FINAL GEOTECHNICAL REPORT
STATE ROUTE 303L (BOB STUMP MEMORIAL PARKWAY), MARICOPA COUNTY 85 TO VAN BUREN STREET
ADOT PROJECT NO. 303L MA 099 H6870 01C
FEDERAL NO. STP-303-A(219)T
ADOT CONTRACT NO. 2021-006
GOODYEAR, ARIZONA

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Ethos Project No. 2021037
December 17, 2024



December 17, 2024
Ethos Project No.: 2021037

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SUBJECT: Final Geotechnical Report
State Route 303L (Bob Stump Memorial Parkway),
Maricopa County 85 to Van Buren Street
ADOT Project No. 303L MA 099 H6870 01D
Federal Project No. STP-303-A(219)T
ADOT Contract No. 2021-006
Goodyear, Arizona

Dear Mr. Slagell:

Ethos Engineering, LLC is pleased to present the findings of the geotechnical exploration for the proposed State Route 303L (Bob Stump Memorial Parkway), Maricopa County (MC) 85 to Van Buren Street project located in Goodyear, Arizona. Our services were conducted in general accordance with the scope of services presented in our revised proposal dated June 13, 2021, and subsequent contract modifications. The results of our field investigation and laboratory testing, and geotechnical engineering recommendations for support of the roadway and foundation designs, are included herein. A Final Pavement Design Summary and Materials Design Report, based on the results included herein, are presented under separate cover.

We appreciate the opportunity to be of service to AZTEC Engineering, Inc. (AZTEC) on this project. If you have any questions regarding this report, please do not hesitate to contact us.

Sincerely,
Ethos Engineering, LLC



Daniel N. Fréchette, PhD, P.E.
Principal/Senior Geotechnical Engineer

Reviewed By:



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1.0 PROJECT DESCRIPTION

The State Route 303L (SR 303L) Bob Stump Memorial Parkway corridor will be extended from Van Buren Street south, generally following the Cotton Lane alignment, to Maricopa County (MC) 85 within the City of Goodyear limits in Maricopa County, Arizona. Overall, the project consists of constructing an interim condition of the SR 303L freeway within the project limits. The interim condition consists of constructing three general-purpose lanes and an auxiliary lane with an open median in each direction between Van Buren Street and Lower Buckeye Road. The bridge structures within these limits will be constructed for the ultimate roadway configuration. Between Lower Buckeye Road and MC 85, the interim condition of SR 303L consists of constructing the ultimate southbound roadway configuration, including bridges, but striping it for two general-purpose lanes in each direction. Construction of the ultimate configuration of the northbound roadway south of Lower Buckeye Road is not part of the current project.

The new freeway features include:

- Constructing three general-purpose lanes and an auxiliary lane with an open median in each direction between Van Buren Street and Lower Buckeye Road;
- Constructing two general-purpose lanes in each direction between Lower Buckeye Road and MC 85, within the limits of the ultimate southbound roadway limits;
- Completing the south half of the Van Buren Street diamond Traffic Interchange (TI);
- Constructing a full-diamond TI at Yuma Road;
- Constructing a half-diamond TI at Elwood Street;
- Constructing overpasses at Elwood Street, Broadway Road and the Union Pacific Railroad (UPRR);
- Constructing one-way frontage roads in each direction to maintain local access, including connections to the major arterial streets;
- Replacing neighborhood retention basins along the Canyon Trails Channel and connecting the Canyon Trails channel to the SR 303L Outfall Channel;
- Constructing a multi-cell box culvert for the Flood Control District of Maricopa County (FCDMC) channel;
- Developing first flush basins where applicable;
- Constructing new Americans with Disabilities Act (ADA) features, where applicable;
- Installing Freeway Management System (FMS) signage, signalization, lighting, other signing, and pavement marking, as necessary; and
- Utility relocations within existing Cotton Lane right-of-way and in arterial street crossings.

This report presents the results of our geotechnical exploration for the proposed SR 303L, MC 85 to Van Buren Street Improvement project. The site is shown on the Vicinity Map presented on Figure 1.

We understand ten (10) bridge structures will be constructed with this project, including the following:

- Atlanta Avenue OP;
- UPRR OP;
- Broadway Road OP;
- Elwood Street OP;
- Lower Buckeye Road Ramp B over Elwood Street;

- Lower Buckeye Road Ramp B over Elwood Ramp D;
- SR 303L Mainline over Ramps;
- Lower Buckeye Road TI OP;
- Yuma Road TI OP; and
- Lilac Street/Canyon Trails Boulevard OP.

The exploration included site reconnaissance, subsurface exploration, soil sampling, field and laboratory testing, percolation testing, engineering analyses, and preparation of this report. The purpose of this report is to provide information regarding the surface and subsurface soil conditions and general site geology, and to provide geotechnical recommendations for design and construction for the proposed bridge structures, retaining walls, roadway and drainage elements at the site.

The project will have 38 retaining walls with a total length of approximately 14,000 lineal feet to provide grade separation related to the mostly elevated roadway embankments and tight project corridor. The heights of these walls will vary from 2 to 42 feet. Additionally, ten (10) noise walls with a total length of approximately 15,000 lineal feet are planned.

A first-flush basin is planned at the southeast corner of Broadway Road and Culver Street. We anticipate the basin to occupy the entirety of the allotted space for this unlined facility. Basin depths of 7 to 10 feet are currently anticipated. In addition, a U-channel and box culvert are planned to convey drainage along and under the SR 303L between Yuma Road and Lower Buckeye Road.

2.0 FIELD EXPLORATION

2.1 Subsurface Exploration

Prior to our field exploration, Ethos obtained ADOT right-of-way use permit #1228522, dated December 28, 2021, and Goodyear permit #22-178, dated January 26, 2022. Upon receipt of the permits, we staked the boring locations, some of which required field adjustment due to the presence of underground or overhead utilities, surface features or other constraints. Upon locating the borings, Ethos coordinated clearing each area with Arizona 811. Various traffic control plans were prepared for this work by Quail Construction (Quail), as a subcontractor to Ethos.

The completed portion of the subsurface exploration for the project was performed between January 2022 and October 2024 and included 230 exploratory borings for structures, roadway, retaining walls, and drainage areas with a total drill footage of approximately 11,278 linear feet. Table 2.1 presents a summary of the drilling program, which includes the primary design element of the boring, boring spacing guidelines and range of boring depths, see Table 1 at the end of the report for more details. The majority of the borings were used for multiple project elements that allowed for a reduced number of borings and drill footage while meeting the project needs.

Table 2.1: Subsurface Exploration Details

Project Element	Spacing Guidelines [feet]	Approximate Depths [feet]	Number of Borings
Bridge	1 boring per bridge element Additional boring if wider than 100 feet	100 to 120	52
Wall	150 to 200 – Retaining 500 – Sound	10 to 80	132
Roadway	800	5 to 40	31
Drainage	1,000	10 to 20	15
		TOTAL	**230**

No existing geotechnical data along the SR 303L corridor was provided. The boring spacings and depths are generally consistent with ADOT guidelines, with modifications based on our existing knowledge of the project corridor geotechnical support conditions. The exploration locations are shown on the Geotechnical Investigation Plan included as Figures 2 through 10.

Drilling was performed by Geomechanics Southwest Inc. (GSI), ACS Services, LLC (ACS), Cascade Environmental Inc. (Cascade), and Yellow Jacket Drilling Services (Yellow Jacket) using a combination of truck-mounted CME-75 drill rig utilizing hollow-stem auger and Tubex down-hole percussion methods, a track-mounted TSI-150CC and truck mounted Terrasonic sonic drill rig. The sonic borings captured continuous core of the borings typically in 2.5-foot intervals. Sampling was performed using a standard penetration test (SPT) split spoon sampler with a 1.375-inch ID and 2-inch OD or an open-end drive sampler (2.42-inch-diameter brass rings) at maximum 5-foot intervals in each boring using an automatic hydraulic actuated 140-pound hammer, free falling 30 inches. The SPT and ring samplers were driven 18 and 12 inches or to refusal (i.e. 50 blows for less than a 6-inch interval), respectively. Unless noted otherwise on the boring logs, the sample driving resistance was recorded as number of blows per six inches of penetration. The penetration results are presented on the borings logs adjacent to each sample. Representative bulk samples of near-surface drill cuttings were also collected from selected borings.

Encountered soils were visually inspected, labeled and classified in the field, and logged in general accordance with ASTM D2488, the Unified Soil Classification System (USCS), Arizona Department of Transportation (ADOT), and Ethos guidelines. Field direction, and logging of borings were performed by Ethos personnel. Logs of the completed borings are presented in Appendix A.

The recovered soil samples were removed from the sampler, sealed to reduce moisture loss, and submitted to either the ACS or WSP USA, Inc. (WSP) laboratories. Completed borings were backfilled with cuttings (and patched with asphalt concrete (AC) for borings completed in pavement) in accordance with the applicable permit requirements.

2.2 Pavement Cores

Two pavement cores were planned for the project. Pavement core C-1 was collected from the Elwood Street roadway surface to determine the existing pavement section. Pavement core C-2 was replaced with a visual assessment of a saw cut from an adjacent construction project.

2.3 Percolation Testing

Percolation testing was completed using a combination of double-ring infiltrometer tests and falling-head percolation tests. Ethos subcontracted ACS to perform three (3) double-ring infiltrometer tests and borings (P-1 through P-3) at the planned stormwater retention basin located at the southeast corner of Broadway Avenue and Culver Street. The double-ring infiltrometer tests were performed in accordance with ASTM D3385. The results of the infiltration tests are presented in Section 4.6. Tests were performed within backhoe test pits excavated by ACS. The number of tests completed were in accordance with the Drainage Policies and Standards for Maricopa County, Arizona (Maricopa County 2018). All field work was supervised by Ethos field personnel. Logs of the borings were prepared by Ethos.

The falling-head percolation tests (P-4 through P-10) were performed to address basin depths deeper than investigated by the double-ring infiltration tests. The falling-head percolation tests were performed within 12-inch diameter borings advanced to a depth of 10 feet to investigate infiltration conditions below a depth of 10 feet. The results of the infiltration tests are presented in Section 4.6.

2.4 Geophysical Evaluation

A geophysical evaluation, consisting of two-dimensional refraction microtremor (2-D ReMi) was completed. Ethos subcontracted Advantage Geophysics, Inc., to perform two (2) 2-D ReMi lines (SL-01 and SL-02) to characterize the deep soil profile in the area of the UPRR and Broadway Road bridges. The evaluation was performed using two 24-channel digital Geometrics Geode seismographs and 48 4.5-Hz vertical component geophones. The geophones were spaced 6 feet apart with a roll-along move of six channel or 36 feet. The total line length was approximately 600 feet resulting in 2-D model lengths of approximately 300 feet. All field work was observed by Ethos field personnel. The results are presented in Appendix C.

3.0 LABORATORY TESTING

Selected laboratory tests were assigned by Ethos and performed on representative samples recovered from the borings to support our field classification and to provide information regarding engineering characteristics and properties of the subsurface soils. The laboratory testing program included the following tests, each followed by a brief discussion of the test relevance:

- Moisture content, sieve analysis and Atterberg limits (plasticity index) – Soil classification and moisture condition, and for computation of correlated R-values for use in pavement design.
- Density of ring samples – Determination of in-place density and moisture, used in compressibility and earthwork computations.
- One-dimensional consolidation – Determination of the magnitude and rate of consolidation of soil, used in estimating the magnitude and rate of both differential and total settlement.
- One-dimensional swell or collapse of soils – Measuring the magnitude of one-dimensional wetting-induced swell or collapse of unsaturated soils, used to develop estimates of heave or settlement.
- R-value – Determination of pavement design parameter (subgrade soil strength).

- Moisture-density relationship (Proctor) – Determination of density targets for construction of compacted fills and used to develop earthwork factors when compared to in situ densities.
- pH and resistivity – Determination of appropriate steel pipe type.
- Total soluble sulfates and chlorides – Assessment of the potential impact of the existing soils on concrete. Used to determine which type of concrete should be used.
- Direct shear – Estimation of shear strength parameters for foundation design.
- ADOT topsoil testing – Determine characteristics of the soil to assess suitability as topsoil.

A summary of the laboratory test results is presented in Table B-1 in Appendix B. The individual results of the laboratory testing program are also included in Appendix B. The results of moisture content and in-place dry density testing are also presented on the boring logs in Appendix A at the corresponding sample depth.

4.0 SITE CONDITIONS AND GEOTECHNICAL PROFILE

4.1 Surface Site Conditions

The study area consists of mostly level terrain that slopes southward toward the Gila River. Cotton Lane is generally at-grade with mainly residential and agricultural developments with some commercial development between Lilac Street and Yuma Road. Some vegetation, consisting of trees, shrubs and landscaping, was observed within the project limits. Depressed stormwater retention exists with an unlined earthen channel north of Lilac Street and west of Cotton Lane. Stormwater retention for adjacent housing also exists in the form of a grass lined depression which runs east of Cotton Lane and north of Lower Buckeye Road extending north to West Pima Street. South of Lower Buckeye Road the area is dominated by active or historical farm fields. The active fields were in various states during our investigation with many of them having been recently harvested at the time of our investigation.

4.2 Regional Geologic Setting

The project site is in the Basin and Range Geologic Province of the southwestern United States. The Basin and Range Province is characterized by a modern landscape consisting of broad alluvial valleys interspersed with and bounded by uplifted and fault-block mountain ranges, often with well-developed pediments and alluvial fans. Generally, the mountain ranges and valleys trend in a north-south to northwest-southeast direction. The modern landscape was formed by late Tertiary (Miocene-Pliocene) extensional tectonism and high-angle normal faulting, followed by subsequent erosion of the uplifted mountains and alluvial deposition of the sediments in the newly-formed basins. The entirety of this site is located within the alluvial basin as generally confirmed by the field investigation.

Published geologic mapping indicates that surficial geologic units along a majority of the project include Holocene-age surficial deposits consisting of unconsolidated deposits associated with modern fluvial systems, and Holocene-age river alluvium mapped at the south end of the project nearing the Gila River (Richard et al 2000). The surficial deposits consist primarily of fine-grained, poorly graded sediment on alluvial plains, but also includes gravelly channel, terrace, and alluvial fan deposits on middle and upper piedmonts. The river alluvium is described as unconsolidated to weakly consolidated alluvial fan, terrace, and basin-floor deposits with moderate to strong soil

development. Fan and terrace deposits are primarily well-graded, moderately bedded gravel and sand, and basin-floor deposits are primarily sand, silt and clay.

4.3 Subsurface Profile

4.3.1 Embankment Fill

Embankment fill soils were observed to be present immediately south of the SR 303L mainline bridge over Van Buren Street and were encountered in borings B-197 through B-199. Minor fills, associated with grading of basins (particularly to the north of Lilac Street) and pavements including entrance roads to the shopping center between Yuma Road and Lilac Street, were observed within the project limits. Embankment fill was also included in borings completed adjacent to Broadway Road and MC 85.

4.3.2 Native Soils

Based on the conditions encountered in the test borings performed along the project alignment, the subsurface materials are generally lenticular alluvial deposits comprising interbedded and intermixed layers of fine to medium sand, silt and clay with gravel lenses encountered near the bottom of the deeper borings on the north side of the project. The gravel increased in thickness and was encountered shallower along the project corridor heading to the south towards the Gila River. The predominant Unified Soil Classification System (USCS) soil types are clayey sand (SC), silty sand (SM) and sandy clay (CL), which comprise approximately two-thirds of the tested samples. As a note, approximately half of the laboratory classification testing was performed on near surface samples obtained from within the upper 10 feet of the existing site grades. With depth, the subsurface conditions also include interbedded sand layers (SP, SP-SM), gravel and gravelly zones (GP, GP-GM, GC), and isolated high plasticity clay and silt layers (CH and MH). In general, the clay and clayey soils are low to medium plasticity, and the sand, gravel and silty layers are typically non-plastic.

The relative firmness/density of the subsurface soils was evaluated based on the results of penetration resistance testing performed in the borings. In general, the near surface soils within the upper 5 to 10 feet of existing site grades are soft to moderately firm /loose to medium dense. Below 10 feet, the subsurface soils are generally firm to hard/medium dense to very dense with isolated softer zones. The near surface soft/moderately firm soils in and around the UPRR and Broadway Road extended to a depth of 20 to 25 feet. Other zones of weaker soils were encountered near the water table at a depth of approximately 40 feet.

The subsurface soils are generally uncemented. Below 15 feet, moderate to strong lime (calcium carbonate) cementation was encountered in isolated areas and typically occurred between depths of 15 and 25 feet below existing site grades. Where encountered, cemented soils were generally very hard/very dense.

A geotechnical site profile presenting the USCS soil types and uncorrected N-values obtained from the borings is presented on Figure 11. Refer to the boring logs in Appendix A for details of the conditions encountered in the borings.

A summary of the laboratory classification testing is presented in Table 4.1. Refer to the laboratory test results in Appendix B for individual test results.

Table 4.1: Summary of Tested Laboratory USCS Samples

USCS Soil Type	No. of Tests	Percentage of Tests (%)
SC	153	28
SM	116	21
CL	87	16
SP-SM	43	8
SC-SM	35	6
ML	30	6
CL-ML	16	3
SP	15	3
GC	13	2
GP	12	2
CH	8	1
GP-GM	8	1
GP-GC	4	1
SP-SC	2	<1
GC-GM	1	<1
Total	**543**	**100%**

NOTE:
USCS = Unified Soil Classification System

4.4 Soil Shear Strength

Direct shear testing was performed to characterize the drained shear strength of the subsurface soils encountered during the field investigation. The testing was performed on relatively undisturbed samples collected at various depths throughout the borings. A total of 74 multi-point direct shear tests were performed on in situ samples that were typically at the in-situ moisture content during testing. Based on the results of the direct shear testing, and for purposes of shear strength characterization, the subsurface soils were broken into two groups based on geography and then further subdivided based on the soil type as described in Tables 4.2 and 4.3.

Table 4.2: Soil Groups for Shear Strength Characterization North of and Including Lower Buckeye Road

Soil Group	General Description
CL, CL-ML, ML, CH	Typically low to medium plasticity clay with sand, sandy clay and sandy silt
SC	Low to medium plasticity clayey sand soils
SP, SP-SM, SM, SP-SC	Nonplastic coarse-grained soils consisting of sand and silt/sand mixtures

Table 4.3: Soil Groups for Shear Strength Characterization South of Lower Buckeye Road

Soil Group	General Description
CL, CL-ML, CH	Typically low to medium plasticity clay with sand, sandy clay and sandy silt
SC	Low to medium plasticity clayey sand soils
SM	Nonplastic silty sand
SP, SP-SM	Nonplastic sand and sand with silt
GP, GP-GM	Nonplastic gravel and gravel with silt
GC, GP-GC	Low plasticity clayey gravel and gravel with clay

Tables 4.4 and 4.5 present the generalized shear strength parameters for the soil groups outlined in Tables 4.2 and 4.3, respectively based on interpretation of the direct shear test results. Refer to the summary plots of direct shear results by soil type presented on Figures 12 through 20. In general, the direct shear plots were developed using non-peak and/or residual values as considered appropriate based on the individual test results. Direct shear test worksheets with detailed individual results are included in Appendix B.

Table 4.4: Shear Strength Parameters North of and including Lower Buckeye Road

Soil Types	Effective Unit Weight (γ) [pcf]	Friction Angle (ϕ) [degrees]	Cohesion (c) [psf]
CL, CL-ML, ML, CH	115	30	200
SC	115	30	100
SP, SP-SM, SM, SP-SC	115	35	0

NOTE:
1. pcf = pounds per cubic foot, psf = pounds per square foot

Table 4.5: Shear Strength Parameters South of Lower Buckeye Road

Soil Types	Effective Unit Weight (γ)[2] [pcf]	Friction Angle (ϕ) [degrees]	Cohesion (c) [psf]
CL, CL-ML, CH	105/120	26	200
SC	110/120	30	100
SM	110/125	30	0
SP, SP-SM	105/120	33	0
GP, GP-GM	135	38	0
GC, GP-GC	135	34	100

NOTE:
1. pcf = pounds per cubic foot, psf = pounds per square foot
2. First number is from 0 to 40 feet and the second number is below 40 feet

4.5 Moisture Sensitive Soils

4.5.1 Collapsible Soils

In arid regions, shallow natural soils subjected to loading can quickly settle a significant amount when wetted, generally referred to as “collapse.” These collapsible soils are generally able to support structural loads with tolerable settlements under consistent dry conditions. However, once these soils are wetted, they can collapse. In order to assess the collapse potential of the soils throughout the project corridor, 56 laboratory consolidation tests were performed. The results of these tests, presented in Table 2, at the end of the report, indicate the collapse potential in the upper 10 feet ranges between 0 and 12.0 percent, when tested at confining stresses of up to 4 kips per square foot (ksf). The data was divided into three categories of severity based on Samtani and Nowatzki (2006):

- Slight - < 2%
- Moderate – 2% < and < 6%
- Moderately Severe – > 6%

The collapse potential across the project corridor (i.e. versus station) is plotted in Figure 21. The data indicates three areas of concern related to collapse potential:

- SR 303L Cst. CL Station 1120+00 to 1150+00 at a depth of 2.5 to 5 feet – South of Elwood Street;
- SR 303L Cst. CL Station 1155+00 to 1165+00 at a depth of 2.5 feet – between Elwood Street and Lower Buckeye Road; and
- SR 303L Cst. CL Station 1173+00 to 1195+00 at a depth of 5 feet – North of Lower Buckeye Road.

In an effort to extrapolate the collapse potential test results across the project to areas where testing was not completed, the collapse potential measured from each test was plotted versus the hammer energy corrected blow counts (N_{60}) in Figure 22. Figure 22 shows that soils with moderate and moderately-severe collapse potential typically had blow counts less than 25. Five (5) samples indicate moderate collapse potential with N_{60} blow counts of approximately 40 or greater. Based on our experience, moderate collapse potential in soils with these blow counts is atypical and is usually due to sample disturbance. Therefore, these values were not included in the evaluation. The collapse potential data, blow count information and visual observations in the field were used to determine the over-excavation depths and limits. These are presented in Section 5.8.1.

4.5.2 Swelling Soils

Swell testing to characterize the expansion potential of the near surface on site soils was performed. The ADOT Pavement Design Manual (ADOT 2017) provides limited guidance for expansive soils for lightly loaded structures. Thus, the Maricopa County Department of Transportation (MCDOT) (MCDOT 2021) criteria was used for this project as it is in Maricopa County. MCDOT defines laboratory expansion less than 2% as non-expansive, between 2 and 5% as marginally expansive, and greater than 5% as expansive when applying a surcharge of 144 pounds per square foot (psf). The expansion tests for this project were predominantly conducted with a surcharge of 100 psf and therefore are conservatively expected to indicate higher rates of expansion.

In order to assess the swell potential of the soils throughout the project corridor, 21 laboratory swell tests were performed on remolded samples. The swell potential across the project corridor (i.e. versus station) is plotted in Figure 23. The results of these tests, presented in Table 3 at the end of the report, indicate the swell potential for the near surface soils (i.e. upper 5 feet) ranges between 0.2 and 3.3 percent with an average value of 1.7 percent. A review of the data shows a correlation between swell potential and soil type. A summary of expansion test results by soil type is presented in Table 4.6.

Table 4.6: Summary of Expansion Test Results at 100 psf Confining Stress

USCS Soil Types	Number of Tests	Percent Swell		
		Minimum	Maximum	Average
SC, SC-SM	11	0.2	1.7	1.0
CL, CL-ML, ML	10	1.0	3.3	2.3

The maximum swell potential for the predominantly sand (SC and SC-SM) soils was below 2 percent indicating these soil types have negligible swell potential. The predominantly silt and clay (CL, CL-ML and ML) soils had a maximum and average swell potential of 3.3 percent and 2.3 percent, respectively. Both values are above the 2 percent threshold indicating they are marginally expansive. A review of the sieve analysis and plasticity index tests of the near surface soils (i.e. 0 to 5 feet) across the project indicate these soils are primarily located between Yuma Road and Lower Buckeye Road.

The expansion potential of these soils could impact the performance of pavement constructed near existing grades for this project, should these soils experience significant increases in moisture. The MCDOT (2021) guidelines recommend removing the subgrade soils to a depth of 2 feet below the bottom of the pavement base course and replacement with non-expansive soils or stabilizing the upper 6 inches of the soil. Either of these measures are unnecessary across most of the project since the project will primarily be constructed on more than two feet of embankment fill. The expansion potential for soils at locations where pavement will be placed near existing grade was further evaluated at confining stresses of 144 psf and 200 psf to better correlate to the MCDOT guidelines and the anticipated field confining stresses, respectively. A series of additional swell tests were completed for six (6) CL soils at 100, 144 and 200 psf confining stress. The test results along with the percent reduction are presented in Table 4.7.

Table 4.7: Comparison of Expansion Test Results at Various Confining Stresses

Boring ID	Station	USCS Soil Type	Percent Swell			Percent of Swell at 100 psf		
			100 psf	144 psf	200 psf	100 psf	144 psf	200 psf
B-8	1164+25	CL	1.5	1.2	1.4	100	80	93
B-18	1167+00	CL	0.9	0.7	0.3	100	78	33
B-36	1175+50	CL	2.0	1.7	1.0	100	85	50
B-39	1180+00	CL	1.5	1.2	0.8	100	80	50
B-47	1192+00	CL	2.7	2.0	1.8	100	74	67
B-52	1199+80	CL	1.5	1.4	1.2	100	93	80
					Average	**100**	**82**	**62**

NOTES
1. SR 303L Cst. CL

All measured percent swell values were equal to or less than 2 percent at 144 and 200 psf confining stress. In an effort to extrapolate these results to the previous expansion test results, we developed a relationship between the percent swell at 100, 144 and 200 psf confining stress, which are presented in Table 4.7.

The data shows that the average percent swell decreases from the percent swell at 100 psf to 82 percent at 144 psf and 62 percent at 200 psf. Adjusting the previous expansion test results to a confining stress of 200 psf would reduce the percent swell to equal to or less than 2 percent indicating they are non-expansive except at one location, which was marginally above 2 percent.

Based on these test results and visual observation of the existing Cotton Lane pavement, which did not identify any expansive features, such as corrugations or settlement, the site soils can generally be categorized as non-expansive and do not require special mitigation provided the roadway is properly drained.

4.6 Percolation

The results of the double-ring infiltrometer (DRI) testing and falling-head percolation (FHP) testing are summarized in Table 4.8. Detailed results are presented in Appendix E.

Table 4.8: Summary of Infiltration Test Results

Test Hole	Depth [feet]	USCS Soil Classification	Test Method	Infiltration Rate [feet^3/hour/feet^2]	Infiltration Rate [inches/hour]
P-1	5	Clay (CL)	DRI[1]	0.047	0.57
P-2	5	Clay (CL)	DRI	0.048	0.57
P-3	5	Silty Clay with Sand (CL-ML)	DRI	0.050	0.60
P-4	10	Sandy Silty Clay (CL-ML)[3]	FHP[2]	5.0	60
P-5	10	Sandy Clay (CL)[4]	FHP	2.15	25.8
P-6	10	Sandy Silt (ML)	FHP	0.025	0.3
P-7	10	Silty Sand (SM)	FHP	0.042	0.5
P-8	10	Silty Sand (SM)	FHP	0.025	0.3
P-9	10	Silty Sand (SM)	FHP	0.067	0.8
P-10	10	Silty Sand (SM)	FHP	0.067	0.8

NOTES
1. DRI = Double-ring Infiltrometer
2. FHP = Falling-head percolation
3. Some thin sand (SP) lenses below 10' and sand (SP) layer at 16 feet.
4. Some thin sand (SP) lenses at 15 feet.'

The measured values appear to be highly dependent on the presence of sand lenses that do not appear to be continuous across the basin sites but appear to increase with depth. The values listed in Table 4.8 do not include a factor of safety or derating factor. It should be noted that siltation and vegetation growth along with other factors may affect the percolation rates of the retention basin areas. The actual percolation rate of each retention area may vary from the values reported here.

4.7 Site Seismicity

The project seismic AASHTO Load and Resistance Factor Design (LRFD) criteria were determined in accordance with Section 3.10 of the AASHTO LRFD Bridge Design Specifications (American Association of State Highway and Transportation Officials [AASHTO], 2012). The horizontal design acceleration is defined as having a 7% chance of exceedance during a 75-year recurrence interval. Based on the conditions encountered in the borings, a Site Class of D was used for the analysis. The probabilistic horizontal spectral acceleration values for the designated return period and corresponding peak horizontal ground acceleration (PGA) were obtained from the U.S. Geological Survey seismic hazards program website (USGS, 2009). The resulting seismic design values are presented in Tables 4.9 to 4.11.

Table 4.9: Seismic Design Parameters[1]

Location	Site Class	Seismic Zone	Seismic Design Parameter	Spectral Acceleration Value [g]
SR 303L, MC 85 to Van Buren Street	D	1	Peak Ground Acceleration (PGA)	0.049
			Short Period Acceleration (S_S)	0.11
			Long Period Acceleration (S_1)	0.038

NOTES
1. Latitude 33.43568°, Longitude -112.42724
2. g = gravity

Table 4.10: Seismic Site Factors

Seismic Site Factor	Value
PGA Site Factor, F_{pga}	1.6
Short Period Acceleration Site Factor (F_a)	1.6
Long Period Acceleration Site Factor (F_v)	2.4

Using the values presented in Tables 4.9 and 4.10, points for developing the design response for the site are presented in Table 4.11.

Table 4.11: Points for Design Response Spectrum

Points	Value
A_s (equal to F_{pga} x PGA)	0.078
S_{DS} (equal to F_a x S_s)	0.176
S_{D1} (equal to F_v x S_1)	0.091

Due to the low site seismicity, the impact of seismic forces on the stability of embankments and structures is negligible.

4.8 Moisture and Groundwater Conditions

The moisture condition in the borings was generally slightly moist to moist in the upper 20 feet and increased in moisture content below a depth of 20 feet. Groundwater was encountered during the subsurface investigation in most of the bridge boring locations. These are summarized in Table 4.12.

Table 4.12: Groundwater Information

Location Description	Approximate Station[1]	Depth below Ground Surface [feet]	Approximate Water Level Elevation [feet]
Lilac Street	1252+00	95 to 100	887 to 882
Yuma Road	1226+00	80 to 85	883 to 878
Lower Buckeye Road	1176+00	70 to 75	870 to 865
Elwood	1143+00	60 to 65	867 to 862
Broadway	1108+00	40	865
UPRR	1092+50	35 to 40	856

NOTES
2. SR 303L Cst. CL

Recent groundwater readings, December 2021, from nearby index wells within one-half mile of the project site obtained from the Arizona Department of Water Resources (ADWR) Groundwater Site Inventory (2022) database, indicated a groundwater elevation varying from 859 to 866 feet, respectively. Based on the observed groundwater depths, other than the drilled shaft construction, groundwater is not anticipated to impact design and construction. Seasonal variation in the groundwater surface elevation is expected to occur due to flows within the Gila River. The contractor should be prepared to deal with the potential for groundwater.

5.0 ENGINEERING ANALYSES AND RECOMMENDATIONS

5.1 General

The following sections of this report present our recommendations regarding foundation design for the nine bridges, abutments and bridge approach wing walls, pavement, construction considerations, site preparations and grading at the abutments, moisture protection, excavations, and bridge approach backfills. These recommendations are based on our understanding of the project, the results of our field exploration, laboratory test results, and engineering analyses.

5.2 Foundation Recommendations

The foundation recommendations provided in this section are based on the AASHTO LRFD Bridge Design Specifications (AASHTO, 2012). Our understanding, based on discussions with the design team, is that while spread footings were considered at Yuma Road, the abutments and piers for all bridges will be founded on drilled shafts. Drilled shafts have less potential for excessive settlement due to near surface moisture condition changes as compared to spread footings. Drilled shafts are also often considered better suited to bridge widenings given the smaller footprint required to construct the foundations.

In general, drilled shafts, which derive their support from both side shear and tip resistance within the mostly firm soils below 10 to 15 feet and generally very firm to hard soils below 50 feet, will provide good support of the abutments and piers with limited post-construction settlements.

Initially both cast-in-place (CIP) and mechanically stabilized earth (MSE) type walls were considered for project retaining walls. Subsequently, CIP walls were selected as the preferred

alternative. Therefore, only evaluations and recommendations for CIP walls are presented in the spread footings section and are applicable for the sound wall foundations as well.

5.2.1 Drilled Shafts

The new bridge structures will be supported on drilled shaft foundations. Embankment fills and retaining walls will be constructed at the bridge approaches. To limit surcharge loading and downdrag forces on drilled shafts adjacent to embankment fills and walls, Ethos recommends the construction of the embankment fills and walls, and the associated settlement to occur, prior to construction of the adjacent drilled shaft foundations. Approximately 85 to 90 percent of the settlement is expected to occur during construction with the remaining settlement to occur shortly afterwards. The embankment fills and walls should be monitored to determine when the settlement is complete at which point the drilled shafts could be constructed.

The recommended design criteria presented herein are applicable to the bridge foundations and are based on the AASHTO LRFD procedures presented in 6th Edition of the AASHTO LRFD Bridge Design Specifications (AASHTO, 2012). The axial compression capacities of the drilled-shaft foundations were determined using ADOT's Geotechnical Design Policy DS-1 memorandum (ADOT, 2010a). The ADOT memorandum outlines the development of drilled-shaft axial resistance charts based on methods specified in AASHTO LRFD Bridge Design Specifications (AASHTO, 2010). The drilled-shaft foundations for the project were designed using the Beta method outlined for cohesionless soils based on the subsurface profile at each bridge structure location. For the analysis N values were limited to 50 per AASHTO (2012).

A summary of the drilled shaft design charts is presented in Table 5.1. The drilled shaft design charts are presented in Appendix E by foundation structure. Development of strength and service limit charts is further discussed in the following sections.

Table 5.1: Summary of Drilled Shaft Design Charts

Structure	Axial Resistance Design Charts	
	Strength Limit State	Service Limit State
Lower Buckeye Road TIOP	E1	E2 through E6
Yuma Road TI OP	E7	E8 through E12
Lilac Street OP	E13	E14 through E18
UPRR OP - Abutments	E19	E20 through E24
UPRR OP - Piers	E25	E26 through E30
Broadway Road OP	E31	E32 through E36
Elwood Street OP	E37	E38 through E42
Lower Buckeye Ramp B over Elwood Street – Abutments	E43	E44 through E48
Lower Buckeye Ramp B over Elwood Street – Piers	E49	E50 through E54
SR 303L Mainline over Ramps	E55	E56 through E60
Lower Buckeye Ramp B over Elwood Street Ramp D - Abutments	E61	E62 through E66
Lower Buckeye Ramp B over Elwood Street Ramp D - Piers	E67	E68 through E72
Atlanta Avenue OP	E73	E74 through E78

5.2.1.1 Axial Resistance

The axial compression resistance of drilled shaft foundations for the project was determined using the AASHTO LRFD Bridge Design Specifications (2012) using both tip and side resistance. The axial resistance design charts presented in Appendix E are applicable for redundant conditions. For non-redundant conditions, the resistance should be reduced by 20%. The provided design charts in Appendix E can be used for non-redundant conditions by increasing the applied loads by a factor that is the inverse of the reduction factor, and then entering the charts with the increased loads. A resistance factor of 0.8 (i.e., 80%) for non-redundant conditions corresponds to a load factor of 1.25 (i.e., 1/0.8 = 1.25) or an increase in the load by 25%.

The following sections provide design recommendations for strength and service limit states for drilled shaft foundations. Drilled shafts should bear in the very firm to hard/dense to very dense soils at the bridge locations. A minimum drilled-shaft diameter of 4 feet is recommended to facilitate construction of the shafts. Table 5.2 presents approximate design load information (provided by the design team) for strength and service limit state loadings for the foundation elements.

Table 5.2 Foundation Design Axial Load Information (Per Shaft)

Foundation Element	Bridge Element	Service[1] [kips]	Strength[1] [kips]
Lower Buckeye Road TI OP	Abutment Pier	960 1,610	1,325 2,215
Yuma Road TI OP	Abutment Pier	1,390 1,395	1,900 2,050
Lilac Street/Canyon Trail OP	Abutment	910	1,165
UPRR OP	Abutment Pier	1,358 4,104	1,950 5,336
Broadway Road OP	Abutments	868	1,197
Elwood Street OP	Abutment Pier	820 1,270	1,060 1,700
Lower Buckeye Ramp B over Elwood Street	Abutment Pier	870 1,720	1,130 2,330
SR 303L Mainline over Ramps	Abutment Pier	814 4,063	1,031 5,418
Lower Buckeye Ramp B over Elwood Street Ramp D	Abutment Pier	1,010 3,900	1,541 5,340

NOTES:
1. Axial loads provided are approximate values for each element

The upper 5 feet of native soil were disregarded for development of axial resistance. The N values used for development of tip resistance were taken as the average of the value at that depth and the next 10 feet below the tip. The N values were normalized to a 60 percent hammer efficiency and limited to a maximum value of 50 in accordance with the design procedure.

5.2.1.1.1 Strength Limit State

Resistance factors used in the determination of the vertical resistance for drilled shafts are a function of the design methodology. The drilled-shaft capacities were calculated using the beta method for side resistance and tip resistance. The corresponding resistance factors for geotechnical resistance of drilled shafts are 0.55 and 0.5 for beta method side resistance and end bearing, respectively, as presented in Table 10.5.5.2.4-1 of AASHTO (2012). These resistance factors assume redundant foundations as defined in Section 10.5.5.2.4 of AASHTO (2012) and Section 10.5.5.2.4 of the ADOT Bridge Practice Guidelines (2011).

5.2.1.1.2 Service Limit State

The vertical resistance provided by the soil is a function of the relative movement between the drilled shaft and the surrounding soil. Article 10.8.2.2.2 of AASHTO (2012) and ADOT (2010a) provide relationships for the development of skin friction and end bearing as a function of settlement normalized to the drilled-shaft diameter for various soil types. The trend line normalized load transfer curves were used in the analyses. The vertical resistances for the drilled shafts at settlements of 0.1, 0.25, 0.5, 0.75, and 1 inch were calculated using these relationships. It should be noted that the resistances determined using this method are not valid when downdrag loads are developed on the drilled shaft. When this is the case, settlements need to be calculated on a case-by-case basis.

5.2.1.1.3 Group Effects – Axial

Design criteria for reductions in axial resistance resulting from group effects are presented in Section 10.8.3.6 of the AASHTO (2012) manual. For cohesionless materials, the individual nominal resistance of each shaft in a group should be reduced by a factor, η, presented in Table 10.8.3.6.3-1 of AASHTO (2012) and reproduced in Table 5.3:

Table 5.3: Group Reduction Factors for Bearing Resistance in Cohesionless Materials

Shaft Group Configuration	Shaft Center-to-Center Spacing	Special Conditions	Reduction Factor for Group Effects (η)
Single Row	2D	---	0.90
	3D or more	---	1.0
Multiple Row	2.5D	---	0.67
	3D	---	0.80
	4D or more	---	1.0
Single and Multiple Rows	2D or more	Shaft group cap in intimate contact with ground consisting of medium dense or denser soil, and no scour below the shaft cap is anticipated	1.0
Single and Multiple Rows	2D or more	Pressure grouting is used along the shaft sides to restore lateral stress losses caused by shaft installation, and the shaft tip is pressure grouted	1.0

The design charts presented in Appendix E apply to single shafts, and therefore do not include a group reduction factor. For axial capacity reductions due to group effects, the factored loads should be increased by the inverse of the appropriate reduction factor when using the design charts.

For a single row of drilled shafts, the minimum center-to-center spacing should be two diameters, and the appropriate reduction factors determined by linear interpolation for center-to-center spacing between two and three diameters. The reduction factors should be applied equally to all shafts within the group regardless of location within the group.

5.2.1.2 Downdrag

Drilled shafts supporting abutments, subject to new embankment fill surcharges, may experience downdrag loads. The new embankment fill soil, if in contact with the drilled shaft, can move downward as it settles, relative to the drilled shaft, and "drag" the shaft down, and/or the new embankment fill soil can cause the existing ground to settle and the existing ground can move downward relative to the shaft. The design charts in Appendix E do not account for these additional downdrag forces.

To limit potential downdrag forces on drilled shaft foundations adjacent to embankment fills and walls at the bridge approaches, Ethos recommends the construction sequence begin with constructing the embankment fills and walls, and then allow the associated settlement to occur prior to construction of the adjacent drilled shaft foundations. We anticipate 85 to 90 percent of the settlement to be complete at the end of construction, with most of the remaining settlement to

occur within 1 to 2 months. The embankment fills and walls should be monitored to determine when the settlement is essentially complete.

Alternatively, a temporary surcharge load, equal to or greater than the height and extents of the embankment, could be placed prior to construction. The temporary surcharge would need to be monitored to determine when the settlement is complete, at which point the surcharge, or a portion of it, could be removed and the next step of construction can proceed.

If drilled shaft foundations for the bridge abutments are installed prior to construction of the adjacent embankment fills and walls for the bridge approaches, additional downdrag forces will need to be accounted for in the design. Downdrag loads for this construction sequence were calculated using procedures outlined in Article 3.11.8 (AASHTO 2012) and the Federal Highway Administration (FHWA) Drilled Shafts Manual (2010). The side shear and end bearing in the founding stratum were assigned based on the results of the vertical resistance analyses, as described in Section 5.2.1.1. Downdrag loads were evaluated for the drilled shaft diameter and length shown on the plans and in conjunction with the foundation design load information. Downdrag loads were calculated at a relative soil to shaft displacement of 0.4 inches required to develop the full side resistance as presented in Article 3.11.8 (AASHTO 2012). Downdrag loads for each structure, as presented in Table 5.4a, should be included when evaluating the shaft structural resistance.

Table 5.4a: Drilled Shaft Downdrag Loading for Interim Condition (i.e. Current Project)

Structure Element	Strength Limit Load per Shaft [kips]	Service Limit Load per Shaft [kips]	Shaft Diameter[1] [feet]	Shaft Tip Elevation[1] [feet]	Shaft Settlement		Downdrag Load per Shaft [kips]
					Below Shaft Tip[2] [inches]	Relative Shaft Tip Movement[3] [inches]	
Lower Buckeye TI OP	1,325	960	5	888	4.1	0.75	268
Yuma TI OP	1,900	1,390	5	898	2.1	0.5	120
Lilac Street/ Canyon Trail OP	1,165	910	5	944	5.3	0.5	455
UPRR OP	1,950	1,358	5	833	6.7	2.25	1,370
Broadway Road OP	1,197	868	5	862	5.5	1.0	250
Elwood Street OP	1,060	820	5	---	2.3	0.75	75
Lower Buckeye Ramp B over Elwood Street	1,130	870	5	---	2.3	0.75	90
SR 303L Mainline over Ramps	1,031	814	5.5	888	6.6	1.25	250
Lower Buckeye Ramp B over Elwood Street Ramp D	1,541	1,010	5	831	3.2	1.25	445

NOTES

1. Shaft diameter and tip elevation based on information provided by designer unless otherwise noted.
2. Settlement of the soil below shaft tip resulting in downward movement of the shaft and surrounding soil.
3. Movement of shaft tip relative to surrounding soil required to develop resistance.
4. Downdrag loads assume the portion of the drilled shafts above the existing grade will be formed as smooth columns and a bond breaker will be applied to prevent the development of additional downdrag load from the embankment fill

The magnitude of the downdrag load and/or the settlement are high for some of the structures and will require mitigation. In addition to specifying the construction sequence or preloading,

which were previously discussed, lightweight backfill behind the abutment would also be an option.

As previously discussed, the current project will construct the ultimate freeway configuration for the bridges north of and including Lower Buckeye Road. However, south of Lower Buckeye Road, the current project will construct only the bridge structures and roadway embankment for the ultimate southbound configuration. The ultimate northbound configuration will be constructed as another phase sometime in the future. Therefore, it is important to note that the construction of the adjacent ultimate northbound configuration will result in additional settlement to the project elements constructed with the current project. These additional downdrag loads and settlement due to the future ultimate northbound roadway were evaluated and should be considered in the current design. These were evaluated using the same loading and shaft geometry shown in Table 5.4a and the additional downdrag loads and settlements are presented in Table 5.4b.

Table 5.4b: Drilled Shaft Downdrag Loading for Ultimate Condition

Structure Element	Additional Shaft Settlement		Additional Downdrag Load per Shaft [kips]
	Below Shaft Tip[2] [inches]	Relative Shaft Tip Movement[3] [inches]	
UPRR OP	2.1	0	60
Broadway Road OP	1.3	0	50
Elwood Street OP	1.9	0	100
Lower Buckeye Ramp B over Elwood Street	1.8	0.25	50
SR 303L Mainline over Ramps	4.5	0	50
Lower Buckeye Ramp B over Elwood Street Ramp D	1.3	0	100

NOTES
1. Shaft diameter and tip elevation based on information provided by designer unless otherwise noted.
2. Settlement of the soil below shaft tip resulting in downward movement of the shaft and surrounding soil.
3. Movement of shaft tip relative to surrounding soil required to develop resistance.

Note that the settlement and downdrag loads presented in Table 5.4b can be mitigated if preloading of the planned future embankments are performed prior to constructing the drilled shafts for the current project.

5.2.1.3 Lateral Loading

Lateral soil-structure interaction analyses of single shafts are typically performed by modeling the lateral load-displacement behavior using a finite difference technique based on elastic beam column theory and soil reaction (p)-displacement (y) curves. The p-y curves define the behavior of the soil surrounding the laterally loaded shaft. These curves are nonlinear and are developed using soil strength, depth below ground and shaft diameter amongst others. Many programs are available that use this approach with the most common locally being LPILE. The soil input parameters below are for use in LPILE and can also be used in FB-MultiPier. In addition, the soil parameters provided for the SR 303L Mainline over Ramps bridge can be utilized for evaluation of the WAPA transmission line towers that cross the project alignment at approximately SR 303L Cst. CL Sta. 1157+00. The soil properties at this location have been modified to include the deformation modulus, per the WAPA designer's request, for use in the MFAD program. The designer using MFAD should ensure compatibility of the presented soil parameters with the MFAD

software and design methodology, and apply any necessary resistance factor or factors of safety per the applicable design code.

5.2.1.3.1 LPILE Input Parameters

Recommended soil input parameters for use in LPILE analyses are provided in Tables 5.5 through 5.13 for the various bridge structures. The soil input parameters were developed using the LPILE technical manual (Ensoft, 2019) and results of the geotechnical investigation.

Table 5.5: Soil Input Parameters for LPILE Analyses at UPRR

Soil Layer	Depth[1] [feet]	Soil Type in LPILE	Effective Unit Weight [pcf]	Friction Angle [degrees]	Cohesion [psf]	Soil Strain Ratio ε_{50}	Horizontal Subgrade Modulus, k [pci]
1	Embankment	Sand	130	30	0	---	90
2	0 – 15	Silt[3]	110	26	200	0.007	330
3	15 – 40	Sand	105	33	0	---	90
4	40 – 75	Sand	72.6	38	0	---	120
5	75 – 105	Sand	57.6	33	0	---	60
6	105 – 120	Sand	57.6	30	0		30

NOTES:
1. Zero depth refers to the existing ground surface elevation of approximately 896 feet at the UPRR OP location.
2. pcf = pounds per cubic foot, pci = pounds per cubic inch, psf = pounds per square foot
3. When using FB-MultiPier, use the C-Phi soil type in lieu of the Silt soil type.

Table 5.6: Soil Input Parameters for LPILE Analyses at Broadway Road OP

Soil Layer	Depth[1] [feet]	Soil Type in LPILE	Effective Unit Weight [pcf]	Friction Angle [degrees]	Cohesion [psf]	Soil Strain Ratio ε_{50}	Horizontal Subgrade Modulus, k [pci]
1	Embankment	Sand	130	30	0	---	90
2	0 – 25	Silt[3]	110	26	200	0.007	330
3	25 – 35	Sand	105	33	0	---	90
4	35 – 40	Sand	135	38	0	---	220
5	40 – 65	Sand	72.6	38	0	---	120
6	65 – 100	Sand	57.6	33	0		60

NOTES:
1. Zero depth refers to the existing ground surface elevation of approximately 906 feet at the Broadway Road OP location.
2. pcf = pounds per cubic foot, pci = pounds per cubic inch, psf = pounds per square foot
3. When using FB-MultiPier, use the C-Phi soil type in lieu of the Silt soil type.

Table 5.7: Soil Input Parameters for LPILE Analyses at Elwood Street OP

Soil Layer	Depth[1] [feet]	Soil Type in LPILE	Effective Unit Weight [pcf]	Friction Angle [degrees]	Cohesion [psf]	Soil Strain Ratio ε_{50}	Horizontal Subgrade Modulus, k [pci]
1	Embankment	Sand	130	30	0	---	90
2	0 – 15	Silt[3]	110	30	100	0.005	330
3	15 – 30	Silt[3]	110	30	100	0.004	330
4	30 – 45	Silt[3]	110	30	100	0.005	330
5	45 – 60	Silt[3]	120	26	200	0.005	330
6	60 – 90	Sand	57.6	33	0	---	60
7	90 – 100	Sand	57.6	33	0	---	60

NOTES:
1. Zero depth refers to the existing ground surface elevation of approximately 927 feet at the Elwood Street OP location.
2. pcf = pounds per cubic foot, pci = pounds per cubic inch, psf = pounds per square foot
3. When using FB-MultiPier, use the C-Phi soil type in lieu of the Silt soil type.

Table 5.8: Soil Input Parameters for LPILE Analyses at Lower Buckeye Road Ramp B over Elwood Street

Soil Layer	Depth[1] [feet]	Soil Type in LPILE	Effective Unit Weight [pcf]	Friction Angle [degrees]	Cohesion [psf]	Soil Strain Ratio ε_{50}	Horizontal Subgrade Modulus, k [pci]
1	Embankment	Sand	130	30	0	---	90
2	0 – 15	Silt[3]	110	30	100	0.004	330
3	15 – 30	Silt[3]	110	30	100	0.004	330
4	30 – 45	Silt[3]	120	30	100	0.004	330
5	45 – 60	Silt[3]	120	26	200	0.004	330
6	60 – 90	Sand	57.6	30	0	---	30
7	90 – 100	Sand	57.6	30	0	---	30

NOTES:
1. Zero depth refers to the existing ground surface elevation of approximately 928 feet at the Lower Buckeye Road Ramp B over Elwood Street location.
2. pcf = pounds per cubic foot, pci = pounds per cubic inch, psf = pounds per square foot
3. When using FB-MultiPier, use the C-Phi soil type in lieu of the Silt soil type.

Table 5.9: Soil Input Parameters for LPILE Analyses at SR 303L Mainline over Ramps

Soil Layer	Depth[1] [feet]	Soil Type in LPILE	Effective Unit Weight [pcf]	Friction Angle [degrees]	Cohesion [psf]	Soil Strain Ratio ε_{50}	Horizontal Subgrade Modulus, k [pci]	Deformation Modulus [ksi][4]
1	Embankment	Sand	130	30	0	---	90	---
2	0 – 10	Silt[3]	110	26	200	0.005	330	1.7
3	10 – 30	Silt[3]	110	30	100	0.004	330	5.6
4	30 – 45	Silt[3]	110	26	200	0.004	330	2.9
5	45 – 65	Silt[3]	120	30	100	0.004	330	4.3
6	65 – 80	Sand	57.6	33	0	---	60	5.6
7	80 – 100	Sand	57.6	33	0	---	60	3.7

NOTES:
1. Zero depth refers to the existing ground surface elevation of approximately 934 feet at the SR 303L Mainline over Ramps location.
2. pcf = pounds per cubic foot, pci = pounds per cubic inch, psf = pounds per square foot
3. When using FB-MultiPier, use the C-Phi soil type in lieu of the Silt soil type.
4. Information for use in the MFAD program

Table 5.10: Soil Input Parameters for LPILE Analyses at Lower Buckeye Road Ramp B over Elwood Street Ramp D

Soil Layer	Depth[1] [feet]	Soil Type in LPILE	Effective Unit Weight [pcf]	Friction Angle [degrees]	Cohesion [psf]	Su [psf]	Soil Strain Ratio ε_{50}	Horizontal Subgrade Modulus, k [pci]
1	Embankment	Sand	130	30	0	---	---	90
2	0 – 15	Sand	110	30	0	---	0.005	330
3	15 – 35	Silt[3]	120	26	200	---	0.004	330
4	35 – 50	Silt[3]	120	30	100	---	0.004	330
5	50 – 65	Silt[3]	120	30	100	---	0.004	330
6	65 – 80	Stiff Clay w/out Free Water	57.6	---	---	6,000	0.004	---
7	80 – 100	Stiff Clay w/out Free Water	57.6	---	---	3,000	0.005	---

NOTES:
1. Zero depth refers to the existing ground surface elevation of approximately 931 feet at the Lower Buckeye Road Ramp B over Elwood Street Ramp D location.
2. pcf = pounds per cubic foot, pci = pounds per cubic inch, psf = pounds per square foot
3. When using FB-MultiPier, use the C-Phi soil type in lieu of the Silt soil type.

Table 5.11: Soil Input Parameters for LPILE Analyses at Lower Buckeye Road TI OP

Soil Layer	Depth[1] [feet]	Soil Type in LPILE	Effective Unit Weight [pcf]	Friction Angle [degrees]	Cohesion [psf]	Soil Strain Ratio ε_{50}	Horizontal Subgrade Modulus, k [pci]
1	Embankment	Sand	130	30	0	---	90
2	0 – 15	Silt[3]	115	30	200	0.007	330
3	15 – 25	Sand	115	35	0	---	350
4	25 – 50	Stiff Clay w/out Free Water	115	---	1,000	0.007	---
5	50 – 70	Sand	125	35	0	---	140
6	> 70	Sand	72.6	35	0	---	80

NOTES:
1. Zero depth refers to the existing ground surface elevation of approximately 937 feet at the Lower Buckeye Road TIOP location.
2. pcf = pounds per cubic foot, pci = pounds per cubic inch, psf = pounds per square foot
3. When using FB-MultiPier, use the C-Phi soil type in lieu of the Silt soil type.

Table 5.12: Soil Input Parameters for LPILE Analyses at Yuma Road TI OP

Soil Layer	Depth[1] [feet]	Soil Type in LPILE	Effective Unit Weight [pcf]	Friction Angle [degrees]	Cohesion [psf]	Soil Strain Ratio ε_{50}	Horizontal Subgrade Modulus, k [pci]
1	Embankment	Sand	130	30	0	---	90
2	0 – 20	Silt[3]	115	30	100	0.007	330
3	20 – 30	Silt[3]	115	30	200	0.007	350
4	30 – 70	Silt[3]	115	30	100	0.007	330
5	70 – 80	Sand	125	35	0	---	140

NOTES:
1. Zero depth refers to the existing ground surface elevation of approximately 960 feet at the Yuma Road TIOP location.
2. pcf = pounds per cubic foot, pci = pounds per cubic inch, psf = pounds per square foot
3. When using FB-MultiPier, use the C-Phi soil type in lieu of the Silt soil type.

Table 5.13: Soil Input Parameters for LPILE Analyses at Lilac Street OP

Soil Layer	Depth[1] [feet]	Soil Type in LPILE	Effective Unit Weight [pcf]	Friction Angle [degrees]	Cohesion [psf]	Soil Strain Ratio ε_{50}	Horizontal Subgrade Modulus, k [pci]
1	Embankment	Sand	130	30	0	---	90
2	0 – 20	Silt[3]	115	30	100	0.007	330
3	20 – 30	Silt[3]	115	30	200	0.007	350
4	30 – 70	Sand	125	35	0	---	140
5	> 70	Silt[3]	125	30	200	0.007	350

NOTES:
1. Zero depth refers to the existing ground surface elevation of approximately 981 feet at the Lilac Street OP location.
2. pcf = pounds per cubic foot, pci = pounds per cubic inch, psf = pounds per square foot
3. When using FB-MultiPier, use the C-Phi soil type in lieu of the Silt soil type.

Where embankments in front of drilled shafts slope downward away from the bridge abutment, the lateral soil resistance against drilled shafts should be reduced. It is conservatively recommended that lateral soil pressures (for loading normal to the column line) be neglected within the zone above the catch point (on the slope) of a horizontal line projected outward a distance of three shaft diameters (e.g. a horizontal distance of 12 feet to the catch point on the slope for a 4-foot-diamter shaft) from the front of the shafts.

5.2.1.3.2 Group Effects – Lateral

The design of laterally loaded drilled shafts must account for the influence from adjacent shafts in a group. Article 10.7.2.4 (AASHTO, 2012) defines a drilled-shaft group with respect to lateral loading as drilled shafts spaced less than five diameters center-to-center (CTC) in the direction parallel and normal to the applied load. When the drilled shafts are in a group, the lateral resistance of the soil is reduced to account for the influence of adjacent drilled shafts by multiplying the p values of the p-y curves by P-multiplier values (P_m). The values of P_m vary as a function of the CTC spacing and the drilled shaft position within the group. The loading direction and spacing are shown on Figure 10.7.2.4.1 from AASHTO (2012). Recommendations for P_m are shown in Table 5.14, based on AASHTO Table 10.7.2.4 1 (AASHTO, 2012) for CTC spacing of 3B and 5B. When determining P-multiplier values for two shafts of different diameters, the larger shaft diameter should be used to calculate the CTC spacing.

Table 5.14: P-Multipliers for Multiple Row Shading

Center-to-Center (CTC) Spacing in the Direction of Loading	P-Multipliers, P_m		
	Row 1	Row 2	Row 3
3B	0.8	0.4	0.3
5B	1.0	0.85	0.7

NOTES:
1. B=drilled shaft diameter

5.2.1.4 Drilled Shaft Construction

The soils consist primarily of interbedded firm fine-grained soils and dense to very dense coarse-grained native soils. Drilled-shaft excavations may encounter caving and/or sloughing of the coarse-grained soils present at depth. Temporary casing and/or slurry may be needed to advance drilled shafts. All construction techniques should be in accordance with Section 609 of the *ADOT Standard Specifications* (ADOT 2021a) and the project-specific special provisions. Quality control during the drilled-shaft construction should include those items specifically called out in the *ADOT Standard Specifications* (ADOT 2021a), Section 609. A quality control report should be submitted for each shaft, stating that all details were monitored and meet the project requirements.

Straight, drilled shaft excavations will likely be advanced with single-flight-auger or bucket auger bits to the recommended depth. Cleaning of the drilled-shaft excavations should be performed in accordance with Section 609 of the *ADOT Standard Specifications* (ADOT 2021a). It should be verified by inspection and measurement that the excavation is open to that depth. The shaft excavation should be cleaned so no more than 2 inches of slough or loose material is present in the bottom of the excavation.

Groundwater may impact the construction of drilled shafts. Groundwater was encountered within geotechnical borings completed as shallow as 40 feet at the UPRR OP location. It is likely that shafts excavated on the project will encounter groundwater within the excavation.

5.2.2 Spread Footings

Spread footings were evaluated as an option to support the bridge structure at Yuma Road, retaining walls and sound walls. Use of spread footings for the Yuma Road bridge would require the bridge engineer to evaluate the potential impacts of settlement and construction considerations associated with founding the footing a minimum of 10 feet below the existing or finished grade, whichever is lower. Spread footing foundations are an option for the retaining walls and are planned for the sound walls. The discussion and recommendations presented in the following sections are applicable to the following retaining and sound walls:

- RW-1084-RT
- RW-1088-LT
- RW-1089-RT
- RW-1093-LT
- RW-1094-RT
- RW-1107
- RW-1108
- RW-1171-LT
- RW-1171-RT
- RW-1175-LT
- RW-1175-RT
- RW-1224-LT
- RW-1224-RT
- RW-NBFR-26-RT
- RW-NBFR-47-RT
- Sound Barrier Walls

Recommendations for the following retaining and sound walls were prepared by AZTEC and are included in Appendix G.

- RW-LBFR-28-LT
- RW-LBFR-28-RT
- RW-LBFR-30-LT
- RW-LBFR-30-RT
- RW-1142-LT
- RW-1142-RT
- RW-1144-LT
- RW-1144-RT
- RW-LBFR-41-LT
- RW-LBFR-41-RT
- RW-LBFR-46-LT
- RW-LBFR-46-RT
- RW-1157-LT
- RW-1157-RT
- RW-1164-LT
- RW-1164-RT
- RW-1228-LT
- RW-1228-RT
- RW-1250-LT
- RW-1250-RT
- RW-1254-LT
- RW-1254-RT
- RW-1274-RT

5.2.2.1 Bearing Resistance

The strength and service limit state design analyses for spread footings were completed per the methods presented in Sections 10.5 and 10.6, respectively, of AASHTO (2012), and ADOT Geotechnical Design Policy SF-1 (2010b). The geotechnical design efforts for the walls were split between Ethos and AZTEC as denoted in Section 5.2.2. Recommendations for the walls analyzed by AZTEC are presented in Appendix G. Based on current design information provided by the design team, the abutments will support integral wing walls and adjacent sections of cast-in-place (CIP) cantilever retaining walls that will be founded on a combination of native ground and new embankment fill. The following recommendations can be applied to all sections of abutment walls and retaining walls assuming the provisions in Section 5.2.2.6 are followed.

The factored net bearing resistance, q_{Rn}, for the strength limit state design was determined using the net nominal bearing resistance (ultimate bearing capacity), q_{nn}, calculated per Section 10.6.3.1.2a and bearing resistance factor, φ_b, from Section 10.5.5.2.2 of AASHTO (2012) for walls on level ground. Modified bearing capacity factors were used as per the equation presented in

Article 10.6.3.1.2c of AASHTO (2012) for walls in close proximity to a slope. The factor Nq was zero and Nc and Nγ were replaced with Ncq and Nγq, respectively from Figures 10.6.3.1.2c-1 and 10.6.3.1.2c-2 of AASHTO (2012). Given the low cohesion values utilized in the design, the impact of the Ncq term on bearing capacity was negligible and therefore assumed to be zero when evaluating the modified bearing resistances for walls near embankment slopes. The parameters presented below in Table 5.15 were assumed for the nominal resistance and strength limit state analyses.

The footing length and depth were assumed based on information provided by the project team. The resulting factored net bearing resistance, q_{Rn}, versus effective footing width, B', is shown as the "Strength Limit State" line in Figures F1 through F7.

Table 5.15 Spread Footing Analysis Parameters – Strength Limit State Design for Bearing

Parameter	Symbol	Value
Soil Angle of Internal Friction [degrees]	ϕ_f	30
Soil Total Unit Weight [pcf]	γ_{total}	115
Cohesion [psf]	c	0[1]
Maximum Footing Length [feet]	L	90
Footing Bearing Depth [feet]	D_f	2
Effective Footing Width [feet]	B_f	3 to 15
Bearing Resistance Factor [dim]	φ_b	0.45

NOTES:
1. Conservatively used a value of zero for the analyses

Per ADOT Geotechnical Design Policy SF-1 (2010b), the modified Schmertmann method presented in Section 8.5 of the Federal Highway Administration Soils and Foundation Reference Manual (Samtani and Nowatzki 2006) was used to calculate settlements for the service limit state analysis. The parameters assumed for this analysis are presented in Table 5.16.

Table 5.16 Spread Footing Analysis Parameters Service Limit State Design for Bearing

Parameter	Symbol	Depth Interval [feet][1]		
		0-15	15-50	Below 50
Soil Type	--	Sand	Sand	Sand
Soil Unit Weight [pcf]	γ	115	115	115
Corrected SPT N-value	N_{60}	19 to 70	50 to 71	45 to 76
Elastic Modulus [ksf]	E_s	$5N_{60}(p_a)$	$5N_{60}(p_a)$	$5N_{60}(p_a)$

NOTES:
1. Depth of zero assumed to be at base of footing.
2. pa = Atmospheric Pressure = 2.116 ksf
3. pcf = pounds per cubic foot, ksf = kips per square foot

The parameters are based on the measured soil densities, distribution of N values and on the E_s-N correlations from Kulhawy and Mayne (1990). Figures F1 through F7 present the family of service limit state curves developed per ADOT Geotechnical Design Policy SF-1 (2010b) for design settlements ranging from 0.25 to 4 inches and effective footing widths, B_f, ranging from 3 to 20 feet.

