+06	0.5	1191.7	10	Embankment 6	130	D85, p=800-1600, Pi=0.10	D85, p=800-1600, Pi=0.10	2.5	Embankment 6	1000
15	17.5	Embankment	Soil	4.04E+06	0.5	1408.3	10	Embankment 7	130	D85, p=800-1600, Pi=0.10	D85, p=800-1600, Pi=0.10	2.5	Embankment 7	1000
17.5	20	Embankment	Soil	4.04E+06	0.5	1625.0	10	Embankment 8	130	D85, p=1600-2500, Pi=0.10	D85, p=1600-2500, Pi=0.10	2.5	Embankment 8	1000
20	22.5	Embankment	Soil	4.04E+06	0.5	1841.7	10	Embankment 9	130	D85, p=1600-2500, Pi=0.10	D85, p=1600-2500, Pi=0.10	2.5	Embankment 9	1000
22.5	25	Embankment	Soil	4.04E+06	0.5	2058.3	10	Embankment 10	130	D85, p=1600-2500, Pi=0.10	D85, p=1600-2500, Pi=0.10	2.5	Embankment 10	1000
25	27.5	Embankment	Soil	4.04E+06	0.5	2275.0	10	Embankment 11	130	D85, p=1600-2500, Pi=0.10	D85, p=1600-2500, Pi=0.10	2.5	Embankment 11	1000
27.5	30	Embankment	Soil	4.04E+06	0.5	2491.7	10	Embankment 12	130	D85, p=1600-2500, Pi=0.10	D85, p=1600-2500, Pi=0.10	2.5	Embankment 12	1000
30	32.5	Embankment	Soil	4.04E+06	0.5	2708.3	10	Embankment 13	130	D85, p=2500-5000, Pi=0.10	D85, p=2500-5000, Pi=0.10	2.5	Embankment 13	1000
32.5	35	Embankment	Soil	4.04E+06	0.5	2925.0	10	Embankment 14	130	D85, p=2500-5000, Pi=0.10	D85, p=2500-5000, Pi=0.10	2.5	Embankment 14	1000
35	36.7	Embankment	Soil	4.04E+06	0.5	3107.0	10	Embankment 15	130	D85, p=2500-5000, Pi=0.10	D85, p=2500-5000, Pi=0.10	1.7	Embankment 15	1000
36.7	39.07	Upper Clay	Soil	3.46E+06	0.5	3278.6	5	Upper Clay 16	124	D85, p=2500-5000, Pi=0.10	D85, p=2500-5000, Pi=0.10	2.37	Upper Clay 16	948
39.07	41.44	Upper Clay	Soil	3.46E+06	0.5	3474.5	5	Upper Clay 17	124	D85, p=2500-5000, Pi=0.10	D85, p=2500-5000, Pi=0.10	2.37	Upper Clay 17	948
41.44	43.81	Upper Clay	Soil	3.46E+06	0.5	3670.5	5	Upper Clay 18	124	D85, p=2500-5000, Pi=0.10	D85, p=2500-5000, Pi=0.10	2.37	Upper Clay 18	948
43.81	46.18	Upper Clay	Soil	3.46E+06	0.5	3866.4	5	Upper Clay 19	124	D85, p=2500-5000, Pi=0.10	D85, p=2500-5000, Pi=0.10	2.37	Upper Clay 19	948
46.18	48.55	Upper Clay	Soil	3.46E+06	0.5	4062.3	5	Upper Clay 20	124	D85, p=2500-5000, Pi=0.10	D85, p=2500-5000, Pi=0.10	2.37	Upper Clay 20	948
48.55	50.1	Upper Clay	Soil	3.46E+06	0.5	4242.3	5	Upper Clay 21	124	D85, p=2500-5000, Pi=0.10	D85, p=2500-5000, Pi=0.10	1.55	Upper Clay 21	948
50.1	51.7	Upper Clay	Soil	3.46E+06	0.5	4321.3	5	Upper Clay 22	124	D85, p=2500-5000, Pi=0.10	D85, p=2500-5000, Pi=0.10	1.6	Upper Clay 22	948
51.7	53.64	Upper Silty Sand	Soil	2.27E+06	0.5	4391.4	0	Upper Silty Sand 23	120	D85, p=2500-5000, Pi=0	D85, p=2500-5000, Pi=0	1.94	Upper Silty Sand 23	780
53.64	55.58	Upper Silty Sand	Soil	2.27E+06	0.5	4465.9	0	Upper Silty Sand 24	120	D85, p=2500-5000, Pi=0	D85, p=2500-5000, Pi=0	1.94	Upper Silty Sand 24	780
55.58	57.52	Upper Silty Sand	Soil	2.27E+06	0.5	4540.3	0	Upper Silty Sand 25	120	D85, p=2500-5000, Pi=0	D85, p=2500-5000, Pi=0	1.94	Upper Silty Sand 25	780
57.52	59.46	Upper Silty Sand	Soil	2.27E+06	0.5	4614.8	0	Upper Silty Sand 26	120	D85, p=2500-5000, Pi=0	D85, p=2500-5000, Pi=0	1.94	Upper Silty Sand 26	780
59.46	61.4	Upper Silty Sand	Soil	2.27E+06	0.5	4689.3	0	Upper Silty Sand 27	120	D85, p=2500-5000, Pi=0	D85, p=2500-5000, Pi=0	1.94	Upper Silty Sand 27	780
61.4	63.34	Upper Silty Sand	Soil	2.27E+06	0.5	4763.8	0	Upper Silty Sand 28	120	D85, p=2500-5000, Pi=0	D85, p=2500-5000, Pi=0	1.94	Upper Silty Sand 28	780
63.34	65.28	Upper Silty Sand	Soil	2.27E+06	0.5	4838.3	0	Upper Silty Sand 29	120	D85, p=2500-5000, Pi=0	D85, p=2500-5000, Pi=0	1.94	Upper Silty Sand 29	780
65.28	67.22	Upper Silty Sand	Soil	2.27E+06	0.5	4912.8	0	Upper Silty Sand 30	120	D85, p=2500-5000, Pi=0	D85, p=2500-5000, Pi=0	1.94	Upper Silty Sand 30	780
67.22	69.16	Upper Silty Sand	Soil	2.27E+06	0.5	4987.3	0	Upper Silty Sand 31	120	D85, p=2500-5000, Pi=0	D85, p=2500-5000, Pi=0	1.94	Upper Silty Sand 31	780
69.16	71.1	Upper Silty Sand	Soil	2.27E+06	0.5	5061.8	0	Upper Silty Sand 32	120	D85, p=5000-7500, Pi=0	D85, p=5000-7500, Pi=0	1.94	Upper Silty Sand 32	780
71.1	73.04	Upper Silty Sand	Soil	2.27E+06	0.5	5136.3	0	Upper Silty Sand 33	120	D85, p=5000-7500, Pi=0	D85, p=5000-7500, Pi=0	1.94	Upper Silty Sand 33	780
73.04	74.98	Upper Silty Sand	Soil	2.27E+06	0.5	5210.8	0	Upper Silty Sand 34	120	D85, p=5000-7500, Pi=0	D85, p=5000-7500, Pi=0	1.94	Upper Silty Sand 34	780
74.98	76.7	Upper Silty Sand	Soil	2.27E+06	0.5	5281.1	0	Upper Silty Sand 35	120	D85, p=5000-7500, Pi=0	D85, p=5000-7500, Pi=0	1.72	Upper Silty Sand 35	780
76.7	78.78	Lower Clays	Soil	2.47E+06	0.5	5350.6	22	Lower Clays 36	115	D85, p=5000-7500, Pi=20-25	D85, p=5000-7500, Pi=20-25	2.08	Lower Clays 36	832
78.78	80.86	Lower Clays	Soil	2.47E+06	0.5	5423.5	22	Lower Clays 37	115	D85, p=5000-7500, Pi=20-25	D85, p=5000-7500, Pi=20-25	2.08	Lower Clays 37	832
80.86	82.94	Lower Clays	Soil	2.47E+06	0.5	5496.5	22	Lower Clays 38	115	D85, p=5000-7500, Pi=20-25	D85, p=5000-7500, Pi=20-25	2.08	Lower Clays 38	832
82.94	85.02	Lower Clays	Soil	2.47E+06	0.5	5569.4	22	Lower Clays 39	115	D85, p=5000-7500, Pi=20-25	D85, p=5000-7500, Pi=20-25	2.08	Lower Clays 39	832
85.02	87.1	Lower Clays	Soil	2.47E+06	0.5	5642.3	22	Lower Clays 40	115	D85, p=5000-7500, Pi=20-25	D85, p=5000-7500, Pi=20-25	2.08	Lower Clays 40	832
87.1	89.18	Lower Clays	Soil	2.47E+06	0.5	5715.3	22	Lower Clays 41	115	D85, p=5000-7500, Pi=20-25	D85, p=5000-7500, Pi=20-25	2.08	Lower Clays 41	832
89.18	91.26	Lower Clays	Soil	2.47E+06	0.5	5788.2	22	Lower Clays 42	115	D85, p=5000-7500, Pi=20-25	D85, p=5000-7500, Pi=20-25	2.08	Lower Clays 42	832
91.26	93.34	Lower Clays	Soil	2.47E+06	0.5	5861.1	22	Lower Clays 43	115	D85, p=5000-7500, Pi=20-25	D85, p=5000-7500, Pi=20-25	2.08	Lower Clays 43	832
93.34	95.42	Lower Clays	Soil	2.47E+06	0.5	5934.1	22	Lower Clays 44	115	D85, p=5000-7500, Pi=20-25	D85, p=5000-7500, Pi=20-25	2.08	Lower Clays 44	832
95.42	97.5	Lower Clays	Soil	2.47E+06	0.5	6007.0	22	Lower Clays 45	115	D85, p=5000-7500, Pi=20-25	D85, p=5000-7500, Pi=20-25	2.08	Lower Clays 45	832
97.5	99.58	Lower Clays	Soil	2.47E+06	0.5	6080.0	22	Lower Clays 46	115	D85, p=5000-7500, Pi=20-25	D85, p=5000-7500, Pi=20-25	2.08	Lower Clays 46	832
99.58	101.66	Lower Clays	Soil	2.47E+06	0.5	6152.9	22	Lower Clays 47	115	D85, p=5000-7500, Pi=20-25	D85, p=5000-7500, Pi=20-25	2.08	Lower Clays 47	832
101.66	101.7	Lower Clays	Soil	2.47E+06	0.5	6190.1	22	Lower Clays 48	115	D85, p=5000-7500, Pi=20-25	D85, p=5000-7500, Pi=20-25	0.04	Lower Clays 48	832
101.7	104.47	Lower Silty Sands	Soil	4.66E+06	0.5	6245.8	0	Lower Silty Sands 49	122	D85, p=5000-7500, Pi=0	D85, p=5000-7500, Pi=0	2.77	Lower Silty Sands 49	1109

Strata Profile														
Non-input Information							Strata "Soil Types" Input					Strata "Soil Profile" Input		
Top Depth (ft)	Bottom Depth (ft)	Layer Name	Layer Type	G _{max} (psf)	K _s	Mean Effective Stress at midpoint (psf)	Plasticity Index	Name (for Strata)	Unit Weight (pcf)	Modulus Reduction (G/G _{max}) Model	Damping Model	Thickness (ft)	Soil Type (for Strata)	Shear Wave Velocity (fps)
104.47	107.24	Lower Silty Sands	Soil	4.66E+06	0.5	6355.9	0	Lower Silty Sands 50	122	D8.5, p=5000-7500, PI=0	D8.5, p=5000-7500, PI=0	2.77	Lower Silty Sands 50	1109
107.24	110.01	Lower Silty Sands	Soil	4.66E+06	0.5	6465.9	0	Lower Silty Sands 51	122	D8.5, p=5000-7500, PI=0	D8.5, p=5000-7500, PI=0	2.77	Lower Silty Sands 51	1109
110.01	112.78	Lower Silty Sands	Soil	4.66E+06	0.5	6576.0	0	Lower Silty Sands 52	122	D8.5, p=5000-7500, PI=0	D8.5, p=5000-7500, PI=0	2.77	Lower Silty Sands 52	1109
112.78	115.55	Lower Silty Sands	Soil	4.66E+06	0.5	6686.0	0	Lower Silty Sands 53	122	D8.5, p=5000-7500, PI=0	D8.5, p=5000-7500, PI=0	2.77	Lower Silty Sands 53	1109
115.55	118.32	Lower Silty Sands	Soil	4.66E+06	0.5	6796.1	0	Lower Silty Sands 54	122	D8.5, p=5000-7500, PI=0	D8.5, p=5000-7500, PI=0	2.77	Lower Silty Sands 54	1109
118.32	121.09	Lower Silty Sands	Soil	4.66E+06	0.5	6906.2	0	Lower Silty Sands 55	122	D8.5, p=5000-7500, PI=0	D8.5, p=5000-7500, PI=0	2.77	Lower Silty Sands 55	1109
121.09	123.86	Lower Silty Sands	Soil	4.66E+06	0.5	7016.2	0	Lower Silty Sands 56	122	D8.5, p=5000-7500, PI=0	D8.5, p=5000-7500, PI=0	2.77	Lower Silty Sands 56	1109
123.86	126.63	Lower Silty Sands	Soil	4.66E+06	0.5	7126.3	0	Lower Silty Sands 57	122	D8.5, p=5000-7500, PI=0	D8.5, p=5000-7500, PI=0	2.77	Lower Silty Sands 57	1109
126.63	129.4	Lower Silty Sands	Soil	4.66E+06	0.5	7236.4	0	Lower Silty Sands 58	122	D8.5, p=5000-7500, PI=0	D8.5, p=5000-7500, PI=0	2.77	Lower Silty Sands 58	1109
129.4	131.7	Lower Silty Sands	Soil	4.66E+06	0.5	7337.1	0	Lower Silty Sands 59	122	D8.5, p=5000-7500, PI=0	D8.5, p=5000-7500, PI=0	2.3	Lower Silty Sands 59	1109
131.7	133.8	Clay 3	Soil	2.87E+06	0.5	7430.1	22	Clay 3 60	130	D8.5, p=5000-7500, PI=20-25	D8.5, p=5000-7500, PI=20-25	2.1	Clay 3 60	842
133.8	135.9	Clay 3	Soil	2.87E+06	0.5	7524.7	22	Clay 3 61	130	D8.5, p=7500-10000, PI=20-25	D8.5, p=7500-10000, PI=20-25	2.1	Clay 3 61	842
135.9	138	Clay 3	Soil	2.87E+06	0.5	7619.4	22	Clay 3 62	130	D8.5, p=7500-10000, PI=20-25	D8.5, p=7500-10000, PI=20-25	2.1	Clay 3 62	842
138	140.1	Clay 3	Soil	2.87E+06	0.5	7714.0	22	Clay 3 63	130	D8.5, p=7500-10000, PI=20-25	D8.5, p=7500-10000, PI=20-25	2.1	Clay 3 63	842
140.1	142.2	Clay 3	Soil	2.87E+06	0.5	7808.7	22	Clay 3 64	130	D8.5, p=7500-10000, PI=20-25	D8.5, p=7500-10000, PI=20-25	2.1	Clay 3 64	842
142.2	144.3	Clay 3	Soil	2.87E+06	0.5	7903.3	22	Clay 3 65	130	D8.5, p=7500-10000, PI=20-25	D8.5, p=7500-10000, PI=20-25	2.1	Clay 3 65	842
144.3	146.4	Clay 3	Soil	2.87E+06	0.5	7997.9	22	Clay 3 66	130	D8.5, p=7500-10000, PI=20-25	D8.5, p=7500-10000, PI=20-25	2.1	Clay 3 66	842
146.4	146.7	Clay 3	Soil	2.87E+06	0.5	8052.0	22	Clay 3 67	130	D8.5, p=7500-10000, PI=20-25	D8.5, p=7500-10000, PI=20-25	0.3	Clay 3 67	842
146.7	149.53	SC-SM 4	Soil	5.20E+06	0.5	8122.5	0	SC-SM 4 68	130	D8.5, p=7500-10000, PI=0	D8.5, p=7500-10000, PI=0	2.83	SC-SM 4 68	1135
149.53	152.36	SC-SM 4	Soil	5.20E+06	0.5	8250.1	0	SC-SM 4 69	130	D8.5, p=7500-10000, PI=0	D8.5, p=7500-10000, PI=0	2.83	SC-SM 4 69	1135
152.36	155.19	SC-SM 4	Soil	5.20E+06	0.5	8377.6	0	SC-SM 4 70	130	D8.5, p=7500-10000, PI=0	D8.5, p=7500-10000, PI=0	2.83	SC-SM 4 70	1135
155.19	158.02	SC-SM 4	Soil	5.20E+06	0.5	8505.2	0	SC-SM 4 71	130	D8.5, p=7500-10000, PI=0	D8.5, p=7500-10000, PI=0	2.83	SC-SM 4 71	1135
158.02	160.85	SC-SM 4	Soil	5.20E+06	0.5	8632.7	0	SC-SM 4 72	130	D8.5, p=7500-10000, PI=0	D8.5, p=7500-10000, PI=0	2.83	SC-SM 4 72	1135
160.85	163.68	SC-SM 4	Soil	5.20E+06	0.5	8760.2	0	SC-SM 4 73	130	D8.5, p=7500-10000, PI=0	D8.5, p=7500-10000, PI=0	2.83	SC-SM 4 73	1135
163.68	165.4	SC-SM 4	Soil	5.20E+06	0.5	8862.8	0	SC-SM 4 74	130	D8.5, p=7500-10000, PI=0	D8.5, p=7500-10000, PI=0	1.72	SC-SM 4 74	1135
165.4	Half-Space	Bedrock	Half-Space	1.21E+08	0.5	Half-Space	0	Bedrock	156	NA, Half-Space	Damping = 0.5%	Half Space	Bedrock	5000

Project Information

Slantec Project Number =

Project Name =

CPT ID =

Boring Location (optional)

Nothing =

Ending =

OR

Baseline Station =

Offset (+ Right) =

178565011
US 80 Bridge
SP04

Using qt (corrected for u2 PWP) or qc (backcalculated uncorrected field tip)

Cone ID (optional) =

Use qc instead of qt?

Cone Area Rate (a) =

Drilling Information

Top of Hole Elevation =

Water Depth during CPT (negative for US borings) =

Depth data collection began =

Avg. Total Unit WL Above 1st Sample =

During Earthquake Information

Water Depth during EQ (relative to CPT TOH, negative for US borings) =

Final Grade Elevation during EQ =

Avg. Total Unit WL of Cui/Fill =

Nonlinear Pore Water Pressure Profile

Cutoff Pore Water Pressure Profile?

If previous answer is No, hydrostatic pressures are assumed.

α Curve Fit Parameters

Associated α profile:

If previous answer is No, then enter curve fit parameters below (α vs. depth curve)

If defaulting to $K_s=1$ (i.e., level ground), assign values of zero to all curve fit parameters below to make

α zero and thus, K_s will be one.

m4:
m3:
m2:
m1:
m0:

Associated ground response profile:

Get CSR from shear stress envelope?

If previous answer is No, then CSR will be calculated using a_{max} and r_d

Max. Shear Stress at each sample depth known?

If previous answer is No, then enter curve fit parameters below (shear stress vs. depth curve)

Max. Shear Stress Curve Fit Parameters (from ground response analysis)

Borings, sp04, nor
0

m4:
m3:
m2:
m1:

Design Source
Design Event
0.22
7.7

Earthquake Information

EQ Source (e.g., New Madrid)

Event (e.g., MCE, OBE)

a_{max} (g) (top of ground surface)

EQ Mag (Mw)

Inputs

Depth (ft)	Corrected Cone Tip Resistance, q_c (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
0.164	3.160	0.096	120							
0.328	4.619	0.112	120							
0.492	6.280	0.107	120							
0.656	7.803	0.127	120							
0.820	9.022	0.118	120							
0.984	10.451	0.170	120							
1.148	12.747	0.276	120							
1.312	13.893	0.283	120							
1.476	12.466	0.338	120							
1.640	15.004	0.420	120							
1.804	17.320	0.529	120							
1.968	17.946	0.624	120							
2.133	18.568	0.686	120							
2.297	19.618	0.747	120							
2.461	19.545	0.769	120							
2.625	17.187	0.754	120							
2.789	17.239	0.776	120							
2.953	18.092	0.801	120							
3.117	18.038	0.799	120							
3.281	17.166	0.775	120							
3.445	16.659	0.707	120							
3.609	16.932	0.881	120							
3.773	16.953	0.886	120							
3.937	16.772	0.869	120							
4.101	17.838	0.851	120							
4.265	19.987	0.732	120							
4.429	22.896	0.854	120							
4.593	24.567	0.968	120							
4.757	26.075	1.052	120							
4.921	28.591	1.117	120							
5.085	30.627	1.179	120							
5.249	31.058	1.239	120							
5.413	30.785	1.285	120							
5.577	30.663	1.299	120							
5.741	30.175	1.302	120							
5.905	30.506	1.339	120							
6.069	31.112	1.348	120							
6.234	30.959	1.359	120							
6.398	31.022	1.348	120							
6.562	31.708	1.261	120							
6.726	31.912	1.274	120							
6.890	32.170	1.295	120							
7.054	31.950	1.317	120							
7.218	31.104	1.308	120							
7.382	29.885	1.274	120							
7.546	29.761	1.266	120							
7.710	31.358	1.289	120							
7.874	33.879	1.395	120							
8.038	33.294	1.401	120							
8.202	30.650	1.375	120							
8.366	29.569	1.361	120							
8.530	30.673	1.313	120							
8.694	34.526	1.366	120							
8.858	37.304	1.474	120							
9.022	38.425	1.341	120							
9.186	40.302	1.155	120							
9.350	42.217	0.927	120							
9.514	42.808	0.793	120							
9.678	42.776	0.776	120							
9.842	41.656	0.678	120							
10.006	39.478	0.762	120							
10.170	38.624	0.922	120							
10.335	30.643	0.947	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
10.499	24.499	0.890	120							
10.663	21.517	0.722	120							
10.827	21.267	0.612	120							
10.991	20.777	0.623	120							
11.155	20.117	0.723	120							
11.319	20.608	0.838	120							
11.483	21.127	0.907	120							
11.647	21.047	0.896	120							
11.811	20.828	0.894	120							
11.975	20.742	0.882	120							
12.139	20.609	0.894	120							
12.303	20.870	0.921	120							
12.467	21.271	0.944	120							
12.631	20.698	0.987	120							
12.795	19.962	0.969	120							
12.959	20.290	0.979	120							
13.123	19.274	0.924	120							
13.287	18.104	0.850	120							
13.451	17.169	0.773	120							
13.615	17.603	0.781	120							
13.779	18.483	0.793	120							
13.943	18.480	0.863	120							
14.107	17.190	0.837	120							
14.271	15.748	0.785	120							
14.436	15.641	0.710	120							
14.600	16.205	0.689	120							
14.764	16.649	0.694	120							
14.928	17.404	0.731	120							
15.092	17.542	0.739	120							
15.256	19.359	0.711	120							
15.420	20.432	0.720	120							
15.584	21.584	0.788	120							
15.748	22.018	0.839	120							
15.912	22.385	0.889	120							
16.076	22.778	0.902	120							
16.240	23.362	0.963	120							
16.404	23.372	0.914	120							
16.568	22.128	0.872	120							
16.732	21.123	0.782	120							
16.896	18.368	0.606	120							
17.060	16.718	0.397	120							
17.224	15.215	0.431	120							
17.388	14.999	0.411	120							
17.552	15.549	0.463	120							
17.716	19.259	0.536	120							
17.880	19.938	0.593	120							
18.044	19.935	0.678	120							
18.208	20.256	0.670	120							
18.372	21.123	0.733	120							
18.537	21.511	0.733	120							
18.701	19.268	0.687	120							
18.865	16.655	0.597	120							
19.029	15.282	0.552	120							
19.193	14.221	0.476	120							
19.357	14.255	0.469	120							
19.521	14.830	0.506	120							
19.685	14.269	0.464	120							
19.849	13.824	0.467	120							
20.013	13.907	0.419	120							
20.177	12.185	0.401	120							
20.341	12.050	0.377	120							
20.505	12.256	0.345	120							
20.669	12.566	0.333	120							
20.833	13.093	0.402	120							
20.997	14.403	0.452	120							
21.161	14.526	0.527	120							
21.325	14.052	0.530	120							
21.489	13.686	0.465	120							
21.653	13.191	0.450	120							
21.817	13.295	0.458	120							
21.981	13.326	0.416	120							
22.145	12.965	0.424	120							
22.309	13.378	0.431	120							
22.473	14.120	0.446	120							
22.638	14.092	0.471	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
22.802	15.263	0.567	120							
22.966	17.078	0.480	120							
23.130	16.769	0.312	120							
23.294	13.168	0.218	120							
23.458	13.771	0.243	120							
23.622	13.178	0.309	120							
23.786	12.013	0.294	120							
23.950	12.408	0.274	120							
24.114	11.860	0.277	120							
24.278	11.264	0.268	120							
24.442	11.931	0.345	120							
24.606	12.121	0.360	120							
24.770	12.226	0.349	120							
24.934	10.270	0.268	120							
25.098	10.719	0.249	120							
25.262	12.075	0.265	120							
25.426	13.766	0.284	120							
25.590	13.476	0.345	120							
25.754	12.613	0.376	120							
25.918	12.603	0.339	120							
26.082	12.898	0.303	120							
26.246	12.463	0.294	120							
26.410	11.284	0.304	120							
26.574	11.679	0.272	120							
26.739	12.618	0.274	120							
26.903	11.858	0.254	120							
27.067	13.407	0.299	120							
27.231	14.085	0.352	120							
27.395	13.225	0.364	120							
27.559	13.427	0.390	120							
27.723	13.619	0.340	120							
27.887	14.111	0.325	120							
28.051	14.412	0.307	120							
28.215	14.713	0.355	120							
28.379	13.817	0.318	120							
28.543	12.677	0.315	120							
28.707	10.941	0.262	120							
28.871	10.723	0.193	120							
29.035	12.669	0.183	120							
29.199	11.836	0.224	120							
29.363	11.667	0.260	120							
29.527	11.169	0.231	120							
29.691	11.399	0.250	120							
29.855	9.744	0.262	120							
30.019	9.349	0.200	120							
30.183	9.133	0.201	120							
30.347	9.981	0.170	120							
30.511	10.519	0.165	120							
30.675	10.134	0.169	120							
30.840	9.465	0.174	120							
31.004	9.841	0.168	120							
31.168	10.295	0.153	120							
31.332	10.474	0.150	120							
31.496	10.131	0.153	120							
31.660	9.621	0.142	120							
31.824	9.452	0.123	120							
31.988	9.204	0.113	120							
32.152	9.066	0.109	120							
32.316	8.491	0.105	120							
32.480	8.479	0.108	120							
32.644	9.259	0.111	120							
32.808	9.450	0.124	120							
32.972	9.203	0.134	120							
33.136	9.078	0.124	120							
33.300	9.176	0.116	120							
33.464	9.125	0.124	120							
33.628	9.105	0.103	120							
33.792	9.764	0.117	120							
33.956	9.697	0.107	120							
34.120	9.189	0.118	120							
34.284	9.608	0.130	120							
34.448	10.218	0.122	120							
34.612	10.987	0.135	120							
34.776	10.401	0.128	120							
34.941	10.032	0.131	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
35.105	9.978	0.133	120							
35.269	10.149	0.147	120							
35.433	10.388	0.150	120							
35.597	12.168	0.107	120							
35.761	9.631	0.106	120							
35.925	9.810	0.109	120							
36.089	9.701	0.109	120							
36.253	10.214	0.125	120							
36.417	10.049	0.130	120							
36.581	10.400	0.133	120							
36.745	10.637	0.134	120							
36.909	10.686	0.144	120							
37.073	11.037	0.129	120							
37.237	18.137	0.160	120							
37.401	18.068	0.130	120							
37.565	9.873	0.143	120							
37.729	9.567	0.116	120							
37.893	9.472	0.128	120							
38.057	11.805	0.104	120							
38.221	21.685	0.190	120							
38.385	35.886	0.351	120							
38.549	20.531	0.475	120							
38.713	18.067	0.360	120							
38.877	15.896	0.213	120							
39.042	12.872	0.143	120							
39.206	11.074	0.118	120							
39.370	11.514	0.091	120							
39.534	10.965	0.105	120							
39.698	10.725	0.126	120							
39.862	11.234	0.189	120							
40.026	16.086	0.266	120							
40.190	17.739	0.384	120							
40.354	21.411	0.613	120							
40.518	17.145	0.559	120							
40.682	16.076	0.389	120							
40.846	14.837	0.284	120							
41.010	19.003	0.314	120							
41.174	62.169	0.466	120							
41.338	63.097	0.877	120							
41.502	36.519	1.196	120							
41.666	42.246	1.177	120							
41.830	35.368	0.177	120							
41.994	32.953	0.860	120							
42.158	57.813	0.891	120							
42.322	46.475	0.891	120							
42.486	50.658	1.036	120							
42.650	38.790	1.255	120							
42.814	25.188	0.734	120							
42.978	24.110	0.929	120							
43.143	29.608	0.928	120							
43.307	19.056	0.738	120							
43.471	16.388	0.494	120							
43.635	26.262	0.288	120							
43.799	61.994	0.532	120							
43.963	72.389	0.978	120							
44.127	46.356	1.308	120							
44.291	25.971	0.969	120							
44.455	21.727	1.003	120							
44.619	35.046	0.897	120							
44.783	23.941	0.717	120							
44.947	19.399	0.336	120							
45.111	16.926	0.259	120							
45.275	25.969	0.372	120							
45.439	37.427	0.731	120							
45.603	29.173	0.813	120							
45.767	20.676	0.634	120							
45.931	12.750	0.360	120							
46.095	13.250	0.158	120							
46.259	14.252	0.117	120							
46.423	12.016	0.113	120							
46.587	12.283	0.111	120							
46.751	12.553	0.105	120							
46.915	11.930	0.110	120							
47.079	11.746	0.123	120							
47.244	12.356	0.128	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
47.408	20,807	0.246	120							
47.572	18,288	0.228	120							
47.736	17,103	0.203	120							
47.900	15,662	0.150	120							
48.064	14,793	0.149	120							
48.228	15,076	0.109	120							
48.392	15,980	0.127	120							
48.556	17,590	0.139	120							
48.720	16,029	0.134	120							
48.884	13,333	0.382	120							
48.048	9,633	0.326	120							
48.212	25,263	1.151	120							
48.376	38,249	1.091	120							
48.540	12,439	0.624	120							
48.704	21,149	0.569	120							

LIQUEFACTION POTENTIAL ASSESSMENT FOR COARSE GRAINED SOILS USING CONE PENETRATION TEST DATA

Facility: US 60 Bridge Project No.: 178565011 CPT ID: SP04	Water Elevation during CPT:	306.9	ft
	Depth to Water during CPT:	27.5	ft (relative to ground surface during CPT)
	Water Elevation during Earthquake:	306.9	ft
	Depth to Water during Earthquake:	27.5	ft (relative to ground surface during CPT)
	Final Grade Elevation during EQ:	334.4	ft (if no fill, then set this equal to top of CPT hole elev.)
	Height of Final Grade above CPT TOH:	0.0	ft (relative to ground surface during CPT, + Fill, - Cut)
	Unit Weight of Cut/Fill to Achieve Final Grade	120	pcf
	Cut/Fill Total Stress (+ Fill, - Cut):	0.00	tsf

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σvCPT (tsf)	Total Vertical Stress during EQ σvEQ (tsf)	Static Pore Water Pressure during CPT uSCPT (tsf)	Static Pore Water Pressure during EQ uSEQ (tsf)	Effective Vertical Stress during CPT σvCPT (tsf)	Effective Vertical Stress during EQ σvEQ (tsf)
334.4					Vertical Stresses above 1st CPT:		0.00	0.00	0.00	0.00	0.00	0.00
334.2	0.164	3.16	0.10	120		0.00	0.25	0.01	0.01	0.00	0.01	0.01
334.1	0.328	4.62	0.11	120		0.25	0.16	0.02	0.02	0.00	0.02	0.02
333.9	0.492	6.28	0.11	120		0.41	0.16	0.03	0.03	0.00	0.03	0.03
333.7	0.656	7.80	0.13	120		0.57	0.16	0.04	0.04	0.00	0.04	0.04
333.6	0.820	9.02	0.12	120		0.74	0.16	0.05	0.05	0.00	0.05	0.05
333.4	0.984	10.45	0.17	120		0.90	0.16	0.06	0.06	0.00	0.06	0.06
333.3	1.148	12.75	0.28	120		1.07	0.16	0.07	0.07	0.00	0.07	0.07
333.1	1.312	13.89	0.28	120		1.23	0.16	0.08	0.08	0.00	0.08	0.08
332.9	1.476	12.49	0.34	120		1.39	0.16	0.09	0.09	0.00	0.09	0.09
332.8	1.640	15.00	0.42	120		1.56	0.16	0.10	0.10	0.00	0.10	0.10
332.6	1.804	17.32	0.53	120		1.72	0.16	0.11	0.11	0.00	0.11	0.11
332.4	1.968	17.95	0.62	120		1.89	0.16	0.12	0.12	0.00	0.12	0.12
332.3	2.133	18.57	0.69	120		2.05	0.16	0.13	0.13	0.00	0.13	0.13
332.1	2.297	19.62	0.75	120		2.21	0.16	0.14	0.14	0.00	0.14	0.14
331.9	2.461	18.54	0.77	120		2.38	0.16	0.15	0.15	0.00	0.15	0.15
331.8	2.625	17.19	0.75	120		2.54	0.16	0.16	0.16	0.00	0.16	0.16
331.6	2.789	17.24	0.78	120		2.71	0.16	0.17	0.17	0.00	0.17	0.17
331.4	2.953	18.09	0.80	120		2.87	0.16	0.18	0.18	0.00	0.18	0.18
331.3	3.117	18.04	0.80	120		3.03	0.16	0.19	0.19	0.00	0.19	0.19
331.1	3.281	17.17	0.78	120		3.20	0.16	0.20	0.20	0.00	0.20	0.20
331.0	3.445	16.66	0.71	120		3.36	0.16	0.21	0.21	0.00	0.21	0.21
330.8	3.609	16.93	0.68	120		3.53	0.16	0.22	0.22	0.00	0.22	0.22
330.6	3.773	16.95	0.69	120		3.69	0.16	0.23	0.23	0.00	0.23	0.23
330.5	3.937	16.77	0.67	120		3.85	0.16	0.24	0.24	0.00	0.24	0.24
330.3	4.101	17.84	0.65	120		4.02	0.16	0.25	0.25	0.00	0.25	0.25
330.1	4.265	19.99	0.73	120		4.18	0.16	0.26	0.26	0.00	0.26	0.26
330.0	4.429	22.90	0.85	120		4.35	0.16	0.27	0.27	0.00	0.27	0.27
329.8	4.593	24.57	0.97	120		4.51	0.16	0.28	0.28	0.00	0.28	0.28
329.6	4.757	26.07	1.05	120		4.68	0.16	0.29	0.29	0.00	0.29	0.29
329.5	4.921	28.59	1.12	120		4.84	0.16	0.30	0.30	0.00	0.30	0.30
329.3	5.085	30.63	1.18	120		5.00	0.16	0.31	0.31	0.00	0.31	0.31
329.2	5.249	31.06	1.24	120		5.17	0.16	0.31	0.31	0.00	0.31	0.31
329.0	5.413	30.79	1.29	120		5.33	0.16	0.32	0.32	0.00	0.32	0.32
328.8	5.577	30.66	1.30	120		5.50	0.16	0.33	0.33	0.00	0.33	0.33
328.7	5.741	30.17	1.30	120		5.66	0.16	0.34	0.34	0.00	0.34	0.34
328.5	5.905	30.51	1.34	120		5.82	0.16	0.35	0.35	0.00	0.35	0.35
328.3	6.069	31.11	1.35	120		5.99	0.16	0.36	0.36	0.00	0.36	0.36
328.2	6.234	30.96	1.36	120		6.15	0.16	0.37	0.37	0.00	0.37	0.37
328.0	6.398	31.02	1.35	120		6.32	0.16	0.38	0.38	0.00	0.38	0.38
327.8	6.562	31.71	1.26	120		6.48	0.16	0.39	0.39	0.00	0.39	0.39
327.7	6.726	31.91	1.27	120		6.64	0.16	0.40	0.40	0.00	0.40	0.40
327.5	6.890	32.17	1.30	120		6.81	0.16	0.41	0.41	0.00	0.41	0.41
327.3	7.054	31.95	1.32	120		6.97	0.16	0.42	0.42	0.00	0.42	0.42
327.2	7.218	31.10	1.31	120		7.14	0.16	0.43	0.43	0.00	0.43	0.43
327.0	7.382	29.89	1.27	120		7.30	0.16	0.44	0.44	0.00	0.44	0.44
326.9	7.546	29.76	1.27	120		7.46	0.16	0.45	0.45	0.00	0.45	0.45
326.7	7.710	31.36	1.29	120		7.63	0.16	0.46	0.46	0.00	0.46	0.46
326.5	7.874	33.88	1.40	120		7.79	0.16	0.47	0.47	0.00	0.47	0.47
326.4	8.038	33.29	1.40	120		7.96	0.16	0.48	0.48	0.00	0.48	0.48
326.2	8.202	30.65	1.38	120		8.12	0.16	0.49	0.49	0.00	0.49	0.49
326.0	8.366	29.57	1.36	120		8.28	0.16	0.50	0.50	0.00	0.50	0.50
325.9	8.530	30.67	1.31	120		8.45	0.16	0.51	0.51	0.00	0.51	0.51
325.7	8.694	34.53	1.37	120		8.61	0.16	0.52	0.52	0.00	0.52	0.52
325.5	8.858	37.30	1.47	120		8.78	0.16	0.53	0.53	0.00	0.53	0.53
325.4	9.022	38.42	1.34	120		8.94	0.16	0.54	0.54	0.00	0.54	0.54
325.2	9.186	40.30	1.16	120		9.10	0.16	0.55	0.55	0.00	0.55	0.55
325.0	9.350	42.22	0.93	120		9.27	0.16	0.56	0.56	0.00	0.56	0.56
324.9	9.514	42.81	0.79	120		9.43	0.16	0.57	0.57	0.00	0.57	0.57
324.7	9.678	42.78	0.78	120		9.60	0.16	0.58	0.58	0.00	0.58	0.58
324.6	9.842	41.96	0.68	120		9.76	0.16	0.59	0.59	0.00	0.59	0.59
324.4	10.006	39.42	0.76	120		9.92	0.16	0.60	0.60	0.00	0.60	0.60
324.2	10.170	36.62	0.92	120	10.09	0.16	0.61	0.61	0.00	0.00	0.61	0.61

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σv CPT (tsf)	Total Vertical Stress during EQ σv EQ (tsf)	Static Pore Water Pressure during CPT us CPT (tsf)	Static Pore Water Pressure during EQ us EQ (tsf)	Effective Vertical Stress during CPT σv CPT (tsf)	Effective Vertical Stress during EQ σv EQ (tsf)
324.1	10.335	30.64	0.95	120	10.25	0.16	0.62	0.62	0.00	0.00	0.62	0.62
323.9	10.499	24.50	0.89	120	10.42	0.16	0.63	0.63	0.00	0.00	0.63	0.63
323.7	10.663	21.52	0.72	120	10.58	0.16	0.64	0.64	0.00	0.00	0.64	0.64
323.6	10.827	21.27	0.61	120	10.74	0.16	0.65	0.65	0.00	0.00	0.65	0.65
323.4	10.991	20.78	0.62	120	10.91	0.16	0.66	0.66	0.00	0.00	0.66	0.66
323.2	11.155	20.12	0.72	120	11.07	0.16	0.67	0.67	0.00	0.00	0.67	0.67
323.1	11.319	20.61	0.84	120	11.24	0.16	0.68	0.68	0.00	0.00	0.68	0.68
322.9	11.483	21.13	0.91	120	11.40	0.16	0.69	0.69	0.00	0.00	0.69	0.69
322.8	11.647	21.05	0.90	120	11.56	0.16	0.70	0.70	0.00	0.00	0.70	0.70
322.6	11.811	20.83	0.89	120	11.73	0.16	0.71	0.71	0.00	0.00	0.71	0.71
322.4	11.975	20.74	0.88	120	11.89	0.16	0.72	0.72	0.00	0.00	0.72	0.72
322.3	12.139	20.61	0.89	120	12.06	0.16	0.73	0.73	0.00	0.00	0.73	0.73
322.1	12.303	20.87	0.92	120	12.22	0.16	0.74	0.74	0.00	0.00	0.74	0.74
321.9	12.467	21.27	0.94	120	12.39	0.16	0.75	0.75	0.00	0.00	0.75	0.75
321.8	12.631	20.70	0.99	120	12.55	0.16	0.76	0.76	0.00	0.00	0.76	0.76
321.6	12.795	19.96	0.97	120	12.71	0.16	0.77	0.77	0.00	0.00	0.77	0.77
321.4	12.959	20.29	0.98	120	12.88	0.16	0.78	0.78	0.00	0.00	0.78	0.78
321.3	13.123	19.27	0.92	120	13.04	0.16	0.79	0.79	0.00	0.00	0.79	0.79
321.1	13.287	18.10	0.85	120	13.21	0.16	0.80	0.80	0.00	0.00	0.80	0.80
320.9	13.451	17.17	0.77	120	13.37	0.16	0.81	0.81	0.00	0.00	0.81	0.81
320.8	13.615	17.60	0.78	120	13.53	0.16	0.82	0.82	0.00	0.00	0.82	0.82
320.6	13.779	18.48	0.79	120	13.70	0.16	0.83	0.83	0.00	0.00	0.83	0.83
320.5	13.943	18.48	0.86	120	13.86	0.16	0.84	0.84	0.00	0.00	0.84	0.84
320.3	14.107	17.19	0.84	120	14.03	0.16	0.85	0.85	0.00	0.00	0.85	0.85
320.1	14.271	15.75	0.79	120	14.19	0.16	0.86	0.86	0.00	0.00	0.86	0.86
320.0	14.436	15.64	0.71	120	14.35	0.16	0.87	0.87	0.00	0.00	0.87	0.87
319.8	14.600	16.21	0.69	120	14.52	0.16	0.88	0.88	0.00	0.00	0.88	0.88
319.6	14.764	16.65	0.69	120	14.68	0.16	0.89	0.89	0.00	0.00	0.89	0.89
319.5	14.928	17.40	0.73	120	14.85	0.16	0.90	0.90	0.00	0.00	0.90	0.90
319.3	15.092	17.54	0.74	120	15.01	0.16	0.91	0.91	0.00	0.00	0.91	0.91
319.1	15.256	19.36	0.71	120	15.17	0.16	0.92	0.92	0.00	0.00	0.92	0.92
319.0	15.420	20.43	0.72	120	15.34	0.16	0.93	0.93	0.00	0.00	0.93	0.93
318.8	15.584	21.58	0.79	120	15.50	0.16	0.94	0.94	0.00	0.00	0.94	0.94
318.7	15.748	22.02	0.84	120	15.67	0.16	0.94	0.94	0.00	0.00	0.94	0.94
318.5	15.912	22.38	0.89	120	15.83	0.16	0.95	0.95	0.00	0.00	0.95	0.95
318.3	16.076	22.78	0.90	120	15.99	0.16	0.96	0.96	0.00	0.00	0.96	0.96
318.2	16.240	23.38	0.96	120	16.16	0.16	0.97	0.97	0.00	0.00	0.97	0.97
318.0	16.404	23.37	0.91	120	16.32	0.16	0.98	0.98	0.00	0.00	0.98	0.98
317.8	16.568	22.13	0.87	120	16.49	0.16	0.99	0.99	0.00	0.00	0.99	0.99
317.7	16.732	21.12	0.78	120	16.65	0.16	1.00	1.00	0.00	0.00	1.00	1.00
317.5	16.896	18.39	0.61	120	16.81	0.16	1.01	1.01	0.00	0.00	1.01	1.01
317.3	17.060	16.72	0.51	120	16.98	0.16	1.02	1.02	0.00	0.00	1.02	1.02
317.2	17.224	15.21	0.44	120	17.14	0.16	1.03	1.03	0.00	0.00	1.03	1.03
317.0	17.388	14.96	0.41	120	17.31	0.16	1.04	1.04	0.00	0.00	1.04	1.04
316.8	17.552	15.55	0.46	120	17.47	0.16	1.05	1.05	0.00	0.00	1.05	1.05
316.7	17.716	18.26	0.54	120	17.63	0.16	1.06	1.06	0.00	0.00	1.06	1.06
316.5	17.880	19.94	0.59	120	17.80	0.16	1.07	1.07	0.00	0.00	1.07	1.07
316.4	18.044	19.93	0.68	120	17.96	0.16	1.08	1.08	0.00	0.00	1.08	1.08
316.2	18.208	20.26	0.67	120	18.13	0.16	1.09	1.09	0.00	0.00	1.09	1.09
316.0	18.372	21.12	0.73	120	18.29	0.16	1.10	1.10	0.00	0.00	1.10	1.10
315.9	18.537	21.51	0.73	120	18.45	0.16	1.11	1.11	0.00	0.00	1.11	1.11
315.7	18.701	19.27	0.69	120	18.62	0.16	1.12	1.12	0.00	0.00	1.12	1.12
315.5	18.865	16.65	0.60	120	18.78	0.16	1.13	1.13	0.00	0.00	1.13	1.13
315.4	19.029	15.28	0.55	120	18.95	0.16	1.14	1.14	0.00	0.00	1.14	1.14
315.2	19.193	14.22	0.48	120	19.11	0.16	1.15	1.15	0.00	0.00	1.15	1.15
315.0	19.357	14.26	0.47	120	19.27	0.16	1.16	1.16	0.00	0.00	1.16	1.16
314.9	19.521	14.83	0.51	120	19.44	0.16	1.17	1.17	0.00	0.00	1.17	1.17
314.7	19.685	14.27	0.46	120	19.60	0.16	1.18	1.18	0.00	0.00	1.18	1.18
314.6	19.849	13.82	0.47	120	19.77	0.16	1.19	1.19	0.00	0.00	1.19	1.19
314.4	20.013	13.91	0.42	120	19.93	0.16	1.20	1.20	0.00	0.00	1.20	1.20
314.2	20.177	12.19	0.40	120	20.09	0.16	1.21	1.21	0.00	0.00	1.21	1.21
314.1	20.341	12.05	0.38	120	20.26	0.16	1.22	1.22	0.00	0.00	1.22	1.22
313.9	20.505	12.26	0.35	120	20.42	0.16	1.23	1.23	0.00	0.00	1.23	1.23
313.7	20.669	12.57	0.33	120	20.59	0.16	1.24	1.24	0.00	0.00	1.24	1.24
313.6	20.833	13.09	0.40	120	20.75	0.16	1.25	1.25	0.00	0.00	1.25	1.25
313.4	20.997	14.40	0.45	120	20.92	0.16	1.26	1.26	0.00	0.00	1.26	1.26
313.2	21.161	14.53	0.53	120	21.08	0.16	1.27	1.27	0.00	0.00	1.27	1.27
313.1	21.325	14.05	0.53	120	21.24	0.16	1.28	1.28	0.00	0.00	1.28	1.28
312.9	21.489	13.69	0.47	120	21.41	0.16	1.29	1.29	0.00	0.00	1.29	1.29
312.7	21.653	13.19	0.45	120	21.57	0.16	1.30	1.30	0.00	0.00	1.30	1.30
312.6	21.817	13.30	0.46	120	21.74	0.16	1.31	1.31	0.00	0.00	1.31	1.31
312.4	21.981	13.33	0.42	120	21.90	0.16	1.32	1.32	0.00	0.00	1.32	1.32
312.3	22.145	12.96	0.42	120	22.06	0.16	1.33	1.33	0.00	0.00	1.33	1.33
312.1	22.309	13.38	0.43	120	22.23	0.16	1.34	1.34	0.00	0.00	1.34	1.34

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σv CPT (tsf)	Total Vertical Stress during EQ σv EQ (tsf)	Static Pore Water Pressure during CPT us CPT (tsf)	Static Pore Water Pressure during EQ us EQ (tsf)	Effective Vertical Stress during CPT σv CPT (tsf)	Effective Vertical Stress during EQ σv EQ (tsf)
311.9	22.473	14.12	0.45	120	22.39	0.16	1.35	1.35	0.00	0.00	1.35	1.35
311.8	22.638	14.09	0.47	120	22.56	0.16	1.36	1.36	0.00	0.00	1.36	1.36
311.6	22.802	15.28	0.57	120	22.72	0.16	1.37	1.37	0.00	0.00	1.37	1.37
311.4	22.966	17.08	0.48	120	22.88	0.16	1.38	1.38	0.00	0.00	1.38	1.38
311.3	23.130	16.77	0.31	120	23.05	0.16	1.39	1.39	0.00	0.00	1.39	1.39
311.1	23.294	13.17	0.22	120	23.21	0.16	1.40	1.40	0.00	0.00	1.40	1.40
310.9	23.458	13.77	0.24	120	23.38	0.16	1.41	1.41	0.00	0.00	1.41	1.41
310.8	23.622	13.18	0.31	120	23.54	0.16	1.42	1.42	0.00	0.00	1.42	1.42
310.6	23.786	12.01	0.29	120	23.70	0.16	1.43	1.43	0.00	0.00	1.43	1.43
310.5	23.950	12.41	0.27	120	23.87	0.16	1.44	1.44	0.00	0.00	1.44	1.44
310.3	24.114	11.86	0.28	120	24.03	0.16	1.45	1.45	0.00	0.00	1.45	1.45
310.1	24.278	11.26	0.27	120	24.20	0.16	1.46	1.46	0.00	0.00	1.46	1.46
310.0	24.442	11.93	0.35	120	24.36	0.16	1.47	1.47	0.00	0.00	1.47	1.47
309.8	24.606	12.12	0.36	120	24.52	0.16	1.48	1.48	0.00	0.00	1.48	1.48
309.6	24.770	12.23	0.35	120	24.69	0.16	1.49	1.49	0.00	0.00	1.49	1.49
309.5	24.934	10.27	0.27	120	24.85	0.16	1.50	1.50	0.00	0.00	1.50	1.50
309.3	25.098	10.72	0.25	120	25.02	0.16	1.51	1.51	0.00	0.00	1.51	1.51
309.1	25.262	12.07	0.27	120	25.18	0.16	1.52	1.52	0.00	0.00	1.52	1.52
309.0	25.426	13.77	0.28	120	25.34	0.16	1.53	1.53	0.00	0.00	1.53	1.53
308.8	25.590	13.48	0.35	120	25.51	0.16	1.54	1.54	0.00	0.00	1.54	1.54
308.6	25.754	12.61	0.38	120	25.67	0.16	1.55	1.55	0.00	0.00	1.55	1.55
308.5	25.918	12.60	0.34	120	25.84	0.16	1.56	1.56	0.00	0.00	1.56	1.56
308.3	26.082	12.90	0.30	120	26.00	0.16	1.56	1.56	0.00	0.00	1.56	1.56
308.2	26.246	12.46	0.29	120	26.16	0.16	1.57	1.57	0.00	0.00	1.57	1.57
308.0	26.410	11.29	0.30	120	26.33	0.16	1.58	1.58	0.00	0.00	1.58	1.58
307.8	26.574	11.68	0.27	120	26.49	0.16	1.59	1.59	0.00	0.00	1.59	1.59
307.7	26.739	12.62	0.27	120	26.66	0.16	1.60	1.60	0.00	0.00	1.60	1.60
307.5	26.903	11.86	0.25	120	26.82	0.16	1.61	1.61	0.00	0.00	1.61	1.61
307.3	27.067	13.41	0.30	120	26.98	0.16	1.62	1.62	0.00	0.00	1.62	1.62
307.2	27.231	14.08	0.35	120	27.15	0.16	1.63	1.63	0.00	0.00	1.63	1.63
307.0	27.395	13.22	0.38	120	27.31	0.16	1.64	1.64	0.00	0.00	1.64	1.64
306.8	27.559	13.43	0.39	120	27.48	0.16	1.65	1.65	0.00	0.00	1.65	1.65
306.7	27.723	13.62	0.34	120	27.64	0.16	1.66	1.66	0.01	0.01	1.66	1.66
306.5	27.887	14.11	0.33	120	27.80	0.16	1.67	1.67	0.01	0.01	1.66	1.66
306.3	28.051	14.41	0.31	120	27.97	0.16	1.68	1.68	0.02	0.02	1.67	1.67
306.2	28.215	14.71	0.36	120	28.13	0.16	1.69	1.69	0.02	0.02	1.67	1.67
306.0	28.379	13.82	0.32	120	28.30	0.16	1.70	1.70	0.03	0.03	1.68	1.68
305.9	28.543	12.68	0.32	120	28.46	0.16	1.71	1.71	0.03	0.03	1.68	1.68
305.7	28.707	10.94	0.26	120	28.62	0.16	1.72	1.72	0.04	0.04	1.68	1.68
305.5	28.871	10.72	0.19	120	28.79	0.16	1.73	1.73	0.04	0.04	1.69	1.69
305.4	29.035	12.69	0.18	120	28.95	0.16	1.74	1.74	0.05	0.05	1.69	1.69
305.2	29.199	11.84	0.22	120	29.12	0.16	1.75	1.75	0.05	0.05	1.70	1.70
305.0	29.363	11.67	0.27	120	29.28	0.16	1.76	1.76	0.06	0.06	1.70	1.70
304.9	29.527	11.11	0.23	120	29.45	0.16	1.77	1.77	0.06	0.06	1.71	1.71
304.7	29.691	11.40	0.28	120	29.61	0.16	1.78	1.78	0.07	0.07	1.71	1.71
304.5	29.855	9.79	0.27	120	29.77	0.16	1.79	1.79	0.07	0.07	1.72	1.72
304.4	30.019	9.35	0.20	120	29.94	0.16	1.80	1.80	0.08	0.08	1.72	1.72
304.2	30.183	9.13	0.20	120	30.10	0.16	1.81	1.81	0.08	0.08	1.73	1.73
304.1	30.347	9.98	0.17	120	30.27	0.16	1.82	1.82	0.09	0.09	1.73	1.73
303.9	30.511	10.52	0.17	120	30.43	0.16	1.83	1.83	0.09	0.09	1.74	1.74
303.7	30.675	10.13	0.17	120	30.59	0.16	1.84	1.84	0.10	0.10	1.74	1.74
303.6	30.840	9.46	0.17	120	30.76	0.16	1.85	1.85	0.10	0.10	1.75	1.75
303.4	31.004	9.84	0.17	120	30.92	0.16	1.86	1.86	0.11	0.11	1.75	1.75
303.2	31.168	10.30	0.15	120	31.09	0.16	1.87	1.87	0.11	0.11	1.76	1.76
303.1	31.332	10.47	0.15	120	31.25	0.16	1.88	1.88	0.12	0.12	1.76	1.76
302.9	31.496	10.13	0.15	120	31.41	0.16	1.89	1.89	0.12	0.12	1.77	1.77
302.7	31.660	9.62	0.14	120	31.58	0.16	1.90	1.90	0.13	0.13	1.77	1.77
302.6	31.824	9.45	0.12	120	31.74	0.16	1.91	1.91	0.13	0.13	1.77	1.77
302.4	31.988	9.20	0.11	120	31.91	0.16	1.92	1.92	0.14	0.14	1.78	1.78
302.2	32.152	9.09	0.11	120	32.07	0.16	1.93	1.93	0.15	0.15	1.78	1.78
302.1	32.316	8.49	0.11	120	32.23	0.16	1.94	1.94	0.15	0.15	1.79	1.79
301.9	32.480	8.48	0.11	120	32.40	0.16	1.95	1.95	0.16	0.16	1.79	1.79
301.8	32.644	9.26	0.11	120	32.56	0.16	1.96	1.96	0.16	0.16	1.80	1.80
301.6	32.808	9.46	0.12	120	32.73	0.16	1.97	1.97	0.17	0.17	1.80	1.80
301.4	32.972	9.20	0.13	120	32.89	0.16	1.98	1.98	0.17	0.17	1.81	1.81
301.3	33.136	9.08	0.12	120	33.05	0.16	1.99	1.99	0.18	0.18	1.81	1.81
301.1	33.300	9.18	0.12	120	33.22	0.16	2.00	2.00	0.18	0.18	1.82	1.82
300.9	33.464	9.12	0.12	120	33.38	0.16	2.01	2.01	0.19	0.19	1.82	1.82
300.8	33.628	9.10	0.10	120	33.55	0.16	2.02	2.02	0.19	0.19	1.83	1.83
300.6	33.792	9.76	0.12	120	33.71	0.16	2.03	2.03	0.20	0.20	1.83	1.83
300.4	33.956	9.70	0.11	120	33.87	0.16	2.04	2.04	0.20	0.20	1.84	1.84
300.3	34.120	9.19	0.12	120	34.04	0.16	2.05	2.05	0.21	0.21	1.84	1.84
300.1	34.284	9.61	0.13	120	34.20	0.16	2.06	2.06	0.21	0.21	1.85	1.85
300.0	34.448	10.22	0.12	120	34.37	0.16	2.07	2.07	0.22	0.22	1.85	1.85

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σv CPT (tsf)	Total Vertical Stress during EQ σv EQ (tsf)	Static Pore Water Pressure during CPT us CPT (tsf)	Static Pore Water Pressure during EQ us EQ (tsf)	Effective Vertical Stress during CPT σv CPT (tsf)	Effective Vertical Stress during EQ σv EQ (tsf)
299.8	34.612	10.99	0.14	120	34.53	0.16	2.08	2.08	0.22	0.22	1.85	1.85
299.6	34.776	10.40	0.13	120	34.69	0.16	2.09	2.09	0.23	0.23	1.86	1.86
299.5	34.941	10.03	0.13	120	34.86	0.16	2.10	2.10	0.23	0.23	1.86	1.86
299.3	35.105	9.98	0.13	120	35.02	0.16	2.11	2.11	0.24	0.24	1.87	1.87
299.1	35.269	10.15	0.15	120	35.19	0.16	2.12	2.12	0.24	0.24	1.87	1.87
299.0	35.433	10.39	0.15	120	35.35	0.16	2.13	2.13	0.25	0.25	1.88	1.88
298.8	35.597	12.17	0.11	120	35.51	0.16	2.14	2.14	0.25	0.25	1.88	1.88
298.6	35.761	9.63	0.11	120	35.68	0.16	2.15	2.15	0.26	0.26	1.89	1.89
298.5	35.925	9.81	0.11	120	35.84	0.16	2.16	2.16	0.26	0.26	1.89	1.89
298.3	36.089	9.70	0.11	120	36.01	0.16	2.17	2.17	0.27	0.27	1.90	1.90
298.1	36.253	10.21	0.13	120	36.17	0.16	2.18	2.18	0.27	0.27	1.90	1.90
298.0	36.417	10.05	0.13	120	36.33	0.16	2.19	2.19	0.28	0.28	1.91	1.91
297.8	36.581	10.40	0.13	120	36.50	0.16	2.19	2.19	0.28	0.28	1.91	1.91
297.7	36.745	10.64	0.13	120	36.66	0.16	2.20	2.20	0.29	0.29	1.92	1.92
297.5	36.909	10.69	0.14	120	36.83	0.16	2.21	2.21	0.29	0.29	1.92	1.92
297.3	37.073	11.04	0.13	120	36.99	0.16	2.22	2.22	0.30	0.30	1.93	1.93
297.2	37.237	18.14	0.16	120	37.16	0.16	2.23	2.23	0.30	0.30	1.93	1.93
297.0	37.401	16.07	0.13	120	37.32	0.16	2.24	2.24	0.31	0.31	1.94	1.94
296.8	37.565	9.87	0.14	120	37.48	0.16	2.25	2.25	0.31	0.31	1.94	1.94
296.7	37.729	9.57	0.12	120	37.65	0.16	2.26	2.26	0.32	0.32	1.94	1.94
296.5	37.893	9.47	0.13	120	37.81	0.16	2.27	2.27	0.32	0.32	1.95	1.95
296.3	38.057	11.80	0.10	120	37.98	0.16	2.28	2.28	0.33	0.33	1.95	1.95
296.2	38.221	21.69	0.19	120	38.14	0.16	2.29	2.29	0.33	0.33	1.96	1.96
296.0	38.385	35.89	0.35	120	38.30	0.16	2.30	2.30	0.34	0.34	1.96	1.96
295.9	38.549	20.53	0.48	120	38.47	0.16	2.31	2.31	0.34	0.34	1.97	1.97
295.7	38.713	18.07	0.36	120	38.63	0.16	2.32	2.32	0.35	0.35	1.97	1.97
295.5	38.877	15.90	0.21	120	38.80	0.16	2.33	2.33	0.35	0.35	1.98	1.98
295.4	39.042	12.87	0.14	120	38.96	0.16	2.34	2.34	0.36	0.36	1.98	1.98
295.2	39.206	11.07	0.12	120	39.12	0.16	2.35	2.35	0.37	0.37	1.99	1.99
295.0	39.370	11.51	0.09	120	39.29	0.16	2.36	2.36	0.37	0.37	1.99	1.99
294.9	39.534	10.96	0.11	120	39.45	0.16	2.37	2.37	0.38	0.38	2.00	2.00
294.7	39.698	10.73	0.13	120	39.62	0.16	2.38	2.38	0.38	0.38	2.00	2.00
294.5	39.862	11.23	0.19	120	39.78	0.16	2.39	2.39	0.39	0.39	2.01	2.01
294.4	40.026	16.09	0.27	120	39.94	0.16	2.40	2.40	0.39	0.39	2.01	2.01
294.2	40.190	17.74	0.38	120	40.11	0.16	2.41	2.41	0.40	0.40	2.02	2.02
294.0	40.354	21.41	0.61	120	40.27	0.16	2.42	2.42	0.40	0.40	2.02	2.02
293.9	40.518	17.14	0.56	120	40.44	0.16	2.43	2.43	0.41	0.41	2.02	2.02
293.7	40.682	16.08	0.39	120	40.60	0.16	2.44	2.44	0.41	0.41	2.03	2.03
293.6	40.846	14.84	0.28	120	40.76	0.16	2.45	2.45	0.42	0.42	2.03	2.03
293.4	41.010	19.00	0.31	120	40.93	0.16	2.46	2.46	0.42	0.42	2.04	2.04
293.2	41.174	62.17	0.47	120	41.09	0.16	2.47	2.47	0.43	0.43	2.04	2.04
293.1	41.338	63.10	0.88	120	41.26	0.16	2.48	2.48	0.43	0.43	2.05	2.05
292.9	41.502	36.52	1.20	120	41.42	0.16	2.49	2.49	0.44	0.44	2.05	2.05
292.7	41.666	22.25	1.12	120	41.58	0.16	2.50	2.50	0.44	0.44	2.06	2.06
292.6	41.830	15.59	0.88	120	41.75	0.16	2.51	2.51	0.45	0.45	2.06	2.06
292.4	41.994	32.65	0.86	120	41.91	0.16	2.52	2.52	0.45	0.45	2.07	2.07
292.2	42.158	57.61	0.90	120	42.08	0.16	2.53	2.53	0.46	0.46	2.07	2.07
292.1	42.322	46.48	0.99	120	42.24	0.16	2.54	2.54	0.46	0.46	2.08	2.08
291.9	42.486	50.70	1.04	120	42.40	0.16	2.55	2.55	0.47	0.47	2.08	2.08
291.7	42.650	38.79	1.26	120	42.57	0.16	2.56	2.56	0.47	0.47	2.09	2.09
291.6	42.814	25.19	0.73	120	42.73	0.16	2.57	2.57	0.48	0.48	2.09	2.09
291.4	42.978	24.11	0.93	120	42.90	0.16	2.58	2.58	0.48	0.48	2.10	2.10
291.3	43.143	29.61	0.93	120	43.06	0.16	2.59	2.59	0.49	0.49	2.10	2.10
291.1	43.307	19.06	0.74	120	43.22	0.16	2.60	2.60	0.49	0.49	2.11	2.11
290.9	43.471	16.39	0.49	120	43.39	0.16	2.61	2.61	0.50	0.50	2.11	2.11
290.8	43.635	26.26	0.29	120	43.55	0.16	2.62	2.62	0.50	0.50	2.11	2.11
290.6	43.799	61.99	0.53	120	43.72	0.16	2.63	2.63	0.51	0.51	2.12	2.12
290.4	43.963	72.39	0.98	120	43.88	0.16	2.64	2.64	0.51	0.51	2.12	2.12
290.3	44.127	46.36	1.31	120	44.04	0.16	2.65	2.65	0.52	0.52	2.13	2.13
290.1	44.291	25.97	0.97	120	44.21	0.16	2.66	2.66	0.52	0.52	2.13	2.13
289.9	44.455	21.73	1.00	120	44.37	0.16	2.67	2.67	0.53	0.53	2.14	2.14
289.8	44.619	35.05	0.90	120	44.54	0.16	2.68	2.68	0.53	0.53	2.14	2.14
289.6	44.783	23.94	0.72	120	44.70	0.16	2.69	2.69	0.54	0.54	2.15	2.15
289.5	44.947	19.40	0.34	120	44.86	0.16	2.70	2.70	0.54	0.54	2.15	2.15
289.3	45.111	16.93	0.26	120	45.03	0.16	2.71	2.71	0.55	0.55	2.16	2.16
289.1	45.275	25.97	0.73	120	45.19	0.16	2.72	2.72	0.55	0.55	2.16	2.16
289.0	45.439	37.43	0.37	120	45.36	0.16	2.73	2.73	0.56	0.56	2.17	2.17
288.8	45.603	29.17	0.81	120	45.52	0.16	2.74	2.74	0.56	0.56	2.17	2.17
288.6	45.767	20.68	0.63	120	45.69	0.16	2.75	2.75	0.57	0.57	2.18	2.18
288.5	45.931	12.75	0.36	120	45.85	0.16	2.76	2.76	0.58	0.58	2.18	2.18
288.3	46.095	13.25	0.16	120	46.01	0.16	2.77	2.77	0.58	0.58	2.19	2.19
288.1	46.259	14.25	0.12	120	46.18	0.16	2.78	2.78	0.59	0.59	2.19	2.19
288.0	46.423	12.02	0.11	120	46.34	0.16	2.79	2.79	0.59	0.59	2.19	2.19
287.8	46.587	12.28	0.11	120	46.51	0.16	2.80	2.80	0.60	0.60	2.20	2.20

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σ _{v CPT} (tsf)	Total Vertical Stress during EQ σ _{v EQ} (tsf)	Static Pore Water Pressure during CPT u _{s CPT} (tsf)	Static Pore Water Pressure during EQ u _{s EQ} (tsf)	Effective Vertical Stress during CPT σ _{v CPT} (tsf)	Effective Vertical Stress during EQ σ _{v EQ} (tsf)
287.6	46.751	12.55	0.11	120	46.67	0.16	2.81	2.81	0.60	0.60	2.20	2.20
287.5	46.915	11.93	0.11	120	46.83	0.16	2.81	2.81	0.61	0.61	2.21	2.21
287.3	47.079	11.75	0.12	120	47.00	0.16	2.82	2.82	0.61	0.61	2.21	2.21
287.2	47.244	12.36	0.13	120	47.16	0.16	2.83	2.83	0.62	0.62	2.22	2.22
287.0	47.408	20.81	0.25	120	47.33	0.16	2.84	2.84	0.62	0.62	2.22	2.22
286.8	47.572	18.29	0.23	120	47.49	0.16	2.85	2.85	0.63	0.63	2.23	2.23
286.7	47.736	17.10	0.20	120	47.65	0.16	2.86	2.86	0.63	0.63	2.23	2.23
286.5	47.900	15.86	0.15	120	47.82	0.16	2.87	2.87	0.64	0.64	2.24	2.24
286.3	48.064	14.79	0.15	120	47.98	0.16	2.88	2.88	0.64	0.64	2.24	2.24
286.2	48.228	15.08	0.11	120	48.15	0.16	2.89	2.89	0.65	0.65	2.25	2.25
286.0	48.392	15.98	0.13	120	48.31	0.16	2.90	2.90	0.65	0.65	2.25	2.25
285.8	48.556	17.59	0.14	120	48.47	0.16	2.91	2.91	0.66	0.66	2.26	2.26
285.7	48.720	16.03	0.13	120	48.64	0.16	2.92	2.92	0.66	0.66	2.26	2.26
285.5	48.884	13.33	0.38	120	48.80	0.16	2.93	2.93	0.67	0.67	2.27	2.27
285.4	49.048	9.63	0.33	120	48.97	0.16	2.94	2.94	0.67	0.67	2.27	2.27
285.2	49.212	25.26	1.15	120	49.13	0.16	2.95	2.95	0.68	0.68	2.28	2.28
285.0	49.376	38.25	1.09	120	49.29	0.16	2.96	2.96	0.68	0.68	2.28	2.28
284.9	49.540	12.44	0.62	120	49.46	0.16	2.97	2.97	0.69	0.69	2.28	2.28
284.7	49.704	21.15	0.57	120	49.62	0.08	2.98	2.98	0.69	0.69	2.29	2.29

LIQUEFACTION POTENTIAL ASSESSMENT FOR COARSE GRAINED SOILS USING CONE PENETRATION TEST DATA

Project Site: US 60 Bridge
Project No.: 178565011
CPT ID: SP04

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	qc_{IN}	FC (%)	Δqc_{IN}	$(qc_{IN})_{CS}$	a	ξ_R
334.4												
334.2	0.164	78.67	3.05	2.32	0.7	1.70	5.08	49	46.86	51.94	0.350	-0.198
334.1	0.328	31.87	2.44	2.54	0.5	1.70	7.42	66	52.09	59.51	0.350	-0.241
333.9	0.492	35.36	1.71	2.41	0.5	1.70	10.09	56	50.45	60.55	0.350	-0.243
333.7	0.656	38.04	1.64	2.37	0.5	1.70	12.54	53	50.25	62.78	0.350	-0.253
333.6	0.820	39.32	1.32	2.30	0.5	1.70	14.50	47	48.85	63.35	0.350	-0.254
333.4	0.984	41.57	1.64	2.34	0.5	1.70	16.79	50	50.57	67.36	0.350	-0.275
333.3	1.148	46.96	2.18	2.38	0.5	1.70	20.48	53	52.57	73.06	0.350	-0.304
333.1	1.312	47.86	2.05	2.36	0.5	1.70	22.32	51	52.44	74.77	0.350	-0.311
332.9	1.476	40.50	2.73	2.49	0.5	1.70	20.07	62	54.90	74.97	0.350	-0.311
332.8	1.640	46.19	2.82	2.46	0.5	1.70	24.11	60	55.41	79.52	0.350	-0.333
332.6	1.804	50.85	3.07	2.45	0.5	1.70	27.83	59	56.36	84.19	0.350	-0.354
332.4	1.968	50.43	3.50	2.50	0.5	1.70	28.84	63	57.49	86.32	0.350	-0.363
332.3	2.133	50.12	3.72	2.52	0.5	1.70	29.84	64	58.15	87.99	0.350	-0.370
332.1	2.297	51.02	3.83	2.52	0.5	1.70	31.52	65	58.71	90.23	0.350	-0.379
331.9	2.461	46.55	4.18	2.58	0.5	1.70	29.80	69	59.13	88.92	0.350	-0.372
331.8	2.625	61.07	4.43	2.51	0.7	1.70	27.62	64	57.45	85.07	0.350	-0.352
331.6	2.789	58.67	4.55	2.53	0.7	1.70	27.70	66	57.83	85.53	0.350	-0.354
331.4	2.953	59.16	4.47	2.53	0.7	1.70	29.07	65	58.09	87.16	0.350	-0.360
331.3	3.117	56.76	4.48	2.54	0.7	1.70	28.98	66	58.28	87.26	0.350	-0.360
331.1	3.281	52.05	4.57	2.57	0.7	1.70	27.58	69	58.39	85.98	0.350	-0.353
331.0	3.445	48.77	4.30	2.57	0.7	1.70	26.77	69	58.16	84.93	0.350	-0.347
330.8	3.609	47.96	4.07	2.56	0.7	1.70	27.21	68	58.11	85.31	0.350	-0.348
330.6	3.773	46.52	4.10	2.57	0.7	1.70	27.24	69	58.29	85.53	0.350	-0.348
330.5	3.937	44.64	4.05	2.58	0.7	1.70	26.95	69	58.34	85.29	0.350	-0.346
330.3	4.101	46.16	3.70	2.54	0.7	1.70	28.66	66	58.23	86.89	0.350	-0.353
330.1	4.265	50.37	3.71	2.52	0.7	1.70	32.12	64	58.76	90.88	0.350	-0.371
330.0	4.429	42.68	3.77	2.57	0.5	1.70	36.79	69	61.08	97.87	0.350	-0.401
329.8	4.593	44.99	3.98	2.57	0.5	1.70	39.47	69	61.87	101.34	0.350	-0.415
329.6	4.757	46.93	4.08	2.57	0.5	1.70	41.90	68	62.47	104.37	0.350	-0.427
329.5	4.921	50.62	3.95	2.53	0.5	1.70	45.94	66	63.05	108.99	0.350	-0.445
329.3	5.085	53.37	3.89	2.51	0.5	1.70	49.21	64	63.58	112.80	0.350	-0.460
329.2	5.249	53.26	4.03	2.52	0.5	1.70	49.90	65	64.02	113.92	0.350	-0.463
329.0	5.413	51.96	4.22	2.55	0.5	1.70	49.47	67	64.30	113.77	0.350	-0.462
328.8	5.577	50.97	4.28	2.56	0.5	1.70	49.27	68	64.44	113.71	0.350	-0.461
328.7	5.741	49.41	4.36	2.57	0.5	1.70	48.36	69	64.44	112.79	0.350	-0.457
328.5	5.905	49.25	4.44	2.58	0.5	1.67	48.25	69	64.52	112.76	0.350	-0.457
328.3	6.069	49.54	4.38	2.57	0.5	1.65	48.54	69	64.50	113.05	0.350	-0.457
328.2	6.234	48.62	4.44	2.58	0.5	1.63	47.79	70	64.45	112.24	0.350	-0.453
328.0	6.398	48.08	4.40	2.58	0.5	1.62	47.35	70	64.33	111.68	0.350	-0.451
327.8	6.562	48.52	4.03	2.55	0.5	1.60	47.82	67	63.94	111.76	0.350	-0.450
327.7	6.726	48.22	4.04	2.56	0.5	1.58	47.59	67	63.93	111.52	0.350	-0.449
327.5	6.890	48.02	4.08	2.56	0.5	1.56	47.44	68	63.96	111.40	0.350	-0.448
327.3	7.054	47.11	4.18	2.57	0.5	1.55	46.66	69	63.96	110.62	0.350	-0.444
327.2	7.218	45.31	4.26	2.59	0.5	1.53	45.08	70	63.80	108.88	0.350	-0.437
327.0	7.382	51.19	4.33	2.56	0.7	1.53	43.09	68	62.69	105.78	0.350	-0.424
326.9	7.546	50.18	4.32	2.56	0.7	1.51	42.51	68	62.61	105.12	0.350	-0.421
326.7	7.710	44.16	4.17	2.59	0.5	1.49	44.13	70	63.54	107.67	0.350	-0.431
326.5	7.874	47.25	4.18	2.57	0.5	1.47	46.94	69	64.02	110.96	0.350	-0.443
326.4	8.038	45.93	4.27	2.59	0.5	1.45	45.77	70	63.94	109.71	0.350	-0.438
326.2	8.202	48.71	4.56	2.59	0.7	1.45	42.05	70	62.90	104.96	0.350	-0.418
326.0	8.366	46.30	4.68	2.61	0.7	1.44	40.30	72	62.76	103.06	0.350	-0.410
325.9	8.530	47.39	4.35	2.58	0.7	1.43	41.35	70	62.60	103.95	0.350	-0.413
325.7	8.694	45.77	4.02	2.57	0.5	1.40	45.74	69	63.64	109.38	0.350	-0.435
325.5	8.858	49.04	4.01	2.55	0.5	1.38	48.74	67	64.12	112.86	0.350	-0.448
325.4	9.022	50.06	3.54	2.50	0.5	1.37	49.75	63	63.54	113.29	0.350	-0.449
325.2	9.186	52.05	2.91	2.43	0.5	1.36	51.68	57	62.43	114.11	0.350	-0.452
325.0	9.350	54.07	2.23	2.34	0.5	1.35	53.70	50	60.30	114.00	0.350	-0.451
324.9	9.514	54.35	1.88	2.29	0.5	1.34	54.10	46	58.54	112.64	0.350	-0.445
324.7	9.678	53.83	1.84	2.29	0.5	1.33	53.67	46	58.32	111.99	0.350	-0.442
324.6	9.842	52.33	1.64	2.26	0.5	1.32	52.39	44	57.04	109.42	0.350	-0.432

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
324.4	10.006	48.70	1.96	2.34	0.5	1.31	48.92	50	58.98	107.89	0.350	-0.425
324.2	10.170	44.82	2.56	2.44	0.5	1.31	45.19	58	60.88	106.08	0.350	-0.417
324.1	10.335	37.07	3.15	2.56	0.5	1.31	37.83	68	61.24	99.06	0.350	-0.388
323.9	10.499	37.89	3.73	2.61	1.0	1.31	30.33	71	59.72	90.05	0.350	-0.347
323.7	10.663	32.63	3.46	2.63	1.0	1.31	26.57	73	58.97	85.54	0.350	-0.326
323.6	10.827	27.42	2.97	2.64	0.7	1.30	26.07	75	59.00	85.07	0.350	-0.323
323.4	10.991	30.51	3.10	2.62	1.0	1.29	25.30	73	58.46	83.77	0.350	-0.317
323.2	11.155	29.06	3.72	2.69	1.0	1.28	24.32	78	59.03	83.35	0.350	-0.314
323.1	11.319	29.35	4.20	2.72	1.0	1.27	24.69	81	59.51	84.21	0.350	-0.318
322.9	11.483	29.66	4.44	2.73	1.0	1.26	25.10	82	59.77	84.87	0.350	-0.321
322.8	11.647	29.12	4.40	2.74	1.0	1.25	24.83	82	59.73	84.55	0.350	-0.319
322.6	11.811	28.39	4.44	2.75	1.0	1.24	24.40	83	59.71	84.11	0.350	-0.316
322.4	11.975	27.87	4.40	2.75	1.0	1.23	24.12	83	59.66	83.79	0.350	-0.314
322.3	12.139	27.30	4.50	2.76	1.0	1.22	23.80	84	59.69	83.49	0.350	-0.313
322.1	12.303	27.27	4.57	2.77	1.0	1.21	23.92	85	59.78	83.71	0.350	-0.313
321.9	12.467	27.44	4.60	2.77	1.0	1.20	24.20	85	59.86	84.07	0.350	-0.315
321.8	12.631	26.31	4.95	2.80	1.0	1.20	23.40	87	59.95	83.35	0.350	-0.311
321.6	12.795	25.00	5.05	2.83	1.0	1.19	22.43	89	59.85	82.29	0.350	-0.305
321.4	12.959	25.10	5.02	2.82	1.0	1.18	22.64	89	59.89	82.53	0.350	-0.306
321.3	13.123	23.48	5.00	2.84	1.0	1.17	21.39	91	59.68	81.07	0.350	-0.299
321.1	13.287	21.71	4.91	2.86	1.0	1.17	19.98	92	59.41	79.39	0.350	-0.290
320.9	13.451	20.27	4.72	2.88	1.0	1.16	18.84	93	59.15	77.99	0.350	-0.282
320.8	13.615	20.55	4.65	2.87	1.0	1.15	19.18	92	59.19	78.37	0.350	-0.284
320.6	13.779	21.36	4.49	2.84	1.0	1.14	20.00	91	59.25	79.25	0.350	-0.288
320.5	13.943	21.09	4.89	2.87	1.0	1.14	19.86	93	59.44	79.31	0.350	-0.288
320.3	14.107	19.31	5.12	2.91	1.0	1.13	18.38	96	59.30	77.68	0.350	-0.280
320.1	14.271	17.39	5.27	2.96	1.0	1.12	16.75	100	59.09	75.84	0.350	-0.270
320.0	14.436	17.06	4.81	2.94	1.0	1.12	16.53	98	58.89	75.42	0.350	-0.267
319.8	14.600	17.50	4.49	2.91	1.0	1.11	17.01	96	58.85	75.86	0.350	-0.269
319.6	14.764	17.79	4.40	2.90	1.0	1.10	17.37	95	58.88	76.24	0.350	-0.271
319.5	14.928	18.43	4.43	2.89	1.0	1.10	18.04	94	59.01	77.04	0.350	-0.275
319.3	15.092	18.37	4.44	2.89	1.0	1.09	18.07	94	59.03	77.10	0.350	-0.275
319.1	15.256	20.15	3.85	2.82	1.0	1.08	19.81	89	58.99	78.81	0.350	-0.283
319.0	15.420	21.08	3.69	2.79	1.0	1.08	20.78	86	59.04	79.82	0.350	-0.288
318.8	15.584	22.08	3.82	2.79	1.0	1.07	21.82	86	59.30	81.12	0.350	-0.294
318.7	15.748	22.30	3.98	2.80	1.0	1.06	22.13	87	59.48	81.60	0.350	-0.296
318.5	15.912	22.45	4.15	2.80	1.0	1.06	22.37	87	59.64	82.00	0.350	-0.298
318.3	16.076	22.62	4.13	2.80	1.0	1.05	22.63	87	59.69	82.32	0.350	-0.299
318.2	16.240	23.00	4.30	2.81	1.0	1.05	23.10	88	59.88	82.98	0.350	-0.302
318.0	16.404	22.75	4.08	2.80	1.0	1.04	22.97	87	59.74	82.71	0.350	-0.300
317.8	16.568	21.26	4.13	2.82	1.0	1.03	21.63	89	59.56	81.19	0.350	-0.293
317.7	16.732	20.04	3.89	2.82	1.0	1.03	20.55	89	59.25	79.80	0.350	-0.285
317.5	16.896	17.14	3.50	2.85	1.0	1.02	17.80	91	58.62	76.41	0.350	-0.268
317.3	17.060	15.33	3.23	2.87	1.0	1.02	16.10	92	58.23	74.33	0.350	-0.257
317.2	17.224	13.72	3.08	2.89	1.0	1.01	14.57	94	57.96	72.54	0.350	-0.247
317.0	17.388	13.34	2.95	2.89	1.0	1.01	14.25	94	57.86	72.11	0.350	-0.244
316.8	17.552	13.76	3.19	2.90	1.0	1.00	14.74	95	58.07	72.81	0.350	-0.248
316.7	17.716	16.18	3.12	2.84	1.0	1.00	17.21	90	58.35	75.56	0.350	-0.262
316.5	17.880	17.58	3.14	2.81	1.0	0.99	18.70	88	58.57	77.27	0.350	-0.271
316.4	18.044	17.41	3.60	2.85	1.0	0.99	18.60	91	58.88	77.48	0.350	-0.271
316.2	18.208	17.54	3.50	2.84	1.0	0.98	18.81	90	58.86	77.67	0.350	-0.272
316.0	18.372	18.16	3.66	2.84	1.0	0.98	19.52	90	59.08	78.60	0.350	-0.277
315.9	18.537	18.34	3.59	2.83	1.0	0.97	19.78	90	59.09	78.87	0.350	-0.278
315.7	18.701	16.17	3.79	2.89	1.0	0.97	17.63	94	58.88	76.51	0.350	-0.265
315.5	18.865	13.71	3.85	2.95	1.0	0.96	15.15	99	58.55	73.71	0.350	-0.250
315.4	19.029	12.39	3.90	2.99	1.0	0.96	13.83	100	58.23	72.06	0.350	-0.241
315.2	19.193	11.35	3.64	3.00	1.0	0.95	12.81	100	57.91	70.71	0.350	-0.234
315.0	19.357	11.27	3.58	3.00	1.0	0.95	12.78	100	57.90	70.67	0.350	-0.233
314.9	19.521	11.66	3.70	3.00	1.0	0.94	13.23	100	58.04	71.27	0.350	-0.236
314.7	19.685	11.08	3.55	3.00	1.0	0.94	12.66	100	57.86	70.53	0.350	-0.232
314.6	19.849	10.61	3.70	3.03	1.0	0.93	12.21	100	57.72	69.93	0.350	-0.228
314.4	20.013	10.58	3.30	3.00	1.0	0.93	12.22	100	57.73	69.95	0.350	-0.228
314.2	20.177	9.07	3.65	3.08	1.0	0.92	10.65	100	57.24	67.89	0.350	-0.216
314.1	20.341	8.87	3.48	3.08	1.0	0.92	10.48	100	57.19	67.67	0.350	-0.215
313.9	20.505	8.96	3.13	3.05	1.0	0.92	10.61	100	57.23	67.84	0.350	-0.216
313.7	20.669	9.13	2.94	3.02	1.0	0.91	10.83	100	57.30	68.13	0.350	-0.217

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(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
313.6	20.833	9.47	3.39	3.05	1.0	0.91	11.24	100	57.42	68.66	0.350	-0.220
313.4	20.997	10.43	3.44	3.02	1.0	0.90	12.32	100	57.76	70.07	0.350	-0.227
313.2	21.161	10.44	3.98	3.05	1.0	0.90	12.37	100	57.77	70.14	0.350	-0.227
313.1	21.325	9.98	4.15	3.08	1.0	0.90	11.91	100	57.63	69.54	0.350	-0.224
312.9	21.489	9.61	3.75	3.07	1.0	0.89	11.54	100	57.52	69.06	0.350	-0.221
312.7	21.653	9.15	3.78	3.09	1.0	0.89	11.07	100	57.37	68.44	0.350	-0.217
312.6	21.817	9.16	3.82	3.09	1.0	0.88	11.11	100	57.38	68.50	0.350	-0.217
312.4	21.981	9.10	3.46	3.07	1.0	0.88	11.09	100	57.38	68.47	0.350	-0.217
312.3	22.145	8.76	3.64	3.09	1.0	0.88	10.74	100	57.27	68.01	0.350	-0.214
312.1	22.309	8.99	3.58	3.08	1.0	0.87	11.04	100	57.36	68.40	0.350	-0.216
311.9	22.473	9.47	3.49	3.05	1.0	0.87	11.61	100	57.54	69.14	0.350	-0.220
311.8	22.638	9.37	3.70	3.07	1.0	0.87	11.53	100	57.51	69.05	0.350	-0.219
311.6	22.802	10.17	4.07	3.07	1.0	0.86	12.47	100	57.80	70.27	0.350	-0.226
311.4	22.966	11.39	3.06	2.96	1.0	0.86	13.90	99	58.20	72.09	0.350	-0.236
311.3	23.130	11.08	2.03	2.87	1.0	0.86	13.58	92	57.47	71.04	0.350	-0.230
311.1	23.294	8.42	1.85	2.95	1.0	0.85	10.59	99	57.12	67.72	0.350	-0.211
310.9	23.458	8.78	1.97	2.94	1.0	0.85	11.04	99	57.25	68.28	0.350	-0.214
310.8	23.622	8.30	2.63	3.03	1.0	0.84	10.51	100	57.20	67.71	0.350	-0.210
310.6	23.786	7.42	2.78	3.09	1.0	0.84	9.53	100	56.89	66.43	0.350	-0.203
310.5	23.950	7.63	2.50	3.05	1.0	0.84	9.81	100	56.98	66.79	0.350	-0.205
310.3	24.114	7.20	2.66	3.09	1.0	0.83	9.34	100	56.83	66.17	0.350	-0.201
310.1	24.278	6.73	2.73	3.12	1.0	0.83	8.83	100	56.67	65.50	0.350	-0.197
310.0	24.442	7.14	3.30	3.14	1.0	0.83	9.32	100	56.83	66.14	0.350	-0.200
309.8	24.606	7.21	3.38	3.14	1.0	0.82	9.43	100	56.86	66.29	0.350	-0.201
309.6	24.770	7.23	3.25	3.13	1.0	0.82	9.48	100	56.87	66.35	0.350	-0.201
309.5	24.934	5.86	3.05	3.19	1.0	0.82	7.91	100	56.39	64.30	0.350	-0.189
309.3	25.098	6.12	2.70	3.15	1.0	0.81	8.23	100	56.49	64.72	0.350	-0.191
309.1	25.262	6.97	2.51	3.09	1.0	0.81	9.25	100	56.80	66.05	0.350	-0.199
309.0	25.426	8.02	2.32	3.02	1.0	0.81	10.52	100	57.20	67.72	0.350	-0.208
308.8	25.590	7.78	2.89	3.08	1.0	0.81	10.26	100	57.12	67.38	0.350	-0.206
308.6	25.754	7.16	3.40	3.15	1.0	0.80	9.56	100	56.90	66.46	0.350	-0.200
308.5	25.918	7.10	3.07	3.13	1.0	0.80	9.51	100	56.89	66.40	0.350	-0.200
308.3	26.082	7.24	2.67	3.09	1.0	0.80	9.70	100	56.95	66.65	0.350	-0.201
308.2	26.246	6.91	2.70	3.11	1.0	0.79	9.34	100	56.83	66.17	0.350	-0.198
308.0	26.410	6.13	3.13	3.18	1.0	0.79	8.42	100	56.55	64.96	0.350	-0.191
307.8	26.574	6.33	2.70	3.14	1.0	0.79	8.68	100	56.63	65.30	0.350	-0.193
307.7	26.739	6.87	2.49	3.09	1.0	0.78	9.35	100	56.84	66.19	0.350	-0.197
307.5	26.903	6.35	2.48	3.12	1.0	0.78	8.75	100	56.65	65.40	0.350	-0.193
307.3	27.067	7.26	2.54	3.07	1.0	0.78	9.87	100	57.00	66.87	0.350	-0.201
307.2	27.231	7.62	2.83	3.08	1.0	0.78	10.34	100	57.14	67.49	0.350	-0.204
307.0	27.395	7.05	3.32	3.15	1.0	0.77	9.67	100	56.93	66.60	0.350	-0.199
306.8	27.559	7.13	3.31	3.14	1.0	0.77	9.79	100	56.97	66.76	0.350	-0.200
306.7	27.723	7.22	2.84	3.10	1.0	0.77	9.92	100	57.01	66.93	0.350	-0.201
306.5	27.887	7.49	2.61	3.07	1.0	0.77	10.26	100	57.12	67.38	0.350	-0.203
306.3	28.051	7.64	2.41	3.04	1.0	0.77	10.47	100	57.18	67.65	0.350	-0.204
306.2	28.215	7.79	2.73	3.06	1.0	0.77	10.67	100	57.25	67.92	0.350	-0.206
306.0	28.379	7.23	2.63	3.08	1.0	0.77	9.99	100	57.04	67.03	0.350	-0.201
305.9	28.543	6.53	2.87	3.14	1.0	0.76	9.14	100	56.77	65.91	0.350	-0.194
305.7	28.707	5.47	2.84	3.20	1.0	0.76	7.86	100	56.37	64.23	0.350	-0.184
305.5	28.871	5.32	2.15	3.15	1.0	0.76	7.69	100	56.32	64.01	0.350	-0.183
305.4	29.035	6.46	1.67	3.03	1.0	0.76	9.10	100	56.76	65.86	0.350	-0.194
305.2	29.199	5.94	2.22	3.12	1.0	0.76	8.47	100	56.56	65.03	0.350	-0.189
305.0	29.363	5.81	2.69	3.17	1.0	0.76	8.33	100	56.52	64.85	0.350	-0.188
304.9	29.527	5.47	2.47	3.17	1.0	0.75	7.91	100	56.39	64.30	0.350	-0.184
304.7	29.691	5.61	2.86	3.20	1.0	0.75	8.11	100	56.45	64.56	0.350	-0.186
304.5	29.855	4.66	3.34	3.30	1.0	0.75	6.94	100	56.09	63.03	0.350	-0.176
304.4	30.019	4.38	2.69	3.27	1.0	0.75	6.61	100	55.99	62.60	0.350	-0.174
304.2	30.183	4.24	2.75	3.29	1.0	0.75	6.45	100	55.93	62.38	0.350	-0.172
304.1	30.347	4.71	2.08	3.19	1.0	0.75	7.04	100	56.12	63.16	0.350	-0.177
303.9	30.511	5.00	1.90	3.15	1.0	0.75	7.41	100	56.23	63.65	0.350	-0.180
303.7	30.675	4.76	2.04	3.18	1.0	0.74	7.13	100	56.15	63.27	0.350	-0.177
303.6	30.840	4.36	2.29	3.24	1.0	0.74	6.64	100	55.99	62.63	0.350	-0.174
303.4	31.004	4.56	2.10	3.21	1.0	0.74	6.90	100	56.07	62.97	0.350	-0.175
303.2	31.168	4.80	1.82	3.16	1.0	0.74	7.21	100	56.17	63.38	0.350	-0.178
303.1	31.332	4.88	1.75	3.14	1.0	0.74	7.32	100	56.21	63.53	0.350	-0.179
302.9	31.496	4.67	1.86	3.17	1.0	0.74	7.07	100	56.13	63.19	0.350	-0.177

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
302.7	31.660	4.36	1.84	3.20	1.0	0.74	6.70	100	56.01	62.71	0.350	-0.174
302.6	31.824	4.25	1.63	3.18	1.0	0.73	6.57	100	55.97	62.54	0.350	-0.172
302.4	31.988	4.09	1.55	3.19	1.0	0.73	6.38	100	55.91	62.29	0.350	-0.171
302.2	32.152	4.01	1.52	3.19	1.0	0.73	6.29	100	55.89	62.17	0.350	-0.170
302.1	32.316	3.66	1.60	3.24	1.0	0.73	5.86	100	55.75	61.61	0.350	-0.167
301.9	32.480	3.64	1.65	3.25	1.0	0.73	5.84	100	55.75	61.59	0.350	-0.166
301.8	32.644	4.06	1.52	3.19	1.0	0.73	6.38	100	55.91	62.29	0.350	-0.170
301.6	32.808	4.16	1.66	3.19	1.0	0.73	6.51	100	55.95	62.46	0.350	-0.171
301.4	32.972	4.00	1.85	3.23	1.0	0.73	6.32	100	55.90	62.21	0.350	-0.170
301.3	33.136	3.91	1.75	3.23	1.0	0.73	6.22	100	55.86	62.09	0.350	-0.169
301.1	33.300	3.95	1.62	3.21	1.0	0.72	6.28	100	55.88	62.16	0.350	-0.169
300.9	33.464	3.91	1.74	3.23	1.0	0.72	6.24	100	55.87	62.10	0.350	-0.169
300.8	33.628	3.88	1.45	3.20	1.0	0.72	6.21	100	55.86	62.07	0.350	-0.169
300.6	33.792	4.22	1.51	3.17	1.0	0.72	6.66	100	56.00	62.66	0.350	-0.172
300.4	33.956	4.17	1.40	3.16	1.0	0.72	6.60	100	55.98	62.58	0.350	-0.171
300.3	34.120	3.88	1.65	3.22	1.0	0.72	6.24	100	55.87	62.11	0.350	-0.168
300.1	34.284	4.09	1.72	3.21	1.0	0.72	6.52	100	55.96	62.48	0.350	-0.171
300.0	34.448	4.41	1.50	3.15	1.0	0.72	6.93	100	56.08	63.01	0.350	-0.174
299.8	34.612	4.80	1.52	3.12	1.0	0.72	7.45	100	56.25	63.69	0.350	-0.178
299.6	34.776	4.47	1.54	3.15	1.0	0.72	7.03	100	56.12	63.15	0.350	-0.174
299.5	34.941	4.26	1.65	3.18	1.0	0.71	6.77	100	56.03	62.80	0.350	-0.172
299.3	35.105	4.21	1.69	3.19	1.0	0.71	6.72	100	56.02	62.74	0.350	-0.172
299.1	35.269	4.29	1.83	3.20	1.0	0.71	6.83	100	56.05	62.88	0.350	-0.172
299.0	35.433	4.40	1.82	3.19	1.0	0.71	6.98	100	56.10	63.08	0.350	-0.174
298.8	35.597	5.33	1.07	3.01	1.0	0.71	8.19	100	56.48	64.66	0.350	-0.183
298.6	35.761	3.96	1.42	3.18	1.0	0.71	6.45	100	55.93	62.38	0.350	-0.169
298.5	35.925	4.04	1.42	3.18	1.0	0.71	6.56	100	55.97	62.53	0.350	-0.170
298.3	36.089	3.97	1.45	3.19	1.0	0.71	6.47	100	55.94	62.42	0.350	-0.169
298.1	36.253	4.23	1.55	3.18	1.0	0.71	6.81	100	56.05	62.86	0.350	-0.172
298.0	36.417	4.12	1.65	3.20	1.0	0.70	6.69	100	56.01	62.70	0.350	-0.171
297.8	36.581	4.29	1.62	3.18	1.0	0.70	6.92	100	56.08	63.00	0.350	-0.172
297.7	36.745	4.40	1.59	3.16	1.0	0.70	7.07	100	56.13	63.19	0.350	-0.174
297.5	36.909	4.41	1.70	3.18	1.0	0.70	7.09	100	56.13	63.22	0.350	-0.174
297.3	37.073	4.58	1.46	3.13	1.0	0.70	7.32	100	56.20	63.52	0.350	-0.175
297.2	37.237	8.24	1.01	2.83	1.0	0.71	12.12	90	56.75	68.87	0.350	-0.206
297.0	37.401	7.14	0.94	2.88	1.0	0.70	10.69	93	56.65	67.34	0.350	-0.197
296.8	37.565	3.93	1.88	3.24	1.0	0.70	6.50	100	55.95	62.45	0.350	-0.169
296.7	37.729	3.76	1.59	3.23	1.0	0.70	6.29	100	55.89	62.17	0.350	-0.167
296.5	37.893	3.69	1.78	3.25	1.0	0.69	6.22	100	55.86	62.08	0.350	-0.166
296.3	38.057	4.87	1.09	3.05	1.0	0.70	7.77	100	56.34	64.11	0.350	-0.178
296.2	38.221	9.90	0.98	2.75	1.0	0.70	14.43	83	56.77	71.20	0.350	-0.218
296.0	38.385	23.30	1.05	2.44	0.5	0.71	24.17	58	55.03	79.20	0.350	-0.260
295.9	38.549	9.26	2.61	2.99	1.0	0.70	13.64	100	58.17	71.81	0.350	-0.222
295.7	38.713	7.98	2.29	3.01	1.0	0.70	11.94	100	57.64	69.58	0.350	-0.209
295.5	38.877	6.86	1.57	2.99	1.0	0.70	10.45	100	57.18	67.63	0.350	-0.198
295.4	39.042	5.31	1.36	3.06	1.0	0.69	8.41	100	56.54	64.95	0.350	-0.183
295.2	39.206	4.39	1.35	3.13	1.0	0.69	7.20	100	56.17	63.37	0.350	-0.173
295.0	39.370	4.59	0.99	3.06	1.0	0.69	7.48	100	56.26	63.74	0.350	-0.175
294.9	39.534	4.30	1.22	3.12	1.0	0.69	7.11	100	56.14	63.25	0.350	-0.172
294.7	39.698	4.17	1.51	3.17	1.0	0.68	6.94	100	56.09	63.03	0.350	-0.171
294.5	39.862	4.41	2.14	3.22	1.0	0.68	7.27	100	56.19	63.46	0.350	-0.173
294.4	40.026	6.81	1.94	3.04	1.0	0.69	10.48	100	57.19	67.66	0.350	-0.198
294.2	40.190	7.61	2.51	3.05	1.0	0.69	11.57	100	57.52	69.09	0.350	-0.206
294.0	40.354	9.40	3.23	3.04	1.0	0.69	14.03	100	58.29	72.32	0.350	-0.223
293.9	40.518	7.27	3.80	3.17	1.0	0.69	11.14	100	57.39	68.53	0.350	-0.202
293.7	40.682	6.72	2.85	3.13	1.0	0.69	10.41	100	57.17	67.58	0.350	-0.197
293.6	40.846	6.09	2.29	3.12	1.0	0.68	9.58	100	56.91	66.48	0.350	-0.191
293.4	41.010	8.11	1.90	2.97	1.0	0.69	12.33	100	57.76	70.10	0.350	-0.211
293.2	41.174	40.60	0.78	2.17	0.5	0.71	41.80	36	49.58	91.38	0.350	-0.317
293.1	41.338	41.17	1.45	2.31	0.5	0.72	42.89	48	56.52	99.41	0.350	-0.353
292.9	41.502	16.57	3.52	2.86	1.0	0.70	24.24	92	60.70	84.94	0.350	-0.287
292.7	41.666	9.60	5.66	3.18	1.0	0.69	14.44	100	58.42	72.85	0.350	-0.226
292.6	41.830	6.34	6.71	3.36	1.0	0.68	9.99	100	57.03	67.03	0.350	-0.193
292.4	41.994	14.58	2.85	2.85	1.0	0.70	21.46	91	59.75	81.21	0.350	-0.269
292.2	42.158	37.20	1.63	2.38	0.5	0.71	38.75	53	57.52	96.27	0.350	-0.339
292.1	42.322	21.15	2.26	2.66	1.0	0.71	31.00	76	60.66	91.66	0.350	-0.318

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
291.9	42.486	23.13	2.15	2.62	1.0	0.71	33.95	72	60.94	94.89	0.350	-0.332
291.7	42.650	17.37	3.46	2.84	1.0	0.70	25.60	90	60.94	86.54	0.350	-0.294
291.6	42.814	10.82	3.25	2.99	1.0	0.68	16.27	100	58.99	75.26	0.350	-0.238
291.4	42.978	10.27	4.31	3.08	1.0	0.68	15.53	100	58.75	74.28	0.350	-0.232
291.3	43.143	12.86	3.43	2.94	1.0	0.69	19.21	98	59.76	78.97	0.350	-0.257
291.1	43.307	7.82	4.47	3.18	1.0	0.67	12.14	100	57.70	69.84	0.350	-0.208
290.9	43.471	6.53	3.58	3.19	1.0	0.67	10.38	100	57.15	67.53	0.350	-0.195
290.8	43.635	11.18	1.22	2.75	1.0	0.68	16.83	83	57.45	74.28	0.350	-0.232
290.6	43.799	39.65	0.90	2.21	0.5	0.70	40.98	40	51.62	92.60	0.350	-0.321
290.4	43.963	46.53	1.40	2.26	0.5	0.71	48.72	44	56.03	104.75	0.350	-0.374
290.3	44.127	20.53	2.99	2.74	1.0	0.70	30.55	83	61.52	92.07	0.350	-0.319
290.1	44.291	10.93	4.16	3.05	1.0	0.68	16.61	100	59.09	75.69	0.350	-0.239
289.9	44.455	8.91	5.26	3.18	1.0	0.67	13.78	100	58.21	71.98	0.350	-0.219
289.8	44.619	15.10	2.77	2.83	1.0	0.68	22.64	89	59.95	82.59	0.350	-0.274
289.6	44.783	9.90	3.37	3.03	1.0	0.67	15.20	100	58.65	73.85	0.350	-0.229
289.5	44.947	7.76	2.01	3.00	1.0	0.67	12.20	100	57.72	69.92	0.350	-0.208
289.3	45.111	6.59	1.82	3.04	1.0	0.66	10.59	100	57.22	67.81	0.350	-0.196
289.1	45.275	10.76	1.60	2.82	1.0	0.67	16.44	89	58.00	74.44	0.350	-0.232
289.0	45.439	16.02	2.11	2.74	1.0	0.68	24.08	82	59.54	83.62	0.350	-0.279
288.8	45.603	12.17	3.08	2.93	1.0	0.67	18.56	98	59.49	78.05	0.350	-0.251
288.6	45.767	8.24	3.54	3.11	1.0	0.66	12.95	100	57.95	70.90	0.350	-0.213
288.5	45.931	4.58	3.60	3.32	1.0	0.65	7.86	100	56.37	64.24	0.350	-0.175
288.3	46.095	4.80	1.51	3.12	1.0	0.65	8.17	100	56.47	64.64	0.350	-0.177
288.1	46.259	5.24	1.02	3.01	1.0	0.65	8.79	100	56.66	65.45	0.350	-0.182
288.0	46.423	4.21	1.22	3.13	1.0	0.65	7.37	100	56.22	63.59	0.350	-0.171
287.8	46.587	4.31	1.17	3.11	1.0	0.65	7.53	100	56.27	63.80	0.350	-0.172
287.6	46.751	4.42	1.08	3.09	1.0	0.65	7.69	100	56.32	64.01	0.350	-0.173
287.5	46.915	4.13	1.21	3.14	1.0	0.65	7.29	100	56.20	63.49	0.350	-0.170
287.3	47.079	4.03	1.38	3.17	1.0	0.65	7.16	100	56.16	63.32	0.350	-0.169
287.2	47.244	4.29	1.34	3.14	1.0	0.65	7.54	100	56.27	63.81	0.350	-0.172
287.0	47.408	8.08	1.37	2.90	1.0	0.65	12.86	95	57.49	70.35	0.350	-0.209
286.8	47.572	6.93	1.48	2.97	1.0	0.65	11.25	100	57.42	68.67	0.350	-0.200
286.7	47.736	6.38	1.43	3.00	1.0	0.65	10.48	100	57.19	67.67	0.350	-0.194
286.5	47.900	5.80	1.15	2.99	1.0	0.65	9.69	100	56.94	66.63	0.350	-0.188
286.3	48.064	5.31	1.25	3.04	1.0	0.64	9.01	100	56.73	65.73	0.350	-0.182
286.2	48.228	5.42	0.89	2.98	1.0	0.64	9.17	100	56.78	65.95	0.350	-0.184
286.0	48.392	5.81	0.97	2.96	1.0	0.64	9.72	100	56.95	66.68	0.350	-0.188
285.8	48.556	6.50	0.95	2.91	1.0	0.64	10.72	96	56.93	67.65	0.350	-0.193
285.7	48.720	5.80	1.02	2.97	1.0	0.64	9.73	100	56.95	66.68	0.350	-0.188
285.5	48.884	4.59	3.67	3.33	1.0	0.64	8.04	100	56.43	64.47	0.350	-0.175
285.4	49.048	2.95	4.87	3.56	1.0	0.63	5.76	100	55.72	61.49	0.350	-0.157
285.2	49.212	9.81	5.16	3.14	1.0	0.65	15.54	100	58.76	74.30	0.350	-0.229
285.0	49.376	15.48	3.09	2.85	1.0	0.66	23.99	91	60.53	84.52	0.350	-0.281
284.9	49.540	4.14	6.59	3.51	1.0	0.63	7.45	100	56.25	63.70	0.350	-0.170
284.7	49.704	7.93	3.13	3.09	1.0	0.64	12.87	100	57.93	70.79	0.350	-0.210

LIQUEFACTION POTENTIAL ASSESSMENT FOR COARSE GRAINED SOILS USING CONE PENETRATION TEST DATA

Depth to Water during Earthquake:		27.5 ft
Final Grade Elevation during EQ:		334.4 ft
Height of Final Grade above CPT TOH:		0.0 ft
Normalize K_v to:		1.058 tsf
a_{max} at top of ground surface:		0.22 g
Earthquake Magnitude:		7.70 Mw
Earthquake File or Source Zone:		Design Source

Project Site: US 60 Bridge

Stantec Project No.: 178665011

CPT ID: SP04

Shear Stress Fit Parameters

m4:	0
m3:	0
m2:	0
m1:	0

Elev. (ft)	Depth z (ft)	Cyclic Resistance Ratio $CRR_{7.5}$	Relative Density D_r (%)	Correction for Overburden Pressure K_σ	Correction for Sloping Ground K_ϕ	Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., r_d	From Ground Response			Sample Screened for:			Factor of Safety FS_{liq}	Material (optional)	Soil Type (see note on following chart)
									Maximum Induced Shear Stress τ_{Max} (psf)	Average Cyclic Shear Stress τ_{Avg} (psf)	Cyclic Stress Ratio CSR	Clay-like $(qc_{3N})_{CS} \geq 175$	High Tip Res.				
334.4																	
334.2	0.164	0.094	29	1.100	N/A	0.99	N/A	1.000	0	0	0.142	FALSE	FALSE	TRUE	N/A	N/A	A1
334.1	0.328	0.099	34	1.100	N/A	0.99	N/A	1.000	0	0	0.142	FALSE	FALSE	TRUE	N/A	N/A	A1
333.9	0.492	0.100	35	1.100	N/A	0.99	N/A	1.000	0	0	0.142	FALSE	FALSE	TRUE	N/A	N/A	A1
333.7	0.656	0.102	36	1.100	N/A	0.99	N/A	1.000	0	0	0.142	FALSE	FALSE	TRUE	N/A	N/A	A1
333.6	0.820	0.102	37	1.100	N/A	0.99	N/A	1.000	0	0	0.142	FALSE	FALSE	TRUE	N/A	N/A	A1
333.4	0.984	0.105	39	1.100	N/A	0.99	N/A	1.000	0	0	0.142	FALSE	FALSE	TRUE	N/A	N/A	A1
333.3	1.148	0.110	42	1.100	N/A	0.99	N/A	1.000	0	0	0.142	FALSE	FALSE	TRUE	N/A	N/A	A1
333.1	1.312	0.111	43	1.100	N/A	0.99	N/A	1.000	0	0	0.142	FALSE	FALSE	TRUE	N/A	N/A	A1
332.9	1.476	0.111	43	1.100	N/A	0.99	N/A	1.000	0	0	0.142	FALSE	FALSE	TRUE	N/A	N/A	A1
332.8	1.640	0.115	45	1.100	N/A	0.99	N/A	1.000	0	0	0.142	FALSE	FALSE	TRUE	N/A	N/A	A1
332.6	1.804	0.120	48	1.100	N/A	0.99	N/A	1.000	0	0	0.142	FALSE	FALSE	TRUE	N/A	N/A	A1
332.4	1.968	0.122	49	1.100	N/A	0.99	N/A	1.000	0	0	0.142	FALSE	FALSE	TRUE	N/A	N/A	A1
332.3	2.133	0.123	50	1.100	N/A	0.99	N/A	1.000	0	0	0.142	FALSE	FALSE	TRUE	N/A	N/A	A1
332.1	2.297	0.126	51	1.100	N/A	0.99	N/A	1.000	0	0	0.142	FALSE	FALSE	TRUE	N/A	N/A	A1
331.9	2.461	0.124	50	1.100	N/A	0.99	N/A	1.000	0	0	0.142	FALSE	FALSE	TRUE	N/A	N/A	A1
331.8	2.625	0.121	48	1.100	N/A	0.99	N/A	1.000	0	0	0.142	FALSE	FALSE	TRUE	N/A	N/A	B
331.6	2.789	0.121	48	1.100	N/A	0.99	N/A	1.000	0	0	0.142	FALSE	FALSE	TRUE	N/A	N/A	B
331.4	2.953	0.123	49	1.100	N/A	0.99	N/A	1.000	0	0	0.142	FALSE	FALSE	TRUE	N/A	N/A	B
331.3	3.117	0.123	49	1.100	N/A	0.99	N/A	1.000	0	0	0.142	FALSE	FALSE	TRUE	N/A	N/A	B
331.1	3.281	0.121	49	1.100	N/A	0.99	N/A	1.000	0	0	0.142	FALSE	FALSE	TRUE	N/A	N/A	B
331.0	3.445	0.120	48	1.100	N/A	0.99	N/A	1.000	0	0	0.142	FALSE	FALSE	TRUE	N/A	N/A	B
330.8	3.609	0.121	48	1.100	N/A	0.99	N/A	0.999	0	0	0.142	FALSE	FALSE	TRUE	N/A	N/A	B
330.6	3.773	0.121	48	1.100	N/A	0.99	N/A	0.999	0	0	0.142	FALSE	FALSE	TRUE	N/A	N/A	B
330.5	3.937	0.121	48	1.100	N/A	0.99	N/A	0.999	0	0	0.142	FALSE	FALSE	TRUE	N/A	N/A	B
330.3	4.101	0.122	49	1.100	N/A	0.99	N/A	0.998	0	0	0.142	FALSE	FALSE	TRUE	N/A	N/A	B
330.1	4.265	0.127	51	1.100	N/A	0.99	N/A	0.998	0	0	0.142	FALSE	FALSE	TRUE	N/A	N/A	B
330.0	4.429	0.135	54	1.100	N/A	0.98	N/A	0.998	0	0	0.141	FALSE	FALSE	TRUE	N/A	N/A	A1
329.8	4.593	0.139	56	1.100	N/A	0.98	N/A	0.997	0	0	0.141	FALSE	FALSE	TRUE	N/A	N/A	A1
329.6	4.757	0.143	57	1.100	N/A	0.98	N/A	0.997	0	0	0.141	FALSE	FALSE	TRUE	N/A	N/A	A1
329.5	4.921	0.150	59	1.100	N/A	0.98	N/A	0.996	0	0	0.141	FALSE	FALSE	TRUE	N/A	N/A	A1
329.3	5.085	0.157	60	1.100	N/A	0.98	N/A	0.996	0	0	0.141	FALSE	FALSE	TRUE	N/A	N/A	A1
329.2	5.249	0.159	61	1.100	N/A	0.98	N/A	0.996	0	0	0.141	FALSE	FALSE	TRUE	N/A	N/A	A1
329.0	5.413	0.159	61	1.100	N/A	0.98	N/A	0.995	0	0	0.141	FALSE	FALSE	TRUE	N/A	N/A	A1
328.8	5.577	0.168	61	1.100	N/A	0.98	N/A	0.995	0	0	0.141	FALSE	FALSE	TRUE	N/A	N/A	A1
328.7	5.741	0.157	60	1.100	N/A	0.98	N/A	0.995	0	0	0.141	FALSE	FALSE	TRUE	N/A	N/A	B
328.5	5.905	0.157	60	1.100	N/A	0.98	N/A	0.994	0	0	0.141	FALSE	FALSE	TRUE	N/A	N/A	B
328.3	6.069	0.157	60	1.100	N/A	0.98	N/A	0.994	0	0	0.141	FALSE	FALSE	TRUE	N/A	N/A	B
328.2	6.234	0.156	60	1.100	N/A	0.98	N/A	0.994	0	0	0.141	FALSE	FALSE	TRUE	N/A	N/A	B
328.0	6.398	0.155	60	1.100	N/A	0.98	N/A	0.993	0	0	0.141	FALSE	FALSE	TRUE	N/A	N/A	B
327.8	6.562	0.155	60	1.100	N/A	0.98	N/A	0.993	0	0	0.141	FALSE	FALSE	TRUE	N/A	N/A	B
327.7	6.726	0.155	60	1.100	N/A	0.98	N/A	0.992	0	0	0.141	FALSE	FALSE	TRUE	N/A	N/A	A1
327.5	6.890	0.154	60	1.100	N/A	0.98	N/A	0.992	0	0	0.141	FALSE	FALSE	TRUE	N/A	N/A	A1
327.3	7.054	0.153	59	1.100	N/A	0.98	N/A	0.992	0	0	0.141	FALSE	FALSE	TRUE	N/A	N/A	B
327.2	7.218	0.150	59	1.100	N/A	0.98	N/A	0.991	0	0	0.141	FALSE	FALSE	TRUE	N/A	N/A	B

Elev. (ft)	Depth z (ft)	Cyclic Resistance Ratio CRR _{7.5}	Relative Density D _r	Correction for		Correction Factor MSF	Magnitude Scaling Factor	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., I _d	Front Ground Response			Factor of Safety FS _{liq}	Material (optional)	Soil Type (see note on following chart)		
				Overburden Pressure K _o	Sloping Ground K _α					τ _{max} (psf)	Shear Stress	Cyclic Shear Stress τ _{avg} (psf)					
																Average	
Sample Screened for:																	
Cyclic Stress Ratio																	
Clay-like (qc _{IN}) ≥ 175																	
High Tip Res.																	
Unsaturated																	
327.0	7.382	0.145	57	1.097	N/A	0.98	N/A	N/A	0.991	0	0	0.141	FALSE	FALSE	TRUE	N/A	N/A
326.9	7.546	0.144	57	1.094	N/A	0.98	N/A	N/A	0.991	0	0	0.140	FALSE	FALSE	TRUE	N/A	N/A
326.7	7.710	0.148	58	1.094	N/A	0.98	N/A	N/A	0.990	0	0	0.140	FALSE	FALSE	TRUE	N/A	N/A
326.5	7.874	0.154	59	1.094	N/A	0.98	N/A	N/A	0.990	0	0	0.140	FALSE	FALSE	TRUE	N/A	N/A
326.4	8.038	0.152	59	1.090	N/A	0.98	N/A	N/A	0.989	0	0	0.140	FALSE	FALSE	TRUE	N/A	N/A
326.2	8.202	0.144	57	1.085	N/A	0.98	N/A	N/A	0.989	0	0	0.140	FALSE	FALSE	TRUE	N/A	N/A
326.0	8.366	0.141	56	1.081	N/A	0.98	N/A	N/A	0.989	0	0	0.140	FALSE	FALSE	TRUE	N/A	N/A
325.9	8.530	0.143	57	1.080	N/A	0.98	N/A	N/A	0.988	0	0	0.140	FALSE	FALSE	TRUE	N/A	N/A
325.7	8.694	0.151	59	1.081	N/A	0.98	N/A	N/A	0.988	0	0	0.140	FALSE	FALSE	TRUE	N/A	N/A
325.5	8.858	0.157	60	1.081	N/A	0.98	N/A	N/A	0.987	0	0	0.140	FALSE	FALSE	TRUE	N/A	N/A
325.4	9.022	0.158	60	1.079	N/A	0.98	N/A	N/A	0.987	0	0	0.140	FALSE	FALSE	TRUE	N/A	A1
325.2	9.186	0.159	61	1.078	N/A	0.98	N/A	N/A	0.987	0	0	0.140	FALSE	FALSE	TRUE	N/A	A1
325.0	9.350	0.159	61	1.075	N/A	0.98	N/A	N/A	0.986	0	0	0.140	FALSE	FALSE	TRUE	N/A	A1
324.9	9.514	0.157	60	1.073	N/A	0.98	N/A	N/A	0.986	0	0	0.140	FALSE	FALSE	TRUE	N/A	A1
324.7	9.678	0.155	60	1.070	N/A	0.98	N/A	N/A	0.985	0	0	0.140	FALSE	FALSE	TRUE	N/A	A1
324.6	9.842	0.151	59	1.067	N/A	0.98	N/A	N/A	0.985	0	0	0.140	FALSE	FALSE	TRUE	N/A	A1
324.4	10.006	0.149	58	1.064	N/A	0.98	N/A	N/A	0.984	0	0	0.140	FALSE	FALSE	TRUE	N/A	A1
324.2	10.170	0.146	57	1.061	N/A	0.98	N/A	N/A	0.984	0	0	0.140	FALSE	FALSE	TRUE	N/A	A1
324.1	10.335	0.136	55	1.056	N/A	0.98	N/A	N/A	0.984	0	0	0.139	FALSE	FALSE	TRUE	N/A	A1
323.9	10.499	N/A	51	N/A	N/A	N/A	N/A	N/A	0.983	0	0	0.139	TRUE	FALSE	TRUE	N/A	N/A
323.7	10.663	N/A	48	N/A	N/A	N/A	N/A	N/A	0.983	0	0	0.139	TRUE	FALSE	TRUE	N/A	N/A
323.6	10.827	0.121	48	1.046	N/A	0.99	N/A	N/A	0.982	0	0	0.139	FALSE	FALSE	TRUE	N/A	N/A
323.4	10.991	N/A	48	N/A	N/A	N/A	N/A	N/A	0.982	0	0	0.139	TRUE	FALSE	TRUE	N/A	N/A
323.2	11.155	N/A	47	N/A	N/A	N/A	N/A	N/A	0.982	0	0	0.139	TRUE	FALSE	TRUE	N/A	N/A
323.1	11.319	N/A	48	N/A	N/A	N/A	N/A	N/A	0.981	0	0	0.139	TRUE	FALSE	TRUE	N/A	N/A
322.9	11.483	N/A	48	N/A	N/A	N/A	N/A	N/A	0.981	0	0	0.139	TRUE	FALSE	TRUE	N/A	N/A
322.8	11.647	N/A	48	N/A	N/A	N/A	N/A	N/A	0.980	0	0	0.139	TRUE	FALSE	TRUE	N/A	N/A
322.6	11.811	N/A	48	N/A	N/A	N/A	N/A	N/A	0.980	0	0	0.139	TRUE	FALSE	TRUE	N/A	N/A
322.4	11.975	N/A	48	N/A	N/A	N/A	N/A	N/A	0.979	0	0	0.139	TRUE	FALSE	TRUE	N/A	N/A
322.3	12.139	N/A	47	N/A	N/A	N/A	N/A	N/A	0.979	0	0	0.139	TRUE	FALSE	TRUE	N/A	N/A
322.1	12.303	N/A	48	N/A	N/A	N/A	N/A	N/A	0.978	0	0	0.139	TRUE	FALSE	TRUE	N/A	N/A
321.9	12.467	N/A	48	N/A	N/A	N/A	N/A	N/A	0.978	0	0	0.139	TRUE	FALSE	TRUE	N/A	N/A
321.8	12.631	N/A	47	N/A	N/A	N/A	N/A	N/A	0.978	0	0	0.139	TRUE	FALSE	TRUE	N/A	N/A
321.6	12.795	N/A	47	N/A	N/A	N/A	N/A	N/A	0.977	0	0	0.139	TRUE	FALSE	TRUE	N/A	N/A
321.4	12.959	N/A	47	N/A	N/A	N/A	N/A	N/A	0.977	0	0	0.138	TRUE	FALSE	TRUE	N/A	N/A
321.3	13.123	N/A	46	N/A	N/A	N/A	N/A	N/A	0.976	0	0	0.138	TRUE	FALSE	TRUE	N/A	N/A
321.1	13.287	N/A	45	N/A	N/A	N/A	N/A	N/A	0.976	0	0	0.138	TRUE	FALSE	TRUE	N/A	N/A
320.9	13.451	N/A	45	N/A	N/A	N/A	N/A	N/A	0.975	0	0	0.138	TRUE	FALSE	TRUE	N/A	N/A
320.8	13.615	N/A	45	N/A	N/A	N/A	N/A	N/A	0.975	0	0	0.138	TRUE	FALSE	TRUE	N/A	N/A
320.6	13.779	N/A	45	N/A	N/A	N/A	N/A	N/A	0.974	0	0	0.138	TRUE	FALSE	TRUE	N/A	N/A
320.5	13.943	N/A	45	N/A	N/A	N/A	N/A	N/A	0.974	0	0	0.138	TRUE	FALSE	TRUE	N/A	N/A
320.3	14.107	N/A	45	N/A	N/A	N/A	N/A	N/A	0.973	0	0	0.138	TRUE	FALSE	TRUE	N/A	N/A
320.1	14.271	N/A	44	N/A	N/A	N/A	N/A	N/A	0.973	0	0	0.138	TRUE	FALSE	TRUE	N/A	N/A
320.0	14.436	N/A	43	N/A	N/A	N/A	N/A	N/A	0.972	0	0	0.138	TRUE	FALSE	TRUE	N/A	N/A
319.8	14.600	N/A	44	N/A	N/A	N/A	N/A	N/A	0.972	0	0	0.138	TRUE	FALSE	TRUE	N/A	N/A
319.6	14.764	N/A	44	N/A	N/A	N/A	N/A	N/A	0.972	0	0	0.138	TRUE	FALSE	TRUE	N/A	N/A
319.5	14.928	N/A	44	N/A	N/A	N/A	N/A	N/A	0.971	0	0	0.138	TRUE	FALSE	TRUE	N/A	N/A
319.3	15.092	N/A	44	N/A	N/A	N/A	N/A	N/A	0.971	0	0	0.138	TRUE	FALSE	TRUE	N/A	N/A
319.1	15.256	N/A	45	N/A	N/A	N/A	N/A	N/A	0.970	0	0	0.138	TRUE	FALSE	TRUE	N/A	N/A
319.0	15.420	N/A	46	N/A	N/A	N/A	N/A	N/A	0.970	0	0	0.137	TRUE	FALSE	TRUE	N/A	N/A
318.8	15.584	N/A	46	N/A	N/A	N/A	N/A	N/A	0.969	0	0	0.137	TRUE	FALSE	TRUE	N/A	N/A
318.7	15.748	N/A	47	N/A	N/A	N/A	N/A	N/A	0.969	0	0	0.137	TRUE	FALSE	TRUE	N/A	N/A
318.5	15.912	N/A	47	N/A	N/A	N/A	N/A	N/A	0.968	0	0	0.137	TRUE	FALSE	TRUE	N/A	N/A
318.3	16.076	N/A	47	N/A	N/A	N/A	N/A	N/A	0.968	0	0	0.137	TRUE	FALSE	TRUE	N/A	N/A
318.2	16.240	N/A	47	N/A	N/A	N/A	N/A	N/A	0.967	0	0	0.137	TRUE	FALSE	TRUE	N/A	N/A

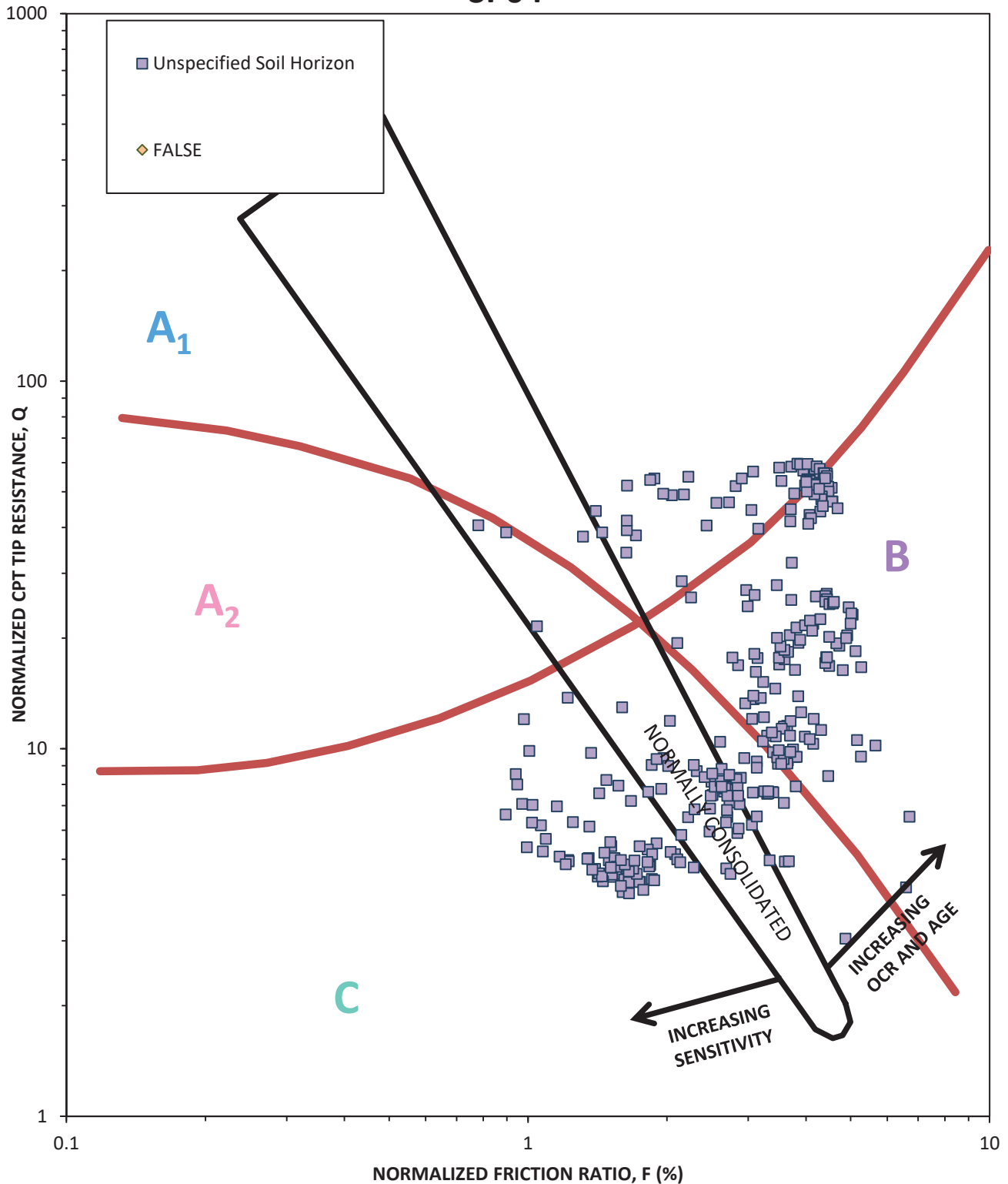
Elev. (ft)	Depth z (ft)	Cyclic Resistance Ratio $CRR_{7.5}$	Relative Density D_r (%)	Correction for Overburden Pressure K_o	Correction for Sloping Ground K_a	Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., t_d	Front Ground Response			Sample Screened for:				Factor of Safety FS_{liq}	Material (optional)	Soil Type (see note on following chart)
									Maximum Induced Shear Stress τ_{Max} (psf)	Cyclic Shear Stress τ_{Avg} (psf)	Average Cyclic Stress	Cyclic Stress Ratio CSR	Clay-like $(q_{c\ 3N})_{cs} \geq 175$	High Tip Res.	Unsaturated			
318.0	16.404	N/A	47	N/A	N/A	N/A	N/A	0.967	0	0	0	0.137	TRUE	FALSE	TRUE	N/A	N/A	B
317.8	16.568	N/A	46	N/A	N/A	N/A	N/A	0.966	0	0	0	0.137	TRUE	FALSE	TRUE	N/A	N/A	B
317.7	16.732	N/A	46	N/A	N/A	N/A	N/A	0.966	0	0	0	0.137	TRUE	FALSE	TRUE	N/A	N/A	B
317.5	16.896	N/A	44	N/A	N/A	N/A	N/A	0.965	0	0	0	0.137	TRUE	FALSE	TRUE	N/A	N/A	B
317.3	17.060	N/A	43	N/A	N/A	N/A	N/A	0.965	0	0	0	0.137	TRUE	FALSE	TRUE	N/A	N/A	B
317.2	17.224	N/A	42	N/A	N/A	N/A	N/A	0.964	0	0	0	0.137	TRUE	FALSE	TRUE	N/A	N/A	B
317.0	17.388	N/A	42	N/A	N/A	N/A	N/A	0.964	0	0	0	0.137	TRUE	FALSE	TRUE	N/A	N/A	B
316.8	17.552	N/A	42	N/A	N/A	N/A	N/A	0.963	0	0	0	0.137	TRUE	FALSE	TRUE	N/A	N/A	B
316.7	17.716	N/A	43	N/A	N/A	N/A	N/A	0.963	0	0	0	0.137	TRUE	FALSE	TRUE	N/A	N/A	B
316.5	17.880	N/A	44	N/A	N/A	N/A	N/A	0.962	0	0	0	0.136	TRUE	FALSE	TRUE	N/A	N/A	B
316.4	18.044	N/A	44	N/A	N/A	N/A	N/A	0.962	0	0	0	0.136	TRUE	FALSE	TRUE	N/A	N/A	B
316.2	18.208	N/A	45	N/A	N/A	N/A	N/A	0.961	0	0	0	0.136	TRUE	FALSE	TRUE	N/A	N/A	B
316.0	18.372	N/A	45	N/A	N/A	N/A	N/A	0.961	0	0	0	0.136	TRUE	FALSE	TRUE	N/A	N/A	B
315.9	18.537	N/A	45	N/A	N/A	N/A	N/A	0.960	0	0	0	0.136	TRUE	FALSE	TRUE	N/A	N/A	B
315.7	18.701	N/A	44	N/A	N/A	N/A	N/A	0.960	0	0	0	0.136	TRUE	FALSE	TRUE	N/A	N/A	B
315.5	18.865	N/A	42	N/A	N/A	N/A	N/A	0.959	0	0	0	0.136	TRUE	FALSE	TRUE	N/A	N/A	B
315.4	19.029	N/A	42	N/A	N/A	N/A	N/A	0.959	0	0	0	0.136	TRUE	FALSE	TRUE	N/A	N/A	B
315.2	19.193	N/A	41	N/A	N/A	N/A	N/A	0.958	0	0	0	0.136	TRUE	FALSE	TRUE	N/A	N/A	B
315.0	19.357	N/A	41	N/A	N/A	N/A	N/A	0.958	0	0	0	0.136	TRUE	FALSE	TRUE	N/A	N/A	B
314.9	19.521	N/A	41	N/A	N/A	N/A	N/A	0.957	0	0	0	0.136	TRUE	FALSE	TRUE	N/A	N/A	B
314.7	19.685	N/A	41	N/A	N/A	N/A	N/A	0.956	0	0	0	0.136	TRUE	FALSE	TRUE	N/A	N/A	B
314.6	19.849	N/A	40	N/A	N/A	N/A	N/A	0.956	0	0	0	0.136	TRUE	FALSE	TRUE	N/A	N/A	B
314.4	20.013	N/A	40	N/A	N/A	N/A	N/A	0.955	0	0	0	0.135	TRUE	FALSE	TRUE	N/A	N/A	B
314.2	20.177	N/A	39	N/A	N/A	N/A	N/A	0.955	0	0	0	0.135	TRUE	FALSE	TRUE	N/A	N/A	B
314.1	20.341	N/A	39	N/A	N/A	N/A	N/A	0.954	0	0	0	0.135	TRUE	FALSE	TRUE	N/A	N/A	C
313.9	20.505	N/A	39	N/A	N/A	N/A	N/A	0.954	0	0	0	0.135	TRUE	FALSE	TRUE	N/A	N/A	C
313.7	20.669	N/A	39	N/A	N/A	N/A	N/A	0.953	0	0	0	0.135	TRUE	FALSE	TRUE	N/A	N/A	C
313.6	20.833	N/A	40	N/A	N/A	N/A	N/A	0.953	0	0	0	0.135	TRUE	FALSE	TRUE	N/A	N/A	C
313.4	20.997	N/A	41	N/A	N/A	N/A	N/A	0.952	0	0	0	0.135	TRUE	FALSE	TRUE	N/A	N/A	B
313.2	21.161	N/A	41	N/A	N/A	N/A	N/A	0.952	0	0	0	0.135	TRUE	FALSE	TRUE	N/A	N/A	B
313.1	21.325	N/A	40	N/A	N/A	N/A	N/A	0.951	0	0	0	0.135	TRUE	FALSE	TRUE	N/A	N/A	B
312.9	21.489	N/A	40	N/A	N/A	N/A	N/A	0.951	0	0	0	0.135	TRUE	FALSE	TRUE	N/A	N/A	B
312.7	21.653	N/A	40	N/A	N/A	N/A	N/A	0.950	0	0	0	0.135	TRUE	FALSE	TRUE	N/A	N/A	B
312.6	21.817	N/A	40	N/A	N/A	N/A	N/A	0.949	0	0	0	0.135	TRUE	FALSE	TRUE	N/A	N/A	B
312.4	21.981	N/A	40	N/A	N/A	N/A	N/A	0.949	0	0	0	0.135	TRUE	FALSE	TRUE	N/A	N/A	B
312.3	22.145	N/A	39	N/A	N/A	N/A	N/A	0.948	0	0	0	0.134	TRUE	FALSE	TRUE	N/A	N/A	B
312.1	22.309	N/A	40	N/A	N/A	N/A	N/A	0.948	0	0	0	0.134	TRUE	FALSE	TRUE	N/A	N/A	B
311.9	22.473	N/A	40	N/A	N/A	N/A	N/A	0.947	0	0	0	0.134	TRUE	FALSE	TRUE	N/A	N/A	B
311.8	22.638	N/A	40	N/A	N/A	N/A	N/A	0.947	0	0	0	0.134	TRUE	FALSE	TRUE	N/A	N/A	B
311.6	22.802	N/A	41	N/A	N/A	N/A	N/A	0.946	0	0	0	0.134	TRUE	FALSE	TRUE	N/A	N/A	B
311.4	22.966	N/A	42	N/A	N/A	N/A	N/A	0.946	0	0	0	0.134	TRUE	FALSE	TRUE	N/A	N/A	B
311.3	23.130	N/A	41	N/A	N/A	N/A	N/A	0.945	0	0	0	0.134	TRUE	FALSE	TRUE	N/A	N/A	B
311.1	23.294	N/A	39	N/A	N/A	N/A	N/A	0.944	0	0	0	0.134	TRUE	FALSE	TRUE	N/A	N/A	C
310.9	23.458	N/A	40	N/A	N/A	N/A	N/A	0.944	0	0	0	0.134	TRUE	FALSE	TRUE	N/A	N/A	C
310.8	23.622	N/A	39	N/A	N/A	N/A	N/A	0.943	0	0	0	0.134	TRUE	FALSE	TRUE	N/A	N/A	C
310.6	23.786	N/A	38	N/A	N/A	N/A	N/A	0.943	0	0	0	0.134	TRUE	FALSE	TRUE	N/A	N/A	C
310.5	23.950	N/A	39	N/A	N/A	N/A	N/A	0.942	0	0	0	0.134	TRUE	FALSE	TRUE	N/A	N/A	C
310.3	24.114	N/A	38	N/A	N/A	N/A	N/A	0.942	0	0	0	0.134	TRUE	FALSE	TRUE	N/A	N/A	C
310.1	24.278	N/A	38	N/A	N/A	N/A	N/A	0.941	0	0	0	0.133	TRUE	FALSE	TRUE	N/A	N/A	C
310.0	24.442	N/A	38	N/A	N/A	N/A	N/A	0.941	0	0	0	0.133	TRUE	FALSE	TRUE	N/A	N/A	C
309.8	24.606	N/A	38	N/A	N/A	N/A	N/A	0.940	0	0	0	0.133	TRUE	FALSE	TRUE	N/A	N/A	C
309.6	24.770	N/A	38	N/A	N/A	N/A	N/A	0.939	0	0	0	0.133	TRUE	FALSE	TRUE	N/A	N/A	C
309.5	24.934	N/A	37	N/A	N/A	N/A	N/A	0.939	0	0	0	0.133	TRUE	FALSE	TRUE	N/A	N/A	C
309.3	25.098	N/A	37	N/A	N/A	N/A	N/A	0.938	0	0	0	0.133	TRUE	FALSE	TRUE	N/A	N/A	C
309.1	25.262	N/A	38	N/A	N/A	N/A	N/A	0.938	0	0	0	0.133	TRUE	FALSE	TRUE	N/A	N/A	C

Elev. (ft)	Depth z	Cyclic Resistance Ratio CRR _{7.5}	Relative Density D _r	Correction for		Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., f _d	Front Ground Response			Sample Screened for:				Factor of Safety FS _{liq}	Material (optional)	Soil Type (see note on following chart)
				Overburden Pressure K _σ	Sloping Ground K _α				Shear Stress τ _{max} (psf)	Induced Shear Stress τ _{avg} (psf)	Average Cyclic Shear Stress τ _{avg} (psf)	Cyclic Stress Ratio CSR	Clay-like (qc ₃₀) ≥ 175	High Tip Res.	Unsaturated			
309.0	25.426	N/A	39	N/A	N/A	N/A	N/A	0.937	0	0	0	0.133	TRUE	FALSE	TRUE	N/A	N/A	C
308.8	25.590	N/A	39	N/A	N/A	N/A	N/A	0.937	0	0	0	0.133	TRUE	FALSE	TRUE	N/A	N/A	C
308.6	25.754	N/A	38	N/A	N/A	N/A	N/A	0.936	0	0	0	0.133	TRUE	FALSE	TRUE	N/A	N/A	C
308.5	25.918	N/A	38	N/A	N/A	N/A	N/A	0.935	0	0	0	0.133	TRUE	FALSE	TRUE	N/A	N/A	C
308.3	26.082	N/A	39	N/A	N/A	N/A	N/A	0.935	0	0	0	0.133	TRUE	FALSE	TRUE	N/A	N/A	C
308.2	26.246	N/A	38	N/A	N/A	N/A	N/A	0.934	0	0	0	0.132	TRUE	FALSE	TRUE	N/A	N/A	C
308.0	26.410	N/A	38	N/A	N/A	N/A	N/A	0.934	0	0	0	0.132	TRUE	FALSE	TRUE	N/A	N/A	C
307.8	26.574	N/A	38	N/A	N/A	N/A	N/A	0.933	0	0	0	0.132	TRUE	FALSE	TRUE	N/A	N/A	C
307.7	26.739	N/A	38	N/A	N/A	N/A	N/A	0.932	0	0	0	0.132	TRUE	FALSE	TRUE	N/A	N/A	C
307.5	26.903	N/A	38	N/A	N/A	N/A	N/A	0.932	0	0	0	0.132	TRUE	FALSE	TRUE	N/A	N/A	C
307.3	27.067	N/A	39	N/A	N/A	N/A	N/A	0.931	0	0	0	0.132	TRUE	FALSE	TRUE	N/A	N/A	C
307.2	27.231	N/A	39	N/A	N/A	N/A	N/A	0.931	0	0	0	0.132	TRUE	FALSE	TRUE	N/A	N/A	C
307.0	27.395	N/A	39	N/A	N/A	N/A	N/A	0.930	0	0	0	0.132	TRUE	FALSE	TRUE	N/A	N/A	C
306.8	27.559	N/A	39	N/A	N/A	N/A	N/A	0.929	0	0	0	0.132	TRUE	FALSE	TRUE	N/A	N/A	C
306.7	27.723	N/A	39	N/A	N/A	N/A	N/A	0.929	0	0	0	0.132	TRUE	FALSE	FALSE	N/A	N/A	C
306.5	27.887	N/A	39	N/A	N/A	N/A	N/A	0.928	0	0	0	0.133	TRUE	FALSE	FALSE	N/A	N/A	C
306.3	28.051	N/A	39	N/A	N/A	N/A	N/A	0.928	0	0	0	0.133	TRUE	FALSE	FALSE	N/A	N/A	C
306.2	28.215	N/A	39	N/A	N/A	N/A	N/A	0.927	0	0	0	0.133	TRUE	FALSE	FALSE	N/A	N/A	C
306.0	28.379	N/A	39	N/A	N/A	N/A	N/A	0.926	0	0	0	0.134	TRUE	FALSE	FALSE	N/A	N/A	C
305.9	28.543	N/A	38	N/A	N/A	N/A	N/A	0.926	0	0	0	0.134	TRUE	FALSE	FALSE	N/A	N/A	C
305.7	28.707	N/A	37	N/A	N/A	N/A	N/A	0.926	0	0	0	0.134	TRUE	FALSE	FALSE	N/A	N/A	C
305.5	28.871	N/A	37	N/A	N/A	N/A	N/A	0.925	0	0	0	0.134	TRUE	FALSE	FALSE	N/A	N/A	C
305.4	29.035	N/A	38	N/A	N/A	N/A	N/A	0.924	0	0	0	0.135	TRUE	FALSE	FALSE	N/A	N/A	C
305.2	29.199	N/A	38	N/A	N/A	N/A	N/A	0.923	0	0	0	0.135	TRUE	FALSE	FALSE	N/A	N/A	C
305.0	29.363	N/A	38	N/A	N/A	N/A	N/A	0.923	0	0	0	0.135	TRUE	FALSE	FALSE	N/A	N/A	C
304.9	29.527	N/A	37	N/A	N/A	N/A	N/A	0.922	0	0	0	0.136	TRUE	FALSE	FALSE	N/A	N/A	C
304.7	29.691	N/A	37	N/A	N/A	N/A	N/A	0.922	0	0	0	0.136	TRUE	FALSE	FALSE	N/A	N/A	C
304.5	29.855	N/A	36	N/A	N/A	N/A	N/A	0.921	0	0	0	0.136	TRUE	FALSE	FALSE	N/A	N/A	C
304.4	30.019	N/A	36	N/A	N/A	N/A	N/A	0.920	0	0	0	0.136	TRUE	FALSE	FALSE	N/A	N/A	C
304.2	30.183	N/A	36	N/A	N/A	N/A	N/A	0.920	0	0	0	0.137	TRUE	FALSE	FALSE	N/A	N/A	C
304.1	30.347	N/A	37	N/A	N/A	N/A	N/A	0.919	0	0	0	0.137	TRUE	FALSE	FALSE	N/A	N/A	C
303.9	30.511	N/A	37	N/A	N/A	N/A	N/A	0.919	0	0	0	0.137	TRUE	FALSE	FALSE	N/A	N/A	C
303.7	30.675	N/A	37	N/A	N/A	N/A	N/A	0.918	0	0	0	0.138	TRUE	FALSE	FALSE	N/A	N/A	C
303.6	30.840	N/A	36	N/A	N/A	N/A	N/A	0.917	0	0	0	0.138	TRUE	FALSE	FALSE	N/A	N/A	C
303.4	31.004	N/A	36	N/A	N/A	N/A	N/A	0.917	0	0	0	0.138	TRUE	FALSE	FALSE	N/A	N/A	C
303.2	31.168	N/A	37	N/A	N/A	N/A	N/A	0.916	0	0	0	0.138	TRUE	FALSE	FALSE	N/A	N/A	C
303.1	31.332	N/A	37	N/A	N/A	N/A	N/A	0.916	0	0	0	0.139	TRUE	FALSE	FALSE	N/A	N/A	C
302.9	31.496	N/A	37	N/A	N/A	N/A	N/A	0.915	0	0	0	0.139	TRUE	FALSE	FALSE	N/A	N/A	C
302.7	31.660	N/A	36	N/A	N/A	N/A	N/A	0.914	0	0	0	0.139	TRUE	FALSE	FALSE	N/A	N/A	C
302.6	31.824	N/A	36	N/A	N/A	N/A	N/A	0.914	0	0	0	0.139	TRUE	FALSE	FALSE	N/A	N/A	C
302.4	31.988	N/A	36	N/A	N/A	N/A	N/A	0.913	0	0	0	0.140	TRUE	FALSE	FALSE	N/A	N/A	C
302.2	32.152	N/A	36	N/A	N/A	N/A	N/A	0.912	0	0	0	0.140	TRUE	FALSE	FALSE	N/A	N/A	C
302.1	32.316	N/A	36	N/A	N/A	N/A	N/A	0.912	0	0	0	0.140	TRUE	FALSE	FALSE	N/A	N/A	C
301.9	32.480	N/A	36	N/A	N/A	N/A	N/A	0.911	0	0	0	0.140	TRUE	FALSE	FALSE	N/A	N/A	C
301.8	32.644	N/A	36	N/A	N/A	N/A	N/A	0.911	0	0	0	0.141	TRUE	FALSE	FALSE	N/A	N/A	C
301.6	32.808	N/A	36	N/A	N/A	N/A	N/A	0.910	0	0	0	0.141	TRUE	FALSE	FALSE	N/A	N/A	C
301.4	32.972	N/A	36	N/A	N/A	N/A	N/A	0.909	0	0	0	0.141	TRUE	FALSE	FALSE	N/A	N/A	C
301.3	33.136	N/A	36	N/A	N/A	N/A	N/A	0.909	0	0	0	0.141	TRUE	FALSE	FALSE	N/A	N/A	C
301.1	33.300	N/A	36	N/A	N/A	N/A	N/A	0.908	0	0	0	0.142	TRUE	FALSE	FALSE	N/A	N/A	C
300.9	33.464	N/A	36	N/A	N/A	N/A	N/A	0.907	0	0	0	0.142	TRUE	FALSE	FALSE	N/A	N/A	C
300.8	33.628	N/A	36	N/A	N/A	N/A	N/A	0.907	0	0	0	0.142	TRUE	FALSE	FALSE	N/A	N/A	C
300.6	33.792	N/A	36	N/A	N/A	N/A	N/A	0.906	0	0	0	0.142	TRUE	FALSE	FALSE	N/A	N/A	C
300.4	33.956	N/A	36	N/A	N/A	N/A	N/A	0.905	0	0	0	0.142	TRUE	FALSE	FALSE	N/A	N/A	C
300.3	34.120	N/A	36	N/A	N/A	N/A	N/A	0.905	0	0	0	0.143	TRUE	FALSE	FALSE	N/A	N/A	C
300.1	34.284	N/A	36	N/A	N/A	N/A	N/A	0.904	0	0	0	0.143	TRUE	FALSE	FALSE	N/A	N/A	C

Front Ground Response										Sample Screened for:					Factor of Safety		Material (optional)	Soil Type (see note on following chart)
Elev. (ft)	Depth z	Cyclic Resistance Ratio $CRR_{7.5}$	Relative Density D_r (%)	Correction for		Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., t_d	Shear Stress τ_{max} (psf)	Maximum Induced Shear Stress τ_{avg} (psf)	Cyclic Stress Ratio		Clay-like $(q_{c,N}) \geq 175$	High Tip Res.	Unsaturated	FS_{liq}		
				Overburden Pressure K_σ	Sloping Ground K_α						CSR	Ratio						
300.0	34.448	N/A	36	N/A	N/A	N/A	N/A	0.904	0	0	0.143	TRUE	FALSE	FALSE	N/A	N/A	C	
299.8	34.612	N/A	37	N/A	N/A	N/A	N/A	0.903	0	0	0.143	TRUE	FALSE	FALSE	N/A	N/A	C	
299.6	34.776	N/A	37	N/A	N/A	N/A	N/A	0.902	0	0	0.144	TRUE	FALSE	FALSE	N/A	N/A	C	
299.5	34.941	N/A	36	N/A	N/A	N/A	N/A	0.902	0	0	0.144	TRUE	FALSE	FALSE	N/A	N/A	C	
299.3	35.105	N/A	36	N/A	N/A	N/A	N/A	0.901	0	0	0.144	TRUE	FALSE	FALSE	N/A	N/A	C	
299.1	35.269	N/A	36	N/A	N/A	N/A	N/A	0.900	0	0	0.144	TRUE	FALSE	FALSE	N/A	N/A	C	
299.0	35.433	N/A	36	N/A	N/A	N/A	N/A	0.900	0	0	0.144	TRUE	FALSE	FALSE	N/A	N/A	C	
298.8	35.597	N/A	37	N/A	N/A	N/A	N/A	0.899	0	0	0.145	TRUE	FALSE	FALSE	N/A	N/A	C	
298.6	35.761	N/A	36	N/A	N/A	N/A	N/A	0.898	0	0	0.145	TRUE	FALSE	FALSE	N/A	N/A	C	
298.5	35.925	N/A	36	N/A	N/A	N/A	N/A	0.898	0	0	0.145	TRUE	FALSE	FALSE	N/A	N/A	C	
298.3	36.089	N/A	36	N/A	N/A	N/A	N/A	0.897	0	0	0.145	TRUE	FALSE	FALSE	N/A	N/A	C	
298.1	36.253	N/A	36	N/A	N/A	N/A	N/A	0.896	0	0	0.145	TRUE	FALSE	FALSE	N/A	N/A	C	
298.0	36.417	N/A	36	N/A	N/A	N/A	N/A	0.896	0	0	0.146	TRUE	FALSE	FALSE	N/A	N/A	C	
297.8	36.581	N/A	36	N/A	N/A	N/A	N/A	0.895	0	0	0.146	TRUE	FALSE	FALSE	N/A	N/A	C	
297.7	36.745	N/A	37	N/A	N/A	N/A	N/A	0.895	0	0	0.146	TRUE	FALSE	FALSE	N/A	N/A	C	
297.5	36.909	N/A	37	N/A	N/A	N/A	N/A	0.894	0	0	0.146	TRUE	FALSE	FALSE	N/A	N/A	C	
297.3	37.073	N/A	37	N/A	N/A	N/A	N/A	0.893	0	0	0.146	TRUE	FALSE	FALSE	N/A	N/A	C	
297.2	37.237	N/A	40	N/A	N/A	N/A	N/A	0.893	0	0	0.146	TRUE	FALSE	FALSE	N/A	N/A	C	
297.0	37.401	N/A	39	N/A	N/A	N/A	N/A	0.892	0	0	0.147	TRUE	FALSE	FALSE	N/A	N/A	C	
296.8	37.565	N/A	36	N/A	N/A	N/A	N/A	0.891	0	0	0.147	TRUE	FALSE	FALSE	N/A	N/A	C	
296.7	37.729	N/A	36	N/A	N/A	N/A	N/A	0.891	0	0	0.147	TRUE	FALSE	FALSE	N/A	N/A	C	
296.5	37.893	N/A	36	N/A	N/A	N/A	N/A	0.890	0	0	0.147	TRUE	FALSE	FALSE	N/A	N/A	C	
296.3	38.057	N/A	37	N/A	N/A	N/A	N/A	0.889	0	0	0.147	TRUE	FALSE	FALSE	N/A	N/A	C	
296.2	38.221	N/A	41	N/A	N/A	N/A	N/A	0.889	0	0	0.148	TRUE	FALSE	FALSE	N/A	N/A	C	
296.0	38.385	0.115	45	0.944	0.781	0.99	0.084	0.888	0	0	0.148	FALSE	FALSE	FALSE	0.6	N/A	A2	
295.9	38.549	N/A	41	N/A	N/A	N/A	N/A	0.887	0	0	0.148	TRUE	FALSE	FALSE	N/A	N/A	C	
295.7	38.713	N/A	40	N/A	N/A	N/A	N/A	0.887	0	0	0.148	TRUE	FALSE	FALSE	N/A	N/A	C	
295.5	38.877	N/A	39	N/A	N/A	N/A	N/A	0.886	0	0	0.148	TRUE	FALSE	FALSE	N/A	N/A	C	
295.4	39.042	N/A	38	N/A	N/A	N/A	N/A	0.885	0	0	0.148	TRUE	FALSE	FALSE	N/A	N/A	C	
295.2	39.206	N/A	37	N/A	N/A	N/A	N/A	0.885	0	0	0.149	TRUE	FALSE	FALSE	N/A	N/A	C	
295.0	39.370	N/A	37	N/A	N/A	N/A	N/A	0.884	0	0	0.149	TRUE	FALSE	FALSE	N/A	N/A	C	
294.9	39.534	N/A	37	N/A	N/A	N/A	N/A	0.883	0	0	0.149	TRUE	FALSE	FALSE	N/A	N/A	C	
294.7	39.698	N/A	36	N/A	N/A	N/A	N/A	0.883	0	0	0.149	TRUE	FALSE	FALSE	N/A	N/A	C	
294.5	39.862	N/A	37	N/A	N/A	N/A	N/A	0.882	0	0	0.149	TRUE	FALSE	FALSE	N/A	N/A	C	
294.4	40.026	N/A	39	N/A	N/A	N/A	N/A	0.881	0	0	0.149	TRUE	FALSE	FALSE	N/A	N/A	C	
294.2	40.190	N/A	40	N/A	N/A	N/A	N/A	0.881	0	0	0.149	TRUE	FALSE	FALSE	N/A	N/A	C	
294.0	40.354	N/A	42	N/A	N/A	N/A	N/A	0.880	0	0	0.150	TRUE	FALSE	FALSE	N/A	N/A	B	
293.9	40.518	N/A	40	N/A	N/A	N/A	N/A	0.879	0	0	0.150	TRUE	FALSE	FALSE	N/A	N/A	C	
293.7	40.682	N/A	39	N/A	N/A	N/A	N/A	0.879	0	0	0.150	TRUE	FALSE	FALSE	N/A	N/A	C	
293.6	40.846	N/A	38	N/A	N/A	N/A	N/A	0.878	0	0	0.150	TRUE	FALSE	FALSE	N/A	N/A	C	
293.4	41.010	N/A	41	N/A	N/A	N/A	N/A	0.877	0	0	0.150	TRUE	FALSE	FALSE	N/A	N/A	C	
293.2	41.174	0.127	51	0.934	0.980	0.99	0.115	0.877	0	0	0.150	FALSE	FALSE	FALSE	0.8	N/A	A2	
293.1	41.338	0.137	55	0.930	1.126	0.98	0.141	0.876	0	0	0.150	FALSE	FALSE	FALSE	0.9	N/A	A1	
292.9	41.502	N/A	48	N/A	N/A	N/A	N/A	0.875	0	0	0.151	TRUE	FALSE	FALSE	N/A	N/A	B	
292.7	41.666	N/A	42	N/A	N/A	N/A	N/A	0.875	0	0	0.151	TRUE	FALSE	FALSE	N/A	N/A	B	
292.6	41.830	N/A	39	N/A	N/A	N/A	N/A	0.874	0	0	0.151	TRUE	FALSE	FALSE	N/A	N/A	B	
292.4	41.994	N/A	46	N/A	N/A	N/A	N/A	0.873	0	0	0.151	TRUE	FALSE	FALSE	N/A	N/A	B	
292.2	42.158	0.133	53	0.930	1.066	0.98	0.129	0.873	0	0	0.151	FALSE	FALSE	FALSE	0.9	N/A	A1	
292.1	42.322	N/A	51	N/A	N/A	N/A	N/A	0.872	0	0	0.151	TRUE	FALSE	FALSE	N/A	N/A	B	
291.9	42.486	N/A	53	N/A	N/A	N/A	N/A	0.871	0	0	0.151	TRUE	FALSE	FALSE	N/A	N/A	A1	
291.7	42.650	N/A	49	N/A	N/A	N/A	N/A	0.871	0	0	0.151	TRUE	FALSE	FALSE	N/A	N/A	B	
291.6	42.814	N/A	43	N/A	N/A	N/A	N/A	0.870	0	0	0.152	TRUE	FALSE	FALSE	N/A	N/A	B	
291.4	42.978	N/A	43	N/A	N/A	N/A	N/A	0.869	0	0	0.152	TRUE	FALSE	FALSE	N/A	N/A	B	
291.3	43.143	N/A	45	N/A	N/A	N/A	N/A	0.869	0	0	0.152	TRUE	FALSE	FALSE	N/A	N/A	B	
291.1	43.307	N/A	40	N/A	N/A	N/A	N/A	0.868	0	0	0.152	TRUE	FALSE	FALSE	N/A	N/A	B	

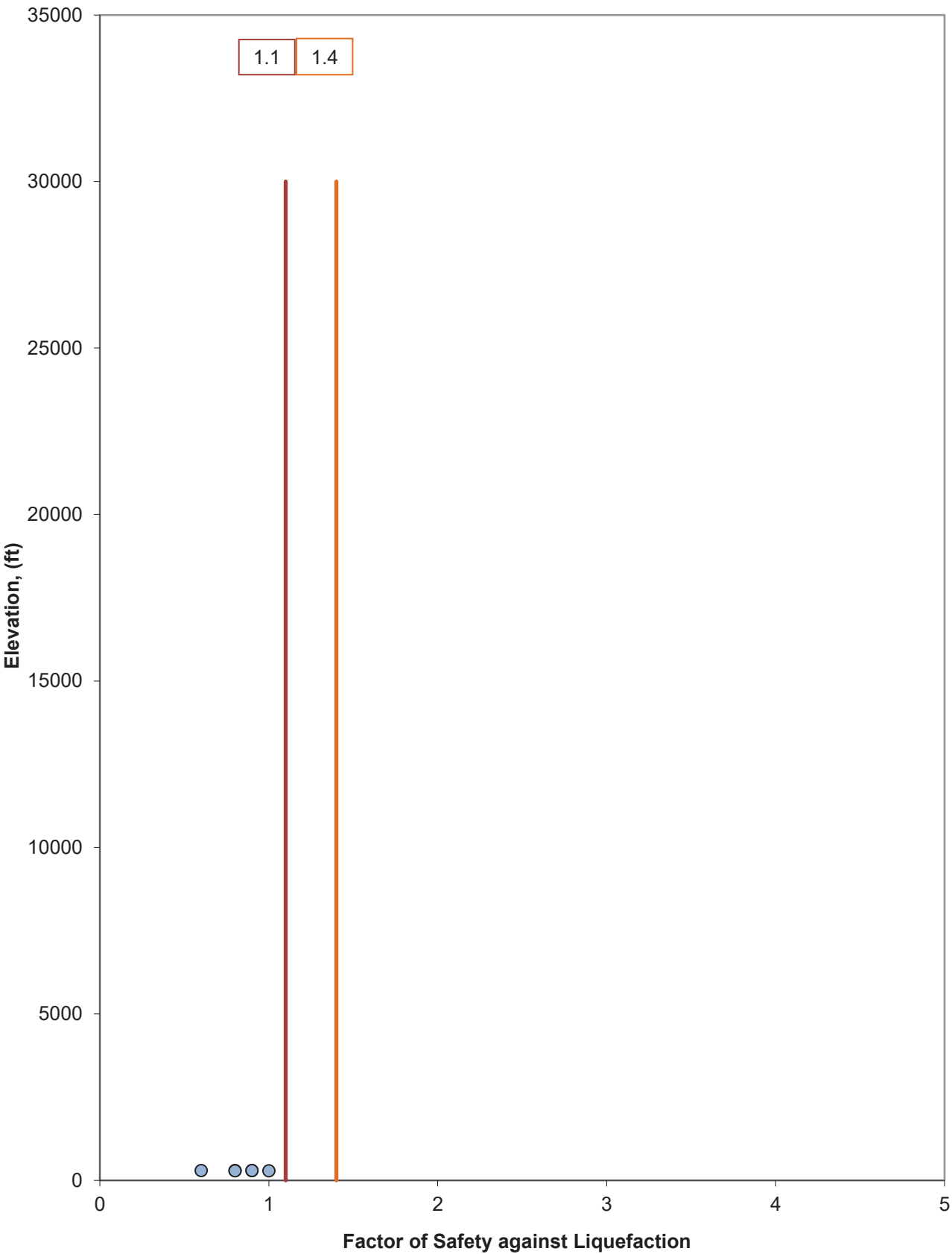
Front Ground Response										Sample Screened for:					Factor of Safety		Soil Type (see note on following chart)
Elev. (ft)	Depth z (ft)	Cyclic Resistance Ratio $CRR_{7.5}$	Relative Density D_r (%)	Correction for		Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., r_d	Maximum Induced Shear Stress τ_{Max} (psf)		Average Cyclic Shear Stress τ_{Avg} (psf)	Cyclic Stress Ratio CSR	High Tip Res. (qc_{1in}) ≥ 175		Safety FS_{eq}	Material (optional)	
				Overburden Pressure K_o	Sloping Ground K_α				Clay-like	Tip Res.			Unsaturated				
290.9	43.471	N/A	39	N/A	N/A	N/A	N/A	0.867	0	0	0	0.152	TRUE	FALSE	N/A	N/A	C
290.8	43.635	N/A	43	N/A	N/A	N/A	N/A	0.867	0	0	0	0.152	TRUE	FALSE	N/A	N/A	C
290.6	43.799	0.128	52	0.930	0.997	0.99	0.117	0.866	0	0	0	0.152	FALSE	FALSE	0.8	N/A	A2
290.4	43.963	0.144	57	0.923	1.221	0.98	0.159	0.865	0	0	0	0.152	FALSE	FALSE	1.0	N/A	A1
290.3	44.127	N/A	51	N/A	N/A	N/A	N/A	0.865	0	0	0	0.153	TRUE	FALSE	N/A	N/A	B
290.1	44.291	N/A	44	N/A	N/A	N/A	N/A	0.864	0	0	0	0.153	TRUE	FALSE	N/A	N/A	B
289.9	44.455	N/A	42	N/A	N/A	N/A	N/A	0.863	0	0	0	0.153	TRUE	FALSE	N/A	N/A	B
289.8	44.619	N/A	47	N/A	N/A	N/A	N/A	0.863	0	0	0	0.153	TRUE	FALSE	N/A	N/A	B
289.6	44.783	N/A	43	N/A	N/A	N/A	N/A	0.862	0	0	0	0.153	TRUE	FALSE	N/A	N/A	B
289.5	44.947	N/A	40	N/A	N/A	N/A	N/A	0.861	0	0	0	0.153	TRUE	FALSE	N/A	N/A	C
289.3	45.111	N/A	39	N/A	N/A	N/A	N/A	0.861	0	0	0	0.153	TRUE	FALSE	N/A	N/A	C
289.1	45.275	N/A	43	N/A	N/A	N/A	N/A	0.860	0	0	0	0.153	TRUE	FALSE	N/A	N/A	C
289.0	45.439	N/A	48	N/A	N/A	N/A	N/A	0.859	0	0	0	0.153	TRUE	FALSE	N/A	N/A	B
288.8	45.603	N/A	45	N/A	N/A	N/A	N/A	0.859	0	0	0	0.153	TRUE	FALSE	N/A	N/A	B
288.6	45.767	N/A	41	N/A	N/A	N/A	N/A	0.858	0	0	0	0.154	TRUE	FALSE	N/A	N/A	B
288.5	45.931	N/A	37	N/A	N/A	N/A	N/A	0.857	0	0	0	0.154	TRUE	FALSE	N/A	N/A	C
288.3	46.095	N/A	37	N/A	N/A	N/A	N/A	0.857	0	0	0	0.154	TRUE	FALSE	N/A	N/A	C
288.1	46.259	N/A	38	N/A	N/A	N/A	N/A	0.856	0	0	0	0.154	TRUE	FALSE	N/A	N/A	C
288.0	46.423	N/A	37	N/A	N/A	N/A	N/A	0.855	0	0	0	0.154	TRUE	FALSE	N/A	N/A	C
287.8	46.587	N/A	37	N/A	N/A	N/A	N/A	0.855	0	0	0	0.154	TRUE	FALSE	N/A	N/A	C
287.6	46.751	N/A	37	N/A	N/A	N/A	N/A	0.854	0	0	0	0.154	TRUE	FALSE	N/A	N/A	C
287.5	46.915	N/A	37	N/A	N/A	N/A	N/A	0.853	0	0	0	0.154	TRUE	FALSE	N/A	N/A	C
287.3	47.079	N/A	37	N/A	N/A	N/A	N/A	0.853	0	0	0	0.154	TRUE	FALSE	N/A	N/A	C
287.2	47.244	N/A	37	N/A	N/A	N/A	N/A	0.852	0	0	0	0.154	TRUE	FALSE	N/A	N/A	C
287.0	47.408	N/A	41	N/A	N/A	N/A	N/A	0.851	0	0	0	0.154	TRUE	FALSE	N/A	N/A	C
286.8	47.572	N/A	40	N/A	N/A	N/A	N/A	0.851	0	0	0	0.155	TRUE	FALSE	N/A	N/A	C
286.7	47.736	N/A	39	N/A	N/A	N/A	N/A	0.850	0	0	0	0.155	TRUE	FALSE	N/A	N/A	C
286.5	47.900	N/A	39	N/A	N/A	N/A	N/A	0.849	0	0	0	0.155	TRUE	FALSE	N/A	N/A	C
286.3	48.064	N/A	38	N/A	N/A	N/A	N/A	0.849	0	0	0	0.155	TRUE	FALSE	N/A	N/A	C
286.2	48.228	N/A	38	N/A	N/A	N/A	N/A	0.848	0	0	0	0.155	TRUE	FALSE	N/A	N/A	C
286.0	48.392	N/A	39	N/A	N/A	N/A	N/A	0.847	0	0	0	0.155	TRUE	FALSE	N/A	N/A	C
285.8	48.556	N/A	39	N/A	N/A	N/A	N/A	0.847	0	0	0	0.155	TRUE	FALSE	N/A	N/A	C
285.7	48.720	N/A	39	N/A	N/A	N/A	N/A	0.846	0	0	0	0.155	TRUE	FALSE	N/A	N/A	C
285.5	48.884	N/A	37	N/A	N/A	N/A	N/A	0.845	0	0	0	0.155	TRUE	FALSE	N/A	N/A	C
285.4	49.048	N/A	36	N/A	N/A	N/A	N/A	0.844	0	0	0	0.155	TRUE	FALSE	N/A	N/A	C
285.2	49.212	N/A	43	N/A	N/A	N/A	N/A	0.844	0	0	0	0.155	TRUE	FALSE	N/A	N/A	B
285.0	49.376	N/A	48	N/A	N/A	N/A	N/A	0.843	0	0	0	0.155	TRUE	FALSE	N/A	N/A	B
284.9	49.540	N/A	37	N/A	N/A	N/A	N/A	0.842	0	0	0	0.155	TRUE	FALSE	N/A	N/A	B
284.7	49.704	N/A	41	N/A	N/A	N/A	N/A	0.842	0	0	0	0.155	TRUE	FALSE	N/A	N/A	C

SP04



Adapted from "Discussion of 'Liquefaction Potential of Silts from CPTu'" (Robertson 2008). Zone A₁ and Zone A₂ samples are generally sand-like. Zone B samples are generally clay-like and not susceptible to cyclic softening. Zone C samples are generally clay-like and susceptible to cyclic softening. Note that the transition from clay-like to sand-like in this chart does not exactly match the liquefaction calculations herein; that is, some transitional samples in Zone B and Zone C will be treated as sand-like and analyzed for liquefaction if the calculations indicate as such.

US 60 Bridge, Boring = SP04, Source = Design Source, Mw = 7.7, Event = Design Event,
CPT Data, Simplified Stress-Based Approach



Project Information

Slantec Project Number =
178565011

Project Name =
US 80 Bridge

CPT ID =
SP05

Boring Location (optional)

Nothing =

Ending =

OR

Baseline Station =

Offset (+ Right) =

Using qt (corrected for u2 PWP) or qc (backcalculated uncorrected field tip)

Cone ID (optional) =

Use qc instead of qt?

Cone Area Rate (a) =

0

0.80

(1: Yes, 0: No)

Drilling Information

Top of Hole Elevation =

Water Depth during CPT (negative for US borings) =

Depth data collection began =

Avg. Total Unit WL Above 1st Sample =

305.9

15.0

0.00

During Earthquake Information

Water Depth during EQ (relative to CPT TOH, negative for US borings) =

Final Grade Elevation during EQ =

Avg. Total Unit WL of Cui/Fill =

15.0

305.9

120

Nonlinear Pore Water Pressure Profile

Cu/Pore Water Pressure Profile?

If previous answer is No, hydrostatic pressures are assumed.

0

(1: Yes, 0: No)

α Curve Fit Parameters

Associated α profile:

α at each Sample Depth known?

If previous answer is No, then enter curve fit parameters below (α vs. depth curve)

If defaulting to K_s=1 (i.e., level ground), assign values of zero to all curve fit parameters below to make α zero and thus, K_s will be one.

1

(1: Yes, 0: No)

Associated ground response profile:

Get CSR from shear stress envelope?

If previous answer is No, then CSR will be calculated using a_{max} and T_d

Max. Shear Stress at each sample depth known?

If previous answer is No, then enter curve fit parameters below (shear stress vs. depth curve)

Borings, sp05, nor

0

(1: Yes, 0: No)

Max. Shear Stress Curve Fit Parameters (from ground response analysis)

m4:

m3:

m2:

m1:

m0:

Earthquake Information

EQ Source (e.g., New Madrid)

Event (e.g., MCE, OBE)

a_{max} (g) (top of ground surface)

EQ Mag (Mw)

Design Source

Design Event

0.20

7.7

Inputs

Depth (ft)	Corrected Cone Tip Resistance, q _c (tsf)	Sleeve Friction, f _s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
0.164	22.495	0.103	120							
0.328	32.056	0.128	120							
0.492	36.272	0.195	120							
0.656	48.819	0.298	120							
0.820	64.345	0.512	120							
0.984	76.304	0.834	120							
1.148	83.253	1.014	120							
1.312	77.465	1.112	120							
1.476	69.506	1.208	120							
1.640	64.627	1.217	120							
1.804	57.968	1.137	120							
1.968	54.081	1.116	120							
2.133	51.689	1.170	120							
2.297	47.026	1.175	120							
2.461	42.696	1.199	120							
2.625	40.128	1.194	120							
2.789	37.485	1.105	120							
2.953	36.650	1.053	120							
3.117	37.066	1.027	120							
3.281	41.924	0.782	120							
3.445	39.603	0.621	120							
3.609	24.907	0.568	120							
3.773	18.729	0.493	120							
3.937	15.330	0.407	120							
4.101	14.092	0.307	120							
4.265	13.381	0.292	120							
4.429	13.398	0.309	120							
4.593	13.073	0.317	120							
4.757	11.913	0.310	120							
4.921	10.495	0.273	120							
5.085	10.053	0.266	120							
5.249	11.060	0.217	120							
5.413	9.492	0.215	120							
5.577	9.117	0.242	120							
5.741	8.487	0.237	120							
5.905	8.856	0.214	120							
6.069	8.595	0.231	120							
6.234	9.100	0.216	120							
6.398	10.149	0.227	120							
6.562	10.698	0.249	120							
6.726	10.948	0.242	120							
6.890	10.487	0.230	120							
7.054	10.393	0.224	120							
7.218	10.230	0.234	120							
7.382	10.298	0.250	120							
7.546	10.964	0.257	120							
7.710	8.228	0.238	120							
7.874	5.904	0.214	120							
8.038	5.418	0.182	120							
8.202	6.305	0.160	120							
8.366	6.236	0.145	120							
8.530	5.278	0.136	120							
8.694	5.119	0.113	120							
8.858	8.298	0.100	120							
9.022	5.975	0.082	120							
9.186	3.914	0.079	120							
9.350	3.358	0.087	120							
9.514	3.582	0.088	120							
9.678	3.856	0.086	120							
9.842	3.849	0.083	120							
10.006	3.850	0.093	120							
10.170	4.033	0.101	120							
10.335	4.201	0.110	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
10.499	4.770	0.115	120							
10.663	4.833	0.117	120							
10.827	5.240	0.130	120							
10.991	4.941	0.131	120							
11.155	4.754	0.128	120							
11.319	4.776	0.122	120							
11.483	4.484	0.119	120							
11.647	4.287	0.104	120							
11.811	3.856	0.097	120							
11.975	3.842	0.092	120							
12.139	4.243	0.100	120							
12.303	5.559	0.099	120							
12.467	6.463	0.117	120							
12.631	6.783	0.160	120							
12.795	6.373	0.171	120							
12.959	5.363	0.153	120							
13.123	3.855	0.121	120							
13.287	3.279	0.107	120							
13.451	3.369	0.083	120							
13.615	4.156	0.103	120							
13.779	9.377	0.172	120							
13.943	6.772	0.146	120							
14.107	5.977	0.134	120							
14.271	9.879	0.145	120							
14.436	8.549	0.133	120							
14.600	5.773	0.149	120							
14.764	5.776	0.110	120							
14.928	4.921	0.126	120							
15.092	4.230	0.137	120		Clay-like					
15.256	6.926	0.143	120		Clay-like					
15.420	7.633	0.130	120		Clay-like					
15.584	6.045	0.112	120		Clay-like					
15.748	6.082	0.125	120		Clay-like					
15.912	6.438	0.112	120		Clay-like					
16.076	12.908	0.175	120		Clay-like					
16.240	20.204	0.318	120		Clay-like					
16.404	12.165	0.284	120		Clay-like					
16.568	13.493	0.281	120		Clay-like					
16.732	38.695	0.223	120		Clay-like					
16.896	54.549	0.278	120		Clay-like					
17.060	60.259	0.310	120		Clay-like					
17.224	69.874	0.313	120							
17.388	69.832	0.313	120							
17.552	67.176	0.480	120							
17.716	67.055	0.520	120							
17.880	66.337	0.552	120							
18.044	64.227	0.586	120							
18.208	54.906	0.654	120							
18.372	36.874	0.753	120							
18.537	19.744	0.823	120							
18.701	12.646	0.692	120							
18.865	9.118	0.507	120							
19.029	8.067	0.219	120							
19.193	9.144	0.218	120							
19.357	12.755	0.174	120							
19.521	12.030	0.167	120							
19.685	9.024	0.164	120							
19.849	7.811	0.108	120							
20.013	7.366	0.076	120							
20.177	7.656	0.073	120							
20.341	16.858	0.193	120							
20.505	11.661	0.185	120							
20.669	7.845	0.158	120							
20.833	8.215	0.052	120							
20.997	9.413	0.064	120							
21.161	8.196	0.054	120							
21.325	6.826	0.085	120							
21.489	11.757	0.098	120							
21.653	28.296	0.124	120							
21.817	42.249	0.179	120							
21.981	44.901	0.226	120							
22.145	43.159	0.309	120							
22.309	41.340	0.396	120							
22.473	36.452	0.512	120							
22.638	24.093	0.699	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
22.802	14.858	0.579	120							
22.966	9.912	0.432	120							
23.130	9.971	0.209	120							
23.294	8.827	0.144	120							
23.458	17.111	0.406	120							
23.622	34.788	0.668	120							
23.786	29.480	0.785	120							
23.950	23.937	0.559	120							
24.114	42.853	0.502	120							
24.278	52.282	0.508	120							
24.442	54.763	0.434	120							
24.606	57.073	0.484	120							
24.770	57.757	0.520	120							
24.934	56.758	0.541	120							
25.098	54.539	0.542	120							
25.262	51.610	0.587	120							
25.426	48.851	0.761	120							
25.590	33.061	0.982	120							
25.754	20.308	0.865	120							
25.918	18.575	0.812	120							
26.082	26.692	0.750	120							
26.246	19.329	0.721	120							
26.410	19.259	0.379	120							
26.574	34.668	0.426	120							
26.739	27.331	0.786	120							
26.903	17.717	0.560	120							
27.067	19.397	0.498	120							
27.231	20.686	0.233	120							
27.395	15.412	0.185	120							
27.559	16.204	0.231	120							
27.723	16.592	0.292	120							
27.887	19.598	0.263	120							
28.051	32.031	0.252	120							
28.215	37.870	0.368	120							
28.379	35.108	0.548	120							
28.543	33.959	0.570	120							
28.707	40.608	0.441	120							
28.871	31.985	0.696	120							
29.035	22.253	0.696	120							
29.199	19.815	0.456	120							
29.363	34.530	0.268	120							
29.527	37.700	0.388	120							
29.691	35.899	0.488	120							
29.855	48.326	0.461	120							
30.019	48.758	0.451	120		Clay-like					
30.183	42.715	0.506	120		Clay-like					
30.347	34.966	0.697	120		Clay-like					
30.511	34.198	0.818	120		Clay-like					
30.675	33.949	0.702	120		Clay-like					
30.840	40.602	0.523	120		Clay-like					
31.004	40.510	0.450	120		Clay-like					
31.168	37.594	0.458	120		Clay-like					
31.332	27.550	0.432	120		Clay-like					
31.496	19.200	0.367	120		Clay-like					
31.660	16.956	0.326	120		Clay-like					
31.824	11.990	0.287	120		Clay-like					
31.988	15.061	0.200	120		Clay-like					
32.152	36.172	0.209	120							
32.316	44.892	0.415	120							
32.480	46.532	0.563	120							
32.644	44.003	0.869	120							
32.808	37.129	0.917	120							
32.972	39.555	0.757	120							
33.136	40.642	0.796	120							
33.300	27.232	0.623	120							
33.464	18.266	0.451	120							
33.628	16.385	0.291	120							
33.792	16.089	0.168	120							
33.956	14.141	0.188	120							
34.120	14.260	0.233	120							
34.284	12.998	0.256	120							
34.448	13.845	0.258	120							
34.612	17.654	0.285	120							
34.776	13.777	0.244	120							
34.941	13.791	0.241	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
35.105	16901	0.188	120							
35.269	14043	0.175	120							
35.433	12258	0.169	120							
35.597	11510	0.105	120							
35.761	12566	0.137	120							
35.925	13516	0.131	120							
36.089	14681	0.193	120							
36.253	20007	0.179	120							
36.417	15887	0.212	120							
36.581	16480	0.215	120							
36.745	19316	0.256	120							
36.909	17557	0.264	120							
37.073	17335	0.275	120							
37.237	15715	0.203	120							
37.401	19092	0.173	120							
37.565	14607	0.180	120							
37.729	16214	0.172	120							
37.893	20845	0.245	120							
38.057	24418	0.349	120							
38.221	19118	0.361	120							
38.385	15362	0.318	120							
38.549	13453	0.243	120							
38.713	14288	0.173	120							
38.877	36935	0.493	120							
39.042	29131	0.676	120							
39.206	23978	0.628	120							
39.370	22340	0.446	120							
39.534	22413	0.296	120							
39.698	22913	0.247	120							
39.862	23241	0.240	120							
40.026	24721	0.243	120							
40.190	25876	0.240	120							
40.354	24653	0.245	120							
40.518	24932	0.239	120							
40.682	25538	0.215	120							
40.846	25968	0.196	120							
41.010	26841	0.404	120							
41.174	29508	0.534	120							
41.338	30875	0.444	120							
41.502	28277	0.302	120							
41.666	32669	0.258	120							
41.830	24894	0.220	120							
41.994	29559	0.254	120							
42.158	26877	0.261	120							
42.322	18152	0.287	120							
42.486	17355	0.252	120							
42.650	15208	0.269	120							
42.814	14600	0.331	120							
42.978	14727	0.272	120							
43.143	21314	0.271	120							
43.307	39598	0.421	120							
43.471	21065	0.407	120							
43.635	17442	0.370	120							
43.799	17031	0.195	120							
43.963	16559	0.125	120							
44.127	16885	0.301	120							
44.291	16273	0.200	120							
44.455	13146	0.157	120							
44.619	12575	0.096	120							
44.783	12288	0.089	120							
44.947	12407	0.111	120							
45.111	12324	0.097	120							
45.275	11920	0.086	120							
45.439	12299	0.089	120							
45.603	13040	0.089	120							
45.767	12185	0.076	120							
45.931	12878	0.091	120							
46.095	12930	0.079	120							
46.259	11952	0.094	120							
46.423	11913	0.105	120							
46.587	11595	0.106	120							
46.751	11417	0.107	120							
46.915	11670	0.083	120							
47.079	11727	0.081	120							
47.244	11617	0.112	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
47.408	11,712	0.108	120							
47.572	12,302	0.168	120							
47.736	15,419	0.172	120							
47.900	12,505	0.165	120							
48.064	11,523	0.194	120							
48.228	11,982	0.133	120							
48.392	11,744	0.115	120							
48.556	11,538	0.205	120							
48.720	12,091	0.467	120							
48.884	70,522	0.690	120							
49.048	158,284	1.059	120							
49.212	181,607	1.395	120							
49.376	178,277	1.506	120							
49.540	163,557	1.552	120							
49.704	144,329	1.509	120							
49.868	131,621	1.366	120							
50.032	118,864	1.273	120							
50.196	112,675	1.092	120							
50.360	95,362	1.147	120							
50.524	66,658	1.486	120							
50.688	40,067	1.613	120							
50.852	22,144	1.268	120							
51.016	33,378	1.202	120							
51.180	32,704	1.104	120							
51.345	21,635	1.077	120							
51.509	16,098	0.754	120							
51.673	62,563	0.677	120							
51.837	40,659	1.283	120							
52.001	26,053	1.126	120							
52.165	14,942	0.900	120							
52.329	15,286	0.411	120							
52.493	14,910	0.228	120							
52.657	14,028	0.215	120							
52.821	13,435	0.200	120							
52.985	13,508	0.188	120							
53.149	13,407	0.161	120							
53.313	12,539	0.148	120							
53.477	13,160	0.136	120							
53.641	12,931	0.151	120							
53.805	18,455	0.196	120							
53.969	16,175	0.211	120							
54.133	13,375	0.224	120							
54.297	13,375	0.228	120							
54.461	13,941	0.198	120							
54.625	13,318	0.176	120							
54.789	13,009	0.178	120							
54.953	13,449	0.159	120							
55.117	13,844	0.174	120							
55.281	13,504	0.204	120							
55.446	13,044	0.205	120							
55.610	13,479	0.180	120							
55.774	13,796	0.173	120							
55.938	13,984	0.207	120							
56.102	13,532	0.204	120							
56.266	13,435	0.214	120							
56.430	12,803	0.177	120							
56.594	12,941	0.159	120							
56.758	12,777	0.127	120							
56.922	12,661	0.124	120							
57.086	13,374	0.152	120							
57.250	13,538	0.189	120							
57.414	13,060	0.197	120							
57.578	12,959	0.187	120							
57.742	12,910	0.158	120							
57.906	13,012	0.155	120							
58.070	13,030	0.154	120							
58.234	13,747	0.172	120							
58.398	13,535	0.194	120							
58.562	13,266	0.235	120							
58.726	13,439	0.200	120							
58.890	14,122	0.175	120							
59.054	13,583	0.167	120							
59.218	13,874	0.196	120							
59.382	13,782	0.195	120							
59.547	13,918	0.212	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
59.711	13.824	0.212	120							
59.875	13.747	0.251	120							
60.039	13.395	0.217	120							
60.203	13.724	0.218	120							
60.367	13.584	0.435	120							
60.531	17.020	0.534	120							
60.695	113.924	0.735	120							
60.859	137.527	1.013	120							
61.023	136.102	1.253	120							
61.187	132.368	1.301	120							
61.351	128.557	1.210	120							
61.515	124.159	1.247	120							
61.679	113.077	1.715	120							
61.843	64.100	2.100	120							
62.007	33.006	1.972	120							
62.171	22.002	1.314	120							
62.335	16.825	0.885	120							
62.499	14.576	0.495	120							
62.663	13.755	0.323	120							
62.827	13.283	0.291	120							
62.991	13.142	0.258	120							
63.155	12.989	0.243	120							
63.319	13.056	0.231	120							
63.483	13.112	0.228	120							
63.648	13.579	0.203	120							
63.812	13.575	0.190	120							
63.976	13.972	0.180	120							
64.140	14.248	0.189	120							
64.304	14.205	0.204	120							
64.468	14.356	0.225	120							
64.632	14.540	0.208	120							
64.796	14.967	0.206	120							
64.960	15.152	0.230	120							
65.124	14.822	0.301	120							
65.288	14.792	0.285	120							
65.452	14.260	0.288	120							
65.616	14.071	0.202	120							
65.780	14.737	0.162	120							
65.944	14.299	0.179	120							
66.108	13.762	0.176	120							
66.272	13.972	0.204	120							
66.436	14.668	0.234	120							
66.600	14.892	0.233	120							
66.764	14.552	0.230	120							
66.928	14.301	0.268	120							
67.092	14.109	0.228	120							
67.256	13.987	0.211	120							
67.420	14.079	0.198	120							
67.584	13.771	0.199	120							
67.749	13.688	0.202	120							
67.913	13.784	0.206	120							
68.077	14.153	0.204	120							
68.241	14.504	0.211	120							
68.405	15.962	0.290	120							
68.569	15.772	0.324	120							
68.733	15.790	0.340	120							
68.897	15.368	0.294	120							
69.061	14.928	0.269	120							
69.225	14.587	0.244	120							
69.389	14.547	0.225	120							
69.553	14.462	0.223	120							
69.717	14.208	0.222	120							
69.881	14.172	0.230	120							
70.045	14.272	0.219	120							
70.209	14.505	0.208	120							
70.373	14.697	0.214	120							
70.537	15.226	0.243	120							
70.701	15.053	0.262	120							
70.865	14.897	0.261	120							
71.029	14.955	0.228	120							
71.193	15.042	0.219	120							
71.357	14.925	0.228	120							
71.521	14.781	0.240	120							
71.685	14.880	0.241	120							
71.850	14.783	0.225	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
72.014	14920	0.227	120							
72.178	14411	0.216	120							
72.342	14250	0.206	120							
72.506	13847	0.171	120							
72.670	13922	0.161	120							
72.834	14281	0.169	120							
72.998	14149	0.182	120							
73.162	14522	0.193	120							
73.326	14836	0.213	120							
73.490	15269	0.236	120							
73.654	14929	0.243	120							
73.818	15130	0.239	120							
73.982	14816	0.221	120							
74.146	15073	0.229	120							
74.310	14560	0.221	120							
74.474	14689	0.210	120							
74.638	15258	0.190	120							
74.802	14640	0.195	120							
74.966	14628	0.265	120							
75.130	14867	0.233	120							
75.294	15899	0.236	120							
75.458	15374	0.237	120							
75.622	15415	0.239	120							
75.786	15466	0.231	120							
75.951	15444	0.235	120							
76.115	16012	0.262	120							
76.279	16041	0.283	120							
76.443	15504	0.311	120							
76.607	15321	0.234	120							
76.771	16433	0.266	120							
76.935	15774	0.243	120							
77.099	15558	0.254	120							
77.263	15452	0.188	120							
77.427	15669	0.176	120							
77.591	15456	0.181	120							
77.755	15473	0.179	120							
77.919	15433	0.182	120							
78.083	15364	0.172	120							
78.247	15027	0.176	120							
78.411	15155	0.177	120							
78.575	14956	0.174	120							
78.739	15100	0.169	120							
78.903	15195	0.191	120							
79.067	15262	0.220	120							
79.231	15087	0.226	120							
79.395	15767	0.287	120							
79.559	17248	0.612	120							
79.723	31670	0.999	120							
79.887	246310	1.264	120							
80.052	327827	1.134	120							
80.216	292310	0.774	120							
80.380	218962	1.282	120							
80.544	143270	1.173	120							
80.708	88963	1.472	120							
80.872	45672	1.804	120							
81.036	28668	1.555	120							
81.200	27131	1.052	120							
81.364	25687	0.542	120							
81.528	36533	0.413	120							
81.692	62406	0.541	120							
81.856	68470	0.413	120							
82.020	86324	0.471	120							
82.184	57348	1.029	120							
82.348	33738	0.944	120							
82.512	22434	1.040	120							
82.676	28502	0.544	120							
82.840	43285	0.665	120							
83.004	169429	1.303	120							
83.168	249953	2.184	120							
83.332	259021	3.105	120							
83.496	255325	3.954	120							
83.660	253807	4.076	120							
83.824	254869	4.117	120							
83.988	276018	4.219	120							
84.153	275671	4.507	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
84.317	258.021	4.542	120							
84.481	226.452	3.907	120							
84.645	191.485	2.921	120							
84.809	170.475	1.631	120							
84.973	138.824	0.622	120							
85.137	105.984	0.201	120							
85.301	92.629	0.122	120							
85.465	54.796	0.263	120							
85.629	58.769	0.554	120							
85.793	76.886	1.258	120							
85.957	194.252	1.210	120							
86.121	231.895	0.901	120							
86.285	243.190	0.561	120							
86.449	258.653	0.684	120							
86.613	254.665	0.817	120							
86.777	258.725	0.817	120							
86.941	293.731	0.974	120							
87.105	308.047	1.248	120							
87.269	326.883	1.222	120							
87.433	288.150	1.560	120							
87.597	222.553	2.508	120							
87.761	174.468	1.986	120							
87.925	131.759	1.621	120							
88.089	67.234	1.446	120							
88.254	90.133	0.845	120							
88.418	109.328	0.404	120							
88.582	123.527	0.409	120							
88.746	150.149	0.249	120							
88.910	163.429	0.417	120							
89.074	193.288	0.392	120							
89.238	211.260	0.302	120							
89.402	207.879	0.571	120							
89.566	205.057	0.335	120							
89.730	193.778	0.414	120							
89.894	235.433	1.781	120							
90.058	223.704	1.117	120							
90.222	151.845	2.102	120							
90.386	70.209	2.028	120							
90.550	31.197	1.806	120							
90.714	20.012	0.894	120							
90.878	18.358	0.258	120							
91.042	15.315	0.282	120							
91.206	22.777	0.288	120							
91.370	20.384	0.280	120							
91.534	17.796	0.254	120							
91.698	37.345	0.425	120							
91.862	40.109	0.389	120							
92.026	31.437	0.520	120							
92.190	27.787	0.490	120							
92.355	19.930	0.370	120							
92.519	19.510	0.176	120							
92.683	18.984	0.136	120							
92.847	19.095	0.134	120							
93.011	19.053	0.127	120							
93.175	18.836	0.141	120							
93.339	19.124	0.191	120							
93.503	20.155	1.202	120							
93.667	126.903	2.597	120							
93.831	165.084	4.697	120							
93.995	180.796	6.190	120							
94.159	192.311	4.690	120							
94.323	220.437	3.145	120							
94.487	239.517	2.890	120							
94.651	219.537	1.634	120							
94.815	187.277	2.119	120							
94.979	163.994	2.502	120							
95.143	139.830	2.465	120							
95.307	96.720	2.017	120							
95.471	42.912	1.886	120							
95.635	26.895	1.529	120							
95.799	84.782	1.311	120							
95.963	236.571	0.667	120							
96.127	273.968	2.059	120							
96.291	264.304	1.678	120							
96.456	211.382	1.504	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
96.620	207.605	0.848	120							
96.784	186.769	0.213	120							
96.948	167.560	0.172	120							
97.112	169.887	0.655	120							
97.276	187.594	0.933	120							
97.440	189.625	2.105	120							
97.604	255.526	4.823	120							
97.768	457.727	4.145	120							
97.932	604.833	3.617	120							
98.096	576.861	4.466	120							
98.260	614.555	3.018	120							
98.424	642.983	1.678	120							
98.588	544.066	1.181	120							
98.752	449.822	0.497	120							
98.916	406.780	1.179	120							
99.080	376.056	0.635	120							
99.244	357.634	0.823	120							
99.408	380.259	0.837	120							
99.572	433.902	1.058	120							
99.736	469.005	1.052	120							
99.900	477.225	0.732	120							
100.064	424.618	1.273	120							
100.228	385.710	1.816	120							
100.392	388.392	1.601	120							
100.557	515.260	1.456	120							

LIQUEFACTION POTENTIAL ASSESSMENT FOR COARSE GRAINED SOILS USING CONE PENETRATION TEST DATA

Facility: US 60 Bridge
Project No.: 178565011
CPT ID: SP05

Water Elevation during CPT:	294.9	ft
Depth to Water during CPT:	15.0	ft (relative to ground surface during CPT)
Water Elevation during Earthquake:	294.9	ft
Depth to Water during Earthquake:	15.0	ft (relative to ground surface during CPT)
Final Grade Elevation during EQ:	309.9	ft (if no fill, then set this equal to top of CPT hole elev.)
Height of Final Grade above CPT TOH:	0.0	ft (relative to ground surface during CPT, + Fill, - Cut)
Unit Weight of Cut/Fill to Achieve Final Grade	120	pcf
Cut/Fill Total Stress (+ Fill, - Cut):	0.00	tsf

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σ _{V CPT} (tsf)	Total Vertical Stress during EQ σ _{V EQ} (tsf)	Static Pore Water Pressure during CPT u _{S CPT} (tsf)	Static Pore Water Pressure during EQ u _{S EQ} (tsf)	Effective Vertical Stress during CPT σ _{V CPT} (tsf)	Effective Vertical Stress during EQ σ _{V EQ} (tsf)
309.9					Vertical Stresses above 1st CPT:		0.00	0.00	0.00	0.00	0.00	0.00
309.7	0.164	22.50	0.10	120		0.00	0.25	0.01	0.01	0.00	0.01	0.01
309.6	0.328	32.06	0.13	120		0.25	0.16	0.02	0.02	0.00	0.02	0.02
309.4	0.492	36.27	0.20	120		0.41	0.16	0.03	0.03	0.00	0.03	0.03
309.2	0.656	48.82	0.30	120		0.57	0.16	0.04	0.04	0.00	0.04	0.04
309.1	0.820	64.34	0.51	120		0.74	0.16	0.05	0.05	0.00	0.05	0.05
308.9	0.984	76.30	0.83	120		0.90	0.16	0.06	0.06	0.00	0.06	0.06
308.8	1.148	83.25	1.01	120		1.07	0.16	0.07	0.07	0.00	0.07	0.07
308.6	1.312	77.46	1.11	120		1.23	0.16	0.08	0.08	0.00	0.08	0.08
308.4	1.476	69.51	1.21	120		1.39	0.16	0.09	0.09	0.00	0.09	0.09
308.3	1.640	64.63	1.22	120		1.56	0.16	0.10	0.10	0.00	0.10	0.10
308.1	1.804	57.97	1.14	120		1.72	0.16	0.11	0.11	0.00	0.11	0.11
307.9	1.968	54.09	1.12	120		1.89	0.16	0.12	0.12	0.00	0.12	0.12
307.8	2.133	51.69	1.17	120		2.05	0.16	0.13	0.13	0.00	0.13	0.13
307.6	2.297	47.03	1.18	120		2.21	0.16	0.14	0.14	0.00	0.14	0.14
307.4	2.461	42.70	1.20	120		2.38	0.16	0.15	0.15	0.00	0.15	0.15
307.3	2.625	40.13	1.19	120		2.54	0.16	0.16	0.16	0.00	0.16	0.16
307.1	2.789	37.48	1.11	120		2.71	0.16	0.17	0.17	0.00	0.17	0.17
306.9	2.953	36.65	1.05	120		2.87	0.16	0.18	0.18	0.00	0.18	0.18
306.8	3.117	37.07	1.03	120		3.03	0.16	0.19	0.19	0.00	0.19	0.19
306.6	3.281	41.92	0.78	120		3.20	0.16	0.20	0.20	0.00	0.20	0.20
306.5	3.445	39.60	0.62	120		3.36	0.16	0.21	0.21	0.00	0.21	0.21
306.3	3.609	24.91	0.57	120		3.53	0.16	0.22	0.22	0.00	0.22	0.22
306.1	3.773	18.73	0.49	120		3.69	0.16	0.23	0.23	0.00	0.23	0.23
306.0	3.937	15.33	0.41	120		3.85	0.16	0.24	0.24	0.00	0.24	0.24
305.8	4.101	14.09	0.31	120		4.02	0.16	0.25	0.25	0.00	0.25	0.25
305.6	4.265	13.38	0.29	120		4.18	0.16	0.26	0.26	0.00	0.26	0.26
305.5	4.429	13.40	0.31	120		4.35	0.16	0.27	0.27	0.00	0.27	0.27
305.3	4.593	13.07	0.32	120		4.51	0.16	0.28	0.28	0.00	0.28	0.28
305.1	4.757	11.91	0.31	120		4.68	0.16	0.29	0.29	0.00	0.29	0.29
305.0	4.921	10.49	0.27	120		4.84	0.16	0.30	0.30	0.00	0.30	0.30
304.8	5.085	10.05	0.26	120		5.00	0.16	0.31	0.31	0.00	0.31	0.31
304.7	5.249	11.06	0.22	120		5.17	0.16	0.31	0.31	0.00	0.31	0.31
304.5	5.413	9.49	0.22	120		5.33	0.16	0.32	0.32	0.00	0.32	0.32
304.3	5.577	9.12	0.24	120		5.50	0.16	0.33	0.33	0.00	0.33	0.33
304.2	5.741	8.49	0.24	120		5.66	0.16	0.34	0.34	0.00	0.34	0.34
304.0	5.905	8.86	0.21	120		5.82	0.16	0.35	0.35	0.00	0.35	0.35
303.8	6.069	8.60	0.23	120		5.99	0.16	0.36	0.36	0.00	0.36	0.36
303.7	6.234	9.10	0.22	120		6.15	0.16	0.37	0.37	0.00	0.37	0.37
303.5	6.398	10.15	0.23	120		6.32	0.16	0.38	0.38	0.00	0.38	0.38
303.3	6.562	10.70	0.25	120		6.48	0.16	0.39	0.39	0.00	0.39	0.39
303.2	6.726	10.95	0.24	120		6.64	0.16	0.40	0.40	0.00	0.40	0.40
303.0	6.890	10.49	0.23	120		6.81	0.16	0.41	0.41	0.00	0.41	0.41
302.8	7.054	10.39	0.22	120		6.97	0.16	0.42	0.42	0.00	0.42	0.42
302.7	7.218	10.23	0.23	120		7.14	0.16	0.43	0.43	0.00	0.43	0.43
302.5	7.382	10.30	0.25	120		7.30	0.16	0.44	0.44	0.00	0.44	0.44
302.4	7.546	10.96	0.26	120		7.46	0.16	0.45	0.45	0.00	0.45	0.45
302.2	7.710	8.23	0.24	120		7.63	0.16	0.46	0.46	0.00	0.46	0.46
302.0	7.874	5.90	0.21	120		7.79	0.16	0.47	0.47	0.00	0.47	0.47
301.9	8.038	5.42	0.18	120		7.96	0.16	0.48	0.48	0.00	0.48	0.48
301.7	8.202	6.31	0.16	120		8.12	0.16	0.49	0.49	0.00	0.49	0.49
301.5	8.366	6.24	0.15	120		8.28	0.16	0.50	0.50	0.00	0.50	0.50
301.4	8.530	5.28	0.14	120		8.45	0.16	0.51	0.51	0.00	0.51	0.51
301.2	8.694	5.12	0.11	120		8.61	0.16	0.52	0.52	0.00	0.52	0.52
301.0	8.858	8.30	0.10	120		8.78	0.16	0.53	0.53	0.00	0.53	0.53
300.9	9.022	5.97	0.08	120		8.94	0.16	0.54	0.54	0.00	0.54	0.54
300.7	9.186	3.91	0.08	120		9.10	0.16	0.55	0.55	0.00	0.55	0.55
300.5	9.350	3.36	0.09	120		9.27	0.16	0.56	0.56	0.00	0.56	0.56
300.4	9.514	3.58	0.09	120		9.43	0.16	0.57	0.57	0.00	0.57	0.57
300.2	9.678	3.86	0.09	120		9.60	0.16	0.58	0.58	0.00	0.58	0.58
300.1	9.842	3.93	0.09	120		9.76	0.16	0.59	0.59	0.00	0.59	0.59
299.9	10.006	3.95	0.09	120		9.92	0.16	0.60	0.60	0.00	0.60	0.60
299.7	10.170	4.03	0.10	120		10.09	0.16	0.61	0.61	0.00	0.61	0.61

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σv CPT (tsf)	Total Vertical Stress during EQ σv EQ (tsf)	Static Pore Water Pressure during CPT us CPT (tsf)	Static Pore Water Pressure during EQ us EQ (tsf)	Effective Vertical Stress during CPT σv CPT (tsf)	Effective Vertical Stress during EQ σv EQ (tsf)
299.6	10.335	4.20	0.11	120	10.25	0.16	0.62	0.62	0.00	0.00	0.62	0.62
299.4	10.499	4.77	0.12	120	10.42	0.16	0.63	0.63	0.00	0.00	0.63	0.63
299.2	10.663	4.83	0.12	120	10.58	0.16	0.64	0.64	0.00	0.00	0.64	0.64
299.1	10.827	5.24	0.13	120	10.74	0.16	0.65	0.65	0.00	0.00	0.65	0.65
298.9	10.991	4.94	0.13	120	10.91	0.16	0.66	0.66	0.00	0.00	0.66	0.66
298.7	11.155	4.75	0.13	120	11.07	0.16	0.67	0.67	0.00	0.00	0.67	0.67
298.6	11.319	4.78	0.12	120	11.24	0.16	0.68	0.68	0.00	0.00	0.68	0.68
298.4	11.483	4.48	0.12	120	11.40	0.16	0.69	0.69	0.00	0.00	0.69	0.69
298.3	11.647	4.29	0.10	120	11.56	0.16	0.70	0.70	0.00	0.00	0.70	0.70
298.1	11.811	3.86	0.10	120	11.73	0.16	0.71	0.71	0.00	0.00	0.71	0.71
297.9	11.975	3.84	0.09	120	11.89	0.16	0.72	0.72	0.00	0.00	0.72	0.72
297.8	12.139	4.24	0.10	120	12.06	0.16	0.73	0.73	0.00	0.00	0.73	0.73
297.6	12.303	5.56	0.10	120	12.22	0.16	0.74	0.74	0.00	0.00	0.74	0.74
297.4	12.467	6.46	0.12	120	12.39	0.16	0.75	0.75	0.00	0.00	0.75	0.75
297.3	12.631	6.78	0.16	120	12.55	0.16	0.76	0.76	0.00	0.00	0.76	0.76
297.1	12.795	6.37	0.17	120	12.71	0.16	0.77	0.77	0.00	0.00	0.77	0.77
296.9	12.959	5.36	0.15	120	12.88	0.16	0.78	0.78	0.00	0.00	0.78	0.78
296.8	13.123	3.85	0.12	120	13.04	0.16	0.79	0.79	0.00	0.00	0.79	0.79
296.6	13.287	3.28	0.11	120	13.21	0.16	0.80	0.80	0.00	0.00	0.80	0.80
296.4	13.451	3.37	0.08	120	13.37	0.16	0.81	0.81	0.00	0.00	0.81	0.81
296.3	13.615	4.16	0.10	120	13.53	0.16	0.82	0.82	0.00	0.00	0.82	0.82
296.1	13.779	9.38	0.17	120	13.70	0.16	0.83	0.83	0.00	0.00	0.83	0.83
296.0	13.943	6.77	0.15	120	13.86	0.16	0.84	0.84	0.00	0.00	0.84	0.84
295.8	14.107	5.98	0.13	120	14.03	0.16	0.85	0.85	0.00	0.00	0.85	0.85
295.6	14.271	9.88	0.15	120	14.19	0.16	0.86	0.86	0.00	0.00	0.86	0.86
295.5	14.436	8.55	0.13	120	14.35	0.16	0.87	0.87	0.00	0.00	0.87	0.87
295.3	14.600	5.77	0.15	120	14.52	0.16	0.88	0.88	0.00	0.00	0.88	0.88
295.1	14.764	5.78	0.11	120	14.68	0.16	0.89	0.89	0.00	0.00	0.89	0.89
295.0	14.928	4.92	0.13	120	14.85	0.16	0.90	0.90	0.00	0.00	0.90	0.90
294.8	15.092	4.23	0.14	120	15.01	0.16	0.91	0.91	0.00	0.00	0.90	0.90
294.6	15.256	6.93	0.14	120	15.17	0.16	0.92	0.92	0.01	0.01	0.91	0.91
294.5	15.420	7.63	0.13	120	15.34	0.16	0.93	0.93	0.01	0.01	0.91	0.91
294.3	15.584	6.05	0.11	120	15.50	0.16	0.94	0.94	0.02	0.02	0.92	0.92
294.2	15.748	6.08	0.13	120	15.67	0.16	0.94	0.94	0.02	0.02	0.92	0.92
294.0	15.912	6.46	0.11	120	15.83	0.16	0.95	0.95	0.03	0.03	0.93	0.93
293.8	16.076	12.91	0.18	120	15.99	0.16	0.96	0.96	0.03	0.03	0.93	0.93
293.7	16.240	20.20	0.32	120	16.16	0.16	0.97	0.97	0.04	0.04	0.94	0.94
293.5	16.404	12.17	0.29	120	16.32	0.16	0.98	0.98	0.04	0.04	0.94	0.94
293.3	16.568	13.49	0.28	120	16.49	0.16	0.99	0.99	0.05	0.05	0.95	0.95
293.2	16.732	38.70	0.22	120	16.65	0.16	1.00	1.00	0.05	0.05	0.95	0.95
293.0	16.896	54.55	0.28	120	16.81	0.16	1.01	1.01	0.06	0.06	0.95	0.95
292.8	17.060	60.26	0.31	120	16.98	0.16	1.02	1.02	0.06	0.06	0.96	0.96
292.7	17.224	60.94	0.37	120	17.14	0.16	1.03	1.03	0.07	0.07	0.96	0.96
292.5	17.388	62.63	0.43	120	17.31	0.16	1.04	1.04	0.07	0.07	0.97	0.97
292.3	17.552	67.18	0.49	120	17.47	0.16	1.05	1.05	0.08	0.08	0.97	0.97
292.2	17.716	67.06	0.53	120	17.63	0.16	1.06	1.06	0.08	0.08	0.98	0.98
292.0	17.880	66.34	0.55	120	17.80	0.16	1.07	1.07	0.09	0.09	0.98	0.98
291.9	18.044	64.23	0.59	120	17.96	0.16	1.08	1.08	0.09	0.09	0.99	0.99
291.7	18.208	54.91	0.65	120	18.13	0.16	1.09	1.09	0.10	0.10	0.99	0.99
291.5	18.372	36.87	0.75	120	18.29	0.16	1.10	1.10	0.11	0.11	1.00	1.00
291.4	18.537	19.74	0.83	120	18.45	0.16	1.11	1.11	0.11	0.11	1.00	1.00
291.2	18.701	12.65	0.69	120	18.62	0.16	1.12	1.12	0.12	0.12	1.01	1.01
291.0	18.865	9.12	0.51	120	18.78	0.16	1.13	1.13	0.12	0.12	1.01	1.01
290.9	19.029	8.07	0.22	120	18.95	0.16	1.14	1.14	0.13	0.13	1.02	1.02
290.7	19.193	9.14	0.22	120	19.11	0.16	1.15	1.15	0.13	0.13	1.02	1.02
290.5	19.357	12.75	0.17	120	19.27	0.16	1.16	1.16	0.14	0.14	1.03	1.03
290.4	19.521	12.03	0.17	120	19.44	0.16	1.17	1.17	0.14	0.14	1.03	1.03
290.2	19.685	9.02	0.16	120	19.60	0.16	1.18	1.18	0.15	0.15	1.03	1.03
290.1	19.849	7.81	0.11	120	19.77	0.16	1.19	1.19	0.15	0.15	1.04	1.04
289.9	20.013	7.37	0.08	120	19.93	0.16	1.20	1.20	0.16	0.16	1.04	1.04
289.7	20.177	7.66	0.07	120	20.09	0.16	1.21	1.21	0.16	0.16	1.05	1.05
289.6	20.341	16.86	0.19	120	20.26	0.16	1.22	1.22	0.17	0.17	1.05	1.05
289.4	20.505	11.66	0.19	120	20.42	0.16	1.23	1.23	0.17	0.17	1.06	1.06
289.2	20.669	7.85	0.16	120	20.59	0.16	1.24	1.24	0.18	0.18	1.06	1.06
289.1	20.833	8.22	0.05	120	20.75	0.16	1.25	1.25	0.18	0.18	1.07	1.07
288.9	20.997	9.41	0.06	120	20.92	0.16	1.26	1.26	0.19	0.19	1.07	1.07
288.7	21.161	8.20	0.05	120	21.08	0.16	1.27	1.27	0.19	0.19	1.08	1.08
288.6	21.325	6.83	0.09	120	21.24	0.16	1.28	1.28	0.20	0.20	1.08	1.08
288.4	21.489	11.76	0.10	120	21.41	0.16	1.29	1.29	0.20	0.20	1.09	1.09
288.2	21.653	28.30	0.12	120	21.57	0.16	1.30	1.30	0.21	0.21	1.09	1.09
288.1	21.817	42.25	0.18	120	21.74	0.16	1.31	1.31	0.21	0.21	1.10	1.10
287.9	21.981	44.90	0.23	120	21.90	0.16	1.32	1.32	0.22	0.22	1.10	1.10
287.8	22.145	43.16	0.31	120	22.06	0.16	1.33	1.33	0.22	0.22	1.11	1.11
287.6	22.309	41.34	0.40	120	22.23	0.16	1.34	1.34	0.23	0.23	1.11	1.11

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σv CPT (tsf)	Total Vertical Stress during EQ σv EQ (tsf)	Static Pore Water Pressure during CPT us CPT (tsf)	Static Pore Water Pressure during EQ us EQ (tsf)	Effective Vertical Stress during CPT σv CPT (tsf)	Effective Vertical Stress during EQ σv EQ (tsf)
287.4	22.473	36.45	0.51	120	22.39	0.16	1.35	1.35	0.23	0.23	1.12	1.12
287.3	22.638	24.09	0.70	120	22.56	0.16	1.36	1.36	0.24	0.24	1.12	1.12
287.1	22.802	14.86	0.58	120	22.72	0.16	1.37	1.37	0.24	0.24	1.12	1.12
286.9	22.966	9.91	0.43	120	22.88	0.16	1.38	1.38	0.25	0.25	1.13	1.13
286.8	23.130	9.97	0.21	120	23.05	0.16	1.39	1.39	0.25	0.25	1.13	1.13
286.6	23.294	8.83	0.14	120	23.21	0.16	1.40	1.40	0.26	0.26	1.14	1.14
286.4	23.458	17.11	0.41	120	23.38	0.16	1.41	1.41	0.26	0.26	1.14	1.14
286.3	23.622	34.79	0.67	120	23.54	0.16	1.42	1.42	0.27	0.27	1.15	1.15
286.1	23.786	29.48	0.79	120	23.70	0.16	1.43	1.43	0.27	0.27	1.15	1.15
286.0	23.950	23.94	0.56	120	23.87	0.16	1.44	1.44	0.28	0.28	1.16	1.16
285.8	24.114	42.85	0.50	120	24.03	0.16	1.45	1.45	0.28	0.28	1.16	1.16
285.6	24.278	52.28	0.51	120	24.20	0.16	1.46	1.46	0.29	0.29	1.17	1.17
285.5	24.442	54.76	0.43	120	24.36	0.16	1.47	1.47	0.29	0.29	1.17	1.17
285.3	24.606	57.07	0.48	120	24.52	0.16	1.48	1.48	0.30	0.30	1.18	1.18
285.1	24.770	57.76	0.52	120	24.69	0.16	1.49	1.49	0.30	0.30	1.18	1.18
285.0	24.934	56.76	0.54	120	24.85	0.16	1.50	1.50	0.31	0.31	1.19	1.19
284.8	25.098	54.54	0.54	120	25.02	0.16	1.51	1.51	0.32	0.32	1.19	1.19
284.6	25.262	51.61	0.59	120	25.18	0.16	1.52	1.52	0.32	0.32	1.20	1.20
284.5	25.426	46.85	0.76	120	25.34	0.16	1.53	1.53	0.33	0.33	1.20	1.20
284.3	25.590	33.06	0.98	120	25.51	0.16	1.54	1.54	0.33	0.33	1.20	1.20
284.1	25.754	20.31	0.87	120	25.67	0.16	1.55	1.55	0.34	0.34	1.21	1.21
284.0	25.918	18.57	0.81	120	25.84	0.16	1.56	1.56	0.34	0.34	1.21	1.21
283.8	26.082	26.69	0.75	120	26.00	0.16	1.56	1.56	0.35	0.35	1.22	1.22
283.7	26.246	19.33	0.72	120	26.16	0.16	1.57	1.57	0.35	0.35	1.22	1.22
283.5	26.410	19.26	0.38	120	26.33	0.16	1.58	1.58	0.36	0.36	1.23	1.23
283.3	26.574	34.67	0.43	120	26.49	0.16	1.59	1.59	0.36	0.36	1.23	1.23
283.2	26.739	27.33	0.79	120	26.66	0.16	1.60	1.60	0.37	0.37	1.24	1.24
283.0	26.903	17.72	0.56	120	26.82	0.16	1.61	1.61	0.37	0.37	1.24	1.24
282.8	27.067	19.40	0.50	120	26.98	0.16	1.62	1.62	0.38	0.38	1.25	1.25
282.7	27.231	20.69	0.23	120	27.15	0.16	1.63	1.63	0.38	0.38	1.25	1.25
282.5	27.395	15.41	0.19	120	27.31	0.16	1.64	1.64	0.39	0.39	1.26	1.26
282.3	27.559	16.20	0.23	120	27.48	0.16	1.65	1.65	0.39	0.39	1.26	1.26
282.2	27.723	16.59	0.29	120	27.64	0.16	1.66	1.66	0.40	0.40	1.27	1.27
282.0	27.887	19.59	0.26	120	27.80	0.16	1.67	1.67	0.40	0.40	1.27	1.27
281.8	28.051	32.03	0.25	120	27.97	0.16	1.68	1.68	0.41	0.41	1.28	1.28
281.7	28.215	37.87	0.37	120	28.13	0.16	1.69	1.69	0.41	0.41	1.28	1.28
281.5	28.379	35.11	0.55	120	28.30	0.16	1.70	1.70	0.42	0.42	1.29	1.29
281.4	28.543	33.96	0.57	120	28.46	0.16	1.71	1.71	0.42	0.42	1.29	1.29
281.2	28.707	40.61	0.44	120	28.62	0.16	1.72	1.72	0.43	0.43	1.29	1.29
281.0	28.871	31.98	0.70	120	28.79	0.16	1.73	1.73	0.43	0.43	1.30	1.30
280.9	29.035	22.25	0.70	120	28.95	0.16	1.74	1.74	0.44	0.44	1.30	1.30
280.7	29.199	19.81	0.46	120	29.12	0.16	1.75	1.75	0.44	0.44	1.31	1.31
280.5	29.363	34.83	0.39	120	29.28	0.16	1.76	1.76	0.45	0.45	1.31	1.31
280.4	29.527	32.70	0.56	120	29.45	0.16	1.77	1.77	0.45	0.45	1.32	1.32
280.2	29.691	33.89	0.49	120	29.61	0.16	1.78	1.78	0.46	0.46	1.32	1.32
280.0	29.855	45.33	0.46	120	29.77	0.16	1.79	1.79	0.46	0.46	1.33	1.33
279.9	30.019	46.76	0.45	120	29.94	0.16	1.80	1.80	0.47	0.47	1.33	1.33
279.7	30.183	42.71	0.51	120	30.10	0.16	1.81	1.81	0.47	0.47	1.34	1.34
279.6	30.347	34.97	0.70	120	30.27	0.16	1.82	1.82	0.48	0.48	1.34	1.34
279.4	30.511	34.20	0.82	120	30.43	0.16	1.83	1.83	0.48	0.48	1.35	1.35
279.2	30.675	33.95	0.70	120	30.59	0.16	1.84	1.84	0.49	0.49	1.35	1.35
279.1	30.840	40.60	0.52	120	30.76	0.16	1.85	1.85	0.49	0.49	1.36	1.36
278.9	31.004	40.51	0.45	120	30.92	0.16	1.86	1.86	0.50	0.50	1.36	1.36
278.7	31.168	37.59	0.46	120	31.09	0.16	1.87	1.87	0.50	0.50	1.37	1.37
278.6	31.332	27.55	0.43	120	31.25	0.16	1.88	1.88	0.51	0.51	1.37	1.37
278.4	31.496	19.20	0.37	120	31.41	0.16	1.89	1.89	0.51	0.51	1.38	1.38
278.2	31.660	16.96	0.33	120	31.58	0.16	1.90	1.90	0.52	0.52	1.38	1.38
278.1	31.824	11.99	0.29	120	31.74	0.16	1.91	1.91	0.52	0.52	1.38	1.38
277.9	31.988	15.06	0.20	120	31.91	0.16	1.92	1.92	0.53	0.53	1.39	1.39
277.7	32.152	36.17	0.21	120	32.07	0.16	1.93	1.93	0.54	0.54	1.39	1.39
277.6	32.316	44.89	0.42	120	32.23	0.16	1.94	1.94	0.54	0.54	1.40	1.40
277.4	32.480	46.53	0.56	120	32.40	0.16	1.95	1.95	0.55	0.55	1.40	1.40
277.3	32.644	44.00	0.87	120	32.56	0.16	1.96	1.96	0.55	0.55	1.41	1.41
277.1	32.808	37.13	0.92	120	32.73	0.16	1.97	1.97	0.56	0.56	1.41	1.41
276.9	32.972	39.55	0.76	120	32.89	0.16	1.98	1.98	0.56	0.56	1.42	1.42
276.8	33.136	40.64	0.80	120	33.05	0.16	1.99	1.99	0.57	0.57	1.42	1.42
276.6	33.300	27.23	0.62	120	33.22	0.16	2.00	2.00	0.57	0.57	1.43	1.43
276.4	33.464	18.27	0.45	120	33.38	0.16	2.01	2.01	0.58	0.58	1.43	1.43
276.3	33.628	16.39	0.29	120	33.55	0.16	2.02	2.02	0.58	0.58	1.44	1.44
276.1	33.792	16.09	0.17	120	33.71	0.16	2.03	2.03	0.59	0.59	1.44	1.44
275.9	33.956	14.14	0.19	120	33.87	0.16	2.04	2.04	0.59	0.59	1.45	1.45
275.8	34.120	14.26	0.23	120	34.04	0.16	2.05	2.05	0.60	0.60	1.45	1.45
275.6	34.284	13.00	0.26	120	34.20	0.16	2.06	2.06	0.60	0.60	1.46	1.46
275.5	34.448	13.85	0.26	120	34.37	0.16	2.07	2.07	0.61	0.61	1.46	1.46

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σv CPT (tsf)	Total Vertical Stress during EQ σv EQ (tsf)	Static Pore Water Pressure during CPT us CPT (tsf)	Static Pore Water Pressure during EQ us EQ (tsf)	Effective Vertical Stress during CPT σv CPT (tsf)	Effective Vertical Stress during EQ σv EQ (tsf)
275.3	34.612	17.65	0.29	120	34.53	0.16	2.08	2.08	0.61	0.61	1.46	1.46
275.1	34.776	13.78	0.24	120	34.69	0.16	2.09	2.09	0.62	0.62	1.47	1.47
275.0	34.941	13.79	0.24	120	34.86	0.16	2.10	2.10	0.62	0.62	1.47	1.47
274.8	35.105	16.90	0.19	120	35.02	0.16	2.11	2.11	0.63	0.63	1.48	1.48
274.6	35.269	14.04	0.18	120	35.19	0.16	2.12	2.12	0.63	0.63	1.48	1.48
274.5	35.433	12.26	0.17	120	35.35	0.16	2.13	2.13	0.64	0.64	1.49	1.49
274.3	35.597	11.51	0.11	120	35.51	0.16	2.14	2.14	0.64	0.64	1.49	1.49
274.1	35.761	12.57	0.14	120	35.68	0.16	2.15	2.15	0.65	0.65	1.50	1.50
274.0	35.925	13.52	0.13	120	35.84	0.16	2.16	2.16	0.65	0.65	1.50	1.50
273.8	36.089	14.68	0.19	120	36.01	0.16	2.17	2.17	0.66	0.66	1.51	1.51
273.6	36.253	20.01	0.18	120	36.17	0.16	2.18	2.18	0.66	0.66	1.51	1.51
273.5	36.417	15.89	0.21	120	36.33	0.16	2.19	2.19	0.67	0.67	1.52	1.52
273.3	36.581	16.48	0.22	120	36.50	0.16	2.19	2.19	0.67	0.67	1.52	1.52
273.2	36.745	19.32	0.26	120	36.66	0.16	2.20	2.20	0.68	0.68	1.53	1.53
273.0	36.909	17.56	0.26	120	36.83	0.16	2.21	2.21	0.68	0.68	1.53	1.53
272.8	37.073	17.33	0.28	120	36.99	0.16	2.22	2.22	0.69	0.69	1.54	1.54
272.7	37.237	15.71	0.20	120	37.16	0.16	2.23	2.23	0.69	0.69	1.54	1.54
272.5	37.401	19.09	0.17	120	37.32	0.16	2.24	2.24	0.70	0.70	1.55	1.55
272.3	37.565	14.61	0.18	120	37.48	0.16	2.25	2.25	0.70	0.70	1.55	1.55
272.2	37.729	16.21	0.17	120	37.65	0.16	2.26	2.26	0.71	0.71	1.55	1.55
272.0	37.893	20.85	0.25	120	37.81	0.16	2.27	2.27	0.71	0.71	1.56	1.56
271.8	38.057	24.42	0.35	120	37.98	0.16	2.28	2.28	0.72	0.72	1.56	1.56
271.7	38.221	19.12	0.36	120	38.14	0.16	2.29	2.29	0.72	0.72	1.57	1.57
271.5	38.385	15.36	0.32	120	38.30	0.16	2.30	2.30	0.73	0.73	1.57	1.57
271.4	38.549	13.45	0.24	120	38.47	0.16	2.31	2.31	0.73	0.73	1.58	1.58
271.2	38.713	14.29	0.17	120	38.63	0.16	2.32	2.32	0.74	0.74	1.58	1.58
271.0	38.877	36.94	0.49	120	38.80	0.16	2.33	2.33	0.74	0.74	1.59	1.59
270.9	39.042	29.13	0.68	120	38.96	0.16	2.34	2.34	0.75	0.75	1.59	1.59
270.7	39.206	23.98	0.63	120	39.12	0.16	2.35	2.35	0.76	0.76	1.60	1.60
270.5	39.370	22.34	0.45	120	39.29	0.16	2.36	2.36	0.76	0.76	1.60	1.60
270.4	39.534	22.41	0.30	120	39.45	0.16	2.37	2.37	0.77	0.77	1.61	1.61
270.2	39.698	22.91	0.25	120	39.62	0.16	2.38	2.38	0.77	0.77	1.61	1.61
270.0	39.862	23.24	0.24	120	39.78	0.16	2.39	2.39	0.78	0.78	1.62	1.62
269.9	40.026	24.72	0.24	120	39.94	0.16	2.40	2.40	0.78	0.78	1.62	1.62
269.7	40.190	25.88	0.24	120	40.11	0.16	2.41	2.41	0.79	0.79	1.63	1.63
269.5	40.354	24.65	0.25	120	40.27	0.16	2.42	2.42	0.79	0.79	1.63	1.63
269.4	40.518	24.93	0.24	120	40.44	0.16	2.43	2.43	0.80	0.80	1.63	1.63
269.2	40.682	25.54	0.22	120	40.60	0.16	2.44	2.44	0.80	0.80	1.64	1.64
269.1	40.846	25.97	0.20	120	40.76	0.16	2.45	2.45	0.81	0.81	1.64	1.64
268.9	41.010	26.84	0.40	120	40.93	0.16	2.46	2.46	0.81	0.81	1.65	1.65
268.7	41.174	29.51	0.53	120	41.09	0.16	2.47	2.47	0.82	0.82	1.65	1.65
268.6	41.338	30.88	0.44	120	41.26	0.16	2.48	2.48	0.82	0.82	1.66	1.66
268.4	41.502	28.28	0.30	120	41.42	0.16	2.49	2.49	0.83	0.83	1.66	1.66
268.2	41.666	23.69	0.26	120	41.58	0.16	2.50	2.50	0.83	0.83	1.67	1.67
268.1	41.830	34.51	0.22	120	41.75	0.16	2.51	2.51	0.84	0.84	1.67	1.67
267.9	41.994	25.86	0.22	120	41.91	0.16	2.52	2.52	0.84	0.84	1.68	1.68
267.7	42.158	20.88	0.37	120	42.08	0.16	2.53	2.53	0.85	0.85	1.68	1.68
267.6	42.322	18.15	0.29	120	42.24	0.16	2.54	2.54	0.85	0.85	1.69	1.69
267.4	42.486	17.36	0.25	120	42.40	0.16	2.55	2.55	0.86	0.86	1.69	1.69
267.2	42.650	15.21	0.27	120	42.57	0.16	2.56	2.56	0.86	0.86	1.70	1.70
267.1	42.814	14.60	0.33	120	42.73	0.16	2.57	2.57	0.87	0.87	1.70	1.70
266.9	42.978	14.73	0.27	120	42.90	0.16	2.58	2.58	0.87	0.87	1.71	1.71
266.8	43.143	21.31	0.27	120	43.06	0.16	2.59	2.59	0.88	0.88	1.71	1.71
266.6	43.307	39.60	0.42	120	43.22	0.16	2.60	2.60	0.88	0.88	1.72	1.72
266.4	43.471	21.07	0.41	120	43.39	0.16	2.61	2.61	0.89	0.89	1.72	1.72
266.3	43.635	17.44	0.37	120	43.55	0.16	2.62	2.62	0.89	0.89	1.72	1.72
266.1	43.799	17.03	0.20	120	43.72	0.16	2.63	2.63	0.90	0.90	1.73	1.73
265.9	43.963	16.56	0.13	120	43.88	0.16	2.64	2.64	0.90	0.90	1.73	1.73
265.8	44.127	16.89	0.30	120	44.04	0.16	2.65	2.65	0.91	0.91	1.74	1.74
265.6	44.291	16.27	0.20	120	44.21	0.16	2.66	2.66	0.91	0.91	1.74	1.74
265.4	44.455	13.15	0.16	120	44.37	0.16	2.67	2.67	0.92	0.92	1.75	1.75
265.3	44.619	12.57	0.10	120	44.54	0.16	2.68	2.68	0.92	0.92	1.75	1.75
265.1	44.783	12.29	0.09	120	44.70	0.16	2.69	2.69	0.93	0.93	1.76	1.76
265.0	44.947	12.41	0.11	120	44.86	0.16	2.70	2.70	0.93	0.93	1.76	1.76
264.8	45.111	12.32	0.10	120	45.03	0.16	2.71	2.71	0.94	0.94	1.77	1.77
264.6	45.275	11.92	0.09	120	45.19	0.16	2.72	2.72	0.94	0.94	1.77	1.77
264.5	45.439	12.30	0.09	120	45.36	0.16	2.73	2.73	0.95	0.95	1.78	1.78
264.3	45.603	13.04	0.09	120	45.52	0.16	2.74	2.74	0.95	0.95	1.78	1.78
264.1	45.767	12.18	0.08	120	45.69	0.16	2.75	2.75	0.96	0.96	1.79	1.79
264.0	45.931	12.88	0.09	120	45.85	0.16	2.76	2.76	0.97	0.97	1.79	1.79
263.8	46.095	12.93	0.08	120	46.01	0.16	2.77	2.77	0.97	0.97	1.80	1.80
263.6	46.259	11.95	0.09	120	46.18	0.16	2.78	2.78	0.98	0.98	1.80	1.80
263.5	46.423	11.91	0.11	120	46.34	0.16	2.79	2.79	0.98	0.98	1.80	1.80
263.3	46.587	11.59	0.11	120	46.51	0.16	2.80	2.80	0.99	0.99	1.81	1.81

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σ _{V CPT} (tsf)	Total Vertical Stress during EQ σ _{V EQ} (tsf)	Static Pore Water Pressure during CPT u _{S CPT} (tsf)	Static Pore Water Pressure during EQ u _{S EQ} (tsf)	Effective Vertical Stress during CPT σ _{V CPT} (tsf)	Effective Vertical Stress during EQ σ _{V EQ} (tsf)
263.1	46.751	11.42	0.11	120	46.67	0.16	2.81	2.81	0.99	0.99	1.81	1.81
263.0	46.915	11.67	0.08	120	46.83	0.16	2.81	2.81	1.00	1.00	1.82	1.82
262.8	47.079	11.73	0.08	120	47.00	0.16	2.82	2.82	1.00	1.00	1.82	1.82
262.7	47.244	11.62	0.11	120	47.16	0.16	2.83	2.83	1.01	1.01	1.83	1.83
262.5	47.408	11.71	0.11	120	47.33	0.16	2.84	2.84	1.01	1.01	1.83	1.83
262.3	47.572	12.30	0.17	120	47.49	0.16	2.85	2.85	1.02	1.02	1.84	1.84
262.2	47.736	15.42	0.17	120	47.65	0.16	2.86	2.86	1.02	1.02	1.84	1.84
262.0	47.900	12.51	0.17	120	47.82	0.16	2.87	2.87	1.03	1.03	1.85	1.85
261.8	48.064	11.52	0.19	120	47.98	0.16	2.88	2.88	1.03	1.03	1.85	1.85
261.7	48.228	11.98	0.13	120	48.15	0.16	2.89	2.89	1.04	1.04	1.86	1.86
261.5	48.392	11.74	0.12	120	48.31	0.16	2.90	2.90	1.04	1.04	1.86	1.86
261.3	48.556	11.54	0.21	120	48.47	0.16	2.91	2.91	1.05	1.05	1.87	1.87
261.2	48.720	12.09	0.47	120	48.64	0.16	2.92	2.92	1.05	1.05	1.87	1.87
261.0	48.884	70.52	0.69	120	48.80	0.16	2.93	2.93	1.06	1.06	1.88	1.88
260.9	49.048	158.28	1.06	120	48.97	0.16	2.94	2.94	1.06	1.06	1.88	1.88
260.7	49.212	181.61	1.40	120	49.13	0.16	2.95	2.95	1.07	1.07	1.89	1.89
260.5	49.376	178.28	1.51	120	49.29	0.16	2.96	2.96	1.07	1.07	1.89	1.89
260.4	49.540	163.56	1.55	120	49.46	0.16	2.97	2.97	1.08	1.08	1.89	1.89
260.2	49.704	144.33	1.51	120	49.62	0.16	2.98	2.98	1.08	1.08	1.90	1.90
260.0	49.868	131.62	1.37	120	49.79	0.16	2.99	2.99	1.09	1.09	1.90	1.90
259.9	50.032	118.86	1.27	120	49.95	0.16	3.00	3.00	1.09	1.09	1.91	1.91
259.7	50.196	112.67	1.09	120	50.11	0.16	3.01	3.01	1.10	1.10	1.91	1.91
259.5	50.360	95.36	1.15	120	50.28	0.16	3.02	3.02	1.10	1.10	1.92	1.92
259.4	50.524	66.66	1.49	120	50.44	0.16	3.03	3.03	1.11	1.11	1.92	1.92
259.2	50.688	40.07	1.61	120	50.61	0.16	3.04	3.04	1.11	1.11	1.93	1.93
259.0	50.852	22.14	1.27	120	50.77	0.16	3.05	3.05	1.12	1.12	1.93	1.93
258.9	51.016	33.38	1.20	120	50.93	0.16	3.06	3.06	1.12	1.12	1.94	1.94
258.7	51.180	32.70	1.10	120	51.10	0.16	3.07	3.07	1.13	1.13	1.94	1.94
258.6	51.345	21.63	1.08	120	51.26	0.16	3.08	3.08	1.13	1.13	1.95	1.95
258.4	51.509	16.10	0.75	120	51.43	0.16	3.09	3.09	1.14	1.14	1.95	1.95
258.2	51.673	62.56	0.68	120	51.59	0.16	3.10	3.10	1.14	1.14	1.96	1.96
258.1	51.837	40.66	1.28	120	51.75	0.16	3.11	3.11	1.15	1.15	1.96	1.96
257.9	52.001	26.05	1.13	120	51.92	0.16	3.12	3.12	1.15	1.15	1.97	1.97
257.7	52.165	14.94	0.90	120	52.08	0.16	3.13	3.13	1.16	1.16	1.97	1.97
257.6	52.329	15.29	0.41	120	52.25	0.16	3.14	3.14	1.16	1.16	1.98	1.98
257.4	52.493	14.91	0.23	120	52.41	0.16	3.15	3.15	1.17	1.17	1.98	1.98
257.2	52.657	14.03	0.22	120	52.57	0.16	3.16	3.16	1.17	1.17	1.98	1.98
257.1	52.821	13.44	0.20	120	52.74	0.16	3.17	3.17	1.18	1.18	1.99	1.99
256.9	52.985	13.51	0.19	120	52.90	0.16	3.18	3.18	1.19	1.19	1.99	1.99
256.8	53.149	13.41	0.16	120	53.07	0.16	3.19	3.19	1.19	1.19	2.00	2.00
256.6	53.313	12.54	0.15	120	53.23	0.16	3.20	3.20	1.20	1.20	2.00	2.00
256.4	53.477	13.18	0.14	120	53.40	0.16	3.21	3.21	1.20	1.20	2.01	2.01
256.3	53.641	12.93	0.15	120	53.56	0.16	3.22	3.22	1.21	1.21	2.01	2.01
256.1	53.805	13.44	0.20	120	53.72	0.16	3.23	3.23	1.21	1.21	2.02	2.02
255.9	53.969	16.17	0.22	120	53.89	0.16	3.24	3.24	1.22	1.22	2.02	2.02
255.8	54.133	13.38	0.23	120	54.05	0.16	3.25	3.25	1.22	1.22	2.03	2.03
255.6	54.297	13.34	0.23	120	54.22	0.16	3.26	3.26	1.23	1.23	2.03	2.03
255.4	54.461	13.32	0.20	120	54.38	0.16	3.27	3.27	1.23	1.23	2.04	2.04
255.3	54.625	13.01	0.18	120	54.54	0.16	3.28	3.28	1.24	1.24	2.04	2.04
255.1	54.789	12.89	0.16	120	54.71	0.16	3.29	3.29	1.24	1.24	2.05	2.05
254.9	54.953	13.45	0.15	120	54.87	0.16	3.30	3.30	1.25	1.25	2.05	2.05
254.8	55.117	13.84	0.17	120	55.04	0.16	3.31	3.31	1.25	1.25	2.06	2.06
254.6	55.281	13.50	0.20	120	55.20	0.16	3.32	3.32	1.26	1.26	2.06	2.06
254.5	55.446	13.04	0.21	120	55.36	0.16	3.33	3.33	1.26	1.26	2.06	2.06
254.3	55.610	13.48	0.18	120	55.53	0.16	3.34	3.34	1.27	1.27	2.07	2.07
254.1	55.774	13.80	0.17	120	55.69	0.16	3.35	3.35	1.27	1.27	2.07	2.07
254.0	55.938	13.98	0.21	120	55.86	0.16	3.36	3.36	1.28	1.28	2.08	2.08
253.8	56.102	13.53	0.20	120	56.02	0.16	3.37	3.37	1.28	1.28	2.08	2.08
253.6	56.266	13.43	0.21	120	56.18	0.16	3.38	3.38	1.29	1.29	2.09	2.09
253.5	56.430	12.80	0.18	120	56.35	0.16	3.39	3.39	1.29	1.29	2.09	2.09
253.3	56.594	12.94	0.16	120	56.51	0.16	3.40	3.40	1.30	1.30	2.10	2.10
253.1	56.758	12.78	0.13	120	56.68	0.16	3.41	3.41	1.30	1.30	2.10	2.10
253.0	56.922	12.66	0.12	120	56.84	0.16	3.42	3.42	1.31	1.31	2.11	2.11
252.8	57.086	13.37	0.15	120	57.00	0.16	3.43	3.43	1.31	1.31	2.11	2.11
252.7	57.250	13.54	0.19	120	57.17	0.16	3.43	3.43	1.32	1.32	2.12	2.12
252.5	57.414	13.06	0.20	120	57.33	0.16	3.44	3.44	1.32	1.32	2.12	2.12
252.3	57.578	12.96	0.19	120	57.50	0.16	3.45	3.45	1.33	1.33	2.13	2.13
252.2	57.742	12.91	0.16	120	57.66	0.16	3.46	3.46	1.33	1.33	2.13	2.13
252.0	57.906	13.01	0.16	120	57.82	0.16	3.47	3.47	1.34	1.34	2.14	2.14
251.8	58.070	13.03	0.15	120	57.99	0.16	3.48	3.48	1.34	1.34	2.14	2.14
251.7	58.234	13.75	0.17	120	58.15	0.16	3.49	3.49	1.35	1.35	2.15	2.15
251.5	58.398	13.53	0.19	120	58.32	0.16	3.50	3.50	1.35	1.35	2.15	2.15
251.3	58.562	13.27	0.24	120	58.48	0.16	3.51	3.51	1.36	1.36	2.15	2.15
251.2	58.726	13.44	0.20	120	58.64	0.16	3.52	3.52	1.36	1.36	2.16	2.16

Elev.	Depth	Cone Tip	Sleeve	Unit Weight	Top of	Thickness of	Total Vertical Stress during CPT	Total Vertical Stress during EQ	Static Pore Water Pressure during CPT	Static Pore Water Pressure during EQ	Effective Vertical Stress during CPT	Effective Vertical Stress during EQ
(ft)	z (ft)	Resistance qt (tsf)	Friction fs (tsf)	Y (pcf)	Sampling Interval (ft)	Sampling Interval (ft)	$\sigma_{V\ CPT}$ (tsf)	$\sigma_{V\ EQ}$ (tsf)	$u_{S\ CPT}$ (tsf)	$u_{S\ EQ}$ (tsf)	$\sigma_{V\ CPT}$ (tsf)	$\sigma_{V\ EQ}$ (tsf)
251.0	58.890	14.12	0.18	120	58.81	0.16	3.53	3.53	1.37	1.37	2.16	2.16
250.8	59.054	13.59	0.17	120	58.97	0.16	3.54	3.54	1.37	1.37	2.17	2.17
250.7	59.218	13.87	0.20	120	59.14	0.16	3.55	3.55	1.38	1.38	2.17	2.17
250.5	59.382	13.78	0.20	120	59.30	0.16	3.56	3.56	1.38	1.38	2.18	2.18
250.4	59.547	13.92	0.21	120	59.46	0.16	3.57	3.57	1.39	1.39	2.18	2.18
250.2	59.711	13.82	0.21	120	59.63	0.16	3.58	3.58	1.39	1.39	2.19	2.19
250.0	59.875	13.75	0.25	120	59.79	0.16	3.59	3.59	1.40	1.40	2.19	2.19
249.9	60.039	13.40	0.22	120	59.96	0.16	3.60	3.60	1.41	1.41	2.20	2.20
249.7	60.203	13.72	0.22	120	60.12	0.16	3.61	3.61	1.41	1.41	2.20	2.20
249.5	60.367	13.58	0.44	120	60.28	0.16	3.62	3.62	1.42	1.42	2.21	2.21
249.4	60.531	17.02	0.53	120	60.45	0.16	3.63	3.63	1.42	1.42	2.21	2.21
249.2	60.695	113.92	0.74	120	60.61	0.16	3.64	3.64	1.43	1.43	2.22	2.22
249.0	60.859	137.53	1.01	120	60.78	0.16	3.65	3.65	1.43	1.43	2.22	2.22
248.9	61.023	136.10	1.25	120	60.94	0.16	3.66	3.66	1.44	1.44	2.23	2.23
248.7	61.187	132.37	1.30	120	61.10	0.16	3.67	3.67	1.44	1.44	2.23	2.23
248.5	61.351	128.96	1.21	120	61.27	0.16	3.68	3.68	1.45	1.45	2.23	2.23
248.4	61.515	124.16	1.25	120	61.43	0.16	3.69	3.69	1.45	1.45	2.24	2.24
248.2	61.679	113.08	1.72	120	61.60	0.16	3.70	3.70	1.46	1.46	2.24	2.24
248.1	61.843	64.10	2.10	120	61.76	0.16	3.71	3.71	1.46	1.46	2.25	2.25
247.9	62.007	33.01	1.97	120	61.93	0.16	3.72	3.72	1.47	1.47	2.25	2.25
247.7	62.171	22.00	1.31	120	62.09	0.16	3.73	3.73	1.47	1.47	2.26	2.26
247.6	62.335	16.82	0.89	120	62.25	0.16	3.74	3.74	1.48	1.48	2.26	2.26
247.4	62.499	14.58	0.50	120	62.42	0.16	3.75	3.75	1.48	1.48	2.27	2.27
247.2	62.663	13.76	0.32	120	62.58	0.16	3.76	3.76	1.49	1.49	2.27	2.27
247.1	62.827	13.29	0.29	120	62.75	0.16	3.77	3.77	1.49	1.49	2.28	2.28
246.9	62.991	13.14	0.26	120	62.91	0.16	3.78	3.78	1.50	1.50	2.28	2.28
246.7	63.155	12.99	0.24	120	63.07	0.16	3.79	3.79	1.50	1.50	2.29	2.29
246.6	63.319	13.06	0.23	120	63.24	0.16	3.80	3.80	1.51	1.51	2.29	2.29
246.4	63.483	13.11	0.23	120	63.40	0.16	3.81	3.81	1.51	1.51	2.30	2.30
246.3	63.648	13.58	0.20	120	63.57	0.16	3.82	3.82	1.52	1.52	2.30	2.30
246.1	63.812	13.58	0.19	120	63.73	0.16	3.83	3.83	1.52	1.52	2.31	2.31
245.9	63.976	13.97	0.18	120	63.89	0.16	3.84	3.84	1.53	1.53	2.31	2.31
245.8	64.140	14.25	0.19	120	64.06	0.16	3.85	3.85	1.53	1.53	2.32	2.32
245.6	64.304	14.21	0.20	120	64.22	0.16	3.86	3.86	1.54	1.54	2.32	2.32
245.4	64.468	14.36	0.23	120	64.39	0.16	3.87	3.87	1.54	1.54	2.32	2.32
245.3	64.632	14.54	0.21	120	64.55	0.16	3.88	3.88	1.55	1.55	2.33	2.33
245.1	64.796	14.97	0.21	120	64.71	0.16	3.89	3.89	1.55	1.55	2.33	2.33
244.9	64.960	15.15	0.23	120	64.88	0.16	3.90	3.90	1.56	1.56	2.34	2.34
244.8	65.124	14.82	0.30	120	65.04	0.16	3.91	3.91	1.56	1.56	2.34	2.34
244.6	65.288	14.79	0.29	120	65.21	0.16	3.92	3.92	1.57	1.57	2.35	2.35
244.4	65.452	14.26	0.24	120	65.37	0.16	3.93	3.93	1.57	1.57	2.35	2.35
244.3	65.616	14.07	0.20	120	65.53	0.16	3.94	3.94	1.58	1.58	2.36	2.36
244.1	65.780	14.74	0.18	120	65.70	0.16	3.95	3.95	1.58	1.58	2.36	2.36
244.0	65.944	14.30	0.18	120	65.86	0.16	3.96	3.96	1.59	1.59	2.37	2.37
243.8	66.108	13.78	0.18	120	66.03	0.16	3.97	3.97	1.59	1.59	2.37	2.37
243.6	66.272	13.97	0.20	120	66.19	0.16	3.98	3.98	1.60	1.60	2.38	2.38
243.5	66.436	14.09	0.20	120	66.35	0.16	3.99	3.99	1.60	1.60	2.38	2.38
243.3	66.600	14.85	0.23	120	66.52	0.16	4.00	4.00	1.61	1.61	2.39	2.39
243.1	66.764	14.53	0.24	120	66.68	0.16	4.01	4.01	1.62	1.62	2.39	2.39
243.0	66.928	14.30	0.26	120	66.85	0.16	4.02	4.02	1.62	1.62	2.40	2.40
242.8	67.092	14.11	0.23	120	67.01	0.16	4.03	4.03	1.63	1.63	2.40	2.40
242.6	67.256	13.99	0.21	120	67.17	0.16	4.04	4.04	1.63	1.63	2.40	2.40
242.5	67.420	14.08	0.20	120	67.34	0.16	4.05	4.05	1.64	1.64	2.41	2.41
242.3	67.584	13.77	0.20	120	67.50	0.16	4.06	4.06	1.64	1.64	2.41	2.41
242.2	67.749	13.69	0.20	120	67.67	0.16	4.06	4.06	1.65	1.65	2.42	2.42
242.0	67.913	13.78	0.21	120	67.83	0.16	4.07	4.07	1.65	1.65	2.42	2.42
241.8	68.077	14.15	0.20	120	67.99	0.16	4.08	4.08	1.66	1.66	2.43	2.43
241.7	68.241	14.50	0.21	120	68.16	0.16	4.09	4.09	1.66	1.66	2.43	2.43
241.5	68.405	15.96	0.29	120	68.32	0.16	4.10	4.10	1.67	1.67	2.44	2.44
241.3	68.569	15.77	0.32	120	68.49	0.16	4.11	4.11	1.67	1.67	2.44	2.44
241.2	68.733	15.79	0.34	120	68.65	0.16	4.12	4.12	1.68	1.68	2.45	2.45
241.0	68.897	15.37	0.29	120	68.81	0.16	4.13	4.13	1.68	1.68	2.45	2.45
240.8	69.061	14.93	0.27	120	68.98	0.16	4.14	4.14	1.69	1.69	2.46	2.46
240.7	69.225	14.59	0.24	120	69.14	0.16	4.15	4.15	1.69	1.69	2.46	2.46
240.5	69.389	14.55	0.23	120	69.31	0.16	4.16	4.16	1.70	1.70	2.47	2.47
240.3	69.553	14.46	0.22	120	69.47	0.16	4.17	4.17	1.70	1.70	2.47	2.47
240.2	69.717	14.21	0.22	120	69.63	0.16	4.18	4.18	1.71	1.71	2.48	2.48
240.0	69.881	14.17	0.23	120	69.80	0.16	4.19	4.19	1.71	1.71	2.48	2.48
239.9	70.045	14.27	0.22	120	69.96	0.16	4.20	4.20	1.72	1.72	2.49	2.49
239.7	70.209	14.50	0.21	120	70.13	0.16	4.21	4.21	1.72	1.72	2.49	2.49
239.5	70.373	14.70	0.21	120	70.29	0.16	4.22	4.22	1.73	1.73	2.49	2.49
239.4	70.537	15.23	0.24	120	70.46	0.16	4.23	4.23	1.73	1.73	2.50	2.50
239.2	70.701	15.05	0.26	120	70.62	0.16	4.24	4.24	1.74	1.74	2.50	2.50
239.0	70.865	14.90	0.26	120	70.78	0.16	4.25	4.25	1.74	1.74	2.51	2.51

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σv CPT (tsf)	Total Vertical Stress during EQ σv EQ (tsf)	Static Pore Water Pressure during CPT us CPT (tsf)	Static Pore Water Pressure during EQ us EQ (tsf)	Effective Vertical Stress during CPT σv CPT (tsf)	Effective Vertical Stress during EQ σv EQ (tsf)
238.9	71.029	14.96	0.23	120	70.95	0.16	4.26	4.26	1.75	1.75	2.51	2.51
238.7	71.193	15.04	0.22	120	71.11	0.16	4.27	4.27	1.75	1.75	2.52	2.52
238.5	71.357	14.92	0.23	120	71.28	0.16	4.28	4.28	1.76	1.76	2.52	2.52
238.4	71.521	14.78	0.24	120	71.44	0.16	4.29	4.29	1.76	1.76	2.53	2.53
238.2	71.685	14.88	0.24	120	71.60	0.16	4.30	4.30	1.77	1.77	2.53	2.53
238.1	71.850	14.78	0.23	120	71.77	0.16	4.31	4.31	1.77	1.77	2.54	2.54
237.9	72.014	14.92	0.23	120	71.93	0.16	4.32	4.32	1.78	1.78	2.54	2.54
237.7	72.178	14.41	0.22	120	72.10	0.16	4.33	4.33	1.78	1.78	2.55	2.55
237.6	72.342	14.25	0.21	120	72.26	0.16	4.34	4.34	1.79	1.79	2.55	2.55
237.4	72.506	13.85	0.17	120	72.42	0.16	4.35	4.35	1.79	1.79	2.56	2.56
237.2	72.670	13.92	0.16	120	72.59	0.16	4.36	4.36	1.80	1.80	2.56	2.56
237.1	72.834	14.28	0.17	120	72.75	0.16	4.37	4.37	1.80	1.80	2.57	2.57
236.9	72.998	14.15	0.18	120	72.92	0.16	4.38	4.38	1.81	1.81	2.57	2.57
236.7	73.162	14.52	0.19	120	73.08	0.16	4.39	4.39	1.81	1.81	2.58	2.58
236.6	73.326	14.84	0.21	120	73.24	0.16	4.40	4.40	1.82	1.82	2.58	2.58
236.4	73.490	15.27	0.24	120	73.41	0.16	4.41	4.41	1.82	1.82	2.58	2.58
236.2	73.654	14.93	0.24	120	73.57	0.16	4.42	4.42	1.83	1.83	2.59	2.59
236.1	73.818	15.13	0.24	120	73.74	0.16	4.43	4.43	1.84	1.84	2.59	2.59
235.9	73.982	14.82	0.22	120	73.90	0.16	4.44	4.44	1.84	1.84	2.60	2.60
235.8	74.146	15.07	0.23	120	74.06	0.16	4.45	4.45	1.85	1.85	2.60	2.60
235.6	74.310	14.56	0.22	120	74.23	0.16	4.46	4.46	1.85	1.85	2.61	2.61
235.4	74.474	14.69	0.21	120	74.39	0.16	4.47	4.47	1.86	1.86	2.61	2.61
235.3	74.638	15.26	0.19	120	74.56	0.16	4.48	4.48	1.86	1.86	2.62	2.62
235.1	74.802	14.64	0.20	120	74.72	0.16	4.49	4.49	1.87	1.87	2.62	2.62
234.9	74.966	14.63	0.27	120	74.88	0.16	4.50	4.50	1.87	1.87	2.63	2.63
234.8	75.130	14.87	0.23	120	75.05	0.16	4.51	4.51	1.88	1.88	2.63	2.63
234.6	75.294	15.90	0.24	120	75.21	0.16	4.52	4.52	1.88	1.88	2.64	2.64
234.4	75.458	15.37	0.24	120	75.38	0.16	4.53	4.53	1.89	1.89	2.64	2.64
234.3	75.622	15.41	0.24	120	75.54	0.16	4.54	4.54	1.89	1.89	2.65	2.65
234.1	75.786	15.47	0.23	120	75.70	0.16	4.55	4.55	1.90	1.90	2.65	2.65
233.9	75.951	15.44	0.24	120	75.87	0.16	4.56	4.56	1.90	1.90	2.66	2.66
233.8	76.115	16.01	0.26	120	76.03	0.16	4.57	4.57	1.91	1.91	2.66	2.66
233.6	76.279	16.04	0.28	120	76.20	0.16	4.58	4.58	1.91	1.91	2.66	2.66
233.5	76.443	15.50	0.31	120	76.36	0.16	4.59	4.59	1.92	1.92	2.67	2.67
233.3	76.607	15.32	0.23	120	76.52	0.16	4.60	4.60	1.92	1.92	2.67	2.67
233.1	76.771	16.43	0.26	120	76.69	0.16	4.61	4.61	1.93	1.93	2.68	2.68
233.0	76.935	15.77	0.24	120	76.85	0.16	4.62	4.62	1.93	1.93	2.68	2.68
232.8	77.099	15.56	0.25	120	77.02	0.16	4.63	4.63	1.94	1.94	2.69	2.69
232.6	77.263	15.45	0.19	120	77.18	0.16	4.64	4.64	1.94	1.94	2.69	2.69
232.5	77.427	15.67	0.18	120	77.34	0.16	4.65	4.65	1.95	1.95	2.70	2.70
232.3	77.591	15.46	0.18	120	77.51	0.16	4.66	4.66	1.95	1.95	2.70	2.70
232.1	77.755	15.47	0.18	120	77.67	0.16	4.67	4.67	1.96	1.96	2.71	2.71
232.0	77.919	15.43	0.18	120	77.84	0.16	4.68	4.68	1.96	1.96	2.71	2.71
231.8	78.083	15.36	0.17	120	78.00	0.16	4.68	4.68	1.97	1.97	2.72	2.72
231.7	78.247	15.03	0.18	120	78.17	0.16	4.69	4.69	1.97	1.97	2.72	2.72
231.5	78.411	15.13	0.18	120	78.33	0.16	4.70	4.70	1.98	1.98	2.73	2.73
231.3	78.575	14.96	0.17	120	78.49	0.16	4.71	4.71	1.98	1.98	2.73	2.73
231.2	78.739	15.10	0.19	120	78.66	0.16	4.72	4.72	1.99	1.99	2.74	2.74
231.0	78.903	15.16	0.20	120	78.82	0.16	4.73	4.73	1.99	1.99	2.74	2.74
230.8	79.067	15.20	0.22	120	78.99	0.16	4.74	4.74	2.00	2.00	2.75	2.75
230.7	79.231	15.09	0.23	120	79.15	0.16	4.75	4.75	2.00	2.00	2.75	2.75
230.5	79.395	15.77	0.29	120	79.31	0.16	4.76	4.76	2.01	2.01	2.75	2.75
230.3	79.559	17.25	0.61	120	79.48	0.16	4.77	4.77	2.01	2.01	2.76	2.76
230.2	79.723	31.67	1.00	120	79.64	0.16	4.78	4.78	2.02	2.02	2.76	2.76
230.0	79.887	246.31	1.26	120	79.81	0.16	4.79	4.79	2.02	2.02	2.77	2.77
229.8	80.052	327.83	1.13	120	79.97	0.16	4.80	4.80	2.03	2.03	2.77	2.77
229.7	80.216	292.31	0.77	120	80.13	0.16	4.81	4.81	2.03	2.03	2.78	2.78
229.5	80.380	218.96	1.28	120	80.30	0.16	4.82	4.82	2.04	2.04	2.78	2.78
229.4	80.544	143.27	1.17	120	80.46	0.16	4.83	4.83	2.04	2.04	2.79	2.79
229.2	80.708	88.96	1.47	120	80.63	0.16	4.84	4.84	2.05	2.05	2.79	2.79
229.0	80.872	45.67	1.80	120	80.79	0.16	4.85	4.85	2.06	2.06	2.80	2.80
228.9	81.036	28.67	1.56	120	80.95	0.16	4.86	4.86	2.06	2.06	2.80	2.80
228.7	81.200	27.13	1.05	120	81.12	0.16	4.87	4.87	2.07	2.07	2.81	2.81
228.5	81.364	25.69	0.54	120	81.28	0.16	4.88	4.88	2.07	2.07	2.81	2.81
228.4	81.528	36.53	0.41	120	81.45	0.16	4.89	4.89	2.08	2.08	2.82	2.82
228.2	81.692	62.41	0.54	120	81.61	0.16	4.90	4.90	2.08	2.08	2.82	2.82
228.0	81.856	68.47	0.41	120	81.77	0.16	4.91	4.91	2.09	2.09	2.83	2.83
227.9	82.020	88.32	0.47	120	81.94	0.16	4.92	4.92	2.09	2.09	2.83	2.83
227.7	82.184	57.35	1.03	120	82.10	0.16	4.93	4.93	2.10	2.10	2.83	2.83
227.6	82.348	33.74	0.94	120	82.27	0.16	4.94	4.94	2.10	2.10	2.84	2.84
227.4	82.512	22.43	1.04	120	82.43	0.16	4.95	4.95	2.11	2.11	2.84	2.84
227.2	82.676	28.50	0.54	120	82.59	0.16	4.96	4.96	2.11	2.11	2.85	2.85
227.1	82.840	43.28	0.67	120	82.76	0.16	4.97	4.97	2.12	2.12	2.85	2.85
226.9	83.004	169.43	1.30	120	82.92	0.16	4.98	4.98	2.12	2.12	2.86	2.86

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σv CPT (tsf)	Total Vertical Stress during EQ σv EQ (tsf)	Static Pore Water Pressure during CPT us CPT (tsf)	Static Pore Water Pressure during EQ us EQ (tsf)	Effective Vertical Stress during CPT σv CPT (tsf)	Effective Vertical Stress during EQ σv EQ (tsf)
226.7	83.168	249.95	2.18	120	83.09	0.16	4.99	4.99	2.13	2.13	2.86	2.86
226.6	83.332	259.02	3.11	120	83.25	0.16	5.00	5.00	2.13	2.13	2.87	2.87
226.4	83.496	255.33	3.95	120	83.41	0.16	5.01	5.01	2.14	2.14	2.87	2.87
226.2	83.660	253.81	4.08	120	83.58	0.16	5.02	5.02	2.14	2.14	2.88	2.88
226.1	83.824	254.87	4.12	120	83.74	0.16	5.03	5.03	2.15	2.15	2.88	2.88
225.9	83.988	276.02	4.22	120	83.91	0.16	5.04	5.04	2.15	2.15	2.89	2.89
225.7	84.153	275.67	4.51	120	84.07	0.16	5.05	5.05	2.16	2.16	2.89	2.89
225.6	84.317	258.02	4.54	120	84.23	0.16	5.06	5.06	2.16	2.16	2.90	2.90
225.4	84.481	226.45	4.00	120	84.40	0.16	5.07	5.07	2.17	2.17	2.90	2.90
225.3	84.645	191.48	2.92	120	84.56	0.16	5.08	5.08	2.17	2.17	2.91	2.91
225.1	84.809	170.48	1.63	120	84.73	0.16	5.09	5.09	2.18	2.18	2.91	2.91
224.9	84.973	138.82	0.62	120	84.89	0.16	5.10	5.10	2.18	2.18	2.92	2.92
224.8	85.137	105.98	0.20	120	85.05	0.16	5.11	5.11	2.19	2.19	2.92	2.92
224.6	85.301	92.63	0.12	120	85.22	0.16	5.12	5.12	2.19	2.19	2.92	2.92
224.4	85.465	54.80	0.26	120	85.38	0.16	5.13	5.13	2.20	2.20	2.93	2.93
224.3	85.629	58.77	0.55	120	85.55	0.16	5.14	5.14	2.20	2.20	2.93	2.93
224.1	85.793	76.89	1.26	120	85.71	0.16	5.15	5.15	2.21	2.21	2.94	2.94
223.9	85.957	194.25	1.21	120	85.87	0.16	5.16	5.16	2.21	2.21	2.94	2.94
223.8	86.121	231.90	0.90	120	86.04	0.16	5.17	5.17	2.22	2.22	2.95	2.95
223.6	86.285	243.19	0.56	120	86.20	0.16	5.18	5.18	2.22	2.22	2.95	2.95
223.5	86.449	258.65	0.68	120	86.37	0.16	5.19	5.19	2.23	2.23	2.96	2.96
223.3	86.613	254.67	0.82	120	86.53	0.16	5.20	5.20	2.23	2.23	2.96	2.96
223.1	86.777	258.72	0.82	120	86.70	0.16	5.21	5.21	2.24	2.24	2.97	2.97
223.0	86.941	293.73	0.97	120	86.86	0.16	5.22	5.22	2.24	2.24	2.97	2.97
222.8	87.105	308.05	1.25	120	87.02	0.16	5.23	5.23	2.25	2.25	2.98	2.98
222.6	87.269	326.88	1.22	120	87.19	0.16	5.24	5.24	2.25	2.25	2.98	2.98
222.5	87.433	288.15	1.56	120	87.35	0.16	5.25	5.25	2.26	2.26	2.99	2.99
222.3	87.597	222.55	2.51	120	87.52	0.16	5.26	5.26	2.27	2.27	2.99	2.99
222.1	87.761	174.47	1.99	120	87.68	0.16	5.27	5.27	2.27	2.27	3.00	3.00
222.0	87.925	131.76	1.62	120	87.84	0.16	5.28	5.28	2.28	2.28	3.00	3.00
221.8	88.089	67.23	1.45	120	88.01	0.16	5.29	5.29	2.28	2.28	3.00	3.00
221.6	88.254	90.13	0.85	120	88.17	0.16	5.30	5.30	2.29	2.29	3.01	3.01
221.5	88.418	109.33	0.40	120	88.34	0.16	5.31	5.31	2.29	2.29	3.01	3.01
221.3	88.582	123.53	0.41	120	88.50	0.16	5.31	5.31	2.30	2.30	3.02	3.02
221.2	88.746	150.15	0.25	120	88.66	0.16	5.32	5.32	2.30	2.30	3.02	3.02
221.0	88.910	163.43	0.45	120	88.83	0.16	5.33	5.33	2.31	2.31	3.03	3.03
220.8	89.074	193.29	0.39	120	88.99	0.16	5.34	5.34	2.31	2.31	3.03	3.03
220.7	89.238	211.26	0.30	120	89.16	0.16	5.35	5.35	2.32	2.32	3.04	3.04
220.5	89.402	207.88	0.57	120	89.32	0.16	5.36	5.36	2.32	2.32	3.04	3.04
220.3	89.566	205.06	0.34	120	89.48	0.16	5.37	5.37	2.33	2.33	3.05	3.05
220.2	89.730	193.78	0.41	120	89.65	0.16	5.38	5.38	2.33	2.33	3.05	3.05
220.0	89.894	235.43	1.78	120	89.81	0.16	5.39	5.39	2.34	2.34	3.06	3.06
219.8	90.058	223.70	1.12	120	89.98	0.16	5.40	5.40	2.34	2.34	3.06	3.06
219.7	90.222	151.84	2.10	120	90.14	0.16	5.41	5.41	2.35	2.35	3.07	3.07
219.5	90.386	70.21	2.03	120	90.30	0.16	5.42	5.42	2.35	2.35	3.07	3.07
219.3	90.550	31.20	1.81	120	90.47	0.16	5.43	5.43	2.36	2.36	3.08	3.08
219.2	90.714	20.01	0.85	120	90.63	0.16	5.44	5.44	2.36	2.36	3.08	3.08
219.0	90.878	18.36	0.23	120	90.80	0.16	5.45	5.45	2.37	2.37	3.09	3.09
218.9	91.042	18.31	0.18	120	90.96	0.16	5.46	5.46	2.37	2.37	3.09	3.09
218.7	91.206	22.28	0.27	120	91.12	0.16	5.47	5.47	2.38	2.38	3.09	3.09
218.5	91.370	20.38	0.29	120	91.29	0.16	5.48	5.48	2.38	2.38	3.10	3.10
218.4	91.534	19.80	0.25	120	91.45	0.16	5.49	5.49	2.39	2.39	3.10	3.10
218.2	91.698	37.34	0.43	120	91.62	0.16	5.50	5.50	2.39	2.39	3.11	3.11
218.0	91.862	40.11	0.39	120	91.78	0.16	5.51	5.51	2.40	2.40	3.11	3.11
217.9	92.026	31.44	0.52	120	91.94	0.16	5.52	5.52	2.40	2.40	3.12	3.12
217.7	92.190	27.79	0.49	120	92.11	0.16	5.53	5.53	2.41	2.41	3.12	3.12
217.5	92.355	19.93	0.37	120	92.27	0.16	5.54	5.54	2.41	2.41	3.13	3.13
217.4	92.519	19.51	0.18	120	92.44	0.16	5.55	5.55	2.42	2.42	3.13	3.13
217.2	92.683	18.98	0.14	120	92.60	0.16	5.56	5.56	2.42	2.42	3.14	3.14
217.1	92.847	19.09	0.13	120	92.76	0.16	5.57	5.57	2.43	2.43	3.14	3.14
216.9	93.011	19.05	0.13	120	92.93	0.16	5.58	5.58	2.43	2.43	3.15	3.15
216.7	93.175	18.84	0.14	120	93.09	0.16	5.59	5.59	2.44	2.44	3.15	3.15
216.6	93.339	19.12	0.19	120	93.26	0.16	5.60	5.60	2.44	2.44	3.16	3.16
216.4	93.503	20.16	1.20	120	93.42	0.16	5.61	5.61	2.45	2.45	3.16	3.16
216.2	93.667	126.90	2.60	120	93.58	0.16	5.62	5.62	2.45	2.45	3.17	3.17
216.1	93.831	165.08	4.70	120	93.75	0.16	5.63	5.63	2.46	2.46	3.17	3.17
215.9	93.995	180.80	6.19	120	93.91	0.16	5.64	5.64	2.46	2.46	3.18	3.18
215.7	94.159	192.31	4.69	120	94.08	0.16	5.65	5.65	2.47	2.47	3.18	3.18
215.6	94.323	220.44	3.15	120	94.24	0.16	5.66	5.66	2.47	2.47	3.18	3.18
215.4	94.487	239.52	2.89	120	94.41	0.16	5.67	5.67	2.48	2.48	3.19	3.19
215.2	94.651	219.54	1.63	120	94.57	0.16	5.68	5.68	2.49	2.49	3.19	3.19
215.1	94.815	187.28	2.12	120	94.73	0.16	5.69	5.69	2.49	2.49	3.20	3.20
214.9	94.979	163.99	2.50	120	94.90	0.16	5.70	5.70	2.50	2.50	3.20	3.20
214.8	95.143	139.83	2.47	120	95.06	0.16	5.71	5.71	2.50	2.50	3.21	3.21

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σ _{v CPT} (tsf)	Total Vertical Stress during EQ σ _{v EQ} (tsf)	Static Pore Water Pressure during CPT u _{s CPT} (tsf)	Static Pore Water Pressure during EQ u _{s EQ} (tsf)	Effective Vertical Stress during CPT σ _{v CPT} (tsf)	Effective Vertical Stress during EQ σ _{v EQ} (tsf)
214.6	95.307	96.72	2.02	120	95.23	0.16	5.72	5.72	2.51	2.51	3.21	3.21
214.4	95.471	42.91	1.89	120	95.39	0.16	5.73	5.73	2.51	2.51	3.22	3.22
214.3	95.635	26.89	1.53	120	95.55	0.16	5.74	5.74	2.52	2.52	3.22	3.22
214.1	95.799	84.78	1.31	120	95.72	0.16	5.75	5.75	2.52	2.52	3.23	3.23
213.9	95.963	236.57	0.67	120	95.88	0.16	5.76	5.76	2.53	2.53	3.23	3.23
213.8	96.127	273.97	2.06	120	96.05	0.16	5.77	5.77	2.53	2.53	3.24	3.24
213.6	96.291	264.30	1.68	120	96.21	0.16	5.78	5.78	2.54	2.54	3.24	3.24
213.4	96.456	211.38	1.50	120	96.37	0.16	5.79	5.79	2.54	2.54	3.25	3.25
213.3	96.620	207.61	0.85	120	96.54	0.16	5.80	5.80	2.55	2.55	3.25	3.25
213.1	96.784	186.80	0.21	120	96.70	0.16	5.81	5.81	2.55	2.55	3.26	3.26
213.0	96.948	167.55	0.17	120	96.87	0.16	5.82	5.82	2.56	2.56	3.26	3.26
212.8	97.112	169.89	0.66	120	97.03	0.16	5.83	5.83	2.56	2.56	3.26	3.26
212.6	97.276	187.59	0.93	120	97.19	0.16	5.84	5.84	2.57	2.57	3.27	3.27
212.5	97.440	189.62	2.11	120	97.36	0.16	5.85	5.85	2.57	2.57	3.27	3.27
212.3	97.604	255.93	4.82	120	97.52	0.16	5.86	5.86	2.58	2.58	3.28	3.28
212.1	97.768	457.73	4.15	120	97.69	0.16	5.87	5.87	2.58	2.58	3.28	3.28
212.0	97.932	604.83	3.62	120	97.85	0.16	5.88	5.88	2.59	2.59	3.29	3.29
211.8	98.096	576.86	4.47	120	98.01	0.16	5.89	5.89	2.59	2.59	3.29	3.29
211.6	98.260	614.56	3.02	120	98.18	0.16	5.90	5.90	2.60	2.60	3.30	3.30
211.5	98.424	642.98	1.68	120	98.34	0.16	5.91	5.91	2.60	2.60	3.30	3.30
211.3	98.588	544.07	1.18	120	98.51	0.16	5.92	5.92	2.61	2.61	3.31	3.31
211.1	98.752	449.82	0.50	120	98.67	0.16	5.93	5.93	2.61	2.61	3.31	3.31
211.0	98.916	406.78	1.18	120	98.83	0.16	5.93	5.93	2.62	2.62	3.32	3.32
210.8	99.080	376.10	0.64	120	99.00	0.16	5.94	5.94	2.62	2.62	3.32	3.32
210.7	99.244	357.63	0.82	120	99.16	0.16	5.95	5.95	2.63	2.63	3.33	3.33
210.5	99.408	380.26	0.84	120	99.33	0.16	5.96	5.96	2.63	2.63	3.33	3.33
210.3	99.572	433.90	1.06	120	99.49	0.16	5.97	5.97	2.64	2.64	3.34	3.34
210.2	99.736	469.01	1.05	120	99.65	0.16	5.98	5.98	2.64	2.64	3.34	3.34
210.0	99.900	477.23	0.73	120	99.82	0.16	5.99	5.99	2.65	2.65	3.35	3.35
209.8	100.064	424.62	1.27	120	99.98	0.16	6.00	6.00	2.65	2.65	3.35	3.35
209.7	100.228	385.71	1.82	120	100.15	0.16	6.01	6.01	2.66	2.66	3.35	3.35
209.5	100.392	398.39	1.60	120	100.31	0.16	6.02	6.02	2.66	2.66	3.36	3.36
209.3	100.557	515.26	1.46	120	100.47	0.08	6.03	6.03	2.67	2.67	3.36	3.36

LIQUEFACTION POTENTIAL ASSESSMENT FOR COARSE GRAINED SOILS USING CONE PENETRATION TEST DATA

Project Site: US 60 Bridge
 Project No.: 178565011
 CPT ID: SP05

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	qc_{IN}	FC (%)	Δqc_{IN}	$(qc_{IN})_{CS}$	a	ξ_R
309.9												
309.7	0.164	220.35	0.46	1.43	0.5	1.70	36.15	0	0.00	36.15	0.350	-0.074
309.6	0.328	221.99	0.40	1.39	0.5	1.70	51.51	0	0.00	51.51	0.350	-0.188
309.4	0.492	205.05	0.54	1.50	0.5	1.70	58.28	0	0.00	58.28	0.350	-0.229
309.2	0.656	239.01	0.61	1.48	0.5	1.70	78.44	0	0.00	78.44	0.350	-0.340
309.1	0.820	281.78	0.80	1.52	0.5	1.70	103.39	0	0.00	103.39	0.350	-0.451
308.9	0.984	305.03	1.09	1.60	0.5	1.70	122.61	0	0.00	122.61	0.350	-0.524
308.8	1.148	308.10	1.22	1.63	0.5	1.70	133.77	0	0.00	133.77	0.350	-0.561
308.6	1.312	268.12	1.44	1.73	0.5	1.70	124.47	1	0.00	124.47	0.350	-0.526
308.4	1.476	226.76	1.74	1.84	0.5	1.70	111.69	10	7.96	119.64	0.350	-0.507
308.3	1.640	199.97	1.89	1.90	0.5	1.70	103.84	15	22.93	126.77	0.350	-0.532
308.1	1.804	170.96	1.97	1.95	0.5	1.70	93.14	19	34.55	127.70	0.350	-0.533
307.9	1.968	152.68	2.07	2.00	0.5	1.70	86.91	23	42.14	129.05	0.350	-0.537
307.8	2.133	140.14	2.27	2.06	0.5	1.70	83.05	28	48.87	131.92	0.350	-0.546
307.6	2.297	122.80	2.51	2.13	0.5	1.70	75.56	33	54.25	129.81	0.350	-0.537
307.4	2.461	107.66	2.82	2.20	0.5	1.70	68.60	39	57.97	126.57	0.350	-0.524
307.3	2.625	97.92	2.99	2.25	0.5	1.70	64.48	43	59.43	123.90	0.350	-0.514
307.1	2.789	88.69	2.96	2.28	0.5	1.70	60.23	45	59.53	119.77	0.350	-0.497
306.9	2.953	84.24	2.89	2.28	0.5	1.70	58.89	46	59.49	118.38	0.350	-0.491
306.8	3.117	82.91	2.78	2.28	0.5	1.70	59.56	45	59.37	118.93	0.350	-0.492
306.6	3.281	91.44	1.87	2.12	0.5	1.70	67.36	33	52.04	119.40	0.350	-0.493
306.5	3.445	84.25	1.58	2.10	0.5	1.70	63.63	31	49.00	112.63	0.350	-0.467
306.3	3.609	51.59	2.30	2.36	0.5	1.70	40.02	52	57.44	97.46	0.350	-0.403
306.1	3.773	37.81	2.66	2.51	0.5	1.70	30.09	64	58.05	88.14	0.350	-0.361
306.0	3.937	30.19	2.70	2.59	0.5	1.70	24.63	70	57.76	82.40	0.350	-0.332
305.8	4.101	27.14	2.22	2.57	0.5	1.70	22.64	69	56.93	79.58	0.350	-0.317
305.6	4.265	25.22	2.22	2.59	0.5	1.70	21.50	71	56.99	78.49	0.350	-0.311
305.5	4.429	32.65	2.35	2.52	0.7	1.70	21.53	65	55.85	77.38	0.350	-0.305
305.3	4.593	31.02	2.48	2.55	0.7	1.70	21.01	67	56.22	77.22	0.350	-0.303
305.1	4.757	27.50	2.67	2.61	0.7	1.70	19.14	72	56.56	75.70	0.350	-0.295
305.0	4.921	23.55	2.68	2.67	0.7	1.70	16.86	76	56.56	73.43	0.350	-0.282
304.8	5.085	22.00	2.63	2.69	0.7	1.70	16.15	78	56.56	72.72	0.350	-0.278
304.7	5.249	23.72	2.02	2.59	0.7	1.70	17.77	70	55.85	73.62	0.350	-0.282
304.5	5.413	19.80	2.35	2.69	0.7	1.70	15.25	78	56.37	71.62	0.350	-0.270
304.3	5.577	26.24	2.76	2.64	1.0	1.70	14.65	74	55.56	70.21	0.350	-0.262
304.2	5.741	23.64	2.91	2.69	1.0	1.70	13.64	78	55.85	69.49	0.350	-0.257
304.0	5.905	23.99	2.52	2.64	1.0	1.70	14.23	75	55.51	69.74	0.350	-0.258
303.8	6.069	22.60	2.81	2.69	1.0	1.70	13.81	79	55.96	69.77	0.350	-0.258
303.7	6.234	23.33	2.48	2.65	1.0	1.70	14.62	75	55.69	70.31	0.350	-0.260
303.5	6.398	25.44	2.32	2.60	1.0	1.70	16.31	71	55.59	71.90	0.350	-0.268
303.3	6.562	26.17	2.42	2.60	1.0	1.70	17.19	71	55.86	73.04	0.350	-0.274
303.2	6.726	19.57	2.30	2.69	0.7	1.70	17.59	78	57.06	74.65	0.350	-0.282
303.0	6.890	24.37	2.28	2.61	1.0	1.70	16.85	72	55.89	72.74	0.350	-0.271
302.8	7.054	23.56	2.25	2.62	1.0	1.68	16.50	73	55.88	72.39	0.350	-0.269
302.7	7.218	22.62	2.39	2.65	1.0	1.66	16.04	75	56.13	72.17	0.350	-0.267
302.5	7.382	22.25	2.54	2.67	1.0	1.64	15.94	77	56.35	72.29	0.350	-0.267
302.4	7.546	23.22	2.44	2.65	1.0	1.61	16.73	75	56.29	73.03	0.350	-0.271
302.2	7.710	16.79	3.06	2.82	1.0	1.61	12.52	89	56.77	69.29	0.350	-0.250
302.0	7.874	11.50	3.94	3.02	1.0	1.60	8.95	100	56.71	65.66	0.350	-0.229
301.9	8.038	10.23	3.69	3.04	1.0	1.59	8.13	100	56.46	64.59	0.350	-0.222
301.7	8.202	11.81	2.75	2.92	1.0	1.57	9.33	96	56.52	65.85	0.350	-0.229
301.5	8.366	11.42	2.53	2.91	1.0	1.55	9.13	96	56.40	65.52	0.350	-0.227
301.4	8.530	9.31	2.85	3.01	1.0	1.54	7.66	100	56.31	63.98	0.350	-0.217
301.2	8.694	8.81	2.46	2.99	1.0	1.52	7.36	100	56.22	63.57	0.350	-0.214
301.0	8.858	14.61	1.29	2.66	1.0	1.49	11.72	76	54.96	66.68	0.350	-0.232
300.9	9.022	10.04	1.51	2.84	1.0	1.49	8.39	90	55.65	64.04	0.350	-0.216
300.7	9.186	6.10	2.35	3.12	1.0	1.48	5.47	100	55.63	61.10	0.350	-0.198
300.5	9.350	4.99	3.11	3.26	1.0	1.47	4.65	100	55.38	60.03	0.350	-0.191
300.4	9.514	5.27	2.92	3.22	1.0	1.45	4.91	100	55.46	60.37	0.350	-0.193
300.2	9.678	5.64	2.63	3.17	1.0	1.43	5.23	100	55.56	60.78	0.350	-0.195
300.1	9.842	5.66	2.58	3.17	1.0	1.42	5.27	100	55.57	60.84	0.350	-0.195

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
299.9	10.006	5.59	2.77	3.19	1.0	1.41	5.25	100	55.56	60.82	0.350	-0.194
299.7	10.170	5.61	2.95	3.20	1.0	1.39	5.30	100	55.58	60.88	0.350	-0.194
299.6	10.335	5.78	3.07	3.20	1.0	1.38	5.47	100	55.63	61.10	0.350	-0.195
299.4	10.499	6.57	2.78	3.13	1.0	1.36	6.15	100	55.84	61.99	0.350	-0.200
299.2	10.663	6.55	2.79	3.13	1.0	1.35	6.17	100	55.85	62.02	0.350	-0.200
299.1	10.827	7.07	2.83	3.11	1.0	1.34	6.62	100	55.99	62.61	0.350	-0.203
298.9	10.991	6.49	3.06	3.16	1.0	1.33	6.19	100	55.86	62.05	0.350	-0.199
298.7	11.155	6.10	3.13	3.19	1.0	1.32	5.91	100	55.77	61.68	0.350	-0.197
298.6	11.319	6.03	2.98	3.18	1.0	1.30	5.89	100	55.76	61.65	0.350	-0.196
298.4	11.483	5.51	3.14	3.22	1.0	1.29	5.48	100	55.64	61.12	0.350	-0.193
298.3	11.647	5.14	2.90	3.23	1.0	1.28	5.20	100	55.55	60.75	0.350	-0.190
298.1	11.811	4.44	3.08	3.30	1.0	1.27	4.64	100	55.37	60.02	0.350	-0.185
297.9	11.975	4.35	2.95	3.30	1.0	1.26	4.59	100	55.36	59.94	0.350	-0.184
297.8	12.139	4.83	2.85	3.25	1.0	1.25	5.02	100	55.49	60.51	0.350	-0.187
297.6	12.303	6.53	2.05	3.07	1.0	1.24	6.51	100	55.95	62.46	0.350	-0.199
297.4	12.467	7.64	2.05	3.01	1.0	1.23	7.50	100	56.26	63.76	0.350	-0.206
297.3	12.631	7.95	2.66	3.05	1.0	1.22	7.81	100	56.36	64.16	0.350	-0.208
297.1	12.795	7.30	3.05	3.11	1.0	1.21	7.28	100	56.19	63.48	0.350	-0.204
296.9	12.959	5.90	3.34	3.21	1.0	1.20	6.09	100	55.82	61.92	0.350	-0.194
296.8	13.123	3.90	3.94	3.40	1.0	1.20	4.36	100	55.29	59.64	0.350	-0.180
296.6	13.287	3.11	4.31	3.51	1.0	1.19	3.68	100	55.08	58.76	0.350	-0.174
296.4	13.451	3.17	3.24	3.44	1.0	1.18	3.75	100	55.10	58.85	0.350	-0.174
296.3	13.615	4.09	3.08	3.33	1.0	1.17	4.59	100	55.36	59.95	0.350	-0.181
296.1	13.779	10.34	2.01	2.89	1.0	1.15	10.23	94	56.61	66.85	0.350	-0.222
296.0	13.943	7.09	2.46	3.07	1.0	1.15	7.36	100	56.22	63.57	0.350	-0.202
295.8	14.107	6.06	2.61	3.15	1.0	1.14	6.45	100	55.94	62.39	0.350	-0.195
295.6	14.271	10.54	1.61	2.83	1.0	1.13	10.56	90	56.28	66.84	0.350	-0.221
295.5	14.436	8.87	1.73	2.91	1.0	1.12	9.09	96	56.43	65.51	0.350	-0.213
295.3	14.600	5.59	3.04	3.21	1.0	1.12	6.11	100	55.83	61.94	0.350	-0.191
295.1	14.764	5.52	2.25	3.15	1.0	1.11	6.07	100	55.82	61.89	0.350	-0.190
295.0	14.928	4.49	3.13	3.30	1.0	1.11	5.14	100	55.53	60.67	0.350	-0.183
294.8	15.092	3.68	4.12	3.43	1.0	1.10	4.40	100	55.30	59.70	0.350	-0.177
294.6	15.256	6.62	2.38	3.09	1.0	1.10	7.17	100	56.16	63.33	0.350	-0.198
294.5	15.420	7.35	1.94	3.01	1.0	1.09	7.87	100	56.38	64.25	0.350	-0.204
294.3	15.584	5.57	2.19	3.14	1.0	1.09	6.22	100	55.87	62.09	0.350	-0.191
294.2	15.748	5.57	2.43	3.16	1.0	1.09	6.24	100	55.87	62.11	0.350	-0.191
294.0	15.912	5.94	2.04	3.10	1.0	1.08	6.61	100	55.98	62.59	0.350	-0.193
293.8	16.076	12.83	1.47	2.74	1.0	1.08	13.13	82	56.21	69.34	0.350	-0.232
293.7	16.240	19.81	1.65	2.61	0.7	1.07	20.44	71	56.83	77.27	0.350	-0.275
293.5	16.404	11.89	2.63	2.90	1.0	1.07	12.30	95	57.34	69.65	0.350	-0.234
293.3	16.568	13.22	2.25	2.83	1.0	1.07	13.60	89	57.15	70.75	0.350	-0.240
293.2	16.732	37.60	0.59	2.14	0.5	1.06	38.73	34	47.00	85.72	0.350	-0.316
293.0	16.896	53.27	0.52	1.98	0.5	1.06	54.42	21	33.38	87.81	0.350	-0.326
292.8	17.060	58.80	0.52	1.94	0.5	1.05	59.96	18	28.10	88.06	0.350	-0.327
292.7	17.224	59.31	0.62	1.98	0.5	1.05	60.40	21	33.98	94.38	0.350	-0.355
292.5	17.388	60.83	0.70	2.00	0.5	1.05	61.87	23	36.97	98.83	0.350	-0.375
292.3	17.552	65.15	0.74	1.98	0.5	1.04	66.16	21	35.41	101.57	0.350	-0.386
292.2	17.716	64.87	0.80	2.00	0.5	1.04	65.85	23	38.47	104.33	0.350	-0.398
292.0	17.880	64.00	0.85	2.02	0.5	1.04	64.98	25	41.04	106.01	0.350	-0.404
291.9	18.044	61.77	0.93	2.06	0.5	1.03	62.75	28	44.97	107.72	0.350	-0.411
291.7	18.208	52.52	1.22	2.18	0.5	1.03	53.53	38	53.15	106.67	0.350	-0.407
291.5	18.372	34.83	2.10	2.47	0.5	1.03	35.92	61	58.94	94.86	0.350	-0.357
291.4	18.537	18.60	4.43	2.89	1.0	1.03	19.23	94	59.35	78.58	0.350	-0.279
291.2	18.701	11.45	6.00	3.13	1.0	1.03	12.30	100	57.75	70.05	0.350	-0.234
291.0	18.865	7.90	6.35	3.27	1.0	1.03	8.85	100	56.68	65.53	0.350	-0.208
290.9	19.029	6.82	3.16	3.15	1.0	1.02	7.81	100	56.36	64.17	0.350	-0.200
290.7	19.193	7.83	2.70	3.06	1.0	1.02	8.83	100	56.67	65.50	0.350	-0.208
290.5	19.357	11.31	1.50	2.79	1.0	1.02	12.27	86	56.45	68.72	0.350	-0.226
290.4	19.521	10.54	1.54	2.82	1.0	1.02	11.55	89	56.50	68.04	0.350	-0.222
290.2	19.685	7.58	2.09	3.01	1.0	1.01	8.64	100	56.62	65.26	0.350	-0.206
290.1	19.849	6.37	1.63	3.03	1.0	1.01	7.46	100	56.25	63.71	0.350	-0.197
289.9	20.013	5.90	1.23	3.00	1.0	1.01	7.02	100	56.11	63.13	0.350	-0.193
289.7	20.177	6.14	1.13	2.97	1.0	1.01	7.27	100	56.19	63.46	0.350	-0.195
289.6	20.341	14.84	1.23	2.65	1.0	1.00	15.97	75	56.04	72.01	0.350	-0.243
289.4	20.505	9.85	1.77	2.88	1.0	1.00	11.02	93	56.78	67.80	0.350	-0.220
289.2	20.669	6.21	2.39	3.12	1.0	1.00	7.39	100	56.23	63.62	0.350	-0.196

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{cIN}	FC (%)	Δq_{cIN}	$(q_{cIN})_{CS}$	a	ξ_R
289.1	20.833	6.52	0.75	2.87	1.0	0.99	7.72	93	55.71	63.43	0.350	-0.194
288.9	20.997	7.60	0.79	2.82	1.0	0.99	8.82	89	55.64	64.46	0.350	-0.200
288.7	21.161	6.43	0.78	2.88	1.0	0.99	7.66	94	55.79	63.45	0.350	-0.194
288.6	21.325	5.13	1.53	3.10	1.0	0.99	6.37	100	55.91	62.27	0.350	-0.187
288.4	21.489	9.63	0.94	2.76	1.0	0.98	10.94	84	55.73	66.67	0.350	-0.213
288.2	21.653	25.12	0.46	2.25	0.5	0.98	26.28	43	49.91	76.19	0.350	-0.265
288.1	21.817	38.01	0.44	2.08	0.5	0.98	39.17	29	42.28	81.45	0.350	-0.291
287.9	21.981	40.38	0.52	2.09	0.5	0.98	41.55	30	43.49	85.03	0.350	-0.308
287.8	22.145	38.67	0.74	2.17	0.5	0.98	39.86	37	49.49	89.36	0.350	-0.329
287.6	22.309	36.90	0.99	2.26	0.5	0.98	38.11	44	53.20	91.30	0.350	-0.337
287.4	22.473	32.32	1.46	2.40	0.5	0.97	33.52	55	56.65	90.17	0.350	-0.332
287.3	22.638	20.30	3.07	2.76	1.0	0.97	22.08	83	59.08	81.16	0.350	-0.289
287.1	22.802	11.99	4.29	3.02	1.0	0.97	13.56	100	58.14	71.71	0.350	-0.240
286.9	22.966	7.56	5.06	3.23	1.0	0.96	9.02	100	56.73	65.75	0.350	-0.206
286.8	23.130	7.57	2.43	3.05	1.0	0.96	9.05	100	56.74	65.79	0.350	-0.206
286.6	23.294	6.52	1.94	3.05	1.0	0.96	7.99	100	56.41	64.40	0.350	-0.198
286.4	23.458	13.73	2.59	2.85	1.0	0.96	15.48	91	57.90	73.37	0.350	-0.248
286.3	23.622	30.28	2.00	2.50	0.5	0.96	31.51	63	58.38	89.89	0.350	-0.330
286.1	23.786	24.33	2.80	2.67	1.0	0.96	26.62	76	59.47	86.09	0.350	-0.312
286.0	23.950	19.43	2.48	2.71	1.0	0.95	21.54	80	58.49	80.03	0.350	-0.282
285.8	24.114	37.34	1.21	2.30	0.5	0.95	38.60	47	55.05	93.64	0.350	-0.347
285.6	24.278	45.74	1.00	2.18	0.5	0.95	47.04	38	51.62	98.67	0.350	-0.369
285.5	24.442	47.86	0.81	2.12	0.5	0.95	49.16	32	47.70	96.86	0.350	-0.361
285.3	24.606	49.83	0.87	2.12	0.5	0.95	51.16	32	48.21	99.37	0.350	-0.371
285.1	24.770	50.33	0.92	2.13	0.5	0.95	51.69	33	49.14	100.82	0.350	-0.377
285.0	24.934	49.33	0.98	2.15	0.5	0.94	50.69	35	50.43	101.12	0.350	-0.379
284.8	25.098	47.25	1.02	2.18	0.5	0.94	48.61	37	51.62	100.22	0.350	-0.375
284.6	25.262	44.54	1.17	2.23	0.5	0.94	45.90	41	53.93	99.83	0.350	-0.373
284.5	25.426	40.22	1.68	2.36	0.5	0.94	41.58	52	57.71	99.29	0.350	-0.370
284.3	25.590	26.16	3.11	2.67	1.0	0.93	29.20	77	60.30	89.50	0.350	-0.327
284.1	25.754	15.51	4.61	2.96	1.0	0.93	17.82	100	59.43	77.25	0.350	-0.267
284.0	25.918	14.01	4.77	3.00	1.0	0.93	16.26	100	58.98	75.23	0.350	-0.256
283.8	26.082	20.61	2.98	2.74	1.0	0.93	23.37	82	59.34	82.71	0.350	-0.294
283.7	26.246	14.51	4.06	2.94	1.0	0.92	16.85	99	59.05	75.89	0.350	-0.260
283.5	26.410	14.39	2.14	2.78	1.0	0.92	16.74	86	57.74	74.48	0.350	-0.252
283.3	26.574	28.95	1.29	2.41	0.5	0.92	30.21	56	55.96	86.17	0.350	-0.310
283.2	26.739	20.78	3.06	2.75	1.0	0.92	23.74	83	59.48	83.22	0.350	-0.296
283.0	26.903	12.96	3.48	2.94	1.0	0.91	15.30	98	58.55	73.85	0.350	-0.248
282.8	27.067	14.25	2.80	2.85	1.0	0.91	16.72	91	58.33	75.05	0.350	-0.255
282.7	27.231	15.21	1.22	2.63	1.0	0.91	17.79	74	56.44	74.22	0.350	-0.250
282.5	27.395	10.95	1.34	2.78	1.0	0.91	13.20	85	56.62	69.82	0.350	-0.226
282.3	27.559	11.53	1.59	2.80	1.0	0.90	13.85	87	56.97	70.82	0.350	-0.231
282.2	27.723	11.79	1.96	2.84	1.0	0.90	14.16	90	57.40	71.55	0.350	-0.235
282.0	27.887	14.09	1.47	2.70	1.0	0.90	16.70	79	56.92	73.62	0.350	-0.246
281.8	28.051	26.12	0.83	2.35	0.5	0.90	27.35	51	53.56	80.91	0.350	-0.284
281.7	28.215	31.08	1.02	2.33	0.5	0.90	32.36	49	54.26	86.62	0.350	-0.311
281.5	28.379	28.65	1.64	2.47	0.5	0.90	29.95	61	57.31	87.25	0.350	-0.314
281.4	28.543	27.60	1.77	2.50	0.5	0.90	28.90	63	57.64	86.54	0.350	-0.311
281.2	28.707	33.22	1.13	2.33	0.5	0.90	34.54	49	54.87	89.41	0.350	-0.324
281.0	28.871	23.28	2.30	2.63	1.0	0.90	27.11	74	59.14	86.25	0.350	-0.309
280.9	29.035	15.73	3.39	2.87	1.0	0.89	18.74	93	59.07	77.82	0.350	-0.267
280.7	29.199	13.80	2.52	2.84	1.0	0.89	16.63	90	58.18	74.81	0.350	-0.252
280.5	29.363	28.05	1.17	2.40	0.5	0.89	29.33	55	55.46	84.79	0.350	-0.302
280.4	29.527	26.19	1.80	2.53	0.5	0.89	27.49	65	57.66	85.15	0.350	-0.303
280.2	29.691	27.14	1.52	2.47	0.5	0.89	28.44	61	56.89	85.33	0.350	-0.304
280.0	29.855	36.73	1.06	2.28	0.5	0.89	38.10	45	53.91	92.01	0.350	-0.335
279.9	30.019	37.86	1.00	2.25	0.5	0.89	39.24	43	53.22	92.46	0.350	-0.337
279.7	30.183	34.39	1.24	2.34	0.5	0.89	35.76	50	55.46	91.22	0.350	-0.331
279.6	30.347	27.82	2.10	2.55	0.5	0.88	29.16	67	58.46	87.62	0.350	-0.315
279.4	30.511	24.03	2.53	2.65	1.0	0.88	28.48	75	59.72	88.20	0.350	-0.317
279.2	30.675	23.76	2.19	2.61	1.0	0.88	28.20	72	59.18	87.38	0.350	-0.313
279.1	30.840	32.35	1.35	2.38	0.5	0.88	33.72	53	56.18	89.90	0.350	-0.325
278.9	31.004	32.21	1.16	2.35	0.5	0.88	33.56	51	55.16	88.71	0.350	-0.319
278.7	31.168	29.72	1.28	2.40	0.5	0.87	31.05	55	55.93	86.98	0.350	-0.311
278.6	31.332	18.73	1.68	2.63	1.0	0.87	22.62	73	57.80	80.42	0.350	-0.279
278.4	31.496	12.59	2.12	2.83	1.0	0.86	15.66	89	57.81	73.47	0.350	-0.243