5.2.2.2 Sliding

The factored sliding resistance, R_R, for limit state design should be determined using the nominal sliding resistance between soil and foundation, R_τ, and nominal passive resistance, R_{ep}, per Section 10.6.3.4, and corresponding resistance factors, φ_τ and φ_{ep}, from Section 10.5.5.2.2 of AASHTO LRFD (2012). We recommend the parameters presented in Table 5.17 be used for analyzing sliding resistance.

Passive lateral soil resistance should typically be neglected in the upper 3 feet of finished grade due to the potential for disturbance. Below a depth of 3 feet, the nominal passive resistance can be estimated assuming a hydrostatic pressure distribution of 345 psf per foot.

Table 5.17 Spread Footing Analysis Parameters - Strength Limit State Design for Sliding

Parameter	Symbol	Value
Factored Sliding Resistance		
Resistance Factor for Shear between Soil and Foundation	φ_τ	0.90[1]
Resistance Factor for Passive Resistance	φ_{ep}	0.50
Nominal Sliding Resistance		
Soil Angle of Internal Friction	ϕ_f	30 degrees
Soil Total Unit Weight	γ	115 pcf
Cohesion	c	0
Passive Earth Pressure Coefficient	K_p	3.0

NOTES:
1. Use resistance factor of 0.90 for soil-on-soil interface for the bottom horizontal plane of footing between toe and front of key. For remainder of footing bottom use values provided in Table 10.5.5.2.2-1 (AASHTO, 2012).

5.2.2.3 Eccentricity

The eccentricity in the L (long) dimension of an abutment or wall footing is typically negligible, such that L = L'. The effective footing length (B') in the B (short) dimension is calculated as $B' = B - 2e_B$, where e_B is the B dimension eccentricity determined by the structural engineer. The maximum allowable eccentricity at the strength limit state should be calculated in accordance with ADOT Geotechnical Design Policy SF-2 (ADOT 2010c).

5.2.2.4 Overall Stability

Global stability analyses for CIP cantilever retaining walls were performed using the geotechnical software Slope/W, and incorporated soil strength parameters determined from the geotechnical investigation. Representative stability models were developed for the planned CIP retaining wall geometries. The geometry of the CIP retaining wall footings 30 feet or less in height was obtained from the ADOT Standard Drawing No. SD 7.01. Case I -Level Fill, Case II – Level Fill with 2-foot Surcharge (Traffic) and Case IV – Adjacent Traffic Barrier were utilized for walls as identified on the plans. The geometry for CIP retaining wall footings greater than 30 feet in height was provided by AZTEC. The stability models did not allow for failure surfaces to pass through the CIP wall or

the area above the footing. In addition, sound walls founded on embankment fill slopes were evaluated using geometry and loading information provided by AZTEC.

Section 11.6.2.3 of AASHTO (2012) requires the resistance factor of overall stability be 0.65 for slopes containing or supporting a structural element. The inverse of this resistance factor results in a minimum required factor of safety (FOS) of approximately 1.5. The stability results presented in Table 5.18 show that full-height CIP retaining walls founded on level native ground have an FOS approximately equal to or greater than the minimum criteria. However, CIP retaining walls founded on embankment fill adjacent to a 3H:1V slope generally have a global stability factor of safety less than 1.5 with the factor of safety decreasing as the wall height is increased assuming the top cover is equal to the minimum top cover of 1.5 feet. Initially, two alternatives were considered to increase the FOS in these situations: Alternative 1 consisted of reinforcing the subgrade with geosynthetic and Alternative 2 consisted of increasing the top cover over the footing. Upon completion of the initial analyses, AZTEC selected Alternative 2 as the preferred option. Therefore, only the results of the stability models with an acceptable factor of safety based on adjusting the minimum top cover are included in the report, which are presented in Appendix H and summarized in Table 5.18.

Table 5.18: Slope Stability Results for CIP Cantilever Retaining Walls and Sound Walls

Retaining Wall ID	Analysis Cross Section	Toe Slope[1]	Wall Height [feet]	Fill Height [feet]	Top Cover[2] [feet]	Foundation Material	Figure	Factor of Safety
RW-1084-RT	0+00 to 0+30	Yes	31	7.5	23.33	Embankment	H-2	2.22
	0+30 to 0+60	Yes	36	0	17.33	Native	H-3	>1.51
	0+60 to 1+20	Yes	40	0	8	Native	H-4	1.53
	1+20 to 1+87	Wall is above RCBC in FCDMC SR 303L outfall channel						
	1+87 to 2+10	Yes	34	2	8	Embankment	H-5	1.50
	2+10 to 2+40	Yes	27	11	11	Embankment	H-6	1.74
	2+40 to 2+70	Yes	23	16	17	Embankment	H-7	>1.54
RW-1089-RT	0+00 to 0+15	Yes	7	32.5	4	Embankment	H-9	>1.55
	0+15 to 0+30	Yes	11	28.5	2.5	Embankment	H-9	>1.55
RW-1088-LT	0+00 to 0+28	No	26	0	10	Native	H-11	>1.51
	0+28 to 1+75	No	38	0	10	Native	H-11	1.51
	1+75 to 2+42	Wall is above RCBC in FCDMC SR 303L outfall channel						
	2+42 to 2+83	Yes	33	4	9	Embankment	H-12	1.52
	2+83 to 3+13	Yes	29	9	16.66	Embankment	H-13	1.51
RW-1093-LT	0+00 to 0+15	Yes	10	24	5	Embankment	H-15	>1.55
	0+15 to 0+30	Yes	14	20	4	Embankment	H-15	>1.55
RW-1094-RT	0+00 to 0+30	Yes	30	4	9	Embankment	H-17	>1.52
	0+30 to 0+45	Yes	26	9.5	10	Embankment	H-18	>1.54
	0+45 to 0+60	Yes	22	14	11	Embankment	H-19	>1.54
	0+60 to 0+75	Yes	18	17.5	12	Embankment	H-19	>1.54
RW-1107	0+00 to 0+55	No	25	0	2	Native	H-21	>1.51
	0+55 to 1+15	No	26	0	2	Native	H-21	>1.51
	1+15 to 2+05	No	25	0	2	Native	H-21	>1.51

Retaining Wall ID	Analysis Cross Section	Toe Slope[1]	Wall Height [feet]	Fill Height [feet]	Top Cover[2] [feet]	Foundation Material	Figure	Factor of Safety
	2+05 to 2+35	No	27	0	2	Native	H-21	>1.51
	2+35 to 2+65	No	23	0	2	Native	H-21	>1.51
	2+65 to 2+95	No	15	0	2	Native	H-21	>1.51
RW-1108	0+00 to 0+30	No	25	0	2	Native	H-21	>1.51
	0+30 to 0+70	No	28	0	2	Native	H-21	>1.51
	0+70 to 1+30	No	26	0	2	Native	H-21	>1.51
	1+30 to 1+90	No	27	0	2	Native	H-21	>1.51
	1+90 to 2+20	No	26	0	2	Native	H-21	>1.51
	2+20 to 2+75	No	25	0	2	Native	H-21	>1.51
RW-NBFR-26-RT	0+00 to 6+67	No	7	0	1.5	Native	H-52	1.82
RW-1171-RT	0+00 to 0+30	Yes	6	8	2.5	Embankment	H-23	1.86
	0+30 to 1+20	Yes	14	6	3.5	Embankment	H-24	1.56
	1+20 to 2+40	Yes	21	2	4.5	Embankment	H-25	1.53
	2+40 to 9+29	No	39	0	3.5	Native	H-27	1.50
	9+29 to 9+83	No	27	0	4	Native	H-28	1.55
RW-1171-LT	0+00 to 0+45	No	20	0	1.5	Native	H-30	1.57
	0+45 to 0+56	No	28	0	1.5	Native	H-31	1.52
	0+56 to 1+15	No	29	0	1.5	Native	H-32	1.53
	1+15 to 6+09	No	28	0	1.5	Native	H-31	1.52
	6+09 to 6+99	Yes	14	1	1.5	Embankment	H-33	1.53
	6+99 to 7+52	Yes	7	3	1.5	Embankment	H-34	1.69
RW-1175-RT	0+00 to 0+44	No	25	0	3	Native	H-36	1.66
	0+44 to 2+80	No	36	0	3	Native	H-37	1.62
	2+80 to 3+70	No	33	0	4	Native	H-38	1.53
	3+70 to 4+40	No	31	0	4	Native	H-39	1.52
	4+40 to 10+30	Yes	25	1.5	5	Embankment	H-40	1.50
	10+30 to 14+30	Yes	16	5.5	3	Embankment	H-41	1.52
RW-1175-LT	0+00 to 7+40	No	20	0	1.5	Native	H-43	1.60
	7+40 to 13+95	No	28	0	1.5	Native	H-44	1.50
RW-1224-RT	0+00 to 0+90	Yes	6	14	2.5	Embankment	H-23	1.86
	0+90 to 4+50	Yes	13	6	3.5	Embankment	H-24	1.56
	4+50 to 5+10	Yes	21	2	4.5	Embankment	H-25	1.53
	5+10 to 5+78	No	25	0	2	Embankment	H-46	1.50
RW-1224-LT	0+00 to 0+26	No	16	0	1.5	Native	H-48	1.68
	0+26 to 2+48	No	24	0	1.5	Native	H-49	1.56
	2+48 to 3+68	Yes	17	3	3.5	Embankment	H-50	1.63
	3+68 to 5+18	Yes	19	1.5	4	Embankment	H-40	1.50

Retaining Wall ID	Analysis Cross Section	Toe Slope[1]	Wall Height [feet]	Fill Height [feet]	Top Cover[2] [feet]	Foundation Material	Figure	Factor of Safety
	5+18 to 10+38	No	17	0	1.5	Native	H-36	1.66
RW-NBFR-47-RT	0+00 to 0+30	No	4	0	2	Native	H-54	1.78
	0+30 to 0+90	No	5	0	2	Native	H-55	1.65
	0+90 to 1+20	No	6	0	2	Native	H-56	1.68
	1+20 to 2+10	No	7	0	1.5	Native	H-57	1.56
	2+10 to 2+40	No	8	0	2	Native	H-58	1.60
	2+40 to 3+60	No	9	0	2	Native	H-59	1.56
	3+60 to 4+20	No	10	0	2	Native	H-60	1.52
	4+20 to 4+50	No	9	0	2	Native	H-59	1.56
	4+50 to 5+70	No	10	0	2	Native	H-60	1.52
	5+70 to 6+60	No	9	0	2	Native	H-59	1.56
	6+60 to 6+90	No	8	0	2	Native	H-58	1.60
	6+90 to 7+20	No	7	0	1.5	Native	H-57	1.56
	7+20 to 8+10	No	6	0	2	Native	H-56	1.68
	8+10 to 9+70	No	4	0	2	Native	H-54	1.78
SB-1216-LT	All	No	14	0	1.5	Native	H-62	1.78
Sound Barrier Walls[3]	Generic	Yes	12	Varies	1.0	Embankment	H-63	1.51

NOTES:
1. Toe slope, when present, is at a 3H:1V slope.
2. Top cover is measured from finished grade to top of footing at the toe edge of footing.
3. Evaluate the critical case for the tallest wall founded adjacent to sloping ground and conservatively with 2H:1V slope.

Table 5.19 summarizes the recommendations for CIP cantilever retaining walls to achieve the minimum required factors of safety.

Table 5.19: Recommendations for CIP Cantilever Retaining and Sound Walls

Retaining Wall ID	Wall Station	Recommendations
RW-1084-RT	0+00 to 1+20	Minimum top cover of 8.0 feet
	1+87 to 2+70	Minimum top cover of 8.0 feet
RW-1088-LT	0+00 to 1+75	Minimum top cover of 10.0 feet
	2+42 to 3+13	Minimum top cover of 9.0 feet
RW-1089-RT	Minimum top cover of 2.5 feet	
RW-1093-LT	Minimum top cover of 2.5 feet	
RW-1094-RT	Minimum top cover of 6.0 feet	
RW-1107	Minimum top cover of 2.0 feet.	
RW-1108	Minimum top cover of 2.0 feet	
RW-NBFR-26-RT	Minimum top cover of 1.5 feet.	

Retaining Wall ID	Wall Station	Recommendations
RW-1171-RT	0+00 to 0+30	Minimum top cover of 2.5 feet.
	0+30 to 1+20	Minimum top cover of 3.5 feet.
	1+20 to 2+40	Minimum top cover of 4.5 feet.
	2+40 to 9+29	Minimum top cover of 3.5 feet.
	9+29 to 9+83	Minimum top cover of 4.0 feet.
RW-1171-LT	Minimum top cover of 1.5 feet.	
RW-1175-RT	0+00 to 2+80	Minimum top cover of 3.0 feet.
	2+80 to 4+40	Minimum top cover of 4.0 feet.
	4+40 to 10+30	Minimum top cover of 5.0 feet.
	10+30 to 14+30	Minimum top cover of 3.0 feet.
RW-1175-LT	Minimum top cover of 1.5 feet.	
RW-1224-RT	0+00 to 0+90	Minimum top cover of 2.5 feet.
	0+90 to 4+50	Minimum top cover of 3.5 feet.
	4+50 to 5+10	Minimum top cover of 4.5 feet.
	5+10 to 5+78	Minimum top cover of 2.0 feet.
RW-1224-LT	0+00 to 2+48	Minimum top cover of 1.5 feet.
	2+48 to 3+68	Minimum top cover of 3.5 feet.
	3+68 to 5+18	Minimum top cover of 4.0 feet.
RW-NBFR-47-RT	Minimum top cover of 2.0 feet	
Sound Barrier Walls	Utilize ADOT standard requirements for sound walls	

NOTES:
1. Top cover is measured from finished grade to top of footing at the toe edge of footing.

5.2.2.5 Nominal Lateral Loads Acting on Retaining Walls

Walls retaining soil should be designed for the lateral earth pressure imposed by the soil. The magnitude of the lateral earth pressure is a function of the backfill material, imposed surcharge loads, drainage accommodations and the rigidity of the retaining structure. The recommended lateral earth pressure values presented below assume the backfill will be structure backfill comprised of granular soils which meet the requirements of Section 203 of the current ADOT Standard Specifications. The limits of structure backfill placement are assumed to be the entire limits of excavations for the abutments and abutment wingwalls, and in all cases the structure backfill should extend a minimum of 3 feet laterally from the back edge of all walls.

Walls free to deflect a minimum of 0.2 percent of the wall height should be designed for the full active earth pressure condition and an active equivalent fluid unit weight on the order of 35 psf per foot of wall height. Walls restrained from lateral movement should be designed for the at rest condition using an equivalent fluid unit weight of 55 psf per foot of wall height. Retaining walls should be designed to drain water and avoid hydrostatic pressures. These recommendations assume a horizontal backfill surface, no surcharge loadings and adequate drainage. Surcharge loads from traffic, sloped backfills, or other sources, will impose additional pressures. Vertical surcharge loads (e.g. traffic loading) should be added to the above earth pressures after multiplying them by an earth pressure coefficient of 0.30 for active conditions, and 0.46 for at-rest

conditions. These values are based on an internal friction angle of 33 degrees for the structure backfill.

Horizontal loads acting on foundations cast in open excavations against undisturbed native soil or properly placed and compacted fill will be resisted by friction acting along the base of the footing and by passive earth pressures against the loaded side of the footing. If the design makes use of passive earth pressure against backfill, it is important that a representative of the geotechnical engineer be present to monitor and test backfill placement and compaction in order to develop passive resistance with low strains.

If heavy mechanical compaction equipment will be operating within a distance of one-half the retained height (defined as being from the backfill grade at the back of the wall to the wall base), additional earth pressure induced by compaction should be used in wall design. The additional earth pressure should be estimated using the procedure presented by Clough and Duncan (1991). If compaction equipment used adjacent to the walls is to consist of small rollers and tampers, the additional earth pressure should not be used.

5.2.2.6 Foundation Subgrade Preparation

Requirements for site and subgrade preparation across the entire project, including beneath the foundation elements, are presented in Section 5.8.1 and 5.8.2, respectively.

Foundation elements for the bridge and associated walls will be constructed on either native or new embankment fill soils. Trash, debris, vegetation (including roots) and other organics, any existing spread fill, any unstable (soft, loose, disturbed, water softened, sedimentation, collapsible, expansive, etc.) soils, and other deleterious materials should be removed from proposed structure foundation areas prior to construction. This site grading should extend laterally a minimum of 2 feet beyond the extents of the footing.

All areas of excavation should be observed and approved by the geotechnical engineer after clearing and before any placement of foundations or backfilling operations begin at the site. For all over-excavated areas that will receive engineered (compacted) fill, the exposed surface should be proof-rolled to determine if any pumping, soft of loose zones exist that should be further removed. Proof rolling should be performed as directed by the geotechnical engineer. Once the inspector, in consultation with the geotechnical engineer, agrees that sufficient material has been removed, the exposed surface upon which embankment fills are to be placed should be scarified to a depth of at least 9 inches and compacted in accordance with the Project Construction Specifications.

Subgrade preparation should be performed as outlined in Section 203 of the current ADOT Standard Specifications. In proposed foundation areas, the ground surface should be prepared to a minimum depth of 6 inches below finished subgrade. Subgrade preparation should consist of scarification of 6 inches, moisture conditioning to within 2 percent of the optimum moisture content, and compaction to a minimum of 95 percent of the maximum ASTM D698 Standard Proctor density.

If soft, loose, disturbed, water softened, low density, collapsible, expansive, or other undesirable materials are encountered in proposed footing areas at the exposed depth of over-excavation, the area should be deepened to extend through these undesirable materials. A lean concrete (Controlled Low Strength Material – MAG Section 728, 1-sack slurry mix) may be used to backfill.

Alternatively, the deepened area could be backfilled with structure backfill. The extent of removal of unsuitable materials should be as directed by the geotechnical engineer.

5.3 Slopes

5.3.1 Permanent Slopes

Non-stabilized embankment cut and fill slopes should be on the order of 3:1 (H:V) or flatter. Flatter slopes will promote re-vegetation and can accept landscaping. Slopes protected with slope paving or rock armored slopes should be not steeper than 2:1 (H:V).

5.3.2 Temporary Slopes

Temporary excavations for construction of footings, drilled shaft caps, etc. can be made with conventional earthmoving equipment. Temporary slopes should be excavated in accordance with OSHA (2020). In accordance with Subpart P, Appendix A, the native soils to a depth of approximately 20 feet are considered to be Type C soils. For excavations less than 20 feet in such soils, Subpart P, Appendix B indicates a maximum allowable unshored slope of 1.5H:1V for Type C soils. Flatter slopes may be required where either sandy soils are encountered or where the soils become excessively wet, and soft.

Should steeper slopes be required due to the proximity of existing structures or other contractor needs, the stability of the slopes should be verified by a registered geotechnical engineer (State of Arizona) who is proficient in slope stability analyses. Based on the overall site conditions, it does appear that steeper slopes will be feasible in some of the more fine-grained areas of the project, pending further analysis.

The perimeter of all excavations should be protected against water runoff and infiltration near the edges to maintain stability. Heavy equipment and spoil piles should not be allowed within 10 feet of the edge of the excavation. The perimeter of all excavations should be protected against water runoff and infiltration near the edges to maintain stability.

5.4 Pavements

5.4.1 Pavement Subgrade Support

Recommended design and construction control R-values were developed based on the results of laboratory testing on the subgrade soils and procedures presented in the ADOT Pavement Design Manual (PDM) (ADOT, 2017). Soil samples used to evaluate the pavement subgrade were obtained from within 5 feet or less of the proposed finished grade and are representative of the materials that will form the final roadway subgrade.

Table 4, at the end of the report, presents the results of correlated R-values determined using Table 202.02-3 in the ADOT PDM and laboratory R-value tests performed in accordance with ASTM D2844. These results are summarized in Table 5.20.

Table 5.20 Summary of Subgrade Testing Results

Parameter	Correlated R-Value [dim]	Tested R-Value [dim]
Number of Tests	124	8
Maximum	85	73
Minimum	15	9
Average	42.4	57.0
Standard Deviation	13.5	20.7

The design procedure outlined by the ADOT PDM for determining the design R-value resulted in a calculated design R-value of 39 for the project. However, the use of the calculated R-value of 39 would result in almost one-third of the subgrade soils tested not meeting this value. Therefore, a lower design R-value was considered to mitigate the amount of subgrade areas that would be deemed unsuitable. Through a review of the R-value data, a design R-value of 25 is recommended, which will also allow for less stringent borrow requirements since most of the mainline roadway will be on embankment fill.

Based on a design R-value of 25, a construction control R-value (Rcc) of 25 (minimum acceptable correlated R-value of soils for construction control purposes) was selected. Site soils identified during construction that do not meet the minimum Rcc should be over-excavated to a minimum depth of 3 feet below the finished subgrade elevation and replaced with soils meeting the construction control R-values outlined herein.

5.4.2 Site Grading for Embankments and Pavement

Recommendations for site grading beneath embankments and pavement are presented in Section 5.8.

5.5 Settlement due to Embankment Fills

Construction of embankment fills will result in settlement of the subsurface soils. As discussed in Section 5.2.1.2, this may result in the development of downdrag forces on drilled shaft foundations for the bridge abutments depending on the construction sequencing. In addition, settlement of the ground may impact roadways, the railroad and utilities (existing or constructed prior to the embankment fills). The project team identified the following project elements to be evaluated for settlement impacts due to construction of the embankment fill:

- UPRR tracks near SR 303L Cst. CL Sta. 1092+00;
- Kinder Morgan gas line located approximately 40 feet south and parallel to the UPRR;
- Broadway Road near SR 303L Cst. CL Sta. 1108+00;
- Gas line approximately 5 feet north and parallel to Broadway Road;
- Roosevelt Irrigation District line west of 175th Avenue near SR 303L Cst. CL Sta. 1120+50;
- City of Goodyear brine and water lines near SR 303L Cst. CL Sta. 1155+00;
- Sanitary sewer along Cotton Lane near SR 303L Cst. CL Sta. 1159+00 to 1161+00; and
- Sanitary sewer along Cotton Lane near SR 303L Cst. CL Sta. 1174+00 to 1183+00.

The settlement evaluation was performed in two stages: Stage 1) the current project, which builds the embankments similar to the ultimate southbound lanes; and Stage 2) the ultimate condition, which includes embankments for the ultimate northbound lanes to be built in the future. The settlements were estimated utilizing a combination of retaining walls and 3H:1V (horizontal to vertical) slopes for the embankment. Settlements were estimated using the Settle3 program by Rocscience. Maximum settlements are presented in Table 5.21 and graphical figures of the estimated settlement are included in Appendix I.

Table 5.21: Estimated Settlement at Existing Features due to Embankment Construction

Description	Approximate SR 303L Cst. CL Station	Maximum Estimated Settlement at Ground Surface [inches]		Maximum Estimated Settlement Gradient [feet/ foot]		Figure No.
		Stage I	Stage II	Stage I	Stage II	
Sanitary Sewer along Cotton Lane	1174+00 to 1183+00	< 0.25	---	< 0.001	---	I-7
UPRR Tracks	1092+00	< 0.1	---[1]	< 0.001	---	I-16
Kinder Morgan Gas Line	1091+50	< 0.1	---[1]	< 0.001	---	I-16
Gas Line north of Broadway Road	1108+00	~0.3	~0.7	0.001	0.001	I-19
Broadway Road	1108+00	~3.9	~4.2	0.001	0.001	I-20
RID Line west of 175th Avenue	1120+50	~1.4	~1.9	0.002	0.003	I-23
COG Brine and Water Lines	1155+00	~10[2]	~12[2]	0.006	0.007	I-32/ I-37
Sanitary Sewer along Cotton Lane	1159+00 to 1161+00	~2.8	---	0.002	---	I-38
Atlanta Avenue	1081+00	~6.5	~7.5	.006	.006	I-43

NOTE:
1. Settlement not evaluated at Stage II. Assumed the designer of the future NB roadway would adjust the bridge lengths as needed to ensure settlement at these features would be within acceptable ranges.
2. Settlement 10 feet below existing ground is approximately 2 inches less.

5.6 Surface Drainage

Long-term performance of pavement and structures will require that the subgrade soils and backfill be protected against excessive water infiltration and/or saturation. Surface drainage should be established away from foundations and pavements to minimize moisture infiltration into the subgrade. Structural fill and backfill should be well compacted to reduce possible moisture infiltration through loose soil intervals.

5.7 Preliminary Soil Corrosion or Degradation Potential

5.7.1 Metal in Contact with Soil

The corrosion potential of near surface soils on corrugated metal pipes was characterized using laboratory pH and electrical resistivity testing, performed on 44 samples in accordance with Arizona Test Method 236. The laboratory pH values ranged from 8.0 to 9.5 (average 8.7). The

resistivity values ranged from 339 to 5,890 ohm-centimeters (ohm-cm) (average 1,422 ohm-cm). It is recommended that the type and/or coating of metal in direct contact with soil be selected in accordance with ADOT Pipe Selection Guidelines (ADOT, 1996). Refer to Table B-1 for the test locations and results for each sample.

5.7.2 Concrete in Contact with Soil

A total of 72 samples from the current investigation were used for soluble sulfates and chlorides (Arizona Test Method 733 and Arizona Test Method 736) to support design of concrete structures. The results of these laboratory tests are included in Appendix B and summarized in Table B-1.

Total soluble sulfate values ranged from 4 to 1,437 parts per million (ppm) with an average of 196 ppm. The sulfate test measures the water-leachable or "available" sulfate content. These results were compared to Table 19.3.1.1, "Exposure Categories and Classes," in Section 19.3.1, of the American Concrete Institute's (ACI's) *Building Code Requirements for Structural Concrete* (ACI 2019). All but two (2) of the samples fall within Exposure Class S0 for water-soluble sulfate (SO_4^{2-}) in soil by percent mass (SO_4 < 0.1% or 1,000 ppm) and are categorized with a severity level of "not applicable" in terms of sulfate exposure. Based on ACI Table 19.3.2.1, "Requirements for Concrete by Exposure Class," in Section 19.3.2 (ACI 2019), there is no restriction on Portland cement type for concrete structures in contact with these materials. The remaining two samples fall within the Exposure Class S1 for water-soluble sulfate (SO_4^{2-}) in soil by percent mass (0.1% < SO_4 < 0.2% or between 1,000 and 2,000 ppm) and require the use of Type II cement in accordance with ACI 2019.

Chloride values ranged from 3 to 967 ppm with an average of 211 ppm. Regarding chloride attack, Section 19.3.2 (ACI 2019) indicates that when concrete is exposed to external sources of chlorides, concrete should be proportioned to satisfy the requirements for the applicable exposure class in Table 19.3.1.1 (ACI 2019). The anticipated concrete exposure for this segment falls within Exposure Class C1. Table 19.3.2.1 (ACI 2019) should be referred to for requirements for concrete by exposure class. For Exposure Class C1, the minimum compressive strength of concrete specified is 2,500 psi and the maximum water-soluble chloride ion content in concrete, by percent weight of cement, is 0.30% for non-prestressed concrete and 0.06% for prestressed concrete.

5.7.3 Further Evaluation

The results presented in this section are general in nature and may not be representative of site conditions. We recommend that the results of our laboratory testing be reviewed by a person or firm experienced in corrosion protection designs for the actual construction at the site, and/or by the appropriate pipe or material manufacturer. A qualified corrosion engineer should be consulted if corrosion of underground utilities is a concern or if a detailed evaluation is necessary.

5.8 Earthwork

5.8.1 Site Preparation

The following site grading recommendations are intended to provide support for the proposed SR 303L mainline pavements, associated embankments at the site and walls. The grading activities at the site should be performed under observation and testing directed by a geotechnical engineer.

All vegetation and debris should be removed from areas designated for pavement or embankment fill in accordance with Section 201 of the Standard Specifications (ADOT 2021). This site grading should extend laterally a minimum of 2 feet beyond pavement areas. Within the foundation footprint of each structure, remove all existing vegetation, existing structures, any uncontrolled fill, and any loose or otherwise unstable materials.

Soft and collapsible soils are present across the surface of the site to depths on the order of 2 to 15 feet. Accordingly, Ethos recommends the existing surface soils be improved through either over-excavation and re-compaction as engineered fill (i.e., moisture conditioned and properly compacted fill), high energy impact compaction (HEIC) or a combination of the two.

5.8.1.1 Ground Improvement

The soft and collapse-susceptible soils along the project alignment need to be improved to mitigate future potential settlement. The minimum depths and limits for improvement are outlined in Table 5.22. A graphical representation of the typical vertical and horizontal extents of the improvement limits is presented on Figure 24.

Table 5.22: Minimum Ground Improvement Depths and Limits

Begin SR 303L Cst CL Station[1]	End SR 303L Cst CL Station[1]	Minimum Improvement Depth (D_{Ex})[2] [feet]	Minimum Lateral Extension (L_{Ex}) [feet]
1066+00	1080+00	4	4
1080+00	1091+00	3	3
1091+00	1095+00	4	4
1095+00	1121+00	9	9
1121+00	1195+00	4	4
1195+00	1210+00	2	2
1210+00	1225+00	4	4
1225+00	1241+00	0[3]	2[3]
1241+00	1271+00	3	3

NOTE:
1. Areas beneath bridges over existing crossroads or the railroad within these limits are excluded.
2. Multiply D_{Ex} by 1.5 and roundup to the nearest whole number for HEIC methods.
3. Scarification, moisture conditioning and re-compaction required.

In general, if the soils are over-excavated, they are anticipated to be acceptable for reuse on the project site. If used within 3 feet of the finished pavement subgrade, they will need to meet the project subgrade requirements.

Additional ground improvement may be required at isolated locations based on the conditions encountered in the field during earthwork construction, and in particular at the locations of ephemeral drainages and areas of heavy vegetation. The minimum ground improvement depth includes all mainline, ramp, embankment, frontage road, and crossroad areas.

Ground improvement should extend a minimum lateral distance beyond the edges of all roadway, curb, embankment, and wall areas as shown in Table 5.22, or to a distance equal to the depth of

improvement below these areas, whichever distance is greater, unless approved otherwise by the Geotechnical Engineer. These areas should be initially graded to create a relatively flat surface to receive fill. A representative of the Geotechnical Engineer should inspect the final excavated surface prior to subgrade preparation.

5.8.1.2 High Energy Impact Compaction (HEIC)

Ground improvement using HEIC methods is a suitable alternative to over-excavation. HEIC utilizes high-energy impact rollers that impact and densify the ground. The specified ground improvement is a minimum of an N_{60} value of 30 blows per foot equal to a depth equal to 1.5 times the depth identified in Table 5.22 rounded up to the nearest whole number.

5.8.2 Subgrade Preparation

Prior to placement of engineered fill in areas not improved with HEIC, , the exposed ground should be subjected to proof rolling with a filled 4,000-gallon water truck to help mitigate potentially collapsible soils. Additionally, the exposed surfaces upon which fill or pavements are to be placed should be scarified to a depth of 6 inches, adjusted to a moisture content within the range of plus or minus 2 percent of optimum, and compacted to at least 95% of maximum dry density as determined by the applicable ADOT test methods.

A representative of the Geotechnical Engineer should observe the subgrade preparation activities. Excessively soft or loose soils at the over-excavation bottom that are not remediated by the outlined subgrade preparation should be improved as directed by the Geotechnical Engineer prior to fill placement.

5.8.3 Embankment Fill

Construction of embankment fill should be in accordance with Section 203 of the ADOT Standard Specifications for Road and Bridge Construction (ADOT, 2021) and the project's special provisions. Fill material should be placed in loose lifts no thicker than 10 inches where heavy compaction equipment is used, provided compaction can be achieved throughout the lift thickness. Where hand operated compactors are used, loose lifts should not exceed 6 inches in thickness. Fill lifts should be of uniform thickness when compacted. All fill should be compacted to a minimum of 95% of the maximum dry density at within plus or minus 2% of the optimum moisture content as determined per ASTM D698.

Approximately 85 to 90 percent of the settlement due to placing the embankment is expected to occur during construction with the remaining settlement to occur shortly afterwards. Embankment fills greater than 15 feet in height should be monitored to determine when the settlement is complete, and the next step of construction can proceed.

5.8.4 Monitoring

Settlement platforms and survey markers should be constructed for embankment fills, walls or a combination of the two equal to or greater than 15 feet. These should be constructed at intervals less than 500 feet. A minimum of two survey markers are required at each interval, one on each side of the embankment fill or wall. Survey should be performed a minimum of every two (2) weeks and should continue until settlement is substantially complete. Substantial completion will

be determined by the Engineer by plotting settlement versus time and looking for the asymptotic trend in the curve indicating substantial completion of movement. All data should be submitted to the Engineer for review.

5.8.5 Structure Backfill

The limits of structure backfill placement are assumed to be the entire limits of excavations for the abutments and abutment wingwalls. In all cases the structure backfill should extend a minimum of 3 feet laterally from the back edge of all walls as shown on ADOT Drawing No. SD 5.02. The structure backfill material should meet the requirements of Section 203 of the current ADOT Standard Specifications and those shown on ADOT Drawing No. SD 7.01. All structure backfill should be moisture conditioned to within 2 percent of the optimum moisture content and compacted to a minimum of 100 percent of the maximum ASTM D698 Standard Proctor density.

5.8.6 Earthwork Factors

Development of earthwork factors for near-surface materials was based on the evaluation and analysis of data from density tests on in situ soil samples and laboratory moisture-density relationships. The recommended earthwork factor for on-site materials was calculated using the following equation:

$$\% \text{ Shrink/Swell} = \left[1 - \frac{\gamma_{ex}}{\gamma_{fill}}\right] 100$$

Where:

γ_{ex} = in situ dry density of material to be excavated
γ_{fil} = 95 percent of the maximum dry density

The moisture-density relationships (Proctor) were developed using ASTM D698, Method A on 39 samples. The Proctor's that contained ten percent rock (material retained above the No. 4 sieve) or more were rock corrected in accordance with AZ Test Method 227c (ADOT 2019). An average rock-corrected maximum dry density for each soil type was determined. Proctor data was unavailable for the SP, SP-SM and GP soil types. Therefore, the Proctor value for the SM soil type was used as it was the most similar soil type. The rock-corrected maximum dry density values used in the analysis along with the average values based on soil type are summarized in Table 5, at the end of the report.

Individual density samples were evaluated using in-situ dry densities and maximum dry densities. For example, the sample collected at 5.0 to 6.0 feet in boring B-14 had an in situ dry density of 109.2 pcf. Using 95 percent of the maximum dry density and the tested in situ dry density, the following calculation was made:

γ_{fill} = 0.95(120.7) = 114.7 pcf
γ_{ex} = 109.2 pcf
% Shrink/Swell = $\left[1 - \frac{109.2}{114.7}\right] 100$ = 4.8%.

Positive results indicated shrink and negative results indicate swell. Based on the positive result, the material represented by the sample is anticipated to swell approximately 4.8 percent when compacted to 95 percent of the maximum dry density. This process was completed for the 28 in situ near-surface (upper 10 feet) samples collected on the project. Calculations for individual samples are provided in Table 6, at the end of this report. An average earthwork factor of 12 percent shrink was calculated for the project. Accounting for a likely average compaction percentage greater than 95 percent and the requirement to round to the nearest 5 percent increment (ADOT 2021b), an earthwork factor of 15 percent shrink is recommended.

5.8.7 Ground Compaction Factor

The ground compaction factor is an estimate of the ground height loss, including clearing and grubbing, that will result from compaction of the surface to 95% relative compaction. The impact of clearing and grubbing is a function of the existing ground cover. The existing ground cover varies across the project between sparse vegetation and heavy vegetation associated with the existing agricultural fields. On average, the project falls within the moderate vegetation category. The impact from compaction is related to the fill placement height. The proposed SR 303L extension is primarily above grade with fills ranging from approximately 0 to 40 feet with the weighted average height falling within the moderate fill placement category of between 10 and 25 feet (ADOT 2021b). Based on these factors, the ground compaction factor would be 0.30 feet. However, in addition to these aspects of ground loss, there is some additional anticipated ground loss due settlement of the soft site soils due to the embankment loading and the collapse that is expected to occur during subgrade preparation. Based on these factors and the settlement analyses across the project, the recommended ground compaction factor for the project is 0.60 feet. Settlement of the planned fill embankments and of the near-surface native soils is anticipated in response to embankment construction; however, most settlement is expected to occur during construction of the embankments.

5.9 Agronometric (Topsoil) Tests

Agronometric testing was performed by IAS Laboratories for the current investigation on six selected near-surface or shallow composite soil samples for the project. The testing consisted of percent calcium carbonate; pH; soluble salts; sodium; exchangeable sodium percent via calcium, magnesium and sodium; plasticity index; gradation sieve analysis; calcium; magnesium; potassium; iron; zinc; manganese; copper; molybdenum; salinity; nitrate; phosphate; sulfur; boron; free lime; cation exchange capacity; chloride; nickel; and cobalt. IAS Laboratories prepared a soil analysis report for each composite sample. The laboratory test results and recommendations are included in Appendix B.

6.0 CLOSURE

The geotechnical services were performed in a manner consistent with that level of care and skill ordinarily exercised by other members of the geotechnical profession practicing in the same locality, under similar conditions and at the date the services were provided. Our conclusions, opinions and recommendations are based on the completed test borings, visual observations and the review of plans prepared by others. It is possible that conditions could vary beyond the data evaluated. Ethos makes no guarantee or warranty, express or implied, regarding the services, communication (oral or written), report, opinion, or instrument of service provided.

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7.0 REFERENCES

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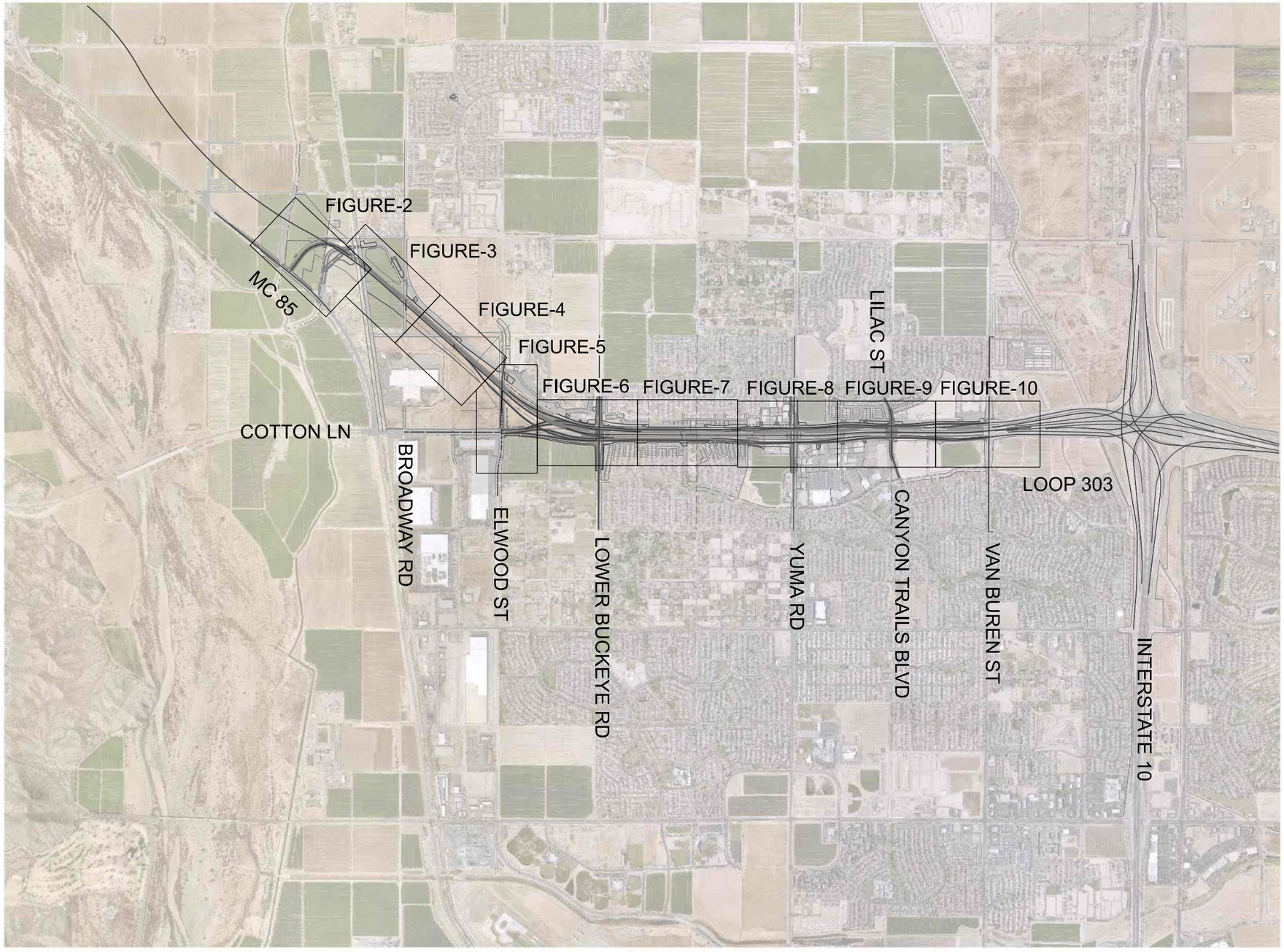
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FIGURES



JOB NO.	2021037
DESIGN	DNF
DRAWN	HGM
DATE:	12/2024
SCALE:	1" = 200'

VICINITY MAP

SR 303L, MC 85 TO VAN BUREN ST
MARICOPA COUNTY

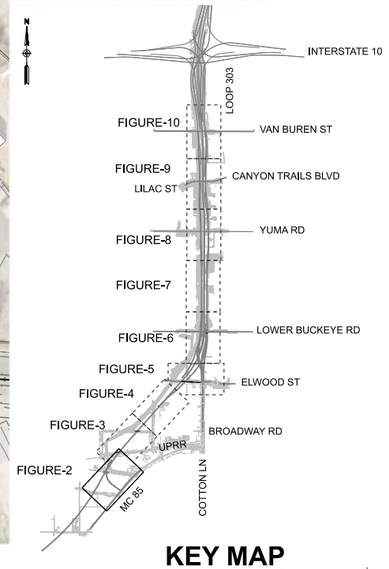
FIGURE 1

ethos ENGINEERING, LLC.
9180 S Kyrene Rd
Suite #104
Tempe, AZ 85284

MATCH LINE - SEE FIGURE 3

MATCH LINE - SEE FIGURE 3

B-133
B-134
B-135
B-137
B-139
B-141
B-142
B-140
SL-01
B-136
B-138
B-132
B-131
B-129A
B-130
B-129
UPRR
LOOP 303
P-10
P-9
P-8
P-7
P-6
END OF FREEWAY
MC 85
B-128
B-127
B-126
BEGIN PROJECT
1070
1075
1080
1085
1090
15+00
20+00
25+00
30+00
35+00



KEY MAP

0 50 100 200
SCALE: 1" = 200'

LEGEND:

Boring Location & ID (New)

Seismic Line & ID (New)

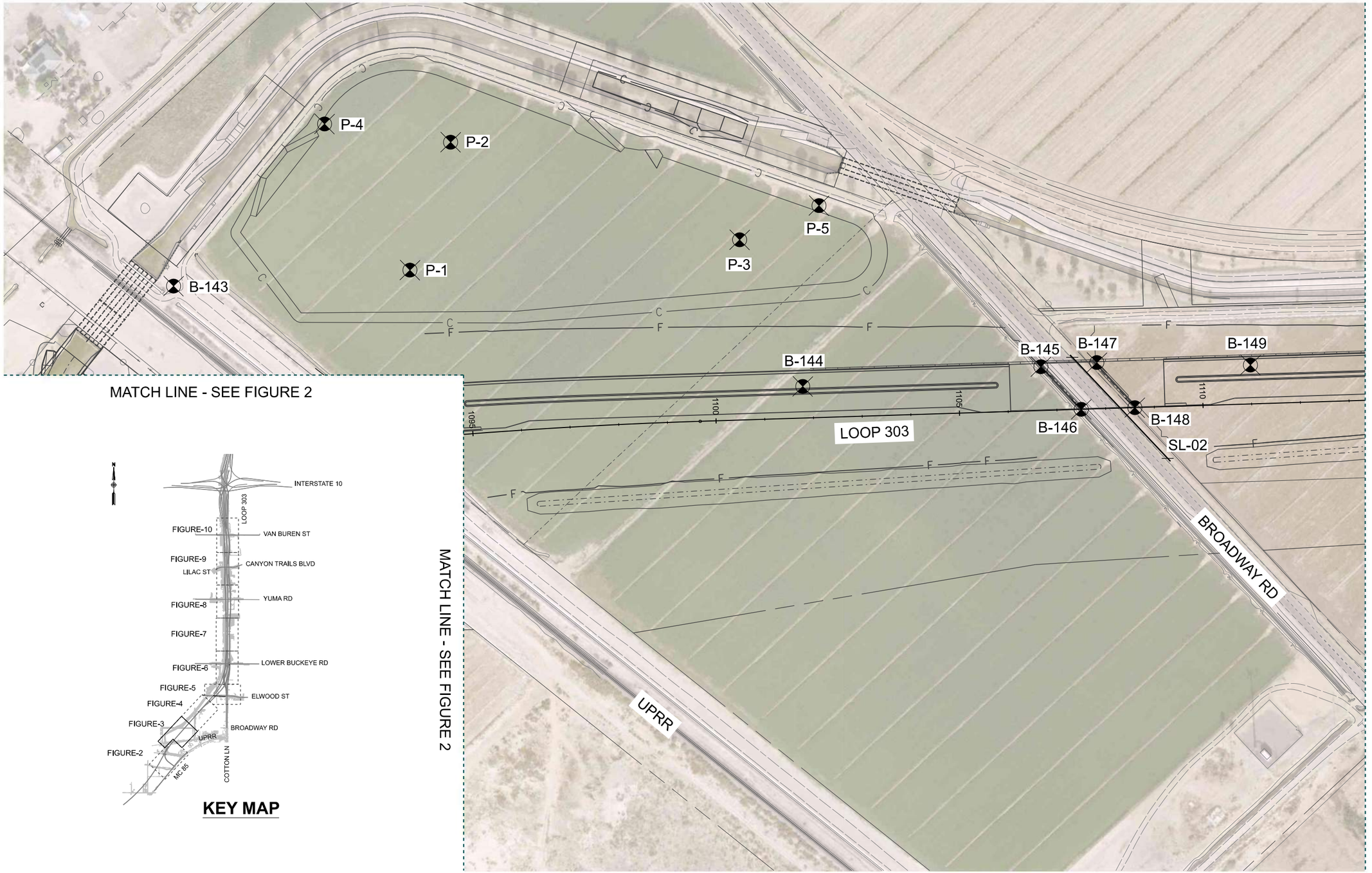
JOB NO.	2021037
DESIGN	DNF
DRAWN	HGM
DATE:	12/2024
SCALE:	1" = 200'

GEOTECHNICAL INVESTIGATION PLAN

SR 303L, MC 85 TO VAN BUREN ST
MARICOPA COUNTY

FIGURE 2

ethos ENGINEERING, LLC.
9180 S Kyrene Rd
Suite #104
Tempe, AZ 85284



KEY MAP

0 50 100 200

SCALE: 1" = 200'

LEGEND:

Boring Location & ID (New)

Seismic Line & ID (New)

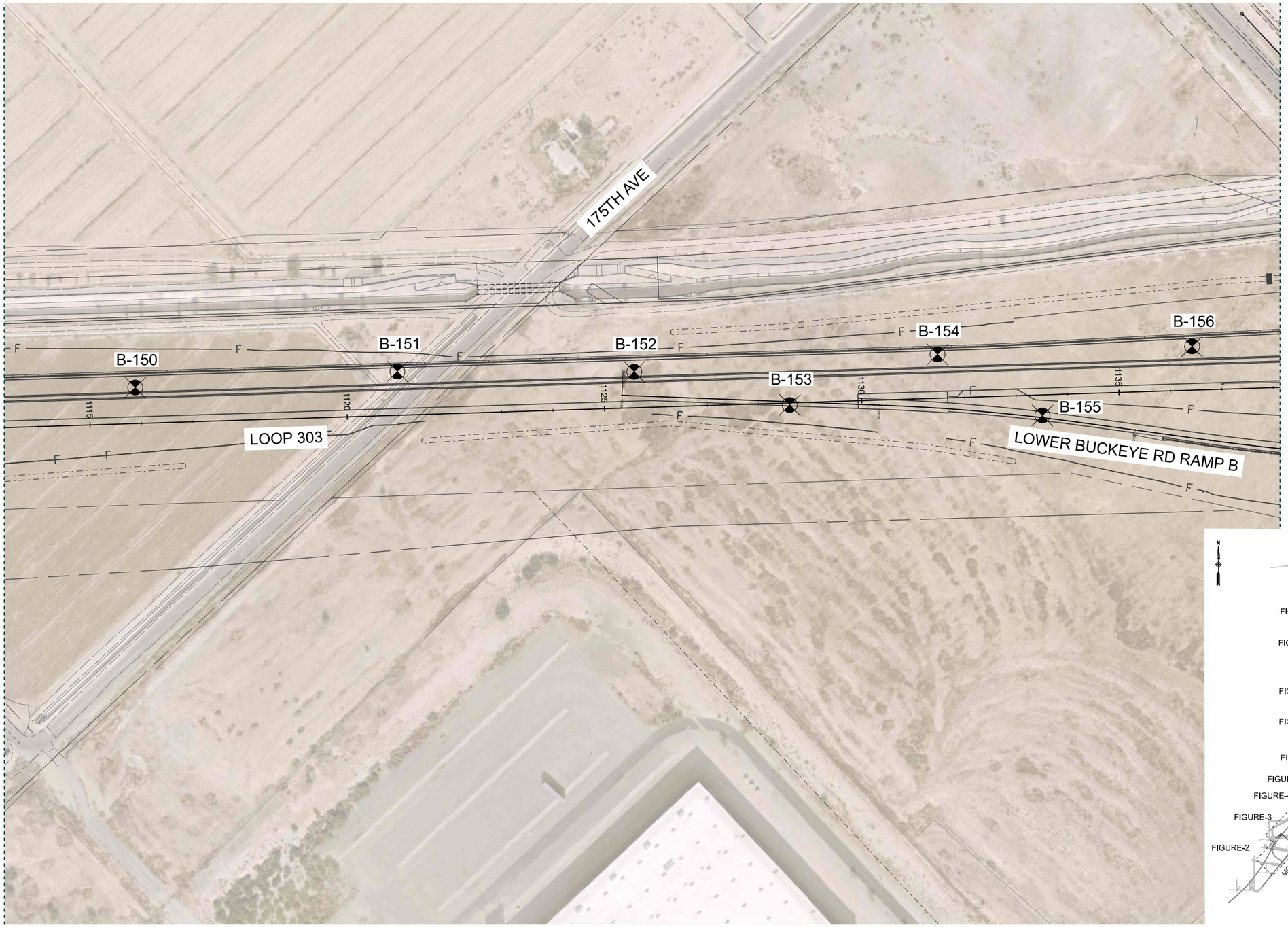
JOB NO.	2021037
DESIGN	DNF
DRAWN	HGM
DATE:	12/2024
SCALE:	1" = 200'

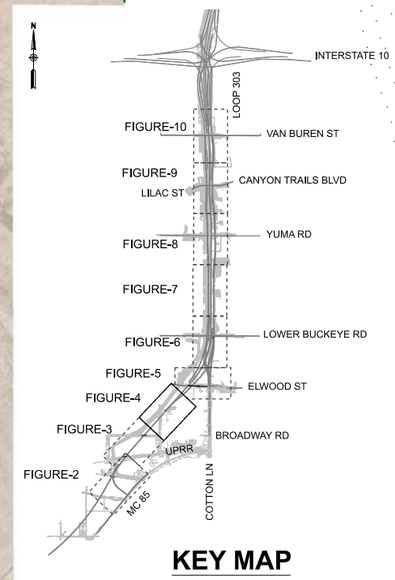
GEOTECHNICAL INVESTIGATION PLAN

SR 303L, MC 85 TO VAN BUREN ST
MARICOPA COUNTY

FIGURE 3

ethos ENGINEERING, LLC.
9180 S Kyrene Rd
Suite #104
Tempe, AZ 85284





KEY MAP

0 50 100 200
SCALE: 1" = 200'

LEGEND:

Boring Location & ID (New)

JOB NO.	2021037
DESIGN	DNF
DRAWN	HGM
DATE:	12/2024
SCALE:	1" = 200'

GEOTECHNICAL INVESTIGATION PLAN

SR 303L, MC 85 TO VAN BUREN ST
MARICOPA COUNTY

FIGURE 4

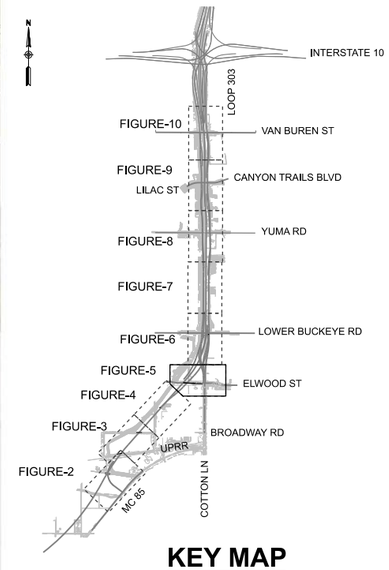
ethos ENGINEERING, LLC.
9180 S Kyrene Rd
Suite #104
Tempe, AZ 85284

MATCH LINE - SEE FIGURE 6

B-172
B-170
B-4
B-2
B-168
B-3
B-169
B-167
B-1
B-162
B-163
B-166
B-160
B-161
B-165
B-158
B-159
B-164
C-1
C-2
B-157

LOOP 303
LOWER BUCKEYE RD RAMP B
ELWOOD ST RAMP D
ELWOOD ST
COTTON LN

MATCH LINE - SEE FIGURE 4



KEY MAP

0 50 100 200
SCALE: 1" = 200'

N

LEGEND:

Boring Location & ID (New)

JOB NO.	2021037
DESIGN	DNF
DRAWN	HGM
DATE:	12/2024
SCALE:	1" = 200'

GEOTECHNICAL INVESTIGATION PLAN

SR 303L, MC 85 TO VAN BUREN ST
MARICOPA COUNTY

FIGURE 5

ethos ENGINEERING, LLC.
9180 S Kyrene Rd
Suite #104
Tempe, AZ 85284

MATCH LINE - SEE FIGURE 5

MATCH LINE - SEE FIGURE 7

B-5 B-175 B-177 B-179 B-7 B-171 B-182 B-176 B-178 B-184 B-9 B-180 B-181 B-7A B-8 B-183 B-186 B-10 B-173 B-174 B-185 B-187 B-11 B-12 B-188 B-22 B-16 B-6 B-13 B-14 B-15 B-17 B-18 B-19 B-20 B-21 B-23 B-25

ELWOOD ST RAMP D

LOWER BUCKEYE RD RAMP B

B-28 B-24 B-26 B-30 B-31 B-32 B-33 B-34 B-35

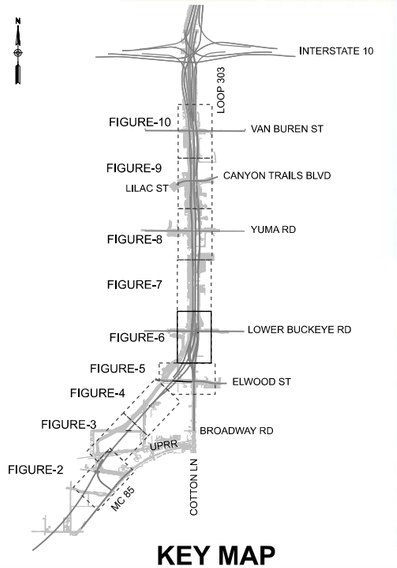
LOOP 303

B-37 B-38 B-39 B-40 B-41 B-27 B-36

LOWER BUCKEYE RD

B-29

SD



KEY MAP

0 50 100 200

SCALE: 1" = 200'

LEGEND:

Boring Location & ID (New)

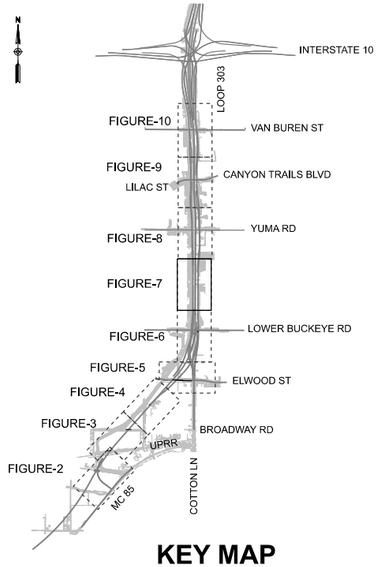
JOB NO.	2021037
DESIGN	DNF
DRAWN	HGM
DATE:	12/2024
SCALE:	1" = 200'

GEOTECHNICAL INVESTIGATION PLAN

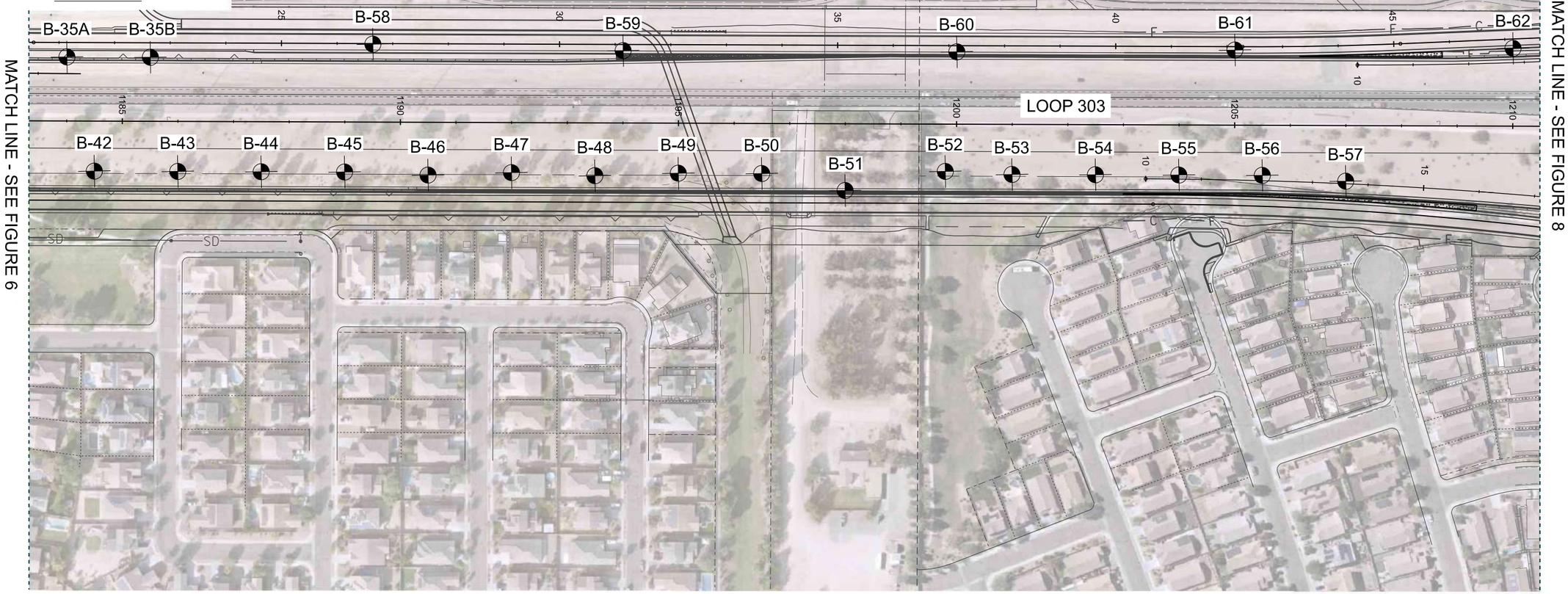
SR 303L, MC 85 TO VAN BUREN ST
MARICOPA COUNTY

FIGURE 6

ethos ENGINEERING, LLC.
9180 S Kyrene Rd
Suite #104
Tempe, AZ 85284



KEY MAP



0 50 100 200
SCALE: 1" = 200'

LEGEND:

Boring Location & ID (New)

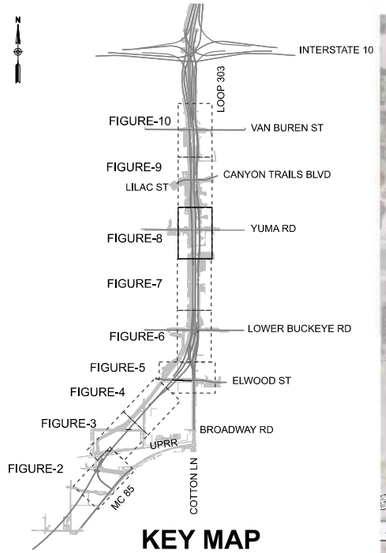
JOB NO.	2021037
DESIGN	DNF
DRAWN	HGM
DATE:	12/2024
SCALE:	1" = 200'

GEOTECHNICAL INVESTIGATION PLAN

SR 303L, MC 85 TO VAN BUREN ST
MARICOPA COUNTY

FIGURE 7

ethos ENGINEERING, LLC.
9180 S Kyrene Rd
Suite #104
Tempe, AZ 85284



KEY MAP

MATCH LINE - SEE FIGURE 7

MATCH LINE - SEE FIGURE 9

B-63 B-64 B-67 B-68 B-69 B-70 B-73 B-74 B-75 B-77 B-79 B-81 B-82 B-83 B-86

B-190 B-191 B-66 B-65 B-71 B-72 B-76 B-78 B-84 B-85 B-192 B-85B B-85A B-193 B-87

B-80

LOOP 303

YUMA RD

0 50 100 200
SCALE: 1" = 200'

LEGEND:

Boring Location & ID (New)

JOB NO.	2021037
DESIGN	DNF
DRAWN	HGM
DATE:	12/2024
SCALE:	1" = 200'

GEOTECHNICAL INVESTIGATION PLAN

SR 303L, MC 85 TO VAN BUREN ST
MARICOPA COUNTY

FIGURE 8

ethos ENGINEERING, LLC.
9180 S Kyrene Rd
Suite #104
Tempe, AZ 85284

MATCH LINE - SEE FIGURE 8

MATCH LINE - SEE FIGURE 10

LILAC ST

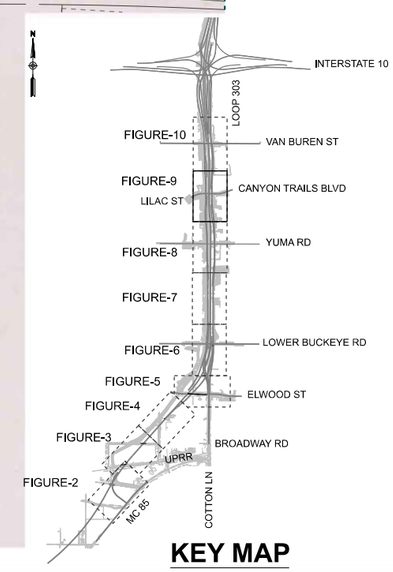
CANYON TRAILS BLVD

LOOP 303

B-88 B-89 B-90 B-91 B-91A B-92 B-93 B-94 B-94A B-95 B-96 B-97 B-97A B-98 B-98A B-99 B-100 B-101 B-102 B-103 B-104 B-105 B-106 B-107 B-108 B-109 B-110 B-111 B-112 B-113 B-113A B-114 B-115 B-116 B-117 B-118 B-119 B-119A B-194 B-195

34+61.41

Developer plans/Canyon Trails



KEY MAP

0 50 100 200

SCALE: 1" = 200'

LEGEND:

Boring Location & ID (New)

JOB NO.	2021037
DESIGN	DNF
DRAWN	HGM
DATE:	12/2024
SCALE:	1" = 200'

GEOTECHNICAL INVESTIGATION PLAN

SR 303L, MC 85 TO VAN BUREN ST
MARICOPA COUNTY

FIGURE 9

ethos ENGINEERING, LLC.
9180 S Kyrene Rd
Suite #104
Tempe, AZ 85284

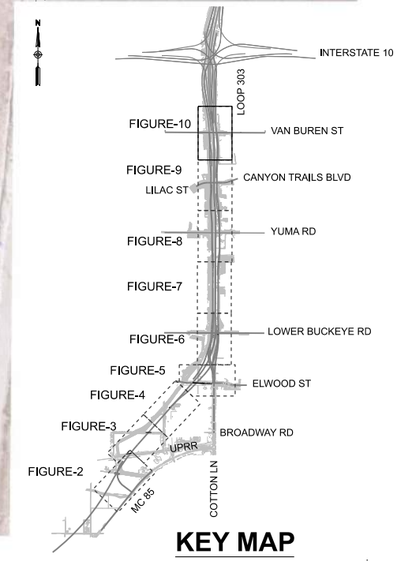
MATCH LINE - SEE FIGURE 9

B-120
B-121
B-122
B-123
B-124
B-124A
B-124B
B-125
B-196
B-196A
B-196B
B-196C
B-196D
B-197
B-198
B-199
B-119B

END PROJECT

LOOP 303

VAN BUREN ST



KEY MAP

0 50 100 200
SCALE: 1" = 200'

LEGEND:

Boring Location & ID (New)

JOB NO.	2021037
DESIGN	DNF
DRAWN	HGM
DATE:	12/2024
SCALE:	1" = 200'

GEOTECHNICAL INVESTIGATION PLAN

SR 303L, MC 85 TO VAN BUREN ST
MARICOPA COUNTY

FIGURE 10

ethos ENGINEERING, LLC.
9180 S Kyrene Rd
Suite #104
Tempe, AZ 85284

FIGURE 11 - GEOTECHNICAL SITE PROFILE - NB and SB
GENERAL LITHOLOGIC PROFILE ALONG SR 303L FROM SOUTH TO NORTH
LOOKING WEST

ethos ENGINEERING, LLC.

USCS PROFILE

Legend	Color	USCS	General Description
		CH, MH, CL/CH, SC/CH, SM/MH, ML/MH	High PI Silts and Clays
		CL, SC/CL, CL-ML	Low to Medium PI Clays
		ML, SM/ML	Low to Medium PI Silts
		SC-SM, SC	Clayey Sands
		SP-SC, SM	Silty Sands and Sands w/ Clay
		SP, SP-SM, SW, SW-SM	NP Sands
		GC-GM, GC, GC/SC	Clayey Gravels
		GP-GC, GM	Silty Gravels and Gravels w/ Clay
		GP, GP-GM, GW/SW, GW-GM, GP/SP	NP Gravels

UPRR STA 1092+00 | ***Broadway Road STA 1108+00*** | ***Elwood Street STA 1143+00***

Station	1069+00	1070+80	1072+40	1074+75	1075+00	1081+50	1083+00	1084+50	1084+80	1086+30	1086+40	1088+30	1089+30	1089+60	1090+40	1091+50	1092+70	1093+00	1094+50	1094+95	1095+50	1097+45	1100+50	1101+80	1105+60	1106+70	1107+50	1107+85	1108+60	1111+00	1115+90	1121+00	1125+60	1128+60	1131+50	1133+50	1136+45	1138+90	1141+50	1142+15	1142+30	1142+40	1143+10	1143+20	1143+85	1144+00
Boring ID	P-6	P-7	P-8	P-9	P-10	B-129	B-130	B-133	B-131	B-134	B-132	B-135	B-136	B-143	B-137	B-138	B-139	B-140	B-141	P-1	B-142	P-2	P-4	P-3	B-144	P-5	B-145	B-146	B-147	B-148	B-149	B-150	B-151	B-152	B-153	B-154	B-155	B-156	B-157	B-158	B-160	B-1	B-159	B-161	B-162	B-164	B-163
Elevation	896	895	896	895	893	899	899	900	899	899	899	896	896	903	901	901	902	902	902	900	902	900	900	900	905	900	906	907	905	906	906	908	911	914	914	918	918	922	922	926	927	928	927	927	927	928	928
Depth (ft)	16.5	16.5	16.5	16.5	16.5	61.5	TBD	61	TBD	61.5	61	101.5	101.5	31	121.5	120.5	TBD	TBD	TBD	10	TBD	100	20	10	41.5	20	101.5	101.5	101.5	101.5	40.2	21.5	21	21	11.5	21	21	56	61	101.5	101.5	6.5	101.5	101.5	101.5	101.5	101.5
1010																																														
1005																																														
1000																																														
995																																														
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945																																														
940																																														
935																																														
930																																														
925																																						SC-SM	SC-SM	CL-ML	SC-SM	SC	SM	GC-GM	CL
920																																				SC-SM	SC-SM	SC-SM	SM	CL-ML	SC	SC	SM	SC-SM	CL-ML
915																																			SM	SM	SC-SM	SP-SM	SC-SM	GC-GM		SC-SM	SC	SC	GC-GM	SM
910																																SC-SM	SC-SM	SM	SM	ML	SP-SM	SP-SM	SP-SM	SC		SC	SC-SM	SC	CL-ML	SC
905																								CL-ML		CL-ML	ML	CL-ML	ML	ML	MH	MH	MH	SC-SM	SC-SM	SM	SP-SM	ML	SC	SC	CL	SC/CL		SC	SC-SM	GC	GC-GM	SC
900								CL						CL-ML	CL-ML	CL-ML				CL-ML		CL-ML	CL-ML	CL-ML	CL-ML	CL-ML	ML	ML	ML	SM	ML	SC-SM	CL-ML	SM	SP-SM	ML	SC	SC	SC-SM	SC/CL		SC	CL	CL	SC	GC
895	CL	CL	CL	CL		CL		CL		CL	CL	CL	CL	CL	CL-ML	ML				CL-ML		CL-ML	SP	CL-ML	ML	CL-ML	CL-ML	ML	ML	SM	SM	ML	SC-SM	CL-ML		SC	ML	SC	SC	SC-SM	SC		SC	SC	SC	SC	SC
890	CL	CL	CL	CL	CL	ML		ML		CL	CL	CL	CL	ML	CL-ML	ML				CL-ML		CL-ML	CL-ML	CL-ML	ML	CL	CL	CL	CL	SM	CL	ML	SC-SM	CL-ML				CL	CL	SC-SM	SC		SC	SC	SC	SC	CH
885	ML	SM	SM	SM	CL	ML		ML		CL	CL	CL	CL	SM	SP-SM	SP-SM				CL		CL	CL	SC	CL	CL	CL	CL-ML	SM	CL	SM	CL						CL	CL	SC	SC		SC	CL	SC	SC	CH
880	SP-SM	SM	SP-SM	SP-SM	SM	ML		SP		CL	CL	SP	SP	SM	GP	SP-SM							SP		SP-SM	CL	SM	SP-SC	GP-GM	SM	CL						CH	CH	CL	SC		CL	SC	SC	SC	CH
875					SP-SM	GP		SP		SP	SP	SP	SP	SM	GP	GP									SP-SM		GP-GM	SP-SM	GP-GM	SM	SC						CH	CH	SC	SC		CL	CL	SC	SC	GC
870						GP		GP-GM		GP-GM	GP-GM	SP	SP	GP	GP	GP									SP		GP-GM	GP-GM	GP-GM	GP	GP-GM						SC	SC	SC-SM	SP-SC		SP-SM	CL	SC	CL	SC
865						GP		GP-GM		GP-GM	GP-GM	GP-GM	GP		GP	GP									SP		GP-GM	SP-SM	GP-GM	GP	GP-GM						SC	SC	SC-SM	SM		SP-SC	SM	SM	CL	SM
860						GP		GP-GM		GP-GM	GP-GM	GP-GM	GP		GP	SP-SM											GP-GM	SP-SM	GP-GM	GP								CL	SP	SP-SM		SP-SM	SC-SM	SC	SM	SM
855						GP		GP		GP	GP	GP-GM	GP		GP	SP-SM											GP-GM	SP-SM	GP	SP									GP-GM	SP-SM		SP-SM	SP-SM	CH	SM	SM
850						GP		GP		GP	GP	GP-GM	GP		GP	SP-SM											GP-GM	GP-GM	GP	SP									GP	SC		SP-SM	SP-SM	SP-SM	SM	SP
845						GP/SP		GP		GP	GP	GP-GM	GP		GP-GM	GP-GM											GP-GM	GP-GM	GP	GP									SP	SP		SP-SM	SP-SM	GP-GM	CL	SP
840						SP		GP		GP	GP	GP-GM	SC		SC	GP-GM											SP	GC	GP/SP	SP									GP	SP-SC		SP	SP-SC	GP-GM	GP-GM	GP-GM
835						SP				SP	SP	GP-GM	SC		SP	GP-GM											SP	SP	GP/SP	SP									SP	SP-SC		SP	GP	GP-GM	GP-GM	GP-GM
830												GP	GP		SP-SM	SP-SM											SP-SM	SP-SM	GP/SP	SP									SP	CL		SP-SC	SP-SC	GP-GC	SP	GP
825												GP	SC		SP-SM	SP-SM											SP-SM	SP-SM	GP/SP	SP									SP	SC		SP-SC	GP-GC	SP	SP	SP
820												SP-SM	SC		SP-SM	SC											SP	SP-SM	SP-SC	SP																
815												SP	SP		SC-SM	SC-SM											SP-SM	SP-SM	SP	SP-SM																
810												SP	SP		SC-SM	SP											SP-SM	SP-SM	SP-SM	SP-SM																
805												SC	SC		SC-SM	SP-SM											SP	SP-SM	SP-SM	CL																
800												SC	SP		SC-SM	SP																														
795												SP	SP		SC	SM																														
790															SM	SM																														
785															SM	SM																														
780															CL	SM																														

N-VALUE PROFILE

Legend	Color	N-Value (BPF)	Notes
		0 to < 10	1) N-values are uncorrected for energy efficiency.
		10 < to < 30	2) Correction factor of (Ring sampler blowcount)*(0.65) = SPT N-Value used for relative
		30 < to < 50	firmness color coding. 3)
		< 50	Blowcounts marked with "---" denote borings where samples were not driven.

UPRR STA 1092+00 | ***Broadway Road STA 1108+00*** | ***Elwood Street STA 1143+00***

Station	1069+00	1070+80	1072+40	1074+75	1075+00	1081+50	1083+00	1084+50	1084+80	1086+30	1086+40	1088+30	1089+30	1089+60	1090+40	1091+50	1092+70	1093+00	1094+50	1094+95	1095+50	1097+45	1100+50	1101+80	1105+60	1106+70	1107+50	1107+85	1108+60	1111+00	1115+90	1121+00	1125+60	1128+60	1131+50	1133+50	1136+45	1138+90	1141+50	1142+15	1142+30	1142+40	1143+10	1143+20	1143+85	1144+00
Boring ID	P-6	P-7	P-8	P-9	P-10	B-129	B-130	B-133	B-131	B-134	B-132	B-135	B-136	B-143	B-137	B-138	B-139	B-140	B-141	P-1	B-142	P-2	P-4	P-3	B-144	P-5	B-145	B-146	B-147	B-148	B-149	B-150	B-151	B-152	B-153	B-154	B-155	B-156	B-157	B-158	B-160	B-1	B-159	B-161	B-162	B-164	B-163
Elevation	896	895	896	895	893	899	899	900	899	899	899	896	896	903	901	901	902	902	902	900	902	900	900	900	905	900	906	907	905	906	906	908	911	914	914	918	918	922	922	926	927	928	927	927	927	928	928
Depth (ft)	16.5	16.5	16.5	16.5	16.5	61.5	TBD	61.0	TBD	61.5	61.0	101.5	101.5	31.0	121.5	120.5	TBD	TBD	TBD	10.0	TBD	100.0	20.0	10.0	41.5	20.0	101.5	101.5	101.5	101.5	40.2	21.5	21.0	21.0	11.5	21.0	21.0	56.0	61.0	101.5	101.5	6.5	101.5	101.5	101.5	101.5	101.5
1010																																														
1005																																														
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925																																						31	13	29	12	21	16	34	14
920																																				28	10	17	25	17	15	26	13	21	11
915																																		12	34	23	13	5	17		20	27	11	25	18
910																															5	25	22	7	13	5	40	25	51		100	98	100	100	39
905																								8		7	5	4	3	5	3	11	5	13	6	7	29	23	35	62		100	100	100	13	58
900								13						5	8	3				---		---		6		5	3	4	3	2	2	6	26	22	11	9	18	20	31	59		21	30	21	53	100
895	4	4	4	8		11		9		21	24	15	16	9	7	8				---		---	9	---	7	5	3	5	6	5	4	5	7	22		10	8	100	100	51	21		23	20	28	25	25
890	4	3	5	2	4	9		6		11	9	11	14	6	20	6				---		---	9	---	10	14	5	5	3	10	2	18	10	9				32	100	20	47		100	29	31	19	21
885	2	12	8	9	3	6		15		6	7	13	19	13	11	43							15		6	18	8	11	3	12	9	14						27	26	13	23		18	20	24	65	21
880	12	42	28	39	11	7		22		8	7	9	21	6	16	31							15		10	17	16	9	100	3	5							5	5	43	15		41	16	86	42	38
875					38	27		25		21	11	7	8	14	14	16									7		17	14	19	21	40							26	34	15	35		39	11	18	19	100
870						25		34		39	24	20	31	21	20	29									26		52	15	43	86	62							41	30	32	45		33	57	36	100	100
865						41		77		23	60	56	17		11	17									42		71	10	29	20	100							15	23	69	16		23	41	28	15	20
860						18		21		29	553	32	20		18	31											93	9	19	28									27	20		16	17	13	26	15
855						26		29		32	47	100	98		7	10											56	33	67	27									23	30		16	15	18	14	21
850						25		33		50	92	100	55		7	2											52	100	54	15									3	18		25	21	32	28	28
845						45		30		27	24	33	48		21	9											43	54	39	38									33	28		3	15	24	16	16
840						27		29		26	40	37	24		41	3											70	16	18	29									3	35		2	74	35	38	18
835						17				20	14	43	39		15	16											29	28	33	42									28	57		8	68	37	69	30
830												6	20		30	66											16	49	34	42									28	27		29	45	36	57	26
825												53	18		28	36											52	30	27	39									29	26		26	49	28	43	14
820												40			23	36											19	31	28	21																
815												40	20		55	27											28	12	52	26																
810												40	16		20	43											26	75	44	23																
805												56	24		27	67											27	44	26	12																
800												59	36		38	22																														
795												23	22		39	70																														
790															39	44																														
785															33	61																														
780															16	100																														

FIGURE 11 - GEOTECHNICAL SITE PROFILE - NB and SB
GENERAL LITHOLOGIC PROFILE ALONG SR 303L FROM SOUTH TO NORTH
LOOKING WEST

ethos ENGINEERING, LLC.

USCS PROFILE

Legend	Color	USCS	General Description
		CH, MH, CL/CH, SC/CH, SM/MH, ML/MH	High PI Silts and Clays
		CL, SC/CL, CL-ML	Low to Medium PI Clays
		ML, SM/ML	Low to Medium PI Silts
		SC-SM, SC	Clayey Sands
		SP-SC, SM	Silty Sands and Sands w/ Clay
		SP, SP-SM, SW, SW-SM	NP Sands
		GC-GM, GC, GC/SC	Clayey Gravels
		GP-GC, GM	Silty Gravels and Gravels w/ Clay
		GP, GP-GM, GW/SW, GW-GM, GP/SP	NP Gravels

Low

Station	1144+50	1145+60	1146+50	1148+00	1148+40	1149+15	1152+50	1153+50	1155+00	1155+25	1155+40	1156+60	1157+10	1157+80	1157+80	1158+75	1158+75	1159+40	1159+50	1159+75	1159+75	1160+60	1160+70	1160+75	1161+60	1161+60	1161+65	1162+30	1162+55	1162+55	1162+90	1163+45	1164+10	1164+25	1165+00	1165+50	1165+60	1166+45	1166+50	1167+00	1167+00	1168+30	1168+80	1169+90	1170+60	1171+00	1171+70
Boring ID	B-165	B-166	B-167	B-2	B-168	B-169	B-170	B-3	B-4	B-172	B-5	B-171	B-173	B-175	B-176	B-177	B-178	B-174	B-6	B-179	B-180	B-181	B-13	B-7	B-182	B-183	B-14	B-7A	B-184	B-185	B-15	B-186	B-16	B-8	B-187	B-17	B-9	B-189	B-188	B-10	B-18	B-19	B-11	B-20	B-12	B-21	B-22
Elevation	928	930	931	932	933	931	934	933	933	931	933	933	932	934	933	935	934	934	933	934	934	934	934	934	935	934	934	934	935	934	934	934	934	934	935	935	935	934	935	936	936	936	937	937	938	937	937
Depth (ft)	101.5	101.5	61.5	6.5	36.5	36.3	36	6.5	6.5	101.5	6.5	61.5	101.5	101.5	101.5	20.9	101	101.5	61.5	101.5	101.5	101.5	61.5	11.5	101.5	101.5	61.5	36.5	101.5	101.5	71.5	101.5	76.5	81.5	81.5	81.5	81.5	TBD	81.5	71.5	71.5	66.5	61.5	61.5	61.5	61.5	101.5
1010																																														
1005																																														
1000																																														
995																																														
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965																																														
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955																																														
950																																														
945																																														
940																																														
935																SC									CL-ML				CL										CL	CL-ML	CL	SM	ML	SM	SP-SM	ML	SC-SM
930		CL	SC-SM	SC-SM	SC-SM	SC-SM	SM	SM	SM	ML	SC-SM	SM	SM	CL-ML	CL-ML	CL	SC	ML	SM	SC/CL	CL	CL	ML	SC	SC-SM	SC/CL	SM	SC-SM	SC-SM	CL	SC-SM	CL	SM	CL-ML	SC-SM	SP	CH		SC-SM	SM	CL-ML	SM	SM	SP	ML	ML	SC-SM
925	CL-ML	SC-SM	SP-SM	SM	SC-SM	GP-GC	SM	SM	SM	ML	SP	SM	SM	SM	CL-ML	SP-SM	SC	SM	SM	SC/CL	ML	CL	SC-SM	SC	SM	SC/CL	SC-SM	SC-SM	SM	CL	SC	CL	SC	CL-ML	SM	SP	SM		SC-SM	SC	SC-SM	SM	SP-SM	SC	SM	SC	ML
920	SP-SM	SP-SM	SP-SM		SC-SM	SP-SM	SM			SM		SM	CL	SP-SM	SP	SP-SM	SP	ML	CL-ML	SP-SM	SC	SP-SM	SP	SM	GC	SM	SP-SM	SP-SM	SM	SC	SC	SM	SC-SM	SM	SM	SC	SM		SC-SM	SC	SC-SM	SP-SC	SM	SP-SC	SP-SM	SC	SP
915	SP-SM	ML	SP-SM		SC-SM	SP-SM	SP-SM			CL		SC	CL	GC	SC	CL	SM	ML	SC-SM	SP-SM	CL	SC	SP		GC	SM	SP-SM	SP-SM	GC	CL	SP	GC	SP-SM	SP	SM	SP-SM	SM		SC-SM	SC	SC-SM	CL	CL-ML	CL	CL	CL	CL-ML
910	SP-SM	SC	CH		CL	SM	CH			CL		SC	CL	SM	SC		GM	ML	CL-ML	GC	CL	SC	CL-ML		GC	SM	CL-ML	SC	GC	SC	SP	SC	SP-SM	SP	SM	SC-SM	CL		SC-SM	SC	SC-SM	CL	CL-ML	SP-SC	CH	CL	CL-ML
905	SC	SC	SC		SC	SM	CH			CL		CH	CL	CL	SC/CL		GM	SC	SP	SP	SC	SC	CL-ML		CL	GC	SC-SM	SC	GC	CL	SW	SM	SM	SP	SM	SP	SC		SC-SM	SC	CL-ML	GM	CL	SP-SC	CL-ML	CL	SC-SM
900	SC-SM	SC-SM	SC		SC	SM	SC			CL		CH	CL	CL	SC/CL		CH	SC	CL-ML	SO	CL	SC	CL-ML		CL	CL	CL-ML	CL	ML	GC	SM	SC	SM	CL-ML	SC	SM	CL		SM	SC	CL-ML	CL	CL	SC	CL	CL	CL
895	SC-SM	SC	SC		SC	SC-SM	SM			SC		CH	CL	SC	SC/CL		CH	SC	CL-ML	CL	CL	SC	SM	CL-ML	CL	CL	CL-ML	CL	ML	SP-SC	CH	CL	CL-ML	CH	SP-SM	ML	SM		SM	SC	SC	SP-SC	SM	SM	SC	SP	CH
890	GC	SC-SM	SP			SM	SC			SM		CH	SP-SM	SC	SC		SC	SP-SM	SC	CL	SC	SM	SC		SP-SM	CL	SP		SP-SM	SP-SM	SC	SP-SM	SM	SC-SM	SP-SM	SP-SM	SP		SM	SP	SM	GP-GC	SP	SP	CH	SP	CL-ML
885	SM	SM	SC			CL	SM	CL	CH	CL		CL	SM	CL	CH		SC	SP-SM	SC	SC	SP	SP-SM	SP		SP-SM	SP-SM	SP		SP-SM	ML	SC	SP-SC	SC-SM	CL	SP-SM	SP-SM	CH		GM	CH	GM	GP	CH	CL	CL-ML	SC	CL-ML
880	GC	CL	SC			CL	SP-SM	CL	CH	SC		CL	SP-SM	CL	CH		CL	GP-GC	SC	SC	SC	SC	SC		SP-SM	SP-SM	SC		SP-SM	SP-SM	CL-ML	SM	SC-SM	CH	SP-SM	SC	SC		SC	SP	SP-SC	GP	CL	GP	CL	SP-SM	CL-ML
875	SC	SC	SC			SM	SC	SC	SC	CL		SC	SC	SC	SC		CL	GP-GC	SP	SP-SC	GP-GC	SC	SC		CL	SP-SM	SM		SP-SM	GP-GC	SC-SM	SP-SM	SM	SC	GP-GM	SC	SP		SC	SM	SP-SC	SP-SC	SM	SP-SC	SM		SC
870	SC	CL	CL			SC	SC	SC	CL	SC		SC	SC	CL	SC		SP-SC	GP-GC	SC	SP-SC	CL	SC	SP		SC	SP-SM	SM		SC-SM	SP-SC	CL-ML	SC	SC-SM	SC	SC	SC	SC		SC	SM	SP	SP					SC
865	CL	CL								CL			SP-SC	GC	SP-SC		SP-SC	GP-GC		SP-SC	SP-SC	SP-SM			SP-SC	SP-SM			GC	SP-SC	SC	SC	SC-SM	SC	SM	SC	CL		GP-GM	CL	SC						SM
860	SM	SP-SC								SC			GC	SP-SM	SP-SC		SP-SC	SP-SC		SP-SC	SC	SP-SM			CL	SP-SM			SC-SM	SC-SM	SC	SC	CL	CL	GP-GM	SC	CL		GP-GM								CL
855	SM	SP-SM								SC			CL	SC	SP		SP	SC		SP	CL	SP-SM			SP-SM	SP-SM			SP-SM	GC		SC-SM	SC	CL	SP-SM	MH	CL		SC								CL
850	SM	SP-SM								SC			SC	GP-GC	SC		SP	SC		SP	CL	SC			GC	SP-SM			SP-SM	GC		SP-SC		CL													CH
845	SM	GP-GM								SC			SP	SP-SM	SP		SP	SC		GP-GC	SP-SC	SP			SP	SP			SP-SM	SP-SM		GC															SM
840	SM	SP								GP-GM			SP	SP-SM	GP		SP	SC		GP-GC	SP-SC	SP			SP	SP			SP-SM	SP-SM		GP															SP
835	SM	GP								SC			SP	GP-GC	GP		SP	SC		SP	SP-SC	SP			SP	SP			SP-SM	SP		GP															SM
830	SM	SP								SP			SP-SC	SP	SC		SP-SC	SC		SP	SP	SP				SP						SP															
825	SM																																													
820																																													
815																																													
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805																																													
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795																																													
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N-VALUE PROFILE

Legend	Color	N-Value (BPF)	Notes
		0 to ≤ 10	1) N-values are uncorrected for energy efficiency.
		10 < to ≤ 30	2) Correction factor of (Ring sampler blowcount)*(0.65) = SPT N-Value used for relative
		30 < to ≤ 50	firmness color coding. 3)
		< 50	Blowcounts marked with "---" denote borings where samples were not driven.

Low

Station	1144+50	1145+60	1146+50	1148+00	1148+40	1149+15	1152+50	1153+50	1155+00	1155+25	1155+40	1156+60	1157+10	1157+80	1157+80	1158+75	1158+75	1159+40	1159+50	1159+75	1159+75	1160+60	1160+70	1160+75	1161+60	1161+60	1161+65	1162+30	1162+55	1162+55	1162+90	1163+45	1164+10	1164+25	1165+00	1165+50	1165+60	1166+45	1166+50	1167+00	1167+00	1168+30	1168+80	1169+90	1170+60	1171+00	1171+70
Boring ID	B-165	B-166	B-167	B-2	B-168	B-169	B-170	B-3	B-4	B-172	B-5	B-171	B-173	B-175	B-176	B-177	B-178	B-174	B-6	B-179	B-180	B-181	B-13	B-7	B-182	B-183	B-14	B-7A	B-184	B-185	B-15	B-186	B-16	B-8	B-187	B-17	B-9	B-189	B-188	B-10	B-18	B-19	B-11	B-20	B-12	B-21	B-22
Elevation	928	930	931	932	933	931	934	933	933	931	933	933	932	934	933	935	934	934	933	934	934	934	934	934	935	934	934	934	935	934	934	934	934	934	935	935	935	934	935	936	936	936	937	937	938	937	937
Depth (ft)	101.5	101.5	61.5	6.5	36.5	36.3	36.0	6.5	6.5	101.5	6.5	61.5	101.5	101.5	101.5	20.9	101.0	101.5	61.5	101.5	101.5	101.5	61.5	11.5	101.5	101.5	61.5	36.5	101.5	101.5	71.5	101.5	76.5	81.5	81.5	81.5	81.5	TBD	81.5	71.5	71.5	66.5	61.5	61.5	61.5	61.5	101.5
1010																																														
1005																																														
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955																																														
950																																														
945																																														
940																																														
935																22									10														20	16	16		17		17		18
930		17	18	18	17	15	14	17	9	6	32	7	2	7	18	29	16	15	22	15	12	17	8	26	6	13	28	11	19	15	18	21	17	15	17	13	13		11	19	4	9	11	5	20	12	11
925	21	29	11	13	24	11	12	7	4	13	7	8	5	10	12	8	15	18	10	21	18	13	4	34	100	15	6	14	9	12	6	18	6	25	13	22	9		18	19	15	8	7	7	42	8	12
920	10	16	4		33	24	13			14		22	7	11	8	100	8	19	13	8	36	23	6	13	8	38	11	60	40	19	5	38	8	10	23	17	20		100	49	100	22	43	83	29	100	25
915	30	34	11		8	39	27			80		100	31	4	62	100	65	100	100	53	100	100	14		100	100	10	100	100	100	15	100	12	34	100	18	100		100	100	100	100	48	40	44	100	100
910	100	100	100		100	65	100			80		100	41	4	100		100	100	64	100	100	100	22		41	100	100	100	100	100	100	17	100	14	100	28	20	27		100	15	30	34	100	36	63	28	29
905	100	18	18		24	100	23			13		20	36	100	33		100	16	17	37	100	27	29		39	46	15	47	46	26	27	25	27	43	100	17	100		100	100	33	100	24	100	100	100	27
900	27	27	23		9	29	46			28		28	30	27	34		35	100	100	100	100	30	24		11	100	25	28	100	100	29	100	24	100	17	28	15		22	100	16	10	19	100	20	19	35
895	22	27	11		17	85	29			16		26	17	14	21		20	28	17	20	20	42	16		12	25	18	36	24	23	12	17	28	22	20	22	20		22	20	23	31	15	23	20	21	14
890	10	80	100							9		14	20	13	12		10	13	25	30	20	12	20		18	16	19		19	42	18	20	23	18	30	13	22		19	5	38	53	5	50	11	43	22
885	33	28	31							11		14	40	14	3		33	31	23	14	25	35	30		21	33	28		45	36	35	29	41	22	31	18	14		36	11	60	39	18	15	100	8	30
880	100	34	22							10		15	31	13	13		21	100	100	16	42	28	52		44	62	59		25	100	45	35	49	12	34	66	25		40	33	42	57	30	39	29	79	13
875	100	100	100							20		22	17	24	31		24	54	66	31	61	36	65		25	61	49		26	57	52	27	62	30	53	46	31		20	30	45	31	33	39	26	84	31
870	15	31	48							17			31	16	25		32	29	97	14	27	41	47		29	33	37		33	32	48	15	90	27	31	32	40		28	26	25	25					29
865	35	23								13			52	28	30		47	48		37	22	51			33	27			33	31	29	37	44	30	21	35	36		53	60	65						48
860	21	50								43			36	48	25		33	40		28	27	29			72	34			31	24	58	67	42	42	58	44	36		33								38
855	15	3								9			33	62	67		26	47		42	33	48			19	40			50	13		21	49	42	31	49	64		21								55
850	18	19								15			5	6	32		29	22		31	8	12			100	30			18	38		34		36													47
845	15	9								12			4	6	24		32	20		27	18	38			79	34			23	15		16															27
840	15	6								4			34	5	52		16	40		16	31	38			6	20			45	31		23															59
835	30	9								13			26	10	40		43	27		62	52	48			15	49			27	24		18															49
830	32	8								4			6	7	26		21	19		41	6	45				19			33	45		11															
825	29																																													
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FIGURE 11 - GEOTECHNICAL SITE PROFILE - NB and SB
GENERAL LITHOLOGIC PROFILE ALONG SR 303L FROM SOUTH TO NORTH
LOOKING WEST

ethos ENGINEERING, LLC.

USCS PROFILE

Legend	Color	USCS	General Description
		CH, MH, CL/CH, SC/CH, SM/MH, ML/MH	High PI Silts and Clays
		CL, SC/CL, CL-ML	Low to Medium PI Clays
		ML, SM/ML	Low to Medium PI Silts
		SC-SM, SC	Clayey Sands
		SP-SC, SM	Silty Sands and Sands w/ Clay
		SP, SP-SM, SW, SW-SM	NP Sands
		GC-GM, GC, GC/SC	Clayey Gravels
		GP-GC, GM	Silty Gravels and Gravels w/ Clay
		GP, GP-GM, GW/SW, GW-GM, GP/SP	NP Gravels

ver Buckeye Road STA 1173+00

Station	1171+80	1172+90	1172+90	1173+00	1173+75	1174+00	1174+00	1175+50	1175+50	1176+90	1177+00	1178+30	1178+50	1179+70	1180+00	1181+00	1181+50	1182+50	1183+00	1184+00	1184+50	1185+50	1186+00	1187+50	1189+00	1189+50	1190+50	1192+00	1193+50	1194+00	1195+00	1196+50	1198+00	1199+80	1200+00	1201+00	1202+50	1204+00	1205+00	1205+50	1207+00	1210+00	1210+90	1212+00	1212+40	1214+50	1216+00	1216+50
Boring ID	B-23	B-24	B-25	B-28	B-29	B-26	B-27	B-30	B-36	B-31	B-37	B-32	B-38	B-33	B-39	B-34	B-40	B-35	B-41	B-35A	B-42	B-35B	B-43	B-44	B-45	B-58	B-46	B-47	B-48	B-59	B-49	B-50	B-51	B-52	B-60	B-53	B-54	B-55	B-61	B-56	B-57	B-62	B-190	B-65	B-191	B-63	B-66	B-64
Elevation	937	939	939	939	939	943	943	937	937	937	937	938	938	939	939	941	941	942	943	945	946	945	946	946	946	946	946	946	948	949	950	952	952	952	952	952	952	951	951	951	953	957	964	958	965	962	962	962
Depth (ft)	100.3	101.5	101.5	6.5	6.5	101.5	101.5	51	51.5	45.75	46.5	46	46.4	45.75	36.5	40.7	21.5	31.5	21.5	30.3	21.5	26.5	20.1	26.2	25.9	20.3	21.5	26.5	21.5	21.5	26.1	31.5	30.9	21.5	21.5	31	31.5	31.5	21.5	31.5	31.5	21.5	21.5	21.5	21.5	26.5	20.9	31.5
1010																																															
1005																																															
1000																																															
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985																																															
980																																															
975																																															
970																																															
965																																															
960																																										SC		SC	SC/CL	CL	CL-ML
955																																									SC-SM	SC-SM	CL-ML	SC-SM	SP-SM	CL	SM
950																															SC	SC	SC-SM	CL	SC	SC	SC	CL	SM	SC	SC	SM	SC	SC	SC-SM	SP-SM	CL-ML	SM
945																				SC-SM	SC	CL	SC	SC	CL	SC-SM	CL	CL	CL-ML	CL	SC	SM	SM	CL	CL-ML	SC	ML	SM	CL-ML	SM	SM	SP-SM	SC	SC	SP	SC-SM	SP-SM	CL-ML	CL-ML
940						CL	CL-ML									SC-SM	CL	CL-ML	SC	SC-SM	ML	SC-SM	CL-ML	SC	CL	SC-SM	SM	CL	CL-ML	CL	SC	SM	SM	CL	CL-ML	SC	CL-ML	CL-ML	CL-ML	SC	CL-ML	SC	CL	SC-SM	SC	CL-ML	CL-ML	CL-ML
935	SM	SP-SC	SC	SC	SC-SM	CL	CL	SC-SM	CL	SC	SC	SC	CL	SC	CL	CL-ML	CL	ML	SC	SC-SM	CL-ML	CL	SM	CL-ML	CL-ML	SC	CL	CL-ML	CL-ML	CL	CL-ML	CL-ML	SM	ML	CL-ML	SC	SC	CL-ML	ML	SC	CL-ML	MH		SC-SM		CL		CL
930	SP	SP-SC	ML	SC	CL-ML	CL	SC-SM	SC-SM	CL	SP	SM	SC	CL	SC	CL	CL-ML	SC-SM	ML	SC	SP-SC	CL-ML	CL	SM	ML	SM	SC	ML	CL-ML	CL-ML	CL	SM	SC	SC	CL-ML	CL-ML	SC	SM	MH	CL	MH	CL-ML							SP
925	SM	SC	SP			SP-SM	SC-SM	SM	SM	SM	SM	SC	CL	SM	CL-ML	CL-ML	SM	SM	ML	SP	SM	SP	SM	SM	SM	SC-SM	CL-ML	SM	SM	SC-SM	SC	SC			CL	SM	CL-ML		SP	SC							
920	SP	SM	SP-SC			SP-SM	SM	SP	SM	SP	SM	SM	SM	CL-ML	SC	SM	SP	SM	SP	GP		SP		SM	SM			SM			SC	CL			SC	SP	CL-ML		CL	CL							
915	SM	SC	SP			CL	SC	SP	SP-SM	SC	SM	CL	SM	SC-SM	SC	SM		SC		GP																												
910	SM	CL	SC			SC-SC	CL	SC	CL-ML	CL	CL	CL	CH	CL	ML	SC		SC																														
905	ML	SP-SC	CL			CL	SC	CL	SM	CL	SC	CL	SM	CL	ML	SC																																
900	ML	SC	CL			CL	SC	CL	SM	CL	SC	SC	SP	SC-SM	CL	SC																																
895	ML	CL	CL			CL	CL	SC	CL-ML	SC	CL	CL	CL-ML	CL																																		
890	SM	SP-SC	SP			CL	CL	CL	CL-ML	SC	CL	CL	CL	CL																																		
885	SM	CL	SP			CL	CL	CL	CL-ML																																							
880	SM	CL	SP			SW	SC																																								
875	SM	SC	SC			SM	GM																																								
870	SM	SP	SP			SW	SP																																								
865	SM	SP	SP			SW	SP																																								
860	SM	GP-GM	GP-GM			SM	SP																																								
855	CL	SP	GP-GM			CL	SP-SC																																								
850	GM	SP-SC	CL			GM	SP																																								
845	CL	SM	CL			CL	CL																																								
840	SM	CL	CL			CL	CL																																								
835	SP	SP	SP																																												
830																																															
825																																															
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N-VALUE PROFILE

Legend	Color	N-Value (BPF)	Notes
		0 to < 10	1) N-values are uncorrected for energy efficiency.
		10 < to < 30	2) Correction factor of (Ring sampler blowcount)*(0.65) = SPT N-Value used for relative
		30 < to < 50	firmness color coding.
		< 50	3) Blowcounts marked with "---" denote borings where samples were not driven.

ver Buckeye Road STA 1173+00

Station	1171+80	1172+90	1172+90	1173+00	1173+75	1174+00	1174+00	1175+50	1175+50	1176+90	1177+00	1178+30	1178+50	1179+70	1180+00	1181+00	1181+50	1182+50	1183+00	1184+00	1184+50	1185+50	1186+00	1187+50	1189+00	1189+50	1190+50	1192+00	1193+50	1194+00	1195+00	1196+50	1198+00	1199+80	1200+00	1201+00	1202+50	1204+00	1205+00	1205+50	1207+00	1210+00	1210+90	1212+00	1212+40	1214+50	1216+00	1216+50
Boring ID	B-23	B-24	B-25	B-28	B-29	B-26	B-27	B-30	B-36	B-31	B-37	B-32	B-38	B-33	B-39	B-34	B-40	B-35	B-41	B-35A	B-42	B-35B	B-43	B-44	B-45	B-58	B-46	B-47	B-48	B-59	B-49	B-50	B-51	B-52	B-60	B-53	B-54	B-55	B-61	B-56	B-57	B-62	B-190	B-65	B-191	B-63	B-66	B-64
Elevation	937	939	939	939	939	943	943	937	937	937	937	938	938	939	939	941	941	942	943	945	946	945	946	946	946	946	946	946	948	949	950	952	952	952	952	952	952	951	951	951	953	957	964	958	965	962	962	962
Depth (ft)	100.3	101.5	101.5	6.5	6.5	101.5	101.5	51.0	51.5	45.8	46.5	46.0	46.4	45.8	36.5	40.7	21.5	31.5	21.5	30.3	21.5	26.5	20.1	26.2	25.9	20.3	21.5	26.5	21.5	21.5	26.1	31.5	30.9	21.5	21.5	31.0	31.5	31.5	21.5	31.5	31.5	21.5	21.5	21.5	21.5	26.5	20.9	31.5
1010																																															
1005																																															
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975																																															
970																																															
965																																												4				
960																																										17		3	23	3	10
955																																									15	13	14	18	8	5	7
950																															15	5	18	15	5	15	12	11	14	23	18	9	66	2	100	12	38	31
945																				12	12	16	14	23	9	17	14	5	19	17	11	11	9	10	15	68	4	29	8	13	9	82	63	13	53	52	79	86
940						40	9									20	17	19	14	30	7	8	11	36	8	12	40	6	7	10	75	38	66	73	45	89	53	53	75	28	77	79	24	100		100	100	84
935	9	4	12	8	8	9	9	23	18	22	11	26	9	27	15	76	4	8	5	100	47	100	78	100	90	77	100	89	38	38	54	51	100	78	63	55	27	61	41	100	100	27		25		27		14
930	4	4	12	9	5	12	15	13	7	16	25	100	25	12	4	78	14	79	14	78	55	100	45	50	50	100	100	100	100	92	33	100	29	56	100	100	66	24	43	13	44							20
925	15	8	7			12	15	12	10	16	16	50	20	10	41	45	16	100	39	27	29	16	100	34	23	100	23	42	51	33	70	31	100			23	30	40		19	31							
920	28	23	37			37	100	11	24	100	34	44	23	30	25	27	18	100	15	100		34		100	100			24				15	100			46	40	35		21	14							
915	100	100	100			23	34	25	30	48	34	45	34	26	100	100		60		100																												
910	100	38	51			36	32	33	100	100	78	100	40	100	33	13		38																														
905	33	60	38			100	100	17	22	14	35	25	22	100	20	31																														
900	29	7	100			32	28	100	100	100	59	100	23	38	22	100																														
895	15	36	15			21	57	28	56	18	45	100	78	49																																
890	22	100	17			100	23	16	27	100	30	10	74	100																																
885	16	26	26			16	23	16	31																																				
880	34	20	20			34	40																																							
875	27	29	20			26	58																																							
870	31	31	26			26	25																																							
865	52	26	35			19	29																																							
860	29	56	26			100	44																																							
855	63	46	33			53	18																																							
850	62	52	47			36	7																																							
845	37	28	35			50	4																																							
840	26	50	40			35	4																																							
835	100	37	36																																											
830																																															
825																																															
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FIGURE 11 - GEOTECHNICAL SITE PROFILE - NB and SB
GENERAL LITHOLOGIC PROFILE ALONG SR 303L FROM SOUTH TO NORTH
LOOKING WEST

ethos ENGINEERING, LLC

USCS PROFILE

Legend	Color	USCS	General Description
		CH, MH, CL/CH, SC/CH, SM/MH, ML/MH	High PI Silts and Clays
		CL, SC/CL, CL-ML	Low to Medium PI Clays
		ML, SM/ML	Low to Medium PI Silts
		SC-SM, SC	Clayey Sands
		SP-SC, SM	Silty Sands and Sands w/ Clay
		SP, SP-SM, SW, SW-SM	NP Sands
		GC-GM, GC, GC/SC	Clayey Gravels
		GP-GC, GM	Silty Gravels and Gravels w/ Clay
		GP, GP-GM, GW/SW, GW-GM, GP/SP	NP Gravels

Yuma Road STA 1225+50

Station	1219+00	1220+50	1222+00	1222+30	1223+80	1224+00	1224+60	1224+60	1225+50	1225+75	1225+75	1226+00	1227+00	1227+00	1228+40	1228+50	1229+90	1230+00	1231+40	1231+70	1231+80	1233+30	1233+40	1235+00	1236+00	1240+00	1240+00	1241+50	1242+70	1242+85	1243+50	1244+40	1244+40	1244+50	1246+00	1247+00	1247+40	1247+40	1247+40	1248+50	1248+90	1250+10
Boring ID	B-67	B-68	B-69	B-71	B-72	B-70	B-73	B-74	B-80	B-75	B-76	B-79	B-77	B-78	B-81	B-84	B-82	B-85	B-83	B-192	B-85A	B-85B	B-193	B-86	B-87	B-88	B-97	B-89	B-97A	B-90	B-98	B-91	B-91A	B-98A	B-92	B-99	B-93	B-94	B-94A	B-100	B-95	B-101
Elevation	963	963	963	963	964	964	964	964	963	963	963	964	965	965	964	964	965	965	965	970	968	970	972	968	970	973	973	974	974	974	974	974	974	977	977	978	978	978	978	979	980	981
Depth (ft)	46	50	56.5	56.5	61.5	61.5	101.5	101.5	6	100.4	100.5	6.5	101.5	101.5	61.5	61.5	56.5	56.5	51.5	21.5	26.5	25.9	21.5	21.5	16	31.5	10.9	36.5	15.9	40.1	15.4	46.5	11	41.5	51.5	56.5	15.6	61.4	11	61.5	66.5	66.5
1010																																									
1005																																									
1000																																									
995																																									
990																																									
985																																									
980																																								SC	SC
975																																		SC	SC	SC	SC	SM	SM	SC	SC	CL-ML
970																				*SC*		SC	SC		SC	SC-SM	SC	SC	SC	SC	SC	SC-SM	SM	CL	SC	SM	SP	SC	CL-ML	SC	SC	SM
965													SC	SP-SM			SC-SM	SC	SC	SM	SC	SC-SM	SC	SC	ML	SC	SP	SP	SC	SC	SC	SP	SM	CL	SM	SC-SM	SM	SP	SM	CH	SC	SM
960	CL-ML	CL	SC	SC	SC	SC	SC	SC	CL	SC	SC	SC	SC	CL-ML	SM	SC	SP	CL-ML	CL-ML	*SM*	SC	SC-SM	SM	CL-ML	ML	SC	CL-ML	CL	SC	SC	SC	SC	SM	SC-SM	SM	CL-ML	SP	SP		SC	SC	SM
955	SC-SM	CL-ML	SC	SC	SM	SP-SC	SP-SC	SM	CL-ML	SM	SP	SM	SP-SM	CL-ML	SP-SC	CL-ML	SP	CL-ML	CL-ML	*SM*	CL	SC-SM	SM	SC-SM	SM	SC		SP	SC	ML	ML	SC		CL	SM	SP-SM		SP		SM	SC	CL
950	SC	SC-SM	SC	CL	SM	CL	SP-SC	SC-SM		SM	SC		SC	SC	SP-SC	ML	SP-SM	CL-ML	CL-ML	SM/ML	GP-GM	GM	*SM/ML*	CL-ML		SP		SP		SM		ML		SC-SM	SM	SP-SM		SP		SM	SC	SM
945	CL-ML	CL-ML	CL-ML	SC	CL	CL	SC	CL		SM	SC		SC	CL-ML	SC	ML	SP-SM	SM	CL-ML		CL	CL		SM		SP		SM		SM		SM		SC-SM	SM	SC		SM		SM	SC	SM
940	CL-ML	CL-ML	SM	CL	CL	SC	SM	CL		SC	ML		GM	CL-ML	SC	CL	SP	SP	CL-ML		SP					SC				SM												
935	SC	SC	SM	CL	CL	CL	SC	CL		SC	ML		SP-SC	SM	SC	SW	SC	SP	CL-ML									SM				SP-SC		CL	SP-SM	CL		SC		SM	CL
930	SP	SP	SP-SM	SM	SM	CL	SP	SM		SC	ML		SP-SC	SC-SM	SP-SC	SW	SP	SP	SM											SM		SP-SC			SM	SC		SP-SM		SC	SM	SP
925	SC	SP	CL-ML	CL	CL	SC-SM	SP-SC	SM		SP-SC	SP		SP	SP	SC	CL-ML	SP-SC	SP	CL													SC			SM	SC		SP-SM		SC	SC	SC
920	SC	CL	CL-ML	SC	SM	SP	SC	SP		CL	SP		CL	SM	SP-SC	CL-ML	SP-SC	CH	CL																SC			SP-SM		SP	SP	SP
915	SC	CL	ML	SC	SM	SC	GP	SC-SM		SC-SM	GC		CL	SM	GC	CL	GC	CL	SC																			SP-SM		SC		SP
910		CL	CL-ML	SP	SM	SC	SM	SC-SM		SC-SM	CL		SM	SM	SP-SC	SM	CL	SM																								
905			SM	CL	SM	SC	SC	SM		CL	SM		SM	CL-ML	SP-SC	SM																										
900					CL	SP-SC	SP-SC	SM		SP-SC	SM		SC	CL-ML	SP-SC	SP																										
895							SC	CL		SP-SM	CL		SP	CL-ML																												
890							GP	SM		SC	SP		SP	CL																												
885							SC	SM		SP-SC	SC		SP	CL																												
880							SP-SM	SM		SP-SC	SM		SP-SM	CL																												
875							SM	SM		SP-SC	GC		SP-SM	CL																												
870							GP	CL-ML		SP-SC	GM		CH	SM																												
865							GP	SP		SP-SC	SC		SP	SM																												
860							GP	CL		SP-SC	SC																														
855																																									
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845																																									
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N-VALUE PROFILE

Legend	Color	N-Value (BPF)	Notes
		0 to < 10	1) N-values are uncorrected for energy efficiency. 2)
		10 < to ≤ 30	Correction factor of (Ring sampler blowcount)*(0.65) = SPT N-Value used for relative firmness color
		30 < to ≤ 50	coding. 3)
		< 50	Blowcounts marked with "---" denote borings where samples were not driven.

Yuma Road STA 1225+50

Station	1219+00	1220+50	1222+00	1222+30	1223+80	1224+00	1224+60	1224+60	1225+50	1225+75	1225+75	1226+00	1227+00	1227+00	1228+40	1228+50	1229+90	1230+00	1231+40	1231+70	1231+80	1233+30	1233+40	1235+00	1236+00	1240+00	1240+00	1241+50	1242+70	1242+85	1243+50	1244+40	1244+40	1244+50	1246+00	1247+00	1247+40	1247+40	1247+40	1248+50	1248+90	1250+10
Boring ID	B-67	B-68	B-69	B-71	B-72	B-70	B-73	B-74	B-80	B-75	B-76	B-79	B-77	B-78	B-81	B-84	B-82	B-85	B-83	B-192	B-85A	B-85B	B-193	B-86	B-87	B-88	B-97	B-89	B-97A	B-90	B-98	B-91	B-91A	B-98A	B-92	B-99	B-93	B-94	B-94A	B-100	B-95	B-101
Elevation	963	963	963	963	964	964	964	964	963	963	963	964	965	965	964	964	965	965	965	970	968	970	972	968	970	973	973	974	974	974	974	974	974	977	977	978	978	978	978	979	980	981
Depth (ft)	46.0	50.0	56.5	56.5	61.5	61.5	101.5	101.5	6.0	100.4	100.5	6.5	101.5	101.5	61.5	61.5	56.5	56.5	51.5	21.5	26.5	25.9	21.5	21.5	16.0	31.5	10.9	36.5	15.9	40.1	15.4	46.5	11.0	41.5	51.5	56.5	15.6	61.4	11.0	61.5	66.5	66.5
1010																																										
1005																																										
1000																																										
995																																										
990																																										
985																																										
980																																								9	18
975																				32		40	30		38	13	17	16	17	7	14	9	10	16	7	13	26	4	12	7	50	35
970													13	29			11	10	14	17	100	45	39	14	14	25	21	8	13	7	26	19	23	33	45	39	26	10	23	41	100	46
965													20	100	22	35	20	98	12	100	27	100	100	36	33	34		35	100	100	100	100		57	62	55		100		100	100	100
960	8	7	8	24	33	5	15	12	12	6	17	13	13	37	22	37	11	89	13	100	16	44	29	18	27	12	100	42	11	7	46	29	11	100	100	52	100	54		36	100	100
955	17	8	6	44	36	5	15	2	5	6	17	25	20	100	22	35	20	98	12	100	27	100	100	36	33	34		35	100	100	100	100		57	62	55		100		100	100	100
950	11	14	78	100	100	100	41	53		32	74	12	49	46	23	100	56	18	87	42	100	69	29	100		17		100		68		36		36	100	100		100		18	23	27
945	89	34	42	100	56	100	56	98		100	100	34	45	100	42	20	53	43	100		37	100		39		100		37		42		26		18	62	22		41		26	100	20
940	69	91	42	33	60	100	75	100		30	49	17	78	32	60	16	31	22	100		27					25		21		55		100		14	25	29		100		100	26	13
935	28	26	24	32	36	16	100	39		100	100	100	29	17	100	100	29	24	28									35		45		85		31	100	100		100		25	37	42
930	22	31	16	19	22	19	11	24		29	30	25	57	60	16	100	45	100	28											37		100			40	43		38		33	29	39
925	24	36	57	14	16	70	28	100		35	37		37	25	51	30	28	100	14											100		38			28	35		43		46	35	33
920	100	100	33	33	18	39	53	23		36	100		100	31	19	22	46	15	29																	33		35		32	58	30
915	31	33	37	33	32	16	100	25		100	100		100	34	100	30	69	30	40																							
910			68	38	31	34	12	37		100	29		24	42	100	48	36	37																					79		92	85	74
905			35	75	33	33	47	41		29	30		67	91	29	100																										
900					55	38	44	100		100	80		100	27	40	33																										
895							38	100		32	46		34	39																												
890							52	38		29	47		42	100																												
885							87	36		46	28		32	57																												
880							51	51		100	38		55	40																												
875							22	51		61	75		4	34																												
870							28	30		58	41		53	31																												
865							22	47		62	100		47	37																												
860							29	21		100	100																														
855																																									
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FIGURE 11 - GEOTECHNICAL SITE PROFILE - NB and SB
GENERAL LITHOLOGIC PROFILE ALONG SR 303L FROM SOUTH TO NORTH
LOOKING WEST

ethos ENGINEERING, LLC

USCS PROFILE

Legend	Color	USCS	General Description
		CH, MH, CL/CH, SC/CH, SM/MH, ML/MH	High PI Silts and Clays
		CL, SC/CL, CL-ML	Low to Medium PI Clays
		ML, SM/ML	Low to Medium PI Silts
		SC-SM, SC	Clayey Sands
		SP-SC, SM	Silty Sands and Sands w/ Clay
		SP, SP-SM, SW, SW-SM	NP Sands
		GC-GM, GC, GC/SC	Clayey Gravels
		GP-GC, GM	Silty Gravels and Gravels w/ Clay
		GP, GP-GM, GW/SW, GW-GM, GP/SP	NP Gravels

Lilac Street STA 1252+00

Station	1250+30	1251+50	1251+50	1251+70	1252+70	1253+00	1253+10	1253+60	1254+20	1254+20	1255+75	1255+80	1257+15	1257+30	1258+65	1258+90	1260+20	1260+30	1260+30	1260+50	1262+25	1262+70	1263+75	1264+70	1265+00	1265+35	1268+80	1269+00	1271+70	1272+50	1273+00	1273+45	1274+50	1275+15	1276+00	1276+85
Boring ID	B-96	B-102	B-103	B-106	B-107	B-105	B-104	B-108	B-109	B-115	B-116	B-110	B-117	B-111	B-118	B-112	B-119	B-113	B-113A	B-114	B-194	B-119A	B-195	B-119B	B-120	B-196	B-124	B-121	B-197	B-124A	B-122	B-198	B-124B	B-199	B-123	B-125
Elevation	981	982	982	982	983	981	981	964	964	982	983	964	983	965	983	983	984	984	984	984	984	985	985	986	987	985	990	990	988	1009	991	990	1010	991	991	991
Depth (ft)	66.5	101.5	101.5	6.5	6	101.3	101.5	16.5	61.5	60.1	56.5	56.5	51.5	51.5	41.2	41	41.5	36	11	16.5	41	41.5	36.5	40.9	16.5	31.5	21.3	11.5	21.5	46.5	11	31.4	46.5	40.9	21.5	11.5
1010																																	SC			
1005																														SC			SC			
1000																														SC			SC			
995																														SC			SC			
990																											SC	SC		SC	SC	SC	CL	SC	SM	SC
985																						SC-SM	SM	SC-SM	SC	SC	SM	SC	SC	SP-SM	SP	SC	CL	SC	SC-SM	SM
980	SC	CL-ML	SC	SC	CL	SC-SM	SC			SC	SC	SC	SC-SM		SM	SC	SM	SC	GP-GM	SC	SM	SP	SM	SC-SM	SP	SC	SM	SP	SC	SP-SM	SP	SC	CL	SC	SM	SC
975	CL	SP	CL-ML	SM	CL	SC	SC			SP-SM	SP-SM	SC	SC		SM	SC	SP	GP	SC-SM	SP	SM	SP	CL-ML	CL-ML	SM	SC	ML		SC	CL		SM	SP	SC	SM	
970	SP	SC	SM			SC	SC			SC	SC	SC	SP-SC		SP	SC	SP-SM	CL	CL-ML	SP	SM	SP	SC	SP	SM	SC-SM	SM		SC	CL		SM	CL	SM	SM	
965	CL	SC	SM			SC	SP			SC-SM	SC	CL	SC	SC	SP	SC	SM	SC		SM	SC-SM	SP-SM	SC	SP-SM		SC			SM	CL		CL	CL	SM		
960	SP	GC	CL-ML			GC	SP-SM	SC	SM	CL	SP-SC	CL	CL	SC	CL	SP	SC	SC			SP	SC	SC	SP-SM		SC			CL		CL			CL		
955	CL	CL	CL-ML			SC	CL	SP	SM	CL	CL	CL	CL	SM	SC	CL	SP-SC	ML			SC	CL	SC	SC-SM		SC										
950	ML	SM	ML			CL	CL	SP	SM	CL	SM	CL	CL-ML	SM	CL	CL	CL	ML			SC	SP-SM		SP												
945	SP-SM	SP-SM	ML			SP	CL-ML	SC	SP	SP	SP-SC	CL	SP-SM	SP-SM	SP	CL	SP	ML			SC	GP		SP												
940	SC	GC	SP			SP-SC	SM		SP	CL	CL	SP	CL	CL	CL	SC	CL				SP-SM														
935	SC	CL	CL			SP-SC	SC		GC	SC	SP-SM	SC	CL	CL																						
930	SC	SP-SC	SC			SP	SP		CL	SP	SP-SM	SC	SP-SC	CL																						
925	SM	SP-SM	SC			GP	CL-ML		SM	SP	SP	SC		SM																						
920	SP	SP	SP-SM			GP	SP		SP	SP				CL																						
915	SP	SP	SC			GP	SC		CL					SM																						
910		GP	GC			GM	SP		CL																											
905		GP	GC			GM	SM		SC																											
900		GC	CL			GC	CL		SC																											
895		SP-SC	CL			GP	CL																													
890		SP-SC	SP			SP-SC	SC																													
885		SP	SC			SP	SC																													
880		SP	SC			CL	SC																													
875																																				
870																																				
865																																				
860																																				
855																																				
850																																				
845																																				
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835																																				
830																																				
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815																																				
810																																				
805																																				
800																																				
795																																				
790																																				
785																																				
780																																				

N-VALUE PROFILE

Legend	Color	N-Value (BPF)	Notes
		0 to < 10	1) N-values are uncorrected for energy efficiency. 2)
		10 < to < 30	Correction factor of (Ring sampler blowcount)*(0.65) = SPT N-Value used for relative firmness color
		30 < to < 50	coding. 3)
		< 50	Blowcounts marked with "---" denote borings where samples were not driven.