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
278.2	31.660	10.91	2.17	2.89	1.0	0.86	13.78	94	57.69	71.46	0.350	-0.232
278.1	31.824	7.28	2.85	3.10	1.0	0.85	9.69	100	56.94	66.63	0.350	-0.205
277.9	31.988	9.46	1.52	2.86	1.0	0.85	12.17	92	57.00	69.17	0.350	-0.219
277.7	32.152	28.20	0.61	2.26	0.5	0.86	29.42	44	50.94	80.36	0.350	-0.278
277.6	32.316	35.31	0.97	2.27	0.5	0.86	36.69	44	53.27	89.96	0.350	-0.324
277.4	32.480	36.59	1.26	2.32	0.5	0.87	38.05	49	55.51	93.56	0.350	-0.340
277.3	32.644	34.45	2.07	2.47	0.5	0.86	35.96	60	58.92	94.88	0.350	-0.346
277.1	32.808	24.89	2.61	2.64	1.0	0.86	30.20	74	60.19	90.38	0.350	-0.326
276.9	32.972	30.68	2.01	2.50	0.5	0.86	32.12	63	58.50	90.61	0.350	-0.327
276.8	33.136	31.51	2.06	2.50	0.5	0.86	32.97	63	58.67	91.64	0.350	-0.331
276.6	33.300	17.68	2.47	2.75	1.0	0.85	21.88	83	58.92	80.79	0.350	-0.280
276.4	33.464	11.36	2.77	2.93	1.0	0.84	14.55	98	58.25	72.80	0.350	-0.238
276.3	33.628	10.00	2.03	2.90	1.0	0.84	13.00	95	57.57	70.57	0.350	-0.226
276.1	33.792	9.76	1.19	2.80	1.0	0.84	12.73	87	56.66	69.39	0.350	-0.219
275.9	33.956	8.37	1.55	2.91	1.0	0.83	11.16	96	57.06	68.21	0.350	-0.213
275.8	34.120	8.42	1.91	2.95	1.0	0.83	11.23	99	57.37	68.60	0.350	-0.215
275.6	34.284	7.52	2.34	3.04	1.0	0.83	10.21	100	57.10	67.31	0.350	-0.207
275.5	34.448	8.07	2.19	3.00	1.0	0.83	10.86	100	57.30	68.17	0.350	-0.212
275.3	34.612	10.63	1.83	2.86	1.0	0.83	13.86	92	57.49	71.35	0.350	-0.229
275.1	34.776	7.96	2.09	3.00	1.0	0.83	10.77	100	57.28	68.04	0.350	-0.211
275.0	34.941	7.93	2.06	2.99	1.0	0.83	10.76	100	57.27	68.03	0.350	-0.211
274.8	35.105	10.00	1.27	2.80	1.0	0.83	13.18	87	56.82	70.01	0.350	-0.222
274.6	35.269	8.04	1.47	2.92	1.0	0.82	10.91	96	57.01	67.92	0.350	-0.210
274.5	35.433	6.81	1.67	3.01	1.0	0.82	9.49	100	56.88	66.37	0.350	-0.201
274.3	35.597	6.28	1.12	2.96	1.0	0.82	8.89	100	56.67	65.56	0.350	-0.196
274.1	35.761	6.96	1.31	2.95	1.0	0.82	9.70	99	56.86	66.55	0.350	-0.202
274.0	35.925	7.56	1.15	2.89	1.0	0.82	10.42	94	56.68	67.10	0.350	-0.205
273.8	36.089	8.30	1.54	2.91	1.0	0.82	11.31	96	57.12	68.43	0.350	-0.212
273.6	36.253	11.79	1.00	2.69	1.0	0.82	15.44	78	56.41	71.85	0.350	-0.231
273.5	36.417	9.03	1.55	2.88	1.0	0.81	12.21	94	57.17	69.37	0.350	-0.217
273.3	36.581	9.39	1.51	2.86	1.0	0.81	12.65	92	57.15	69.79	0.350	-0.220
273.2	36.745	11.21	1.50	2.79	1.0	0.81	14.83	86	57.25	72.08	0.350	-0.232
273.0	36.909	10.02	1.72	2.87	1.0	0.81	13.44	92	57.42	70.86	0.350	-0.225
272.8	37.073	9.84	1.82	2.89	1.0	0.81	13.24	94	57.51	70.75	0.350	-0.225
272.7	37.237	8.75	1.51	2.89	1.0	0.81	11.96	94	57.14	69.10	0.350	-0.215
272.5	37.401	10.90	1.03	2.73	1.0	0.81	14.54	81	56.52	71.06	0.350	-0.226
272.3	37.565	7.97	1.46	2.92	1.0	0.80	11.07	96	57.07	68.14	0.350	-0.210
272.2	37.729	8.97	1.23	2.84	1.0	0.80	12.28	90	56.85	69.13	0.350	-0.215
272.0	37.893	11.91	1.32	2.74	1.0	0.80	15.83	82	57.08	72.90	0.350	-0.236
271.8	38.057	14.15	1.58	2.72	1.0	0.80	18.57	80	57.64	76.21	0.350	-0.253
271.7	38.221	10.72	2.15	2.89	1.0	0.80	14.46	94	57.93	72.38	0.350	-0.233
271.5	38.385	8.30	2.44	3.01	1.0	0.80	11.55	100	57.52	69.07	0.350	-0.214
271.4	38.549	7.06	2.18	3.05	1.0	0.79	10.08	100	57.06	67.14	0.350	-0.203
271.2	38.713	7.56	1.45	2.94	1.0	0.79	10.69	98	57.08	67.77	0.350	-0.207
271.0	38.877	26.70	1.42	2.46	0.5	0.81	28.11	60	56.59	84.70	0.350	-0.295
270.9	39.042	16.82	2.52	2.77	1.0	0.80	22.06	85	59.20	81.26	0.350	-0.278
270.7	39.206	13.54	2.90	2.88	1.0	0.80	18.04	93	58.95	76.99	0.350	-0.256
270.5	39.370	12.47	2.23	2.85	1.0	0.79	16.75	91	58.27	75.02	0.350	-0.246
270.4	39.534	12.47	1.48	2.75	1.0	0.79	16.76	83	57.43	74.18	0.350	-0.242
270.2	39.698	12.74	1.20	2.70	1.0	0.79	17.10	79	56.99	74.09	0.350	-0.241
270.0	39.862	12.90	1.15	2.68	1.0	0.79	17.32	78	56.90	74.22	0.350	-0.242
269.9	40.026	13.77	1.09	2.65	1.0	0.79	18.41	75	56.79	75.20	0.350	-0.247
269.7	40.190	14.44	1.02	2.62	1.0	0.79	19.26	72	56.64	75.90	0.350	-0.250
269.5	40.354	13.64	1.10	2.65	1.0	0.79	18.30	75	56.83	75.13	0.350	-0.246
269.4	40.518	13.76	1.06	2.64	1.0	0.78	18.48	74	56.75	75.23	0.350	-0.247
269.2	40.682	14.09	0.93	2.61	1.0	0.78	18.90	72	56.41	75.31	0.350	-0.247
269.1	40.846	17.83	0.83	2.49	0.5	0.78	19.15	63	54.70	73.86	0.350	-0.239
268.9	41.010	14.78	1.66	2.71	1.0	0.78	19.86	80	57.97	77.84	0.350	-0.260
268.7	41.174	16.35	1.98	2.72	1.0	0.78	21.87	80	58.63	80.50	0.350	-0.273
268.6	41.338	17.12	1.56	2.65	1.0	0.78	22.86	75	58.08	80.93	0.350	-0.275
268.4	41.502	15.50	1.17	2.62	1.0	0.78	20.83	72	57.12	77.95	0.350	-0.260
268.2	41.666	12.70	1.22	2.70	1.0	0.77	17.35	79	57.10	74.45	0.350	-0.242
268.1	41.830	24.06	0.69	2.34	0.5	0.78	25.35	50	52.83	78.18	0.350	-0.261
267.9	41.994	13.91	0.95	2.62	1.0	0.77	18.90	72	56.52	75.42	0.350	-0.247
267.7	42.158	10.91	1.99	2.87	1.0	0.77	15.19	92	57.97	73.16	0.350	-0.235
267.6	42.322	9.26	1.84	2.91	1.0	0.77	13.15	96	57.66	70.81	0.350	-0.222

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(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
267.4	42.486	8.75	1.70	2.91	1.0	0.76	12.54	96	57.50	70.04	0.350	-0.217
267.2	42.650	7.46	2.13	3.02	1.0	0.76	10.94	100	57.33	68.27	0.350	-0.207
267.1	42.814	7.07	2.75	3.10	1.0	0.76	10.48	100	57.19	67.66	0.350	-0.204
266.9	42.978	7.12	2.24	3.05	1.0	0.76	10.55	100	57.21	67.76	0.350	-0.204
266.8	43.143	10.95	1.45	2.80	1.0	0.76	15.35	87	57.42	72.78	0.350	-0.232
266.6	43.307	27.47	1.14	2.40	0.5	0.77	28.91	55	55.36	84.26	0.350	-0.290
266.4	43.471	10.73	2.21	2.90	1.0	0.76	15.14	95	58.18	73.32	0.350	-0.235
266.3	43.635	8.59	2.50	3.01	1.0	0.76	12.46	100	57.80	70.27	0.350	-0.218
266.1	43.799	8.33	1.35	2.89	1.0	0.75	12.13	94	57.17	69.30	0.350	-0.212
265.9	43.963	8.03	0.90	2.82	1.0	0.75	11.76	89	56.55	68.31	0.350	-0.207
265.8	44.127	8.19	2.11	2.99	1.0	0.75	12.00	100	57.66	69.66	0.350	-0.214
265.6	44.291	7.81	1.47	2.93	1.0	0.75	11.53	97	57.28	68.81	0.350	-0.209
265.4	44.455	5.99	1.50	3.03	1.0	0.75	9.26	100	56.81	66.07	0.350	-0.194
265.3	44.619	5.65	0.97	2.97	1.0	0.74	8.84	100	56.68	65.52	0.350	-0.190
265.1	44.783	5.46	0.93	2.98	1.0	0.74	8.62	100	56.61	65.23	0.350	-0.189
265.0	44.947	5.51	1.14	3.01	1.0	0.74	8.69	100	56.63	65.32	0.350	-0.189
264.8	45.111	5.44	1.01	3.00	1.0	0.74	8.62	100	56.61	65.23	0.350	-0.188
264.6	45.275	5.19	0.96	3.00	1.0	0.74	8.32	100	56.52	64.83	0.350	-0.186
264.5	45.439	5.39	0.93	2.99	1.0	0.74	8.57	100	56.59	65.17	0.350	-0.188
264.3	45.603	5.78	0.86	2.94	1.0	0.74	9.08	99	56.64	65.72	0.350	-0.191
264.1	45.767	5.28	0.81	2.97	1.0	0.74	8.47	100	56.56	65.03	0.350	-0.187
264.0	45.931	5.65	0.90	2.96	1.0	0.73	8.94	100	56.70	65.64	0.350	-0.190
263.8	46.095	5.66	0.78	2.94	1.0	0.73	8.96	98	56.54	65.50	0.350	-0.189
263.6	46.259	5.10	1.02	3.02	1.0	0.73	8.26	100	56.50	64.76	0.350	-0.185
263.5	46.423	5.06	1.15	3.05	1.0	0.73	8.22	100	56.49	64.71	0.350	-0.185
263.3	46.587	4.86	1.20	3.07	1.0	0.73	7.98	100	56.41	64.40	0.350	-0.183
263.1	46.751	4.75	1.24	3.09	1.0	0.73	7.85	100	56.37	64.22	0.350	-0.182
263.0	46.915	4.87	0.94	3.03	1.0	0.73	8.01	100	56.42	64.43	0.350	-0.183
262.8	47.079	4.88	0.91	3.02	1.0	0.73	8.04	100	56.43	64.47	0.350	-0.183
262.7	47.244	4.80	1.28	3.09	1.0	0.72	7.95	100	56.40	64.35	0.350	-0.182
262.5	47.408	4.84	1.22	3.08	1.0	0.72	8.00	100	56.42	64.42	0.350	-0.182
262.3	47.572	5.14	1.78	3.13	1.0	0.72	8.40	100	56.54	64.94	0.350	-0.185
262.2	47.736	6.81	1.37	2.97	1.0	0.72	10.57	100	57.21	67.78	0.350	-0.202
262.0	47.900	5.21	1.71	3.11	1.0	0.72	8.52	100	56.58	65.10	0.350	-0.186
261.8	48.064	4.66	2.25	3.21	1.0	0.72	7.82	100	56.36	64.19	0.350	-0.181
261.7	48.228	4.89	1.46	3.11	1.0	0.72	8.13	100	56.46	64.59	0.350	-0.183
261.5	48.392	4.75	1.30	3.10	1.0	0.72	7.95	100	56.40	64.36	0.350	-0.181
261.3	48.556	4.62	2.38	3.23	1.0	0.72	7.80	100	56.35	64.15	0.350	-0.180
261.2	48.720	4.90	5.09	3.38	1.0	0.71	8.17	100	56.47	64.64	0.350	-0.183
261.0	48.884	47.98	1.02	2.17	0.5	0.75	50.25	37	51.64	101.89	0.350	-0.366
260.9	49.048	110.13	0.68	1.77	0.5	0.76	114.36	5	0.16	114.52	0.350	-0.417
260.7	49.212	126.50	0.78	1.76	0.5	0.78	133.87	4	0.03	133.89	0.350	-0.487
260.5	49.376	123.98	0.86	1.80	0.5	0.78	131.07	7	1.36	132.43	0.350	-0.482
260.4	49.540	113.42	0.97	1.86	0.5	0.78	120.31	12	13.66	133.98	0.350	-0.487
260.2	49.704	99.71	1.07	1.93	0.5	0.78	106.41	17	30.75	137.16	0.350	-0.498
260.0	49.868	90.62	1.06	1.96	0.5	0.78	96.46	20	36.02	132.48	0.350	-0.482
259.9	50.032	81.53	1.10	2.00	0.5	0.77	86.70	23	42.39	129.09	0.350	-0.470
259.7	50.196	77.07	1.00	2.00	0.5	0.76	81.44	23	40.42	121.86	0.350	-0.444
259.5	50.360	64.82	1.24	2.12	0.5	0.76	68.75	32	51.78	120.53	0.350	-0.439
259.4	50.524	44.61	2.34	2.42	0.5	0.75	47.29	56	60.84	108.13	0.350	-0.391
259.2	50.688	19.21	4.36	2.87	1.0	0.73	27.69	93	61.83	89.52	0.350	-0.311
259.0	50.852	9.88	6.64	3.21	1.0	0.71	14.91	100	58.56	73.47	0.350	-0.231
258.9	51.016	15.65	3.96	2.91	1.0	0.72	22.80	96	60.66	83.46	0.350	-0.282
258.7	51.180	15.26	3.73	2.90	1.0	0.72	22.29	95	60.44	82.72	0.350	-0.278
258.6	51.345	9.53	5.80	3.18	1.0	0.71	14.49	100	58.43	72.92	0.350	-0.228
258.4	51.509	6.67	5.80	3.31	1.0	0.70	10.67	100	57.25	67.92	0.350	-0.200
258.2	51.673	41.33	1.14	2.25	0.5	0.73	43.41	43	54.21	97.61	0.350	-0.347
258.1	51.837	19.15	3.42	2.80	1.0	0.72	27.83	87	61.29	89.12	0.350	-0.308
257.9	52.001	11.67	4.91	3.07	1.0	0.71	17.47	100	59.36	76.83	0.350	-0.248
257.7	52.165	5.99	7.62	3.42	1.0	0.70	9.83	100	56.99	66.82	0.350	-0.194
257.6	52.329	6.15	3.38	3.20	1.0	0.70	10.05	100	57.05	67.10	0.350	-0.195
257.4	52.493	5.94	1.92	3.09	1.0	0.69	9.78	100	56.97	66.75	0.350	-0.193
257.2	52.657	5.48	1.98	3.12	1.0	0.69	9.18	100	56.78	65.96	0.350	-0.188
257.1	52.821	5.16	1.95	3.14	1.0	0.69	8.77	100	56.66	65.42	0.350	-0.185
256.9	52.985	5.18	1.82	3.13	1.0	0.69	8.80	100	56.67	65.47	0.350	-0.185
256.8	53.149	5.11	1.58	3.10	1.0	0.69	8.72	100	56.64	65.37	0.350	-0.185

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
256.6	53.313	4.66	1.58	3.14	1.0	0.69	8.14	100	56.46	64.59	0.350	-0.180
256.4	53.477	4.97	1.36	3.09	1.0	0.69	8.55	100	56.59	65.14	0.350	-0.183
256.3	53.641	4.83	1.55	3.12	1.0	0.68	8.37	100	56.53	64.90	0.350	-0.182
256.1	53.805	5.06	1.92	3.15	1.0	0.68	8.69	100	56.63	65.33	0.350	-0.184
255.9	53.969	6.40	1.68	3.03	1.0	0.69	10.50	100	57.19	67.69	0.350	-0.198
255.8	54.133	5.00	2.31	3.19	1.0	0.68	8.63	100	56.61	65.24	0.350	-0.184
255.6	54.297	4.96	2.26	3.19	1.0	0.68	8.60	100	56.60	65.20	0.350	-0.183
255.4	54.461	4.94	1.97	3.16	1.0	0.68	8.57	100	56.59	65.16	0.350	-0.183
255.3	54.625	4.77	1.81	3.16	1.0	0.68	8.35	100	56.53	64.88	0.350	-0.181
255.1	54.789	4.70	1.66	3.15	1.0	0.68	8.27	100	56.50	64.77	0.350	-0.180
254.9	54.953	4.95	1.48	3.10	1.0	0.68	8.62	100	56.61	65.23	0.350	-0.183
254.8	55.117	5.13	1.65	3.11	1.0	0.68	8.87	100	56.69	65.55	0.350	-0.185
254.6	55.281	4.95	2.00	3.17	1.0	0.68	8.63	100	56.61	65.24	0.350	-0.183
254.5	55.446	4.71	2.11	3.20	1.0	0.67	8.32	100	56.52	64.83	0.350	-0.180
254.3	55.610	4.90	1.77	3.14	1.0	0.67	8.59	100	56.60	65.19	0.350	-0.182
254.1	55.774	5.04	1.66	3.12	1.0	0.67	8.79	100	56.66	65.45	0.350	-0.184
254.0	55.938	5.11	1.95	3.15	1.0	0.67	8.90	100	56.69	65.59	0.350	-0.185
253.8	56.102	4.88	2.01	3.17	1.0	0.67	8.59	100	56.60	65.19	0.350	-0.182
253.6	56.266	4.82	2.13	3.19	1.0	0.67	8.51	100	56.58	65.09	0.350	-0.181
253.5	56.430	4.50	1.88	3.19	1.0	0.67	8.09	100	56.45	64.54	0.350	-0.178
253.3	56.594	4.55	1.67	3.16	1.0	0.67	8.17	100	56.47	64.64	0.350	-0.179
253.1	56.758	4.46	1.36	3.13	1.0	0.67	8.06	100	56.43	64.49	0.350	-0.178
253.0	56.922	4.39	1.34	3.13	1.0	0.67	7.97	100	56.41	64.38	0.350	-0.177
252.8	57.086	4.71	1.53	3.13	1.0	0.67	8.42	100	56.55	64.97	0.350	-0.180
252.7	57.250	4.77	1.87	3.16	1.0	0.67	8.51	100	56.58	65.09	0.350	-0.181
252.5	57.414	4.53	2.05	3.20	1.0	0.66	8.19	100	56.48	64.67	0.350	-0.178
252.3	57.578	4.47	1.97	3.20	1.0	0.66	8.12	100	56.45	64.57	0.350	-0.178
252.2	57.742	4.43	1.67	3.17	1.0	0.66	8.08	100	56.44	64.52	0.350	-0.177
252.0	57.906	4.47	1.63	3.16	1.0	0.66	8.13	100	56.46	64.59	0.350	-0.178
251.8	58.070	4.46	1.61	3.16	1.0	0.66	8.13	100	56.46	64.59	0.350	-0.178
251.7	58.234	4.78	1.68	3.14	1.0	0.66	8.58	100	56.60	65.17	0.350	-0.181
251.5	58.398	4.67	1.93	3.18	1.0	0.66	8.43	100	56.55	64.98	0.350	-0.180
251.3	58.562	4.53	2.41	3.24	1.0	0.66	8.25	100	56.49	64.74	0.350	-0.178
251.2	58.726	4.59	2.02	3.20	1.0	0.66	8.35	100	56.52	64.87	0.350	-0.179
251.0	58.890	4.89	1.65	3.13	1.0	0.66	8.77	100	56.66	65.43	0.350	-0.182
250.8	59.054	4.63	1.66	3.15	1.0	0.66	8.42	100	56.55	64.97	0.350	-0.179
250.7	59.218	4.75	1.90	3.17	1.0	0.66	8.59	100	56.60	65.19	0.350	-0.181
250.5	59.382	4.69	1.91	3.18	1.0	0.65	8.52	100	56.58	65.10	0.350	-0.180
250.4	59.547	4.74	2.05	3.19	1.0	0.65	8.60	100	56.60	65.20	0.350	-0.180
250.2	59.711	4.68	2.07	3.19	1.0	0.65	8.53	100	56.58	65.11	0.350	-0.180
250.0	59.875	4.63	2.47	3.24	1.0	0.65	8.47	100	56.56	65.03	0.350	-0.179
249.9	60.039	4.46	2.22	3.23	1.0	0.65	8.23	100	56.49	64.72	0.350	-0.177
249.7	60.203	4.59	2.16	3.21	1.0	0.65	8.43	100	56.55	64.98	0.350	-0.179
249.5	60.367	4.51	4.37	3.37	1.0	0.65	8.33	100	56.52	64.85	0.350	-0.178
249.4	60.531	6.05	3.99	3.25	1.0	0.65	10.49	100	57.19	67.68	0.350	-0.194
249.2	60.695	72.02	0.67	1.92	0.5	0.69	74.53	17	25.45	99.98	0.350	-0.352
249.0	60.859	87.34	0.76	1.88	0.5	0.70	91.23	14	18.13	109.35	0.350	-0.390
248.9	61.023	86.31	0.95	1.95	0.5	0.72	92.25	19	32.49	124.75	0.350	-0.449
248.7	61.187	83.78	1.01	1.97	0.5	0.72	89.99	21	37.59	127.58	0.350	-0.459
248.5	61.351	81.47	0.97	1.97	0.5	0.71	87.13	21	36.71	123.84	0.350	-0.445
248.4	61.515	78.26	1.04	2.00	0.5	0.72	84.02	23	41.61	125.63	0.350	-0.452
248.2	61.679	70.98	1.57	2.15	0.5	0.72	77.31	35	56.42	133.73	0.350	-0.480
248.1	61.843	26.85	3.48	2.70	1.0	0.69	42.07	79	64.41	106.48	0.350	-0.378
247.9	62.007	12.99	6.73	3.12	1.0	0.66	20.69	100	60.36	81.05	0.350	-0.264
247.7	62.171	8.09	7.19	3.30	1.0	0.65	13.51	100	58.13	71.64	0.350	-0.215
247.6	62.335	5.78	6.76	3.40	1.0	0.64	10.22	100	57.11	67.33	0.350	-0.191
247.4	62.499	4.77	4.57	3.37	1.0	0.64	8.81	100	56.67	65.48	0.350	-0.181
247.2	62.663	4.40	3.23	3.31	1.0	0.64	8.29	100	56.51	64.80	0.350	-0.176
247.1	62.827	4.18	3.06	3.32	1.0	0.64	7.99	100	56.41	64.41	0.350	-0.174
246.9	62.991	4.10	2.76	3.30	1.0	0.64	7.89	100	56.38	64.27	0.350	-0.173
246.7	63.155	4.02	2.64	3.30	1.0	0.63	7.79	100	56.35	64.14	0.350	-0.172
246.6	63.319	4.04	2.50	3.29	1.0	0.63	7.82	100	56.36	64.18	0.350	-0.173
246.4	63.483	4.05	2.45	3.28	1.0	0.63	7.84	100	56.37	64.21	0.350	-0.173
246.3	63.648	4.24	2.08	3.23	1.0	0.63	8.12	100	56.45	64.57	0.350	-0.175
246.1	63.812	4.23	1.95	3.22	1.0	0.63	8.11	100	56.45	64.56	0.350	-0.175
245.9	63.976	4.39	1.78	3.19	1.0	0.63	8.34	100	56.52	64.86	0.350	-0.176

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	(ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
245.8	64.140	4.49	1.82	3.18	1.0	0.63	8.50	100	56.57	65.07	0.350	-0.177
245.6	64.304	4.46	1.97	3.20	1.0	0.63	8.46	100	56.56	65.02	0.350	-0.177
245.4	64.468	4.51	2.15	3.21	1.0	0.63	8.54	100	56.59	65.13	0.350	-0.178
245.3	64.632	4.58	1.95	3.19	1.0	0.63	8.65	100	56.62	65.26	0.350	-0.178
245.1	64.796	4.75	1.86	3.17	1.0	0.63	8.90	100	56.69	65.59	0.350	-0.180
244.9	64.960	4.81	2.04	3.18	1.0	0.63	9.00	100	56.73	65.73	0.350	-0.181
244.8	65.124	4.66	2.76	3.26	1.0	0.63	8.79	100	56.66	65.45	0.350	-0.179
244.6	65.288	4.63	2.62	3.25	1.0	0.63	8.76	100	56.65	65.41	0.350	-0.179
244.4	65.452	4.39	2.30	3.24	1.0	0.62	8.42	100	56.55	64.97	0.350	-0.176
244.3	65.616	4.30	1.99	3.22	1.0	0.62	8.30	100	56.51	64.81	0.350	-0.175
244.1	65.780	4.57	1.69	3.16	1.0	0.62	8.69	100	56.63	65.32	0.350	-0.178
244.0	65.944	4.37	1.73	3.18	1.0	0.62	8.42	100	56.55	64.96	0.350	-0.176
243.8	66.108	4.14	1.81	3.21	1.0	0.62	8.09	100	56.45	64.54	0.350	-0.173
243.6	66.272	4.21	2.04	3.23	1.0	0.62	8.20	100	56.48	64.68	0.350	-0.174
243.5	66.436	4.24	2.02	3.23	1.0	0.62	8.26	100	56.50	64.76	0.350	-0.174
243.3	66.600	4.55	2.15	3.21	1.0	0.62	8.71	100	56.64	65.35	0.350	-0.178
243.1	66.764	4.40	2.27	3.24	1.0	0.62	8.51	100	56.57	65.08	0.350	-0.176
243.0	66.928	4.29	2.49	3.27	1.0	0.62	8.36	100	56.53	64.89	0.350	-0.175
242.8	67.092	4.20	2.26	3.25	1.0	0.62	8.23	100	56.49	64.72	0.350	-0.174
242.6	67.256	4.14	2.12	3.25	1.0	0.62	8.15	100	56.46	64.61	0.350	-0.173
242.5	67.420	4.16	1.97	3.23	1.0	0.62	8.19	100	56.48	64.67	0.350	-0.173
242.3	67.584	4.02	2.05	3.25	1.0	0.61	8.00	100	56.42	64.42	0.350	-0.172
242.2	67.749	3.98	2.10	3.26	1.0	0.61	7.94	100	56.40	64.34	0.350	-0.171
242.0	67.913	4.01	2.12	3.26	1.0	0.61	7.99	100	56.41	64.40	0.350	-0.172
241.8	68.077	4.15	2.03	3.24	1.0	0.61	8.20	100	56.48	64.68	0.350	-0.173
241.7	68.241	4.28	2.03	3.22	1.0	0.61	8.40	100	56.54	64.94	0.350	-0.175
241.5	68.405	4.86	2.45	3.21	1.0	0.61	9.26	100	56.81	66.07	0.350	-0.181
241.3	68.569	4.77	2.78	3.25	1.0	0.61	9.14	100	56.77	65.90	0.350	-0.180
241.2	68.733	4.77	2.91	3.26	1.0	0.61	9.14	100	56.77	65.91	0.350	-0.180
241.0	68.897	4.58	2.62	3.25	1.0	0.61	8.87	100	56.69	65.56	0.350	-0.178
240.8	69.061	4.39	2.49	3.26	1.0	0.61	8.60	100	56.60	65.21	0.350	-0.176
240.7	69.225	4.24	2.34	3.26	1.0	0.61	8.39	100	56.54	64.93	0.350	-0.174
240.5	69.389	4.21	2.17	3.24	1.0	0.61	8.36	100	56.53	64.88	0.350	-0.174
240.3	69.553	4.16	2.17	3.25	1.0	0.61	8.30	100	56.51	64.81	0.350	-0.173
240.2	69.717	4.05	2.21	3.26	1.0	0.61	8.14	100	56.46	64.60	0.350	-0.172
240.0	69.881	4.02	2.30	3.27	1.0	0.61	8.11	100	56.45	64.56	0.350	-0.172
239.9	70.045	4.05	2.17	3.26	1.0	0.60	8.16	100	56.47	64.62	0.350	-0.172
239.7	70.209	4.13	2.02	3.24	1.0	0.60	8.28	100	56.50	64.79	0.350	-0.173
239.5	70.373	4.20	2.04	3.23	1.0	0.60	8.39	100	56.54	64.92	0.350	-0.173
239.4	70.537	4.40	2.21	3.23	1.0	0.60	8.69	100	56.63	65.32	0.350	-0.176
239.2	70.701	4.32	2.42	3.26	1.0	0.60	8.58	100	56.60	65.17	0.350	-0.175
239.0	70.865	4.24	2.45	3.27	1.0	0.60	8.48	100	56.56	65.04	0.350	-0.174
238.9	71.029	4.25	2.13	3.24	1.0	0.60	8.50	100	56.57	65.07	0.350	-0.174
238.7	71.193	4.28	2.03	3.22	1.0	0.60	8.54	100	56.58	65.13	0.350	-0.174
238.5	71.357	4.22	2.14	3.24	1.0	0.60	8.46	100	56.56	65.02	0.350	-0.174
238.4	71.521	4.15	2.29	3.26	1.0	0.60	8.37	100	56.53	64.90	0.350	-0.173
238.2	71.685	4.18	2.28	3.26	1.0	0.60	8.42	100	56.55	64.96	0.350	-0.173
238.1	71.850	4.13	2.15	3.25	1.0	0.60	8.35	100	56.53	64.88	0.350	-0.173
237.9	72.014	4.17	2.14	3.24	1.0	0.60	8.42	100	56.55	64.97	0.350	-0.173
237.7	72.178	3.96	2.14	3.26	1.0	0.60	8.12	100	56.45	64.57	0.350	-0.171
237.6	72.342	3.88	2.08	3.27	1.0	0.60	8.01	100	56.42	64.44	0.350	-0.170
237.4	72.506	3.72	1.80	3.25	1.0	0.59	7.77	100	56.35	64.12	0.350	-0.168
237.2	72.670	3.73	1.68	3.24	1.0	0.59	7.81	100	56.36	64.16	0.350	-0.168
237.1	72.834	3.86	1.71	3.23	1.0	0.59	8.01	100	56.42	64.42	0.350	-0.169
236.9	72.998	3.80	1.86	3.25	1.0	0.59	7.92	100	56.39	64.31	0.350	-0.169
236.7	73.162	3.93	1.90	3.24	1.0	0.59	8.13	100	56.46	64.58	0.350	-0.170
236.6	73.326	4.05	2.04	3.25	1.0	0.59	8.30	100	56.51	64.81	0.350	-0.171
236.4	73.490	4.20	2.17	3.24	1.0	0.59	8.54	100	56.58	65.12	0.350	-0.173
236.2	73.654	4.06	2.31	3.27	1.0	0.59	8.33	100	56.52	64.85	0.350	-0.172
236.1	73.818	4.13	2.23	3.26	1.0	0.59	8.44	100	56.55	64.99	0.350	-0.172
235.9	73.982	3.99	2.13	3.26	1.0	0.59	8.25	100	56.49	64.75	0.350	-0.171
235.8	74.146	4.08	2.16	3.25	1.0	0.59	8.39	100	56.54	64.93	0.350	-0.172
235.6	74.310	3.87	2.19	3.28	1.0	0.59	8.09	100	56.44	64.53	0.350	-0.169
235.4	74.474	3.91	2.05	3.26	1.0	0.59	8.15	100	56.46	64.61	0.350	-0.170
235.3	74.638	4.12	1.76	3.21	1.0	0.59	8.47	100	56.56	65.03	0.350	-0.172
235.1	74.802	3.87	1.92	3.25	1.0	0.59	8.10	100	56.45	64.55	0.350	-0.169

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
234.9	74.966	3.86	2.62	3.32	1.0	0.59	8.09	100	56.44	64.53	0.350	-0.169
234.8	75.130	3.94	2.25	3.28	1.0	0.58	8.22	100	56.48	64.70	0.350	-0.170
234.6	75.294	4.32	2.07	3.22	1.0	0.59	8.80	100	56.66	65.46	0.350	-0.174
234.4	75.458	4.11	2.19	3.25	1.0	0.58	8.49	100	56.57	65.05	0.350	-0.172
234.3	75.622	4.11	2.20	3.26	1.0	0.58	8.50	100	56.57	65.07	0.350	-0.172
234.1	75.786	4.12	2.12	3.25	1.0	0.58	8.52	100	56.58	65.10	0.350	-0.172
233.9	75.951	4.10	2.16	3.25	1.0	0.58	8.50	100	56.57	65.07	0.350	-0.172
233.8	76.115	4.30	2.29	3.25	1.0	0.58	8.81	100	56.67	65.48	0.350	-0.174
233.6	76.279	4.30	2.47	3.26	1.0	0.58	8.82	100	56.67	65.49	0.350	-0.174
233.5	76.443	4.09	2.85	3.31	1.0	0.58	8.51	100	56.57	65.08	0.350	-0.172
233.3	76.607	4.01	2.18	3.26	1.0	0.58	8.39	100	56.54	64.93	0.350	-0.171
233.1	76.771	4.41	2.16	3.22	1.0	0.58	9.01	100	56.73	65.75	0.350	-0.175
233.0	76.935	4.16	2.18	3.25	1.0	0.58	8.63	100	56.61	65.24	0.350	-0.172
232.8	77.099	4.07	2.32	3.27	1.0	0.58	8.50	100	56.57	65.07	0.350	-0.171
232.6	77.263	4.02	1.74	3.22	1.0	0.58	8.43	100	56.55	64.98	0.350	-0.171
232.5	77.427	4.09	1.60	3.19	1.0	0.58	8.54	100	56.59	65.13	0.350	-0.171
232.3	77.591	4.00	1.68	3.21	1.0	0.58	8.42	100	56.55	64.96	0.350	-0.170
232.1	77.755	3.99	1.66	3.21	1.0	0.58	8.42	100	56.55	64.96	0.350	-0.170
232.0	77.919	3.97	1.69	3.22	1.0	0.57	8.39	100	56.54	64.92	0.350	-0.170
231.8	78.083	3.93	1.61	3.21	1.0	0.57	8.34	100	56.52	64.86	0.350	-0.170
231.7	78.247	3.80	1.72	3.24	1.0	0.57	8.14	100	56.46	64.60	0.350	-0.168
231.5	78.411	3.83	1.70	3.23	1.0	0.57	8.19	100	56.48	64.67	0.350	-0.168
231.3	78.575	3.75	1.70	3.24	1.0	0.57	8.08	100	56.44	64.53	0.350	-0.167
231.2	78.739	3.79	1.78	3.24	1.0	0.57	8.15	100	56.46	64.62	0.350	-0.168
231.0	78.903	3.81	1.89	3.25	1.0	0.57	8.18	100	56.47	64.66	0.350	-0.168
230.8	79.067	3.81	2.10	3.28	1.0	0.57	8.19	100	56.48	64.67	0.350	-0.168
230.7	79.231	3.76	2.19	3.29	1.0	0.57	8.12	100	56.45	64.58	0.350	-0.167
230.5	79.395	3.99	2.61	3.30	1.0	0.57	8.49	100	56.57	65.06	0.350	-0.170
230.3	79.559	4.52	4.91	3.40	1.0	0.57	9.31	100	56.82	66.13	0.350	-0.176
230.2	79.723	9.73	3.72	3.06	1.0	0.59	17.59	100	59.39	76.98	0.350	-0.235
230.0	79.887	141.11	0.52	1.62	0.5	0.69	160.65	0	0.00	160.65	0.350	-0.558
229.8	80.052	188.57	0.35	1.42	0.5	0.76	235.58	0	0.00	235.58	0.350	-0.600
229.7	80.216	167.69	0.27	1.40	0.5	0.73	201.50	0	0.00	201.50	0.350	-0.600
229.5	80.380	124.80	0.60	1.70	0.5	0.66	137.30	0	0.00	137.30	0.350	-0.483
229.4	80.544	80.61	0.85	1.94	0.5	0.64	86.60	18	30.74	117.34	0.350	-0.412
229.2	80.708	48.94	1.75	2.30	0.5	0.63	53.19	47	58.90	112.08	0.350	-0.392
229.0	80.872	14.59	4.42	2.97	1.0	0.60	25.89	100	61.97	87.86	0.350	-0.288
228.9	81.036	8.50	6.53	3.26	1.0	0.58	15.70	100	58.81	74.51	0.350	-0.222
228.7	81.200	7.93	4.73	3.19	1.0	0.58	14.80	100	58.53	73.32	0.350	-0.216
228.5	81.364	7.40	2.61	3.07	1.0	0.57	13.95	100	58.26	72.22	0.350	-0.210
228.4	81.528	11.24	1.31	2.76	1.0	0.58	20.17	84	58.58	78.76	0.350	-0.244
228.2	81.692	33.29	0.94	2.28	0.5	0.60	35.30	46	53.53	88.83	0.350	-0.292
228.0	81.856	36.76	0.65	2.17	0.5	0.60	38.55	36	48.72	87.27	0.350	-0.285
227.9	82.020	48.20	0.56	2.03	0.5	0.60	50.02	26	40.01	90.03	0.350	-0.298
227.7	82.184	18.49	1.96	2.67	1.0	0.60	32.76	77	61.34	94.10	0.350	-0.316
227.6	82.348	10.14	3.28	3.01	1.0	0.58	18.52	100	59.68	78.20	0.350	-0.240
227.4	82.512	6.15	5.95	3.34	1.0	0.57	12.02	100	57.66	69.68	0.350	-0.195
227.2	82.676	8.26	2.31	3.00	1.0	0.57	15.45	100	58.73	74.18	0.350	-0.219
227.1	82.840	13.43	1.74	2.76	1.0	0.59	24.03	84	59.71	83.74	0.350	-0.268
226.9	83.004	94.56	0.79	1.87	0.5	0.63	100.89	12	14.73	115.62	0.350	-0.405
226.7	83.168	140.74	0.89	1.77	0.5	0.68	161.04	4	0.04	161.08	0.350	-0.558
226.6	83.332	145.83	1.22	1.85	0.5	0.71	172.95	11	12.74	185.69	0.350	-0.600
226.4	83.496	143.58	1.58	1.93	0.5	0.74	177.64	18	39.53	217.16	0.350	-0.600
226.2	83.660	142.59	1.64	1.95	0.5	0.74	177.23	19	43.29	220.52	0.350	-0.600
226.1	83.824	143.07	1.65	1.95	0.5	0.74	178.17	19	43.63	221.80	0.350	-0.600
225.9	83.988	155.05	1.56	1.91	0.5	0.74	194.07	15	32.85	226.92	0.350	-0.600
225.7	84.153	154.72	1.67	1.93	0.5	0.75	195.86	17	40.13	235.99	0.350	-0.600
225.6	84.317	144.51	1.80	1.97	0.5	0.75	182.63	21	50.60	233.24	0.350	-0.600
225.4	84.481	126.36	1.81	2.01	0.5	0.73	155.86	24	55.22	211.08	0.350	-0.600
225.3	84.645	106.31	1.57	2.02	0.5	0.69	125.73	25	51.54	177.27	0.350	-0.600
225.1	84.809	94.25	0.99	1.93	0.5	0.65	104.27	17	29.79	134.06	0.350	-0.471
224.9	84.973	76.14	0.47	1.82	0.5	0.57	75.29	9	3.81	79.10	0.350	-0.244
224.8	85.137	57.39	0.20	1.79	0.5	0.53	53.11	6	0.53	53.65	0.350	-0.096
224.6	85.301	49.75	0.15	1.82	0.5	0.52	45.50	8	3.01	48.51	0.350	-0.060
224.4	85.465	28.21	0.53	2.23	0.5	0.57	29.67	41	49.86	79.53	0.350	-0.246
224.3	85.629	30.44	1.03	2.34	0.5	0.58	32.42	50	54.63	87.05	0.350	-0.282

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
224.1	85.793	40.68	1.75	2.37	0.5	0.60	43.96	52	58.58	102.54	0.350	-0.351
223.9	85.957	107.15	0.64	1.77	0.5	0.62	113.67	4	0.06	113.73	0.350	-0.396
223.8	86.121	128.37	0.40	1.59	0.5	0.65	143.44	0	0.00	143.44	0.350	-0.501
223.6	86.285	134.66	0.24	1.47	0.5	0.66	152.73	0	0.00	152.73	0.350	-0.531
223.5	86.449	143.28	0.27	1.47	0.5	0.68	165.82	0	0.00	165.82	0.350	-0.570
223.3	86.613	140.91	0.33	1.51	0.5	0.67	162.24	0	0.00	162.24	0.350	-0.560
223.1	86.777	143.08	0.32	1.50	0.5	0.68	165.61	0	0.00	165.61	0.350	-0.570
223.0	86.941	162.71	0.34	1.46	0.5	0.71	196.78	0	0.00	196.78	0.350	-0.600
222.8	87.105	170.64	0.41	1.49	0.5	0.72	210.01	0	0.00	210.01	0.350	-0.600
222.6	87.269	181.10	0.38	1.45	0.5	0.74	227.96	0	0.00	227.96	0.350	-0.600
222.5	87.433	159.16	0.55	1.59	0.5	0.70	191.23	0	0.00	191.23	0.350	-0.600
222.3	87.597	122.16	1.15	1.89	0.5	0.67	141.72	14	22.54	164.26	0.350	-0.565
222.1	87.761	95.04	1.17	1.97	0.5	0.66	108.09	21	40.00	148.09	0.350	-0.516
222.0	87.925	70.99	1.28	2.09	0.5	0.64	79.09	30	51.92	131.01	0.350	-0.459
221.8	88.089	20.62	2.33	2.68	1.0	0.60	37.87	77	62.93	100.80	0.350	-0.343
221.6	88.254	47.54	1.00	2.17	0.5	0.60	50.93	36	51.63	102.56	0.350	-0.350
221.5	88.418	58.25	0.39	1.89	0.5	0.56	57.40	14	16.73	74.13	0.350	-0.217
221.3	88.582	66.14	0.35	1.82	0.5	0.54	63.31	8	3.10	66.41	0.350	-0.174
221.2	88.746	80.97	0.17	1.63	0.5	0.56	80.01	0	0.00	80.01	0.350	-0.247
221.0	88.910	88.32	0.28	1.67	0.5	0.58	89.14	0	0.00	89.14	0.350	-0.291
220.8	89.074	104.91	0.21	1.55	0.5	0.61	110.83	0	0.00	110.83	0.350	-0.383
220.7	89.238	114.85	0.15	1.46	0.5	0.62	124.54	0	0.00	124.54	0.350	-0.435
220.5	89.402	112.87	0.28	1.57	0.5	0.62	121.79	0	0.00	121.79	0.350	-0.425
220.3	89.566	111.21	0.17	1.49	0.5	0.62	119.49	0	0.00	119.49	0.350	-0.416
220.2	89.730	104.84	0.22	1.55	0.5	0.60	110.77	0	0.00	110.77	0.350	-0.383
220.0	89.894	127.91	0.77	1.76	0.5	0.64	143.48	4	0.01	143.49	0.350	-0.500
219.8	90.058	121.29	0.51	1.67	0.5	0.63	133.83	0	0.00	133.83	0.350	-0.467
219.7	90.222	81.30	1.44	2.08	0.5	0.65	92.88	29	53.38	146.26	0.350	-0.509
219.5	90.386	21.10	3.13	2.75	1.0	0.59	39.38	83	64.21	103.58	0.350	-0.353
219.3	90.550	8.38	7.01	3.28	1.0	0.55	16.25	100	58.98	75.22	0.350	-0.222
219.2	90.714	4.73	5.86	3.43	1.0	0.54	10.16	100	57.09	67.25	0.350	-0.178
219.0	90.878	4.18	1.77	3.20	1.0	0.53	9.28	100	56.81	66.10	0.350	-0.171
218.9	91.042	4.16	1.42	3.16	1.0	0.53	9.25	100	56.80	66.05	0.350	-0.171
218.7	91.206	5.43	1.59	3.08	1.0	0.54	11.34	100	57.45	68.79	0.350	-0.186
218.5	91.370	4.81	1.91	3.17	1.0	0.54	10.32	100	57.14	67.46	0.350	-0.179
218.4	91.534	4.61	1.78	3.17	1.0	0.53	10.00	100	57.04	67.04	0.350	-0.176
218.2	91.698	10.24	1.33	2.80	1.0	0.55	19.50	87	58.75	78.26	0.350	-0.237
218.0	91.862	11.11	1.12	2.74	1.0	0.55	21.01	82	58.57	79.58	0.350	-0.243
217.9	92.026	8.31	2.01	2.97	1.0	0.55	16.25	100	58.98	75.22	0.350	-0.221
217.7	92.190	7.13	2.20	3.05	1.0	0.54	14.24	100	58.35	72.59	0.350	-0.207
217.5	92.355	4.60	2.57	3.25	1.0	0.53	10.03	100	57.05	67.07	0.350	-0.176
217.4	92.519	4.46	1.26	3.11	1.0	0.53	9.80	100	56.97	66.77	0.350	-0.174
217.2	92.683	4.28	1.01	3.09	1.0	0.53	9.51	100	56.89	66.40	0.350	-0.172
217.1	92.847	4.30	0.99	3.09	1.0	0.53	9.56	100	56.90	66.46	0.350	-0.173
216.9	93.011	4.28	0.94	3.08	1.0	0.53	9.53	100	56.89	66.42	0.350	-0.172
216.7	93.175	4.20	1.06	3.11	1.0	0.53	9.41	100	56.85	66.26	0.350	-0.171
216.6	93.339	4.28	1.41	3.15	1.0	0.53	9.55	100	56.90	66.45	0.350	-0.172
216.4	93.503	4.60	8.26	3.53	1.0	0.53	10.08	100	57.06	67.14	0.350	-0.176
216.2	93.667	66.27	2.14	2.26	0.5	0.63	75.49	44	62.84	138.33	0.350	-0.481
216.1	93.831	87.06	2.95	2.28	0.5	0.67	104.81	45	71.07	175.88	0.350	-0.596
215.9	93.995	95.57	3.53	2.31	0.5	0.69	118.01	48	76.10	194.11	0.350	-0.600
215.7	94.159	101.77	2.51	2.18	0.5	0.69	125.79	38	70.04	195.83	0.350	-0.600
215.6	94.323	117.01	1.46	1.97	0.5	0.68	142.14	21	44.59	186.73	0.350	-0.600
215.4	94.487	127.31	1.24	1.89	0.5	0.67	152.17	14	25.48	177.66	0.350	-0.600
215.2	94.651	116.34	0.76	1.79	0.5	0.61	127.47	6	0.57	128.04	0.350	-0.445
215.1	94.815	98.71	1.17	1.96	0.5	0.64	113.71	20	37.93	151.64	0.350	-0.524
214.9	94.979	85.98	1.58	2.09	0.5	0.65	100.35	30	55.97	156.32	0.350	-0.538
214.8	95.143	72.80	1.84	2.19	0.5	0.63	83.65	38	60.57	144.22	0.350	-0.500
214.6	95.307	49.36	2.22	2.37	0.5	0.60	54.60	52	61.47	116.07	0.350	-0.401
214.4	95.471	11.56	5.07	3.08	1.0	0.55	22.31	100	60.86	83.16	0.350	-0.260
214.3	95.635	6.57	7.23	3.37	1.0	0.53	13.50	100	58.12	71.62	0.350	-0.200
214.1	95.799	42.77	1.66	2.34	0.5	0.58	46.55	50	58.27	104.81	0.350	-0.356
213.9	95.963	124.82	0.29	1.53	0.5	0.63	139.94	0	0.00	139.94	0.350	-0.486
213.8	96.127	144.94	0.77	1.71	0.5	0.66	171.35	0	0.00	171.35	0.350	-0.582
213.6	96.291	139.61	0.65	1.68	0.5	0.65	162.85	0	0.00	162.85	0.350	-0.558
213.4	96.456	110.94	0.73	1.79	0.5	0.60	120.03	6	0.84	120.87	0.350	-0.419

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	<i>z</i> (ft)	<i>Q</i>	<i>F</i> (%)	<i>I_c</i>	<i>n</i>	<i>C_N</i>	<i>q_{c1N}</i>	<i>FC</i> (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	<i>a</i>	ξ_R
213.3	96.620	108.82	0.42	1.66	0.5	0.59	116.75	0	0.00	116.75	0.350	-0.403
213.1	96.784	97.52	0.15	1.53	0.5	0.57	101.23	0	0.00	101.23	0.350	-0.341
213.0	96.948	87.08	0.15	1.58	0.5	0.55	87.55	0	0.00	87.55	0.350	-0.280
212.8	97.112	88.27	0.40	1.73	0.5	0.55	89.08	2	0.00	89.08	0.350	-0.287
212.6	97.276	97.72	0.51	1.75	0.5	0.57	101.51	3	0.00	101.51	0.350	-0.342
212.5	97.440	98.74	1.15	1.95	0.5	0.64	113.85	19	36.80	150.65	0.350	-0.520
212.3	97.604	134.26	1.93	2.02	0.5	0.72	175.02	24	59.12	234.14	0.350	-0.600
212.1	97.768	242.43	0.92	1.61	0.5	0.74	321.19	0	0.00	321.19	0.350	-0.600
212.0	97.932	321.11	0.60	1.39	0.5	0.74	424.25	0	0.00	424.25	0.350	-0.600
211.8	98.096	305.89	0.78	1.49	0.5	0.74	404.48	0	0.00	404.48	0.350	-0.600
211.6	98.260	325.85	0.50	1.32	0.5	0.74	430.74	0	0.00	430.74	0.350	-0.600
211.5	98.424	340.82	0.26	1.14	0.5	0.74	450.50	0	0.00	450.50	0.350	-0.600
211.3	98.588	287.69	0.22	1.16	0.5	0.74	381.05	0	0.00	381.05	0.350	-0.600
211.1	98.752	237.13	0.15	1.16	0.5	0.74	314.93	0	0.00	314.93	0.350	-0.600
211.0	98.916	213.98	0.29	1.33	0.5	0.74	284.69	0	0.00	284.69	0.350	-0.600
210.8	99.080	197.45	0.17	1.26	0.5	0.74	263.11	0	0.00	263.11	0.350	-0.600
210.7	99.244	187.47	0.23	1.33	0.5	0.73	248.16	0	0.00	248.16	0.350	-0.600
210.5	99.408	199.38	0.22	1.30	0.5	0.74	265.83	0	0.00	265.83	0.350	-0.600
210.3	99.572	227.79	0.25	1.27	0.5	0.74	303.21	0	0.00	303.21	0.350	-0.600
210.2	99.736	246.30	0.23	1.22	0.5	0.74	327.62	0	0.00	327.62	0.350	-0.600
210.0	99.900	250.49	0.16	1.15	0.5	0.74	333.24	0	0.00	333.24	0.350	-0.600
209.8	100.064	222.36	0.30	1.32	0.5	0.74	296.39	0	0.00	296.39	0.350	-0.600
209.7	100.228	201.55	0.48	1.47	0.5	0.74	269.14	0	0.00	269.14	0.350	-0.600
209.5	100.392	208.13	0.41	1.42	0.5	0.74	277.88	0	0.00	277.88	0.350	-0.600
209.3	100.557	269.92	0.29	1.24	0.5	0.74	359.27	0	0.00	359.27	0.350	-0.600

LIQUEFACTION POTENTIAL ASSESSMENT FOR COARSE GRAINED SOILS USING CONE PENETRATION TEST DATA

Shear Stress Fit Parameters	
m4:	0
m3:	0
m2:	0
m1:	0

Depth to Water during Earthquake: 15.0 ft
Final Grade Elevation during EQ: 309.9 ft
Height of Final Grade above CPT TOH: 0.0 ft
Normalize K_v to: 1.058 tsf
 a_{max} at top of ground surface: 0.20 g
Earthquake Magnitude: 7.70 Mw
Earthquake File or Source Zone: Design Source

Project Site: US 60 Bridge
Stantec Project No.: 178565011
CPT ID: SP05

Elev. (ft)	Depth z (ft)	Cyclic Resistance Ratio $CRR_{7.5}$	Relative Density D_r (%)	Correction for Overburden Pressure K_σ	Correction for Sloping Ground K_α	Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., f_d	From Ground Response				Sample Screened for:				Factor of Safety FS_{liq}	Material (optional)	Soil Type (see note on following chart)
									Maximum Induced Shear Stress τ_{Max} (psf)	Average Cyclic Shear Stress τ_{Avg} (psf)	Cyclic Ratio CSR	Clay-like $(qc_{IN})_{CS} \geq 175$	High Tip Res.	Unsaturated					
309.9																			
309.7	0.164	0.083	17	1.100	N/A	0.99	N/A	1.000	0	0	0.133	FALSE	FALSE	TRUE	N/A	N/A	A1		
309.6	0.328	0.093	29	1.100	N/A	0.99	N/A	1.000	0	0	0.133	FALSE	FALSE	TRUE	N/A	N/A	A1		
309.4	0.492	0.098	34	1.100	N/A	0.99	N/A	1.000	0	0	0.133	FALSE	FALSE	TRUE	N/A	N/A	A1		
309.2	0.656	0.114	45	1.100	N/A	0.99	N/A	1.000	0	0	0.133	FALSE	FALSE	TRUE	N/A	N/A	A1		
309.1	0.820	0.142	56	1.100	N/A	0.98	N/A	1.000	0	0	0.133	FALSE	FALSE	TRUE	N/A	N/A	A1		
308.9	0.984	0.177	64	1.100	N/A	0.97	N/A	1.000	0	0	0.133	FALSE	FALSE	TRUE	N/A	N/A	A1		
308.8	1.148	0.210	68	1.100	N/A	0.97	N/A	1.000	0	0	0.133	FALSE	FALSE	TRUE	N/A	N/A	A1		
308.6	1.312	0.182	65	1.100	N/A	0.97	N/A	1.000	0	0	0.133	FALSE	FALSE	TRUE	N/A	N/A	A1		
308.4	1.476	0.170	63	1.100	N/A	0.98	N/A	1.000	0	0	0.133	FALSE	FALSE	TRUE	N/A	N/A	A1		
308.3	1.640	0.188	65	1.100	N/A	0.97	N/A	1.000	0	0	0.133	FALSE	FALSE	TRUE	N/A	N/A	A1		
308.1	1.804	0.191	66	1.100	N/A	0.97	N/A	1.000	0	0	0.133	FALSE	FALSE	TRUE	N/A	N/A	A1		
307.9	1.968	0.195	66	1.100	N/A	0.97	N/A	1.000	0	0	0.133	FALSE	FALSE	TRUE	N/A	N/A	A1		
307.8	2.133	0.204	67	1.100	N/A	0.97	N/A	1.000	0	0	0.133	FALSE	FALSE	TRUE	N/A	N/A	A1		
307.6	2.297	0.197	66	1.100	N/A	0.97	N/A	1.000	0	0	0.133	FALSE	FALSE	TRUE	N/A	N/A	A1		
307.4	2.461	0.187	65	1.100	N/A	0.97	N/A	1.000	0	0	0.133	FALSE	FALSE	TRUE	N/A	N/A	A1		
307.3	2.625	0.180	64	1.100	N/A	0.97	N/A	1.000	0	0	0.133	FALSE	FALSE	TRUE	N/A	N/A	A1		
307.1	2.789	0.171	63	1.100	N/A	0.98	N/A	1.000	0	0	0.133	FALSE	FALSE	TRUE	N/A	N/A	A1		
306.9	2.953	0.168	62	1.100	N/A	0.98	N/A	1.000	0	0	0.133	FALSE	FALSE	TRUE	N/A	N/A	A1		
306.8	3.117	0.169	63	1.100	N/A	0.98	N/A	1.000	0	0	0.133	FALSE	FALSE	TRUE	N/A	N/A	A1		
306.6	3.281	0.170	63	1.100	N/A	0.98	N/A	1.000	0	0	0.133	FALSE	FALSE	TRUE	N/A	N/A	A1		
306.5	3.445	0.157	60	1.100	N/A	0.98	N/A	1.000	0	0	0.133	FALSE	FALSE	TRUE	N/A	N/A	A1		
306.3	3.609	0.134	54	1.100	N/A	0.98	N/A	0.999	0	0	0.132	FALSE	FALSE	TRUE	N/A	N/A	A1		
306.1	3.773	0.124	50	1.100	N/A	0.99	N/A	0.999	0	0	0.132	FALSE	FALSE	TRUE	N/A	N/A	A1		
306.0	3.937	0.118	47	1.100	N/A	0.99	N/A	0.999	0	0	0.132	FALSE	FALSE	TRUE	N/A	N/A	A1		
305.8	4.101	0.115	46	1.100	N/A	0.99	N/A	0.998	0	0	0.132	FALSE	FALSE	TRUE	N/A	N/A	A1		
305.6	4.265	0.114	45	1.100	N/A	0.99	N/A	0.998	0	0	0.132	FALSE	FALSE	TRUE	N/A	N/A	A1		
305.5	4.429	0.113	44	1.100	N/A	0.99	N/A	0.998	0	0	0.132	FALSE	FALSE	TRUE	N/A	N/A	A1		
305.3	4.593	0.113	44	1.100	N/A	0.99	N/A	0.997	0	0	0.132	FALSE	FALSE	TRUE	N/A	N/A	B		
305.1	4.757	0.112	44	1.100	N/A	0.99	N/A	0.997	0	0	0.132	FALSE	FALSE	TRUE	N/A	N/A	B		
305.0	4.921	0.110	42	1.100	N/A	0.99	N/A	0.996	0	0	0.132	FALSE	FALSE	TRUE	N/A	N/A	B		
304.8	5.085	0.109	42	1.100	N/A	0.99	N/A	0.996	0	0	0.132	FALSE	FALSE	TRUE	N/A	N/A	B		
304.7	5.249	0.110	42	1.100	N/A	0.99	N/A	0.996	0	0	0.132	FALSE	FALSE	TRUE	N/A	N/A	B		
304.5	5.413	0.109	41	1.100	N/A	0.99	N/A	0.995	0	0	0.132	FALSE	FALSE	TRUE	N/A	N/A	B		
304.3	5.577	N/A	41	N/A	N/A	N/A	N/A	0.995	0	0	0.132	TRUE	FALSE	TRUE	N/A	N/A	B		
304.2	5.741	N/A	40	N/A	N/A	N/A	N/A	0.995	0	0	0.132	TRUE	FALSE	TRUE	N/A	N/A	B		
304.0	5.905	N/A	40	N/A	N/A	N/A	N/A	0.994	0	0	0.132	TRUE	FALSE	TRUE	N/A	N/A	B		
303.8	6.069	N/A	40	N/A	N/A	N/A	N/A	0.994	0	0	0.132	TRUE	FALSE	TRUE	N/A	N/A	B		
303.7	6.234	N/A	41	N/A	N/A	N/A	N/A	0.994	0	0	0.132	TRUE	FALSE	TRUE	N/A	N/A	B		
303.5	6.398	N/A	42	N/A	N/A	N/A	N/A	0.993	0	0	0.132	TRUE	FALSE	TRUE	N/A	N/A	B		
303.3	6.562	N/A	42	N/A	N/A	N/A	N/A	0.993	0	0	0.132	TRUE	FALSE	TRUE	N/A	N/A	B		
303.2	6.726	0.111	43	1.084	N/A	0.99	N/A	0.992	0	0	0.132	FALSE	FALSE	TRUE	N/A	N/A	B		
303.0	6.890	N/A	42	N/A	N/A	N/A	N/A	0.992	0	0	0.132	TRUE	FALSE	TRUE	N/A	N/A	B		
302.8	7.054	N/A	42	N/A	N/A	N/A	N/A	0.992	0	0	0.131	TRUE	FALSE	TRUE	N/A	N/A	B		
302.7	7.218	N/A	42	N/A	N/A	N/A	N/A	0.991	0	0	0.131	TRUE	FALSE	TRUE	N/A	N/A	B		

Front Ground Response										Sample Screened for:										Soil Type	
Elev. (ft)	Depth z	Cyclic Resistance Ratio $CRR_{7.5}$	Relative Density D_r	Correction for Overburden Pressure		Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., t_d	Shear Stress τ_{max} (psf)	Maximum Induced Shear Stress τ_{Avg} (psf)	Cyclic Shear Stress Ratio CSR	High Tip Res. $(q_{c30})_{cs} \geq 175$			Factor of Safety FS_{liq}	Material (optional)	Soil Type (see note on following chart)				
				K_o	K_a							Clay-like	Tip Res.	Unsaturated							
302.5	7.382	N/A	42	N/A	N/A	N/A	N/A	0.991	0	0	0.131	TRUE	FALSE	TRUE	N/A	N/A	B				
302.4	7.546	N/A	42	N/A	N/A	N/A	N/A	0.991	0	0	0.131	TRUE	FALSE	TRUE	N/A	N/A	B				
302.2	7.710	N/A	40	N/A	N/A	N/A	N/A	0.990	0	0	0.131	TRUE	FALSE	TRUE	N/A	N/A	B				
302.0	7.874	N/A	38	N/A	N/A	N/A	N/A	0.990	0	0	0.131	TRUE	FALSE	TRUE	N/A	N/A	B				
301.9	8.038	N/A	37	N/A	N/A	N/A	N/A	0.989	0	0	0.131	TRUE	FALSE	TRUE	N/A	N/A	B				
301.7	8.202	N/A	38	N/A	N/A	N/A	N/A	0.989	0	0	0.131	TRUE	FALSE	TRUE	N/A	N/A	C				
301.5	8.366	N/A	38	N/A	N/A	N/A	N/A	0.989	0	0	0.131	TRUE	FALSE	TRUE	N/A	N/A	C				
301.4	8.530	N/A	37	N/A	N/A	N/A	N/A	0.988	0	0	0.131	TRUE	FALSE	TRUE	N/A	N/A	C				
301.2	8.694	N/A	37	N/A	N/A	N/A	N/A	0.988	0	0	0.131	TRUE	FALSE	TRUE	N/A	N/A	C				
301.0	8.858	N/A	39	N/A	N/A	N/A	N/A	0.987	0	0	0.131	TRUE	FALSE	TRUE	N/A	N/A	C				
300.9	9.022	N/A	37	N/A	N/A	N/A	N/A	0.987	0	0	0.131	TRUE	FALSE	TRUE	N/A	N/A	C				
300.7	9.186	N/A	35	N/A	N/A	N/A	N/A	0.987	0	0	0.131	TRUE	FALSE	TRUE	N/A	N/A	C				
300.5	9.350	N/A	35	N/A	N/A	N/A	N/A	0.986	0	0	0.131	TRUE	FALSE	TRUE	N/A	N/A	C				
300.4	9.514	N/A	35	N/A	N/A	N/A	N/A	0.986	0	0	0.131	TRUE	FALSE	TRUE	N/A	N/A	C				
300.2	9.678	N/A	35	N/A	N/A	N/A	N/A	0.985	0	0	0.131	TRUE	FALSE	TRUE	N/A	N/A	C				
300.1	9.842	N/A	35	N/A	N/A	N/A	N/A	0.985	0	0	0.131	TRUE	FALSE	TRUE	N/A	N/A	C				
299.9	10.006	N/A	35	N/A	N/A	N/A	N/A	0.984	0	0	0.131	TRUE	FALSE	TRUE	N/A	N/A	C				
299.7	10.170	N/A	35	N/A	N/A	N/A	N/A	0.984	0	0	0.130	TRUE	FALSE	TRUE	N/A	N/A	C				
299.6	10.335	N/A	35	N/A	N/A	N/A	N/A	0.984	0	0	0.130	TRUE	FALSE	TRUE	N/A	N/A	C				
299.4	10.499	N/A	36	N/A	N/A	N/A	N/A	0.983	0	0	0.130	TRUE	FALSE	TRUE	N/A	N/A	C				
299.2	10.663	N/A	36	N/A	N/A	N/A	N/A	0.983	0	0	0.130	TRUE	FALSE	TRUE	N/A	N/A	C				
299.1	10.827	N/A	36	N/A	N/A	N/A	N/A	0.982	0	0	0.130	TRUE	FALSE	TRUE	N/A	N/A	C				
298.9	10.991	N/A	36	N/A	N/A	N/A	N/A	0.982	0	0	0.130	TRUE	FALSE	TRUE	N/A	N/A	C				
298.7	11.155	N/A	36	N/A	N/A	N/A	N/A	0.982	0	0	0.130	TRUE	FALSE	TRUE	N/A	N/A	C				
298.6	11.319	N/A	36	N/A	N/A	N/A	N/A	0.981	0	0	0.130	TRUE	FALSE	TRUE	N/A	N/A	C				
298.4	11.483	N/A	35	N/A	N/A	N/A	N/A	0.981	0	0	0.130	TRUE	FALSE	TRUE	N/A	N/A	C				
298.3	11.647	N/A	35	N/A	N/A	N/A	N/A	0.980	0	0	0.130	TRUE	FALSE	TRUE	N/A	N/A	C				
298.1	11.811	N/A	35	N/A	N/A	N/A	N/A	0.980	0	0	0.130	TRUE	FALSE	TRUE	N/A	N/A	C				
297.9	11.975	N/A	35	N/A	N/A	N/A	N/A	0.979	0	0	0.130	TRUE	FALSE	TRUE	N/A	N/A	C				
297.8	12.139	N/A	35	N/A	N/A	N/A	N/A	0.979	0	0	0.130	TRUE	FALSE	TRUE	N/A	N/A	C				
297.6	12.303	N/A	36	N/A	N/A	N/A	N/A	0.978	0	0	0.130	TRUE	FALSE	TRUE	N/A	N/A	C				
297.4	12.467	N/A	37	N/A	N/A	N/A	N/A	0.978	0	0	0.130	TRUE	FALSE	TRUE	N/A	N/A	C				
297.3	12.631	N/A	37	N/A	N/A	N/A	N/A	0.978	0	0	0.130	TRUE	FALSE	TRUE	N/A	N/A	C				
297.1	12.795	N/A	37	N/A	N/A	N/A	N/A	0.977	0	0	0.130	TRUE	FALSE	TRUE	N/A	N/A	C				
296.9	12.959	N/A	36	N/A	N/A	N/A	N/A	0.977	0	0	0.129	TRUE	FALSE	TRUE	N/A	N/A	C				
296.8	13.123	N/A	34	N/A	N/A	N/A	N/A	0.976	0	0	0.129	TRUE	FALSE	TRUE	N/A	N/A	C				
296.6	13.287	N/A	34	N/A	N/A	N/A	N/A	0.976	0	0	0.129	TRUE	FALSE	TRUE	N/A	N/A	C				
296.4	13.451	N/A	34	N/A	N/A	N/A	N/A	0.975	0	0	0.129	TRUE	FALSE	TRUE	N/A	N/A	C				
296.3	13.615	N/A	35	N/A	N/A	N/A	N/A	0.975	0	0	0.129	TRUE	FALSE	TRUE	N/A	N/A	C				
296.1	13.779	N/A	39	N/A	N/A	N/A	N/A	0.974	0	0	0.129	TRUE	FALSE	TRUE	N/A	N/A	C				
296.0	13.943	N/A	37	N/A	N/A	N/A	N/A	0.974	0	0	0.129	TRUE	FALSE	TRUE	N/A	N/A	C				
295.8	14.107	N/A	36	N/A	N/A	N/A	N/A	0.973	0	0	0.129	TRUE	FALSE	TRUE	N/A	N/A	C				
295.6	14.271	N/A	39	N/A	N/A	N/A	N/A	0.973	0	0	0.129	TRUE	FALSE	TRUE	N/A	N/A	C				
295.5	14.436	N/A	38	N/A	N/A	N/A	N/A	0.972	0	0	0.129	TRUE	FALSE	TRUE	N/A	N/A	C				
295.3	14.600	N/A	36	N/A	N/A	N/A	N/A	0.972	0	0	0.129	TRUE	FALSE	TRUE	N/A	N/A	C				
295.1	14.764	N/A	36	N/A	N/A	N/A	N/A	0.972	0	0	0.129	TRUE	FALSE	TRUE	N/A	N/A	C				
295.0	14.928	N/A	35	N/A	N/A	N/A	N/A	0.971	0	0	0.129	TRUE	FALSE	TRUE	N/A	N/A	C				
294.8	15.092	N/A	34	N/A	N/A	N/A	N/A	0.971	0	0	0.129	TRUE	FALSE	FALSE	N/A	N/A	C				
294.6	15.256	N/A	37	N/A	N/A	N/A	N/A	0.970	0	0	0.130	TRUE	FALSE	FALSE	N/A	N/A	C				
294.5	15.420	N/A	37	N/A	N/A	N/A	N/A	0.970	0	0	0.130	TRUE	FALSE	FALSE	N/A	N/A	C				
294.3	15.584	N/A	36	N/A	N/A	N/A	N/A	0.969	0	0	0.131	TRUE	FALSE	FALSE	N/A	N/A	C				
294.2	15.748	N/A	36	N/A	N/A	N/A	N/A	0.969	0	0	0.132	TRUE	FALSE	FALSE	N/A	N/A	C				
294.0	15.912	N/A	36	N/A	N/A	N/A	N/A	0.968	0	0	0.132	TRUE	FALSE	FALSE	N/A	N/A	C				
293.8	16.076	N/A	40	N/A	N/A	N/A	N/A	0.968	0	0	0.133	TRUE	FALSE	FALSE	N/A	N/A	C				
293.7	16.240	N/A	44	N/A	N/A	N/A	N/A	0.967	0	0	0.134	TRUE	FALSE	FALSE	N/A	N/A	C				

Elev. (ft)	Depth z (ft)	Cyclic Resistance Ratio $CRR_{7.5}$	Relative Density D_r (%)	Correction for Overburden Pressure		Correction for Sloping Ground K_α	Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CHR	Stress Reduction Coeff., t_d	Front Ground Response			Sample Screened for:				Factor of Safety FS_{liq}	Material (optional)	Soil Type (see note on following chart)
				K_σ	K_α					Induced Shear Stress τ_{Max} (psf)	Maximum Cyclic Shear Stress τ_{Avg} (psf)	Cyclic Stress Ratio CSR	Clay-like $(qc_{30}) \geq 175$	High Tip Res.	Unsaturated				
293.5	16.404	N/A	40	N/A	N/A	N/A	N/A	N/A	0.967	0	0	0.134	TRUE	FALSE	FALSE	N/A	N/A	C	
293.3	16.568	N/A	41	N/A	N/A	N/A	N/A	N/A	0.966	0	0	0.135	TRUE	FALSE	FALSE	N/A	N/A	C	
293.2	16.732	N/A	49	N/A	N/A	N/A	N/A	N/A	0.966	0	0	0.135	TRUE	FALSE	FALSE	N/A	N/A	A2	
293.0	16.896	N/A	50	N/A	N/A	N/A	N/A	N/A	0.965	0	0	0.136	TRUE	FALSE	FALSE	N/A	N/A	A2	
292.8	17.060	0.124	50	1.009	1.018	0.99	0.125	0.965	0.965	0	0	0.136	FALSE	FALSE	FALSE	0.9	N/A	A1	
292.7	17.224	0.130	53	1.009	1.139	0.98	0.148	0.964	0.964	0	0	0.137	FALSE	FALSE	FALSE	1.1	N/A	A1	
292.5	17.388	0.136	54	1.009	1.227	0.98	0.165	0.964	0.964	0	0	0.138	FALSE	FALSE	FALSE	1.2	N/A	A1	
292.3	17.552	0.139	56	1.009	1.282	0.98	0.177	0.963	0.963	0	0	0.138	FALSE	FALSE	FALSE	1.3	N/A	A1	
292.2	17.716	0.143	57	1.009	1.339	0.98	0.190	0.963	0.963	0	0	0.139	FALSE	FALSE	FALSE	1.4	N/A	A1	
292.0	17.880	0.146	57	1.008	1.374	0.98	0.198	0.962	0.962	0	0	0.139	FALSE	FALSE	FALSE	1.4	N/A	A1	
291.9	18.044	0.148	58	1.008	1.410	0.98	0.207	0.962	0.962	0	0	0.140	FALSE	FALSE	FALSE	1.5	N/A	A1	
291.7	18.208	0.147	58	1.007	1.386	0.98	0.201	0.961	0.961	0	0	0.140	FALSE	FALSE	FALSE	1.4	N/A	A1	
291.5	18.372	0.131	53	1.006	1.144	0.98	0.148	0.961	0.961	0	0	0.141	FALSE	FALSE	FALSE	1.1	N/A	A1	
291.4	18.537	N/A	45	N/A	N/A	N/A	N/A	N/A	0.960	0	0	0.141	TRUE	FALSE	FALSE	N/A	N/A	B	
291.2	18.701	N/A	40	N/A	N/A	N/A	N/A	N/A	0.960	0	0	0.142	TRUE	FALSE	FALSE	N/A	N/A	B	
291.0	18.865	N/A	38	N/A	N/A	N/A	N/A	N/A	0.959	0	0	0.142	TRUE	FALSE	FALSE	N/A	N/A	B	
290.9	19.029	N/A	37	N/A	N/A	N/A	N/A	N/A	0.959	0	0	0.143	TRUE	FALSE	FALSE	N/A	N/A	C	
290.7	19.193	N/A	38	N/A	N/A	N/A	N/A	N/A	0.958	0	0	0.143	TRUE	FALSE	FALSE	N/A	N/A	C	
290.5	19.357	N/A	40	N/A	N/A	N/A	N/A	N/A	0.958	0	0	0.144	TRUE	FALSE	FALSE	N/A	N/A	C	
290.4	19.521	N/A	39	N/A	N/A	N/A	N/A	N/A	0.957	0	0	0.144	TRUE	FALSE	FALSE	N/A	N/A	C	
290.2	19.685	N/A	38	N/A	N/A	N/A	N/A	N/A	0.956	0	0	0.145	TRUE	FALSE	FALSE	N/A	N/A	C	
290.1	19.849	N/A	37	N/A	N/A	N/A	N/A	N/A	0.956	0	0	0.145	TRUE	FALSE	FALSE	N/A	N/A	C	
289.9	20.013	N/A	37	N/A	N/A	N/A	N/A	N/A	0.955	0	0	0.146	TRUE	FALSE	FALSE	N/A	N/A	C	
289.7	20.177	N/A	37	N/A	N/A	N/A	N/A	N/A	0.955	0	0	0.146	TRUE	FALSE	FALSE	N/A	N/A	C	
289.6	20.341	N/A	42	N/A	N/A	N/A	N/A	N/A	0.954	0	0	0.147	TRUE	FALSE	FALSE	N/A	N/A	C	
289.4	20.505	N/A	39	N/A	N/A	N/A	N/A	N/A	0.954	0	0	0.147	TRUE	FALSE	FALSE	N/A	N/A	C	
289.2	20.669	N/A	37	N/A	N/A	N/A	N/A	N/A	0.953	0	0	0.147	TRUE	FALSE	FALSE	N/A	N/A	C	
289.1	20.833	N/A	37	N/A	N/A	N/A	N/A	N/A	0.953	0	0	0.148	TRUE	FALSE	FALSE	N/A	N/A	C	
288.9	20.997	N/A	37	N/A	N/A	N/A	N/A	N/A	0.952	0	0	0.148	TRUE	FALSE	FALSE	N/A	N/A	C	
288.7	21.161	N/A	37	N/A	N/A	N/A	N/A	N/A	0.952	0	0	0.149	TRUE	FALSE	FALSE	N/A	N/A	C	
288.6	21.325	N/A	36	N/A	N/A	N/A	N/A	N/A	0.951	0	0	0.149	TRUE	FALSE	FALSE	N/A	N/A	C	
288.4	21.489	N/A	39	N/A	N/A	N/A	N/A	N/A	0.951	0	0	0.150	TRUE	FALSE	FALSE	N/A	N/A	C	
288.2	21.653	0.112	44	0.997	0.794	0.99	0.088	0.950	0.950	0	0	0.150	FALSE	FALSE	FALSE	0.6	N/A	A2	
288.1	21.817	0.117	46	0.997	0.884	0.99	0.102	0.949	0.949	0	0	0.150	FALSE	FALSE	FALSE	0.7	N/A	A2	
287.9	21.981	0.121	48	0.996	0.947	0.99	0.112	0.949	0.949	0	0	0.151	FALSE	FALSE	FALSE	0.7	N/A	A2	
287.8	22.145	0.125	50	0.996	1.026	0.99	0.126	0.948	0.948	0	0	0.151	FALSE	FALSE	FALSE	0.8	N/A	A2	
287.6	22.309	0.127	51	0.995	1.062	0.99	0.132	0.948	0.948	0	0	0.151	FALSE	FALSE	FALSE	0.9	N/A	A2	
287.4	22.473	0.126	51	0.995	1.040	0.99	0.128	0.947	0.947	0	0	0.152	FALSE	FALSE	FALSE	0.8	N/A	A1	
287.3	22.638	N/A	46	N/A	N/A	N/A	N/A	N/A	0.947	0	0	0.152	TRUE	FALSE	FALSE	N/A	N/A	B	
287.1	22.802	N/A	41	N/A	N/A	N/A	N/A	N/A	0.946	0	0	0.153	TRUE	FALSE	FALSE	N/A	N/A	B	
286.9	22.966	N/A	38	N/A	N/A	N/A	N/A	N/A	0.946	0	0	0.153	TRUE	FALSE	FALSE	N/A	N/A	B	
286.8	23.130	N/A	38	N/A	N/A	N/A	N/A	N/A	0.945	0	0	0.153	TRUE	FALSE	FALSE	N/A	N/A	C	
286.6	23.294	N/A	37	N/A	N/A	N/A	N/A	N/A	0.944	0	0	0.154	TRUE	FALSE	FALSE	N/A	N/A	C	
286.4	23.458	N/A	42	N/A	N/A	N/A	N/A	N/A	0.944	0	0	0.154	TRUE	FALSE	FALSE	N/A	N/A	B	
286.3	23.622	0.125	50	0.992	1.031	0.99	0.127	0.943	0.943	0	0	0.154	FALSE	FALSE	FALSE	0.8	N/A	A1	
286.1	23.786	N/A	49	N/A	N/A	N/A	N/A	N/A	0.943	0	0	0.155	TRUE	FALSE	FALSE	N/A	N/A	B	
286.0	23.950	N/A	46	N/A	N/A	N/A	N/A	N/A	0.942	0	0	0.155	TRUE	FALSE	FALSE	N/A	N/A	B	
285.8	24.114	0.130	52	0.990	1.100	0.99	0.139	0.942	0.942	0	0	0.155	FALSE	FALSE	FALSE	0.9	N/A	A1	
285.6	24.278	0.136	54	0.990	1.197	0.98	0.158	0.941	0.941	0	0	0.156	FALSE	FALSE	FALSE	1.0	N/A	A1	
285.5	24.442	0.133	54	0.989	1.161	0.98	0.151	0.941	0.941	0	0	0.156	FALSE	FALSE	FALSE	1.0	N/A	A1	
285.3	24.606	0.136	55	0.989	1.210	0.98	0.161	0.940	0.940	0	0	0.156	FALSE	FALSE	FALSE	1.0	N/A	A1	
285.1	24.770	0.138	55	0.988	1.239	0.98	0.166	0.939	0.939	0	0	0.157	FALSE	FALSE	FALSE	1.1	N/A	A1	
285.0	24.934	0.139	55	0.988	1.244	0.98	0.168	0.939	0.939	0	0	0.157	FALSE	FALSE	FALSE	1.1	N/A	A1	
284.8	25.098	0.138	55	0.987	1.226	0.98	0.164	0.938	0.938	0	0	0.157	FALSE	FALSE	FALSE	1.0	N/A	A1	
284.6	25.262	0.137	55	0.987	1.217	0.98	0.162	0.938	0.938	0	0	0.158	FALSE	FALSE	FALSE	1.0	N/A	A1	

Front Ground Response										Sample Screened for:					Factor of Safety FS _{liq}	Material (optional)	Soil Type (see note on following chart)
Maximum Induced Shear Stress τ _{Max} (psf)	Average Cyclic Shear Stress τ _{Avg} (psf)	Cyclic Stress Ratio CSR	Clay-like (qc ₃₀) _{CS} ≥ 175	High Tip Res. (qc ₃₀) _{CS} ≥ 175	Unsaturated												
Elev. (ft)	Depth z (ft)	Cyclic Resistance Ratio CRR _{7.5}	Relative Density D _r (%)	Correction for Overburden Pressure K _σ	Correction for Sloping Ground K _σ	Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., t _d	CSR	Clay-like (qc ₃₀) _{CS} ≥ 175	High Tip Res. (qc ₃₀) _{CS} ≥ 175	Unsaturated	Factor of Safety FS _{liq}	Material (optional)	Soil Type (see note on following chart)		
284.5	25.426	0.136	55	0.987	1.206	0.98	0.160	0.937	0	0	0.158	FALSE	FALSE	1.0	N/A	A1	
284.3	25.590	N/A	50	N/A	N/A	N/A	N/A	0.937	0	0	0.158	TRUE	FALSE	N/A	N/A	B	
284.1	25.754	N/A	44	N/A	N/A	N/A	N/A	0.936	0	0	0.159	TRUE	FALSE	N/A	N/A	B	
284.0	25.918	N/A	43	N/A	N/A	N/A	N/A	0.935	0	0	0.159	TRUE	FALSE	N/A	N/A	B	
283.8	26.082	N/A	47	N/A	N/A	N/A	N/A	0.935	0	0	0.159	TRUE	FALSE	N/A	N/A	B	
283.7	26.246	N/A	44	N/A	N/A	N/A	N/A	0.934	0	0	0.159	TRUE	FALSE	N/A	N/A	B	
283.5	26.410	N/A	43	N/A	N/A	N/A	N/A	0.934	0	0	0.160	TRUE	FALSE	N/A	N/A	C	
283.3	26.574	0.122	49	0.985	0.954	0.99	0.113	0.933	0	0	0.160	FALSE	FALSE	0.7	N/A	A2	
283.2	26.739	N/A	47	N/A	N/A	N/A	N/A	0.932	0	0	0.160	TRUE	FALSE	N/A	N/A	B	
283.0	26.903	N/A	43	N/A	N/A	N/A	N/A	0.932	0	0	0.160	TRUE	FALSE	N/A	N/A	B	
282.8	27.067	N/A	43	N/A	N/A	N/A	N/A	0.931	0	0	0.161	TRUE	FALSE	N/A	N/A	B	
282.7	27.231	N/A	43	N/A	N/A	N/A	N/A	0.931	0	0	0.161	TRUE	FALSE	N/A	N/A	C	
282.5	27.395	N/A	40	N/A	N/A	N/A	N/A	0.930	0	0	0.161	TRUE	FALSE	N/A	N/A	C	
282.3	27.559	N/A	41	N/A	N/A	N/A	N/A	0.929	0	0	0.162	TRUE	FALSE	N/A	N/A	C	
282.2	27.723	N/A	41	N/A	N/A	N/A	N/A	0.929	0	0	0.162	TRUE	FALSE	N/A	N/A	C	
282.0	27.887	N/A	42	N/A	N/A	N/A	N/A	0.928	0	0	0.162	TRUE	FALSE	N/A	N/A	C	
281.8	28.051	0.117	46	0.983	0.858	0.99	0.097	0.928	0	0	0.162	FALSE	FALSE	0.6	N/A	A2	
281.7	28.215	0.122	49	0.982	0.958	0.99	0.113	0.927	0	0	0.162	FALSE	FALSE	0.7	N/A	A2	
281.5	28.379	0.123	49	0.981	0.969	0.99	0.115	0.926	0	0	0.163	FALSE	FALSE	0.7	N/A	A1	
281.4	28.543	0.122	49	0.981	0.955	0.99	0.113	0.926	0	0	0.163	FALSE	FALSE	0.7	N/A	A1	
281.2	28.707	0.125	50	0.980	1.007	0.99	0.122	0.925	0	0	0.163	FALSE	FALSE	0.7	N/A	A2	
281.0	28.871	N/A	49	N/A	N/A	N/A	N/A	0.925	0	0	0.163	TRUE	FALSE	N/A	N/A	B	
280.9	29.035	N/A	45	N/A	N/A	N/A	N/A	0.924	0	0	0.164	TRUE	FALSE	N/A	N/A	B	
280.7	29.199	N/A	43	N/A	N/A	N/A	N/A	0.923	0	0	0.164	TRUE	FALSE	N/A	N/A	B	
280.5	29.363	0.120	48	0.980	0.922	0.99	0.107	0.923	0	0	0.164	FALSE	FALSE	0.7	N/A	A2	
280.4	29.527	0.121	48	0.979	0.928	0.99	0.108	0.922	0	0	0.164	FALSE	FALSE	0.7	N/A	A1	
280.2	29.691	0.121	48	0.979	0.931	0.99	0.109	0.922	0	0	0.165	FALSE	FALSE	0.7	N/A	A1	
280.0	29.855	0.128	51	0.977	1.052	0.99	0.129	0.921	0	0	0.165	FALSE	FALSE	0.8	N/A	A1	
279.9	30.019	N/A	52	N/A	N/A	N/A	N/A	0.920	0	0	0.165	TRUE	FALSE	N/A	N/A	A1	
279.7	30.183	N/A	51	N/A	N/A	N/A	N/A	0.920	0	0	0.165	TRUE	FALSE	N/A	N/A	A1	
279.6	30.347	N/A	49	N/A	N/A	N/A	N/A	0.919	0	0	0.165	TRUE	FALSE	N/A	N/A	A1	
279.4	30.511	N/A	50	N/A	N/A	N/A	N/A	0.919	0	0	0.166	TRUE	FALSE	N/A	N/A	B	
279.2	30.675	N/A	49	N/A	N/A	N/A	N/A	0.918	0	0	0.166	TRUE	FALSE	N/A	N/A	B	
279.1	30.840	N/A	50	N/A	N/A	N/A	N/A	0.917	0	0	0.166	TRUE	FALSE	N/A	N/A	A1	
278.9	31.004	N/A	50	N/A	N/A	N/A	N/A	0.917	0	0	0.166	TRUE	FALSE	N/A	N/A	A2	
278.7	31.168	N/A	49	N/A	N/A	N/A	N/A	0.916	0	0	0.166	TRUE	FALSE	N/A	N/A	A2	
278.6	31.332	N/A	46	N/A	N/A	N/A	N/A	0.916	0	0	0.167	TRUE	FALSE	N/A	N/A	C	
278.4	31.496	N/A	42	N/A	N/A	N/A	N/A	0.915	0	0	0.167	TRUE	FALSE	N/A	N/A	C	
278.2	31.660	N/A	41	N/A	N/A	N/A	N/A	0.914	0	0	0.167	TRUE	FALSE	N/A	N/A	C	
278.1	31.824	N/A	39	N/A	N/A	N/A	N/A	0.914	0	0	0.167	TRUE	FALSE	N/A	N/A	C	
277.9	31.988	N/A	40	N/A	N/A	N/A	N/A	0.913	0	0	0.167	TRUE	FALSE	N/A	N/A	C	
277.7	32.152	0.116	46	0.975	0.839	0.99	0.094	0.912	0	0	0.167	FALSE	FALSE	0.6	N/A	A2	
277.6	32.316	0.126	51	0.973	1.007	0.99	0.121	0.912	0	0	0.168	FALSE	FALSE	0.7	N/A	A2	
277.4	32.480	0.129	52	0.971	1.073	0.99	0.133	0.911	0	0	0.168	FALSE	FALSE	0.8	N/A	A1	
277.3	32.644	0.131	53	0.971	1.098	0.98	0.137	0.911	0	0	0.168	FALSE	FALSE	0.8	N/A	A1	
277.1	32.808	N/A	51	N/A	N/A	N/A	N/A	0.910	0	0	0.168	TRUE	FALSE	N/A	N/A	B	
276.9	32.972	0.126	51	0.971	1.017	0.99	0.123	0.909	0	0	0.168	FALSE	FALSE	0.7	N/A	A1	
276.8	33.136	0.127	51	0.970	1.036	0.99	0.126	0.909	0	0	0.168	FALSE	FALSE	0.7	N/A	A1	
276.6	33.300	N/A	46	N/A	N/A	N/A	N/A	0.908	0	0	0.169	TRUE	FALSE	N/A	N/A	B	
276.4	33.464	N/A	42	N/A	N/A	N/A	N/A	0.907	0	0	0.169	TRUE	FALSE	N/A	N/A	C	
276.3	33.628	N/A	41	N/A	N/A	N/A	N/A	0.907	0	0	0.169	TRUE	FALSE	N/A	N/A	C	
276.1	33.792	N/A	40	N/A	N/A	N/A	N/A	0.906	0	0	0.169	TRUE	FALSE	N/A	N/A	C	
275.9	33.956	N/A	39	N/A	N/A	N/A	N/A	0.905	0	0	0.169	TRUE	FALSE	N/A	N/A	C	
275.8	34.120	N/A	40	N/A	N/A	N/A	N/A	0.905	0	0	0.169	TRUE	FALSE	N/A	N/A	C	
275.6	34.284	N/A	39	N/A	N/A	N/A	N/A	0.904	0	0	0.169	TRUE	FALSE	N/A	N/A	C	

Front Ground Response										Sample Screened for:					Factor of Safety	Material (optional)	Soil Type (see note on following chart)
Elev. (ft)	Depth z	Cyclic Resistance Ratio $CRR_{7.5}$	Relative Density D_r (%)	Correction for Overburden Pressure K_o	Correction for Sloping Ground K_α	Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., f_d	Maximum Induced Shear Stress τ_{max} (psf)	Average Cyclic Shear Stress τ_{Avg} (psf)	Cyclic Stress Ratio CSR	Clay-like $(q_{c30}) \geq 175$	High Tip Res. $(q_{c30}) \geq 175$	Unsaturated			
275.5	34.448	N/A	39	N/A	N/A	N/A	N/A	0.904	0	0	0.170	TRUE	FALSE	FALSE	N/A	C	
275.3	34.612	N/A	41	N/A	N/A	N/A	N/A	0.903	0	0	0.170	TRUE	FALSE	FALSE	N/A	C	
275.1	34.776	N/A	39	N/A	N/A	N/A	N/A	0.902	0	0	0.170	TRUE	FALSE	FALSE	N/A	C	
275.0	34.941	N/A	39	N/A	N/A	N/A	N/A	0.902	0	0	0.170	TRUE	FALSE	FALSE	N/A	C	
274.8	35.105	N/A	40	N/A	N/A	N/A	N/A	0.901	0	0	0.170	TRUE	FALSE	FALSE	N/A	C	
274.6	35.269	N/A	39	N/A	N/A	N/A	N/A	0.900	0	0	0.170	TRUE	FALSE	FALSE	N/A	C	
274.5	35.433	N/A	38	N/A	N/A	N/A	N/A	0.900	0	0	0.170	TRUE	FALSE	FALSE	N/A	C	
274.3	35.597	N/A	38	N/A	N/A	N/A	N/A	0.899	0	0	0.171	TRUE	FALSE	FALSE	N/A	C	
274.1	35.761	N/A	39	N/A	N/A	N/A	N/A	0.898	0	0	0.171	TRUE	FALSE	FALSE	N/A	C	
274.0	35.925	N/A	39	N/A	N/A	N/A	N/A	0.898	0	0	0.171	TRUE	FALSE	FALSE	N/A	C	
273.8	36.089	N/A	40	N/A	N/A	N/A	N/A	0.897	0	0	0.171	TRUE	FALSE	FALSE	N/A	C	
273.6	36.253	N/A	41	N/A	N/A	N/A	N/A	0.896	0	0	0.171	TRUE	FALSE	FALSE	N/A	C	
273.5	36.417	N/A	40	N/A	N/A	N/A	N/A	0.896	0	0	0.171	TRUE	FALSE	FALSE	N/A	C	
273.3	36.581	N/A	40	N/A	N/A	N/A	N/A	0.895	0	0	0.171	TRUE	FALSE	FALSE	N/A	C	
273.2	36.745	N/A	42	N/A	N/A	N/A	N/A	0.895	0	0	0.171	TRUE	FALSE	FALSE	N/A	C	
273.0	36.909	N/A	41	N/A	N/A	N/A	N/A	0.894	0	0	0.171	TRUE	FALSE	FALSE	N/A	C	
272.8	37.073	N/A	41	N/A	N/A	N/A	N/A	0.893	0	0	0.172	TRUE	FALSE	FALSE	N/A	C	
272.7	37.237	N/A	40	N/A	N/A	N/A	N/A	0.893	0	0	0.172	TRUE	FALSE	FALSE	N/A	C	
272.5	37.401	N/A	41	N/A	N/A	N/A	N/A	0.892	0	0	0.172	TRUE	FALSE	FALSE	N/A	C	
272.3	37.565	N/A	39	N/A	N/A	N/A	N/A	0.891	0	0	0.172	TRUE	FALSE	FALSE	N/A	C	
272.2	37.729	N/A	40	N/A	N/A	N/A	N/A	0.891	0	0	0.172	TRUE	FALSE	FALSE	N/A	C	
272.0	37.893	N/A	42	N/A	N/A	N/A	N/A	0.890	0	0	0.172	TRUE	FALSE	FALSE	N/A	C	
271.8	38.057	N/A	44	N/A	N/A	N/A	N/A	0.889	0	0	0.172	TRUE	FALSE	FALSE	N/A	C	
271.7	38.221	N/A	42	N/A	N/A	N/A	N/A	0.889	0	0	0.172	TRUE	FALSE	FALSE	N/A	C	
271.5	38.385	N/A	40	N/A	N/A	N/A	N/A	0.888	0	0	0.172	TRUE	FALSE	FALSE	N/A	C	
271.4	38.549	N/A	39	N/A	N/A	N/A	N/A	0.887	0	0	0.172	TRUE	FALSE	FALSE	N/A	C	
271.2	38.713	N/A	39	N/A	N/A	N/A	N/A	0.887	0	0	0.173	TRUE	FALSE	FALSE	N/A	C	
271.0	38.877	0.120	48	0.962	0.898	0.99	0.102	0.886	0	0	0.173	FALSE	FALSE	FALSE	0.6	A2	
270.9	39.042	N/A	46	N/A	N/A	N/A	N/A	0.885	0	0	0.173	TRUE	FALSE	FALSE	N/A	B	
270.7	39.206	N/A	44	N/A	N/A	N/A	N/A	0.885	0	0	0.173	TRUE	FALSE	FALSE	N/A	B	
270.5	39.370	N/A	43	N/A	N/A	N/A	N/A	0.884	0	0	0.173	TRUE	FALSE	FALSE	N/A	C	
270.4	39.534	N/A	43	N/A	N/A	N/A	N/A	0.883	0	0	0.173	TRUE	FALSE	FALSE	N/A	C	
270.2	39.698	N/A	43	N/A	N/A	N/A	N/A	0.883	0	0	0.173	TRUE	FALSE	FALSE	N/A	C	
270.0	39.862	N/A	43	N/A	N/A	N/A	N/A	0.882	0	0	0.173	TRUE	FALSE	FALSE	N/A	C	
269.9	40.026	N/A	43	N/A	N/A	N/A	N/A	0.881	0	0	0.173	TRUE	FALSE	FALSE	N/A	C	
269.7	40.190	N/A	44	N/A	N/A	N/A	N/A	0.881	0	0	0.173	TRUE	FALSE	FALSE	N/A	A2	
269.5	40.354	N/A	43	N/A	N/A	N/A	N/A	0.880	0	0	0.173	TRUE	FALSE	FALSE	N/A	C	
269.4	40.518	N/A	43	N/A	N/A	N/A	N/A	0.879	0	0	0.173	TRUE	FALSE	FALSE	N/A	A2	
269.2	40.682	N/A	43	N/A	N/A	N/A	N/A	0.879	0	0	0.173	TRUE	FALSE	FALSE	N/A	A2	
269.1	40.846	0.110	43	0.962	0.715	0.99	0.075	0.878	0	0	0.174	FALSE	FALSE	FALSE	0.4	A2	
268.9	41.010	N/A	45	N/A	N/A	N/A	N/A	0.877	0	0	0.174	TRUE	FALSE	FALSE	N/A	C	
268.7	41.174	N/A	46	N/A	N/A	N/A	N/A	0.877	0	0	0.174	TRUE	FALSE	FALSE	N/A	C	
268.6	41.338	N/A	46	N/A	N/A	N/A	N/A	0.876	0	0	0.174	TRUE	FALSE	FALSE	N/A	C	
268.4	41.502	N/A	45	N/A	N/A	N/A	N/A	0.875	0	0	0.174	TRUE	FALSE	FALSE	N/A	A2	
268.2	41.666	N/A	43	N/A	N/A	N/A	N/A	0.875	0	0	0.174	TRUE	FALSE	FALSE	N/A	C	
268.1	41.830	0.114	45	0.959	0.783	0.99	0.085	0.874	0	0	0.174	FALSE	FALSE	FALSE	0.5	A2	
267.9	41.994	N/A	43	N/A	N/A	N/A	N/A	0.873	0	0	0.174	TRUE	FALSE	FALSE	N/A	A2	
267.7	42.158	N/A	42	N/A	N/A	N/A	N/A	0.873	0	0	0.174	TRUE	FALSE	FALSE	N/A	C	
267.6	42.322	N/A	41	N/A	N/A	N/A	N/A	0.872	0	0	0.174	TRUE	FALSE	FALSE	N/A	C	
267.4	42.486	N/A	40	N/A	N/A	N/A	N/A	0.871	0	0	0.174	TRUE	FALSE	FALSE	N/A	C	
267.2	42.650	N/A	40	N/A	N/A	N/A	N/A	0.871	0	0	0.174	TRUE	FALSE	FALSE	N/A	C	
267.1	42.814	N/A	39	N/A	N/A	N/A	N/A	0.870	0	0	0.174	TRUE	FALSE	FALSE	N/A	C	
266.9	42.978	N/A	39	N/A	N/A	N/A	N/A	0.869	0	0	0.174	TRUE	FALSE	FALSE	N/A	C	
266.8	43.143	N/A	42	N/A	N/A	N/A	N/A	0.869	0	0	0.174	TRUE	FALSE	FALSE	N/A	C	
266.6	43.307	0.120	48	0.955	0.881	0.99	0.099	0.868	0	0	0.174	FALSE	FALSE	FALSE	0.6	A2	

Elev. (ft)	Depth z	Cyclic Resistance Ratio CRR _{7.5}	Relative Density D _r (%)	Correction for			Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., f _d	From Ground Response			Sample Screened for:				Factor of Safety FS _{liq}	Material (optional)	Soil Type (see note on following chart)
				Overburden Pressure K _o	Sloping Ground K _α	Cyclic Stress Ratio CSR				Maximum Induced Shear Stress τ _{max} (psf)	Average Cyclic Shear Stress τ _{avg} (psf)	Cyclic Stress Ratio CSR	Clay-like (qc ₃₀ /cs ₂ ≥ 175)	High Tip Res.					
266.4	43.471	N/A	42	N/A	N/A	N/A	N/A	N/A	0.867	0	0	0.174	TRUE	FALSE	FALSE	N/A	N/A	C	
266.3	43.635	N/A	41	N/A	N/A	N/A	N/A	N/A	0.867	0	0	0.174	TRUE	FALSE	FALSE	N/A	N/A	C	
266.1	43.799	N/A	40	N/A	N/A	N/A	N/A	N/A	0.866	0	0	0.174	TRUE	FALSE	FALSE	N/A	N/A	C	
265.9	43.963	N/A	40	N/A	N/A	N/A	N/A	N/A	0.865	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
265.8	44.127	N/A	40	N/A	N/A	N/A	N/A	N/A	0.865	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
265.6	44.291	N/A	40	N/A	N/A	N/A	N/A	N/A	0.864	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
265.4	44.455	N/A	38	N/A	N/A	N/A	N/A	N/A	0.863	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
265.3	44.619	N/A	38	N/A	N/A	N/A	N/A	N/A	0.863	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
265.1	44.783	N/A	38	N/A	N/A	N/A	N/A	N/A	0.862	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
265.0	44.947	N/A	38	N/A	N/A	N/A	N/A	N/A	0.861	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
264.8	45.111	N/A	38	N/A	N/A	N/A	N/A	N/A	0.861	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
264.6	45.275	N/A	38	N/A	N/A	N/A	N/A	N/A	0.860	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
264.5	45.439	N/A	38	N/A	N/A	N/A	N/A	N/A	0.859	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
264.3	45.603	N/A	38	N/A	N/A	N/A	N/A	N/A	0.859	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
264.1	45.767	N/A	38	N/A	N/A	N/A	N/A	N/A	0.858	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
264.0	45.931	N/A	38	N/A	N/A	N/A	N/A	N/A	0.857	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
263.8	46.095	N/A	38	N/A	N/A	N/A	N/A	N/A	0.857	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
263.6	46.259	N/A	37	N/A	N/A	N/A	N/A	N/A	0.856	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
263.5	46.423	N/A	37	N/A	N/A	N/A	N/A	N/A	0.855	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
263.3	46.587	N/A	37	N/A	N/A	N/A	N/A	N/A	0.855	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
263.1	46.751	N/A	37	N/A	N/A	N/A	N/A	N/A	0.854	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
263.0	46.915	N/A	37	N/A	N/A	N/A	N/A	N/A	0.853	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
262.8	47.079	N/A	37	N/A	N/A	N/A	N/A	N/A	0.853	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
262.7	47.244	N/A	37	N/A	N/A	N/A	N/A	N/A	0.852	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
262.5	47.408	N/A	37	N/A	N/A	N/A	N/A	N/A	0.851	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
262.3	47.572	N/A	38	N/A	N/A	N/A	N/A	N/A	0.851	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
262.2	47.736	N/A	39	N/A	N/A	N/A	N/A	N/A	0.850	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
262.0	47.900	N/A	38	N/A	N/A	N/A	N/A	N/A	0.849	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
261.8	48.064	N/A	37	N/A	N/A	N/A	N/A	N/A	0.849	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
261.7	48.228	N/A	37	N/A	N/A	N/A	N/A	N/A	0.848	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
261.5	48.392	N/A	37	N/A	N/A	N/A	N/A	N/A	0.847	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
261.3	48.556	N/A	37	N/A	N/A	N/A	N/A	N/A	0.847	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
261.2	48.720	N/A	37	N/A	N/A	N/A	N/A	N/A	0.846	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
261.0	48.884	0.140	56	0.938	1.187	0.98	N/A	0.845	0	0	0.175	FALSE	FALSE	FALSE	0.9	N/A	A1		
260.9	49.048	0.160	61	0.931	1.441	0.98	N/A	0.844	0	0	0.175	FALSE	FALSE	FALSE	1.2	N/A	A1		
260.7	49.212	0.210	68	0.919	1.875	0.97	N/A	0.844	0	0	0.175	FALSE	FALSE	FALSE	2.0	N/A	A1		
260.5	49.376	0.205	67	0.920	1.839	0.97	N/A	0.843	0	0	0.175	FALSE	FALSE	FALSE	1.9	N/A	A1		
260.4	49.540	0.211	68	0.919	1.876	0.97	N/A	0.842	0	0	0.175	FALSE	FALSE	FALSE	2.0	N/A	A1		
260.2	49.704	0.222	69	0.916	1.952	0.97	N/A	0.842	0	0	0.175	FALSE	FALSE	FALSE	2.2	N/A	A1		
260.0	49.868	0.205	67	0.919	1.839	0.97	N/A	0.841	0	0	0.175	FALSE	FALSE	FALSE	1.9	N/A	A1		
259.9	50.032	0.195	66	0.921	1.759	0.97	N/A	0.840	0	0	0.175	FALSE	FALSE	FALSE	1.7	N/A	A1		
259.7	50.196	0.175	64	0.925	1.595	0.97	N/A	0.840	0	0	0.175	FALSE	FALSE	FALSE	1.4	N/A	A1		
259.5	50.360	0.172	63	0.925	1.566	0.97	N/A	0.839	0	0	0.175	FALSE	FALSE	FALSE	1.4	N/A	A1		
259.4	50.524	0.149	58	0.932	1.306	0.98	N/A	0.838	0	0	0.175	FALSE	FALSE	FALSE	1.0	N/A	A1		
259.2	50.688	N/A	50	N/A	N/A	N/A	N/A	0.838	0	0	0.175	TRUE	FALSE	FALSE	0.9	N/A	A1		
259.0	50.852	N/A	42	N/A	N/A	N/A	N/A	0.837	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	B		
258.9	51.016	N/A	47	N/A	N/A	N/A	N/A	0.836	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	B		
258.7	51.180	N/A	47	N/A	N/A	N/A	N/A	0.836	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	B		
258.6	51.345	N/A	42	N/A	N/A	N/A	N/A	0.835	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	B		
258.4	51.509	N/A	39	N/A	N/A	N/A	N/A	0.834	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	B		
258.2	51.673	0.134	54	0.936	1.100	0.98	N/A	0.834	0	0	0.175	TRUE	FALSE	FALSE	0.8	N/A	A1		
258.1	51.837	N/A	50	N/A	N/A	N/A	N/A	0.833	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	B		
257.9	52.001	N/A	44	N/A	N/A	N/A	N/A	0.832	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	B		
257.7	52.165	N/A	39	N/A	N/A	N/A	N/A	0.832	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	B		
257.6	52.329	N/A	39	N/A	N/A	N/A	N/A	0.831	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C		

Elev. (ft)	Depth z	Cyclic Resistance Ratio CRR _{7.5}	Relative Density D _r	Correction for			Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., f _d	Front Ground Response			Cyclic Stress Ratio CSR	Sample Screened for:			Factor of Safety F _{S_{liq}}	Material (optional)	Soil Type (see note on following chart)
				Overburden Pressure K _o	Sloping Ground K _α	Correction for Sloping Ground K _α				Maximum Induced Shear Stress τ _{max} (psf)	Average Cyclic Shear Stress τ _{Avg} (psf)	Cyclic Stress Ratio CSR		Clay-like (q _{c 3N}) ≥ 175	High Tip Res.	Unsaturated			
257.4	52.493	N/A	39	N/A	N/A	N/A	N/A	N/A	0.830	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
257.2	52.657	N/A	38	N/A	N/A	N/A	N/A	N/A	0.830	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
257.1	52.821	N/A	38	N/A	N/A	N/A	N/A	N/A	0.829	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
256.9	52.985	N/A	38	N/A	N/A	N/A	N/A	N/A	0.828	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
256.8	53.149	N/A	38	N/A	N/A	N/A	N/A	N/A	0.828	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
256.6	53.313	N/A	37	N/A	N/A	N/A	N/A	N/A	0.827	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
256.4	53.477	N/A	38	N/A	N/A	N/A	N/A	N/A	0.826	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
256.3	53.641	N/A	38	N/A	N/A	N/A	N/A	N/A	0.825	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
256.1	53.805	N/A	38	N/A	N/A	N/A	N/A	N/A	0.825	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
255.9	53.969	N/A	39	N/A	N/A	N/A	N/A	N/A	0.824	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
255.8	54.133	N/A	38	N/A	N/A	N/A	N/A	N/A	0.823	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
255.6	54.297	N/A	38	N/A	N/A	N/A	N/A	N/A	0.823	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
255.4	54.461	N/A	38	N/A	N/A	N/A	N/A	N/A	0.822	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
255.3	54.625	N/A	38	N/A	N/A	N/A	N/A	N/A	0.821	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
255.1	54.789	N/A	37	N/A	N/A	N/A	N/A	N/A	0.821	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
254.9	54.953	N/A	38	N/A	N/A	N/A	N/A	N/A	0.820	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
254.8	55.117	N/A	38	N/A	N/A	N/A	N/A	N/A	0.819	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
254.6	55.281	N/A	38	N/A	N/A	N/A	N/A	N/A	0.819	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
254.5	55.446	N/A	38	N/A	N/A	N/A	N/A	N/A	0.818	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
254.3	55.610	N/A	38	N/A	N/A	N/A	N/A	N/A	0.817	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
254.1	55.774	N/A	38	N/A	N/A	N/A	N/A	N/A	0.817	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
254.0	55.938	N/A	38	N/A	N/A	N/A	N/A	N/A	0.816	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
253.8	56.102	N/A	38	N/A	N/A	N/A	N/A	N/A	0.815	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
253.6	56.266	N/A	38	N/A	N/A	N/A	N/A	N/A	0.815	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
253.5	56.430	N/A	37	N/A	N/A	N/A	N/A	N/A	0.814	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
253.3	56.594	N/A	37	N/A	N/A	N/A	N/A	N/A	0.813	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
253.1	56.758	N/A	37	N/A	N/A	N/A	N/A	N/A	0.813	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
253.0	56.922	N/A	37	N/A	N/A	N/A	N/A	N/A	0.812	0	0	0.174	TRUE	FALSE	FALSE	N/A	N/A	C	
252.8	57.086	N/A	38	N/A	N/A	N/A	N/A	N/A	0.811	0	0	0.174	TRUE	FALSE	FALSE	N/A	N/A	C	
252.7	57.250	N/A	38	N/A	N/A	N/A	N/A	N/A	0.811	0	0	0.174	TRUE	FALSE	FALSE	N/A	N/A	C	
252.5	57.414	N/A	37	N/A	N/A	N/A	N/A	N/A	0.810	0	0	0.174	TRUE	FALSE	FALSE	N/A	N/A	C	
252.3	57.578	N/A	37	N/A	N/A	N/A	N/A	N/A	0.809	0	0	0.174	TRUE	FALSE	FALSE	N/A	N/A	C	
252.2	57.742	N/A	37	N/A	N/A	N/A	N/A	N/A	0.809	0	0	0.174	TRUE	FALSE	FALSE	N/A	N/A	C	
252.0	57.906	N/A	37	N/A	N/A	N/A	N/A	N/A	0.808	0	0	0.174	TRUE	FALSE	FALSE	N/A	N/A	C	
251.8	58.070	N/A	37	N/A	N/A	N/A	N/A	N/A	0.807	0	0	0.174	TRUE	FALSE	FALSE	N/A	N/A	C	
251.7	58.234	N/A	38	N/A	N/A	N/A	N/A	N/A	0.807	0	0	0.174	TRUE	FALSE	FALSE	N/A	N/A	C	
251.5	58.398	N/A	38	N/A	N/A	N/A	N/A	N/A	0.806	0	0	0.174	TRUE	FALSE	FALSE	N/A	N/A	C	
251.3	58.562	N/A	37	N/A	N/A	N/A	N/A	N/A	0.805	0	0	0.174	TRUE	FALSE	FALSE	N/A	N/A	C	
251.2	58.726	N/A	38	N/A	N/A	N/A	N/A	N/A	0.805	0	0	0.174	TRUE	FALSE	FALSE	N/A	N/A	C	
251.0	58.890	N/A	38	N/A	N/A	N/A	N/A	N/A	0.804	0	0	0.174	TRUE	FALSE	FALSE	N/A	N/A	C	
250.8	59.054	N/A	38	N/A	N/A	N/A	N/A	N/A	0.803	0	0	0.174	TRUE	FALSE	FALSE	N/A	N/A	C	
250.7	59.218	N/A	38	N/A	N/A	N/A	N/A	N/A	0.803	0	0	0.174	TRUE	FALSE	FALSE	N/A	N/A	C	
250.5	59.382	N/A	38	N/A	N/A	N/A	N/A	N/A	0.802	0	0	0.174	TRUE	FALSE	FALSE	N/A	N/A	C	
250.4	59.547	N/A	38	N/A	N/A	N/A	N/A	N/A	0.801	0	0	0.174	TRUE	FALSE	FALSE	N/A	N/A	C	
250.2	59.711	N/A	38	N/A	N/A	N/A	N/A	N/A	0.801	0	0	0.174	TRUE	FALSE	FALSE	N/A	N/A	C	
250.0	59.875	N/A	38	N/A	N/A	N/A	N/A	N/A	0.800	0	0	0.174	TRUE	FALSE	FALSE	N/A	N/A	C	
249.9	60.039	N/A	37	N/A	N/A	N/A	N/A	N/A	0.799	0	0	0.174	TRUE	FALSE	FALSE	N/A	N/A	C	
249.7	60.203	N/A	38	N/A	N/A	N/A	N/A	N/A	0.799	0	0	0.174	TRUE	FALSE	FALSE	N/A	N/A	C	
249.5	60.367	N/A	38	N/A	N/A	N/A	N/A	N/A	0.798	0	0	0.174	TRUE	FALSE	FALSE	N/A	N/A	C	
249.4	60.531	N/A	39	N/A	N/A	N/A	N/A	N/A	0.797	0	0	0.174	TRUE	FALSE	FALSE	N/A	N/A	C	
249.2	60.695	0.137	55	0.921	1.123	0.98	0.140	0.797	0	0	0	0.174	FALSE	FALSE	FALSE	0.8	N/A	C	
249.0	60.859	0.151	59	0.915	1.303	0.98	0.176	0.796	0	0	0	0.174	FALSE	FALSE	FALSE	1.0	N/A	A1	
248.9	61.023	0.183	65	0.904	1.624	0.97	0.261	0.795	0	0	0	0.173	FALSE	FALSE	FALSE	1.5	N/A	A1	
248.7	61.187	0.190	66	0.901	1.687	0.97	0.281	0.795	0	0	0	0.173	FALSE	FALSE	FALSE	1.6	N/A	A1	
248.5	61.351	0.180	64	0.904	1.603	0.97	0.254	0.794	0	0	0	0.173	FALSE	FALSE	FALSE	1.5	N/A	A1	

Elev. (ft)	Depth z	Cyclic Resistance Ratio CRR _{7.5}	Relative Density D _r	Correction for		Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., f _d	Front Ground Response			Sample Screened for:				Factor of Safety FS _{1q}	Material (optional)	Soil Type (see note on following chart)
				Overburden Pressure K _o	Sloping Ground K _α				τ _{max} Shear Stress (psf)	τ _{Avg} Cyclic Shear Stress (psf)	Cyclic Stress Ratio CSR	Clay-like (qc ₃₀) ≥ 175	High Tip Res.					
														Average				
248.4	61.515	0.185	65	0.902	1.642	0.97	0.266	0.793	0	0	0.173	FALSE	FALSE	FALSE	1.5	N/A	A1	
248.2	61.679	0.210	68	0.895	1.826	0.97	0.332	0.793	0	0	0.173	FALSE	FALSE	FALSE	1.9	N/A	A1	
248.1	61.843	N/A	58	N/A	N/A	N/A	N/A	0.792	0	0	0.173	TRUE	FALSE	FALSE	N/A	N/A	B	
247.9	62.007	N/A	46	N/A	N/A	N/A	N/A	0.791	0	0	0.173	TRUE	FALSE	FALSE	N/A	N/A	B	
247.7	62.171	N/A	41	N/A	N/A	N/A	N/A	0.791	0	0	0.173	TRUE	FALSE	FALSE	N/A	N/A	B	
247.6	62.335	N/A	39	N/A	N/A	N/A	N/A	0.790	0	0	0.173	TRUE	FALSE	FALSE	N/A	N/A	B	
247.4	62.499	N/A	38	N/A	N/A	N/A	N/A	0.789	0	0	0.173	TRUE	FALSE	FALSE	N/A	N/A	C	
247.2	62.663	N/A	38	N/A	N/A	N/A	N/A	0.789	0	0	0.173	TRUE	FALSE	FALSE	N/A	N/A	C	
247.1	62.827	N/A	37	N/A	N/A	N/A	N/A	0.788	0	0	0.173	TRUE	FALSE	FALSE	N/A	N/A	C	
246.9	62.991	N/A	37	N/A	N/A	N/A	N/A	0.787	0	0	0.173	TRUE	FALSE	FALSE	N/A	N/A	C	
246.7	63.155	N/A	37	N/A	N/A	N/A	N/A	0.787	0	0	0.173	TRUE	FALSE	FALSE	N/A	N/A	C	
246.6	63.319	N/A	37	N/A	N/A	N/A	N/A	0.786	0	0	0.173	TRUE	FALSE	FALSE	N/A	N/A	C	
246.4	63.483	N/A	37	N/A	N/A	N/A	N/A	0.785	0	0	0.173	TRUE	FALSE	FALSE	N/A	N/A	C	
246.3	63.648	N/A	37	N/A	N/A	N/A	N/A	0.785	0	0	0.173	TRUE	FALSE	FALSE	N/A	N/A	C	
246.1	63.812	N/A	37	N/A	N/A	N/A	N/A	0.784	0	0	0.173	TRUE	FALSE	FALSE	N/A	N/A	C	
245.9	63.976	N/A	38	N/A	N/A	N/A	N/A	0.783	0	0	0.173	TRUE	FALSE	FALSE	N/A	N/A	C	
245.8	64.140	N/A	38	N/A	N/A	N/A	N/A	0.783	0	0	0.173	TRUE	FALSE	FALSE	N/A	N/A	C	
245.6	64.304	N/A	38	N/A	N/A	N/A	N/A	0.782	0	0	0.172	TRUE	FALSE	FALSE	N/A	N/A	C	
245.4	64.468	N/A	38	N/A	N/A	N/A	N/A	0.782	0	0	0.172	TRUE	FALSE	FALSE	N/A	N/A	C	
245.3	64.632	N/A	38	N/A	N/A	N/A	N/A	0.781	0	0	0.172	TRUE	FALSE	FALSE	N/A	N/A	C	
245.1	64.796	N/A	38	N/A	N/A	N/A	N/A	0.780	0	0	0.172	TRUE	FALSE	FALSE	N/A	N/A	C	
244.9	64.960	N/A	38	N/A	N/A	N/A	N/A	0.780	0	0	0.172	TRUE	FALSE	FALSE	N/A	N/A	C	
244.8	65.124	N/A	38	N/A	N/A	N/A	N/A	0.779	0	0	0.172	TRUE	FALSE	FALSE	N/A	N/A	C	
244.6	65.288	N/A	38	N/A	N/A	N/A	N/A	0.778	0	0	0.172	TRUE	FALSE	FALSE	N/A	N/A	C	
244.4	65.452	N/A	38	N/A	N/A	N/A	N/A	0.778	0	0	0.172	TRUE	FALSE	FALSE	N/A	N/A	C	
244.3	65.616	N/A	38	N/A	N/A	N/A	N/A	0.777	0	0	0.172	TRUE	FALSE	FALSE	N/A	N/A	C	
244.1	65.780	N/A	38	N/A	N/A	N/A	N/A	0.776	0	0	0.172	TRUE	FALSE	FALSE	N/A	N/A	C	
244.0	65.944	N/A	38	N/A	N/A	N/A	N/A	0.776	0	0	0.172	TRUE	FALSE	FALSE	N/A	N/A	C	
243.8	66.108	N/A	37	N/A	N/A	N/A	N/A	0.775	0	0	0.172	TRUE	FALSE	FALSE	N/A	N/A	C	
243.6	66.272	N/A	37	N/A	N/A	N/A	N/A	0.774	0	0	0.172	TRUE	FALSE	FALSE	N/A	N/A	C	
243.5	66.436	N/A	37	N/A	N/A	N/A	N/A	0.774	0	0	0.172	TRUE	FALSE	FALSE	N/A	N/A	C	
243.3	66.600	N/A	38	N/A	N/A	N/A	N/A	0.773	0	0	0.172	TRUE	FALSE	FALSE	N/A	N/A	C	
243.1	66.764	N/A	38	N/A	N/A	N/A	N/A	0.773	0	0	0.172	TRUE	FALSE	FALSE	N/A	N/A	C	
243.0	66.928	N/A	38	N/A	N/A	N/A	N/A	0.772	0	0	0.172	TRUE	FALSE	FALSE	N/A	N/A	C	
242.8	67.092	N/A	37	N/A	N/A	N/A	N/A	0.771	0	0	0.171	TRUE	FALSE	FALSE	N/A	N/A	C	
242.6	67.256	N/A	37	N/A	N/A	N/A	N/A	0.771	0	0	0.171	TRUE	FALSE	FALSE	N/A	N/A	C	
242.5	67.420	N/A	37	N/A	N/A	N/A	N/A	0.770	0	0	0.171	TRUE	FALSE	FALSE	N/A	N/A	C	
242.3	67.584	N/A	37	N/A	N/A	N/A	N/A	0.769	0	0	0.171	TRUE	FALSE	FALSE	N/A	N/A	C	
242.2	67.749	N/A	37	N/A	N/A	N/A	N/A	0.769	0	0	0.171	TRUE	FALSE	FALSE	N/A	N/A	C	
242.0	67.913	N/A	37	N/A	N/A	N/A	N/A	0.768	0	0	0.171	TRUE	FALSE	FALSE	N/A	N/A	C	
241.8	68.077	N/A	37	N/A	N/A	N/A	N/A	0.767	0	0	0.171	TRUE	FALSE	FALSE	N/A	N/A	C	
241.7	68.241	N/A	38	N/A	N/A	N/A	N/A	0.767	0	0	0.171	TRUE	FALSE	FALSE	N/A	N/A	C	
241.5	68.405	N/A	38	N/A	N/A	N/A	N/A	0.766	0	0	0.171	TRUE	FALSE	FALSE	N/A	N/A	C	
241.3	68.569	N/A	38	N/A	N/A	N/A	N/A	0.766	0	0	0.171	TRUE	FALSE	FALSE	N/A	N/A	C	
241.2	68.733	N/A	38	N/A	N/A	N/A	N/A	0.765	0	0	0.171	TRUE	FALSE	FALSE	N/A	N/A	C	
241.0	68.897	N/A	38	N/A	N/A	N/A	N/A	0.764	0	0	0.171	TRUE	FALSE	FALSE	N/A	N/A	C	
240.8	69.061	N/A	38	N/A	N/A	N/A	N/A	0.764	0	0	0.171	TRUE	FALSE	FALSE	N/A	N/A	C	
240.7	69.225	N/A	38	N/A	N/A	N/A	N/A	0.763	0	0	0.171	TRUE	FALSE	FALSE	N/A	N/A	C	
240.5	69.389	N/A	38	N/A	N/A	N/A	N/A	0.762	0	0	0.171	TRUE	FALSE	FALSE	N/A	N/A	C	
240.3	69.553	N/A	38	N/A	N/A	N/A	N/A	0.762	0	0	0.171	TRUE	FALSE	FALSE	N/A	N/A	C	
240.2	69.717	N/A	37	N/A	N/A	N/A	N/A	0.761	0	0	0.170	TRUE	FALSE	FALSE	N/A	N/A	C	
240.0	69.881	N/A	37	N/A	N/A	N/A	N/A	0.760	0	0	0.170	TRUE	FALSE	FALSE	N/A	N/A	C	
239.9	70.045	N/A	37	N/A	N/A	N/A	N/A	0.760	0	0	0.170	TRUE	FALSE	FALSE	N/A	N/A	C	
239.7	70.209	N/A	38	N/A	N/A	N/A	N/A	0.759	0	0	0.170	TRUE	FALSE	FALSE	N/A	N/A	C	
239.5	70.373	N/A	38	N/A	N/A	N/A	N/A	0.759	0	0	0.170	TRUE	FALSE	FALSE	N/A	N/A	C	

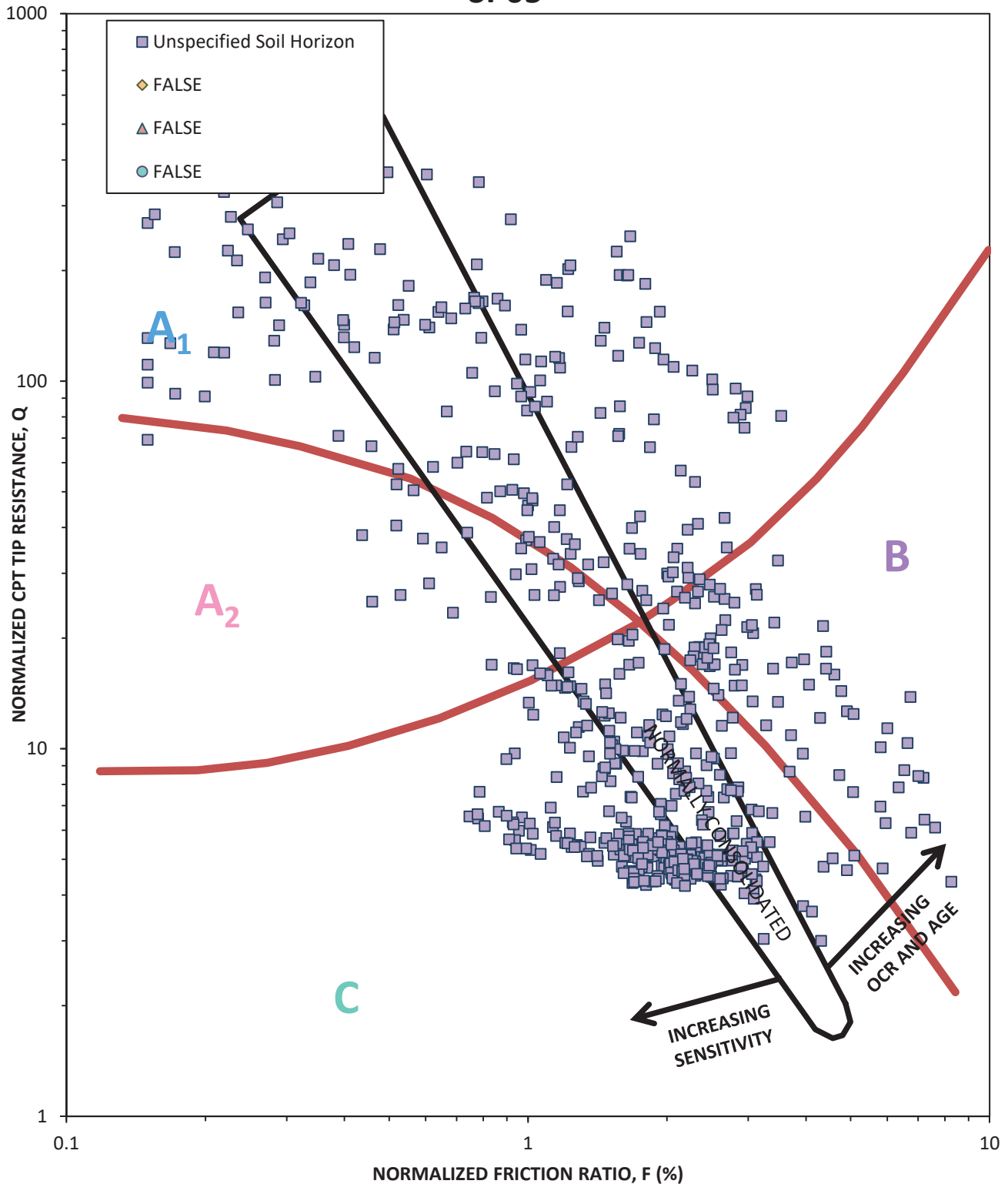
Elev. (ft)	Depth z (ft)	Cyclic Resistance Ratio $CRR_{7.5}$	Relative Density D_r (%)	Correction for Overburden Pressure K_o	Correction for Sloping Ground K_σ	Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., t_d	Front Ground Response			Cyclic Stress Ratio CSR	Sample Screened for:			Factor of Safety FS_{liq}	Material (optional)	Soil Type (see note on following chart)
									Maximum Induced Shear Stress τ_{max} (psf)	Average Cyclic Shear Stress τ_{Avg} (psf)	Cyclic Stress Ratio		Clay-like $(qc_{3N})_{cs} \geq 175$	High Tip Res.	Unsaturated			
239.4	70.537	N/A	38	N/A	N/A	N/A	N/A	0.758	0	0	0.170	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
239.2	70.701	N/A	38	N/A	N/A	N/A	N/A	0.757	0	0	0.170	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
239.0	70.865	N/A	38	N/A	N/A	N/A	N/A	0.757	0	0	0.170	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
238.9	71.029	N/A	38	N/A	N/A	N/A	N/A	0.756	0	0	0.170	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
238.7	71.193	N/A	38	N/A	N/A	N/A	N/A	0.756	0	0	0.170	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
238.5	71.357	N/A	38	N/A	N/A	N/A	N/A	0.755	0	0	0.170	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
238.4	71.521	N/A	38	N/A	N/A	N/A	N/A	0.754	0	0	0.170	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
238.2	71.685	N/A	38	N/A	N/A	N/A	N/A	0.754	0	0	0.170	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
238.1	71.850	N/A	38	N/A	N/A	N/A	N/A	0.753	0	0	0.170	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
237.9	72.014	N/A	38	N/A	N/A	N/A	N/A	0.752	0	0	0.170	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
237.7	72.178	N/A	37	N/A	N/A	N/A	N/A	0.752	0	0	0.170	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
237.6	72.342	N/A	37	N/A	N/A	N/A	N/A	0.751	0	0	0.169	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
237.4	72.506	N/A	37	N/A	N/A	N/A	N/A	0.751	0	0	0.169	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
237.2	72.670	N/A	37	N/A	N/A	N/A	N/A	0.750	0	0	0.169	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
237.1	72.834	N/A	37	N/A	N/A	N/A	N/A	0.749	0	0	0.169	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
236.9	72.998	N/A	37	N/A	N/A	N/A	N/A	0.749	0	0	0.169	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
236.7	73.162	N/A	37	N/A	N/A	N/A	N/A	0.748	0	0	0.169	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
236.6	73.326	N/A	38	N/A	N/A	N/A	N/A	0.748	0	0	0.169	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
236.4	73.490	N/A	38	N/A	N/A	N/A	N/A	0.747	0	0	0.169	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
236.2	73.654	N/A	38	N/A	N/A	N/A	N/A	0.746	0	0	0.169	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
236.1	73.818	N/A	38	N/A	N/A	N/A	N/A	0.746	0	0	0.169	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
235.9	73.982	N/A	37	N/A	N/A	N/A	N/A	0.745	0	0	0.169	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
235.8	74.146	N/A	38	N/A	N/A	N/A	N/A	0.745	0	0	0.169	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
235.6	74.310	N/A	37	N/A	N/A	N/A	N/A	0.744	0	0	0.169	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
235.4	74.474	N/A	37	N/A	N/A	N/A	N/A	0.743	0	0	0.169	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
235.3	74.638	N/A	38	N/A	N/A	N/A	N/A	0.743	0	0	0.168	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
235.1	74.802	N/A	37	N/A	N/A	N/A	N/A	0.742	0	0	0.168	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
234.9	74.966	N/A	37	N/A	N/A	N/A	N/A	0.742	0	0	0.168	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
234.8	75.130	N/A	37	N/A	N/A	N/A	N/A	0.741	0	0	0.168	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
234.6	75.294	N/A	38	N/A	N/A	N/A	N/A	0.740	0	0	0.168	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
234.4	75.458	N/A	38	N/A	N/A	N/A	N/A	0.740	0	0	0.168	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
234.3	75.622	N/A	38	N/A	N/A	N/A	N/A	0.739	0	0	0.168	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
234.1	75.786	N/A	38	N/A	N/A	N/A	N/A	0.739	0	0	0.168	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
233.9	75.951	N/A	38	N/A	N/A	N/A	N/A	0.738	0	0	0.168	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
233.8	76.115	N/A	38	N/A	N/A	N/A	N/A	0.737	0	0	0.168	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
233.6	76.279	N/A	38	N/A	N/A	N/A	N/A	0.737	0	0	0.168	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
233.5	76.443	N/A	38	N/A	N/A	N/A	N/A	0.736	0	0	0.168	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
233.3	76.607	N/A	38	N/A	N/A	N/A	N/A	0.736	0	0	0.168	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
233.1	76.771	N/A	38	N/A	N/A	N/A	N/A	0.735	0	0	0.168	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
233.0	76.935	N/A	38	N/A	N/A	N/A	N/A	0.735	0	0	0.168	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
232.8	77.099	N/A	38	N/A	N/A	N/A	N/A	0.734	0	0	0.167	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
232.6	77.263	N/A	38	N/A	N/A	N/A	N/A	0.733	0	0	0.167	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
232.5	77.427	N/A	38	N/A	N/A	N/A	N/A	0.733	0	0	0.167	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
232.3	77.591	N/A	38	N/A	N/A	N/A	N/A	0.732	0	0	0.167	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
232.1	77.755	N/A	38	N/A	N/A	N/A	N/A	0.732	0	0	0.167	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
232.0	77.919	N/A	38	N/A	N/A	N/A	N/A	0.731	0	0	0.167	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
231.8	78.083	N/A	38	N/A	N/A	N/A	N/A	0.731	0	0	0.167	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
231.7	78.247	N/A	37	N/A	N/A	N/A	N/A	0.730	0	0	0.167	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
231.5	78.411	N/A	37	N/A	N/A	N/A	N/A	0.729	0	0	0.167	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
231.3	78.575	N/A	37	N/A	N/A	N/A	N/A	0.729	0	0	0.167	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
231.2	78.739	N/A	37	N/A	N/A	N/A	N/A	0.728	0	0	0.167	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
231.0	78.903	N/A	37	N/A	N/A	N/A	N/A	0.728	0	0	0.167	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
230.8	79.067	N/A	37	N/A	N/A	N/A	N/A	0.727	0	0	0.167	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
230.7	79.231	N/A	37	N/A	N/A	N/A	N/A	0.727	0	0	0.167	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
230.5	79.395	N/A	38	N/A	N/A	N/A	N/A	0.726	0	0	0.166	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C

Front Ground Response										Sample Screened for:					Factor of Safety FS _{req}	Material (optional)	Soil Type (see note on following chart)
Elev. (ft)	Depth z (ft)	Cyclic Resistance Ratio CRR _{7.5}	Relative Density D _r (%)	Correction for		Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., f _d	Maximum Induced Shear Stress τ _{max} (psf)	Average Cyclic Shear Stress τ _{avg} (psf)	Cyclic Stress Ratio CSR		High Tip Res. (q _{c 3N}) ≥ 175				
				Overburden Pressure K _o	Sloping Ground K _α						Clay-like	Unsat					
230.3	79.559	N/A	38	N/A	N/A	N/A	N/A	0.725	0	0	0.166	TRUE	FALSE	FALSE	N/A	C	
230.2	79.723	N/A	44	N/A	N/A	N/A	N/A	0.725	0	0	0.166	TRUE	FALSE	FALSE	N/A	B	
230.0	79.887	0.378	76	0.830	2.431	0.95	0.724	0.724	0	0	0.166	FALSE	FALSE	FALSE	4.4	A1	
229.8	80.052	N/A	96	N/A	N/A	N/A	N/A	0.724	0	0	0.166	FALSE	TRUE	FALSE	N/A	A1	
229.7	80.216	N/A	88	N/A	N/A	N/A	N/A	0.723	0	0	0.166	FALSE	TRUE	FALSE	N/A	A1	
229.5	80.380	0.223	69	0.861	1.848	0.97	0.343	0.723	0	0	0.166	FALSE	FALSE	FALSE	2.1	A1	
229.4	80.544	0.166	62	0.882	1.415	0.98	0.202	0.722	0	0	0.166	FALSE	FALSE	FALSE	1.2	A1	
229.2	80.708	0.156	60	0.886	1.310	0.98	0.177	0.722	0	0	0.166	FALSE	FALSE	FALSE	1.1	A1	
229.0	80.872	N/A	50	N/A	N/A	N/A	N/A	0.721	0	0	0.166	TRUE	FALSE	FALSE	N/A	B	
228.9	81.036	N/A	43	N/A	N/A	N/A	N/A	0.720	0	0	0.166	TRUE	FALSE	FALSE	N/A	B	
228.7	81.200	N/A	42	N/A	N/A	N/A	N/A	0.720	0	0	0.166	TRUE	FALSE	FALSE	N/A	B	
228.5	81.364	N/A	42	N/A	N/A	N/A	N/A	0.719	0	0	0.166	TRUE	FALSE	FALSE	N/A	B	
228.4	81.528	N/A	45	N/A	N/A	N/A	N/A	0.719	0	0	0.166	TRUE	FALSE	FALSE	N/A	C	
228.2	81.692	0.124	50	0.904	0.889	0.99	0.099	0.718	0	0	0.165	FALSE	FALSE	FALSE	N/A	C	
228.0	81.856	0.123	49	0.905	0.863	0.99	0.095	0.718	0	0	0.165	FALSE	FALSE	FALSE	N/A	A2	
227.9	82.020	0.126	51	0.903	0.908	0.99	0.102	0.717	0	0	0.165	FALSE	FALSE	FALSE	N/A	A2	
227.7	82.184	N/A	52	N/A	N/A	N/A	N/A	0.717	0	0	0.165	TRUE	FALSE	FALSE	N/A	B	
227.6	82.348	N/A	45	N/A	N/A	N/A	N/A	0.716	0	0	0.165	TRUE	FALSE	FALSE	N/A	B	
227.4	82.512	N/A	40	N/A	N/A	N/A	N/A	0.716	0	0	0.165	TRUE	FALSE	FALSE	N/A	B	
227.2	82.676	N/A	43	N/A	N/A	N/A	N/A	0.715	0	0	0.165	TRUE	FALSE	FALSE	N/A	B	
227.1	82.840	N/A	48	N/A	N/A	N/A	N/A	0.715	0	0	0.165	TRUE	FALSE	FALSE	N/A	C	
226.9	83.004	0.162	61	0.880	1.374	0.98	0.192	0.714	0	0	0.165	TRUE	FALSE	FALSE	N/A	C	
226.7	83.168	0.383	77	0.824	2.429	0.95	0.726	0.713	0	0	0.165	FALSE	FALSE	FALSE	1.2	A1	
226.6	83.332	N/A	84	N/A	N/A	N/A	N/A	0.713	0	0	0.165	FALSE	TRUE	FALSE	4.4	A1	
226.4	83.496	N/A	92	N/A	N/A	N/A	N/A	0.712	0	0	0.165	FALSE	TRUE	FALSE	N/A	A1	
226.2	83.660	N/A	92	N/A	N/A	N/A	N/A	0.712	0	0	0.165	FALSE	TRUE	FALSE	N/A	A1	
226.1	83.824	N/A	93	N/A	N/A	N/A	N/A	0.711	0	0	0.165	FALSE	TRUE	FALSE	N/A	A1	
225.9	83.988	N/A	94	N/A	N/A	N/A	N/A	0.711	0	0	0.165	FALSE	TRUE	FALSE	N/A	A1	
225.7	84.153	N/A	96	N/A	N/A	N/A	N/A	0.710	0	0	0.164	FALSE	TRUE	FALSE	N/A	A1	
225.6	84.317	N/A	95	N/A	N/A	N/A	N/A	0.710	0	0	0.164	FALSE	TRUE	FALSE	N/A	A1	
225.4	84.481	N/A	90	N/A	N/A	N/A	N/A	0.709	0	0	0.164	FALSE	TRUE	FALSE	N/A	A1	
225.3	84.645	N/A	81	N/A	N/A	N/A	N/A	0.709	0	0	0.164	FALSE	TRUE	FALSE	N/A	A1	
225.1	84.809	0.211	68	0.858	1.762	0.97	0.308	0.708	0	0	0.164	FALSE	FALSE	FALSE	1.9	A1	
224.9	84.973	0.115	45	0.908	0.730	0.99	0.075	0.708	0	0	0.164	FALSE	FALSE	FALSE	0.5	A1	
224.8	85.137	0.095	31	0.925	0.382	0.99	0.033	0.707	0	0	0.164	FALSE	FALSE	FALSE	0.2	A1	
224.6	85.301	0.091	27	0.929	0.321	0.99	0.027	0.707	0	0	0.164	FALSE	FALSE	FALSE	0.2	A2	
224.4	85.465	0.115	46	0.908	0.736	0.99	0.076	0.706	0	0	0.164	FALSE	FALSE	FALSE	0.5	A2	
224.3	85.629	0.123	49	0.902	0.854	0.99	0.093	0.706	0	0	0.164	FALSE	FALSE	FALSE	0.6	A2	
224.1	85.793	0.141	56	0.889	1.119	0.98	0.138	0.705	0	0	0.164	FALSE	FALSE	FALSE	0.8	A2	
223.9	85.957	0.159	61	0.879	1.330	0.98	0.181	0.705	0	0	0.164	FALSE	FALSE	FALSE	1.1	A1	
223.8	86.121	0.251	71	0.845	1.975	0.96	0.402	0.704	0	0	0.164	FALSE	FALSE	FALSE	2.5	A1	
223.6	86.285	0.308	74	0.831	2.202	0.95	0.538	0.704	0	0	0.164	FALSE	FALSE	FALSE	3.3	A1	
223.5	86.449	0.440	78	0.810	2.544	0.94	0.856	0.703	0	0	0.163	FALSE	FALSE	FALSE	5.2	A1	
223.3	86.613	0.396	77	0.816	2.447	0.95	0.748	0.703	0	0	0.163	FALSE	FALSE	FALSE	4.6	A1	
223.1	86.777	0.437	78	0.810	2.537	0.94	0.848	0.702	0	0	0.163	FALSE	FALSE	FALSE	5.2	A1	
223.0	86.941	N/A	87	N/A	N/A	N/A	N/A	0.702	0	0	0.163	FALSE	TRUE	FALSE	N/A	A1	
222.8	87.105	N/A	90	N/A	N/A	N/A	N/A	0.701	0	0	0.163	FALSE	TRUE	FALSE	N/A	A1	
222.6	87.269	N/A	94	N/A	N/A	N/A	N/A	0.701	0	0	0.163	FALSE	TRUE	FALSE	N/A	A1	
222.5	87.433	N/A	85	N/A	N/A	N/A	N/A	0.700	0	0	0.163	FALSE	TRUE	FALSE	N/A	A1	
222.3	87.597	0.420	78	0.811	2.497	0.95	0.803	0.700	0	0	0.163	FALSE	FALSE	FALSE	4.9	A1	
222.1	87.761	0.276	73	0.836	2.082	0.96	0.461	0.699	0	0	0.163	FALSE	FALSE	FALSE	2.8	A1	
222.0	87.925	0.201	67	0.858	1.685	0.97	0.281	0.699	0	0	0.163	FALSE	FALSE	FALSE	1.7	A1	
221.8	88.089	N/A	55	N/A	N/A	N/A	N/A	0.698	0	0	0.163	TRUE	FALSE	FALSE	N/A	B	
221.6	88.254	0.141	56	0.886	1.115	0.98	0.137	0.698	0	0	0.163	FALSE	FALSE	FALSE	N/A	A1	
221.5	88.418	0.111	43	0.909	0.652	0.99	0.065	0.697	0	0	0.163	FALSE	FALSE	FALSE	0.4	A1	

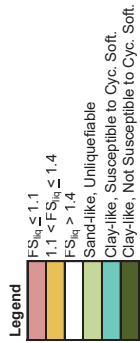
Elev. (ft)	Depth z (ft)	Cyclic Resistance Ratio CRR _{7.5}	Relative Density D _r	Correction for			Cyclic Resistance Ratio CRR	Stress Reduction Coeff., I _d	Front Ground Response			Sample Screened for:				Factor of Safety FS _{slq}	Material (optional)	Soil Type (see note on following chart)
				Overburden Pressure K _σ	Sloping Ground K _α	Correction Factor MSF			Maximum Induced Shear Stress τ _{max} (psf)	Cyclic Shear Stress τ _{avg} (psf)	Cyclic Stress Ratio CSR	Clay-like (qc _N) ≥ 175	High Tip Res.	Unsaturated				
221.3	88.582	0.104	38	0.914	0.543	0.99	0.051	0.697	0	0	0.163	FALSE	FALSE	FALSE	0.3	N/A	A1	
221.2	88.746	0.116	46	0.904	0.739	0.99	0.077	0.696	0	0	0.163	FALSE	FALSE	FALSE	0.5	N/A	A1	
221.0	88.910	0.125	50	0.897	0.883	0.99	0.097	0.696	0	0	0.162	FALSE	FALSE	FALSE	0.6	N/A	A1	
220.8	89.074	0.153	59	0.878	1.268	0.98	0.167	0.695	0	0	0.162	FALSE	FALSE	FALSE	1.0	N/A	A1	
220.7	89.238	0.182	65	0.863	1.543	0.97	0.236	0.695	0	0	0.162	FALSE	FALSE	FALSE	1.5	N/A	A1	
220.5	89.402	0.175	64	0.866	1.485	0.97	0.220	0.694	0	0	0.162	FALSE	FALSE	FALSE	1.4	N/A	A1	
220.3	89.566	0.170	63	0.869	1.437	0.98	0.207	0.694	0	0	0.162	FALSE	FALSE	FALSE	1.3	N/A	A1	
220.2	89.730	0.153	59	0.877	1.265	0.98	0.167	0.693	0	0	0.162	FALSE	FALSE	FALSE	1.0	N/A	A1	
220.0	89.894	0.251	71	0.839	1.964	0.96	0.398	0.693	0	0	0.162	FALSE	FALSE	FALSE	2.5	N/A	A1	
219.8	90.058	0.210	68	0.852	1.742	0.97	0.301	0.692	0	0	0.162	FALSE	FALSE	FALSE	1.9	N/A	A1	
219.7	90.222	0.266	72	0.835	2.030	0.96	0.432	0.692	0	0	0.162	FALSE	FALSE	FALSE	2.7	N/A	A1	
219.5	90.386	N/A	56	N/A	N/A	N/A	N/A	0.692	0	0	0.162	TRUE	FALSE	FALSE	N/A	N/A	B	
219.3	90.550	N/A	43	N/A	N/A	N/A	N/A	0.691	0	0	0.162	TRUE	FALSE	FALSE	N/A	N/A	B	
219.2	90.714	N/A	39	N/A	N/A	N/A	N/A	0.691	0	0	0.162	TRUE	FALSE	FALSE	N/A	N/A	B	
219.0	90.878	N/A	38	N/A	N/A	N/A	N/A	0.690	0	0	0.162	TRUE	FALSE	FALSE	N/A	N/A	C	
218.9	91.042	N/A	38	N/A	N/A	N/A	N/A	0.690	0	0	0.162	TRUE	FALSE	FALSE	N/A	N/A	C	
218.7	91.206	N/A	40	N/A	N/A	N/A	N/A	0.689	0	0	0.162	TRUE	FALSE	FALSE	N/A	N/A	C	
218.5	91.370	N/A	39	N/A	N/A	N/A	N/A	0.689	0	0	0.162	TRUE	FALSE	FALSE	N/A	N/A	C	
218.4	91.534	N/A	39	N/A	N/A	N/A	N/A	0.688	0	0	0.161	TRUE	FALSE	FALSE	N/A	N/A	C	
218.2	91.698	N/A	45	N/A	N/A	N/A	N/A	0.688	0	0	0.161	TRUE	FALSE	FALSE	N/A	N/A	C	
218.0	91.862	N/A	46	N/A	N/A	N/A	N/A	0.687	0	0	0.161	TRUE	FALSE	FALSE	N/A	N/A	C	
217.9	92.026	N/A	43	N/A	N/A	N/A	N/A	0.687	0	0	0.161	TRUE	FALSE	FALSE	N/A	N/A	C	
217.7	92.190	N/A	42	N/A	N/A	N/A	N/A	0.686	0	0	0.161	TRUE	FALSE	FALSE	N/A	N/A	C	
217.5	92.355	N/A	39	N/A	N/A	N/A	N/A	0.686	0	0	0.161	TRUE	FALSE	FALSE	N/A	N/A	C	
217.4	92.519	N/A	38	N/A	N/A	N/A	N/A	0.686	0	0	0.161	TRUE	FALSE	FALSE	N/A	N/A	C	
217.2	92.683	N/A	38	N/A	N/A	N/A	N/A	0.685	0	0	0.161	TRUE	FALSE	FALSE	N/A	N/A	C	
217.1	92.847	N/A	38	N/A	N/A	N/A	N/A	0.685	0	0	0.161	TRUE	FALSE	FALSE	N/A	N/A	C	
216.9	93.011	N/A	38	N/A	N/A	N/A	N/A	0.684	0	0	0.161	TRUE	FALSE	FALSE	N/A	N/A	C	
216.7	93.175	N/A	38	N/A	N/A	N/A	N/A	0.684	0	0	0.161	TRUE	FALSE	FALSE	N/A	N/A	C	
216.6	93.339	N/A	38	N/A	N/A	N/A	N/A	0.683	0	0	0.161	TRUE	FALSE	FALSE	N/A	N/A	C	
216.4	93.503	N/A	39	N/A	N/A	N/A	N/A	0.683	0	0	0.161	TRUE	FALSE	FALSE	N/A	N/A	C	
216.2	93.667	0.227	69	0.841	1.833	0.96	0.338	0.683	0	0	0.161	FALSE	FALSE	FALSE	2.1	N/A	A1	
216.1	93.831	N/A	81	N/A	N/A	N/A	N/A	0.682	0	0	0.161	FALSE	TRUE	FALSE	N/A	N/A	A1	
215.9	93.995	N/A	86	N/A	N/A	N/A	N/A	0.682	0	0	0.161	FALSE	TRUE	FALSE	N/A	N/A	A1	
215.7	94.159	N/A	86	N/A	N/A	N/A	N/A	0.681	0	0	0.160	FALSE	TRUE	FALSE	N/A	N/A	A1	
215.6	94.323	N/A	84	N/A	N/A	N/A	N/A	0.681	0	0	0.160	FALSE	TRUE	FALSE	N/A	N/A	A1	
215.4	94.487	N/A	81	N/A	N/A	N/A	N/A	0.680	0	0	0.160	FALSE	TRUE	FALSE	N/A	N/A	A1	
215.2	94.651	0.192	66	0.853	1.604	0.97	0.254	0.680	0	0	0.160	FALSE	FALSE	FALSE	1.6	N/A	A1	
215.1	94.815	0.300	74	0.820	2.146	0.96	0.504	0.680	0	0	0.160	FALSE	FALSE	FALSE	3.1	N/A	A1	
214.9	94.979	0.336	75	0.812	2.263	0.95	0.589	0.679	0	0	0.160	FALSE	FALSE	FALSE	3.7	N/A	A1	
214.8	95.143	0.255	71	0.831	1.966	0.96	0.400	0.679	0	0	0.160	FALSE	FALSE	FALSE	2.5	N/A	A1	
214.6	95.307	0.163	61	0.866	1.357	0.98	0.187	0.678	0	0	0.160	FALSE	FALSE	FALSE	1.2	N/A	A1	
214.4	95.471	N/A	47	N/A	N/A	N/A	N/A	0.678	0	0	0.160	TRUE	FALSE	FALSE	N/A	N/A	B	
214.3	95.635	N/A	41	N/A	N/A	N/A	N/A	0.677	0	0	0.160	TRUE	FALSE	FALSE	N/A	N/A	B	
214.1	95.799	0.144	57	0.877	1.142	0.98	0.141	0.677	0	0	0.160	FALSE	FALSE	FALSE	0.9	N/A	A1	
213.9	95.963	0.234	70	0.836	1.864	0.96	0.351	0.677	0	0	0.160	FALSE	FALSE	FALSE	2.2	N/A	A1	
213.8	96.127	0.527	80	0.782	2.657	0.94	1.028	0.676	0	0	0.160	FALSE	FALSE	FALSE	6.4	N/A	A1	
213.6	96.291	0.403	77	0.799	2.427	0.95	0.738	0.676	0	0	0.160	FALSE	FALSE	FALSE	4.6	N/A	A1	
213.4	96.456	0.173	63	0.859	1.450	0.97	0.210	0.675	0	0	0.160	FALSE	FALSE	FALSE	1.3	N/A	A1	
213.3	96.620	0.164	62	0.864	1.367	0.98	0.189	0.675	0	0	0.160	FALSE	FALSE	FALSE	1.2	N/A	A1	
213.1	96.784	0.139	55	0.879	1.076	0.98	0.129	0.675	0	0	0.160	FALSE	FALSE	FALSE	0.8	N/A	A1	
213.0	96.948	0.123	49	0.891	0.846	0.99	0.092	0.674	0	0	0.159	FALSE	FALSE	FALSE	0.6	N/A	A1	
212.8	97.112	0.125	50	0.890	0.870	0.99	0.095	0.674	0	0	0.159	FALSE	FALSE	FALSE	0.6	N/A	A1	
212.6	97.276	0.139	56	0.878	1.080	0.98	0.130	0.673	0	0	0.159	FALSE	FALSE	FALSE	0.8	N/A	A1	
212.5	97.440	0.293	73	0.818	2.114	0.96	0.484	0.673	0	0	0.159	FALSE	FALSE	FALSE	3.0	N/A	A1	

From Ground Response															Sample Screened for:					Soil Type (see note on following chart)
Elev. (ft)	Depth z (ft)	Cyclic Resistance Ratio $CRR_{7.5}$	Relative Density D_r (%)	Correction for		Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., r_d	Maximum Induced Shear Stress τ_{max} (psf)		Average Cyclic Shear Stress τ_{Avg} (psf)		Cyclic Stress Ratio CSR	Clay-like $(q_c)_{N(10)} \geq 175$	High Tip Res.	Factor of Safety FS_{liq}	Material (optional)			
				Overburden Pressure K_o	Sloping Ground K_a				Shear Stress	Shear Stress										
212.3	97.604	N/A	96	N/A	N/A	N/A	N/A	0.673	0	0	0	0.159	FALSE	TRUE	FALSE	N/A	N/A	A1		
212.1	97.768	N/A	100	N/A	N/A	N/A	N/A	0.672	0	0	0	0.159	FALSE	TRUE	FALSE	N/A	N/A	A1		
212.0	97.932	N/A	100	N/A	N/A	N/A	N/A	0.672	0	0	0	0.159	FALSE	TRUE	FALSE	N/A	N/A	A1		
211.8	98.096	N/A	100	N/A	N/A	N/A	N/A	0.671	0	0	0	0.159	FALSE	TRUE	FALSE	N/A	N/A	A1		
211.6	98.260	N/A	100	N/A	N/A	N/A	N/A	0.671	0	0	0	0.159	FALSE	TRUE	FALSE	N/A	N/A	A1		
211.5	98.424	N/A	100	N/A	N/A	N/A	N/A	0.671	0	0	0	0.159	FALSE	TRUE	FALSE	N/A	N/A	A1		
211.3	98.588	N/A	100	N/A	N/A	N/A	N/A	0.670	0	0	0	0.159	FALSE	TRUE	FALSE	N/A	N/A	A1		
211.1	98.752	N/A	100	N/A	N/A	N/A	N/A	0.670	0	0	0	0.159	FALSE	TRUE	FALSE	N/A	N/A	A1		
211.0	98.916	N/A	100	N/A	N/A	N/A	N/A	0.670	0	0	0	0.159	FALSE	TRUE	FALSE	N/A	N/A	A1		
210.8	99.080	N/A	100	N/A	N/A	N/A	N/A	0.669	0	0	0	0.159	FALSE	TRUE	FALSE	N/A	N/A	A1		
210.7	99.244	N/A	99	N/A	N/A	N/A	N/A	0.669	0	0	0	0.159	FALSE	TRUE	FALSE	N/A	N/A	A1		
210.5	99.408	N/A	100	N/A	N/A	N/A	N/A	0.668	0	0	0	0.159	FALSE	TRUE	FALSE	N/A	N/A	A1		
210.3	99.572	N/A	100	N/A	N/A	N/A	N/A	0.668	0	0	0	0.159	FALSE	TRUE	FALSE	N/A	N/A	A1		
210.2	99.736	N/A	100	N/A	N/A	N/A	N/A	0.668	0	0	0	0.159	FALSE	TRUE	FALSE	N/A	N/A	A1		
210.0	99.900	N/A	100	N/A	N/A	N/A	N/A	0.667	0	0	0	0.159	FALSE	TRUE	FALSE	N/A	N/A	A1		
209.8	100.064	N/A	100	N/A	N/A	N/A	N/A	0.667	0	0	0	0.158	FALSE	TRUE	FALSE	N/A	N/A	A1		
209.7	100.228	N/A	100	N/A	N/A	N/A	N/A	0.667	0	0	0	0.158	FALSE	TRUE	FALSE	N/A	N/A	A1		
209.5	100.392	N/A	100	N/A	N/A	N/A	N/A	0.666	0	0	0	0.158	FALSE	TRUE	FALSE	N/A	N/A	A1		
209.3	100.557	N/A	100	N/A	N/A	N/A	N/A	0.666	0	0	0	0.158	FALSE	TRUE	FALSE	N/A	N/A	A1		

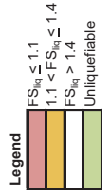
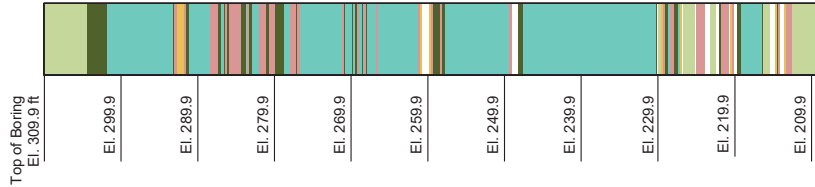
SP05



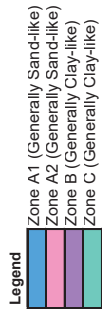
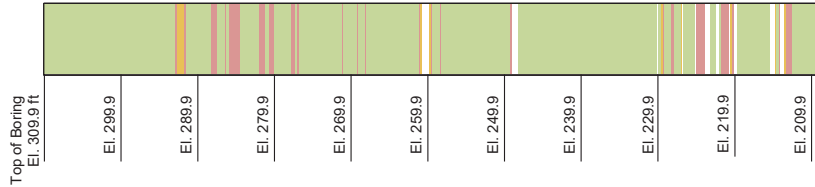
Adapted from "Discussion of 'Liquefaction Potential of Silts from CPTu'" (Robertson 2008). Zone A_1 and Zone A_2 samples are generally sand-like. Zone B samples are generally clay-like and not susceptible to cyclic softening. Zone C samples are generally clay-like and susceptible to cyclic softening. Note that the transition from clay-like to sand-like in this chart does not exactly match the liquefaction calculations herein; that is, some transitional samples in Zone B and Zone C will be treated as sand-like and analyzed for liquefaction if the calculations indicate as such.



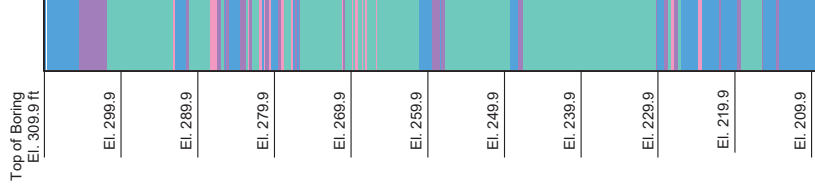
SP05, Liquefaction Triggering Results



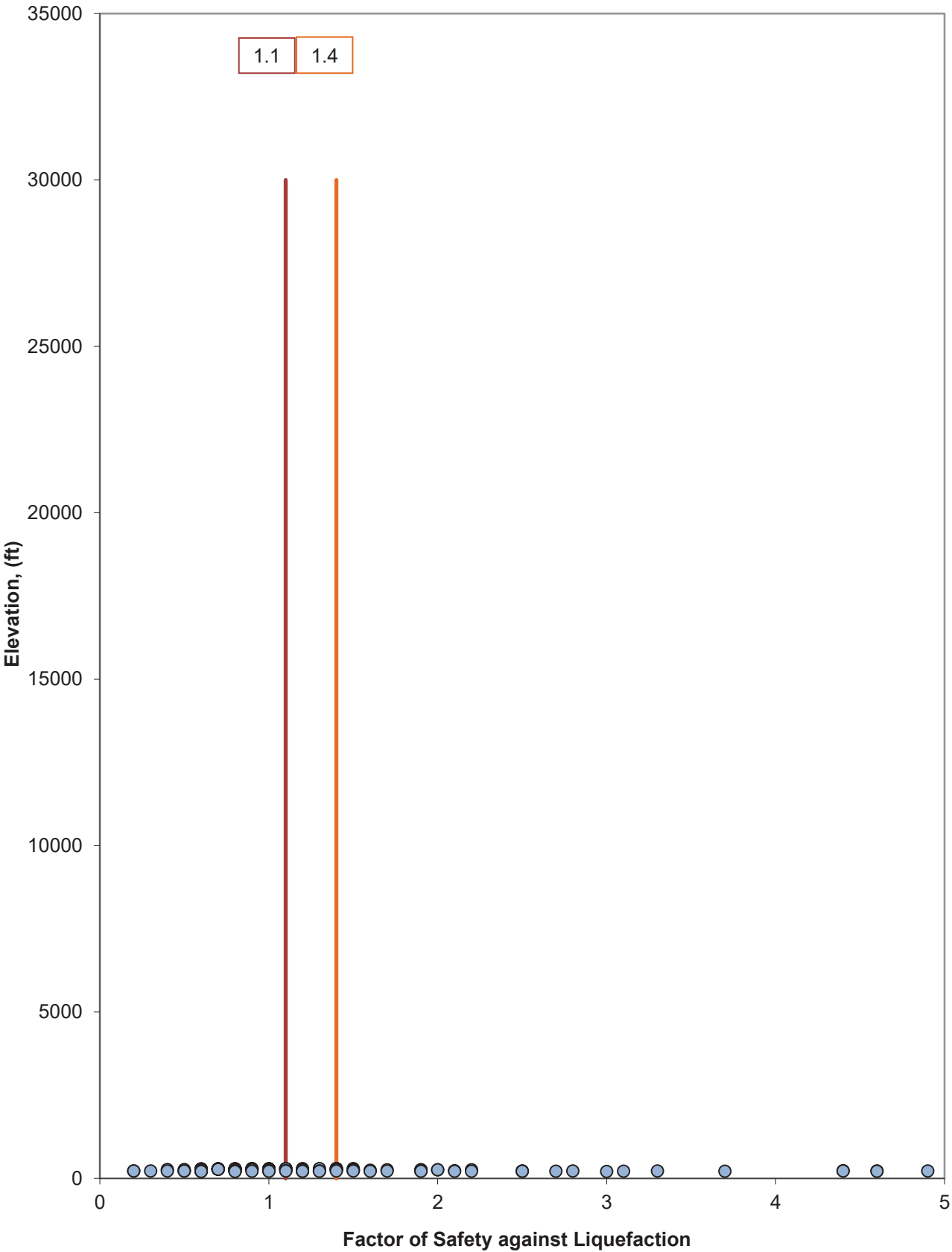
SP05, Liquefaction Triggering Results



SP05, Robertson Soil Type



US 60 Bridge, Boring = SP05, Source = Design Source, Mw = 7.7, Event = Design Event,
CPT Data, Simplified Stress-Based Approach



Project Information

Slantec Project Number = 178565011
Project Name = US 80 Bridge
CPT ID = SP06

Boring Location (optional)

Nothing =
Easting =

OR

Baseline Station =
Offset (+ Right) =

Using qt (corrected for u2 PWP) or qc (backcalculated uncorrected field tip)

Cone ID (optional) =
Use qc instead of qt? (1: Yes, 0: No)
Cone Area Rate (a) = 0.80

Drilling Information

Top of Hole Elevation = 324.9 feet
Water Depth during CPT (negative for US borings) = 11.8 feet
Depth data collection began = 0.00 feet
Avg. Total Unit WL Above 1st Sample =

During Earthquake Information

Water Depth during EQ (relative to CPT TOH, negative for US borings) = 11.8 feet
Final Grade Elevation during EQ = 324.9 feet
Avg. Total Unit WL of Cui/Fill = 120 pcf

Nonlinear Pore Water Pressure Profile

Custom Pore Water Pressure Profile? (1: Yes, 0: No)
If previous answer is No, hydrostatic pressures are assumed.

α Curve Fit Parameters

Associated α profile:
 α at each Sample Depth known? (1: Yes, 0: No)
If previous answer is No, then enter curve fit parameters below (α vs. depth curve)
If defaulting to $K_s=1$ (i.e., level ground), assign values of zero to all curve fit parameters below to make α zero and thus, K_s will be one.

m4:
m3:
m2:
m1:
m0:

Associated ground response profile:

Get CSR from shear stress envelope?
If previous answer is No, then CSR will be calculated using a_{max} and r_d
Max. Shear Stress at each sample depth known?
If previous answer is No, then enter curve fit parameters below (shear stress vs. depth curve)

Max. Shear Stress Curve Fit Parameters (from ground response analysis)

Borings, sp06, nor
0
m4:
m3:
m2:
m1:

Earthquake Information

EQ Source (e.g., New Madrid)
Event (e.g., MCE, OBE)
 a_{max} (g) (top of ground surface)
EQ Mag (Mw)
Design Source
Design Event
0.24
7.7

Inputs

Depth (ft)	Corrected Cone Tip Resistance, q_c (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
0.164	21557	0.221	120							
0.328	37550	0.285	120							
0.492	43394	0.522	120							
0.656	49490	1.040	120							
0.820	62675	0.795	120							
0.984	94737	0.618	120							
1.148	80710	0.505	120							
1.312	64400	0.584	120							
1.476	59625	0.749	120							
1.640	55864	0.899	120							
1.804	54488	0.932	120							
1.968	51245	0.945	120							
2.133	47142	0.874	120							
2.297	45156	0.843	120							
2.461	44628	0.908	120							
2.625	44489	0.999	120							
2.789	41838	0.966	120							
2.953	39965	0.852	120							
3.117	37932	0.837	120							
3.281	37868	0.895	120							
3.445	37567	0.941	120							
3.609	32774	0.893	120							
3.773	28825	0.830	120							
3.937	26935	0.776	120							
4.101	25577	0.739	120							
4.265	25338	0.711	120							
4.429	24138	0.667	120							
4.593	22370	0.639	120							
4.757	22851	0.593	120							
4.921	20002	0.519	120							
5.085	16036	0.442	120							
5.249	14287	0.360	120							
5.413	13027	0.305	120							
5.577	10169	0.231	120							
5.741	8482	0.218	120							
5.905	9084	0.201	120							
6.069	8865	0.219	120							
6.234	8076	0.251	120							
6.398	6443	0.196	120							
6.562	5030	0.131	120							
6.726	4485	0.122	120							
6.890	4885	0.116	120							
7.054	4376	0.115	120							
7.218	4575	0.135	120							
7.382	6941	0.163	120							
7.546	8345	0.182	120							
7.710	6719	0.185	120							
7.874	5611	0.175	120							
8.038	5418	0.154	120							
8.202	6114	0.166	120							
8.366	8802	0.213	120							
8.530	10484	0.214	120							
8.694	9195	0.228	120							
8.858	7433	0.216	120							
9.022	4909	0.179	120							
9.186	3910	0.136	120							
9.350	3842	0.104	120							
9.514	3374	0.122	120							
9.678	4093	0.126	120							
9.842	4463	0.123	120							
10.006	4171	0.096	120							
10.170	4239	0.086	120							
10.335	4444	0.099	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
10.499	3.979	0.103	120							
10.663	5.842	0.097	120							
10.827	5.772	0.108	120							
10.991	4.783	0.096	120							
11.155	3.656	0.104	120							
11.319	3.608	0.090	120							
11.483	3.977	0.075	120							
11.647	3.779	0.073	120							
11.811	3.068	0.075	120							
11.975	2.673	0.075	120							
12.139	2.926	0.077	120							
12.303	2.641	0.078	120							
12.467	2.493	0.076	120							
12.631	2.727	0.069	120							
12.795	2.639	0.073	120							
12.959	3.092	0.073	120							
13.123	3.366	0.088	120							
13.287	3.097	0.082	120							
13.451	3.779	0.082	120							
13.615	4.033	0.081	120							
13.779	4.631	0.075	120							
13.943	5.011	0.092	120							
14.107	4.806	0.091	120							
14.271	4.083	0.089	120							
14.436	3.671	0.074	120							
14.600	3.476	0.065	120							
14.764	3.847	0.063	120							
14.928	3.741	0.085	120							
15.092	3.363	0.092	120							
15.256	4.767	0.079	120							
15.420	3.936	0.064	120							
15.584	4.271	0.048	120							
15.748	4.626	0.057	120							
15.912	4.262	0.047	120							
16.076	4.013	0.089	120							
16.240	4.379	0.084	120							
16.404	5.041	0.083	120							
16.568	18.377	0.156	120							
16.732	36.574	0.214	120							
16.896	47.770	0.231	120							
17.060	47.741	0.203	120							
17.224	46.658	0.203	120							
17.388	41.658	0.209	120							
17.552	30.635	0.452	120							
17.716	18.650	0.486	120							
17.880	10.596	0.483	120							
18.044	6.511	0.321	120							
18.208	7.309	0.143	120							
18.372	8.598	0.063	120							
18.537	8.410	0.056	120							
18.701	6.576	0.064	120							
18.865	5.932	0.058	120							
19.029	4.864	0.063	120							
19.193	4.839	0.060	120							
19.357	5.456	0.055	120							
19.521	15.452	0.097	120							
19.685	21.300	0.258	120							
19.849	15.204	0.313	120							
20.013	18.271	0.284	120							
20.177	22.089	0.344	120							
20.341	13.829	0.288	120							
20.505	9.272	0.207	120							
20.669	8.279	0.149	120							
20.833	6.474	0.080	120							
20.997	10.157	0.172	120							
21.161	8.811	0.138	120							
21.325	6.420	0.129	120							
21.489	6.358	0.057	120							
21.653	5.959	0.035	120							
21.817	5.857	0.028	120							
21.981	5.216	0.025	120							
22.145	5.861	0.026	120							
22.309	5.725	0.029	120							
22.473	5.322	0.033	120							
22.638	5.087	0.042	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
22.802	4.908	0.042	120							
22.966	5.651	0.043	120							
23.130	5.537	0.037	120							
23.294	5.118	0.047	120							
23.458	5.917	0.035	120							
23.622	8.116	0.041	120							
23.786	13.405	0.104	120							
23.950	10.781	0.114	120							
24.114	9.622	0.127	120							
24.278	8.127	0.095	120							
24.442	6.749	0.072	120							
24.606	6.327	0.104	120							
24.770	6.609	0.114	120							
24.934	7.389	0.149	120							
25.098	7.101	0.155	120							
25.262	6.467	0.152	120							
25.426	5.805	0.136	120							
25.590	6.152	0.141	120							
25.754	6.355	0.132	120							
25.918	6.185	0.143	120							
26.082	5.972	0.120	120							
26.246	6.039	0.118	120							
26.410	6.056	0.137	120							
26.574	5.839	0.126	120							
26.739	5.436	0.113	120							
26.903	5.344	0.109	120							
27.067	5.016	0.085	120							
27.231	4.560	0.081	120							
27.395	4.517	0.057	120							
27.559	4.698	0.057	120							
27.723	4.805	0.059	120							
27.887	4.493	0.066	120							
28.051	4.745	0.063	120							
28.215	4.931	0.070	120							
28.379	5.014	0.082	120							
28.543	5.523	0.087	120							
28.707	6.313	0.122	120							
28.871	6.188	0.151	120							
29.035	5.590	0.158	120							
29.199	5.399	0.195	120							
29.363	7.448	0.221	120							
29.527	8.068	0.236	120							
29.691	7.948	0.333	120							
29.855	6.531	0.307	120							
30.019	6.910	0.306	120							
30.183	8.030	0.320	120							
30.347	10.267	0.302	120							
30.511	8.293	0.258	120							
30.675	7.445	0.200	120							
30.840	6.894	0.178	120							
31.004	6.805	0.163	120							
31.168	7.170	0.154	120							
31.332	7.292	0.165	120							
31.496	7.029	0.152	120							
31.660	6.904	0.144	120							
31.824	6.730	0.124	120							
31.988	6.930	0.121	120							
32.152	6.933	0.108	120							
32.316	6.817	0.102	120							
32.480	6.935	0.108	120							
32.644	9.755	0.100	120							
32.808	8.586	0.066	120							
32.972	8.197	0.052	120							
33.136	8.890	0.056	120							
33.300	9.874	0.092	120							
33.464	11.848	0.098	120							
33.628	9.962	0.102	120							
33.792	9.051	0.129	120							
33.956	9.232	0.099	120							
34.120	10.000	0.110	120							
34.284	9.709	0.133	120							
34.448	9.924	0.163	120							
34.612	9.911	0.154	120							
34.776	9.780	0.143	120							
34.941	9.336	0.121	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
35.105	9.620	0.142	120							
35.269	9.803	0.156	120							
35.433	9.809	0.181	120							
35.597	9.727	0.189	120							
35.761	11.157	0.228	120							
35.925	9.946	0.288	120							
36.089	13.307	0.204	120							
36.253	10.506	0.132	120							
36.417	9.324	0.122	120							
36.581	10.204	0.134	120							
36.745	10.207	0.181	120							
36.909	10.348	0.199	120							
37.073	10.590	0.217	120							
37.237	10.066	0.182	120							
37.401	13.176	0.177	120							
37.565	34.707	0.351	120							
37.729	19.770	0.426	120							
37.893	12.227	0.395	120							
38.057	20.295	0.233	120							
38.221	100.036	0.398	120							
38.385	115.232	0.634	120							
38.549	114.173	0.792	120							
38.713	116.602	0.850	120							
38.877	118.451	0.908	120							
39.042	130.045	0.933	120							
39.206	137.435	1.039	120							
39.370	131.401	1.114	120							
39.534	120.780	1.363	120							
39.698	85.662	1.618	120							
39.862	40.241	1.626	120							
40.026	23.141	1.187	120							
40.190	15.023	0.867	120							
40.354	14.009	0.863	120							
40.518	42.526	0.770	120							
40.682	91.574	0.979	120							
40.846	62.117	1.287	120							
41.010	34.177	1.360	120							
41.174	21.953	1.049	120							
41.338	13.615	0.689	120							
41.502	14.973	0.289	120							
41.666	13.849	0.161	120							
41.830	14.269	0.870	120							
41.994	46.035	0.882	120							
42.158	27.035	0.910	120							
42.322	17.733	0.950	120							
42.486	15.667	0.250	120							
42.650	12.885	0.146	120							
42.814	12.250	0.143	120							
42.978	12.129	0.124	120							
43.143	11.650	0.103	120							
43.307	11.646	0.092	120							
43.471	12.471	0.103	120							
43.635	12.575	0.128	120							
43.799	12.328	0.163	120							
43.963	11.615	0.139	120							
44.127	11.904	0.128	120							
44.291	12.108	0.121	120							
44.455	11.807	0.129	120							
44.619	11.273	0.142	120							
44.783	11.314	0.118	120							
44.947	11.118	0.097	120							
45.111	10.563	0.096	120							
45.275	12.167	0.100	120							
45.439	15.583	0.105	120							
45.603	11.710	0.157	120							
45.767	10.727	0.140	120							
45.931	10.797	0.084	120							
46.095	10.960	0.080	120							
46.259	11.713	0.084	120							
46.423	11.541	0.093	120							
46.587	11.149	0.079	120							
46.751	11.923	0.117	120							
46.915	12.376	0.106	120							
47.079	10.697	0.100	120							
47.244	11.570	0.094	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
47.408	11170	0.102	120							
47.572	10646	0.098	120							
47.736	12871	0.108	120							
47.900	12383	0.133	120							
48.064	11170	0.159	120							
48.228	11348	0.132	120							
48.392	11114	0.122	120							
48.556	10864	0.111	120							
48.720	11189	0.112	120							
48.884	11181	0.159	120							
49.048	14115	0.198	120							
49.212	16777	0.163	120							
49.376	11751	0.193	120							
49.540	11322	0.172	120							
49.704	11062	0.119	120							
49.868	11108	0.106	120							
50.032	11109	0.088	120							
50.196	10988	0.083	120							
50.360	10802	0.118	120							
50.524	11317	0.180	120							
50.688	24602	0.286	120							
50.852	119492	0.551	120							
51.016	137382	0.842	120							
51.180	133720	1.046	120							
51.345	132505	1.096	120							
51.509	135463	1.085	120							
51.673	132488	1.388	120							
51.837	99964	1.732	120							
52.001	47226	1.781	120							
52.165	26356	1.448	120							
52.329	19581	1.017	120							
52.493	15504	0.524	120							
52.657	13460	0.349	120							
52.821	13072	0.215	120							
52.985	12231	0.160	120							
53.149	12742	0.141	120							
53.313	12681	0.147	120							
53.477	12915	0.189	120							
53.641	15516	0.346	120							
53.805	64911	0.699	120							
53.969	53716	0.943	120							
54.133	11445	0.161	120							
54.297	11407	0.161	120							
54.461	14897	0.346	120							
54.625	18053	0.983	120							
54.789	70030	1.325	120							
54.953	121550	1.628	120							
55.117	51828	1.792	120							
55.281	29666	1.401	120							
55.446	17921	0.990	120							
55.610	14268	0.578	120							
55.774	15509	0.238	120							
55.938	14112	0.213	120							
56.102	14814	0.338	120							
56.266	18848	0.303	120							
56.430	14233	0.334	120							
56.594	13837	0.277	120							
56.758	13421	0.233	120							
56.922	12766	0.203	120							
57.086	12395	0.152	120							
57.250	12397	0.119	120							
57.414	12405	0.110	120							
57.578	12832	0.100	120							
57.742	12560	0.112	120							
57.906	12957	0.115	120							
58.070	13219	0.109	120							
58.234	14089	0.129	120							
58.398	13658	0.155	120							
58.562	13280	0.164	120							
58.726	13384	0.237	120							
58.890	13973	0.226	120							
59.054	92810	0.351	120							
59.218	109889	0.919	120							
59.382	52802	1.571	120							
59.547	28774	1.332	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
59.711	16,320	0.995	120							
59.875	13,919	0.390	120							
60.039	14,402	0.221	120							
60.203	13,433	0.237	120							
60.367	12,738	0.228	120							
60.531	12,994	0.209	120							
60.695	13,792	0.209	120							
60.859	13,019	0.203	120							
61.023	13,054	0.194	120							
61.187	12,854	0.197	120							
61.351	12,595	0.183	120							
61.515	12,716	0.184	120							
61.679	12,765	0.136	120							
61.843	13,136	0.155	120							
62.007	13,471	0.167	120							
62.171	12,671	0.157	120							
62.335	12,990	0.126	120							
62.499	13,033	0.121	120							
62.663	13,015	0.130	120							
62.827	13,039	0.127	120							
62.991	13,952	0.130	120							
63.155	14,150	0.151	120							
63.319	13,786	0.178	120							
63.483	13,330	0.167	120							
63.648	13,349	0.150	120							
63.812	12,997	0.132	120							
63.976	13,214	0.144	120							
64.140	13,256	0.150	120							
64.304	13,463	0.163	120							
64.468	13,908	0.182	120							
64.632	13,740	0.183	120							
64.796	14,560	0.201	120							
64.960	14,113	0.200	120							
65.124	14,106	0.214	120							
65.288	13,927	0.210	120							
65.452	13,557	0.193	120							
65.616	13,767	0.205	120							
65.780	13,819	0.191	120							
65.944	16,236	0.326	120							
66.108	37,454	0.638	120							
66.272	43,691	0.611	120							
66.436	44,862	0.594	120							
66.600	43,888	0.570	120							
66.764	43,483	0.214	120							
66.928	43,224	0.171	120							
67.092	42,966	0.153	120							
67.256	43,016	0.147	120							
67.420	43,009	0.145	120							
67.584	43,279	0.133	120							
67.749	43,692	0.218	120							
67.913	47,770	0.223	120							
68.077	43,469	0.236	120							
68.241	44,349	0.192	120							
68.405	44,239	0.150	120							
68.569	44,247	0.206	120							
68.733	44,087	0.183	120							
68.897	44,829	0.162	120							
69.061	45,201	0.151	120							
69.225	44,912	0.193	120							
69.389	44,674	0.218	120							
69.553	44,272	0.184	120							
69.717	43,899	0.158	120							
69.881	44,069	0.141	120							
70.045	44,623	0.146	120							
70.209	44,830	0.173	120							
70.373	44,612	0.193	120							
70.537	44,437	0.193	120							
70.701	44,284	0.160	120							
70.865	44,103	0.144	120							
71.029	43,776	0.141	120							
71.193	43,842	0.140	120							
71.357	44,090	0.139	120							
71.521	44,324	0.150	120							
71.685	45,088	0.160	120							
71.850	46,719	0.270	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
72.014	16464	0.287	120							
72.178	16500	0.283	120							
72.342	15610	0.245	120							
72.506	14976	0.219	120							
72.670	14813	0.191	120							
72.834	14754	0.168	120							
72.998	14941	0.166	120							
73.162	14654	0.161	120							
73.326	14583	0.158	120							
73.490	14504	0.154	120							
73.654	14659	0.149	120							
73.818	15154	0.154	120							
73.982	15400	0.174	120							
74.146	15378	0.186	120							
74.310	15521	0.178	120							
74.474	15555	0.167	120							
74.638	15313	0.171	120							
74.802	15476	0.180	120							
74.966	15383	0.203	120							
75.130	15374	0.193	120							
75.294	16471	0.187	120							
75.458	16417	0.184	120							
75.622	16193	0.189	120							
75.786	15500	0.210	120							
75.951	15521	0.193	120							
76.115	15784	0.174	120							
76.279	15661	0.162	120							
76.443	17648	0.200	120							
76.607	15499	0.225	120							
76.771	15536	0.230	120							
76.935	15777	0.175	120							
77.099	16089	0.172	120							
77.263	16298	0.206	120							
77.427	15621	0.220	120							
77.591	15234	0.192	120							
77.755	15774	0.147	120							
77.919	15446	0.136	120							
78.083	15364	0.125	120							
78.247	15153	0.132	120							
78.411	15778	0.174	120							
78.575	12346	0.198	120							
78.739	11282	0.170	120							
78.903	10945	2.177	120							
79.067	263375	2.167	120							
79.231	169464	2.726	120							
79.395	121818	1.874	120							
79.559	53029	1.595	120							
79.723	32076	1.262	120							
79.887	41219	0.916	120							
80.052	44233	0.560	120							
80.216	42762	0.802	120							
80.380	39842	1.222	120							
80.544	33148	1.117	120							
80.708	23528	0.799	120							
80.872	18426	0.446	120							
81.036	17478	0.241	120							
81.200	17370	0.167	120							
81.364	17002	0.146	120							
81.528	18293	0.189	120							
81.692	43906	0.277	120							
81.856	75181	0.902	120							
82.020	48203	1.493	120							
82.184	39544	1.365	120							
82.348	38063	1.117	120							
82.512	54745	1.107	120							
82.676	40661	1.008	120							
82.840	27788	0.823	120							
83.004	22969	0.633	120							
83.168	18520	0.465	120							
83.332	18147	0.835	120							
83.496	95644	0.547	120							
83.660	174831	1.623	120							
83.824	221651	2.275	120							
83.988	240289	2.341	120							
84.153	170647	3.183	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
84.317	100.452	3.636	120							
84.481	47.897	2.048	120							
84.645	135.019	1.430	120							
84.809	190.772	0.864	120							
84.973	129.524	1.892	120							
85.137	73.628	2.166	120							
85.301	42.294	2.244	120							
85.465	33.755	1.825	120							
85.629	36.272	1.155	120							
85.793	30.613	0.515	120							
85.957	56.375	1.048	120							
86.121	41.170	0.873	120							
86.285	104.864	0.785	120							
86.449	138.538	1.135	120							
86.613	79.571	1.575	120							
86.777	45.821	1.440	120							
86.941	65.431	1.069	120							
87.105	86.151	1.641	120							
87.269	74.418	2.268	120							
87.433	40.666	2.298	120							
87.597	84.137	2.151	120							
87.761	285.527	2.895	120							
87.925	344.961	3.852	120							
88.089	365.365	4.678	120							
88.254	351.097	5.086	120							
88.418	319.348	4.701	120							
88.582	277.026	3.856	120							
88.746	226.244	3.536	120							
88.910	161.273	3.722	120							
89.074	74.941	3.923	120							
89.238	44.133	2.848	120							
89.402	32.858	1.270	120							
89.566	47.611	0.924	120							
89.730	31.052	1.217	120							
89.894	156.650	1.720	120							
90.058	244.291	2.241	120							
90.222	254.776	2.723	120							
90.386	250.748	3.147	120							
90.550	280.136	3.085	120							
90.714	263.915	4.126	120							
90.878	430.481	3.863	120							
91.042	164.263	3.144	120							
91.206	175.163	2.731	120							
91.370	142.148	2.184	120							
91.534	124.770	1.767	120							
91.698	117.289	1.551	120							
91.862	113.897	1.804	120							
92.026	99.553	1.335	120							
92.190	91.471	1.106	120							
92.355	77.356	1.180	120							
92.519	66.499	1.056	120							
92.683	86.715	0.964	120							
92.847	76.703	1.103	120							
93.011	73.543	1.313	120							
93.175	56.020	1.915	120							
93.339	49.323	1.282	120							
93.503	113.097	0.898	120							
93.667	144.753	1.026	120							
93.831	121.650	1.032	120							
93.995	104.169	1.200	120							
94.159	81.218	1.665	120							
94.323	57.576	1.998	120							
94.487	39.610	3.925	120							

LIQUEFACTION POTENTIAL ASSESSMENT FOR COARSE GRAINED SOILS USING CONE PENETRATION TEST DATA

Facility: US 60 Bridge
Project No.: 178565011
CPT ID: SP06

Water Elevation during CPT:	313.1	ft
Depth to Water during CPT:	11.8	ft (relative to ground surface during CPT)
Water Elevation during Earthquake:	313.1	ft
Depth to Water during Earthquake:	11.8	ft (relative to ground surface during CPT)
Final Grade Elevation during EQ:	324.9	ft (if no fill, then set this equal to top of CPT hole elev.)
Height of Final Grade above CPT TOH:	0.0	ft (relative to ground surface during CPT, + Fill, - Cut)
Unit Weight of Cut/Fill to Achieve Final Grade	120	pcf
Cut/Fill Total Stress (+ Fill, - Cut):	0.00	tsf

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σ _{V CPT} (tsf)	Total Vertical Stress during EQ σ _{V EQ} (tsf)	Static Pore Water Pressure during CPT u _{S CPT} (tsf)	Static Pore Water Pressure during EQ u _{S EQ} (tsf)	Effective Vertical Stress during CPT σ _{V CPT} (tsf)	Effective Vertical Stress during EQ σ _{V EQ} (tsf)
324.9					Vertical Stresses above 1st CPT:		0.00	0.00	0.00	0.00	0.00	0.00
324.7	0.164	21.56	0.22	120		0.00	0.25	0.01	0.01	0.00	0.01	0.01
324.6	0.328	37.55	0.29	120		0.25	0.16	0.02	0.02	0.00	0.02	0.02
324.4	0.492	43.39	0.52	120		0.41	0.16	0.03	0.03	0.00	0.03	0.03
324.2	0.656	49.49	1.04	120		0.57	0.16	0.04	0.04	0.00	0.04	0.04
324.1	0.820	62.68	0.80	120		0.74	0.16	0.05	0.05	0.00	0.05	0.05
323.9	0.984	94.74	0.62	120		0.90	0.16	0.06	0.06	0.00	0.06	0.06
323.8	1.148	80.71	0.51	120		1.07	0.16	0.07	0.07	0.00	0.07	0.07
323.6	1.312	64.40	0.58	120		1.23	0.16	0.08	0.08	0.00	0.08	0.08
323.4	1.476	59.82	0.75	120		1.39	0.16	0.09	0.09	0.00	0.09	0.09
323.3	1.640	55.88	0.90	120		1.56	0.16	0.10	0.10	0.00	0.10	0.10
323.1	1.804	54.49	0.93	120		1.72	0.16	0.11	0.11	0.00	0.11	0.11
322.9	1.968	51.25	0.95	120		1.89	0.16	0.12	0.12	0.00	0.12	0.12
322.8	2.133	47.14	0.87	120		2.05	0.16	0.13	0.13	0.00	0.13	0.13
322.6	2.297	45.16	0.84	120		2.21	0.16	0.14	0.14	0.00	0.14	0.14
322.4	2.461	44.63	0.91	120		2.38	0.16	0.15	0.15	0.00	0.15	0.15
322.3	2.625	44.49	1.00	120		2.54	0.16	0.16	0.16	0.00	0.16	0.16
322.1	2.789	41.84	1.00	120		2.71	0.16	0.17	0.17	0.00	0.17	0.17
321.9	2.953	39.97	0.85	120		2.87	0.16	0.18	0.18	0.00	0.18	0.18
321.8	3.117	37.93	0.84	120		3.03	0.16	0.19	0.19	0.00	0.19	0.19
321.6	3.281	37.87	0.90	120		3.20	0.16	0.20	0.20	0.00	0.20	0.20
321.5	3.445	37.57	0.94	120		3.36	0.16	0.21	0.21	0.00	0.21	0.21
321.3	3.609	32.77	0.89	120		3.53	0.16	0.22	0.22	0.00	0.22	0.22
321.1	3.773	28.82	0.83	120		3.69	0.16	0.23	0.23	0.00	0.23	0.23
321.0	3.937	26.94	0.78	120		3.85	0.16	0.24	0.24	0.00	0.24	0.24
320.8	4.101	25.58	0.74	120		4.02	0.16	0.25	0.25	0.00	0.25	0.25
320.6	4.265	25.34	0.71	120		4.18	0.16	0.26	0.26	0.00	0.26	0.26
320.5	4.429	24.14	0.67	120		4.35	0.16	0.27	0.27	0.00	0.27	0.27
320.3	4.593	22.37	0.64	120		4.51	0.16	0.28	0.28	0.00	0.28	0.28
320.1	4.757	22.85	0.59	120		4.68	0.16	0.29	0.29	0.00	0.29	0.29
320.0	4.921	20.00	0.52	120		4.84	0.16	0.30	0.30	0.00	0.30	0.30
319.8	5.085	16.04	0.44	120		5.00	0.16	0.31	0.31	0.00	0.31	0.31
319.7	5.249	14.29	0.36	120		5.17	0.16	0.31	0.31	0.00	0.31	0.31
319.5	5.413	13.03	0.31	120		5.33	0.16	0.32	0.32	0.00	0.32	0.32
319.3	5.577	10.17	0.23	120		5.50	0.16	0.33	0.33	0.00	0.33	0.33
319.2	5.741	8.48	0.22	120		5.66	0.16	0.34	0.34	0.00	0.34	0.34
319.0	5.905	9.08	0.20	120		5.82	0.16	0.35	0.35	0.00	0.35	0.35
318.8	6.069	8.86	0.22	120		5.99	0.16	0.36	0.36	0.00	0.36	0.36
318.7	6.234	8.08	0.25	120		6.15	0.16	0.37	0.37	0.00	0.37	0.37
318.5	6.398	6.44	0.20	120		6.32	0.16	0.38	0.38	0.00	0.38	0.38
318.3	6.562	5.03	0.13	120		6.48	0.16	0.39	0.39	0.00	0.39	0.39
318.2	6.726	4.48	0.12	120		6.64	0.16	0.40	0.40	0.00	0.40	0.40
318.0	6.890	4.89	0.12	120		6.81	0.16	0.41	0.41	0.00	0.41	0.41
317.8	7.054	4.38	0.12	120		6.97	0.16	0.42	0.42	0.00	0.42	0.42
317.7	7.218	4.58	0.14	120		7.14	0.16	0.43	0.43	0.00	0.43	0.43
317.5	7.382	6.94	0.16	120		7.30	0.16	0.44	0.44	0.00	0.44	0.44
317.4	7.546	8.35	0.18	120		7.46	0.16	0.45	0.45	0.00	0.45	0.45
317.2	7.710	6.72	0.19	120		7.63	0.16	0.46	0.46	0.00	0.46	0.46
317.0	7.874	5.61	0.18	120		7.79	0.16	0.47	0.47	0.00	0.47	0.47
316.9	8.038	5.42	0.15	120		7.96	0.16	0.48	0.48	0.00	0.48	0.48
316.7	8.202	6.11	0.17	120		8.12	0.16	0.49	0.49	0.00	0.49	0.49
316.5	8.366	8.80	0.21	120		8.28	0.16	0.50	0.50	0.00	0.50	0.50
316.4	8.530	10.48	0.21	120		8.45	0.16	0.51	0.51	0.00	0.51	0.51
316.2	8.694	9.19	0.23	120		8.61	0.16	0.52	0.52	0.00	0.52	0.52
316.0	8.858	7.43	0.22	120		8.78	0.16	0.53	0.53	0.00	0.53	0.53
315.9	9.022	4.91	0.18	120		8.94	0.16	0.54	0.54	0.00	0.54	0.54
315.7	9.186	3.91	0.14	120		9.10	0.16	0.55	0.55	0.00	0.55	0.55
315.5	9.350	3.84	0.10	120		9.27	0.16	0.56	0.56	0.00	0.56	0.56
315.4	9.514	3.37	0.12	120		9.43	0.16	0.57	0.57	0.00	0.57	0.57
315.2	9.678	3.09	0.13	120		9.60	0.16	0.58	0.58	0.00	0.58	0.58
315.1	9.842	4.46	0.12	120		9.76	0.16	0.59	0.59	0.00	0.59	0.59
314.9	10.006	4.11	0.11	120		9.92	0.16	0.60	0.60	0.00	0.60	0.60
314.7	10.170	4.24	0.10	120		10.09	0.16	0.61	0.61	0.00	0.61	0.61

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σv CPT (tsf)	Total Vertical Stress during EQ σv EQ (tsf)	Static Pore Water Pressure during CPT us CPT (tsf)	Static Pore Water Pressure during EQ us EQ (tsf)	Effective Vertical Stress during CPT σv CPT (tsf)	Effective Vertical Stress during EQ σv EQ (tsf)
314.6	10.335	4.44	0.10	120	10.25	0.16	0.62	0.62	0.00	0.00	0.62	0.62
314.4	10.499	3.98	0.10	120	10.42	0.16	0.63	0.63	0.00	0.00	0.63	0.63
314.2	10.663	5.84	0.10	120	10.58	0.16	0.64	0.64	0.00	0.00	0.64	0.64
314.1	10.827	5.77	0.11	120	10.74	0.16	0.65	0.65	0.00	0.00	0.65	0.65
313.9	10.991	4.78	0.10	120	10.91	0.16	0.66	0.66	0.00	0.00	0.66	0.66
313.7	11.155	3.66	0.10	120	11.07	0.16	0.67	0.67	0.00	0.00	0.67	0.67
313.6	11.319	3.61	0.09	120	11.24	0.16	0.68	0.68	0.00	0.00	0.68	0.68
313.4	11.483	3.98	0.08	120	11.40	0.16	0.69	0.69	0.00	0.00	0.69	0.69
313.3	11.647	3.78	0.07	120	11.56	0.16	0.70	0.70	0.00	0.00	0.70	0.70
313.1	11.811	3.07	0.08	120	11.73	0.16	0.71	0.71	0.00	0.00	0.71	0.71
312.9	11.975	2.67	0.08	120	11.89	0.16	0.72	0.72	0.01	0.01	0.71	0.71
312.8	12.139	2.93	0.08	120	12.06	0.16	0.73	0.73	0.01	0.01	0.72	0.72
312.6	12.303	2.64	0.08	120	12.22	0.16	0.74	0.74	0.02	0.02	0.72	0.72
312.4	12.467	2.49	0.08	120	12.39	0.16	0.75	0.75	0.02	0.02	0.73	0.73
312.3	12.631	2.73	0.07	120	12.55	0.16	0.76	0.76	0.03	0.03	0.73	0.73
312.1	12.795	2.64	0.07	120	12.71	0.16	0.77	0.77	0.03	0.03	0.74	0.74
311.9	12.959	3.09	0.07	120	12.88	0.16	0.78	0.78	0.04	0.04	0.74	0.74
311.8	13.123	3.37	0.09	120	13.04	0.16	0.79	0.79	0.04	0.04	0.75	0.75
311.6	13.287	3.10	0.08	120	13.21	0.16	0.80	0.80	0.05	0.05	0.75	0.75
311.4	13.451	3.78	0.08	120	13.37	0.16	0.81	0.81	0.05	0.05	0.76	0.76
311.3	13.615	4.03	0.08	120	13.53	0.16	0.82	0.82	0.06	0.06	0.76	0.76
311.1	13.779	4.63	0.08	120	13.70	0.16	0.83	0.83	0.06	0.06	0.77	0.77
311.0	13.943	5.01	0.09	120	13.86	0.16	0.84	0.84	0.07	0.07	0.77	0.77
310.8	14.107	4.81	0.09	120	14.03	0.16	0.85	0.85	0.07	0.07	0.77	0.77
310.6	14.271	4.08	0.09	120	14.19	0.16	0.86	0.86	0.08	0.08	0.78	0.78
310.5	14.436	3.67	0.07	120	14.35	0.16	0.87	0.87	0.08	0.08	0.78	0.78
310.3	14.600	3.48	0.07	120	14.52	0.16	0.88	0.88	0.09	0.09	0.79	0.79
310.1	14.764	3.85	0.06	120	14.68	0.16	0.89	0.89	0.09	0.09	0.79	0.79
310.0	14.928	3.74	0.09	120	14.85	0.16	0.90	0.90	0.10	0.10	0.80	0.80
309.8	15.092	3.36	0.09	120	15.01	0.16	0.91	0.91	0.10	0.10	0.80	0.80
309.6	15.256	4.77	0.08	120	15.17	0.16	0.92	0.92	0.11	0.11	0.81	0.81
309.5	15.420	3.94	0.06	120	15.34	0.16	0.93	0.93	0.11	0.11	0.81	0.81
309.3	15.584	4.27	0.05	120	15.50	0.16	0.94	0.94	0.12	0.12	0.82	0.82
309.2	15.748	4.63	0.06	120	15.67	0.16	0.94	0.94	0.12	0.12	0.82	0.82
309.0	15.912	4.26	0.05	120	15.83	0.16	0.95	0.95	0.13	0.13	0.83	0.83
308.8	16.076	4.01	0.06	120	15.99	0.16	0.96	0.96	0.13	0.13	0.83	0.83
308.7	16.240	4.38	0.06	120	16.16	0.16	0.97	0.97	0.14	0.14	0.84	0.84
308.5	16.404	5.04	0.08	120	16.32	0.16	0.98	0.98	0.14	0.14	0.84	0.84
308.3	16.568	18.38	0.16	120	16.49	0.16	0.99	0.99	0.15	0.15	0.85	0.85
308.2	16.732	36.57	0.21	120	16.65	0.16	1.00	1.00	0.15	0.15	0.85	0.85
308.0	16.896	47.77	0.25	120	16.81	0.16	1.01	1.01	0.16	0.16	0.85	0.85
307.8	17.060	47.74	0.20	120	16.98	0.16	1.02	1.02	0.16	0.16	0.86	0.86
307.7	17.224	45.63	0.20	120	17.14	0.16	1.03	1.03	0.17	0.17	0.86	0.86
307.5	17.388	41.01	0.28	120	17.31	0.16	1.04	1.04	0.17	0.17	0.87	0.87
307.3	17.552	30.63	0.45	120	17.47	0.16	1.05	1.05	0.18	0.18	0.87	0.87
307.2	17.716	18.65	0.59	120	17.63	0.16	1.06	1.06	0.18	0.18	0.88	0.88
307.0	17.880	10.60	0.48	120	17.80	0.16	1.07	1.07	0.19	0.19	0.88	0.88
306.9	18.044	6.51	0.32	120	17.96	0.16	1.08	1.08	0.19	0.19	0.89	0.89
306.7	18.208	7.31	0.14	120	18.13	0.16	1.09	1.09	0.20	0.20	0.89	0.89
306.5	18.372	8.60	0.06	120	18.29	0.16	1.10	1.10	0.21	0.21	0.90	0.90
306.4	18.537	8.41	0.06	120	18.45	0.16	1.11	1.11	0.21	0.21	0.90	0.90
306.2	18.701	6.58	0.06	120	18.62	0.16	1.12	1.12	0.22	0.22	0.91	0.91
306.0	18.865	5.93	0.06	120	18.78	0.16	1.13	1.13	0.22	0.22	0.91	0.91
305.9	19.029	4.86	0.06	120	18.95	0.16	1.14	1.14	0.23	0.23	0.92	0.92
305.7	19.193	4.84	0.06	120	19.11	0.16	1.15	1.15	0.23	0.23	0.92	0.92
305.5	19.357	5.46	0.06	120	19.27	0.16	1.16	1.16	0.24	0.24	0.93	0.93
305.4	19.521	15.45	0.10	120	19.44	0.16	1.17	1.17	0.24	0.24	0.93	0.93
305.2	19.685	21.30	0.26	120	19.60	0.16	1.18	1.18	0.25	0.25	0.94	0.94
305.1	19.849	15.20	0.31	120	19.77	0.16	1.19	1.19	0.25	0.25	0.94	0.94
304.9	20.013	18.27	0.28	120	19.93	0.16	1.20	1.20	0.26	0.26	0.94	0.94
304.7	20.177	22.09	0.34	120	20.09	0.16	1.21	1.21	0.26	0.26	0.95	0.95
304.6	20.341	13.83	0.29	120	20.26	0.16	1.22	1.22	0.27	0.27	0.95	0.95
304.4	20.505	9.27	0.21	120	20.42	0.16	1.23	1.23	0.27	0.27	0.96	0.96
304.2	20.669	8.28	0.15	120	20.59	0.16	1.24	1.24	0.28	0.28	0.96	0.96
304.1	20.833	6.47	0.08	120	20.75	0.16	1.25	1.25	0.28	0.28	0.97	0.97
303.9	20.997	10.16	0.17	120	20.92	0.16	1.26	1.26	0.29	0.29	0.97	0.97
303.7	21.161	8.81	0.14	120	21.08	0.16	1.27	1.27	0.29	0.29	0.98	0.98
303.6	21.325	6.42	0.13	120	21.24	0.16	1.28	1.28	0.30	0.30	0.98	0.98
303.4	21.489	6.36	0.06	120	21.41	0.16	1.29	1.29	0.30	0.30	0.99	0.99
303.2	21.653	5.96	0.04	120	21.57	0.16	1.30	1.30	0.31	0.31	0.99	0.99
303.1	21.817	5.86	0.03	120	21.74	0.16	1.31	1.31	0.31	0.31	1.00	1.00
302.9	21.981	5.22	0.03	120	21.90	0.16	1.32	1.32	0.32	0.32	1.00	1.00
302.8	22.145	5.86	0.03	120	22.06	0.16	1.33	1.33	0.32	0.32	1.01	1.01
302.6	22.309	5.72	0.03	120	22.23	0.16	1.34	1.34	0.33	0.33	1.01	1.01

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σv CPT (tsf)	Total Vertical Stress during EQ σv EQ (tsf)	Static Pore Water Pressure during CPT us CPT (tsf)	Static Pore Water Pressure during EQ us EQ (tsf)	Effective Vertical Stress during CPT σv CPT (tsf)	Effective Vertical Stress during EQ σv EQ (tsf)
302.4	22.473	5.32	0.03	120	22.39	0.16	1.35	1.35	0.33	0.33	1.02	1.02
302.3	22.638	5.09	0.04	120	22.56	0.16	1.36	1.36	0.34	0.34	1.02	1.02
302.1	22.802	5.00	0.04	120	22.72	0.16	1.37	1.37	0.34	0.34	1.02	1.02
301.9	22.966	5.65	0.04	120	22.88	0.16	1.38	1.38	0.35	0.35	1.03	1.03
301.8	23.130	5.54	0.04	120	23.05	0.16	1.39	1.39	0.35	0.35	1.03	1.03
301.6	23.294	5.12	0.05	120	23.21	0.16	1.40	1.40	0.36	0.36	1.04	1.04
301.4	23.458	5.92	0.04	120	23.38	0.16	1.41	1.41	0.36	0.36	1.04	1.04
301.3	23.622	8.12	0.04	120	23.54	0.16	1.42	1.42	0.37	0.37	1.05	1.05
301.1	23.786	13.40	0.10	120	23.70	0.16	1.43	1.43	0.37	0.37	1.05	1.05
301.0	23.950	10.78	0.11	120	23.87	0.16	1.44	1.44	0.38	0.38	1.06	1.06
300.8	24.114	9.62	0.13	120	24.03	0.16	1.45	1.45	0.38	0.38	1.06	1.06
300.6	24.278	8.13	0.10	120	24.20	0.16	1.46	1.46	0.39	0.39	1.07	1.07
300.5	24.442	6.75	0.07	120	24.36	0.16	1.47	1.47	0.39	0.39	1.07	1.07
300.3	24.606	6.33	0.10	120	24.52	0.16	1.48	1.48	0.40	0.40	1.08	1.08
300.1	24.770	6.61	0.11	120	24.69	0.16	1.49	1.49	0.40	0.40	1.08	1.08
300.0	24.934	7.39	0.15	120	24.85	0.16	1.50	1.50	0.41	0.41	1.09	1.09
299.8	25.098	7.10	0.16	120	25.02	0.16	1.51	1.51	0.41	0.41	1.09	1.09
299.6	25.262	6.47	0.15	120	25.18	0.16	1.52	1.52	0.42	0.42	1.10	1.10
299.5	25.426	5.80	0.14	120	25.34	0.16	1.53	1.53	0.43	0.43	1.10	1.10
299.3	25.590	6.15	0.14	120	25.51	0.16	1.54	1.54	0.43	0.43	1.11	1.11
299.1	25.754	6.36	0.13	120	25.67	0.16	1.55	1.55	0.44	0.44	1.11	1.11
299.0	25.918	6.18	0.14	120	25.84	0.16	1.56	1.56	0.44	0.44	1.11	1.11
298.8	26.082	5.97	0.12	120	26.00	0.16	1.56	1.56	0.45	0.45	1.12	1.12
298.7	26.246	6.04	0.12	120	26.16	0.16	1.57	1.57	0.45	0.45	1.12	1.12
298.5	26.410	6.06	0.14	120	26.33	0.16	1.58	1.58	0.46	0.46	1.13	1.13
298.3	26.574	5.84	0.13	120	26.49	0.16	1.59	1.59	0.46	0.46	1.13	1.13
298.2	26.739	5.44	0.11	120	26.66	0.16	1.60	1.60	0.47	0.47	1.14	1.14
298.0	26.903	5.34	0.11	120	26.82	0.16	1.61	1.61	0.47	0.47	1.14	1.14
297.8	27.067	5.02	0.09	120	26.98	0.16	1.62	1.62	0.48	0.48	1.15	1.15
297.7	27.231	4.56	0.08	120	27.15	0.16	1.63	1.63	0.48	0.48	1.15	1.15
297.5	27.395	4.52	0.06	120	27.31	0.16	1.64	1.64	0.49	0.49	1.16	1.16
297.3	27.559	4.70	0.06	120	27.48	0.16	1.65	1.65	0.49	0.49	1.16	1.16
297.2	27.723	4.80	0.06	120	27.64	0.16	1.66	1.66	0.50	0.50	1.17	1.17
297.0	27.887	4.49	0.07	120	27.80	0.16	1.67	1.67	0.50	0.50	1.17	1.17
296.8	28.051	4.74	0.06	120	27.97	0.16	1.68	1.68	0.51	0.51	1.18	1.18
296.7	28.215	4.93	0.07	120	28.13	0.16	1.69	1.69	0.51	0.51	1.18	1.18
296.5	28.379	5.01	0.08	120	28.30	0.16	1.70	1.70	0.52	0.52	1.19	1.19
296.4	28.543	5.52	0.09	120	28.46	0.16	1.71	1.71	0.52	0.52	1.19	1.19
296.2	28.707	6.31	0.12	120	28.62	0.16	1.72	1.72	0.53	0.53	1.19	1.19
296.0	28.871	6.19	0.15	120	28.79	0.16	1.73	1.73	0.53	0.53	1.20	1.20
295.9	29.035	5.59	0.16	120	28.95	0.16	1.74	1.74	0.54	0.54	1.20	1.20
295.7	29.199	6.40	0.20	120	29.12	0.16	1.75	1.75	0.54	0.54	1.21	1.21
295.5	29.363	7.45	0.22	120	29.28	0.16	1.76	1.76	0.55	0.55	1.21	1.21
295.4	29.527	8.47	0.27	120	29.45	0.16	1.77	1.77	0.55	0.55	1.22	1.22
295.2	29.691	7.95	0.33	120	29.61	0.16	1.78	1.78	0.56	0.56	1.22	1.22
295.0	29.855	6.53	0.31	120	29.77	0.16	1.79	1.79	0.56	0.56	1.23	1.23
294.9	30.019	6.91	0.31	120	29.94	0.16	1.80	1.80	0.57	0.57	1.23	1.23
294.7	30.183	8.03	0.32	120	30.10	0.16	1.81	1.81	0.57	0.57	1.24	1.24
294.6	30.347	10.27	0.30	120	30.27	0.16	1.82	1.82	0.58	0.58	1.24	1.24
294.4	30.511	8.28	0.26	120	30.43	0.16	1.83	1.83	0.58	0.58	1.25	1.25
294.2	30.675	7.45	0.20	120	30.59	0.16	1.84	1.84	0.59	0.59	1.25	1.25
294.1	30.840	6.89	0.18	120	30.76	0.16	1.85	1.85	0.59	0.59	1.26	1.26
293.9	31.004	6.80	0.16	120	30.92	0.16	1.86	1.86	0.60	0.60	1.26	1.26
293.7	31.168	7.17	0.15	120	31.09	0.16	1.87	1.87	0.60	0.60	1.27	1.27
293.6	31.332	7.29	0.17	120	31.25	0.16	1.88	1.88	0.61	0.61	1.27	1.27
293.4	31.496	7.03	0.15	120	31.41	0.16	1.89	1.89	0.61	0.61	1.28	1.28
293.2	31.660	6.90	0.14	120	31.58	0.16	1.90	1.90	0.62	0.62	1.28	1.28
293.1	31.824	6.73	0.12	120	31.74	0.16	1.91	1.91	0.62	0.62	1.28	1.28
292.9	31.988	6.93	0.12	120	31.91	0.16	1.92	1.92	0.63	0.63	1.29	1.29
292.7	32.152	6.93	0.11	120	32.07	0.16	1.93	1.93	0.63	0.63	1.29	1.29
292.6	32.316	6.82	0.10	120	32.23	0.16	1.94	1.94	0.64	0.64	1.30	1.30
292.4	32.480	6.94	0.11	120	32.40	0.16	1.95	1.95	0.65	0.65	1.30	1.30
292.3	32.644	9.76	0.10	120	32.56	0.16	1.96	1.96	0.65	0.65	1.31	1.31
292.1	32.808	8.59	0.07	120	32.73	0.16	1.97	1.97	0.66	0.66	1.31	1.31
291.9	32.972	8.20	0.05	120	32.89	0.16	1.98	1.98	0.66	0.66	1.32	1.32
291.8	33.136	8.89	0.06	120	33.05	0.16	1.99	1.99	0.67	0.67	1.32	1.32
291.6	33.300	9.87	0.09	120	33.22	0.16	2.00	2.00	0.67	0.67	1.33	1.33
291.4	33.464	11.85	0.10	120	33.38	0.16	2.01	2.01	0.68	0.68	1.33	1.33
291.3	33.628	9.96	0.10	120	33.55	0.16	2.02	2.02	0.68	0.68	1.34	1.34
291.1	33.792	9.05	0.13	120	33.71	0.16	2.03	2.03	0.69	0.69	1.34	1.34
290.9	33.956	9.23	0.10	120	33.87	0.16	2.04	2.04	0.69	0.69	1.35	1.35
290.8	34.120	10.00	0.11	120	34.04	0.16	2.05	2.05	0.70	0.70	1.35	1.35
290.6	34.284	9.71	0.13	120	34.20	0.16	2.06	2.06	0.70	0.70	1.36	1.36
290.5	34.448	9.92	0.16	120	34.37	0.16	2.07	2.07	0.71	0.71	1.36	1.36

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σv CPT (tsf)	Total Vertical Stress during EQ σv EQ (tsf)	Static Pore Water Pressure during CPT us CPT (tsf)	Static Pore Water Pressure during EQ us EQ (tsf)	Effective Vertical Stress during CPT σv CPT (tsf)	Effective Vertical Stress during EQ σv EQ (tsf)
290.3	34.612	9.91	0.15	120	34.53	0.16	2.08	2.08	0.71	0.71	1.36	1.36
290.1	34.776	9.78	0.14	120	34.69	0.16	2.09	2.09	0.72	0.72	1.37	1.37
290.0	34.941	9.34	0.12	120	34.86	0.16	2.10	2.10	0.72	0.72	1.37	1.37
289.8	35.105	9.62	0.14	120	35.02	0.16	2.11	2.11	0.73	0.73	1.38	1.38
289.6	35.269	9.80	0.16	120	35.19	0.16	2.12	2.12	0.73	0.73	1.38	1.38
289.5	35.433	9.81	0.18	120	35.35	0.16	2.13	2.13	0.74	0.74	1.39	1.39
289.3	35.597	9.73	0.19	120	35.51	0.16	2.14	2.14	0.74	0.74	1.39	1.39
289.1	35.761	11.16	0.23	120	35.68	0.16	2.15	2.15	0.75	0.75	1.40	1.40
289.0	35.925	9.95	0.29	120	35.84	0.16	2.16	2.16	0.75	0.75	1.40	1.40
288.8	36.089	13.31	0.20	120	36.01	0.16	2.17	2.17	0.76	0.76	1.41	1.41
288.6	36.253	10.51	0.13	120	36.17	0.16	2.18	2.18	0.76	0.76	1.41	1.41
288.5	36.417	9.32	0.12	120	36.33	0.16	2.19	2.19	0.77	0.77	1.42	1.42
288.3	36.581	10.20	0.13	120	36.50	0.16	2.19	2.19	0.77	0.77	1.42	1.42
288.2	36.745	10.21	0.18	120	36.66	0.16	2.20	2.20	0.78	0.78	1.43	1.43
288.0	36.909	10.35	0.20	120	36.83	0.16	2.21	2.21	0.78	0.78	1.43	1.43
287.8	37.073	10.59	0.22	120	36.99	0.16	2.22	2.22	0.79	0.79	1.44	1.44
287.7	37.237	10.07	0.18	120	37.16	0.16	2.23	2.23	0.79	0.79	1.44	1.44
287.5	37.401	13.18	0.18	120	37.32	0.16	2.24	2.24	0.80	0.80	1.45	1.45
287.3	37.565	34.71	0.35	120	37.48	0.16	2.25	2.25	0.80	0.80	1.45	1.45
287.2	37.729	19.77	0.43	120	37.65	0.16	2.26	2.26	0.81	0.81	1.45	1.45
287.0	37.893	12.23	0.40	120	37.81	0.16	2.27	2.27	0.81	0.81	1.46	1.46
286.8	38.057	20.29	0.23	120	37.98	0.16	2.28	2.28	0.82	0.82	1.46	1.46
286.7	38.221	100.04	0.40	120	38.14	0.16	2.29	2.29	0.82	0.82	1.47	1.47
286.5	38.385	115.23	0.63	120	38.30	0.16	2.30	2.30	0.83	0.83	1.47	1.47
286.4	38.549	114.17	0.79	120	38.47	0.16	2.31	2.31	0.83	0.83	1.48	1.48
286.2	38.713	116.60	0.85	120	38.63	0.16	2.32	2.32	0.84	0.84	1.48	1.48
286.0	38.877	118.45	0.91	120	38.80	0.16	2.33	2.33	0.84	0.84	1.49	1.49
285.9	39.042	130.05	0.93	120	38.96	0.16	2.34	2.34	0.85	0.85	1.49	1.49
285.7	39.206	137.44	1.04	120	39.12	0.16	2.35	2.35	0.86	0.86	1.50	1.50
285.5	39.370	131.40	1.11	120	39.29	0.16	2.36	2.36	0.86	0.86	1.50	1.50
285.4	39.534	120.78	1.36	120	39.45	0.16	2.37	2.37	0.87	0.87	1.51	1.51
285.2	39.698	85.66	1.62	120	39.62	0.16	2.38	2.38	0.87	0.87	1.51	1.51
285.0	39.862	40.24	1.63	120	39.78	0.16	2.39	2.39	0.88	0.88	1.52	1.52
284.9	40.026	23.14	1.19	120	39.94	0.16	2.40	2.40	0.88	0.88	1.52	1.52
284.7	40.190	15.02	0.87	120	40.11	0.16	2.41	2.41	0.89	0.89	1.53	1.53
284.5	40.354	14.01	0.86	120	40.27	0.16	2.42	2.42	0.89	0.89	1.53	1.53
284.4	40.518	42.53	0.77	120	40.44	0.16	2.43	2.43	0.90	0.90	1.54	1.54
284.2	40.682	91.57	0.98	120	40.60	0.16	2.44	2.44	0.90	0.90	1.54	1.54
284.1	40.846	62.12	1.29	120	40.76	0.16	2.45	2.45	0.91	0.91	1.54	1.54
283.9	41.010	34.18	1.36	120	40.93	0.16	2.46	2.46	0.91	0.91	1.55	1.55
283.7	41.174	21.95	1.05	120	41.09	0.16	2.47	2.47	0.92	0.92	1.55	1.55
283.6	41.338	13.62	0.69	120	41.26	0.16	2.48	2.48	0.92	0.92	1.56	1.56
283.4	41.502	14.97	0.29	120	41.42	0.16	2.49	2.49	0.93	0.93	1.56	1.56
283.2	41.666	13.85	0.16	120	41.58	0.16	2.50	2.50	0.93	0.93	1.57	1.57
283.1	41.830	14.27	0.53	120	41.75	0.16	2.51	2.51	0.94	0.94	1.57	1.57
282.9	41.994	46.04	0.88	120	41.91	0.16	2.52	2.52	0.94	0.94	1.58	1.58
282.7	42.158	27.04	0.91	120	42.08	0.16	2.53	2.53	0.95	0.95	1.58	1.58
282.6	42.322	17.73	0.55	120	42.24	0.16	2.54	2.54	0.95	0.95	1.59	1.59
282.4	42.486	15.67	0.25	120	42.40	0.16	2.55	2.55	0.96	0.96	1.59	1.59
282.2	42.650	12.89	0.15	120	42.57	0.16	2.56	2.56	0.96	0.96	1.60	1.60
282.1	42.814	12.25	0.14	120	42.73	0.16	2.57	2.57	0.97	0.97	1.60	1.60
281.9	42.978	12.13	0.12	120	42.90	0.16	2.58	2.58	0.97	0.97	1.61	1.61
281.8	43.143	11.65	0.10	120	43.06	0.16	2.59	2.59	0.98	0.98	1.61	1.61
281.6	43.307	11.65	0.09	120	43.22	0.16	2.60	2.60	0.98	0.98	1.62	1.62
281.4	43.471	12.47	0.10	120	43.39	0.16	2.61	2.61	0.99	0.99	1.62	1.62
281.3	43.635	12.58	0.13	120	43.55	0.16	2.62	2.62	0.99	0.99	1.62	1.62
281.1	43.799	12.33	0.16	120	43.72	0.16	2.63	2.63	1.00	1.00	1.63	1.63
280.9	43.963	11.62	0.14	120	43.88	0.16	2.64	2.64	1.00	1.00	1.63	1.63
280.8	44.127	11.90	0.13	120	44.04	0.16	2.65	2.65	1.01	1.01	1.64	1.64
280.6	44.291	12.11	0.12	120	44.21	0.16	2.66	2.66	1.01	1.01	1.64	1.64
280.4	44.455	11.81	0.13	120	44.37	0.16	2.67	2.67	1.02	1.02	1.65	1.65
280.3	44.619	11.27	0.14	120	44.54	0.16	2.68	2.68	1.02	1.02	1.65	1.65
280.1	44.783	11.31	0.12	120	44.70	0.16	2.69	2.69	1.03	1.03	1.66	1.66
280.0	44.947	11.12	0.10	120	44.86	0.16	2.70	2.70	1.03	1.03	1.66	1.66
279.8	45.111	10.56	0.10	120	45.03	0.16	2.71	2.71	1.04	1.04	1.67	1.67
279.6	45.275	12.17	0.10	120	45.19	0.16	2.72	2.72	1.04	1.04	1.67	1.67
279.5	45.439	15.58	0.11	120	45.36	0.16	2.73	2.73	1.05	1.05	1.68	1.68
279.3	45.603	11.71	0.16	120	45.52	0.16	2.74	2.74	1.05	1.05	1.68	1.68
279.1	45.767	10.73	0.14	120	45.69	0.16	2.75	2.75	1.06	1.06	1.69	1.69
279.0	45.931	10.80	0.08	120	45.85	0.16	2.76	2.76	1.06	1.06	1.69	1.69
278.8	46.095	10.96	0.08	120	46.01	0.16	2.77	2.77	1.07	1.07	1.70	1.70
278.6	46.259	11.71	0.08	120	46.18	0.16	2.78	2.78	1.08	1.08	1.70	1.70
278.5	46.423	11.54	0.09	120	46.34	0.16	2.79	2.79	1.08	1.08	1.71	1.71
278.3	46.587	11.15	0.08	120	46.51	0.16	2.80	2.80	1.09	1.09	1.71	1.71

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σv CPT (tsf)	Total Vertical Stress during EQ σv EQ (tsf)	Static Pore Water Pressure during CPT us CPT (tsf)	Static Pore Water Pressure during EQ us EQ (tsf)	Effective Vertical Stress during CPT σv CPT (tsf)	Effective Vertical Stress during EQ σv EQ (tsf)
278.1	46.751	11.92	0.12	120	46.67	0.16	2.81	2.81	1.09	1.09	1.71	1.71
278.0	46.915	12.38	0.11	120	46.83	0.16	2.81	2.81	1.10	1.10	1.72	1.72
277.8	47.079	10.70	0.10	120	47.00	0.16	2.82	2.82	1.10	1.10	1.72	1.72
277.7	47.244	11.57	0.09	120	47.16	0.16	2.83	2.83	1.11	1.11	1.73	1.73
277.5	47.408	11.17	0.10	120	47.33	0.16	2.84	2.84	1.11	1.11	1.73	1.73
277.3	47.572	10.65	0.10	120	47.49	0.16	2.85	2.85	1.12	1.12	1.74	1.74
277.2	47.736	12.87	0.11	120	47.65	0.16	2.86	2.86	1.12	1.12	1.74	1.74
277.0	47.900	12.38	0.13	120	47.82	0.16	2.87	2.87	1.13	1.13	1.75	1.75
276.8	48.064	11.17	0.16	120	47.98	0.16	2.88	2.88	1.13	1.13	1.75	1.75
276.7	48.228	11.35	0.13	120	48.15	0.16	2.89	2.89	1.14	1.14	1.76	1.76
276.5	48.392	11.11	0.12	120	48.31	0.16	2.90	2.90	1.14	1.14	1.76	1.76
276.3	48.556	10.86	0.11	120	48.47	0.16	2.91	2.91	1.15	1.15	1.77	1.77
276.2	48.720	11.19	0.11	120	48.64	0.16	2.92	2.92	1.15	1.15	1.77	1.77
276.0	48.884	11.18	0.16	120	48.80	0.16	2.93	2.93	1.16	1.16	1.78	1.78
275.9	49.048	14.11	0.20	120	48.97	0.16	2.94	2.94	1.16	1.16	1.78	1.78
275.7	49.212	16.78	0.16	120	49.13	0.16	2.95	2.95	1.17	1.17	1.79	1.79
275.5	49.376	11.75	0.19	120	49.29	0.16	2.96	2.96	1.17	1.17	1.79	1.79
275.4	49.540	11.32	0.17	120	49.46	0.16	2.97	2.97	1.18	1.18	1.79	1.79
275.2	49.704	11.06	0.12	120	49.62	0.16	2.98	2.98	1.18	1.18	1.80	1.80
275.0	49.868	11.11	0.11	120	49.79	0.16	2.99	2.99	1.19	1.19	1.80	1.80
274.9	50.032	11.11	0.09	120	49.95	0.16	3.00	3.00	1.19	1.19	1.81	1.81
274.7	50.196	10.99	0.08	120	50.11	0.16	3.01	3.01	1.20	1.20	1.81	1.81
274.5	50.360	10.80	0.12	120	50.28	0.16	3.02	3.02	1.20	1.20	1.82	1.82
274.4	50.524	11.32	0.18	120	50.44	0.16	3.03	3.03	1.21	1.21	1.82	1.82
274.2	50.688	24.60	0.29	120	50.61	0.16	3.04	3.04	1.21	1.21	1.83	1.83
274.0	50.852	119.49	0.55	120	50.77	0.16	3.05	3.05	1.22	1.22	1.83	1.83
273.9	51.016	137.38	0.84	120	50.93	0.16	3.06	3.06	1.22	1.22	1.84	1.84
273.7	51.180	133.72	1.05	120	51.10	0.16	3.07	3.07	1.23	1.23	1.84	1.84
273.6	51.345	132.51	1.10	120	51.26	0.16	3.08	3.08	1.23	1.23	1.85	1.85
273.4	51.509	135.46	1.09	120	51.43	0.16	3.09	3.09	1.24	1.24	1.85	1.85
273.2	51.673	132.49	1.39	120	51.59	0.16	3.10	3.10	1.24	1.24	1.86	1.86
273.1	51.837	99.96	1.73	120	51.75	0.16	3.11	3.11	1.25	1.25	1.86	1.86
272.9	52.001	47.23	1.78	120	51.92	0.16	3.12	3.12	1.25	1.25	1.87	1.87
272.7	52.165	26.36	1.45	120	52.08	0.16	3.13	3.13	1.26	1.26	1.87	1.87
272.6	52.329	19.58	1.02	120	52.25	0.16	3.14	3.14	1.26	1.26	1.88	1.88
272.4	52.493	15.50	0.52	120	52.41	0.16	3.15	3.15	1.27	1.27	1.88	1.88
272.2	52.657	13.46	0.35	120	52.57	0.16	3.16	3.16	1.27	1.27	1.88	1.88
272.1	52.821	13.07	0.22	120	52.74	0.16	3.17	3.17	1.28	1.28	1.89	1.89
271.9	52.985	12.23	0.16	120	52.90	0.16	3.18	3.18	1.28	1.28	1.89	1.89
271.8	53.149	12.74	0.14	120	53.07	0.16	3.19	3.19	1.29	1.29	1.90	1.90
271.6	53.313	12.68	0.15	120	53.23	0.16	3.20	3.20	1.30	1.30	1.90	1.90
271.4	53.477	12.91	0.19	120	53.40	0.16	3.21	3.21	1.30	1.30	1.91	1.91
271.3	53.641	15.52	0.35	120	53.56	0.16	3.22	3.22	1.31	1.31	1.91	1.91
271.1	53.805	64.91	0.70	120	53.72	0.16	3.23	3.23	1.31	1.31	1.92	1.92
270.9	53.969	33.72	0.94	120	53.89	0.16	3.24	3.24	1.32	1.32	1.92	1.92
270.8	54.133	21.35	0.76	120	54.05	0.16	3.25	3.25	1.32	1.32	1.93	1.93
270.6	54.297	15.41	0.58	120	54.22	0.16	3.26	3.26	1.33	1.33	1.93	1.93
270.4	54.461	14.86	0.35	120	54.38	0.16	3.27	3.27	1.33	1.33	1.94	1.94
270.3	54.625	16.05	0.98	120	54.54	0.16	3.28	3.28	1.34	1.34	1.94	1.94
270.1	54.789	70.03	1.33	120	54.71	0.16	3.29	3.29	1.34	1.34	1.95	1.95
269.9	54.953	121.55	1.63	120	54.87	0.16	3.30	3.30	1.35	1.35	1.95	1.95
269.8	55.117	51.83	1.79	120	55.04	0.16	3.31	3.31	1.35	1.35	1.96	1.96
269.6	55.281	29.67	1.40	120	55.20	0.16	3.32	3.32	1.36	1.36	1.96	1.96
269.5	55.446	17.92	0.99	120	55.36	0.16	3.33	3.33	1.36	1.36	1.96	1.96
269.3	55.610	14.27	0.58	120	55.53	0.16	3.34	3.34	1.37	1.37	1.97	1.97
269.1	55.774	15.51	0.24	120	55.69	0.16	3.35	3.35	1.37	1.37	1.97	1.97
269.0	55.938	14.11	0.21	120	55.86	0.16	3.36	3.36	1.38	1.38	1.98	1.98
268.8	56.102	14.81	0.34	120	56.02	0.16	3.37	3.37	1.38	1.38	1.98	1.98
268.6	56.266	18.85	0.30	120	56.18	0.16	3.38	3.38	1.39	1.39	1.99	1.99
268.5	56.430	14.23	0.33	120	56.35	0.16	3.39	3.39	1.39	1.39	1.99	1.99
268.3	56.594	13.84	0.28	120	56.51	0.16	3.40	3.40	1.40	1.40	2.00	2.00
268.1	56.758	13.42	0.23	120	56.68	0.16	3.41	3.41	1.40	1.40	2.00	2.00
268.0	56.922	12.77	0.20	120	56.84	0.16	3.42	3.42	1.41	1.41	2.01	2.01
267.8	57.086	12.39	0.15	120	57.00	0.16	3.43	3.43	1.41	1.41	2.01	2.01
267.7	57.250	12.40	0.12	120	57.17	0.16	3.43	3.43	1.42	1.42	2.02	2.02
267.5	57.414	12.41	0.11	120	57.33	0.16	3.44	3.44	1.42	1.42	2.02	2.02
267.3	57.578	12.83	0.10	120	57.50	0.16	3.45	3.45	1.43	1.43	2.03	2.03
267.2	57.742	12.56	0.11	120	57.66	0.16	3.46	3.46	1.43	1.43	2.03	2.03
267.0	57.906	12.96	0.12	120	57.82	0.16	3.47	3.47	1.44	1.44	2.04	2.04
266.8	58.070	13.22	0.11	120	57.99	0.16	3.48	3.48	1.44	1.44	2.04	2.04
266.7	58.234	14.09	0.13	120	58.15	0.16	3.49	3.49	1.45	1.45	2.05	2.05
266.5	58.398	13.66	0.16	120	58.32	0.16	3.50	3.50	1.45	1.45	2.05	2.05
266.3	58.562	13.28	0.16	120	58.48	0.16	3.51	3.51	1.46	1.46	2.05	2.05
266.2	58.726	13.38	0.24	120	58.64	0.16	3.52	3.52	1.46	1.46	2.06	2.06

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σv CPT (tsf)	Total Vertical Stress during EQ σv EQ (tsf)	Static Pore Water Pressure during CPT us CPT (tsf)	Static Pore Water Pressure during EQ us EQ (tsf)	Effective Vertical Stress during CPT σv CPT (tsf)	Effective Vertical Stress during EQ σv EQ (tsf)
266.0	58.890	13.97	0.23	120	58.81	0.16	3.53	3.53	1.47	1.47	2.06	2.06
265.8	59.054	92.81	0.35	120	58.97	0.16	3.54	3.54	1.47	1.47	2.07	2.07
265.7	59.218	109.89	0.92	120	59.14	0.16	3.55	3.55	1.48	1.48	2.07	2.07
265.5	59.382	52.80	1.57	120	59.30	0.16	3.56	3.56	1.48	1.48	2.08	2.08
265.4	59.547	28.77	1.33	120	59.46	0.16	3.57	3.57	1.49	1.49	2.08	2.08
265.2	59.711	16.32	1.00	120	59.63	0.16	3.58	3.58	1.49	1.49	2.09	2.09
265.0	59.875	13.92	0.39	120	59.79	0.16	3.59	3.59	1.50	1.50	2.09	2.09
264.9	60.039	14.40	0.22	120	59.96	0.16	3.60	3.60	1.51	1.51	2.10	2.10
264.7	60.203	13.43	0.24	120	60.12	0.16	3.61	3.61	1.51	1.51	2.10	2.10
264.5	60.367	12.74	0.23	120	60.28	0.16	3.62	3.62	1.52	1.52	2.11	2.11
264.4	60.531	12.99	0.21	120	60.45	0.16	3.63	3.63	1.52	1.52	2.11	2.11
264.2	60.695	13.79	0.21	120	60.61	0.16	3.64	3.64	1.53	1.53	2.12	2.12
264.0	60.859	13.02	0.20	120	60.78	0.16	3.65	3.65	1.53	1.53	2.12	2.12
263.9	61.023	13.05	0.19	120	60.94	0.16	3.66	3.66	1.54	1.54	2.13	2.13
263.7	61.187	12.85	0.20	120	61.10	0.16	3.67	3.67	1.54	1.54	2.13	2.13
263.5	61.351	12.60	0.18	120	61.27	0.16	3.68	3.68	1.55	1.55	2.14	2.14
263.4	61.515	12.72	0.18	120	61.43	0.16	3.69	3.69	1.55	1.55	2.14	2.14
263.2	61.679	12.77	0.14	120	61.60	0.16	3.70	3.70	1.56	1.56	2.14	2.14
263.1	61.843	13.14	0.16	120	61.76	0.16	3.71	3.71	1.56	1.56	2.15	2.15
262.9	62.007	13.47	0.17	120	61.93	0.16	3.72	3.72	1.57	1.57	2.15	2.15
262.7	62.171	12.67	0.16	120	62.09	0.16	3.73	3.73	1.57	1.57	2.16	2.16
262.6	62.335	12.99	0.13	120	62.25	0.16	3.74	3.74	1.58	1.58	2.16	2.16
262.4	62.499	13.03	0.12	120	62.42	0.16	3.75	3.75	1.58	1.58	2.17	2.17
262.2	62.663	13.02	0.13	120	62.58	0.16	3.76	3.76	1.59	1.59	2.17	2.17
262.1	62.827	13.04	0.13	120	62.75	0.16	3.77	3.77	1.59	1.59	2.18	2.18
261.9	62.991	13.95	0.13	120	62.91	0.16	3.78	3.78	1.60	1.60	2.18	2.18
261.7	63.155	14.15	0.15	120	63.07	0.16	3.79	3.79	1.60	1.60	2.19	2.19
261.6	63.319	13.79	0.18	120	63.24	0.16	3.80	3.80	1.61	1.61	2.19	2.19
261.4	63.483	13.33	0.17	120	63.40	0.16	3.81	3.81	1.61	1.61	2.20	2.20
261.3	63.648	13.35	0.15	120	63.57	0.16	3.82	3.82	1.62	1.62	2.20	2.20
261.1	63.812	13.00	0.13	120	63.73	0.16	3.83	3.83	1.62	1.62	2.21	2.21
260.9	63.976	13.21	0.14	120	63.89	0.16	3.84	3.84	1.63	1.63	2.21	2.21
260.8	64.140	13.26	0.15	120	64.06	0.16	3.85	3.85	1.63	1.63	2.22	2.22
260.6	64.304	13.46	0.16	120	64.22	0.16	3.86	3.86	1.64	1.64	2.22	2.22
260.4	64.468	13.91	0.18	120	64.39	0.16	3.87	3.87	1.64	1.64	2.22	2.22
260.3	64.632	13.74	0.18	120	64.55	0.16	3.88	3.88	1.65	1.65	2.23	2.23
260.1	64.796	14.56	0.20	120	64.71	0.16	3.89	3.89	1.65	1.65	2.23	2.23
259.9	64.960	14.11	0.20	120	64.88	0.16	3.90	3.90	1.66	1.66	2.24	2.24
259.8	65.124	14.11	0.21	120	65.04	0.16	3.91	3.91	1.66	1.66	2.24	2.24
259.6	65.288	13.93	0.21	120	65.21	0.16	3.92	3.92	1.67	1.67	2.25	2.25
259.4	65.452	13.56	0.19	120	65.37	0.16	3.93	3.93	1.67	1.67	2.25	2.25
259.3	65.616	13.77	0.21	120	65.53	0.16	3.94	3.94	1.68	1.68	2.26	2.26
259.1	65.780	13.82	0.19	120	65.70	0.16	3.95	3.95	1.68	1.68	2.26	2.26
259.0	65.944	16.24	0.33	120	65.86	0.16	3.96	3.96	1.69	1.69	2.27	2.27
258.8	66.108	37.45	0.64	120	66.03	0.16	3.97	3.97	1.69	1.69	2.27	2.27
258.6	66.272	23.69	0.61	120	66.19	0.16	3.98	3.98	1.70	1.70	2.28	2.28
258.5	66.436	14.88	0.65	120	66.35	0.16	3.99	3.99	1.70	1.70	2.28	2.28
258.3	66.600	13.89	0.24	120	66.52	0.16	4.00	4.00	1.71	1.71	2.29	2.29
258.1	66.764	13.48	0.21	120	66.68	0.16	4.01	4.01	1.71	1.71	2.29	2.29
258.0	66.928	13.22	0.17	120	66.85	0.16	4.02	4.02	1.72	1.72	2.30	2.30
257.8	67.092	12.99	0.15	120	67.01	0.16	4.03	4.03	1.73	1.73	2.30	2.30
257.6	67.256	13.02	0.15	120	67.17	0.16	4.04	4.04	1.73	1.73	2.31	2.31
257.5	67.420	13.01	0.15	120	67.34	0.16	4.05	4.05	1.74	1.74	2.31	2.31
257.3	67.584	13.28	0.13	120	67.50	0.16	4.06	4.06	1.74	1.74	2.31	2.31
257.2	67.749	13.69	0.22	120	67.67	0.16	4.06	4.06	1.75	1.75	2.32	2.32
257.0	67.913	17.77	0.22	120	67.83	0.16	4.07	4.07	1.75	1.75	2.32	2.32
256.8	68.077	13.47	0.24	120	67.99	0.16	4.08	4.08	1.76	1.76	2.33	2.33
256.7	68.241	14.35	0.19	120	68.16	0.16	4.09	4.09	1.76	1.76	2.33	2.33
256.5	68.405	14.24	0.15	120	68.32	0.16	4.10	4.10	1.77	1.77	2.34	2.34
256.3	68.569	14.25	0.21	120	68.49	0.16	4.11	4.11	1.77	1.77	2.34	2.34
256.2	68.733	14.09	0.18	120	68.65	0.16	4.12	4.12	1.78	1.78	2.35	2.35
256.0	68.897	14.83	0.16	120	68.81	0.16	4.13	4.13	1.78	1.78	2.35	2.35
255.8	69.061	15.20	0.15	120	68.98	0.16	4.14	4.14	1.79	1.79	2.36	2.36
255.7	69.225	14.91	0.19	120	69.14	0.16	4.15	4.15	1.79	1.79	2.36	2.36
255.5	69.389	14.67	0.22	120	69.31	0.16	4.16	4.16	1.80	1.80	2.37	2.37
255.3	69.553	14.27	0.18	120	69.47	0.16	4.17	4.17	1.80	1.80	2.37	2.37
255.2	69.717	13.90	0.16	120	69.63	0.16	4.18	4.18	1.81	1.81	2.38	2.38
255.0	69.881	14.07	0.14	120	69.80	0.16	4.19	4.19	1.81	1.81	2.38	2.38
254.9	70.045	14.62	0.15	120	69.96	0.16	4.20	4.20	1.82	1.82	2.39	2.39
254.7	70.209	14.83	0.17	120	70.13	0.16	4.21	4.21	1.82	1.82	2.39	2.39
254.5	70.373	14.61	0.19	120	70.29	0.16	4.22	4.22	1.83	1.83	2.39	2.39
254.4	70.537	14.44	0.19	120	70.46	0.16	4.23	4.23	1.83	1.83	2.40	2.40
254.2	70.701	14.29	0.16	120	70.62	0.16	4.24	4.24	1.84	1.84	2.40	2.40
254.0	70.865	14.10	0.14	120	70.78	0.16	4.25	4.25	1.84	1.84	2.41	2.41

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σv CPT (tsf)	Total Vertical Stress during EQ σv EQ (tsf)	Static Pore Water Pressure during CPT us CPT (tsf)	Static Pore Water Pressure during EQ us EQ (tsf)	Effective Vertical Stress during CPT σv CPT (tsf)	Effective Vertical Stress during EQ σv EQ (tsf)
253.9	71.029	13.78	0.14	120	70.95	0.16	4.26	4.26	1.85	1.85	2.41	2.41
253.7	71.193	13.84	0.14	120	71.11	0.16	4.27	4.27	1.85	1.85	2.42	2.42
253.5	71.357	14.09	0.14	120	71.28	0.16	4.28	4.28	1.86	1.86	2.42	2.42
253.4	71.521	14.32	0.15	120	71.44	0.16	4.29	4.29	1.86	1.86	2.43	2.43
253.2	71.685	15.09	0.16	120	71.60	0.16	4.30	4.30	1.87	1.87	2.43	2.43
253.1	71.850	16.72	0.27	120	71.77	0.16	4.31	4.31	1.87	1.87	2.44	2.44
252.9	72.014	16.46	0.29	120	71.93	0.16	4.32	4.32	1.88	1.88	2.44	2.44
252.7	72.178	16.50	0.28	120	72.10	0.16	4.33	4.33	1.88	1.88	2.45	2.45
252.6	72.342	15.61	0.25	120	72.26	0.16	4.34	4.34	1.89	1.89	2.45	2.45
252.4	72.506	14.98	0.22	120	72.42	0.16	4.35	4.35	1.89	1.89	2.46	2.46
252.2	72.670	14.81	0.19	120	72.59	0.16	4.36	4.36	1.90	1.90	2.46	2.46
252.1	72.834	14.75	0.17	120	72.75	0.16	4.37	4.37	1.90	1.90	2.47	2.47
251.9	72.998	14.94	0.17	120	72.92	0.16	4.38	4.38	1.91	1.91	2.47	2.47
251.7	73.162	14.65	0.16	120	73.08	0.16	4.39	4.39	1.91	1.91	2.48	2.48
251.6	73.326	14.58	0.16	120	73.24	0.16	4.40	4.40	1.92	1.92	2.48	2.48
251.4	73.490	14.50	0.15	120	73.41	0.16	4.41	4.41	1.92	1.92	2.48	2.48
251.2	73.654	14.66	0.15	120	73.57	0.16	4.42	4.42	1.93	1.93	2.49	2.49
251.1	73.818	15.15	0.15	120	73.74	0.16	4.43	4.43	1.93	1.93	2.49	2.49
250.9	73.982	15.40	0.17	120	73.90	0.16	4.44	4.44	1.94	1.94	2.50	2.50
250.8	74.146	15.38	0.19	120	74.06	0.16	4.45	4.45	1.95	1.95	2.50	2.50
250.6	74.310	15.52	0.18	120	74.23	0.16	4.46	4.46	1.95	1.95	2.51	2.51
250.4	74.474	15.55	0.17	120	74.39	0.16	4.47	4.47	1.96	1.96	2.51	2.51
250.3	74.638	15.31	0.17	120	74.56	0.16	4.48	4.48	1.96	1.96	2.52	2.52
250.1	74.802	15.48	0.18	120	74.72	0.16	4.49	4.49	1.97	1.97	2.52	2.52
249.9	74.966	15.39	0.20	120	74.88	0.16	4.50	4.50	1.97	1.97	2.53	2.53
249.8	75.130	15.37	0.19	120	75.05	0.16	4.51	4.51	1.98	1.98	2.53	2.53
249.6	75.294	16.47	0.19	120	75.21	0.16	4.52	4.52	1.98	1.98	2.54	2.54
249.4	75.458	16.42	0.18	120	75.38	0.16	4.53	4.53	1.99	1.99	2.54	2.54
249.3	75.622	16.19	0.19	120	75.54	0.16	4.54	4.54	1.99	1.99	2.55	2.55
249.1	75.786	15.50	0.21	120	75.70	0.16	4.55	4.55	2.00	2.00	2.55	2.55
248.9	75.951	15.52	0.19	120	75.87	0.16	4.56	4.56	2.00	2.00	2.56	2.56
248.8	76.115	15.78	0.17	120	76.03	0.16	4.57	4.57	2.01	2.01	2.56	2.56
248.6	76.279	15.66	0.16	120	76.20	0.16	4.58	4.58	2.01	2.01	2.56	2.56
248.5	76.443	17.65	0.20	120	76.36	0.16	4.59	4.59	2.02	2.02	2.57	2.57
248.3	76.607	15.50	0.23	120	76.52	0.16	4.60	4.60	2.02	2.02	2.57	2.57
248.1	76.771	15.54	0.23	120	76.69	0.16	4.61	4.61	2.03	2.03	2.58	2.58
248.0	76.935	15.78	0.18	120	76.85	0.16	4.62	4.62	2.03	2.03	2.58	2.58
247.8	77.099	16.09	0.17	120	77.02	0.16	4.63	4.63	2.04	2.04	2.59	2.59
247.6	77.263	16.30	0.21	120	77.18	0.16	4.64	4.64	2.04	2.04	2.59	2.59
247.5	77.427	15.62	0.22	120	77.34	0.16	4.65	4.65	2.05	2.05	2.60	2.60
247.3	77.591	15.23	0.19	120	77.51	0.16	4.66	4.66	2.05	2.05	2.60	2.60
247.1	77.755	15.77	0.15	120	77.67	0.16	4.67	4.67	2.06	2.06	2.61	2.61
247.0	77.919	15.45	0.14	120	77.84	0.16	4.68	4.68	2.06	2.06	2.61	2.61
246.8	78.083	15.36	0.13	120	78.00	0.16	4.68	4.68	2.07	2.07	2.62	2.62
246.7	78.247	15.15	0.13	120	78.17	0.16	4.69	4.69	2.07	2.07	2.62	2.62
246.5	78.411	15.78	0.71	120	78.33	0.16	4.70	4.70	2.08	2.08	2.63	2.63
246.3	78.575	12.35	1.00	120	78.49	0.16	4.71	4.71	2.08	2.08	2.63	2.63
246.2	78.739	112.53	1.78	120	78.66	0.16	4.72	4.72	2.09	2.09	2.64	2.64
246.0	78.903	193.55	2.48	120	78.82	0.16	4.73	4.73	2.09	2.09	2.64	2.64
245.8	79.067	254.97	2.97	120	78.99	0.16	4.74	4.74	2.10	2.10	2.65	2.65
245.7	79.231	199.85	2.74	120	79.15	0.16	4.75	4.75	2.10	2.10	2.65	2.65
245.5	79.395	121.82	1.87	120	79.31	0.16	4.76	4.76	2.11	2.11	2.65	2.65
245.3	79.559	53.03	1.60	120	79.48	0.16	4.77	4.77	2.11	2.11	2.66	2.66
245.2	79.723	32.08	1.26	120	79.64	0.16	4.78	4.78	2.12	2.12	2.66	2.66
245.0	79.887	41.22	0.92	120	79.81	0.16	4.79	4.79	2.12	2.12	2.67	2.67
244.8	80.052	44.23	0.56	120	79.97	0.16	4.80	4.80	2.13	2.13	2.67	2.67
244.7	80.216	42.76	0.80	120	80.13	0.16	4.81	4.81	2.13	2.13	2.68	2.68
244.5	80.380	39.84	1.22	120	80.30	0.16	4.82	4.82	2.14	2.14	2.68	2.68
244.4	80.544	33.15	1.12	120	80.46	0.16	4.83	4.83	2.14	2.14	2.69	2.69
244.2	80.708	23.53	0.80	120	80.63	0.16	4.84	4.84	2.15	2.15	2.69	2.69
244.0	80.872	18.43	0.45	120	80.79	0.16	4.85	4.85	2.16	2.16	2.70	2.70
243.9	81.036	17.48	0.24	120	80.95	0.16	4.86	4.86	2.16	2.16	2.70	2.70
243.7	81.200	17.37	0.17	120	81.12	0.16	4.87	4.87	2.17	2.17	2.71	2.71
243.5	81.364	17.00	0.15	120	81.28	0.16	4.88	4.88	2.17	2.17	2.71	2.71
243.4	81.528	18.29	0.19	120	81.45	0.16	4.89	4.89	2.18	2.18	2.72	2.72
243.2	81.692	43.91	0.28	120	81.61	0.16	4.90	4.90	2.18	2.18	2.72	2.72
243.0	81.856	75.18	0.90	120	81.77	0.16	4.91	4.91	2.19	2.19	2.73	2.73
242.9	82.020	48.20	1.49	120	81.94	0.16	4.92	4.92	2.19	2.19	2.73	2.73
242.7	82.184	39.54	1.37	120	82.10	0.16	4.93	4.93	2.20	2.20	2.74	2.74
242.6	82.348	38.06	1.12	120	82.27	0.16	4.94	4.94	2.20	2.20	2.74	2.74
242.4	82.512	54.74	1.11	120	82.43	0.16	4.95	4.95	2.21	2.21	2.74	2.74
242.2	82.676	40.66	1.01	120	82.59	0.16	4.96	4.96	2.21	2.21	2.75	2.75
242.1	82.840	27.79	0.82	120	82.76	0.16	4.97	4.97	2.22	2.22	2.75	2.75
241.9	83.004	22.97	0.63	120	82.92	0.16	4.98	4.98	2.22	2.22	2.76	2.76

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σv CPT (tsf)	Total Vertical Stress during EQ σv EQ (tsf)	Static Pore Water Pressure during CPT us CPT (tsf)	Static Pore Water Pressure during EQ us EQ (tsf)	Effective Vertical Stress during CPT σv CPT (tsf)	Effective Vertical Stress during EQ σv EQ (tsf)
241.7	83.168	18.52	0.47	120	83.09	0.16	4.99	4.99	2.23	2.23	2.76	2.76
241.6	83.332	18.15	0.84	120	83.25	0.16	5.00	5.00	2.23	2.23	2.77	2.77
241.4	83.496	95.64	0.55	120	83.41	0.16	5.01	5.01	2.24	2.24	2.77	2.77
241.2	83.660	174.83	1.62	120	83.58	0.16	5.02	5.02	2.24	2.24	2.78	2.78
241.1	83.824	221.65	2.28	120	83.74	0.16	5.03	5.03	2.25	2.25	2.78	2.78
240.9	83.988	240.29	2.34	120	83.91	0.16	5.04	5.04	2.25	2.25	2.79	2.79
240.7	84.153	170.65	3.18	120	84.07	0.16	5.05	5.05	2.26	2.26	2.79	2.79
240.6	84.317	100.45	3.64	120	84.23	0.16	5.06	5.06	2.26	2.26	2.80	2.80
240.4	84.481	47.90	2.05	120	84.40	0.16	5.07	5.07	2.27	2.27	2.80	2.80
240.3	84.645	135.02	1.43	120	84.56	0.16	5.08	5.08	2.27	2.27	2.81	2.81
240.1	84.809	190.77	0.86	120	84.73	0.16	5.09	5.09	2.28	2.28	2.81	2.81
239.9	84.973	129.52	1.89	120	84.89	0.16	5.10	5.10	2.28	2.28	2.82	2.82
239.8	85.137	73.63	2.17	120	85.05	0.16	5.11	5.11	2.29	2.29	2.82	2.82
239.6	85.301	42.29	2.24	120	85.22	0.16	5.12	5.12	2.29	2.29	2.82	2.82
239.4	85.465	33.75	1.83	120	85.38	0.16	5.13	5.13	2.30	2.30	2.83	2.83
239.3	85.629	36.27	1.16	120	85.55	0.16	5.14	5.14	2.30	2.30	2.83	2.83
239.1	85.793	30.61	0.52	120	85.71	0.16	5.15	5.15	2.31	2.31	2.84	2.84
238.9	85.957	56.38	1.05	120	85.87	0.16	5.16	5.16	2.31	2.31	2.84	2.84
238.8	86.121	41.17	0.87	120	86.04	0.16	5.17	5.17	2.32	2.32	2.85	2.85
238.6	86.285	104.86	0.79	120	86.20	0.16	5.18	5.18	2.32	2.32	2.85	2.85
238.5	86.449	138.54	1.14	120	86.37	0.16	5.19	5.19	2.33	2.33	2.86	2.86
238.3	86.613	79.57	1.58	120	86.53	0.16	5.20	5.20	2.33	2.33	2.86	2.86
238.1	86.777	45.82	1.44	120	86.70	0.16	5.21	5.21	2.34	2.34	2.87	2.87
238.0	86.941	65.43	1.07	120	86.86	0.16	5.22	5.22	2.34	2.34	2.87	2.87
237.8	87.105	86.15	1.64	120	87.02	0.16	5.23	5.23	2.35	2.35	2.88	2.88
237.6	87.269	74.42	2.27	120	87.19	0.16	5.24	5.24	2.35	2.35	2.88	2.88
237.5	87.433	40.67	2.30	120	87.35	0.16	5.25	5.25	2.36	2.36	2.89	2.89
237.3	87.597	84.14	2.15	120	87.52	0.16	5.26	5.26	2.36	2.36	2.89	2.89
237.1	87.761	285.53	2.90	120	87.68	0.16	5.27	5.27	2.37	2.37	2.90	2.90
237.0	87.925	344.96	3.85	120	87.84	0.16	5.28	5.28	2.38	2.38	2.90	2.90
236.8	88.089	365.36	4.68	120	88.01	0.16	5.29	5.29	2.38	2.38	2.91	2.91
236.6	88.254	351.10	5.09	120	88.17	0.16	5.30	5.30	2.39	2.39	2.91	2.91
236.5	88.418	319.35	4.70	120	88.34	0.16	5.31	5.31	2.39	2.39	2.91	2.91
236.3	88.582	277.03	3.86	120	88.50	0.16	5.31	5.31	2.40	2.40	2.92	2.92
236.2	88.746	226.24	3.54	120	88.66	0.16	5.32	5.32	2.40	2.40	2.92	2.92
236.0	88.910	161.27	3.72	120	88.83	0.16	5.33	5.33	2.41	2.41	2.93	2.93
235.8	89.074	74.94	3.92	120	88.99	0.16	5.34	5.34	2.41	2.41	2.93	2.93
235.7	89.238	44.13	2.85	120	89.16	0.16	5.35	5.35	2.42	2.42	2.94	2.94
235.5	89.402	32.86	1.27	120	89.32	0.16	5.36	5.36	2.42	2.42	2.94	2.94
235.3	89.566	47.61	0.92	120	89.48	0.16	5.37	5.37	2.43	2.43	2.95	2.95
235.2	89.730	31.05	1.22	120	89.65	0.16	5.38	5.38	2.43	2.43	2.95	2.95
235.0	89.894	156.65	1.72	120	89.81	0.16	5.39	5.39	2.44	2.44	2.96	2.96
234.8	90.058	244.29	2.24	120	89.98	0.16	5.40	5.40	2.44	2.44	2.96	2.96
234.7	90.222	254.78	2.72	120	90.14	0.16	5.41	5.41	2.45	2.45	2.97	2.97
234.5	90.386	250.75	3.15	120	90.30	0.16	5.42	5.42	2.45	2.45	2.97	2.97
234.3	90.550	280.14	3.09	120	90.47	0.16	5.43	5.43	2.46	2.46	2.98	2.98
234.2	90.714	263.51	4.13	120	90.63	0.16	5.44	5.44	2.46	2.46	2.98	2.98
234.0	90.878	230.48	3.67	120	90.80	0.16	5.45	5.45	2.47	2.47	2.99	2.99
233.9	91.042	180.28	3.41	120	90.96	0.16	5.46	5.46	2.47	2.47	2.99	2.99
233.7	91.206	175.12	2.74	120	91.12	0.16	5.47	5.47	2.48	2.48	2.99	2.99
233.5	91.370	142.75	2.18	120	91.29	0.16	5.48	5.48	2.48	2.48	3.00	3.00
233.4	91.534	124.78	1.77	120	91.45	0.16	5.49	5.49	2.49	2.49	3.00	3.00
233.2	91.698	117.29	1.55	120	91.62	0.16	5.50	5.50	2.49	2.49	3.01	3.01
233.0	91.862	113.90	1.80	120	91.78	0.16	5.51	5.51	2.50	2.50	3.01	3.01
232.9	92.026	99.55	1.34	120	91.94	0.16	5.52	5.52	2.50	2.50	3.02	3.02
232.7	92.190	91.47	1.11	120	92.11	0.16	5.53	5.53	2.51	2.51	3.02	3.02
232.5	92.355	77.36	1.18	120	92.27	0.16	5.54	5.54	2.51	2.51	3.03	3.03
232.4	92.519	66.50	1.06	120	92.44	0.16	5.55	5.55	2.52	2.52	3.03	3.03
232.2	92.683	86.71	0.96	120	92.60	0.16	5.56	5.56	2.52	2.52	3.04	3.04
232.1	92.847	76.70	1.10	120	92.76	0.16	5.57	5.57	2.53	2.53	3.04	3.04
231.9	93.011	73.54	1.31	120	92.93	0.16	5.58	5.58	2.53	2.53	3.05	3.05
231.7	93.175	56.02	1.92	120	93.09	0.16	5.59	5.59	2.54	2.54	3.05	3.05
231.6	93.339	49.32	1.28	120	93.26	0.16	5.60	5.60	2.54	2.54	3.06	3.06
231.4	93.503	113.10	0.90	120	93.42	0.16	5.61	5.61	2.55	2.55	3.06	3.06
231.2	93.667	144.75	1.03	120	93.58	0.16	5.62	5.62	2.55	2.55	3.07	3.07
231.1	93.831	121.65	1.03	120	93.75	0.16	5.63	5.63	2.56	2.56	3.07	3.07
230.9	93.995	104.17	1.20	120	93.91	0.16	5.64	5.64	2.56	2.56	3.08	3.08
230.7	94.159	81.22	1.67	120	94.08	0.16	5.65	5.65	2.57	2.57	3.08	3.08
230.6	94.323	57.58	2.00	120	94.24	0.16	5.66	5.66	2.57	2.57	3.08	3.08
230.4	94.487	39.81	3.93	120	94.41	0.08	5.67	5.67	2.58	2.58	3.09	3.09

LIQUEFACTION POTENTIAL ASSESSMENT FOR COARSE GRAINED SOILS USING CONE PENETRATION TEST DATA

Project Site: US 60 Bridge
 Project No.: 178565011
 CPT ID: SP06

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	qc_{IN}	FC (%)	Δqc_{IN}	$(qc_{IN})_{CS}$	a	ξ_R
324.9												
324.7	0.164	211.15	1.03	1.68	0.5	1.70	34.64	0	0.00	34.64	0.350	-0.060
324.6	0.328	260.06	0.76	1.52	0.5	1.70	60.34	0	0.00	60.34	0.350	-0.246
324.4	0.492	245.35	1.20	1.69	0.5	1.70	69.73	0	0.00	69.73	0.350	-0.297
324.2	0.656	242.30	2.10	1.89	0.5	1.70	79.52	14	18.21	97.73	0.350	-0.430
324.1	0.820	274.46	1.27	1.68	0.5	1.70	100.71	0	0.00	100.71	0.350	-0.440
323.9	0.984	378.77	0.65	1.37	0.5	1.70	152.22	0	0.00	152.22	0.350	-0.600
323.8	1.148	298.69	0.63	1.42	0.5	1.70	129.69	0	0.00	129.69	0.350	-0.547
323.6	1.312	222.85	0.91	1.63	0.5	1.70	103.48	0	0.00	103.48	0.350	-0.445
323.4	1.476	195.13	1.25	1.77	0.5	1.70	96.13	5	0.06	96.19	0.350	-0.412
323.3	1.640	172.87	1.61	1.89	0.5	1.70	89.79	14	18.72	108.52	0.350	-0.462
323.1	1.804	160.67	1.71	1.93	0.5	1.70	87.55	17	28.05	115.60	0.350	-0.489
322.9	1.968	144.63	1.85	1.98	0.5	1.70	82.34	22	37.94	120.28	0.350	-0.505
322.8	2.133	127.78	1.86	2.02	0.5	1.70	75.75	25	42.64	118.39	0.350	-0.497
322.6	2.297	117.90	1.87	2.05	0.5	1.70	72.56	27	45.41	117.97	0.350	-0.494
322.4	2.461	112.55	2.04	2.09	0.5	1.70	71.71	30	49.71	121.42	0.350	-0.506
322.3	2.625	108.61	2.25	2.13	0.5	1.70	71.49	33	53.42	124.91	0.350	-0.517
322.1	2.789	99.04	2.39	2.17	0.5	1.70	67.23	37	55.82	123.05	0.350	-0.510
321.9	2.953	91.90	2.14	2.16	0.5	1.70	64.22	36	54.30	118.52	0.350	-0.492
321.8	3.117	84.86	2.22	2.20	0.5	1.70	60.95	39	55.76	116.71	0.350	-0.484
321.6	3.281	82.55	2.38	2.23	0.5	1.70	60.85	41	57.38	118.23	0.350	-0.489
321.5	3.445	79.89	2.52	2.26	0.5	1.70	60.36	43	58.65	119.01	0.350	-0.491
321.3	3.609	68.02	2.74	2.33	0.5	1.70	52.66	49	59.71	112.37	0.350	-0.465
321.1	3.773	58.44	2.90	2.39	0.5	1.70	46.32	55	59.99	106.31	0.350	-0.440
321.0	3.937	53.41	2.91	2.42	0.5	1.70	43.28	57	59.91	103.19	0.350	-0.426
320.8	4.101	49.65	2.92	2.45	0.5	1.70	41.10	59	59.88	100.98	0.350	-0.416
320.6	4.265	48.20	2.83	2.45	0.5	1.70	40.71	59	59.79	100.50	0.350	-0.413
320.5	4.429	45.02	2.79	2.47	0.5	1.70	38.78	60	59.64	98.43	0.350	-0.404
320.3	4.593	40.92	2.89	2.51	0.5	1.70	35.94	63	59.67	95.62	0.350	-0.391
320.1	4.757	41.06	2.63	2.48	0.5	1.70	36.72	61	59.31	96.03	0.350	-0.392
320.0	4.921	35.26	2.63	2.53	0.5	1.70	32.14	65	58.99	91.13	0.350	-0.369
319.8	5.085	35.50	2.81	2.54	0.7	1.70	25.77	66	57.43	83.20	0.350	-0.331
319.7	5.249	30.84	2.58	2.57	0.7	1.70	22.96	68	56.98	79.94	0.350	-0.314
319.5	5.413	27.44	2.40	2.59	0.7	1.70	20.93	70	56.70	77.63	0.350	-0.302
319.3	5.577	20.81	2.35	2.68	0.7	1.70	16.34	77	56.51	72.85	0.350	-0.276
319.2	5.741	23.62	2.68	2.67	1.0	1.70	13.63	76	55.59	69.22	0.350	-0.256
319.0	5.905	24.64	2.30	2.61	1.0	1.70	14.60	72	55.20	69.80	0.350	-0.259
318.8	6.069	23.34	2.58	2.66	1.0	1.70	14.24	76	55.70	69.95	0.350	-0.259
318.7	6.234	20.59	3.26	2.77	1.0	1.70	12.98	84	56.44	69.41	0.350	-0.255
318.5	6.398	15.79	3.23	2.86	1.0	1.70	10.35	91	56.39	66.75	0.350	-0.240
318.3	6.562	11.78	2.83	2.92	1.0	1.70	8.08	97	56.19	64.27	0.350	-0.225
318.2	6.726	10.11	2.99	2.99	1.0	1.70	7.21	100	56.17	63.38	0.350	-0.219
318.0	6.890	10.82	2.59	2.93	1.0	1.70	7.85	98	56.18	64.03	0.350	-0.222
317.8	7.054	9.34	2.91	3.01	1.0	1.70	7.03	100	56.12	63.15	0.350	-0.216
317.7	7.218	9.56	3.26	3.03	1.0	1.70	7.34	100	56.21	63.55	0.350	-0.218
317.5	7.382	14.67	2.51	2.82	1.0	1.66	10.89	88	56.24	67.12	0.350	-0.239
317.4	7.546	17.43	2.31	2.73	1.0	1.63	12.86	82	56.08	68.95	0.350	-0.248
317.2	7.710	13.52	2.96	2.89	1.0	1.62	10.28	94	56.60	66.88	0.350	-0.236
317.0	7.874	10.88	3.41	3.00	1.0	1.61	8.52	100	56.58	65.09	0.350	-0.225
316.9	8.038	10.23	3.12	3.00	1.0	1.59	8.14	100	56.46	64.59	0.350	-0.222
316.7	8.202	11.42	2.95	2.95	1.0	1.57	9.05	99	56.63	65.68	0.350	-0.228
316.5	8.366	16.53	2.57	2.78	1.0	1.54	12.78	85	56.49	69.27	0.350	-0.248
316.4	8.530	19.49	2.15	2.68	1.0	1.51	14.99	77	56.11	71.10	0.350	-0.258
316.2	8.694	16.63	2.63	2.78	1.0	1.50	13.04	86	56.61	69.66	0.350	-0.249
316.0	8.858	12.99	3.13	2.91	1.0	1.49	10.48	96	56.87	67.35	0.350	-0.236
315.9	9.022	8.07	4.10	3.15	1.0	1.49	6.91	100	56.08	62.99	0.350	-0.210
315.7	9.186	6.09	4.05	3.25	1.0	1.48	5.47	100	55.63	61.10	0.350	-0.198
315.5	9.350	5.85	3.17	3.20	1.0	1.46	5.32	100	55.58	60.90	0.350	-0.196
315.4	9.514	4.91	4.35	3.34	1.0	1.45	4.63	100	55.37	60.00	0.350	-0.190
315.2	9.678	4.33	5.01	3.42	1.0	1.44	4.20	100	55.24	59.44	0.350	-0.186
315.1	9.842	6.56	3.18	3.16	1.0	1.42	5.98	100	55.79	61.77	0.350	-0.200

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
314.9	10.006	5.85	3.16	3.20	1.0	1.40	5.46	100	55.63	61.09	0.350	-0.196
314.7	10.170	5.95	2.65	3.16	1.0	1.39	5.57	100	55.66	61.24	0.350	-0.196
314.6	10.335	6.17	2.59	3.14	1.0	1.38	5.78	100	55.73	61.51	0.350	-0.198
314.4	10.499	5.32	3.08	3.23	1.0	1.37	5.14	100	55.53	60.67	0.350	-0.192
314.2	10.663	8.13	1.86	2.96	1.0	1.35	7.44	100	56.24	63.68	0.350	-0.210
314.1	10.827	7.89	2.11	3.00	1.0	1.34	7.28	100	56.19	63.48	0.350	-0.208
313.9	10.991	6.25	2.33	3.11	1.0	1.33	6.00	100	55.80	61.79	0.350	-0.198
313.7	11.155	4.46	3.48	3.33	1.0	1.32	4.56	100	55.35	59.90	0.350	-0.186
313.6	11.319	4.31	3.07	3.31	1.0	1.31	4.46	100	55.32	59.78	0.350	-0.185
313.4	11.483	4.77	2.28	3.21	1.0	1.29	4.87	100	55.44	60.31	0.350	-0.188
313.3	11.647	4.41	2.37	3.24	1.0	1.28	4.59	100	55.36	59.95	0.350	-0.185
313.1	11.811	3.33	3.18	3.41	1.0	1.28	3.70	100	55.08	58.78	0.350	-0.177
312.9	11.975	2.74	3.84	3.53	1.0	1.27	3.21	100	54.93	58.14	0.350	-0.173
312.8	12.139	3.06	3.50	3.47	1.0	1.27	3.50	100	55.02	58.52	0.350	-0.175
312.6	12.303	2.63	4.10	3.56	1.0	1.26	3.15	100	54.91	58.06	0.350	-0.172
312.4	12.467	2.40	4.35	3.61	1.0	1.26	2.96	100	54.85	57.82	0.350	-0.171
312.3	12.631	2.69	3.50	3.52	1.0	1.25	3.23	100	54.94	58.16	0.350	-0.173
312.1	12.795	2.54	3.90	3.56	1.0	1.25	3.11	100	54.90	58.01	0.350	-0.171
311.9	12.959	3.12	3.15	3.44	1.0	1.24	3.63	100	55.06	58.69	0.350	-0.176
311.8	13.123	3.46	3.41	3.42	1.0	1.24	3.93	100	55.15	59.09	0.350	-0.178
311.6	13.287	3.06	3.57	3.47	1.0	1.23	3.61	100	55.05	58.66	0.350	-0.175
311.4	13.451	3.93	2.76	3.32	1.0	1.23	4.38	100	55.29	59.67	0.350	-0.181
311.3	13.615	4.23	2.52	3.27	1.0	1.22	4.65	100	55.38	60.03	0.350	-0.183
311.1	13.779	4.97	1.97	3.16	1.0	1.22	5.32	100	55.58	60.90	0.350	-0.188
311.0	13.943	5.42	2.20	3.15	1.0	1.21	5.73	100	55.71	61.44	0.350	-0.192
310.8	14.107	5.11	2.30	3.18	1.0	1.21	5.48	100	55.63	61.11	0.350	-0.189
310.6	14.271	4.14	2.76	3.30	1.0	1.20	4.64	100	55.37	60.02	0.350	-0.183
310.5	14.436	3.58	2.64	3.35	1.0	1.20	4.16	100	55.22	59.39	0.350	-0.178
310.3	14.600	3.30	2.50	3.37	1.0	1.20	3.93	100	55.15	59.08	0.350	-0.176
310.1	14.764	3.73	2.13	3.29	1.0	1.19	4.33	100	55.28	59.60	0.350	-0.179
310.0	14.928	3.57	2.99	3.37	1.0	1.19	4.19	100	55.24	59.43	0.350	-0.178
309.8	15.092	3.06	3.74	3.48	1.0	1.18	3.76	100	55.10	58.86	0.350	-0.174
309.6	15.256	4.77	2.05	3.18	1.0	1.18	5.30	100	55.58	60.88	0.350	-0.187
309.5	15.420	3.71	2.13	3.29	1.0	1.17	4.36	100	55.29	59.65	0.350	-0.179
309.3	15.584	4.08	1.44	3.17	1.0	1.17	4.72	100	55.40	60.12	0.350	-0.182
309.2	15.748	4.48	1.55	3.15	1.0	1.16	5.09	100	55.51	60.60	0.350	-0.185
309.0	15.912	4.00	1.42	3.18	1.0	1.16	4.68	100	55.38	60.06	0.350	-0.181
308.8	16.076	3.67	1.94	3.27	1.0	1.16	4.39	100	55.30	59.69	0.350	-0.179
308.7	16.240	4.07	1.88	3.23	1.0	1.15	4.77	100	55.41	60.18	0.350	-0.182
308.5	16.404	4.83	2.05	3.18	1.0	1.15	5.47	100	55.63	61.10	0.350	-0.187
308.3	16.568	18.38	0.90	2.50	0.5	1.13	19.70	63	54.91	74.61	0.350	-0.264
308.2	16.732	37.51	0.60	2.14	0.5	1.12	38.82	34	47.30	86.12	0.350	-0.321
308.0	16.896	49.17	0.54	2.02	0.5	1.12	50.50	24	37.94	88.43	0.350	-0.332
307.8	17.060	48.99	0.43	1.98	0.5	1.12	50.47	21	32.40	82.86	0.350	-0.305
307.7	17.224	46.63	0.46	2.00	0.5	1.11	48.06	23	35.98	84.04	0.350	-0.311
307.5	17.388	41.69	0.70	2.13	0.5	1.11	42.94	34	47.60	90.54	0.350	-0.341
307.3	17.552	30.77	1.53	2.43	0.5	1.11	32.01	57	56.94	88.95	0.350	-0.334
307.2	17.716	20.02	3.33	2.78	1.0	1.11	19.53	86	58.56	78.09	0.350	-0.281
307.0	17.880	10.78	5.07	3.11	1.0	1.11	11.12	100	57.38	68.50	0.350	-0.229
306.9	18.044	6.11	5.91	3.34	1.0	1.11	6.83	100	56.05	62.88	0.350	-0.196
306.7	18.208	6.97	2.30	3.07	1.0	1.11	7.64	100	56.30	63.94	0.350	-0.203
306.5	18.372	8.35	0.84	2.79	1.0	1.10	8.96	86	55.46	64.42	0.350	-0.205
306.4	18.537	8.09	0.77	2.79	1.0	1.10	8.73	86	55.37	64.10	0.350	-0.203
306.2	18.701	6.01	1.17	2.98	1.0	1.10	6.81	100	56.05	62.86	0.350	-0.196
306.0	18.865	5.27	1.21	3.04	1.0	1.09	6.13	100	55.84	61.97	0.350	-0.190
305.9	19.029	4.06	1.69	3.21	1.0	1.09	5.01	100	55.49	60.50	0.350	-0.181
305.7	19.193	4.00	1.63	3.20	1.0	1.09	4.97	100	55.48	60.45	0.350	-0.181
305.5	19.357	4.64	1.28	3.10	1.0	1.08	5.59	100	55.67	61.25	0.350	-0.185
305.4	19.521	14.39	0.68	2.54	0.5	1.08	15.72	66	54.48	70.21	0.350	-0.237
305.2	19.685	20.23	1.28	2.54	0.5	1.07	21.55	66	56.15	77.70	0.350	-0.277
305.1	19.849	14.91	2.23	2.78	1.0	1.07	15.37	86	57.30	72.66	0.350	-0.250
304.9	20.013	18.07	1.66	2.64	1.0	1.07	18.40	74	56.69	75.09	0.350	-0.263
304.7	20.177	20.83	1.65	2.59	0.5	1.06	22.16	70	57.06	79.22	0.350	-0.284
304.6	20.341	13.22	2.28	2.83	1.0	1.06	13.86	89	57.27	71.13	0.350	-0.242
304.4	20.505	8.39	2.57	3.02	1.0	1.06	9.28	100	56.82	66.10	0.350	-0.213
304.2	20.669	7.31	2.12	3.03	1.0	1.06	8.27	100	56.50	64.77	0.350	-0.205

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
304.1	20.833	5.40	1.53	3.08	1.0	1.05	6.45	100	55.94	62.39	0.350	-0.191
303.9	20.997	9.15	1.93	2.93	1.0	1.05	10.08	97	56.82	66.90	0.350	-0.217
303.7	21.161	7.71	1.83	2.98	1.0	1.05	8.72	100	56.64	65.36	0.350	-0.208
303.6	21.325	5.23	2.51	3.19	1.0	1.05	6.34	100	55.90	62.24	0.350	-0.190
303.4	21.489	5.13	1.12	3.04	1.0	1.04	6.26	100	55.88	62.14	0.350	-0.189
303.2	21.653	4.70	0.75	3.00	1.0	1.04	5.85	100	55.75	61.61	0.350	-0.186
303.1	21.817	4.56	0.62	2.99	1.0	1.04	5.74	100	55.71	61.45	0.350	-0.184
302.9	21.981	3.89	0.64	3.06	1.0	1.03	5.10	100	55.52	60.61	0.350	-0.179
302.8	22.145	4.51	0.57	2.98	1.0	1.03	5.71	100	55.71	61.41	0.350	-0.184
302.6	22.309	4.34	0.66	3.02	1.0	1.03	5.56	100	55.66	61.22	0.350	-0.183
302.4	22.473	3.91	0.83	3.09	1.0	1.03	5.16	100	55.53	60.69	0.350	-0.179
302.3	22.638	3.66	1.13	3.17	1.0	1.02	4.91	100	55.46	60.37	0.350	-0.177
302.1	22.802	3.54	1.16	3.19	1.0	1.02	4.82	100	55.43	60.24	0.350	-0.176
301.9	22.966	4.15	1.01	3.10	1.0	1.02	5.43	100	55.62	61.05	0.350	-0.181
301.8	23.130	4.01	0.89	3.10	1.0	1.01	5.30	100	55.58	60.88	0.350	-0.180
301.6	23.294	3.58	1.26	3.20	1.0	1.01	4.89	100	55.45	60.34	0.350	-0.176
301.4	23.458	4.32	0.78	3.04	1.0	1.01	5.64	100	55.68	61.32	0.350	-0.182
301.3	23.622	6.39	0.61	2.85	1.0	1.01	7.71	91	55.53	63.24	0.350	-0.194
301.1	23.786	11.37	0.87	2.68	1.0	1.00	12.70	77	55.45	68.15	0.350	-0.222
301.0	23.950	8.83	1.22	2.84	1.0	1.00	10.19	90	56.24	66.43	0.350	-0.212
300.8	24.114	7.69	1.55	2.94	1.0	1.00	9.07	99	56.63	65.70	0.350	-0.208
300.6	24.278	6.25	1.42	3.01	1.0	0.99	7.64	100	56.31	63.95	0.350	-0.197
300.5	24.442	4.93	1.36	3.09	1.0	0.99	6.33	100	55.90	62.23	0.350	-0.187
300.3	24.606	4.50	2.14	3.22	1.0	0.99	5.92	100	55.77	61.69	0.350	-0.184
300.1	24.770	4.74	2.23	3.20	1.0	0.99	6.17	100	55.85	62.01	0.350	-0.185
300.0	24.934	5.42	2.53	3.18	1.0	0.98	6.88	100	56.07	62.94	0.350	-0.191
299.8	25.098	5.13	2.77	3.22	1.0	0.98	6.59	100	55.98	62.57	0.350	-0.189
299.6	25.262	4.52	3.07	3.29	1.0	0.98	5.99	100	55.79	61.78	0.350	-0.184
299.5	25.426	3.89	3.18	3.36	1.0	0.98	5.36	100	55.60	60.96	0.350	-0.178
299.3	25.590	4.18	3.05	3.32	1.0	0.97	5.66	100	55.69	61.36	0.350	-0.181
299.1	25.754	4.33	2.74	3.28	1.0	0.97	5.84	100	55.75	61.58	0.350	-0.182
299.0	25.918	4.15	3.09	3.32	1.0	0.97	5.67	100	55.69	61.36	0.350	-0.181
298.8	26.082	3.94	2.72	3.32	1.0	0.97	5.46	100	55.63	61.08	0.350	-0.179
298.7	26.246	3.97	2.64	3.31	1.0	0.96	5.50	100	55.64	61.15	0.350	-0.179
298.5	26.410	3.96	3.06	3.34	1.0	0.96	5.51	100	55.64	61.15	0.350	-0.179
298.3	26.574	3.74	2.97	3.35	1.0	0.96	5.29	100	55.58	60.87	0.350	-0.177
298.2	26.739	3.37	2.95	3.39	1.0	0.96	4.92	100	55.46	60.38	0.350	-0.174
298.0	26.903	3.26	2.92	3.40	1.0	0.95	4.82	100	55.43	60.25	0.350	-0.173
297.8	27.067	2.96	2.51	3.41	1.0	0.95	4.51	100	55.33	59.85	0.350	-0.170
297.7	27.231	2.54	2.77	3.49	1.0	0.95	4.09	100	55.20	59.30	0.350	-0.167
297.5	27.395	2.48	1.98	3.43	1.0	0.95	4.04	100	55.19	59.23	0.350	-0.166
297.3	27.559	2.62	1.87	3.40	1.0	0.94	4.20	100	55.24	59.43	0.350	-0.167
297.2	27.723	2.69	1.88	3.39	1.0	0.94	4.28	100	55.26	59.54	0.350	-0.168
297.0	27.887	2.41	2.34	3.47	1.0	0.94	3.99	100	55.17	59.17	0.350	-0.165
296.8	28.051	2.60	2.06	3.42	1.0	0.94	4.21	100	55.24	59.45	0.350	-0.167
296.7	28.215	2.74	2.16	3.41	1.0	0.94	4.36	100	55.29	59.65	0.350	-0.168
296.5	28.379	2.79	2.48	3.43	1.0	0.93	4.42	100	55.31	59.73	0.350	-0.169
296.4	28.543	3.20	2.28	3.36	1.0	0.93	4.86	100	55.44	60.31	0.350	-0.172
296.2	28.707	3.84	2.66	3.32	1.0	0.93	5.55	100	55.66	61.20	0.350	-0.177
296.0	28.871	3.71	3.39	3.39	1.0	0.93	5.42	100	55.62	61.04	0.350	-0.176
295.9	29.035	3.20	4.11	3.49	1.0	0.92	4.89	100	55.45	60.34	0.350	-0.172
295.7	29.199	3.84	4.20	3.42	1.0	0.92	5.58	100	55.67	61.25	0.350	-0.177
295.5	29.363	4.69	3.89	3.33	1.0	0.92	6.49	100	55.95	62.43	0.350	-0.184
295.4	29.527	5.49	3.96	3.28	1.0	0.92	7.36	100	56.22	63.58	0.350	-0.191
295.2	29.691	5.04	5.40	3.39	1.0	0.92	6.89	100	56.07	62.96	0.350	-0.187
295.0	29.855	3.86	6.48	3.53	1.0	0.91	5.65	100	55.69	61.33	0.350	-0.177
294.9	30.019	4.14	5.99	3.48	1.0	0.91	5.96	100	55.78	61.74	0.350	-0.180
294.7	30.183	5.03	5.15	3.38	1.0	0.91	6.91	100	56.08	62.99	0.350	-0.187
294.6	30.347	6.80	3.58	3.18	1.0	0.91	8.83	100	56.68	65.51	0.350	-0.202
294.4	30.511	5.17	4.00	3.30	1.0	0.91	7.10	100	56.14	63.24	0.350	-0.188
294.2	30.675	4.48	3.57	3.33	1.0	0.90	6.37	100	55.91	62.28	0.350	-0.183
294.1	30.840	4.01	3.53	3.37	1.0	0.90	5.88	100	55.76	61.64	0.350	-0.179
293.9	31.004	3.92	3.30	3.36	1.0	0.90	5.79	100	55.73	61.52	0.350	-0.178
293.7	31.168	4.19	2.91	3.31	1.0	0.90	6.09	100	55.82	61.91	0.350	-0.180
293.6	31.332	4.26	3.05	3.31	1.0	0.90	6.18	100	55.85	62.03	0.350	-0.181
293.4	31.496	4.03	2.96	3.33	1.0	0.89	5.94	100	55.78	61.72	0.350	-0.179

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
293.2	31.660	3.91	2.88	3.33	1.0	0.89	5.82	100	55.74	61.56	0.350	-0.178
293.1	31.824	3.75	2.57	3.32	1.0	0.89	5.66	100	55.69	61.35	0.350	-0.176
292.9	31.988	3.89	2.41	3.30	1.0	0.89	5.82	100	55.74	61.56	0.350	-0.177
292.7	32.152	3.87	2.16	3.27	1.0	0.89	5.81	100	55.74	61.54	0.350	-0.177
292.6	32.316	3.76	2.09	3.28	1.0	0.88	5.70	100	55.70	61.40	0.350	-0.176
292.4	32.480	3.83	2.17	3.28	1.0	0.88	5.78	100	55.73	61.51	0.350	-0.177
292.3	32.644	5.96	1.28	3.00	1.0	0.88	8.14	100	56.46	64.60	0.350	-0.195
292.1	32.808	5.04	1.00	3.02	1.0	0.88	7.14	100	56.15	63.29	0.350	-0.187
291.9	32.972	4.72	0.84	3.02	1.0	0.88	6.80	100	56.04	62.84	0.350	-0.184
291.8	33.136	5.22	0.81	2.98	1.0	0.88	7.36	100	56.22	63.58	0.350	-0.189
291.6	33.300	5.93	1.17	2.99	1.0	0.87	8.17	100	56.47	64.63	0.350	-0.195
291.4	33.464	7.39	1.00	2.87	1.0	0.87	9.79	93	56.35	66.14	0.350	-0.203
291.3	33.628	5.94	1.28	3.01	1.0	0.87	8.21	100	56.48	64.69	0.350	-0.195
291.1	33.792	5.24	1.84	3.13	1.0	0.87	7.43	100	56.24	63.67	0.350	-0.189
290.9	33.956	5.34	1.38	3.06	1.0	0.87	7.57	100	56.28	63.85	0.350	-0.190
290.8	34.120	5.89	1.38	3.02	1.0	0.87	8.18	100	56.47	64.66	0.350	-0.194
290.6	34.284	5.64	1.74	3.09	1.0	0.86	7.93	100	56.39	64.32	0.350	-0.192
290.5	34.448	5.78	2.07	3.11	1.0	0.86	8.09	100	56.44	64.53	0.350	-0.193
290.3	34.612	5.74	1.97	3.10	1.0	0.86	8.06	100	56.44	64.50	0.350	-0.193
290.1	34.776	5.62	1.86	3.10	1.0	0.86	7.94	100	56.40	64.33	0.350	-0.192
290.0	34.941	5.27	1.67	3.10	1.0	0.86	7.56	100	56.28	63.84	0.350	-0.189
289.8	35.105	5.45	1.89	3.12	1.0	0.86	7.77	100	56.35	64.12	0.350	-0.190
289.6	35.269	5.55	2.03	3.12	1.0	0.85	7.91	100	56.39	64.30	0.350	-0.191
289.5	35.433	5.53	2.36	3.16	1.0	0.85	7.90	100	56.38	64.28	0.350	-0.191
289.3	35.597	5.45	2.49	3.18	1.0	0.85	7.81	100	56.36	64.17	0.350	-0.190
289.1	35.761	6.45	2.53	3.12	1.0	0.85	8.96	100	56.71	65.67	0.350	-0.199
289.0	35.925	5.55	3.70	3.26	1.0	0.85	7.96	100	56.40	64.36	0.350	-0.191
288.8	36.089	7.92	1.83	2.97	1.0	0.85	10.66	100	57.24	67.90	0.350	-0.212
288.6	36.253	5.90	1.58	3.05	1.0	0.84	8.38	100	56.53	64.91	0.350	-0.194
288.5	36.417	5.04	1.71	3.13	1.0	0.84	7.41	100	56.23	63.65	0.350	-0.187
288.3	36.581	5.63	1.67	3.08	1.0	0.84	8.10	100	56.45	64.55	0.350	-0.192
288.2	36.745	5.61	2.26	3.14	1.0	0.84	8.09	100	56.44	64.53	0.350	-0.192
288.0	36.909	5.68	2.45	3.16	1.0	0.84	8.19	100	56.47	64.66	0.350	-0.192
287.8	37.073	5.83	2.59	3.16	1.0	0.84	8.36	100	56.53	64.89	0.350	-0.194
287.7	37.237	5.44	2.32	3.16	1.0	0.83	7.93	100	56.40	64.33	0.350	-0.190
287.5	37.401	7.56	1.62	2.96	1.0	0.83	10.39	100	57.14	67.53	0.350	-0.209
287.3	37.565	26.20	1.08	2.40	0.5	0.84	27.68	55	55.17	82.85	0.350	-0.289
287.2	37.729	12.03	2.43	2.88	1.0	0.84	15.62	93	58.19	73.82	0.350	-0.243
287.0	37.893	6.82	3.97	3.20	1.0	0.83	9.58	100	56.91	66.49	0.350	-0.202
286.8	38.057	12.30	1.29	2.73	1.0	0.83	15.97	81	56.95	72.92	0.350	-0.238
286.7	38.221	78.40	0.41	1.78	0.5	0.84	79.00	5	0.29	79.29	0.350	-0.271
286.5	38.385	90.44	0.56	1.80	0.5	0.84	91.88	7	1.27	93.15	0.350	-0.337
286.4	38.549	89.44	0.71	1.86	0.5	0.85	91.61	12	12.02	103.62	0.350	-0.382
286.2	38.713	91.23	0.74	1.86	0.5	0.85	93.64	12	13.43	107.07	0.350	-0.396
286.0	38.877	92.55	0.78	1.87	0.5	0.85	95.22	13	15.43	110.65	0.350	-0.410
285.9	39.042	101.62	0.73	1.82	0.5	0.85	104.24	9	4.45	108.69	0.350	-0.402
285.7	39.206	107.33	0.77	1.82	0.5	0.85	110.41	8	3.62	114.03	0.350	-0.423
285.5	39.370	102.36	0.86	1.86	0.5	0.85	105.82	12	13.83	119.65	0.350	-0.444
285.4	39.534	93.78	1.15	1.97	0.5	0.86	98.21	21	38.39	136.60	0.350	-0.504
285.2	39.698	65.86	1.94	2.24	0.5	0.86	69.23	42	59.94	129.18	0.350	-0.479
285.0	39.862	24.96	4.30	2.78	1.0	0.83	31.64	85	62.22	93.86	0.350	-0.339
284.9	40.026	13.64	5.72	3.06	1.0	0.82	17.90	100	59.49	77.39	0.350	-0.260
284.7	40.190	8.27	6.87	3.28	1.0	0.81	11.50	100	57.50	69.00	0.350	-0.215
284.5	40.354	7.57	7.45	3.33	1.0	0.81	10.69	100	57.25	67.94	0.350	-0.209
284.4	40.518	31.46	1.92	2.48	0.5	0.82	33.16	61	58.37	91.53	0.350	-0.328
284.2	40.682	69.83	1.10	2.06	0.5	0.84	72.93	28	46.89	119.82	0.350	-0.444
284.1	40.846	46.68	2.16	2.38	0.5	0.83	49.00	53	60.27	109.28	0.350	-0.403
283.9	41.010	20.47	4.29	2.84	1.0	0.82	26.43	91	61.23	87.65	0.350	-0.310
283.7	41.174	12.54	5.38	3.07	1.0	0.81	16.75	100	59.13	75.89	0.350	-0.252
283.6	41.338	7.14	6.19	3.30	1.0	0.80	10.28	100	57.12	67.40	0.350	-0.205
283.4	41.502	7.98	2.32	3.02	1.0	0.80	11.30	100	57.44	68.74	0.350	-0.213
283.2	41.666	7.24	1.42	2.95	1.0	0.80	10.42	99	57.08	67.50	0.350	-0.206
283.1	41.830	7.48	4.51	3.20	1.0	0.79	10.72	100	57.26	67.98	0.350	-0.208
282.9	41.994	33.68	2.03	2.47	0.5	0.82	35.48	61	58.84	94.32	0.350	-0.340
282.7	42.158	15.49	3.71	2.90	1.0	0.80	20.52	95	59.85	80.37	0.350	-0.274
282.6	42.322	9.57	3.62	3.06	1.0	0.79	13.31	100	58.06	71.37	0.350	-0.227

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
282.4	42.486	8.24	1.91	2.96	1.0	0.79	11.71	100	57.56	69.27	0.350	-0.215
282.2	42.650	6.47	1.41	2.99	1.0	0.79	9.58	100	56.91	66.49	0.350	-0.199
282.1	42.814	6.05	1.48	3.03	1.0	0.78	9.08	100	56.75	65.84	0.350	-0.195
281.9	42.978	5.95	1.30	3.01	1.0	0.78	8.98	100	56.72	65.70	0.350	-0.195
281.8	43.143	5.63	1.14	3.00	1.0	0.78	8.60	100	56.60	65.21	0.350	-0.192
281.6	43.307	5.60	1.02	2.99	1.0	0.78	8.58	100	56.60	65.18	0.350	-0.191
281.4	43.471	6.09	1.04	2.96	1.0	0.78	9.19	100	56.75	65.94	0.350	-0.196
281.3	43.635	6.13	1.29	2.99	1.0	0.78	9.25	100	56.80	66.05	0.350	-0.196
281.1	43.799	5.95	1.68	3.06	1.0	0.78	9.05	100	56.74	65.79	0.350	-0.195
280.9	43.963	5.49	1.55	3.07	1.0	0.77	8.50	100	56.57	65.08	0.350	-0.190
280.8	44.127	5.65	1.38	3.04	1.0	0.77	8.70	100	56.63	65.34	0.350	-0.192
280.6	44.291	5.75	1.28	3.02	1.0	0.77	8.84	100	56.68	65.52	0.350	-0.193
280.4	44.455	5.54	1.41	3.05	1.0	0.77	8.60	100	56.60	65.20	0.350	-0.191
280.3	44.619	5.20	1.65	3.11	1.0	0.77	8.19	100	56.48	64.67	0.350	-0.188
280.1	44.783	5.20	1.37	3.07	1.0	0.77	8.21	100	56.48	64.69	0.350	-0.188
280.0	44.947	5.07	1.15	3.05	1.0	0.77	8.05	100	56.43	64.48	0.350	-0.186
279.8	45.111	4.71	1.22	3.09	1.0	0.76	7.63	100	56.30	63.93	0.350	-0.183
279.6	45.275	5.65	1.06	2.99	1.0	0.76	8.79	100	56.66	65.45	0.350	-0.192
279.5	45.439	7.67	0.82	2.82	1.0	0.77	11.28	89	56.41	67.69	0.350	-0.204
279.3	45.603	5.34	1.75	3.11	1.0	0.76	8.43	100	56.55	64.98	0.350	-0.189
279.1	45.767	4.73	1.75	3.16	1.0	0.76	7.70	100	56.32	64.02	0.350	-0.183
279.0	45.931	4.76	1.04	3.06	1.0	0.76	7.74	100	56.33	64.07	0.350	-0.183
278.8	46.095	4.83	0.98	3.04	1.0	0.76	7.84	100	56.37	64.21	0.350	-0.184
278.6	46.259	5.26	0.94	3.00	1.0	0.76	8.37	100	56.53	64.91	0.350	-0.188
278.5	46.423	5.13	1.06	3.03	1.0	0.76	8.24	100	56.49	64.73	0.350	-0.187
278.3	46.587	4.89	0.95	3.03	1.0	0.75	7.94	100	56.40	64.34	0.350	-0.184
278.1	46.751	5.32	1.28	3.05	1.0	0.75	8.49	100	56.57	65.05	0.350	-0.189
278.0	46.915	5.56	1.11	3.00	1.0	0.75	8.80	100	56.66	65.46	0.350	-0.191
277.8	47.079	4.57	1.27	3.11	1.0	0.75	7.57	100	56.28	63.86	0.350	-0.181
277.7	47.244	5.05	1.08	3.04	1.0	0.75	8.19	100	56.48	64.67	0.350	-0.186
277.5	47.408	4.80	1.23	3.08	1.0	0.75	7.89	100	56.38	64.27	0.350	-0.184
277.3	47.572	4.48	1.26	3.11	1.0	0.75	7.50	100	56.26	63.76	0.350	-0.180
277.2	47.736	5.74	1.08	2.99	1.0	0.75	9.08	100	56.75	65.84	0.350	-0.192
277.0	47.900	5.44	1.40	3.06	1.0	0.74	8.72	100	56.64	65.36	0.350	-0.190
276.8	48.064	4.73	1.92	3.17	1.0	0.74	7.84	100	56.37	64.20	0.350	-0.183
276.7	48.228	4.81	1.56	3.13	1.0	0.74	7.95	100	56.40	64.35	0.350	-0.184
276.5	48.392	4.66	1.49	3.13	1.0	0.74	7.77	100	56.35	64.12	0.350	-0.182
276.3	48.556	4.50	1.40	3.13	1.0	0.74	7.58	100	56.29	63.87	0.350	-0.180
276.2	48.720	4.67	1.36	3.11	1.0	0.74	7.80	100	56.35	64.16	0.350	-0.182
276.0	48.884	4.64	1.93	3.18	1.0	0.74	7.78	100	56.35	64.13	0.350	-0.182
275.9	49.048	6.27	1.77	3.05	1.0	0.74	9.85	100	56.99	66.84	0.350	-0.198
275.7	49.212	7.74	1.18	2.89	1.0	0.74	11.73	94	57.05	68.77	0.350	-0.208
275.5	49.376	4.91	2.20	3.19	1.0	0.73	8.15	100	56.46	64.61	0.350	-0.184
275.4	49.540	4.65	2.06	3.19	1.0	0.73	7.83	100	56.36	64.20	0.350	-0.182
275.2	49.704	4.49	1.47	3.14	1.0	0.73	7.64	100	56.30	63.94	0.350	-0.180
275.0	49.868	4.50	1.31	3.12	1.0	0.73	7.66	100	56.31	63.97	0.350	-0.180
274.9	50.032	4.48	1.09	3.09	1.0	0.73	7.65	100	56.31	63.95	0.350	-0.180
274.7	50.196	4.40	1.04	3.09	1.0	0.73	7.55	100	56.28	63.83	0.350	-0.179
274.5	50.360	4.28	1.52	3.17	1.0	0.73	7.41	100	56.23	63.64	0.350	-0.178
274.4	50.524	4.54	2.17	3.21	1.0	0.73	7.76	100	56.34	64.10	0.350	-0.181
274.2	50.688	11.79	1.33	2.75	1.0	0.74	17.12	83	57.51	74.63	0.350	-0.239
274.0	50.852	83.62	0.47	1.79	0.5	0.75	84.26	6	0.59	84.84	0.350	-0.291
273.9	51.016	96.34	0.63	1.80	0.5	0.76	98.70	7	1.64	100.34	0.350	-0.361
273.7	51.180	93.58	0.80	1.87	0.5	0.77	97.45	13	16.12	113.57	0.350	-0.414
273.6	51.345	92.59	0.85	1.89	0.5	0.77	96.88	14	20.69	117.57	0.350	-0.429
273.4	51.509	94.58	0.82	1.88	0.5	0.77	98.70	13	16.83	115.53	0.350	-0.421
273.2	51.673	92.33	1.07	1.96	0.5	0.79	98.31	20	35.58	133.90	0.350	-0.488
273.1	51.837	69.02	1.79	2.20	0.5	0.78	74.02	39	58.88	132.90	0.350	-0.484
272.9	52.001	23.64	4.04	2.78	1.0	0.75	33.50	85	62.78	96.28	0.350	-0.342
272.7	52.165	12.42	6.23	3.12	1.0	0.73	18.19	100	59.58	77.77	0.350	-0.255
272.6	52.329	8.77	6.19	3.23	1.0	0.72	13.36	100	58.08	71.44	0.350	-0.221
272.4	52.493	6.57	4.24	3.23	1.0	0.72	10.50	100	57.19	67.69	0.350	-0.200
272.2	52.657	5.47	3.39	3.24	1.0	0.71	9.07	100	56.75	65.82	0.350	-0.190
272.1	52.821	5.24	2.17	3.16	1.0	0.71	8.79	100	56.66	65.46	0.350	-0.187
271.9	52.985	4.78	1.77	3.15	1.0	0.71	8.20	100	56.48	64.68	0.350	-0.183
271.8	53.149	5.03	1.48	3.10	1.0	0.71	8.54	100	56.58	65.13	0.350	-0.185

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
271.6	53.313	4.98	1.55	3.11	1.0	0.71	8.49	100	56.57	65.05	0.350	-0.185
271.4	53.477	5.09	1.95	3.15	1.0	0.71	8.63	100	56.61	65.25	0.350	-0.186
271.3	53.641	6.43	2.81	3.14	1.0	0.71	10.40	100	57.16	67.56	0.350	-0.199
271.1	53.805	43.30	1.13	2.23	0.5	0.74	45.61	42	53.93	99.54	0.350	-0.356
270.9	53.969	15.85	3.09	2.84	1.0	0.73	23.12	90	60.20	83.32	0.350	-0.282
270.8	54.133	9.39	4.21	3.10	1.0	0.71	14.37	100	58.40	72.77	0.350	-0.228
270.6	54.297	6.29	4.74	3.28	1.0	0.70	10.27	100	57.12	67.38	0.350	-0.198
270.4	54.461	5.98	2.99	3.18	1.0	0.70	9.88	100	57.00	66.87	0.350	-0.195
270.3	54.625	6.58	7.69	3.39	1.0	0.70	10.68	100	57.25	67.92	0.350	-0.201
270.1	54.789	46.51	1.99	2.36	0.5	0.75	49.47	52	59.72	109.19	0.350	-0.395
269.9	54.953	82.31	1.38	2.06	0.5	0.77	88.84	28	50.78	139.61	0.350	-0.505
269.8	55.117	24.81	3.69	2.74	1.0	0.74	36.04	82	63.11	99.15	0.350	-0.353
269.6	55.281	13.44	5.32	3.04	1.0	0.71	20.03	100	60.15	80.19	0.350	-0.265
269.5	55.446	7.43	6.78	3.31	1.0	0.70	11.87	100	57.62	69.49	0.350	-0.209
269.3	55.610	5.55	5.27	3.35	1.0	0.70	9.38	100	56.84	66.22	0.350	-0.190
269.1	55.774	6.16	1.94	3.08	1.0	0.70	10.20	100	57.10	67.30	0.350	-0.196
269.0	55.938	5.43	1.98	3.13	1.0	0.69	9.25	100	56.80	66.05	0.350	-0.189
268.8	56.102	5.77	2.95	3.19	1.0	0.69	9.71	100	56.95	66.65	0.350	-0.192
268.6	56.266	7.78	1.96	2.99	1.0	0.70	12.41	100	57.79	70.20	0.350	-0.212
268.5	56.430	5.44	3.08	3.22	1.0	0.69	9.29	100	56.82	66.11	0.350	-0.189
268.3	56.594	5.23	2.65	3.21	1.0	0.69	9.01	100	56.73	65.74	0.350	-0.187
268.1	56.758	5.00	2.33	3.19	1.0	0.69	8.72	100	56.64	65.36	0.350	-0.185
268.0	56.922	4.66	2.17	3.21	1.0	0.69	8.28	100	56.50	64.78	0.350	-0.181
267.8	57.086	4.46	1.69	3.17	1.0	0.68	8.02	100	56.42	64.44	0.350	-0.179
267.7	57.250	4.44	1.33	3.13	1.0	0.68	8.01	100	56.42	64.43	0.350	-0.179
267.5	57.414	4.43	1.23	3.11	1.0	0.68	8.00	100	56.42	64.42	0.350	-0.179
267.3	57.578	4.63	1.07	3.07	1.0	0.68	8.27	100	56.50	64.77	0.350	-0.181
267.2	57.742	4.48	1.23	3.11	1.0	0.68	8.08	100	56.44	64.52	0.350	-0.179
267.0	57.906	4.66	1.21	3.09	1.0	0.68	8.33	100	56.52	64.85	0.350	-0.181
266.8	58.070	4.77	1.12	3.07	1.0	0.68	8.49	100	56.57	65.06	0.350	-0.182
266.7	58.234	5.18	1.22	3.05	1.0	0.68	9.05	100	56.74	65.80	0.350	-0.186
266.5	58.398	4.95	1.53	3.11	1.0	0.68	8.76	100	56.65	65.41	0.350	-0.184
266.3	58.562	4.75	1.68	3.14	1.0	0.68	8.50	100	56.57	65.07	0.350	-0.182
266.2	58.726	4.79	2.40	3.22	1.0	0.68	8.55	100	56.59	65.14	0.350	-0.182
266.0	58.890	5.06	2.16	3.17	1.0	0.68	8.93	100	56.70	65.63	0.350	-0.185
265.8	59.054	60.34	0.39	1.88	0.5	0.69	60.26	13	14.45	74.71	0.350	-0.235
265.7	59.218	71.79	0.86	1.99	0.5	0.73	75.74	22	37.64	113.38	0.350	-0.409
265.5	59.382	23.69	3.19	2.71	1.0	0.71	35.57	80	62.68	98.25	0.350	-0.347
265.4	59.547	12.10	5.29	3.08	1.0	0.69	18.74	100	59.75	78.49	0.350	-0.255
265.2	59.711	6.10	7.81	3.42	1.0	0.67	10.40	100	57.16	67.56	0.350	-0.196
265.0	59.875	4.94	3.78	3.31	1.0	0.67	8.82	100	56.67	65.49	0.350	-0.184
264.9	60.039	5.15	2.05	3.15	1.0	0.67	9.12	100	56.76	65.89	0.350	-0.186
264.7	60.203	4.67	2.41	3.23	1.0	0.67	8.48	100	56.57	65.05	0.350	-0.181
264.5	60.367	4.33	2.50	3.26	1.0	0.67	8.02	100	56.42	64.44	0.350	-0.177
264.4	60.531	4.43	2.23	3.23	1.0	0.67	8.18	100	56.47	64.65	0.350	-0.178
264.2	60.695	4.80	2.06	3.18	1.0	0.67	8.68	100	56.63	65.30	0.350	-0.182
264.0	60.859	4.42	2.17	3.23	1.0	0.66	8.17	100	56.47	64.64	0.350	-0.178
263.9	61.023	4.42	2.07	3.21	1.0	0.66	8.18	100	56.47	64.65	0.350	-0.178
263.7	61.187	4.31	2.15	3.23	1.0	0.66	8.04	100	56.43	64.47	0.350	-0.177
263.5	61.351	4.18	2.05	3.24	1.0	0.66	7.87	100	56.37	64.24	0.350	-0.176
263.4	61.515	4.22	2.04	3.23	1.0	0.66	7.93	100	56.40	64.33	0.350	-0.176
263.2	61.679	4.23	1.50	3.17	1.0	0.66	7.95	100	56.40	64.36	0.350	-0.176
263.1	61.843	4.39	1.64	3.17	1.0	0.66	8.18	100	56.47	64.65	0.350	-0.178
262.9	62.007	4.53	1.71	3.17	1.0	0.66	8.38	100	56.54	64.92	0.350	-0.179
262.7	62.171	4.14	1.76	3.21	1.0	0.66	7.86	100	56.37	64.24	0.350	-0.175
262.6	62.335	4.28	1.36	3.15	1.0	0.66	8.05	100	56.43	64.49	0.350	-0.177
262.4	62.499	4.28	1.30	3.14	1.0	0.66	8.07	100	56.44	64.51	0.350	-0.177
262.2	62.663	4.26	1.40	3.15	1.0	0.65	8.05	100	56.43	64.48	0.350	-0.176
262.1	62.827	4.26	1.37	3.15	1.0	0.65	8.05	100	56.43	64.49	0.350	-0.176
261.9	62.991	4.66	1.28	3.10	1.0	0.65	8.62	100	56.61	65.23	0.350	-0.181
261.7	63.155	4.74	1.46	3.12	1.0	0.65	8.73	100	56.64	65.38	0.350	-0.181
261.6	63.319	4.56	1.78	3.17	1.0	0.65	8.49	100	56.57	65.06	0.350	-0.179
261.4	63.483	4.33	1.75	3.19	1.0	0.65	8.19	100	56.48	64.67	0.350	-0.177
261.3	63.648	4.33	1.57	3.17	1.0	0.65	8.20	100	56.48	64.67	0.350	-0.177
261.1	63.812	4.16	1.44	3.17	1.0	0.65	7.96	100	56.41	64.37	0.350	-0.175
260.9	63.976	4.24	1.54	3.17	1.0	0.65	8.09	100	56.44	64.53	0.350	-0.176

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	(ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
260.8	64.140	4.25	1.59	3.18	1.0	0.65	8.11	100	56.45	64.55	0.350	-0.176
260.6	64.304	4.33	1.70	3.18	1.0	0.65	8.22	100	56.49	64.71	0.350	-0.177
260.4	64.468	4.51	1.81	3.18	1.0	0.65	8.49	100	56.57	65.06	0.350	-0.179
260.3	64.632	4.42	1.86	3.19	1.0	0.65	8.38	100	56.53	64.91	0.350	-0.178
260.1	64.796	4.78	1.88	3.17	1.0	0.65	8.88	100	56.69	65.57	0.350	-0.182
259.9	64.960	4.56	1.96	3.19	1.0	0.64	8.59	100	56.60	65.19	0.350	-0.179
259.8	65.124	4.55	2.10	3.21	1.0	0.64	8.57	100	56.59	65.17	0.350	-0.179
259.6	65.288	4.45	2.10	3.22	1.0	0.64	8.45	100	56.56	65.01	0.350	-0.178
259.4	65.452	4.27	2.00	3.22	1.0	0.64	8.21	100	56.48	64.69	0.350	-0.176
259.3	65.616	4.35	2.09	3.22	1.0	0.64	8.33	100	56.52	64.85	0.350	-0.177
259.1	65.780	4.36	1.93	3.21	1.0	0.64	8.35	100	56.53	64.88	0.350	-0.177
259.0	65.944	5.42	2.65	3.19	1.0	0.64	9.85	100	56.99	66.84	0.350	-0.188
258.8	66.108	14.74	1.91	2.75	1.0	0.66	23.46	83	59.41	82.87	0.350	-0.273
258.6	66.272	8.66	3.10	3.06	1.0	0.65	14.53	100	58.44	72.97	0.350	-0.222
258.5	66.436	4.78	6.00	3.43	1.0	0.64	8.97	100	56.72	65.68	0.350	-0.182
258.3	66.600	4.33	2.39	3.25	1.0	0.64	8.34	100	56.52	64.87	0.350	-0.177
258.1	66.764	4.14	2.26	3.26	1.0	0.63	8.08	100	56.44	64.52	0.350	-0.175
258.0	66.928	4.01	1.86	3.23	1.0	0.63	7.91	100	56.39	64.30	0.350	-0.173
257.8	67.092	3.90	1.71	3.23	1.0	0.63	7.76	100	56.34	64.10	0.350	-0.172
257.6	67.256	3.90	1.64	3.22	1.0	0.63	7.77	100	56.34	64.11	0.350	-0.172
257.5	67.420	3.88	1.62	3.22	1.0	0.63	7.75	100	56.34	64.09	0.350	-0.172
257.3	67.584	3.99	1.44	3.18	1.0	0.63	7.91	100	56.39	64.30	0.350	-0.173
257.2	67.749	4.15	2.26	3.26	1.0	0.63	8.15	100	56.46	64.61	0.350	-0.175
257.0	67.913	5.89	1.63	3.06	1.0	0.63	10.65	100	57.24	67.89	0.350	-0.193
256.8	68.077	4.03	2.51	3.29	1.0	0.63	7.99	100	56.41	64.41	0.350	-0.173
256.7	68.241	4.39	1.87	3.20	1.0	0.63	8.52	100	56.58	65.10	0.350	-0.177
256.5	68.405	4.33	1.48	3.16	1.0	0.63	8.44	100	56.55	65.00	0.350	-0.177
256.3	68.569	4.33	2.03	3.22	1.0	0.63	8.44	100	56.55	64.99	0.350	-0.176
256.2	68.733	4.24	1.84	3.21	1.0	0.63	8.33	100	56.52	64.85	0.350	-0.176
256.0	68.897	4.55	1.51	3.14	1.0	0.63	8.77	100	56.66	65.43	0.350	-0.179
255.8	69.061	4.69	1.37	3.11	1.0	0.63	8.99	100	56.72	65.71	0.350	-0.180
255.7	69.225	4.56	1.79	3.17	1.0	0.62	8.80	100	56.67	65.47	0.350	-0.179
255.5	69.389	4.44	2.07	3.21	1.0	0.62	8.64	100	56.62	65.26	0.350	-0.178
255.3	69.553	4.26	1.82	3.20	1.0	0.62	8.39	100	56.54	64.93	0.350	-0.176
255.2	69.717	4.09	1.63	3.20	1.0	0.62	8.16	100	56.47	64.62	0.350	-0.174
255.0	69.881	4.15	1.43	3.17	1.0	0.62	8.25	100	56.49	64.74	0.350	-0.174
254.9	70.045	4.37	1.40	3.14	1.0	0.62	8.57	100	56.59	65.17	0.350	-0.177
254.7	70.209	4.44	1.63	3.16	1.0	0.62	8.69	100	56.63	65.32	0.350	-0.178
254.5	70.373	4.34	1.86	3.20	1.0	0.62	8.55	100	56.59	65.13	0.350	-0.176
254.4	70.537	4.25	1.89	3.21	1.0	0.62	8.43	100	56.55	64.98	0.350	-0.175
254.2	70.701	4.18	1.59	3.18	1.0	0.62	8.33	100	56.52	64.86	0.350	-0.175
254.0	70.865	4.09	1.46	3.18	1.0	0.62	8.21	100	56.48	64.69	0.350	-0.174
253.9	71.029	3.94	1.48	3.19	1.0	0.61	8.01	100	56.42	64.42	0.350	-0.172
253.7	71.193	3.96	1.46	3.19	1.0	0.61	8.04	100	56.43	64.46	0.350	-0.172
253.5	71.357	4.05	1.42	3.17	1.0	0.61	8.17	100	56.47	64.64	0.350	-0.173
253.4	71.521	4.13	1.50	3.18	1.0	0.61	8.30	100	56.51	64.81	0.350	-0.174
253.2	71.685	4.43	1.48	3.15	1.0	0.61	8.75	100	56.65	65.40	0.350	-0.177
253.1	71.850	5.09	2.18	3.17	1.0	0.61	9.72	100	56.95	66.66	0.350	-0.185
252.9	72.014	4.97	2.36	3.20	1.0	0.61	9.55	100	56.90	66.45	0.350	-0.183
252.7	72.178	4.97	2.33	3.20	1.0	0.61	9.56	100	56.90	66.46	0.350	-0.183
252.6	72.342	4.60	2.17	3.21	1.0	0.61	9.02	100	56.73	65.75	0.350	-0.179
252.4	72.506	4.33	2.06	3.22	1.0	0.61	8.63	100	56.61	65.24	0.350	-0.176
252.2	72.670	4.25	1.83	3.21	1.0	0.61	8.52	100	56.58	65.10	0.350	-0.175
252.1	72.834	4.21	1.62	3.18	1.0	0.61	8.48	100	56.57	65.05	0.350	-0.175
251.9	72.998	4.27	1.57	3.17	1.0	0.61	8.58	100	56.60	65.18	0.350	-0.175
251.7	73.162	4.15	1.57	3.18	1.0	0.61	8.40	100	56.54	64.94	0.350	-0.174
251.6	73.326	4.11	1.55	3.19	1.0	0.61	8.35	100	56.53	64.88	0.350	-0.173
251.4	73.490	4.06	1.53	3.19	1.0	0.61	8.29	100	56.51	64.80	0.350	-0.173
251.2	73.654	4.11	1.46	3.17	1.0	0.60	8.38	100	56.53	64.91	0.350	-0.173
251.1	73.818	4.30	1.44	3.15	1.0	0.60	8.66	100	56.62	65.28	0.350	-0.176
250.9	73.982	4.39	1.59	3.16	1.0	0.60	8.79	100	56.66	65.45	0.350	-0.177
250.8	74.146	4.37	1.70	3.18	1.0	0.60	8.77	100	56.66	65.42	0.350	-0.176
250.6	74.310	4.41	1.61	3.17	1.0	0.60	8.84	100	56.68	65.52	0.350	-0.177
250.4	74.474	4.41	1.51	3.15	1.0	0.60	8.85	100	56.68	65.53	0.350	-0.177
250.3	74.638	4.30	1.58	3.17	1.0	0.60	8.70	100	56.63	65.34	0.350	-0.176
250.1	74.802	4.36	1.64	3.17	1.0	0.60	8.79	100	56.66	65.45	0.350	-0.176

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
249.9	74.966	4.31	1.86	3.20	1.0	0.60	8.73	100	56.64	65.37	0.350	-0.176
249.8	75.130	4.29	1.78	3.20	1.0	0.60	8.71	100	56.64	65.34	0.350	-0.175
249.6	75.294	4.71	1.56	3.13	1.0	0.60	9.34	100	56.83	66.17	0.350	-0.180
249.4	75.458	4.68	1.55	3.13	1.0	0.60	9.30	100	56.82	66.12	0.350	-0.180
249.3	75.622	4.58	1.62	3.15	1.0	0.60	9.16	100	56.78	65.93	0.350	-0.179
249.1	75.786	4.29	1.92	3.21	1.0	0.60	8.74	100	56.65	65.39	0.350	-0.175
248.9	75.951	4.29	1.76	3.19	1.0	0.60	8.74	100	56.65	65.39	0.350	-0.175
248.8	76.115	4.38	1.55	3.16	1.0	0.60	8.89	100	56.69	65.58	0.350	-0.176
248.6	76.279	4.32	1.46	3.15	1.0	0.59	8.81	100	56.67	65.47	0.350	-0.176
248.5	76.443	5.08	1.53	3.10	1.0	0.60	9.95	100	57.02	66.97	0.350	-0.184
248.3	76.607	4.24	2.06	3.23	1.0	0.59	8.69	100	56.63	65.32	0.350	-0.175
248.1	76.771	4.24	2.10	3.23	1.0	0.59	8.70	100	56.64	65.34	0.350	-0.175
248.0	76.935	4.32	1.57	3.17	1.0	0.59	8.83	100	56.68	65.51	0.350	-0.175
247.8	77.099	4.43	1.50	3.15	1.0	0.59	9.00	100	56.73	65.73	0.350	-0.177
247.6	77.263	4.50	1.77	3.18	1.0	0.59	9.11	100	56.76	65.88	0.350	-0.177
247.5	77.427	4.22	2.00	3.23	1.0	0.59	8.71	100	56.64	65.35	0.350	-0.174
247.3	77.591	4.06	1.81	3.22	1.0	0.59	8.48	100	56.57	65.05	0.350	-0.172
247.1	77.755	4.26	1.32	3.14	1.0	0.59	8.78	100	56.66	65.44	0.350	-0.175
247.0	77.919	4.12	1.26	3.15	1.0	0.59	8.59	100	56.60	65.18	0.350	-0.173
246.8	78.083	4.08	1.17	3.14	1.0	0.59	8.53	100	56.58	65.11	0.350	-0.173
246.7	78.247	3.99	1.26	3.16	1.0	0.59	8.40	100	56.54	64.94	0.350	-0.172
246.5	78.411	4.22	6.45	3.49	1.0	0.59	8.75	100	56.65	65.40	0.350	-0.174
246.3	78.575	2.90	13.04	3.81	1.0	0.58	6.79	100	56.04	62.83	0.350	-0.159
246.2	78.739	64.56	1.65	2.20	0.5	0.67	71.28	39	58.11	129.39	0.350	-0.459
246.0	78.903	112.97	1.31	1.95	0.5	0.71	129.88	19	37.97	167.85	0.350	-0.581
245.8	79.067	149.58	1.19	1.83	0.5	0.72	174.35	9	8.00	182.35	0.350	-0.600
245.7	79.231	116.52	1.40	1.96	0.5	0.72	135.53	20	41.04	176.57	0.350	-0.600
245.5	79.395	69.84	1.60	2.16	0.5	0.67	77.63	36	57.33	134.96	0.350	-0.478
245.3	79.559	18.14	3.31	2.81	1.0	0.62	31.27	88	62.42	93.69	0.350	-0.317
245.2	79.723	10.24	4.62	3.10	1.0	0.60	18.22	100	59.59	77.81	0.350	-0.241
245.0	79.887	13.65	2.51	2.84	1.0	0.61	23.75	90	60.39	84.13	0.350	-0.273
244.8	80.052	14.75	1.42	2.68	1.0	0.61	25.49	77	59.27	84.76	0.350	-0.276
244.7	80.216	14.17	2.11	2.79	1.0	0.61	24.62	86	60.15	84.77	0.350	-0.276
244.5	80.380	13.05	3.49	2.94	1.0	0.61	22.87	98	60.88	83.75	0.350	-0.271
244.4	80.544	10.53	3.94	3.05	1.0	0.60	18.77	100	59.76	78.53	0.350	-0.245
244.2	80.708	6.94	4.28	3.21	1.0	0.59	13.06	100	57.99	71.04	0.350	-0.205
244.0	80.872	5.03	3.29	3.27	1.0	0.58	10.11	100	57.07	67.18	0.350	-0.183
243.9	81.036	4.67	1.91	3.18	1.0	0.58	9.56	100	56.90	66.46	0.350	-0.179
243.7	81.200	4.62	1.34	3.11	1.0	0.58	9.49	100	56.88	66.37	0.350	-0.178
243.5	81.364	4.47	1.20	3.11	1.0	0.58	9.27	100	56.81	66.08	0.350	-0.177
243.4	81.528	4.93	1.41	3.10	1.0	0.58	9.99	100	57.03	67.02	0.350	-0.182
243.2	81.692	22.99	0.71	2.37	0.5	0.59	24.66	52	53.33	77.99	0.350	-0.241
243.0	81.856	41.38	1.28	2.28	0.5	0.62	44.38	45	55.69	100.07	0.350	-0.344
242.9	82.020	15.85	3.45	2.87	1.0	0.61	27.79	93	61.86	89.65	0.350	-0.298
242.7	82.184	12.66	3.94	2.98	1.0	0.60	22.44	100	60.90	83.34	0.350	-0.268
242.6	82.348	12.09	3.37	2.96	1.0	0.60	21.52	100	60.59	82.11	0.350	-0.262
242.4	82.512	18.14	2.22	2.71	1.0	0.61	31.73	80	61.49	93.22	0.350	-0.314
242.2	82.676	12.99	2.82	2.89	1.0	0.60	23.02	94	60.54	83.57	0.350	-0.269
242.1	82.840	8.29	3.61	3.11	1.0	0.58	15.35	100	58.70	74.04	0.350	-0.220
241.9	83.004	6.52	3.52	3.19	1.0	0.58	12.55	100	57.83	70.38	0.350	-0.200
241.7	83.168	4.90	3.44	3.29	1.0	0.57	10.01	100	57.04	67.06	0.350	-0.182
241.6	83.332	4.75	6.35	3.45	1.0	0.57	9.79	100	56.97	66.77	0.350	-0.180
241.4	83.496	52.92	0.60	2.01	0.5	0.61	55.17	24	38.31	93.48	0.350	-0.314
241.2	83.660	99.06	0.96	1.90	0.5	0.66	108.90	15	24.06	132.96	0.350	-0.469
241.1	83.824	126.26	1.05	1.85	0.5	0.68	142.95	11	11.60	154.55	0.350	-0.539
240.9	83.988	137.00	1.00	1.81	0.5	0.69	155.80	7	2.64	158.43	0.350	-0.551
240.7	84.153	96.36	1.92	2.11	0.5	0.70	113.20	32	61.11	174.31	0.350	-0.597
240.6	84.317	34.11	3.81	2.65	1.0	0.66	62.28	75	69.71	131.99	0.350	-0.465
240.4	84.481	15.29	4.78	2.97	1.0	0.60	27.24	100	62.39	89.63	0.350	-0.297
240.3	84.645	75.42	1.10	2.03	0.5	0.65	83.11	26	45.61	128.72	0.350	-0.453
240.1	84.809	107.68	0.47	1.69	0.5	0.63	114.17	0	0.00	114.17	0.350	-0.400
239.9	84.973	72.09	1.52	2.14	0.5	0.66	80.76	34	56.10	136.86	0.350	-0.481
239.8	85.137	24.30	3.16	2.70	1.0	0.62	43.49	79	64.91	108.40	0.350	-0.377
239.6	85.301	13.16	6.04	3.09	1.0	0.59	23.68	100	61.29	84.97	0.350	-0.274
239.4	85.465	10.12	6.38	3.19	1.0	0.58	18.57	100	59.70	78.26	0.350	-0.241
239.3	85.629	10.98	3.71	3.02	1.0	0.58	20.03	100	60.15	80.19	0.350	-0.251

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	(ft)	Q	F (%)	I_c	n	C_N	qc_{IN}	FC (%)	Δqc_{IN}	$(qc_{IN})_{CS}$	a	ξ_R
239.1	85.793	8.97	2.02	2.94	1.0	0.58	16.69	98	58.99	75.68	0.350	-0.227
238.9	85.957	18.01	2.05	2.69	1.0	0.60	32.10	78	61.39	93.49	0.350	-0.313
238.8	86.121	12.64	2.42	2.86	1.0	0.59	22.85	92	60.27	83.11	0.350	-0.265
238.6	86.285	57.38	0.79	2.04	0.5	0.62	61.03	26	43.04	104.07	0.350	-0.359
238.5	86.449	76.69	0.85	1.96	0.5	0.63	82.66	20	33.91	116.57	0.350	-0.408
238.3	86.613	42.74	2.12	2.40	0.5	0.62	46.50	55	60.27	106.77	0.350	-0.370
238.1	86.777	14.16	3.55	2.92	1.0	0.59	25.59	96	61.55	87.14	0.350	-0.284
238.0	86.941	20.97	1.78	2.60	1.0	0.61	37.57	71	61.80	99.37	0.350	-0.339
237.8	87.105	46.39	2.03	2.36	0.5	0.62	50.67	52	60.26	110.92	0.350	-0.386
237.6	87.269	24.01	3.28	2.72	1.0	0.62	43.52	80	65.10	108.62	0.350	-0.377
237.5	87.433	12.27	6.49	3.13	1.0	0.58	22.42	100	60.89	83.31	0.350	-0.265
237.3	87.597	27.29	2.73	2.62	1.0	0.63	49.83	73	65.70	115.53	0.350	-0.404
237.1	87.761	160.12	1.03	1.77	0.5	0.71	191.60	4	0.07	191.67	0.350	-0.600
237.0	87.925	193.91	1.13	1.74	0.5	0.76	248.47	2	0.00	248.47	0.350	-0.600
236.8	88.089	205.39	1.30	1.77	0.5	0.77	264.77	4	0.06	264.83	0.350	-0.600
236.6	88.254	197.08	1.47	1.82	0.5	0.77	254.32	8	6.27	260.59	0.350	-0.600
236.5	88.418	178.84	1.50	1.85	0.5	0.76	228.77	11	16.14	244.91	0.350	-0.600
236.3	88.582	154.61	1.42	1.88	0.5	0.73	191.01	13	22.98	213.99	0.350	-0.600
236.2	88.746	125.60	1.60	1.98	0.5	0.72	153.20	21	47.47	200.67	0.350	-0.600
236.0	88.910	88.59	2.39	2.21	0.5	0.69	104.69	40	66.83	171.52	0.350	-0.587
235.8	89.074	23.72	5.64	2.88	1.0	0.62	43.62	93	66.77	110.39	0.350	-0.383
235.7	89.238	13.20	7.34	3.14	1.0	0.58	24.25	100	61.46	85.71	0.350	-0.276
235.5	89.402	9.34	4.62	3.13	1.0	0.57	17.63	100	59.41	77.03	0.350	-0.233
235.3	89.566	14.33	2.19	2.79	1.0	0.58	26.19	86	60.66	86.85	0.350	-0.281
235.2	89.730	8.69	4.74	3.16	1.0	0.56	16.57	100	59.08	75.64	0.350	-0.226
235.0	89.894	85.51	1.14	2.00	0.5	0.65	95.99	23	42.84	138.83	0.350	-0.486
234.8	90.058	134.95	0.94	1.79	0.5	0.67	153.82	6	1.18	155.00	0.350	-0.538
234.7	90.222	140.75	1.09	1.82	0.5	0.68	164.40	9	6.32	170.71	0.350	-0.584
234.5	90.386	138.37	1.28	1.88	0.5	0.70	165.90	13	22.01	187.92	0.350	-0.600
234.3	90.550	154.81	1.12	1.80	0.5	0.70	185.19	7	2.53	187.72	0.350	-0.600
234.2	90.714	145.32	1.60	1.93	0.5	0.73	182.58	18	40.17	222.75	0.350	-0.600
234.0	90.878	126.62	1.63	1.98	0.5	0.72	155.78	21	48.51	204.29	0.350	-0.600
233.9	91.042	98.29	1.95	2.11	0.5	0.69	117.54	32	61.90	179.45	0.350	-0.600
233.7	91.206	95.30	1.61	2.06	0.5	0.68	111.97	28	55.19	167.17	0.350	-0.574
233.5	91.370	77.05	1.59	2.13	0.5	0.65	87.88	33	56.94	144.82	0.350	-0.505
233.4	91.534	66.91	1.48	2.15	0.5	0.63	74.85	35	56.12	130.97	0.350	-0.458
233.2	91.698	62.65	1.39	2.16	0.5	0.63	69.45	36	55.17	124.63	0.350	-0.436
233.0	91.862	60.70	1.66	2.22	0.5	0.63	67.60	40	58.58	126.19	0.350	-0.441
232.9	92.026	52.62	1.42	2.22	0.5	0.61	57.60	41	56.38	113.98	0.350	-0.396
232.7	92.190	48.05	1.29	2.23	0.5	0.60	52.15	41	55.32	107.47	0.350	-0.370
232.5	92.355	40.12	1.64	2.35	0.5	0.59	43.48	51	58.08	101.56	0.350	-0.346
232.4	92.519	20.10	1.73	2.61	1.0	0.59	37.12	72	61.81	98.93	0.350	-0.334
232.2	92.683	45.27	1.19	2.23	0.5	0.60	48.88	41	54.54	103.42	0.350	-0.353
232.1	92.847	39.65	1.55	2.34	0.5	0.59	42.91	50	57.57	100.48	0.350	-0.341
231.9	93.011	22.31	1.93	2.60	1.0	0.60	41.48	71	62.93	104.41	0.350	-0.357
231.7	93.175	16.53	3.80	2.88	1.0	0.58	30.78	94	62.88	93.66	0.350	-0.311
231.6	93.339	14.31	2.93	2.86	1.0	0.57	26.71	92	61.48	88.19	0.350	-0.286
231.4	93.503	59.73	0.84	2.04	0.5	0.60	64.12	26	43.57	107.69	0.350	-0.370
231.2	93.667	77.25	0.74	1.92	0.5	0.60	82.09	17	26.02	108.11	0.350	-0.372
231.1	93.831	64.37	0.89	2.03	0.5	0.61	69.66	26	43.19	112.85	0.350	-0.391
230.9	93.995	54.62	1.22	2.17	0.5	0.61	59.68	37	53.76	113.43	0.350	-0.393
230.7	94.159	24.54	2.20	2.60	1.0	0.60	46.20	71	64.31	110.51	0.350	-0.381
230.6	94.323	16.83	3.85	2.88	1.0	0.58	31.54	93	63.09	94.63	0.350	-0.315
230.4	94.487	11.05	11.50	3.33	1.0	0.56	21.06	100	60.47	81.53	0.350	-0.253

LIQUEFACTION POTENTIAL ASSESSMENT FOR COARSE GRAINED SOILS USING CONE PENETRATION TEST DATA

Project Site: US 60 Bridge		Depth to Water during Earthquake: 11.8 ft		Shear Stress Fit Parameters	
Stantec Project No.: 178565011		Final Grade Elevation during EQ: 324.9 ft		m4:	0
CPT ID: SP06		Height of Final Grade above CPT TOH: 0.0 ft		m3:	0
		Normalize K_v to: 1.058 tsf		m2:	0
		a_{max} at top of ground surface: 0.24 g		m1:	0
		Earthquake Magnitude: 7.70 Mw			
		Earthquake File or Source Zone: Design Source			

Elev. (ft)	Depth z (ft)	Cyclic Resistance Ratio $CRR_{7.5}$	Relative Density D_r (%)	Correction for Overburden Pressure K_σ	Correction for Sloping Ground K_ϕ	Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., r_d	From Ground Response			Sample Screened for:			Factor of Safety FS_{liq}	Material (optional)	Soil Type (see note on following chart)
									Maximum Induced Shear Stress τ_{Max} (psf)	Average Cyclic Shear Stress τ_{Avg} (psf)	Cyclic Stress Ratio CSR	Clay-like $(qc_{3N})/cs \geq 175$	High Tip Res.	Unsaturated			
324.9																	
324.7	0.164	0.082	16	1.100	N/A	0.99	N/A	1.000	0	0	0.154	FALSE	FALSE	TRUE	N/A	N/A	A1
324.6	0.328	0.100	35	1.100	N/A	0.99	N/A	1.000	0	0	0.154	FALSE	FALSE	TRUE	N/A	N/A	A1
324.4	0.492	0.107	40	1.100	N/A	0.99	N/A	1.000	0	0	0.154	FALSE	FALSE	TRUE	N/A	N/A	A1
324.2	0.656	0.134	54	1.100	N/A	0.98	N/A	1.000	0	0	0.154	FALSE	FALSE	TRUE	N/A	N/A	A1
324.1	0.820	0.138	55	1.100	N/A	0.98	N/A	1.000	0	0	0.154	FALSE	FALSE	TRUE	N/A	N/A	A1
323.9	0.984	0.304	74	1.100	N/A	0.96	N/A	1.000	0	0	0.154	FALSE	FALSE	TRUE	N/A	N/A	A1
323.8	1.148	0.196	66	1.100	N/A	0.97	N/A	1.000	0	0	0.154	FALSE	FALSE	TRUE	N/A	N/A	A1
323.6	1.312	0.142	56	1.100	N/A	0.98	N/A	1.000	0	0	0.154	FALSE	FALSE	TRUE	N/A	N/A	A1
323.4	1.476	0.133	53	1.100	N/A	0.98	N/A	1.000	0	0	0.154	FALSE	FALSE	TRUE	N/A	N/A	A1
323.3	1.640	0.150	58	1.100	N/A	0.98	N/A	1.000	0	0	0.154	FALSE	FALSE	TRUE	N/A	N/A	A1
323.1	1.804	0.162	61	1.100	N/A	0.98	N/A	1.000	0	0	0.154	FALSE	FALSE	TRUE	N/A	N/A	A1
322.9	1.968	0.172	63	1.100	N/A	0.97	N/A	1.000	0	0	0.154	FALSE	FALSE	TRUE	N/A	N/A	A1
322.8	2.133	0.168	62	1.100	N/A	0.98	N/A	1.000	0	0	0.154	FALSE	FALSE	TRUE	N/A	N/A	A1
322.6	2.297	0.167	62	1.100	N/A	0.98	N/A	1.000	0	0	0.154	FALSE	FALSE	TRUE	N/A	N/A	A1
322.4	2.461	0.174	63	1.100	N/A	0.97	N/A	1.000	0	0	0.154	FALSE	FALSE	TRUE	N/A	N/A	A1
322.3	2.625	0.183	65	1.100	N/A	0.97	N/A	1.000	0	0	0.154	FALSE	FALSE	TRUE	N/A	N/A	A1
322.1	2.789	0.178	64	1.100	N/A	0.97	N/A	1.000	0	0	0.154	FALSE	FALSE	TRUE	N/A	N/A	A1
321.9	2.953	0.168	62	1.100	N/A	0.98	N/A	1.000	0	0	0.154	FALSE	FALSE	TRUE	N/A	N/A	A1
321.8	3.117	0.164	62	1.100	N/A	0.98	N/A	1.000	0	0	0.154	FALSE	FALSE	TRUE	N/A	N/A	A1
321.6	3.281	0.167	62	1.100	N/A	0.98	N/A	1.000	0	0	0.154	FALSE	FALSE	TRUE	N/A	N/A	A1
321.5	3.445	0.169	63	1.100	N/A	0.98	N/A	1.000	0	0	0.154	FALSE	FALSE	TRUE	N/A	N/A	A1
321.3	3.609	0.166	60	1.100	N/A	0.98	N/A	0.999	0	0	0.154	FALSE	FALSE	TRUE	N/A	N/A	A1
321.1	3.773	0.146	58	1.100	N/A	0.98	N/A	0.999	0	0	0.154	FALSE	FALSE	TRUE	N/A	N/A	A1
321.0	3.937	0.142	56	1.100	N/A	0.98	N/A	0.999	0	0	0.153	FALSE	FALSE	TRUE	N/A	N/A	A1
320.8	4.101	0.139	55	1.100	N/A	0.98	N/A	0.998	0	0	0.153	FALSE	FALSE	TRUE	N/A	N/A	A1
320.6	4.265	0.138	55	1.100	N/A	0.98	N/A	0.998	0	0	0.153	FALSE	FALSE	TRUE	N/A	N/A	A1
320.5	4.429	0.135	54	1.100	N/A	0.98	N/A	0.998	0	0	0.153	FALSE	FALSE	TRUE	N/A	N/A	A1
320.3	4.593	0.132	53	1.100	N/A	0.98	N/A	0.997	0	0	0.153	FALSE	FALSE	TRUE	N/A	N/A	A1
320.1	4.757	0.132	53	1.100	N/A	0.98	N/A	0.997	0	0	0.153	FALSE	FALSE	TRUE	N/A	N/A	A1
320.0	4.921	0.127	51	1.100	N/A	0.99	N/A	0.996	0	0	0.153	FALSE	FALSE	TRUE	N/A	N/A	A1
319.8	5.085	0.119	47	1.100	N/A	0.99	N/A	0.996	0	0	0.153	FALSE	FALSE	TRUE	N/A	N/A	B
319.7	5.249	0.116	46	1.100	N/A	0.99	N/A	0.996	0	0	0.153	FALSE	FALSE	TRUE	N/A	N/A	B
319.5	5.413	0.114	45	1.100	N/A	0.99	N/A	0.995	0	0	0.153	FALSE	FALSE	TRUE	N/A	N/A	B
319.3	5.577	0.110	42	1.099	N/A	0.99	N/A	0.995	0	0	0.153	FALSE	FALSE	TRUE	N/A	N/A	B
319.2	5.741	N/A	40	N/A	N/A	N/A	N/A	0.995	0	0	0.153	TRUE	FALSE	TRUE	N/A	N/A	B
319.0	5.905	N/A	40	N/A	N/A	N/A	N/A	0.994	0	0	0.153	TRUE	FALSE	TRUE	N/A	N/A	B
318.8	6.069	N/A	40	N/A	N/A	N/A	N/A	0.994	0	0	0.153	TRUE	FALSE	TRUE	N/A	N/A	B
318.7	6.234	N/A	40	N/A	N/A	N/A	N/A	0.994	0	0	0.153	TRUE	FALSE	TRUE	N/A	N/A	B
318.5	6.398	N/A	39	N/A	N/A	N/A	N/A	0.993	0	0	0.153	TRUE	FALSE	TRUE	N/A	N/A	B
318.3	6.562	N/A	37	N/A	N/A	N/A	N/A	0.993	0	0	0.153	TRUE	FALSE	TRUE	N/A	N/A	C
318.2	6.726	N/A	37	N/A	N/A	N/A	N/A	0.992	0	0	0.153	TRUE	FALSE	TRUE	N/A	N/A	C
318.0	6.890	N/A	37	N/A	N/A	N/A	N/A	0.992	0	0	0.152	TRUE	FALSE	TRUE	N/A	N/A	C
317.8	7.054	N/A	37	N/A	N/A	N/A	N/A	0.992	0	0	0.152	TRUE	FALSE	TRUE	N/A	N/A	C
317.7	7.218	N/A	37	N/A	N/A	N/A	N/A	0.991	0	0	0.152	TRUE	FALSE	TRUE	N/A	N/A	C

Elev. (ft)	Depth z (ft)	Cyclic Resistance Ratio $CRR_{7.5}$	Relative Density D_r (%)	Correction for		Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., t_d	Front Ground Response			Sample Screened for:				Factor of Safety FS_{liq}	Material (optional)	Soil Type (see note on following chart)
				Overburden Pressure K_o	Sloping Ground K_σ				Shear Stress τ_{max} (psf)	Induced Shear Stress τ_{avg} (psf)	Average Cyclic Shear Stress τ_{Avg} (psf)	Cyclic Stress Ratio CSR	Clay-like $(q_{c30}) \geq 175$	High Tip Res.	Unsaturated			
317.5	7.382	N/A	39	N/A	N/A	N/A	N/A	0.991	0	0	0	0.152	TRUE	FALSE	TRUE	N/A	N/A	C
317.4	7.546	N/A	40	N/A	N/A	N/A	N/A	0.991	0	0	0	0.152	TRUE	FALSE	TRUE	N/A	N/A	C
317.2	7.710	N/A	39	N/A	N/A	N/A	N/A	0.990	0	0	0	0.152	TRUE	FALSE	TRUE	N/A	N/A	C
317.0	7.874	N/A	38	N/A	N/A	N/A	N/A	0.990	0	0	0	0.152	TRUE	FALSE	TRUE	N/A	N/A	C
316.9	8.038	N/A	37	N/A	N/A	N/A	N/A	0.989	0	0	0	0.152	TRUE	FALSE	TRUE	N/A	N/A	C
316.7	8.202	N/A	38	N/A	N/A	N/A	N/A	0.989	0	0	0	0.152	TRUE	FALSE	TRUE	N/A	N/A	C
316.5	8.366	N/A	40	N/A	N/A	N/A	N/A	0.988	0	0	0	0.152	TRUE	FALSE	TRUE	N/A	N/A	C
316.4	8.530	N/A	41	N/A	N/A	N/A	N/A	0.988	0	0	0	0.152	TRUE	FALSE	TRUE	N/A	N/A	C
316.2	8.694	N/A	40	N/A	N/A	N/A	N/A	0.988	0	0	0	0.152	TRUE	FALSE	TRUE	N/A	N/A	B
316.0	8.858	N/A	39	N/A	N/A	N/A	N/A	0.987	0	0	0	0.152	TRUE	FALSE	TRUE	N/A	N/A	B
315.9	9.022	N/A	36	N/A	N/A	N/A	N/A	0.987	0	0	0	0.152	TRUE	FALSE	TRUE	N/A	N/A	C
315.7	9.186	N/A	35	N/A	N/A	N/A	N/A	0.987	0	0	0	0.152	TRUE	FALSE	TRUE	N/A	N/A	C
315.5	9.350	N/A	35	N/A	N/A	N/A	N/A	0.986	0	0	0	0.152	TRUE	FALSE	TRUE	N/A	N/A	C
315.4	9.514	N/A	35	N/A	N/A	N/A	N/A	0.986	0	0	0	0.152	TRUE	FALSE	TRUE	N/A	N/A	C
315.2	9.678	N/A	34	N/A	N/A	N/A	N/A	0.985	0	0	0	0.151	TRUE	FALSE	TRUE	N/A	N/A	C
315.1	9.842	N/A	36	N/A	N/A	N/A	N/A	0.985	0	0	0	0.151	TRUE	FALSE	TRUE	N/A	N/A	C
314.9	10.006	N/A	35	N/A	N/A	N/A	N/A	0.984	0	0	0	0.151	TRUE	FALSE	TRUE	N/A	N/A	C
314.7	10.170	N/A	35	N/A	N/A	N/A	N/A	0.984	0	0	0	0.151	TRUE	FALSE	TRUE	N/A	N/A	C
314.6	10.335	N/A	36	N/A	N/A	N/A	N/A	0.984	0	0	0	0.151	TRUE	FALSE	TRUE	N/A	N/A	C
314.4	10.499	N/A	35	N/A	N/A	N/A	N/A	0.983	0	0	0	0.151	TRUE	FALSE	TRUE	N/A	N/A	C
314.2	10.663	N/A	37	N/A	N/A	N/A	N/A	0.983	0	0	0	0.151	TRUE	FALSE	TRUE	N/A	N/A	C
314.1	10.827	N/A	37	N/A	N/A	N/A	N/A	0.982	0	0	0	0.151	TRUE	FALSE	TRUE	N/A	N/A	C
313.9	10.991	N/A	36	N/A	N/A	N/A	N/A	0.982	0	0	0	0.151	TRUE	FALSE	TRUE	N/A	N/A	C
313.7	11.155	N/A	35	N/A	N/A	N/A	N/A	0.982	0	0	0	0.151	TRUE	FALSE	TRUE	N/A	N/A	C
313.6	11.319	N/A	34	N/A	N/A	N/A	N/A	0.981	0	0	0	0.151	TRUE	FALSE	TRUE	N/A	N/A	C
313.4	11.483	N/A	35	N/A	N/A	N/A	N/A	0.981	0	0	0	0.151	TRUE	FALSE	TRUE	N/A	N/A	C
313.3	11.647	N/A	35	N/A	N/A	N/A	N/A	0.980	0	0	0	0.151	TRUE	FALSE	TRUE	N/A	N/A	C
313.1	11.811	N/A	34	N/A	N/A	N/A	N/A	0.980	0	0	0	0.151	TRUE	FALSE	TRUE	N/A	N/A	C
312.9	11.975	N/A	33	N/A	N/A	N/A	N/A	0.979	0	0	0	0.152	TRUE	FALSE	FALSE	N/A	N/A	C
312.8	12.139	N/A	34	N/A	N/A	N/A	N/A	0.979	0	0	0	0.153	TRUE	FALSE	FALSE	N/A	N/A	C
312.6	12.303	N/A	33	N/A	N/A	N/A	N/A	0.978	0	0	0	0.154	TRUE	FALSE	FALSE	N/A	N/A	C
312.4	12.467	N/A	33	N/A	N/A	N/A	N/A	0.978	0	0	0	0.155	TRUE	FALSE	FALSE	N/A	N/A	C
312.3	12.631	N/A	33	N/A	N/A	N/A	N/A	0.978	0	0	0	0.156	TRUE	FALSE	FALSE	N/A	N/A	C
312.1	12.795	N/A	33	N/A	N/A	N/A	N/A	0.977	0	0	0	0.157	TRUE	FALSE	FALSE	N/A	N/A	C
311.9	12.959	N/A	34	N/A	N/A	N/A	N/A	0.977	0	0	0	0.157	TRUE	FALSE	FALSE	N/A	N/A	C
311.8	13.123	N/A	34	N/A	N/A	N/A	N/A	0.976	0	0	0	0.158	TRUE	FALSE	FALSE	N/A	N/A	C
311.6	13.287	N/A	34	N/A	N/A	N/A	N/A	0.976	0	0	0	0.159	TRUE	FALSE	FALSE	N/A	N/A	C
311.4	13.451	N/A	34	N/A	N/A	N/A	N/A	0.975	0	0	0	0.160	TRUE	FALSE	FALSE	N/A	N/A	C
311.3	13.615	N/A	35	N/A	N/A	N/A	N/A	0.975	0	0	0	0.161	TRUE	FALSE	FALSE	N/A	N/A	C
311.1	13.779	N/A	35	N/A	N/A	N/A	N/A	0.974	0	0	0	0.162	TRUE	FALSE	FALSE	N/A	N/A	C
311.0	13.943	N/A	36	N/A	N/A	N/A	N/A	0.974	0	0	0	0.163	TRUE	FALSE	FALSE	N/A	N/A	C
310.8	14.107	N/A	35	N/A	N/A	N/A	N/A	0.973	0	0	0	0.164	TRUE	FALSE	FALSE	N/A	N/A	C
310.6	14.271	N/A	35	N/A	N/A	N/A	N/A	0.973	0	0	0	0.164	TRUE	FALSE	FALSE	N/A	N/A	C
310.5	14.436	N/A	34	N/A	N/A	N/A	N/A	0.972	0	0	0	0.165	TRUE	FALSE	FALSE	N/A	N/A	C
310.3	14.600	N/A	34	N/A	N/A	N/A	N/A	0.972	0	0	0	0.166	TRUE	FALSE	FALSE	N/A	N/A	C
310.1	14.764	N/A	34	N/A	N/A	N/A	N/A	0.972	0	0	0	0.167	TRUE	FALSE	FALSE	N/A	N/A	C
310.0	14.928	N/A	34	N/A	N/A	N/A	N/A	0.971	0	0	0	0.168	TRUE	FALSE	FALSE	N/A	N/A	C
309.8	15.092	N/A	34	N/A	N/A	N/A	N/A	0.971	0	0	0	0.168	TRUE	FALSE	FALSE	N/A	N/A	C
309.6	15.256	N/A	35	N/A	N/A	N/A	N/A	0.970	0	0	0	0.169	TRUE	FALSE	FALSE	N/A	N/A	C
309.5	15.420	N/A	34	N/A	N/A	N/A	N/A	0.970	0	0	0	0.170	TRUE	FALSE	FALSE	N/A	N/A	C
309.3	15.584	N/A	35	N/A	N/A	N/A	N/A	0.969	0	0	0	0.170	TRUE	FALSE	FALSE	N/A	N/A	C
309.2	15.748	N/A	35	N/A	N/A	N/A	N/A	0.969	0	0	0	0.171	TRUE	FALSE	FALSE	N/A	N/A	C
309.0	15.912	N/A	35	N/A	N/A	N/A	N/A	0.968	0	0	0	0.172	TRUE	FALSE	FALSE	N/A	N/A	C
308.8	16.076	N/A	34	N/A	N/A	N/A	N/A	0.968	0	0	0	0.173	TRUE	FALSE	FALSE	N/A	N/A	C
308.7	16.240	N/A	35	N/A	N/A	N/A	N/A	0.967	0	0	0	0.173	TRUE	FALSE	FALSE	N/A	N/A	C

Elev. (ft)	Depth z (ft)	Cyclic Resistance Ratio $CRR_{7.5}$	Relative Density D_r (%)	Correction for Overburden Pressure K_o	Correction for Sloping Ground K_σ	Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., T_d	From Ground Response			Sample Screened for:				Factor of Safety FS_{liq}	Material (optional)	Soil Type (see note on following chart)
									Maximum Induced Shear Stress τ_{max} (psf)	Average Cyclic Shear Stress τ_{Avg} (psf)	Cyclic Stress Ratio CSR	Clay-like $(q_c)_{30} \geq 175$	High Tip Res.	Unsaturated				
299.5	25.426	N/A	35	N/A	N/A	N/A	N/A	0.937	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	C	
299.3	25.590	N/A	35	N/A	N/A	N/A	N/A	0.937	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	C	
299.1	25.754	N/A	36	N/A	N/A	N/A	N/A	0.936	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	C	
299.0	25.918	N/A	35	N/A	N/A	N/A	N/A	0.935	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C	
298.8	26.082	N/A	35	N/A	N/A	N/A	N/A	0.935	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C	
298.7	26.246	N/A	35	N/A	N/A	N/A	N/A	0.934	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C	
298.5	26.410	N/A	35	N/A	N/A	N/A	N/A	0.934	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C	
298.3	26.574	N/A	35	N/A	N/A	N/A	N/A	0.933	0	0	0.202	TRUE	FALSE	FALSE	N/A	N/A	C	
298.2	26.739	N/A	35	N/A	N/A	N/A	N/A	0.932	0	0	0.202	TRUE	FALSE	FALSE	N/A	N/A	C	
298.0	26.903	N/A	35	N/A	N/A	N/A	N/A	0.932	0	0	0.202	TRUE	FALSE	FALSE	N/A	N/A	C	
297.8	27.067	N/A	35	N/A	N/A	N/A	N/A	0.931	0	0	0.203	TRUE	FALSE	FALSE	N/A	N/A	C	
297.7	27.231	N/A	34	N/A	N/A	N/A	N/A	0.931	0	0	0.203	TRUE	FALSE	FALSE	N/A	N/A	C	
297.5	27.395	N/A	34	N/A	N/A	N/A	N/A	0.930	0	0	0.203	TRUE	FALSE	FALSE	N/A	N/A	C	
297.3	27.559	N/A	34	N/A	N/A	N/A	N/A	0.929	0	0	0.203	TRUE	FALSE	FALSE	N/A	N/A	C	
297.2	27.723	N/A	34	N/A	N/A	N/A	N/A	0.929	0	0	0.204	TRUE	FALSE	FALSE	N/A	N/A	C	
297.0	27.887	N/A	34	N/A	N/A	N/A	N/A	0.928	0	0	0.204	TRUE	FALSE	FALSE	N/A	N/A	C	
296.8	28.051	N/A	34	N/A	N/A	N/A	N/A	0.928	0	0	0.204	TRUE	FALSE	FALSE	N/A	N/A	C	
296.7	28.215	N/A	34	N/A	N/A	N/A	N/A	0.927	0	0	0.204	TRUE	FALSE	FALSE	N/A	N/A	C	
296.5	28.379	N/A	34	N/A	N/A	N/A	N/A	0.926	0	0	0.205	TRUE	FALSE	FALSE	N/A	N/A	C	
296.4	28.543	N/A	35	N/A	N/A	N/A	N/A	0.926	0	0	0.205	TRUE	FALSE	FALSE	N/A	N/A	C	
296.2	28.707	N/A	35	N/A	N/A	N/A	N/A	0.925	0	0	0.205	TRUE	FALSE	FALSE	N/A	N/A	C	
296.0	28.871	N/A	35	N/A	N/A	N/A	N/A	0.925	0	0	0.205	TRUE	FALSE	FALSE	N/A	N/A	C	
295.9	29.035	N/A	35	N/A	N/A	N/A	N/A	0.924	0	0	0.205	TRUE	FALSE	FALSE	N/A	N/A	C	
295.7	29.199	N/A	35	N/A	N/A	N/A	N/A	0.923	0	0	0.206	TRUE	FALSE	FALSE	N/A	N/A	C	
295.5	29.363	N/A	36	N/A	N/A	N/A	N/A	0.923	0	0	0.206	TRUE	FALSE	FALSE	N/A	N/A	C	
295.4	29.527	N/A	37	N/A	N/A	N/A	N/A	0.922	0	0	0.206	TRUE	FALSE	FALSE	N/A	N/A	C	
295.2	29.691	N/A	36	N/A	N/A	N/A	N/A	0.922	0	0	0.206	TRUE	FALSE	FALSE	N/A	N/A	B	
295.0	29.855	N/A	35	N/A	N/A	N/A	N/A	0.921	0	0	0.207	TRUE	FALSE	FALSE	N/A	N/A	B	
294.9	30.019	N/A	36	N/A	N/A	N/A	N/A	0.920	0	0	0.207	TRUE	FALSE	FALSE	N/A	N/A	B	
294.7	30.183	N/A	36	N/A	N/A	N/A	N/A	0.920	0	0	0.207	TRUE	FALSE	FALSE	N/A	N/A	C	
294.6	30.347	N/A	38	N/A	N/A	N/A	N/A	0.919	0	0	0.207	TRUE	FALSE	FALSE	N/A	N/A	C	
294.4	30.511	N/A	37	N/A	N/A	N/A	N/A	0.919	0	0	0.207	TRUE	FALSE	FALSE	N/A	N/A	C	
294.2	30.675	N/A	36	N/A	N/A	N/A	N/A	0.918	0	0	0.207	TRUE	FALSE	FALSE	N/A	N/A	C	
294.1	30.840	N/A	36	N/A	N/A	N/A	N/A	0.917	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C	
293.9	31.004	N/A	36	N/A	N/A	N/A	N/A	0.917	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C	
293.7	31.168	N/A	36	N/A	N/A	N/A	N/A	0.916	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C	
293.6	31.332	N/A	36	N/A	N/A	N/A	N/A	0.916	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C	
293.4	31.496	N/A	36	N/A	N/A	N/A	N/A	0.915	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C	
293.2	31.660	N/A	36	N/A	N/A	N/A	N/A	0.914	0	0	0.209	TRUE	FALSE	FALSE	N/A	N/A	C	
293.1	31.824	N/A	35	N/A	N/A	N/A	N/A	0.914	0	0	0.209	TRUE	FALSE	FALSE	N/A	N/A	C	
292.9	31.988	N/A	36	N/A	N/A	N/A	N/A	0.913	0	0	0.209	TRUE	FALSE	FALSE	N/A	N/A	C	
292.7	32.152	N/A	36	N/A	N/A	N/A	N/A	0.912	0	0	0.209	TRUE	FALSE	FALSE	N/A	N/A	C	
292.6	32.316	N/A	35	N/A	N/A	N/A	N/A	0.912	0	0	0.209	TRUE	FALSE	FALSE	N/A	N/A	C	
292.4	32.480	N/A	36	N/A	N/A	N/A	N/A	0.911	0	0	0.209	TRUE	FALSE	FALSE	N/A	N/A	C	
292.3	32.644	N/A	37	N/A	N/A	N/A	N/A	0.911	0	0	0.210	TRUE	FALSE	FALSE	N/A	N/A	C	
292.1	32.808	N/A	37	N/A	N/A	N/A	N/A	0.910	0	0	0.210	TRUE	FALSE	FALSE	N/A	N/A	C	
291.9	32.972	N/A	36	N/A	N/A	N/A	N/A	0.909	0	0	0.210	TRUE	FALSE	FALSE	N/A	N/A	C	
291.8	33.136	N/A	37	N/A	N/A	N/A	N/A	0.909	0	0	0.210	TRUE	FALSE	FALSE	N/A	N/A	C	
291.6	33.300	N/A	37	N/A	N/A	N/A	N/A	0.908	0	0	0.210	TRUE	FALSE	FALSE	N/A	N/A	C	
291.4	33.464	N/A	38	N/A	N/A	N/A	N/A	0.907	0	0	0.210	TRUE	FALSE	FALSE	N/A	N/A	C	
291.3	33.628	N/A	37	N/A	N/A	N/A	N/A	0.907	0	0	0.210	TRUE	FALSE	FALSE	N/A	N/A	C	
291.1	33.792	N/A	37	N/A	N/A	N/A	N/A	0.906	0	0	0.211	TRUE	FALSE	FALSE	N/A	N/A	C	
290.9	33.956	N/A	37	N/A	N/A	N/A	N/A	0.905	0	0	0.211	TRUE	FALSE	FALSE	N/A	N/A	C	
290.8	34.120	N/A	37	N/A	N/A	N/A	N/A	0.905	0	0	0.211	TRUE	FALSE	FALSE	N/A	N/A	C	
290.6	34.284	N/A	37	N/A	N/A	N/A	N/A	0.904	0	0	0.211	TRUE	FALSE	FALSE	N/A	N/A	C	

Elev. (ft)	Depth z (ft)	Cyclic Resistance Ratio $CRR_{7.5}$	Relative Density D_r (%)	Correction for		Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CHR	Stress Reduction Coeff., t_d	Front Ground Response			Sample Screened for:				Factor of Safety FS_{liq}	Material (optional)	Soil Type (see note on following chart)
				Overburden Pressure K_o	Sloping Ground K_σ				Induced Shear Stress τ_{max} (psf)	Maximum Cyclic Shear Stress τ_{Avg} (psf)	Cyclic Stress Ratio CSR	Clay-like $(qc_{30}) \geq 175$	High Tip Res.	Unsaturated				
290.5	34.448	N/A	37	N/A	N/A	N/A	N/A	0.904	0	0	0.211	TRUE	FALSE	FALSE	N/A	N/A	C	
290.3	34.612	N/A	37	N/A	N/A	N/A	N/A	0.903	0	0	0.211	TRUE	FALSE	FALSE	N/A	N/A	C	
290.1	34.776	N/A	37	N/A	N/A	N/A	N/A	0.902	0	0	0.211	TRUE	FALSE	FALSE	N/A	N/A	C	
290.0	34.941	N/A	37	N/A	N/A	N/A	N/A	0.902	0	0	0.211	TRUE	FALSE	FALSE	N/A	N/A	C	
289.8	35.105	N/A	37	N/A	N/A	N/A	N/A	0.901	0	0	0.212	TRUE	FALSE	FALSE	N/A	N/A	C	
289.6	35.269	N/A	37	N/A	N/A	N/A	N/A	0.900	0	0	0.212	TRUE	FALSE	FALSE	N/A	N/A	C	
289.5	35.433	N/A	37	N/A	N/A	N/A	N/A	0.900	0	0	0.212	TRUE	FALSE	FALSE	N/A	N/A	C	
289.3	35.597	N/A	37	N/A	N/A	N/A	N/A	0.899	0	0	0.212	TRUE	FALSE	FALSE	N/A	N/A	C	
289.1	35.761	N/A	38	N/A	N/A	N/A	N/A	0.898	0	0	0.212	TRUE	FALSE	FALSE	N/A	N/A	C	
289.0	35.925	N/A	37	N/A	N/A	N/A	N/A	0.898	0	0	0.212	TRUE	FALSE	FALSE	N/A	N/A	C	
288.8	36.089	N/A	39	N/A	N/A	N/A	N/A	0.897	0	0	0.212	TRUE	FALSE	FALSE	N/A	N/A	C	
288.6	36.253	N/A	38	N/A	N/A	N/A	N/A	0.896	0	0	0.212	TRUE	FALSE	FALSE	N/A	N/A	C	
288.5	36.417	N/A	37	N/A	N/A	N/A	N/A	0.896	0	0	0.212	TRUE	FALSE	FALSE	N/A	N/A	C	
288.3	36.581	N/A	37	N/A	N/A	N/A	N/A	0.895	0	0	0.212	TRUE	FALSE	FALSE	N/A	N/A	C	
288.2	36.745	N/A	37	N/A	N/A	N/A	N/A	0.895	0	0	0.213	TRUE	FALSE	FALSE	N/A	N/A	C	
288.0	36.909	N/A	37	N/A	N/A	N/A	N/A	0.894	0	0	0.213	TRUE	FALSE	FALSE	N/A	N/A	C	
287.8	37.073	N/A	38	N/A	N/A	N/A	N/A	0.893	0	0	0.213	TRUE	FALSE	FALSE	N/A	N/A	C	
287.7	37.237	N/A	37	N/A	N/A	N/A	N/A	0.893	0	0	0.213	TRUE	FALSE	FALSE	N/A	N/A	C	
287.5	37.401	N/A	39	N/A	N/A	N/A	N/A	0.892	0	0	0.213	TRUE	FALSE	FALSE	N/A	N/A	C	
287.3	37.565	0.118	47	0.971	0.877	0.99	0.100	0.891	0	0	0.213	FALSE	FALSE	FALSE	0.5	N/A	A2	
287.2	37.729	N/A	43	N/A	N/A	N/A	N/A	0.891	0	0	0.213	TRUE	FALSE	FALSE	N/A	N/A	C	
287.0	37.893	N/A	38	N/A	N/A	N/A	N/A	0.890	0	0	0.213	TRUE	FALSE	FALSE	N/A	N/A	C	
286.8	38.057	N/A	42	N/A	N/A	N/A	N/A	0.889	0	0	0.213	TRUE	FALSE	FALSE	N/A	N/A	C	
286.7	38.221	0.115	45	0.970	0.815	0.99	0.090	0.889	0	0	0.213	FALSE	FALSE	FALSE	0.4	N/A	A1	
286.5	38.385	0.129	52	0.967	1.059	0.93	0.130	0.888	0	0	0.213	FALSE	FALSE	FALSE	0.6	N/A	A1	
286.4	38.549	0.142	56	0.963	1.261	0.98	0.170	0.887	0	0	0.213	FALSE	FALSE	FALSE	0.8	N/A	A1	
286.2	38.713	0.147	58	0.962	1.330	0.98	0.185	0.887	0	0	0.213	FALSE	FALSE	FALSE	0.9	N/A	A1	
286.0	38.877	0.153	59	0.961	1.404	0.98	0.202	0.886	0	0	0.214	FALSE	FALSE	FALSE	0.9	N/A	A1	
285.9	39.042	0.150	59	0.959	1.362	0.98	0.192	0.885	0	0	0.214	FALSE	FALSE	FALSE	0.9	N/A	A1	
285.7	39.206	0.159	61	0.957	1.475	0.98	0.220	0.885	0	0	0.214	FALSE	FALSE	FALSE	1.0	N/A	A1	
285.5	39.370	0.170	63	0.956	1.597	0.98	0.254	0.884	0	0	0.214	FALSE	FALSE	FALSE	1.2	N/A	A1	
285.4	39.534	0.220	69	0.949	1.997	0.97	0.403	0.883	0	0	0.214	FALSE	FALSE	FALSE	1.9	N/A	A1	
285.2	39.698	0.195	66	0.952	1.816	0.97	0.327	0.883	0	0	0.214	FALSE	FALSE	FALSE	1.5	N/A	A1	
285.0	39.862	N/A	52	N/A	N/A	N/A	N/A	0.882	0	0	0.214	TRUE	FALSE	FALSE	N/A	N/A	B	
284.9	40.026	N/A	44	N/A	N/A	N/A	N/A	0.881	0	0	0.214	TRUE	FALSE	FALSE	N/A	N/A	B	
284.7	40.190	N/A	40	N/A	N/A	N/A	N/A	0.881	0	0	0.214	TRUE	FALSE	FALSE	N/A	N/A	B	
284.5	40.354	N/A	39	N/A	N/A	N/A	N/A	0.880	0	0	0.214	TRUE	FALSE	FALSE	N/A	N/A	B	
284.4	40.518	0.127	51	0.963	1.023	0.99	0.124	0.879	0	0	0.214	FALSE	FALSE	FALSE	0.6	N/A	A1	
284.2	40.682	0.171	63	0.953	1.596	0.98	0.253	0.879	0	0	0.214	FALSE	FALSE	FALSE	1.2	N/A	A1	
284.1	40.846	0.151	59	0.957	1.368	0.98	0.193	0.878	0	0	0.214	FALSE	FALSE	FALSE	0.9	N/A	A1	
283.9	41.010	N/A	49	N/A	N/A	N/A	N/A	0.877	0	0	0.214	TRUE	FALSE	FALSE	N/A	N/A	B	
283.7	41.174	N/A	44	N/A	N/A	N/A	N/A	0.877	0	0	0.214	TRUE	FALSE	FALSE	N/A	N/A	B	
283.6	41.338	N/A	39	N/A	N/A	N/A	N/A	0.876	0	0	0.214	TRUE	FALSE	FALSE	N/A	N/A	B	
283.4	41.502	N/A	40	N/A	N/A	N/A	N/A	0.875	0	0	0.214	TRUE	FALSE	FALSE	N/A	N/A	C	
283.2	41.666	N/A	39	N/A	N/A	N/A	N/A	0.875	0	0	0.214	TRUE	FALSE	FALSE	N/A	N/A	C	
283.1	41.830	N/A	39	N/A	N/A	N/A	N/A	0.874	0	0	0.214	TRUE	FALSE	FALSE	N/A	N/A	B	
282.9	41.994	0.130	52	0.959	1.071	0.98	0.132	0.873	0	0	0.214	FALSE	FALSE	FALSE	0.6	N/A	A1	
282.7	42.158	N/A	46	N/A	N/A	N/A	N/A	0.873	0	0	0.214	TRUE	FALSE	FALSE	N/A	N/A	B	
282.6	42.322	N/A	41	N/A	N/A	N/A	N/A	0.872	0	0	0.214	TRUE	FALSE	FALSE	N/A	N/A	B	
282.4	42.486	N/A	40	N/A	N/A	N/A	N/A	0.871	0	0	0.215	TRUE	FALSE	FALSE	N/A	N/A	C	
282.2	42.650	N/A	38	N/A	N/A	N/A	N/A	0.871	0	0	0.215	TRUE	FALSE	FALSE	N/A	N/A	C	
282.1	42.814	N/A	38	N/A	N/A	N/A	N/A	0.870	0	0	0.215	TRUE	FALSE	FALSE	N/A	N/A	C	
281.9	42.978	N/A	38	N/A	N/A	N/A	N/A	0.869	0	0	0.215	TRUE	FALSE	FALSE	N/A	N/A	C	
281.8	43.143	N/A	38	N/A	N/A	N/A	N/A	0.869	0	0	0.215	TRUE	FALSE	FALSE	N/A	N/A	C	
281.6	43.307	N/A	38	N/A	N/A	N/A	N/A	0.868	0	0	0.215	TRUE	FALSE	FALSE	N/A	N/A	C	

From Ground Response										Sample Screened for:				Factor of Safety	Material (optional)	Soil Type (see note on following chart)
Depth z (ft)	Cyclic Resistance Ratio CRR _{7.5}	Relative Density D _r (%)	Correction for Overburden Pressure K _σ	Correction for Sloping Ground K _α	Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., T _d	Maximum Induced Shear Stress τ _{Max} (psf)	Average Cyclic Shear Stress τ _{Avg} (psf)	Cyclic Stress Ratio CSR	Clay-like (qc _N /cs ≥ 175)	High Tip Res. (qc _N /cs ≥ 175)	Unsaturated			
281.4	43.471	N/A	38	N/A	N/A	N/A	0.867	0	0	0.215	TRUE	FALSE	FALSE	N/A	C	
281.3	43.635	N/A	38	N/A	N/A	N/A	0.867	0	0	0.215	TRUE	FALSE	FALSE	N/A	C	
281.1	43.799	N/A	38	N/A	N/A	N/A	0.866	0	0	0.215	TRUE	FALSE	FALSE	N/A	C	
280.9	43.963	N/A	38	N/A	N/A	N/A	0.865	0	0	0.215	TRUE	FALSE	FALSE	N/A	C	
280.8	44.127	N/A	38	N/A	N/A	N/A	0.865	0	0	0.215	TRUE	FALSE	FALSE	N/A	C	
280.6	44.291	N/A	38	N/A	N/A	N/A	0.864	0	0	0.215	TRUE	FALSE	FALSE	N/A	C	
280.4	44.455	N/A	38	N/A	N/A	N/A	0.863	0	0	0.215	TRUE	FALSE	FALSE	N/A	C	
280.3	44.619	N/A	37	N/A	N/A	N/A	0.863	0	0	0.215	TRUE	FALSE	FALSE	N/A	C	
280.1	44.783	N/A	37	N/A	N/A	N/A	0.862	0	0	0.215	TRUE	FALSE	FALSE	N/A	C	
280.0	44.947	N/A	37	N/A	N/A	N/A	0.861	0	0	0.215	TRUE	FALSE	FALSE	N/A	C	
279.8	45.111	N/A	37	N/A	N/A	N/A	0.861	0	0	0.215	TRUE	FALSE	FALSE	N/A	C	
279.6	45.275	N/A	38	N/A	N/A	N/A	0.860	0	0	0.215	TRUE	FALSE	FALSE	N/A	C	
279.5	45.439	N/A	39	N/A	N/A	N/A	0.859	0	0	0.215	TRUE	FALSE	FALSE	N/A	C	
279.3	45.603	N/A	38	N/A	N/A	N/A	0.859	0	0	0.215	TRUE	FALSE	FALSE	N/A	C	
279.1	45.767	N/A	37	N/A	N/A	N/A	0.858	0	0	0.215	TRUE	FALSE	FALSE	N/A	C	
279.0	45.931	N/A	37	N/A	N/A	N/A	0.857	0	0	0.215	TRUE	FALSE	FALSE	N/A	C	
278.8	46.095	N/A	37	N/A	N/A	N/A	0.857	0	0	0.215	TRUE	FALSE	FALSE	N/A	C	
278.6	46.259	N/A	38	N/A	N/A	N/A	0.856	0	0	0.215	TRUE	FALSE	FALSE	N/A	C	
278.5	46.423	N/A	37	N/A	N/A	N/A	0.855	0	0	0.215	TRUE	FALSE	FALSE	N/A	C	
278.3	46.587	N/A	37	N/A	N/A	N/A	0.855	0	0	0.215	TRUE	FALSE	FALSE	N/A	C	
278.1	46.751	N/A	38	N/A	N/A	N/A	0.854	0	0	0.215	TRUE	FALSE	FALSE	N/A	C	
278.0	46.915	N/A	38	N/A	N/A	N/A	0.853	0	0	0.215	TRUE	FALSE	FALSE	N/A	C	
277.8	47.079	N/A	37	N/A	N/A	N/A	0.853	0	0	0.215	TRUE	FALSE	FALSE	N/A	C	
277.7	47.244	N/A	37	N/A	N/A	N/A	0.852	0	0	0.215	TRUE	FALSE	FALSE	N/A	C	
277.5	47.408	N/A	37	N/A	N/A	N/A	0.851	0	0	0.215	TRUE	FALSE	FALSE	N/A	C	
277.3	47.572	N/A	37	N/A	N/A	N/A	0.851	0	0	0.215	TRUE	FALSE	FALSE	N/A	C	
277.2	47.736	N/A	38	N/A	N/A	N/A	0.850	0	0	0.215	TRUE	FALSE	FALSE	N/A	C	
277.0	47.900	N/A	38	N/A	N/A	N/A	0.849	0	0	0.215	TRUE	FALSE	FALSE	N/A	C	
276.8	48.064	N/A	37	N/A	N/A	N/A	0.849	0	0	0.215	TRUE	FALSE	FALSE	N/A	C	
276.7	48.228	N/A	37	N/A	N/A	N/A	0.848	0	0	0.215	TRUE	FALSE	FALSE	N/A	C	
276.5	48.392	N/A	37	N/A	N/A	N/A	0.847	0	0	0.215	TRUE	FALSE	FALSE	N/A	C	
276.3	48.556	N/A	37	N/A	N/A	N/A	0.847	0	0	0.215	TRUE	FALSE	FALSE	N/A	C	
276.2	48.720	N/A	37	N/A	N/A	N/A	0.846	0	0	0.215	TRUE	FALSE	FALSE	N/A	C	
276.0	48.884	N/A	37	N/A	N/A	N/A	0.845	0	0	0.215	TRUE	FALSE	FALSE	N/A	C	
275.9	49.048	N/A	39	N/A	N/A	N/A	0.844	0	0	0.215	TRUE	FALSE	FALSE	N/A	C	
275.7	49.212	N/A	40	N/A	N/A	N/A	0.844	0	0	0.214	TRUE	FALSE	FALSE	N/A	C	
275.5	49.376	N/A	37	N/A	N/A	N/A	0.843	0	0	0.214	TRUE	FALSE	FALSE	N/A	C	
275.4	49.540	N/A	37	N/A	N/A	N/A	0.842	0	0	0.214	TRUE	FALSE	FALSE	N/A	C	
275.2	49.704	N/A	37	N/A	N/A	N/A	0.842	0	0	0.214	TRUE	FALSE	FALSE	N/A	C	
275.0	49.868	N/A	37	N/A	N/A	N/A	0.841	0	0	0.214	TRUE	FALSE	FALSE	N/A	C	
274.9	50.032	N/A	37	N/A	N/A	N/A	0.840	0	0	0.214	TRUE	FALSE	FALSE	N/A	C	
274.7	50.196	N/A	37	N/A	N/A	N/A	0.840	0	0	0.214	TRUE	FALSE	FALSE	N/A	C	
274.5	50.360	N/A	37	N/A	N/A	N/A	0.839	0	0	0.214	TRUE	FALSE	FALSE	N/A	C	
274.4	50.524	N/A	37	N/A	N/A	N/A	0.838	0	0	0.214	TRUE	FALSE	FALSE	N/A	C	
274.2	50.688	N/A	43	N/A	N/A	N/A	0.838	0	0	0.214	TRUE	FALSE	FALSE	N/A	C	
274.0	50.852	0.120	48	0.948	0.882	0.99	0.837	0	0	0.214	FALSE	FALSE	FALSE	0.5	A1	
273.9	51.016	0.138	55	0.941	1.161	0.98	0.836	0	0	0.214	FALSE	FALSE	FALSE	0.7	A1	
273.7	51.180	0.158	60	0.934	1.425	0.98	0.836	0	0	0.214	FALSE	FALSE	FALSE	1.0	A1	
273.6	51.345	0.166	62	0.932	1.509	0.98	0.835	0	0	0.214	FALSE	FALSE	FALSE	1.1	A1	
273.4	51.509	0.162	61	0.933	1.465	0.98	0.834	0	0	0.214	FALSE	FALSE	FALSE	1.0	A1	
273.2	51.673	0.210	68	0.921	1.879	0.97	0.834	0	0	0.214	FALSE	FALSE	FALSE	1.6	A1	
273.1	51.837	0.207	68	0.922	1.855	0.97	0.833	0	0	0.214	FALSE	FALSE	FALSE	1.6	A1	
272.9	52.001	N/A	53	N/A	N/A	N/A	0.832	0	0	0.214	TRUE	FALSE	FALSE	N/A	B	
272.7	52.165	N/A	45	N/A	N/A	N/A	0.832	0	0	0.214	TRUE	FALSE	FALSE	N/A	B	
272.6	52.329	N/A	41	N/A	N/A	N/A	0.831	0	0	0.214	TRUE	FALSE	FALSE	N/A	B	

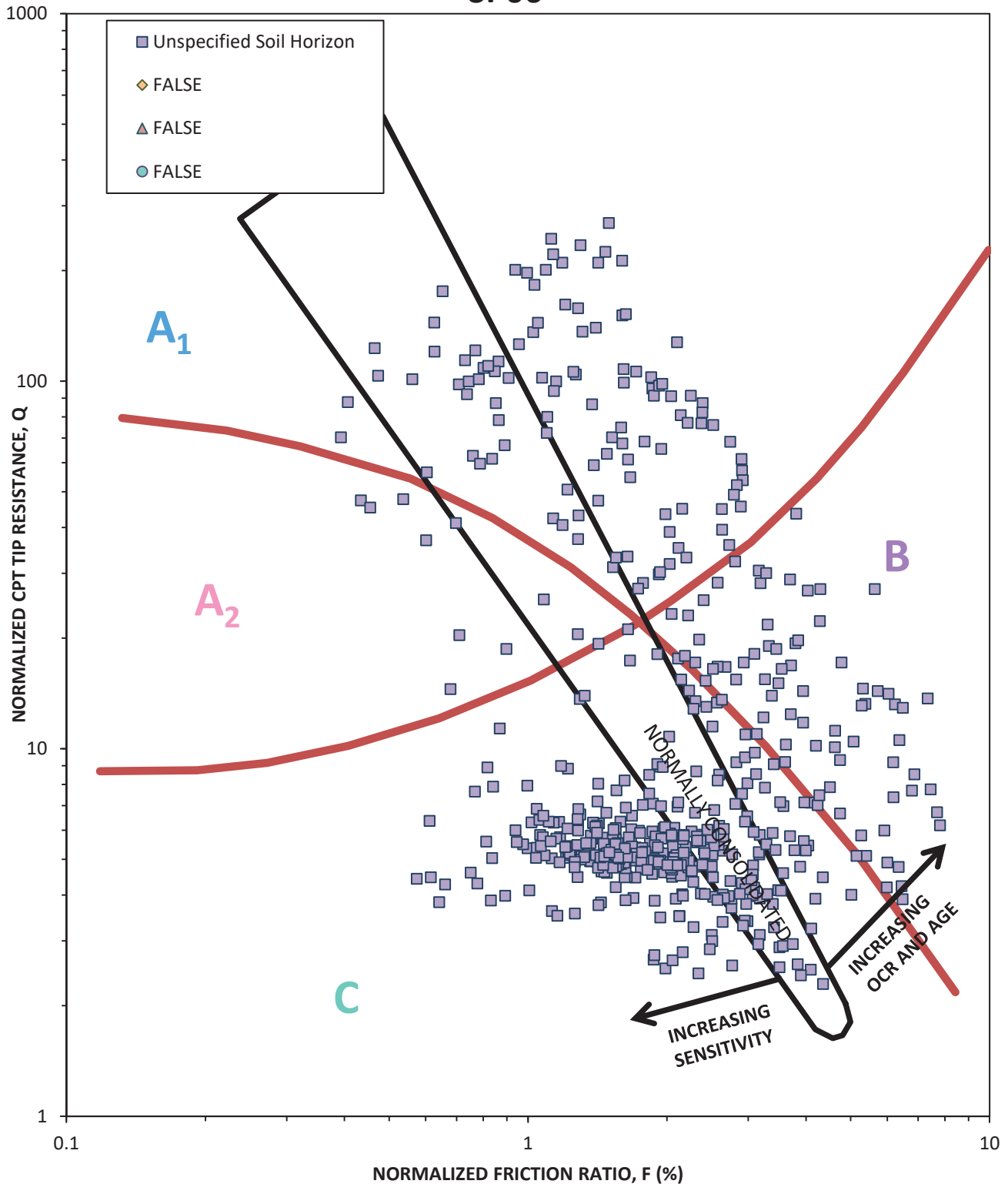
Elev. (ft)	Depth z	Cyclic Resistance Ratio $CRR_{7.5}$	Relative Density D_r	Correction for		Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CHR	Stress Reduction Coeff., t_d	Front Ground Response			Cyclic Stress Ratio CSR	Sample Screened for:			Factor of Safety FS_{liq}	Material (optional)	Soil Type (see note on following chart)	
				Overburden Pressure K_o	Sloping Ground K_σ				Shear Stress τ_{max}	Induced Shear Stress τ_{Avg}	Average Cyclic Shear Stress τ_{Avg} (psf)		Cyclic Stress Ratio	Clay-like $(qc_{3N})_{cs} \geq 175$	High Tip Res.				Unsaturated
263.4	61.515	N/A	37	N/A	N/A	N/A	N/A	0.793	0	0	0.210	TRUE	FALSE	FALSE	N/A	N/A	C		
263.2	61.679	N/A	37	N/A	N/A	N/A	N/A	0.793	0	0	0.210	TRUE	FALSE	FALSE	N/A	N/A	C		
263.1	61.843	N/A	37	N/A	N/A	N/A	N/A	0.792	0	0	0.210	TRUE	FALSE	FALSE	N/A	N/A	C		
262.9	62.007	N/A	38	N/A	N/A	N/A	N/A	0.791	0	0	0.210	TRUE	FALSE	FALSE	N/A	N/A	C		
262.7	62.171	N/A	37	N/A	N/A	N/A	N/A	0.791	0	0	0.210	TRUE	FALSE	FALSE	N/A	N/A	C		
262.6	62.335	N/A	37	N/A	N/A	N/A	N/A	0.790	0	0	0.210	TRUE	FALSE	FALSE	N/A	N/A	C		
262.4	62.499	N/A	37	N/A	N/A	N/A	N/A	0.789	0	0	0.210	TRUE	FALSE	FALSE	N/A	N/A	C		
262.2	62.663	N/A	37	N/A	N/A	N/A	N/A	0.789	0	0	0.210	TRUE	FALSE	FALSE	N/A	N/A	C		
262.1	62.827	N/A	37	N/A	N/A	N/A	N/A	0.788	0	0	0.210	TRUE	FALSE	FALSE	N/A	N/A	C		
261.9	62.991	N/A	38	N/A	N/A	N/A	N/A	0.787	0	0	0.210	TRUE	FALSE	FALSE	N/A	N/A	C		
261.7	63.155	N/A	38	N/A	N/A	N/A	N/A	0.787	0	0	0.210	TRUE	FALSE	FALSE	N/A	N/A	C		
261.6	63.319	N/A	38	N/A	N/A	N/A	N/A	0.786	0	0	0.209	TRUE	FALSE	FALSE	N/A	N/A	C		
261.4	63.483	N/A	37	N/A	N/A	N/A	N/A	0.785	0	0	0.209	TRUE	FALSE	FALSE	N/A	N/A	C		
261.3	63.648	N/A	37	N/A	N/A	N/A	N/A	0.785	0	0	0.209	TRUE	FALSE	FALSE	N/A	N/A	C		
261.1	63.812	N/A	37	N/A	N/A	N/A	N/A	0.784	0	0	0.209	TRUE	FALSE	FALSE	N/A	N/A	C		
260.9	63.976	N/A	37	N/A	N/A	N/A	N/A	0.783	0	0	0.209	TRUE	FALSE	FALSE	N/A	N/A	C		
260.8	64.140	N/A	37	N/A	N/A	N/A	N/A	0.783	0	0	0.209	TRUE	FALSE	FALSE	N/A	N/A	C		
260.6	64.304	N/A	37	N/A	N/A	N/A	N/A	0.782	0	0	0.209	TRUE	FALSE	FALSE	N/A	N/A	C		
260.4	64.468	N/A	38	N/A	N/A	N/A	N/A	0.782	0	0	0.209	TRUE	FALSE	FALSE	N/A	N/A	C		
260.3	64.632	N/A	38	N/A	N/A	N/A	N/A	0.781	0	0	0.209	TRUE	FALSE	FALSE	N/A	N/A	C		
260.1	64.796	N/A	38	N/A	N/A	N/A	N/A	0.780	0	0	0.209	TRUE	FALSE	FALSE	N/A	N/A	C		
259.9	64.960	N/A	38	N/A	N/A	N/A	N/A	0.780	0	0	0.209	TRUE	FALSE	FALSE	N/A	N/A	C		
259.8	65.124	N/A	38	N/A	N/A	N/A	N/A	0.779	0	0	0.209	TRUE	FALSE	FALSE	N/A	N/A	C		
259.6	65.288	N/A	38	N/A	N/A	N/A	N/A	0.778	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C		
259.4	65.452	N/A	37	N/A	N/A	N/A	N/A	0.778	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C		
259.3	65.616	N/A	38	N/A	N/A	N/A	N/A	0.777	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C		
259.1	65.780	N/A	38	N/A	N/A	N/A	N/A	0.776	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C		
259.0	65.944	N/A	39	N/A	N/A	N/A	N/A	0.776	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C		
258.8	66.108	N/A	47	N/A	N/A	N/A	N/A	0.775	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C		
258.6	66.272	N/A	42	N/A	N/A	N/A	N/A	0.774	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C		
258.5	66.436	N/A	38	N/A	N/A	N/A	N/A	0.774	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	B		
258.3	66.600	N/A	38	N/A	N/A	N/A	N/A	0.773	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C		
258.1	66.764	N/A	37	N/A	N/A	N/A	N/A	0.773	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C		
258.0	66.928	N/A	37	N/A	N/A	N/A	N/A	0.772	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C		
257.8	67.092	N/A	37	N/A	N/A	N/A	N/A	0.771	0	0	0.207	TRUE	FALSE	FALSE	N/A	N/A	C		
257.6	67.256	N/A	37	N/A	N/A	N/A	N/A	0.771	0	0	0.207	TRUE	FALSE	FALSE	N/A	N/A	C		
257.5	67.420	N/A	37	N/A	N/A	N/A	N/A	0.770	0	0	0.207	TRUE	FALSE	FALSE	N/A	N/A	C		
257.3	67.584	N/A	37	N/A	N/A	N/A	N/A	0.769	0	0	0.207	TRUE	FALSE	FALSE	N/A	N/A	C		
257.2	67.749	N/A	37	N/A	N/A	N/A	N/A	0.769	0	0	0.207	TRUE	FALSE	FALSE	N/A	N/A	C		
257.0	67.913	N/A	39	N/A	N/A	N/A	N/A	0.768	0	0	0.207	TRUE	FALSE	FALSE	N/A	N/A	C		
256.8	68.077	N/A	37	N/A	N/A	N/A	N/A	0.767	0	0	0.207	TRUE	FALSE	FALSE	N/A	N/A	C		
256.7	68.241	N/A	38	N/A	N/A	N/A	N/A	0.767	0	0	0.207	TRUE	FALSE	FALSE	N/A	N/A	C		
256.5	68.405	N/A	38	N/A	N/A	N/A	N/A	0.766	0	0	0.207	TRUE	FALSE	FALSE	N/A	N/A	C		
256.3	68.569	N/A	38	N/A	N/A	N/A	N/A	0.766	0	0	0.207	TRUE	FALSE	FALSE	N/A	N/A	C		
256.2	68.733	N/A	38	N/A	N/A	N/A	N/A	0.765	0	0	0.207	TRUE	FALSE	FALSE	N/A	N/A	C		
256.0	68.897	N/A	38	N/A	N/A	N/A	N/A	0.764	0	0	0.206	TRUE	FALSE	FALSE	N/A	N/A	C		
255.8	69.061	N/A	38	N/A	N/A	N/A	N/A	0.764	0	0	0.206	TRUE	FALSE	FALSE	N/A	N/A	C		
255.7	69.225	N/A	38	N/A	N/A	N/A	N/A	0.763	0	0	0.206	TRUE	FALSE	FALSE	N/A	N/A	C		
255.5	69.389	N/A	38	N/A	N/A	N/A	N/A	0.762	0	0	0.206	TRUE	FALSE	FALSE	N/A	N/A	C		
255.3	69.553	N/A	38	N/A	N/A	N/A	N/A	0.762	0	0	0.206	TRUE	FALSE	FALSE	N/A	N/A	C		
255.2	69.717	N/A	37	N/A	N/A	N/A	N/A	0.761	0	0	0.206	TRUE	FALSE	FALSE	N/A	N/A	C		
255.0	69.881	N/A	37	N/A	N/A	N/A	N/A	0.760	0	0	0.206	TRUE	FALSE	FALSE	N/A	N/A	C		
254.9	70.045	N/A	38	N/A	N/A	N/A	N/A	0.760	0	0	0.206	TRUE	FALSE	FALSE	N/A	N/A	C		
254.7	70.209	N/A	38	N/A	N/A	N/A	N/A	0.759	0	0	0.206	TRUE	FALSE	FALSE	N/A	N/A	C		
254.5	70.373	N/A	38	N/A	N/A	N/A	N/A	0.759	0	0	0.206	TRUE	FALSE	FALSE	N/A	N/A	C		

Elev. (ft)	Depth z (ft)	Cyclic Resistance Ratio CRR _{7.5}	Relative Density D _r	Correction for Overburden Pressure			Correction for Sloping Ground K _a	Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., f _d	Front Ground Response			Cyclic Stress Ratio CSR	Sample Screened for:			Factor of Safety F _{S_{liq}}	Material (optional)	Soil Type (see note on following chart)
				K _σ	K _σ	K _σ					τ _{max} (psf)	Shear Stress	Cyclic Shear Stress τ _{Avg} (psf)		Average	Cyclic Tip Res. (q _{c IN}) ≥ 175	Unsaturated			
254.4	70.537	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.758	0	0	0.205	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
254.2	70.701	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.757	0	0	0.205	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
254.0	70.865	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.757	0	0	0.205	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
253.9	71.029	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.756	0	0	0.205	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
253.7	71.193	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.756	0	0	0.205	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
253.5	71.357	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.755	0	0	0.205	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
253.4	71.521	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.754	0	0	0.205	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
253.2	71.685	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.754	0	0	0.205	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
253.1	71.850	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.753	0	0	0.205	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
252.9	72.014	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.752	0	0	0.205	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
252.7	72.178	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.752	0	0	0.205	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
252.6	72.342	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.751	0	0	0.204	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
252.4	72.506	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.751	0	0	0.204	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
252.2	72.670	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.750	0	0	0.204	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
252.1	72.834	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.749	0	0	0.204	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
251.9	72.998	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.749	0	0	0.204	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
251.7	73.162	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.748	0	0	0.204	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
251.6	73.326	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.748	0	0	0.204	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
251.4	73.490	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.747	0	0	0.204	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
251.2	73.654	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.746	0	0	0.204	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
251.1	73.818	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.746	0	0	0.204	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
250.9	73.982	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.745	0	0	0.203	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
250.8	74.146	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.745	0	0	0.203	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
250.6	74.310	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.744	0	0	0.203	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
250.4	74.474	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.743	0	0	0.203	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
250.3	74.638	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.743	0	0	0.203	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
250.1	74.802	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.742	0	0	0.203	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
249.9	74.966	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.742	0	0	0.203	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
249.8	75.130	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.741	0	0	0.203	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
249.6	75.294	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.740	0	0	0.203	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
249.4	75.458	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.740	0	0	0.203	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
249.3	75.622	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.739	0	0	0.203	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
249.1	75.786	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.739	0	0	0.202	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
248.9	75.951	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.738	0	0	0.202	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
248.8	76.115	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.737	0	0	0.202	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
248.6	76.279	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.737	0	0	0.202	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
248.5	76.443	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.736	0	0	0.202	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
248.3	76.607	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.736	0	0	0.202	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
248.1	76.771	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.735	0	0	0.202	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
248.0	76.935	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.735	0	0	0.202	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
247.8	77.099	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.734	0	0	0.202	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
247.6	77.263	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.733	0	0	0.202	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
247.5	77.427	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.733	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
247.3	77.591	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.732	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
247.1	77.755	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.732	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
247.0	77.919	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.731	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
246.8	78.083	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.731	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
246.7	78.247	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.730	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
246.5	78.411	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.729	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	N/A	B
246.3	78.575	N/A	36	N/A	N/A	N/A	N/A	N/A	N/A	0.729	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	N/A	B
246.2	78.739	0.196	66	0.877	1.684	0.97	0.280	0.728	0	0.201	FALSE	FALSE	FALSE	FALSE	FALSE	1.4	N/A	N/A	N/A	A1
246.0	78.903	0.469	79	0.828	2.646	0.94	0.968	0.728	0	0.201	FALSE	FALSE	FALSE	FALSE	FALSE	4.8	N/A	N/A	N/A	A1
245.8	79.067	N/A	83	N/A	N/A	N/A	N/A	0.727	0	0.200	FALSE	TRUE	FALSE	FALSE	FALSE	N/A	N/A	N/A	N/A	A1
245.7	79.231	N/A	81	N/A	N/A	N/A	N/A	0.727	0	0.200	FALSE	TRUE	FALSE	FALSE	FALSE	N/A	N/A	N/A	N/A	A1
245.5	79.395	0.214	68	0.870	1.808	0.97	0.326	0.726	0	0.200	FALSE	FALSE	FALSE	FALSE	FALSE	1.6	N/A	N/A	N/A	A1

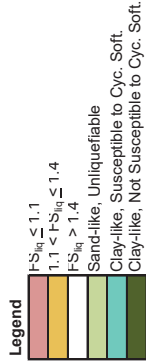
Front Ground Response										Sample Screened for:					Factor of Safety		Material (optional)	Soil Type (see note on following chart)
Elev. (ft)	Depth z (ft)	Cyclic Resistance Ratio $CRR_{7.5}$	Relative Density D_r (%)	Correction for Overburden Pressure		Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., f_d	Shear Stress τ_{max} (psf)	Maximum Induced Shear Stress τ_{Avg} (psf)	Cyclic Stress Ratio CSR	Clay-like $(q_c)_{IN} \geq 175$	High Tip Res. $(q_c)_{IN} \geq 175$	Unsaturated	FS_{liq}			
245.3	79.559	N/A	52	N/A	N/A	N/A	N/A	0.725	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	B	
245.2	79.723	N/A	45	N/A	N/A	N/A	N/A	0.725	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	B	
245.0	79.887	N/A	48	N/A	N/A	N/A	N/A	0.724	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	B	
244.8	80.052	N/A	48	N/A	N/A	N/A	N/A	0.724	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	A2	
244.7	80.216	N/A	48	N/A	N/A	N/A	N/A	0.723	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	C	
244.5	80.380	N/A	48	N/A	N/A	N/A	N/A	0.723	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	B	
244.4	80.544	N/A	45	N/A	N/A	N/A	N/A	0.722	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	B	
244.2	80.708	N/A	41	N/A	N/A	N/A	N/A	0.722	0	0	0.199	TRUE	FALSE	FALSE	N/A	N/A	B	
244.0	80.872	N/A	39	N/A	N/A	N/A	N/A	0.721	0	0	0.199	TRUE	FALSE	FALSE	N/A	N/A	C	
243.9	81.036	N/A	38	N/A	N/A	N/A	N/A	0.720	0	0	0.199	TRUE	FALSE	FALSE	N/A	N/A	C	
243.7	81.200	N/A	38	N/A	N/A	N/A	N/A	0.720	0	0	0.199	TRUE	FALSE	FALSE	N/A	N/A	C	
243.5	81.364	N/A	38	N/A	N/A	N/A	N/A	0.719	0	0	0.199	TRUE	FALSE	FALSE	N/A	N/A	C	
243.4	81.528	N/A	39	N/A	N/A	N/A	N/A	0.719	0	0	0.199	TRUE	FALSE	FALSE	N/A	N/A	C	
243.2	81.692	0.114	45	0.915	0.722	0.99	0.074	0.718	0	0	0.199	FALSE	FALSE	FALSE	0.4	N/A	A2	
243.0	81.856	0.137	55	0.899	1.088	0.98	0.132	0.718	0	0	0.199	FALSE	FALSE	FALSE	0.7	N/A	A1	
242.9	82.020	N/A	50	N/A	N/A	N/A	N/A	0.717	0	0	0.199	TRUE	FALSE	FALSE	N/A	N/A	B	
242.7	82.184	N/A	47	N/A	N/A	N/A	N/A	0.717	0	0	0.199	TRUE	FALSE	FALSE	N/A	N/A	B	
242.6	82.348	N/A	47	N/A	N/A	N/A	N/A	0.716	0	0	0.199	TRUE	FALSE	FALSE	N/A	N/A	B	
242.4	82.512	N/A	52	N/A	N/A	N/A	N/A	0.716	0	0	0.198	TRUE	FALSE	FALSE	N/A	N/A	B	
242.2	82.676	N/A	47	N/A	N/A	N/A	N/A	0.715	0	0	0.198	TRUE	FALSE	FALSE	N/A	N/A	B	
242.1	82.840	N/A	43	N/A	N/A	N/A	N/A	0.715	0	0	0.198	TRUE	FALSE	FALSE	N/A	N/A	B	
241.9	83.004	N/A	41	N/A	N/A	N/A	N/A	0.714	0	0	0.198	TRUE	FALSE	FALSE	N/A	N/A	C	
241.7	83.168	N/A	39	N/A	N/A	N/A	N/A	0.713	0	0	0.198	TRUE	FALSE	FALSE	N/A	N/A	C	
241.6	83.332	N/A	39	N/A	N/A	N/A	N/A	0.713	0	0	0.198	TRUE	FALSE	FALSE	N/A	N/A	B	
241.4	83.496	0.129	52	0.903	0.970	0.99	0.112	0.712	0	0	0.198	FALSE	FALSE	FALSE	0.6	N/A	A1	
241.2	83.660	0.207	68	0.866	1.750	0.97	0.304	0.712	0	0	0.198	FALSE	FALSE	FALSE	1.5	N/A	A1	
241.1	83.824	0.322	75	0.839	2.269	0.95	0.584	0.711	0	0	0.198	FALSE	FALSE	FALSE	3.0	N/A	A1	
240.9	83.988	0.356	76	0.833	2.370	0.95	0.667	0.711	0	0	0.198	FALSE	FALSE	FALSE	3.4	N/A	A1	
240.7	84.153	0.585	80	0.805	2.805	0.94	1.236	0.710	0	0	0.197	FALSE	FALSE	FALSE	6.3	N/A	A1	
240.6	84.317	N/A	67	N/A	N/A	N/A	N/A	0.710	0	0	0.197	TRUE	FALSE	FALSE	N/A	N/A	B	
240.4	84.481	N/A	50	N/A	N/A	N/A	N/A	0.709	0	0	0.197	TRUE	FALSE	FALSE	N/A	N/A	B	
240.3	84.645	0.194	66	0.869	1.653	0.97	0.270	0.709	0	0	0.197	FALSE	FALSE	FALSE	1.4	N/A	A1	
240.1	84.809	0.159	61	0.884	1.349	0.98	0.186	0.708	0	0	0.197	FALSE	FALSE	FALSE	0.9	N/A	A1	
239.9	84.973	0.221	69	0.860	1.835	0.97	0.337	0.708	0	0	0.197	FALSE	FALSE	FALSE	1.7	N/A	A1	
239.8	85.137	N/A	58	N/A	N/A	N/A	N/A	0.707	0	0	0.197	TRUE	FALSE	FALSE	N/A	N/A	B	
239.6	85.301	N/A	48	N/A	N/A	N/A	N/A	0.707	0	0	0.197	TRUE	FALSE	FALSE	N/A	N/A	B	
239.4	85.465	N/A	45	N/A	N/A	N/A	N/A	0.706	0	0	0.197	TRUE	FALSE	FALSE	N/A	N/A	B	
239.3	85.629	N/A	46	N/A	N/A	N/A	N/A	0.706	0	0	0.197	TRUE	FALSE	FALSE	N/A	N/A	B	
239.1	85.793	N/A	44	N/A	N/A	N/A	N/A	0.705	0	0	0.197	TRUE	FALSE	FALSE	N/A	N/A	C	
238.9	85.957	N/A	52	N/A	N/A	N/A	N/A	0.705	0	0	0.196	TRUE	FALSE	FALSE	N/A	N/A	B	
238.8	86.121	N/A	47	N/A	N/A	N/A	N/A	0.704	0	0	0.196	TRUE	FALSE	FALSE	N/A	N/A	B	
238.6	86.285	0.143	57	0.891	1.153	0.98	0.144	0.704	0	0	0.196	FALSE	FALSE	FALSE	0.7	N/A	A1	
238.5	86.449	0.164	62	0.879	1.394	0.98	0.196	0.703	0	0	0.196	FALSE	FALSE	FALSE	1.0	N/A	A1	
238.3	86.613	0.147	58	0.888	1.203	0.98	0.154	0.703	0	0	0.196	FALSE	FALSE	FALSE	0.8	N/A	A1	
238.1	86.777	N/A	49	N/A	N/A	N/A	N/A	0.702	0	0	0.196	TRUE	FALSE	FALSE	N/A	N/A	B	
238.0	86.941	N/A	55	N/A	N/A	N/A	N/A	0.702	0	0	0.196	TRUE	FALSE	FALSE	N/A	N/A	A1	
237.8	87.105	0.154	59	0.884	1.281	0.98	0.170	0.701	0	0	0.196	FALSE	FALSE	FALSE	0.9	N/A	A1	
237.6	87.269	N/A	59	N/A	N/A	N/A	N/A	0.701	0	0	0.196	TRUE	FALSE	FALSE	N/A	N/A	B	
237.5	87.433	N/A	47	N/A	N/A	N/A	N/A	0.700	0	0	0.196	TRUE	FALSE	FALSE	N/A	N/A	B	
237.3	87.597	N/A	61	N/A	N/A	N/A	N/A	0.700	0	0	0.196	TRUE	FALSE	FALSE	N/A	N/A	A1	
237.1	87.761	N/A	85	N/A	N/A	N/A	N/A	0.699	0	0	0.195	FALSE	TRUE	FALSE	N/A	N/A	A1	
237.0	87.925	N/A	99	N/A	N/A	N/A	N/A	0.699	0	0	0.195	FALSE	TRUE	FALSE	N/A	N/A	A1	
236.8	88.089	N/A	100	N/A	N/A	N/A	N/A	0.698	0	0	0.195	FALSE	TRUE	FALSE	N/A	N/A	A1	
236.6	88.254	N/A	100	N/A	N/A	N/A	N/A	0.698	0	0	0.195	FALSE	TRUE	FALSE	N/A	N/A	A1	
236.5	88.418	N/A	98	N/A	N/A	N/A	N/A	0.697	0	0	0.195	FALSE	TRUE	FALSE	N/A	N/A	A1	

Front Ground Response										Sample Screened for:										Soil Type (see note on following chart)	
Elev. (ft)	Depth z (ft)	Cyclic Resistance Ratio CRR _{7.5}	Relative Density D _r	Correction for Overburden Pressure		Correction for Sloping Ground K _α	Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., T _d	Shear Stress τ _{Max} (psf)	Induced Shear Stress τ _{Avg} (psf)	Cyclic Stress Ratio			High Tip Res. (q _{c 3N}) _{CS} ≥ 175		Factor of Safety FS _{eq}	Material (optional)			
				K _σ	K _α							CSR	Clay-like	Tip Res.	Unsaturated						
236.3	88.582	N/A	91	N/A	N/A	N/A	N/A	N/A	0.697	0	0	0.195	FALSE	TRUE	FALSE	FALSE	N/A	N/A	A1		
236.2	88.746	N/A	88	N/A	N/A	N/A	N/A	N/A	0.696	0	0	0.195	FALSE	TRUE	FALSE	FALSE	N/A	N/A	A1		
236.0	88.910	0.530	80	0.801	2.705	0.94	1.078	0.696	0	0	0	0.195	FALSE	FALSE	FALSE	FALSE	5.5	N/A	A1		
235.8	89.074	N/A	59	N/A	N/A	N/A	N/A	N/A	0.695	0	0	0.195	TRUE	FALSE	FALSE	FALSE	N/A	N/A	B		
235.7	89.238	N/A	49	N/A	N/A	N/A	N/A	N/A	0.695	0	0	0.195	TRUE	FALSE	FALSE	FALSE	N/A	N/A	B		
235.5	89.402	N/A	44	N/A	N/A	N/A	N/A	N/A	0.694	0	0	0.195	TRUE	FALSE	FALSE	FALSE	N/A	N/A	B		
235.3	89.566	N/A	49	N/A	N/A	N/A	N/A	N/A	0.694	0	0	0.194	TRUE	FALSE	FALSE	FALSE	N/A	N/A	B		
235.2	89.730	N/A	44	N/A	N/A	N/A	N/A	N/A	0.693	0	0	0.194	TRUE	FALSE	FALSE	FALSE	N/A	N/A	B		
235.0	89.894	0.229	70	0.850	1.866	0.96	0.351	0.693	0	0	0	0.194	FALSE	FALSE	FALSE	FALSE	1.8	N/A	A1		
234.8	90.058	0.325	75	0.828	2.258	0.95	0.579	0.692	0	0	0	0.194	FALSE	FALSE	FALSE	FALSE	3.0	N/A	A1		
234.7	90.222	0.516	79	0.800	2.677	0.94	1.037	0.692	0	0	0	0.194	FALSE	TRUE	FALSE	FALSE	5.3	N/A	A1		
234.5	90.386	N/A	84	N/A	N/A	N/A	N/A	0.692	0	0	0	0.194	FALSE	FALSE	FALSE	FALSE	N/A	N/A	A1		
234.3	90.550	N/A	84	N/A	N/A	N/A	N/A	0.691	0	0	0	0.194	FALSE	TRUE	FALSE	FALSE	N/A	N/A	A1		
234.2	90.714	N/A	93	N/A	N/A	N/A	N/A	0.691	0	0	0	0.194	FALSE	TRUE	FALSE	FALSE	N/A	N/A	A1		
234.0	90.878	N/A	88	N/A	N/A	N/A	N/A	N/A	0.690	0	0	0.194	FALSE	TRUE	FALSE	FALSE	N/A	N/A	A1		
233.9	91.042	N/A	82	N/A	N/A	N/A	N/A	N/A	0.690	0	0	0.194	FALSE	TRUE	FALSE	FALSE	N/A	N/A	A1		
233.7	91.206	0.459	78	0.805	2.575	0.94	0.897	0.689	0	0	0	0.194	FALSE	FALSE	FALSE	FALSE	4.6	N/A	A1		
233.5	91.370	0.258	72	0.840	2.002	0.96	0.417	0.689	0	0	0	0.193	FALSE	FALSE	FALSE	FALSE	2.2	N/A	A1		
233.4	91.534	0.200	67	0.858	1.684	0.97	0.281	0.688	0	0	0	0.193	FALSE	FALSE	FALSE	FALSE	1.5	N/A	A1		
233.2	91.698	0.182	65	0.865	1.547	0.97	0.237	0.688	0	0	0	0.193	FALSE	FALSE	FALSE	FALSE	1.2	N/A	A1		
233.0	91.862	0.186	65	0.863	1.580	0.97	0.247	0.687	0	0	0	0.193	FALSE	FALSE	FALSE	FALSE	1.3	N/A	A1		
232.9	92.026	0.159	61	0.875	1.330	0.98	0.181	0.687	0	0	0	0.193	FALSE	FALSE	FALSE	FALSE	0.9	N/A	A1		
232.7	92.190	0.148	58	0.881	1.205	0.98	0.154	0.686	0	0	0	0.193	FALSE	FALSE	FALSE	FALSE	0.8	N/A	A1		
232.5	92.355	0.139	56	0.887	1.096	0.98	0.133	0.686	0	0	0	0.193	FALSE	FALSE	FALSE	FALSE	0.7	N/A	A1		
232.4	92.519	N/A	55	N/A	N/A	N/A	N/A	0.686	0	0	0	0.193	TRUE	FALSE	FALSE	FALSE	N/A	N/A	A1		
232.2	92.683	0.142	56	0.885	1.129	0.98	0.139	0.685	0	0	0	0.193	FALSE	FALSE	FALSE	FALSE	0.7	N/A	A1		
232.1	92.847	0.138	55	0.887	1.076	0.98	0.129	0.685	0	0	0	0.193	FALSE	FALSE	FALSE	FALSE	0.7	N/A	A1		
231.9	93.011	N/A	57	N/A	N/A	N/A	N/A	0.684	0	0	0	0.193	TRUE	FALSE	FALSE	FALSE	N/A	N/A	A1		
231.7	93.175	N/A	52	N/A	N/A	N/A	N/A	0.684	0	0	0	0.193	TRUE	FALSE	FALSE	FALSE	N/A	N/A	B		
231.6	93.339	N/A	50	N/A	N/A	N/A	N/A	0.683	0	0	0	0.192	TRUE	FALSE	FALSE	FALSE	N/A	N/A	B		
231.4	93.503	0.148	58	0.880	1.206	0.98	0.154	0.683	0	0	0	0.192	FALSE	FALSE	FALSE	FALSE	0.8	N/A	A1		
231.2	93.667	0.149	58	0.879	1.214	0.98	0.156	0.683	0	0	0	0.192	FALSE	FALSE	FALSE	FALSE	0.8	N/A	A1		
231.1	93.831	0.157	60	0.874	1.304	0.98	0.175	0.682	0	0	0	0.192	FALSE	FALSE	FALSE	FALSE	0.9	N/A	A1		
230.9	93.995	0.158	60	0.874	1.315	0.98	0.178	0.682	0	0	0	0.192	FALSE	FALSE	FALSE	FALSE	0.9	N/A	A1		
230.7	94.159	N/A	59	N/A	N/A	N/A	N/A	0.681	0	0	0	0.192	TRUE	FALSE	FALSE	FALSE	N/A	N/A	A1		
230.6	94.323	N/A	53	N/A	N/A	N/A	N/A	0.681	0	0	0	0.192	TRUE	FALSE	FALSE	FALSE	N/A	N/A	B		
230.4	94.487	N/A	46	N/A	N/A	N/A	N/A	0.680	0	0	0	0.192	TRUE	FALSE	FALSE	FALSE	N/A	N/A	B		

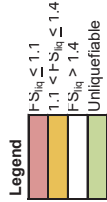
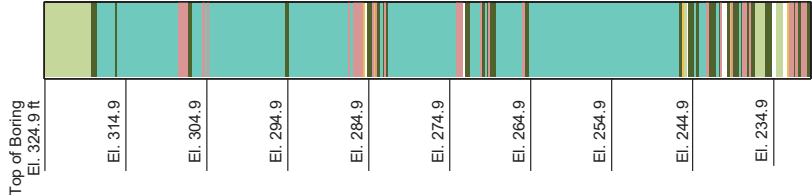
SP06



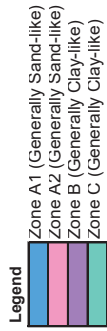
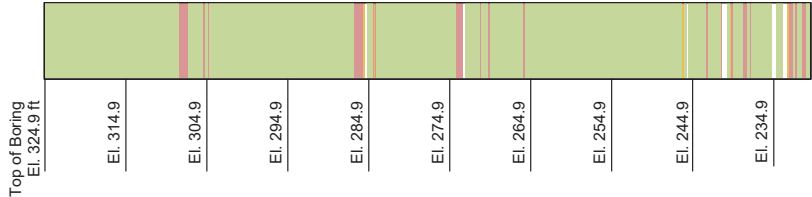
Adapted from "Discussion of 'Liquefaction Potential of Silts from CPTu'" (Robertson 2008). Zone A_1 and Zone A_2 samples are generally sand-like. Zone B samples are generally clay-like and not susceptible to cyclic softening. Zone C samples are generally clay-like and susceptible to cyclic softening. Note that the transition from clay-like to sand-like in this chart does not exactly match the liquefaction calculations herein; that is, some transitional samples in Zone B and Zone C will be treated as sand-like and analyzed for liquefaction if the calculations indicate as such.



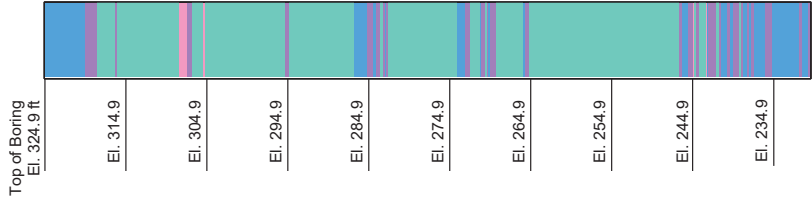
SP06, Liquefaction Triggering Results



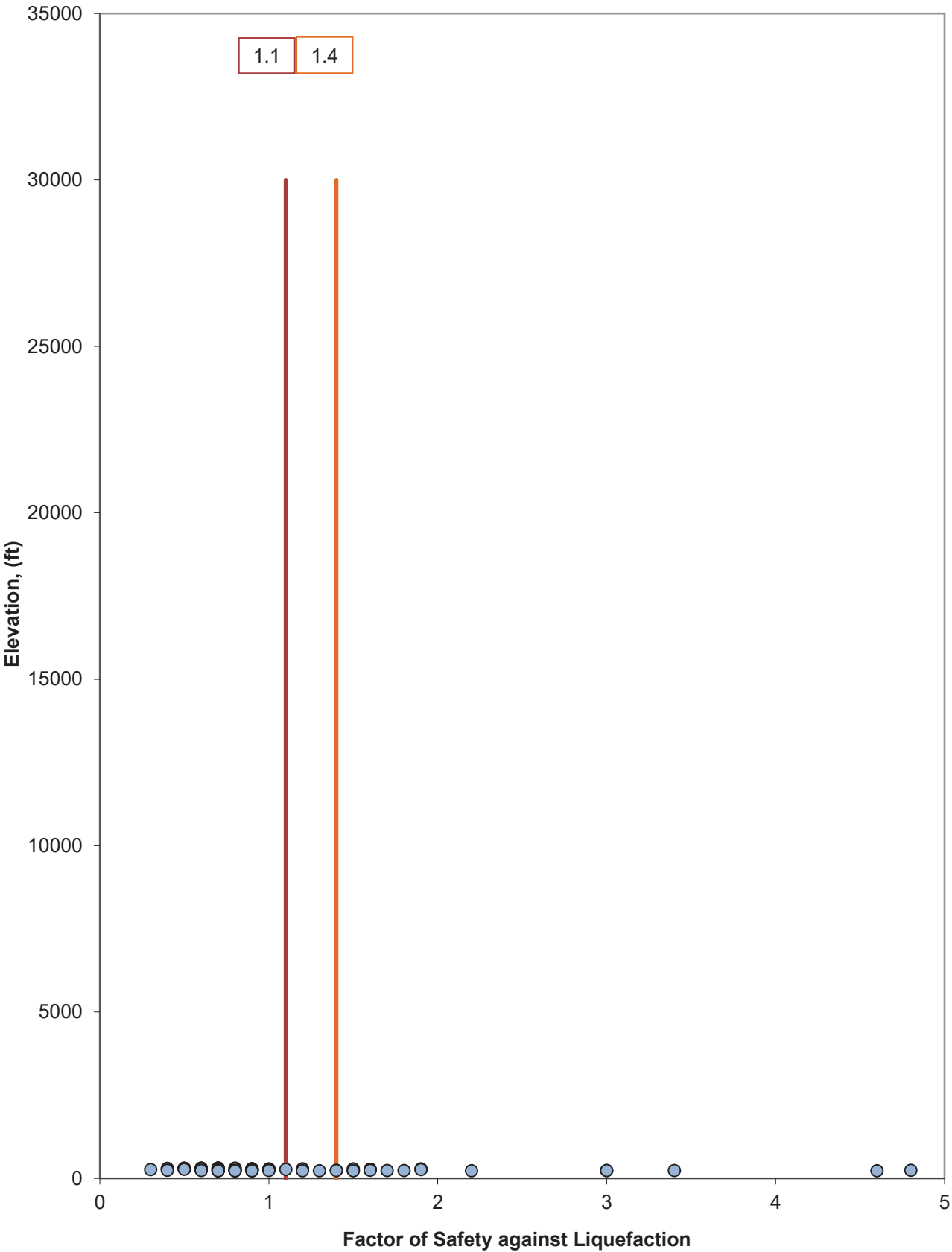
SP06, Liquefaction Triggering Results



SP06, Robertson Soil Type



US 60 Bridge, Boring = SP06, Source = Design Source, Mw = 7.7, Event = Design Event,
CPT Data, Simplified Stress-Based Approach



Project Information
Slantec Project Number =
Project Name =
CPT ID =
Boring Location (optional)
Northing =
Easting =
OR
Baseline Station =
Offset (+ Right) =

178565011
US 60 Bridge
SP07

Using qt (corrected for u2 PWP) or qc (backcalculated uncorrected field tip)

Cone ID (optional) =
Use qc instead of qt?
Cone Area Rate (a) =
0
0.80
(1: Yes, 0: No)

Drilling Information

Top of Hole Elevation =
Water Depth during CPT (negative for US borings) =
Depth data collection began =
feet
3.6
feet
0.00
pcf
327.9
120

During Earthquake Information

Water Depth during EQ (relative to CPT TOH, negative for US borings) =
Final Grade Elevation during EQ =
Avg. Total Unit WL of Cu/Fill =
3.6
327.9
120
pcf

Nonlinear Pore Water Pressure Profile

Custom Pore Water Pressure Profile?
If previous answer is No, hydrostatic pressures are assumed.
0
(1: Yes, 0: No)

α Curve Fit Parameters

Associated α profile:
α at each Sample Depth known?
If previous answer is No, then enter curve fit parameters below (α vs. depth curve)
If (referring to $K_v = 1$ (i.e., level ground), assign values of zero to all curve fit parameters below to make
alpha zero and thus, K_v will be one.
1
m4:
m3:
m2:
m1:
m0:

Associated ground response profile:

Get CSR from shear stress envelope?
If previous answer is No, then CSR will be calculated using a_{max} and r_d
Max. Shear Stress at each sample depth known?
If previous answer is No, then enter curve fit parameters below (shear stress vs. depth curve)
Max. Shear Stress Curve Fit Parameters (from ground response analysis)
Borings, sp07 nor
0
(1: Yes, 0: No)
0.22
(1: Yes, 0: No)

Earthquake Information

EQ Source (e.g., New Madrid)
Event (e.g., MCE, OBE)
 a_{max} (g) (top of ground surface)
EQ Mag (Mw)
Design Source
Design Event
0.22
7.7

Inputs

Depth (ft)	Corrected Cone Tip Resistance, q_c (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
0.164	5.502	0.109	120							
0.328	12.653	0.221	120							
0.492	25.797	0.380	120							
0.656	34.314	0.571	120							
0.820	41.312	0.755	120							
0.984	45.372	0.893	120							
1.148	43.161	1.003	120							
1.312	41.128	1.057	120							
1.476	38.019	1.109	120							
1.640	32.642	1.089	120							
1.804	28.915	0.998	120							
1.968	27.321	0.887	120							
2.133	27.965	0.834	120							
2.297	28.331	0.850	120							
2.461	27.924	0.822	120							
2.625	26.243	0.761	120							
2.789	25.006	0.723	120							
2.953	24.930	0.717	120							
3.117	24.231	0.733	120							
3.281	22.930	0.667	120							
3.445	19.816	0.583	120							
3.609	19.603	0.536	120							
3.773	20.225	0.498	120							
3.937	18.102	0.529	120							
4.101	18.543	0.496	120							
4.265	15.233	0.459	120							
4.429	14.273	0.437	120							
4.593	15.246	0.420	120							
4.757	15.479	0.416	120							
4.921	15.551	0.414	120							
5.085	14.616	0.397	120							
5.249	13.030	0.393	120							
5.413	17.551	0.366	120							
5.577	10.707	0.349	120							
5.741	10.137	0.325	120							
5.905	10.473	0.319	120							
6.069	10.995	0.322	120							
6.234	11.369	0.343	120							
6.398	10.975	0.381	120							
6.562	10.444	0.375	120							
6.726	10.101	0.357	120							
6.890	9.411	0.332	120							
7.054	8.027	0.296	120							
7.218	7.241	0.249	120							
7.382	7.809	0.204	120							
7.546	14.896	0.141	120							
7.710	24.819	0.126	120							
7.874	27.594	0.107	120							
8.038	25.644	0.121	120							
8.202	20.813	0.193	120							
8.366	12.389	0.166	120							
8.530	8.337	0.124	120							
8.694	6.262	0.103	120							
8.858	5.710	0.063	120							
9.022	5.366	0.053	120							
9.186	4.811	0.062	120							
9.350	4.197	0.062	120							
9.514	3.259	0.068	120							
9.678	2.831	0.079	120							
9.842	2.777	0.057	120							
10.006	4.281	0.063	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
10.170	4.498	0.073	120							
10.335	4.623	0.081	120							
10.499	4.720	0.102	120							
10.663	5.331	0.126	120							
10.827	6.225	0.148	120							
10.991	7.160	0.156	120							
11.155	7.473	0.162	120							
11.319	7.069	0.176	120							
11.483	6.201	0.193	120							
11.647	6.113	0.193	120							
11.811	5.553	0.188	120							
11.975	4.166	0.187	120							
12.139	3.581	0.181	120							
12.303	3.533	0.149	120							
12.467	4.211	0.136	120							
12.631	4.899	0.160	120							
12.795	5.919	0.176	120							
12.959	7.430	0.201	120							
13.123	8.042	0.220	120							
13.287	7.975	0.230	120							
13.451	9.035	0.234	120							
13.615	10.177	0.255	120							
13.779	10.848	0.292	120							
13.943	11.657	0.340	120							
14.107	12.530	0.388	120							
14.271	13.079	0.447	120							
14.436	13.171	0.429	120							
14.600	14.203	0.422	120							
14.764	14.758	0.438	120							
14.928	13.527	0.493	120							
15.092	12.548	0.496	120							
15.256	12.434	0.439	120							
15.420	12.371	0.429	120							
15.584	12.936	0.421	120							
15.748	12.984	0.456	120							
15.912	13.691	0.461	120							
16.076	13.617	0.458	120							
16.240	13.462	0.418	120							
16.404	13.419	0.367	120							
16.568	14.146	0.377	120							
16.732	15.310	0.471	120							
16.896	15.395	0.530	120							
17.060	13.557	0.548	120							
17.224	13.303	0.493	120							
17.388	13.305	0.518	120							
17.552	12.760	0.523	120							
17.716	12.720	0.517	120							
17.880	12.401	0.509	120							
18.044	12.377	0.536	120							
18.208	13.232	0.534	120							
18.372	13.607	0.534	120							
18.537	13.332	0.552	120							
18.701	14.724	0.616	120							
18.865	29.463	0.532	120							
19.029	46.132	0.453	120							
19.193	44.042	0.734	120							
19.357	32.895	0.903	120							
19.521	24.400	0.842	120							
19.685	19.347	0.716	120							
19.849	24.850	0.544	120							
20.013	22.771	0.376	120							
20.177	24.740	0.412	120							
20.341	20.206	0.334	120							
20.505	24.085	0.381	120							
20.669	13.950	0.370	120							
20.833	10.522	0.224	120							
20.997	9.784	0.115	120							
21.161	15.801	0.144	120							
21.325	22.178	0.392	120							
21.489	18.993	0.421	120							
21.653	17.725	0.523	120							
21.817	12.084	0.315	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
21.961	9.071	0.306	120							
22.145	9.001	0.160	120							
22.309	10.260	0.150	120							
22.473	9.948	0.137	120							
22.638	8.963	0.143	120							
22.802	8.958	0.213	120							
22.966	9.077	0.176	120							
23.130	9.652	0.168	120							
23.294	9.717	0.388	120							
23.458	22.181	0.380	120							
23.622	10.590	0.326	120							
23.786	9.822	0.284	120							
23.950	23.253	0.191	120							
24.114	42.209	0.531	120							
24.278	23.177	0.726	120							
24.442	13.214	0.590	120							
24.606	10.746	0.365	120							
24.770	10.452	0.147	120							
24.934	10.421	0.149	120							
25.098	31.913	0.151	120							
25.262	31.013	0.405	120							
25.426	17.913	0.389	120							
25.590	11.699	0.378	120							
25.754	10.279	0.156	120							
25.918	10.128	0.092	120							
26.082	9.484	0.100	120							
26.246	8.728	0.119	120							
26.410	8.611	0.114	120							
26.574	8.942	0.103	120							
26.738	8.859	0.095	120							
26.903	8.565	0.094	120							
27.067	8.285	0.101	120							
27.231	8.984	0.094	120							
27.395	8.910	0.093	120							
27.559	8.687	0.150	120							
27.723	9.201	0.121	120							
27.887	13.538	0.274	120							
28.051	12.139	0.258	120							
28.215	9.257	0.259	120							
28.379	9.673	0.139	120							
28.543	9.506	0.127	120							
28.707	9.516	0.108	120							
28.871	10.660	0.099	120							
29.035	9.273	0.134	120							
29.199	9.150	0.087	120							
29.363	18.794	0.292	120							
29.527	16.171	0.304	120							
29.691	11.554	0.299	120							
29.855	10.673	0.197	120							
30.019	10.251	0.141	120							
30.183	10.370	0.117	120							
30.347	10.324	0.093	120							
30.511	9.738	0.091	120							
30.675	9.842	0.088	120							
30.840	9.446	0.079	120							
31.004	8.831	0.088	120							
31.168	8.642	0.091	120							
31.332	9.330	0.105	120							
31.496	11.998	0.128	120							
31.660	9.048	0.140	120							
31.824	9.588	0.161	120							
31.988	10.242	0.092	120							
32.152	9.951	0.100	120							
32.316	9.879	0.106	120							
32.480	9.712	0.108	120							
32.644	9.819	0.112	120							
32.808	9.671	0.117	120							
32.972	9.992	0.108	120							
33.136	9.519	0.108	120							
33.300	9.146	0.102	120							
33.464	9.395	0.119	120							
33.628	11.255	0.162	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
33.792	9,374	0.175	120							
33.956	11,159	0.203	120							
34.120	11,697	0.126	120							
34.284	9,669	0.156	120							
34.448	9,838	0.142	120							
34.612	10,133	0.134	120							
34.776	9,961	0.142	120							
34.941	10,001	0.137	120							
35.105	10,020	0.137	120							
35.269	10,244	0.162	120							
35.433	10,237	0.176	120							
35.597	9,865	0.154	120							
35.761	9,974	0.120	120							
35.925	10,194	0.147	120							
36.089	10,203	0.215	120							
36.253	13,604	0.184	120							
36.417	12,114	0.178	120							
36.581	42,766	0.571	120							
36.745	21,016	0.807	120							
36.909	13,389	0.564	120							
37.073	12,960	0.315	120							
37.237	15,324	0.253	120							
37.401	11,982	0.232	120							
37.565	9,856	0.239	120							
37.729	10,147	0.114	120							
37.893	10,440	0.110	120							
38.057	10,624	0.098	120							
38.221	10,412	0.105	120							
38.385	10,621	0.111	120							
38.549	11,721	0.135	120							
38.713	11,136	0.163	120							
38.877	10,627	0.175	120							
39.042	11,604	0.146	120							
39.206	11,253	0.143	120							
39.370	10,652	0.171	120							
39.534	11,285	0.113	120							
39.698	11,179	0.120	120							
39.862	11,166	0.117	120							
40.026	11,164	0.120	120							
40.190	11,465	0.128	120							
40.354	12,225	0.132	120							
40.518	11,582	0.135	120							
40.682	13,561	0.187	120							
40.846	12,312	0.195	120							
41.010	10,999	0.185	120							
41.174	11,262	0.112	120							
41.338	11,346	0.121	120							
41.502	12,451	0.125	120							
41.666	11,712	0.148	120							
41.830	11,910	0.217	120							
41.994	19,647	0.294	120							
42.158	16,610	0.352	120							
42.322	13,208	0.395	120							
42.486	11,451	0.332	120							
42.650	12,246	0.102	120							
42.814	45,652	0.539	120							
42.978	29,147	0.538	120							
43.143	16,296	0.527	120							
43.307	16,329	0.318	120							
43.471	14,658	0.181	120							
43.635	13,661	0.185	120							
43.799	12,546	0.123	120							
43.963	12,795	0.083	120							
44.127	15,453	0.152	120							
44.291	16,719	0.186	120							
44.455	12,417	0.207	120							
44.619	12,020	0.134	120							
44.783	11,784	0.110	120							
44.947	15,747	0.194	120							
45.111	13,568	0.210	120							
45.275	12,719	0.266	120							
45.439	12,252	0.171	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
45.603	12,371	0.166	120							
45.767	12,333	0.255	120							
45.931	12,496	0.266	120							
46.095	13,496	0.247	120							
46.259	13,171	0.247	120							
46.423	13,006	0.218	120							
46.587	12,574	0.166	120							
46.751	11,965	0.182	120							
46.915	12,027	0.126	120							
47.079	12,159	0.123	120							
47.243	12,247	0.128	120							
47.408	12,311	0.129	120							
47.572	12,653	0.133	120							
47.736	12,736	0.115	120							
47.900	12,788	0.148	120							
48.064	14,025	0.179	120							
48.228	12,643	0.176	120							
48.392	12,903	0.164	120							
48.556	13,300	0.152	120							
48.720	13,372	0.153	120							
48.884	12,734	0.141	120							
49.048	12,576	0.141	120							
49.212	12,692	0.130	120							
49.376	12,917	0.139	120							
49.540	13,075	0.125	120							
49.704	17,953	0.308	120							
49.868	111,179	0.688	120							
50.032	87,079	1.202	120							
50.196	40,772	1.233	120							
50.360	22,267	0.918	120							
50.524	16,052	0.636	120							
50.688	16,204	0.219	120							
50.852	15,539	0.132	120							
51.016	14,987	0.119	120							
51.180	14,703	0.103	120							
51.345	14,571	0.095	120							
51.509	14,250	0.124	120							
51.673	13,669	0.127	120							
51.837	13,518	0.108	120							
52.001	13,529	0.104	120							
52.165	14,825	0.148	120							
52.329	17,364	0.298	120							
52.493	28,152	0.468	120							
52.657	22,187	0.412	120							
52.821	18,356	0.450	120							
52.985	17,260	0.300	120							
53.149	14,777	0.224	120							
53.313	15,117	0.161	120							
53.477	14,624	0.123	120							
53.641	14,654	0.142	120							
53.805	14,393	0.204	120							
53.969	16,073	0.490	120							
54.133	49,003	0.838	120							
54.297	28,201	0.803	120							
54.461	18,689	0.577	120							
54.625	17,762	0.264	120							
54.789	16,802	0.174	120							
54.953	18,881	0.135	120							
55.117	18,443	0.113	120							
55.281	16,121	0.114	120							
55.446	16,460	0.098	120							
55.610	16,296	0.093	120							
55.774	16,722	0.098	120							
55.938	17,349	0.096	120							
56.102	17,136	0.110	120							
56.266	18,212	0.107	120							
56.430	17,494	0.098	120							
56.594	17,374	0.120	120							
56.758	17,549	0.122	120							
56.922	16,857	0.116	120							
57.086	16,712	0.118	120							
57.250	16,950	0.105	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
57.414	17,353	0.099	120							
57.578	17,030	0.100	120							
57.742	17,757	0.103	120							
57.906	17,641	0.101	120							
58.070	16,784	0.111	120							
58.234	16,597	0.123	120							
58.398	18,827	0.103	120							
58.562	18,621	0.102	120							
58.726	18,902	0.095	120							
58.890	17,544	0.304	120							
59.054	17,555	0.814	120							
59.218	49,000	1.080	120							
59.382	45,072	1.192	120							
59.547	25,277	0.810	120							
59.711	21,118	0.499	120							
59.875	19,845	0.342	120							
60.039	18,500	0.293	120							
60.203	19,596	0.198	120							
60.367	18,429	0.139	120							
60.531	19,259	0.212	120							
60.695	17,279	0.291	120							
60.859	15,328	0.272	120							
61.023	14,726	0.191	120							
61.187	15,602	0.263	120							
61.351	20,717	0.236	120							
61.515	15,600	0.269	120							
61.679	14,960	0.245	120							
61.843	15,087	0.169	120							
62.007	14,462	0.151	120							
62.171	14,519	0.142	120							
62.335	14,427	0.146	120							
62.499	14,826	0.163	120							
62.663	14,795	0.157	120							
62.827	15,035	0.141	120							
62.991	15,484	0.127	120							
63.155	15,399	0.146	120							
63.319	14,962	0.156	120							
63.483	14,688	0.160	120							
63.648	14,854	0.133	120							
63.812	14,736	0.137	120							
63.976	14,391	0.142	120							
64.140	14,406	0.141	120							
64.304	14,950	0.136	120							
64.468	14,781	0.152	120							
64.632	14,894	0.179	120							
64.796	14,896	0.151	120							
64.960	15,296	0.139	120							
65.124	15,225	0.149	120							
65.288	15,058	0.166	120							
65.452	14,793	0.181	120							
65.616	14,626	0.149	120							
65.780	15,180	0.147	120							
65.944	16,239	0.162	120							
66.108	15,188	0.195	120							
66.272	15,129	0.194	120							
66.436	15,694	0.192	120							
66.600	16,050	0.203	120							
66.764	15,591	0.217	120							
66.928	15,481	0.210	120							
67.092	15,611	0.184	120							
67.256	15,325	0.174	120							
67.420	15,216	0.160	120							
67.584	14,944	0.174	120							
67.749	14,925	0.168	120							
67.913	15,004	0.167	120							
68.077	15,240	0.156	120							
68.241	15,308	0.154	120							
68.405	15,849	0.190	120							
68.569	15,610	0.193	120							
68.733	16,355	0.249	120							
68.897	15,615	0.225	120							
69.061	16,306	0.246	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
60.225	16,390	0.192	120							
60.389	16,075	0.180	120							
60.553	17,006	0.186	120							
60.717	16,019	0.175	120							
60.881	16,402	0.176	120							
70.045	16,489	0.196	120							
70.209	16,168	0.175	120							
70.373	17,483	0.189	120							
70.537	15,284	0.208	120							
70.701	15,313	0.223	120							
70.865	15,624	0.160	120							
71.029	16,278	0.146	120							
71.193	16,228	0.285	120							
71.357	22,093	0.361	120							
71.521	17,031	0.388	120							
71.685	17,256	0.363	120							
71.850	21,674	0.427	120							
72.014	156,421	0.895	120							
72.178	169,497	1.382	120							
72.342	131,621	2.083	120							
72.506	63,853	2.457	120							
72.670	37,606	1.586	120							
72.834	21,295	1.340	120							
72.998	20,439	0.841	120							
73.162	21,040	0.345	120							
73.326	18,239	0.252	120							
73.490	18,161	0.258	120							
73.654	17,788	0.207	120							
73.818	18,045	0.213	120							
73.982	17,639	0.209	120							
74.146	17,119	0.209	120							
74.310	17,073	0.179	120							
74.474	18,814	0.169	120							
74.638	18,076	0.167	120							
74.802	17,948	0.172	120							
74.966	17,184	0.251	120							
75.130	17,407	0.201	120							
75.294	16,711	0.204	120							
75.458	16,838	0.217	120							
75.622	17,224	0.244	120							
75.786	19,524	0.361	120							
75.951	117,726	0.909	120							
76.115	95,520	1.708	120							
76.279	110,116	2.236	120							
76.443	61,763	2.244	120							
76.607	74,272	2.158	120							
76.771	53,252	2.095	120							
76.935	33,534	1.196	120							
77.099	27,124	0.760	120							
77.263	35,593	0.550	120							
77.427	31,140	0.582	120							
77.591	40,761	1.066	120							
77.755	30,261	0.867	120							
77.919	31,427	1.116	120							
78.083	54,927	1.061	120							
78.247	63,841	1.081	120							
78.411	70,698	0.851	120							
78.575	54,403	0.748	120							
78.739	27,038	0.921	120							
78.903	21,927	0.851	120							
79.067	23,727	0.467	120							
79.231	43,007	0.822	120							
79.395	82,702	1.027	120							
79.559	77,967	2.103	120							
79.723	58,676	1.955	120							
79.887	27,252	1.751	120							
80.052	22,851	0.973	120							
80.216	26,233	0.521	120							
80.380	52,263	0.677	120							
80.544	103,831	0.954	120							
80.708	104,269	1.537	120							
80.872	74,864	1.948	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
81.036	52,791	1,981	120							
81.200	43,763	1,455	120							
81.364	68,640	1,122	120							
81.528	51,821	1,119	120							
81.692	46,217	1,224	120							
81.856	51,380	0,975	120							
82.020	55,305	1,262	120							
82.184	38,913	1,325	120							
82.348	24,531	0,920	120							
82.512	40,322	1,005	120							
82.676	40,749	1,984	120							
82.840	56,265	2,463	120							
83.004	39,799	1,986	120							
83.168	64,298	1,910	120							
83.332	51,575	1,876	120							
83.496	64,565	1,538	120							
83.660	120,438	1,597	120							
83.824	105,180	2,207	120							
83.988	58,174	2,857	120							
84.153	35,591	2,092	120							
84.317	50,460	1,585	120							
84.481	62,585	1,713	120							
84.645	46,852	1,504	120							
84.809	69,074	1,201	120							
84.973	94,331	1,648	120							
85.137	46,712	2,227	120							
85.301	35,444	1,780	120							
85.465	23,840	1,212	120							
85.629	30,374	0,764	120							
85.793	61,715	1,192	120							
85.957	39,242	1,318	120							
86.121	50,790	1,369	120							
86.285	63,647	1,202	120							
86.449	67,529	1,277	120							
86.613	58,693	1,226	120							
86.777	66,582	1,196	120							
86.941	63,159	1,075	120							
87.105	59,691	1,228	120							
87.269	34,110	1,456	120							
87.433	30,493	0,981	120							
87.597	78,056	0,897	120							
87.761	97,555	1,384	120							
87.925	97,326	1,758	120							
88.089	84,705	2,814	120							
88.254	42,938	2,401	120							
88.418	79,818	1,962	120							
88.582	185,504	1,954	120							
88.746	177,256	2,346	120							
88.910	108,738	2,784	120							
89.074	58,989	2,795	120							
89.238	41,634	2,134	120							
89.402	54,077	2,129	120							
89.566	104,505	1,786	120							
89.730	135,118	1,672	120							
89.894	143,003	1,506	120							
90.058	145,452	1,398	120							
90.222	144,265	1,362	120							
90.386	146,367	1,371	120							
90.550	138,533	1,557	120							
90.714	94,224	1,976	120							
90.878	57,677	2,089	120							
91.042	41,322	1,355	120							
91.206	28,758	1,143	120							
91.370	24,736	0,758	120							
91.534	24,498	0,406	120							
91.698	37,635	0,472	120							
91.862	26,208	0,574	120							
92.026	20,697	0,523	120							
92.190	28,720	0,293	120							
92.355	43,787	0,868	120							
92.519	97,730	1,183	120							
92.683	112,454	1,737	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
92.847	104.373	2.313	120							
93.011	66486	2.381	120							
93.175	41422	2.160	120							
93.339	34446	1.502	120							
93.503	31018	1.230	120							
93.667	46208	1.165	120							
93.831	26848	0.939	120							
93.995	22783	0.690	120							
94.159	26083	0.395	120							
94.323	27135	0.348	120							
94.487	49787	0.426	120							
94.651	30770	0.413	120							
94.815	28475	0.639	120							
94.979	25733	0.797	120							
95.143	22940	0.590	120							
95.307	27867	1.081	120							
95.471	45342	1.380	120							
95.635	30211	1.140	120							
95.799	20371	0.907	120							
95.963	20127	0.330	120							
96.127	20188	0.266	120							
96.291	20131	0.252	120							
96.455	19905	0.233	120							
96.620	19353	0.215	120							
96.784	19108	0.198	120							
96.948	18867	0.182	120							
97.112	18951	0.178	120							
97.276	18681	0.174	120							
97.440	18775	0.190	120							
97.604	19027	0.219	120							
97.768	19388	0.225	120							
97.932	18887	0.228	120							
98.096	18744	0.215	120							
98.260	18348	0.201	120							
98.424	18586	0.235	120							
98.588	19523	0.231	120							
98.752	21793	0.540	120							
98.916	73581	1.252	120							
99.080	42884	1.283	120							
99.244	29941	1.012	120							
99.408	32575	0.697	120							
99.572	52522	0.654	120							
99.736	33777	0.765	120							
99.900	24607	0.567	120							
100.064	21064	0.286	120							
100.228	21563	0.217	120							
100.392	21724	0.142	120							
100.557	28957	0.270	120							
100.721	34469	0.524	120							
100.885	22158	0.629	120							
101.049	19687	0.518	120							
101.213	20346	0.148	120							
101.377	20078	0.153	120							
101.541	19398	0.146	120							
101.705	19668	0.161	120							
101.869	19519	0.154	120							
102.033	20079	0.156	120							
102.197	20013	0.141	120							
102.361	20414	0.148	120							
102.525	20092	0.156	120							
102.689	20632	0.151	120							
102.853	19905	0.142	120							
103.017	19556	0.139	120							
103.181	19605	0.125	120							
103.345	20161	0.149	120							
103.509	20295	0.172	120							
103.673	20957	0.246	120							
103.837	20965	0.237	120							
104.001	26076	0.402	120							
104.165	64436	1.185	120							
104.329	55385	1.623	120							
104.493	32351	1.571	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
104.659	26,326	0.686	120							
104.822	21,324	0.526	120							
104.986	19,864	0.274	120							
105.150	19,868	0.260	120							
105.314	20,595	0.220	120							
105.478	20,519	0.215	120							
105.642	20,804	0.192	120							
105.806	20,222	0.225	120							
105.970	22,506	0.240	120							
106.134	20,076	0.267	120							
106.298	19,827	0.262	120							
106.462	20,168	0.132	120							
106.626	24,243	0.404	120							
106.790	26,666	0.475	120							
106.954	22,186	0.477	120							
107.118	24,148	0.621	120							
107.282	29,938	0.666	120							
107.446	21,203	0.605	120							
107.610	46,095	0.966	120							
107.774	32,586	0.824	120							
107.938	21,019	0.797	120							
108.102	21,737	0.282	120							
108.266	21,933	0.203	120							
108.430	22,603	0.333	120							
108.594	27,717	0.824	120							
108.759	35,351	1.261	120							
108.923	187,510	1.313	120							
109.087	345,535	2.235	120							
109.251	456,885	2.395	120							
109.415	600,427	2.376	120							

LIQUEFACTION POTENTIAL ASSESSMENT FOR COARSE GRAINED SOILS USING CONE PENETRATION TEST DATA

Facility: US 60 Bridge
Project No.: 178565011
CPT ID: SP07

Water Elevation during CPT:	324.3	ft
Depth to Water during CPT:	3.6	ft (relative to ground surface during CPT)
Water Elevation during Earthquake:	324.3	ft
Depth to Water during Earthquake:	3.6	ft (relative to ground surface during CPT)
Final Grade Elevation during EQ:	327.9	ft (if no fill, then set this equal to top of CPT hole elev.)
Height of Final Grade above CPT TOH:	0.0	ft (relative to ground surface during CPT, + Fill, - Cut)
Unit Weight of Cut/Fill to Achieve Final Grade	120	pcf
Cut/Fill Total Stress (+ Fill, - Cut):	0.00	tsf

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σ _{V CPT} (tsf)	Total Vertical Stress during EQ σ _{V EQ} (tsf)	Static Pore Water Pressure during CPT u _{S CPT} (tsf)	Static Pore Water Pressure during EQ u _{S EQ} (tsf)	Effective Vertical Stress during CPT σ _{V CPT} (tsf)	Effective Vertical Stress during EQ σ _{V EQ} (tsf)
327.9					Vertical Stresses above 1st CPT:		0.00	0.00	0.00	0.00	0.00	0.00
327.7	0.164	5.50	0.11	120		0.00	0.25	0.01	0.01	0.00	0.01	0.01
327.6	0.328	12.65	0.22	120		0.25	0.16	0.02	0.02	0.00	0.02	0.02
327.4	0.492	25.80	0.38	120		0.41	0.16	0.03	0.03	0.00	0.03	0.03
327.2	0.656	34.31	0.57	120		0.57	0.16	0.04	0.04	0.00	0.04	0.04
327.1	0.820	41.31	0.76	120		0.74	0.16	0.05	0.05	0.00	0.05	0.05
326.9	0.984	45.37	0.89	120		0.90	0.16	0.06	0.06	0.00	0.06	0.06
326.8	1.148	43.16	1.00	120		1.07	0.16	0.07	0.07	0.00	0.07	0.07
326.6	1.312	41.13	1.07	120		1.23	0.16	0.08	0.08	0.00	0.08	0.08
326.4	1.476	38.02	1.11	120		1.39	0.16	0.09	0.09	0.00	0.09	0.09
326.3	1.640	32.64	1.09	120		1.56	0.16	0.10	0.10	0.00	0.10	0.10
326.1	1.804	28.92	1.00	120		1.72	0.16	0.11	0.11	0.00	0.11	0.11
325.9	1.968	27.32	0.89	120		1.89	0.16	0.12	0.12	0.00	0.12	0.12
325.8	2.133	27.96	0.83	120		2.05	0.16	0.13	0.13	0.00	0.13	0.13
325.6	2.297	28.33	0.85	120		2.21	0.16	0.14	0.14	0.00	0.14	0.14
325.4	2.461	27.92	0.82	120		2.38	0.16	0.15	0.15	0.00	0.15	0.15
325.3	2.625	26.24	0.76	120		2.54	0.16	0.16	0.16	0.00	0.16	0.16
325.1	2.789	25.01	0.72	120		2.71	0.16	0.17	0.17	0.00	0.17	0.17
324.9	2.953	24.93	0.72	120		2.87	0.16	0.18	0.18	0.00	0.18	0.18
324.8	3.117	24.23	0.73	120		3.03	0.16	0.19	0.19	0.00	0.19	0.19
324.6	3.281	22.93	0.67	120		3.20	0.16	0.20	0.20	0.00	0.20	0.20
324.5	3.445	19.82	0.58	120		3.36	0.16	0.21	0.21	0.00	0.21	0.21
324.3	3.609	19.60	0.54	120		3.53	0.16	0.22	0.22	0.00	0.22	0.22
324.1	3.773	20.22	0.50	120		3.69	0.16	0.23	0.23	0.01	0.22	0.22
324.0	3.937	18.10	0.53	120		3.85	0.16	0.24	0.24	0.01	0.23	0.23
323.8	4.101	16.54	0.50	120		4.02	0.16	0.25	0.25	0.02	0.23	0.23
323.6	4.265	15.23	0.46	120		4.18	0.16	0.26	0.26	0.02	0.24	0.24
323.5	4.429	14.27	0.44	120		4.35	0.16	0.27	0.27	0.03	0.24	0.24
323.3	4.593	15.25	0.42	120		4.51	0.16	0.28	0.28	0.03	0.24	0.24
323.1	4.757	15.48	0.42	120		4.68	0.16	0.29	0.29	0.04	0.25	0.25
323.0	4.921	15.55	0.41	120		4.84	0.16	0.30	0.30	0.04	0.25	0.25
322.8	5.085	14.62	0.40	120		5.00	0.16	0.31	0.31	0.05	0.26	0.26
322.7	5.249	13.03	0.39	120		5.17	0.16	0.31	0.31	0.05	0.26	0.26
322.5	5.413	11.55	0.37	120		5.33	0.16	0.32	0.32	0.06	0.27	0.27
322.3	5.577	10.71	0.35	120		5.50	0.16	0.33	0.33	0.06	0.27	0.27
322.2	5.741	10.14	0.33	120		5.66	0.16	0.34	0.34	0.07	0.28	0.28
322.0	5.905	10.47	0.32	120		5.82	0.16	0.35	0.35	0.07	0.28	0.28
321.8	6.069	11.00	0.32	120		5.99	0.16	0.36	0.36	0.08	0.29	0.29
321.7	6.234	11.37	0.34	120		6.15	0.16	0.37	0.37	0.08	0.29	0.29
321.5	6.398	10.98	0.38	120		6.32	0.16	0.38	0.38	0.09	0.30	0.30
321.3	6.562	10.44	0.38	120		6.48	0.16	0.39	0.39	0.09	0.30	0.30
321.2	6.726	10.10	0.36	120		6.64	0.16	0.40	0.40	0.10	0.31	0.31
321.0	6.890	9.41	0.33	120		6.81	0.16	0.41	0.41	0.10	0.31	0.31
320.8	7.054	8.03	0.30	120		6.97	0.16	0.42	0.42	0.11	0.32	0.32
320.7	7.218	7.24	0.25	120		7.14	0.16	0.43	0.43	0.11	0.32	0.32
320.5	7.382	7.81	0.20	120		7.30	0.16	0.44	0.44	0.12	0.32	0.32
320.4	7.546	14.90	0.14	120		7.46	0.16	0.45	0.45	0.12	0.33	0.33
320.2	7.710	24.82	0.13	120		7.63	0.16	0.46	0.46	0.13	0.33	0.33
320.0	7.874	27.59	0.11	120		7.79	0.16	0.47	0.47	0.13	0.34	0.34
319.9	8.038	25.64	0.12	120		7.96	0.16	0.48	0.48	0.14	0.34	0.34
319.7	8.202	20.81	0.19	120		8.12	0.16	0.49	0.49	0.14	0.35	0.35
319.5	8.366	12.39	0.17	120		8.28	0.16	0.50	0.50	0.15	0.35	0.35
319.4	8.530	8.34	0.12	120		8.45	0.16	0.51	0.51	0.15	0.36	0.36
319.2	8.694	6.26	0.10	120		8.61	0.16	0.52	0.52	0.16	0.36	0.36
319.0	8.858	5.71	0.06	120		8.78	0.16	0.53	0.53	0.16	0.37	0.37
318.9	9.022	5.37	0.05	120		8.94	0.16	0.54	0.54	0.17	0.37	0.37
318.7	9.186	4.81	0.06	120		9.10	0.16	0.55	0.55	0.17	0.38	0.38
318.5	9.350	4.20	0.06	120		9.27	0.16	0.56	0.56	0.18	0.38	0.38
318.4	9.514	3.26	0.07	120		9.43	0.16	0.57	0.57	0.18	0.39	0.39
318.2	9.678	2.83	0.08	120		9.60	0.16	0.58	0.58	0.19	0.39	0.39
318.1	9.842	2.78	0.06	120		9.76	0.16	0.59	0.59	0.19	0.40	0.40
317.9	10.006	4.28	0.06	120		9.92	0.16	0.60	0.60	0.20	0.40	0.40
317.7	10.170	4.50	0.07	120	10.09	0.16	0.61	0.61	0.20	0.20	0.41	0.41

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σv CPT (tsf)	Total Vertical Stress during EQ σv EQ (tsf)	Static Pore Water Pressure during CPT us CPT (tsf)	Static Pore Water Pressure during EQ us EQ (tsf)	Effective Vertical Stress during CPT σv CPT (tsf)	Effective Vertical Stress during EQ σv EQ (tsf)
317.6	10.335	4.62	0.08	120	10.25	0.16	0.62	0.62	0.21	0.21	0.41	0.41
317.4	10.499	4.72	0.10	120	10.42	0.16	0.63	0.63	0.22	0.22	0.41	0.41
317.2	10.663	5.33	0.13	120	10.58	0.16	0.64	0.64	0.22	0.22	0.42	0.42
317.1	10.827	6.23	0.15	120	10.74	0.16	0.65	0.65	0.23	0.23	0.42	0.42
316.9	10.991	7.16	0.16	120	10.91	0.16	0.66	0.66	0.23	0.23	0.43	0.43
316.7	11.155	7.47	0.16	120	11.07	0.16	0.67	0.67	0.24	0.24	0.43	0.43
316.6	11.319	7.07	0.18	120	11.24	0.16	0.68	0.68	0.24	0.24	0.44	0.44
316.4	11.483	6.20	0.19	120	11.40	0.16	0.69	0.69	0.25	0.25	0.44	0.44
316.3	11.647	6.11	0.19	120	11.56	0.16	0.70	0.70	0.25	0.25	0.45	0.45
316.1	11.811	5.53	0.20	120	11.73	0.16	0.71	0.71	0.26	0.26	0.45	0.45
315.9	11.975	4.19	0.19	120	11.89	0.16	0.72	0.72	0.26	0.26	0.46	0.46
315.8	12.139	3.38	0.18	120	12.06	0.16	0.73	0.73	0.27	0.27	0.46	0.46
315.6	12.303	3.53	0.15	120	12.22	0.16	0.74	0.74	0.27	0.27	0.47	0.47
315.4	12.467	4.21	0.14	120	12.39	0.16	0.75	0.75	0.28	0.28	0.47	0.47
315.3	12.631	4.90	0.16	120	12.55	0.16	0.76	0.76	0.28	0.28	0.48	0.48
315.1	12.795	5.92	0.18	120	12.71	0.16	0.77	0.77	0.29	0.29	0.48	0.48
314.9	12.959	7.43	0.20	120	12.88	0.16	0.78	0.78	0.29	0.29	0.49	0.49
314.8	13.123	8.04	0.22	120	13.04	0.16	0.79	0.79	0.30	0.30	0.49	0.49
314.6	13.287	7.98	0.23	120	13.21	0.16	0.80	0.80	0.30	0.30	0.49	0.49
314.4	13.451	9.03	0.23	120	13.37	0.16	0.81	0.81	0.31	0.31	0.50	0.50
314.3	13.615	10.18	0.26	120	13.53	0.16	0.82	0.82	0.31	0.31	0.50	0.50
314.1	13.779	10.85	0.29	120	13.70	0.16	0.83	0.83	0.32	0.32	0.51	0.51
314.0	13.943	11.66	0.34	120	13.86	0.16	0.84	0.84	0.32	0.32	0.51	0.51
313.8	14.107	12.53	0.39	120	14.03	0.16	0.85	0.85	0.33	0.33	0.52	0.52
313.6	14.271	13.08	0.45	120	14.19	0.16	0.86	0.86	0.33	0.33	0.52	0.52
313.5	14.436	13.17	0.43	120	14.35	0.16	0.87	0.87	0.34	0.34	0.53	0.53
313.3	14.600	14.20	0.42	120	14.52	0.16	0.88	0.88	0.34	0.34	0.53	0.53
313.1	14.764	14.76	0.44	120	14.68	0.16	0.89	0.89	0.35	0.35	0.54	0.54
313.0	14.928	13.53	0.49	120	14.85	0.16	0.90	0.90	0.35	0.35	0.54	0.54
312.8	15.092	12.55	0.50	120	15.01	0.16	0.91	0.91	0.36	0.36	0.55	0.55
312.6	15.256	12.43	0.44	120	15.17	0.16	0.92	0.92	0.36	0.36	0.55	0.55
312.5	15.420	12.37	0.43	120	15.34	0.16	0.93	0.93	0.37	0.37	0.56	0.56
312.3	15.584	12.94	0.42	120	15.50	0.16	0.94	0.94	0.37	0.37	0.56	0.56
312.2	15.748	12.98	0.46	120	15.67	0.16	0.94	0.94	0.38	0.38	0.57	0.57
312.0	15.912	13.69	0.46	120	15.83	0.16	0.95	0.95	0.38	0.38	0.57	0.57
311.8	16.076	13.62	0.46	120	15.99	0.16	0.96	0.96	0.39	0.39	0.58	0.58
311.7	16.240	13.46	0.42	120	16.16	0.16	0.97	0.97	0.39	0.39	0.58	0.58
311.5	16.404	13.42	0.37	120	16.32	0.16	0.98	0.98	0.40	0.40	0.58	0.58
311.3	16.568	14.15	0.38	120	16.49	0.16	0.99	0.99	0.40	0.40	0.59	0.59
311.2	16.732	15.31	0.47	120	16.65	0.16	1.00	1.00	0.41	0.41	0.59	0.59
311.0	16.896	15.40	0.53	120	16.81	0.16	1.01	1.01	0.41	0.41	0.60	0.60
310.8	17.060	13.56	0.55	120	16.98	0.16	1.02	1.02	0.42	0.42	0.60	0.60
310.7	17.224	13.30	0.49	120	17.14	0.16	1.03	1.03	0.43	0.43	0.61	0.61
310.5	17.388	13.31	0.52	120	17.31	0.16	1.04	1.04	0.43	0.43	0.61	0.61
310.3	17.552	12.76	0.52	120	17.47	0.16	1.05	1.05	0.44	0.44	0.62	0.62
310.2	17.716	12.72	0.52	120	17.63	0.16	1.06	1.06	0.44	0.44	0.62	0.62
310.0	17.880	12.40	0.51	120	17.80	0.16	1.07	1.07	0.45	0.45	0.63	0.63
309.9	18.044	12.38	0.54	120	17.96	0.16	1.08	1.08	0.45	0.45	0.63	0.63
309.7	18.208	13.23	0.53	120	18.13	0.16	1.09	1.09	0.46	0.46	0.64	0.64
309.5	18.372	13.61	0.53	120	18.29	0.16	1.10	1.10	0.46	0.46	0.64	0.64
309.4	18.537	13.33	0.55	120	18.45	0.16	1.11	1.11	0.47	0.47	0.65	0.65
309.2	18.701	14.72	0.62	120	18.62	0.16	1.12	1.12	0.47	0.47	0.65	0.65
309.0	18.865	29.49	0.53	120	18.78	0.16	1.13	1.13	0.48	0.48	0.66	0.66
308.9	19.029	46.13	0.45	120	18.95	0.16	1.14	1.14	0.48	0.48	0.66	0.66
308.7	19.193	44.04	0.73	120	19.11	0.16	1.15	1.15	0.49	0.49	0.67	0.67
308.5	19.357	32.90	0.90	120	19.27	0.16	1.16	1.16	0.49	0.49	0.67	0.67
308.4	19.521	24.40	0.84	120	19.44	0.16	1.17	1.17	0.50	0.50	0.67	0.67
308.2	19.685	19.35	0.72	120	19.60	0.16	1.18	1.18	0.50	0.50	0.68	0.68
308.1	19.849	24.88	0.54	120	19.77	0.16	1.19	1.19	0.51	0.51	0.68	0.68
307.9	20.013	22.77	0.38	120	19.93	0.16	1.20	1.20	0.51	0.51	0.69	0.69
307.7	20.177	24.74	0.41	120	20.09	0.16	1.21	1.21	0.52	0.52	0.69	0.69
307.6	20.341	20.21	0.33	120	20.26	0.16	1.22	1.22	0.52	0.52	0.70	0.70
307.4	20.505	24.08	0.38	120	20.42	0.16	1.23	1.23	0.53	0.53	0.70	0.70
307.2	20.669	13.95	0.37	120	20.59	0.16	1.24	1.24	0.53	0.53	0.71	0.71
307.1	20.833	10.52	0.22	120	20.75	0.16	1.25	1.25	0.54	0.54	0.71	0.71
306.9	20.997	9.78	0.12	120	20.92	0.16	1.26	1.26	0.54	0.54	0.72	0.72
306.7	21.161	15.80	0.14	120	21.08	0.16	1.27	1.27	0.55	0.55	0.72	0.72
306.6	21.325	22.18	0.39	120	21.24	0.16	1.28	1.28	0.55	0.55	0.73	0.73
306.4	21.489	18.99	0.42	120	21.41	0.16	1.29	1.29	0.56	0.56	0.73	0.73
306.2	21.653	17.72	0.52	120	21.57	0.16	1.30	1.30	0.56	0.56	0.74	0.74
306.1	21.817	12.08	0.32	120	21.74	0.16	1.31	1.31	0.57	0.57	0.74	0.74
305.9	21.981	9.07	0.31	120	21.90	0.16	1.32	1.32	0.57	0.57	0.75	0.75
305.8	22.145	9.00	0.16	120	22.06	0.16	1.33	1.33	0.58	0.58	0.75	0.75
305.6	22.309	10.28	0.15	120	22.23	0.16	1.34	1.34	0.58	0.58	0.75	0.75

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σv CPT (tsf)	Total Vertical Stress during EQ σv EQ (tsf)	Static Pore Water Pressure during CPT us CPT (tsf)	Static Pore Water Pressure during EQ us EQ (tsf)	Effective Vertical Stress during CPT σv CPT (tsf)	Effective Vertical Stress during EQ σv EQ (tsf)
305.4	22.473	9.95	0.14	120	22.39	0.16	1.35	1.35	0.59	0.59	0.76	0.76
305.3	22.638	8.96	0.14	120	22.56	0.16	1.36	1.36	0.59	0.59	0.76	0.76
305.1	22.802	8.96	0.21	120	22.72	0.16	1.37	1.37	0.60	0.60	0.77	0.77
304.9	22.966	9.08	0.18	120	22.88	0.16	1.38	1.38	0.60	0.60	0.77	0.77
304.8	23.130	9.65	0.17	120	23.05	0.16	1.39	1.39	0.61	0.61	0.78	0.78
304.6	23.294	9.72	0.40	120	23.21	0.16	1.40	1.40	0.61	0.61	0.78	0.78
304.4	23.458	22.16	0.38	120	23.38	0.16	1.41	1.41	0.62	0.62	0.79	0.79
304.3	23.622	10.53	0.33	120	23.54	0.16	1.42	1.42	0.62	0.62	0.79	0.79
304.1	23.786	9.82	0.28	120	23.70	0.16	1.43	1.43	0.63	0.63	0.80	0.80
304.0	23.950	25.25	0.19	120	23.87	0.16	1.44	1.44	0.63	0.63	0.80	0.80
303.8	24.114	42.21	0.53	120	24.03	0.16	1.45	1.45	0.64	0.64	0.81	0.81
303.6	24.278	23.18	0.73	120	24.20	0.16	1.46	1.46	0.65	0.65	0.81	0.81
303.5	24.442	13.21	0.59	120	24.36	0.16	1.47	1.47	0.65	0.65	0.82	0.82
303.3	24.606	10.75	0.37	120	24.52	0.16	1.48	1.48	0.66	0.66	0.82	0.82
303.1	24.770	10.45	0.15	120	24.69	0.16	1.49	1.49	0.66	0.66	0.83	0.83
303.0	24.934	10.42	0.15	120	24.85	0.16	1.50	1.50	0.67	0.67	0.83	0.83
302.8	25.098	31.91	0.15	120	25.02	0.16	1.51	1.51	0.67	0.67	0.84	0.84
302.6	25.262	31.01	0.41	120	25.18	0.16	1.52	1.52	0.68	0.68	0.84	0.84
302.5	25.426	17.91	0.39	120	25.34	0.16	1.53	1.53	0.68	0.68	0.84	0.84
302.3	25.590	11.70	0.38	120	25.51	0.16	1.54	1.54	0.69	0.69	0.85	0.85
302.1	25.754	10.28	0.16	120	25.67	0.16	1.55	1.55	0.69	0.69	0.85	0.85
302.0	25.918	10.13	0.09	120	25.84	0.16	1.56	1.56	0.70	0.70	0.86	0.86
301.8	26.082	9.48	0.10	120	26.00	0.16	1.56	1.56	0.70	0.70	0.86	0.86
301.7	26.246	8.73	0.12	120	26.16	0.16	1.57	1.57	0.71	0.71	0.87	0.87
301.5	26.410	8.61	0.11	120	26.33	0.16	1.58	1.58	0.71	0.71	0.87	0.87
301.3	26.574	8.94	0.10	120	26.49	0.16	1.59	1.59	0.72	0.72	0.88	0.88
301.2	26.739	8.86	0.10	120	26.66	0.16	1.60	1.60	0.72	0.72	0.88	0.88
301.0	26.903	8.56	0.09	120	26.82	0.16	1.61	1.61	0.73	0.73	0.89	0.89
300.8	27.067	8.29	0.10	120	26.98	0.16	1.62	1.62	0.73	0.73	0.89	0.89
300.7	27.231	8.99	0.09	120	27.15	0.16	1.63	1.63	0.74	0.74	0.90	0.90
300.5	27.395	8.91	0.09	120	27.31	0.16	1.64	1.64	0.74	0.74	0.90	0.90
300.3	27.559	8.69	0.15	120	27.48	0.16	1.65	1.65	0.75	0.75	0.91	0.91
300.2	27.723	9.20	0.12	120	27.64	0.16	1.66	1.66	0.75	0.75	0.91	0.91
300.0	27.887	13.54	0.27	120	27.80	0.16	1.67	1.67	0.76	0.76	0.92	0.92
299.8	28.051	12.14	0.26	120	27.97	0.16	1.68	1.68	0.76	0.76	0.92	0.92
299.7	28.215	9.26	0.26	120	28.13	0.16	1.69	1.69	0.77	0.77	0.92	0.92
299.5	28.379	9.67	0.14	120	28.30	0.16	1.70	1.70	0.77	0.77	0.93	0.93
299.4	28.543	9.51	0.13	120	28.46	0.16	1.71	1.71	0.78	0.78	0.93	0.93
299.2	28.707	9.52	0.11	120	28.62	0.16	1.72	1.72	0.78	0.78	0.94	0.94
299.0	28.871	10.66	0.10	120	28.79	0.16	1.73	1.73	0.79	0.79	0.94	0.94
298.9	29.035	9.27	0.13	120	28.95	0.16	1.74	1.74	0.79	0.79	0.95	0.95
298.7	29.199	9.15	0.09	120	29.12	0.16	1.75	1.75	0.80	0.80	0.95	0.95
298.5	29.363	18.79	0.29	120	29.28	0.16	1.76	1.76	0.80	0.80	0.96	0.96
298.4	29.527	16.17	0.30	120	29.45	0.16	1.77	1.77	0.81	0.81	0.96	0.96
298.2	29.691	11.55	0.30	120	29.61	0.16	1.78	1.78	0.81	0.81	0.97	0.97
298.0	29.855	10.67	0.20	120	29.77	0.16	1.79	1.79	0.82	0.82	0.97	0.97
297.9	30.019	10.25	0.14	120	29.94	0.16	1.80	1.80	0.82	0.82	0.98	0.98
297.7	30.183	10.37	0.12	120	30.10	0.16	1.81	1.81	0.83	0.83	0.98	0.98
297.6	30.347	10.32	0.09	120	30.27	0.16	1.82	1.82	0.83	0.83	0.99	0.99
297.4	30.511	9.74	0.09	120	30.43	0.16	1.83	1.83	0.84	0.84	0.99	0.99
297.2	30.675	9.84	0.09	120	30.59	0.16	1.84	1.84	0.84	0.84	1.00	1.00
297.1	30.840	9.45	0.08	120	30.76	0.16	1.85	1.85	0.85	0.85	1.00	1.00
296.9	31.004	8.83	0.09	120	30.92	0.16	1.86	1.86	0.85	0.85	1.01	1.01
296.7	31.168	8.64	0.09	120	31.09	0.16	1.87	1.87	0.86	0.86	1.01	1.01
296.6	31.332	9.33	0.11	120	31.25	0.16	1.88	1.88	0.87	0.87	1.01	1.01
296.4	31.496	11.91	0.13	120	31.41	0.16	1.89	1.89	0.87	0.87	1.02	1.02
296.2	31.660	9.05	0.14	120	31.58	0.16	1.90	1.90	0.88	0.88	1.02	1.02
296.1	31.824	9.59	0.16	120	31.74	0.16	1.91	1.91	0.88	0.88	1.03	1.03
295.9	31.988	10.24	0.09	120	31.91	0.16	1.92	1.92	0.89	0.89	1.03	1.03
295.7	32.152	9.95	0.10	120	32.07	0.16	1.93	1.93	0.89	0.89	1.04	1.04
295.6	32.316	9.88	0.11	120	32.23	0.16	1.94	1.94	0.90	0.90	1.04	1.04
295.4	32.480	9.71	0.11	120	32.40	0.16	1.95	1.95	0.90	0.90	1.05	1.05
295.3	32.644	9.82	0.11	120	32.56	0.16	1.96	1.96	0.91	0.91	1.05	1.05
295.1	32.808	9.67	0.12	120	32.73	0.16	1.97	1.97	0.91	0.91	1.06	1.06
294.9	32.972	9.99	0.11	120	32.89	0.16	1.98	1.98	0.92	0.92	1.06	1.06
294.8	33.136	9.52	0.11	120	33.05	0.16	1.99	1.99	0.92	0.92	1.07	1.07
294.6	33.300	9.15	0.10	120	33.22	0.16	2.00	2.00	0.93	0.93	1.07	1.07
294.4	33.464	9.40	0.12	120	33.38	0.16	2.01	2.01	0.93	0.93	1.08	1.08
294.3	33.628	11.25	0.16	120	33.55	0.16	2.02	2.02	0.94	0.94	1.08	1.08
294.1	33.792	9.37	0.18	120	33.71	0.16	2.03	2.03	0.94	0.94	1.09	1.09
293.9	33.956	11.16	0.20	120	33.87	0.16	2.04	2.04	0.95	0.95	1.09	1.09
293.8	34.120	11.70	0.13	120	34.04	0.16	2.05	2.05	0.95	0.95	1.09	1.09
293.6	34.284	9.69	0.16	120	34.20	0.16	2.06	2.06	0.96	0.96	1.10	1.10
293.5	34.448	9.84	0.14	120	34.37	0.16	2.07	2.07	0.96	0.96	1.10	1.10

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σv CPT (tsf)	Total Vertical Stress during EQ σv EQ (tsf)	Static Pore Water Pressure during CPT us CPT (tsf)	Static Pore Water Pressure during EQ us EQ (tsf)	Effective Vertical Stress during CPT σv CPT (tsf)	Effective Vertical Stress during EQ σv EQ (tsf)
293.3	34.612	10.13	0.13	120	34.53	0.16	2.08	2.08	0.97	0.97	1.11	1.11
293.1	34.776	9.96	0.14	120	34.69	0.16	2.09	2.09	0.97	0.97	1.11	1.11
293.0	34.941	10.00	0.14	120	34.86	0.16	2.10	2.10	0.98	0.98	1.12	1.12
292.8	35.105	10.02	0.14	120	35.02	0.16	2.11	2.11	0.98	0.98	1.12	1.12
292.6	35.269	10.24	0.16	120	35.19	0.16	2.12	2.12	0.99	0.99	1.13	1.13
292.5	35.433	10.24	0.18	120	35.35	0.16	2.13	2.13	0.99	0.99	1.13	1.13
292.3	35.597	9.98	0.15	120	35.51	0.16	2.14	2.14	1.00	1.00	1.14	1.14
292.1	35.761	9.97	0.12	120	35.68	0.16	2.15	2.15	1.00	1.00	1.14	1.14
292.0	35.925	10.19	0.15	120	35.84	0.16	2.16	2.16	1.01	1.01	1.15	1.15
291.8	36.089	10.20	0.22	120	36.01	0.16	2.17	2.17	1.01	1.01	1.15	1.15
291.6	36.253	13.60	0.18	120	36.17	0.16	2.18	2.18	1.02	1.02	1.16	1.16
291.5	36.417	12.11	0.18	120	36.33	0.16	2.19	2.19	1.02	1.02	1.16	1.16
291.3	36.581	42.77	0.57	120	36.50	0.16	2.19	2.19	1.03	1.03	1.17	1.17
291.2	36.745	21.02	0.61	120	36.66	0.16	2.20	2.20	1.03	1.03	1.17	1.17
291.0	36.909	13.39	0.56	120	36.83	0.16	2.21	2.21	1.04	1.04	1.18	1.18
290.8	37.073	12.96	0.32	120	36.99	0.16	2.22	2.22	1.04	1.04	1.18	1.18
290.7	37.237	15.32	0.25	120	37.16	0.16	2.23	2.23	1.05	1.05	1.18	1.18
290.5	37.401	11.98	0.23	120	37.32	0.16	2.24	2.24	1.05	1.05	1.19	1.19
290.3	37.565	9.86	0.24	120	37.48	0.16	2.25	2.25	1.06	1.06	1.19	1.19
290.2	37.729	10.15	0.11	120	37.65	0.16	2.26	2.26	1.06	1.06	1.20	1.20
290.0	37.893	10.44	0.11	120	37.81	0.16	2.27	2.27	1.07	1.07	1.20	1.20
289.8	38.057	10.62	0.10	120	37.98	0.16	2.28	2.28	1.08	1.08	1.21	1.21
289.7	38.221	10.41	0.11	120	38.14	0.16	2.29	2.29	1.08	1.08	1.21	1.21
289.5	38.385	10.62	0.11	120	38.30	0.16	2.30	2.30	1.09	1.09	1.22	1.22
289.4	38.549	11.72	0.14	120	38.47	0.16	2.31	2.31	1.09	1.09	1.22	1.22
289.2	38.713	11.14	0.16	120	38.63	0.16	2.32	2.32	1.10	1.10	1.23	1.23
289.0	38.877	10.63	0.18	120	38.80	0.16	2.33	2.33	1.10	1.10	1.23	1.23
288.9	39.042	11.60	0.15	120	38.96	0.16	2.34	2.34	1.11	1.11	1.24	1.24
288.7	39.206	11.25	0.14	120	39.12	0.16	2.35	2.35	1.11	1.11	1.24	1.24
288.5	39.370	10.65	0.17	120	39.29	0.16	2.36	2.36	1.12	1.12	1.25	1.25
288.4	39.534	11.26	0.11	120	39.45	0.16	2.37	2.37	1.12	1.12	1.25	1.25
288.2	39.698	11.18	0.12	120	39.62	0.16	2.38	2.38	1.13	1.13	1.26	1.26
288.0	39.862	11.17	0.12	120	39.78	0.16	2.39	2.39	1.13	1.13	1.26	1.26
287.9	40.026	11.16	0.12	120	39.94	0.16	2.40	2.40	1.14	1.14	1.27	1.27
287.7	40.190	11.47	0.13	120	40.11	0.16	2.41	2.41	1.14	1.14	1.27	1.27
287.5	40.354	12.22	0.13	120	40.27	0.16	2.42	2.42	1.15	1.15	1.27	1.27
287.4	40.518	11.58	0.14	120	40.44	0.16	2.43	2.43	1.15	1.15	1.28	1.28
287.2	40.682	13.56	0.19	120	40.60	0.16	2.44	2.44	1.16	1.16	1.28	1.28
287.1	40.846	12.31	0.20	120	40.76	0.16	2.45	2.45	1.16	1.16	1.29	1.29
286.9	41.010	11.00	0.19	120	40.93	0.16	2.46	2.46	1.17	1.17	1.29	1.29
286.7	41.174	11.26	0.11	120	41.09	0.16	2.47	2.47	1.17	1.17	1.30	1.30
286.6	41.338	11.35	0.12	120	41.26	0.16	2.48	2.48	1.18	1.18	1.30	1.30
286.4	41.502	12.45	0.13	120	41.42	0.16	2.49	2.49	1.18	1.18	1.31	1.31
286.2	41.666	11.71	0.15	120	41.58	0.16	2.50	2.50	1.19	1.19	1.31	1.31
286.1	41.830	11.91	0.22	120	41.75	0.16	2.51	2.51	1.19	1.19	1.32	1.32
285.9	41.994	19.65	0.29	120	41.91	0.16	2.52	2.52	1.20	1.20	1.32	1.32
285.7	42.158	16.61	0.35	120	42.08	0.16	2.53	2.53	1.20	1.20	1.33	1.33
285.6	42.322	13.21	0.40	120	42.24	0.16	2.54	2.54	1.21	1.21	1.33	1.33
285.4	42.486	11.45	0.33	120	42.40	0.16	2.55	2.55	1.21	1.21	1.34	1.34
285.2	42.650	12.25	0.10	120	42.57	0.16	2.56	2.56	1.22	1.22	1.34	1.34
285.1	42.814	45.65	0.54	120	42.73	0.16	2.57	2.57	1.22	1.22	1.35	1.35
284.9	42.978	29.15	0.54	120	42.90	0.16	2.58	2.58	1.23	1.23	1.35	1.35
284.8	43.143	16.30	0.53	120	43.06	0.16	2.59	2.59	1.23	1.23	1.35	1.35
284.6	43.307	16.33	0.32	120	43.22	0.16	2.60	2.60	1.24	1.24	1.36	1.36
284.4	43.471	14.66	0.19	120	43.39	0.16	2.61	2.61	1.24	1.24	1.36	1.36
284.3	43.635	13.66	0.19	120	43.55	0.16	2.62	2.62	1.25	1.25	1.37	1.37
284.1	43.799	12.55	0.12	120	43.72	0.16	2.63	2.63	1.25	1.25	1.37	1.37
283.9	43.963	12.79	0.08	120	43.88	0.16	2.64	2.64	1.26	1.26	1.38	1.38
283.8	44.127	15.45	0.15	120	44.04	0.16	2.65	2.65	1.26	1.26	1.38	1.38
283.6	44.291	16.72	0.19	120	44.21	0.16	2.66	2.66	1.27	1.27	1.39	1.39
283.4	44.455	12.42	0.21	120	44.37	0.16	2.67	2.67	1.27	1.27	1.39	1.39
283.3	44.619	12.02	0.13	120	44.54	0.16	2.68	2.68	1.28	1.28	1.40	1.40
283.1	44.783	11.78	0.11	120	44.70	0.16	2.69	2.69	1.28	1.28	1.40	1.40
283.0	44.947	15.75	0.19	120	44.86	0.16	2.70	2.70	1.29	1.29	1.41	1.41
282.8	45.111	13.57	0.21	120	45.03	0.16	2.71	2.71	1.30	1.30	1.41	1.41
282.6	45.275	12.72	0.27	120	45.19	0.16	2.72	2.72	1.30	1.30	1.42	1.42
282.5	45.439	12.25	0.17	120	45.36	0.16	2.73	2.73	1.31	1.31	1.42	1.42
282.3	45.603	12.37	0.17	120	45.52	0.16	2.74	2.74	1.31	1.31	1.43	1.43
282.1	45.767	12.33	0.26	120	45.69	0.16	2.75	2.75	1.32	1.32	1.43	1.43
282.0	45.931	12.50	0.27	120	45.85	0.16	2.76	2.76	1.32	1.32	1.44	1.44
281.8	46.095	13.50	0.25	120	46.01	0.16	2.77	2.77	1.33	1.33	1.44	1.44
281.6	46.259	13.17	0.25	120	46.18	0.16	2.78	2.78	1.33	1.33	1.44	1.44
281.5	46.423	13.01	0.22	120	46.34	0.16	2.79	2.79	1.34	1.34	1.45	1.45
281.3	46.587	12.57	0.19	120	46.51	0.16	2.80	2.80	1.34	1.34	1.45	1.45

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σv CPT (tsf)	Total Vertical Stress during EQ σv EQ (tsf)	Static Pore Water Pressure during CPT us CPT (tsf)	Static Pore Water Pressure during EQ us EQ (tsf)	Effective Vertical Stress during CPT σv CPT (tsf)	Effective Vertical Stress during EQ σv EQ (tsf)
281.1	46.751	11.97	0.18	120	46.67	0.16	2.81	2.81	1.35	1.35	1.46	1.46
281.0	46.915	12.03	0.13	120	46.83	0.16	2.81	2.81	1.35	1.35	1.46	1.46
280.8	47.079	12.16	0.12	120	47.00	0.16	2.82	2.82	1.36	1.36	1.47	1.47
280.7	47.244	12.25	0.13	120	47.16	0.16	2.83	2.83	1.36	1.36	1.47	1.47
280.5	47.408	12.31	0.13	120	47.33	0.16	2.84	2.84	1.37	1.37	1.48	1.48
280.3	47.572	12.65	0.13	120	47.49	0.16	2.85	2.85	1.37	1.37	1.48	1.48
280.2	47.736	12.74	0.12	120	47.65	0.16	2.86	2.86	1.38	1.38	1.49	1.49
280.0	47.900	12.79	0.15	120	47.82	0.16	2.87	2.87	1.38	1.38	1.49	1.49
279.8	48.064	14.03	0.18	120	47.98	0.16	2.88	2.88	1.39	1.39	1.50	1.50
279.7	48.228	12.64	0.18	120	48.15	0.16	2.89	2.89	1.39	1.39	1.50	1.50
279.5	48.392	12.90	0.16	120	48.31	0.16	2.90	2.90	1.40	1.40	1.51	1.51
279.3	48.556	13.30	0.15	120	48.47	0.16	2.91	2.91	1.40	1.40	1.51	1.51
279.2	48.720	13.37	0.15	120	48.64	0.16	2.92	2.92	1.41	1.41	1.52	1.52
279.0	48.884	12.73	0.14	120	48.80	0.16	2.93	2.93	1.41	1.41	1.52	1.52
278.9	49.048	12.58	0.14	120	48.97	0.16	2.94	2.94	1.42	1.42	1.52	1.52
278.7	49.212	12.69	0.13	120	49.13	0.16	2.95	2.95	1.42	1.42	1.53	1.53
278.5	49.376	12.92	0.14	120	49.29	0.16	2.96	2.96	1.43	1.43	1.53	1.53
278.4	49.540	13.07	0.13	120	49.46	0.16	2.97	2.97	1.43	1.43	1.54	1.54
278.2	49.704	17.95	0.31	120	49.62	0.16	2.98	2.98	1.44	1.44	1.54	1.54
278.0	49.868	111.18	0.69	120	49.79	0.16	2.99	2.99	1.44	1.44	1.55	1.55
277.9	50.032	87.08	1.20	120	49.95	0.16	3.00	3.00	1.45	1.45	1.55	1.55
277.7	50.196	40.77	1.23	120	50.11	0.16	3.01	3.01	1.45	1.45	1.56	1.56
277.5	50.360	22.27	0.92	120	50.28	0.16	3.02	3.02	1.46	1.46	1.56	1.56
277.4	50.524	16.05	0.64	120	50.44	0.16	3.03	3.03	1.46	1.46	1.57	1.57
277.2	50.688	16.20	0.22	120	50.61	0.16	3.04	3.04	1.47	1.47	1.57	1.57
277.0	50.852	15.54	0.13	120	50.77	0.16	3.05	3.05	1.47	1.47	1.58	1.58
276.9	51.016	15.00	0.12	120	50.93	0.16	3.06	3.06	1.48	1.48	1.58	1.58
276.7	51.180	14.70	0.10	120	51.10	0.16	3.07	3.07	1.48	1.48	1.59	1.59
276.6	51.345	14.57	0.10	120	51.26	0.16	3.08	3.08	1.49	1.49	1.59	1.59
276.4	51.509	14.25	0.12	120	51.43	0.16	3.09	3.09	1.49	1.49	1.60	1.60
276.2	51.673	13.67	0.13	120	51.59	0.16	3.10	3.10	1.50	1.50	1.60	1.60
276.1	51.837	13.52	0.11	120	51.75	0.16	3.11	3.11	1.50	1.50	1.61	1.61
275.9	52.001	13.53	0.10	120	51.92	0.16	3.12	3.12	1.51	1.51	1.61	1.61
275.7	52.165	14.82	0.15	120	52.08	0.16	3.13	3.13	1.52	1.52	1.61	1.61
275.6	52.329	17.36	0.30	120	52.25	0.16	3.14	3.14	1.52	1.52	1.62	1.62
275.4	52.493	28.15	0.47	120	52.41	0.16	3.15	3.15	1.53	1.53	1.62	1.62
275.2	52.657	22.19	0.41	120	52.57	0.16	3.16	3.16	1.53	1.53	1.63	1.63
275.1	52.821	18.36	0.45	120	52.74	0.16	3.17	3.17	1.54	1.54	1.63	1.63
274.9	52.985	17.26	0.30	120	52.90	0.16	3.18	3.18	1.54	1.54	1.64	1.64
274.8	53.149	14.78	0.22	120	53.07	0.16	3.19	3.19	1.55	1.55	1.64	1.64
274.6	53.313	15.12	0.16	120	53.23	0.16	3.20	3.20	1.55	1.55	1.65	1.65
274.4	53.477	14.62	0.12	120	53.40	0.16	3.21	3.21	1.56	1.56	1.65	1.65
274.3	53.641	14.65	0.14	120	53.56	0.16	3.22	3.22	1.56	1.56	1.66	1.66
274.1	53.805	14.39	0.20	120	53.72	0.16	3.23	3.23	1.57	1.57	1.66	1.66
273.9	53.969	16.07	0.49	120	53.89	0.16	3.24	3.24	1.57	1.57	1.67	1.67
273.8	54.133	49.00	0.84	120	54.05	0.16	3.25	3.25	1.58	1.58	1.67	1.67
273.6	54.297	28.20	0.80	120	54.22	0.16	3.26	3.26	1.58	1.58	1.68	1.68
273.4	54.461	18.69	0.58	120	54.38	0.16	3.27	3.27	1.59	1.59	1.68	1.68
273.3	54.625	17.76	0.26	120	54.54	0.16	3.28	3.28	1.59	1.59	1.69	1.69
273.1	54.789	16.80	0.17	120	54.71	0.16	3.29	3.29	1.60	1.60	1.69	1.69
272.9	54.953	16.86	0.14	120	54.87	0.16	3.30	3.30	1.60	1.60	1.69	1.69
272.8	55.117	16.44	0.11	120	55.04	0.16	3.31	3.31	1.61	1.61	1.70	1.70
272.6	55.281	16.12	0.11	120	55.20	0.16	3.32	3.32	1.61	1.61	1.70	1.70
272.5	55.446	16.48	0.10	120	55.36	0.16	3.33	3.33	1.62	1.62	1.71	1.71
272.3	55.610	16.30	0.09	120	55.53	0.16	3.34	3.34	1.62	1.62	1.71	1.71
272.1	55.774	16.72	0.10	120	55.69	0.16	3.35	3.35	1.63	1.63	1.72	1.72
272.0	55.938	17.35	0.10	120	55.86	0.16	3.36	3.36	1.63	1.63	1.72	1.72
271.8	56.102	17.14	0.11	120	56.02	0.16	3.37	3.37	1.64	1.64	1.73	1.73
271.6	56.266	18.21	0.11	120	56.18	0.16	3.38	3.38	1.64	1.64	1.73	1.73
271.5	56.430	17.49	0.10	120	56.35	0.16	3.39	3.39	1.65	1.65	1.74	1.74
271.3	56.594	17.37	0.12	120	56.51	0.16	3.40	3.40	1.65	1.65	1.74	1.74
271.1	56.758	17.55	0.12	120	56.68	0.16	3.41	3.41	1.66	1.66	1.75	1.75
271.0	56.922	16.86	0.12	120	56.84	0.16	3.42	3.42	1.66	1.66	1.75	1.75
270.8	57.086	16.71	0.12	120	57.00	0.16	3.43	3.43	1.67	1.67	1.76	1.76
270.7	57.250	16.95	0.11	120	57.17	0.16	3.43	3.43	1.67	1.67	1.76	1.76
270.5	57.414	17.35	0.10	120	57.33	0.16	3.44	3.44	1.68	1.68	1.77	1.77
270.3	57.578	17.03	0.10	120	57.50	0.16	3.45	3.45	1.68	1.68	1.77	1.77
270.2	57.742	17.76	0.10	120	57.66	0.16	3.46	3.46	1.69	1.69	1.78	1.78
270.0	57.906	17.64	0.10	120	57.82	0.16	3.47	3.47	1.69	1.69	1.78	1.78
269.8	58.070	16.78	0.11	120	57.99	0.16	3.48	3.48	1.70	1.70	1.78	1.78
269.7	58.234	16.60	0.12	120	58.15	0.16	3.49	3.49	1.70	1.70	1.79	1.79
269.5	58.398	16.83	0.10	120	58.32	0.16	3.50	3.50	1.71	1.71	1.79	1.79
269.3	58.562	16.62	0.10	120	58.48	0.16	3.51	3.51	1.71	1.71	1.80	1.80
269.2	58.726	16.90	0.10	120	58.64	0.16	3.52	3.52	1.72	1.72	1.80	1.80

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σv CPT (tsf)	Total Vertical Stress during EQ σv EQ (tsf)	Static Pore Water Pressure during CPT us CPT (tsf)	Static Pore Water Pressure during EQ us EQ (tsf)	Effective Vertical Stress during CPT σv CPT (tsf)	Effective Vertical Stress during EQ σv EQ (tsf)
269.0	58.890	17.54	0.39	120	58.81	0.16	3.53	3.53	1.73	1.73	1.81	1.81
268.8	59.054	17.53	0.81	120	58.97	0.16	3.54	3.54	1.73	1.73	1.81	1.81
268.7	59.218	49.00	1.06	120	59.14	0.16	3.55	3.55	1.74	1.74	1.82	1.82
268.5	59.382	45.07	1.19	120	59.30	0.16	3.56	3.56	1.74	1.74	1.82	1.82
268.4	59.547	25.28	0.81	120	59.46	0.16	3.57	3.57	1.75	1.75	1.83	1.83
268.2	59.711	21.12	0.50	120	59.63	0.16	3.58	3.58	1.75	1.75	1.83	1.83
268.0	59.875	19.84	0.34	120	59.79	0.16	3.59	3.59	1.76	1.76	1.84	1.84
267.9	60.039	18.50	0.29	120	59.96	0.16	3.60	3.60	1.76	1.76	1.84	1.84
267.7	60.203	19.60	0.20	120	60.12	0.16	3.61	3.61	1.77	1.77	1.85	1.85
267.5	60.367	18.43	0.14	120	60.28	0.16	3.62	3.62	1.77	1.77	1.85	1.85
267.4	60.531	19.26	0.21	120	60.45	0.16	3.63	3.63	1.78	1.78	1.86	1.86
267.2	60.695	17.28	0.29	120	60.61	0.16	3.64	3.64	1.78	1.78	1.86	1.86
267.0	60.859	15.33	0.27	120	60.78	0.16	3.65	3.65	1.79	1.79	1.87	1.87
266.9	61.023	14.73	0.19	120	60.94	0.16	3.66	3.66	1.79	1.79	1.87	1.87
266.7	61.187	15.60	0.26	120	61.10	0.16	3.67	3.67	1.80	1.80	1.87	1.87
266.5	61.351	20.72	0.24	120	61.27	0.16	3.68	3.68	1.80	1.80	1.88	1.88
266.4	61.515	15.60	0.27	120	61.43	0.16	3.69	3.69	1.81	1.81	1.88	1.88
266.2	61.679	14.96	0.25	120	61.60	0.16	3.70	3.70	1.81	1.81	1.89	1.89
266.1	61.843	15.09	0.17	120	61.76	0.16	3.71	3.71	1.82	1.82	1.89	1.89
265.9	62.007	14.46	0.15	120	61.93	0.16	3.72	3.72	1.82	1.82	1.90	1.90
265.7	62.171	14.52	0.14	120	62.09	0.16	3.73	3.73	1.83	1.83	1.90	1.90
265.6	62.335	14.43	0.15	120	62.25	0.16	3.74	3.74	1.83	1.83	1.91	1.91
265.4	62.499	14.83	0.16	120	62.42	0.16	3.75	3.75	1.84	1.84	1.91	1.91
265.2	62.663	14.79	0.16	120	62.58	0.16	3.76	3.76	1.84	1.84	1.92	1.92
265.1	62.827	15.04	0.14	120	62.75	0.16	3.77	3.77	1.85	1.85	1.92	1.92
264.9	62.991	15.48	0.13	120	62.91	0.16	3.78	3.78	1.85	1.85	1.93	1.93
264.7	63.155	15.40	0.15	120	63.07	0.16	3.79	3.79	1.86	1.86	1.93	1.93
264.6	63.319	14.96	0.16	120	63.24	0.16	3.80	3.80	1.86	1.86	1.94	1.94
264.4	63.483	14.69	0.16	120	63.40	0.16	3.81	3.81	1.87	1.87	1.94	1.94
264.3	63.648	14.85	0.13	120	63.57	0.16	3.82	3.82	1.87	1.87	1.95	1.95
264.1	63.812	14.74	0.14	120	63.73	0.16	3.83	3.83	1.88	1.88	1.95	1.95
263.9	63.976	14.39	0.14	120	63.89	0.16	3.84	3.84	1.88	1.88	1.95	1.95
263.8	64.140	14.41	0.14	120	64.06	0.16	3.85	3.85	1.89	1.89	1.96	1.96
263.6	64.304	14.95	0.14	120	64.22	0.16	3.86	3.86	1.89	1.89	1.96	1.96
263.4	64.468	14.78	0.15	120	64.39	0.16	3.87	3.87	1.90	1.90	1.97	1.97
263.3	64.632	14.89	0.18	120	64.55	0.16	3.88	3.88	1.90	1.90	1.97	1.97
263.1	64.796	14.90	0.15	120	64.71	0.16	3.89	3.89	1.91	1.91	1.98	1.98
262.9	64.960	15.30	0.14	120	64.88	0.16	3.90	3.90	1.91	1.91	1.98	1.98
262.8	65.124	15.22	0.15	120	65.04	0.16	3.91	3.91	1.92	1.92	1.99	1.99
262.6	65.288	15.06	0.17	120	65.21	0.16	3.92	3.92	1.92	1.92	1.99	1.99
262.4	65.452	14.79	0.18	120	65.37	0.16	3.93	3.93	1.93	1.93	2.00	2.00
262.3	65.616	14.63	0.15	120	65.53	0.16	3.94	3.94	1.93	1.93	2.00	2.00
262.1	65.780	15.18	0.15	120	65.70	0.16	3.95	3.95	1.94	1.94	2.01	2.01
262.0	65.944	16.24	0.16	120	65.86	0.16	3.96	3.96	1.95	1.95	2.01	2.01
261.8	66.108	15.19	0.20	120	66.03	0.16	3.97	3.97	1.95	1.95	2.02	2.02
261.6	66.272	15.13	0.19	120	66.19	0.16	3.98	3.98	1.96	1.96	2.02	2.02
261.5	66.436	15.69	0.19	120	66.35	0.16	3.99	3.99	1.96	1.96	2.03	2.03
261.3	66.600	16.05	0.20	120	66.52	0.16	4.00	4.00	1.97	1.97	2.03	2.03
261.1	66.764	15.59	0.22	120	66.68	0.16	4.01	4.01	1.97	1.97	2.04	2.04
261.0	66.928	15.48	0.21	120	66.85	0.16	4.02	4.02	1.98	1.98	2.04	2.04
260.8	67.092	15.61	0.18	120	67.01	0.16	4.03	4.03	1.98	1.98	2.04	2.04
260.6	67.256	15.52	0.17	120	67.17	0.16	4.04	4.04	1.99	1.99	2.05	2.05
260.5	67.420	15.22	0.17	120	67.34	0.16	4.05	4.05	1.99	1.99	2.05	2.05
260.3	67.584	14.94	0.17	120	67.50	0.16	4.06	4.06	2.00	2.00	2.06	2.06
260.2	67.749	14.93	0.17	120	67.67	0.16	4.06	4.06	2.00	2.00	2.06	2.06
260.0	67.913	15.00	0.17	120	67.83	0.16	4.07	4.07	2.01	2.01	2.07	2.07
259.8	68.077	15.24	0.16	120	67.99	0.16	4.08	4.08	2.01	2.01	2.07	2.07
259.7	68.241	15.31	0.15	120	68.16	0.16	4.09	4.09	2.02	2.02	2.08	2.08
259.5	68.405	15.85	0.19	120	68.32	0.16	4.10	4.10	2.02	2.02	2.08	2.08
259.3	68.569	15.61	0.19	120	68.49	0.16	4.11	4.11	2.03	2.03	2.09	2.09
259.2	68.733	16.35	0.25	120	68.65	0.16	4.12	4.12	2.03	2.03	2.09	2.09
259.0	68.897	15.62	0.23	120	68.81	0.16	4.13	4.13	2.04	2.04	2.10	2.10
258.8	69.061	16.31	0.25	120	68.98	0.16	4.14	4.14	2.04	2.04	2.10	2.10
258.7	69.225	16.39	0.19	120	69.14	0.16	4.15	4.15	2.05	2.05	2.11	2.11
258.5	69.389	16.07	0.18	120	69.31	0.16	4.16	4.16	2.05	2.05	2.11	2.11
258.3	69.553	17.01	0.19	120	69.47	0.16	4.17	4.17	2.06	2.06	2.12	2.12
258.2	69.717	16.02	0.18	120	69.63	0.16	4.18	4.18	2.06	2.06	2.12	2.12
258.0	69.881	16.40	0.18	120	69.80	0.16	4.19	4.19	2.07	2.07	2.12	2.12
257.9	70.045	16.49	0.20	120	69.96	0.16	4.20	4.20	2.07	2.07	2.13	2.13
257.7	70.209	16.17	0.18	120	70.13	0.16	4.21	4.21	2.08	2.08	2.13	2.13
257.5	70.373	17.48	0.19	120	70.29	0.16	4.22	4.22	2.08	2.08	2.14	2.14
257.4	70.537	15.28	0.21	120	70.46	0.16	4.23	4.23	2.09	2.09	2.14	2.14
257.2	70.701	15.31	0.22	120	70.62	0.16	4.24	4.24	2.09	2.09	2.15	2.15
257.0	70.865	15.62	0.16	120	70.78	0.16	4.25	4.25	2.10	2.10	2.15	2.15

Elev.	Depth	Cone Tip	Sleeve	Unit Weight	Top of	Thickness of	Total Vertical Stress during CPT	Total Vertical Stress during EQ	Static Pore Water Pressure during CPT	Static Pore Water Pressure during EQ	Effective Vertical Stress during CPT	Effective Vertical Stress during EQ
(ft)	z (ft)	qt (tsf)	fs (tsf)	γ (pcf)	Sampling Interval (ft)	Sampling Interval (ft)	σ _{V CPT} (tsf)	σ _{V EQ} (tsf)	u _{S CPT} (tsf)	u _{S EQ} (tsf)	σ _{V CPT} (tsf)	σ _{V EQ} (tsf)
256.9	71.029	16.28	0.15	120	70.95	0.16	4.26	4.26	2.10	2.10	2.16	2.16
256.7	71.193	16.23	0.30	120	71.11	0.16	4.27	4.27	2.11	2.11	2.16	2.16
256.5	71.357	22.09	0.36	120	71.28	0.16	4.28	4.28	2.11	2.11	2.17	2.17
256.4	71.521	17.03	0.39	120	71.44	0.16	4.29	4.29	2.12	2.12	2.17	2.17
256.2	71.685	17.26	0.36	120	71.60	0.16	4.30	4.30	2.12	2.12	2.18	2.18
256.1	71.850	21.67	0.43	120	71.77	0.16	4.31	4.31	2.13	2.13	2.18	2.18
255.9	72.014	156.42	0.70	120	71.93	0.16	4.32	4.32	2.13	2.13	2.19	2.19
255.7	72.178	169.50	1.38	120	72.10	0.16	4.33	4.33	2.14	2.14	2.19	2.19
255.6	72.342	131.62	2.08	120	72.26	0.16	4.34	4.34	2.14	2.14	2.20	2.20
255.4	72.506	63.83	2.46	120	72.42	0.16	4.35	4.35	2.15	2.15	2.20	2.20
255.2	72.670	37.61	1.59	120	72.59	0.16	4.36	4.36	2.15	2.15	2.21	2.21
255.1	72.834	21.30	1.34	120	72.75	0.16	4.37	4.37	2.16	2.16	2.21	2.21
254.9	72.998	20.44	0.84	120	72.92	0.16	4.38	4.38	2.17	2.17	2.21	2.21
254.7	73.162	21.04	0.35	120	73.08	0.16	4.39	4.39	2.17	2.17	2.22	2.22
254.6	73.326	18.24	0.25	120	73.24	0.16	4.40	4.40	2.18	2.18	2.22	2.22
254.4	73.490	18.16	0.26	120	73.41	0.16	4.41	4.41	2.18	2.18	2.23	2.23
254.2	73.654	17.79	0.21	120	73.57	0.16	4.42	4.42	2.19	2.19	2.23	2.23
254.1	73.818	18.04	0.21	120	73.74	0.16	4.43	4.43	2.19	2.19	2.24	2.24
253.9	73.982	17.64	0.21	120	73.90	0.16	4.44	4.44	2.20	2.20	2.24	2.24
253.8	74.146	17.12	0.21	120	74.06	0.16	4.45	4.45	2.20	2.20	2.25	2.25
253.6	74.310	17.07	0.18	120	74.23	0.16	4.46	4.46	2.21	2.21	2.25	2.25
253.4	74.474	18.81	0.17	120	74.39	0.16	4.47	4.47	2.21	2.21	2.26	2.26
253.3	74.638	18.08	0.17	120	74.56	0.16	4.48	4.48	2.22	2.22	2.26	2.26
253.1	74.802	17.95	0.17	120	74.72	0.16	4.49	4.49	2.22	2.22	2.27	2.27
252.9	74.966	17.18	0.25	120	74.88	0.16	4.50	4.50	2.23	2.23	2.27	2.27
252.8	75.130	17.41	0.20	120	75.05	0.16	4.51	4.51	2.23	2.23	2.28	2.28
252.6	75.294	16.71	0.20	120	75.21	0.16	4.52	4.52	2.24	2.24	2.28	2.28
252.4	75.458	16.84	0.22	120	75.38	0.16	4.53	4.53	2.24	2.24	2.29	2.29
252.3	75.622	17.22	0.24	120	75.54	0.16	4.54	4.54	2.25	2.25	2.29	2.29
252.1	75.786	19.52	0.36	120	75.70	0.16	4.55	4.55	2.25	2.25	2.29	2.29
251.9	75.951	117.73	0.91	120	75.87	0.16	4.56	4.56	2.26	2.26	2.30	2.30
251.8	76.115	95.52	1.71	120	76.03	0.16	4.57	4.57	2.26	2.26	2.30	2.30
251.6	76.279	110.12	2.24	120	76.20	0.16	4.58	4.58	2.27	2.27	2.31	2.31
251.5	76.443	61.76	2.24	120	76.36	0.16	4.59	4.59	2.27	2.27	2.31	2.31
251.3	76.607	74.27	2.16	120	76.52	0.16	4.60	4.60	2.28	2.28	2.32	2.32
251.1	76.771	53.25	2.10	120	76.69	0.16	4.61	4.61	2.28	2.28	2.32	2.32
251.0	76.935	33.53	1.20	120	76.85	0.16	4.62	4.62	2.29	2.29	2.33	2.33
250.8	77.099	27.12	0.76	120	77.02	0.16	4.63	4.63	2.29	2.29	2.33	2.33
250.6	77.263	35.59	0.55	120	77.18	0.16	4.64	4.64	2.30	2.30	2.34	2.34
250.5	77.427	31.14	0.58	120	77.34	0.16	4.65	4.65	2.30	2.30	2.34	2.34
250.3	77.591	40.76	1.07	120	77.51	0.16	4.66	4.66	2.31	2.31	2.35	2.35
250.1	77.755	30.26	0.87	120	77.67	0.16	4.67	4.67	2.31	2.31	2.35	2.35
250.0	77.919	31.43	1.12	120	77.84	0.16	4.68	4.68	2.32	2.32	2.36	2.36
249.8	78.083	54.93	1.06	120	78.00	0.16	4.68	4.68	2.32	2.32	2.36	2.36
249.7	78.247	63.84	1.08	120	78.17	0.16	4.69	4.69	2.33	2.33	2.37	2.37
249.5	78.411	70.69	0.85	120	78.33	0.16	4.70	4.70	2.33	2.33	2.37	2.37
249.3	78.575	54.40	0.75	120	78.49	0.16	4.71	4.71	2.34	2.34	2.38	2.38
249.2	78.739	27.93	0.92	120	78.66	0.16	4.72	4.72	2.34	2.34	2.38	2.38
249.0	78.903	21.93	0.65	120	78.82	0.16	4.73	4.73	2.35	2.35	2.38	2.38
248.8	79.067	29.73	0.47	120	78.99	0.16	4.74	4.74	2.35	2.35	2.39	2.39
248.7	79.231	43.01	0.52	120	79.15	0.16	4.75	4.75	2.36	2.36	2.39	2.39
248.5	79.395	82.70	1.03	120	79.31	0.16	4.76	4.76	2.36	2.36	2.40	2.40
248.3	79.559	77.97	2.10	120	79.48	0.16	4.77	4.77	2.37	2.37	2.40	2.40
248.2	79.723	58.68	1.96	120	79.64	0.16	4.78	4.78	2.38	2.38	2.41	2.41
248.0	79.887	27.25	1.75	120	79.81	0.16	4.79	4.79	2.38	2.38	2.41	2.41
247.8	80.052	22.85	0.97	120	79.97	0.16	4.80	4.80	2.39	2.39	2.42	2.42
247.7	80.216	26.23	0.52	120	80.13	0.16	4.81	4.81	2.39	2.39	2.42	2.42
247.5	80.380	52.26	0.68	120	80.30	0.16	4.82	4.82	2.40	2.40	2.43	2.43
247.4	80.544	103.83	0.95	120	80.46	0.16	4.83	4.83	2.40	2.40	2.43	2.43
247.2	80.708	104.30	1.54	120	80.63	0.16	4.84	4.84	2.41	2.41	2.44	2.44
247.0	80.872	74.86	1.95	120	80.79	0.16	4.85	4.85	2.41	2.41	2.44	2.44
246.9	81.036	52.79	1.98	120	80.95	0.16	4.86	4.86	2.42	2.42	2.45	2.45
246.7	81.200	43.76	1.46	120	81.12	0.16	4.87	4.87	2.42	2.42	2.45	2.45
246.5	81.364	68.64	1.12	120	81.28	0.16	4.88	4.88	2.43	2.43	2.46	2.46
246.4	81.528	51.82	1.12	120	81.45	0.16	4.89	4.89	2.43	2.43	2.46	2.46
246.2	81.692	46.22	1.22	120	81.61	0.16	4.90	4.90	2.44	2.44	2.47	2.47
246.0	81.856	51.38	0.98	120	81.77	0.16	4.91	4.91	2.44	2.44	2.47	2.47
245.9	82.020	55.31	1.26	120	81.94	0.16	4.92	4.92	2.45	2.45	2.47	2.47
245.7	82.184	36.91	1.33	120	82.10	0.16	4.93	4.93	2.45	2.45	2.48	2.48
245.6	82.348	24.53	0.93	120	82.27	0.16	4.94	4.94	2.46	2.46	2.48	2.48
245.4	82.512	102.92	1.01	120	82.43	0.16	4.95	4.95	2.46	2.46	2.49	2.49
245.2	82.676	107.30	1.96	120	82.59	0.16	4.96	4.96	2.47	2.47	2.49	2.49
245.1	82.840	56.26	2.46	120	82.76	0.16	4.97	4.97	2.47	2.47	2.50	2.50
244.9	83.004	39.80	1.99	120	82.92	0.16	4.98	4.98	2.48	2.48	2.50	2.50

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σv CPT (tsf)	Total Vertical Stress during EQ σv EQ (tsf)	Static Pore Water Pressure during CPT us CPT (tsf)	Static Pore Water Pressure during EQ us EQ (tsf)	Effective Vertical Stress during CPT σv CPT (tsf)	Effective Vertical Stress during EQ σv EQ (tsf)
244.7	83.168	64.30	1.91	120	83.09	0.16	4.99	4.99	2.48	2.48	2.51	2.51
244.6	83.332	51.58	1.88	120	83.25	0.16	5.00	5.00	2.49	2.49	2.51	2.51
244.4	83.496	64.56	1.54	120	83.41	0.16	5.01	5.01	2.49	2.49	2.52	2.52
244.2	83.660	120.44	1.60	120	83.58	0.16	5.02	5.02	2.50	2.50	2.52	2.52
244.1	83.824	105.18	2.21	120	83.74	0.16	5.03	5.03	2.50	2.50	2.53	2.53
243.9	83.988	58.17	2.66	120	83.91	0.16	5.04	5.04	2.51	2.51	2.53	2.53
243.7	84.153	35.59	2.09	120	84.07	0.16	5.05	5.05	2.51	2.51	2.54	2.54
243.6	84.317	50.46	1.59	120	84.23	0.16	5.06	5.06	2.52	2.52	2.54	2.54
243.4	84.481	62.59	1.71	120	84.40	0.16	5.07	5.07	2.52	2.52	2.55	2.55
243.3	84.645	46.85	1.50	120	84.56	0.16	5.08	5.08	2.53	2.53	2.55	2.55
243.1	84.809	69.07	1.20	120	84.73	0.16	5.09	5.09	2.53	2.53	2.55	2.55
242.9	84.973	94.33	1.65	120	84.89	0.16	5.10	5.10	2.54	2.54	2.56	2.56
242.8	85.137	46.71	2.23	120	85.05	0.16	5.11	5.11	2.54	2.54	2.56	2.56
242.6	85.301	35.44	1.79	120	85.22	0.16	5.12	5.12	2.55	2.55	2.57	2.57
242.4	85.465	23.84	1.21	120	85.38	0.16	5.13	5.13	2.55	2.55	2.57	2.57
242.3	85.629	30.37	0.76	120	85.55	0.16	5.14	5.14	2.56	2.56	2.58	2.58
242.1	85.793	61.72	1.19	120	85.71	0.16	5.15	5.15	2.56	2.56	2.58	2.58
241.9	85.957	39.24	1.32	120	85.87	0.16	5.16	5.16	2.57	2.57	2.59	2.59
241.8	86.121	50.79	1.37	120	86.04	0.16	5.17	5.17	2.57	2.57	2.59	2.59
241.6	86.285	63.65	1.20	120	86.20	0.16	5.18	5.18	2.58	2.58	2.60	2.60
241.5	86.449	67.53	1.28	120	86.37	0.16	5.19	5.19	2.58	2.58	2.60	2.60
241.3	86.613	58.69	1.23	120	86.53	0.16	5.20	5.20	2.59	2.59	2.61	2.61
241.1	86.777	66.58	1.20	120	86.70	0.16	5.21	5.21	2.60	2.60	2.61	2.61
241.0	86.941	63.16	1.08	120	86.86	0.16	5.22	5.22	2.60	2.60	2.62	2.62
240.8	87.105	59.69	1.23	120	87.02	0.16	5.23	5.23	2.61	2.61	2.62	2.62
240.6	87.269	34.11	1.46	120	87.19	0.16	5.24	5.24	2.61	2.61	2.63	2.63
240.5	87.433	30.49	0.98	120	87.35	0.16	5.25	5.25	2.62	2.62	2.63	2.63
240.3	87.597	78.06	0.90	120	87.52	0.16	5.26	5.26	2.62	2.62	2.64	2.64
240.1	87.761	97.56	1.38	120	87.68	0.16	5.27	5.27	2.63	2.63	2.64	2.64
240.0	87.925	97.33	1.76	120	87.84	0.16	5.28	5.28	2.63	2.63	2.64	2.64
239.8	88.089	84.70	2.81	120	88.01	0.16	5.29	5.29	2.64	2.64	2.65	2.65
239.6	88.254	42.94	2.40	120	88.17	0.16	5.30	5.30	2.64	2.64	2.65	2.65
239.5	88.418	79.82	1.96	120	88.34	0.16	5.31	5.31	2.65	2.65	2.66	2.66
239.3	88.582	185.50	1.95	120	88.50	0.16	5.31	5.31	2.65	2.65	2.66	2.66
239.2	88.746	177.26	2.35	120	88.66	0.16	5.32	5.32	2.66	2.66	2.67	2.67
239.0	88.910	108.74	2.78	120	88.83	0.16	5.33	5.33	2.66	2.66	2.67	2.67
238.8	89.074	58.99	2.80	120	88.99	0.16	5.34	5.34	2.67	2.67	2.68	2.68
238.7	89.238	41.63	2.13	120	89.16	0.16	5.35	5.35	2.67	2.67	2.68	2.68
238.5	89.402	54.08	2.13	120	89.32	0.16	5.36	5.36	2.68	2.68	2.69	2.69
238.3	89.566	104.50	1.79	120	89.48	0.16	5.37	5.37	2.68	2.68	2.69	2.69
238.2	89.730	135.12	1.67	120	89.65	0.16	5.38	5.38	2.69	2.69	2.70	2.70
238.0	89.894	143.00	1.51	120	89.81	0.16	5.39	5.39	2.69	2.69	2.70	2.70
237.8	90.058	145.45	1.40	120	89.98	0.16	5.40	5.40	2.70	2.70	2.71	2.71
237.7	90.222	144.26	1.36	120	90.14	0.16	5.41	5.41	2.70	2.70	2.71	2.71
237.5	90.386	146.37	1.37	120	90.30	0.16	5.42	5.42	2.71	2.71	2.72	2.72
237.3	90.550	138.53	1.56	120	90.47	0.16	5.43	5.43	2.71	2.71	2.72	2.72
237.2	90.714	94.22	1.98	120	90.63	0.16	5.44	5.44	2.72	2.72	2.72	2.72
237.0	90.878	57.68	2.09	120	90.80	0.16	5.45	5.45	2.72	2.72	2.73	2.73
236.9	91.042	41.32	1.56	120	90.96	0.16	5.46	5.46	2.73	2.73	2.73	2.73
236.7	91.206	28.76	1.14	120	91.12	0.16	5.47	5.47	2.73	2.73	2.74	2.74
236.5	91.370	24.74	0.76	120	91.29	0.16	5.48	5.48	2.74	2.74	2.74	2.74
236.4	91.534	24.50	0.41	120	91.45	0.16	5.49	5.49	2.74	2.74	2.75	2.75
236.2	91.698	37.64	0.47	120	91.62	0.16	5.50	5.50	2.75	2.75	2.75	2.75
236.0	91.862	26.21	0.57	120	91.78	0.16	5.51	5.51	2.75	2.75	2.76	2.76
235.9	92.026	20.70	0.52	120	91.94	0.16	5.52	5.52	2.76	2.76	2.76	2.76
235.7	92.190	28.72	0.29	120	92.11	0.16	5.53	5.53	2.76	2.76	2.77	2.77
235.5	92.355	43.79	0.67	120	92.27	0.16	5.54	5.54	2.77	2.77	2.77	2.77
235.4	92.519	97.73	1.18	120	92.44	0.16	5.55	5.55	2.77	2.77	2.78	2.78
235.2	92.683	112.45	1.74	120	92.60	0.16	5.56	5.56	2.78	2.78	2.78	2.78
235.1	92.847	104.37	2.31	120	92.76	0.16	5.57	5.57	2.78	2.78	2.79	2.79
234.9	93.011	66.49	2.38	120	92.93	0.16	5.58	5.58	2.79	2.79	2.79	2.79
234.7	93.175	41.42	2.16	120	93.09	0.16	5.59	5.59	2.79	2.79	2.80	2.80
234.6	93.339	34.45	1.50	120	93.26	0.16	5.60	5.60	2.80	2.80	2.80	2.80
234.4	93.503	31.02	1.23	120	93.42	0.16	5.61	5.61	2.80	2.80	2.81	2.81
234.2	93.667	46.21	1.17	120	93.58	0.16	5.62	5.62	2.81	2.81	2.81	2.81
234.1	93.831	26.85	0.94	120	93.75	0.16	5.63	5.63	2.82	2.82	2.81	2.81
233.9	93.995	22.78	0.69	120	93.91	0.16	5.64	5.64	2.82	2.82	2.82	2.82
233.7	94.159	26.08	0.40	120	94.08	0.16	5.65	5.65	2.83	2.83	2.82	2.82
233.6	94.323	27.13	0.35	120	94.24	0.16	5.66	5.66	2.83	2.83	2.83	2.83
233.4	94.487	19.79	0.43	120	94.41	0.16	5.67	5.67	2.84	2.84	2.83	2.83
233.2	94.651	30.77	0.41	120	94.57	0.16	5.68	5.68	2.84	2.84	2.84	2.84
233.1	94.815	25.47	0.64	120	94.73	0.16	5.69	5.69	2.85	2.85	2.84	2.84
232.9	94.979	25.73	0.76	120	94.90	0.16	5.70	5.70	2.85	2.85	2.85	2.85
232.8	95.143	22.94	0.59	120	95.06	0.16	5.71	5.71	2.86	2.86	2.85	2.85

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σv CPT (tsf)	Total Vertical Stress during EQ σv EQ (tsf)	Static Pore Water Pressure during CPT us CPT (tsf)	Static Pore Water Pressure during EQ us EQ (tsf)	Effective Vertical Stress during CPT σv CPT (tsf)	Effective Vertical Stress during EQ σv EQ (tsf)
232.6	95.307	27.87	1.08	120	95.23	0.16	5.72	5.72	2.86	2.86	2.86	2.86
232.4	95.471	45.34	1.38	120	95.39	0.16	5.73	5.73	2.87	2.87	2.86	2.86
232.3	95.635	30.21	1.14	120	95.55	0.16	5.74	5.74	2.87	2.87	2.87	2.87
232.1	95.799	20.37	0.91	120	95.72	0.16	5.75	5.75	2.88	2.88	2.87	2.87
231.9	95.963	20.13	0.33	120	95.88	0.16	5.76	5.76	2.88	2.88	2.88	2.88
231.8	96.127	20.19	0.27	120	96.05	0.16	5.77	5.77	2.89	2.89	2.88	2.88
231.6	96.291	20.13	0.25	120	96.21	0.16	5.78	5.78	2.89	2.89	2.89	2.89
231.4	96.456	19.91	0.23	120	96.37	0.16	5.79	5.79	2.90	2.90	2.89	2.89
231.3	96.620	19.35	0.22	120	96.54	0.16	5.80	5.80	2.90	2.90	2.89	2.89
231.1	96.784	19.11	0.20	120	96.70	0.16	5.81	5.81	2.91	2.91	2.90	2.90
231.0	96.948	18.87	0.18	120	96.87	0.16	5.82	5.82	2.91	2.91	2.90	2.90
230.8	97.112	18.95	0.18	120	97.03	0.16	5.83	5.83	2.92	2.92	2.91	2.91
230.6	97.276	18.68	0.17	120	97.19	0.16	5.84	5.84	2.92	2.92	2.91	2.91
230.5	97.440	18.77	0.19	120	97.36	0.16	5.85	5.85	2.93	2.93	2.92	2.92
230.3	97.604	19.03	0.22	120	97.52	0.16	5.86	5.86	2.93	2.93	2.92	2.92
230.1	97.768	19.39	0.23	120	97.69	0.16	5.87	5.87	2.94	2.94	2.93	2.93
230.0	97.932	18.89	0.23	120	97.85	0.16	5.88	5.88	2.94	2.94	2.93	2.93
229.8	98.096	18.74	0.22	120	98.01	0.16	5.89	5.89	2.95	2.95	2.94	2.94
229.6	98.260	18.35	0.20	120	98.18	0.16	5.90	5.90	2.95	2.95	2.94	2.94
229.5	98.424	18.59	0.24	120	98.34	0.16	5.91	5.91	2.96	2.96	2.95	2.95
229.3	98.588	19.52	0.23	120	98.51	0.16	5.92	5.92	2.96	2.96	2.95	2.95
229.1	98.752	21.79	0.54	120	98.67	0.16	5.93	5.93	2.97	2.97	2.96	2.96
229.0	98.916	73.58	1.25	120	98.83	0.16	5.93	5.93	2.97	2.97	2.96	2.96
228.8	99.080	42.88	1.28	120	99.00	0.16	5.94	5.94	2.98	2.98	2.97	2.97
228.7	99.244	29.94	1.01	120	99.16	0.16	5.95	5.95	2.98	2.98	2.97	2.97
228.5	99.408	32.58	0.70	120	99.33	0.16	5.96	5.96	2.99	2.99	2.98	2.98
228.3	99.572	52.52	0.65	120	99.49	0.16	5.97	5.97	2.99	2.99	2.98	2.98
228.2	99.736	33.78	0.77	120	99.65	0.16	5.98	5.98	3.00	3.00	2.98	2.98
228.0	99.900	24.61	0.57	120	99.82	0.16	5.99	5.99	3.00	3.00	2.99	2.99
227.8	100.064	21.06	0.29	120	99.98	0.16	6.00	6.00	3.01	3.01	2.99	2.99
227.7	100.228	21.56	0.22	120	100.15	0.16	6.01	6.01	3.01	3.01	3.00	3.00
227.5	100.392	21.72	0.14	120	100.31	0.16	6.02	6.02	3.02	3.02	3.00	3.00
227.3	100.557	28.96	0.27	120	100.47	0.16	6.03	6.03	3.03	3.03	3.01	3.01
227.2	100.721	34.47	0.52	120	100.64	0.16	6.04	6.04	3.03	3.03	3.01	3.01
227.0	100.885	22.16	0.63	120	100.80	0.16	6.05	6.05	3.04	3.04	3.02	3.02
226.9	101.049	19.69	0.52	120	100.97	0.16	6.06	6.06	3.04	3.04	3.02	3.02
226.7	101.213	20.35	0.15	120	101.13	0.16	6.07	6.07	3.05	3.05	3.03	3.03
226.5	101.377	20.08	0.15	120	101.29	0.16	6.08	6.08	3.05	3.05	3.03	3.03
226.4	101.541	19.40	0.15	120	101.46	0.16	6.09	6.09	3.06	3.06	3.04	3.04
226.2	101.705	19.67	0.16	120	101.62	0.16	6.10	6.10	3.06	3.06	3.04	3.04
226.0	101.869	19.52	0.15	120	101.79	0.16	6.11	6.11	3.07	3.07	3.05	3.05
225.9	102.033	20.08	0.16	120	101.95	0.16	6.12	6.12	3.07	3.07	3.05	3.05
225.7	102.197	20.01	0.14	120	102.11	0.16	6.13	6.13	3.08	3.08	3.06	3.06
225.5	102.361	20.41	0.15	120	102.28	0.16	6.14	6.14	3.08	3.08	3.06	3.06
225.4	102.525	20.09	0.16	120	102.44	0.16	6.15	6.15	3.09	3.09	3.07	3.07
225.2	102.689	20.63	0.15	120	102.61	0.16	6.16	6.16	3.09	3.09	3.07	3.07
225.0	102.853	19.91	0.14	120	102.77	0.16	6.17	6.17	3.10	3.10	3.07	3.07
224.9	103.017	19.56	0.14	120	102.94	0.16	6.18	6.18	3.10	3.10	3.08	3.08
224.7	103.181	19.61	0.13	120	103.10	0.16	6.19	6.19	3.11	3.11	3.08	3.08
224.6	103.345	20.16	0.15	120	103.26	0.16	6.20	6.20	3.11	3.11	3.09	3.09
224.4	103.509	20.29	0.17	120	103.43	0.16	6.21	6.21	3.12	3.12	3.09	3.09
224.2	103.673	20.96	0.25	120	103.59	0.16	6.22	6.22	3.12	3.12	3.10	3.10
224.1	103.837	20.96	0.24	120	103.76	0.16	6.23	6.23	3.13	3.13	3.10	3.10
223.9	104.001	26.08	0.40	120	103.92	0.16	6.24	6.24	3.13	3.13	3.11	3.11
223.7	104.165	64.44	1.19	120	104.08	0.16	6.25	6.25	3.14	3.14	3.11	3.11
223.6	104.329	56.38	1.62	120	104.25	0.16	6.26	6.26	3.14	3.14	3.12	3.12
223.4	104.493	32.35	1.57	120	104.41	0.16	6.27	6.27	3.15	3.15	3.12	3.12
223.2	104.658	26.33	0.89	120	104.58	0.16	6.28	6.28	3.15	3.15	3.13	3.13
223.1	104.822	21.32	0.53	120	104.74	0.16	6.29	6.29	3.16	3.16	3.13	3.13
222.9	104.986	19.89	0.27	120	104.90	0.16	6.30	6.30	3.16	3.16	3.14	3.14
222.8	105.150	19.87	0.25	120	105.07	0.16	6.31	6.31	3.17	3.17	3.14	3.14
222.6	105.314	20.60	0.22	120	105.23	0.16	6.32	6.32	3.17	3.17	3.15	3.15
222.4	105.478	20.52	0.22	120	105.40	0.16	6.33	6.33	3.18	3.18	3.15	3.15
222.3	105.642	20.80	0.19	120	105.56	0.16	6.34	6.34	3.18	3.18	3.15	3.15
222.1	105.806	20.22	0.23	120	105.72	0.16	6.35	6.35	3.19	3.19	3.16	3.16
221.9	105.970	22.51	0.25	120	105.89	0.16	6.36	6.36	3.19	3.19	3.16	3.16
221.8	106.134	20.08	0.26	120	106.05	0.16	6.37	6.37	3.20	3.20	3.17	3.17
221.6	106.298	19.83	0.26	120	106.22	0.16	6.38	6.38	3.20	3.20	3.17	3.17
221.4	106.462	20.17	0.15	120	106.38	0.16	6.39	6.39	3.21	3.21	3.18	3.18
221.3	106.626	24.24	0.40	120	106.54	0.16	6.40	6.40	3.21	3.21	3.18	3.18
221.1	106.790	26.87	0.48	120	106.71	0.16	6.41	6.41	3.22	3.22	3.19	3.19
220.9	106.954	22.19	0.48	120	106.87	0.16	6.42	6.42	3.22	3.22	3.19	3.19
220.8	107.118	24.15	0.62	120	107.04	0.16	6.43	6.43	3.23	3.23	3.20	3.20
220.6	107.282	29.94	0.67	120	107.20	0.16	6.44	6.44	3.23	3.23	3.20	3.20

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σ _{v CPT} (tsf)	Total Vertical Stress during EQ σ _{v EQ} (tsf)	Static Pore Water Pressure during CPT u _{s CPT} (tsf)	Static Pore Water Pressure during EQ u _{s EQ} (tsf)	Effective Vertical Stress during CPT σ _{v CPT} (tsf)	Effective Vertical Stress during EQ σ _{v EQ} (tsf)
220.5	107.446	21.20	0.61	120	107.36	0.16	6.45	6.45	3.24	3.24	3.21	3.21
220.3	107.610	46.09	0.97	120	107.53	0.16	6.46	6.46	3.25	3.25	3.21	3.21
220.1	107.774	32.59	0.82	120	107.69	0.16	6.47	6.47	3.25	3.25	3.22	3.22
220.0	107.938	21.02	0.80	120	107.86	0.16	6.48	6.48	3.26	3.26	3.22	3.22
219.8	108.102	21.74	0.28	120	108.02	0.16	6.49	6.49	3.26	3.26	3.23	3.23
219.6	108.266	21.93	0.20	120	108.18	0.16	6.50	6.50	3.27	3.27	3.23	3.23
219.5	108.430	22.60	0.33	120	108.35	0.16	6.51	6.51	3.27	3.27	3.24	3.24
219.3	108.594	27.72	0.82	120	108.51	0.16	6.52	6.52	3.28	3.28	3.24	3.24
219.1	108.759	35.35	1.26	120	108.68	0.16	6.53	6.53	3.28	3.28	3.24	3.24
219.0	108.923	187.51	1.31	120	108.84	0.16	6.54	6.54	3.29	3.29	3.25	3.25
218.8	109.087	345.54	2.24	120	109.00	0.16	6.55	6.55	3.29	3.29	3.25	3.25
218.6	109.251	456.88	2.40	120	109.17	0.16	6.56	6.56	3.30	3.30	3.26	3.26
218.5	109.415	600.43	2.38	120	109.33	0.08	6.56	6.56	3.30	3.30	3.26	3.26

LIQUEFACTION POTENTIAL ASSESSMENT FOR COARSE GRAINED SOILS USING CONE PENETRATION TEST DATA

Project Site: US 60 Bridge
Project No.: 178565011
CPT ID: SP07

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	qc_{IN}	FC (%)	Δqc_{IN}	$(qc_{IN})_{CS}$	a	ξ_R
327.9												
327.7	0.164	53.82	1.98	2.31	0.5	1.70	8.84	48	47.50	56.35	0.350	-0.228
327.6	0.328	87.54	1.75	2.12	0.5	1.70	20.33	32	41.40	61.73	0.350	-0.255
327.4	0.492	145.79	1.47	1.91	0.5	1.70	41.45	16	19.38	60.83	0.350	-0.245
327.2	0.656	167.94	1.67	1.90	0.5	1.70	55.14	15	20.25	75.38	0.350	-0.324
327.1	0.820	180.83	1.83	1.92	0.5	1.70	66.38	16	23.46	89.84	0.350	-0.392
326.9	0.984	181.28	1.97	1.94	0.5	1.70	72.90	18	29.09	101.99	0.350	-0.443
326.8	1.148	159.61	2.33	2.03	0.5	1.70	69.35	25	43.03	112.38	0.350	-0.483
326.6	1.312	142.22	2.60	2.10	0.5	1.70	66.08	31	49.77	115.86	0.350	-0.494
326.4	1.476	123.90	2.92	2.18	0.5	1.70	61.09	37	54.55	115.64	0.350	-0.492
326.3	1.640	100.85	3.35	2.28	0.5	1.70	52.45	45	57.70	110.15	0.350	-0.469
326.1	1.804	85.12	3.46	2.34	0.5	1.70	46.46	50	58.34	104.80	0.350	-0.446
325.9	1.968	76.95	3.26	2.35	0.5	1.70	43.90	51	57.97	101.87	0.350	-0.432
325.8	2.133	75.66	3.00	2.33	0.5	1.70	44.93	49	57.52	102.46	0.350	-0.434
325.6	2.297	73.84	3.01	2.34	0.5	1.70	45.52	50	57.99	103.51	0.350	-0.437
325.4	2.461	70.28	2.96	2.34	0.5	1.70	44.87	51	58.11	102.97	0.350	-0.433
325.3	2.625	63.91	2.92	2.37	0.5	1.70	42.17	52	58.13	100.30	0.350	-0.421
325.1	2.789	59.04	2.91	2.39	0.5	1.70	40.18	54	58.26	98.44	0.350	-0.412
324.9	2.953	57.17	2.90	2.40	0.5	1.70	40.06	55	58.45	98.51	0.350	-0.411
324.8	3.117	54.05	3.05	2.43	0.5	1.70	38.93	58	58.97	97.90	0.350	-0.408
324.6	3.281	49.81	2.93	2.45	0.5	1.70	36.84	59	58.71	95.55	0.350	-0.397
324.5	3.445	41.93	2.97	2.51	0.5	1.70	31.84	63	58.51	90.35	0.350	-0.372
324.3	3.609	40.53	2.76	2.50	0.5	1.70	31.50	63	58.22	89.72	0.350	-0.369
324.1	3.773	41.36	2.49	2.46	0.5	1.70	32.50	60	57.75	90.25	0.350	-0.371
324.0	3.937	36.56	2.96	2.55	0.5	1.70	29.09	67	58.48	87.57	0.350	-0.358
323.8	4.101	33.01	3.04	2.59	0.5	1.70	26.58	70	58.40	84.98	0.350	-0.345
323.6	4.265	40.56	3.06	2.53	0.7	1.70	24.48	65	56.76	81.24	0.350	-0.327
323.5	4.429	37.41	3.12	2.56	0.7	1.70	22.93	68	56.83	79.76	0.350	-0.319
323.3	4.593	39.44	2.81	2.51	0.7	1.70	24.50	64	56.47	80.97	0.350	-0.325
323.1	4.757	29.58	2.75	2.60	0.5	1.70	24.87	71	58.02	82.89	0.350	-0.334
323.0	4.921	29.43	2.71	2.60	0.5	1.70	24.99	71	58.02	83.01	0.350	-0.334
322.8	5.085	36.25	2.77	2.53	0.7	1.70	23.49	66	56.60	80.09	0.350	-0.319
322.7	5.249	31.80	3.09	2.61	0.7	1.70	20.94	72	56.99	77.93	0.350	-0.308
322.5	5.413	27.73	3.26	2.67	0.7	1.70	18.56	76	57.06	75.62	0.350	-0.296
322.3	5.577	25.31	3.36	2.71	0.7	1.70	17.20	79	57.10	74.30	0.350	-0.288
322.2	5.741	23.61	3.32	2.73	0.7	1.70	16.29	81	57.03	73.32	0.350	-0.283
322.0	5.905	24.11	3.15	2.70	0.7	1.70	16.83	79	56.97	73.80	0.350	-0.285
321.8	6.069	25.04	3.03	2.68	0.7	1.70	17.67	77	56.95	74.62	0.350	-0.289
321.7	6.234	25.60	3.12	2.68	0.7	1.70	18.27	77	57.14	75.41	0.350	-0.293
321.5	6.398	35.71	3.60	2.61	1.0	1.70	17.64	72	56.11	73.75	0.350	-0.284
321.3	6.562	33.36	3.73	2.65	1.0	1.70	16.78	75	56.28	73.06	0.350	-0.280
321.2	6.726	31.69	3.68	2.66	1.0	1.70	16.23	76	56.27	72.50	0.350	-0.276
321.0	6.890	28.96	3.69	2.69	1.0	1.70	15.12	78	56.28	71.40	0.350	-0.270
320.8	7.054	24.10	3.89	2.76	1.0	1.70	12.90	84	56.38	69.28	0.350	-0.258
320.7	7.218	21.26	3.66	2.79	1.0	1.70	11.64	86	56.22	67.86	0.350	-0.250
320.5	7.382	22.67	2.77	2.69	1.0	1.70	12.55	78	55.53	68.08	0.350	-0.251
320.4	7.546	24.46	0.98	2.41	0.5	1.70	23.93	56	54.21	78.15	0.350	-0.304
320.2	7.710	40.95	0.52	2.08	0.5	1.70	39.88	29	42.63	82.51	0.350	-0.326
320.0	7.874	45.28	0.39	1.99	0.5	1.70	44.34	22	33.41	77.75	0.350	-0.302
319.9	8.038	41.72	0.48	2.06	0.5	1.70	41.21	28	40.91	82.11	0.350	-0.323
319.7	8.202	33.46	0.95	2.28	0.5	1.70	33.44	46	53.06	86.50	0.350	-0.344
319.5	8.366	19.44	1.40	2.57	0.5	1.70	19.91	69	56.20	76.11	0.350	-0.293
319.4	8.530	15.79	1.58	2.68	0.7	1.70	13.40	77	55.66	69.06	0.350	-0.254
319.2	8.694	15.83	1.79	2.71	1.0	1.70	10.06	80	54.97	65.04	0.350	-0.231
319.0	8.858	14.09	1.22	2.66	1.0	1.70	9.17	76	54.23	63.40	0.350	-0.221
318.9	9.022	12.96	1.10	2.67	1.0	1.70	8.62	77	54.18	62.80	0.350	-0.217
318.7	9.186	11.30	1.46	2.78	1.0	1.70	7.73	86	55.01	62.74	0.350	-0.217
318.5	9.350	9.53	1.71	2.88	1.0	1.70	6.74	94	55.49	62.24	0.350	-0.213
318.4	9.514	6.96	2.53	3.09	1.0	1.70	5.24	100	55.56	60.80	0.350	-0.204
318.2	9.678	5.76	3.51	3.23	1.0	1.70	4.55	100	55.35	59.89	0.350	-0.198
318.1	9.842	5.52	2.61	3.18	1.0	1.70	4.46	100	55.32	59.78	0.350	-0.197

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
317.9	10.006	9.19	1.71	2.90	1.0	1.70	6.88	95	55.64	62.52	0.350	-0.214
317.7	10.170	9.59	1.88	2.90	1.0	1.70	7.23	95	55.78	63.00	0.350	-0.217
317.6	10.335	9.76	2.02	2.91	1.0	1.70	7.43	96	55.91	63.34	0.350	-0.218
317.4	10.499	9.86	2.49	2.96	1.0	1.70	7.58	100	56.25	63.84	0.350	-0.221
317.2	10.663	11.19	2.73	2.93	1.0	1.70	8.57	98	56.40	64.97	0.350	-0.227
317.1	10.827	13.15	2.65	2.87	1.0	1.70	10.00	93	56.39	66.39	0.350	-0.235
316.9	10.991	15.16	2.40	2.79	1.0	1.69	11.43	86	56.21	67.64	0.350	-0.242
316.7	11.155	15.69	2.38	2.78	1.0	1.68	11.84	85	56.21	68.04	0.350	-0.244
316.6	11.319	14.58	2.79	2.84	1.0	1.67	11.14	91	56.55	67.69	0.350	-0.242
316.4	11.483	12.44	3.50	2.96	1.0	1.66	9.74	100	56.93	66.67	0.350	-0.236
316.3	11.647	12.09	3.58	2.97	1.0	1.65	9.54	100	56.90	66.44	0.350	-0.234
316.1	11.811	10.66	4.11	3.05	1.0	1.65	8.61	100	56.61	65.22	0.350	-0.227
315.9	11.975	7.58	5.39	3.24	1.0	1.65	6.52	100	55.96	62.48	0.350	-0.211
315.8	12.139	5.74	6.82	3.40	1.0	1.65	5.26	100	55.57	60.82	0.350	-0.200
315.6	12.303	5.99	5.33	3.32	1.0	1.63	5.46	100	55.63	61.09	0.350	-0.202
315.4	12.467	7.35	3.93	3.17	1.0	1.62	6.44	100	55.93	62.38	0.350	-0.209
315.3	12.631	8.70	3.86	3.11	1.0	1.60	7.43	100	56.24	63.67	0.350	-0.217
315.1	12.795	10.71	3.42	3.00	1.0	1.59	8.88	100	56.69	65.57	0.350	-0.228
314.9	12.959	13.70	3.02	2.89	1.0	1.57	11.03	94	56.84	67.87	0.350	-0.241
314.8	13.123	14.80	3.03	2.86	1.0	1.56	11.85	92	56.89	68.74	0.350	-0.245
314.6	13.287	14.50	3.20	2.88	1.0	1.55	11.68	94	57.01	68.69	0.350	-0.245
314.4	13.451	16.46	2.84	2.81	1.0	1.54	13.13	88	56.85	69.97	0.350	-0.252
314.3	13.615	18.56	2.72	2.75	1.0	1.52	14.66	83	56.83	71.49	0.350	-0.260
314.1	13.779	19.68	2.91	2.75	1.0	1.51	15.51	83	57.06	72.57	0.350	-0.266
314.0	13.943	21.06	3.14	2.75	1.0	1.50	16.53	83	57.34	73.88	0.350	-0.272
313.8	14.107	22.53	3.32	2.74	1.0	1.49	17.63	82	57.60	75.23	0.350	-0.279
313.6	14.271	23.36	3.66	2.76	1.0	1.48	18.28	83	57.94	76.22	0.350	-0.284
313.5	14.436	23.30	3.49	2.74	1.0	1.47	18.32	82	57.83	76.15	0.350	-0.284
313.3	14.600	25.01	3.17	2.69	1.0	1.46	19.62	78	57.68	77.29	0.350	-0.289
313.1	14.764	25.81	3.16	2.68	1.0	1.45	20.26	78	57.74	78.00	0.350	-0.293
313.0	14.928	23.29	3.90	2.78	1.0	1.45	18.52	85	58.20	76.72	0.350	-0.286
312.8	15.092	21.29	4.26	2.83	1.0	1.45	17.14	89	58.26	75.40	0.350	-0.279
312.6	15.256	20.88	3.81	2.80	1.0	1.44	16.92	87	57.98	74.90	0.350	-0.276
312.5	15.420	20.57	3.75	2.81	1.0	1.43	16.76	87	57.93	74.69	0.350	-0.275
312.3	15.584	21.39	3.51	2.77	1.0	1.42	17.42	85	57.85	75.27	0.350	-0.278
312.2	15.748	21.28	3.79	2.80	1.0	1.42	17.40	87	58.06	75.45	0.350	-0.278
312.0	15.912	22.32	3.62	2.77	1.0	1.41	18.24	84	58.04	76.28	0.350	-0.283
311.8	16.076	21.99	3.62	2.77	1.0	1.40	18.06	85	58.04	76.10	0.350	-0.281
311.7	16.240	21.53	3.35	2.76	1.0	1.40	17.79	84	57.82	75.60	0.350	-0.279
311.5	16.404	21.26	2.95	2.73	1.0	1.39	17.66	81	57.48	75.14	0.350	-0.276
311.3	16.568	22.31	2.87	2.70	1.0	1.38	18.51	79	57.47	75.99	0.350	-0.280
311.2	16.732	24.08	3.29	2.72	1.0	1.37	19.89	80	58.02	77.91	0.350	-0.290
311.0	16.896	24.01	3.69	2.75	1.0	1.37	19.90	83	58.36	78.26	0.350	-0.292
310.8	17.060	20.76	4.37	2.85	1.0	1.37	17.51	91	58.51	76.01	0.350	-0.280
310.7	17.224	20.17	4.02	2.83	1.0	1.36	17.12	89	58.27	75.39	0.350	-0.276
310.5	17.388	20.00	4.22	2.85	1.0	1.36	17.05	91	58.39	75.44	0.350	-0.276
310.3	17.552	18.95	4.47	2.88	1.0	1.35	16.30	94	58.42	74.72	0.350	-0.272
310.2	17.716	18.72	4.44	2.88	1.0	1.35	16.18	94	58.40	74.58	0.350	-0.272
310.0	17.880	18.06	4.49	2.90	1.0	1.34	15.72	95	58.37	74.09	0.350	-0.269
309.9	18.044	17.87	4.75	2.92	1.0	1.34	15.62	96	58.48	74.10	0.350	-0.269
309.7	18.208	19.07	4.40	2.88	1.0	1.33	16.61	93	58.47	75.08	0.350	-0.274
309.5	18.372	19.49	4.27	2.86	1.0	1.32	17.00	92	58.46	75.47	0.350	-0.275
309.4	18.537	18.91	4.52	2.89	1.0	1.32	16.60	94	58.54	75.14	0.350	-0.274
309.2	18.701	20.90	4.53	2.85	1.0	1.31	18.21	91	58.78	77.00	0.350	-0.283
309.0	18.865	34.05	1.88	2.45	0.5	1.28	35.61	59	58.34	93.95	0.350	-0.364
308.9	19.029	53.83	1.01	2.13	0.5	1.26	54.88	33	49.61	104.49	0.350	-0.409
308.7	19.193	51.13	1.71	2.28	0.5	1.25	51.94	46	57.76	109.70	0.350	-0.430
308.5	19.357	37.70	2.85	2.53	0.5	1.26	39.03	65	60.97	100.00	0.350	-0.390
308.4	19.521	34.44	3.62	2.63	1.0	1.27	29.19	73	59.69	88.88	0.350	-0.340
308.2	19.685	26.74	3.95	2.73	1.0	1.27	23.22	82	59.20	82.43	0.350	-0.309
308.1	19.849	27.85	2.30	2.57	0.5	1.26	29.56	69	58.95	88.51	0.350	-0.338
307.9	20.013	25.27	1.74	2.53	0.5	1.26	27.07	66	57.61	84.67	0.350	-0.320
307.7	20.177	27.47	1.75	2.50	0.5	1.25	29.23	63	57.72	86.95	0.350	-0.330
307.6	20.341	22.09	1.76	2.58	0.5	1.25	23.92	70	57.50	81.43	0.350	-0.304
307.4	20.505	26.50	1.67	2.50	0.5	1.24	28.29	63	57.45	85.74	0.350	-0.324
307.2	20.669	17.96	2.91	2.78	1.0	1.25	16.53	86	57.66	74.19	0.350	-0.266

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
307.1	20.833	13.02	2.42	2.85	1.0	1.26	12.48	91	57.00	69.48	0.350	-0.240
306.9	20.997	11.89	1.35	2.75	1.0	1.25	11.59	83	55.85	67.45	0.350	-0.229
306.7	21.161	16.63	0.99	2.56	0.5	1.24	18.51	68	55.55	74.07	0.350	-0.265
306.6	21.325	23.84	1.88	2.57	0.5	1.22	25.65	69	57.84	83.48	0.350	-0.313
306.4	21.489	24.21	2.38	2.63	1.0	1.22	21.97	73	57.56	79.53	0.350	-0.293
306.2	21.653	22.32	3.18	2.73	1.0	1.22	20.45	82	58.36	78.80	0.350	-0.289
306.1	21.817	14.55	2.92	2.86	1.0	1.22	13.99	92	57.52	71.51	0.350	-0.251
305.9	21.981	10.40	3.95	3.05	1.0	1.23	10.50	100	57.19	67.70	0.350	-0.229
305.8	22.145	10.23	2.09	2.90	1.0	1.22	10.39	95	56.75	67.14	0.350	-0.226
305.6	22.309	11.85	1.68	2.80	1.0	1.22	11.81	87	56.37	68.18	0.350	-0.232
305.4	22.473	11.32	1.59	2.80	1.0	1.21	11.40	87	56.29	67.68	0.350	-0.229
305.3	22.638	9.95	1.88	2.89	1.0	1.21	10.24	94	56.61	66.85	0.350	-0.224
305.1	22.802	9.87	2.81	2.99	1.0	1.20	10.19	100	57.10	67.29	0.350	-0.226
304.9	22.966	9.95	2.29	2.93	1.0	1.20	10.29	98	56.94	67.23	0.350	-0.226
304.8	23.130	10.62	2.03	2.88	1.0	1.19	10.90	94	56.77	67.67	0.350	-0.228
304.6	23.294	10.62	4.78	3.10	1.0	1.19	10.93	100	57.33	68.26	0.350	-0.231
304.4	23.458	22.73	1.83	2.58	0.5	1.17	24.56	70	57.68	82.24	0.350	-0.304
304.3	23.622	11.50	3.60	2.99	1.0	1.18	11.75	100	57.58	69.33	0.350	-0.237
304.1	23.786	10.53	3.38	3.01	1.0	1.18	10.93	100	57.33	68.26	0.350	-0.231
304.0	23.950	25.85	0.80	2.34	0.5	1.16	27.74	51	53.57	81.30	0.350	-0.299
303.8	24.114	44.12	1.30	2.26	0.5	1.14	45.63	44	55.23	100.86	0.350	-0.389
303.6	24.278	26.76	3.34	2.69	1.0	1.15	25.24	78	59.27	84.51	0.350	-0.315
303.5	24.442	14.39	5.02	3.01	1.0	1.16	14.46	100	58.42	72.88	0.350	-0.255
303.3	24.606	11.29	3.94	3.02	1.0	1.16	11.75	100	57.58	69.33	0.350	-0.236
303.1	24.770	10.86	1.64	2.83	1.0	1.15	11.40	89	56.48	67.88	0.350	-0.228
303.0	24.934	10.75	1.67	2.83	1.0	1.15	11.33	90	56.52	67.85	0.350	-0.227
302.8	25.098	32.35	0.50	2.16	0.5	1.14	34.28	36	47.56	81.84	0.350	-0.301
302.6	25.262	31.29	1.37	2.40	0.5	1.13	33.07	55	56.43	89.50	0.350	-0.337
302.5	25.426	19.40	2.37	2.70	1.0	1.13	19.18	79	57.66	76.84	0.350	-0.275
302.3	25.590	11.97	3.72	2.99	1.0	1.13	12.54	100	57.83	70.36	0.350	-0.241
302.1	25.754	10.23	1.79	2.87	1.0	1.13	11.00	92	56.68	67.68	0.350	-0.225
302.0	25.918	9.98	1.07	2.77	1.0	1.13	10.81	85	55.81	66.62	0.350	-0.219
301.8	26.082	9.17	1.26	2.83	1.0	1.13	10.09	90	56.15	66.24	0.350	-0.217
301.7	26.246	8.24	1.66	2.93	1.0	1.12	9.26	98	56.61	65.88	0.350	-0.215
301.5	26.410	8.05	1.62	2.94	1.0	1.12	9.11	98	56.59	65.70	0.350	-0.213
301.3	26.574	8.37	1.40	2.89	1.0	1.12	9.43	94	56.37	65.80	0.350	-0.214
301.2	26.739	8.22	1.31	2.88	1.0	1.11	9.31	94	56.29	65.60	0.350	-0.213
301.0	26.903	7.84	1.35	2.91	1.0	1.11	8.98	96	56.36	65.34	0.350	-0.211
300.8	27.067	7.47	1.52	2.95	1.0	1.11	8.66	99	56.54	65.20	0.350	-0.210
300.7	27.231	8.21	1.28	2.88	1.0	1.10	9.37	93	56.27	65.64	0.350	-0.212
300.5	27.395	8.06	1.28	2.89	1.0	1.10	9.25	94	56.29	65.54	0.350	-0.212
300.3	27.559	7.76	2.13	3.01	1.0	1.10	8.99	100	56.72	65.72	0.350	-0.213
300.2	27.723	8.28	1.61	2.92	1.0	1.09	9.49	97	56.62	66.12	0.350	-0.215
300.0	27.887	12.96	2.31	2.84	1.0	1.09	13.90	90	57.35	71.25	0.350	-0.243
299.8	28.051	11.36	2.47	2.90	1.0	1.08	12.43	95	57.39	69.82	0.350	-0.235
299.7	28.215	8.18	3.42	3.10	1.0	1.08	9.46	100	56.87	66.33	0.350	-0.216
299.5	28.379	8.57	1.74	2.93	1.0	1.08	9.86	97	56.77	66.62	0.350	-0.217
299.4	28.543	8.34	1.63	2.92	1.0	1.08	9.66	97	56.68	66.34	0.350	-0.215
299.2	28.707	8.30	1.39	2.89	1.0	1.07	9.64	94	56.45	66.09	0.350	-0.214
299.0	28.871	9.46	1.11	2.80	1.0	1.07	10.77	87	56.04	66.81	0.350	-0.218
298.9	29.035	7.94	1.78	2.96	1.0	1.07	9.34	100	56.82	66.17	0.350	-0.214
298.7	29.199	7.76	1.18	2.88	1.0	1.06	9.19	94	56.26	65.45	0.350	-0.210
298.5	29.363	17.78	1.71	2.65	1.0	1.06	18.77	75	56.97	75.74	0.350	-0.266
298.4	29.527	14.96	2.11	2.77	1.0	1.05	16.12	84	57.39	73.51	0.350	-0.254
298.2	29.691	10.10	3.06	3.00	1.0	1.05	11.50	100	57.50	69.00	0.350	-0.229
298.0	29.855	9.14	2.22	2.96	1.0	1.05	10.59	100	57.19	67.79	0.350	-0.222
297.9	30.019	8.65	1.67	2.91	1.0	1.05	10.15	96	56.77	66.92	0.350	-0.217
297.7	30.183	8.72	1.37	2.87	1.0	1.04	10.24	93	56.47	66.71	0.350	-0.216
297.6	30.347	8.62	1.09	2.83	1.0	1.04	10.17	89	56.13	66.30	0.350	-0.213
297.4	30.511	7.98	1.15	2.87	1.0	1.04	9.56	93	56.26	65.83	0.350	-0.211
297.2	30.675	8.04	1.10	2.86	1.0	1.04	9.64	92	56.20	65.84	0.350	-0.211
297.1	30.840	7.59	1.04	2.87	1.0	1.03	9.23	93	56.16	65.39	0.350	-0.208
296.9	31.004	6.94	1.26	2.94	1.0	1.03	8.60	98	56.47	65.08	0.350	-0.206
296.7	31.168	6.71	1.34	2.97	1.0	1.03	8.39	100	56.54	64.93	0.350	-0.205
296.6	31.332	7.34	1.41	2.94	1.0	1.02	9.04	98	56.61	65.64	0.350	-0.209
296.4	31.496	9.83	1.28	2.81	1.0	1.02	11.50	88	56.38	67.88	0.350	-0.222

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
296.2	31.660	6.98	1.96	3.03	1.0	1.02	8.72	100	56.64	65.36	0.350	-0.207
296.1	31.824	7.46	2.10	3.02	1.0	1.02	9.21	100	56.79	66.00	0.350	-0.211
295.9	31.988	8.05	1.11	2.86	1.0	1.01	9.81	92	56.25	66.07	0.350	-0.211
295.7	32.152	7.73	1.25	2.90	1.0	1.01	9.51	95	56.45	65.96	0.350	-0.210
295.6	32.316	7.61	1.34	2.92	1.0	1.01	9.42	96	56.56	65.97	0.350	-0.210
295.4	32.480	7.41	1.39	2.94	1.0	1.01	9.23	98	56.63	65.86	0.350	-0.209
295.3	32.644	7.47	1.42	2.94	1.0	1.00	9.31	98	56.66	65.97	0.350	-0.210
295.1	32.808	7.29	1.52	2.96	1.0	1.00	9.15	100	56.76	65.90	0.350	-0.209
294.9	32.972	7.55	1.35	2.92	1.0	1.00	9.42	97	56.60	66.02	0.350	-0.210
294.8	33.136	7.06	1.43	2.96	1.0	1.00	8.95	100	56.70	65.66	0.350	-0.207
294.6	33.300	6.67	1.43	2.98	1.0	0.99	8.58	100	56.60	65.18	0.350	-0.205
294.4	33.464	6.87	1.61	3.00	1.0	0.99	8.79	100	56.66	65.46	0.350	-0.206
294.3	33.628	8.55	1.75	2.93	1.0	0.99	10.51	97	56.98	67.49	0.350	-0.218
294.1	33.792	6.77	2.38	3.09	1.0	0.99	8.73	100	56.64	65.37	0.350	-0.205
293.9	33.956	8.37	2.23	2.99	1.0	0.98	10.36	100	57.15	67.52	0.350	-0.217
293.8	34.120	8.81	1.31	2.86	1.0	0.98	10.84	92	56.55	67.39	0.350	-0.217
293.6	34.284	6.94	2.04	3.04	1.0	0.98	8.95	100	56.71	65.67	0.350	-0.207
293.5	34.448	7.04	1.83	3.01	1.0	0.98	9.07	100	56.75	65.82	0.350	-0.207
293.3	34.612	7.26	1.66	2.98	1.0	0.97	9.32	100	56.83	66.14	0.350	-0.209
293.1	34.776	7.07	1.80	3.01	1.0	0.97	9.14	100	56.77	65.91	0.350	-0.208
293.0	34.941	7.07	1.73	3.00	1.0	0.97	9.15	100	56.77	65.92	0.350	-0.208
292.8	35.105	7.05	1.73	3.00	1.0	0.97	9.14	100	56.77	65.92	0.350	-0.207
292.6	35.269	7.21	1.99	3.02	1.0	0.96	9.33	100	56.83	66.15	0.350	-0.209
292.5	35.433	7.16	2.17	3.04	1.0	0.96	9.30	100	56.82	66.12	0.350	-0.208
292.3	35.597	6.90	1.96	3.03	1.0	0.96	9.05	100	56.74	65.79	0.350	-0.206
292.1	35.761	6.85	1.53	2.99	1.0	0.96	9.01	100	56.73	65.75	0.350	-0.206
292.0	35.925	7.01	1.83	3.01	1.0	0.95	9.19	100	56.79	65.98	0.350	-0.207
291.8	36.089	6.98	2.67	3.10	1.0	0.95	9.18	100	56.78	65.96	0.350	-0.207
291.6	36.253	9.88	1.61	2.86	1.0	0.95	12.22	92	56.98	69.19	0.350	-0.225
291.5	36.417	8.55	1.79	2.93	1.0	0.95	10.85	98	57.12	67.97	0.350	-0.218
291.3	36.581	36.53	1.41	2.35	0.5	0.95	38.47	51	56.51	94.98	0.350	-0.353
291.2	36.745	16.07	3.23	2.85	1.0	0.95	18.79	91	58.92	77.71	0.350	-0.270
291.0	36.909	9.51	5.05	3.15	1.0	0.94	11.91	100	57.63	69.54	0.350	-0.227
290.8	37.073	9.10	2.93	3.03	1.0	0.94	11.50	100	57.50	69.01	0.350	-0.223
290.7	37.237	11.05	1.93	2.86	1.0	0.94	13.58	91	57.39	70.97	0.350	-0.234
290.5	37.401	8.19	2.38	3.01	1.0	0.93	10.58	100	57.22	67.80	0.350	-0.216
290.3	37.565	6.37	3.14	3.17	1.0	0.93	8.68	100	56.63	65.30	0.350	-0.202
290.2	37.729	6.58	1.45	2.99	1.0	0.93	8.91	100	56.70	65.61	0.350	-0.204
290.0	37.893	6.79	1.35	2.96	1.0	0.93	9.15	100	56.77	65.92	0.350	-0.205
289.8	38.057	6.90	1.18	2.93	1.0	0.93	9.29	97	56.61	65.90	0.350	-0.205
289.7	38.221	6.69	1.29	2.96	1.0	0.92	9.08	100	56.74	65.83	0.350	-0.205
289.5	38.385	6.83	1.33	2.96	1.0	0.92	9.25	100	56.78	66.03	0.350	-0.206
289.4	38.549	7.70	1.43	2.93	1.0	0.92	10.18	97	56.87	67.05	0.350	-0.211
289.2	38.713	7.18	1.85	3.01	1.0	0.92	9.65	100	56.93	66.58	0.350	-0.209
289.0	38.877	6.73	2.11	3.06	1.0	0.91	9.19	100	56.79	65.97	0.350	-0.205
288.9	39.042	7.49	1.58	2.96	1.0	0.91	10.02	100	57.01	67.03	0.350	-0.211
288.7	39.206	7.17	1.61	2.98	1.0	0.91	9.69	100	56.94	66.63	0.350	-0.208
288.5	39.370	6.65	2.06	3.06	1.0	0.91	9.15	100	56.77	65.92	0.350	-0.204
288.4	39.534	7.11	1.27	2.93	1.0	0.91	9.66	98	56.74	66.40	0.350	-0.207
288.2	39.698	7.01	1.36	2.95	1.0	0.90	9.56	99	56.84	66.41	0.350	-0.207
288.0	39.862	6.96	1.33	2.95	1.0	0.90	9.53	99	56.82	66.35	0.350	-0.206
287.9	40.026	6.93	1.37	2.96	1.0	0.90	9.51	100	56.86	66.37	0.350	-0.206
287.7	40.190	7.13	1.41	2.95	1.0	0.90	9.74	99	56.90	66.65	0.350	-0.208
287.5	40.354	7.69	1.35	2.91	1.0	0.90	10.37	96	56.84	67.21	0.350	-0.211
287.4	40.518	7.15	1.48	2.96	1.0	0.90	9.80	100	56.97	66.77	0.350	-0.208
287.2	40.682	8.66	1.68	2.92	1.0	0.89	11.46	96	57.18	68.64	0.350	-0.219
287.1	40.846	7.65	1.98	3.00	1.0	0.89	10.38	100	57.15	67.53	0.350	-0.212
286.9	41.010	6.60	2.17	3.07	1.0	0.89	9.24	100	56.80	66.05	0.350	-0.204
286.7	41.174	6.77	1.27	2.95	1.0	0.89	9.45	99	56.81	66.25	0.350	-0.205
286.6	41.338	6.80	1.36	2.96	1.0	0.89	9.50	100	56.88	66.38	0.350	-0.205
286.4	41.502	7.62	1.25	2.90	1.0	0.88	10.41	95	56.77	67.18	0.350	-0.210
286.2	41.666	7.02	1.61	2.99	1.0	0.88	9.76	100	56.96	66.73	0.350	-0.207
286.1	41.830	7.14	2.31	3.06	1.0	0.88	9.91	100	57.01	66.92	0.350	-0.208
285.9	41.994	12.96	1.72	2.77	1.0	0.88	16.39	85	57.50	73.89	0.350	-0.247
285.7	42.158	10.61	2.50	2.93	1.0	0.88	13.81	97	58.01	71.82	0.350	-0.235
285.6	42.322	8.01	3.70	3.13	1.0	0.88	10.93	100	57.33	68.26	0.350	-0.215

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	qc_{IN}	FC (%)	Δqc_{IN}	$(qc_{IN})_{CS}$	a	ξ_R
285.4	42.486	6.66	3.73	3.20	1.0	0.87	9.45	100	56.87	66.31	0.350	-0.204
285.2	42.650	7.23	1.05	2.89	1.0	0.87	10.08	94	56.58	66.66	0.350	-0.206
285.1	42.814	36.11	1.25	2.32	0.5	0.88	38.16	49	55.61	93.77	0.350	-0.343
284.9	42.978	19.68	2.03	2.66	1.0	0.88	24.16	76	58.61	82.77	0.350	-0.291
284.8	43.143	10.12	3.84	3.06	1.0	0.87	13.38	100	58.09	71.47	0.350	-0.233
284.6	43.307	10.10	2.32	2.93	1.0	0.87	13.38	97	57.88	71.26	0.350	-0.231
284.4	43.471	8.83	1.59	2.90	1.0	0.86	11.97	95	57.19	69.16	0.350	-0.220
284.3	43.635	8.07	1.68	2.94	1.0	0.86	11.13	98	57.25	68.38	0.350	-0.215
284.1	43.799	7.22	1.24	2.92	1.0	0.86	10.19	97	56.84	67.02	0.350	-0.207
283.9	43.963	7.37	0.82	2.84	1.0	0.86	10.36	90	56.26	66.63	0.350	-0.205
283.8	44.127	9.26	1.19	2.82	1.0	0.86	12.52	88	56.76	69.28	0.350	-0.220
283.6	44.291	10.13	1.32	2.81	1.0	0.86	13.53	87	56.96	70.49	0.350	-0.227
283.4	44.455	7.00	2.12	3.05	1.0	0.85	10.00	100	57.04	67.04	0.350	-0.207
283.3	44.619	6.69	1.43	2.98	1.0	0.85	9.66	100	56.93	66.59	0.350	-0.204
283.1	44.783	6.49	1.21	2.96	1.0	0.85	9.45	100	56.85	66.30	0.350	-0.203
283.0	44.947	9.28	1.49	2.86	1.0	0.85	12.64	92	57.16	69.80	0.350	-0.222
282.8	45.111	7.69	1.93	2.99	1.0	0.85	10.85	100	57.30	68.16	0.350	-0.213
282.6	45.275	7.06	2.68	3.10	1.0	0.84	10.15	100	57.08	67.23	0.350	-0.208
282.5	45.439	6.70	1.80	3.03	1.0	0.84	9.75	100	56.96	66.71	0.350	-0.205
282.3	45.603	6.76	1.72	3.02	1.0	0.84	9.83	100	56.98	66.81	0.350	-0.205
282.1	45.767	6.70	2.66	3.11	1.0	0.84	9.78	100	56.97	66.75	0.350	-0.205
282.0	45.931	6.79	2.73	3.12	1.0	0.84	9.89	100	57.00	66.89	0.350	-0.205
281.8	46.095	7.45	2.30	3.04	1.0	0.84	10.67	100	57.25	67.92	0.350	-0.211
281.6	46.259	7.20	2.38	3.06	1.0	0.83	10.39	100	57.16	67.55	0.350	-0.209
281.5	46.423	7.05	2.13	3.05	1.0	0.83	10.24	100	57.11	67.35	0.350	-0.208
281.3	46.587	6.73	1.90	3.04	1.0	0.83	9.88	100	57.00	66.88	0.350	-0.205
281.1	46.751	6.28	1.99	3.07	1.0	0.83	9.37	100	56.84	66.22	0.350	-0.201
281.0	46.915	6.29	1.40	3.00	1.0	0.83	9.41	100	56.85	66.26	0.350	-0.201
280.8	47.079	6.36	1.32	2.98	1.0	0.83	9.49	100	56.88	66.37	0.350	-0.201
280.7	47.244	6.39	1.36	2.99	1.0	0.82	9.54	100	56.90	66.44	0.350	-0.202
280.5	47.408	6.41	1.36	2.99	1.0	0.82	9.58	100	56.91	66.48	0.350	-0.202
280.3	47.572	6.61	1.36	2.98	1.0	0.82	9.83	100	56.98	66.81	0.350	-0.204
280.2	47.736	6.64	1.16	2.94	1.0	0.82	9.87	99	56.88	66.75	0.350	-0.203
280.0	47.900	6.65	1.49	2.99	1.0	0.82	9.90	100	57.01	66.90	0.350	-0.204
279.8	48.064	7.44	1.61	2.96	1.0	0.82	10.85	100	57.30	68.15	0.350	-0.211
279.7	48.228	6.49	1.81	3.04	1.0	0.82	9.75	100	56.96	66.70	0.350	-0.203
279.5	48.392	6.64	1.64	3.01	1.0	0.81	9.93	100	57.02	66.95	0.350	-0.204
279.3	48.556	6.88	1.46	2.97	1.0	0.81	10.22	100	57.11	67.33	0.350	-0.206
279.2	48.720	6.89	1.46	2.97	1.0	0.81	10.26	100	57.12	67.38	0.350	-0.206
279.0	48.884	6.45	1.44	3.00	1.0	0.81	9.74	100	56.96	66.70	0.350	-0.202
278.9	49.048	6.32	1.46	3.01	1.0	0.81	9.60	100	56.91	66.52	0.350	-0.201
278.7	49.212	6.37	1.33	2.99	1.0	0.81	9.68	100	56.94	66.61	0.350	-0.202
278.5	49.376	6.49	1.40	2.99	1.0	0.81	9.83	100	56.99	66.82	0.350	-0.203
278.4	49.540	6.56	1.24	2.96	1.0	0.80	9.94	100	57.00	66.94	0.350	-0.203
278.2	49.704	9.70	2.06	2.92	1.0	0.81	13.69	96	57.89	71.57	0.350	-0.229
278.0	49.868	84.52	0.64	1.85	0.5	0.83	86.72	11	10.40	97.12	0.350	-0.353
277.9	50.032	65.59	1.43	2.15	0.5	0.84	69.28	35	54.62	123.90	0.350	-0.459
277.7	50.196	24.24	3.27	2.71	1.0	0.82	31.59	80	61.47	93.07	0.350	-0.335
277.5	50.360	12.32	4.77	3.04	1.0	0.81	16.94	100	59.19	76.14	0.350	-0.253
277.4	50.524	8.31	4.88	3.19	1.0	0.80	12.11	100	57.69	69.80	0.350	-0.219
277.2	50.688	8.37	1.66	2.93	1.0	0.80	12.20	97	57.48	69.68	0.350	-0.218
277.0	50.852	7.92	1.06	2.86	1.0	0.79	11.66	92	56.80	68.47	0.350	-0.211
276.9	51.016	7.55	1.00	2.86	1.0	0.79	11.23	92	56.73	67.96	0.350	-0.208
276.7	51.180	7.33	0.89	2.85	1.0	0.79	10.99	91	56.58	67.57	0.350	-0.206
276.6	51.345	7.22	0.83	2.85	1.0	0.79	10.87	91	56.50	67.36	0.350	-0.204
276.4	51.509	6.99	1.11	2.91	1.0	0.79	10.61	96	56.91	67.52	0.350	-0.205
276.2	51.673	6.60	1.20	2.95	1.0	0.79	10.16	99	57.02	67.17	0.350	-0.203
276.1	51.837	6.48	1.04	2.93	1.0	0.78	10.02	98	56.84	66.86	0.350	-0.201
275.9	52.001	6.47	1.00	2.93	1.0	0.78	10.01	97	56.80	66.81	0.350	-0.201
275.7	52.165	7.24	1.27	2.93	1.0	0.78	10.97	97	57.10	68.07	0.350	-0.208
275.6	52.329	8.78	2.09	2.96	1.0	0.78	12.87	100	57.91	70.78	0.350	-0.223
275.4	52.493	15.39	1.87	2.73	1.0	0.79	21.05	81	58.48	79.53	0.350	-0.269
275.2	52.657	11.68	2.17	2.86	1.0	0.79	16.47	92	58.32	74.79	0.350	-0.244
275.1	52.821	9.30	2.96	3.02	1.0	0.78	13.55	100	58.14	71.70	0.350	-0.228
274.9	52.985	8.59	2.13	2.97	1.0	0.78	12.71	100	57.88	70.58	0.350	-0.221
274.8	53.149	7.05	1.93	3.02	1.0	0.78	10.83	100	57.29	68.12	0.350	-0.208

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{CIN}	FC (%)	Δq_{CIN}	$(q_{CIN})_{CS}$	a	ξ_R
274.6	53.313	7.23	1.35	2.94	1.0	0.77	11.06	98	57.22	68.27	0.350	-0.208
274.4	53.477	6.91	1.08	2.91	1.0	0.77	10.67	96	56.92	67.59	0.350	-0.204
274.3	53.641	6.90	1.24	2.94	1.0	0.77	10.68	98	57.11	67.79	0.350	-0.205
274.1	53.805	6.72	1.83	3.03	1.0	0.77	10.47	100	57.18	67.65	0.350	-0.205
273.9	53.969	7.70	3.82	3.15	1.0	0.77	11.70	100	57.56	69.26	0.350	-0.214
273.8	54.133	34.41	1.83	2.44	0.5	0.79	36.71	58	58.42	95.13	0.350	-0.341
273.6	54.297	14.88	3.22	2.87	1.0	0.78	20.75	93	59.73	80.48	0.350	-0.273
273.4	54.461	9.18	3.74	3.08	1.0	0.77	13.58	100	58.15	71.73	0.350	-0.227
273.3	54.625	8.59	1.82	2.94	1.0	0.77	12.87	98	57.76	70.62	0.350	-0.221
273.1	54.789	8.00	1.29	2.89	1.0	0.76	12.13	94	57.21	69.34	0.350	-0.213
272.9	54.953	8.00	1.00	2.84	1.0	0.76	12.15	90	56.83	68.98	0.350	-0.211
272.8	55.117	7.73	0.86	2.83	1.0	0.76	11.82	89	56.63	68.44	0.350	-0.208
272.6	55.281	7.51	0.89	2.85	1.0	0.76	11.57	91	56.69	68.25	0.350	-0.207
272.5	55.446	7.70	0.75	2.81	1.0	0.76	11.80	87	56.43	68.23	0.350	-0.207
272.3	55.610	7.56	0.72	2.81	1.0	0.76	11.65	87	56.39	68.04	0.350	-0.206
272.1	55.774	7.78	0.73	2.80	1.0	0.76	11.94	87	56.41	68.35	0.350	-0.207
272.0	55.938	8.12	0.69	2.77	1.0	0.75	12.37	85	56.29	68.66	0.350	-0.209
271.8	56.102	7.97	0.80	2.80	1.0	0.75	12.20	87	56.53	68.74	0.350	-0.209
271.6	56.266	8.56	0.72	2.76	1.0	0.75	12.96	84	56.34	69.30	0.350	-0.212
271.5	56.430	8.12	0.69	2.77	1.0	0.75	12.42	85	56.32	68.74	0.350	-0.209
271.3	56.594	8.02	0.86	2.81	1.0	0.75	12.32	88	56.65	68.97	0.350	-0.210
271.1	56.758	8.10	0.86	2.81	1.0	0.75	12.43	88	56.66	69.09	0.350	-0.211
271.0	56.922	7.67	0.86	2.83	1.0	0.75	11.91	90	56.68	68.59	0.350	-0.208
270.8	57.086	7.56	0.89	2.84	1.0	0.75	11.79	90	56.73	68.52	0.350	-0.208
270.7	57.250	7.67	0.78	2.81	1.0	0.75	11.94	88	56.54	68.47	0.350	-0.207
270.5	57.414	7.88	0.71	2.79	1.0	0.74	12.20	86	56.40	68.60	0.350	-0.208
270.3	57.578	7.67	0.74	2.80	1.0	0.74	11.95	87	56.47	68.42	0.350	-0.207
270.2	57.742	8.05	0.72	2.78	1.0	0.74	12.45	86	56.42	68.87	0.350	-0.209
270.0	57.906	7.96	0.71	2.78	1.0	0.74	12.35	86	56.41	68.76	0.350	-0.208
269.8	58.070	7.45	0.83	2.84	1.0	0.74	11.73	90	56.67	68.40	0.350	-0.206
269.7	58.234	7.32	0.94	2.87	1.0	0.74	11.58	92	56.85	68.43	0.350	-0.206
269.5	58.398	7.43	0.77	2.83	1.0	0.74	11.72	89	56.57	68.29	0.350	-0.205
269.3	58.562	7.29	0.78	2.83	1.0	0.74	11.56	90	56.60	68.15	0.350	-0.205
269.2	58.726	7.42	0.71	2.81	1.0	0.73	11.73	88	56.46	68.20	0.350	-0.205
269.0	58.890	7.75	2.81	3.07	1.0	0.74	12.19	100	57.72	69.91	0.350	-0.214
268.8	59.054	7.72	5.82	3.26	1.0	0.73	12.17	100	57.71	69.88	0.350	-0.214
268.7	59.218	25.00	2.33	2.61	1.0	0.76	35.23	72	61.23	96.45	0.350	-0.344
268.5	59.382	22.78	2.87	2.70	1.0	0.76	32.25	79	61.50	93.75	0.350	-0.332
268.4	59.547	11.88	3.73	2.99	1.0	0.74	17.66	100	59.41	77.07	0.350	-0.252
268.2	59.711	9.57	2.85	3.00	1.0	0.73	14.64	100	58.48	73.12	0.350	-0.231
268.0	59.875	8.85	2.10	2.96	1.0	0.73	13.71	100	58.16	71.87	0.350	-0.224
267.9	60.039	8.09	1.97	2.98	1.0	0.73	12.74	100	57.89	70.63	0.350	-0.218
267.7	60.203	8.66	1.24	2.85	1.0	0.73	13.48	91	57.33	70.81	0.350	-0.218
267.5	60.367	8.00	0.94	2.83	1.0	0.73	12.63	89	56.89	69.52	0.350	-0.211
267.4	60.531	8.42	1.36	2.88	1.0	0.73	13.21	94	57.47	70.68	0.350	-0.218
267.2	60.695	7.33	2.13	3.03	1.0	0.72	11.81	100	57.60	69.41	0.350	-0.210
267.0	60.859	6.26	2.33	3.11	1.0	0.72	10.43	100	57.17	67.60	0.350	-0.200
266.9	61.023	5.92	1.73	3.07	1.0	0.72	9.99	100	57.04	67.03	0.350	-0.197
266.7	61.187	6.36	2.20	3.09	1.0	0.72	10.59	100	57.22	67.81	0.350	-0.201
266.5	61.351	9.07	1.39	2.86	1.0	0.72	14.13	92	57.57	71.70	0.350	-0.223
266.4	61.515	6.32	2.26	3.10	1.0	0.72	10.55	100	57.21	67.76	0.350	-0.201
266.2	61.679	5.96	2.18	3.11	1.0	0.71	10.10	100	57.07	67.16	0.350	-0.197
266.1	61.843	6.01	1.49	3.03	1.0	0.71	10.17	100	57.09	67.26	0.350	-0.198
265.9	62.007	5.66	1.41	3.04	1.0	0.71	9.72	100	56.95	66.67	0.350	-0.194
265.7	62.171	5.67	1.32	3.03	1.0	0.71	9.75	100	56.96	66.71	0.350	-0.194
265.6	62.335	5.60	1.37	3.04	1.0	0.71	9.67	100	56.94	66.60	0.350	-0.194
265.4	62.499	5.79	1.47	3.04	1.0	0.71	9.93	100	57.02	66.94	0.350	-0.196
265.2	62.663	5.76	1.42	3.04	1.0	0.71	9.89	100	57.00	66.90	0.350	-0.195
265.1	62.827	5.86	1.25	3.01	1.0	0.71	10.04	100	57.05	67.09	0.350	-0.196
264.9	62.991	6.08	1.09	2.97	1.0	0.71	10.33	100	57.14	67.48	0.350	-0.198
264.7	63.155	6.01	1.26	3.00	1.0	0.71	10.26	100	57.12	67.38	0.350	-0.198
264.6	63.319	5.77	1.40	3.03	1.0	0.70	9.95	100	57.02	66.97	0.350	-0.195
264.4	63.483	5.61	1.47	3.05	1.0	0.70	9.75	100	56.96	66.71	0.350	-0.194
264.3	63.648	5.67	1.21	3.01	1.0	0.70	9.85	100	56.99	66.84	0.350	-0.194
264.1	63.812	5.59	1.26	3.03	1.0	0.70	9.75	100	56.96	66.71	0.350	-0.193
263.9	63.976	5.40	1.35	3.05	1.0	0.70	9.51	100	56.88	66.39	0.350	-0.192

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	(ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
263.8	64.140	5.39	1.34	3.05	1.0	0.70	9.50	100	56.88	66.38	0.350	-0.191
263.6	64.304	5.65	1.23	3.02	1.0	0.70	9.86	100	56.99	66.85	0.350	-0.194
263.4	64.468	5.54	1.39	3.05	1.0	0.70	9.73	100	56.95	66.68	0.350	-0.193
263.3	64.632	5.58	1.62	3.08	1.0	0.70	9.79	100	56.97	66.76	0.350	-0.193
263.1	64.796	5.56	1.37	3.04	1.0	0.69	9.78	100	56.97	66.74	0.350	-0.193
262.9	64.960	5.75	1.22	3.01	1.0	0.69	10.03	100	57.05	67.08	0.350	-0.195
262.8	65.124	5.69	1.32	3.03	1.0	0.69	9.97	100	57.03	67.00	0.350	-0.194
262.6	65.288	5.59	1.49	3.06	1.0	0.69	9.84	100	56.99	66.83	0.350	-0.193
262.4	65.452	5.44	1.67	3.09	1.0	0.69	9.65	100	56.93	66.58	0.350	-0.192
262.3	65.616	5.34	1.39	3.06	1.0	0.69	9.53	100	56.89	66.42	0.350	-0.191
262.1	65.780	5.60	1.31	3.03	1.0	0.69	9.88	100	57.00	66.89	0.350	-0.193
262.0	65.944	6.11	1.32	3.00	1.0	0.69	10.58	100	57.22	67.79	0.350	-0.198
261.8	66.108	5.57	1.74	3.09	1.0	0.69	9.86	100	56.99	66.86	0.350	-0.193
261.6	66.272	5.52	1.74	3.09	1.0	0.69	9.81	100	56.98	66.79	0.350	-0.193
261.5	66.436	5.78	1.64	3.06	1.0	0.69	10.17	100	57.09	67.26	0.350	-0.195
261.3	66.600	5.94	1.68	3.06	1.0	0.69	10.39	100	57.16	67.55	0.350	-0.197
261.1	66.764	5.69	1.87	3.10	1.0	0.68	10.07	100	57.06	67.13	0.350	-0.194
261.0	66.928	5.62	1.83	3.10	1.0	0.68	9.99	100	57.03	67.02	0.350	-0.194
260.8	67.092	5.67	1.59	3.07	1.0	0.68	10.06	100	57.06	67.11	0.350	-0.194
260.6	67.256	5.61	1.51	3.06	1.0	0.68	9.99	100	57.03	67.02	0.350	-0.193
260.5	67.420	5.44	1.49	3.07	1.0	0.68	9.77	100	56.97	66.74	0.350	-0.192
260.3	67.584	5.29	1.60	3.09	1.0	0.68	9.58	100	56.91	66.48	0.350	-0.190
260.2	67.749	5.26	1.55	3.09	1.0	0.68	9.55	100	56.90	66.45	0.350	-0.190
260.0	67.913	5.28	1.53	3.09	1.0	0.68	9.59	100	56.91	66.50	0.350	-0.190
259.8	68.077	5.38	1.40	3.06	1.0	0.68	9.73	100	56.95	66.69	0.350	-0.191
259.7	68.241	5.40	1.37	3.06	1.0	0.67	9.76	100	56.96	66.73	0.350	-0.191
259.5	68.405	5.64	1.62	3.07	1.0	0.67	10.10	100	57.07	67.17	0.350	-0.194
259.3	68.569	5.51	1.68	3.09	1.0	0.67	9.93	100	57.02	66.95	0.350	-0.192
259.2	68.733	5.85	2.04	3.11	1.0	0.67	10.41	100	57.16	67.57	0.350	-0.196
259.0	68.897	5.48	1.96	3.12	1.0	0.67	9.91	100	57.01	66.92	0.350	-0.192
258.8	69.061	5.79	2.02	3.11	1.0	0.67	10.35	100	57.15	67.49	0.350	-0.195
258.7	69.225	5.81	1.57	3.05	1.0	0.67	10.39	100	57.16	67.55	0.350	-0.195
258.5	69.389	5.64	1.51	3.06	1.0	0.67	10.17	100	57.09	67.26	0.350	-0.194
258.3	69.553	6.07	1.45	3.02	1.0	0.67	10.76	100	57.27	68.04	0.350	-0.198
258.2	69.717	5.58	1.48	3.06	1.0	0.67	10.11	100	57.07	67.18	0.350	-0.193
258.0	69.881	5.75	1.44	3.04	1.0	0.67	10.34	100	57.14	67.49	0.350	-0.195
257.9	70.045	5.77	1.60	3.06	1.0	0.67	10.38	100	57.16	67.54	0.350	-0.195
257.7	70.209	5.60	1.46	3.05	1.0	0.67	10.16	100	57.09	67.25	0.350	-0.193
257.5	70.373	6.20	1.43	3.01	1.0	0.67	11.00	100	57.35	68.35	0.350	-0.199
257.4	70.537	5.16	1.88	3.14	1.0	0.66	9.57	100	56.90	66.47	0.350	-0.188
257.2	70.701	5.15	2.02	3.15	1.0	0.66	9.57	100	56.91	66.48	0.350	-0.188
257.0	70.865	5.28	1.41	3.07	1.0	0.66	9.76	100	56.96	66.72	0.350	-0.190
256.9	71.029	5.57	1.22	3.02	1.0	0.66	10.17	100	57.09	67.26	0.350	-0.193
256.7	71.193	5.53	2.47	3.17	1.0	0.66	10.12	100	57.08	67.20	0.350	-0.192
256.5	71.357	8.22	2.03	2.98	1.0	0.67	13.91	100	58.25	72.16	0.350	-0.220
256.4	71.521	5.86	3.05	3.19	1.0	0.66	10.61	100	57.23	67.84	0.350	-0.196
256.2	71.685	5.95	2.80	3.17	1.0	0.66	10.74	100	57.27	68.01	0.350	-0.197
256.1	71.850	7.96	2.46	3.03	1.0	0.66	13.58	100	58.15	71.73	0.350	-0.217
255.9	72.014	100.01	0.46	1.71	0.5	0.70	103.62	0	0.00	103.62	0.350	-0.368
255.7	72.178	108.48	0.84	1.83	0.5	0.72	115.37	10	7.35	122.72	0.350	-0.442
255.6	72.342	83.51	1.64	2.11	0.5	0.74	92.59	32	56.34	148.94	0.350	-0.531
255.4	72.506	27.03	4.13	2.74	1.0	0.70	42.41	82	65.07	107.48	0.350	-0.383
255.2	72.670	15.08	4.78	2.98	1.0	0.68	24.05	100	61.40	85.45	0.350	-0.287
255.1	72.834	7.66	7.92	3.34	1.0	0.66	13.23	100	58.04	71.27	0.350	-0.214
254.9	72.998	7.25	5.24	3.25	1.0	0.66	12.66	100	57.86	70.53	0.350	-0.210
254.7	73.162	7.50	2.07	3.02	1.0	0.66	13.03	100	57.98	71.01	0.350	-0.213
254.6	73.326	6.22	1.82	3.06	1.0	0.65	11.23	100	57.42	68.65	0.350	-0.199
254.4	73.490	6.17	1.88	3.07	1.0	0.65	11.16	100	57.40	68.56	0.350	-0.199
254.2	73.654	5.99	1.55	3.04	1.0	0.65	10.91	100	57.32	68.24	0.350	-0.197
254.1	73.818	6.08	1.56	3.04	1.0	0.65	11.06	100	57.37	68.43	0.350	-0.198
253.9	73.982	5.88	1.58	3.05	1.0	0.65	10.79	100	57.28	68.08	0.350	-0.196
253.8	74.146	5.64	1.65	3.08	1.0	0.65	10.45	100	57.18	67.63	0.350	-0.193
253.6	74.310	5.60	1.42	3.05	1.0	0.65	10.41	100	57.16	67.57	0.350	-0.193
253.4	74.474	6.36	1.18	2.96	1.0	0.65	11.49	100	57.50	68.99	0.350	-0.201
253.3	74.638	6.01	1.23	2.99	1.0	0.64	11.01	100	57.35	68.37	0.350	-0.197
253.1	74.802	5.94	1.28	3.00	1.0	0.64	10.92	100	57.32	68.24	0.350	-0.196

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
252.9	74.966	5.59	1.98	3.12	1.0	0.64	10.43	100	57.17	67.60	0.350	-0.193
252.8	75.130	5.67	1.56	3.06	1.0	0.64	10.55	100	57.21	67.76	0.350	-0.194
252.6	75.294	5.35	1.67	3.10	1.0	0.64	10.11	100	57.07	67.18	0.350	-0.190
252.4	75.458	5.39	1.76	3.11	1.0	0.64	10.17	100	57.09	67.26	0.350	-0.191
252.3	75.622	5.54	1.92	3.11	1.0	0.64	10.40	100	57.16	67.56	0.350	-0.192
252.1	75.786	6.53	2.41	3.10	1.0	0.64	11.82	100	57.60	69.43	0.350	-0.203
251.9	75.951	72.55	0.80	1.96	0.5	0.69	77.01	20	34.07	111.08	0.350	-0.396
251.8	76.115	58.25	1.88	2.27	0.5	0.70	63.64	44	60.00	123.64	0.350	-0.443
251.6	76.279	67.52	2.12	2.25	0.5	0.72	74.70	43	62.20	136.89	0.350	-0.490
251.5	76.443	24.71	3.92	2.76	1.0	0.68	39.84	84	64.46	104.30	0.350	-0.368
251.3	76.607	30.05	3.10	2.63	1.0	0.69	48.62	73	65.39	114.02	0.350	-0.407
251.1	76.771	20.94	4.31	2.84	1.0	0.67	33.87	90	63.45	97.31	0.350	-0.339
251.0	76.935	12.42	4.14	3.00	1.0	0.65	20.65	100	60.34	81.00	0.350	-0.263
250.8	77.099	9.64	3.38	3.04	1.0	0.64	16.50	100	59.05	75.55	0.350	-0.235
250.6	77.263	13.24	1.78	2.77	1.0	0.65	21.87	85	59.16	81.03	0.350	-0.263
250.5	77.427	11.31	2.20	2.88	1.0	0.65	19.01	93	59.22	78.22	0.350	-0.249
250.3	77.591	15.38	2.95	2.84	1.0	0.66	25.25	90	60.83	86.08	0.350	-0.287
250.1	77.755	10.88	3.39	3.00	1.0	0.64	18.42	100	59.65	78.07	0.350	-0.248
250.0	77.919	11.35	4.17	3.04	1.0	0.64	19.15	100	59.88	79.03	0.350	-0.252
249.8	78.083	21.28	2.11	2.64	1.0	0.67	34.57	74	61.46	96.03	0.350	-0.332
249.7	78.247	37.38	1.83	2.41	0.5	0.67	40.36	56	58.72	99.08	0.350	-0.346
249.5	78.411	41.66	1.29	2.28	0.5	0.67	44.76	45	55.74	100.50	0.350	-0.351
249.3	78.575	31.34	1.51	2.42	0.5	0.66	33.81	56	57.19	91.01	0.350	-0.310
249.2	78.739	9.75	3.97	3.08	1.0	0.64	16.81	100	59.15	75.96	0.350	-0.236
249.0	78.903	7.21	3.79	3.17	1.0	0.63	13.04	100	57.98	71.02	0.350	-0.210
248.8	79.067	10.46	1.87	2.87	1.0	0.64	17.88	93	58.81	76.69	0.350	-0.240
248.7	79.231	15.98	1.36	2.64	1.0	0.65	26.32	74	59.03	85.35	0.350	-0.283
248.5	79.395	48.92	1.32	2.23	0.5	0.68	52.77	41	55.47	108.25	0.350	-0.383
248.3	79.559	30.45	2.87	2.60	1.0	0.68	50.34	71	65.50	115.84	0.350	-0.413
248.2	79.723	22.38	3.63	2.77	1.0	0.66	36.87	84	63.67	100.54	0.350	-0.351
248.0	79.887	9.31	7.80	3.27	1.0	0.63	16.25	100	58.98	75.23	0.350	-0.232
247.8	80.052	7.46	5.39	3.25	1.0	0.63	13.50	100	58.12	71.63	0.350	-0.213
247.7	80.216	8.84	2.43	2.99	1.0	0.63	15.58	100	58.77	74.35	0.350	-0.227
247.5	80.380	29.60	1.43	2.43	0.5	0.65	31.98	57	56.86	88.84	0.350	-0.299
247.4	80.544	61.72	0.96	2.07	0.5	0.68	66.36	28	46.62	112.98	0.350	-0.401
247.2	80.708	61.94	1.55	2.19	0.5	0.69	67.91	38	57.05	124.96	0.350	-0.446
247.0	80.872	28.68	2.78	2.61	1.0	0.67	47.73	72	64.91	112.64	0.350	-0.400
246.9	81.036	19.59	4.13	2.85	1.0	0.65	32.62	91	63.16	95.78	0.350	-0.330
246.7	81.200	15.87	3.74	2.89	1.0	0.64	26.62	94	61.68	88.29	0.350	-0.296
246.5	81.364	39.56	1.76	2.38	0.5	0.66	42.78	53	58.57	101.35	0.350	-0.354
246.4	81.528	19.07	2.38	2.71	1.0	0.65	31.77	80	61.50	93.27	0.350	-0.318
246.2	81.692	16.76	2.96	2.81	1.0	0.64	28.10	88	61.44	89.54	0.350	-0.301
246.0	81.856	18.81	2.10	2.68	1.0	0.65	31.39	78	61.06	92.45	0.350	-0.315
245.9	82.020	20.36	2.50	2.70	1.0	0.65	33.99	79	62.05	96.04	0.350	-0.331
245.7	82.184	12.90	4.14	2.99	1.0	0.63	22.06	100	60.78	82.84	0.350	-0.269
245.6	82.348	7.89	4.74	3.20	1.0	0.62	14.31	100	58.38	72.68	0.350	-0.217
245.4	82.512	60.38	1.03	2.09	0.5	0.67	65.17	30	48.73	113.91	0.350	-0.404
245.2	82.676	63.01	1.92	2.25	0.5	0.69	69.74	43	60.61	130.36	0.350	-0.464
245.1	82.840	20.53	4.80	2.88	1.0	0.65	34.58	93	63.99	98.58	0.350	-0.341
244.9	83.004	13.91	5.70	3.05	1.0	0.63	23.78	100	61.31	85.09	0.350	-0.280
244.7	83.168	23.65	3.22	2.72	1.0	0.66	39.84	80	63.99	103.84	0.350	-0.363
244.6	83.332	18.54	4.03	2.86	1.0	0.64	31.34	92	62.86	94.20	0.350	-0.322
244.4	83.496	23.66	2.58	2.66	1.0	0.65	39.88	76	63.25	103.13	0.350	-0.360
244.2	83.660	70.66	1.38	2.12	0.5	0.69	78.09	32	53.83	131.92	0.350	-0.469
244.1	83.824	61.26	2.20	2.30	0.5	0.68	67.98	47	62.43	130.41	0.350	-0.464
243.9	83.988	20.99	5.00	2.88	1.0	0.65	35.62	93	64.35	99.97	0.350	-0.347
243.7	84.153	12.04	6.85	3.15	1.0	0.62	20.94	100	60.43	81.38	0.350	-0.261
243.6	84.317	17.87	3.49	2.83	1.0	0.64	30.40	90	62.34	92.74	0.350	-0.315
243.4	84.481	22.60	2.98	2.71	1.0	0.65	38.35	80	63.48	101.83	0.350	-0.354
243.3	84.645	16.38	3.60	2.87	1.0	0.63	28.01	93	61.93	89.94	0.350	-0.302
243.1	84.809	38.92	1.88	2.40	0.5	0.65	42.20	55	59.05	101.25	0.350	-0.352
242.9	84.973	54.22	1.85	2.29	0.5	0.67	59.51	46	59.77	119.28	0.350	-0.423
242.8	85.137	16.22	5.35	2.98	1.0	0.63	27.87	100	62.59	90.46	0.350	-0.304
242.6	85.301	11.80	5.90	3.12	1.0	0.62	20.69	100	60.36	81.05	0.350	-0.259
242.4	85.465	7.27	6.48	3.31	1.0	0.60	13.60	100	58.15	71.75	0.350	-0.211
242.3	85.629	9.79	3.03	3.01	1.0	0.61	17.53	100	59.37	76.90	0.350	-0.238

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{cIN}	FC (%)	Δq_{cIN}	$(q_{cIN})_{CS}$	a	ξ_R
242.1	85.793	21.90	2.11	2.63	1.0	0.64	37.37	73	62.14	99.52	0.350	-0.344
241.9	85.957	13.17	3.87	2.96	1.0	0.62	22.98	100	61.07	84.04	0.350	-0.273
241.8	86.121	17.60	3.00	2.80	1.0	0.63	30.25	87	61.97	92.21	0.350	-0.312
241.6	86.285	22.51	2.06	2.61	1.0	0.64	38.54	72	62.25	100.79	0.350	-0.349
241.5	86.449	37.57	2.05	2.44	0.5	0.64	40.82	58	59.56	100.38	0.350	-0.347
241.3	86.613	20.52	2.29	2.67	1.0	0.63	35.23	77	62.10	97.33	0.350	-0.334
241.1	86.777	36.92	1.95	2.43	0.5	0.64	40.08	57	59.18	99.26	0.350	-0.342
241.0	86.941	34.83	1.86	2.44	0.5	0.63	37.77	58	58.70	96.47	0.350	-0.330
240.8	87.105	20.78	2.25	2.67	1.0	0.63	35.77	76	62.15	97.92	0.350	-0.336
240.6	87.269	11.00	5.04	3.10	1.0	0.61	19.62	100	60.02	79.64	0.350	-0.251
240.5	87.433	9.60	3.89	3.08	1.0	0.60	17.40	100	59.33	76.73	0.350	-0.236
240.3	87.597	43.60	1.23	2.25	0.5	0.64	47.06	43	55.15	102.21	0.350	-0.354
240.1	87.761	55.22	1.50	2.22	0.5	0.66	60.49	41	57.00	117.48	0.350	-0.415
240.0	87.925	55.03	1.91	2.29	0.5	0.66	60.67	46	60.26	120.92	0.350	-0.428
239.8	88.089	29.98	3.54	2.67	1.0	0.66	52.65	76	67.15	119.80	0.350	-0.424
239.6	88.254	14.18	6.38	3.08	1.0	0.61	24.95	100	61.68	86.63	0.350	-0.285
239.5	88.418	28.03	2.63	2.60	1.0	0.65	49.03	71	65.17	114.20	0.350	-0.402
239.3	88.582	107.34	1.08	1.91	0.5	0.69	120.49	16	27.32	147.80	0.350	-0.520
239.2	88.746	102.33	1.36	1.99	0.5	0.70	117.63	22	45.13	162.75	0.350	-0.566
239.0	88.910	61.49	2.69	2.36	0.5	0.67	68.97	51	64.92	133.89	0.350	-0.474
238.8	89.074	20.03	5.21	2.91	1.0	0.63	35.09	96	64.41	99.49	0.350	-0.342
238.7	89.238	13.53	5.88	3.07	1.0	0.61	23.99	100	61.38	85.37	0.350	-0.278
238.5	89.402	18.13	4.37	2.89	1.0	0.62	31.81	94	63.26	95.07	0.350	-0.323
238.3	89.566	58.74	1.80	2.25	0.5	0.66	65.06	43	59.67	124.73	0.350	-0.441
238.2	89.730	76.81	1.29	2.07	0.5	0.67	85.74	29	50.65	136.39	0.350	-0.482
238.0	89.894	81.40	1.09	2.00	0.5	0.67	90.17	23	42.87	133.03	0.350	-0.470
237.8	90.058	82.77	1.00	1.97	0.5	0.66	90.99	21	37.86	128.85	0.350	-0.456
237.7	90.222	81.99	0.98	1.97	0.5	0.66	89.94	21	37.46	127.41	0.350	-0.450
237.5	90.386	83.15	0.97	1.97	0.5	0.66	91.21	20	36.33	127.54	0.350	-0.451
237.3	90.550	78.46	1.17	2.03	0.5	0.67	87.23	26	46.78	134.00	0.350	-0.473
237.2	90.714	52.29	2.23	2.35	0.5	0.65	57.79	51	61.76	119.55	0.350	-0.421
237.0	90.878	19.13	4.00	2.85	1.0	0.62	33.82	91	63.51	97.34	0.350	-0.332
236.9	91.042	13.11	4.34	3.00	1.0	0.60	23.53	100	61.24	84.77	0.350	-0.275
236.7	91.206	8.50	4.91	3.18	1.0	0.59	15.96	100	58.89	74.85	0.350	-0.225
236.5	91.370	7.02	3.94	3.19	1.0	0.58	13.61	100	58.16	71.76	0.350	-0.208
236.4	91.534	6.92	2.14	3.05	1.0	0.58	13.45	100	58.11	71.56	0.350	-0.207
236.2	91.698	11.67	1.47	2.77	1.0	0.59	21.11	85	58.97	80.08	0.350	-0.251
236.0	91.862	7.50	2.77	3.08	1.0	0.58	14.41	100	58.41	72.82	0.350	-0.214
235.9	92.026	5.49	3.45	3.25	1.0	0.57	11.24	100	57.42	68.67	0.350	-0.191
235.7	92.190	8.38	1.26	2.87	1.0	0.58	15.82	93	58.18	73.99	0.350	-0.220
235.5	92.355	13.80	1.75	2.75	1.0	0.60	24.74	83	59.84	84.58	0.350	-0.273
235.4	92.519	53.78	1.28	2.19	0.5	0.64	58.74	38	54.73	113.47	0.350	-0.398
235.2	92.683	62.31	1.62	2.20	0.5	0.65	69.33	39	58.12	127.44	0.350	-0.449
235.1	92.847	57.55	2.34	2.33	0.5	0.65	64.27	50	62.92	127.19	0.350	-0.448
234.9	93.011	21.82	3.91	2.80	1.0	0.62	39.09	87	64.65	103.73	0.350	-0.358
234.7	93.175	12.82	6.03	3.10	1.0	0.60	23.30	100	61.16	84.46	0.350	-0.272
234.6	93.339	10.30	5.21	3.13	1.0	0.59	19.09	100	59.86	78.95	0.350	-0.245
234.4	93.503	9.06	4.84	3.15	1.0	0.58	17.05	100	59.23	76.28	0.350	-0.231
234.2	93.667	14.44	2.87	2.86	1.0	0.60	26.10	91	61.22	87.31	0.350	-0.286
234.1	93.831	7.54	4.43	3.19	1.0	0.58	14.61	100	58.47	73.08	0.350	-0.214
233.9	93.995	6.08	4.02	3.25	1.0	0.57	12.28	100	57.75	70.02	0.350	-0.197
233.7	94.159	7.24	1.93	3.01	1.0	0.57	14.14	100	58.32	72.46	0.350	-0.211
233.6	94.323	7.59	1.61	2.96	1.0	0.57	14.72	100	58.47	73.19	0.350	-0.214
233.4	94.487	4.98	3.01	3.25	1.0	0.56	10.57	100	57.21	67.78	0.350	-0.185
233.2	94.651	8.84	1.65	2.90	1.0	0.58	16.77	95	58.73	75.50	0.350	-0.227
233.1	94.815	6.96	3.23	3.15	1.0	0.57	13.74	100	58.20	71.94	0.350	-0.207
232.9	94.979	7.04	3.78	3.18	1.0	0.57	13.87	100	58.24	72.11	0.350	-0.208
232.8	95.143	6.04	3.42	3.21	1.0	0.57	12.28	100	57.75	70.03	0.350	-0.197
232.6	95.307	7.75	4.88	3.21	1.0	0.57	15.06	100	58.61	73.67	0.350	-0.217
232.4	95.471	13.84	3.48	2.92	1.0	0.59	25.33	97	61.49	86.83	0.350	-0.282
232.3	95.635	8.54	4.66	3.16	1.0	0.57	16.37	100	59.02	75.39	0.350	-0.226
232.1	95.799	5.09	6.20	3.42	1.0	0.56	10.80	100	57.29	68.09	0.350	-0.186
231.9	95.963	5.00	2.30	3.19	1.0	0.56	10.66	100	57.24	67.90	0.350	-0.185
231.8	96.127	5.01	1.86	3.15	1.0	0.56	10.68	100	57.25	67.93	0.350	-0.185
231.6	96.291	4.97	1.76	3.14	1.0	0.56	10.64	100	57.24	67.88	0.350	-0.184
231.4	96.456	4.88	1.65	3.13	1.0	0.56	10.51	100	57.19	67.70	0.350	-0.183