Lilac Street STA 1252+00

Station	1250+30	1251+50	1251+50	1251+70	1252+70	1253+00	1253+10	1253+60	1254+20	1254+20	1255+75	1255+80	1257+15	1257+30	1258+65	1258+90	1260+20	1260+30	1260+30	1260+50	1262+25	1262+70	1263+75	1264+70	1265+00	1265+35	1268+80	1269+00	1271+70	1272+50	1273+00	1273+45	1274+50	1275+15	1276+00	1276+85
Boring ID	B-96	B-102	B-103	B-106	B-107	B-105	B-104	B-108	B-109	B-115	B-116	B-110	B-117	B-111	B-118	B-112	B-119	B-113	B-113A	B-114	B-194	B-119A	B-195	B-119B	B-120	B-196	B-124	B-121	B-197	B-124A	B-122	B-198	B-124B	B-199	B-123	B-125
Elevation	981	982	982	982	983	981	981	964	964	982	983	964	983	965	983	983	984	984	984	984	984	985	985	986	987	985	990	990	988	1009	991	990	1010	991	991	991
Depth (ft)	66.5	101.5	101.5	6.5	6.0	101.3	101.5	16.5	61.5	60.1	56.5	56.5	51.5	51.5	41.2	41.0	41.5	36.0	11.0	16.5	41.0	41.5	36.5	40.9	16.5	31.5	21.3	11.5	21.5	46.5	11.0	31.4	46.5	40.9	21.5	11.5
1010																																	8			
1005																														17			16			
1000																														20			54			
995																														18			9			
990																											18	7		13	29	16	7	27	13	13
985																						16	8	8	20	11	12	25	28	7	17	18	64	46	7	9
980	15	11	21	18	15	36	17									17		49	19	17	10	5	18	8	10	5	30	37	10	100	10	14	100	18	21	27
975	41	11	28	11	6	36	17			30	27		15		7	23	11	12	6	30	8	5	21	53	17	16	100		20	18		52	100	22	29	
970	24	22	76			49	28			48	77		100		18	12	48	8	17	16	11	100	18	8	46	17	100		15	100		20	59	27	36	
965	50	84	100			100	18			100	100		100	21	100	100	100	14		30	100	100	18	100		100			18	42		19	36	27		
960	96	100	100			100	31	30	9	100	100	16	43	21	23	20	48	79			36	100	100	100		24				51		97		31		
955	100	52	36			78	100	12	9	100	100	16	100	49	100	100	100	100			100	100	22	56		54								44		
950	37	39	43			18	100	17	29	36	40	27	29	100	48	100	45	100			48	89	60	28										55		
945	25	100	26			36	29	34	100	100	32	39	26	31	29	25	31	20			50	41		100												
940	24	38	37			100	29		65	24	30	100	100	100	100	27	16				30															
935	31	21	100			28	100		100	41	40	36	22	100																						
930	39	39	37			38	39		53	42	48	48	39	13																						
925	41	38	48			39	30		19	37	33	14		37																						
920	99	34	52			100	37		28	100		34		31																						
915	45	100	62			100	45		35			33		26																						
910		39	100			100	56		20			38																								
905		74	100			100	87		31			45																								
900		66	100			45	100		34																											
895		26	38			65	36																													
890		28	32			32	35																													
885		48	28			26	25																													
880		28	70			100	89																													
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780																																				

Figure 12: Direct Shear Test Results and Shear Strength Envelope for Fine-Grained Soils (CL, CL-ML, ML, and CH) North of and Including Lower Buckeye Road

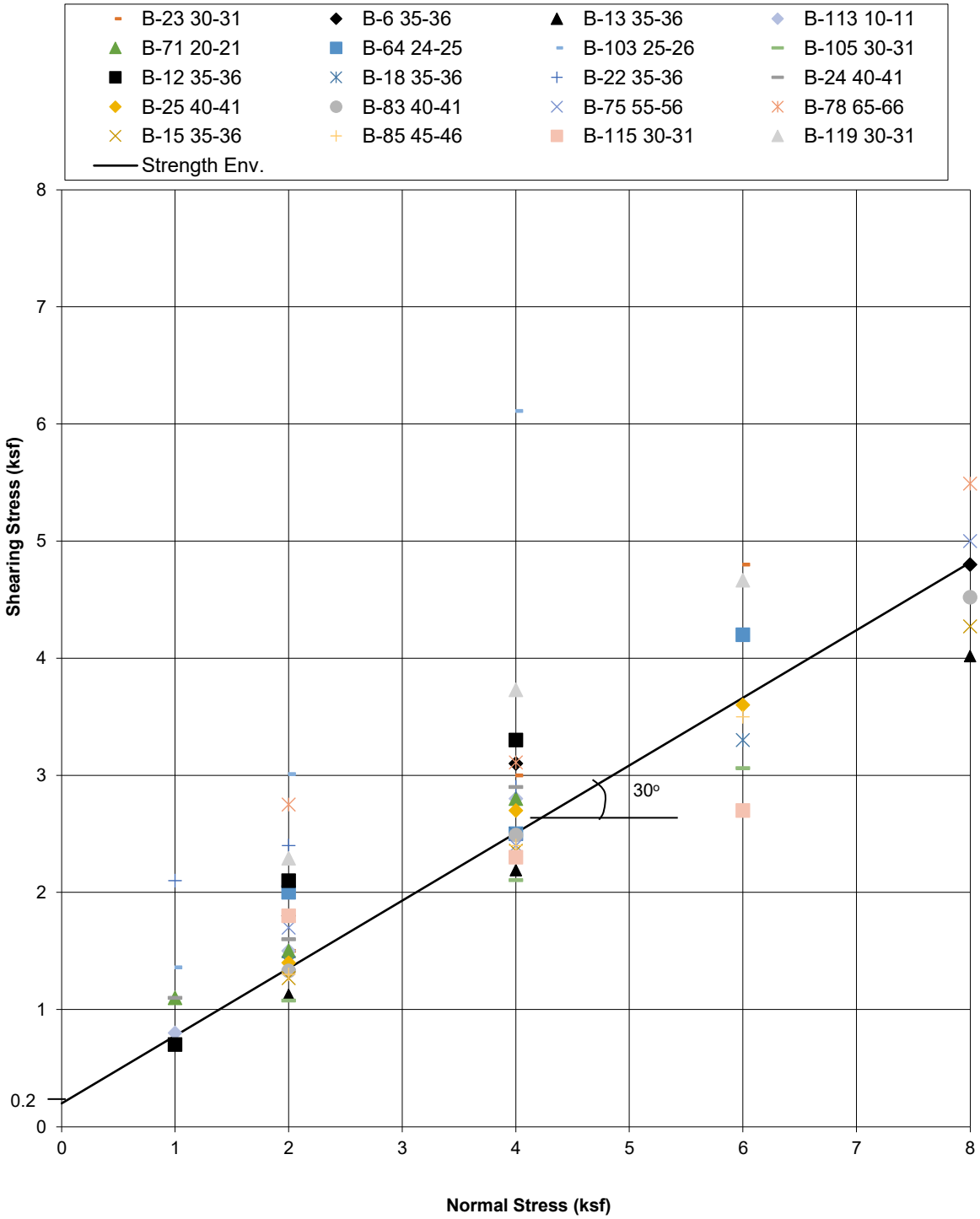


Figure 13: Direct Shear Test Results and Shear Strength Envelope for Clayey Sand (SC) Soils North of and Including Lower Buckeye Road

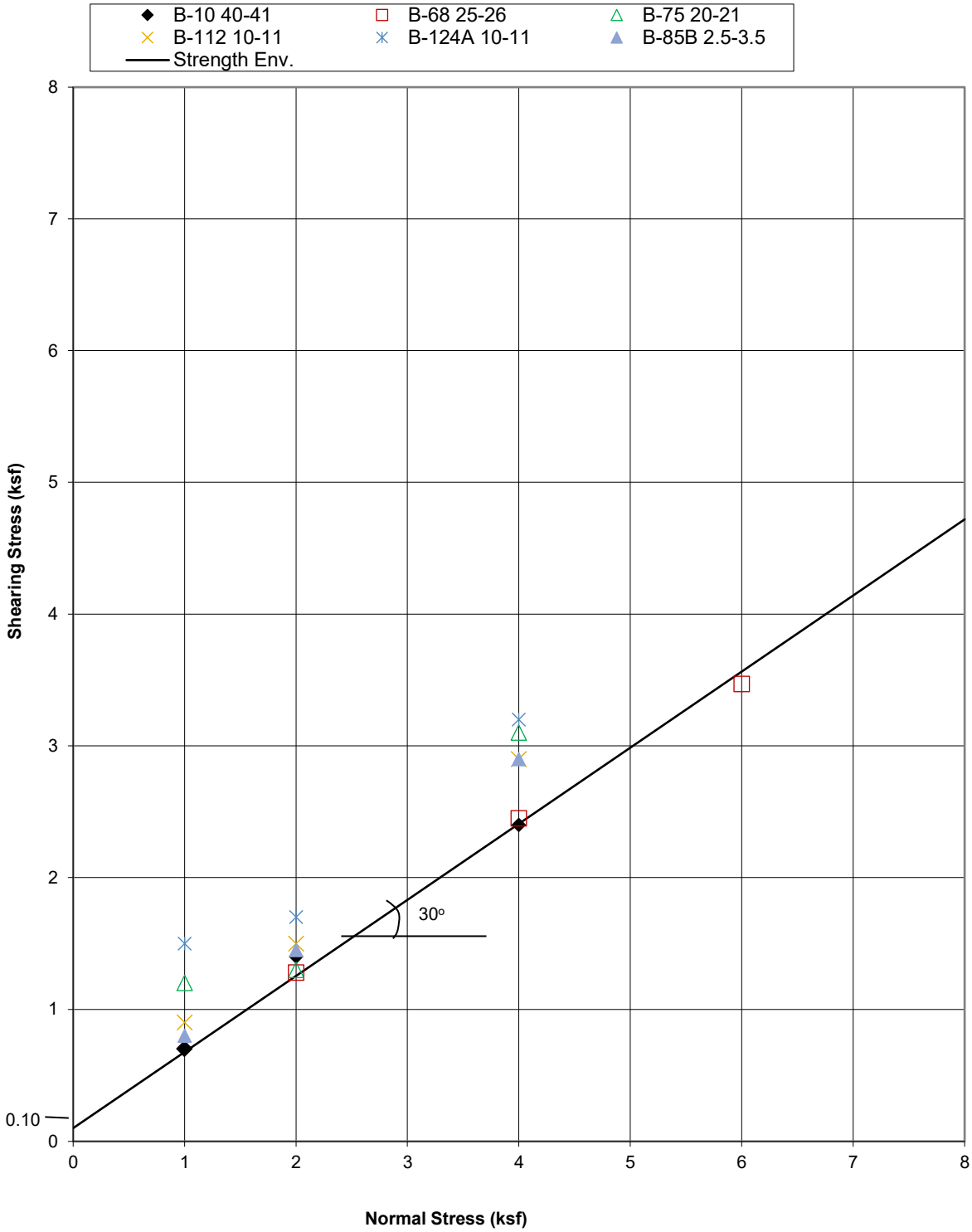


Figure 14: Direct Shear Test Results and Shear Strength Envelope for Nonplastic Coarse-Grained Soils (SP, SP-SM, SP-SC, and SM) North of and Including Lower Buckeye Road

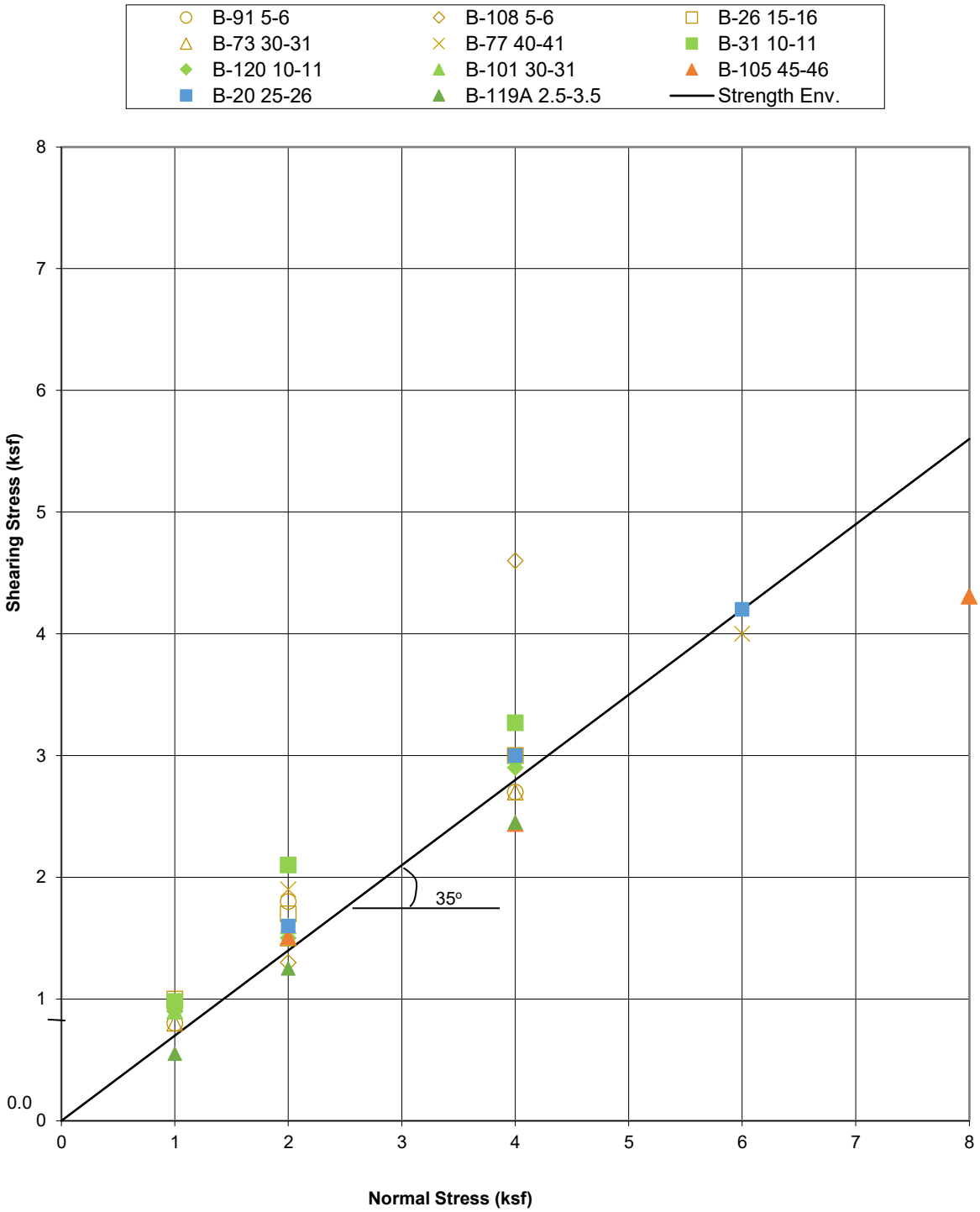


Figure 15: Direct Shear Test Results and Shear Strength Envelope for Fine-Grained Soils (CL, CL-ML, ML, and CH) South of Lower Buckeye Road

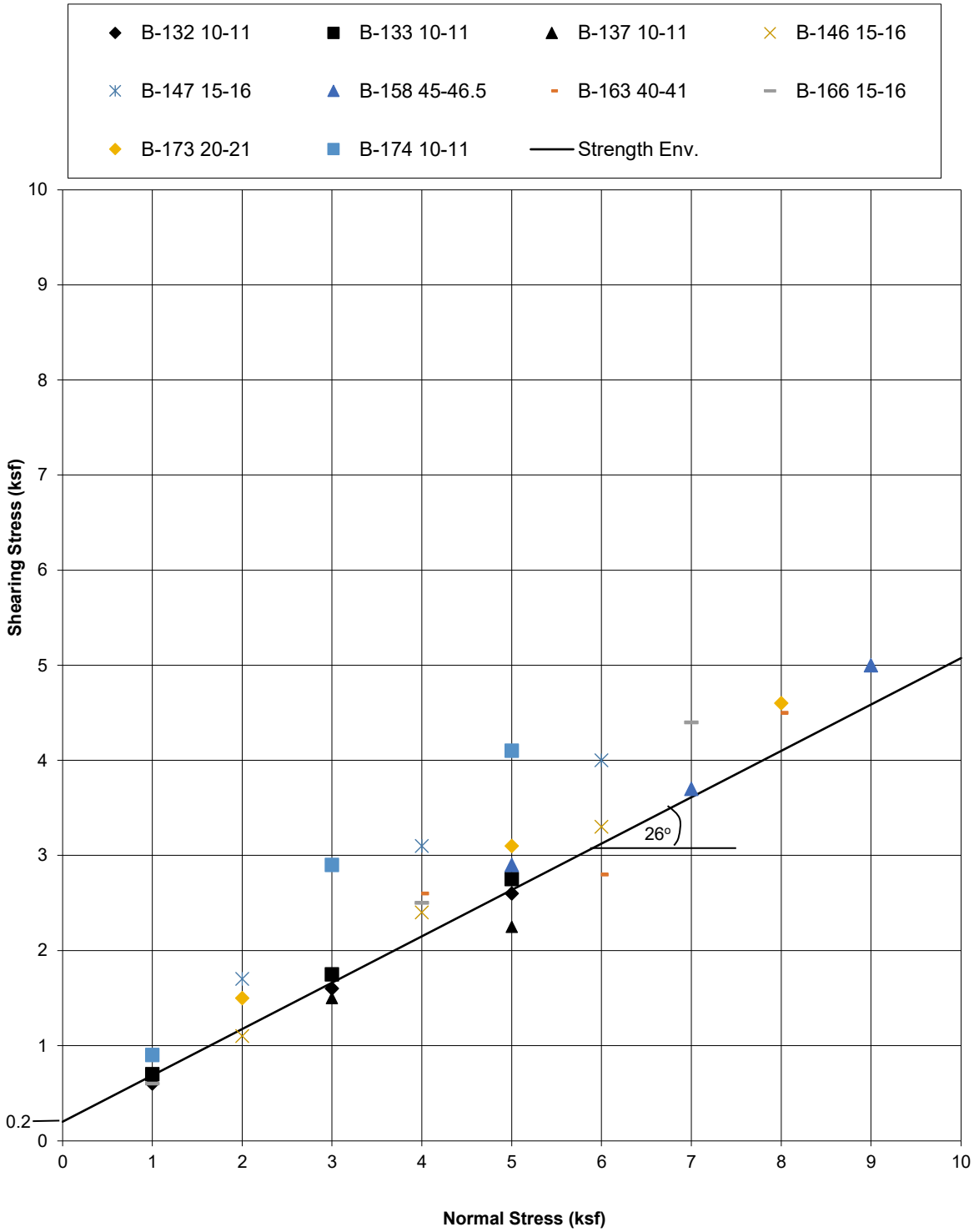


Figure 16: Direct Shear Test Results and Shear Strength Envelope for Clayey Sand (SC) Soils South of Lower Buckeye Road

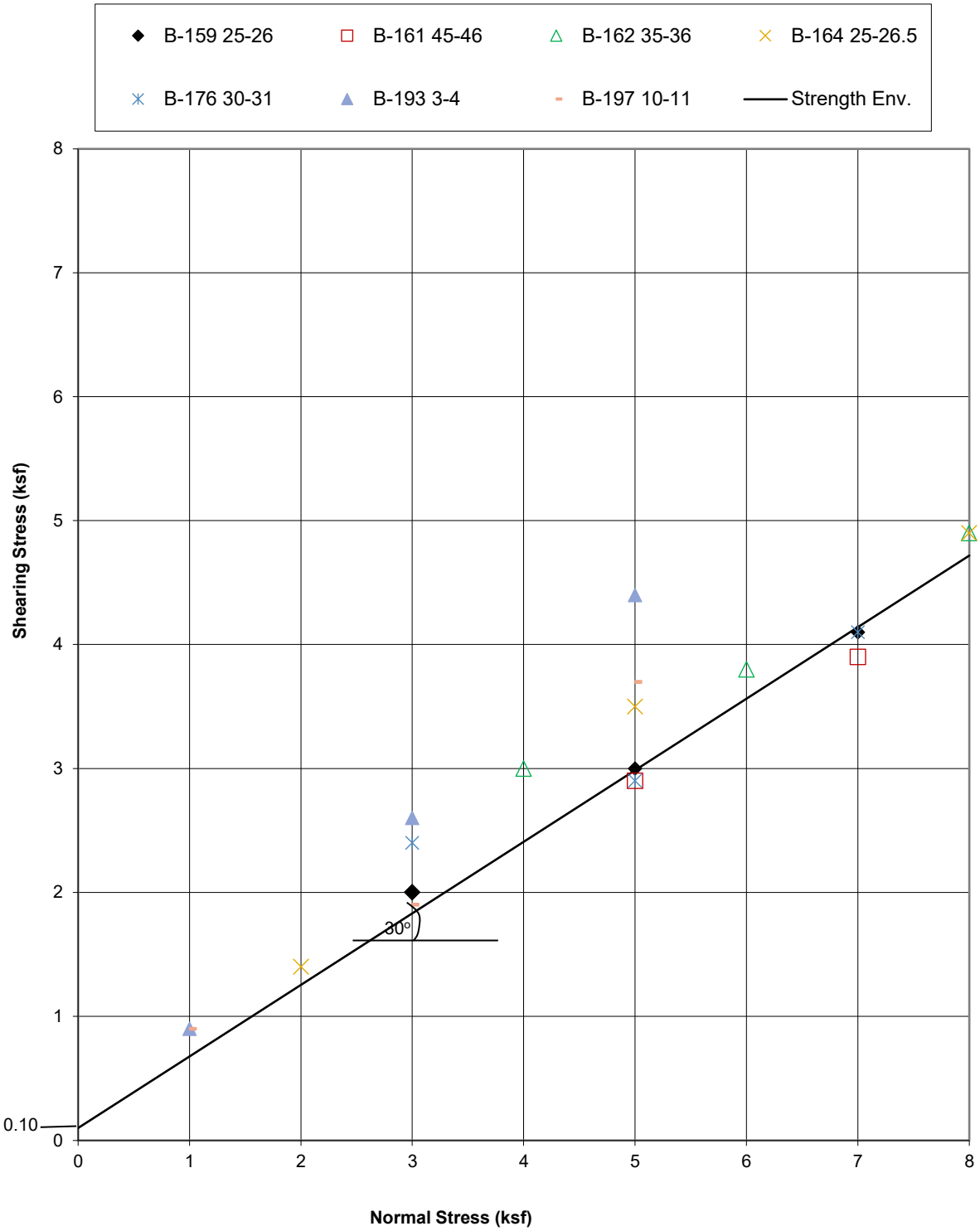


Figure 17: Direct Shear Test Results and Shear Strength Envelope for Silty Sand (SM) Soils South of Lower Buckeye Road

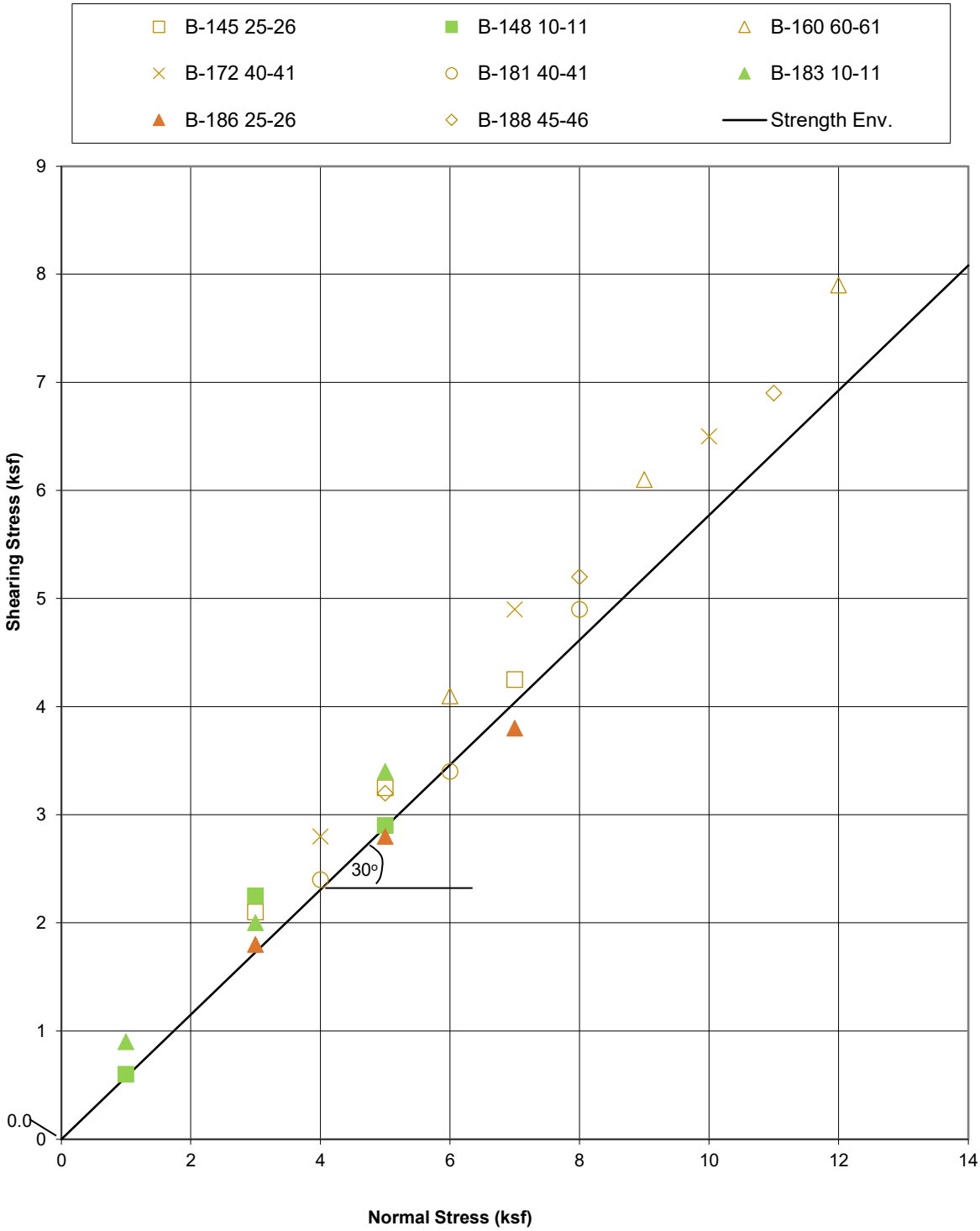


Figure 18: Direct Shear Test Results and Shear Strength Envelope for Sand Soils (SP, SP-SM) South of Lower Buckeye Road

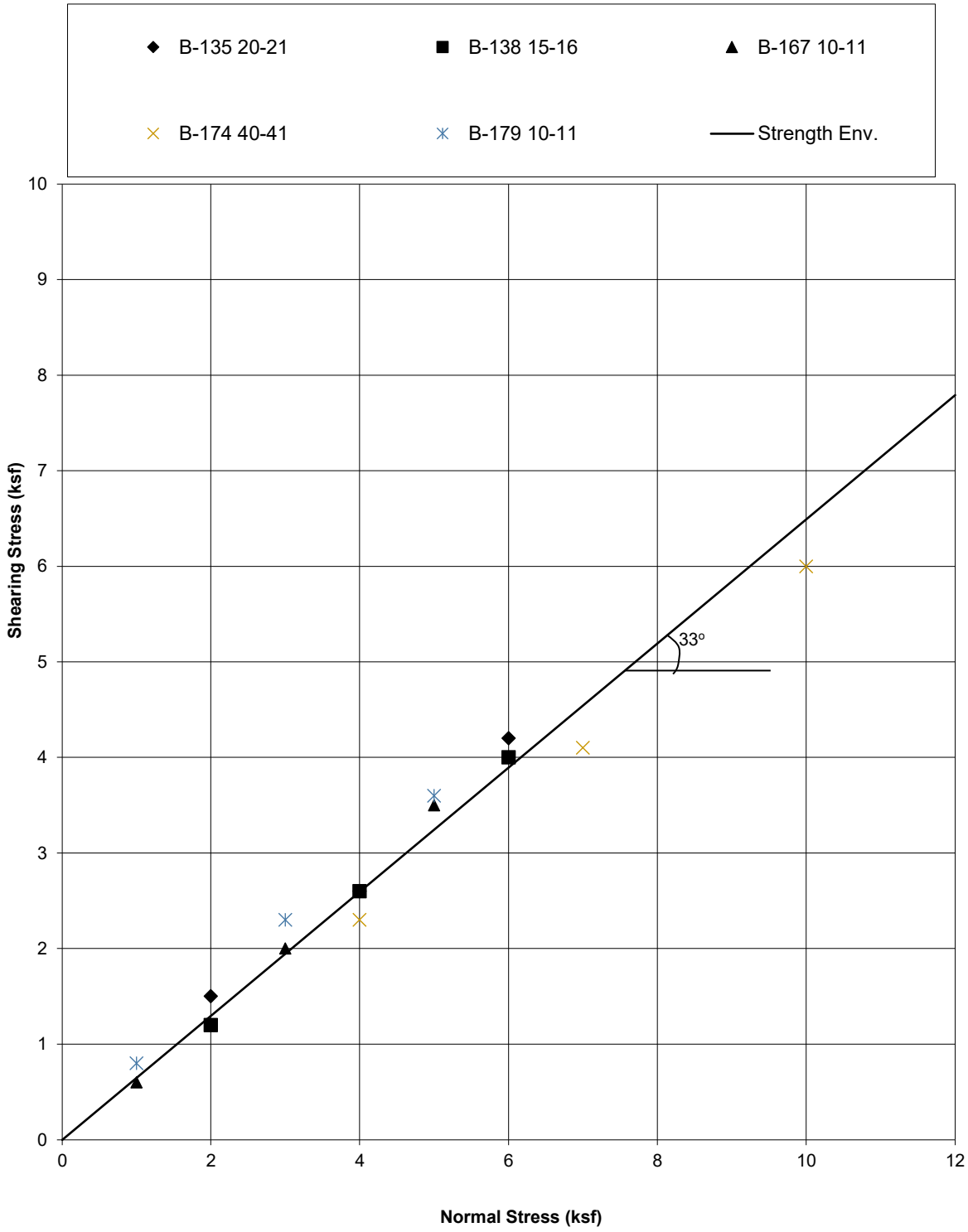


Figure 19: Direct Shear Test Results and Shear Strength Envelope for Non-plastic Gravel Soil(GP and GP-GM) South of Lower Buckeye Road

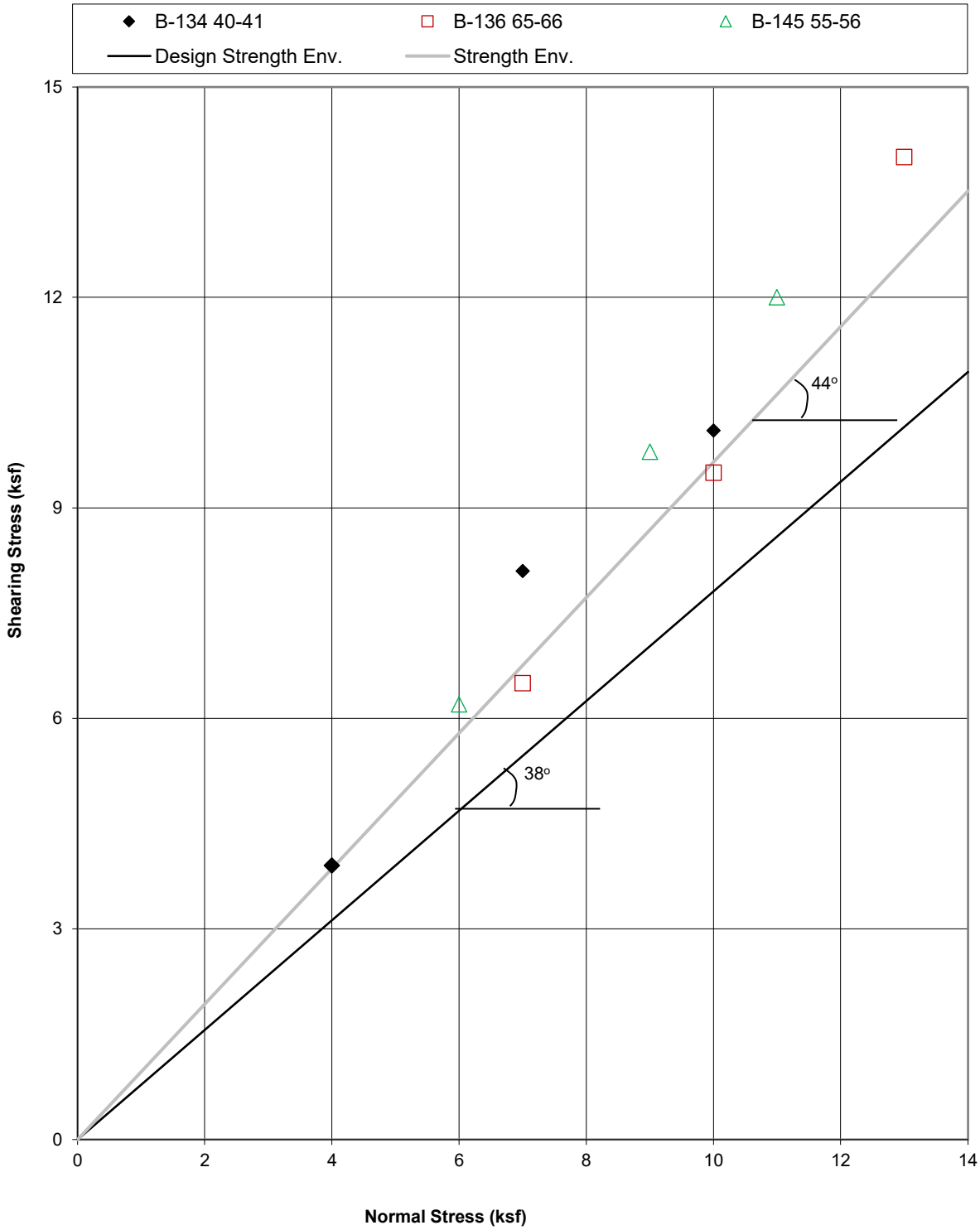


Figure 20: Direct Shear Test Results and Shear Strength Envelope for Plastic Gravel Soils (GP-GC and GC) South of Lower Buckeye Road

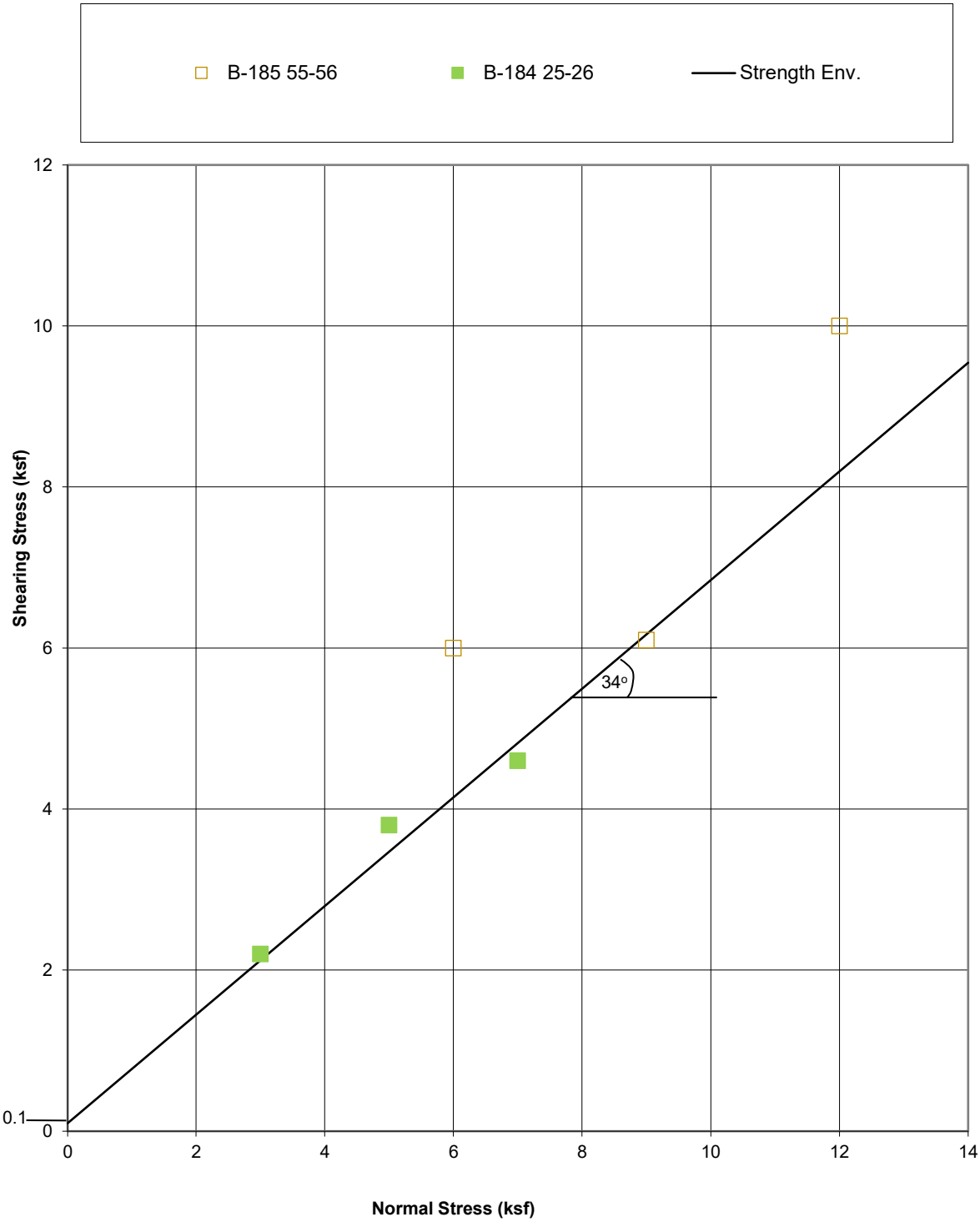


Figure 21
Collapse Potential along SR 303L Project Corridor

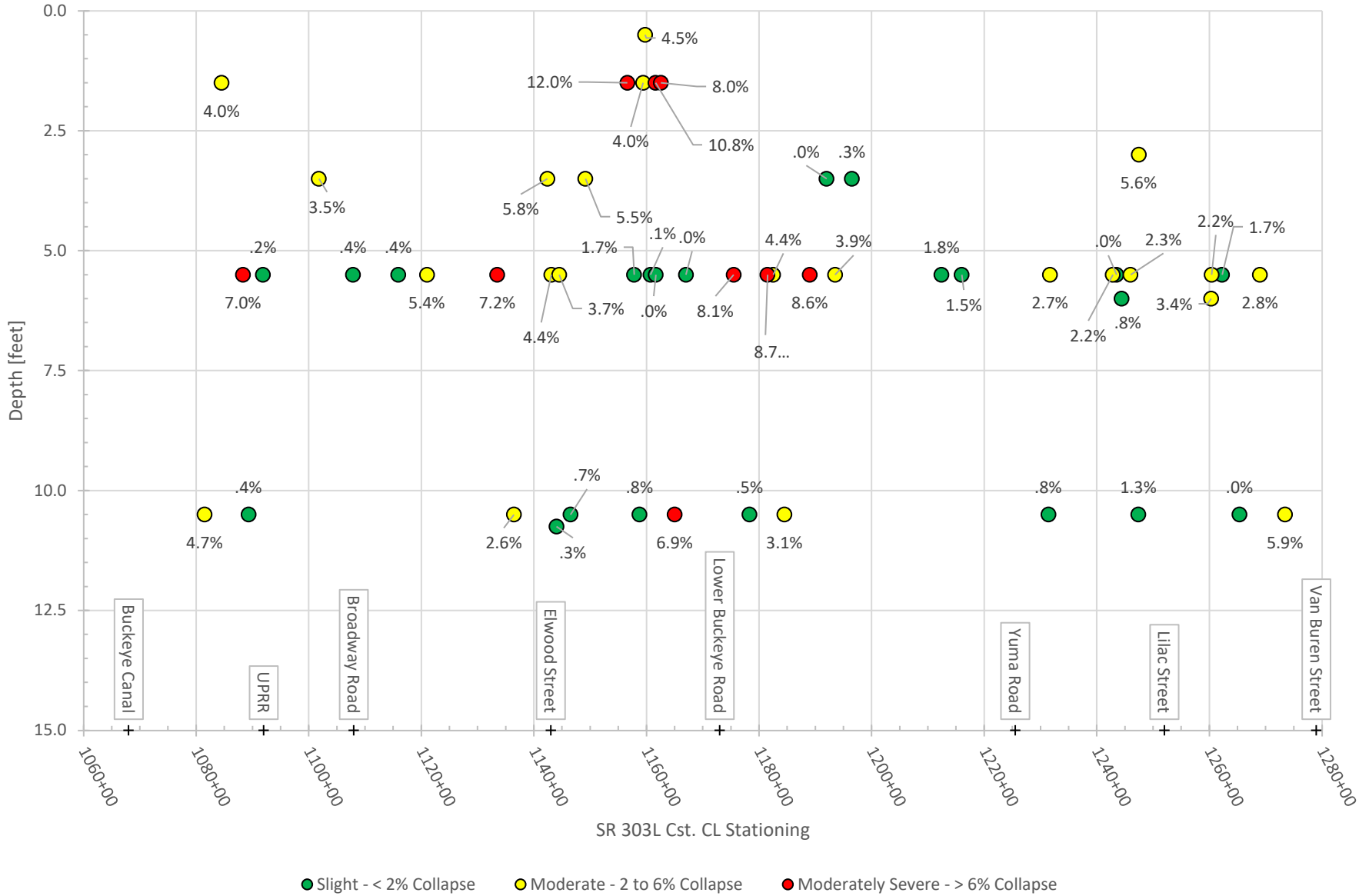


Figure 22
Collapse Potential vs. N_{60}

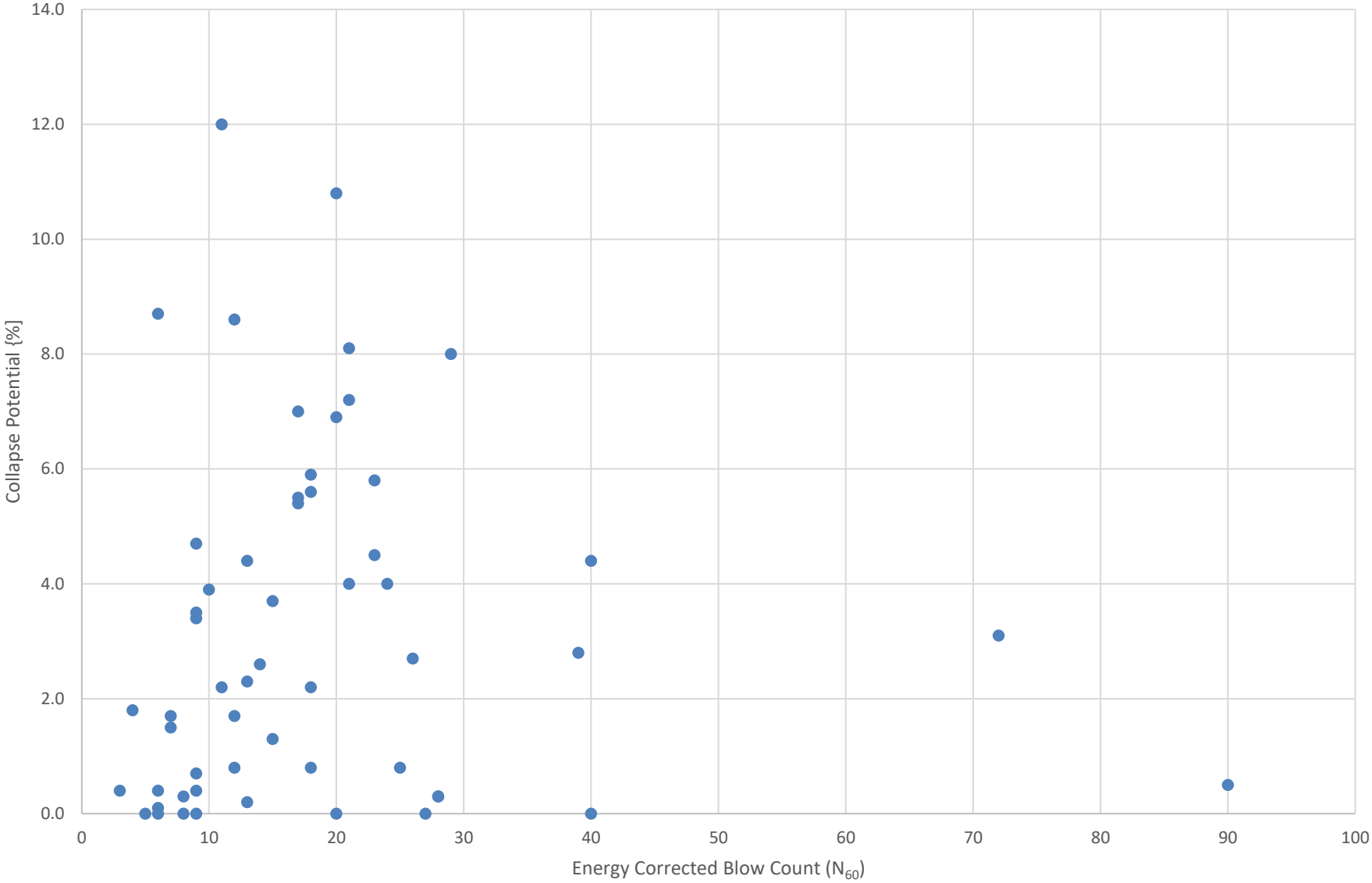
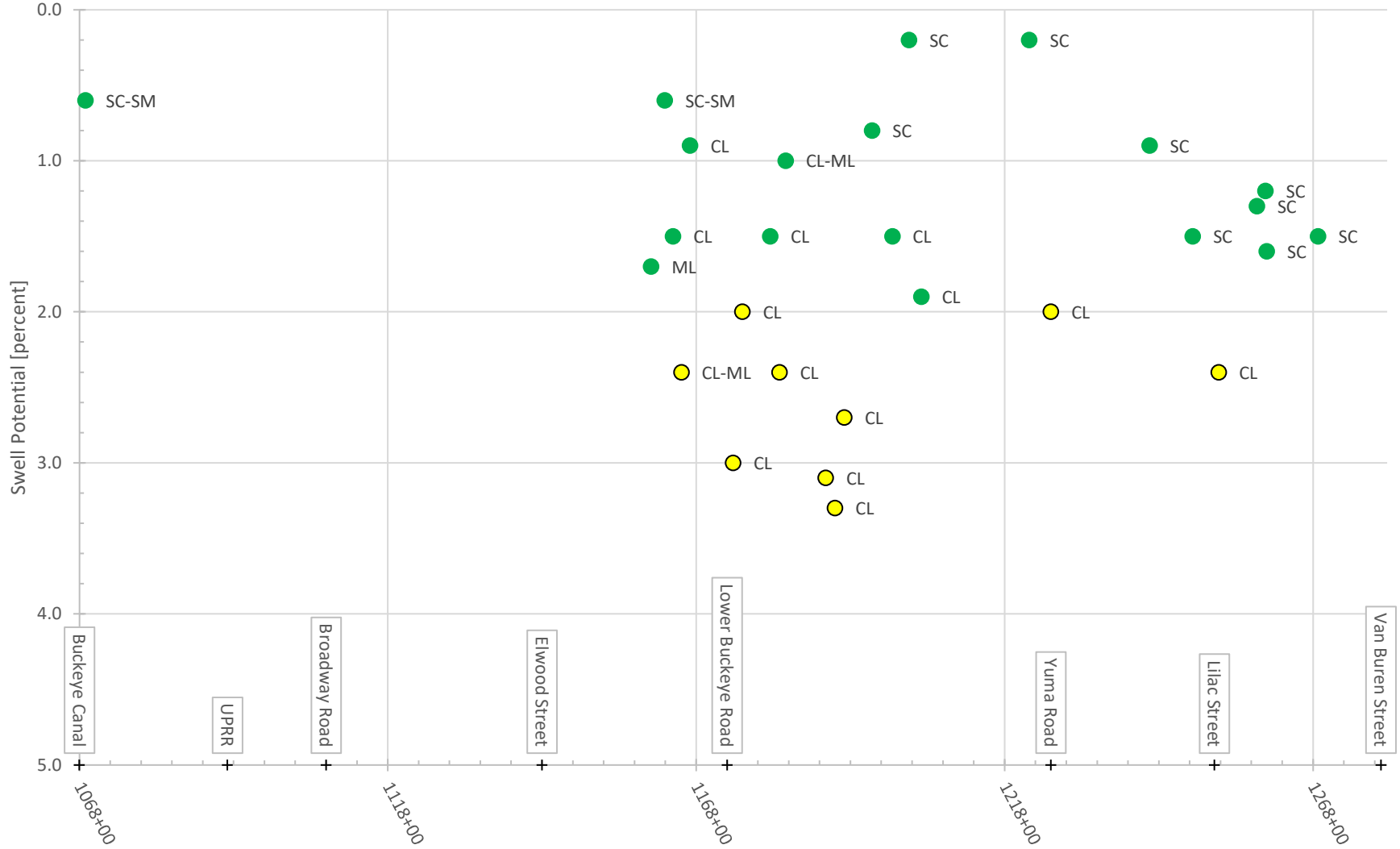
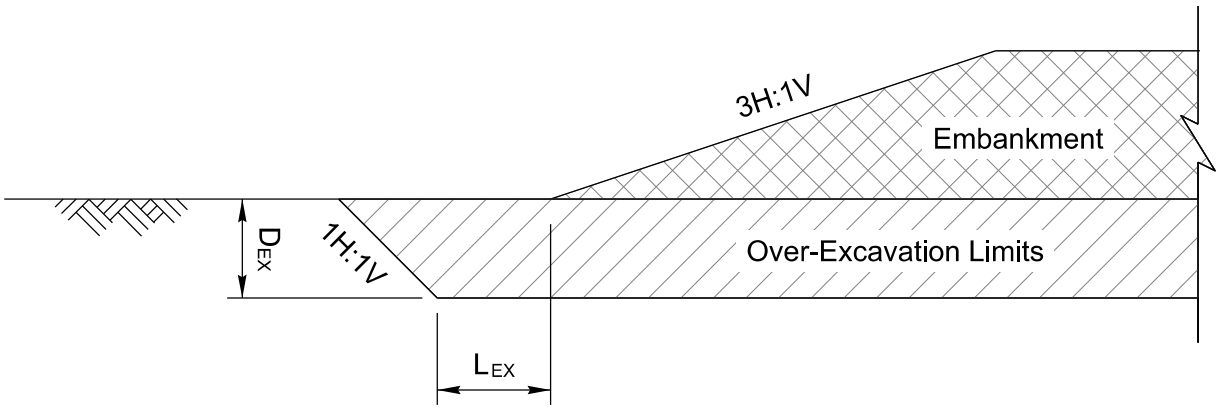


Figure 23
Swell Potential along SR 303L Project Corridor



Notes:
- Samples remolded to 95% of maximum dry density and -2% of optimum moisture
- Confining Stress = 100 psf.



TYPICAL VERTICAL AND HORIZONTAL EXTENTS OF OVER-EXCAVATION LIMITS

SR 303L, MC 85 TO VAN BUREN ST
MARICOPA COUNTY

FIGURE 24

ethos ENGINEERING, LLC.
9180 S Kyrene Rd
Suite #104
Tempe, AZ 85284

TABLES

TABLE 1 - Field Exploration Program SR 303L, MC 85 to Van Buren

Location ID	Project Element	Stationing Reference	Station and Offset [Feet]	Depth [feet]
B-1	Roadway	SR 303L Cst CL	1142+30, 238’ L	5.00
B-2	Roadway	SR 303L Cst CL	1148+00, 270’ L	5.00
B-3	Roadway	SR 303L Cst CL	1153+50, 735’ R	5.00
B-4	Roadway	SR 303L Cst CL	1155+00, 450’ R	5.00
B-5	Roadway	SR 303L Cst CL	1155+40, 255’ L	5.00
B-6	Wall	SR 303L Cst CL	1159+50, 285' R	60.00
B-7	Wall	SR 303L Cst CL	1160+75, 110’ L	10.00
B-7A	Wall	SR 303L Cst CL	1162+30, 102' L	35.00
B-8	Wall	SR 303L Cst CL	1164+25, 160’ L	80.00
B-9	Wall	SR 303L Cst CL	1165+60, 170’ L	80.00
B-10	Wall	SR 303L Cst CL	1167+00, 155’ L	70.00
B-11	Wall	SR 303L Cst CL	1168+80, 150’ L	60.00
B-12	Wall	SR 303L Cst CL	1170+60. 125’ L	60.00
B-13	Wall	SR 303L Cst CL	1160+70, 250' R	60.00
B-14	Wall	SR 303L Cst CL	1161+65 220' R	60.00
B-15	Wall	SR 303L Cst CL	1162+90, 165' R	70.00
B-16	Wall	SR 303L Cst CL	1164+10, 150, R	75.00
B-17	Wall	SR 303L Cst CL	1165+50, 170’ R	80.00
B-18	Wall	SR 303L Cst CL	1167+00, 160’ R	70.00
B-19	Wall	SR 303L Cst CL	1168+30, 160’ R	65.00
B-20	Wall	SR 303L Cst CL	1169+90, 145’ R	60.00
B-21	Wall	SR 303L Cst CL	1171+00, 140’ R	60.00
B-22	Bridge	SR 303L Cst CL	1171+70, 145’ L	100.00
B-23	Bridge	SR 303L Cst CL	1171+80, 30’ R	100.00
B-24	Bridge	SR 303L Cst CL	1172+90, 125’ L	100.00
B-25	Bridge	SR 303L Cst CL	1172+90, 125' R	100.00
B-26	Bridge	SR 303L Cst CL	1174+00 135' L	100.00
B-27	Bridge	SR 303L Cst CL	1174+00, 105' R	100.00
B-28	Roadway	SR 303L Cst CL	1173+00, 870’ L	5.00
B-29	Roadway	SR 303L Cst CL	1173+75, 710’ R	5.00
B-30	Wall	SR 303L Cst CL	1175+50, 140’ L	50.00
B-31	Wall	SR 303L Cst CL	1176+90, 125’ L	45.00
B-32	Wall	SR 303L Cst CL	1178+30, 125’ L	45.00
B-33	Wall	SR 303L Cst CL	1179+70, 130’ L	45.00
B-34	Wall	SR 303L Cst CL	1181+00, 130’ L	40.00
B-35	Wall	SR 303L Cst CL	1182+50, 115’ L	30.00
B-35A	Wall	SR 303L Cst CL	1184+00, 115' L	30.00
B-35B	Wall	SR 303L Cst CL	1185+50, 115' L	25.00
B-36	Wall	SR 303L Cst CL	1175+50, 120’ R	50.00
B-37	Wall	SR 303L Cst CL	1177+00, 120’ R	45.00
B-38	Wall	SR 303L Cst CL	1178+50, 125’ R	45.00

TABLE 1 - Field Exploration Program SR 303L, MC 85 to Van Buren

Location ID	Project Element	Stationing Reference	Station and Offset [Feet]	Depth [feet]
B-39	Wall	SR 303L Cst CL	1180+00, 125’ R	35.00
B-40	Wall	SR 303L Cst CL	1181+50 125’ R	20.00
B-41	Wall	SR 303L Cst CL	1183+00, 90' R	20.00
B-42	Wall	SR 303L Cst CL	1184+50, 90' R	20.00
B-43	Wall	SR 303L Cst CL	1186+00, 90' R	20.00
B-44	Wall	SR 303L Cst CL	1187+50, 90' R	25.00
B-45	Wall	SR 303L Cst CL	1189+00, 90' R	25.00
B-46	Wall	SR 303L Cst CL	1190+50, 95’ R	20.00
B-47	Wall	SR 303L Cst CL	1192+00, 90’ R	25.00
B-48	Wall	SR 303L Cst CL	1193+50, 95’ R	20.00
B-49	Wall	SR 303L Cst CL	1195+00, 90' R	25.00
B-50	Wall	SR 303L Cst CL	1196+50, 90' R	30.00
B-51	Wall	SR 303L Cst CL	1198+00, 120' R	30.00
B-52	Wall	SR 303L Cst CL	1199+80, 85’ R	20.00
B-53	Wall	SR 303L Cst CL	1201+00, 90' R	30.00
B-54	Wall	SR 303L Cst CL	1202+50, 90' R	30.00
B-55	Wall	SR 303L Cst CL	1204+00, 90' R	30.00
B-56	Wall	SR 303L Cst CL	1205+50, 90' R	30.00
B-57	Wall	SR 303L Cst CL	1207+00, 100' R	30.00
B-58	Wall	SR 303L Cst CL	1189+50, 140’ L	20.00
B-59	Wall	SR 303L Cst CL	1194+00, 130’ L	20.00
B-60	Wall	SR 303L Cst CL	1200+00, 130’ L	20.00
B-61	Wall	SR 303L Cst CL	1205+00, 135’ L	20.00
B-62	Wall	SR 303L Cst CL	1210+00, 140' L	20.00
B-63	Wall	SR 303L Cst CL	1214+50, 165’ L	25.00
B-64	Wall	SR 303L Cst CL	1216+50, 175’ L	30.00
B-65	Wall	SR 303L Cst CL	1212+00, 165' R	20.00
B-66	Wall	SR 303L Cst CL	1216+00, 170' R	20.00
B-67	Wall	SR 303L Cst CL	1919+00, 140’ L	45.00
B-68	Wall	SR 303L Cst CL	1220+50, 135’ L	50.00
B-69	Wall	SR 303L Cst CL	1222+00, 145’ L	55.00
B-70	Wall	SR 303L Cst CL	1224+00, 140’ L	60.00
B-71	Wall	SR 303L Cst CL	1222+30, 110' R	55.00
B-72	Wall	SR 303L Cst CL	1223+80, 110’ R	60.00
B-73	Bridge	SR 303L Cst CL	1224+60, 128' L	100.00
B-74	Bridge	SR 303L Cst CL	1224+60, 40’ R	100.00
B-75	Bridge	SR 303L Cst CL	1225+75, 10' L	100.00
B-76	Bridge	SR 303L Cst CL	1225+75, 110' R	100.00
B-77	Bridge	SR 303L Cst CL	1227+00, 125’ L	100.00
B-78	Bridge	SR 303L Cst CL	1227+00, 95’ R	100.00
B-79	Roadway	SR 303L Cst CL	1226+00, 890’ L	5.00

TABLE 1 - Field Exploration Program SR 303L, MC 85 to Van Buren

Location ID	Project Element	Stationing Reference	Station and Offset [Feet]	Depth [feet]
B-80	Roadway	SR 303L Cst CL	1225+50, 800’ R	5.00
B-81	Wall	SR 303L Cst CL	1228+40, 130’ L	60.00
B-82	Wall	SR 303L Cst CL	1229+90, 105’ L	55.00
B-83	Wall	SR 303L Cst CL	1231+40, 135’ L	50.00
B-84	Wall	SR 303L Cst CL	1228+50, 115’ R	60.00
B-85	Wall	SR 303L Cst CL	1230+00, 115’ R	55.00
B-85A	Wall	SR 303L Cst CL	1231+80, 112' R	25.00
B-85B	Wall	SR 303L Cst CL	1233+30, 112' R	25.00
B-86	Wall	SR 303L Cst CL	1235+00, 165’ L	20.00
B-87	Wall	SR 303L Cst CL	1236+00, 130’ R	15.00
B-88	Wall	SR 303L Cst CL	1240+00, 120’ L	30.00
B-89	Wall	SR 303L Cst CL	1241+50, 120’ L	35.00
B-90	Wall	SR 303L Cst CL	1242+85, 170’ L	40.00
B-91	Wall	SR 303L Cst CL	1244+40, 165’ L	45.00
B-91A	Wall	SR 303L Cst CL	1244+40, 160' L	10.00
B-92	Wall	SR 303L Cst CL	1246+00, 155’ L	50.00
B-93	Drainage	SR 303L Cst CL	1247+40, 235’ L	15.00
B-94	Wall	SR 303L Cst CL	1247+40, 145’ L	60.00
B-94A	Wall	SR 303L Cst CL	1247+40, 140' L	10.00
B-95	Wall	SR 303L Cst CL	1248+90, 135’ L	65.00
B-96	Wall	SR 303L Cst CL	1250+30, 135’ L	65.00
B-97	Wall	SR 303L Cst CL	1240+00, 190' R	10.00
B-97A	Wall	SR 303L Cst CL	1242+70, 120' R	15.00
B-98	Wall	SR 303L Cst CL	1243+50, 95' R	15.00
B-98A	Wall	SR 303L Cst CL	1244+50, 115' R	40.00
B-99	Wall	SR 303L Cst CL	1247+00, 110’ R	55.00
B-100	Wall	SR 303L Cst CL	1248+50, 110’ R	60.00
B-101	Wall	SR 303L Cst CL	1250+10, 110’ R	65.00
B-102	Bridge	SR 303L Cst CL	1251+50, 105' L	100.00
B-103	Bridge	SR 303L Cst CL	1251+50, 105’ R	100.00
B-104	Bridge	SR 303L Cst CL	1253+10, 120' L	100.00
B-105	Bridge	SR 303L Cst CL	1253+00, 105' R	100.00
B-106	Roadway	SR 303L Cst CL	1251+70, 740’ L	5.00
B-107	Roadway	SR 303L Cst CL	1252+70, 615’ R	5.00
B-108	Drainage	SR 303L Cst CL	1253+60, 205’ L	15.00
B-109	Wall	SR 303L Cst CL	1254+20, 135’ L	60.00
B-110	Wall	SR 303L Cst CL	1255+80, 130’ L	55.00
B-111	Wall	SR 303L Cst CL	1257+30, 135’ L	50.00
B-112	Wall	SR 303L Cst CL	1258+90, 135’ L	40.00
B-113	Wall	SR 303L Cst CL	1260+30, 140’ L	35.00
B-113A	Wall	SR 303L Cst CL	1260+30, 135' L	10.00

TABLE 1 - Field Exploration Program SR 303L, MC 85 to Van Buren

Location ID	Project Element	Stationing Reference	Station and Offset [Feet]	Depth [feet]
B-114	Wall	SR 303L Cst CL	1260+50, 210’ L	10.00
B-115	Wall	SR 303L Cst CL	1254+20, 105’ R	60.00
B-116	Wall	SR 303L Cst CL	1255+75, 100’ R	55.00
B-117	Wall	SR 303L Cst CL	1257+15, 100’ R	50.00
B-118	Wall	SR 303L Cst CL	1258+65, 105’ R	40.00
B-119	Wall	SR 303L Cst CL	1260+20, 100’ R	40.00
B-119A	Wall	SR 303L Cst CL	1262+70, 150' R	40.00
B-119B	Wall	SR 303L Cst CL	1264+70, 165' R	40.00
B-120	Drainage	SR 303L Cst CL	1265+00, 190’ L	15.00
B-121	Wall	SR 303L Cst CL	1269+00, 190’ L	10.00
B-122	Wall	SR 303L Cst CL	1273+00, 240’ L	10.00
B-123	Wall	SR 303L Cst CL	1276+00, 130' L	20.00
B-124	Wall	SR 303L Cst CL	1268+80, 190’ R	20.00
B-124A	Wall	SR 303L Cst CL	1272+50, 105' R	45.00
B-124B	Wall	SR 303L Cst CL	1274+50, 100' R	45.00
B-125	Wall	SR 303L Cst CL	1276+85, 155’ R	10.00
B-126	Roadway	MC 85 Cst CL	16+50, 22’ R	5.00
B-127	Roadway	MC 85 Cst CL	22+60 23’ R	5.00
B-128	Roadway	MC 85 Cst CL	31+20, 22’ R	5.00
B-129	Bridge	SR 303L Cst CL	1081+50, 50’ R	60.00
B-129A	Bridge	SR 303L Cst CL	1081+10, 10' L	60.00
B-130	Wall	SR 303L Cst CL	1083+00, 45’ R	60.00
B-131	Wall	SR 303L Cst CL	1084+80, 45’ R	60.00
B-132	Wall	SR 303L Cst CL	1086+40, 45’ R	60.00
B-133	Wall	SR 303L Cst CL	1184+50, 90’ L	60.00
B-134	Wall	SR 303L Cst CL	1086+30, 60’ L	60.00
B-135	Bridge	SR 303L Cst CL	1088+30, 115’ L	100.00
B-136	Bridge	SR 303L Cst CL	1089+30, 20’ L	100.00
B-137	Bridge	SR 303L Cst CL	1089+60, 110’ L	120.00
B-138	Bridge	SR 303L Cst CL	1090+40, 20’ L	120.00
B-139	Bridge	SR 303L Cst CL	1091+85, 110’ L	120.00
B-140	Bridge	SR 303L Cst CL	1092+70, 10’ L	120.00
B-141	Bridge	SR 303L Cst CL	1093+00, 105’ L	100.00
B-142	Bridge	SR 303L Cst CL	1093+95, 10’ L	100.00
B-143	Drainage	SR 303L Cst CL	1089+30, 365, L	30.00
B-144	Roadway	SR 303L Cst CL	1101+80, 65’ L	40.00
B-145	Bridge	SR 303L Cst CL	1106+70, 90’ L	100.00
B-146	Bridge	SR 303L Cst CL	1107+50, CL	100.00
B-147	Bridge	SR 303L Cst CL	1107+85, 95’ L	100.00
B-148	Bridge	SR 303L Cst CL	1108+60, CL	100.00
B-149	Roadway	SR 303L Cst CL	1111+00, 80’ L	40.00

TABLE 1 - Field Exploration Program SR 303L, MC 85 to Van Buren

Location ID	Project Element	Stationing Reference	Station and Offset [Feet]	Depth [feet]
B-150	Bridge	SR 303L Cst CL	1115+90, 70' L	20.00
B-151	Roadway	SR 303L Cst CL	1121+00, 85' L	20.00
B-152	Roadway	SR 303L Cst CL	1125+60, 70' L	20.00
B-153	Roadway	SR 303L Cst CL	1128+60, 4' R	10.00
B-154	Roadway	SR 303L Cst CL	1131+50, 85' L	20.00
B-155	Roadway	SR 303L Cst CL	1133+50, 40' R	20.00
B-156	Roadway	SR 303L Cst CL	1136+45, 85' L	55.00
B-157	Roadway	SR 303L Cst CL	1138+90 125' R	55.00
B-158	Roadway	SR 303L Cst CL	1141+50, 95' L	100.00
B-159	Roadway	SR 303L Cst CL	1142+40, CL	100.00
B-160	Bridge	SR 303L Cst CL	1142+15, 110' L	100.00
B-161	Bridge	SR 303L Cst CL	1143+10, 5' L	100.00
B-162	Bridge	SR 303L Cst CL	1143+20, 100' L	100.00
B-163	Bridge	SR 303L Cst CL	1144+00,10' L	100.00
B-164	Bridge	SR 303L Cst CL	1143+85, 165' R	100.00
B-165	Bridge	SR 303L Cst CL	1144+50, 160' R	100.00
B-166	Bridge	SR 303L Cst CL	1145+60, 170' R	100.00
B-167	Wall	SR 303L Cst CL	1146+50, 150' R	60.00
B-168	Roadway	SR 303L Cst CL	1148+40, 100' L	35.00
B-169	Roadway	SR 303L Cst CL	1149+15, 180' R	35.00
B-170	Roadway	SR 303L Cst CL	1152+50, 100' L	40.00
B-171	Wall	SR 303L Cst CL	1156+60, CL	60.00
B-172	Bridge	SR 303L Cst CL	1155+25, 230' R	100.00
B-173	Bridge	SR 303L Cst CL	1157+80, 240' R	100.00
B-174	Bridge	SR 303L Cst CL	1159+40, 230' R	100.00
B-175	Bridge	SR 303L Cst CL	1157+80, 95' L	100.00
B-176	Bridge	SR 303L Cst CL	1157+80, 5' R	100.00
B-177	Roadway	SR 303L Cst CL	1158+75, 160' L	20.00
B-178	Bridge	SR 303L Cst CL	1158+75, 35' L	100.00
B-179	Bridge	SR 303L Cst CL	1159+75, 100' L	100.00
B-180	Bridge	SR 303L Cst CL	1159+75, 5' L	100.00
B-181	Bridge	SR 303L Cst CL	1160+60, 40' L	100.00
B-182	Bridge	SR 303L Cst CL	1161+60, 90' L	100.00
B-183	Bridge	SR 303L Cst CL	1161+60, CL	100.00
B-184	Bridge	SR 303L Cst CL	1162+55, 125' L	100.00
B-185	Bridge	SR 303L Cst CL	1162+55, CL	100.00
B-186	Bridge	SR 303L Cst CL	1163+45, 80' L	100.00
B-187	Wall	SR 303L Cst CL	1165+00, 90' L	80.00
B-188	Wall	SR 303L Cst CL	1166+50, 90' L	80.00
B-190	Wall	SR 303L Cst CL	1210+90, 125' L	20.00
B-191	Wall	SR 303L Cst CL	1212+40, 165' R	20.00

TABLE 1 - Field Exploration Program SR 303L, MC 85 to Van Buren

Location ID	Project Element	Stationing Reference	Station and Offset [Feet]	Depth [feet]
B-192	Wall	SR 303L Cst CL	1231+70, 110’ R	20.00
B-193	Wall	SR 303L Cst CL	1233+40, 105’ R	20.00
B-194	Wall	SR 303L Cst CL	1262+25, 145’ R	40.00
B-195	Wall	SR 303L Cst CL	1263+75, 155’ R	35.00
B-196	Wall	SR 303L Cst CL	1265+35, 165’ R	30.00
B-196A	Wall	SR 303L Cst CL	1266+90, 210' R	30.00
B-19B	Wall	SR 303L Cst CL	1268+00, 210' R	30.00
B-196C	Wall	SR 303L Cst CL	1270+00, 210' R	20.00
B-196D	Wall	SR 303L Cst CL	1271+50, 210' R	15.00
B-197	Wall	SR 303L Cst CL	1271+70, 85’ R	20.00
B-198	Wall	SR 303L Cst CL	1273+45, 85’ R	30.00
B-199	Wall	SR 303L Cst CL	1275+15, 90’ R	40.00
C-1	Roadway	---	---	0.50
C-2	Roadway	---	---	0.50
P-1	Drainage	SR 303L Cst CL	1094+50, 210’ L	15.00
P-2	Drainage	SR 303L Cst CL	1095+50, 550’ L	15.00
P-3	Drainage	SR 303L Cst CL	1100+50, 260’ L	15.00
P-4	Drainage	SR 303L Cst CL	1097+45, 845' L	20.00
P-5	Drainage	SR 303L Cst CL	1105+60, 610' L	20.00
P-6	Drainage	SR 303L Cst CL	1069+00, 165’ L	15.00
P-6A	Drainage	SR 303L Cst CL	1069+00, 210' L	2.00
P-7	Drainage	SR 303L Cst CL	1070+80, 95’ R	15.00
P-8	Drainage	SR 303L Cst CL	1072+40, 240’ L	15.00
P-9	Drainage	SR 303L Cst CL	1074+75, 60’ R	15.00
P-10	Drainage	SR 303L Cst CL	1075+00, 290’	15.00

TABLE 2 - Collapse Potential Test Data

		Depth			
Boring ID	Station	Begin [ft]	End [ft]	Collapse [%]	N_{60} [dim]
B-013	1160+70	5	6	0.1	6
B-014	1161+65	5	6	0.0	9
B-018	1167+00	5	6	0.0	6
B-030	1175+50	5	6	8.1	21
B-032	1178+30	10	11	0.5	90
B-035	1182+50	5	6	4.4	13
B-040	1181+50	5	6	8.7	6
B-042	1184+50	10	11	3.1	72
B-045	1189+00	5	6	8.6	12
B-047	1192+00	3	4	0.0	8
B-048	1193+50	5	6	3.9	10
B-050	1196+50	3	4	0.3	8
B-054	1202+50	15	16	0.0	27
B-066	1216+00	5	6	1.5	7
B-083	1231+40	10	11	0.8	18
B-085	1230+00	15	16	0.3	28
B-090	1242+85	5	6	2.2	11
B-091A	1244+40	5.5	6.5	0.8	25
B-092	1246+00	5	6	2.3	13
B-094	1247+40	10	11	1.3	15
B-094A	1247+45	2.5	3.5	5.6	18
B-098	1243+50	5	6	0.0	40
B-113	1260+40	5	6	2.2	18
B-113A	1260+30	5.5	6.5	3.4	9
B-121	1269+00	5	6	2.8	39
B-129	1081+50	10	11	4.7	9
B-133	1084+50	1	2	4.0	21
B-135	1088+30	5	6	7.0	17
B-138	1091+85	5	6	0.2	13
B-143	1089+30	10	11	0.4	9
B-144	1101+80	3	4	3.5	9
B-147	1107+85	5	6	0.4	6
B-150	1115+90	5	6	0.4	3
B-151	1121+00	5	6	5.4	17
B-155	1133+50	5	6	7.2	21
B-156	1136+45	10	11	2.6	14
B-159	1142+40	3	4	5.8	23
B-161	1143+10	5	6	4.4	40
B-163	1144+00	10	11.5	0.3	28
B-165	1144+50	5	6	3.7	15
B-167	1146+50	10	11	0.7	9
B-169	1149+15	3	4	5.5	17
B-171	1156+60	1	2	12.0	11
B-173	1157+80	5	6	1.7	7
B-174	1159+40	1	2	4.0	24
B-176	1157+80	45	46	0.0	5
B-178	1158+75	10	11	0.8	12
B-179	1159+75	0	1	4.5	23
B-183	1161+60	1	2	10.8	20
B-184	1162+55	1	2	8.0	29
B-187	1165+00	10	11	6.9	20
B-191	1212+40	5	6	1.8	4
B-192	1231+70	5	6	2.7	26
B-194	1262+25	5	6	1.7	12
B-196	1265+35	10	11	0.0	20
B-198	1273+45	10	11	5.9	18

TABLE 3 - Swell Potential Test Data

		Depth			
Boring ID	Station	Begin [ft]	End [ft]	Swell [%]	USCS [dim]
B-9	1165+60	0	5	2.4	CL-ML
B-13	1160+70	0	5	1.7	ML
B-15	1162+90	0	5	0.6	SC-SM
B-26	1174+00	0	5	3.0	CL
B-35	1182+50	0	5	1.0	CL-ML
B-40	1181+50	0	5	2.4	CL
B-45	1189+00	0	5	3.1	CL
B-46	1190+50	0	5	3.3	CL
B-50	1196+50	0	5	0.8	SC
B-54	1202+50	0	5	0.2	SC
B-55	1204+50	0	5	1.9	CL
B-69	1222+00	1	4	0.2	SC
B-80	1225+50	0	5	2.0	CL
B-89	1241+50	0	5	0.9	SC
B-97	124+00	0	5	1.7	SC
B-100	1248+50	0	5	1.5	SC
B-107	1252+70	0	5	2.4	CL
B-112	1258+90	0	5	1.3	SC
B-113	1260+30	0	5	1.2	SC
B-114	1260+50	0	5	1.6	SC
B-124	1268+80	0	5	1.5	SC
B-8	1164+25	0	5	1.5	CL
B-18	1167+00	0	5	0.9	CL
B-36	1175+50	0	5	2.0	CL
B-39	1180+00	0	5	1.5	CL
B-47	1192+00	0	5	2.7	CL
B-52	1199+80	0	5	1.5	CL
P-6A	1069+00	0	2	0.6	SC-SM

TABLE 4 - Pavement Subgrade Testing Results

Boring ID (Depth) [feet]	USCS	%Passing #200 Sieve	Plasticity Index	Correlated R-Value	Tested R-Value
B-002 (0 - 5)	SC-SM	40.6	7	19	--
B-003 (0 - 5)	SM	35.8	3	24	69
B-004 (0 - 5)	SM	41.1	2	19	--
B-005 (0 - 5)	SC-SM	20	6	42	--
B-006 (0 - 5)	SM	14.6	0	56	--
B-007 (0 - 5)	SC	41.9	8	17	49
B-007A (0 - 5)	SC-SM	48	7	14	--
B-008 (0 - 5)	CL	64.7	8	7	--
B-009 (0 - 5)	CL-ML	59.5	7	9	--
B-010 (0 - 5)	SC-SM	45.8	5	16	--
B-012 (0 - 5)	SC-SM	42.3	6	18	--
B-013 (0 - 5)	ML	52.3	0	13	--
B-014 (0 - 5)	SM	29.9	0	31	--
B-015 (0 - 5)	SC-SM	46.8	6	15	--
B-016 (0 - 5)	SM	39.6	0	21	--
B-017 (0 - 5)	ML	56.1	0	11	--
B-018 (0 - 5)	CL	54.8	9	10	--
B-019 (0 - 5)	SM	18.1	0	49	--
B-020 (0 - 5)	SM	29.2	0	32	--
B-022 (0 - 5)	SC-SM	24.5	5	36	--
B-023 (0 - 5)	SM	39.5	0	21	--
B-026 (0 - 5)	CL	58.3	8	9	--
B-028 (0 - 5)	SM	21.9	3	41	--
B-029 (0 - 5)	SC-SM	45.7	4	16	--
B-030 (0 - 5)	SC-SM	33.4	7	25	--
B-031 (0 - 5)	SC	45.4	9	15	--
B-032 (0 - 5)	SC	33.1	9	24	--
B-033 (0 - 5)	SC	44.3	8	16	69
B-034 (0 - 5)	SC-SM	41.8	7	18	--
B-035 (0 - 5)	CL-ML	56.8	7	10	--
B-035A (0 - 2.5)	SC-SM	41.2	6	18	--
B-036 (0 - 5)	CL	59.5	11	8	--
B-037 (0 - 5)	SC	48.1	10	13	--
B-038 (0 - 5)	CL	59.4	14	8	63
B-039 (0 - 5)	CL	53	11	11	--
B-040 (0 - 5)	CL	51.5	10	12	--
B-041 (0 - 5)	SC	43.9	11	15	--
B-042 (0 - 5)	SC	46.8	9	14	61
B-043 (0 - 5)	SC	48	10	13	--
B-044 (0 - 5)	SC	43.7	8	16	--

TABLE 4 - Pavement Subgrade Testing Results

Boring ID (Depth) [feet]	USCS	%Passing #200 Sieve	Plasticity Index	Correlated R-Value	Tested R-Value
B-045 (0 - 5)	CL	52.8	10	11	--
B-046 (0 - 5)	CL	51.5	11	11	--
B-047 (0 - 5)	CL	56.8	10	9	--
B-049 (0 - 5)	SC	49.7	12	12	--
B-050 (0 - 5)	SC	37.1	10	20	--
B-051 (0 - 5)	SC-SM	48.7	5	14	--
B-052 (0 - 5)	CL	75.1	8	5	--
B-053 (0 - 5)	SC	28.1	10	29	--
B-054 (0 - 5)	SC	28	10	29	--
B-055 (0 - 5)	CL	53.7	11	10	--
B-056 (0 - 5)	SC	40.1	14	17	--
B-057 (0 - 5)	SC	37.9	12	19	--
B-058 (0 - 5)	SC-SM	44.8	6	16	--
B-059 (0 - 5)	CL	74.3	8	5	--
B-060 (0 - 5)	SC	42	11	17	--
B-062 (0 - 5)	SC-SM	17.1	5	48	--
B-063 (0 - 5)	SC	40	10	18	--
B-066 (0 - 5)	CL	70.6	11	5	--
B-068 (0 - 5)	CL	60.5	9	8	--
B-071 (0 - 5)	SC	33	11	24	--
B-074 (0 - 5)	SC		11	86	--
B-077 (0 - 5)	SC	36.9	9	21	--
B-078 (0 - 5)	SP-SM	11.8	0	63	--
B-079 (0 - 5)	SC	33.9	10	23	--
B-080 (0 - 5)	CL	56.9	10	9	--
B-083 (0 - 5)	SC	27.1	8	31	--
B-084 (0 - 5)	SC	16.6	12	44	--
B-085 (0 - 5)	SC	13.8	12	49	--
B-085A (0 - 2.5)	SC	21.4	27	30	--
B-085B (0 - 2.5)	SC	28.6	11	28	--
B-087 (0 - 5)	SC	35.6	14	20	--
B-089 (0 - 5)	SC	44.7	13	15	--
B-090 (0 - 5)	SC	48.1	13	13	--
B-092 (0 - 5)	SC	23.6	8	36	63
B-093 (0 - 5)	SC	33.5	10	23	--
B-094 (0 - 5)	SM	28.7	0	33	73
B-095 (0 - 5)	SC	22	19	33	--
B-096 (0 - 5)	SC	14.9	15	45	--
B-097 (0 - 5)	SC	41.2	15	16	--
B-097A (0 - 2.5)	SC	42.8	14	15	--

TABLE 4 - Pavement Subgrade Testing Results

Boring ID (Depth) [feet]	USCS	%Passing #200 Sieve	Plasticity Index	Correlated R-Value	Tested R-Value
B-098 (0 - 5)	SC	42.8	12	16	--
B-098A (0 - 2.5)	SC	39	15	18	--
B-099 (0 - 5)	SC	25.9	9	32	--
B-100 (0 - 5)	SC	36.9	9	21	--
B-101 (0 - 5)	SC	30.8	9	26	--
B-103 (0 - 5)	SC	24	10	34	--
B-106 (0 - 5)	SC	31.9	12	24	--
B-107 (0 - 5)	CL	50.6	10	12	--
B-108 (0 - 5)	SC	41.8	12	16	--
B-112 (0 - 5)	SC	34.8	11	22	--
B-113 (0 - 5)	SC	34.4	11	22	--
B-114 (0 - 5)	SC	40.3	12	17	--
B-115 (0 - 5)	SC	19.2	11	41	--
B-118 (0 - 5)	SM	19.2	0	47	--
B-119A (0 - 2.5)	SC-SM	25.7	5	34	--
B-119B (0 - 2.5)	SC-SM	26.3	4	34	--
B-120 (0 - 5)	SC	34.2	12	22	--
B-121 (0 - 5)	SC	37.1	9	21	--
B-122 (0 - 5)	SC	37.2	9	21	--
B-123 (0 - 5)	SM	30.1	0	31	--
B-124 (0 - 5)	SC	38.3	11	19	--
B-124A (0 - 2.5)	SC	23.7	15	32	--
B-125 (0 - 5)	SC	31.2	11	25	--
B-126 (0 - 1.5)	SC-SM	43	7	17	--
B-128 (1 - 4)	CL	63	15	7	9
B-129 (0 - 5)	CL	86	14	3	--
B-134 (0 - 5)	CL	85	11	3	--
B-148 (0 - 5)	ML	66	3	7	--
B-154 (0 - 5)	SM	32	0	29	--
B-157 (0 - 5)	SC-SM	42	4	18	--
B-162 (0 - 5)	SM	36	0	24	--
B-168 (0 - 5)	SC-SM	25	6	35	--
B-170 (0 - 5)	SM	26	0	36	--
B-171 (0 - 3)	SM	37	3	23	--
B-176 (0 - 5)	CL-ML	77	6	5	--
B-179 (0 - 1)	SC	49	9	13	--
B-180 (0 - 1.5)	CL	69	10	6	--
B-181 (0 - 5)	CL	53	11	11	--
B-187 (0 - 5)	CL-ML	62	5	8	--
B-190 (0 - 5)	SC	36	9	22	--

TABLE 4 - Pavement Subgrade Testing Results

Boring ID (Depth) [feet]	USCS	%Passing #200 Sieve	Plasticity Index	Correlated R-Value	Tested R-Value
B-199 (0 - 5)	SC	24	13	33	--
P-001 (0 - 5)	CL	94.1	16	2	--
P-002 (0 - 5)	CL	95.1	9	2	--
P-003 (0 - 5)	CL-ML	81.9	7	4	--
			Count	**124**	**8**
			Max	**86**	**73**
			Min	**2**	**9**
			Average	**21.3**	**57.0**
			StdDev	**13.4**	**20.7**

Table 5 - Proctor Data for Estimating Earthwork Factors

Boring ID	USCS	Max Dry Density (pcf)	Fines %	Sand %	Gravel %	Rock-Corrected Max Dry Density (pcf)	Average Rock-Corrected Max Dry Density (pcf)
B-107	CL	124.4	51	47	2	124.4	
B-127	CL	107.9	95	5	0	107.9	
B-128	CL	110.7			2	110.7	
B-26	CL	118.7	58	39	3	118.7	
B-40	CL	117.5	52	43	5	117.5	
B-45	CL	117.1	53	43	4	117.1	
B-46	CL	122.4	52	42	6	122.4	
B-55	CL	118.3	54	41	5	118.3	
B-80	CL	118.8	57	40	3	118.8	
P-6	CL	105.9			2	105.9	
P-7	CL	103			1	103.0	
P-8	CL	103.5			0	103.5	
P-9	CL	103.3			0	103.3	113.2
B-187	CL-ML	118.3			0	118.3	
B-35	CL-ML	119.1	57	38	5	119.1	
B-9	CL-ML	120.1	60	39	1	120.1	119.2
B-13	ML	120.7	52	47	1	120.7	120.7
B-100	SC	126.3	37	46	17	129.9	
B-112	SC	117.5	30	66	4	117.5	
B-113	SC	125.3	29	60	11	127.7	
B-114	SC	115.9	40	53	7	115.9	
B-124	SC	117.8	38	53	9	117.8	
B-50	SC	118.3	37	54	9	118.3	
B-54	SC	123.6	28	61	11	126.2	
B-69	SC	124.5	43	50	7	124.5	
B-89	SC	117.3	45	49	6	117.3	
B-97	SC	120	41	51	8	120.0	121.5
B-15	SC-SM	122.8	47	51	2	122.8	
B-157	SC-SM	119.2			5	119.2	121.0
B-171	SM	126.3			4	126.3	126.3

Table 6 - Estimated Earthwork Factors (Depth of 0 to 10 Feet)

Boring ID	Station and Offset	Depth (feet)		USCS/ Group Symbol[1]	Rock Corrected Maximum	In-Place Dry Density[3]	Value Compacted to 95%	95% Density Shrink (+) Swell (-)
		Begin	End					
B-013	1160+70, 250' R	5.0	6.0	SC-SM	121.0	108.8	115.0	5
B-014	1161+65 220' R	5.0	6.0	ML	120.7	109.2	114.7	5
B-014	1161+65 220' R	5.0	6.0	ML	120.7	109.2	114.7	5
B-015	1162+90, 165' R	0.0	1.0	SC-SM	121.0	113.6	115.0	1
B-018	1167+00, 160' R	5.0	6.0	SM	126.3	109.3	120.0	9
B-030	1175+50, 140' L	5.0	6.0	SC-SM	121.0	92.3	115.0	20
B-032	1178+30, 125' L	10.0	11.0	SC	121.5	102.3	115.4	11
B-035	1182+50, 115' L	5.0	6.0	ML	120.7	92.2	114.7	20
B-040	1181+50 125' R	5	6	CL	113.2	90.3	107.5	16
B-042	1184+50, 90' R	10	11	CL	113.2	81	107.5	25
B-043	1186+00, 90' R	10	10.5	SM	126.3	95.5	120.0	20
B-045	1189+00, 90' R	5	6	CL	113.2	83	107.5	23
B-047	1192+00, 90' R	3	4	CL	113.2	101.8	107.5	5
B-048	1193+50, 95' R	5	6	ML	120.7	87	114.7	24
B-050	1196+50, 90' R	3	4	SC	121.5	103.6	115.4	10
B-051	1198+00, 120' R	10	10.9	SM	126.3	109.6	120.0	9
B-066	1216+00, 170' R	5	6	CL	113.2	100.9	107.5	6
B-083	1231+40, 135' L	10	11	CL	113.2	105.4	107.5	2
B-090	1242+85, 170' L	5	6	SC	121.5	93.1	115.4	19
B-091	1244+40, 165' L	10	11	SC	121.5	96.67	115.4	16
B-092	1246+00, 155' L	5	6	SC	121.5	102.7	115.4	11
B-094	1247+40, 145' L	10	11	SP	126.3	104.3	120.0	13
B-095	1248+90, 135' L	5	5.9	SC	121.5	121.19	115.4	-5
B-098	1243+50, 95' R	5	6	SC	121.5	109	115.4	6
B-113	1260+30, 140' L	5	6	GP	126.3	107.3	120.0	11
B-114	1260+50, 210' L	10	11	SP	126.3	108.3	120.0	10
B-121	1269+00, 190' L	5	6	SC	121.5	103.3	115.4	11
B-122	1273+00, 240' L	10	11	SP	126.3	100.6	120.0	16
B-129	1081+50, 50 R	10	11	ML	120.7	89.8	114.7	22
B-132	1086+40, 45 R	1	2	CL	113.2	86.1	107.5	20
B-132	1086+40, 45 R	10	11	CL	113.2	88.56667	107.5	18
B-133	1084+50, 90 L	1	2	CL	113.2	91.9	107.5	15
B-133	1084+50, 90 L	10	11	ML	120.7	87.5	114.7	24
B-134	1086+30, 60 L	10	11	CL	113.2	93.8	107.5	13
B-135	1088+30, 115 L	5	6	CL	113.2	87.2	107.5	19
B-136	1089+30, 20 L	5	6	CL	113.2	102.6	107.5	5
B-138	1090+40, 20 L	5	6	ML	120.7	98.9	114.7	14
B-143	1089+30, 365 L	10	11	ML	120.7	94.5	114.7	18
B-144	1101+80, 65 L	3	4	CL-ML	119.2	105.4	113.2	7
B-145	1106+70, 90 L	1	2	CL-ML	119.2	98.9	113.2	13
B-145	1106+70, 90 L	10	11	CL-ML	119.2	92.3	113.2	18
B-146	1107+50, CL	5	6	ML	120.7	97.3	114.7	15
B-147	1107+85, 95 L	5	6	ML	120.7	97	114.7	15
B-148	1108+60, CL	1	2	ML	120.7	101.6	114.7	11
B-148	1108+60, CL	10	11	SM	126.3	96.56667	120.0	20
B-149	1111+00, 80 L	10	11	SM	126.3	110.2	120.0	8
B-150	1115+90, 70 L	5	6	ML	120.7	107.4	114.7	6
B-151	1115+90, 70 L	5	6	SC-SM	121.0	97.5	115.0	15
B-153	1128+60, 4 R	5	6	SM	126.3	102.4	120.0	15
B-154	1131+50, 85 L	5	6	SM	126.3	109	120.0	9
B-155	1133+50, 40 R	5	6	ML	120.7	98.1	114.7	14
B-159	1142+40, CL	3	4	SC-SM	121.0	104.1	115.0	9
B-161	1143+10, 5 L	5	6	SC	121.5	95.6	115.4	17

Table 6 - Estimated Earthwork Factors (Depth of 0 to 10 Feet)

Boring ID	Station and Offset	Depth (feet)		USCS/ Group Symbol[1]	Rock Corrected Maximum	In-Place Dry Density[3]	Value Compacted to 95%	95% Density Shrink (+) Swell (-)
		Begin	End					
B-163	1144+00, 10 L	10	11.5	SM	126.3	102	120.0	15
B-164	1143+85, 165 R	10	11.5	GC	126.3	122.2	120.0	-2
B-165	1144+50, 160 R	5	6	SP-SM	126.3	95.4	120.0	20
B-167	1146+50, 150 R	10	11	SP-SM	126.3	96.26667	120.0	20
B-171	1156+60, CL	1	2	SM	126.3	96.6	120.0	19
B-171	1156+60, CL	10	11	SM	126.3	113.9	120.0	5
B-172	1155+25, 230 R	10	11	SM	126.3	103.2	120.0	14
B-173	1157+10, 230 R	5	6	SM	126.3	107.1	120.0	11
B-174	1159+40, 230 R	1	2	ML	120.7	92.7	114.7	19
B-174	1159+40, 230 R	10	11	ML	120.7	103.3	114.7	10
B-178	1158+75, 35 L	10	11	SP	126.3	103.3	120.0	14
B-179	1159+75, 100 L	0	1	SC	121.5	99.5	115.4	14
B-179	1159+75, 100 L	10	11	SP-SM	126.3	101.4667	120.0	15
B-181	1160+60, 40 L	10	11	SP-SM	126.3	104.1	120.0	13
B-183	1161+60, CL	10	11	SM	126.3	98.46667	120.0	18
B-184	1162+55, 125 L	1	2	CL	113.2	96.4	107.5	10
B-184	1162+55, 125 L	10	11	SM	126.3	113.7	120.0	5
B-186	1163+45, 80 L	10	11	SM	126.3	94.8	120.0	21
B-187	1165+00, 90 L	10	11	SM	126.3	109.5	120.0	9
B-190	1210+90, 125 L	3	4	SC	121.5	109.6	115.4	5
B-191	1212+40, 165 R	5	6	SC-SM	121.0	109.6	115.0	5
B-192	1231+70, 110 R	5	6	SM	126.3	106.5	120.0	11
B-193	1233+40, 105 R	3	4	SC	121.5	109.8667	115.4	5
B-194	1262+25, 145 R	5	6	SM	126.3	94.1	120.0	22
B-195	1263+75, 155 R	5	6	SM	126.3	104.3	120.0	13
B-196	1265+35, 165 R	10	11	SC	121.5	105.2	115.4	9
B-197	1271+70, 85 R	1	2	SC	121.5	105.5	115.4	9
B-197	1271+70, 85 R	10	11	SC	121.5	100.4	115.4	13
B-198	1273+45, 85 R	1	2	SC	121.5	108.6	115.4	6
B-198	1273+45, 85 R	10	11	SC	121.5	106.4	115.4	8
B-199	1275+15, 90 R	1	2	SC	121.5	115.8	115.4	0
					MEAN	**101.3**	---	**12**
					STANDARD DEVIATION	**8.2**	---	**6**
					MAXIMUM	**122.2**	---	**25**
					MINIMUM	**81.0**	---	**-5**
					COUNT	**84**	---	**84**

Notes:

[1] USCS/Group Symbols are listed as depicted on logs.

[2] Average rock corrected maximum dry density based on soil type.

[3] In situ dry density values from laboratory results of ring samples and consolidation tests.

[4] Percent shrink or swell - Positive values = shrink, negative values = swell

pcf = pounds per cubic foot

APPENDIX A

Boring Logs

SOILS SAMPLING & BORING LOG INFORMATION

The material and in-situ moisture descriptions of soils presented on the boring logs are based on visual observation and classification in accordance with the Unified Soil Classification System (USCS), presented on the next page. The field logs were modified, where appropriate, based on laboratory testing of selected samples.

The relative density and firmness described on the test boring logs are generally based on standard penetration test (SPT) blows per foot (N) for mostly cohesionless and cohesive soils. 2-inch outside diameter (O.D.) SPT samplers are advanced up to 18 inches into undisturbed soils beyond the base of either a hollow stem auger or drill casing. The samplers are driven with a 140-pound hammer and a 30-inch drop. SPT values are recorded on the boring logs for each 6-inch increment of penetration with sampler refusal based on a penetration of less than 6 inches and a blowcount of 50.

Relative Density

Relative density for mostly cohesionless, uncemented sands and sand and gravel mixtures is described based on the following SPT blowcounts:

N	Relative Density
0-4	Very Loose
5-10	Loose
11-30	Medium Dense
31-50	Dense
>50	Very Dense

Relative Firmness

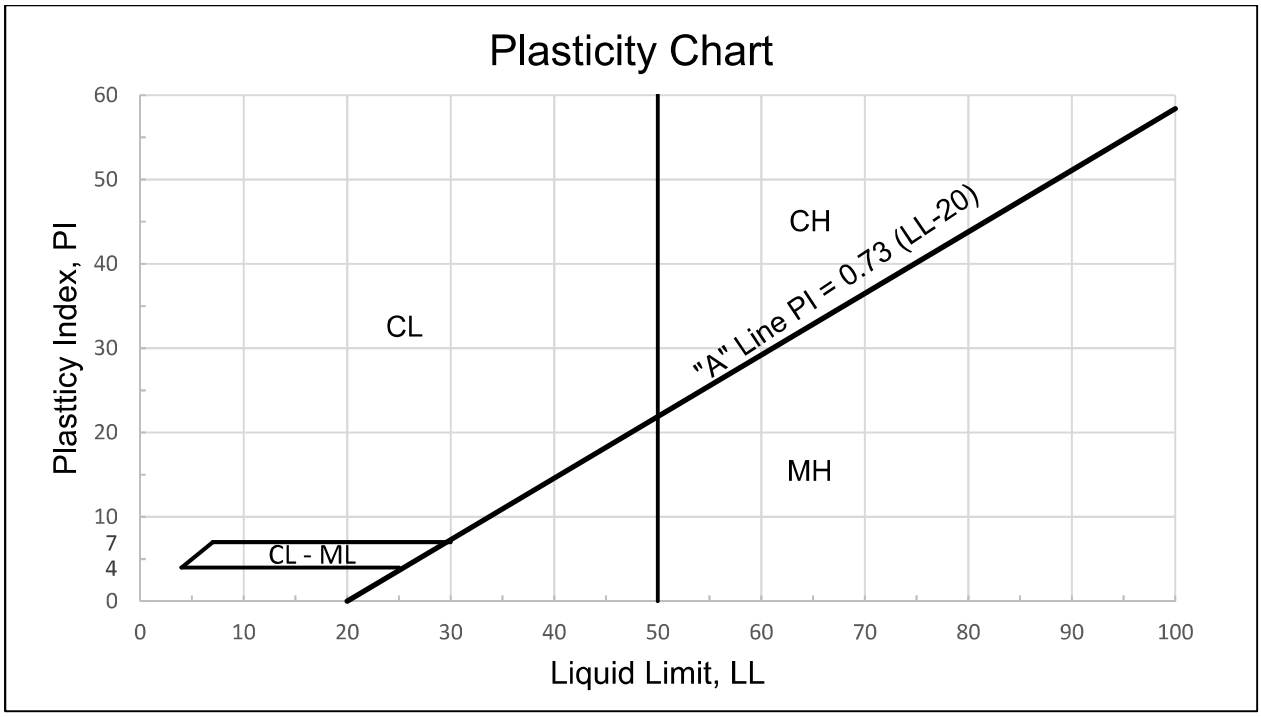
Relative Firmness for cohesive and/or cemented soils including silts, clays and silty to clayey sandy and gravelly soils is described based on the following SPT blowcounts:

N	Relative Firmness
0-4	Very Soft
5-8	Soft
9-15	Moderately Firm
16-30	Firm
31-49	Very Firm
50+	Hard

Undisturbed samples of firmer soils, typically present in the southwest, are obtained with 3-inch O.D. samplers lined with 2.42-inch inside diameter (I.D.) brass rings. The samplers are advanced up to 12 inches into undisturbed soils beyond the base of either a hollow stem auger or drill casing. The samplers are driven with a 140-pound hammer and a 30-inch drop. The N value blowcounts are recorded on the boring logs for each 6-inch increment of penetration with sampler refusal based on a penetration of less than 12 inches and a blowcount of 100.

Unified Soil Classification System
(ASTM D2487)

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests				Group Symbol	Group Description
Coarse-Grained Soils (More than 50% Retained on No. 200 Sieve).	Gravels More than 50% of Coarse Fraction Retained on No. 4 Sieve	Clean Gravels Less than 5% Fines		GW	Well Graded Gravels, Gravel-Sand Mixtures or Sand-Gravel-Cobble Mixtures.
				GP	Poorly Graded Gravels, Gravel-Sand Mixtures or Sand-Gravel-Cobble Mixtures.
		Gravels with More than 12% Fines	Fines Classify as ML or MH	GM	Silty Gravels, Gravel-Sand-Silt Mixtures
			Fines Classify as CL or CH	GC	Clayey Gravels, Gravel-Sand-Clay Mixtures
	Sands 50% or More of Coarse Fraction Passes No. 4 Sieve	Clean Sands Less than 5% Fines		SW	Well Graded Sands, Gravelly Sands.
				SP	Poorly Graded Sands, Gravelly Sands.
		Sands with More than 12% Fines	Fines Classify as ML or MH	SM	Silty Sands, Sand-Silt Mixtures
			Fines Classify as CL or CH	SC	Clayey Sands, Sand-Clay Mixtures
Fine-Grained Soils (50% or More Passes No. 200 Sieve).	Silts and Clays (Liquid Limit less than 50)	PI > 7 and Plots on Above “A” Line		CL	Inorganic Clays of Low to Medium Plasticity, Gravelly Clays, Sandy Clays, Silty Clays, Lean Clays
		PI <4 or Plots Below “A” Line		ML	Inorganic Silts, Clayey Silts with Low Plasticity
	Silts and Clays (Liquid Limit 50 or More)	PI Plots on Above “A” Line		CH	Inorganic Clays of High Plasticity, Fat Clays, Silty and Sandy Clays of High Plasticity
		PI Plots Below “A” Line		MH	Inorganic Silts of High Plasticity, Silty Soils, Elastic Silts



Angularity	
Angular	
Subangular	
Subrounded	
Rounded	

Soil Particle Definitions	
Material	Particle Size Range
Boulders	Greater than 300 mm (12 in.)
Cobbles	300 mm to 75 mm (12 in. to 3
Coarse Gravel	75 mm to 19 mm (3 in. to ¾ in.)
Fine Gravel	19mm (3/4 in.) to No. 4 sieve
Coarse Sand	No. 4 Sieve to No. 10 Sieve
Medium Sand	No. 10 Sieve to No. 40 Sieve
Fine Sand	No. 40 Sieve to No. 200 Sieve
Fines (Silt or Clay)	Less than No. 200 Sieve

Plasticity	
PI = 0	Non-Plastic
1 ≤ PI ≤ 7	Low
8 ≤ PI ≤ 25	Medium
PI ≥ 25	High

Moisture
Slightly Moist
Moist
Wet
(Saturated)

BORING NUMBER B-1

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 2/14/2022 **COMPLETED** 2/14/2022
BORING LOCATION STA 1142+30, 238' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** P. Jones
GPS COORDINATES 33.4141°N, -112.43137°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 928 ft **BOREHOLE DEPTH** 6.5 ft
RIG TYPE / # CME 75/120
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 91
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
925	5		SILTY LEAN CLAY (CL-ML), light brown, moist, firm, medium plasticity, trace fine gravel, some fine sand	SPT	7-14-15 (29)						
				SPT	7-8-9 (17)						

Bottom of borehole at 6.5 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-2

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 2/14/2022 **COMPLETED** 2/14/2022
BORING LOCATION STA 1148+00, 270' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** P. Jones
GPS COORDINATES 33.41534°N, -112.43017°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 932 ft **BOREHOLE DEPTH** 6.5 ft
RIG TYPE / # CME 75/120
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 91
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
930			SILTY, CLAYEY SAND (SC-SM), light brown, fine grained, slightly moist, firm, low plasticity, occasional fine gravel	SPT	4-6-12 (18)						
				AU			4.3	26	19	7	41
	5		SILTY SAND (SM), light brown, fine grained, slightly moist, moderately firm, non plastic, trace fine gravel	SPT	6-6-7 (13)		3.0	NP	NP	NP	27

Bottom of borehole at 6.5 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-3

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 4/26/2022 **COMPLETED** 2/26/2022
BORING LOCATION STA 1153+50, 735' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41477°N, -112.42661°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 933 ft **BOREHOLE DEPTH** 6.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY SAND (SM), light brown, fine to medium grained, slightly moist, firm to soft, low plasticity, trace fine gravel	SPT	8-9-8 (17)						
930				AU			3.5	21	18	3	36
	5			SPT	2-3-4 (7)						

Bottom of borehole at 6.5 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-4

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 4/26/2022 **COMPLETED** 4/26/2022
BORING LOCATION STA 1155+00, 450' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.4157°N, -112.42702°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 933 ft **BOREHOLE DEPTH** 6.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
930	0		SILTY SAND (SM), light brown, rounded, fine to medium grained, slightly moist, moderately firm to soft, low plasticity, trace fine gravel	SPT	6-4-5 (9)						
				AU			3.6	20	18	2	41
	5			SPT	1-2-2 (4)						

Bottom of borehole at 6.5 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-5

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 2/14/2022 **COMPLETED** 2/14/2022
BORING LOCATION STA 1155+40, 255' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** P. Jones
GPS COORDINATES 33.4169°N, -112.42887°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 933 ft **BOREHOLE DEPTH** 6.5 ft
RIG TYPE / # CME 75/120
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 91
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
930	0		SILTY, CLAYEY SAND WITH GRAVEL (SC-SM), light brown, fine to medium grained, slightly moist, very firm, low plasticity, considerable gravel	SPT	13-19-13 (32)						
				AU			3.5	24	18	6	20
	5		SAND (SP), light brown, subrounded, slightly moist, loose, non plastic, occasional gravel	SPT	4-3-4 (7)						

Bottom of borehole at 6.5 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-6

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 4/27/2022 **COMPLETED** 4/27/2022
BORING LOCATION STA 1159+50, 285' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.4172°N, -112.4267°E
DRILLING METHOD Tubex
GROUND ELEVATION 933 ft **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY SAND (SM), light brown, fine to medium grained, slightly moist, medium dense to loose, non plastic, trace fine gravel	SPT	5-9-13 (22)						
930				AU			1.0	NP	NP	NP	15
	5			SPT	4-5-5 (10)						
925											
	10		SANDY SILTY CLAY (CL-ML), brown, slightly moist, moderately firm, low plasticity, trace fine gravel, some fine to medium sand	SPT	7-6-7 (13)						
920											
	15		SILTY, CLAYEY SAND (SC-SM), light brown, fine grained, slightly moist, hard, no to low plasticity, trace fine gravel, weak to moderate lime cementation	SPT	8-50/3"						
915											
	20		SILTY CLAY (CL-ML), light brown, slightly moist, hard, low to medium plasticity, trace fine gravel, trace fine sand, weak to moderate lime cementation	SPT	12-24-40/4"						
910											
	25										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 4/27/2022 **COMPLETED** 4/27/2022 **BORING LOCATION** STA 1159+50, 285' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.4172°N, -112.4267°E
DRILLING METHOD Tubex **GROUND ELEVATION** 933 ft **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # CME 75/109 ▼ **GROUNDWATER DEPTH** ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
905			SAND (SP), brown, fine grained, slightly moist, medium dense, non plastic, trace fine gravel	SPT	6-8-9 (17)						
	30		Moderate lime cementation between 29' and 30'								
900			SILTY CLAY (CL-ML), brown, slightly moist, hard to firm, low to medium plasticity, trace fine gravel, trace fine sand	SPT	5-50/5"						
	35		Increased moisture, increased plasticity below 35'	R	6-20						
895											
	40		CLAYEY SAND (SC), brown, subrounded, fine to medium grained, moist, firm to hard, low plasticity, trace gravel	SPT	5-9-16 (25)						
890											
	45			SPT	7-11-12 (23)						
885											
	50										

(Continued Next Page)

Ethos Engineering s

BORING NUMBER B-6

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 4/27/2022 **COMPLETED** 4/27/2022
BORING LOCATION STA 1159+50, 285' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.4172°N, -112.4267°E
DRILLING METHOD Tubex
GROUND ELEVATION 933 ft **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND (SC), brown, subrounded, fine to medium grained, moist, firm to hard, low plasticity, trace gravel *(continued)*	SPT	32-50/4"						
880	55		SAND (SP), light brown, subrounded, fine to medium grained, slightly moist, very dense, non plastic, some gravel	SPT	9-42-24 (66)						
875	60		CLAYEY SAND (SC), grayish brown, subangular, fine to medium grained, hard, considerable gravel	SPT	20-37-50/5"						

Bottom of borehole at 61.5 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-7

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 2/14/2022 **COMPLETED** 2/14/2022
BORING LOCATION STA 1160+75, 110' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** P. Jones
GPS COORDINATES 33.41792°N, -112.42776°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 934 ft **BOREHOLE DEPTH** 11.5 ft
RIG TYPE / # CME 75/120
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 91
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND (SC), light brown, slightly moist, firm to very firm, medium plasticity, trace fine gravel	SPT	4-12-14 (26)						
				AU			4.1	26	18	8	42
930	5		very firm; high plasticity from 5' to 7'	SPT	12-17-17 (34)						
			occasional cobbles encountered below 6'								
925	10		SILTY SAND WITH GRAVEL (SM), light brown, subangular, fine grained, slightly moist, medium dense, non plastic, considerable gravel	SPT	3-4-9 (13)						

Bottom of borehole at 11.5 feet. Backfilled with soil cuttings.

BORING NUMBER B-7A

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 6/14/2022 **COMPLETED** 6/14/2022
BORING LOCATION STA 1162+30, 102' L SR 303L Cst CL
DRILLER ACS Services **DRILLED BY** N. Zamora
GPS COORDINATES 33.41838°N, -112.42766°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 934 ft **BOREHOLE DEPTH** 36.5 ft
RIG TYPE / # CME-75/BY
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 88
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY, CLAYEY SAND (SC-SM), light brown, subangular, slightly moist, moderately firm to soft, low plasticity, trace gravel, some fine to medium sand	AU			2.4	26	19	7	48
				SPT	4-5-6 (11)						
930	5		Increased gravel below 5'	R	7-7						
925	10		SAND WITH SILT AND GRAVEL (SP-SM), light brown to whitish brown, subangular, medium to coarse grained, slightly moist, very dense, non plastic	SPT	17-25-35 (60)						
920	15		Increased gravel below 14'	SPT	6-11-50/3"						
915	20		CLAYEY SAND WITH GRAVEL (SC), light brown to white, subangular, fine to medium grained, slightly moist, hard to very firm, low plasticity, weak to moderate lime cementation	SPT	20-39-50/4"						
910	25										

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Ethos Engineering s

BORING NUMBER B-7A

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 6/14/2022 **COMPLETED** 6/14/2022
BORING LOCATION STA 1162+30, 102' L SR 303L Cst CL
DRILLER ACS Services **DRILLED BY** N. Zamora
GPS COORDINATES 33.41838°N, -112.42766°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 934 ft **BOREHOLE DEPTH** 36.5 ft
RIG TYPE / # CME-75/BY
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 88
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND WITH GRAVEL (SC), light brown to white, subangular, fine to medium grained, slightly moist, hard to very firm, low plasticity, weak to moderate lime cementation *(continued)* Low to medium plasticity, weak lime cementation below 25'	SPT	18-22-25 (47)						
905	30		GRAVELLY CLAY WITH SAND (CL), brown, poorly graded, moist, firm to very firm, medium plasticity, fine gravel, weak lime cementation	SPT	30-15-13 (28)						
900	35			SPT	15-18-18 (36)						

Bottom of borehole at 36.5 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-8

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 2/18/2022 **COMPLETED** 2/18/2022
BORING LOCATION STA 1164+25, 160' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.4189°N, -112.42758°E
DRILLING METHOD Tubex
GROUND ELEVATION 934 ft **BOREHOLE DEPTH** 81.5 ft
RIG TYPE / # CME 75/120
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 91
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY CLAY (CL-ML), light brown, slightly moist, moderately firm, medium plasticity, trace fine gravel, trace fine sand	SPT	2-8-7 (15)		3.8	24	16	8	65
				AU							
930	5		Subangular, firm, low plasticity, trace gravel	SPT	7-9-16 (25)						
925	10		SILTY SAND (SM), light brown, fine grained, slightly moist, loose, non plastic, trace gravel, occasional cobbles	SPT	2-5-5 (10)						
920	15		SAND (SP), poorly graded, slightly moist, dense to very dense, non plastic, some gravel	R	24-28						
915	20		Strong lime cementation from 20' to 23'	SPT	50/1"						
910	25										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 2/18/2022 **COMPLETED** 2/18/2022 **BORING LOCATION** STA 1164+25, 160' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.4189°N, -112.42758°E
DRILLING METHOD Tubex **GROUND ELEVATION** 934 ft **BOREHOLE DEPTH** 81.5 ft
RIG TYPE / # CME 75/120 **GROUNDWATER DEPTH** ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 91 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SAND (SP), poorly graded, slightly moist, dense to very dense, non plastic, some gravel*(continued)*	SPT	10-26-17 (43)						
			Silty sand (SM) layer from 25' to 26'								
905			SANDY CLAY (CL), brown, slightly moist, very firm, low to medium plasticity, occasional gravel								
	30		SILTY CLAY (CL-ML), light brown to brown, slightly moist, hard, medium plasticity, occasional gravel, trace fine sand, occasional cobbles	SPT	40-50/5"						
900											
	35		CLAY (CH), brown, moist, firm, medium to high plasticity, trace fine gravel, trace fine sand	SPT	6-9-13 (22)						
895											
	40		SILTY, CLAYEY SAND (SC-SM), brown, fine grained, moist, firm, low plasticity, trace fine gravel	R	9-18						
890											
	45		sand and gravel (SP/GP) layer from 45' to 46'	SPT	10-14-8 (22)						
			SANDY CLAY (CL), brown, slightly moist, firm, medium plasticity, trace gravel, occasional fine to medium sand								
885											
	50										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 2/18/2022 **COMPLETED** 2/18/2022 **BORING LOCATION** STA 1164+25, 160' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.4189°N, -112.42758°E
DRILLING METHOD Tubex **GROUND ELEVATION** 934 ft **BOREHOLE DEPTH** 81.5 ft
RIG TYPE / # CME 75/120 **GROUNDWATER DEPTH** ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 91 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
880	55		CLAY (CH), brown, moist, moderately firm, medium to high plasticity, trace fine gravel, trace fine sand	SPT	1-4-9 (13)						
875	60		CLAYEY SAND (SC), light brown to brown, fine to medium grained, moist, moderately firm, low to medium plasticity, trace fine gravel	SPT	13-14-16 (30)						
870	65		color change to brown below 61'	SPT	9-12-15 (27)						
865	70		some gravel below 65'	SPT	9-13-17 (30)						
860	75		SANDY CLAY WITH GRAVEL (CL), dark brown, moist, very firm, low to medium plasticity, considerable gravel, considerable medium to coarse sand very moist to wet at 74'	SPT	13-15-17 (32)						

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 2/18/2022 **COMPLETED** 2/18/2022
BORING LOCATION STA 1164+25, 160' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.4189°N, -112.42758°E
DRILLING METHOD Tubex
GROUND ELEVATION 934 ft **BOREHOLE DEPTH** 81.5 ft
RIG TYPE / # CME 75/120
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 91
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SANDY CLAY WITH GRAVEL (CL), dark brown, moist, very firm, low to medium plasticity, considerable gravel, considerable medium to coarse sand*(continued)*	SPT	9-19-23 (42)						
			moist below 78'								
855											
	80		medium to high plasticity below 80'	SPT	13-14-22 (36)						

Bottom of borehole at 81.5 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-9

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 2/16/2022 **COMPLETED** 2/17/2022
BORING LOCATION STA 1165+60, 170' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41925°N, -112.42749°E
DRILLING METHOD Tubex
GROUND ELEVATION 935 ft **BOREHOLE DEPTH** 81.5 ft
RIG TYPE / # CME 75/120
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 91
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
935											
			SANDY SILTY CLAY (CL-ML), light brown, slightly moist, moderately firm, medium plasticity, trace fine gravel, considerable fine sand	SPT	2-5-8 (13)						
				AU			3.9	24	17	7	60
930	5										
			SILTY CLAY (CH), light brown, slightly moist, soft, medium to high plasticity, trace fine gravel, trace fine sand	SPT	3-4-4 (8)						
925	10										
			SILTY SAND (SM), light brown, fine grained, slightly moist, loose to very dense, no to low plasticity, trace gravel	SPT	3-4-5 (9)		2.7	NP	NP	NP	
920	15										
				R	15-16	116	2.4	NP	NP	NP	31
			Considerable gravel and cobbles at 16'								
915	20										
				SPT	50/5"						
			Gravel to cobble size strongly lime cemented nodules from 20.5' to 23'								
910	25										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 2/16/2022 **COMPLETED** 2/17/2022 **BORING LOCATION** STA 1165+60, 170' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.41925°N, -112.42749°E
DRILLING METHOD Tubex **GROUND ELEVATION** 935 ft **BOREHOLE DEPTH** 81.5 ft
RIG TYPE / # CME 75/120 **GROUNDWATER DEPTH** ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 91 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
910											
905	30		SANDY CLAY (CL), light brown, slightly moist, firm, medium plasticity, trace fine gravel, trace fine sand	SPT	6-11-16 (27)						
900	35		CLAYEY SAND (SC), light brown, fine grained, moist, hard, no to low plasticity, trace fine gravel	SPT	50/5"						
895	40		CLAY (CL), brown, moist, firm, low to medium plasticity, trace fine gravel, trace fine sand	R	7-16	87	33.0	48	27	21	92
890	45		SILTY SAND (SM), light brown, fine grained, moist, medium dense, no to low plasticity, trace fine gravel	SPT	5-8-12 (20)						
885	50		SAND (SP), light brown, fine to medium grained, moist, medium dense, non plastic, trace gravel	SPT	6-11-11 (22)						

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CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 2/16/2022 **COMPLETED** 2/17/2022 **BORING LOCATION** STA 1165+60, 170' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.41925°N, -112.42749°E
DRILLING METHOD Tubex **GROUND ELEVATION** 935 ft **BOREHOLE DEPTH** 81.5 ft
RIG TYPE / # CME 75/120 **GROUNDWATER DEPTH** ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 91 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
885											
880	55		CLAY (CH), brown, moist, moderately firm, high plasticity, trace fine gravel, trace fine sand	SPT	2-5-9 (14)		28.4				
875	60		CLAYEY SAND (SC), brown, fine to medium grained, moist, medium dense, no to low plasticity, occasional fine gravel	SPT	9-14-11 (25)						
870	65		SAND (SP), light brown to brown, fine to medium grained, moist, dense, non plastic, trace fine gravel	SPT	9-15-16 (31)						
865	70		CLAYEY SAND (SC), brown, medium grained, moist, very firm, low plasticity, considerable gravel	SPT	13-17-23 (40)						
860	75		GRAVELLY CLAY (CL), dark brown, very moist to wet, very firm, low to medium plasticity, considerable gravel, considerable medium sand	SPT	13-19-17 (36)						

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Ethos Engineering s

BORING NUMBER B-9

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 2/16/2022 **COMPLETED** 2/17/2022
BORING LOCATION STA 1165+60, 170' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41925°N, -112.42749°E
DRILLING METHOD Tubex
GROUND ELEVATION 935 ft **BOREHOLE DEPTH** 81.5 ft
RIG TYPE / # CME 75/120
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 91
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
860			GRAVELLY CLAY (CL), dark brown, very moist to wet, very firm, low to medium plasticity, considerable gravel, considerable medium sand*(continued)*	SPT	13-19-17 (36)		17.5				
855	80		Medium to high plasticity, some gravel. some medium sand below 80'	SPT	7-25-39 (64)						

Bottom of borehole at 81.5 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-10

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 2/15/2022 **COMPLETED** 2/16/2022
BORING LOCATION STA 1167+00, 155' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41963°N, -112.42739°E
DRILLING METHOD Tubex
GROUND ELEVATION 936 ft **BOREHOLE DEPTH** 71.5 ft
RIG TYPE / # CME 75/120
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 91
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
935			SILTY, CLAYEY SAND (SC-SM), light brown, fine grained, slightly moist, firm, low to medium plasticity, trace fine gravel	SPT	2-5-11 (16)						
				AU			3.4	23	18	5	46
	5										
930			SILTY SAND (SM), light brown, fine grained, slightly moist, medium dense, non plastic, trace fine gravel	SPT	8-9-10 (19)						
	10										
925			CLAYEY SAND (SC), light brown, fine to medium grained, slightly moist, moderately firm to hard, low to medium plasticity, trace gravel	SPT	8-8-11 (19)						
	15										
920			Medium to coarse grained, hard, considerable gravel and/or strongly lime cemented nodules from 13' to 17'	R	30-45	105	3.2	30	22	8	18
	20										
915			Some gravel to cobble sized strongly lime cemented nodules from 19' to 22'	SPT	50/5"						
	25										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 2/15/2022 **COMPLETED** 2/16/2022 **BORING LOCATION** STA 1167+00, 155' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.41963°N, -112.42739°E
DRILLING METHOD Tubex **GROUND ELEVATION** 936 ft **BOREHOLE DEPTH** 71.5 ft
RIG TYPE / # CME 75/120 **GROUNDWATER DEPTH** ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 91 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
910			CLAYEY SAND (SC), light brown, fine to medium grained, slightly moist, moderately firm to hard, low to medium plasticity, trace gravel*(continued)* Light brown, fine grained, moist. trace fine gravel below 25'	SPT	4-7-8 (15)						
	30										
905			Some gravel to cobble sized strongly lime cemented nodules from 29' to 37'	SPT	7-50/1"						
	35			SPT	50/1"						
900											
	40										
895				R	11-21						
	45										
890			Sand (SP) lense from 45' to 46'	SPT	4-2-3 (5)		3.5	47	24	23	18
			CLAY (CH), brown, moist, soft to moderately firm, medium to high plasticity, trace fine gravel, trace fine sand								
	50										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 2/15/2022 **COMPLETED** 2/16/2022 **BORING LOCATION** STA 1167+00, 155' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.41963°N, -112.42739°E
DRILLING METHOD Tubex **GROUND ELEVATION** 936 ft **BOREHOLE DEPTH** 71.5 ft
RIG TYPE / # CME 75/120 **GROUNDWATER DEPTH** ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 91 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
885			CLAY (CH), brown, moist, soft to moderately firm, medium to high plasticity, trace fine gravel, trace fine sand *(continued)*	SPT	2-4-7 (11)						
	55			SPT	7-16-17 (33)						
880			SAND (SP), light brown, fine grained, moist, dense, non plastic, trace gravel								
	60										
875			SILTY SAND (SM), light brown to brown, fine grained, moist, medium dense, non plastic, trace fine gravel	SPT	9-14-16 (30)						
	65		Low plasticity, occasional gravel below 65'	SPT	8-12-14 (26)						
870											
	70										
865			SANDY CLAY (CL), dark brown, very moist to wet, hard, low to medium plasticity, considerable gravel, considerable medium to coarse sand	SPT	12-25-35 (60)						

Bottom of borehole at 71.5 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-11

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 2/11/2022 **COMPLETED** 2/15/2022
BORING LOCATION STA 1168+80, 150' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42008°N, -112.42727°E
DRILLING METHOD Tubex
GROUND ELEVATION 937 ft **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # CME 75/120
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 91
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
935	5		SILT (ML), light brown, slightly moist, firm, low to medium plasticity, trace fine gravel, trace fine sand	SPT	2-7-10 (17)						
930	10		SILTY SAND (SM), light brown, fine grained, slightly moist, medium dense, no to low plasticity, occasional gravel Cobbles encountered at 6'	SPT	4-6-5 (11)						
925	15		SAND (SP), light brown, medium grained, slightly moist, loose, non plastic, some gravel	R	4-6		0.4	NP	NP	NP	5
920	20		SILTY SAND (SM), light brown, fine to medium grained, slightly moist, dense, non plastic, occasional gravel	SPT	10-19-24 (43)						
915	25		SILTY CLAY (CL), brown and white, slightly moist to moist, very firm, medium plasticity, trace fine gravel, trace fine sand	SPT	32-23-25 (48)						

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 2/11/2022 **COMPLETED** 2/15/2022 **BORING LOCATION** STA 1168+80, 150' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.42008°N, -112.42727°E
DRILLING METHOD Tubex **GROUND ELEVATION** 937 ft **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # CME 75/120 **GROUNDWATER DEPTH** ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 91 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY CLAY (CL), brown and white, slightly moist to moist, very firm, medium plasticity, trace fine gravel, trace fine sand *(continued)*	SPT	31-50/1"						
910											
	30		SANDY CLAY (CL), brown, moist, firm, low to medium plasticity, trace fine gravel, some fine sand	SPT	9-11-13 (24)		24.9	41	21	20	60
905											
	35			R	9-20						
900											
	40			SPT	3-5-10 (15)						
895			SILTY SAND (SM), brown, fine grained, moist, medium dense, no to low plasticity, trace fine gravel								
	45		Sand (SP) lense from 45' to 46'	SPT	4-2-3 (5)						
890			CLAY (CH), brown, moist, soft to moderately firm, high plasticity, trace fine gravel, trace fine sand								
	50										

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CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 2/11/2022 **COMPLETED** 2/15/2022
BORING LOCATION STA 1168+80, 150' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42008°N, -112.42727°E
DRILLING METHOD Tubex
GROUND ELEVATION 937 ft **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # CME 75/120
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 91
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
885	55		CLAY (CH), brown, moist, soft to moderately firm, high plasticity, trace fine gravel, trace fine sand *(continued)* Wet layer at 50'	SPT	3-7-11 (18)						
880	60		SANDY CLAY (CL), brown, moist, firm, medium plasticity, trace fine gravel, considerable fine sand	SPT	9-12-18 (30)						
			SILTY SAND (SM), brown, fine to medium grained, moist, dense, no to low plasticity, trace fine gravel	SPT	9-15-18 (33)						

Bottom of borehole at 61.5 feet. Backfilled with soil cuttings.

BORING NUMBER B-12

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 2/11/2022 **COMPLETED** 2/11/2022
BORING LOCATION STA 1170+60. 125' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42051°N, -112.42718°E
DRILLING METHOD Tubex
GROUND ELEVATION 938 ft **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # CME 75/120
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 91
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY CLAY (CL), light brown, slightly moist, firm, low plasticity, trace fine gravel, trace fine sand	SPT	7-9-8 (17)						
935				AU			3.1	24	18	6	42
	5		SILT (ML), light brown, slightly moist, firm, low plasticity, occasional gravel, trace fine sand	SPT	5-10-10 (20)						
930											
	10		SILTY SAND (SM), light brown, fine grained, slightly moist, dense, non plastic, occasional gravel	SPT	9-22-20 (42)						
925											
	15		SAND WITH SILT (SP-SM), light brown, medium to coarse grained, slightly moist, dense, non plastic, trace gravel	R	21-23	108	3.5	NP	NP	NP	8
920											
	20		CLAY WITH SAND (CL), white to light brown, moist, very firm, medium plasticity, trace gravel, trace fine sand, weak lime cementation	SPT	33-18-26 (44)						
915											
	25										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 2/11/2022 **COMPLETED** 2/11/2022 **BORING LOCATION** STA 1170+60. 125' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.42051°N, -112.42718°E
DRILLING METHOD Tubex **GROUND ELEVATION** 938 ft **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # CME 75/120 **GROUNDWATER DEPTH** ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 91 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
910	30		SANDY CLAY (CH), light brown to brown, moist, hard, medium to high plasticity, occasional gravel, trace fine sand	SPT	12-34-29 (63)						
905	35		SILTY CLAY (CL), light brown to brown, moist, hard, medium plasticity, trace fine gravel, trace fine sand, moderate lime cementation	SPT	19-50/1"						
900	40		SANDY CLAY (CL), brown, moist, firm, medium plasticity, trace fine gravel, considerable fine sand	R	10-21						
895	45		CLAYEY SAND (SC), brown, fine grained, moist, medium dense, no to low plasticity, trace fine gravel	SPT	8-9-11 (20)						
890	50		CLAY (CH), brown, moist, moderately firm to hard, high plasticity, trace fine gravel, trace fine sand	SPT	5-1-10 (11)						

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CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 2/11/2022 **COMPLETED** 2/11/2022
BORING LOCATION STA 1170+60. 125' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42051°N, -112.42718°E
DRILLING METHOD Tubex
GROUND ELEVATION 938 ft **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # CME 75/120
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 91
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAY (CH), brown, moist, moderately firm to hard, high plasticity, trace fine gravel, trace fine sand*(continued)*	SPT	30-50/1"						
885			Light brown to brown. hard, medium to high plasticity below 50'								
	55			SPT	4-11-18 (29)						
			SANDY CLAY (CL), brown, moist, firm, low to medium plasticity, occasional fine gravel, occasional fine to medium sand								
880											
	60		SILTY SAND (SM), brown, fine to medium grained, moist, medium dense, non plastic, trace fine gravel	SPT	8-11-15 (26)						

Bottom of borehole at 61.5 feet. Backfilled with soil cuttings.

BORING NUMBER B-13

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 4/21/2022 **COMPLETED** 4/21/2022
BORING LOCATION STA 1160+70, 250' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41754°N, -112.42669°E
DRILLING METHOD Tubex
GROUND ELEVATION 934 ft **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
930	5		SANDY SILT (ML), brown, slightly moist to moist, loose, non plastic, trace fine gravel, considerable fine sand	SPT	4-3-5 (8)						
				AU			12.6	NP	NP	NP	52
925	10		SILTY, CLAYEY SAND (SC-SM), brown, fine to medium grained, moist, very soft, low plasticity, trace fine gravel	R	3-3						
920	15		SAND (SP), brown, fine to medium grained, moist, loose to medium dense, non plastic, trace fine gravel	SPT	2-2-4 (6)						
915	20			SPT	4-5-9 (14)						
910	25		SILTY CLAY (CL-ML), whitish brown, subrounded, slightly moist to moist, moderately firm to firm, low to medium plasticity, trace gravel, trace fine sand	SPT	4-9-13 (22)						

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 4/21/2022 **COMPLETED** 4/21/2022 **BORING LOCATION** STA 1160+70, 250' R SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.41754°N, -112.42669°E

DRILLING METHOD Tubex **GROUND ELEVATION** 934 ft **BOREHOLE DEPTH** 61.5 ft

RIG TYPE / # CME 75/109 **GROUNDWATER DEPTH** ---

HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY CLAY (CL-ML), whitish brown, subrounded, slightly moist to moist, moderately firm to firm, low to medium plasticity, trace gravel, trace fine sand*(continued)*	SPT	7-12-17 (29)						
905	30			SPT	4-10-14 (24)						
900	35			R	8-17						
895	40		CLAYEY SAND (SC), brown, fine to medium grained, moist, firm, low to medium plasticity, trace fine gravel	SPT	5-8-12 (20)						
890	45		SAND (SP), brown, subrounded, fine to medium grained, moist, dense, non plastic, trace gravel	SPT	6-12-18 (30)						
885	50										

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Ethos Engineering s

BORING NUMBER B-13

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 4/21/2022 **COMPLETED** 4/21/2022
BORING LOCATION STA 1160+70, 250' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41754°N, -112.42669°E
DRILLING METHOD Tubex
GROUND ELEVATION 934 ft **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND (SC), light brown to grayish brown, subrounded, fine to medium grained, slightly moist, hard, low to medium plasticity, some gravel, weak to moderate lime cementation	SPT	12-25-27 (52)						
880											
	55			SPT	22-34-31 (65)						
875											
	60		SAND (SP), light brown, subrounded, fine to medium grained, slightly moist, dense, non plastic, trace gravel	SPT	7-23-24 (47)						

Bottom of borehole at 61.5 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-14

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 4/20/2022 **COMPLETED** 4/20/2022
BORING LOCATION STA 1161+65 220' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41788°N, -112.42667°E
DRILLING METHOD Tubex
GROUND ELEVATION 934 ft **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
930	5		SILTY SAND (SM), light brown, fine to medium grained, slightly moist, medium dense, non plastic, trace fine gravel	SPT	9-13-15 (28)						
				AU			6.7	NP	NP	NP	30
925	10		SILTY, CLAYEY SAND (ML), brown, fine to medium grained, moist, soft, low plasticity, trace fine gravel	R	5-4	109	17.6				
920	15		SAND WITH SILT (SP-SM), brown, poorly graded, moist, loose, non plastic, trace gravel	SPT	3-4-7 (11)		6.5	NP	NP	NP	12
915	20			SPT	4-5-5 (10)						
910	25		SILTY CLAY (CL-ML), whitish brown, angular, slightly moist to moist, hard, medium plasticity, trace gravel, trace fine sand, moderate lime cementation	SPT	26-50/3"						

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 4/20/2022 **COMPLETED** 4/20/2022 **BORING LOCATION** STA 1161+65 220' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.41788°N, -112.42667°E
DRILLING METHOD Tubex **GROUND ELEVATION** 934 ft **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # CME 75/109 **GROUNDWATER DEPTH** ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY, CLAYEY SAND (SC-SM), light brown, fine grained, slightly moist, firm, low plasticity, trace fine gravel	R	8-15						
905	30		SAND (SP), brown, fine to medium grained, moist, medium dense, non plastic, trace fine gravel	SPT	5-9-16 (25)						
			SILTY CLAY (CL-ML), brown, moist, moderately firm, low to medium plasticity, trace fine gravel, trace fine sand Moderate lime cementation between 32' and 34'								
900	35		Increased plasticity below 35'	SPT	4-8-10 (18)						
895	40		SAND (SP), light brown, fine to medium grained, slightly moist, medium dense, non plastic, trace fine gravel	SPT	5-9-10 (19)						
890	45		Increased gravel, moist below 45'	SPT	12-11-17 (28)						
885	50										

(Continued Next Page)

Ethos Engineering s

BORING NUMBER B-14

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 4/20/2022 **COMPLETED** 4/20/2022
BORING LOCATION STA 1161+65 220' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41788°N, -112.42667°E
DRILLING METHOD Tubex
GROUND ELEVATION 934 ft **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND WITH GRAVEL (SC), grayish brown, well graded, subangular, moist, hard, low plasticity, considerable gravel	SPT	13-27-32 (59)						
880	55		SILTY SAND WITH GRAVEL (SM), light brown, subrounded, fine to medium grained, moist, dense, non plastic, some gravel	SPT	5-17-32 (49)						
875	60			SPT	9-16-21 (37)						

Bottom of borehole at 61.5 feet. Backfilled with soil cuttings.