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
231.3	96.620	4.68	1.59	3.14	1.0	0.56	10.19	100	57.10	67.29	0.350	-0.181
231.1	96.784	4.59	1.49	3.13	1.0	0.56	10.05	100	57.05	67.10	0.350	-0.180
231.0	96.948	4.49	1.39	3.13	1.0	0.56	9.91	100	57.01	66.91	0.350	-0.179
230.8	97.112	4.51	1.36	3.12	1.0	0.56	9.94	100	57.02	66.96	0.350	-0.179
230.6	97.276	4.41	1.35	3.13	1.0	0.55	9.78	100	56.97	66.76	0.350	-0.178
230.5	97.440	4.43	1.47	3.15	1.0	0.55	9.83	100	56.98	66.81	0.350	-0.178
230.3	97.604	4.51	1.66	3.16	1.0	0.55	9.95	100	57.02	66.98	0.350	-0.179
230.1	97.768	4.62	1.66	3.15	1.0	0.55	10.14	100	57.08	67.22	0.350	-0.180
230.0	97.932	4.44	1.75	3.18	1.0	0.55	9.86	100	56.99	66.85	0.350	-0.178
229.8	98.096	4.38	1.67	3.18	1.0	0.55	9.77	100	56.97	66.74	0.350	-0.177
229.6	98.260	4.23	1.61	3.18	1.0	0.55	9.55	100	56.90	66.44	0.350	-0.175
229.5	98.424	4.30	1.85	3.20	1.0	0.55	9.67	100	56.93	66.60	0.350	-0.176
229.3	98.588	4.61	1.70	3.16	1.0	0.55	10.16	100	57.09	67.25	0.350	-0.180
229.1	98.752	5.37	3.40	3.25	1.0	0.55	11.39	100	57.47	68.86	0.350	-0.189
229.0	98.916	38.22	1.85	2.40	0.5	0.60	41.74	55	58.99	100.73	0.350	-0.343
228.8	99.080	12.46	3.47	2.96	1.0	0.58	23.37	99	61.15	84.52	0.350	-0.270
228.7	99.244	8.07	4.22	3.16	1.0	0.56	15.88	100	58.86	74.74	0.350	-0.221
228.5	99.408	8.94	2.62	3.00	1.0	0.56	17.35	100	59.32	76.67	0.350	-0.231
228.3	99.572	15.62	1.41	2.66	1.0	0.58	28.87	75	59.97	88.84	0.350	-0.290
228.2	99.736	9.31	2.75	3.00	1.0	0.56	18.01	100	59.52	77.53	0.350	-0.235
228.0	99.900	6.23	3.05	3.17	1.0	0.55	12.85	100	57.92	70.78	0.350	-0.199
227.8	100.064	5.03	1.90	3.15	1.0	0.55	10.91	100	57.32	68.23	0.350	-0.185
227.7	100.228	5.19	1.40	3.07	1.0	0.55	11.17	100	57.40	68.57	0.350	-0.187
227.5	100.392	5.23	0.90	2.99	1.0	0.55	11.25	100	57.42	68.67	0.350	-0.187
227.3	100.557	7.62	1.18	2.89	1.0	0.55	15.19	94	58.16	73.34	0.350	-0.213
227.2	100.721	9.43	1.84	2.90	1.0	0.56	18.28	95	59.20	77.47	0.350	-0.234
227.0	100.885	5.34	3.91	3.29	1.0	0.55	11.45	100	57.49	68.94	0.350	-0.188
226.9	101.049	4.51	3.80	3.34	1.0	0.54	10.11	100	57.07	67.18	0.350	-0.178
226.7	101.213	4.71	1.04	3.06	1.0	0.54	10.45	100	57.18	67.63	0.350	-0.181
226.5	101.377	4.62	1.09	3.08	1.0	0.54	10.30	100	57.13	67.43	0.350	-0.180
226.4	101.541	4.38	1.10	3.10	1.0	0.54	9.92	100	57.01	66.94	0.350	-0.177
226.2	101.705	4.46	1.19	3.10	1.0	0.54	10.06	100	57.06	67.12	0.350	-0.178
226.0	101.869	4.40	1.15	3.10	1.0	0.54	9.97	100	57.03	67.00	0.350	-0.177
225.9	102.033	4.57	1.12	3.08	1.0	0.54	10.26	100	57.12	67.38	0.350	-0.179
225.7	102.197	4.54	1.02	3.07	1.0	0.54	10.21	100	57.10	67.32	0.350	-0.179
225.5	102.361	4.66	1.04	3.06	1.0	0.54	10.42	100	57.17	67.59	0.350	-0.180
225.4	102.525	4.55	1.13	3.09	1.0	0.54	10.24	100	57.11	67.35	0.350	-0.179
225.2	102.689	4.71	1.04	3.06	1.0	0.54	10.51	100	57.20	67.71	0.350	-0.181
225.0	102.853	4.47	1.03	3.08	1.0	0.54	10.12	100	57.07	67.19	0.350	-0.178
224.9	103.017	4.34	1.04	3.09	1.0	0.54	9.93	100	57.01	66.94	0.350	-0.176
224.7	103.181	4.35	0.93	3.07	1.0	0.54	9.94	100	57.02	66.96	0.350	-0.176
224.6	103.345	4.52	1.07	3.08	1.0	0.54	10.23	100	57.11	67.33	0.350	-0.178
224.4	103.509	4.55	1.22	3.10	1.0	0.54	10.29	100	57.13	67.41	0.350	-0.179
224.2	103.673	4.76	1.67	3.14	1.0	0.54	10.63	100	57.23	67.86	0.350	-0.181
224.1	103.837	4.75	1.61	3.14	1.0	0.54	10.62	100	57.23	67.85	0.350	-0.181
223.9	104.001	6.38	2.03	3.07	1.0	0.54	13.35	100	58.08	71.43	0.350	-0.201
223.7	104.165	18.70	2.04	2.68	1.0	0.58	35.39	77	62.19	97.58	0.350	-0.327
223.6	104.329	16.08	3.24	2.85	1.0	0.57	30.61	91	62.55	93.15	0.350	-0.308
223.4	104.493	8.35	6.02	3.24	1.0	0.55	16.74	100	59.13	75.87	0.350	-0.224
223.2	104.658	6.41	4.42	3.25	1.0	0.54	13.44	100	58.10	71.54	0.350	-0.201
223.1	104.822	4.80	3.50	3.30	1.0	0.53	10.75	100	57.27	68.03	0.350	-0.182
222.9	104.986	4.34	2.02	3.22	1.0	0.53	9.99	100	57.04	67.03	0.350	-0.176
222.8	105.150	4.32	1.84	3.20	1.0	0.53	9.97	100	57.03	67.00	0.350	-0.176
222.6	105.314	4.54	1.54	3.15	1.0	0.53	10.34	100	57.14	67.49	0.350	-0.178
222.4	105.478	4.50	1.52	3.15	1.0	0.53	10.29	100	57.13	67.42	0.350	-0.178
222.3	105.642	4.59	1.33	3.11	1.0	0.53	10.43	100	57.17	67.60	0.350	-0.179
222.1	105.806	4.39	1.62	3.17	1.0	0.53	10.12	100	57.07	67.19	0.350	-0.176
221.9	105.970	5.10	1.54	3.10	1.0	0.53	11.31	100	57.44	68.75	0.350	-0.185
221.8	106.134	4.33	1.87	3.20	1.0	0.53	10.02	100	57.05	67.07	0.350	-0.176
221.6	106.298	4.24	1.95	3.22	1.0	0.53	9.89	100	57.00	66.89	0.350	-0.174
221.4	106.462	4.34	1.10	3.10	1.0	0.53	10.05	100	57.05	67.11	0.350	-0.176
221.3	106.626	5.61	2.26	3.14	1.0	0.53	12.18	100	57.72	69.90	0.350	-0.191
221.1	106.790	6.42	2.32	3.10	1.0	0.53	13.57	100	58.15	71.71	0.350	-0.201
220.9	106.954	4.94	3.02	3.26	1.0	0.53	11.08	100	57.37	68.45	0.350	-0.183
220.8	107.118	5.54	3.50	3.25	1.0	0.53	12.10	100	57.69	69.79	0.350	-0.191
220.6	107.282	7.34	2.83	3.10	1.0	0.54	15.18	100	58.65	73.83	0.350	-0.212

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	(ft)	Q	F (%)	I_c	n	C_N	qc_{1N}	FC (%)	Δqc_{1N}	$(qc_{1N})_{CS}$	a	ξ_R
220.5	107.446	4.60	4.10	3.35	1.0	0.53	10.54	100	57.20	67.74	0.350	-0.179
220.3	107.610	12.34	2.44	2.87	1.0	0.55	24.10	93	60.73	84.83	0.350	-0.268
220.1	107.774	8.12	3.15	3.08	1.0	0.54	16.57	100	59.08	75.65	0.350	-0.222
220.0	107.938	4.51	5.48	3.43	1.0	0.52	10.41	100	57.17	67.58	0.350	-0.178
219.8	108.102	4.73	1.85	3.17	1.0	0.52	10.78	100	57.28	68.06	0.350	-0.180
219.6	108.266	4.78	1.31	3.10	1.0	0.52	10.87	100	57.31	68.18	0.350	-0.181
219.5	108.430	4.98	2.07	3.17	1.0	0.52	11.21	100	57.41	68.62	0.350	-0.183
219.3	108.594	6.54	3.89	3.21	1.0	0.53	13.89	100	58.24	72.13	0.350	-0.203
219.1	108.759	8.88	4.37	3.13	1.0	0.54	17.99	100	59.52	77.51	0.350	-0.231
219.0	108.923	97.61	0.73	1.83	0.5	0.59	104.09	10	6.84	110.92	0.350	-0.381
218.8	109.087	182.70	0.66	1.59	0.5	0.73	238.05	0	0.00	238.05	0.350	-0.600
218.6	109.251	242.53	0.53	1.44	0.5	0.74	321.24	0	0.00	321.24	0.350	-0.600
218.5	109.415	319.60	0.40	1.27	0.5	0.74	422.00	0	0.00	422.00	0.350	-0.600

LIQUEFACTION POTENTIAL ASSESSMENT FOR COARSE GRAINED SOILS USING CONE PENETRATION TEST DATA

Shear Stress Fit Parameters	
m4:	0
m3:	0
m2:	0
m1:	0

Depth to Water during Earthquake: 3.6 ft
Final Grade Elevation during EQ: 327.9 ft
Height of Final Grade above CPT TOH: 0.0 ft
Normalize K_v to: 1.058 tsf
 a_{max} at top of ground surface: 0.22 g
Earthquake Magnitude: 7.70 M_w
Earthquake File or Source Zone: Design Source

Project Site: US 60 Bridge
Stantec Project No.: 178565011
CPT ID: SP07

Elev. (ft)	Depth z (ft)	Cyclic Resistance Ratio $CRR_{7.5}$	Relative Density D_r (%)	Correction for		Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., r_d	From Ground Response			Cyclic Stress Ratio CSR	Sample Screened for:			Factor of Safety FS_{liq}	Material (optional)	Soil Type (see note on following chart)
				Overburden Pressure K_v	Sloping Ground K_σ				Maximum Induced Shear Stress τ_{Max} (psf)	Average Cyclic Shear Stress τ_{Avg} (psf)	Clay-like $(qc_{1N})_{CS \geq 175}$		High Tip Res.	Unsaturated				
327.9																		
327.7	0.164	0.097	32	1.100	N/A	0.99	N/A	1.000	0	0	0.146	FALSE	FALSE	TRUE	N/A	N/A	A1	
327.6	0.328	0.101	36	1.100	N/A	0.99	N/A	1.000	0	0	0.146	FALSE	FALSE	TRUE	N/A	N/A	A1	
327.4	0.492	0.100	35	1.100	N/A	0.99	N/A	1.000	0	0	0.146	FALSE	FALSE	TRUE	N/A	N/A	A1	
327.2	0.656	0.112	43	1.100	N/A	0.99	N/A	1.000	0	0	0.146	FALSE	FALSE	TRUE	N/A	N/A	A1	
327.1	0.820	0.125	50	1.100	N/A	0.99	N/A	1.000	0	0	0.146	FALSE	FALSE	TRUE	N/A	N/A	A1	
326.9	0.984	0.140	56	1.100	N/A	0.98	N/A	1.000	0	0	0.146	FALSE	FALSE	TRUE	N/A	N/A	A1	
326.8	1.148	0.156	60	1.100	N/A	0.98	N/A	1.000	0	0	0.146	FALSE	FALSE	TRUE	N/A	N/A	A1	
326.6	1.312	0.163	61	1.100	N/A	0.98	N/A	1.000	0	0	0.146	FALSE	FALSE	TRUE	N/A	N/A	A1	
326.4	1.476	0.162	61	1.100	N/A	0.98	N/A	1.000	0	0	0.146	FALSE	FALSE	TRUE	N/A	N/A	A1	
326.3	1.640	0.152	59	1.100	N/A	0.98	N/A	1.000	0	0	0.146	FALSE	FALSE	TRUE	N/A	N/A	A1	
326.1	1.804	0.144	57	1.100	N/A	0.98	N/A	1.000	0	0	0.146	FALSE	FALSE	TRUE	N/A	N/A	A1	
325.9	1.968	0.140	56	1.100	N/A	0.98	N/A	1.000	0	0	0.146	FALSE	FALSE	TRUE	N/A	N/A	A1	
325.8	2.133	0.141	56	1.100	N/A	0.98	N/A	1.000	0	0	0.146	FALSE	FALSE	TRUE	N/A	N/A	A1	
325.6	2.297	0.142	56	1.100	N/A	0.98	N/A	1.000	0	0	0.146	FALSE	FALSE	TRUE	N/A	N/A	A1	
325.4	2.461	0.141	56	1.100	N/A	0.98	N/A	1.000	0	0	0.146	FALSE	FALSE	TRUE	N/A	N/A	A1	
325.3	2.625	0.138	55	1.100	N/A	0.98	N/A	1.000	0	0	0.146	FALSE	FALSE	TRUE	N/A	N/A	A1	
325.1	2.789	0.135	54	1.100	N/A	0.98	N/A	1.000	0	0	0.146	FALSE	FALSE	TRUE	N/A	N/A	A1	
324.9	2.953	0.135	54	1.100	N/A	0.98	N/A	1.000	0	0	0.146	FALSE	FALSE	TRUE	N/A	N/A	A1	
324.8	3.117	0.135	54	1.100	N/A	0.98	N/A	1.000	0	0	0.146	FALSE	FALSE	TRUE	N/A	N/A	A1	
324.6	3.281	0.132	53	1.100	N/A	0.98	N/A	1.000	0	0	0.146	FALSE	FALSE	TRUE	N/A	N/A	A1	
324.5	3.445	0.126	51	1.100	N/A	0.99	N/A	1.000	0	0	0.145	FALSE	FALSE	TRUE	N/A	N/A	A1	
324.3	3.609	0.125	50	1.100	1.198	0.99	0.163	0.999	0	0	0.146	FALSE	FALSE	FALSE	N/A	N/A	A1	
324.1	3.773	0.126	51	1.100	1.208	0.99	0.165	0.999	0	0	0.149	FALSE	FALSE	FALSE	N/A	N/A	A1	
324.0	3.937	0.123	49	1.100	1.149	0.99	0.154	0.999	0	0	0.152	FALSE	FALSE	FALSE	N/A	N/A	A1	
323.8	4.101	0.120	48	1.100	1.094	0.99	0.143	0.998	0	0	0.155	FALSE	FALSE	FALSE	N/A	N/A	A1	
323.6	4.265	0.117	46	1.100	1.017	0.99	0.129	0.998	0	0	0.158	FALSE	FALSE	FALSE	N/A	N/A	B	
323.5	4.429	0.116	46	1.100	0.987	0.99	0.124	0.998	0	0	0.161	FALSE	FALSE	FALSE	N/A	N/A	B	
323.3	4.593	0.117	46	1.100	1.009	0.99	0.128	0.997	0	0	0.164	FALSE	FALSE	FALSE	N/A	N/A	A1	
323.1	4.757	0.118	47	1.100	1.046	0.99	0.135	0.997	0	0	0.166	FALSE	FALSE	FALSE	N/A	N/A	A1	
323.0	4.921	0.119	47	1.100	1.047	0.99	0.135	0.996	0	0	0.169	FALSE	FALSE	FALSE	N/A	N/A	A1	
322.8	5.085	0.116	46	1.100	0.988	0.99	0.124	0.996	0	0	0.171	FALSE	FALSE	FALSE	N/A	N/A	B	
322.7	5.249	0.114	45	1.100	0.944	0.99	0.117	0.996	0	0	0.173	FALSE	FALSE	FALSE	N/A	N/A	B	
322.5	5.413	0.112	43	1.100	0.900	0.99	0.110	0.995	0	0	0.175	FALSE	FALSE	FALSE	N/A	N/A	B	
322.3	5.577	0.111	43	1.100	0.874	0.99	0.105	0.995	0	0	0.178	FALSE	FALSE	FALSE	N/A	N/A	B	
322.2	5.741	0.110	42	1.100	0.854	0.99	0.102	0.995	0	0	0.180	FALSE	FALSE	FALSE	N/A	N/A	B	
322.0	5.905	0.110	43	1.100	0.862	0.99	0.104	0.994	0	0	0.182	FALSE	FALSE	FALSE	N/A	N/A	B	
321.8	6.069	0.111	43	1.100	0.876	0.99	0.106	0.994	0	0	0.183	FALSE	FALSE	FALSE	N/A	N/A	B	
321.7	6.234	0.112	43	1.100	0.890	0.99	0.108	0.994	0	0	0.185	FALSE	FALSE	FALSE	N/A	N/A	B	
321.5	6.398	N/A	43	N/A	N/A	N/A	N/A	0.993	0	0	0.187	TRUE	FALSE	FALSE	N/A	N/A	B	
321.3	6.562	N/A	42	N/A	N/A	N/A	N/A	0.993	0	0	0.189	TRUE	FALSE	FALSE	N/A	N/A	B	
321.2	6.726	N/A	42	N/A	N/A	N/A	N/A	0.992	0	0	0.190	TRUE	FALSE	FALSE	N/A	N/A	B	
321.0	6.890	N/A	41	N/A	N/A	N/A	N/A	0.992	0	0	0.192	TRUE	FALSE	FALSE	N/A	N/A	B	
320.8	7.054	N/A	40	N/A	N/A	N/A	N/A	0.992	0	0	0.194	TRUE	FALSE	FALSE	N/A	N/A	B	
320.7	7.218	N/A	39	N/A	N/A	N/A	N/A	0.991	0	0	0.195	TRUE	FALSE	FALSE	N/A	N/A	B	

Elev. (ft)	Depth z (ft)	Cyclic Resistance Ratio $CRR_{7.5}$	Relative Density D_r	Correction for			Cyclic Resistance Ratio CRR	Magnitude Scaling Factor MSF	Stress Reduction Coeff., t_d	Front Ground Response			Sample Screened for:				Factor of Safety FS_{liq}	Material (optional)	Soil Type (see note on following chart)
				Overburden Pressure K_o	Sloping Ground K_σ	Cyclic Resistance Ratio CRR				Maximum Induced Shear Stress τ_{max} (psf)	Average Cyclic Shear Stress τ_{Avg} (psf)	Cyclic Stress Ratio CSR	Clay-like $(q_{c30})_{cs} \geq 175$	High Tip Res.	Unsaturated				
320.5	7.382	N/A	39	N/A	N/A	N/A	0.991	0	0	0	0.197	TRUE	FALSE	FALSE	N/A	N/A	B		
320.4	7.546	0.114	45	1.100	0.932	0.99	0.116	0.991	0	0	0.198	FALSE	FALSE	FALSE	0.6	N/A	A2		
320.2	7.710	0.118	47	1.100	1.015	0.99	0.130	0.990	0	0	0.199	FALSE	FALSE	FALSE	0.7	N/A	A2		
320.0	7.874	0.114	45	1.100	0.922	0.99	0.114	0.990	0	0	0.201	FALSE	FALSE	FALSE	0.6	N/A	A2		
319.9	8.038	0.118	47	1.100	1.005	0.99	0.129	0.989	0	0	0.202	FALSE	FALSE	FALSE	0.6	N/A	A2		
319.7	8.202	0.122	49	1.100	1.090	0.99	0.144	0.989	0	0	0.203	FALSE	FALSE	FALSE	0.7	N/A	A2		
319.5	8.366	0.112	44	1.097	0.889	0.99	0.108	0.989	0	0	0.204	FALSE	FALSE	FALSE	0.5	N/A	A2		
319.4	8.530	0.107	40	1.090	0.761	0.99	0.088	0.988	0	0	0.206	FALSE	FALSE	FALSE	0.4	N/A	C		
319.2	8.694	N/A	38	N/A	N/A	N/A	N/A	0.988	0	0	0.207	TRUE	FALSE	FALSE	N/A	N/A	C		
319.0	8.858	N/A	37	N/A	N/A	N/A	N/A	0.987	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C		
318.9	9.022	N/A	36	N/A	N/A	N/A	N/A	0.987	0	0	0.209	TRUE	FALSE	FALSE	N/A	N/A	C		
318.7	9.186	N/A	36	N/A	N/A	N/A	N/A	0.987	0	0	0.210	TRUE	FALSE	FALSE	N/A	N/A	C		
318.5	9.350	N/A	36	N/A	N/A	N/A	N/A	0.986	0	0	0.211	TRUE	FALSE	FALSE	N/A	N/A	C		
318.4	9.514	N/A	35	N/A	N/A	N/A	N/A	0.986	0	0	0.212	TRUE	FALSE	FALSE	N/A	N/A	C		
318.2	9.678	N/A	35	N/A	N/A	N/A	N/A	0.985	0	0	0.213	TRUE	FALSE	FALSE	N/A	N/A	C		
318.1	9.842	N/A	34	N/A	N/A	N/A	N/A	0.985	0	0	0.214	TRUE	FALSE	FALSE	N/A	N/A	C		
317.9	10.006	N/A	36	N/A	N/A	N/A	N/A	0.984	0	0	0.215	TRUE	FALSE	FALSE	N/A	N/A	C		
317.7	10.170	N/A	36	N/A	N/A	N/A	N/A	0.984	0	0	0.216	TRUE	FALSE	FALSE	N/A	N/A	C		
317.6	10.335	N/A	37	N/A	N/A	N/A	N/A	0.984	0	0	0.217	TRUE	FALSE	FALSE	N/A	N/A	C		
317.4	10.499	N/A	37	N/A	N/A	N/A	N/A	0.983	0	0	0.217	TRUE	FALSE	FALSE	N/A	N/A	C		
317.2	10.663	N/A	38	N/A	N/A	N/A	N/A	0.983	0	0	0.218	TRUE	FALSE	FALSE	N/A	N/A	C		
317.1	10.827	N/A	38	N/A	N/A	N/A	N/A	0.982	0	0	0.219	TRUE	FALSE	FALSE	N/A	N/A	C		
316.9	10.991	N/A	39	N/A	N/A	N/A	N/A	0.982	0	0	0.220	TRUE	FALSE	FALSE	N/A	N/A	C		
316.7	11.155	N/A	39	N/A	N/A	N/A	N/A	0.982	0	0	0.220	TRUE	FALSE	FALSE	N/A	N/A	C		
316.6	11.319	N/A	39	N/A	N/A	N/A	N/A	0.981	0	0	0.221	TRUE	FALSE	FALSE	N/A	N/A	C		
316.4	11.483	N/A	39	N/A	N/A	N/A	N/A	0.981	0	0	0.222	TRUE	FALSE	FALSE	N/A	N/A	B		
316.3	11.647	N/A	38	N/A	N/A	N/A	N/A	0.980	0	0	0.223	TRUE	FALSE	FALSE	N/A	N/A	B		
316.1	11.811	N/A	38	N/A	N/A	N/A	N/A	0.980	0	0	0.223	TRUE	FALSE	FALSE	N/A	N/A	B		
315.9	11.975	N/A	36	N/A	N/A	N/A	N/A	0.979	0	0	0.224	TRUE	FALSE	FALSE	N/A	N/A	B		
315.8	12.139	N/A	35	N/A	N/A	N/A	N/A	0.979	0	0	0.225	TRUE	FALSE	FALSE	N/A	N/A	B		
315.6	12.303	N/A	35	N/A	N/A	N/A	N/A	0.978	0	0	0.225	TRUE	FALSE	FALSE	N/A	N/A	B		
315.4	12.467	N/A	36	N/A	N/A	N/A	N/A	0.978	0	0	0.226	TRUE	FALSE	FALSE	N/A	N/A	C		
315.3	12.631	N/A	37	N/A	N/A	N/A	N/A	0.978	0	0	0.226	TRUE	FALSE	FALSE	N/A	N/A	C		
315.1	12.795	N/A	38	N/A	N/A	N/A	N/A	0.977	0	0	0.227	TRUE	FALSE	FALSE	N/A	N/A	C		
314.9	12.959	N/A	39	N/A	N/A	N/A	N/A	0.977	0	0	0.228	TRUE	FALSE	FALSE	N/A	N/A	C		
314.8	13.123	N/A	40	N/A	N/A	N/A	N/A	0.976	0	0	0.228	TRUE	FALSE	FALSE	N/A	N/A	B		
314.6	13.287	N/A	40	N/A	N/A	N/A	N/A	0.976	0	0	0.229	TRUE	FALSE	FALSE	N/A	N/A	B		
314.4	13.451	N/A	40	N/A	N/A	N/A	N/A	0.975	0	0	0.229	TRUE	FALSE	FALSE	N/A	N/A	B		
314.3	13.615	N/A	41	N/A	N/A	N/A	N/A	0.975	0	0	0.230	TRUE	FALSE	FALSE	N/A	N/A	B		
314.1	13.779	N/A	42	N/A	N/A	N/A	N/A	0.974	0	0	0.230	TRUE	FALSE	FALSE	N/A	N/A	B		
314.0	13.943	N/A	43	N/A	N/A	N/A	N/A	0.974	0	0	0.231	TRUE	FALSE	FALSE	N/A	N/A	B		
313.8	14.107	N/A	43	N/A	N/A	N/A	N/A	0.973	0	0	0.231	TRUE	FALSE	FALSE	N/A	N/A	B		
313.6	14.271	N/A	44	N/A	N/A	N/A	N/A	0.973	0	0	0.232	TRUE	FALSE	FALSE	N/A	N/A	B		
313.5	14.436	N/A	44	N/A	N/A	N/A	N/A	0.972	0	0	0.232	TRUE	FALSE	FALSE	N/A	N/A	B		
313.3	14.600	N/A	44	N/A	N/A	N/A	N/A	0.972	0	0	0.233	TRUE	FALSE	FALSE	N/A	N/A	B		
313.1	14.764	N/A	45	N/A	N/A	N/A	N/A	0.972	0	0	0.233	TRUE	FALSE	FALSE	N/A	N/A	B		
313.0	14.928	N/A	44	N/A	N/A	N/A	N/A	0.971	0	0	0.233	TRUE	FALSE	FALSE	N/A	N/A	B		
312.8	15.092	N/A	43	N/A	N/A	N/A	N/A	0.971	0	0	0.234	TRUE	FALSE	FALSE	N/A	N/A	B		
312.6	15.256	N/A	43	N/A	N/A	N/A	N/A	0.970	0	0	0.234	TRUE	FALSE	FALSE	N/A	N/A	B		
312.5	15.420	N/A	43	N/A	N/A	N/A	N/A	0.970	0	0	0.235	TRUE	FALSE	FALSE	N/A	N/A	B		
312.3	15.584	N/A	43	N/A	N/A	N/A	N/A	0.969	0	0	0.235	TRUE	FALSE	FALSE	N/A	N/A	B		
312.2	15.748	N/A	43	N/A	N/A	N/A	N/A	0.969	0	0	0.235	TRUE	FALSE	FALSE	N/A	N/A	B		
312.0	15.912	N/A	44	N/A	N/A	N/A	N/A	0.968	0	0	0.236	TRUE	FALSE	FALSE	N/A	N/A	B		
311.8	16.076	N/A	44	N/A	N/A	N/A	N/A	0.968	0	0	0.236	TRUE	FALSE	FALSE	N/A	N/A	B		
311.7	16.240	N/A	43	N/A	N/A	N/A	N/A	0.967	0	0	0.236	TRUE	FALSE	FALSE	N/A	N/A	B		

Elev. (ft)	Depth z	Cyclic Resistance Ratio $CRR_{7.5}$	Relative Density D_r	Correction for Overburden Pressure		Correction for Sloping Ground K_α	Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CHR	Stress Reduction Coeff., t_d	Front Ground Response			Sample Screened for:				Factor of Safety FS_{liq}	Material (optional)	Soil Type (see note on following chart)
				Cyclic Ratio	Cyclic Stress τ_{Avg} (psf)					Maximum Induced Shear Stress τ_{Max} (psf)	Cyclic Stress Ratio CSR	Clay-like $(qc_{30}) \geq 175$	High Tip Res.	Unsaturated					
311.5	16.404	N/A	43	N/A	N/A	N/A	N/A	N/A	0.967	0	0	0.237	TRUE	FALSE	FALSE	N/A	N/A	B	
311.3	16.568	N/A	44	N/A	N/A	N/A	N/A	N/A	0.966	0	0	0.237	TRUE	FALSE	FALSE	N/A	N/A	B	
311.2	16.732	N/A	45	N/A	N/A	N/A	N/A	N/A	0.966	0	0	0.237	TRUE	FALSE	FALSE	N/A	N/A	B	
311.0	16.896	N/A	45	N/A	N/A	N/A	N/A	N/A	0.965	0	0	0.238	TRUE	FALSE	FALSE	N/A	N/A	B	
310.8	17.060	N/A	44	N/A	N/A	N/A	N/A	N/A	0.965	0	0	0.238	TRUE	FALSE	FALSE	N/A	N/A	B	
310.7	17.224	N/A	43	N/A	N/A	N/A	N/A	N/A	0.964	0	0	0.238	TRUE	FALSE	FALSE	N/A	N/A	B	
310.5	17.388	N/A	43	N/A	N/A	N/A	N/A	N/A	0.964	0	0	0.239	TRUE	FALSE	FALSE	N/A	N/A	B	
310.3	17.552	N/A	43	N/A	N/A	N/A	N/A	N/A	0.963	0	0	0.239	TRUE	FALSE	FALSE	N/A	N/A	B	
310.2	17.716	N/A	43	N/A	N/A	N/A	N/A	N/A	0.963	0	0	0.239	TRUE	FALSE	FALSE	N/A	N/A	B	
310.0	17.880	N/A	43	N/A	N/A	N/A	N/A	N/A	0.962	0	0	0.239	TRUE	FALSE	FALSE	N/A	N/A	B	
309.9	18.044	N/A	43	N/A	N/A	N/A	N/A	N/A	0.962	0	0	0.240	TRUE	FALSE	FALSE	N/A	N/A	B	
309.7	18.208	N/A	43	N/A	N/A	N/A	N/A	N/A	0.961	0	0	0.240	TRUE	FALSE	FALSE	N/A	N/A	B	
309.5	18.372	N/A	43	N/A	N/A	N/A	N/A	N/A	0.961	0	0	0.240	TRUE	FALSE	FALSE	N/A	N/A	B	
309.4	18.537	N/A	43	N/A	N/A	N/A	N/A	N/A	0.960	0	0	0.240	TRUE	FALSE	FALSE	N/A	N/A	B	
309.2	18.701	N/A	44	N/A	N/A	N/A	N/A	N/A	0.960	0	0	0.241	TRUE	FALSE	FALSE	N/A	N/A	B	
309.0	18.865	0.130	52	1.049	1.177	0.98	0.98	0.158	0.959	0	0	0.241	FALSE	FALSE	FALSE	0.7	N/A	A1	
308.9	19.029	0.143	57	1.052	1.398	0.98	0.98	0.207	0.959	0	0	0.241	FALSE	FALSE	FALSE	0.9	N/A	A1	
308.7	19.193	0.151	59	1.053	1.513	0.98	0.98	0.236	0.958	0	0	0.241	FALSE	FALSE	FALSE	1.0	N/A	A1	
308.5	19.357	0.137	55	1.049	1.299	0.98	0.98	0.184	0.958	0	0	0.242	FALSE	FALSE	FALSE	0.8	N/A	A1	
308.4	19.521	N/A	50	N/A	N/A	N/A	N/A	N/A	0.957	0	0	0.242	TRUE	FALSE	FALSE	N/A	N/A	B	
308.2	19.685	N/A	47	N/A	N/A	N/A	N/A	N/A	0.956	0	0	0.242	TRUE	FALSE	FALSE	N/A	N/A	B	
308.1	19.849	0.124	50	1.042	1.064	0.99	0.99	0.136	0.956	0	0	0.242	FALSE	FALSE	FALSE	0.6	N/A	A1	
307.9	20.013	0.120	48	1.041	0.990	0.99	0.99	0.122	0.955	0	0	0.242	FALSE	FALSE	FALSE	0.5	N/A	A1	
307.7	20.177	0.122	49	1.041	1.033	0.99	0.99	0.130	0.955	0	0	0.243	FALSE	FALSE	FALSE	0.5	N/A	A1	
307.6	20.341	0.117	46	1.038	0.929	0.99	0.99	0.112	0.954	0	0	0.243	FALSE	FALSE	FALSE	0.5	N/A	A1	
307.4	20.505	0.121	49	1.039	1.008	0.99	0.99	0.125	0.954	0	0	0.243	FALSE	FALSE	FALSE	0.5	N/A	A1	
307.2	20.669	N/A	43	N/A	N/A	N/A	N/A	N/A	0.953	0	0	0.243	TRUE	FALSE	FALSE	N/A	N/A	B	
307.1	20.833	N/A	40	N/A	N/A	N/A	N/A	N/A	0.953	0	0	0.243	TRUE	FALSE	FALSE	N/A	N/A	C	
306.9	20.997	N/A	39	N/A	N/A	N/A	N/A	N/A	0.952	0	0	0.243	TRUE	FALSE	FALSE	N/A	N/A	C	
306.7	21.161	0.111	43	1.033	0.796	0.99	0.99	0.090	0.952	0	0	0.244	FALSE	FALSE	FALSE	0.4	N/A	A2	
306.6	21.325	0.119	47	1.035	0.963	0.99	0.99	0.117	0.951	0	0	0.244	FALSE	FALSE	FALSE	0.5	N/A	A1	
306.4	21.489	N/A	46	N/A	N/A	N/A	N/A	N/A	0.951	0	0	0.244	TRUE	FALSE	FALSE	N/A	N/A	B	
306.2	21.653	N/A	45	N/A	N/A	N/A	N/A	N/A	0.950	0	0	0.244	TRUE	FALSE	FALSE	N/A	N/A	B	
306.1	21.817	N/A	41	N/A	N/A	N/A	N/A	N/A	0.949	0	0	0.244	TRUE	FALSE	FALSE	N/A	N/A	B	
305.9	21.981	N/A	39	N/A	N/A	N/A	N/A	N/A	0.949	0	0	0.244	TRUE	FALSE	FALSE	N/A	N/A	B	
305.8	22.145	N/A	39	N/A	N/A	N/A	N/A	N/A	0.948	0	0	0.244	TRUE	FALSE	FALSE	N/A	N/A	C	
305.6	22.309	N/A	39	N/A	N/A	N/A	N/A	N/A	0.948	0	0	0.245	TRUE	FALSE	FALSE	N/A	N/A	C	
305.4	22.473	N/A	39	N/A	N/A	N/A	N/A	N/A	0.947	0	0	0.245	TRUE	FALSE	FALSE	N/A	N/A	C	
305.3	22.638	N/A	39	N/A	N/A	N/A	N/A	N/A	0.947	0	0	0.245	TRUE	FALSE	FALSE	N/A	N/A	C	
305.1	22.802	N/A	39	N/A	N/A	N/A	N/A	N/A	0.946	0	0	0.245	TRUE	FALSE	FALSE	N/A	N/A	C	
304.9	22.966	N/A	39	N/A	N/A	N/A	N/A	N/A	0.946	0	0	0.245	TRUE	FALSE	FALSE	N/A	N/A	C	
304.8	23.130	N/A	39	N/A	N/A	N/A	N/A	N/A	0.945	0	0	0.245	TRUE	FALSE	FALSE	N/A	N/A	C	
304.6	23.294	N/A	39	N/A	N/A	N/A	N/A	N/A	0.944	0	0	0.245	TRUE	FALSE	FALSE	N/A	N/A	B	
304.4	23.458	0.118	47	1.027	0.932	0.99	0.99	0.111	0.944	0	0	0.245	FALSE	FALSE	FALSE	0.5	N/A	A1	
304.3	23.622	N/A	40	N/A	N/A	N/A	N/A	N/A	0.943	0	0	0.245	TRUE	FALSE	FALSE	N/A	N/A	B	
304.1	23.786	N/A	39	N/A	N/A	N/A	N/A	N/A	0.943	0	0	0.246	TRUE	FALSE	FALSE	N/A	N/A	B	
304.0	23.950	0.117	46	1.025	0.913	0.99	0.99	0.108	0.942	0	0	0.246	FALSE	FALSE	FALSE	0.4	N/A	A2	
303.8	24.114	0.138	55	1.029	1.293	0.98	0.98	0.181	0.942	0	0	0.246	FALSE	FALSE	FALSE	0.7	N/A	A1	
303.6	24.278	N/A	48	N/A	N/A	N/A	N/A	N/A	0.941	0	0	0.246	TRUE	FALSE	FALSE	N/A	N/A	B	
303.5	24.442	N/A	42	N/A	N/A	N/A	N/A	N/A	0.941	0	0	0.246	TRUE	FALSE	FALSE	N/A	N/A	B	
303.3	24.606	N/A	40	N/A	N/A	N/A	N/A	N/A	0.940	0	0	0.246	TRUE	FALSE	FALSE	N/A	N/A	B	
303.1	24.770	N/A	39	N/A	N/A	N/A	N/A	N/A	0.939	0	0	0.246	TRUE	FALSE	FALSE	N/A	N/A	C	
303.0	24.934	N/A	39	N/A	N/A	N/A	N/A	N/A	0.939	0	0	0.246	TRUE	FALSE	FALSE	N/A	N/A	C	
302.8	25.098	0.117	47	1.022	0.919	0.99	0.99	0.109	0.938	0	0	0.246	FALSE	FALSE	FALSE	0.4	N/A	A2	
302.6	25.262	0.125	50	1.023	1.061	0.99	0.99	0.134	0.938	0	0	0.246	FALSE	FALSE	FALSE	0.5	N/A	A1	

Elev. z (ft)	Depth z (ft)	Cyclic Resistance Ratio $CRR_{7.5}$	Relative Density D_r	Correction for Overburden Pressure K_o	Correction for Sloping Ground K_σ	Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CHR	Stress Reduction Coeff., t_d	Front Ground Response			Cyclic Shear Stress τ_{Avg} (psf)	Sample Screened for:			Factor of Safety FS_{liq}	Material (optional)	Soil Type (see note on following chart)
									Maximum Induced Shear Stress τ_{Max} (psf)	Average Cyclic Shear Stress (psf)	Cyclic Stress Ratio CSR		Clay-like $(qc_{30}) \geq 175$	High Tip Res.	Unsaturated			
302.5	25.426	N/A	44	N/A	N/A	N/A	N/A	0.937	0	0	0.246	TRUE	FALSE	FALSE	N/A	N/A	B	
302.3	25.590	N/A	41	N/A	N/A	N/A	N/A	0.937	0	0	0.246	TRUE	FALSE	FALSE	N/A	N/A	B	
302.1	25.754	N/A	39	N/A	N/A	N/A	N/A	0.936	0	0	0.246	TRUE	FALSE	FALSE	N/A	N/A	C	
302.0	25.918	N/A	39	N/A	N/A	N/A	N/A	0.935	0	0	0.247	TRUE	FALSE	FALSE	N/A	N/A	C	
301.8	26.082	N/A	38	N/A	N/A	N/A	N/A	0.935	0	0	0.247	TRUE	FALSE	FALSE	N/A	N/A	C	
301.7	26.246	N/A	38	N/A	N/A	N/A	N/A	0.934	0	0	0.247	TRUE	FALSE	FALSE	N/A	N/A	C	
301.5	26.410	N/A	38	N/A	N/A	N/A	N/A	0.934	0	0	0.247	TRUE	FALSE	FALSE	N/A	N/A	C	
301.3	26.574	N/A	38	N/A	N/A	N/A	N/A	0.933	0	0	0.247	TRUE	FALSE	FALSE	N/A	N/A	C	
301.2	26.739	N/A	38	N/A	N/A	N/A	N/A	0.932	0	0	0.247	TRUE	FALSE	FALSE	N/A	N/A	C	
301.0	26.903	N/A	38	N/A	N/A	N/A	N/A	0.932	0	0	0.247	TRUE	FALSE	FALSE	N/A	N/A	C	
300.8	27.067	N/A	38	N/A	N/A	N/A	N/A	0.931	0	0	0.247	TRUE	FALSE	FALSE	N/A	N/A	C	
300.7	27.231	N/A	38	N/A	N/A	N/A	N/A	0.931	0	0	0.247	TRUE	FALSE	FALSE	N/A	N/A	C	
300.5	27.395	N/A	38	N/A	N/A	N/A	N/A	0.930	0	0	0.247	TRUE	FALSE	FALSE	N/A	N/A	C	
300.3	27.559	N/A	38	N/A	N/A	N/A	N/A	0.929	0	0	0.247	TRUE	FALSE	FALSE	N/A	N/A	C	
300.2	27.723	N/A	38	N/A	N/A	N/A	N/A	0.929	0	0	0.247	TRUE	FALSE	FALSE	N/A	N/A	C	
300.0	27.887	N/A	41	N/A	N/A	N/A	N/A	0.928	0	0	0.247	TRUE	FALSE	FALSE	N/A	N/A	C	
299.8	28.051	N/A	40	N/A	N/A	N/A	N/A	0.928	0	0	0.247	TRUE	FALSE	FALSE	N/A	N/A	C	
299.7	28.215	N/A	38	N/A	N/A	N/A	N/A	0.927	0	0	0.247	TRUE	FALSE	FALSE	N/A	N/A	C	
299.5	28.379	N/A	39	N/A	N/A	N/A	N/A	0.926	0	0	0.247	TRUE	FALSE	FALSE	N/A	N/A	C	
299.4	28.543	N/A	38	N/A	N/A	N/A	N/A	0.926	0	0	0.247	TRUE	FALSE	FALSE	N/A	N/A	C	
299.2	28.707	N/A	38	N/A	N/A	N/A	N/A	0.925	0	0	0.247	TRUE	FALSE	FALSE	N/A	N/A	C	
299.0	28.871	N/A	39	N/A	N/A	N/A	N/A	0.925	0	0	0.247	TRUE	FALSE	FALSE	N/A	N/A	C	
298.9	29.035	N/A	38	N/A	N/A	N/A	N/A	0.924	0	0	0.247	TRUE	FALSE	FALSE	N/A	N/A	C	
298.7	29.199	N/A	38	N/A	N/A	N/A	N/A	0.923	0	0	0.247	TRUE	FALSE	FALSE	N/A	N/A	C	
298.5	29.363	N/A	44	N/A	N/A	N/A	N/A	0.923	0	0	0.247	TRUE	FALSE	FALSE	N/A	N/A	C	
298.4	29.527	N/A	42	N/A	N/A	N/A	N/A	0.922	0	0	0.247	TRUE	FALSE	FALSE	N/A	N/A	C	
298.2	29.691	N/A	40	N/A	N/A	N/A	N/A	0.922	0	0	0.247	TRUE	FALSE	FALSE	N/A	N/A	C	
298.0	29.855	N/A	39	N/A	N/A	N/A	N/A	0.921	0	0	0.247	TRUE	FALSE	FALSE	N/A	N/A	C	
297.9	30.019	N/A	39	N/A	N/A	N/A	N/A	0.920	0	0	0.247	TRUE	FALSE	FALSE	N/A	N/A	C	
297.7	30.183	N/A	39	N/A	N/A	N/A	N/A	0.920	0	0	0.247	TRUE	FALSE	FALSE	N/A	N/A	C	
297.6	30.347	N/A	38	N/A	N/A	N/A	N/A	0.919	0	0	0.247	TRUE	FALSE	FALSE	N/A	N/A	C	
297.4	30.511	N/A	38	N/A	N/A	N/A	N/A	0.919	0	0	0.247	TRUE	FALSE	FALSE	N/A	N/A	C	
297.2	30.675	N/A	38	N/A	N/A	N/A	N/A	0.918	0	0	0.247	TRUE	FALSE	FALSE	N/A	N/A	C	
297.1	30.840	N/A	38	N/A	N/A	N/A	N/A	0.917	0	0	0.247	TRUE	FALSE	FALSE	N/A	N/A	C	
296.9	31.004	N/A	38	N/A	N/A	N/A	N/A	0.917	0	0	0.247	TRUE	FALSE	FALSE	N/A	N/A	C	
296.7	31.168	N/A	38	N/A	N/A	N/A	N/A	0.916	0	0	0.247	TRUE	FALSE	FALSE	N/A	N/A	C	
296.6	31.332	N/A	38	N/A	N/A	N/A	N/A	0.916	0	0	0.247	TRUE	FALSE	FALSE	N/A	N/A	C	
296.4	31.496	N/A	39	N/A	N/A	N/A	N/A	0.915	0	0	0.247	TRUE	FALSE	FALSE	N/A	N/A	C	
296.2	31.660	N/A	38	N/A	N/A	N/A	N/A	0.914	0	0	0.247	TRUE	FALSE	FALSE	N/A	N/A	C	
296.1	31.824	N/A	38	N/A	N/A	N/A	N/A	0.914	0	0	0.247	TRUE	FALSE	FALSE	N/A	N/A	C	
295.9	31.988	N/A	38	N/A	N/A	N/A	N/A	0.913	0	0	0.247	TRUE	FALSE	FALSE	N/A	N/A	C	
295.7	32.152	N/A	38	N/A	N/A	N/A	N/A	0.912	0	0	0.247	TRUE	FALSE	FALSE	N/A	N/A	C	
295.6	32.316	N/A	38	N/A	N/A	N/A	N/A	0.912	0	0	0.247	TRUE	FALSE	FALSE	N/A	N/A	C	
295.4	32.480	N/A	38	N/A	N/A	N/A	N/A	0.911	0	0	0.247	TRUE	FALSE	FALSE	N/A	N/A	C	
295.3	32.644	N/A	38	N/A	N/A	N/A	N/A	0.911	0	0	0.247	TRUE	FALSE	FALSE	N/A	N/A	C	
295.1	32.808	N/A	38	N/A	N/A	N/A	N/A	0.910	0	0	0.247	TRUE	FALSE	FALSE	N/A	N/A	C	
294.9	32.972	N/A	38	N/A	N/A	N/A	N/A	0.909	0	0	0.247	TRUE	FALSE	FALSE	N/A	N/A	C	
294.8	33.136	N/A	38	N/A	N/A	N/A	N/A	0.909	0	0	0.246	TRUE	FALSE	FALSE	N/A	N/A	C	
294.6	33.300	N/A	38	N/A	N/A	N/A	N/A	0.908	0	0	0.246	TRUE	FALSE	FALSE	N/A	N/A	C	
294.4	33.464	N/A	38	N/A	N/A	N/A	N/A	0.907	0	0	0.246	TRUE	FALSE	FALSE	N/A	N/A	C	
294.3	33.628	N/A	39	N/A	N/A	N/A	N/A	0.907	0	0	0.246	TRUE	FALSE	FALSE	N/A	N/A	C	
294.1	33.792	N/A	38	N/A	N/A	N/A	N/A	0.906	0	0	0.246	TRUE	FALSE	FALSE	N/A	N/A	C	
293.9	33.956	N/A	39	N/A	N/A	N/A	N/A	0.905	0	0	0.246	TRUE	FALSE	FALSE	N/A	N/A	C	
293.8	34.120	N/A	39	N/A	N/A	N/A	N/A	0.905	0	0	0.246	TRUE	FALSE	FALSE	N/A	N/A	C	
293.6	34.284	N/A	38	N/A	N/A	N/A	N/A	0.904	0	0	0.246	TRUE	FALSE	FALSE	N/A	N/A	C	

Front Ground Response										Sample Screened for:				Factor of Safety		Material (optional)	Soil Type (see note on following chart)
Maximum Induced Shear Stress τ_{max}	Average Cyclic Shear Stress τ_{Avg}	Cyclic Stress Ratio CSR	Clay-like $(q_{c30}) \geq 175$	High Tip Res. $(q_{c30}) \geq 175$	Unsaturated	FS _{liq}											
Elev. z (ft)	Depth z (ft)	Cyclic Resistance Ratio CRR _{7.5}	Relative Density D _r (%)	Correction for Overburden Pressure K _o	Correction for Sloping Ground K _α	Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., I _d	CSR	Clay-like	High Tip Res.	Unsaturated	FS _{liq}	Material (optional)	Soil Type (see note on following chart)		
293.5	34.448	N/A	38	N/A	N/A	N/A	N/A	0.904	0	0	0.246	TRUE	FALSE	N/A	C		
293.3	34.612	N/A	38	N/A	N/A	N/A	N/A	0.903	0	0	0.246	TRUE	FALSE	N/A	C		
293.1	34.776	N/A	38	N/A	N/A	N/A	N/A	0.902	0	0	0.246	TRUE	FALSE	N/A	C		
293.0	34.941	N/A	38	N/A	N/A	N/A	N/A	0.902	0	0	0.246	TRUE	FALSE	N/A	C		
292.8	35.105	N/A	38	N/A	N/A	N/A	N/A	0.901	0	0	0.246	TRUE	FALSE	N/A	C		
292.6	35.269	N/A	38	N/A	N/A	N/A	N/A	0.900	0	0	0.246	TRUE	FALSE	N/A	C		
292.5	35.433	N/A	38	N/A	N/A	N/A	N/A	0.900	0	0	0.246	TRUE	FALSE	N/A	C		
292.3	35.597	N/A	38	N/A	N/A	N/A	N/A	0.899	0	0	0.246	TRUE	FALSE	N/A	C		
292.1	35.761	N/A	38	N/A	N/A	N/A	N/A	0.898	0	0	0.246	TRUE	FALSE	N/A	C		
292.0	35.925	N/A	38	N/A	N/A	N/A	N/A	0.898	0	0	0.246	TRUE	FALSE	N/A	C		
291.8	36.089	N/A	38	N/A	N/A	N/A	N/A	0.897	0	0	0.245	TRUE	FALSE	N/A	C		
291.6	36.253	N/A	40	N/A	N/A	N/A	N/A	0.896	0	0	0.245	TRUE	FALSE	N/A	C		
291.5	36.417	N/A	39	N/A	N/A	N/A	N/A	0.896	0	0	0.245	TRUE	FALSE	N/A	C		
291.3	36.581	0.131	53	0.990	1.126	0.98	0.144	0.895	0	0	0.245	FALSE	FALSE	N/A	A1		
291.2	36.745	N/A	45	N/A	N/A	N/A	N/A	0.895	0	0	0.245	TRUE	FALSE	N/A	B		
291.0	36.909	N/A	40	N/A	N/A	N/A	N/A	0.894	0	0	0.245	TRUE	FALSE	N/A	B		
290.8	37.073	N/A	40	N/A	N/A	N/A	N/A	0.893	0	0	0.245	TRUE	FALSE	N/A	C		
290.7	37.237	N/A	41	N/A	N/A	N/A	N/A	0.893	0	0	0.245	TRUE	FALSE	N/A	C		
290.5	37.401	N/A	39	N/A	N/A	N/A	N/A	0.892	0	0	0.245	TRUE	FALSE	N/A	C		
290.3	37.565	N/A	38	N/A	N/A	N/A	N/A	0.891	0	0	0.245	TRUE	FALSE	N/A	C		
290.2	37.729	N/A	38	N/A	N/A	N/A	N/A	0.891	0	0	0.245	TRUE	FALSE	N/A	C		
290.0	37.893	N/A	38	N/A	N/A	N/A	N/A	0.890	0	0	0.245	TRUE	FALSE	N/A	C		
289.8	38.057	N/A	38	N/A	N/A	N/A	N/A	0.889	0	0	0.245	TRUE	FALSE	N/A	C		
289.7	38.221	N/A	38	N/A	N/A	N/A	N/A	0.889	0	0	0.244	TRUE	FALSE	N/A	C		
289.5	38.385	N/A	38	N/A	N/A	N/A	N/A	0.888	0	0	0.244	TRUE	FALSE	N/A	C		
289.4	38.549	N/A	39	N/A	N/A	N/A	N/A	0.887	0	0	0.244	TRUE	FALSE	N/A	C		
289.2	38.713	N/A	39	N/A	N/A	N/A	N/A	0.887	0	0	0.244	TRUE	FALSE	N/A	C		
289.0	38.877	N/A	38	N/A	N/A	N/A	N/A	0.886	0	0	0.244	TRUE	FALSE	N/A	C		
288.9	39.042	N/A	39	N/A	N/A	N/A	N/A	0.885	0	0	0.244	TRUE	FALSE	N/A	C		
288.7	39.206	N/A	39	N/A	N/A	N/A	N/A	0.885	0	0	0.244	TRUE	FALSE	N/A	C		
288.5	39.370	N/A	38	N/A	N/A	N/A	N/A	0.884	0	0	0.244	TRUE	FALSE	N/A	C		
288.4	39.534	N/A	38	N/A	N/A	N/A	N/A	0.883	0	0	0.244	TRUE	FALSE	N/A	C		
288.2	39.698	N/A	38	N/A	N/A	N/A	N/A	0.883	0	0	0.244	TRUE	FALSE	N/A	C		
288.0	39.862	N/A	38	N/A	N/A	N/A	N/A	0.882	0	0	0.244	TRUE	FALSE	N/A	C		
287.9	40.026	N/A	38	N/A	N/A	N/A	N/A	0.881	0	0	0.244	TRUE	FALSE	N/A	C		
287.7	40.190	N/A	39	N/A	N/A	N/A	N/A	0.881	0	0	0.243	TRUE	FALSE	N/A	C		
287.5	40.354	N/A	39	N/A	N/A	N/A	N/A	0.880	0	0	0.243	TRUE	FALSE	N/A	C		
287.4	40.518	N/A	39	N/A	N/A	N/A	N/A	0.879	0	0	0.243	TRUE	FALSE	N/A	C		
287.2	40.682	N/A	40	N/A	N/A	N/A	N/A	0.879	0	0	0.243	TRUE	FALSE	N/A	C		
287.1	40.846	N/A	39	N/A	N/A	N/A	N/A	0.878	0	0	0.243	TRUE	FALSE	N/A	C		
286.9	41.010	N/A	38	N/A	N/A	N/A	N/A	0.877	0	0	0.243	TRUE	FALSE	N/A	C		
286.7	41.174	N/A	38	N/A	N/A	N/A	N/A	0.877	0	0	0.243	TRUE	FALSE	N/A	C		
286.6	41.338	N/A	38	N/A	N/A	N/A	N/A	0.876	0	0	0.243	TRUE	FALSE	N/A	C		
286.4	41.502	N/A	39	N/A	N/A	N/A	N/A	0.875	0	0	0.243	TRUE	FALSE	N/A	C		
286.2	41.666	N/A	39	N/A	N/A	N/A	N/A	0.875	0	0	0.243	TRUE	FALSE	N/A	C		
286.1	41.830	N/A	39	N/A	N/A	N/A	N/A	0.874	0	0	0.242	TRUE	FALSE	N/A	C		
285.9	41.994	N/A	43	N/A	N/A	N/A	N/A	0.873	0	0	0.242	TRUE	FALSE	N/A	C		
285.7	42.158	N/A	41	N/A	N/A	N/A	N/A	0.873	0	0	0.242	TRUE	FALSE	N/A	C		
285.6	42.322	N/A	39	N/A	N/A	N/A	N/A	0.872	0	0	0.242	TRUE	FALSE	N/A	C		
285.4	42.486	N/A	38	N/A	N/A	N/A	N/A	0.871	0	0	0.242	TRUE	FALSE	N/A	C		
285.2	42.650	N/A	39	N/A	N/A	N/A	N/A	0.871	0	0	0.242	TRUE	FALSE	N/A	C		
285.1	42.814	0.130	52	0.976	1.083	0.99	0.135	0.870	0	0	0.242	FALSE	FALSE	N/A	A1		
284.9	42.978	N/A	47	N/A	N/A	N/A	N/A	0.869	0	0	0.242	TRUE	FALSE	N/A	B		
284.8	43.143	N/A	41	N/A	N/A	N/A	N/A	0.869	0	0	0.242	TRUE	FALSE	N/A	B		
284.6	43.307	N/A	41	N/A	N/A	N/A	N/A	0.868	0	0	0.241	TRUE	FALSE	N/A	C		

Elev. z (ft)	Depth z (ft)	Cyclic Resistance Ratio CRR _{7.5}	Relative Density D _r (%)	Correction for Overburden Pressure		K _σ	Sloping Ground K _σ	Correction for Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., t _d	From Ground Response			Cyclic Shear Stress τ _{Max} (psf)	Cyclic Ratio CSR	Sample Screened for:			Factor of Safety FS _{liq}	Material (optional)	Soil Type (see note on following chart)
				K _σ	K _σ						Maximum Induced Shear Stress τ _{Max} (psf)	Average Cyclic Shear Stress τ _{Avg} (psf)	Clay-like (qc ₃₀) _{cs} ≥ 175			High Tip Res.	Unsaturated				
284.4	43.471	N/A	40	N/A	N/A	N/A	N/A	N/A	N/A	0.867	0	0	0	0.241	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
284.3	43.635	N/A	40	N/A	N/A	N/A	N/A	N/A	N/A	0.867	0	0	0	0.241	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
284.1	43.799	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.866	0	0	0	0.241	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
283.9	43.963	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.865	0	0	0	0.241	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
283.8	44.127	N/A	40	N/A	N/A	N/A	N/A	N/A	N/A	0.865	0	0	0	0.241	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
283.6	44.291	N/A	41	N/A	N/A	N/A	N/A	N/A	N/A	0.864	0	0	0	0.241	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
283.4	44.455	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.863	0	0	0	0.241	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
283.3	44.619	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.863	0	0	0	0.241	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
283.1	44.783	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.862	0	0	0	0.240	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
283.0	44.947	N/A	40	N/A	N/A	N/A	N/A	N/A	N/A	0.861	0	0	0	0.240	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
282.8	45.111	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.861	0	0	0	0.240	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
282.6	45.275	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.860	0	0	0	0.240	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
282.5	45.439	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.859	0	0	0	0.240	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
282.3	45.603	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.859	0	0	0	0.240	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
282.1	45.767	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.858	0	0	0	0.240	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
282.0	45.931	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.857	0	0	0	0.240	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
281.8	46.095	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.857	0	0	0	0.239	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
281.6	46.259	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.856	0	0	0	0.239	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
281.5	46.423	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.855	0	0	0	0.239	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
281.3	46.587	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.855	0	0	0	0.239	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
281.1	46.751	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.854	0	0	0	0.239	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
281.0	46.915	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.853	0	0	0	0.239	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
280.8	47.079	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.853	0	0	0	0.239	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
280.7	47.244	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.852	0	0	0	0.239	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
280.5	47.408	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.851	0	0	0	0.238	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
280.3	47.572	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.851	0	0	0	0.238	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
280.2	47.736	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.850	0	0	0	0.238	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
280.0	47.900	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.849	0	0	0	0.238	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
279.8	48.064	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.849	0	0	0	0.238	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
279.7	48.228	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.848	0	0	0	0.238	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
279.5	48.392	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.847	0	0	0	0.238	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
279.3	48.556	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.847	0	0	0	0.238	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
279.2	48.720	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.846	0	0	0	0.237	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
279.0	48.884	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.845	0	0	0	0.237	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
278.9	49.048	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.844	0	0	0	0.237	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
278.7	49.212	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.844	0	0	0	0.237	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
278.5	49.376	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.843	0	0	0	0.237	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
278.4	49.540	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.842	0	0	0	0.237	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
278.2	49.704	N/A	41	N/A	N/A	N/A	N/A	N/A	N/A	0.842	0	0	0	0.237	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
278.0	49.868	0.134	54	0.960	1.126	0.98	0.142	0.841	0	0	0	0	0.237	FALSE	FALSE	FALSE	N/A	N/A	N/A	A1	
277.9	50.032	0.180	64	0.951	1.687	0.97	0.282	0.840	0	0	0	0	0.236	FALSE	FALSE	FALSE	N/A	N/A	N/A	A1	
277.7	50.196	N/A	52	N/A	N/A	N/A	N/A	0.840	0	0	0	0	0.236	TRUE	FALSE	FALSE	N/A	N/A	N/A	B	
277.5	50.360	N/A	44	N/A	N/A	N/A	N/A	0.839	0	0	0	0	0.236	TRUE	FALSE	FALSE	N/A	N/A	N/A	B	
277.4	50.524	N/A	40	N/A	N/A	N/A	N/A	0.838	0	0	0	0	0.236	TRUE	FALSE	FALSE	N/A	N/A	N/A	B	
277.2	50.688	N/A	40	N/A	N/A	N/A	N/A	0.838	0	0	0	0	0.236	TRUE	FALSE	FALSE	N/A	N/A	N/A	C	
277.0	50.852	N/A	40	N/A	N/A	N/A	N/A	0.837	0	0	0	0	0.236	TRUE	FALSE	FALSE	N/A	N/A	N/A	C	
276.9	51.016	N/A	39	N/A	N/A	N/A	N/A	0.836	0	0	0	0	0.236	TRUE	FALSE	FALSE	N/A	N/A	N/A	C	
276.7	51.180	N/A	39	N/A	N/A	N/A	N/A	0.836	0	0	0	0	0.235	TRUE	FALSE	FALSE	N/A	N/A	N/A	C	
276.6	51.345	N/A	39	N/A	N/A	N/A	N/A	0.835	0	0	0	0	0.235	TRUE	FALSE	FALSE	N/A	N/A	N/A	C	
276.4	51.509	N/A	39	N/A	N/A	N/A	N/A	0.834	0	0	0	0	0.235	TRUE	FALSE	FALSE	N/A	N/A	N/A	C	
276.2	51.673	N/A	39	N/A	N/A	N/A	N/A	0.834	0	0	0	0	0.235	TRUE	FALSE	FALSE	N/A	N/A	N/A	C	
276.1	51.837	N/A	39	N/A	N/A	N/A	N/A	0.833	0	0	0	0	0.235	TRUE	FALSE	FALSE	N/A	N/A	N/A	C	
275.9	52.001	N/A	39	N/A	N/A	N/A	N/A	0.832	0	0	0	0	0.235	TRUE	FALSE	FALSE	N/A	N/A	N/A	C	
275.7	52.165	N/A	39	N/A	N/A	N/A	N/A	0.832	0	0	0	0	0.235	TRUE	FALSE	FALSE	N/A	N/A	N/A	C	
275.6	52.329	N/A	41	N/A	N/A	N/A	N/A	0.831	0	0	0	0	0.234	TRUE	FALSE	FALSE	N/A	N/A	N/A	C	

Front Ground Response										Sample Screened for:					Factor of Safety		Material (optional)	Soil Type (see note on following chart)
Elev. (ft)	Depth z	Cyclic Resistance Ratio $CRR_{7.5}$	Relative Density D_r	Correction for		Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., I_d	Shear Stress τ_{max}	Maximum Induced Shear Stress τ_{Avg}	Cyclic Shear Stress Ratio CSR	High Tip Res. $(q_{c30}) \geq 175$		FS_{1q}				
				Overburden Pressure K_o	Sloping Ground K_α							Clay-like	Unsaturated					
275.4	52.493	N/A	45	N/A	N/A	N/A	N/A	0.830	0	0	0.234	TRUE	FALSE	FALSE	N/A	N/A	C	
275.2	52.657	N/A	43	N/A	N/A	N/A	N/A	0.830	0	0	0.234	TRUE	FALSE	FALSE	N/A	N/A	C	
275.1	52.821	N/A	41	N/A	N/A	N/A	N/A	0.829	0	0	0.234	TRUE	FALSE	FALSE	N/A	N/A	C	
274.9	52.985	N/A	41	N/A	N/A	N/A	N/A	0.828	0	0	0.234	TRUE	FALSE	FALSE	N/A	N/A	C	
274.8	53.149	N/A	39	N/A	N/A	N/A	N/A	0.828	0	0	0.234	TRUE	FALSE	FALSE	N/A	N/A	C	
274.6	53.313	N/A	40	N/A	N/A	N/A	N/A	0.827	0	0	0.234	TRUE	FALSE	FALSE	N/A	N/A	C	
274.4	53.477	N/A	39	N/A	N/A	N/A	N/A	0.826	0	0	0.233	TRUE	FALSE	FALSE	N/A	N/A	C	
274.3	53.641	N/A	39	N/A	N/A	N/A	N/A	0.825	0	0	0.233	TRUE	FALSE	FALSE	N/A	N/A	C	
274.1	53.805	N/A	39	N/A	N/A	N/A	N/A	0.825	0	0	0.233	TRUE	FALSE	FALSE	N/A	N/A	C	
273.9	53.969	N/A	40	N/A	N/A	N/A	N/A	0.824	0	0	0.233	TRUE	FALSE	FALSE	N/A	N/A	C	
273.8	54.133	0.131	53	0.953	1.078	0.98	0.133	0.823	0	0	0.233	FALSE	FALSE	FALSE	0.6	N/A	B	
273.6	54.297	N/A	46	N/A	N/A	N/A	N/A	0.823	0	0	0.233	TRUE	FALSE	FALSE	N/A	N/A	A1	
273.4	54.461	N/A	41	N/A	N/A	N/A	N/A	0.822	0	0	0.233	TRUE	FALSE	FALSE	N/A	N/A	B	
273.3	54.625	N/A	41	N/A	N/A	N/A	N/A	0.821	0	0	0.232	TRUE	FALSE	FALSE	N/A	N/A	B	
273.1	54.789	N/A	40	N/A	N/A	N/A	N/A	0.821	0	0	0.232	TRUE	FALSE	FALSE	N/A	N/A	C	
272.9	54.953	N/A	40	N/A	N/A	N/A	N/A	0.820	0	0	0.232	TRUE	FALSE	FALSE	N/A	N/A	C	
272.8	55.117	N/A	40	N/A	N/A	N/A	N/A	0.819	0	0	0.232	TRUE	FALSE	FALSE	N/A	N/A	C	
272.6	55.281	N/A	39	N/A	N/A	N/A	N/A	0.819	0	0	0.232	TRUE	FALSE	FALSE	N/A	N/A	C	
272.5	55.446	N/A	39	N/A	N/A	N/A	N/A	0.818	0	0	0.232	TRUE	FALSE	FALSE	N/A	N/A	C	
272.3	55.610	N/A	39	N/A	N/A	N/A	N/A	0.817	0	0	0.232	TRUE	FALSE	FALSE	N/A	N/A	C	
272.1	55.774	N/A	40	N/A	N/A	N/A	N/A	0.817	0	0	0.231	TRUE	FALSE	FALSE	N/A	N/A	C	
272.0	55.938	N/A	40	N/A	N/A	N/A	N/A	0.816	0	0	0.231	TRUE	FALSE	FALSE	N/A	N/A	C	
271.8	56.102	N/A	40	N/A	N/A	N/A	N/A	0.815	0	0	0.231	TRUE	FALSE	FALSE	N/A	N/A	C	
271.6	56.266	N/A	40	N/A	N/A	N/A	N/A	0.815	0	0	0.231	TRUE	FALSE	FALSE	N/A	N/A	C	
271.5	56.430	N/A	40	N/A	N/A	N/A	N/A	0.814	0	0	0.231	TRUE	FALSE	FALSE	N/A	N/A	C	
271.3	56.594	N/A	40	N/A	N/A	N/A	N/A	0.813	0	0	0.231	TRUE	FALSE	FALSE	N/A	N/A	C	
271.1	56.758	N/A	40	N/A	N/A	N/A	N/A	0.813	0	0	0.231	TRUE	FALSE	FALSE	N/A	N/A	C	
271.0	56.922	N/A	40	N/A	N/A	N/A	N/A	0.812	0	0	0.230	TRUE	FALSE	FALSE	N/A	N/A	C	
270.8	57.086	N/A	40	N/A	N/A	N/A	N/A	0.811	0	0	0.230	TRUE	FALSE	FALSE	N/A	N/A	C	
270.7	57.250	N/A	40	N/A	N/A	N/A	N/A	0.811	0	0	0.230	TRUE	FALSE	FALSE	N/A	N/A	C	
270.5	57.414	N/A	40	N/A	N/A	N/A	N/A	0.810	0	0	0.230	TRUE	FALSE	FALSE	N/A	N/A	C	
270.3	57.578	N/A	40	N/A	N/A	N/A	N/A	0.809	0	0	0.230	TRUE	FALSE	FALSE	N/A	N/A	C	
270.2	57.742	N/A	40	N/A	N/A	N/A	N/A	0.809	0	0	0.230	TRUE	FALSE	FALSE	N/A	N/A	C	
270.0	57.906	N/A	40	N/A	N/A	N/A	N/A	0.808	0	0	0.230	TRUE	FALSE	FALSE	N/A	N/A	C	
269.8	58.070	N/A	40	N/A	N/A	N/A	N/A	0.807	0	0	0.229	TRUE	FALSE	FALSE	N/A	N/A	C	
269.7	58.234	N/A	40	N/A	N/A	N/A	N/A	0.807	0	0	0.229	TRUE	FALSE	FALSE	N/A	N/A	C	
269.5	58.398	N/A	40	N/A	N/A	N/A	N/A	0.806	0	0	0.229	TRUE	FALSE	FALSE	N/A	N/A	C	
269.3	58.562	N/A	39	N/A	N/A	N/A	N/A	0.805	0	0	0.229	TRUE	FALSE	FALSE	N/A	N/A	C	
269.2	58.726	N/A	39	N/A	N/A	N/A	N/A	0.805	0	0	0.229	TRUE	FALSE	FALSE	N/A	N/A	C	
269.0	58.890	N/A	40	N/A	N/A	N/A	N/A	0.804	0	0	0.229	TRUE	FALSE	FALSE	N/A	N/A	C	
268.8	59.054	N/A	40	N/A	N/A	N/A	N/A	0.803	0	0	0.228	TRUE	FALSE	FALSE	N/A	N/A	C	
268.7	59.218	N/A	53	N/A	N/A	N/A	N/A	0.803	0	0	0.228	TRUE	FALSE	FALSE	N/A	N/A	B	
268.5	59.382	N/A	52	N/A	N/A	N/A	N/A	0.802	0	0	0.228	TRUE	FALSE	FALSE	N/A	N/A	A1	
268.4	59.547	N/A	44	N/A	N/A	N/A	N/A	0.801	0	0	0.228	TRUE	FALSE	FALSE	N/A	N/A	B	
268.2	59.711	N/A	42	N/A	N/A	N/A	N/A	0.801	0	0	0.228	TRUE	FALSE	FALSE	N/A	N/A	B	
268.0	59.875	N/A	41	N/A	N/A	N/A	N/A	0.800	0	0	0.228	TRUE	FALSE	FALSE	N/A	N/A	C	
267.9	60.039	N/A	41	N/A	N/A	N/A	N/A	0.799	0	0	0.228	TRUE	FALSE	FALSE	N/A	N/A	C	
267.7	60.203	N/A	41	N/A	N/A	N/A	N/A	0.799	0	0	0.227	TRUE	FALSE	FALSE	N/A	N/A	C	
267.5	60.367	N/A	40	N/A	N/A	N/A	N/A	0.798	0	0	0.227	TRUE	FALSE	FALSE	N/A	N/A	C	
267.4	60.531	N/A	41	N/A	N/A	N/A	N/A	0.797	0	0	0.227	TRUE	FALSE	FALSE	N/A	N/A	C	
267.2	60.695	N/A	40	N/A	N/A	N/A	N/A	0.797	0	0	0.227	TRUE	FALSE	FALSE	N/A	N/A	C	
267.0	60.859	N/A	39	N/A	N/A	N/A	N/A	0.796	0	0	0.227	TRUE	FALSE	FALSE	N/A	N/A	C	
266.9	61.023	N/A	39	N/A	N/A	N/A	N/A	0.795	0	0	0.227	TRUE	FALSE	FALSE	N/A	N/A	C	
266.7	61.187	N/A	39	N/A	N/A	N/A	N/A	0.795	0	0	0.226	TRUE	FALSE	FALSE	N/A	N/A	C	
266.5	61.351	N/A	41	N/A	N/A	N/A	N/A	0.794	0	0	0.226	TRUE	FALSE	FALSE	N/A	N/A	C	

Elev. (ft)	Depth z (ft)	Cyclic Resistance Ratio $CRR_{7.5}$	Relative Density D_r	Correction for		Cyclic Resistance Ratio CRR	Stress Reduction Coeff., r_d	From Ground Response			Sample Screened for:			Factor of Safety FS_{liq}	Material (optional)	Soil Type (see note on following chart)	
				Overburden Pressure K_o	Sloping Ground K_σ			Magnitude Scaling Factor MSF	Maximum Induced Shear Stress τ_{max} (psf)	Average Cyclic Shear Stress τ_{Avg} (psf)	Cyclic Stress Ratio CSR	Clay-like ($qc_{30}/cs \geq 175$)	High Tip Res.				Unsaturation
266.4	61.515	N/A	39	N/A	N/A	N/A	0.793	0	0	0.226	TRUE	FALSE	FALSE	N/A	N/A	C	
266.2	61.679	N/A	39	N/A	N/A	N/A	0.793	0	0	0.226	TRUE	FALSE	FALSE	N/A	N/A	C	
266.1	61.843	N/A	39	N/A	N/A	N/A	0.792	0	0	0.226	TRUE	FALSE	FALSE	N/A	N/A	C	
265.9	62.007	N/A	39	N/A	N/A	N/A	0.791	0	0	0.226	TRUE	FALSE	FALSE	N/A	N/A	C	
265.7	62.171	N/A	39	N/A	N/A	N/A	0.791	0	0	0.226	TRUE	FALSE	FALSE	N/A	N/A	C	
265.6	62.335	N/A	39	N/A	N/A	N/A	0.790	0	0	0.225	TRUE	FALSE	FALSE	N/A	N/A	C	
265.4	62.499	N/A	39	N/A	N/A	N/A	0.789	0	0	0.225	TRUE	FALSE	FALSE	N/A	N/A	C	
265.2	62.663	N/A	39	N/A	N/A	N/A	0.789	0	0	0.225	TRUE	FALSE	FALSE	N/A	N/A	C	
265.1	62.827	N/A	39	N/A	N/A	N/A	0.788	0	0	0.225	TRUE	FALSE	FALSE	N/A	N/A	C	
264.9	62.991	N/A	39	N/A	N/A	N/A	0.787	0	0	0.225	TRUE	FALSE	FALSE	N/A	N/A	C	
264.7	63.155	N/A	39	N/A	N/A	N/A	0.787	0	0	0.225	TRUE	FALSE	FALSE	N/A	N/A	C	
264.6	63.319	N/A	39	N/A	N/A	N/A	0.786	0	0	0.225	TRUE	FALSE	FALSE	N/A	N/A	C	
264.4	63.483	N/A	39	N/A	N/A	N/A	0.785	0	0	0.224	TRUE	FALSE	FALSE	N/A	N/A	C	
264.3	63.648	N/A	39	N/A	N/A	N/A	0.785	0	0	0.224	TRUE	FALSE	FALSE	N/A	N/A	C	
264.1	63.812	N/A	39	N/A	N/A	N/A	0.784	0	0	0.224	TRUE	FALSE	FALSE	N/A	N/A	C	
263.9	63.976	N/A	38	N/A	N/A	N/A	0.783	0	0	0.224	TRUE	FALSE	FALSE	N/A	N/A	C	
263.8	64.140	N/A	38	N/A	N/A	N/A	0.783	0	0	0.224	TRUE	FALSE	FALSE	N/A	N/A	C	
263.6	64.304	N/A	39	N/A	N/A	N/A	0.782	0	0	0.224	TRUE	FALSE	FALSE	N/A	N/A	C	
263.4	64.468	N/A	39	N/A	N/A	N/A	0.782	0	0	0.223	TRUE	FALSE	FALSE	N/A	N/A	C	
263.3	64.632	N/A	39	N/A	N/A	N/A	0.781	0	0	0.223	TRUE	FALSE	FALSE	N/A	N/A	C	
263.1	64.796	N/A	39	N/A	N/A	N/A	0.780	0	0	0.223	TRUE	FALSE	FALSE	N/A	N/A	C	
262.9	64.960	N/A	39	N/A	N/A	N/A	0.780	0	0	0.223	TRUE	FALSE	FALSE	N/A	N/A	C	
262.8	65.124	N/A	39	N/A	N/A	N/A	0.779	0	0	0.223	TRUE	FALSE	FALSE	N/A	N/A	C	
262.6	65.288	N/A	39	N/A	N/A	N/A	0.778	0	0	0.223	TRUE	FALSE	FALSE	N/A	N/A	C	
262.4	65.452	N/A	39	N/A	N/A	N/A	0.778	0	0	0.223	TRUE	FALSE	FALSE	N/A	N/A	C	
262.3	65.616	N/A	38	N/A	N/A	N/A	0.777	0	0	0.222	TRUE	FALSE	FALSE	N/A	N/A	C	
262.1	65.780	N/A	39	N/A	N/A	N/A	0.776	0	0	0.222	TRUE	FALSE	FALSE	N/A	N/A	C	
262.0	65.944	N/A	39	N/A	N/A	N/A	0.776	0	0	0.222	TRUE	FALSE	FALSE	N/A	N/A	C	
261.8	66.108	N/A	39	N/A	N/A	N/A	0.775	0	0	0.222	TRUE	FALSE	FALSE	N/A	N/A	C	
261.6	66.272	N/A	39	N/A	N/A	N/A	0.774	0	0	0.222	TRUE	FALSE	FALSE	N/A	N/A	C	
261.5	66.436	N/A	39	N/A	N/A	N/A	0.774	0	0	0.222	TRUE	FALSE	FALSE	N/A	N/A	C	
261.3	66.600	N/A	39	N/A	N/A	N/A	0.773	0	0	0.221	TRUE	FALSE	FALSE	N/A	N/A	C	
261.1	66.764	N/A	39	N/A	N/A	N/A	0.773	0	0	0.221	TRUE	FALSE	FALSE	N/A	N/A	C	
261.0	66.928	N/A	39	N/A	N/A	N/A	0.772	0	0	0.221	TRUE	FALSE	FALSE	N/A	N/A	C	
260.8	67.092	N/A	39	N/A	N/A	N/A	0.771	0	0	0.221	TRUE	FALSE	FALSE	N/A	N/A	C	
260.6	67.256	N/A	39	N/A	N/A	N/A	0.771	0	0	0.221	TRUE	FALSE	FALSE	N/A	N/A	C	
260.5	67.420	N/A	39	N/A	N/A	N/A	0.770	0	0	0.221	TRUE	FALSE	FALSE	N/A	N/A	C	
260.3	67.584	N/A	38	N/A	N/A	N/A	0.769	0	0	0.221	TRUE	FALSE	FALSE	N/A	N/A	C	
260.2	67.749	N/A	38	N/A	N/A	N/A	0.769	0	0	0.220	TRUE	FALSE	FALSE	N/A	N/A	C	
260.0	67.913	N/A	38	N/A	N/A	N/A	0.768	0	0	0.220	TRUE	FALSE	FALSE	N/A	N/A	C	
259.8	68.077	N/A	39	N/A	N/A	N/A	0.767	0	0	0.220	TRUE	FALSE	FALSE	N/A	N/A	C	
259.7	68.241	N/A	39	N/A	N/A	N/A	0.767	0	0	0.220	TRUE	FALSE	FALSE	N/A	N/A	C	
259.5	68.405	N/A	39	N/A	N/A	N/A	0.766	0	0	0.220	TRUE	FALSE	FALSE	N/A	N/A	C	
259.3	68.569	N/A	39	N/A	N/A	N/A	0.766	0	0	0.220	TRUE	FALSE	FALSE	N/A	N/A	C	
259.2	68.733	N/A	39	N/A	N/A	N/A	0.765	0	0	0.219	TRUE	FALSE	FALSE	N/A	N/A	C	
259.0	68.897	N/A	39	N/A	N/A	N/A	0.764	0	0	0.219	TRUE	FALSE	FALSE	N/A	N/A	C	
258.8	69.061	N/A	39	N/A	N/A	N/A	0.764	0	0	0.219	TRUE	FALSE	FALSE	N/A	N/A	C	
258.7	69.225	N/A	39	N/A	N/A	N/A	0.763	0	0	0.219	TRUE	FALSE	FALSE	N/A	N/A	C	
258.5	69.389	N/A	39	N/A	N/A	N/A	0.762	0	0	0.219	TRUE	FALSE	FALSE	N/A	N/A	C	
258.3	69.553	N/A	39	N/A	N/A	N/A	0.762	0	0	0.219	TRUE	FALSE	FALSE	N/A	N/A	C	
258.2	69.717	N/A	39	N/A	N/A	N/A	0.761	0	0	0.219	TRUE	FALSE	FALSE	N/A	N/A	C	
258.0	69.881	N/A	39	N/A	N/A	N/A	0.760	0	0	0.218	TRUE	FALSE	FALSE	N/A	N/A	C	
257.9	70.045	N/A	39	N/A	N/A	N/A	0.760	0	0	0.218	TRUE	FALSE	FALSE	N/A	N/A	C	
257.7	70.209	N/A	39	N/A	N/A	N/A	0.759	0	0	0.218	TRUE	FALSE	FALSE	N/A	N/A	C	
257.5	70.373	N/A	40	N/A	N/A	N/A	0.759	0	0	0.218	TRUE	FALSE	FALSE	N/A	N/A	C	

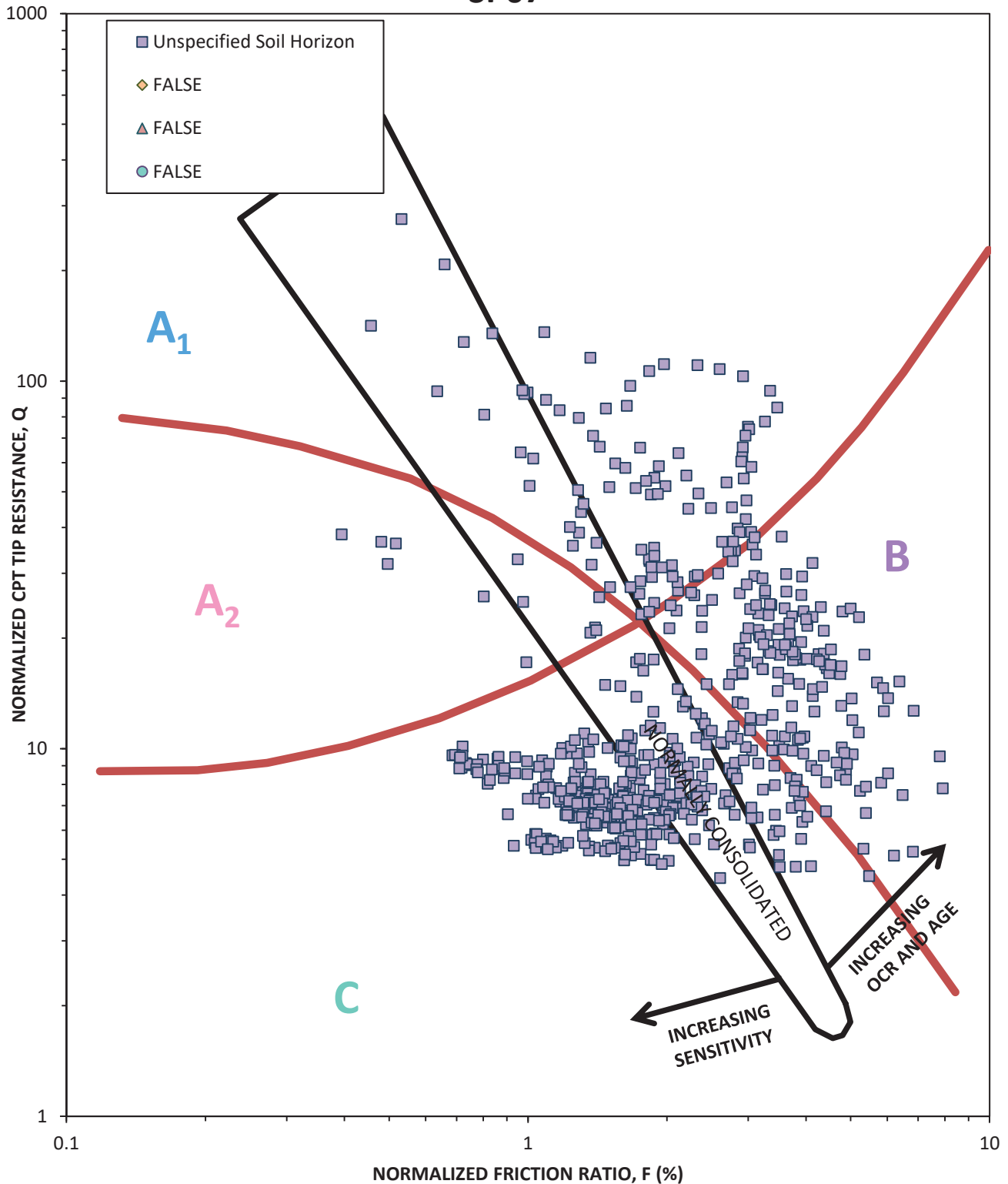
Front Ground Response										Sample Screened for:					Factor of Safety		Soil Type (see note on following chart)
Elev. (ft)	Depth z	Cyclic Resistance Ratio CRR _{7.5}	Relative Density D _r	Correction for		Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., I _d	Shear Stress τ _{max}	Cyclic Shear Stress τ _{avg}	Cyclic Stress Ratio CSR	High Tip Res.		FS _{liq}			
				Overburden Pressure K _o	Sloping Ground K _α							Clay-like (q _{c30}) ≥ 175	Unsaturated				
248.3	79.559	N/A	61	N/A	N/A	N/A	N/A	0.725	0	0	0.210	TRUE	FALSE	FALSE	N/A	N/A	A1
248.2	79.723	N/A	55	N/A	N/A	N/A	N/A	0.725	0	0	0.210	TRUE	FALSE	FALSE	N/A	N/A	B
248.0	79.887	N/A	43	N/A	N/A	N/A	N/A	0.724	0	0	0.209	TRUE	FALSE	FALSE	N/A	N/A	B
247.8	80.052	N/A	41	N/A	N/A	N/A	N/A	0.724	0	0	0.209	TRUE	FALSE	FALSE	N/A	N/A	B
247.7	80.216	N/A	43	N/A	N/A	N/A	N/A	0.723	0	0	0.209	TRUE	FALSE	FALSE	N/A	N/A	C
247.5	80.380	0.124	50	0.919	0.911	0.99	0.103	0.723	0	0	0.209	FALSE	FALSE	FALSE	0.5	N/A	A2
247.4	80.544	0.157	60	0.902	1.357	0.98	0.188	0.722	0	0	0.209	FALSE	FALSE	FALSE	0.9	N/A	A1
247.2	80.708	0.183	65	0.892	1.607	0.97	0.255	0.722	0	0	0.209	FALSE	FALSE	FALSE	1.2	N/A	A1
247.0	80.872	N/A	60	N/A	N/A	N/A	N/A	0.721	0	0	0.209	TRUE	FALSE	FALSE	N/A	N/A	A1
246.9	81.036	N/A	53	N/A	N/A	N/A	N/A	0.720	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	B
246.7	81.200	N/A	50	N/A	N/A	N/A	N/A	0.720	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	B
246.5	81.364	0.139	56	0.909	1.131	0.98	0.141	0.719	0	0	0.208	TRUE	FALSE	FALSE	0.7	N/A	A1
246.4	81.528	N/A	52	N/A	N/A	N/A	N/A	0.719	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	B
246.2	81.692	N/A	50	N/A	N/A	N/A	N/A	0.718	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	B
246.0	81.856	N/A	52	N/A	N/A	N/A	N/A	0.718	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	B
245.9	82.020	N/A	53	N/A	N/A	N/A	N/A	0.717	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	B
245.7	82.184	N/A	47	N/A	N/A	N/A	N/A	0.717	0	0	0.207	TRUE	FALSE	FALSE	N/A	N/A	B
245.6	82.348	N/A	42	N/A	N/A	N/A	N/A	0.716	0	0	0.207	TRUE	FALSE	FALSE	N/A	N/A	B
245.4	82.512	0.159	61	0.898	1.371	0.98	0.191	0.716	0	0	0.207	FALSE	FALSE	FALSE	0.9	N/A	A1
245.2	82.676	0.199	67	0.884	1.721	0.97	0.293	0.715	0	0	0.207	FALSE	FALSE	FALSE	1.4	N/A	A1
245.1	82.840	N/A	54	N/A	N/A	N/A	N/A	0.715	0	0	0.207	TRUE	FALSE	FALSE	N/A	N/A	B
244.9	83.004	N/A	48	N/A	N/A	N/A	N/A	0.714	0	0	0.207	TRUE	FALSE	FALSE	N/A	N/A	B
244.7	83.168	N/A	57	N/A	N/A	N/A	N/A	0.713	0	0	0.207	TRUE	FALSE	FALSE	N/A	N/A	B
244.6	83.332	N/A	52	N/A	N/A	N/A	N/A	0.713	0	0	0.206	TRUE	FALSE	FALSE	N/A	N/A	B
244.4	83.496	N/A	56	N/A	N/A	N/A	N/A	0.712	0	0	0.206	TRUE	FALSE	FALSE	N/A	N/A	B
244.2	83.660	0.203	67	0.881	1.753	0.97	0.304	0.712	0	0	0.206	FALSE	FALSE	FALSE	1.5	N/A	A1
244.1	83.824	0.199	67	0.882	1.718	0.97	0.292	0.711	0	0	0.206	FALSE	FALSE	FALSE	1.4	N/A	A1
243.9	83.988	N/A	55	N/A	N/A	N/A	N/A	0.711	0	0	0.206	TRUE	FALSE	FALSE	N/A	N/A	B
243.7	84.153	N/A	46	N/A	N/A	N/A	N/A	0.710	0	0	0.206	TRUE	FALSE	FALSE	N/A	N/A	B
243.6	84.317	N/A	52	N/A	N/A	N/A	N/A	0.710	0	0	0.206	TRUE	FALSE	FALSE	N/A	N/A	B
243.4	84.481	N/A	56	N/A	N/A	N/A	N/A	0.709	0	0	0.206	TRUE	FALSE	FALSE	N/A	N/A	B
243.3	84.645	N/A	51	N/A	N/A	N/A	N/A	0.709	0	0	0.205	TRUE	FALSE	FALSE	N/A	N/A	B
243.1	84.809	0.139	55	0.905	1.122	0.98	0.139	0.708	0	0	0.205	FALSE	FALSE	FALSE	0.7	N/A	A1
242.9	84.973	0.170	63	0.890	1.474	0.98	0.217	0.708	0	0	0.205	FALSE	FALSE	FALSE	1.1	N/A	A1
242.8	85.137	N/A	51	N/A	N/A	N/A	N/A	0.707	0	0	0.205	TRUE	FALSE	FALSE	N/A	N/A	B
242.6	85.301	N/A	46	N/A	N/A	N/A	N/A	0.707	0	0	0.205	TRUE	FALSE	FALSE	N/A	N/A	B
242.4	85.465	N/A	41	N/A	N/A	N/A	N/A	0.706	0	0	0.205	TRUE	FALSE	FALSE	N/A	N/A	B
242.3	85.629	N/A	44	N/A	N/A	N/A	N/A	0.706	0	0	0.205	TRUE	FALSE	FALSE	N/A	N/A	C
242.1	85.793	N/A	55	N/A	N/A	N/A	N/A	0.705	0	0	0.205	TRUE	FALSE	FALSE	N/A	N/A	A1
241.9	85.957	N/A	48	N/A	N/A	N/A	N/A	0.705	0	0	0.204	TRUE	FALSE	FALSE	N/A	N/A	B
241.8	86.121	N/A	52	N/A	N/A	N/A	N/A	0.704	0	0	0.204	TRUE	FALSE	FALSE	N/A	N/A	B
241.6	86.285	N/A	55	N/A	N/A	N/A	N/A	0.704	0	0	0.204	TRUE	FALSE	FALSE	N/A	N/A	A1
241.5	86.449	0.138	55	0.904	1.102	0.98	0.135	0.703	0	0	0.204	TRUE	FALSE	FALSE	0.7	N/A	A1
241.3	86.613	N/A	54	N/A	N/A	N/A	N/A	0.703	0	0	0.204	FALSE	FALSE	FALSE	0.6	N/A	B
241.1	86.777	0.136	55	0.904	1.081	0.98	0.131	0.702	0	0	0.204	FALSE	FALSE	FALSE	0.6	N/A	A1
241.0	86.941	0.133	53	0.906	1.031	0.98	0.122	0.702	0	0	0.204	FALSE	FALSE	FALSE	0.6	N/A	A1
240.8	87.105	N/A	54	N/A	N/A	N/A	N/A	0.701	0	0	0.203	TRUE	FALSE	FALSE	N/A	N/A	B
240.6	87.269	N/A	46	N/A	N/A	N/A	N/A	0.701	0	0	0.203	TRUE	FALSE	FALSE	N/A	N/A	B
240.5	87.433	N/A	44	N/A	N/A	N/A	N/A	0.700	0	0	0.203	TRUE	FALSE	FALSE	N/A	N/A	B
240.3	87.597	0.140	56	0.901	1.134	0.98	0.141	0.700	0	0	0.203	FALSE	FALSE	FALSE	0.7	N/A	A1
240.1	87.761	0.166	62	0.888	1.430	0.98	0.206	0.699	0	0	0.203	FALSE	FALSE	FALSE	1.0	N/A	A1
240.0	87.925	0.173	63	0.885	1.501	0.97	0.224	0.699	0	0	0.203	FALSE	FALSE	FALSE	1.1	N/A	A1
239.8	88.089	N/A	63	N/A	N/A	N/A	N/A	0.698	0	0	0.203	TRUE	FALSE	FALSE	N/A	N/A	B
239.6	88.254	N/A	49	N/A	N/A	N/A	N/A	0.698	0	0	0.203	TRUE	FALSE	FALSE	N/A	N/A	B
239.5	88.418	N/A	61	N/A	N/A	N/A	N/A	0.697	0	0	0.202	TRUE	FALSE	FALSE	N/A	N/A	A1

Elev. (ft)	Depth z (ft)	Cyclic Resistance Ratio $CRR_{7.5}$	Relative Density D_r	Correction for Overburden Pressure		Correction for Sloping Ground K_a	Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CHR	Stress Reduction Coeff., t_d	Front Ground Response		Cyclic Shear Stress τ_{Avg} (psf)	Sample Screened for:			Factor of Safety FS_{liq}	Material (optional)	Soil Type (see note on following chart)
				Cyclic Ratio $CRR_{7.5}$	Relative Density D_r					Cyclic Stress Ratio CSR	Clay-like $(qc_{30}) \geq 175$		High Tip Res. $(qc_{30}) \geq 175$	Unsaturated				
															Maximum Induced Shear Stress τ_{Max} (psf)			
239.3	88.582	0.275	72	0.855	2.114	0.96	0.476	0.697	0	0	0.202	FALSE	FALSE	FALSE	2.4	N/A	A1	
239.2	88.746	0.402	77	0.834	2.501	0.95	0.792	0.696	0	0	0.202	FALSE	FALSE	FALSE	3.9	N/A	A1	
239.0	88.910	0.210	68	0.871	1.782	0.97	0.315	0.696	0	0	0.202	FALSE	FALSE	FALSE	1.6	N/A	A1	
238.8	89.074	N/A	55	N/A	N/A	N/A	N/A	0.695	0	0	0.202	TRUE	FALSE	FALSE	N/A	N/A	B	
238.7	89.238	N/A	48	N/A	N/A	N/A	N/A	0.695	0	0	0.202	TRUE	FALSE	FALSE	N/A	N/A	B	
238.5	89.402	N/A	53	N/A	N/A	N/A	N/A	0.694	0	0	0.202	TRUE	FALSE	FALSE	N/A	N/A	B	
238.3	89.566	0.183	65	0.879	1.577	0.97	0.246	0.694	0	0	0.202	FALSE	FALSE	FALSE	1.2	N/A	A1	
238.2	89.730	0.219	69	0.867	1.837	0.97	0.337	0.693	0	0	0.201	FALSE	FALSE	FALSE	1.7	N/A	A1	
238.0	89.894	0.207	68	0.870	1.759	0.97	0.307	0.693	0	0	0.201	FALSE	FALSE	FALSE	1.5	N/A	A1	
237.8	90.058	0.194	66	0.874	1.666	0.97	0.274	0.692	0	0	0.201	FALSE	FALSE	FALSE	1.4	N/A	A1	
237.7	90.222	0.190	66	0.875	1.634	0.97	0.264	0.692	0	0	0.201	FALSE	FALSE	FALSE	1.3	N/A	A1	
237.5	90.386	0.190	66	0.875	1.636	0.97	0.264	0.692	0	0	0.201	FALSE	FALSE	FALSE	1.3	N/A	A1	
237.3	90.550	0.211	68	0.868	1.779	0.97	0.315	0.691	0	0	0.201	FALSE	FALSE	FALSE	1.6	N/A	A1	
237.2	90.714	0.170	63	0.882	1.465	0.98	0.215	0.691	0	0	0.201	FALSE	FALSE	FALSE	1.1	N/A	A1	
237.0	90.878	N/A	54	N/A	N/A	N/A	N/A	0.690	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	B	
236.9	91.042	N/A	48	N/A	N/A	N/A	N/A	0.690	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	B	
236.7	91.206	N/A	43	N/A	N/A	N/A	N/A	0.689	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	B	
236.5	91.370	N/A	41	N/A	N/A	N/A	N/A	0.689	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	C	
236.4	91.534	N/A	41	N/A	N/A	N/A	N/A	0.688	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	C	
236.2	91.698	N/A	46	N/A	N/A	N/A	N/A	0.688	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	C	
236.0	91.862	N/A	42	N/A	N/A	N/A	N/A	0.687	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	C	
235.9	92.026	N/A	40	N/A	N/A	N/A	N/A	0.687	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	C	
235.7	92.190	N/A	43	N/A	N/A	N/A	N/A	0.686	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	C	
235.5	92.355	N/A	48	N/A	N/A	N/A	N/A	0.686	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	C	
235.4	92.519	0.158	60	0.886	1.338	0.98	0.183	0.686	0	0	0.199	FALSE	FALSE	FALSE	0.9	N/A	A1	
235.2	92.683	0.190	66	0.872	1.628	0.97	0.262	0.685	0	0	0.199	FALSE	FALSE	FALSE	1.3	N/A	A1	
235.1	92.847	0.189	66	0.872	1.622	0.97	0.260	0.685	0	0	0.199	FALSE	FALSE	FALSE	1.3	N/A	A1	
234.9	93.011	N/A	57	N/A	N/A	N/A	N/A	0.684	0	0	0.199	TRUE	FALSE	FALSE	N/A	N/A	B	
234.7	93.175	N/A	48	N/A	N/A	N/A	N/A	0.684	0	0	0.199	TRUE	FALSE	FALSE	N/A	N/A	B	
234.6	93.339	N/A	45	N/A	N/A	N/A	N/A	0.683	0	0	0.199	TRUE	FALSE	FALSE	N/A	N/A	B	
234.4	93.503	N/A	44	N/A	N/A	N/A	N/A	0.683	0	0	0.199	TRUE	FALSE	FALSE	N/A	N/A	B	
234.2	93.667	N/A	49	N/A	N/A	N/A	N/A	0.683	0	0	0.199	TRUE	FALSE	FALSE	N/A	N/A	B	
234.1	93.831	N/A	42	N/A	N/A	N/A	N/A	0.682	0	0	0.199	TRUE	FALSE	FALSE	N/A	N/A	B	
233.9	93.995	N/A	40	N/A	N/A	N/A	N/A	0.682	0	0	0.198	TRUE	FALSE	FALSE	N/A	N/A	C	
233.7	94.159	N/A	42	N/A	N/A	N/A	N/A	0.681	0	0	0.198	TRUE	FALSE	FALSE	N/A	N/A	C	
233.6	94.323	N/A	42	N/A	N/A	N/A	N/A	0.681	0	0	0.198	TRUE	FALSE	FALSE	N/A	N/A	C	
233.4	94.487	N/A	39	N/A	N/A	N/A	N/A	0.680	0	0	0.198	TRUE	FALSE	FALSE	N/A	N/A	C	
233.2	94.651	N/A	43	N/A	N/A	N/A	N/A	0.680	0	0	0.198	TRUE	FALSE	FALSE	N/A	N/A	C	
233.1	94.815	N/A	42	N/A	N/A	N/A	N/A	0.680	0	0	0.198	TRUE	FALSE	FALSE	N/A	N/A	C	
232.9	94.979	N/A	42	N/A	N/A	N/A	N/A	0.679	0	0	0.198	TRUE	FALSE	FALSE	N/A	N/A	C	
232.8	95.143	N/A	40	N/A	N/A	N/A	N/A	0.679	0	0	0.198	TRUE	FALSE	FALSE	N/A	N/A	C	
232.6	95.307	N/A	42	N/A	N/A	N/A	N/A	0.678	0	0	0.198	TRUE	FALSE	FALSE	N/A	N/A	C	
232.4	95.471	N/A	49	N/A	N/A	N/A	N/A	0.678	0	0	0.197	TRUE	FALSE	FALSE	N/A	N/A	B	
232.3	95.635	N/A	43	N/A	N/A	N/A	N/A	0.677	0	0	0.197	TRUE	FALSE	FALSE	N/A	N/A	B	
232.1	95.799	N/A	39	N/A	N/A	N/A	N/A	0.677	0	0	0.197	TRUE	FALSE	FALSE	N/A	N/A	B	
231.9	95.963	N/A	39	N/A	N/A	N/A	N/A	0.677	0	0	0.197	TRUE	FALSE	FALSE	N/A	N/A	C	
231.8	96.127	N/A	39	N/A	N/A	N/A	N/A	0.676	0	0	0.197	TRUE	FALSE	FALSE	N/A	N/A	C	
231.6	96.291	N/A	39	N/A	N/A	N/A	N/A	0.676	0	0	0.197	TRUE	FALSE	FALSE	N/A	N/A	C	
231.4	96.456	N/A	39	N/A	N/A	N/A	N/A	0.675	0	0	0.197	TRUE	FALSE	FALSE	N/A	N/A	C	
231.3	96.620	N/A	39	N/A	N/A	N/A	N/A	0.675	0	0	0.197	TRUE	FALSE	FALSE	N/A	N/A	C	
231.1	96.784	N/A	39	N/A	N/A	N/A	N/A	0.675	0	0	0.197	TRUE	FALSE	FALSE	N/A	N/A	C	
231.0	96.948	N/A	39	N/A	N/A	N/A	N/A	0.674	0	0	0.197	TRUE	FALSE	FALSE	N/A	N/A	C	
230.8	97.112	N/A	39	N/A	N/A	N/A	N/A	0.674	0	0	0.196	TRUE	FALSE	FALSE	N/A	N/A	C	
230.6	97.276	N/A	39	N/A	N/A	N/A	N/A	0.673	0	0	0.196	TRUE	FALSE	FALSE	N/A	N/A	C	
230.5	97.440	N/A	39	N/A	N/A	N/A	N/A	0.673	0	0	0.196	TRUE	FALSE	FALSE	N/A	N/A	C	

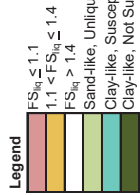
Elev. (ft)	Depth z (ft)	Cyclic Resistance Ratio $CRP_{7.5}$	Relative Density D_r (%)	Correction for		Cyclic Resistance Ratio $CRP_{7.5}$	Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., t_d	From Ground Response		Cyclic Stress Ratio CSR	Sample Screened for:		Factor of Safety FS_{liq}	Material (optional)	Soil Type (see note on following chart)
				Overburden Pressure K_o	Sloping Ground K_σ					Maximum Induced Shear Stress τ_{max} (psf)	Average Cyclic Shear Stress τ_{avg} (psf)		Clay-like $(qc_{30})_{cs} \geq 175$	High Tip Res.			
				D_r	K_σ	$CRP_{7.5}$	MSF	CRR	t_d	τ_{max}	τ_{avg}		Clay-like $(qc_{30})_{cs} \geq 175$	High Tip Res.			
230.3	97.604	N/A	39	N/A	N/A	N/A	N/A	N/A	0.673	0	0	0.196	TRUE	FALSE	FALSE	N/A	C
230.1	97.768	N/A	39	N/A	N/A	N/A	N/A	N/A	0.672	0	0	0.196	TRUE	FALSE	FALSE	N/A	C
230.0	97.932	N/A	39	N/A	N/A	N/A	N/A	N/A	0.672	0	0	0.196	TRUE	FALSE	FALSE	N/A	C
229.8	98.096	N/A	39	N/A	N/A	N/A	N/A	N/A	0.671	0	0	0.196	TRUE	FALSE	FALSE	N/A	C
229.6	98.260	N/A	38	N/A	N/A	N/A	N/A	N/A	0.671	0	0	0.196	TRUE	FALSE	FALSE	N/A	C
229.5	98.424	N/A	39	N/A	N/A	N/A	N/A	N/A	0.671	0	0	0.196	TRUE	FALSE	FALSE	N/A	C
229.3	98.588	N/A	39	N/A	N/A	N/A	N/A	N/A	0.670	0	0	0.196	TRUE	FALSE	FALSE	N/A	C
229.1	98.752	N/A	40	N/A	N/A	N/A	N/A	N/A	0.670	0	0	0.195	TRUE	FALSE	FALSE	N/A	C
229.0	98.916	0.138	55	0.890	1.085	0.131	0.98	0.131	0.670	0	0	0.195	FALSE	FALSE	FALSE	0.7	A1
228.8	99.080	N/A	48	N/A	N/A	N/A	N/A	N/A	0.669	0	0	0.195	TRUE	FALSE	FALSE	N/A	B
228.7	99.244	N/A	43	N/A	N/A	N/A	N/A	N/A	0.669	0	0	0.195	TRUE	FALSE	FALSE	N/A	B
228.5	99.408	N/A	44	N/A	N/A	N/A	N/A	N/A	0.668	0	0	0.195	TRUE	FALSE	FALSE	N/A	C
228.3	99.572	N/A	50	N/A	N/A	N/A	N/A	N/A	0.668	0	0	0.195	TRUE	FALSE	FALSE	N/A	A2
228.2	99.736	N/A	44	N/A	N/A	N/A	N/A	N/A	0.668	0	0	0.195	TRUE	FALSE	FALSE	N/A	C
228.0	99.900	N/A	41	N/A	N/A	N/A	N/A	N/A	0.667	0	0	0.195	TRUE	FALSE	FALSE	N/A	C
227.8	100.064	N/A	39	N/A	N/A	N/A	N/A	N/A	0.667	0	0	0.195	TRUE	FALSE	FALSE	N/A	C
227.7	100.228	N/A	40	N/A	N/A	N/A	N/A	N/A	0.667	0	0	0.195	TRUE	FALSE	FALSE	N/A	C
227.5	100.392	N/A	40	N/A	N/A	N/A	N/A	N/A	0.666	0	0	0.194	TRUE	FALSE	FALSE	N/A	C
227.3	100.557	N/A	42	N/A	N/A	N/A	N/A	N/A	0.666	0	0	0.194	TRUE	FALSE	FALSE	N/A	C
227.2	100.721	N/A	44	N/A	N/A	N/A	N/A	N/A	0.666	0	0	0.194	TRUE	FALSE	FALSE	N/A	C
227.0	100.885	N/A	40	N/A	N/A	N/A	N/A	N/A	0.665	0	0	0.194	TRUE	FALSE	FALSE	N/A	C
226.9	101.049	N/A	39	N/A	N/A	N/A	N/A	N/A	0.665	0	0	0.194	TRUE	FALSE	FALSE	N/A	C
226.7	101.213	N/A	39	N/A	N/A	N/A	N/A	N/A	0.664	0	0	0.194	TRUE	FALSE	FALSE	N/A	C
226.5	101.377	N/A	39	N/A	N/A	N/A	N/A	N/A	0.664	0	0	0.194	TRUE	FALSE	FALSE	N/A	C
226.4	101.541	N/A	39	N/A	N/A	N/A	N/A	N/A	0.664	0	0	0.194	TRUE	FALSE	FALSE	N/A	C
226.2	101.705	N/A	39	N/A	N/A	N/A	N/A	N/A	0.663	0	0	0.194	TRUE	FALSE	FALSE	N/A	C
226.0	101.869	N/A	39	N/A	N/A	N/A	N/A	N/A	0.663	0	0	0.194	TRUE	FALSE	FALSE	N/A	C
225.9	102.033	N/A	39	N/A	N/A	N/A	N/A	N/A	0.663	0	0	0.194	TRUE	FALSE	FALSE	N/A	C
225.7	102.197	N/A	39	N/A	N/A	N/A	N/A	N/A	0.662	0	0	0.193	TRUE	FALSE	FALSE	N/A	C
225.5	102.361	N/A	39	N/A	N/A	N/A	N/A	N/A	0.662	0	0	0.193	TRUE	FALSE	FALSE	N/A	C
225.4	102.525	N/A	39	N/A	N/A	N/A	N/A	N/A	0.662	0	0	0.193	TRUE	FALSE	FALSE	N/A	C
225.2	102.689	N/A	39	N/A	N/A	N/A	N/A	N/A	0.661	0	0	0.193	TRUE	FALSE	FALSE	N/A	C
225.0	102.853	N/A	39	N/A	N/A	N/A	N/A	N/A	0.661	0	0	0.193	TRUE	FALSE	FALSE	N/A	C
224.9	103.017	N/A	39	N/A	N/A	N/A	N/A	N/A	0.661	0	0	0.193	TRUE	FALSE	FALSE	N/A	C
224.7	103.181	N/A	39	N/A	N/A	N/A	N/A	N/A	0.660	0	0	0.193	TRUE	FALSE	FALSE	N/A	C
224.6	103.345	N/A	39	N/A	N/A	N/A	N/A	N/A	0.660	0	0	0.193	TRUE	FALSE	FALSE	N/A	C
224.4	103.509	N/A	39	N/A	N/A	N/A	N/A	N/A	0.660	0	0	0.193	TRUE	FALSE	FALSE	N/A	C
224.2	103.673	N/A	39	N/A	N/A	N/A	N/A	N/A	0.659	0	0	0.193	TRUE	FALSE	FALSE	N/A	C
224.1	103.837	N/A	39	N/A	N/A	N/A	N/A	N/A	0.659	0	0	0.193	TRUE	FALSE	FALSE	N/A	C
223.9	104.001	N/A	41	N/A	N/A	N/A	N/A	N/A	0.659	0	0	0.193	TRUE	FALSE	FALSE	N/A	C
223.7	104.165	N/A	54	N/A	N/A	N/A	N/A	N/A	0.658	0	0	0.192	TRUE	FALSE	FALSE	N/A	B
223.6	104.329	N/A	52	N/A	N/A	N/A	N/A	N/A	0.658	0	0	0.192	TRUE	FALSE	FALSE	N/A	B
223.4	104.493	N/A	44	N/A	N/A	N/A	N/A	N/A	0.658	0	0	0.192	TRUE	FALSE	FALSE	N/A	B
223.2	104.658	N/A	41	N/A	N/A	N/A	N/A	N/A	0.658	0	0	0.192	TRUE	FALSE	FALSE	N/A	B
223.1	104.822	N/A	39	N/A	N/A	N/A	N/A	N/A	0.657	0	0	0.192	TRUE	FALSE	FALSE	N/A	C
222.9	104.986	N/A	39	N/A	N/A	N/A	N/A	N/A	0.657	0	0	0.192	TRUE	FALSE	FALSE	N/A	C
222.8	105.150	N/A	39	N/A	N/A	N/A	N/A	N/A	0.657	0	0	0.192	TRUE	FALSE	FALSE	N/A	C
222.6	105.314	N/A	39	N/A	N/A	N/A	N/A	N/A	0.656	0	0	0.192	TRUE	FALSE	FALSE	N/A	C
222.4	105.478	N/A	39	N/A	N/A	N/A	N/A	N/A	0.656	0	0	0.192	TRUE	FALSE	FALSE	N/A	C
222.3	105.642	N/A	39	N/A	N/A	N/A	N/A	N/A	0.656	0	0	0.192	TRUE	FALSE	FALSE	N/A	C
222.1	105.806	N/A	39	N/A	N/A	N/A	N/A	N/A	0.655	0	0	0.192	TRUE	FALSE	FALSE	N/A	C
221.9	105.970	N/A	40	N/A	N/A	N/A	N/A	N/A	0.655	0	0	0.192	TRUE	FALSE	FALSE	N/A	C
221.8	106.134	N/A	39	N/A	N/A	N/A	N/A	N/A	0.655	0	0	0.191	TRUE	FALSE	FALSE	N/A	C
221.6	106.298	N/A	39	N/A	N/A	N/A	N/A	N/A	0.654	0	0	0.191	TRUE	FALSE	FALSE	N/A	C
221.4	106.462	N/A	39	N/A	N/A	N/A	N/A	N/A	0.654	0	0	0.191	TRUE	FALSE	FALSE	N/A	C

From Ground Response															Sample Screened for:					Soil Type (see note on following chart)
Elev. (ft)	Depth z (ft)	Cyclic Resistance Ratio $CRR_{7.5}$	Relative Density D_r (%)	Correction for		Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., r_d	Maximum Induced		Cyclic Shear Stress τ_{Avg} (psf)	Cyclic Stress Ratio		High Tip Res. ($qc_{30} \geq 175$)		Factor of Safety FS_{liq}	Material (optional)			
				Overburden Pressure K_o	Sloping Ground K_a				Shear Stress τ_{Max} (psf)	CSR		Clay-like	Unsaturated							
221.3	106.626	N/A	40	N/A	N/A	N/A	N/A	0.654	0	0	0	0.191	TRUE	FALSE	FALSE	N/A	N/A	C		
221.1	106.790	N/A	41	N/A	N/A	N/A	N/A	0.654	0	0	0	0.191	TRUE	FALSE	FALSE	N/A	N/A	C		
220.9	106.954	N/A	40	N/A	N/A	N/A	N/A	0.653	0	0	0	0.191	TRUE	FALSE	FALSE	N/A	N/A	C		
220.8	107.118	N/A	40	N/A	N/A	N/A	N/A	0.653	0	0	0	0.191	TRUE	FALSE	FALSE	N/A	N/A	C		
220.6	107.282	N/A	43	N/A	N/A	N/A	N/A	0.653	0	0	0	0.191	TRUE	FALSE	FALSE	N/A	N/A	C		
220.5	107.446	N/A	39	N/A	N/A	N/A	N/A	0.652	0	0	0	0.191	TRUE	FALSE	FALSE	N/A	N/A	C		
220.3	107.610	N/A	48	N/A	N/A	N/A	N/A	0.652	0	0	0	0.191	TRUE	FALSE	FALSE	N/A	N/A	B		
220.1	107.774	N/A	44	N/A	N/A	N/A	N/A	0.652	0	0	0	0.191	TRUE	FALSE	FALSE	N/A	N/A	C		
220.0	107.938	N/A	39	N/A	N/A	N/A	N/A	0.652	0	0	0	0.191	TRUE	FALSE	FALSE	N/A	N/A	C		
219.8	108.102	N/A	39	N/A	N/A	N/A	N/A	0.651	0	0	0	0.191	TRUE	FALSE	FALSE	N/A	N/A	C		
219.6	108.266	N/A	39	N/A	N/A	N/A	N/A	0.651	0	0	0	0.191	TRUE	FALSE	FALSE	N/A	N/A	C		
219.5	108.430	N/A	40	N/A	N/A	N/A	N/A	0.651	0	0	0	0.190	TRUE	FALSE	FALSE	N/A	N/A	C		
219.3	108.594	N/A	42	N/A	N/A	N/A	N/A	0.651	0	0	0	0.190	TRUE	FALSE	FALSE	N/A	N/A	C		
219.1	108.759	N/A	44	N/A	N/A	N/A	N/A	0.650	0	0	0	0.190	TRUE	FALSE	FALSE	N/A	N/A	C		
219.0	108.923	0.154	59	0.870	1.254	0.98	N/A	0.650	0	0	0	0.190	FALSE	FALSE	FALSE	0.9	N/A	B		
218.8	109.087	N/A	96	N/A	N/A	N/A	N/A	0.650	0	0	0	0.190	FALSE	TRUE	FALSE	N/A	N/A	A1		
218.6	109.251	N/A	100	N/A	N/A	N/A	N/A	0.650	0	0	0	0.190	FALSE	TRUE	FALSE	N/A	N/A	A1		
218.5	109.415	N/A	100	N/A	N/A	N/A	N/A	0.649	0	0	0	0.190	FALSE	TRUE	FALSE	N/A	N/A	A1		

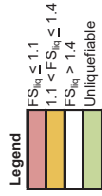
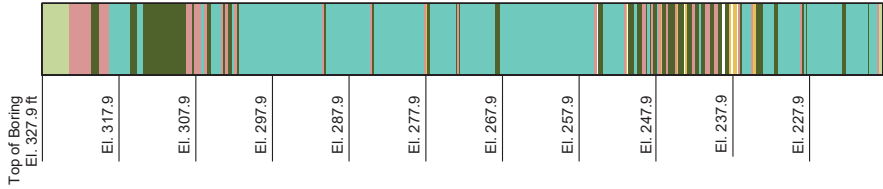
SP07



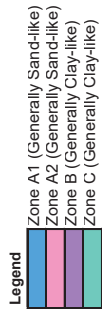
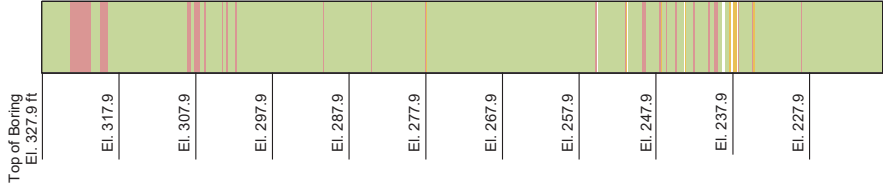
Adapted from "Discussion of 'Liquefaction Potential of Silts from CPTu'" (Robertson 2008). Zone A₁ and Zone A₂ samples are generally sand-like. Zone B samples are generally clay-like and not susceptible to cyclic softening. Zone C samples are generally clay-like and susceptible to cyclic softening. Note that the transition from clay-like to sand-like in this chart does not exactly match the liquefaction calculations herein; that is, some transitional samples in Zone B and Zone C will be treated as sand-like and analyzed for liquefaction if the calculations indicate as such.



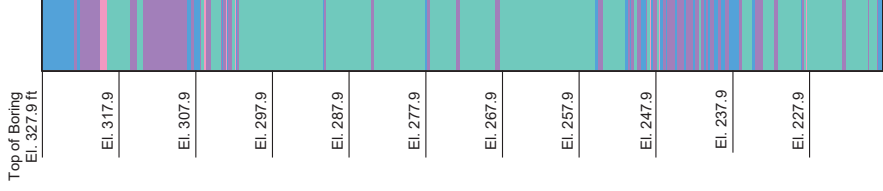
SP07, Liquefaction Triggering Results



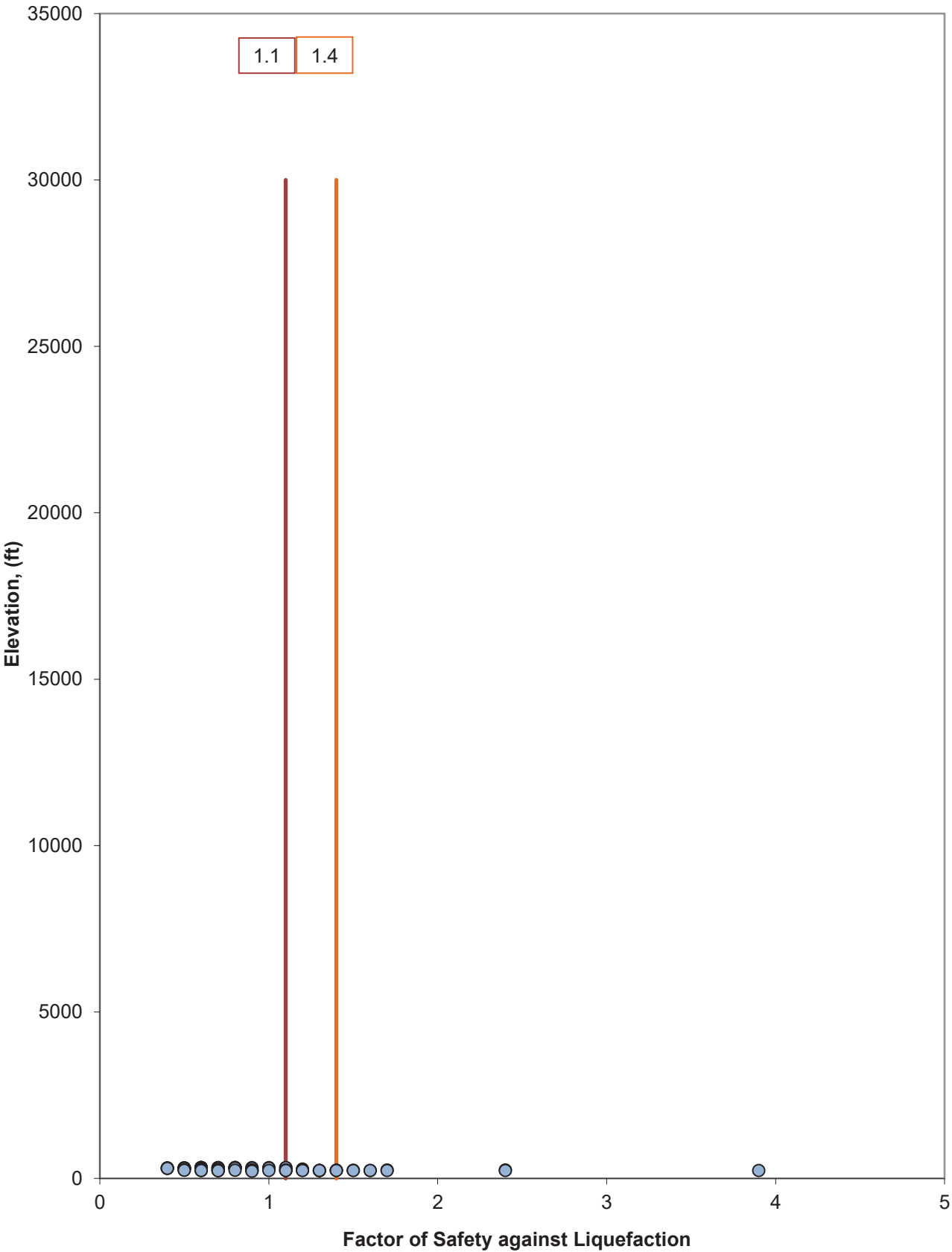
SP07, Liquefaction Triggering Results



SP07, Robertson Soil Type



US 60 Bridge, Boring = SP07, Source = Design Source, Mw = 7.7, Event = Design Event,
CPT Data, Simplified Stress-Based Approach



Project Information

Slantec Project Number =
Project Name =

CPT ID =

Boring Location (optional)

Nothing =

Ending =

OR

Baseline Station =

Offset (+ Right) =

178565011
US 60 Bridge
SP08

Using qt (corrected for u2 PWP) or qc (backcalculated uncorrected field tip)

Cone ID (optional) =

Use qc instead of qt?

Cone Area Rate (a) =

Drilling Information

Top of Hole Elevation =

Water Depth during CPT (negative for US borings) =

Depth data collection began =

Avg. Total Unit WL Above 1st Sample =

feet

feet

feet

pcf

During Earthquake Information

Water Depth during EQ (relative to CPT TOH, negative for US borings) =

Final Grade Elevation during EQ =

Avg. Total Unit WL of Cui/Fill =

feet

feet

pcf

Nonlinear Pore Water Pressure Profile

Custom Pore Water Pressure Profile?

If previous answer is No, hydrostatic pressures are assumed.

(1: Yes, 0: No)

α Curve Fit Parameters

Associated α profile:

α at each Sample Depth known?

If previous answer is No, then enter curve fit parameters below (a vs. depth curve)

If defaulting to $K_s=1$ (i.e., level ground), assign values of zero to all curve fit parameters below to make

alpha zero and thus, K_s will be one.

m4:
m3:
m2:
m1:
m0:

Borings, sp08, nor
0

(1: Yes, 0: No)

(1: Yes, 0: No)

(1: Yes, 0: No)

(1: Yes, 0: No)

(1: Yes, 0: No)

(1: Yes, 0: No)

(1: Yes, 0: No)

(1: Yes, 0: No)

(1: Yes, 0: No)

(1: Yes, 0: No)

(1: Yes, 0: No)

(1: Yes, 0: No)

(1: Yes, 0: No)

(1: Yes, 0: No)

(1: Yes, 0: No)

(1: Yes, 0: No)

(1: Yes, 0: No)

(1: Yes, 0: No)

(1: Yes, 0: No)

(1: Yes, 0: No)

(1: Yes, 0: No)

(1: Yes, 0: No)

(1: Yes, 0: No)

(1: Yes, 0: No)

(1: Yes, 0: No)

(1: Yes, 0: No)

(1: Yes, 0: No)

(1: Yes, 0: No)

(1: Yes, 0: No)

(1: Yes, 0: No)

(1: Yes, 0: No)

(1: Yes, 0: No)

(1: Yes, 0: No)

(1: Yes, 0: No)

(1: Yes, 0: No)

(1: Yes, 0: No)

(1: Yes, 0: No)

(1: Yes, 0: No)

(1: Yes, 0: No)

(1: Yes, 0: No)

Earthquake Information

EQ Source (e.g., New Madrid)

Event (e.g., MCE, OBE)

A_{max} (g) (top of ground surface)

EQ Mag (Mw)

Design Source
Design Event
0.22
7.7

Inputs

Depth (ft)	Corrected Cone Tip Resistance, q_c (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
0.164	3.718	0.094	120							
0.328	18.612	0.283	120							
0.492	41.018	0.559	120							
0.656	41.754	0.831	120							
0.820	47.261	1.010	120							
0.984	49.411	1.228	120							
1.148	48.775	1.333	120							
1.312	47.367	1.506	120							
1.476	47.577	1.948	120							
1.640	48.972	1.511	120							
1.804	50.580	1.511	120							
1.968	51.809	1.547	120							
2.133	51.750	1.531	120							
2.297	50.830	1.525	120							
2.461	50.090	1.507	120							
2.625	51.480	1.576	120							
2.789	54.538	1.700	120							
2.953	56.346	1.732	120							
3.117	56.570	1.776	120							
3.281	55.712	1.594	120							
3.445	56.604	1.571	120							
3.609	60.881	1.384	120							
3.773	60.511	1.321	120							
3.937	59.917	1.444	120							
4.101	58.737	1.618	120							
4.265	58.863	1.739	120							
4.429	55.194	1.780	120							
4.593	51.376	1.800	120							
4.757	47.787	1.715	120							
4.921	44.368	1.473	120							
5.085	43.014	1.288	120							
5.249	42.930	1.358	120							
5.413	44.341	1.412	120							
5.577	42.505	1.404	120							
5.741	38.086	1.282	120							
5.905	35.505	1.029	120							
6.069	40.203	1.027	120							
6.234	44.976	0.922	120							
6.398	48.084	0.880	120							
6.562	51.008	0.701	120							
6.726	54.788	0.688	120							
6.890	54.277	0.829	120							
7.054	41.176	1.012	120							
7.218	30.575	1.081	120							
7.382	23.619	0.851	120							
7.546	19.842	0.670	120							
7.710	19.921	0.551	120							
7.874	16.649	0.450	120							
8.038	16.570	0.440	120							
8.202	13.951	0.374	120							
8.366	15.035	0.326	120							
8.530	15.196	0.305	120							
8.694	15.851	0.305	120							
8.858	15.475	0.349	120							
9.022	15.533	0.373	120							
9.186	14.265	0.401	120							
9.350	13.721	0.422	120							
9.514	17.191	0.500	120							
9.678	23.415	0.611	120							
9.842	21.454	0.626	120							
10.006	19.270	0.658	120							
10.170	18.905	0.478	120							
10.335	15.623	0.468	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
10.499	15162	0.407	120							
10.663	17764	0.506	120							
10.827	21349	0.571	120							
10.991	15757	0.451	120							
11.155	14273	0.386	120							
11.319	13924	0.355	120							
11.483	14093	0.401	120							
11.647	11961	0.493	120							
11.811	21657	0.580	120							
11.975	48155	0.627	120							
12.139	45634	0.842	120							
12.303	26669	0.855	120							
12.467	18774	0.773	120							
12.631	14139	0.724	120							
12.795	20755	0.584	120							
12.959	16071	0.485	120							
13.123	14199	0.428	120							
13.287	13734	0.356	120							
13.451	13288	0.357	120							
13.615	9577	0.359	120							
13.779	14173	0.253	120							
13.943	11843	0.204	120							
14.107	15150	0.181	120							
14.271	22385	0.312	120							
14.436	11164	0.276	120							
14.600	7352	0.220	120							
14.764	5747	0.144	120							
14.928	4906	0.143	120							
15.092	5110	0.124	120							
15.256	18990	0.151	120							
15.420	22757	0.236	120							
15.584	15262	0.397	120							
15.748	10415	0.347	120							
15.912	6979	0.185	120							
16.076	38680	0.292	120							
16.240	34859	0.637	120							
16.404	14842	0.794	120							
16.568	8095	0.626	120							
16.732	8564	0.321	120							
16.896	11021	0.226	120							
17.060	19867	0.346	120							
17.224	11893	0.377	120							
17.388	8163	0.226	120							
17.552	6792	0.188	120							
17.716	9445	0.126	120							
17.880	8056	0.114	120							
18.044	7336	0.104	120							
18.208	7418	0.090	120							
18.372	6776	0.089	120							
18.537	6473	0.116	120							
18.701	6705	0.120	120							
18.865	13682	0.240	120							
19.029	8405	0.243	120							
19.193	6739	0.218	120							
19.357	7752	0.129	120							
19.521	6274	0.129	120							
19.685	8154	0.134	120							
19.849	6102	0.104	120							
20.013	6074	0.092	120							
20.177	5860	0.082	120							
20.341	7888	0.111	120							
20.505	6623	0.137	120							
20.669	6212	0.169	120							
20.833	6127	0.136	120							
20.997	6237	0.134	120							
21.161	6625	0.131	120							
21.325	7698	0.172	120							
21.489	8744	0.205	120							
21.653	6837	0.223	120							
21.817	9684	0.143	120							
21.981	30607	0.371	120							
22.145	14631	0.367	120							
22.309	8931	0.337	120							
22.473	8933	0.331	120							
22.638	13792	0.508	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
22.802	11453	0.351	120							
22.966	7196	0.244	120							
23.130	6985	0.129	120							
23.294	6986	0.095	120							
23.458	7100	0.087	120							
23.622	7158	0.072	120							
23.786	7382	0.080	120							
23.950	8054	0.077	120							
24.114	7284	0.085	120							
24.278	7601	0.093	120							
24.442	7195	0.093	120							
24.606	7303	0.092	120							
24.770	7369	0.092	120							
24.934	7312	0.105	120							
25.098	7727	0.114	120							
25.262	7729	0.119	120							
25.426	7625	0.100	120							
25.590	8043	0.104	120							
25.754	7615	0.114	120							
25.918	7338	0.117	120							
26.082	7218	0.099	120							
26.246	8400	0.151	120							
26.410	7812	0.177	120							
26.574	8078	0.201	120							
26.739	8320	0.112	120							
26.903	16647	0.244	120							
27.067	26033	0.432	120							
27.231	14573	0.605	120							
27.395	19828	0.683	120							
27.559	12715	0.417	120							
27.723	9361	0.245	120							
27.887	9349	0.121	120							
28.051	13213	0.195	120							
28.215	9701	0.186	120							
28.379	8341	0.216	120							
28.543	8741	0.093	120							
28.707	8538	0.093	120							
28.871	8170	0.107	120							
29.035	8239	0.091	120							
29.199	8542	0.108	120							
29.363	8698	0.116	120							
29.527	8444	0.121	120							
29.691	8528	0.114	120							
29.855	8821	0.114	120							
30.019	8695	0.084	120							
30.183	11976	0.150	120							
30.347	11961	0.178	120							
30.511	9016	0.181	120							
30.675	9116	0.087	120							
30.840	9693	0.091	120							
31.004	9325	0.106	120							
31.168	9286	0.116	120							
31.332	9458	0.111	120							
31.496	9366	0.108	120							
31.660	9172	0.137	120							
31.824	10403	0.079	120							
31.988	13640	0.276	120							
32.152	14465	0.309	120							
32.316	9716	0.267	120							
32.480	9477	0.128	120							
32.644	10299	0.085	120							
32.808	9580	0.082	120							
32.972	9203	0.086	120							
33.136	9596	0.086	120							
33.300	9458	0.093	120							
33.464	9542	0.098	120							
33.628	10071	0.104	120							
33.792	9839	0.115	120							
33.956	9620	0.115	120							
34.120	9806	0.115	120							
34.284	9834	0.115	120							
34.448	9895	0.105	120							
34.612	9327	0.100	120							
34.776	9115	0.079	120							
34.941	9184	0.098	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
35.105	10,273	0.186	120							
35.269	32,136	0.543	120							
35.433	16,619	0.498	120							
35.597	14,839	0.457	120							
35.761	32,077	0.530	120							
35.925	16,968	0.475	120							
36.089	10,847	0.395	120							
36.253	10,768	0.180	120							
36.417	11,317	0.150	120							
36.581	10,927	0.136	120							
36.745	10,901	0.127	120							
36.909	11,084	0.122	120							
37.073	10,949	0.124	120							
37.237	11,049	0.119	120							
37.401	11,299	0.139	120							
37.565	11,439	0.133	120							
37.729	11,632	0.134	120							
37.893	11,128	0.142	120							
38.057	11,326	0.137	120							
38.221	11,952	0.120	120							
38.385	12,112	0.101	120							
38.549	11,269	0.083	120							
38.713	11,327	0.055	120							
38.877	11,136	0.063	120							
39.042	11,219	0.079	120							
39.206	11,129	0.083	120							
39.370	11,116	0.104	120							
39.534	11,669	0.110	120							
39.698	11,497	0.112	120							
39.862	11,395	0.102	120							
40.026	10,993	0.084	120							
40.190	11,015	0.098	120							
40.354	11,636	0.103	120							
40.518	11,921	0.115	120							
40.682	11,440	0.121	120							
40.846	11,439	0.132	120							
41.010	11,798	0.110	120							
41.174	11,778	0.127	120							
41.338	12,365	0.208	120							
41.502	14,694	0.227	120							
41.666	11,123	0.218	120							
41.830	10,824	0.196	120							
41.994	11,956	0.081	120							
42.158	10,995	0.081	120							
42.322	10,913	0.102	120							
42.486	11,250	0.097	120							
42.650	11,383	0.126	120							
42.814	11,376	0.100	120							
42.978	14,681	0.292	120							
43.143	17,673	0.280	120							
43.307	16,327	0.320	120							
43.471	11,905	0.255	120							
43.635	11,464	0.212	120							
43.799	11,563	0.113	120							
43.963	10,756	0.112	120							
44.127	10,738	0.111	120							
44.291	11,217	0.099	120							
44.455	11,463	0.119	120							
44.619	12,195	0.159	120							
44.783	11,874	0.170	120							
44.947	12,548	0.189	120							
45.111	11,979	0.177	120							
45.275	14,406	0.206	120							
45.439	12,448	0.194	120							
45.603	12,690	0.224	120							
45.767	12,037	0.177	120							
45.931	11,879	0.161	120							
46.095	11,428	0.121	120							
46.259	11,788	0.121	120							
46.423	11,717	0.124	120							
46.587	12,025	0.116	120							
46.751	12,221	0.114	120							
46.915	12,564	0.118	120							
47.079	11,981	0.142	120							
47.244	12,325	0.161	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
47.408	11974	0.151	120							
47.572	12177	0.148	120							
47.736	12221	0.127	120							
47.900	12391	0.118	120							
48.064	12032	0.121	120							
48.228	12889	0.122	120							
48.392	11709	0.122	120							
48.556	12013	0.128	120							
48.720	11928	0.112	120							
48.884	11935	0.102	120							
49.048	11850	0.106	120							
49.212	11567	0.096	120							
49.376	12041	0.124	120							
49.540	12535	0.150	120							
49.704	12138	0.166	120							
49.868	12446	0.175	120							
50.032	12427	0.142	120							
50.196	12419	0.134	120							
50.360	12175	0.131	120							
50.524	12260	0.127	120							
50.688	12214	0.125	120							
50.852	12276	0.109	120							
51.016	12157	0.113	120							
51.180	12183	0.127	120							
51.345	13774	0.130	120							
51.509	25770	0.316	120							
51.673	21893	0.334	120							
51.837	16785	0.383	120							
52.001	15068	0.233	120							
52.165	14980	0.623	120							
52.329	24208	0.617	120							
52.493	15717	0.483	120							
52.657	13680	0.313	120							
52.821	14108	0.227	120							
52.985	14179	0.213	120							
53.149	14903	0.230	120							
53.313	13176	0.202	120							
53.477	13821	0.181	120							
53.641	13397	0.174	120							
53.805	13046	0.183	120							
53.969	13251	0.164	120							
54.133	13243	0.160	120							
54.297	12245	0.149	120							
54.461	12095	0.143	120							
54.625	13221	0.143	120							
54.789	13108	0.142	120							
54.953	13557	0.165	120							
55.117	13502	0.172	120							
55.281	13365	0.170	120							
55.446	13806	0.162	120							
55.610	13924	0.169	120							
55.774	13766	0.229	120							
55.938	13693	0.193	120							
56.102	13415	0.175	120							
56.266	13570	0.142	120							
56.430	13794	0.143	120							
56.594	13106	0.142	120							
56.758	12904	0.142	120							
56.922	12781	0.125	120							
57.086	12924	0.126	120							
57.250	13014	0.117	120							
57.414	13802	0.121	120							
57.578	13220	0.134	120							
57.742	13655	0.159	120							
57.906	15049	0.165	120							
58.070	13314	0.165	120							
58.234	13353	0.149	120							
58.398	14226	0.143	120							
58.562	14052	0.154	120							
58.726	14103	0.160	120							
58.890	13935	0.149	120							
59.054	14115	0.237	120							
59.218	21976	0.401	120							
59.382	114401	0.783	120							
59.547	128506	1.152	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
59.711	142.434	1.134	120							
59.875	146.621	1.144	120							
60.039	142.067	1.575	120							
60.203	99.256	1.958	120							
60.367	44.284	2.106	120							
60.531	28.367	1.480	120							
60.695	17.342	1.008	120							
60.859	19.290	0.381	120							
61.023	17.226	0.265	120							
61.187	16.073	0.249	120							
61.351	14.858	0.202	120							
61.515	14.554	0.163	120							
61.679	14.607	0.149	120							
61.843	14.906	0.140	120							
62.007	15.639	0.127	120							
62.171	15.460	0.141	120							
62.335	15.215	0.170	120							
62.499	15.288	0.162	120							
62.663	15.518	0.128	120							
62.827	15.147	0.138	120							
62.991	14.836	0.137	120							
63.155	15.401	0.138	120							
63.319	15.511	0.131	120							
63.483	14.876	0.126	120							
63.648	15.369	0.134	120							
63.812	15.249	0.140	120							
63.976	15.346	0.142	120							
64.140	15.775	0.147	120							
64.304	15.361	0.160	120							
64.468	15.160	0.169	120							
64.632	15.236	0.147	120							
64.796	15.472	0.143	120							
64.960	16.044	0.181	120							
65.124	15.771	0.209	120							
65.288	15.515	0.216	120							
65.452	15.971	0.202	120							
65.616	15.694	0.222	120							
65.780	15.752	0.219	120							
65.944	15.639	0.189	120							
66.108	15.724	0.163	120							
66.272	15.346	0.163	120							
66.436	15.444	0.169	120							
66.600	15.556	0.166	120							
66.764	15.315	0.156	120							
66.928	15.603	0.166	120							
67.092	16.067	0.201	120							
67.256	15.614	0.200	120							
67.420	16.082	0.205	120							
67.584	16.131	0.183	120							
67.749	15.785	0.194	120							
67.913	15.764	0.179	120							
68.077	16.006	0.179	120							
68.241	16.227	0.164	120							
68.405	16.553	0.171	120							
68.569	16.323	0.166	120							
68.733	16.117	0.175	120							
68.897	16.305	0.228	120							
69.061	15.739	0.231	120							
69.225	17.688	0.301	120							
69.389	17.126	0.139	120							
69.553	74.012	0.690	120							
69.717	60.703	1.238	120							
69.881	31.261	1.152	120							
70.045	18.555	0.873	120							
70.209	18.353	0.399	120							
70.373	19.110	0.208	120							
70.537	18.471	0.163	120							
70.701	17.281	0.138	120							
70.865	16.806	0.108	120							
71.029	17.179	0.084	120							
71.193	17.177	0.107	120							
71.357	16.926	0.129	120							
71.521	17.603	0.150	120							
71.685	17.198	0.170	120							
71.850	16.982	0.174	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
72.014	16,866	0.181	120							
72.178	18,203	0.184	120							
72.342	15,527	0.184	120							
72.506	15,764	0.166	120							
72.670	17,111	0.178	120							
72.834	17,145	0.181	120							
72.998	15,939	0.173	120							
73.162	16,597	0.121	120							
73.326	16,413	0.096	120							
73.490	16,072	0.119	120							
73.654	16,552	0.158	120							
73.818	16,445	0.253	120							
73.982	39,271	0.636	120							
74.146	67,655	1.829	120							
74.310	41,013	1.476	120							
74.474	22,306	0.944	120							
74.638	20,088	0.347	120							
74.802	18,780	0.168	120							
74.966	17,702	0.137	120							
75.130	17,345	0.200	120							
75.294	17,718	0.176	120							
75.458	18,714	0.169	120							
75.622	17,735	0.221	120							
75.786	22,083	0.258	120							
75.951	25,945	0.330	120							
76.115	20,126	0.610	120							
76.279	55,522	0.887	120							
76.443	89,017	1.056	120							
76.607	117,341	1.272	120							
76.771	122,537	1.635	120							
76.935	80,793	1.978	120							
77.099	61,127	2.030	120							
77.263	53,581	2.271	120							
77.427	59,966	1.789	120							
77.591	101,088	1.920	120							
77.755	79,641	2.846	120							
77.919	47,370	2.292	120							
78.083	34,151	1.706	120							
78.247	81,824	1.144	120							
78.411	135,738	1.309	120							
78.575	86,097	1.903	120							
78.739	59,454	2.232	120							
78.903	27,778	1.611	120							
79.067	34,765	1.226	120							
79.231	34,975	1.264	120							
79.395	49,487	1.330	120							
79.559	193,499	1.752	120							
79.723	453,461	2.634	120							
79.887	77,759	3.068	120							
80.052	49,568	2.353	120							
80.216	100,733	1.841	120							
80.380	161,774	1.863	120							
80.544	196,659	1.847	120							
80.708	189,244	2.023	120							
80.872	176,317	1.865	120							
81.036	148,405	2.052	120							
81.200	97,254	2.033	120							
81.364	73,064	2.140	120							
81.528	52,082	1.961	120							
81.692	26,919	1.502	120							
81.856	18,154	0.905	120							
82.020	24,078	0.571	120							
82.184	85,777	0.725	120							
82.348	193,086	1.337	120							
82.512	198,501	2.174	120							
82.676	136,154	2.707	120							
82.840	68,689	2.635	120							
83.004	54,528	1.832	120							
83.168	69,825	1.578	120							
83.332	89,310	1.564	120							
83.496	71,161	1.337	120							
83.660	50,815	1.409	120							
83.824	38,983	1.602	120							
83.988	25,808	1.133	120							
84.153	31,327	1.489	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
84.317	67.854	1.278	120							
84.481	62.398	1.728	120							
84.645	118.806	2.382	120							
84.809	103.922	1.964	120							
84.973	191.704	2.083	120							
85.137	176.803	2.599	120							
85.301	129.842	2.431	120							
85.465	119.380	2.094	120							
85.629	91.443	2.068	120							
85.793	49.520	1.589	120							
85.957	29.069	0.990	120							
86.121	19.923	0.530	120							
86.285	26.369	0.164	120							
86.449	56.332	0.384	120							
86.613	59.650	0.907	120							
86.777	31.222	0.885	120							
86.941	23.252	0.625	120							
87.105	23.534	0.172	120							
87.269	23.205	0.135	120							
87.433	22.787	0.145	120							
87.597	28.983	0.787	120							
87.761	47.747	1.051	120							
87.925	27.639	0.734	120							
88.089	30.000	0.521	120							
88.254	28.574	0.410	120							
88.418	112.610	0.804	120							
88.582	92.637	1.357	120							
88.746	50.608	1.949	120							
88.910	41.866	1.835	120							
89.074	30.426	1.214	120							
89.238	23.832	0.652	120							
89.402	22.235	0.290	120							
89.566	18.901	0.200	120							
89.730	24.266	0.357	120							
89.894	53.757	0.782	120							
90.058	32.311	0.839	120							
90.222	25.022	0.511	120							
90.386	46.097	0.949	120							
90.550	44.434	1.134	120							
90.714	28.418	1.199	120							
90.878	50.072	1.077	120							
91.042	59.951	1.342	120							
91.206	37.453	1.383	120							
91.370	41.663	1.292	120							
91.534	86.184	1.522	120							
91.698	93.298	1.602	120							
91.862	91.011	1.583	120							
92.026	81.805	2.091	120							
92.190	55.638	2.766	120							
92.355	60.981	2.428	120							
92.519	183.573	2.518	120							
92.683	278.686	3.109	120							
92.847	263.411	3.318	120							
93.011	228.791	3.046	120							
93.175	199.113	2.510	120							
93.339	181.325	2.068	120							
93.503	166.900	1.848	120							
93.667	151.638	2.153	120							
93.831	115.177	2.700	120							
93.995	60.850	2.611	120							
94.159	38.185	2.100	120							
94.323	27.749	1.268	120							
94.487	21.507	0.952	120							
94.651	21.128	0.765	120							
94.815	23.723	0.486	120							
94.979	46.086	0.840	120							
95.143	80.986	1.059	120							
95.307	85.816	0.819	120							
95.471	78.124	0.833	120							
95.635	51.480	1.085	120							
95.799	29.678	0.892	120							
95.963	48.671	0.967	120							
96.127	68.653	1.566	120							
96.291	57.345	1.977	120							
96.456	86.580	2.561	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
96.620	41,278	1,916	120							
96.784	24,539	1,272	120							
96.948	51,572	1,229	120							
97.112	125,517	1,554	120							
97.276	103,097	1,975	120							
97.440	81,066	2,155	120							
97.604	65,804	2,214	120							
97.768	36,390	1,748	120							
97.932	24,286	0,849	120							
98.096	22,067	0,374	120							
98.260	22,559	0,406	120							
98.424	21,512	0,274	120							
98.588	54,666	0,882	120							
98.752	39,626	0,895	120							
98.916	33,096	0,796	120							
99.080	27,978	0,292	120							
99.244	23,970	0,251	120							
99.408	22,476	0,207	120							
99.572	22,325	0,183	120							
99.736	22,277	0,179	120							
99.900	22,577	0,149	120							
100.064	21,932	0,119	120							
100.228	20,928	0,143	120							
100.392	20,558	0,159	120							
100.557	21,088	0,228	120							
100.721	22,667	0,200	120							
100.885	38,770	0,369	120							
101.049	59,713	0,952	120							
101.213	33,786	1,029	120							
101.377	25,368	0,775	120							
101.541	24,145	0,307	120							
101.705	22,694	0,185	120							
101.869	21,186	0,142	120							
102.033	22,427	0,138	120							
102.197	22,465	0,141	120							
102.361	20,751	0,139	120							
102.525	20,099	0,129	120							
102.689	20,065	0,176	120							
102.853	20,614	0,121	120							
103.017	39,298	0,455	120							
103.181	39,979	0,981	120							
103.345	38,957	0,143	120							
103.509	28,771	0,18	120							
103.673	25,948	0,146	120							
103.837	38,152	0,638	120							
104.001	23,838	0,621	120							
104.165	20,329	0,547	120							
104.329	20,295	0,225	120							
104.493	21,125	0,193	120							
104.657	21,725	0,259	120							
104.822	34,909	0,628	120							
104.986	31,397	0,663	120							
105.150	23,613	0,861	120							
105.314	20,441	0,465	120							
105.478	21,025	0,194	120							
105.642	20,668	0,205	120							
105.806	20,172	0,205	120							
105.970	20,225	0,243	120							
106.134	20,233	0,158	120							
106.298	26,756	0,486	120							
106.462	31,050	0,612	120							
106.626	20,380	0,655	120							
106.790	20,353	0,335	120							
106.954	20,687	0,191	120							
107.118	20,508	0,193	120							
107.282	20,333	0,271	120							
107.446	30,846	0,458	120							
107.610	25,241	0,479	120							
107.774	21,270	0,502	120							
107.938	20,998	0,176	120							
108.102	32,181	0,499	120							
108.266	35,449	0,783	120							
108.430	20,786	0,750	120							
108.594	20,004	0,219	120							
108.759	20,475	0,145	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
108.923	19752	0.139	120							
109.087	21806	0.160	120							
109.251	20601	0.150	120							
109.415	21401	0.295	120							
109.579	22538	0.289	120							
109.743	36535	0.690	120							
109.907	27953	0.737	120							
110.071	20925	0.744	120							
110.235	19900	0.196	120							
110.399	19097	0.161	120							
110.563	18795	0.169	120							
110.727	20145	0.164	120							
110.891	20549	0.162	120							
111.055	20275	0.164	120							
111.219	20143	0.154	120							
111.383	20620	0.153	120							
111.547	20412	0.215	120							
111.711	23365	0.223	120							
111.875	19812	0.267	120							
112.039	23582	0.913	120							
112.203	53018	1.138	120							
112.367	45019	1.552	120							
112.531	23729	1.294	120							
112.695	18508	1.263	120							
112.860	25498	1.234	120							
113.024	155830	1.250	120							
113.188	229594	0.725	120							
113.352	205944	0.422	120							
113.516	126319	0.477	120							
113.680	70533	0.872	120							
113.844	36820	1.203	120							
114.008	17432	1.007	120							
114.172	8959	0.493	120							
114.336	84993	0.364	120							
114.500	136024	0.343	120							
114.664	148157	0.162	120							
114.828	109219	0.215	120							
114.992	55661	0.358	120							
115.156	19601	0.687	120							
115.320	19127	0.686	120							
115.484	16605	0.209	120							
115.648	45015	0.950	120							
115.812	245200	1.470	120							

LIQUEFACTION POTENTIAL ASSESSMENT FOR COARSE GRAINED SOILS USING CONE PENETRATION TEST DATA

Facility: US 60 Bridge
Project No.: 178565011
CPT ID: SP08

Water Elevation during CPT:	323.1	ft
Depth to Water during CPT:	8.7	ft (relative to ground surface during CPT)
Water Elevation during Earthquake:	323.1	ft
Depth to Water during Earthquake:	8.7	ft (relative to ground surface during CPT)
Final Grade Elevation during EQ:	331.8	ft (if no fill, then set this equal to top of CPT hole elev.)
Height of Final Grade above CPT TOH:	0.0	ft (relative to ground surface during CPT, + Fill, - Cut)
Unit Weight of Cut/Fill to Achieve Final Grade	120	pcf
Cut/Fill Total Stress (+ Fill, - Cut):	0.00	tsf

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σvCPT (tsf)	Total Vertical Stress during EQ σvEQ (tsf)	Static Pore Water Pressure during CPT uSCPT (tsf)	Static Pore Water Pressure during EQ uSEQ (tsf)	Effective Vertical Stress during CPT σvCPT (tsf)	Effective Vertical Stress during EQ σvEQ (tsf)
331.8					Vertical Stresses above 1st CPT:		0.00	0.00	0.00	0.00	0.00	0.00
331.6	0.164	3.72	0.09	120		0.00	0.25	0.01	0.01	0.00	0.01	0.01
331.5	0.328	18.81	0.29	120		0.25	0.16	0.02	0.02	0.00	0.02	0.02
331.3	0.492	41.02	0.56	120		0.41	0.16	0.03	0.03	0.00	0.03	0.03
331.1	0.656	41.75	0.83	120		0.57	0.16	0.04	0.04	0.00	0.04	0.04
331.0	0.820	47.26	1.01	120		0.74	0.16	0.05	0.05	0.00	0.05	0.05
330.8	0.984	49.41	1.23	120		0.90	0.16	0.06	0.06	0.00	0.06	0.06
330.7	1.148	48.77	1.33	120		1.07	0.16	0.07	0.07	0.00	0.07	0.07
330.5	1.312	47.37	1.51	120		1.23	0.16	0.08	0.08	0.00	0.08	0.08
330.3	1.476	47.58	1.55	120		1.39	0.16	0.09	0.09	0.00	0.09	0.09
330.2	1.640	48.97	1.51	120		1.56	0.16	0.10	0.10	0.00	0.10	0.10
330.0	1.804	50.58	1.51	120		1.72	0.16	0.11	0.11	0.00	0.11	0.11
329.8	1.968	51.81	1.55	120		1.89	0.16	0.12	0.12	0.00	0.12	0.12
329.7	2.133	51.75	1.53	120		2.05	0.16	0.13	0.13	0.00	0.13	0.13
329.5	2.297	50.83	1.53	120		2.21	0.16	0.14	0.14	0.00	0.14	0.14
329.3	2.461	50.09	1.51	120		2.38	0.16	0.15	0.15	0.00	0.15	0.15
329.2	2.625	51.48	1.58	120		2.54	0.16	0.16	0.16	0.00	0.16	0.16
329.0	2.789	54.54	1.70	120		2.71	0.16	0.17	0.17	0.00	0.17	0.17
328.8	2.953	56.35	1.73	120		2.87	0.16	0.18	0.18	0.00	0.18	0.18
328.7	3.117	56.57	1.78	120		3.03	0.16	0.19	0.19	0.00	0.19	0.19
328.5	3.281	55.71	1.59	120		3.20	0.16	0.20	0.20	0.00	0.20	0.20
328.4	3.445	56.60	1.57	120		3.36	0.16	0.21	0.21	0.00	0.21	0.21
328.2	3.609	60.88	1.38	120		3.53	0.16	0.22	0.22	0.00	0.22	0.22
328.0	3.773	60.51	1.32	120		3.69	0.16	0.23	0.23	0.00	0.23	0.23
327.9	3.937	59.92	1.44	120		3.85	0.16	0.24	0.24	0.00	0.24	0.24
327.7	4.101	58.74	1.62	120		4.02	0.16	0.25	0.25	0.00	0.25	0.25
327.5	4.265	56.86	1.74	120		4.18	0.16	0.26	0.26	0.00	0.26	0.26
327.4	4.429	55.19	1.78	120		4.35	0.16	0.27	0.27	0.00	0.27	0.27
327.2	4.593	51.38	1.80	120		4.51	0.16	0.28	0.28	0.00	0.28	0.28
327.0	4.757	47.79	1.72	120		4.68	0.16	0.29	0.29	0.00	0.29	0.29
326.9	4.921	44.37	1.47	120		4.84	0.16	0.30	0.30	0.00	0.30	0.30
326.7	5.085	43.01	1.29	120		5.00	0.16	0.31	0.31	0.00	0.31	0.31
326.6	5.249	42.93	1.36	120		5.17	0.16	0.31	0.31	0.00	0.31	0.31
326.4	5.413	44.34	1.41	120		5.33	0.16	0.32	0.32	0.00	0.32	0.32
326.2	5.577	42.50	1.40	120		5.50	0.16	0.33	0.33	0.00	0.33	0.33
326.1	5.741	38.09	1.28	120		5.66	0.16	0.34	0.34	0.00	0.34	0.34
325.9	5.905	35.50	1.03	120		5.82	0.16	0.35	0.35	0.00	0.35	0.35
325.7	6.069	40.20	1.03	120		5.99	0.16	0.36	0.36	0.00	0.36	0.36
325.6	6.234	44.98	0.92	120		6.15	0.16	0.37	0.37	0.00	0.37	0.37
325.4	6.398	48.08	0.88	120		6.32	0.16	0.38	0.38	0.00	0.38	0.38
325.2	6.562	51.01	0.70	120		6.48	0.16	0.39	0.39	0.00	0.39	0.39
325.1	6.726	54.79	0.69	120		6.64	0.16	0.40	0.40	0.00	0.40	0.40
324.9	6.890	54.28	0.83	120		6.81	0.16	0.41	0.41	0.00	0.41	0.41
324.7	7.054	41.18	1.01	120		6.97	0.16	0.42	0.42	0.00	0.42	0.42
324.6	7.218	30.57	1.08	120		7.14	0.16	0.43	0.43	0.00	0.43	0.43
324.4	7.382	23.62	0.85	120		7.30	0.16	0.44	0.44	0.00	0.44	0.44
324.3	7.546	19.84	0.67	120		7.46	0.16	0.45	0.45	0.00	0.45	0.45
324.1	7.710	19.92	0.55	120		7.63	0.16	0.46	0.46	0.00	0.46	0.46
323.9	7.874	16.65	0.45	120		7.79	0.16	0.47	0.47	0.00	0.47	0.47
323.8	8.038	16.57	0.44	120		7.96	0.16	0.48	0.48	0.00	0.48	0.48
323.6	8.202	13.95	0.37	120		8.12	0.16	0.49	0.49	0.00	0.49	0.49
323.4	8.366	15.04	0.33	120		8.28	0.16	0.50	0.50	0.00	0.50	0.50
323.3	8.530	15.20	0.31	120		8.45	0.16	0.51	0.51	0.00	0.51	0.51
323.1	8.694	15.85	0.31	120		8.61	0.16	0.52	0.52	0.00	0.52	0.52
322.9	8.858	15.47	0.35	120		8.78	0.16	0.53	0.53	0.00	0.53	0.53
322.8	9.022	15.53	0.37	120		8.94	0.16	0.54	0.54	0.01	0.53	0.53
322.6	9.186	14.27	0.40	120		9.10	0.16	0.55	0.55	0.02	0.54	0.54
322.4	9.350	13.72	0.42	120		9.27	0.16	0.56	0.56	0.02	0.54	0.54
322.3	9.514	17.19	0.51	120		9.43	0.16	0.57	0.57	0.03	0.55	0.55
322.1	9.678	23.22	0.61	120		9.60	0.16	0.58	0.58	0.03	0.55	0.55
322.0	9.842	21.48	0.66	120		9.76	0.16	0.59	0.59	0.04	0.55	0.55
321.8	10.006	19.22	0.63	120		9.92	0.16	0.60	0.60	0.04	0.56	0.56
321.6	10.170	18.90	0.48	120	10.09	0.16	0.61	0.61	0.05	0.05	0.56	0.56

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σv CPT (tsf)	Total Vertical Stress during EQ σv EQ (tsf)	Static Pore Water Pressure during CPT us CPT (tsf)	Static Pore Water Pressure during EQ us EQ (tsf)	Effective Vertical Stress during CPT σv CPT (tsf)	Effective Vertical Stress during EQ σv EQ (tsf)
321.5	10.335	15.62	0.49	120	10.25	0.16	0.62	0.62	0.05	0.05	0.57	0.57
321.3	10.499	15.16	0.50	120	10.42	0.16	0.63	0.63	0.06	0.06	0.57	0.57
321.1	10.663	17.76	0.51	120	10.58	0.16	0.64	0.64	0.06	0.06	0.58	0.58
321.0	10.827	21.35	0.57	120	10.74	0.16	0.65	0.65	0.07	0.07	0.58	0.58
320.8	10.991	15.76	0.45	120	10.91	0.16	0.66	0.66	0.07	0.07	0.59	0.59
320.6	11.155	14.27	0.39	120	11.07	0.16	0.67	0.67	0.08	0.08	0.59	0.59
320.5	11.319	13.92	0.36	120	11.24	0.16	0.68	0.68	0.08	0.08	0.60	0.60
320.3	11.483	14.09	0.40	120	11.40	0.16	0.69	0.69	0.09	0.09	0.60	0.60
320.2	11.647	11.96	0.49	120	11.56	0.16	0.70	0.70	0.09	0.09	0.61	0.61
320.0	11.811	21.66	0.58	120	11.73	0.16	0.71	0.71	0.10	0.10	0.61	0.61
319.8	11.975	48.15	0.63	120	11.89	0.16	0.72	0.72	0.10	0.10	0.62	0.62
319.7	12.139	45.83	0.84	120	12.06	0.16	0.73	0.73	0.11	0.11	0.62	0.62
319.5	12.303	26.67	0.86	120	12.22	0.16	0.74	0.74	0.11	0.11	0.63	0.63
319.3	12.467	18.77	0.77	120	12.39	0.16	0.75	0.75	0.12	0.12	0.63	0.63
319.2	12.631	14.14	0.72	120	12.55	0.16	0.76	0.76	0.12	0.12	0.64	0.64
319.0	12.795	20.76	0.58	120	12.71	0.16	0.77	0.77	0.13	0.13	0.64	0.64
318.8	12.959	16.07	0.49	120	12.88	0.16	0.78	0.78	0.13	0.13	0.64	0.64
318.7	13.123	14.20	0.43	120	13.04	0.16	0.79	0.79	0.14	0.14	0.65	0.65
318.5	13.287	13.73	0.36	120	13.21	0.16	0.80	0.80	0.14	0.14	0.65	0.65
318.3	13.451	13.29	0.36	120	13.37	0.16	0.81	0.81	0.15	0.15	0.66	0.66
318.2	13.615	9.58	0.36	120	13.53	0.16	0.82	0.82	0.15	0.15	0.66	0.66
318.0	13.779	14.17	0.25	120	13.70	0.16	0.83	0.83	0.16	0.16	0.67	0.67
317.9	13.943	11.84	0.20	120	13.86	0.16	0.84	0.84	0.16	0.16	0.67	0.67
317.7	14.107	15.15	0.18	120	14.03	0.16	0.85	0.85	0.17	0.17	0.68	0.68
317.5	14.271	22.39	0.31	120	14.19	0.16	0.86	0.86	0.17	0.17	0.68	0.68
317.4	14.436	11.16	0.28	120	14.35	0.16	0.87	0.87	0.18	0.18	0.69	0.69
317.2	14.600	7.35	0.22	120	14.52	0.16	0.88	0.88	0.18	0.18	0.69	0.69
317.0	14.764	5.75	0.14	120	14.68	0.16	0.89	0.89	0.19	0.19	0.70	0.70
316.9	14.928	4.91	0.14	120	14.85	0.16	0.90	0.90	0.19	0.19	0.70	0.70
316.7	15.092	5.11	0.12	120	15.01	0.16	0.91	0.91	0.20	0.20	0.71	0.71
316.5	15.256	18.99	0.15	120	15.17	0.16	0.92	0.92	0.20	0.20	0.71	0.71
316.4	15.420	22.76	0.24	120	15.34	0.16	0.93	0.93	0.21	0.21	0.72	0.72
316.2	15.584	16.26	0.40	120	15.50	0.16	0.94	0.94	0.21	0.21	0.72	0.72
316.1	15.748	10.41	0.35	120	15.67	0.16	0.94	0.94	0.22	0.22	0.72	0.72
315.9	15.912	6.98	0.19	120	15.83	0.16	0.95	0.95	0.23	0.23	0.73	0.73
315.7	16.076	38.88	0.29	120	15.99	0.16	0.96	0.96	0.23	0.23	0.73	0.73
315.6	16.240	34.86	0.64	120	16.16	0.16	0.97	0.97	0.24	0.24	0.74	0.74
315.4	16.404	14.84	0.75	120	16.32	0.16	0.98	0.98	0.24	0.24	0.74	0.74
315.2	16.568	9.10	0.63	120	16.49	0.16	0.99	0.99	0.25	0.25	0.75	0.75
315.1	16.732	8.56	0.32	120	16.65	0.16	1.00	1.00	0.25	0.25	0.75	0.75
314.9	16.896	11.02	0.23	120	16.81	0.16	1.01	1.01	0.26	0.26	0.76	0.76
314.7	17.060	19.87	0.33	120	16.98	0.16	1.02	1.02	0.26	0.26	0.76	0.76
314.6	17.224	11.60	0.35	120	17.14	0.16	1.03	1.03	0.27	0.27	0.77	0.77
314.4	17.388	6.86	0.23	120	17.31	0.16	1.04	1.04	0.27	0.27	0.77	0.77
314.2	17.552	6.73	0.19	120	17.47	0.16	1.05	1.05	0.28	0.28	0.78	0.78
314.1	17.716	9.44	0.13	120	17.63	0.16	1.06	1.06	0.28	0.28	0.78	0.78
313.9	17.880	8.06	0.11	120	17.80	0.16	1.07	1.07	0.29	0.29	0.79	0.79
313.8	18.044	7.34	0.10	120	17.96	0.16	1.08	1.08	0.29	0.29	0.79	0.79
313.6	18.208	7.42	0.09	120	18.13	0.16	1.09	1.09	0.30	0.30	0.80	0.80
313.4	18.372	6.78	0.09	120	18.29	0.16	1.10	1.10	0.30	0.30	0.80	0.80
313.3	18.537	6.47	0.12	120	18.45	0.16	1.11	1.11	0.31	0.31	0.81	0.81
313.1	18.701	6.71	0.12	120	18.62	0.16	1.12	1.12	0.31	0.31	0.81	0.81
312.9	18.865	13.68	0.24	120	18.78	0.16	1.13	1.13	0.32	0.32	0.81	0.81
312.8	19.029	8.40	0.24	120	18.95	0.16	1.14	1.14	0.32	0.32	0.82	0.82
312.6	19.193	6.74	0.22	120	19.11	0.16	1.15	1.15	0.33	0.33	0.82	0.82
312.4	19.357	7.75	0.13	120	19.27	0.16	1.16	1.16	0.33	0.33	0.83	0.83
312.3	19.521	6.27	0.13	120	19.44	0.16	1.17	1.17	0.34	0.34	0.83	0.83
312.1	19.685	8.15	0.13	120	19.60	0.16	1.18	1.18	0.34	0.34	0.84	0.84
312.0	19.849	6.10	0.10	120	19.77	0.16	1.19	1.19	0.35	0.35	0.84	0.84
311.8	20.013	6.07	0.09	120	19.93	0.16	1.20	1.20	0.35	0.35	0.85	0.85
311.6	20.177	5.86	0.08	120	20.09	0.16	1.21	1.21	0.36	0.36	0.85	0.85
311.5	20.341	7.89	0.11	120	20.26	0.16	1.22	1.22	0.36	0.36	0.86	0.86
311.3	20.505	6.62	0.14	120	20.42	0.16	1.23	1.23	0.37	0.37	0.86	0.86
311.1	20.669	6.21	0.17	120	20.59	0.16	1.24	1.24	0.37	0.37	0.87	0.87
311.0	20.833	6.13	0.14	120	20.75	0.16	1.25	1.25	0.38	0.38	0.87	0.87
310.8	20.997	6.24	0.13	120	20.92	0.16	1.26	1.26	0.38	0.38	0.88	0.88
310.6	21.161	6.62	0.13	120	21.08	0.16	1.27	1.27	0.39	0.39	0.88	0.88
310.5	21.325	7.70	0.17	120	21.24	0.16	1.28	1.28	0.39	0.39	0.89	0.89
310.3	21.489	8.74	0.21	120	21.41	0.16	1.29	1.29	0.40	0.40	0.89	0.89
310.1	21.653	6.84	0.22	120	21.57	0.16	1.30	1.30	0.40	0.40	0.90	0.90
310.0	21.817	9.68	0.14	120	21.74	0.16	1.31	1.31	0.41	0.41	0.90	0.90
309.8	21.981	30.61	0.37	120	21.90	0.16	1.32	1.32	0.41	0.41	0.90	0.90
309.7	22.145	14.63	0.37	120	22.06	0.16	1.33	1.33	0.42	0.42	0.91	0.91
309.5	22.309	8.93	0.34	120	22.23	0.16	1.34	1.34	0.42	0.42	0.91	0.91

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σv CPT (tsf)	Total Vertical Stress during EQ σv EQ (tsf)	Static Pore Water Pressure during CPT us CPT (tsf)	Static Pore Water Pressure during EQ us EQ (tsf)	Effective Vertical Stress during CPT σv CPT (tsf)	Effective Vertical Stress during EQ σv EQ (tsf)
309.3	22.473	8.93	0.33	120	22.39	0.16	1.35	1.35	0.43	0.43	0.92	0.92
309.2	22.638	13.79	0.51	120	22.56	0.16	1.36	1.36	0.43	0.43	0.92	0.92
309.0	22.802	11.45	0.35	120	22.72	0.16	1.37	1.37	0.44	0.44	0.93	0.93
308.8	22.966	7.20	0.24	120	22.88	0.16	1.38	1.38	0.45	0.45	0.93	0.93
308.7	23.130	6.99	0.13	120	23.05	0.16	1.39	1.39	0.45	0.45	0.94	0.94
308.5	23.294	6.99	0.10	120	23.21	0.16	1.40	1.40	0.46	0.46	0.94	0.94
308.3	23.458	7.10	0.09	120	23.38	0.16	1.41	1.41	0.46	0.46	0.95	0.95
308.2	23.622	7.16	0.07	120	23.54	0.16	1.42	1.42	0.47	0.47	0.95	0.95
308.0	23.786	7.38	0.08	120	23.70	0.16	1.43	1.43	0.47	0.47	0.96	0.96
307.9	23.950	8.05	0.08	120	23.87	0.16	1.44	1.44	0.48	0.48	0.96	0.96
307.7	24.114	7.28	0.09	120	24.03	0.16	1.45	1.45	0.48	0.48	0.97	0.97
307.5	24.278	7.60	0.09	120	24.20	0.16	1.46	1.46	0.49	0.49	0.97	0.97
307.4	24.442	7.19	0.09	120	24.36	0.16	1.47	1.47	0.49	0.49	0.98	0.98
307.2	24.606	7.30	0.09	120	24.52	0.16	1.48	1.48	0.50	0.50	0.98	0.98
307.0	24.770	7.37	0.09	120	24.69	0.16	1.49	1.49	0.50	0.50	0.98	0.98
306.9	24.934	7.31	0.11	120	24.85	0.16	1.50	1.50	0.51	0.51	0.99	0.99
306.7	25.098	7.73	0.11	120	25.02	0.16	1.51	1.51	0.51	0.51	0.99	0.99
306.5	25.262	7.73	0.12	120	25.18	0.16	1.52	1.52	0.52	0.52	1.00	1.00
306.4	25.426	7.62	0.10	120	25.34	0.16	1.53	1.53	0.52	0.52	1.00	1.00
306.2	25.590	8.04	0.10	120	25.51	0.16	1.54	1.54	0.53	0.53	1.01	1.01
306.0	25.754	7.62	0.11	120	25.67	0.16	1.55	1.55	0.53	0.53	1.01	1.01
305.9	25.918	7.34	0.12	120	25.84	0.16	1.56	1.56	0.54	0.54	1.02	1.02
305.7	26.082	7.22	0.10	120	26.00	0.16	1.56	1.56	0.54	0.54	1.02	1.02
305.6	26.246	8.40	0.15	120	26.16	0.16	1.57	1.57	0.55	0.55	1.03	1.03
305.4	26.410	7.81	0.18	120	26.33	0.16	1.58	1.58	0.55	0.55	1.03	1.03
305.2	26.574	8.08	0.20	120	26.49	0.16	1.59	1.59	0.56	0.56	1.04	1.04
305.1	26.739	8.32	0.11	120	26.66	0.16	1.60	1.60	0.56	0.56	1.04	1.04
304.9	26.903	16.65	0.24	120	26.82	0.16	1.61	1.61	0.57	0.57	1.05	1.05
304.7	27.067	26.03	0.43	120	26.98	0.16	1.62	1.62	0.57	0.57	1.05	1.05
304.6	27.231	14.57	0.61	120	27.15	0.16	1.63	1.63	0.58	0.58	1.06	1.06
304.4	27.395	19.83	0.68	120	27.31	0.16	1.64	1.64	0.58	0.58	1.06	1.06
304.2	27.559	12.71	0.42	120	27.48	0.16	1.65	1.65	0.59	0.59	1.07	1.07
304.1	27.723	9.36	0.25	120	27.64	0.16	1.66	1.66	0.59	0.59	1.07	1.07
303.9	27.887	9.35	0.12	120	27.80	0.16	1.67	1.67	0.60	0.60	1.07	1.07
303.7	28.051	13.21	0.16	120	27.97	0.16	1.68	1.68	0.60	0.60	1.08	1.08
303.6	28.215	9.70	0.19	120	28.13	0.16	1.69	1.69	0.61	0.61	1.08	1.08
303.4	28.379	8.34	0.22	120	28.30	0.16	1.70	1.70	0.61	0.61	1.09	1.09
303.3	28.543	8.74	0.09	120	28.46	0.16	1.71	1.71	0.62	0.62	1.09	1.09
303.1	28.707	8.54	0.09	120	28.62	0.16	1.72	1.72	0.62	0.62	1.10	1.10
302.9	28.871	8.17	0.11	120	28.79	0.16	1.73	1.73	0.63	0.63	1.10	1.10
302.8	29.035	8.24	0.09	120	28.95	0.16	1.74	1.74	0.63	0.63	1.11	1.11
302.6	29.199	8.54	0.11	120	29.12	0.16	1.75	1.75	0.64	0.64	1.11	1.11
302.4	29.363	8.97	0.12	120	29.28	0.16	1.76	1.76	0.64	0.64	1.12	1.12
302.3	29.527	8.84	0.12	120	29.45	0.16	1.77	1.77	0.65	0.65	1.12	1.12
302.1	29.691	8.53	0.11	120	29.61	0.16	1.78	1.78	0.65	0.65	1.13	1.13
301.9	29.855	8.82	0.11	120	29.77	0.16	1.79	1.79	0.66	0.66	1.13	1.13
301.8	30.019	8.70	0.09	120	29.94	0.16	1.80	1.80	0.67	0.67	1.14	1.14
301.6	30.183	11.98	0.15	120	30.10	0.16	1.81	1.81	0.67	0.67	1.14	1.14
301.5	30.347	11.99	0.18	120	30.27	0.16	1.82	1.82	0.68	0.68	1.15	1.15
301.3	30.511	9.02	0.18	120	30.43	0.16	1.83	1.83	0.68	0.68	1.15	1.15
301.1	30.675	9.12	0.09	120	30.59	0.16	1.84	1.84	0.69	0.69	1.15	1.15
301.0	30.840	9.69	0.09	120	30.76	0.16	1.85	1.85	0.69	0.69	1.16	1.16
300.8	31.004	9.32	0.11	120	30.92	0.16	1.86	1.86	0.70	0.70	1.16	1.16
300.6	31.168	9.29	0.12	120	31.09	0.16	1.87	1.87	0.70	0.70	1.17	1.17
300.5	31.332	9.46	0.11	120	31.25	0.16	1.88	1.88	0.71	0.71	1.17	1.17
300.3	31.496	9.37	0.11	120	31.41	0.16	1.89	1.89	0.71	0.71	1.18	1.18
300.1	31.660	9.17	0.14	120	31.58	0.16	1.90	1.90	0.72	0.72	1.18	1.18
300.0	31.824	10.40	0.08	120	31.74	0.16	1.91	1.91	0.72	0.72	1.19	1.19
299.8	31.988	13.64	0.28	120	31.91	0.16	1.92	1.92	0.73	0.73	1.19	1.19
299.6	32.152	14.46	0.31	120	32.07	0.16	1.93	1.93	0.73	0.73	1.20	1.20
299.5	32.316	9.72	0.27	120	32.23	0.16	1.94	1.94	0.74	0.74	1.20	1.20
299.3	32.480	9.48	0.13	120	32.40	0.16	1.95	1.95	0.74	0.74	1.21	1.21
299.2	32.644	10.30	0.09	120	32.56	0.16	1.96	1.96	0.75	0.75	1.21	1.21
299.0	32.808	9.58	0.08	120	32.73	0.16	1.97	1.97	0.75	0.75	1.22	1.22
298.8	32.972	9.20	0.09	120	32.89	0.16	1.98	1.98	0.76	0.76	1.22	1.22
298.7	33.136	9.60	0.09	120	33.05	0.16	1.99	1.99	0.76	0.76	1.23	1.23
298.5	33.300	9.46	0.09	120	33.22	0.16	2.00	2.00	0.77	0.77	1.23	1.23
298.3	33.464	9.54	0.10	120	33.38	0.16	2.01	2.01	0.77	0.77	1.24	1.24
298.2	33.628	10.07	0.10	120	33.55	0.16	2.02	2.02	0.78	0.78	1.24	1.24
298.0	33.792	9.84	0.12	120	33.71	0.16	2.03	2.03	0.78	0.78	1.24	1.24
297.8	33.956	9.62	0.12	120	33.87	0.16	2.04	2.04	0.79	0.79	1.25	1.25
297.7	34.120	9.81	0.12	120	34.04	0.16	2.05	2.05	0.79	0.79	1.25	1.25
297.5	34.284	9.83	0.12	120	34.20	0.16	2.06	2.06	0.80	0.80	1.26	1.26
297.4	34.448	9.89	0.11	120	34.37	0.16	2.07	2.07	0.80	0.80	1.26	1.26

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σv CPT (tsf)	Total Vertical Stress during EQ σv EQ (tsf)	Static Pore Water Pressure during CPT us CPT (tsf)	Static Pore Water Pressure during EQ us EQ (tsf)	Effective Vertical Stress during CPT σv CPT (tsf)	Effective Vertical Stress during EQ σv EQ (tsf)
297.2	34.612	9.33	0.10	120	34.53	0.16	2.08	2.08	0.81	0.81	1.27	1.27
297.0	34.776	9.12	0.08	120	34.69	0.16	2.09	2.09	0.81	0.81	1.27	1.27
296.9	34.941	9.18	0.10	120	34.86	0.16	2.10	2.10	0.82	0.82	1.28	1.28
296.7	35.105	10.27	0.19	120	35.02	0.16	2.11	2.11	0.82	0.82	1.28	1.28
296.5	35.269	32.14	0.54	120	35.19	0.16	2.12	2.12	0.83	0.83	1.29	1.29
296.4	35.433	16.62	0.50	120	35.35	0.16	2.13	2.13	0.83	0.83	1.29	1.29
296.2	35.597	14.84	0.46	120	35.51	0.16	2.14	2.14	0.84	0.84	1.30	1.30
296.0	35.761	32.08	0.53	120	35.68	0.16	2.15	2.15	0.84	0.84	1.30	1.30
295.9	35.925	16.97	0.48	120	35.84	0.16	2.16	2.16	0.85	0.85	1.31	1.31
295.7	36.089	10.85	0.40	120	36.01	0.16	2.17	2.17	0.85	0.85	1.31	1.31
295.5	36.253	10.77	0.18	120	36.17	0.16	2.18	2.18	0.86	0.86	1.32	1.32
295.4	36.417	11.32	0.15	120	36.33	0.16	2.19	2.19	0.86	0.86	1.32	1.32
295.2	36.581	10.93	0.14	120	36.50	0.16	2.19	2.19	0.87	0.87	1.32	1.32
295.1	36.745	10.90	0.13	120	36.66	0.16	2.20	2.20	0.88	0.88	1.33	1.33
294.9	36.909	11.08	0.12	120	36.83	0.16	2.21	2.21	0.88	0.88	1.33	1.33
294.7	37.073	10.95	0.12	120	36.99	0.16	2.22	2.22	0.89	0.89	1.34	1.34
294.6	37.237	11.05	0.12	120	37.16	0.16	2.23	2.23	0.89	0.89	1.34	1.34
294.4	37.401	11.30	0.14	120	37.32	0.16	2.24	2.24	0.90	0.90	1.35	1.35
294.2	37.565	11.44	0.13	120	37.48	0.16	2.25	2.25	0.90	0.90	1.35	1.35
294.1	37.729	11.63	0.13	120	37.65	0.16	2.26	2.26	0.91	0.91	1.36	1.36
293.9	37.893	11.13	0.14	120	37.81	0.16	2.27	2.27	0.91	0.91	1.36	1.36
293.7	38.057	11.33	0.14	120	37.98	0.16	2.28	2.28	0.92	0.92	1.37	1.37
293.6	38.221	11.95	0.12	120	38.14	0.16	2.29	2.29	0.92	0.92	1.37	1.37
293.4	38.385	12.11	0.10	120	38.30	0.16	2.30	2.30	0.93	0.93	1.38	1.38
293.3	38.549	11.27	0.08	120	38.47	0.16	2.31	2.31	0.93	0.93	1.38	1.38
293.1	38.713	11.33	0.06	120	38.63	0.16	2.32	2.32	0.94	0.94	1.39	1.39
292.9	38.877	11.14	0.06	120	38.80	0.16	2.33	2.33	0.94	0.94	1.39	1.39
292.8	39.042	11.22	0.08	120	38.96	0.16	2.34	2.34	0.95	0.95	1.40	1.40
292.6	39.206	11.13	0.08	120	39.12	0.16	2.35	2.35	0.95	0.95	1.40	1.40
292.4	39.370	11.12	0.10	120	39.29	0.16	2.36	2.36	0.96	0.96	1.41	1.41
292.3	39.534	11.67	0.11	120	39.45	0.16	2.37	2.37	0.96	0.96	1.41	1.41
292.1	39.698	11.50	0.11	120	39.62	0.16	2.38	2.38	0.97	0.97	1.41	1.41
291.9	39.862	11.39	0.10	120	39.78	0.16	2.39	2.39	0.97	0.97	1.42	1.42
291.8	40.026	10.99	0.08	120	39.94	0.16	2.40	2.40	0.98	0.98	1.42	1.42
291.6	40.190	11.01	0.10	120	40.11	0.16	2.41	2.41	0.98	0.98	1.43	1.43
291.4	40.354	11.64	0.10	120	40.27	0.16	2.42	2.42	0.99	0.99	1.43	1.43
291.3	40.518	11.92	0.12	120	40.44	0.16	2.43	2.43	0.99	0.99	1.44	1.44
291.1	40.682	11.44	0.12	120	40.60	0.16	2.44	2.44	1.00	1.00	1.44	1.44
291.0	40.846	11.44	0.13	120	40.76	0.16	2.45	2.45	1.00	1.00	1.45	1.45
290.8	41.010	11.80	0.11	120	40.93	0.16	2.46	2.46	1.01	1.01	1.45	1.45
290.6	41.174	11.78	0.13	120	41.09	0.16	2.47	2.47	1.01	1.01	1.46	1.46
290.5	41.338	12.37	0.21	120	41.26	0.16	2.48	2.48	1.02	1.02	1.46	1.46
290.3	41.502	14.69	0.23	120	41.42	0.16	2.49	2.49	1.02	1.02	1.47	1.47
290.1	41.666	11.12	0.22	120	41.58	0.16	2.50	2.50	1.03	1.03	1.47	1.47
290.0	41.830	10.82	0.12	120	41.75	0.16	2.51	2.51	1.03	1.03	1.48	1.48
289.8	41.994	11.39	0.08	120	41.91	0.16	2.52	2.52	1.04	1.04	1.48	1.48
289.6	42.158	10.92	0.09	120	42.08	0.16	2.53	2.53	1.04	1.04	1.49	1.49
289.5	42.322	10.91	0.10	120	42.24	0.16	2.54	2.54	1.05	1.05	1.49	1.49
289.3	42.486	11.25	0.10	120	42.40	0.16	2.55	2.55	1.05	1.05	1.50	1.50
289.1	42.650	11.38	0.13	120	42.57	0.16	2.56	2.56	1.06	1.06	1.50	1.50
289.0	42.814	11.38	0.10	120	42.73	0.16	2.57	2.57	1.06	1.06	1.50	1.50
288.8	42.978	14.68	0.29	120	42.90	0.16	2.58	2.58	1.07	1.07	1.51	1.51
288.7	43.143	17.67	0.28	120	43.06	0.16	2.59	2.59	1.07	1.07	1.51	1.51
288.5	43.307	16.33	0.32	120	43.22	0.16	2.60	2.60	1.08	1.08	1.52	1.52
288.3	43.471	11.91	0.26	120	43.39	0.16	2.61	2.61	1.08	1.08	1.52	1.52
288.2	43.635	11.46	0.21	120	43.55	0.16	2.62	2.62	1.09	1.09	1.53	1.53
288.0	43.799	11.56	0.11	120	43.72	0.16	2.63	2.63	1.10	1.10	1.53	1.53
287.8	43.963	10.76	0.11	120	43.88	0.16	2.64	2.64	1.10	1.10	1.54	1.54
287.7	44.127	10.74	0.11	120	44.04	0.16	2.65	2.65	1.11	1.11	1.54	1.54
287.5	44.291	11.22	0.10	120	44.21	0.16	2.66	2.66	1.11	1.11	1.55	1.55
287.3	44.455	11.46	0.12	120	44.37	0.16	2.67	2.67	1.12	1.12	1.55	1.55
287.2	44.619	12.20	0.16	120	44.54	0.16	2.68	2.68	1.12	1.12	1.56	1.56
287.0	44.783	11.87	0.17	120	44.70	0.16	2.69	2.69	1.13	1.13	1.56	1.56
286.9	44.947	12.55	0.19	120	44.86	0.16	2.70	2.70	1.13	1.13	1.57	1.57
286.7	45.111	11.98	0.18	120	45.03	0.16	2.71	2.71	1.14	1.14	1.57	1.57
286.5	45.275	14.41	0.21	120	45.19	0.16	2.72	2.72	1.14	1.14	1.58	1.58
286.4	45.439	12.45	0.19	120	45.36	0.16	2.73	2.73	1.15	1.15	1.58	1.58
286.2	45.603	12.69	0.22	120	45.52	0.16	2.74	2.74	1.15	1.15	1.58	1.58
286.0	45.767	12.04	0.18	120	45.69	0.16	2.75	2.75	1.16	1.16	1.59	1.59
285.9	45.931	11.88	0.16	120	45.85	0.16	2.76	2.76	1.16	1.16	1.59	1.59
285.7	46.095	11.43	0.12	120	46.01	0.16	2.77	2.77	1.17	1.17	1.60	1.60
285.5	46.259	11.79	0.12	120	46.18	0.16	2.78	2.78	1.17	1.17	1.60	1.60
285.4	46.423	11.72	0.12	120	46.34	0.16	2.79	2.79	1.18	1.18	1.61	1.61
285.2	46.587	12.02	0.12	120	46.51	0.16	2.80	2.80	1.18	1.18	1.61	1.61

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σv CPT (tsf)	Total Vertical Stress during EQ σv EQ (tsf)	Static Pore Water Pressure during CPT us CPT (tsf)	Static Pore Water Pressure during EQ us EQ (tsf)	Effective Vertical Stress during CPT σv CPT (tsf)	Effective Vertical Stress during EQ σv EQ (tsf)
285.0	46.751	12.22	0.11	120	46.67	0.16	2.81	2.81	1.19	1.19	1.62	1.62
284.9	46.915	12.56	0.12	120	46.83	0.16	2.81	2.81	1.19	1.19	1.62	1.62
284.7	47.079	11.99	0.14	120	47.00	0.16	2.82	2.82	1.20	1.20	1.63	1.63
284.6	47.244	12.32	0.16	120	47.16	0.16	2.83	2.83	1.20	1.20	1.63	1.63
284.4	47.408	11.97	0.15	120	47.33	0.16	2.84	2.84	1.21	1.21	1.64	1.64
284.2	47.572	12.18	0.15	120	47.49	0.16	2.85	2.85	1.21	1.21	1.64	1.64
284.1	47.736	12.22	0.13	120	47.65	0.16	2.86	2.86	1.22	1.22	1.65	1.65
283.9	47.900	12.39	0.12	120	47.82	0.16	2.87	2.87	1.22	1.22	1.65	1.65
283.7	48.064	12.03	0.12	120	47.98	0.16	2.88	2.88	1.23	1.23	1.66	1.66
283.6	48.228	12.89	0.12	120	48.15	0.16	2.89	2.89	1.23	1.23	1.66	1.66
283.4	48.392	11.71	0.12	120	48.31	0.16	2.90	2.90	1.24	1.24	1.67	1.67
283.2	48.556	12.01	0.13	120	48.47	0.16	2.91	2.91	1.24	1.24	1.67	1.67
283.1	48.720	11.93	0.11	120	48.64	0.16	2.92	2.92	1.25	1.25	1.67	1.67
282.9	48.884	11.93	0.10	120	48.80	0.16	2.93	2.93	1.25	1.25	1.68	1.68
282.8	49.048	11.85	0.11	120	48.97	0.16	2.94	2.94	1.26	1.26	1.68	1.68
282.6	49.212	11.57	0.10	120	49.13	0.16	2.95	2.95	1.26	1.26	1.69	1.69
282.4	49.376	12.04	0.12	120	49.29	0.16	2.96	2.96	1.27	1.27	1.69	1.69
282.3	49.540	12.53	0.15	120	49.46	0.16	2.97	2.97	1.27	1.27	1.70	1.70
282.1	49.704	12.14	0.17	120	49.62	0.16	2.98	2.98	1.28	1.28	1.70	1.70
281.9	49.868	12.45	0.18	120	49.79	0.16	2.99	2.99	1.28	1.28	1.71	1.71
281.8	50.032	12.43	0.14	120	49.95	0.16	3.00	3.00	1.29	1.29	1.71	1.71
281.6	50.196	12.42	0.13	120	50.11	0.16	3.01	3.01	1.29	1.29	1.72	1.72
281.4	50.360	12.17	0.13	120	50.28	0.16	3.02	3.02	1.30	1.30	1.72	1.72
281.3	50.524	12.26	0.13	120	50.44	0.16	3.03	3.03	1.30	1.30	1.73	1.73
281.1	50.688	12.21	0.13	120	50.61	0.16	3.04	3.04	1.31	1.31	1.73	1.73
280.9	50.852	12.28	0.11	120	50.77	0.16	3.05	3.05	1.32	1.32	1.74	1.74
280.8	51.016	12.16	0.11	120	50.93	0.16	3.06	3.06	1.32	1.32	1.74	1.74
280.6	51.180	12.18	0.13	120	51.10	0.16	3.07	3.07	1.33	1.33	1.75	1.75
280.5	51.345	13.77	0.13	120	51.26	0.16	3.08	3.08	1.33	1.33	1.75	1.75
280.3	51.509	25.77	0.32	120	51.43	0.16	3.09	3.09	1.34	1.34	1.75	1.75
280.1	51.673	21.89	0.33	120	51.59	0.16	3.10	3.10	1.34	1.34	1.76	1.76
280.0	51.837	16.78	0.38	120	51.75	0.16	3.11	3.11	1.35	1.35	1.76	1.76
279.8	52.001	15.07	0.23	120	51.92	0.16	3.12	3.12	1.35	1.35	1.77	1.77
279.6	52.165	14.98	0.62	120	52.08	0.16	3.13	3.13	1.36	1.36	1.77	1.77
279.5	52.329	24.21	0.62	120	52.25	0.16	3.14	3.14	1.36	1.36	1.78	1.78
279.3	52.493	15.72	0.48	120	52.41	0.16	3.15	3.15	1.37	1.37	1.78	1.78
279.1	52.657	13.68	0.31	120	52.57	0.16	3.16	3.16	1.37	1.37	1.79	1.79
279.0	52.821	14.11	0.23	120	52.74	0.16	3.17	3.17	1.38	1.38	1.79	1.79
278.8	52.985	14.18	0.21	120	52.90	0.16	3.18	3.18	1.38	1.38	1.80	1.80
278.7	53.149	14.90	0.23	120	53.07	0.16	3.19	3.19	1.39	1.39	1.80	1.80
278.5	53.313	13.18	0.20	120	53.23	0.16	3.20	3.20	1.39	1.39	1.81	1.81
278.3	53.477	13.82	0.18	120	53.40	0.16	3.21	3.21	1.40	1.40	1.81	1.81
278.2	53.641	13.40	0.17	120	53.56	0.16	3.22	3.22	1.40	1.40	1.82	1.82
278.0	53.805	13.05	0.18	120	53.72	0.16	3.23	3.23	1.41	1.41	1.82	1.82
277.8	53.969	13.25	0.16	120	53.89	0.16	3.24	3.24	1.41	1.41	1.83	1.83
277.7	54.133	13.24	0.15	120	54.05	0.16	3.25	3.25	1.42	1.42	1.83	1.83
277.5	54.297	12.99	0.15	120	54.22	0.16	3.26	3.26	1.42	1.42	1.84	1.84
277.3	54.461	13.00	0.14	120	54.38	0.16	3.27	3.27	1.43	1.43	1.84	1.84
277.2	54.625	13.22	0.14	120	54.54	0.16	3.28	3.28	1.43	1.43	1.84	1.84
277.0	54.789	13.11	0.14	120	54.71	0.16	3.29	3.29	1.44	1.44	1.85	1.85
276.8	54.953	13.56	0.17	120	54.87	0.16	3.30	3.30	1.44	1.44	1.85	1.85
276.7	55.117	13.50	0.17	120	55.04	0.16	3.31	3.31	1.45	1.45	1.86	1.86
276.5	55.281	13.37	0.17	120	55.20	0.16	3.32	3.32	1.45	1.45	1.86	1.86
276.4	55.446	13.81	0.16	120	55.36	0.16	3.33	3.33	1.46	1.46	1.87	1.87
276.2	55.610	13.92	0.17	120	55.53	0.16	3.34	3.34	1.46	1.46	1.87	1.87
276.0	55.774	13.80	0.23	120	55.69	0.16	3.35	3.35	1.47	1.47	1.88	1.88
275.9	55.938	13.69	0.19	120	55.86	0.16	3.36	3.36	1.47	1.47	1.88	1.88
275.7	56.102	13.41	0.18	120	56.02	0.16	3.37	3.37	1.48	1.48	1.89	1.89
275.5	56.266	13.57	0.14	120	56.18	0.16	3.38	3.38	1.48	1.48	1.89	1.89
275.4	56.430	13.79	0.14	120	56.35	0.16	3.39	3.39	1.49	1.49	1.90	1.90
275.2	56.594	13.11	0.14	120	56.51	0.16	3.40	3.40	1.49	1.49	1.90	1.90
275.0	56.758	12.90	0.14	120	56.68	0.16	3.41	3.41	1.50	1.50	1.91	1.91
274.9	56.922	12.78	0.13	120	56.84	0.16	3.42	3.42	1.50	1.50	1.91	1.91
274.7	57.086	12.92	0.13	120	57.00	0.16	3.43	3.43	1.51	1.51	1.92	1.92
274.6	57.250	13.01	0.12	120	57.17	0.16	3.43	3.43	1.51	1.51	1.92	1.92
274.4	57.414	13.80	0.12	120	57.33	0.16	3.44	3.44	1.52	1.52	1.92	1.92
274.2	57.578	13.22	0.13	120	57.50	0.16	3.45	3.45	1.52	1.52	1.93	1.93
274.1	57.742	13.66	0.16	120	57.66	0.16	3.46	3.46	1.53	1.53	1.93	1.93
273.9	57.906	15.05	0.17	120	57.82	0.16	3.47	3.47	1.54	1.54	1.94	1.94
273.7	58.070	13.31	0.17	120	57.99	0.16	3.48	3.48	1.54	1.54	1.94	1.94
273.6	58.234	13.35	0.15	120	58.15	0.16	3.49	3.49	1.55	1.55	1.95	1.95
273.4	58.398	14.23	0.14	120	58.32	0.16	3.50	3.50	1.55	1.55	1.95	1.95
273.2	58.562	14.05	0.15	120	58.48	0.16	3.51	3.51	1.56	1.56	1.96	1.96
273.1	58.726	14.10	0.16	120	58.64	0.16	3.52	3.52	1.56	1.56	1.96	1.96

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σv CPT (tsf)	Total Vertical Stress during EQ σv EQ (tsf)	Static Pore Water Pressure during CPT us CPT (tsf)	Static Pore Water Pressure during EQ us EQ (tsf)	Effective Vertical Stress during CPT σv CPT (tsf)	Effective Vertical Stress during EQ σv EQ (tsf)
272.9	58.890	13.93	0.15	120	58.81	0.16	3.53	3.53	1.57	1.57	1.97	1.97
272.7	59.054	14.11	0.24	120	58.97	0.16	3.54	3.54	1.57	1.57	1.97	1.97
272.6	59.218	21.98	0.40	120	59.14	0.16	3.55	3.55	1.58	1.58	1.98	1.98
272.4	59.382	114.40	0.78	120	59.30	0.16	3.56	3.56	1.58	1.58	1.98	1.98
272.3	59.547	128.51	1.15	120	59.46	0.16	3.57	3.57	1.59	1.59	1.99	1.99
272.1	59.711	142.43	1.13	120	59.63	0.16	3.58	3.58	1.59	1.59	1.99	1.99
271.9	59.875	146.62	1.14	120	59.79	0.16	3.59	3.59	1.60	1.60	2.00	2.00
271.8	60.039	142.07	1.58	120	59.96	0.16	3.60	3.60	1.60	1.60	2.00	2.00
271.6	60.203	99.26	1.96	120	60.12	0.16	3.61	3.61	1.61	1.61	2.01	2.01
271.4	60.367	44.28	2.11	120	60.28	0.16	3.62	3.62	1.61	1.61	2.01	2.01
271.3	60.531	28.37	1.48	120	60.45	0.16	3.63	3.63	1.62	1.62	2.01	2.01
271.1	60.695	17.34	1.01	120	60.61	0.16	3.64	3.64	1.62	1.62	2.02	2.02
270.9	60.859	19.29	0.38	120	60.78	0.16	3.65	3.65	1.63	1.63	2.02	2.02
270.8	61.023	17.23	0.27	120	60.94	0.16	3.66	3.66	1.63	1.63	2.03	2.03
270.6	61.187	16.07	0.25	120	61.10	0.16	3.67	3.67	1.64	1.64	2.03	2.03
270.4	61.351	14.86	0.20	120	61.27	0.16	3.68	3.68	1.64	1.64	2.04	2.04
270.3	61.515	14.55	0.16	120	61.43	0.16	3.69	3.69	1.65	1.65	2.04	2.04
270.1	61.679	14.61	0.15	120	61.60	0.16	3.70	3.70	1.65	1.65	2.05	2.05
270.0	61.843	14.91	0.14	120	61.76	0.16	3.71	3.71	1.66	1.66	2.05	2.05
269.8	62.007	15.84	0.13	120	61.93	0.16	3.72	3.72	1.66	1.66	2.06	2.06
269.6	62.171	15.46	0.14	120	62.09	0.16	3.73	3.73	1.67	1.67	2.06	2.06
269.5	62.335	15.21	0.17	120	62.25	0.16	3.74	3.74	1.67	1.67	2.07	2.07
269.3	62.499	15.29	0.16	120	62.42	0.16	3.75	3.75	1.68	1.68	2.07	2.07
269.1	62.663	15.52	0.13	120	62.58	0.16	3.76	3.76	1.68	1.68	2.08	2.08
269.0	62.827	15.15	0.14	120	62.75	0.16	3.77	3.77	1.69	1.69	2.08	2.08
268.8	62.991	14.84	0.14	120	62.91	0.16	3.78	3.78	1.69	1.69	2.09	2.09
268.6	63.155	15.40	0.14	120	63.07	0.16	3.79	3.79	1.70	1.70	2.09	2.09
268.5	63.319	15.51	0.13	120	63.24	0.16	3.80	3.80	1.70	1.70	2.10	2.10
268.3	63.483	14.88	0.13	120	63.40	0.16	3.81	3.81	1.71	1.71	2.10	2.10
268.2	63.648	15.37	0.13	120	63.57	0.16	3.82	3.82	1.71	1.71	2.10	2.10
268.0	63.812	15.25	0.14	120	63.73	0.16	3.83	3.83	1.72	1.72	2.11	2.11
267.8	63.976	15.35	0.14	120	63.89	0.16	3.84	3.84	1.72	1.72	2.11	2.11
267.7	64.140	15.77	0.15	120	64.06	0.16	3.85	3.85	1.73	1.73	2.12	2.12
267.5	64.304	15.36	0.16	120	64.22	0.16	3.86	3.86	1.73	1.73	2.12	2.12
267.3	64.468	15.16	0.17	120	64.39	0.16	3.87	3.87	1.74	1.74	2.13	2.13
267.2	64.632	15.24	0.15	120	64.55	0.16	3.88	3.88	1.75	1.75	2.13	2.13
267.0	64.796	15.47	0.14	120	64.71	0.16	3.89	3.89	1.75	1.75	2.14	2.14
266.8	64.960	16.04	0.18	120	64.88	0.16	3.90	3.90	1.76	1.76	2.14	2.14
266.7	65.124	15.77	0.21	120	65.04	0.16	3.91	3.91	1.76	1.76	2.15	2.15
266.5	65.288	15.52	0.22	120	65.21	0.16	3.92	3.92	1.77	1.77	2.15	2.15
266.3	65.452	15.97	0.20	120	65.37	0.16	3.93	3.93	1.77	1.77	2.16	2.16
266.2	65.616	15.69	0.22	120	65.53	0.16	3.94	3.94	1.78	1.78	2.16	2.16
266.0	65.780	15.75	0.22	120	65.70	0.16	3.95	3.95	1.78	1.78	2.17	2.17
265.9	65.944	15.64	0.19	120	65.86	0.16	3.96	3.96	1.79	1.79	2.17	2.17
265.7	66.108	15.72	0.16	120	66.03	0.16	3.97	3.97	1.79	1.79	2.18	2.18
265.5	66.272	15.35	0.16	120	66.19	0.16	3.98	3.98	1.80	1.80	2.18	2.18
265.4	66.436	15.46	0.17	120	66.35	0.16	3.99	3.99	1.80	1.80	2.18	2.18
265.2	66.600	15.54	0.17	120	66.52	0.16	4.00	4.00	1.81	1.81	2.19	2.19
265.0	66.764	15.31	0.16	120	66.68	0.16	4.01	4.01	1.81	1.81	2.19	2.19
264.9	66.928	15.60	0.17	120	66.85	0.16	4.02	4.02	1.82	1.82	2.20	2.20
264.7	67.092	16.07	0.20	120	67.01	0.16	4.03	4.03	1.82	1.82	2.20	2.20
264.5	67.256	15.61	0.20	120	67.17	0.16	4.04	4.04	1.83	1.83	2.21	2.21
264.4	67.420	16.08	0.21	120	67.34	0.16	4.05	4.05	1.83	1.83	2.21	2.21
264.2	67.584	16.13	0.18	120	67.50	0.16	4.06	4.06	1.84	1.84	2.22	2.22
264.1	67.749	15.79	0.19	120	67.67	0.16	4.06	4.06	1.84	1.84	2.22	2.22
263.9	67.913	15.76	0.18	120	67.83	0.16	4.07	4.07	1.85	1.85	2.23	2.23
263.7	68.077	16.01	0.18	120	67.99	0.16	4.08	4.08	1.85	1.85	2.23	2.23
263.6	68.241	16.23	0.16	120	68.16	0.16	4.09	4.09	1.86	1.86	2.24	2.24
263.4	68.405	16.55	0.17	120	68.32	0.16	4.10	4.10	1.86	1.86	2.24	2.24
263.2	68.569	16.32	0.17	120	68.49	0.16	4.11	4.11	1.87	1.87	2.25	2.25
263.1	68.733	16.12	0.18	120	68.65	0.16	4.12	4.12	1.87	1.87	2.25	2.25
262.9	68.897	16.31	0.23	120	68.81	0.16	4.13	4.13	1.88	1.88	2.26	2.26
262.7	69.061	15.74	0.23	120	68.98	0.16	4.14	4.14	1.88	1.88	2.26	2.26
262.6	69.225	17.69	0.30	120	69.14	0.16	4.15	4.15	1.89	1.89	2.27	2.27
262.4	69.389	17.13	0.14	120	69.31	0.16	4.16	4.16	1.89	1.89	2.27	2.27
262.2	69.553	74.01	0.69	120	69.47	0.16	4.17	4.17	1.90	1.90	2.27	2.27
262.1	69.717	60.70	1.24	120	69.63	0.16	4.18	4.18	1.90	1.90	2.28	2.28
261.9	69.881	31.26	1.15	120	69.80	0.16	4.19	4.19	1.91	1.91	2.28	2.28
261.8	70.045	18.56	0.87	120	69.96	0.16	4.20	4.20	1.91	1.91	2.29	2.29
261.6	70.209	18.35	0.40	120	70.13	0.16	4.21	4.21	1.92	1.92	2.29	2.29
261.4	70.373	19.11	0.21	120	70.29	0.16	4.22	4.22	1.92	1.92	2.30	2.30
261.3	70.537	18.47	0.16	120	70.46	0.16	4.23	4.23	1.93	1.93	2.30	2.30
261.1	70.701	17.28	0.14	120	70.62	0.16	4.24	4.24	1.93	1.93	2.31	2.31
260.9	70.865	16.81	0.11	120	70.78	0.16	4.25	4.25	1.94	1.94	2.31	2.31

Elev.	Depth	Cone Tip	Sleeve	Unit Weight	Top of	Thickness of	Total Vertical	Total Vertical	Static Pore Water	Static Pore Water	Effective Vertical	Effective Vertical
(ft)	z	Resistance	Friction	(pcf)	Sampling	Sampling	Stress	Stress	Pressure	Pressure	Stress	Stress
	(ft)	qt	f _s		Interval	Interval	during CPT	during EQ	during CPT	during EQ	during CPT	during EQ
		(tsf)	(tsf)		(ft)	(ft)	σ _{V CPT}	σ _{V EQ}	u _{S CPT}	u _{S EQ}	σ _{V CPT}	σ _{V EQ}
		(tsf)	(tsf)				(tsf)	(tsf)	(tsf)	(tsf)	(tsf)	(tsf)
260.8	71.029	17.18	0.08	120	70.95	0.16	4.26	4.26	1.94	1.94	2.32	2.32
260.6	71.193	17.18	0.11	120	71.11	0.16	4.27	4.27	1.95	1.95	2.32	2.32
260.4	71.357	16.93	0.13	120	71.28	0.16	4.28	4.28	1.95	1.95	2.33	2.33
260.3	71.521	17.60	0.15	120	71.44	0.16	4.29	4.29	1.96	1.96	2.33	2.33
260.1	71.685	17.20	0.17	120	71.60	0.16	4.30	4.30	1.97	1.97	2.34	2.34
260.0	71.850	16.98	0.17	120	71.77	0.16	4.31	4.31	1.97	1.97	2.34	2.34
259.8	72.014	16.87	0.18	120	71.93	0.16	4.32	4.32	1.98	1.98	2.35	2.35
259.6	72.178	16.20	0.18	120	72.10	0.16	4.33	4.33	1.98	1.98	2.35	2.35
259.5	72.342	15.53	0.18	120	72.26	0.16	4.34	4.34	1.99	1.99	2.35	2.35
259.3	72.506	15.76	0.17	120	72.42	0.16	4.35	4.35	1.99	1.99	2.36	2.36
259.1	72.670	17.11	0.18	120	72.59	0.16	4.36	4.36	2.00	2.00	2.36	2.36
259.0	72.834	17.15	0.18	120	72.75	0.16	4.37	4.37	2.00	2.00	2.37	2.37
258.8	72.998	15.94	0.17	120	72.92	0.16	4.38	4.38	2.01	2.01	2.37	2.37
258.6	73.162	16.60	0.12	120	73.08	0.16	4.39	4.39	2.01	2.01	2.38	2.38
258.5	73.326	16.41	0.10	120	73.24	0.16	4.40	4.40	2.02	2.02	2.38	2.38
258.3	73.490	16.07	0.12	120	73.41	0.16	4.41	4.41	2.02	2.02	2.39	2.39
258.1	73.654	16.55	0.16	120	73.57	0.16	4.42	4.42	2.03	2.03	2.39	2.39
258.0	73.818	16.44	0.25	120	73.74	0.16	4.43	4.43	2.03	2.03	2.40	2.40
257.8	73.982	39.27	0.64	120	73.90	0.16	4.44	4.44	2.04	2.04	2.40	2.40
257.7	74.146	67.65	1.83	120	74.06	0.16	4.45	4.45	2.04	2.04	2.41	2.41
257.5	74.310	41.01	1.48	120	74.23	0.16	4.46	4.46	2.05	2.05	2.41	2.41
257.3	74.474	22.31	0.94	120	74.39	0.16	4.47	4.47	2.05	2.05	2.42	2.42
257.2	74.638	20.09	0.35	120	74.56	0.16	4.48	4.48	2.06	2.06	2.42	2.42
257.0	74.802	18.78	0.17	120	74.72	0.16	4.49	4.49	2.06	2.06	2.43	2.43
256.8	74.966	17.70	0.14	120	74.88	0.16	4.50	4.50	2.07	2.07	2.43	2.43
256.7	75.130	17.34	0.20	120	75.05	0.16	4.51	4.51	2.07	2.07	2.44	2.44
256.5	75.294	19.72	0.18	120	75.21	0.16	4.52	4.52	2.08	2.08	2.44	2.44
256.3	75.458	18.71	0.17	120	75.38	0.16	4.53	4.53	2.08	2.08	2.44	2.44
256.2	75.622	17.74	0.22	120	75.54	0.16	4.54	4.54	2.09	2.09	2.45	2.45
256.0	75.786	22.08	0.26	120	75.70	0.16	4.55	4.55	2.09	2.09	2.45	2.45
255.8	75.951	25.95	0.33	120	75.87	0.16	4.56	4.56	2.10	2.10	2.46	2.46
255.7	76.115	20.13	0.61	120	76.03	0.16	4.57	4.57	2.10	2.10	2.46	2.46
255.5	76.279	55.52	0.89	120	76.20	0.16	4.58	4.58	2.11	2.11	2.47	2.47
255.4	76.443	89.02	1.06	120	76.36	0.16	4.59	4.59	2.11	2.11	2.47	2.47
255.2	76.607	117.34	1.27	120	76.52	0.16	4.60	4.60	2.12	2.12	2.48	2.48
255.0	76.771	122.54	1.64	120	76.69	0.16	4.61	4.61	2.12	2.12	2.48	2.48
254.9	76.935	80.79	1.98	120	76.85	0.16	4.62	4.62	2.13	2.13	2.49	2.49
254.7	77.099	61.13	2.03	120	77.02	0.16	4.63	4.63	2.13	2.13	2.49	2.49
254.5	77.263	53.58	2.27	120	77.18	0.16	4.64	4.64	2.14	2.14	2.50	2.50
254.4	77.427	59.97	1.79	120	77.34	0.16	4.65	4.65	2.14	2.14	2.50	2.50
254.2	77.591	101.09	1.92	120	77.51	0.16	4.66	4.66	2.15	2.15	2.51	2.51
254.0	77.755	79.64	2.55	120	77.67	0.16	4.67	4.67	2.15	2.15	2.51	2.51
253.9	77.919	47.37	2.29	120	77.84	0.16	4.68	4.68	2.16	2.16	2.52	2.52
253.7	78.083	34.15	1.71	120	78.00	0.16	4.68	4.68	2.16	2.16	2.52	2.52
253.6	78.247	81.82	1.14	120	78.17	0.16	4.69	4.69	2.17	2.17	2.52	2.52
253.4	78.411	135.74	1.31	120	78.33	0.16	4.70	4.70	2.17	2.17	2.53	2.53
253.2	78.575	106.09	1.91	120	78.49	0.16	4.71	4.71	2.18	2.18	2.53	2.53
253.1	78.739	55.43	2.20	120	78.66	0.16	4.72	4.72	2.19	2.19	2.54	2.54
252.9	78.903	27.78	1.83	120	78.82	0.16	4.73	4.73	2.19	2.19	2.54	2.54
252.7	79.067	34.76	1.73	120	78.99	0.16	4.74	4.74	2.20	2.20	2.55	2.55
252.6	79.231	34.97	1.26	120	79.15	0.16	4.75	4.75	2.20	2.20	2.55	2.55
252.4	79.395	49.49	1.33	120	79.31	0.16	4.76	4.76	2.21	2.21	2.56	2.56
252.2	79.559	193.50	1.75	120	79.48	0.16	4.77	4.77	2.21	2.21	2.56	2.56
252.1	79.723	153.46	2.63	120	79.64	0.16	4.78	4.78	2.22	2.22	2.57	2.57
251.9	79.887	77.76	3.07	120	79.81	0.16	4.79	4.79	2.22	2.22	2.57	2.57
251.7	80.052	49.57	2.35	120	79.97	0.16	4.80	4.80	2.23	2.23	2.58	2.58
251.6	80.216	100.73	1.84	120	80.13	0.16	4.81	4.81	2.23	2.23	2.58	2.58
251.4	80.380	161.77	1.86	120	80.30	0.16	4.82	4.82	2.24	2.24	2.59	2.59
251.3	80.544	196.66	1.85	120	80.46	0.16	4.83	4.83	2.24	2.24	2.59	2.59
251.1	80.708	189.24	2.02	120	80.63	0.16	4.84	4.84	2.25	2.25	2.60	2.60
250.9	80.872	176.32	1.87	120	80.79	0.16	4.85	4.85	2.25	2.25	2.60	2.60
250.8	81.036	148.41	2.05	120	80.95	0.16	4.86	4.86	2.26	2.26	2.61	2.61
250.6	81.200	97.25	2.03	120	81.12	0.16	4.87	4.87	2.26	2.26	2.61	2.61
250.4	81.364	73.06	2.14	120	81.28	0.16	4.88	4.88	2.27	2.27	2.61	2.61
250.3	81.528	52.08	1.96	120	81.45	0.16	4.89	4.89	2.27	2.27	2.62	2.62
250.1	81.692	26.92	1.50	120	81.61	0.16	4.90	4.90	2.28	2.28	2.62	2.62
249.9	81.856	18.15	0.91	120	81.77	0.16	4.91	4.91	2.28	2.28	2.63	2.63
249.8	82.020	24.08	0.57	120	81.94	0.16	4.92	4.92	2.29	2.29	2.63	2.63
249.6	82.184	85.78	0.73	120	82.10	0.16	4.93	4.93	2.29	2.29	2.64	2.64
249.5	82.348	193.09	1.34	120	82.27	0.16	4.94	4.94	2.30	2.30	2.64	2.64
249.3	82.512	198.50	2.17	120	82.43	0.16	4.95	4.95	2.30	2.30	2.65	2.65
249.1	82.676	136.15	2.71	120	82.59	0.16	4.96	4.96	2.31	2.31	2.65	2.65
249.0	82.840	68.69	2.64	120	82.76	0.16	4.97	4.97	2.31	2.31	2.66	2.66
248.8	83.004	54.53	1.83	120	82.92	0.16	4.98	4.98	2.32	2.32	2.66	2.66

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σv CPT (tsf)	Total Vertical Stress during EQ σv EQ (tsf)	Static Pore Water Pressure during CPT us CPT (tsf)	Static Pore Water Pressure during EQ us EQ (tsf)	Effective Vertical Stress during CPT σv CPT (tsf)	Effective Vertical Stress during EQ σv EQ (tsf)
248.6	83.168	69.83	1.58	120	83.09	0.16	4.99	4.99	2.32	2.32	2.67	2.67
248.5	83.332	89.31	1.56	120	83.25	0.16	5.00	5.00	2.33	2.33	2.67	2.67
248.3	83.496	71.16	1.34	120	83.41	0.16	5.01	5.01	2.33	2.33	2.68	2.68
248.1	83.660	50.81	1.41	120	83.58	0.16	5.02	5.02	2.34	2.34	2.68	2.68
248.0	83.824	38.98	1.60	120	83.74	0.16	5.03	5.03	2.34	2.34	2.69	2.69
247.8	83.988	25.81	1.13	120	83.91	0.16	5.04	5.04	2.35	2.35	2.69	2.69
247.6	84.153	31.33	1.49	120	84.07	0.16	5.05	5.05	2.35	2.35	2.70	2.70
247.5	84.317	67.85	1.28	120	84.23	0.16	5.06	5.06	2.36	2.36	2.70	2.70
247.3	84.481	62.40	1.73	120	84.40	0.16	5.07	5.07	2.36	2.36	2.70	2.70
247.2	84.645	118.81	2.38	120	84.56	0.16	5.08	5.08	2.37	2.37	2.71	2.71
247.0	84.809	103.92	1.96	120	84.73	0.16	5.09	5.09	2.37	2.37	2.71	2.71
246.8	84.973	191.70	2.08	120	84.89	0.16	5.10	5.10	2.38	2.38	2.72	2.72
246.7	85.137	176.80	2.60	120	85.05	0.16	5.11	5.11	2.38	2.38	2.72	2.72
246.5	85.301	129.84	2.43	120	85.22	0.16	5.12	5.12	2.39	2.39	2.73	2.73
246.3	85.465	119.38	2.09	120	85.38	0.16	5.13	5.13	2.40	2.40	2.73	2.73
246.2	85.629	91.44	2.07	120	85.55	0.16	5.14	5.14	2.40	2.40	2.74	2.74
246.0	85.793	49.52	1.59	120	85.71	0.16	5.15	5.15	2.41	2.41	2.74	2.74
245.8	85.957	29.07	0.99	120	85.87	0.16	5.16	5.16	2.41	2.41	2.75	2.75
245.7	86.121	19.92	0.53	120	86.04	0.16	5.17	5.17	2.42	2.42	2.75	2.75
245.5	86.285	26.37	0.16	120	86.20	0.16	5.18	5.18	2.42	2.42	2.76	2.76
245.4	86.449	56.33	0.38	120	86.37	0.16	5.19	5.19	2.43	2.43	2.76	2.76
245.2	86.613	59.85	0.91	120	86.53	0.16	5.20	5.20	2.43	2.43	2.77	2.77
245.0	86.777	31.22	0.89	120	86.70	0.16	5.21	5.21	2.44	2.44	2.77	2.77
244.9	86.941	23.25	0.63	120	86.86	0.16	5.22	5.22	2.44	2.44	2.78	2.78
244.7	87.105	23.53	0.17	120	87.02	0.16	5.23	5.23	2.45	2.45	2.78	2.78
244.5	87.269	23.21	0.14	120	87.19	0.16	5.24	5.24	2.45	2.45	2.78	2.78
244.4	87.433	22.79	0.15	120	87.35	0.16	5.25	5.25	2.46	2.46	2.79	2.79
244.2	87.597	28.99	0.79	120	87.52	0.16	5.26	5.26	2.46	2.46	2.79	2.79
244.0	87.761	47.75	1.05	120	87.68	0.16	5.27	5.27	2.47	2.47	2.80	2.80
243.9	87.925	27.84	0.73	120	87.84	0.16	5.28	5.28	2.47	2.47	2.80	2.80
243.7	88.089	30.00	0.52	120	88.01	0.16	5.29	5.29	2.48	2.48	2.81	2.81
243.5	88.254	28.57	0.41	120	88.17	0.16	5.30	5.30	2.48	2.48	2.81	2.81
243.4	88.418	112.61	0.80	120	88.34	0.16	5.31	5.31	2.49	2.49	2.82	2.82
243.2	88.582	92.64	1.36	120	88.50	0.16	5.31	5.31	2.49	2.49	2.82	2.82
243.1	88.746	50.61	1.95	120	88.66	0.16	5.32	5.32	2.50	2.50	2.83	2.83
242.9	88.910	41.87	1.84	120	88.83	0.16	5.33	5.33	2.50	2.50	2.83	2.83
242.7	89.074	30.43	1.21	120	88.99	0.16	5.34	5.34	2.51	2.51	2.84	2.84
242.6	89.238	23.83	0.65	120	89.16	0.16	5.35	5.35	2.51	2.51	2.84	2.84
242.4	89.402	22.24	0.29	120	89.32	0.16	5.36	5.36	2.52	2.52	2.85	2.85
242.2	89.566	18.90	0.20	120	89.48	0.16	5.37	5.37	2.52	2.52	2.85	2.85
242.1	89.730	24.27	0.36	120	89.65	0.16	5.38	5.38	2.53	2.53	2.86	2.86
241.9	89.894	53.76	0.78	120	89.81	0.16	5.39	5.39	2.53	2.53	2.86	2.86
241.7	90.058	32.31	0.84	120	89.98	0.16	5.40	5.40	2.54	2.54	2.87	2.87
241.6	90.222	25.02	0.51	120	90.14	0.16	5.41	5.41	2.54	2.54	2.87	2.87
241.4	90.386	48.10	0.55	120	90.30	0.16	5.42	5.42	2.55	2.55	2.87	2.87
241.2	90.550	44.43	1.13	120	90.47	0.16	5.43	5.43	2.55	2.55	2.88	2.88
241.1	90.714	28.42	1.20	120	90.63	0.16	5.44	5.44	2.56	2.56	2.88	2.88
240.9	90.878	70.07	1.08	120	90.80	0.16	5.45	5.45	2.56	2.56	2.89	2.89
240.8	91.042	58.65	1.34	120	90.96	0.16	5.46	5.46	2.57	2.57	2.89	2.89
240.6	91.206	37.42	1.38	120	91.12	0.16	5.47	5.47	2.57	2.57	2.90	2.90
240.4	91.370	47.69	1.19	120	91.29	0.16	5.48	5.48	2.58	2.58	2.90	2.90
240.3	91.534	88.18	1.52	120	91.45	0.16	5.49	5.49	2.58	2.58	2.91	2.91
240.1	91.698	93.30	1.61	120	91.62	0.16	5.50	5.50	2.59	2.59	2.91	2.91
239.9	91.862	91.01	1.58	120	91.78	0.16	5.51	5.51	2.59	2.59	2.92	2.92
239.8	92.026	81.80	2.09	120	91.94	0.16	5.52	5.52	2.60	2.60	2.92	2.92
239.6	92.190	55.64	2.77	120	92.11	0.16	5.53	5.53	2.60	2.60	2.93	2.93
239.4	92.355	60.98	2.43	120	92.27	0.16	5.54	5.54	2.61	2.61	2.93	2.93
239.3	92.519	183.57	2.52	120	92.44	0.16	5.55	5.55	2.62	2.62	2.94	2.94
239.1	92.683	278.69	3.11	120	92.60	0.16	5.56	5.56	2.62	2.62	2.94	2.94
239.0	92.847	263.41	3.32	120	92.76	0.16	5.57	5.57	2.63	2.63	2.95	2.95
238.8	93.011	228.79	3.05	120	92.93	0.16	5.58	5.58	2.63	2.63	2.95	2.95
238.6	93.175	199.11	2.51	120	93.09	0.16	5.59	5.59	2.64	2.64	2.95	2.95
238.5	93.339	181.32	2.07	120	93.26	0.16	5.60	5.60	2.64	2.64	2.96	2.96
238.3	93.503	166.90	1.85	120	93.42	0.16	5.61	5.61	2.65	2.65	2.96	2.96
238.1	93.667	151.64	2.15	120	93.58	0.16	5.62	5.62	2.65	2.65	2.97	2.97
238.0	93.831	115.18	2.70	120	93.75	0.16	5.63	5.63	2.66	2.66	2.97	2.97
237.8	93.995	60.85	2.61	120	93.91	0.16	5.64	5.64	2.66	2.66	2.98	2.98
237.6	94.159	38.18	2.10	120	94.08	0.16	5.65	5.65	2.67	2.67	2.98	2.98
237.5	94.323	27.75	1.27	120	94.24	0.16	5.66	5.66	2.67	2.67	2.99	2.99
237.3	94.487	21.51	0.95	120	94.41	0.16	5.67	5.67	2.68	2.68	2.99	2.99
237.1	94.651	21.13	0.77	120	94.57	0.16	5.68	5.68	2.68	2.68	3.00	3.00
237.0	94.815	23.72	0.49	120	94.73	0.16	5.69	5.69	2.69	2.69	3.00	3.00
236.8	94.979	46.09	0.84	120	94.90	0.16	5.70	5.70	2.69	2.69	3.01	3.01
236.7	95.143	80.99	1.06	120	95.06	0.16	5.71	5.71	2.70	2.70	3.01	3.01

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σv CPT (tsf)	Total Vertical Stress during EQ σv EQ (tsf)	Static Pore Water Pressure during CPT us CPT (tsf)	Static Pore Water Pressure during EQ us EQ (tsf)	Effective Vertical Stress during CPT σv CPT (tsf)	Effective Vertical Stress during EQ σv EQ (tsf)
236.5	95.307	85.82	0.82	120	95.23	0.16	5.72	5.72	2.70	2.70	3.02	3.02
236.3	95.471	78.12	0.83	120	95.39	0.16	5.73	5.73	2.71	2.71	3.02	3.02
236.2	95.635	51.48	1.09	120	95.55	0.16	5.74	5.74	2.71	2.71	3.03	3.03
236.0	95.799	29.68	0.89	120	95.72	0.16	5.75	5.75	2.72	2.72	3.03	3.03
235.8	95.963	48.67	0.97	120	95.88	0.16	5.76	5.76	2.72	2.72	3.04	3.04
235.7	96.127	68.65	1.57	120	96.05	0.16	5.77	5.77	2.73	2.73	3.04	3.04
235.5	96.291	57.35	1.98	120	96.21	0.16	5.78	5.78	2.73	2.73	3.04	3.04
235.3	96.456	86.58	2.56	120	96.37	0.16	5.79	5.79	2.74	2.74	3.05	3.05
235.2	96.620	41.28	1.92	120	96.54	0.16	5.80	5.80	2.74	2.74	3.05	3.05
235.0	96.784	24.54	1.27	120	96.70	0.16	5.81	5.81	2.75	2.75	3.06	3.06
234.9	96.948	51.57	1.23	120	96.87	0.16	5.82	5.82	2.75	2.75	3.06	3.06
234.7	97.112	125.52	1.55	120	97.03	0.16	5.83	5.83	2.76	2.76	3.07	3.07
234.5	97.276	103.10	1.98	120	97.19	0.16	5.84	5.84	2.76	2.76	3.07	3.07
234.4	97.440	81.07	2.16	120	97.36	0.16	5.85	5.85	2.77	2.77	3.08	3.08
234.2	97.604	65.80	2.21	120	97.52	0.16	5.86	5.86	2.77	2.77	3.08	3.08
234.0	97.768	36.39	1.75	120	97.69	0.16	5.87	5.87	2.78	2.78	3.09	3.09
233.9	97.932	24.29	0.85	120	97.85	0.16	5.88	5.88	2.78	2.78	3.09	3.09
233.7	98.096	22.07	0.37	120	98.01	0.16	5.89	5.89	2.79	2.79	3.10	3.10
233.5	98.260	22.56	0.41	120	98.18	0.16	5.90	5.90	2.79	2.79	3.10	3.10
233.4	98.424	21.51	0.27	120	98.34	0.16	5.91	5.91	2.80	2.80	3.11	3.11
233.2	98.588	54.67	0.88	120	98.51	0.16	5.92	5.92	2.80	2.80	3.11	3.11
233.0	98.752	39.83	0.90	120	98.67	0.16	5.93	5.93	2.81	2.81	3.12	3.12
232.9	98.916	33.10	0.80	120	98.83	0.16	5.93	5.93	2.81	2.81	3.12	3.12
232.7	99.080	27.98	0.29	120	99.00	0.16	5.94	5.94	2.82	2.82	3.12	3.12
232.6	99.244	23.97	0.25	120	99.16	0.16	5.95	5.95	2.82	2.82	3.13	3.13
232.4	99.408	22.48	0.21	120	99.33	0.16	5.96	5.96	2.83	2.83	3.13	3.13
232.2	99.572	22.32	0.18	120	99.49	0.16	5.97	5.97	2.84	2.84	3.14	3.14
232.1	99.736	22.28	0.18	120	99.65	0.16	5.98	5.98	2.84	2.84	3.14	3.14
231.9	99.900	22.58	0.15	120	99.82	0.16	5.99	5.99	2.85	2.85	3.15	3.15
231.7	100.064	21.93	0.12	120	99.98	0.16	6.00	6.00	2.85	2.85	3.15	3.15
231.6	100.228	20.93	0.14	120	100.15	0.16	6.01	6.01	2.86	2.86	3.16	3.16
231.4	100.392	20.56	0.16	120	100.31	0.16	6.02	6.02	2.86	2.86	3.16	3.16
231.2	100.557	21.09	0.23	120	100.47	0.16	6.03	6.03	2.87	2.87	3.17	3.17
231.1	100.721	22.67	0.20	120	100.64	0.16	6.04	6.04	2.87	2.87	3.17	3.17
230.9	100.885	38.77	0.37	120	100.80	0.16	6.05	6.05	2.88	2.88	3.18	3.18
230.8	101.049	59.71	0.95	120	100.97	0.16	6.06	6.06	2.88	2.88	3.18	3.18
230.6	101.213	33.79	1.03	120	101.13	0.16	6.07	6.07	2.89	2.89	3.19	3.19
230.4	101.377	25.37	0.78	120	101.29	0.16	6.08	6.08	2.89	2.89	3.19	3.19
230.3	101.541	24.14	0.31	120	101.46	0.16	6.09	6.09	2.90	2.90	3.20	3.20
230.1	101.705	22.68	0.19	120	101.62	0.16	6.10	6.10	2.90	2.90	3.20	3.20
229.9	101.869	21.19	0.14	120	101.79	0.16	6.11	6.11	2.91	2.91	3.21	3.21
229.8	102.033	22.43	0.14	120	101.95	0.16	6.12	6.12	2.91	2.91	3.21	3.21
229.6	102.197	22.47	0.14	120	102.11	0.16	6.13	6.13	2.92	2.92	3.21	3.21
229.4	102.361	20.75	0.14	120	102.28	0.16	6.14	6.14	2.92	2.92	3.22	3.22
229.3	102.525	20.10	0.13	120	102.44	0.16	6.15	6.15	2.93	2.93	3.22	3.22
229.1	102.689	20.06	0.18	120	102.61	0.16	6.16	6.16	2.93	2.93	3.23	3.23
228.9	102.853	20.61	0.12	120	102.77	0.16	6.17	6.17	2.94	2.94	3.23	3.23
228.8	103.017	39.29	0.46	120	102.94	0.16	6.18	6.18	2.94	2.94	3.24	3.24
228.6	103.181	60.98	0.98	120	103.10	0.16	6.19	6.19	2.95	2.95	3.24	3.24
228.5	103.345	36.86	1.14	120	103.26	0.16	6.20	6.20	2.95	2.95	3.25	3.25
228.3	103.509	26.71	0.92	120	103.43	0.16	6.21	6.21	2.96	2.96	3.25	3.25
228.1	103.673	25.95	0.55	120	103.59	0.16	6.22	6.22	2.96	2.96	3.26	3.26
228.0	103.837	38.15	0.64	120	103.76	0.16	6.23	6.23	2.97	2.97	3.26	3.26
227.8	104.001	23.84	0.62	120	103.92	0.16	6.24	6.24	2.97	2.97	3.27	3.27
227.6	104.165	20.33	0.55	120	104.08	0.16	6.25	6.25	2.98	2.98	3.27	3.27
227.5	104.329	20.29	0.23	120	104.25	0.16	6.26	6.26	2.98	2.98	3.28	3.28
227.3	104.493	21.12	0.19	120	104.41	0.16	6.27	6.27	2.99	2.99	3.28	3.28
227.1	104.658	21.73	0.26	120	104.58	0.16	6.28	6.28	2.99	2.99	3.29	3.29
227.0	104.822	34.91	0.63	120	104.74	0.16	6.29	6.29	3.00	3.00	3.29	3.29
226.8	104.986	31.40	0.87	120	104.90	0.16	6.30	6.30	3.00	3.00	3.30	3.30
226.7	105.150	23.61	0.86	120	105.07	0.16	6.31	6.31	3.01	3.01	3.30	3.30
226.5	105.314	20.44	0.47	120	105.23	0.16	6.32	6.32	3.01	3.01	3.30	3.30
226.3	105.478	21.03	0.19	120	105.40	0.16	6.33	6.33	3.02	3.02	3.31	3.31
226.2	105.642	20.67	0.21	120	105.56	0.16	6.34	6.34	3.02	3.02	3.31	3.31
226.0	105.806	20.17	0.21	120	105.72	0.16	6.35	6.35	3.03	3.03	3.32	3.32
225.8	105.970	20.23	0.24	120	105.89	0.16	6.36	6.36	3.03	3.03	3.32	3.32
225.7	106.134	20.23	0.16	120	106.05	0.16	6.37	6.37	3.04	3.04	3.33	3.33
225.5	106.298	26.76	0.49	120	106.22	0.16	6.38	6.38	3.05	3.05	3.33	3.33
225.3	106.462	31.05	0.61	120	106.38	0.16	6.39	6.39	3.05	3.05	3.34	3.34
225.2	106.626	20.38	0.66	120	106.54	0.16	6.40	6.40	3.06	3.06	3.34	3.34
225.0	106.790	20.35	0.34	120	106.71	0.16	6.41	6.41	3.06	3.06	3.35	3.35
224.8	106.954	20.69	0.19	120	106.87	0.16	6.42	6.42	3.07	3.07	3.35	3.35
224.7	107.118	20.51	0.19	120	107.04	0.16	6.43	6.43	3.07	3.07	3.36	3.36
224.5	107.282	20.33	0.27	120	107.20	0.16	6.44	6.44	3.08	3.08	3.36	3.36

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σ _{v CPT} (tsf)	Total Vertical Stress during EQ σ _{v EQ} (tsf)	Static Pore Water Pressure during CPT u _{s CPT} (tsf)	Static Pore Water Pressure during EQ u _{s EQ} (tsf)	Effective Vertical Stress during CPT σ _{v CPT} (tsf)	Effective Vertical Stress during EQ σ _{v EQ} (tsf)
224.4	107.446	30.85	0.46	120	107.36	0.16	6.45	6.45	3.08	3.08	3.37	3.37
224.2	107.610	25.24	0.48	120	107.53	0.16	6.46	6.46	3.09	3.09	3.37	3.37
224.0	107.774	21.27	0.50	120	107.69	0.16	6.47	6.47	3.09	3.09	3.38	3.38
223.9	107.938	21.00	0.18	120	107.86	0.16	6.48	6.48	3.10	3.10	3.38	3.38
223.7	108.102	32.18	0.50	120	108.02	0.16	6.49	6.49	3.10	3.10	3.38	3.38
223.5	108.266	35.45	0.78	120	108.18	0.16	6.50	6.50	3.11	3.11	3.39	3.39
223.4	108.430	20.79	0.75	120	108.35	0.16	6.51	6.51	3.11	3.11	3.39	3.39
223.2	108.594	20.00	0.22	120	108.51	0.16	6.52	6.52	3.12	3.12	3.40	3.40
223.0	108.759	20.48	0.15	120	108.68	0.16	6.53	6.53	3.12	3.12	3.40	3.40
222.9	108.923	19.75	0.14	120	108.84	0.16	6.54	6.54	3.13	3.13	3.41	3.41
222.7	109.087	21.81	0.16	120	109.00	0.16	6.55	6.55	3.13	3.13	3.41	3.41
222.5	109.251	20.60	0.15	120	109.17	0.16	6.56	6.56	3.14	3.14	3.42	3.42
222.4	109.415	21.40	0.30	120	109.33	0.16	6.56	6.56	3.14	3.14	3.42	3.42
222.2	109.579	22.54	0.29	120	109.50	0.16	6.57	6.57	3.15	3.15	3.43	3.43
222.1	109.743	36.53	0.69	120	109.66	0.16	6.58	6.58	3.15	3.15	3.43	3.43
221.9	109.907	27.95	0.74	120	109.82	0.16	6.59	6.59	3.16	3.16	3.44	3.44
221.7	110.071	20.93	0.74	120	109.99	0.16	6.60	6.60	3.16	3.16	3.44	3.44
221.6	110.235	19.90	0.20	120	110.15	0.16	6.61	6.61	3.17	3.17	3.45	3.45
221.4	110.399	19.10	0.16	120	110.32	0.16	6.62	6.62	3.17	3.17	3.45	3.45
221.2	110.563	18.79	0.17	120	110.48	0.16	6.63	6.63	3.18	3.18	3.46	3.46
221.1	110.727	20.15	0.16	120	110.64	0.16	6.64	6.64	3.18	3.18	3.46	3.46
220.9	110.891	20.55	0.16	120	110.81	0.16	6.65	6.65	3.19	3.19	3.47	3.47
220.7	111.055	20.28	0.16	120	110.97	0.16	6.66	6.66	3.19	3.19	3.47	3.47
220.6	111.219	20.14	0.15	120	111.14	0.16	6.67	6.67	3.20	3.20	3.47	3.47
220.4	111.383	20.62	0.15	120	111.30	0.16	6.68	6.68	3.20	3.20	3.48	3.48
220.3	111.547	20.41	0.22	120	111.47	0.16	6.69	6.69	3.21	3.21	3.48	3.48
220.1	111.711	23.37	0.22	120	111.63	0.16	6.70	6.70	3.21	3.21	3.49	3.49
219.9	111.875	19.81	0.27	120	111.79	0.16	6.71	6.71	3.22	3.22	3.49	3.49
219.8	112.039	23.58	0.91	120	111.96	0.16	6.72	6.72	3.22	3.22	3.50	3.50
219.6	112.203	53.02	1.14	120	112.12	0.16	6.73	6.73	3.23	3.23	3.50	3.50
219.4	112.367	45.02	1.55	120	112.29	0.16	6.74	6.74	3.23	3.23	3.51	3.51
219.3	112.531	23.73	1.29	120	112.45	0.16	6.75	6.75	3.24	3.24	3.51	3.51
219.1	112.695	18.51	1.26	120	112.61	0.16	6.76	6.76	3.24	3.24	3.52	3.52
218.9	112.860	25.50	1.23	120	112.78	0.16	6.77	6.77	3.25	3.25	3.52	3.52
218.8	113.024	155.83	1.25	120	112.94	0.16	6.78	6.78	3.25	3.25	3.53	3.53
218.6	113.188	229.99	0.73	120	113.11	0.16	6.79	6.79	3.26	3.26	3.53	3.53
218.4	113.352	205.94	0.42	120	113.27	0.16	6.80	6.80	3.27	3.27	3.54	3.54
218.3	113.516	126.32	0.48	120	113.43	0.16	6.81	6.81	3.27	3.27	3.54	3.54
218.1	113.680	70.53	0.87	120	113.60	0.16	6.82	6.82	3.28	3.28	3.55	3.55
218.0	113.844	36.82	1.20	120	113.76	0.16	6.83	6.83	3.28	3.28	3.55	3.55
217.8	114.008	17.43	1.01	120	113.93	0.16	6.84	6.84	3.29	3.29	3.55	3.55
217.6	114.172	8.96	0.49	120	114.09	0.16	6.85	6.85	3.29	3.29	3.56	3.56
217.5	114.336	84.99	0.36	120	114.25	0.16	6.86	6.86	3.30	3.30	3.56	3.56
217.3	114.500	136.02	0.34	120	114.42	0.16	6.87	6.87	3.30	3.30	3.57	3.57
217.1	114.664	148.16	0.16	120	114.58	0.16	6.88	6.88	3.31	3.31	3.57	3.57
217.0	114.828	108.22	0.22	120	114.75	0.16	6.89	6.89	3.31	3.31	3.58	3.58
216.8	114.992	55.66	0.36	120	114.91	0.16	6.90	6.90	3.32	3.32	3.58	3.58
216.6	115.156	19.80	0.69	120	115.07	0.16	6.91	6.91	3.32	3.32	3.59	3.59
216.5	115.320	19.13	0.69	120	115.24	0.16	6.92	6.92	3.33	3.33	3.59	3.59
216.3	115.484	18.81	0.21	120	115.40	0.16	6.93	6.93	3.33	3.33	3.60	3.60
216.2	115.648	45.01	0.59	120	115.57	0.16	6.94	6.94	3.34	3.34	3.60	3.60
216.0	115.812	245.20	1.47	120	115.73	0.08	6.95	6.95	3.34	3.34	3.61	3.61

LIQUEFACTION POTENTIAL ASSESSMENT FOR COARSE GRAINED SOILS USING CONE PENETRATION TEST DATA

Project Site: US 60 Bridge
Project No.: 178565011
CPT ID: SP08

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	qc_{IN}	FC (%)	Δqc_{IN}	$(qc_{IN})_{CS}$	a	ξ_R
331.8												
331.6	0.164	36.34	2.53	2.51	0.5	1.70	5.97	64	51.16	57.13	0.350	-0.233
331.5	0.328	130.22	1.56	1.96	0.5	1.70	30.23	20	26.88	57.11	0.350	-0.226
331.3	0.492	231.90	1.36	1.75	0.5	1.70	65.91	3	0.00	65.91	0.350	-0.275
331.1	0.656	204.39	1.99	1.91	0.5	1.70	67.09	16	22.69	89.78	0.350	-0.394
331.0	0.820	206.90	2.14	1.93	0.5	1.70	75.94	18	28.07	104.01	0.350	-0.454
330.8	0.984	197.44	2.49	2.00	0.5	1.70	79.39	23	40.11	119.51	0.350	-0.512
330.7	1.148	180.40	2.74	2.05	0.5	1.70	78.37	27	47.55	125.92	0.350	-0.534
330.5	1.312	163.84	3.18	2.13	0.5	1.70	76.11	34	54.72	130.83	0.350	-0.549
330.3	1.476	155.12	3.26	2.15	0.5	1.70	76.45	35	56.52	132.97	0.350	-0.555
330.2	1.640	151.45	3.09	2.14	0.5	1.70	78.69	34	56.09	134.77	0.350	-0.559
330.0	1.804	149.13	2.99	2.13	0.5	1.70	81.27	34	56.09	137.36	0.350	-0.567
329.8	1.968	146.23	2.99	2.14	0.5	1.70	83.25	34	56.94	140.19	0.350	-0.575
329.7	2.133	140.30	2.97	2.15	0.5	1.70	83.15	35	57.55	140.70	0.350	-0.575
329.5	2.297	132.76	3.01	2.17	0.5	1.70	81.67	36	58.69	140.36	0.350	-0.573
329.3	2.461	126.37	3.02	2.18	0.5	1.70	80.48	38	59.41	139.90	0.350	-0.570
329.2	2.625	125.73	3.07	2.19	0.5	1.70	82.72	38	60.42	143.14	0.350	-0.580
329.0	2.789	129.22	3.13	2.19	0.5	1.70	87.63	38	61.49	149.13	0.350	-0.598
328.8	2.953	129.74	3.08	2.18	0.5	1.70	90.54	38	61.78	152.31	0.350	-0.600
328.7	3.117	126.76	3.15	2.20	0.5	1.70	90.90	39	62.78	153.68	0.350	-0.600
328.5	3.281	121.65	2.87	2.18	0.5	1.70	89.52	37	61.08	150.60	0.350	-0.600
328.4	3.445	120.60	2.79	2.17	0.5	1.70	90.95	36	60.85	151.80	0.350	-0.600
328.2	3.609	126.74	2.28	2.09	0.5	1.70	97.82	30	55.16	152.98	0.350	-0.600
328.0	3.773	123.18	2.19	2.08	0.5	1.70	97.23	30	54.49	151.72	0.350	-0.600
327.9	3.937	119.38	2.42	2.12	0.5	1.70	96.27	33	58.44	154.71	0.350	-0.600
327.7	4.101	114.64	2.77	2.18	0.5	1.70	94.38	37	62.51	156.89	0.350	-0.600
327.5	4.265	108.79	3.07	2.23	0.5	1.70	91.37	41	64.99	156.35	0.350	-0.600
327.4	4.429	103.59	3.24	2.26	0.5	1.70	88.69	44	66.04	154.73	0.350	-0.600
327.2	4.593	94.64	3.52	2.31	0.5	1.70	82.55	48	66.92	149.47	0.350	-0.590
327.0	4.757	86.44	3.61	2.35	0.5	1.70	76.78	51	66.71	143.50	0.350	-0.570
326.9	4.921	78.85	3.34	2.35	0.5	1.70	71.29	51	65.29	136.59	0.350	-0.547
326.7	5.085	75.17	3.02	2.33	0.5	1.70	69.12	49	64.03	133.15	0.350	-0.534
326.6	5.249	73.82	3.19	2.35	0.5	1.69	68.46	51	64.68	133.14	0.350	-0.534
326.4	5.413	75.09	3.21	2.35	0.5	1.66	69.58	51	64.88	134.46	0.350	-0.538
326.2	5.577	70.87	3.33	2.38	0.5	1.65	66.29	53	64.96	131.25	0.350	-0.526
326.1	5.741	62.52	3.40	2.42	0.5	1.65	59.55	57	64.39	123.95	0.350	-0.499
325.9	5.905	57.41	2.93	2.40	0.5	1.65	55.49	55	62.72	118.21	0.350	-0.477
325.7	6.069	64.18	2.58	2.33	0.5	1.62	61.39	49	61.97	123.36	0.350	-0.496
325.6	6.234	70.90	2.07	2.23	0.5	1.59	67.42	42	59.23	126.65	0.350	-0.507
325.4	6.398	74.85	1.84	2.18	0.5	1.56	71.05	37	57.11	128.17	0.350	-0.512
325.2	6.562	78.42	1.38	2.08	0.5	1.56	74.98	30	49.95	124.94	0.350	-0.500
325.1	6.726	83.23	1.27	2.04	0.5	1.54	79.61	26	45.68	125.29	0.350	-0.501
324.9	6.890	81.45	1.54	2.10	0.5	1.51	77.43	31	52.21	129.64	0.350	-0.516
324.7	7.054	60.90	2.48	2.33	0.5	1.52	59.05	50	61.53	120.59	0.350	-0.482
324.6	7.218	44.53	3.59	2.54	0.5	1.54	44.45	66	62.80	107.25	0.350	-0.430
324.4	7.382	40.30	3.67	2.58	0.7	1.56	34.75	70	60.64	95.39	0.350	-0.380
324.3	7.546	33.20	3.46	2.62	0.7	1.56	29.24	73	59.68	88.92	0.350	-0.350
324.1	7.710	32.82	2.83	2.57	0.7	1.54	29.09	69	58.85	87.93	0.350	-0.345
323.9	7.874	26.88	2.78	2.63	0.7	1.54	24.30	74	58.33	82.63	0.350	-0.319
323.8	8.038	26.35	2.73	2.64	0.7	1.53	23.94	74	58.25	82.19	0.350	-0.316
323.6	8.202	27.35	2.78	2.63	1.0	1.53	20.14	73	57.03	77.17	0.350	-0.291
323.4	8.366	23.15	2.24	2.63	0.7	1.51	21.40	73	57.40	78.79	0.350	-0.299
323.3	8.530	23.07	2.10	2.61	0.7	1.49	21.41	72	57.18	78.59	0.350	-0.297
323.1	8.694	23.77	1.99	2.59	0.7	1.47	22.07	70	57.04	79.11	0.350	-0.299
322.9	8.858	23.02	2.34	2.64	0.7	1.47	21.44	74	57.57	79.01	0.350	-0.299
322.8	9.022	22.95	2.49	2.66	0.7	1.46	21.41	76	57.78	79.20	0.350	-0.299
322.6	9.186	25.59	2.92	2.66	1.0	1.46	19.65	76	57.34	76.99	0.350	-0.288
322.4	9.350	24.34	3.21	2.71	1.0	1.45	18.83	79	57.58	76.41	0.350	-0.285
322.3	9.514	30.47	3.06	2.62	1.0	1.43	23.28	72	57.83	81.11	0.350	-0.308
322.1	9.678	29.67	2.70	2.59	0.5	1.40	30.82	70	59.66	90.48	0.350	-0.353
322.0	9.842	31.02	3.15	2.62	0.7	1.40	28.51	73	59.40	87.90	0.350	-0.341

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
321.8	10.006	33.27	3.38	2.62	1.0	1.41	25.55	72	58.49	84.04	0.350	-0.322
321.6	10.170	26.85	2.60	2.61	0.7	1.40	25.04	72	58.30	83.35	0.350	-0.318
321.5	10.335	26.36	3.24	2.68	1.0	1.41	20.76	78	57.89	78.65	0.350	-0.295
321.3	10.499	25.33	3.42	2.71	1.0	1.40	20.07	80	58.01	78.08	0.350	-0.292
321.1	10.663	29.60	2.95	2.62	1.0	1.39	23.30	72	57.83	81.13	0.350	-0.307
321.0	10.827	29.68	2.76	2.60	0.7	1.37	27.66	71	58.82	86.48	0.350	-0.333
320.8	10.991	25.68	2.99	2.67	1.0	1.38	20.58	76	57.67	78.25	0.350	-0.292
320.6	11.155	22.95	2.84	2.69	1.0	1.38	18.62	78	57.37	75.99	0.350	-0.280
320.5	11.319	22.17	2.68	2.69	1.0	1.38	18.11	78	57.18	75.28	0.350	-0.276
320.3	11.483	22.26	2.99	2.72	1.0	1.37	18.23	80	57.52	75.76	0.350	-0.279
320.2	11.647	18.56	4.38	2.88	1.0	1.37	15.46	94	58.17	73.63	0.350	-0.267
320.0	11.811	29.06	2.77	2.61	0.7	1.34	27.37	71	58.86	86.22	0.350	-0.330
319.8	11.975	58.74	1.32	2.17	0.5	1.29	58.74	36	53.32	112.06	0.350	-0.441
319.7	12.139	55.65	1.87	2.28	0.5	1.28	55.58	45	58.53	114.12	0.350	-0.449
319.5	12.303	35.40	3.30	2.59	0.7	1.31	33.00	70	60.28	93.28	0.350	-0.362
319.3	12.467	28.59	4.29	2.74	1.0	1.32	23.45	82	59.29	82.74	0.350	-0.313
319.2	12.631	21.06	5.41	2.90	1.0	1.33	17.73	95	59.01	76.75	0.350	-0.282
319.0	12.795	26.86	2.92	2.65	0.7	1.31	25.66	75	58.91	84.57	0.350	-0.321
318.8	12.959	23.72	3.17	2.71	1.0	1.31	19.96	80	57.98	77.94	0.350	-0.288
318.7	13.123	20.65	3.19	2.76	1.0	1.31	17.62	84	57.78	75.40	0.350	-0.275
318.5	13.287	19.78	2.75	2.73	1.0	1.31	17.00	82	57.34	74.34	0.350	-0.269
318.3	13.451	18.94	2.86	2.76	1.0	1.31	16.39	84	57.41	73.80	0.350	-0.266
318.2	13.615	13.20	4.10	2.98	1.0	1.31	11.84	100	57.61	69.44	0.350	-0.242
318.0	13.779	19.97	1.90	2.64	1.0	1.30	17.35	74	56.33	73.67	0.350	-0.265
317.9	13.943	16.35	1.85	2.70	1.0	1.29	14.49	79	56.25	70.75	0.350	-0.249
317.7	14.107	18.47	1.27	2.57	0.7	1.28	18.39	69	55.72	74.10	0.350	-0.267
317.5	14.271	25.34	1.45	2.49	0.5	1.27	26.77	62	56.68	83.45	0.350	-0.314
317.4	14.436	14.99	2.68	2.82	1.0	1.28	13.50	89	57.11	70.61	0.350	-0.248
317.2	14.600	9.36	3.40	3.05	1.0	1.28	8.91	100	56.70	65.61	0.350	-0.219
317.0	14.764	6.98	2.96	3.12	1.0	1.28	6.96	100	56.09	63.06	0.350	-0.204
316.9	14.928	5.72	3.57	3.24	1.0	1.28	5.93	100	55.77	61.70	0.350	-0.196
316.7	15.092	5.95	2.95	3.18	1.0	1.27	6.15	100	55.84	61.99	0.350	-0.197
316.5	15.256	20.84	0.84	2.44	0.5	1.25	22.38	58	54.42	76.79	0.350	-0.280
316.4	15.420	25.09	1.08	2.42	0.5	1.24	26.58	57	55.25	81.82	0.350	-0.305
316.2	15.584	21.28	2.59	2.69	1.0	1.24	19.03	78	57.51	76.53	0.350	-0.278
316.1	15.748	13.06	3.66	2.95	1.0	1.24	12.23	99	57.67	69.90	0.350	-0.242
315.9	15.912	8.26	3.07	3.07	1.0	1.24	8.21	100	56.48	64.69	0.350	-0.212
315.7	16.076	43.01	0.77	2.14	0.5	1.21	44.33	35	48.59	92.92	0.350	-0.356
315.6	16.240	38.32	1.88	2.41	0.5	1.20	39.45	56	58.44	97.90	0.350	-0.378
315.4	16.404	18.63	5.44	2.94	1.0	1.22	17.06	98	59.10	76.17	0.350	-0.275
315.2	16.568	10.82	7.73	3.22	1.0	1.22	10.51	100	57.20	67.70	0.350	-0.229
315.1	16.732	10.03	4.25	3.08	1.0	1.22	9.86	100	57.00	66.86	0.350	-0.224
314.9	16.896	13.20	2.25	2.83	1.0	1.21	12.62	89	56.86	69.47	0.350	-0.239
314.7	17.060	20.98	1.73	2.60	0.5	1.20	22.45	71	57.29	79.74	0.350	-0.293
314.6	17.224	13.77	3.28	2.91	1.0	1.20	13.17	96	57.64	70.81	0.350	-0.246
314.4	17.388	7.53	3.87	3.16	1.0	1.20	7.81	100	56.36	64.17	0.350	-0.208
314.2	17.552	7.31	3.31	3.13	1.0	1.20	7.64	100	56.30	63.94	0.350	-0.206
314.1	17.716	10.72	1.50	2.81	1.0	1.19	10.65	88	56.13	66.78	0.350	-0.223
313.9	17.880	8.88	1.63	2.90	1.0	1.19	9.06	95	56.33	65.39	0.350	-0.215
313.8	18.044	7.90	1.66	2.95	1.0	1.19	8.23	99	56.40	64.63	0.350	-0.210
313.6	18.208	7.95	1.42	2.91	1.0	1.18	8.29	96	56.19	64.48	0.350	-0.209
313.4	18.372	7.09	1.57	2.98	1.0	1.18	7.55	100	56.28	63.83	0.350	-0.205
313.3	18.537	6.66	2.16	3.07	1.0	1.18	7.19	100	56.17	63.36	0.350	-0.202
313.1	18.701	6.89	2.15	3.06	1.0	1.17	7.42	100	56.24	63.66	0.350	-0.204
312.9	18.865	15.40	1.91	2.73	1.0	1.16	15.00	82	56.71	71.71	0.350	-0.249
312.8	19.029	8.86	3.35	3.07	1.0	1.16	9.22	100	56.80	66.02	0.350	-0.217
312.6	19.193	6.78	3.90	3.20	1.0	1.16	7.39	100	56.23	63.61	0.350	-0.203
312.4	19.357	7.95	1.96	2.98	1.0	1.15	8.46	100	56.56	65.02	0.350	-0.211
312.3	19.521	6.12	2.53	3.14	1.0	1.15	6.83	100	56.05	62.89	0.350	-0.198
312.1	19.685	8.32	1.92	2.96	1.0	1.15	8.83	100	56.66	65.50	0.350	-0.213
312.0	19.849	5.82	2.12	3.12	1.0	1.14	6.60	100	55.98	62.58	0.350	-0.196
311.8	20.013	5.75	1.89	3.10	1.0	1.14	6.55	100	55.97	62.52	0.350	-0.195
311.6	20.177	5.45	1.76	3.10	1.0	1.14	6.30	100	55.89	62.19	0.350	-0.193
311.5	20.341	7.78	1.66	2.95	1.0	1.13	8.44	99	56.50	64.94	0.350	-0.210
311.3	20.505	6.26	2.54	3.13	1.0	1.13	7.07	100	56.13	63.20	0.350	-0.199
311.1	20.669	5.74	3.40	3.23	1.0	1.13	6.61	100	55.99	62.60	0.350	-0.195

Elev. (ft)	Depth z (ft)	Normalized Cone Resistance Q	Normalized Friction Ratio F (%)	Soil Behavior Type Index I_c	Soil Type Exponent n	Normalizing Factor for CPT Resistance C_N	Normalized Average Cone Tip Resistance qc_{IN}	Fines Content FC (%)	Clean Sand Correction Δqc_{IN}	Clean Sand Normalized Average Cone Tip Resistance (qc_{IN}) _{CS}	Static Shear Stress Ratio a	Relative State Parameter Index ξ_R
311.0	20.833	5.60	2.79	3.19	1.0	1.12	6.50	100	55.95	62.45	0.350	-0.194
310.8	20.997	5.68	2.69	3.18	1.0	1.12	6.60	100	55.98	62.58	0.350	-0.195
310.6	21.161	6.08	2.45	3.13	1.0	1.11	6.98	100	56.10	63.08	0.350	-0.198
310.5	21.325	7.25	2.68	3.09	1.0	1.11	8.08	100	56.44	64.52	0.350	-0.206
310.3	21.489	8.37	2.75	3.04	1.0	1.11	9.14	100	56.77	65.91	0.350	-0.214
310.1	21.653	6.19	4.03	3.24	1.0	1.10	7.14	100	56.15	63.28	0.350	-0.199
310.0	21.817	9.31	1.71	2.89	1.0	1.10	10.06	94	56.58	66.64	0.350	-0.218
309.8	21.981	29.94	1.27	2.39	0.5	1.09	31.42	54	55.89	87.31	0.350	-0.325
309.7	22.145	14.63	2.76	2.84	1.0	1.09	15.07	90	57.72	72.79	0.350	-0.252
309.5	22.309	8.31	4.44	3.16	1.0	1.09	9.20	100	56.79	65.98	0.350	-0.214
309.3	22.473	8.26	4.36	3.16	1.0	1.09	9.17	100	56.78	65.95	0.350	-0.213
309.2	22.638	13.47	4.09	2.97	1.0	1.08	14.08	100	58.30	72.38	0.350	-0.249
309.0	22.802	10.87	3.48	3.00	1.0	1.08	11.67	100	57.56	69.23	0.350	-0.232
308.8	22.966	6.24	4.19	3.25	1.0	1.08	7.33	100	56.21	63.54	0.350	-0.199
308.7	23.130	5.97	2.30	3.12	1.0	1.07	7.09	100	56.14	63.23	0.350	-0.197
308.5	23.294	5.93	1.70	3.06	1.0	1.07	7.07	100	56.13	63.20	0.350	-0.197
308.3	23.458	6.01	1.53	3.04	1.0	1.07	7.17	100	56.16	63.32	0.350	-0.197
308.2	23.622	6.03	1.25	3.00	1.0	1.06	7.20	100	56.17	63.37	0.350	-0.197
308.0	23.786	6.23	1.34	3.00	1.0	1.06	7.41	100	56.23	63.64	0.350	-0.199
307.9	23.950	6.88	1.16	2.93	1.0	1.06	8.06	97	56.22	64.28	0.350	-0.202
307.7	24.114	6.04	1.46	3.02	1.0	1.06	7.27	100	56.19	63.46	0.350	-0.197
307.5	24.278	6.33	1.51	3.01	1.0	1.05	7.56	100	56.28	63.84	0.350	-0.200
307.4	24.442	5.87	1.62	3.06	1.0	1.05	7.14	100	56.15	63.29	0.350	-0.196
307.2	24.606	5.95	1.58	3.05	1.0	1.05	7.22	100	56.18	63.40	0.350	-0.197
307.0	24.770	5.97	1.56	3.04	1.0	1.04	7.27	100	56.19	63.46	0.350	-0.197
306.9	24.934	5.88	1.81	3.08	1.0	1.04	7.19	100	56.17	63.36	0.350	-0.196
306.7	25.098	6.26	1.83	3.06	1.0	1.04	7.58	100	56.29	63.86	0.350	-0.199
306.5	25.262	6.22	1.92	3.07	1.0	1.03	7.56	100	56.28	63.84	0.350	-0.199
306.4	25.426	6.08	1.64	3.05	1.0	1.03	7.43	100	56.24	63.68	0.350	-0.198
306.2	25.590	6.45	1.60	3.02	1.0	1.03	7.82	100	56.36	64.18	0.350	-0.200
306.0	25.754	5.99	1.88	3.08	1.0	1.03	7.38	100	56.23	63.61	0.350	-0.197
305.9	25.918	5.68	2.02	3.11	1.0	1.02	7.10	100	56.14	63.23	0.350	-0.195
305.7	26.082	5.53	1.75	3.10	1.0	1.02	6.96	100	56.09	63.06	0.350	-0.193
305.6	26.246	6.64	2.21	3.08	1.0	1.02	8.08	100	56.44	64.52	0.350	-0.202
305.4	26.410	6.03	2.84	3.17	1.0	1.01	7.49	100	56.26	63.75	0.350	-0.197
305.2	26.574	6.25	3.10	3.17	1.0	1.01	7.73	100	56.33	64.06	0.350	-0.199
305.1	26.739	6.45	1.67	3.03	1.0	1.01	7.94	100	56.40	64.33	0.350	-0.200
304.9	26.903	14.37	1.62	2.72	1.0	1.01	15.83	81	56.83	72.66	0.350	-0.247
304.7	27.067	23.15	1.77	2.57	0.5	1.00	24.70	68	57.50	82.19	0.350	-0.296
304.6	27.231	12.26	4.68	3.04	1.0	1.00	13.79	100	58.21	72.01	0.350	-0.243
304.4	27.395	17.15	3.76	2.87	1.0	1.00	18.72	92	59.05	77.77	0.350	-0.274
304.2	27.559	10.39	3.77	3.04	1.0	1.00	11.97	100	57.65	69.62	0.350	-0.230
304.1	27.723	7.20	3.18	3.13	1.0	0.99	8.79	100	56.66	65.45	0.350	-0.206
303.9	27.887	7.14	1.58	2.98	1.0	0.99	8.76	100	56.65	65.41	0.350	-0.206
303.7	28.051	10.68	1.34	2.79	1.0	0.99	12.35	86	56.45	68.80	0.350	-0.225
303.6	28.215	7.39	2.32	3.05	1.0	0.99	9.04	100	56.74	65.78	0.350	-0.208
303.4	28.379	6.10	3.25	3.20	1.0	0.98	7.75	100	56.34	64.09	0.350	-0.198
303.3	28.543	6.43	1.32	2.98	1.0	0.98	8.10	100	56.45	64.55	0.350	-0.200
303.1	28.707	6.21	1.36	3.00	1.0	0.98	7.89	100	56.38	64.28	0.350	-0.199
302.9	28.871	5.84	1.66	3.06	1.0	0.98	7.53	100	56.27	63.81	0.350	-0.196
302.8	29.035	5.87	1.40	3.03	1.0	0.97	7.58	100	56.29	63.86	0.350	-0.196
302.6	29.199	6.10	1.59	3.04	1.0	0.97	7.84	100	56.37	64.20	0.350	-0.198
302.4	29.363	6.45	1.61	3.02	1.0	0.97	8.21	100	56.48	64.69	0.350	-0.200
302.3	29.527	6.30	1.71	3.04	1.0	0.97	8.07	100	56.44	64.51	0.350	-0.199
302.1	29.691	5.99	1.69	3.06	1.0	0.96	7.77	100	56.34	64.11	0.350	-0.197
301.9	29.855	6.21	1.62	3.03	1.0	0.96	8.01	100	56.42	64.44	0.350	-0.199
301.8	30.019	6.07	1.28	3.00	1.0	0.96	7.88	100	56.38	64.26	0.350	-0.197
301.6	30.183	8.91	1.48	2.88	1.0	0.96	10.84	93	56.71	67.55	0.350	-0.216
301.5	30.347	8.88	1.75	2.92	1.0	0.96	10.82	96	56.98	67.80	0.350	-0.218
301.3	30.511	6.25	2.52	3.13	1.0	0.95	8.11	100	56.45	64.56	0.350	-0.199
301.1	30.675	6.30	1.20	2.97	1.0	0.95	8.18	100	56.47	64.66	0.350	-0.199
301.0	30.840	6.76	1.16	2.94	1.0	0.95	8.68	98	56.46	65.14	0.350	-0.202
300.8	31.004	6.41	1.42	3.00	1.0	0.95	8.33	100	56.52	64.85	0.350	-0.200
300.6	31.168	6.34	1.56	3.02	1.0	0.94	8.28	100	56.50	64.78	0.350	-0.200
300.5	31.332	6.46	1.46	3.00	1.0	0.94	8.41	100	56.54	64.95	0.350	-0.200
300.3	31.496	6.34	1.44	3.00	1.0	0.94	8.31	100	56.51	64.82	0.350	-0.200

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
300.1	31.660	6.15	1.88	3.07	1.0	0.94	8.12	100	56.45	64.57	0.350	-0.198
300.0	31.824	7.15	0.93	2.87	1.0	0.93	9.19	93	56.17	65.36	0.350	-0.202
299.8	31.988	9.83	2.35	2.94	1.0	0.93	12.03	99	57.55	69.59	0.350	-0.226
299.6	32.152	10.47	2.46	2.93	1.0	0.93	12.74	98	57.69	70.43	0.350	-0.231
299.5	32.316	6.47	3.43	3.19	1.0	0.93	8.52	100	56.58	65.10	0.350	-0.201
299.3	32.480	6.24	1.70	3.04	1.0	0.93	8.29	100	56.51	64.80	0.350	-0.199
299.2	32.644	6.88	1.02	2.90	1.0	0.92	8.99	95	56.34	65.33	0.350	-0.202
299.0	32.808	6.26	1.08	2.95	1.0	0.92	8.34	99	56.46	64.80	0.350	-0.198
298.8	32.972	5.92	1.19	2.99	1.0	0.92	7.99	100	56.41	64.41	0.350	-0.196
298.7	33.136	6.21	1.16	2.97	1.0	0.92	8.32	100	56.52	64.83	0.350	-0.198
298.5	33.300	6.06	1.25	2.99	1.0	0.91	8.18	100	56.47	64.65	0.350	-0.197
298.3	33.464	6.10	1.30	3.00	1.0	0.91	8.23	100	56.49	64.72	0.350	-0.198
298.2	33.628	6.50	1.29	2.97	1.0	0.91	8.67	100	56.63	65.30	0.350	-0.201
298.0	33.792	6.28	1.47	3.01	1.0	0.91	8.45	100	56.56	65.01	0.350	-0.199
297.8	33.956	6.07	1.52	3.03	1.0	0.91	8.24	100	56.49	64.74	0.350	-0.197
297.7	34.120	6.19	1.48	3.02	1.0	0.90	8.39	100	56.54	64.92	0.350	-0.198
297.5	34.284	6.18	1.48	3.02	1.0	0.90	8.39	100	56.54	64.93	0.350	-0.198
297.4	34.448	6.20	1.34	3.00	1.0	0.90	8.43	100	56.55	64.97	0.350	-0.198
297.2	34.612	5.72	1.38	3.03	1.0	0.90	7.92	100	56.39	64.31	0.350	-0.194
297.0	34.776	5.52	1.12	3.01	1.0	0.90	7.72	100	56.33	64.05	0.350	-0.193
296.9	34.941	5.55	1.38	3.05	1.0	0.89	7.76	100	56.34	64.11	0.350	-0.193
296.7	35.105	6.37	2.28	3.10	1.0	0.89	8.67	100	56.63	65.30	0.350	-0.200
296.5	35.269	25.72	1.81	2.53	0.5	0.90	27.36	66	57.74	85.11	0.350	-0.304
296.4	35.433	11.22	3.44	2.99	1.0	0.89	14.03	100	58.29	72.31	0.350	-0.239
296.2	35.597	9.80	3.60	3.05	1.0	0.89	12.48	100	57.81	70.29	0.350	-0.228
296.0	35.761	25.51	1.77	2.53	0.5	0.90	27.15	66	57.64	84.79	0.350	-0.302
295.9	35.925	11.34	3.21	2.97	1.0	0.89	14.24	100	58.35	72.59	0.350	-0.240
295.7	36.089	6.62	4.55	3.25	1.0	0.88	9.04	100	56.74	65.78	0.350	-0.202
295.5	36.253	6.53	2.09	3.07	1.0	0.88	8.96	100	56.71	65.67	0.350	-0.201
295.4	36.417	6.92	1.64	3.00	1.0	0.88	9.40	100	56.85	66.25	0.350	-0.204
295.2	36.581	6.59	1.56	3.00	1.0	0.88	9.05	100	56.74	65.80	0.350	-0.202
295.1	36.745	6.54	1.46	2.99	1.0	0.87	9.01	100	56.73	65.74	0.350	-0.201
294.9	36.909	6.65	1.38	2.98	1.0	0.87	9.15	100	56.77	65.92	0.350	-0.202
294.7	37.073	6.52	1.42	2.99	1.0	0.87	9.01	100	56.73	65.75	0.350	-0.201
294.6	37.237	6.56	1.35	2.98	1.0	0.87	9.08	100	56.75	65.83	0.350	-0.201
294.4	37.401	6.71	1.54	2.99	1.0	0.87	9.27	100	56.81	66.08	0.350	-0.203
294.2	37.565	6.79	1.45	2.98	1.0	0.87	9.36	100	56.84	66.20	0.350	-0.203
294.1	37.729	6.90	1.43	2.97	1.0	0.86	9.50	100	56.88	66.39	0.350	-0.204
293.9	37.893	6.50	1.60	3.02	1.0	0.86	9.07	100	56.75	65.82	0.350	-0.201
293.7	38.057	6.61	1.52	3.00	1.0	0.86	9.21	100	56.79	66.01	0.350	-0.202
293.6	38.221	7.04	1.24	2.93	1.0	0.86	9.71	98	56.76	66.46	0.350	-0.204
293.4	38.385	7.12	1.03	2.89	1.0	0.86	9.82	94	56.51	66.33	0.350	-0.203
293.3	38.549	6.48	0.93	2.91	1.0	0.86	9.11	96	56.42	65.53	0.350	-0.199
293.1	38.713	6.49	0.61	2.84	1.0	0.85	9.13	90	55.91	65.05	0.350	-0.196
292.9	38.877	6.33	0.72	2.88	1.0	0.85	8.96	93	56.13	65.09	0.350	-0.196
292.8	39.042	6.36	0.89	2.91	1.0	0.85	9.01	96	56.39	65.41	0.350	-0.198
292.6	39.206	6.27	0.95	2.93	1.0	0.85	8.92	97	56.48	65.40	0.350	-0.197
292.4	39.370	6.23	1.19	2.97	1.0	0.85	8.90	100	56.69	65.59	0.350	-0.198
292.3	39.534	6.59	1.18	2.95	1.0	0.85	9.32	99	56.74	66.07	0.350	-0.201
292.1	39.698	6.44	1.23	2.97	1.0	0.84	9.17	100	56.78	65.95	0.350	-0.200
291.9	39.862	6.34	1.13	2.96	1.0	0.84	9.07	100	56.71	65.78	0.350	-0.199
291.8	40.026	6.03	0.98	2.95	1.0	0.84	8.73	99	56.56	65.28	0.350	-0.196
291.6	40.190	6.02	1.14	2.98	1.0	0.84	8.73	100	56.64	65.37	0.350	-0.197
291.4	40.354	6.43	1.12	2.95	1.0	0.84	9.21	99	56.70	65.91	0.350	-0.200
291.3	40.518	6.60	1.21	2.95	1.0	0.84	9.42	99	56.80	66.22	0.350	-0.201
291.1	40.682	6.24	1.34	3.00	1.0	0.83	9.02	100	56.73	65.75	0.350	-0.198
291.0	40.846	6.21	1.47	3.01	1.0	0.83	9.00	100	56.73	65.72	0.350	-0.198
290.8	41.010	6.43	1.18	2.96	1.0	0.83	9.26	100	56.78	66.05	0.350	-0.200
290.6	41.174	6.39	1.36	2.99	1.0	0.83	9.23	100	56.80	66.03	0.350	-0.200
290.5	41.338	6.76	2.10	3.06	1.0	0.83	9.68	100	56.94	66.62	0.350	-0.203
290.3	41.502	8.32	1.86	2.95	1.0	0.83	11.51	99	57.44	68.95	0.350	-0.216
290.1	41.666	5.86	2.49	3.15	1.0	0.82	8.66	100	56.62	65.29	0.350	-0.195
290.0	41.830	5.63	1.38	3.04	1.0	0.82	8.41	100	56.54	64.96	0.350	-0.193
289.8	41.994	5.99	0.91	2.94	1.0	0.82	8.83	98	56.53	65.37	0.350	-0.195
289.6	42.158	5.65	1.05	2.99	1.0	0.82	8.46	100	56.56	65.02	0.350	-0.193
289.5	42.322	5.62	1.22	3.02	1.0	0.82	8.43	100	56.55	64.98	0.350	-0.193

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
289.3	42.486	5.82	1.11	2.99	1.0	0.82	8.68	100	56.63	65.31	0.350	-0.195
289.1	42.650	5.88	1.43	3.03	1.0	0.81	8.77	100	56.65	65.42	0.350	-0.195
289.0	42.814	5.85	1.14	2.99	1.0	0.81	8.75	100	56.65	65.39	0.350	-0.195
288.8	42.978	8.02	2.41	3.03	1.0	0.81	11.31	100	57.44	68.75	0.350	-0.214
288.7	43.143	9.96	1.86	2.89	1.0	0.82	13.62	94	57.62	71.24	0.350	-0.228
288.5	43.307	9.04	2.33	2.97	1.0	0.81	12.55	100	57.83	70.38	0.350	-0.223
288.3	43.471	6.10	2.74	3.16	1.0	0.81	9.09	100	56.76	65.85	0.350	-0.197
288.2	43.635	5.79	2.40	3.14	1.0	0.81	8.73	100	56.64	65.38	0.350	-0.194
288.0	43.799	5.83	1.26	3.01	1.0	0.80	8.79	100	56.66	65.46	0.350	-0.195
287.8	43.963	5.28	1.38	3.07	1.0	0.80	8.16	100	56.47	64.62	0.350	-0.190
287.7	44.127	5.25	1.37	3.07	1.0	0.80	8.13	100	56.46	64.58	0.350	-0.189
287.5	44.291	5.53	1.16	3.01	1.0	0.80	8.48	100	56.57	65.05	0.350	-0.192
287.3	44.455	5.67	1.35	3.03	1.0	0.80	8.65	100	56.62	65.27	0.350	-0.193
287.2	44.619	6.12	1.67	3.05	1.0	0.80	9.20	100	56.79	65.98	0.350	-0.197
287.0	44.783	5.88	1.85	3.08	1.0	0.80	8.93	100	56.71	65.64	0.350	-0.195
286.9	44.947	6.29	1.92	3.07	1.0	0.80	9.43	100	56.86	66.29	0.350	-0.199
286.7	45.111	5.90	1.91	3.09	1.0	0.79	8.98	100	56.72	65.71	0.350	-0.195
286.5	45.275	7.42	1.76	2.98	1.0	0.79	10.81	100	57.29	68.10	0.350	-0.209
286.4	45.439	6.15	2.00	3.08	1.0	0.79	9.31	100	56.82	66.13	0.350	-0.198
286.2	45.603	6.28	2.25	3.10	1.0	0.79	9.47	100	56.87	66.35	0.350	-0.199
286.0	45.767	5.84	1.91	3.09	1.0	0.79	8.96	100	56.72	65.68	0.350	-0.195
285.9	45.931	5.72	1.76	3.08	1.0	0.79	8.83	100	56.67	65.50	0.350	-0.194
285.7	46.095	5.42	1.40	3.06	1.0	0.78	8.47	100	56.56	65.04	0.350	-0.191
285.5	46.259	5.62	1.34	3.04	1.0	0.78	8.73	100	56.64	65.37	0.350	-0.193
285.4	46.423	5.55	1.39	3.05	1.0	0.78	8.66	100	56.62	65.28	0.350	-0.192
285.2	46.587	5.72	1.26	3.02	1.0	0.78	8.88	100	56.69	65.56	0.350	-0.194
285.0	46.751	5.82	1.21	3.00	1.0	0.78	9.01	100	56.73	65.74	0.350	-0.195
284.9	46.915	6.01	1.21	2.99	1.0	0.78	9.25	100	56.80	66.05	0.350	-0.196
284.7	47.079	5.63	1.55	3.06	1.0	0.78	8.80	100	56.67	65.47	0.350	-0.193
284.6	47.244	5.81	1.70	3.07	1.0	0.78	9.04	100	56.74	65.78	0.350	-0.194
284.4	47.408	5.58	1.65	3.08	1.0	0.77	8.76	100	56.65	65.41	0.350	-0.192
284.2	47.572	5.68	1.59	3.06	1.0	0.77	8.90	100	56.70	65.59	0.350	-0.193
284.1	47.736	5.68	1.36	3.03	1.0	0.77	8.91	100	56.70	65.61	0.350	-0.193
283.9	47.900	5.76	1.24	3.01	1.0	0.77	9.02	100	56.73	65.76	0.350	-0.194
283.7	48.064	5.53	1.32	3.04	1.0	0.77	8.74	100	56.65	65.39	0.350	-0.192
283.6	48.228	6.02	1.22	2.99	1.0	0.77	9.36	100	56.84	66.20	0.350	-0.196
283.4	48.392	5.29	1.39	3.07	1.0	0.77	8.48	100	56.56	65.04	0.350	-0.189
283.2	48.556	5.45	1.41	3.06	1.0	0.76	8.69	100	56.63	65.32	0.350	-0.191
283.1	48.720	5.38	1.24	3.04	1.0	0.76	8.61	100	56.61	65.21	0.350	-0.190
282.9	48.884	5.36	1.13	3.02	1.0	0.76	8.60	100	56.60	65.20	0.350	-0.190
282.8	49.048	5.29	1.19	3.04	1.0	0.76	8.52	100	56.58	65.10	0.350	-0.189
282.6	49.212	5.10	1.11	3.04	1.0	0.76	8.30	100	56.51	64.81	0.350	-0.188
282.4	49.376	5.36	1.37	3.06	1.0	0.76	8.63	100	56.61	65.25	0.350	-0.190
282.3	49.540	5.63	1.57	3.07	1.0	0.76	8.98	100	56.72	65.70	0.350	-0.193
282.1	49.704	5.38	1.81	3.11	1.0	0.76	8.68	100	56.63	65.30	0.350	-0.190
281.9	49.868	5.54	1.85	3.11	1.0	0.76	8.88	100	56.69	65.58	0.350	-0.192
281.8	50.032	5.50	1.51	3.07	1.0	0.75	8.86	100	56.68	65.54	0.350	-0.191
281.6	50.196	5.48	1.42	3.06	1.0	0.75	8.84	100	56.68	65.51	0.350	-0.191
281.4	50.360	5.32	1.43	3.07	1.0	0.75	8.65	100	56.62	65.26	0.350	-0.190
281.3	50.524	5.35	1.38	3.06	1.0	0.75	8.69	100	56.63	65.32	0.350	-0.190
281.1	50.688	5.30	1.36	3.06	1.0	0.75	8.65	100	56.62	65.26	0.350	-0.189
280.9	50.852	5.31	1.18	3.03	1.0	0.75	8.68	100	56.63	65.30	0.350	-0.190
280.8	51.016	5.23	1.24	3.05	1.0	0.75	8.58	100	56.60	65.17	0.350	-0.189
280.6	51.180	5.22	1.39	3.07	1.0	0.75	8.58	100	56.60	65.18	0.350	-0.189
280.5	51.345	6.11	1.22	2.98	1.0	0.75	9.71	100	56.95	66.66	0.350	-0.197
280.3	51.509	12.92	1.39	2.72	1.0	0.75	18.38	81	57.65	76.03	0.350	-0.248
280.1	51.673	10.68	1.78	2.85	1.0	0.75	15.54	91	57.94	73.47	0.350	-0.235
280.0	51.837	7.75	2.80	3.07	1.0	0.75	11.82	100	57.60	69.43	0.350	-0.212
279.8	52.001	6.75	1.95	3.04	1.0	0.74	10.57	100	57.22	67.79	0.350	-0.203
279.6	52.165	6.68	5.26	3.28	1.0	0.74	10.49	100	57.19	67.68	0.350	-0.202
279.5	52.329	11.85	2.93	2.93	1.0	0.75	17.14	97	59.04	76.18	0.350	-0.248
279.3	52.493	7.05	3.84	3.18	1.0	0.74	10.99	100	57.34	68.33	0.350	-0.206
279.1	52.657	5.88	2.98	3.19	1.0	0.74	9.52	100	56.89	66.41	0.350	-0.195
279.0	52.821	6.10	2.08	3.09	1.0	0.74	9.81	100	56.98	66.79	0.350	-0.197
278.8	52.985	6.12	1.94	3.08	1.0	0.73	9.84	100	56.99	66.83	0.350	-0.197
278.7	53.149	6.50	1.96	3.06	1.0	0.73	10.34	100	57.14	67.48	0.350	-0.201

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
278.5	53.313	5.52	2.02	3.13	1.0	0.73	9.10	100	56.76	65.86	0.350	-0.191
278.3	53.477	5.86	1.71	3.07	1.0	0.73	9.54	100	56.90	66.44	0.350	-0.195
278.2	53.641	5.60	1.71	3.09	1.0	0.73	9.23	100	56.80	66.03	0.350	-0.192
278.0	53.805	5.39	1.86	3.12	1.0	0.73	8.97	100	56.72	65.69	0.350	-0.190
277.8	53.969	5.48	1.64	3.08	1.0	0.73	9.10	100	56.76	65.86	0.350	-0.191
277.7	54.133	5.46	1.46	3.06	1.0	0.73	9.08	100	56.75	65.83	0.350	-0.191
277.5	54.297	5.30	1.53	3.08	1.0	0.72	8.89	100	56.69	65.58	0.350	-0.189
277.3	54.461	5.29	1.46	3.08	1.0	0.72	8.88	100	56.69	65.57	0.350	-0.189
277.2	54.625	5.39	1.44	3.07	1.0	0.72	9.02	100	56.73	65.76	0.350	-0.190
277.0	54.789	5.31	1.45	3.07	1.0	0.72	8.93	100	56.71	65.64	0.350	-0.189
276.8	54.953	5.53	1.61	3.08	1.0	0.72	9.23	100	56.80	66.03	0.350	-0.191
276.7	55.117	5.48	1.69	3.09	1.0	0.72	9.18	100	56.78	65.96	0.350	-0.191
276.5	55.281	5.39	1.69	3.10	1.0	0.72	9.07	100	56.75	65.82	0.350	-0.190
276.4	55.446	5.61	1.55	3.06	1.0	0.72	9.36	100	56.84	66.20	0.350	-0.192
276.2	55.610	5.65	1.60	3.07	1.0	0.72	9.43	100	56.86	66.29	0.350	-0.193
276.0	55.774	5.57	2.19	3.14	1.0	0.72	9.33	100	56.83	66.15	0.350	-0.192
275.9	55.938	5.49	1.87	3.11	1.0	0.71	9.24	100	56.80	66.04	0.350	-0.191
275.7	56.102	5.32	1.74	3.11	1.0	0.71	9.03	100	56.74	65.77	0.350	-0.189
275.5	56.266	5.39	1.39	3.06	1.0	0.71	9.13	100	56.77	65.89	0.350	-0.190
275.4	56.430	5.49	1.37	3.05	1.0	0.71	9.27	100	56.81	66.08	0.350	-0.191
275.2	56.594	5.11	1.46	3.09	1.0	0.71	8.78	100	56.66	65.44	0.350	-0.187
275.0	56.758	4.98	1.49	3.10	1.0	0.71	8.63	100	56.61	65.25	0.350	-0.186
274.9	56.922	4.90	1.33	3.09	1.0	0.71	8.54	100	56.58	65.12	0.350	-0.185
274.7	57.086	4.96	1.33	3.08	1.0	0.71	8.62	100	56.61	65.23	0.350	-0.186
274.6	57.250	4.99	1.22	3.06	1.0	0.70	8.67	100	56.62	65.29	0.350	-0.186
274.4	57.414	5.38	1.17	3.03	1.0	0.70	9.19	100	56.79	65.98	0.350	-0.190
274.2	57.578	5.06	1.37	3.08	1.0	0.70	8.78	100	56.66	65.44	0.350	-0.187
274.1	57.742	5.27	1.56	3.09	1.0	0.70	9.07	100	56.75	65.81	0.350	-0.189
273.9	57.906	5.97	1.43	3.02	1.0	0.70	10.00	100	57.04	67.04	0.350	-0.196
273.7	58.070	5.06	1.68	3.12	1.0	0.70	8.81	100	56.67	65.48	0.350	-0.186
273.6	58.234	5.06	1.51	3.10	1.0	0.70	8.82	100	56.67	65.49	0.350	-0.186
273.4	58.398	5.49	1.33	3.04	1.0	0.70	9.40	100	56.85	66.25	0.350	-0.191
273.2	58.562	5.38	1.46	3.07	1.0	0.70	9.27	100	56.81	66.08	0.350	-0.190
273.1	58.726	5.39	1.51	3.08	1.0	0.70	9.29	100	56.82	66.10	0.350	-0.190
272.9	58.890	5.29	1.43	3.07	1.0	0.70	9.16	100	56.78	65.94	0.350	-0.189
272.7	59.054	5.36	2.24	3.16	1.0	0.69	9.27	100	56.81	66.08	0.350	-0.189
272.6	59.218	9.32	2.18	2.95	1.0	0.70	14.59	99	58.35	72.95	0.350	-0.228
272.4	59.382	76.55	0.71	1.91	0.5	0.74	79.53	16	24.19	103.72	0.350	-0.372
272.3	59.547	86.18	0.92	1.94	0.5	0.75	91.40	18	31.07	122.47	0.350	-0.445
272.1	59.711	95.67	0.82	1.87	0.5	0.75	100.40	13	15.69	116.09	0.350	-0.421
271.9	59.875	98.43	0.80	1.86	0.5	0.74	103.11	11	11.98	115.09	0.350	-0.417
271.8	60.039	95.17	1.14	1.96	0.5	0.77	102.81	20	37.44	140.25	0.350	-0.507
271.6	60.203	65.66	2.05	2.25	0.5	0.76	71.12	43	61.24	132.36	0.350	-0.480
271.4	60.367	20.23	5.18	2.90	1.0	0.72	30.10	95	62.83	92.93	0.350	-0.325
271.3	60.531	12.28	5.98	3.11	1.0	0.70	18.82	100	59.78	78.60	0.350	-0.256
271.1	60.695	6.78	7.36	3.36	1.0	0.69	11.29	100	57.44	68.73	0.350	-0.204
270.9	60.859	7.73	2.44	3.04	1.0	0.69	12.58	100	57.84	70.42	0.350	-0.213
270.8	61.023	6.69	1.95	3.05	1.0	0.69	11.18	100	57.40	68.58	0.350	-0.203
270.6	61.187	6.10	2.01	3.09	1.0	0.68	10.40	100	57.16	67.56	0.350	-0.197
270.4	61.351	5.48	1.81	3.10	1.0	0.68	9.58	100	56.91	66.49	0.350	-0.191
270.3	61.515	5.32	1.50	3.08	1.0	0.68	9.37	100	56.84	66.21	0.350	-0.189
270.1	61.679	5.33	1.37	3.06	1.0	0.68	9.39	100	56.85	66.23	0.350	-0.189
270.0	61.843	5.45	1.25	3.03	1.0	0.68	9.57	100	56.90	66.47	0.350	-0.190
269.8	62.007	5.89	1.05	2.97	1.0	0.68	10.17	100	57.09	67.26	0.350	-0.195
269.6	62.171	5.69	1.20	3.01	1.0	0.68	9.91	100	57.01	66.92	0.350	-0.193
269.5	62.335	5.55	1.48	3.06	1.0	0.68	9.73	100	56.95	66.69	0.350	-0.191
269.3	62.499	5.57	1.40	3.05	1.0	0.68	9.77	100	56.97	66.73	0.350	-0.191
269.1	62.663	5.66	1.09	2.99	1.0	0.68	9.91	100	57.01	66.91	0.350	-0.192
269.0	62.827	5.47	1.21	3.03	1.0	0.67	9.65	100	56.93	66.58	0.350	-0.190
268.8	62.991	5.30	1.24	3.04	1.0	0.67	9.43	100	56.86	66.30	0.350	-0.189
268.6	63.155	5.56	1.19	3.02	1.0	0.67	9.79	100	56.97	66.76	0.350	-0.191
268.5	63.319	5.59	1.12	3.00	1.0	0.67	9.85	100	56.99	66.84	0.350	-0.191
268.3	63.483	5.27	1.14	3.03	1.0	0.67	9.42	100	56.86	66.28	0.350	-0.188
268.2	63.648	5.49	1.16	3.02	1.0	0.67	9.73	100	56.95	66.68	0.350	-0.190
268.0	63.812	5.41	1.23	3.03	1.0	0.67	9.64	100	56.93	66.56	0.350	-0.190
267.8	63.976	5.44	1.23	3.03	1.0	0.67	9.69	100	56.94	66.63	0.350	-0.190