BORING NUMBER B-15

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 4/19/2022 **COMPLETED** 4/19/2022
BORING LOCATION STA 1162+90, 165' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41824°N, -112.4267°E
DRILLING METHOD Tubex
GROUND ELEVATION 934 ft **BOREHOLE DEPTH** 71.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH 70 ft / Elev 864 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY SAND (SC-SM), light brown, fine to medium grained, slightly moist, firm, low plasticity, trace fine gravel	R	12-16	114	6.3				
				AU			8.5	22	16	6	47
930	5		CLAYEY SAND (SC), light brown to brown, fine to medium grained, slightly moist to moist, soft, low to medium plasticity, trace fine gravel	SPT	2-3-3 (6)						
925	10		Increased moisture below 10'	SPT	2-2-3 (5)						
920	15		SAND (SP), light brown, poorly graded, fine to medium grained, moist, medium dense, non plastic, trace fine gravel	SPT	3-6-9 (15)						
915	20		Weak to Moderate lime cementation between 20' and 25'	SPT	5-7-10 (17)						
910	25										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 4/19/2022 **COMPLETED** 4/19/2022 **BORING LOCATION** STA 1162+90, 165' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.41824°N, -112.4267°E
DRILLING METHOD Tubex **GROUND ELEVATION** 934 ft **BOREHOLE DEPTH** 71.5 ft
RIG TYPE / # CME 75/109 ▼ **GROUNDWATER DEPTH** 70 ft / Elev 864 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
905	30		SAND (SW), brown, well graded, moist, medium dense, non plastic, trace fine gravel	SPT	5-13-14 (27)						
900	35		SILTY SAND (SM), light brown to white, well graded, subangular, slightly moist, medium dense, non plastic, trace gravel, moderate lime cementation	SPT	5-12-17 (29)						
895	40		SANDY CLAY (CH), light brown, moist, moderately firm, high plasticity, trace fine gravel, considerable fine sand, weak lime cementation	R	7-12			51	21	30	64
890	45		CLAYEY SAND (SC), brown, subangular, fine grained, moist, firm, low to medium plasticity, trace fine gravel	SPT	5-6-12 (18)						
885	50		Increased gravel, well graded sand below 45'	SPT	16-15-20 (35)						

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 4/19/2022 **COMPLETED** 4/19/2022 **BORING LOCATION** STA 1162+90, 165' R SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.41824°N, -112.4267°E

DRILLING METHOD Tubex **GROUND ELEVATION** 934 ft **BOREHOLE DEPTH** 71.5 ft

RIG TYPE / # CME 75/109 ▼ **GROUNDWATER DEPTH** 70 ft / Elev 864 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
880	55		SANDY SILTY CLAY (CL-ML), grayish brown, subangular, moist, very firm, low to medium plasticity, considerable gravel, considerable fine to medium sand	SPT	20-22-23 (45)						
875	60		SILTY, CLAYEY SAND WITH GRAVEL (SC-SM), light brown to gray, subrounded, fine to medium grained, slightly moist, hard, considerable gravel	SPT	16-18-34 (52)						
870	65		SANDY SILTY CLAY (CL-ML), grayish brown, subrounded, slightly moist, very firm, low to medium plasticity, some gravel, considerable fine to medium sand	SPT	19-17-31 (48)						
865	70		CLAYEY SAND (SC), light brown to dark brown, well graded, rounded, moist to wet, firm to hard, low plasticity, trace gravel	SPT	5-12-17 (29)						
		▼	Increased gravel below 70'	SPT	7-33-25 (58)						

Bottom of borehole at 71.5 feet. Backfilled with soil cuttings; grouted upper 25'.

BORING NUMBER B-16

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 4/18/2022 **COMPLETED** 4/18/2022
BORING LOCATION STA 1164+10, 150, R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41863°N, -112.42661°E
DRILLING METHOD Tubex
GROUND ELEVATION 934 ft **BOREHOLE DEPTH** 76.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH 70 ft / Elev 864 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
930	5		SILTY SAND (SM), light brown, fine to medium grained, slightly moist, medium dense, non plastic, trace fine gravel	SPT	10-7-10 (17)						
				AU			7.6	NP	NP	NP	40
925	10		CLAYEY SAND (SC), brown, angular, fine to medium grained, moist, soft, low to medium plasticity, trace fine gravel	SPT	3-3-3 (6)						
920	15		SILTY, CLAYEY SAND WITH GRAVEL (SC-SM), light brown to brown, subrounded, fine to medium grained, moist, soft, low plasticity, some gravel	SPT	6-5-3 (8)						
915	20		SAND WITH SILT (SP-SM), brown, poorly graded, fine to medium grained, slightly moist to moist, loose to medium dense, non plastic, trace fine gravel	SPT	4-6-6 (12)						
				SPT	4-5-9 (14)		3.4	NP	NP	NP	7
910	25										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 4/18/2022 **COMPLETED** 4/18/2022 **BORING LOCATION** STA 1164+10, 150, R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.41863°N, -112.42661°E
DRILLING METHOD Tubex **GROUND ELEVATION** 934 ft **BOREHOLE DEPTH** 76.5 ft
RIG TYPE / # CME 75/109 ▼ **GROUNDWATER DEPTH** 70 ft / Elev 864 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY SAND (SM), light brown, well graded, subangular, slightly moist, medium dense, non plastic, trace gravel	SPT	10-13-14 (27)						
905	30			SPT	7-12-12 (24)						
900	35		Moderate lime cementation 34' to 35'								
			SILTY CLAY (CL-ML), brown, moist, firm, low to medium plasticity, trace fine gravel, trace fine to medium sand	SPT	10-13-15 (28)						
895	40										
			SILTY SAND (SM), brown, subangular, fine to medium grained, moist, medium dense, non plastic, trace gravel	SPT	7-11-12 (23)		9.7	NP	NP	NP	21
890	45										
			SILTY, CLAYEY SAND (SC-SM), brown, subangular, fine to medium grained, slightly moist to moist, very firm, low plasticity, trace gravel	SPT	7-25-16 (41)						
885	50										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 4/18/2022 **COMPLETED** 4/18/2022 **BORING LOCATION** STA 1164+10, 150, R SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.41863°N, -112.42661°E

DRILLING METHOD Tubex **GROUND ELEVATION** 934 ft **BOREHOLE DEPTH** 76.5 ft

RIG TYPE / # CME 75/109 ▼ **GROUNDWATER DEPTH** 70 ft / Elev 864 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY, CLAYEY SAND (SC-SM), brown, subangular, fine to medium grained, slightly moist to moist, very firm, low plasticity, trace gravel*(continued)* Increased gravel below 50'	SPT	10-23-26 (49)						
880	55		SILTY SAND (SM), light brown to gray, subrounded, fine to medium grained, slightly moist, very dense, non plastic, considerable gravel	SPT	17-21-41 (62)						
875	60		SILTY, CLAYEY SAND WITH GRAVEL (SC-SM), light brown to gray, well graded, subangular, slightly moist, hard to very firm, low plasticity, considerable gravel	SPT	16-42-48 (90)						
870	65			SPT	13-20-24 (44)						
865	70	▼	SANDY CLAY (CL), dark brown, rounded, wet, very firm, low to medium plasticity, some gravel, some medium to coarse sand	SPT	14-22-27 (49)						
860	75										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 4/18/2022 **COMPLETED** 4/18/2022 **BORING LOCATION** STA 1164+10, 150, R SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.41863°N, -112.42661°E

DRILLING METHOD Tubex **GROUND ELEVATION** 934 ft **BOREHOLE DEPTH** 76.5 ft

RIG TYPE / # CME 75/109 ▼ **GROUNDWATER DEPTH** 70 ft / Elev 864 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
			CLAYEY SAND WITH GRAVEL (SC), dark brown, subrounded, fine to medium grained, wet, very firm, low plasticity, some gravel	SPT	13-20-29 (49)						

Bottom of borehole at 76.5 feet. Backfilled with soil cuttings; grouted upper 25'.

Ethos Engineering s

BORING NUMBER B-17

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 4/15/2022 **COMPLETED** 4/15/2022
BORING LOCATION STA 1165+50, 170' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41906°N, -112.42651°E
DRILLING METHOD Tubex
GROUND ELEVATION 935 ft **BOREHOLE DEPTH** 81.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH 65 ft / Elev 870 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
935											
930	5		SANDY SILT (ML), brown, slightly moist, medium dense, non plastic, trace fine gravel, considerable fine to medium sand	SPT	5-5-8 (13)						
				AU			10.8	NP	NP	NP	56
925	10		SAND (SP), brown, fine to medium grained, moist, very loose to medium dense, non plastic, trace fine gravel	SPT	2-2-1 (3)						
920	15			SPT	5-11-11 (22)						
915	20		CLAYEY SAND (SC), brown, subangular, fine to medium grained, moist, firm, low plasticity, trace gravel	SPT	5-6-11 (17)						
910	25		SAND WITH SILT AND GRAVEL (SP-SM), whitish brown, subrounded, slightly moist, medium dense, non plastic, some gravel, weak to moderate lime cementation	SPT	3-8-10 (18)		2.8	NP	NP	NP	8

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 4/15/2022 **COMPLETED** 4/15/2022 **BORING LOCATION** STA 1165+50, 170' R SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.41906°N, -112.42651°E

DRILLING METHOD Tubex **GROUND ELEVATION** 935 ft **BOREHOLE DEPTH** 81.5 ft

RIG TYPE / # CME 75/109 ▼ **GROUNDWATER DEPTH** 65 ft / Elev 870 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
910											
905	30		SILTY, CLAYEY SAND (SC-SM), light brown, subangular, fine to medium grained, moist, firm, low plasticity, trace gravel	SPT	6-6-14 (20)						
900	35		SAND (SP), light brown, fine to medium grained, slightly moist, medium dense, non plastic, trace fine gravel	SPT	3-6-11 (17)						
895	40		SILTY SAND (SM), light brown, subangular, fine to medium grained, slightly moist, medium dense, non plastic, trace gravel	SPT	5-11-17 (28)						
890	45		GRAVELLY SILT WITH SAND (ML), light brown, angular, slightly moist, medium dense, non plastic, considerable gravel, some fine to medium sand, weak lime cementation	SPT	6-11-11 (22)						
885	50		SAND WITH SILT (SP-SM), light brown, medium grained, slightly moist, medium dense, non plastic, trace fine gravel	SPT	6-6-7 (13)		3.1	NP	NP	NP	6

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 4/15/2022 **COMPLETED** 4/15/2022 **BORING LOCATION** STA 1165+50, 170' R SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.41906°N, -112.42651°E

DRILLING METHOD Tubex **GROUND ELEVATION** 935 ft **BOREHOLE DEPTH** 81.5 ft

RIG TYPE / # CME 75/109 ▼ **GROUNDWATER DEPTH** 65 ft / Elev 870 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
885											
880	55		SAND WITH SILT (SP-SM), light brown, medium grained, slightly moist, medium dense, non plastic, trace fine gravel*(continued)*	R	6-22	110	8.4	NP	NP	NP	5
875	60		CLAYEY SAND WITH GRAVEL (SC), grayish brown, angular, moist to wet, hard to very firm, low plasticity, poorly graded gravel	SPT	12-31-35 (66)						
870	65		Increased plasticity below 60'	SPT	9-25-21 (46)						
865	70	▼	Fine to medium sand below 65'	SPT	15-18-14 (32)						
860	75			SPT	8-14-21 (35)						

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 4/15/2022 **COMPLETED** 4/15/2022 **BORING LOCATION** STA 1165+50, 170' R SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.41906°N, -112.42651°E

DRILLING METHOD Tubex **GROUND ELEVATION** 935 ft **BOREHOLE DEPTH** 81.5 ft

RIG TYPE / # CME 75/109 ▼ **GROUNDWATER DEPTH** 65 ft / Elev 870 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
860											
			CLAYEY SAND WITH GRAVEL (SC), grayish brown, angular, moist to wet, hard to very firm, low plasticity, poorly graded gravel*(continued)* Medium to coarse sand below 75'	SPT	10-21-23 (44)						
855	80										
			CLAYEY SILT (MH), brown, wet, very firm, medium to high plasticity, trace fine gravel, trace fine sand	SPT	17-21-28 (49)						

Bottom of borehole at 81.5 feet. Backfilled with soil cuttings; grouted upper 25'.

BORING NUMBER B-18

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 4/14/2022 **COMPLETED** 4/14/2022
BORING LOCATION STA 1167+00, 160' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41945°N, -112.42642°E
DRILLING METHOD Tubex
GROUND ELEVATION 936 ft **BOREHOLE DEPTH** 71.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
935			SANDY CLAY (CL), light brown, slightly moist, firm, low to medium plasticity, trace fine gravel, considerable fine to medium sand	SPT	5-6-10 (16)						
				AU			11.1	24	15	9	55
	5										
930			SANDY SILTY CLAY (SM), brown, moist, soft, low plasticity, trace fine gravel, trace fine sand	R	2-4						
	10										
925			SILTY, CLAYEY SAND (SC-SM), light brown, angular, slightly moist, firm to hard, low plasticity, trace gravel	SPT	5-9-6 (15)						
	15		Increased gravel Below 15'	SPT	41-50/2"						
920											
	20		Moderate to strong lime cementation from 20' to 25'	SPT	50/2"						
915											
	25										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 4/14/2022 **COMPLETED** 4/14/2022 **BORING LOCATION** STA 1167+00, 160' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.41945°N, -112.42642°E
DRILLING METHOD Tubex **GROUND ELEVATION** 936 ft **BOREHOLE DEPTH** 71.5 ft
RIG TYPE / # CME 75/109 **GROUNDWATER DEPTH** ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
910			SILTY, CLAYEY SAND (SC-SM), light brown, angular, slightly moist, firm to hard, low plasticity, trace gravel *(continued)*	SPT	16-15-15 (30)						
	30										
905			SILTY CLAY (CL), brown, moist, very firm to firm, low to medium plasticity, trace fine gravel, trace fine sand	SPT	7-13-20 (33)		23.4	34	22	12	51
	35										
900			Increased plasticity below 35'	R	7-17						
	40										
895			CLAYEY SAND (SC), brown, fine to medium grained, moist, firm, low to medium plasticity, trace fine gravel	SPT	7-8-15 (23)						
	45										
890			SILTY SAND (SM), brown, subrounded, fine to medium grained, moist, very firm, non plastic, trace gravel	SPT	8-16-22 (38)						
	50										

(Continued Next Page)

BORING NUMBER B-18

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 4/14/2022 **COMPLETED** 4/14/2022
BORING LOCATION STA 1167+00, 160' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41945°N, -112.42642°E
DRILLING METHOD Tubex
GROUND ELEVATION 936 ft **BOREHOLE DEPTH** 71.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
885			SILTY GRAVEL WITH SAND (GM), dark brown to gray, slightly moist, very dense, non plastic, considerable fine sand Cobbles encountered below 51'	SPT	15-27-33 (60)						
	55										
880			SAND WITH CLAY AND GRAVEL (SP-SC), light brown to gray, subrounded, slightly moist, dense, low plasticity, poorly graded gravel	SPT	9-20-22 (42)						
	60										
875				SPT	13-17-28 (45)						
	65										
870			SAND (SP), brown, subrounded, fine to medium grained, moist, medium dense, non plastic, trace gravel	SPT	10-13-12 (25)						
	70										
865			CLAYEY SAND WITH GRAVEL (SC), brown, subangular, medium to coarse grained, moist to wet, hard, low plasticity, some gravel	SPT	10-26-39 (65)						

Bottom of borehole at 71.5 feet. Backfilled with soil cuttings.

BORING NUMBER B-19

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 6/9/2022 **COMPLETED** 6/10/2022
BORING LOCATION STA 1168+30, 160' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41984°N, -112.42626°E
DRILLING METHOD Tubex
GROUND ELEVATION 936 ft **BOREHOLE DEPTH** 66.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
935			SILTY SAND (SM), light brown to brown, well graded, subangular, slightly moist to moist, loose, non plastic, trace to some fine gravel Root zone from 0 to 1'								
				AU			4.9	NP	NP	NP	18
	5										
930				R	3-6						
	10										
925			Decreased gravel below 10'	SPT	3-4-4 (8)						
	15		SAND WITH CLAY AND GRAVEL (SP-SC), whitish brown to light brown, subangular, medium grained, slightly moist, firm, no to low plasticity, fine gravel, weak lime cementation								
920				SPT	23-6-16 (22)						
			Weak to moderate lime cementation, light brown below 17'								
	20										
915			GRAVELLY CLAY WITH SAND (CL), white to light brown, slightly moist, hard, low plasticity, fine gravel, moderate lime cementation	SPT	8-36-50/4"						
			Moist, brown below 24'								
	25										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 6/9/2022 **COMPLETED** 6/10/2022 **BORING LOCATION** STA 1168+30, 160' R SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.41984°N, -112.42626°E

DRILLING METHOD Tubex **GROUND ELEVATION** 936 ft **BOREHOLE DEPTH** 66.5 ft

RIG TYPE / # CME 75/109 **GROUNDWATER DEPTH** ---

HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
910			SANDY CLAY (CL), brown, subangular, moist, very firm, low to medium plasticity, occasional gravel, considerable fine to medium gravel, weak lime cementation	SPT	6-9-25 (34)						
	30		SILTY GRAVEL WITH SAND (GM), gray to reddish brown, subangular, slightly moist, very dense, non plastic, considerable medium sand, occasional cobbles	SPT	50/2"						
905			CLAY WITH SAND (CL), brown, subangular, moist, moderately firm, low to medium plasticity, trace fine gravel, some fine gravel								
	35			SPT	3-3-7 (10)						
900											
	40		SAND WITH CLAY (SP-SC), light brown, subangular, fine to medium grained, moist, very firm, low plasticity, trace fine gravel	SPT	7-13-18 (31)						
895											
	45		GRAVEL WITH CLAY AND SAND (GP-GC), gray to light brown, poorly graded, angular, slightly moist, very dense, no to low plasticity, considerable medium sand	SPT	13-31-22 (53)						
890											
	50										

(Continued Next Page)

Ethos Engineering s

BORING NUMBER B-19

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 6/9/2022 **COMPLETED** 6/10/2022
BORING LOCATION STA 1168+30, 160' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41984°N, -112.42626°E
DRILLING METHOD Tubex
GROUND ELEVATION 936 ft **BOREHOLE DEPTH** 66.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
885			GRAVEL WITH SAND (GP), light brown to gray, subangular, moist to slightly moist, dense to very dense, non plastic, considerable medium to coarse sand	SPT	11-21-18 (39)						
	55			SPT	17-15-42 (57)						
880											
	60		SAND WITH CLAY (SP-SC), brown, subangular, moist, very firm, low plasticity, trace gravel	SPT	8-12-19 (31)						
875											
	65		SAND (SP), light brown, subangular, fine to medium grained, moist, medium dense, non plastic, trace fine gravel	SPT	10-15-10 (25)						
870											

Bottom of borehole at 66.5 feet. Backfilled with soil cuttings.

BORING NUMBER B-20

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 6/10/2022 **COMPLETED** 6/10/2022 **BORING LOCATION** STA 1169+90, 145' R SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.42022°N, -112.42622°E

DRILLING METHOD Tubex **GROUND ELEVATION** 937 ft **BOREHOLE DEPTH** 61.5 ft

RIG TYPE / # CME 75/109 **GROUNDWATER DEPTH** ---

HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY SAND (SM), brown, subangular, fine to medium grained, moist, non plastic, trace fine gravel								
935			Root zone from 0-1'	AU			6.7	NP	NP	NP	29
	5		SAND (SP), brown to light brown, subangular, medium to coarse grained, slightly moist to moist, very loose, non plastic, trace fine gravel	SPT	2-2-2 (4)						
930											
	10		CLAYEY SAND (SC), brown to light brown, medium grained, moist, soft, medium plasticity	SPT	4-4-3 (7)		8.3	30	12	18	23
925											
	15		SAND WITH CLAY AND GRAVEL (SP-SC), light brown to whitish brown, subangular, medium to coarse grained, slightly moist, hard, low plasticity, trace to some gravel, weak lime cementation	SPT	4-33-50/6"						
920											
	20		SANDY CLAY (CL), brown to whitish brown, subangular, slightly moist, very firm, low to medium plasticity, trace fine gravel, some fine sand, moderate to strong lime cementation	SPT	27-18-22 (40)						
915											
	25		Moist below 24.5'								

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 6/10/2022 **COMPLETED** 6/10/2022 **BORING LOCATION** STA 1169+90, 145' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.42022°N, -112.42622°E
DRILLING METHOD Tubex **GROUND ELEVATION** 937 ft **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # CME 75/109 **GROUNDWATER DEPTH** ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
910			SAND WITH CLAY (SP-SC), brown, subangular, fine to medium grained, moist, moderately firm to hard, low plasticity, trace fine gravel, weak lime cementation	R	12-24						
			Increased gravel, moderate lime cementation below 28.5'								
	30			SPT	50/1"						
905											
			CLAYEY SAND (SC), brown, subangular, fine grained, moist, hard, low plasticity, trace gravel								
	35			SPT	7-14-50/1"						
900											
	40		SILTY SAND (SM), brown, subangular, fine grained, moist, moderately firm to very firm, low plasticity, trace gravel	SPT	7-12-11 (23)						
895											
	45		Increased gravel below 45'	SPT	13-27-23 (50)						
890			SAND (SP), brown, subangular, fine grained, moist, dense, non plastic, trace gravel								
	50										

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Ethos Engineering s

BORING NUMBER B-20

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 6/10/2022 **COMPLETED** 6/10/2022
BORING LOCATION STA 1169+90, 145' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42022°N, -112.42622°E
DRILLING METHOD Tubex
GROUND ELEVATION 937 ft **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SANDY CLAY (CL), brown, subangular, moist, moderately firm, medium to high plasticity, trace gravel, some to considerable medium sand	SPT	7-6-9 (15)						
885											
			GRAVEL WITH SAND (GP), light brown to whitish brown, slightly moist, dense, non plastic, considerable sand								
	55			SPT	14-17-22 (39)						
880											
	60		SAND WITH CLAY (SP-SC), brown to light brown, subangular, fine grained, slightly moist, very firm, low plasticity, trace fine gravel, weak lime cementation	SPT	14-17-22 (39)						

Bottom of borehole at 61.5 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-21

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 6/8/2022 **COMPLETED** 6/9/2022
BORING LOCATION STA 1171+00, 140' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42059°N, -112.42625°E
DRILLING METHOD Tubex
GROUND ELEVATION 937 ft **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SANDY SILT (ML), light brown, subangular, slightly moist to moist, moderately firm, non plastic, trace fine gravel, fine sand Root zone from 0' to 1'								
935				AU			8.2	NP	NP	NP	51
	5		Increased fines below 5'	SPT	3-4-8 (12)						
930			CLAYEY SAND (SC), light brown, subangular, fine grained, moist to slightly moist, soft to hard, low plasticity, some fine gravel, weak to moderate lime cementation								
	10			SPT	3-3-5 (8)						
925											
	15			SPT	27-29-50/4"						
920											
	20		CLAY WITH SAND (CL), white to light brown, subangular, slightly moist to moist, firm to hard, low to medium plasticity, some fine gravel, some fine sand, moderate lime cementation	SPT	28-38-50/5"						
915											
	25		Increased sand, decreased gravel, low plasticity, no cementation below 24'								

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 6/8/2022 **COMPLETED** 6/9/2022 **BORING LOCATION** STA 1171+00, 140' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.42059°N, -112.42625°E
DRILLING METHOD Tubex **GROUND ELEVATION** 937 ft **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # CME 75/109 **GROUNDWATER DEPTH** ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
910			CLAY WITH SAND (CL), white to light brown, subangular, slightly moist to moist, firm to hard, low to medium plasticity, some fine gravel, some fine sand, moderate lime cementation *(continued)*	SPT	6-10-18 (28)						
	30		Low to medium plasticity, weak lime cementation below 30'	SPT	50/5"						
905											
	35		Decreased sand, moderately firm below 35'	R	6-13						
900											
	40		SAND (SP), light brown, subangular, fine grained, slightly moist, medium dense to dense, non plastic, trace fine gravel	SPT	6-9-12 (21)						
895											
	45		Brown, increased gravel below 45'	SPT	13-18-25 (43)						
890											
	50										

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Ethos Engineering s

BORING NUMBER B-21

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 6/8/2022 **COMPLETED** 6/9/2022
BORING LOCATION STA 1171+00, 140' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42059°N, -112.42625°E
DRILLING METHOD Tubex
GROUND ELEVATION 937 ft **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND WITH GRAVEL (SC), reddish brown to brown, subangular, medium grained, moist, soft, low to medium plasticity, some fine gravel	SPT	9-4-4 (8)						
885											
	55		SAND WITH SILT AND GRAVEL (SP-SM), gray to light brown, subangular, medium to coarse grained, slightly moist, very dense, low plasticity, some fine gravel	SPT	17-29-50/6"						
880											
	60			SPT	18-36-48 (84)						

Bottom of borehole at 61.5 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-22

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 2/21/2022 **COMPLETED** 2/21/2022
BORING LOCATION STA 1171+70, 145' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42079°N, -112.42715°E
DRILLING METHOD Tubex
GROUND ELEVATION 937 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH 72 ft / Elev 865 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
935			SILTY, CLAYEY SAND (SC-SM), light brown, fine to medium grained, slightly moist, firm, low plasticity, trace fine gravel	SPT	5-7-11 (18)						
				AU			3.1	21	16	5	25
	5		Moderately firm, medium plasticity, trace gravel below 5'	SPT	4-5-6 (11)						
930											
	10		SANDY SILT (ML), light brown, slightly moist, moderately firm, non plastic, trace gravel, considerable fine to medium sand	SPT	4-6-6 (12)						
925											
	15		SAND WITH GRAVEL (SP), light brown, medium grained, slightly moist, dense, non plastic, some fine gravel	R	17-22	112	2.3	NP	NP	NP	3
920											
	20		SILTY CLAY (CL), white to light brown, slightly moist, hard, medium plasticity, trace fine gravel, trace fine sand	SPT	50/4"						
915											
	25		Strongly lime cemented gravel and cobble size nodules from 23' to 25'								

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 2/21/2022 **COMPLETED** 2/21/2022 **BORING LOCATION** STA 1171+70, 145' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.42079°N, -112.42715°E
DRILLING METHOD Tubex **GROUND ELEVATION** 937 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME 75/109 **GROUNDWATER DEPTH** 72 ft / Elev 865 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
910	30		SILTY CLAY (CL), white to light brown, slightly moist, hard, medium plasticity, trace fine gravel, trace fine sand *(continued)* Brown, firm, low to medium plasticity	SPT	13-13-16 (29)						
905	35		SILTY, CLAYEY SAND (SC-SM), brown, fine grained, slightly moist, firm, low plasticity, occasional fine gravel	SPT	8-13-14 (27)		13.5	28	21	7	43
900	40		SANDY CLAY (CL), brown, moist, very firm, medium plasticity, trace fine gravel, trace fine sand	R	18-36						
895	45		CLAY (CH), brown, moist, moderately firm, high plasticity, trace to some fine sand	SPT	4-7-7 (14)		31.4	44	22	22	89
890	50		SILTY SANDY CLAY (CL-ML), light brown to brown, slightly moist, firm, low to medium plasticity, some gravel, some fine to medium sand	SPT	4-7-15 (22)						

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 2/21/2022 **COMPLETED** 2/21/2022 **BORING LOCATION** STA 1171+70, 145' L SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.42079°N, -112.42715°E

DRILLING METHOD Tubex **GROUND ELEVATION** 937 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # CME 75/109 ▼ **GROUNDWATER DEPTH** 72 ft / Elev 865 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY SANDY CLAY (CL-ML), light brown to brown, slightly moist, firm, low to medium plasticity, some gravel, some fine to medium sand*(continued)*	SPT	14-13-17 (30)						
885			Moist, medium plasticity, trace fine gravel, trace fine sand below 50'								
	55		Moderately firm at 55'	SPT	5-7-6 (13)						
880											
	60		CLAYEY SAND (SC), brown, fine to medium grained, moist, firm to very firm, low plasticity, trace fine gravel	SPT	10-15-16 (31)						
875											
	65			SPT	11-12-17 (29)						
870											
	70		SILTY SAND (SM), dark brown, medium to coarse grained, wet, dense, no to low plasticity	SPT	16-20-28 (48)						
865			▼								
	75										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 2/21/2022 **COMPLETED** 2/21/2022 **BORING LOCATION** STA 1171+70, 145' L SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.42079°N, -112.42715°E

DRILLING METHOD Tubex **GROUND ELEVATION** 937 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # CME 75/109 **GROUNDWATER DEPTH** 72 ft / Elev 865 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SANDY CLAY (CL), dark brown, very moist to wet, very firm to hard, low to medium plasticity, some gravel, considerable coarse sand	SPT	14-19-19 (38)						
860											
	80		Considerable gravel, considerable medium to coarse sand below 80'	SPT	15-25-30 (55)						
855											
	85		Clayey sand (SC) from 85' to 86'	SPT	15-23-24 (47)						
			SANDY CLAY (CH), dark brown, wet, very firm, medium to high plasticity, trace gravel, occasional medium sand								
850											
	90		SILTY SAND (SM), brown, fine to medium grained, wet, medium dense, no to low plasticity, occasional gravel	SPT	22-12-15 (27)						
845											
	95		SAND (SP), brown, fine to medium grained, wet, very dense, non plastic, trace fine gravel	SPT	12-24-35 (59)						
840											
	100										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 2/21/2022 **COMPLETED** 2/21/2022
BORING LOCATION STA 1171+70, 145' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42079°N, -112.42715°E
DRILLING METHOD Tubex
GROUND ELEVATION 937 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH 72 ft / Elev 865 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
			SILTY SAND (SM), brown, fine to medium grained, wet, dense, no to low plasticity, trace gravel	SPT	10-22-27 (49)						

Bottom of borehole at 101.5 feet. Backfilled with soil cuttings; grouted upper 25'.

Ethos Engineering s

BORING NUMBER B-23

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 4/12/2022 **COMPLETED** 4/13/2022
BORING LOCATION STA 1171+80, 30' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42079°N, -112.42656°E
DRILLING METHOD Tubex
GROUND ELEVATION 937 ft **BOREHOLE DEPTH** 100.3 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH 70 ft / Elev 867 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
935	0		SILTY SAND (SM), light brown, fine to medium grained, moist, loose, non plastic, trace fine gravel	SPT	6-5-4 (9)						
	5			AU			8.6	NP	NP	NP	40
930	10		SAND (SP), light brown, fine to medium grained, moist, very loose, non plastic, trace fine gravel	SPT	2-2-2 (4)						
925	15		SILTY SAND (SM), light brown, angular, fine to medium grained, moist, medium dense, no to low plasticity, occasional gravel	SPT	3-6-9 (15)						
920	20		SAND (SP), light brown, angular, fine to medium grained, slightly moist, medium dense, non plastic, some gravel, weak lime cementation	SPT	7-16-12 (28)						
915	25		SILTY SAND (SM), light brown, angular, fine to medium grained, slightly moist, very dense, non plastic, trace gravel, weak lime cementation	SPT	50/5"						

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 4/12/2022 **COMPLETED** 4/13/2022 **BORING LOCATION** STA 1171+80, 30' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.42079°N, -112.42656°E
DRILLING METHOD Tubex **GROUND ELEVATION** 937 ft **BOREHOLE DEPTH** 100.3 ft
RIG TYPE / # CME 75/109 ▼ **GROUNDWATER DEPTH** 70 ft / Elev 867 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
910	30		SILTY SAND (SM), light brown, angular, fine to medium grained, slightly moist, very dense, non plastic, trace gravel, weak lime cementation*(continued)*	SPT	50/3"						
905	35		SILT WITH SAND (ML), brown, moist, firm to moderately firm, low plasticity, trace fine gravel, some fine sand	R	17-33						
900	40			SPT	5-10-19 (29)		21.7	35	27	8	72
895	45			SPT	3-5-10 (15)						
890	50		SILTY SAND (SM), light brown, angular, fine to medium grained, moist, medium dense to very dense, non plastic, occasional gravel	SPT	6-10-12 (22)						

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 4/12/2022 **COMPLETED** 4/13/2022 **BORING LOCATION** STA 1171+80, 30' R SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.42079°N, -112.42656°E

DRILLING METHOD Tubex **GROUND ELEVATION** 937 ft **BOREHOLE DEPTH** 100.3 ft

RIG TYPE / # CME 75/109 ▼ **GROUNDWATER DEPTH** 70 ft / Elev 867 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY SAND (SM), light brown, angular, fine to medium grained, moist, medium dense to very dense, non plastic, occasional gravel *(continued)*	SPT	5-7-9 (16)						
885											
	55			SPT	6-14-20 (34)		9.4	NP	NP	NP	12
880											
	60			SPT	7-12-15 (27)						
875											
	65		Brown to dark brown; dense to very dense; very moist to wet; no to low plasticity; some gravel below 65'	SPT	9-13-18 (31)						
870											
	70	▼		SPT	9-21-31 (52)						
865											
	75										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 4/12/2022 **COMPLETED** 4/13/2022 **BORING LOCATION** STA 1171+80, 30' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.42079°N, -112.42656°E
DRILLING METHOD Tubex **GROUND ELEVATION** 937 ft **BOREHOLE DEPTH** 100.3 ft
RIG TYPE / # CME 75/109 ▼ **GROUNDWATER DEPTH** 70 ft / Elev 867 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
860	80		SILTY SAND (SM), light brown, angular, fine to medium grained, moist, medium dense to very dense, non plastic, occasional gravel*(continued)*	SPT	9-15-14 (29)						
855	85		SANDY CLAY WITH GRAVEL (CL), dark brown, subangular, wet, hard, medium plasticity, some gravel	SPT	14-31-32 (63)						
850	90		SILTY GRAVEL (GM), dark brown, angular, wet, very dense, no to low plasticity, some fine to coarse sand	SPT	8-34-34 (68)						
845	95		SANDY CLAY WITH GRAVEL (CL), dark brown, angular, wet, hard, medium plasticity, considerable gravel	SPT	10-16-21 (37)						
840	100		SILTY SAND (SM), dark brown, fine grained, wet, medium dense, no to low plasticity, trace fine gravel	SPT	5-9-17 (26)						

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Ethos Engineering s

BORING NUMBER B-23

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 4/12/2022 **COMPLETED** 4/13/2022
BORING LOCATION STA 1171+80, 30' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42079°N, -112.42656°E
DRILLING METHOD Tubex
GROUND ELEVATION 937 ft **BOREHOLE DEPTH** 100.3 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH 70 ft / Elev 867 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			Sand (SP) lense at 100'	SPT	50/3"						
			Bottom of borehole at 100.3 feet. Backfilled with soil cuttings; grouted upper 25'.								

BORING NUMBER B-24

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/21/2022 **COMPLETED** 3/22/2022
BORING LOCATION STA 1172+90, 125' L SR 303L Cst CL
DRILLER Cascade **DRILLED BY** M. Villalobos
GPS COORDINATES 33.42113°N, -112.42706°E
DRILLING METHOD Roto-Sonic
GROUND ELEVATION 939 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # TSI-150CC/BB6B45
GROUNDWATER DEPTH 72 ft / Elev 867 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 77
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			2-5/8" Asphalt 5" Aggregate Base Course								
935	5		SAND WITH CLAY (SP-SC), brown, medium grained, moist, very loose, low to medium plasticity, some fine gravel	AU							
				SPT	5-1-3 (4)						
930	10		CLAYEY SAND (SC), brown to light brown, fine to medium grained, moist, soft, low to medium plasticity, weak lime cementation	AU			9.0	25	16	9	34
				SPT	4-3-5 (8)						
925	15		SILTY SAND WITH GRAVEL (SM), light brown to brown, fine to medium grained, slightly moist, medium dense, non plastic, trace fine gravel	AU							
				SPT	11-12-11 (23)						
920	20		Occasional strongly cemented gravel to cobble sized nodules below 17'	AU			3.5	NP	NP	NP	15
				SPT	50/4"						
915	25		CLAYEY SAND (SC), light brown, fine grained, moist to slightly moist, firm to hard, low to medium plasticity, trace gravel, weak to moderate lime cementation	AU							

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 3/21/2022 **COMPLETED** 3/22/2022 **BORING LOCATION** STA 1172+90, 125' L SR 303L Cst CL

DRILLER Cascade **DRILLED BY** M. Villalobos **GPS COORDINATES** 33.42113°N, -112.42706°E

DRILLING METHOD Roto-Sonic **GROUND ELEVATION** 939 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # TSI-150CC/BB6B45 **GROUNDWATER DEPTH** 72 ft / Elev 867 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 77 **LOGGED BY** M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAY WITH SAND (CL), light brown, slightly moist to moist, hard, medium plasticity, trace fine gravel, considerable fine sand, moderate lime cementation	R	9-50	94	8.1				
910				AU							
	30		SAND WITH CLAY (SP-SC), brown to gray, fine to medium grained, slightly moist, very dense, low to medium plasticity, trace fine gravel, moderate lime cementation	SPT	10-10-50 (60)						
			CLAYEY SAND (SC), light brown, fine to medium grained, slightly moist, soft, medium plasticity, trace fine gravel, moderate lime cementation								
905				AU							
	35			SPT	2-4-3 (7)						
			CLAY WITH SAND (CL), brown, moist, firm, medium to high plasticity, occasional fine gravel, some fine sand, weak lime cementation								
900				AU							
	40			R	9-27						
			SAND WITH GRAVEL (SP), brown, fine to medium grained, moist, non plastic, some gravel, occasional cobbles								
895				AU							
	45		SAND WITH CLAY (SP-SC), light brown to brown, fine grained, moist, hard, low to medium plasticity, trace fine gravel, weak to moderate lime cementation	SPT	39-50/4"						
			Increased cementation from 47' to 49'								
890				AU							
	50										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 3/21/2022 **COMPLETED** 3/22/2022 **BORING LOCATION** STA 1172+90, 125' L SR 303L Cst CL
DRILLER Cascade **DRILLED BY** M. Villalobos **GPS COORDINATES** 33.42113°N, -112.42706°E
DRILLING METHOD Roto-Sonic **GROUND ELEVATION** 939 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # TSI-150CC/BB6B45 **GROUNDWATER DEPTH** 72 ft / Elev 867 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 77 **LOGGED BY** M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SANDY CLAY (CL), brown, moist, firm, medium plasticity, trace fine gravel, trace fine sand, weak lime cementation	SPT	5-10-16 (26)						
885				AU		104	20.7	39	20	19	55
	55		Increased sand below 55'	R	10-21						
880			CLAYEY SAND (SC), light brown to brown, fine to medium grained, moist, firm, medium plasticity, considerable gravel, weak lime cementation	AU							
	60		Decreased gravel below 59'	SPT	13-13-16 (29)						
875			SAND WITH GRAVEL (SP), light brown to brown, poorly graded, medium to coarse grained, slightly moist, dense to medium dense, non plastic, considerable gravel	AU							
	65			SPT	11-13-18 (31)						
			Interbedded clay layers (less than 4" thick) from 66' to 68'								
870			Increased gravel below 68.5'	AU							
	70			SPT	8-13-13 (26)						
			▼								
865			CLAY (CL), brown, very moist to wet, medium to high plasticity, trace fine gravel, some fine sand	AU							
	75		GRAVEL WITH SILT (GP-GM), grayish brown, subangular, wet, very dense, non plastic, some medium to coarse sand								

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CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 3/21/2022 **COMPLETED** 3/22/2022 **BORING LOCATION** STA 1172+90, 125' L SR 303L Cst CL

DRILLER Cascade **DRILLED BY** M. Villalobos **GPS COORDINATES** 33.42113°N, -112.42706°E

DRILLING METHOD Roto-Sonic **GROUND ELEVATION** 939 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # TSI-150CC/BB6B45 **GROUNDWATER DEPTH** 72 ft / Elev 867 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 77 **LOGGED BY** M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			GRAVEL WITH SILT (GP-GM), grayish brown, subangular, wet, very dense, non plastic, some medium to coarse sand*(continued)*	SPT	9-19-37 (56)						
			CLAY WITH GRAVEL (CL), brown, wet, medium plasticity, considerable gravel, some fine to medium sand								
860				AU							
	80		SAND WITH GRAVEL (SP), brown, medium to coarse grained, wet, dense, non plastic, some gravel, trace silt	SPT	10-12-34 (46)						
855				AU							
	85		SAND WITH CLAY (SP-SC), dark brown to brown, fine to medium grained, wet, very dense, low plasticity, some gravel	SPT	14-19-33 (52)						
			CLAYEY SAND (SC), brown, fine grained, wet, medium plasticity, some gravel, moderate lime cementation								
850				AU							
	90		SILTY SAND (SM), dark brown, fine grained, wet, medium dense, no to low plasticity, trace fine gravel	SPT	10-11-17 (28)						
			SAND (SP), light brown, medium grained, wet, non plastic, some gravel	AU							
845											
	95		CLAY (CL), brown, moist, hard, medium to high plasticity, trace gravel, some fine sand, moderate lime cementation	SPT	18-19-31 (50)						
			SAND WITH GRAVEL (SP), light brown, medium grained, wet, dense, non plastic, some fine gravel								
840				AU							
	100										

(Continued Next Page)

Ethos Engineering s

BORING NUMBER B-24

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/21/2022 **COMPLETED** 3/22/2022
BORING LOCATION STA 1172+90, 125' L SR 303L Cst CL
DRILLER Cascade **DRILLED BY** M. Villalobos
GPS COORDINATES 33.42113°N, -112.42706°E
DRILLING METHOD Roto-Sonic
GROUND ELEVATION 939 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # TSI-150CC/BB6B45
GROUNDWATER DEPTH 72 ft / Elev 867 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 77
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
			SAND WITH GRAVEL (SP), light brown, medium grained, wet, dense, non plastic, some fine gravel*(continued)*	SPT	10-17-20 (37)						

Bottom of borehole at 101.5 feet. Backfilled with soil cuttings; grouted upper 25'; sawcut and patched surface with Hot Mix AC.

Ethos Engineering s

BORING NUMBER B-25

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/22/2022 **COMPLETED** 3/24/2022
BORING LOCATION STA 1172+90, 125' R SR 303L Cst CL
DRILLER Cascade **DRILLED BY** M. Villalobos
GPS COORDINATES 33.42113°N, -112.42624°E
DRILLING METHOD Roto-Sonic
GROUND ELEVATION 939 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # TSI-150CC/BB6B45
GROUNDWATER DEPTH 72 ft / Elev 867 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 77
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			4-3/8" Asphalt								
			5"Aggregate Base Course								
			CLAYEY SAND (SC), brown, fine to medium grained, moist, medium plasticity, trace fine gravel	AU							
935	5										
			SANDY SILT (ML), brown, moist, medium dense, non plastic, trace fine gravel, some fine sand, weak lime cementation	SPT	3-6-6 (12)						
				AU			1.2	NP	NP	NP	53
930	10										
			SAND (SP), light brown, fine to medium grained, slightly moist, loose, non plastic, trace fine gravel	SPT	4-4-3 (7)						
			SAND WITH CLAY (SP-SC), light brown, fine to medium grained, slightly moist, very firm, low to medium plasticity, trace gravel, moderate lime cementation	AU							
925	15			SPT	24-24-13 (37)						
			SAND WITH GRAVEL (SP), light brown to brown, medium grained, slightly moist, very dense, non plastic, some gravel	AU							
920	20			SPT	50						
			CLAYEY GRAVEL (GC), light brown, fine to medium grained, slightly moist, medium plasticity, moderate lime cementation	AU			16.4	42	20	22	37
915	25										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 3/22/2022 **COMPLETED** 3/24/2022 **BORING LOCATION** STA 1172+90, 125' R SR 303L Cst CL

DRILLER Cascade **DRILLED BY** M. Villalobos **GPS COORDINATES** 33.42113°N, -112.42624°E

DRILLING METHOD Roto-Sonic **GROUND ELEVATION** 939 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # TSI-150CC/BB6B45 **GROUNDWATER DEPTH** 72 ft / Elev 867 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 77 **LOGGED BY** M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND (SC), light brown, fine grained, slightly moist, hard, medium plasticity, trace fine gravel, moderate lime cementation	SPT	12-18-33 (51)						
910	30		CLAY WITH SAND (CL), light brown to brown, moist, hard, medium plasticity, trace fine gravel, some fine to medium sand, weak lime cementation	AU							
				R	8-50	107	10.9				
905	35			AU							
				SPT	18-50						
			Brown, medium to high plasticity, trace fine sand below 37'	AU			2.4	35	21	14	84
900	40			R	8-15						
895	45		SAND WITH CLAY (SP-SC), brown, fine grained, moist, firm, low to medium plasticity, trace fine gravel	AU							
			SAND (SP), light brown, fine grained, moist, medium dense, non plastic, trace fine gravel	SPT	7-8-9 (17)						
890	50			AU							

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 3/22/2022 **COMPLETED** 3/24/2022 **BORING LOCATION** STA 1172+90, 125' R SR 303L Cst CL
DRILLER Cascade **DRILLED BY** M. Villalobos **GPS COORDINATES** 33.42113°N, -112.42624°E
DRILLING METHOD Roto-Sonic **GROUND ELEVATION** 939 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # TSI-150CC/BB6B45 **GROUNDWATER DEPTH** 72 ft / Elev 867 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 77 **LOGGED BY** M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SAND (SP), light brown, fine grained, moist, medium dense, non plastic, trace fine gravel*(continued)*	SPT	11-13-13 (26)						
				AU							
885	55			SPT	9-8-12 (20)						
			CLAYEY SAND (SC), brown, fine to medium grained, moist, firm, medium plasticity, some gravel, weak lime cementation	AU							
880	60			SPT	4-8-12 (20)						
			SAND WITH CLAY (SP-SC), light brown to brown, fine to medium grained, slightly moist, low plasticity, some gravel	AU							
			SAND WITH GRAVEL (SP), light brown, medium grained, slightly moist, medium dense, non plastic, considerable gravel, trace clay	AU							
875	65			SPT	11-12-14 (26)						
			decreased gravel below 67'	AU							
870	70			SPT	12-18-17 (35)						
			SILTY GRAVEL WITH SAND (GM), brown, poorly graded, subangular, wet, medium dense, non plastic, occasional cobbles, some medium to coarse sand	AU							
865	75										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 3/22/2022 **COMPLETED** 3/24/2022 **BORING LOCATION** STA 1172+90, 125' R SR 303L Cst CL

DRILLER Cascade **DRILLED BY** M. Villalobos **GPS COORDINATES** 33.42113°N, -112.42624°E

DRILLING METHOD Roto-Sonic **GROUND ELEVATION** 939 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # TSI-150CC/BB6B45 **GROUNDWATER DEPTH** 72 ft / Elev 867 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 77 **LOGGED BY** M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY GRAVEL WITH SAND (GM), brown, poorly graded, subangular, wet, medium dense, non plastic, occasional cobbles, some medium to coarse sand *(continued)*	SPT	10-12-14 (26)						
860				AU							
	80		GRAVEL WITH SAND (GP), light brown to brown, poorly graded, wet, dense, non plastic, occasional cobbles, considerable coarse sand	SPT	6-15-18 (33)						
			CLAY WITH SAND (CL), brown, wet, very firm, high plasticity, trace gravel, some medium to coarse sand								
855				AU							
	85		decreased gravel; trace fine grained sand below 85'	SPT	17-19-24 (43)						
850				AU							
	90			SPT	4-12-23 (35)						
			SAND (SP), light brown to brown, fine grained, wet, non plastic, trace gravel								
845				AU							
	95		CLAY (CL), brown, wet, very firm, medium to high plasticity, trace gravel, trace fine sand	SPT	5-18-22 (40)						
840				AU							
	100		SAND (SP), light brown to brown, medium grained, wet, dense, non plastic, trace gravel								

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Ethos Engineering s

BORING NUMBER B-25

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/22/2022 **COMPLETED** 3/24/2022
BORING LOCATION STA 1172+90, 125' R SR 303L Cst CL
DRILLER Cascade **DRILLED BY** M. Villalobos
GPS COORDINATES 33.42113°N, -112.42624°E
DRILLING METHOD Roto-Sonic
GROUND ELEVATION 939 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # TSI-150CC/BB6B45
GROUNDWATER DEPTH 72 ft / Elev 867 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 77
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
			SAND (SP), light brown to brown, medium grained, wet, dense, non plastic, trace gravel*(continued)*	SPT	8-18-18 (36)						

Bottom of borehole at 101.5 feet. Backfilled with soil cuttings; grouted upper 25'; sawcut and patched surface with Hot Mix AC.

BORING NUMBER B-26

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 2/24/2022 **COMPLETED** 2/28/2022
BORING LOCATION STA 1174+00 135' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42141°N, -112.42709°E
DRILLING METHOD Tubex
GROUND ELEVATION 943 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH 75 ft / Elev 868 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SANDY CLAY (CL), light brown, slightly moist, very firm to moderately firm, low to medium plasticity, trace fine gravel, trace fine sand	SPT	17-24-16 (40)						
940				AU			8.0	25	17	8	58
	5		Medium to high plasticity from 5' to 8'	SPT	3-5-4 (9)						
935											
	10			SPT	5-6-6 (12)						
930											
	15		SAND WITH SILT (SP-SM), light brown, fine to medium grained, slightly moist, medium dense to dense, non plastic, occasional gravel	R	8-11						
925											
	20			SPT	12-18-19 (37)		2.6	NP	NP	NP	9
920											
	25		Weak lime cementation below 24'								

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 2/24/2022 **COMPLETED** 2/28/2022 **BORING LOCATION** STA 1174+00 135' L SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.42141°N, -112.42709°E

DRILLING METHOD Tubex **GROUND ELEVATION** 943 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # CME 75/109 **GROUNDWATER DEPTH** 75 ft / Elev 868 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SANDY CLAY (CL), light brown, moist, firm, medium plasticity, trace gravel, some fine to medium sand	SPT	11-12-11 (23)						
915			Strong lime cementation from 27' to 29'								
	30		SILTY, CLAYEY SAND (SC-SM), brown, fine grained, moist, very firm, low plasticity, occasional gravel	SPT	14-17-19 (36)		13.3	28	22	6	35
910											
	35		CLAY (CL), brown, moist, hard to firm, medium to high plasticity, trace fine gravel, trace fine sand	R	50/2"						
905											
	40			SPT	10-14-18 (32)						
900											
	45			SPT	8-9-12 (21)						
895											
	50										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 2/24/2022 **COMPLETED** 2/28/2022 **BORING LOCATION** STA 1174+00 135' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.42141°N, -112.42709°E
DRILLING METHOD Tubex **GROUND ELEVATION** 943 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME 75/109 **GROUNDWATER DEPTH** 75 ft / Elev 868 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAY (CL), brown, moist, hard to firm, medium to high plasticity, trace fine gravel, trace fine sand*(continued)*	SPT	50/5"						
890											
	55		Increased sand below 55'	SPT	6-7-9 (16)		24.7	38	21	17	69
885											
	60		SAND (SW), light brown, fine grained, moist, dense, non plastic, trace fine gravel	SPT	13-17-17 (34)						
880											
	65		Sandy lean clay (CL) lense from 65' to 66'	SPT	10-11-15 (26)						
			SILTY SAND (SM), brown, fine to medium grained, moist, medium dense, no to low plasticity, trace fine gravel								
875											
	70		SAND (SW), light brown, fine grained, moist, medium dense, non plastic, trace fine gravel	SPT	11-12-14 (26)						
870											
	75		▼								

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 2/24/2022 **COMPLETED** 2/28/2022 **BORING LOCATION** STA 1174+00 135' L SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.42141°N, -112.42709°E

DRILLING METHOD Tubex **GROUND ELEVATION** 943 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # CME 75/109 **GROUNDWATER DEPTH** 75 ft / Elev 868 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SAND (SW), light brown, fine grained, moist, medium dense, non plastic, trace fine gravel *(continued)*	SPT	6-9-10 (19)						
865			Dark brown, medium grained sand, wet below 75'								
	80		SILTY SAND (SM), dark brown, fine to medium grained, wet, very dense, low to medium plasticity, considerable gravel	SPT	36-50/5"						
860											
	85		SANDY CLAY WITH GRAVEL (CL), brown, wet, hard, low to medium plasticity, considerable gravel, some medium sand	SPT	15-23-30 (53)						
855											
	90		SILTY GRAVEL WITH SAND (GM), brown to dark brown, subangular, wet, very firm, no to low plasticity, some fine to medium sand	SPT	18-15-21 (36)						
850											
	95		Sand (SP) lense from 95' to 95.5'								
			CLAY (CL), brown, slightly moist, hard to very firm, low to medium plasticity, occasional gravel, some fine to medium sand	SPT	7-25-25 (50)						
845											
	100										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 2/24/2022 **COMPLETED** 2/28/2022
BORING LOCATION STA 1174+00 135' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42141°N, -112.42709°E
DRILLING METHOD Tubex
GROUND ELEVATION 943 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH 75 ft / Elev 868 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
			CLAY (CL), brown, slightly moist, hard to very firm, low to medium plasticity, occasional gravel, some fine to medium sand*(continued)*	SPT	14-15-20 (35)						

Bottom of borehole at 101.5 feet. Backfilled with soil cuttings; grouted upper 25'.

Ethos Engineering s

BORING NUMBER B-27

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/2/2022 **COMPLETED** 3/3/2022
BORING LOCATION STA 1174+00, 105' R SR 303L Cst CL
DRILLER Cascade **DRILLED BY** M. Villalobos
GPS COORDINATES 33.42142°N, -112.4263°E
DRILLING METHOD Roto-Sonic
GROUND ELEVATION 943 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # TSI-150CC/BB6B45
GROUNDWATER DEPTH 73 ft / Elev 870 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 77
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
940			SANDY SILTY CLAY (CL-ML), light brown to brown, slightly moist, low plasticity, trace fine gravel, some fine sand								
	5		CLAY WITH SAND (CL), brown, slightly moist, moderately firm, low to medium plasticity, trace fine gravel, some fine sand	SPT	4-4-5 (9)						
935			SANDY SILTY CLAY (CL-ML), brown, moist, firm, low plasticity, some fine gravel, some fine to medium sand	AU			6.2	21	17	4	55
	10		SILTY, CLAYEY SAND WITH GRAVEL (SC-SM), light brown to brown, fine to medium grained, slightly moist, medium dense, low plasticity, trace gravel	SPT	9-8-7 (15)						
930			Increased gravel below 13'	AU			3.8	24	17	7	13
	15			SPT	5-8-7 (15)						
925			SILTY SAND WITH GRAVEL (SM), light brown to brown, medium grained, slightly moist, very dense, no to low plasticity, considerable fine gravel	AU							
	20			SPT	50/2"						
920			CLAYEY SAND WITH GRAVEL (SC), brown, subangular, fine grained, moist, very firm, medium plasticity, fine gravel, weak to moderate lime cementation	AU			6.6	32	17	15	37
	25										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 3/2/2022 **COMPLETED** 3/3/2022 **BORING LOCATION** STA 1174+00, 105' R SR 303L Cst CL
DRILLER Cascade **DRILLED BY** M. Villalobos **GPS COORDINATES** 33.42142°N, -112.4263°E
DRILLING METHOD Roto-Sonic **GROUND ELEVATION** 943 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # TSI-150CC/BB6B45 **GROUNDWATER DEPTH** 73 ft / Elev 870 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 77 **LOGGED BY** M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND WITH GRAVEL (SC), brown, subangular, fine grained, moist, very firm, medium plasticity, fine gravel, weak to moderate lime cementation*(continued)*	SPT	5-21-13 (34)						
915			Cobbles at 27'								
	30		CLAY (CL), brown, moist, very firm, medium to high plasticity, trace fine gravel, some fine to medium sand, weak lime cementation	SPT	9-16-16 (32)						
910			CLAYEY SAND WITH GRAVEL (SC), brown, fine to medium grained, moist, hard to firm, medium plasticity, some gravel, weak to moderate lime cementation	AU							
	35			SPT	21-50/3"						
			Interbedded sand (SP) layers from 36' to 38'								
905				AU			21.1	50	27	23	47
	40		Increased gravel from 38' to 40'	SPT	3-11-17 (28)						
900			CLAY WITH SAND (CL), brown, moist, hard to firm, medium to high plasticity, trace fine gravel, some fine sand	AU							
	45			SPT	7-21-36 (57)						
895											
	50										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 3/2/2022 **COMPLETED** 3/3/2022 **BORING LOCATION** STA 1174+00, 105' R SR 303L Cst CL
DRILLER Cascade **DRILLED BY** M. Villalobos **GPS COORDINATES** 33.42142°N, -112.4263°E
DRILLING METHOD Roto-Sonic **GROUND ELEVATION** 943 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # TSI-150CC/BB6B45 **GROUNDWATER DEPTH** 73 ft / Elev 870 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 77 **LOGGED BY** M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAY WITH SAND (CL), brown, moist, hard to firm, medium to high plasticity, trace fine gravel, some fine sand *(continued)*	SPT	6-11-12 (23)						
890				AU							
	55		Weak lime cementation below 55'	SPT	8-10-13 (23)						
885			CLAYEY SAND (SC), brown, fine to medium grained, moist, very firm, medium plasticity, trace fine gravel, weak cementation	AU							
	60			SPT	9-16-24 (40)						
880				AU							
	65			SPT	27-28-30 (58)						
			SILTY GRAVEL WITH SAND (GM), light brown to reddish brown, subangular, slightly moist, very dense, non plastic, some fine sand								
875			SAND (SP), light brown, medium to coarse grained, slightly moist to wet, medium dense, non plastic, trace gravel	AU							
	70			SPT	7-12-13 (25)						
870		▼		AU							
	75										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 3/2/2022 **COMPLETED** 3/3/2022 **BORING LOCATION** STA 1174+00, 105' R SR 303L Cst CL
DRILLER Cascade **DRILLED BY** M. Villalobos **GPS COORDINATES** 33.42142°N, -112.4263°E
DRILLING METHOD Roto-Sonic **GROUND ELEVATION** 943 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # TSI-150CC/BB6B45 **GROUNDWATER DEPTH** 73 ft / Elev 870 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 77 **LOGGED BY** M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SAND (SP), light brown, medium to coarse grained, slightly moist to wet, medium dense, non plastic, trace gravel*(continued)* Brown to dark brown, very moist to wet below 75'	R	6-38						
865			SAND WITH CLAY (SP-SC), brown, subangular, medium grained, wet, dense, low to medium plasticity, some gravel	AU							
	80		SAND (SP), brown, medium to coarse grained, wet, dense, non plastic, some fine gravel	SPT	9-20-24 (44)						
860											
	85		SAND WITH CLAY AND GRAVEL (SP-SC), light brown to brown, subangular, medium to coarse grained, wet, firm, low plasticity, some gravel	SPT	2-3-15 (18)						
855			CLAYEY SAND (SC), brown, medium grained, wet, moderately firm, low to medium plasticity, trace fine gravel	AU							
	90			R	5-5						
			SAND (SP), brown, medium to coarse grained, wet, loose, non plastic, trace fine gravel	AU							
850			CLAY (CL), brown, wet, very soft, medium to high plasticity, trace fine gravel, trace fine sand	AU							
	95			SPT	2-2-2 (4)						
845				AU							
	100										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/2/2022 **COMPLETED** 3/3/2022
BORING LOCATION STA 1174+00, 105' R SR 303L Cst CL
DRILLER Cascade **DRILLED BY** M. Villalobos
GPS COORDINATES 33.42142°N, -112.4263°E
DRILLING METHOD Roto-Sonic
GROUND ELEVATION 943 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # TSI-150CC/BB6B45
GROUNDWATER DEPTH 73 ft / Elev 870 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 77
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
			CLAY (CL), brown, wet, very soft, medium to high plasticity, trace fine gravel, trace fine sand*(continued)*	SPT	2-2-2 (4)						

Bottom of borehole at 101.5 feet. Backfilled with soil cuttings; grouted upper 25'.

Ethos Engineering s

BORING NUMBER B-28

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 4/26/2022 **COMPLETED** 4/26/2022
BORING LOCATION STA 1173+00, 870' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42118°N, -112.42948°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 939 ft **BOREHOLE DEPTH** 6.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			3" Asphalt								
			SILTY SAND (SM), brown, fine to medium grained, moist, soft, low plasticity, trace fine gravel								
				AU			7.9	23	20	3	22
935				SPT	5-3-5 (8)						
	5		CLAYEY SAND (SC), brown, angular, fine to medium grained, moist, moderately firm, low plasticity, trace gravel	SPT	4-5-4 (9)						

Bottom of borehole at 6.5 feet. Backfilled with soil cuttings; sawcut and patched surface with Hot Mix AC.

Ethos Engineering s

BORING NUMBER B-29

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 4/26/2022 **COMPLETED** 4/26/2022
BORING LOCATION STA 1173+75, 710' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.4212°N, -112.42429°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 939 ft **BOREHOLE DEPTH** 6.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			3" Asphalt								
			SILTY, CLAYEY SAND (SC-SM), brown, fine to medium grained, moist, soft, low plasticity, some fine gravel								
				AU SPT	2-4-4 (8)		12.5	24	20	4	46
935											
	5										
			SILTY CLAY (CL), brown, moist, soft, low to medium plasticity, trace fine gravel, trace fine sand	SPT	3-2-3 (5)						

Bottom of borehole at 6.5 feet. Backfilled with soil cuttings; sawcut and patched surface with Hot Mix AC.