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(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
267.7	64.140	5.63	1.23	3.02	1.0	0.67	9.95	100	57.02	66.98	0.350	-0.192
267.5	64.304	5.42	1.39	3.06	1.0	0.67	9.67	100	56.94	66.61	0.350	-0.190
267.3	64.468	5.31	1.50	3.08	1.0	0.67	9.53	100	56.89	66.42	0.350	-0.188
267.2	64.632	5.33	1.29	3.05	1.0	0.66	9.57	100	56.90	66.47	0.350	-0.189
267.0	64.796	5.42	1.23	3.03	1.0	0.66	9.71	100	56.95	66.65	0.350	-0.190
266.8	64.960	5.67	1.49	3.05	1.0	0.66	10.06	100	57.06	67.12	0.350	-0.192
266.7	65.124	5.53	1.76	3.10	1.0	0.66	9.87	100	57.00	66.87	0.350	-0.191
266.5	65.288	5.39	1.86	3.12	1.0	0.66	9.69	100	56.94	66.64	0.350	-0.189
266.3	65.452	5.58	1.68	3.08	1.0	0.66	9.97	100	57.03	67.00	0.350	-0.191
266.2	65.616	5.44	1.89	3.12	1.0	0.66	9.78	100	56.97	66.75	0.350	-0.190
266.0	65.780	5.45	1.86	3.11	1.0	0.66	9.81	100	56.98	66.79	0.350	-0.190
265.9	65.944	5.38	1.62	3.09	1.0	0.66	9.72	100	56.95	66.67	0.350	-0.189
265.7	66.108	5.40	1.39	3.06	1.0	0.66	9.76	100	56.96	66.73	0.350	-0.189
265.5	66.272	5.22	1.43	3.08	1.0	0.66	9.51	100	56.89	66.40	0.350	-0.187
265.4	66.436	5.25	1.44	3.08	1.0	0.65	9.57	100	56.91	66.48	0.350	-0.188
265.2	66.600	5.27	1.43	3.07	1.0	0.65	9.61	100	56.92	66.52	0.350	-0.188
265.0	66.764	5.15	1.38	3.07	1.0	0.65	9.45	100	56.87	66.32	0.350	-0.187
264.9	66.928	5.27	1.43	3.07	1.0	0.65	9.62	100	56.92	66.55	0.350	-0.188
264.7	67.092	5.46	1.67	3.09	1.0	0.65	9.91	100	57.01	66.92	0.350	-0.190
264.5	67.256	5.24	1.73	3.11	1.0	0.65	9.61	100	56.92	66.52	0.350	-0.188
264.4	67.420	5.44	1.70	3.10	1.0	0.65	9.89	100	57.00	66.89	0.350	-0.190
264.2	67.584	5.44	1.52	3.07	1.0	0.65	9.91	100	57.01	66.92	0.350	-0.190
264.1	67.749	5.27	1.66	3.10	1.0	0.65	9.68	100	56.94	66.62	0.350	-0.188
263.9	67.913	5.25	1.53	3.09	1.0	0.65	9.65	100	56.93	66.58	0.350	-0.188
263.7	68.077	5.34	1.50	3.08	1.0	0.65	9.79	100	56.97	66.77	0.350	-0.189
263.6	68.241	5.42	1.35	3.05	1.0	0.65	9.92	100	57.01	66.93	0.350	-0.189
263.4	68.405	5.55	1.37	3.04	1.0	0.65	10.11	100	57.07	67.18	0.350	-0.191
263.2	68.569	5.44	1.36	3.05	1.0	0.65	9.95	100	57.02	66.98	0.350	-0.190
263.1	68.733	5.33	1.46	3.07	1.0	0.64	9.81	100	56.98	66.79	0.350	-0.188
262.9	68.897	5.40	1.87	3.12	1.0	0.64	9.92	100	57.01	66.93	0.350	-0.189
262.7	69.061	5.13	1.99	3.15	1.0	0.64	9.55	100	56.90	66.45	0.350	-0.186
262.6	69.225	5.98	2.22	3.12	1.0	0.64	10.76	100	57.27	68.03	0.350	-0.195
262.4	69.389	5.71	1.07	2.99	1.0	0.64	10.39	100	57.16	67.55	0.350	-0.192
262.2	69.553	45.02	0.99	2.19	0.5	0.68	47.77	38	51.96	99.74	0.350	-0.350
262.1	69.717	36.40	2.19	2.47	0.5	0.68	39.08	60	59.74	98.82	0.350	-0.346
261.9	69.881	11.85	4.26	3.03	1.0	0.66	19.39	100	59.95	79.34	0.350	-0.255
261.8	70.045	6.27	6.08	3.34	1.0	0.64	11.24	100	57.42	68.66	0.350	-0.198
261.6	70.209	6.17	2.82	3.16	1.0	0.64	11.10	100	57.38	68.47	0.350	-0.197
261.4	70.373	6.48	1.40	2.99	1.0	0.64	11.56	100	57.52	69.08	0.350	-0.201
261.3	70.537	6.18	1.14	2.97	1.0	0.64	11.14	100	57.39	68.53	0.350	-0.197
261.1	70.701	5.65	1.06	2.99	1.0	0.64	10.39	100	57.16	67.55	0.350	-0.192
260.9	70.865	5.43	0.86	2.97	1.0	0.63	10.08	100	57.06	67.14	0.350	-0.189
260.8	71.029	5.57	0.65	2.91	1.0	0.63	10.29	96	56.80	67.09	0.350	-0.189
260.6	71.193	5.56	0.83	2.95	1.0	0.63	10.28	99	57.07	67.35	0.350	-0.190
260.4	71.357	5.43	1.02	3.00	1.0	0.63	10.12	100	57.07	67.19	0.350	-0.189
260.3	71.521	5.71	1.13	3.00	1.0	0.63	10.52	100	57.20	67.72	0.350	-0.192
260.1	71.685	5.52	1.32	3.04	1.0	0.63	10.26	100	57.12	67.38	0.350	-0.190
260.0	71.850	5.41	1.37	3.05	1.0	0.63	10.12	100	57.07	67.19	0.350	-0.189
259.8	72.014	5.35	1.44	3.07	1.0	0.63	10.03	100	57.05	67.08	0.350	-0.188
259.6	72.178	5.05	1.55	3.11	1.0	0.63	9.61	100	56.92	66.53	0.350	-0.185
259.5	72.342	4.75	1.64	3.14	1.0	0.63	9.19	100	56.79	65.98	0.350	-0.182
259.3	72.506	4.84	1.45	3.11	1.0	0.63	9.32	100	56.83	66.15	0.350	-0.183
259.1	72.670	5.39	1.40	3.06	1.0	0.63	10.13	100	57.08	67.21	0.350	-0.189
259.0	72.834	5.39	1.42	3.06	1.0	0.63	10.14	100	57.08	67.22	0.350	-0.189
258.8	72.998	4.87	1.50	3.11	1.0	0.62	9.40	100	56.85	66.25	0.350	-0.183
258.6	73.162	5.13	0.99	3.02	1.0	0.62	9.78	100	56.97	66.76	0.350	-0.186
258.5	73.326	5.04	0.80	2.99	1.0	0.62	9.66	100	56.93	66.59	0.350	-0.185
258.3	73.490	4.88	1.02	3.04	1.0	0.62	9.44	100	56.86	66.31	0.350	-0.183
258.1	73.654	5.07	1.30	3.07	1.0	0.62	9.72	100	56.95	66.67	0.350	-0.185
258.0	73.818	5.01	2.11	3.17	1.0	0.62	9.65	100	56.93	66.57	0.350	-0.185
257.8	73.982	14.50	1.83	2.74	1.0	0.64	23.90	82	59.50	83.40	0.350	-0.273
257.7	74.146	26.26	2.89	2.65	1.0	0.67	43.02	75	64.11	107.13	0.350	-0.378
257.5	74.310	15.16	4.04	2.93	1.0	0.65	25.07	97	61.47	86.54	0.350	-0.288
257.3	74.474	7.38	5.29	3.25	1.0	0.62	13.17	100	58.02	71.19	0.350	-0.210
257.2	74.638	6.45	2.22	3.09	1.0	0.62	11.80	100	57.60	69.39	0.350	-0.200
257.0	74.802	5.89	1.18	2.99	1.0	0.62	10.99	100	57.34	68.33	0.350	-0.194

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{CIN}	FC (%)	Δq_{CIN}	$(q_{CIN})_{CS}$	a	ξ_R
256.8	74.966	5.43	1.04	3.00	1.0	0.62	10.32	100	57.14	67.46	0.350	-0.189
256.7	75.130	5.27	1.56	3.09	1.0	0.62	10.10	100	57.07	67.16	0.350	-0.187
256.5	75.294	6.23	1.16	2.97	1.0	0.62	11.52	100	57.51	69.03	0.350	-0.198
256.3	75.458	5.80	1.19	3.00	1.0	0.62	10.90	100	57.32	68.21	0.350	-0.193
256.2	75.622	5.39	1.67	3.10	1.0	0.61	10.30	100	57.13	67.43	0.350	-0.189
256.0	75.786	7.15	1.47	2.96	1.0	0.62	12.91	100	57.93	70.85	0.350	-0.208
255.8	75.951	8.70	1.54	2.90	1.0	0.62	15.25	95	58.21	73.45	0.350	-0.222
255.7	76.115	6.32	3.92	3.23	1.0	0.61	11.70	100	57.56	69.26	0.350	-0.199
255.5	76.279	20.64	1.74	2.60	1.0	0.65	34.09	71	60.79	94.88	0.350	-0.326
255.4	76.443	52.20	1.25	2.19	0.5	0.67	56.21	38	54.35	110.55	0.350	-0.391
255.2	76.607	69.64	1.13	2.07	0.5	0.68	75.72	28	48.34	124.06	0.350	-0.442
255.0	76.771	72.77	1.39	2.11	0.5	0.69	80.21	32	53.45	133.66	0.350	-0.476
254.9	76.935	46.96	2.60	2.43	0.5	0.67	51.13	57	62.26	113.39	0.350	-0.402
254.7	77.099	22.67	3.59	2.76	1.0	0.66	37.85	84	63.90	101.74	0.350	-0.355
254.5	77.263	19.60	4.64	2.88	1.0	0.65	32.80	93	63.49	96.29	0.350	-0.331
254.4	77.427	22.12	3.23	2.74	1.0	0.65	36.96	82	63.40	100.36	0.350	-0.349
254.2	77.591	59.22	1.99	2.28	0.5	0.68	65.11	45	60.89	125.99	0.350	-0.449
254.0	77.755	29.86	3.40	2.65	1.0	0.67	50.48	75	66.35	116.83	0.350	-0.415
253.9	77.919	16.97	5.37	2.97	1.0	0.64	28.60	100	62.81	91.42	0.350	-0.309
253.7	78.083	11.69	5.79	3.11	1.0	0.62	20.11	100	60.18	80.29	0.350	-0.256
253.6	78.247	47.19	1.48	2.27	0.5	0.66	50.92	45	57.02	107.93	0.350	-0.380
253.4	78.411	80.09	1.00	1.99	0.5	0.68	87.12	22	39.29	126.41	0.350	-0.450
253.2	78.575	61.91	1.88	2.25	0.5	0.68	68.27	43	60.26	128.52	0.350	-0.457
253.1	78.739	19.97	4.34	2.86	1.0	0.64	33.71	92	63.56	97.27	0.350	-0.335
252.9	78.903	9.06	7.95	3.29	1.0	0.61	16.08	100	58.92	75.00	0.350	-0.229
252.7	79.067	11.78	5.75	3.11	1.0	0.62	20.37	100	60.26	80.62	0.350	-0.257
252.6	79.231	11.84	4.18	3.02	1.0	0.62	20.48	100	60.29	80.76	0.350	-0.258
252.4	79.395	17.48	2.97	2.80	1.0	0.63	29.62	87	61.78	91.40	0.350	-0.308
252.2	79.559	114.61	0.93	1.84	0.5	0.68	125.26	11	10.03	135.29	0.350	-0.480
252.1	79.723	90.21	1.77	2.11	0.5	0.71	103.20	32	58.52	161.72	0.350	-0.564
251.9	79.887	28.37	4.20	2.73	1.0	0.66	48.62	82	66.82	115.44	0.350	-0.408
251.7	80.052	17.37	5.26	2.96	1.0	0.63	29.64	100	63.09	92.73	0.350	-0.314
251.6	80.216	58.04	1.92	2.27	0.5	0.67	63.84	45	60.38	124.22	0.350	-0.441
251.4	80.380	94.88	1.19	1.98	0.5	0.69	106.14	21	40.44	146.58	0.350	-0.517
251.3	80.544	115.86	0.96	1.85	0.5	0.69	127.52	11	11.83	139.35	0.350	-0.493
251.1	80.708	111.27	1.10	1.90	0.5	0.70	124.63	15	25.47	150.10	0.350	-0.528
250.9	80.872	103.37	1.09	1.92	0.5	0.69	115.21	17	30.12	145.32	0.350	-0.513
250.8	81.036	86.46	1.43	2.06	0.5	0.69	97.48	28	51.82	149.30	0.350	-0.525
250.6	81.200	55.59	2.20	2.33	0.5	0.67	61.21	49	61.86	123.07	0.350	-0.436
250.4	81.364	26.08	3.14	2.68	1.0	0.65	44.87	77	65.00	109.87	0.350	-0.386
250.3	81.528	18.02	4.16	2.88	1.0	0.63	30.96	93	62.90	93.86	0.350	-0.319
250.1	81.692	8.39	6.82	3.27	1.0	0.60	15.27	100	58.67	73.94	0.350	-0.222
249.9	81.856	5.04	6.83	3.45	1.0	0.59	10.11	100	57.07	67.18	0.350	-0.184
249.8	82.020	7.27	2.98	3.11	1.0	0.60	13.55	100	58.14	71.69	0.350	-0.209
249.6	82.184	48.39	0.90	2.14	0.5	0.64	51.58	34	49.63	101.21	0.350	-0.350
249.5	82.348	112.51	0.71	1.78	0.5	0.66	120.31	5	0.25	120.55	0.350	-0.426
249.3	82.512	115.64	1.12	1.90	0.5	0.70	130.65	15	24.43	155.08	0.350	-0.543
249.1	82.676	78.31	2.06	2.20	0.5	0.69	89.11	39	62.62	151.73	0.350	-0.532
249.0	82.840	23.98	4.14	2.78	1.0	0.64	41.62	86	65.26	106.89	0.350	-0.373
248.8	83.004	18.61	3.70	2.84	1.0	0.63	32.24	90	62.92	95.15	0.350	-0.324
248.6	83.168	24.31	2.43	2.63	1.0	0.64	42.14	74	63.56	105.70	0.350	-0.368
248.5	83.332	50.15	1.86	2.31	0.5	0.65	54.75	48	59.61	114.37	0.350	-0.403
248.3	83.496	39.31	2.02	2.42	0.5	0.63	42.57	56	59.58	102.15	0.350	-0.353
248.1	83.660	17.08	3.08	2.81	1.0	0.62	29.71	88	61.96	91.67	0.350	-0.308
248.0	83.824	12.64	4.72	3.03	1.0	0.61	22.33	100	60.87	83.20	0.350	-0.268
247.8	83.988	7.72	5.46	3.24	1.0	0.59	14.39	100	58.40	72.80	0.350	-0.214
247.6	84.153	9.75	5.67	3.17	1.0	0.60	17.65	100	59.41	77.06	0.350	-0.237
247.5	84.317	23.26	2.04	2.60	1.0	0.63	40.50	71	62.61	103.11	0.350	-0.357
247.3	84.481	21.20	3.01	2.74	1.0	0.63	37.00	82	63.36	100.35	0.350	-0.345
247.2	84.645	67.17	2.09	2.25	0.5	0.67	75.40	43	62.29	137.68	0.350	-0.486
247.0	84.809	58.33	1.99	2.28	0.5	0.66	64.54	46	60.93	125.48	0.350	-0.443
246.8	84.973	110.03	1.12	1.91	0.5	0.69	124.29	16	27.73	152.02	0.350	-0.532
246.7	85.137	101.15	1.51	2.03	0.5	0.70	117.34	25	50.89	168.22	0.350	-0.581
246.5	85.301	73.41	1.95	2.20	0.5	0.68	83.07	39	61.39	144.46	0.350	-0.508
246.3	85.465	67.19	1.83	2.21	0.5	0.67	75.18	40	60.10	135.28	0.350	-0.477
246.2	85.629	50.71	2.40	2.38	0.5	0.65	55.81	54	62.22	118.02	0.350	-0.416

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	(ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
246.0	85.793	16.18	3.58	2.87	1.0	0.61	28.55	93	62.12	90.67	0.350	-0.302
245.8	85.957	8.70	4.14	3.13	1.0	0.59	16.12	100	58.94	75.06	0.350	-0.226
245.7	86.121	5.36	3.59	3.27	1.0	0.58	10.83	100	57.30	68.13	0.350	-0.188
245.5	86.285	7.69	0.77	2.81	1.0	0.58	14.47	88	57.30	71.76	0.350	-0.208
245.4	86.449	29.92	0.75	2.28	0.5	0.60	31.87	45	52.30	84.17	0.350	-0.271
245.2	86.613	19.76	1.66	2.61	1.0	0.61	34.75	72	61.05	95.79	0.350	-0.325
245.0	86.777	9.39	3.40	3.05	1.0	0.59	17.30	100	59.30	76.60	0.350	-0.233
244.9	86.941	6.50	3.47	3.19	1.0	0.58	12.66	100	57.86	70.53	0.350	-0.201
244.7	87.105	6.59	0.94	2.91	1.0	0.58	12.80	96	57.53	70.33	0.350	-0.200
244.5	87.269	6.45	0.75	2.88	1.0	0.57	12.59	93	57.25	69.84	0.350	-0.197
244.4	87.433	6.29	0.83	2.90	1.0	0.57	12.35	95	57.36	69.71	0.350	-0.196
244.2	87.597	8.50	3.32	3.08	1.0	0.58	15.91	100	58.87	74.79	0.350	-0.223
244.0	87.761	15.18	2.47	2.80	1.0	0.60	27.07	87	61.03	88.10	0.350	-0.289
243.9	87.925	8.05	3.25	3.09	1.0	0.58	15.21	100	58.66	73.87	0.350	-0.218
243.7	88.089	8.80	2.11	2.96	1.0	0.58	16.45	100	59.02	75.47	0.350	-0.227
243.5	88.254	8.28	1.76	2.94	1.0	0.58	15.60	98	58.65	74.25	0.350	-0.220
243.4	88.418	62.15	0.75	2.00	0.5	0.62	66.03	23	38.66	104.69	0.350	-0.362
243.2	88.582	50.53	1.55	2.26	0.5	0.63	55.18	44	57.62	112.80	0.350	-0.394
243.1	88.746	16.02	4.30	2.93	1.0	0.60	28.76	97	62.61	91.37	0.350	-0.304
242.9	88.910	12.90	5.02	3.04	1.0	0.59	23.39	100	61.19	84.59	0.350	-0.272
242.7	89.074	8.84	4.84	3.16	1.0	0.58	16.60	100	59.09	75.68	0.350	-0.228
242.6	89.238	6.50	3.53	3.19	1.0	0.57	12.81	100	57.91	70.72	0.350	-0.201
242.4	89.402	5.93	1.72	3.06	1.0	0.57	11.90	100	57.63	69.53	0.350	-0.194
242.2	89.566	4.74	1.48	3.12	1.0	0.56	10.04	100	57.05	67.09	0.350	-0.180
242.1	89.730	6.61	1.89	3.04	1.0	0.57	13.02	100	57.97	70.99	0.350	-0.202
241.9	89.894	16.91	1.62	2.66	1.0	0.60	30.33	76	60.44	90.77	0.350	-0.301
241.7	90.058	9.39	3.12	3.03	1.0	0.58	17.59	100	59.39	76.99	0.350	-0.234
241.6	90.222	6.83	2.61	3.10	1.0	0.57	13.41	100	58.09	71.50	0.350	-0.205
241.4	90.386	14.85	1.29	2.66	1.0	0.59	26.76	75	59.34	86.10	0.350	-0.279
241.2	90.550	13.55	2.91	2.88	1.0	0.59	24.67	93	60.99	85.66	0.350	-0.277
241.1	90.714	7.97	5.22	3.22	1.0	0.57	15.29	100	58.68	73.97	0.350	-0.218
240.9	90.878	36.96	1.67	2.39	0.5	0.60	40.00	54	58.07	98.07	0.350	-0.333
240.8	91.042	18.38	2.52	2.74	1.0	0.60	33.26	82	62.26	95.52	0.350	-0.322
240.6	91.206	11.03	4.33	3.06	1.0	0.58	20.45	100	60.28	80.73	0.350	-0.252
240.4	91.370	14.54	2.82	2.85	1.0	0.59	26.51	91	61.29	87.80	0.350	-0.286
240.3	91.534	47.15	1.84	2.33	0.5	0.62	51.62	49	59.46	111.07	0.350	-0.386
240.1	91.698	50.02	1.83	2.31	0.5	0.62	54.95	48	59.54	114.49	0.350	-0.399
239.9	91.862	48.67	1.85	2.32	0.5	0.62	53.40	49	59.60	113.00	0.350	-0.394
239.8	92.026	26.11	2.74	2.64	1.0	0.62	48.00	74	65.40	113.40	0.350	-0.395
239.6	92.190	17.12	5.52	2.98	1.0	0.60	31.33	100	63.66	94.99	0.350	-0.319
239.4	92.355	18.91	4.38	2.88	1.0	0.60	34.60	93	64.00	98.61	0.350	-0.335
239.3	92.519	101.01	1.41	2.01	0.5	0.68	118.01	24	47.79	165.80	0.350	-0.571
239.1	92.683	154.84	1.14	1.81	0.5	0.70	185.16	8	3.17	188.33	0.350	-0.600
239.0	92.847	146.06	1.29	1.86	0.5	0.71	176.31	12	17.66	193.96	0.350	-0.600
238.8	93.011	126.34	1.36	1.93	0.5	0.70	151.34	17	34.68	186.01	0.350	-0.600
238.6	93.175	109.45	1.30	1.96	0.5	0.68	127.97	19	39.24	167.21	0.350	-0.575
238.5	93.339	99.31	1.18	1.96	0.5	0.66	113.55	20	38.00	151.56	0.350	-0.527
238.3	93.503	91.08	1.15	1.98	0.5	0.65	103.05	21	40.64	143.70	0.350	-0.502
238.1	93.667	82.39	1.47	2.08	0.5	0.66	94.33	30	54.04	148.37	0.350	-0.517
238.0	93.831	61.76	2.46	2.33	0.5	0.64	69.78	49	64.12	133.90	0.350	-0.469
237.8	93.995	18.54	4.73	2.90	1.0	0.60	34.23	95	64.12	98.36	0.350	-0.333
237.6	94.159	10.91	6.45	3.17	1.0	0.57	20.55	100	60.31	80.86	0.350	-0.252
237.5	94.323	7.39	5.74	3.27	1.0	0.56	14.60	100	58.46	73.06	0.350	-0.211
237.3	94.487	5.29	6.01	3.40	1.0	0.55	11.15	100	57.40	68.55	0.350	-0.187
237.1	94.651	5.15	4.95	3.36	1.0	0.55	10.94	100	57.33	68.26	0.350	-0.185
237.0	94.815	6.01	2.69	3.16	1.0	0.55	12.34	100	57.76	70.10	0.350	-0.195
236.8	94.979	13.43	2.08	2.80	1.0	0.57	24.99	87	60.41	85.40	0.350	-0.274
236.7	95.143	42.17	1.41	2.30	0.5	0.60	45.74	47	56.69	102.43	0.350	-0.350
236.5	95.307	44.84	1.02	2.20	0.5	0.59	48.26	39	52.63	100.89	0.350	-0.343
236.3	95.471	40.49	1.15	2.26	0.5	0.59	43.64	44	54.69	98.33	0.350	-0.332
236.2	95.635	15.12	2.37	2.79	1.0	0.58	28.11	86	61.25	89.36	0.350	-0.292
236.0	95.799	7.90	3.73	3.13	1.0	0.55	15.54	100	58.76	74.30	0.350	-0.217
235.8	95.963	14.14	2.25	2.80	1.0	0.57	26.39	87	60.84	87.22	0.350	-0.282
235.7	96.127	20.69	2.49	2.69	1.0	0.59	38.54	78	63.32	101.87	0.350	-0.347
235.5	96.291	16.94	3.83	2.88	1.0	0.58	31.63	93	63.09	94.72	0.350	-0.316
235.3	96.456	26.49	3.17	2.67	1.0	0.61	50.14	77	66.53	116.67	0.350	-0.406

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
235.2	96.620	11.62	5.40	3.10	1.0	0.57	22.05	100	60.78	82.82	0.350	-0.260
235.0	96.784	6.12	6.79	3.38	1.0	0.55	12.64	100	57.86	70.50	0.350	-0.196
234.9	96.948	14.94	2.69	2.83	1.0	0.57	27.99	89	61.55	89.54	0.350	-0.292
234.7	97.112	66.43	1.30	2.12	0.5	0.62	74.08	33	53.24	127.31	0.350	-0.445
234.5	97.276	53.94	2.03	2.31	0.5	0.62	60.05	48	61.05	121.10	0.350	-0.422
234.4	97.440	24.44	2.86	2.67	1.0	0.60	46.24	77	65.36	111.60	0.350	-0.386
234.2	97.604	19.45	3.69	2.82	1.0	0.59	36.59	89	64.11	100.70	0.350	-0.341
234.0	97.768	9.89	5.73	3.17	1.0	0.56	19.12	100	59.87	78.99	0.350	-0.241
233.9	97.932	5.95	4.61	3.29	1.0	0.54	12.42	100	57.79	70.21	0.350	-0.194
233.7	98.096	5.23	2.31	3.18	1.0	0.54	11.22	100	57.42	68.64	0.350	-0.186
233.5	98.260	5.37	2.44	3.18	1.0	0.54	11.47	100	57.50	68.97	0.350	-0.187
233.4	98.424	5.02	1.76	3.13	1.0	0.54	10.91	100	57.32	68.23	0.350	-0.183
233.2	98.588	15.67	1.81	2.71	1.0	0.57	29.49	80	60.85	90.34	0.350	-0.295
233.0	98.752	10.88	2.64	2.94	1.0	0.56	20.95	98	60.25	81.20	0.350	-0.251
232.9	98.916	8.70	2.93	3.04	1.0	0.55	17.16	100	59.26	76.42	0.350	-0.227
232.7	99.080	7.05	1.33	2.95	1.0	0.54	14.33	99	58.27	72.60	0.350	-0.207
232.6	99.244	5.76	1.39	3.03	1.0	0.54	12.16	100	57.71	69.87	0.350	-0.192
232.4	99.408	5.27	1.25	3.05	1.0	0.53	11.36	100	57.46	68.82	0.350	-0.186
232.2	99.572	5.21	1.12	3.03	1.0	0.53	11.27	100	57.43	68.70	0.350	-0.185
232.1	99.736	5.18	1.10	3.03	1.0	0.53	11.23	100	57.42	68.65	0.350	-0.185
231.9	99.900	5.27	0.90	2.99	1.0	0.53	11.38	100	57.47	68.85	0.350	-0.186
231.7	100.064	5.05	0.75	2.97	1.0	0.53	11.03	100	57.36	68.39	0.350	-0.183
231.6	100.228	4.72	0.96	3.04	1.0	0.53	10.49	100	57.19	67.68	0.350	-0.179
231.4	100.392	4.60	1.09	3.08	1.0	0.53	10.29	100	57.13	67.41	0.350	-0.178
231.2	100.557	4.75	1.51	3.12	1.0	0.53	10.56	100	57.21	67.77	0.350	-0.180
231.1	100.721	5.24	1.20	3.04	1.0	0.53	11.38	100	57.46	68.84	0.350	-0.186
230.9	100.885	10.30	1.13	2.77	1.0	0.55	20.03	84	58.57	78.60	0.350	-0.238
230.8	101.049	16.86	1.77	2.68	1.0	0.57	32.09	78	61.25	93.35	0.350	-0.308
230.6	101.213	8.70	3.71	3.10	1.0	0.54	17.33	100	59.31	76.64	0.350	-0.227
230.4	101.377	6.04	4.02	3.25	1.0	0.53	12.76	100	57.89	70.66	0.350	-0.195
230.3	101.541	5.65	1.70	3.08	1.0	0.53	12.10	100	57.69	69.79	0.350	-0.191
230.1	101.705	5.18	1.12	3.03	1.0	0.53	11.32	100	57.45	68.77	0.350	-0.185
229.9	101.869	4.70	0.94	3.04	1.0	0.53	10.53	100	57.20	67.73	0.350	-0.179
229.8	102.033	5.08	0.85	2.99	1.0	0.53	11.17	100	57.40	68.57	0.350	-0.184
229.6	102.197	5.08	0.86	3.00	1.0	0.53	11.18	100	57.40	68.58	0.350	-0.184
229.4	102.361	4.54	0.95	3.06	1.0	0.52	10.28	100	57.12	67.40	0.350	-0.177
229.3	102.525	4.33	0.92	3.07	1.0	0.52	9.93	100	57.02	66.95	0.350	-0.174
229.1	102.689	4.31	1.27	3.13	1.0	0.52	9.90	100	57.01	66.91	0.350	-0.174
228.9	102.853	4.47	0.84	3.04	1.0	0.52	10.18	100	57.09	67.27	0.350	-0.176
228.8	103.017	10.22	1.37	2.81	1.0	0.54	20.11	88	59.00	79.12	0.350	-0.239
228.6	103.181	16.89	1.79	2.68	1.0	0.56	32.50	78	61.39	93.89	0.350	-0.309
228.5	103.345	9.44	3.73	3.07	1.0	0.54	18.81	100	59.77	78.58	0.350	-0.236
228.3	103.509	6.30	4.46	3.26	1.0	0.53	13.32	100	58.07	71.39	0.350	-0.199
228.1	103.673	6.06	2.78	3.16	1.0	0.53	12.91	100	57.94	70.85	0.350	-0.196
228.0	103.837	9.79	1.99	2.91	1.0	0.54	19.45	96	59.59	79.04	0.350	-0.239
227.8	104.001	5.39	3.53	3.26	1.0	0.52	11.78	100	57.59	69.37	0.350	-0.187
227.6	104.165	4.30	3.89	3.36	1.0	0.52	9.96	100	57.03	66.99	0.350	-0.174
227.5	104.329	4.28	1.60	3.18	1.0	0.52	9.93	100	57.02	66.95	0.350	-0.173
227.3	104.493	4.53	1.30	3.11	1.0	0.52	10.35	100	57.15	67.50	0.350	-0.176
227.1	104.658	4.70	1.68	3.15	1.0	0.52	10.65	100	57.24	67.89	0.350	-0.179
227.0	104.822	8.70	2.19	2.97	1.0	0.53	17.61	100	59.40	77.00	0.350	-0.228
226.8	104.986	7.62	3.46	3.13	1.0	0.53	15.70	100	58.81	74.51	0.350	-0.215
226.7	105.150	5.24	4.98	3.35	1.0	0.52	11.60	100	57.53	69.13	0.350	-0.185
226.5	105.314	4.27	3.29	3.33	1.0	0.52	9.96	100	57.02	66.98	0.350	-0.173
226.3	105.478	4.44	1.32	3.12	1.0	0.52	10.25	100	57.11	67.36	0.350	-0.175
226.2	105.642	4.32	1.43	3.15	1.0	0.51	10.06	100	57.05	67.11	0.350	-0.174
226.0	105.806	4.17	1.48	3.17	1.0	0.51	9.80	100	56.97	66.77	0.350	-0.172
225.8	105.970	4.17	1.75	3.20	1.0	0.51	9.81	100	56.98	66.79	0.350	-0.172
225.7	106.134	4.17	1.14	3.12	1.0	0.51	9.81	100	56.98	66.79	0.350	-0.172
225.5	106.298	6.11	2.38	3.12	1.0	0.52	13.15	100	58.02	71.17	0.350	-0.196
225.3	106.462	7.39	2.48	3.06	1.0	0.52	15.40	100	58.71	74.11	0.350	-0.212
225.2	106.626	4.18	4.69	3.42	1.0	0.51	9.86	100	56.99	66.85	0.350	-0.172
225.0	106.790	4.17	2.40	3.27	1.0	0.51	9.84	100	56.99	66.82	0.350	-0.172
224.8	106.954	4.26	1.34	3.14	1.0	0.51	10.00	100	57.04	67.03	0.350	-0.173
224.7	107.118	4.20	1.37	3.15	1.0	0.51	9.90	100	57.01	66.90	0.350	-0.172
224.5	107.282	4.13	1.95	3.23	1.0	0.51	9.80	100	56.98	66.78	0.350	-0.171

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(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
224.4	107.446	7.25	1.88	3.01	1.0	0.52	15.21	100	58.65	73.87	0.350	-0.210
224.2	107.610	5.57	2.55	3.17	1.0	0.51	12.28	100	57.75	70.03	0.350	-0.189
224.0	107.774	4.39	3.39	3.33	1.0	0.51	10.25	100	57.11	67.36	0.350	-0.174
223.9	107.938	4.30	1.21	3.12	1.0	0.51	10.10	100	57.07	67.17	0.350	-0.173
223.7	108.102	7.59	1.94	3.00	1.0	0.52	15.86	100	58.86	74.72	0.350	-0.215
223.5	108.266	8.54	2.70	3.03	1.0	0.52	17.58	100	59.39	76.98	0.350	-0.226
223.4	108.430	4.21	5.25	3.44	1.0	0.51	9.97	100	57.03	67.00	0.350	-0.172
223.2	108.594	3.97	1.62	3.21	1.0	0.51	9.57	100	56.90	66.47	0.350	-0.169
223.0	108.759	4.10	1.04	3.11	1.0	0.51	9.80	100	56.97	66.77	0.350	-0.171
222.9	108.923	3.88	1.05	3.14	1.0	0.50	9.43	100	56.86	66.29	0.350	-0.168
222.7	109.087	4.47	1.05	3.08	1.0	0.51	10.45	100	57.18	67.62	0.350	-0.175
222.5	109.251	4.11	1.07	3.12	1.0	0.51	9.83	100	56.99	66.82	0.350	-0.171
222.4	109.415	4.33	1.99	3.21	1.0	0.51	10.23	100	57.11	67.34	0.350	-0.174
222.2	109.579	4.66	1.81	3.17	1.0	0.51	10.79	100	57.28	68.07	0.350	-0.178
222.1	109.743	8.73	2.30	2.98	1.0	0.52	18.03	100	59.53	77.56	0.350	-0.229
221.9	109.907	6.21	3.45	3.20	1.0	0.51	13.52	100	58.13	71.66	0.350	-0.197
221.7	110.071	4.16	5.20	3.45	1.0	0.50	9.96	100	57.02	66.98	0.350	-0.171
221.6	110.235	3.86	1.48	3.20	1.0	0.50	9.44	100	56.86	66.30	0.350	-0.167
221.4	110.399	3.61	1.29	3.20	1.0	0.50	9.03	100	56.74	65.77	0.350	-0.164
221.2	110.563	3.52	1.39	3.23	1.0	0.50	8.88	100	56.69	65.56	0.350	-0.163
221.1	110.727	3.90	1.21	3.16	1.0	0.50	9.54	100	56.89	66.43	0.350	-0.168
220.9	110.891	4.01	1.17	3.14	1.0	0.50	9.73	100	56.95	66.68	0.350	-0.169
220.7	111.055	3.92	1.20	3.16	1.0	0.50	9.58	100	56.91	66.49	0.350	-0.168
220.6	111.219	3.88	1.14	3.15	1.0	0.50	9.51	100	56.89	66.40	0.350	-0.167
220.4	111.383	4.01	1.10	3.13	1.0	0.50	9.74	100	56.96	66.69	0.350	-0.169
220.3	111.547	3.94	1.57	3.20	1.0	0.50	9.63	100	56.92	66.55	0.350	-0.168
220.1	111.711	4.78	1.34	3.10	1.0	0.50	11.09	100	57.37	68.46	0.350	-0.179
219.9	111.875	3.75	2.04	3.27	1.0	0.50	9.32	100	56.83	66.14	0.350	-0.166
219.8	112.039	4.82	5.42	3.40	1.0	0.50	11.18	100	57.40	68.58	0.350	-0.180
219.6	112.203	13.21	2.46	2.85	1.0	0.53	26.72	91	61.35	88.06	0.350	-0.279
219.4	112.367	10.91	4.05	3.04	1.0	0.53	22.34	100	60.87	83.21	0.350	-0.256
219.3	112.531	4.83	7.62	3.49	1.0	0.50	11.22	100	57.42	68.64	0.350	-0.180
219.1	112.695	3.34	10.75	3.71	1.0	0.49	8.64	100	56.62	65.26	0.350	-0.160
218.9	112.860	5.32	6.59	3.42	1.0	0.50	12.09	100	57.69	69.77	0.350	-0.186
218.8	113.024	77.16	0.84	1.95	0.5	0.57	84.56	19	33.03	117.58	0.350	-0.403
218.6	113.188	115.48	0.32	1.59	0.5	0.59	127.65	0	0.00	127.65	0.350	-0.439
218.4	113.352	102.96	0.21	1.56	0.5	0.56	109.41	0	0.00	109.41	0.350	-0.371
218.3	113.516	61.75	0.40	1.87	0.5	0.51	60.49	13	13.12	73.61	0.350	-0.207
218.1	113.680	32.90	1.37	2.38	0.5	0.54	35.77	53	56.67	92.43	0.350	-0.299
218.0	113.844	8.45	4.01	3.13	1.0	0.51	17.82	100	59.47	77.28	0.350	-0.226
217.8	114.008	2.98	9.51	3.72	1.0	0.49	8.06	100	56.44	64.50	0.350	-0.155
217.6	114.172	0.59	23.38	4.51	1.0	0.48	4.06	100	55.19	59.25	0.350	-0.124
217.5	114.336	40.24	0.47	2.07	0.5	0.52	41.89	28	41.83	83.71	0.350	-0.258
217.3	114.500	66.46	0.27	1.77	0.5	0.48	62.27	5	0.06	62.33	0.350	-0.142
217.1	114.664	72.65	0.15	1.66	0.5	0.50	69.61	0	0.00	69.61	0.350	-0.184
217.0	114.828	52.08	0.21	1.84	0.5	0.47	47.81	10	6.08	53.88	0.350	-0.088
216.8	114.992	25.04	0.73	2.34	0.5	0.51	27.06	50	53.21	80.27	0.350	-0.240
216.6	115.156	3.59	5.33	3.50	1.0	0.49	9.16	100	56.78	65.94	0.350	-0.163
216.5	115.320	3.40	5.64	3.54	1.0	0.49	8.83	100	56.67	65.50	0.350	-0.161
216.3	115.484	3.30	1.76	3.30	1.0	0.49	8.66	100	56.62	65.29	0.350	-0.159
216.2	115.648	10.57	1.55	2.82	1.0	0.52	21.91	89	59.66	81.57	0.350	-0.247
216.0	115.812	121.96	0.62	1.71	0.5	0.60	137.91	0	0.00	137.91	0.350	-0.474

LIQUEFACTION POTENTIAL ASSESSMENT FOR COARSE GRAINED SOILS USING CONE PENETRATION TEST DATA

Shear Stress Fit Parameters	
m4:	0
m3:	0
m2:	0
m1:	0

Depth to Water during Earthquake: 8.7 ft
Final Grade Elevation during EQ: 331.8 ft
Height of Final Grade above CPT TOH: 0.0 ft
Normalize K_v to: 1.058 tsf
 a_{max} at top of ground surface: 0.22 g
Earthquake Magnitude: 7.70 Mw
Earthquake File or Source Zone: Design Source

Project Site: US 60 Bridge
Stantec Project No.: 178565011
CPT ID: SP08

Elev. (ft)	Depth z (ft)	Cyclic Resistance Ratio $CRR_{7.5}$	Relative Density D_r (%)	Correction for		Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., t_d	From Ground Response			Sample Screened for:				Factor of Safety FS_{liq}	Material (optional)	Soil Type (see note on following chart)
				Overburden Pressure K_{σ}	Sloping Ground K_{σ}				Maximum Induced Shear Stress τ_{Max} (psf)	Average Cyclic Shear Stress τ_{Avg} (psf)	Cyclic Stress Ratio CSR	Clay-like	High Tip Res. $(qc_{10})_{CS \geq 175}$	Unsaturated				
331.8																		
331.6	0.164	0.097	33	1.100	N/A	0.99	N/A	1.000	0	0	0.140	FALSE	TRUE	FALSE	N/A	N/A	A1	
331.5	0.328	0.097	33	1.100	N/A	0.99	N/A	1.000	0	0	0.140	FALSE	TRUE	FALSE	N/A	N/A	A1	
331.3	0.492	0.104	38	1.100	N/A	0.99	N/A	1.000	0	0	0.140	FALSE	TRUE	FALSE	N/A	N/A	A1	
331.1	0.656	0.125	50	1.100	N/A	0.99	N/A	1.000	0	0	0.140	FALSE	TRUE	FALSE	N/A	N/A	A1	
331.0	0.820	0.143	57	1.100	N/A	0.98	N/A	1.000	0	0	0.140	FALSE	TRUE	FALSE	N/A	N/A	A1	
330.8	0.984	0.170	63	1.100	N/A	0.98	N/A	1.000	0	0	0.140	FALSE	TRUE	FALSE	N/A	N/A	A1	
330.7	1.148	0.186	65	1.100	N/A	0.97	N/A	1.000	0	0	0.140	FALSE	TRUE	FALSE	N/A	N/A	A1	
330.5	1.312	0.200	67	1.100	N/A	0.97	N/A	1.000	0	0	0.140	FALSE	TRUE	FALSE	N/A	N/A	A1	
330.3	1.476	0.207	68	1.100	N/A	0.97	N/A	1.000	0	0	0.140	FALSE	TRUE	FALSE	N/A	N/A	A1	
330.2	1.640	0.213	68	1.100	N/A	0.97	N/A	1.000	0	0	0.140	FALSE	TRUE	FALSE	N/A	N/A	A1	
330.0	1.804	0.223	69	1.100	N/A	0.97	N/A	1.000	0	0	0.140	FALSE	TRUE	FALSE	N/A	N/A	A1	
329.8	1.968	0.235	70	1.100	N/A	0.96	N/A	1.000	0	0	0.140	FALSE	TRUE	FALSE	N/A	N/A	A1	
329.7	2.133	0.237	70	1.100	N/A	0.96	N/A	1.000	0	0	0.140	FALSE	TRUE	FALSE	N/A	N/A	A1	
329.5	2.297	0.236	70	1.100	N/A	0.96	N/A	1.000	0	0	0.140	FALSE	TRUE	FALSE	N/A	N/A	A1	
329.3	2.461	0.234	70	1.100	N/A	0.96	N/A	1.000	0	0	0.140	FALSE	TRUE	FALSE	N/A	N/A	A1	
329.2	2.625	0.249	71	1.100	N/A	0.96	N/A	1.000	0	0	0.140	FALSE	TRUE	FALSE	N/A	N/A	A1	
329.0	2.789	0.283	73	1.100	N/A	0.96	N/A	1.000	0	0	0.140	FALSE	TRUE	FALSE	N/A	N/A	A1	
328.8	2.953	0.305	74	1.100	N/A	0.96	N/A	1.000	0	0	0.140	FALSE	TRUE	FALSE	N/A	N/A	A1	
328.7	3.117	0.315	74	1.100	N/A	0.95	N/A	1.000	0	0	0.140	FALSE	TRUE	FALSE	N/A	N/A	A1	
328.5	3.281	0.293	73	1.100	N/A	0.96	N/A	1.000	0	0	0.140	FALSE	TRUE	FALSE	N/A	N/A	A1	
328.4	3.445	0.301	74	1.100	N/A	0.96	N/A	1.000	0	0	0.140	FALSE	TRUE	FALSE	N/A	N/A	A1	
328.2	3.609	0.310	74	1.100	N/A	0.95	N/A	0.999	0	0	0.140	FALSE	TRUE	FALSE	N/A	N/A	A1	
328.0	3.773	0.300	74	1.100	N/A	0.96	N/A	0.999	0	0	0.140	FALSE	TRUE	FALSE	N/A	N/A	A1	
327.9	3.937	0.323	75	1.100	N/A	0.95	N/A	0.999	0	0	0.140	FALSE	TRUE	FALSE	N/A	N/A	A1	
327.7	4.101	0.341	75	1.100	N/A	0.95	N/A	0.998	0	0	0.140	FALSE	TRUE	FALSE	N/A	N/A	A1	
327.5	4.265	0.337	75	1.100	N/A	0.95	N/A	0.998	0	0	0.140	FALSE	TRUE	FALSE	N/A	N/A	A1	
327.4	4.429	0.323	75	1.100	N/A	0.95	N/A	0.998	0	0	0.140	FALSE	TRUE	FALSE	N/A	N/A	A1	
327.2	4.593	0.285	73	1.100	N/A	0.96	N/A	0.997	0	0	0.140	FALSE	TRUE	FALSE	N/A	N/A	A1	
327.0	4.757	0.251	71	1.100	N/A	0.96	N/A	0.997	0	0	0.140	FALSE	TRUE	FALSE	N/A	N/A	A1	
326.9	4.921	0.220	69	1.100	N/A	0.97	N/A	0.996	0	0	0.140	FALSE	TRUE	FALSE	N/A	N/A	A1	
326.7	5.085	0.208	68	1.100	N/A	0.97	N/A	0.996	0	0	0.140	FALSE	TRUE	FALSE	N/A	N/A	A1	
326.6	5.249	0.208	68	1.100	N/A	0.97	N/A	0.996	0	0	0.140	FALSE	TRUE	FALSE	N/A	N/A	A1	
326.4	5.413	0.212	68	1.100	N/A	0.97	N/A	0.995	0	0	0.139	FALSE	TRUE	FALSE	N/A	N/A	A1	
326.2	5.577	0.201	67	1.100	N/A	0.97	N/A	0.995	0	0	0.139	FALSE	TRUE	FALSE	N/A	N/A	A1	
326.1	5.741	0.181	64	1.100	N/A	0.97	N/A	0.995	0	0	0.139	FALSE	TRUE	FALSE	N/A	N/A	A1	
325.9	5.905	0.167	62	1.100	N/A	0.98	N/A	0.994	0	0	0.139	FALSE	TRUE	FALSE	N/A	N/A	A1	
325.7	6.069	0.179	64	1.100	N/A	0.97	N/A	0.994	0	0	0.139	FALSE	TRUE	FALSE	N/A	N/A	A1	
325.6	6.234	0.188	65	1.100	N/A	0.97	N/A	0.994	0	0	0.139	FALSE	TRUE	FALSE	N/A	N/A	A1	
325.4	6.398	0.192	66	1.100	N/A	0.97	N/A	0.993	0	0	0.139	FALSE	TRUE	FALSE	N/A	N/A	A1	
325.2	6.562	0.183	65	1.100	N/A	0.97	N/A	0.993	0	0	0.139	FALSE	TRUE	FALSE	N/A	N/A	A1	
325.1	6.726	0.184	65	1.100	N/A	0.97	N/A	0.992	0	0	0.139	FALSE	TRUE	FALSE	N/A	N/A	A1	
324.9	6.890	0.196	66	1.100	N/A	0.97	N/A	0.992	0	0	0.139	FALSE	TRUE	FALSE	N/A	N/A	A1	
324.7	7.054	0.173	63	1.100	N/A	0.97	N/A	0.992	0	0	0.139	FALSE	TRUE	FALSE	N/A	N/A	A1	
324.6	7.218	0.148	58	1.100	N/A	0.98	N/A	0.991	0	0	0.139	FALSE	TRUE	FALSE	N/A	N/A	A1	

Elev. (ft)	Depth z	Cyclic Resistance Ratio CRR _{7.5}	Relative Density D _r (%)	Correction for Overburden Pressure			Correction for Sloping Ground K _α	Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., I _d	Front Ground Response			Sample Screened for:				Factor of Safety FS _{req}	Material (optional)	Soil Type (see note on following chart)
				K _σ	K _α	K _σ					τ _{max} (psf)	Shear Stress	Cyclic Shear Stress τ _{Avg} (psf)	Cyclic Stress Ratio CSR	Clay-like (qc _{IN}) ≥ 175	High Tip Res.	Unsaturated			
324.4	7.382	0.132	53	1.089	N/A	0.98	N/A	N/A	0.991	0	0	0	0.139	FALSE	TRUE	N/A	N/A	B		
324.3	7.546	0.124	50	1.083	N/A	0.99	N/A	N/A	0.991	0	0	0	0.139	FALSE	TRUE	N/A	N/A	B		
324.1	7.710	0.123	50	1.080	N/A	0.99	N/A	N/A	0.990	0	0	0	0.139	FALSE	TRUE	N/A	N/A	B		
323.9	7.874	0.118	47	1.075	N/A	0.99	N/A	N/A	0.990	0	0	0	0.139	FALSE	TRUE	N/A	N/A	B		
323.8	8.038	0.118	47	1.073	N/A	0.99	N/A	N/A	0.989	0	0	0	0.139	FALSE	TRUE	N/A	N/A	B		
323.6	8.202	N/A	44	N/A	N/A	N/A	N/A	N/A	0.989	0	0	0	0.139	TRUE	TRUE	N/A	N/A	B		
323.4	8.366	0.115	45	1.067	N/A	0.99	N/A	N/A	0.989	0	0	0	0.139	FALSE	TRUE	N/A	N/A	B		
323.3	8.530	0.115	45	1.065	N/A	0.99	N/A	N/A	0.988	0	0	0	0.138	FALSE	TRUE	N/A	N/A	B		
323.1	8.694	0.115	45	1.064	N/A	0.99	N/A	N/A	0.988	0	0	0	0.138	FALSE	TRUE	N/A	N/A	B		
322.9	8.858	0.115	45	1.063	0.910	0.99	0.110	0.110	0.987	0	0	0	0.140	FALSE	FALSE	N/A	N/A	B		
322.8	9.022	0.115	45	1.062	0.913	0.99	0.110	0.110	0.987	0	0	0	0.141	FALSE	FALSE	0.8	N/A	B		
322.6	9.186	N/A	44	N/A	N/A	N/A	N/A	N/A	0.987	0	0	0	0.142	TRUE	FALSE	N/A	N/A	B		
322.4	9.350	N/A	44	N/A	N/A	N/A	N/A	N/A	0.986	0	0	0	0.143	TRUE	FALSE	N/A	N/A	B		
322.3	9.514	N/A	46	N/A	N/A	N/A	N/A	N/A	0.986	0	0	0	0.145	TRUE	FALSE	N/A	N/A	B		
322.1	9.678	0.126	51	1.065	1.126	0.99	0.149	0.149	0.985	0	0	0	0.146	FALSE	FALSE	1.0	N/A	B		
322.0	9.842	0.123	50	1.063	1.074	0.99	0.139	0.139	0.985	0	0	0	0.147	FALSE	FALSE	0.9	N/A	B		
321.8	10.006	N/A	48	N/A	N/A	N/A	N/A	N/A	0.984	0	0	0	0.148	TRUE	FALSE	N/A	N/A	B		
321.6	10.170	0.119	47	1.059	0.985	0.99	0.122	0.122	0.984	0	0	0	0.149	FALSE	FALSE	0.8	N/A	B		
321.5	10.335	N/A	45	N/A	N/A	N/A	N/A	N/A	0.984	0	0	0	0.150	TRUE	FALSE	N/A	N/A	B		
321.3	10.499	N/A	45	N/A	N/A	N/A	N/A	N/A	0.983	0	0	0	0.151	TRUE	FALSE	N/A	N/A	B		
321.1	10.663	N/A	46	N/A	N/A	N/A	N/A	N/A	0.983	0	0	0	0.152	TRUE	FALSE	N/A	N/A	B		
321.0	10.827	0.122	49	1.057	1.041	0.99	0.133	0.133	0.982	0	0	0	0.153	FALSE	FALSE	0.9	N/A	B		
320.8	10.991	N/A	45	N/A	N/A	N/A	N/A	N/A	0.982	0	0	0	0.154	TRUE	FALSE	N/A	N/A	B		
320.6	11.155	N/A	44	N/A	N/A	N/A	N/A	N/A	0.982	0	0	0	0.155	TRUE	FALSE	N/A	N/A	B		
320.5	11.319	N/A	43	N/A	N/A	N/A	N/A	N/A	0.981	0	0	0	0.156	TRUE	FALSE	N/A	N/A	B		
320.3	11.483	N/A	44	N/A	N/A	N/A	N/A	N/A	0.981	0	0	0	0.157	TRUE	FALSE	N/A	N/A	B		
320.2	11.647	N/A	42	N/A	N/A	N/A	N/A	N/A	0.980	0	0	0	0.158	TRUE	FALSE	N/A	N/A	B		
320.0	11.811	0.122	49	1.052	1.032	0.99	0.130	0.130	0.980	0	0	0	0.159	FALSE	FALSE	0.8	N/A	B		
319.8	11.975	0.156	60	1.063	1.578	0.98	0.255	0.255	0.979	0	0	0	0.160	FALSE	FALSE	1.6	N/A	A1		
319.7	12.139	0.159	61	1.063	1.625	0.98	0.269	0.269	0.979	0	0	0	0.161	FALSE	FALSE	1.7	N/A	A1		
319.5	12.303	0.129	52	1.053	1.168	0.99	0.157	0.157	0.978	0	0	0	0.162	FALSE	FALSE	1.0	N/A	B		
319.3	12.467	N/A	47	N/A	N/A	N/A	N/A	N/A	0.978	0	0	0	0.163	TRUE	FALSE	N/A	N/A	B		
319.2	12.631	N/A	44	N/A	N/A	N/A	N/A	N/A	0.978	0	0	0	0.163	TRUE	FALSE	N/A	N/A	B		
319.0	12.795	0.120	48	1.047	0.996	0.99	0.124	0.124	0.977	0	0	0	0.164	FALSE	FALSE	0.8	N/A	B		
318.8	12.959	N/A	45	N/A	N/A	N/A	N/A	N/A	0.977	0	0	0	0.165	TRUE	FALSE	N/A	N/A	B		
318.7	13.123	N/A	43	N/A	N/A	N/A	N/A	N/A	0.976	0	0	0	0.166	TRUE	FALSE	N/A	N/A	B		
318.5	13.287	N/A	43	N/A	N/A	N/A	N/A	N/A	0.976	0	0	0	0.167	TRUE	FALSE	N/A	N/A	B		
318.3	13.451	N/A	43	N/A	N/A	N/A	N/A	N/A	0.975	0	0	0	0.167	TRUE	FALSE	N/A	N/A	B		
318.2	13.615	N/A	40	N/A	N/A	N/A	N/A	N/A	0.975	0	0	0	0.168	TRUE	FALSE	N/A	N/A	B		
318.0	13.779	N/A	42	N/A	N/A	N/A	N/A	N/A	0.974	0	0	0	0.169	TRUE	FALSE	N/A	N/A	C		
317.9	13.943	N/A	41	N/A	N/A	N/A	N/A	N/A	0.974	0	0	0	0.170	TRUE	FALSE	N/A	N/A	C		
317.7	14.107	0.111	43	1.039	0.802	0.99	0.091	0.091	0.973	0	0	0	0.170	FALSE	FALSE	0.5	N/A	C		
317.5	14.271	0.119	47	1.041	0.968	0.99	0.118	0.118	0.973	0	0	0	0.171	FALSE	FALSE	0.7	N/A	A2		
317.4	14.436	N/A	41	N/A	N/A	N/A	N/A	N/A	0.972	0	0	0	0.172	TRUE	FALSE	N/A	N/A	B		
317.2	14.600	N/A	38	N/A	N/A	N/A	N/A	N/A	0.972	0	0	0	0.172	TRUE	FALSE	N/A	N/A	C		
317.0	14.764	N/A	36	N/A	N/A	N/A	N/A	N/A	0.972	0	0	0	0.173	TRUE	FALSE	N/A	N/A	C		
316.9	14.928	N/A	36	N/A	N/A	N/A	N/A	N/A	0.971	0	0	0	0.174	TRUE	FALSE	N/A	N/A	C		
316.7	15.092	N/A	36	N/A	N/A	N/A	N/A	N/A	0.971	0	0	0	0.174	TRUE	FALSE	N/A	N/A	C		
316.5	15.256	0.113	44	1.035	0.844	0.99	0.098	0.098	0.970	0	0	0	0.175	FALSE	FALSE	0.6	N/A	A2		
316.4	15.420	0.117	47	1.036	0.934	0.99	0.112	0.112	0.970	0	0	0	0.176	FALSE	FALSE	0.6	N/A	A2		
316.2	15.584	N/A	44	N/A	N/A	N/A	N/A	N/A	0.969	0	0	0	0.176	TRUE	FALSE	N/A	N/A	B		
316.1	15.748	N/A	40	N/A	N/A	N/A	N/A	N/A	0.969	0	0	0	0.177	TRUE	FALSE	N/A	N/A	B		
315.9	15.912	N/A	37	N/A	N/A	N/A	N/A	N/A	0.968	0	0	0	0.178	TRUE	FALSE	N/A	N/A	C		
315.7	16.076	0.129	52	1.037	1.143	0.99	0.150	0.150	0.968	0	0	0	0.178	FALSE	FALSE	0.8	N/A	A2		
315.6	16.240	0.135	54	1.038	1.243	0.98	0.171	0.171	0.967	0	0	0	0.179	FALSE	FALSE	1.0	N/A	A1		

Elev. (ft)	Depth z	Cyclic Resistance Ratio CRR _{7.5}	Relative Density D _r	Correction for Overburden Pressure		K _σ	Correction for Sloping Ground	K _α	Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., t _d	From Ground Response			Sample Screened for:				Factor of Safety FS _{liq}	Material (optional)	Soil Type (see note on following chart)
				Cyclic Ratio	Cyclic Resistance Ratio							Cyclic Stress Ratio	Maximum Induced Shear Stress τ _{Max} (psf)	Average Cyclic Shear Stress τ _{Avg} (psf)	Cyclic Stress Ratio	Clay-like (qc ₃₀) _{CS} ≥ 175	High Tip Res.	Unsaturation			
315.4	16.404	N/A	44	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.967	0	0	0.179	TRUE	FALSE	FALSE	N/A	N/A	N/A	B
315.2	16.568	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.966	0	0	0.180	TRUE	FALSE	FALSE	N/A	N/A	N/A	B
315.1	16.732	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.966	0	0	0.180	TRUE	FALSE	FALSE	N/A	N/A	N/A	B
314.9	16.896	N/A	40	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.965	0	0	0.181	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
314.7	17.060	0.116	46	1.030	0.890	0.99	0.105	0.105	0.99	0.105	0.965	0	0	0.181	FALSE	FALSE	FALSE	0.6	N/A	N/A	C
314.6	17.224	N/A	41	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.964	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	N/A	B
314.4	17.388	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.964	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
314.2	17.552	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.963	0	0	0.183	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
314.1	17.716	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.963	0	0	0.183	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
313.9	17.880	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.962	0	0	0.184	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
313.8	18.044	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.962	0	0	0.184	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
313.6	18.208	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.961	0	0	0.185	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
313.4	18.372	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.961	0	0	0.185	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
313.3	18.537	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.960	0	0	0.186	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
313.1	18.701	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.960	0	0	0.186	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
312.9	18.865	N/A	41	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.959	0	0	0.187	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
312.8	19.029	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.959	0	0	0.187	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
312.6	19.193	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.958	0	0	0.188	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
312.4	19.357	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.958	0	0	0.188	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
312.3	19.521	N/A	36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.957	0	0	0.188	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
312.1	19.685	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.956	0	0	0.189	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
312.0	19.849	N/A	36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.956	0	0	0.189	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
311.8	20.013	N/A	36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.955	0	0	0.190	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
311.6	20.177	N/A	36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.955	0	0	0.190	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
311.5	20.341	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.954	0	0	0.190	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
311.3	20.505	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.954	0	0	0.191	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
311.1	20.669	N/A	36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.953	0	0	0.191	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
311.0	20.833	N/A	36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.953	0	0	0.192	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
310.8	20.997	N/A	36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.952	0	0	0.192	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
310.6	21.161	N/A	36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.952	0	0	0.192	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
310.5	21.325	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.951	0	0	0.193	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
310.3	21.489	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.951	0	0	0.193	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
310.1	21.653	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.950	0	0	0.193	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
310.0	21.817	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.949	0	0	0.194	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
309.8	21.981	0.123	49	1.015	1.011	0.99	0.124	0.124	0.99	0.124	0.949	0	0	0.194	FALSE	FALSE	FALSE	0.6	N/A	N/A	A2
309.7	22.145	N/A	42	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.948	0	0	0.194	TRUE	FALSE	FALSE	N/A	N/A	N/A	B
309.5	22.309	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.948	0	0	0.195	TRUE	FALSE	FALSE	N/A	N/A	N/A	B
309.3	22.473	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.947	0	0	0.195	TRUE	FALSE	FALSE	N/A	N/A	N/A	B
309.2	22.638	N/A	42	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.947	0	0	0.195	TRUE	FALSE	FALSE	N/A	N/A	N/A	B
309.0	22.802	N/A	40	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.946	0	0	0.195	TRUE	FALSE	FALSE	N/A	N/A	N/A	B
308.8	22.966	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.946	0	0	0.196	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
308.7	23.130	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.945	0	0	0.196	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
308.5	23.294	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.944	0	0	0.196	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
308.3	23.458	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.944	0	0	0.197	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
308.2	23.622	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.943	0	0	0.197	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
308.0	23.786	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.943	0	0	0.197	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
307.9	23.950	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.942	0	0	0.197	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
307.7	24.114	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.942	0	0	0.198	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
307.5	24.278	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.941	0	0	0.198	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
307.4	24.442	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.941	0	0	0.198	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
307.2	24.606	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.940	0	0	0.198	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
307.0	24.770	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.939	0	0	0.199	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
306.9	24.934	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.939	0	0	0.199	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
306.7	25.098	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.938	0	0	0.199	TRUE	FALSE	FALSE	N/A	N/A	N/A	C
306.5	25.262	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.938	0	0	0.199	TRUE	FALSE	FALSE	N/A	N/A	N/A	C

Elev. (ft)	Depth z	Cyclic Resistance Ratio CRR _{7.5}	Relative Density D _r (%)	Correction for Overburden Pressure			Sloping Ground K _α	Correction for Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., T _d	From Ground Response			Cyclic Stress Ratio CSR	Sample Screened for:			Factor of Safety FS _{1q}	Material (optional)	Soil Type (see note on following chart)
				K _σ	K _α	K _σ					Maximum Induced Shear Stress τ _{Max} (psf)	Average Cyclic Shear Stress τ _{Avg} (psf)	Cyclic Stress Ratio CSR		Clay-like (q _{c 1N}) _{CS} ≥ 175	High Tip Res.				
306.4	25.426	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.937	0	0	0.200	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
306.2	25.590	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.937	0	0	0.200	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
306.0	25.754	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.936	0	0	0.200	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
305.9	25.918	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.935	0	0	0.200	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
305.7	26.082	N/A	36	N/A	N/A	N/A	N/A	N/A	N/A	0.935	0	0	0.200	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
305.6	26.246	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.934	0	0	0.201	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
305.4	26.410	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.934	0	0	0.201	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
305.2	26.574	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.933	0	0	0.201	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
305.1	26.739	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.932	0	0	0.201	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
304.9	26.903	N/A	42	N/A	N/A	N/A	N/A	N/A	N/A	0.932	0	0	0.201	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
304.7	27.067	0.118	47	1.001	0.901	0.99	0.105	0.931	0	0.931	0	0	0.202	FALSE	FALSE	FALSE	FALSE	0.5	N/A	A1
304.6	27.231	N/A	42	N/A	N/A	N/A	N/A	N/A	N/A	0.931	0	0	0.202	TRUE	FALSE	FALSE	FALSE	N/A	N/A	B
304.4	27.395	N/A	45	N/A	N/A	N/A	N/A	N/A	N/A	0.930	0	0	0.202	TRUE	FALSE	FALSE	FALSE	N/A	N/A	B
304.2	27.559	N/A	40	N/A	N/A	N/A	N/A	N/A	N/A	0.929	0	0	0.202	TRUE	FALSE	FALSE	FALSE	N/A	N/A	B
304.1	27.723	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.929	0	0	0.202	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
303.9	27.887	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.928	0	0	0.203	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
303.7	28.051	N/A	40	N/A	N/A	N/A	N/A	N/A	N/A	0.928	0	0	0.203	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
303.6	28.215	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.927	0	0	0.203	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
303.4	28.379	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.926	0	0	0.203	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
303.3	28.543	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.926	0	0	0.203	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
303.1	28.707	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.925	0	0	0.203	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
302.9	28.871	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.925	0	0	0.204	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
302.8	29.035	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.924	0	0	0.204	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
302.6	29.199	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.923	0	0	0.204	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
302.4	29.363	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.923	0	0	0.204	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
302.3	29.527	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.922	0	0	0.204	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
302.1	29.691	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.922	0	0	0.204	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
301.9	29.855	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.921	0	0	0.204	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
301.8	30.019	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.920	0	0	0.205	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
301.6	30.183	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.920	0	0	0.205	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
301.5	30.347	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.919	0	0	0.205	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
301.3	30.511	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.919	0	0	0.205	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
301.1	30.675	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.918	0	0	0.205	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
301.0	30.840	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.917	0	0	0.205	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
300.8	31.004	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.917	0	0	0.205	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
300.6	31.168	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.916	0	0	0.205	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
300.5	31.332	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.916	0	0	0.205	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
300.3	31.496	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.915	0	0	0.206	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
300.1	31.660	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.914	0	0	0.206	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
300.0	31.824	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.914	0	0	0.206	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
299.8	31.988	N/A	40	N/A	N/A	N/A	N/A	N/A	N/A	0.913	0	0	0.206	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
299.6	32.152	N/A	41	N/A	N/A	N/A	N/A	N/A	N/A	0.912	0	0	0.206	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
299.5	32.316	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.912	0	0	0.206	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
299.3	32.480	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.911	0	0	0.206	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
299.2	32.644	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.911	0	0	0.206	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
299.0	32.808	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.910	0	0	0.206	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
298.8	32.972	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.909	0	0	0.206	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
298.7	33.136	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.909	0	0	0.207	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
298.5	33.300	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.908	0	0	0.207	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
298.3	33.464	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.907	0	0	0.207	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
298.2	33.628	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.907	0	0	0.207	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
298.0	33.792	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.906	0	0	0.207	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
297.8	33.956	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.905	0	0	0.207	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
297.7	34.120	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.905	0	0	0.207	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C
297.5	34.284	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.904	0	0	0.207	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C

Elev. (ft)	Depth z (ft)	Cyclic Resistance Ratio CRR _{7.5}	Relative Density D _r (%)	Correction for		Correction for Overburden Pressure K _σ	Sloping Ground K _α	Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., f _d	Front Ground Response			Cyclic Stress Ratio CSR	Sample Screened for:			Factor of Safety F _{S_{req}}	Material (optional)	Soil Type (see note on following chart)
				Induced Shear Stress τ _{max} (psf)	Average Cyclic Shear Stress τ _{Avg} (psf)						Cyclic Stress Ratio CSR	Clay-like (q _{c30}) ≥ 175	High Tip Res. (q _{c30}) ≥ 175		Unsaturated					
																Maximum				
297.4	34.448	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.904	0	0	0.207	TRUE	FALSE	FALSE	N/A	N/A	C	
297.2	34.612	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.903	0	0	0.207	TRUE	FALSE	FALSE	N/A	N/A	C	
297.0	34.776	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.902	0	0	0.207	TRUE	FALSE	FALSE	N/A	N/A	C	
296.9	34.941	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.902	0	0	0.207	TRUE	FALSE	FALSE	N/A	N/A	C	
296.7	35.105	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.901	0	0	0.207	TRUE	FALSE	FALSE	N/A	N/A	C	
296.5	35.269	0.121	48	0.981	0.930	0.99	0.109	0.900	0	0.900	0	0	0.207	FALSE	FALSE	FALSE	N/A	N/A	A1	
296.4	35.433	N/A	42	N/A	N/A	N/A	N/A	N/A	N/A	0.900	0	0	0.207	TRUE	FALSE	FALSE	N/A	N/A	B	
296.2	35.597	N/A	41	N/A	N/A	N/A	N/A	N/A	N/A	0.899	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	B	
296.0	35.761	0.120	48	0.980	0.923	0.99	0.108	0.898	0	0.898	0	0	0.208	FALSE	FALSE	FALSE	N/A	N/A	A1	
295.9	35.925	N/A	42	N/A	N/A	N/A	N/A	N/A	N/A	0.898	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	B	
295.7	36.089	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.897	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	B	
295.5	36.253	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.896	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C	
295.4	36.417	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.896	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C	
295.2	36.581	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.895	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C	
295.1	36.745	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.895	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C	
294.9	36.909	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.894	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C	
294.7	37.073	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.893	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C	
294.6	37.237	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.893	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C	
294.4	37.401	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.892	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C	
294.2	37.565	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.891	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C	
294.1	37.729	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.891	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C	
293.9	37.893	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.890	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C	
293.7	38.057	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.889	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C	
293.6	38.221	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.889	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C	
293.4	38.385	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.888	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C	
293.3	38.549	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.887	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C	
293.1	38.713	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.887	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C	
292.9	38.877	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.886	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C	
292.8	39.042	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.885	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C	
292.6	39.206	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.885	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C	
292.4	39.370	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.884	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C	
292.3	39.534	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.883	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C	
292.1	39.698	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.883	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C	
291.9	39.862	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.882	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C	
291.8	40.026	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.881	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C	
291.6	40.190	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.881	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C	
291.4	40.354	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.880	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C	
291.3	40.518	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.879	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C	
291.1	40.682	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.879	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C	
291.0	40.846	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.878	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C	
290.8	41.010	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.877	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C	
290.6	41.174	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.877	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C	
290.5	41.338	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.876	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C	
290.3	41.502	N/A	40	N/A	N/A	N/A	N/A	N/A	N/A	0.875	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C	
290.1	41.666	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.875	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C	
290.0	41.830	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.874	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C	
289.8	41.994	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.873	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C	
289.6	42.158	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.873	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C	
289.5	42.322	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.872	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C	
289.3	42.486	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.871	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C	
289.1	42.650	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.871	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C	
289.0	42.814	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.870	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C	
288.8	42.978	N/A	40	N/A	N/A	N/A	N/A	N/A	N/A	0.869	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C	
288.7	43.143	N/A	41	N/A	N/A	N/A	N/A	N/A	N/A	0.869	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C	
288.5	43.307	N/A	41	N/A	N/A	N/A	N/A	N/A	N/A	0.868	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C	

Elev. (ft)	Depth z	Cyclic Resistance Ratio $CRR_{7.5}$	Relative Density D_r	Correction for		Correction for Overburden Pressure K_o	Sloping Ground K_σ	Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., t_d	Front Ground Response			Sample Screened for:			Factor of Safety FS_{liq}	Material (optional)	Soil Type (see note on following chart)
				Shear Stress τ_{max} (psf)	Induced Shear Stress τ_{avg} (psf)						Average Cyclic Shear Stress τ_{avg} (psf)	Cyclic Stress Ratio CSR	Clay-like $(qc_{30})_{cs} \geq 175$	High Tip Res.	Unsaturated				
288.3	43.471	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.867	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C
288.2	43.635	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.867	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C
288.0	43.799	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.866	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C
287.8	43.963	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.865	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C
287.7	44.127	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.865	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C
287.5	44.291	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.864	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C
287.3	44.455	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.863	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C
287.2	44.619	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.863	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C
287.0	44.783	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.862	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C
286.9	44.947	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.861	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C
286.7	45.111	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.861	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C
286.5	45.275	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.860	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C
286.4	45.439	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.859	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C
286.2	45.603	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.859	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C
286.0	45.767	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.858	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C
285.9	45.931	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.857	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C
285.7	46.095	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.857	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C
285.5	46.259	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.856	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C
285.4	46.423	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.855	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C
285.2	46.587	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.855	0	0	0.208	TRUE	FALSE	FALSE	N/A	N/A	C
285.0	46.751	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.854	0	0	0.207	TRUE	FALSE	FALSE	N/A	N/A	C
284.9	46.915	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.853	0	0	0.207	TRUE	FALSE	FALSE	N/A	N/A	C
284.7	47.079	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.853	0	0	0.207	TRUE	FALSE	FALSE	N/A	N/A	C
284.6	47.244	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.852	0	0	0.207	TRUE	FALSE	FALSE	N/A	N/A	C
284.4	47.408	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.851	0	0	0.207	TRUE	FALSE	FALSE	N/A	N/A	C
284.2	47.572	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.851	0	0	0.207	TRUE	FALSE	FALSE	N/A	N/A	C
284.1	47.736	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.850	0	0	0.207	TRUE	FALSE	FALSE	N/A	N/A	C
283.9	47.900	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.849	0	0	0.207	TRUE	FALSE	FALSE	N/A	N/A	C
283.7	48.064	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.849	0	0	0.207	TRUE	FALSE	FALSE	N/A	N/A	C
283.6	48.228	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.848	0	0	0.207	TRUE	FALSE	FALSE	N/A	N/A	C
283.4	48.392	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.847	0	0	0.207	TRUE	FALSE	FALSE	N/A	N/A	C
283.2	48.556	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.847	0	0	0.207	TRUE	FALSE	FALSE	N/A	N/A	C
283.1	48.720	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.846	0	0	0.207	TRUE	FALSE	FALSE	N/A	N/A	C
282.9	48.884	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.845	0	0	0.207	TRUE	FALSE	FALSE	N/A	N/A	C
282.8	49.048	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.844	0	0	0.207	TRUE	FALSE	FALSE	N/A	N/A	C
282.6	49.212	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.844	0	0	0.207	TRUE	FALSE	FALSE	N/A	N/A	C
282.4	49.376	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.843	0	0	0.207	TRUE	FALSE	FALSE	N/A	N/A	C
282.3	49.540	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.842	0	0	0.207	TRUE	FALSE	FALSE	N/A	N/A	C
282.1	49.704	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.842	0	0	0.207	TRUE	FALSE	FALSE	N/A	N/A	C
281.9	49.868	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.841	0	0	0.207	TRUE	FALSE	FALSE	N/A	N/A	C
281.8	50.032	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.840	0	0	0.206	TRUE	FALSE	FALSE	N/A	N/A	C
281.6	50.196	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.840	0	0	0.206	TRUE	FALSE	FALSE	N/A	N/A	C
281.4	50.360	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.839	0	0	0.206	TRUE	FALSE	FALSE	N/A	N/A	C
281.3	50.524	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.838	0	0	0.206	TRUE	FALSE	FALSE	N/A	N/A	C
281.1	50.688	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.838	0	0	0.206	TRUE	FALSE	FALSE	N/A	N/A	C
280.9	50.852	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.837	0	0	0.206	TRUE	FALSE	FALSE	N/A	N/A	C
280.8	51.016	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.836	0	0	0.206	TRUE	FALSE	FALSE	N/A	N/A	C
280.6	51.180	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.836	0	0	0.206	TRUE	FALSE	FALSE	N/A	N/A	C
280.5	51.345	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.835	0	0	0.206	TRUE	FALSE	FALSE	N/A	N/A	C
280.3	51.509	N/A	44	N/A	N/A	N/A	N/A	N/A	N/A	0.834	0	0	0.206	TRUE	FALSE	FALSE	N/A	N/A	C
280.1	51.673	N/A	42	N/A	N/A	N/A	N/A	N/A	N/A	0.834	0	0	0.206	TRUE	FALSE	FALSE	N/A	N/A	C
280.0	51.837	N/A	40	N/A	N/A	N/A	N/A	N/A	N/A	0.833	0	0	0.206	TRUE	FALSE	FALSE	N/A	N/A	C
279.8	52.001	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.832	0	0	0.206	TRUE	FALSE	FALSE	N/A	N/A	C
279.6	52.165	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.832	0	0	0.206	TRUE	FALSE	FALSE	N/A	N/A	C
279.5	52.329	N/A	44	N/A	N/A	N/A	N/A	N/A	N/A	0.831	0	0	0.206	TRUE	FALSE	FALSE	N/A	N/A	B

Elev. (ft)	Depth z (ft)	Cyclic Resistance Ratio CRR _{7.5}	Relative Density D _r (%)	Correction for Overburden Pressure		Correction for Sloping Ground K _α	Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., f _d	Front Ground Response			Sample Screened for:				Factor of Safety FS _{liq}	Material (optional)	Soil Type (see note on following chart)
				K _σ	K _α					τ _{max} Shear Stress (psf)	τ _{avg} Cyclic Shear Stress (psf)	Cyclic Stress Ratio CSR	Clay-like (qc ₃₀) ≥ 175	High Tip Res.					
															Maximum Induced Shear Stress (psf)	Average Cyclic Shear Stress (psf)			
279.3	52.493	N/A	40	N/A	N/A	N/A	N/A	N/A	0.830	0	0	0.205	TRUE	FALSE	FALSE	N/A	N/A	C	
279.1	52.657	N/A	38	N/A	N/A	N/A	N/A	N/A	0.830	0	0	0.205	TRUE	FALSE	FALSE	N/A	N/A	C	
279.0	52.821	N/A	39	N/A	N/A	N/A	N/A	N/A	0.829	0	0	0.205	TRUE	FALSE	FALSE	N/A	N/A	C	
278.8	52.985	N/A	39	N/A	N/A	N/A	N/A	N/A	0.828	0	0	0.205	TRUE	FALSE	FALSE	N/A	N/A	C	
278.7	53.149	N/A	39	N/A	N/A	N/A	N/A	N/A	0.828	0	0	0.205	TRUE	FALSE	FALSE	N/A	N/A	C	
278.5	53.313	N/A	38	N/A	N/A	N/A	N/A	N/A	0.827	0	0	0.205	TRUE	FALSE	FALSE	N/A	N/A	C	
278.3	53.477	N/A	38	N/A	N/A	N/A	N/A	N/A	0.826	0	0	0.205	TRUE	FALSE	FALSE	N/A	N/A	C	
278.2	53.641	N/A	38	N/A	N/A	N/A	N/A	N/A	0.825	0	0	0.205	TRUE	FALSE	FALSE	N/A	N/A	C	
278.0	53.805	N/A	38	N/A	N/A	N/A	N/A	N/A	0.825	0	0	0.205	TRUE	FALSE	FALSE	N/A	N/A	C	
277.8	53.969	N/A	38	N/A	N/A	N/A	N/A	N/A	0.824	0	0	0.205	TRUE	FALSE	FALSE	N/A	N/A	C	
277.7	54.133	N/A	38	N/A	N/A	N/A	N/A	N/A	0.823	0	0	0.205	TRUE	FALSE	FALSE	N/A	N/A	C	
277.5	54.297	N/A	38	N/A	N/A	N/A	N/A	N/A	0.823	0	0	0.205	TRUE	FALSE	FALSE	N/A	N/A	C	
277.3	54.461	N/A	38	N/A	N/A	N/A	N/A	N/A	0.822	0	0	0.205	TRUE	FALSE	FALSE	N/A	N/A	C	
277.2	54.625	N/A	38	N/A	N/A	N/A	N/A	N/A	0.821	0	0	0.205	TRUE	FALSE	FALSE	N/A	N/A	C	
277.0	54.789	N/A	38	N/A	N/A	N/A	N/A	N/A	0.821	0	0	0.204	TRUE	FALSE	FALSE	N/A	N/A	C	
276.8	54.953	N/A	38	N/A	N/A	N/A	N/A	N/A	0.820	0	0	0.204	TRUE	FALSE	FALSE	N/A	N/A	C	
276.7	55.117	N/A	38	N/A	N/A	N/A	N/A	N/A	0.819	0	0	0.204	TRUE	FALSE	FALSE	N/A	N/A	C	
276.5	55.281	N/A	38	N/A	N/A	N/A	N/A	N/A	0.819	0	0	0.204	TRUE	FALSE	FALSE	N/A	N/A	C	
276.4	55.446	N/A	38	N/A	N/A	N/A	N/A	N/A	0.818	0	0	0.204	TRUE	FALSE	FALSE	N/A	N/A	C	
276.2	55.610	N/A	38	N/A	N/A	N/A	N/A	N/A	0.817	0	0	0.204	TRUE	FALSE	FALSE	N/A	N/A	C	
276.0	55.774	N/A	38	N/A	N/A	N/A	N/A	N/A	0.817	0	0	0.204	TRUE	FALSE	FALSE	N/A	N/A	C	
275.9	55.938	N/A	38	N/A	N/A	N/A	N/A	N/A	0.816	0	0	0.204	TRUE	FALSE	FALSE	N/A	N/A	C	
275.7	56.102	N/A	38	N/A	N/A	N/A	N/A	N/A	0.815	0	0	0.204	TRUE	FALSE	FALSE	N/A	N/A	C	
275.5	56.266	N/A	38	N/A	N/A	N/A	N/A	N/A	0.815	0	0	0.204	TRUE	FALSE	FALSE	N/A	N/A	C	
275.4	56.430	N/A	38	N/A	N/A	N/A	N/A	N/A	0.814	0	0	0.204	TRUE	FALSE	FALSE	N/A	N/A	C	
275.2	56.594	N/A	38	N/A	N/A	N/A	N/A	N/A	0.813	0	0	0.204	TRUE	FALSE	FALSE	N/A	N/A	C	
275.0	56.758	N/A	38	N/A	N/A	N/A	N/A	N/A	0.813	0	0	0.203	TRUE	FALSE	FALSE	N/A	N/A	C	
274.9	56.922	N/A	38	N/A	N/A	N/A	N/A	N/A	0.812	0	0	0.203	TRUE	FALSE	FALSE	N/A	N/A	C	
274.7	57.086	N/A	38	N/A	N/A	N/A	N/A	N/A	0.811	0	0	0.203	TRUE	FALSE	FALSE	N/A	N/A	C	
274.6	57.250	N/A	38	N/A	N/A	N/A	N/A	N/A	0.811	0	0	0.203	TRUE	FALSE	FALSE	N/A	N/A	C	
274.4	57.414	N/A	38	N/A	N/A	N/A	N/A	N/A	0.810	0	0	0.203	TRUE	FALSE	FALSE	N/A	N/A	C	
274.2	57.578	N/A	38	N/A	N/A	N/A	N/A	N/A	0.809	0	0	0.203	TRUE	FALSE	FALSE	N/A	N/A	C	
274.1	57.742	N/A	38	N/A	N/A	N/A	N/A	N/A	0.809	0	0	0.203	TRUE	FALSE	FALSE	N/A	N/A	C	
273.9	57.906	N/A	39	N/A	N/A	N/A	N/A	N/A	0.808	0	0	0.203	TRUE	FALSE	FALSE	N/A	N/A	C	
273.7	58.070	N/A	38	N/A	N/A	N/A	N/A	N/A	0.807	0	0	0.203	TRUE	FALSE	FALSE	N/A	N/A	C	
273.6	58.234	N/A	38	N/A	N/A	N/A	N/A	N/A	0.807	0	0	0.203	TRUE	FALSE	FALSE	N/A	N/A	C	
273.4	58.398	N/A	38	N/A	N/A	N/A	N/A	N/A	0.806	0	0	0.203	TRUE	FALSE	FALSE	N/A	N/A	C	
273.2	58.562	N/A	38	N/A	N/A	N/A	N/A	N/A	0.805	0	0	0.203	TRUE	FALSE	FALSE	N/A	N/A	C	
273.1	58.726	N/A	38	N/A	N/A	N/A	N/A	N/A	0.805	0	0	0.202	TRUE	FALSE	FALSE	N/A	N/A	C	
272.9	58.890	N/A	38	N/A	N/A	N/A	N/A	N/A	0.804	0	0	0.202	TRUE	FALSE	FALSE	N/A	N/A	C	
272.7	59.054	N/A	38	N/A	N/A	N/A	N/A	N/A	0.803	0	0	0.202	TRUE	FALSE	FALSE	N/A	N/A	C	
272.6	59.218	N/A	42	N/A	N/A	N/A	N/A	N/A	0.803	0	0	0.202	TRUE	FALSE	FALSE	N/A	N/A	C	
272.4	59.382	0.142	57	0.931	1.213	0.98	0.98	0.158	0.802	0	0	0.202	FALSE	FALSE	FALSE	N/A	N/A	A1	
272.3	59.547	0.177	64	0.920	1.600	0.97	0.97	0.254	0.801	0	0	0.202	FALSE	FALSE	FALSE	N/A	N/A	A1	
272.1	59.711	0.163	61	0.924	1.462	0.98	0.98	0.215	0.801	0	0	0.202	FALSE	FALSE	FALSE	N/A	N/A	A1	
271.9	59.875	0.161	61	0.924	1.441	0.98	0.98	0.210	0.800	0	0	0.202	FALSE	FALSE	FALSE	N/A	N/A	A1	
271.8	60.039	0.235	70	0.906	2.013	0.96	0.96	0.414	0.799	0	0	0.202	FALSE	FALSE	FALSE	N/A	N/A	A1	
271.6	60.203	0.205	67	0.912	1.823	0.97	0.97	0.330	0.799	0	0	0.202	FALSE	FALSE	FALSE	N/A	N/A	A1	
271.4	60.367	N/A	52	N/A	N/A	N/A	N/A	N/A	0.798	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	B	
271.3	60.531	N/A	45	N/A	N/A	N/A	N/A	N/A	0.797	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	B	
271.1	60.695	N/A	40	N/A	N/A	N/A	N/A	N/A	0.797	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	B	
270.9	60.859	N/A	41	N/A	N/A	N/A	N/A	N/A	0.796	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C	
270.8	61.023	N/A	40	N/A	N/A	N/A	N/A	N/A	0.795	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C	
270.6	61.187	N/A	39	N/A	N/A	N/A	N/A	N/A	0.795	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C	
270.4	61.351	N/A	38	N/A	N/A	N/A	N/A	N/A	0.794	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C	

Elev. (ft)	Depth z (ft)	Cyclic Resistance Ratio CRR _{7.5}	Relative Density D _r (%)	Correction for		Correction for Overburden Pressure K _o	Sloping Ground K _α	Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., f _d	Front Ground Response			Cyclic Stress Ratio CSR	Sample Screened for:			Factor of Safety FS _{liq}	Material (optional)	Soil Type (see note on following chart)
				Maximum Induced Shear Stress τ _{max} (psf)	Average Cyclic Shear Stress τ _{avg} (psf)						Cyclic Stress Ratio CSR	Clay-like (qc ₃₀) ≥ 175	High Tip Res.		Unsaturated					
270.3	61.515	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.793	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C	
270.1	61.679	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.793	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C	
270.0	61.843	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.792	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C	
269.8	62.007	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.791	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C	
269.6	62.171	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.791	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	C	
269.5	62.335	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.790	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	C	
269.3	62.499	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.789	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	C	
269.1	62.663	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.789	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	C	
269.0	62.827	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.788	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	C	
268.8	62.991	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.787	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	C	
268.6	63.155	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.787	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	C	
268.5	63.319	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.786	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	C	
268.3	63.483	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.785	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	C	
268.2	63.648	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.785	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	C	
268.0	63.812	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.784	0	0	0.199	TRUE	FALSE	FALSE	N/A	N/A	C	
267.8	63.976	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.783	0	0	0.199	TRUE	FALSE	FALSE	N/A	N/A	C	
267.7	64.140	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.783	0	0	0.199	TRUE	FALSE	FALSE	N/A	N/A	C	
267.5	64.304	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.782	0	0	0.199	TRUE	FALSE	FALSE	N/A	N/A	C	
267.3	64.468	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.782	0	0	0.199	TRUE	FALSE	FALSE	N/A	N/A	C	
267.2	64.632	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.781	0	0	0.199	TRUE	FALSE	FALSE	N/A	N/A	C	
267.0	64.796	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.780	0	0	0.199	TRUE	FALSE	FALSE	N/A	N/A	C	
266.8	64.960	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.780	0	0	0.199	TRUE	FALSE	FALSE	N/A	N/A	C	
266.7	65.124	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.779	0	0	0.199	TRUE	FALSE	FALSE	N/A	N/A	C	
266.5	65.288	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.778	0	0	0.199	TRUE	FALSE	FALSE	N/A	N/A	C	
266.3	65.452	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.777	0	0	0.198	TRUE	FALSE	FALSE	N/A	N/A	C	
266.2	65.616	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.776	0	0	0.198	TRUE	FALSE	FALSE	N/A	N/A	C	
266.0	65.780	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.776	0	0	0.198	TRUE	FALSE	FALSE	N/A	N/A	C	
265.9	65.944	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.775	0	0	0.198	TRUE	FALSE	FALSE	N/A	N/A	C	
265.7	66.108	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.775	0	0	0.198	TRUE	FALSE	FALSE	N/A	N/A	C	
265.5	66.272	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.774	0	0	0.198	TRUE	FALSE	FALSE	N/A	N/A	C	
265.4	66.436	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.774	0	0	0.198	TRUE	FALSE	FALSE	N/A	N/A	C	
265.2	66.600	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.773	0	0	0.198	TRUE	FALSE	FALSE	N/A	N/A	C	
265.0	66.764	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.773	0	0	0.198	TRUE	FALSE	FALSE	N/A	N/A	C	
264.9	66.928	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.772	0	0	0.198	TRUE	FALSE	FALSE	N/A	N/A	C	
264.7	67.092	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.771	0	0	0.197	TRUE	FALSE	FALSE	N/A	N/A	C	
264.5	67.256	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.771	0	0	0.197	TRUE	FALSE	FALSE	N/A	N/A	C	
264.4	67.420	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.770	0	0	0.197	TRUE	FALSE	FALSE	N/A	N/A	C	
264.2	67.584	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.769	0	0	0.197	TRUE	FALSE	FALSE	N/A	N/A	C	
264.1	67.749	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.769	0	0	0.197	TRUE	FALSE	FALSE	N/A	N/A	C	
263.9	67.913	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.768	0	0	0.197	TRUE	FALSE	FALSE	N/A	N/A	C	
263.7	68.077	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.767	0	0	0.197	TRUE	FALSE	FALSE	N/A	N/A	C	
263.6	68.241	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.767	0	0	0.197	TRUE	FALSE	FALSE	N/A	N/A	C	
263.4	68.405	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.766	0	0	0.197	TRUE	FALSE	FALSE	N/A	N/A	C	
263.2	68.569	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.766	0	0	0.196	TRUE	FALSE	FALSE	N/A	N/A	C	
263.1	68.733	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.765	0	0	0.196	TRUE	FALSE	FALSE	N/A	N/A	C	
262.9	68.897	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.764	0	0	0.196	TRUE	FALSE	FALSE	N/A	N/A	C	
262.7	69.061	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.764	0	0	0.196	TRUE	FALSE	FALSE	N/A	N/A	C	
262.6	69.225	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.763	0	0	0.196	TRUE	FALSE	FALSE	N/A	N/A	C	
262.4	69.389	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.762	0	0	0.196	TRUE	FALSE	FALSE	N/A	N/A	C	
262.2	69.553	0.137	55	0.919	1.114	0.98	0.138	0.762	0	0.196	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	N/A	N/A	A1	
262.1	69.717	0.136	54	0.919	1.097	0.98	0.135	0.761	0	0.196	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	N/A	N/A	A1	
261.9	69.881	N/A	45	N/A	N/A	N/A	N/A	0.760	0	0.196	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	N/A	N/A	B	
261.8	70.045	N/A	40	N/A	N/A	N/A	N/A	0.760	0	0.196	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	N/A	N/A	B	
261.6	70.209	N/A	40	N/A	N/A	N/A	N/A	0.759	0	0.195	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	N/A	N/A	C	
261.4	70.373	N/A	40	N/A	N/A	N/A	N/A	0.759	0	0.195	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	N/A	N/A	C	

Elev. (ft)	Depth z (ft)	Cyclic Resistance Ratio $CRR_{7.5}$	Relative Density D_r	Correction for			Cyclic Resistance Ratio CRR	Stress Reduction Coeff., t_d	From Ground Response			Cyclic Stress Ratio CSR	Sample Screened for:			Factor of Safety FS_{liq}	Material (optional)	Soil Type (see note on following chart)
				Overburden Pressure K_o	Sloping Ground K_σ	Magnitude Scaling Factor MSF			Maximum Induced Shear Stress τ_{max}	Average Cyclic Shear Stress τ_{Avg}	Clay-like $(qC_{30})_{CS} \geq 175$		High Tip Res.	Unsaturated				
															(%)			
261.3	70.537	N/A	40	N/A	N/A	N/A	N/A	0.758	0	0	0.195	TRUE	FALSE	FALSE	N/A	N/A	C	
261.1	70.701	N/A	39	N/A	N/A	N/A	N/A	0.757	0	0	0.195	TRUE	FALSE	FALSE	N/A	N/A	C	
260.9	70.865	N/A	39	N/A	N/A	N/A	N/A	0.757	0	0	0.195	TRUE	FALSE	FALSE	N/A	N/A	C	
260.8	71.029	N/A	39	N/A	N/A	N/A	N/A	0.756	0	0	0.195	TRUE	FALSE	FALSE	N/A	N/A	C	
260.6	71.193	N/A	39	N/A	N/A	N/A	N/A	0.756	0	0	0.195	TRUE	FALSE	FALSE	N/A	N/A	C	
260.4	71.357	N/A	39	N/A	N/A	N/A	N/A	0.755	0	0	0.195	TRUE	FALSE	FALSE	N/A	N/A	C	
260.3	71.521	N/A	39	N/A	N/A	N/A	N/A	0.754	0	0	0.195	TRUE	FALSE	FALSE	N/A	N/A	C	
260.1	71.685	N/A	39	N/A	N/A	N/A	N/A	0.754	0	0	0.194	TRUE	FALSE	FALSE	N/A	N/A	C	
260.0	71.850	N/A	39	N/A	N/A	N/A	N/A	0.753	0	0	0.194	TRUE	FALSE	FALSE	N/A	N/A	C	
259.8	72.014	N/A	39	N/A	N/A	N/A	N/A	0.752	0	0	0.194	TRUE	FALSE	FALSE	N/A	N/A	C	
259.6	72.178	N/A	39	N/A	N/A	N/A	N/A	0.752	0	0	0.194	TRUE	FALSE	FALSE	N/A	N/A	C	
259.5	72.342	N/A	38	N/A	N/A	N/A	N/A	0.751	0	0	0.194	TRUE	FALSE	FALSE	N/A	N/A	C	
259.3	72.506	N/A	38	N/A	N/A	N/A	N/A	0.751	0	0	0.194	TRUE	FALSE	FALSE	N/A	N/A	C	
259.1	72.670	N/A	39	N/A	N/A	N/A	N/A	0.750	0	0	0.194	TRUE	FALSE	FALSE	N/A	N/A	C	
259.0	72.834	N/A	39	N/A	N/A	N/A	N/A	0.749	0	0	0.194	TRUE	FALSE	FALSE	N/A	N/A	C	
258.8	72.998	N/A	38	N/A	N/A	N/A	N/A	0.749	0	0	0.194	TRUE	FALSE	FALSE	N/A	N/A	C	
258.6	73.162	N/A	39	N/A	N/A	N/A	N/A	0.748	0	0	0.194	TRUE	FALSE	FALSE	N/A	N/A	C	
258.5	73.326	N/A	39	N/A	N/A	N/A	N/A	0.748	0	0	0.193	TRUE	FALSE	FALSE	N/A	N/A	C	
258.3	73.490	N/A	38	N/A	N/A	N/A	N/A	0.747	0	0	0.193	TRUE	FALSE	FALSE	N/A	N/A	C	
258.1	73.654	N/A	39	N/A	N/A	N/A	N/A	0.746	0	0	0.193	TRUE	FALSE	FALSE	N/A	N/A	C	
258.0	73.818	N/A	39	N/A	N/A	N/A	N/A	0.746	0	0	0.193	TRUE	FALSE	FALSE	N/A	N/A	C	
257.8	73.982	N/A	47	N/A	N/A	N/A	N/A	0.745	0	0	0.193	TRUE	FALSE	FALSE	N/A	N/A	C	
257.7	74.146	N/A	58	N/A	N/A	N/A	N/A	0.745	0	0	0.193	TRUE	FALSE	FALSE	N/A	N/A	B	
257.5	74.310	N/A	49	N/A	N/A	N/A	N/A	0.744	0	0	0.193	TRUE	FALSE	FALSE	N/A	N/A	B	
257.3	74.474	N/A	41	N/A	N/A	N/A	N/A	0.743	0	0	0.193	TRUE	FALSE	FALSE	N/A	N/A	B	
257.2	74.638	N/A	40	N/A	N/A	N/A	N/A	0.743	0	0	0.193	TRUE	FALSE	FALSE	N/A	N/A	C	
257.0	74.802	N/A	40	N/A	N/A	N/A	N/A	0.742	0	0	0.192	TRUE	FALSE	FALSE	N/A	N/A	C	
256.8	74.966	N/A	39	N/A	N/A	N/A	N/A	0.742	0	0	0.192	TRUE	FALSE	FALSE	N/A	N/A	C	
256.7	75.130	N/A	39	N/A	N/A	N/A	N/A	0.741	0	0	0.192	TRUE	FALSE	FALSE	N/A	N/A	C	
256.5	75.294	N/A	40	N/A	N/A	N/A	N/A	0.740	0	0	0.192	TRUE	FALSE	FALSE	N/A	N/A	C	
256.3	75.458	N/A	39	N/A	N/A	N/A	N/A	0.740	0	0	0.192	TRUE	FALSE	FALSE	N/A	N/A	C	
256.2	75.622	N/A	39	N/A	N/A	N/A	N/A	0.739	0	0	0.192	TRUE	FALSE	FALSE	N/A	N/A	C	
256.0	75.786	N/A	41	N/A	N/A	N/A	N/A	0.739	0	0	0.192	TRUE	FALSE	FALSE	N/A	N/A	C	
255.8	75.951	N/A	42	N/A	N/A	N/A	N/A	0.738	0	0	0.192	TRUE	FALSE	FALSE	N/A	N/A	C	
255.7	76.115	N/A	40	N/A	N/A	N/A	N/A	0.737	0	0	0.192	TRUE	FALSE	FALSE	N/A	N/A	C	
255.5	76.279	N/A	53	N/A	N/A	N/A	N/A	0.737	0	0	0.191	TRUE	FALSE	FALSE	N/A	N/A	A1	
255.4	76.443	0.153	59	0.902	1.305	0.98	0.176	0.736	0	0	0.191	FALSE	FALSE	FALSE	0.9	N/A	A1	
255.2	76.607	0.181	64	0.890	1.583	0.97	0.248	0.736	0	0	0.191	FALSE	FALSE	FALSE	1.3	N/A	A1	
255.0	76.771	0.209	68	0.881	1.797	0.97	0.321	0.735	0	0	0.191	FALSE	FALSE	FALSE	1.7	N/A	A1	
254.9	76.935	0.158	60	0.899	1.360	0.98	0.189	0.735	0	0	0.191	FALSE	FALSE	FALSE	1.0	N/A	A1	
254.7	77.099	N/A	56	N/A	N/A	N/A	N/A	0.734	0	0	0.191	TRUE	FALSE	FALSE	N/A	N/A	B	
254.5	77.263	N/A	53	N/A	N/A	N/A	N/A	0.733	0	0	0.191	TRUE	FALSE	FALSE	N/A	N/A	B	
254.4	77.427	N/A	55	N/A	N/A	N/A	N/A	0.733	0	0	0.191	TRUE	FALSE	FALSE	N/A	N/A	B	
254.2	77.591	0.186	65	0.887	1.623	0.97	0.260	0.732	0	0	0.191	FALSE	FALSE	FALSE	1.4	N/A	A1	
254.0	77.755	N/A	62	N/A	N/A	N/A	N/A	0.732	0	0	0.191	TRUE	FALSE	FALSE	N/A	N/A	B	
253.9	77.919	N/A	51	N/A	N/A	N/A	N/A	0.731	0	0	0.190	TRUE	FALSE	FALSE	N/A	N/A	B	
253.7	78.083	N/A	46	N/A	N/A	N/A	N/A	0.731	0	0	0.190	TRUE	FALSE	FALSE	N/A	N/A	B	
253.6	78.247	0.149	58	0.901	1.250	0.98	0.164	0.730	0	0	0.190	FALSE	FALSE	FALSE	0.9	N/A	A1	
253.4	78.411	0.187	65	0.885	1.629	0.97	0.262	0.729	0	0	0.190	FALSE	FALSE	FALSE	1.4	N/A	A1	
253.2	78.575	0.193	66	0.883	1.675	0.97	0.277	0.729	0	0	0.190	FALSE	FALSE	FALSE	1.5	N/A	A1	
253.1	78.739	N/A	54	N/A	N/A	N/A	N/A	0.728	0	0	0.190	TRUE	FALSE	FALSE	N/A	N/A	B	
252.9	78.903	N/A	43	N/A	N/A	N/A	N/A	0.728	0	0	0.190	TRUE	FALSE	FALSE	N/A	N/A	B	
252.7	79.067	N/A	46	N/A	N/A	N/A	N/A	0.727	0	0	0.190	TRUE	FALSE	FALSE	N/A	N/A	B	
252.6	79.231	N/A	46	N/A	N/A	N/A	N/A	0.727	0	0	0.190	TRUE	FALSE	FALSE	N/A	N/A	B	
252.4	79.395	N/A	51	N/A	N/A	N/A	N/A	0.726	0	0	0.189	TRUE	FALSE	FALSE	N/A	N/A	B	

Elev. (ft)	Depth z (ft)	Cyclic Resistance Ratio $CRR_{7.5}$	Relative Density D_r	Correction for			Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CHR	Stress Reduction Coeff., t_d	Front Ground Response			Cyclic Stress Ratio CSR	Sample Screened for:			Factor of Safety FS_{liq}	Material (optional)	Soil Type (see note on following chart)
				Overburden Pressure K_o	Sloping Ground K_σ	Induced Shear Stress τ_{Max}				Maximum Cyclic Shear Stress τ_{Avg}	Clay-like (qc_{30}) ≥ 175	High Tip Res.		Unsaturated					
252.2	79.559	0.215	68	0.875	1.826	0.97	0.332	0.725	0	0	0	0.189	FALSE	FALSE	FALSE	1.8	N/A	A1	
252.1	79.723	0.390	77	0.842	2.488	0.95	0.774	0.725	0	0	0	0.189	FALSE	FALSE	FALSE	4.1	N/A	A1	
251.9	79.887	N/A	61	N/A	N/A	N/A	N/A	0.724	0	0	0	0.189	TRUE	FALSE	FALSE	N/A	N/A	B	
251.7	80.052	N/A	52	N/A	N/A	N/A	N/A	0.724	0	0	0	0.189	TRUE	FALSE	FALSE	N/A	N/A	B	
251.6	80.216	0.181	64	0.885	1.577	0.97	0.246	0.723	0	0	0	0.189	FALSE	FALSE	FALSE	1.3	N/A	A1	
251.4	80.380	0.267	72	0.861	2.093	0.96	0.462	0.723	0	0	0	0.189	FALSE	FALSE	FALSE	2.4	N/A	A1	
251.3	80.544	0.232	70	0.869	1.917	0.96	0.372	0.722	0	0	0	0.189	FALSE	FALSE	FALSE	2.0	N/A	A1	
251.1	80.708	0.289	73	0.856	2.180	0.96	0.516	0.722	0	0	0	0.189	FALSE	FALSE	FALSE	2.7	N/A	A1	
250.9	80.872	0.260	72	0.862	2.060	0.96	0.444	0.721	0	0	0	0.189	FALSE	FALSE	FALSE	2.4	N/A	A1	
250.8	81.036	0.284	73	0.856	2.158	0.96	0.503	0.720	0	0	0	0.188	FALSE	FALSE	FALSE	2.7	N/A	A1	
250.6	81.200	0.178	64	0.885	1.550	0.97	0.238	0.720	0	0	0	0.188	FALSE	FALSE	FALSE	1.3	N/A	A1	
250.4	81.364	N/A	59	N/A	N/A	N/A	N/A	0.719	0	0	0	0.188	TRUE	FALSE	FALSE	N/A	N/A	B	
250.3	81.528	N/A	52	N/A	N/A	N/A	N/A	0.719	0	0	0	0.188	TRUE	FALSE	FALSE	N/A	N/A	B	
250.1	81.692	N/A	43	N/A	N/A	N/A	N/A	0.718	0	0	0	0.188	TRUE	FALSE	FALSE	N/A	N/A	B	
249.9	81.856	N/A	39	N/A	N/A	N/A	N/A	0.718	0	0	0	0.188	TRUE	FALSE	FALSE	N/A	N/A	B	
249.8	82.020	N/A	41	N/A	N/A	N/A	N/A	0.717	0	0	0	0.188	TRUE	FALSE	FALSE	N/A	N/A	C	
249.6	82.184	0.139	55	0.902	1.115	0.98	0.137	0.717	0	0	0	0.188	FALSE	FALSE	FALSE	0.7	N/A	A1	
249.5	82.348	0.172	63	0.885	1.493	0.97	0.222	0.716	0	0	0	0.188	FALSE	FALSE	FALSE	1.2	N/A	A1	
249.3	82.512	0.326	75	0.846	2.301	0.95	0.605	0.716	0	0	0	0.187	FALSE	FALSE	FALSE	3.2	N/A	A1	
249.1	82.676	0.300	74	0.850	2.214	0.96	0.540	0.715	0	0	0	0.187	FALSE	FALSE	FALSE	2.9	N/A	A1	
249.0	82.840	N/A	58	N/A	N/A	N/A	N/A	0.715	0	0	0	0.187	TRUE	FALSE	FALSE	N/A	N/A	B	
248.8	83.004	N/A	53	N/A	N/A	N/A	N/A	0.714	0	0	0	0.187	TRUE	FALSE	FALSE	N/A	N/A	B	
248.6	83.168	N/A	57	N/A	N/A	N/A	N/A	0.713	0	0	0	0.187	TRUE	FALSE	FALSE	N/A	N/A	A1	
248.5	83.332	0.160	61	0.890	1.364	0.98	0.190	0.713	0	0	0	0.187	FALSE	FALSE	FALSE	1.0	N/A	A1	
248.3	83.496	0.140	56	0.900	1.130	0.98	0.140	0.712	0	0	0	0.187	TRUE	FALSE	FALSE	0.7	N/A	A1	
248.1	83.660	N/A	51	N/A	N/A	N/A	N/A	0.712	0	0	0	0.187	TRUE	FALSE	FALSE	N/A	N/A	B	
248.0	83.824	N/A	47	N/A	N/A	N/A	N/A	0.711	0	0	0	0.187	TRUE	FALSE	FALSE	N/A	N/A	B	
247.8	83.988	N/A	42	N/A	N/A	N/A	N/A	0.711	0	0	0	0.187	TRUE	FALSE	FALSE	N/A	N/A	B	
247.6	84.153	N/A	44	N/A	N/A	N/A	N/A	0.710	0	0	0	0.186	TRUE	FALSE	FALSE	N/A	N/A	B	
247.5	84.317	N/A	56	N/A	N/A	N/A	N/A	0.710	0	0	0	0.186	TRUE	FALSE	FALSE	N/A	N/A	A1	
247.3	84.481	N/A	55	N/A	N/A	N/A	N/A	0.709	0	0	0	0.186	TRUE	FALSE	FALSE	N/A	N/A	B	
247.2	84.645	0.225	69	0.864	1.865	0.97	0.349	0.709	0	0	0	0.186	FALSE	FALSE	FALSE	1.9	N/A	A1	
247.0	84.809	0.184	65	0.877	1.591	0.97	0.250	0.708	0	0	0	0.186	FALSE	FALSE	FALSE	1.3	N/A	A1	
246.8	84.973	0.302	74	0.846	2.213	0.96	0.541	0.708	0	0	0	0.186	FALSE	FALSE	FALSE	2.9	N/A	A1	
246.7	85.137	0.475	79	0.821	2.643	0.94	0.971	0.707	0	0	0	0.186	FALSE	FALSE	FALSE	5.2	N/A	A1	
246.5	85.301	0.256	71	0.855	2.024	0.96	0.426	0.707	0	0	0	0.186	FALSE	FALSE	FALSE	2.3	N/A	A1	
246.3	85.465	0.215	68	0.866	1.807	0.97	0.326	0.706	0	0	0	0.186	FALSE	FALSE	FALSE	1.8	N/A	A1	
246.2	85.629	0.167	62	0.883	1.433	0.98	0.206	0.706	0	0	0	0.186	FALSE	FALSE	FALSE	1.1	N/A	A1	
246.0	85.793	N/A	51	N/A	N/A	N/A	N/A	0.705	0	0	0	0.185	TRUE	FALSE	FALSE	N/A	N/A	B	
245.8	85.957	N/A	43	N/A	N/A	N/A	N/A	0.705	0	0	0	0.185	TRUE	FALSE	FALSE	N/A	N/A	B	
245.7	86.121	N/A	39	N/A	N/A	N/A	N/A	0.704	0	0	0	0.185	TRUE	FALSE	FALSE	N/A	N/A	C	
245.5	86.285	N/A	41	N/A	N/A	N/A	N/A	0.704	0	0	0	0.185	TRUE	FALSE	FALSE	N/A	N/A	C	
245.4	86.449	0.120	48	0.910	0.816	0.99	0.088	0.703	0	0	0	0.185	FALSE	FALSE	FALSE	0.5	N/A	A2	
245.2	86.613	N/A	53	N/A	N/A	N/A	N/A	0.703	0	0	0	0.185	TRUE	FALSE	FALSE	N/A	N/A	A1	
245.0	86.777	N/A	44	N/A	N/A	N/A	N/A	0.702	0	0	0	0.185	TRUE	FALSE	FALSE	N/A	N/A	B	
244.9	86.941	N/A	41	N/A	N/A	N/A	N/A	0.702	0	0	0	0.185	TRUE	FALSE	FALSE	N/A	N/A	C	
244.7	87.105	N/A	41	N/A	N/A	N/A	N/A	0.701	0	0	0	0.185	TRUE	FALSE	FALSE	N/A	N/A	C	
244.5	87.269	N/A	40	N/A	N/A	N/A	N/A	0.701	0	0	0	0.185	TRUE	FALSE	FALSE	N/A	N/A	C	
244.4	87.433	N/A	40	N/A	N/A	N/A	N/A	0.700	0	0	0	0.185	TRUE	FALSE	FALSE	N/A	N/A	C	
244.2	87.597	N/A	43	N/A	N/A	N/A	N/A	0.700	0	0	0	0.184	TRUE	FALSE	FALSE	N/A	N/A	C	
244.0	87.761	N/A	50	N/A	N/A	N/A	N/A	0.699	0	0	0	0.184	TRUE	FALSE	FALSE	N/A	N/A	B	
243.9	87.925	N/A	43	N/A	N/A	N/A	N/A	0.699	0	0	0	0.184	TRUE	FALSE	FALSE	N/A	N/A	B	
243.7	88.089	N/A	43	N/A	N/A	N/A	N/A	0.698	0	0	0	0.184	TRUE	FALSE	FALSE	N/A	N/A	C	
243.5	88.254	N/A	43	N/A	N/A	N/A	N/A	0.698	0	0	0	0.184	TRUE	FALSE	FALSE	N/A	N/A	C	
243.4	88.418	0.144	57	0.892	1.167	0.98	0.147	0.697	0	0	0	0.184	FALSE	FALSE	FALSE	0.8	N/A	A1	

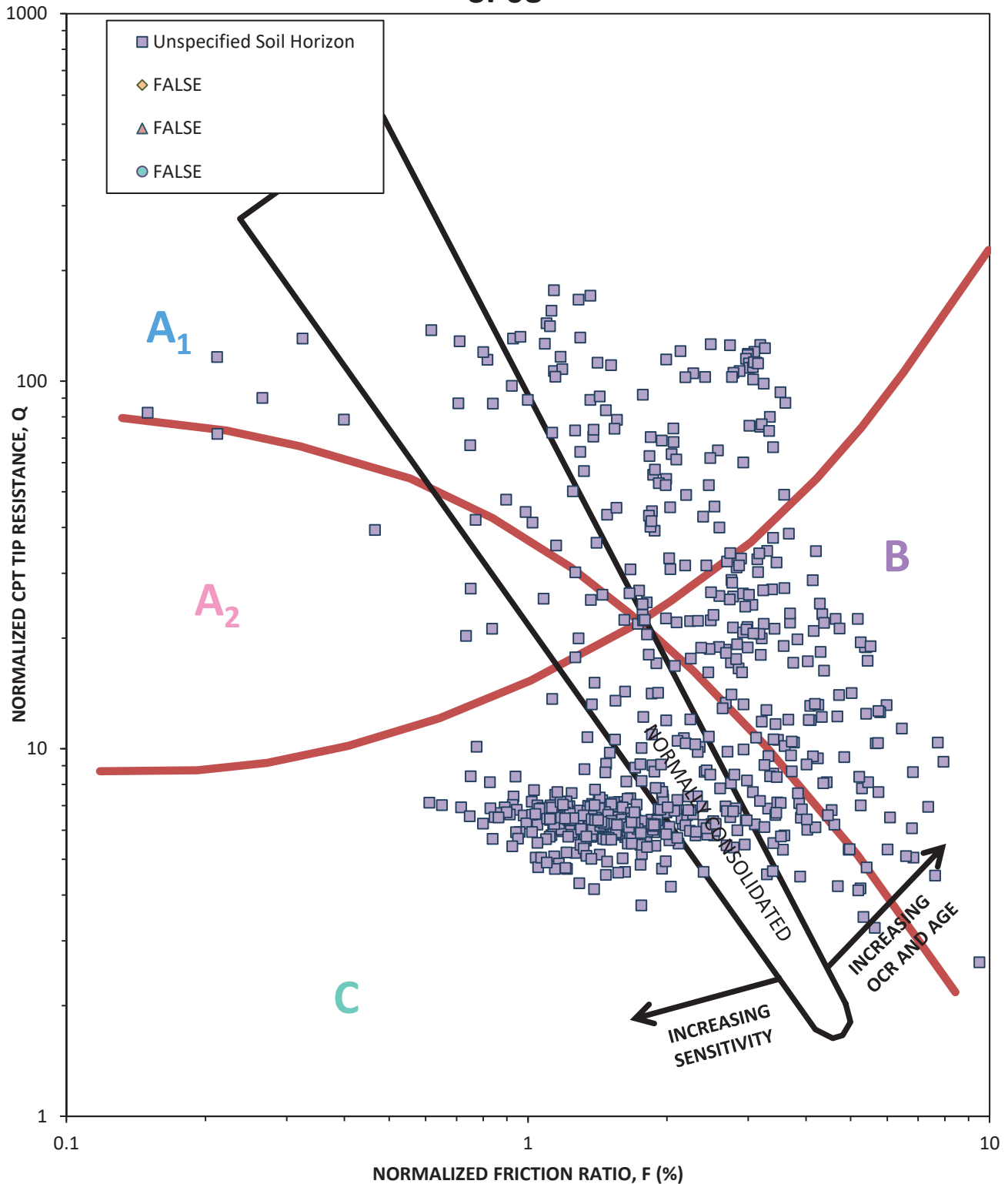
Elev. (ft)	Depth z	Cyclic Resistance Ratio $CRR_{7.5}$	Relative Density D_r	Correction for Overburden Pressure		Correction for Sloping Ground K_α	Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CHR	Stress Reduction Coeff., r_d	Front Ground Response			Sample Screened for:			Factor of Safety FS_{liq}	Material (optional)	Soil Type (see note on following chart)		
				K_σ	K_α					τ_{max}	Shear Stress	τ_{Avg}	Cyclic Shear Stress	Cyclic Stress Ratio CSR	Clay-like $(qc_{30}) \geq 175$				High Tip Res.	Unsaturated
243.2	88.582	0.157	60	0.884	1.321	N/A	0.98	0.179	0.697	0	0	0	0.184	FALSE	FALSE	FALSE	1.0	N/A	A1	
243.1	88.746	N/A	51	N/A	N/A	N/A	N/A	N/A	0.696	0	0	0	0.184	TRUE	FALSE	FALSE	N/A	N/A	B	
242.9	88.910	N/A	48	N/A	N/A	N/A	N/A	N/A	0.696	0	0	0	0.184	TRUE	FALSE	FALSE	N/A	N/A	B	
242.7	89.074	N/A	44	N/A	N/A	N/A	N/A	N/A	0.695	0	0	0	0.184	TRUE	FALSE	FALSE	N/A	N/A	B	
242.6	89.238	N/A	41	N/A	N/A	N/A	N/A	N/A	0.695	0	0	0	0.183	TRUE	FALSE	FALSE	N/A	N/A	C	
242.4	89.402	N/A	40	N/A	N/A	N/A	N/A	N/A	0.694	0	0	0	0.183	TRUE	FALSE	FALSE	N/A	N/A	C	
242.2	89.566	N/A	39	N/A	N/A	N/A	N/A	N/A	0.694	0	0	0	0.183	TRUE	FALSE	FALSE	N/A	N/A	C	
242.1	89.730	N/A	41	N/A	N/A	N/A	N/A	N/A	0.693	0	0	0	0.183	TRUE	FALSE	FALSE	N/A	N/A	C	
241.9	89.894	N/A	51	N/A	N/A	N/A	N/A	N/A	0.693	0	0	0	0.183	TRUE	FALSE	FALSE	N/A	N/A	A2	
241.7	90.058	N/A	44	N/A	N/A	N/A	N/A	N/A	0.692	0	0	0	0.183	TRUE	FALSE	FALSE	N/A	N/A	C	
241.6	90.222	N/A	41	N/A	N/A	N/A	N/A	N/A	0.692	0	0	0	0.183	TRUE	FALSE	FALSE	N/A	N/A	C	
241.4	90.386	N/A	49	N/A	N/A	N/A	N/A	N/A	0.692	0	0	0	0.183	TRUE	FALSE	FALSE	N/A	N/A	A2	
241.2	90.550	N/A	49	N/A	N/A	N/A	N/A	N/A	0.691	0	0	0	0.183	TRUE	FALSE	FALSE	N/A	N/A	B	
241.1	90.714	N/A	43	N/A	N/A	N/A	N/A	N/A	0.691	0	0	0	0.183	TRUE	FALSE	FALSE	N/A	N/A	B	
240.9	90.878	0.135	54	0.895	1.042	0.98	N/A	0.124	0.690	0	0	0	0.183	FALSE	FALSE	FALSE	0.7	N/A	A1	
240.8	91.042	N/A	53	N/A	N/A	N/A	N/A	N/A	0.690	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	B	
240.6	91.206	N/A	46	N/A	N/A	N/A	N/A	N/A	0.689	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	B	
240.4	91.370	N/A	50	N/A	N/A	N/A	N/A	N/A	0.689	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	B	
240.3	91.534	0.154	59	0.883	1.281	0.98	N/A	0.170	0.688	0	0	0	0.182	FALSE	FALSE	FALSE	0.9	N/A	A1	
240.1	91.698	0.160	61	0.879	1.348	0.98	N/A	0.185	0.688	0	0	0	0.182	FALSE	FALSE	FALSE	1.0	N/A	A1	
239.9	91.862	0.157	60	0.880	1.318	0.98	N/A	0.178	0.687	0	0	0	0.182	FALSE	FALSE	FALSE	1.0	N/A	A1	
239.8	92.026	N/A	60	N/A	N/A	N/A	N/A	N/A	0.687	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	A1	
239.6	92.190	N/A	53	N/A	N/A	N/A	N/A	N/A	0.686	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	B	
239.4	92.355	N/A	54	N/A	N/A	N/A	N/A	N/A	0.686	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	B	
239.3	92.519	0.440	78	0.811	2.546	0.94	N/A	0.857	0.686	0	0	0	0.182	FALSE	FALSE	FALSE	4.7	N/A	A1	
239.1	92.683	N/A	84	N/A	N/A	N/A	N/A	N/A	0.685	0	0	0	0.182	FALSE	TRUE	FALSE	N/A	N/A	A1	
239.0	92.847	N/A	86	N/A	N/A	N/A	N/A	N/A	0.685	0	0	0	0.181	FALSE	TRUE	FALSE	N/A	N/A	A1	
238.8	93.011	N/A	84	N/A	N/A	N/A	N/A	N/A	0.684	0	0	0	0.181	FALSE	TRUE	FALSE	N/A	N/A	A1	
238.6	93.175	0.460	78	0.808	2.582	0.94	N/A	0.903	0.684	0	0	0	0.181	FALSE	FALSE	FALSE	5.0	N/A	A1	
238.5	93.339	0.299	74	0.833	2.172	0.96	N/A	0.517	0.683	0	0	0	0.181	FALSE	FALSE	FALSE	2.9	N/A	A1	
238.3	93.503	0.252	71	0.844	1.979	0.96	N/A	0.404	0.683	0	0	0	0.181	FALSE	FALSE	FALSE	2.2	N/A	A1	
238.1	93.667	0.278	73	0.837	2.092	0.96	N/A	0.466	0.683	0	0	0	0.181	FALSE	FALSE	FALSE	2.6	N/A	A1	
238.0	93.831	0.210	68	0.856	1.752	0.97	N/A	0.305	0.682	0	0	0	0.181	FALSE	FALSE	FALSE	1.7	N/A	A1	
237.8	93.995	N/A	54	N/A	N/A	N/A	N/A	N/A	0.682	0	0	0	0.181	TRUE	FALSE	FALSE	N/A	N/A	B	
237.6	94.159	N/A	46	N/A	N/A	N/A	N/A	N/A	0.681	0	0	0	0.181	TRUE	FALSE	FALSE	N/A	N/A	B	
237.5	94.323	N/A	42	N/A	N/A	N/A	N/A	N/A	0.681	0	0	0	0.181	TRUE	FALSE	FALSE	N/A	N/A	B	
237.3	94.487	N/A	40	N/A	N/A	N/A	N/A	N/A	0.680	0	0	0	0.181	TRUE	FALSE	FALSE	N/A	N/A	B	
237.1	94.651	N/A	40	N/A	N/A	N/A	N/A	N/A	0.680	0	0	0	0.181	TRUE	FALSE	FALSE	N/A	N/A	C	
237.0	94.815	N/A	41	N/A	N/A	N/A	N/A	N/A	0.680	0	0	0	0.180	TRUE	FALSE	FALSE	N/A	N/A	C	
236.8	94.979	N/A	48	N/A	N/A	N/A	N/A	N/A	0.679	0	0	0	0.180	TRUE	FALSE	FALSE	N/A	N/A	C	
236.7	95.143	0.141	56	0.886	1.112	0.98	N/A	0.136	0.679	0	0	0	0.180	FALSE	FALSE	FALSE	0.8	N/A	A1	
236.5	95.307	0.138	55	0.888	1.085	0.98	N/A	0.131	0.678	0	0	0	0.180	FALSE	FALSE	FALSE	0.7	N/A	A1	
236.3	95.471	0.135	54	0.890	1.039	0.98	N/A	0.123	0.678	0	0	0	0.180	FALSE	FALSE	FALSE	0.7	N/A	A1	
236.2	95.635	N/A	50	N/A	N/A	N/A	N/A	N/A	0.677	0	0	0	0.180	TRUE	FALSE	FALSE	N/A	N/A	B	
236.0	95.799	N/A	43	N/A	N/A	N/A	N/A	N/A	0.677	0	0	0	0.180	TRUE	FALSE	FALSE	N/A	N/A	B	
235.8	95.963	N/A	49	N/A	N/A	N/A	N/A	N/A	0.677	0	0	0	0.180	TRUE	FALSE	FALSE	N/A	N/A	B	
235.7	96.127	N/A	56	N/A	N/A	N/A	N/A	N/A	0.676	0	0	0	0.180	TRUE	FALSE	FALSE	N/A	N/A	B	
235.5	96.291	N/A	53	N/A	N/A	N/A	N/A	N/A	0.676	0	0	0	0.180	TRUE	FALSE	FALSE	N/A	N/A	B	
235.3	96.456	N/A	62	N/A	N/A	N/A	N/A	N/A	0.675	0	0	0	0.180	TRUE	FALSE	FALSE	N/A	N/A	B	
235.2	96.620	N/A	47	N/A	N/A	N/A	N/A	N/A	0.675	0	0	0	0.180	TRUE	FALSE	FALSE	N/A	N/A	B	
235.0	96.784	N/A	41	N/A	N/A	N/A	N/A	N/A	0.675	0	0	0	0.179	TRUE	FALSE	FALSE	N/A	N/A	B	
234.9	96.948	N/A	50	N/A	N/A	N/A	N/A	N/A	0.674	0	0	0	0.179	TRUE	FALSE	FALSE	N/A	N/A	B	
234.7	97.112	0.189	66	0.859	1.599	0.97	N/A	0.253	0.674	0	0	0	0.179	FALSE	FALSE	FALSE	1.4	N/A	A1	
234.5	97.276	0.174	63	0.866	1.468	0.97	N/A	0.215	0.673	0	0	0	0.179	FALSE	FALSE	FALSE	1.2	N/A	A1	
234.4	97.440	N/A	60	N/A	N/A	N/A	N/A	N/A	0.673	0	0	0	0.179	TRUE	FALSE	FALSE	N/A	N/A	B	

Elev. (ft)	Depth z (ft)	Cyclic Resistance Ratio $CRR_{7.5}$	Relative Density D_r (%)	Correction for Overburden Pressure K_o	Correction for Sloping Ground K_σ	Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CHR	Stress Reduction Coeff., t_d	Front Ground Response			Cyclic Shear Stress τ_{Avg} (psf)	Cyclic Stress Ratio CSR	Sample Screened for:			Factor of Safety FS_{liq}	Material (optional)	Soil Type (see note on following chart)
									Maximum Induced Shear Stress τ_{Max} (psf)	Average Cyclic Shear Stress (psf)	High Tip Res. $(q_{c30})_{cs} \geq 175$			Unsatrated					
234.2	97.604	N/A	55	N/A	N/A	N/A	N/A	0.673	0	0	0.179	TRUE	FALSE	FALSE	FALSE	N/A	N/A	B	
234.0	97.768	N/A	45	N/A	N/A	N/A	N/A	0.672	0	0	0.179	TRUE	FALSE	FALSE	FALSE	N/A	N/A	B	
233.9	97.932	N/A	41	N/A	N/A	N/A	N/A	0.672	0	0	0.179	TRUE	FALSE	FALSE	FALSE	N/A	N/A	B	
233.7	98.096	N/A	40	N/A	N/A	N/A	N/A	0.671	0	0	0.179	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C	
233.5	98.260	N/A	40	N/A	N/A	N/A	N/A	0.671	0	0	0.179	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C	
233.4	98.424	N/A	39	N/A	N/A	N/A	N/A	0.671	0	0	0.179	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C	
233.2	98.588	N/A	51	N/A	N/A	N/A	N/A	0.670	0	0	0.179	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C	
233.0	98.752	N/A	46	N/A	N/A	N/A	N/A	0.670	0	0	0.179	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C	
232.9	98.916	N/A	44	N/A	N/A	N/A	N/A	0.670	0	0	0.178	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C	
232.7	99.080	N/A	42	N/A	N/A	N/A	N/A	0.669	0	0	0.178	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C	
232.6	99.244	N/A	40	N/A	N/A	N/A	N/A	0.669	0	0	0.178	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C	
232.4	99.408	N/A	40	N/A	N/A	N/A	N/A	0.668	0	0	0.178	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C	
232.2	99.572	N/A	40	N/A	N/A	N/A	N/A	0.668	0	0	0.178	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C	
232.1	99.736	N/A	40	N/A	N/A	N/A	N/A	0.668	0	0	0.178	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C	
231.9	99.900	N/A	40	N/A	N/A	N/A	N/A	0.667	0	0	0.178	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C	
231.7	100.064	N/A	40	N/A	N/A	N/A	N/A	0.667	0	0	0.178	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C	
231.6	100.228	N/A	39	N/A	N/A	N/A	N/A	0.667	0	0	0.178	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C	
231.4	100.392	N/A	39	N/A	N/A	N/A	N/A	0.666	0	0	0.178	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C	
231.2	100.557	N/A	39	N/A	N/A	N/A	N/A	0.666	0	0	0.178	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C	
231.1	100.721	N/A	40	N/A	N/A	N/A	N/A	0.666	0	0	0.178	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C	
230.9	100.885	N/A	45	N/A	N/A	N/A	N/A	0.665	0	0	0.178	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C	
230.8	101.049	N/A	52	N/A	N/A	N/A	N/A	0.665	0	0	0.178	TRUE	FALSE	FALSE	FALSE	N/A	N/A	B	
230.6	101.213	N/A	44	N/A	N/A	N/A	N/A	0.664	0	0	0.177	TRUE	FALSE	FALSE	FALSE	N/A	N/A	B	
230.4	101.377	N/A	41	N/A	N/A	N/A	N/A	0.664	0	0	0.177	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C	
230.3	101.541	N/A	40	N/A	N/A	N/A	N/A	0.664	0	0	0.177	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C	
230.1	101.705	N/A	40	N/A	N/A	N/A	N/A	0.663	0	0	0.177	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C	
229.9	101.869	N/A	39	N/A	N/A	N/A	N/A	0.663	0	0	0.177	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C	
229.8	102.033	N/A	40	N/A	N/A	N/A	N/A	0.663	0	0	0.177	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C	
229.6	102.197	N/A	40	N/A	N/A	N/A	N/A	0.662	0	0	0.177	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C	
229.4	102.361	N/A	39	N/A	N/A	N/A	N/A	0.662	0	0	0.177	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C	
229.3	102.525	N/A	39	N/A	N/A	N/A	N/A	0.662	0	0	0.177	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C	
229.1	102.689	N/A	39	N/A	N/A	N/A	N/A	0.661	0	0	0.177	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C	
228.9	102.853	N/A	39	N/A	N/A	N/A	N/A	0.661	0	0	0.177	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C	
228.8	103.017	N/A	45	N/A	N/A	N/A	N/A	0.661	0	0	0.177	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C	
228.6	103.181	N/A	52	N/A	N/A	N/A	N/A	0.660	0	0	0.177	TRUE	FALSE	FALSE	FALSE	N/A	N/A	B	
228.5	103.345	N/A	45	N/A	N/A	N/A	N/A	0.660	0	0	0.177	TRUE	FALSE	FALSE	FALSE	N/A	N/A	B	
228.3	103.509	N/A	41	N/A	N/A	N/A	N/A	0.660	0	0	0.177	TRUE	FALSE	FALSE	FALSE	N/A	N/A	B	
228.1	103.673	N/A	41	N/A	N/A	N/A	N/A	0.659	0	0	0.176	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C	
228.0	103.837	N/A	45	N/A	N/A	N/A	N/A	0.659	0	0	0.176	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C	
227.8	104.001	N/A	40	N/A	N/A	N/A	N/A	0.659	0	0	0.176	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C	
227.6	104.165	N/A	39	N/A	N/A	N/A	N/A	0.658	0	0	0.176	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C	
227.5	104.329	N/A	39	N/A	N/A	N/A	N/A	0.658	0	0	0.176	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C	
227.3	104.493	N/A	39	N/A	N/A	N/A	N/A	0.658	0	0	0.176	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C	
227.1	104.658	N/A	39	N/A	N/A	N/A	N/A	0.658	0	0	0.176	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C	
227.0	104.822	N/A	44	N/A	N/A	N/A	N/A	0.657	0	0	0.176	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C	
226.8	104.986	N/A	43	N/A	N/A	N/A	N/A	0.657	0	0	0.176	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C	
226.7	105.150	N/A	40	N/A	N/A	N/A	N/A	0.657	0	0	0.176	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C	
226.5	105.314	N/A	39	N/A	N/A	N/A	N/A	0.656	0	0	0.176	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C	
226.3	105.478	N/A	39	N/A	N/A	N/A	N/A	0.656	0	0	0.176	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C	
226.2	105.642	N/A	39	N/A	N/A	N/A	N/A	0.656	0	0	0.176	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C	
226.0	105.806	N/A	39	N/A	N/A	N/A	N/A	0.655	0	0	0.176	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C	
225.8	105.970	N/A	39	N/A	N/A	N/A	N/A	0.655	0	0	0.176	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C	
225.7	106.134	N/A	39	N/A	N/A	N/A	N/A	0.655	0	0	0.176	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C	
225.5	106.298	N/A	41	N/A	N/A	N/A	N/A	0.654	0	0	0.175	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C	
225.3	106.462	N/A	43	N/A	N/A	N/A	N/A	0.654	0	0	0.175	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C	

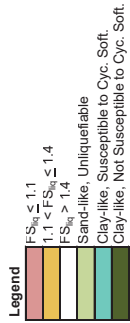
Elev. (ft)	Depth z	Cyclic Resistance Ratio $CRR_{7.5}$	Relative Density D_r	Correction for		Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., t_d	Front Ground Response			Sample Screened for:			Factor of Safety FS_{liq}	Material (optional)	Soil Type (see note on following chart)
				Overburden Pressure K_o	Sloping Ground K_σ				Shear Stress τ_{max} (psf)	Induced Shear Stress τ_{avg} (psf)	Average Cyclic Shear Stress τ_{avg} (psf)	Cyclic Stress Ratio CSR	Clay-like $(q_{c,IN}) \geq 175$	High Tip Res.			
225.2	106.626	N/A	39	N/A	N/A	N/A	N/A	0.654	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C
225.0	106.790	N/A	39	N/A	N/A	N/A	N/A	0.654	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C
224.8	106.954	N/A	39	N/A	N/A	N/A	N/A	0.653	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C
224.7	107.118	N/A	39	N/A	N/A	N/A	N/A	0.653	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C
224.5	107.282	N/A	39	N/A	N/A	N/A	N/A	0.653	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C
224.4	107.446	N/A	43	N/A	N/A	N/A	N/A	0.652	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C
224.2	107.610	N/A	40	N/A	N/A	N/A	N/A	0.652	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C
224.0	107.774	N/A	39	N/A	N/A	N/A	N/A	0.652	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C
223.9	107.938	N/A	39	N/A	N/A	N/A	N/A	0.652	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C
223.7	108.102	N/A	43	N/A	N/A	N/A	N/A	0.651	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C
223.5	108.266	N/A	44	N/A	N/A	N/A	N/A	0.651	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C
223.4	108.430	N/A	39	N/A	N/A	N/A	N/A	0.651	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C
223.2	108.594	N/A	38	N/A	N/A	N/A	N/A	0.651	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C
223.0	108.759	N/A	39	N/A	N/A	N/A	N/A	0.650	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C
222.9	108.923	N/A	38	N/A	N/A	N/A	N/A	0.650	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C
222.7	109.087	N/A	39	N/A	N/A	N/A	N/A	0.650	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C
222.5	109.251	N/A	39	N/A	N/A	N/A	N/A	0.650	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C
222.4	109.415	N/A	39	N/A	N/A	N/A	N/A	0.649	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C
222.2	109.579	N/A	39	N/A	N/A	N/A	N/A	0.649	0	0	0.174	TRUE	FALSE	FALSE	N/A	N/A	C
222.1	109.743	N/A	44	N/A	N/A	N/A	N/A	0.649	0	0	0.174	TRUE	FALSE	FALSE	N/A	N/A	C
221.9	109.907	N/A	41	N/A	N/A	N/A	N/A	0.649	0	0	0.174	TRUE	FALSE	FALSE	N/A	N/A	C
221.7	110.071	N/A	39	N/A	N/A	N/A	N/A	0.648	0	0	0.174	TRUE	FALSE	FALSE	N/A	N/A	C
221.6	110.235	N/A	38	N/A	N/A	N/A	N/A	0.648	0	0	0.174	TRUE	FALSE	FALSE	N/A	N/A	C
221.4	110.399	N/A	38	N/A	N/A	N/A	N/A	0.648	0	0	0.174	TRUE	FALSE	FALSE	N/A	N/A	C
221.2	110.563	N/A	38	N/A	N/A	N/A	N/A	0.648	0	0	0.174	TRUE	FALSE	FALSE	N/A	N/A	C
221.1	110.727	N/A	38	N/A	N/A	N/A	N/A	0.647	0	0	0.174	TRUE	FALSE	FALSE	N/A	N/A	C
220.9	110.891	N/A	39	N/A	N/A	N/A	N/A	0.647	0	0	0.174	TRUE	FALSE	FALSE	N/A	N/A	C
220.7	111.055	N/A	38	N/A	N/A	N/A	N/A	0.647	0	0	0.174	TRUE	FALSE	FALSE	N/A	N/A	C
220.6	111.219	N/A	38	N/A	N/A	N/A	N/A	0.647	0	0	0.174	TRUE	FALSE	FALSE	N/A	N/A	C
220.4	111.383	N/A	39	N/A	N/A	N/A	N/A	0.646	0	0	0.174	TRUE	FALSE	FALSE	N/A	N/A	C
220.3	111.547	N/A	39	N/A	N/A	N/A	N/A	0.646	0	0	0.174	TRUE	FALSE	FALSE	N/A	N/A	C
220.1	111.711	N/A	40	N/A	N/A	N/A	N/A	0.646	0	0	0.174	TRUE	FALSE	FALSE	N/A	N/A	C
219.9	111.875	N/A	38	N/A	N/A	N/A	N/A	0.646	0	0	0.174	TRUE	FALSE	FALSE	N/A	N/A	C
219.8	112.039	N/A	40	N/A	N/A	N/A	N/A	0.646	0	0	0.174	TRUE	FALSE	FALSE	N/A	N/A	C
219.6	112.203	N/A	50	N/A	N/A	N/A	N/A	0.645	0	0	0.174	TRUE	FALSE	FALSE	N/A	N/A	B
219.4	112.367	N/A	47	N/A	N/A	N/A	N/A	0.645	0	0	0.174	TRUE	FALSE	FALSE	N/A	N/A	B
219.3	112.531	N/A	40	N/A	N/A	N/A	N/A	0.645	0	0	0.174	TRUE	FALSE	FALSE	N/A	N/A	B
219.1	112.695	N/A	38	N/A	N/A	N/A	N/A	0.645	0	0	0.174	TRUE	FALSE	FALSE	N/A	N/A	B
218.9	112.860	N/A	40	N/A	N/A	N/A	N/A	0.644	0	0	0.174	TRUE	FALSE	FALSE	N/A	N/A	B
218.8	113.024	0.166	62	0.853	1.364	0.98	0.189	0.644	0	0	0.174	FALSE	FALSE	FALSE	1.1	N/A	A1
218.6	113.188	0.150	66	0.840	1.568	0.97	0.244	0.644	0	0	0.174	FALSE	FALSE	FALSE	1.4	N/A	A1
218.4	113.352	0.191	59	0.862	1.207	0.98	0.154	0.644	0	0	0.173	FALSE	FALSE	FALSE	0.9	N/A	A1
218.3	113.516	0.110	42	0.895	0.625	0.99	0.061	0.644	0	0	0.173	FALSE	FALSE	FALSE	0.4	N/A	A1
218.1	113.680	0.128	52	0.879	0.911	0.99	0.101	0.643	0	0	0.173	FALSE	FALSE	FALSE	0.6	N/A	A2
218.0	113.844	N/A	44	N/A	N/A	N/A	N/A	0.643	0	0	0.173	TRUE	FALSE	FALSE	N/A	N/A	B
217.8	114.008	N/A	37	N/A	N/A	N/A	N/A	0.643	0	0	0.173	TRUE	FALSE	FALSE	N/A	N/A	B
217.6	114.172	N/A	34	N/A	N/A	N/A	N/A	0.643	0	0	0.173	TRUE	FALSE	FALSE	N/A	N/A	B
217.5	114.336	0.119	48	0.886	0.772	0.99	0.081	0.643	0	0	0.173	FALSE	FALSE	FALSE	0.5	N/A	A2
217.3	114.500	0.101	36	0.904	0.472	0.99	0.043	0.642	0	0	0.173	FALSE	FALSE	FALSE	0.2	N/A	A1
217.1	114.664	0.107	40	0.898	0.568	0.99	0.054	0.642	0	0	0.173	FALSE	FALSE	FALSE	0.3	N/A	A1
217.0	114.828	0.095	31	0.910	0.368	0.99	0.032	0.642	0	0	0.173	FALSE	FALSE	FALSE	0.2	N/A	A2
216.8	114.992	0.116	46	0.889	0.719	0.99	0.073	0.642	0	0	0.173	FALSE	FALSE	FALSE	0.4	N/A	A2
216.6	115.156	N/A	38	N/A	N/A	N/A	N/A	0.642	0	0	0.173	TRUE	FALSE	FALSE	N/A	N/A	C
216.5	115.320	N/A	38	N/A	N/A	N/A	N/A	0.642	0	0	0.173	TRUE	FALSE	FALSE	N/A	N/A	C
216.3	115.484	N/A	38	N/A	N/A	N/A	N/A	0.641	0	0	0.173	TRUE	FALSE	FALSE	N/A	N/A	C

Elev. z (ft)	Depth z (ft)	Cyclic Resistance Ratio CRR _{7.5}	Relative Density D _r (%)	Correction for Overburden Pressure K _o	Correction for Sloping Ground K _α	Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., r _d	From Ground Response			Sample Screened for:			Factor of Safety FS _{liq}	Material (optional)	Soil Type (see note on following chart)
									Maximum Induced Shear Stress τ _{max} (psf)	Cyclic Average Shear Stress τ _{avg} (psf)	Cyclic Stress Ratio CSR	Clay-like (qc ₃₀) _{CS} ≥ 175	High Tip Res.	Unsaturated			
216.2	115.648	N/A	47	N/A	N/A	N/A	N/A	0.641	0	0	0.173	TRUE	FALSE	FALSE	N/A	N/A	C
216.0	115.812	0.225	69	0.823	1.783	0.97	0.319	0.641	0	0	0.173	FALSE	FALSE	FALSE	FALSE	N/A	A1

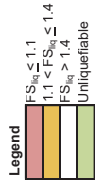
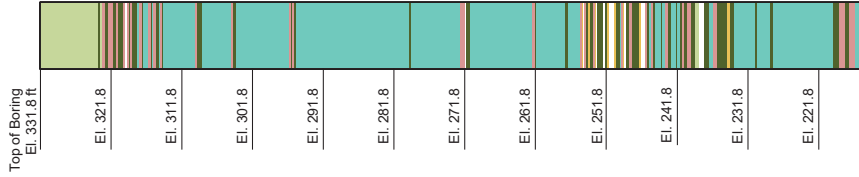
SP08



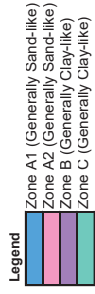
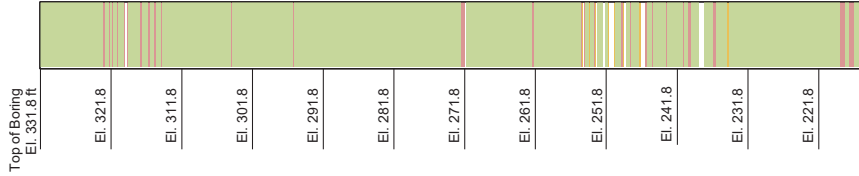
Adapted from "Discussion of 'Liquefaction Potential of Silts from CPTu'" (Robertson 2008). Zone A_1 and Zone A_2 samples are generally sand-like. Zone B samples are generally clay-like and not susceptible to cyclic softening. Zone C samples are generally clay-like and susceptible to cyclic softening. Note that the transition from clay-like to sand-like in this chart does not exactly match the liquefaction calculations herein; that is, some transitional samples in Zone B and Zone C will be treated as sand-like and analyzed for liquefaction if the calculations indicate as such.



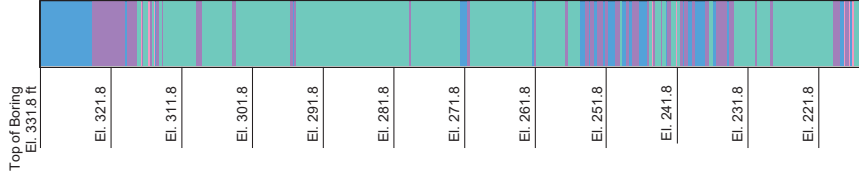
SP08, Liquefaction Triggering Results



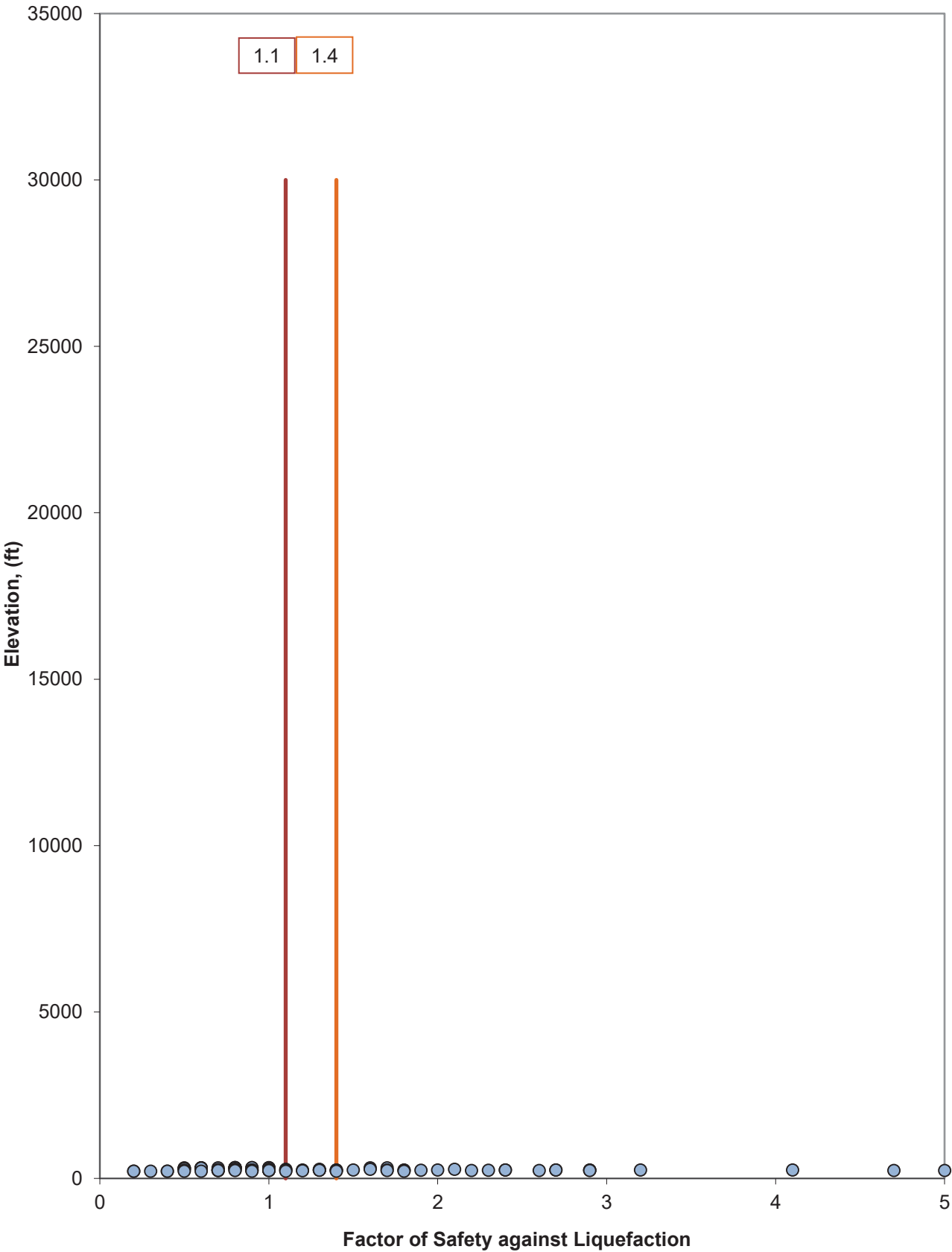
SP08, Liquefaction Triggering Results



SP08, Robertson Soil Type



US 60 Bridge, Boring = SP08, Source = Design Source, Mw = 7.7, Event = Design Event,
CPT Data, Simplified Stress-Based Approach



Project Information

Slantec Project Number =
178565011

Project Name =
US 80 Bridge

CPT ID =
SP09

Boring Location (optional)

Nothing =

Ending =

OR

Baseline Station =

Offset (+ Right) =

Using qt (corrected for u2 PWP) or qc (backcalculated uncorrected field tip)

Cone ID (optional) =

Use qc instead of qt? (1: Yes, 0: No)

Cone Area Rate (a) =
0

0.80

Drilling Information

Top of Hole Elevation =
337.1
feet

Water Depth during CPT (negative for US borings) =
9.3
feet

Depth data collection began =
0.00
feet

Avg. Total Unit WL Above 1st Sample =
pcf

During Earthquake Information

Water Depth during EQ (relative to CPT TOH, negative for US borings) =
9.3
feet

Final Grade Elevation during EQ =
337.1
feet

Avg. Total Unit WL of Cui/Fill =
pcf

120

Nonlinear Pore Water Pressure Profile

Cu/Pore Pore Water Pressure Profile?
0 (1: Yes, 0: No)

If previous answer is No, hydrostatic pressures are assumed.

α Curve Fit Parameters

Associated α profile:
1 (1: Yes, 0: No)

If previous answer is No, then enter curve fit parameters below (a vs. depth curve)
If defaulting to $K_s=1$ (i.e., level ground), assign values of zero to all curve fit parameters below to make alpha zero and thus, K_s will be one.

m4:

m3:

m2:

m1:

m0:

Associated ground response profile:

Get CSR from shear stress envelope?
0 (1: Yes, 0: No)

If previous answer is No, then CSR will be calculated using a_{max} and r_d
Max. Shear Stress at each sample depth known?
If previous answer is No, then enter curve fit parameters below (shear stress vs. depth curve)

Max. Shear Stress Curve Fit Parameters (from ground response analysis)

m4:

m3:

m2:

m1:

Earthquake Information

EQ Source (e.g., New Madrid)
Design Source

Event (e.g., MCE, OBE)
Design Event

a_{max} (g) (top of ground surface)
0.21

EQ Mag (Mw)
7.7

Inputs

Depth (ft)	Corrected Cone Tip Resistance, q_c (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
0.164	1.653	0.088	120							
0.328	19.956	0.210	120							
0.492	59.188	0.540	120							
0.656	89.286	0.861	120							
0.820	101.739	1.070	120							
0.984	87.075	1.309	120							
1.148	78.746	1.377	120							
1.312	74.661	1.433	120							
1.476	68.603	1.457	120							
1.640	65.467	1.456	120							
1.804	61.887	1.467	120							
1.968	57.722	1.563	120							
2.133	56.104	1.816	120							
2.297	55.664	2.101	120							
2.461	55.283	2.307	120							
2.625	57.861	2.416	120							
2.789	58.689	2.394	120							
2.953	59.389	2.408	120							
3.117	63.340	2.467	120							
3.281	66.370	2.392	120							
3.445	62.431	2.510	120							
3.609	54.383	2.462	120							
3.773	47.989	2.280	120							
3.937	44.827	2.082	120							
4.101	41.996	1.962	120							
4.265	39.741	1.843	120							
4.429	38.834	1.736	120							
4.593	34.236	1.627	120							
4.757	31.204	1.433	120							
4.921	27.155	1.242	120							
5.085	22.795	0.931	120							
5.249	20.153	0.735	120							
5.413	18.919	0.602	120							
5.577	19.673	0.571	120							
5.741	20.272	0.596	120							
5.905	22.132	0.652	120							
6.069	22.535	0.727	120							
6.234	24.060	0.751	120							
6.398	26.070	0.828	120							
6.562	26.723	1.069	120							
6.726	32.260	0.943	120							
6.890	55.272	0.999	120							
7.054	42.861	1.141	120							
7.218	33.156	1.071	120							
7.382	31.329	0.981	120							
7.546	26.346	0.891	120							
7.710	24.695	0.895	120							
7.874	25.878	0.643	120							
8.038	25.502	0.634	120							
8.202	21.837	0.592	120							
8.366	21.246	0.490	120							
8.530	21.342	0.439	120							
8.694	21.538	0.500	120							
8.858	19.811	0.516	120							
9.022	17.211	0.530	120							
9.186	15.784	0.458	120							
9.350	12.914	0.425	120							
9.514	14.577	0.376	120							
9.678	23.109	0.503	120							
9.842	27.776	0.549	120							
10.006	16.635	0.498	120							
10.170	15.715	0.341	120							
10.335	17.315	0.393	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
10.499	17.152	0.349	120							
10.663	12.006	0.335	120							
10.827	9.413	0.247	120							
10.991	8.766	0.203	120							
11.155	9.103	0.175	120							
11.319	8.160	0.174	120							
11.483	7.741	0.168	120							
11.647	9.792	0.175	120							
11.811	14.160	0.218	120							
11.975	20.321	0.299	120							
12.139	14.676	0.312	120							
12.303	10.911	0.314	120							
12.467	11.025	0.436	120							
12.631	19.440	0.508	120							
12.795	68.274	0.487	120							
12.959	89.484	0.506	120							
13.123	54.314	0.675	120							
13.287	24.270	0.879	120							
13.451	13.665	0.669	120							
13.615	8.229	0.404	120							
13.779	7.675	0.159	120							
13.943	7.180	0.135	120							
14.107	6.598	0.132	120							
14.271	5.689	0.128	120							
14.436	5.109	0.119	120							
14.600	5.005	0.112	120							
14.764	5.353	0.109	120							
14.928	6.024	0.134	120							
15.092	6.175	0.132	120							
15.256	6.354	0.127	120							
15.420	7.032	0.131	120							
15.584	7.371	0.123	120							
15.748	8.326	0.121	120							
15.912	7.209	0.119	120							
16.076	7.254	0.129	120							
16.240	7.143	0.177	120							
16.404	8.923	0.191	120							
16.568	7.157	0.192	120							
16.732	6.703	0.145	120							
16.896	6.798	0.117	120							
17.060	8.973	0.092	120							
17.224	8.241	0.110	120							
17.388	8.151	0.181	120							
17.552	14.532	0.262	120							
17.716	26.808	0.472	120							
17.880	15.533	0.454	120							
18.044	8.724	0.362	120							
18.208	9.145	0.174	120							
18.372	11.267	0.176	120							
18.537	18.124	0.278	120							
18.701	18.584	0.392	120							
18.865	13.434	0.439	120							
19.029	9.161	0.346	120							
19.193	6.533	0.216	120							
19.357	7.568	0.181	120							
19.521	13.947	0.206	120							
19.685	14.525	0.278	120							
19.849	8.331	0.257	120							
20.013	9.884	0.232	120							
20.177	7.876	0.151	120							
20.341	6.318	0.151	120							
20.505	6.155	0.062	120							
20.669	6.069	0.057	120							
20.833	5.815	0.062	120							
20.997	5.883	0.059	120							
21.161	6.201	0.060	120							
21.325	6.307	0.064	120							
21.489	7.353	0.107	120							
21.653	7.054	0.159	120							
21.817	18.178	0.323	120							
21.981	12.748	0.328	120							
22.145	7.399	0.282	120							
22.309	8.190	0.136	120							
22.473	6.296	0.075	120							
22.638	6.661	0.076	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
22.802	6.549	0.066	120							
22.966	6.134	0.067	120							
23.130	7.266	0.149	120							
23.294	9.703	0.144	120							
23.458	6.462	0.151	120							
23.622	13.891	0.297	120							
23.786	27.855	0.320	120							
23.950	53.026	0.357	120							
24.114	61.578	0.619	120							
24.278	36.981	0.885	120							
24.442	19.797	0.951	120							
24.606	16.362	0.657	120							
24.770	11.420	0.354	120							
24.934	9.435	0.144	120							
25.098	8.718	0.061	120							
25.262	7.588	0.058	120							
25.426	7.184	0.065	120							
25.590	6.640	0.061	120							
25.754	6.763	0.050	120							
25.918	7.073	0.057	120							
26.082	6.794	0.057	120							
26.246	7.559	0.090	120							
26.410	21.255	0.276	120							
26.574	17.196	0.327	120							
26.739	10.961	0.293	120							
26.903	7.815	0.137	120							
27.067	7.720	0.059	120							
27.231	7.477	0.058	120							
27.395	7.342	0.061	120							
27.559	7.372	0.079	120							
27.723	8.866	0.070	120							
27.887	7.530	0.063	120							
28.051	6.994	0.054	120							
28.215	7.108	0.058	120							
28.379	7.338	0.059	120							
28.543	8.258	0.089	120							
28.707	7.888	0.063	120							
28.871	7.458	0.066	120							
29.035	7.268	0.062	120							
29.199	7.394	0.073	120							
29.363	7.814	0.074	120							
29.527	7.485	0.077	120							
29.691	7.545	0.077	120							
29.855	15.823	0.113	120							
30.019	22.848	0.190	120							
30.183	22.964	0.677	120							
30.347	15.030	0.625	120							
30.511	9.027	0.370	120							
30.675	13.162	0.237	120							
30.840	10.380	0.171	120							
31.004	8.052	0.186	120							
31.168	8.305	0.084	120							
31.332	8.415	0.070	120							
31.496	8.779	0.083	120							
31.660	8.287	0.084	120							
31.824	8.479	0.081	120							
31.988	8.494	0.089	120							
32.152	9.249	0.090	120							
32.316	8.251	0.094	120							
32.480	8.504	0.081	120							
32.644	8.617	0.085	120							
32.808	8.694	0.092	120							
32.972	8.860	0.092	120							
33.136	9.201	0.097	120							
33.300	9.018	0.098	120							
33.464	8.923	0.101	120							
33.628	8.848	0.093	120							
33.792	8.902	0.094	120							
33.956	9.258	0.102	120							
34.120	8.885	0.111	120							
34.284	9.051	0.151	120							
34.448	11.681	0.147	120							
34.612	9.193	0.162	120							
34.776	9.060	0.177	120							
34.941	9.454	0.090	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
35.105	9.768	0.099	120							
35.269	9.060	0.106	120							
35.433	9.222	0.091	120							
35.597	9.164	0.090	120							
35.761	9.435	0.095	120							
35.925	9.852	0.098	120							
36.089	9.552	0.156	120							
36.253	9.230	0.172	120							
36.417	9.280	0.106	120							
36.581	9.365	0.102	120							
36.745	9.517	0.099	120							
36.909	9.603	0.098	120							
37.073	9.512	0.095	120							
37.237	9.713	0.099	120							
37.401	9.650	0.096	120							
37.565	9.684	0.100	120							
37.729	9.526	0.096	120							
37.893	9.610	0.096	120							
38.057	9.555	0.091	120							
38.221	10.035	0.099	120							
38.385	9.506	0.109	120							
38.549	9.526	0.108	120							
38.713	9.897	0.092	120							
38.877	9.602	0.095	120							
39.042	10.091	0.104	120							
39.206	9.922	0.155	120							
39.370	13.497	0.212	120							
39.534	9.264	0.190	120							
39.698	10.100	0.159	120							
39.862	9.647	0.094	120							
40.026	9.669	0.105	120							
40.190	10.071	0.099	120							
40.354	10.303	0.096	120							
40.518	11.312	0.134	120							
40.682	10.189	0.137	120							
40.846	9.902	0.145	120							
41.010	10.088	0.105	120							
41.174	10.274	0.106	120							
41.338	10.130	0.105	120							
41.502	10.211	0.106	120							
41.666	10.478	0.103	120							
41.830	10.976	0.110	120							
41.994	10.777	0.110	120							
42.158	10.439	0.122	120							
42.322	10.246	0.112	120							
42.486	10.084	0.102	120							
42.650	9.740	0.102	120							
42.814	10.001	0.092	120							
42.978	10.625	0.085	120							
43.143	11.392	0.096	120							
43.307	10.300	0.100	120							
43.471	10.349	0.111	120							
43.635	10.447	0.101	120							
43.799	10.364	0.092	120							
43.963	10.815	0.131	120							
44.127	13.726	0.086	120							
44.291	10.965	0.078	120							
44.455	10.222	0.074	120							
44.619	10.410	0.068	120							
44.783	10.211	0.081	120							
44.947	10.129	0.149	120							
45.111	10.189	0.133	120							
45.275	10.670	0.118	120							
45.439	10.265	0.109	120							
45.603	10.170	0.081	120							
45.767	10.209	0.074	120							
45.931	10.317	0.072	120							
46.095	10.282	0.077	120							
46.259	10.379	0.073	120							
46.423	10.412	0.090	120							
46.587	12.083	0.105	120							
46.751	17.083	0.144	120							
46.915	19.097	0.135	120							
47.079	13.809	0.124	120							
47.244	11.218	0.096	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
47.408	10782	0.070	120							
47.572	11024	0.075	120							
47.736	10914	0.093	120							
47.900	10950	0.068	120							
48.064	11085	0.106	120							
48.228	11684	0.150	120							
48.392	15453	0.076	120							
48.556	11657	0.080	120							
48.720	11273	0.104	120							
48.884	13923	0.100	120							
49.048	14229	0.257	120							
49.212	19379	0.339	120							
49.376	11920	0.303	120							
49.540	12275	0.177	120							
49.704	12018	0.088	120							
49.868	11367	0.082	120							
50.032	11337	0.086	120							
50.196	11332	0.077	120							
50.360	12051	0.076	120							
50.524	12869	0.058	120							
50.688	11194	0.053	120							
50.852	11302	0.056	120							
51.016	11521	0.062	120							
51.180	11607	0.073	120							
51.345	11511	0.082	120							
51.509	11862	0.080	120							
51.673	11448	0.074	120							
51.837	11689	0.085	120							
52.001	12241	0.082	120							
52.165	11637	0.087	120							
52.329	11733	0.085	120							
52.493	11741	0.114	120							
52.657	11702	0.078	120							
52.821	17717	0.189	120							
52.985	17005	0.138	120							
53.149	12919	0.131	120							
53.313	12181	0.099	120							
53.477	12857	0.072	120							
53.641	12747	0.081	120							
53.805	12561	0.098	120							
53.969	12494	0.089	120							
54.133	15353	0.137	120							
54.297	15993	0.190	120							
54.461	13718	0.180	120							
54.625	55456	0.207	120							
54.789	76276	0.900	120							
54.953	35499	1.158	120							
55.117	21367	0.937	120							
55.281	18299	0.442	120							
55.446	17245	0.148	120							
55.610	16781	0.193	120							
55.774	21891	0.425	120							
55.938	39627	1.012	120							
56.102	30971	1.049	120							
56.266	20144	0.775	120							
56.430	16815	0.362	120							
56.594	18542	0.325	120							
56.758	47551	0.758	120							
56.922	25244	0.812	120							
57.086	17529	0.570	120							
57.250	17017	0.306	120							
57.414	15693	0.096	120							
57.578	14947	0.074	120							
57.742	14196	0.083	120							
57.906	13753	0.087	120							
58.070	14520	0.222	120							
58.234	19720	0.279	120							
58.398	28256	0.516	120							
58.562	26602	0.555	120							
58.726	19672	0.437	120							
58.890	19158	0.195	120							
59.054	16978	0.168	120							
59.218	17469	0.256	120							
59.382	63079	0.335	120							
59.547	72100	1.276	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
59.711	39,267	1,709	120							
59.875	26,273	1,351	120							
60.039	19,377	1,052	120							
60.203	16,662	0,437	120							
60.367	15,020	0,223	120							
60.531	15,406	0,320	120							
60.695	20,736	0,380	120							
60.859	15,996	0,331	120							
61.023	51,734	0,732	120							
61.187	36,166	0,597	120							
61.351	23,414	0,565	120							
61.515	20,389	0,193	120							
61.679	18,060	0,131	120							
61.843	18,571	0,177	120							
62.007	21,109	0,944	120							
62.171	58,296	1,254	120							
62.335	96,047	1,255	120							
62.499	77,102	1,596	120							
62.663	40,085	1,361	120							
62.827	22,719	1,109	120							
62.991	23,588	0,453	120							
63.155	20,420	0,169	120							
63.319	17,255	0,109	120							
63.483	19,551	0,255	120							
63.648	23,663	0,375	120							
63.812	106,048	0,539	120							
63.976	210,131	1,173	120							
64.140	139,373	2,403	120							
64.304	66,710	3,057	120							
64.468	45,747	2,749	120							
64.632	145,253	2,281	120							
64.796	200,969	2,069	120							
64.960	169,247	1,838	120							
65.124	144,295	2,048	120							
65.288	123,560	2,271	120							
65.452	170,267	2,020	120							
65.616	163,235	1,959	120							
65.780	168,472	1,482	120							
65.944	200,532	1,305	120							
66.108	165,222	1,747	120							
66.272	52,457	2,225	120							
66.436	59,163	2,822	120							
66.600	33,319	1,668	120							
66.764	18,223	1,150	120							
66.928	16,247	0,381	120							
67.092	17,488	0,184	120							
67.256	17,224	0,184	120							
67.420	16,674	0,247	120							
67.584	17,422	0,206	120							
67.749	92,109	0,318	120							
67.913	123,767	1,018	120							
68.077	79,757	1,802	120							
68.241	45,257	1,619	120							
68.405	27,281	1,091	120							
68.569	29,016	1,877	120							
68.733	111,383	1,979	120							
68.897	182,953	1,892	120							
69.061	194,486	1,564	120							
69.225	191,296	1,365	120							
69.389	175,765	1,627	120							
69.553	130,553	1,745	120							
69.717	89,584	2,025	120							
69.881	79,023	2,427	120							
70.045	40,439	2,051	120							
70.209	23,410	1,322	120							
70.373	21,430	0,442	120							
70.537	28,905	0,335	120							
70.701	24,771	0,344	120							
70.865	18,350	0,256	120							
71.029	18,295	0,224	120							
71.193	25,426	0,351	120							
71.357	23,620	0,355	120							
71.521	18,923	0,376	120							
71.685	19,501	0,246	120							
71.850	21,136	0,358	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
72.014	77,608	0.653	120							
72.178	169,026	1.042	120							
72.342	185,135	1.485	120							
72.506	195,984	1.676	120							
72.670	208,713	1.902	120							
72.834	212,259	2.151	120							
72.998	233,051	2.382	120							
73.162	264,966	2.697	120							
73.326	316,546	3.895	120							
73.490	366,312	4.801	120							
73.654	394,465	5.297	120							
73.818	400,238	5.821	120							
73.982	401,968	6.290	120							
74.146	399,348	6.358	120							
74.310	400,119	6.532	120							
74.474	401,031	6.631	120							
74.638	406,835	7.154	120							
74.802	414,690	6.722	120							
74.966	380,104	6.595	120							
75.130	422,496	6.670	120							
75.294	415,702	6.812	120							
75.458	436,023	7.072	120							
75.622	434,591	7.309	120							
75.786	431,197	7.505	120							
75.951	426,921	7.568	120							
76.115	431,740	7.660	120							
76.279	442,124	7.926	120							
76.443	432,469	8.180	120							
76.607	431,842	8.071	120							
76.771	423,553	7.653	120							
76.935	418,902	7.594	120							
77.099	387,851	7.208	120							
77.263	380,184	6.960	120							
77.427	359,531	6.507	120							
77.591	330,789	5.915	120							
77.755	314,688	4.982	120							
77.919	309,922	4.343	120							
78.083	288,361	4.286	120							
78.247	283,616	3.739	120							
78.411	254,021	4.755	120							
78.575	201,831	4.372	120							
78.739	201,350	3.736	120							
78.903	284,130	3.460	120							
79.067	315,030	3.164	120							
79.231	341,078	4.063	120							

LIQUEFACTION POTENTIAL ASSESSMENT FOR COARSE GRAINED SOILS USING CONE PENETRATION TEST DATA

Facility: US 60 Bridge Project No.: 178565011 CPT ID: SP09	Water Elevation during CPT:	327.8	ft
	Depth to Water during CPT:	9.3	ft (relative to ground surface during CPT)
	Water Elevation during Earthquake:	327.8	ft
	Depth to Water during Earthquake:	9.3	ft (relative to ground surface during CPT)
	Final Grade Elevation during EQ:	337.1	ft (if no fill, then set this equal to top of CPT hole elev.)
	Height of Final Grade above CPT TOH:	0.0	ft (relative to ground surface during CPT, + Fill, - Cut)
	Unit Weight of Cut/Fill to Achieve Final Grade	120	pcf
	Cut/Fill Total Stress (+ Fill, - Cut):	0.00	tsf

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σ _{V CPT} (tsf)	Total Vertical Stress during EQ σ _{V EQ} (tsf)	Static Pore Water Pressure during CPT u _{S CPT} (tsf)	Static Pore Water Pressure during EQ u _{S EQ} (tsf)	Effective Vertical Stress during CPT σ _{V CPT} (tsf)	Effective Vertical Stress during EQ σ _{V EQ} (tsf)
337.1					Vertical Stresses above 1st CPT:		0.00	0.00	0.00	0.00	0.00	0.00
336.9	0.164	1.69	0.09	120		0.00	0.25	0.01	0.01	0.00	0.01	0.01
336.8	0.328	19.96	0.21	120		0.25	0.16	0.02	0.02	0.00	0.02	0.02
336.6	0.492	59.19	0.54	120		0.41	0.16	0.03	0.03	0.00	0.03	0.03
336.4	0.656	89.29	0.86	120		0.57	0.16	0.04	0.04	0.00	0.04	0.04
336.3	0.820	101.74	1.07	120		0.74	0.16	0.05	0.05	0.00	0.05	0.05
336.1	0.984	87.07	1.31	120		0.90	0.16	0.06	0.06	0.00	0.06	0.06
336.0	1.148	78.75	1.38	120		1.07	0.16	0.07	0.07	0.00	0.07	0.07
335.8	1.312	74.66	1.43	120		1.23	0.16	0.08	0.08	0.00	0.08	0.08
335.6	1.476	68.60	1.46	120		1.39	0.16	0.09	0.09	0.00	0.09	0.09
335.5	1.640	65.47	1.46	120		1.56	0.16	0.10	0.10	0.00	0.10	0.10
335.3	1.804	61.89	1.47	120		1.72	0.16	0.11	0.11	0.00	0.11	0.11
335.1	1.968	57.72	1.56	120		1.89	0.16	0.12	0.12	0.00	0.12	0.12
335.0	2.133	56.10	1.82	120		2.05	0.16	0.13	0.13	0.00	0.13	0.13
334.8	2.297	55.66	2.10	120		2.21	0.16	0.14	0.14	0.00	0.14	0.14
334.6	2.461	55.28	2.31	120		2.38	0.16	0.15	0.15	0.00	0.15	0.15
334.5	2.625	57.86	2.42	120		2.54	0.16	0.16	0.16	0.00	0.16	0.16
334.3	2.789	58.69	2.39	120		2.71	0.16	0.17	0.17	0.00	0.17	0.17
334.1	2.953	59.39	2.41	120		2.87	0.16	0.18	0.18	0.00	0.18	0.18
334.0	3.117	63.34	2.47	120		3.03	0.16	0.19	0.19	0.00	0.19	0.19
333.8	3.281	66.37	2.39	120		3.20	0.16	0.20	0.20	0.00	0.20	0.20
333.7	3.445	62.43	2.51	120		3.36	0.16	0.21	0.21	0.00	0.21	0.21
333.5	3.609	54.38	2.46	120		3.53	0.16	0.22	0.22	0.00	0.22	0.22
333.3	3.773	47.99	2.28	120		3.69	0.16	0.23	0.23	0.00	0.23	0.23
333.2	3.937	44.83	2.08	120		3.85	0.16	0.24	0.24	0.00	0.24	0.24
333.0	4.101	42.00	1.96	120		4.02	0.16	0.25	0.25	0.00	0.25	0.25
332.8	4.265	39.74	1.84	120		4.18	0.16	0.26	0.26	0.00	0.26	0.26
332.7	4.429	38.83	1.74	120		4.35	0.16	0.27	0.27	0.00	0.27	0.27
332.5	4.593	34.24	1.63	120		4.51	0.16	0.28	0.28	0.00	0.28	0.28
332.3	4.757	31.20	1.43	120		4.68	0.16	0.29	0.29	0.00	0.29	0.29
332.2	4.921	27.16	1.24	120		4.84	0.16	0.30	0.30	0.00	0.30	0.30
332.0	5.085	22.79	0.93	120		5.00	0.16	0.31	0.31	0.00	0.31	0.31
331.9	5.249	20.15	0.74	120		5.17	0.16	0.31	0.31	0.00	0.31	0.31
331.7	5.413	18.92	0.60	120		5.33	0.16	0.32	0.32	0.00	0.32	0.32
331.5	5.577	19.67	0.57	120		5.50	0.16	0.33	0.33	0.00	0.33	0.33
331.4	5.741	20.27	0.60	120		5.66	0.16	0.34	0.34	0.00	0.34	0.34
331.2	5.905	22.13	0.65	120		5.82	0.16	0.35	0.35	0.00	0.35	0.35
331.0	6.069	22.54	0.73	120		5.99	0.16	0.36	0.36	0.00	0.36	0.36
330.9	6.234	24.06	0.75	120		6.15	0.16	0.37	0.37	0.00	0.37	0.37
330.7	6.398	26.07	0.83	120		6.32	0.16	0.38	0.38	0.00	0.38	0.38
330.5	6.562	26.72	1.07	120		6.48	0.16	0.39	0.39	0.00	0.39	0.39
330.4	6.726	32.26	0.94	120		6.64	0.16	0.40	0.40	0.00	0.40	0.40
330.2	6.890	55.27	1.00	120		6.81	0.16	0.41	0.41	0.00	0.41	0.41
330.0	7.054	42.86	1.14	120		6.97	0.16	0.42	0.42	0.00	0.42	0.42
329.9	7.218	33.16	1.07	120		7.14	0.16	0.43	0.43	0.00	0.43	0.43
329.7	7.382	31.33	0.98	120		7.30	0.16	0.44	0.44	0.00	0.44	0.44
329.6	7.546	26.35	0.69	120		7.46	0.16	0.45	0.45	0.00	0.45	0.45
329.4	7.710	24.70	0.60	120		7.63	0.16	0.46	0.46	0.00	0.46	0.46
329.2	7.874	25.88	0.64	120		7.79	0.16	0.47	0.47	0.00	0.47	0.47
329.1	8.038	25.50	0.63	120		7.96	0.16	0.48	0.48	0.00	0.48	0.48
328.9	8.202	21.84	0.59	120		8.12	0.16	0.49	0.49	0.00	0.49	0.49
328.7	8.366	21.25	0.49	120		8.28	0.16	0.50	0.50	0.00	0.50	0.50
328.6	8.530	21.34	0.44	120		8.45	0.16	0.51	0.51	0.00	0.51	0.51
328.4	8.694	21.54	0.50	120		8.61	0.16	0.52	0.52	0.00	0.52	0.52
328.2	8.858	19.81	0.52	120		8.78	0.16	0.53	0.53	0.00	0.53	0.53
328.1	9.022	17.21	0.53	120		8.94	0.16	0.54	0.54	0.00	0.54	0.54
327.9	9.186	15.78	0.46	120		9.10	0.16	0.55	0.55	0.00	0.55	0.55
327.7	9.350	12.91	0.43	120		9.27	0.16	0.56	0.56	0.00	0.56	0.56
327.6	9.514	14.58	0.38	120		9.43	0.16	0.57	0.57	0.01	0.56	0.56
327.4	9.678	23.11	0.50	120		9.60	0.16	0.58	0.58	0.01	0.57	0.57
327.3	9.842	27.71	0.57	120		9.76	0.16	0.59	0.59	0.02	0.57	0.57
327.1	10.006	18.63	0.45	120		9.92	0.16	0.60	0.60	0.02	0.58	0.58
326.9	10.170	15.72	0.34	120		10.09	0.16	0.61	0.61	0.03	0.58	0.58

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σv CPT (tsf)	Total Vertical Stress during EQ σv EQ (tsf)	Static Pore Water Pressure during CPT us CPT (tsf)	Static Pore Water Pressure during EQ us EQ (tsf)	Effective Vertical Stress during CPT σv CPT (tsf)	Effective Vertical Stress during EQ σv EQ (tsf)
326.8	10.335	17.32	0.39	120	10.25	0.16	0.62	0.62	0.03	0.03	0.59	0.59
326.6	10.499	17.15	0.35	120	10.42	0.16	0.63	0.63	0.04	0.04	0.59	0.59
326.4	10.663	12.01	0.34	120	10.58	0.16	0.64	0.64	0.04	0.04	0.60	0.60
326.3	10.827	9.41	0.25	120	10.74	0.16	0.65	0.65	0.05	0.05	0.60	0.60
326.1	10.991	8.77	0.20	120	10.91	0.16	0.66	0.66	0.05	0.05	0.61	0.61
325.9	11.155	9.10	0.18	120	11.07	0.16	0.67	0.67	0.06	0.06	0.61	0.61
325.8	11.319	8.16	0.17	120	11.24	0.16	0.68	0.68	0.06	0.06	0.62	0.62
325.6	11.483	7.74	0.17	120	11.40	0.16	0.69	0.69	0.07	0.07	0.62	0.62
325.5	11.647	9.79	0.18	120	11.56	0.16	0.70	0.70	0.07	0.07	0.63	0.63
325.3	11.811	14.16	0.22	120	11.73	0.16	0.71	0.71	0.08	0.08	0.63	0.63
325.1	11.975	20.32	0.30	120	11.89	0.16	0.72	0.72	0.08	0.08	0.64	0.64
325.0	12.139	14.68	0.31	120	12.06	0.16	0.73	0.73	0.09	0.09	0.64	0.64
324.8	12.303	10.91	0.31	120	12.22	0.16	0.74	0.74	0.09	0.09	0.64	0.64
324.6	12.467	11.03	0.44	120	12.39	0.16	0.75	0.75	0.10	0.10	0.65	0.65
324.5	12.631	19.44	0.51	120	12.55	0.16	0.76	0.76	0.10	0.10	0.65	0.65
324.3	12.795	68.27	0.49	120	12.71	0.16	0.77	0.77	0.11	0.11	0.66	0.66
324.1	12.959	89.48	0.51	120	12.88	0.16	0.78	0.78	0.11	0.11	0.66	0.66
324.0	13.123	54.31	0.68	120	13.04	0.16	0.79	0.79	0.12	0.12	0.67	0.67
323.8	13.287	24.27	0.88	120	13.21	0.16	0.80	0.80	0.12	0.12	0.67	0.67
323.6	13.451	13.66	0.67	120	13.37	0.16	0.81	0.81	0.13	0.13	0.68	0.68
323.5	13.615	8.23	0.40	120	13.53	0.16	0.82	0.82	0.13	0.13	0.68	0.68
323.3	13.779	7.67	0.16	120	13.70	0.16	0.83	0.83	0.14	0.14	0.69	0.69
323.2	13.943	7.18	0.14	120	13.86	0.16	0.84	0.84	0.14	0.14	0.69	0.69
323.0	14.107	6.60	0.13	120	14.03	0.16	0.85	0.85	0.15	0.15	0.70	0.70
322.8	14.271	5.69	0.13	120	14.19	0.16	0.86	0.86	0.16	0.16	0.70	0.70
322.7	14.436	5.11	0.12	120	14.35	0.16	0.87	0.87	0.16	0.16	0.71	0.71
322.5	14.600	5.01	0.11	120	14.52	0.16	0.88	0.88	0.17	0.17	0.71	0.71
322.3	14.764	5.35	0.11	120	14.68	0.16	0.89	0.89	0.17	0.17	0.72	0.72
322.2	14.928	6.02	0.13	120	14.85	0.16	0.90	0.90	0.18	0.18	0.72	0.72
322.0	15.092	6.17	0.13	120	15.01	0.16	0.91	0.91	0.18	0.18	0.72	0.72
321.8	15.256	6.35	0.13	120	15.17	0.16	0.92	0.92	0.19	0.19	0.73	0.73
321.7	15.420	7.03	0.13	120	15.34	0.16	0.93	0.93	0.19	0.19	0.73	0.73
321.5	15.584	7.37	0.12	120	15.50	0.16	0.94	0.94	0.20	0.20	0.74	0.74
321.4	15.748	8.33	0.12	120	15.67	0.16	0.94	0.94	0.20	0.20	0.74	0.74
321.2	15.912	7.21	0.12	120	15.83	0.16	0.95	0.95	0.21	0.21	0.75	0.75
321.0	16.076	7.25	0.13	120	15.99	0.16	0.96	0.96	0.21	0.21	0.75	0.75
320.9	16.240	7.14	0.18	120	16.16	0.16	0.97	0.97	0.22	0.22	0.76	0.76
320.7	16.404	8.92	0.19	120	16.32	0.16	0.98	0.98	0.22	0.22	0.76	0.76
320.5	16.568	7.16	0.19	120	16.49	0.16	0.99	0.99	0.23	0.23	0.77	0.77
320.4	16.732	6.70	0.15	120	16.65	0.16	1.00	1.00	0.23	0.23	0.77	0.77
320.2	16.896	6.80	0.12	120	16.81	0.16	1.01	1.01	0.24	0.24	0.78	0.78
320.0	17.060	6.87	0.09	120	16.98	0.16	1.02	1.02	0.24	0.24	0.78	0.78
319.9	17.224	6.32	0.11	120	17.14	0.16	1.03	1.03	0.25	0.25	0.79	0.79
319.7	17.388	6.13	0.18	120	17.31	0.16	1.04	1.04	0.25	0.25	0.79	0.79
319.5	17.552	14.53	0.25	120	17.47	0.16	1.05	1.05	0.26	0.26	0.80	0.80
319.4	17.716	26.81	0.48	120	17.63	0.16	1.06	1.06	0.26	0.26	0.80	0.80
319.2	17.880	15.53	0.45	120	17.80	0.16	1.07	1.07	0.27	0.27	0.81	0.81
319.1	18.044	8.72	0.35	120	17.96	0.16	1.08	1.08	0.27	0.27	0.81	0.81
318.9	18.208	9.14	0.17	120	18.13	0.16	1.09	1.09	0.28	0.28	0.81	0.81
318.7	18.372	11.29	0.18	120	18.29	0.16	1.10	1.10	0.28	0.28	0.82	0.82
318.6	18.537	18.12	0.28	120	18.45	0.16	1.11	1.11	0.29	0.29	0.82	0.82
318.4	18.701	18.58	0.39	120	18.62	0.16	1.12	1.12	0.29	0.29	0.83	0.83
318.2	18.865	13.43	0.44	120	18.78	0.16	1.13	1.13	0.30	0.30	0.83	0.83
318.1	19.029	9.16	0.35	120	18.95	0.16	1.14	1.14	0.30	0.30	0.84	0.84
317.9	19.193	6.53	0.22	120	19.11	0.16	1.15	1.15	0.31	0.31	0.84	0.84
317.7	19.357	7.57	0.18	120	19.27	0.16	1.16	1.16	0.31	0.31	0.85	0.85
317.6	19.521	13.95	0.21	120	19.44	0.16	1.17	1.17	0.32	0.32	0.85	0.85
317.4	19.685	14.52	0.28	120	19.60	0.16	1.18	1.18	0.32	0.32	0.86	0.86
317.3	19.849	8.33	0.26	120	19.77	0.16	1.19	1.19	0.33	0.33	0.86	0.86
317.1	20.013	9.88	0.23	120	19.93	0.16	1.20	1.20	0.33	0.33	0.87	0.87
316.9	20.177	7.88	0.15	120	20.09	0.16	1.21	1.21	0.34	0.34	0.87	0.87
316.8	20.341	6.32	0.15	120	20.26	0.16	1.22	1.22	0.34	0.34	0.88	0.88
316.6	20.505	6.16	0.06	120	20.42	0.16	1.23	1.23	0.35	0.35	0.88	0.88
316.4	20.669	6.07	0.06	120	20.59	0.16	1.24	1.24	0.35	0.35	0.89	0.89
316.3	20.833	5.82	0.06	120	20.75	0.16	1.25	1.25	0.36	0.36	0.89	0.89
316.1	20.997	5.88	0.06	120	20.92	0.16	1.26	1.26	0.36	0.36	0.89	0.89
315.9	21.161	6.20	0.06	120	21.08	0.16	1.27	1.27	0.37	0.37	0.90	0.90
315.8	21.325	6.31	0.06	120	21.24	0.16	1.28	1.28	0.38	0.38	0.90	0.90
315.6	21.489	7.35	0.11	120	21.41	0.16	1.29	1.29	0.38	0.38	0.91	0.91
315.4	21.653	7.05	0.16	120	21.57	0.16	1.30	1.30	0.39	0.39	0.91	0.91
315.3	21.817	18.18	0.32	120	21.74	0.16	1.31	1.31	0.39	0.39	0.92	0.92
315.1	21.981	12.75	0.33	120	21.90	0.16	1.32	1.32	0.40	0.40	0.92	0.92
315.0	22.145	7.40	0.28	120	22.06	0.16	1.33	1.33	0.40	0.40	0.93	0.93
314.8	22.309	8.19	0.14	120	22.23	0.16	1.34	1.34	0.41	0.41	0.93	0.93

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σv CPT (tsf)	Total Vertical Stress during EQ σv EQ (tsf)	Static Pore Water Pressure during CPT us CPT (tsf)	Static Pore Water Pressure during EQ us EQ (tsf)	Effective Vertical Stress during CPT σv CPT (tsf)	Effective Vertical Stress during EQ σv EQ (tsf)
314.6	22.473	6.30	0.08	120	22.39	0.16	1.35	1.35	0.41	0.41	0.94	0.94
314.5	22.638	6.66	0.08	120	22.56	0.16	1.36	1.36	0.42	0.42	0.94	0.94
314.3	22.802	6.55	0.07	120	22.72	0.16	1.37	1.37	0.42	0.42	0.95	0.95
314.1	22.966	6.13	0.07	120	22.88	0.16	1.38	1.38	0.43	0.43	0.95	0.95
314.0	23.130	7.27	0.15	120	23.05	0.16	1.39	1.39	0.43	0.43	0.96	0.96
313.8	23.294	9.70	0.14	120	23.21	0.16	1.40	1.40	0.44	0.44	0.96	0.96
313.6	23.458	6.46	0.15	120	23.38	0.16	1.41	1.41	0.44	0.44	0.97	0.97
313.5	23.622	13.89	0.30	120	23.54	0.16	1.42	1.42	0.45	0.45	0.97	0.97
313.3	23.786	27.85	0.32	120	23.70	0.16	1.43	1.43	0.45	0.45	0.98	0.98
313.2	23.950	53.03	0.36	120	23.87	0.16	1.44	1.44	0.46	0.46	0.98	0.98
313.0	24.114	61.58	0.62	120	24.03	0.16	1.45	1.45	0.46	0.46	0.98	0.98
312.8	24.278	36.98	0.89	120	24.20	0.16	1.46	1.46	0.47	0.47	0.99	0.99
312.7	24.442	19.80	0.95	120	24.36	0.16	1.47	1.47	0.47	0.47	0.99	0.99
312.5	24.606	16.36	0.66	120	24.52	0.16	1.48	1.48	0.48	0.48	1.00	1.00
312.3	24.770	11.42	0.35	120	24.69	0.16	1.49	1.49	0.48	0.48	1.00	1.00
312.2	24.934	9.43	0.14	120	24.85	0.16	1.50	1.50	0.49	0.49	1.01	1.01
312.0	25.098	8.72	0.06	120	25.02	0.16	1.51	1.51	0.49	0.49	1.01	1.01
311.8	25.262	7.59	0.06	120	25.18	0.16	1.52	1.52	0.50	0.50	1.02	1.02
311.7	25.426	7.18	0.07	120	25.34	0.16	1.53	1.53	0.50	0.50	1.02	1.02
311.5	25.590	6.64	0.06	120	25.51	0.16	1.54	1.54	0.51	0.51	1.03	1.03
311.3	25.754	6.76	0.05	120	25.67	0.16	1.55	1.55	0.51	0.51	1.03	1.03
311.2	25.918	7.07	0.06	120	25.84	0.16	1.56	1.56	0.52	0.52	1.04	1.04
311.0	26.082	6.79	0.06	120	26.00	0.16	1.56	1.56	0.52	0.52	1.04	1.04
310.9	26.246	7.56	0.09	120	26.16	0.16	1.57	1.57	0.53	0.53	1.05	1.05
310.7	26.410	21.25	0.28	120	26.33	0.16	1.58	1.58	0.53	0.53	1.05	1.05
310.5	26.574	17.20	0.33	120	26.49	0.16	1.59	1.59	0.54	0.54	1.06	1.06
310.4	26.739	10.96	0.29	120	26.66	0.16	1.60	1.60	0.54	0.54	1.06	1.06
310.2	26.903	7.81	0.14	120	26.82	0.16	1.61	1.61	0.55	0.55	1.06	1.06
310.0	27.067	7.72	0.06	120	26.98	0.16	1.62	1.62	0.55	0.55	1.07	1.07
309.9	27.231	7.48	0.06	120	27.15	0.16	1.63	1.63	0.56	0.56	1.07	1.07
309.7	27.395	7.34	0.06	120	27.31	0.16	1.64	1.64	0.56	0.56	1.08	1.08
309.5	27.559	7.37	0.08	120	27.48	0.16	1.65	1.65	0.57	0.57	1.08	1.08
309.4	27.723	8.87	0.07	120	27.64	0.16	1.66	1.66	0.57	0.57	1.09	1.09
309.2	27.887	7.53	0.06	120	27.80	0.16	1.67	1.67	0.58	0.58	1.09	1.09
309.0	28.051	6.99	0.05	120	27.97	0.16	1.68	1.68	0.59	0.59	1.10	1.10
308.9	28.215	7.11	0.06	120	28.13	0.16	1.69	1.69	0.59	0.59	1.10	1.10
308.7	28.379	7.34	0.06	120	28.30	0.16	1.70	1.70	0.60	0.60	1.11	1.11
308.6	28.543	8.26	0.07	120	28.46	0.16	1.71	1.71	0.60	0.60	1.11	1.11
308.4	28.707	7.89	0.06	120	28.62	0.16	1.72	1.72	0.61	0.61	1.12	1.12
308.2	28.871	7.46	0.07	120	28.79	0.16	1.73	1.73	0.61	0.61	1.12	1.12
308.1	29.035	7.27	0.06	120	28.95	0.16	1.74	1.74	0.62	0.62	1.13	1.13
307.9	29.199	7.38	0.07	120	29.12	0.16	1.75	1.75	0.62	0.62	1.13	1.13
307.7	29.363	7.61	0.07	120	29.28	0.16	1.76	1.76	0.63	0.63	1.14	1.14
307.6	29.527	7.96	0.09	120	29.45	0.16	1.77	1.77	0.63	0.63	1.14	1.14
307.4	29.691	7.54	0.08	120	29.61	0.16	1.78	1.78	0.64	0.64	1.15	1.15
307.2	29.855	15.82	0.11	120	29.77	0.16	1.79	1.79	0.64	0.64	1.15	1.15
307.1	30.019	27.85	0.51	120	29.94	0.16	1.80	1.80	0.65	0.65	1.15	1.15
306.9	30.183	22.96	0.68	120	30.10	0.16	1.81	1.81	0.65	0.65	1.16	1.16
306.8	30.347	15.03	0.63	120	30.27	0.16	1.82	1.82	0.66	0.66	1.16	1.16
306.6	30.511	9.03	0.37	120	30.43	0.16	1.83	1.83	0.66	0.66	1.17	1.17
306.4	30.675	13.18	0.24	120	30.59	0.16	1.84	1.84	0.67	0.67	1.17	1.17
306.3	30.840	10.38	0.17	120	30.76	0.16	1.85	1.85	0.67	0.67	1.18	1.18
306.1	31.004	8.05	0.19	120	30.92	0.16	1.86	1.86	0.68	0.68	1.18	1.18
305.9	31.168	8.31	0.08	120	31.09	0.16	1.87	1.87	0.68	0.68	1.19	1.19
305.8	31.332	8.41	0.07	120	31.25	0.16	1.88	1.88	0.69	0.69	1.19	1.19
305.6	31.496	8.78	0.08	120	31.41	0.16	1.89	1.89	0.69	0.69	1.20	1.20
305.4	31.660	8.29	0.08	120	31.58	0.16	1.90	1.90	0.70	0.70	1.20	1.20
305.3	31.824	8.48	0.08	120	31.74	0.16	1.91	1.91	0.70	0.70	1.21	1.21
305.1	31.988	8.49	0.09	120	31.91	0.16	1.92	1.92	0.71	0.71	1.21	1.21
304.9	32.152	9.25	0.09	120	32.07	0.16	1.93	1.93	0.71	0.71	1.22	1.22
304.8	32.316	8.25	0.09	120	32.23	0.16	1.94	1.94	0.72	0.72	1.22	1.22
304.6	32.480	8.50	0.08	120	32.40	0.16	1.95	1.95	0.72	0.72	1.23	1.23
304.5	32.644	8.62	0.09	120	32.56	0.16	1.96	1.96	0.73	0.73	1.23	1.23
304.3	32.808	8.69	0.09	120	32.73	0.16	1.97	1.97	0.73	0.73	1.24	1.24
304.1	32.972	8.86	0.09	120	32.89	0.16	1.98	1.98	0.74	0.74	1.24	1.24
304.0	33.136	9.20	0.10	120	33.05	0.16	1.99	1.99	0.74	0.74	1.24	1.24
303.8	33.300	9.02	0.10	120	33.22	0.16	2.00	2.00	0.75	0.75	1.25	1.25
303.6	33.464	8.92	0.10	120	33.38	0.16	2.01	2.01	0.75	0.75	1.25	1.25
303.5	33.628	8.85	0.09	120	33.55	0.16	2.02	2.02	0.76	0.76	1.26	1.26
303.3	33.792	8.90	0.09	120	33.71	0.16	2.03	2.03	0.76	0.76	1.26	1.26
303.1	33.956	9.26	0.10	120	33.87	0.16	2.04	2.04	0.77	0.77	1.27	1.27
303.0	34.120	8.89	0.11	120	34.04	0.16	2.05	2.05	0.77	0.77	1.27	1.27
302.8	34.284	9.05	0.15	120	34.20	0.16	2.06	2.06	0.78	0.78	1.28	1.28
302.7	34.448	11.68	0.15	120	34.37	0.16	2.07	2.07	0.78	0.78	1.28	1.28

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σv CPT (tsf)	Total Vertical Stress during EQ σv EQ (tsf)	Static Pore Water Pressure during CPT us CPT (tsf)	Static Pore Water Pressure during EQ us EQ (tsf)	Effective Vertical Stress during CPT σv CPT (tsf)	Effective Vertical Stress during EQ σv EQ (tsf)
302.5	34.612	9.19	0.16	120	34.53	0.16	2.08	2.08	0.79	0.79	1.29	1.29
302.3	34.776	9.06	0.18	120	34.69	0.16	2.09	2.09	0.79	0.79	1.29	1.29
302.2	34.941	9.46	0.09	120	34.86	0.16	2.10	2.10	0.80	0.80	1.30	1.30
302.0	35.105	9.77	0.10	120	35.02	0.16	2.11	2.11	0.81	0.81	1.30	1.30
301.8	35.269	9.06	0.11	120	35.19	0.16	2.12	2.12	0.81	0.81	1.31	1.31
301.7	35.433	9.22	0.09	120	35.35	0.16	2.13	2.13	0.82	0.82	1.31	1.31
301.5	35.597	9.16	0.09	120	35.51	0.16	2.14	2.14	0.82	0.82	1.32	1.32
301.3	35.761	9.44	0.10	120	35.68	0.16	2.15	2.15	0.83	0.83	1.32	1.32
301.2	35.925	9.85	0.10	120	35.84	0.16	2.16	2.16	0.83	0.83	1.32	1.32
301.0	36.089	9.55	0.16	120	36.01	0.16	2.17	2.17	0.84	0.84	1.33	1.33
300.8	36.253	9.23	0.17	120	36.17	0.16	2.18	2.18	0.84	0.84	1.33	1.33
300.7	36.417	9.28	0.11	120	36.33	0.16	2.19	2.19	0.85	0.85	1.34	1.34
300.5	36.581	9.37	0.10	120	36.50	0.16	2.19	2.19	0.85	0.85	1.34	1.34
300.4	36.745	9.52	0.10	120	36.66	0.16	2.20	2.20	0.86	0.86	1.35	1.35
300.2	36.909	9.60	0.10	120	36.83	0.16	2.21	2.21	0.86	0.86	1.35	1.35
300.0	37.073	9.51	0.10	120	36.99	0.16	2.22	2.22	0.87	0.87	1.36	1.36
299.9	37.237	9.71	0.10	120	37.16	0.16	2.23	2.23	0.87	0.87	1.36	1.36
299.7	37.401	9.65	0.10	120	37.32	0.16	2.24	2.24	0.88	0.88	1.37	1.37
299.5	37.565	9.68	0.10	120	37.48	0.16	2.25	2.25	0.88	0.88	1.37	1.37
299.4	37.729	9.53	0.10	120	37.65	0.16	2.26	2.26	0.89	0.89	1.38	1.38
299.2	37.893	9.61	0.10	120	37.81	0.16	2.27	2.27	0.89	0.89	1.38	1.38
299.0	38.057	9.56	0.09	120	37.98	0.16	2.28	2.28	0.90	0.90	1.39	1.39
298.9	38.221	10.04	0.10	120	38.14	0.16	2.29	2.29	0.90	0.90	1.39	1.39
298.7	38.385	9.51	0.11	120	38.30	0.16	2.30	2.30	0.91	0.91	1.40	1.40
298.6	38.549	9.53	0.11	120	38.47	0.16	2.31	2.31	0.91	0.91	1.40	1.40
298.4	38.713	9.90	0.09	120	38.63	0.16	2.32	2.32	0.92	0.92	1.41	1.41
298.2	38.877	9.60	0.10	120	38.80	0.16	2.33	2.33	0.92	0.92	1.41	1.41
298.1	39.042	10.09	0.10	120	38.96	0.16	2.34	2.34	0.93	0.93	1.41	1.41
297.9	39.206	9.92	0.16	120	39.12	0.16	2.35	2.35	0.93	0.93	1.42	1.42
297.7	39.370	13.50	0.21	120	39.29	0.16	2.36	2.36	0.94	0.94	1.42	1.42
297.6	39.534	9.26	0.19	120	39.45	0.16	2.37	2.37	0.94	0.94	1.43	1.43
297.4	39.698	10.10	0.16	120	39.62	0.16	2.38	2.38	0.95	0.95	1.43	1.43
297.2	39.862	9.65	0.09	120	39.78	0.16	2.39	2.39	0.95	0.95	1.44	1.44
297.1	40.026	9.67	0.11	120	39.94	0.16	2.40	2.40	0.96	0.96	1.44	1.44
296.9	40.190	10.07	0.10	120	40.11	0.16	2.41	2.41	0.96	0.96	1.45	1.45
296.7	40.354	10.30	0.10	120	40.27	0.16	2.42	2.42	0.97	0.97	1.45	1.45
296.6	40.518	11.31	0.13	120	40.44	0.16	2.43	2.43	0.97	0.97	1.46	1.46
296.4	40.682	10.19	0.14	120	40.60	0.16	2.44	2.44	0.98	0.98	1.46	1.46
296.3	40.846	9.90	0.15	120	40.76	0.16	2.45	2.45	0.98	0.98	1.47	1.47
296.1	41.010	10.09	0.11	120	40.93	0.16	2.46	2.46	0.99	0.99	1.47	1.47
295.9	41.174	10.27	0.11	120	41.09	0.16	2.47	2.47	0.99	0.99	1.48	1.48
295.8	41.338	10.13	0.11	120	41.26	0.16	2.48	2.48	1.00	1.00	1.48	1.48
295.6	41.502	10.21	0.11	120	41.42	0.16	2.49	2.49	1.00	1.00	1.49	1.49
295.4	41.666	10.48	0.10	120	41.58	0.16	2.50	2.50	1.01	1.01	1.49	1.49
295.3	41.830	10.62	0.11	120	41.75	0.16	2.51	2.51	1.01	1.01	1.49	1.49
295.1	41.994	10.28	0.11	120	41.91	0.16	2.52	2.52	1.02	1.02	1.50	1.50
294.9	42.158	10.44	0.12	120	42.08	0.16	2.53	2.53	1.03	1.03	1.50	1.50
294.8	42.322	10.25	0.11	120	42.24	0.16	2.54	2.54	1.03	1.03	1.51	1.51
294.6	42.486	10.08	0.11	120	42.40	0.16	2.55	2.55	1.04	1.04	1.51	1.51
294.4	42.650	9.74	0.10	120	42.57	0.16	2.56	2.56	1.04	1.04	1.52	1.52
294.3	42.814	10.00	0.09	120	42.73	0.16	2.57	2.57	1.05	1.05	1.52	1.52
294.1	42.978	10.62	0.09	120	42.90	0.16	2.58	2.58	1.05	1.05	1.53	1.53
294.0	43.143	11.39	0.10	120	43.06	0.16	2.59	2.59	1.06	1.06	1.53	1.53
293.8	43.307	10.30	0.10	120	43.22	0.16	2.60	2.60	1.06	1.06	1.54	1.54
293.6	43.471	10.35	0.11	120	43.39	0.16	2.61	2.61	1.07	1.07	1.54	1.54
293.5	43.635	10.45	0.10	120	43.55	0.16	2.62	2.62	1.07	1.07	1.55	1.55
293.3	43.799	10.36	0.09	120	43.72	0.16	2.63	2.63	1.08	1.08	1.55	1.55
293.1	43.963	10.82	0.13	120	43.88	0.16	2.64	2.64	1.08	1.08	1.56	1.56
293.0	44.127	13.73	0.09	120	44.04	0.16	2.65	2.65	1.09	1.09	1.56	1.56
292.8	44.291	10.96	0.08	120	44.21	0.16	2.66	2.66	1.09	1.09	1.57	1.57
292.6	44.455	10.22	0.07	120	44.37	0.16	2.67	2.67	1.10	1.10	1.57	1.57
292.5	44.619	10.41	0.07	120	44.54	0.16	2.68	2.68	1.10	1.10	1.58	1.58
292.3	44.783	10.21	0.08	120	44.70	0.16	2.69	2.69	1.11	1.11	1.58	1.58
292.2	44.947	10.13	0.15	120	44.86	0.16	2.70	2.70	1.11	1.11	1.58	1.58
292.0	45.111	10.19	0.13	120	45.03	0.16	2.71	2.71	1.12	1.12	1.59	1.59
291.8	45.275	10.67	0.12	120	45.19	0.16	2.72	2.72	1.12	1.12	1.59	1.59
291.7	45.439	10.27	0.11	120	45.36	0.16	2.73	2.73	1.13	1.13	1.60	1.60
291.5	45.603	10.17	0.08	120	45.52	0.16	2.74	2.74	1.13	1.13	1.60	1.60
291.3	45.767	10.21	0.07	120	45.69	0.16	2.75	2.75	1.14	1.14	1.61	1.61
291.2	45.931	10.32	0.07	120	45.85	0.16	2.76	2.76	1.14	1.14	1.61	1.61
291.0	46.095	10.28	0.08	120	46.01	0.16	2.77	2.77	1.15	1.15	1.62	1.62
290.8	46.259	10.38	0.07	120	46.18	0.16	2.78	2.78	1.15	1.15	1.62	1.62
290.7	46.423	10.41	0.09	120	46.34	0.16	2.79	2.79	1.16	1.16	1.63	1.63
290.5	46.587	12.08	0.11	120	46.51	0.16	2.80	2.80	1.16	1.16	1.63	1.63

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σv CPT (tsf)	Total Vertical Stress during EQ σv EQ (tsf)	Static Pore Water Pressure during CPT us CPT (tsf)	Static Pore Water Pressure during EQ us EQ (tsf)	Effective Vertical Stress during CPT σv CPT (tsf)	Effective Vertical Stress during EQ σv EQ (tsf)
290.3	46.751	17.08	0.14	120	46.67	0.16	2.81	2.81	1.17	1.17	1.64	1.64
290.2	46.915	19.10	0.14	120	46.83	0.16	2.81	2.81	1.17	1.17	1.64	1.64
290.0	47.079	13.81	0.12	120	47.00	0.16	2.82	2.82	1.18	1.18	1.65	1.65
289.9	47.244	11.22	0.10	120	47.16	0.16	2.83	2.83	1.18	1.18	1.65	1.65
289.7	47.408	10.78	0.07	120	47.33	0.16	2.84	2.84	1.19	1.19	1.66	1.66
289.5	47.572	11.02	0.08	120	47.49	0.16	2.85	2.85	1.19	1.19	1.66	1.66
289.4	47.736	10.91	0.08	120	47.65	0.16	2.86	2.86	1.20	1.20	1.66	1.66
289.2	47.900	10.95	0.07	120	47.82	0.16	2.87	2.87	1.20	1.20	1.67	1.67
289.0	48.064	11.08	0.11	120	47.98	0.16	2.88	2.88	1.21	1.21	1.67	1.67
288.9	48.228	11.68	0.15	120	48.15	0.16	2.89	2.89	1.21	1.21	1.68	1.68
288.7	48.392	15.45	0.08	120	48.31	0.16	2.90	2.90	1.22	1.22	1.68	1.68
288.5	48.556	11.66	0.08	120	48.47	0.16	2.91	2.91	1.22	1.22	1.69	1.69
288.4	48.720	11.27	0.10	120	48.64	0.16	2.92	2.92	1.23	1.23	1.69	1.69
288.2	48.884	13.92	0.10	120	48.80	0.16	2.93	2.93	1.24	1.24	1.70	1.70
288.1	49.048	14.23	0.26	120	48.97	0.16	2.94	2.94	1.24	1.24	1.70	1.70
287.9	49.212	19.38	0.34	120	49.13	0.16	2.95	2.95	1.25	1.25	1.71	1.71
287.7	49.376	11.92	0.30	120	49.29	0.16	2.96	2.96	1.25	1.25	1.71	1.71
287.6	49.540	12.27	0.18	120	49.46	0.16	2.97	2.97	1.26	1.26	1.72	1.72
287.4	49.704	12.02	0.09	120	49.62	0.16	2.98	2.98	1.26	1.26	1.72	1.72
287.2	49.868	11.37	0.08	120	49.79	0.16	2.99	2.99	1.27	1.27	1.73	1.73
287.1	50.032	11.34	0.09	120	49.95	0.16	3.00	3.00	1.27	1.27	1.73	1.73
286.9	50.196	11.33	0.08	120	50.11	0.16	3.01	3.01	1.28	1.28	1.74	1.74
286.7	50.360	12.05	0.08	120	50.28	0.16	3.02	3.02	1.28	1.28	1.74	1.74
286.6	50.524	12.87	0.06	120	50.44	0.16	3.03	3.03	1.29	1.29	1.75	1.75
286.4	50.688	11.19	0.05	120	50.61	0.16	3.04	3.04	1.29	1.29	1.75	1.75
286.2	50.852	11.30	0.06	120	50.77	0.16	3.05	3.05	1.30	1.30	1.75	1.75
286.1	51.016	11.52	0.06	120	50.93	0.16	3.06	3.06	1.30	1.30	1.76	1.76
285.9	51.180	11.61	0.07	120	51.10	0.16	3.07	3.07	1.31	1.31	1.76	1.76
285.8	51.345	11.51	0.08	120	51.26	0.16	3.08	3.08	1.31	1.31	1.77	1.77
285.6	51.509	11.86	0.08	120	51.43	0.16	3.09	3.09	1.32	1.32	1.77	1.77
285.4	51.673	11.45	0.07	120	51.59	0.16	3.10	3.10	1.32	1.32	1.78	1.78
285.3	51.837	11.69	0.09	120	51.75	0.16	3.11	3.11	1.33	1.33	1.78	1.78
285.1	52.001	12.24	0.08	120	51.92	0.16	3.12	3.12	1.33	1.33	1.79	1.79
284.9	52.165	11.64	0.09	120	52.08	0.16	3.13	3.13	1.34	1.34	1.79	1.79
284.8	52.329	11.73	0.09	120	52.25	0.16	3.14	3.14	1.34	1.34	1.80	1.80
284.6	52.493	11.74	0.11	120	52.41	0.16	3.15	3.15	1.35	1.35	1.80	1.80
284.4	52.657	11.70	0.08	120	52.57	0.16	3.16	3.16	1.35	1.35	1.81	1.81
284.3	52.821	17.72	0.19	120	52.74	0.16	3.17	3.17	1.36	1.36	1.81	1.81
284.1	52.985	17.00	0.14	120	52.90	0.16	3.18	3.18	1.36	1.36	1.82	1.82
284.0	53.149	12.92	0.13	120	53.07	0.16	3.19	3.19	1.37	1.37	1.82	1.82
283.8	53.313	12.18	0.10	120	53.23	0.16	3.20	3.20	1.37	1.37	1.83	1.83
283.6	53.477	12.86	0.07	120	53.40	0.16	3.21	3.21	1.38	1.38	1.83	1.83
283.5	53.641	12.75	0.08	120	53.56	0.16	3.22	3.22	1.38	1.38	1.84	1.84
283.3	53.805	12.56	0.10	120	53.72	0.16	3.23	3.23	1.39	1.39	1.84	1.84
283.1	53.969	12.58	0.09	120	53.89	0.16	3.24	3.24	1.39	1.39	1.84	1.84
283.0	54.133	15.12	0.14	120	54.05	0.16	3.25	3.25	1.40	1.40	1.85	1.85
282.8	54.297	15.99	0.18	120	54.22	0.16	3.26	3.26	1.40	1.40	1.85	1.85
282.6	54.461	13.72	0.19	120	54.38	0.16	3.27	3.27	1.41	1.41	1.86	1.86
282.5	54.625	54.57	0.31	120	54.54	0.16	3.28	3.28	1.41	1.41	1.86	1.86
282.3	54.789	76.28	0.91	120	54.71	0.16	3.29	3.29	1.42	1.42	1.87	1.87
282.1	54.953	35.50	1.16	120	54.87	0.16	3.30	3.30	1.42	1.42	1.87	1.87
282.0	55.117	21.37	0.84	120	55.04	0.16	3.31	3.31	1.43	1.43	1.88	1.88
281.8	55.281	18.30	0.44	120	55.20	0.16	3.32	3.32	1.43	1.43	1.88	1.88
281.7	55.446	17.25	0.15	120	55.36	0.16	3.33	3.33	1.44	1.44	1.89	1.89
281.5	55.610	16.78	0.19	120	55.53	0.16	3.34	3.34	1.44	1.44	1.89	1.89
281.3	55.774	21.89	0.43	120	55.69	0.16	3.35	3.35	1.45	1.45	1.90	1.90
281.2	55.938	39.63	1.01	120	55.86	0.16	3.36	3.36	1.46	1.46	1.90	1.90
281.0	56.102	30.97	1.05	120	56.02	0.16	3.37	3.37	1.46	1.46	1.91	1.91
280.8	56.266	20.14	0.78	120	56.18	0.16	3.38	3.38	1.47	1.47	1.91	1.91
280.7	56.430	16.82	0.36	120	56.35	0.16	3.39	3.39	1.47	1.47	1.92	1.92
280.5	56.594	18.54	0.33	120	56.51	0.16	3.40	3.40	1.48	1.48	1.92	1.92
280.3	56.758	47.55	0.76	120	56.68	0.16	3.41	3.41	1.48	1.48	1.92	1.92
280.2	56.922	25.24	0.81	120	56.84	0.16	3.42	3.42	1.49	1.49	1.93	1.93
280.0	57.086	17.53	0.57	120	57.00	0.16	3.43	3.43	1.49	1.49	1.93	1.93
279.9	57.250	17.02	0.31	120	57.17	0.16	3.43	3.43	1.50	1.50	1.94	1.94
279.7	57.414	15.69	0.10	120	57.33	0.16	3.44	3.44	1.50	1.50	1.94	1.94
279.5	57.578	14.95	0.07	120	57.50	0.16	3.45	3.45	1.51	1.51	1.95	1.95
279.4	57.742	14.20	0.08	120	57.66	0.16	3.46	3.46	1.51	1.51	1.95	1.95
279.2	57.906	13.75	0.09	120	57.82	0.16	3.47	3.47	1.52	1.52	1.96	1.96
279.0	58.070	14.52	0.22	120	57.99	0.16	3.48	3.48	1.52	1.52	1.96	1.96
278.9	58.234	19.72	0.28	120	58.15	0.16	3.49	3.49	1.53	1.53	1.97	1.97
278.7	58.398	29.26	0.52	120	58.32	0.16	3.50	3.50	1.53	1.53	1.97	1.97
278.5	58.562	26.60	0.56	120	58.48	0.16	3.51	3.51	1.54	1.54	1.98	1.98
278.4	58.726	19.67	0.44	120	58.64	0.16	3.52	3.52	1.54	1.54	1.98	1.98

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σ _{V CPT} (tsf)	Total Vertical Stress during EQ σ _{V EQ} (tsf)	Static Pore Water Pressure during CPT u _{S CPT} (tsf)	Static Pore Water Pressure during EQ u _{S EQ} (tsf)	Effective Vertical Stress during CPT σ _{V CPT} (tsf)	Effective Vertical Stress during EQ σ _{V EQ} (tsf)
278.2	58.890	19.16	0.20	120	58.81	0.16	3.53	3.53	1.55	1.55	1.99	1.99
278.0	59.054	16.98	0.17	120	58.97	0.16	3.54	3.54	1.55	1.55	1.99	1.99
277.9	59.218	17.47	0.26	120	59.14	0.16	3.55	3.55	1.56	1.56	2.00	2.00
277.7	59.382	63.08	0.34	120	59.30	0.16	3.56	3.56	1.56	1.56	2.00	2.00
277.6	59.547	72.10	1.28	120	59.46	0.16	3.57	3.57	1.57	1.57	2.01	2.01
277.4	59.711	39.27	1.71	120	59.63	0.16	3.58	3.58	1.57	1.57	2.01	2.01
277.2	59.875	26.27	1.35	120	59.79	0.16	3.59	3.59	1.58	1.58	2.01	2.01
277.1	60.039	19.38	1.05	120	59.96	0.16	3.60	3.60	1.58	1.58	2.02	2.02
276.9	60.203	16.66	0.44	120	60.12	0.16	3.61	3.61	1.59	1.59	2.02	2.02
276.7	60.367	15.02	0.22	120	60.28	0.16	3.62	3.62	1.59	1.59	2.03	2.03
276.6	60.531	15.41	0.32	120	60.45	0.16	3.63	3.63	1.60	1.60	2.03	2.03
276.4	60.695	20.74	0.38	120	60.61	0.16	3.64	3.64	1.60	1.60	2.04	2.04
276.2	60.859	16.00	0.33	120	60.78	0.16	3.65	3.65	1.61	1.61	2.04	2.04
276.1	61.023	51.73	0.73	120	60.94	0.16	3.66	3.66	1.61	1.61	2.05	2.05
275.9	61.187	36.17	0.60	120	61.10	0.16	3.67	3.67	1.62	1.62	2.05	2.05
275.7	61.351	23.41	0.57	120	61.27	0.16	3.68	3.68	1.62	1.62	2.06	2.06
275.6	61.515	20.39	0.19	120	61.43	0.16	3.69	3.69	1.63	1.63	2.06	2.06
275.4	61.679	18.06	0.13	120	61.60	0.16	3.70	3.70	1.63	1.63	2.07	2.07
275.3	61.843	18.57	0.18	120	61.76	0.16	3.71	3.71	1.64	1.64	2.07	2.07
275.1	62.007	21.11	0.94	120	61.93	0.16	3.72	3.72	1.64	1.64	2.08	2.08
274.9	62.171	58.30	1.25	120	62.09	0.16	3.73	3.73	1.65	1.65	2.08	2.08
274.8	62.335	96.05	1.26	120	62.25	0.16	3.74	3.74	1.65	1.65	2.09	2.09
274.6	62.499	77.10	1.60	120	62.42	0.16	3.75	3.75	1.66	1.66	2.09	2.09
274.4	62.663	40.09	1.36	120	62.58	0.16	3.76	3.76	1.66	1.66	2.09	2.09
274.3	62.827	22.72	1.11	120	62.75	0.16	3.77	3.77	1.67	1.67	2.10	2.10
274.1	62.991	23.59	0.45	120	62.91	0.16	3.78	3.78	1.68	1.68	2.10	2.10
273.9	63.155	20.42	0.17	120	63.07	0.16	3.79	3.79	1.68	1.68	2.11	2.11
273.8	63.319	17.26	0.11	120	63.24	0.16	3.80	3.80	1.69	1.69	2.11	2.11
273.6	63.483	19.55	0.26	120	63.40	0.16	3.81	3.81	1.69	1.69	2.12	2.12
273.5	63.648	23.66	0.38	120	63.57	0.16	3.82	3.82	1.70	1.70	2.12	2.12
273.3	63.812	106.05	0.54	120	63.73	0.16	3.83	3.83	1.70	1.70	2.13	2.13
273.1	63.976	210.13	1.17	120	63.89	0.16	3.84	3.84	1.71	1.71	2.13	2.13
273.0	64.140	139.37	2.40	120	64.06	0.16	3.85	3.85	1.71	1.71	2.14	2.14
272.8	64.304	66.71	3.06	120	64.22	0.16	3.86	3.86	1.72	1.72	2.14	2.14
272.6	64.468	45.75	2.75	120	64.39	0.16	3.87	3.87	1.72	1.72	2.15	2.15
272.5	64.632	145.25	2.28	120	64.55	0.16	3.88	3.88	1.73	1.73	2.15	2.15
272.3	64.796	200.97	2.07	120	64.71	0.16	3.89	3.89	1.73	1.73	2.16	2.16
272.1	64.960	189.25	1.84	120	64.88	0.16	3.90	3.90	1.74	1.74	2.16	2.16
272.0	65.124	144.30	2.05	120	65.04	0.16	3.91	3.91	1.74	1.74	2.17	2.17
271.8	65.288	123.56	2.27	120	65.21	0.16	3.92	3.92	1.75	1.75	2.17	2.17
271.6	65.452	170.27	2.02	120	65.37	0.16	3.93	3.93	1.75	1.75	2.18	2.18
271.5	65.616	163.23	1.96	120	65.53	0.16	3.94	3.94	1.76	1.76	2.18	2.18
271.3	65.780	188.47	1.48	120	65.70	0.16	3.95	3.95	1.76	1.76	2.18	2.18
271.2	65.944	200.55	1.31	120	65.86	0.16	3.96	3.96	1.77	1.77	2.19	2.19
271.0	66.108	185.82	1.75	120	66.03	0.16	3.97	3.97	1.77	1.77	2.19	2.19
270.8	66.272	132.44	2.23	120	66.19	0.16	3.98	3.98	1.78	1.78	2.20	2.20
270.7	66.436	59.77	2.57	120	66.35	0.16	3.99	3.99	1.78	1.78	2.20	2.20
270.5	66.600	33.32	1.69	120	66.52	0.16	4.00	4.00	1.79	1.79	2.21	2.21
270.3	66.764	18.22	1.16	120	66.68	0.16	4.01	4.01	1.79	1.79	2.21	2.21
270.2	66.928	16.25	0.38	120	66.85	0.16	4.02	4.02	1.80	1.80	2.22	2.22
270.0	67.092	17.49	0.18	120	67.01	0.16	4.03	4.03	1.80	1.80	2.22	2.22
269.8	67.256	17.22	0.18	120	67.17	0.16	4.04	4.04	1.81	1.81	2.23	2.23
269.7	67.420	16.67	0.25	120	67.34	0.16	4.05	4.05	1.81	1.81	2.23	2.23
269.5	67.584	17.42	0.21	120	67.50	0.16	4.06	4.06	1.82	1.82	2.24	2.24
269.4	67.749	92.11	0.32	120	67.67	0.16	4.06	4.06	1.82	1.82	2.24	2.24
269.2	67.913	123.77	1.02	120	67.83	0.16	4.07	4.07	1.83	1.83	2.25	2.25
269.0	68.077	79.76	1.80	120	67.99	0.16	4.08	4.08	1.83	1.83	2.25	2.25
268.9	68.241	45.26	1.62	120	68.16	0.16	4.09	4.09	1.84	1.84	2.26	2.26
268.7	68.405	27.28	1.09	120	68.32	0.16	4.10	4.10	1.84	1.84	2.26	2.26
268.5	68.569	29.02	1.88	120	68.49	0.16	4.11	4.11	1.85	1.85	2.26	2.26
268.4	68.733	111.38	1.98	120	68.65	0.16	4.12	4.12	1.85	1.85	2.27	2.27
268.2	68.897	182.95	1.89	120	68.81	0.16	4.13	4.13	1.86	1.86	2.27	2.27
268.0	69.061	194.49	1.56	120	68.98	0.16	4.14	4.14	1.86	1.86	2.28	2.28
267.9	69.225	191.30	1.37	120	69.14	0.16	4.15	4.15	1.87	1.87	2.28	2.28
267.7	69.389	175.77	1.63	120	69.31	0.16	4.16	4.16	1.87	1.87	2.29	2.29
267.5	69.553	130.65	1.75	120	69.47	0.16	4.17	4.17	1.88	1.88	2.29	2.29
267.4	69.717	89.58	2.03	120	69.63	0.16	4.18	4.18	1.89	1.89	2.30	2.30
267.2	69.881	79.02	2.43	120	69.80	0.16	4.19	4.19	1.89	1.89	2.30	2.30
267.1	70.045	40.44	2.05	120	69.96	0.16	4.20	4.20	1.90	1.90	2.31	2.31
266.9	70.209	23.41	1.32	120	70.13	0.16	4.21	4.21	1.90	1.90	2.31	2.31
266.7	70.373	21.43	0.44	120	70.29	0.16	4.22	4.22	1.91	1.91	2.32	2.32
266.6	70.537	28.91	0.34	120	70.46	0.16	4.23	4.23	1.91	1.91	2.32	2.32
266.4	70.701	24.77	0.34	120	70.62	0.16	4.24	4.24	1.92	1.92	2.33	2.33
266.2	70.865	18.35	0.26	120	70.78	0.16	4.25	4.25	1.92	1.92	2.33	2.33

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σv CPT (tsf)	Total Vertical Stress during EQ σv EQ (tsf)	Static Pore Water Pressure during CPT us CPT (tsf)	Static Pore Water Pressure during EQ us EQ (tsf)	Effective Vertical Stress during CPT σv CPT (tsf)	Effective Vertical Stress during EQ σv EQ (tsf)
266.1	71.029	18.30	0.22	120	70.95	0.16	4.26	4.26	1.93	1.93	2.34	2.34
265.9	71.193	25.43	0.35	120	71.11	0.16	4.27	4.27	1.93	1.93	2.34	2.34
265.7	71.357	23.62	0.36	120	71.28	0.16	4.28	4.28	1.94	1.94	2.35	2.35
265.6	71.521	18.92	0.38	120	71.44	0.16	4.29	4.29	1.94	1.94	2.35	2.35
265.4	71.685	19.50	0.25	120	71.60	0.16	4.30	4.30	1.95	1.95	2.35	2.35
265.3	71.850	21.14	0.36	120	71.77	0.16	4.31	4.31	1.95	1.95	2.36	2.36
265.1	72.014	77.61	0.65	120	71.93	0.16	4.32	4.32	1.96	1.96	2.36	2.36
264.9	72.178	169.03	1.04	120	72.10	0.16	4.33	4.33	1.96	1.96	2.37	2.37
264.8	72.342	185.14	1.49	120	72.26	0.16	4.34	4.34	1.97	1.97	2.37	2.37
264.6	72.506	195.98	1.68	120	72.42	0.16	4.35	4.35	1.97	1.97	2.38	2.38
264.4	72.670	208.71	1.90	120	72.59	0.16	4.36	4.36	1.98	1.98	2.38	2.38
264.3	72.834	212.26	2.15	120	72.75	0.16	4.37	4.37	1.98	1.98	2.39	2.39
264.1	72.998	233.05	2.38	120	72.92	0.16	4.38	4.38	1.99	1.99	2.39	2.39
263.9	73.162	264.97	2.70	120	73.08	0.16	4.39	4.39	1.99	1.99	2.40	2.40
263.8	73.326	316.55	3.90	120	73.24	0.16	4.40	4.40	2.00	2.00	2.40	2.40
263.6	73.490	366.31	4.80	120	73.41	0.16	4.41	4.41	2.00	2.00	2.41	2.41
263.4	73.654	394.47	5.30	120	73.57	0.16	4.42	4.42	2.01	2.01	2.41	2.41
263.3	73.818	400.24	5.82	120	73.74	0.16	4.43	4.43	2.01	2.01	2.42	2.42
263.1	73.982	401.97	6.29	120	73.90	0.16	4.44	4.44	2.02	2.02	2.42	2.42
263.0	74.146	399.35	6.36	120	74.06	0.16	4.45	4.45	2.02	2.02	2.43	2.43
262.8	74.310	400.12	6.53	120	74.23	0.16	4.46	4.46	2.03	2.03	2.43	2.43
262.6	74.474	401.03	6.63	120	74.39	0.16	4.47	4.47	2.03	2.03	2.44	2.44
262.5	74.638	406.83	7.15	120	74.56	0.16	4.48	4.48	2.04	2.04	2.44	2.44
262.3	74.802	414.69	6.72	120	74.72	0.16	4.49	4.49	2.04	2.04	2.44	2.44
262.1	74.966	380.10	6.60	120	74.88	0.16	4.50	4.50	2.05	2.05	2.45	2.45
262.0	75.130	422.50	6.67	120	75.05	0.16	4.51	4.51	2.05	2.05	2.45	2.45
261.8	75.294	415.70	6.81	120	75.21	0.16	4.52	4.52	2.06	2.06	2.46	2.46
261.6	75.458	436.02	7.07	120	75.38	0.16	4.53	4.53	2.06	2.06	2.46	2.46
261.5	75.622	434.59	7.31	120	75.54	0.16	4.54	4.54	2.07	2.07	2.47	2.47
261.3	75.786	431.20	7.51	120	75.70	0.16	4.55	4.55	2.07	2.07	2.47	2.47
261.1	75.951	426.92	7.57	120	75.87	0.16	4.56	4.56	2.08	2.08	2.48	2.48
261.0	76.115	431.74	7.66	120	76.03	0.16	4.57	4.57	2.08	2.08	2.48	2.48
260.8	76.279	442.12	7.93	120	76.20	0.16	4.58	4.58	2.09	2.09	2.49	2.49
260.7	76.443	432.47	8.18	120	76.36	0.16	4.59	4.59	2.09	2.09	2.49	2.49
260.5	76.607	431.84	8.07	120	76.52	0.16	4.60	4.60	2.10	2.10	2.50	2.50
260.3	76.771	423.55	7.65	120	76.69	0.16	4.61	4.61	2.11	2.11	2.50	2.50
260.2	76.935	418.90	7.59	120	76.85	0.16	4.62	4.62	2.11	2.11	2.51	2.51
260.0	77.099	397.85	7.21	120	77.02	0.16	4.63	4.63	2.12	2.12	2.51	2.51
259.8	77.263	380.18	6.96	120	77.18	0.16	4.64	4.64	2.12	2.12	2.52	2.52
259.7	77.427	359.53	6.51	120	77.34	0.16	4.65	4.65	2.13	2.13	2.52	2.52
259.5	77.591	330.79	5.92	120	77.51	0.16	4.66	4.66	2.13	2.13	2.52	2.52
259.3	77.755	314.69	4.98	120	77.67	0.16	4.67	4.67	2.14	2.14	2.53	2.53
259.2	77.919	309.92	4.34	120	77.84	0.16	4.68	4.68	2.14	2.14	2.53	2.53
259.0	78.083	288.36	4.30	120	78.00	0.16	4.68	4.68	2.15	2.15	2.54	2.54
258.9	78.247	285.62	3.74	120	78.17	0.16	4.69	4.69	2.15	2.15	2.54	2.54
258.7	78.411	254.02	4.76	120	78.33	0.16	4.70	4.70	2.16	2.16	2.55	2.55
258.5	78.575	201.53	4.37	120	78.49	0.16	4.71	4.71	2.16	2.16	2.55	2.55
258.4	78.739	191.35	3.76	120	78.66	0.16	4.72	4.72	2.17	2.17	2.56	2.56
258.2	78.903	284.17	3.44	120	78.82	0.16	4.73	4.73	2.17	2.17	2.56	2.56
258.0	79.067	315.03	4.16	120	78.99	0.16	4.74	4.74	2.18	2.18	2.57	2.57
257.9	79.231	341.08	4.06	120	79.15	0.08	4.75	4.75	2.18	2.18	2.57	2.57

LIQUEFACTION POTENTIAL ASSESSMENT FOR COARSE GRAINED SOILS USING CONE PENETRATION TEST DATA

Project Site: US 60 Bridge
Project No.: 178565011
CPT ID: SP09

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	qc_{IN}	FC (%)	Δqc_{IN}	$(qc_{IN})_{CS}$	a	ξ_R
337.1												
336.9	0.164	42.04	5.23	2.68	0.7	1.70	2.72	77	52.47	55.19	0.350	-0.220
336.8	0.328	138.15	1.05	1.82	0.5	1.70	32.07	9	3.20	35.26	0.350	-0.059
336.6	0.492	334.71	0.91	1.51	0.5	1.70	95.10	0	0.00	95.10	0.350	-0.422
336.4	0.656	437.29	0.96	1.46	0.5	1.70	143.46	0	0.00	143.46	0.350	-0.600
336.3	0.820	445.65	1.05	1.49	0.5	1.70	163.47	0	0.00	163.47	0.350	-0.600
336.1	0.984	348.12	1.50	1.68	0.5	1.70	139.91	0	0.00	139.91	0.350	-0.584
336.0	1.148	291.41	1.75	1.78	0.5	1.70	126.53	5	0.18	126.71	0.350	-0.536
335.8	1.312	258.40	1.92	1.84	0.5	1.70	119.97	10	8.46	128.43	0.350	-0.541
335.6	1.476	223.80	2.13	1.91	0.5	1.70	110.23	16	26.57	136.80	0.350	-0.568
335.5	1.640	202.57	2.23	1.95	0.5	1.70	105.19	19	35.62	140.81	0.350	-0.580
335.3	1.804	182.54	2.37	2.00	0.5	1.70	99.44	23	43.95	143.39	0.350	-0.587
335.1	1.968	162.96	2.71	2.08	0.5	1.70	92.75	29	53.01	145.76	0.350	-0.593
335.0	2.133	152.14	3.24	2.16	0.5	1.70	90.15	36	59.87	150.02	0.350	-0.600
334.8	2.297	145.42	3.78	2.22	0.5	1.70	89.44	41	64.14	153.58	0.350	-0.600
334.6	2.461	139.51	4.18	2.27	0.5	1.70	88.83	45	66.49	155.32	0.350	-0.600
334.5	2.625	141.37	4.19	2.27	0.5	1.70	92.97	44	67.38	160.35	0.350	-0.600
334.3	2.789	139.09	4.09	2.26	0.5	1.70	94.30	44	67.51	161.81	0.350	-0.600
334.1	2.953	136.77	4.07	2.26	0.5	1.70	95.43	44	67.91	163.33	0.350	-0.600
334.0	3.117	141.98	3.91	2.24	0.5	1.70	101.77	42	68.19	169.96	0.350	-0.600
333.8	3.281	145.00	3.61	2.21	0.5	1.70	106.64	40	67.34	173.98	0.350	-0.600
333.7	3.445	133.06	4.03	2.27	0.5	1.70	100.31	44	69.36	169.67	0.350	-0.600
333.5	3.609	113.17	4.55	2.35	0.5	1.70	87.38	51	69.70	157.08	0.350	-0.600
333.3	3.773	97.60	4.77	2.41	0.5	1.70	77.11	56	68.81	145.91	0.350	-0.583
333.2	3.937	89.20	4.67	2.42	0.5	1.70	72.03	57	67.90	139.92	0.350	-0.562
333.0	4.101	81.83	4.70	2.45	0.5	1.70	67.48	59	67.33	134.81	0.350	-0.544
332.8	4.265	75.88	4.67	2.47	0.5	1.70	63.86	61	66.78	130.63	0.350	-0.529
332.7	4.429	72.74	4.50	2.47	0.5	1.70	62.40	61	66.37	128.76	0.350	-0.522
332.5	4.593	62.89	4.79	2.53	0.5	1.70	55.01	65	65.61	120.62	0.350	-0.491
332.3	4.757	56.26	4.63	2.55	0.5	1.70	50.14	67	64.61	114.75	0.350	-0.469
332.2	4.921	48.06	4.62	2.60	0.5	1.70	43.63	71	63.50	107.13	0.350	-0.438
332.0	5.085	50.76	4.14	2.55	0.7	1.70	36.63	67	60.62	97.25	0.350	-0.396
331.9	5.249	43.79	3.70	2.56	0.7	1.70	32.38	68	59.58	91.96	0.350	-0.372
331.7	5.413	40.17	3.24	2.54	0.7	1.70	30.40	67	58.79	89.19	0.350	-0.358
331.5	5.577	32.50	2.95	2.59	0.5	1.70	31.61	70	59.81	91.42	0.350	-0.368
331.4	5.741	33.01	2.99	2.59	0.5	1.70	32.57	70	60.07	92.64	0.350	-0.373
331.2	5.905	35.57	2.99	2.56	0.5	1.70	35.56	68	60.55	96.11	0.350	-0.388
331.0	6.069	35.72	3.28	2.59	0.5	1.70	36.21	70	61.14	97.35	0.350	-0.393
330.9	6.234	37.65	3.17	2.56	0.5	1.68	38.20	68	61.29	99.49	0.350	-0.401
330.7	6.398	40.31	3.22	2.54	0.5	1.65	40.60	66	61.68	102.29	0.350	-0.413
330.5	6.562	49.71	4.06	2.55	0.7	1.63	41.05	67	61.90	102.95	0.350	-0.415
330.4	6.726	48.75	2.96	2.46	0.5	1.58	48.22	60	62.10	110.33	0.350	-0.444
330.2	6.890	82.95	1.82	2.14	0.5	1.50	78.22	35	56.15	134.37	0.350	-0.532
330.0	7.054	63.42	2.69	2.35	0.5	1.51	61.14	51	62.49	123.63	0.350	-0.494
329.9	7.218	48.34	3.27	2.49	0.5	1.53	47.90	62	62.74	110.64	0.350	-0.444
329.7	7.382	45.12	3.18	2.50	0.5	1.52	45.05	63	62.20	107.25	0.350	-0.430
329.6	7.546	37.41	2.67	2.51	0.5	1.53	38.10	64	60.40	98.50	0.350	-0.393
329.4	7.710	34.64	2.46	2.51	0.5	1.52	35.54	64	59.71	95.26	0.350	-0.378
329.2	7.874	35.93	2.53	2.51	0.5	1.50	36.75	64	59.98	96.73	0.350	-0.384
329.1	8.038	35.03	2.53	2.52	0.5	1.49	35.90	65	59.91	95.81	0.350	-0.380
328.9	8.202	34.48	2.77	2.55	0.7	1.49	30.76	67	58.97	89.73	0.350	-0.352
328.7	8.366	28.47	2.36	2.57	0.5	1.48	29.68	69	58.98	88.66	0.350	-0.346
328.6	8.530	28.31	2.11	2.54	0.5	1.46	29.54	66	58.48	88.02	0.350	-0.343
328.4	8.694	28.29	2.38	2.57	0.5	1.45	29.50	69	58.99	88.49	0.350	-0.345
328.2	8.858	29.50	2.68	2.59	0.7	1.44	27.00	70	58.54	85.54	0.350	-0.330
328.1	9.022	30.79	3.18	2.63	1.0	1.44	23.39	73	57.96	81.36	0.350	-0.310
327.9	9.186	27.64	3.01	2.65	1.0	1.43	21.33	75	57.62	78.95	0.350	-0.297
327.7	9.350	22.08	3.44	2.76	1.0	1.43	17.43	84	57.70	75.12	0.350	-0.277
327.6	9.514	24.83	2.70	2.65	1.0	1.42	19.53	75	57.16	76.69	0.350	-0.285
327.4	9.678	29.04	2.23	2.55	0.5	1.38	30.22	67	58.78	89.00	0.350	-0.345
327.3	9.842	34.81	2.10	2.47	0.5	1.37	35.78	61	58.88	94.67	0.350	-0.371

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{CIN}	FC (%)	Δq_{CIN}	$(q_{CIN})_{CS}$	a	ξ_R
327.1	10.006	26.01	2.48	2.61	0.7	1.39	24.39	72	58.10	82.49	0.350	-0.314
326.9	10.170	21.67	2.26	2.65	0.7	1.39	20.62	75	57.48	78.11	0.350	-0.291
326.8	10.335	23.81	2.35	2.63	0.7	1.38	22.54	73	57.77	80.31	0.350	-0.302
326.6	10.499	23.43	2.11	2.61	0.7	1.37	22.26	72	57.38	79.64	0.350	-0.299
326.4	10.663	19.03	2.95	2.77	1.0	1.38	15.67	84	57.25	72.92	0.350	-0.264
326.3	10.827	14.56	2.82	2.85	1.0	1.38	12.31	91	56.93	69.24	0.350	-0.243
326.1	10.991	13.36	2.50	2.85	1.0	1.38	11.43	91	56.67	68.10	0.350	-0.237
325.9	11.155	13.79	2.08	2.79	1.0	1.37	11.82	86	56.31	68.13	0.350	-0.237
325.8	11.319	12.14	2.33	2.87	1.0	1.37	10.56	92	56.53	67.10	0.350	-0.231
325.6	11.483	11.36	2.38	2.90	1.0	1.36	9.98	95	56.58	66.56	0.350	-0.227
325.5	11.647	14.54	1.92	2.75	1.0	1.35	12.53	83	56.19	68.72	0.350	-0.239
325.3	11.811	18.27	1.62	2.63	0.7	1.34	17.90	73	56.41	74.31	0.350	-0.270
325.1	11.975	23.91	1.53	2.52	0.5	1.32	25.30	64	56.87	82.18	0.350	-0.310
325.0	12.139	21.80	2.24	2.65	1.0	1.32	18.37	75	56.76	75.14	0.350	-0.274
324.8	12.303	15.78	3.09	2.84	1.0	1.33	13.68	90	57.32	71.00	0.350	-0.251
324.6	12.467	15.83	4.24	2.93	1.0	1.32	13.75	97	57.97	71.72	0.350	-0.255
324.5	12.631	28.57	2.72	2.61	1.0	1.30	23.84	72	57.83	81.68	0.350	-0.307
324.3	12.795	80.87	0.72	1.90	0.5	1.26	81.48	15	21.07	102.55	0.350	-0.401
324.1	12.959	105.88	0.57	1.74	0.5	1.25	106.04	3	0.00	106.04	0.350	-0.415
324.0	13.123	63.67	1.26	2.13	0.5	1.24	63.60	33	51.51	115.11	0.350	-0.451
323.8	13.287	34.89	3.74	2.63	1.0	1.27	29.07	74	59.73	88.81	0.350	-0.340
323.6	13.451	18.98	5.20	2.92	1.0	1.28	16.56	97	58.82	75.38	0.350	-0.274
323.5	13.615	10.86	5.45	3.12	1.0	1.29	10.04	100	57.05	67.09	0.350	-0.228
323.3	13.779	9.97	2.32	2.94	1.0	1.29	9.34	98	56.66	66.00	0.350	-0.222
323.2	13.943	9.17	2.13	2.95	1.0	1.28	8.71	99	56.54	65.25	0.350	-0.217
323.0	14.107	8.26	2.29	3.00	1.0	1.28	7.98	100	56.41	64.39	0.350	-0.212
322.8	14.271	6.89	2.65	3.10	1.0	1.28	6.87	100	56.06	62.93	0.350	-0.203
322.7	14.436	6.01	2.80	3.17	1.0	1.27	6.15	100	55.84	61.99	0.350	-0.197
322.5	14.600	5.81	2.71	3.17	1.0	1.27	6.00	100	55.80	61.80	0.350	-0.196
322.3	14.764	6.25	2.44	3.12	1.0	1.26	6.39	100	55.92	62.31	0.350	-0.199
322.2	14.928	7.12	2.61	3.09	1.0	1.26	7.15	100	56.15	63.31	0.350	-0.205
322.0	15.092	7.27	2.51	3.07	1.0	1.25	7.30	100	56.20	63.50	0.350	-0.206
321.8	15.256	7.45	2.34	3.04	1.0	1.25	7.48	100	56.26	63.74	0.350	-0.207
321.7	15.420	8.32	2.15	2.98	1.0	1.24	8.24	100	56.49	64.73	0.350	-0.213
321.5	15.584	8.71	1.91	2.94	1.0	1.23	8.60	98	56.47	65.07	0.350	-0.214
321.4	15.748	9.92	1.64	2.86	1.0	1.23	9.67	92	56.22	65.89	0.350	-0.219
321.2	15.912	8.36	1.90	2.96	1.0	1.23	8.35	100	56.49	64.84	0.350	-0.213
321.0	16.076	8.35	2.05	2.97	1.0	1.22	8.37	100	56.53	64.91	0.350	-0.213
320.9	16.240	8.14	2.87	3.06	1.0	1.22	8.22	100	56.48	64.70	0.350	-0.211
320.7	16.404	10.41	2.41	2.93	1.0	1.21	10.20	97	56.88	67.08	0.350	-0.225
320.5	16.568	8.03	3.12	3.08	1.0	1.21	8.17	100	56.47	64.64	0.350	-0.211
320.4	16.732	7.38	2.54	3.07	1.0	1.20	7.63	100	56.30	63.94	0.350	-0.206
320.2	16.896	7.45	2.02	3.01	1.0	1.20	7.71	100	56.33	64.04	0.350	-0.207
320.0	17.060	7.49	1.57	2.96	1.0	1.20	7.77	100	56.31	64.08	0.350	-0.207
319.9	17.224	6.73	2.08	3.06	1.0	1.19	7.13	100	56.15	63.27	0.350	-0.202
319.7	17.388	6.43	3.56	3.20	1.0	1.19	6.89	100	56.07	62.96	0.350	-0.200
319.5	17.552	16.94	1.87	2.69	1.0	1.17	16.14	78	56.63	72.76	0.350	-0.255
319.4	17.716	27.98	1.85	2.51	0.5	1.16	29.35	64	57.90	87.26	0.350	-0.328
319.2	17.880	17.96	3.14	2.80	1.0	1.16	17.10	87	58.02	75.12	0.350	-0.268
319.1	18.044	9.44	4.61	3.13	1.0	1.17	9.64	100	56.93	66.56	0.350	-0.221
318.9	18.208	9.89	2.16	2.92	1.0	1.16	10.07	97	56.80	66.86	0.350	-0.222
318.7	18.372	12.43	1.73	2.79	1.0	1.16	12.36	86	56.44	68.80	0.350	-0.233
318.6	18.537	19.15	1.62	2.61	0.7	1.15	19.68	72	56.72	76.40	0.350	-0.274
318.4	18.701	21.07	2.24	2.66	1.0	1.14	20.10	76	57.43	77.53	0.350	-0.279
318.2	18.865	14.76	3.57	2.90	1.0	1.14	14.53	95	58.05	72.58	0.350	-0.253
318.1	19.029	9.57	4.31	3.10	1.0	1.15	9.92	100	57.01	66.93	0.350	-0.222
317.9	19.193	6.38	4.01	3.23	1.0	1.14	7.07	100	56.13	63.19	0.350	-0.200
317.7	19.357	7.56	2.83	3.08	1.0	1.14	8.15	100	56.46	64.61	0.350	-0.208
317.6	19.521	14.99	1.61	2.70	1.0	1.13	14.91	79	56.37	71.28	0.350	-0.246
317.4	19.685	15.57	2.08	2.75	1.0	1.13	15.47	83	57.02	72.49	0.350	-0.252
317.3	19.849	8.28	3.60	3.11	1.0	1.13	8.88	100	56.69	65.57	0.350	-0.213
317.1	20.013	10.02	2.67	2.97	1.0	1.12	10.49	100	57.19	67.68	0.350	-0.225
316.9	20.177	7.65	2.27	3.03	1.0	1.12	8.35	100	56.52	64.87	0.350	-0.209
316.8	20.341	5.82	2.96	3.19	1.0	1.12	6.68	100	56.01	62.69	0.350	-0.196
316.6	20.505	5.59	1.26	3.03	1.0	1.12	6.49	100	55.95	62.44	0.350	-0.194
316.4	20.669	5.45	1.18	3.02	1.0	1.11	6.38	100	55.91	62.29	0.350	-0.193

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
316.3	20.833	5.13	1.36	3.07	1.0	1.11	6.09	100	55.83	61.92	0.350	-0.191
316.1	20.997	5.17	1.28	3.06	1.0	1.11	6.15	100	55.84	61.99	0.350	-0.191
315.9	21.161	5.48	1.22	3.03	1.0	1.10	6.46	100	55.94	62.39	0.350	-0.193
315.8	21.325	5.56	1.27	3.03	1.0	1.10	6.55	100	55.97	62.51	0.350	-0.194
315.6	21.489	6.67	1.76	3.03	1.0	1.09	7.60	100	56.29	63.90	0.350	-0.202
315.4	21.653	6.30	2.76	3.15	1.0	1.09	7.27	100	56.19	63.46	0.350	-0.199
315.3	21.817	18.37	1.91	2.67	1.0	1.08	18.59	77	57.09	75.68	0.350	-0.267
315.1	21.981	12.38	2.87	2.91	1.0	1.08	13.02	96	57.62	70.64	0.350	-0.240
315.0	22.145	6.54	4.65	3.26	1.0	1.08	7.56	100	56.28	63.84	0.350	-0.201
314.8	22.309	7.35	1.98	3.01	1.0	1.08	8.34	100	56.52	64.86	0.350	-0.207
314.6	22.473	5.28	1.52	3.08	1.0	1.07	6.40	100	55.92	62.32	0.350	-0.191
314.5	22.638	5.63	1.43	3.05	1.0	1.07	6.75	100	56.03	62.77	0.350	-0.194
314.3	22.802	5.47	1.27	3.04	1.0	1.07	6.61	100	55.99	62.60	0.350	-0.193
314.1	22.966	5.00	1.41	3.09	1.0	1.07	6.18	100	55.85	62.03	0.350	-0.189
314.0	23.130	6.15	2.53	3.13	1.0	1.06	7.29	100	56.20	63.49	0.350	-0.198
313.8	23.294	8.64	1.73	2.92	1.0	1.06	9.70	97	56.69	66.39	0.350	-0.215
313.6	23.458	5.23	2.99	3.23	1.0	1.06	6.45	100	55.94	62.38	0.350	-0.191
313.5	23.622	12.85	2.38	2.85	1.0	1.05	13.79	91	57.41	71.20	0.350	-0.241
313.3	23.786	26.02	1.21	2.43	0.5	1.04	27.51	58	55.79	83.30	0.350	-0.304
313.2	23.950	50.67	0.69	2.06	0.5	1.04	52.11	28	43.11	95.22	0.350	-0.359
313.0	24.114	58.91	1.03	2.10	0.5	1.03	60.24	31	48.58	108.82	0.350	-0.416
312.8	24.278	34.72	2.49	2.52	0.5	1.03	36.16	64	59.95	96.11	0.350	-0.362
312.7	24.442	18.44	5.19	2.93	1.0	1.03	19.36	98	59.74	79.10	0.350	-0.282
312.5	24.606	14.90	4.41	2.96	1.0	1.03	15.97	100	58.86	74.84	0.350	-0.260
312.3	24.770	9.90	3.56	3.04	1.0	1.03	11.13	100	57.39	68.52	0.350	-0.226
312.2	24.934	7.87	1.81	2.97	1.0	1.03	9.17	100	56.78	65.95	0.350	-0.211
312.0	25.098	7.12	0.85	2.86	1.0	1.03	8.45	92	55.83	64.29	0.350	-0.201
311.8	25.262	5.97	0.96	2.95	1.0	1.02	7.34	99	56.13	63.47	0.350	-0.196
311.7	25.426	5.53	1.15	3.01	1.0	1.02	6.93	100	56.08	63.01	0.350	-0.193
311.5	25.590	4.97	1.20	3.06	1.0	1.02	6.39	100	55.92	62.30	0.350	-0.189
311.3	25.754	5.06	0.96	3.02	1.0	1.02	6.49	100	55.95	62.44	0.350	-0.189
311.2	25.918	5.32	1.03	3.01	1.0	1.01	6.77	100	56.03	62.80	0.350	-0.191
311.0	26.082	5.02	1.09	3.04	1.0	1.01	6.48	100	55.95	62.43	0.350	-0.189
310.9	26.246	5.72	1.50	3.05	1.0	1.01	7.19	100	56.17	63.36	0.350	-0.195
310.7	26.410	18.66	1.40	2.59	0.5	1.00	20.17	70	56.52	76.69	0.350	-0.268
310.5	26.574	14.78	2.10	2.77	1.0	1.00	16.27	85	57.46	73.73	0.350	-0.253
310.4	26.739	8.83	3.13	3.05	1.0	1.00	10.35	100	57.15	67.49	0.350	-0.218
310.2	26.903	5.82	2.21	3.12	1.0	1.00	7.36	100	56.22	63.58	0.350	-0.195
310.0	27.067	5.70	0.97	2.97	1.0	0.99	7.25	100	56.18	63.43	0.350	-0.194
309.9	27.231	5.44	0.99	2.99	1.0	0.99	7.00	100	56.11	63.11	0.350	-0.192
309.7	27.395	5.28	1.07	3.02	1.0	0.99	6.86	100	56.06	62.92	0.350	-0.191
309.5	27.559	5.28	1.38	3.07	1.0	0.99	6.87	100	56.07	62.93	0.350	-0.191
309.4	27.723	6.62	0.97	2.91	1.0	0.98	8.24	96	56.16	64.40	0.350	-0.199
309.2	27.887	5.36	1.08	3.01	1.0	0.98	6.98	100	56.10	63.08	0.350	-0.192
309.0	28.051	4.84	1.02	3.04	1.0	0.98	6.47	100	55.94	62.41	0.350	-0.187
308.9	28.215	4.91	1.07	3.05	1.0	0.98	6.55	100	55.97	62.52	0.350	-0.188
308.7	28.379	5.09	1.05	3.03	1.0	0.97	6.75	100	56.03	62.78	0.350	-0.189
308.6	28.543	5.88	1.05	2.97	1.0	0.97	7.58	100	56.29	63.86	0.350	-0.196
308.4	28.707	5.52	1.02	2.99	1.0	0.97	7.22	100	56.17	63.39	0.350	-0.193
308.2	28.871	5.10	1.15	3.04	1.0	0.97	6.81	100	56.05	62.86	0.350	-0.189
308.1	29.035	4.91	1.12	3.06	1.0	0.96	6.62	100	55.99	62.61	0.350	-0.188
307.9	29.199	4.98	1.30	3.08	1.0	0.96	6.71	100	56.02	62.72	0.350	-0.188
307.7	29.363	5.15	1.26	3.06	1.0	0.96	6.90	100	56.08	62.97	0.350	-0.190
307.6	29.527	5.43	1.47	3.07	1.0	0.96	7.20	100	56.17	63.36	0.350	-0.192
307.4	29.691	5.03	1.34	3.08	1.0	0.95	6.80	100	56.05	62.85	0.350	-0.189
307.2	29.855	12.20	0.81	2.64	1.0	0.95	14.26	74	55.41	69.67	0.350	-0.228
307.1	30.019	23.57	1.94	2.58	0.5	0.95	25.11	70	57.88	82.99	0.350	-0.297
306.9	30.183	18.24	3.20	2.80	1.0	0.95	20.65	87	59.09	79.74	0.350	-0.281
306.8	30.347	11.35	4.73	3.07	1.0	0.95	13.45	100	58.11	71.56	0.350	-0.238
306.6	30.511	6.16	5.14	3.30	1.0	0.94	8.04	100	56.43	64.48	0.350	-0.198
306.4	30.675	9.66	2.09	2.92	1.0	0.94	11.74	97	57.32	69.05	0.350	-0.224
306.3	30.840	7.24	2.00	3.02	1.0	0.94	9.21	100	56.79	66.01	0.350	-0.206
306.1	31.004	5.23	3.00	3.23	1.0	0.94	7.12	100	56.14	63.27	0.350	-0.190
305.9	31.168	5.42	1.31	3.04	1.0	0.93	7.33	100	56.21	63.54	0.350	-0.192
305.8	31.332	5.48	1.07	3.00	1.0	0.93	7.41	100	56.23	63.64	0.350	-0.192
305.6	31.496	5.75	1.20	3.01	1.0	0.93	7.71	100	56.33	64.04	0.350	-0.194

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
305.4	31.660	5.31	1.32	3.05	1.0	0.93	7.26	100	56.19	63.45	0.350	-0.191
305.3	31.824	5.44	1.23	3.03	1.0	0.93	7.41	100	56.23	63.65	0.350	-0.192
305.1	31.988	5.43	1.35	3.05	1.0	0.92	7.41	100	56.23	63.64	0.350	-0.192
304.9	32.152	6.02	1.23	2.99	1.0	0.92	8.05	100	56.43	64.49	0.350	-0.197
304.8	32.316	5.17	1.49	3.09	1.0	0.92	7.16	100	56.16	63.32	0.350	-0.190
304.6	32.480	5.35	1.24	3.04	1.0	0.92	7.37	100	56.22	63.59	0.350	-0.191
304.5	32.644	5.41	1.28	3.04	1.0	0.91	7.45	100	56.25	63.69	0.350	-0.192
304.3	32.808	5.45	1.37	3.05	1.0	0.91	7.50	100	56.26	63.76	0.350	-0.192
304.1	32.972	5.55	1.34	3.04	1.0	0.91	7.62	100	56.30	63.93	0.350	-0.193
304.0	33.136	5.80	1.34	3.02	1.0	0.91	7.90	100	56.39	64.29	0.350	-0.195
303.8	33.300	5.62	1.40	3.04	1.0	0.91	7.73	100	56.33	64.06	0.350	-0.193
303.6	33.464	5.51	1.46	3.06	1.0	0.90	7.63	100	56.30	63.93	0.350	-0.192
303.5	33.628	5.43	1.36	3.05	1.0	0.90	7.55	100	56.28	63.82	0.350	-0.192
303.3	33.792	5.44	1.37	3.05	1.0	0.90	7.58	100	56.29	63.86	0.350	-0.192
303.1	33.956	5.69	1.41	3.04	1.0	0.90	7.86	100	56.37	64.24	0.350	-0.194
303.0	34.120	5.37	1.62	3.09	1.0	0.90	7.53	100	56.27	63.80	0.350	-0.191
302.8	34.284	5.47	2.16	3.14	1.0	0.89	7.65	100	56.31	63.96	0.350	-0.192
302.7	34.448	7.50	1.53	2.95	1.0	0.89	9.87	99	56.92	66.79	0.350	-0.208
302.5	34.612	5.53	2.28	3.15	1.0	0.89	7.74	100	56.34	64.07	0.350	-0.192
302.3	34.776	5.40	2.54	3.18	1.0	0.89	7.61	100	56.30	63.91	0.350	-0.191
302.2	34.941	5.68	1.22	3.01	1.0	0.89	7.93	100	56.40	64.33	0.350	-0.194
302.0	35.105	5.89	1.29	3.01	1.0	0.89	8.17	100	56.47	64.64	0.350	-0.195
301.8	35.269	5.32	1.53	3.08	1.0	0.88	7.56	100	56.28	63.84	0.350	-0.191
301.7	35.433	5.41	1.28	3.04	1.0	0.88	7.68	100	56.32	64.00	0.350	-0.191
301.5	35.597	5.34	1.28	3.05	1.0	0.88	7.62	100	56.30	63.91	0.350	-0.191
301.3	35.761	5.52	1.30	3.04	1.0	0.88	7.83	100	56.36	64.19	0.350	-0.192
301.2	35.925	5.81	1.27	3.01	1.0	0.88	8.16	100	56.47	64.62	0.350	-0.195
301.0	36.089	5.56	2.11	3.13	1.0	0.87	7.89	100	56.38	64.27	0.350	-0.193
300.8	36.253	5.29	2.44	3.18	1.0	0.87	7.61	100	56.29	63.90	0.350	-0.190
300.7	36.417	5.30	1.49	3.08	1.0	0.87	7.63	100	56.30	63.93	0.350	-0.190
300.5	36.581	5.34	1.42	3.07	1.0	0.87	7.69	100	56.32	64.00	0.350	-0.191
300.4	36.745	5.42	1.35	3.05	1.0	0.87	7.80	100	56.35	64.15	0.350	-0.191
300.2	36.909	5.46	1.33	3.04	1.0	0.86	7.85	100	56.37	64.22	0.350	-0.192
300.0	37.073	5.37	1.30	3.05	1.0	0.86	7.76	100	56.34	64.10	0.350	-0.191
299.9	37.237	5.49	1.32	3.04	1.0	0.86	7.91	100	56.39	64.30	0.350	-0.192
299.7	37.401	5.42	1.30	3.04	1.0	0.86	7.84	100	56.37	64.21	0.350	-0.191
299.5	37.565	5.42	1.35	3.05	1.0	0.86	7.85	100	56.37	64.22	0.350	-0.191
299.4	37.729	5.27	1.32	3.06	1.0	0.86	7.71	100	56.33	64.03	0.350	-0.190
299.2	37.893	5.31	1.31	3.05	1.0	0.85	7.76	100	56.34	64.10	0.350	-0.190
299.0	38.057	5.25	1.25	3.05	1.0	0.85	7.70	100	56.32	64.02	0.350	-0.190
298.9	38.221	5.57	1.28	3.03	1.0	0.85	8.07	100	56.44	64.51	0.350	-0.192
298.7	38.385	5.16	1.51	3.09	1.0	0.85	7.63	100	56.30	63.93	0.350	-0.189
298.6	38.549	5.15	1.50	3.09	1.0	0.85	7.63	100	56.30	63.93	0.350	-0.189
298.4	38.713	5.39	1.21	3.03	1.0	0.85	7.91	100	56.39	64.30	0.350	-0.191
298.2	38.877	5.16	1.31	3.06	1.0	0.84	7.66	100	56.31	63.97	0.350	-0.189
298.1	39.042	5.48	1.34	3.05	1.0	0.84	8.04	100	56.43	64.47	0.350	-0.192
297.9	39.206	5.33	2.05	3.14	1.0	0.84	7.89	100	56.38	64.27	0.350	-0.190
297.7	39.370	7.82	1.90	2.98	1.0	0.84	10.74	100	57.27	68.01	0.350	-0.212
297.6	39.534	4.82	2.76	3.24	1.0	0.84	7.33	100	56.21	63.54	0.350	-0.186
297.4	39.698	5.38	2.06	3.14	1.0	0.84	7.98	100	56.41	64.39	0.350	-0.191
297.2	39.862	5.04	1.30	3.07	1.0	0.83	7.60	100	56.29	63.90	0.350	-0.188
297.1	40.026	5.04	1.44	3.09	1.0	0.83	7.61	100	56.29	63.90	0.350	-0.188
296.9	40.190	5.29	1.29	3.05	1.0	0.83	7.91	100	56.39	64.30	0.350	-0.190
296.7	40.354	5.43	1.22	3.03	1.0	0.83	8.08	100	56.44	64.52	0.350	-0.191
296.6	40.518	6.09	1.51	3.03	1.0	0.83	8.86	100	56.68	65.55	0.350	-0.197
296.4	40.682	5.30	1.77	3.11	1.0	0.83	7.96	100	56.40	64.36	0.350	-0.190
296.3	40.846	5.08	1.95	3.15	1.0	0.82	7.72	100	56.33	64.05	0.350	-0.188
296.1	41.010	5.18	1.38	3.07	1.0	0.82	7.85	100	56.37	64.22	0.350	-0.189
295.9	41.174	5.29	1.36	3.06	1.0	0.82	7.98	100	56.41	64.39	0.350	-0.190
295.8	41.338	5.17	1.37	3.07	1.0	0.82	7.85	100	56.37	64.22	0.350	-0.189
295.6	41.502	5.20	1.37	3.07	1.0	0.82	7.90	100	56.39	64.29	0.350	-0.189
295.4	41.666	5.35	1.29	3.05	1.0	0.82	8.09	100	56.45	64.54	0.350	-0.190
295.3	41.830	5.42	1.37	3.05	1.0	0.82	8.19	100	56.47	64.66	0.350	-0.191
295.1	41.994	5.17	1.42	3.08	1.0	0.81	7.91	100	56.39	64.29	0.350	-0.189
294.9	42.158	5.26	1.54	3.09	1.0	0.81	8.02	100	56.42	64.44	0.350	-0.189
294.8	42.322	5.11	1.45	3.09	1.0	0.81	7.85	100	56.37	64.22	0.350	-0.188

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
294.6	42.486	4.98	1.42	3.09	1.0	0.81	7.71	100	56.33	64.04	0.350	-0.187
294.4	42.650	4.73	1.42	3.11	1.0	0.81	7.43	100	56.24	63.67	0.350	-0.185
294.3	42.814	4.88	1.24	3.08	1.0	0.81	7.62	100	56.30	63.92	0.350	-0.186
294.1	42.978	5.27	1.06	3.02	1.0	0.81	8.09	100	56.44	64.53	0.350	-0.189
294.0	43.143	5.74	1.09	2.99	1.0	0.80	8.66	100	56.62	65.28	0.350	-0.194
293.8	43.307	5.01	1.30	3.07	1.0	0.80	7.81	100	56.36	64.16	0.350	-0.187
293.6	43.471	5.02	1.43	3.09	1.0	0.80	7.83	100	56.36	64.20	0.350	-0.187
293.5	43.635	5.06	1.29	3.07	1.0	0.80	7.89	100	56.38	64.27	0.350	-0.188
293.3	43.799	4.99	1.19	3.06	1.0	0.80	7.81	100	56.36	64.17	0.350	-0.187
293.1	43.963	5.25	1.60	3.10	1.0	0.80	8.14	100	56.46	64.60	0.350	-0.189
293.0	44.127	7.10	0.78	2.84	1.0	0.80	10.34	91	56.30	66.65	0.350	-0.201
292.8	44.291	5.31	0.94	2.99	1.0	0.79	8.23	100	56.49	64.72	0.350	-0.190
292.6	44.455	4.81	0.98	3.04	1.0	0.79	7.65	100	56.31	63.96	0.350	-0.185
292.5	44.619	4.91	0.88	3.01	1.0	0.79	7.78	100	56.35	64.13	0.350	-0.186
292.3	44.783	4.76	1.08	3.06	1.0	0.79	7.61	100	56.30	63.91	0.350	-0.185
292.2	44.947	4.69	2.00	3.19	1.0	0.79	7.54	100	56.27	63.81	0.350	-0.184
292.0	45.111	4.71	1.78	3.16	1.0	0.79	7.57	100	56.28	63.85	0.350	-0.184
291.8	45.275	4.99	1.48	3.10	1.0	0.79	7.92	100	56.39	64.31	0.350	-0.187
291.7	45.439	4.72	1.45	3.12	1.0	0.78	7.60	100	56.29	63.89	0.350	-0.184
291.5	45.603	4.64	1.09	3.07	1.0	0.78	7.52	100	56.27	63.78	0.350	-0.183
291.3	45.767	4.64	0.99	3.06	1.0	0.78	7.53	100	56.27	63.80	0.350	-0.183
291.2	45.931	4.69	0.95	3.04	1.0	0.78	7.60	100	56.29	63.89	0.350	-0.184
291.0	46.095	4.65	1.02	3.06	1.0	0.78	7.56	100	56.28	63.84	0.350	-0.183
290.8	46.259	4.69	0.96	3.05	1.0	0.78	7.62	100	56.30	63.92	0.350	-0.184
290.7	46.423	4.69	1.18	3.08	1.0	0.78	7.63	100	56.30	63.93	0.350	-0.184
290.5	46.587	5.69	1.13	3.00	1.0	0.78	8.86	100	56.68	65.54	0.350	-0.193
290.3	46.751	8.72	1.01	2.81	1.0	0.78	12.56	88	56.70	69.26	0.350	-0.214
290.2	46.915	9.92	0.83	2.72	1.0	0.78	14.04	81	56.33	70.37	0.350	-0.220
290.0	47.079	6.67	1.13	2.94	1.0	0.77	10.09	98	56.89	66.98	0.350	-0.201
289.9	47.244	5.08	1.15	3.05	1.0	0.77	8.16	100	56.47	64.62	0.350	-0.187
289.7	47.408	4.79	0.88	3.02	1.0	0.77	7.82	100	56.36	64.19	0.350	-0.185
289.5	47.572	4.92	0.92	3.02	1.0	0.77	7.99	100	56.41	64.40	0.350	-0.186
289.4	47.736	4.83	1.03	3.05	1.0	0.77	7.89	100	56.38	64.28	0.350	-0.185
289.2	47.900	4.84	0.84	3.01	1.0	0.76	7.91	100	56.39	64.29	0.350	-0.185
289.0	48.064	4.90	1.29	3.08	1.0	0.76	7.99	100	56.41	64.41	0.350	-0.186
288.9	48.228	5.24	1.71	3.11	1.0	0.76	8.42	100	56.55	64.96	0.350	-0.189
288.7	48.392	7.45	0.61	2.78	1.0	0.76	11.15	86	56.05	67.19	0.350	-0.202
288.5	48.556	5.18	0.91	3.00	1.0	0.76	8.37	100	56.53	64.90	0.350	-0.188
288.4	48.720	4.93	1.25	3.07	1.0	0.76	8.08	100	56.44	64.52	0.350	-0.186
288.2	48.884	6.47	0.91	2.91	1.0	0.76	9.99	96	56.67	66.66	0.350	-0.198
288.1	49.048	6.63	2.28	3.08	1.0	0.76	10.20	100	57.10	67.30	0.350	-0.202
287.9	49.212	9.62	2.06	2.92	1.0	0.76	13.96	97	58.00	71.95	0.350	-0.228
287.7	49.376	5.23	3.38	3.26	1.0	0.75	8.49	100	56.57	65.06	0.350	-0.189
287.6	49.540	5.42	1.90	3.12	1.0	0.75	8.73	100	56.64	65.38	0.350	-0.190
287.4	49.704	5.25	0.97	3.00	1.0	0.75	8.53	100	56.58	65.12	0.350	-0.189
287.2	49.868	4.85	0.98	3.04	1.0	0.75	8.05	100	56.43	64.48	0.350	-0.185
287.1	50.032	4.82	1.03	3.05	1.0	0.75	8.02	100	56.42	64.44	0.350	-0.185
286.9	50.196	4.79	0.93	3.03	1.0	0.75	8.00	100	56.42	64.42	0.350	-0.184
286.7	50.360	5.19	0.84	2.98	1.0	0.75	8.50	100	56.57	65.07	0.350	-0.188
286.6	50.524	5.64	0.59	2.89	1.0	0.75	9.07	95	56.28	65.35	0.350	-0.190
286.4	50.688	4.66	0.65	2.99	1.0	0.74	7.86	100	56.37	64.24	0.350	-0.183
286.2	50.852	4.70	0.68	2.99	1.0	0.74	7.93	100	56.39	64.32	0.350	-0.183
286.1	51.016	4.81	0.73	2.99	1.0	0.74	8.07	100	56.44	64.51	0.350	-0.184
285.9	51.180	4.84	0.86	3.01	1.0	0.74	8.12	100	56.45	64.57	0.350	-0.185
285.8	51.345	4.77	0.97	3.04	1.0	0.74	8.04	100	56.43	64.46	0.350	-0.184
285.6	51.509	4.95	0.91	3.02	1.0	0.74	8.27	100	56.50	64.77	0.350	-0.186
285.4	51.673	4.69	0.89	3.03	1.0	0.74	7.97	100	56.41	64.37	0.350	-0.183
285.3	51.837	4.81	0.99	3.04	1.0	0.74	8.12	100	56.45	64.58	0.350	-0.184
285.1	52.001	5.10	0.90	3.00	1.0	0.73	8.50	100	56.57	65.07	0.350	-0.187
284.9	52.165	4.75	1.02	3.05	1.0	0.73	8.06	100	56.44	64.50	0.350	-0.184
284.8	52.329	4.78	0.99	3.04	1.0	0.73	8.12	100	56.45	64.57	0.350	-0.184
284.6	52.493	4.77	1.33	3.10	1.0	0.73	8.11	100	56.45	64.56	0.350	-0.184
284.4	52.657	4.73	0.91	3.03	1.0	0.73	8.07	100	56.44	64.51	0.350	-0.183
284.3	52.821	8.03	1.30	2.89	1.0	0.73	12.30	94	57.26	69.56	0.350	-0.212
284.1	52.985	7.61	1.00	2.86	1.0	0.73	11.77	92	56.87	68.64	0.350	-0.207
284.0	53.149	5.34	1.35	3.06	1.0	0.73	8.88	100	56.69	65.57	0.350	-0.189

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
283.8	53.313	4.92	1.10	3.05	1.0	0.73	8.35	100	56.53	64.88	0.350	-0.185
283.6	53.477	5.27	0.75	2.96	1.0	0.73	8.81	100	56.64	65.45	0.350	-0.188
283.5	53.641	5.19	0.85	2.98	1.0	0.72	8.72	100	56.64	65.36	0.350	-0.188
283.3	53.805	5.07	1.05	3.03	1.0	0.72	8.58	100	56.60	65.17	0.350	-0.187
283.1	53.969	5.07	0.95	3.01	1.0	0.72	8.58	100	56.60	65.18	0.350	-0.187
283.0	54.133	6.42	1.15	2.95	1.0	0.72	10.34	99	57.09	67.43	0.350	-0.200
282.8	54.297	6.87	1.37	2.96	1.0	0.72	10.93	100	57.33	68.25	0.350	-0.204
282.6	54.461	5.62	1.78	3.09	1.0	0.72	9.33	100	56.83	66.16	0.350	-0.192
282.5	54.625	36.53	0.60	2.15	0.5	0.74	38.20	35	47.76	85.95	0.350	-0.295
282.3	54.789	51.92	1.25	2.19	0.5	0.76	54.93	38	54.09	109.02	0.350	-0.396
282.1	54.953	17.19	3.60	2.85	1.0	0.74	24.77	91	60.80	85.57	0.350	-0.293
282.0	55.117	9.62	4.63	3.12	1.0	0.72	14.61	100	58.47	73.08	0.350	-0.230
281.8	55.281	7.96	2.95	3.08	1.0	0.72	12.44	100	57.79	70.23	0.350	-0.215
281.7	55.446	7.38	1.06	2.89	1.0	0.72	11.67	94	57.03	68.70	0.350	-0.206
281.5	55.610	7.11	1.44	2.96	1.0	0.72	11.34	100	57.43	68.77	0.350	-0.206
281.3	55.774	9.78	2.29	2.94	1.0	0.72	14.89	98	58.41	73.30	0.350	-0.231
281.2	55.938	19.08	2.79	2.75	1.0	0.74	27.53	83	60.68	88.21	0.350	-0.305
281.0	56.102	14.48	3.80	2.93	1.0	0.73	21.28	97	60.30	81.58	0.350	-0.273
280.8	56.266	8.78	4.62	3.15	1.0	0.71	13.61	100	58.16	71.77	0.350	-0.222
280.7	56.430	7.01	2.70	3.10	1.0	0.71	11.29	100	57.44	68.72	0.350	-0.206
280.5	56.594	7.89	2.15	3.00	1.0	0.71	12.46	100	57.80	70.26	0.350	-0.214
280.3	56.758	30.94	1.72	2.46	0.5	0.73	32.95	60	57.83	90.77	0.350	-0.317
280.2	56.922	11.31	3.72	3.01	1.0	0.72	17.09	100	59.24	76.33	0.350	-0.246
280.0	57.086	7.29	4.04	3.18	1.0	0.71	11.71	100	57.57	69.28	0.350	-0.208
279.9	57.250	7.00	2.25	3.06	1.0	0.71	11.34	100	57.45	68.80	0.350	-0.205
279.7	57.414	6.30	0.78	2.89	1.0	0.70	10.41	94	56.70	67.11	0.350	-0.196
279.5	57.578	5.90	0.64	2.89	1.0	0.70	9.89	94	56.50	66.39	0.350	-0.192
279.4	57.742	5.49	0.77	2.95	1.0	0.70	9.38	99	56.74	66.12	0.350	-0.190
279.2	57.906	5.25	0.85	2.98	1.0	0.70	9.07	100	56.75	65.81	0.350	-0.188
279.0	58.070	5.62	2.01	3.12	1.0	0.70	9.57	100	56.90	66.47	0.350	-0.192
278.9	58.234	8.25	1.72	2.94	1.0	0.70	13.08	98	57.84	70.93	0.350	-0.217
278.7	58.398	13.06	2.00	2.80	1.0	0.71	19.64	87	58.79	78.43	0.350	-0.256
278.5	58.562	11.68	2.40	2.89	1.0	0.71	17.78	94	58.92	76.70	0.350	-0.247
278.4	58.726	8.15	2.71	3.05	1.0	0.70	13.00	100	57.97	70.97	0.350	-0.217
278.2	58.890	7.87	1.25	2.89	1.0	0.70	12.62	94	57.36	69.98	0.350	-0.211
278.0	59.054	6.75	1.25	2.95	1.0	0.69	11.14	99	57.32	68.45	0.350	-0.203
277.9	59.218	6.97	1.84	3.02	1.0	0.69	11.45	100	57.49	68.94	0.350	-0.205
277.7	59.382	40.91	0.56	2.10	0.5	0.71	42.61	31	44.65	87.26	0.350	-0.299
277.6	59.547	47.05	1.86	2.33	0.5	0.74	50.22	50	59.21	109.44	0.350	-0.395
277.4	59.711	17.75	4.79	2.92	1.0	0.71	26.51	97	61.88	88.38	0.350	-0.304
277.2	59.875	11.26	5.96	3.14	1.0	0.70	17.38	100	59.33	76.70	0.350	-0.247
277.1	60.039	7.81	6.67	3.29	1.0	0.69	12.66	100	57.86	70.52	0.350	-0.214
276.9	60.203	6.45	3.35	3.18	1.0	0.69	10.82	100	57.29	68.11	0.350	-0.200
276.7	60.367	5.62	1.96	3.11	1.0	0.68	9.71	100	56.95	66.66	0.350	-0.192
276.6	60.531	5.79	2.72	3.17	1.0	0.68	9.96	100	57.02	66.98	0.350	-0.193
276.4	60.695	8.39	2.22	2.99	1.0	0.69	13.50	100	58.12	71.63	0.350	-0.219
276.2	60.859	6.04	2.68	3.15	1.0	0.68	10.32	100	57.14	67.46	0.350	-0.196
276.1	61.023	32.66	1.52	2.41	0.5	0.71	34.78	56	57.17	91.95	0.350	-0.320
275.9	61.187	15.83	1.84	2.71	1.0	0.70	23.94	80	59.18	83.12	0.350	-0.278
275.7	61.351	9.59	2.86	3.00	1.0	0.69	15.23	100	58.66	73.89	0.350	-0.231
275.6	61.515	8.10	1.16	2.86	1.0	0.68	13.16	92	57.33	70.49	0.350	-0.213
275.4	61.679	6.95	0.91	2.88	1.0	0.68	11.60	93	56.97	68.57	0.350	-0.202
275.3	61.843	7.17	1.19	2.92	1.0	0.68	11.93	96	57.34	69.26	0.350	-0.206
275.1	62.007	8.38	5.43	3.21	1.0	0.68	13.60	100	58.16	71.76	0.350	-0.219
274.9	62.171	36.78	2.30	2.48	0.5	0.71	39.31	61	60.01	99.33	0.350	-0.352
274.8	62.335	62.14	1.36	2.15	0.5	0.73	66.70	35	54.35	121.06	0.350	-0.438
274.6	62.499	49.33	2.18	2.36	0.5	0.73	52.98	52	60.87	113.85	0.350	-0.410
274.4	62.663	17.34	3.75	2.86	1.0	0.70	26.45	92	61.39	87.84	0.350	-0.300
274.3	62.827	9.03	5.85	3.21	1.0	0.68	14.58	100	58.46	73.04	0.350	-0.226
274.1	62.991	9.41	2.29	2.95	1.0	0.68	15.14	99	58.58	73.72	0.350	-0.229
273.9	63.155	7.89	1.02	2.85	1.0	0.67	13.00	91	57.17	70.17	0.350	-0.210
273.8	63.319	6.37	0.81	2.90	1.0	0.67	10.92	95	56.87	67.79	0.350	-0.197
273.6	63.483	7.43	1.62	2.97	1.0	0.67	12.42	100	57.79	70.21	0.350	-0.210
273.5	63.648	9.35	1.89	2.91	1.0	0.68	15.10	96	58.28	73.39	0.350	-0.227
273.3	63.812	68.13	0.53	1.89	0.5	0.69	69.34	14	17.91	87.24	0.350	-0.297
273.1	63.976	137.33	0.57	1.65	0.5	0.75	149.71	0	0.00	149.71	0.350	-0.535

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
273.0	64.140	90.12	1.77	2.11	0.5	0.76	100.16	32	57.94	158.10	0.350	-0.561
272.8	64.304	29.34	4.86	2.77	1.0	0.72	45.15	84	66.15	111.29	0.350	-0.400
272.6	64.468	19.51	6.56	2.98	1.0	0.70	30.08	100	63.27	93.35	0.350	-0.324
272.5	64.632	93.70	1.61	2.07	0.5	0.76	104.16	29	54.33	158.50	0.350	-0.562
272.3	64.796	130.48	1.05	1.84	0.5	0.75	142.88	10	8.80	151.68	0.350	-0.541
272.1	64.960	122.58	0.99	1.84	0.5	0.74	132.94	10	9.42	142.36	0.350	-0.511
272.0	65.124	92.74	1.46	2.04	0.5	0.75	102.59	26	50.63	153.22	0.350	-0.545
271.8	65.288	78.95	1.90	2.17	0.5	0.75	87.18	37	60.28	147.46	0.350	-0.527
271.6	65.452	109.65	1.21	1.94	0.5	0.75	121.08	18	33.80	154.88	0.350	-0.550
271.5	65.616	104.89	1.23	1.95	0.5	0.75	115.72	19	37.21	152.92	0.350	-0.544
271.3	65.780	121.37	0.80	1.78	0.5	0.73	129.78	6	0.53	130.31	0.350	-0.469
271.2	65.944	129.17	0.66	1.71	0.5	0.74	139.64	0	0.00	139.64	0.350	-0.501
271.0	66.108	119.36	0.96	1.84	0.5	0.73	129.04	10	9.22	138.26	0.350	-0.496
270.8	66.272	84.22	1.73	2.12	0.5	0.75	93.37	33	57.82	151.19	0.350	-0.538
270.7	66.436	25.31	4.61	2.80	1.0	0.70	39.48	87	64.76	104.23	0.350	-0.370
270.5	66.600	13.28	5.76	3.07	1.0	0.67	21.14	100	60.50	81.64	0.350	-0.268
270.3	66.764	6.42	8.13	3.41	1.0	0.65	11.25	100	57.43	68.68	0.350	-0.200
270.2	66.928	5.52	3.11	3.22	1.0	0.65	9.98	100	57.03	67.02	0.350	-0.190
270.0	67.092	6.06	1.37	3.01	1.0	0.65	10.76	100	57.27	68.03	0.350	-0.196
269.8	67.256	5.92	1.40	3.02	1.0	0.65	10.58	100	57.22	67.79	0.350	-0.195
269.7	67.420	5.66	1.96	3.11	1.0	0.65	10.21	100	57.10	67.32	0.350	-0.192
269.5	67.584	5.98	1.54	3.04	1.0	0.65	10.67	100	57.25	67.92	0.350	-0.195
269.4	67.749	57.17	0.36	1.88	0.5	0.65	56.90	13	15.42	72.33	0.350	-0.219
269.2	67.913	77.65	0.85	1.95	0.5	0.70	82.41	19	32.92	115.33	0.350	-0.413
269.0	68.077	49.04	2.38	2.39	0.5	0.70	53.00	54	61.72	114.72	0.350	-0.411
268.9	68.241	18.25	3.93	2.86	1.0	0.68	28.89	92	62.10	90.99	0.350	-0.312
268.7	68.405	10.25	4.71	3.10	1.0	0.66	16.91	100	59.18	76.09	0.350	-0.239
268.5	68.569	10.99	7.54	3.21	1.0	0.66	18.01	100	59.53	77.54	0.350	-0.246
268.4	68.733	69.22	1.85	2.21	0.5	0.72	76.01	39	59.85	135.86	0.350	-0.487
268.2	68.897	115.28	1.06	1.88	0.5	0.73	126.41	13	19.59	146.00	0.350	-0.520
268.0	69.061	122.58	0.82	1.79	0.5	0.72	131.88	6	0.70	132.58	0.350	-0.476
267.9	69.225	120.39	0.73	1.76	0.5	0.71	128.95	4	0.02	128.97	0.350	-0.463
267.7	69.389	110.28	0.95	1.86	0.5	0.72	119.18	12	14.66	133.84	0.350	-0.480
267.5	69.553	81.20	1.38	2.07	0.5	0.72	89.36	29	51.46	140.82	0.350	-0.503
267.4	69.717	54.77	2.37	2.35	0.5	0.70	59.61	51	62.36	121.98	0.350	-0.437
267.2	69.881	32.50	3.24	2.61	1.0	0.70	52.26	72	66.27	118.53	0.350	-0.425
267.1	70.045	15.70	5.66	3.01	1.0	0.66	25.33	100	61.80	87.13	0.350	-0.293
266.9	70.209	8.30	6.89	3.28	1.0	0.64	14.22	100	58.35	72.56	0.350	-0.219
266.7	70.373	7.43	2.57	3.07	1.0	0.64	12.95	100	57.95	70.90	0.350	-0.210
266.6	70.537	10.63	1.36	2.79	1.0	0.65	17.63	86	58.09	75.73	0.350	-0.236
266.4	70.701	8.82	1.68	2.91	1.0	0.64	15.01	96	58.22	73.23	0.350	-0.223
266.2	70.865	6.05	1.82	3.07	1.0	0.63	10.99	100	57.34	68.33	0.350	-0.196
266.1	71.029	6.01	1.60	3.04	1.0	0.63	10.94	100	57.33	68.27	0.350	-0.195
265.9	71.193	9.04	1.66	2.90	1.0	0.64	15.37	95	58.25	73.62	0.350	-0.225
265.7	71.357	8.25	1.84	2.95	1.0	0.64	14.23	99	58.29	72.52	0.350	-0.219
265.6	71.521	6.23	2.57	3.13	1.0	0.63	11.29	100	57.44	68.72	0.350	-0.198
265.4	71.685	6.45	1.62	3.02	1.0	0.63	11.63	100	57.54	69.17	0.350	-0.200
265.3	71.850	7.13	2.13	3.04	1.0	0.63	12.63	100	57.85	70.48	0.350	-0.207
265.1	72.014	46.34	0.89	2.15	0.5	0.67	49.09	35	50.07	99.16	0.350	-0.346
264.9	72.178	104.03	0.63	1.78	0.5	0.68	108.61	5	0.18	108.79	0.350	-0.386
264.8	72.342	114.09	0.82	1.81	0.5	0.70	122.02	8	3.24	125.26	0.350	-0.448
264.6	72.506	120.81	0.87	1.81	0.5	0.71	130.69	8	3.04	133.73	0.350	-0.478
264.4	72.670	128.70	0.93	1.81	0.5	0.71	141.03	8	2.64	143.67	0.350	-0.511
264.3	72.834	130.80	1.03	1.83	0.5	0.72	145.07	10	7.63	152.70	0.350	-0.540
264.1	72.998	143.73	1.04	1.80	0.5	0.73	161.47	7	2.43	163.90	0.350	-0.574
263.9	73.162	163.62	1.04	1.76	0.5	0.75	189.05	4	0.02	189.08	0.350	-0.600
263.8	73.326	195.81	1.25	1.77	0.5	0.79	237.40	4	0.06	237.47	0.350	-0.600
263.6	73.490	226.80	1.33	1.74	0.5	0.81	278.93	3	0.00	278.93	0.350	-0.600
263.4	73.654	244.20	1.36	1.73	0.5	0.81	300.21	2	0.00	300.21	0.350	-0.600
263.3	73.818	247.56	1.47	1.76	0.5	0.80	304.45	3	0.01	304.46	0.350	-0.600
263.1	73.982	248.40	1.58	1.78	0.5	0.80	305.61	5	0.52	306.13	0.350	-0.600
263.0	74.146	246.51	1.61	1.79	0.5	0.80	303.46	6	1.14	304.60	0.350	-0.600
262.8	74.310	246.75	1.65	1.80	0.5	0.80	303.89	7	2.20	306.08	0.350	-0.600
262.6	74.474	247.07	1.67	1.80	0.5	0.80	304.43	7	2.88	307.30	0.350	-0.600
262.5	74.638	250.44	1.78	1.82	0.5	0.80	308.67	9	7.20	315.88	0.350	-0.600
262.3	74.802	255.07	1.64	1.79	0.5	0.80	314.47	6	0.91	315.38	0.350	-0.600

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	<i>z</i> (ft)	<i>Q</i>	<i>F</i> (%)	<i>I_c</i>	<i>n</i>	<i>C_N</i>	<i>q_{c1N}</i>	<i>FC</i> (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	<i>a</i>	ξ_R
262.1	74.966	233.33	1.76	1.83	0.5	0.80	288.10	10	11.31	299.41	0.350	-0.600
262.0	75.130	259.41	1.60	1.77	0.5	0.80	320.07	5	0.19	320.26	0.350	-0.600
261.8	75.294	254.94	1.66	1.79	0.5	0.80	314.76	6	1.29	316.05	0.350	-0.600
261.6	75.458	267.28	1.64	1.77	0.5	0.80	329.98	5	0.24	330.22	0.350	-0.600
261.5	75.622	266.13	1.70	1.79	0.5	0.80	328.73	6	1.11	329.85	0.350	-0.600
261.3	75.786	263.77	1.76	1.80	0.5	0.80	326.00	7	3.20	329.20	0.350	-0.600
261.1	75.951	260.88	1.79	1.81	0.5	0.80	322.61	8	5.27	327.87	0.350	-0.600
261.0	76.115	263.60	1.79	1.81	0.5	0.80	326.09	8	4.72	330.80	0.350	-0.600
260.8	76.279	269.74	1.81	1.81	0.5	0.80	333.76	8	4.27	338.03	0.350	-0.600
260.7	76.443	263.53	1.91	1.83	0.5	0.80	326.31	10	11.82	338.13	0.350	-0.600
260.5	76.607	262.89	1.89	1.83	0.5	0.80	325.67	9	10.48	336.16	0.350	-0.600
260.3	76.771	257.54	1.83	1.82	0.5	0.80	319.26	9	8.10	327.37	0.350	-0.600
260.2	76.935	254.44	1.83	1.83	0.5	0.80	315.60	9	9.43	325.04	0.350	-0.600
260.0	77.099	241.27	1.83	1.84	0.5	0.80	299.59	10	13.93	313.53	0.350	-0.600
259.8	77.263	230.21	1.85	1.86	0.5	0.80	286.15	11	19.79	305.94	0.350	-0.600
259.7	77.427	217.34	1.83	1.87	0.5	0.80	270.47	12	23.68	294.15	0.350	-0.600
259.5	77.591	199.54	1.81	1.89	0.5	0.80	248.73	14	29.96	278.68	0.350	-0.600
259.3	77.755	189.51	1.61	1.86	0.5	0.80	236.50	12	19.03	255.53	0.350	-0.600
259.2	77.919	186.42	1.42	1.82	0.5	0.78	228.52	9	7.13	235.64	0.350	-0.600
259.0	78.083	173.08	1.51	1.86	0.5	0.78	211.62	12	20.00	231.62	0.350	-0.600
258.9	78.247	171.24	1.33	1.83	0.5	0.76	205.26	9	7.50	212.76	0.350	-0.600
258.7	78.411	151.84	1.91	1.98	0.5	0.78	187.98	21	52.73	240.71	0.350	-0.600
258.5	78.575	119.75	2.22	2.10	0.5	0.76	144.16	31	65.51	209.67	0.350	-0.600
258.4	78.739	113.45	2.01	2.08	0.5	0.74	134.68	29	61.59	196.27	0.350	-0.600
258.2	78.903	169.71	1.23	1.80	0.5	0.75	201.85	7	2.69	204.54	0.350	-0.600
258.0	79.067	188.27	1.34	1.80	0.5	0.78	230.88	7	2.50	233.38	0.350	-0.600
257.9	79.231	203.88	1.21	1.74	0.5	0.79	255.21	3	0.00	255.21	0.350	-0.600

LIQUEFACTION POTENTIAL ASSESSMENT FOR COARSE GRAINED SOILS USING CONE PENETRATION TEST DATA

Shear Stress Fit Parameters	
m4:	0
m3:	0
m2:	0
m1:	0

Depth to Water during Earthquake: 9.3 ft
Final Grade Elevation during EQ: 337.1 ft
Height of Final Grade above CPT TOH: 0.0 ft
Normalize K_v to: 1.058 tsf
 a_{max} at top of ground surface: 0.21 g
Earthquake Magnitude: 7.70 Mw
Earthquake File or Source Zone: Design Source

Project Site: US 60 Bridge
Stantec Project No.: 178665011
CPT ID: SP09

Elev. (ft)	Depth z (ft)	Cyclic Resistance Ratio $CRR_{7.5}$	Relative Density D_r (%)	Overburden Pressure K_σ	Correction for Sloping Ground K_ϕ	Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., r_d	From Ground Response			Sample Screened for:				Factor of Safety FS_{liq}	Material (optional)	Soil Type (see note on following chart)
									Maximum Induced Shear Stress τ_{Max} (psf)	Average Cyclic Shear Stress τ_{Avg} (psf)	Cyclic Stress Ratio CSR	Clay-like $(qc_{3N})/CS \geq 175$	High Tip Res.	Unsaturated				
337.1																		
336.9	0.164	0.096	32	1.100	N/A	0.99	N/A	1.000	0	0	0.137	FALSE	FALSE	TRUE	N/A	N/A	B	
336.8	0.328	0.082	16	1.100	N/A	0.99	N/A	1.000	0	0	0.137	FALSE	FALSE	TRUE	N/A	N/A	A1	
336.6	0.492	0.131	53	1.100	N/A	0.98	N/A	1.000	0	0	0.137	FALSE	FALSE	TRUE	N/A	N/A	A1	
336.4	0.656	0.251	71	1.100	N/A	0.96	N/A	1.000	0	0	0.137	FALSE	FALSE	TRUE	N/A	N/A	A1	
336.3	0.820	0.410	77	1.100	N/A	0.95	N/A	1.000	0	0	0.137	FALSE	FALSE	TRUE	N/A	N/A	A1	
336.1	0.984	0.234	70	1.100	N/A	0.96	N/A	1.000	0	0	0.137	FALSE	FALSE	TRUE	N/A	N/A	A1	
336.0	1.148	0.188	65	1.100	N/A	0.97	N/A	1.000	0	0	0.137	FALSE	FALSE	TRUE	N/A	N/A	A1	
335.8	1.312	0.193	66	1.100	N/A	0.97	N/A	1.000	0	0	0.137	FALSE	FALSE	TRUE	N/A	N/A	A1	
335.6	1.476	0.221	69	1.100	N/A	0.97	N/A	1.000	0	0	0.137	FALSE	FALSE	TRUE	N/A	N/A	A1	
335.5	1.640	0.238	70	1.100	N/A	0.96	N/A	1.000	0	0	0.137	FALSE	FALSE	TRUE	N/A	N/A	A1	
335.3	1.804	0.250	71	1.100	N/A	0.96	N/A	1.000	0	0	0.137	FALSE	FALSE	TRUE	N/A	N/A	A1	
335.1	1.968	0.263	72	1.100	N/A	0.96	N/A	1.000	0	0	0.137	FALSE	FALSE	TRUE	N/A	N/A	A1	
335.0	2.133	0.289	73	1.100	N/A	0.96	N/A	1.000	0	0	0.137	FALSE	FALSE	TRUE	N/A	N/A	A1	
334.8	2.297	0.314	74	1.100	N/A	0.95	N/A	1.000	0	0	0.137	FALSE	FALSE	TRUE	N/A	N/A	A1	
334.6	2.461	0.328	75	1.100	N/A	0.95	N/A	1.000	0	0	0.137	FALSE	FALSE	TRUE	N/A	N/A	A1	
334.5	2.625	0.375	76	1.100	N/A	0.95	N/A	1.000	0	0	0.137	FALSE	FALSE	TRUE	N/A	N/A	A1	
334.3	2.789	0.391	77	1.100	N/A	0.95	N/A	1.000	0	0	0.137	FALSE	FALSE	TRUE	N/A	N/A	A1	
334.1	2.953	0.408	77	1.100	N/A	0.95	N/A	1.000	0	0	0.137	FALSE	FALSE	TRUE	N/A	N/A	A1	
334.0	3.117	0.503	79	1.100	N/A	0.94	N/A	1.000	0	0	0.137	FALSE	FALSE	TRUE	N/A	N/A	A1	
333.8	3.281	0.578	80	1.100	N/A	0.94	N/A	1.000	0	0	0.137	FALSE	FALSE	TRUE	N/A	N/A	A1	
333.7	3.445	0.498	79	1.100	N/A	0.94	N/A	1.000	0	0	0.137	FALSE	FALSE	TRUE	N/A	N/A	A1	
333.5	3.609	0.343	75	1.100	N/A	0.95	N/A	0.999	0	0	0.137	FALSE	FALSE	TRUE	N/A	N/A	A1	
333.3	3.773	0.264	72	1.100	N/A	0.96	N/A	0.999	0	0	0.137	FALSE	FALSE	TRUE	N/A	N/A	A1	
333.2	3.937	0.234	70	1.100	N/A	0.96	N/A	0.999	0	0	0.137	FALSE	FALSE	TRUE	N/A	N/A	A1	
333.0	4.101	0.213	68	1.100	N/A	0.97	N/A	0.998	0	0	0.137	FALSE	FALSE	TRUE	N/A	N/A	A1	
332.8	4.265	0.199	67	1.100	N/A	0.97	N/A	0.998	0	0	0.137	FALSE	FALSE	TRUE	N/A	N/A	A1	
332.7	4.429	0.194	66	1.100	N/A	0.97	N/A	0.998	0	0	0.137	FALSE	FALSE	TRUE	N/A	N/A	A1	
332.5	4.593	0.173	63	1.100	N/A	0.97	N/A	0.997	0	0	0.137	FALSE	FALSE	TRUE	N/A	N/A	A1	
332.3	4.757	0.160	61	1.100	N/A	0.98	N/A	0.997	0	0	0.137	FALSE	FALSE	TRUE	N/A	N/A	A1	
332.2	4.921	0.147	58	1.100	N/A	0.98	N/A	0.996	0	0	0.137	FALSE	FALSE	TRUE	N/A	N/A	B	
332.0	5.085	0.134	54	1.100	N/A	0.98	N/A	0.996	0	0	0.137	FALSE	FALSE	TRUE	N/A	N/A	B	
331.9	5.249	0.128	51	1.100	N/A	0.99	N/A	0.996	0	0	0.137	FALSE	FALSE	TRUE	N/A	N/A	B	
331.7	5.413	0.125	50	1.100	N/A	0.99	N/A	0.995	0	0	0.137	FALSE	FALSE	TRUE	N/A	N/A	B	
331.5	5.577	0.127	51	1.100	N/A	0.99	N/A	0.995	0	0	0.137	FALSE	FALSE	TRUE	N/A	N/A	A1	
331.4	5.741	0.128	52	1.100	N/A	0.99	N/A	0.995	0	0	0.137	FALSE	FALSE	TRUE	N/A	N/A	A1	
331.2	5.905	0.132	53	1.100	N/A	0.98	N/A	0.994	0	0	0.137	FALSE	FALSE	TRUE	N/A	N/A	A1	
331.0	6.069	0.134	54	1.100	N/A	0.98	N/A	0.994	0	0	0.137	FALSE	FALSE	TRUE	N/A	N/A	A1	
330.9	6.234	0.137	55	1.100	N/A	0.98	N/A	0.994	0	0	0.136	FALSE	FALSE	TRUE	N/A	N/A	A1	
330.7	6.398	0.140	56	1.100	N/A	0.98	N/A	0.993	0	0	0.136	FALSE	FALSE	TRUE	N/A	N/A	A1	
330.5	6.562	0.141	56	1.100	N/A	0.98	N/A	0.993	0	0	0.136	FALSE	FALSE	TRUE	N/A	N/A	B	
330.4	6.726	0.153	59	1.100	N/A	0.98	N/A	0.992	0	0	0.136	FALSE	FALSE	TRUE	N/A	N/A	A1	
330.2	6.890	0.212	68	1.100	N/A	0.97	N/A	0.992	0	0	0.136	FALSE	FALSE	TRUE	N/A	N/A	A1	
330.0	7.054	0.180	64	1.100	N/A	0.97	N/A	0.992	0	0	0.136	FALSE	FALSE	TRUE	N/A	N/A	A1	
329.9	7.218	0.153	59	1.100	N/A	0.98	N/A	0.991	0	0	0.136	FALSE	FALSE	TRUE	N/A	N/A	A1	

Front Ground Response										Sample Screened for:					Factor of Safety		Material (optional)	Soil Type (see note on following chart)
Elev. (ft)	Depth z (ft)	Cyclic Resistance Ratio $CRR_{7.5}$	Relative Density D_r (%)	Correction for		Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., I_d	Shear Stress τ_{Max} (psf)	Cyclic Shear Stress τ_{Avg} (psf)	Cyclic Stress Ratio CSR	Clay-like $(q_{c30}) \geq 175$	High Tip Res. $(q_{c30}) \geq 175$	Unsaturated	FS_{liq}			
				Overburden Pressure K_o	Sloping Ground K_α													
320.7	16.404	N/A	39	N/A	N/A	N/A	N/A	0.967	0	0	0.171	TRUE	FALSE	FALSE	N/A	N/A	C	
320.5	16.568	N/A	37	N/A	N/A	N/A	N/A	0.966	0	0	0.172	TRUE	FALSE	FALSE	N/A	N/A	C	
320.4	16.732	N/A	37	N/A	N/A	N/A	N/A	0.966	0	0	0.172	TRUE	FALSE	FALSE	N/A	N/A	C	
320.2	16.896	N/A	37	N/A	N/A	N/A	N/A	0.965	0	0	0.173	TRUE	FALSE	FALSE	N/A	N/A	C	
320.0	17.060	N/A	37	N/A	N/A	N/A	N/A	0.965	0	0	0.174	TRUE	FALSE	FALSE	N/A	N/A	C	
319.9	17.224	N/A	37	N/A	N/A	N/A	N/A	0.964	0	0	0.174	TRUE	FALSE	FALSE	N/A	N/A	C	
319.7	17.388	N/A	36	N/A	N/A	N/A	N/A	0.964	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
319.5	17.552	N/A	42	N/A	N/A	N/A	N/A	0.963	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	C	
319.4	17.716	0.123	49	1.027	1.023	0.99	0.127	0.963	0	0	0.176	FALSE	FALSE	FALSE	0.7	N/A	A1	
319.2	17.880	N/A	43	N/A	N/A	N/A	N/A	0.962	0	0	0.176	TRUE	FALSE	FALSE	N/A	N/A	B	
319.1	18.044	N/A	39	N/A	N/A	N/A	N/A	0.962	0	0	0.177	TRUE	FALSE	FALSE	N/A	N/A	B	
318.9	18.208	N/A	39	N/A	N/A	N/A	N/A	0.961	0	0	0.177	TRUE	FALSE	FALSE	N/A	N/A	C	
318.7	18.372	N/A	40	N/A	N/A	N/A	N/A	0.961	0	0	0.178	TRUE	FALSE	FALSE	N/A	N/A	C	
318.6	18.537	0.113	44	1.022	0.824	0.99	0.094	0.960	0	0	0.178	FALSE	FALSE	FALSE	0.5	N/A	C	
318.4	18.701	N/A	44	N/A	N/A	N/A	N/A	0.960	0	0	0.178	TRUE	FALSE	FALSE	N/A	N/A	B	
318.2	18.865	N/A	42	N/A	N/A	N/A	N/A	0.959	0	0	0.179	TRUE	FALSE	FALSE	N/A	N/A	B	
318.1	19.029	N/A	39	N/A	N/A	N/A	N/A	0.959	0	0	0.179	TRUE	FALSE	FALSE	N/A	N/A	B	
317.9	19.193	N/A	37	N/A	N/A	N/A	N/A	0.958	0	0	0.180	TRUE	FALSE	FALSE	N/A	N/A	C	
317.7	19.357	N/A	37	N/A	N/A	N/A	N/A	0.958	0	0	0.180	TRUE	FALSE	FALSE	N/A	N/A	C	
317.6	19.521	N/A	41	N/A	N/A	N/A	N/A	0.957	0	0	0.181	TRUE	FALSE	FALSE	N/A	N/A	C	
317.4	19.685	N/A	42	N/A	N/A	N/A	N/A	0.956	0	0	0.181	TRUE	FALSE	FALSE	N/A	N/A	C	
317.3	19.849	N/A	38	N/A	N/A	N/A	N/A	0.956	0	0	0.181	TRUE	FALSE	FALSE	N/A	N/A	C	
317.1	20.013	N/A	39	N/A	N/A	N/A	N/A	0.955	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	C	
316.9	20.177	N/A	38	N/A	N/A	N/A	N/A	0.955	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	C	
316.8	20.341	N/A	36	N/A	N/A	N/A	N/A	0.954	0	0	0.183	TRUE	FALSE	FALSE	N/A	N/A	C	
316.6	20.505	N/A	36	N/A	N/A	N/A	N/A	0.954	0	0	0.183	TRUE	FALSE	FALSE	N/A	N/A	C	
316.4	20.669	N/A	36	N/A	N/A	N/A	N/A	0.953	0	0	0.183	TRUE	FALSE	FALSE	N/A	N/A	C	
316.3	20.833	N/A	36	N/A	N/A	N/A	N/A	0.953	0	0	0.184	TRUE	FALSE	FALSE	N/A	N/A	C	
316.1	20.997	N/A	36	N/A	N/A	N/A	N/A	0.952	0	0	0.184	TRUE	FALSE	FALSE	N/A	N/A	C	
315.9	21.161	N/A	36	N/A	N/A	N/A	N/A	0.952	0	0	0.185	TRUE	FALSE	FALSE	N/A	N/A	C	
315.8	21.325	N/A	36	N/A	N/A	N/A	N/A	0.951	0	0	0.185	TRUE	FALSE	FALSE	N/A	N/A	C	
315.6	21.489	N/A	37	N/A	N/A	N/A	N/A	0.951	0	0	0.185	TRUE	FALSE	FALSE	N/A	N/A	C	
315.4	21.653	N/A	37	N/A	N/A	N/A	N/A	0.950	0	0	0.186	TRUE	FALSE	FALSE	N/A	N/A	C	
315.3	21.817	N/A	44	N/A	N/A	N/A	N/A	0.949	0	0	0.186	TRUE	FALSE	FALSE	N/A	N/A	C	
315.1	21.981	N/A	41	N/A	N/A	N/A	N/A	0.949	0	0	0.186	TRUE	FALSE	FALSE	N/A	N/A	C	
315.0	22.145	N/A	37	N/A	N/A	N/A	N/A	0.948	0	0	0.187	TRUE	FALSE	FALSE	N/A	N/A	B	
314.8	22.309	N/A	38	N/A	N/A	N/A	N/A	0.948	0	0	0.187	TRUE	FALSE	FALSE	N/A	N/A	C	
314.6	22.473	N/A	36	N/A	N/A	N/A	N/A	0.947	0	0	0.187	TRUE	FALSE	FALSE	N/A	N/A	C	
314.5	22.638	N/A	36	N/A	N/A	N/A	N/A	0.947	0	0	0.187	TRUE	FALSE	FALSE	N/A	N/A	C	
314.3	22.802	N/A	36	N/A	N/A	N/A	N/A	0.946	0	0	0.188	TRUE	FALSE	FALSE	N/A	N/A	C	
314.1	22.966	N/A	36	N/A	N/A	N/A	N/A	0.946	0	0	0.188	TRUE	FALSE	FALSE	N/A	N/A	C	
314.0	23.130	N/A	37	N/A	N/A	N/A	N/A	0.945	0	0	0.188	TRUE	FALSE	FALSE	N/A	N/A	C	
313.8	23.294	N/A	38	N/A	N/A	N/A	N/A	0.944	0	0	0.189	TRUE	FALSE	FALSE	N/A	N/A	C	
313.6	23.458	N/A	36	N/A	N/A	N/A	N/A	0.944	0	0	0.189	TRUE	FALSE	FALSE	N/A	N/A	C	
313.5	23.622	N/A	41	N/A	N/A	N/A	N/A	0.943	0	0	0.189	TRUE	FALSE	FALSE	N/A	N/A	C	
313.3	23.786	0.119	47	1.008	0.929	0.99	0.110	0.943	0	0	0.190	FALSE	FALSE	FALSE	0.6	N/A	A2	
313.2	23.950	0.131	53	1.008	1.153	0.98	0.150	0.942	0	0	0.190	FALSE	FALSE	FALSE	0.8	N/A	A1	
313.0	24.114	0.150	59	1.008	1.434	0.98	0.213	0.942	0	0	0.190	FALSE	FALSE	FALSE	1.1	N/A	A1	
312.8	24.278	0.132	53	1.007	1.169	0.98	0.154	0.941	0	0	0.190	FALSE	FALSE	FALSE	0.8	N/A	A1	
312.7	24.442	N/A	45	N/A	N/A	N/A	N/A	0.941	0	0	0.191	TRUE	FALSE	FALSE	N/A	N/A	B	
312.5	24.606	N/A	43	N/A	N/A	N/A	N/A	0.940	0	0	0.191	TRUE	FALSE	FALSE	N/A	N/A	B	
312.3	24.770	N/A	40	N/A	N/A	N/A	N/A	0.939	0	0	0.191	TRUE	FALSE	FALSE	N/A	N/A	B	
312.2	24.934	N/A	38	N/A	N/A	N/A	N/A	0.939	0	0	0.191	TRUE	FALSE	FALSE	N/A	N/A	C	
312.0	25.098	N/A	37	N/A	N/A	N/A	N/A	0.938	0	0	0.192	TRUE	FALSE	FALSE	N/A	N/A	C	
311.8	25.262	N/A	37	N/A	N/A	N/A	N/A	0.938	0	0	0.192	TRUE	FALSE	FALSE	N/A	N/A	C	

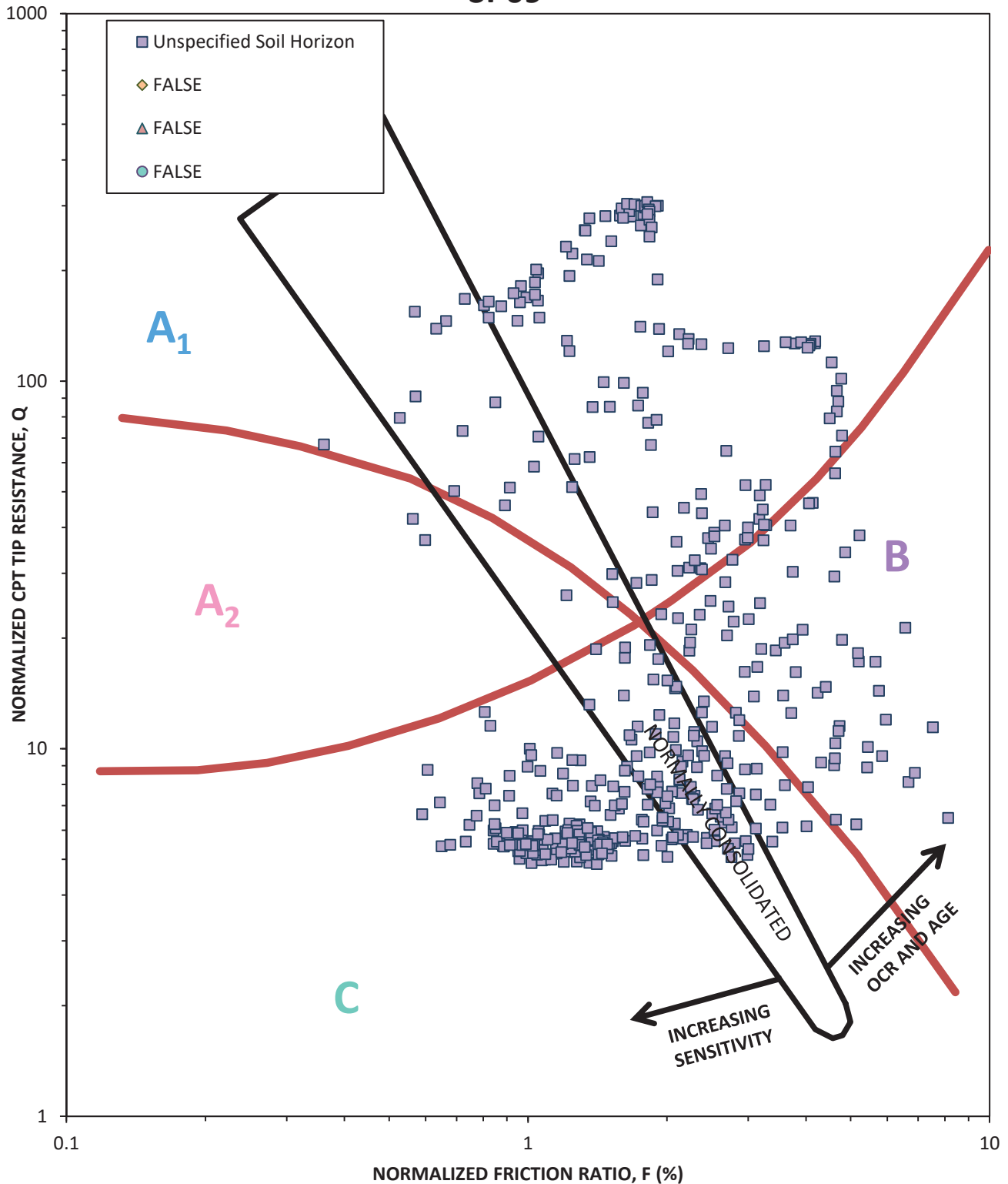
Front Ground Response										Sample Screened for:										Factor of Safety		Material (optional)	Soil Type (see note on following chart)
Elev. (ft)	Depth z	Cyclic Resistance Ratio $CRR_{7.5}$	Relative Density D_r	Correction for		Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., t_d	τ_{max} (psf)	Induced Shear Stress	Maximum Shear Stress τ_{Avg} (psf)	Average Cyclic Shear Stress	Cyclic Stress Ratio CSR	Clay-like $(qc_{30}) \geq 175$	High Tip Res.	Unsaturated	FS_{liq}						
				Overburden Pressure K_o	Sloping Ground K_a																		
311.7	25.426	N/A	36	N/A	N/A	N/A	N/A	0.937	0	0	0	0.192	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
311.5	25.590	N/A	36	N/A	N/A	N/A	N/A	0.937	0	0	0	0.192	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
311.3	25.754	N/A	36	N/A	N/A	N/A	N/A	0.936	0	0	0	0.193	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
311.2	25.918	N/A	36	N/A	N/A	N/A	N/A	0.935	0	0	0	0.193	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
311.0	26.082	N/A	36	N/A	N/A	N/A	N/A	0.935	0	0	0	0.193	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
310.9	26.246	N/A	37	N/A	N/A	N/A	N/A	0.934	0	0	0	0.193	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
310.7	26.410	0.113	44	1.001	0.806	0.99	0.090	0.934	0	0	0	0.193	FALSE	FALSE	FALSE	FALSE	0.5	N/A	C				
310.5	26.574	N/A	42	N/A	N/A	N/A	N/A	0.933	0	0	0	0.194	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
310.4	26.739	N/A	39	N/A	N/A	N/A	N/A	0.932	0	0	0	0.194	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
310.2	26.903	N/A	37	N/A	N/A	N/A	N/A	0.932	0	0	0	0.194	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
310.0	27.067	N/A	37	N/A	N/A	N/A	N/A	0.931	0	0	0	0.194	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
309.9	27.231	N/A	37	N/A	N/A	N/A	N/A	0.931	0	0	0	0.194	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
309.7	27.395	N/A	36	N/A	N/A	N/A	N/A	0.930	0	0	0	0.195	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
309.5	27.559	N/A	36	N/A	N/A	N/A	N/A	0.929	0	0	0	0.195	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
309.4	27.723	N/A	37	N/A	N/A	N/A	N/A	0.929	0	0	0	0.195	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
309.2	27.887	N/A	36	N/A	N/A	N/A	N/A	0.928	0	0	0	0.195	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
309.0	28.051	N/A	36	N/A	N/A	N/A	N/A	0.928	0	0	0	0.195	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
308.9	28.215	N/A	36	N/A	N/A	N/A	N/A	0.927	0	0	0	0.196	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
308.7	28.379	N/A	36	N/A	N/A	N/A	N/A	0.926	0	0	0	0.196	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
308.6	28.543	N/A	37	N/A	N/A	N/A	N/A	0.926	0	0	0	0.196	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
308.4	28.707	N/A	37	N/A	N/A	N/A	N/A	0.925	0	0	0	0.196	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
308.2	28.871	N/A	36	N/A	N/A	N/A	N/A	0.925	0	0	0	0.196	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
308.1	29.035	N/A	36	N/A	N/A	N/A	N/A	0.924	0	0	0	0.196	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
307.9	29.199	N/A	36	N/A	N/A	N/A	N/A	0.923	0	0	0	0.196	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
307.7	29.363	N/A	36	N/A	N/A	N/A	N/A	0.923	0	0	0	0.197	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
307.6	29.527	N/A	37	N/A	N/A	N/A	N/A	0.922	0	0	0	0.197	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
307.4	29.691	N/A	36	N/A	N/A	N/A	N/A	0.922	0	0	0	0.197	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
307.2	29.855	N/A	40	N/A	N/A	N/A	N/A	0.921	0	0	0	0.197	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
307.1	30.019	0.119	47	0.992	0.905	0.99	0.105	0.920	0	0	0	0.197	FALSE	FALSE	FALSE	FALSE	0.5	N/A	B				
306.9	30.183	N/A	46	N/A	N/A	N/A	N/A	0.920	0	0	0	0.197	TRUE	FALSE	FALSE	FALSE	N/A	N/A	B				
306.8	30.347	N/A	41	N/A	N/A	N/A	N/A	0.919	0	0	0	0.197	TRUE	FALSE	FALSE	FALSE	N/A	N/A	B				
306.6	30.511	N/A	37	N/A	N/A	N/A	N/A	0.919	0	0	0	0.198	TRUE	FALSE	FALSE	FALSE	N/A	N/A	B				
306.4	30.675	N/A	40	N/A	N/A	N/A	N/A	0.918	0	0	0	0.198	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
306.3	30.840	N/A	38	N/A	N/A	N/A	N/A	0.917	0	0	0	0.198	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
306.1	31.004	N/A	37	N/A	N/A	N/A	N/A	0.917	0	0	0	0.198	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
305.9	31.168	N/A	37	N/A	N/A	N/A	N/A	0.916	0	0	0	0.198	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
305.8	31.332	N/A	37	N/A	N/A	N/A	N/A	0.916	0	0	0	0.198	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
305.6	31.496	N/A	37	N/A	N/A	N/A	N/A	0.915	0	0	0	0.198	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
305.4	31.660	N/A	37	N/A	N/A	N/A	N/A	0.914	0	0	0	0.198	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
305.3	31.824	N/A	37	N/A	N/A	N/A	N/A	0.914	0	0	0	0.199	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
305.1	31.988	N/A	37	N/A	N/A	N/A	N/A	0.913	0	0	0	0.199	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
304.9	32.152	N/A	37	N/A	N/A	N/A	N/A	0.912	0	0	0	0.199	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
304.8	32.316	N/A	37	N/A	N/A	N/A	N/A	0.912	0	0	0	0.199	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
304.6	32.480	N/A	37	N/A	N/A	N/A	N/A	0.911	0	0	0	0.199	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
304.5	32.644	N/A	37	N/A	N/A	N/A	N/A	0.911	0	0	0	0.199	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
304.3	32.808	N/A	37	N/A	N/A	N/A	N/A	0.910	0	0	0	0.199	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
304.1	32.972	N/A	37	N/A	N/A	N/A	N/A	0.909	0	0	0	0.199	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
304.0	33.136	N/A	37	N/A	N/A	N/A	N/A	0.909	0	0	0	0.199	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
303.8	33.300	N/A	37	N/A	N/A	N/A	N/A	0.908	0	0	0	0.199	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
303.6	33.464	N/A	37	N/A	N/A	N/A	N/A	0.907	0	0	0	0.200	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
303.5	33.628	N/A	37	N/A	N/A	N/A	N/A	0.907	0	0	0	0.200	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
303.3	33.792	N/A	37	N/A	N/A	N/A	N/A	0.906	0	0	0	0.200	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
303.1	33.956	N/A	37	N/A	N/A	N/A	N/A	0.905	0	0	0	0.200	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
303.0	34.120	N/A	37	N/A	N/A	N/A	N/A	0.905	0	0	0	0.200	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
302.8	34.284	N/A	37	N/A	N/A	N/A	N/A	0.904	0	0	0	0.200	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				

Elev. (ft)	Depth z (ft)	Cyclic Resistance Ratio $CRR_{7.5}$	Relative Density D_r (%)	Correction for		Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CHR	Stress Reduction Coeff., t_d	Front Ground Response			Cyclic Stress Ratio CSR	Sample Screened for:			Factor of Safety FS_{liq}	Material (optional)	Soil Type (see note on following chart)
				Overburden Pressure K_o	Sloping Ground K_σ				Shear Stress τ_{max} (psf)	Induced Shear Stress τ_{avg} (psf)	Average Cyclic Shear Stress (psf)		Clay-like $(qc_{30})_{cs} \geq 175$	High Tip Res.	Unsaturated			
302.7	34.448	N/A	39	N/A	N/A	N/A	N/A	0.904	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	C	
302.5	34.612	N/A	37	N/A	N/A	N/A	N/A	0.903	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	C	
302.3	34.776	N/A	37	N/A	N/A	N/A	N/A	0.902	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	C	
302.2	34.941	N/A	37	N/A	N/A	N/A	N/A	0.902	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	C	
302.0	35.105	N/A	37	N/A	N/A	N/A	N/A	0.901	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	C	
301.8	35.269	N/A	37	N/A	N/A	N/A	N/A	0.900	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	C	
301.7	35.433	N/A	37	N/A	N/A	N/A	N/A	0.900	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	C	
301.5	35.597	N/A	37	N/A	N/A	N/A	N/A	0.899	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C	
301.3	35.761	N/A	37	N/A	N/A	N/A	N/A	0.898	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C	
301.2	35.925	N/A	37	N/A	N/A	N/A	N/A	0.898	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C	
301.0	36.089	N/A	37	N/A	N/A	N/A	N/A	0.897	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C	
300.8	36.253	N/A	37	N/A	N/A	N/A	N/A	0.896	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C	
300.7	36.417	N/A	37	N/A	N/A	N/A	N/A	0.896	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C	
300.5	36.581	N/A	37	N/A	N/A	N/A	N/A	0.895	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C	
300.4	36.745	N/A	37	N/A	N/A	N/A	N/A	0.895	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C	
300.2	36.909	N/A	37	N/A	N/A	N/A	N/A	0.894	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C	
300.0	37.073	N/A	37	N/A	N/A	N/A	N/A	0.893	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C	
299.9	37.237	N/A	37	N/A	N/A	N/A	N/A	0.893	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C	
299.7	37.401	N/A	37	N/A	N/A	N/A	N/A	0.892	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C	
299.5	37.565	N/A	37	N/A	N/A	N/A	N/A	0.891	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C	
299.4	37.729	N/A	37	N/A	N/A	N/A	N/A	0.891	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C	
299.2	37.893	N/A	37	N/A	N/A	N/A	N/A	0.890	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C	
299.0	38.057	N/A	37	N/A	N/A	N/A	N/A	0.889	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C	
298.9	38.221	N/A	37	N/A	N/A	N/A	N/A	0.889	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C	
298.7	38.385	N/A	37	N/A	N/A	N/A	N/A	0.888	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C	
298.6	38.549	N/A	37	N/A	N/A	N/A	N/A	0.887	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C	
298.4	38.713	N/A	37	N/A	N/A	N/A	N/A	0.887	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C	
298.2	38.877	N/A	37	N/A	N/A	N/A	N/A	0.886	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C	
298.1	39.042	N/A	37	N/A	N/A	N/A	N/A	0.885	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C	
297.9	39.206	N/A	37	N/A	N/A	N/A	N/A	0.885	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C	
297.7	39.370	N/A	39	N/A	N/A	N/A	N/A	0.884	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C	
297.6	39.534	N/A	37	N/A	N/A	N/A	N/A	0.883	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C	
297.4	39.698	N/A	37	N/A	N/A	N/A	N/A	0.883	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C	
297.2	39.862	N/A	37	N/A	N/A	N/A	N/A	0.882	0	0	0.202	TRUE	FALSE	FALSE	N/A	N/A	C	
297.1	40.026	N/A	37	N/A	N/A	N/A	N/A	0.881	0	0	0.202	TRUE	FALSE	FALSE	N/A	N/A	C	
296.9	40.190	N/A	37	N/A	N/A	N/A	N/A	0.881	0	0	0.202	TRUE	FALSE	FALSE	N/A	N/A	C	
296.7	40.354	N/A	37	N/A	N/A	N/A	N/A	0.880	0	0	0.202	TRUE	FALSE	FALSE	N/A	N/A	C	
296.6	40.518	N/A	38	N/A	N/A	N/A	N/A	0.879	0	0	0.202	TRUE	FALSE	FALSE	N/A	N/A	C	
296.4	40.682	N/A	37	N/A	N/A	N/A	N/A	0.879	0	0	0.202	TRUE	FALSE	FALSE	N/A	N/A	C	
296.3	40.846	N/A	37	N/A	N/A	N/A	N/A	0.878	0	0	0.202	TRUE	FALSE	FALSE	N/A	N/A	C	
296.1	41.010	N/A	37	N/A	N/A	N/A	N/A	0.877	0	0	0.202	TRUE	FALSE	FALSE	N/A	N/A	C	
295.9	41.174	N/A	37	N/A	N/A	N/A	N/A	0.877	0	0	0.202	TRUE	FALSE	FALSE	N/A	N/A	C	
295.8	41.338	N/A	37	N/A	N/A	N/A	N/A	0.876	0	0	0.202	TRUE	FALSE	FALSE	N/A	N/A	C	
295.6	41.502	N/A	37	N/A	N/A	N/A	N/A	0.875	0	0	0.202	TRUE	FALSE	FALSE	N/A	N/A	C	
295.4	41.666	N/A	37	N/A	N/A	N/A	N/A	0.875	0	0	0.202	TRUE	FALSE	FALSE	N/A	N/A	C	
295.3	41.830	N/A	37	N/A	N/A	N/A	N/A	0.874	0	0	0.202	TRUE	FALSE	FALSE	N/A	N/A	C	
295.1	41.994	N/A	37	N/A	N/A	N/A	N/A	0.873	0	0	0.202	TRUE	FALSE	FALSE	N/A	N/A	C	
294.9	42.158	N/A	37	N/A	N/A	N/A	N/A	0.873	0	0	0.202	TRUE	FALSE	FALSE	N/A	N/A	C	
294.8	42.322	N/A	37	N/A	N/A	N/A	N/A	0.872	0	0	0.202	TRUE	FALSE	FALSE	N/A	N/A	C	
294.6	42.486	N/A	37	N/A	N/A	N/A	N/A	0.871	0	0	0.202	TRUE	FALSE	FALSE	N/A	N/A	C	
294.4	42.650	N/A	37	N/A	N/A	N/A	N/A	0.871	0	0	0.202	TRUE	FALSE	FALSE	N/A	N/A	C	
294.3	42.814	N/A	37	N/A	N/A	N/A	N/A	0.870	0	0	0.202	TRUE	FALSE	FALSE	N/A	N/A	C	
294.1	42.978	N/A	37	N/A	N/A	N/A	N/A	0.869	0	0	0.202	TRUE	FALSE	FALSE	N/A	N/A	C	
294.0	43.143	N/A	38	N/A	N/A	N/A	N/A	0.869	0	0	0.202	TRUE	FALSE	FALSE	N/A	N/A	C	
293.8	43.307	N/A	37	N/A	N/A	N/A	N/A	0.868	0	0	0.202	TRUE	FALSE	FALSE	N/A	N/A	C	

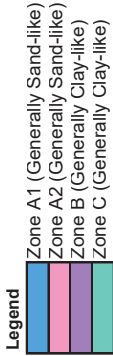
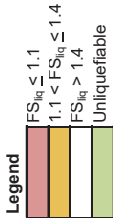
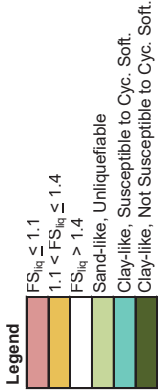
Elev. (ft)	Depth z (ft)	Cyclic Resistance Ratio $CRR_{7.5}$	Relative Density D_r (%)	Correction for		Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CHR	Stress Reduction Coeff., t_d	Front Ground Response			Cyclic Stress Ratio CSR	Sample Screened for:			Factor of Safety FS_{liq}	Material (optional)	Soil Type (see note on following chart)	
				Overburden Pressure K_o	Sloping Ground K_σ				Shear Stress τ_{max} (psf)	Induced Shear Stress τ_{avg} (psf)	Average Cyclic Shear Stress τ_{avg} (psf)		Cyclic Stress Ratio CSR	Clay-like $(qc_{30}) \geq 175$	High Tip Res. $(qc_{30}) \geq 175$				Unsaturated
293.6	43.471	N/A	37	N/A	N/A	N/A	N/A	0.867	0	0	0.202	TRUE	FALSE	FALSE	N/A	N/A	C		
293.5	43.635	N/A	37	N/A	N/A	N/A	N/A	0.867	0	0	0.202	TRUE	FALSE	FALSE	N/A	N/A	C		
293.3	43.799	N/A	37	N/A	N/A	N/A	N/A	0.866	0	0	0.202	TRUE	FALSE	FALSE	N/A	N/A	C		
293.1	43.963	N/A	37	N/A	N/A	N/A	N/A	0.865	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C		
293.0	44.127	N/A	39	N/A	N/A	N/A	N/A	0.865	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C		
292.8	44.291	N/A	37	N/A	N/A	N/A	N/A	0.864	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C		
292.6	44.455	N/A	37	N/A	N/A	N/A	N/A	0.863	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C		
292.5	44.619	N/A	37	N/A	N/A	N/A	N/A	0.863	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C		
292.3	44.783	N/A	37	N/A	N/A	N/A	N/A	0.862	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C		
292.2	44.947	N/A	37	N/A	N/A	N/A	N/A	0.861	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C		
292.0	45.111	N/A	37	N/A	N/A	N/A	N/A	0.861	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C		
291.8	45.275	N/A	37	N/A	N/A	N/A	N/A	0.860	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C		
291.7	45.439	N/A	37	N/A	N/A	N/A	N/A	0.859	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C		
291.5	45.603	N/A	37	N/A	N/A	N/A	N/A	0.859	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C		
291.3	45.767	N/A	37	N/A	N/A	N/A	N/A	0.858	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C		
291.2	45.931	N/A	37	N/A	N/A	N/A	N/A	0.857	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C		
291.0	46.095	N/A	37	N/A	N/A	N/A	N/A	0.857	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C		
290.8	46.259	N/A	37	N/A	N/A	N/A	N/A	0.856	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C		
290.7	46.423	N/A	37	N/A	N/A	N/A	N/A	0.855	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C		
290.5	46.587	N/A	38	N/A	N/A	N/A	N/A	0.855	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C		
290.3	46.751	N/A	40	N/A	N/A	N/A	N/A	0.854	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C		
290.2	46.915	N/A	41	N/A	N/A	N/A	N/A	0.853	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C		
290.0	47.079	N/A	39	N/A	N/A	N/A	N/A	0.853	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C		
289.9	47.244	N/A	37	N/A	N/A	N/A	N/A	0.852	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C		
289.7	47.408	N/A	37	N/A	N/A	N/A	N/A	0.851	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C		
289.5	47.572	N/A	37	N/A	N/A	N/A	N/A	0.851	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C		
289.4	47.736	N/A	37	N/A	N/A	N/A	N/A	0.850	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C		
289.2	47.900	N/A	37	N/A	N/A	N/A	N/A	0.849	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C		
289.0	48.064	N/A	37	N/A	N/A	N/A	N/A	0.849	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C		
288.9	48.228	N/A	38	N/A	N/A	N/A	N/A	0.848	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C		
288.7	48.392	N/A	39	N/A	N/A	N/A	N/A	0.847	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C		
288.5	48.556	N/A	38	N/A	N/A	N/A	N/A	0.847	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C		
288.4	48.720	N/A	37	N/A	N/A	N/A	N/A	0.846	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C		
288.2	48.884	N/A	39	N/A	N/A	N/A	N/A	0.845	0	0	0.201	TRUE	FALSE	FALSE	N/A	N/A	C		
288.1	49.048	N/A	39	N/A	N/A	N/A	N/A	0.844	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	C		
287.9	49.212	N/A	42	N/A	N/A	N/A	N/A	0.844	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	C		
287.7	49.376	N/A	38	N/A	N/A	N/A	N/A	0.843	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	C		
287.6	49.540	N/A	38	N/A	N/A	N/A	N/A	0.842	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	C		
287.4	49.704	N/A	38	N/A	N/A	N/A	N/A	0.842	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	C		
287.2	49.868	N/A	37	N/A	N/A	N/A	N/A	0.841	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	C		
287.1	50.032	N/A	37	N/A	N/A	N/A	N/A	0.840	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	C		
286.9	50.196	N/A	37	N/A	N/A	N/A	N/A	0.840	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	C		
286.7	50.360	N/A	38	N/A	N/A	N/A	N/A	0.839	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	C		
286.6	50.524	N/A	38	N/A	N/A	N/A	N/A	0.838	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	C		
286.4	50.688	N/A	37	N/A	N/A	N/A	N/A	0.838	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	C		
286.2	50.852	N/A	37	N/A	N/A	N/A	N/A	0.837	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	C		
286.1	51.016	N/A	37	N/A	N/A	N/A	N/A	0.836	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	C		
285.9	51.180	N/A	37	N/A	N/A	N/A	N/A	0.836	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	C		
285.8	51.345	N/A	37	N/A	N/A	N/A	N/A	0.835	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	C		
285.6	51.509	N/A	37	N/A	N/A	N/A	N/A	0.834	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	C		
285.4	51.673	N/A	37	N/A	N/A	N/A	N/A	0.834	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	C		
285.3	51.837	N/A	37	N/A	N/A	N/A	N/A	0.833	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	C		
285.1	52.001	N/A	38	N/A	N/A	N/A	N/A	0.832	0	0	0.200	TRUE	FALSE	FALSE	N/A	N/A	C		
284.9	52.165	N/A	37	N/A	N/A	N/A	N/A	0.832	0	0	0.199	TRUE	FALSE	FALSE	N/A	N/A	C		
284.8	52.329	N/A	37	N/A	N/A	N/A	N/A	0.831	0	0	0.199	TRUE	FALSE	FALSE	N/A	N/A	C		

Front Ground Response										Sample Screened for:					Factor of Safety FS _{liq}	Material (optional)	Soil Type (see note on following chart)
Elev. (ft)	Depth z (ft)	Cyclic Resistance Ratio CRR _{7.5}	Relative Density D _r (%)	Correction for Overburden Pressure K _σ	Correction for Sloping Ground K _α	Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., t _d	Induced Shear Stress τ _{max} (psf)	Average Cyclic Shear Stress τ _{Avg} (psf)	Cyclic Stress Ratio CSR	Clay-like (qc ₃₀) ≥ 175	High Tip Res. (qc ₃₀) ≥ 175	Unsaturated			
266.6	70.537	N/A	44	N/A	N/A	N/A	N/A	0.758	0	0	0.190	TRUE	FALSE	FALSE	N/A	N/A	C
266.4	70.701	N/A	42	N/A	N/A	N/A	N/A	0.757	0	0	0.190	TRUE	FALSE	FALSE	N/A	N/A	C
266.2	70.865	N/A	40	N/A	N/A	N/A	N/A	0.757	0	0	0.190	TRUE	FALSE	FALSE	N/A	N/A	C
266.1	71.029	N/A	40	N/A	N/A	N/A	N/A	0.756	0	0	0.190	TRUE	FALSE	FALSE	N/A	N/A	C
265.9	71.193	N/A	42	N/A	N/A	N/A	N/A	0.756	0	0	0.189	TRUE	FALSE	FALSE	N/A	N/A	C
265.7	71.357	N/A	42	N/A	N/A	N/A	N/A	0.755	0	0	0.189	TRUE	FALSE	FALSE	N/A	N/A	C
265.6	71.521	N/A	40	N/A	N/A	N/A	N/A	0.754	0	0	0.189	TRUE	FALSE	FALSE	N/A	N/A	C
265.4	71.685	N/A	40	N/A	N/A	N/A	N/A	0.754	0	0	0.189	TRUE	FALSE	FALSE	N/A	N/A	C
265.3	71.850	N/A	41	N/A	N/A	N/A	N/A	0.753	0	0	0.189	TRUE	FALSE	FALSE	N/A	N/A	C
265.1	72.014	0.136	55	0.915	1.097	0.98	0.134	0.752	0	0	0.189	FALSE	FALSE	FALSE	0.7	N/A	A1
264.9	72.178	0.150	59	0.908	1.279	0.98	0.171	0.752	0	0	0.189	FALSE	FALSE	FALSE	0.9	N/A	A1
264.8	72.342	0.184	65	0.895	1.620	0.97	0.259	0.751	0	0	0.189	FALSE	FALSE	FALSE	1.4	N/A	A1
264.6	72.506	0.210	68	0.887	1.810	0.97	0.326	0.751	0	0	0.189	FALSE	FALSE	FALSE	1.7	N/A	A1
264.4	72.670	0.252	71	0.877	2.047	0.96	0.434	0.750	0	0	0.189	FALSE	FALSE	FALSE	2.3	N/A	A1
264.3	72.834	0.307	74	0.866	2.274	0.95	0.578	0.749	0	0	0.188	FALSE	FALSE	FALSE	3.1	N/A	A1
264.1	72.998	0.415	77	0.852	2.574	0.95	0.861	0.749	0	0	0.188	FALSE	FALSE	FALSE	4.6	N/A	A1
263.9	73.162	N/A	84	N/A	N/A	N/A	N/A	0.748	0	0	0.188	FALSE	TRUE	FALSE	N/A	N/A	A1
263.8	73.326	N/A	96	N/A	N/A	N/A	N/A	0.748	0	0	0.188	FALSE	TRUE	FALSE	N/A	N/A	A1
263.6	73.490	N/A	100	N/A	N/A	N/A	N/A	0.747	0	0	0.188	FALSE	TRUE	FALSE	N/A	N/A	A1
263.4	73.654	N/A	100	N/A	N/A	N/A	N/A	0.746	0	0	0.188	FALSE	TRUE	FALSE	N/A	N/A	A1
263.3	73.818	N/A	100	N/A	N/A	N/A	N/A	0.746	0	0	0.188	FALSE	TRUE	FALSE	N/A	N/A	A1
263.1	73.982	N/A	100	N/A	N/A	N/A	N/A	0.745	0	0	0.188	FALSE	TRUE	FALSE	N/A	N/A	A1
263.0	74.146	N/A	100	N/A	N/A	N/A	N/A	0.745	0	0	0.188	FALSE	TRUE	FALSE	N/A	N/A	A1
262.8	74.310	N/A	100	N/A	N/A	N/A	N/A	0.744	0	0	0.187	FALSE	TRUE	FALSE	N/A	N/A	A1
262.6	74.474	N/A	100	N/A	N/A	N/A	N/A	0.743	0	0	0.187	FALSE	TRUE	FALSE	N/A	N/A	A1
262.5	74.638	N/A	100	N/A	N/A	N/A	N/A	0.743	0	0	0.187	FALSE	TRUE	FALSE	N/A	N/A	A1
262.3	74.802	N/A	100	N/A	N/A	N/A	N/A	0.742	0	0	0.187	FALSE	TRUE	FALSE	N/A	N/A	A1
262.1	74.966	N/A	100	N/A	N/A	N/A	N/A	0.742	0	0	0.187	FALSE	TRUE	FALSE	N/A	N/A	A1
262.0	75.130	N/A	100	N/A	N/A	N/A	N/A	0.741	0	0	0.187	FALSE	TRUE	FALSE	N/A	N/A	A1
261.8	75.294	N/A	100	N/A	N/A	N/A	N/A	0.740	0	0	0.187	FALSE	TRUE	FALSE	N/A	N/A	A1
261.6	75.458	N/A	100	N/A	N/A	N/A	N/A	0.740	0	0	0.187	FALSE	TRUE	FALSE	N/A	N/A	A1
261.5	75.622	N/A	100	N/A	N/A	N/A	N/A	0.739	0	0	0.187	FALSE	TRUE	FALSE	N/A	N/A	A1
261.3	75.786	N/A	100	N/A	N/A	N/A	N/A	0.739	0	0	0.187	FALSE	TRUE	FALSE	N/A	N/A	A1
261.1	75.951	N/A	100	N/A	N/A	N/A	N/A	0.738	0	0	0.186	FALSE	TRUE	FALSE	N/A	N/A	A1
261.0	76.115	N/A	100	N/A	N/A	N/A	N/A	0.737	0	0	0.186	FALSE	TRUE	FALSE	N/A	N/A	A1
260.8	76.279	N/A	100	N/A	N/A	N/A	N/A	0.737	0	0	0.186	FALSE	TRUE	FALSE	N/A	N/A	A1
260.7	76.443	N/A	100	N/A	N/A	N/A	N/A	0.736	0	0	0.186	FALSE	TRUE	FALSE	N/A	N/A	A1
260.5	76.607	N/A	100	N/A	N/A	N/A	N/A	0.736	0	0	0.186	FALSE	TRUE	FALSE	N/A	N/A	A1
260.3	76.771	N/A	100	N/A	N/A	N/A	N/A	0.735	0	0	0.186	FALSE	TRUE	FALSE	N/A	N/A	A1
260.2	76.935	N/A	100	N/A	N/A	N/A	N/A	0.735	0	0	0.186	FALSE	TRUE	FALSE	N/A	N/A	A1
260.0	77.099	N/A	100	N/A	N/A	N/A	N/A	0.734	0	0	0.186	FALSE	TRUE	FALSE	N/A	N/A	A1
259.8	77.263	N/A	100	N/A	N/A	N/A	N/A	0.733	0	0	0.186	FALSE	TRUE	FALSE	N/A	N/A	A1
259.7	77.427	N/A	100	N/A	N/A	N/A	N/A	0.733	0	0	0.186	FALSE	TRUE	FALSE	N/A	N/A	A1
259.5	77.591	N/A	100	N/A	N/A	N/A	N/A	0.732	0	0	0.185	FALSE	TRUE	FALSE	N/A	N/A	A1
259.3	77.755	N/A	100	N/A	N/A	N/A	N/A	0.732	0	0	0.185	FALSE	TRUE	FALSE	N/A	N/A	A1
259.2	77.919	N/A	96	N/A	N/A	N/A	N/A	0.731	0	0	0.185	FALSE	TRUE	FALSE	N/A	N/A	A1
259.0	78.083	N/A	95	N/A	N/A	N/A	N/A	0.731	0	0	0.185	FALSE	TRUE	FALSE	N/A	N/A	A1
258.9	78.247	N/A	91	N/A	N/A	N/A	N/A	0.730	0	0	0.185	FALSE	TRUE	FALSE	N/A	N/A	A1
258.7	78.411	N/A	97	N/A	N/A	N/A	N/A	0.729	0	0	0.185	FALSE	TRUE	FALSE	N/A	N/A	A1
258.5	78.575	N/A	90	N/A	N/A	N/A	N/A	0.729	0	0	0.185	FALSE	TRUE	FALSE	N/A	N/A	A1
258.4	78.739	N/A	86	N/A	N/A	N/A	N/A	0.728	0	0	0.185	FALSE	TRUE	FALSE	N/A	N/A	A1
258.2	78.903	N/A	88	N/A	N/A	N/A	N/A	0.728	0	0	0.185	FALSE	TRUE	FALSE	N/A	N/A	A1
258.0	79.067	N/A	95	N/A	N/A	N/A	N/A	0.727	0	0	0.185	FALSE	TRUE	FALSE	N/A	N/A	A1
257.9	79.231	N/A	100	N/A	N/A	N/A	N/A	0.727	0	0	0.184	FALSE	TRUE	FALSE	N/A	N/A	A1

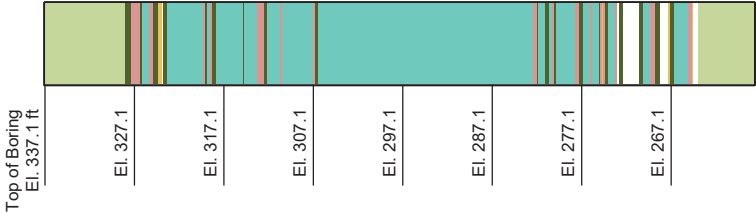
SP09



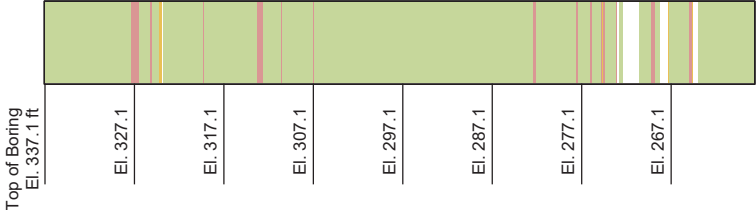
Adapted from "Discussion of 'Liquefaction Potential of Silts from CPTu'" (Robertson 2008). Zone A_1 and Zone A_2 samples are generally sand-like. Zone B samples are generally clay-like and not susceptible to cyclic softening. Zone C samples are generally clay-like and susceptible to cyclic softening. Note that the transition from clay-like to sand-like in this chart does not exactly match the liquefaction calculations herein; that is, some transitional samples in Zone B and Zone C will be treated as sand-like and analyzed for liquefaction if the calculations indicate as such.