Ethos Engineering s

BORING NUMBER B-30

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 2/8/2022 **COMPLETED** 2/8/2022
BORING LOCATION STA 1175+50, 140' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42183°N, -112.42708°E
DRILLING METHOD Tubex
GROUND ELEVATION 937 ft **BOREHOLE DEPTH** 51 ft
RIG TYPE / # CME 75/120
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 91
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
935			SILTY, CLAYEY SAND (SC-SM), light brown, slightly moist, firm, medium plasticity, some gravel, some fine sand	SPT	7-10-13 (23)						
				AU			4.2	26	19	7	33
	5										
				R	8-12						
930											
	10										
925			SILTY SAND (SM), light brown, fine grained, slightly moist, medium dense, non plastic, trace gravel	SPT	7-7-5 (12)						
	15										
920			SAND (SP), light brown, medium grained, slightly moist, medium dense, non plastic, trace gravel	SPT	6-6-5 (11)						
	20										
915				SPT	9-13-12 (25)						
	25										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 2/8/2022 **COMPLETED** 2/8/2022 **BORING LOCATION** STA 1175+50, 140' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.42183°N, -112.42708°E
DRILLING METHOD Tubex **GROUND ELEVATION** 937 ft **BOREHOLE DEPTH** 51 ft
RIG TYPE / # CME 75/120 **GROUNDWATER DEPTH** ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 91 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
910	30		CLAYEY SAND (SC), brown, fine grained, moist, very firm, medium plasticity, occasional gravel	SPT	11-14-19 (33)		16.9	41	21	20	43
905	35		CLAY WITH SAND (CL), firm, high plasticity, trace gravel, trace fine sand	SPT	4-7-10 (17)						
900	40		Light brown to brown. hard. medium to high plasticity. occasional gravel below 34'	SPT	13-36-50/4"						
895	45		CLAYEY SAND (SC), brown, fine grained, moist, firm, medium plasticity, occasional gravel	SPT	6-12-16 (28)		19.9	38	23	15	38
890	50		CLAY WITH SAND (CL), firm, medium plasticity, trace gravel, trace fine sand	SPT	6-9-17 (26)						

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Ethos Engineering s

BORING NUMBER B-30

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 2/8/2022 **COMPLETED** 2/8/2022
BORING LOCATION STA 1175+50, 140' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42183°N, -112.42708°E
DRILLING METHOD Tubex
GROUND ELEVATION 937 ft **BOREHOLE DEPTH** 51 ft
RIG TYPE / # CME 75/120
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 91
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
			CLAY WITH SAND (CL), firm, medium plasticity, trace gravel, trace fine sand*(continued)*	R	12-13	95	24.3				

Bottom of borehole at 51.0 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-31

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 2/7/2022 **COMPLETED** 2/7/2022
BORING LOCATION STA 1176+90, 125' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42222°N, -112.42704°E
DRILLING METHOD Tubex
GROUND ELEVATION 937 ft **BOREHOLE DEPTH** 45.75 ft
RIG TYPE / # CME 75/120
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 91
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
935	0		CLAYEY SAND (SC), light brown, fine grained, slightly moist, firm, medium plasticity, trace fine gravel	SPT	6-10-12 (22)						
				AU			4.6	26	17	9	45
	5		SAND (SP), light brown, fine grained, slightly moist, medium dense, non plastic, trace fine gravel	SPT	4-7-9 (16)						
930											
	10		SILTY SAND (SM), light brown, fine grained, slightly moist, firm, low plasticity, trace fine gravel	R	9-15						
925											
	15		SAND (SP), light brown, subangular, fine to medium grained, slightly moist, very dense, non plastic, some gravel Some cobbles at 16'	SPT	7-39-50/1"						
920											
	20		CLAYEY SAND (SC), light brown, fine to medium grained, slightly moist, very firm, medium plasticity, trace fine gravel	SPT	24-23-25 (48)		6.7	28	20	8	19
915											
	25										

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Ethos Engineering s

BORING NUMBER B-31

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 2/7/2022 **COMPLETED** 2/7/2022
BORING LOCATION STA 1176+90, 125' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42222°N, -112.42704°E
DRILLING METHOD Tubex
GROUND ELEVATION 937 ft **BOREHOLE DEPTH** 45.75 ft
RIG TYPE / # CME 75/120
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 91
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAY (CL), light brown to brown, slightly moist, hard to moderately firm, medium to high plasticity, trace fine gravel, trace to some fine to medium sand	SPT	28-8-50/2"						
910											
	30			SPT	4-6-8 (14)						
905											
	35			SPT	50/2"						
900											
	40			R	10-18	96	23.5	46	22	24	38
895											
	45			SPT	34-50/3"						

Bottom of borehole at 45.8 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-32

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 2/7/2022 **COMPLETED** 2/7/2022
BORING LOCATION STA 1178+30, 125' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42261°N, -112.42702°E
DRILLING METHOD Tubex
GROUND ELEVATION 938 ft **BOREHOLE DEPTH** 46 ft
RIG TYPE / # CME 75/120
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 91
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND (SC), light brown, subangular, fine grained, slightly moist, firm, low to medium plasticity, trace gravel	SPT	7-11-15 (26)						
935				AU			4.7	31	22	9	33
	5		hard, cobble sized strongly cemented nodules at 5'	R	50/1"						
930											
	10		decreased fines, moist, medium sand	R	17-50/5"						
925											
	15		SILTY SAND (SM), light brown, fine to medium grained, moist, dense, non plastic, trace fine gravel	SPT	8-16-28 (44)		4.8	NP	NP	NP	16
920											
	20		SANDY CLAY (CL), light brown, slightly moist, firm to hard, low to medium plasticity, trace fine gravel, considerable medium sand	SPT	17-23-22 (45)						
915											
	25										

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Ethos Engineering s

BORING NUMBER B-32

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 2/7/2022 **COMPLETED** 2/7/2022
BORING LOCATION STA 1178+30, 125' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42261°N, -112.42702°E
DRILLING METHOD Tubex
GROUND ELEVATION 938 ft **BOREHOLE DEPTH** 46 ft
RIG TYPE / # CME 75/120
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 91
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SANDY CLAY (CL), light brown, slightly moist, firm to hard, low to medium plasticity, trace fine gravel, considerable medium sand*(continued)*	SPT	50/1"						
910											
	30			SPT	15-12-13 (25)						
905											
	35		CLAYEY SAND (SC), brown, fine to medium grained, moist, hard, low plasticity, trace fine gravel	SPT	6-9-50/3"						
900											
	40		CLAY WITH SAND (CL), brown, moist, hard to moderately firm, medium plasticity, trace fine gravel, some fine sand	SPT	5-24-50/2"						
895											
	45			R	5-10	88	31.1	41	22	19	72

Bottom of borehole at 46.0 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-33

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 2/8/2022 **COMPLETED** 2/8/2022
BORING LOCATION STA 1179+70, 130' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42298°N, -112.42705°E
DRILLING METHOD Tubex
GROUND ELEVATION 939 ft **BOREHOLE DEPTH** 45.75 ft
RIG TYPE / # CME 75/120
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 91
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND (SC), light brown, subrounded, fine grained, slightly moist, firm, low plasticity, occasional gravel	SPT	6-13-14 (27)						
935	5			AU			3.7	28	20	8	44
				R	14-34						
930	10		SILTY SAND WITH GRAVEL (SM), light brown, subrounded, fine grained, slightly moist, loose, non plastic, trace gravel	SPT	3-5-5 (10)		5.0	NP	NP	NP	21
925	15		SILTY CLAY (CL), light brown to brown, slightly moist, firm, low to medium plasticity, trace fine gravel, trace fine sand	SPT	10-13-17 (30)						
920	20		SILTY, CLAYEY SAND (SC-SM), fine to medium grained, firm, low to medium plasticity, trace fine gravel	SPT	9-14-12 (26)						
915	25										

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Ethos Engineering s

BORING NUMBER B-33

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 2/8/2022 **COMPLETED** 2/8/2022
BORING LOCATION STA 1179+70, 130' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42298°N, -112.42705°E
DRILLING METHOD Tubex
GROUND ELEVATION 939 ft **BOREHOLE DEPTH** 45.75 ft
RIG TYPE / # CME 75/120
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 91
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SANDY CLAY (CL), brown, subangular, moist, hard, low to medium plasticity, trace gravel, some fine to medium sand	SPT	13-50/5"						
			cobbles encountered at 26'								
910											
	30			SPT	50/5"						
905											
	35		SILTY, CLAYEY SAND (SC-SM), fine grained, moist, very firm, low plasticity, trace fine gravel	SPT	8-16-22 (38)		9.5	25	21	4	39
900											
	40		CLAY WITH SAND (CL), brown, moist, very firm to hard, low to medium plasticity, trace fine gravel, trace fine sand	SPT	32-25-24 (49)						
895											
	45			R	13-50/3"	91	16.7				

Bottom of borehole at 45.8 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-34

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 2/9/2022 **COMPLETED** 2/9/2022
BORING LOCATION STA 1181+00, 130' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42334°N, -112.42705°E
DRILLING METHOD Tubex
GROUND ELEVATION 941 ft **BOREHOLE DEPTH** 40.7 ft
RIG TYPE / # CME 75/120
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 91
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
940			SILTY, CLAYEY SAND (SC-SM), light brown, subrounded, fine grained, slightly moist, firm, low plasticity, some gravel	SPT	5-10-10 (20)						
				AU			4.0	27	20	7	42
	5										
935			SILTY CLAY (CL), light brown, slightly moist, hard to very firm, low plasticity, trace fine gravel, trace fine sand	SPT	16-28-48 (76)						
	10		Weak to moderate lime cementation from 8' to 11'	R	50/5"						
930											
	15										
925				SPT	20-23-22 (45)						
	20										
920			SILTY SAND WITH GRAVEL (SM), light brown, subrounded, fine to medium grained, moist, dense to very dense, non plastic, occasional gravel	R	14-28	110	4.5	NP	NP	NP	37
	25										

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Ethos Engineering s

BORING NUMBER B-34

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 2/9/2022 **COMPLETED** 2/9/2022
BORING LOCATION STA 1181+00, 130' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42334°N, -112.42705°E
DRILLING METHOD Tubex
GROUND ELEVATION 941 ft **BOREHOLE DEPTH** 40.7 ft
RIG TYPE / # CME 75/120
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 91
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
915			SILTY SAND WITH GRAVEL (SM), light brown, subrounded, fine to medium grained, moist, dense to very dense, non plastic, occasional gravel*(continued)* Moderate to strong lime cementation from 26' to 28'	SPT	50/2"						
	30										
910			CLAYEY SAND (SC), brown, fine to medium grained, moist, moderately firm to hard, low to medium plasticity, trace fine gravel	SPT	6-5-8 (13)		9.1	30	19	11	18
	35										
905				SPT	5-11-20 (31)						
	40										
				R	22-50/2"	91	22.2				

Bottom of borehole at 40.7 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-35

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 2/9/2022 **COMPLETED** 2/9/2022
BORING LOCATION STA 1182+50, 115' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42375°N, -112.42703°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 942 ft **BOREHOLE DEPTH** 31.5 ft
RIG TYPE / # CME 75/120
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 91
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
940	0		SANDY SILTY CLAY (CL-ML), light brown, slightly moist, firm, low plasticity, trace fine gravel, trace fine sand	SPT	5-8-11 (19)						
				AU			5.2	26	19	7	57
	5		SILT (ML), light brown, slightly moist, moderately firm to hard, low to medium plasticity, trace fine gravel, trace fine sand	R	5-8						
935											
	10			SPT	19-50/5"						
930											
	15		SILTY SAND (SM), light brown, subrounded, fine to medium grained, slightly moist, very dense, non plastic, occasional gravel	SPT	37-50/3"						
925											
	20			SPT	50/5"						
920											
	25										

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Ethos Engineering s

BORING NUMBER B-35

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 2/9/2022 **COMPLETED** 2/9/2022
BORING LOCATION STA 1182+50, 115' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42375°N, -112.42703°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 942 ft **BOREHOLE DEPTH** 31.5 ft
RIG TYPE / # CME 75/120
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 91
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY SAND (SM), light brown, subrounded, fine to medium grained, slightly moist, very dense, non plastic, occasional gravel *(continued)*	SPT	48-30-30 (60)						
915											
	30		Moist, dense below 30'	SPT	14-22-16 (38)						

Bottom of borehole at 31.5 feet. Backfilled with soil cuttings.

BORING NUMBER B-35A

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 6/13/2022 **COMPLETED** 6/13/2022
BORING LOCATION STA 1184+00, 115' L SR 303L Cst CL
DRILLER ACS Services **DRILLED BY** M. Valdez
GPS COORDINATES 33.42425°N, -112.42702°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 945 ft **BOREHOLE DEPTH** 30.3 ft
RIG TYPE / # CME 75/BY
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 88
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
945			SILTY, CLAYEY SAND (SC-SM), light brown, subangular, fine to medium grained, slightly moist, moderately firm to firm, low plasticity, trace fine gravel	AU			2.1	23	17	6	41
				SPT	5-6-6 (12)						
940	5		Increased gravel below 5'	R	17-13	118	2.0				
935	10		CLAYEY SAND (SC), light brown to brown, subangular, fine grained, slightly moist, hard, low to medium plasticity, trace fine gravel, moderate to strong lime cementation	SPT	15-36-50/3"						
930	15		SAND WITH CLAY (SP-SC), light brown, subangular, fine grained, slightly moist, hard to firm, low plasticity, trace fine gravel, weak lime cementation	SPT	32-46						
925	20			SPT	8-12-15 (27)						
920	25		SAND (SP), light brown, subangular, fine grained, slightly moist, medium dense, non plastic, trace fine gravel								

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 6/13/2022 **COMPLETED** 6/13/2022
BORING LOCATION STA 1184+00, 115' L SR 303L Cst CL
DRILLER ACS Services **DRILLED BY** M. Valdez
GPS COORDINATES 33.42425°N, -112.42702°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 945 ft **BOREHOLE DEPTH** 30.3 ft
RIG TYPE / # CME 75/BY
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 88
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
920			GRAVEL WITH SAND (GP), light brown, poorly graded, slightly moist, very dense, non plastic, considerable fine sand	SPT	10-50/1"						
915	30			SPT	50/4"						

Bottom of borehole at 30.3 feet. Backfilled with soil cuttings.

BORING NUMBER B-35B

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 6/13/2022 **COMPLETED** 6/13/2022
BORING LOCATION STA 1185+50, 115' L SR 303L Cst CL
DRILLER ACS Services **DRILLED BY** M. Valdez
GPS COORDINATES 33.4248°N, -112.42702°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 945 ft **BOREHOLE DEPTH** 26.5 ft
RIG TYPE / # CME 75/BY
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 88
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
945			SANDY CLAY (CL), light brown, subangular, slightly moist, firm, medium plasticity, trace fine gravel, considerable fine to medium sand								
				SPT	3-9-7 (16)		3.9	28	18	10	54
940	5		SILTY, CLAYEY SAND WITH GRAVEL (SC-SM), light brown, subangular, fine to medium grained, slightly moist, soft, low plasticity, some fine gravel	SPT	4-4-4 (8)						
935	10		CLAY WITH SAND (CL), light brown, subangular, slightly moist, hard, medium plasticity, trace fine gravel, considerable fine to medium sand, weak to moderate lime cementation	R	35-50/4"						
930	15		Weak lime cementation below 15'	SPT	10-26-50/3"						
925	20		SAND (SP), light brown, subangular, fine to medium grained, slightly moist, medium dense to dense, non plastic, trace fine gravel	SPT	4-7-9 (16)						
920	25										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 6/13/2022 **COMPLETED** 6/13/2022
BORING LOCATION STA 1185+50, 115' L SR 303L Cst CL
DRILLER ACS Services **DRILLED BY** M. Valdez
GPS COORDINATES 33.4248°N, -112.42702°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 945 ft **BOREHOLE DEPTH** 26.5 ft
RIG TYPE / # CME 75/BY
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 88
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
920			SAND (SP), light brown, subangular, fine to medium grained, slightly moist, medium dense to dense, non plastic, trace fine gravel *(continued)*	SPT	8-13-21 (34)						

Bottom of borehole at 26.5 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-36

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/1/2022 **COMPLETED** 3/1/2022
BORING LOCATION STA 1175+50, 120' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** J. Aguilar
GPS COORDINATES 33.42185°N, -112.42623°E
DRILLING METHOD Tubex
GROUND ELEVATION 937 ft **BOREHOLE DEPTH** 51.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SANDY CLAY (CL), brown, slightly moist to moist, firm to soft, low to medium plasticity, occasional gravel, fine sand	SPT	5-7-11 (18)						
935				AU			9.2	27	16	11	60
	5			SPT	7-4-3 (7)						
930											
	10		SILTY SAND (SM), light brown, subangular, fine to medium grained, slightly moist, loose to medium dense, non plastic, trace gravel	SPT	4-4-6 (10)						
925											
	15			R	8-29		5.4	NP	NP	NP	35
920											
	20		SAND WITH SILT (SP-SM), light brown, fine grained, slightly moist, medium dense, non plastic, trace fine gravel	SPT	7-11-19 (30)		4.4	NP	NP	NP	10
915			Moderate to strong lime cementation at 22'								
	25										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 3/1/2022 **COMPLETED** 3/1/2022 **BORING LOCATION** STA 1175+50, 120' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** J. Aguilar **GPS COORDINATES** 33.42185°N, -112.42623°E
DRILLING METHOD Tubex **GROUND ELEVATION** 937 ft **BOREHOLE DEPTH** 51.5 ft
RIG TYPE / # CME 75/109 **GROUNDWATER DEPTH** ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
910	30		SILTY CLAY (CL), light brown, slightly moist, hard, low to medium plasticity, trace fine gravel, trace fine sand, weak lime cementation	SPT	32-50/3"						
905	35		SILTY SAND (SM), light brown, fine grained, slightly moist, medium dense to very dense, non plastic, trace fine gravel	SPT	10-11-11 (22)		6.9	NP	NP	NP	20
900	40			SPT	50/3"						
895	45		SILTY CLAY (CL), brown, moist, hard to very firm, low to medium plasticity, trace fine gravel, trace fine sand	SPT	26-25-31 (56)						
890	50		cobbles from 46' to 47'	R	15-26						

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 3/1/2022 **COMPLETED** 3/1/2022 **BORING LOCATION** STA 1175+50, 120' R SR 303L Cst CL

DRILLER GSI **DRILLED BY** J. Aguilar **GPS COORDINATES** 33.42185°N, -112.42623°E

DRILLING METHOD Tubex **GROUND ELEVATION** 937 ft **BOREHOLE DEPTH** 51.5 ft

RIG TYPE / # CME 75/109 ▼ **GROUNDWATER DEPTH** ---

HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
			SILTY CLAY (CL), brown, moist, hard to very firm, low to medium plasticity, trace fine gravel, trace fine sand*(continued)*	SPT	9-11-20 (31)						

Bottom of borehole at 51.5 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-37

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/1/2022 **COMPLETED** 3/1/2022
BORING LOCATION STA 1177+00, 120' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** J. Aguilar
GPS COORDINATES 33.42227°N, -112.42634°E
DRILLING METHOD Tubex
GROUND ELEVATION 937 ft **BOREHOLE DEPTH** 46.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
935	0		CLAYEY SAND (SC), brown, subangular, fine grained, slightly moist, moderately firm, low to medium plasticity, occasional gravel	SPT	5-5-6 (11)						
				AU			7.2	25	15	10	48
	5		SILTY SAND (SM), light brown, fine grained, slightly moist, medium dense to dense, no to low plasticity, trace fine gravel	SPT	16-14-11 (25)						
930											
	10			SPT	7-8-8 (16)						
925											
	15		Occasional gravel and cobbles from 15' to 18'	SPT	12-18-16 (34)		4.8	30	23	7	16
920											
	20			SPT	15-19-15 (34)						
915											
	25										

(Continued Next Page)

Ethos Engineering s

BORING NUMBER B-37

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/1/2022 **COMPLETED** 3/1/2022
BORING LOCATION STA 1177+00, 120' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** J. Aguilar
GPS COORDINATES 33.42227°N, -112.42634°E
DRILLING METHOD Tubex
GROUND ELEVATION 937 ft **BOREHOLE DEPTH** 46.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
910	30		CLAY (CL), brown, moist, hard, medium plasticity, trace fine gravel, trace fine sand	R	50/5"	102	10.9				
905	35		CLAYEY SAND (SC), light brown, fine grained, slightly moist, very firm to hard, medium plasticity, trace fine gravel	SPT	11-16-19 (35)						
900	40			R	16-50/4"		25.7	44	23	21	28
895	45		CLAY (CL), brown, slightly moist, very firm to firm, medium plasticity, trace fine gravel, trace to some fine sand	SPT	11-18-27 (45)						
				SPT	10-14-16 (30)						

Bottom of borehole at 46.5 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-38

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/2/2022 **COMPLETED** 3/2/2022
BORING LOCATION STA 1178+50, 125' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42267°N, -112.42634°E
DRILLING METHOD Tubex
GROUND ELEVATION 938 ft **BOREHOLE DEPTH** 46.4 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SANDY CLAY (CL), brown, subangular, slightly moist, moderately firm to firm, medium plasticity, occasional gravel, trace medium to coarse sand	SPT	5-5-4 (9)						
935				AU			9.1	30	16	14	59
	5			SPT	12-13-12 (25)						
930											
	10			R	13-17						
925											
	15		SILTY SAND (SM), light brown, subangular, medium to coarse grained, slightly moist, medium dense, low plasticity, trace gravel	SPT	10-13-10 (23)		4.9	22	19	3	18
			SANDY CLAY (CL), light brown, slightly moist, firm, low plasticity, trace fine gravel, some fine to medium sand								
920											
	20		SILTY SAND (SM), light brown, subangular, fine to medium grained, slightly moist, dense, non plastic, trace gravel, trace cobbles	SPT	14-18-16 (34)						
915											
	25										

(Continued Next Page)

Ethos Engineering s

BORING NUMBER B-38

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/2/2022 **COMPLETED** 3/2/2022
BORING LOCATION STA 1178+50, 125' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42267°N, -112.42634°E
DRILLING METHOD Tubex
GROUND ELEVATION 938 ft **BOREHOLE DEPTH** 46.4 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY CLAY (CH), white to light brown, slightly moist, very firm, medium to high plasticity, trace fine gravel, trace fine sand	SPT	18-15-25 (40)						
910	30										
			SILTY SAND (SM), light brown, fine to medium grained, slightly moist, medium dense, no to low plasticity, trace fine gravel	SPT	9-12-10 (22)		7.9	NP	NP	NP	41
905	35		Sandy clay (CL) lense from 35' to 35.5'								
			SAND (SP), light brown, fine grained, slightly moist, medium dense, non plastic, trace fine gravel	SPT	8-12-11 (23)						
900	40										
			SILTY CLAY (CL), brown, moist, hard, low to medium plasticity, trace fine gravel, trace fine sand	R	50/5"						
895	45			SPT	8-14-50/5"						

Bottom of borehole at 46.4 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-39

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/2/2022 **COMPLETED** 3/3/2022
BORING LOCATION STA 1180+00, 125' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42305°N, -112.42634°E
DRILLING METHOD Tubex
GROUND ELEVATION 939 ft **BOREHOLE DEPTH** 36.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SANDY CLAY (CL), brown, moist, moderately firm to very soft, medium plasticity, trace fine gravel, considerable fine to medium sand	SPT	7-8-7 (15)						
				AU			10.0	29	18	11	53
935	5			SPT	1-2-2 (4)						
930	10		SANDY SILTY CLAY (CL), light brown to brown, subrounded, moist, very firm, medium plasticity, trace gravel, some fine to medium sand	SPT	14-23-18 (41)						
925	15		CLAYEY SAND (SC), black, fine to medium grained, moist, firm to hard, medium plasticity, trace fine gravel	SPT	10-13-12 (25)		5.9	25	17	8	18
920	20		Moderate to strong lime cementation between 20' and 25'	SPT	50/3"						
915	25										

(Continued Next Page)

Ethos Engineering s

BORING NUMBER B-39

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/2/2022 **COMPLETED** 3/3/2022
BORING LOCATION STA 1180+00, 125' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42305°N, -112.42634°E
DRILLING METHOD Tubex
GROUND ELEVATION 939 ft **BOREHOLE DEPTH** 36.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SANDY SILT (ML), light whitish brown to brown, slightly moist to moist, very firm, medium plasticity, trace fine gravel, considerable fine sand	SPT	9-12-21 (33)						
910	30			R	11-20	103	21.8	42	26	16	56
905	35		SANDY CLAY (CL), brown, slightly moist, firm, low to medium plasticity, trace fine gravel, some fine sand	SPT	6-9-13 (22)						

Bottom of borehole at 36.5 feet. Backfilled with soil cuttings.

BORING NUMBER B-40

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/3/2022 **COMPLETED** 3/3/2022
BORING LOCATION STA 1181+50 125' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42346°N, -112.42634°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 941 ft **BOREHOLE DEPTH** 21.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
940			SANDY CLAY (CL), brown, moist, firm to soft, medium plasticity, trace fine gravel, considerable fine to medium sand	SPT	6-9-8 (17)						
				AU			10.3	27	17	10	52
	5										
935				R	2-4						
	10										
930			SILTY, CLAYEY SAND (SC-SM), brown, fine to medium grained, moist, moderately firm, low plasticity, trace fine gravel	SPT	13-8-6 (14)		9.6	24	17	7	44
	15										
925			SILTY SAND (SM), light brown, fine grained, slightly moist, medium dense, non plastic, trace fine gravel	SPT	8-8-8 (16)						
	20										
920			SAND (SP), light brown, fine grained, slightly moist, medium dense, non plastic, trace fine gravel	SPT	5-7-11 (18)						

Bottom of borehole at 21.5 feet. Backfilled with soil cuttings.

BORING NUMBER B-41

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/3/2022 **COMPLETED** 3/3/2022
BORING LOCATION STA 1183+00, 90' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42388°N, -112.42633°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 943 ft **BOREHOLE DEPTH** 21.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
940	0		CLAYEY SAND (SC), light brown to brown, fine to medium grained, slightly moist to moist, soft to firm, medium plasticity, trace fine gravel	SPT	8-7-7 (14)						
				AU			8.0	28	17	11	44
	5			SPT	2-2-3 (5)						
935											
	10			R	9-12						
930											
	15		SANDY SILT (ML), light brown, slightly moist, very firm, low to medium plasticity, considerable fine sand	SPT	9-16-23 (39)		11.0	34	27	7	55
925											
	20		SAND (SP), light brown, fine grained, slightly moist, medium dense, non plastic, trace fine gravel	SPT	4-7-8 (15)						

Bottom of borehole at 21.5 feet. Backfilled with soil cuttings.

BORING NUMBER B-42

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/3/2022 **COMPLETED** 3/3/2022
BORING LOCATION STA 1184+50, 90' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42429°N, -112.42635°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 946 ft **BOREHOLE DEPTH** 21.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
945			CLAYEY SAND (SC), brown, fine to medium grained, moist, moderately firm, low to medium plasticity, trace fine gravel	SPT	4-5-7 (12)						
	5			AU			9.5	27	18	9	47
940			SANDY SILT (ML), light brown, slightly moist, soft, medium plasticity, trace fine gravel, considerable fine to medium sand	SPT	3-3-4 (7)						
	10										
935			SILTY CLAY (CL), light brown, slightly moist, hard, low to medium plasticity, trace fine gravel, trace fine sand	R	25-47						
	15										
930			Decreased plasticity below 15'	SPT	16-28-27 (55)						
	20										
925			SILTY SAND (SM), light brown, fine to medium grained, slightly moist, medium dense, non plastic, trace fine gravel	SPT	8-13-16 (29)		3.8	NP	NP	NP	12

Bottom of borehole at 21.5 feet. Backfilled with soil cuttings.

BORING NUMBER B-43

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/3/2022 **COMPLETED** 3/3/2022
BORING LOCATION STA 1186+00, 90' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42473°N, -112.42634°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 946 ft **BOREHOLE DEPTH** 20.1 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
945			CLAYEY SAND (SC), brown, fine to medium grained, moist, moderately firm, medium plasticity, trace fine gravel	SPT	4-7-7 (14)						
				AU			10.0	28	18	10	48
	5										
940			SILTY CLAY WITH SAND (CL), light brown, slightly moist, moderately firm, low plasticity, trace fine gravel, considerable fine to medium sand	SPT	4-6-5 (11)						
	10										
935			CLAYEY SAND (SC), light brown, fine grained, slightly moist, very firm to hard, low to medium plasticity, trace fine gravel	R	50/5"	96	9.5				
	15										
930			Decreased plasticity below 15'	SPT	14-20-25 (45)		7.7	29	26	3	39
	20										
			Strongly lime cemented at 20'	SPT	50/1"						

Bottom of borehole at 20.1 feet. Backfilled with soil cuttings.

BORING NUMBER B-44

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/3/2022 **COMPLETED** 3/3/2022
BORING LOCATION STA 1187+50, 90' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42514°N, -112.42635°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 946 ft **BOREHOLE DEPTH** 26.2 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
945			CLAYEY SAND (SC), light brown to brown, subrounded, fine to medium grained, slightly moist to moist, firm to very firm, low to medium plasticity, trace fine gravel	SPT	7-13-10 (23)						
				AU			9.2	26	18	8	44
	5										
940				SPT	5-14-22 (36)						
	10										
935			SILTY CLAY (CL), light brown to brown, slightly moist to moist, hard, medium plasticity, trace fine gravel, trace fine sand, moderate to strong lime cementation	SPT	50/5"						
	15										
930			SANDY SILT (ML), light brown, moist, hard, medium plasticity, considerable fine sand	SPT	9-18-32 (50)		13.3	42	29	13	64
	20										
925			SILTY SAND (SM), light brown, fine grained, slightly moist, dense to very dense, non plastic, some coarse gravel	SPT	17-19-15 (34)						
	25										

(Continued Next Page)

Ethos Engineering s

BORING NUMBER B-44

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/3/2022 **COMPLETED** 3/3/2022
BORING LOCATION STA 1187+50, 90' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42514°N, -112.42635°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 946 ft **BOREHOLE DEPTH** 26.2 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
920			SILTY SAND (SM), light brown, fine grained, slightly moist, dense to very dense, non plastic, some coarse gravel*(continued)*	SPT	4-12-50/2"		6.0	NP	NP	NP	15

Bottom of borehole at 26.2 feet. Backfilled with soil cuttings.

BORING NUMBER B-45

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/3/2022 **COMPLETED** 3/3/2022
BORING LOCATION STA 1189+00, 90' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42554°N, -112.42633°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 946 ft **BOREHOLE DEPTH** 25.9 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
945			SANDY CLAY (CL), light brown, slightly moist, moderately firm, medium plasticity, trace fine gravel, considerable fine to medium sand	SPT	5-5-4 (9)						
				AU			9.9	28	18	10	53
	5		Decreased plasticity below 5'	R	5-7						
940											
	10		SILTY CLAY (CL), light brown to white, slightly moist, hard, low to medium plasticity, trace fine gravel, trace fine sand, weak to moderate lime cementation	SPT	14-30-50/5"						
935											
	15		SILTY SAND (SM), light brown, fine to medium grained, slightly moist, very dense to medium dense, non plastic, trace fine gravel, some cobbles	SPT	11-24-26 (50)		9.0	NP	NP	NP	48
930											
	20			SPT	6-10-13 (23)						
925											
	25										

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Ethos Engineering s

BORING NUMBER B-45

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/3/2022 **COMPLETED** 3/3/2022
BORING LOCATION STA 1189+00, 90' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42554°N, -112.42633°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 946 ft **BOREHOLE DEPTH** 25.9 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
				SPT	3-50/5"						

Bottom of borehole at 25.9 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-46

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/3/2022 **COMPLETED** 3/3/2022
BORING LOCATION STA 1190+50, 95' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42596°N, -112.42633°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 946 ft **BOREHOLE DEPTH** 21.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
945			SANDY CLAY (CL), light brown, subrounded, slightly moist, moderately firm to very firm, medium plasticity, trace fine gravel, fine to medium sand	SPT	5-5-9 (14)						
				AU			8.8	29	18	11	52
	5										
940			SILTY SAND (SM), light brown, subrounded, medium to coarse grained, slightly moist, dense, non plastic, some gravel	SPT	14-22-18 (40)						
	10										
935			SANDY CLAY (CL), light brown, slightly moist, hard, medium plasticity, trace gravel, considerable fine sand, weak to moderate lime cementation	SPT	23-43-50/3"		9.9	46	24	22	51
	15										
930			GRAVELLY SILT (ML), light brown, subangular, slightly moist, hard, no to low plasticity, considerable gravel, trace fine sand	SPT	50/5"						
	20										
925			SANDY SILTY CLAY (ML), light brown, slightly moist, firm, low plasticity, trace fine gravel, fine sand	SPT	10-11-12 (23)						

Bottom of borehole at 21.5 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-47

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/29/2022 **COMPLETED** 3/29/2022
BORING LOCATION STA 1192+00, 90' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42637°N, -112.42636°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 946 ft **BOREHOLE DEPTH** 26.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
945			SANDY CLAY (CL), brown to light brown, moist, soft, low to medium plasticity, trace fine gravel, considerable fine to medium sand	AU			8.7	28	18	10	57
				R	3-5						
	5										
940			Decreased plasticity below 5'	SPT	3-3-3 (6)						
	10										
935			Clayey Sand (SC) lense from 10' to 10.5' SILTY CLAY (CL), light brown to white, slightly moist, hard, low to medium plasticity, trace fine gravel, trace fine sand, moderate lime cementation	SPT	18-29-50/5"						
	15										
930			CLAYEY SILT (ML), light brown, subrounded, slightly moist, hard, low plasticity, trace fine gravel, trace fine sand, moderate lime cementation	SPT	29-50/5"						
	20										
925			SILTY SAND (SM), light brown, fine grained, slightly moist, dense to medium dense, non plastic, trace fine gravel	SPT	7-14-28 (42)						
	25										

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Ethos Engineering s

BORING NUMBER B-47

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/29/2022 **COMPLETED** 3/29/2022
BORING LOCATION STA 1192+00, 90' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42637°N, -112.42636°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 946 ft **BOREHOLE DEPTH** 26.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
920			SILTY SAND (SM), light brown, fine grained, slightly moist, dense to medium dense, non plastic, trace fine gravel*(continued)* Weak lime cementation below 25'	SPT	27-11-13 (24)						

Bottom of borehole at 26.5 feet. Backfilled with soil cuttings.

BORING NUMBER B-48

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/29/2022 **COMPLETED** 3/29/2022
BORING LOCATION STA 1193+50, 95' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42677°N, -112.42634°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 948 ft **BOREHOLE DEPTH** 21.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
945	0		SANDY SILTY CLAY (CL), light brown, slightly moist, firm, low to medium plasticity, trace fine gravel, trace fine sand	AU							
				SPT	4-10-9 (19)						
	5		CLAYEY SILT (ML), light brown, slightly moist, soft to moderately firm, low to medium plasticity, trace fine gravel, trace fine sand	R	4-6						
940											
	10		SILTY CLAY WITH SAND (CL), light brown, slightly moist, very firm, low plasticity, trace fine gravel, fine to medium sand	SPT	6-13-25 (38)						
935											
	15		CLAYEY SILT (ML), light brown, slightly moist, hard, low plasticity, trace fine gravel, trace fine sand	SPT	30-50/5"						
930											
	20		SILTY SAND (SM), light brown, slightly moist, very dense, non plastic, trace fine gravel, trace fine sand	SPT	9-22-29 (51)						

Bottom of borehole at 21.5 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-49

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/30/2022 **COMPLETED** 3/30/2022
BORING LOCATION STA 1195+00, 90' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.4272°N, -112.42636°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 950 ft **BOREHOLE DEPTH** 26.1 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
950											
			CLAYEY SAND (SC), light whitish brown to brown, subangular, fine to medium grained, slightly moist to moist, moderately firm to hard, medium plasticity, trace fine gravel	AU			9.2	30	18	12	50
945	5			SPT	6-9-6 (15)						
				SPT	3-6-5 (11)						
940	10										
			Weak to moderate lime cementation below 10'	SPT	22-30-45 (75)		11.8	42	23	19	42
935	15										
			SILTY SANDY CLAY (CL), light brown, slightly moist, hard, low plasticity, trace fine gravel, trace fine sand	SPT	11-20-34 (54)						
930	20										
			SILTY SAND (SM), light brown, fine grained, slightly moist, dense, non plastic, trace cobbles, trace fine gravel	SPT	5-15-18 (33)						
925	25										

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CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/30/2022 **COMPLETED** 3/30/2022
BORING LOCATION STA 1195+00, 90' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.4272°N, -112.42636°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 950 ft **BOREHOLE DEPTH** 26.1 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
925			SILTY, CLAYEY SAND (SC-SM), light brown, angular, fine grained, slightly moist, hard, low plasticity, trace gravel, trace cobbles, moderate lime cementation	SPT	7-20-50/1"						

Bottom of borehole at 26.1 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-50

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/30/2022 **COMPLETED** 3/30/2022
BORING LOCATION STA 1196+50, 90' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.4276°N, -112.42636°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 952 ft **BOREHOLE DEPTH** 31.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
950			CLAYEY SAND (SC), brown, fine to medium grained, moist, soft to moderately firm, low to medium plasticity, trace fine gravel	AU			9.2	29	19	10	37
				R	5-3						
	5										
			Decreased plasticity below 5'	SPT	5-6-5 (11)						
945											
	10										
			SILTY SAND (SM), light brown, slightly moist, dense, non plastic, trace fine gravel	SPT	10-18-20 (38)						
940											
	15										
			SILTY CLAY (CL), light brown, slightly moist, hard, low to medium plasticity, trace fine gravel, trace fine sand, weak to moderate lime cementation	SPT	12-20-31 (51)						
935											
	20										
			CLAYEY SAND WITH GRAVEL (SC), light brown, fine to medium grained, slightly moist, hard, medium plasticity, some gravel, moderate lime cementation	SPT	25-50/4"		12.6	39	24	15	26
930											
	25										

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Ethos Engineering s

BORING NUMBER B-50

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/30/2022 **COMPLETED** 3/30/2022
BORING LOCATION STA 1196+50, 90' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.4276°N, -112.42636°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 952 ft **BOREHOLE DEPTH** 31.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
925			SILTY SAND (SM), light brown, fine grained, slightly moist, dense, non plastic, trace fine gravel	SPT	9-12-19 (31)						
	30		CLAYEY SAND (SC), light brown, fine to medium grained, slightly moist, moderately firm, low plasticity, trace fine gravel	SPT	7-7-8 (15)						

Bottom of borehole at 31.5 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-51

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 2/9/2022 **COMPLETED** 2/9/2022
BORING LOCATION STA 1198+00, 120' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42801°N, -112.42627°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 952 ft **BOREHOLE DEPTH** 30.9 ft
RIG TYPE / # CME 75/120
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 91
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
950	0		SILTY, CLAYEY SAND (SC-SM), light brown, subrounded, fine grained, slightly moist, firm, low plasticity, occasional gravel	SPT	3-7-11 (18)						
				AU			3.3	25	20	5	49
	5		SANDY SILT (ML), light brown, slightly moist, moderately firm, no to low plasticity, trace fine gravel, trace fine sand	SPT	5-5-4 (9)						
945											
	10		SILTY SAND WITH GRAVEL (SM), brown to light brown, medium grained, slightly moist, very dense to dense, non plastic, some fine gravel Some cobbles from 10' to 12'	R	42-50/5"	110	6.7	NP	NP	NP	27
940											
	15			SPT	20-50/3"						
935											
	20			SPT	8-15-14 (29)						
930											
	25										

(Continued Next Page)

Ethos Engineering s

BORING NUMBER B-51

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 2/9/2022 **COMPLETED** 2/9/2022
BORING LOCATION STA 1198+00, 120' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42801°N, -112.42627°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 952 ft **BOREHOLE DEPTH** 30.9 ft
RIG TYPE / # CME 75/120
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 91
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
925			CLAYEY SAND (SC), light brown, subrounded, fine grained, slightly moist, hard, no to low plasticity, occasional gravel	SPT	9-50/5"						
	30		SANDY CLAY (CL), light brown, moist, hard, low plasticity, trace fine gravel, considerable fine sand	SPT	24-50/5"						

Bottom of borehole at 30.9 feet. Backfilled with soil cuttings.

BORING NUMBER B-52

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 2/10/2022 **COMPLETED** 2/10/2022
BORING LOCATION STA 1199+80, 85' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42853°N, -112.42634°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 952 ft **BOREHOLE DEPTH** 21.5 ft
RIG TYPE / # CME 75/120
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 91
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
950	0		CLAY WITH SAND (CL), light brown, fine grained, slightly moist, moderately firm to hard, low to medium plasticity, occasional gravel, trace fine sand	SPT	4-4-11 (15)						
				AU			5.4	27	19	8	75
	5			SPT	3-4-6 (10)						
945											
	10			SPT	15-31-37 (68)		8.1	37	21	16	76
940			Weak lime cementation below 10'								
	15		SANDY SILT (ML), light brown, slightly moist, hard, low to medium plasticity, considerable fine gravel	R	50/5"						
935											
	20		SILTY CLAY (CL), light brown to brown, moist, hard, medium plasticity, trace fine gravel, occasional fine sand	SPT	13-23-33 (56)						

Bottom of borehole at 21.5 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-53

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 2/10/2022 **COMPLETED** 2/10/2022
BORING LOCATION STA 1201+00, 90' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42884°N, -112.42637°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 952 ft **BOREHOLE DEPTH** 31 ft
RIG TYPE / # CME 75/120
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 91
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
950	0		CLAYEY SAND (SC), light brown, subrounded, fine grained, slightly moist, moderately firm, low to medium plasticity, occasional gravel	SPT	3-7-8 (15)						
				AU			3.2	27	17	10	28
	5		GRAVELLY SILT (ML), white to light brown, subrounded, slightly moist, hard, low plasticity, some gravel, trace fine sand	SPT	10-31-37 (68)						
945											
	10		CLAYEY SAND (SC), light brown, fine grained, slightly moist, hard, medium to high plasticity, trace fine gravel	SPT	12-29-50/5"						
940											
	15			SPT	16-22-33 (55)						
935											
	20			SPT	48-50/1"						
930											
	25										

(Continued Next Page)

Ethos Engineering s

BORING NUMBER B-53

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 2/10/2022 **COMPLETED** 2/10/2022
BORING LOCATION STA 1201+00, 90' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42884°N, -112.42637°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 952 ft **BOREHOLE DEPTH** 31 ft
RIG TYPE / # CME 75/120
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 91
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
925			SANDY CLAY (CL), brown, moist, firm, low plasticity, trace fine gravel, some fine sand	SPT	15-13-10 (23)						
	30		CLAYEY SAND (SC), brown, fine grained, moist, hard, low to medium plasticity, trace fine gravel	R	32-38						

Bottom of borehole at 31.0 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-54

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 2/10/2022 **COMPLETED** 2/10/2022
BORING LOCATION STA 1202+50, 90' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42926°N, -112.42636°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 952 ft **BOREHOLE DEPTH** 31.5 ft
RIG TYPE / # CME 75/120
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 91
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
950	0		CLAYEY SAND (SC), light brown, fine grained, slightly moist, moderately firm, low to medium plasticity, trace fine gravel	SPT	3-6-6 (12)						
				AU			3.5	30	20	10	28
	5		SILTY SAND (SM), light brown, fine grained, slightly moist, very loose, non plastic, trace fine gravel	SPT	3-2-2 (4)						
945											
	10		SILTY CLAY WITH SAND (CL), light brown, subrounded, slightly moist, hard, low plasticity, occasional gravel, medium sand	SPT	14-27-26 (53)						
940											
	15		CLAYEY SAND (SC), light brown, fine grained, slightly moist, firm, low plasticity, trace fine gravel	R	14-28						
935											
	20		SILTY SAND WITH GRAVEL (SM), brown, fine grained, moist, hard to firm, medium plasticity, some fine gravel	SPT	13-41-25 (66)		22.4	49	31	18	47
930											
	25										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 2/10/2022 **COMPLETED** 2/10/2022 **BORING LOCATION** STA 1202+50, 90' R SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.42926°N, -112.42636°E

DRILLING METHOD Hollow Stem Auger **GROUND ELEVATION** 952 ft **BOREHOLE DEPTH** 31.5 ft

RIG TYPE / # CME 75/120 ▼ **GROUNDWATER DEPTH** ---

HAMMER TYPE Auto **HAMMER EFFICIENCY** 91 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY SAND WITH GRAVEL (SM), brown, fine grained, moist, hard to firm, medium plasticity, some fine gravel *(continued)*	SPT	9-12-18 (30)						
925											
	30		SAND (SP), light brown, subrounded, fine to medium grained, slightly moist, dense, non plastic, occasional gravel	SPT	13-19-21 (40)						

Bottom of borehole at 31.5 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-55

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/30/2022 **COMPLETED** 3/30/2022
BORING LOCATION STA 1204+00, 90' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42968°N, -112.42636°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 951 ft **BOREHOLE DEPTH** 31.5 ft
RIG TYPE / # CME 75/120
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 91
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
950			SANDY CLAY (CL), brown, slightly moist, moderately firm, medium plasticity, trace gravel, fine to medium sand	AU			8.1	29	18	11	54
				R	7-10						
	5										
945			SILTY CLAY (CL), light brown to whitish brown, slightly moist, moderately firm to hard, low to medium plasticity, trace fine gravel, trace fine sand	SPT	8-14-15 (29)						
	10		Weak to moderate lime cementation below 10'								
940				SPT	7-16-37 (53)						
	15										
935				SPT	12-27-34 (61)						
	20										
930			CLAY (CH), whitish brown, moist, moderately firm, medium to high plasticity, trace fine gravel, trace fine sand	SPT	5-11-13 (24)						
	25										

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Ethos Engineering s

BORING NUMBER B-55

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/30/2022 **COMPLETED** 3/30/2022
BORING LOCATION STA 1204+00, 90' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42968°N, -112.42636°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 951 ft **BOREHOLE DEPTH** 31.5 ft
RIG TYPE / # CME 75/120
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 91
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
925			SILTY SANDY CLAY (CL), light brown, slightly moist, very firm, low plasticity, trace fine gravel, some fine sand	SPT	8-20-20 (40)						
	30										
920			SILTY CLAY (CL), brown, moist, very firm, medium plasticity, trace fine gravel, trace fine sand	SPT	9-16-19 (35)						

Bottom of borehole at 31.5 feet. Backfilled with soil cuttings.

BORING NUMBER B-56

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/31/2022 **COMPLETED** 3/31/2022
BORING LOCATION STA 1205+50, 90' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.43008°N, -112.42633°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 951 ft **BOREHOLE DEPTH** 31.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
950			CLAYEY SAND (SC), light brown, fine to medium grained, slightly moist, firm, medium plasticity, trace fine gravel	SPT	12-11-12 (23)		7.4	31	17	14	40
	5			AU							
945			SILTY SAND (SM), light brown, subangular, slightly moist, medium dense, non plastic, trace gravel	SPT	5-5-8 (13)						
	10										
940			CLAYEY SAND WITH GRAVEL (SC), light whitish brown, slightly moist, firm to hard, medium plasticity, some fine gravel, weak to moderate lime cementation	SPT	13-11-17 (28)		9.9	37	24	13	38
	15		Moderate to strong lime cementation at 15'	SPT	50/4"						
935											
	20										
930			CLAYEY SILT (CL), light brown, moist, moderately firm, medium to high plasticity, trace fine gravel, trace fine sand	SPT	3-5-8 (13)						
	25										

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Ethos Engineering s

BORING NUMBER B-56

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/31/2022 **COMPLETED** 3/31/2022
BORING LOCATION STA 1205+50, 90' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.43008°N, -112.42633°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 951 ft **BOREHOLE DEPTH** 31.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
925			SAND (SP), light brown, subrounded, fine to medium grained, slightly moist, medium dense, non plastic, trace gravel	SPT	7-13-6 (19)						
	30										
920			SANDY CLAY (CL), brown, moist, firm, medium plasticity, trace fine gravel, some fine sand	R	10-23						

Bottom of borehole at 31.5 feet. Backfilled with soil cuttings.

BORING NUMBER B-57

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/31/2022 **COMPLETED** 3/31/2022
BORING LOCATION STA 1207+00, 100' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.43049°N, -112.42631°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 953 ft **BOREHOLE DEPTH** 31.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
950	5		CLAYEY SAND (SC), light brown, fine to medium grained, slightly moist, firm, medium plasticity, trace fine gravel	SPT	10-9-9 (18)		7.9	30	18	12	38
				AU							
945	10		SAND WITH SILT (SP-SM), light brown, fine to medium grained, slightly moist, loose, non plastic, trace fine gravel	SPT	3-4-5 (9)		3.4	NP	NP	NP	10
940	15		SILTY CLAY (CL), light whitish brown, slightly moist, hard, low to medium plasticity, trace fine gravel, trace fine sand, weak to moderate lime cementation	SPT	11-17-50/5"						
935	20		CLAYEY SILT (ML), light brown, slightly moist, hard, low to medium plasticity, trace fine gravel, trace fine sand	SPT	26-31-50/2"						
930	25		SILTY CLAY (CL), light brown, slightly moist, very firm, low to medium plasticity, trace fine gravel, trace fine sand	SPT	12-24-20 (44)						

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Ethos Engineering s

BORING NUMBER B-57

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/31/2022 **COMPLETED** 3/31/2022
BORING LOCATION STA 1207+00, 100' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.43049°N, -112.42631°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 953 ft **BOREHOLE DEPTH** 31.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
925	30		CLAYEY SAND (SC), light brown, fine grained, slightly moist, very firm, low to medium plasticity, trace fine gravel	SPT	9-14-17 (31)						
			SANDY CLAY (CL), light brown, slightly moist, moderately firm, low to medium plasticity, trace fine gravel, some fine sand	SPT	2-4-10 (14)						

Bottom of borehole at 31.5 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-58

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/3/2022 **COMPLETED** 3/3/2022
BORING LOCATION STA 1189+50, 140' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42562°N, -112.42711°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 946 ft **BOREHOLE DEPTH** 20.3 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
945			SILTY, CLAYEY SAND (SC-SM), light brown, subangular, fine to medium grained, slightly moist, firm to moderately firm, low plasticity, trace fine gravel	SPT	3-7-10 (17)						
				AU			3.1	26	20	6	45
	5										
940				SPT	3-4-8 (12)						
	10										
935			CLAYEY SAND (SC), light brown to white, slightly moist, hard, medium plasticity, trace fine gravel, weak to moderate lime cementation	SPT	12-30-47 (77)		7.8	38	23	15	49
	15										
930				SPT	22-50/5"						
	20										
			SILTY, CLAYEY SAND (SC-SM), light brown, fine grained, slightly moist, hard, low plasticity, trace fine gravel	SPT	50/3"						

Bottom of borehole at 20.3 feet. Backfilled with soil cuttings.

BORING NUMBER B-59

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 4/1/2022 **COMPLETED** 4/2/2022
BORING LOCATION STA 1194+00, 130' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42692°N, -112.42705°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 949 ft **BOREHOLE DEPTH** 21.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SANDY CLAY (CL), light brown, subrounded, slightly moist, moderately firm to hard, low to medium plasticity, trace fine gravel, some fine to medium sand	SPT	6-6-11 (17)						
				AU			5.3	27	19	8	74
945	5			SPT	3-5-5 (10)						
940	10		Increased sand below 10'	SPT	9-16-22 (38)		8.8	36	21	15	65
935	15			SPT	19-32-50/5"						
930	20		SILTY SAND (SM), light brown, fine grained, slightly moist, dense, non plastic, trace fine gravel	SPT	9-16-17 (33)						

Bottom of borehole at 21.5 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-60

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 4/1/2022 **COMPLETED** 4/1/2022
BORING LOCATION STA 1200+00, 130' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42856°N, -112.42706°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 952 ft **BOREHOLE DEPTH** 21.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
950	0		CLAYEY SAND (SC), light brown, fine to medium grained, slightly moist, soft, medium plasticity, trace fine gravel	SPT	3-3-2 (5)						
				AU			4.1	29	18	11	42
	5		SILTY SAND (SM), light brown, fine to medium grained, slightly moist, medium dense, non plastic, trace fine gravel	SPT	4-8-7 (15)						
945											
	10		SILTY SANDY CLAY (CL), light brown, slightly moist, very firm, low to medium plasticity, trace fine gravel, some fine to medium sand	SPT	15-19-26 (45)						
940											
	15		SILTY CLAY (CL), light whitish brown to light brown, slightly moist to moist, hard, low to medium plasticity, trace fine gravel, trace fine sand, weak to moderate lime cementation	SPT	26-31-32 (63)						
935											
	20			SPT	12-45-50/5"						

Bottom of borehole at 21.5 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-61

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 4/1/2022 **COMPLETED** 4/1/2022
BORING LOCATION STA 1205+00, 135' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.42993°N, -112.42707°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 951 ft **BOREHOLE DEPTH** 21.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
950			SILTY SAND (SM), light brown, fine to medium grained, slightly moist, medium dense to loose, non plastic, trace fine gravel	SPT	5-7-7 (14)						
				AU							
	5										
945				SPT	2-3-5 (8)						
	10		SILTY CLAY (CL), light brown, slightly moist, hard, low to medium plasticity, trace fine gravel, trace fine sand								
940				SPT	13-28-47 (75)						
	15		SANDY SILT (ML), light brown, slightly moist, dense, non plastic, trace fine gravel, considerable fine sand								
935				SPT	12-18-23 (41)		8.4	NP	NP	NP	50
	20										
930			SANDY CLAY (CL), light brown to brown, slightly moist to moist, very firm, low to medium plasticity, trace fine gravel, trace fine gravel	SPT	17-23-20 (43)						

Bottom of borehole at 21.5 feet. Backfilled with soil cuttings.

BORING NUMBER B-62

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 4/1/2022 **COMPLETED** 4/1/2022
BORING LOCATION STA 1210+00, 140' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.43134°N, -112.42711°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 957 ft **BOREHOLE DEPTH** 21.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
955	0		SILTY, CLAYEY SAND WITH GRAVEL (SC-SM), light brown, subangular, fine to medium grained, slightly moist, moderately firm, low plasticity, some gravel, trace cobbles	SPT	7-7-8 (15)						
				AU			2.7	23	18	5	17
	5		SILTY SAND (SM), light brown, subrounded, fine to medium grained, slightly moist, loose, non plastic, trace gravel	SPT	4-4-5 (9)						
950											
	10		CLAYEY SAND (SC), light brown, fine to medium grained, slightly moist, hard, medium plasticity, little gravel	SPT	32-45-37 (82)		7.3	35	20	15	40
945											
	15		Increased plasticity below 15'	SPT	17-37-42 (79)						
940											
	20		CLAYEY SILT (MH), brown, moist, moderately firm, medium to high plasticity, trace fine gravel, trace fine sand	SPT	5-10-17 (27)						

Bottom of borehole at 21.5 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-63

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 4/4/2022 **COMPLETED** 4/4/2022
BORING LOCATION STA 1214+50, 165' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** S. Melson
GPS COORDINATES 33.43258°N, -112.42717°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 962 ft **BOREHOLE DEPTH** 26.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
960	0		CLAYEY SAND (SC), light brown, subangular, fine to medium grained, slightly moist, firm, medium plasticity, little fine gravel	SPT	13-14-9 (23)						
				AU			5.0	27	17	10	40
	5		SAND WITH SILT AND GRAVEL (SP-SM), light brown, subangular, medium grained, slightly moist, loose to medium dense, some gravel	SPT	3-4-4 (8)						
955											
	10			SPT	6-7-5 (12)		3.2	NP	NP	NP	9
950											
	15			SPT	6-16-36 (52)						
945			SILTY CLAY (CL), whitish brown, slightly moist, hard, medium plasticity, trace fine gravel, trace fine sand								
	20		Moderate lime cementation below 20'	SPT	13-29-50/4"						
940											
	25										

(Continued Next Page)

Ethos Engineering s

BORING NUMBER B-63

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 4/4/2022 **COMPLETED** 4/4/2022
BORING LOCATION STA 1214+50, 165' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** S. Melson
GPS COORDINATES 33.43258°N, -112.42717°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 962 ft **BOREHOLE DEPTH** 26.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
			SANDY CLAY (CL), light brown, slightly moist, firm, low to medium plasticity, trace fine gravel, trace fine sand	SPT	5-12-15 (27)						

Bottom of borehole at 26.5 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-64

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 4/4/2022 **COMPLETED** 4/4/2022
BORING LOCATION STA 1216+50, 175' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** S. Melson
GPS COORDINATES 33.43311°N, -112.42722°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 962 ft **BOREHOLE DEPTH** 31.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
960	0		SILTY CLAY WITH GRAVEL (CL), brown, subangular, slightly moist, moderately firm, low to medium plasticity, some gravel, trace fine sand	SPT	12-6-4 (10)						
				AU							
	5										
955			SILTY SAND (SM), light brown, subangular, fine to medium grained, slightly moist, loose to dense, non plastic, trace fine gravel	SPT	3-3-4 (7)						
	10			SPT	10-14-17 (31)		6.6	NP	NP	NP	18
950											
	15										
945			CLAYEY SILT (ML), white to light brown, slightly moist, hard, low plasticity, trace fine gravel, trace fine sand	SPT	10-26-50/5"						
	20										
940			SILTY CLAY (CL), light brown, slightly moist, hard, low to medium plasticity, trace fine gravel, trace fine sand, weak to moderate lime cementation	SPT	5-45-39 (84)						
	25										

(Continued Next Page)

Ethos Engineering s

BORING NUMBER B-64

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 4/4/2022 **COMPLETED** 4/4/2022
BORING LOCATION STA 1216+50, 175' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** S. Melson
GPS COORDINATES 33.43311°N, -112.42722°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 962 ft **BOREHOLE DEPTH** 31.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
935			SANDY CLAY (CL), brown, slightly moist, firm, low to medium plasticity, trace fine gravel, fine sand Some cobbles encountered below 25.5'	R	6-16						
	30		SAND (SP), light brown, fine to medium grained, slightly moist, medium dense, non plastic, trace fine gravel	SPT	7-8-12 (20)						

Bottom of borehole at 31.5 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-65

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 4/22/2022 **COMPLETED** 4/22/2022
BORING LOCATION STA 1212+00, 165' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.43184°N, -112.42609°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 958 ft **BOREHOLE DEPTH** 21.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
955	0		SILTY CLAY (CL), light brown, slightly moist, moderately firm, low to medium plasticity, trace fine gravel, trace fine to medium sand	SPT	8-8-6 (14)						
				AU							
	5		SILTY SAND (SM), brown, fine to medium grained, moist, very loose, no to low plasticity, trace fine gravel	SPT	2-1-1 (2)						
950											
	10		SAND (SP), light brown, fine to medium grained, slightly moist, medium dense, non plastic, trace fine gravel	SPT	4-5-8 (13)						
945											
	15		SILTY, CLAYEY SAND WITH GRAVEL (SC-SM), light brown, subrounded, fine to medium grained, slightly moist, hard, low plasticity, some gravel	SPT	13-50/3"						
940											
	20		SILTY, CLAYEY SAND (SC-SM), light brown, fine grained, slightly moist, firm, low plasticity, trace fine gravel	SPT	7-12-13 (25)						

Bottom of borehole at 21.5 feet. Backfilled with soil cuttings.

BORING NUMBER B-66

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/31/2022 **COMPLETED** 3/31/2022
BORING LOCATION STA 1216+00, 170' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.43295°N, -112.42598°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 962 ft **BOREHOLE DEPTH** 20.9 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
960	0		SANDY CLAY (CL), brown, moist, very soft to soft, low to medium plasticity, trace fine gravel, some fine sand	AU			14.4	31	20	11	71
				SPT	1-2-1 (3)						
	5			R	3-4						
955											
	10		SILTY CLAY (CL), light brown, slightly moist, very firm, low to medium plasticity, trace fine gravel, trace fine sand	SPT	10-12-24 (36)						
950											
	15		CLAYEY SILT (ML), light brown, slightly moist, hard, low to medium plasticity, trace fine gravel, trace fine sand	SPT	23-31-48 (79)						
945											
	20		SILTY CLAY (CL), light brown, slightly moist, hard, low to medium plasticity, trace fine gravel, trace fine sand	SPT	12-50/5"						

Bottom of borehole at 20.9 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-67

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/29/2022 **COMPLETED** 3/29/2022
BORING LOCATION STA 1919+00, 140' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.43377°N, -112.4271°E
DRILLING METHOD Tubex
GROUND ELEVATION 963 ft **BOREHOLE DEPTH** 46 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
960	0		SANDY SILTY CLAY (CL), light brown, moist, soft, medium plasticity, trace fine gravel, trace to some fine to medium sand	SPT	4-4-4 (8)						
				AU							
	5										
955			SILTY, CLAYEY SAND (SC-SM), light brown, angular, fine to medium grained, moist, firm, low plasticity, trace gravel	SPT	2-5-12 (17)						
	10										
			CLAYEY SAND (SC), light brown, fine to medium grained, moist, moderately firm, medium plasticity, trace fine gravel	SPT	4-5-6 (11)		8.0	28	19	9	16
950			SAND (SP), light brown, fine to medium grained, moist, medium dense, non plastic, trace fine gravel								
	15										
			SILTY SANDY CLAY (CL), light brown to white, slightly moist, hard, medium to high plasticity, trace fine gravel, some fine to medium sand, moderate lime cementation	SPT	10-29-50/5"						
945											
	20										
			SILTY CLAY (CL), light brown to whitish brown, moist, hard, medium plasticity, trace fine gravel, trace fine sand, weak to moderate lime cementation	SPT	13-31-38 (69)						
940											
	25										

(Continued Next Page)

Ethos Engineering s

BORING NUMBER B-67

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/29/2022 **COMPLETED** 3/29/2022
BORING LOCATION STA 1919+00, 140' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.43377°N, -112.4271°E
DRILLING METHOD Tubex
GROUND ELEVATION 963 ft **BOREHOLE DEPTH** 46 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND (SC), brown, fine grained, moist, firm, low to medium plasticity, trace fine gravel	SPT	6-11-17 (28)						
935	30		SAND (SP), light brown, fine grained, moist, medium dense, non plastic, trace fine gravel	SPT	6-10-12 (22)						
930	35		CLAYEY SAND (SC), light brown, fine to medium grained, moist, firm to hard, low plasticity, trace fine gravel	SPT	6-11-13 (24)						
925	40		Strong lime cementation at 40'	SPT	50/1"						
920	45		Fine sand below 45'	R	15-33	107	11.3				

Bottom of borehole at 46.0 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-68

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/4/2022 **COMPLETED** 3/4/2022
BORING LOCATION STA 1220+50, 135' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.43418°N, -112.4271°E
DRILLING METHOD Tubex
GROUND ELEVATION 963 ft **BOREHOLE DEPTH** 50 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SANDY CLAY (CL), brown, slightly moist, soft, low to medium plasticity, trace fine gravel, fine to medium sand	SPT	4-4-3 (7)						
960				AU			9.7	28	19	9	61
	5		SANDY SILTY CLAY (CL), brown, slightly moist, soft, low plasticity, trace fine gravel, some fine to medium sand	SPT	2-4-4 (8)						
955											
	10		SILTY, CLAYEY SAND (SC-SM), light brown, angular, fine to medium grained, slightly moist, moderately firm, low plasticity, trace gravel	SPT	5-7-7 (14)						
950											
	15		SILTY CLAY (CL), brown, slightly moist, very firm to hard, medium plasticity, trace fine gravel, trace fine sand	SPT	8-14-30 (44)			38	22	16	
945											
	20		Moderate lime cementation below 20'	SPT	17-31-50/5"						
940											
	25										

(Continued Next Page)

Ethos Engineering s

BORING NUMBER B-68

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/4/2022 **COMPLETED** 3/4/2022
BORING LOCATION STA 1220+50, 135' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.43418°N, -112.4271°E
DRILLING METHOD Tubex
GROUND ELEVATION 963 ft **BOREHOLE DEPTH** 50 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
935	30		CLAYEY SAND (SC), light brown, fine grained, slightly moist, very firm, low to medium plasticity, trace fine gravel	R	14-26						
930	35		SAND (SP), light brown, fine to medium grained, slightly moist to moist, dense, non plastic, trace fine gravel	SPT	11-13-18 (31)						
925	40			SPT	10-18-18 (36)						
920	45		SANDY CLAY WITH GRAVEL (CL), light brown, subangular, moist, hard, medium plasticity, some gravel, some fine sand, moderate lime cementation	SPT	39-50/1"						
915	50		CLAY (CL), brown, moist, hard, medium plasticity, trace fine gravel, trace fine sand	R	12-39	113	9.9				

Bottom of borehole at 50.0 feet. Backfilled with soil cuttings.