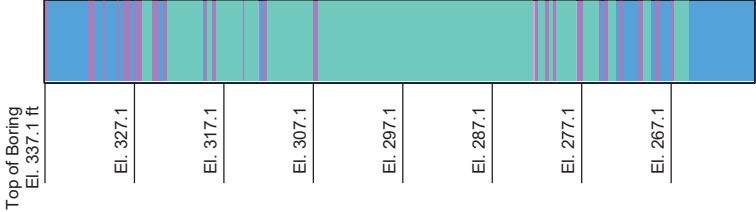
SP09, Liquefaction Triggering Results



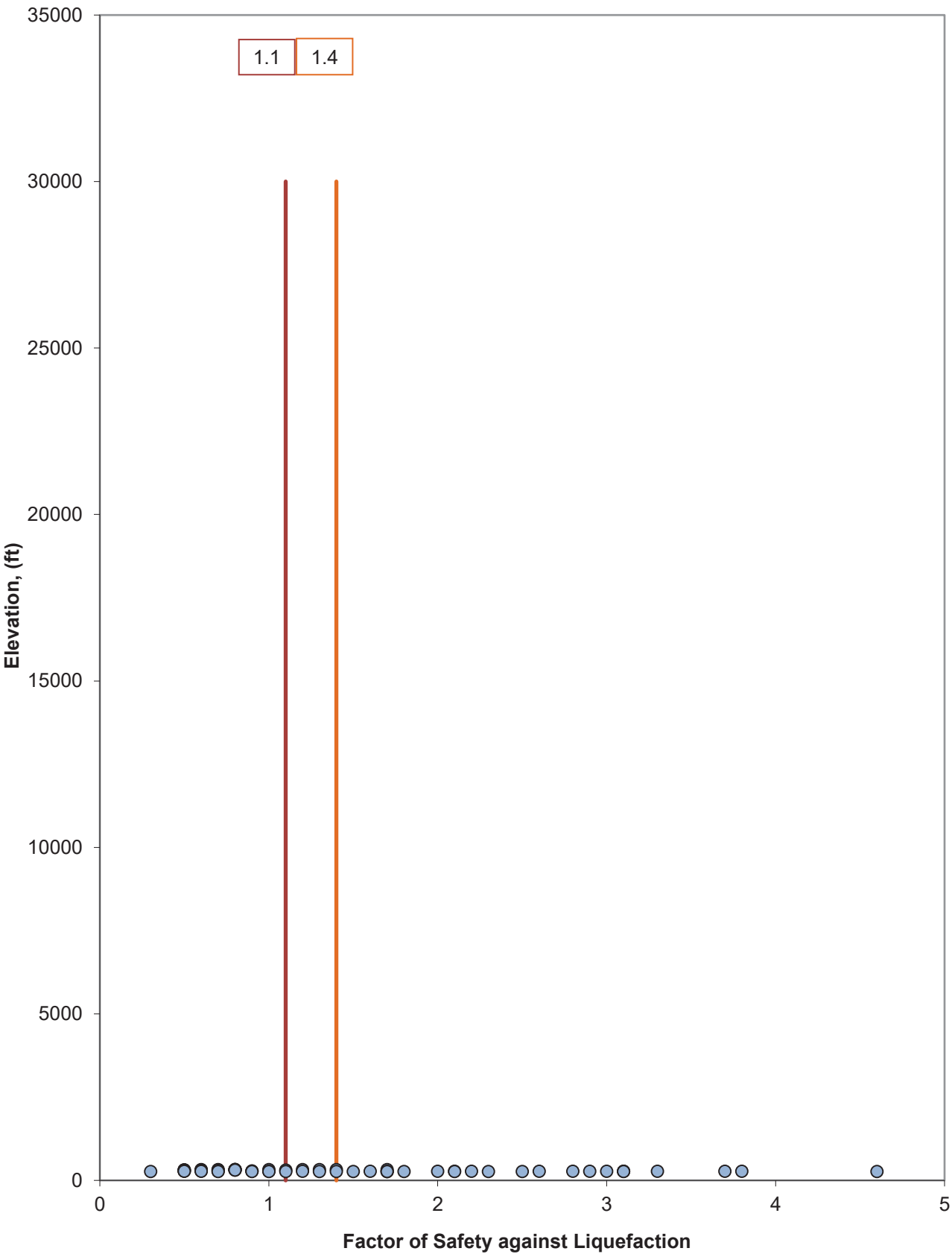
SP09, Liquefaction Triggering Results



SP09, Robertson Soil Type



US 60 Bridge, Boring = SP09, Source = Design Source, Mw = 7.7, Event = Design Event,
CPT Data, Simplified Stress-Based Approach



Project Information

Slantec Project Number = 178565011
Project Name = US 60 Bridge
CPT ID = SP10

Boring Location (optional)

Nothing =
Easting =

OR

Baseline Station =
Offset (+ Right) =

Inputs

Depth (ft)	Corrected Cone Tip Resistance, q_c (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
0.164	18156	0.936	120							
0.328	38171	0.965	120							
0.492	54702	0.716	120							
0.656	57426	0.674	120							
0.820	53236	0.590	120							
0.984	51221	0.550	120							
1.148	47231	0.698	120							
1.312	42475	0.945	120							
1.476	36971	1.144	120							
1.640	31879	1.181	120							
1.804	27731	1.042	120							
1.968	24178	0.852	120							
2.133	22638	0.682	120							
2.297	23064	0.647	120							
2.461	22916	0.637	120							
2.625	23225	0.668	120							
2.789	23674	0.753	120							
2.953	23740	0.841	120							
3.117	23273	0.821	120							
3.281	21848	0.848	120							
3.445	21379	0.853	120							
3.609	20217	0.775	120							
3.773	19701	0.717	120							
3.937	19600	0.894	120							
4.101	19447	0.710	120							
4.265	18746	0.674	120							
4.429	22621	0.722	120							
4.593	24976	0.810	120							
4.757	25411	0.862	120							
4.921	30340	1.038	120							
5.085	38327	1.221	120							
5.249	33338	1.339	120							
5.413	34978	1.373	120							
5.577	29521	1.151	120							
5.741	25163	1.065	120							
5.905	24372	0.970	120							
6.069	22083	0.951	120							
6.234	18506	0.795	120							
6.398	13254	0.590	120							
6.562	9524	0.536	120							
6.726	9413	0.490	120							
6.890	9378	0.508	120							
7.054	9166	0.425	120							
7.218	9046	0.392	120							
7.382	10012	0.397	120							
7.546	10842	0.427	120							
7.710	12311	0.470	120							
7.874	12714	0.463	120							
8.038	12063	0.525	120							
8.202	10153	0.508	120							
8.366	18623	0.520	120							
8.530	38011	0.639	120							
8.694	31980	0.762	120							
8.858	22243	0.685	120							
9.022	14657	0.579	120							
9.186	11537	0.306	120							
9.350	8955	0.225	120							
9.514	9342	0.215	120							
9.678	91043	0.130	120							
9.842	8166	0.043	120							
10.006	9392	0.188	120							
10.170	12558	0.268	120							
10.335	13211	0.268	120							

Using qt (corrected for u2 PWP) or qc (backcalculated uncorrected field tip)

Cone ID (optional) =
Use qc instead of qt? (1: Yes, 0: No)
Cone Area Rate (a) = 0

Drilling Information

Top of Hole Elevation = 338.3 feet
Water Depth during CPT (negative for US borings) = 13.8 feet
Depth data collection began = 0.00 feet
Avg. Total Unit WL Above 1st Sample =

During Earthquake Information

Water Depth during EQ (relative to CPT TOH, negative for US borings) = 13.8 feet
Final Grade Elevation during EQ = 338.3 feet
Avg. Total Unit WL of Cui/Fill = 120 pcf

Nonlinear Pore Water Pressure Profile

Cu/Pore Water Pressure Profile? (1: Yes, 0: No)
If previous answer is No, hydrostatic pressures are assumed.

α Curve Fit Parameters

Associated α profile: 1 (1: Yes, 0: No)
 α at each Sample Depth known?
If previous answer is No, then enter curve fit parameters below (a vs. depth curve)
If defaulting to $K_s=1$ (i.e., level ground), assign values of zero to all curve fit parameters below to make α zero and thus, K_s will be one.

m4:
m3:
m2:
m1:
m0:

Associated ground response profile:

Get CSR from shear stress envelope?
If previous answer is No, then CSR will be calculated using a_{max} and r_d
Max. Shear Stress at each sample depth known?
If previous answer is No, then enter curve fit parameters below (shear stress vs. depth curve)

Max. Shear Stress Curve Fit Parameters (from ground response analysis)

Borings, spr10, nor 0 (1: Yes, 0: No)
m4:
m3:
m2:
m1:

Earthquake Information

EQ Source (e.g., New Madrid)
Event (e.g., MCE, OBE)
 a_{max} (g) (top of ground surface)
EQ Mag (Mw)
Design Source
Design Event
0.21
7.7

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
10.499	12,328	0.330	120							
10.663	15,066	0.304	120							
10.827	16,672	0.368	120							
10.991	11,485	0.331	120							
11.155	8,362	0.313	120							
11.319	12,370	0.335	120							
11.483	20,213	0.555	120							
11.647	50,406	0.715	120							
11.811	77,825	1.280	120							
11.975	72,329	1.367	120							
12.139	57,922	1.180	120							
12.303	30,120	1.258	120							
12.467	16,608	0.801	120							
12.631	9,818	0.370	120							
12.795	10,536	0.214	120							
12.959	9,012	0.227	120							
13.123	12,664	0.332	120							
13.287	14,594	0.416	120							
13.451	14,286	0.523	120							
13.615	8,759	0.415	120							
13.779	6,511	0.295	120							
13.943	12,573	0.237	120							
14.107	10,704	0.216	120							
14.271	6,064	0.206	120							
14.436	5,929	0.148	120							
14.600	3,819	0.092	120							
14.764	5,962	0.123	120							
14.928	6,517	0.087	120							
15.092	4,964	0.101	120							
15.256	4,453	0.080	120							
15.420	3,723	0.058	120							
15.584	4,123	0.051	120							
15.748	4,946	0.072	120							
15.912	6,408	0.125	120							
16.076	5,824	0.153	120							
16.240	8,510	0.150	120							
16.404	6,776	0.144	120							
16.568	8,451	0.115	120							
16.732	9,855	0.106	120							
16.896	7,370	0.085	120							
17.060	6,113	0.118	120							
17.224	11,318	0.116	120							
17.388	7,318	0.151	120							
17.552	5,684	0.114	120							
17.716	5,269	0.053	120							
17.880	5,165	0.053	120							
18.044	5,656	0.045	120							
18.208	5,556	0.051	120							
18.372	5,674	0.052	120							
18.537	4,869	0.050	120							
18.701	5,209	0.058	120							
18.865	5,720	0.061	120							
19.029	5,411	0.063	120							
19.193	6,081	0.071	120							
19.357	6,498	0.065	120							
19.521	5,269	0.143	120							
19.685	9,527	0.130	120							
19.849	10,009	0.153	120							
20.013	7,423	0.136	120							
20.177	5,192	0.098	120							
20.341	5,048	0.069	120							
20.505	5,231	0.051	120							
20.669	4,989	0.049	120							
20.833	5,142	0.053	120							
20.997	5,210	0.051	120							
21.161	5,703	0.048	120							
21.325	5,770	0.060	120							
21.489	6,311	0.065	120							
21.653	9,078	0.081	120							
21.817	6,414	0.081	120							
21.981	5,541	0.076	120							
22.145	5,675	0.039	120							
22.309	6,208	0.051	120							
22.473	14,934	0.139	120							
22.638	18,355	0.211	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
22.802	13,143	0.274	120							
22.966	8,103	0.236	120							
23.130	9,625	0.165	120							
23.294	16,054	0.248	120							
23.458	12,740	0.260	120							
23.622	20,473	0.351	120							
23.786	22,552	0.313	120							
23.950	15,360	0.276	120							
24.114	10,627	0.247	120							
24.278	19,156	0.237	120							
24.442	17,733	0.212	120							
24.606	20,238	0.231	120							
24.770	16,265	0.260	120							
24.934	12,852	0.140	120							
25.098	13,800	0.098	120							
25.262	9,514	0.074	120							
25.426	8,043	0.096	120							
25.590	9,189	0.128	120							
25.754	10,760	0.097	120							
25.918	8,498	0.134	120							
26.082	21,163	0.300	120							
26.246	14,191	0.257	120							
26.410	10,841	0.260	120							
26.574	8,228	0.136	120							
26.739	8,526	0.099	120							
26.903	9,749	0.089	120							
27.067	8,131	0.083	120							
27.231	7,280	0.077	120							
27.395	7,632	0.072	120							
27.559	8,588	0.076	120							
27.723	8,590	0.088	120							
27.887	9,080	0.095	120							
28.051	9,814	0.130	120							
28.215	14,257	0.193	120							
28.379	12,148	0.249	120							
28.543	13,413	0.169	120							
28.707	11,862	0.096	120							
28.871	10,529	0.163	120							
29.035	12,633	0.196	120							
29.199	26,361	0.238	120							
29.363	36,917	0.390	120							
29.527	89,413	0.821	120							
29.691	84,418	0.626	120							
29.855	74,978	0.270	120							
30.019	58,339	1.114	120							
30.183	43,184	1.244	120							
30.347	26,020	1.558	120							
30.511	26,772	1.268	120							
30.675	54,852	1.030	120							
30.840	66,754	0.982	120							
31.004	49,662	0.949	120							
31.168	30,388	0.889	120							
31.332	16,498	0.655	120							
31.496	13,563	0.396	120							
31.660	14,700	0.161	120							
31.824	11,873	0.160	120							
31.988	16,512	0.178	120							
32.152	15,801	0.186	120							
32.316	11,168	0.174	120							
32.480	29,725	0.220	120							
32.644	44,898	0.600	120							
32.808	27,495	0.826	120							
32.972	18,014	0.625	120							
33.136	15,479	0.594	120							
33.300	17,800	0.326	120							
33.464	11,727	0.299	120							
33.628	11,180	0.198	120							
33.792	10,633	0.139	120							
33.956	14,711	0.155	120							
34.120	19,085	0.210	120							
34.284	36,022	0.489	120							
34.448	21,729	0.394	120							
34.612	14,117	0.393	120							
34.776	15,910	0.227	120							
34.941	20,811	0.201	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
35.105	25,609	0.332	120							
35.269	21,227	0.320	120							
35.433	15,642	0.240	120							
35.597	45,045	0.314	120							
35.761	57,319	0.522	120							
35.925	49,027	0.807	120							
36.089	41,155	1.022	120							
36.253	38,507	0.965	120							
36.417	22,388	0.532	120							
36.581	15,987	0.363	120							
36.745	11,531	0.255	120							
36.909	11,060	0.127	120							
37.073	20,035	0.283	120							
37.237	28,371	0.429	120							
37.401	22,473	0.578	120							
37.565	24,430	0.397	120							
37.729	31,653	0.323	120							
37.893	37,918	0.455	120							
38.057	47,136	0.490	120							
38.221	55,861	0.235	120							
38.385	40,053	0.586	120							
38.549	24,710	0.590	120							
38.713	16,049	0.524	120							
38.877	13,603	0.295	120							
39.042	20,145	0.288	120							
39.206	31,091	0.520	120							
39.370	28,302	0.553	120							
39.534	98,638	0.615	120							
39.698	87,482	0.982	120							
39.862	44,824	1.239	120							
40.026	25,440	0.940	120							
40.190	15,944	0.624	120							
40.354	12,830	0.266	120							
40.518	10,618	0.150	120							
40.682	10,711	0.117	120							
40.846	10,945	0.103	120							
41.010	10,877	0.101	120							
41.174	10,010	0.094	120							
41.338	10,899	0.113	120							
41.502	10,742	0.086	120							
41.666	12,400	0.078	120							
41.830	13,259	0.089	120							
41.994	10,712	0.080	120							
42.158	9,037	0.084	120							
42.322	8,998	0.055	120							
42.486	8,964	0.076	120							
42.650	11,203	0.512	120							
42.814	23,401	0.326	120							
42.978	15,772	0.729	120							
43.143	9,450	0.248	120							
43.307	9,964	0.101	120							
43.471	8,797	0.082	120							
43.635	8,572	0.079	120							
43.799	8,671	0.071	120							
43.963	8,842	0.064	120							
44.127	8,910	0.081	120							
44.291	8,741	0.074	120							
44.455	9,742	0.153	120							
44.619	10,480	0.170	120							
44.783	9,472	0.179	120							
44.947	9,808	0.107	120							
45.111	10,042	0.097	120							
45.275	9,957	0.101	120							
45.439	9,699	0.096	120							
45.603	9,601	0.090	120							
45.767	9,821	0.077	120							
45.931	10,062	0.086	120							
46.095	10,158	0.092	120							
46.259	10,254	0.093	120							
46.423	10,406	0.268	120							
46.587	20,596	0.420	120							
46.751	12,411	0.452	120							
46.915	11,590	0.459	120							
47.079	11,066	0.139	120							
47.244	11,487	0.152	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
47.408	10,629	0.518	120							
47.572	27,287	0.951	120							
47.736	22,336	0.925	120							
47.900	11,999	0.798	120							
48.064	13,334	0.900	120							
48.228	29,856	0.563	120							
48.392	14,863	0.583	120							
48.556	13,688	0.580	120							
48.720	11,154	0.271	120							
48.884	11,033	0.195	120							
49.048	11,145	0.096	120							
49.212	10,698	0.103	120							
49.376	11,076	0.106	120							
49.540	17,064	0.246	120							
49.704	15,311	0.284	120							
49.868	11,432	0.296	120							
50.032	11,152	0.121	120							
50.196	11,158	0.074	120							
50.360	18,292	0.356	120							
50.524	16,827	0.375	120							
50.688	11,497	0.324	120							
50.852	11,047	0.112	120							
51.016	10,850	0.086	120							
51.180	10,862	0.124	120							
51.345	15,733	0.242	120							
51.509	91,501	0.709	120							
51.673	75,281	1.379	120							
51.837	83,132	1.941	120							
52.001	35,011	1.830	120							
52.165	20,074	0.958	120							
52.329	19,949	0.973	120							
52.493	95,928	1.313	120							
52.657	45,496	1.767	120							
52.821	27,211	0.906	120							
52.985	17,517	0.614	120							
53.149	13,592	0.373	120							
53.313	13,711	0.384	120							
53.477	109,034	0.689	120							
53.641	163,259	1.019	120							
53.805	177,049	1.384	120							
53.969	127,697	2.158	120							
54.133	39,413	2.226	120							
54.297	39,403	1.370	120							
54.461	158,398	1.461	120							
54.625	146,934	1.241	120							
54.789	83,212	2.561	120							
54.953	44,037	2.283	120							
55.117	51,589	2.524	120							
55.281	48,574	1.752	120							
55.446	32,528	1.288	120							
55.610	26,313	0.863	120							
55.774	30,729	0.610	120							
55.938	30,181	0.661	120							
56.102	30,419	0.666	120							
56.266	47,452	0.510	120							
56.430	137,632	1.052	120							
56.594	83,526	1.862	120							
56.758	42,770	1.829	120							
56.922	34,626	1.365	120							
57.086	28,769	0.761	120							
57.250	19,445	0.414	120							
57.414	19,141	0.234	120							
57.578	16,504	0.133	120							
57.742	17,972	0.231	120							
57.906	16,400	0.392	120							
58.070	36,561	0.574	120							
58.234	85,021	0.979	120							
58.398	74,793	1.689	120							
58.562	41,429	1.779	120							
58.726	26,441	1.077	120							
58.890	19,836	0.512	120							
59.054	17,202	0.196	120							
59.218	15,843	0.139	120							
59.382	15,249	0.094	120							
59.547	15,472	0.087	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
59.711	13,947	0.065	120							
59.875	13,615	0.095	120							
60.039	14,167	0.087	120							
60.203	17,167	0.131	120							
60.367	18,643	0.344	120							
60.531	23,798	0.460	120							
60.695	130,582	0.708	120							
60.859	171,331	1.284	120							
61.023	175,742	1.544	120							
61.187	199,517	1.919	120							
61.351	224,195	2.201	120							
61.515	231,688	2.001	120							
61.679	247,244	1.703	120							
61.843	232,696	1.798	120							
62.007	205,290	1.850	120							
62.171	195,633	1.822	120							
62.335	185,720	1.675	120							
62.499	178,482	1.554	120							
62.663	174,095	1.547	120							
62.827	166,469	1.528	120							
62.991	156,192	1.552	120							
63.155	141,261	1.857	120							
63.319	100,844	2.591	120							
63.483	51,280	2.463	120							
63.648	32,067	1.699	120							
63.812	26,494	0.810	120							
63.976	76,674	0.376	120							
64.140	149,483	1.205	120							
64.304	163,357	1.983	120							
64.468	124,059	1.809	120							
64.632	74,561	1.770	120							
64.796	84,692	2.846	120							
64.960	55,254	1.851	120							
65.124	37,941	1.783	120							
65.288	83,769	1.245	120							
65.452	86,642	1.199	120							
65.616	86,377	1.046	120							
65.780	119,570	0.715	120							
65.944	112,603	1.241	120							
66.108	68,974	2.062	120							
66.272	42,742	1.716	120							
66.436	46,476	1.19	120							
66.600	110,434	1.088	120							
66.764	98,933	2.075	120							
66.928	98,592	2.148	120							
67.092	134,090	1.814	120							
67.256	206,165	2.232	120							
67.420	158,772	2.739	120							
67.584	72,128	3.927	120							
67.749	49,508	2.326	120							
67.913	77,582	2.122	120							
68.077	309,536	2.401	120							
68.241	347,432	3.744	120							
68.405	251,444	4.978	120							
68.569	123,845	5.953	120							
68.733	62,095	3.775	120							
68.897	49,488	2.988	120							
69.061	164,794	2.786	120							
69.225	148,725	3.491	120							
69.389	73,061	2.922	120							
69.553	87,573	2.734	120							
69.717	209,493	2.817	120							
69.881	293,183	3.332	120							
70.045	328,066	3.696	120							
70.209	331,066	4.284	120							
70.373	314,026	5.114	120							
70.537	272,937	5.486	120							
70.701	218,437	5.173	120							
70.865	289,697	4.124	120							
71.029	330,260	3.812	120							
71.193	277,725	3.691	120							
71.357	182,184	3.462	120							
71.521	93,355	3.089	120							
71.685	51,456	2.411	120							
71.850	36,119	1.452	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
72.014	37.181	0.986	120							
72.178	71.528	1.641	120							
72.342	129.433	1.650	120							
72.506	156.143	1.201	120							
72.670	140.082	2.226	120							
72.834	103.011	2.439	120							
72.998	109.631	2.407	120							
73.162	72.131	2.452	120							
73.326	42.525	1.520	120							
73.490	29.793	1.526	120							
73.654	41.102	2.038	120							
73.818	132.114	2.286	120							
73.982	197.250	2.172	120							
74.146	232.069	1.948	120							
74.310	221.032	2.063	120							
74.474	206.497	1.922	120							
74.638	198.021	1.773	120							
74.802	187.067	1.663	120							
74.966	178.133	1.589	120							
75.130	170.180	1.310	120							
75.294	153.725	1.383	120							
75.458	121.470	1.490	120							
75.622	82.411	1.807	120							
75.786	65.173	2.012	120							
75.951	41.649	1.994	120							
76.115	40.991	2.098	120							
76.279	41.638	1.456	120							
76.443	121.527	1.360	120							
76.607	235.140	1.565	120							
76.771	217.351	1.901	120							
76.935	202.054	1.998	120							
77.099	194.869	2.086	120							
77.263	205.065	1.982	120							
77.427	238.713	1.974	120							
77.591	258.212	1.756	120							
77.755	237.057	1.421	120							
77.919	206.325	0.936	120							
78.083	191.017	0.986	120							
78.247	194.976	0.337	120							
78.411	133.977	0.276	120							
78.575	115.365	0.153	120							
78.739	146.677	0.662	120							
78.903	189.222	0.897	120							
79.067	246.165	1.687	120							
79.231	266.589	5.131	120							
79.395	338.063	4.587	120							
79.559	363.359	4.002	120							
79.723	260.983	2.743	120							
79.887	220.042	1.663	120							
80.052	220.555	1.484	120							
80.216	236.357	1.839	120							
80.380	236.538	1.961	120							
80.544	220.380	2.160	120							
80.708	230.815	2.094	120							
80.872	279.637	2.060	120							
81.036	326.053	2.582	120							
81.200	342.998	3.150	120							
81.364	345.326	3.441	120							
81.528	353.595	3.447	120							
81.692	343.497	3.623	120							
81.856	353.279	3.591	120							
82.020	338.559	3.554	120							
82.184	316.346	3.734	120							
82.348	301.212	3.525	120							
82.512	300.183	3.407	120							
82.676	288.436	3.343	120							
82.840	285.166	3.191	120							
83.004	295.676	3.086	120							
83.168	303.188	3.397	120							
83.332	292.013	3.747	120							
83.496	280.538	3.822	120							
83.660	277.412	3.756	120							
83.824	278.406	3.715	120							
83.988	277.496	3.665	120							
84.153	276.620	3.650	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
84.317	261.700	3.689	120							
84.481	260.360	3.703	120							
84.645	303.268	3.610	120							
84.809	318.440	3.159	120							
84.973	308.570	3.208	120							
85.137	286.450	2.828	120							
85.301	263.199	2.763	120							
85.465	266.225	3.288	120							
85.629	276.379	2.707	120							
85.793	256.371	3.020	120							
85.957	248.410	2.389	120							
86.121	250.095	2.237	120							
86.285	239.024	2.260	120							
86.449	245.509	2.163	120							
86.613	258.348	2.445	120							
86.777	263.769	2.391	120							
86.941	310.267	2.309	120							
87.105	353.534	2.335	120							
87.269	356.703	2.635	120							
87.433	328.924	3.093	120							
87.597	316.477	3.044	120							
87.761	321.017	3.359	120							
87.925	335.834	3.511	120							
88.089	371.831	3.675	120							
88.254	392.585	3.998	120							
88.418	386.923	3.121	120							
88.582	357.358	3.295	120							
88.746	260.638	2.532	120							
88.910	244.482	1.824	120							
89.074	353.089	1.872	120							
89.238	403.552	2.015	120							
89.402	450.265	1.959	120							
89.566	468.301	2.434	120							
89.730	494.914	2.741	120							
89.894	495.810	2.820	120							
90.058	499.646	2.889	120							
90.222	485.601	2.804	120							
90.386	614.222	2.684	120							
90.550	635.245	3.120	120							
90.714	556.371	4.197	120							
90.878	343.071	2.017	120							
91.042	346.728	2.300	120							
91.206	369.443	2.230	120							
91.370	241.142	1.431	120							
91.534	191.817	0.972	120							
91.698	164.570	0.963	120							
91.862	145.116	0.987	120							
92.026	172.534	0.639	120							
92.190	317.876	1.131	120							
92.355	364.597	1.486	120							
92.519	376.905	1.961	120							
92.683	335.519	2.024	120							
92.847	303.169	1.999	120							
93.011	291.249	1.579	120							
93.175	277.448	1.383	120							
93.339	276.984	1.420	120							
93.503	257.474	1.083	120							
93.667	227.785	1.522	120							
93.831	188.668	1.227	120							
93.995	113.717	0.472	120							
94.159	103.823	0.385	120							
94.323	130.576	1.534	120							
94.487	157.860	1.589	120							
94.651	157.299	2.257	120							
94.815	198.788	2.003	120							
94.979	262.142	1.819	120							
95.143	360.591	1.871	120							
95.307	379.728	2.054	120							
95.471	341.056	1.845	120							
95.635	282.773	1.933	120							
95.799	243.179	1.617	120							
95.963	202.259	2.734	120							
96.127	151.500	4.546	120							
96.291	158.908	3.809	120							
96.456	317.310	2.517	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
96.620	414.739	1.893	120							
96.784	362.634	1.948	120							
96.948	305.173	2.749	120							
97.112	274.561	2.707	120							
97.276	195.374	2.720	120							
97.440	130.575	3.738	120							
97.604	82.845	2.809	120							
97.768	34.939	1.952	120							
97.932	21.777	1.101	120							
98.096	25.643	0.454	120							
98.260	22.960	0.323	120							
98.424	22.792	0.227	120							
98.588	22.939	0.191	120							
98.752	22.942	0.183	120							
98.916	23.034	0.201	120							
99.080	22.799	0.204	120							
99.244	21.640	0.192	120							
99.408	21.935	0.182	120							
99.572	22.234	0.191	120							
99.736	22.800	0.206	120							
99.900	21.588	0.194	120							
100.064	21.022	0.189	120							
100.228	21.069	0.166	120							
100.392	20.553	0.151	120							
100.557	20.649	0.168	120							
100.721	21.187	0.183	120							
100.885	21.192	0.205	120							
101.049	21.084	0.204	120							
101.213	20.763	0.220	120							
101.377	19.997	0.192	120							
101.541	20.164	0.160	120							
101.705	20.486	0.159	120							
101.869	19.926	0.179	120							
102.033	20.432	0.181	120							
102.197	20.699	0.201	120							
102.361	20.866	0.201	120							
102.525	21.492	0.185	120							
102.689	21.021	0.182	120							
102.853	20.925	0.192	120							
103.017	20.900	0.185	120							
103.181	20.806	0.181	120							
103.345	21.450	0.174	120							
103.509	20.921	0.190	120							
103.673	20.960	0.197	120							
103.837	20.838	0.203	120							
104.001	21.514	0.203	120							
104.165	21.681	0.238	120							
104.329	21.772	0.287	120							
104.493	24.135	0.368	120							
104.656	122.526	1.458	120							
104.820	92.973	1.761	120							
104.984	46.659	1.694	120							
105.150	37.513	1.038	120							
105.314	33.919	0.460	120							
105.478	26.916	0.550	120							
105.642	25.543	0.824	120							
105.806	130.042	1.397	120							
105.970	106.671	2.382	120							
106.134	77.768	2.431	120							
106.298	43.809	1.800	120							
106.462	32.176	0.965	120							
106.626	27.864	0.322	120							
106.790	31.285	0.316	120							
106.954	48.096	0.603	120							
107.118	36.715	0.839	120							
107.282	24.821	0.782	120							
107.446	23.243	0.430	120							
107.610	22.392	0.179	120							
107.774	22.298	0.177	120							
107.938	26.189	0.242	120							
108.102	22.817	0.309	120							
108.266	22.190	0.486	120							
108.430	23.768	0.423	120							
108.594	63.284	0.429	120							
108.759	155.404	0.498	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
108.923	140.133	1.558	120							
109.087	95.558	2.378	120							
109.251	51.894	2.237	120							
109.415	35.216	1.455	120							
109.579	37.963	0.642	120							
109.743	37.843	0.430	120							
109.907	32.423	0.751	120							
110.071	25.334	0.869	120							
110.235	62.345	0.748	120							
110.399	96.849	1.236	120							
110.563	83.336	1.808	120							
110.727	76.889	1.943	120							
110.891	115.647	2.455	120							
111.055	89.850	2.577	120							
111.219	66.743	2.252	120							
111.383	85.061	2.496	120							
111.547	68.641	2.023	120							
111.711	102.886	1.601	120							
111.875	89.509	2.261	120							
112.039	47.039	1.802	120							
112.203	28.290	1.213	120							
112.367	22.444	0.522	120							
112.531	23.583	0.328	120							
112.695	22.949	0.209	120							
112.860	28.010	0.368	120							
113.024	31.600	0.482	120							
113.188	25.604	0.790	120							
113.352	26.568	0.581	120							
113.516	62.306	0.397	120							
113.680	139.124	1.448	120							
113.844	80.919	2.572	120							
114.008	47.402	2.215	120							
114.172	84.345	2.330	120							
114.336	66.940	1.911	120							
114.500	38.823	1.416	120							
114.664	30.312	0.674	120							
114.828	32.580	0.614	120							
114.992	44.456	0.907	120							
115.156	137.733	0.914	120							
115.320	228.411	1.436	120							
115.484	69.367	2.023	120							
115.648	47.424	2.333	120							
115.812	41.154	1.114	120							
115.976	31.170	0.880	120							
116.140	26.477	0.394	120							
116.304	26.153	0.345	120							
116.468	26.348	0.292	120							
116.632	21.745	0.311	120							
116.796	22.756	0.243	120							
116.961	30.885	0.303	120							
117.125	23.619	0.353	120							
117.289	22.603	0.351	120							
117.453	22.665	0.146	120							
117.617	22.639	0.145	120							
117.781	22.171	0.119	120							
117.945	20.767	0.095	120							
118.109	19.168	0.125	120							
118.273	20.298	0.228	120							
118.437	23.350	0.290	120							
118.601	22.022	0.381	120							
118.765	33.269	0.542	120							
118.929	68.432	0.899	120							
119.093	54.357	1.510	120							
119.257	27.064	1.153	120							
119.421	22.924	0.635	120							
119.585	23.581	0.887	120							
119.749	25.567	0.784	120							
119.913	186.056	0.772	120							
120.077	217.440	1.839	120							
120.241	155.249	1.966	120							
120.405	125.614	1.826	120							
120.569	201.319	1.810	120							
120.733	237.340	1.840	120							
120.897	222.578	1.347	120							
121.062	177.728	1.596	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
121.226	151.368	2.247	120							
121.300	111.249	2.891	120							
121.564	53.383	2.633	120							
121.718	28.052	1.432	120							
121.882	26.417	1.086	120							
122.046	62.782	0.730	120							
122.210	96.368	0.927	120							
122.374	119.507	0.890	120							
122.538	109.010	1.896	120							
122.702	58.951	1.949	120							
122.866	40.268	2.100	120							
123.030	27.975	1.787	120							
123.194	157.703	1.665	120							
123.358	383.085	1.744	120							
123.522	253.739	0.883	120							
123.686	173.350	0.820	120							
123.850	103.017	1.801	120							
124.014	61.246	1.263	120							
124.178	38.916	1.094	120							
124.342	59.188	1.241	120							
124.506	93.905	0.952	120							
124.670	142.338	0.957	120							
124.834	180.557	1.603	120							
124.998	183.711	1.606	120							
125.163	109.892	0.958	120							
125.327	144.404	1.778	120							
125.491	69.932	0.863	120							
125.655	106.067	0.725	120							
125.819	247.406	1.120	120							
125.983	287.617	1.749	120							
126.147	373.827	1.023	120							
126.311	461.410	1.780	120							
126.475	460.769	1.786	120							

LIQUEFACTION POTENTIAL ASSESSMENT FOR COARSE GRAINED SOILS USING CONE PENETRATION TEST DATA

Facility: US 60 Bridge Project No.: 178565011 CPT ID: SP10	Water Elevation during CPT:	324.5	ft
	Depth to Water during CPT:	13.8	ft (relative to ground surface during CPT)
	Water Elevation during Earthquake:	324.5	ft
	Depth to Water during Earthquake:	13.8	ft (relative to ground surface during CPT)
	Final Grade Elevation during EQ:	338.3	ft (if no fill, then set this equal to top of CPT hole elev.)
	Height of Final Grade above CPT TOH:	0.0	ft (relative to ground surface during CPT, + Fill, - Cut)
	Unit Weight of Cut/Fill to Achieve Final Grade	120	pcf
	Cut/Fill Total Stress (+ Fill, - Cut):	0.00	tsf

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σvCPT (tsf)	Total Vertical Stress during EQ σvEQ (tsf)	Static Pore Water Pressure during CPT uSCPT (tsf)	Static Pore Water Pressure during EQ uSEQ (tsf)	Effective Vertical Stress during CPT σvCPT (tsf)	Effective Vertical Stress during EQ σvEQ (tsf)
338.3					Vertical Stresses above 1st CPT:		0.00	0.00	0.00	0.00	0.00	0.00
338.1	0.164	19.16	0.36	120		0.00	0.25	0.01	0.01	0.00	0.01	0.01
338.0	0.328	38.17	0.57	120		0.25	0.16	0.02	0.02	0.00	0.02	0.02
337.8	0.492	54.70	0.72	120		0.41	0.16	0.03	0.03	0.00	0.03	0.03
337.6	0.656	57.43	0.67	120		0.57	0.16	0.04	0.04	0.00	0.04	0.04
337.5	0.820	53.24	0.59	120		0.74	0.16	0.05	0.05	0.00	0.05	0.05
337.3	0.984	51.22	0.55	120		0.90	0.16	0.06	0.06	0.00	0.06	0.06
337.2	1.148	47.23	0.70	120		1.07	0.16	0.07	0.07	0.00	0.07	0.07
337.0	1.312	42.48	0.95	120		1.23	0.16	0.08	0.08	0.00	0.08	0.08
336.8	1.476	36.97	1.14	120		1.39	0.16	0.09	0.09	0.00	0.09	0.09
336.7	1.640	31.88	1.18	120		1.56	0.16	0.10	0.10	0.00	0.10	0.10
336.5	1.804	27.73	1.04	120		1.72	0.16	0.11	0.11	0.00	0.11	0.11
336.3	1.968	24.18	0.85	120		1.89	0.16	0.12	0.12	0.00	0.12	0.12
336.2	2.133	22.64	0.68	120		2.05	0.16	0.13	0.13	0.00	0.13	0.13
336.0	2.297	23.06	0.65	120		2.21	0.16	0.14	0.14	0.00	0.14	0.14
335.8	2.461	22.92	0.64	120		2.38	0.16	0.15	0.15	0.00	0.15	0.15
335.7	2.625	23.23	0.67	120		2.54	0.16	0.16	0.16	0.00	0.16	0.16
335.5	2.789	23.67	0.75	120		2.71	0.16	0.17	0.17	0.00	0.17	0.17
335.3	2.953	23.74	0.84	120		2.87	0.16	0.18	0.18	0.00	0.18	0.18
335.2	3.117	23.27	0.82	120		3.03	0.16	0.19	0.19	0.00	0.19	0.19
335.0	3.281	21.85	0.85	120		3.20	0.16	0.20	0.20	0.00	0.20	0.20
334.9	3.445	21.38	0.85	120		3.36	0.16	0.21	0.21	0.00	0.21	0.21
334.7	3.609	20.22	0.78	120		3.53	0.16	0.22	0.22	0.00	0.22	0.22
334.5	3.773	19.70	0.72	120		3.69	0.16	0.23	0.23	0.00	0.23	0.23
334.4	3.937	19.60	0.69	120		3.85	0.16	0.24	0.24	0.00	0.24	0.24
334.2	4.101	19.45	0.71	120		4.02	0.16	0.25	0.25	0.00	0.25	0.25
334.0	4.265	18.75	0.67	120		4.18	0.16	0.26	0.26	0.00	0.26	0.26
333.9	4.429	22.62	0.72	120		4.35	0.16	0.27	0.27	0.00	0.27	0.27
333.7	4.593	24.98	0.81	120		4.51	0.16	0.28	0.28	0.00	0.28	0.28
333.5	4.757	25.41	0.86	120		4.68	0.16	0.29	0.29	0.00	0.29	0.29
333.4	4.921	30.34	1.04	120		4.84	0.16	0.30	0.30	0.00	0.30	0.30
333.2	5.085	38.33	1.22	120		5.00	0.16	0.31	0.31	0.00	0.31	0.31
333.1	5.249	33.34	1.34	120		5.17	0.16	0.31	0.31	0.00	0.31	0.31
332.9	5.413	34.98	1.37	120		5.33	0.16	0.32	0.32	0.00	0.32	0.32
332.7	5.577	29.52	1.15	120		5.50	0.16	0.33	0.33	0.00	0.33	0.33
332.6	5.741	25.16	1.07	120		5.66	0.16	0.34	0.34	0.00	0.34	0.34
332.4	5.905	24.37	0.97	120		5.82	0.16	0.35	0.35	0.00	0.35	0.35
332.2	6.069	22.09	0.95	120		5.99	0.16	0.36	0.36	0.00	0.36	0.36
332.1	6.234	18.51	0.80	120		6.15	0.16	0.37	0.37	0.00	0.37	0.37
331.9	6.398	13.25	0.59	120		6.32	0.16	0.38	0.38	0.00	0.38	0.38
331.7	6.562	9.52	0.54	120		6.48	0.16	0.39	0.39	0.00	0.39	0.39
331.6	6.726	9.41	0.49	120		6.64	0.16	0.40	0.40	0.00	0.40	0.40
331.4	6.890	9.38	0.51	120		6.81	0.16	0.41	0.41	0.00	0.41	0.41
331.2	7.054	9.17	0.43	120		6.97	0.16	0.42	0.42	0.00	0.42	0.42
331.1	7.218	9.05	0.39	120		7.14	0.16	0.43	0.43	0.00	0.43	0.43
330.9	7.382	10.01	0.40	120		7.30	0.16	0.44	0.44	0.00	0.44	0.44
330.8	7.546	10.84	0.43	120		7.46	0.16	0.45	0.45	0.00	0.45	0.45
330.6	7.710	12.31	0.47	120		7.63	0.16	0.46	0.46	0.00	0.46	0.46
330.4	7.874	12.71	0.46	120		7.79	0.16	0.47	0.47	0.00	0.47	0.47
330.3	8.038	12.06	0.53	120		7.96	0.16	0.48	0.48	0.00	0.48	0.48
330.1	8.202	10.15	0.51	120		8.12	0.16	0.49	0.49	0.00	0.49	0.49
329.9	8.366	18.62	0.52	120		8.28	0.16	0.50	0.50	0.00	0.50	0.50
329.8	8.530	38.01	0.64	120		8.45	0.16	0.51	0.51	0.00	0.51	0.51
329.6	8.694	31.98	0.76	120		8.61	0.16	0.52	0.52	0.00	0.52	0.52
329.4	8.858	22.24	0.69	120		8.78	0.16	0.53	0.53	0.00	0.53	0.53
329.3	9.022	14.66	0.58	120		8.94	0.16	0.54	0.54	0.00	0.54	0.54
329.1	9.186	11.54	0.31	120		9.10	0.16	0.55	0.55	0.00	0.55	0.55
328.9	9.350	8.95	0.23	120		9.27	0.16	0.56	0.56	0.00	0.56	0.56
328.8	9.514	9.34	0.22	120		9.43	0.16	0.57	0.57	0.00	0.57	0.57
328.6	9.678	11.04	0.13	120		9.60	0.16	0.58	0.58	0.00	0.58	0.58
328.5	9.842	9.79	0.18	120		9.76	0.16	0.59	0.59	0.00	0.59	0.59
328.3	10.006	9.82	0.19	120		9.92	0.16	0.60	0.60	0.00	0.60	0.60
328.1	10.170	12.54	0.27	120		10.09	0.16	0.61	0.61	0.00	0.61	0.61

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σv CPT (tsf)	Total Vertical Stress during EQ σv EQ (tsf)	Static Pore Water Pressure during CPT us CPT (tsf)	Static Pore Water Pressure during EQ us EQ (tsf)	Effective Vertical Stress during CPT σv CPT (tsf)	Effective Vertical Stress during EQ σv EQ (tsf)
328.0	10.335	13.21	0.27	120	10.25	0.16	0.62	0.62	0.00	0.00	0.62	0.62
327.8	10.499	12.33	0.33	120	10.42	0.16	0.63	0.63	0.00	0.00	0.63	0.63
327.6	10.663	15.07	0.30	120	10.58	0.16	0.64	0.64	0.00	0.00	0.64	0.64
327.5	10.827	16.67	0.37	120	10.74	0.16	0.65	0.65	0.00	0.00	0.65	0.65
327.3	10.991	11.48	0.33	120	10.91	0.16	0.66	0.66	0.00	0.00	0.66	0.66
327.1	11.155	8.36	0.31	120	11.07	0.16	0.67	0.67	0.00	0.00	0.67	0.67
327.0	11.319	12.37	0.34	120	11.24	0.16	0.68	0.68	0.00	0.00	0.68	0.68
326.8	11.483	20.21	0.56	120	11.40	0.16	0.69	0.69	0.00	0.00	0.69	0.69
326.7	11.647	50.41	0.72	120	11.56	0.16	0.70	0.70	0.00	0.00	0.70	0.70
326.5	11.811	77.83	1.28	120	11.73	0.16	0.71	0.71	0.00	0.00	0.71	0.71
326.3	11.975	72.33	1.37	120	11.89	0.16	0.72	0.72	0.00	0.00	0.72	0.72
326.2	12.139	57.92	1.18	120	12.06	0.16	0.73	0.73	0.00	0.00	0.73	0.73
326.0	12.303	30.12	1.26	120	12.22	0.16	0.74	0.74	0.00	0.00	0.74	0.74
325.8	12.467	16.61	0.80	120	12.39	0.16	0.75	0.75	0.00	0.00	0.75	0.75
325.7	12.631	9.82	0.37	120	12.55	0.16	0.76	0.76	0.00	0.00	0.76	0.76
325.5	12.795	10.54	0.21	120	12.71	0.16	0.77	0.77	0.00	0.00	0.77	0.77
325.3	12.959	9.01	0.23	120	12.88	0.16	0.78	0.78	0.00	0.00	0.78	0.78
325.2	13.123	12.66	0.33	120	13.04	0.16	0.79	0.79	0.00	0.00	0.79	0.79
325.0	13.287	14.59	0.42	120	13.21	0.16	0.80	0.80	0.00	0.00	0.80	0.80
324.8	13.451	14.29	0.52	120	13.37	0.16	0.81	0.81	0.00	0.00	0.81	0.81
324.7	13.615	8.76	0.42	120	13.53	0.16	0.82	0.82	0.00	0.00	0.82	0.82
324.5	13.779	6.51	0.30	120	13.70	0.16	0.83	0.83	0.00	0.00	0.83	0.83
324.4	13.943	12.57	0.24	120	13.86	0.16	0.84	0.84	0.00	0.00	0.83	0.83
324.2	14.107	10.70	0.22	120	14.03	0.16	0.85	0.85	0.01	0.01	0.84	0.84
324.0	14.271	6.06	0.21	120	14.19	0.16	0.86	0.86	0.01	0.01	0.84	0.84
323.9	14.436	5.93	0.15	120	14.35	0.16	0.87	0.87	0.02	0.02	0.85	0.85
323.7	14.600	3.82	0.09	120	14.52	0.16	0.88	0.88	0.02	0.02	0.85	0.85
323.5	14.764	5.96	0.12	120	14.68	0.16	0.89	0.89	0.03	0.03	0.86	0.86
323.4	14.928	6.52	0.09	120	14.85	0.16	0.90	0.90	0.04	0.04	0.86	0.86
323.2	15.092	4.96	0.10	120	15.01	0.16	0.91	0.91	0.04	0.04	0.87	0.87
323.0	15.256	4.45	0.08	120	15.17	0.16	0.92	0.92	0.05	0.05	0.87	0.87
322.9	15.420	3.72	0.06	120	15.34	0.16	0.93	0.93	0.05	0.05	0.87	0.87
322.7	15.584	4.12	0.05	120	15.50	0.16	0.94	0.94	0.06	0.06	0.88	0.88
322.6	15.748	4.95	0.07	120	15.67	0.16	0.94	0.94	0.06	0.06	0.88	0.88
322.4	15.912	6.41	0.13	120	15.83	0.16	0.95	0.95	0.07	0.07	0.89	0.89
322.2	16.076	5.82	0.15	120	15.99	0.16	0.96	0.96	0.07	0.07	0.89	0.89
322.1	16.240	8.51	0.15	120	16.16	0.16	0.97	0.97	0.08	0.08	0.90	0.90
321.9	16.404	6.78	0.14	120	16.32	0.16	0.98	0.98	0.08	0.08	0.90	0.90
321.7	16.568	8.45	0.12	120	16.49	0.16	0.99	0.99	0.09	0.09	0.91	0.91
321.6	16.732	6.86	0.11	120	16.65	0.16	1.00	1.00	0.09	0.09	0.91	0.91
321.4	16.896	7.37	0.09	120	16.81	0.16	1.01	1.01	0.10	0.10	0.92	0.92
321.2	17.060	9.11	0.12	120	16.98	0.16	1.02	1.02	0.10	0.10	0.92	0.92
321.1	17.224	11.32	0.16	120	17.14	0.16	1.03	1.03	0.11	0.11	0.93	0.93
320.9	17.388	7.04	0.15	120	17.31	0.16	1.04	1.04	0.11	0.11	0.93	0.93
320.7	17.552	5.66	0.11	120	17.47	0.16	1.05	1.05	0.12	0.12	0.94	0.94
320.6	17.716	5.30	0.06	120	17.63	0.16	1.06	1.06	0.12	0.12	0.94	0.94
320.4	17.880	5.17	0.05	120	17.80	0.16	1.07	1.07	0.13	0.13	0.95	0.95
320.3	18.044	5.67	0.05	120	17.96	0.16	1.08	1.08	0.13	0.13	0.95	0.95
320.1	18.208	5.56	0.05	120	18.13	0.16	1.09	1.09	0.14	0.14	0.95	0.95
319.9	18.372	5.67	0.05	120	18.29	0.16	1.10	1.10	0.14	0.14	0.96	0.96
319.8	18.537	4.87	0.05	120	18.45	0.16	1.11	1.11	0.15	0.15	0.96	0.96
319.6	18.701	5.21	0.06	120	18.62	0.16	1.12	1.12	0.15	0.15	0.97	0.97
319.4	18.865	5.72	0.06	120	18.78	0.16	1.13	1.13	0.16	0.16	0.97	0.97
319.3	19.029	5.41	0.06	120	18.95	0.16	1.14	1.14	0.16	0.16	0.98	0.98
319.1	19.193	6.08	0.07	120	19.11	0.16	1.15	1.15	0.17	0.17	0.98	0.98
318.9	19.357	6.50	0.07	120	19.27	0.16	1.16	1.16	0.17	0.17	0.99	0.99
318.8	19.521	5.27	0.14	120	19.44	0.16	1.17	1.17	0.18	0.18	0.99	0.99
318.6	19.685	9.53	0.13	120	19.60	0.16	1.18	1.18	0.18	0.18	1.00	1.00
318.5	19.849	10.01	0.15	120	19.77	0.16	1.19	1.19	0.19	0.19	1.00	1.00
318.3	20.013	7.42	0.14	120	19.93	0.16	1.20	1.20	0.19	0.19	1.01	1.01
318.1	20.177	5.19	0.10	120	20.09	0.16	1.21	1.21	0.20	0.20	1.01	1.01
318.0	20.341	5.05	0.07	120	20.26	0.16	1.22	1.22	0.20	0.20	1.02	1.02
317.8	20.505	5.23	0.05	120	20.42	0.16	1.23	1.23	0.21	0.21	1.02	1.02
317.6	20.669	4.99	0.05	120	20.59	0.16	1.24	1.24	0.21	0.21	1.03	1.03
317.5	20.833	5.14	0.05	120	20.75	0.16	1.25	1.25	0.22	0.22	1.03	1.03
317.3	20.997	5.21	0.05	120	20.92	0.16	1.26	1.26	0.22	0.22	1.04	1.04
317.1	21.161	5.70	0.05	120	21.08	0.16	1.27	1.27	0.23	0.23	1.04	1.04
317.0	21.325	5.77	0.06	120	21.24	0.16	1.28	1.28	0.23	0.23	1.04	1.04
316.8	21.489	6.31	0.07	120	21.41	0.16	1.29	1.29	0.24	0.24	1.05	1.05
316.6	21.653	9.08	0.08	120	21.57	0.16	1.30	1.30	0.25	0.25	1.05	1.05
316.5	21.817	6.41	0.08	120	21.74	0.16	1.31	1.31	0.25	0.25	1.06	1.06
316.3	21.981	5.54	0.08	120	21.90	0.16	1.32	1.32	0.26	0.26	1.06	1.06
316.2	22.145	5.68	0.04	120	22.06	0.16	1.33	1.33	0.26	0.26	1.07	1.07
316.0	22.309	6.21	0.05	120	22.23	0.16	1.34	1.34	0.27	0.27	1.07	1.07

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σv CPT (tsf)	Total Vertical Stress during EQ σv EQ (tsf)	Static Pore Water Pressure during CPT us CPT (tsf)	Static Pore Water Pressure during EQ us EQ (tsf)	Effective Vertical Stress during CPT σv CPT (tsf)	Effective Vertical Stress during EQ σv EQ (tsf)
315.8	22.473	14.93	0.14	120	22.39	0.16	1.35	1.35	0.27	0.27	1.08	1.08
315.7	22.638	18.36	0.21	120	22.56	0.16	1.36	1.36	0.28	0.28	1.08	1.08
315.5	22.802	13.14	0.27	120	22.72	0.16	1.37	1.37	0.28	0.28	1.09	1.09
315.3	22.966	8.10	0.24	120	22.88	0.16	1.38	1.38	0.29	0.29	1.09	1.09
315.2	23.130	9.62	0.17	120	23.05	0.16	1.39	1.39	0.29	0.29	1.10	1.10
315.0	23.294	16.05	0.25	120	23.21	0.16	1.40	1.40	0.30	0.30	1.10	1.10
314.8	23.458	12.74	0.26	120	23.38	0.16	1.41	1.41	0.30	0.30	1.11	1.11
314.7	23.622	20.47	0.35	120	23.54	0.16	1.42	1.42	0.31	0.31	1.11	1.11
314.5	23.786	22.55	0.31	120	23.70	0.16	1.43	1.43	0.31	0.31	1.12	1.12
314.4	23.950	15.36	0.28	120	23.87	0.16	1.44	1.44	0.32	0.32	1.12	1.12
314.2	24.114	10.63	0.25	120	24.03	0.16	1.45	1.45	0.32	0.32	1.13	1.13
314.0	24.278	19.16	0.24	120	24.20	0.16	1.46	1.46	0.33	0.33	1.13	1.13
313.9	24.442	17.73	0.21	120	24.36	0.16	1.47	1.47	0.33	0.33	1.13	1.13
313.7	24.606	20.24	0.23	120	24.52	0.16	1.48	1.48	0.34	0.34	1.14	1.14
313.5	24.770	16.26	0.26	120	24.69	0.16	1.49	1.49	0.34	0.34	1.14	1.14
313.4	24.934	12.85	0.14	120	24.85	0.16	1.50	1.50	0.35	0.35	1.15	1.15
313.2	25.098	13.80	0.10	120	25.02	0.16	1.51	1.51	0.35	0.35	1.15	1.15
313.0	25.262	9.51	0.07	120	25.18	0.16	1.52	1.52	0.36	0.36	1.16	1.16
312.9	25.426	8.04	0.10	120	25.34	0.16	1.53	1.53	0.36	0.36	1.16	1.16
312.7	25.590	9.19	0.13	120	25.51	0.16	1.54	1.54	0.37	0.37	1.17	1.17
312.5	25.754	10.76	0.10	120	25.67	0.16	1.55	1.55	0.37	0.37	1.17	1.17
312.4	25.918	8.50	0.13	120	25.84	0.16	1.56	1.56	0.38	0.38	1.18	1.18
312.2	26.082	21.16	0.30	120	26.00	0.16	1.56	1.56	0.38	0.38	1.18	1.18
312.1	26.246	14.19	0.26	120	26.16	0.16	1.57	1.57	0.39	0.39	1.19	1.19
311.9	26.410	10.84	0.26	120	26.33	0.16	1.58	1.58	0.39	0.39	1.19	1.19
311.7	26.574	8.23	0.14	120	26.49	0.16	1.59	1.59	0.40	0.40	1.20	1.20
311.6	26.739	8.53	0.10	120	26.66	0.16	1.60	1.60	0.40	0.40	1.20	1.20
311.4	26.903	9.75	0.09	120	26.82	0.16	1.61	1.61	0.41	0.41	1.21	1.21
311.2	27.067	8.13	0.08	120	26.98	0.16	1.62	1.62	0.41	0.41	1.21	1.21
311.1	27.231	7.28	0.08	120	27.15	0.16	1.63	1.63	0.42	0.42	1.21	1.21
310.9	27.395	7.63	0.07	120	27.31	0.16	1.64	1.64	0.42	0.42	1.22	1.22
310.7	27.559	8.57	0.08	120	27.48	0.16	1.65	1.65	0.43	0.43	1.22	1.22
310.6	27.723	8.59	0.09	120	27.64	0.16	1.66	1.66	0.43	0.43	1.23	1.23
310.4	27.887	9.08	0.10	120	27.80	0.16	1.67	1.67	0.44	0.44	1.23	1.23
310.2	28.051	9.81	0.13	120	27.97	0.16	1.68	1.68	0.44	0.44	1.24	1.24
310.1	28.215	14.26	0.19	120	28.13	0.16	1.69	1.69	0.45	0.45	1.24	1.24
309.9	28.379	12.15	0.25	120	28.30	0.16	1.70	1.70	0.45	0.45	1.25	1.25
309.8	28.543	13.41	0.17	120	28.46	0.16	1.71	1.71	0.46	0.46	1.25	1.25
309.6	28.707	11.88	0.10	120	28.62	0.16	1.72	1.72	0.47	0.47	1.26	1.26
309.4	28.871	10.53	0.16	120	28.79	0.16	1.73	1.73	0.47	0.47	1.26	1.26
309.3	29.035	12.63	0.20	120	28.95	0.16	1.74	1.74	0.48	0.48	1.27	1.27
309.1	29.199	26.36	0.24	120	29.12	0.16	1.75	1.75	0.48	0.48	1.27	1.27
308.9	29.363	56.92	0.39	120	29.28	0.16	1.76	1.76	0.49	0.49	1.28	1.28
308.8	29.527	69.81	0.52	120	29.45	0.16	1.77	1.77	0.49	0.49	1.28	1.28
308.6	29.691	84.13	0.70	120	29.61	0.16	1.78	1.78	0.50	0.50	1.29	1.29
308.4	29.855	74.98	0.98	120	29.77	0.16	1.79	1.79	0.50	0.50	1.29	1.29
308.3	30.019	58.34	1.11	120	29.94	0.16	1.80	1.80	0.51	0.51	1.30	1.30
308.1	30.183	43.19	1.24	120	30.10	0.16	1.81	1.81	0.51	0.51	1.30	1.30
308.0	30.347	28.02	1.56	120	30.27	0.16	1.82	1.82	0.52	0.52	1.30	1.30
307.8	30.511	26.77	1.27	120	30.43	0.16	1.83	1.83	0.52	0.52	1.31	1.31
307.6	30.675	54.85	1.03	120	30.59	0.16	1.84	1.84	0.53	0.53	1.31	1.31
307.5	30.840	66.75	0.98	120	30.76	0.16	1.85	1.85	0.53	0.53	1.32	1.32
307.3	31.004	49.66	0.95	120	30.92	0.16	1.86	1.86	0.54	0.54	1.32	1.32
307.1	31.168	30.39	0.89	120	31.09	0.16	1.87	1.87	0.54	0.54	1.33	1.33
307.0	31.332	16.50	0.66	120	31.25	0.16	1.88	1.88	0.55	0.55	1.33	1.33
306.8	31.496	13.56	0.40	120	31.41	0.16	1.89	1.89	0.55	0.55	1.34	1.34
306.6	31.660	14.70	0.16	120	31.58	0.16	1.90	1.90	0.56	0.56	1.34	1.34
306.5	31.824	11.87	0.16	120	31.74	0.16	1.91	1.91	0.56	0.56	1.35	1.35
306.3	31.988	16.51	0.18	120	31.91	0.16	1.92	1.92	0.57	0.57	1.35	1.35
306.1	32.152	15.80	0.19	120	32.07	0.16	1.93	1.93	0.57	0.57	1.36	1.36
306.0	32.316	11.17	0.17	120	32.23	0.16	1.94	1.94	0.58	0.58	1.36	1.36
305.8	32.480	29.72	0.22	120	32.40	0.16	1.95	1.95	0.58	0.58	1.37	1.37
305.7	32.644	44.90	0.60	120	32.56	0.16	1.96	1.96	0.59	0.59	1.37	1.37
305.5	32.808	27.50	0.83	120	32.73	0.16	1.97	1.97	0.59	0.59	1.38	1.38
305.3	32.972	18.01	0.63	120	32.89	0.16	1.98	1.98	0.60	0.60	1.38	1.38
305.2	33.136	15.48	0.59	120	33.05	0.16	1.99	1.99	0.60	0.60	1.38	1.38
305.0	33.300	17.80	0.33	120	33.22	0.16	2.00	2.00	0.61	0.61	1.39	1.39
304.8	33.464	11.73	0.30	120	33.38	0.16	2.01	2.01	0.61	0.61	1.39	1.39
304.7	33.628	11.18	0.20	120	33.55	0.16	2.02	2.02	0.62	0.62	1.40	1.40
304.5	33.792	10.63	0.14	120	33.71	0.16	2.03	2.03	0.62	0.62	1.40	1.40
304.3	33.956	14.71	0.16	120	33.87	0.16	2.04	2.04	0.63	0.63	1.41	1.41
304.2	34.120	19.08	0.21	120	34.04	0.16	2.05	2.05	0.63	0.63	1.41	1.41
304.0	34.284	36.02	0.49	120	34.20	0.16	2.06	2.06	0.64	0.64	1.42	1.42
303.9	34.448	21.73	0.39	120	34.37	0.16	2.07	2.07	0.64	0.64	1.42	1.42

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σv CPT (tsf)	Total Vertical Stress during EQ σv EQ (tsf)	Static Pore Water Pressure during CPT us CPT (tsf)	Static Pore Water Pressure during EQ us EQ (tsf)	Effective Vertical Stress during CPT σv CPT (tsf)	Effective Vertical Stress during EQ σv EQ (tsf)
303.7	34.612	14.12	0.39	120	34.53	0.16	2.08	2.08	0.65	0.65	1.43	1.43
303.5	34.776	15.91	0.23	120	34.69	0.16	2.09	2.09	0.65	0.65	1.43	1.43
303.4	34.941	20.81	0.20	120	34.86	0.16	2.10	2.10	0.66	0.66	1.44	1.44
303.2	35.105	25.61	0.33	120	35.02	0.16	2.11	2.11	0.66	0.66	1.44	1.44
303.0	35.269	21.23	0.32	120	35.19	0.16	2.12	2.12	0.67	0.67	1.45	1.45
302.9	35.433	15.64	0.24	120	35.35	0.16	2.13	2.13	0.67	0.67	1.45	1.45
302.7	35.597	45.04	0.31	120	35.51	0.16	2.14	2.14	0.68	0.68	1.46	1.46
302.5	35.761	57.32	0.52	120	35.68	0.16	2.15	2.15	0.69	0.69	1.46	1.46
302.4	35.925	49.03	0.81	120	35.84	0.16	2.16	2.16	0.69	0.69	1.47	1.47
302.2	36.089	41.15	1.02	120	36.01	0.16	2.17	2.17	0.70	0.70	1.47	1.47
302.0	36.253	38.51	0.97	120	36.17	0.16	2.18	2.18	0.70	0.70	1.47	1.47
301.9	36.417	22.39	0.53	120	36.33	0.16	2.19	2.19	0.71	0.71	1.48	1.48
301.7	36.581	15.99	0.36	120	36.50	0.16	2.19	2.19	0.71	0.71	1.48	1.48
301.6	36.745	11.53	0.26	120	36.66	0.16	2.20	2.20	0.72	0.72	1.49	1.49
301.4	36.909	11.06	0.13	120	36.83	0.16	2.21	2.21	0.72	0.72	1.49	1.49
301.2	37.073	20.03	0.28	120	36.99	0.16	2.22	2.22	0.73	0.73	1.50	1.50
301.1	37.237	28.37	0.43	120	37.16	0.16	2.23	2.23	0.73	0.73	1.50	1.50
300.9	37.401	22.47	0.58	120	37.32	0.16	2.24	2.24	0.74	0.74	1.51	1.51
300.7	37.565	24.43	0.40	120	37.48	0.16	2.25	2.25	0.74	0.74	1.51	1.51
300.6	37.729	31.65	0.32	120	37.65	0.16	2.26	2.26	0.75	0.75	1.52	1.52
300.4	37.893	37.92	0.46	120	37.81	0.16	2.27	2.27	0.75	0.75	1.52	1.52
300.2	38.057	47.14	0.49	120	37.98	0.16	2.28	2.28	0.76	0.76	1.53	1.53
300.1	38.221	55.86	0.24	120	38.14	0.16	2.29	2.29	0.76	0.76	1.53	1.53
299.9	38.385	40.05	0.59	120	38.30	0.16	2.30	2.30	0.77	0.77	1.54	1.54
299.8	38.549	24.71	0.59	120	38.47	0.16	2.31	2.31	0.77	0.77	1.54	1.54
299.6	38.713	16.05	0.52	120	38.63	0.16	2.32	2.32	0.78	0.78	1.55	1.55
299.4	38.877	13.60	0.30	120	38.80	0.16	2.33	2.33	0.78	0.78	1.55	1.55
299.3	39.042	20.15	0.29	120	38.96	0.16	2.34	2.34	0.79	0.79	1.55	1.55
299.1	39.206	31.09	0.52	120	39.12	0.16	2.35	2.35	0.79	0.79	1.56	1.56
298.9	39.370	28.30	0.55	120	39.29	0.16	2.36	2.36	0.80	0.80	1.56	1.56
298.8	39.534	98.64	0.62	120	39.45	0.16	2.37	2.37	0.80	0.80	1.57	1.57
298.6	39.698	87.48	0.98	120	39.62	0.16	2.38	2.38	0.81	0.81	1.57	1.57
298.4	39.862	44.82	1.24	120	39.78	0.16	2.39	2.39	0.81	0.81	1.58	1.58
298.3	40.026	25.44	0.94	120	39.94	0.16	2.40	2.40	0.82	0.82	1.58	1.58
298.1	40.190	15.94	0.62	120	40.11	0.16	2.41	2.41	0.82	0.82	1.59	1.59
297.9	40.354	12.83	0.27	120	40.27	0.16	2.42	2.42	0.83	0.83	1.59	1.59
297.8	40.518	10.62	0.15	120	40.44	0.16	2.43	2.43	0.83	0.83	1.60	1.60
297.6	40.682	10.71	0.12	120	40.60	0.16	2.44	2.44	0.84	0.84	1.60	1.60
297.5	40.846	10.94	0.10	120	40.76	0.16	2.45	2.45	0.84	0.84	1.61	1.61
297.3	41.010	10.88	0.10	120	40.93	0.16	2.46	2.46	0.85	0.85	1.61	1.61
297.1	41.174	10.01	0.09	120	41.09	0.16	2.47	2.47	0.85	0.85	1.62	1.62
297.0	41.338	10.81	0.11	120	41.26	0.16	2.48	2.48	0.86	0.86	1.62	1.62
296.8	41.502	10.74	0.09	120	41.42	0.16	2.49	2.49	0.86	0.86	1.63	1.63
296.6	41.666	12.40	0.08	120	41.58	0.16	2.50	2.50	0.87	0.87	1.63	1.63
296.5	41.830	13.21	0.10	120	41.75	0.16	2.51	2.51	0.87	0.87	1.64	1.64
296.3	41.994	10.67	0.11	120	41.91	0.16	2.52	2.52	0.88	0.88	1.64	1.64
296.1	42.158	9.03	0.08	120	42.08	0.16	2.53	2.53	0.88	0.88	1.64	1.64
296.0	42.322	9.00	0.06	120	42.24	0.16	2.54	2.54	0.89	0.89	1.65	1.65
295.8	42.486	8.96	0.08	120	42.40	0.16	2.55	2.55	0.90	0.90	1.65	1.65
295.6	42.650	11.20	0.51	120	42.57	0.16	2.56	2.56	0.90	0.90	1.66	1.66
295.5	42.814	23.40	0.33	120	42.73	0.16	2.57	2.57	0.91	0.91	1.66	1.66
295.3	42.978	15.77	0.73	120	42.90	0.16	2.58	2.58	0.91	0.91	1.67	1.67
295.2	43.143	9.45	0.25	120	43.06	0.16	2.59	2.59	0.92	0.92	1.67	1.67
295.0	43.307	9.96	0.10	120	43.22	0.16	2.60	2.60	0.92	0.92	1.68	1.68
294.8	43.471	8.80	0.08	120	43.39	0.16	2.61	2.61	0.93	0.93	1.68	1.68
294.7	43.635	8.57	0.08	120	43.55	0.16	2.62	2.62	0.93	0.93	1.69	1.69
294.5	43.799	8.67	0.07	120	43.72	0.16	2.63	2.63	0.94	0.94	1.69	1.69
294.3	43.963	8.84	0.06	120	43.88	0.16	2.64	2.64	0.94	0.94	1.70	1.70
294.2	44.127	8.91	0.08	120	44.04	0.16	2.65	2.65	0.95	0.95	1.70	1.70
294.0	44.291	8.74	0.07	120	44.21	0.16	2.66	2.66	0.95	0.95	1.71	1.71
293.8	44.455	9.74	0.15	120	44.37	0.16	2.67	2.67	0.96	0.96	1.71	1.71
293.7	44.619	10.48	0.17	120	44.54	0.16	2.68	2.68	0.96	0.96	1.72	1.72
293.5	44.783	9.47	0.18	120	44.70	0.16	2.69	2.69	0.97	0.97	1.72	1.72
293.4	44.947	9.81	0.11	120	44.86	0.16	2.70	2.70	0.97	0.97	1.73	1.73
293.2	45.111	10.04	0.10	120	45.03	0.16	2.71	2.71	0.98	0.98	1.73	1.73
293.0	45.275	10.00	0.10	120	45.19	0.16	2.72	2.72	0.98	0.98	1.73	1.73
292.9	45.439	9.70	0.10	120	45.36	0.16	2.73	2.73	0.99	0.99	1.74	1.74
292.7	45.603	9.60	0.09	120	45.52	0.16	2.74	2.74	0.99	0.99	1.74	1.74
292.5	45.767	9.82	0.08	120	45.69	0.16	2.75	2.75	1.00	1.00	1.75	1.75
292.4	45.931	10.06	0.09	120	45.85	0.16	2.76	2.76	1.00	1.00	1.75	1.75
292.2	46.095	10.16	0.09	120	46.01	0.16	2.77	2.77	1.01	1.01	1.76	1.76
292.0	46.259	10.25	0.09	120	46.18	0.16	2.78	2.78	1.01	1.01	1.76	1.76
291.9	46.423	10.41	0.27	120	46.34	0.16	2.79	2.79	1.02	1.02	1.77	1.77
291.7	46.587	20.60	0.42	120	46.51	0.16	2.80	2.80	1.02	1.02	1.77	1.77

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σv CPT (tsf)	Total Vertical Stress during EQ σv EQ (tsf)	Static Pore Water Pressure during CPT us CPT (tsf)	Static Pore Water Pressure during EQ us EQ (tsf)	Effective Vertical Stress during CPT σv CPT (tsf)	Effective Vertical Stress during EQ σv EQ (tsf)
291.5	46.751	12.41	0.45	120	46.67	0.16	2.81	2.81	1.03	1.03	1.78	1.78
291.4	46.915	11.59	0.46	120	46.83	0.16	2.81	2.81	1.03	1.03	1.78	1.78
291.2	47.079	11.07	0.14	120	47.00	0.16	2.82	2.82	1.04	1.04	1.79	1.79
291.1	47.244	11.49	0.15	120	47.16	0.16	2.83	2.83	1.04	1.04	1.79	1.79
290.9	47.408	10.63	0.52	120	47.33	0.16	2.84	2.84	1.05	1.05	1.80	1.80
290.7	47.572	27.29	0.95	120	47.49	0.16	2.85	2.85	1.05	1.05	1.80	1.80
290.6	47.736	22.34	0.93	120	47.65	0.16	2.86	2.86	1.06	1.06	1.81	1.81
290.4	47.900	12.00	0.80	120	47.82	0.16	2.87	2.87	1.06	1.06	1.81	1.81
290.2	48.064	13.33	0.50	120	47.98	0.16	2.88	2.88	1.07	1.07	1.81	1.81
290.1	48.228	29.86	0.56	120	48.15	0.16	2.89	2.89	1.07	1.07	1.82	1.82
289.9	48.392	14.88	0.58	120	48.31	0.16	2.90	2.90	1.08	1.08	1.82	1.82
289.7	48.556	13.69	0.58	120	48.47	0.16	2.91	2.91	1.08	1.08	1.83	1.83
289.6	48.720	11.15	0.27	120	48.64	0.16	2.92	2.92	1.09	1.09	1.83	1.83
289.4	48.884	11.03	0.20	120	48.80	0.16	2.93	2.93	1.09	1.09	1.84	1.84
289.3	49.048	11.14	0.10	120	48.97	0.16	2.94	2.94	1.10	1.10	1.84	1.84
289.1	49.212	10.70	0.10	120	49.13	0.16	2.95	2.95	1.10	1.10	1.85	1.85
288.9	49.376	11.08	0.11	120	49.29	0.16	2.96	2.96	1.11	1.11	1.85	1.85
288.8	49.540	17.06	0.25	120	49.46	0.16	2.97	2.97	1.12	1.12	1.86	1.86
288.6	49.704	15.31	0.28	120	49.62	0.16	2.98	2.98	1.12	1.12	1.86	1.86
288.4	49.868	11.43	0.30	120	49.79	0.16	2.99	2.99	1.13	1.13	1.87	1.87
288.3	50.032	11.15	0.12	120	49.95	0.16	3.00	3.00	1.13	1.13	1.87	1.87
288.1	50.196	11.16	0.07	120	50.11	0.16	3.01	3.01	1.14	1.14	1.88	1.88
287.9	50.360	18.29	0.36	120	50.28	0.16	3.02	3.02	1.14	1.14	1.88	1.88
287.8	50.524	16.83	0.38	120	50.44	0.16	3.03	3.03	1.15	1.15	1.89	1.89
287.6	50.688	11.50	0.32	120	50.61	0.16	3.04	3.04	1.15	1.15	1.89	1.89
287.4	50.852	11.05	0.11	120	50.77	0.16	3.05	3.05	1.16	1.16	1.90	1.90
287.3	51.016	10.85	0.09	120	50.93	0.16	3.06	3.06	1.16	1.16	1.90	1.90
287.1	51.180	10.86	0.12	120	51.10	0.16	3.07	3.07	1.17	1.17	1.90	1.90
287.0	51.345	15.73	0.24	120	51.26	0.16	3.08	3.08	1.17	1.17	1.91	1.91
286.8	51.509	91.50	0.71	120	51.43	0.16	3.09	3.09	1.18	1.18	1.91	1.91
286.6	51.673	75.28	1.38	120	51.59	0.16	3.10	3.10	1.18	1.18	1.92	1.92
286.5	51.837	83.13	1.94	120	51.75	0.16	3.11	3.11	1.19	1.19	1.92	1.92
286.3	52.001	35.01	1.83	120	51.92	0.16	3.12	3.12	1.19	1.19	1.93	1.93
286.1	52.165	20.07	0.96	120	52.08	0.16	3.13	3.13	1.20	1.20	1.93	1.93
286.0	52.329	19.95	0.97	120	52.25	0.16	3.14	3.14	1.20	1.20	1.94	1.94
285.8	52.493	95.93	1.31	120	52.41	0.16	3.15	3.15	1.21	1.21	1.94	1.94
285.6	52.657	45.50	1.77	120	52.57	0.16	3.16	3.16	1.21	1.21	1.95	1.95
285.5	52.821	27.21	0.91	120	52.74	0.16	3.17	3.17	1.22	1.22	1.95	1.95
285.3	52.985	17.52	0.61	120	52.90	0.16	3.18	3.18	1.22	1.22	1.96	1.96
285.2	53.149	13.59	0.37	120	53.07	0.16	3.19	3.19	1.23	1.23	1.96	1.96
285.0	53.313	13.71	0.38	120	53.23	0.16	3.20	3.20	1.23	1.23	1.97	1.97
284.8	53.477	109.03	0.69	120	53.40	0.16	3.21	3.21	1.24	1.24	1.97	1.97
284.7	53.641	185.86	1.02	120	53.56	0.16	3.22	3.22	1.24	1.24	1.98	1.98
284.5	53.805	177.05	1.38	120	53.72	0.16	3.23	3.23	1.25	1.25	1.98	1.98
284.3	53.969	132.69	2.16	120	53.89	0.16	3.24	3.24	1.25	1.25	1.98	1.98
284.2	54.133	61.91	2.23	120	54.05	0.16	3.25	3.25	1.26	1.26	1.99	1.99
284.0	54.297	36.49	1.57	120	54.22	0.16	3.26	3.26	1.26	1.26	1.99	1.99
283.8	54.461	158.40	1.47	120	54.38	0.16	3.27	3.27	1.27	1.27	2.00	2.00
283.7	54.625	146.93	1.74	120	54.54	0.16	3.28	3.28	1.27	1.27	2.00	2.00
283.5	54.789	83.21	2.56	120	54.71	0.16	3.29	3.29	1.28	1.28	2.01	2.01
283.3	54.953	44.04	2.28	120	54.87	0.16	3.30	3.30	1.28	1.28	2.01	2.01
283.2	55.117	51.59	2.52	120	55.04	0.16	3.31	3.31	1.29	1.29	2.02	2.02
283.0	55.281	48.57	1.75	120	55.20	0.16	3.32	3.32	1.29	1.29	2.02	2.02
282.9	55.446	32.53	1.29	120	55.36	0.16	3.33	3.33	1.30	1.30	2.03	2.03
282.7	55.610	29.31	0.86	120	55.53	0.16	3.34	3.34	1.30	1.30	2.03	2.03
282.5	55.774	30.73	0.61	120	55.69	0.16	3.35	3.35	1.31	1.31	2.04	2.04
282.4	55.938	30.18	0.66	120	55.86	0.16	3.36	3.36	1.31	1.31	2.04	2.04
282.2	56.102	30.42	0.67	120	56.02	0.16	3.37	3.37	1.32	1.32	2.05	2.05
282.0	56.266	47.45	0.51	120	56.18	0.16	3.38	3.38	1.32	1.32	2.05	2.05
281.9	56.430	137.63	1.05	120	56.35	0.16	3.39	3.39	1.33	1.33	2.06	2.06
281.7	56.594	83.53	1.86	120	56.51	0.16	3.40	3.40	1.34	1.34	2.06	2.06
281.5	56.758	42.77	1.83	120	56.68	0.16	3.41	3.41	1.34	1.34	2.07	2.07
281.4	56.922	34.63	1.37	120	56.84	0.16	3.42	3.42	1.35	1.35	2.07	2.07
281.2	57.086	28.77	0.76	120	57.00	0.16	3.43	3.43	1.35	1.35	2.07	2.07
281.1	57.250	19.44	0.41	120	57.17	0.16	3.43	3.43	1.36	1.36	2.08	2.08
280.9	57.414	19.14	0.23	120	57.33	0.16	3.44	3.44	1.36	1.36	2.08	2.08
280.7	57.578	16.50	0.13	120	57.50	0.16	3.45	3.45	1.37	1.37	2.09	2.09
280.6	57.742	17.97	0.23	120	57.66	0.16	3.46	3.46	1.37	1.37	2.09	2.09
280.4	57.906	16.40	0.39	120	57.82	0.16	3.47	3.47	1.38	1.38	2.10	2.10
280.2	58.070	36.56	0.57	120	57.99	0.16	3.48	3.48	1.38	1.38	2.10	2.10
280.1	58.234	85.02	0.98	120	58.15	0.16	3.49	3.49	1.39	1.39	2.11	2.11
279.9	58.398	74.79	1.69	120	58.32	0.16	3.50	3.50	1.39	1.39	2.11	2.11
279.7	58.562	41.43	1.78	120	58.48	0.16	3.51	3.51	1.40	1.40	2.12	2.12
279.6	58.726	26.44	1.08	120	58.64	0.16	3.52	3.52	1.40	1.40	2.12	2.12

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σv CPT (tsf)	Total Vertical Stress during EQ σv EQ (tsf)	Static Pore Water Pressure during CPT us CPT (tsf)	Static Pore Water Pressure during EQ us EQ (tsf)	Effective Vertical Stress during CPT σv CPT (tsf)	Effective Vertical Stress during EQ σv EQ (tsf)
279.4	58.890	19.84	0.51	120	58.81	0.16	3.53	3.53	1.41	1.41	2.13	2.13
279.2	59.054	17.20	0.20	120	58.97	0.16	3.54	3.54	1.41	1.41	2.13	2.13
279.1	59.218	15.84	0.14	120	59.14	0.16	3.55	3.55	1.42	1.42	2.14	2.14
278.9	59.382	15.25	0.09	120	59.30	0.16	3.56	3.56	1.42	1.42	2.14	2.14
278.8	59.547	15.47	0.09	120	59.46	0.16	3.57	3.57	1.43	1.43	2.15	2.15
278.6	59.711	13.95	0.07	120	59.63	0.16	3.58	3.58	1.43	1.43	2.15	2.15
278.4	59.875	13.61	0.10	120	59.79	0.16	3.59	3.59	1.44	1.44	2.15	2.15
278.3	60.039	14.17	0.09	120	59.96	0.16	3.60	3.60	1.44	1.44	2.16	2.16
278.1	60.203	17.17	0.13	120	60.12	0.16	3.61	3.61	1.45	1.45	2.16	2.16
277.9	60.367	18.64	0.34	120	60.28	0.16	3.62	3.62	1.45	1.45	2.17	2.17
277.8	60.531	23.80	0.46	120	60.45	0.16	3.63	3.63	1.46	1.46	2.17	2.17
277.6	60.695	130.58	0.71	120	60.61	0.16	3.64	3.64	1.46	1.46	2.18	2.18
277.4	60.859	171.33	1.28	120	60.78	0.16	3.65	3.65	1.47	1.47	2.18	2.18
277.3	61.023	175.74	1.54	120	60.94	0.16	3.66	3.66	1.47	1.47	2.19	2.19
277.1	61.187	199.52	1.92	120	61.10	0.16	3.67	3.67	1.48	1.48	2.19	2.19
276.9	61.351	224.20	2.20	120	61.27	0.16	3.68	3.68	1.48	1.48	2.20	2.20
276.8	61.515	231.69	2.00	120	61.43	0.16	3.69	3.69	1.49	1.49	2.20	2.20
276.6	61.679	247.24	1.70	120	61.60	0.16	3.70	3.70	1.49	1.49	2.21	2.21
276.5	61.843	232.70	1.80	120	61.76	0.16	3.71	3.71	1.50	1.50	2.21	2.21
276.3	62.007	205.29	1.85	120	61.93	0.16	3.72	3.72	1.50	1.50	2.22	2.22
276.1	62.171	195.63	1.82	120	62.09	0.16	3.73	3.73	1.51	1.51	2.22	2.22
276.0	62.335	185.72	1.68	120	62.25	0.16	3.74	3.74	1.51	1.51	2.23	2.23
275.8	62.499	178.48	1.55	120	62.42	0.16	3.75	3.75	1.52	1.52	2.23	2.23
275.6	62.663	174.10	1.55	120	62.58	0.16	3.76	3.76	1.52	1.52	2.24	2.24
275.5	62.827	166.47	1.53	120	62.75	0.16	3.77	3.77	1.53	1.53	2.24	2.24
275.3	62.991	156.19	1.55	120	62.91	0.16	3.78	3.78	1.53	1.53	2.24	2.24
275.1	63.155	141.26	1.86	120	63.07	0.16	3.79	3.79	1.54	1.54	2.25	2.25
275.0	63.319	100.84	2.59	120	63.24	0.16	3.80	3.80	1.55	1.55	2.25	2.25
274.8	63.483	51.28	2.46	120	63.40	0.16	3.81	3.81	1.55	1.55	2.26	2.26
274.7	63.648	32.07	1.70	120	63.57	0.16	3.82	3.82	1.56	1.56	2.26	2.26
274.5	63.812	26.49	0.81	120	63.73	0.16	3.83	3.83	1.56	1.56	2.27	2.27
274.3	63.976	76.67	0.38	120	63.89	0.16	3.84	3.84	1.57	1.57	2.27	2.27
274.2	64.140	149.48	1.21	120	64.06	0.16	3.85	3.85	1.57	1.57	2.28	2.28
274.0	64.304	163.36	1.98	120	64.22	0.16	3.86	3.86	1.58	1.58	2.28	2.28
273.8	64.468	124.06	1.81	120	64.39	0.16	3.87	3.87	1.58	1.58	2.29	2.29
273.7	64.632	74.56	1.77	120	64.55	0.16	3.88	3.88	1.59	1.59	2.29	2.29
273.5	64.796	84.69	2.85	120	64.71	0.16	3.89	3.89	1.59	1.59	2.30	2.30
273.3	64.960	56.25	1.85	120	64.88	0.16	3.90	3.90	1.60	1.60	2.30	2.30
273.2	65.124	37.94	1.78	120	65.04	0.16	3.91	3.91	1.60	1.60	2.31	2.31
273.0	65.288	83.77	1.25	120	65.21	0.16	3.92	3.92	1.61	1.61	2.31	2.31
272.8	65.452	88.64	1.20	120	65.37	0.16	3.93	3.93	1.61	1.61	2.32	2.32
272.7	65.616	88.38	1.05	120	65.53	0.16	3.94	3.94	1.62	1.62	2.32	2.32
272.5	65.780	119.57	0.78	120	65.70	0.16	3.95	3.95	1.62	1.62	2.33	2.33
272.4	65.944	112.60	1.24	120	65.86	0.16	3.96	3.96	1.63	1.63	2.33	2.33
272.2	66.108	68.07	2.06	120	66.03	0.16	3.97	3.97	1.63	1.63	2.33	2.33
272.0	66.272	42.74	1.72	120	66.19	0.16	3.98	3.98	1.64	1.64	2.34	2.34
271.9	66.436	46.48	1.22	120	66.35	0.16	3.99	3.99	1.64	1.64	2.34	2.34
271.7	66.600	110.43	1.09	120	66.52	0.16	4.00	4.00	1.65	1.65	2.35	2.35
271.5	66.764	98.99	2.08	120	66.68	0.16	4.01	4.01	1.65	1.65	2.35	2.35
271.4	66.928	96.59	2.15	120	66.85	0.16	4.02	4.02	1.66	1.66	2.36	2.36
271.2	67.092	134.09	1.81	120	67.01	0.16	4.03	4.03	1.66	1.66	2.36	2.36
271.0	67.256	206.17	2.23	120	67.17	0.16	4.04	4.04	1.67	1.67	2.37	2.37
270.9	67.420	158.77	2.74	120	67.34	0.16	4.05	4.05	1.67	1.67	2.37	2.37
270.7	67.584	72.13	3.93	120	67.50	0.16	4.06	4.06	1.68	1.68	2.38	2.38
270.6	67.749	49.51	2.33	120	67.67	0.16	4.06	4.06	1.68	1.68	2.38	2.38
270.4	67.913	77.58	2.12	120	67.83	0.16	4.07	4.07	1.69	1.69	2.39	2.39
270.2	68.077	309.54	2.40	120	67.99	0.16	4.08	4.08	1.69	1.69	2.39	2.39
270.1	68.241	347.43	3.74	120	68.16	0.16	4.09	4.09	1.70	1.70	2.40	2.40
269.9	68.405	251.44	4.98	120	68.32	0.16	4.10	4.10	1.70	1.70	2.40	2.40
269.7	68.569	123.85	5.95	120	68.49	0.16	4.11	4.11	1.71	1.71	2.41	2.41
269.6	68.733	62.10	3.78	120	68.65	0.16	4.12	4.12	1.71	1.71	2.41	2.41
269.4	68.897	49.49	2.99	120	68.81	0.16	4.13	4.13	1.72	1.72	2.41	2.41
269.2	69.061	164.79	2.79	120	68.98	0.16	4.14	4.14	1.72	1.72	2.42	2.42
269.1	69.225	148.73	3.49	120	69.14	0.16	4.15	4.15	1.73	1.73	2.42	2.42
268.9	69.389	73.06	2.92	120	69.31	0.16	4.16	4.16	1.73	1.73	2.43	2.43
268.7	69.553	87.57	2.73	120	69.47	0.16	4.17	4.17	1.74	1.74	2.43	2.43
268.6	69.717	209.49	2.82	120	69.63	0.16	4.18	4.18	1.74	1.74	2.44	2.44
268.4	69.881	293.18	3.33	120	69.80	0.16	4.19	4.19	1.75	1.75	2.44	2.44
268.3	70.045	328.07	3.70	120	69.96	0.16	4.20	4.20	1.75	1.75	2.45	2.45
268.1	70.209	331.07	4.28	120	70.13	0.16	4.21	4.21	1.76	1.76	2.45	2.45
267.9	70.373	314.03	5.11	120	70.29	0.16	4.22	4.22	1.77	1.77	2.46	2.46
267.8	70.537	272.94	5.49	120	70.46	0.16	4.23	4.23	1.77	1.77	2.46	2.46
267.6	70.701	218.44	5.17	120	70.62	0.16	4.24	4.24	1.78	1.78	2.47	2.47
267.4	70.865	289.70	4.12	120	70.78	0.16	4.25	4.25	1.78	1.78	2.47	2.47

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σv CPT (tsf)	Total Vertical Stress during EQ σv EQ (tsf)	Static Pore Water Pressure during CPT us CPT (tsf)	Static Pore Water Pressure during EQ us EQ (tsf)	Effective Vertical Stress during CPT σv CPT (tsf)	Effective Vertical Stress during EQ σv EQ (tsf)
267.3	71.029	330.26	3.81	120	70.95	0.16	4.26	4.26	1.79	1.79	2.48	2.48
267.1	71.193	277.72	3.69	120	71.11	0.16	4.27	4.27	1.79	1.79	2.48	2.48
266.9	71.357	182.18	3.46	120	71.28	0.16	4.28	4.28	1.80	1.80	2.49	2.49
266.8	71.521	93.35	3.09	120	71.44	0.16	4.29	4.29	1.80	1.80	2.49	2.49
266.6	71.685	51.46	2.41	120	71.60	0.16	4.30	4.30	1.81	1.81	2.50	2.50
266.5	71.850	36.12	1.45	120	71.77	0.16	4.31	4.31	1.81	1.81	2.50	2.50
266.3	72.014	37.18	0.99	120	71.93	0.16	4.32	4.32	1.82	1.82	2.50	2.50
266.1	72.178	71.53	1.64	120	72.10	0.16	4.33	4.33	1.82	1.82	2.51	2.51
266.0	72.342	129.43	1.65	120	72.26	0.16	4.34	4.34	1.83	1.83	2.51	2.51
265.8	72.506	156.14	1.20	120	72.42	0.16	4.35	4.35	1.83	1.83	2.52	2.52
265.6	72.670	140.09	2.23	120	72.59	0.16	4.36	4.36	1.84	1.84	2.52	2.52
265.5	72.834	103.01	2.44	120	72.75	0.16	4.37	4.37	1.84	1.84	2.53	2.53
265.3	72.998	109.63	2.41	120	72.92	0.16	4.38	4.38	1.85	1.85	2.53	2.53
265.1	73.162	72.13	2.45	120	73.08	0.16	4.39	4.39	1.85	1.85	2.54	2.54
265.0	73.326	42.53	1.52	120	73.24	0.16	4.40	4.40	1.86	1.86	2.54	2.54
264.8	73.490	29.79	1.53	120	73.41	0.16	4.41	4.41	1.86	1.86	2.55	2.55
264.6	73.654	41.10	2.04	120	73.57	0.16	4.42	4.42	1.87	1.87	2.55	2.55
264.5	73.818	132.11	2.29	120	73.74	0.16	4.43	4.43	1.87	1.87	2.56	2.56
264.3	73.982	197.25	2.17	120	73.90	0.16	4.44	4.44	1.88	1.88	2.56	2.56
264.2	74.146	232.17	1.95	120	74.06	0.16	4.45	4.45	1.88	1.88	2.57	2.57
264.0	74.310	221.03	2.06	120	74.23	0.16	4.46	4.46	1.89	1.89	2.57	2.57
263.8	74.474	206.50	1.92	120	74.39	0.16	4.47	4.47	1.89	1.89	2.58	2.58
263.7	74.638	198.02	1.77	120	74.56	0.16	4.48	4.48	1.90	1.90	2.58	2.58
263.5	74.802	187.07	1.66	120	74.72	0.16	4.49	4.49	1.90	1.90	2.58	2.58
263.3	74.966	178.13	1.59	120	74.88	0.16	4.50	4.50	1.91	1.91	2.59	2.59
263.2	75.130	170.18	1.31	120	75.05	0.16	4.51	4.51	1.91	1.91	2.59	2.59
263.0	75.294	153.72	1.38	120	75.21	0.16	4.52	4.52	1.92	1.92	2.60	2.60
262.8	75.458	121.47	1.49	120	75.38	0.16	4.53	4.53	1.92	1.92	2.60	2.60
262.7	75.622	82.41	1.81	120	75.54	0.16	4.54	4.54	1.93	1.93	2.61	2.61
262.5	75.786	65.17	2.01	120	75.70	0.16	4.55	4.55	1.93	1.93	2.61	2.61
262.3	75.951	41.65	1.99	120	75.87	0.16	4.56	4.56	1.94	1.94	2.62	2.62
262.2	76.115	40.99	2.10	120	76.03	0.16	4.57	4.57	1.94	1.94	2.62	2.62
262.0	76.279	41.64	1.46	120	76.20	0.16	4.58	4.58	1.95	1.95	2.63	2.63
261.9	76.443	121.53	1.36	120	76.36	0.16	4.59	4.59	1.95	1.95	2.63	2.63
261.7	76.607	235.14	1.57	120	76.52	0.16	4.60	4.60	1.96	1.96	2.64	2.64
261.5	76.771	217.35	1.90	120	76.69	0.16	4.61	4.61	1.96	1.96	2.64	2.64
261.4	76.935	202.05	2.00	120	76.85	0.16	4.62	4.62	1.97	1.97	2.65	2.65
261.2	77.099	194.87	2.09	120	77.02	0.16	4.63	4.63	1.97	1.97	2.65	2.65
261.0	77.263	205.06	1.98	120	77.18	0.16	4.64	4.64	1.98	1.98	2.66	2.66
260.9	77.427	238.71	1.97	120	77.34	0.16	4.65	4.65	1.99	1.99	2.66	2.66
260.7	77.591	258.21	1.76	120	77.51	0.16	4.66	4.66	1.99	1.99	2.67	2.67
260.5	77.755	237.06	1.42	120	77.67	0.16	4.67	4.67	2.00	2.00	2.67	2.67
260.4	77.919	206.33	0.94	120	77.84	0.16	4.68	4.68	2.00	2.00	2.67	2.67
260.2	78.083	191.02	0.39	120	78.00	0.16	4.68	4.68	2.01	2.01	2.68	2.68
260.1	78.247	154.98	0.34	120	78.17	0.16	4.69	4.69	2.01	2.01	2.68	2.68
259.9	78.411	133.98	0.28	120	78.33	0.16	4.70	4.70	2.02	2.02	2.69	2.69
259.7	78.575	115.37	0.13	120	78.49	0.16	4.71	4.71	2.02	2.02	2.69	2.69
259.6	78.739	146.62	0.86	120	78.66	0.16	4.72	4.72	2.03	2.03	2.70	2.70
259.4	78.903	188.22	0.94	120	78.82	0.16	4.73	4.73	2.03	2.03	2.70	2.70
259.2	79.067	245.06	1.69	120	78.99	0.16	4.74	4.74	2.04	2.04	2.71	2.71
259.1	79.231	296.36	5.13	120	79.15	0.16	4.75	4.75	2.04	2.04	2.71	2.71
258.9	79.395	338.06	4.59	120	79.31	0.16	4.76	4.76	2.05	2.05	2.72	2.72
258.7	79.559	363.36	4.00	120	79.48	0.16	4.77	4.77	2.05	2.05	2.72	2.72
258.6	79.723	280.98	2.74	120	79.64	0.16	4.78	4.78	2.06	2.06	2.73	2.73
258.4	79.887	220.04	1.66	120	79.81	0.16	4.79	4.79	2.06	2.06	2.73	2.73
258.2	80.052	220.95	1.48	120	79.97	0.16	4.80	4.80	2.07	2.07	2.74	2.74
258.1	80.216	236.36	1.84	120	80.13	0.16	4.81	4.81	2.07	2.07	2.74	2.74
257.9	80.380	236.54	1.96	120	80.30	0.16	4.82	4.82	2.08	2.08	2.75	2.75
257.8	80.544	220.36	2.16	120	80.46	0.16	4.83	4.83	2.08	2.08	2.75	2.75
257.6	80.708	230.82	2.09	120	80.63	0.16	4.84	4.84	2.09	2.09	2.75	2.75
257.4	80.872	279.64	2.06	120	80.79	0.16	4.85	4.85	2.09	2.09	2.76	2.76
257.3	81.036	326.05	2.58	120	80.95	0.16	4.86	4.86	2.10	2.10	2.76	2.76
257.1	81.200	343.00	3.15	120	81.12	0.16	4.87	4.87	2.10	2.10	2.77	2.77
256.9	81.364	345.33	3.44	120	81.28	0.16	4.88	4.88	2.11	2.11	2.77	2.77
256.8	81.528	353.95	3.45	120	81.45	0.16	4.89	4.89	2.11	2.11	2.78	2.78
256.6	81.692	343.50	3.62	120	81.61	0.16	4.90	4.90	2.12	2.12	2.78	2.78
256.4	81.856	353.28	3.59	120	81.77	0.16	4.91	4.91	2.12	2.12	2.79	2.79
256.3	82.020	338.96	3.55	120	81.94	0.16	4.92	4.92	2.13	2.13	2.79	2.79
256.1	82.184	316.35	3.73	120	82.10	0.16	4.93	4.93	2.13	2.13	2.80	2.80
256.0	82.348	301.21	3.53	120	82.27	0.16	4.94	4.94	2.14	2.14	2.80	2.80
255.8	82.512	300.18	3.41	120	82.43	0.16	4.95	4.95	2.14	2.14	2.81	2.81
255.6	82.676	288.44	3.34	120	82.59	0.16	4.96	4.96	2.15	2.15	2.81	2.81
255.5	82.840	285.17	3.19	120	82.76	0.16	4.97	4.97	2.15	2.15	2.82	2.82
255.3	83.004	295.68	3.09	120	82.92	0.16	4.98	4.98	2.16	2.16	2.82	2.82

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255.1	83.168	303.19	3.40	120	83.09	0.16	4.99	4.99	2.16	2.16	2.83	2.83
255.0	83.332	292.01	3.75	120	83.25	0.16	5.00	5.00	2.17	2.17	2.83	2.83
254.8	83.496	280.54	3.82	120	83.41	0.16	5.01	5.01	2.17	2.17	2.84	2.84
254.6	83.660	277.41	3.76	120	83.58	0.16	5.02	5.02	2.18	2.18	2.84	2.84
254.5	83.824	278.41	3.72	120	83.74	0.16	5.03	5.03	2.18	2.18	2.84	2.84
254.3	83.988	277.50	3.67	120	83.91	0.16	5.04	5.04	2.19	2.19	2.85	2.85
254.1	84.153	276.62	3.65	120	84.07	0.16	5.05	5.05	2.19	2.19	2.85	2.85
254.0	84.317	281.79	3.69	120	84.23	0.16	5.06	5.06	2.20	2.20	2.86	2.86
253.8	84.481	290.36	3.70	120	84.40	0.16	5.07	5.07	2.21	2.21	2.86	2.86
253.7	84.645	303.27	3.61	120	84.56	0.16	5.08	5.08	2.21	2.21	2.87	2.87
253.5	84.809	318.44	3.16	120	84.73	0.16	5.09	5.09	2.22	2.22	2.87	2.87
253.3	84.973	308.57	3.21	120	84.89	0.16	5.10	5.10	2.22	2.22	2.88	2.88
253.2	85.137	286.45	2.63	120	85.05	0.16	5.11	5.11	2.23	2.23	2.88	2.88
253.0	85.301	263.20	2.76	120	85.22	0.16	5.12	5.12	2.23	2.23	2.89	2.89
252.8	85.465	266.22	3.29	120	85.38	0.16	5.13	5.13	2.24	2.24	2.89	2.89
252.7	85.629	276.38	2.71	120	85.55	0.16	5.14	5.14	2.24	2.24	2.90	2.90
252.5	85.793	256.37	3.02	120	85.71	0.16	5.15	5.15	2.25	2.25	2.90	2.90
252.3	85.957	248.41	2.39	120	85.87	0.16	5.16	5.16	2.25	2.25	2.91	2.91
252.2	86.121	250.09	2.24	120	86.04	0.16	5.17	5.17	2.26	2.26	2.91	2.91
252.0	86.285	239.02	2.26	120	86.20	0.16	5.18	5.18	2.26	2.26	2.92	2.92
251.9	86.449	245.51	2.16	120	86.37	0.16	5.19	5.19	2.27	2.27	2.92	2.92
251.7	86.613	258.35	2.45	120	86.53	0.16	5.20	5.20	2.27	2.27	2.93	2.93
251.5	86.777	263.77	2.39	120	86.70	0.16	5.21	5.21	2.28	2.28	2.93	2.93
251.4	86.941	310.27	2.31	120	86.86	0.16	5.22	5.22	2.28	2.28	2.93	2.93
251.2	87.105	353.53	2.34	120	87.02	0.16	5.23	5.23	2.29	2.29	2.94	2.94
251.0	87.269	356.70	2.64	120	87.19	0.16	5.24	5.24	2.29	2.29	2.94	2.94
250.9	87.433	328.92	3.09	120	87.35	0.16	5.25	5.25	2.30	2.30	2.95	2.95
250.7	87.597	316.48	3.04	120	87.52	0.16	5.26	5.26	2.30	2.30	2.95	2.95
250.5	87.761	321.02	3.36	120	87.68	0.16	5.27	5.27	2.31	2.31	2.96	2.96
250.4	87.925	335.83	3.51	120	87.84	0.16	5.28	5.28	2.31	2.31	2.96	2.96
250.2	88.089	371.83	3.68	120	88.01	0.16	5.29	5.29	2.32	2.32	2.97	2.97
250.0	88.254	392.59	4.00	120	88.17	0.16	5.30	5.30	2.32	2.32	2.97	2.97
249.9	88.418	386.92	3.12	120	88.34	0.16	5.31	5.31	2.33	2.33	2.98	2.98
249.7	88.582	357.36	3.30	120	88.50	0.16	5.31	5.31	2.33	2.33	2.98	2.98
249.6	88.746	260.64	2.53	120	88.66	0.16	5.32	5.32	2.34	2.34	2.99	2.99
249.4	88.910	244.48	1.82	120	88.83	0.16	5.33	5.33	2.34	2.34	2.99	2.99
249.2	89.074	353.09	1.87	120	88.99	0.16	5.34	5.34	2.35	2.35	3.00	3.00
249.1	89.238	403.55	2.02	120	89.16	0.16	5.35	5.35	2.35	2.35	3.00	3.00
248.9	89.402	450.26	1.96	120	89.32	0.16	5.36	5.36	2.36	2.36	3.01	3.01
248.7	89.566	488.30	2.43	120	89.48	0.16	5.37	5.37	2.36	2.36	3.01	3.01
248.6	89.730	494.91	2.74	120	89.65	0.16	5.38	5.38	2.37	2.37	3.01	3.01
248.4	89.894	495.81	2.82	120	89.81	0.16	5.39	5.39	2.37	2.37	3.02	3.02
248.2	90.058	499.65	2.69	120	89.98	0.16	5.40	5.40	2.38	2.38	3.02	3.02
248.1	90.222	486.60	2.80	120	90.14	0.16	5.41	5.41	2.38	2.38	3.03	3.03
247.9	90.386	614.22	2.66	120	90.30	0.16	5.42	5.42	2.39	2.39	3.03	3.03
247.7	90.550	635.25	3.12	120	90.47	0.16	5.43	5.43	2.39	2.39	3.04	3.04
247.6	90.714	556.37	4.20	120	90.63	0.16	5.44	5.44	2.40	2.40	3.04	3.04
247.4	90.878	521.02	2.02	120	90.80	0.16	5.45	5.45	2.40	2.40	3.05	3.05
247.3	91.042	448.73	1.39	120	90.96	0.16	5.46	5.46	2.41	2.41	3.05	3.05
247.1	91.206	369.45	2.23	120	91.12	0.16	5.47	5.47	2.42	2.42	3.06	3.06
246.9	91.370	241.14	1.43	120	91.29	0.16	5.48	5.48	2.42	2.42	3.06	3.06
246.8	91.534	191.62	0.87	120	91.45	0.16	5.49	5.49	2.43	2.43	3.07	3.07
246.6	91.698	164.57	0.36	120	91.62	0.16	5.50	5.50	2.43	2.43	3.07	3.07
246.4	91.862	145.12	0.59	120	91.78	0.16	5.51	5.51	2.44	2.44	3.08	3.08
246.3	92.026	172.53	0.64	120	91.94	0.16	5.52	5.52	2.44	2.44	3.08	3.08
246.1	92.190	317.88	1.13	120	92.11	0.16	5.53	5.53	2.45	2.45	3.09	3.09
245.9	92.355	384.40	1.49	120	92.27	0.16	5.54	5.54	2.45	2.45	3.09	3.09
245.8	92.519	376.90	1.96	120	92.44	0.16	5.55	5.55	2.46	2.46	3.10	3.10
245.6	92.683	335.52	2.02	120	92.60	0.16	5.56	5.56	2.46	2.46	3.10	3.10
245.5	92.847	303.17	2.00	120	92.76	0.16	5.57	5.57	2.47	2.47	3.10	3.10
245.3	93.011	291.25	1.58	120	92.93	0.16	5.58	5.58	2.47	2.47	3.11	3.11
245.1	93.175	277.45	1.38	120	93.09	0.16	5.59	5.59	2.48	2.48	3.11	3.11
245.0	93.339	276.95	1.42	120	93.26	0.16	5.60	5.60	2.48	2.48	3.12	3.12
244.8	93.503	257.47	1.08	120	93.42	0.16	5.61	5.61	2.49	2.49	3.12	3.12
244.6	93.667	227.78	1.52	120	93.58	0.16	5.62	5.62	2.49	2.49	3.13	3.13
244.5	93.831	188.67	1.23	120	93.75	0.16	5.63	5.63	2.50	2.50	3.13	3.13
244.3	93.995	113.72	0.47	120	93.91	0.16	5.64	5.64	2.50	2.50	3.14	3.14
244.1	94.159	103.82	0.39	120	94.08	0.16	5.65	5.65	2.51	2.51	3.14	3.14
244.0	94.323	130.58	1.53	120	94.24	0.16	5.66	5.66	2.51	2.51	3.15	3.15
243.8	94.487	157.86	1.59	120	94.41	0.16	5.67	5.67	2.52	2.52	3.15	3.15
243.6	94.651	157.30	2.26	120	94.57	0.16	5.68	5.68	2.52	2.52	3.16	3.16
243.5	94.815	198.79	2.00	120	94.73	0.16	5.69	5.69	2.53	2.53	3.16	3.16
243.3	94.979	262.14	1.82	120	94.90	0.16	5.70	5.70	2.53	2.53	3.17	3.17
243.2	95.143	360.59	1.87	120	95.06	0.16	5.71	5.71	2.54	2.54	3.17	3.17

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σv CPT (tsf)	Total Vertical Stress during EQ σv EQ (tsf)	Static Pore Water Pressure during CPT us CPT (tsf)	Static Pore Water Pressure during EQ us EQ (tsf)	Effective Vertical Stress during CPT σv CPT (tsf)	Effective Vertical Stress during EQ σv EQ (tsf)
243.0	95.307	379.73	2.05	120	95.23	0.16	5.72	5.72	2.54	2.54	3.18	3.18
242.8	95.471	341.06	1.85	120	95.39	0.16	5.73	5.73	2.55	2.55	3.18	3.18
242.7	95.635	282.77	1.93	120	95.55	0.16	5.74	5.74	2.55	2.55	3.18	3.18
242.5	95.799	243.18	1.62	120	95.72	0.16	5.75	5.75	2.56	2.56	3.19	3.19
242.3	95.963	202.26	2.73	120	95.88	0.16	5.76	5.76	2.56	2.56	3.19	3.19
242.2	96.127	151.50	4.55	120	96.05	0.16	5.77	5.77	2.57	2.57	3.20	3.20
242.0	96.291	158.91	3.91	120	96.21	0.16	5.78	5.78	2.57	2.57	3.20	3.20
241.8	96.456	317.31	2.52	120	96.37	0.16	5.79	5.79	2.58	2.58	3.21	3.21
241.7	96.620	414.74	1.89	120	96.54	0.16	5.80	5.80	2.58	2.58	3.21	3.21
241.5	96.784	362.63	1.95	120	96.70	0.16	5.81	5.81	2.59	2.59	3.22	3.22
241.4	96.948	305.17	2.75	120	96.87	0.16	5.82	5.82	2.59	2.59	3.22	3.22
241.2	97.112	274.56	2.71	120	97.03	0.16	5.83	5.83	2.60	2.60	3.23	3.23
241.0	97.276	195.37	2.72	120	97.19	0.16	5.84	5.84	2.60	2.60	3.23	3.23
240.9	97.440	130.58	3.74	120	97.36	0.16	5.85	5.85	2.61	2.61	3.24	3.24
240.7	97.604	82.84	2.81	120	97.52	0.16	5.86	5.86	2.61	2.61	3.24	3.24
240.5	97.768	34.94	1.95	120	97.69	0.16	5.87	5.87	2.62	2.62	3.25	3.25
240.4	97.932	27.78	1.10	120	97.85	0.16	5.88	5.88	2.62	2.62	3.25	3.25
240.2	98.096	25.84	0.45	120	98.01	0.16	5.89	5.89	2.63	2.63	3.26	3.26
240.0	98.260	22.96	0.32	120	98.18	0.16	5.90	5.90	2.64	2.64	3.26	3.26
239.9	98.424	22.79	0.23	120	98.34	0.16	5.91	5.91	2.64	2.64	3.27	3.27
239.7	98.588	22.94	0.19	120	98.51	0.16	5.92	5.92	2.65	2.65	3.27	3.27
239.5	98.752	22.94	0.18	120	98.67	0.16	5.93	5.93	2.65	2.65	3.27	3.27
239.4	98.916	23.03	0.20	120	98.83	0.16	5.93	5.93	2.66	2.66	3.28	3.28
239.2	99.080	22.80	0.20	120	99.00	0.16	5.94	5.94	2.66	2.66	3.28	3.28
239.1	99.244	21.64	0.19	120	99.16	0.16	5.95	5.95	2.67	2.67	3.29	3.29
238.9	99.408	21.94	0.18	120	99.33	0.16	5.96	5.96	2.67	2.67	3.29	3.29
238.7	99.572	22.23	0.19	120	99.49	0.16	5.97	5.97	2.68	2.68	3.30	3.30
238.6	99.736	22.80	0.21	120	99.65	0.16	5.98	5.98	2.68	2.68	3.30	3.30
238.4	99.900	21.60	0.19	120	99.82	0.16	5.99	5.99	2.69	2.69	3.31	3.31
238.2	100.064	21.02	0.19	120	99.98	0.16	6.00	6.00	2.69	2.69	3.31	3.31
238.1	100.228	21.07	0.17	120	100.15	0.16	6.01	6.01	2.70	2.70	3.32	3.32
237.9	100.392	20.55	0.15	120	100.31	0.16	6.02	6.02	2.70	2.70	3.32	3.32
237.7	100.557	20.65	0.17	120	100.47	0.16	6.03	6.03	2.71	2.71	3.33	3.33
237.6	100.721	21.19	0.18	120	100.64	0.16	6.04	6.04	2.71	2.71	3.33	3.33
237.4	100.885	21.19	0.21	120	100.80	0.16	6.05	6.05	2.72	2.72	3.34	3.34
237.3	101.049	21.06	0.20	120	100.97	0.16	6.06	6.06	2.72	2.72	3.34	3.34
237.1	101.213	20.76	0.22	120	101.13	0.16	6.07	6.07	2.73	2.73	3.35	3.35
236.9	101.377	20.00	0.19	120	101.29	0.16	6.08	6.08	2.73	2.73	3.35	3.35
236.8	101.541	20.16	0.16	120	101.46	0.16	6.09	6.09	2.74	2.74	3.35	3.35
236.6	101.705	20.49	0.16	120	101.62	0.16	6.10	6.10	2.74	2.74	3.36	3.36
236.4	101.869	19.93	0.18	120	101.79	0.16	6.11	6.11	2.75	2.75	3.36	3.36
236.3	102.033	20.43	0.18	120	101.95	0.16	6.12	6.12	2.75	2.75	3.37	3.37
236.1	102.197	20.70	0.20	120	102.11	0.16	6.13	6.13	2.76	2.76	3.37	3.37
235.9	102.361	20.87	0.20	120	102.28	0.16	6.14	6.14	2.76	2.76	3.38	3.38
235.8	102.525	21.49	0.19	120	102.44	0.16	6.15	6.15	2.77	2.77	3.38	3.38
235.6	102.689	21.02	0.18	120	102.61	0.16	6.16	6.16	2.77	2.77	3.39	3.39
235.4	102.853	20.92	0.19	120	102.77	0.16	6.17	6.17	2.78	2.78	3.39	3.39
235.3	103.017	20.90	0.19	120	102.94	0.16	6.18	6.18	2.78	2.78	3.40	3.40
235.1	103.181	20.81	0.18	120	103.10	0.16	6.19	6.19	2.79	2.79	3.40	3.40
235.0	103.345	21.43	0.20	120	103.26	0.16	6.20	6.20	2.79	2.79	3.41	3.41
234.8	103.509	20.82	0.20	120	103.43	0.16	6.21	6.21	2.80	2.80	3.41	3.41
234.6	103.673	20.99	0.20	120	103.59	0.16	6.22	6.22	2.80	2.80	3.42	3.42
234.5	103.837	20.84	0.20	120	103.76	0.16	6.23	6.23	2.81	2.81	3.42	3.42
234.3	104.001	21.51	0.20	120	103.92	0.16	6.24	6.24	2.81	2.81	3.43	3.43
234.1	104.165	21.68	0.24	120	104.08	0.16	6.25	6.25	2.82	2.82	3.43	3.43
234.0	104.329	21.77	0.29	120	104.25	0.16	6.26	6.26	2.82	2.82	3.44	3.44
233.8	104.493	24.14	0.37	120	104.41	0.16	6.27	6.27	2.83	2.83	3.44	3.44
233.6	104.658	122.83	1.46	120	104.58	0.16	6.28	6.28	2.83	2.83	3.44	3.44
233.5	104.822	92.97	1.76	120	104.74	0.16	6.29	6.29	2.84	2.84	3.45	3.45
233.3	104.986	46.66	1.69	120	104.90	0.16	6.30	6.30	2.84	2.84	3.45	3.45
233.2	105.150	37.51	1.04	120	105.07	0.16	6.31	6.31	2.85	2.85	3.46	3.46
233.0	105.314	33.92	0.46	120	105.23	0.16	6.32	6.32	2.86	2.86	3.46	3.46
232.8	105.478	26.92	0.55	120	105.40	0.16	6.33	6.33	2.86	2.86	3.47	3.47
232.7	105.642	25.54	0.82	120	105.56	0.16	6.34	6.34	2.87	2.87	3.47	3.47
232.5	105.806	130.04	1.40	120	105.72	0.16	6.35	6.35	2.87	2.87	3.48	3.48
232.3	105.970	106.67	2.38	120	105.89	0.16	6.36	6.36	2.88	2.88	3.48	3.48
232.2	106.134	77.77	2.43	120	106.05	0.16	6.37	6.37	2.88	2.88	3.49	3.49
232.0	106.298	43.81	1.80	120	106.22	0.16	6.38	6.38	2.89	2.89	3.49	3.49
231.8	106.462	32.18	0.97	120	106.38	0.16	6.39	6.39	2.89	2.89	3.50	3.50
231.7	106.626	27.86	0.32	120	106.54	0.16	6.40	6.40	2.90	2.90	3.50	3.50
231.5	106.790	31.29	0.32	120	106.71	0.16	6.41	6.41	2.90	2.90	3.51	3.51
231.3	106.954	48.10	0.60	120	106.87	0.16	6.42	6.42	2.91	2.91	3.51	3.51
231.2	107.118	36.72	0.84	120	107.04	0.16	6.43	6.43	2.91	2.91	3.52	3.52
231.0	107.282	24.82	0.78	120	107.20	0.16	6.44	6.44	2.92	2.92	3.52	3.52

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σv CPT (tsf)	Total Vertical Stress during EQ σv EQ (tsf)	Static Pore Water Pressure during CPT us CPT (tsf)	Static Pore Water Pressure during EQ us EQ (tsf)	Effective Vertical Stress during CPT σv CPT (tsf)	Effective Vertical Stress during EQ σv EQ (tsf)
230.9	107.446	23.24	0.43	120	107.36	0.16	6.45	6.45	2.92	2.92	3.53	3.53
230.7	107.610	22.39	0.18	120	107.53	0.16	6.46	6.46	2.93	2.93	3.53	3.53
230.5	107.774	22.30	0.18	120	107.69	0.16	6.47	6.47	2.93	2.93	3.53	3.53
230.4	107.938	26.19	0.24	120	107.86	0.16	6.48	6.48	2.94	2.94	3.54	3.54
230.2	108.102	22.82	0.31	120	108.02	0.16	6.49	6.49	2.94	2.94	3.54	3.54
230.0	108.266	22.19	0.49	120	108.18	0.16	6.50	6.50	2.95	2.95	3.55	3.55
229.9	108.430	23.77	0.42	120	108.35	0.16	6.51	6.51	2.95	2.95	3.55	3.55
229.7	108.594	63.28	0.43	120	108.51	0.16	6.52	6.52	2.96	2.96	3.56	3.56
229.5	108.759	155.40	0.50	120	108.68	0.16	6.53	6.53	2.96	2.96	3.56	3.56
229.4	108.923	140.13	1.56	120	108.84	0.16	6.54	6.54	2.97	2.97	3.57	3.57
229.2	109.087	95.56	2.38	120	109.00	0.16	6.55	6.55	2.97	2.97	3.57	3.57
229.0	109.251	51.89	2.24	120	109.17	0.16	6.56	6.56	2.98	2.98	3.58	3.58
228.9	109.415	35.22	1.46	120	109.33	0.16	6.56	6.56	2.98	2.98	3.58	3.58
228.7	109.579	37.96	0.64	120	109.50	0.16	6.57	6.57	2.99	2.99	3.59	3.59
228.6	109.743	37.84	0.43	120	109.66	0.16	6.58	6.58	2.99	2.99	3.59	3.59
228.4	109.907	32.42	0.75	120	109.82	0.16	6.59	6.59	3.00	3.00	3.60	3.60
228.2	110.071	25.33	0.87	120	109.99	0.16	6.60	6.60	3.00	3.00	3.60	3.60
228.1	110.235	62.35	0.75	120	110.15	0.16	6.61	6.61	3.01	3.01	3.61	3.61
227.9	110.399	96.85	1.24	120	110.32	0.16	6.62	6.62	3.01	3.01	3.61	3.61
227.7	110.563	83.34	1.81	120	110.48	0.16	6.63	6.63	3.02	3.02	3.61	3.61
227.6	110.727	76.89	1.94	120	110.64	0.16	6.64	6.64	3.02	3.02	3.62	3.62
227.4	110.891	115.65	2.46	120	110.81	0.16	6.65	6.65	3.03	3.03	3.62	3.62
227.2	111.055	89.85	2.58	120	110.97	0.16	6.66	6.66	3.03	3.03	3.63	3.63
227.1	111.219	66.74	2.25	120	111.14	0.16	6.67	6.67	3.04	3.04	3.63	3.63
226.9	111.383	85.06	2.50	120	111.30	0.16	6.68	6.68	3.04	3.04	3.64	3.64
226.8	111.547	68.64	2.02	120	111.47	0.16	6.69	6.69	3.05	3.05	3.64	3.64
226.6	111.711	102.89	1.60	120	111.63	0.16	6.70	6.70	3.05	3.05	3.65	3.65
226.4	111.875	89.51	2.26	120	111.79	0.16	6.71	6.71	3.06	3.06	3.65	3.65
226.3	112.039	47.04	1.80	120	111.96	0.16	6.72	6.72	3.07	3.07	3.66	3.66
226.1	112.203	28.29	1.21	120	112.12	0.16	6.73	6.73	3.07	3.07	3.66	3.66
225.9	112.367	22.44	0.52	120	112.29	0.16	6.74	6.74	3.08	3.08	3.67	3.67
225.8	112.531	23.58	0.33	120	112.45	0.16	6.75	6.75	3.08	3.08	3.67	3.67
225.6	112.695	22.95	0.21	120	112.61	0.16	6.76	6.76	3.09	3.09	3.68	3.68
225.4	112.860	28.01	0.37	120	112.78	0.16	6.77	6.77	3.09	3.09	3.68	3.68
225.3	113.024	31.60	0.48	120	112.94	0.16	6.78	6.78	3.10	3.10	3.69	3.69
225.1	113.188	25.60	0.79	120	113.11	0.16	6.79	6.79	3.10	3.10	3.69	3.69
224.9	113.352	26.57	0.58	120	113.27	0.16	6.80	6.80	3.11	3.11	3.70	3.70
224.8	113.516	62.31	0.40	120	113.43	0.16	6.81	6.81	3.11	3.11	3.70	3.70
224.6	113.680	139.12	1.45	120	113.60	0.16	6.82	6.82	3.12	3.12	3.70	3.70
224.5	113.844	80.92	2.57	120	113.76	0.16	6.83	6.83	3.12	3.12	3.71	3.71
224.3	114.008	47.40	2.22	120	113.93	0.16	6.84	6.84	3.13	3.13	3.71	3.71
224.1	114.172	84.34	2.33	120	114.09	0.16	6.85	6.85	3.13	3.13	3.72	3.72
224.0	114.336	66.94	1.91	120	114.25	0.16	6.86	6.86	3.14	3.14	3.72	3.72
223.8	114.500	39.82	1.42	120	114.42	0.16	6.87	6.87	3.14	3.14	3.73	3.73
223.6	114.664	30.31	0.67	120	114.58	0.16	6.88	6.88	3.15	3.15	3.73	3.73
223.5	114.828	32.58	0.61	120	114.75	0.16	6.89	6.89	3.15	3.15	3.74	3.74
223.3	114.992	44.46	0.91	120	114.91	0.16	6.90	6.90	3.16	3.16	3.74	3.74
223.1	115.156	137.75	0.91	120	115.07	0.16	6.91	6.91	3.16	3.16	3.75	3.75
223.0	115.320	228.41	1.44	120	115.24	0.16	6.92	6.92	3.17	3.17	3.75	3.75
222.8	115.484	138.35	2.63	120	115.40	0.16	6.93	6.93	3.17	3.17	3.76	3.76
222.7	115.648	67.29	2.53	120	115.57	0.16	6.94	6.94	3.18	3.18	3.76	3.76
222.5	115.812	41.15	1.63	120	115.73	0.16	6.95	6.95	3.18	3.18	3.77	3.77
222.3	115.976	31.17	0.99	120	115.89	0.16	6.96	6.96	3.19	3.19	3.77	3.77
222.2	116.140	25.48	0.39	120	116.06	0.16	6.97	6.97	3.19	3.19	3.78	3.78
222.0	116.304	26.16	0.35	120	116.22	0.16	6.98	6.98	3.20	3.20	3.78	3.78
221.8	116.468	26.35	0.29	120	116.39	0.16	6.99	6.99	3.20	3.20	3.78	3.78
221.7	116.632	21.74	0.31	120	116.55	0.16	7.00	7.00	3.21	3.21	3.79	3.79
221.5	116.796	22.76	0.24	120	116.71	0.16	7.01	7.01	3.21	3.21	3.79	3.79
221.3	116.961	30.89	0.31	120	116.88	0.16	7.02	7.02	3.22	3.22	3.80	3.80
221.2	117.125	23.62	0.35	120	117.04	0.16	7.03	7.03	3.22	3.22	3.80	3.80
221.0	117.289	22.60	0.35	120	117.21	0.16	7.04	7.04	3.23	3.23	3.81	3.81
220.8	117.453	22.67	0.15	120	117.37	0.16	7.05	7.05	3.23	3.23	3.81	3.81
220.7	117.617	22.64	0.15	120	117.53	0.16	7.06	7.06	3.24	3.24	3.82	3.82
220.5	117.781	22.17	0.12	120	117.70	0.16	7.07	7.07	3.24	3.24	3.82	3.82
220.4	117.945	20.77	0.10	120	117.86	0.16	7.08	7.08	3.25	3.25	3.83	3.83
220.2	118.109	19.17	0.13	120	118.03	0.16	7.09	7.09	3.25	3.25	3.83	3.83
220.0	118.273	20.30	0.23	120	118.19	0.16	7.10	7.10	3.26	3.26	3.84	3.84
219.9	118.437	23.35	0.29	120	118.35	0.16	7.11	7.11	3.26	3.26	3.84	3.84
219.7	118.601	22.02	0.38	120	118.52	0.16	7.12	7.12	3.27	3.27	3.85	3.85
219.5	118.765	33.27	0.54	120	118.68	0.16	7.13	7.13	3.27	3.27	3.85	3.85
219.4	118.929	68.43	0.90	120	118.85	0.16	7.14	7.14	3.28	3.28	3.86	3.86
219.2	119.093	54.36	1.51	120	119.01	0.16	7.15	7.15	3.29	3.29	3.86	3.86
219.0	119.257	27.06	1.15	120	119.18	0.16	7.16	7.16	3.29	3.29	3.87	3.87
218.9	119.421	22.92	0.64	120	119.34	0.16	7.17	7.17	3.30	3.30	3.87	3.87

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σv CPT (tsf)	Total Vertical Stress during EQ σv EQ (tsf)	Static Pore Water Pressure during CPT us CPT (tsf)	Static Pore Water Pressure during EQ us EQ (tsf)	Effective Vertical Stress during CPT σv CPT (tsf)	Effective Vertical Stress during EQ σv EQ (tsf)
218.7	119.585	23.58	0.89	120	119.50	0.16	7.18	7.18	3.30	3.30	3.87	3.87
218.6	119.749	25.57	0.78	120	119.67	0.16	7.18	7.18	3.31	3.31	3.88	3.88
218.4	119.913	186.06	0.77	120	119.83	0.16	7.19	7.19	3.31	3.31	3.88	3.88
218.2	120.077	217.44	1.84	120	120.00	0.16	7.20	7.20	3.32	3.32	3.89	3.89
218.1	120.241	155.25	1.97	120	120.16	0.16	7.21	7.21	3.32	3.32	3.89	3.89
217.9	120.405	125.61	1.83	120	120.32	0.16	7.22	7.22	3.33	3.33	3.90	3.90
217.7	120.569	201.32	1.81	120	120.49	0.16	7.23	7.23	3.33	3.33	3.90	3.90
217.6	120.733	237.34	1.84	120	120.65	0.16	7.24	7.24	3.34	3.34	3.91	3.91
217.4	120.897	222.58	1.35	120	120.82	0.16	7.25	7.25	3.34	3.34	3.91	3.91
217.2	121.062	177.73	1.60	120	120.98	0.16	7.26	7.26	3.35	3.35	3.92	3.92
217.1	121.226	151.37	2.25	120	121.14	0.16	7.27	7.27	3.35	3.35	3.92	3.92
216.9	121.390	111.25	2.89	120	121.31	0.16	7.28	7.28	3.36	3.36	3.93	3.93
216.7	121.554	53.38	2.63	120	121.47	0.16	7.29	7.29	3.36	3.36	3.93	3.93
216.6	121.718	28.05	1.43	120	121.64	0.16	7.30	7.30	3.37	3.37	3.94	3.94
216.4	121.882	26.42	1.09	120	121.80	0.16	7.31	7.31	3.37	3.37	3.94	3.94
216.3	122.046	62.78	0.73	120	121.96	0.16	7.32	7.32	3.38	3.38	3.95	3.95
216.1	122.210	96.37	0.93	120	122.13	0.16	7.33	7.33	3.38	3.38	3.95	3.95
215.9	122.374	119.91	0.89	120	122.29	0.16	7.34	7.34	3.39	3.39	3.95	3.95
215.8	122.538	109.01	1.70	120	122.46	0.16	7.35	7.35	3.39	3.39	3.96	3.96
215.6	122.702	58.95	1.95	120	122.62	0.16	7.36	7.36	3.40	3.40	3.96	3.96
215.4	122.866	40.27	2.10	120	122.78	0.16	7.37	7.37	3.40	3.40	3.97	3.97
215.3	123.030	27.97	1.79	120	122.95	0.16	7.38	7.38	3.41	3.41	3.97	3.97
215.1	123.194	157.70	1.67	120	123.11	0.16	7.39	7.39	3.41	3.41	3.98	3.98
214.9	123.358	383.08	1.74	120	123.28	0.16	7.40	7.40	3.42	3.42	3.98	3.98
214.8	123.522	253.74	0.88	120	123.44	0.16	7.41	7.41	3.42	3.42	3.99	3.99
214.6	123.686	173.35	0.82	120	123.60	0.16	7.42	7.42	3.43	3.43	3.99	3.99
214.4	123.850	103.02	1.80	120	123.77	0.16	7.43	7.43	3.43	3.43	4.00	4.00
214.3	124.014	61.25	1.26	120	123.93	0.16	7.44	7.44	3.44	3.44	4.00	4.00
214.1	124.178	38.92	1.09	120	124.10	0.16	7.45	7.45	3.44	3.44	4.01	4.01
214.0	124.342	59.19	1.24	120	124.26	0.16	7.46	7.46	3.45	3.45	4.01	4.01
213.8	124.506	93.90	0.95	120	124.42	0.16	7.47	7.47	3.45	3.45	4.02	4.02
213.6	124.670	142.36	0.96	120	124.59	0.16	7.48	7.48	3.46	3.46	4.02	4.02
213.5	124.834	180.56	1.60	120	124.75	0.16	7.49	7.49	3.46	3.46	4.03	4.03
213.3	124.998	183.71	1.61	120	124.92	0.16	7.50	7.50	3.47	3.47	4.03	4.03
213.1	125.163	109.89	0.96	120	125.08	0.16	7.51	7.51	3.47	3.47	4.04	4.04
213.0	125.327	144.40	1.78	120	125.24	0.16	7.52	7.52	3.48	3.48	4.04	4.04
212.8	125.491	69.93	0.86	120	125.41	0.16	7.53	7.53	3.48	3.48	4.04	4.04
212.6	125.655	106.07	0.73	120	125.57	0.16	7.54	7.54	3.49	3.49	4.05	4.05
212.5	125.819	247.41	1.12	120	125.74	0.16	7.55	7.55	3.49	3.49	4.05	4.05
212.3	125.983	287.62	1.75	120	125.90	0.16	7.56	7.56	3.50	3.50	4.06	4.06
212.2	126.147	373.83	1.02	120	126.06	0.16	7.57	7.57	3.51	3.51	4.06	4.06
212.0	126.311	461.41	1.78	120	126.23	0.16	7.58	7.58	3.51	3.51	4.07	4.07
211.8	126.475	460.71	1.80	120	126.39	0.08	7.59	7.59	3.52	3.52	4.07	4.07

LIQUEFACTION POTENTIAL ASSESSMENT FOR COARSE GRAINED SOILS USING CONE PENETRATION TEST DATA

Project Site: US 60 Bridge
Project No.: 178565011
CPT ID: SP10

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	qc_{IN}	FC (%)	Δqc_{IN}	$(qc_{IN})_{CS}$	a	ξ_R
338.3												
338.1	0.164	187.62	1.86	1.91	0.5	1.70	30.78	16	19.15	49.93	0.350	-0.184
338.0	0.328	264.36	1.48	1.74	0.5	1.70	61.33	2	0.00	61.33	0.350	-0.252
337.8	0.492	309.32	1.31	1.66	0.5	1.70	87.90	0	0.00	87.90	0.350	-0.389
337.6	0.656	281.18	1.17	1.65	0.5	1.70	92.27	0	0.00	92.27	0.350	-0.406
337.5	0.820	233.09	1.11	1.68	0.5	1.70	85.54	0	0.00	85.54	0.350	-0.372
337.3	0.984	204.68	1.08	1.71	0.5	1.70	82.30	0	0.00	82.30	0.350	-0.354
337.2	1.148	174.68	1.48	1.85	0.5	1.70	75.89	11	10.67	86.56	0.350	-0.372
337.0	1.312	146.89	2.23	2.04	0.5	1.70	68.25	26	43.85	112.10	0.350	-0.480
336.8	1.476	120.48	3.10	2.20	0.5	1.70	59.41	39	55.81	115.21	0.350	-0.490
336.7	1.640	98.49	3.72	2.32	0.5	1.70	51.22	49	58.98	110.21	0.350	-0.469
336.5	1.804	81.62	3.77	2.38	0.5	1.70	44.56	53	59.06	103.62	0.350	-0.441
336.3	1.968	68.06	3.54	2.41	0.5	1.70	38.85	56	58.38	97.23	0.350	-0.413
336.2	2.133	61.18	3.03	2.39	0.5	1.70	36.38	54	57.26	93.63	0.350	-0.395
336.0	2.297	60.05	2.82	2.38	0.5	1.70	37.06	53	57.01	94.07	0.350	-0.396
335.8	2.461	57.61	2.80	2.39	0.5	1.70	36.82	54	57.23	94.05	0.350	-0.395
335.7	2.625	56.51	2.90	2.40	0.5	1.70	37.32	55	57.79	95.11	0.350	-0.399
335.5	2.789	55.87	3.20	2.44	0.5	1.70	38.04	58	58.84	96.88	0.350	-0.405
335.3	2.953	54.42	3.57	2.48	0.5	1.70	38.15	61	59.78	97.92	0.350	-0.409
335.2	3.117	51.90	3.56	2.49	0.5	1.70	37.40	62	59.84	97.23	0.350	-0.405
335.0	3.281	47.44	3.92	2.55	0.5	1.70	35.11	67	60.24	95.35	0.350	-0.396
334.9	3.445	45.28	4.03	2.57	0.5	1.70	34.35	69	60.40	94.75	0.350	-0.392
334.7	3.609	41.79	3.87	2.59	0.5	1.70	32.49	70	60.06	92.55	0.350	-0.382
334.5	3.773	39.79	3.68	2.59	0.5	1.70	31.66	70	59.82	91.47	0.350	-0.376
334.4	3.937	38.73	3.58	2.59	0.5	1.70	31.49	70	59.78	91.27	0.350	-0.374
334.2	4.101	50.38	3.70	2.51	0.7	1.70	31.25	64	58.49	89.74	0.350	-0.366
334.0	4.265	47.20	3.65	2.53	0.7	1.70	30.12	65	58.45	88.57	0.350	-0.360
333.9	4.429	42.16	3.23	2.53	0.5	1.70	36.35	65	60.22	96.56	0.350	-0.396
333.7	4.593	45.74	3.28	2.51	0.5	1.70	40.13	64	60.90	101.03	0.350	-0.414
333.5	4.757	45.72	3.43	2.52	0.5	1.70	40.83	65	61.36	102.19	0.350	-0.418
333.4	4.921	53.75	3.45	2.47	0.5	1.70	48.75	61	62.63	111.38	0.350	-0.455
333.2	5.085	66.92	3.21	2.38	0.5	1.70	61.58	54	63.86	125.44	0.350	-0.507
333.1	5.249	57.21	4.05	2.50	0.5	1.70	53.57	63	64.67	118.24	0.350	-0.480
332.9	5.413	59.11	3.96	2.49	0.5	1.70	56.20	62	65.05	121.25	0.350	-0.491
332.7	5.577	49.05	3.94	2.54	0.5	1.70	47.43	66	63.65	111.08	0.350	-0.451
332.6	5.741	51.45	4.29	2.55	0.7	1.70	40.43	67	61.84	102.28	0.350	-0.415
332.4	5.905	48.82	4.04	2.55	0.7	1.70	39.16	67	61.42	100.58	0.350	-0.407
332.2	6.069	43.33	4.38	2.61	0.7	1.70	35.50	72	61.33	96.83	0.350	-0.390
332.1	6.234	35.49	4.38	2.67	0.7	1.70	29.74	77	60.47	90.21	0.350	-0.360
331.9	6.398	33.53	4.58	2.71	1.0	1.70	21.30	79	58.32	79.62	0.350	-0.309
331.7	6.562	23.19	5.87	2.90	1.0	1.70	15.30	95	58.22	73.52	0.350	-0.277
331.6	6.726	22.33	5.44	2.89	1.0	1.70	15.12	94	58.08	73.21	0.350	-0.274
331.4	6.890	21.69	5.67	2.91	1.0	1.70	15.06	96	58.22	73.28	0.350	-0.274
331.2	7.054	20.66	4.86	2.88	1.0	1.68	14.56	93	57.85	72.41	0.350	-0.269
331.1	7.218	19.89	4.55	2.87	1.0	1.66	14.20	93	57.69	71.89	0.350	-0.266
330.9	7.382	21.60	4.15	2.82	1.0	1.63	15.47	88	57.65	73.12	0.350	-0.272
330.8	7.546	22.95	4.11	2.79	1.0	1.61	16.50	87	57.76	74.26	0.350	-0.277
330.6	7.710	25.61	3.97	2.75	1.0	1.58	18.42	83	57.91	76.34	0.350	-0.288
330.4	7.874	25.91	3.78	2.73	1.0	1.56	18.79	82	57.85	76.64	0.350	-0.289
330.3	8.038	24.01	4.53	2.81	1.0	1.55	17.66	88	58.24	75.89	0.350	-0.285
330.1	8.202	19.63	5.26	2.92	1.0	1.54	14.78	96	58.21	72.99	0.350	-0.269
329.9	8.366	28.86	2.87	2.62	0.7	1.49	26.20	72	58.68	84.88	0.350	-0.329
329.8	8.530	50.96	1.70	2.28	0.5	1.42	50.90	46	57.49	108.38	0.350	-0.431
329.6	8.694	42.35	2.42	2.44	0.5	1.42	42.77	58	60.27	103.05	0.350	-0.409
329.4	8.858	33.23	3.15	2.60	0.7	1.43	30.11	71	59.55	89.66	0.350	-0.350
329.3	9.022	26.08	4.10	2.75	1.0	1.45	20.02	83	58.43	78.46	0.350	-0.295
329.1	9.186	19.93	2.79	2.74	1.0	1.45	15.77	82	56.98	72.74	0.350	-0.265
328.9	9.350	14.96	2.68	2.83	1.0	1.44	12.20	89	56.72	68.92	0.350	-0.243
328.8	9.514	15.37	2.45	2.79	1.0	1.43	12.59	86	56.57	69.16	0.350	-0.244
328.6	9.678	15.05	1.24	2.64	0.7	1.41	14.71	74	55.62	70.34	0.350	-0.250
328.5	9.842	15.58	1.93	2.73	1.0	1.40	12.95	81	56.08	69.03	0.350	-0.243

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
328.3	10.006	15.36	2.02	2.75	1.0	1.39	12.86	83	56.21	69.07	0.350	-0.242
328.1	10.170	19.55	2.26	2.69	1.0	1.36	16.18	78	56.59	72.76	0.350	-0.262
328.0	10.335	20.31	2.13	2.66	1.0	1.35	16.88	76	56.47	73.35	0.350	-0.265
327.8	10.499	18.57	2.82	2.76	1.0	1.34	15.62	84	57.20	72.82	0.350	-0.262
327.6	10.663	22.55	2.11	2.62	1.0	1.32	18.85	73	56.56	75.41	0.350	-0.275
327.5	10.827	24.67	2.30	2.61	1.0	1.31	20.63	72	56.96	77.59	0.350	-0.286
327.3	10.991	16.42	3.06	2.83	1.0	1.31	14.20	89	57.34	71.55	0.350	-0.254
327.1	11.155	11.49	4.07	3.03	1.0	1.30	10.31	100	57.13	67.44	0.350	-0.231
327.0	11.319	17.21	2.87	2.79	1.0	1.29	15.03	86	57.31	72.34	0.350	-0.257
326.8	11.483	28.34	2.84	2.62	1.0	1.26	24.09	73	58.11	82.20	0.350	-0.308
326.7	11.647	57.81	1.44	2.19	0.5	1.22	57.91	39	54.88	112.79	0.350	-0.441
326.5	11.811	89.06	1.66	2.09	0.5	1.18	86.99	31	53.58	140.58	0.350	-0.540
326.3	11.975	82.13	1.91	2.16	0.5	1.18	80.50	36	57.97	138.47	0.350	-0.533
326.2	12.139	65.15	2.06	2.26	0.5	1.18	64.70	44	59.86	124.56	0.350	-0.484
326.0	12.303	39.80	4.28	2.63	1.0	1.20	34.18	74	61.22	95.40	0.350	-0.367
325.8	12.467	21.20	5.05	2.88	1.0	1.21	19.00	93	59.24	78.23	0.350	-0.286
325.7	12.631	11.95	4.08	3.01	1.0	1.21	11.25	100	57.43	68.67	0.350	-0.234
325.5	12.795	12.72	2.19	2.83	1.0	1.20	11.98	90	56.72	68.70	0.350	-0.234
325.3	12.959	10.59	2.76	2.96	1.0	1.20	10.19	99	57.05	67.24	0.350	-0.225
325.2	13.123	15.08	2.80	2.83	1.0	1.18	14.16	90	57.38	71.54	0.350	-0.249
325.0	13.287	17.31	3.02	2.81	1.0	1.17	16.17	87	57.76	73.93	0.350	-0.262
324.8	13.451	16.70	3.88	2.88	1.0	1.16	15.72	94	58.27	73.99	0.350	-0.262
324.7	13.615	9.72	5.23	3.15	1.0	1.16	9.63	100	56.92	66.55	0.350	-0.220
324.5	13.779	6.88	5.19	3.27	1.0	1.16	7.12	100	56.14	63.27	0.350	-0.201
324.4	13.943	14.10	2.02	2.78	1.0	1.15	13.63	85	56.73	70.37	0.350	-0.241
324.2	14.107	11.78	2.19	2.86	1.0	1.15	11.58	92	56.82	68.41	0.350	-0.230
324.0	14.271	6.19	3.96	3.24	1.0	1.15	6.57	100	55.97	62.54	0.350	-0.196
323.9	14.436	5.98	2.92	3.18	1.0	1.14	6.40	100	55.92	62.32	0.350	-0.194
323.7	14.600	3.46	3.13	3.40	1.0	1.14	4.12	100	55.21	59.33	0.350	-0.176
323.5	14.764	5.93	2.42	3.14	1.0	1.13	6.40	100	55.92	62.31	0.350	-0.194
323.4	14.928	6.53	1.55	3.01	1.0	1.13	6.96	100	56.10	63.06	0.350	-0.198
323.2	15.092	4.69	2.49	3.23	1.0	1.13	5.29	100	55.58	60.87	0.350	-0.185
323.0	15.256	4.07	2.26	3.27	1.0	1.13	4.74	100	55.40	60.14	0.350	-0.180
322.9	15.420	3.20	2.07	3.34	1.0	1.12	3.95	100	55.16	59.11	0.350	-0.174
322.7	15.584	3.63	1.60	3.24	1.0	1.12	4.36	100	55.29	59.64	0.350	-0.177
322.6	15.748	4.53	1.80	3.18	1.0	1.11	5.21	100	55.55	60.76	0.350	-0.184
322.4	15.912	6.14	2.29	3.11	1.0	1.11	6.72	100	56.02	62.74	0.350	-0.195
322.2	16.076	5.44	3.15	3.23	1.0	1.11	6.09	100	55.82	61.91	0.350	-0.190
322.1	16.240	8.39	1.99	2.96	1.0	1.10	8.85	100	56.68	65.53	0.350	-0.212
321.9	16.404	6.41	2.49	3.11	1.0	1.10	7.04	100	56.12	63.15	0.350	-0.198
321.7	16.568	8.21	1.54	2.92	1.0	1.09	8.74	96	56.35	65.09	0.350	-0.209
321.6	16.732	6.41	1.81	3.05	1.0	1.09	7.07	100	56.13	63.20	0.350	-0.198
321.4	16.896	6.93	1.34	2.95	1.0	1.09	7.58	99	56.23	63.81	0.350	-0.201
321.2	17.060	8.77	1.42	2.88	1.0	1.08	9.34	93	56.24	65.57	0.350	-0.211
321.1	17.224	11.10	1.52	2.80	1.0	1.08	11.55	87	56.31	67.86	0.350	-0.224
320.9	17.388	6.44	2.57	3.12	1.0	1.08	7.18	100	56.16	63.34	0.350	-0.198
320.7	17.552	4.93	2.47	3.21	1.0	1.08	5.76	100	55.72	61.48	0.350	-0.186
320.6	17.716	4.50	1.37	3.13	1.0	1.07	5.37	100	55.60	60.98	0.350	-0.183
320.4	17.880	4.33	1.30	3.13	1.0	1.07	5.22	100	55.55	60.78	0.350	-0.182
320.3	18.044	4.82	0.98	3.04	1.0	1.07	5.71	100	55.71	61.42	0.350	-0.186
320.1	18.208	4.67	1.14	3.08	1.0	1.06	5.58	100	55.67	61.25	0.350	-0.184
319.9	18.372	4.76	1.14	3.07	1.0	1.06	5.69	100	55.70	61.38	0.350	-0.185
319.8	18.537	3.90	1.33	3.18	1.0	1.06	4.87	100	55.44	60.31	0.350	-0.178
319.6	18.701	4.22	1.42	3.16	1.0	1.05	5.19	100	55.54	60.73	0.350	-0.181
319.4	18.865	4.71	1.33	3.10	1.0	1.05	5.68	100	55.70	61.38	0.350	-0.185
319.3	19.029	4.36	1.48	3.15	1.0	1.05	5.36	100	55.60	60.96	0.350	-0.182
319.1	19.193	5.01	1.44	3.09	1.0	1.04	6.01	100	55.80	61.80	0.350	-0.187
318.9	19.357	5.40	1.22	3.03	1.0	1.04	6.40	100	55.92	62.32	0.350	-0.190
318.8	19.521	4.13	3.49	3.35	1.0	1.04	5.17	100	55.54	60.71	0.350	-0.180
318.6	19.685	8.37	1.56	2.91	1.0	1.04	9.32	96	56.50	65.82	0.350	-0.210
318.5	19.849	8.80	1.73	2.92	1.0	1.03	9.76	96	56.66	66.43	0.350	-0.214
318.3	20.013	6.18	2.19	3.10	1.0	1.03	7.22	100	56.18	63.40	0.350	-0.196
318.1	20.177	3.94	2.46	3.30	1.0	1.03	5.04	100	55.50	60.54	0.350	-0.178
318.0	20.341	3.77	1.80	3.25	1.0	1.02	4.89	100	55.45	60.34	0.350	-0.177
317.8	20.505	3.92	1.27	3.17	1.0	1.02	5.05	100	55.50	60.55	0.350	-0.178
317.6	20.669	3.65	1.31	3.20	1.0	1.02	4.80	100	55.42	60.23	0.350	-0.176

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{CIN}	FC (%)	Δq_{CIN}	$(q_{CIN})_{CS}$	a	ξ_R
317.5	20.833	3.78	1.36	3.19	1.0	1.02	4.94	100	55.47	60.40	0.350	-0.177
317.3	20.997	3.82	1.29	3.18	1.0	1.01	4.99	100	55.48	60.47	0.350	-0.177
317.1	21.161	4.26	1.08	3.11	1.0	1.01	5.45	100	55.62	61.07	0.350	-0.181
317.0	21.325	4.30	1.34	3.14	1.0	1.01	5.50	100	55.64	61.13	0.350	-0.181
316.8	21.489	4.79	1.29	3.09	1.0	1.00	5.99	100	55.79	61.79	0.350	-0.185
316.6	21.653	7.38	1.04	2.88	1.0	1.00	8.60	94	56.05	64.65	0.350	-0.202
316.5	21.817	4.82	1.59	3.13	1.0	1.00	6.06	100	55.81	61.87	0.350	-0.185
316.3	21.981	3.97	1.80	3.23	1.0	1.00	5.22	100	55.55	60.77	0.350	-0.178
316.2	22.145	4.07	0.90	3.09	1.0	0.99	5.33	100	55.59	60.92	0.350	-0.179
316.0	22.309	4.54	1.05	3.07	1.0	0.99	5.82	100	55.74	61.56	0.350	-0.183
315.8	22.473	12.61	1.02	2.67	1.0	0.99	13.97	77	55.73	69.69	0.350	-0.230
315.7	22.638	15.70	1.24	2.63	1.0	0.99	17.13	73	56.13	73.26	0.350	-0.249
315.5	22.802	10.83	2.33	2.91	1.0	0.98	12.23	96	57.35	69.58	0.350	-0.229
315.3	22.966	6.16	3.51	3.21	1.0	0.98	7.52	100	56.27	63.78	0.350	-0.196
315.2	23.130	7.51	2.00	3.01	1.0	0.98	8.91	100	56.70	65.61	0.350	-0.206
315.0	23.294	13.31	1.69	2.76	1.0	0.98	14.83	84	56.91	71.74	0.350	-0.241
314.8	23.458	10.24	2.29	2.92	1.0	0.97	11.74	97	57.32	69.05	0.350	-0.226
314.7	23.622	17.15	1.84	2.68	1.0	0.97	18.83	78	57.34	76.17	0.350	-0.264
314.5	23.786	19.44	1.48	2.59	0.5	0.97	20.70	70	56.64	77.34	0.350	-0.270
314.4	23.950	12.43	1.98	2.82	1.0	0.97	14.05	88	57.23	71.28	0.350	-0.238
314.2	24.114	8.16	2.69	3.04	1.0	0.96	9.69	100	56.94	66.63	0.350	-0.211
314.0	24.278	15.67	1.34	2.64	1.0	0.96	17.45	75	56.45	73.90	0.350	-0.251
313.9	24.442	14.34	1.30	2.67	1.0	0.96	16.11	77	56.38	72.49	0.350	-0.244
313.7	24.606	16.47	1.23	2.61	1.0	0.96	18.35	72	56.23	74.58	0.350	-0.255
313.5	24.770	12.92	1.76	2.78	1.0	0.96	14.71	85	57.06	71.76	0.350	-0.240
313.4	24.934	9.89	1.23	2.80	1.0	0.95	11.58	87	56.32	67.90	0.350	-0.218
313.2	25.098	10.66	0.80	2.69	1.0	0.95	12.41	78	55.46	67.87	0.350	-0.218
313.0	25.262	6.91	0.93	2.89	1.0	0.95	8.53	94	56.06	64.59	0.350	-0.199
312.9	25.426	5.60	1.47	3.06	1.0	0.95	7.19	100	56.16	63.35	0.350	-0.191
312.7	25.590	6.55	1.67	3.02	1.0	0.94	8.20	100	56.48	64.67	0.350	-0.199
312.5	25.754	7.86	1.05	2.86	1.0	0.94	9.58	92	56.18	65.76	0.350	-0.205
312.4	25.918	5.90	1.93	3.09	1.0	0.94	7.54	100	56.27	63.82	0.350	-0.194
312.2	26.082	16.58	1.53	2.65	1.0	0.94	18.81	75	56.96	75.77	0.350	-0.260
312.1	26.246	10.63	2.04	2.88	1.0	0.94	12.56	94	57.28	69.84	0.350	-0.228
311.9	26.410	7.77	2.81	3.07	1.0	0.93	9.56	100	56.90	66.46	0.350	-0.209
311.7	26.574	5.55	2.05	3.13	1.0	0.93	7.23	100	56.18	63.41	0.350	-0.191
311.6	26.739	5.76	1.43	3.04	1.0	0.93	7.48	100	56.25	63.73	0.350	-0.193
311.4	26.903	6.75	1.09	2.93	1.0	0.93	8.53	97	56.34	64.88	0.350	-0.199
311.2	27.067	5.38	1.28	3.04	1.0	0.92	7.10	100	56.14	63.23	0.350	-0.189
311.1	27.231	4.65	1.36	3.11	1.0	0.92	6.34	100	55.90	62.24	0.350	-0.183
310.9	27.395	4.91	1.20	3.07	1.0	0.92	6.63	100	55.99	62.62	0.350	-0.185
310.7	27.559	5.65	1.10	3.00	1.0	0.92	7.43	100	56.24	63.67	0.350	-0.192
310.6	27.723	5.64	1.27	3.02	1.0	0.92	7.43	100	56.24	63.67	0.350	-0.191
310.4	27.887	6.00	1.28	3.00	1.0	0.91	7.84	100	56.37	64.20	0.350	-0.194
310.2	28.051	6.57	1.60	3.01	1.0	0.91	8.46	100	56.56	65.01	0.350	-0.199
310.1	28.215	10.11	1.54	2.84	1.0	0.91	12.28	90	56.85	69.13	0.350	-0.223
309.9	28.379	8.37	2.38	3.01	1.0	0.91	10.43	100	57.17	67.61	0.350	-0.214
309.8	28.543	9.34	1.44	2.86	1.0	0.91	11.50	91	56.74	68.24	0.350	-0.217
309.6	28.707	8.08	0.94	2.83	1.0	0.90	10.15	89	56.11	66.27	0.350	-0.206
309.4	28.871	6.97	1.85	3.02	1.0	0.90	8.97	100	56.72	65.69	0.350	-0.203
309.3	29.035	8.60	1.80	2.93	1.0	0.90	10.76	98	57.08	67.84	0.350	-0.215
309.1	29.199	21.22	0.97	2.46	0.5	0.90	22.51	60	54.96	77.47	0.350	-0.266
308.9	29.363	47.47	0.71	2.09	0.5	0.91	48.88	30	45.20	94.08	0.350	-0.346
308.8	29.527	58.45	0.77	2.03	0.5	0.91	60.03	25	41.28	101.31	0.350	-0.377
308.6	29.691	70.61	0.85	1.99	0.5	0.91	72.46	22	37.19	109.65	0.350	-0.411
308.4	29.855	62.64	1.33	2.15	0.5	0.91	64.68	35	53.32	118.01	0.350	-0.443
308.3	30.019	48.30	1.97	2.34	0.5	0.91	50.07	50	59.41	109.48	0.350	-0.410
308.1	30.183	35.29	3.01	2.56	0.5	0.90	36.81	68	60.98	97.79	0.350	-0.361
308.0	30.347	20.08	5.95	2.95	1.0	0.89	23.68	99	61.16	84.85	0.350	-0.302
307.8	30.511	19.05	5.08	2.92	1.0	0.89	22.57	96	60.61	83.18	0.350	-0.294
307.6	30.675	44.96	1.94	2.36	0.5	0.90	46.67	52	59.14	105.81	0.350	-0.395
307.5	30.840	54.95	1.51	2.23	0.5	0.90	56.89	41	56.34	113.23	0.350	-0.424
307.3	31.004	40.40	1.99	2.40	0.5	0.90	42.01	55	59.07	101.08	0.350	-0.375
307.1	31.168	21.47	3.12	2.74	1.0	0.89	25.45	82	59.94	85.39	0.350	-0.304
307.0	31.332	10.97	4.48	3.07	1.0	0.88	13.68	100	58.18	71.86	0.350	-0.235
306.8	31.496	8.73	3.39	3.08	1.0	0.87	11.20	100	57.41	68.61	0.350	-0.217

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
306.6	31.660	9.54	1.26	2.82	1.0	0.87	12.11	88	56.64	68.75	0.350	-0.218
306.5	31.824	7.40	1.61	2.97	1.0	0.87	9.75	100	56.96	66.71	0.350	-0.206
306.3	31.988	10.79	1.22	2.76	1.0	0.87	13.56	84	56.60	70.16	0.350	-0.226
306.1	32.152	10.23	1.34	2.81	1.0	0.87	12.95	87	56.77	69.72	0.350	-0.223
306.0	32.316	6.78	1.89	3.03	1.0	0.86	9.11	100	56.76	65.87	0.350	-0.201
305.8	32.480	23.10	0.79	2.38	0.5	0.87	24.41	54	53.78	78.19	0.350	-0.268
305.7	32.644	35.66	1.40	2.35	0.5	0.88	37.16	51	56.37	93.53	0.350	-0.341
305.5	32.808	18.56	3.24	2.80	1.0	0.87	22.55	87	59.65	82.20	0.350	-0.288
305.3	32.972	11.62	3.90	3.01	1.0	0.86	14.65	100	58.48	73.14	0.350	-0.241
305.2	33.136	9.74	4.40	3.10	1.0	0.86	12.54	100	57.83	70.37	0.350	-0.226
305.0	33.300	11.37	2.06	2.86	1.0	0.86	14.41	92	57.68	72.09	0.350	-0.235
304.8	33.464	6.97	3.08	3.13	1.0	0.85	9.43	100	56.86	66.30	0.350	-0.203
304.7	33.628	6.55	2.16	3.08	1.0	0.85	8.97	100	56.72	65.69	0.350	-0.199
304.5	33.792	6.13	1.62	3.04	1.0	0.85	8.51	100	56.58	65.09	0.350	-0.196
304.3	33.956	9.00	1.22	2.84	1.0	0.85	11.79	90	56.67	68.46	0.350	-0.215
304.2	34.120	12.06	1.23	2.72	1.0	0.85	15.31	81	56.73	72.04	0.350	-0.234
304.0	34.284	27.73	1.44	2.45	0.5	0.86	29.14	59	56.65	85.79	0.350	-0.304
303.9	34.448	13.82	2.00	2.78	1.0	0.85	17.41	86	57.93	75.34	0.350	-0.252
303.7	34.612	8.44	3.26	3.08	1.0	0.84	11.23	100	57.42	68.64	0.350	-0.215
303.5	34.776	9.65	1.64	2.87	1.0	0.84	12.64	93	57.21	69.85	0.350	-0.222
303.4	34.941	13.02	1.07	2.67	1.0	0.84	16.55	76	56.46	73.01	0.350	-0.239
303.2	35.105	16.30	1.41	2.64	1.0	0.84	20.41	74	57.29	77.69	0.350	-0.264
303.0	35.269	13.21	1.67	2.76	1.0	0.84	16.84	84	57.51	74.35	0.350	-0.246
302.9	35.433	9.31	1.78	2.90	1.0	0.83	12.33	95	57.34	69.67	0.350	-0.221
302.7	35.597	34.58	0.73	2.21	0.5	0.84	35.96	40	50.72	86.68	0.350	-0.307
302.5	35.761	44.39	0.95	2.18	0.5	0.85	46.06	37	51.25	97.31	0.350	-0.356
302.4	35.925	37.65	1.72	2.39	0.5	0.85	39.33	54	57.95	97.28	0.350	-0.355
302.2	36.089	26.53	2.62	2.62	1.0	0.84	32.87	73	60.69	93.56	0.350	-0.339
302.0	36.253	24.64	2.66	2.65	1.0	0.84	30.64	75	60.43	91.07	0.350	-0.327
301.9	36.417	13.66	2.63	2.85	1.0	0.83	17.56	91	58.59	76.15	0.350	-0.255
301.7	36.581	9.29	2.63	2.99	1.0	0.82	12.45	100	57.80	70.25	0.350	-0.223
301.6	36.745	6.26	2.73	3.14	1.0	0.82	8.92	100	56.70	65.62	0.350	-0.197
301.4	36.909	5.92	1.44	3.03	1.0	0.82	8.54	100	56.58	65.12	0.350	-0.194
301.2	37.073	11.89	1.59	2.78	1.0	0.82	15.56	86	57.39	72.95	0.350	-0.237
301.1	37.237	17.39	1.64	2.65	1.0	0.83	22.14	75	57.93	80.08	0.350	-0.274
300.9	37.401	13.42	2.86	2.88	1.0	0.82	17.45	93	58.76	76.21	0.350	-0.254
300.7	37.565	14.66	1.79	2.73	1.0	0.82	18.94	82	57.92	76.86	0.350	-0.258
300.6	37.729	23.20	1.10	2.45	0.5	0.82	24.58	59	55.42	79.99	0.350	-0.274
300.4	37.893	28.09	1.28	2.42	0.5	0.82	29.54	56	55.99	85.53	0.350	-0.301
300.2	38.057	35.29	1.09	2.30	0.5	0.83	36.85	47	54.42	91.27	0.350	-0.327
300.1	38.221	42.09	0.44	2.04	0.5	0.82	43.25	26	39.15	82.40	0.350	-0.285
299.9	38.385	29.61	1.55	2.45	0.5	0.82	31.13	59	57.09	88.22	0.350	-0.313
299.8	38.549	14.54	2.63	2.83	1.0	0.81	18.98	90	58.84	77.82	0.350	-0.262
299.6	38.713	8.88	3.82	3.10	1.0	0.80	12.21	100	57.72	69.93	0.350	-0.220
299.4	38.877	7.27	2.62	3.08	1.0	0.80	10.30	100	57.13	67.43	0.350	-0.206
299.3	39.042	11.45	1.62	2.80	1.0	0.80	15.32	87	57.48	72.79	0.350	-0.235
299.1	39.206	18.43	1.81	2.65	1.0	0.81	23.83	75	58.46	82.29	0.350	-0.284
298.9	39.370	16.58	2.13	2.73	1.0	0.81	21.62	82	58.70	80.31	0.350	-0.274
298.8	39.534	74.71	0.64	1.90	0.5	0.82	76.42	15	20.50	96.92	0.350	-0.351
298.6	39.698	65.95	1.15	2.09	0.5	0.83	68.90	30	49.50	118.40	0.350	-0.438
298.4	39.862	26.88	2.92	2.65	1.0	0.82	34.60	75	61.55	96.15	0.350	-0.348
298.3	40.026	14.55	4.08	2.95	1.0	0.80	19.28	99	59.80	79.08	0.350	-0.267
298.1	40.190	8.52	4.61	3.16	1.0	0.79	11.93	100	57.64	69.57	0.350	-0.217
297.9	40.354	6.54	2.56	3.11	1.0	0.79	9.55	100	56.90	66.45	0.350	-0.199
297.8	40.518	5.12	1.83	3.13	1.0	0.78	7.87	100	56.38	64.24	0.350	-0.186
297.6	40.682	5.16	1.41	3.08	1.0	0.78	7.92	100	56.39	64.32	0.350	-0.187
297.5	40.846	5.29	1.21	3.04	1.0	0.78	8.09	100	56.44	64.53	0.350	-0.188
297.3	41.010	5.22	1.20	3.04	1.0	0.78	8.02	100	56.42	64.44	0.350	-0.187
297.1	41.174	4.66	1.25	3.09	1.0	0.78	7.36	100	56.22	63.58	0.350	-0.182
297.0	41.338	5.14	1.36	3.07	1.0	0.78	7.94	100	56.40	64.34	0.350	-0.186
296.8	41.502	5.08	1.04	3.03	1.0	0.78	7.88	100	56.38	64.26	0.350	-0.186
296.6	41.666	6.07	0.80	2.91	1.0	0.78	9.09	96	56.42	65.51	0.350	-0.193
296.5	41.830	6.54	0.93	2.91	1.0	0.78	9.68	96	56.57	66.25	0.350	-0.197
296.3	41.994	4.97	1.29	3.08	1.0	0.77	7.79	100	56.35	64.14	0.350	-0.185
296.1	42.158	3.95	1.29	3.17	1.0	0.77	6.57	100	55.97	62.54	0.350	-0.175
296.0	42.322	3.92	0.85	3.10	1.0	0.77	6.53	100	55.96	62.49	0.350	-0.175

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
295.8	42.486	3.88	1.18	3.16	1.0	0.77	6.49	100	55.95	62.44	0.350	-0.174
295.6	42.650	5.21	5.92	3.40	1.0	0.77	8.12	100	56.46	64.58	0.350	-0.187
295.5	42.814	12.52	1.56	2.76	1.0	0.78	17.17	84	57.66	74.83	0.350	-0.244
295.3	42.978	7.91	5.53	3.24	1.0	0.77	11.47	100	57.49	68.96	0.350	-0.212
295.2	43.143	4.10	3.61	3.37	1.0	0.76	6.80	100	56.04	62.85	0.350	-0.176
295.0	43.307	4.39	1.37	3.14	1.0	0.76	7.16	100	56.16	63.32	0.350	-0.179
294.8	43.471	3.68	1.32	3.20	1.0	0.76	6.30	100	55.89	62.20	0.350	-0.172
294.7	43.635	3.53	1.33	3.22	1.0	0.76	6.13	100	55.84	61.97	0.350	-0.171
294.5	43.799	3.57	1.17	3.19	1.0	0.76	6.19	100	55.86	62.05	0.350	-0.171
294.3	43.963	3.66	1.03	3.16	1.0	0.75	6.30	100	55.89	62.20	0.350	-0.172
294.2	44.127	3.68	1.29	3.19	1.0	0.75	6.34	100	55.90	62.25	0.350	-0.172
294.0	44.291	3.57	1.22	3.20	1.0	0.75	6.21	100	55.86	62.07	0.350	-0.171
293.8	44.455	4.14	2.16	3.25	1.0	0.75	6.92	100	56.08	63.00	0.350	-0.176
293.7	44.619	4.55	2.18	3.21	1.0	0.75	7.44	100	56.24	63.68	0.350	-0.180
293.5	44.783	3.94	2.64	3.31	1.0	0.75	6.70	100	56.01	62.72	0.350	-0.175
293.4	44.947	4.12	1.50	3.18	1.0	0.75	6.93	100	56.09	63.02	0.350	-0.176
293.2	45.111	4.24	1.32	3.14	1.0	0.75	7.09	100	56.13	63.22	0.350	-0.177
293.0	45.275	4.20	1.39	3.16	1.0	0.75	7.05	100	56.12	63.17	0.350	-0.177
292.9	45.439	4.01	1.38	3.17	1.0	0.74	6.82	100	56.05	62.87	0.350	-0.175
292.7	45.603	3.94	1.31	3.17	1.0	0.74	6.74	100	56.03	62.77	0.350	-0.174
292.5	45.767	4.05	1.09	3.13	1.0	0.74	6.89	100	56.07	62.96	0.350	-0.175
292.4	45.931	4.17	1.18	3.13	1.0	0.74	7.05	100	56.12	63.17	0.350	-0.177
292.2	46.095	4.20	1.24	3.14	1.0	0.74	7.10	100	56.14	63.24	0.350	-0.177
292.0	46.259	4.24	1.24	3.13	1.0	0.74	7.16	100	56.16	63.32	0.350	-0.177
291.9	46.423	4.31	3.52	3.34	1.0	0.74	7.26	100	56.19	63.44	0.350	-0.178
291.7	46.587	10.04	2.36	2.94	1.0	0.75	14.54	98	58.28	72.82	0.350	-0.231
291.5	46.751	5.41	4.71	3.33	1.0	0.74	8.65	100	56.62	65.27	0.350	-0.189
291.4	46.915	4.93	5.23	3.39	1.0	0.74	8.06	100	56.43	64.49	0.350	-0.184
291.2	47.079	4.61	1.69	3.16	1.0	0.73	7.67	100	56.32	63.99	0.350	-0.181
291.1	47.244	4.83	1.76	3.15	1.0	0.73	7.96	100	56.40	64.36	0.350	-0.183
290.9	47.408	4.33	6.65	3.49	1.0	0.73	7.34	100	56.21	63.56	0.350	-0.178
290.7	47.572	13.57	3.89	2.96	1.0	0.75	19.27	100	59.88	79.15	0.350	-0.263
290.6	47.736	10.79	4.75	3.09	1.0	0.74	15.65	100	58.79	74.44	0.350	-0.239
290.4	47.900	5.04	8.75	3.51	1.0	0.73	8.27	100	56.50	64.77	0.350	-0.185
290.2	48.064	5.76	4.78	3.31	1.0	0.73	9.19	100	56.79	65.98	0.350	-0.192
290.1	48.228	14.82	2.09	2.77	1.0	0.74	20.99	84	58.86	79.85	0.350	-0.266
289.9	48.392	6.57	4.87	3.27	1.0	0.73	10.25	100	57.12	67.37	0.350	-0.200
289.7	48.556	5.89	5.38	3.33	1.0	0.73	9.40	100	56.85	66.25	0.350	-0.193
289.6	48.720	4.49	3.29	3.31	1.0	0.72	7.62	100	56.30	63.91	0.350	-0.179
289.4	48.884	4.41	2.41	3.25	1.0	0.72	7.52	100	56.27	63.79	0.350	-0.179
289.3	49.048	4.45	1.17	3.10	1.0	0.72	7.59	100	56.29	63.87	0.350	-0.179
289.1	49.212	4.19	1.33	3.15	1.0	0.72	7.27	100	56.19	63.45	0.350	-0.176
288.9	49.376	4.38	1.31	3.13	1.0	0.72	7.52	100	56.27	63.78	0.350	-0.178
288.8	49.540	7.59	1.75	2.97	1.0	0.72	11.67	100	57.56	69.22	0.350	-0.209
288.6	49.704	6.62	2.30	3.09	1.0	0.72	10.42	100	57.17	67.59	0.350	-0.200
288.4	49.868	4.52	3.51	3.32	1.0	0.71	7.73	100	56.33	64.06	0.350	-0.180
288.3	50.032	4.35	1.48	3.15	1.0	0.71	7.52	100	56.27	63.79	0.350	-0.178
288.1	50.196	4.34	0.91	3.07	1.0	0.71	7.51	100	56.27	63.78	0.350	-0.178
287.9	50.360	8.12	2.33	3.01	1.0	0.72	12.44	100	57.79	70.23	0.350	-0.215
287.8	50.524	7.32	2.72	3.09	1.0	0.72	11.40	100	57.47	68.87	0.350	-0.207
287.6	50.688	4.47	3.83	3.35	1.0	0.71	7.71	100	56.33	64.04	0.350	-0.179
287.4	50.852	4.22	1.40	3.16	1.0	0.71	7.39	100	56.23	63.62	0.350	-0.176
287.3	51.016	4.10	1.10	3.12	1.0	0.71	7.25	100	56.18	63.43	0.350	-0.175
287.1	51.180	4.09	1.59	3.19	1.0	0.71	7.25	100	56.18	63.43	0.350	-0.175
287.0	51.345	6.63	1.91	3.04	1.0	0.71	10.56	100	57.21	67.77	0.350	-0.200
286.8	51.509	62.13	0.80	2.02	0.5	0.75	64.85	24	40.71	105.56	0.350	-0.381
286.6	51.673	50.66	1.91	2.32	0.5	0.76	53.81	48	59.54	113.35	0.350	-0.412
286.5	51.837	56.09	2.43	2.35	0.5	0.76	59.99	51	62.43	122.42	0.350	-0.446
286.3	52.001	16.54	5.74	3.00	1.0	0.73	24.05	100	61.40	85.45	0.350	-0.292
286.1	52.165	8.77	5.65	3.21	1.0	0.71	13.47	100	58.11	71.58	0.350	-0.221
286.0	52.329	8.68	5.79	3.22	1.0	0.71	13.36	100	58.08	71.45	0.350	-0.220
285.8	52.493	64.72	1.42	2.15	0.5	0.76	69.02	35	54.68	123.70	0.350	-0.450
285.6	52.657	21.74	4.17	2.82	1.0	0.73	31.48	88	62.52	94.01	0.350	-0.331
285.5	52.821	12.32	3.77	2.98	1.0	0.71	18.35	100	59.63	77.98	0.350	-0.254
285.3	52.985	7.33	4.28	3.20	1.0	0.70	11.62	100	57.54	69.16	0.350	-0.207
285.2	53.149	5.30	3.59	3.27	1.0	0.70	8.95	100	56.71	65.66	0.350	-0.187

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{CIN}	FC (%)	Δq_{CIN}	$(q_{CIN})_{CS}$	a	ξ_R
285.0	53.313	5.35	3.65	3.27	1.0	0.70	9.01	100	56.73	65.75	0.350	-0.188
284.8	53.477	73.29	0.65	1.91	0.5	0.73	75.46	16	22.98	98.44	0.350	-0.350
284.7	53.641	126.34	0.56	1.68	0.5	0.76	134.34	0	0.00	134.34	0.350	-0.487
284.5	53.805	120.09	0.80	1.79	0.5	0.76	126.84	6	0.59	127.42	0.350	-0.463
284.3	53.969	89.33	1.67	2.09	0.5	0.78	97.69	31	55.82	153.51	0.350	-0.549
284.2	54.133	29.49	3.79	2.69	1.0	0.74	43.20	78	64.68	107.87	0.350	-0.389
284.0	54.297	16.67	4.72	2.94	1.0	0.71	24.65	98	61.43	86.07	0.350	-0.293
283.8	54.461	106.67	0.95	1.87	0.5	0.76	113.41	13	17.11	130.53	0.350	-0.473
283.7	54.625	98.66	1.21	1.97	0.5	0.77	106.95	21	39.24	146.19	0.350	-0.526
283.5	54.789	54.83	3.20	2.44	0.5	0.75	58.98	59	64.80	123.79	0.350	-0.449
283.3	54.953	20.24	5.60	2.93	1.0	0.72	29.90	97	62.94	92.85	0.350	-0.324
283.2	55.117	23.93	5.23	2.85	1.0	0.72	35.33	91	64.01	99.34	0.350	-0.353
283.0	55.281	22.37	3.87	2.79	1.0	0.72	33.05	86	62.70	95.75	0.350	-0.337
282.9	55.446	14.40	4.41	2.97	1.0	0.70	21.64	100	60.65	82.29	0.350	-0.275
282.7	55.610	12.78	3.32	2.94	1.0	0.70	19.37	98	59.76	79.14	0.350	-0.259
282.5	55.774	13.44	2.23	2.82	1.0	0.70	20.29	88	59.12	79.42	0.350	-0.260
282.4	55.938	13.14	2.46	2.85	1.0	0.70	19.90	91	59.28	79.18	0.350	-0.259
282.2	56.102	13.22	2.46	2.85	1.0	0.70	20.04	91	59.30	79.34	0.350	-0.260
282.0	56.266	29.92	1.16	2.37	0.5	0.71	31.62	53	55.37	86.99	0.350	-0.297
281.9	56.430	91.03	0.78	1.88	0.5	0.73	95.08	13	17.00	112.08	0.350	-0.404
281.7	56.594	54.27	2.32	2.35	0.5	0.74	58.26	51	61.90	120.16	0.350	-0.435
281.5	56.758	19.06	4.65	2.89	1.0	0.71	28.58	94	62.27	90.84	0.350	-0.314
281.4	56.922	15.08	4.37	2.95	1.0	0.70	22.84	99	60.95	83.79	0.350	-0.281
281.2	57.086	12.22	3.00	2.93	1.0	0.69	18.77	97	59.51	78.28	0.350	-0.254
281.1	57.250	7.70	2.59	3.06	1.0	0.68	12.48	100	57.81	70.29	0.350	-0.211
280.9	57.414	7.53	1.49	2.94	1.0	0.68	12.26	99	57.62	69.88	0.350	-0.209
280.7	57.578	6.25	1.02	2.94	1.0	0.67	10.51	98	57.07	67.58	0.350	-0.196
280.6	57.742	6.93	1.59	2.99	1.0	0.67	11.46	100	57.49	68.96	0.350	-0.203
280.4	57.906	6.16	3.03	3.18	1.0	0.67	10.42	100	57.17	67.59	0.350	-0.196
280.2	58.070	15.73	1.74	2.70	1.0	0.69	23.88	79	59.04	82.92	0.350	-0.276
280.1	58.234	54.59	1.20	2.17	0.5	0.72	57.97	36	53.13	111.10	0.350	-0.399
279.9	58.398	47.69	2.37	2.40	0.5	0.72	51.03	55	61.40	112.43	0.350	-0.405
279.7	58.562	17.91	4.69	2.91	1.0	0.70	27.26	96	62.04	89.30	0.350	-0.306
279.6	58.726	10.80	4.70	3.08	1.0	0.68	16.97	100	59.20	76.18	0.350	-0.242
279.4	58.890	7.67	3.14	3.10	1.0	0.67	12.58	100	57.84	70.41	0.350	-0.211
279.2	59.054	6.41	1.43	3.00	1.0	0.67	10.84	100	57.30	68.14	0.350	-0.198
279.1	59.218	5.75	1.13	2.99	1.0	0.66	9.95	100	57.02	66.97	0.350	-0.191
278.9	59.382	5.46	0.80	2.96	1.0	0.66	9.55	99	56.85	66.41	0.350	-0.188
278.8	59.547	5.55	0.73	2.93	1.0	0.66	9.68	98	56.75	66.43	0.350	-0.188
278.6	59.711	4.82	0.63	2.97	1.0	0.66	8.69	100	56.63	65.33	0.350	-0.182
278.4	59.875	4.65	0.95	3.05	1.0	0.66	8.47	100	56.56	65.03	0.350	-0.180
278.3	60.039	4.89	0.82	3.00	1.0	0.66	8.81	100	56.67	65.48	0.350	-0.182
278.1	60.203	6.26	0.97	2.93	1.0	0.66	10.72	98	57.06	67.78	0.350	-0.196
277.9	60.367	6.93	2.29	3.07	1.0	0.66	11.66	100	57.55	69.21	0.350	-0.204
277.8	60.531	9.28	2.28	2.96	1.0	0.67	15.00	100	58.56	73.56	0.350	-0.227
277.6	60.695	83.61	0.56	1.82	0.5	0.69	84.66	9	4.82	89.48	0.350	-0.306
277.4	60.859	110.33	0.77	1.80	0.5	0.72	116.07	7	2.16	118.23	0.350	-0.425
277.3	61.023	113.10	0.90	1.84	0.5	0.73	120.80	10	8.66	129.46	0.350	-0.466
277.1	61.187	128.58	0.98	1.82	0.5	0.74	139.76	9	5.24	145.01	0.350	-0.519
276.9	61.351	144.62	1.00	1.79	0.5	0.75	159.87	6	0.87	160.74	0.350	-0.568
276.8	61.515	149.37	0.88	1.74	0.5	0.76	166.08	2	0.00	166.08	0.350	-0.583
276.6	61.679	159.38	0.70	1.66	0.5	0.77	179.75	0	0.00	179.75	0.350	-0.600
276.5	61.843	149.70	0.79	1.71	0.5	0.76	166.64	0	0.00	166.64	0.350	-0.585
276.3	62.007	131.63	0.92	1.80	0.5	0.74	143.06	7	1.31	144.37	0.350	-0.516
276.1	62.171	125.19	0.95	1.82	0.5	0.73	135.58	9	5.10	140.68	0.350	-0.504
276.0	62.335	118.59	0.92	1.83	0.5	0.73	127.54	9	6.85	134.39	0.350	-0.483
275.8	62.499	113.74	0.89	1.83	0.5	0.72	121.62	10	7.67	129.30	0.350	-0.465
275.6	62.663	110.76	0.91	1.85	0.5	0.72	118.59	11	11.13	129.72	0.350	-0.466
275.5	62.827	105.69	0.94	1.87	0.5	0.72	113.48	13	17.43	130.91	0.350	-0.470
275.3	62.991	98.90	1.02	1.92	0.5	0.72	107.01	17	28.34	135.36	0.350	-0.486
275.1	63.155	89.11	1.35	2.03	0.5	0.73	98.13	26	48.51	146.64	0.350	-0.523
275.0	63.319	62.84	2.67	2.35	0.5	0.72	68.78	51	64.54	133.32	0.350	-0.479
274.8	63.483	21.02	5.19	2.89	1.0	0.68	33.04	94	63.64	96.69	0.350	-0.337
274.7	63.648	12.48	6.01	3.10	1.0	0.66	20.02	100	60.15	80.17	0.350	-0.260
274.5	63.812	9.99	3.57	3.04	1.0	0.65	16.36	100	59.01	75.37	0.350	-0.235
274.3	63.976	46.97	0.52	2.03	0.5	0.67	48.41	25	38.76	87.17	0.350	-0.294

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	(ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
274.2	64.140	93.81	0.83	1.88	0.5	0.70	99.19	13	18.19	117.38	0.350	-0.421
274.0	64.304	102.64	1.24	1.96	0.5	0.74	113.68	20	39.08	152.76	0.350	-0.542
273.8	64.468	77.26	1.51	2.11	0.5	0.72	84.80	32	54.75	139.55	0.350	-0.499
273.7	64.632	45.39	2.50	2.43	0.5	0.69	48.80	57	61.63	110.43	0.350	-0.394
273.5	64.796	35.18	3.52	2.61	1.0	0.71	56.55	72	67.50	124.04	0.350	-0.445
273.3	64.960	22.75	3.54	2.76	1.0	0.68	36.08	83	63.30	99.38	0.350	-0.348
273.2	65.124	14.76	5.24	3.01	1.0	0.66	23.67	100	61.28	84.95	0.350	-0.283
273.0	65.288	51.07	1.56	2.26	0.5	0.69	54.77	44	57.40	112.16	0.350	-0.400
272.8	65.452	54.12	1.42	2.21	0.5	0.69	58.07	40	55.93	114.00	0.350	-0.407
272.7	65.616	53.89	1.24	2.18	0.5	0.69	57.60	37	53.85	111.46	0.350	-0.397
272.5	65.780	73.72	0.67	1.91	0.5	0.68	76.45	16	24.11	100.57	0.350	-0.353
272.4	65.944	69.20	1.14	2.07	0.5	0.70	74.62	29	48.71	123.33	0.350	-0.442
272.2	66.108	27.46	3.22	2.67	1.0	0.68	44.04	76	64.61	108.65	0.350	-0.386
272.0	66.272	16.57	4.43	2.92	1.0	0.66	26.65	97	61.93	88.59	0.350	-0.299
271.9	66.436	18.13	2.87	2.78	1.0	0.66	29.06	85	61.39	90.45	0.350	-0.308
271.7	66.600	67.52	1.02	2.05	0.5	0.69	72.36	27	45.95	118.30	0.350	-0.423
271.5	66.764	60.20	2.19	2.30	0.5	0.70	65.74	47	62.00	127.73	0.350	-0.457
271.4	66.928	58.61	2.32	2.33	0.5	0.70	63.97	49	62.53	126.50	0.350	-0.453
271.2	67.092	82.26	1.39	2.07	0.5	0.72	90.76	28	51.60	142.37	0.350	-0.507
271.0	67.256	127.71	1.10	1.86	0.5	0.73	142.13	12	14.65	156.78	0.350	-0.553
270.9	67.420	97.67	1.77	2.08	0.5	0.74	110.98	30	57.47	168.45	0.350	-0.587
270.7	67.584	28.64	5.77	2.82	1.0	0.68	46.66	89	67.22	113.89	0.350	-0.406
270.6	67.749	19.08	5.12	2.92	1.0	0.66	30.91	96	63.20	94.11	0.350	-0.324
270.4	67.913	46.26	2.89	2.47	0.5	0.68	50.01	60	62.82	112.83	0.350	-0.401
270.2	68.077	192.04	0.79	1.63	0.5	0.79	230.99	0	0.00	230.99	0.350	-0.600
270.1	68.241	215.65	1.09	1.69	0.5	0.81	264.86	0	0.00	264.86	0.350	-0.600
269.9	68.405	155.20	2.01	1.99	0.5	0.80	190.13	22	55.80	245.93	0.350	-0.600
269.7	68.569	49.78	4.97	2.61	1.0	0.73	85.35	72	75.92	161.26	0.350	-0.566
269.6	68.733	24.05	6.51	2.92	1.0	0.67	39.32	96	65.78	105.10	0.350	-0.370
269.4	68.897	18.78	6.59	3.00	1.0	0.66	30.68	100	63.46	94.14	0.350	-0.323
269.2	69.061	100.41	1.73	2.07	0.5	0.74	114.74	29	56.44	171.18	0.350	-0.594
269.1	69.225	90.27	2.41	2.21	0.5	0.73	103.28	39	66.36	169.64	0.350	-0.590
268.9	69.389	28.37	4.24	2.74	1.0	0.68	46.72	82	66.28	113.01	0.350	-0.401
268.7	69.553	51.97	3.28	2.47	0.5	0.69	56.74	60	64.75	121.48	0.350	-0.433
268.6	69.717	127.82	1.37	1.92	0.5	0.74	147.17	17	33.71	180.89	0.350	-0.600
268.4	69.881	179.75	1.15	1.77	0.5	0.77	213.57	4	0.06	213.63	0.350	-0.600
268.3	70.045	201.25	1.14	1.73	0.5	0.80	247.01	1	0.00	247.01	0.350	-0.600
268.1	70.209	202.91	1.31	1.77	0.5	0.80	249.85	5	0.17	250.02	0.350	-0.600
267.9	70.373	192.14	1.65	1.86	0.5	0.80	237.81	12	21.02	258.82	0.350	-0.600
267.8	70.537	166.49	2.04	1.97	0.5	0.80	206.59	21	54.68	261.26	0.350	-0.600
267.6	70.701	132.59	2.42	2.09	0.5	0.78	161.43	31	68.88	230.31	0.350	-0.600
267.4	70.865	176.52	1.44	1.84	0.5	0.78	213.01	11	12.90	225.92	0.350	-0.600
267.3	71.029	201.41	1.17	1.74	0.5	0.79	248.16	2	0.00	248.16	0.350	-0.600
267.1	71.193	168.78	1.35	1.84	0.5	0.76	200.65	10	9.81	210.46	0.350	-0.600
266.9	71.357	109.70	1.95	2.08	0.5	0.75	128.30	29	60.24	188.54	0.350	-0.600
266.8	71.521	35.76	3.47	2.60	1.0	0.69	60.59	71	68.52	129.12	0.350	-0.460
266.6	71.685	18.90	5.11	2.92	1.0	0.65	31.42	97	63.38	94.79	0.350	-0.325
266.5	71.850	12.72	4.56	3.02	1.0	0.63	21.45	100	60.59	82.04	0.350	-0.265
266.3	72.014	13.12	3.00	2.90	1.0	0.63	22.08	95	60.34	82.42	0.350	-0.267
266.1	72.178	41.24	2.44	2.45	0.5	0.66	44.44	59	60.99	105.43	0.350	-0.370
266.0	72.342	76.70	1.32	2.08	0.5	0.69	84.53	29	51.18	135.71	0.350	-0.482
265.8	72.506	92.99	0.79	1.87	0.5	0.67	98.40	13	15.97	114.37	0.350	-0.405
265.6	72.670	83.07	1.64	2.11	0.5	0.70	93.31	32	56.71	150.02	0.350	-0.529
265.5	72.834	60.31	2.47	2.34	0.5	0.68	66.53	50	63.57	130.10	0.350	-0.463
265.3	72.998	64.29	2.29	2.29	0.5	0.69	71.21	46	63.08	134.30	0.350	-0.477
265.1	73.162	26.69	3.62	2.71	1.0	0.66	44.98	80	65.44	110.43	0.350	-0.389
265.0	73.326	15.00	3.99	2.93	1.0	0.63	25.29	97	61.54	86.84	0.350	-0.288
264.8	73.490	9.97	6.01	3.18	1.0	0.61	17.30	100	59.30	76.60	0.350	-0.237
264.6	73.654	14.38	5.56	3.03	1.0	0.63	24.34	100	61.49	85.84	0.350	-0.283
264.5	73.818	77.64	1.79	2.16	0.5	0.70	87.07	36	59.36	146.44	0.350	-0.517
264.3	73.982	117.13	1.13	1.89	0.5	0.71	131.56	14	23.59	155.14	0.350	-0.544
264.2	74.146	138.21	0.86	1.76	0.5	0.70	154.62	4	0.01	154.63	0.350	-0.543
264.0	74.310	131.32	0.95	1.81	0.5	0.70	145.79	8	2.69	148.48	0.350	-0.523
263.8	74.474	122.39	0.95	1.83	0.5	0.69	134.67	9	6.77	141.44	0.350	-0.501
263.7	74.638	117.14	0.92	1.83	0.5	0.68	127.81	10	7.47	135.28	0.350	-0.480
263.5	74.802	110.41	0.91	1.85	0.5	0.68	119.94	11	11.66	131.60	0.350	-0.467

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(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
263.3	74.966	104.90	0.92	1.87	0.5	0.68	113.83	13	16.22	130.06	0.350	-0.462
263.2	75.130	100.00	0.79	1.85	0.5	0.66	106.11	11	10.03	116.14	0.350	-0.411
263.0	75.294	89.98	0.93	1.93	0.5	0.67	97.47	17	28.82	126.29	0.350	-0.448
262.8	75.458	70.46	1.27	2.09	0.5	0.67	77.29	31	51.64	128.94	0.350	-0.457
262.7	75.622	46.88	2.32	2.40	0.5	0.65	50.89	55	61.35	112.24	0.350	-0.395
262.5	75.786	23.20	3.32	2.73	1.0	0.64	39.56	82	64.08	103.65	0.350	-0.361
262.3	75.951	14.17	5.38	3.03	1.0	0.62	24.34	100	61.49	85.82	0.350	-0.282
262.2	76.115	13.89	5.76	3.06	1.0	0.62	23.90	100	61.35	85.25	0.350	-0.279
262.0	76.279	14.11	3.93	2.95	1.0	0.62	24.27	99	61.35	85.62	0.350	-0.280
261.9	76.443	70.08	1.16	2.07	0.5	0.67	76.54	29	49.15	125.69	0.350	-0.445
261.7	76.607	138.03	0.68	1.70	0.5	0.70	155.01	0	0.00	155.01	0.350	-0.543
261.5	76.771	127.26	0.89	1.80	0.5	0.68	140.39	7	1.65	142.04	0.350	-0.501
261.4	76.935	118.00	1.01	1.86	0.5	0.69	131.06	12	14.18	145.24	0.350	-0.512
261.2	77.099	113.60	1.10	1.89	0.5	0.69	127.49	15	23.84	151.33	0.350	-0.531
261.0	77.263	119.57	0.99	1.85	0.5	0.68	132.53	11	11.29	143.82	0.350	-0.507
260.9	77.427	139.51	0.84	1.75	0.5	0.70	157.35	3	0.00	157.35	0.350	-0.550
260.7	77.591	151.00	0.69	1.67	0.5	0.71	174.18	0	0.00	174.18	0.350	-0.599
260.5	77.755	138.27	0.61	1.67	0.5	0.69	155.65	0	0.00	155.65	0.350	-0.544
260.4	77.919	119.87	0.46	1.65	0.5	0.67	129.98	0	0.00	129.98	0.350	-0.460
260.2	78.083	110.67	0.21	1.52	0.5	0.65	117.66	0	0.00	117.66	0.350	-0.415
260.1	78.247	89.18	0.22	1.62	0.5	0.62	90.26	0	0.00	90.26	0.350	-0.301
259.9	78.411	76.65	0.21	1.68	0.5	0.59	75.22	0	0.00	75.22	0.350	-0.227
259.7	78.575	65.55	0.15	1.70	0.5	0.57	62.49	0	0.00	62.49	0.350	-0.156
259.6	78.739	83.98	0.61	1.84	0.5	0.62	85.94	10	8.47	94.41	0.350	-0.320
259.4	78.903	108.50	0.51	1.71	0.5	0.65	114.88	0	0.00	114.88	0.350	-0.404
259.2	79.067	141.98	0.70	1.70	0.5	0.70	161.39	0	0.00	161.39	0.350	-0.561
259.1	79.231	172.14	1.76	1.92	0.5	0.78	218.67	16	38.54	257.22	0.350	-0.600
258.9	79.395	196.58	1.38	1.80	0.5	0.78	248.31	7	2.00	250.30	0.350	-0.600
258.7	79.559	211.31	1.12	1.71	0.5	0.78	267.87	0	0.00	267.87	0.350	-0.600
258.6	79.723	162.62	0.99	1.75	0.5	0.73	192.71	3	0.00	192.72	0.350	-0.600
258.4	79.887	126.62	0.77	1.76	0.5	0.67	139.61	4	0.01	139.63	0.350	-0.492
258.2	80.052	127.04	0.69	1.73	0.5	0.67	140.23	1	0.00	140.23	0.350	-0.494
258.1	80.216	135.97	0.79	1.74	0.5	0.68	152.97	2	0.00	152.97	0.350	-0.535
257.9	80.380	135.96	0.85	1.76	0.5	0.68	152.99	4	0.02	153.01	0.350	-0.535
257.8	80.544	126.35	1.00	1.83	0.5	0.68	141.69	10	7.99	149.69	0.350	-0.524
257.6	80.708	132.36	0.93	1.80	0.5	0.68	148.33	7	1.42	149.75	0.350	-0.525
257.4	80.872	160.81	0.75	1.67	0.5	0.72	190.44	0	0.00	190.44	0.350	-0.600
257.3	81.036	187.81	0.80	1.64	0.5	0.76	234.14	0	0.00	234.14	0.350	-0.600
257.1	81.200	197.54	0.93	1.67	0.5	0.77	250.79	0	0.00	250.79	0.350	-0.600
256.9	81.364	198.73	1.01	1.69	0.5	0.78	252.98	0	0.00	252.98	0.350	-0.600
256.8	81.528	203.59	0.99	1.68	0.5	0.78	259.52	0	0.00	259.52	0.350	-0.600
256.6	81.692	197.31	1.07	1.71	0.5	0.77	250.82	0	0.00	250.82	0.350	-0.600
256.4	81.856	202.84	1.03	1.69	0.5	0.78	258.80	0	0.00	258.80	0.350	-0.600
256.3	82.020	194.33	1.06	1.72	0.5	0.77	245.97	0	0.00	245.97	0.350	-0.600
256.1	82.184	181.02	1.20	1.78	0.5	0.75	223.73	5	0.28	224.01	0.350	-0.600
256.0	82.348	172.07	1.19	1.79	0.5	0.74	209.41	6	0.99	210.40	0.350	-0.600
255.8	82.512	171.32	1.15	1.78	0.5	0.73	208.10	5	0.45	208.55	0.350	-0.600
255.6	82.676	164.36	1.18	1.80	0.5	0.72	197.61	7	2.16	199.77	0.350	-0.600
255.5	82.840	162.32	1.14	1.79	0.5	0.72	194.16	6	1.31	195.47	0.350	-0.600
255.3	83.004	168.26	1.06	1.76	0.5	0.73	203.27	4	0.02	203.29	0.350	-0.600
255.1	83.168	172.46	1.14	1.78	0.5	0.73	210.24	5	0.22	210.46	0.350	-0.600
255.0	83.332	165.85	1.31	1.83	0.5	0.73	202.47	9	8.32	210.79	0.350	-0.600
254.8	83.496	159.08	1.39	1.86	0.5	0.74	194.90	12	17.90	212.80	0.350	-0.600
254.6	83.660	157.14	1.38	1.86	0.5	0.73	192.04	12	18.34	210.39	0.350	-0.600
254.5	83.824	157.58	1.36	1.86	0.5	0.73	192.24	12	16.55	208.79	0.350	-0.600
254.3	83.988	156.92	1.35	1.86	0.5	0.73	191.05	11	15.85	206.90	0.350	-0.600
254.1	84.153	156.28	1.34	1.86	0.5	0.73	190.20	12	16.12	206.33	0.350	-0.600
254.0	84.317	159.12	1.33	1.85	0.5	0.73	194.01	11	13.72	207.72	0.350	-0.600
253.8	84.481	163.90	1.30	1.83	0.5	0.73	200.08	10	8.73	208.81	0.350	-0.600
253.7	84.645	171.17	1.21	1.80	0.5	0.73	209.51	7	1.71	211.22	0.350	-0.600
253.5	84.809	179.73	1.01	1.72	0.5	0.74	223.20	1	0.00	223.20	0.350	-0.600
253.3	84.973	173.92	1.06	1.75	0.5	0.73	213.60	3	0.00	213.60	0.350	-0.600
253.2	85.137	161.10	0.93	1.74	0.5	0.71	192.83	2	0.00	192.83	0.350	-0.600
253.0	85.301	147.66	1.07	1.80	0.5	0.69	172.68	7	2.47	175.15	0.350	-0.598
252.8	85.465	149.27	1.26	1.85	0.5	0.71	178.94	11	13.59	192.54	0.350	-0.600
252.7	85.629	154.94	1.00	1.77	0.5	0.70	183.29	4	0.07	183.35	0.350	-0.600

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{CIN}	FC (%)	Δq_{CIN}	$(q_{CIN})_{CS}$	a	ξ_R
252.5	85.793	143.39	1.20	1.85	0.5	0.70	169.67	11	12.65	182.31	0.350	-0.600
252.3	85.957	138.73	0.98	1.80	0.5	0.68	159.03	7	1.65	160.68	0.350	-0.556
252.2	86.121	139.57	0.91	1.77	0.5	0.68	159.84	5	0.19	160.03	0.350	-0.554
252.0	86.285	133.15	0.97	1.81	0.5	0.67	151.16	8	2.70	153.85	0.350	-0.535
251.9	86.449	136.72	0.90	1.78	0.5	0.67	155.69	5	0.25	155.94	0.350	-0.541
251.7	86.613	143.90	0.97	1.78	0.5	0.68	166.63	6	0.41	167.04	0.350	-0.574
251.5	86.777	146.86	0.92	1.76	0.5	0.69	171.09	4	0.02	171.12	0.350	-0.586
251.4	86.941	173.13	0.76	1.65	0.5	0.73	213.43	0	0.00	213.43	0.350	-0.600
251.2	87.105	197.52	0.67	1.57	0.5	0.76	255.41	0	0.00	255.41	0.350	-0.600
251.0	87.269	199.15	0.75	1.60	0.5	0.76	257.59	0	0.00	257.59	0.350	-0.600
250.9	87.433	183.26	0.96	1.70	0.5	0.74	230.99	0	0.00	230.99	0.350	-0.600
250.7	87.597	176.06	0.98	1.72	0.5	0.73	218.77	1	0.00	218.77	0.350	-0.600
250.5	87.761	178.48	1.06	1.74	0.5	0.73	222.99	2	0.00	222.99	0.350	-0.600
250.4	87.925	186.70	1.06	1.73	0.5	0.75	237.35	1	0.00	237.35	0.350	-0.600
250.2	88.089	206.87	1.00	1.68	0.5	0.76	267.95	0	0.00	267.95	0.350	-0.600
250.0	88.254	218.40	1.03	1.67	0.5	0.76	282.79	0	0.00	282.79	0.350	-0.600
249.9	88.418	215.03	0.82	1.61	0.5	0.76	278.60	0	0.00	278.60	0.350	-0.600
249.7	88.582	198.21	0.94	1.67	0.5	0.76	257.20	0	0.00	257.20	0.350	-0.600
249.6	88.746	143.63	0.99	1.79	0.5	0.68	167.04	6	0.91	167.95	0.350	-0.576
249.4	88.910	134.43	0.76	1.74	0.5	0.66	152.77	2	0.00	152.77	0.350	-0.530
249.2	89.074	195.32	0.54	1.51	0.5	0.76	253.65	0	0.00	253.65	0.350	-0.600
249.1	89.238	223.49	0.51	1.45	0.5	0.76	289.97	0	0.00	289.97	0.350	-0.600
248.9	89.402	249.50	0.44	1.38	0.5	0.76	323.40	0	0.00	323.40	0.350	-0.600
248.7	89.566	270.61	0.50	1.39	0.5	0.76	350.57	0	0.00	350.57	0.350	-0.600
248.6	89.730	274.10	0.56	1.42	0.5	0.76	355.17	0	0.00	355.17	0.350	-0.600
248.4	89.894	274.38	0.58	1.42	0.5	0.76	355.67	0	0.00	355.67	0.350	-0.600
248.2	90.058	276.31	0.54	1.40	0.5	0.76	358.27	0	0.00	358.27	0.350	-0.600
248.1	90.222	268.80	0.58	1.43	0.5	0.76	348.78	0	0.00	348.78	0.350	-0.600
247.9	90.386	339.82	0.44	1.27	0.5	0.76	440.07	0	0.00	440.07	0.350	-0.600
247.7	90.550	351.27	0.50	1.30	0.5	0.76	454.95	0	0.00	454.95	0.350	-0.600
247.6	90.714	307.04	0.76	1.48	0.5	0.76	398.30	0	0.00	398.30	0.350	-0.600
247.4	90.878	287.11	0.39	1.30	0.5	0.76	372.83	0	0.00	372.83	0.350	-0.600
247.3	91.042	246.65	0.31	1.29	0.5	0.76	320.97	0	0.00	320.97	0.350	-0.600
247.1	91.206	202.38	0.61	1.54	0.5	0.76	264.16	0	0.00	264.16	0.350	-0.600
246.9	91.370	130.93	0.61	1.68	0.5	0.65	148.06	0	0.00	148.06	0.350	-0.515
246.8	91.534	103.33	0.47	1.71	0.5	0.60	108.82	0	0.00	108.82	0.350	-0.375
246.6	91.698	88.24	0.23	1.63	0.5	0.57	89.09	0	0.00	89.09	0.350	-0.290
246.4	91.862	77.38	0.42	1.79	0.5	0.55	75.90	6	0.83	76.73	0.350	-0.229
246.3	92.026	92.51	0.38	1.70	0.5	0.58	94.55	0	0.00	94.55	0.350	-0.315
246.1	92.190	172.87	0.36	1.46	0.5	0.72	216.02	0	0.00	216.02	0.350	-0.600
245.9	92.355	209.62	0.39	1.41	0.5	0.75	274.07	0	0.00	274.07	0.350	-0.600
245.8	92.519	205.21	0.53	1.49	0.5	0.75	268.62	0	0.00	268.62	0.350	-0.600
245.6	92.683	182.20	0.61	1.57	0.5	0.73	232.76	0	0.00	232.76	0.350	-0.600
245.5	92.847	164.21	0.67	1.63	0.5	0.70	201.55	0	0.00	201.55	0.350	-0.600
245.3	93.011	157.50	0.55	1.60	0.5	0.69	190.41	0	0.00	190.41	0.350	-0.600
245.1	93.175	149.78	0.51	1.59	0.5	0.68	177.85	0	0.00	177.85	0.350	-0.600
245.0	93.339	149.38	0.52	1.60	0.5	0.68	177.27	0	0.00	177.27	0.350	-0.600
244.8	93.503	138.55	0.43	1.58	0.5	0.66	160.17	0	0.00	160.17	0.350	-0.551
244.6	93.667	122.12	0.69	1.74	0.5	0.63	135.43	2	0.00	135.43	0.350	-0.472
244.5	93.831	100.54	0.67	1.80	0.5	0.59	105.76	7	1.84	107.61	0.350	-0.369
244.3	93.995	59.32	0.44	1.90	0.5	0.55	59.29	15	20.12	79.41	0.350	-0.242
244.1	94.159	53.84	0.39	1.92	0.5	0.55	53.67	17	23.09	76.77	0.350	-0.229
244.0	94.323	68.46	1.23	2.09	0.5	0.62	76.25	31	51.39	127.65	0.350	-0.445
243.8	94.487	83.34	1.04	1.98	0.5	0.62	93.12	22	39.90	133.02	0.350	-0.463
243.6	94.651	82.97	1.49	2.08	0.5	0.64	95.76	30	54.38	150.14	0.350	-0.520
243.5	94.815	105.59	1.04	1.90	0.5	0.64	119.87	15	25.38	145.25	0.350	-0.504
243.3	94.979	140.12	0.71	1.70	0.5	0.66	163.02	0	0.00	163.02	0.350	-0.559
243.2	95.143	193.76	0.53	1.51	0.5	0.75	255.37	0	0.00	255.37	0.350	-0.600
243.0	95.307	204.05	0.55	1.51	0.5	0.75	268.82	0	0.00	268.82	0.350	-0.600
242.8	95.471	182.81	0.55	1.54	0.5	0.73	235.80	0	0.00	235.80	0.350	-0.600
242.7	95.635	150.92	0.70	1.67	0.5	0.68	180.58	0	0.00	180.58	0.350	-0.600
242.5	95.799	129.25	0.68	1.72	0.5	0.64	146.41	1	0.00	146.41	0.350	-0.507
242.3	95.963	106.89	1.39	1.98	0.5	0.67	127.34	22	45.09	172.43	0.350	-0.586
242.2	96.127	79.21	3.12	2.33	0.5	0.66	94.08	49	70.42	164.50	0.350	-0.563
242.0	96.291	83.17	2.55	2.25	0.5	0.66	99.03	43	67.90	166.93	0.350	-0.570
241.8	96.456	169.08	0.81	1.68	0.5	0.71	211.80	0	0.00	211.80	0.350	-0.600

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(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
241.7	96.620	221.79	0.46	1.43	0.5	0.75	292.69	0	0.00	292.69	0.350	-0.600
241.5	96.784	193.39	0.55	1.52	0.5	0.75	255.82	0	0.00	255.82	0.350	-0.600
241.4	96.948	162.12	0.92	1.73	0.5	0.69	199.94	1	0.00	199.94	0.350	-0.600
241.2	97.112	145.43	1.01	1.79	0.5	0.66	172.51	6	0.97	173.49	0.350	-0.589
241.0	97.276	102.50	1.44	2.01	0.5	0.66	122.08	24	48.40	170.48	0.350	-0.580
240.9	97.440	67.40	3.00	2.36	0.5	0.63	78.02	52	67.51	145.53	0.350	-0.504
240.7	97.604	23.75	3.65	2.75	1.0	0.59	46.21	83	66.30	112.50	0.350	-0.387
240.5	97.768	8.96	6.71	3.24	1.0	0.54	17.76	100	59.45	77.21	0.350	-0.229
240.4	97.932	6.74	5.03	3.27	1.0	0.53	13.89	100	58.25	72.14	0.350	-0.203
240.2	98.096	6.13	2.27	3.11	1.0	0.53	12.86	100	57.92	70.78	0.350	-0.195
240.0	98.260	5.23	1.89	3.13	1.0	0.52	11.34	100	57.45	68.79	0.350	-0.184
239.9	98.424	5.17	1.34	3.07	1.0	0.52	11.24	100	57.42	68.67	0.350	-0.183
239.7	98.588	5.21	1.12	3.03	1.0	0.52	11.31	100	57.44	68.75	0.350	-0.184
239.5	98.752	5.20	1.08	3.03	1.0	0.52	11.30	100	57.44	68.74	0.350	-0.184
239.4	98.916	5.21	1.18	3.04	1.0	0.52	11.34	100	57.45	68.79	0.350	-0.184
239.2	99.080	5.13	1.21	3.05	1.0	0.52	11.21	100	57.41	68.62	0.350	-0.183
239.1	99.244	4.77	1.22	3.08	1.0	0.52	10.60	100	57.22	67.83	0.350	-0.178
238.9	99.408	4.85	1.14	3.06	1.0	0.52	10.74	100	57.27	68.01	0.350	-0.179
238.7	99.572	4.93	1.17	3.06	1.0	0.52	10.89	100	57.31	68.20	0.350	-0.180
238.6	99.736	5.09	1.23	3.06	1.0	0.52	11.17	100	57.40	68.57	0.350	-0.182
238.4	99.900	4.72	1.24	3.09	1.0	0.52	10.54	100	57.21	67.75	0.350	-0.178
238.2	100.064	4.53	1.26	3.11	1.0	0.52	10.24	100	57.11	67.35	0.350	-0.175
238.1	100.228	4.54	1.10	3.08	1.0	0.51	10.25	100	57.12	67.37	0.350	-0.175
237.9	100.392	4.37	1.04	3.09	1.0	0.51	9.98	100	57.03	67.01	0.350	-0.173
237.7	100.557	4.39	1.15	3.10	1.0	0.51	10.02	100	57.04	67.07	0.350	-0.173
237.6	100.721	4.55	1.21	3.10	1.0	0.51	10.29	100	57.13	67.41	0.350	-0.175
237.4	100.885	4.54	1.35	3.12	1.0	0.51	10.28	100	57.12	67.41	0.350	-0.175
237.3	101.049	4.49	1.36	3.13	1.0	0.51	10.21	100	57.10	67.31	0.350	-0.175
237.1	101.213	4.39	1.50	3.15	1.0	0.51	10.05	100	57.05	67.10	0.350	-0.173
236.9	101.377	4.15	1.38	3.16	1.0	0.51	9.65	100	56.93	66.58	0.350	-0.170
236.8	101.541	4.19	1.14	3.12	1.0	0.51	9.73	100	56.95	66.68	0.350	-0.171
236.6	101.705	4.28	1.11	3.11	1.0	0.51	9.88	100	57.00	66.88	0.350	-0.172
236.4	101.869	4.11	1.30	3.15	1.0	0.51	9.59	100	56.91	66.50	0.350	-0.170
236.3	102.033	4.25	1.26	3.13	1.0	0.51	9.84	100	56.99	66.82	0.350	-0.171
236.1	102.197	4.32	1.38	3.14	1.0	0.51	9.96	100	57.03	66.99	0.350	-0.172
235.9	102.361	4.36	1.37	3.14	1.0	0.51	10.04	100	57.05	67.09	0.350	-0.173
235.8	102.525	4.53	1.21	3.10	1.0	0.51	10.35	100	57.14	67.49	0.350	-0.175
235.6	102.689	4.39	1.22	3.12	1.0	0.51	10.10	100	57.07	67.17	0.350	-0.173
235.4	102.853	4.35	1.30	3.13	1.0	0.51	10.04	100	57.05	67.09	0.350	-0.173
235.3	103.017	4.33	1.26	3.13	1.0	0.51	10.02	100	57.04	67.06	0.350	-0.172
235.1	103.181	4.30	1.24	3.13	1.0	0.51	9.97	100	57.03	66.99	0.350	-0.172
235.0	103.345	4.47	1.29	3.12	1.0	0.51	10.27	100	57.12	67.39	0.350	-0.174
234.8	103.509	4.28	1.36	3.14	1.0	0.51	9.96	100	57.02	66.98	0.350	-0.172
234.6	103.673	4.32	1.33	3.14	1.0	0.51	10.03	100	57.05	67.08	0.350	-0.172
234.5	103.837	4.27	1.39	3.15	1.0	0.51	9.95	100	57.02	66.97	0.350	-0.172
234.3	104.001	4.46	1.33	3.12	1.0	0.51	10.28	100	57.12	67.40	0.350	-0.174
234.1	104.165	4.50	1.53	3.15	1.0	0.51	10.35	100	57.15	67.50	0.350	-0.174
234.0	104.329	4.52	1.85	3.18	1.0	0.50	10.39	100	57.16	67.55	0.350	-0.175
233.8	104.493	5.19	2.06	3.15	1.0	0.51	11.57	100	57.52	69.09	0.350	-0.183
233.6	104.658	61.05	1.25	2.14	0.5	0.59	67.97	34	53.42	121.38	0.350	-0.418
233.5	104.822	45.38	2.03	2.37	0.5	0.57	50.11	53	60.35	110.46	0.350	-0.376
233.3	104.986	11.68	4.20	3.03	1.0	0.53	23.45	100	61.21	84.66	0.350	-0.264
233.2	105.150	9.02	3.33	3.06	1.0	0.52	18.47	100	59.67	78.13	0.350	-0.231
233.0	105.314	7.97	1.67	2.95	1.0	0.52	16.55	99	58.96	75.50	0.350	-0.218
232.8	105.478	5.94	2.67	3.16	1.0	0.51	12.92	100	57.94	70.86	0.350	-0.193
232.7	105.642	5.53	4.29	3.30	1.0	0.51	12.21	100	57.72	69.94	0.350	-0.188
232.5	105.806	64.48	1.13	2.09	0.5	0.58	71.75	30	50.28	122.03	0.350	-0.420
232.3	105.970	52.26	2.37	2.37	0.5	0.58	58.73	53	62.63	121.36	0.350	-0.417
232.2	106.134	20.47	3.40	2.78	1.0	0.56	41.28	85	65.14	106.42	0.350	-0.359
232.0	106.298	10.72	4.81	3.09	1.0	0.53	21.74	100	60.68	82.43	0.350	-0.252
231.8	106.462	7.38	3.74	3.16	1.0	0.51	15.55	100	58.76	74.31	0.350	-0.211
231.7	106.626	6.13	1.50	3.02	1.0	0.51	13.33	100	58.07	71.40	0.350	-0.195
231.5	106.790	7.10	1.27	2.93	1.0	0.51	15.06	98	58.42	73.48	0.350	-0.206
231.3	106.954	11.87	1.45	2.76	1.0	0.53	23.89	84	59.72	83.61	0.350	-0.258
231.2	107.118	8.62	2.77	3.03	1.0	0.51	17.87	100	59.48	77.35	0.350	-0.226
231.0	107.282	5.22	4.25	3.32	1.0	0.50	11.75	100	57.58	69.33	0.350	-0.184

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
230.9	107.446	4.76	2.56	3.23	1.0	0.50	10.96	100	57.33	68.29	0.350	-0.178
230.7	107.610	4.51	1.12	3.09	1.0	0.50	10.53	100	57.20	67.73	0.350	-0.174
230.5	107.774	4.48	1.12	3.09	1.0	0.50	10.47	100	57.18	67.65	0.350	-0.174
230.4	107.938	5.57	1.23	3.02	1.0	0.50	12.40	100	57.78	70.18	0.350	-0.188
230.2	108.102	4.61	1.89	3.18	1.0	0.50	10.71	100	57.26	67.97	0.350	-0.176
230.0	108.266	4.42	3.10	3.30	1.0	0.50	10.39	100	57.16	67.55	0.350	-0.173
229.9	108.430	4.86	2.45	3.22	1.0	0.50	11.16	100	57.40	68.56	0.350	-0.179
229.7	108.594	29.26	0.76	2.29	0.5	0.52	31.22	46	52.51	83.73	0.350	-0.258
229.5	108.759	76.68	0.33	1.75	0.5	0.51	74.34	3	0.00	74.34	0.350	-0.210
229.4	108.923	68.77	1.17	2.08	0.5	0.58	77.39	29	50.07	127.47	0.350	-0.438
229.2	109.087	24.92	2.67	2.65	1.0	0.57	51.62	75	66.60	118.22	0.350	-0.404
229.0	109.251	12.68	4.93	3.04	1.0	0.53	25.84	100	61.96	87.80	0.350	-0.277
228.9	109.415	8.00	5.08	3.21	1.0	0.51	16.89	100	59.18	76.07	0.350	-0.219
228.7	109.579	8.75	2.05	2.96	1.0	0.51	18.30	99	59.57	77.87	0.350	-0.228
228.6	109.743	8.70	1.38	2.87	1.0	0.51	18.19	93	58.93	77.11	0.350	-0.224
228.4	109.907	7.18	2.91	3.11	1.0	0.50	15.42	100	58.72	74.14	0.350	-0.209
228.2	110.071	5.20	4.64	3.34	1.0	0.49	11.85	100	57.61	69.46	0.350	-0.183
228.1	110.235	15.46	1.34	2.65	1.0	0.53	31.30	75	60.61	91.91	0.350	-0.295
227.9	110.399	46.17	1.37	2.26	0.5	0.55	50.63	44	56.36	107.00	0.350	-0.360
227.7	110.563	21.22	2.36	2.67	1.0	0.55	43.68	77	64.55	108.23	0.350	-0.365
227.6	110.727	19.41	2.77	2.74	1.0	0.55	39.85	82	64.30	104.15	0.350	-0.348
227.4	110.891	55.66	2.25	2.33	0.5	0.58	63.18	50	62.61	125.79	0.350	-0.431
227.2	111.055	22.92	3.10	2.72	1.0	0.56	47.70	80	66.35	114.05	0.350	-0.388
227.1	111.219	16.53	3.75	2.88	1.0	0.54	33.93	93	63.82	97.74	0.350	-0.321
226.9	111.383	21.54	3.18	2.74	1.0	0.56	44.70	83	65.78	110.49	0.350	-0.374
226.8	111.547	17.00	3.27	2.83	1.0	0.54	34.93	90	63.72	98.65	0.350	-0.325
226.6	111.711	48.96	1.66	2.29	0.5	0.56	54.35	46	58.66	113.00	0.350	-0.383
226.4	111.875	22.67	2.73	2.69	1.0	0.56	47.26	78	65.83	113.09	0.350	-0.384
226.3	112.039	11.02	4.47	3.06	1.0	0.51	22.88	100	61.04	83.91	0.350	-0.257
226.1	112.203	5.89	5.63	3.34	1.0	0.49	13.18	100	58.03	71.21	0.350	-0.192
225.9	112.367	4.28	3.32	3.33	1.0	0.49	10.31	100	57.13	67.44	0.350	-0.171
225.8	112.531	4.58	1.95	3.19	1.0	0.49	10.85	100	57.30	68.15	0.350	-0.175
225.6	112.695	4.40	1.29	3.12	1.0	0.49	10.54	100	57.20	67.74	0.350	-0.172
225.4	112.860	5.77	1.73	3.08	1.0	0.49	13.00	100	57.97	70.97	0.350	-0.190
225.3	113.024	6.73	1.94	3.04	1.0	0.49	14.78	100	58.52	73.30	0.350	-0.203
225.1	113.188	5.10	4.20	3.32	1.0	0.49	11.80	100	57.60	69.40	0.350	-0.182
224.9	113.352	5.35	2.94	3.22	1.0	0.49	12.26	100	57.74	70.00	0.350	-0.185
224.8	113.516	28.05	0.72	2.29	0.5	0.51	29.97	46	52.36	82.33	0.350	-0.249
224.6	113.680	66.83	1.09	2.07	0.5	0.57	74.91	29	48.83	123.74	0.350	-0.423
224.5	113.844	19.97	3.47	2.79	1.0	0.55	41.78	87	65.43	107.21	0.350	-0.360
224.3	114.008	10.92	5.46	3.12	1.0	0.51	22.86	100	61.03	83.90	0.350	-0.257
224.1	114.172	20.84	3.01	2.74	1.0	0.55	43.72	82	65.44	109.15	0.350	-0.367
224.0	114.336	16.14	3.18	2.84	1.0	0.53	33.53	90	63.39	96.92	0.350	-0.316
223.8	114.500	8.84	4.30	3.13	1.0	0.50	18.84	100	59.78	78.63	0.350	-0.230
223.6	114.664	6.28	2.88	3.16	1.0	0.49	14.03	100	58.29	72.31	0.350	-0.197
223.5	114.828	6.87	2.39	3.08	1.0	0.49	15.14	100	58.63	73.78	0.350	-0.205
223.3	114.992	10.04	2.42	2.94	1.0	0.50	21.20	98	60.38	81.58	0.350	-0.245
223.1	115.156	65.71	0.70	1.97	0.5	0.54	70.07	20	33.46	103.53	0.350	-0.344
223.0	115.320	111.17	0.65	1.76	0.5	0.56	121.68	4	0.01	121.69	0.350	-0.415
222.8	115.484	65.92	2.00	2.24	0.5	0.59	76.64	43	62.18	138.82	0.350	-0.475
222.7	115.648	16.05	4.20	2.92	1.0	0.53	33.61	97	64.05	97.66	0.350	-0.319
222.5	115.812	9.08	4.77	3.15	1.0	0.50	19.41	100	59.96	79.37	0.350	-0.234
222.3	115.976	6.42	4.08	3.23	1.0	0.49	14.36	100	58.39	72.75	0.350	-0.199
222.2	116.140	4.90	2.13	3.18	1.0	0.48	11.58	100	57.53	69.10	0.350	-0.179
222.0	116.304	5.08	1.80	3.13	1.0	0.48	11.90	100	57.63	69.53	0.350	-0.181
221.8	116.468	5.12	1.51	3.10	1.0	0.48	11.98	100	57.65	69.63	0.350	-0.182
221.7	116.632	3.89	2.11	3.27	1.0	0.48	9.77	100	56.97	66.74	0.350	-0.165
221.5	116.796	4.15	1.54	3.18	1.0	0.48	10.24	100	57.11	67.36	0.350	-0.169
221.3	116.961	6.28	1.28	2.98	1.0	0.48	14.16	100	58.33	72.49	0.350	-0.197
221.2	117.125	4.36	2.13	3.23	1.0	0.48	10.64	100	57.24	67.87	0.350	-0.172
221.0	117.289	4.09	2.26	3.26	1.0	0.47	10.15	100	57.08	67.23	0.350	-0.168
220.8	117.453	4.10	0.93	3.10	1.0	0.47	10.17	100	57.09	67.26	0.350	-0.168
220.7	117.617	4.08	0.93	3.10	1.0	0.47	10.15	100	57.08	67.23	0.350	-0.168
220.5	117.781	3.95	0.79	3.08	1.0	0.47	9.92	100	57.01	66.93	0.350	-0.166
220.4	117.945	3.58	0.69	3.10	1.0	0.47	9.25	100	56.81	66.06	0.350	-0.161
220.2	118.109	3.15	1.03	3.22	1.0	0.47	8.50	100	56.57	65.08	0.350	-0.155

Elev. (ft)	Depth z (ft)	Normalized Cone Resistance Q	Normalized Friction Ratio F (%)	Soil Behavior Type Index I_c	Soil Type Exponent n	Normalizing Factor for CPT Resistance C_N	Normalized Average Cone Tip Resistance q_{c1N}	Fines Content FC (%)	Clean Sand Correction Δq_{c1N}	Clean Sand Normalized Average Cone Tip Resistance (q_{c1N}) _{CS}	Static Shear Stress Ratio a	Relative State Parameter Index ξ_R
220.0	118.273	3.44	1.73	3.28	1.0	0.47	9.02	100	56.73	65.76	0.350	-0.159
219.9	118.437	4.23	1.79	3.20	1.0	0.47	10.45	100	57.18	67.62	0.350	-0.170
219.7	118.601	3.88	2.56	3.31	1.0	0.47	9.81	100	56.98	66.79	0.350	-0.165
219.5	118.765	6.79	2.07	3.05	1.0	0.48	15.21	100	58.65	73.86	0.350	-0.204
219.4	118.929	15.90	1.47	2.66	1.0	0.52	33.48	76	61.38	94.86	0.350	-0.305
219.2	119.093	12.23	3.20	2.94	1.0	0.51	26.01	98	61.86	87.87	0.350	-0.274
219.0	119.257	5.15	5.79	3.40	1.0	0.48	12.17	100	57.71	69.88	0.350	-0.182
218.9	119.421	4.07	4.03	3.39	1.0	0.47	10.20	100	57.10	67.30	0.350	-0.167
218.7	119.585	4.23	5.41	3.45	1.0	0.47	10.50	100	57.19	67.69	0.350	-0.170
218.6	119.749	4.74	4.27	3.35	1.0	0.47	11.43	100	57.48	68.91	0.350	-0.176
218.4	119.913	88.23	0.43	1.75	0.5	0.51	89.09	3	0.00	89.09	0.350	-0.279
218.2	120.077	103.65	0.87	1.86	0.5	0.57	116.48	12	14.18	130.66	0.350	-0.445
218.1	120.241	72.94	1.33	2.09	0.5	0.58	84.47	31	53.11	137.58	0.350	-0.469
217.9	120.405	58.30	1.54	2.21	0.5	0.56	66.13	40	57.79	123.92	0.350	-0.421
217.7	120.569	95.51	0.93	1.91	0.5	0.57	108.52	16	25.45	133.96	0.350	-0.457
217.6	120.733	113.16	0.80	1.81	0.5	0.56	126.37	8	2.62	129.00	0.350	-0.439
217.4	120.897	105.83	0.63	1.77	0.5	0.54	114.11	4	0.05	114.16	0.350	-0.384
217.2	121.062	83.74	0.94	1.95	0.5	0.56	94.49	19	34.32	128.81	0.350	-0.438
217.1	121.226	70.74	1.56	2.15	0.5	0.58	82.60	35	57.57	140.17	0.350	-0.477
216.9	121.390	26.48	2.78	2.64	1.0	0.56	58.89	74	68.60	127.50	0.350	-0.434
216.7	121.554	11.72	5.71	3.11	1.0	0.50	25.23	100	61.77	87.00	0.350	-0.269
216.6	121.718	5.27	6.90	3.43	1.0	0.47	12.50	100	57.81	70.32	0.350	-0.184
216.4	121.882	4.85	5.68	3.41	1.0	0.47	11.72	100	57.57	69.29	0.350	-0.178
216.3	122.046	14.06	1.32	2.68	1.0	0.50	29.96	77	60.61	90.57	0.350	-0.285
216.1	122.210	43.55	1.04	2.21	0.5	0.52	47.37	40	53.22	100.59	0.350	-0.329
215.9	122.374	55.03	0.79	2.06	0.5	0.52	59.49	28	44.54	104.02	0.350	-0.343
215.8	122.538	49.67	1.67	2.29	0.5	0.54	55.61	46	58.81	114.42	0.350	-0.385
215.6	122.702	13.01	3.78	2.96	1.0	0.50	28.07	100	62.65	90.72	0.350	-0.285
215.4	122.866	8.29	6.38	3.26	1.0	0.48	18.37	100	59.64	78.01	0.350	-0.224
215.3	123.030	5.18	8.68	3.50	1.0	0.47	12.39	100	57.78	70.17	0.350	-0.182
215.1	123.194	73.26	1.11	2.04	0.5	0.56	83.70	26	47.22	130.92	0.350	-0.445
214.9	123.358	183.00	0.46	1.50	0.5	0.71	255.50	0	0.00	255.50	0.350	-0.600
214.8	123.522	119.92	0.36	1.59	0.5	0.57	136.24	0	0.00	136.24	0.350	-0.463
214.6	123.686	80.73	0.49	1.81	0.5	0.49	80.12	8	2.60	82.72	0.350	-0.247
214.4	123.850	46.48	1.88	2.34	0.5	0.53	51.97	50	59.92	111.89	0.350	-0.375
214.3	124.014	13.44	2.35	2.83	1.0	0.50	29.04	89	61.90	90.95	0.350	-0.286
214.1	124.178	7.85	3.48	3.12	1.0	0.48	17.60	100	59.40	76.99	0.350	-0.218
214.0	124.342	12.89	2.40	2.85	1.0	0.50	27.92	91	61.74	89.65	0.350	-0.280
213.8	124.506	41.93	1.10	2.24	0.5	0.51	45.68	42	54.16	99.84	0.350	-0.325
213.6	124.670	65.39	0.71	1.97	0.5	0.52	70.16	21	34.40	104.57	0.350	-0.345
213.5	124.834	83.86	0.93	1.95	0.5	0.56	94.76	19	33.68	128.44	0.350	-0.436
213.3	124.998	85.33	0.91	1.94	0.5	0.55	96.25	18	31.71	127.96	0.350	-0.434
213.1	125.163	49.55	0.94	2.14	0.5	0.52	54.03	34	50.29	104.32	0.350	-0.344
213.0	125.327	66.21	1.30	2.12	0.5	0.56	75.89	33	53.73	129.62	0.350	-0.440
212.8	125.491	15.43	1.38	2.66	1.0	0.50	33.37	76	61.32	94.69	0.350	-0.302
212.6	125.655	47.60	0.74	2.10	0.5	0.51	51.00	31	46.36	97.36	0.350	-0.314
212.5	125.819	115.81	0.47	1.66	0.5	0.56	129.91	0	0.00	129.91	0.350	-0.441
212.3	125.983	135.15	0.62	1.68	0.5	0.60	162.49	0	0.00	162.49	0.350	-0.546
212.2	126.147	176.64	0.28	1.39	0.5	0.69	244.30	0	0.00	244.30	0.350	-0.600
212.0	126.311	218.75	0.39	1.39	0.5	0.70	306.03	0	0.00	306.03	0.350	-0.600
211.8	126.475	218.28	0.40	1.40	0.5	0.70	305.47	0	0.00	305.47	0.350	-0.600

LIQUEFACTION POTENTIAL ASSESSMENT FOR COARSE GRAINED SOILS USING CONE PENETRATION TEST DATA

Depth to Water during Earthquake:		13.8 ft
Final Grade Elevation during EQ:		338.3 ft
Height of Final Grade above CPT TOH:		0.0 ft
Normalize K_v to:		1.058 tsf
a_{max} at top of ground surface:		0.21 g
Earthquake Magnitude:		7.70 Mw
Earthquake File or Source Zone:		Design Source

Project Site: US 60 Bridge

Stantec Project No.: 178565011

CPT ID: SP10

Shear Stress Fit Parameters

m4:	0
m3:	0
m2:	0
m1:	0

Elev. (ft)	Depth z (ft)	Cyclic Resistance Ratio $CRR_{7.5}$	Relative Density D_r (%)	Correction for Overburden Pressure K_σ	Correction for Sloping Ground K_ϕ	Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., r_d	From Ground Response			Cyclic Ratio CSR	Sample Screened for:			Factor of Safety FS_{liq}	Material (optional)	Soil Type (see note on following chart)
									Maximum Induced Shear Stress τ_{Max} (psf)	Average Cyclic Shear Stress τ_{Avg} (psf)	Shear Stress Ratio		Clay-like ($qc_{3N}/CS \geq 175$)	High Tip Res.	Unsaturated			
338.3																		
338.1	0.164	0.092	28	1.100	N/A	0.99	N/A	1.000	0	0	0.135	FALSE	FALSE	TRUE	N/A	N/A	A1	
338.0	0.328	0.101	35	1.100	N/A	0.99	N/A	1.000	0	0	0.135	FALSE	FALSE	TRUE	N/A	N/A	A1	
337.8	0.492	0.123	50	1.100	N/A	0.99	N/A	1.000	0	0	0.135	FALSE	FALSE	TRUE	N/A	N/A	A1	
337.6	0.656	0.128	52	1.100	N/A	0.99	N/A	1.000	0	0	0.135	FALSE	FALSE	TRUE	N/A	N/A	A1	
337.5	0.820	0.121	48	1.100	N/A	0.99	N/A	1.000	0	0	0.135	FALSE	FALSE	TRUE	N/A	N/A	A1	
337.3	0.984	0.118	47	1.100	N/A	0.99	N/A	1.000	0	0	0.135	FALSE	FALSE	TRUE	N/A	N/A	A1	
337.2	1.148	0.122	49	1.100	N/A	0.99	N/A	1.000	0	0	0.135	FALSE	FALSE	TRUE	N/A	N/A	A1	
337.0	1.312	0.156	60	1.100	N/A	0.98	N/A	1.000	0	0	0.135	FALSE	FALSE	TRUE	N/A	N/A	A1	
336.8	1.476	0.161	61	1.100	N/A	0.98	N/A	1.000	0	0	0.135	FALSE	FALSE	TRUE	N/A	N/A	A1	
336.7	1.640	0.152	59	1.100	N/A	0.98	N/A	1.000	0	0	0.135	FALSE	FALSE	TRUE	N/A	N/A	A1	
336.5	1.804	0.142	56	1.100	N/A	0.98	N/A	1.000	0	0	0.135	FALSE	FALSE	TRUE	N/A	N/A	A1	
336.3	1.968	0.134	54	1.100	N/A	0.98	N/A	1.000	0	0	0.135	FALSE	FALSE	TRUE	N/A	N/A	A1	
336.2	2.133	0.130	52	1.100	N/A	0.99	N/A	1.000	0	0	0.135	FALSE	FALSE	TRUE	N/A	N/A	A1	
336.0	2.297	0.130	52	1.100	N/A	0.98	N/A	1.000	0	0	0.135	FALSE	FALSE	TRUE	N/A	N/A	A1	
335.8	2.461	0.130	52	1.100	N/A	0.98	N/A	1.000	0	0	0.135	FALSE	FALSE	TRUE	N/A	N/A	A1	
335.7	2.625	0.131	53	1.100	N/A	0.98	N/A	1.000	0	0	0.135	FALSE	FALSE	TRUE	N/A	N/A	A1	
335.5	2.789	0.133	54	1.100	N/A	0.98	N/A	1.000	0	0	0.135	FALSE	FALSE	TRUE	N/A	N/A	A1	
335.3	2.953	0.135	54	1.100	N/A	0.98	N/A	1.000	0	0	0.135	FALSE	FALSE	TRUE	N/A	N/A	A1	
335.2	3.117	0.134	54	1.100	N/A	0.98	N/A	1.000	0	0	0.135	FALSE	FALSE	TRUE	N/A	N/A	A1	
335.0	3.281	0.132	53	1.100	N/A	0.98	N/A	1.000	0	0	0.135	FALSE	FALSE	TRUE	N/A	N/A	A1	
334.9	3.445	0.131	53	1.100	N/A	0.98	N/A	1.000	0	0	0.135	FALSE	FALSE	TRUE	N/A	N/A	A1	
334.7	3.609	0.128	52	1.100	N/A	0.99	N/A	0.999	0	0	0.135	FALSE	FALSE	TRUE	N/A	N/A	A1	
334.5	3.773	0.127	51	1.100	N/A	0.99	N/A	0.999	0	0	0.135	FALSE	FALSE	TRUE	N/A	N/A	A1	
334.4	3.937	0.127	51	1.100	N/A	0.99	N/A	0.999	0	0	0.135	FALSE	FALSE	TRUE	N/A	N/A	A1	
334.2	4.101	0.125	50	1.100	N/A	0.99	N/A	0.998	0	0	0.135	FALSE	FALSE	TRUE	N/A	N/A	B	
334.0	4.265	0.124	50	1.100	N/A	0.99	N/A	0.998	0	0	0.135	FALSE	FALSE	TRUE	N/A	N/A	B	
333.9	4.429	0.133	53	1.100	N/A	0.98	N/A	0.998	0	0	0.135	FALSE	FALSE	TRUE	N/A	N/A	A1	
333.7	4.593	0.139	55	1.100	N/A	0.98	N/A	0.997	0	0	0.135	FALSE	FALSE	TRUE	N/A	N/A	A1	
333.5	4.757	0.140	56	1.100	N/A	0.98	N/A	0.997	0	0	0.135	FALSE	FALSE	TRUE	N/A	N/A	A1	
333.4	4.921	0.154	60	1.100	N/A	0.98	N/A	0.996	0	0	0.135	FALSE	FALSE	TRUE	N/A	N/A	A1	
333.2	5.085	0.184	65	1.100	N/A	0.97	N/A	0.996	0	0	0.134	FALSE	FALSE	TRUE	N/A	N/A	A1	
333.1	5.249	0.167	62	1.100	N/A	0.98	N/A	0.996	0	0	0.134	FALSE	FALSE	TRUE	N/A	N/A	A1	
332.9	5.413	0.174	63	1.100	N/A	0.97	N/A	0.995	0	0	0.134	FALSE	FALSE	TRUE	N/A	N/A	A1	
332.7	5.577	0.154	60	1.100	N/A	0.98	N/A	0.995	0	0	0.134	FALSE	FALSE	TRUE	N/A	N/A	A1	
332.6	5.741	0.140	56	1.100	N/A	0.98	N/A	0.995	0	0	0.134	FALSE	FALSE	TRUE	N/A	N/A	B	
332.4	5.905	0.138	55	1.100	N/A	0.98	N/A	0.994	0	0	0.134	FALSE	FALSE	TRUE	N/A	N/A	B	
332.2	6.069	0.133	54	1.100	N/A	0.98	N/A	0.994	0	0	0.134	FALSE	FALSE	TRUE	N/A	N/A	B	
332.1	6.234	0.126	51	1.100	N/A	0.99	N/A	0.994	0	0	0.134	FALSE	FALSE	TRUE	N/A	N/A	B	
331.9	6.398	N/A	46	N/A	N/A	N/A	N/A	0.993	0	0	0.134	TRUE	FALSE	TRUE	N/A	N/A	B	
331.7	6.562	N/A	42	N/A	N/A	N/A	N/A	0.993	0	0	0.134	TRUE	FALSE	TRUE	N/A	N/A	B	
331.6	6.726	N/A	42	N/A	N/A	N/A	N/A	0.992	0	0	0.134	TRUE	FALSE	TRUE	N/A	N/A	B	
331.4	6.890	N/A	42	N/A	N/A	N/A	N/A	0.992	0	0	0.134	TRUE	FALSE	TRUE	N/A	N/A	B	
331.2	7.054	N/A	42	N/A	N/A	N/A	N/A	0.992	0	0	0.134	TRUE	FALSE	TRUE	N/A	N/A	B	
331.1	7.218	N/A	42	N/A	N/A	N/A	N/A	0.991	0	0	0.134	TRUE	FALSE	TRUE	N/A	N/A	B	

Elev. (ft)	Depth z (ft)	Cyclic Resistance Ratio $CRR_{7.5}$	Relative Density D_r (%)	Correction for		Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., t_d	Front Ground Response			Sample Screened for:				Factor of Safety FS_{liq}	Material (optional)	Soil Type (see note on following chart)
				Overburden Pressure K_o	Sloping Ground K_σ				Shear Stress τ_{max} (psf)	Induced Shear Stress τ_{max} (psf)	Average Cyclic Shear Stress τ_{Avg} (psf)	Cyclic Stress Ratio CSR	High Tip Res. $(qc_{30}) \geq 175$					
													Clay-like	Unsaturated				
330.9	7.382	N/A	42	N/A	N/A	N/A	N/A	0.991	0	0	0.134	TRUE	FALSE	TRUE	N/A	N/A	B	
330.8	7.546	N/A	43	N/A	N/A	N/A	N/A	0.991	0	0	0.134	TRUE	FALSE	TRUE	N/A	N/A	B	
330.6	7.710	N/A	44	N/A	N/A	N/A	N/A	0.990	0	0	0.134	TRUE	FALSE	TRUE	N/A	N/A	B	
330.4	7.874	N/A	44	N/A	N/A	N/A	N/A	0.990	0	0	0.134	TRUE	FALSE	TRUE	N/A	N/A	B	
330.3	8.038	N/A	44	N/A	N/A	N/A	N/A	0.989	0	0	0.134	TRUE	FALSE	TRUE	N/A	N/A	B	
330.1	8.202	N/A	42	N/A	N/A	N/A	N/A	0.989	0	0	0.134	TRUE	FALSE	TRUE	N/A	N/A	B	
329.9	8.366	0.120	48	N/A	0.99	N/A	N/A	0.989	0	0	0.133	FALSE	FALSE	TRUE	N/A	N/A	B	
329.8	8.530	0.149	58	N/A	0.98	N/A	N/A	0.988	0	0	0.133	FALSE	FALSE	TRUE	N/A	N/A	A1	
329.6	8.694	0.141	56	N/A	0.98	N/A	N/A	0.988	0	0	0.133	FALSE	FALSE	TRUE	N/A	N/A	A1	
329.4	8.858	0.125	50	N/A	0.99	N/A	N/A	0.987	0	0	0.133	FALSE	FALSE	TRUE	N/A	N/A	B	
329.3	9.022	N/A	45	N/A	N/A	N/A	N/A	0.987	0	0	0.133	TRUE	FALSE	TRUE	N/A	N/A	B	
329.1	9.186	N/A	42	N/A	N/A	N/A	N/A	0.987	0	0	0.133	TRUE	FALSE	TRUE	N/A	N/A	B	
328.9	9.350	N/A	40	N/A	N/A	N/A	N/A	0.986	0	0	0.133	TRUE	FALSE	TRUE	N/A	N/A	C	
328.8	9.514	N/A	40	N/A	N/A	N/A	N/A	0.986	0	0	0.133	TRUE	FALSE	TRUE	N/A	N/A	C	
328.6	9.678	0.108	41	N/A	0.99	N/A	N/A	0.985	0	0	0.133	FALSE	FALSE	TRUE	N/A	N/A	C	
328.5	9.842	N/A	40	N/A	N/A	N/A	N/A	0.985	0	0	0.133	TRUE	FALSE	TRUE	N/A	N/A	C	
328.3	10.006	N/A	40	N/A	N/A	N/A	N/A	0.984	0	0	0.133	TRUE	FALSE	TRUE	N/A	N/A	C	
328.1	10.170	N/A	42	N/A	N/A	N/A	N/A	0.984	0	0	0.133	TRUE	FALSE	TRUE	N/A	N/A	C	
328.0	10.335	N/A	42	N/A	N/A	N/A	N/A	0.984	0	0	0.133	TRUE	FALSE	TRUE	N/A	N/A	C	
327.8	10.499	N/A	42	N/A	N/A	N/A	N/A	0.983	0	0	0.133	TRUE	FALSE	TRUE	N/A	N/A	C	
327.6	10.663	N/A	43	N/A	N/A	N/A	N/A	0.983	0	0	0.133	TRUE	FALSE	TRUE	N/A	N/A	B	
327.5	10.827	N/A	45	N/A	N/A	N/A	N/A	0.982	0	0	0.133	TRUE	FALSE	TRUE	N/A	N/A	B	
327.3	10.991	N/A	41	N/A	N/A	N/A	N/A	0.982	0	0	0.133	TRUE	FALSE	TRUE	N/A	N/A	B	
327.1	11.155	N/A	39	N/A	N/A	N/A	N/A	0.982	0	0	0.132	TRUE	FALSE	TRUE	N/A	N/A	B	
327.0	11.319	N/A	42	N/A	N/A	N/A	N/A	0.981	0	0	0.132	TRUE	FALSE	TRUE	N/A	N/A	B	
326.8	11.483	N/A	47	N/A	N/A	N/A	N/A	0.981	0	0	0.132	TRUE	FALSE	TRUE	N/A	N/A	B	
326.7	11.647	0.157	60	N/A	0.98	N/A	N/A	0.980	0	0	0.132	FALSE	FALSE	TRUE	N/A	N/A	A1	
326.5	11.811	0.237	70	N/A	0.96	N/A	N/A	0.980	0	0	0.132	FALSE	FALSE	TRUE	N/A	N/A	A1	
326.3	11.975	0.228	69	N/A	0.96	N/A	N/A	0.979	0	0	0.132	FALSE	FALSE	TRUE	N/A	N/A	A1	
326.2	12.139	0.182	65	N/A	0.97	N/A	N/A	0.978	0	0	0.132	FALSE	FALSE	TRUE	N/A	N/A	A1	
326.0	12.303	N/A	53	N/A	N/A	N/A	N/A	0.978	0	0	0.132	TRUE	FALSE	TRUE	N/A	N/A	B	
325.8	12.467	N/A	45	N/A	N/A	N/A	N/A	0.978	0	0	0.132	TRUE	FALSE	TRUE	N/A	N/A	B	
325.7	12.631	N/A	40	N/A	N/A	N/A	N/A	0.978	0	0	0.132	TRUE	FALSE	TRUE	N/A	N/A	B	
325.5	12.795	N/A	40	N/A	N/A	N/A	N/A	0.977	0	0	0.132	TRUE	FALSE	TRUE	N/A	N/A	C	
325.3	12.959	N/A	39	N/A	N/A	N/A	N/A	0.977	0	0	0.132	TRUE	FALSE	TRUE	N/A	N/A	C	
325.2	13.123	N/A	41	N/A	N/A	N/A	N/A	0.976	0	0	0.132	TRUE	FALSE	TRUE	N/A	N/A	C	
325.0	13.287	N/A	43	N/A	N/A	N/A	N/A	0.976	0	0	0.132	TRUE	FALSE	TRUE	N/A	N/A	B	
324.8	13.451	N/A	43	N/A	N/A	N/A	N/A	0.975	0	0	0.132	TRUE	FALSE	TRUE	N/A	N/A	B	
324.7	13.615	N/A	39	N/A	N/A	N/A	N/A	0.975	0	0	0.132	TRUE	FALSE	TRUE	N/A	N/A	B	
324.5	13.779	N/A	37	N/A	N/A	N/A	N/A	0.974	0	0	0.132	TRUE	FALSE	TRUE	N/A	N/A	B	
324.4	13.943	N/A	41	N/A	N/A	N/A	N/A	0.974	0	0	0.132	TRUE	FALSE	FALSE	N/A	N/A	B	
324.2	14.107	N/A	40	N/A	N/A	N/A	N/A	0.973	0	0	0.133	TRUE	FALSE	FALSE	N/A	N/A	C	
324.0	14.271	N/A	36	N/A	N/A	N/A	N/A	0.973	0	0	0.134	TRUE	FALSE	FALSE	N/A	N/A	C	
323.9	14.436	N/A	36	N/A	N/A	N/A	N/A	0.972	0	0	0.134	TRUE	FALSE	FALSE	N/A	N/A	C	
323.7	14.600	N/A	34	N/A	N/A	N/A	N/A	0.972	0	0	0.135	TRUE	FALSE	FALSE	N/A	N/A	C	
323.5	14.764	N/A	36	N/A	N/A	N/A	N/A	0.972	0	0	0.136	TRUE	FALSE	FALSE	N/A	N/A	C	
323.4	14.928	N/A	36	N/A	N/A	N/A	N/A	0.971	0	0	0.136	TRUE	FALSE	FALSE	N/A	N/A	C	
323.2	15.092	N/A	35	N/A	N/A	N/A	N/A	0.971	0	0	0.137	TRUE	FALSE	FALSE	N/A	N/A	C	
323.0	15.256	N/A	35	N/A	N/A	N/A	N/A	0.970	0	0	0.138	TRUE	FALSE	FALSE	N/A	N/A	C	
322.9	15.420	N/A	34	N/A	N/A	N/A	N/A	0.970	0	0	0.138	TRUE	FALSE	FALSE	N/A	N/A	C	
322.7	15.584	N/A	34	N/A	N/A	N/A	N/A	0.969	0	0	0.139	TRUE	FALSE	FALSE	N/A	N/A	C	
322.6	15.748	N/A	35	N/A	N/A	N/A	N/A	0.969	0	0	0.140	TRUE	FALSE	FALSE	N/A	N/A	C	
322.4	15.912	N/A	36	N/A	N/A	N/A	N/A	0.968	0	0	0.140	TRUE	FALSE	FALSE	N/A	N/A	C	
322.2	16.076	N/A	36	N/A	N/A	N/A	N/A	0.968	0	0	0.141	TRUE	FALSE	FALSE	N/A	N/A	C	
322.1	16.240	N/A	38	N/A	N/A	N/A	N/A	0.967	0	0	0.142	TRUE	FALSE	FALSE	N/A	N/A	C	

Elev. (ft)	Depth z	Cyclic Resistance Ratio $CRR_{7.5}$	Relative Density D_r	Correction for		Correction for Overburden Pressure K_o	Sloping Ground K_a	Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., t_d	Front Ground Response			Sample Screened for:				Factor of Safety FS_{liq}	Material (optional)	Soil Type (see note on following chart)
				Resistance Ratio $CRR_{7.5}$	Relative Density D_r						Induced Shear Stress τ_{max}	Maximum Cyclic Shear Stress τ_{Avg}	Cyclic Stress Ratio CSR	Clay-like $(qc_{30}) \geq 175$	High Tip Res.	Unsaturated				
321.9	16.404	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.967	0	0	0.142	TRUE	FALSE	FALSE	N/A	N/A	C	
321.7	16.568	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.966	0	0	0.143	TRUE	FALSE	FALSE	N/A	N/A	C	
321.6	16.732	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.966	0	0	0.143	TRUE	FALSE	FALSE	N/A	N/A	C	
321.4	16.896	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.965	0	0	0.144	TRUE	FALSE	FALSE	N/A	N/A	C	
321.2	17.060	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.965	0	0	0.145	TRUE	FALSE	FALSE	N/A	N/A	C	
321.1	17.224	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.964	0	0	0.145	TRUE	FALSE	FALSE	N/A	N/A	C	
320.9	17.388	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.964	0	0	0.146	TRUE	FALSE	FALSE	N/A	N/A	C	
320.7	17.552	N/A	36	N/A	N/A	N/A	N/A	N/A	N/A	0.963	0	0	0.146	TRUE	FALSE	FALSE	N/A	N/A	C	
320.6	17.716	N/A	35	N/A	N/A	N/A	N/A	N/A	N/A	0.963	0	0	0.147	TRUE	FALSE	FALSE	N/A	N/A	C	
320.4	17.880	N/A	35	N/A	N/A	N/A	N/A	N/A	N/A	0.962	0	0	0.147	TRUE	FALSE	FALSE	N/A	N/A	C	
320.3	18.044	N/A	35	N/A	N/A	N/A	N/A	N/A	N/A	0.962	0	0	0.148	TRUE	FALSE	FALSE	N/A	N/A	C	
320.1	18.208	N/A	35	N/A	N/A	N/A	N/A	N/A	N/A	0.961	0	0	0.148	TRUE	FALSE	FALSE	N/A	N/A	C	
319.9	18.372	N/A	35	N/A	N/A	N/A	N/A	N/A	N/A	0.961	0	0	0.149	TRUE	FALSE	FALSE	N/A	N/A	C	
319.8	18.537	N/A	35	N/A	N/A	N/A	N/A	N/A	N/A	0.960	0	0	0.149	TRUE	FALSE	FALSE	N/A	N/A	C	
319.6	18.701	N/A	35	N/A	N/A	N/A	N/A	N/A	N/A	0.960	0	0	0.150	TRUE	FALSE	FALSE	N/A	N/A	C	
319.4	18.865	N/A	35	N/A	N/A	N/A	N/A	N/A	N/A	0.959	0	0	0.150	TRUE	FALSE	FALSE	N/A	N/A	C	
319.3	19.029	N/A	35	N/A	N/A	N/A	N/A	N/A	N/A	0.959	0	0	0.151	TRUE	FALSE	FALSE	N/A	N/A	C	
319.1	19.193	N/A	36	N/A	N/A	N/A	N/A	N/A	N/A	0.958	0	0	0.151	TRUE	FALSE	FALSE	N/A	N/A	C	
318.9	19.357	N/A	36	N/A	N/A	N/A	N/A	N/A	N/A	0.958	0	0	0.152	TRUE	FALSE	FALSE	N/A	N/A	C	
318.8	19.521	N/A	35	N/A	N/A	N/A	N/A	N/A	N/A	0.957	0	0	0.152	TRUE	FALSE	FALSE	N/A	N/A	C	
318.6	19.685	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.956	0	0	0.153	TRUE	FALSE	FALSE	N/A	N/A	C	
318.5	19.849	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.956	0	0	0.153	TRUE	FALSE	FALSE	N/A	N/A	C	
318.3	20.013	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.955	0	0	0.154	TRUE	FALSE	FALSE	N/A	N/A	C	
318.1	20.177	N/A	35	N/A	N/A	N/A	N/A	N/A	N/A	0.955	0	0	0.154	TRUE	FALSE	FALSE	N/A	N/A	C	
318.0	20.341	N/A	35	N/A	N/A	N/A	N/A	N/A	N/A	0.954	0	0	0.155	TRUE	FALSE	FALSE	N/A	N/A	C	
317.8	20.505	N/A	35	N/A	N/A	N/A	N/A	N/A	N/A	0.954	0	0	0.155	TRUE	FALSE	FALSE	N/A	N/A	C	
317.6	20.669	N/A	35	N/A	N/A	N/A	N/A	N/A	N/A	0.953	0	0	0.156	TRUE	FALSE	FALSE	N/A	N/A	C	
317.5	20.833	N/A	35	N/A	N/A	N/A	N/A	N/A	N/A	0.953	0	0	0.156	TRUE	FALSE	FALSE	N/A	N/A	C	
317.3	20.997	N/A	35	N/A	N/A	N/A	N/A	N/A	N/A	0.952	0	0	0.156	TRUE	FALSE	FALSE	N/A	N/A	C	
317.1	21.161	N/A	35	N/A	N/A	N/A	N/A	N/A	N/A	0.952	0	0	0.157	TRUE	FALSE	FALSE	N/A	N/A	C	
317.0	21.325	N/A	35	N/A	N/A	N/A	N/A	N/A	N/A	0.951	0	0	0.157	TRUE	FALSE	FALSE	N/A	N/A	C	
316.8	21.489	N/A	36	N/A	N/A	N/A	N/A	N/A	N/A	0.951	0	0	0.158	TRUE	FALSE	FALSE	N/A	N/A	C	
316.6	21.653	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.950	0	0	0.158	TRUE	FALSE	FALSE	N/A	N/A	C	
316.5	21.817	N/A	36	N/A	N/A	N/A	N/A	N/A	N/A	0.949	0	0	0.158	TRUE	FALSE	FALSE	N/A	N/A	C	
316.3	21.981	N/A	35	N/A	N/A	N/A	N/A	N/A	N/A	0.949	0	0	0.159	TRUE	FALSE	FALSE	N/A	N/A	C	
316.2	22.145	N/A	35	N/A	N/A	N/A	N/A	N/A	N/A	0.948	0	0	0.159	TRUE	FALSE	FALSE	N/A	N/A	C	
316.0	22.309	N/A	36	N/A	N/A	N/A	N/A	N/A	N/A	0.948	0	0	0.160	TRUE	FALSE	FALSE	N/A	N/A	C	
315.8	22.473	N/A	40	N/A	N/A	N/A	N/A	N/A	N/A	0.947	0	0	0.160	TRUE	FALSE	FALSE	N/A	N/A	C	
315.7	22.638	N/A	42	N/A	N/A	N/A	N/A	N/A	N/A	0.947	0	0	0.160	TRUE	FALSE	FALSE	N/A	N/A	C	
315.5	22.802	N/A	40	N/A	N/A	N/A	N/A	N/A	N/A	0.946	0	0	0.161	TRUE	FALSE	FALSE	N/A	N/A	C	
315.3	22.966	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.946	0	0	0.161	TRUE	FALSE	FALSE	N/A	N/A	C	
315.2	23.130	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.945	0	0	0.161	TRUE	FALSE	FALSE	N/A	N/A	C	
315.0	23.294	N/A	41	N/A	N/A	N/A	N/A	N/A	N/A	0.944	0	0	0.162	TRUE	FALSE	FALSE	N/A	N/A	C	
314.8	23.458	N/A	40	N/A	N/A	N/A	N/A	N/A	N/A	0.944	0	0	0.162	TRUE	FALSE	FALSE	N/A	N/A	C	
314.7	23.622	N/A	44	N/A	N/A	N/A	N/A	N/A	N/A	0.943	0	0	0.162	TRUE	FALSE	FALSE	N/A	N/A	C	
314.5	23.786	0.113	44	0.995	0.811	0.99	0.091	0.943	0	0	0	0.163	FALSE	FALSE	FALSE	0.6	N/A	C		
314.4	23.950	N/A	41	N/A	N/A	N/A	N/A	N/A	N/A	0.942	0	0	0.163	TRUE	FALSE	FALSE	N/A	N/A	C	
314.2	24.114	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.942	0	0	0.163	TRUE	FALSE	FALSE	N/A	N/A	C	
314.0	24.278	N/A	43	N/A	N/A	N/A	N/A	N/A	N/A	0.941	0	0	0.164	TRUE	FALSE	FALSE	N/A	N/A	C	
313.9	24.442	N/A	42	N/A	N/A	N/A	N/A	N/A	N/A	0.941	0	0	0.164	TRUE	FALSE	FALSE	N/A	N/A	C	
313.7	24.606	N/A	43	N/A	N/A	N/A	N/A	N/A	N/A	0.940	0	0	0.164	TRUE	FALSE	FALSE	N/A	N/A	C	
313.5	24.770	N/A	41	N/A	N/A	N/A	N/A	N/A	N/A	0.939	0	0	0.165	TRUE	FALSE	FALSE	N/A	N/A	C	
313.4	24.934	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.939	0	0	0.165	TRUE	FALSE	FALSE	N/A	N/A	C	
313.2	25.098	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.938	0	0	0.165	TRUE	FALSE	FALSE	N/A	N/A	C	
313.0	25.262	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.938	0	0	0.166	TRUE	FALSE	FALSE	N/A	N/A	C	

Elev. (ft)	Depth z	Cyclic Resistance Ratio CRR _{7.5}	Relative Density D _r (%)	Correction for		Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CHR	Stress Reduction Coeff., f _d	Front Ground Response			Sample Screened for:			Factor of Safety FS _{liq}	Material (optional)	Soil Type (see note on following chart)
				Overburden Pressure K _σ	Sloping Ground K _α				τ _{max} (psf)	Shear Stress	Cyclic Shear Stress τ _{Avg} (psf)	Cyclic Stress Ratio CSR	Clay-like (q _{c30}) ≥ 175	High Tip Res.			
303.9	34.448	N/A	43	N/A	N/A	N/A	N/A	0.904	0	0	0.177	TRUE	FALSE	N/A	N/A	C	
303.7	34.612	N/A	40	N/A	N/A	N/A	N/A	0.903	0	0	0.177	TRUE	FALSE	N/A	N/A	C	
303.5	34.776	N/A	40	N/A	N/A	N/A	N/A	0.902	0	0	0.177	TRUE	FALSE	N/A	N/A	C	
303.4	34.941	N/A	42	N/A	N/A	N/A	N/A	0.902	0	0	0.178	TRUE	FALSE	N/A	N/A	C	
303.2	35.105	N/A	45	N/A	N/A	N/A	N/A	0.901	0	0	0.178	TRUE	FALSE	N/A	N/A	C	
303.0	35.269	N/A	43	N/A	N/A	N/A	N/A	0.900	0	0	0.178	TRUE	FALSE	N/A	N/A	C	
302.9	35.433	N/A	40	N/A	N/A	N/A	N/A	0.900	0	0	0.178	TRUE	FALSE	N/A	N/A	C	
302.7	35.597	0.122	49	0.969	0.943	0.99	0.110	0.899	0	0	0.178	FALSE	FALSE	N/A	N/A	A2	
302.5	35.761	0.134	54	0.966	1.139	0.98	0.145	0.898	0	0	0.178	FALSE	FALSE	N/A	N/A	A1	
302.4	35.925	0.134	54	0.966	1.138	0.98	0.145	0.898	0	0	0.178	FALSE	FALSE	N/A	N/A	A1	
302.2	36.089	N/A	52	N/A	N/A	N/A	N/A	0.897	0	0	0.178	TRUE	FALSE	N/A	N/A	B	
302.0	36.253	N/A	51	N/A	N/A	N/A	N/A	0.896	0	0	0.179	TRUE	FALSE	N/A	N/A	B	
301.9	36.417	N/A	44	N/A	N/A	N/A	N/A	0.896	0	0	0.179	TRUE	FALSE	N/A	N/A	B	
301.7	36.581	N/A	41	N/A	N/A	N/A	N/A	0.895	0	0	0.179	TRUE	FALSE	N/A	N/A	C	
301.6	36.745	N/A	38	N/A	N/A	N/A	N/A	0.895	0	0	0.179	TRUE	FALSE	N/A	N/A	C	
301.4	36.909	N/A	38	N/A	N/A	N/A	N/A	0.894	0	0	0.179	TRUE	FALSE	N/A	N/A	C	
301.2	37.073	N/A	42	N/A	N/A	N/A	N/A	0.893	0	0	0.179	TRUE	FALSE	N/A	N/A	C	
301.1	37.237	N/A	46	N/A	N/A	N/A	N/A	0.893	0	0	0.179	TRUE	FALSE	N/A	N/A	C	
300.9	37.401	N/A	44	N/A	N/A	N/A	N/A	0.892	0	0	0.179	TRUE	FALSE	N/A	N/A	B	
300.7	37.565	N/A	44	N/A	N/A	N/A	N/A	0.891	0	0	0.179	TRUE	FALSE	N/A	N/A	C	
300.6	37.729	0.116	46	0.967	0.823	0.99	0.091	0.891	0	0	0.179	FALSE	FALSE	N/A	N/A	A2	
300.4	37.893	0.121	48	0.965	0.918	0.99	0.106	0.890	0	0	0.179	FALSE	FALSE	N/A	N/A	A2	
300.2	38.057	0.127	51	0.964	1.019	0.99	0.123	0.889	0	0	0.180	FALSE	FALSE	N/A	N/A	A1	
300.1	38.221	0.118	47	0.966	0.863	0.99	0.097	0.889	0	0	0.180	FALSE	FALSE	N/A	N/A	A2	
299.9	38.385	0.124	50	0.964	0.964	0.99	0.113	0.888	0	0	0.180	FALSE	FALSE	N/A	N/A	A1	
299.8	38.549	N/A	45	N/A	N/A	N/A	N/A	0.887	0	0	0.180	TRUE	FALSE	N/A	N/A	B	
299.6	38.713	N/A	40	N/A	N/A	N/A	N/A	0.887	0	0	0.180	TRUE	FALSE	N/A	N/A	B	
299.4	38.877	N/A	39	N/A	N/A	N/A	N/A	0.886	0	0	0.180	TRUE	FALSE	N/A	N/A	C	
299.3	39.042	N/A	42	N/A	N/A	N/A	N/A	0.885	0	0	0.180	TRUE	FALSE	N/A	N/A	C	
299.1	39.206	N/A	47	N/A	N/A	N/A	N/A	0.885	0	0	0.180	TRUE	FALSE	N/A	N/A	C	
298.9	39.370	N/A	46	N/A	N/A	N/A	N/A	0.884	0	0	0.180	TRUE	FALSE	N/A	N/A	B	
298.8	39.534	0.133	54	0.959	1.121	0.98	0.141	0.883	0	0	0.180	FALSE	FALSE	N/A	N/A	A1	
298.6	39.698	0.168	62	0.951	1.560	0.98	0.243	0.883	0	0	0.180	FALSE	FALSE	N/A	N/A	A1	
298.4	39.862	N/A	53	N/A	N/A	N/A	N/A	0.882	0	0	0.180	TRUE	FALSE	N/A	N/A	B	
298.3	40.026	N/A	45	N/A	N/A	N/A	N/A	0.881	0	0	0.180	TRUE	FALSE	N/A	N/A	B	
298.1	40.190	N/A	40	N/A	N/A	N/A	N/A	0.881	0	0	0.181	TRUE	FALSE	N/A	N/A	B	
297.9	40.354	N/A	38	N/A	N/A	N/A	N/A	0.880	0	0	0.181	TRUE	FALSE	N/A	N/A	C	
297.8	40.518	N/A	37	N/A	N/A	N/A	N/A	0.879	0	0	0.181	TRUE	FALSE	N/A	N/A	C	
297.6	40.682	N/A	37	N/A	N/A	N/A	N/A	0.879	0	0	0.181	TRUE	FALSE	N/A	N/A	C	
297.5	40.846	N/A	37	N/A	N/A	N/A	N/A	0.878	0	0	0.181	TRUE	FALSE	N/A	N/A	C	
297.3	41.010	N/A	37	N/A	N/A	N/A	N/A	0.877	0	0	0.181	TRUE	FALSE	N/A	N/A	C	
297.1	41.174	N/A	37	N/A	N/A	N/A	N/A	0.877	0	0	0.181	TRUE	FALSE	N/A	N/A	C	
297.0	41.338	N/A	37	N/A	N/A	N/A	N/A	0.876	0	0	0.181	TRUE	FALSE	N/A	N/A	C	
296.8	41.502	N/A	37	N/A	N/A	N/A	N/A	0.875	0	0	0.181	TRUE	FALSE	N/A	N/A	C	
296.6	41.666	N/A	38	N/A	N/A	N/A	N/A	0.875	0	0	0.181	TRUE	FALSE	N/A	N/A	C	
296.5	41.830	N/A	38	N/A	N/A	N/A	N/A	0.874	0	0	0.181	TRUE	FALSE	N/A	N/A	C	
296.3	41.994	N/A	37	N/A	N/A	N/A	N/A	0.873	0	0	0.181	TRUE	FALSE	N/A	N/A	C	
296.1	42.158	N/A	36	N/A	N/A	N/A	N/A	0.873	0	0	0.181	TRUE	FALSE	N/A	N/A	C	
296.0	42.322	N/A	36	N/A	N/A	N/A	N/A	0.872	0	0	0.181	TRUE	FALSE	N/A	N/A	C	
295.8	42.486	N/A	36	N/A	N/A	N/A	N/A	0.871	0	0	0.181	TRUE	FALSE	N/A	N/A	C	
295.6	42.650	N/A	37	N/A	N/A	N/A	N/A	0.871	0	0	0.181	TRUE	FALSE	N/A	N/A	C	
295.5	42.814	N/A	43	N/A	N/A	N/A	N/A	0.870	0	0	0.181	TRUE	FALSE	N/A	N/A	C	
295.3	42.978	N/A	40	N/A	N/A	N/A	N/A	0.869	0	0	0.181	TRUE	FALSE	N/A	N/A	B	
295.2	43.143	N/A	36	N/A	N/A	N/A	N/A	0.869	0	0	0.181	TRUE	FALSE	N/A	N/A	C	
295.0	43.307	N/A	37	N/A	N/A	N/A	N/A	0.868	0	0	0.181	TRUE	FALSE	N/A	N/A	C	

Elev. (ft)	Depth z (ft)	Cyclic Resistance Ratio CRR _{7.5}	Relative Density D _r	Correction for		Correction for Overburden Pressure K _σ	Sloping Ground K _α	Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., f _d	Front Ground Response			Cyclic Shear Stress τ _{avg} (psf)	Cyclic Stress Ratio CSR	Sample Screened for:			Factor of Safety FS _{req}	Material (optional)	Soil Type (see note on following chart)
				Induced Shear Stress τ _{max} (psf)	Maximum Cyclic Shear Stress τ _{avg} (psf)						Average Cyclic Shear Stress τ _{avg} (psf)	Clay-like (qc ₃₀) ≥ 175	High Tip Res.			Unsaturated					
																	Cyclic Stress Ratio CSR	High Tip Res.			
294.8	43.471	N/A	36	N/A	N/A	N/A	N/A	N/A	N/A	0.867	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	C	
294.7	43.635	N/A	36	N/A	N/A	N/A	N/A	N/A	N/A	0.867	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	C	
294.5	43.799	N/A	36	N/A	N/A	N/A	N/A	N/A	N/A	0.866	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	C	
294.3	43.963	N/A	36	N/A	N/A	N/A	N/A	N/A	N/A	0.865	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	C	
294.2	44.127	N/A	36	N/A	N/A	N/A	N/A	N/A	N/A	0.865	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	C	
294.0	44.291	N/A	36	N/A	N/A	N/A	N/A	N/A	N/A	0.864	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	C	
293.8	44.455	N/A	36	N/A	N/A	N/A	N/A	N/A	N/A	0.863	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	C	
293.7	44.619	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.863	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	C	
293.5	44.783	N/A	36	N/A	N/A	N/A	N/A	N/A	N/A	0.862	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	C	
293.4	44.947	N/A	36	N/A	N/A	N/A	N/A	N/A	N/A	0.861	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	C	
293.2	45.111	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.861	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	C	
293.0	45.275	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.860	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	C	
292.9	45.439	N/A	36	N/A	N/A	N/A	N/A	N/A	N/A	0.859	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	C	
292.7	45.603	N/A	36	N/A	N/A	N/A	N/A	N/A	N/A	0.859	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	C	
292.5	45.767	N/A	36	N/A	N/A	N/A	N/A	N/A	N/A	0.858	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	C	
292.4	45.931	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.857	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	C	
292.2	46.095	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.857	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	C	
292.0	46.259	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.856	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	C	
291.9	46.423	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.855	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	C	
291.7	46.587	N/A	42	N/A	N/A	N/A	N/A	N/A	N/A	0.855	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	C	
291.5	46.751	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.854	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	C	
291.4	46.915	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.853	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	B	
291.2	47.079	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.853	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	C	
291.1	47.244	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.852	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	C	
290.9	47.408	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.851	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	B	
290.7	47.572	N/A	45	N/A	N/A	N/A	N/A	N/A	N/A	0.851	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	B	
290.6	47.736	N/A	43	N/A	N/A	N/A	N/A	N/A	N/A	0.850	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	B	
290.4	47.900	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.849	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	B	
290.2	48.064	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.849	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	B	
290.1	48.228	N/A	46	N/A	N/A	N/A	N/A	N/A	N/A	0.848	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	C	
289.9	48.392	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.847	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	B	
289.7	48.556	N/A	38	N/A	N/A	N/A	N/A	N/A	N/A	0.847	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	B	
289.6	48.720	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.846	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	C	
289.4	48.884	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.845	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	C	
289.3	49.048	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.844	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	C	
289.1	49.212	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.844	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	C	
288.9	49.376	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.843	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	C	
288.8	49.540	N/A	40	N/A	N/A	N/A	N/A	N/A	N/A	0.842	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	C	
288.6	49.704	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.842	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	C	
288.4	49.868	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.841	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	C	
288.3	50.032	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.840	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	C	
288.1	50.196	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.840	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	C	
287.9	50.360	N/A	41	N/A	N/A	N/A	N/A	N/A	N/A	0.839	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	C	
287.8	50.524	N/A	40	N/A	N/A	N/A	N/A	N/A	N/A	0.838	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	C	
287.6	50.688	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.838	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	C	
287.4	50.852	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.837	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	C	
287.3	51.016	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.836	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	C	
287.1	51.180	N/A	37	N/A	N/A	N/A	N/A	N/A	N/A	0.836	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	C	
287.0	51.345	N/A	39	N/A	N/A	N/A	N/A	N/A	N/A	0.835	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	C	
286.8	51.509	0.145	57	0.934	1.255	0.98	0.98	0.167	0.834	0	0	0	0	0.182	FALSE	FALSE	FALSE	0.9	N/A	A1	
286.6	51.673	0.158	60	0.930	1.413	0.98	0.98	0.203	0.834	0	0	0	0	0.182	FALSE	FALSE	FALSE	1.1	N/A	A1	
286.5	51.837	0.177	64	0.924	1.606	0.97	0.97	0.256	0.833	0	0	0	0	0.182	FALSE	FALSE	FALSE	1.4	N/A	A1	
286.3	52.001	N/A	48	N/A	N/A	N/A	N/A	N/A	0.832	0	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	B	
286.1	52.165	N/A	41	N/A	N/A	N/A	N/A	N/A	0.832	0	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	B	
286.0	52.329	N/A	41	N/A	N/A	N/A	N/A	N/A	0.831	0	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	B	

Elev. (ft)	Depth z (ft)	Cyclic Resistance Ratio $CRR_{7.5}$	Relative Density D_r	Correction for Overburden Pressure		Correction for Sloping Ground K_σ	Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CHR	Stress Reduction Coeff., t_d	Front Ground Response			Sample Screened for:			Factor of Safety FS_{liq}	Material (optional)	Soil Type (see note on on following chart)
				Cyclic Ratio	Cyclic Stress Ratio					Cyclic Shear Stress τ_{Avg} (psf)	Maximum Induced Shear Stress τ_{Max} (psf)	Cyclic Stress Ratio	Clay-like $(qc_{30}) \geq 175$	High Tip Res. $(qc_{30}) \geq 175$	Unsaturated			
265.8	52.493	0.180	64	0.922	1.633	0.97	0.264	0.830	0	0	0	0.182	FALSE	FALSE	FALSE	1.5	N/A	A1
265.6	52.657	N/A	52	N/A	N/A	N/A	N/A	0.830	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	B
265.5	52.821	N/A	45	N/A	N/A	N/A	N/A	0.829	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	B
265.3	52.985	N/A	40	N/A	N/A	N/A	N/A	0.828	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	B
265.2	53.149	N/A	38	N/A	N/A	N/A	N/A	0.828	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	C
265.0	53.313	N/A	38	N/A	N/A	N/A	N/A	0.827	0	0	0	0.182	TRUE	FALSE	FALSE	N/A	N/A	C
264.8	53.477	0.135	54	0.935	1.114	0.98	0.139	0.826	0	0	0	0.182	FALSE	FALSE	FALSE	0.8	N/A	A1
264.7	53.641	0.212	68	0.912	1.874	0.97	0.350	0.825	0	0	0	0.182	FALSE	FALSE	FALSE	1.9	N/A	A1
264.5	53.805	0.190	66	0.917	1.712	0.97	0.289	0.825	0	0	0	0.182	FALSE	FALSE	FALSE	1.6	N/A	A1
264.3	53.969	0.314	74	0.896	2.356	0.95	0.632	0.824	0	0	0	0.181	FALSE	FALSE	FALSE	3.5	N/A	A1
264.2	54.133	N/A	58	N/A	N/A	N/A	N/A	0.823	0	0	0	0.181	TRUE	FALSE	FALSE	N/A	N/A	A1
264.0	54.297	N/A	49	N/A	N/A	N/A	N/A	0.823	0	0	0	0.181	TRUE	FALSE	FALSE	N/A	N/A	B
263.8	54.461	0.199	67	0.914	1.781	0.97	0.314	0.822	0	0	0	0.181	FALSE	FALSE	FALSE	1.7	N/A	B
263.7	54.625	0.265	72	0.901	2.162	0.96	0.496	0.821	0	0	0	0.181	FALSE	FALSE	FALSE	2.7	N/A	A1
263.5	54.789	0.180	64	0.918	1.627	0.97	0.262	0.821	0	0	0	0.181	FALSE	FALSE	FALSE	1.4	N/A	A1
263.3	54.953	N/A	52	N/A	N/A	N/A	N/A	0.820	0	0	0	0.181	TRUE	FALSE	FALSE	N/A	N/A	B
263.2	55.117	N/A	55	N/A	N/A	N/A	N/A	0.819	0	0	0	0.181	TRUE	FALSE	FALSE	N/A	N/A	B
263.0	55.281	N/A	53	N/A	N/A	N/A	N/A	0.819	0	0	0	0.181	TRUE	FALSE	FALSE	N/A	N/A	B
262.9	55.446	N/A	47	N/A	N/A	N/A	N/A	0.818	0	0	0	0.181	TRUE	FALSE	FALSE	N/A	N/A	B
262.7	55.610	N/A	45	N/A	N/A	N/A	N/A	0.817	0	0	0	0.181	TRUE	FALSE	FALSE	N/A	N/A	B
262.5	55.774	N/A	45	N/A	N/A	N/A	N/A	0.817	0	0	0	0.181	TRUE	FALSE	FALSE	N/A	N/A	C
262.4	55.938	N/A	45	N/A	N/A	N/A	N/A	0.816	0	0	0	0.181	TRUE	FALSE	FALSE	N/A	N/A	B
262.2	56.102	N/A	45	N/A	N/A	N/A	N/A	0.815	0	0	0	0.181	TRUE	FALSE	FALSE	N/A	N/A	B
262.0	56.266	0.122	49	0.936	0.904	0.99	0.102	0.815	0	0	0	0.181	FALSE	FALSE	FALSE	0.6	N/A	A2
261.9	56.430	0.156	60	0.922	1.373	0.98	0.193	0.814	0	0	0	0.181	FALSE	FALSE	FALSE	1.1	N/A	A1
261.7	56.594	0.172	63	0.917	1.542	0.97	0.236	0.813	0	0	0	0.181	FALSE	FALSE	FALSE	1.3	N/A	A1
261.5	56.758	N/A	51	N/A	N/A	N/A	N/A	0.813	0	0	0	0.181	TRUE	FALSE	FALSE	N/A	N/A	B
261.4	56.922	N/A	48	N/A	N/A	N/A	N/A	0.812	0	0	0	0.181	TRUE	FALSE	FALSE	N/A	N/A	B
261.2	57.086	N/A	45	N/A	N/A	N/A	N/A	0.811	0	0	0	0.181	TRUE	FALSE	FALSE	N/A	N/A	B
261.1	57.250	N/A	41	N/A	N/A	N/A	N/A	0.811	0	0	0	0.181	TRUE	FALSE	FALSE	N/A	N/A	B
260.9	57.414	N/A	40	N/A	N/A	N/A	N/A	0.810	0	0	0	0.181	TRUE	FALSE	FALSE	N/A	N/A	C
260.7	57.578	N/A	39	N/A	N/A	N/A	N/A	0.809	0	0	0	0.181	TRUE	FALSE	FALSE	N/A	N/A	C
260.6	57.742	N/A	40	N/A	N/A	N/A	N/A	0.809	0	0	0	0.181	TRUE	FALSE	FALSE	N/A	N/A	C
260.4	57.906	N/A	39	N/A	N/A	N/A	N/A	0.808	0	0	0	0.181	TRUE	FALSE	FALSE	N/A	N/A	C
260.2	58.070	N/A	47	N/A	N/A	N/A	N/A	0.807	0	0	0	0.181	TRUE	FALSE	FALSE	N/A	N/A	C
260.1	58.234	0.154	60	0.920	1.348	0.98	0.187	0.807	0	0	0	0.181	FALSE	FALSE	FALSE	1.0	N/A	A1
279.9	58.398	0.156	60	0.919	1.374	0.98	0.193	0.806	0	0	0	0.180	FALSE	FALSE	FALSE	1.1	N/A	A1
279.7	58.562	N/A	50	N/A	N/A	N/A	N/A	0.805	0	0	0	0.180	TRUE	FALSE	FALSE	N/A	N/A	B
279.6	58.726	N/A	44	N/A	N/A	N/A	N/A	0.805	0	0	0	0.180	TRUE	FALSE	FALSE	N/A	N/A	B
279.4	58.890	N/A	41	N/A	N/A	N/A	N/A	0.804	0	0	0	0.180	TRUE	FALSE	FALSE	N/A	N/A	C
279.2	59.054	N/A	39	N/A	N/A	N/A	N/A	0.803	0	0	0	0.180	TRUE	FALSE	FALSE	N/A	N/A	C
279.1	59.218	N/A	39	N/A	N/A	N/A	N/A	0.803	0	0	0	0.180	TRUE	FALSE	FALSE	N/A	N/A	C
278.9	59.382	N/A	38	N/A	N/A	N/A	N/A	0.802	0	0	0	0.180	TRUE	FALSE	FALSE	N/A	N/A	C
278.8	59.547	N/A	38	N/A	N/A	N/A	N/A	0.801	0	0	0	0.180	TRUE	FALSE	FALSE	N/A	N/A	C
278.6	59.711	N/A	38	N/A	N/A	N/A	N/A	0.801	0	0	0	0.180	TRUE	FALSE	FALSE	N/A	N/A	C
278.4	59.875	N/A	38	N/A	N/A	N/A	N/A	0.800	0	0	0	0.180	TRUE	FALSE	FALSE	N/A	N/A	C
278.3	60.039	N/A	38	N/A	N/A	N/A	N/A	0.799	0	0	0	0.180	TRUE	FALSE	FALSE	N/A	N/A	C
278.1	60.203	N/A	39	N/A	N/A	N/A	N/A	0.799	0	0	0	0.180	TRUE	FALSE	FALSE	N/A	N/A	C
277.9	60.367	N/A	40	N/A	N/A	N/A	N/A	0.798	0	0	0	0.180	TRUE	FALSE	FALSE	N/A	N/A	C
277.8	60.531	N/A	42	N/A	N/A	N/A	N/A	0.797	0	0	0	0.180	TRUE	FALSE	FALSE	N/A	N/A	C
277.6	60.695	0.125	50	0.929	0.938	0.99	0.107	0.797	0	0	0	0.180	FALSE	FALSE	FALSE	0.6	N/A	C
277.4	60.859	0.167	62	0.911	1.488	0.98	0.221	0.796	0	0	0	0.180	FALSE	FALSE	FALSE	1.2	N/A	A1
277.3	61.023	0.196	66	0.902	1.734	0.97	0.297	0.795	0	0	0	0.180	FALSE	FALSE	FALSE	1.7	N/A	A1
277.1	61.187	0.259	72	0.888	2.105	0.96	0.465	0.795	0	0	0	0.180	FALSE	FALSE	FALSE	2.6	N/A	A1
276.9	61.351	0.379	76	0.871	2.518	0.95	0.788	0.794	0	0	0	0.180	FALSE	FALSE	FALSE	4.4	N/A	A1

Elev. (ft)	Depth z (ft)	Cyclic Resistance Ratio CRR _{7.5}	Relative Density D _r	Correction for			Cyclic Resistance Ratio CRR	Stress Reduction Coeff., f _d	Front Ground Response			Sample Screened for:				Factor of Safety FS _{liq}	Material (optional)	Soil Type (see note on following chart)
				Overburden Pressure K _σ	Sloping Ground K _α	Magnitude Scaling Factor MSF			Maximum Induced Shear Stress τ _{Max}	Cyclic Shear Stress τ _{Avg}	Cyclic Stress Ratio CSR	Clay-like (qc ₃₀) ≥ 175	High Tip Res.	Unsaturated				
276.8	61.515	0.444	78	0.864	2.666	0.94	0.965	0	0	0	0.179	FALSE	FALSE	FALSE	5.4	N/A	A1	
276.6	61.879	N/A	82	N/A	N/A	N/A	N/A	0	0	0	0.179	FALSE	TRUE	FALSE	N/A	N/A	A1	
276.5	61.843	0.452	78	0.863	2.681	0.94	0.984	0	0.863	0	0.179	FALSE	FALSE	FALSE	5.5	N/A	A1	
276.3	62.007	0.255	71	0.887	2.086	0.96	0.454	0.791	0	0	0.179	FALSE	FALSE	FALSE	2.5	N/A	A1	
276.1	62.171	0.237	70	0.890	1.994	0.96	0.406	0.791	0	0	0.179	FALSE	FALSE	FALSE	2.3	N/A	A1	
276.0	62.335	0.212	68	0.896	1.843	0.97	0.339	0.790	0	0	0.179	FALSE	FALSE	FALSE	1.9	N/A	A1	
275.8	62.499	0.195	66	0.900	1.725	0.97	0.294	0.789	0	0	0.179	FALSE	FALSE	FALSE	1.6	N/A	A1	
275.6	62.663	0.197	66	0.899	1.734	0.97	0.297	0.789	0	0	0.179	FALSE	FALSE	FALSE	1.7	N/A	A1	
275.5	62.827	0.200	67	0.898	1.761	0.97	0.307	0.788	0	0	0.179	FALSE	FALSE	FALSE	1.7	N/A	A1	
275.3	62.991	0.216	68	0.894	1.864	0.97	0.347	0.787	0	0	0.179	FALSE	FALSE	FALSE	1.9	N/A	A1	
275.1	63.155	0.268	72	0.883	2.138	0.96	0.485	0.787	0	0	0.179	FALSE	FALSE	FALSE	2.7	N/A	A1	
275.0	63.319	0.208	68	0.895	1.815	0.97	0.327	0.786	0	0	0.179	TRUE	FALSE	FALSE	1.8	N/A	A1	
274.8	63.483	N/A	54	N/A	N/A	N/A	N/A	0.785	0	0	0.179	TRUE	FALSE	FALSE	N/A	N/A	B	
274.7	63.648	N/A	46	N/A	N/A	N/A	N/A	0.785	0	0	0.179	TRUE	FALSE	FALSE	N/A	N/A	B	
274.5	63.812	N/A	43	N/A	N/A	N/A	N/A	0.784	0	0	0.179	TRUE	FALSE	FALSE	N/A	N/A	B	
274.3	63.976	0.123	49	0.926	0.893	0.99	0.100	0.783	0	0	0.179	FALSE	FALSE	FALSE	0.6	A2	A2	
274.2	64.140	0.166	62	0.906	1.461	0.98	0.214	0.783	0	0	0.179	FALSE	FALSE	FALSE	1.2	N/A	A1	
274.0	64.304	0.308	74	0.874	2.291	0.95	0.588	0.782	0	0	0.178	FALSE	FALSE	FALSE	3.3	N/A	A1	
273.8	64.468	0.232	70	0.887	1.959	0.96	0.389	0.782	0	0	0.178	FALSE	FALSE	FALSE	2.2	N/A	A1	
273.7	64.632	0.153	59	0.911	1.318	0.98	0.179	0.781	0	0	0.178	FALSE	FALSE	FALSE	1.0	N/A	A1	
273.5	64.796	N/A	64	N/A	N/A	N/A	N/A	0.780	0	0	0.178	TRUE	FALSE	FALSE	N/A	N/A	A1	
273.3	64.960	N/A	55	N/A	N/A	N/A	N/A	0.780	0	0	0.178	TRUE	FALSE	FALSE	N/A	N/A	B	
273.2	65.124	N/A	48	N/A	N/A	N/A	N/A	0.779	0	0	0.178	TRUE	FALSE	FALSE	N/A	N/A	B	
273.0	65.288	0.156	60	0.908	1.351	0.98	0.187	0.778	0	0	0.178	FALSE	FALSE	FALSE	1.0	N/A	A1	
272.8	65.452	0.159	61	0.907	1.388	0.98	0.196	0.778	0	0	0.178	FALSE	FALSE	FALSE	1.1	N/A	A1	
272.7	65.616	0.154	60	0.908	1.336	0.98	0.183	0.777	0	0	0.178	FALSE	FALSE	FALSE	1.0	N/A	A1	
272.5	65.780	0.138	55	0.916	1.126	0.98	0.140	0.776	0	0	0.178	FALSE	FALSE	FALSE	0.8	N/A	A1	
272.4	65.944	0.179	64	0.899	1.582	0.97	0.248	0.776	0	0	0.178	FALSE	FALSE	FALSE	1.4	N/A	A1	
272.2	66.108	N/A	59	N/A	N/A	N/A	N/A	0.775	0	0	0.178	TRUE	FALSE	FALSE	N/A	N/A	B	
272.0	66.272	N/A	50	N/A	N/A	N/A	N/A	0.774	0	0	0.178	TRUE	FALSE	FALSE	N/A	N/A	B	
271.9	66.436	N/A	51	N/A	N/A	N/A	N/A	0.774	0	0	0.178	TRUE	FALSE	FALSE	N/A	N/A	B	
271.7	66.600	0.168	62	0.902	1.473	0.98	0.217	0.773	0	0	0.178	FALSE	FALSE	FALSE	1.2	N/A	A1	
271.5	66.764	0.191	66	0.894	1.677	0.97	0.278	0.773	0	0	0.178	FALSE	FALSE	FALSE	1.6	N/A	A1	
271.4	66.928	0.187	65	0.895	1.649	0.97	0.268	0.772	0	0	0.177	FALSE	FALSE	FALSE	1.5	N/A	A1	
271.2	67.092	0.245	71	0.879	2.017	0.96	0.419	0.771	0	0	0.177	FALSE	FALSE	FALSE	2.4	N/A	A1	
271.0	67.256	0.340	75	0.863	2.384	0.95	0.667	0.771	0	0	0.177	FALSE	FALSE	FALSE	3.8	N/A	A1	
270.9	67.420	0.479	79	0.847	2.705	0.94	1.032	0.770	0	0	0.177	FALSE	FALSE	FALSE	5.8	N/A	A1	
270.7	67.584	N/A	61	N/A	N/A	N/A	N/A	0.769	0	0	0.177	TRUE	FALSE	FALSE	N/A	N/A	B	
270.6	67.749	N/A	52	N/A	N/A	N/A	N/A	0.769	0	0	0.177	TRUE	FALSE	FALSE	N/A	N/A	B	
270.4	67.913	0.157	60	0.904	1.358	0.98	0.188	0.768	0	0	0.177	FALSE	FALSE	FALSE	1.1	N/A	A1	
270.2	68.077	N/A	95	N/A	N/A	N/A	N/A	0.767	0	0	0.177	FALSE	TRUE	FALSE	N/A	N/A	A1	
270.1	68.241	N/A	100	N/A	N/A	N/A	N/A	0.767	0	0	0.177	FALSE	TRUE	FALSE	N/A	N/A	A1	
269.9	68.405	N/A	98	N/A	N/A	N/A	N/A	0.766	0	0	0.177	FALSE	TRUE	FALSE	N/A	N/A	A1	
269.7	68.569	N/A	77	N/A	N/A	N/A	N/A	0.766	0	0	0.177	TRUE	FALSE	FALSE	N/A	N/A	B	
269.6	68.733	N/A	57	N/A	N/A	N/A	N/A	0.765	0	0	0.177	TRUE	FALSE	FALSE	N/A	N/A	B	
269.4	68.897	N/A	52	N/A	N/A	N/A	N/A	0.764	0	0	0.177	TRUE	FALSE	FALSE	N/A	N/A	B	
269.2	69.061	0.524	80	0.839	2.775	0.94	1.145	0.764	0	0	0.177	FALSE	FALSE	FALSE	6.5	N/A	A1	
269.1	69.225	0.497	79	0.841	2.730	0.94	1.074	0.763	0	0	0.176	FALSE	FALSE	FALSE	6.1	N/A	A1	
268.9	69.389	N/A	60	N/A	N/A	N/A	N/A	0.762	0	0	0.176	TRUE	FALSE	FALSE	N/A	N/A	B	
268.7	69.553	0.175	63	0.895	1.532	0.97	0.233	0.762	0	0	0.176	FALSE	FALSE	FALSE	1.3	N/A	A1	
268.6	69.717	N/A	82	N/A	N/A	N/A	N/A	0.761	0	0	0.176	FALSE	TRUE	FALSE	N/A	N/A	A1	
268.4	69.881	N/A	91	N/A	N/A	N/A	N/A	0.760	0	0	0.176	FALSE	TRUE	FALSE	N/A	N/A	A1	
268.3	70.045	N/A	98	N/A	N/A	N/A	N/A	0.760	0	0	0.176	FALSE	TRUE	FALSE	N/A	N/A	A1	
268.1	70.209	N/A	99	N/A	N/A	N/A	N/A	0.759	0	0	0.176	FALSE	TRUE	FALSE	N/A	N/A	A1	
267.9	70.373	N/A	100	N/A	N/A	N/A	N/A	0.759	0	0	0.176	FALSE	TRUE	FALSE	N/A	N/A	A1	

Elev. (ft)	Depth z (ft)	Cyclic Resistance Ratio $CRR_{7.5}$	Relative Density D_r	Correction for			Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CHR	Stress Reduction Coeff., t_d	From Ground Response			Sample Screened for:			Factor of Safety FS_{liq}	Material (optional)	Soil Type (see note on following chart)
				Overburden Pressure K_o	Sloping Ground K_σ	Cyclic Shear Stress τ_{max}				Maximum Induced Shear Stress τ_{max}	Average Cyclic Shear Stress τ_{Avg}	Cyclic Stress Ratio CSR	Clay-like $(qc_{30})_{cs} \geq 175$	High Tip Res.				
267.8	70.537	N/A	100	N/A	N/A	N/A	N/A	N/A	0.758	0	0	0.176	FALSE	TRUE	FALSE	N/A	N/A	A1
267.6	70.701	N/A	95	N/A	N/A	N/A	N/A	N/A	0.757	0	0	0.176	FALSE	TRUE	FALSE	N/A	N/A	A1
267.4	70.865	N/A	94	N/A	N/A	N/A	N/A	N/A	0.757	0	0	0.176	FALSE	TRUE	FALSE	N/A	N/A	A1
267.3	71.029	N/A	99	N/A	N/A	N/A	N/A	N/A	0.756	0	0	0.176	FALSE	TRUE	FALSE	N/A	N/A	A1
267.1	71.193	N/A	90	N/A	N/A	N/A	N/A	N/A	0.756	0	0	0.176	FALSE	TRUE	FALSE	N/A	N/A	A1
266.9	71.357	N/A	84	N/A	N/A	N/A	N/A	N/A	0.755	0	0	0.176	FALSE	TRUE	FALSE	N/A	N/A	A1
266.8	71.521	N/A	66	N/A	N/A	N/A	N/A	N/A	0.754	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	A1
266.6	71.685	N/A	53	N/A	N/A	N/A	N/A	N/A	0.754	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	B
266.5	71.850	N/A	47	N/A	N/A	N/A	N/A	N/A	0.753	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	B
266.3	72.014	N/A	47	N/A	N/A	N/A	N/A	N/A	0.752	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	B
266.1	72.178	N/A	57	0.904	1.203	0.98	0.155	0.752	0	0	0	0.175	FALSE	FALSE	FALSE	0.9	N/A	A1
266.0	72.342	N/A	69	0.877	1.841	0.97	0.338	0.751	0	0	0	0.175	FALSE	FALSE	FALSE	1.9	N/A	A1
265.8	72.506	N/A	61	0.897	1.377	0.98	0.193	0.751	0	0	0	0.175	FALSE	FALSE	FALSE	1.1	N/A	A1
265.6	72.670	N/A	73	0.861	2.187	0.96	0.520	0.750	0	0	0	0.175	FALSE	FALSE	FALSE	3.0	N/A	A1
265.5	72.834	N/A	67	0.882	1.711	0.97	0.289	0.749	0	0	0	0.175	FALSE	FALSE	FALSE	1.7	N/A	A1
265.3	72.998	N/A	68	0.878	1.806	0.97	0.324	0.749	0	0	0	0.175	FALSE	FALSE	FALSE	1.9	N/A	A1
265.1	73.162	N/A	59	N/A	N/A	N/A	N/A	N/A	0.748	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	B
265.0	73.326	N/A	49	N/A	N/A	N/A	N/A	N/A	0.748	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	B
264.8	73.490	N/A	44	N/A	N/A	N/A	N/A	N/A	0.747	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	B
264.6	73.654	N/A	49	N/A	N/A	N/A	N/A	N/A	0.746	0	0	0.175	TRUE	FALSE	FALSE	N/A	N/A	B
264.5	73.818	N/A	72	0.863	2.093	0.96	0.462	0.746	0	0	0	0.174	FALSE	FALSE	FALSE	2.6	N/A	B
264.3	73.982	N/A	75	0.852	2.314	0.95	0.613	0.745	0	0	0	0.174	FALSE	FALSE	FALSE	3.5	N/A	A1
264.2	74.146	N/A	75	0.852	2.300	0.95	0.602	0.745	0	0	0	0.174	FALSE	FALSE	FALSE	3.5	N/A	A1
264.0	74.310	N/A	73	0.860	2.142	0.96	0.492	0.744	0	0	0	0.174	FALSE	FALSE	FALSE	2.8	N/A	A1
263.8	74.474	N/A	70	0.868	1.969	0.96	0.396	0.743	0	0	0	0.174	FALSE	FALSE	FALSE	2.3	N/A	A1
263.7	74.638	N/A	68	0.874	1.824	0.97	0.332	0.743	0	0	0	0.174	FALSE	FALSE	FALSE	1.9	N/A	A1
263.5	74.802	N/A	67	0.878	1.739	0.97	0.299	0.742	0	0	0	0.174	FALSE	FALSE	FALSE	1.7	N/A	A1
263.3	74.966	N/A	67	0.879	1.704	0.97	0.287	0.742	0	0	0	0.174	FALSE	FALSE	FALSE	1.6	N/A	A1
263.2	75.130	N/A	61	0.892	1.407	0.98	0.200	0.741	0	0	0	0.174	FALSE	FALSE	FALSE	1.1	N/A	A1
263.0	75.294	N/A	65	0.882	1.620	0.97	0.259	0.740	0	0	0	0.174	FALSE	FALSE	FALSE	1.5	N/A	A1
262.8	75.458	N/A	66	0.879	1.678	0.97	0.278	0.740	0	0	0	0.174	FALSE	FALSE	FALSE	1.6	N/A	A1
262.7	75.622	N/A	60	0.894	1.327	0.98	0.181	0.739	0	0	0	0.174	FALSE	FALSE	FALSE	1.0	N/A	A1
262.5	75.786	N/A	56	N/A	N/A	N/A	N/A	0.739	0	0	0	0.174	TRUE	FALSE	FALSE	N/A	N/A	B
262.3	75.951	N/A	49	N/A	N/A	N/A	N/A	0.738	0	0	0	0.173	TRUE	FALSE	FALSE	N/A	N/A	B
262.2	76.115	N/A	48	N/A	N/A	N/A	N/A	0.737	0	0	0	0.173	TRUE	FALSE	FALSE	N/A	N/A	B
262.0	76.279	N/A	48	N/A	N/A	N/A	N/A	0.737	0	0	0	0.173	TRUE	FALSE	FALSE	N/A	N/A	B
261.9	76.443	N/A	65	0.881	1.604	0.97	0.254	0.736	0	0	0	0.173	FALSE	FALSE	FALSE	1.5	N/A	A1
261.7	76.607	N/A	75	0.847	2.300	0.95	0.604	0.736	0	0	0	0.173	FALSE	FALSE	FALSE	3.5	N/A	A1
261.5	76.771	N/A	71	0.863	1.976	0.96	0.400	0.735	0	0	0	0.173	FALSE	FALSE	FALSE	2.3	N/A	A1
261.4	76.935	N/A	72	0.859	2.053	0.96	0.440	0.735	0	0	0	0.173	FALSE	FALSE	FALSE	2.5	N/A	A1
261.2	77.099	N/A	74	0.851	2.204	0.96	0.533	0.734	0	0	0	0.173	FALSE	FALSE	FALSE	3.1	N/A	A1
261.0	77.263	N/A	71	0.860	2.017	0.96	0.421	0.733	0	0	0	0.173	FALSE	FALSE	FALSE	2.4	N/A	A1
260.9	77.427	N/A	75	0.842	2.358	0.95	0.653	0.733	0	0	0	0.173	FALSE	FALSE	FALSE	3.8	N/A	A1
260.7	77.591	N/A	80	0.815	2.822	0.94	1.252	0.732	0	0	0	0.173	FALSE	FALSE	FALSE	7.3	N/A	A1
260.5	77.755	N/A	75	0.844	2.312	0.95	0.615	0.732	0	0	0	0.173	FALSE	FALSE	FALSE	3.6	N/A	A1
260.4	77.919	N/A	67	0.875	1.694	0.97	0.283	0.731	0	0	0	0.173	FALSE	FALSE	FALSE	1.6	N/A	A1
260.2	78.083	N/A	62	0.886	1.430	0.98	0.206	0.731	0	0	0	0.172	FALSE	FALSE	FALSE	1.2	N/A	A1
260.1	78.247	N/A	51	0.908	0.920	0.99	0.104	0.730	0	0	0	0.172	FALSE	FALSE	FALSE	0.6	N/A	A1
259.9	78.411	N/A	43	0.918	0.682	0.99	0.069	0.729	0	0	0	0.172	FALSE	FALSE	FALSE	0.4	N/A	A1
259.7	78.575	N/A	36	0.926	0.502	0.99	0.047	0.729	0	0	0	0.172	FALSE	FALSE	FALSE	0.3	N/A	A1
259.6	78.739	N/A	53	0.905	0.990	0.98	0.115	0.728	0	0	0	0.172	FALSE	FALSE	FALSE	0.7	N/A	A1
259.4	78.903	N/A	61	0.888	1.372	0.98	0.191	0.728	0	0	0	0.172	FALSE	FALSE	FALSE	1.1	N/A	A1
259.2	79.067	N/A	77	0.833	2.459	0.95	0.749	0.727	0	0	0	0.172	FALSE	FALSE	FALSE	4.4	N/A	A1
259.1	79.231	N/A	100	N/A	N/A	N/A	N/A	0.727	0	0	0	0.172	FALSE	TRUE	FALSE	N/A	N/A	A1
258.9	79.395	N/A	99	N/A	N/A	N/A	N/A	0.726	0	0	0	0.172	FALSE	TRUE	FALSE	N/A	N/A	A1

Elev. (ft)		Depth z (ft)	Cyclic Resistance Ratio CRR _{7.5}	Relative Density D _r	Correction for		Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., f _d	Front Ground Response			Sample Screened for:				Factor of Safety F _{S_{liq}}	Material (optional)	Soil Type (see note on following chart)
					Overburden Pressure K _o	Sloping Ground K _α				Maximum Induced Shear Stress τ _{max} (psf)	Average Cyclic Shear Stress τ _{Avg} (psf)	Cyclic Stress Ratio CSR	Clay-like (q _{c IN}) _{CS ≥ 175}	High Tip Res.	Unsaturated				
258.7	79.559	N/A	N/A	100	N/A	N/A	N/A	N/A	0.725	0	0	0	0.172	FALSE	TRUE	FALSE	N/A	N/A	A1
258.6	79.723	N/A	N/A	85	N/A	N/A	N/A	N/A	0.725	0	0	0	0.172	FALSE	TRUE	FALSE	N/A	N/A	A1
258.4	79.887	0.233	70	0.861	1.908	0.96	0.369	0.724	0.724	0	0	0	0.172	FALSE	FALSE	FALSE	2.1	N/A	A1
258.2	80.052	0.235	70	0.860	1.922	0.96	0.375	0.724	0.724	0	0	0	0.172	FALSE	FALSE	FALSE	2.2	N/A	A1
258.1	80.216	0.309	74	0.843	2.234	0.95	0.557	0.723	0.723	0	0	0	0.171	FALSE	FALSE	FALSE	3.2	N/A	A1
257.9	80.380	0.310	74	0.843	2.235	0.95	0.557	0.723	0.723	0	0	0	0.171	FALSE	FALSE	FALSE	3.3	N/A	A1
257.8	80.544	0.286	73	0.847	2.150	0.96	0.500	0.722	0.722	0	0	0	0.171	FALSE	FALSE	FALSE	2.9	N/A	A1
257.6	80.708	0.287	73	0.847	2.151	0.96	0.500	0.722	0.722	0	0	0	0.171	FALSE	FALSE	FALSE	2.9	N/A	A1
257.4	80.872	N/A	85	N/A	N/A	N/A	N/A	N/A	0.721	0	0	0	0.171	FALSE	TRUE	FALSE	N/A	N/A	A1
257.3	81.036	N/A	96	N/A	N/A	N/A	N/A	N/A	0.720	0	0	0	0.171	FALSE	TRUE	FALSE	N/A	N/A	A1
257.1	81.200	N/A	99	N/A	N/A	N/A	N/A	N/A	0.720	0	0	0	0.171	FALSE	TRUE	FALSE	N/A	N/A	A1
256.9	81.364	N/A	100	N/A	N/A	N/A	N/A	N/A	0.719	0	0	0	0.171	FALSE	TRUE	FALSE	N/A	N/A	A1
256.8	81.528	N/A	100	N/A	N/A	N/A	N/A	N/A	0.719	0	0	0	0.171	FALSE	TRUE	FALSE	N/A	N/A	A1
256.6	81.692	N/A	99	N/A	N/A	N/A	N/A	N/A	0.718	0	0	0	0.171	FALSE	TRUE	FALSE	N/A	N/A	A1
256.4	81.856	N/A	100	N/A	N/A	N/A	N/A	N/A	0.718	0	0	0	0.171	FALSE	TRUE	FALSE	N/A	N/A	A1
256.3	82.020	N/A	98	N/A	N/A	N/A	N/A	N/A	0.717	0	0	0	0.171	FALSE	TRUE	FALSE	N/A	N/A	A1
256.1	82.184	N/A	93	N/A	N/A	N/A	N/A	N/A	0.717	0	0	0	0.171	FALSE	TRUE	FALSE	N/A	N/A	A1
256.0	82.348	N/A	90	N/A	N/A	N/A	N/A	N/A	0.716	0	0	0	0.170	FALSE	TRUE	FALSE	N/A	N/A	A1
255.8	82.512	N/A	89	N/A	N/A	N/A	N/A	N/A	0.716	0	0	0	0.170	FALSE	TRUE	FALSE	N/A	N/A	A1
255.6	82.676	N/A	87	N/A	N/A	N/A	N/A	N/A	0.715	0	0	0	0.170	FALSE	TRUE	FALSE	N/A	N/A	A1
255.5	82.840	N/A	86	N/A	N/A	N/A	N/A	N/A	0.715	0	0	0	0.170	FALSE	TRUE	FALSE	N/A	N/A	A1
255.3	83.004	N/A	88	N/A	N/A	N/A	N/A	N/A	0.714	0	0	0	0.170	FALSE	TRUE	FALSE	N/A	N/A	A1
255.1	83.168	N/A	90	N/A	N/A	N/A	N/A	N/A	0.713	0	0	0	0.170	FALSE	TRUE	FALSE	N/A	N/A	A1
255.0	83.332	N/A	90	N/A	N/A	N/A	N/A	N/A	0.713	0	0	0	0.170	FALSE	TRUE	FALSE	N/A	N/A	A1
254.8	83.496	N/A	91	N/A	N/A	N/A	N/A	N/A	0.712	0	0	0	0.170	FALSE	TRUE	FALSE	N/A	N/A	A1
254.6	83.660	N/A	90	N/A	N/A	N/A	N/A	N/A	0.712	0	0	0	0.170	FALSE	TRUE	FALSE	N/A	N/A	A1
254.5	83.824	N/A	90	N/A	N/A	N/A	N/A	N/A	0.711	0	0	0	0.170	FALSE	TRUE	FALSE	N/A	N/A	A1
254.3	83.988	N/A	89	N/A	N/A	N/A	N/A	N/A	0.711	0	0	0	0.170	FALSE	TRUE	FALSE	N/A	N/A	A1
254.1	84.153	N/A	89	N/A	N/A	N/A	N/A	N/A	0.710	0	0	0	0.170	FALSE	TRUE	FALSE	N/A	N/A	A1
254.0	84.317	N/A	89	N/A	N/A	N/A	N/A	N/A	0.710	0	0	0	0.170	FALSE	TRUE	FALSE	N/A	N/A	A1
253.8	84.481	N/A	90	N/A	N/A	N/A	N/A	N/A	0.709	0	0	0	0.170	FALSE	TRUE	FALSE	N/A	N/A	A1
253.7	84.645	N/A	90	N/A	N/A	N/A	N/A	N/A	0.709	0	0	0	0.169	FALSE	TRUE	FALSE	N/A	N/A	A1
253.5	84.809	N/A	93	N/A	N/A	N/A	N/A	N/A	0.708	0	0	0	0.169	FALSE	TRUE	FALSE	N/A	N/A	A1
253.3	84.973	N/A	91	N/A	N/A	N/A	N/A	N/A	0.708	0	0	0	0.169	FALSE	TRUE	FALSE	N/A	N/A	A1
253.2	85.137	N/A	85	N/A	N/A	N/A	N/A	N/A	0.707	0	0	0	0.169	FALSE	TRUE	FALSE	N/A	N/A	A1
253.0	85.301	N/A	81	N/A	N/A	N/A	N/A	N/A	0.707	0	0	0	0.169	FALSE	TRUE	FALSE	N/A	N/A	A1
252.8	85.465	N/A	85	N/A	N/A	N/A	N/A	N/A	0.706	0	0	0	0.169	FALSE	TRUE	FALSE	N/A	N/A	A1
252.7	85.629	N/A	83	N/A	N/A	N/A	N/A	N/A	0.706	0	0	0	0.169	FALSE	TRUE	FALSE	N/A	N/A	A1
252.5	85.793	N/A	83	N/A	N/A	N/A	N/A	N/A	0.705	0	0	0	0.169	FALSE	TRUE	FALSE	N/A	N/A	A1
252.3	85.957	0.378	76	0.822	2.413	0.95	0.711	0.705	0.705	0	0	0	0.169	FALSE	FALSE	FALSE	4.2	N/A	A1
252.2	86.121	0.372	76	0.823	2.395	0.95	0.695	0.704	0.704	0	0	0	0.169	FALSE	FALSE	FALSE	4.1	N/A	A1
252.0	86.285	0.316	74	0.832	2.235	0.95	0.561	0.704	0.704	0	0	0	0.169	FALSE	FALSE	FALSE	3.3	N/A	A1
251.9	86.449	0.333	75	0.828	2.288	0.95	0.601	0.703	0.703	0	0	0	0.169	FALSE	FALSE	FALSE	3.6	N/A	A1
251.7	86.613	0.457	78	0.810	2.582	0.94	0.901	0.703	0.703	0	0	0	0.169	FALSE	FALSE	FALSE	5.3	N/A	A1
251.5	86.777	0.523	80	0.802	2.694	0.94	1.060	0.702	0.702	0	0	0	0.168	FALSE	FALSE	FALSE	6.3	N/A	A1
251.4	86.941	N/A	91	N/A	N/A	N/A	N/A	N/A	0.702	0	0	0	0.168	FALSE	TRUE	FALSE	N/A	N/A	A1
251.2	87.105	N/A	100	N/A	N/A	N/A	N/A	N/A	0.701	0	0	0	0.168	FALSE	TRUE	FALSE	N/A	N/A	A1
251.0	87.269	N/A	100	N/A	N/A	N/A	N/A	N/A	0.701	0	0	0	0.168	FALSE	TRUE	FALSE	N/A	N/A	A1
250.9	87.433	N/A	95	N/A	N/A	N/A	N/A	N/A	0.700	0	0	0	0.168	FALSE	TRUE	FALSE	N/A	N/A	A1
250.7	87.597	N/A	92	N/A	N/A	N/A	N/A	N/A	0.700	0	0	0	0.168	FALSE	TRUE	FALSE	N/A	N/A	A1
250.5	87.761	N/A	93	N/A	N/A	N/A	N/A	N/A	0.699	0	0	0	0.168	FALSE	TRUE	FALSE	N/A	N/A	A1
250.4	87.925	N/A	96	N/A	N/A	N/A	N/A	N/A	0.699	0	0	0	0.168	FALSE	TRUE	FALSE	N/A	N/A	A1
250.2	88.089	N/A	100	N/A	N/A	N/A	N/A	N/A	0.698	0	0	0	0.168	FALSE	TRUE	FALSE	N/A	N/A	A1
250.0	88.254	N/A	100	N/A	N/A	N/A	N/A	N/A	0.698	0	0	0	0.168	FALSE	TRUE	FALSE	N/A	N/A	A1
249.9	88.418	N/A	100	N/A	N/A	N/A	N/A	N/A	0.697	0	0	0	0.168	FALSE	TRUE	FALSE	N/A	N/A	A1

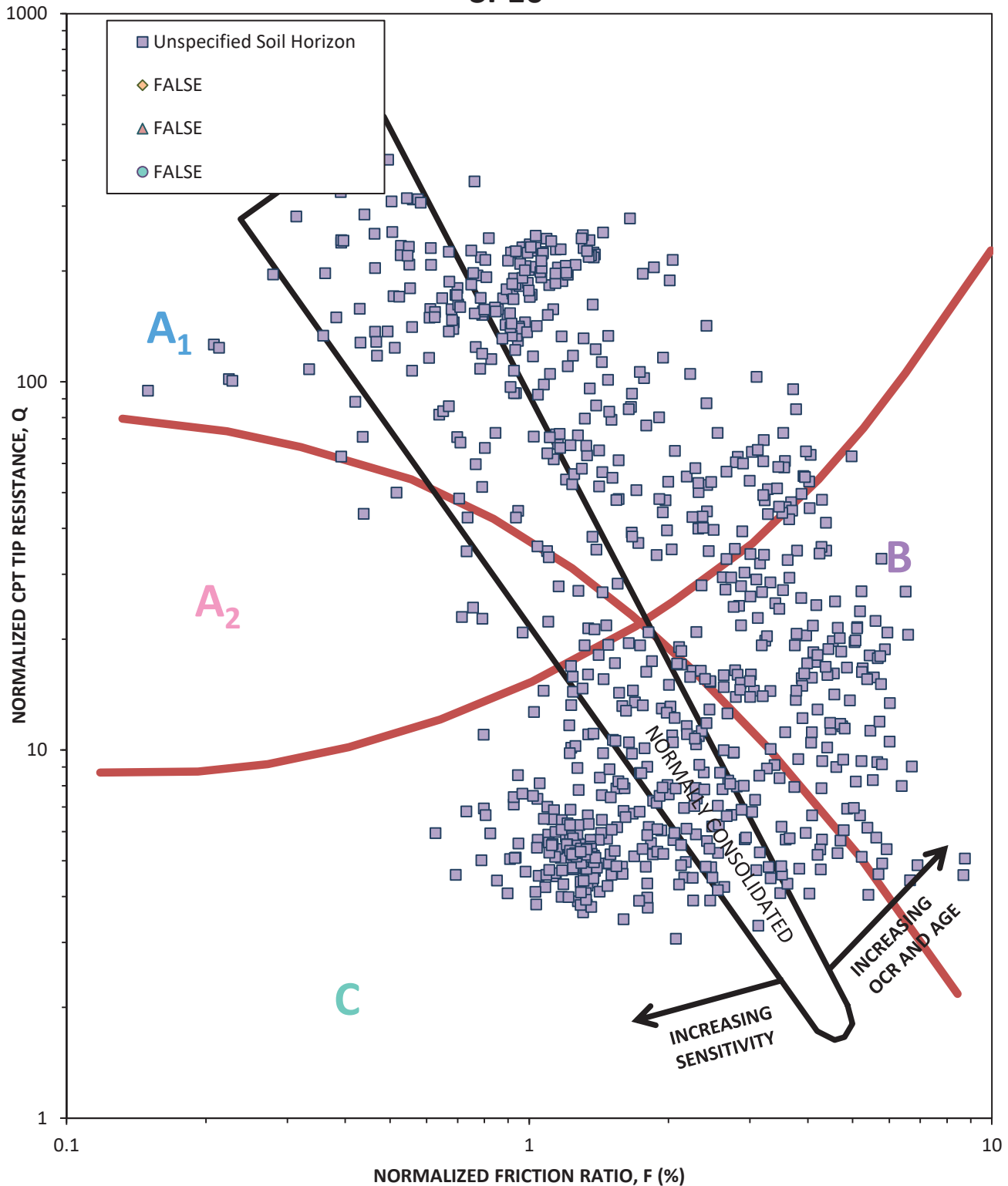
Front Ground Response										Sample Screened for:										Factor of Safety		Material (optional)	Soil Type (see note on following chart)
Elev. (ft)	Depth z (ft)	Cyclic Resistance Ratio $CRR_{7.5}$	Relative Density D_r (%)	Correction for Overburden Pressure K_σ	Correction for Sloping Ground K_α	Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., r_d	Maximum Induced Shear Stress τ_{max} (psf)	Average Cyclic Shear Stress τ_{Avg} (psf)	Cyclic Stress Ratio	CSR	Clay-like $(qc_{30})_{cs} \geq 175$	High Tip Res.	Unsaturated	FS_{liq}							
240.7	97.604	N/A	60	N/A	N/A	N/A	N/A	0.673	0	0	0	0.164	TRUE	FALSE	FALSE	FALSE	N/A	N/A	B				
240.5	97.768	N/A	44	N/A	N/A	N/A	N/A	0.672	0	0	0	0.164	TRUE	FALSE	FALSE	FALSE	N/A	N/A	B				
240.4	97.932	N/A	42	N/A	N/A	N/A	N/A	0.672	0	0	0	0.164	TRUE	FALSE	FALSE	FALSE	N/A	N/A	B				
240.2	98.096	N/A	41	N/A	N/A	N/A	N/A	0.671	0	0	0	0.164	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
240.0	98.260	N/A	40	N/A	N/A	N/A	N/A	0.671	0	0	0	0.164	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
239.9	98.424	N/A	40	N/A	N/A	N/A	N/A	0.671	0	0	0	0.164	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
239.7	98.588	N/A	40	N/A	N/A	N/A	N/A	0.670	0	0	0	0.164	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
239.5	98.752	N/A	40	N/A	N/A	N/A	N/A	0.670	0	0	0	0.164	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
239.4	98.916	N/A	40	N/A	N/A	N/A	N/A	0.670	0	0	0	0.164	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
239.2	99.080	N/A	40	N/A	N/A	N/A	N/A	0.669	0	0	0	0.164	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
239.1	99.244	N/A	39	N/A	N/A	N/A	N/A	0.669	0	0	0	0.163	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
238.9	99.408	N/A	39	N/A	N/A	N/A	N/A	0.668	0	0	0	0.163	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
238.7	99.572	N/A	39	N/A	N/A	N/A	N/A	0.668	0	0	0	0.163	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
238.6	99.736	N/A	40	N/A	N/A	N/A	N/A	0.668	0	0	0	0.163	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
238.4	99.900	N/A	39	N/A	N/A	N/A	N/A	0.667	0	0	0	0.163	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
238.2	100.064	N/A	39	N/A	N/A	N/A	N/A	0.667	0	0	0	0.163	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
238.1	100.228	N/A	39	N/A	N/A	N/A	N/A	0.667	0	0	0	0.163	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
237.9	100.392	N/A	39	N/A	N/A	N/A	N/A	0.666	0	0	0	0.163	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
237.7	100.557	N/A	39	N/A	N/A	N/A	N/A	0.666	0	0	0	0.163	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
237.6	100.721	N/A	39	N/A	N/A	N/A	N/A	0.666	0	0	0	0.163	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
237.4	100.885	N/A	39	N/A	N/A	N/A	N/A	0.665	0	0	0	0.163	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
237.3	101.049	N/A	39	N/A	N/A	N/A	N/A	0.665	0	0	0	0.163	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
237.1	101.213	N/A	39	N/A	N/A	N/A	N/A	0.664	0	0	0	0.163	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
236.9	101.377	N/A	39	N/A	N/A	N/A	N/A	0.664	0	0	0	0.163	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
236.8	101.541	N/A	39	N/A	N/A	N/A	N/A	0.664	0	0	0	0.163	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
236.6	101.705	N/A	39	N/A	N/A	N/A	N/A	0.663	0	0	0	0.163	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
236.4	101.869	N/A	38	N/A	N/A	N/A	N/A	0.663	0	0	0	0.163	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
236.3	102.033	N/A	39	N/A	N/A	N/A	N/A	0.663	0	0	0	0.163	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
236.1	102.197	N/A	39	N/A	N/A	N/A	N/A	0.662	0	0	0	0.163	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
235.9	102.361	N/A	39	N/A	N/A	N/A	N/A	0.662	0	0	0	0.162	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
235.8	102.525	N/A	39	N/A	N/A	N/A	N/A	0.662	0	0	0	0.162	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
235.6	102.689	N/A	39	N/A	N/A	N/A	N/A	0.661	0	0	0	0.162	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
235.4	102.853	N/A	39	N/A	N/A	N/A	N/A	0.661	0	0	0	0.162	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
235.3	103.017	N/A	39	N/A	N/A	N/A	N/A	0.661	0	0	0	0.162	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
235.1	103.181	N/A	39	N/A	N/A	N/A	N/A	0.660	0	0	0	0.162	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
235.0	103.345	N/A	39	N/A	N/A	N/A	N/A	0.660	0	0	0	0.162	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
234.8	103.509	N/A	39	N/A	N/A	N/A	N/A	0.660	0	0	0	0.162	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
234.6	103.673	N/A	39	N/A	N/A	N/A	N/A	0.659	0	0	0	0.162	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
234.5	103.837	N/A	39	N/A	N/A	N/A	N/A	0.659	0	0	0	0.162	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
234.3	104.001	N/A	39	N/A	N/A	N/A	N/A	0.659	0	0	0	0.162	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
234.1	104.165	N/A	39	N/A	N/A	N/A	N/A	0.658	0	0	0	0.162	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
234.0	104.329	N/A	39	N/A	N/A	N/A	N/A	0.658	0	0	0	0.162	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
233.8	104.493	N/A	40	N/A	N/A	N/A	N/A	0.658	0	0	0	0.162	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
233.6	104.658	0.174	63	0.851	1.445	0.97	0.209	0.658	0	0	0	0.162	TRUE	FALSE	FALSE	FALSE	N/A	N/A	A1				
233.5	104.822	0.153	59	0.863	1.232	0.98	0.159	0.657	0	0	0	0.162	FALSE	FALSE	FALSE	FALSE	N/A	N/A	A1				
233.3	104.986	N/A	48	N/A	N/A	N/A	N/A	0.657	0	0	0	0.162	TRUE	FALSE	FALSE	FALSE	N/A	N/A	B				
233.2	105.150	N/A	45	N/A	N/A	N/A	N/A	0.657	0	0	0	0.162	TRUE	FALSE	FALSE	FALSE	N/A	N/A	B				
233.0	105.314	N/A	43	N/A	N/A	N/A	N/A	0.656	0	0	0	0.162	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
232.8	105.478	N/A	41	N/A	N/A	N/A	N/A	0.656	0	0	0	0.162	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
232.7	105.642	N/A	40	N/A	N/A	N/A	N/A	0.656	0	0	0	0.162	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
232.5	105.806	0.176	64	0.849	1.456	0.97	0.212	0.655	0	0	0	0.161	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				
232.3	105.970	0.174	63	0.850	1.442	0.97	0.208	0.655	0	0	0	0.161	FALSE	FALSE	FALSE	FALSE	N/A	N/A	A1				
232.2	106.134	N/A	58	N/A	N/A	N/A	N/A	0.655	0	0	0	0.161	TRUE	FALSE	FALSE	FALSE	N/A	N/A	B				
232.0	106.298	N/A	47	N/A	N/A	N/A	N/A	0.654	0	0	0	0.161	TRUE	FALSE	FALSE	FALSE	N/A	N/A	B				
231.8	106.462	N/A	43	N/A	N/A	N/A	N/A	0.654	0	0	0	0.161	TRUE	FALSE	FALSE	FALSE	N/A	N/A	C				

Front Ground Response										Sample Screened for:				Factor of Safety	Material (optional)	Soil Type (see note on following chart)
Elev. (ft)	Depth z (ft)	Cyclic Resistance Ratio $CRR_{7.5}$	Relative Density D_r (%)	Correction for Overburden Pressure K_o	Correction for Sloping Ground K_α	Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., τ_d	τ_{max} (psf)	Shear Stress	Average Cyclic Shear Stress τ_{Avg} (psf)	Cyclic Stress Ratio	Clay-like $(q_{c,N}) \geq 175$			
231.7	106.626	N/A	41	N/A	N/A	N/A	N/A	0.654	0	0	0	0.161	TRUE	FALSE	N/A	C
231.5	106.790	N/A	42	N/A	N/A	N/A	N/A	0.654	0	0	0	0.161	TRUE	FALSE	N/A	C
231.3	106.954	N/A	48	N/A	N/A	N/A	N/A	0.653	0	0	0	0.161	TRUE	FALSE	N/A	C
231.2	107.118	N/A	44	N/A	N/A	N/A	N/A	0.653	0	0	0	0.161	TRUE	FALSE	N/A	C
231.0	107.282	N/A	40	N/A	N/A	N/A	N/A	0.653	0	0	0	0.161	TRUE	FALSE	N/A	C
230.9	107.446	N/A	40	N/A	N/A	N/A	N/A	0.652	0	0	0	0.161	TRUE	FALSE	N/A	C
230.7	107.610	N/A	39	N/A	N/A	N/A	N/A	0.652	0	0	0	0.161	TRUE	FALSE	N/A	C
230.5	107.774	N/A	39	N/A	N/A	N/A	N/A	0.652	0	0	0	0.161	TRUE	FALSE	N/A	C
230.4	107.938	N/A	41	N/A	N/A	N/A	N/A	0.652	0	0	0	0.161	TRUE	FALSE	N/A	C
230.2	108.102	N/A	39	N/A	N/A	N/A	N/A	0.651	0	0	0	0.161	TRUE	FALSE	N/A	C
230.0	108.266	N/A	39	N/A	N/A	N/A	N/A	0.651	0	0	0	0.161	TRUE	FALSE	N/A	C
229.9	108.430	N/A	40	N/A	N/A	N/A	N/A	0.651	0	0	0	0.161	TRUE	FALSE	N/A	C
229.7	108.594	0.119	48	0.886	0.773	0.99	0.081	0.651	0	0	0	0.161	FALSE	FALSE	N/A	A2
229.5	108.759	0.111	43	0.894	0.634	0.99	0.062	0.650	0	0	0	0.161	FALSE	FALSE	N/A	A1
229.4	108.923	0.190	66	0.839	1.561	0.97	0.242	0.650	0	0	0	0.161	FALSE	FALSE	N/A	A1
229.2	109.087	N/A	62	N/A	N/A	N/A	N/A	0.650	0	0	0	0.161	TRUE	FALSE	N/A	A1
229.0	109.251	N/A	50	N/A	N/A	N/A	N/A	0.650	0	0	0	0.161	TRUE	FALSE	N/A	B
228.9	109.415	N/A	44	N/A	N/A	N/A	N/A	0.649	0	0	0	0.161	TRUE	FALSE	N/A	B
228.7	109.579	N/A	45	N/A	N/A	N/A	N/A	0.649	0	0	0	0.161	TRUE	FALSE	N/A	C
228.6	109.743	N/A	44	N/A	N/A	N/A	N/A	0.649	0	0	0	0.161	TRUE	FALSE	N/A	C
228.4	109.907	N/A	43	N/A	N/A	N/A	N/A	0.649	0	0	0	0.161	TRUE	FALSE	N/A	C
228.2	110.071	N/A	40	N/A	N/A	N/A	N/A	0.648	0	0	0	0.161	TRUE	FALSE	N/A	C
228.1	110.235	N/A	51	N/A	N/A	N/A	N/A	0.648	0	0	0	0.160	TRUE	FALSE	N/A	A2
227.9	110.399	0.147	58	0.862	1.159	0.98	0.144	0.648	0	0	0	0.160	FALSE	FALSE	N/A	A1
227.7	110.563	N/A	58	N/A	N/A	N/A	N/A	0.648	0	0	0	0.160	TRUE	FALSE	N/A	B
227.6	110.727	N/A	57	N/A	N/A	N/A	N/A	0.647	0	0	0	0.160	TRUE	FALSE	N/A	B
227.4	110.891	0.185	65	0.839	1.522	0.97	0.230	0.647	0	0	0	0.160	FALSE	FALSE	N/A	A1
227.2	111.055	N/A	61	N/A	N/A	N/A	N/A	0.647	0	0	0	0.160	TRUE	FALSE	N/A	B
227.1	111.219	N/A	54	N/A	N/A	N/A	N/A	0.647	0	0	0	0.160	TRUE	FALSE	N/A	B
226.9	111.383	N/A	59	N/A	N/A	N/A	N/A	0.646	0	0	0	0.160	TRUE	FALSE	N/A	B
226.8	111.547	N/A	54	N/A	N/A	N/A	N/A	0.646	0	0	0	0.160	TRUE	FALSE	N/A	B
226.6	111.711	0.157	60	0.854	1.268	0.98	0.166	0.646	0	0	0	0.160	FALSE	FALSE	N/A	A1
226.4	111.875	N/A	60	N/A	N/A	N/A	N/A	0.646	0	0	0	0.160	TRUE	FALSE	N/A	B
226.3	112.039	N/A	48	N/A	N/A	N/A	N/A	0.646	0	0	0	0.160	TRUE	FALSE	N/A	B
226.1	112.203	N/A	41	N/A	N/A	N/A	N/A	0.645	0	0	0	0.160	TRUE	FALSE	N/A	B
225.9	112.367	N/A	39	N/A	N/A	N/A	N/A	0.645	0	0	0	0.160	TRUE	FALSE	N/A	C
225.8	112.531	N/A	39	N/A	N/A	N/A	N/A	0.645	0	0	0	0.160	TRUE	FALSE	N/A	C
225.6	112.695	N/A	39	N/A	N/A	N/A	N/A	0.645	0	0	0	0.160	TRUE	FALSE	N/A	C
225.4	112.860	N/A	41	N/A	N/A	N/A	N/A	0.644	0	0	0	0.160	TRUE	FALSE	N/A	C
225.3	113.024	N/A	42	N/A	N/A	N/A	N/A	0.644	0	0	0	0.160	TRUE	FALSE	N/A	C
225.1	113.188	N/A	40	N/A	N/A	N/A	N/A	0.644	0	0	0	0.160	TRUE	FALSE	N/A	C
224.9	113.352	N/A	40	N/A	N/A	N/A	N/A	0.644	0	0	0	0.160	TRUE	FALSE	N/A	C
224.8	113.516	0.118	47	0.884	0.745	0.99	0.077	0.644	0	0	0	0.160	FALSE	FALSE	N/A	A2
224.6	113.680	0.180	64	0.839	1.474	0.97	0.217	0.643	0	0	0	0.160	FALSE	FALSE	N/A	A1
224.5	113.844	N/A	58	N/A	N/A	N/A	N/A	0.643	0	0	0	0.160	TRUE	FALSE	N/A	B
224.3	114.008	N/A	48	N/A	N/A	N/A	N/A	0.643	0	0	0	0.160	TRUE	FALSE	N/A	B
224.1	114.172	N/A	59	N/A	N/A	N/A	N/A	0.643	0	0	0	0.160	TRUE	FALSE	N/A	B
224.0	114.336	N/A	54	N/A	N/A	N/A	N/A	0.643	0	0	0	0.160	TRUE	FALSE	N/A	B
223.8	114.500	N/A	45	N/A	N/A	N/A	N/A	0.642	0	0	0	0.160	TRUE	FALSE	N/A	B
223.6	114.664	N/A	42	N/A	N/A	N/A	N/A	0.642	0	0	0	0.160	TRUE	FALSE	N/A	C
223.5	114.828	N/A	43	N/A	N/A	N/A	N/A	0.642	0	0	0	0.160	TRUE	FALSE	N/A	C
223.3	114.992	N/A	47	N/A	N/A	N/A	N/A	0.642	0	0	0	0.160	TRUE	FALSE	N/A	C
223.1	115.156	0.142	56	0.862	1.089	0.98	0.131	0.642	0	0	0	0.160	FALSE	FALSE	N/A	A1
223.0	115.320	0.175	64	0.840	1.429	0.97	0.205	0.642	0	0	0	0.160	FALSE	FALSE	N/A	A1
222.8	115.484	0.229	70	0.815	1.790	0.96	0.323	0.641	0	0	0	0.160	FALSE	FALSE	N/A	A1

Elev. (ft)	Depth z (ft)	Cyclic Resistance Ratio $CRR_{7.5}$	Relative Density D_r (%)	Correction for Overburden Pressure K_o	Correction for Sloping Ground K_α	Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., I_d	From Ground Response				Sample Screened for:				Factor of Safety FS_{liq}	Material (optional)	Soil Type (see note on following chart)
									Maximum Induced Shear Stress τ_{Max} (psf)	Average Cyclic Shear Stress τ_{Avg} (psf)	Cyclic Stress Ratio CSR	Clay-like $(qc_{30}/CS \geq 175$	High Tip Res. $(qc_{30}/CS \geq 175$						

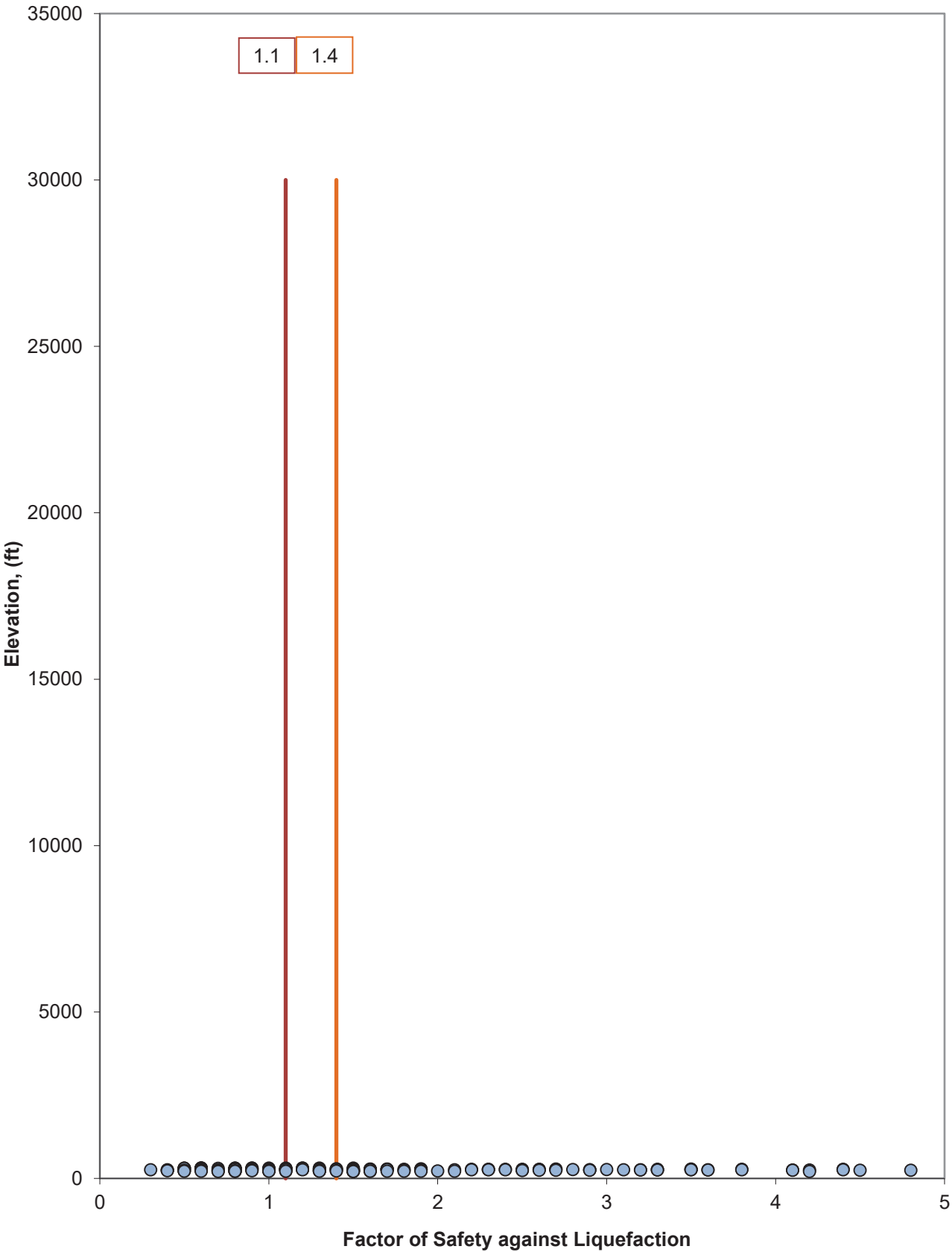
213.6	124.670	0.144	57	0.853	1.092	0.98	0.131	0.635	0	0	0.159	FALSE	FALSE	0.8	N/A	A1
213.5	124.834	0.193	66	0.821	1.547	0.97	0.238	0.635	0	0	0.159	FALSE	FALSE	1.5	N/A	A1
213.3	124.998	0.191	66	0.822	1.536	0.97	0.235	0.635	0	0	0.159	FALSE	FALSE	1.5	N/A	A1
213.1	125.163	0.143	57	0.853	1.087	0.98	0.130	0.635	0	0	0.159	FALSE	FALSE	0.8	N/A	A1
213.0	125.327	0.196	66	0.819	1.570	0.97	0.245	0.635	0	0	0.159	FALSE	FALSE	1.5	N/A	A1
212.8	125.491	N/A	53	N/A	N/A	N/A	N/A	0.635	0	0	0.160	TRUE	FALSE	N/A	N/A	A1
212.6	125.655	0.134	54	0.860	0.968	0.98	0.110	0.635	0	0	0.160	FALSE	FALSE	0.7	N/A	A2
212.5	125.819	0.197	66	0.818	1.575	0.97	0.246	0.635	0	0	0.160	FALSE	FALSE	1.5	N/A	A1
212.3	125.983	0.398	77	0.759	2.324	0.95	0.665	0.635	0	0	0.160	FALSE	FALSE	4.2	N/A	A1
212.2	126.147	N/A	98	N/A	N/A	N/A	N/A	0.635	0	0	0.160	FALSE	TRUE	N/A	N/A	A1
212.0	126.311	N/A	100	N/A	N/A	N/A	N/A	0.635	0	0	0.160	FALSE	TRUE	N/A	N/A	A1
211.8	126.475	N/A	100	N/A	N/A	N/A	N/A	0.635	0	0	0.160	FALSE	TRUE	N/A	N/A	A1

SP10



Adapted from "Discussion of 'Liquefaction Potential of Silts from CPTu'" (Robertson 2008). Zone A₁ and Zone A₂ samples are generally sand-like. Zone B samples are generally clay-like and not susceptible to cyclic softening. Zone C samples are generally clay-like and susceptible to cyclic softening. Note that the transition from clay-like to sand-like in this chart does not exactly match the liquefaction calculations herein; that is, some transitional samples in Zone B and Zone C will be treated as sand-like and analyzed for liquefaction if the calculations indicate as such.

US 60 Bridge, Boring = SP10, Source = Design Source, Mw = 7.7, Event = Design Event,
CPT Data, Simplified Stress-Based Approach



Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
10.499	30.104	0.782	120							
10.663	54.368	0.669	120							
10.827	49.224	0.794	120							
10.991	37.956	0.654	120							
11.155	21.999	0.554	120							
11.319	13.273	0.418	120							
11.483	11.977	0.263	120							
11.647	12.612	0.308	120							
11.811	10.500	0.244	120							
11.975	13.466	0.200	120							
12.139	11.856	0.193	120							
12.303	14.574	0.373	120							
12.467	29.378	0.344	120							
12.631	44.793	0.529	120							
12.795	37.216	0.685	120							
12.959	39.526	0.636	120							
13.123	50.051	0.230	120							
13.287	75.770	0.391	120							
13.451	38.818	0.565	120							
13.615	18.256	0.566	120							
13.779	12.900	0.323	120							
13.943	14.317	0.272	120							
14.107	10.533	0.251	120							
14.271	7.712	0.220	120							
14.436	15.175	0.351	120							
14.600	18.289	0.334	120							
14.764	16.996	0.431	120							
14.928	10.611	0.411	120							
15.092	6.311	0.280	120							
15.256	6.847	0.236	120							
15.420	8.823	0.178	120							
15.584	60.329	0.307	120							
15.748	32.711	0.851	120							
15.912	16.141	0.618	120							
16.076	10.802	0.405	120							
16.240	13.087	0.421	120							
16.404	30.389	0.436	120							
16.568	24.476	0.414	120							
16.732	25.120	0.286	120							
16.896	25.330	0.326	120							
17.060	20.697	0.411	120							
17.224	27.914	0.411	120							
17.388	26.504	0.362	120							
17.552	48.131	0.486	120							
17.716	57.501	0.886	120							
17.880	28.511	1.203	120							
18.044	18.009	1.419	120							
18.208	57.215	1.445	120							
18.372	124.051	1.865	120							
18.537	26.159	2.573	120							
18.701	234.583	3.608	120							
18.865	162.303	4.217	120							
19.029	115.205	3.836	120							
19.193	185.234	3.251	120							
19.357	240.549	3.482	120							
19.521	241.800	2.784	120							
19.685	238.238	2.382	120							
19.849	219.285	2.203	120							
20.013	198.243	1.782	120							
20.177	168.721	1.517	120							
20.341	119.509	1.440	120							
20.505	93.553	1.422	120							
20.669	69.255	1.970	120							
20.833	45.678	1.693	120							
20.997	46.123	1.020	120							
21.161	150.106	1.038	120							
21.325	200.660	1.293	120							
21.489	198.582	1.643	120							
21.653	183.474	1.853	120							
21.817	163.237	1.943	120							
21.981	146.991	1.806	120							
22.145	118.233	1.874	120							
22.309	82.453	1.463	120							
22.473	86.962	1.479	120							
22.638	120.011	1.814	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
22.802	81.146	1.857	120							
22.966	108.941	1.157	120							
23.130	120.843	0.923	120							
23.294	114.506	0.825	120							
23.458	124.010	1.024	120							
23.622	128.724	1.013	120							
23.786	117.541	1.183	120							
23.950	113.452	1.315	120							
24.114	97.561	1.416	120							
24.278	66.179	1.781	120							
24.442	37.814	1.382	120							
24.606	48.878	1.446	120							
24.770	62.401	1.951	120							
24.934	48.804	1.954	120							
25.098	39.159	1.479	120							
25.262	82.023	1.185	120							
25.426	131.317	0.996	120							
25.590	128.307	1.005	120							
25.754	112.906	1.018	120							
25.918	102.780	0.904	120							
26.082	92.022	0.979	120							
26.246	63.827	1.093	120							
26.410	42.654	1.256	120							
26.574	31.265	1.351	120							
26.739	19.831	0.993	120							
26.903	14.155	0.543	120							
27.067	54.758	0.479	120							
27.231	38.491	0.961	120							
27.395	28.656	0.773	120							
27.559	117.976	0.844	120							
27.723	134.894	1.007	120							
27.887	98.126	1.398	120							
28.051	67.017	1.548	120							
28.215	66.409	1.785	120							
28.379	63.709	1.612	120							
28.543	114.810	1.514	120							
28.707	158.576	1.481	120							
28.871	166.097	1.419	120							
29.035	167.144	1.328	120							
29.199	164.177	1.010	120							
29.363	189.268	1.605	120							
29.527	182.043	1.608	120							
29.691	196.176	1.722	120							
29.855	206.871	1.971	120							
30.019	210.628	1.982	120							
30.183	204.391	1.955	120							
30.347	206.760	1.862	120							
30.511	214.017	1.922	120							
30.675	222.553	2.022	120							
30.840	215.517	2.104	120							
31.004	201.308	1.933	120							
31.168	187.543	1.702	120							
31.332	153.021	1.651	120							
31.496	100.284	1.633	120							
31.660	66.236	1.817	120							
31.824	35.503	1.490	120							
31.988	25.000	1.279	120							
32.152	50.535	1.479	120							
32.316	26.721	1.416	120							
32.480	29.108	1.387	120							
32.644	84.688	1.349	120							
32.808	91.330	1.078	120							
32.972	85.518	0.661	120							
33.136	76.487	0.569	120							
33.300	74.957	0.590	120							
33.464	74.937	0.649	120							
33.628	73.523	0.669	120							
33.792	75.340	0.692	120							
33.956	76.960	0.684	120							
34.120	82.225	0.688	120							
34.284	92.932	0.707	120							
34.448	99.241	1.009	120							
34.612	88.666	1.196	120							
34.776	52.604	1.248	120							
34.941	61.383	0.972	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
35.105	53.139	0.913	120							
35.269	48.957	0.801	120							
35.433	90.247	0.891	120							
35.597	61.262	1.093	120							
35.761	38.871	1.134	120							
35.925	26.413	1.008	120							
36.089	15.737	0.755	120							
36.253	11.185	0.354	120							
36.417	18.680	0.593	120							
36.581	46.150	1.373	120							
36.745	24.404	1.243	120							
36.909	36.615	0.611	120							
37.073	91.724	0.666	120							
37.237	59.452	0.873	120							
37.401	30.127	1.097	120							
37.565	19.328	0.970	120							
37.729	12.170	0.739	120							
37.893	9.243	0.381	120							
38.057	9.788	0.149	120							
38.221	9.394	0.136	120							
38.385	9.266	0.104	120							
38.549	9.490	0.091	120							
38.713	9.731	0.082	120							
38.877	10.696	0.074	120							
39.042	9.721	0.069	120							
39.206	10.052	0.100	120							
39.370	10.431	0.124	120							
39.534	9.269	0.124	120							
39.698	10.011	0.098	120							
39.862	11.151	0.079	120							
40.026	10.919	0.080	120							
40.190	10.803	0.085	120							
40.354	10.703	0.085	120							
40.518	10.261	0.084	120							
40.682	10.106	0.109	120							
40.846	11.517	0.125	120							
41.010	10.080	0.128	120							
41.174	10.267	0.136	120							
41.338	10.340	0.104	120							
41.502	10.649	0.108	120							
41.666	10.777	0.116	120							
41.830	11.094	0.119	120							
41.994	11.376	0.108	120							
42.158	14.816	0.288	120							
42.322	15.301	0.439	120							
42.486	89.614	0.844	120							
42.650	179.631	1.279	120							
42.814	200.613	1.647	120							
42.978	213.105	1.892	120							
43.143	244.165	2.168	120							
43.307	262.757	2.558	120							
43.471	242.857	2.950	120							
43.635	182.813	3.081	120							
43.799	99.723	2.865	120							
43.963	45.649	2.026	120							
44.127	26.376	1.319	120							
44.291	20.021	0.644	120							
44.455	19.215	0.232	120							
44.619	21.764	0.347	120							
44.783	19.459	0.366	120							
44.947	21.319	0.624	120							
45.111	23.986	0.650	120							
45.275	17.809	0.697	120							
45.439	89.033	0.838	120							
45.603	92.271	1.407	120							
45.767	52.805	1.741	120							
45.931	30.309	1.219	120							
46.095	18.650	0.788	120							
46.259	18.133	0.283	120							
46.423	16.531	0.147	120							
46.587	17.260	0.184	120							
46.751	17.283	0.120	120							
46.915	17.458	0.119	120							
47.079	13.617	0.134	120							
47.244	12.792	0.137	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
47.408	12,900	0.126	120							
47.572	13,056	0.122	120							
47.736	13,689	0.138	120							
47.900	13,568	0.129	120							
48.064	14,811	0.150	120							
48.228	13,772	0.245	120							
48.392	13,595	0.159	120							
48.556	37,614	0.423	120							
48.720	37,568	1.121	120							
48.884	22,580	1.161	120							
49.048	14,037	0.916	120							
49.212	72,214	0.867	120							
49.376	112,184	1.109	120							
49.540	109,784	1.495	120							
49.704	100,893	2.241	120							
49.868	57,697	2.658	120							
50.032	29,614	1.835	120							
50.196	54,358	1.515	120							
50.360	41,247	1.450	120							
50.524	37,081	1.174	120							
50.688	19,725	0.998	120							
50.852	19,714	0.535	120							
51.016	43,866	0.576	120							
51.180	132,403	0.518	120							
51.345	137,885	1.168	120							
51.509	133,201	1.343	120							
51.673	96,764	2.546	120							
51.837	56,694	2.721	120							
52.001	31,058	2.016	120							
52.165	18,002	1.090	120							
52.329	16,759	0.452	120							
52.493	16,735	0.720	120							
52.657	132,191	0.910	120							
52.821	203,809	1.451	120							
52.985	211,097	1.780	120							
53.149	207,586	2.039	120							
53.313	219,913	2.313	120							
53.477	229,837	2.393	120							
53.641	257,021	1.632	120							
53.805	211,485	2.239	120							
53.969	72,940	2.660	120							
54.133	78,224	2.810	120							
54.297	48,256	2.165	120							
54.461	39,632	1.157	120							
54.625	20,897	0.150	120							
54.789	30,832	0.710	120							
54.953	36,163	1.041	120							
55.117	73,401	1.606	120							
55.281	97,846	1.615	120							
55.446	134,215	2.087	120							
55.610	80,734	2.158	120							
55.774	68,776	1.888	120							
55.938	67,310	1.562	120							
56.102	56,944	1.459	120							
56.266	43,932	1.727	120							
56.430	81,452	1.600	120							
56.594	106,417	1.711	120							
56.758	118,673	2.744	120							
56.922	80,048	3.061	120							
57.086	41,399	2.223	120							
57.250	26,406	1.411	120							
57.414	22,870	0.699	120							
57.578	23,154	0.347	120							
57.742	26,638	0.229	120							
57.906	23,679	0.401	120							
58.070	24,163	0.477	120							
58.234	115,495	0.617	120							
58.398	144,587	1.322	120							
58.562	76,785	1.861	120							
58.726	46,611	1.603	120							
58.890	32,541	0.869	120							
59.054	36,665	0.638	120							
59.218	28,197	0.342	120							
59.382	22,399	0.392	120							
59.547	26,449	0.382	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
59.711	22,863	0.369	120							
59.875	149,531	0.673	120							
60.039	82,433	1.796	120							
60.203	50,621	1.792	120							
60.367	27,727	1.437	120							
60.531	20,979	0.903	120							
60.695	35,331	0.360	120							
60.859	24,906	0.327	120							
61.023	24,579	0.412	120							
61.187	17,803	0.567	120							
61.351	22,430	0.800	120							
61.515	162,546	0.796	120							
61.679	176,449	0.804	120							
61.843	172,049	0.789	120							
62.007	164,841	0.367	120							
62.171	169,342	0.465	120							
62.335	186,644	0.558	120							
62.499	190,673	0.500	120							
62.663	195,162	0.898	120							
62.827	112,348	2.305	120							
62.991	66,744	2.449	120							
63.155	37,519	1.590	120							
63.319	64,122	1.089	120							
63.483	52,713	0.455	120							
63.648	75,029	0.834	120							
63.812	47,478	1.076	120							
63.976	26,885	0.963	120							
64.140	20,577	0.604	120							
64.304	24,977	0.939	120							
64.468	56,154	1.065	120							
64.632	21,796	0.875	120							
64.796	30,654	0.989	120							
64.960	38,314	0.835	120							
65.124	29,774	1.083	120							
65.288	120,177	0.875	120							
65.452	169,660	0.937	120							
65.616	167,663	0.941	120							
65.780	157,716	1.096	120							
65.944	151,414	1.154	120							
66.108	162,665	1.123	120							
66.272	167,153	1.191	120							
66.436	157,322	1.168	120							
66.600	142,669	1.166	120							
66.764	132,663	1.030	120							
66.928	126,130	0.970	120							
67.092	124,162	0.878	120							
67.256	125,901	0.943	120							
67.420	116,494	1.528	120							
67.584	73,515	1.970	120							
67.749	40,851	1.909	120							
67.913	36,804	1.573	120							
68.077	65,783	1.591	120							
68.241	97,026	1.536	120							
68.405	99,604	1.409	120							
68.569	99,407	1.044	120							
68.733	100,283	1.034	120							
68.897	98,548	1.066	120							
69.061	52,686	1.507	120							
69.225	34,993	1.236	120							
69.389	40,318	1.232	120							
69.553	40,083	1.461	120							
69.717	114,513	1.480	120							
69.881	386,242	1.220	120							
70.045	303,592	0.887	120							
70.209	229,898	0.798	120							
70.373	172,034	0.822	120							
70.537	155,489	0.779	120							
70.701	183,674	0.395	120							
70.865	192,892	0.346	120							
71.029	158,185	0.344	120							
71.193	132,739	0.386	120							
71.357	128,673	0.653	120							
71.521	136,520	0.636	120							
71.685	158,677	0.323	120							
71.850	199,445	0.520	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
72.014	185.777	0.750	120							
72.178	151.753	1.074	120							
72.342	101.300	1.718	120							
72.506	57.339	1.633	120							
72.670	38.974	1.586	120							
72.834	49.470	1.207	120							
72.998	104.583	0.977	120							
73.162	171.464	0.893	120							
73.326	195.703	1.406	120							
73.490	139.647	2.276	120							
73.654	66.873	2.824	120							
73.818	39.540	1.396	120							
73.982	62.201	3.437	120							
74.146	71.109	4.153	120							
74.310	62.764	3.670	120							
74.474	53.692	2.915	120							
74.638	111.460	2.231	120							
74.802	184.921	1.976	120							
74.966	238.905	1.892	120							
75.130	242.568	2.104	120							
75.294	234.095	2.249	120							
75.458	253.314	2.640	120							
75.622	287.959	2.680	120							
75.786	314.537	2.778	120							
75.951	343.149	3.514	120							
76.115	353.360	3.970	120							
76.279	353.393	4.450	120							
76.443	375.730	4.786	120							
76.607	448.178	4.235	120							
76.771	539.596	4.104	120							
76.935	491.696	3.364	120							
77.099	540.935	4.200	120							
77.263	546.073	2.880	120							
77.427	554.307	3.472	120							
77.591	579.960	4.224	120							
77.755	409.906	4.056	120							
77.919	347.506	4.245	120							
78.083	259.977	3.516	120							
78.247	227.719	3.447	120							
78.411	207.416	2.778	120							
78.575	223.484	2.826	120							
78.739	277.362	2.032	120							
78.903	302.377	2.032	120							
79.067	318.047	1.858	120							
79.231	268.503	1.520	120							
79.395	347.765	2.117	120							
79.559	347.449	2.307	120							
79.723	346.098	3.155	120							
79.887	317.624	3.090	120							
80.052	303.945	2.948	120							
80.216	263.743	2.598	120							
80.380	269.453	2.445	120							
80.544	263.787	2.004	120							
80.708	240.254	1.457	120							
80.872	221.571	1.524	120							
81.036	160.499	2.051	120							
81.200	127.687	2.493	120							
81.364	160.120	2.363	120							
81.528	298.684	2.560	120							
81.692	273.347	2.026	120							
81.856	241.663	2.421	120							
82.020	200.580	3.432	120							
82.184	179.531	3.469	120							
82.348	329.784	3.212	120							
82.512	454.662	4.206	120							
82.676	491.742	3.845	120							
82.840	521.017	3.563	120							
83.004	548.587	3.910	120							
83.168	505.475	4.207	120							
83.332	449.427	4.471	120							
83.496	413.234	2.742	120							
83.660	348.120	1.461	120							
83.824	232.662	1.279	120							
83.988	142.591	2.479	120							
84.153	85.658	3.055	120							

Depth (ft)	Corrected Cone Tip Resistance, q_t (tsf)	Sleeve Friction, f_s (tsf)	Total Unit Weight (pcf)	Material (optional)	Clay-like/ Sand-like Override (optional)	Fines Content Correction Override (optional)	Static Shear Stress Ratio, α	Maximum Shear Stress (psf)	Static Pore Water Pressure During CPT (psf)	Static Pore Water Pressure During EQ (psf)
84.317	60.604	2.567	120							
84.481	65.106	2.644	120							
84.645	84.245	1.624	120							
84.809	138.277	1.099	120							
84.973	191.191	0.881	120							
85.137	267.647	0.602	120							
85.301	251.396	0.642	120							
85.465	213.293	0.543	120							
85.629	180.409	0.276	120							
85.793	179.053	0.166	120							
85.957	174.855	0.385	120							
86.121	161.506	0.454	120							
86.285	153.906	0.437	120							
86.449	170.130	0.917	120							
86.613	190.353	0.586	120							
86.777	202.991	0.486	120							
86.941	244.478	0.272	120							
87.105	230.607	0.063	120							
87.269	213.187	0.091	120							
87.433	182.073	0.637	120							
87.597	144.322	2.331	120							
87.761	88.091	1.906	120							
87.925	95.977	1.077	120							
88.089	221.106	2.046	120							
88.254	129.122	2.351	120							
88.418	69.975	3.015	120							
88.582	88.207	3.332	120							
88.746	60.108	2.790	120							
88.910	47.941	2.384	120							
89.074	65.561	1.663	120							
89.238	143.027	2.307	120							
89.402	100.128	3.291	120							
89.566	90.160	3.020	120							
89.730	239.655	2.479	120							
89.894	267.271	1.782	120							
90.058	225.385	3.229	120							
90.222	136.918	3.866	120							
90.386	134.448	3.079	120							
90.550	223.059	1.998	120							
90.714	240.155	2.445	120							
90.878	184.372	2.466	120							
91.042	197.230	2.618	120							
91.206	197.881	2.618	120							
91.370	352.801	3.184	120							
91.534	376.659	3.667	120							
91.698	392.066	4.892	120							
91.862	412.658	5.726	120							
92.026	457.392	5.957	120							
92.190	511.668	5.410	120							
92.355	471.110	4.868	120							
92.519	263.410	2.372	120							
92.683	236.447	1.716	120							
92.847	207.317	0.924	120							
93.011	217.278	1.154	120							
93.175	261.477	2.102	120							

LIQUEFACTION POTENTIAL ASSESSMENT FOR COARSE GRAINED SOILS USING CONE PENETRATION TEST DATA

Facility: US 60 Bridge
Project No.: 178565011
CPT ID: SP11

Water Elevation during CPT:	325.1	ft
Depth to Water during CPT:	13.8	ft (relative to ground surface during CPT)
Water Elevation during Earthquake:	325.1	ft
Depth to Water during Earthquake:	13.8	ft (relative to ground surface during CPT)
Final Grade Elevation during EQ:	376	ft (if no fill, then set this equal to top of CPT hole elev.)
Height of Final Grade above CPT TOH:	37.1	ft (relative to ground surface during CPT, + Fill, - Cut)
Unit Weight of Cut/Fill to Achieve Final Grade	120	pcf
Cut/Fill Total Stress (+ Fill, - Cut):	2.23	tsf

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σvCPT (tsf)	Total Vertical Stress during EQ σvEQ (tsf)	Static Pore Water Pressure during CPT uSCPT (tsf)	Static Pore Water Pressure during EQ uSEQ (tsf)	Effective Vertical Stress during CPT σvCPT (tsf)	Effective Vertical Stress during EQ σvEQ (tsf)
338.9					Vertical Stresses above 1st CPT:		0.00	2.23	0.00	0.00	0.00	2.23
338.7	0.164	6.26	0.14	120		0.00	0.25	0.01	2.24	0.00	0.01	2.24
338.6	0.328	29.55	0.33	120		0.25	0.16	0.02	2.25	0.00	0.02	2.25
338.4	0.492	77.67	0.60	120		0.41	0.16	0.03	2.26	0.00	0.03	2.26
338.2	0.656	98.71	0.86	120		0.57	0.16	0.04	2.27	0.00	0.04	2.27
338.1	0.820	106.75	0.98	120		0.74	0.16	0.05	2.28	0.00	0.05	2.28
337.9	0.984	99.88	1.06	120		0.90	0.16	0.06	2.29	0.00	0.06	2.29
337.8	1.148	92.49	1.09	120		1.07	0.16	0.07	2.29	0.00	0.07	2.29
337.6	1.312	84.74	1.11	120		1.23	0.16	0.08	2.30	0.00	0.08	2.30
337.4	1.476	79.19	1.12	120		1.39	0.16	0.09	2.31	0.00	0.09	2.31
337.3	1.640	73.42	1.22	120		1.56	0.16	0.10	2.32	0.00	0.10	2.32
337.1	1.804	65.06	1.37	120		1.72	0.16	0.11	2.33	0.00	0.11	2.33
336.9	1.968	55.54	1.56	120		1.89	0.16	0.12	2.34	0.00	0.12	2.34
336.8	2.133	50.76	1.75	120		2.05	0.16	0.13	2.35	0.00	0.13	2.35
336.6	2.297	48.04	1.85	120		2.21	0.16	0.14	2.36	0.00	0.14	2.36
336.4	2.461	45.78	1.73	120		2.38	0.16	0.15	2.37	0.00	0.15	2.37
336.3	2.625	43.82	1.72	120		2.54	0.16	0.16	2.38	0.00	0.16	2.38
336.1	2.789	39.30	1.78	120		2.71	0.16	0.17	2.39	0.00	0.17	2.39
335.9	2.953	38.57	1.62	120		2.87	0.16	0.18	2.40	0.00	0.18	2.40
335.8	3.117	44.45	1.48	120		3.03	0.16	0.19	2.41	0.00	0.19	2.41
335.6	3.281	49.38	1.30	120		3.20	0.16	0.20	2.42	0.00	0.20	2.42
335.5	3.445	54.62	1.07	120		3.36	0.16	0.21	2.43	0.00	0.21	2.43
335.3	3.609	53.31	0.91	120		3.53	0.16	0.22	2.44	0.00	0.22	2.44
335.1	3.773	46.24	0.72	120		3.69	0.16	0.23	2.45	0.00	0.23	2.45
335.0	3.937	35.49	0.96	120		3.85	0.16	0.24	2.46	0.00	0.24	2.46
334.8	4.101	31.10	1.16	120		4.02	0.16	0.25	2.47	0.00	0.25	2.47
334.6	4.265	25.96	1.17	120		4.18	0.16	0.26	2.48	0.00	0.26	2.48
334.5	4.429	23.99	1.09	120		4.35	0.16	0.27	2.49	0.00	0.27	2.49
334.3	4.593	25.85	1.11	120		4.51	0.16	0.28	2.50	0.00	0.28	2.50
334.1	4.757	29.14	1.07	120		4.68	0.16	0.29	2.51	0.00	0.29	2.51
334.0	4.921	37.33	0.90	120		4.84	0.16	0.30	2.52	0.00	0.30	2.52
333.8	5.085	42.76	1.01	120		5.00	0.16	0.31	2.53	0.00	0.31	2.53
333.7	5.249	32.26	1.09	120		5.17	0.16	0.31	2.54	0.00	0.31	2.54
333.5	5.413	25.70	1.15	120		5.33	0.16	0.32	2.55	0.00	0.32	2.55
333.3	5.577	25.47	1.02	120		5.50	0.16	0.33	2.56	0.00	0.33	2.56
333.2	5.741	23.66	0.98	120		5.66	0.16	0.34	2.57	0.00	0.34	2.57
333.0	5.905	22.86	0.90	120		5.82	0.16	0.35	2.58	0.00	0.35	2.58
332.8	6.069	24.37	0.85	120		5.99	0.16	0.36	2.59	0.00	0.36	2.59
332.7	6.234	27.84	0.91	120		6.15	0.16	0.37	2.60	0.00	0.37	2.60
332.5	6.398	31.35	1.13	120		6.32	0.16	0.38	2.61	0.00	0.38	2.61
332.3	6.562	31.85	1.17	120		6.48	0.16	0.39	2.62	0.00	0.39	2.62
332.2	6.726	26.76	1.15	120		6.64	0.16	0.40	2.63	0.00	0.40	2.63
332.0	6.890	23.61	1.04	120		6.81	0.16	0.41	2.64	0.00	0.41	2.64
331.8	7.054	24.76	0.89	120		6.97	0.16	0.42	2.65	0.00	0.42	2.65
331.7	7.218	22.00	0.80	120		7.14	0.16	0.43	2.66	0.00	0.43	2.66
331.5	7.382	22.90	0.75	120		7.30	0.16	0.44	2.67	0.00	0.44	2.67
331.4	7.546	17.84	0.61	120		7.46	0.16	0.45	2.68	0.00	0.45	2.68
331.2	7.710	12.30	0.54	120		7.63	0.16	0.46	2.69	0.00	0.46	2.69
331.0	7.874	10.60	0.46	120		7.79	0.16	0.47	2.70	0.00	0.47	2.70
330.9	8.038	8.99	0.41	120		7.96	0.16	0.48	2.71	0.00	0.48	2.71
330.7	8.202	6.72	0.40	120		8.12	0.16	0.49	2.72	0.00	0.49	2.72
330.5	8.366	8.76	0.37	120		8.28	0.16	0.50	2.73	0.00	0.50	2.73
330.4	8.530	10.20	0.36	120		8.45	0.16	0.51	2.74	0.00	0.51	2.74
330.2	8.694	13.59	0.38	120		8.61	0.16	0.52	2.75	0.00	0.52	2.75
330.0	8.858	19.85	0.55	120		8.78	0.16	0.53	2.76	0.00	0.53	2.76
329.9	9.022	19.35	0.62	120		8.94	0.16	0.54	2.77	0.00	0.54	2.77
329.7	9.186	15.60	0.57	120		9.10	0.16	0.55	2.78	0.00	0.55	2.78
329.5	9.350	12.71	0.44	120		9.27	0.16	0.56	2.79	0.00	0.56	2.79
329.4	9.514	28.95	0.61	120		9.43	0.16	0.57	2.80	0.00	0.57	2.80
329.2	9.678	28.28	0.50	120		9.60	0.16	0.58	2.81	0.00	0.58	2.81
329.1	9.842	24.25	0.43	120		9.76	0.16	0.59	2.82	0.00	0.59	2.82
328.9	10.006	39.88	0.54	120		9.92	0.16	0.60	2.83	0.00	0.60	2.83
328.7	10.170	50.89	0.77	120		10.09	0.16	0.61	2.84	0.00	0.61	2.84

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σv CPT (tsf)	Total Vertical Stress during EQ σv EQ (tsf)	Static Pore Water Pressure during CPT us CPT (tsf)	Static Pore Water Pressure during EQ us EQ (tsf)	Effective Vertical Stress during CPT σv CPT (tsf)	Effective Vertical Stress during EQ σv EQ (tsf)
328.6	10.335	43.59	1.04	120	10.25	0.16	0.62	2.85	0.00	0.00	0.62	2.85
328.4	10.499	30.10	0.78	120	10.42	0.16	0.63	2.86	0.00	0.00	0.63	2.86
328.2	10.663	54.37	0.67	120	10.58	0.16	0.64	2.87	0.00	0.00	0.64	2.87
328.1	10.827	49.22	0.79	120	10.74	0.16	0.65	2.88	0.00	0.00	0.65	2.88
327.9	10.991	37.96	0.65	120	10.91	0.16	0.66	2.89	0.00	0.00	0.66	2.89
327.7	11.155	22.00	0.55	120	11.07	0.16	0.67	2.90	0.00	0.00	0.67	2.90
327.6	11.319	13.27	0.42	120	11.24	0.16	0.68	2.91	0.00	0.00	0.68	2.91
327.4	11.483	11.98	0.26	120	11.40	0.16	0.69	2.91	0.00	0.00	0.69	2.91
327.3	11.647	12.61	0.31	120	11.56	0.16	0.70	2.92	0.00	0.00	0.70	2.92
327.1	11.811	10.50	0.24	120	11.73	0.16	0.71	2.93	0.00	0.00	0.71	2.93
326.9	11.975	13.47	0.20	120	11.89	0.16	0.72	2.94	0.00	0.00	0.72	2.94
326.8	12.139	11.86	0.19	120	12.06	0.16	0.73	2.95	0.00	0.00	0.73	2.95
326.6	12.303	14.57	0.37	120	12.22	0.16	0.74	2.96	0.00	0.00	0.74	2.96
326.4	12.467	29.38	0.34	120	12.39	0.16	0.75	2.97	0.00	0.00	0.75	2.97
326.3	12.631	44.79	0.53	120	12.55	0.16	0.76	2.98	0.00	0.00	0.76	2.98
326.1	12.795	37.22	0.69	120	12.71	0.16	0.77	2.99	0.00	0.00	0.77	2.99
325.9	12.959	39.53	0.64	120	12.88	0.16	0.78	3.00	0.00	0.00	0.78	3.00
325.8	13.123	50.05	0.23	120	13.04	0.16	0.79	3.01	0.00	0.00	0.79	3.01
325.6	13.287	75.77	0.39	120	13.21	0.16	0.80	3.02	0.00	0.00	0.80	3.02
325.4	13.451	38.82	0.57	120	13.37	0.16	0.81	3.03	0.00	0.00	0.81	3.03
325.3	13.615	18.26	0.57	120	13.53	0.16	0.82	3.04	0.00	0.00	0.82	3.04
325.1	13.779	12.90	0.32	120	13.70	0.16	0.83	3.05	0.00	0.00	0.83	3.05
325.0	13.943	14.32	0.27	120	13.86	0.16	0.84	3.06	0.00	0.00	0.83	3.06
324.8	14.107	10.53	0.25	120	14.03	0.16	0.85	3.07	0.01	0.01	0.84	3.06
324.6	14.271	7.71	0.22	120	14.19	0.16	0.86	3.08	0.01	0.01	0.84	3.07
324.5	14.436	15.17	0.35	120	14.35	0.16	0.87	3.09	0.02	0.02	0.85	3.07
324.3	14.600	18.29	0.33	120	14.52	0.16	0.88	3.10	0.02	0.02	0.85	3.08
324.1	14.764	17.00	0.43	120	14.68	0.16	0.89	3.11	0.03	0.03	0.86	3.08
324.0	14.928	10.61	0.41	120	14.85	0.16	0.90	3.12	0.04	0.04	0.86	3.09
323.8	15.092	6.31	0.28	120	15.01	0.16	0.91	3.13	0.04	0.04	0.87	3.09
323.6	15.256	6.85	0.24	120	15.17	0.16	0.92	3.14	0.05	0.05	0.87	3.10
323.5	15.420	8.82	0.18	120	15.34	0.16	0.93	3.15	0.05	0.05	0.87	3.10
323.3	15.584	60.33	0.31	120	15.50	0.16	0.94	3.16	0.06	0.06	0.88	3.11
323.2	15.748	32.71	0.65	120	15.67	0.16	0.94	3.17	0.06	0.06	0.88	3.11
323.0	15.912	16.14	0.62	120	15.83	0.16	0.95	3.18	0.07	0.07	0.89	3.11
322.8	16.076	10.80	0.41	120	15.99	0.16	0.96	3.19	0.07	0.07	0.89	3.12
322.7	16.240	13.09	0.42	120	16.16	0.16	0.97	3.20	0.08	0.08	0.90	3.12
322.5	16.404	30.39	0.44	120	16.32	0.16	0.98	3.21	0.08	0.08	0.90	3.13
322.3	16.568	24.48	0.41	120	16.49	0.16	0.99	3.22	0.09	0.09	0.91	3.13
322.2	16.732	25.12	0.30	120	16.65	0.16	1.00	3.23	0.09	0.09	0.91	3.14
322.0	16.896	25.33	0.53	120	16.81	0.16	1.01	3.24	0.10	0.10	0.92	3.14
321.8	17.060	20.70	0.41	120	16.98	0.16	1.02	3.25	0.10	0.10	0.92	3.15
321.7	17.224	27.91	0.41	120	17.14	0.16	1.03	3.26	0.11	0.11	0.93	3.15
321.5	17.388	25.50	0.36	120	17.31	0.16	1.04	3.27	0.11	0.11	0.93	3.16
321.3	17.552	48.13	0.49	120	17.47	0.16	1.05	3.28	0.12	0.12	0.94	3.16
321.2	17.716	57.50	0.89	120	17.63	0.16	1.06	3.29	0.12	0.12	0.94	3.17
321.0	17.880	28.51	1.30	120	17.80	0.16	1.07	3.30	0.13	0.13	0.95	3.17
320.9	18.044	18.01	1.42	120	17.96	0.16	1.08	3.31	0.13	0.13	0.95	3.18
320.7	18.208	57.21	1.45	120	18.13	0.16	1.09	3.32	0.14	0.14	0.95	3.18
320.5	18.372	124.05	1.87	120	18.29	0.16	1.10	3.33	0.14	0.14	0.96	3.19
320.4	18.537	281.60	2.57	120	18.45	0.16	1.11	3.34	0.15	0.15	0.96	3.19
320.2	18.701	234.58	3.81	120	18.62	0.16	1.12	3.35	0.15	0.15	0.97	3.20
320.0	18.865	162.30	4.22	120	18.78	0.16	1.13	3.36	0.16	0.16	0.97	3.20
319.9	19.029	115.20	3.84	120	18.95	0.16	1.14	3.37	0.16	0.16	0.98	3.20
319.7	19.193	185.23	3.25	120	19.11	0.16	1.15	3.38	0.17	0.17	0.98	3.21
319.5	19.357	240.55	3.48	120	19.27	0.16	1.16	3.39	0.17	0.17	0.99	3.21
319.4	19.521	241.80	2.78	120	19.44	0.16	1.17	3.40	0.18	0.18	0.99	3.22
319.2	19.685	238.24	2.38	120	19.60	0.16	1.18	3.41	0.18	0.18	1.00	3.22
319.1	19.849	219.28	2.20	120	19.77	0.16	1.19	3.42	0.19	0.19	1.00	3.23
318.9	20.013	198.24	1.78	120	19.93	0.16	1.20	3.43	0.19	0.19	1.01	3.23
318.7	20.177	168.72	1.52	120	20.09	0.16	1.21	3.44	0.20	0.20	1.01	3.24
318.6	20.341	119.81	1.44	120	20.26	0.16	1.22	3.45	0.20	0.20	1.02	3.24
318.4	20.505	93.55	1.42	120	20.42	0.16	1.23	3.46	0.21	0.21	1.02	3.25
318.2	20.669	69.25	1.97	120	20.59	0.16	1.24	3.47	0.21	0.21	1.03	3.25
318.1	20.833	45.68	1.69	120	20.75	0.16	1.25	3.48	0.22	0.22	1.03	3.26
317.9	20.997	46.12	1.02	120	20.92	0.16	1.26	3.49	0.22	0.22	1.04	3.26
317.7	21.161	150.11	1.04	120	21.08	0.16	1.27	3.50	0.23	0.23	1.04	3.27
317.6	21.325	200.66	1.29	120	21.24	0.16	1.28	3.51	0.23	0.23	1.04	3.27
317.4	21.489	198.88	1.64	120	21.41	0.16	1.29	3.52	0.24	0.24	1.05	3.28
317.2	21.653	183.47	1.85	120	21.57	0.16	1.30	3.53	0.25	0.25	1.05	3.28
317.1	21.817	163.24	1.94	120	21.74	0.16	1.31	3.54	0.25	0.25	1.06	3.28
316.9	21.981	146.99	1.81	120	21.90	0.16	1.32	3.54	0.26	0.26	1.06	3.29
316.8	22.145	118.23	1.87	120	22.06	0.16	1.33	3.55	0.26	0.26	1.07	3.29
316.6	22.309	82.45	1.46	120	22.23	0.16	1.34	3.56	0.27	0.27	1.07	3.30

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σv CPT (tsf)	Total Vertical Stress during EQ σv EQ (tsf)	Static Pore Water Pressure during CPT us CPT (tsf)	Static Pore Water Pressure during EQ us EQ (tsf)	Effective Vertical Stress during CPT σv CPT (tsf)	Effective Vertical Stress during EQ σv EQ (tsf)
316.4	22.473	86.96	1.48	120	22.39	0.16	1.35	3.57	0.27	0.27	1.08	3.30
316.3	22.638	120.01	1.81	120	22.56	0.16	1.36	3.58	0.28	0.28	1.08	3.31
316.1	22.802	81.15	1.86	120	22.72	0.16	1.37	3.59	0.28	0.28	1.09	3.31
315.9	22.966	108.94	1.16	120	22.88	0.16	1.38	3.60	0.29	0.29	1.09	3.32
315.8	23.130	120.84	0.92	120	23.05	0.16	1.39	3.61	0.29	0.29	1.10	3.32
315.6	23.294	114.51	0.83	120	23.21	0.16	1.40	3.62	0.30	0.30	1.10	3.33
315.4	23.458	124.01	1.02	120	23.38	0.16	1.41	3.63	0.30	0.30	1.11	3.33
315.3	23.622	128.72	1.01	120	23.54	0.16	1.42	3.64	0.31	0.31	1.11	3.34
315.1	23.786	117.54	1.18	120	23.70	0.16	1.43	3.65	0.31	0.31	1.12	3.34
315.0	23.950	113.45	1.32	120	23.87	0.16	1.44	3.66	0.32	0.32	1.12	3.35
314.8	24.114	97.56	1.42	120	24.03	0.16	1.45	3.67	0.32	0.32	1.13	3.35
314.6	24.278	66.18	1.78	120	24.20	0.16	1.46	3.68	0.33	0.33	1.13	3.36
314.5	24.442	37.81	1.38	120	24.36	0.16	1.47	3.69	0.33	0.33	1.13	3.36
314.3	24.606	48.88	1.45	120	24.52	0.16	1.48	3.70	0.34	0.34	1.14	3.37
314.1	24.770	62.40	1.95	120	24.69	0.16	1.49	3.71	0.34	0.34	1.14	3.37
314.0	24.934	48.80	1.95	120	24.85	0.16	1.50	3.72	0.35	0.35	1.15	3.37
313.8	25.098	39.16	1.48	120	25.02	0.16	1.51	3.73	0.35	0.35	1.15	3.38
313.6	25.262	82.02	1.19	120	25.18	0.16	1.52	3.74	0.36	0.36	1.16	3.38
313.5	25.426	131.32	1.00	120	25.34	0.16	1.53	3.75	0.36	0.36	1.16	3.39
313.3	25.590	128.31	1.01	120	25.51	0.16	1.54	3.76	0.37	0.37	1.17	3.39
313.1	25.754	112.91	1.02	120	25.67	0.16	1.55	3.77	0.37	0.37	1.17	3.40
313.0	25.918	102.78	0.90	120	25.84	0.16	1.56	3.78	0.38	0.38	1.18	3.40
312.8	26.082	92.02	0.98	120	26.00	0.16	1.56	3.79	0.38	0.38	1.18	3.41
312.7	26.246	63.83	1.09	120	26.16	0.16	1.57	3.80	0.39	0.39	1.19	3.41
312.5	26.410	42.65	1.26	120	26.33	0.16	1.58	3.81	0.39	0.39	1.19	3.42
312.3	26.574	31.26	1.35	120	26.49	0.16	1.59	3.82	0.40	0.40	1.20	3.42
312.2	26.739	19.83	0.99	120	26.66	0.16	1.60	3.83	0.40	0.40	1.20	3.43
312.0	26.903	14.16	0.54	120	26.82	0.16	1.61	3.84	0.41	0.41	1.21	3.43
311.8	27.067	54.76	0.48	120	26.98	0.16	1.62	3.85	0.41	0.41	1.21	3.44
311.7	27.231	38.49	0.96	120	27.15	0.16	1.63	3.86	0.42	0.42	1.21	3.44
311.5	27.395	28.66	0.77	120	27.31	0.16	1.64	3.87	0.42	0.42	1.22	3.45
311.3	27.559	117.98	0.84	120	27.48	0.16	1.65	3.88	0.43	0.43	1.22	3.45
311.2	27.723	134.89	1.01	120	27.64	0.16	1.66	3.89	0.43	0.43	1.23	3.45
311.0	27.887	98.13	1.40	120	27.80	0.16	1.67	3.90	0.44	0.44	1.23	3.46
310.8	28.051	67.02	1.55	120	27.97	0.16	1.68	3.91	0.44	0.44	1.24	3.46
310.7	28.215	66.41	1.77	120	28.13	0.16	1.69	3.92	0.45	0.45	1.24	3.47
310.5	28.379	63.71	1.61	120	28.30	0.16	1.70	3.93	0.45	0.45	1.25	3.47
310.4	28.543	114.81	1.51	120	28.46	0.16	1.71	3.94	0.46	0.46	1.25	3.48
310.2	28.707	158.58	1.48	120	28.62	0.16	1.72	3.95	0.47	0.47	1.26	3.48
310.0	28.871	166.10	1.42	120	28.79	0.16	1.73	3.96	0.47	0.47	1.26	3.49
309.9	29.035	167.14	1.53	120	28.95	0.16	1.74	3.97	0.48	0.48	1.27	3.49
309.7	29.199	164.18	1.61	120	29.12	0.16	1.75	3.98	0.48	0.48	1.27	3.50
309.5	29.363	169.56	1.61	120	29.28	0.16	1.76	3.99	0.49	0.49	1.28	3.50
309.4	29.527	182.04	1.56	120	29.45	0.16	1.77	4.00	0.49	0.49	1.28	3.51
309.2	29.691	196.76	1.76	120	29.61	0.16	1.78	4.01	0.50	0.50	1.29	3.51
309.0	29.855	206.87	1.97	120	29.77	0.16	1.79	4.02	0.50	0.50	1.29	3.52
308.9	30.019	210.83	1.98	120	29.94	0.16	1.80	4.03	0.51	0.51	1.30	3.52
308.7	30.183	204.39	1.96	120	30.10	0.16	1.81	4.04	0.51	0.51	1.30	3.53
308.6	30.347	206.26	1.86	120	30.27	0.16	1.82	4.05	0.52	0.52	1.30	3.53
308.4	30.511	214.02	1.92	120	30.43	0.16	1.83	4.06	0.52	0.52	1.31	3.54
308.2	30.675	222.55	2.02	120	30.59	0.16	1.84	4.07	0.53	0.53	1.31	3.54
308.1	30.840	215.52	2.10	120	30.76	0.16	1.85	4.08	0.53	0.53	1.32	3.54
307.9	31.004	201.31	1.93	120	30.92	0.16	1.86	4.09	0.54	0.54	1.32	3.55
307.7	31.168	187.54	1.70	120	31.09	0.16	1.87	4.10	0.54	0.54	1.33	3.55
307.6	31.332	153.02	1.65	120	31.25	0.16	1.88	4.11	0.55	0.55	1.33	3.56
307.4	31.496	100.28	1.63	120	31.41	0.16	1.89	4.12	0.55	0.55	1.34	3.56
307.2	31.660	66.24	1.82	120	31.58	0.16	1.90	4.13	0.56	0.56	1.34	3.57
307.1	31.824	35.50	1.49	120	31.74	0.16	1.91	4.14	0.56	0.56	1.35	3.57
306.9	31.988	25.00	1.28	120	31.91	0.16	1.92	4.15	0.57	0.57	1.35	3.58
306.7	32.152	50.53	1.48	120	32.07	0.16	1.93	4.16	0.57	0.57	1.36	3.58
306.6	32.316	26.72	1.42	120	32.23	0.16	1.94	4.16	0.58	0.58	1.36	3.59
306.4	32.480	29.11	1.39	120	32.40	0.16	1.95	4.17	0.58	0.58	1.37	3.59
306.3	32.644	84.69	1.35	120	32.56	0.16	1.96	4.18	0.59	0.59	1.37	3.60
306.1	32.808	91.33	1.08	120	32.73	0.16	1.97	4.19	0.59	0.59	1.38	3.60
305.9	32.972	85.52	0.66	120	32.89	0.16	1.98	4.20	0.60	0.60	1.38	3.61
305.8	33.136	76.49	0.57	120	33.05	0.16	1.99	4.21	0.60	0.60	1.38	3.61
305.6	33.300	74.96	0.59	120	33.22	0.16	2.00	4.22	0.61	0.61	1.39	3.62
305.4	33.464	74.94	0.65	120	33.38	0.16	2.01	4.23	0.61	0.61	1.39	3.62
305.3	33.628	73.52	0.67	120	33.55	0.16	2.02	4.24	0.62	0.62	1.40	3.63
305.1	33.792	75.34	0.69	120	33.71	0.16	2.03	4.25	0.62	0.62	1.40	3.63
304.9	33.956	76.96	0.68	120	33.87	0.16	2.04	4.26	0.63	0.63	1.41	3.63
304.8	34.120	82.22	0.69	120	34.04	0.16	2.05	4.27	0.63	0.63	1.41	3.64
304.6	34.284	92.93	0.71	120	34.20	0.16	2.06	4.28	0.64	0.64	1.42	3.64
304.5	34.448	99.24	1.01	120	34.37	0.16	2.07	4.29	0.64	0.64	1.42	3.65

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σv CPT (tsf)	Total Vertical Stress during EQ σv EQ (tsf)	Static Pore Water Pressure during CPT us CPT (tsf)	Static Pore Water Pressure during EQ us EQ (tsf)	Effective Vertical Stress during CPT σv CPT (tsf)	Effective Vertical Stress during EQ σv EQ (tsf)
304.3	34.612	88.67	1.20	120	34.53	0.16	2.08	4.30	0.65	0.65	1.43	3.65
304.1	34.776	52.60	1.25	120	34.69	0.16	2.09	4.31	0.65	0.65	1.43	3.66
304.0	34.941	61.38	0.97	120	34.86	0.16	2.10	4.32	0.66	0.66	1.44	3.66
303.8	35.105	53.14	0.91	120	35.02	0.16	2.11	4.33	0.66	0.66	1.44	3.67
303.6	35.269	48.96	0.80	120	35.19	0.16	2.12	4.34	0.67	0.67	1.45	3.67
303.5	35.433	90.25	0.89	120	35.35	0.16	2.13	4.35	0.67	0.67	1.45	3.68
303.3	35.597	61.26	1.09	120	35.51	0.16	2.14	4.36	0.68	0.68	1.46	3.68
303.1	35.761	38.87	1.13	120	35.68	0.16	2.15	4.37	0.69	0.69	1.46	3.69
303.0	35.925	26.41	1.01	120	35.84	0.16	2.16	4.38	0.69	0.69	1.47	3.69
302.8	36.089	15.74	0.76	120	36.01	0.16	2.17	4.39	0.70	0.70	1.47	3.70
302.6	36.253	11.18	0.35	120	36.17	0.16	2.18	4.40	0.70	0.70	1.47	3.70
302.5	36.417	18.68	0.59	120	36.33	0.16	2.19	4.41	0.71	0.71	1.48	3.71
302.3	36.581	46.15	1.37	120	36.50	0.16	2.19	4.42	0.71	0.71	1.48	3.71
302.2	36.745	24.40	1.24	120	36.66	0.16	2.20	4.43	0.72	0.72	1.49	3.71
302.0	36.909	36.61	0.61	120	36.83	0.16	2.21	4.44	0.72	0.72	1.49	3.72
301.8	37.073	91.72	0.67	120	36.99	0.16	2.22	4.45	0.73	0.73	1.50	3.72
301.7	37.237	59.45	0.87	120	37.16	0.16	2.23	4.46	0.73	0.73	1.50	3.73
301.5	37.401	30.13	1.10	120	37.32	0.16	2.24	4.47	0.74	0.74	1.51	3.73
301.3	37.565	19.33	0.97	120	37.48	0.16	2.25	4.48	0.74	0.74	1.51	3.74
301.2	37.729	12.17	0.74	120	37.65	0.16	2.26	4.49	0.75	0.75	1.52	3.74
301.0	37.893	9.24	0.38	120	37.81	0.16	2.27	4.50	0.75	0.75	1.52	3.75
300.8	38.057	9.79	0.15	120	37.98	0.16	2.28	4.51	0.76	0.76	1.53	3.75
300.7	38.221	9.39	0.14	120	38.14	0.16	2.29	4.52	0.76	0.76	1.53	3.76
300.5	38.385	9.27	0.10	120	38.30	0.16	2.30	4.53	0.77	0.77	1.54	3.76
300.4	38.549	9.49	0.09	120	38.47	0.16	2.31	4.54	0.77	0.77	1.54	3.77
300.2	38.713	9.73	0.08	120	38.63	0.16	2.32	4.55	0.78	0.78	1.55	3.77
300.0	38.877	10.70	0.07	120	38.80	0.16	2.33	4.56	0.78	0.78	1.55	3.78
299.9	39.042	9.72	0.07	120	38.96	0.16	2.34	4.57	0.79	0.79	1.55	3.78
299.7	39.206	10.05	0.10	120	39.12	0.16	2.35	4.58	0.79	0.79	1.56	3.79
299.5	39.370	10.43	0.12	120	39.29	0.16	2.36	4.59	0.80	0.80	1.56	3.79
299.4	39.534	9.27	0.12	120	39.45	0.16	2.37	4.60	0.80	0.80	1.57	3.80
299.2	39.698	10.01	0.10	120	39.62	0.16	2.38	4.61	0.81	0.81	1.57	3.80
299.0	39.862	11.15	0.08	120	39.78	0.16	2.39	4.62	0.81	0.81	1.58	3.80
298.9	40.026	10.92	0.08	120	39.94	0.16	2.40	4.63	0.82	0.82	1.58	3.81
298.7	40.190	10.80	0.09	120	40.11	0.16	2.41	4.64	0.82	0.82	1.59	3.81
298.5	40.354	10.70	0.09	120	40.27	0.16	2.42	4.65	0.83	0.83	1.59	3.82
298.4	40.518	10.26	0.08	120	40.44	0.16	2.43	4.66	0.83	0.83	1.60	3.82
298.2	40.682	10.11	0.11	120	40.60	0.16	2.44	4.67	0.84	0.84	1.60	3.83
298.1	40.846	11.52	0.13	120	40.76	0.16	2.45	4.68	0.84	0.84	1.61	3.83
297.9	41.010	10.08	0.13	120	40.93	0.16	2.46	4.69	0.85	0.85	1.61	3.84
297.7	41.174	10.27	0.14	120	41.09	0.16	2.47	4.70	0.85	0.85	1.62	3.84
297.6	41.338	10.34	0.10	120	41.26	0.16	2.48	4.71	0.86	0.86	1.62	3.85
297.4	41.502	10.65	0.11	120	41.42	0.16	2.49	4.72	0.86	0.86	1.63	3.85
297.2	41.666	10.78	0.12	120	41.58	0.16	2.50	4.73	0.87	0.87	1.63	3.86
297.1	41.830	11.09	0.12	120	41.75	0.16	2.51	4.74	0.87	0.87	1.64	3.86
296.9	41.994	11.38	0.11	120	41.91	0.16	2.52	4.75	0.88	0.88	1.64	3.87
296.7	42.158	14.82	0.27	120	42.08	0.16	2.53	4.76	0.88	0.88	1.64	3.87
296.6	42.322	15.30	0.44	120	42.24	0.16	2.54	4.77	0.89	0.89	1.65	3.88
296.4	42.486	89.61	0.84	120	42.40	0.16	2.55	4.78	0.90	0.90	1.65	3.88
296.2	42.650	179.63	1.28	120	42.57	0.16	2.56	4.79	0.90	0.90	1.66	3.88
296.1	42.814	200.61	1.65	120	42.73	0.16	2.57	4.79	0.91	0.91	1.66	3.89
295.9	42.978	213.11	1.89	120	42.90	0.16	2.58	4.80	0.91	0.91	1.67	3.89
295.8	43.143	244.17	2.17	120	43.06	0.16	2.59	4.81	0.92	0.92	1.67	3.90
295.6	43.307	262.76	2.56	120	43.22	0.16	2.60	4.82	0.92	0.92	1.68	3.90
295.4	43.471	242.86	2.95	120	43.39	0.16	2.61	4.83	0.93	0.93	1.68	3.91
295.3	43.635	182.81	3.08	120	43.55	0.16	2.62	4.84	0.93	0.93	1.69	3.91
295.1	43.799	99.72	2.87	120	43.72	0.16	2.63	4.85	0.94	0.94	1.69	3.92
294.9	43.963	45.85	2.03	120	43.88	0.16	2.64	4.86	0.94	0.94	1.70	3.92
294.8	44.127	26.38	1.32	120	44.04	0.16	2.65	4.87	0.95	0.95	1.70	3.93
294.6	44.291	20.02	0.64	120	44.21	0.16	2.66	4.88	0.95	0.95	1.71	3.93
294.4	44.455	19.22	0.23	120	44.37	0.16	2.67	4.89	0.96	0.96	1.71	3.94
294.3	44.619	21.76	0.35	120	44.54	0.16	2.68	4.90	0.96	0.96	1.72	3.94
294.1	44.783	19.46	0.37	120	44.70	0.16	2.69	4.91	0.97	0.97	1.72	3.95
294.0	44.947	21.32	0.62	120	44.86	0.16	2.70	4.92	0.97	0.97	1.73	3.95
293.8	45.111	23.99	0.65	120	45.03	0.16	2.71	4.93	0.98	0.98	1.73	3.96
293.6	45.275	17.81	0.70	120	45.19	0.16	2.72	4.94	0.98	0.98	1.73	3.96
293.5	45.439	89.03	0.84	120	45.36	0.16	2.73	4.95	0.99	0.99	1.74	3.97
293.3	45.603	92.27	1.41	120	45.52	0.16	2.74	4.96	0.99	0.99	1.74	3.97
293.1	45.767	52.80	1.74	120	45.69	0.16	2.75	4.97	1.00	1.00	1.75	3.97
293.0	45.931	30.31	1.22	120	45.85	0.16	2.76	4.98	1.00	1.00	1.75	3.98
292.8	46.095	18.65	0.79	120	46.01	0.16	2.77	4.99	1.01	1.01	1.76	3.98
292.6	46.259	18.13	0.28	120	46.18	0.16	2.78	5.00	1.01	1.01	1.76	3.99
292.5	46.423	16.53	0.15	120	46.34	0.16	2.79	5.01	1.02	1.02	1.77	3.99
292.3	46.587	17.26	0.18	120	46.51	0.16	2.80	5.02	1.02	1.02	1.77	4.00

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σv CPT (tsf)	Total Vertical Stress during EQ σv EQ (tsf)	Static Pore Water Pressure during CPT us CPT (tsf)	Static Pore Water Pressure during EQ us EQ (tsf)	Effective Vertical Stress during CPT σv CPT (tsf)	Effective Vertical Stress during EQ σv EQ (tsf)
292.1	46.751	17.29	0.12	120	46.67	0.16	2.81	5.03	1.03	1.03	1.78	4.00
292.0	46.915	17.46	0.12	120	46.83	0.16	2.81	5.04	1.03	1.03	1.78	4.01
291.8	47.079	13.62	0.13	120	47.00	0.16	2.82	5.05	1.04	1.04	1.79	4.01
291.7	47.244	12.79	0.14	120	47.16	0.16	2.83	5.06	1.04	1.04	1.79	4.02
291.5	47.408	12.99	0.13	120	47.33	0.16	2.84	5.07	1.05	1.05	1.80	4.02
291.3	47.572	13.06	0.12	120	47.49	0.16	2.85	5.08	1.05	1.05	1.80	4.03
291.2	47.736	13.69	0.14	120	47.65	0.16	2.86	5.09	1.06	1.06	1.81	4.03
291.0	47.900	13.57	0.13	120	47.82	0.16	2.87	5.10	1.06	1.06	1.81	4.04
290.8	48.064	14.81	0.15	120	47.98	0.16	2.88	5.11	1.07	1.07	1.81	4.04
290.7	48.228	13.77	0.25	120	48.15	0.16	2.89	5.12	1.07	1.07	1.82	4.05
290.5	48.392	13.58	0.16	120	48.31	0.16	2.90	5.13	1.08	1.08	1.82	4.05
290.3	48.556	37.61	0.42	120	48.47	0.16	2.91	5.14	1.08	1.08	1.83	4.05
290.2	48.720	37.57	1.12	120	48.64	0.16	2.92	5.15	1.09	1.09	1.83	4.06
290.0	48.884	22.58	1.16	120	48.80	0.16	2.93	5.16	1.09	1.09	1.84	4.06
289.9	49.048	14.04	0.92	120	48.97	0.16	2.94	5.17	1.10	1.10	1.84	4.07
289.7	49.212	72.21	0.87	120	49.13	0.16	2.95	5.18	1.10	1.10	1.85	4.07
289.5	49.376	112.18	1.11	120	49.29	0.16	2.96	5.19	1.11	1.11	1.85	4.08
289.4	49.540	109.78	1.50	120	49.46	0.16	2.97	5.20	1.12	1.12	1.86	4.08
289.2	49.704	100.89	2.24	120	49.62	0.16	2.98	5.21	1.12	1.12	1.86	4.09
289.0	49.868	57.70	2.66	120	49.79	0.16	2.99	5.22	1.13	1.13	1.87	4.09
288.9	50.032	29.61	1.84	120	49.95	0.16	3.00	5.23	1.13	1.13	1.87	4.10
288.7	50.196	54.36	1.52	120	50.11	0.16	3.01	5.24	1.14	1.14	1.88	4.10
288.5	50.360	41.25	1.45	120	50.28	0.16	3.02	5.25	1.14	1.14	1.88	4.11
288.4	50.524	37.08	1.17	120	50.44	0.16	3.03	5.26	1.15	1.15	1.89	4.11
288.2	50.688	19.72	1.00	120	50.61	0.16	3.04	5.27	1.15	1.15	1.89	4.12
288.0	50.852	19.71	0.54	120	50.77	0.16	3.05	5.28	1.16	1.16	1.90	4.12
287.9	51.016	43.87	0.58	120	50.93	0.16	3.06	5.29	1.16	1.16	1.90	4.13
287.7	51.180	132.40	0.52	120	51.10	0.16	3.07	5.30	1.17	1.17	1.90	4.13
287.6	51.345	137.89	1.17	120	51.26	0.16	3.08	5.31	1.17	1.17	1.91	4.14
287.4	51.509	133.20	1.34	120	51.43	0.16	3.09	5.32	1.18	1.18	1.91	4.14
287.2	51.673	96.76	2.55	120	51.59	0.16	3.10	5.33	1.18	1.18	1.92	4.14
287.1	51.837	56.69	2.72	120	51.75	0.16	3.11	5.34	1.19	1.19	1.92	4.15
286.9	52.001	31.06	2.02	120	51.92	0.16	3.12	5.35	1.19	1.19	1.93	4.15
286.7	52.165	18.00	1.09	120	52.08	0.16	3.13	5.36	1.20	1.20	1.93	4.16
286.6	52.329	16.76	0.45	120	52.25	0.16	3.14	5.37	1.20	1.20	1.94	4.16
286.4	52.493	16.74	0.72	120	52.41	0.16	3.15	5.38	1.21	1.21	1.94	4.17
286.2	52.657	132.19	0.91	120	52.57	0.16	3.16	5.39	1.21	1.21	1.95	4.17
286.1	52.821	203.81	1.45	120	52.74	0.16	3.17	5.40	1.22	1.22	1.95	4.18
285.9	52.985	211.10	1.75	120	52.90	0.16	3.18	5.41	1.22	1.22	1.96	4.18
285.8	53.149	207.60	2.04	120	53.07	0.16	3.19	5.41	1.23	1.23	1.96	4.19
285.6	53.313	219.91	2.31	120	53.23	0.16	3.20	5.42	1.23	1.23	1.97	4.19
285.4	53.477	229.84	2.39	120	53.40	0.16	3.21	5.43	1.24	1.24	1.97	4.20
285.3	53.641	257.62	1.63	120	53.56	0.16	3.22	5.44	1.24	1.24	1.98	4.20
285.1	53.805	211.48	2.26	120	53.72	0.16	3.23	5.45	1.25	1.25	1.98	4.21
284.9	53.969	129.84	2.67	120	53.89	0.16	3.24	5.46	1.25	1.25	1.98	4.21
284.8	54.133	78.22	2.82	120	54.05	0.16	3.25	5.47	1.26	1.26	1.99	4.22
284.6	54.297	48.51	2.67	120	54.22	0.16	3.26	5.48	1.26	1.26	1.99	4.22
284.4	54.461	38.63	1.16	120	54.38	0.16	3.27	5.49	1.27	1.27	2.00	4.23
284.3	54.625	28.89	0.56	120	54.54	0.16	3.28	5.50	1.27	1.27	2.00	4.23
284.1	54.789	30.83	0.71	120	54.71	0.16	3.29	5.51	1.28	1.28	2.01	4.23
283.9	54.953	36.16	1.04	120	54.87	0.16	3.30	5.52	1.28	1.28	2.01	4.24
283.8	55.117	73.40	1.61	120	55.04	0.16	3.31	5.53	1.29	1.29	2.02	4.24
283.6	55.281	97.85	1.62	120	55.20	0.16	3.32	5.54	1.29	1.29	2.02	4.25
283.5	55.446	134.21	2.09	120	55.36	0.16	3.33	5.55	1.30	1.30	2.03	4.25
283.3	55.610	80.73	2.16	120	55.53	0.16	3.34	5.56	1.30	1.30	2.03	4.26
283.1	55.774	68.78	1.89	120	55.69	0.16	3.35	5.57	1.31	1.31	2.04	4.26
283.0	55.938	67.31	1.56	120	55.86	0.16	3.36	5.58	1.31	1.31	2.04	4.27
282.8	56.102	56.94	1.46	120	56.02	0.16	3.37	5.59	1.32	1.32	2.05	4.27
282.6	56.266	43.93	1.73	120	56.18	0.16	3.38	5.60	1.32	1.32	2.05	4.28
282.5	56.430	81.45	1.60	120	56.35	0.16	3.39	5.61	1.33	1.33	2.06	4.28
282.3	56.594	106.42	1.71	120	56.51	0.16	3.40	5.62	1.34	1.34	2.06	4.29
282.1	56.758	118.67	2.74	120	56.68	0.16	3.41	5.63	1.34	1.34	2.07	4.29
282.0	56.922	80.05	3.06	120	56.84	0.16	3.42	5.64	1.35	1.35	2.07	4.30
281.8	57.086	41.40	2.22	120	57.00	0.16	3.43	5.65	1.35	1.35	2.07	4.30
281.7	57.250	26.41	1.41	120	57.17	0.16	3.43	5.66	1.36	1.36	2.08	4.31
281.5	57.414	22.87	0.70	120	57.33	0.16	3.44	5.67	1.36	1.36	2.08	4.31
281.3	57.578	23.15	0.35	120	57.50	0.16	3.45	5.68	1.37	1.37	2.09	4.31
281.2	57.742	26.64	0.23	120	57.66	0.16	3.46	5.69	1.37	1.37	2.09	4.32
281.0	57.906	23.68	0.40	120	57.82	0.16	3.47	5.70	1.38	1.38	2.10	4.32
280.8	58.070	24.16	0.48	120	57.99	0.16	3.48	5.71	1.38	1.38	2.10	4.33
280.7	58.234	115.49	0.62	120	58.15	0.16	3.49	5.72	1.39	1.39	2.11	4.33
280.5	58.398	144.59	1.32	120	58.32	0.16	3.50	5.73	1.39	1.39	2.11	4.34
280.3	58.562	76.78	1.86	120	58.48	0.16	3.51	5.74	1.40	1.40	2.12	4.34
280.2	58.726	46.61	1.60	120	58.64	0.16	3.52	5.75	1.40	1.40	2.12	4.35

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σv CPT (tsf)	Total Vertical Stress during EQ σv EQ (tsf)	Static Pore Water Pressure during CPT us CPT (tsf)	Static Pore Water Pressure during EQ us EQ (tsf)	Effective Vertical Stress during CPT σv CPT (tsf)	Effective Vertical Stress during EQ σv EQ (tsf)
280.0	58.890	32.54	0.87	120	58.81	0.16	3.53	5.76	1.41	1.41	2.13	4.35
279.8	59.054	36.67	0.64	120	58.97	0.16	3.54	5.77	1.41	1.41	2.13	4.36
279.7	59.218	28.20	0.34	120	59.14	0.16	3.55	5.78	1.42	1.42	2.14	4.36
279.5	59.382	22.40	0.39	120	59.30	0.16	3.56	5.79	1.42	1.42	2.14	4.37
279.4	59.547	26.45	0.38	120	59.46	0.16	3.57	5.80	1.43	1.43	2.15	4.37
279.2	59.711	22.86	0.37	120	59.63	0.16	3.58	5.81	1.43	1.43	2.15	4.38
279.0	59.875	149.53	0.67	120	59.79	0.16	3.59	5.82	1.44	1.44	2.15	4.38
278.9	60.039	82.43	1.74	120	59.96	0.16	3.60	5.83	1.44	1.44	2.16	4.39
278.7	60.203	50.62	1.79	120	60.12	0.16	3.61	5.84	1.45	1.45	2.16	4.39
278.5	60.367	27.73	1.44	120	60.28	0.16	3.62	5.85	1.45	1.45	2.17	4.40
278.4	60.531	20.98	0.90	120	60.45	0.16	3.63	5.86	1.46	1.46	2.17	4.40
278.2	60.695	35.33	0.36	120	60.61	0.16	3.64	5.87	1.46	1.46	2.18	4.40
278.0	60.859	24.91	0.33	120	60.78	0.16	3.65	5.88	1.47	1.47	2.18	4.41
277.9	61.023	24.58	0.41	120	60.94	0.16	3.66	5.89	1.47	1.47	2.19	4.41
277.7	61.187	17.80	0.57	120	61.10	0.16	3.67	5.90	1.48	1.48	2.19	4.42
277.5	61.351	22.43	0.80	120	61.27	0.16	3.68	5.91	1.48	1.48	2.20	4.42
277.4	61.515	162.55	0.80	120	61.43	0.16	3.69	5.92	1.49	1.49	2.20	4.43
277.2	61.679	176.45	0.80	120	61.60	0.16	3.70	5.93	1.49	1.49	2.21	4.43
277.1	61.843	172.05	0.79	120	61.76	0.16	3.71	5.94	1.50	1.50	2.21	4.44
276.9	62.007	164.84	0.37	120	61.93	0.16	3.72	5.95	1.50	1.50	2.22	4.44
276.7	62.171	169.34	0.47	120	62.09	0.16	3.73	5.96	1.51	1.51	2.22	4.45
276.6	62.335	186.64	0.56	120	62.25	0.16	3.74	5.97	1.51	1.51	2.23	4.45
276.4	62.499	190.67	0.50	120	62.42	0.16	3.75	5.98	1.52	1.52	2.23	4.46
276.2	62.663	195.16	0.90	120	62.58	0.16	3.76	5.99	1.52	1.52	2.24	4.46
276.1	62.827	112.35	2.31	120	62.75	0.16	3.77	6.00	1.53	1.53	2.24	4.47
275.9	62.991	66.74	2.45	120	62.91	0.16	3.78	6.01	1.53	1.53	2.24	4.47
275.7	63.155	37.52	1.59	120	63.07	0.16	3.79	6.02	1.54	1.54	2.25	4.48
275.6	63.319	64.12	1.09	120	63.24	0.16	3.80	6.03	1.55	1.55	2.25	4.48
275.4	63.483	52.71	0.46	120	63.40	0.16	3.81	6.04	1.55	1.55	2.26	4.48
275.3	63.648	75.03	0.83	120	63.57	0.16	3.82	6.04	1.56	1.56	2.26	4.49
275.1	63.812	47.48	1.08	120	63.73	0.16	3.83	6.05	1.56	1.56	2.27	4.49
274.9	63.976	26.88	0.96	120	63.89	0.16	3.84	6.06	1.57	1.57	2.27	4.50
274.8	64.140	20.58	0.60	120	64.06	0.16	3.85	6.07	1.57	1.57	2.28	4.50
274.6	64.304	24.98	0.94	120	64.22	0.16	3.86	6.08	1.58	1.58	2.28	4.51
274.4	64.468	56.15	1.07	120	64.39	0.16	3.87	6.09	1.58	1.58	2.29	4.51
274.3	64.632	21.80	0.88	120	64.55	0.16	3.88	6.10	1.59	1.59	2.29	4.52
274.1	64.796	30.65	0.99	120	64.71	0.16	3.89	6.11	1.59	1.59	2.30	4.52
273.9	64.960	38.31	0.84	120	64.88	0.16	3.90	6.12	1.60	1.60	2.30	4.53
273.8	65.124	29.77	1.08	120	65.04	0.16	3.91	6.13	1.60	1.60	2.31	4.53
273.6	65.288	120.18	0.88	120	65.21	0.16	3.92	6.14	1.61	1.61	2.31	4.54
273.4	65.452	169.66	0.94	120	65.37	0.16	3.93	6.15	1.61	1.61	2.32	4.54
273.3	65.616	167.66	0.94	120	65.53	0.16	3.94	6.16	1.62	1.62	2.32	4.55
273.1	65.780	157.72	1.10	120	65.70	0.16	3.95	6.17	1.62	1.62	2.33	4.55
273.0	65.944	151.41	1.15	120	65.86	0.16	3.96	6.18	1.63	1.63	2.33	4.56
272.8	66.108	162.66	1.12	120	66.03	0.16	3.97	6.19	1.63	1.63	2.33	4.56
272.6	66.272	167.12	1.19	120	66.19	0.16	3.98	6.20	1.64	1.64	2.34	4.57
272.5	66.436	157.34	1.17	120	66.35	0.16	3.99	6.21	1.64	1.64	2.34	4.57
272.3	66.600	142.69	1.17	120	66.52	0.16	4.00	6.22	1.65	1.65	2.35	4.57
272.1	66.764	132.56	1.04	120	66.68	0.16	4.01	6.23	1.65	1.65	2.35	4.58
272.0	66.928	126.63	0.97	120	66.85	0.16	4.02	6.24	1.66	1.66	2.36	4.58
271.8	67.092	124.19	0.88	120	67.01	0.16	4.03	6.25	1.66	1.66	2.36	4.59
271.6	67.256	125.90	0.94	120	67.17	0.16	4.04	6.26	1.67	1.67	2.37	4.59
271.5	67.420	116.49	1.53	120	67.34	0.16	4.05	6.27	1.67	1.67	2.37	4.60
271.3	67.584	73.51	1.97	120	67.50	0.16	4.06	6.28	1.68	1.68	2.38	4.60
271.2	67.749	40.85	1.91	120	67.67	0.16	4.06	6.29	1.68	1.68	2.38	4.61
271.0	67.913	36.80	1.57	120	67.83	0.16	4.07	6.30	1.69	1.69	2.39	4.61
270.8	68.077	65.78	1.59	120	67.99	0.16	4.08	6.31	1.69	1.69	2.39	4.62
270.7	68.241	97.03	1.54	120	68.16	0.16	4.09	6.32	1.70	1.70	2.40	4.62
270.5	68.405	99.60	1.41	120	68.32	0.16	4.10	6.33	1.70	1.70	2.40	4.63
270.3	68.569	99.41	1.04	120	68.49	0.16	4.11	6.34	1.71	1.71	2.41	4.63
270.2	68.733	100.28	1.03	120	68.65	0.16	4.12	6.35	1.71	1.71	2.41	4.64
270.0	68.897	98.55	1.07	120	68.81	0.16	4.13	6.36	1.72	1.72	2.41	4.64
269.8	69.061	52.69	1.51	120	68.98	0.16	4.14	6.37	1.72	1.72	2.42	4.65
269.7	69.225	34.99	1.24	120	69.14	0.16	4.15	6.38	1.73	1.73	2.42	4.65
269.5	69.389	40.32	1.23	120	69.31	0.16	4.16	6.39	1.73	1.73	2.43	4.65
269.3	69.553	40.08	1.46	120	69.47	0.16	4.17	6.40	1.74	1.74	2.43	4.66
269.2	69.717	114.51	1.48	120	69.63	0.16	4.18	6.41	1.74	1.74	2.44	4.66
269.0	69.881	386.24	1.22	120	69.80	0.16	4.19	6.42	1.75	1.75	2.44	4.67
268.9	70.045	303.59	0.89	120	69.96	0.16	4.20	6.43	1.75	1.75	2.45	4.67
268.7	70.209	229.90	0.80	120	70.13	0.16	4.21	6.44	1.76	1.76	2.45	4.68
268.5	70.373	172.03	0.82	120	70.29	0.16	4.22	6.45	1.77	1.77	2.46	4.68
268.4	70.537	155.49	0.78	120	70.46	0.16	4.23	6.46	1.77	1.77	2.46	4.69
268.2	70.701	183.67	0.40	120	70.62	0.16	4.24	6.47	1.78	1.78	2.47	4.69
268.0	70.865	192.89	0.35	120	70.78	0.16	4.25	6.48	1.78	1.78	2.47	4.70

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σ _{V CPT} (tsf)	Total Vertical Stress during EQ σ _{V EQ} (tsf)	Static Pore Water Pressure during CPT u _{S CPT} (tsf)	Static Pore Water Pressure during EQ u _{S EQ} (tsf)	Effective Vertical Stress during CPT σ _{V CPT} (tsf)	Effective Vertical Stress during EQ σ _{V EQ} (tsf)
267.9	71.029	158.18	0.34	120	70.95	0.16	4.26	6.49	1.79	1.79	2.48	4.70
267.7	71.193	132.74	0.39	120	71.11	0.16	4.27	6.50	1.79	1.79	2.48	4.71
267.5	71.357	128.67	0.65	120	71.28	0.16	4.28	6.51	1.80	1.80	2.49	4.71
267.4	71.521	136.52	0.64	120	71.44	0.16	4.29	6.52	1.80	1.80	2.49	4.72
267.2	71.685	158.68	0.32	120	71.60	0.16	4.30	6.53	1.81	1.81	2.50	4.72
267.1	71.850	199.44	0.52	120	71.77	0.16	4.31	6.54	1.81	1.81	2.50	4.73
266.9	72.014	185.78	0.75	120	71.93	0.16	4.32	6.55	1.82	1.82	2.50	4.73
266.7	72.178	151.75	1.07	120	72.10	0.16	4.33	6.56	1.82	1.82	2.51	4.74
266.6	72.342	101.30	1.72	120	72.26	0.16	4.34	6.57	1.83	1.83	2.51	4.74
266.4	72.506	57.34	1.63	120	72.42	0.16	4.35	6.58	1.83	1.83	2.52	4.74
266.2	72.670	38.97	1.59	120	72.59	0.16	4.36	6.59	1.84	1.84	2.52	4.75
266.1	72.834	49.47	1.21	120	72.75	0.16	4.37	6.60	1.84	1.84	2.53	4.75
265.9	72.998	104.58	0.98	120	72.92	0.16	4.38	6.61	1.85	1.85	2.53	4.76
265.7	73.162	171.46	0.89	120	73.08	0.16	4.39	6.62	1.85	1.85	2.54	4.76
265.6	73.326	195.70	1.41	120	73.24	0.16	4.40	6.63	1.86	1.86	2.54	4.77
265.4	73.490	139.65	2.28	120	73.41	0.16	4.41	6.64	1.86	1.86	2.55	4.77
265.2	73.654	66.87	2.82	120	73.57	0.16	4.42	6.65	1.87	1.87	2.55	4.78
265.1	73.818	39.54	1.40	120	73.74	0.16	4.43	6.66	1.87	1.87	2.56	4.78
264.9	73.982	62.20	3.44	120	73.90	0.16	4.44	6.66	1.88	1.88	2.56	4.79
264.8	74.146	71.11	4.15	120	74.06	0.16	4.45	6.67	1.88	1.88	2.57	4.79
264.6	74.310	62.76	3.67	120	74.23	0.16	4.46	6.68	1.89	1.89	2.57	4.80
264.4	74.474	53.69	2.92	120	74.39	0.16	4.47	6.69	1.89	1.89	2.58	4.80
264.3	74.638	111.46	2.23	120	74.56	0.16	4.48	6.70	1.90	1.90	2.58	4.81
264.1	74.802	184.92	1.98	120	74.72	0.16	4.49	6.71	1.90	1.90	2.58	4.81
263.9	74.966	238.90	1.89	120	74.88	0.16	4.50	6.72	1.91	1.91	2.59	4.82
263.8	75.130	242.57	2.10	120	75.05	0.16	4.51	6.73	1.91	1.91	2.59	4.82
263.6	75.294	234.10	2.25	120	75.21	0.16	4.52	6.74	1.92	1.92	2.60	4.83
263.4	75.458	253.31	2.64	120	75.38	0.16	4.53	6.75	1.92	1.92	2.60	4.83
263.3	75.622	287.96	2.68	120	75.54	0.16	4.54	6.76	1.93	1.93	2.61	4.83
263.1	75.786	314.54	2.78	120	75.70	0.16	4.55	6.77	1.93	1.93	2.61	4.84
262.9	75.951	343.15	3.51	120	75.87	0.16	4.56	6.78	1.94	1.94	2.62	4.84
262.8	76.115	353.36	3.97	120	76.03	0.16	4.57	6.79	1.94	1.94	2.62	4.85
262.6	76.279	353.39	4.45	120	76.20	0.16	4.58	6.80	1.95	1.95	2.63	4.85
262.5	76.443	375.73	4.79	120	76.36	0.16	4.59	6.81	1.95	1.95	2.63	4.86
262.3	76.607	448.18	4.24	120	76.52	0.16	4.60	6.82	1.96	1.96	2.64	4.86
262.1	76.771	539.64	4.10	120	76.69	0.16	4.61	6.83	1.96	1.96	2.64	4.87
262.0	76.935	491.64	3.36	120	76.85	0.16	4.62	6.84	1.97	1.97	2.65	4.87
261.8	77.099	540.83	4.20	120	77.02	0.16	4.63	6.85	1.97	1.97	2.65	4.88
261.6	77.263	546.07	2.88	120	77.18	0.16	4.64	6.86	1.98	1.98	2.66	4.88
261.5	77.427	554.31	3.47	120	77.34	0.16	4.65	6.87	1.99	1.99	2.66	4.89
261.3	77.591	579.99	4.22	120	77.51	0.16	4.66	6.88	1.99	1.99	2.67	4.89
261.1	77.755	409.91	4.06	120	77.67	0.16	4.67	6.89	2.00	2.00	2.67	4.90
261.0	77.919	347.51	4.25	120	77.84	0.16	4.68	6.90	2.00	2.00	2.67	4.90
260.8	78.083	299.98	3.52	120	78.00	0.16	4.68	6.91	2.01	2.01	2.68	4.91
260.7	78.247	227.72	3.45	120	78.17	0.16	4.69	6.92	2.01	2.01	2.68	4.91
260.5	78.411	207.42	2.78	120	78.33	0.16	4.70	6.93	2.02	2.02	2.69	4.91
260.3	78.575	223.47	2.53	120	78.49	0.16	4.71	6.94	2.02	2.02	2.69	4.92
260.2	78.739	279.35	2.05	120	78.66	0.16	4.72	6.95	2.03	2.03	2.70	4.92
260.0	78.903	302.78	2.15	120	78.82	0.16	4.73	6.96	2.03	2.03	2.70	4.93
259.8	79.067	318.95	1.96	120	78.99	0.16	4.74	6.97	2.04	2.04	2.71	4.93
259.7	79.231	298.50	1.52	120	79.15	0.16	4.75	6.98	2.04	2.04	2.71	4.94
259.5	79.395	347.78	2.12	120	79.31	0.16	4.76	6.99	2.05	2.05	2.72	4.94
259.3	79.559	347.45	2.31	120	79.48	0.16	4.77	7.00	2.05	2.05	2.72	4.95
259.2	79.723	346.50	3.16	120	79.64	0.16	4.78	7.01	2.06	2.06	2.73	4.95
259.0	79.887	317.62	3.09	120	79.81	0.16	4.79	7.02	2.06	2.06	2.73	4.96
258.8	80.052	303.04	2.95	120	79.97	0.16	4.80	7.03	2.07	2.07	2.74	4.96
258.7	80.216	283.74	2.59	120	80.13	0.16	4.81	7.04	2.07	2.07	2.74	4.97
258.5	80.380	269.45	2.45	120	80.30	0.16	4.82	7.05	2.08	2.08	2.75	4.97
258.4	80.544	263.79	2.00	120	80.46	0.16	4.83	7.06	2.08	2.08	2.75	4.98
258.2	80.708	240.25	1.46	120	80.63	0.16	4.84	7.07	2.09	2.09	2.75	4.98
258.0	80.872	221.57	1.52	120	80.79	0.16	4.85	7.08	2.09	2.09	2.76	4.99
257.9	81.036	160.50	2.05	120	80.95	0.16	4.86	7.09	2.10	2.10	2.76	4.99
257.7	81.200	127.69	2.49	120	81.12	0.16	4.87	7.10	2.10	2.10	2.77	5.00
257.5	81.364	160.12	2.36	120	81.28	0.16	4.88	7.11	2.11	2.11	2.77	5.00
257.4	81.528	288.68	2.56	120	81.45	0.16	4.89	7.12	2.11	2.11	2.78	5.00
257.2	81.692	273.35	2.03	120	81.61	0.16	4.90	7.13	2.12	2.12	2.78	5.01
257.0	81.856	241.66	2.42	120	81.77	0.16	4.91	7.14	2.12	2.12	2.79	5.01
256.9	82.020	200.58	3.43	120	81.94	0.16	4.92	7.15	2.13	2.13	2.79	5.02
256.7	82.184	179.53	3.47	120	82.10	0.16	4.93	7.16	2.13	2.13	2.80	5.02
256.6	82.348	329.78	3.21	120	82.27	0.16	4.94	7.17	2.14	2.14	2.80	5.03
256.4	82.512	454.66	4.21	120	82.43	0.16	4.95	7.18	2.14	2.14	2.81	5.03
256.2	82.676	491.74	3.85	120	82.59	0.16	4.96	7.19	2.15	2.15	2.81	5.04
256.1	82.840	521.02	3.56	120	82.76	0.16	4.97	7.20	2.15	2.15	2.82	5.04
255.9	83.004	548.59	3.91	120	82.92	0.16	4.98	7.21	2.16	2.16	2.82	5.05

Elev. (ft)	Depth z (ft)	Cone Tip Resistance qt (tsf)	Sleeve Friction fs (tsf)	Unit Weight γ (pcf)	Top of Sampling Interval (ft)	Thickness of Sampling Interval (ft)	Total Vertical Stress during CPT σ _{v CPT} (tsf)	Total Vertical Stress during EQ σ _{v EQ} (tsf)	Static Pore Water Pressure during CPT u _{s CPT} (tsf)	Static Pore Water Pressure during EQ u _{s EQ} (tsf)	Effective Vertical Stress during CPT σ _{v CPT} (tsf)	Effective Vertical Stress during EQ σ _{v EQ} (tsf)
255.7	83.168	505.47	4.21	120	83.09	0.16	4.99	7.22	2.16	2.16	2.83	5.05
255.6	83.332	449.43	4.47	120	83.25	0.16	5.00	7.23	2.17	2.17	2.83	5.06
255.4	83.496	413.23	2.74	120	83.41	0.16	5.01	7.24	2.17	2.17	2.84	5.06
255.2	83.660	348.12	1.46	120	83.58	0.16	5.02	7.25	2.18	2.18	2.84	5.07
255.1	83.824	232.66	1.28	120	83.74	0.16	5.03	7.26	2.18	2.18	2.84	5.07
254.9	83.988	142.99	2.48	120	83.91	0.16	5.04	7.27	2.19	2.19	2.85	5.08
254.7	84.153	85.66	3.06	120	84.07	0.16	5.05	7.28	2.19	2.19	2.85	5.08
254.6	84.317	60.60	2.57	120	84.23	0.16	5.06	7.28	2.20	2.20	2.86	5.08
254.4	84.481	65.11	2.64	120	84.40	0.16	5.07	7.29	2.21	2.21	2.86	5.09
254.3	84.645	84.24	1.62	120	84.56	0.16	5.08	7.30	2.21	2.21	2.87	5.09
254.1	84.809	138.28	1.10	120	84.73	0.16	5.09	7.31	2.22	2.22	2.87	5.10
253.9	84.973	191.19	0.88	120	84.89	0.16	5.10	7.32	2.22	2.22	2.88	5.10
253.8	85.137	267.65	0.60	120	85.05	0.16	5.11	7.33	2.23	2.23	2.88	5.11
253.6	85.301	251.40	0.64	120	85.22	0.16	5.12	7.34	2.23	2.23	2.89	5.11
253.4	85.465	213.29	0.54	120	85.38	0.16	5.13	7.35	2.24	2.24	2.89	5.12
253.3	85.629	180.41	0.28	120	85.55	0.16	5.14	7.36	2.24	2.24	2.90	5.12
253.1	85.793	179.05	0.17	120	85.71	0.16	5.15	7.37	2.25	2.25	2.90	5.13
252.9	85.957	174.85	0.39	120	85.87	0.16	5.16	7.38	2.25	2.25	2.91	5.13
252.8	86.121	161.51	0.45	120	86.04	0.16	5.17	7.39	2.26	2.26	2.91	5.14
252.6	86.285	153.91	0.44	120	86.20	0.16	5.18	7.40	2.26	2.26	2.92	5.14
252.5	86.449	170.13	0.92	120	86.37	0.16	5.19	7.41	2.27	2.27	2.92	5.15
252.3	86.613	190.35	0.59	120	86.53	0.16	5.20	7.42	2.27	2.27	2.93	5.15
252.1	86.777	202.99	0.49	120	86.70	0.16	5.21	7.43	2.28	2.28	2.93	5.16
252.0	86.941	244.48	0.27	120	86.86	0.16	5.22	7.44	2.28	2.28	2.93	5.16
251.8	87.105	230.61	0.06	120	87.02	0.16	5.23	7.45	2.29	2.29	2.94	5.17
251.6	87.269	213.19	0.09	120	87.19	0.16	5.24	7.46	2.29	2.29	2.94	5.17
251.5	87.433	182.07	0.64	120	87.35	0.16	5.25	7.47	2.30	2.30	2.95	5.17
251.3	87.597	144.32	2.33	120	87.52	0.16	5.26	7.48	2.30	2.30	2.95	5.18
251.1	87.761	88.09	1.91	120	87.68	0.16	5.27	7.49	2.31	2.31	2.96	5.18
251.0	87.925	95.98	1.08	120	87.84	0.16	5.28	7.50	2.31	2.31	2.96	5.19
250.8	88.089	221.11	2.05	120	88.01	0.16	5.29	7.51	2.32	2.32	2.97	5.19
250.6	88.254	129.12	2.35	120	88.17	0.16	5.30	7.52	2.32	2.32	2.97	5.20
250.5	88.418	69.97	3.02	120	88.34	0.16	5.31	7.53	2.33	2.33	2.98	5.20
250.3	88.582	88.21	3.33	120	88.50	0.16	5.31	7.54	2.33	2.33	2.98	5.21
250.2	88.746	60.11	2.79	120	88.66	0.16	5.32	7.55	2.34	2.34	2.99	5.21
250.0	88.910	47.94	2.38	120	88.83	0.16	5.33	7.56	2.34	2.34	2.99	5.22
249.8	89.074	65.56	1.66	120	88.99	0.16	5.34	7.57	2.35	2.35	3.00	5.22
249.7	89.238	143.03	2.31	120	89.16	0.16	5.35	7.58	2.35	2.35	3.00	5.23
249.5	89.402	100.13	3.29	120	89.32	0.16	5.36	7.59	2.36	2.36	3.01	5.23
249.3	89.566	90.16	3.02	120	89.48	0.16	5.37	7.60	2.36	2.36	3.01	5.24
249.2	89.730	239.65	2.48	120	89.65	0.16	5.38	7.61	2.37	2.37	3.01	5.24
249.0	89.894	267.27	1.78	120	89.81	0.16	5.39	7.62	2.37	2.37	3.02	5.25
248.8	90.058	225.40	3.23	120	89.98	0.16	5.40	7.63	2.38	2.38	3.02	5.25
248.7	90.222	136.92	3.87	120	90.14	0.16	5.41	7.64	2.38	2.38	3.03	5.25
248.5	90.386	134.45	3.08	120	90.30	0.16	5.42	7.65	2.39	2.39	3.03	5.26
248.3	90.550	223.06	2.00	120	90.47	0.16	5.43	7.66	2.39	2.39	3.04	5.26
248.2	90.714	240.16	2.45	120	90.63	0.16	5.44	7.67	2.40	2.40	3.04	5.27
248.0	90.878	154.57	2.49	120	90.80	0.16	5.45	7.68	2.40	2.40	3.05	5.27
247.9	91.042	110.25	2.65	120	90.96	0.16	5.46	7.69	2.41	2.41	3.05	5.28
247.7	91.206	197.58	2.62	120	91.12	0.16	5.47	7.70	2.42	2.42	3.06	5.28
247.5	91.370	352.80	3.18	120	91.29	0.16	5.48	7.71	2.42	2.42	3.06	5.29
247.4	91.534	378.66	3.57	120	91.45	0.16	5.49	7.72	2.43	2.43	3.07	5.29
247.2	91.698	382.07	4.69	120	91.62	0.16	5.50	7.73	2.43	2.43	3.07	5.30
247.0	91.862	412.66	5.73	120	91.78	0.16	5.51	7.74	2.44	2.44	3.08	5.30
246.9	92.026	457.39	5.96	120	91.94	0.16	5.52	7.75	2.44	2.44	3.08	5.31
246.7	92.190	511.47	5.41	120	92.11	0.16	5.53	7.76	2.45	2.45	3.09	5.31
246.5	92.355	471.11	4.87	120	92.27	0.16	5.54	7.77	2.45	2.45	3.09	5.32
246.4	92.519	293.41	2.37	120	92.44	0.16	5.55	7.78	2.46	2.46	3.10	5.32
246.2	92.683	236.45	1.72	120	92.60	0.16	5.56	7.79	2.46	2.46	3.10	5.33
246.1	92.847	207.32	0.92	120	92.76	0.16	5.57	7.80	2.47	2.47	3.10	5.33
245.9	93.011	217.28	1.15	120	92.93	0.16	5.58	7.81	2.47	2.47	3.11	5.34
245.7	93.175	261.48	2.10	120	93.09	0.08	5.59	7.82	2.48	2.48	3.11	5.34

LIQUEFACTION POTENTIAL ASSESSMENT FOR COARSE GRAINED SOILS USING CONE PENETRATION TEST DATA

Project Site: US 60 Bridge
 Project No.: 178565011
 CPT ID: SP11

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	qc_{IN}	FC (%)	Δqc_{IN}	$(qc_{IN})_{CS}$	a	ξ_R
338.9												
338.7	0.164	61.21	2.23	2.30	0.5	1.70	10.05	47	47.57	57.62	0.350	-0.133
338.6	0.328	204.65	1.12	1.72	0.5	1.70	47.49	1	0.00	47.49	0.350	-0.064
338.4	0.492	439.26	0.78	1.38	0.5	1.70	124.80	0	0.00	124.80	0.350	-0.448
338.2	0.656	483.45	0.87	1.40	0.5	1.70	158.60	0	0.00	158.60	0.350	-0.560
338.1	0.820	467.61	0.92	1.43	0.5	1.70	171.52	0	0.00	171.52	0.350	-0.598
337.9	0.984	399.34	1.06	1.52	0.5	1.70	160.48	0	0.00	160.48	0.350	-0.565
337.8	1.148	342.34	1.18	1.60	0.5	1.70	148.62	0	0.00	148.62	0.350	-0.528
337.6	1.312	293.34	1.31	1.67	0.5	1.70	136.17	0	0.00	136.17	0.350	-0.487
337.4	1.476	258.40	1.42	1.73	0.5	1.70	127.25	2	0.00	127.25	0.350	-0.456
337.3	1.640	227.21	1.67	1.82	0.5	1.70	117.97	9	4.94	122.91	0.350	-0.440
337.1	1.804	191.90	2.10	1.95	0.5	1.70	104.53	19	34.27	138.81	0.350	-0.496
336.9	1.968	156.79	2.81	2.10	0.5	1.70	89.25	31	54.57	143.82	0.350	-0.512
336.8	2.133	137.60	3.45	2.21	0.5	1.70	81.56	39	61.16	142.71	0.350	-0.508
336.6	2.297	125.46	3.86	2.27	0.5	1.70	77.19	44	63.51	140.70	0.350	-0.502
336.4	2.461	115.45	3.79	2.28	0.5	1.70	73.55	46	63.32	136.87	0.350	-0.489
336.3	2.625	106.98	3.94	2.32	0.5	1.70	70.41	48	63.92	134.33	0.350	-0.480
336.1	2.789	93.00	4.54	2.40	0.5	1.70	63.14	55	64.85	127.99	0.350	-0.458
335.9	2.953	88.69	4.22	2.39	0.5	1.70	61.98	54	64.20	126.18	0.350	-0.451
335.8	3.117	99.51	3.34	2.28	0.5	1.70	71.43	46	62.67	134.10	0.350	-0.479
335.6	3.281	107.77	2.65	2.18	0.5	1.70	79.34	38	59.24	138.58	0.350	-0.494
335.5	3.445	116.36	1.96	2.06	0.5	1.70	87.76	28	50.43	138.19	0.350	-0.492
335.3	3.609	110.92	1.70	2.03	0.5	1.70	85.66	26	46.39	132.04	0.350	-0.471
335.1	3.773	94.02	1.57	2.06	0.5	1.70	74.30	28	47.56	121.85	0.350	-0.434
335.0	3.937	70.52	2.71	2.32	0.5	1.70	57.02	48	60.34	117.37	0.350	-0.417
334.8	4.101	60.46	3.75	2.46	0.5	1.70	49.97	60	62.74	112.71	0.350	-0.399
334.6	4.265	49.40	4.56	2.59	0.5	1.70	41.71	70	62.74	104.45	0.350	-0.366
334.5	4.429	58.97	4.60	2.54	0.7	1.70	38.54	66	60.99	99.53	0.350	-0.345
334.3	4.593	47.36	4.34	2.58	0.5	1.70	41.54	70	62.64	104.18	0.350	-0.365
334.1	4.757	52.51	3.70	2.50	0.5	1.70	46.82	63	62.69	109.51	0.350	-0.386
334.0	4.921	66.25	2.44	2.30	0.5	1.70	59.97	47	60.60	120.58	0.350	-0.429
333.8	5.085	74.72	2.38	2.26	0.5	1.70	68.70	44	60.85	129.56	0.350	-0.461
333.7	5.249	55.34	3.40	2.46	0.5	1.70	51.83	60	63.17	115.01	0.350	-0.407
333.5	5.413	54.83	4.53	2.55	0.7	1.70	41.30	67	62.06	103.37	0.350	-0.361
333.3	5.577	42.25	4.05	2.60	0.5	1.70	40.93	71	62.68	103.61	0.350	-0.361
333.2	5.741	48.34	4.22	2.57	0.7	1.70	38.02	68	61.37	99.39	0.350	-0.343
333.0	5.905	45.75	4.02	2.57	0.7	1.70	36.73	69	61.03	97.76	0.350	-0.336
332.8	6.069	38.68	3.53	2.58	0.5	1.70	39.08	70	61.92	100.99	0.350	-0.350
332.7	6.234	43.66	3.32	2.53	0.5	1.66	43.57	65	62.23	105.80	0.350	-0.370
332.5	6.398	48.58	3.65	2.52	0.5	1.62	47.89	65	63.38	111.27	0.350	-0.392
332.3	6.562	48.73	3.72	2.53	0.5	1.60	48.04	65	63.53	111.57	0.350	-0.393
332.2	6.726	48.92	4.38	2.58	0.7	1.61	40.62	69	62.26	102.88	0.350	-0.357
332.0	6.890	42.32	4.48	2.63	0.7	1.60	35.81	73	61.64	97.44	0.350	-0.334
331.8	7.054	43.68	3.65	2.55	0.7	1.58	37.08	67	60.87	97.95	0.350	-0.336
331.7	7.218	38.09	3.69	2.60	0.7	1.58	32.88	71	60.39	93.27	0.350	-0.315
331.5	7.382	39.05	3.32	2.56	0.7	1.56	33.79	68	60.04	93.83	0.350	-0.318
331.4	7.546	29.77	3.49	2.66	0.7	1.57	26.46	76	59.36	85.82	0.350	-0.281
331.2	7.710	25.58	4.58	2.79	1.0	1.58	18.39	86	58.30	76.69	0.350	-0.235
331.0	7.874	21.44	4.53	2.85	1.0	1.57	15.77	91	57.97	73.74	0.350	-0.219
330.9	8.038	17.64	4.85	2.93	1.0	1.56	13.30	97	57.83	71.13	0.350	-0.205
330.7	8.202	12.66	6.42	3.12	1.0	1.56	9.92	100	57.01	66.93	0.350	-0.182
330.5	8.366	16.46	4.47	2.93	1.0	1.53	12.69	97	57.65	70.33	0.350	-0.200
330.4	8.530	18.93	3.76	2.83	1.0	1.51	14.55	90	57.51	72.06	0.350	-0.210
330.2	8.694	25.05	2.89	2.67	1.0	1.48	19.03	76	57.20	76.22	0.350	-0.232
330.0	8.858	29.56	2.85	2.61	0.7	1.44	27.04	72	58.79	85.82	0.350	-0.279
329.9	9.022	28.42	3.32	2.66	0.7	1.43	26.12	76	59.27	85.39	0.350	-0.277
329.7	9.186	27.30	3.80	2.72	1.0	1.43	21.07	80	58.36	79.43	0.350	-0.248
329.5	9.350	21.65	3.61	2.78	1.0	1.43	17.12	85	57.80	74.92	0.350	-0.224
329.4	9.514	36.51	2.14	2.46	0.5	1.37	37.38	60	59.11	96.48	0.350	-0.327
329.2	9.678	35.34	1.82	2.43	0.5	1.36	36.30	57	58.05	94.36	0.350	-0.318
329.1	9.842	29.93	1.81	2.48	0.5	1.36	31.09	61	57.81	88.91	0.350	-0.293

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
328.9	10.006	49.28	1.37	2.24	0.5	1.32	49.68	42	55.06	104.74	0.350	-0.362
328.7	10.170	62.57	1.54	2.19	0.5	1.29	62.00	38	55.34	117.34	0.350	-0.411
328.6	10.335	53.05	2.42	2.37	0.5	1.28	52.91	53	61.06	113.98	0.350	-0.398
328.4	10.499	36.10	2.65	2.52	0.5	1.30	36.95	65	60.26	97.21	0.350	-0.330
328.2	10.663	65.31	1.25	2.11	0.5	1.26	64.92	32	50.80	115.72	0.350	-0.405
328.1	10.827	58.59	1.63	2.23	0.5	1.26	58.40	41	56.70	115.09	0.350	-0.402
327.9	10.991	44.65	1.75	2.34	0.5	1.26	45.24	50	57.93	103.18	0.350	-0.355
327.7	11.155	27.78	2.60	2.60	0.7	1.28	26.54	71	58.58	85.12	0.350	-0.274
327.6	11.319	18.54	3.32	2.81	1.0	1.28	16.10	88	57.75	73.85	0.350	-0.217
327.4	11.483	16.38	2.33	2.76	1.0	1.28	14.45	84	56.80	71.26	0.350	-0.203
327.3	11.647	17.05	2.59	2.77	1.0	1.27	15.08	85	57.11	72.19	0.350	-0.208
327.1	11.811	13.82	2.49	2.84	1.0	1.26	12.50	90	56.89	69.39	0.350	-0.192
326.9	11.975	17.74	1.57	2.63	1.0	1.25	15.86	74	55.85	71.71	0.350	-0.205
326.8	12.139	15.28	1.73	2.71	1.0	1.24	13.88	80	56.17	70.05	0.350	-0.195
326.6	12.303	18.74	2.70	2.75	1.0	1.22	16.86	83	57.43	74.29	0.350	-0.218
326.4	12.467	32.18	1.20	2.35	0.5	1.20	33.30	51	55.32	88.62	0.350	-0.289
326.3	12.631	49.18	1.20	2.20	0.5	1.18	49.86	39	53.42	103.29	0.350	-0.354
326.1	12.795	40.44	1.88	2.39	0.5	1.17	41.27	54	58.45	99.72	0.350	-0.338
325.9	12.959	42.72	1.64	2.33	0.5	1.16	43.52	50	57.39	100.91	0.350	-0.343
325.8	13.123	53.97	0.47	1.95	0.5	1.17	55.39	19	29.22	84.61	0.350	-0.270
325.6	13.287	81.63	0.52	1.82	0.5	1.16	83.16	8	3.74	86.91	0.350	-0.280
325.4	13.451	41.13	1.49	2.32	0.5	1.15	42.02	49	56.55	98.57	0.350	-0.333
325.3	13.615	21.35	3.25	2.75	1.0	1.15	19.89	83	58.40	78.29	0.350	-0.238
325.1	13.779	14.60	2.68	2.83	1.0	1.15	14.03	90	57.35	71.38	0.350	-0.201
325.0	13.943	16.20	2.02	2.73	1.0	1.15	15.50	81	56.81	72.31	0.350	-0.206
324.8	14.107	11.58	2.59	2.91	1.0	1.15	11.40	96	57.11	68.51	0.350	-0.185
324.6	14.271	8.15	3.21	3.09	1.0	1.14	8.34	100	56.52	64.86	0.350	-0.164
324.5	14.436	16.91	2.45	2.76	1.0	1.13	16.26	84	57.37	73.63	0.350	-0.213
324.3	14.600	20.46	1.92	2.63	1.0	1.13	19.51	73	56.89	76.40	0.350	-0.228
324.1	14.764	18.83	2.68	2.74	1.0	1.13	18.08	83	57.76	75.84	0.350	-0.225
324.0	14.928	11.29	4.23	3.04	1.0	1.13	11.30	100	57.44	68.74	0.350	-0.186
323.8	15.092	6.25	5.18	3.30	1.0	1.13	6.72	100	56.02	62.74	0.350	-0.151
323.6	15.256	6.82	3.98	3.20	1.0	1.12	7.27	100	56.19	63.46	0.350	-0.156
323.5	15.420	9.03	2.25	2.97	1.0	1.12	9.32	100	56.83	66.15	0.350	-0.171
323.3	15.584	61.58	0.52	1.92	0.5	1.10	62.86	17	24.56	87.42	0.350	-0.282
323.2	15.748	32.85	2.05	2.48	0.5	1.10	33.91	62	58.64	92.55	0.350	-0.305
323.0	15.912	17.09	4.07	2.89	1.0	1.10	16.81	94	58.64	75.46	0.350	-0.222
322.8	16.076	11.01	4.12	3.04	1.0	1.10	11.26	100	57.43	68.68	0.350	-0.185
322.7	16.240	13.48	3.48	2.93	1.0	1.10	13.58	97	57.92	71.50	0.350	-0.201
322.5	16.404	30.08	1.48	2.43	0.5	1.09	31.22	57	56.73	87.95	0.350	-0.284
322.3	16.568	23.96	1.76	2.55	0.5	1.09	25.13	67	57.41	82.54	0.350	-0.258
322.2	16.732	24.55	1.23	2.46	0.5	1.08	25.73	60	55.83	81.55	0.350	-0.253
322.0	16.896	24.69	2.17	2.60	0.5	1.08	25.84	71	58.27	84.12	0.350	-0.265
321.8	17.060	21.34	2.09	2.64	1.0	1.08	21.10	74	57.44	78.54	0.350	-0.238
321.7	17.224	27.15	1.53	2.47	0.5	1.07	28.31	61	56.88	85.19	0.350	-0.270
321.5	17.388	24.64	1.48	2.50	0.5	1.07	25.82	63	56.69	82.52	0.350	-0.257
321.3	17.552	47.31	1.03	2.18	0.5	1.06	48.35	37	51.68	100.03	0.350	-0.337
321.2	17.716	56.57	1.57	2.23	0.5	1.06	57.42	41	56.47	113.89	0.350	-0.393
321.0	17.880	29.02	4.75	2.76	1.0	1.06	28.57	84	61.10	89.68	0.350	-0.291
320.9	18.044	17.81	8.38	3.09	1.0	1.06	18.06	100	59.54	77.60	0.350	-0.232
320.7	18.208	55.83	2.57	2.37	0.5	1.05	56.68	53	62.16	118.84	0.350	-0.412
320.5	18.372	122.02	1.52	1.97	0.5	1.04	121.70	21	41.29	162.99	0.350	-0.559
320.4	18.537	277.68	0.92	1.57	0.5	1.02	272.72	0	0.00	272.72	0.350	-0.600
320.2	18.701	230.56	1.63	1.81	0.5	1.03	227.42	8	4.11	231.53	0.350	-0.600
320.0	18.865	158.78	2.62	2.07	0.5	1.03	157.27	29	65.05	222.32	0.350	-0.600
319.9	19.029	112.10	3.36	2.25	0.5	1.03	111.92	43	71.35	183.27	0.350	-0.600
319.7	19.193	180.48	1.77	1.90	0.5	1.02	179.17	15	30.96	210.13	0.350	-0.600
319.5	19.357	234.14	1.45	1.77	0.5	1.02	231.90	4	0.07	231.97	0.350	-0.600
319.4	19.521	234.79	1.16	1.69	0.5	1.02	232.77	0	0.00	232.77	0.350	-0.600
319.2	19.685	230.76	1.00	1.65	0.5	1.02	229.09	0	0.00	229.09	0.350	-0.600
319.1	19.849	211.80	1.01	1.68	0.5	1.02	210.83	0	0.00	210.83	0.350	-0.600
318.9	20.013	190.90	0.90	1.67	0.5	1.02	190.57	0	0.00	190.57	0.350	-0.600
318.7	20.177	161.91	0.91	1.72	0.5	1.02	162.23	1	0.00	162.23	0.350	-0.556
318.6	20.341	114.36	1.21	1.92	0.5	1.02	115.12	17	29.90	145.02	0.350	-0.502
318.4	20.505	88.82	1.54	2.07	0.5	1.01	89.74	29	51.87	141.61	0.350	-0.491
318.2	20.669	65.29	2.90	2.36	0.5	1.01	66.35	52	64.35	130.70	0.350	-0.454

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(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
318.1	20.833	42.55	3.81	2.58	0.5	1.01	43.72	69	63.16	106.88	0.350	-0.364
317.9	20.997	42.87	2.27	2.42	0.5	1.01	44.06	57	60.09	104.15	0.350	-0.353
317.7	21.161	141.89	0.70	1.69	0.5	1.01	142.89	0	0.00	142.89	0.350	-0.495
317.6	21.325	189.64	0.65	1.58	0.5	1.00	190.48	0	0.00	190.48	0.350	-0.600
317.4	21.489	187.52	0.83	1.65	0.5	1.00	188.51	0	0.00	188.51	0.350	-0.600
317.2	21.653	172.50	1.02	1.74	0.5	1.00	173.65	2	0.00	173.65	0.350	-0.588
317.1	21.817	152.99	1.20	1.83	0.5	1.00	154.24	9	6.77	161.01	0.350	-0.551
316.9	21.981	137.32	1.24	1.87	0.5	1.00	138.64	13	17.90	156.55	0.350	-0.538
316.8	22.145	109.96	1.60	2.02	0.5	1.00	111.33	24	48.51	159.85	0.350	-0.548
316.6	22.309	76.13	1.80	2.17	0.5	0.99	77.46	36	57.78	135.24	0.350	-0.469
316.4	22.473	80.17	1.73	2.14	0.5	0.99	81.55	34	56.50	138.05	0.350	-0.478
316.3	22.638	110.87	1.53	2.00	0.5	0.99	112.42	23	45.89	158.32	0.350	-0.543
316.1	22.802	74.38	2.33	2.25	0.5	0.99	75.82	43	62.39	138.21	0.350	-0.479
315.9	22.966	100.07	1.08	1.93	0.5	0.99	101.57	17	30.43	131.99	0.350	-0.458
315.8	23.130	110.90	0.77	1.81	0.5	0.98	112.32	7	2.21	114.52	0.350	-0.394
315.6	23.294	104.78	0.73	1.81	0.5	0.98	106.17	8	2.73	108.90	0.350	-0.371
315.4	23.458	113.33	0.84	1.82	0.5	0.98	114.85	8	4.28	119.13	0.350	-0.411
315.3	23.622	117.43	0.80	1.79	0.5	0.98	118.99	6	1.06	120.05	0.350	-0.414
315.1	23.786	106.88	1.02	1.89	0.5	0.98	108.56	14	22.08	130.64	0.350	-0.452
315.0	23.950	102.89	1.17	1.95	0.5	0.98	104.68	19	34.27	138.95	0.350	-0.481
314.8	24.114	88.10	1.47	2.06	0.5	0.97	89.87	28	50.69	140.56	0.350	-0.486
314.6	24.278	59.20	2.75	2.37	0.5	0.97	60.74	53	63.31	124.05	0.350	-0.429
314.5	24.442	32.04	3.80	2.66	1.0	0.97	34.50	76	61.76	96.26	0.350	-0.318
314.3	24.606	43.18	3.05	2.50	0.5	0.96	44.58	63	62.10	106.68	0.350	-0.362
314.1	24.770	55.37	3.20	2.44	0.5	0.97	56.92	58	64.15	121.08	0.350	-0.418
314.0	24.934	41.19	4.13	2.61	1.0	0.96	44.34	72	63.89	108.24	0.350	-0.368
313.8	25.098	32.65	3.93	2.67	1.0	0.96	35.44	76	62.08	97.52	0.350	-0.323
313.6	25.262	72.73	1.47	2.12	0.5	0.96	74.50	33	53.73	128.23	0.350	-0.443
313.5	25.426	117.02	0.77	1.78	0.5	0.96	118.87	6	0.51	119.38	0.350	-0.411
313.3	25.590	114.06	0.79	1.80	0.5	0.96	115.89	7	1.91	117.80	0.350	-0.405
313.1	25.754	99.99	0.91	1.89	0.5	0.95	101.87	14	19.60	121.47	0.350	-0.419
313.0	25.918	90.71	0.89	1.91	0.5	0.95	92.49	16	25.40	117.90	0.350	-0.405
312.8	26.082	80.90	1.08	2.00	0.5	0.95	82.77	23	41.52	124.29	0.350	-0.429
312.7	26.246	55.56	1.76	2.26	0.5	0.95	57.20	44	58.21	115.41	0.350	-0.396
312.5	26.410	36.58	3.06	2.56	0.5	0.94	38.00	68	61.21	99.20	0.350	-0.330
312.3	26.574	24.81	4.55	2.80	1.0	0.94	27.72	87	61.21	88.93	0.350	-0.284
312.2	26.739	15.18	5.45	3.01	1.0	0.93	17.48	100	59.36	76.83	0.350	-0.225
312.0	26.903	10.40	4.33	3.08	1.0	0.93	12.42	100	57.79	70.20	0.350	-0.190
311.8	27.067	46.96	0.90	2.15	0.5	0.93	48.38	35	49.77	98.15	0.350	-0.325
311.7	27.231	32.51	2.61	2.55	0.5	0.93	33.90	67	59.91	93.81	0.350	-0.306
311.5	27.395	22.15	2.86	2.71	1.0	0.93	25.11	80	59.47	84.57	0.350	-0.263
311.3	27.559	102.21	0.73	1.82	0.5	0.93	103.95	8	3.81	107.76	0.350	-0.365
311.2	27.723	116.84	0.76	1.78	0.5	0.93	119.06	6	0.36	119.41	0.350	-0.410
311.0	27.887	84.42	1.45	2.07	0.5	0.94	86.91	29	51.15	138.06	0.350	-0.476
310.8	28.051	57.08	2.37	2.34	0.5	0.93	58.97	50	61.74	120.70	0.350	-0.415
310.7	28.215	56.43	2.73	2.39	0.5	0.93	58.34	54	63.04	121.38	0.350	-0.417
310.5	28.379	53.96	2.60	2.39	0.5	0.93	55.82	54	62.34	118.16	0.350	-0.405
310.4	28.543	98.24	1.34	2.00	0.5	0.93	101.24	23	43.84	145.08	0.350	-0.499
310.2	28.707	136.00	0.94	1.79	0.5	0.93	139.43	6	1.08	140.51	0.350	-0.484
310.0	28.871	142.24	0.86	1.75	0.5	0.93	146.06	3	0.00	146.06	0.350	-0.502
309.9	29.035	142.87	0.92	1.77	0.5	0.93	146.79	5	0.10	146.89	0.350	-0.505
309.7	29.199	140.04	0.99	1.80	0.5	0.93	143.90	7	1.54	145.44	0.350	-0.500
309.5	29.363	144.40	0.96	1.78	0.5	0.93	148.55	5	0.25	148.80	0.350	-0.511
309.4	29.527	154.85	0.86	1.73	0.5	0.93	159.79	1	0.00	159.79	0.350	-0.545
309.2	29.691	167.18	0.90	1.71	0.5	0.93	173.15	0	0.00	173.15	0.350	-0.584
309.0	29.855	175.52	0.96	1.72	0.5	0.93	182.28	0	0.00	182.28	0.350	-0.600
308.9	30.019	178.57	0.95	1.71	0.5	0.93	185.71	0	0.00	185.71	0.350	-0.600
308.7	30.183	172.75	0.97	1.72	0.5	0.93	179.48	1	0.00	179.48	0.350	-0.600
308.6	30.347	174.02	0.91	1.70	0.5	0.93	180.97	0	0.00	180.97	0.350	-0.600
308.4	30.511	180.28	0.91	1.69	0.5	0.93	187.93	0	0.00	187.93	0.350	-0.600
308.2	30.675	187.19	0.92	1.68	0.5	0.93	195.63	0	0.00	195.63	0.350	-0.600
308.1	30.840	180.89	0.98	1.72	0.5	0.93	188.83	0	0.00	188.83	0.350	-0.600
307.9	31.004	168.55	0.97	1.73	0.5	0.92	175.41	2	0.00	175.41	0.350	-0.590
307.7	31.168	156.63	0.92	1.74	0.5	0.92	162.48	2	0.00	162.48	0.350	-0.552
307.6	31.332	127.27	1.09	1.86	0.5	0.91	131.54	12	13.58	145.12	0.350	-0.498
307.4	31.496	82.71	1.66	2.12	0.5	0.91	85.96	32	55.60	141.56	0.350	-0.487

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
307.2	31.660	53.99	2.82	2.41	0.5	0.90	56.14	56	63.13	119.28	0.350	-0.408
307.1	31.824	24.94	4.44	2.79	1.0	0.88	29.61	86	61.70	91.31	0.350	-0.293
306.9	31.988	17.07	5.54	2.98	1.0	0.88	20.69	100	60.35	81.04	0.350	-0.244
306.7	32.152	40.57	3.04	2.52	0.5	0.89	42.30	65	61.82	104.12	0.350	-0.349
306.6	32.316	18.20	5.71	2.97	1.0	0.87	22.05	100	60.78	82.83	0.350	-0.253
306.4	32.480	19.88	5.11	2.90	1.0	0.87	24.01	95	60.96	84.97	0.350	-0.263
306.3	32.644	68.70	1.63	2.17	0.5	0.89	71.41	37	56.64	128.05	0.350	-0.440
306.1	32.808	74.08	1.21	2.06	0.5	0.89	76.78	28	48.22	125.00	0.350	-0.429
305.9	32.972	69.13	0.79	1.98	0.5	0.88	71.09	21	35.56	106.64	0.350	-0.359
305.8	33.136	61.55	0.76	2.01	0.5	0.88	63.33	24	39.34	102.67	0.350	-0.342
305.6	33.300	60.17	0.81	2.03	0.5	0.88	62.00	26	41.93	103.93	0.350	-0.347
305.4	33.464	60.05	0.89	2.06	0.5	0.88	61.99	28	44.69	106.68	0.350	-0.359
305.3	33.628	58.77	0.94	2.08	0.5	0.87	60.74	29	46.52	107.26	0.350	-0.361
305.1	33.792	60.16	0.94	2.07	0.5	0.87	62.18	29	46.20	108.38	0.350	-0.365
304.9	33.956	61.38	0.91	2.05	0.5	0.87	63.41	27	44.80	108.21	0.350	-0.365
304.8	34.120	65.57	0.86	2.02	0.5	0.87	67.65	24	40.82	108.47	0.350	-0.366
304.6	34.284	74.19	0.78	1.95	0.5	0.87	76.28	19	31.03	107.31	0.350	-0.361
304.5	34.448	79.21	1.04	2.00	0.5	0.88	82.08	23	40.80	122.88	0.350	-0.421
304.3	34.612	70.46	1.38	2.12	0.5	0.88	73.36	32	52.86	126.22	0.350	-0.433
304.1	34.776	41.04	2.47	2.46	0.5	0.86	42.87	60	60.66	103.53	0.350	-0.345
304.0	34.941	48.08	1.64	2.29	0.5	0.86	50.08	46	57.63	107.71	0.350	-0.362
303.8	35.105	41.32	1.79	2.37	0.5	0.86	43.10	52	58.36	101.46	0.350	-0.336
303.6	35.269	37.87	1.71	2.39	0.5	0.85	39.54	54	57.90	97.44	0.350	-0.319
303.5	35.433	71.12	1.01	2.03	0.5	0.86	73.73	25	43.64	117.37	0.350	-0.400
303.3	35.597	47.64	1.85	2.33	0.5	0.86	49.69	49	58.86	108.55	0.350	-0.365
303.1	35.761	25.15	3.09	2.68	1.0	0.85	31.11	78	61.00	92.11	0.350	-0.295
303.0	35.925	16.56	4.16	2.91	1.0	0.84	20.92	96	60.03	80.95	0.350	-0.242
302.8	36.089	9.23	5.66	3.18	1.0	0.83	12.32	100	57.76	70.08	0.350	-0.185
302.6	36.253	6.11	3.93	3.24	1.0	0.82	8.70	100	56.63	65.33	0.350	-0.158
302.5	36.417	11.15	3.60	3.00	1.0	0.83	14.61	100	58.47	73.08	0.350	-0.202
302.3	36.581	29.62	3.12	2.63	1.0	0.84	36.83	74	62.02	98.85	0.350	-0.325
302.2	36.745	14.91	5.60	3.02	1.0	0.83	19.13	100	59.87	79.00	0.350	-0.232
302.0	36.909	27.37	1.78	2.51	0.5	0.83	28.84	64	57.70	86.53	0.350	-0.269
301.8	37.073	71.09	0.74	1.95	0.5	0.84	73.17	19	31.47	104.64	0.350	-0.349
301.7	37.237	45.37	1.53	2.29	0.5	0.84	47.34	46	56.95	104.29	0.350	-0.347
301.5	37.401	18.49	3.93	2.85	1.0	0.83	23.56	91	60.43	83.98	0.350	-0.257
301.3	37.565	11.29	5.68	3.12	1.0	0.82	14.94	100	58.57	73.51	0.350	-0.203
301.2	37.729	6.53	7.46	3.38	1.0	0.81	9.32	100	56.83	66.14	0.350	-0.162
301.0	37.893	4.58	5.47	3.42	1.0	0.81	7.04	100	56.12	63.16	0.350	-0.145
300.8	38.057	4.92	1.99	3.17	1.0	0.80	7.45	100	56.24	63.69	0.350	-0.148
300.7	38.221	4.64	1.92	3.18	1.0	0.80	7.13	100	56.15	63.28	0.350	-0.145
300.5	38.385	4.53	1.49	3.14	1.0	0.80	7.02	100	56.11	63.13	0.350	-0.145
300.4	38.549	4.66	1.27	3.10	1.0	0.80	7.18	100	56.16	63.34	0.350	-0.146
300.2	38.713	4.79	1.11	3.06	1.0	0.80	7.35	100	56.21	63.56	0.350	-0.147
300.0	38.877	5.39	0.88	2.98	1.0	0.80	8.07	100	56.44	64.51	0.350	-0.153
299.9	39.042	4.74	0.94	3.04	1.0	0.80	7.31	100	56.20	63.52	0.350	-0.147
299.7	39.206	4.94	1.30	3.08	1.0	0.79	7.55	100	56.28	63.83	0.350	-0.148
299.5	39.370	5.16	1.54	3.10	1.0	0.79	7.83	100	56.36	64.19	0.350	-0.150
299.4	39.534	4.40	1.80	3.19	1.0	0.79	6.93	100	56.09	63.02	0.350	-0.143
299.2	39.698	4.85	1.28	3.09	1.0	0.79	7.48	100	56.26	63.74	0.350	-0.148
299.0	39.862	5.55	0.90	2.97	1.0	0.79	8.33	100	56.52	64.85	0.350	-0.154
298.9	40.026	5.38	0.94	2.99	1.0	0.79	8.14	100	56.46	64.60	0.350	-0.153
298.7	40.190	5.28	1.01	3.01	1.0	0.79	8.04	100	56.43	64.46	0.350	-0.152
298.5	40.354	5.20	1.03	3.02	1.0	0.79	7.95	100	56.40	64.35	0.350	-0.151
298.4	40.518	4.90	1.07	3.05	1.0	0.78	7.60	100	56.29	63.89	0.350	-0.148
298.2	40.682	4.78	1.42	3.11	1.0	0.78	7.47	100	56.25	63.72	0.350	-0.147
298.1	40.846	5.64	1.38	3.04	1.0	0.78	8.51	100	56.58	65.09	0.350	-0.155
297.9	41.010	4.73	1.68	3.15	1.0	0.78	7.43	100	56.24	63.66	0.350	-0.147
297.7	41.174	4.82	1.74	3.15	1.0	0.78	7.55	100	56.28	63.83	0.350	-0.148
297.6	41.338	4.85	1.32	3.09	1.0	0.78	7.59	100	56.29	63.88	0.350	-0.148
297.4	41.502	5.02	1.32	3.08	1.0	0.78	7.81	100	56.36	64.17	0.350	-0.150
297.2	41.666	5.08	1.40	3.08	1.0	0.77	7.89	100	56.38	64.27	0.350	-0.150
297.1	41.830	5.25	1.39	3.07	1.0	0.77	8.11	100	56.45	64.56	0.350	-0.152
296.9	41.994	5.40	1.22	3.03	1.0	0.77	8.31	100	56.51	64.82	0.350	-0.153
296.7	42.158	7.47	2.18	3.03	1.0	0.77	10.85	100	57.30	68.15	0.350	-0.172
296.6	42.322	7.74	3.44	3.12	1.0	0.77	11.19	100	57.41	68.60	0.350	-0.175

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
296.4	42.486	65.81	0.97	2.05	0.5	0.81	68.67	27	44.71	113.39	0.350	-0.382
296.2	42.650	133.66	0.72	1.72	0.5	0.83	140.66	1	0.00	140.66	0.350	-0.479
296.1	42.814	149.28	0.83	1.73	0.5	0.84	159.07	1	0.00	159.07	0.350	-0.538
295.9	42.978	158.46	0.90	1.73	0.5	0.84	170.10	1	0.00	170.10	0.350	-0.570
295.8	43.143	181.57	0.90	1.69	0.5	0.86	198.28	0	0.00	198.28	0.350	-0.600
295.6	43.307	195.27	0.98	1.69	0.5	0.87	215.37	0	0.00	215.37	0.350	-0.600
295.4	43.471	180.07	1.23	1.79	0.5	0.86	196.75	6	0.70	197.45	0.350	-0.600
295.3	43.635	134.87	1.71	1.98	0.5	0.85	147.67	21	46.59	194.26	0.350	-0.600
295.1	43.799	72.57	2.95	2.33	0.5	0.82	77.66	50	66.42	144.08	0.350	-0.490
294.9	43.963	25.47	4.69	2.80	1.0	0.79	34.16	87	63.17	97.33	0.350	-0.315
294.8	44.127	13.95	5.56	3.04	1.0	0.77	19.22	100	59.90	79.11	0.350	-0.230
294.6	44.291	10.18	3.71	3.04	1.0	0.76	14.45	100	58.42	72.86	0.350	-0.197
294.4	44.455	9.67	1.40	2.84	1.0	0.76	13.81	90	57.29	71.10	0.350	-0.188
294.3	44.619	11.13	1.82	2.84	1.0	0.76	15.67	90	57.90	73.56	0.350	-0.201
294.1	44.783	9.75	2.18	2.93	1.0	0.76	13.96	97	58.05	72.01	0.350	-0.193
294.0	44.947	10.80	3.35	3.00	1.0	0.76	15.31	100	58.69	74.00	0.350	-0.203
293.8	45.111	12.30	3.05	2.93	1.0	0.76	17.25	97	59.05	76.30	0.350	-0.215
293.6	45.275	8.70	4.62	3.16	1.0	0.75	12.69	100	57.87	70.56	0.350	-0.185
293.5	45.439	63.62	0.97	2.06	0.5	0.79	66.57	28	45.71	112.28	0.350	-0.376
293.3	45.603	65.92	1.57	2.18	0.5	0.80	69.85	37	56.49	126.34	0.350	-0.429
293.1	45.767	28.63	3.48	2.67	1.0	0.78	38.96	77	63.22	102.18	0.350	-0.335
293.0	45.931	15.71	4.42	2.94	1.0	0.76	21.81	98	60.56	82.37	0.350	-0.246
292.8	46.095	9.03	4.96	3.16	1.0	0.75	13.20	100	58.03	71.23	0.350	-0.188
292.6	46.259	8.71	1.84	2.93	1.0	0.75	12.80	98	57.72	70.52	0.350	-0.184
292.5	46.423	7.78	1.07	2.87	1.0	0.74	11.62	92	56.86	68.48	0.350	-0.173
292.3	46.587	8.16	1.27	2.88	1.0	0.74	12.12	93	57.13	69.25	0.350	-0.177
292.1	46.751	8.15	0.83	2.80	1.0	0.74	12.12	87	56.48	68.60	0.350	-0.173
292.0	46.915	8.22	0.81	2.79	1.0	0.74	12.21	87	56.45	68.67	0.350	-0.173
291.8	47.079	6.04	1.24	2.99	1.0	0.74	9.48	100	56.88	66.35	0.350	-0.160
291.7	47.244	5.56	1.38	3.04	1.0	0.73	8.88	100	56.69	65.57	0.350	-0.156
291.5	47.408	5.65	1.24	3.02	1.0	0.73	9.01	100	56.73	65.74	0.350	-0.157
291.3	47.572	5.67	1.20	3.01	1.0	0.73	9.04	100	56.74	65.78	0.350	-0.157
291.2	47.736	6.00	1.27	3.00	1.0	0.73	9.47	100	56.87	66.34	0.350	-0.160
291.0	47.900	5.91	1.21	3.00	1.0	0.73	9.37	100	56.84	66.21	0.350	-0.159
290.8	48.064	6.57	1.26	2.96	1.0	0.73	10.23	100	57.11	67.34	0.350	-0.166
290.7	48.228	5.98	2.25	3.12	1.0	0.73	9.48	100	56.88	66.36	0.350	-0.160
290.5	48.392	5.86	1.49	3.04	1.0	0.73	9.34	100	56.83	66.17	0.350	-0.159
290.3	48.556	24.95	1.22	2.45	0.5	0.74	26.46	59	55.87	82.33	0.350	-0.245
290.2	48.720	18.89	3.24	2.79	1.0	0.75	26.57	87	60.81	87.39	0.350	-0.269
290.0	48.884	10.69	5.91	3.15	1.0	0.73	15.66	100	58.79	74.45	0.350	-0.204
289.9	49.048	6.02	8.26	3.44	1.0	0.72	9.60	100	56.91	66.51	0.350	-0.160
289.7	49.212	49.54	1.25	2.21	0.5	0.76	52.12	40	54.40	106.53	0.350	-0.352
289.5	49.376	78.01	1.02	2.00	0.5	0.78	82.40	23	40.72	123.12	0.350	-0.416
289.4	49.540	76.20	1.40	2.09	0.5	0.78	81.45	31	52.51	133.97	0.350	-0.454
289.2	49.704	69.76	2.29	2.27	0.5	0.79	75.08	44	62.93	138.00	0.350	-0.468
289.0	49.868	29.30	4.86	2.77	1.0	0.76	41.44	84	65.03	106.46	0.350	-0.352
288.9	50.032	14.22	6.90	3.10	1.0	0.73	20.53	100	60.31	80.84	0.350	-0.237
288.7	50.196	27.37	2.95	2.64	1.0	0.75	38.70	74	62.72	101.42	0.350	-0.331
288.5	50.360	20.32	3.79	2.81	1.0	0.74	28.92	88	61.70	90.62	0.350	-0.283
288.4	50.524	18.06	3.45	2.83	1.0	0.74	25.82	89	60.88	86.70	0.350	-0.265
288.2	50.688	8.83	5.98	3.22	1.0	0.72	13.40	100	58.09	71.49	0.350	-0.188
288.0	50.852	8.79	3.21	3.06	1.0	0.72	13.37	100	58.08	71.46	0.350	-0.188
287.9	51.016	28.78	1.41	2.43	0.5	0.73	30.44	58	56.60	87.04	0.350	-0.266
287.7	51.180	91.11	0.40	1.72	0.5	0.74	92.46	1	0.00	92.46	0.350	-0.291
287.6	51.345	94.85	0.87	1.89	0.5	0.76	99.54	14	20.34	119.88	0.350	-0.403
287.4	51.509	91.43	1.03	1.95	0.5	0.77	97.27	19	33.95	131.22	0.350	-0.444
287.2	51.673	65.74	2.72	2.34	0.5	0.78	70.93	50	64.81	135.74	0.350	-0.460
287.1	51.837	27.86	5.08	2.79	1.0	0.75	40.06	87	64.91	104.97	0.350	-0.345
286.9	52.001	14.49	7.22	3.11	1.0	0.72	21.21	100	60.52	81.73	0.350	-0.240
286.7	52.165	7.69	7.33	3.32	1.0	0.71	12.04	100	57.67	69.71	0.350	-0.177
286.6	52.329	7.03	3.32	3.15	1.0	0.71	11.17	100	57.40	68.57	0.350	-0.171
286.4	52.493	6.99	5.30	3.27	1.0	0.70	11.14	100	57.39	68.53	0.350	-0.171
286.2	52.657	89.90	0.71	1.85	0.5	0.74	92.75	11	11.40	104.15	0.350	-0.341
286.1	52.821	139.62	0.72	1.71	0.5	0.78	150.63	0	0.00	150.63	0.350	-0.508
285.9	52.985	144.51	0.84	1.74	0.5	0.79	156.83	2	0.00	156.83	0.350	-0.527
285.8	53.149	141.90	1.00	1.80	0.5	0.78	153.83	7	1.35	155.18	0.350	-0.522

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
285.6	53.313	150.26	1.07	1.80	0.5	0.79	164.54	7	1.61	166.16	0.350	-0.555
285.4	53.477	156.95	1.06	1.78	0.5	0.80	172.98	5	0.38	173.36	0.350	-0.576
285.3	53.641	175.97	0.64	1.60	0.5	0.81	197.95	0	0.00	197.95	0.350	-0.600
285.1	53.805	143.88	1.08	1.82	0.5	0.79	157.09	8	4.33	161.42	0.350	-0.541
284.9	53.969	87.36	2.11	2.17	0.5	0.78	96.07	37	62.35	158.42	0.350	-0.532
284.8	54.133	37.68	3.76	2.61	1.0	0.75	55.62	72	67.18	122.80	0.350	-0.413
284.6	54.297	22.69	5.90	2.90	1.0	0.73	33.31	95	63.83	97.14	0.350	-0.311
284.4	54.461	17.69	3.27	2.82	1.0	0.71	26.10	89	60.90	87.00	0.350	-0.265
284.3	54.625	12.78	2.18	2.83	1.0	0.70	19.21	90	58.91	78.11	0.350	-0.221
284.1	54.789	13.71	2.58	2.85	1.0	0.70	20.54	91	59.44	79.98	0.350	-0.231
283.9	54.953	16.32	3.17	2.84	1.0	0.71	24.25	90	60.51	84.76	0.350	-0.254
283.8	55.117	47.97	2.29	2.39	0.5	0.74	51.16	54	61.10	112.27	0.350	-0.373
283.6	55.281	64.62	1.71	2.21	0.5	0.75	69.47	39	58.29	127.75	0.350	-0.431
283.5	55.446	89.37	1.59	2.08	0.5	0.77	97.86	29	54.41	152.27	0.350	-0.512
283.3	55.610	52.79	2.79	2.41	0.5	0.74	56.66	56	63.36	120.02	0.350	-0.402
283.1	55.774	44.57	2.89	2.48	0.5	0.73	47.58	61	62.40	109.98	0.350	-0.364
283.0	55.938	43.52	2.44	2.44	0.5	0.73	46.36	58	61.11	107.47	0.350	-0.354
282.8	56.102	26.18	2.72	2.64	1.0	0.72	38.85	74	62.66	101.51	0.350	-0.329
282.6	56.266	19.77	4.26	2.85	1.0	0.71	29.50	91	62.25	91.75	0.350	-0.286
282.5	56.430	52.93	2.05	2.32	0.5	0.74	56.65	49	60.49	117.14	0.350	-0.391
282.3	56.594	69.78	1.66	2.17	0.5	0.75	75.42	37	57.58	133.00	0.350	-0.449
282.1	56.758	77.98	2.38	2.24	0.5	0.76	85.70	43	64.46	150.15	0.350	-0.505
282.0	56.922	37.02	3.99	2.63	1.0	0.74	55.97	74	67.66	123.63	0.350	-0.415
281.8	57.086	18.30	5.85	2.97	1.0	0.70	27.56	100	62.49	90.05	0.350	-0.278
281.7	57.250	11.05	6.14	3.15	1.0	0.69	17.15	100	59.26	76.41	0.350	-0.212
281.5	57.414	9.32	3.60	3.07	1.0	0.68	14.75	100	58.51	73.26	0.350	-0.195
281.3	57.578	9.43	1.76	2.89	1.0	0.68	14.91	95	58.09	72.99	0.350	-0.193
281.2	57.742	11.07	0.99	2.71	1.0	0.68	17.17	80	57.16	74.33	0.350	-0.201
281.0	57.906	9.63	1.98	2.91	1.0	0.68	15.22	96	58.32	73.54	0.350	-0.196
280.8	58.070	9.83	2.31	2.94	1.0	0.68	15.53	98	58.60	74.13	0.350	-0.199
280.7	58.234	75.00	0.55	1.86	0.5	0.70	76.04	12	12.33	88.37	0.350	-0.270
280.5	58.398	94.37	0.94	1.91	0.5	0.74	100.55	16	26.02	126.58	0.350	-0.425
280.3	58.562	48.96	2.54	2.41	0.5	0.72	52.50	56	62.12	114.62	0.350	-0.381
280.2	58.726	20.31	3.72	2.81	1.0	0.70	30.82	88	62.23	93.05	0.350	-0.291
280.0	58.890	13.64	3.00	2.89	1.0	0.68	21.05	94	59.92	80.97	0.350	-0.234
279.8	59.054	15.54	1.93	2.73	1.0	0.69	23.78	81	59.33	83.11	0.350	-0.245
279.7	59.218	11.54	1.39	2.77	1.0	0.68	18.03	84	57.96	75.99	0.350	-0.209
279.5	59.382	8.80	2.08	2.96	1.0	0.67	14.21	100	58.31	72.52	0.350	-0.190
279.4	59.547	10.66	1.67	2.84	1.0	0.67	16.84	90	58.23	75.07	0.350	-0.204
279.2	59.711	8.97	1.91	2.93	1.0	0.67	14.47	98	58.22	72.69	0.350	-0.191
279.0	59.875	96.65	0.46	1.73	0.5	0.70	99.05	1	0.00	99.05	0.350	-0.317
278.9	60.039	52.15	2.20	2.35	0.5	0.72	56.05	51	61.22	117.27	0.350	-0.390
278.7	60.203	21.72	3.81	2.79	1.0	0.70	33.30	86	62.84	96.14	0.350	-0.304
278.5	60.367	11.11	5.96	3.14	1.0	0.67	17.61	100	59.40	77.01	0.350	-0.214
278.4	60.531	7.98	5.21	3.22	1.0	0.66	13.16	100	58.02	71.17	0.350	-0.183
278.2	60.695	14.55	1.14	2.64	1.0	0.67	22.53	74	57.85	80.38	0.350	-0.231
278.0	60.859	9.73	1.54	2.85	1.0	0.67	15.66	91	58.00	73.66	0.350	-0.196
277.9	61.023	9.56	1.97	2.91	1.0	0.66	15.44	96	58.39	73.83	0.350	-0.197
277.7	61.187	6.44	4.01	3.23	1.0	0.66	11.04	100	57.36	68.41	0.350	-0.167
277.5	61.351	8.53	4.27	3.14	1.0	0.66	14.01	100	58.28	72.29	0.350	-0.188
277.4	61.515	104.07	0.50	1.72	0.5	0.70	108.04	1	0.00	108.04	0.350	-0.354
277.2	61.679	113.05	0.47	1.67	0.5	0.71	119.10	0	0.00	119.10	0.350	-0.397
277.1	61.843	110.05	0.47	1.68	0.5	0.71	115.39	0	0.00	115.39	0.350	-0.383
276.9	62.007	105.22	0.23	1.56	0.5	0.70	109.47	0	0.00	109.47	0.350	-0.360
276.7	62.171	108.04	0.28	1.58	0.5	0.71	112.93	0	0.00	112.93	0.350	-0.373
276.6	62.335	119.19	0.31	1.56	0.5	0.72	126.88	0	0.00	126.88	0.350	-0.425
276.4	62.499	121.68	0.27	1.53	0.5	0.72	130.07	0	0.00	130.07	0.350	-0.436
276.2	62.663	124.46	0.47	1.64	0.5	0.72	133.65	0	0.00	133.65	0.350	-0.449
276.1	62.827	70.53	2.12	2.24	0.5	0.73	77.49	42	62.22	139.71	0.350	-0.469
275.9	62.991	28.05	3.89	2.71	1.0	0.70	44.04	80	65.22	109.26	0.350	-0.358
275.7	63.155	14.99	4.71	2.97	1.0	0.67	23.72	100	61.30	85.02	0.350	-0.253
275.6	63.319	39.06	1.81	2.39	0.5	0.69	41.61	54	58.57	100.18	0.350	-0.321
275.4	63.483	31.63	0.93	2.30	0.5	0.67	33.38	47	53.63	87.01	0.350	-0.262
275.3	63.648	46.01	1.17	2.22	0.5	0.69	48.80	41	54.06	102.86	0.350	-0.332
275.1	63.812	19.24	2.47	2.72	1.0	0.67	30.24	80	61.11	91.35	0.350	-0.282
274.9	63.976	10.14	4.18	3.08	1.0	0.65	16.59	100	59.08	75.68	0.350	-0.206

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	(ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
274.8	64.140	7.34	3.61	3.15	1.0	0.64	12.54	100	57.83	70.37	0.350	-0.177
274.6	64.304	9.25	4.45	3.12	1.0	0.65	15.33	100	58.69	74.02	0.350	-0.197
274.4	64.468	22.86	2.04	2.61	1.0	0.68	36.00	72	61.39	97.40	0.350	-0.309
274.3	64.632	7.82	4.88	3.21	1.0	0.64	13.27	100	58.05	71.32	0.350	-0.182
274.1	64.796	11.65	3.69	3.00	1.0	0.65	18.93	100	59.81	78.74	0.350	-0.221
273.9	64.960	14.95	2.43	2.80	1.0	0.66	23.88	87	60.06	83.94	0.350	-0.247
273.8	65.124	11.22	4.19	3.04	1.0	0.65	18.32	100	59.62	77.94	0.350	-0.217
273.6	65.288	74.35	0.75	1.94	0.5	0.69	77.98	18	29.48	107.46	0.350	-0.350
273.4	65.452	105.89	0.57	1.74	0.5	0.69	110.52	2	0.00	110.52	0.350	-0.363
273.3	65.616	104.50	0.57	1.75	0.5	0.69	108.81	3	0.00	108.82	0.350	-0.356
273.1	65.780	98.04	0.71	1.83	0.5	0.68	102.08	9	5.65	107.73	0.350	-0.351
273.0	65.944	93.92	0.78	1.87	0.5	0.69	98.77	12	14.40	113.18	0.350	-0.373
272.8	66.108	100.98	0.71	1.81	0.5	0.68	105.25	8	3.47	108.72	0.350	-0.355
272.6	66.272	103.71	0.73	1.81	0.5	0.69	108.59	8	3.31	111.90	0.350	-0.368
272.5	66.436	97.38	0.76	1.85	0.5	0.69	102.14	11	9.75	111.89	0.350	-0.368
272.3	66.600	87.98	0.84	1.91	0.5	0.69	93.39	16	24.23	117.62	0.350	-0.390
272.1	66.764	81.47	0.81	1.92	0.5	0.69	86.10	17	27.32	113.43	0.350	-0.373
272.0	66.928	77.63	0.79	1.94	0.5	0.68	81.87	18	29.33	111.21	0.350	-0.365
271.8	67.092	76.00	0.73	1.92	0.5	0.68	79.53	17	26.53	106.06	0.350	-0.344
271.6	67.256	77.00	0.77	1.93	0.5	0.68	81.05	18	28.69	109.75	0.350	-0.359
271.5	67.420	70.98	1.36	2.11	0.5	0.70	77.40	32	53.06	130.46	0.350	-0.436
271.3	67.584	29.22	2.84	2.61	1.0	0.68	47.43	72	64.80	112.24	0.350	-0.369
271.2	67.749	15.45	5.19	2.99	1.0	0.65	25.15	100	61.74	86.89	0.350	-0.260
271.0	67.913	13.71	4.81	3.01	1.0	0.65	22.48	100	60.91	83.39	0.350	-0.243
270.8	68.077	25.80	2.58	2.63	1.0	0.67	41.82	73	63.40	105.22	0.350	-0.340
270.7	68.241	58.37	1.65	2.23	0.5	0.69	63.30	41	58.12	121.43	0.350	-0.403
270.5	68.405	59.92	1.48	2.19	0.5	0.69	64.90	38	56.23	121.12	0.350	-0.402
270.3	68.569	59.73	1.10	2.11	0.5	0.68	64.01	32	50.34	114.35	0.350	-0.376
270.2	68.733	60.22	1.08	2.10	0.5	0.68	64.50	31	49.78	114.29	0.350	-0.376
270.0	68.897	59.07	1.13	2.12	0.5	0.68	63.36	33	51.17	114.53	0.350	-0.377
269.8	69.061	20.06	3.10	2.76	1.0	0.66	32.69	84	62.35	95.04	0.350	-0.297
269.7	69.225	12.72	4.01	2.99	1.0	0.64	21.11	100	60.49	81.60	0.350	-0.234
269.5	69.389	14.88	3.41	2.89	1.0	0.64	24.50	94	61.00	85.50	0.350	-0.253
269.3	69.553	14.76	4.07	2.94	1.0	0.64	24.34	98	61.33	85.67	0.350	-0.253
269.2	69.717	68.69	1.34	2.12	0.5	0.69	74.91	32	53.22	128.12	0.350	-0.427
269.0	69.881	237.63	0.32	1.31	0.5	0.80	292.94	0	0.00	292.94	0.350	-0.600
268.9	70.045	186.04	0.30	1.39	0.5	0.78	223.26	0	0.00	223.26	0.350	-0.600
268.7	70.209	140.10	0.35	1.53	0.5	0.72	156.20	0	0.00	156.20	0.350	-0.519
268.5	70.373	104.08	0.49	1.71	0.5	0.67	108.58	0	0.00	108.58	0.350	-0.353
268.4	70.537	93.72	0.52	1.76	0.5	0.65	95.76	4	0.03	95.79	0.350	-0.299
268.2	70.701	111.07	0.22	1.53	0.5	0.68	117.50	0	0.00	117.50	0.350	-0.388
268.0	70.865	116.66	0.18	1.48	0.5	0.68	124.76	0	0.00	124.76	0.350	-0.415
267.9	71.029	95.10	0.22	1.60	0.5	0.65	97.45	0	0.00	97.45	0.350	-0.307
267.7	71.193	79.29	0.30	1.72	0.5	0.63	78.54	1	0.00	78.54	0.350	-0.218
267.5	71.357	76.71	0.52	1.84	0.5	0.63	77.21	10	8.18	85.39	0.350	-0.252
267.4	71.521	81.46	0.48	1.80	0.5	0.63	81.41	7	1.57	82.98	0.350	-0.240
267.2	71.685	95.01	0.21	1.59	0.5	0.65	97.37	0	0.00	97.37	0.350	-0.306
267.1	71.850	119.99	0.27	1.53	0.5	0.69	129.27	0	0.00	129.27	0.350	-0.430
266.9	72.014	111.47	0.41	1.65	0.5	0.67	118.14	0	0.00	118.14	0.350	-0.390
266.7	72.178	90.48	0.73	1.86	0.5	0.66	94.65	12	12.90	107.55	0.350	-0.348
266.6	72.342	59.45	1.77	2.24	0.5	0.68	64.96	42	59.22	124.18	0.350	-0.412
266.4	72.506	21.04	3.08	2.74	1.0	0.65	35.06	83	62.87	97.93	0.350	-0.308
266.2	72.670	13.72	4.58	3.00	1.0	0.63	23.14	100	61.12	84.26	0.350	-0.246
266.1	72.834	17.84	2.68	2.76	1.0	0.64	29.79	84	61.49	91.27	0.350	-0.279
265.9	72.998	61.21	0.98	2.07	0.5	0.66	65.53	29	47.07	112.60	0.350	-0.368
265.7	73.162	101.97	0.53	1.74	0.5	0.65	106.08	2	0.00	106.08	0.350	-0.342
265.6	73.326	116.64	0.73	1.77	0.5	0.68	125.09	5	0.16	125.25	0.350	-0.416
265.4	73.490	82.38	1.68	2.12	0.5	0.70	92.69	33	57.53	150.22	0.350	-0.500
265.2	73.654	24.47	4.52	2.80	1.0	0.65	41.31	87	65.36	106.67	0.350	-0.344
265.1	73.818	13.73	3.98	2.96	1.0	0.62	23.33	100	61.15	84.47	0.350	-0.246
264.9	73.982	22.55	5.95	2.91	1.0	0.65	38.12	96	65.35	103.47	0.350	-0.331
264.8	74.146	25.98	6.23	2.88	1.0	0.66	44.17	93	66.95	111.12	0.350	-0.362
264.6	74.310	22.68	6.29	2.92	1.0	0.65	38.43	97	65.57	104.00	0.350	-0.333
264.4	74.474	19.11	5.92	2.96	1.0	0.64	32.36	100	63.96	96.31	0.350	-0.300
264.3	74.638	64.75	2.09	2.26	0.5	0.68	71.75	44	61.88	133.63	0.350	-0.445
264.1	74.802	109.11	1.10	1.91	0.5	0.70	121.70	16	26.77	148.47	0.350	-0.494

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
263.9	74.966	141.62	0.81	1.73	0.5	0.71	159.67	2	0.00	159.67	0.350	-0.528
263.8	75.130	143.69	0.88	1.76	0.5	0.71	162.69	3	0.01	162.70	0.350	-0.537
263.6	75.294	138.45	0.98	1.80	0.5	0.70	155.72	7	1.62	157.34	0.350	-0.521
263.4	75.458	149.89	1.06	1.80	0.5	0.72	172.25	7	1.54	173.79	0.350	-0.569
263.3	75.622	170.61	0.95	1.72	0.5	0.75	203.00	1	0.00	203.00	0.350	-0.600
263.1	75.786	186.43	0.90	1.68	0.5	0.77	228.02	0	0.00	228.02	0.350	-0.600
262.9	75.951	203.45	1.04	1.70	0.5	0.79	255.57	0	0.00	255.57	0.350	-0.600
262.8	76.115	209.39	1.14	1.72	0.5	0.79	263.05	0	0.00	263.05	0.350	-0.600
262.6	76.279	209.21	1.28	1.75	0.5	0.79	262.95	3	0.00	262.96	0.350	-0.600
262.5	76.443	222.41	1.29	1.74	0.5	0.79	279.44	2	0.00	279.44	0.350	-0.600
262.3	76.607	265.58	0.95	1.59	0.5	0.79	333.17	0	0.00	333.17	0.350	-0.600
262.1	76.771	320.04	0.77	1.47	0.5	0.79	400.96	0	0.00	400.96	0.350	-0.600
262.0	76.935	291.06	0.69	1.46	0.5	0.79	365.13	0	0.00	365.13	0.350	-0.600
261.8	77.099	320.17	0.78	1.47	0.5	0.79	401.48	0	0.00	401.48	0.350	-0.600
261.6	77.263	323.01	0.53	1.35	0.5	0.79	405.18	0	0.00	405.18	0.350	-0.600
261.5	77.427	327.62	0.63	1.40	0.5	0.78	411.09	0	0.00	411.09	0.350	-0.600
261.3	77.591	342.62	0.73	1.43	0.5	0.78	429.94	0	0.00	429.94	0.350	-0.600
261.1	77.755	241.12	1.00	1.63	0.5	0.78	303.72	0	0.00	303.72	0.350	-0.600
261.0	77.919	203.80	1.24	1.75	0.5	0.78	257.36	3	0.00	257.37	0.350	-0.600
260.8	78.083	175.39	1.19	1.78	0.5	0.75	212.10	6	0.61	212.70	0.350	-0.600
260.7	78.247	132.35	1.55	1.95	0.5	0.74	158.55	19	41.91	200.46	0.350	-0.600
260.5	78.411	120.19	1.37	1.94	0.5	0.72	140.18	18	37.74	177.92	0.350	-0.580
260.3	78.575	129.59	1.16	1.87	0.5	0.70	148.46	12	17.55	166.00	0.350	-0.546
260.2	78.739	162.54	0.75	1.67	0.5	0.73	192.13	0	0.00	192.13	0.350	-0.600
260.0	78.903	176.24	0.72	1.63	0.5	0.75	213.76	0	0.00	213.76	0.350	-0.600
259.8	79.067	185.64	0.62	1.57	0.5	0.76	229.10	0	0.00	229.10	0.350	-0.600
259.7	79.231	173.40	0.52	1.55	0.5	0.74	209.42	0	0.00	209.42	0.350	-0.600
259.5	79.395	202.31	0.62	1.54	0.5	0.78	256.50	0	0.00	256.50	0.350	-0.600
259.3	79.559	201.93	0.67	1.57	0.5	0.78	256.14	0	0.00	256.14	0.350	-0.600
259.2	79.723	201.19	0.92	1.66	0.5	0.78	255.32	0	0.00	255.32	0.350	-0.600
259.0	79.887	184.03	0.99	1.71	0.5	0.76	227.03	0	0.00	227.03	0.350	-0.600
258.8	80.052	175.29	0.99	1.73	0.5	0.74	212.93	1	0.00	212.93	0.350	-0.600
258.7	80.216	163.80	0.93	1.73	0.5	0.73	194.79	1	0.00	194.79	0.350	-0.600
258.5	80.380	155.27	0.92	1.74	0.5	0.71	181.68	3	0.00	181.68	0.350	-0.590
258.4	80.544	151.81	0.77	1.70	0.5	0.71	176.48	0	0.00	176.48	0.350	-0.575
258.2	80.708	137.89	0.62	1.67	0.5	0.69	155.87	0	0.00	155.87	0.350	-0.515
258.0	80.872	126.83	0.70	1.73	0.5	0.67	140.08	2	0.00	140.08	0.350	-0.464
257.9	81.036	91.01	1.32	2.02	0.5	0.68	103.12	25	47.35	150.47	0.350	-0.498
257.7	81.200	71.75	2.03	2.22	0.5	0.67	81.01	41	62.05	143.05	0.350	-0.474
257.5	81.364	90.62	1.52	2.06	0.5	0.69	103.83	28	53.45	157.27	0.350	-0.519
257.4	81.528	165.52	0.90	1.72	0.5	0.73	198.13	0	0.00	198.13	0.350	-0.600
257.2	81.692	156.44	0.75	1.68	0.5	0.71	184.00	0	0.00	184.00	0.350	-0.596
257.0	81.856	137.85	1.02	1.81	0.5	0.69	157.25	8	3.61	160.86	0.350	-0.530
256.9	82.020	113.83	1.75	2.04	0.5	0.72	136.32	26	55.62	191.93	0.350	-0.600
256.7	82.184	101.49	1.99	2.11	0.5	0.71	120.37	32	62.06	182.43	0.350	-0.591
256.6	82.348	188.66	0.99	1.70	0.5	0.76	236.56	0	0.00	236.56	0.350	-0.600
256.4	82.512	260.96	0.94	1.59	0.5	0.77	332.48	0	0.00	332.48	0.350	-0.600
256.2	82.676	282.24	0.79	1.51	0.5	0.77	359.43	0	0.00	359.43	0.350	-0.600
256.1	82.840	298.95	0.69	1.45	0.5	0.77	380.66	0	0.00	380.66	0.350	-0.600
255.9	83.004	314.65	0.72	1.45	0.5	0.77	400.63	0	0.00	400.63	0.350	-0.600
255.7	83.168	289.45	0.84	1.53	0.5	0.77	368.98	0	0.00	368.98	0.350	-0.600
255.6	83.332	256.82	1.01	1.62	0.5	0.77	327.92	0	0.00	327.92	0.350	-0.600
255.4	83.496	235.70	0.67	1.52	0.5	0.77	301.38	0	0.00	301.38	0.350	-0.600
255.2	83.660	197.93	0.43	1.45	0.5	0.77	253.62	0	0.00	253.62	0.350	-0.600
255.1	83.824	131.21	0.56	1.66	0.5	0.67	146.91	0	0.00	146.91	0.350	-0.486
254.9	83.988	79.45	1.80	2.15	0.5	0.67	90.76	35	59.72	150.48	0.350	-0.497
254.7	84.153	28.24	3.79	2.70	1.0	0.63	51.35	79	67.28	118.63	0.350	-0.388
254.6	84.317	19.43	4.62	2.88	1.0	0.61	34.85	94	64.13	98.98	0.350	-0.309
254.4	84.481	20.97	4.40	2.84	1.0	0.61	37.69	91	64.67	102.35	0.350	-0.323
254.3	84.645	45.44	2.05	2.37	0.5	0.62	49.49	53	60.25	109.74	0.350	-0.353
254.1	84.809	76.39	0.83	1.95	0.5	0.63	81.97	19	32.58	114.56	0.350	-0.372
253.9	84.973	106.65	0.47	1.70	0.5	0.62	112.87	0	0.00	112.87	0.350	-0.365
253.8	85.137	150.34	0.23	1.42	0.5	0.70	175.90	0	0.00	175.90	0.350	-0.572
253.6	85.301	140.91	0.26	1.47	0.5	0.68	161.57	0	0.00	161.57	0.350	-0.531
253.4	85.465	119.01	0.26	1.53	0.5	0.64	129.82	0	0.00	129.82	0.350	-0.428
253.3	85.629	100.12	0.16	1.53	0.5	0.61	104.27	0	0.00	104.27	0.350	-0.331

Elev.	Depth	Normalized Cone Resistance	Normalized Friction Ratio	Soil Behavior Type Index	Soil Type Exponent	Normalizing Factor for CPT Resistance	Normalized Average Cone Tip Resistance	Fines Content	Clean Sand Correction	Clean Sand Normalized Average Cone Tip Resistance	Static Shear Stress Ratio	Relative State Parameter Index
(ft)	z (ft)	Q	F (%)	I_c	n	C_N	q_{c1N}	FC (%)	Δq_{c1N}	$(q_{c1N})_{CS}$	a	ξ_R
253.1	85.793	99.26	0.15	1.53	0.5	0.61	103.16	0	0.00	103.16	0.350	-0.326
252.9	85.957	96.78	0.23	1.59	0.5	0.60	99.94	0	0.00	99.94	0.350	-0.312
252.8	86.121	89.09	0.29	1.67	0.5	0.59	90.16	0	0.00	90.16	0.350	-0.269
252.6	86.285	84.68	0.29	1.69	0.5	0.58	84.68	0	0.00	84.68	0.350	-0.243
252.5	86.449	93.84	0.56	1.78	0.5	0.60	96.27	6	0.34	96.61	0.350	-0.298
252.3	86.613	105.25	0.32	1.62	0.5	0.62	111.11	0	0.00	111.11	0.350	-0.358
252.1	86.777	112.34	0.25	1.55	0.5	0.63	120.73	0	0.00	120.73	0.350	-0.395
252.0	86.941	135.79	0.15	1.39	0.5	0.67	154.33	0	0.00	154.33	0.350	-0.508
251.8	87.105	127.81	0.15	1.42	0.5	0.65	142.63	0	0.00	142.63	0.350	-0.471
251.6	87.269	117.83	0.15	1.45	0.5	0.64	128.40	0	0.00	128.40	0.350	-0.422
251.5	87.433	100.11	0.36	1.66	0.5	0.61	104.34	0	0.00	104.34	0.350	-0.330
251.3	87.597	78.67	1.68	2.14	0.5	0.66	89.92	34	58.11	148.03	0.350	-0.488
251.1	87.761	46.82	2.30	2.40	0.5	0.62	51.32	55	61.41	112.73	0.350	-0.364
251.0	87.925	51.23	1.19	2.19	0.5	0.61	55.46	38	53.76	109.22	0.350	-0.350
250.8	88.089	121.80	0.95	1.83	0.5	0.65	136.37	9	6.94	143.31	0.350	-0.473
250.6	88.254	69.83	1.90	2.21	0.5	0.65	79.13	40	60.94	140.06	0.350	-0.462
250.5	88.418	21.72	4.66	2.85	1.0	0.60	40.01	91	65.42	105.43	0.350	-0.335
250.3	88.582	27.80	4.02	2.73	1.0	0.62	51.93	81	67.74	119.67	0.350	-0.390
250.2	88.746	18.34	5.09	2.93	1.0	0.59	33.73	97	64.16	97.89	0.350	-0.303
250.0	88.910	14.24	5.60	3.04	1.0	0.58	26.27	100	62.09	88.35	0.350	-0.260
249.8	89.074	20.10	2.76	2.73	1.0	0.60	36.93	81	63.28	100.21	0.350	-0.313
249.7	89.238	77.27	1.68	2.14	0.5	0.65	88.31	34	58.23	146.54	0.350	-0.483
249.5	89.402	31.53	3.47	2.64	1.0	0.63	59.80	74	68.94	128.74	0.350	-0.423
249.3	89.566	28.17	3.56	2.69	1.0	0.62	52.94	78	67.54	120.48	0.350	-0.393
249.2	89.730	131.17	1.06	1.84	0.5	0.67	151.20	10	9.20	160.39	0.350	-0.526
249.0	89.894	146.52	0.68	1.68	0.5	0.68	171.56	0	0.00	171.56	0.350	-0.558
248.8	90.058	122.99	1.47	1.96	0.5	0.70	148.91	20	42.19	191.10	0.350	-0.600
248.7	90.222	73.46	2.94	2.33	0.5	0.66	85.23	49	68.23	153.46	0.350	-0.504
248.5	90.386	72.02	2.39	2.27	0.5	0.65	82.83	45	65.02	147.86	0.350	-0.487
248.3	90.550	121.38	0.92	1.82	0.5	0.64	135.64	9	5.23	140.87	0.350	-0.464
248.2	90.714	130.81	1.04	1.83	0.5	0.66	150.57	10	8.24	158.81	0.350	-0.521
248.0	90.878	83.04	1.67	2.12	0.5	0.66	96.04	32	57.76	153.80	0.350	-0.505
247.9	91.042	58.31	2.53	2.35	0.5	0.63	65.48	51	63.90	129.38	0.350	-0.425
247.7	91.206	106.82	1.36	1.98	0.5	0.67	125.84	21	43.69	169.52	0.350	-0.552
247.5	91.370	192.97	0.92	1.67	0.5	0.75	251.28	0	0.00	251.28	0.350	-0.600
247.4	91.534	207.17	0.96	1.66	0.5	0.76	270.52	0	0.00	270.52	0.350	-0.600
247.2	91.698	208.89	1.25	1.75	0.5	0.76	272.85	3	0.00	272.85	0.350	-0.600
247.0	91.862	225.68	1.41	1.77	0.5	0.76	294.58	4	0.07	294.64	0.350	-0.600
246.9	92.026	250.28	1.32	1.72	0.5	0.75	326.38	0	0.00	326.38	0.350	-0.600
246.7	92.190	280.01	1.07	1.61	0.5	0.75	364.82	0	0.00	364.82	0.350	-0.600
246.5	92.355	257.48	1.05	1.63	0.5	0.75	335.90	0	0.00	335.90	0.350	-0.600
246.4	92.519	159.07	0.82	1.70	0.5	0.70	192.80	0	0.00	192.80	0.350	-0.600
246.2	92.683	127.49	0.74	1.75	0.5	0.64	143.19	3	0.00	143.19	0.350	-0.471
246.1	92.847	111.32	0.46	1.67	0.5	0.61	119.88	0	0.00	119.88	0.350	-0.390
245.9	93.011	116.72	0.55	1.70	0.5	0.62	127.54	0	0.00	127.54	0.350	-0.417
245.7	93.175	140.98	0.82	1.74	0.5	0.66	163.87	2	0.00	163.87	0.350	-0.535

LIQUEFACTION POTENTIAL ASSESSMENT FOR COARSE GRAINED SOILS USING CONE PENETRATION TEST DATA

Depth to Water during Earthquake:		13.8 ft
Final Grade Elevation during EQ:		376.0 ft
Height of Final Grade above CPT TOH:		37.1 ft
Normalize K_v to:		1.058 tsf
a_{max} at top of ground surface:		0.16 g
Earthquake Magnitude:		7.70 Mw
Earthquake File or Source Zone:		Design Source

Shear Stress Fit Parameters

m4:	0
m3:	0
m2:	0
m1:	0

Project Site: US 60 Bridge

Stantec Project No.: 178665011

CPT ID: SP11

Elev. (ft)	Depth z (ft)	Cyclic Resistance Ratio $CRR_{7.5}$	Relative Density D_r (%)	Correction for Overburden Pressure K_σ	Sloping Ground K_α	Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., r_d	From Ground Response			Sample Screened for:			Factor of Safety FS_{eq}	Material (optional)	Soil Type (see note on following chart)
									Maximum Induced Shear Stress τ_{Max} (psf)	Average Cyclic Shear Stress τ_{Avg} (psf)	Cyclic Stress Ratio CSR	Clay-like $(qc_{3N})/CS \geq 175$	High Tip Res.	Unsaturated			
338.9																	
338.7	0.164	0.098	33	0.943	N/A	0.99	N/A	0.892	0	0	0.094	FALSE	FALSE	TRUE	N/A	N/A	A1
338.6	0.328	0.091	26	0.948	N/A	0.99	N/A	0.892	0	0	0.094	FALSE	FALSE	TRUE	N/A	N/A	A1
338.4	0.492	0.183	65	0.902	N/A	0.97	N/A	0.891	0	0	0.094	FALSE	FALSE	TRUE	N/A	N/A	A1
338.2	0.656	0.357	76	0.868	N/A	0.95	N/A	0.891	0	0	0.094	FALSE	FALSE	TRUE	N/A	N/A	A1
338.1	0.820	0.530	80	0.850	N/A	0.94	N/A	0.890	0	0	0.094	FALSE	FALSE	TRUE	N/A	N/A	A1
337.9	0.984	0.376	76	0.864	N/A	0.95	N/A	0.889	0	0	0.094	FALSE	FALSE	TRUE	N/A	N/A	A1
337.8	1.148	0.280	73	0.877	N/A	0.96	N/A	0.889	0	0	0.094	FALSE	FALSE	TRUE	N/A	N/A	A1
337.6	1.312	0.219	69	0.889	N/A	0.97	N/A	0.888	0	0	0.094	FALSE	FALSE	TRUE	N/A	N/A	A1
337.4	1.476	0.189	66	0.896	N/A	0.97	N/A	0.887	0	0	0.094	FALSE	FALSE	TRUE	N/A	N/A	A1
337.3	1.640	0.178	64	0.899	N/A	0.97	N/A	0.887	0	0	0.094	FALSE	FALSE	TRUE	N/A	N/A	A1
337.1	1.804	0.229	70	0.885	N/A	0.96	N/A	0.886	0	0	0.094	FALSE	FALSE	TRUE	N/A	N/A	A1
336.9	1.968	0.253	71	0.879	N/A	0.96	N/A	0.885	0	0	0.094	FALSE	FALSE	TRUE	N/A	N/A	A1
336.8	2.133	0.247	71	0.880	N/A	0.96	N/A	0.885	0	0	0.094	FALSE	FALSE	TRUE	N/A	N/A	A1
336.6	2.297	0.237	70	0.881	N/A	0.96	N/A	0.884	0	0	0.093	FALSE	FALSE	TRUE	N/A	N/A	A1
336.4	2.461	0.221	69	0.884	N/A	0.97	N/A	0.883	0	0	0.093	FALSE	FALSE	TRUE	N/A	N/A	A1
336.3	2.625	0.212	68	0.886	N/A	0.97	N/A	0.883	0	0	0.093	FALSE	FALSE	TRUE	N/A	N/A	A1
336.1	2.789	0.191	66	0.891	N/A	0.97	N/A	0.882	0	0	0.093	FALSE	FALSE	TRUE	N/A	N/A	A1
335.9	2.953	0.186	65	0.892	N/A	0.97	N/A	0.881	0	0	0.093	FALSE	FALSE	TRUE	N/A	N/A	A1
335.8	3.117	0.211	68	0.885	N/A	0.97	N/A	0.881	0	0	0.093	FALSE	FALSE	TRUE	N/A	N/A	A1
335.6	3.281	0.228	69	0.880	N/A	0.96	N/A	0.880	0	0	0.093	FALSE	FALSE	TRUE	N/A	N/A	A1
335.5	3.445	0.227	69	0.879	N/A	0.96	N/A	0.879	0	0	0.093	FALSE	FALSE	TRUE	N/A	N/A	A1
335.3	3.609	0.204	67	0.885	N/A	0.97	N/A	0.879	0	0	0.093	FALSE	FALSE	TRUE	N/A	N/A	A1
335.1	3.773	0.175	64	0.894	N/A	0.97	N/A	0.878	0	0	0.093	FALSE	FALSE	TRUE	N/A	N/A	A1
335.0	3.937	0.166	62	0.897	N/A	0.98	N/A	0.877	0	0	0.093	FALSE	FALSE	TRUE	N/A	N/A	A1
334.8	4.101	0.157	60	0.900	N/A	0.98	N/A	0.877	0	0	0.093	FALSE	FALSE	TRUE	N/A	N/A	A1
334.6	4.265	0.143	57	0.906	N/A	0.98	N/A	0.876	0	0	0.093	FALSE	FALSE	TRUE	N/A	N/A	B
334.5	4.429	0.137	55	0.909	N/A	0.98	N/A	0.875	0	0	0.093	FALSE	FALSE	TRUE	N/A	N/A	B
334.3	4.593	0.143	57	0.905	N/A	0.98	N/A	0.875	0	0	0.093	FALSE	FALSE	TRUE	N/A	N/A	B
334.1	4.757	0.151	59	0.901	N/A	0.98	N/A	0.874	0	0	0.092	FALSE	FALSE	TRUE	N/A	N/A	A1
334.0	4.921	0.173	63	0.891	N/A	0.97	N/A	0.873	0	0	0.092	FALSE	FALSE	TRUE	N/A	N/A	A1
333.8	5.085	0.196	66	0.882	N/A	0.97	N/A	0.873	0	0	0.092	FALSE	FALSE	TRUE	N/A	N/A	A1
333.7	5.249	0.161	61	0.895	N/A	0.98	N/A	0.872	0	0	0.092	FALSE	FALSE	TRUE	N/A	N/A	A1
333.5	5.413	0.142	56	0.904	N/A	0.98	N/A	0.871	0	0	0.092	FALSE	FALSE	TRUE	N/A	N/A	B
333.3	5.577	0.142	56	0.903	N/A	0.98	N/A	0.871	0	0	0.092	FALSE	FALSE	TRUE	N/A	N/A	B
333.2	5.741	0.137	55	0.906	N/A	0.98	N/A	0.870	0	0	0.092	FALSE	FALSE	TRUE	N/A	N/A	B
333.0	5.905	0.134	54	0.907	N/A	0.98	N/A	0.869	0	0	0.092	FALSE	FALSE	TRUE	N/A	N/A	B
332.8	6.069	0.139	55	0.904	N/A	0.98	N/A	0.869	0	0	0.092	FALSE	FALSE	TRUE	N/A	N/A	A1
332.7	6.234	0.145	57	0.900	N/A	0.98	N/A	0.868	0	0	0.092	FALSE	FALSE	TRUE	N/A	N/A	A1
332.5	6.398	0.154	60	0.895	N/A	0.98	N/A	0.867	0	0	0.092	FALSE	FALSE	TRUE	N/A	N/A	A1
332.3	6.562	0.155	60	0.894	N/A	0.98	N/A	0.867	0	0	0.092	FALSE	FALSE	TRUE	N/A	N/A	A1
332.2	6.726	0.141	56	0.901	N/A	0.98	N/A	0.866	0	0	0.092	FALSE	FALSE	TRUE	N/A	N/A	B
332.0	6.890	0.134	54	0.905	N/A	0.98	N/A	0.865	0	0	0.092	FALSE	FALSE	TRUE	N/A	N/A	B
331.8	7.054	0.135	54	0.904	N/A	0.98	N/A	0.865	0	0	0.091	FALSE	FALSE	TRUE	N/A	N/A	B
331.7	7.218	0.129	52	0.907	N/A	0.99	N/A	0.864	0	0	0.091	FALSE	FALSE	TRUE	N/A	N/A	B

From Ground Response										Sample Screened for:										Factor of Safety		Material (optional)	Soil Type (see note on following chart)
Elev. (ft)	Depth z	Cyclic Resistance Ratio $CRR_{7.5}$	Relative Density D_r (%)	Correction for Overburden Pressure		Correction for Sloping Ground K_σ	Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., r_d	Induced Shear Stress τ_{max} (psf)	Maximum Average Cyclic Shear Stress τ_{Avg} (psf)	Cyclic Stress Ratio CSR	Clay-like $(q_{c30}/c_s \geq 175)$	Unsaturated	High Tip Res.	FS_{liq}							
				Pressure K_p	Ground K_σ																		
331.5	7.382	0.130	52	0.906	N/A	0.99	N/A	N/A	0.863	0	0	0.091	FALSE	TRUE	FALSE	N/A	N/A	B					
331.4	7.546	0.121	49	0.911	N/A	0.99	N/A	N/A	0.863	0	0	0.091	FALSE	TRUE	FALSE	N/A	N/A	B					
331.2	7.710	N/A	44	N/A	N/A	N/A	N/A	N/A	0.862	0	0	0.091	TRUE	TRUE	FALSE	N/A	N/A	B					
331.0	7.874	N/A	43	N/A	N/A	N/A	N/A	N/A	0.861	0	0	0.091	TRUE	TRUE	FALSE	N/A	N/A	B					
330.9	8.038	N/A	41	N/A	N/A	N/A	N/A	N/A	0.861	0	0	0.091	TRUE	TRUE	FALSE	N/A	N/A	B					
330.7	8.202	N/A	39	N/A	N/A	N/A	N/A	N/A	0.860	0	0	0.091	TRUE	TRUE	FALSE	N/A	N/A	B					
330.5	8.366	N/A	41	N/A	N/A	N/A	N/A	N/A	0.859	0	0	0.091	TRUE	TRUE	FALSE	N/A	N/A	B					
330.4	8.530	N/A	42	N/A	N/A	N/A	N/A	N/A	0.859	0	0	0.091	TRUE	TRUE	FALSE	N/A	N/A	B					
330.2	8.694	N/A	44	N/A	N/A	N/A	N/A	N/A	0.858	0	0	0.091	TRUE	TRUE	FALSE	N/A	N/A	B					
330.0	8.858	0.121	49	0.909	N/A	0.99	N/A	N/A	0.857	0	0	0.091	FALSE	TRUE	FALSE	N/A	N/A	B					
329.9	9.022	0.121	48	0.909	N/A	0.99	N/A	N/A	0.857	0	0	0.091	FALSE	TRUE	FALSE	N/A	N/A	B					
329.7	9.186	N/A	45	N/A	N/A	N/A	N/A	N/A	0.856	0	0	0.091	TRUE	TRUE	FALSE	N/A	N/A	B					
329.5	9.350	N/A	43	N/A	N/A	N/A	N/A	N/A	0.855	0	0	0.090	TRUE	TRUE	FALSE	N/A	N/A	B					
329.4	9.514	0.133	53	0.899	N/A	0.98	N/A	N/A	0.855	0	0	0.090	FALSE	TRUE	FALSE	N/A	N/A	B					
329.2	9.678	0.130	53	0.901	N/A	0.98	N/A	N/A	0.854	0	0	0.090	FALSE	TRUE	FALSE	N/A	N/A	A1					
329.1	9.842	0.124	50	0.904	N/A	0.99	N/A	N/A	0.853	0	0	0.090	FALSE	TRUE	FALSE	N/A	N/A	A1					
328.9	10.006	0.144	57	0.891	N/A	0.98	N/A	N/A	0.853	0	0	0.090	FALSE	TRUE	FALSE	N/A	N/A	A1					
328.7	10.170	0.166	62	0.880	N/A	0.98	N/A	N/A	0.852	0	0	0.090	FALSE	TRUE	FALSE	N/A	N/A	A1					
328.6	10.335	0.159	61	0.882	N/A	0.98	N/A	N/A	0.851	0	0	0.090	FALSE	TRUE	FALSE	N/A	N/A	A1					
328.4	10.499	0.134	54	0.897	N/A	0.98	N/A	N/A	0.850	0	0	0.090	FALSE	TRUE	FALSE	N/A	N/A	A1					
328.2	10.663	0.162	61	0.880	N/A	0.98	N/A	N/A	0.850	0	0	0.090	FALSE	TRUE	FALSE	N/A	N/A	A1					
328.1	10.827	0.161	61	0.880	N/A	0.98	N/A	N/A	0.849	0	0	0.090	FALSE	TRUE	FALSE	N/A	N/A	A1					
327.9	10.991	0.142	56	0.890	N/A	0.98	N/A	N/A	0.848	0	0	0.090	FALSE	TRUE	FALSE	N/A	N/A	A1					
327.7	11.155	0.121	48	0.905	N/A	0.99	N/A	N/A	0.848	0	0	0.090	FALSE	TRUE	FALSE	N/A	N/A	B					
327.6	11.319	N/A	43	N/A	N/A	N/A	N/A	N/A	0.847	0	0	0.090	TRUE	TRUE	FALSE	N/A	N/A	B					
327.4	11.483	N/A	41	N/A	N/A	N/A	N/A	N/A	0.846	0	0	0.090	TRUE	TRUE	FALSE	N/A	N/A	C					
327.3	11.647	N/A	42	N/A	N/A	N/A	N/A	N/A	0.846	0	0	0.089	TRUE	TRUE	FALSE	N/A	N/A	B					
327.1	11.811	N/A	40	N/A	N/A	N/A	N/A	N/A	0.845	0	0	0.089	TRUE	TRUE	FALSE	N/A	N/A	C					
326.9	11.975	N/A	41	N/A	N/A	N/A	N/A	N/A	0.844	0	0	0.089	TRUE	TRUE	FALSE	N/A	N/A	C					
326.8	12.139	N/A	40	N/A	N/A	N/A	N/A	N/A	0.844	0	0	0.089	TRUE	TRUE	FALSE	N/A	N/A	C					
326.6	12.303	N/A	43	N/A	N/A	N/A	N/A	N/A	0.843	0	0	0.089	TRUE	TRUE	FALSE	N/A	N/A	B					
326.4	12.467	0.124	50	0.899	N/A	0.99	N/A	N/A	0.842	0	0	0.089	FALSE	TRUE	FALSE	N/A	N/A	A1					
326.3	12.631	0.142	56	0.887	N/A	0.98	N/A	N/A	0.842	0	0	0.089	FALSE	TRUE	FALSE	N/A	N/A	A1					
326.1	12.795	0.137	55	0.889	N/A	0.98	N/A	N/A	0.841	0	0	0.089	FALSE	TRUE	FALSE	N/A	N/A	A1					
325.9	12.959	0.138	55	0.888	N/A	0.98	N/A	N/A	0.840	0	0	0.089	FALSE	TRUE	FALSE	N/A	N/A	A1					
325.8	13.123	0.120	48	0.901	N/A	0.99	N/A	N/A	0.840	0	0	0.089	FALSE	TRUE	FALSE	N/A	N/A	A2					
325.6	13.287	0.122	49	0.899	N/A	0.99	N/A	N/A	0.839	0	0	0.089	FALSE	TRUE	FALSE	N/A	N/A	A1					
325.4	13.451	0.135	54	0.889	N/A	0.98	N/A	N/A	0.838	0	0	0.089	FALSE	TRUE	FALSE	N/A	N/A	A1					
325.3	13.615	N/A	45	N/A	N/A	N/A	N/A	N/A	0.838	0	0	0.089	TRUE	TRUE	FALSE	N/A	N/A	B					
325.1	13.779	N/A	41	N/A	N/A	N/A	N/A	N/A	0.837	0	0	0.089	TRUE	TRUE	FALSE	N/A	N/A	B					
325.0	13.943	N/A	42	N/A	N/A	N/A	N/A	N/A	0.836	0	0	0.089	TRUE	FALSE	FALSE	N/A	N/A	C					
324.8	14.107	N/A	40	N/A	N/A	N/A	N/A	N/A	0.836	0	0	0.089	TRUE	FALSE	FALSE	N/A	N/A	C					
324.6	14.271	N/A	38	N/A	N/A	N/A	N/A	N/A	0.835	0	0	0.089	TRUE	FALSE	FALSE	N/A	N/A	C					
324.5	14.436	N/A	42	N/A	N/A	N/A	N/A	N/A	0.834	0	0	0.089	TRUE	FALSE	FALSE	N/A	N/A	B					
324.3	14.600	N/A	44	N/A	N/A	N/A	N/A	N/A	0.834	0	0	0.089	TRUE	FALSE	FALSE	N/A	N/A	C					
324.1	14.764	N/A	44	N/A	N/A	N/A	N/A	N/A	0.833	0	0	0.089	TRUE	FALSE	FALSE	N/A	N/A	B					
324.0	14.928	N/A	40	N/A	N/A	N/A	N/A	N/A	0.832	0	0	0.089	TRUE	FALSE	FALSE	N/A	N/A	B					
323.8	15.092	N/A	36	N/A	N/A	N/A	N/A	N/A	0.831	0	0	0.089	TRUE	FALSE	FALSE	N/A	N/A	B					
323.6	15.256	N/A	37	N/A	N/A	N/A	N/A	N/A	0.831	0	0	0.089	TRUE	FALSE	FALSE	N/A	N/A	C					
323.5	15.420	N/A	38	N/A	N/A	N/A	N/A	N/A	0.830	0	0	0.089	TRUE	FALSE	FALSE	N/A	N/A	C					
323.3	15.584	0.123	49	0.896	0.851	0.99	0.092	0.829	0	0	0.089	FALSE	FALSE	FALSE	1.0	N/A	A1						
323.2	15.748	0.128	52	0.892	0.935	0.99	0.105	0.829	0	0	0.089	FALSE	FALSE	FALSE	1.2	N/A	A1						
323.0	15.912	N/A	43	N/A	N/A	N/A	N/A	N/A	0.828	0	0	0.089	TRUE	FALSE	FALSE	N/A	N/A	B					
322.8	16.076	N/A	40	N/A	N/A	N/A	N/A	N/A	0.827	0	0	0.089	TRUE	FALSE	FALSE	N/A	N/A	B					
322.7	16.240	N/A	41	N/A	N/A	N/A	N/A	N/A	0.827	0	0	0.090	TRUE	FALSE	FALSE	N/A	N/A	B					

Front Ground Response										Sample Screened for:					Factor of Safety		Soil Type	
Elev. (ft)	Depth z (ft)	Cyclic Resistance Ratio $CRR_{7.5}$	Relative Density D_r (%)	Correction for Overburden Pressure		Correction for Sloping Ground K_α	Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., t_d	Shear Stress τ_{max} (psf)	Induced Shear Stress τ_{Avg} (psf)	Cyclic Stress Ratio		High Tip Res. $(q_c)_{IN} \geq 175$	Unsaturated	FS _{slq}	Material (optional)	(see note on following chart)
				K_σ	K_α													
322.5	16.404	0.123	50	0.895	0.858	0.99	0.094	0.826	0	0	0	0.090	FALSE	FALSE	FALSE	1.0	N/A	A1
322.3	16.568	0.118	47	0.899	0.773	0.99	0.081	0.825	0	0	0	0.090	FALSE	FALSE	FALSE	0.9	N/A	A1
322.2	16.732	0.117	47	0.900	0.757	0.99	0.079	0.825	0	0	0	0.090	FALSE	FALSE	FALSE	0.9	N/A	A2
322.0	16.896	0.120	48	0.898	0.797	0.99	0.085	0.824	0	0	0	0.090	FALSE	FALSE	FALSE	0.9	N/A	B
321.8	17.060	N/A	45	N/A	N/A	N/A	N/A	0.823	0	0	0	0.090	TRUE	FALSE	FALSE	N/A	N/A	B
321.7	17.224	0.121	48	0.896	0.813	0.99	0.087	0.823	0	0	0	0.090	FALSE	FALSE	FALSE	1.0	N/A	A1
321.5	17.388	0.118	47	0.898	0.771	0.99	0.081	0.822	0	0	0	0.090	FALSE	FALSE	FALSE	0.9	N/A	A2
321.3	17.552	0.137	55	0.883	1.060	0.98	0.126	0.821	0	0	0	0.090	FALSE	FALSE	FALSE	1.4	N/A	A1
321.2	17.716	0.159	61	0.870	1.317	0.98	0.178	0.821	0	0	0	0.090	FALSE	FALSE	FALSE	2.0	N/A	A1
321.0	17.880	N/A	50	N/A	N/A	N/A	N/A	0.820	0	0	0	0.090	TRUE	FALSE	FALSE	N/A	N/A	B
320.9	18.044	N/A	45	N/A	N/A	N/A	N/A	0.819	0	0	0	0.090	TRUE	FALSE	FALSE	N/A	N/A	B
320.7	18.208	0.169	62	0.864	1.414	0.98	0.201	0.819	0	0	0	0.090	FALSE	FALSE	FALSE	2.2	N/A	A1
320.5	18.372	0.404	77	0.801	2.438	0.95	0.748	0.818	0	0	0	0.090	FALSE	FALSE	FALSE	8.3	N/A	A1
320.4	18.537	N/A	100	N/A	N/A	N/A	N/A	0.817	0	0	0	0.090	FALSE	TRUE	FALSE	N/A	N/A	A1
320.2	18.701	N/A	95	N/A	N/A	N/A	N/A	0.817	0	0	0	0.090	FALSE	TRUE	FALSE	N/A	N/A	A1
320.0	18.865	N/A	93	N/A	N/A	N/A	N/A	0.816	0	0	0	0.091	FALSE	TRUE	FALSE	N/A	N/A	A1
319.9	19.029	N/A	83	N/A	N/A	N/A	N/A	0.815	0	0	0	0.091	FALSE	TRUE	FALSE	N/A	N/A	A1
319.7	19.193	N/A	90	N/A	N/A	N/A	N/A	0.815	0	0	0	0.091	FALSE	TRUE	FALSE	N/A	N/A	A1
319.5	19.357	N/A	95	N/A	N/A	N/A	N/A	0.814	0	0	0	0.091	FALSE	TRUE	FALSE	N/A	N/A	A1
319.4	19.521	N/A	95	N/A	N/A	N/A	N/A	0.813	0	0	0	0.091	FALSE	TRUE	FALSE	N/A	N/A	A1
319.2	19.685	N/A	94	N/A	N/A	N/A	N/A	0.813	0	0	0	0.091	FALSE	TRUE	FALSE	N/A	N/A	A1
319.1	19.849	N/A	90	N/A	N/A	N/A	N/A	0.812	0	0	0	0.091	FALSE	TRUE	FALSE	N/A	N/A	A1
318.9	20.013	N/A	85	N/A	N/A	N/A	N/A	0.811	0	0	0	0.091	FALSE	TRUE	FALSE	N/A	N/A	A1
318.7	20.177	0.395	77	0.800	2.411	0.95	0.722	0.811	0	0	0	0.091	FALSE	FALSE	FALSE	7.9	N/A	A1
318.6	20.341	0.259	72	0.828	1.981	0.96	0.408	0.810	0	0	0	0.091	FALSE	FALSE	FALSE	4.5	N/A	A1
318.4	20.505	0.242	70	0.833	1.901	0.96	0.368	0.809	0	0	0	0.091	FALSE	FALSE	FALSE	4.0	N/A	A1
318.2	20.669	0.200	67	0.847	1.656	0.97	0.271	0.809	0	0	0	0.091	FALSE	FALSE	FALSE	3.0	N/A	A1
318.1	20.833	0.147	58	0.874	1.178	0.98	0.148	0.808	0	0	0	0.091	FALSE	FALSE	FALSE	1.6	N/A	B
317.9	20.997	0.143	57	0.876	1.128	0.98	0.139	0.807	0	0	0	0.091	FALSE	FALSE	FALSE	1.5	N/A	A1
317.7	21.161	0.248	71	0.830	1.929	0.96	0.382	0.807	0	0	0	0.091	FALSE	FALSE	FALSE	4.2	N/A	A1
317.6	21.325	N/A	85	N/A	N/A	N/A	N/A	0.806	0	0	0	0.091	FALSE	TRUE	FALSE	N/A	N/A	A1
317.4	21.489	N/A	84	N/A	N/A	N/A	N/A	0.805	0	0	0	0.091	FALSE	TRUE	FALSE	N/A	N/A	A1
317.2	21.653	0.571	80	0.774	2.715	0.94	1.124	0.805	0	0	0	0.091	FALSE	FALSE	FALSE	12.3	N/A	A1
317.1	21.817	0.382	77	0.800	2.374	0.95	0.687	0.804	0	0	0	0.091	FALSE	FALSE	FALSE	7.5	N/A	A1
316.9	21.981	0.338	75	0.807	2.259	0.95	0.587	0.803	0	0	0	0.092	FALSE	FALSE	FALSE	6.4	N/A	A1
316.8	22.145	0.370	76	0.801	2.342	0.95	0.658	0.803	0	0	0	0.092	FALSE	FALSE	FALSE	7.2	N/A	A1
316.6	22.309	0.215	68	0.839	1.751	0.97	0.306	0.802	0	0	0	0.092	FALSE	FALSE	FALSE	3.3	N/A	A1
316.4	22.473	0.226	69	0.835	1.814	0.97	0.331	0.801	0	0	0	0.092	FALSE	FALSE	FALSE	3.6	N/A	A1
316.3	22.638	0.355	76	0.803	2.302	0.95	0.623	0.801	0	0	0	0.092	FALSE	FALSE	FALSE	6.8	N/A	A1
316.1	22.802	0.227	69	0.835	1.817	0.96	0.332	0.800	0	0	0	0.092	FALSE	FALSE	FALSE	3.6	N/A	A1
315.9	22.966	0.204	67	0.843	1.678	0.97	0.279	0.799	0	0	0	0.092	FALSE	FALSE	FALSE	3.0	N/A	A1
315.8	23.130	0.160	61	0.863	1.318	0.98	0.178	0.799	0	0	0	0.092	FALSE	FALSE	FALSE	1.9	N/A	A1
315.6	23.294	0.150	59	0.869	1.211	0.98	0.155	0.798	0	0	0	0.092	FALSE	FALSE	FALSE	1.7	N/A	A1
315.4	23.458	0.169	63	0.858	1.408	0.98	0.200	0.797	0	0	0	0.092	FALSE	FALSE	FALSE	2.2	N/A	A1
315.3	23.622	0.171	63	0.857	1.427	0.98	0.204	0.797	0	0	0	0.092	FALSE	FALSE	FALSE	2.2	N/A	A1
315.1	23.786	0.199	67	0.844	1.647	0.97	0.269	0.796	0	0	0	0.092	FALSE	FALSE	FALSE	2.9	N/A	A1
315.0	23.950	0.230	70	0.832	1.830	0.96	0.338	0.795	0	0	0	0.092	FALSE	FALSE	FALSE	3.7	N/A	A1
314.8	24.114	0.237	70	0.830	1.867	0.96	0.353	0.795	0	0	0	0.092	FALSE	FALSE	FALSE	3.8	N/A	A1
314.6	24.278	0.181	64	0.851	1.507	0.97	0.226	0.794	0	0	0	0.092	FALSE	FALSE	FALSE	2.4	N/A	A1
314.5	24.442	N/A	53	N/A	N/A	N/A	N/A	0.793	0	0	0	0.092	TRUE	FALSE	FALSE	N/A	N/A	B
314.3	24.606	0.147	58	0.870	1.168	0.98	0.146	0.793	0	0	0	0.092	FALSE	FALSE	FALSE	1.6	N/A	A1
314.1	24.770	0.174	63	0.854	1.445	0.97	0.209	0.792	0	0	0	0.092	FALSE	FALSE	FALSE	2.3	N/A	A1
314.0	24.934	N/A	58	N/A	N/A	N/A	N/A	0.791	0	0	0	0.092	TRUE	FALSE	FALSE	N/A	N/A	B
313.8	25.098	N/A	54	N/A	N/A	N/A	N/A	0.791	0	0	0	0.092	TRUE	FALSE	FALSE	N/A	N/A	B
313.6	25.262	0.192	66	0.845	1.592	0.97	0.251	0.790	0	0	0	0.092	FALSE	FALSE	FALSE	2.7	N/A	A1

Front Ground Response										Sample Screened for:					Factor of Safety		Material (optional)	Soil Type (see note on following chart)
Elev. (ft)	Depth z (ft)	Cyclic Resistance Ratio $CRR_{7.5}$	Relative Density D_r	Correction for		Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CHR	Stress Reduction Coeff., t_d	τ_{Max} (psf)	Shear Stress	τ_{Avg} (psf)	Cyclic Stress Ratio CSR	High Tip Res. ($q_{c(IN)} \geq 175$)		FS_{liq}			
				Overburden Pressure K_o	Sloping Ground K_α								Clay-like	Unsaturated				
313.5	25.426	0.170	63	0.855	1.409	0.98	0.200	0.789	0	0	0	0.092	FALSE	FALSE	2.2	N/A	A1	
313.3	25.590	0.167	62	0.857	1.377	0.98	0.192	0.789	0	0	0	0.092	FALSE	FALSE	2.1	N/A	A1	
313.1	25.754	0.175	63	0.853	1.450	0.97	0.210	0.788	0	0	0	0.092	FALSE	FALSE	2.3	N/A	A1	
313.0	25.918	0.167	62	0.857	1.379	0.98	0.192	0.787	0	0	0	0.093	FALSE	FALSE	2.1	N/A	A1	
312.8	26.082	0.181	64	0.849	1.508	0.97	0.226	0.787	0	0	0	0.093	FALSE	FALSE	2.4	N/A	A1	
312.7	26.246	0.162	61	0.859	1.329	0.98	0.180	0.786	0	0	0	0.093	FALSE	FALSE	1.9	N/A	A1	
312.5	26.410	0.136	55	0.876	1.031	0.98	0.121	0.785	0	0	0	0.093	TRUE	FALSE	1.3	N/A	B	
312.3	26.574	N/A	50	N/A	N/A	N/A	N/A	0.785	0	0	0	0.093	TRUE	FALSE	N/A	N/A	B	
312.2	26.739	N/A	44	N/A	N/A	N/A	N/A	0.784	0	0	0	0.093	TRUE	FALSE	N/A	N/A	B	
312.0	26.903	N/A	41	N/A	N/A	N/A	N/A	0.783	0	0	0	0.093	TRUE	FALSE	N/A	N/A	B	
311.8	27.067	0.135	54	0.876	1.012	0.98	0.118	0.783	0	0	0	0.093	FALSE	FALSE	1.3	N/A	A1	
311.7	27.231	0.130	52	0.880	0.939	0.99	0.106	0.782	0	0	0	0.093	FALSE	FALSE	1.1	N/A	A1	
311.5	27.395	N/A	48	N/A	N/A	N/A	N/A	0.781	0	0	0	0.093	TRUE	FALSE	N/A	N/A	B	
311.3	27.559	0.148	58	0.866	1.182	0.98	0.149	0.781	0	0	0	0.093	FALSE	FALSE	1.6	N/A	A1	
311.2	27.723	0.170	63	0.853	1.405	0.98	0.199	0.780	0	0	0	0.093	FALSE	FALSE	2.1	N/A	A1	
311.0	27.887	0.226	69	0.829	1.800	0.97	0.325	0.779	0	0	0	0.093	FALSE	FALSE	3.5	N/A	A1	
310.8	28.051	0.173	63	0.851	1.430	0.97	0.205	0.779	0	0	0	0.093	FALSE	FALSE	2.2	N/A	A1	
310.7	28.215	0.174	63	0.850	1.443	0.97	0.208	0.778	0	0	0	0.093	FALSE	FALSE	2.2	N/A	A1	
310.5	28.379	0.167	62	0.854	1.379	0.98	0.192	0.778	0	0	0	0.093	FALSE	FALSE	2.1	N/A	A1	
310.4	28.543	0.259	72	0.817	1.959	0.96	0.398	0.777	0	0	0	0.093	FALSE	FALSE	4.3	N/A	A1	
310.2	28.707	0.237	70	0.824	1.853	0.96	0.348	0.776	0	0	0	0.093	FALSE	FALSE	3.7	N/A	A1	
310.0	28.871	0.265	72	0.815	1.981	0.96	0.410	0.776	0	0	0	0.093	FALSE	FALSE	4.4	N/A	A1	
309.9	29.035	0.269	72	0.814	2.000	0.96	0.420	0.775	0	0	0	0.093	FALSE	FALSE	4.5	N/A	A1	
309.7	29.199	0.261	72	0.816	1.966	0.96	0.402	0.774	0	0	0	0.093	FALSE	FALSE	4.3	N/A	A1	
309.5	29.363	0.281	73	0.810	2.045	0.96	0.445	0.774	0	0	0	0.093	FALSE	FALSE	4.8	N/A	A1	
309.4	29.527	0.369	76	0.790	2.316	0.95	0.641	0.773	0	0	0	0.093	FALSE	FALSE	6.9	N/A	A1	
309.2	29.691	0.561	80	0.762	2.670	0.94	1.069	0.772	0	0	0	0.093	FALSE	FALSE	11.5	N/A	A1	
309.0	29.855	N/A	83	N/A	N/A	N/A	N/A	0.772	0	0	0	0.093	FALSE	TRUE	N/A	N/A	A1	
308.9	30.019	N/A	84	N/A	N/A	N/A	N/A	0.771	0	0	0	0.093	FALSE	TRUE	N/A	N/A	A1	
308.7	30.183	N/A	82	N/A	N/A	N/A	N/A	0.770	0	0	0	0.093	FALSE	TRUE	N/A	N/A	A1	
308.6	30.347	N/A	82	N/A	N/A	N/A	N/A	0.770	0	0	0	0.093	FALSE	TRUE	N/A	N/A	A1	
308.4	30.511	N/A	84	N/A	N/A	N/A	N/A	0.769	0	0	0	0.093	FALSE	TRUE	N/A	N/A	A1	
308.2	30.675	N/A	86	N/A	N/A	N/A	N/A	0.769	0	0	0	0.093	FALSE	TRUE	N/A	N/A	A1	
308.1	30.840	N/A	84	N/A	N/A	N/A	N/A	0.768	0	0	0	0.093	FALSE	TRUE	N/A	N/A	A1	
307.9	31.004	N/A	81	N/A	N/A	N/A	N/A	0.767	0	0	0	0.093	FALSE	TRUE	N/A	N/A	A1	
307.7	31.168	0.398	77	0.783	2.380	0.95	0.702	0.767	0	0	0	0.093	FALSE	FALSE	7.5	N/A	A1	
307.6	31.332	0.259	72	0.814	1.952	0.96	0.396	0.766	0	0	0	0.093	FALSE	FALSE	4.2	N/A	A1	
307.4	31.496	0.241	70	0.819	1.869	0.96	0.356	0.765	0	0	0	0.093	FALSE	FALSE	3.8	N/A	A1	
307.2	31.660	0.170	63	0.849	1.394	0.98	0.196	0.765	0	0	0	0.094	FALSE	FALSE	2.1	N/A	A1	
307.1	31.824	N/A	51	N/A	N/A	N/A	N/A	0.764	0	0	0	0.094	TRUE	FALSE	N/A	N/A	B	
306.9	31.988	N/A	46	N/A	N/A	N/A	N/A	0.764	0	0	0	0.094	TRUE	FALSE	N/A	N/A	B	
306.7	32.152	0.143	57	0.866	1.109	0.98	0.135	0.763	0	0	0	0.094	FALSE	FALSE	1.4	N/A	A1	
306.6	32.316	N/A	47	N/A	N/A	N/A	N/A	0.762	0	0	0	0.094	TRUE	FALSE	N/A	N/A	B	
306.4	32.480	N/A	48	N/A	N/A	N/A	N/A	0.762	0	0	0	0.094	TRUE	FALSE	N/A	N/A	B	
306.3	32.644	0.192	66	0.837	1.571	0.97	0.245	0.761	0	0	0	0.094	FALSE	FALSE	2.6	N/A	A1	
306.1	32.808	0.183	65	0.841	1.507	0.97	0.226	0.760	0	0	0	0.094	FALSE	FALSE	2.4	N/A	A1	
305.9	32.972	0.147	58	0.862	1.152	0.98	0.143	0.760	0	0	0	0.094	FALSE	FALSE	1.5	N/A	A1	
305.8	33.136	0.141	56	0.867	1.081	0.98	0.130	0.759	0	0	0	0.094	FALSE	FALSE	1.4	N/A	A1	
305.6	33.300	0.143	57	0.865	1.103	0.98	0.134	0.759	0	0	0	0.094	FALSE	FALSE	1.4	N/A	A1	
305.4	33.464	0.147	58	0.862	1.152	0.98	0.143	0.758	0	0	0	0.094	FALSE	FALSE	1.5	N/A	A1	
305.3	33.628	0.148	58	0.861	1.162	0.98	0.145	0.757	0	0	0	0.094	FALSE	FALSE	1.5	N/A	A1	
305.1	33.792	0.149	58	0.860	1.183	0.98	0.149	0.757	0	0	0	0.094	FALSE	FALSE	1.6	N/A	A1	
304.9	33.956	0.149	58	0.860	1.179	0.98	0.148	0.756	0	0	0	0.094	FALSE	FALSE	1.6	N/A	A1	
304.8	34.120	0.149	58	0.859	1.184	0.98	0.149	0.755	0	0	0	0.094	FALSE	FALSE	1.6	N/A	A1	
304.6	34.284	0.148	58	0.861	1.162	0.98	0.145	0.755	0	0	0	0.094	FALSE	FALSE	1.5	N/A	A1	

Elev. z (ft)	Depth z (ft)	Cyclic Resistance Ratio CRR _{7.5}	Relative Density D _r	Correction for			Cyclic Resistance Ratio CRR	Stress Reduction Coeff., f _d	Front Ground Response			Sample Screened for:				Factor of Safety FS _{slq}	Material (optional)	Soil Type (see note on following chart)	
				Overburden Pressure K _o	Sloping Ground K _α	Correction for Sloping Ground K _α			Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Shear Stress τ _{max}	Cyclic Shear Stress τ _{Avg}	Cyclic Stress Ratio CSR	Clay-like (q _{c30}) ≥ 175	High Tip Res.				Unsaturated
304.5	34.448	0.178	64	0.842	1.460	0.97	0.213	0.754	0	0	0	0.094	FALSE	FALSE	FALSE	2.3	N/A	A1	
304.3	34.612	0.186	65	0.837	1.528	0.97	0.232	0.754	0	0	0	0.094	FALSE	FALSE	FALSE	2.5	N/A	A1	
304.1	34.776	0.142	56	0.864	1.094	0.98	0.132	0.753	0	0	0	0.094	FALSE	FALSE	FALSE	1.4	N/A	A1	
304.0	34.941	0.148	58	0.860	1.168	0.98	0.146	0.752	0	0	0	0.094	FALSE	FALSE	FALSE	1.6	N/A	A1	
303.8	35.105	0.139	56	0.866	1.057	0.98	0.125	0.752	0	0	0	0.094	FALSE	FALSE	FALSE	1.3	N/A	A1	
303.6	35.269	0.134	54	0.870	0.988	0.98	0.113	0.751	0	0	0	0.094	FALSE	FALSE	FALSE	1.2	N/A	A1	
303.5	35.433	0.166	62	0.848	1.349	0.98	0.185	0.751	0	0	0	0.094	FALSE	FALSE	FALSE	2.0	N/A	A1	
303.3	35.597	0.150	58	0.858	1.183	0.98	0.149	0.750	0	0	0	0.094	FALSE	FALSE	FALSE	1.6	N/A	A1	
303.1	35.761	N/A	52	N/A	N/A	N/A	N/A	0.749	0	0	0	0.094	TRUE	FALSE	FALSE	N/A	N/A	B	
303.0	35.925	N/A	46	N/A	N/A	N/A	N/A	0.749	0	0	0	0.094	TRUE	FALSE	FALSE	N/A	N/A	B	
302.8	36.089	N/A	41	N/A	N/A	N/A	N/A	0.748	0	0	0	0.094	TRUE	FALSE	FALSE	N/A	N/A	B	
302.6	36.253	N/A	38	N/A	N/A	N/A	N/A	0.748	0	0	0	0.094	TRUE	FALSE	FALSE	N/A	N/A	C	
302.5	36.417	N/A	42	N/A	N/A	N/A	N/A	0.747	0	0	0	0.094	TRUE	FALSE	FALSE	N/A	N/A	C	
302.3	36.581	N/A	54	N/A	N/A	N/A	N/A	0.746	0	0	0	0.094	TRUE	FALSE	FALSE	N/A	N/A	B	
302.2	36.745	N/A	45	N/A	N/A	N/A	N/A	0.746	0	0	0	0.094	TRUE	FALSE	FALSE	N/A	N/A	B	
302.0	36.909	0.122	49	0.880	0.809	0.99	0.086	0.745	0	0	0	0.094	FALSE	FALSE	FALSE	0.9	N/A	A1	
301.8	37.073	0.144	57	0.861	1.110	0.98	0.135	0.745	0	0	0	0.094	FALSE	FALSE	FALSE	1.4	N/A	A1	
301.7	37.237	0.143	57	0.861	1.103	0.98	0.134	0.744	0	0	0	0.094	FALSE	FALSE	FALSE	1.4	N/A	A1	
301.5	37.401	N/A	48	N/A	N/A	N/A	N/A	0.743	0	0	0	0.094	TRUE	FALSE	FALSE	N/A	N/A	B	
301.3	37.565	N/A	42	N/A	N/A	N/A	N/A	0.743	0	0	0	0.094	TRUE	FALSE	FALSE	N/A	N/A	B	
301.2	37.729	N/A	38	N/A	N/A	N/A	N/A	0.742	0	0	0	0.094	TRUE	FALSE	FALSE	N/A	N/A	B	
301.0	37.893	N/A	37	N/A	N/A	N/A	N/A	0.742	0	0	0	0.094	TRUE	FALSE	FALSE	N/A	N/A	B	
300.8	38.057	N/A	37	N/A	N/A	N/A	N/A	0.741	0	0	0	0.094	TRUE	FALSE	FALSE	N/A	N/A	C	
300.7	38.221	N/A	37	N/A	N/A	N/A	N/A	0.740	0	0	0	0.094	TRUE	FALSE	FALSE	N/A	N/A	C	
300.5	38.385	N/A	37	N/A	N/A	N/A	N/A	0.740	0	0	0	0.094	TRUE	FALSE	FALSE	N/A	N/A	C	
300.4	38.549	N/A	37	N/A	N/A	N/A	N/A	0.739	0	0	0	0.094	TRUE	FALSE	FALSE	N/A	N/A	C	
300.2	38.713	N/A	37	N/A	N/A	N/A	N/A	0.739	0	0	0	0.094	TRUE	FALSE	FALSE	N/A	N/A	C	
300.0	38.877	N/A	37	N/A	N/A	N/A	N/A	0.738	0	0	0	0.094	TRUE	FALSE	FALSE	N/A	N/A	C	
299.9	39.042	N/A	37	N/A	N/A	N/A	N/A	0.737	0	0	0	0.094	TRUE	FALSE	FALSE	N/A	N/A	C	
299.7	39.206	N/A	37	N/A	N/A	N/A	N/A	0.737	0	0	0	0.094	TRUE	FALSE	FALSE	N/A	N/A	C	
299.5	39.370	N/A	37	N/A	N/A	N/A	N/A	0.736	0	0	0	0.094	TRUE	FALSE	FALSE	N/A	N/A	C	
299.4	39.534	N/A	36	N/A	N/A	N/A	N/A	0.736	0	0	0	0.094	TRUE	FALSE	FALSE	N/A	N/A	C	
299.2	39.698	N/A	37	N/A	N/A	N/A	N/A	0.735	0	0	0	0.094	TRUE	FALSE	FALSE	N/A	N/A	C	
299.0	39.862	N/A	38	N/A	N/A	N/A	N/A	0.734	0	0	0	0.094	TRUE	FALSE	FALSE	N/A	N/A	C	
298.9	40.026	N/A	37	N/A	N/A	N/A	N/A	0.734	0	0	0	0.094	TRUE	FALSE	FALSE	N/A	N/A	C	
298.7	40.190	N/A	37	N/A	N/A	N/A	N/A	0.733	0	0	0	0.094	TRUE	FALSE	FALSE	N/A	N/A	C	
298.5	40.354	N/A	37	N/A	N/A	N/A	N/A	0.733	0	0	0	0.094	TRUE	FALSE	FALSE	N/A	N/A	C	
298.4	40.518	N/A	37	N/A	N/A	N/A	N/A	0.732	0	0	0	0.094	TRUE	FALSE	FALSE	N/A	N/A	C	
298.2	40.682	N/A	37	N/A	N/A	N/A	N/A	0.732	0	0	0	0.094	TRUE	FALSE	FALSE	N/A	N/A	C	
298.1	40.846	N/A	38	N/A	N/A	N/A	N/A	0.731	0	0	0	0.094	TRUE	FALSE	FALSE	N/A	N/A	C	
297.9	41.010	N/A	37	N/A	N/A	N/A	N/A	0.730	0	0	0	0.094	TRUE	FALSE	FALSE	N/A	N/A	C	
297.7	41.174	N/A	37	N/A	N/A	N/A	N/A	0.730	0	0	0	0.094	TRUE	FALSE	FALSE	N/A	N/A	C	
297.6	41.338	N/A	37	N/A	N/A	N/A	N/A	0.729	0	0	0	0.094	TRUE	FALSE	FALSE	N/A	N/A	C	
297.4	41.502	N/A	37	N/A	N/A	N/A	N/A	0.729	0	0	0	0.094	TRUE	FALSE	FALSE	N/A	N/A	C	
297.2	41.666	N/A	37	N/A	N/A	N/A	N/A	0.728	0	0	0	0.094	TRUE	FALSE	FALSE	N/A	N/A	C	
297.1	41.830	N/A	37	N/A	N/A	N/A	N/A	0.727	0	0	0	0.094	TRUE	FALSE	FALSE	N/A	N/A	C	
296.9	41.994	N/A	38	N/A	N/A	N/A	N/A	0.727	0	0	0	0.094	TRUE	FALSE	FALSE	N/A	N/A	C	
296.7	42.158	N/A	39	N/A	N/A	N/A	N/A	0.727	0	0	0	0.094	TRUE	FALSE	FALSE	N/A	N/A	C	
296.6	42.322	N/A	40	N/A	N/A	N/A	N/A	0.726	0	0	0	0.094	TRUE	FALSE	FALSE	N/A	N/A	C	
296.4	42.486	0.158	60	0.846	1.260	0.98	0.165	0.725	0	0	0	0.094	FALSE	FALSE	FALSE	1.7	N/A	A1	
296.2	42.650	0.237	70	0.808	1.820	0.96	0.336	0.725	0	0	0	0.094	FALSE	FALSE	FALSE	3.6	N/A	A1	
296.1	42.814	0.362	76	0.774	2.256	0.95	0.600	0.724	0	0	0	0.094	FALSE	FALSE	FALSE	6.4	N/A	A1	
295.9	42.978	0.505	79	0.749	2.540	0.94	0.903	0.724	0	0	0	0.094	FALSE	FALSE	FALSE	9.6	N/A	A1	
295.8	43.143	N/A	87	N/A	N/A	N/A	N/A	0.723	0	0	0	0.094	FALSE	TRUE	FALSE	N/A	N/A	A1	
295.6	43.307	N/A	91	N/A	N/A	N/A	N/A	0.723	0	0	0	0.094	FALSE	TRUE	FALSE	N/A	N/A	A1	

Front Ground Response										Sample Screened for:				Factor of Safety		Material (optional)	Soil Type (see note on following chart)
Elev. (ft)	Depth z	Cyclic Resistance Ratio $CRR_{7.5}$	Relative Density D_r	Correction for Overburden Pressure K_o	Correction for Sloping Ground K_σ	Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., t_d	Induced Shear Stress τ_{max} (psf)	Average Cyclic Shear Stress τ_{Avg} (psf)	Cyclic Stress Ratio CSR	Clay-like $(q_{c30})_{cs} \geq 175$	High Tip Res. $(q_{c30})_{cs} \geq 175$	Unsaturated $F_{S_{liq}}$			
295.4	43.471	N/A	87	N/A	N/A	N/A	N/A	0.722	0	0	0.094	FALSE	TRUE	FALSE	N/A	A1	
295.3	43.635	N/A	86	N/A	N/A	N/A	N/A	0.721	0	0	0.094	FALSE	TRUE	FALSE	N/A	A1	
295.1	43.799	0.254	71	0.801	1.895	0.96	0.370	0.721	0	0	0.094	FALSE	FALSE	FALSE	3.9	A1	
294.9	43.963	N/A	54	N/A	N/A	N/A	N/A	0.720	0	0	0.094	TRUE	FALSE	FALSE	N/A	B	
294.8	44.127	N/A	45	N/A	N/A	N/A	N/A	0.720	0	0	0.094	TRUE	FALSE	FALSE	N/A	B	
294.6	44.291	N/A	42	N/A	N/A	N/A	N/A	0.719	0	0	0.094	TRUE	FALSE	FALSE	N/A	B	
294.4	44.455	N/A	41	N/A	N/A	N/A	N/A	0.719	0	0	0.094	TRUE	FALSE	FALSE	N/A	C	
294.3	44.619	N/A	42	N/A	N/A	N/A	N/A	0.718	0	0	0.094	TRUE	FALSE	FALSE	N/A	C	
294.1	44.783	N/A	42	N/A	N/A	N/A	N/A	0.718	0	0	0.094	TRUE	FALSE	FALSE	N/A	C	
294.0	44.947	N/A	43	N/A	N/A	N/A	N/A	0.717	0	0	0.094	TRUE	FALSE	FALSE	N/A	B	
293.8	45.111	N/A	44	N/A	N/A	N/A	N/A	0.717	0	0	0.094	TRUE	FALSE	FALSE	N/A	B	
293.6	45.275	N/A	41	N/A	N/A	N/A	N/A	0.716	0	0	0.095	TRUE	FALSE	FALSE	N/A	B	
293.5	45.439	0.156	60	0.845	1.234	0.98	0.159	0.716	0	0	0.095	FALSE	FALSE	FALSE	1.7	A1	
293.3	45.603	0.187	65	0.826	1.508	0.97	0.226	0.715	0	0	0.095	FALSE	FALSE	FALSE	2.4	A1	
293.1	45.767	N/A	56	N/A	N/A	N/A	N/A	0.714	0	0	0.095	TRUE	FALSE	FALSE	N/A	B	
293.0	45.931	N/A	47	N/A	N/A	N/A	N/A	0.714	0	0	0.095	TRUE	FALSE	FALSE	N/A	B	
292.8	46.095	N/A	41	N/A	N/A	N/A	N/A	0.713	0	0	0.095	TRUE	FALSE	FALSE	N/A	B	
292.6	46.259	N/A	41	N/A	N/A	N/A	N/A	0.713	0	0	0.095	TRUE	FALSE	FALSE	N/A	C	
292.5	46.423	N/A	40	N/A	N/A	N/A	N/A	0.712	0	0	0.095	TRUE	FALSE	FALSE	N/A	C	
292.3	46.587	N/A	40	N/A	N/A	N/A	N/A	0.712	0	0	0.095	TRUE	FALSE	FALSE	N/A	C	
292.1	46.751	N/A	40	N/A	N/A	N/A	N/A	0.711	0	0	0.095	TRUE	FALSE	FALSE	N/A	C	
292.0	46.915	N/A	40	N/A	N/A	N/A	N/A	0.711	0	0	0.095	TRUE	FALSE	FALSE	N/A	C	
291.8	47.079	N/A	38	N/A	N/A	N/A	N/A	0.710	0	0	0.095	TRUE	FALSE	FALSE	N/A	C	
291.7	47.244	N/A	38	N/A	N/A	N/A	N/A	0.710	0	0	0.095	TRUE	FALSE	FALSE	N/A	C	
291.5	47.408	N/A	38	N/A	N/A	N/A	N/A	0.709	0	0	0.095	TRUE	FALSE	FALSE	N/A	C	
291.3	47.572	N/A	38	N/A	N/A	N/A	N/A	0.709	0	0	0.095	TRUE	FALSE	FALSE	N/A	C	
291.2	47.736	N/A	38	N/A	N/A	N/A	N/A	0.708	0	0	0.095	TRUE	FALSE	FALSE	N/A	C	
291.0	47.900	N/A	38	N/A	N/A	N/A	N/A	0.708	0	0	0.095	TRUE	FALSE	FALSE	N/A	C	
290.8	48.064	N/A	39	N/A	N/A	N/A	N/A	0.707	0	0	0.095	TRUE	FALSE	FALSE	N/A	C	
290.7	48.228	N/A	38	N/A	N/A	N/A	N/A	0.707	0	0	0.095	TRUE	FALSE	FALSE	N/A	C	
290.5	48.392	N/A	38	N/A	N/A	N/A	N/A	0.706	0	0	0.095	TRUE	FALSE	FALSE	N/A	C	
290.3	48.556	0.118	47	0.875	0.732	0.99	0.075	0.706	0	0	0.095	FALSE	FALSE	FALSE	0.8	A2	
290.2	48.720	N/A	49	N/A	N/A	N/A	N/A	0.705	0	0	0.095	TRUE	FALSE	FALSE	N/A	B	
290.0	48.884	N/A	43	N/A	N/A	N/A	N/A	0.705	0	0	0.095	TRUE	FALSE	FALSE	N/A	B	
289.9	49.048	N/A	39	N/A	N/A	N/A	N/A	0.704	0	0	0.095	TRUE	FALSE	FALSE	N/A	B	
289.7	49.212	0.146	58	0.849	1.124	0.98	0.137	0.704	0	0	0.095	FALSE	FALSE	FALSE	1.4	A1	
289.5	49.376	0.178	64	0.827	1.435	0.97	0.206	0.703	0	0	0.095	FALSE	FALSE	FALSE	2.2	A1	
289.4	49.540	0.210	68	0.811	1.658	0.97	0.274	0.703	0	0	0.095	FALSE	FALSE	FALSE	2.9	A1	
289.2	49.704	0.226	69	0.805	1.745	0.97	0.306	0.702	0	0	0.095	FALSE	FALSE	FALSE	3.2	A1	
289.0	49.868	N/A	58	N/A	N/A	N/A	N/A	0.702	0	0	0.095	TRUE	FALSE	FALSE	N/A	B	
288.9	50.032	N/A	46	N/A	N/A	N/A	N/A	0.701	0	0	0.095	TRUE	FALSE	FALSE	N/A	B	
288.7	50.196	N/A	56	N/A	N/A	N/A	N/A	0.701	0	0	0.095	TRUE	FALSE	FALSE	N/A	B	
288.5	50.360	N/A	51	N/A	N/A	N/A	N/A	0.700	0	0	0.095	TRUE	FALSE	FALSE	N/A	B	
288.4	50.524	N/A	49	N/A	N/A	N/A	N/A	0.700	0	0	0.095	TRUE	FALSE	FALSE	N/A	B	
288.2	50.688	N/A	41	N/A	N/A	N/A	N/A	0.699	0	0	0.095	TRUE	FALSE	FALSE	N/A	B	
288.0	50.852	N/A	41	N/A	N/A	N/A	N/A	0.699	0	0	0.095	TRUE	FALSE	FALSE	N/A	C	
287.9	51.016	0.123	49	0.869	0.800	0.99	0.084	0.698	0	0	0.095	FALSE	FALSE	FALSE	0.9	A2	
287.7	51.180	0.128	52	0.863	0.884	0.99	0.096	0.698	0	0	0.095	FALSE	FALSE	FALSE	1.0	A1	
287.6	51.345	0.171	63	0.830	1.368	0.98	0.189	0.697	0	0	0.095	FALSE	FALSE	FALSE	2.0	A1	
287.4	51.509	0.201	67	0.814	1.596	0.97	0.253	0.697	0	0	0.095	FALSE	FALSE	FALSE	2.7	A1	
287.2	51.673	0.217	69	0.806	1.691	0.97	0.286	0.696	0	0	0.095	FALSE	FALSE	FALSE	3.0	A1	
287.1	51.837	N/A	57	N/A	N/A	N/A	N/A	0.696	0	0	0.095	TRUE	FALSE	FALSE	N/A	B	
286.9	52.001	N/A	47	N/A	N/A	N/A	N/A	0.695	0	0	0.095	TRUE	FALSE	FALSE	N/A	B	
286.7	52.165	N/A	40	N/A	N/A	N/A	N/A	0.695	0	0	0.095	TRUE	FALSE	FALSE	N/A	B	
286.6	52.329	N/A	40	N/A	N/A	N/A	N/A	0.694	0	0	0.095	TRUE	FALSE	FALSE	N/A	C	

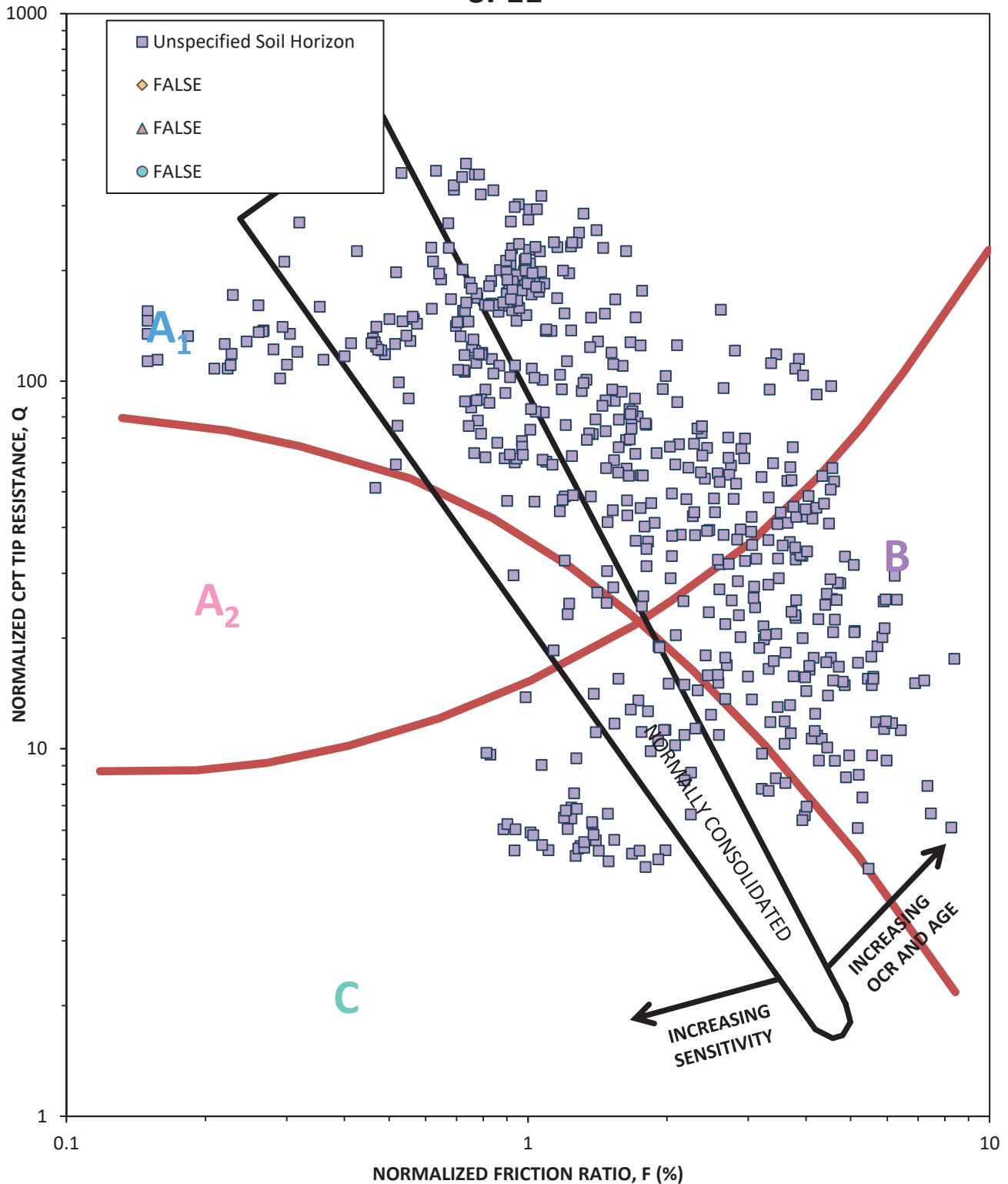
Elev. (ft)	Depth z	Cyclic Resistance Ratio CRR _{7.5}	Relative Density D _r	Correction for Overburden Pressure			Correction for Sloping Ground	Magnitude Scaling Factor	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., I _d	From Ground Response			Sample Screened for:				Factor of Safety FS _{req}	Material (optional)	Soil Type (see note on following chart)
				K _o	K _σ	K _α					τ _{max} Shear Stress	τ _{Avg} Cyclic Shear Stress	Cyclic Stress Ratio CSR	Clay-like (q _{c IN}) ≥ 175	High Tip Res.	Unsaturated				
277.4	61.515	0.149	58	0.838	1.132	0.98	0.98	0.138	0.670	0	0	0.095	FALSE	FALSE	FALSE	1.5	N/A	A1		
277.2	61.679	0.169	63	0.823	1.335	0.98	0.98	0.181	0.670	0	0	0.095	FALSE	FALSE	FALSE	1.9	N/A	A1		
277.1	61.843	0.162	61	0.828	1.265	0.98	0.98	0.165	0.669	0	0	0.095	FALSE	FALSE	FALSE	1.7	N/A	A1		
276.9	62.007	0.151	59	0.835	1.156	0.98	0.98	0.143	0.669	0	0	0.095	FALSE	FALSE	FALSE	1.5	N/A	A1		
276.7	62.171	0.157	60	0.831	1.219	0.98	0.98	0.156	0.669	0	0	0.095	FALSE	FALSE	FALSE	1.6	N/A	A1		
276.6	62.335	0.188	65	0.810	1.485	0.97	0.97	0.220	0.668	0	0	0.095	FALSE	FALSE	FALSE	2.3	N/A	A1		
276.4	62.499	0.198	67	0.805	1.550	0.97	0.97	0.239	0.668	0	0	0.095	FALSE	FALSE	FALSE	2.5	N/A	A1		
276.2	62.663	0.209	68	0.799	1.623	0.97	0.97	0.263	0.668	0	0	0.095	FALSE	FALSE	FALSE	2.8	N/A	A1		
276.1	62.827	0.233	70	0.789	1.752	0.96	0.96	0.310	0.667	0	0	0.095	FALSE	FALSE	FALSE	3.3	N/A	A1		
275.9	62.991	N/A	59	N/A	N/A	N/A	N/A	N/A	0.667	0	0	0.095	TRUE	FALSE	FALSE	N/A	N/A	B		
275.7	63.155	N/A	48	N/A	N/A	N/A	N/A	N/A	0.667	0	0	0.095	TRUE	FALSE	FALSE	N/A	N/A	B		
275.6	63.319	0.138	55	0.846	0.995	0.98	0.98	0.114	0.666	0	0	0.095	FALSE	FALSE	FALSE	1.2	N/A	A1		
275.4	63.483	0.122	49	0.861	0.786	0.99	0.99	0.082	0.666	0	0	0.095	FALSE	FALSE	FALSE	0.9	N/A	A2		
275.3	63.648	0.141	56	0.843	1.039	0.98	0.98	0.121	0.665	0	0	0.095	FALSE	FALSE	FALSE	1.3	N/A	A1		
275.1	63.812	N/A	51	N/A	N/A	N/A	N/A	N/A	0.665	0	0	0.095	TRUE	FALSE	FALSE	N/A	N/A	B		
274.9	63.976	N/A	44	N/A	N/A	N/A	N/A	N/A	0.665	0	0	0.095	TRUE	FALSE	FALSE	N/A	N/A	B		
274.8	64.140	N/A	41	N/A	N/A	N/A	N/A	N/A	0.664	0	0	0.095	TRUE	FALSE	FALSE	N/A	N/A	C		
274.6	64.304	N/A	43	N/A	N/A	N/A	N/A	N/A	0.664	0	0	0.095	TRUE	FALSE	FALSE	N/A	N/A	B		
274.4	64.468	N/A	54	N/A	N/A	N/A	N/A	N/A	0.664	0	0	0.095	TRUE	FALSE	FALSE	N/A	N/A	A1		
274.3	64.632	N/A	41	N/A	N/A	N/A	N/A	N/A	0.663	0	0	0.095	TRUE	FALSE	FALSE	N/A	N/A	B		
274.1	64.796	N/A	45	N/A	N/A	N/A	N/A	N/A	0.663	0	0	0.095	TRUE	FALSE	FALSE	N/A	N/A	B		
273.9	64.960	N/A	48	N/A	N/A	N/A	N/A	N/A	0.663	0	0	0.095	TRUE	FALSE	FALSE	N/A	N/A	B		
273.8	65.124	N/A	45	N/A	N/A	N/A	N/A	N/A	0.662	0	0	0.095	TRUE	FALSE	FALSE	N/A	N/A	B		
273.6	65.288	0.148	58	0.836	1.116	0.98	0.98	0.135	0.662	0	0	0.095	FALSE	FALSE	FALSE	1.4	N/A	A1		
273.4	65.452	0.153	59	0.831	1.170	0.98	0.98	0.146	0.662	0	0	0.095	FALSE	FALSE	FALSE	1.5	N/A	A1		
273.3	65.616	0.150	59	0.834	1.140	0.98	0.98	0.140	0.661	0	0	0.095	FALSE	FALSE	FALSE	1.5	N/A	A1		
273.1	65.780	0.148	58	0.835	1.120	0.98	0.98	0.136	0.661	0	0	0.095	FALSE	FALSE	FALSE	1.4	N/A	A1		
273.0	65.944	0.158	60	0.828	1.217	0.98	0.98	0.155	0.661	0	0	0.095	FALSE	FALSE	FALSE	1.6	N/A	A1		
272.8	66.108	0.150	59	0.833	1.137	0.98	0.98	0.139	0.660	0	0	0.095	FALSE	FALSE	FALSE	1.5	N/A	A1		
272.6	66.272	0.155	60	0.829	1.194	0.98	0.98	0.150	0.660	0	0	0.095	FALSE	FALSE	FALSE	1.6	N/A	A1		
272.5	66.436	0.155	60	0.829	1.193	0.98	0.98	0.150	0.660	0	0	0.095	FALSE	FALSE	FALSE	1.6	N/A	A1		
272.3	66.600	0.166	62	0.821	1.298	0.98	0.98	0.173	0.659	0	0	0.095	FALSE	FALSE	FALSE	1.8	N/A	A1		
272.1	66.764	0.158	60	0.827	1.220	0.98	0.98	0.156	0.659	0	0	0.095	FALSE	FALSE	FALSE	1.6	N/A	A1		
272.0	66.928	0.154	60	0.829	1.180	0.98	0.98	0.148	0.659	0	0	0.095	FALSE	FALSE	FALSE	1.6	N/A	A1		
271.8	67.092	0.146	57	0.836	1.089	0.98	0.98	0.130	0.658	0	0	0.095	FALSE	FALSE	FALSE	1.4	N/A	A1		
271.6	67.256	0.152	59	0.831	1.154	0.98	0.98	0.142	0.658	0	0	0.095	FALSE	FALSE	FALSE	1.5	N/A	A1		
271.5	67.420	0.199	67	0.800	1.548	0.97	0.97	0.239	0.658	0	0	0.095	FALSE	FALSE	FALSE	2.5	N/A	A1		
271.3	67.584	N/A	60	N/A	N/A	N/A	N/A	N/A	0.657	0	0	0.095	TRUE	FALSE	FALSE	N/A	N/A	A1		
271.2	67.749	N/A	49	N/A	N/A	N/A	N/A	N/A	0.657	0	0	0.095	TRUE	FALSE	FALSE	N/A	N/A	B		
271.0	67.913	N/A	47	N/A	N/A	N/A	N/A	N/A	0.657	0	0	0.095	TRUE	FALSE	FALSE	N/A	N/A	B		
270.8	68.077	N/A	57	N/A	N/A	N/A	N/A	N/A	0.657	0	0	0.095	TRUE	FALSE	FALSE	N/A	N/A	A1		
270.7	68.241	0.174	63	0.814	1.368	0.97	0.97	0.189	0.656	0	0	0.095	FALSE	FALSE	FALSE	2.0	N/A	A1		
270.5	68.405	0.174	63	0.814	1.362	0.97	0.97	0.188	0.656	0	0	0.095	FALSE	FALSE	FALSE	2.0	N/A	A1		
270.3	68.569	0.160	61	0.824	1.234	0.98	0.98	0.159	0.656	0	0	0.095	FALSE	FALSE	FALSE	1.7	N/A	A1		
270.2	68.733	0.160	61	0.824	1.233	0.98	0.98	0.158	0.655	0	0	0.095	FALSE	FALSE	FALSE	1.7	N/A	A1		
270.0	68.897	0.160	61	0.823	1.237	0.98	0.98	0.159	0.655	0	0	0.095	FALSE	FALSE	FALSE	1.7	N/A	A1		
269.8	69.061	N/A	53	N/A	N/A	N/A	N/A	N/A	0.655	0	0	0.095	TRUE	FALSE	FALSE	N/A	N/A	B		
269.7	69.225	N/A	47	N/A	N/A	N/A	N/A	N/A	0.654	0	0	0.095	TRUE	FALSE	FALSE	N/A	N/A	B		
269.5	69.389	N/A	48	N/A	N/A	N/A	N/A	N/A	0.654	0	0	0.095	TRUE	FALSE	FALSE	N/A	N/A	B		
269.3	69.553	N/A	49	N/A	N/A	N/A	N/A	N/A	0.654	0	0	0.095	TRUE	FALSE	FALSE	N/A	N/A	B		
269.2	69.717	0.192	66	0.802	1.496	0.97	0.97	0.224	0.654	0	0	0.095	FALSE	FALSE	FALSE	2.4	N/A	A1		
269.0	69.881	N/A	100	N/A	N/A	N/A	N/A	N/A	0.653	0	0	0.095	FALSE	TRUE	FALSE	N/A	N/A	A1		
268.9	70.045	N/A	93	N/A	N/A	N/A	N/A	N/A	0.653	0	0	0.095	FALSE	TRUE	FALSE	N/A	N/A	A1		
268.7	70.209	0.335	75	0.748	2.110	0.95	0.95	0.504	0.653	0	0	0.095	FALSE	FALSE	FALSE	5.3	N/A	A1		
268.5	70.373	0.150	59	0.831	1.128	0.98	0.98	0.137	0.652	0	0	0.095	FALSE	FALSE	FALSE	1.4	N/A	A1		

Front Ground Response										Sample Screened for:										Soil Type	
Elev. (ft)	Depth z	Cyclic Resistance Ratio CRR _{7.5}	Relative Density D _r	Correction for		Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., f _d	τ _{max} Shear Stress (psf)	τ _{avg} Shear Stress (psf)	Cyclic Stress			High Tip Res. (q _{c IN}) ≥ 175		Factor of Safety FS _{req}	Material (optional)	(see note on following chart)			
				Overburden Pressure K _o	Sloping Ground K _o						Ratio	CSR	Clay-like	Unsatrated							
268.4	70.537	0.132	53	0.847	0.914	0.98	0.101	0.652	0	0	0.095	FALSE	FALSE	FALSE	1.1	N/A	A1				
268.2	70.701	0.166	62	0.818	1.289	0.98	0.171	0.652	0	0	0.095	FALSE	FALSE	FALSE	1.8	N/A	A1				
268.0	70.865	0.183	65	0.807	1.428	0.97	0.205	0.652	0	0	0.095	FALSE	FALSE	FALSE	2.2	N/A	A1				
267.9	71.029	0.134	54	0.844	0.940	0.98	0.105	0.651	0	0	0.095	FALSE	FALSE	FALSE	1.1	N/A	A1				
267.7	71.193	0.114	45	0.866	0.655	0.99	0.064	0.651	0	0	0.095	FALSE	FALSE	FALSE	0.7	N/A	A1				
267.5	71.357	0.121	48	0.858	0.753	0.99	0.077	0.651	0	0	0.095	FALSE	FALSE	FALSE	0.8	N/A	A1				
267.4	71.521	0.119	47	0.861	0.718	0.99	0.072	0.651	0	0	0.095	FALSE	FALSE	FALSE	0.8	N/A	A1				
267.2	71.685	0.134	54	0.844	0.938	0.98	0.104	0.650	0	0	0.095	FALSE	FALSE	FALSE	1.1	N/A	A1				
267.1	71.850	0.195	66	0.799	1.515	0.97	0.229	0.650	0	0	0.095	FALSE	FALSE	FALSE	2.4	N/A	A1				
266.9	72.014	0.167	62	0.816	1.299	0.98	0.173	0.650	0	0	0.095	FALSE	FALSE	FALSE	1.8	N/A	A1				
266.7	72.178	0.148	58	0.831	1.108	0.98	0.134	0.650	0	0	0.095	FALSE	FALSE	FALSE	1.4	N/A	A1				
266.6	72.342	0.181	64	0.806	1.414	0.97	0.201	0.649	0	0	0.095	TRUE	FALSE	FALSE	2.1	N/A	A1				
266.4	72.506	N/A	54	N/A	N/A	N/A	N/A	0.649	0	0	0.095	TRUE	FALSE	FALSE	N/A	N/A	B				
266.2	72.670	N/A	48	N/A	N/A	N/A	N/A	0.649	0	0	0.095	TRUE	FALSE	FALSE	N/A	N/A	B				
266.1	72.834	N/A	51	N/A	N/A	N/A	N/A	0.649	0	0	0.095	TRUE	FALSE	FALSE	N/A	N/A	B				
265.9	72.998	0.156	60	0.823	1.196	0.98	0.151	0.648	0	0	0.095	FALSE	FALSE	FALSE	1.6	N/A	A1				
265.7	73.162	0.146	57	0.832	1.081	0.98	0.129	0.648	0	0	0.095	FALSE	FALSE	FALSE	1.4	N/A	A1				
265.6	73.326	0.184	65	0.804	1.433	0.97	0.206	0.648	0	0	0.095	FALSE	FALSE	FALSE	2.2	N/A	A1				
265.4	73.490	0.290	73	0.758	1.962	0.96	0.413	0.648	0	0	0.095	TRUE	FALSE	FALSE	4.3	N/A	A1				
265.2	73.654	N/A	58	N/A	N/A	N/A	N/A	0.647	0	0	0.095	TRUE	FALSE	FALSE	N/A	N/A	B				
265.1	73.818	N/A	48	N/A	N/A	N/A	N/A	0.647	0	0	0.095	TRUE	FALSE	FALSE	N/A	N/A	B				
264.9	73.982	N/A	56	N/A	N/A	N/A	N/A	0.647	0	0	0.095	TRUE	FALSE	FALSE	N/A	N/A	B				
264.8	74.146	N/A	60	N/A	N/A	N/A	N/A	0.647	0	0	0.095	TRUE	FALSE	FALSE	N/A	N/A	B				
264.6	74.310	N/A	57	N/A	N/A	N/A	N/A	0.646	0	0	0.095	TRUE	FALSE	FALSE	N/A	N/A	B				
264.4	74.474	N/A	53	N/A	N/A	N/A	N/A	0.646	0	0	0.095	FALSE	FALSE	FALSE	2.7	N/A	A1				
264.3	74.638	0.209	68	0.789	1.599	0.97	0.256	0.646	0	0	0.095	FALSE	FALSE	FALSE	4.1	N/A	A1				
264.1	74.802	0.279	73	0.760	1.919	0.96	0.390	0.646	0	0	0.095	FALSE	FALSE	FALSE	5.9	N/A	A1				
263.9	74.966	0.368	76	0.735	2.181	0.95	0.560	0.645	0	0	0.095	FALSE	FALSE	FALSE	6.5	N/A	A1				
263.8	75.130	0.401	77	0.728	2.254	0.95	0.622	0.645	0	0	0.095	FALSE	FALSE	FALSE	6.5	N/A	A1				
263.6	75.294	0.346	75	0.740	2.124	0.95	0.517	0.645	0	0	0.095	FALSE	FALSE	FALSE	5.4	N/A	A1				
263.4	75.458	0.574	80	0.697	2.534	0.94	0.949	0.645	0	0	0.095	FALSE	FALSE	FALSE	9.9	N/A	A1				
263.3	75.622	N/A	88	N/A	N/A	N/A	N/A	0.645	0	0	0.095	FALSE	TRUE	FALSE	N/A	N/A	A1				
263.1	75.786	N/A	94	N/A	N/A	N/A	N/A	0.644	0	0	0.095	FALSE	TRUE	FALSE	N/A	N/A	A1				
262.9	75.951	N/A	100	N/A	N/A	N/A	N/A	0.644	0	0	0.095	FALSE	TRUE	FALSE	N/A	N/A	A1				
262.8	76.115	N/A	100	N/A	N/A	N/A	N/A	0.644	0	0	0.095	FALSE	TRUE	FALSE	N/A	N/A	A1				
262.6	76.279	N/A	100	N/A	N/A	N/A	N/A	0.644	0	0	0.095	FALSE	TRUE	FALSE	N/A	N/A	A1				
262.5	76.443	N/A	100	N/A	N/A	N/A	N/A	0.644	0	0	0.095	FALSE	TRUE	FALSE	N/A	N/A	A1				
262.3	76.607	N/A	100	N/A	N/A	N/A	N/A	0.643	0	0	0.095	FALSE	TRUE	FALSE	N/A	N/A	A1				
262.1	76.771	N/A	100	N/A	N/A	N/A	N/A	0.643	0	0	0.095	FALSE	TRUE	FALSE	N/A	N/A	A1				
262.0	76.935	N/A	100	N/A	N/A	N/A	N/A	0.643	0	0	0.095	FALSE	TRUE	FALSE	N/A	N/A	A1				
261.8	77.099	N/A	100	N/A	N/A	N/A	N/A	0.643	0	0	0.096	FALSE	TRUE	FALSE	N/A	N/A	A1				
261.6	77.263	N/A	100	N/A	N/A	N/A	N/A	0.643	0	0	0.096	FALSE	TRUE	FALSE	N/A	N/A	A1				
261.5	77.427	N/A	100	N/A	N/A	N/A	N/A	0.642	0	0	0.096	FALSE	TRUE	FALSE	N/A	N/A	A1				
261.3	77.591	N/A	100	N/A	N/A	N/A	N/A	0.642	0	0	0.096	FALSE	TRUE	FALSE	N/A	N/A	A1				
261.1	77.755	N/A	100	N/A	N/A	N/A	N/A	0.642	0	0	0.096	FALSE	TRUE	FALSE	N/A	N/A	A1				
261.0	77.919	N/A	100	N/A	N/A	N/A	N/A	0.642	0	0	0.096	FALSE	TRUE	FALSE	N/A	N/A	A1				
260.8	78.083	N/A	91	N/A	N/A	N/A	N/A	0.642	0	0	0.096	FALSE	TRUE	FALSE	N/A	N/A	A1				
260.7	78.247	N/A	87	N/A	N/A	N/A	N/A	0.641	0	0	0.096	FALSE	TRUE	FALSE	N/A	N/A	A1				
260.5	78.411	N/A	81	N/A	N/A	N/A	N/A	0.641	0	0	0.096	FALSE	TRUE	FALSE	N/A	N/A	A1				
260.3	78.575	0.443	78	0.715	2.327	0.94	0.695	0.641	0	0	0.096	FALSE	FALSE	FALSE	7.3	N/A	A1				
260.2	78.739	N/A	85	N/A	N/A	N/A	N/A	0.641	0	0	0.096	FALSE	TRUE	FALSE	N/A	N/A	A1				
260.0	78.903	N/A	91	N/A	N/A	N/A	N/A	0.641	0	0	0.096	FALSE	TRUE	FALSE	N/A	N/A	A1				
259.8	79.067	N/A	94	N/A	N/A	N/A	N/A	0.641	0	0	0.096	FALSE	TRUE	FALSE	N/A	N/A	A1				
259.7	79.231	N/A	90	N/A	N/A	N/A	N/A	0.640	0	0	0.096	FALSE	TRUE	FALSE	N/A	N/A	A1				
259.5	79.395	N/A	100	N/A	N/A	N/A	N/A	0.640	0	0	0.096	FALSE	TRUE	FALSE	N/A	N/A	A1				

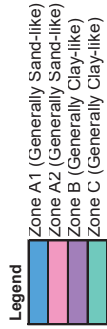
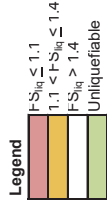
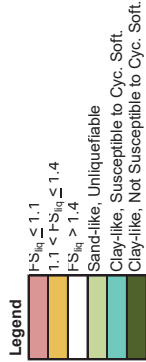
Elev. (ft)	Depth z (ft)	Cyclic Resistance Ratio CRR _{7.5}	Relative Density D _r (%)	Correction for			Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., f _d	Front Ground Response			Cyclic Stress Ratio CSR	Sample Screened for:			Factor of Safety FS _{req}	Material (optional)	Soil Type (see note on following chart)
				Overburden Pressure K _o	Sloping Ground K _α	Induced Shear Stress τ _{max} (psf)				Average Cyclic Shear Stress τ _{avg} (psf)	Cyclic Stress Ratio CSR	Clay-like (q _{c30}) _{cs} ≥ 175		High Tip Res.	Unsatrated				
259.3	79.559	N/A	100	N/A	N/A	N/A	N/A	N/A	0.640	0	0	0.096	FALSE	TRUE	FALSE	N/A	N/A	A1	
259.2	79.723	N/A	100	N/A	N/A	N/A	N/A	N/A	0.640	0	0	0.096	FALSE	TRUE	FALSE	N/A	N/A	A1	
259.0	79.887	N/A	94	N/A	N/A	N/A	N/A	N/A	0.640	0	0	0.096	FALSE	TRUE	FALSE	N/A	N/A	A1	
258.8	80.052	N/A	91	N/A	N/A	N/A	N/A	N/A	0.640	0	0	0.096	FALSE	TRUE	FALSE	N/A	N/A	A1	
258.7	80.216	N/A	86	N/A	N/A	N/A	N/A	N/A	0.640	0	0	0.096	FALSE	TRUE	FALSE	N/A	N/A	A1	
258.5	80.380	N/A	82	N/A	N/A	N/A	N/A	N/A	0.639	0	0	0.096	FALSE	TRUE	FALSE	N/A	N/A	A1	
258.4	80.544	N/A	81	N/A	N/A	N/A	N/A	N/A	0.639	0	0	0.096	FALSE	TRUE	FALSE	N/A	N/A	A1	
258.2	80.708	0.333	75	0.738	2.076	0.95	0.485	0.639	0	0	0	0.096	FALSE	FALSE	FALSE	5.1	N/A	A1	
258.0	80.872	0.235	70	0.772	1.722	0.96	0.301	0.639	0	0	0	0.096	FALSE	FALSE	FALSE	3.1	N/A	A1	
257.9	81.036	0.292	73	0.750	1.950	0.96	0.408	0.639	0	0	0	0.096	FALSE	FALSE	FALSE	4.3	N/A	A1	
257.7	81.200	0.249	71	0.766	1.785	0.96	0.327	0.639	0	0	0	0.096	FALSE	FALSE	FALSE	3.4	N/A	A1	
257.5	81.364	0.345	75	0.734	2.107	0.95	0.508	0.639	0	0	0	0.096	FALSE	FALSE	FALSE	5.3	N/A	A1	
257.4	81.528	N/A	87	N/A	N/A	N/A	N/A	0.638	0	0	0	0.096	FALSE	TRUE	FALSE	N/A	N/A	A1	
257.2	81.692	N/A	83	N/A	N/A	N/A	N/A	0.638	0	0	0	0.096	FALSE	TRUE	FALSE	N/A	N/A	A1	
257.0	81.856	0.380	77	0.725	2.192	0.95	0.573	0.638	0	0	0	0.096	FALSE	FALSE	FALSE	6.0	N/A	A1	
256.9	82.020	N/A	85	N/A	N/A	N/A	N/A	0.638	0	0	0	0.096	FALSE	TRUE	FALSE	N/A	N/A	A1	
256.7	82.184	N/A	83	N/A	N/A	N/A	N/A	0.638	0	0	0	0.096	FALSE	TRUE	FALSE	N/A	N/A	A1	
256.6	82.348	N/A	96	N/A	N/A	N/A	N/A	0.638	0	0	0	0.096	FALSE	TRUE	FALSE	N/A	N/A	A1	
256.4	82.512	N/A	100	N/A	N/A	N/A	N/A	0.638	0	0	0	0.096	FALSE	TRUE	FALSE	N/A	N/A	A1	
256.2	82.676	N/A	100	N/A	N/A	N/A	N/A	0.637	0	0	0	0.096	FALSE	TRUE	FALSE	N/A	N/A	A1	
256.1	82.840	N/A	100	N/A	N/A	N/A	N/A	0.637	0	0	0	0.096	FALSE	TRUE	FALSE	N/A	N/A	A1	
255.9	83.004	N/A	100	N/A	N/A	N/A	N/A	0.637	0	0	0	0.096	FALSE	TRUE	FALSE	N/A	N/A	A1	
255.7	83.168	N/A	100	N/A	N/A	N/A	N/A	0.637	0	0	0	0.096	FALSE	TRUE	FALSE	N/A	N/A	A1	
255.6	83.332	N/A	100	N/A	N/A	N/A	N/A	0.637	0	0	0	0.096	FALSE	TRUE	FALSE	N/A	N/A	A1	
255.4	83.496	N/A	100	N/A	N/A	N/A	N/A	0.637	0	0	0	0.096	FALSE	TRUE	FALSE	N/A	N/A	A1	
255.2	83.660	N/A	100	N/A	N/A	N/A	N/A	0.637	0	0	0	0.096	FALSE	TRUE	FALSE	N/A	N/A	A1	
255.1	83.824	0.269	72	0.756	1.864	0.96	0.364	0.637	0	0	0	0.096	FALSE	FALSE	FALSE	3.8	N/A	A1	
254.9	83.988	0.292	73	0.748	1.944	0.96	0.405	0.637	0	0	0	0.096	FALSE	FALSE	FALSE	4.2	N/A	A1	
254.7	84.153	N/A	62	N/A	N/A	N/A	N/A	0.637	0	0	0	0.096	TRUE	FALSE	FALSE	N/A	N/A	B	
254.6	84.317	N/A	55	N/A	N/A	N/A	N/A	0.636	0	0	0	0.096	TRUE	FALSE	FALSE	N/A	N/A	B	
254.4	84.481	N/A	56	N/A	N/A	N/A	N/A	0.636	0	0	0	0.096	TRUE	FALSE	FALSE	N/A	N/A	B	
254.3	84.645	0.152	59	0.819	1.129	0.98	0.137	0.636	0	0	0	0.096	FALSE	FALSE	FALSE	1.4	N/A	A1	
254.1	84.809	0.160	61	0.812	1.214	0.98	0.154	0.636	0	0	0	0.097	FALSE	FALSE	FALSE	1.6	N/A	A1	
253.9	84.973	0.157	60	0.815	1.183	0.98	0.148	0.636	0	0	0	0.097	FALSE	FALSE	FALSE	1.5	N/A	A1	
253.8	85.137	N/A	81	N/A	N/A	N/A	N/A	0.636	0	0	0	0.097	FALSE	TRUE	FALSE	N/A	N/A	A1	
253.6	85.301	0.388	77	0.720	2.200	0.95	0.582	0.636	0	0	0	0.097	FALSE	FALSE	FALSE	6.0	N/A	A1	
253.4	85.465	0.197	66	0.787	1.501	0.97	0.226	0.636	0	0	0	0.097	FALSE	FALSE	FALSE	2.3	N/A	A1	
253.3	85.629	0.143	57	0.826	1.034	0.98	0.120	0.636	0	0	0	0.097	FALSE	FALSE	FALSE	1.2	N/A	A1	
253.1	85.793	0.142	56	0.828	1.015	0.98	0.117	0.636	0	0	0	0.097	FALSE	FALSE	FALSE	1.2	N/A	A1	
252.9	85.957	0.137	55	0.832	0.962	0.98	0.108	0.636	0	0	0	0.097	FALSE	FALSE	FALSE	1.1	N/A	A1	
252.8	86.121	0.126	51	0.844	0.809	0.99	0.085	0.635	0	0	0	0.097	FALSE	FALSE	FALSE	0.9	N/A	A1	
252.6	86.285	0.120	48	0.851	0.728	0.99	0.074	0.635	0	0	0	0.097	FALSE	FALSE	FALSE	0.8	N/A	A1	
252.5	86.449	0.133	54	0.836	0.908	0.98	0.099	0.635	0	0	0	0.097	FALSE	FALSE	FALSE	1.0	N/A	A1	
252.3	86.613	0.154	60	0.816	1.150	0.98	0.141	0.635	0	0	0	0.097	FALSE	FALSE	FALSE	1.5	N/A	A1	
252.1	86.777	0.173	63	0.801	1.324	0.97	0.179	0.635	0	0	0	0.097	FALSE	FALSE	FALSE	1.8	N/A	A1	
252.0	86.941	0.320	75	0.736	2.025	0.95	0.455	0.635	0	0	0	0.097	FALSE	FALSE	FALSE	4.7	N/A	A1	
251.8	87.105	0.247	71	0.762	1.764	0.96	0.319	0.635	0	0	0	0.097	FALSE	FALSE	FALSE	3.3	N/A	A1	
251.6	87.269	0.193	66	0.788	1.470	0.97	0.217	0.635	0	0	0	0.097	FALSE	FALSE	FALSE	2.2	N/A	A1	
251.5	87.433	0.143	57	0.825	1.033	0.98	0.120	0.635	0	0	0	0.097	FALSE	FALSE	FALSE	1.2	N/A	A1	
251.3	87.597	0.276	73	0.750	1.881	0.96	0.373	0.635	0	0	0	0.097	FALSE	FALSE	FALSE	3.8	N/A	A1	
251.1	87.761	0.157	60	0.813	1.177	0.98	0.147	0.635	0	0	0	0.097	FALSE	FALSE	FALSE	1.5	N/A	A1	
251.0	87.925	0.151	59	0.818	1.115	0.98	0.135	0.635	0	0	0	0.097	FALSE	FALSE	FALSE	1.4	N/A	A1	
250.8	88.089	0.250	71	0.759	1.776	0.96	0.324	0.635	0	0	0	0.097	FALSE	FALSE	FALSE	3.3	N/A	A1	
250.6	88.254	0.235	70	0.766	1.707	0.96	0.295	0.635	0	0	0	0.097	FALSE	FALSE	FALSE	3.0	N/A	A1	
250.5	88.418	N/A	57	N/A	N/A	N/A	N/A	0.635	0	0	0	0.097	TRUE	FALSE	FALSE	N/A	N/A	B	

From Ground Response										Sample Screened for:				Factor of Safety FS _{liq}	Material (optional)	Soil Type (see note on following chart)	
Elev. z (ft)	Depth z (ft)	Cyclic Resistance Ratio CRR _{7.5}	Relative Density D _r (%)	Correction for Overburden Pressure		Magnitude Scaling Factor MSF	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., I _d	Induced Shear Stress τ _{max} (psf)		Average Cyclic Shear Stress τ _{avg} (psf)	Cyclic Stress Ratio CSR	High Tip Res. (qc ₃₀ /cs ≥ 175)				Clay-like
				K _σ	K _α				Sloping Ground	Tip Res. (qc ₃₀ /cs ≥ 175)							
250.3	88.582	N/A	63	N/A	N/A	N/A	N/A	0.635	0	0	0	0.097	TRUE	FALSE	FALSE	N/A	B
250.2	88.746	N/A	54	N/A	N/A	N/A	N/A	0.635	0	0	0	0.097	TRUE	FALSE	FALSE	N/A	B
250.0	88.910	N/A	50	N/A	N/A	N/A	N/A	0.635	0	0	0	0.097	TRUE	FALSE	FALSE	N/A	B
249.8	89.074	N/A	55	N/A	N/A	N/A	N/A	0.635	0	0	0	0.097	TRUE	FALSE	FALSE	N/A	B
249.7	89.238	0.267	72	0.752	1.844	0.96	0.355	0.635	0	0	0	0.097	FALSE	FALSE	FALSE	N/A	A1
249.5	89.402	N/A	66	N/A	N/A	N/A	N/A	0.635	0	0	0	0.097	TRUE	FALSE	FALSE	N/A	B
249.3	89.566	N/A	63	N/A	N/A	N/A	N/A	0.635	0	0	0	0.097	TRUE	FALSE	FALSE	N/A	B
249.2	89.730	0.375	76	0.719	2.161	0.95	0.553	0.634	0	0	0	0.097	FALSE	FALSE	FALSE	N/A	A1
249.0	89.894	0.531	80	0.687	2.435	0.94	0.833	0.634	0	0	0	0.097	FALSE	FALSE	FALSE	N/A	A1
248.8	90.058	N/A	85	N/A	N/A	N/A	N/A	0.634	0	0	0	0.098	FALSE	TRUE	FALSE	N/A	A1
248.7	90.222	0.313	74	0.735	1.997	0.95	0.439	0.634	0	0	0	0.098	FALSE	FALSE	FALSE	N/A	A1
248.5	90.386	0.275	73	0.748	1.871	0.96	0.369	0.634	0	0	0	0.098	FALSE	FALSE	FALSE	N/A	A1
248.3	90.550	0.238	70	0.762	1.719	0.96	0.301	0.634	0	0	0	0.098	FALSE	FALSE	FALSE	N/A	A1
248.2	90.714	0.359	76	0.722	2.121	0.95	0.522	0.634	0	0	0	0.098	FALSE	FALSE	FALSE	N/A	A1
248.0	90.878	0.316	74	0.734	2.004	0.95	0.443	0.634	0	0	0	0.098	FALSE	FALSE	FALSE	N/A	A1
247.9	91.042	0.196	66	0.747	1.483	0.97	0.220	0.634	0	0	0	0.098	FALSE	FALSE	FALSE	N/A	A1
247.7	91.206	0.496	79	0.692	2.380	0.94	0.767	0.634	0	0	0	0.098	FALSE	FALSE	FALSE	N/A	A1
247.5	91.370	N/A	99	N/A	N/A	N/A	N/A	0.634	0	0	0	0.098	FALSE	TRUE	FALSE	N/A	A1
247.4	91.534	N/A	100	N/A	N/A	N/A	N/A	0.634	0	0	0	0.098	FALSE	TRUE	FALSE	N/A	A1
247.2	91.698	N/A	100	N/A	N/A	N/A	N/A	0.634	0	0	0	0.098	FALSE	TRUE	FALSE	N/A	A1
247.0	91.862	N/A	100	N/A	N/A	N/A	N/A	0.634	0	0	0	0.098	FALSE	TRUE	FALSE	N/A	A1
246.9	92.026	N/A	100	N/A	N/A	N/A	N/A	0.634	0	0	0	0.098	FALSE	TRUE	FALSE	N/A	A1
246.7	92.190	N/A	100	N/A	N/A	N/A	N/A	0.634	0	0	0	0.098	FALSE	TRUE	FALSE	N/A	A1
246.5	92.355	N/A	100	N/A	N/A	N/A	N/A	0.634	0	0	0	0.098	FALSE	TRUE	FALSE	N/A	A1
246.4	92.519	N/A	85	N/A	N/A	N/A	N/A	0.634	0	0	0	0.098	FALSE	TRUE	FALSE	N/A	A1
246.2	92.683	0.249	71	0.756	1.764	0.96	0.320	0.635	0	0	0	0.098	FALSE	FALSE	FALSE	N/A	A1
246.1	92.847	0.171	63	0.798	1.299	0.98	0.173	0.635	0	0	0	0.098	FALSE	FALSE	FALSE	N/A	A1
245.9	93.011	0.190	66	0.785	1.443	0.97	0.209	0.635	0	0	0	0.098	FALSE	FALSE	FALSE	N/A	A1
245.7	93.175	0.415	77	0.706	2.236	0.95	0.619	0.635	0	0	0	0.098	FALSE	FALSE	FALSE	N/A	A1

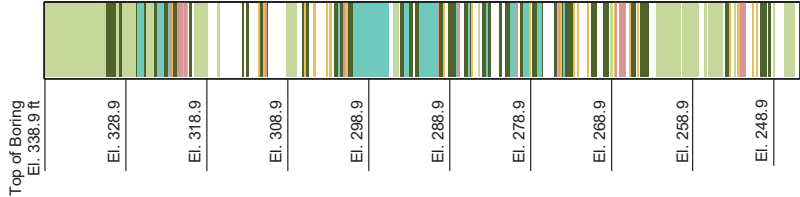
SP11



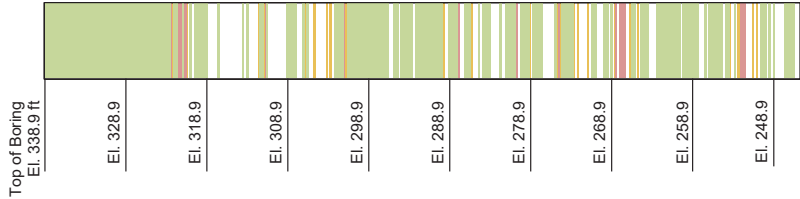
Adapted from "Discussion of 'Liquefaction Potential of Silts from CPTu'" (Robertson 2008). Zone A₁ and Zone A₂ samples are generally sand-like. Zone B samples are generally clay-like and not susceptible to cyclic softening. Zone C samples are generally clay-like and susceptible to cyclic softening. Note that the transition from clay-like to sand-like in this chart does not exactly match the liquefaction calculations herein; that is, some transitional samples in Zone B and Zone C will be treated as sand-like and analyzed for liquefaction if the calculations indicate as such.



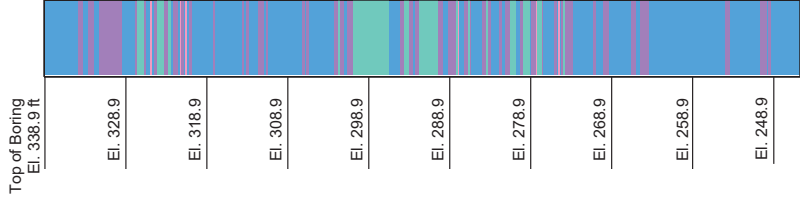
SP11, Liquefaction Triggering Results



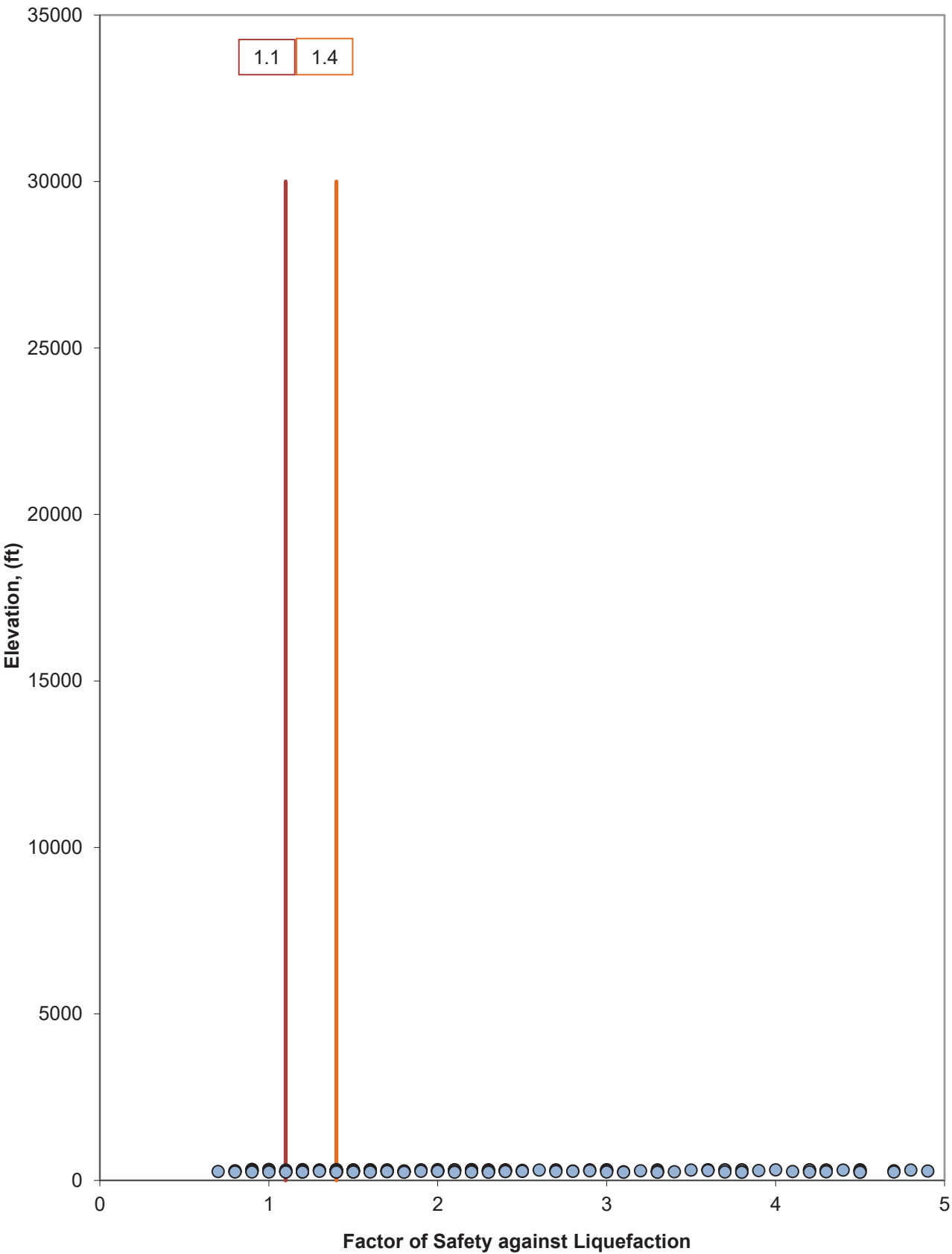
SP11, Liquefaction Triggering Results



SP11, Robertson Soil Type



US 60 Bridge, Boring = SP11, Source = Design Source, Mw = 7.7, Event = Design Event,
CPT Data, Simplified Stress-Based Approach



US60 Bridge, Boring ID: 1013

Liquefaction Potential Evaluations

For Coarse Grained Soils

Elev. Of Mid. Pt. of Sample (ft)	Depth of Mid. Pt. of Sample (ft.)	Unit Weight (pcf)	γ _T	σ _v	u	Static Pore Pressure during SPT (tsf)	Hammer Efficiency (%)	E _m	Borehole Diameter Correction	C _b	Sampler Correction	C _s	Rod Length Correction	C _R	Overburden Stress Correction Factor	C _N	Hammer Energy Correction Factor	C _E	Corrected Blow Count	N ₆₀	Normalized Blow Count	(N ₁) ₆₀	Relative Density (%)	D _r	Unified Soil Classification	Fines Content (%)	Relative State Parameter Index	ξ _R	a				
Top of Hole Elevation (ft)			309.6				Boring ID = 1013																										
begin sampling (depth-ft)			0.0				Boring Inner Dia. (in) = 4.25																										
total unit wt. above 1st SPT (pcf)			0				Assumed Rod Stickup = 5.0 feet																										
water elevation during SPT (ft)			294.6				E _m Measurement? = 1 (1: Yes, 0: No)																										
water depth during SPT (ft)			15.0				SPT Sampler w/ Liners? = 0 (1: Yes, 0: No)																										
water elevation during EQ (ft)			294.6																														
water during EQ (depth-ft)			15.0																														
vert. total stress above 1st SPT (tsf)			0.00																														
293.6	16.0	120		0.96	0.03	0.93		80.0	1.000	1.000	1.10	1.10	1.00	1.00	1.00	0.99	1.33	1.33	0	0	0	0	35		0	56	-0.19		0.350				
288.6	21.0	120		1.26	0.19	1.07		80.0	1.000	1.000	1.10	1.10	1.00	1.00	1.00	0.99	1.33	1.33	4	4	4	4	47		0	56	-0.29		0.350				
283.6	26.0	120		1.56	0.34	1.22		80.0	1.000	1.000	1.10	1.10	1.00	1.00	1.00	0.93	1.33	1.33	6	5	6	5	49		0	56	-0.31		0.350				
278.6	31.0	120		1.86	0.50	1.36		80.0	1.000	1.000	1.10	1.10	1.00	1.00	1.00	0.87	1.33	1.33	6	5	6	5	48		0	56	-0.30		0.350				

Assumed Rod Stickup = 5.0 feet

E_m Measurement? = 1 (1: Yes, 0: No)

SPT Sampler w/ Liners? = 0 (1: Yes, 0: No)

US60 Bridge Boring ID: 1013
Liquefaction Potential Evaluations
For Coarse Grained Soils

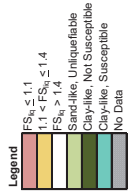
EQ Source Design Source	a max (g) 0.20	EQ Mag (Mw) 7.7	Event Design Event

Shear Stress Curve Fit Parameters			
m4:	0		
m3:	0		
m2:	0		
m1:	0		

Depth of Sample	Ver. Total Stress during EQ	Static Pore Pressure during EQ	Ver. Eff. Stress during EQ	Clean Sand Correction ΔN_{pore}	Equivalent Clean Sand N-Value $(N)_{\text{eqs}}$	Cyclic Resistance Ratio CRR7.5	Overburden Correction Factor K_o	Static Shear Stress Correction K_s	Mag. Scaling Factor (MSF)	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., r_d	Sample Screened for:				Factor of Safety F_{eq}	Material (optional)
												From Ground Response Max. Induced Shear Stress (psf)	From Ground Response Avg. Cyclic Shear Stress (psf)	Cyclic Stress Ratio	Clay-like $(N)_{\text{cor}} \geq 32$		
2	σ_v with fill	u	w/ Fill (tsf)														
Boring ID: 1013.00																	
Top of Fill Elevation:				ft													
Fill Height:				ft (relative to ground surface during SP7)													
Fill Total Unit Weight:				pcf													
Fill Total Stress:				tsf													
total-top				0.00													
u-top				0.00													
eff-top				0.00													
16.0	0.96	0.03	0.93	5.61	6	0.091	1.010	0.571	0.99	0.052	0.968	0	0	0.130	FALSE	FALSE	0.4
21.0	1.26	0.19	1.07	5.61	10	0.118	0.989	0.962	0.99	0.104	0.952	0	0	0.145	FALSE	FALSE	0.7
26.0	1.56	0.34	1.22	5.61	11	0.126	0.987	0.967	0.99	0.118	0.935	0	0	0.156	FALSE	FALSE	0.8
31.0	1.86	0.50	1.36	5.61	11	0.123	0.976	0.927	0.99	0.110	0.917	0	0	0.163	FALSE	FALSE	0.7

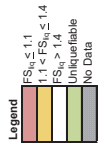
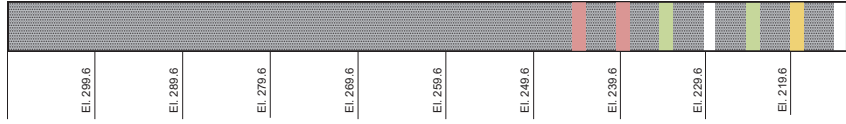
Note: A factor of safety shown as "N/A" implies that the soil type is not appropriately evaluated using this methodology. This applies to clay-like soils (typically CL, CH, CI-MI, and MH material type), samples with high blow counts, and unsaturated samples.

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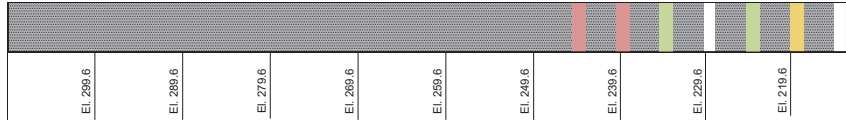
R11, Liquefaction Triggering Results

Top of Boring
El. 309.6 ft



R11, Liquefaction Triggering Results

Top of Boring
El. 309.6 ft



Project Name =

Boring ID =

Boring Location

Northing =

Easting =

Baseline Station =

Offset (+ Right) =

US60 Bridge

1027

OR

US60 Bridge, Boring ID: 1027

Liquefaction Potential Evaluations

For Coarse Grained Soils

Elev. Of Sample (ft)	Mid. Pt. (ft)	Depth of Sample (ft)	Unit Weight (γ_r) (pcf)	Ver. Total Stress during SPT (tsf)	Static Pore Pressure during SPT (tsf)	SPT Stress Value	SPT N	Hammer Efficiency (%)	Borehole Diameter	C_b	C_s	Rod Length Correction	C_r	Overburden Stress Correction Factor	C_n	CE	N_{60}	Corrected Blow Count	Normalized Blow Count	Relative Density (%)	Unified Soil Classification	Fines Content (%)	Relative State Parameter Index	Static Shear Stress Ratio	
									Boring ID = 1027																
									Boring Inner Dia. (in) = 4.25																
									Assumed Rod Stickup = 5.0 feet																
									E _m Measurement? = 1 (1: Yes, 0: No)																
									SPT Sampler w/ Liners? = 0 (1: Yes, 0: No)																
									u-top																
									erist-top																
									0.00																
									0.00																
272.9	66.0	120	3.96	1.63	2.33	9	80.0	1.000	1.10	1.00	0.68	1.33	13	9	56	0	35	-0.36	0.350						
267.9	71.0	120	4.26	1.78	2.48	6	80.0	1.000	1.10	1.00	0.64	1.33	9	6	49	0	35	-0.29	0.350						
262.9	76.0	120	4.56	1.94	2.62	22	80.0	1.000	1.27	1.00	0.73	1.33	37	27	85	0	35	-0.60	0.350						
257.9	81.0	120	4.86	2.10	2.76	15	80.0	1.000	1.15	1.00	0.66	1.33	23	15	67	0	35	-0.46	0.350						
252.9	86.0	120	5.16	2.25	2.91	24	80.0	1.000	1.30	1.00	0.72	1.33	42	30	88	0	35	-0.60	0.350						
247.9	91.0	120	5.46	2.41	3.05	12	80.0	1.000	1.11	1.00	0.65	1.33	18	11	74	0	35	-0.38	0.350						
242.9	96.0	120	5.76	2.56	3.20	19	80.0	1.000	1.19	1.00	0.64	1.33	30	19	74	0	35	-0.52	0.350						

US60 Bridge Boring ID: 1027
Liquefaction Potential Evaluations
For Coarse Grained Soils

EQ Source	a max (g)	EQ Mag (Mw)	Event
Design Source	0.21	7.7	Design Event

Shear Stress Curve Fit Parameters			
m4:	0		
m3:	0		
m2:	0		
m1:	0		

Depth of Mid. Pt. of Sample (ft.) z	Ver. Total Stress during EQ w/ Fill (tsf) σ_v with fill	Static Pore Pressure during EQ (tsf) u	Ver. Eff. Stress during EQ w/ Fill (tsf) σ'_v with fill	Clean Sand Correction $\Delta(N)_{1/60cs}$	Equivalent Clean Sand N-Value (N) _{60cs}	Cyclic Resistance Ratio CRR7.5	Overburden Correction Factor K_o	Static Shear Stress Correction K_o	Mag. Scaling Factor (MSF)	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., r_d	Sample Screened for:			Factor of Safety FS_{eq}	Material (optional)			
												From Ground Response Stress (psf)	Max. Induced Shear Stress (psf)	Avg. Cyclic Shear Stress (psf)			Cyclic Stress Ratio CSR	Clay-like	Blow Count (N) _{60eq} ≥ 32
Boring ID: 1027.00																			
Top of Fill Elevation: 368.9 ft																			
Fill Height: 30.0 ft (relative to ground surface during SPT)																			
Fill Total Unit Weight: 0 pcf																			
Fill Total Stress: 0.00 tsf																			
total-top u-top eff-top																			
66.0	3.96	1.63	2.33		5.51	14	0.152	0.914	1.163	0.98	0.158	0.677	0	0	0.155	FALSE	FALSE	FALSE	N/A
71.0	4.26	1.78	2.48	5.51	11	0.126	0.918	0.879	0.99	0.100	0.665	0	0	0.154	FALSE	FALSE	FALSE	N/A	
76.0	4.56	1.94	2.62	5.51	33	N/A	N/A	N/A	N/A	N/A	0.655	0	0	0.154	FALSE	TRUE	FALSE	N/A	
81.0	4.86	2.10	2.76	5.51	21	0.124	0.888	1.719	0.97	0.309	0.647	0	0	0.154	FALSE	FALSE	FALSE	N/A	
86.0	5.16	2.25	2.91	5.51	35	N/A	N/A	N/A	N/A	N/A	0.641	0	0	0.154	FALSE	TRUE	FALSE	N/A	
91.0	5.46	2.41	3.05	5.51	16	0.167	0.877	1.266	0.97	0.181	0.635	0	0	0.154	FALSE	FALSE	FALSE	N/A	
96.0	5.76	2.56	3.20	5.51	25	0.289	0.821	2.142	0.95	0.484	0.635	0	0	0.154	FALSE	FALSE	FALSE	N/A	

Note: A factor of safety shown as "N/A" implies that the soil type is not appropriately evaluated using this methodology. This applies to clay-like soils (typically CL, CH, CL-ML, and MH material type), samples with high blow counts, and unsaturated samples.

Note: A factor of safety shown as "N/A" implies that the soil type is not appropriately evaluated using this methodology. This applies to clay-like soils (typically CL, CH, CL-ML and MH material type), samples with high blow counts, and unsaturated samples.

Project Name =

Boring ID =

Boring Location

Nothing =

Eating =

OR

Baseline Station =

Offset (+ Right) =

US60 Bridge

1028

US60 Bridge, Boring ID: 1028

Liquefaction Potential Evaluations

For Coarse Grained Soils

Elev. Of Mid. Pt. of Sample (ft)	Depth of Sample (ft.)	Unit Weight (pcf)	Ver. Total Stress during SPT (tsf)	Static Pore Pressure during SPT (tsf)	SPT Value	Hammer Efficiency (%)	Borehole Diameter Correction	C _b	C _s	Sampler Correction	Rod Length Correction	C _R	Overburden Stress Correction Factor	C _N	Hammer Correction Factor	Corrected Blow Count	Normalized Blow Count (N ₁) ₆₀	Relative Density (%)	Unified Soil Classification	Fines Content (%)	Relative State Parameter Index	Static Shear Stress Ratio
Top of Hole Elevation (ft) = 338.9 Boring ID = 1028 Boring Inner Dia. (in) = 4.25																						
Begin sampling (depth-ft) = 0.0 Boring inner diameter (in) = 4.25																						
total unit wt. above 1st SPT (pcf) = 0 Assumed Rod Stickup = 5.0 feet																						
water elevation during SPT (ft) = 325.1 E_m Measurement? = 1 (1: Yes, 0: No)																						
water depth during SPT (ft) = 13.8 SPT Sampler w/ Liners? = 0 (1: Yes, 0: No)																						
water elevation during EQ (ft) = 325.1 ft. (relative to ground surface during SPT)																						
water during EQ (depth-ft) = 13.8 ft. (relative to ground surface during SPT)																						
vert. total stress above 1st SPT (tsf) = 0.00 u-top effsit-top = 0.00																						
322.9	16.0	120	0.96	0.07	0.89	6	80.0	1.000	1.10	1.10	1.00	1.00	1.09	1.33	1.33	9	10	57	0	40	-0.41	0.350
317.9	21.0	120	1.26	0.22	1.04	11	80.0	1.000	1.17	1.17	1.00	1.00	1.01	1.33	1.33	17	17	71	0	40	-0.53	0.350
312.9	26.0	120	1.56	0.38	1.18	10	80.0	1.000	1.15	1.15	1.00	1.00	0.95	1.33	1.33	15	15	66	0	40	-0.49	0.350
307.9	31.0	120	1.86	0.54	1.32	7	80.0	1.000	1.10	1.10	1.00	1.00	0.90	1.33	1.33	10	9	57	0	40	-0.39	0.350
302.9	36.0	120	2.16	0.69	1.47	7	80.0	1.000	1.10	1.10	1.00	1.00	0.85	1.33	1.33	10	9	56	0	40	-0.38	0.350
297.9	41.0	120	2.46	0.85	1.61	0	80.0	1.000	1.10	1.10	1.00	1.00	0.73	1.33	1.33	0	0	5	0	0	0.10	0.350
292.9	46.0	120	3.36	1.32	2.04	17	80.0	1.000	1.20	1.20	1.00	1.00	0.75	1.33	1.33	27	20	67	0	0	-0.47	0.350
287.9	51.0	120	3.66	1.47	2.19	3	80.0	1.000	1.10	1.10	1.00	1.00	0.62	1.33	1.33	4	3	24	0	0	-0.05	0.350
282.9	56.0	120	3.96	1.63	2.33	8	80.0	1.000	1.10	1.10	1.00	1.00	0.67	1.33	1.33	12	8	54	0	90	-0.34	0.350
277.9	61.0	120	4.26	1.78	2.48	18	80.0	1.000	1.21	1.21	1.00	1.00	0.72	1.33	1.33	29	21	76	0	90	-0.55	0.350
272.9	66.0	120	4.56	1.94	2.62	19	80.0	1.000	1.22	1.22	1.00	1.00	0.71	1.33	1.33	31	22	77	0	60	-0.57	0.350
267.9	71.0	120	4.86	2.10	2.76	11	80.0	1.000	1.10	1.10	1.00	1.00	0.63	1.33	1.33	16	10	59	0	60	-0.38	0.350
262.9	76.0	120	5.16	2.25	2.91	12	80.0	1.000	1.11	1.11	1.00	1.00	0.62	1.33	1.33	18	11	60	0	60	-0.39	0.350
257.9	81.0	120	5.46	2.41	3.05	59	80.0	1.000	#N/A	#N/A	1.00	1.00	#N/A	#N/A	1.33	#N/A	#N/A	#N/A	#N/A	10	#N/A	0.350
252.9	86.0	120	5.76	2.56	3.20	7	80.0	1.000	#N/A	#N/A	1.00	1.00	#N/A	#N/A	1.33	#N/A	#N/A	#N/A	#N/A	0	#N/A	0.350
247.9	91.0	120	6.06	2.88	3.48	15	80.0	1.000	#N/A	#N/A	1.00	1.00	#N/A	#N/A	1.33	#N/A	#N/A	#N/A	#N/A	0	#N/A	0.350
242.9	96.0	120	6.36	3.03	3.63	13	80.0	1.000	#N/A	#N/A	1.00	1.00	#N/A	#N/A	1.33	#N/A	#N/A	#N/A	#N/A	0	#N/A	0.350
237.9	101.0	120	6.66	3.19	3.77	33	80.0	1.000	#N/A	#N/A	1.00	1.00	#N/A	#N/A	1.33	#N/A	#N/A	#N/A	#N/A	0	#N/A	0.350
232.9	106.0	120	6.96	3.34	3.92	12	80.0	1.000	#N/A	#N/A	1.00	1.00	#N/A	#N/A	1.33	#N/A	#N/A	#N/A	#N/A	0	#N/A	0.350
227.9	111.0	120	7.26																	0	#N/A	0.350
222.9	116.0	120																		0	#N/A	0.350
217.9	121.0	120																		0	#N/A	0.350

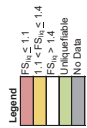
US60 Bridge Boring ID: 1028
Liquefaction Potential Evaluations
For Coarse Grained Soils

EQ Source New Madrid	a max (g) 0.17	EQ Mag (Mw) 7.7	Event Determin.

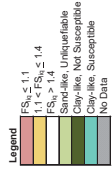
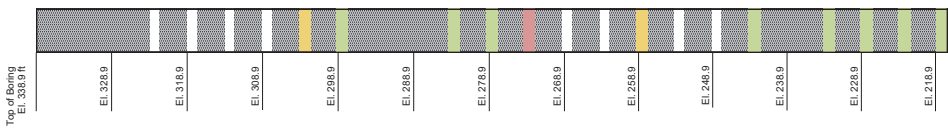
Shear Stress Curve Fit Parameters			
m4:	0		
m3:	0		
m2:	0		
m1:	0		

Depth of Sample (ft.)	Ver. Total Stress during EQ	Static Pore Pressure during EQ	Ver. Eff. Stress during EQ	Clean Sand Correction $\Delta N_{1/300}$	Equivalent Clean Sand N-Value $(N)_{eq,cs}$	Cyclic Resistance Ratio CRR7.5	Overburden Correction Factor K_o	Static Shear Stress Correction K_s	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., r_d	Sample Screened for:				Factor of Safety F_{eq}	Material (optional)	
											Max. Induced Shear Stress (psf)	Avg. Cyclic Shear Stress (psf)	High Blow Count $(N)_{60s} \geq 32$	Clay-like			
																	From Ground Response
2	$\sigma_{v,eq} (tsf)$	u	$w/F (tsf)$	$\Delta N_{1/300}$	$N_{eq,cs}$	$CRR_{7.5}$											
Boring ID: 1028.00																	
Top of Fill Elevation: 368.9 ft																	
Fill Height: 30.0 ft (relative to ground surface during SPT)																	
Fill Total Unit Weight: 0.00 pcf																	
Fill Total Stress: 0.00 tsf																	
u_{top} eff: 0.00																	
$u_{total-top}$ eff: 0.00																	
16.0	0.96	0.07	0.89	5.58	15	0.157	1.019	1.383	0.98	0.217	0.857	0	0	FALSE	FALSE	2.1	N/A
21.0	1.26	0.22	1.04	5.58	23	0.248	1.003	2.231	0.96	0.534	0.836	0	0	FALSE	FALSE	4.7	N/A
26.0	1.56	0.36	1.18	5.58	20	0.208	0.985	1.866	0.97	0.369	0.816	0	0	FALSE	FALSE	3.1	N/A
31.0	1.86	0.54	1.32	5.58	15	0.154	0.975	1.288	0.98	0.190	0.795	0	0	FALSE	FALSE	1.5	N/A
36.0	2.16	0.69	1.47	5.58	14	0.150	0.965	1.228	0.98	0.175	0.775	0	0	FALSE	FALSE	1.4	N/A
41.0	2.46	0.85	1.61	0.00	0	N/A	N/A	N/A	0.99	N/A	0.756	0	0	TRUE	FALSE	N/A	N/A
56.0	3.36	1.32	2.04	0.00	20	N/A	N/A	N/A	0.97	N/A	0.705	0	0	TRUE	FALSE	N/A	N/A
61.0	3.66	1.47	2.19	0.00	3	N/A	N/A	N/A	0.99	N/A	0.690	0	0	TRUE	FALSE	N/A	N/A
66.0	3.96	1.63	2.33	5.51	13	0.143	0.917	1.073	0.98	0.138	0.677	0	0	FALSE	FALSE	1.1	N/A
71.0	4.26	1.78	2.48	5.51	26	0.325	0.854	2.401	0.95	0.633	0.665	0	0	FALSE	FALSE	5.0	N/A
76.0	4.56	1.94	2.62	5.60	27	0.362	0.836	2.522	0.95	0.722	0.655	0	0	FALSE	FALSE	5.7	N/A
81.0	4.86	2.10	2.76	5.60	16	0.163	0.890	1.250	0.98	0.178	0.647	0	0	FALSE	FALSE	1.4	N/A
86.0	5.16	2.25	2.91	5.60	17	0.171	0.881	1.314	0.98	0.193	0.641	0	0	FALSE	FALSE	1.5	N/A
91.0	5.46	2.41	3.05	1.15	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	0.637	0	0	FALSE	FALSE	#N/A	N/A
96.0	5.76	2.56	3.20	0.00	#N/A	N/A	#N/A	#N/A	#N/A	#N/A	0.635	0	0	TRUE	FALSE	#N/A	N/A
106.0	6.36	2.88	3.48	0.00	#N/A	N/A	#N/A	#N/A	#N/A	#N/A	0.637	0	0	TRUE	FALSE	#N/A	N/A
111.0	6.66	3.03	3.63	0.00	#N/A	N/A	#N/A	#N/A	#N/A	#N/A	0.642	0	0	TRUE	FALSE	#N/A	N/A
116.0	6.96	3.19	3.77	0.00	#N/A	N/A	#N/A	#N/A	#N/A	#N/A	0.649	0	0	TRUE	FALSE	#N/A	N/A
121.0	7.26	3.34	3.92	0.00	#N/A	N/A	#N/A	#N/A	#N/A	#N/A	0.658	0	0	TRUE	FALSE	#N/A	N/A

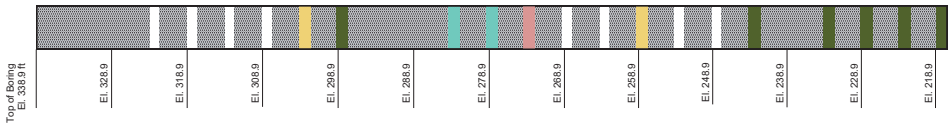
Note: A factor of safety shown as "N/A" implies that the soil type is not appropriately evaluated using this methodology. This applies to clay-like soils (typically CL, CH, CL-ML and MH material type), samples with high blow counts, and unsaturated samples.



R11, Liquefaction Triggering Results



R11, Liquefaction Triggering Results



US60 Bridge, Boring ID: R11

Liquefaction Potential Evaluations

For Coarse Grained Soils

Elev. Of Mid. Pt. of Sample (ft)	Depth of Mid. Pt. of Sample (ft.)	Unit Weight (pcf)	Ver. Total Stress during SPT (tsf)	Static Pore Pressure during SPT (tsf)	Ver. Eff. Stress during SPT (tsf)	SPT Value	Hammer Efficiency (%)	Borehole Diameter Correction	Sampler Correction	Rod Length Correction	Overburden Stress Correction Factor	Hammer Energy Correction Factor	Corrected Blow Count	Normalized Blow Count (N ₁) ₆₀	Relative Density (%)	Unified Soil Classification	Fines Content (%)	Relative State Parameter Index	Static Shear Stress Ratio
Z			σ_v	u	σ'_v	N	E _m	C _B	C _s	C _R	C _N	C _E	N ₆₀	(N ₁) ₆₀	D _r			ξ_R	a
Top of Hole Elevation (ft)			336.8			Boring ID = R11													
begin sampling (depth-ft)			0.0			Boring Inner Dia. (in) = 4.25													
total unit wt. above 1st SPT (pcf) =			0			ft (relative to ground surface during SPT)													
water elevation during SPT (ft) =			325.1			Assumed Rod Pickup = 5.0 feet													
water depth during SPT (ft) =			11.7			E _m Measurement? = 1 (1: Yes, 0: No)													
water elevation during EQ (ft) =			325.1			SPT Sampler w/ Liners? = 0 (1: Yes, 0: No)													
water during EQ (depth-ft) =			11.7			ft (relative to ground surface during SPT)													
vert. total stress above 1st SPT (tsf) =			0.00		0.00														
325.8	11.0	120	0.66	0.00	0.66	6	80.0	1.000	1.11	1.00	1.25	1.33	9	11	60	0	72	-0.44	0.350
320.8	16.0	120	0.96	0.13	0.83	3	80.0	1.000	1.10	1.00	1.14	1.33	4	5	48	0	72	-0.31	0.350
315.8	21.0	120	1.26	0.29	0.97	6	80.0	1.000	1.10	1.00	1.04	1.33	9	9	57	0	40	-0.40	0.350
310.8	26.0	120	1.56	0.45	1.11	3	80.0	1.000	1.10	1.00	0.97	1.33	4	4	46	0	40	-0.29	0.350
305.8	31.0	120	1.86	0.60	1.26	12	80.0	1.000	1.17	1.00	0.93	1.33	19	17	71	0	40	-0.53	0.350
300.8	36.0	120	2.16	0.76	1.40	2	80.0	1.000	1.10	1.00	0.85	1.33	3	3	42	0	74	-0.24	0.350
295.8	41.0	120	2.46	0.91	1.55	12	80.0	1.000	1.16	1.00	0.85	1.33	19	16	68	0	74	-0.50	0.350
290.8	46.0	120	2.76	1.07	1.69	2	80.0	1.000	1.10	1.00	0.77	1.33	3	2	41	0	97	-0.22	0.350
285.8	51.0	120	3.06	1.23	1.83	3	80.0	1.000	1.10	1.00	0.73	1.33	4	3	42	0	25	-0.23	0.350
280.8	56.0	120	3.36	1.38	1.98	32	80.0	1.000	1.30	1.00	0.85	1.33	55	47	100	0	25	-0.60	0.350
275.8	61.0	120	3.66	1.54	2.12	18	80.0	1.000	1.23	1.00	0.77	1.33	29	23	78	0	25	-0.58	0.350
270.8	66.0	120	3.96	1.69	2.27	12	80.0	1.000	1.13	1.00	0.70	1.33	18	13	62	0	25	-0.42	0.350
267.8	69.0	120	4.14	1.79	2.35	10	80.0	1.000	1.10	1.00	0.68	1.33	15	10	57	0	25	-0.37	0.350

US60 Bridge, Boring ID: R11
Liquefaction Potential Evaluations
For Coarse Grained Soils

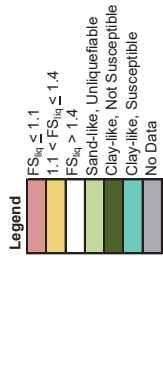
EQ Source	a max (g)	EQ Mag (Mw)	Event
Design Source	0.21	7.7	Design Event

Shear Stress Curve Fit Parameters			
m4:	0		
m3:	0		
m2:	0		
m1:	0		

Depth of Sample (ft.)	Ver. Total Stress during EQ (tsf)	Ver. Eff. Stress during EQ (tsf)	Static Pore Pressure during EQ (tsf)	Clean Sand Correction $\Delta(N)_{\text{flow}}$	Equivalent Clean Sand N-Value $(N)_{\text{flow}}$	Cyclic Resistance Ratio CRR7.5	Overburden Correction Factor K_c	Static Shear Stress Correction K_s	Cyclic Resistance Ratio CRR	Stress Reduction Coeff., r_d	From Ground Response			Cyclic Stress Ratio			Sample Screened for:			Factor of Safety FS_{eq}	Material (optional)	
											Max. Induced Shear Stress (psf)	Avg. Cyclic Shear Stress (psf)		CSR	Clay-like	Blow Count $(N_{\text{flow}} \geq 32)$	High	Unsaturated				
z	σ_v with fill	σ_v with fill	u	$\Delta(N)_{\text{flow}}$	$(N)_{\text{flow}}$																	
Boring ID: R11																						
Top of Fill Elevation: 338.8 ft																						
Fill Height: 0.0 ft (relative to ground surface during SPT)																						
Fill Total Unit Weight: 0.00 pcf																						
Fill Total Stress: 0.00 tsf																						
tsf		u-top		u-top		u-top		u-top		u-top		u-top		u-top		u-top		u-top		u-top		
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
11.0	0.66	0.00	0.13	0.83	5.57	17	0.171	1.056	1.586	0.98	0.982	0	0	0	0.136	FALSE	FALSE	TRUE	FALSE	FALSE	N/A	N/A
16.0	0.96	0.13	0.83	5.57	11	0.122	1.023	0.970	0.99	0.982	0	0	0	0.155	FALSE	FALSE	FALSE	FALSE	FALSE	0.8	N/A	
21.0	1.26	0.29	0.97	5.58	15	0.154	1.010	1.333	0.98	0.962	0	0	0	0.171	FALSE	FALSE	FALSE	FALSE	FALSE	1.2	N/A	
26.0	1.56	0.45	1.11	5.58	20	0.177	0.995	1.609	0.97	0.955	0	0	0	0.181	FALSE	FALSE	FALSE	FALSE	FALSE	0.6	N/A	
31.0	1.86	0.60	1.26	5.58	23	0.251	0.974	2.199	0.96	0.917	0	0	0	0.187	FALSE	FALSE	FALSE	FALSE	FALSE	2.7	N/A	
36.0	2.16	0.76	1.40	5.56	8	N/A	N/A	N/A	0.99	0.897	0	0	0	0.191	TRUE	TRUE	FALSE	FALSE	FALSE	N/A	N/A	
41.0	2.46	0.91	1.55	5.56	21	N/A	N/A	N/A	0.96	0.878	0	0	0	0.193	TRUE	TRUE	FALSE	FALSE	FALSE	N/A	N/A	
46.0	2.76	1.07	1.69	5.49	8	N/A	N/A	N/A	0.98	0.878	0	0	0	0.193	TRUE	TRUE	FALSE	FALSE	FALSE	N/A	N/A	
51.0	3.06	1.23	1.83	5.07	8	N/A	N/A	N/A	0.99	0.856	0	0	0	0.193	TRUE	TRUE	FALSE	FALSE	FALSE	N/A	N/A	
56.0	3.36	1.38	1.98	5.07	52	N/A	N/A	N/A	N/A	0.816	0	0	0	0.192	FALSE	FALSE	TRUE	FALSE	FALSE	N/A	N/A	
61.0	3.66	1.54	2.12	5.07	28	0.370	0.873	2.629	0.94	0.802	0	0	0	0.190	FALSE	FALSE	FALSE	FALSE	FALSE	4.2	N/A	
66.0	3.96	1.69	2.27	5.07	18	0.181	0.907	1.475	0.97	0.775	0	0	0	0.187	FALSE	FALSE	FALSE	FALSE	FALSE	1.3	N/A	
69.0	4.14	1.79	2.35	5.07	15	0.156	0.911	1.211	0.98	0.764	0	0	0	0.186	FALSE	FALSE	FALSE	FALSE	FALSE	0.9	N/A	

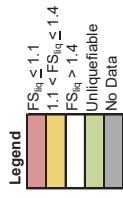
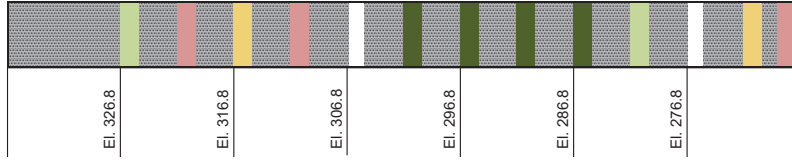
Note: A factor of safety shown as "N/A" implies that the soil type is not appropriately evaluated using this methodology. This applies to clay soils (MH, CH, OH) and to MH soils with blow counts less than 15, and to CH and OH samples with high blow counts, and unsaturated samples.

Note: A factor of safety shown as "N/A" implies that the soil type is not appropriately evaluated using this methodology. This applies to clay-like soils (typically CL, CH, CL-ML and MH material type), samples with high blow counts, and unsaturated samples.



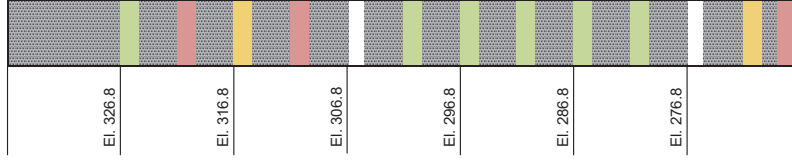
R11, Liquefaction Triggering Results

Top of Boring
El. 336.8 ft

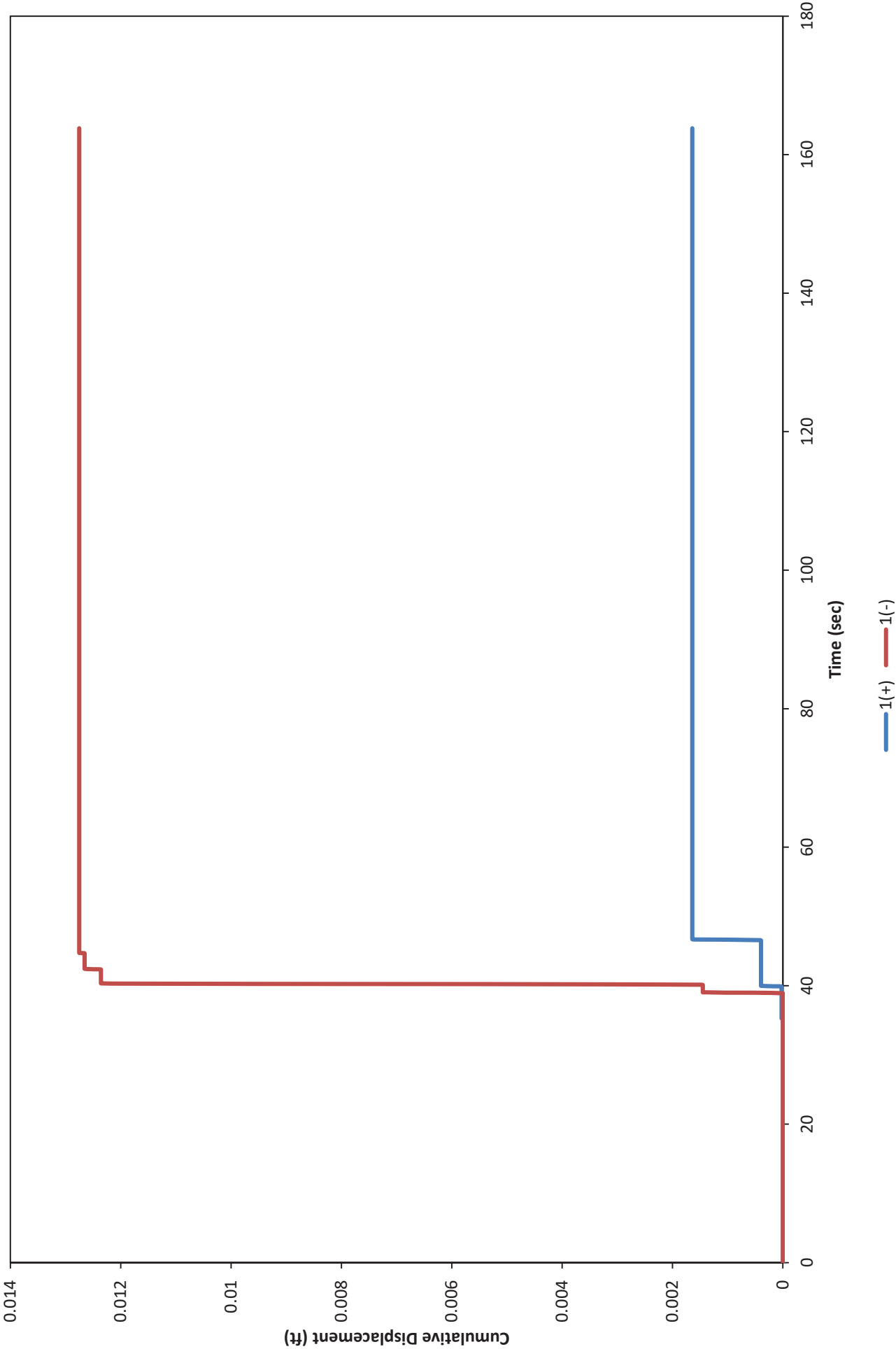


R11, Liquefaction Triggering Results

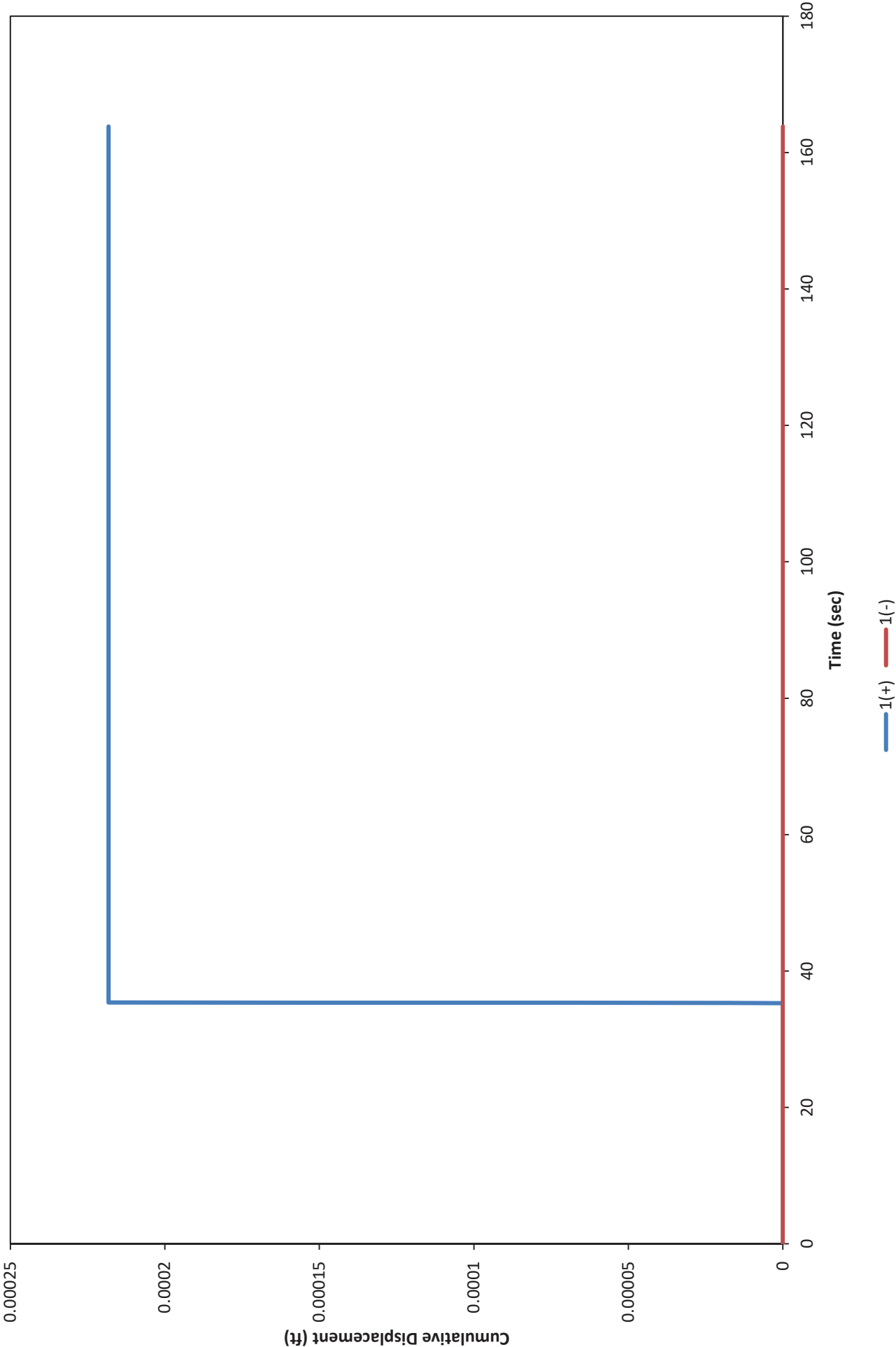
Top of Boring
El. 336.8 ft



Newmark Displacement Plot: US60-NorthBank-Design Event-Design Source-
nor-ds



Newmark Displacement Plot: US60-SpillSlope-Design Event-Design Source-nor-ds



APPENDIX G

Coordinate Data Submission Form

**COORDINATE DATA SUBMISSION FORM
KYTC DIVISION OF MATERIALS -- GEOTECHNICAL BRANCH**

County Livingston Date 2/21/2020

Road Number US 60

Survey Crew / Consultant BFW Engineering

Contact Person Tim Choate

Item # 1-1142.00

Program Code _____

Project # FD52 070 0060 012 013

Notes:

(circle one)
(Sea Level) Assumed

Elevation Datum
NAVD 88

HOLE NUMBER	STATION	OFFSET	ELEVATION (ft)	LATITUDE (Decimal Degrees)	LONGITUDE (Decimal Degrees)
US 60 Roadway					
R-1	100+00	CL	366.2	37.142774	-88.401919
R-2	102+00	40' RT	374.3	37.143143	-88.401392
R-3	104+00	40' LT	380.0	37.143722	-88.401245
R-4	106+00	40' RT	385.7	37.144126	-88.400706
R-6	108+00	35' LT	389.1	37.144712	-88.400752
R-7	110+00	32' LT	398.4	37.145246	-88.400621
R-8	111+00	32' RT	406.2	37.145487	-88.400346
R-9	112+00	40' LT	405.8	37.145791	-88.400531
R-10	114+00	45' LT	407.4	37.146334	-88.400432
R-11	134+00	100' LT	336.8	37.151774	-88.399455
R-12	136+00	75' LT	339.3	37.152303	-88.399254
R-13	140+00	50' RT	343.9	37.153328	-88.398599

HOLE NUMBER	STATION	OFFSET	ELEVATION (ft)	LATITUDE (Decimal Degrees)	LONGITUDE (Decimal Degrees)
R-14	144+00	45' RT	345.3	37.154413	-88.398383
R-15	148+00	30' RT	347.4	37.155502	-88.398201
R-16	150+00	32' LT	351.7	37.156073	-88.398294
R-17	152+00	32' RT	347.1	37.156591	-88.397972
R-18	154+00	40' LT	343.4	37.157149	-88.398180
R-19	156+00	20' RT	347.7	37.157703	-88.398009
R-20	158+00	20' LT	345.3	37.158228	-88.398250
R-21	160+00	35' RT	344.4	37.158799	-88.398245
R-22	161+75	CL	347.1	37.159228	-88.398542
KY 70 Roadway					
R-23	53+50	20' LT	397.6	37.143302	-88.400172
US 60 over Cumberland River - Structure Borings					
1001	114+90	20' LT	400.7	37.146566	-88.400295
1002	114+90	CL	400.3	37.146557	-88.400227
1003	114+90	20' RT	399.4	37.146548	-88.400160
1004	116+13	20' LT	340.0	37.146899	-88.400223
1005	116+13	20' RT	341.8	37.146881	-88.400088
1006	117+37	20' LT	334.6	37.147235	-88.400151
1007	117+37	20' RT	335.2	37.147216	-88.400016
1008	118+50	25' LT	334.4	37.147543	-88.400103
1009	118+50	25' RT	335.3	37.147520	-88.399934
1010	118+60	CL	335.2	37.147559	-88.400012
1011	118+70	25' LT	329.8	37.147597	-88.400091
1012	118+70	25' RT	334.2	37.147574	-88.399922
1013	125+50	25' LT	309.6	37.149438	-88.399696
1014	125+50	25' RT	306.0	37.149415	-88.399526
1015	125+60	CL	309.9	37.149453	-88.399605

HOLE NUMBER	STATION	OFFSET	ELEVATION (ft)	LATITUDE (Decimal Degrees)	LONGITUDE (Decimal Degrees)
1016	125+70	25' LT	316.5	37.149492	-88.399684
1017	125+70	25' RT	310.6	37.149469	-88.399515
1018	127+00	25' LT	325.6	37.149844	-88.399608
1019	127+00	25' RT	324.9	37.149821	-88.399439
1020	128+40	25' LT	327.9	37.150223	-88.399527
1021	128+40	25' RT	328.6	37.150200	-88.399358
1022	129+00	10' LT	333.1	37.150378	-88.399441
1023	129+00	25' RT	331.8	37.150362	-88.399323
1024	131+50	25' LT	337.1	37.151062	-88.399347
1025	131+50	25' RT	337.5	37.151039	-88.399177
1026	132+60	25' LT	337.1	37.151360	-88.399283
1027	132+60	25' RT	338.3	37.151336	-88.399113
1028	134+00	20' LT	338.9	37.151736	-88.399184
1029	134+00	20' RT	340.1	37.151718	-88.399049
US 60 over Cumberland River - CPT Soundings					
CPT-1	114+80	CL	400.9	37.146530	-88.400233
CPT-2	116+13	CL	344.9	37.146890	-88.400156
CPT-3	117+37	CL	335.2	37.147226	-88.400084
CPT-4	118+50	CL	334.2	37.147532	-88.400018
CPT-5	125+70	CL	314.5	37.149480	-88.399599
CPT-6	127+00	CL	325.2	37.149832	-88.399524
CPT-7	128+40	CL	328.1	37.150211	-88.399442
CPT-8	129+00	CL	332.6	37.150374	-88.399407
CPT-9	131+50	CL	337.4	37.151050	-88.399262
CPT-10	132+60	CL	338.0	37.151348	-88.399198
CPT-11	134+00	CL	339.6	37.151727	-88.399117

APPENDIX H

Driller's and Geologist's Subsurface Logs

**Driller's Subsurface Logs -
Roadway**

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>R-1</u>		Immediate Water Depth <u>(07/30/19)</u>		Start Date <u>07/30/2019</u>		Hole Type <u>cut profile</u>			
Surface Elevation <u>366.2'</u>		Static Water Depth <u>NA</u>		End Date <u>07/30/2019</u>		Rig Number <u>55 Truck</u>			
Total Depth <u>5.0'</u>		Driller <u>Tim Caudill</u>		Latitude(83) <u>37.142774</u>					
Location <u>100+00.00 CL</u>				Longitude(83) <u>-88.401919</u>					
Lithology		Overburden		Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Description		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	
365.8	0.4	Blacktop.							Boring moved 3' into center of lane to avoid two lane closures @ 0
365.2	1.0	Concrete.							
363.7	2.5	Dense Grade Aggregate.							
361.2	5.0	Tan to brown, moist, sandy lean clay.		1	2.5-4.5	1.0		ST	
		(Bottom of Hole 5.0') (No Refusal)							

Drilling Firm: Stantec
For: Division of Structural Design
Geotechnical Branch

DRILLER'S SUBSURFACE LOG

Printed: 3/5/20

Page 1 of 1

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>		Project Type: <u>Geotechnical</u>					
Item Number:		<u>Cumberland River</u>		Project Manager: <u> </u>					
Hole Number <u>R-2</u>		Immediate Water Depth <u>(07/30/19)</u>		Start Date <u>07/30/2019</u>					
Surface Elevation <u>374.3'</u>		Static Water Depth <u>NA</u>		End Date <u>07/30/2019</u>					
Total Depth <u>10.0'</u>		Driller <u>Tim Caudill</u>		Latitude(83) <u>37.143143</u>					
Location <u>102+00.00 40.0' Rt.</u>				Longitude(83) <u>-88.401392</u>					
Lithology		Overburden		Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Description		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	
374.1	0.2	Topsoil.		1	0.2-5.0			MC	Boring offset 45' 274W due to roadway, water line, and culvert @ 0
		Tan to brown, moist, sandy lean clay (Trace fine gravel from 5.0 to 10.0).		2	5.0-10.0			MC	
364.3	10.0								
		(Bottom of Hole 10.0') (No Refusal)							

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>R-3</u>		Immediate Water Depth <u>(07/30/19)</u>		Start Date <u>07/30/2019</u>		Hole Type <u>cut profile</u>			
Surface Elevation <u>380.0'</u>		Static Water Depth <u>NA</u>		End Date <u>07/30/2019</u>		Rig Number <u>55 Truck</u>			
Total Depth <u>8.0'</u>		Driller <u>Tim Caudill</u>		Latitude(83) <u>37.143722</u>					
Location <u>104+00.00 40.0' Lt.</u>				Longitude(83) <u>-88.401245</u>					
Lithology		Overburden		Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Description		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	
379.7	0.3	Topsoil.							Bulk Sample @ 0.3-8
		Tan to brown, moist, sandy lean clay.		1	0.3-5.0			MC	
				2	5.0-8.0			MC	
372.0	8.0								
10		(Bottom of Hole 8.0') (No Refusal)							10
15									15
20									20
25									25
30									30
35									35
40									40
45									45
50									50

Drilling Firm: Stantec
For: Division of Structural Design
Geotechnical Branch

DRILLER'S SUBSURFACE LOG

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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>		Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>		Project Manager: <u> </u>				
Hole Number <u>R-4</u>		Immediate Water Depth <u>(07/30/19)</u>	Start Date <u>07/30/2019</u>		Hole Type <u>cut profile</u>			
Surface Elevation <u>385.7'</u>		Static Water Depth <u>NA</u>	End Date <u>07/30/2019</u>		Rig_Number <u>55 Truck</u>			
Total Depth <u>9.0'</u>		Driller <u>Tim Caudill</u>	Latitude(83) <u>37.144126</u>					
Location <u>106+00.00 40.0' Rt.</u>			Longitude(83) <u>-88.400706</u>					
Lithology		Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
385.6	0.1	Topsoil.						
		Brown to tan, moist, silty lean clay.	1	0.1-5.0			MC	
380.7	5.0							
		Brown, moist, gravelly lean clay.	2	5.0-9.0			MC	
376.7	9.0							
		(Bottom of Hole 9.0') (No Refusal)						

Drilling Firm: Stantec
For: Division of Structural Design
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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>		Project Type: <u>Geotechnical</u>					
Item Number:		<u>Cumberland River</u>		Project Manager: <u> </u>					
Hole Number <u>R-6</u>		Immediate Water Depth <u>(07/30/19)</u>		Start Date <u>07/30/2019</u>					
Surface Elevation <u>389.1'</u>		Static Water Depth <u>NA</u>		End Date <u>07/30/2019</u>					
Total Depth <u>8.0'</u>		Driller <u>Tim Caudill</u>		Latitude(83) <u>37.144712</u>					
Location <u>108+00.00 35.0' Lt.</u>				Longitude(83) <u>-88.400752</u>					
Lithology		Overburden		Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Description Rock Core		Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
388.8	0.3	Topsoil.							Bulk Sample @ 0.3-8
		Brown to tan, moist, sandy lean clay with gravel.		1	0.3-5.0			MC	
381.1	8.0			2	5.0-8.0			MC	
10		(Bottom of Hole 8.0') (No Refusal)							10
15									15
20									20
25									25
30									30
35									35
40									40
45									45
50									50

Drilling Firm: Stantec
For: Division of Structural Design
Geotechnical Branch

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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>R-8</u>		Immediate Water Depth <u>(08/01/19)</u>		Start Date <u>08/01/2019</u>		Hole Type <u>sounding</u>			
Surface Elevation <u>406.2'</u>		Static Water Depth <u>NA</u>		End Date <u>08/01/2019</u>		Rig Number <u>55 Truck</u>			
Total Depth <u>14.0'</u>		Driller <u>Tim Caudill</u>		Latitude(83) <u>37.145487</u>					
Location <u>111+00.00 32.0' Rt.</u>				Longitude(83) <u>-88.400346</u>					
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
5		Overburden.							Boring moved 10.0 60NE due to overhead lines @ 0
10									
394.1	12.1								
392.2	14.0	Weathered Shale.							
15		(Bottom of Hole 14.0') (No Refusal)							
20									
25									
30									
35									
40									
45									
50									

Drilling Firm: Stantec
For: Division of Structural Design
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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>		Project Type: <u>Geotechnical</u>					
Item Number:		<u>Cumberland River</u>		Project Manager: <u> </u>					
Hole Number <u>R-9</u>	Immediate Water Depth <u>(07/31/19)</u>	Start Date <u>07/31/2019</u>		Hole Type <u>cut profile</u>					
Surface Elevation <u>405.8'</u>	Static Water Depth <u>NA</u>	End Date <u>07/31/2019</u>		Rig_Number <u>55 Truck</u>					
Total Depth <u>10.5'</u>	Driller <u>Tim Caudill</u>	Latitude(83) <u>37.145791</u>							
Location <u>112+00.00 40.0' Lt.</u>		Longitude(83) <u>-88.400531</u>							
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
405.5	0.3	Topsoil.							
		Brown to tan, moist, silty lean clay.		1	0.3-5.0			MC	Boring moved 10 3N due to overhead lines @ 0 Bulk Sample @ 0.3-9.9
				2	5.0-9.9			MC	
395.9	9.9	Weathered shale.							
395.3	10.5								
		(Bottom of Hole 10.5') (Refusal @ 10.5)							

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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>		Project Type: <u>Geotechnical</u>					
Item Number:		<u>Cumberland River</u>		Project Manager: <u> </u>					
Hole Number <u>R-10</u>		Immediate Water Depth <u>(07/30/19)</u>	Start Date <u>07/30/2019</u>		Hole Type <u>cut profile</u>				
Surface Elevation <u>407.4'</u>		Static Water Depth <u>NA</u>	End Date <u>07/30/2019</u>		Rig_Number <u>55 Truck</u>				
Total Depth <u>12.0'</u>		Driller <u>Tim Caudill</u>	Latitude(83) <u>37.146334</u>						
Location <u>114+00.00 45.0' Lt.</u>			Longitude(83) <u>-88.400432</u>						
Lithology		Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks	
Elevation	Depth	Description	Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)		SDI (JS)
407.3	0.1	Topsoil.		1	0.1-5.0			MC	
		Brown, moist, silty lean clay.		2	5.0-10.0			MC	
				3	10.0-12.0			MC	
395.4	12.0	(Bottom of Hole 12.0') (No Refusal)							

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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>		Project Type: <u>Geotechnical</u>	
Item Number:		<u>Cumberland River</u>		Project Manager: <u> </u>	

Hole Number <u>R-11</u>		Immediate Water Depth <u>19.0 (07/31/19)</u>	Start Date <u>07/31/2019</u>		Hole Type <u>sample</u>
Surface Elevation <u>336.8'</u>		Static Water Depth <u>22.7 (10/07/19)</u>	End Date <u>07/31/2019</u>		Rig Number <u>55 Truck</u>
Total Depth <u>69.5'</u>		Driller <u>Tim Caudill</u>	Latitude(83) <u>37.151774</u>		
Location <u>134+00.00 100.0' Lt.</u>			Longitude(83) <u>-88.399455</u>		

Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
336.6	0.2	Topsoil.							
		Tan to brown, moist, sandy lean clay.		1	2.5-4.5	2.0		ST	
				2	5.0-7.0	2.0		ST	
326.8	10.0	Loose, gray to light gray, moist, silty lean clay.		1	10.0-11.5	1.5	4-2-4	SPT	
				2	15.0-16.5	1.5	1-1-2	SPT	
316.8	20.0	Medium dense, dark gray to gray, moist, silty sand.		3	20.0-21.5	0.7	2-3-3	SPT	
				4	25.0-26.5	0.9	1-1-2	SPT	
				5	30.0-31.5	0.8	1-2-10	SPT	
301.8	35.0	Soft, gray to dark gray, moist, lean clay with sand lenses.		6	35.0-36.5	1.4	1-1-1	SPT	
				7	40.0-41.5	1.5	4-5-7	SPT	
				8	45.0-46.5	1.5	0-1-1	SPT	

augers
charged with
bentonite
mud to
prevent
heave @ 21.5

DRILLER'S SUBSURFACE LOG

Project ID: <u>178565011</u>		<u>Livingston - US 60</u> <u>Cumberland River</u>			Project Type: <u>Geotechnical</u> Project Manager: <u> </u>				
Hole Number <u>R-11</u>		Immediate Water Depth <u>19.0 (07/31/19)</u>		Start Date <u>07/31/2019</u>			Hole Type <u>sample</u>		
Surface Elevation <u>336.8'</u>		Static Water Depth <u>22.7 (10/07/19)</u>		End Date <u>07/31/2019</u>			Rig Number <u>55 Truck</u>		
Total Depth <u>69.5'</u>		Driller <u>Tim Caudill</u>		Latitude(83) <u>37.151774</u>					
Location <u>134+00.00 100.0' Lt.</u>				Longitude(83) <u>-88.399455</u>					

Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks	
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)		
55	281.8	55.0		9	50.0-51.5	1.5	0-0-3	SPT	1" pvc observation well installed @ 69.5	
60		60.0		10	55.0-56.5	1.5	9-15-17	SPT		
				11	60.0-61.5	0.9	6-10-8	SPT		
65		65.0		12	65.0-66.5	1.5	2-7-5	SPT		
70	267.3	69.5		13	68.0-69.5	1.2	2-5-5	SPT		
75		75.0								
80		80.0								
85		85.0								
90		90.0								
95		95.0								
100		100.0								

Drilling Firm: Stantec
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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>		Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>		Project Manager: <u> </u>				
Hole Number <u>R-12</u>		Immediate Water Depth <u>10.0 (07/31/19)</u>	Start Date <u>07/31/2019</u>		Hole Type <u>fill profile</u>			
Surface Elevation <u>339.3'</u>		Static Water Depth <u>NA</u>	End Date <u>07/31/2019</u>		Rig_Number <u>55 Truck</u>			
Total Depth <u>24.0'</u>		Driller <u>Tim Caudill</u>	Latitude(83) <u>37.152303</u>					
Location <u>136+00.00 75.0' Lt.</u>			Longitude(83) <u>-88.399254</u>					
Lithology		Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Description	Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	
339.0	0.3	Topsoil.						
		Brown, moist, silty lean clay.		1	0.3-5.0			MC
334.3	5.0	Brown to tan, moist, sandy silt.		2	5.0-10.0			MC
329.3	10.0	Tan to brown, moist, silty sand.		3	10.0-15.0			MC
				4	15.0-20.0			MC
				5	20.0-24.0			MC
315.3	24.0	(Bottom of Hole 24.0') (No Refusal)						

Drilling Firm: Stantec
For: Division of Structural Design
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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>		Project Type: <u>Geotechnical</u>					
Item Number:		<u>Cumberland River</u>		Project Manager: _					
Hole Number <u>R-13</u>		Immediate Water Depth <u>(07/31/19)</u>		Start Date <u>07/31/2019</u>					
Surface Elevation <u>343.9'</u>		Static Water Depth <u>NA</u>		End Date <u>07/31/2019</u>					
Total Depth <u>10.0'</u>		Driller <u>Tim Caudill</u>		Latitude(83) <u>37.153328</u>					
Location <u>140+00.00 50.0' Rt.</u>				Longitude(83) <u>-88.398599</u>					
Lithology		Overburden		Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Description Rock Core		Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
343.7	0.2	Topsoil.		1	0.2-5.0			MC	Bulk sample @ 0.2-10
		Brown to tan, moist, silty lean clay.		2	5.0-10.0			MC	
333.9	10.0								
		(Bottom of Hole 10.0') (No Refusal)							

Drilling Firm: Stantec
For: Division of Structural Design
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Project ID: <u>178565011</u>						<u>Livingston - US 60</u>									Project Type: <u>Geotechnical</u>								
Item Number:						<u>Cumberland River</u>									Project Manager: _								
Hole Number <u>R-14</u>						Immediate Water Depth <u>(07/31/19)</u>						Start Date <u>07/31/2019</u>						Hole Type <u>fill profile</u>					
Surface Elevation <u>345.3'</u>						Static Water Depth <u>NA</u>						End Date <u>07/31/2019</u>						Rig_Number <u>55 Truck</u>					
Total Depth <u>10.0'</u>						Driller <u>Tim Caudill</u>						Latitude(83) <u>37.154413</u>											
Location <u>144+00.00 45.0' Rt.</u>												Longitude(83) <u>-88.398383</u>											
Lithology						Overburden			Sample No.		Depth (ft)		Rec. (ft)		SPT Blows		Sample Type		Remarks				
Elevation	Depth		Description			Rock Core			Std/Ky RQD		Run (ft)		Rec (ft)		Rec (%)		SDI (JS)						
345.2	0.1		Topsoil.														MC						
340.3	5.0		Tan to brown, moist, silty lean clay.						1		0.1-5.0												
335.3	10.0		Brown, moist, sandy lean clay.						2		5.0-10.0						MC						
(Bottom of Hole 10.0') (No Refusal)																							

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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>R-17</u>		Immediate Water Depth <u>(08/01/19)</u>		Start Date <u>08/01/2019</u>		Hole Type <u>fill profile</u>			
Surface Elevation <u>347.1'</u>		Static Water Depth <u>NA</u>		End Date <u>08/01/2019</u>		Rig_Number <u>55 Truck</u>			
Total Depth <u>5.0'</u>		Driller <u>Tim Caudill</u>		Latitude(83) <u>37.156591</u>					
Location <u>152+00.00 32.0' Rt.</u>				Longitude(83) <u>-88.397972</u>					
Lithology		Overburden		Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Description		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	
346.8	0.3	Topsoil.							
		Tan to brown, moist, silty sand.		1	0.3-5.0			MC	
5 342.1	5.0								5
10		(Bottom of Hole 5.0') (No Refusal)							10
15									15
20									20
25									25
30									30
35									35
40									40
45									45
50									50

Drilling Firm: Stantec
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Project ID: <u>178565011</u>						<u>Livingston - US 60</u>									Project Type: <u>Geotechnical</u>								
Item Number:						<u>Cumberland River</u>									Project Manager: _								
Hole Number <u>R-18</u>						Immediate Water Depth <u>(08/01/19)</u>						Start Date <u>08/01/2019</u>						Hole Type <u>fill profile</u>					
Surface Elevation <u>343.4'</u>						Static Water Depth <u>NA</u>						End Date <u>08/01/2019</u>						Rig_Number <u>55 Truck</u>					
Total Depth <u>10.0'</u>						Driller <u>Tim Caudill</u>						Latitude(83) <u>37.157149</u>											
Location <u>154+00.00 40.0' Lt.</u>												Longitude(83) <u>-88.398180</u>											
Lithology		Description					Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks										
Elevation	Depth						Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)											
343.2	0.2	Topsoil.																					
		Brown to tan, moist, silty sand.					1	0.2-5.0				MC											
5 338.4	5.0												5										
		Tan to brown, moist, silty sand.					2	5.0-10.0				MC											
10 333.4	10.0												10										
15		(Bottom of Hole 10.0') (No Refusal)											15										
20													20										
25													25										
30													30										
35													35										
40													40										
45													45										
50													50										

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Project ID: <u>178565011</u>						<u>Livingston - US 60</u>									Project Type: <u>Geotechnical</u>								
Item Number:						<u>Cumberland River</u>									Project Manager: _								
Hole Number <u>R-20</u>						Immediate Water Depth <u>(08/01/19)</u>						Start Date <u>08/01/2019</u>						Hole Type <u>fill profile</u>					
Surface Elevation <u>345.3'</u>						Static Water Depth <u>NA</u>						End Date <u>08/01/2019</u>						Rig_Number <u>55 Truck</u>					
Total Depth <u>5.0'</u>						Driller <u>Tim Caudill</u>						Latitude(83) <u>37.158228</u>											
Location <u>158+00.00 20.0' Lt.</u>												Longitude(83) <u>-88.398250</u>											
Lithology			Description						Overburden		Sample No.		Depth (ft)		Rec. (ft)		SPT Blows		Sample Type		Remarks		
Elevation	Depth								Rock Core		Std/Ky RQD		Run (ft)		Rec (ft)		Rec (%)		SDI (JS)				
345.0			0.3		Topsoil.																		
					Brown to tan, moist, silty lean clay.						1		0.3-5.0						MC				
5 340.3			5.0																		5		
10					(Bottom of Hole 5.0') (No Refusal)																10		
15																					15		
20																					20		
25																					25		
30																					30		
35																					35		
40																					40		
45																					45		
50																					50		

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>R-21</u>		Immediate Water Depth <u>(08/01/19)</u>		Start Date <u>08/01/2019</u>		Hole Type <u>fill profile</u>			
Surface Elevation <u>344.4'</u>		Static Water Depth <u>NA</u>		End Date <u>08/01/2019</u>		Rig_Number <u>55 Truck</u>			
Total Depth <u>5.0'</u>		Driller <u>Tim Caudill</u>		Latitude(83) <u>37.158799</u>					
Location <u>160+00.00 35.0' Rt.</u>				Longitude(83) <u>-88.398245</u>					
Lithology		Overburden		Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Description		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	
344.0	0.4	Topsoil.							Bulk sample @ 0.4-5
		Tan to brown, moist, silty lean clay.		1	0.4-5.0			MC	
5 339.4	5.0								5
10		(Bottom of Hole 5.0') (No Refusal)							10
15									15
20									20
25									25
30									30
35									35
40									40
45									45
50									50

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>R-22</u>		Immediate Water Depth <u>(08/01/19)</u>		Start Date <u>08/01/2019</u>		Hole Type <u>fill profile</u>			
Surface Elevation <u>347.1'</u>		Static Water Depth <u>NA</u>		End Date <u>08/01/2019</u>		Rig Number <u>55 Truck</u>			
Total Depth <u>5.0'</u>		Driller <u>Tim Caudill</u>		Latitude(83) <u>37.159228</u>					
Location <u>161+75.00 CL</u>				Longitude(83) <u>-88.398542</u>					
Lithology		Overburden		Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Description		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	
346.2	0.9	Blacktop.							Moved 5' into northbound lane for single lane road closure @ 0
345.4	1.7	Concrete.							
		Light gray to gray, moist, silty lean clay.		1	3.0-5.0	2.0		ST	
5 342.1	5.0								
10		(Bottom of Hole 5.0') (No Refusal)							10
15									15
20									20
25									25
30									30
35									35
40									40
45									45
50									50

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>R-23</u>		Immediate Water Depth <u>(07/30/19)</u>		Start Date <u>07/30/2019</u>		Hole Type <u>cut profile</u>			
Surface Elevation <u>397.6'</u>		Static Water Depth <u>NA</u>		End Date <u>07/30/2019</u>		Rig Number <u>55 Truck</u>			
Total Depth <u>8.0'</u>		Driller <u>Tim Caudill</u>		Latitude(83) <u>37.143302</u>					
Location <u>53+50.00 20.0' Lt.</u>				Longitude(83) <u>-88.400172</u>					
Lithology		Overburden		Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Description		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	
397.4	0.2	Topsoil.							boring offset 23 300NW due to culvert @ 0 Bulk sample @ 0.2-8
		Tan to brown, moist, sandy lean clay.		1	0.2-5.0			MC	
392.6	5.0			2	5.0-8.0			MC	
		(Bottom of Hole 8.0') (No Refusal)							

Driller's Subsurface Logs - Bridge

Drilling Firm: Stantec
For: Division of Structural Design
Geotechnical Branch

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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>		Project Type: <u>Geotechnical</u>					
Item Number:		<u>Cumberland River</u>		Project Manager: <u> </u>					
Hole Number <u>1001</u>		Immediate Water Depth <u>(08/12/19)</u>		Start Date <u>08/12/2019</u>					
Surface Elevation <u>400.7'</u>		Static Water Depth <u>NA</u>		End Date <u>08/12/2019</u>					
Total Depth <u>27.5'</u>		Driller <u>Tim Caudill</u>		Latitude(83) <u>37.146566</u>					
Location <u>114+90.00 20.0' Lt.</u>				Longitude(83) <u>-88.400295</u>					
Lithology		Overburden		Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Description		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	
5 394.3	6.4	Reddish brown, moist, lean clay (gray mottling). (Begin Core)		1	2.5-4.5	2.0		ST	Boring moved 3.0' 178S due to overhead trees @ 0
				2	5.0-5.1	0.0		ST	
				1	5.1-6.4	1.3	22-35-50/0.30	SPT	
10 390.9	9.8	Brown to light gray sandstone, weathered.		19 / 0	2.7	2.7	100		9.1
15 383.8	16.9	Gray to dark gray shale with sandstone.		22 / 0	5.0	5.0	100		14.1
20		Gray to light gray sandstone.		12 / 0	5.0	5.0	100		19.1
25				0 / 0	5.0	5.0	100		24.1
30 373.2	27.5			32 / 32	3.4	3.4	100		27.5
35		(Bottom of Hole 27.5')							
40									
45									
50									

Drilling Firm: Stantec
For: Division of Structural Design
Geotechnical Branch

DRILLER'S SUBSURFACE LOG

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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>		Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>		Project Manager: <u> </u>				
Hole Number <u>1002</u>		Immediate Water Depth <u>NA</u>	Start Date <u>08/12/2019</u>		Hole Type <u>sounding</u>			
Surface Elevation <u>400.3'</u>		Static Water Depth <u>NA</u>	End Date <u>08/12/2019</u>		Rig_Number <u>55 Truck</u>			
Total Depth <u>5.5'</u>		Driller <u>Tim Caudill</u>	Latitude(83) <u>37.146557</u>					
Location <u>114+90.00 CL</u>			Longitude(83) <u>-88.400227</u>					
Lithology		Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
5	394.8	5.5	Overburden.	(Refusal)				Boring offset 2.0' 200S due to tree cover @ 0
10			(Bottom of Hole 5.5') (Refusal @ 5.5)					
15								
20								
25								
30								
35								
40								
45								
50								

Drilling Firm: Stantec
For: Division of Structural Design
Geotechnical Branch

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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>		Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>		Project Manager: <u> </u>				
Hole Number <u>1003</u>		Immediate Water Depth <u>(08/13/19)</u>	Start Date <u>08/13/2019</u>		Hole Type <u>core</u>			
Surface Elevation <u>399.4'</u>		Static Water Depth <u>NA</u>	End Date <u>08/13/2019</u>		Rig_Number <u>55 Truck</u>			
Total Depth <u>17.7'</u>		Driller <u>Tim Caudill</u>	Latitude(83) <u>37.146548</u>					
Location <u>114+90.00 20.0' Rt.</u>			Longitude(83) <u>-88.400160</u>					
Lithology		Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
5 393.8	5.6	Overburden. (Begin Core)						
10 388.6	10.8	Brown to light gray sandstone with shale, weathered.	0 / 0	3.9	2.7	69		9.5
15 381.7	17.7	Gray to dark gray shale with sandstone.	44 / 10	4.8	4.8	100		14.3
			29 / 0	3.4	3.4	100		17.7
20 25 30 35 40 45 50		(Bottom of Hole 17.7')						20 25 30 35 40 45 50

Drilling Firm: Stantec
For: Division of Structural Design
Geotechnical Branch

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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>1004</u>		Immediate Water Depth <u>NA</u>		Start Date <u>10/03/2019</u>		Hole Type <u>core</u>			
Surface Elevation <u>340.0'</u>		Static Water Depth <u>NA</u>		End Date <u>10/04/2019</u>		Rig_Number <u>45 Truck</u>			
Total Depth <u>24.1'</u>		Driller <u>Donald Clements</u>		Latitude(83) <u>37.146899</u>					
Location <u>116+13.00 20.0' Lt.</u>				Longitude(83) <u>-88.400223</u>					
Lithology		Overburden		Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Description Rock Core		Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
337.0	3.0	Overburden.							
333.0	7.0	Overburden (Cored Boulders).							
327.7	12.3	Overburden. (Begin Core)							
320.6	19.4	Brown to dark gray shale, weathered.		48 / 19	2.7	2.7	100		15.0
315.9	24.1			23 / 9	4.7	4.7	100		
		Dark gray sandy shale.		70 / 52	4.4	4.4	100		19.7
		(Bottom of Hole 24.1')							24.1

DRILLER'S SUBSURFACE LOG

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>		Project Type: <u>Geotechnical</u>	
Item Number:		<u>Cumberland River</u>		Project Manager: <u> </u>	

Hole Number <u>1005</u>		Immediate Water Depth <u>(10/03/19)</u>	Start Date <u>10/03/2019</u>		Hole Type <u>core and sample</u>
Surface Elevation <u>341.8'</u>		Static Water Depth <u>NA</u>	End Date <u>10/03/2019</u>		Rig Number <u>45 Truck</u>
Total Depth <u>36.9'</u>		Driller <u>Donald Clements</u>	Latitude(83) <u>37.146881</u>		
Location <u>116+19.00 20.0' Rt.</u>			Longitude(83) <u>-88.400088</u>		

Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
		Very stiff, tan to light brown, dry to moist, clayey sand with gravel.		1	2.5-4.0	1.1	5-8-11	SPT	boring offset 7.5' 5N due to hill slope and trees greater than 3" in diameter @ 0
				2	5.0-6.5	1.2	28-30-25	SPT	
				3	10.0-11.5	0.9	21-14-18	SPT	
325.5	16.3		(Begin Core)	4	15.0-16.3	1.2	14-34-50/0.30	SPT	
322.4	19.4	Brown to dark gray shale, weathered.	0 / 0	3.8	3.8	100		20.1	
		Dark gray to gray shale, silty.	66 / 0	5.0	5.0	100		25.1	
			78 / 48	5.0	5.0	100		30.1	
			40 / 26	5.0	5.0	100		35.1	
304.9	36.9		100 / 78	1.8	1.8	100		36.9	
		(Bottom of Hole 36.9')							

DRILLER'S SUBSURFACE LOG

Project ID: 178565011		Livingston - US 60			Project Type: Geotechnical				
Item Number:		Cumberland River			Project Manager: _				
Hole Number 1006		Immediate Water Depth 29.0 (10/02/19)		Start Date 10/02/2019		Hole Type core and sample			
Surface Elevation 334.6'		Static Water Depth NA		End Date 10/03/2019		Rig Number 45 Truck			
Total Depth 57.3'		Driller Donald Clements		Latitude(83) 37.147235					
Location 117+22.00 20.0' Lt.				Longitude(83) -88.400151					
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
		Stiff, brown, damp, lean clay with with sand.		1	2.5-4.5	2.0		ST	
				2	5.0-6.8	1.8		ST	
				1	6.8-8.3	1.2	8-12-16	SPT	
				2	10.0-11.5	1.5	7-7-11	SPT	
				3	15.0-16.5	1.5	3-3-5	SPT	
				3	16.5-18.5	1.9		ST	
				4	20.0-22.0	2.0		ST	
				5	25.0-27.0	2.0		ST	
				6	30.0-32.0	0.8		ST	
				4	32.0-33.5	0.8	4-11-12	SPT	
35	299.4	(Begin Core)	5	34.6-35.2	0.6	27-50/0.10'	SPT		
		Dark gray shale, silty.	85 / 72	4.6	4.6	100		39.8	
			76 / 53	5.1	5.1	100		44.9	
			48 / 44	5.0	5.0	100		49.9	

Drilling Firm: Stantec
For: Division of Structural Design
Geotechnical Branch

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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>		Project Type: <u>Geotechnical</u>					
Item Number:		<u>Cumberland River</u>		Project Manager: <u> </u>					
Hole Number <u>1006</u>		Immediate Water Depth <u>29.0 (10/02/19)</u>		Start Date <u>10/02/2019</u>					
Surface Elevation <u>334.6'</u>		Static Water Depth <u>NA</u>		End Date <u>10/03/2019</u>					
Total Depth <u>57.3'</u>		Driller <u>Donald Clements</u>		Latitude(83) <u>37.147235</u>					
Location <u>117+22.00 20.0' Lt.</u>				Longitude(83) <u>-88.400151</u>					
Lithology		Overburden		Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Description Rock Core		Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
55	277.3	Dark gray shale, silty.		77 / 69	4.8	4.8	100		54.7
				81 / 35	2.6	2.6	100		57.3
60		(Bottom of Hole 57.3')							
65									
70									
75									
80									
85									
90									
95									
100									

Drilling Firm: Stantec
For: Division of Structural Design
Geotechnical Branch

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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>					
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>					
Hole Number <u>1007</u>		Immediate Water Depth <u>NA</u>		Start Date <u>10/04/2019</u>		Hole Type <u>core</u>				
Surface Elevation <u>335.2'</u>		Static Water Depth <u>NA</u>		End Date <u>10/04/2019</u>		Rig_Number <u>45 Truck</u>				
Total Depth <u>46.8'</u>		Driller <u>Donald Clements</u>		Latitude(83) <u>37.147216</u>						
Location <u>117+37.00 20.0' Rt.</u>				Longitude(83) <u>-88.400016</u>						
Lithology		Overburden		Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks	
Elevation	Depth	Description		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)		SDI (JS)
5		Overburden.								
10										
15										
20										
25										
30										
35	300.0	35.2	(Begin Core)							
	298.9	36.3	Dark gray to brown shale, weathered.		45 / 20	4.9	4.9	100		
40			Dark gray shale, silty.						40.1	
					61 / 35	4.9	4.9	100		
45										45.0
	288.4	46.8			50 / 50	1.8	1.8	100	46.8	
50										

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>					
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>					
Hole Number <u>1007</u>		Immediate Water Depth <u>NA</u>		Start Date <u>10/04/2019</u>		Hole Type <u>core</u>				
Surface Elevation <u>335.2'</u>		Static Water Depth <u>NA</u>		End Date <u>10/04/2019</u>		Rig_Number <u>45 Truck</u>				
Total Depth <u>46.8'</u>		Driller <u>Donald Clements</u>		Latitude(83) <u>37.147216</u>						
Location <u>117+37.00 20.0' Rt.</u>				Longitude(83) <u>-88.400016</u>						
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks	
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)		
55		(Bottom of Hole 46.8')							55	
60									60	
65									65	
70									70	
75									75	
80									80	
85									85	
90									90	
95									95	
100									100	

Drilling Firm: Stantec
For: Division of Structural Design
Geotechnical Branch

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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>		Project Type: <u>Geotechnical</u>					
Item Number:		<u>Cumberland River</u>		Project Manager: <u> </u>					
Hole Number <u>1008</u>	Immediate Water Depth <u>27.5 (09/25/19)</u>	Start Date <u>09/24/2019</u>		Hole Type <u>core and sample</u>					
Surface Elevation <u>334.4'</u>	Static Water Depth <u>NA</u>	End Date <u>09/25/2019</u>		Rig_Number <u>45 Truck</u>					
Total Depth <u>97.1'</u>	Driller <u>Donald Clements</u>	Latitude(83) <u>37.147543</u>							
Location <u>118+50.00 25.0' Lt.</u>		Longitude(83) <u>-88.400103</u>							
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
5 10 15 20 25 30	304.4 30.0	Brown, moist, Lean Clay.		1	2.5-4.5	2.0		ST	
				2	5.0-7.0	2.0		ST	
				3	10.0-12.0	2.0		ST	
				4	15.0-17.0	2.0		ST	
				5	20.0-22.0	2.0		ST	
				6	25.0-27.0	2.0		ST	
				7	30.0-32.0	1.8		ST	
				8	35.0-37.0	1.9		ST	
				9	40.0-42.0	2.0		ST	
				10	45.0-47.0	2.0		ST	

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For: Division of Structural Design
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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>		Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>		Project Manager: <u> </u>				
Hole Number <u>1008</u>		Immediate Water Depth <u>27.5 (09/25/19)</u>	Start Date <u>09/24/2019</u>		Hole Type <u>core and sample</u>			
Surface Elevation <u>334.4'</u>		Static Water Depth <u>NA</u>	End Date <u>09/25/2019</u>		Rig_Number <u>45 Truck</u>			
Total Depth <u>97.1'</u>		Driller <u>Donald Clements</u>	Latitude(83) <u>37.147543</u>					
Location <u>118+50.00 25.0' Lt.</u>			Longitude(83) <u>-88.400103</u>					
Lithology		Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Description	Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	
		Gray, moist, Lean Clay with Sand.	1	50.0-51.5	1.5	5-6-5	SPT	
55								
278.4	56.0	(Begin Core)	2	55.0-56.5	1.5	5-17-26	SPT	
277.9	56.5							
		Weathered Shale.						
275.7	58.7	Dark gray to brown shale, weathered.	39 / 15	3.3	3.3	100		
60		Dark gray shale.						59.8
			68 / 44	5.0	5.0	100		
65								64.8
			67 / 51	5.1	5.1	100		
70								69.9
			59 / 43	4.9	4.9	100		
75								74.8
			54 / 48	5.0	5.0	100		
80								79.8
			76 / 67	5.1	5.1	100		
85							84.9	
		94 / 51	5.1	5.1	100			
90							90.0	
		58 / 50	5.2	5.2	100			
95							95.2	
237.3	97.1		84 / 42	1.9	1.9	100		97.1
100								

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Item Number:		<u>Cumberland River</u>		Project Manager: <u> </u>					
Hole Number <u>1008</u>		Immediate Water Depth <u>27.5 (09/25/19)</u>		Start Date <u>09/24/2019</u>					
Surface Elevation <u>334.4'</u>		Static Water Depth <u>NA</u>		End Date <u>09/25/2019</u>					
Total Depth <u>97.1'</u>		Driller <u>Donald Clements</u>		Latitude(83) <u>37.147543</u>					
Location <u>118+50.00 25.0' Lt.</u>				Longitude(83) <u>-88.400103</u>					
Lithology		Overburden		Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Description		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	
105		(Bottom of Hole 97.1')							
110									
115									
120									
125									
130									
135									
140									
145									
150									

Drilling Firm: Stantec
For: Division of Structural Design
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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>		Project Type: <u>Geotechnical</u>					
Item Number:		<u>Cumberland River</u>		Project Manager: <u> </u>					
Hole Number <u>1009</u>		Immediate Water Depth <u>26.0 (09/26/19)</u>		Start Date <u>09/26/2019</u>					
Surface Elevation <u>335.3'</u>		Static Water Depth <u>NA</u>		End Date <u>09/30/2019</u>					
Total Depth <u>98.8'</u>		Driller <u>Donald Clements</u>		Latitude(83) <u>37.147520</u>					
Location <u>118+50.00 25.0' Rt.</u>				Longitude(83) <u>-88.399934</u>					
Lithology		Overburden		Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Description		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	
5									
10									
15									
20									
25		Overburden.							
30									
35									
40									
45									
50									

Drilling Firm: Stantec
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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>			
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>			
Hole Number <u>1009</u>		Immediate Water Depth <u>26.0 (09/26/19)</u>		Start Date <u>09/26/2019</u>		Hole Type <u>core</u>		
Surface Elevation <u>335.3'</u>		Static Water Depth <u>NA</u>		End Date <u>09/30/2019</u>		Rig_Number <u>45 Truck</u>		
Total Depth <u>98.8'</u>		Driller <u>Donald Clements</u>		Latitude(83) <u>37.147520</u>				
Location <u>118+50.00 25.0' Rt.</u>				Longitude(83) <u>-88.399934</u>				
Lithology		Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
55		Overburden.						55
277.3	58.0	(Begin Core)						
276.7	58.6	Light gray to brown sandstone, weathered.	0 / 0	0.8	0.5	63		58.8
60		Dark gray shale, silty.	69 / 49	4.9	4.9	100		60
65								63.7
65			80 / 54	5.0	5.0	100		65
70								68.7
70			71 / 63	4.9	4.9	100		70
75								73.6
75			84 / 76	5.0	5.0	100		75
80								78.6
80		82 / 75	5.1	5.1	100		80	
85								83.7
85		38 / 0	5.0	5.0	100		85	
90								88.7
90		80 / 66	5.0	5.0	100		90	
95								93.7
95		82 / 67	5.1	5.1	100		95	
236.5	98.8							98.8
100								100

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>1009</u>		Immediate Water Depth <u>26.0 (09/26/19)</u>		Start Date <u>09/26/2019</u>		Hole Type <u>core</u>			
Surface Elevation <u>335.3'</u>		Static Water Depth <u>NA</u>		End Date <u>09/30/2019</u>		Rig_Number <u>45 Truck</u>			
Total Depth <u>98.8'</u>		Driller <u>Donald Clements</u>		Latitude(83) <u>37.147520</u>					
Location <u>118+50.00 25.0' Rt.</u>				Longitude(83) <u>-88.399934</u>					
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
105		(Bottom of Hole 98.8')							105
110									110
115									115
120									120
125									125
130									130
135									135
140									140
145									145
150									150

Drilling Firm: Stantec
For: Division of Structural Design
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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>1010</u>		Immediate Water Depth <u>16.0 (09/25/19)</u>		Start Date <u>09/25/2019</u>		Hole Type <u>core</u>			
Surface Elevation <u>335.2'</u>		Static Water Depth <u>NA</u>		End Date <u>09/26/2019</u>		Rig_Number <u>45 Truck</u>			
Total Depth <u>99.3'</u>		Driller <u>Donald Clements</u>		Latitude(83) <u>37.147559</u>					
Location <u>118+60.00 CL</u>				Longitude(83) <u>-88.400012</u>					
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
5		Overburden.							5
10									10
15									15
20									20
25									25
30									30
35									35
40									40
45									45
50									50

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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>			
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>			
Hole Number <u>1010</u>		Immediate Water Depth <u>16.0 (09/25/19)</u>		Start Date <u>09/25/2019</u>		Hole Type <u>core</u>		
Surface Elevation <u>335.2'</u>		Static Water Depth <u>NA</u>		End Date <u>09/26/2019</u>		Rig_Number <u>45 Truck</u>		
Total Depth <u>99.3'</u>		Driller <u>Donald Clements</u>		Latitude(83) <u>37.147559</u>				
Location <u>118+60.00 CL</u>				Longitude(83) <u>-88.400012</u>				
Lithology		Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Description	Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	
		Overburden.						
55								55
278.2	57.0	(Begin Core)						
277.9	57.3	Gray to brown sandstone, weathered.						
275.7	59.5	Dark gray to brown shale, weathered.	15 / 0	2.6	2.4	92		59.6
60								60
			71 / 59	4.9	4.9	100		64.5
65								65
			61 / 59	5.1	5.1	100		69.6
70								70
			78 / 67	4.9	4.9	100		74.5
75								75
			90 / 77	4.8	4.8	100		79.3
80		Dark gray shale, silty.						80
			92 / 63	4.9	4.9	100		84.2
85								85
			78 / 55	5.1	5.1	100		89.3
90								90
			98 / 80	5.0	5.0	100		94.3
95								95
			66 / 40	5.0	5.0	100		99.3
235.9	99.3							99.3
100								100

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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>		Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>		Project Manager: <u> </u>				
Hole Number <u>1010</u>		Immediate Water Depth <u>16.0 (09/25/19)</u>	Start Date <u>09/25/2019</u>		Hole Type <u>core</u>			
Surface Elevation <u>335.2'</u>		Static Water Depth <u>NA</u>	End Date <u>09/26/2019</u>		Rig_Number <u>45 Truck</u>			
Total Depth <u>99.3'</u>		Driller <u>Donald Clements</u>	Latitude(83) <u>37.147559</u>					
Location <u>118+60.00 CL</u>			Longitude(83) <u>-88.400012</u>					
Lithology		Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
105		(Bottom of Hole 99.3')						105
110								110
115								115
120								120
125								125
130								130
135								135
140								140
145								145
150								

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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>1011</u>		Immediate Water Depth <u>27.0 (09/23/19)</u>		Start Date <u>09/23/2019</u>		Hole Type <u>core</u>			
Surface Elevation <u>329.8'</u>		Static Water Depth <u>NA</u>		End Date <u>09/24/2019</u>		Rig_Number <u>45 Truck</u>			
Total Depth <u>98.5'</u>		Driller <u>Donald Clements</u>		Latitude(83) <u>37.147597</u>					
Location <u>118+60.00 25.0' Lt.</u>				Longitude(83) <u>-88.400091</u>					
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
5		Overburden.							5
10									10
15									15
20									20
25									25
30									30
35									35
40									40
45									45
50									50

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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>		Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>		Project Manager: <u> </u>				
Hole Number <u>1011</u>		Immediate Water Depth <u>27.0 (09/23/19)</u>	Start Date <u>09/23/2019</u>		Hole Type <u>core</u>			
Surface Elevation <u>329.8'</u>		Static Water Depth <u>NA</u>	End Date <u>09/24/2019</u>		Rig_Number <u>45 Truck</u>			
Total Depth <u>98.5'</u>		Driller <u>Donald Clements</u>	Latitude(83) <u>37.147597</u>					
Location <u>118+60.00 25.0' Lt.</u>			Longitude(83) <u>-88.400091</u>					
Lithology		Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
		Overburden.						
55								55
272.3	57.5	(Begin Core)						
271.6	58.2	Light gray to brown sandstone, weathered.	61 / 22	1.8	1.3	72		59.3
60								60
			64 / 46	5.0	5.0	100		64.3
65								65
			74 / 38	5.0	5.0	100		69.3
70								70
			66 / 38	5.0	5.0	100		74.3
75								75
			86 / 56	5.0	5.0	100		79.3
80								80
		Dark gray shale, silty.	88 / 77	4.8	4.8	100		84.1
85								85
			54 / 48	4.8	4.8	100		88.9
90								90
			64 / 56	5.0	5.0	100		93.9
95								95
			72 / 48	4.6	4.6	100		98.5
231.3	98.5							
100								100

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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>		Project Type: <u>Geotechnical</u>					
Item Number:		<u>Cumberland River</u>		Project Manager: <u> </u>					
Hole Number <u>1011</u>		Immediate Water Depth <u>27.0 (09/23/19)</u>		Start Date <u>09/23/2019</u>					
Surface Elevation <u>329.8'</u>		Static Water Depth <u>NA</u>		End Date <u>09/24/2019</u>					
Total Depth <u>98.5'</u>		Driller <u>Donald Clements</u>		Latitude(83) <u>37.147597</u>					
Location <u>118+60.00 25.0' Lt.</u>				Longitude(83) <u>-88.400091</u>					
Lithology		Overburden		Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Description		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	
105		(Bottom of Hole 98.5')							
110									
115									
120									
125									
130									
135									
140									
145									
150									

Drilling Firm: Stantec
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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>		Project Type: <u>Geotechnical</u>					
Item Number:		<u>Cumberland River</u>		Project Manager: _					
Hole Number <u>1012</u>	Immediate Water Depth <u>43.5 (10/01/19)</u>	Start Date <u>10/01/2019</u>		Hole Type <u>core and sample</u>					
Surface Elevation <u>334.2'</u>	Static Water Depth <u>NA</u>	End Date <u>10/02/2019</u>		Rig_Number <u>45 Truck</u>					
Total Depth <u>99.5'</u>	Driller <u>Donald Clements</u>	Latitude(83) <u>37.147574</u>							
Location <u>118+63.00 25.0' Rt.</u>		Longitude(83) <u>-88.399922</u>							
Lithology		Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks	
Elevation	Depth	Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)		
	25.0	Brown, moist, sandy lean clay.							
			1	2.5-4.5	2.0		ST		
			2	5.0-7.0	2.0		ST		
			3	10.0-12.0	2.0		ST		
			4	15.0-17.0	2.0		ST		
309.2	25.0								
307.2	27.0	Gray, moist, silty sand.	6	25.0-27.0	2.0		ST		
	27.0	Gray, moist to wet, sandy lean clay.							
				7	30.0-32.0	2.0			ST
				8	35.0-37.0	2.0			ST
				9	40.0-42.0	1.8			ST
	10	45.0-47.0	1.7		ST				

DRILLER'S SUBSURFACE LOG

Project ID: 178565011		Livingston - US 60				Project Type: Geotechnical			
Item Number:		Cumberland River				Project Manager: _			
Hole Number 1012		Immediate Water Depth 43.5 (10/01/19)		Start Date 10/01/2019		Hole Type core and sample			
Surface Elevation 334.2'		Static Water Depth NA		End Date 10/02/2019		Rig Number 45 Truck			
Total Depth 99.5'		Driller Donald Clements		Latitude(83) 37.147574					
Location 118+63.00 25.0' Rt.				Longitude(83) -88.399922					

Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
		Gray, moist to wet, sandy lean clay.		1	50.0-51.5	0.9	7-9-11	SPT	
				2	55.0-56.5	1.1	8-11-15	SPT	
275.1	59.1	(Begin Core)							
60 274.5	59.7	Light gray to brown sandstone, weathered.	0 / 0	0.7	0.3	43			59.7
		Dark gray shale, weathered, (loss).							
		Dark gray shale, silty.		73 / 39	4.9	4.9	100		64.6
				52 / 48	5.0	5.0	100		69.6
				71 / 48	4.8	4.8	100		74.4
				80 / 70	5.0	5.0	100		79.4
				78 / 57	5.1	5.1	100		84.5
				76 / 71	5.1	5.1	100		89.6
				82 / 82	4.9	4.9	100		94.5
				84 / 74	5.0	5.0	100		99.5
234.7	99.5								

Drilling Firm: Stantec
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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>		Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>		Project Manager: <u> </u>				
Hole Number <u>1012</u>		Immediate Water Depth <u>43.5 (10/01/19)</u>	Start Date <u>10/01/2019</u>		Hole Type <u>core and sample</u>			
Surface Elevation <u>334.2'</u>		Static Water Depth <u>NA</u>	End Date <u>10/02/2019</u>		Rig_Number <u>45 Truck</u>			
Total Depth <u>99.5'</u>		Driller <u>Donald Clements</u>	Latitude(83) <u>37.147574</u>					
Location <u>118+63.00 25.0' Rt.</u>			Longitude(83) <u>-88.399922</u>					
Lithology		Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
105		(Bottom of Hole 99.5')						105
110								110
115								115
120								120
125								125
130								130
135								135
140								140
145								145
150								150

DRILLER'S SUBSURFACE LOG

Project ID: <u>178565011</u>		Project Type: <u>Geotechnical</u>			Project Manager: <u> </u>	
Item Number: <u> </u>		<u>Livingston - US 60</u>			<u>Cumberland River</u>	
Hole Number <u>1013</u>		Immediate Water Depth <u>13.0 (10/16/19)</u>		Start Date <u>10/16/2019</u>		Hole Type <u>core and sample</u>
Surface Elevation <u>309.6'</u>		Static Water Depth <u>NA</u>		End Date <u>10/17/2019</u>		Rig Number <u>55 Truck</u>
Total Depth <u>136.1'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.149438</u>		
Location <u>125+50.00 25.0' Lt.</u>				Longitude(83) <u>-88.399696</u>		

Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
307.1	2.5	Light brown, moist, sand with silt.							
5		Soft, light gray, wet, Lean Clay.	1	2.5-4.0	1.5	3-3-4	SPT		
			2	5.0-6.5	1.5	0-2-1	SPT		
10	10.0	Very loose, light gray, wet, Silty Clayey Sand.	3	10.0-11.5	1.5	0-1-0	SPT		
15			4	15.0-16.5	0.8	0-0-0	SPT		
20			5	20.0-21.5	0.9	0-1-2	SPT		
25			6	25.0-26.5	1.1	2-2-2	SPT		
30	279.6		30.0	7	30.0-31.5	1.3	1-2-2	SPT	
35				8	35.0-36.5	1.5	4-4-5	SPT	
40		Medium stiff, gray, wet, Lean Clay with Sand.	9	40.0-41.5	1.5	3-4-6	SPT		
45			10	45.0-46.5	1.5	3-5-5	SPT		
50									

DRILLER'S SUBSURFACE LOG

Project ID: 178565011		Livingston - US 60			Project Type: Geotechnical					
Item Number:		Cumberland River			Project Manager: _					
Hole Number 1013		Immediate Water Depth 13.0 (10/16/19)		Start Date 10/16/2019		Hole Type core and sample				
Surface Elevation 309.6'		Static Water Depth NA		End Date 10/17/2019		Rig Number 55 Truck				
Total Depth 136.1'		Driller Greg Wilson		Latitude(83) 37.149438						
Location 125+50.00 25.0' Lt.				Longitude(83) -88.399696						
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks	
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)		
55 60 249.6	60.0	Medium stiff, gray, wet, Lean Clay with Sand.		11	50.0-51.5	1.2	1-3-3	SPT	55 60	
				1	55.0-57.0	1.9				ST
65 70 75 80 229.6	80.0	Very soft, gray, wet, Fat Clay.		12	60.0-61.5	1.5	0-1-2	SPT	65 70 75 80	
				2	65.0-67.0	2.0				ST
				13	70.0-71.5	1.5	0-2-12	SPT		
85 90 95 214.5	95.1	Very dense, light gray, wet, with sand Poorly Graded Gravel.		14	75.0-76.5	1.5	8-8-8	SPT	85 90 95	
				15	80.0-81.5	0.9	3-5-8	SPT		
				16	85.0-86.5	1.1	10-21-18	SPT		
95 100	98.4	Light gray to gray sandstone.		17	90.0-91.5	1.1	8-22-21	SPT	95 100	
				18	95.0-95.1	0.1	50/0.10'	SPT		
				0 / 0	3.3	3.3	100			
			26 / 26	5.0	5.0	100				

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For: Division of Structural Design
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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>		Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>		Project Manager: <u> </u>				
Hole Number <u>1013</u>		Immediate Water Depth <u>13.0 (10/16/19)</u>	Start Date <u>10/16/2019</u>		Hole Type <u>core and sample</u>			
Surface Elevation <u>309.6'</u>		Static Water Depth <u>NA</u>	End Date <u>10/17/2019</u>		Rig_Number <u>55 Truck</u>			
Total Depth <u>136.1'</u>		Driller <u>Greg Wilson</u>	Latitude(83) <u>37.149438</u>					
Location <u>125+50.00 25.0' Lt.</u>			Longitude(83) <u>-88.399696</u>					
Lithology		Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
105		Light gray to gray sandstone.	26 / 26	5.0	5.0	100		103.4
	46 / 46		5.0	5.0	100		108.4	
110			92 / 68	5.0	5.0	100		110.4
	53 / 53		4.7	4.7	100		113.4	
115			79 / 79	4.7	4.7	100		118.1
	88 / 88		5.6	5.6	100		122.8	
120			90 / 90	5.0	5.0	100		128.4
	89 / 63		2.7	2.7	100		133.4	
125								136.1
130	173.5	136.1						
135		(Bottom of Hole 136.1')						
140								
145								
150								

Drilling Firm: Stantec
For: Division of Structural Design
Geotechnical Branch

DRILLER'S SUBSURFACE LOG

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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>1014</u>		Immediate Water Depth <u>7.0 (10/02/19)</u>		Start Date <u>10/02/2019</u>		Hole Type <u>core</u>			
Surface Elevation <u>306.0'</u>		Static Water Depth <u>NA</u>		End Date <u>10/04/2019</u>		Rig_Number <u>55 Truck</u>			
Total Depth <u>134.9'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.149415</u>					
Location <u>125+50.00 25.0' Rt.</u>				Longitude(83) <u>-88.399526</u>					
Lithology		Overburden		Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Description		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	
5									
10									
15									
20									
25		Overburden.							
30									
35									
40									
45									
50									

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>					
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>					
Hole Number <u>1014</u>		Immediate Water Depth <u>7.0 (10/02/19)</u>		Start Date <u>10/02/2019</u>		Hole Type <u>core</u>				
Surface Elevation <u>306.0'</u>		Static Water Depth <u>NA</u>		End Date <u>10/04/2019</u>		Rig_Number <u>55 Truck</u>				
Total Depth <u>134.9'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.149415</u>						
Location <u>125+50.00 25.0' Rt.</u>				Longitude(83) <u>-88.399526</u>						
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks	
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)		
55		Overburden.							55	
60									60	
65									65	
70									70	
75									75	
80									80	
85									85	
90									90	
95	211.5		(Begin Core)							95
			Light gray to gray sandstone.	13 / 13	4.0	4.0	100		98.5	
100		8 / 8		5.0	5.0	100		100		

Drilling Firm: Stantec
For: Division of Structural Design
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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>		Project Type: <u>Geotechnical</u>					
Item Number:		<u>Cumberland River</u>		Project Manager: <u> </u>					
Hole Number <u>1014</u>		Immediate Water Depth <u>7.0 (10/02/19)</u>		Start Date <u>10/02/2019</u>					
Surface Elevation <u>306.0'</u>		Static Water Depth <u>NA</u>		End Date <u>10/04/2019</u>					
Total Depth <u>134.9'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.149415</u>					
Location <u>125+50.00 25.0' Rt.</u>				Longitude(83) <u>-88.399526</u>					
Lithology		Overburden		Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Description		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	
105		Light gray to gray sandstone.		8 / 8	5.0	5.0	100		103.5
110				24 / 16	5.0	5.0	100		108.5
115				28 / 28	5.0	5.0	100		113.5
120				68 / 62	5.0	5.0	100		118.5
125				56 / 56	3.9	3.9	100		122.4
130				68 / 68	5.0	5.0	100		127.4
135				100 / 100	1.6	1.6	100		129.0
135	134.9			100 / 100	0.9	0.9	100		134.0 134.9
140		(Bottom of Hole 134.9')							140
145									145
150									150

Drilling Firm: Stantec
For: Division of Structural Design
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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>			
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>			
Hole Number <u>1015</u>		Immediate Water Depth <u>15.0 (10/07/19)</u>		Start Date <u>10/07/2019</u>		Hole Type <u>core</u>		
Surface Elevation <u>309.9'</u>		Static Water Depth <u>NA</u>		End Date <u>10/09/2019</u>		Rig_Number <u>55 Truck</u>		
Total Depth <u>140.1'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.149453</u>				
Location <u>125+60.00 CL</u>				Longitude(83) <u>-88.399605</u>				
Lithology		Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
5		Overburden.						
10								
15								
20								
25								
30								
35								
40								
45								
50								

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>1015</u>		Immediate Water Depth <u>15.0 (10/07/19)</u>		Start Date <u>10/07/2019</u>		Hole Type <u>core</u>			
Surface Elevation <u>309.9'</u>		Static Water Depth <u>NA</u>		End Date <u>10/09/2019</u>		Rig_Number <u>55 Truck</u>			
Total Depth <u>140.1'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.149453</u>					
Location <u>125+60.00 CL</u>				Longitude(83) <u>-88.399605</u>					
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
55		Overburden.							55
60									60
65									65
70									70
75									75
80									80
85		(Begin Core)							85
90									90
95	214.7								95
	95.2								
		Light gray to gray sandstone.	15 / 15	3.3	2.4	73			98.5
100			16 /	5.0	4.8	96		100	

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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>			
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>			
Hole Number <u>1015</u>		Immediate Water Depth <u>15.0 (10/07/19)</u>		Start Date <u>10/07/2019</u>		Hole Type <u>core</u>		
Surface Elevation <u>309.9'</u>		Static Water Depth <u>NA</u>		End Date <u>10/09/2019</u>		Rig_Number <u>55 Truck</u>		
Total Depth <u>140.1'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.149453</u>				
Location <u>125+60.00 CL</u>				Longitude(83) <u>-88.399605</u>				
Lithology		Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Description	Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	
105		Light gray to gray sandstone.	16 / 16	5.0	4.8	96		Loss occurred due to inner barrel failing to latch. Drill action was smooth and consistant. @ 103.5-108.5
110			0 / 0	5.0	2.6	52		
115			44 / 20	5.0	4.1	82		
120			64 / 64	5.0	5.0	100		
125			90 / 90	5.0	5.0	100		
130			100 / 96	4.9	4.9	100		
135			83 / 83	4.6	4.6	100		
140	140.1		100 / 98	5.1	5.1	100		
			40 / 40	2.0	2.0	100		
145		(Bottom of Hole 140.1')						
150								

Drilling Firm: Stantec
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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>		Project Type: <u>Geotechnical</u>					
Item Number:		<u>Cumberland River</u>		Project Manager: <u> </u>					
Hole Number <u>1016</u>		Immediate Water Depth <u>26.0 (10/17/19)</u>		Start Date <u>10/17/2019</u>					
Surface Elevation <u>316.5'</u>		Static Water Depth <u>NA</u>		End Date <u>10/21/2019</u>					
Total Depth <u>145.8'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.149492</u>					
Location <u>125+70.00 25.0' Lt.</u>				Longitude(83) <u>-88.399684</u>					
Lithology		Overburden		Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Description		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	
5									
10									
15									
20									
25		Overburden.							
30									
35									
40									
45									
50									

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For: Division of Structural Design
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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>		Project Type: <u>Geotechnical</u>					
Item Number:		<u>Cumberland River</u>		Project Manager: <u> </u>					
Hole Number <u>1016</u>		Immediate Water Depth <u>26.0 (10/17/19)</u>		Start Date <u>10/17/2019</u>					
Surface Elevation <u>316.5'</u>		Static Water Depth <u>NA</u>		End Date <u>10/21/2019</u>					
Total Depth <u>145.8'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.149492</u>					
Location <u>125+70.00 25.0' Lt.</u>				Longitude(83) <u>-88.399684</u>					
Lithology		Overburden		Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Description		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	
55									
60									
65									
70									
75		Overburden.							
80									
85									
90									
95									
100									

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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>1016</u>		Immediate Water Depth <u>26.0 (10/17/19)</u>		Start Date <u>10/17/2019</u>		Hole Type <u>core</u>			
Surface Elevation <u>316.5'</u>		Static Water Depth <u>NA</u>		End Date <u>10/21/2019</u>		Rig_Number <u> </u>			
Total Depth <u>145.8'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.149492</u>					
Location <u>125+70.00 25.0' Lt.</u>				Longitude(83) <u>-88.399684</u>					
Lithology		Overburden		Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Description		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	
105211.3	105.2	Overburden.							
110		Light gray to gray sandstone.		35 / 35	2.6	2.6	100		107.8
115				29 / 17	4.8	4.8	100		112.6
120				0 / 0	5.0	0.7	14		117.6
125				28 / 28	4.7	4.7	100		122.3
130				40 / 40	5.0	5.0	100		127.3
135				48 / 48	5.0	5.0	100		132.3
140				73 / 73	5.2	5.2	100		137.5
145				75 / 58	4.8	4.8	100		142.3
172.3	144.2			31 / 31	3.5	3.5	100		145.8
170.7	145.8	Dark gray shale, clayey.							
150									

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>				Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>				Project Manager: <u> </u>				
Hole Number <u>1016</u>		Immediate Water Depth <u>26.0 (10/17/19)</u>		Start Date <u>10/17/2019</u>		Hole Type <u>core</u>				
Surface Elevation <u>316.5'</u>		Static Water Depth <u>NA</u>		End Date <u>10/21/2019</u>		Rig_Number <u> </u>				
Total Depth <u>145.8'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.149492</u>						
Location <u>125+70.00 25.0' Lt.</u>				Longitude(83) <u>-88.399684</u>						
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks	
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)		
155		(Bottom of Hole 145.8')							155	
160									160	
165									165	
170									170	
175									175	
180									180	
185									185	
190									190	
195									195	
200									200	

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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>			
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>			
Hole Number <u>1017</u>		Immediate Water Depth <u>13.0 (10/10/19)</u>		Start Date <u>10/10/2019</u>		Hole Type <u>core and sample</u>		
Surface Elevation <u>310.6'</u>		Static Water Depth <u>NA</u>		End Date <u>10/15/2019</u>		Rig_Number <u>55 Truck</u>		
Total Depth <u>140.3'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.149469</u>				
Location <u>125+70.00 25.0' Rt.</u>				Longitude(83) <u>-88.399515</u>				
Lithology		Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Description	Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	
105		Light gray to gray sandstone.	0 / 0	3.4	3.3	97		103.0
			0 / 0	3.4	3.3	97		
110			0 / 0	5.0	4.9	98		108.0
			10 / 10	5.0	4.9	98		
115			0 / 0	5.0	2.4	48		113.0
			61 / 61	3.3	3.3	100		118.0
120		Light gray to gray sandstone.	42 / 42	5.9	5.9	100		121.3
			83 / 83	5.2	5.2	100		127.2
130			84 / 76	5.0	5.0	100		132.4
			55 / 55	2.9	2.9	100		137.4
140	170.3							140.3
145		(Bottom of Hole 140.3')						
150								

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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>		Project Type: <u>Geotechnical</u>					
Item Number:		<u>Cumberland River</u>		Project Manager: <u> </u>					
Hole Number <u>1018</u>		Immediate Water Depth <u>17.0 (10/01/19)</u>		Start Date <u>10/01/2019</u>					
Surface Elevation <u>325.6'</u>		Static Water Depth <u>NA</u>		End Date <u>10/02/2019</u>					
Total Depth <u>113.9'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.149844</u>					
Location <u>127+00.00 25.0' Lt.</u>				Longitude(83) <u>-88.399608</u>					
Lithology		Overburden		Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Description		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	
5									
10									
15									
20									
25		Overburden.							
30									
35									
40									
45									
50									

Drilling Firm: Stantec
For: Division of Structural Design
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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>		Project Type: <u>Geotechnical</u>					
Item Number:		<u>Cumberland River</u>		Project Manager: <u> </u>					
Hole Number <u>1018</u>		Immediate Water Depth <u>17.0 (10/01/19)</u>		Start Date <u>10/01/2019</u>					
Surface Elevation <u>325.6'</u>		Static Water Depth <u>NA</u>		End Date <u>10/02/2019</u>					
Total Depth <u>113.9'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.149844</u>					
Location <u>127+00.00 25.0' Lt.</u>				Longitude(83) <u>-88.399608</u>					
Hole Type <u>sounding</u>				Rig_Number <u>55 Truck</u>					
Rig_Type <u> </u>									
Lithology		Overburden		Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Description		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	
55									
60									
65									
70									
75		Overburden.							
80									
85									
90									
95									
100									

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>					
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>					
Hole Number <u>1018</u>		Immediate Water Depth <u>17.0 (10/01/19)</u>		Start Date <u>10/01/2019</u>		Hole Type <u>sounding</u>				
Surface Elevation <u>325.6'</u>		Static Water Depth <u>NA</u>		End Date <u>10/02/2019</u>		Rig_Number <u>55 Truck</u>				
Total Depth <u>113.9'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.149844</u>						
Location <u>127+00.00 25.0' Lt.</u>				Longitude(83) <u>-88.399608</u>						
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks	
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)		
105		Overburden.							105	
110									110	
211.7	113.9		(Refusal)							
115		(Bottom of Hole 113.9') (Refusal @ 113.9)							115	
120									120	
125									125	
130									130	
135									135	
140									140	
145									145	
150									150	

Drilling Firm: Stantec
For: Division of Structural Design
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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>		Project Type: <u>Geotechnical</u>	
Item Number:		<u>Cumberland River</u>		Project Manager: <u> </u>	

Hole Number <u>1019</u>		Immediate Water Depth <u>16.0 (09/26/19)</u>	Start Date <u>09/26/2019</u>		Hole Type <u>core and sample</u>
Surface Elevation <u>324.9'</u>		Static Water Depth <u>NA</u>	End Date <u>10/01/2019</u>		Rig Number <u>55 Truck</u>
Total Depth <u>134.6'</u>		Driller <u>Greg Wilson</u>	Latitude(83) <u>37.149821</u>		
Location <u>127+00.00 25.0' Rt.</u>			Longitude(83) <u>-88.399439</u>		

Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
		Brown, moist, lean clay with sand (gray below 10').		8	50.0-52.0	2.0		ST	
				9	55.0-57.0	1.8		ST	
				4	60.0-61.5	1.5	2-3-3	SPT	
				10	65.0-67.0	2.0		ST	
				11	70.0-72.0	2.0		ST	
		Gray to dark gray, fine grained Silty Clayey Sand.		12	75.0-77.0	2.0		ST	
				13	80.0-80.7	0.7		ST	
				5	80.7-82.2	1.3	5-9-9	SPT	
				6	85.0-86.5	1.2	4-5-22	SPT	
				7	90.0-91.5	1.5	1-13-13	SPT	
		Gray, with silty and clay Poorly Graded Gravel.							
				8	95.0-96.5	1.1	29-24-17	SPT	

DRILLER'S SUBSURFACE LOG

Project ID: <u>178565011</u>		<u>Livingston - US 60</u> <u>Cumberland River</u>			Project Type: <u>Geotechnical</u> Project Manager: <u> </u>				
Item Number: <u> </u>		Hole Number <u>1019</u>			Immediate Water Depth <u>16.0 (09/26/19)</u>		Start Date <u>09/26/2019</u>		Hole Type <u>core and sample</u>
Surface Elevation <u>324.9'</u>		Static Water Depth <u>NA</u>			End Date <u>10/01/2019</u>		Rig Number <u>55 Truck</u>		
Total Depth <u>134.6'</u>		Driller <u>Greg Wilson</u>			Latitude(83) <u>37.149821</u>		Longitude(83) <u>-88.399439</u>		
Location <u>127+00.00 25.0' Rt.</u>									

Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
		Gray, with silty and clay Poorly Graded Gravel.		9	100.0-101.5	1.5	0-4-22	SPT	
105				10	105.0-106.5	1.0	16-27-29	SPT	105
110				11	110.0-111.5	0.3	14-22-35	SPT	110
211.9	113.0	(Begin Core)							
115		Light gray to gray sandstone.		32 / 32	2.8	2.8	100		115.8
				16 / 16	4.9	4.9	100		120.7
120				55 / 55	5.1	5.1	100		125.8
				50 / 50	5.0	5.0	100		130.8
125				89 / 89	3.8	3.8	100		134.6
130									
135	190.3	134.6							
		(Bottom of Hole 134.6')							
140									140
145									145
150									150

Drilling Firm: Stantec
For: Division of Structural Design
Geotechnical Branch

DRILLER'S SUBSURFACE LOG

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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>		Project Type: <u>Geotechnical</u>					
Item Number:		<u>Cumberland River</u>		Project Manager: _					
Hole Number <u>1020</u>		Immediate Water Depth <u>17.0 (09/23/19)</u>		Start Date <u>09/23/2019</u>					
Surface Elevation <u>327.9'</u>		Static Water Depth <u>NA</u>		End Date <u>09/25/2019</u>					
Total Depth <u>135.5'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.150223</u>					
Location <u>128+40.00 25.0' Lt.</u>				Longitude(83) <u>-88.399527</u>					
Lithology		Overburden		Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Description Rock Core		Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
<u>5</u> <u>10</u> <u>15</u> <u>20</u> <u>25</u> <u>30</u> <u>35</u> <u>40</u> <u>45</u> <u>50</u>		Light brown to tan, Lean Clay.							
			1	2.5-4.0	1.2	5-7-8	SPT		
			2	5.0-6.5	0.8	3-4-5	SPT		
			1	10.0-12.0	1.9		ST		
			2	15.0-17.0	2.0		ST		
			3	20.0-22.0	2.0		ST		
			3	25.0-26.5	1.4	2-2-3	SPT		
			4	30.0-32.0	1.5		ST		
			5	35.0-37.0	2.0		ST		
6	40.0-42.0	2.0		ST					
7	45.0-47.0	2.0		ST					

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>					
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>					
Hole Number <u>1020</u>		Immediate Water Depth <u>17.0 (09/23/19)</u>		Start Date <u>09/23/2019</u>		Hole Type <u>core and sample</u>				
Surface Elevation <u>327.9'</u>		Static Water Depth <u>NA</u>		End Date <u>09/25/2019</u>		Rig Number <u>55 Truck</u>				
Total Depth <u>135.5'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.150223</u>						
Location <u>128+40.00 25.0' Lt.</u>				Longitude(83) <u>-88.399527</u>						
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks	
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)		
55 60 65 70 75 80 85 90 95 100	55 60 65 70 75 80 85 90 95 100	Light brown to tan, Lean Clay.	8	50.0-52.0	2.0		ST			
			9	55.0-57.0	2.0		ST			
			10	60.0-62.0	2.0		ST			
			11	65.0-67.0	2.0		ST			
			4	70.0-71.5	1.5	0-0-1	SPT			
			12	75.0-77.0	2.0		ST			
			13	80.0-80.1	0.0	3-3-4	ST			
			5	80.1-81.6	1.4		SPT			
			6	85.0-86.5	1.5	3-4-8	SPT			
			7	90.0-91.5	1.1	10-10-10	SPT			
8	95.0-96.5	1.2	3-4-3	SPT						

Drilling Firm: Stantec
For: Division of Structural Design
Geotechnical Branch

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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>			
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>			
Hole Number <u>1020</u>		Immediate Water Depth <u>17.0 (09/23/19)</u>		Start Date <u>09/23/2019</u>		Hole Type <u>core and sample</u>		
Surface Elevation <u>327.9'</u>		Static Water Depth <u>NA</u>		End Date <u>09/25/2019</u>		Rig_Number <u>55 Truck</u>		
Total Depth <u>135.5'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.150223</u>				
Location <u>128+40.00 25.0' Lt.</u>				Longitude(83) <u>-88.399527</u>				
Lithology		Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Description	Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	
105		Light brown to tan, Lean Clay.	14	100.0-102.0	1.9		ST	
110			9	105.0-106.5	1.5	0-1-2	SPT	
115			10	110.0-111.5	1.5	7-4-2	SPT	
115	112.6	(Begin Core)	11	115.0-115.3	0.3	50/0.30'	SPT	
120		Light gray to gray sandstone.	40 / 40	5.0	5.0	100		120.3
125			38 / 38	5.0	5.0	100		125.3
130			63 / 63	5.2	5.2	100		130.5
135	192.4		135.5	62 / 62	5.0	5.0	100	
140		(Bottom of Hole 135.5')						
145								
150								

Drilling Firm: Stantec
For: Division of Structural Design
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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>		Project Type: <u>Geotechnical</u>					
Item Number:		<u>Cumberland River</u>		Project Manager: <u> </u>					
Hole Number <u>1021</u>		Immediate Water Depth <u>17.0 (09/25/19)</u>		Start Date <u>09/25/2019</u>					
Surface Elevation <u>328.6'</u>		Static Water Depth <u>NA</u>		End Date <u>09/25/2019</u>					
Total Depth <u>117.7'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.150200</u>					
Location <u>128+40.00 25.0' Rt.</u>				Longitude(83) <u>-88.399358</u>					
Lithology		Overburden		Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Description		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	
5									
10									
15									
20									
25		Overburden.							
30									
35									
40									
45									
50									

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>1021</u>		Immediate Water Depth <u>17.0 (09/25/19)</u>		Start Date <u>09/25/2019</u>		Hole Type <u>sounding</u>			
Surface Elevation <u>328.6'</u>		Static Water Depth <u>NA</u>		End Date <u>09/25/2019</u>		Rig_Number <u>55 Truck</u>			
Total Depth <u>117.7'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.150200</u>					
Location <u>128+40.00 25.0' Rt.</u>				Longitude(83) <u>-88.399358</u>					
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
55		Overburden.							55
60									60
65									65
70									70
75									75
80									80
85									85
90									90
95									95
100									100

Drilling Firm: Stantec
For: Division of Structural Design
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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>		Project Type: <u>Geotechnical</u>					
Item Number:		<u>Cumberland River</u>		Project Manager: <u> </u>					
Hole Number <u>1021</u>		Immediate Water Depth <u>17.0 (09/25/19)</u>		Start Date <u>09/25/2019</u>					
Surface Elevation <u>328.6'</u>		Static Water Depth <u>NA</u>		End Date <u>09/25/2019</u>					
Total Depth <u>117.7'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.150200</u>					
Location <u>128+40.00 25.0' Rt.</u>				Longitude(83) <u>-88.399358</u>					
Lithology		Overburden		Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Description		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	
105		Overburden.							105
110									110
115									115
211.0	117.6	(Refusal)							
120		(Bottom of Hole 117.7') (Refusal @ 117.6)							120
125									125
130									130
135									135
140									140
145									145
150									150

Drilling Firm: Stantec
For: Division of Structural Design
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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>		Project Type: <u>Geotechnical</u>					
Item Number:		<u>Cumberland River</u>		Project Manager: <u> </u>					
Hole Number <u>1022</u>		Immediate Water Depth <u>16.0 (09/19/19)</u>		Start Date <u>09/19/2019</u>					
Surface Elevation <u>333.1'</u>		Static Water Depth <u>NA</u>		End Date <u>09/20/2019</u>					
Total Depth <u>120.6'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.150378</u>					
Location <u>129+00.00 10.0' Lt.</u>				Longitude(83) <u>-88.399441</u>					
Lithology		Overburden		Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Description		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	
5									
10									
15									
20									
25		Overburden.							
30									
35									
40									
45									
50									

Drilling Firm: Stantec
For: Division of Structural Design
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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>		Project Type: <u>Geotechnical</u>					
Item Number:		<u>Cumberland River</u>		Project Manager: <u> </u>					
Hole Number <u>1022</u>		Immediate Water Depth <u>16.0 (09/19/19)</u>		Start Date <u>09/19/2019</u>					
Surface Elevation <u>333.1'</u>		Static Water Depth <u>NA</u>		End Date <u>09/20/2019</u>					
Total Depth <u>120.6'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.150378</u>					
Location <u>129+00.00 10.0' Lt.</u>				Longitude(83) <u>-88.399441</u>					
Lithology		Overburden		Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Description		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	
55									
60									
65									
70									
75		Overburden.							
80									
85									
90									
95									
100									

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>1022</u>		Immediate Water Depth <u>16.0 (09/19/19)</u>		Start Date <u>09/19/2019</u>		Hole Type <u>sounding</u>			
Surface Elevation <u>333.1'</u>		Static Water Depth <u>NA</u>		End Date <u>09/20/2019</u>		Rig_Number <u>55 Truck</u>			
Total Depth <u>120.6'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.150378</u>					
Location <u>129+00.00 10.0' Lt.</u>				Longitude(83) <u>-88.399441</u>					
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
105		Overburden.							105
110									110
115									115
120	212.5		(Refusal)						120
125		(Bottom of Hole 120.6') (Refusal @ 120.6)							125
130									130
135									135
140									140
145									145
150									150

Drilling Firm: Stantec
For: Division of Structural Design
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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>		Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>		Project Manager: <u> </u>				
Hole Number <u>1023</u>		Immediate Water Depth <u>17.0 (09/18/19)</u>	Start Date <u>09/17/2019</u>		Hole Type <u>core and sample</u>			
Surface Elevation <u>331.8'</u>		Static Water Depth <u>NA</u>	End Date <u>09/19/2019</u>		Rig Number <u>55 Truck</u>			
Total Depth <u>141.0'</u>		Driller <u>Greg Wilson</u>	Latitude(83) <u>37.150362</u>					
Location <u>129+00.00 25.0' Rt.</u>			Longitude(83) <u>-88.399323</u>					
Lithology		Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
329.3	2.5	Light brown to tan, moist, sandy silt.						
5 10 15	316.8	Brown, lean clay with silt and sand.	1	2.5-2.6	0.0	8-7-9	ST	
			1	2.6-4.1	1.1		SPT	
			2	5.0-6.5	1.5	5-7-7	SPT	
			3	10.0-11.5	1.5	4-5-5	SPT	
20 25 30	301.8	Gray, moist to wet, Silty Clayey Sand.	4	15.0-16.5	1.4	2-2-3	SPT	
			5	20.0-21.5	1.3	2-4-3	SPT	
			6	25.0-26.5	1.5	4-3-2	SPT	
35 40 45 50		Gray, moist to wet, Lean Clay with Sand.	7	30.0-31.5	1.5	2-2-1	SPT	
			2	35.0-37.0	2.0		ST	
			3	40.0-42.0	2.0		ST	
			4	45.0-47.0	2.0		ST	

DRILLER'S SUBSURFACE LOG

Project ID: <u>178565011</u>		<u>Livingston - US 60</u> <u>Cumberland River</u>			Project Type: <u>Geotechnical</u> Project Manager: <u> </u>				
Hole Number <u>1023</u>		Immediate Water Depth <u>17.0 (09/18/19)</u>		Start Date <u>09/17/2019</u>			Hole Type <u>core and sample</u>		
Surface Elevation <u>331.8'</u>		Static Water Depth <u>NA</u>		End Date <u>09/19/2019</u>			Rig Number <u>55 Truck</u>		
Total Depth <u>141.0'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.150362</u>					
Location <u>129+00.00 25.0' Rt.</u>				Longitude(83) <u>-88.399323</u>					

Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks	
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)		
		Gray, moist to wet, Lean Clay with Sand.		5	50.0-52.0	2.0		ST		
55									55	
		Dark gray, moist to wet, Fat Clay.		6	55.0-57.0	2.0		ST		
60	271.8								60	
		Dark gray, moist to wet, Fat Clay.		7	60.0-62.0	2.0		ST		
65									65	
		Dark gray, moist to wet, Fat Clay.		8	65.0-67.0	2.0		ST		
70									70	
		Dark gray, moist to wet, Fat Clay.		9	70.0-72.0	2.0		ST		
75									75	
		Dark gray, moist to wet, Fat Clay.		10	75.0-77.0	2.0		ST		
80	251.8								80	
		Gray, wet, Silty Clayey Sand.		8	80.0-81.5	1.3	7-6-5	SPT		
85									85	
		Gray, wet, Silty Clayey Sand.		9	85.0-86.5	1.2	3-11-22	SPT		
90									90	
		Gray, wet, Silty Clayey Sand.		10	90.0-91.5	1.5	5-9-12	SPT		
95	236.8								95	
		Lean Clay.		11	95.0-96.5	1.2	4-8-15	SPT		
100									100	

Drilling Firm: Stantec
For: Division of Structural Design
Geotechnical Branch

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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>						
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>						
Hole Number <u>1023</u>		Immediate Water Depth <u>17.0 (09/18/19)</u>		Start Date <u>09/17/2019</u>		Hole Type <u>core and sample</u>					
Surface Elevation <u>331.8'</u>		Static Water Depth <u>NA</u>		End Date <u>09/19/2019</u>		Rig_Number <u>55 Truck</u>					
Total Depth <u>141.0'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.150362</u>							
Location <u>129+00.00 25.0' Rt.</u>				Longitude(83) <u>-88.399323</u>							
Lithology		Overburden		Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks		
Elevation	Depth	Description		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)		SDI (JS)	
105		Lean Clay.			12	100.0-101.5	1.5	0-0-4	SPT		
110					11	105.0-107.0	2.0				ST
115					12	110.0-112.0	2.0				ST
					13	115.0-116.5	1.5	0-0-3			SPT
120	11.8	120.0	(Begin Core)								
210.8	121.0	Poorly Graded Gravel with with silt and clay.		14	120.0-121.0	0.9	8-50/0.50'	SPT			
125		Light gray to gray sandstone.			44 / 44	5.0	5.0	100		126.0 130 135.9 140	
					52 / 52	5.0	4.9	98			
130					71 / 71	4.9	4.9	100			
					53 / 53	5.1	5.1	100			
140	190.8	141.0									
145		(Bottom of Hole 141.0')									
150											

Drilling Firm: Stantec
For: Division of Structural Design
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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>		Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>		Project Manager: <u> </u>				
Hole Number <u>1024</u>		Immediate Water Depth <u>19.0 (09/10/19)</u>	Start Date <u>09/10/2019</u>		Hole Type <u>core and sample</u>			
Surface Elevation <u>337.1'</u>		Static Water Depth <u>NA</u>	End Date <u>09/12/2019</u>		Rig Number <u>55 Truck</u>			
Total Depth <u>146.1'</u>		Driller <u>Greg Wilson</u>	Latitude(83) <u>37.151062</u>					
Location <u>131+50.00 25.0' Lt.</u>			Longitude(83) <u>-88.399347</u>					
Lithology		Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
5 10 15 20 25 30 35 40 45 50		Gray to brown, damp to moist, Sandy Lean Clay.						
			1	2.5-4.5	2.0		ST	
			1	5.0-6.5	1.5	3-6-8	SPT	
			2	10.0-12.0	1.7		ST	
			3	15.0-17.0	2.0		ST	
			2	20.0-21.5	1.5	1-1-1	SPT	
			4	25.0-27.0	1.9		ST	
			5	30.0-32.0	2.0		ST	
			3	35.0-36.5	1.5	0-0-2	SPT	
			6	40.0-42.0	2.0		ST	
7	45.0-47.0	2.0		ST				

Drilling Firm: Stantec
For: Division of Structural Design
Geotechnical Branch

DRILLER'S SUBSURFACE LOG

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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>		Project Type: <u>Geotechnical</u>					
Item Number:		<u>Cumberland River</u>		Project Manager: _					
Hole Number <u>1024</u>		Immediate Water Depth <u>19.0 (09/10/19)</u>	Start Date <u>09/10/2019</u>		Hole Type <u>core and sample</u>				
Surface Elevation <u>337.1'</u>		Static Water Depth <u>NA</u>	End Date <u>09/12/2019</u>		Rig_Number <u>55 Truck</u>				
Total Depth <u>146.1'</u>		Driller <u>Greg Wilson</u>	Latitude(83) <u>37.151062</u>						
Location <u>131+50.00 25.0' Lt.</u>			Longitude(83) <u>-88.399347</u>						
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
55 60 65 272.1	65.0	Gray to brown, damp to moist, Sandy Lean Clay.		8	50.0-52.0	0.6		ST	
				4	52.0-53.5	1.5	2-3-2	SPT	
				5	55.0-56.5	1.5	4-3-8	SPT	
				6	60.0-61.5	1.2	4-6-12	SPT	
70 75 80 85 90 95 100 237.1	100.0	Gray, wet, clayey Sand with with local gravel lenses.		7	65.0-66.5	1.3	4-7-7	SPT	
				8	70.0-71.5	1.3	4-4-17	SPT	
				9	75.0-76.5	1.5	16-37-47/0.50	SPT	
				10	80.0-81.5	1.2	7-13-19	SPT	
				11	85.0-86.5	1.4	8-8-14	SPT	
				12	90.0-91.5	1.3	15-19-30	SPT	
	13	95.0-96.5	1.5	13-16-25	SPT				

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>					
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>					
Hole Number <u>1024</u>		Immediate Water Depth <u>19.0 (09/10/19)</u>		Start Date <u>09/10/2019</u>		Hole Type <u>core and sample</u>				
Surface Elevation <u>337.1'</u>		Static Water Depth <u>NA</u>		End Date <u>09/12/2019</u>		Rig_Number <u>55 Truck</u>				
Total Depth <u>146.1'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.151062</u>						
Location <u>131+50.00 25.0' Lt.</u>				Longitude(83) <u>-88.399347</u>						
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks	
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)		
155		(Bottom of Hole 146.1')							155	
160									160	
165									165	
170									170	
175									175	
180									180	
185									185	
190									190	
195									195	
200									200	

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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>		Project Type: <u>Geotechnical</u>					
Item Number:		<u>Cumberland River</u>		Project Manager: <u> </u>					
Hole Number <u>1025</u>		Immediate Water Depth <u>19.0 (09/17/19)</u>		Start Date <u>09/17/2019</u>					
Surface Elevation <u>337.5'</u>		Static Water Depth <u>NA</u>		End Date <u>09/17/2019</u>					
Total Depth <u>126.2'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.151039</u>					
Location <u>131+50.00 25.0' Rt.</u>				Longitude(83) <u>-88.399177</u>					
Lithology		Overburden		Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Description		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	
5									
10									
15									
20									
25		Overburden.							
30									
35									
40									
45									
50									

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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>1025</u>		Immediate Water Depth <u>19.0 (09/17/19)</u>		Start Date <u>09/17/2019</u>		Hole Type <u>sounding</u>			
Surface Elevation <u>337.5'</u>		Static Water Depth <u>NA</u>		End Date <u>09/17/2019</u>		Rig_Number <u>55 Truck</u>			
Total Depth <u>126.2'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.151039</u>					
Location <u>131+50.00 25.0' Rt.</u>				Longitude(83) <u>-88.399177</u>					
Lithology		Overburden		Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Description		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	
55									
60									
65									
70									
75		Overburden.							
80									
85									
90									
95									
100									

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>1025</u>		Immediate Water Depth <u>19.0 (09/17/19)</u>		Start Date <u>09/17/2019</u>		Hole Type <u>sounding</u>			
Surface Elevation <u>337.5'</u>		Static Water Depth <u>NA</u>		End Date <u>09/17/2019</u>		Rig_Number <u>55 Truck</u>			
Total Depth <u>126.2'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.151039</u>					
Location <u>131+50.00 25.0' Rt.</u>				Longitude(83) <u>-88.399177</u>					
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
105 110 115 120 125 211.3	126.2	Overburden.							105 110 115 120 125
		(Refusal)							
130 135 140 145 150		(Bottom of Hole 126.2') (Refusal @ 126.2)							130 135 140 145 150

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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>		Project Type: <u>Geotechnical</u>					
Item Number:		<u>Cumberland River</u>		Project Manager: <u> </u>					
Hole Number <u>1026</u>		Immediate Water Depth <u>21.0 (08/30/19)</u>		Start Date <u>08/30/2019</u>					
Surface Elevation <u>337.1'</u>		Static Water Depth <u>NA</u>		End Date <u>09/10/2019</u>					
Total Depth <u>137.1'</u>		Driller <u>Tim Caudill</u>		Latitude(83) <u>37.151360</u>					
Location <u>132+60.00 25.0' Lt.</u>				Longitude(83) <u>-88.399283</u>					
Lithology		Overburden		Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Description		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	
5									
10									
15									
20									
25		Overburden.							
30									
35									
40									
45									
50									

Drilling Firm: Stantec
For: Division of Structural Design
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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>		Project Type: <u>Geotechnical</u>					
Item Number:		<u>Cumberland River</u>		Project Manager: <u> </u>					
Hole Number <u>1026</u>		Immediate Water Depth <u>21.0 (08/30/19)</u>		Start Date <u>08/30/2019</u>					
Surface Elevation <u>337.1'</u>		Static Water Depth <u>NA</u>		End Date <u>09/10/2019</u>					
Total Depth <u>137.1'</u>		Driller <u>Tim Caudill</u>		Latitude(83) <u>37.151360</u>					
Location <u>132+60.00 25.0' Lt.</u>				Longitude(83) <u>-88.399283</u>					
Lithology		Overburden		Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Description		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	
55									
60									
65									
70									
75		Overburden.							
80									
85									
90									
95									
100									

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>1026</u>		Immediate Water Depth <u>21.0 (08/30/19)</u>		Start Date <u>08/30/2019</u>		Hole Type <u>core</u>			
Surface Elevation <u>337.1'</u>		Static Water Depth <u>NA</u>		End Date <u>09/10/2019</u>		Rig_Number <u>55 Truck</u>			
Total Depth <u>137.1'</u>		Driller <u>Tim Caudill</u>		Latitude(83) <u>37.151360</u>					
Location <u>132+60.00 25.0' Lt.</u>				Longitude(83) <u>-88.399283</u>					
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
105		Overburden. (Begin Core)							105
110									110
115									115
120									120
125									125
211.0	126.1								
130	205.0	Light gray to gray sandstone.	0 / 0	1.0	1.0	100			127.1
			44 / 44	5.0	4.7	94			130
135	200.0	Dark gray shale, silty.	0 / 0	5.0	3.3	66			135
140	137.1								137.1
145		(Bottom of Hole 137.1')							140
									145
									150

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>1027</u>		Immediate Water Depth <u>18.0 (08/27/19)</u>		Start Date <u>08/27/2019</u>			Hole Type <u>core and sample</u>		
Surface Elevation <u>338.3'</u>		Static Water Depth <u>NA</u>		End Date <u>08/29/2019</u>			Rig Number <u>55 Truck</u>		
Total Depth <u>153.3'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.151336</u>					
Location <u>132+60.00 25.0' Rt.</u>				Longitude(83) <u>-88.399113</u>					
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
5 10 15 20 25 30 35 40 45 50	5 10 15 20 25 30 35 40 45 50	Tan to light gray, moist, Lean Clay with Sand.		1	2.5-4.5	2.0		ST	
				2	5.0-7.0	2.0		ST	
				3	10.0-12.0	2.0		ST	
				1	15.0-16.5	1.5	0-1-1	SPT	
				2	20.0-21.5	1.5	1-2-1	SPT	
				3	25.0-26.5	1.5	0-1-2	SPT	
				4	30.0-31.5	1.2	1-1-1	SPT	
				5	35.0-36.5	1.4	2-2-2	SPT	
				6	40.0-41.5	1.0	1-1-1	SPT	
				4	45.0-47.0	2.0		ST	

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>					
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>					
Hole Number <u>1027</u>		Immediate Water Depth <u>18.0 (08/27/19)</u>		Start Date <u>08/27/2019</u>		Hole Type <u>core and sample</u>				
Surface Elevation <u>338.3'</u>		Static Water Depth <u>NA</u>		End Date <u>08/29/2019</u>		Rig Number <u>55 Truck</u>				
Total Depth <u>153.3'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.151336</u>						
Location <u>132+60.00 25.0' Rt.</u>				Longitude(83) <u>-88.399113</u>						
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks	
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)		
55 60	273.3 65.0	Tan to light gray, moist, Lean Clay with Sand.		6	50.0-51.5	0.8	4-5-9	SPT	55 60	
				7	55.0-56.5	1.5	2-4-5	SPT		
				8	60.0-61.5	1.5	3-3-13	SPT		
70 80 85 90 95 100	238.3 100.0	Gray, wet, Silty Clayey Sand.		9	65.0-66.5	1.3	3-4-5	SPT	70 75 80 85 90 95 100	
				10	70.0-71.5	1.0	3-3-3	SPT		
				11	75.0-76.5	1.0	4-6-16	SPT		
				12	80.0-81.5	1.1	3-7-8	SPT		
				13	85.0-86.5	1.2	4-8-16	SPT		
	14	90.0-91.5	0.7	2-4-8	SPT					
	15	95.0-96.5	1.5	20-9-10	SPT					

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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>					
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>					
Hole Number <u>1027</u>		Immediate Water Depth <u>18.0 (08/27/19)</u>		Start Date <u>08/27/2019</u>		Hole Type <u>core and sample</u>				
Surface Elevation <u>338.3'</u>		Static Water Depth <u>NA</u>		End Date <u>08/29/2019</u>		Rig Number <u>55 Truck</u>				
Total Depth <u>153.3'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.151336</u>						
Location <u>132+60.00 25.0' Rt.</u>				Longitude(83) <u>-88.399113</u>						
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks	
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)		
105		Lean Clay.		16	100.0-101.5	1.5	0-0-1	SPT	105	
				17	105.0-106.5	1.5	1-2-2	SPT		
				5	106.5-107.8	1.3		ST		
110									110	
				18	110.0-111.5	1.5	1-2-4	SPT		
115									115	
				19	115.0-116.5	1.5	6-9-20	SPT		
120				20	120.0-121.5	1.5	4-10-17	SPT	120	
125	123.3	125.0							125	
				21	125.0-125.7	0.7	4-50/0.20'	SPT		
210.2	128.1	Well Graded Gravel with with silt and clay. (Begin Core)								
130		Light gray to gray sandstone.		0 / 0	2.5	2.5	100		130.6	130
				0 / 0	5.0	1.4	28			
135									135.6	135
202.3	136.0									
140		Dark gray shale, silty.		12 / 8	5.0	4.0	80		140.6	140
				12 / 0	5.0	4.6	92			
145									145.6	145
191.1	147.2			33 / 15	2.7	2.7	100			
190.6	147.7	Light gray to gray sandstone.							148.3	
		Dark gray shale, silty.		36 / 18	5.0	5.0	100			150

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>1027</u>		Immediate Water Depth <u>18.0 (08/27/19)</u>		Start Date <u>08/27/2019</u>		Hole Type <u>core and sample</u>			
Surface Elevation <u>338.3'</u>		Static Water Depth <u>NA</u>		End Date <u>08/29/2019</u>		Rig_Number <u>55 Truck</u>			
Total Depth <u>153.3'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.151336</u>					
Location <u>132+60.00 25.0' Rt.</u>				Longitude(83) <u>-88.399113</u>					
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
185.0	153.3	Dark gray shale, silty.		36 / 18	5.0	5.0	100		153.3
155		(Bottom of Hole 153.3')							155
160									160
165									165
170									170
175									175
180									180
185									185
190									190
195									195
200									200

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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>		Project Type: <u>Geotechnical</u>					
Item Number:		<u>Cumberland River</u>		Project Manager: _					
Hole Number <u>1028</u>		Immediate Water Depth <u>18.0 (08/13/19)</u>		Start Date <u>08/13/2019</u>					
Surface Elevation <u>338.9'</u>		Static Water Depth <u>NA</u>		End Date <u>08/23/2019</u>					
Total Depth <u>150.2'</u>		Driller <u>Tim Caudill</u>		Latitude(83) <u>37.151736</u>					
Location <u>134+00.00 20.0' Lt.</u>				Longitude(83) <u>-88.399184</u>					
Lithology		Overburden		Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Description	Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
5		Tan to light brown, moist, lean clay.		1	2.5-4.5	2.0		ST	
				2	5.0-7.0	2.0		ST	
10									
				3	10.0-12.0	2.0		ST	
15	323.9		15.0						
20		Gray, moist, silty clayey sand with with clay lenses.		1	15.0-16.5	1.1	3-4-2	SPT	
				2	20.0-21.5	1.5	3-4-7	SPT	
25									
				3	25.0-26.5	1.0	3-4-6	SPT	
30				4	30.0-31.5	0.8	4-2-5	SPT	
35				5	35.0-36.5	0.7	4-2-5	SPT	
40	298.9	40.0		6	40.0-41.5	1.5	0-0-0	SPT	
		Gray to light gray, moist to wet, lean clay.		4	41.5-43.5	2.0		ST	
45									
				5	45.0-47.0	2.0		ST	
50									

DRILLER'S SUBSURFACE LOG

Project ID: <u>178565011</u>		<u>Livingston - US 60</u> <u>Cumberland River</u>			Project Type: <u>Geotechnical</u> Project Manager: <u> </u>					
Item Number: <u> </u>										
Hole Number <u>1028</u>		Immediate Water Depth <u>18.0 (08/13/19)</u>			Start Date <u>08/13/2019</u>			Hole Type <u>core and sample</u>		
Surface Elevation <u>338.9'</u>		Static Water Depth <u>NA</u>			End Date <u>08/23/2019</u>			Rig Number <u>55 Truck</u>		
Total Depth <u>150.2'</u>		Driller <u>Tim Caudill</u>			Latitude(83) <u>37.151736</u>					
Location <u>134+00.00 20.0' Lt.</u>					Longitude(83) <u>-88.399184</u>					
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks	
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)		
55 60 65 273.9	65.0	Gray to light gray, moist to wet, lean clay.		6	50.0-52.0	1.6		ST		
				7	55.0-56.5	1.2	4-5-12	SPT		
				8	60.0-61.5	1.0	1-1-2	SPT		
70 75 80 85 90 95 243.9	95.0	Gray to light gray, moist to wet, silty sand with locally contains gravel.		9	65.0-66.5	0.6	2-3-5	SPT		
				10	70.0-71.5	0.8	4-7-11	SPT		
				11	75.0-76.5	1.3	2-7-12	SPT		
				12	80.0-81.5	0.7	5-4-7	SPT		
				13	85.0-86.5	1.3	5-7-5	SPT		
100		Dark gray, moist to wet, lean clay with locally sandy.		14	90.0-91.5	1.0	10-20-39	SPT		
				15	95.0-96.5	1.5	3-3-4	SPT		

DRILLER'S SUBSURFACE LOG

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>		Project Type: <u>Geotechnical</u>	
Item Number:		<u>Cumberland River</u>		Project Manager: <u> </u>	

Hole Number <u>1028</u>		Immediate Water Depth <u>18.0 (08/13/19)</u>	Start Date <u>08/13/2019</u>		Hole Type <u>core and sample</u>
Surface Elevation <u>338.9'</u>		Static Water Depth <u>NA</u>	End Date <u>08/23/2019</u>		Rig Number <u>55 Truck</u>
Total Depth <u>150.2'</u>		Driller <u>Tim Caudill</u>	Latitude(83) <u>37.151736</u>		
Location <u>134+00.00 20.0' Lt.</u>			Longitude(83) <u>-88.399184</u>		

Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks	
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)		
105 110	110.0	Dark gray, moist to wet, lean clay with locally sandy.		16	100.0-101.5	1.5	7-7-8	SPT		
				7	105.0-106.3	1.3				ST
115 120	125.0	Gray to dark gray, wet, silty clayey sand.		17	110.0-111.5	1.4	8-5-8	SPT		
				18	115.0-116.5	1.4	8-13-21			SPT
				19	120.0-121.5	1.5	7-5-7			SPT
125 130	129.1	Light brown to light gray, silty clayey gravel. (Begin Core)		20	125.0-126.4	0.9	10-34-50/0.40'	SPT		
				21	127.1-128.0	0.9	19-50/0.40'			SPT
				22	128.7-129.1	0.4	50/0.40'			SPT
130 135	136.0	Dark gray shale, silty.		0 / 0	4.6	4.6	100		133.7	
				12 / 0	5.2	5.1	98			
135 140	137.3	Light gray to gray sandstone.							138.9	
				28 / 12	5.0	5.0	100			
140 145	150.2	Dark gray shale, silty.							143.9	
				0 / 0	5.0	5.0	100			
145 150	150.2								148.9	
				0 / 0	1.3	1.3	100			

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>1028</u>		Immediate Water Depth <u>18.0 (08/13/19)</u>		Start Date <u>08/13/2019</u>		Hole Type <u>core and sample</u>			
Surface Elevation <u>338.9'</u>		Static Water Depth <u>NA</u>		End Date <u>08/23/2019</u>		Rig_Number <u>55 Truck</u>			
Total Depth <u>150.2'</u>		Driller <u>Tim Caudill</u>		Latitude(83) <u>37.151736</u>					
Location <u>134+00.00 20.0' Lt.</u>				Longitude(83) <u>-88.399184</u>					
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
155		(Bottom of Hole 150.2')							150.2
160									
165									
170									
175									
180									
185									
190									
195									
200									

Drilling Firm: Stantec
For: Division of Structural Design
Geotechnical Branch

DRILLER'S SUBSURFACE LOG

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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>		Project Type: <u>Geotechnical</u>					
Item Number:		<u>Cumberland River</u>		Project Manager: <u> </u>					
Hole Number <u>1029</u>		Immediate Water Depth <u>20.0 (08/26/19)</u>		Start Date <u>08/26/2019</u>					
Surface Elevation <u>340.1'</u>		Static Water Depth <u>NA</u>		End Date <u>08/27/2019</u>					
Total Depth <u>138.7'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.151718</u>					
Location <u>134+00.00 20.0' Rt.</u>				Longitude(83) <u>-88.399049</u>					
Lithology		Overburden		Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Description		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	
5									
10									
15									
20									
25		Overburden.							
30									
35									
40									
45									
50									

Drilling Firm: Stantec
For: Division of Structural Design
Geotechnical Branch

DRILLER'S SUBSURFACE LOG

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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>		Project Type: <u>Geotechnical</u>					
Item Number:		<u>Cumberland River</u>		Project Manager: <u> </u>					
Hole Number <u>1029</u>		Immediate Water Depth <u>20.0 (08/26/19)</u>		Start Date <u>08/26/2019</u>					
Surface Elevation <u>340.1'</u>		Static Water Depth <u>NA</u>		End Date <u>08/27/2019</u>					
Total Depth <u>138.7'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.151718</u>					
Location <u>134+00.00 20.0' Rt.</u>				Longitude(83) <u>-88.399049</u>					
Lithology		Overburden		Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Description		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	
55									
60									
65									
70									
75		Overburden.							
80									
85									
90									
95									
100									

Drilling Firm: Stantec
For: Division of Structural Design
Geotechnical Branch

DRILLER'S SUBSURFACE LOG

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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>			
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>			
Hole Number <u>1029</u>		Immediate Water Depth <u>20.0 (08/26/19)</u>		Start Date <u>08/26/2019</u>		Hole Type <u>core</u>		
Surface Elevation <u>340.1'</u>		Static Water Depth <u>NA</u>		End Date <u>08/27/2019</u>		Rig_Number <u>55 Truck</u>		
Total Depth <u>138.7'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.151718</u>				
Location <u>134+00.00 20.0' Rt.</u>				Longitude(83) <u>-88.399049</u>				
Lithology		Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	
Elevation	Depth	Description	Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)
105		Overburden.						
110								
115								
120								
125								
211.6	128.5	(Begin Core)						
130	209.6	Light gray to gray sandstone.	21 / 21	2.4	2.4	100		130.9
135		Dark gray shale, silty.	12 / 0	5.0	5.0	100		135.9
201.4	138.7		54 / 36	2.8	2.8	100		138.7
140		(Bottom of Hole 138.7')						
145								
150								

Geologist's Subsurface Logs - Bridge

GEOLOGIST'S SUBSURFACE LOG

Project ID: 178565011		Livingston - US 60		Project Type: Geotechnical	
Item Number:		Cumberland River		Project Manager: _	

Hole Number 1001		Immediate Water Depth (08/12/19)	Start Date 08/12/2019		Hole Type core and sample
Surface Elevation 400.7'		Static Water Depth NA	End Date 08/12/2019		Rig Number 55 Truck
Total Depth 27.5'		Driller Tim Caudill	Latitude(83) 37.146566		GQ-
Location 114+90.00 20.0' Lt.		Geologist	Longitude(83) -88.400295		

Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
		Overburden: see driller's log for overburden details.		1	2.5-4.5	2.0		ST	Boring moved 3.0' 178S due to overhead trees @ 0
				2	5.0-5.1	0.0		ST	
394.3	6.4		(Begin Core)	1	5.1-6.4	1.3	22-35-50/0.30	SPT	
390.9	9.8	Sandstone: with clayey lenses, brownish gray to light gray, medium to fine grained, thin bedded.	19 / 0	2.7	2.7	100			Abundant fracturing 90 degrees to core axis along bedding planes, water stained, minimal seperation @ 6.4-9.1 Mechanically fractured sandstone lense @ 10.7-11.1 Fracture 30 degrees to core axis, water stained, minimal seperation @ 20.4-21.2 water staining less prominent @ 26.4
		Shale: with interbedded siltstone, gray to dark gray, clayey, fine to coarsely laminated.	22 / 0	5.0	5.0	100			
383.8	16.9		12 / 0	5.0	5.0	100			
			Sandstone: (90%) with clayey shale lenses, brownish gray to light gray, fine to medium grained, thin to very thin bedded, moderately to highly fractured.	0 / 0	5.0	5.0	100		
373.2	27.5	32 / 32		3.4	3.4	100			
		(Bottom of Hole 27.5')							

Top of Rock = 6.4'
 Elevation = 394.3'

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>1002</u>		Immediate Water Depth <u>NA</u>		Start Date <u>08/12/2019</u>		Hole Type <u>sounding</u>			
Surface Elevation <u>400.3'</u>		Static Water Depth <u>NA</u>		End Date <u>08/12/2019</u>		Rig Number <u>55 Truck</u>			
Total Depth <u>5.5'</u>		Driller <u>Tim Caudill</u>		Latitude(83) <u>37.146557</u>		<u>GQ-</u>			
Location <u>114+90.00 CL</u>		Geologist <u> </u>		Longitude(83) <u>-88.400227</u>					
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
									Boring offset 2.0' 200S due to tree cover @ 0
5									5
10		(Bottom of Hole 5.5') (Refusal @ 5.5)							10
15									15
20									20
25									25
30									30
35									35
40									40
45									45
50									50
Top of Rock = 5.5' Elevation = 394.8'									

GEOLOGIST'S SUBSURFACE LOG

Project ID: 178565011		Livingston - US 60			Project Type: Geotechnical				
Item Number:		Cumberland River			Project Manager: _				
Hole Number 1003		Immediate Water Depth (08/13/19)		Start Date 08/13/2019		Hole Type core			
Surface Elevation 399.4'		Static Water Depth NA		End Date 08/13/2019		Rig Number 55 Truck			
Total Depth 17.7'		Driller Tim Caudill		Latitude(83) 37.146548		GQ-			
Location 114+90.00 20.0' Rt.		Geologist _		Longitude(83) -88.400160					
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
		Overburden: see driller's log for overburden details.							
393.8	5.6	(Begin Core)							
388.6	10.8	Sandstone: with clay lenses, brownish gray to light gray, medium to fine grained, thin bedded.	0 / 0	3.9	2.7	69			Loss is run 1 due to clayey shale being washed away @ 5.6-9.5 Vertical fracture 0 degrees to core axis @ 5.8-6 water staining along seperations @ 6.9-7.1
			44 / 10	4.8	4.8	100			
381.7	17.7	Shale: with interbedded siltstone, gray to dark gray, clayey, finely to coarsely laminated.	29 / 0	3.4	3.4	100			
		(Bottom of Hole 17.7')							

Top of Rock = 5.6'
 Elevation = 393.8'

GEOLOGIST'S SUBSURFACE LOG

Project ID: 178565011		Livingston - US 60			Project Type: Geotechnical		
Item Number:		Cumberland River			Project Manager: _		
Hole Number 1004		Immediate Water Depth NA		Start Date 10/03/2019		Hole Type core	
Surface Elevation 340.0'		Static Water Depth NA		End Date 10/04/2019		Rig Number 45 Truck	
Total Depth 24.1'		Driller Donald Clements		Latitude(83) 37.146899		GQ-	
Location 116+13.00 20.0' Lt.		Geologist		Longitude(83) -88.400223			

Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
337.0	3.0	Overburden: see driller's log for overburden details.							sandstone boulder @ 3-7
		Cored Overburden: sandstone boulder.							
327.7	12.3	(Begin Core)							
320.6	19.4	Shale: dark brownish gray to orange brown, silty, coarsely laminated, weathered.		48 / 19	2.7	2.7	100		very soft zone @ 17-17.4 clayey lense @ 18.5-18.6 fracture 45 degrees to core axis, water stained, rough contact, minimal seperation @ 21.5-22
				23 / 9	4.7	4.7	100		
315.9	24.1	Shale: dark gray, silty with sandy lenses, clayey zones, coarsely laminated.		70 / 52	4.4	4.4	100		
		(Bottom of Hole 24.1')							

Top of Rock = 12.3'
 Elevation = 327.7'

GEOLOGIST'S SUBSURFACE LOG

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Project ID: 178565011		Livingston - US 60		Project Type: Geotechnical	
Item Number:		Cumberland River		Project Manager: _	
Hole Number 1005		Immediate Water Depth (10/03/19)		Start Date 10/03/2019	
Surface Elevation 341.8'		Static Water Depth NA		End Date 10/03/2019	
Total Depth 36.9'		Driller Donald Clements		Latitude(83) 37.146881	
Location 116+19.00 20.0' Rt.		Geologist _		Longitude(83) -88.400088	
Hole Type core and sample		Rig Number 45 Truck		GQ-	

Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
		Overburden: see driller's log for overburden details.		1	2.5-4.0	1.1	5-8-11	SPT	boring offset 7.5' 5N due to hill slope and trees greater than 3" in diameter @ 0
				2	5.0-6.5	1.2	28-30-25	SPT	
				3	10.0-11.5	0.9	21-14-18	SPT	
325.5	16.3		(Begin Core)	4	15.0-16.3	1.2	14-34-50/0.30	SPT	
322.4	19.4	Shale: dark brownish gray to gray, silty with sandy lenses, coarsely laminated, weathered.	0 / 0	3.8	3.8	100			calcareous sandstone lense, very fine to fine grained, very thin bedded @ 16.7-17.1 clay lense, brown to grayish brown @ 19.3-19.4 siltstone lense, light gray, hard @ 20.4-20.5 zone of abundant siltstone and calcareous sandstone laminations, highly mechanically fractured @ 30.1-31 soft zone, consistant lithology, coarsely laminated @ 33.8-36.9
		Shale: dark gray, silty with sandy lenses, clayey zones, coarsely laminated.	66 / 0	5.0	5.0	100			
			78 / 48	5.0	5.0	100			
			40 / 26	5.0	5.0	100			
304.9	36.9		100 / 78	1.8	1.8	100			
		(Bottom of Hole 36.9')							

Top of Rock = 16.3'
Elevation = 325.5'

GEOLOGIST'S SUBSURFACE LOG

Project ID: 178565011		Livingston - US 60		Project Type: Geotechnical	
Item Number:		Cumberland River		Project Manager: _	
Hole Number 1006		Immediate Water Depth 29.0 (10/02/19)		Start Date 10/02/2019	
Surface Elevation 334.6'		Static Water Depth NA		End Date 10/03/2019	
Total Depth 57.3'		Driller Donald Clements		Latitude(83) 37.147235	
Location 117+22.00 20.0' Lt.		Geologist _		Longitude(83) -88.400151	
Hole Type core and sample		Rig Number 45 Truck		GQ-	

Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
		Overburden: see driller's log for overburden details.		1	2.5-4.5	2.0		ST	
				2	5.0-6.8	1.8		ST	
				1	6.8-8.3	1.2	8-12-16	SPT	
				2	10.0-11.5	1.5	7-7-11	SPT	
				3	15.0-16.5	1.5	3-3-5	SPT	
				3	16.5-18.5	1.9		ST	
				4	20.0-22.0	2.0		ST	
				5	25.0-27.0	2.0		ST	
				6	30.0-32.0	0.8		ST	
				4	32.0-33.5	0.8	4-11-12	SPT	
35	299.4		(Begin Core)	5	34.6-35.2	0.6	27-50/0.10'	SPT	
40			Shale: dark gray to blackish gray, with sandy laminations, locally pyritic, locally clayey.	85 / 72	4.6	4.6	100		39.8
45				76 / 53	5.1	5.1	100		44.9
50				48 / 44	5.0	5.0	100		49.9

Top of Rock = 35.2'
Elevation = 299.4'

GEOLOGIST'S SUBSURFACE LOG

Project ID: 178565011		Livingston - US 60			Project Type: Geotechnical				
Item Number:		Cumberland River			Project Manager: _				
Hole Number 1006		Immediate Water Depth 29.0 (10/02/19)		Start Date 10/02/2019		Hole Type core and sample			
Surface Elevation 334.6'		Static Water Depth NA		End Date 10/03/2019		Rig Number 45 Truck			
Total Depth 57.3'		Driller Donald Clements		Latitude(83) 37.147235		GQ-			
Location 117+22.00 20.0' Lt.		Geologist _		Longitude(83) -88.400151					
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
55		Shale: dark gray to blackish gray, with sandy laminations, locally pyritic, locally clayey.		77 / 69	4.8	4.8	100		seperation @ 42.4-42.6 mechanically fractured zone @ 49.3-49.5 siltstone lense, mechanically fractured 45 degrees to core axis, rough contact, minimal seperation, mildly calcareous @ 52.3-52.5
277.3	57.3			81 / 35	2.6	2.6	100		
60		(Bottom of Hole 57.3')							
65									
70									
75									
80									
85									
90									
95									
100									
Top of Rock = 35.2' Elevation = 299.4'									

Drilling Firm: Stantec
For: Division of Structural Design
Geotechnical Branch

GEOLOGIST'S SUBSURFACE LOG

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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>		Project Type: <u>Geotechnical</u>						
Item Number:		<u>Cumberland River</u>		Project Manager: <u> </u>						
Hole Number <u>1007</u>		Immediate Water Depth <u>NA</u>		Start Date <u>10/04/2019</u>						
Surface Elevation <u>335.2'</u>		Static Water Depth <u>NA</u>		End Date <u>10/04/2019</u>						
Total Depth <u>46.8'</u>		Driller <u>Donald Clements</u>		Latitude(83) <u>37.147216</u>						
Location <u>117+37.00 20.0' Rt.</u>		Geologist <u> </u>		Longitude(83) <u>-88.400016</u>						
Lithology		Overburden		Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks	
Elevation	Depth	Description		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)		SDI (JS)
5		<u>Overburden</u> : see driller's log for overburden details.								
10										
15										
20										
25										
30										
35	300.0	35.2	(Begin Core)							
	298.9	36.3	<u>Shale</u> : dark brownish gray to orangish gray, silty with clayey zones.		45 / 20	4.9	4.9	100		
40			<u>Shale</u> : dark gray to blackish gray, with sandy laminations, locally pyritic, locally clayey.		61 / 35	4.9	4.9	100		
45					50 / 50	1.8	1.8	100		
	288.4	46.8								
50										

Top of Rock = 35.2'

Elevation = 300.0'

fracture 45 degrees to core axis, clay filled @ 37.5-37.7

fracture set, 30 to core axis, moderately smooth contact, minimal seperation @ 42.1-42.9

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>1007</u>		Immediate Water Depth <u>NA</u>		Start Date <u>10/04/2019</u>		Hole Type <u>core</u>			
Surface Elevation <u>335.2'</u>		Static Water Depth <u>NA</u>		End Date <u>10/04/2019</u>		Rig_Number <u>45 Truck</u>			
Total Depth <u>46.8'</u>		Driller <u>Donald Clements</u>		Latitude(83) <u>37.147216</u>		<u>GQ-</u>			
Location <u>117+37.00 20.0' Rt.</u>		Geologist <u> </u>		Longitude(83) <u>-88.400016</u>					
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
55		(Bottom of Hole 46.8')							highly mechanically fractured zone @ 43.5-44
60									
65									
70									
75									
80									
85									
90									
95									
100									
Top of Rock = 35.2' Elevation = 300.0'									

GEOLOGIST'S SUBSURFACE LOG

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>		Project Type: <u>Geotechnical</u>	
Item Number:		<u>Cumberland River</u>		Project Manager: <u> </u>	

Hole Number <u>1008</u>		Immediate Water Depth <u>27.5 (09/25/19)</u>	Start Date <u>09/24/2019</u>		Hole Type <u>core and sample</u>
Surface Elevation <u>334.4'</u>		Static Water Depth <u>NA</u>	End Date <u>09/25/2019</u>		Rig Number <u>45 Truck</u>
Total Depth <u>97.1'</u>		Driller <u>Donald Clements</u>	Latitude(83) <u>37.147543</u>		<u>GQ-</u>
Location <u>118+50.00 25.0' Lt.</u>		Geologist <u> </u>	Longitude(83) <u>-88.400103</u>		

Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
		<u>Overburden:</u> see driller's log for overburden details.		1	2.5-4.5	2.0		ST	
				2	5.0-7.0	2.0		ST	
				3	10.0-12.0	2.0		ST	
				4	15.0-17.0	2.0		ST	
				5	20.0-22.0	2.0		ST	
				6	25.0-27.0	2.0		ST	
			7	30.0-32.0	1.8		ST		
			8	35.0-37.0	1.9		ST		
			9	40.0-42.0	2.0		ST		
			10	45.0-47.0	2.0		ST		

Top of Rock = 56.5'
 Elevation = 277.9'

GEOLOGIST'S SUBSURFACE LOG

Project ID: <u>178565011</u>		<u>Livingston - US 60</u> <u>Cumberland River</u>			Project Type: <u>Geotechnical</u> Project Manager: <u> </u>				
Hole Number <u>1008</u>		Immediate Water Depth <u>27.5 (09/25/19)</u>		Start Date <u>09/24/2019</u>			Hole Type <u>core and sample</u>		
Surface Elevation <u>334.4'</u>		Static Water Depth <u>NA</u>		End Date <u>09/25/2019</u>			Rig Number <u>45 Truck</u>		
Total Depth <u>97.1'</u>		Driller <u>Donald Clements</u>		Latitude(83) <u>37.147543</u>			<u>GQ-</u>		
Location <u>118+50.00 25.0' Lt.</u>		Geologist <u> </u>		Longitude(83) <u>-88.400103</u>					

Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
		<u>Overburden:</u> see driller's log for overburden details.		1	50.0-51.5	1.5	5-6-5	SPT	
55			(Begin Core)	2	55.0-56.5	1.5	5-17-26	SPT	55
277.9	56.5								
		<u>Shale:</u> weathered, dark gray to brown.		39 / 15	3.3	3.3	100		59.8
60				68 / 44	5.0	5.0	100		60
65				67 / 51	5.1	5.1	100		65
70				59 / 43	4.9	4.9	100		70
75				54 / 48	5.0	5.0	100		75
80				76 / 67	5.1	5.1	100		80
85				94 / 51	5.1	5.1	100		85
90				58 / 50	5.2	5.2	100		90
95				84 / 42	1.9	1.9	100		95
237.3	97.1								97.1
									100

Top of Rock = 56.5'
 Elevation = 277.9'

fracture, 45 degrees to core axis, smooth contact, minimal seperation @ 83.5-83.6
 fracture, 45 degrees to core axis, smooth contact, minimal seperation @ 83.9-84
 sandy limestone lense, 1/2"

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>1008</u>		Immediate Water Depth <u>27.5 (09/25/19)</u>		Start Date <u>09/24/2019</u>		Hole Type <u>core and sample</u>			
Surface Elevation <u>334.4'</u>		Static Water Depth <u>NA</u>		End Date <u>09/25/2019</u>		Rig_Number <u>45 Truck</u>			
Total Depth <u>97.1'</u>		Driller <u>Donald Clements</u>		Latitude(83) <u>37.147543</u>		<u>GQ-</u>			
Location <u>118+50.00 25.0' Lt.</u>		Geologist <u> </u>		Longitude(83) <u>-88.400103</u>					
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
105		(Bottom of Hole 97.1')							thick, very fine to fine grained, calcareous @ 95
110									
115									
120									
125									
130									
135									
140									
145									
150									
Top of Rock = 56.5' Elevation = 277.9'									

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>1009</u>		Immediate Water Depth <u>26.0 (09/26/19)</u>		Start Date <u>09/26/2019</u>		Hole Type <u>core</u>			
Surface Elevation <u>335.3'</u>		Static Water Depth <u>NA</u>		End Date <u>09/30/2019</u>		Rig_Number <u>45 Truck</u>			
Total Depth <u>98.8'</u>		Driller <u>Donald Clements</u>		Latitude(83) <u>37.147520</u>		<u>GQ-</u>			
Location <u>118+50.00 25.0' Rt.</u>		Geologist <u> </u>		Longitude(83) <u>-88.399934</u>					
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
5		<u>Overburden</u> : see driller's log for overburden details.							5
10									10
15									15
20									20
25									25
30									30
35									35
40									40
45									45
50									50
Top of Rock = 58.0' Elevation = 277.3'									

GEOLOGIST'S SUBSURFACE LOG

Project ID: <u>178565011</u>		<u>Livingston - US 60</u> <u>Cumberland River</u>			Project Type: <u>Geotechnical</u> Project Manager: <u> </u>				
Hole Number <u>1009</u>		Immediate Water Depth <u>26.0 (09/26/19)</u>		Start Date <u>09/26/2019</u>			Hole Type <u>core</u>		
Surface Elevation <u>335.3'</u>		Static Water Depth <u>NA</u>		End Date <u>09/30/2019</u>			Rig Number <u>45 Truck</u>		
Total Depth <u>98.8'</u>		Driller <u>Donald Clements</u>		Latitude(83) <u>37.147520</u>			<u>GQ-</u>		
Location <u>118+50.00 25.0' Rt.</u>		Geologist <u> </u>		Longitude(83) <u>-88.399934</u>					

Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
55		<u>Overburden:</u> see driller's log for overburden details.							55
277.3	58.0	(Begin Core)							
60		<u>Shale:</u> dark gray to blackish, silty with limey sand lenses, very thin to thin bedded, laminated with pyritic zones.		0 / 0	0.8	0.5	63		58.8
65				69 / 49	4.9	4.9	100		63.7
70				80 / 54	5.0	5.0	100		68.7
75				71 / 63	4.9	4.9	100		73.6
80				84 / 76	5.0	5.0	100		78.6
85				82 / 75	5.1	5.1	100		83.7
90				38 / 0	5.0	5.0	100		88.7
95				80 / 66	5.0	5.0	100		93.7
236.5	98.8			82 / 67	5.1	5.1	100		98.8
100									100

Top of Rock = 58.0'

Elevation = 277.3'

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>1009</u>		Immediate Water Depth <u>26.0 (09/26/19)</u>		Start Date <u>09/26/2019</u>		Hole Type <u>core</u>			
Surface Elevation <u>335.3'</u>		Static Water Depth <u>NA</u>		End Date <u>09/30/2019</u>		Rig_Number <u>45 Truck</u>			
Total Depth <u>98.8'</u>		Driller <u>Donald Clements</u>		Latitude(83) <u>37.147520</u>		<u>GQ-</u>			
Location <u>118+50.00 25.0' Rt.</u>		Geologist <u> </u>		Longitude(83) <u>-88.399934</u>					
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
105		(Bottom of Hole 98.8')							core axis, smooth contact, no seperation @ 92.2-92.3 mechanically fractured zone @ 95.7-96.1
110									
115									
120									
125									
130									
135									
140									
145									
150									
Top of Rock = 58.0' Elevation = 277.3'									

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>1010</u>		Immediate Water Depth <u>16.0 (09/25/19)</u>		Start Date <u>09/25/2019</u>		Hole Type <u>core</u>			
Surface Elevation <u>335.2'</u>		Static Water Depth <u>NA</u>		End Date <u>09/26/2019</u>		Rig_Number <u>45 Truck</u>			
Total Depth <u>99.3'</u>		Driller <u>Donald Clements</u>		Latitude(83) <u>37.147559</u>		<u>GQ-</u>			
Location <u>118+60.00 CL</u>		Geologist <u> </u>		Longitude(83) <u>-88.400012</u>					
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
5		<u>Overburden</u> : see driller's log for overburden details.							5
10									10
15									15
20									20
25									25
30									30
35									35
40									40
45									45
50									50
Top of Rock = 57.0' Elevation = 278.2'									

GEOLOGIST'S SUBSURFACE LOG

Project ID: <u>178565011</u>		<u>Livingston - US 60</u> <u>Cumberland River</u>			Project Type: <u>Geotechnical</u> Project Manager: <u> </u>				
Hole Number <u>1010</u>		Immediate Water Depth <u>16.0 (09/25/19)</u>		Start Date <u>09/25/2019</u>			Hole Type <u>core</u>		
Surface Elevation <u>335.2'</u>		Static Water Depth <u>NA</u>		End Date <u>09/26/2019</u>			Rig Number <u>45 Truck</u>		
Total Depth <u>99.3'</u>		Driller <u>Donald Clements</u>		Latitude(83) <u>37.147559</u>			<u>GQ-</u>		
Location <u>118+60.00 CL</u>		Geologist <u> </u>		Longitude(83) <u>-88.400012</u>					

Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
		<u>Overburden:</u> see driller's log for overburden details.							
55 278.2	57.0	(Begin Core)							55
60 275.7	59.5	<u>Shale:</u> gray-brown, weathered, locally clayey.		15 / 0	2.6	2.4	92		59.6 60
65		<u>Shale:</u> dark gray to black with sandy laminations.		71 / 59	4.9	4.9	100		64.5 65
70			61 / 59	5.1	5.1	100		69.6 70	
75			78 / 67	4.9	4.9	100		74.5 75	
80			90 / 77	4.8	4.8	100		79.3 80	
85			92 / 63	4.9	4.9	100		84.2 85	
90			78 / 55	5.1	5.1	100		89.3 90	
95			98 / 80	5.0	5.0	100		94.3 95	
235.9	99.3			66 / 40	5.0	5.0	100		99.3 100
fracture 45 degrees to core axis, smooth contact, minimal seperation @ 87-87.4 Calcareous sandstone lense 1/2" thick @ 93									

Top of Rock = 57.0'
Elevation = 278.2'

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>1010</u>		Immediate Water Depth <u>16.0 (09/25/19)</u>		Start Date <u>09/25/2019</u>		Hole Type <u>core</u>			
Surface Elevation <u>335.2'</u>		Static Water Depth <u>NA</u>		End Date <u>09/26/2019</u>		Rig_Number <u>45 Truck</u>			
Total Depth <u>99.3'</u>		Driller <u>Donald Clements</u>		Latitude(83) <u>37.147559</u>		<u>GQ-</u>			
Location <u>118+60.00 CL</u>		Geologist <u> </u>		Longitude(83) <u>-88.400012</u>					
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
105		(Bottom of Hole 99.3')							105
110									110
115									115
120									120
125									125
130									130
135									135
140									140
145									145
150									
Top of Rock = 57.0' Elevation = 278.2'									

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>1011</u>		Immediate Water Depth <u>27.0 (09/23/19)</u>		Start Date <u>09/23/2019</u>		Hole Type <u>core</u>			
Surface Elevation <u>329.8'</u>		Static Water Depth <u>NA</u>		End Date <u>09/24/2019</u>		Rig_Number <u>45 Truck</u>			
Total Depth <u>98.5'</u>		Driller <u>Donald Clements</u>		Latitude(83) <u>37.147597</u>		<u>GQ-</u>			
Location <u>118+60.00 25.0' Lt.</u>		Geologist <u> </u>		Longitude(83) <u>-88.400091</u>					
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
5		<u>Overburden</u> : see driller's log for overburden details.							5
10									10
15									15
20									20
25									25
30									30
35									35
40									40
45									45
50									50
Top of Rock = 57.5' Elevation = 272.3'									

Drilling Firm: Stantec
For: Division of Structural Design
Geotechnical Branch

GEOLOGIST'S SUBSURFACE LOG

Printed: 3/6/20

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Project ID: <u>178565011</u>		<u>Livingston - US 60</u>		Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>		Project Manager: <u> </u>				
Hole Number <u>1011</u>		Immediate Water Depth <u>27.0 (09/23/19)</u>	Start Date <u>09/23/2019</u>		Hole Type <u>core</u>			
Surface Elevation <u>329.8'</u>		Static Water Depth <u>NA</u>	End Date <u>09/24/2019</u>		Rig_Number <u>45 Truck</u>			
Total Depth <u>98.5'</u>		Driller <u>Donald Clements</u>	Latitude(83) <u>37.147597</u>		<u>GQ-</u>			
Location <u>118+60.00 25.0' Lt.</u>		Geologist <u> </u>	Longitude(83) <u>-88.400091</u>					
Lithology		Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Description	Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)
55		<u>Overburden</u> : see driller's log for overburden details.						
272.3	57.5	(Begin Core)						
271.6	58.2	<u>Sandstone</u> : light gry to brown, weathered.	61 / 22	1.8	1.3	72		59.3
60			64 / 46	5.0	5.0	100		60
65			74 / 38	5.0	5.0	100		65
70			66 / 38	5.0	5.0	100		70
75			86 / 56	5.0	5.0	100		75
80		<u>Shale</u> : dark gray, silty, very thin to thin bedded.	88 / 77	4.8	4.8	100		80
85			54 / 48	4.8	4.8	100		85
90			64 / 56	5.0	5.0	100		90
95			72 / 48	4.6	4.6	100		95
231.3	98.5							98.5
100								100
Top of Rock = 57.5' Elevation = 272.3'								

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>1011</u>		Immediate Water Depth <u>27.0 (09/23/19)</u>		Start Date <u>09/23/2019</u>		Hole Type <u>core</u>			
Surface Elevation <u>329.8'</u>		Static Water Depth <u>NA</u>		End Date <u>09/24/2019</u>		Rig_Number <u>45 Truck</u>			
Total Depth <u>98.5'</u>		Driller <u>Donald Clements</u>		Latitude(83) <u>37.147597</u>		<u>GQ-</u>			
Location <u>118+60.00 25.0' Lt.</u>		Geologist <u> </u>		Longitude(83) <u>-88.400091</u>					
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
105		(Bottom of Hole 98.5')							105
110									110
115									115
120									120
125									125
130									130
135									135
140									140
145									145
150									
Top of Rock = 57.5' Elevation = 272.3'									

GEOLOGIST'S SUBSURFACE LOG

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>		Project Type: <u>Geotechnical</u>	
Item Number:		<u>Cumberland River</u>		Project Manager: <u> </u>	

Hole Number <u>1012</u>		Immediate Water Depth <u>43.5 (10/01/19)</u>	Start Date <u>10/01/2019</u>		Hole Type <u>core and sample</u>
Surface Elevation <u>334.2'</u>		Static Water Depth <u>NA</u>	End Date <u>10/02/2019</u>		Rig Number <u>45 Truck</u>
Total Depth <u>99.5'</u>		Driller <u>Donald Clements</u>	Latitude(83) <u>37.147574</u>		<u>GQ-</u>
Location <u>118+63.00 25.0' Rt.</u>		Geologist <u> </u>	Longitude(83) <u>-88.399922</u>		

Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
		<u>Overburden:</u> see driller's log for overburden details.		1	2.5-4.5	2.0		ST	
				2	5.0-7.0	2.0		ST	
				3	10.0-12.0	2.0		ST	
				4	15.0-17.0	2.0		ST	
				5	20.0-22.0	2.0		ST	
				6	25.0-27.0	2.0		ST	
			7	30.0-32.0	2.0		ST		
			8	35.0-37.0	2.0		ST		
			9	40.0-42.0	1.8		ST		
			10	45.0-47.0	1.7		ST		

Top of Rock = 59.0'
 Elevation = 275.2'

GEOLOGIST'S SUBSURFACE LOG

Project ID: <u>178565011</u>		<u>Livingston - US 60</u> <u>Cumberland River</u>			Project Type: <u>Geotechnical</u> Project Manager: <u> </u>				
Hole Number <u>1012</u>		Immediate Water Depth <u>43.5 (10/01/19)</u>		Start Date <u>10/01/2019</u>			Hole Type <u>core and sample</u>		
Surface Elevation <u>334.2'</u>		Static Water Depth <u>NA</u>		End Date <u>10/02/2019</u>			Rig Number <u>45 Truck</u>		
Total Depth <u>99.5'</u>		Driller <u>Donald Clements</u>		Latitude(83) <u>37.147574</u>			<u>GQ-</u>		
Location <u>118+63.00 25.0' Rt.</u>		Geologist <u> </u>		Longitude(83) <u>-88.399922</u>					

Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
		<u>Overburden:</u> see driller's log for overburden details.		1	50.0-51.5	0.9	7-9-11	SPT	
				2	55.0-56.5	1.1	8-11-15	SPT	
275.2	59.0	(Begin Core)							
275.1	59.1	<u>Sandstone:</u> light gray to brown, very fine grained, weathered.		0 / 0	0.7	0.3	43		59.7
274.5	59.7								60
		<u>Shale:</u> weathered, loss from 59.1 tp 59.7.							
		<u>Shale:</u> dark gray, silty very thin to thin bedded.		73 / 39	4.9	4.9	100		64.6
									65
				52 / 48	5.0	5.0	100		69.6
									70
				71 / 48	4.8	4.8	100		74.4
									75
				80 / 70	5.0	5.0	100		79.4
									80
				78 / 57	5.1	5.1	100		84.5
									85
			76 / 71	5.1	5.1	100		89.6	
								90	
			82 / 82	4.9	4.9	100		94.5	
								95	
			84 / 74	5.0	5.0	100		99.5	
								100	

Top of Rock = 59.0'

Elevation = 275.2'

Siltstone lense 1/2" light gray @ 70.5 fracture 45 degrees to core axis, smooth contact, minimal seperation @ 71.9-72.1 very silty lense @ 77.4-77.5 mechanically fractured zone @ 80.3-80.5

siltstone lense, light gray, hard @ 93.6-93.8 soft zone, mechanically fractured by

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>1012</u>		Immediate Water Depth <u>43.5 (10/01/19)</u>		Start Date <u>10/01/2019</u>		Hole Type <u>core and sample</u>			
Surface Elevation <u>334.2'</u>		Static Water Depth <u>NA</u>		End Date <u>10/02/2019</u>		Rig_Number <u>45 Truck</u>			
Total Depth <u>99.5'</u>		Driller <u>Donald Clements</u>		Latitude(83) <u>37.147574</u>		<u>GQ-</u>			
Location <u>118+63.00 25.0' Rt.</u>		Geologist <u> </u>		Longitude(83) <u>-88.399922</u>					
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
105		(Bottom of Hole 99.5')							blocked off inner-barrel @ 94.5-95.3
110									
115									
120									
125									
130									
135									
140									
145									
150									
Top of Rock = 59.0' Elevation = 275.2'									

GEOLOGIST'S SUBSURFACE LOG

Project ID: 178565011		Livingston - US 60		Project Type: Geotechnical	
Item Number:		Cumberland River		Project Manager: _	

Hole Number 1013	Immediate Water Depth 13.0 (10/16/19)	Start Date 10/16/2019	Hole Type core and sample
Surface Elevation 309.6'	Static Water Depth NA	End Date 10/17/2019	Rig Number 55 Truck
Total Depth 136.1'	Driller Greg Wilson	Latitude(83) 37.149438	GQ-
Location 125+50.00 25.0' Lt.	Geologist	Longitude(83) -88.399696	

Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
		Overburden: see driller's log for overburden details.		1	2.5-4.0	1.5	3-3-4	SPT	
				2	5.0-6.5	1.5	0-2-1	SPT	
				3	10.0-11.5	1.5	0-1-0	SPT	
				4	15.0-16.5	0.8	0-0-0	SPT	
				5	20.0-21.5	0.9	0-1-2	SPT	
				6	25.0-26.5	1.1	2-2-2	SPT	
				7	30.0-31.5	1.3	1-2-2	SPT	
				8	35.0-36.5	1.5	4-4-5	SPT	
				9	40.0-41.5	1.5	3-4-6	SPT	
				10	45.0-46.5	1.5	3-5-5	SPT	

Top of Rock = 95.1'	
Elevation = 214.5'	

Drilling Firm: Stantec
For: Division of Structural Design
Geotechnical Branch

GEOLOGIST'S SUBSURFACE LOG

Printed: 3/6/20

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GEOLOGIST'S SUBSURFACE LOG

Project ID: <u>178565011</u>		<u>Livingston - US 60</u> <u>Cumberland River</u>			Project Type: <u>Geotechnical</u> Project Manager: <u> </u>				
Hole Number <u>1013</u>		Immediate Water Depth <u>13.0 (10/16/19)</u>		Start Date <u>10/16/2019</u>			Hole Type <u>core and sample</u>		
Surface Elevation <u>309.6'</u>		Static Water Depth <u>NA</u>		End Date <u>10/17/2019</u>			Rig Number <u>55 Truck</u>		
Total Depth <u>136.1'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.149438</u>			<u>GQ-</u>		
Location <u>125+50.00 25.0' Lt.</u>		Geologist <u> </u>		Longitude(83) <u>-88.399696</u>					

Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
		<u>Sandstone:</u> light gray, with shale streaks and partings, very fine grained.		26 / 26	5.0	5.0	100		103.4 degrees to core axis @ 96.9-97.2 shale lense 1/2" @ 97.6 mechanical fracture along healed fracture, vertical, 0 degrees to core axis @ 100.6-100.8 mechanical fracture along healed fracture, vertical, 0 degrees to core axis @ 102-102.7 shale lense 1/2" @ 103.1 mechanical fracture along healed fracture, 15 degrees to core axis @ 103.5-103.9 mechanical fracture along healed fracture, 15 degrees to core axis @ 104.9-105.1 shales streaks and partings less abundant @ 113.4 fracture 45 degrees to core axis, water stained, minimal seperation, lost water return @ 114.6-114.9 mechanical fracture along healed fracture, 30 degrees to
105				46 / 46	5.0	5.0	100		
110				92 / 68	5.0	5.0	100		
115				53 / 53	4.7	4.7	100		
120				79 / 79	4.7	4.7	100		
125				88 / 88	5.6	5.6	100		
130				90 / 90	5.0	5.0	100		
135	173.5		136.1	89 / 63	2.7	2.7	100		
140		(Bottom of Hole 136.1')							
145									
150									

Top of Rock = 95.1'
 Elevation = 214.5'

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>					
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>					
Hole Number <u>1013</u>		Immediate Water Depth <u>13.0 (10/16/19)</u>		Start Date <u>10/16/2019</u>		Hole Type <u>core and sample</u>				
Surface Elevation <u>309.6'</u>		Static Water Depth <u>NA</u>		End Date <u>10/17/2019</u>		Rig Number <u>55 Truck</u>				
Total Depth <u>136.1'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.149438</u>		<u>GQ-</u>				
Location <u>125+50.00 25.0' Lt.</u>		Geologist <u> </u>		Longitude(83) <u>-88.399696</u>						
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks	
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)		
155									core axis @ 116-116.5 mechanical fracture along healed fracture, 15 degrees to core axis @ 118.5-119.1	
160										
165										
170										
175										
180										
185										
190										
195										
200										
Top of Rock = 95.1' Elevation = 214.5'										

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>1014</u>		Immediate Water Depth <u>7.0 (10/02/19)</u>		Start Date <u>10/02/2019</u>		Hole Type <u>core</u>			
Surface Elevation <u>306.0'</u>		Static Water Depth <u>NA</u>		End Date <u>10/04/2019</u>		Rig_Number <u>55 Truck</u>			
Total Depth <u>134.9'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.149415</u>		<u>GQ-</u>			
Location <u>125+50.00 25.0' Rt.</u>		Geologist <u> </u>		Longitude(83) <u>-88.399526</u>					
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
5		<u>Overburden</u> : see driller's log for overburden details.							5
10									10
15									15
20									20
25									25
30									30
35									35
40									40
45									45
50									50
Top of Rock = 94.5' Elevation = 211.5'									

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>					
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>					
Hole Number <u>1014</u>		Immediate Water Depth <u>7.0 (10/02/19)</u>		Start Date <u>10/02/2019</u>		Hole Type <u>core</u>				
Surface Elevation <u>306.0'</u>		Static Water Depth <u>NA</u>		End Date <u>10/04/2019</u>		Rig Number <u>55 Truck</u>				
Total Depth <u>134.9'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.149415</u>		<u>GQ-</u>				
Location <u>125+50.00 25.0' Rt.</u>		Geologist <u> </u>		Longitude(83) <u>-88.399526</u>						
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks	
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)		
55		<u>Overburden</u> : see driller's log for overburden details.							55	
60									60	
65									65	
70									70	
75									75	
80									80	
85									85	
90									90	
95	211.5		(Begin Core)							95
100			<u>Sandstone</u> : light gray to gray, very fine grained, thin bedded with local shale streaks, stringers, and partings.	13 / 13	4.0	4.0	100			98.5
			8 / 8	5.0	5.0	100			shale lense, 100	
Top of Rock = 94.5' Elevation = 211.5'										

GEOLOGIST'S SUBSURFACE LOG

Project ID: 178565011		Livingston - US 60		Project Type: Geotechnical				
Item Number:		Cumberland River		Project Manager: _				
Hole Number 1014		Immediate Water Depth 7.0 (10/02/19)	Start Date 10/02/2019		Hole Type core			
Surface Elevation 306.0'		Static Water Depth NA	End Date 10/04/2019		Rig Number 55 Truck			
Total Depth 134.9'		Driller Greg Wilson	Latitude(83) 37.149415		GQ-			
Location 125+50.00 25.0' Rt.		Geologist	Longitude(83) -88.399526					
Lithology		Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
105		Sandstone: light gray to gray, very fine grained, thin bedded with local shale streaks, stringers, and partings.	8 / 8	5.0	5.0	100		103.5 silty @ 99.6-99.7
	24 / 16		5.0	5.0	100		105 shale lense, silty @ 107.4-107.5	
110	28 / 28		5.0	5.0	100		110 shale lense @ 109.8-109.9	
115	68 / 62		5.0	5.0	100		115 mechanical fracture along healed fracture, 10 degrees to core axis @ 110.9-111.4	
120	56 / 56		3.9	3.9	100		120 mechanical fracture along healed fracture, 10 degrees to core axis @ 113.2-113.9	
125	68 / 68		5.0	5.0	100		125 shale streaks and partings less common below 113.5 @ 113.5	
130	100 / 100		1.6	1.6	100		130 mechanical fracture along healed fracture, 15 degrees to core axis @ 117.5-118.5	
135	92 / 92		5.0	5.0	100		135 mechanical fracture 45 degrees to core axis @ 119.8-120.1	
135	171.1	134.9	100 / 100	0.9	0.9	100		134.0 mechanical fracture along healed fracture @ 121.5-122.2
140		(Bottom of Hole 134.9')						140 mechanical fracture @ 122.4-122.7
145								145 healed fracture 10 degrees to core axis @ 150
150								150
Top of Rock = 94.5' Elevation = 211.5'								

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>1014</u>		Immediate Water Depth <u>7.0 (10/02/19)</u>		Start Date <u>10/02/2019</u>		Hole Type <u>core</u>			
Surface Elevation <u>306.0'</u>		Static Water Depth <u>NA</u>		End Date <u>10/04/2019</u>		Rig_Number <u>55 Truck</u>			
Total Depth <u>134.9'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.149415</u>		<u>GQ-</u>			
Location <u>125+50.00 25.0' Rt.</u>		Geologist <u> </u>		Longitude(83) <u>-88.399526</u>					
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
155									133.5-134 healed fracture 45 degrees to core axis @ 134.6-134.9
160									
165									
170									
175									
180									
185									
190									
195									
200									
Top of Rock = 94.5' Elevation = 211.5'									

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>1015</u>		Immediate Water Depth <u>15.0 (10/07/19)</u>		Start Date <u>10/07/2019</u>		Hole Type <u>core</u>			
Surface Elevation <u>309.9'</u>		Static Water Depth <u>NA</u>		End Date <u>10/09/2019</u>		Rig_Number <u>55 Truck</u>			
Total Depth <u>140.1'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.149453</u>		<u>GQ-</u>			
Location <u>125+60.00 CL</u>		Geologist <u> </u>		Longitude(83) <u>-88.399605</u>					
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
5		<u>Overburden</u> : see driller's log for overburden details.							5
10									10
15									15
20									20
25									25
30									30
35									35
40									40
45									45
50									50
Top of Rock = 95.2' Elevation = 214.7'									

GEOLOGIST'S SUBSURFACE LOG

Project ID: 178565011		Livingston - US 60			Project Type: Geotechnical					
Item Number:		Cumberland River			Project Manager: _					
Hole Number 1015		Immediate Water Depth 15.0 (10/07/19)		Start Date 10/07/2019		Hole Type core				
Surface Elevation 309.9'		Static Water Depth NA		End Date 10/09/2019		Rig Number 55 Truck				
Total Depth 140.1'		Driller Greg Wilson		Latitude(83) 37.149453		GQ-				
Location 125+60.00 CL		Geologist _		Longitude(83) -88.399605						
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks	
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)		
55		Overburden: see driller's log for overburden details.							55	
60									60	
65									65	
70									70	
75									75	
80									80	
85									85	
90									90	
95	214.7		(Begin Core)							95
			Sandstone: light gray to gray, very fine grained, with local shale streaks and partings.	15 / 15	3.3	2.4	73		98.5	
100		16 /		5.0	4.8	96		100		
Top of Rock = 95.2' Elevation = 214.7'										

GEOLOGIST'S SUBSURFACE LOG

Project ID: 178565011		Livingston - US 60		Project Type: Geotechnical	
Item Number:		Cumberland River		Project Manager: _	

Hole Number 1015		Immediate Water Depth 15.0 (10/07/19)	Start Date 10/07/2019		Hole Type core
Surface Elevation 309.9'		Static Water Depth NA	End Date 10/09/2019		Rig Number 55 Truck
Total Depth 140.1'		Driller Greg Wilson	Latitude(83) 37.149453		GQ-
Location 125+60.00 CL		Geologist	Longitude(83) -88.399605		

Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
105		Sandstone: light gray to gray, very fine grained, with local shale streaks and partings.		16 / 16	5.0	4.8	96		zone of abundant shale streaks and partings @ 100.3-100.6
				0 / 0	5.0	2.6	52		loss occurred due to inner barrel failing to latch. Drill action was smooth and consistant. Highly mechanically fractured @ 103.5-108.5
110				44 / 20	5.0	4.1	82		mechanical fracture 45 degrees to core axis @ 113.7-113.9
115				64 / 64	5.0	5.0	100		mechanical fracture 30 degrees to core axis @ 114.1-114.5
120				90 / 90	5.0	5.0	100		mechanical fracture 60 degrees to core axis along shale streak @ 118.9-119
125				100 / 96	4.9	4.9	100		mechanical fracture along healed fracture 15 degrees to core axis @ 132.8-133.1
130				83 / 83	4.6	4.6	100		mechanical fracture 30 to core axis @ 139.2-139.7
135				100 / 98	5.1	5.1	100		shale lense, silty @ 140-140.1
140	140.1			40 / 40	2.0	2.0	100		
145		(Bottom of Hole 140.1')							

Top of Rock = 95.2'
 Elevation = 214.7'

GEOLOGIST'S SUBSURFACE LOG

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>		Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>		Project Manager: <u> </u>				
Hole Number <u>1016</u>		Immediate Water Depth <u>26.0 (10/17/19)</u>		Start Date <u>10/17/2019</u>				
Surface Elevation <u>316.5'</u>		Static Water Depth <u>NA</u>		End Date <u>10/21/2019</u>				
Total Depth <u>145.8'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.149492</u>				
Location <u>125+70.00 25.0' Lt.</u>		Geologist <u> </u>		Longitude(83) <u>-88.399684</u>				
Lithology		Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth	Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
5		<u>Overburden</u> : see driller's log for overburden details.						5
10								10
15								15
20								20
25								25
30								30
35								35
40								40
45								45
50								50
Top of Rock = 105.2' Elevation = 211.3'								

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>					
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>					
Hole Number <u>1016</u>		Immediate Water Depth <u>26.0 (10/17/19)</u>		Start Date <u>10/17/2019</u>		Hole Type <u>core</u>				
Surface Elevation <u>316.5'</u>		Static Water Depth <u>NA</u>		End Date <u>10/21/2019</u>		Rig_Number <u> </u>				
Total Depth <u>145.8'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.149492</u>		<u>GQ-</u>				
Location <u>125+70.00 25.0' Lt.</u>		Geologist <u> </u>		Longitude(83) <u>-88.399684</u>						
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks	
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)		
55		<u>Overburden</u> : see driller's log for overburden details.							55	
60									60	
65									65	
70									70	
75									75	
80									80	
85									85	
90									90	
95									95	
100									100	
Top of Rock = 105.2' Elevation = 211.3'										

GEOLOGIST'S SUBSURFACE LOG

Project ID: <u>178565011</u>		<u>Livingston - US 60</u> <u>Cumberland River</u>			Project Type: <u>Geotechnical</u> Project Manager: <u> </u>				
Hole Number <u>1016</u>		Immediate Water Depth <u>26.0 (10/17/19)</u>		Start Date <u>10/17/2019</u>			Hole Type <u>core</u>		
Surface Elevation <u>316.5'</u>		Static Water Depth <u>NA</u>		End Date <u>10/21/2019</u>			Rig Number <u> </u>		
Total Depth <u>145.8'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.149492</u>			<u>GQ-</u>		
Location <u>125+70.00 25.0' Lt.</u>		Geologist <u> </u>		Longitude(83) <u>-88.399684</u>					

Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
		<u>Overburden:</u> see driller's log for overburden details.							
105211.3	105.2	(Begin Core)							105
		<u>Sandstone:</u> light gray to gray with shale streaks and partings, very fine grained.		35 / 35	2.6	2.6	100		shale lense @ 107.8
110				29 / 17	4.8	4.8	100		105.6-105.7 healed fracture 10 degrees to core axis @ 110
115				0 / 0	5.0	0.7	14		112.6 mechanical fracture along healed fracture 10 degrees to core axis @ 115
120				28 / 28	4.7	4.7	100		117.6 shale lense @ 107.8-108.5 shale lense @ 108.9-109 loss attributed to eggd bit. Drill action was smooth and consistant. Bit replaced at 117.6 @ 122.3
125				40 / 40	5.0	5.0	100		127.3 mechanical fracture along healed fracture 10 degrees to core axis @ 125
130				48 / 48	5.0	5.0	100		132.3 mechanical fracture along healed fracture 10 degrees to core axis @ 130
135				73 / 73	5.2	5.2	100		137.5 mechanical fracture along healed fracture 45 degrees to core axis @ 135
140				75 / 58	4.8	4.8	100		142.3 mechanical fracture along healed fracture 30 degrees to core axis @ 140
145	144.2	<u>Shale:</u> dark gray, clayey, highly fractured.		31 / 31	3.5	3.5	100		145.8 vertical, 0 degrees to core axis @ 145
170.7	145.8								degrees to core axis @ 150
150									150

Top of Rock = 105.2'
 Elevation = 211.3'

GEOLOGIST'S SUBSURFACE LOG

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>				Project Type: <u>Geotechnical</u>					
Item Number:		<u>Cumberland River</u>				Project Manager: <u> </u>					
Hole Number <u>1016</u>		Immediate Water Depth <u>26.0 (10/17/19)</u>		Start Date <u>10/17/2019</u>		Hole Type <u>core</u>					
Surface Elevation <u>316.5'</u>		Static Water Depth <u>NA</u>		End Date <u>10/21/2019</u>		Rig Number <u> </u>					
Total Depth <u>145.8'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.149492</u>		<u>GQ-</u>					
Location <u>125+70.00 25.0' Lt.</u>		Geologist <u> </u>		Longitude(83) <u>-88.399684</u>							
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks		
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)			
155		(Bottom of Hole 145.8')							core axis, minimal seperation, rough contact, water stained @ 134.2-134.6 fracture 45 degrees to core axis, minimal seperation, rough contact, water stained. Lost water at 140.3 @ 140.3-140.5		
160											
165											
170											
175											
180											
185											
190											
195											
200											
Top of Rock = 105.2' Elevation = 211.3'											

GEOLOGIST'S SUBSURFACE LOG

Project ID: <u>178565011</u>		<u>Livingston - US 60</u> <u>Cumberland River</u>			Project Type: <u>Geotechnical</u> Project Manager: <u> </u>				
Item Number: <u> </u>		Immediate Water Depth <u>13.0 (10/10/19)</u>			Start Date <u>10/10/2019</u>		Hole Type <u>core and sample</u>		
Surface Elevation <u>310.6'</u>		Static Water Depth <u>NA</u>			End Date <u>10/15/2019</u>		Rig Number <u>55 Truck</u>		
Total Depth <u>140.3'</u>		Driller <u>Greg Wilson</u>			Latitude(83) <u>37.149469</u>		<u>GQ-</u>		
Location <u>125+70.00 25.0' Rt.</u>		Geologist <u> </u>			Longitude(83) <u>-88.399515</u>				

Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
				1	2.5-4.0	1.3	4-5-7	SPT	
				1	5.0-6.6	1.5		ST	
				2	10.0-11.4	1.4		ST	
				3	15.0-17.0	2.0		ST	
				4	20.0-22.0	2.0		ST	
				5	25.0-27.0	2.0		ST	
				2	30.0-31.5	1.2	4-3-6	SPT	
				3	35.0-36.5	1.0	2-2-4	SPT	
				4	40.0-41.5	1.0	0-0-0	SPT	
				5	45.0-46.5	0.9	1-1-1	SPT	

Top of Rock = 101.0'

Elevation = 209.6'

50

GEOLOGIST'S SUBSURFACE LOG

Project ID: <u>178565011</u>		<u>Livingston - US 60</u> <u>Cumberland River</u>			Project Type: <u>Geotechnical</u> Project Manager: <u> </u>				
Hole Number <u>1017</u>		Immediate Water Depth <u>13.0 (10/10/19)</u>		Start Date <u>10/10/2019</u>			Hole Type <u>core and sample</u>		
Surface Elevation <u>310.6'</u>		Static Water Depth <u>NA</u>		End Date <u>10/15/2019</u>			Rig Number <u>55 Truck</u>		
Total Depth <u>140.3'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.149469</u>			<u>GQ-</u>		
Location <u>125+70.00 25.0' Rt.</u>		Geologist <u> </u>		Longitude(83) <u>-88.399515</u>					

Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
				6	50.0-52.0			ST	
				7	55.0-57.0	2.0		ST	
				8	60.0-62.0	2.0		ST	
				9	65.0-67.0	2.0		ST	
				10	70.0-72.0	2.0		ST	
				11	75.0-76.7	1.7		ST	
				6	80.0-81.5	0.9	2-2-4	SPT	
				7	85.0-86.5	1.5	0-0-0	SPT	
				8	90.0-91.5	0.9	11-17-35	SPT	
				9	95.0-95.9	0.9	10-50/0.40'	SPT	
				(Begin Core)					

Top of Rock = 101.0'
 Elevation = 209.6'

GEOLOGIST'S SUBSURFACE LOG

Project ID: 178565011		Livingston - US 60		Project Type: Geotechnical					
Item Number:		Cumberland River		Project Manager: _					
Hole Number 1017		Immediate Water Depth 13.0 (10/10/19)		Start Date 10/10/2019		Hole Type core and sample			
Surface Elevation 310.6'		Static Water Depth NA		End Date 10/15/2019		Rig Number 55 Truck			
Total Depth 140.3'		Driller Greg Wilson		Latitude(83) 37.149469		GQ-			
Location 125+70.00 25.0' Rt.		Geologist _		Longitude(83) -88.399515					
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
209.6	101.0	Overburden.		0 / 0	3.4	3.3	97		103.0 105 108.0 110 113.0 115 118.0 120 121.3 125 127.2 130 132.4 135 137.4 140 140.3 145 150
				0 / 0	3.4	3.3	97		
105				0 / 0	5.0	4.9	98		
110				10 / 10	5.0	4.9	98		
115				0 / 0	5.0	2.4	48		
120				61 / 61	3.3	3.3	100		
125				42 / 42	5.9	5.9	100		
130				83 / 83	5.2	5.2	100		
135				84 / 76	5.0	5.0	100		
140	170.3			55 / 55	2.9	2.9	100		
									125.2-125.9 mechanical fracture along healed fracture 30 degrees to core axis @ 126.9-127.2 mechanical fracture
145		(Bottom of Hole 140.3')							
150									

Top of Rock = 101.0'
 Elevation = 209.6'

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>1017</u>		Immediate Water Depth <u>13.0 (10/10/19)</u>		Start Date <u>10/10/2019</u>		Hole Type <u>core and sample</u>			
Surface Elevation <u>310.6'</u>		Static Water Depth <u>NA</u>		End Date <u>10/15/2019</u>		Rig_Number <u>55 Truck</u>			
Total Depth <u>140.3'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.149469</u>		<u>GQ-</u>			
Location <u>125+70.00 25.0' Rt.</u>		Geologist <u> </u>		Longitude(83) <u>-88.399515</u>					
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
155									along healed fracture 10 degrees to core axis @ 137.7-138.4
160									
165									
170									
175									
180									
185									
190									
195									
200									
Top of Rock = 101.0' Elevation = 209.6'									

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>1018</u>		Immediate Water Depth <u>17.0 (10/01/19)</u>		Start Date <u>10/01/2019</u>		Hole Type <u>sounding</u>			
Surface Elevation <u>325.6'</u>		Static Water Depth <u>NA</u>		End Date <u>10/02/2019</u>		Rig_Number <u>55 Truck</u>			
Total Depth <u>113.9'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.149844</u>		<u>GQ-</u>			
Location <u>127+00.00 25.0' Lt.</u>		Geologist <u> </u>		Longitude(83) <u>-88.399608</u>					
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
5									5
10									10
15									15
20									20
25									25
30									30
35									35
40									40
45									45
50									50
Top of Rock = 113.9' Elevation = 211.7'									

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>1018</u>		Immediate Water Depth <u>17.0 (10/01/19)</u>		Start Date <u>10/01/2019</u>		Hole Type <u>sounding</u>			
Surface Elevation <u>325.6'</u>		Static Water Depth <u>NA</u>		End Date <u>10/02/2019</u>		Rig_Number <u>55 Truck</u>			
Total Depth <u>113.9'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.149844</u>		<u>GQ-</u>			
Location <u>127+00.00 25.0' Lt.</u>		Geologist <u> </u>		Longitude(83) <u>-88.399608</u>					
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
55									55
60									60
65									65
70									70
75									75
80									80
85									85
90									90
95									95
100									100
Top of Rock = 113.9' Elevation = 211.7'									

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>1018</u>		Immediate Water Depth <u>17.0 (10/01/19)</u>		Start Date <u>10/01/2019</u>		Hole Type <u>sounding</u>			
Surface Elevation <u>325.6'</u>		Static Water Depth <u>NA</u>		End Date <u>10/02/2019</u>		Rig_Number <u>55 Truck</u>			
Total Depth <u>113.9'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.149844</u>		<u>GQ-</u>			
Location <u>127+00.00 25.0' Lt.</u>		Geologist <u> </u>		Longitude(83) <u>-88.399608</u>					
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
105									105
110									110
115									115
120		(Bottom of Hole 113.9') (Refusal @ 113.9)							120
125									125
130									130
135									135
140									140
145									145
150									150
Top of Rock = 113.9' Elevation = 211.7'									

GEOLOGIST'S SUBSURFACE LOG

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>		Project Type: <u>Geotechnical</u>	
Item Number:		<u>Cumberland River</u>		Project Manager: <u> </u>	

Hole Number <u>1019</u>		Immediate Water Depth <u>16.0 (09/26/19)</u>	Start Date <u>09/26/2019</u>		Hole Type <u>core and sample</u>
Surface Elevation <u>324.9'</u>		Static Water Depth <u>NA</u>	End Date <u>10/01/2019</u>		Rig Number <u>55 Truck</u>
Total Depth <u>134.6'</u>		Driller <u>Greg Wilson</u>	Latitude(83) <u>37.149821</u>		<u>GQ-</u>
Location <u>127+00.00 25.0' Rt.</u>		Geologist <u> </u>	Longitude(83) <u>-88.399439</u>		

Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
				1	2.5-4.0	1.4	6-8-9	SPT	
				2	5.0-6.5	1.3	3-3-4	SPT	
				1	10.0-12.0	2.0		ST	
				2	15.0-17.0	1.9		ST	
				3	20.0-22.0	1.9		ST	
				3	25.0-26.5	1.5	0-2-3	SPT	
				4	30.0-32.0	2.0		ST	
				5	35.0-37.0	1.9		ST	
				6	40.0-42.0	2.0		ST	
				7	45.0-47.0	2.0		ST	

Overburden: see driller's log for overburden details.

Top of Rock = 113.0'
 Elevation = 211.9'

GEOLOGIST'S SUBSURFACE LOG

Project ID: <u>178565011</u>		<u>Livingston - US 60</u> <u>Cumberland River</u>			Project Type: <u>Geotechnical</u> Project Manager: <u> </u>				
Hole Number <u>1019</u>		Immediate Water Depth <u>16.0 (09/26/19)</u>		Start Date <u>09/26/2019</u>			Hole Type <u>core and sample</u>		
Surface Elevation <u>324.9'</u>		Static Water Depth <u>NA</u>		End Date <u>10/01/2019</u>			Rig Number <u>55 Truck</u>		
Total Depth <u>134.6'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.149821</u>			<u>GQ-</u>		
Location <u>127+00.00 25.0' Rt.</u>		Geologist <u> </u>		Longitude(83) <u>-88.399439</u>					

Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
		<u>Overburden:</u> see driller's log for overburden details.		8	50.0-52.0	2.0		ST	
				9	55.0-57.0	1.8		ST	
				4	60.0-61.5	1.5	2-3-3	SPT	
				10	65.0-67.0	2.0		ST	
				11	70.0-72.0	2.0		ST	
				12	75.0-77.0	2.0		ST	
				13	80.0-80.7	0.7		ST	
				5	80.7-82.2	1.3	5-9-9	SPT	
				6	85.0-86.5	1.2	4-5-22	SPT	
				7	90.0-91.5	1.5	1-13-13	SPT	
				8	95.0-96.5	1.1	29-24-17	SPT	

Top of Rock = 113.0'
 Elevation = 211.9'

GEOLOGIST'S SUBSURFACE LOG

Project ID: 178565011		Livingston - US 60		Project Type: Geotechnical	
Item Number:		Cumberland River		Project Manager: _	

Hole Number 1019		Immediate Water Depth 16.0 (09/26/19)	Start Date 09/26/2019		Hole Type core and sample
Surface Elevation 324.9'		Static Water Depth NA	End Date 10/01/2019		Rig Number 55 Truck
Total Depth 134.6'		Driller Greg Wilson	Latitude(83) 37.149821		GQ-
Location 127+00.00 25.0' Rt.		Geologist	Longitude(83) -88.399439		

Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
		Overburden: see driller's log for overburden details.		9	100.0-101.5	1.5	0-4-22	SPT	
				10	105.0-106.5	1.0	16-27-29	SPT	
				11	110.0-111.5	0.3	14-22-35	SPT	
211.9	113.0	(Begin Core)							
115		Sandstone: light gray with local shale stringers and partings, very fine to fine grained, thin to medium bedded, with locally healed fractures.		32 / 32	2.8	2.8	100		mechanical fracture 0 degrees to core axis, vertical @ 113-113.2 hihgly mechanically fractured along shale streaks and partings @ 113.1 healed fracture 0 degrees to core axis, vertical @ 115.3-115.8 mechanical fracture along healed fracture 0 degrees to core axis, vertical @ 125.2-126.4 mechanical fracture along healed fracture 0 degrees to core axis, vertical @ 129.3-129.6 mechanical fracture along healed fracture 30 degrees to core axis @ 134.4-134.6
120				16 / 16	4.9	4.9	100		
125				55 / 55	5.1	5.1	100		
130				50 / 50	5.0	5.0	100		
135				89 / 89	3.8	3.8	100		
190.3	134.6								
140		(Bottom of Hole 134.6')							
145									
150									

Top of Rock = 113.0'
Elevation = 211.9'

GEOLOGIST'S SUBSURFACE LOG

Project ID: <u>178565011</u>		<u>Livingston - US 60</u> <u>Cumberland River</u>			Project Type: <u>Geotechnical</u> Project Manager: <u> </u>				
Item Number: <u> </u>		Immediate Water Depth <u>17.0 (09/23/19)</u>			Start Date <u>09/23/2019</u>		Hole Type <u>core and sample</u>		
Surface Elevation <u>327.9'</u>		Static Water Depth <u>NA</u>			End Date <u>09/25/2019</u>		Rig Number <u>55 Truck</u>		
Total Depth <u>135.5'</u>		Driller <u>Greg Wilson</u>			Latitude(83) <u>37.150223</u>		<u>GQ-</u>		
Location <u>128+40.00 25.0' Lt.</u>		Geologist <u> </u>			Longitude(83) <u>-88.399527</u>				

Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
				1	2.5-4.0	1.2	5-7-8	SPT	
				2	5.0-6.5	0.8	3-4-5	SPT	
				1	10.0-12.0	1.9		ST	
				2	15.0-17.0	2.0		ST	
				3	20.0-22.0	2.0		ST	
				3	25.0-26.5	1.4	2-2-3	SPT	
				4	30.0-32.0	1.5		ST	
				5	35.0-37.0	2.0		ST	
				6	40.0-42.0	2.0		ST	
				7	45.0-47.0	2.0		ST	

Overburden: see driller's log for overburden details.

Top of Rock = 115.3'
Elevation = 212.6'

GEOLOGIST'S SUBSURFACE LOG

Project ID: <u>178565011</u>		<u>Livingston - US 60</u> <u>Cumberland River</u>			Project Type: <u>Geotechnical</u> Project Manager: <u> </u>				
Hole Number <u>1020</u>		Immediate Water Depth <u>17.0 (09/23/19)</u>		Start Date <u>09/23/2019</u>			Hole Type <u>core and sample</u>		
Surface Elevation <u>327.9'</u>		Static Water Depth <u>NA</u>		End Date <u>09/25/2019</u>			Rig Number <u>55 Truck</u>		
Total Depth <u>135.5'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.150223</u>			<u>GQ-</u>		
Location <u>128+40.00 25.0' Lt.</u>		Geologist <u> </u>		Longitude(83) <u>-88.399527</u>					

Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
		<u>Overburden:</u> see driller's log for overburden details.		8	50.0-52.0	2.0		ST	
				9	55.0-57.0	2.0		ST	
				10	60.0-62.0	2.0		ST	
				11	65.0-67.0	2.0		ST	
				4	70.0-71.5	1.5	0-0-1	SPT	
				12	75.0-77.0	2.0		ST	
				13	80.0-80.1	0.0	3-3-4	ST	
				5	80.1-81.6	1.4			
				6	85.0-86.5	1.5	3-4-8	SPT	
				7	90.0-91.5	1.1	10-10-10	SPT	
				8	95.0-96.5	1.2	3-4-3	SPT	

Top of Rock = 115.3'
Elevation = 212.6'

GEOLOGIST'S SUBSURFACE LOG

Project ID: 178565011		Livingston - US 60		Project Type: Geotechnical	
Item Number:		Cumberland River		Project Manager: _	
Hole Number 1020		Immediate Water Depth 17.0 (09/23/19)		Start Date 09/23/2019	
Surface Elevation 327.9'		Static Water Depth NA		End Date 09/25/2019	
Total Depth 135.5'		Driller Greg Wilson		Latitude(83) 37.150223	
Location 128+40.00 25.0' Lt.		Geologist _		Longitude(83) -88.399527	
Hole Type core and sample		Rig Number 55 Truck		GQ-	

Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
105		Overburden: see driller's log for overburden details.		14	100.0-102.0	1.9		ST	
110				9	105.0-106.5	1.5	0-1-2	SPT	
				10	110.0-111.5	1.5	7-4-2	SPT	
115	115.3	(Begin Core)							
		Sandstone: light gray to gray, very fine to fine grained, thin to medium bedded, with local shale streaks and partings, with locally healed fractures.		11	115.0-115.3	0.3	50/0.30'	SPT	mechanical fracture along healed fracture 5 degrees to core axis @ 115.5-117.6
120				40 / 40	5.0	5.0	100		
					38 / 38	5.0	5.0	100	
125					63 / 63	5.2	5.2	100	
					62 / 62	5.0	5.0	100	
130		mechanical fracture along healed fracture 15 degrees to core axis @ 131.1-132.2							
135	135.5								
140		(Bottom of Hole 135.5')							
145									
150									

Top of Rock = 115.3'
Elevation = 212.6'

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>1021</u>		Immediate Water Depth <u>17.0 (09/25/19)</u>		Start Date <u>09/25/2019</u>		Hole Type <u>sounding</u>			
Surface Elevation <u>328.6'</u>		Static Water Depth <u>NA</u>		End Date <u>09/25/2019</u>		Rig_Number <u>55 Truck</u>			
Total Depth <u>117.7'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.150200</u>		<u>GQ-</u>			
Location <u>128+40.00 25.0' Rt.</u>		Geologist <u> </u>		Longitude(83) <u>-88.399358</u>					
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
5									5
10									10
15									15
20									20
25									25
30									30
35									35
40									40
45									45
50									50
Top of Rock = 117.6' Elevation = 211.0'									

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>1021</u>		Immediate Water Depth <u>17.0 (09/25/19)</u>		Start Date <u>09/25/2019</u>		Hole Type <u>sounding</u>			
Surface Elevation <u>328.6'</u>		Static Water Depth <u>NA</u>		End Date <u>09/25/2019</u>		Rig_Number <u>55 Truck</u>			
Total Depth <u>117.7'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.150200</u>		<u>GQ-</u>			
Location <u>128+40.00 25.0' Rt.</u>		Geologist <u> </u>		Longitude(83) <u>-88.399358</u>					
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
55									55
60									60
65									65
70									70
75									75
80									80
85									85
90									90
95									95
100									100
Top of Rock = 117.6' Elevation = 211.0'									

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>1021</u>		Immediate Water Depth <u>17.0 (09/25/19)</u>		Start Date <u>09/25/2019</u>		Hole Type <u>sounding</u>			
Surface Elevation <u>328.6'</u>		Static Water Depth <u>NA</u>		End Date <u>09/25/2019</u>		Rig_Number <u>55 Truck</u>			
Total Depth <u>117.7'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.150200</u>		<u>GQ-</u>			
Location <u>128+40.00 25.0' Rt.</u>		Geologist <u> </u>		Longitude(83) <u>-88.399358</u>					
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
105									105
110									110
115									115
120		(Bottom of Hole 117.7') (Refusal @ 117.6)							120
125									125
130									130
135									135
140									140
145									145
150									150
Top of Rock = 117.6' Elevation = 211.0'									

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>1022</u>		Immediate Water Depth <u>16.0 (09/19/19)</u>		Start Date <u>09/19/2019</u>		Hole Type <u>sounding</u>			
Surface Elevation <u>333.1'</u>		Static Water Depth <u>NA</u>		End Date <u>09/20/2019</u>		Rig_Number <u>55 Truck</u>			
Total Depth <u>120.6'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.150378</u>		<u>GQ-</u>			
Location <u>129+00.00 10.0' Lt.</u>		Geologist <u> </u>		Longitude(83) <u>-88.399441</u>					
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
5									5
10									10
15									15
20									20
25									25
30									30
35									35
40									40
45									45
50									50
Top of Rock = 120.6' Elevation = 212.5'									

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>1022</u>		Immediate Water Depth <u>16.0 (09/19/19)</u>		Start Date <u>09/19/2019</u>		Hole Type <u>sounding</u>			
Surface Elevation <u>333.1'</u>		Static Water Depth <u>NA</u>		End Date <u>09/20/2019</u>		Rig_Number <u>55 Truck</u>			
Total Depth <u>120.6'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.150378</u>		<u>GQ-</u>			
Location <u>129+00.00 10.0' Lt.</u>		Geologist <u> </u>		Longitude(83) <u>-88.399441</u>					
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
55									55
60									60
65									65
70									70
75									75
80									80
85									85
90									90
95									95
100									100
Top of Rock = 120.6' Elevation = 212.5'									

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>				Project Type: <u>Geotechnical</u>			
Item Number:		<u>Cumberland River</u>				Project Manager: <u> </u>			
Hole Number <u>1022</u>		Immediate Water Depth <u>16.0 (09/19/19)</u>		Start Date <u>09/19/2019</u>		Hole Type <u>sounding</u>			
Surface Elevation <u>333.1'</u>		Static Water Depth <u>NA</u>		End Date <u>09/20/2019</u>		Rig_Number <u>55 Truck</u>			
Total Depth <u>120.6'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.150378</u>		<u>GQ-</u>			
Location <u>129+00.00 10.0' Lt.</u>		Geologist <u> </u>		Longitude(83) <u>-88.399441</u>					
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
105									105
110									110
115									115
120									120
125		(Bottom of Hole 120.6') (Refusal @ 120.6)							125
130									130
135									135
140									140
145									145
150									150
Top of Rock = 120.6' Elevation = 212.5'									

GEOLOGIST'S SUBSURFACE LOG

Project ID: <u>178565011</u>		<u>Livingston - US 60</u> <u>Cumberland River</u>			Project Type: <u>Geotechnical</u> Project Manager: <u> </u>				
Hole Number <u>1023</u>		Immediate Water Depth <u>17.0 (09/18/19)</u>		Start Date <u>09/17/2019</u>			Hole Type <u>core and sample</u>		
Surface Elevation <u>331.8'</u>		Static Water Depth <u>NA</u>		End Date <u>09/19/2019</u>			Rig Number <u>55 Truck</u>		
Total Depth <u>141.0'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.150362</u>			<u>GQ-</u>		
Location <u>129+00.00 25.0' Rt.</u>		Geologist <u> </u>		Longitude(83) <u>-88.399323</u>					

Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
				1	2.5-2.6	0.0		ST	
				1	2.6-4.1	1.1	8-7-9	SPT	
				2	5.0-6.5	1.5	5-7-7	SPT	
				3	10.0-11.5	1.5	4-5-5	SPT	
				4	15.0-16.5	1.4	2-2-3	SPT	
				5	20.0-21.5	1.3	2-4-3	SPT	
				6	25.0-26.5	1.5	4-3-2	SPT	
				7	30.0-31.5	1.5	2-2-1	SPT	
				2	35.0-37.0	2.0		ST	
				3	40.0-42.0	2.0		ST	
				4	45.0-47.0	2.0		ST	

Overburden: see driller's log for overburden details.

Top of Rock = 121.0'
 Elevation = 210.8'

GEOLOGIST'S SUBSURFACE LOG

Project ID: 178565011		Livingston - US 60		Project Type: Geotechnical	
Item Number:		Cumberland River		Project Manager: _	

Hole Number 1023		Immediate Water Depth 17.0 (09/18/19)	Start Date 09/17/2019		Hole Type core and sample
Surface Elevation 331.8'		Static Water Depth NA	End Date 09/19/2019		Rig Number 55 Truck
Total Depth 141.0'		Driller Greg Wilson	Latitude(83) 37.150362		GQ-
Location 129+00.00 25.0' Rt.		Geologist _	Longitude(83) -88.399323		

Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
				5	50.0-52.0	2.0		ST	
55									55
				6	55.0-57.0	2.0		ST	
60									60
				7	60.0-62.0	2.0		ST	
65									65
				8	65.0-67.0	2.0		ST	
70									70
				9	70.0-72.0	2.0		ST	
75									75
		Overburden: see driller's log for overburden details.		10	75.0-77.0	2.0		ST	
80									80
			8	80.0-81.5	1.3	7-6-5	SPT		
85									85
			9	85.0-86.5	1.2	3-11-22	SPT		
90									90
			10	90.0-91.5	1.5	5-9-12	SPT		
95									95
			11	95.0-96.5	1.2	4-8-15	SPT		
100									100

Top of Rock = 121.0'
 Elevation = 210.8'

GEOLOGIST'S SUBSURFACE LOG

Project ID: 178565011		Livingston - US 60		Project Type: Geotechnical	
Item Number:		Cumberland River		Project Manager: _	

Hole Number 1023		Immediate Water Depth 17.0 (09/18/19)	Start Date 09/17/2019		Hole Type core and sample
Surface Elevation 331.8'		Static Water Depth NA	End Date 09/19/2019		Rig Number 55 Truck
Total Depth 141.0'		Driller Greg Wilson	Latitude(83) 37.150362		GQ-
Location 129+00.00 25.0' Rt.		Geologist	Longitude(83) -88.399323		

Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
105		Overburden: see driller's log for overburden details.		12	100.0-101.5	1.5	0-0-4	SPT	105
110				11	105.0-107.0	2.0		ST	110
115				12	110.0-112.0	2.0		ST	115
				13	115.0-116.5	1.5	0-0-3	SPT	
120	210.8	(Begin Core)		14	120.0-121.0	0.9	8-50/0.50'	SPT	120
125		Sandstone: light gray to gray, very fine to fine grained, thin to medium bedded, with local shale streaks and partings.		44 / 44	5.0	5.0	100		healed fracture 45 degrees to core axis @ 121-121.2 125
130				52 / 52	5.0	4.9	98		mechanical fracture along healed fracture 10 degrees to core axis @ 126-126.9 126.0
135				71 / 71	4.9	4.9	100		mechanical fracture 45 degrees to core axis @ 127.8-128 131.0
140	190.8			53 / 53	5.1	5.1	100		mechanical fracture @ 131.7-131.8 135.9
145		(Bottom of Hole 141.0')							mechanical fracture @ 132.4-132.5 141.0
150									mechanical fracture @ 133.3-133.4 145
									mechanical fracture along healed fracture 30 degrees to core axis @ 134.4-134.7 150

Top of Rock = 121.0'
Elevation = 210.8'

GEOLOGIST'S SUBSURFACE LOG

Project ID: <u>178565011</u>		<u>Livingston - US 60</u> <u>Cumberland River</u>			Project Type: <u>Geotechnical</u> Project Manager: <u> </u>				
Item Number: <u> </u>		Immediate Water Depth <u>19.0 (09/10/19)</u>			Start Date <u>09/10/2019</u>		Hole Type <u>core and sample</u>		
Surface Elevation <u>337.1'</u>		Static Water Depth <u>NA</u>			End Date <u>09/12/2019</u>		Rig Number <u>55 Truck</u>		
Total Depth <u>146.1'</u>		Driller <u>Greg Wilson</u>			Latitude(83) <u>37.151062</u>		<u>GQ-</u>		
Location <u>131+50.00 25.0' Lt.</u>		Geologist <u> </u>			Longitude(83) <u>-88.399347</u>				

Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
		<u>Overburden:</u> see drillers log for overburden details.							
				1	2.5-4.5	2.0			ST
				1	5.0-6.5	1.5		3-6-8	SPT
				2	10.0-12.0	1.7			ST
				3	15.0-17.0	2.0			ST
				2	20.0-21.5	1.5		1-1-1	SPT
				4	25.0-27.0	1.9			ST
				5	30.0-32.0	2.0			ST
				3	35.0-36.5	1.5		0-0-2	SPT
				6	40.0-42.0	2.0			ST
				7	45.0-47.0	2.0			ST

Top of Rock = 125.1'
 Elevation = 212.0'

GEOLOGIST'S SUBSURFACE LOG

Project ID: <u>178565011</u>		<u>Livingston - US 60</u> <u>Cumberland River</u>			Project Type: <u>Geotechnical</u> Project Manager: <u> </u>				
Item Number: <u> </u>		Immediate Water Depth <u>19.0 (09/10/19)</u>			Start Date <u>09/10/2019</u>		Hole Type <u>core and sample</u>		
Surface Elevation <u>337.1'</u>		Static Water Depth <u>NA</u>			End Date <u>09/12/2019</u>		Rig Number <u>55 Truck</u>		
Total Depth <u>146.1'</u>		Driller <u>Greg Wilson</u>			Latitude(83) <u>37.151062</u>		<u>GQ-</u>		
Location <u>131+50.00 25.0' Lt.</u>		Geologist <u> </u>			Longitude(83) <u>-88.399347</u>				

Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
		<u>Overburden:</u> see drillers log for overburden details.		8	50.0-52.0	0.6		ST	
				4	52.0-53.5	1.5	2-3-2	SPT	
				5	55.0-56.5	1.5	4-3-8	SPT	
				6	60.0-61.5	1.2	4-6-12	SPT	
				7	65.0-66.5	1.3	4-7-7	SPT	
				8	70.0-71.5	1.3	4-4-17	SPT	
				9	75.0-76.5	1.5	16-37-47/0.50	SPT	
				10	80.0-81.5	1.2	7-13-19	SPT	
				11	85.0-86.5	1.4	8-8-14	SPT	
				12	90.0-91.5	1.3	15-19-30	SPT	
			13	95.0-96.5	1.5	13-16-25	SPT		

Top of Rock = 125.1'
 Elevation = 212.0'

GEOLOGIST'S SUBSURFACE LOG

Project ID: <u>178565011</u>		<u>Livingston - US 60</u> <u>Cumberland River</u>			Project Type: <u>Geotechnical</u> Project Manager: <u> </u>				
Hole Number <u>1024</u>		Immediate Water Depth <u>19.0 (09/10/19)</u>		Start Date <u>09/10/2019</u>			Hole Type <u>core and sample</u>		
Surface Elevation <u>337.1'</u>		Static Water Depth <u>NA</u>		End Date <u>09/12/2019</u>			Rig Number <u>55 Truck</u>		
Total Depth <u>146.1'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.151062</u>			<u>GQ-</u>		
Location <u>131+50.00 25.0' Lt.</u>		Geologist <u> </u>		Longitude(83) <u>-88.399347</u>					

Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks	
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)		
		<u>Overburden</u> : see drillers log for overburden details.		14	100.0-101.5	1.0	3-3-7	SPT		
				9	105.0-106.6	1.6		ST		
				15	110.0-111.5	1.5	1-2-2	SPT		
				16	115.0-116.5	1.5	2-4-7	SPT		
				17	120.0-121.5	1.2	10-13-14	SPT		
125.2	12.0	(Begin Core)								
		<u>Sandstone</u> : light gray to gray, very fine to fine grained, thin to medium bedded, with local shale streaks and partings.		18	125.0-125.1	0.1	50/0.10'	SPT	fracture 0 degrees to core axis, vertical, moderate seperation, water stained @ 125.6-126.1 healed fracture 5 degrees to core axis @ 126.2-126.4 mechanical fracture along healed fracture 45 degrees to core axis @ 126.8-127.1 loss attributed to malfunctioning lifter spring plugging inner barrel @	
				0 / 0	1.6	1.6	100			
				54 / 54	5.0	4.8	96			
			69 / 69	4.5	4.5	100				
199.9	137.2									
		<u>Shale</u> : dark gray to gray, locally clayey with silty zones, poorly laminated.		0 / 0	5.0	2.8	56			
				47 / 35	4.9	4.9	100			
191.0	146.1									

Top of Rock = 125.1'
 Elevation = 212.0'

GEOLOGIST'S SUBSURFACE LOG

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>1024</u>		Immediate Water Depth <u>19.0 (09/10/19)</u>		Start Date <u>09/10/2019</u>		Hole Type <u>core and sample</u>			
Surface Elevation <u>337.1'</u>		Static Water Depth <u>NA</u>		End Date <u>09/12/2019</u>		Rig Number <u>55 Truck</u>			
Total Depth <u>146.1'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.151062</u>		<u>GQ-</u>			
Location <u>131+50.00 25.0' Lt.</u>		Geologist <u> </u>		Longitude(83) <u>-88.399347</u>					
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
155		(Bottom of Hole 146.1')							127.6-127.8 fracture 90 degrees to core axis, horizontal along bedding plane, smooth contact, moderate seperation, lost water @ 130
160									mechanical fracture 80 degrees to core axis along shale parting @ 134.2-134.3
165									siltstone (sandstone) lense @ 142.7
170									mechanically fractured zone @ 144.8-145
175									siltstone (sandstone) lense @ 146
180									
185									
190									
195									
200									
Top of Rock = 125.1' Elevation = 212.0'									

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>1025</u>		Immediate Water Depth <u>19.0 (09/17/19)</u>		Start Date <u>09/17/2019</u>		Hole Type <u>sounding</u>			
Surface Elevation <u>337.5'</u>		Static Water Depth <u>NA</u>		End Date <u>09/17/2019</u>		Rig_Number <u>55 Truck</u>			
Total Depth <u>126.2'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.151039</u>		<u>GQ-</u>			
Location <u>131+50.00 25.0' Rt.</u>		Geologist <u> </u>		Longitude(83) <u>-88.399177</u>					
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
5									5
10									10
15									15
20									20
25									25
30									30
35									35
40									40
45									45
50									50
Top of Rock = 126.2' Elevation = 211.3'									

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>1025</u>		Immediate Water Depth <u>19.0 (09/17/19)</u>		Start Date <u>09/17/2019</u>		Hole Type <u>sounding</u>			
Surface Elevation <u>337.5'</u>		Static Water Depth <u>NA</u>		End Date <u>09/17/2019</u>		Rig_Number <u>55 Truck</u>			
Total Depth <u>126.2'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.151039</u>		<u>GQ-</u>			
Location <u>131+50.00 25.0' Rt.</u>		Geologist <u> </u>		Longitude(83) <u>-88.399177</u>					
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
55									55
60									60
65									65
70									70
75									75
80									80
85									85
90									90
95									95
100									100
Top of Rock = 126.2' Elevation = 211.3'									

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>1025</u>		Immediate Water Depth <u>19.0 (09/17/19)</u>		Start Date <u>09/17/2019</u>		Hole Type <u>sounding</u>			
Surface Elevation <u>337.5'</u>		Static Water Depth <u>NA</u>		End Date <u>09/17/2019</u>		Rig_Number <u>55 Truck</u>			
Total Depth <u>126.2'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.151039</u>		<u>GQ-</u>			
Location <u>131+50.00 25.0' Rt.</u>		Geologist <u> </u>		Longitude(83) <u>-88.399177</u>					
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
105									105
110									110
115									115
120									120
125									125
130		(Bottom of Hole 126.2') (Refusal @ 126.2)							130
135									135
140									140
145									145
150									150
Top of Rock = 126.2' Elevation = 211.3'									

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>1026</u>		Immediate Water Depth <u>21.0 (08/30/19)</u>		Start Date <u>08/30/2019</u>		Hole Type <u>core</u>			
Surface Elevation <u>337.1'</u>		Static Water Depth <u>NA</u>		End Date <u>09/10/2019</u>		Rig_Number <u>55 Truck</u>			
Total Depth <u>137.1'</u>		Driller <u>Tim Caudill</u>		Latitude(83) <u>37.151360</u>		<u>GQ-</u>			
Location <u>132+60.00 25.0' Lt.</u>		Geologist <u> </u>		Longitude(83) <u>-88.399283</u>					
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
5		<u>Overburden</u> : see driller's log for overburden details.							5
10									10
15									15
20									20
25									25
30									30
35									35
40									40
45									45
50									50
Top of Rock = 126.1' Elevation = 211.0'									

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>					
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>					
Hole Number <u>1026</u>		Immediate Water Depth <u>21.0 (08/30/19)</u>		Start Date <u>08/30/2019</u>		Hole Type <u>core</u>				
Surface Elevation <u>337.1'</u>		Static Water Depth <u>NA</u>		End Date <u>09/10/2019</u>		Rig_Number <u>55 Truck</u>				
Total Depth <u>137.1'</u>		Driller <u>Tim Caudill</u>		Latitude(83) <u>37.151360</u>		<u>GQ-</u>				
Location <u>132+60.00 25.0' Lt.</u>		Geologist <u> </u>		Longitude(83) <u>-88.399283</u>						
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks	
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)		
55		<u>Overburden</u> : see driller's log for overburden details.							55	
60									60	
65									65	
70									70	
75									75	
80									80	
85									85	
90									90	
95									95	
100									100	
Top of Rock = 126.1' Elevation = 211.0'										

GEOLOGIST'S SUBSURFACE LOG

Project ID: 178565011		Livingston - US 60		Project Type: Geotechnical	
Item Number:		Cumberland River		Project Manager: _	

Hole Number 1026		Immediate Water Depth 21.0 (08/30/19)	Start Date 08/30/2019		Hole Type core
Surface Elevation 337.1'		Static Water Depth NA	End Date 09/10/2019		Rig Number 55 Truck
Total Depth 137.1'		Driller Tim Caudill	Latitude(83) 37.151360		GQ-
Location 132+60.00 25.0' Lt.		Geologist _	Longitude(83) -88.399283		

Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
105		Overburden: see driller's log for overburden details.							105
110									110
115									115
120									120
125									125
211.0	126.1	(Begin Core)							
130		Sandstone: light gray to gray, very fine to fine grained, thin to medium bedded, with local shale streaks and partings.	0 / 0	1.0	1.0	100			127.1 extent of orangish brown water staining @ 126.6
205.0	132.1		44 / 44	5.0	4.7	94			130 fracture 10 degrees to core axis with additional mechanical fracturing.
135		Shale: dark gray to gray, locally clayey with silty zones, poorly laminated.	0 / 0	5.0	3.3	66			132.1 Water stained @ 128.4-129.5
200.0	137.1								135 fracture 10 degrees to core axis, minimal seperation, water stained @ 131.5-132.1
140		(Bottom of Hole 137.1')							137.1 lost water @ 135.7
145									
150									

Top of Rock = 126.1'
 Elevation = 211.0'

GEOLOGIST'S SUBSURFACE LOG

Project ID: <u>178565011</u>		<u>Livingston - US 60</u> <u>Cumberland River</u>			Project Type: <u>Geotechnical</u> Project Manager: <u> </u>				
Item Number: <u> </u>		Immediate Water Depth <u>18.0 (08/27/19)</u>			Start Date <u>08/27/2019</u>		Hole Type <u>core and sample</u>		
Surface Elevation <u>338.3'</u>		Static Water Depth <u>NA</u>			End Date <u>08/29/2019</u>		Rig Number <u>55 Truck</u>		
Total Depth <u>153.3'</u>		Driller <u>Greg Wilson</u>			Latitude(83) <u>37.151336</u>		<u>GQ-</u>		
Location <u>132+60.00 25.0' Rt.</u>		Geologist <u> </u>			Longitude(83) <u>-88.399113</u>				

Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
		<u>Overburden:</u> see driller's log for overburden details.							
				1	2.5-4.5	2.0			ST
				2	5.0-7.0	2.0			ST
				3	10.0-12.0	2.0			ST
				1	15.0-16.5	1.5	0-1-1		SPT
				2	20.0-21.5	1.5	1-2-1		SPT
				3	25.0-26.5	1.5	0-1-2		SPT
				4	30.0-31.5	1.2	1-1-1		SPT
				5	35.0-36.5	1.4	2-2-2		SPT
				6	40.0-41.5	1.0	1-1-1		SPT
				4	45.0-47.0	2.0			ST

Top of Rock = 128.1'
 Elevation = 210.2'

GEOLOGIST'S SUBSURFACE LOG

Project ID: <u>178565011</u>		<u>Livingston - US 60</u> <u>Cumberland River</u>			Project Type: <u>Geotechnical</u> Project Manager: <u> </u>				
Hole Number <u>1027</u>		Immediate Water Depth <u>18.0 (08/27/19)</u>		Start Date <u>08/27/2019</u>			Hole Type <u>core and sample</u>		
Surface Elevation <u>338.3'</u>		Static Water Depth <u>NA</u>		End Date <u>08/29/2019</u>			Rig Number <u>55 Truck</u>		
Total Depth <u>153.3'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.151336</u>			<u>GQ-</u>		
Location <u>132+60.00 25.0' Rt.</u>		Geologist <u> </u>		Longitude(83) <u>-88.399113</u>					

Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks	
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)		
		<u>Overburden:</u> see driller's log for overburden details.		6	50.0-51.5	0.8	4-5-9	SPT		
				11	75.0-76.5	1.0	4-6-16	SPT		
				12	80.0-81.5	1.1	3-7-8	SPT		
				13	85.0-86.5	1.2	4-8-16	SPT		
				14	90.0-91.5	0.7	2-4-8	SPT		
				15	95.0-96.5	1.5	20-9-10	SPT		

Top of Rock = 128.1'
 Elevation = 210.2'

GEOLOGIST'S SUBSURFACE LOG

Project ID: <u>178565011</u>		<u>Livingston - US 60</u> <u>Cumberland River</u>			Project Type: <u>Geotechnical</u> Project Manager: <u> </u>				
Hole Number <u>1027</u>		Immediate Water Depth <u>18.0 (08/27/19)</u>		Start Date <u>08/27/2019</u>			Hole Type <u>core and sample</u>		
Surface Elevation <u>338.3'</u>		Static Water Depth <u>NA</u>		End Date <u>08/29/2019</u>			Rig Number <u>55 Truck</u>		
Total Depth <u>153.3'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.151336</u>			<u>GQ-</u>		
Location <u>132+60.00 25.0' Rt.</u>		Geologist <u> </u>		Longitude(83) <u>-88.399113</u>					

Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks	
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)		
		<u>Overburden:</u> see driller's log for overburden details.		16	100.0-101.5	1.5	0-0-1	SPT		
				17	105.0-106.5	1.5	1-2-2	SPT		
				5	106.5-107.8	1.3		ST		
				18	110.0-111.5	1.5	1-2-4	SPT		
				19	115.0-116.5	1.5	6-9-20	SPT		
				20	120.0-121.5	1.5	4-10-17	SPT		
				21	125.0-125.7	0.7	4-50/0.20'	SPT		
210.2	128.1	(Begin Core)								
		<u>Sandstone:</u> light gray to gray, very fine to fine grained, thin to medium bedded, with local shale streaks and partings.		0 / 0	2.5	2.5	100			
				0 / 0	5.0	1.4	28			
130				12 / 8	5.0	4.0	80		mechanically fractured zone @ 129.4-130.6 loss in run two occurred due to lifter spring malfunction @ 130.6-135.6 1/4" siltstone (sandstone) lense @ 134.3 1/4" siltstone (sandstone) lense @ 142.2 loss in run 4 occurring within highly mechanically fractured	
135				12 / 0	5.0	4.6	92			
202.3	136.0			33 / 15	2.7	2.7	100			
				36 / 18	5.0	5.0	100			
		<u>Sandstone:</u> light gray to gray, very fine to fine grained, thin bedded, with local shale streaks and partings.								
140		<u>Shale:</u> dark gray to gray, locally clayey with silty zones, poorly laminated.								
145										
191.1	147.2									
190.6	147.7									
150										

Top of Rock = 128.1'
Elevation = 210.2'

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>1027</u>		Immediate Water Depth <u>18.0 (08/27/19)</u>		Start Date <u>08/27/2019</u>		Hole Type <u>core and sample</u>			
Surface Elevation <u>338.3'</u>		Static Water Depth <u>NA</u>		End Date <u>08/29/2019</u>		Rig_Number <u>55 Truck</u>			
Total Depth <u>153.3'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.151336</u>		<u>GQ-</u>			
Location <u>132+60.00 25.0' Rt.</u>		Geologist <u> </u>		Longitude(83) <u>-88.399113</u>					
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
185.0	153.3	<u>Shale</u> : dark gray to gray, silty with sandy lenses, laminated.		36 / 18	5.0	5.0	100		zone @ 143.9-144.7
155		(Bottom of Hole 153.3')							155
160									160
165									165
170									170
175									175
180									180
185									185
190									190
195									195
200									200
Top of Rock = 128.1' Elevation = 210.2'									

GEOLOGIST'S SUBSURFACE LOG

Project ID: 178565011		Livingston - US 60		Project Type: Geotechnical	
Item Number:		Cumberland River		Project Manager: _	

Hole Number 1028		Immediate Water Depth 18.0 (08/13/19)	Start Date 08/13/2019		Hole Type core and sample
Surface Elevation 338.9'		Static Water Depth NA	End Date 08/23/2019		Rig Number 55 Truck
Total Depth 150.2'		Driller Tim Caudill	Latitude(83) 37.151736		GQ-
Location 134+00.00 20.0' Lt.		Geologist	Longitude(83) -88.399184		

Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
		Overburden: see driller's log for overburden details.		1	2.5-4.5	2.0		ST	
				2	5.0-7.0	2.0		ST	
				3	10.0-12.0	2.0		ST	
				1	15.0-16.5	1.1	3-4-2	SPT	
				2	20.0-21.5	1.5	3-4-7	SPT	
				3	25.0-26.5	1.0	3-4-6	SPT	
				4	30.0-31.5	0.8	4-2-5	SPT	
				5	35.0-36.5	0.7	4-2-5	SPT	
				6	40.0-41.5	1.5	0-0-0	SPT	
				4	41.5-43.5	2.0		ST	
				5	45.0-47.0	2.0		ST	

Top of Rock = 129.1'	
Elevation = 209.8'	

GEOLOGIST'S SUBSURFACE LOG

Project ID: <u>178565011</u>		<u>Livingston - US 60</u> <u>Cumberland River</u>			Project Type: <u>Geotechnical</u> Project Manager: <u> </u>						
Item Number: <u> </u>											
Hole Number <u>1028</u> Surface Elevation <u>338.9'</u> Total Depth <u>150.2'</u> Location <u>134+00.00 20.0' Lt.</u>		Immediate Water Depth <u>18.0 (08/13/19)</u> Static Water Depth <u>NA</u> Driller <u>Tim Caudill</u> Geologist <u> </u>			Start Date <u>08/13/2019</u> End Date <u>08/23/2019</u> Latitude(83) <u>37.151736</u> Longitude(83) <u>-88.399184</u>			Hole Type <u>core and sample</u> Rig Number <u>55 Truck</u> <u>GQ-</u>			
Lithology		Description			Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth				Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
55 60 65 70 75 80 85 90 95 100	55 60 65 70 75 80 85 90 95 100	<u>Overburden:</u> see driller's log for overburden details.			6 7 8 9 10 11 12 13 14 15	50.0-52.0 55.0-56.5 60.0-61.5 65.0-66.5 70.0-71.5 75.0-76.5 80.0-81.5 85.0-86.5 90.0-91.5 95.0-96.5	1.6 1.2 1.0 0.6 0.8 1.3 0.7 1.3 1.0 1.5	4-5-12 1-1-2 2-3-5 4-7-11 2-7-12 5-4-7 5-7-5 10-20-39 3-3-4	ST SPT SPT SPT SPT SPT SPT SPT		
Top of Rock = 129.1' Elevation = 209.8'											

GEOLOGIST'S SUBSURFACE LOG

Project ID: <u>178565011</u>		<u>Livingston - US 60</u> <u>Cumberland River</u>			Project Type: <u>Geotechnical</u> Project Manager: <u> </u>				
Hole Number <u>1028</u>		Immediate Water Depth <u>18.0 (08/13/19)</u>		Start Date <u>08/13/2019</u>			Hole Type <u>core and sample</u>		
Surface Elevation <u>338.9'</u>		Static Water Depth <u>NA</u>		End Date <u>08/23/2019</u>			Rig Number <u>55 Truck</u>		
Total Depth <u>150.2'</u>		Driller <u>Tim Caudill</u>		Latitude(83) <u>37.151736</u>			<u>GQ-</u>		
Location <u>134+00.00 20.0' Lt.</u>		Geologist <u> </u>		Longitude(83) <u>-88.399184</u>					

Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks	
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)		
		<u>Overburden:</u> see driller's log for overburden details.		16	100.0-101.5	1.5	7-7-8	SPT		
105				7	105.0-106.3	1.3		ST	105	
110				17	110.0-111.5	1.4	8-5-8	SPT	110	
115				18	115.0-116.5	1.4	8-13-21	SPT	115	
120				19	120.0-121.5	1.5	7-5-7	SPT	120	
125				20	125.0-126.4	0.9	10-34-50/0.40'	SPT	125	
				21	127.1-128.0	0.9	19-50/0.40'	SPT		
209.8	129.1	(Begin Core)		22	128.7-129.1	0.4	50/0.40'	SPT		
130		<u>Shale:</u> dark gray to gray, silty with sandy lenses, laminated.		0 / 0	4.6	4.6	100		130	
135				12 / 0	5.2	5.1	98		135	
140				28 / 12	5.0	5.0	100		140	
145			0 / 0	5.0	5.0	100		145		
150	188.7		0 / 0	1.3	1.3	100		150		

highly mechanically fractured zone @ 144.1-144.4 highly mechanically

Top of Rock = 129.1'
Elevation = 209.8'

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>1028</u>		Immediate Water Depth <u>18.0 (08/13/19)</u>		Start Date <u>08/13/2019</u>		Hole Type <u>core and sample</u>			
Surface Elevation <u>338.9'</u>		Static Water Depth <u>NA</u>		End Date <u>08/23/2019</u>		Rig_Number <u>55 Truck</u>			
Total Depth <u>150.2'</u>		Driller <u>Tim Caudill</u>		Latitude(83) <u>37.151736</u>		<u>GQ-</u>			
Location <u>134+00.00 20.0' Lt.</u>		Geologist <u> </u>		Longitude(83) <u>-88.399184</u>					
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
		(Bottom of Hole 150.2')							150.2 fractured zone @ 146.7-147
155									155
160									160
165									165
170									170
175									175
180									180
185									185
190									190
195									195
200									200
Top of Rock = 129.1' Elevation = 209.8'									

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>1029</u>		Immediate Water Depth <u>20.0 (08/26/19)</u>		Start Date <u>08/26/2019</u>		Hole Type <u>core</u>			
Surface Elevation <u>340.1'</u>		Static Water Depth <u>NA</u>		End Date <u>08/27/2019</u>		Rig_Number <u>55 Truck</u>			
Total Depth <u>138.7'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.151718</u>		<u>GQ-</u>			
Location <u>134+00.00 20.0' Rt.</u>		Geologist <u> </u>		Longitude(83) <u>-88.399049</u>					
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
5		<u>Overburden</u> : see driller's log for overburden details.							5
10									10
15									15
20									20
25									25
30									30
35									35
40									40
45									45
50									50
Top of Rock = 128.5' Elevation = 211.6'									

Project ID: <u>178565011</u>		<u>Livingston - US 60</u>			Project Type: <u>Geotechnical</u>				
Item Number:		<u>Cumberland River</u>			Project Manager: <u> </u>				
Hole Number <u>1029</u>		Immediate Water Depth <u>20.0 (08/26/19)</u>		Start Date <u>08/26/2019</u>		Hole Type <u>core</u>			
Surface Elevation <u>340.1'</u>		Static Water Depth <u>NA</u>		End Date <u>08/27/2019</u>		Rig_Number <u>55 Truck</u>			
Total Depth <u>138.7'</u>		Driller <u>Greg Wilson</u>		Latitude(83) <u>37.151718</u>		<u>GQ-</u>			
Location <u>134+00.00 20.0' Rt.</u>		Geologist <u> </u>		Longitude(83) <u>-88.399049</u>					
Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
55		<u>Overburden</u> : see driller's log for overburden details.							55
60									60
65									65
70									70
75									75
80									80
85									85
90									90
95									95
100									100
Top of Rock = 128.5' Elevation = 211.6'									

GEOLOGIST'S SUBSURFACE LOG

Project ID: 178565011		Livingston - US 60		Project Type: Geotechnical	
Item Number:		Cumberland River		Project Manager: _	
Hole Number 1029		Immediate Water Depth 20.0 (08/26/19)		Start Date 08/26/2019	
Surface Elevation 340.1'		Static Water Depth NA		End Date 08/27/2019	
Total Depth 138.7'		Driller Greg Wilson		Latitude(83) 37.151718	
Location 134+00.00 20.0' Rt.		Geologist _		Longitude(83) -88.399049	
Hole Type core		Rig Number 55 Truck		GQ-	

Lithology		Description	Overburden	Sample No.	Depth (ft)	Rec. (ft)	SPT Blows	Sample Type	Remarks
Elevation	Depth		Rock Core	Std/Ky RQD	Run (ft)	Rec (ft)	Rec (%)	SDI (JS)	
105		Overburden: see driller's log for overburden details.							105
110									110
115									115
120									120
125									125
211.6	128.5	(Begin Core)							
130.9	130.5	Sandstone: light gray to gray, very fine to fine grained, thin to medium bedded, with local shale streaks and partings.		21 / 21	2.4	2.4	100		mechanical fracture 45 degrees to core axis @ 129.5-129.7
135.9		Shale: dark gray to gray, silty with sandy lenses, laminated.		12 / 0	5.0	5.0	100		mechanical fracture 45 degrees to core axis @ 133.9-134.1
138.7				54 / 36	2.8	2.8	100		siltstone
140		(Bottom of Hole 138.7')							(sandstone) lense, light gray to gray @ 136.3-136.4
145									
150									

Top of Rock = 128.5'
Elevation = 211.6'