BORING NUMBER B-69

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/11/2022 **COMPLETED** 3/11/2022
BORING LOCATION STA 1222+00, 145' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.43459°N, -112.42714°E
DRILLING METHOD Tubex
GROUND ELEVATION 963 ft **BOREHOLE DEPTH** 56.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY K. Dahlen **CHECKED BY** K. Mackay

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			4.5" Asphalt								
			8" Aggregate Base Course								
960			CLAYEY SAND (SC), light brown to brown, medium grained, slightly moist to moist, very soft to hard, medium plasticity, trace fine gravel	AU			5.5	27	17	10	43
				SPT	2-1-2 (3)						
	5										
				R	4-5						
955			Weakly lime cemented below 8'								
	10										
				R	50-50/4"						
			SILTY CLAY (CL), brown, slightly moist, very firm, low to medium plasticity, trace fine sand, weak to moderate lime cementation								
950											
	15										
				SPT	6-17-25 (42)						
945											
			SILTY SAND (SM), light brown, fine to medium grained, moist, very firm, medium plasticity, weak to moderate lime cementation								
	20										
				SPT	9-16-26 (42)		24.6	48	28	20	47
940											
	25										

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CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 3/11/2022 **COMPLETED** 3/11/2022 **BORING LOCATION** STA 1222+00, 145' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.43459°N, -112.42714°E
DRILLING METHOD Tubex **GROUND ELEVATION** 963 ft **BOREHOLE DEPTH** 56.5 ft
RIG TYPE / # CME 75/109 **GROUNDWATER DEPTH** ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** K. Dahlen **CHECKED BY** K. Mackay

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY SAND (SM), light brown, fine to medium grained, moist, very firm, medium plasticity, weak to moderate lime cementation *(continued)*	SPT	7-12-12 (24)						
935			SAND WITH SILT (SP-SM), light brown, fine to medium grained, moist, medium dense, non plastic								
	30			R	7-17	109	3.6	NP	NP	NP	9
930			Thin moderately lime cemented lenses below 33'								
	35		SILTY CLAY (CL), light brown to tan, moist, hard to very firm, low to medium plasticity, little fine sand, weak to moderate lime cementation	SPT	14-34-23 (57)						
925											
	40			SPT	7-11-21 (32)						
920											
	45		SILT (ML), brown, moist, firm, no to low plasticity, little fine sand	SPT	7-10-17 (27)						
915											
	50										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 3/11/2022 **COMPLETED** 3/11/2022 **BORING LOCATION** STA 1222+00, 145' L SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.43459°N, -112.42714°E

DRILLING METHOD Tubex **GROUND ELEVATION** 963 ft **BOREHOLE DEPTH** 56.5 ft

RIG TYPE / # CME 75/109 ▼ **GROUNDWATER DEPTH** ---

HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** K. Dahlen **CHECKED BY** K. Mackay

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY CLAY (CL), brown, moist, hard, medium plasticity, little fine sand, weak lime cementation	SPT	5-25-43 (68)						
910											
	55		SILTY SAND (SM), light brown, fine grained, moist, dense, non plastic	SPT	11-16-19 (35)						

Bottom of borehole at 56.5 feet. Backfilled with soil cuttings; sawcut and patched surface with Hot Mix AC.

BORING NUMBER B-70

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/9/2022 **COMPLETED** 3/9/2022
BORING LOCATION STA 1224+00, 140' L SR 303L Cst CL
DRILLER Cascade **DRILLED BY** M. Villalobos
GPS COORDINATES 33.43502°N, -112.42713°E
DRILLING METHOD Roto-Sonic
GROUND ELEVATION 964 ft **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # TSI-150CC/BB6B45
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 77
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			4.75" Asphalt								
			6" Aggregate Base Course								
			CLAYEY SAND (SC), brown, subangular, medium grained, moist, medium plasticity, trace fine gravel	AU			9.0	34	17	17	28
960	5										
			SAND WITH CLAY (SP-SC), light brown to brown, subangular, medium grained, slightly moist, soft, low plasticity, trace fine gravel	SPT	2-3-2 (5)						
955			SANDY CLAY (CL), light brown to whitish brown, subangular, slightly moist, hard, low to medium plasticity, trace fine gravel, weak lime cementation								
	10			SPT	13-50/5"						
950			Moderate lime cementaton below 13'								
	15		Some cobbles, increased gravel below 15'	SPT	30-50/4"						
945			CLAYEY SAND WITH GRAVEL (SC), light brown to whitish brown, subangular, fine to medium grained, slightly moist to moist, hard, medium plasticity, considerable fine gravel, weak to moderate lime cementation	AU			11.5	32	21	11	41
	20			SPT	15-50/5"						
940			Decreased gravel, weak lime cementation below 22'	AU							
	25										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 3/9/2022 **COMPLETED** 3/9/2022 **BORING LOCATION** STA 1224+00, 140' L SR 303L Cst CL

DRILLER Cascade **DRILLED BY** M. Villalobos **GPS COORDINATES** 33.43502°N, -112.42713°E

DRILLING METHOD Roto-Sonic **GROUND ELEVATION** 964 ft **BOREHOLE DEPTH** 61.5 ft

RIG TYPE / # TSI-150CC/BB6B45 **GROUNDWATER DEPTH** ---

HAMMER TYPE Auto **HAMMER EFFICIENCY** 77 **LOGGED BY** M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAY (CL), light brown to brown, slightly moist to moist, firm, medium to high plasticity, trace fine gravel, trace fine sand, weak lime cementation	R	8-17						
935											
	30		Increased sand below 30'	SPT	7-10-9 (19)						
			SAND WITH SILT (SP-SM), light brown to brown, subangular, fine to medium grained, slightly moist, little fine gravel, trace cobbles	AU							
930											
	35		SILTY, CLAYEY SAND (SC-SM), light brown, subangular, fine to medium grained, slightly moist, hard, low plasticity, trace fine gravel, weak to moderate lime cementation	R	32-50/4"	114	10.0				
925			Increased gravel below 38'								
	40		SAND WITH GRAVEL (SP), light brown, subangular, fine to medium grained, slightly moist, dense, non plastic, some fine gravel	SPT	15-20-19 (39)						
			CLAYEY GRAVEL WITH SAND (GC), light brown to whitish brown, slightly moist, medium plasticity, trace cobbles, considerable fine to medium sand, weak lime cementation	AU			11.0	33	16	17	30
920	45		CLAYEY SAND (SC), light brown to brown, subangular, fine grained, slightly moist to moist, firm to very firm, medium plasticity, trace fine gravel, weak lime cementation	SPT	9-8-8 (16)						
				AU							
915	50										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 3/9/2022 **COMPLETED** 3/9/2022 **BORING LOCATION** STA 1224+00, 140' L SR 303L Cst CL

DRILLER Cascade **DRILLED BY** M. Villalobos **GPS COORDINATES** 33.43502°N, -112.42713°E

DRILLING METHOD Roto-Sonic **GROUND ELEVATION** 964 ft **BOREHOLE DEPTH** 61.5 ft

RIG TYPE / # TSI-150CC/BB6B45 **GROUNDWATER DEPTH** ---

HAMMER TYPE Auto **HAMMER EFFICIENCY** 77 **LOGGED BY** M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND (SC), light brown to brown, subangular, fine grained, slightly moist to moist, firm to very firm, medium plasticity, trace fine gravel, weak lime cementation *(continued)*	SPT	5-15-19 (34)						
910	55		Whitish brown to light brown, weak to moderate lime cementation below 54'	SPT	8-15-18 (33)						
			SAND WITH CLAY (SP-SC), light brown, subrounded, fine to medium grained, slightly moist, very firm, low plasticity, trace fine gravel, trace cobbles	AU							
905	60		Weak lime cementation below 60'	SPT	10-12-26 (38)						

Bottom of borehole at 61.5 feet. Backfilled with soil cuttings; sawcut and patched surface with Hot Mix AC.

Ethos Engineering s

BORING NUMBER B-71

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 4/11/2022 **COMPLETED** 4/12/2022
BORING LOCATION STA 1222+30, 110' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.4347°N, -112.4263°E
DRILLING METHOD Tubex
GROUND ELEVATION 963 ft **BOREHOLE DEPTH** 56.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
960	0		CLAYEY SAND (SC), light brown, subangular, medium to coarse grained, slightly moist, moderately firm to firm, low to medium plasticity, trace gravel	SPT	9-10-14 (24)						
				AU			3.5	29	18	11	33
	5			SPT	20-21-23 (44)						
955											
	10		SANDY CLAY (CL), light brown, angular, slightly moist, hard, low to medium plasticity, trace gravel, some fine sand, weak to strong lime cementation	SPT	50/5"						
950											
	15		CLAYEY SAND (SC), light brown to white, subangular, fine grained, slightly moist, hard, low to medium plasticity, some gravel	SPT	44-50/3"						
945											
	20		SANDY CLAY (CL), brown, moist, hard, low to medium plasticity, trace fine gravel, some fine sand	R	13-38						
940											
	25										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 4/11/2022 **COMPLETED** 4/12/2022 **BORING LOCATION** STA 1222+30, 110' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.4347°N, -112.4263°E
DRILLING METHOD Tubex **GROUND ELEVATION** 963 ft **BOREHOLE DEPTH** 56.5 ft
RIG TYPE / # CME 75/109 **GROUNDWATER DEPTH** ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SANDY CLAY (CL), brown, moist, hard, low to medium plasticity, trace fine gravel, some fine sand*(continued)*	SPT	10-13-19 (32)		10.7	32	23	9	61
935	30		SILTY SAND (SM), light brown, subangular, fine to medium grained, slightly moist, medium dense, non plastic, occasional gravel, weak lime cementation	SPT	6-8-11 (19)						
930	35		SANDY CLAY (CL), brown, moist, moderately firm, low to medium plasticity, trace fine gravel, fine to medium sand	SPT	10-5-9 (14)						
925	40		CLAYEY SAND (SC), light brown, rounded, fine to medium grained, slightly moist to moist, very firm, occasional gravel	SPT	10-13-20 (33)						
920	45		Weak lime cementation from 43' to 45'	SPT	6-12-21 (33)						
915	50										

(Continued Next Page)

Ethos Engineering s

BORING NUMBER B-71

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 4/11/2022 **COMPLETED** 4/12/2022
BORING LOCATION STA 1222+30, 110' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.4347°N, -112.4263°E
DRILLING METHOD Tubex
GROUND ELEVATION 963 ft **BOREHOLE DEPTH** 56.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
910	55		SAND (SP), light brown, subrounded, fine to coarse grained, slightly moist, dense, non plastic, some gravel	SPT	11-18-20 (38)						
			CLAYEY SAND (SC), light brown to white, angular, fine to medium grained, moist, hard, low plasticity, occasional gravel, weak lime cementation	SPT	8-37-38 (75)						

Bottom of borehole at 56.5 feet. Backfilled with soil cuttings.

BORING NUMBER B-72

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 4/11/2022 **COMPLETED** 4/11/2022
BORING LOCATION STA 1223+80, 110' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.43511°N, -112.4263°E
DRILLING METHOD Tubex
GROUND ELEVATION 964 ft **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND (SC), light brown, subrounded, fine to medium grained, slightly moist, very firm, low to medium plasticity, some gravel	SPT	9-13-20 (33)						
				AU							
960	5										
			SILTY SAND (SM), light brown, subangular, fine to coarse grained, slightly moist, very firm to hard, low to medium plasticity, trace gravel	SPT	11-15-21 (36)		4.2	28	18	10	15
955											
	10		Moderate to strong cementation from 10' to 11'	SPT	50/2"						
950											
	15		SANDY CLAY (CL), light brown, slightly moist, hard to very firm, low to medium plasticity, trace fine gravel, considerable fine to medium sand, weak lime cementation	R	26-50/5"	95	10.0				
945											
	20		Decreased sand below 20'	SPT	13-23-37 (60)						
940											
	25										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 4/11/2022 **COMPLETED** 4/11/2022 **BORING LOCATION** STA 1223+80, 110' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.43511°N, -112.4263°E
DRILLING METHOD Tubex **GROUND ELEVATION** 964 ft **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # CME 75/109 **GROUNDWATER DEPTH** ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SANDY CLAY (CL), light brown, slightly moist, hard to very firm, low to medium plasticity, trace fine gravel, considerable fine to medium sand, weak lime cementation*(continued)*	SPT	10-16-20 (36)						
935	30		SILTY SAND (SM), light brown, fine grained, slightly moist, medium dense, non plastic, trace fine gravel	SPT	7-11-11 (22)		4.8	NP	NP	NP	24
930	35		SANDY CLAY (CL), brown, slightly moist, firm, medium plasticity, trace fine gravel, occasional fine sand, weak lime cementation	SPT	7-5-11 (16)						
925	40		SILTY SAND (SM), light brown, subangular, fine to medium grained, slightly moist, medium dense to dense, non plastic, occasional gravel Weak lime cementation from 42' to 45'	SPT	5-7-11 (18)						
920	45			SPT	7-14-18 (32)						
915	50										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 4/11/2022 **COMPLETED** 4/11/2022
BORING LOCATION STA 1223+80, 110' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.43511°N, -112.4263°E
DRILLING METHOD Tubex
GROUND ELEVATION 964 ft **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY SAND (SM), light brown, subangular, fine to medium grained, slightly moist, medium dense to dense, non plastic, occasional gravel*(continued)*	SPT	9-13-18 (31)		5.7	NP	NP	NP	19
910	55			SPT	9-13-20 (33)						
905	60		SANDY CLAY (CL), brown, subangular, moist, hard, low to medium plasticity, occasional gravel, trace fine sand	SPT	14-24-31 (55)						

Bottom of borehole at 61.5 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-73

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/10/2022 **COMPLETED** 3/14/2022
BORING LOCATION STA 1224+60, 128' L SR 303L Cst CL
DRILLER Cascade **DRILLED BY** M. Villalobos
GPS COORDINATES 33.43531°N, -112.42709°E
DRILLING METHOD Roto-Sonic
GROUND ELEVATION 964 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # TSI-150CC/BB6B45
GROUNDWATER DEPTH 85 ft / Elev 879 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 77
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			4.5" Asphalt								
			6" Aggregate Base Course								
			CLAYEY SAND (SC), light brown, subangular, fine to medium grained, slightly moist, low plasticity, trace fine gravel								
960				AU							
	5										
			SAND WITH CLAY (SP-SC), light brown, subangular, medium grained, slightly moist, moderately firm to very firm, low to medium plasticity, trace fine gravel								
				SPT	5-8-7 (15)						
955											
	10										
			Weak lime cementation below 10'	SPT	11-16-25 (41)						
			CLAYEY SAND (SC), light brown to white, subangular, fine grained, moist, hard, medium plasticity, trace fine gravel, weak to moderate lime cementation								
950											
	15										
				SPT	9-36-20 (56)						
			SILTY SAND (SM), light brown to gray, subangular, medium to coarse grained, slightly moist, very dense, non plastic, considerable gravel, occasional cobbles	AU			8.4	NP	NP	NP	45
945											
	20										
			Decreased gravel below 20'	SPT	11-15-50/5"						
			CLAYEY SAND (SC), white to light brown, subangular, fine grained, slightly moist, hard, low to medium plasticity, trace fine gravel, weak to moderate lime cementation								
940				AU							
	25										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 3/10/2022 **COMPLETED** 3/14/2022 **BORING LOCATION** STA 1224+60, 128' L SR 303L Cst CL
DRILLER Cascade **DRILLED BY** M. Villalobos **GPS COORDINATES** 33.43531°N, -112.42709°E
DRILLING METHOD Roto-Sonic **GROUND ELEVATION** 964 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # TSI-150CC/BB6B45 **GROUNDWATER DEPTH** 85 ft / Elev 879 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 77 **LOGGED BY** M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND (SC), white to light brown, subangular, fine grained, slightly moist, hard, low to medium plasticity, trace fine gravel, weak to moderate lime cementation *(continued)* Increased fines at 25'	SPT	50/4"						
			Decreased cementation below 27'								
935	30			AU							
			SAND (SP), light brown, subrounded, fine to medium grained, slightly moist, medium dense, non plastic, trace fine gravel	R	8-9						
930			SAND WITH CLAY AND GRAVEL (SP-SC), brown, subangular, fine grained, slightly moist, firm, low plasticity, some gravel, occasional cobbles, weak lime cementation	AU							
	35			SPT	10-12-16 (28)						
			Clay lense from 36.5' to 37'								
925			SAND WITH GRAVEL (SP), brown, subangular, fine to medium grained, slightly moist, non plastic, some gravel, occasional cobbles	AU							
	40		CLAYEY SAND (SC), light brown, subangular, fine to medium grained, slightly moist, hard, low plasticity, trace fine gravel, occasional cobbles	SPT	12-26-27 (53)						
920				AU			8.5	28	19	9	21
	45		GRAVEL WITH SAND (GP), brown to light brown, subangular, moist, very dense, non plastic, medium sand, occasional cobbles	SPT	8-50/4"						
			SILTY SAND (SM), brown to light brown, fine grained, moist, medium dense, non plastic, trace fine gravel, weak lime cementation								
915	50			AU							

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 3/10/2022 **COMPLETED** 3/14/2022 **BORING LOCATION** STA 1224+60, 128' L SR 303L Cst CL
DRILLER Cascade **DRILLED BY** M. Villalobos **GPS COORDINATES** 33.43531°N, -112.42709°E
DRILLING METHOD Roto-Sonic **GROUND ELEVATION** 964 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # TSI-150CC/BB6B45 **GROUNDWATER DEPTH** 85 ft / Elev 879 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 77 **LOGGED BY** M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY SAND (SM), brown to light brown, fine grained, moist, medium dense, non plastic, trace fine gravel, weak lime cementation *(continued)*	R	6-12	113	15.4	NP	NP	NP	12
			CLAYEY SAND (SC), brown to light brown, fine grained, trace fine gravel								
910	55			SPT	12-20-27 (47)						
			SAND WITH CLAY (SP-SC), light brown to brown, subangular, fine grained, slightly moist, very firm, low plasticity, trace fine gravel	AU							
905	60		Weak lime cementation below 60'	SPT	8-16-26 (42)						
			CLAYEY SAND (SC), light brown, fine to medium grained, moist to slightly moist, hard, low to medium plasticity, trace fine gravel, weak lime cementation	AU							
900	65			R	8-50	107	13.6				
			GRAVEL WITH SAND (GP), light brown, poorly graded, medium grained, slightly moist to moist, very dense, non plastic, occasional cobbles								
895	70		Trace silty clay below 70'	SPT	17-21-31 (52)						
				AU							
890	75										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 3/10/2022 **COMPLETED** 3/14/2022 **BORING LOCATION** STA 1224+60, 128' L SR 303L Cst CL

DRILLER Cascade **DRILLED BY** M. Villalobos **GPS COORDINATES** 33.43531°N, -112.42709°E

DRILLING METHOD Roto-Sonic **GROUND ELEVATION** 964 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # TSI-150CC/BB6B45 **GROUNDWATER DEPTH** 85 ft / Elev 879 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 77 **LOGGED BY** M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND (SC), dark brown to brown, poorly graded, subangular, fine grained, moist, hard, medium plasticity, some gravel, weak to moderate lime cementation	SPT	5-12-50/4"						
			SAND WITH SILT AND GRAVEL (SP-SM), dark brown to brown, poorly graded, medium grained, moist to wet, hard, no to low plasticity, some gravel	AU							
885	80			SPT	11-19-32 (51)						
			SILTY SAND WITH GRAVEL (SM), brown, poorly graded, subangular, fine to medium grained, wet, very firm to firm, low to medium plasticity, some gravel	AU							
880	85		▼	RC	7-27	120	13.7	34	24	10	31
				AU							
875	90		SAND WITH GRAVEL (GP), brown to dark brown, poorly graded, subrounded, fine to medium grained, wet, medium dense, non plastic, gravel	SPT	9-11-17 (28)						
				AU							
870	95		Trace cobbles below 94'	SPT	7-10-12 (22)						
			Increased gravel below 97'	AU							
865	100										

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Ethos Engineering s

BORING NUMBER B-73

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/10/2022 **COMPLETED** 3/14/2022
BORING LOCATION STA 1224+60, 128' L SR 303L Cst CL
DRILLER Cascade **DRILLED BY** M. Villalobos
GPS COORDINATES 33.43531°N, -112.42709°E
DRILLING METHOD Roto-Sonic
GROUND ELEVATION 964 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # TSI-150CC/BB6B45
GROUNDWATER DEPTH 85 ft / Elev 879 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 77
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
			SAND WITH GRAVEL (GP), brown to dark brown, poorly graded, subrounded, fine to medium grained, wet, medium dense, non plastic, gravel*(continued)*	SPT	9-13-16 (29)						

Bottom of borehole at 101.5 feet. Backfilled with soil cuttings; grouted upper 25'; sawcut and patched surface with Hot Mix AC.

Ethos Engineering s

BORING NUMBER B-74

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 4/7/2022 **COMPLETED** 4/8/2022
BORING LOCATION STA 1224+60, 40' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.43531°N, -112.42653°E
DRILLING METHOD Tubex
GROUND ELEVATION 964 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH 80 ft / Elev 884 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
960	5		CLAYEY SAND (SC), light brown, subangular, fine to medium grained, slightly moist, moderately firm, medium plasticity, trace gravel	SPT	8-5-7 (12)						
				AU			2.8	29	18	11	16
955	10		SILTY SAND (SM), light brown, subangular, fine to medium grained, slightly moist, very loose, non plastic, occasional gravel	SPT	2-1-1 (2)						
950	15		SILTY, CLAYEY SAND (SC-SM), light brown, subangular, fine to medium grained, slightly moist, hard, low plasticity, trace gravel	R	21-50/5"			33	26	7	
945	20		SILTY CLAY (CL), brown to white, slightly moist, hard to very firm, low to medium plasticity, trace fine gravel, trace fine sand, weak lime cementation	SPT	20-38-50/5"						
				SPT	13-33-50/4"						
940	25										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 4/7/2022 **COMPLETED** 4/8/2022 **BORING LOCATION** STA 1224+60, 40' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.43531°N, -112.42653°E
DRILLING METHOD Tubex **GROUND ELEVATION** 964 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME 75/109 **GROUNDWATER DEPTH** 80 ft / Elev 884 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY CLAY (CL), brown to white, slightly moist, hard to very firm, low to medium plasticity, trace fine gravel, trace fine sand, weak lime cementation*(continued)*	SPT	13-16-23 (39)						
935	30		SILTY SAND (SM), light brown, fine grained, slightly moist, medium dense to very dense, non plastic, trace fine gravel	SPT	9-11-13 (24)		6.6	NP	NP	NP	41
930	35			SPT	50/1"						
925	40		SAND (SP), light brown, subrounded, fine to medium grained, slightly moist, medium dense, non plastic, occasional gravel	SPT	8-10-13 (23)						
920	45		Some gravel at 43'								
915	50		SILTY, CLAYEY SAND (SC-SM), brown, fine grained, slightly moist, firm to very firm, low plasticity, trace fine gravel	SPT	6-10-15 (25)						

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 4/7/2022 **COMPLETED** 4/8/2022 **BORING LOCATION** STA 1224+60, 40' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.43531°N, -112.42653°E
DRILLING METHOD Tubex **GROUND ELEVATION** 964 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME 75/109 **GROUNDWATER DEPTH** 80 ft / Elev 884 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY, CLAYEY SAND (SC-SM), brown, fine grained, slightly moist, firm to very firm, low plasticity, trace fine gravel *(continued)*	SPT	9-16-21 (37)						
910	55		SILTY SAND (SM), light brown, fine grained, slightly moist, dense to very dense, non plastic, trace fine gravel	SPT	8-23-18 (41)						
905	60			SPT	16-28-50/4"		11.0	NP	NP	NP	38
900	65		SANDY CLAY (CL), light brown, slightly moist, hard, medium plasticity, trace fine gravel, trace fine sand	SPT	15-50/2"						
895	70		SILTY SAND (SM), brown, subangular, fine to medium grained, moist to wet, dense to very dense, no to low plasticity, occasional gravel	SPT	10-15-23 (38)						
890	75										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 4/7/2022 **COMPLETED** 4/8/2022 **BORING LOCATION** STA 1224+60, 40' R SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.43531°N, -112.42653°E

DRILLING METHOD Tubex **GROUND ELEVATION** 964 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # CME 75/109 ▼ **GROUNDWATER DEPTH** 80 ft / Elev 884 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY SAND (SM), brown, subangular, fine to medium grained, moist to wet, dense to very dense, no to low plasticity, occasional gravel*(continued)*	SPT	8-14-22 (36)						
885											
	80		▼	SPT	17-25-26 (51)						
880											
	85			SPT	7-21-30 (51)						
875											
	90		SILTY SANDY CLAY (CL), dark brown, subangular, moist to wet, firm, low to medium plasticity, occasional gravel, considerable fine to medium sand	SPT	6-14-16 (30)						
870											
	95		SAND (SP), dark brown, subrounded, fine to medium grained, wet, dense, non plastic, trace gravel	SPT	10-16-31 (47)						
865											
	100										

(Continued Next Page)

Ethos Engineering s

BORING NUMBER B-74

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 4/7/2022 **COMPLETED** 4/8/2022
BORING LOCATION STA 1224+60, 40' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.43531°N, -112.42653°E
DRILLING METHOD Tubex
GROUND ELEVATION 964 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH 80 ft / Elev 884 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
			SILTY SANDY CLAY (CL), dark brown, moist to wet, moderately firm, low to medium plasticity, trace fine gravel, trace fine to medium sand	SPT	6-7-14 (21)						

Bottom of borehole at 101.5 feet. Backfilled with soil cuttings; grouted upper 25'.

Ethos Engineering s

BORING NUMBER B-75

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/16/2022 **COMPLETED** 3/17/2022
BORING LOCATION STA 1225+75, 10' L SR 303L Cst CL
DRILLER Cascade **DRILLED BY** M. Villalobos
GPS COORDINATES 33.43565°N, -112.42668°E
DRILLING METHOD Roto-Sonic
GROUND ELEVATION 963 ft **BOREHOLE DEPTH** 100.4 ft
RIG TYPE / # TSI-150CC/BB6B45
GROUNDWATER DEPTH 80 ft / Elev 883 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 77
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			4-1/4" Asphalt 6-1/2" Aggregate Base Course CLAYEY SAND (SC), light brown to brown, fine to medium grained, moist, low to medium plasticity, some fine gravel								
960											
	5		SILTY SAND WITH GRAVEL (SM), light brown to brown, medium grained, slightly moist, loose, no to low plasticity, trace fine gravel	SPT	4-4-2 (6)						
955				AU			5.7	NP	NP	NP	16
	10		Moist, dense, weak cementation, increased fines below 10'	SPT	12-16-16 (32)						
950			Light brown to white, weak to moderate lime cementation below 13'	AU							
	15		Very dense, increased gravel below 15'	SPT	50/4"						
945			SILTY CLAY WITH SAND AND GRAVEL (CL-ML), light brown, moist, low plasticity, trace fine gravel	AU			15.1	29	22	7	55
	20		CLAYEY SAND WITH GRAVEL (SC), white to light brown, fine grained, moist, very firm to hard, medium plasticity, some fine gravel, weak lime cementation	R	3-43						
940			Light brown to brown, slightly moist, moderate lime cementation below 23'	AU			8.3	25	16	9	24
	25										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 3/16/2022 **COMPLETED** 3/17/2022 **BORING LOCATION** STA 1225+75, 10' L SR 303L Cst CL

DRILLER Cascade **DRILLED BY** M. Villalobos **GPS COORDINATES** 33.43565°N, -112.42668°E

DRILLING METHOD Roto-Sonic **GROUND ELEVATION** 963 ft **BOREHOLE DEPTH** 100.4 ft

RIG TYPE / # TSI-150CC/BB6B45 **GROUNDWATER DEPTH** 80 ft / Elev 883 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 77 **LOGGED BY** M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND WITH GRAVEL (SC), white to light brown, fine grained, moist, very firm to hard, medium plasticity, some fine gravel, weak lime cementation*(continued)*	SPT	13-50/5"						
935				AU							
	30		Moist, firm, decreased cementation below 30'	SPT	8-15-14 (29)						
930				AU							
	35		SAND WITH CLAY (SP-SC), light brown, fine grained, slightly moist, very firm, low plasticity, trace fine gravel	SPT	12-22-13 (35)						
925			CLAY WITH SAND (CL), light brown to white, slightly moist, very firm, low to medium plasticity, trace fine gravel, some fine sand, weak to moderate lime cementation								
	40			R	13-43	116	11.7				
920			increased gravel and sand, decreased cementation below 43.5'								
	45		SILTY, CLAYEY SAND WITH GRAVEL (SC-SM), light brown to gray, medium grained, slightly moist, hard, low plasticity, considerable gravel, weak to strong lime cementation	SPT	50/2"						
915				AU							
	50										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 3/16/2022 **COMPLETED** 3/17/2022 **BORING LOCATION** STA 1225+75, 10' L SR 303L Cst CL
DRILLER Cascade **DRILLED BY** M. Villalobos **GPS COORDINATES** 33.43565°N, -112.42668°E
DRILLING METHOD Roto-Sonic **GROUND ELEVATION** 963 ft **BOREHOLE DEPTH** 100.4 ft
RIG TYPE / # TSI-150CC/BB6B45 **GROUNDWATER DEPTH** 80 ft / Elev 883 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 77 **LOGGED BY** M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
				SPT	50/3"						
			CLAY WITH SAND (CL), brown, moist, very firm, medium plasticity, trace fine gravel, trace fine sand								
910				AU							
	55			R	12-33						
905											
	60		SAND WITH CLAY (SP-SC), light brown, fine to medium grained, slightly moist, hard, low plasticity, trace fine gravel, weak lime cementation	SPT	50/3"						
			CLAYEY GRAVEL WITH SAND (GC), light brown to brown, subangular, moist, low to medium plasticity, some fine to medium sand, weak lime cementation								
900				AU							
	65		SAND WITH SILT (SP-SM), light brown to gray, fine to medium grained, slightly moist, dense, non plastic, trace fine gravel	SPT	14-14-18 (32)						
895											
	70		CLAYEY SAND WITH GRAVEL (SC), brown, poorly graded, fine to medium grained, moist, firm, low to medium plasticity, considerable gravel, weak lime cementation	SPT	8-12-17 (29)						
890			SAND WITH GRAVEL (SP), light brown, medium grained, slightly moist, non plastic, some gravel, occasional cobbles	AU							
	75										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 3/16/2022 **COMPLETED** 3/17/2022 **BORING LOCATION** STA 1225+75, 10' L SR 303L Cst CL

DRILLER Cascade **DRILLED BY** M. Villalobos **GPS COORDINATES** 33.43565°N, -112.42668°E

DRILLING METHOD Roto-Sonic **GROUND ELEVATION** 963 ft **BOREHOLE DEPTH** 100.4 ft

RIG TYPE / # TSI-150CC/BB6B45 **GROUNDWATER DEPTH** 80 ft / Elev 883 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 77 **LOGGED BY** M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SAND WITH CLAY (SP-SC), brown to gray, medium grained, slightly moist, very firm to hard, low plasticity, trace fine gravel	SPT	17-22-24 (46)						
885											
	80		▼ Wet, some gravel below 80'	SPT	10-50/6"						
880				AU							
	85		Brown to dark brown, fine grained, low to medium plasticity, occasional cobbles from 85' to 97'	SPT	12-27-34 (61)						
875				AU							
	90			SPT	17-28-30 (58)						
870				AU							
	95			SPT	10-20-42 (62)						
865				AU							
	100										

(Continued Next Page)

Ethos Engineering s

BORING NUMBER B-75

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/16/2022 **COMPLETED** 3/17/2022
BORING LOCATION STA 1225+75, 10' L SR 303L Cst CL
DRILLER Cascade **DRILLED BY** M. Villalobos
GPS COORDINATES 33.43565°N, -112.42668°E
DRILLING METHOD Roto-Sonic
GROUND ELEVATION 963 ft **BOREHOLE DEPTH** 100.4 ft
RIG TYPE / # TSI-150CC/BB6B45
GROUNDWATER DEPTH 80 ft / Elev 883 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 77
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
				SPT	50/4"						

Bottom of borehole at 100.4 feet. Backfilled with soil cuttings; grouted upper 25'; sawcut and patched surface with Hot Mix AC.

Ethos Engineering s

BORING NUMBER B-76

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/14/2022 **COMPLETED** 3/16/2022
BORING LOCATION STA 1225+75, 110' R SR 303L Cst CL
DRILLER Cascade **DRILLED BY** M. Villalobos
GPS COORDINATES 33.43565°N, -112.42631°E
DRILLING METHOD Roto-Sonic
GROUND ELEVATION 963 ft **BOREHOLE DEPTH** 100.5 ft
RIG TYPE / # TSI-150CC/BB6B45
GROUNDWATER DEPTH 83 ft / Elev 880 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 77
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			4" Asphalt								
			6" Aggregate Base Course								
960			CLAYEY SAND (SC), brown to light brown, fine to medium grained, moist, low to medium plasticity, some fine gravel								
	5		SAND (SP), brown to light brown, fine to medium grained, slightly moist, medium dense, non plastic, trace fine gravel	SPT	7-9-8 (17)						
955			CLAYEY SAND (SC), white to light brown, fine grained, slightly moist, hard, medium plasticity, occasional fine gravel								
	10			SPT	26-35-39 (74)		10.3	37	21	16	31
950			Increased sand below 12'								
	15		Weak to moderate lime cementation, moist, light brown to brown below 15'	SPT	19-35-50/4"						
945											
	20		SILT (ML), brown, moist, very firm to hard, low plasticity, trace fine gravel, trace fine sand	SPT	12-23-26 (49)		14.3	32	25	7	91
940											
	25										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 3/14/2022 **COMPLETED** 3/16/2022 **BORING LOCATION** STA 1225+75, 110' R SR 303L Cst CL
DRILLER Cascade **DRILLED BY** M. Villalobos **GPS COORDINATES** 33.43565°N, -112.42631°E
DRILLING METHOD Roto-Sonic **GROUND ELEVATION** 963 ft **BOREHOLE DEPTH** 100.5 ft
RIG TYPE / # TSI-150CC/BB6B45 **GROUNDWATER DEPTH** 83 ft / Elev 880 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 77 **LOGGED BY** M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILT (ML), brown, moist, very firm to hard, low plasticity, trace fine gravel, trace fine sand*(continued)* Weak to moderate cementation from 25' to 28'	SPT	34-50/5"						
935											
	30		Increased sand, brown below 30'	SPT	9-12-18 (30)		16.3	33	25	8	69
930											
	35		SAND WITH GRAVEL (SP), light brown, fine to medium grained, slightly moist, dense, non plastic, trace fine gravel	SPT	13-23-14 (37)						
			Increased gravel, occasional cobbles, very dense from 37' to 42'								
925											
	40			SPT	50/6"						
920											
	45		CLAYEY GRAVEL (GC), brown to white, poorly graded, subangular, slightly moist, hard, medium plasticity, some fine sand, moderate lime cementation	SPT	50/6"						
			CLAYEY SAND (SC), light brown to white, subangular, fine grained, moist, medium plasticity, some fine gravel, weak to moderate lime cementation								
915											
	50										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 3/14/2022 **COMPLETED** 3/16/2022 **BORING LOCATION** STA 1225+75, 110' R SR 303L Cst CL

DRILLER Cascade **DRILLED BY** M. Villalobos **GPS COORDINATES** 33.43565°N, -112.42631°E

DRILLING METHOD Roto-Sonic **GROUND ELEVATION** 963 ft **BOREHOLE DEPTH** 100.5 ft

RIG TYPE / # TSI-150CC/BB6B45 **GROUNDWATER DEPTH** 83 ft / Elev 880 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 77 **LOGGED BY** M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SANDY CLAY (CL), brown, moist, firm, medium plasticity, trace fine gravel, some fine sand, weak lime cementation	SPT	14-14-15 (29)						
910											
	55		SILTY SAND (SM), light brown, fine to medium grained, slightly moist, dense to very dense, non plastic, some gravel, occasional cobbles	R	10-36	97	12.9	NP	NP	NP	34
905											
	60			SPT	16-20-50/5"						
900											
	65		CLAY WITH SAND (CL), brown, moist, very firm, medium plasticity, trace gravel, some fine sand, weak lime cementation	SPT	19-22-24 (46)						
895			SAND WITH GRAVEL (SP), brown to light brown, subangular, medium grained, slightly moist, dense, non plastic, some gravel								
	70		Decreased gravel below 70'	SPT	13-21-26 (47)						
890											
	75		CLAYEY SAND (SC), light brown, subangular, fine to medium grained, slightly moist, firm, low to medium plasticity, trace gravel, weak lime cementation								

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 3/14/2022 **COMPLETED** 3/16/2022 **BORING LOCATION** STA 1225+75, 110' R SR 303L Cst CL

DRILLER Cascade **DRILLED BY** M. Villalobos **GPS COORDINATES** 33.43565°N, -112.42631°E

DRILLING METHOD Roto-Sonic **GROUND ELEVATION** 963 ft **BOREHOLE DEPTH** 100.5 ft

RIG TYPE / # TSI-150CC/BB6B45 **GROUNDWATER DEPTH** 83 ft / Elev 880 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 77 **LOGGED BY** M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND (SC), light brown, subangular, fine to medium grained, slightly moist, firm, low to medium plasticity, trace gravel, weak lime cementation*(continued)*	SPT	9-11-17 (28)						
885			CLAY WITH SAND (CL), brown, very moist, medium plasticity, trace fine gravel, some fine sand, weak lime cementation								
	80		SILTY SAND WITH GRAVEL (SM), dark brown to brown, subangular, medium to coarse grained, very moist, very dense, no to low plasticity, considerable gravel	R	23-36	118	14.6				
880			CLAYEY GRAVEL (GC), brown, poorly graded, subangular, wet, hard, medium plasticity, some fine to medium sand ▼								
	85			SPT	23-36-39 (75)						
			SILTY GRAVEL WITH SAND (GM), dark brown to brown, poorly graded, subangular, wet, very dense to dense, low plasticity, considerable medium to coarse sand								
875											
	90			SPT	4-20-21 (41)						
			CLAYEY SAND WITH GRAVEL (SC), brown, poorly graded, subangular, medium to coarse grained, wet, hard, medium plasticity, some gravel								
870											
	95			SPT	50/4"						
865											
	100										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/14/2022 **COMPLETED** 3/16/2022
BORING LOCATION STA 1225+75, 110' R SR 303L Cst CL
DRILLER Cascade **DRILLED BY** M. Villalobos
GPS COORDINATES 33.43565°N, -112.42631°E
DRILLING METHOD Roto-Sonic
GROUND ELEVATION 963 ft **BOREHOLE DEPTH** 100.5 ft
RIG TYPE / # TSI-150CC/BB6B45
GROUNDWATER DEPTH 83 ft / Elev 880 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 77
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
				SPT	50/6"						

Bottom of borehole at 100.5 feet. Backfilled with soil cuttings; grouted upper 25'; sawcut and patched surface with Hot Mix AC.

Ethos Engineering s

BORING NUMBER B-77

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/4/2022 **COMPLETED** 3/8/2022
BORING LOCATION STA 1227+00, 125' L SR 303L Cst CL
DRILLER Cascade **DRILLED BY** M. Villalobos
GPS COORDINATES 33.43599°N, -112.42708°E
DRILLING METHOD Roto-Sonic
GROUND ELEVATION 965 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # TSI-150CC/BB6B45
GROUNDWATER DEPTH 85 ft / Elev 880 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 77
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
965											
			CLAYEY SAND (SC), brown, subangular, medium to coarse grained, slightly moist, moderately firm, low plasticity, trace fine gravel	AU			9.7	28	19	9	37
960	5			SPT	6-6-7 (13)						
			SAND WITH SILT (SP-SM), light brown to brown, subangular, medium grained, slightly moist, medium dense, non plastic, some fine gravel								
955	10			SPT	7-8-12 (20)						
			CLAYEY SAND WITH GRAVEL (SC), light brown to brown, subangular, fine to medium grained, slightly moist to moist, very firm, low plasticity, trace fine gravel	AU			8.6	30	19	11	40
950	15			SPT	16-24-25 (49)						
			Increased gravel from 17.5' to 22'								
945	20			SPT	15-19-26 (45)						
			Weak lime cementation below 22'								
940	25										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 3/4/2022 **COMPLETED** 3/8/2022 **BORING LOCATION** STA 1227+00, 125' L SR 303L Cst CL

DRILLER Cascade **DRILLED BY** M. Villalobos **GPS COORDINATES** 33.43599°N, -112.42708°E

DRILLING METHOD Roto-Sonic **GROUND ELEVATION** 965 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # TSI-150CC/BB6B45 **GROUNDWATER DEPTH** 85 ft / Elev 880 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 77 **LOGGED BY** M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
940			SILTY GRAVEL WITH SAND (GM), light brown to white, poorly graded, subangular, slightly moist, very dense, low plasticity, some fine to medium sand	R	50/6"						
935	30		GRAVELLY CLAY WITH SAND (CL), light brown, subangular, slightly moist, firm, medium plasticity, considerable gravel, some fine sand, weak lime cementation	AU			20.3	42	22	20	58
930	35		SAND WITH CLAY (SP-SC), brown, fine grained, moist to slightly moist, firm to hard, low to medium plasticity, trace fine gravel Increased gravel below 32' Occasional cobbles below 33'	SPT	8-14-15 (29)						
925	40		GRAVELLY CLAY WITH SAND (CL), brown, subangular, moist, medium plasticity, considerable gravel, occasional cobbles	SPT	15-33-24 (57)						
920	45		SAND WITH GRAVEL (SP), light brown, poorly graded, subangular, medium to coarse grained, slightly moist, dense, non plastic, considerable gravel Some silt, very dense below 42.5'	R	19-38						
915	50		CLAY WITH GRAVEL (CL), brown, subangular, slightly moist, hard, medium plasticity, gravel	SPT	50/4"						
				AU							

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 3/4/2022 **COMPLETED** 3/8/2022 **BORING LOCATION** STA 1227+00, 125' L SR 303L Cst CL
DRILLER Cascade **DRILLED BY** M. Villalobos **GPS COORDINATES** 33.43599°N, -112.42708°E
DRILLING METHOD Roto-Sonic **GROUND ELEVATION** 965 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # TSI-150CC/BB6B45 **GROUNDWATER DEPTH** 85 ft / Elev 880 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 77 **LOGGED BY** M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
915			CLAY WITH GRAVEL (CL), brown, subangular, slightly moist, hard, medium plasticity, gravel *(continued)*	SPT	50/6"						
			Decreased gravel, increased sand, moderate lime cementation at 50'								
910	55		SILTY SAND (SM), brown to light brown, subangular, fine to medium grained, slightly moist, medium dense to very dense, non plastic, trace fine gravel	R	18-19	111	8.4	NP	NP	NP	13
905	60			SPT	55-17-50 (67)						
900	65		SAND WITH CLAY (SP-SC), brown to light brown, subrounded, fine to medium grained, moist, low to medium plasticity, some gravel, occasional cobbles								
			CLAYEY SAND (SC), light brown, subangular, fine grained, slightly moist, hard, medium plasticity, some fine gravel	SPT	43-50						
895	70		CLAY (CL), brown, subangular, moist, medium plasticity, trace fine gravel, some fine sand, weak lime cementation Increased gravel from 69' to 70'	AU							
890	75		SAND (SP), light brown to brown, fine grained, slightly moist to moist, dense, non plastic, trace fine gravel	SPT	12-17-17 (34)						
			Interbedded layers of Sand with Clay (SP-SC) and Sand with Gravel (SP) from 72' to 75'	AU							

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 3/4/2022 **COMPLETED** 3/8/2022 **BORING LOCATION** STA 1227+00, 125' L SR 303L Cst CL
DRILLER Cascade **DRILLED BY** M. Villalobos **GPS COORDINATES** 33.43599°N, -112.42708°E
DRILLING METHOD Roto-Sonic **GROUND ELEVATION** 965 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # TSI-150CC/BB6B45 **GROUNDWATER DEPTH** 85 ft / Elev 880 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 77 **LOGGED BY** M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
890			SAND (SP), light brown to brown, fine grained, slightly moist to moist, dense, non plastic, trace fine gravel*(continued)*	SPT	10-23-19 (42)						
			Some cobbles below 76'								
885	80			SPT	8-15-17 (32)						
			CLAYEY GRAVEL WITH SAND (GC), brown to dark brown, subangular, moist, medium plasticity, occasional cobbles, some fine to medium sand	AU							
880	85		SAND WITH SILT AND GRAVEL (SP-SM), dark brown to gray, subangular, medium to coarse grained, wet, very dense to very loose, no to low plasticity, some gravel	SPT	13-22-33 (55)						
			Increased gravel below 87'	AU							
875	90		Occasional cobbles below 90'	SPT	2-2-2 (4)						
			Increased cobbles from 93' to 98'	AU							
870	95		CLAY (CH), brown, subangular, very moist to wet, hard, medium to high plasticity, trace fine gravel, trace fine sand	R	31-50						
				AU							
			SAND (SP), light brown to brown, subangular, medium grained, wet, dense, non plastic, some gravel								
865	100										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 3/4/2022 **COMPLETED** 3/8/2022 **BORING LOCATION** STA 1227+00, 125' L SR 303L Cst CL

DRILLER Cascade **DRILLED BY** M. Villalobos **GPS COORDINATES** 33.43599°N, -112.42708°E

DRILLING METHOD Roto-Sonic **GROUND ELEVATION** 965 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # TSI-150CC/BB6B45 ▼ **GROUNDWATER DEPTH** 85 ft / Elev 880 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 77 **LOGGED BY** M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
865			SAND (SP), light brown to brown, subangular, medium grained, wet, dense, non plastic, some gravel*(continued)*	SPT	20-26-21 (47)						

Bottom of borehole at 101.5 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-78

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 3/24/2022 **COMPLETED** 3/28/2022 **BORING LOCATION** STA 1227+00, 95' R SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.43599°N, -112.42636°E

DRILLING METHOD Tubex **GROUND ELEVATION** 965 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # CME 75/109 ▼ **GROUNDWATER DEPTH** 80 ft / Elev 885 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
965											
			SAND WITH SILT (SP), brown, subangular, fine to medium grained, slightly moist, medium dense, non plastic, occasional gravel	AU			7.3	NP	NP	NP	12
960	5			SPT	14-14-15 (29)						
			SILTY SANDY CLAY (CL), white to light brown, subangular, slightly moist to moist, very firm to hard, low to medium plasticity, trace gravel, trace fine to medium sand	SPT	21-20-17 (37)						
955	10										
			Weak to moderate lime cementation below 10'	SPT	23-50/2"						
950	15										
			CLAYEY SAND (SC), brown, fine grained, moist, very firm, medium plasticity, trace fine gravel	SPT	9-19-27 (46)		11.8	45	22	23	48
945	20										
			SILTY SANDY CLAY (CL), white to brown, subangular, moist, hard to very firm, low to medium plasticity, some gravel, some fine sand	SPT	15-50/5"						
940	25										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 3/24/2022 **COMPLETED** 3/28/2022 **BORING LOCATION** STA 1227+00, 95' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.43599°N, -112.42636°E
DRILLING METHOD Tubex **GROUND ELEVATION** 965 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME 75/109 **GROUNDWATER DEPTH** 80 ft / Elev 885 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
940											
			SILTY SANDY CLAY (CL), white to brown, subangular, moist, hard to very firm, low to medium plasticity, some gravel, some fine sand*(continued)*	SPT	11-13-19 (32)						
935	30										
			SILTY SAND (SM), light brown, fine grained, moist, medium dense, non plastic, trace fine gravel	SPT	3-7-10 (17)		6.3	NP	NP	NP	14
930	35										
			SILTY, CLAYEY SAND (SC-SM), light brown, subangular, fine to medium grained, moist, hard, low plasticity, trace gravel	SPT	9-27-33 (60)						
925	40										
			SAND (SP), light brown, fine to medium grained, moist, medium dense, non plastic, trace fine gravel, weak lime cementation	SPT	9-13-12 (25)						
920	45										
			Sandy Clay (CL) lense below 45'	SPT	13-13-18 (31)						
			SILTY SAND (SM), light brown to brown, fine grained, moist, dense, no to low plasticity, trace fine gravel								
915	50										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 3/24/2022 **COMPLETED** 3/28/2022 **BORING LOCATION** STA 1227+00, 95' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.43599°N, -112.42636°E
DRILLING METHOD Tubex **GROUND ELEVATION** 965 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME 75/109 **GROUNDWATER DEPTH** 80 ft / Elev 885 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
915			SILTY SAND (SM), light brown to brown, fine grained, moist, dense, no to low plasticity, trace fine gravel*(continued)*	SPT	6-15-19 (34)						
910	55			SPT	12-16-26 (42)						
905	60		SILTY SANDY CLAY (CL), light brown to brown, moist, hard, low to medium plasticity, trace fine gravel, some fine to medium sand	SPT	43-31-50/5"						
900	65		Decreased sand, increased plasticity from 65' to 70'	R	16-26						
895	70		Clayey Sand (SC) lense from 70' to 71'	SPT	8-14-25 (39)						
890	75		SAND (SP), light brown, medium to coarse grained, moist, dense, non plastic, trace fine gravel								

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 3/24/2022 **COMPLETED** 3/28/2022 **BORING LOCATION** STA 1227+00, 95' R SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.43599°N, -112.42636°E

DRILLING METHOD Tubex **GROUND ELEVATION** 965 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # CME 75/109 **GROUNDWATER DEPTH** 80 ft / Elev 885 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
890			SANDY CLAY (CL), dark brown, subangular, moist to wet, hard to very firm, low to medium plasticity, some gravel, some fine to medium sand	SPT	50/3"						
885	80		Increased gravel from 80' to 90'	SPT	10-26-29 (55)						
880	85			SPT	13-23-17 (40)						
875	90		Increased plasticity below 90'	SPT	8-12-22 (34)						
870	95										
865	100		SILTY SAND (SM), brown, fine to medium grained, moist to wet, dense, non plastic, trace fine gravel	SPT	11-12-19 (31)						

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/24/2022 **COMPLETED** 3/28/2022
BORING LOCATION STA 1227+00, 95' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.43599°N, -112.42636°E
DRILLING METHOD Tubex
GROUND ELEVATION 965 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH 80 ft / Elev 885 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
865			SILTY SAND (SM), brown, fine to medium grained, moist to wet, dense, non plastic, trace fine gravel*(continued)*	SPT	8-9-28 (37)						

Bottom of borehole at 101.5 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-79

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 4/5/2022 **COMPLETED** 4/5/2022
BORING LOCATION STA 1226+00, 890' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** S. Melson
GPS COORDINATES 33.43572°N, -112.42957°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 964 ft **BOREHOLE DEPTH** 6.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
			CLAYEY SAND (SC), brown, subangular, fine grained, slightly moist, moderately firm, medium plasticity, trace gravel	SPT	16-7-8 (15)						
				AU			9.4	27	17	10	34
960											
	5		SILTY SAND (SM), light brown, subangular, fine to medium grained, moist, loose, non plastic, occasional gravel Asphalt gravel in sample at 5' (possible fill)	SPT	2-4-5 (9)						

Bottom of borehole at 6.5 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-80

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 4/5/2022 **COMPLETED** 4/5/2022
BORING LOCATION STA 1225+50, 800' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** S. Melson
GPS COORDINATES 33.43557°N, -112.424°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 963 ft **BOREHOLE DEPTH** 6 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SANDY CLAY (CL), light brown, slightly moist, moderately firm, medium plasticity, trace fine gravel, trace fine to medium sand	SPT	5-4-8 (12)		9.9	27	17	10	57
960											
	5		CLAYEY SILT (ML), light brown, slightly moist, soft, low to medium plasticity, trace fine gravel, trace fine sand	R	3-4						

Bottom of borehole at 6.0 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-81

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/25/2022 **COMPLETED** 3/25/2022
BORING LOCATION STA 1228+40, 130' L SR 303L Cst CL
DRILLER Cascade **DRILLED BY** M. Villalobos
GPS COORDINATES 33.43636°N, -112.42713°E
DRILLING METHOD Roto-Sonic
GROUND ELEVATION 964 ft **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # TSI-150CC/BB6B45
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 77
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
960			SILTY SAND (SM), reddish brown to light brown, subangular, medium grained, low plasticity, some gravel								
	5		SAND WITH CLAY (SP-SC), light brown to white, subangular, medium to coarse grained, slightly moist, medium dense, low plasticity, some fine gravel, weak lime cementation	SPT	11-11-11 (22)						
955			Increased gravel from 8' to 9'	AU							
	10			SPT	8-11-12 (23)						
950			CLAYEY SAND (SC), brown to light brown, fine grained, slightly moist, very firm to hard, low to medium plasticity, some fine gravel	AU							
	15			SPT	21-18-24 (42)						
945				AU							
	20			SPT	18-22-38 (60)						
940			White to light brown and weak to moderate lime cementation below 25'	AU							
	25										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 3/25/2022 **COMPLETED** 3/25/2022 **BORING LOCATION** STA 1228+40, 130' L SR 303L Cst CL
DRILLER Cascade **DRILLED BY** M. Villalobos **GPS COORDINATES** 33.43636°N, -112.42713°E
DRILLING METHOD Roto-Sonic **GROUND ELEVATION** 964 ft **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # TSI-150CC/BB6B45 **GROUNDWATER DEPTH** ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 77 **LOGGED BY** M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND (SC), brown to light brown, fine grained, slightly moist, very firm to hard, low to medium plasticity, some fine gravel *(continued)*	R	28-50/1"						
			CLAY WITH SAND (CL), brown, moist, medium to high plasticity, occasional fine gravel, some fine sand								
935				AU							
	30		SAND (SP), light brown, fine to medium grained, slightly moist, medium dense, non plastic, trace fine gravel	R	11-13						
930			CLAYEY SAND (SC), light brown to white, fine grained, slightly moist, hard, medium plasticity, trace fine gravel, moderate to strong lime cementation	AU							
	35			SPT	21-26-25 (51)						
			CLAY WITH SAND (CL), brown, moist, medium to high plasticity, occasional fine gravel, some fine sand								
925				AU							
	40		SAND WITH CLAY AND GRAVEL (SP-SC), brown, fine grained, moist, firm, low plasticity, trace fine gravel, weak lime cementation	R	11-18						
920			CLAYEY GRAVEL WITH SAND (GC), brown, subangular, moist, hard, low to medium plasticity, some medium sand, weak lime cementation	AU							
	45			SPT	50/2"						
			CLAY WITH SAND (CL), brown, subangular, moist, medium to high plasticity, occasional gravel, some fine sand, weak lime cementation								
915				AU							
	50										

(Continued Next Page)

Ethos Engineering s

BORING NUMBER B-81

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/25/2022 **COMPLETED** 3/25/2022
BORING LOCATION STA 1228+40, 130' L SR 303L Cst CL
DRILLER Cascade **DRILLED BY** M. Villalobos
GPS COORDINATES 33.43636°N, -112.42713°E
DRILLING METHOD Roto-Sonic
GROUND ELEVATION 964 ft **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # TSI-150CC/BB6B45
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 77
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SAND WITH CLAY AND GRAVEL (SP-SC), brown to light brown, subangular, fine to medium grained, slightly moist, hard to firm, low plasticity, considerable gravel, moderate lime cementation	R	25-50/1"						
			No cementation, decreased gravel from 52' to 54'								
910				AU							
	55			SPT	4-9-20 (29)						
			Light brown to brown, moderate to strong lime cementation, increased gravel below 58'								
905				AU							
	60			SPT	8-13-17 (30)						

Bottom of borehole at 61.5 feet. Backfilled with soil cuttings.

BORING NUMBER B-82

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 3/25/2022 **COMPLETED** 3/28/2022 **BORING LOCATION** STA 1229+90, 105' L SR 303L Cst CL

DRILLER Cascade **DRILLED BY** M. Villalobos **GPS COORDINATES** 33.43681°N, -112.42713°E

DRILLING METHOD Roto-Sonic **GROUND ELEVATION** 965 ft **BOREHOLE DEPTH** 56.5 ft

RIG TYPE / # TSI-150CC/BB6B45 **GROUNDWATER DEPTH** ---

HAMMER TYPE Auto **HAMMER EFFICIENCY** 77 **LOGGED BY** M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
965											
960	5		SILTY, CLAYEY SAND (SC-SM), brown, subangular, fine grained, slightly moist, low plasticity, some fine gravel								
			SAND WITH GRAVEL (SP), brown to reddish brown, medium grained, slightly moist, medium dense, non plastic, fine gravel	SPT	6-6-5 (11)						
			Increased gravel from 8' to 10'	AU							
955	10			SPT	10-10-10 (20)						
			SAND WITH SILT AND GRAVEL (SP-SM), brown to grayish brown, subangular, medium to coarse grained, slightly moist, very dense, no to low plasticity, fine gravel	AU							
950	15		Very dense, light brown, low plasticity, some clay from 15' to 17'	SPT	31-29-27 (56)						
			Weak to moderate lime cementation from 17' to 20'	AU							
945	20		Moist, some clay, decreased silt and gravel at 20'	SPT	23-29-24 (53)						
				AU							
940	25										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 3/25/2022 **COMPLETED** 3/28/2022 **BORING LOCATION** STA 1229+90, 105' L SR 303L Cst CL
DRILLER Cascade **DRILLED BY** M. Villalobos **GPS COORDINATES** 33.43681°N, -112.42713°E
DRILLING METHOD Roto-Sonic **GROUND ELEVATION** 965 ft **BOREHOLE DEPTH** 56.5 ft
RIG TYPE / # TSI-150CC/BB6B45 **GROUNDWATER DEPTH** ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 77 **LOGGED BY** M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
940			SAND (SP), brown to light brown, fine grained, moist, dense, non plastic, trace fine gravel	SPT	11-17-14 (31)						
935	30		CLAYEY SAND (SC), brown, fine grained, moist, very firm, low to medium plasticity, occasional fine gravel	AU							
				R	12-33						
930	35		SAND (SP), brown, fine to medium grained, slightly moist, dense, non plastic, occasional fine gravel	AU							
				SPT	16-23-22 (45)						
925	40		Increased gravel, trace clay at 37' SILTY, CLAYEY SAND (SC-SM), white to light brown, subangular, fine grained, slightly moist, low plasticity, some gravel, moderate lime cementation	AU							
920	45		SAND WITH CLAY (SP-SC), brown, fine grained, moist, firm, low to medium plasticity, occasional gravel, weak lime cementation	SPT	9-11-17 (28)						
			Increased gravel below 42'	AU							
				R	28-43						
915	50		CLAYEY GRAVEL WITH SAND (GC), brown to light brown, subangular, slightly moist, hard, medium plasticity, medium to coarse sand, moderate lime cementation	AU							

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Ethos Engineering s

BORING NUMBER B-82

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/25/2022 **COMPLETED** 3/28/2022
BORING LOCATION STA 1229+90, 105' L SR 303L Cst CL
DRILLER Cascade **DRILLED BY** M. Villalobos
GPS COORDINATES 33.43681°N, -112.42713°E
DRILLING METHOD Roto-Sonic
GROUND ELEVATION 965 ft **BOREHOLE DEPTH** 56.5 ft
RIG TYPE / # TSI-150CC/BB6B45
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 77
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
915				SPT	31-50/4"						
			SANDY CLAY WITH GRAVEL (CL), brown to reddish brown, subrounded, moist, very firm, medium to high plasticity, considerable gravel, some fine sand, weak lime cementation								
				AU							
910	55			SPT	24-9-27 (36)						

Bottom of borehole at 56.5 feet. Backfilled with soil cuttings.

BORING NUMBER B-83

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 4/21/2022 **COMPLETED** 4/21/2022
BORING LOCATION STA 1231+40, 135' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.43722°N, -112.42712°E
DRILLING METHOD Tubex
GROUND ELEVATION 965 ft **BOREHOLE DEPTH** 51.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
965											
			CLAYEY SAND (SC), light brown, angular, fine grained, slightly moist, moderately firm, low to medium plasticity, trace gravel	SPT	8-8-6 (14)						
				AU			3.9	26	18	8	27
960	5										
			SILTY SANDY CLAY (CL), light brown, angular, slightly moist, moderately firm to hard, low to medium plasticity, some gravel, some fine to medium sand	SPT	5-6-7 (13)						
955	10										
				R	9-9		16.2				
950	15										
			Decreased sand, low to medium plasticity from 15' to 20'	SPT	14-11-50/4"						
945	20										
			Silty sand (SM) lense from 20' to 21'	SPT	13-48-50/3"						
940	25										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 4/21/2022 **COMPLETED** 4/21/2022 **BORING LOCATION** STA 1231+40, 135' L SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.43722°N, -112.42712°E

DRILLING METHOD Tubex **GROUND ELEVATION** 965 ft **BOREHOLE DEPTH** 51.5 ft

RIG TYPE / # CME 75/109 **GROUNDWATER DEPTH** ---

HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
940			SILTY SANDY CLAY (CL), light brown, angular, slightly moist, moderately firm to hard, low to medium plasticity, some gravel, some fine to medium sand*(continued)* Weak lime cementation below 25'	SPT	24-50/3"						
935	30			SPT	16-10-18 (28)						
930	35		SILTY SAND (SM), light brown, fine to medium grained, slightly moist, medium dense, non plastic, trace fine gravel	SPT	9-11-17 (28)						
925	40		SANDY CLAY (CL), brown, moist, moderately firm to very firm, medium plasticity, trace fine gravel, occasional fine sand	R	5-17						
920	45			SPT	6-17-17 (34)						
915	50										

(Continued Next Page)

Ethos Engineering s

BORING NUMBER B-83

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 4/21/2022 **COMPLETED** 4/21/2022
BORING LOCATION STA 1231+40, 135' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.43722°N, -112.42712°E
DRILLING METHOD Tubex
GROUND ELEVATION 965 ft **BOREHOLE DEPTH** 51.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
915			CLAYEY SAND (SC), light brown, angular, fine to medium grained, moist, very firm, low to medium plasticity, occasional gravel, weak lime cementation	SPT	8-19-21 (40)						

Bottom of borehole at 51.5 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-84

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/23/2022 **COMPLETED** 3/24/2022
BORING LOCATION STA 1228+50, 115' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.43641°N, -112.42627°E
DRILLING METHOD Tubex
GROUND ELEVATION 964 ft **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND (SC), light brown, subangular, medium to coarse grained, slightly moist, dense, medium plasticity, trace gravel	AU			7.2	33	21	12	17
960			SILTY CLAY WITH SAND (CL), light brown, slightly moist, very firm, low to medium plasticity, trace fine gravel, occasional fine to medium sand	SPT	11-16-21 (37)						
	5			SPT	15-22-13 (35)						
955											
	10		SANDY SILT (ML), light brown, subangular, slightly moist, very dense to medium dense, non plastic, some gravel, trace fine sand, weak lime cementation	SPT	17-50/4"						
			No cementation below 12'								
950											
	15		Sand lense (SP) from 15' to 15.5'	SPT	6-9-11 (20)		9.5	NP	NP	NP	55
945											
	20		SILTY CLAY WITH SAND (CL), light brown, slightly moist, firm, medium plasticity, trace fine gravel, some fine sand	SPT	9-6-11 (17)						
940											
	25										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 3/23/2022 **COMPLETED** 3/24/2022 **BORING LOCATION** STA 1228+50, 115' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.43641°N, -112.42627°E
DRILLING METHOD Tubex **GROUND ELEVATION** 964 ft **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # CME 75/109 **GROUNDWATER DEPTH** ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SAND (SW), light brown, well graded, fine grained, slightly moist, very dense, non plastic, trace fine gravel, weak lime cementation	SPT	50/3"						
935			no cementation from 26' to 30'								
	30		Poorly graded sand at 30'	SPT	8-50/5"						
930											
	35		SANDY SILTY CLAY (CL-ML), light brown, slightly moist, medium dense, low plasticity, trace fine gravel, trace fine sand	SPT	7-12-18 (30)		13.4	27	21	6	57
925											
	40			SPT	6-9-13 (22)						
920											
	45		SANDY CLAY (CL), brown, moist, firm, low to medium plasticity, trace fine gravel, trace fine sand	SPT	4-12-18 (30)						
915											
	50										

(Continued Next Page)

Ethos Engineering s

BORING NUMBER B-84

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/23/2022 **COMPLETED** 3/24/2022
BORING LOCATION STA 1228+50, 115' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.43641°N, -112.42627°E
DRILLING METHOD Tubex
GROUND ELEVATION 964 ft **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY SAND (SM), brown, fine grained, moist, dense to very dense, no to low plasticity, trace fine gravel	SPT	15-31-17 (48)						
910											
	55			SPT	17-50/1"						
905											
	60		SAND (SP), light brown, fine grained, slightly moist, dense, non plastic, trace fine gravel	SPT	8-14-19 (33)						

Bottom of borehole at 61.5 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-85

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/23/2022 **COMPLETED** 3/23/2022
BORING LOCATION STA 1230+00, 115' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.43682°N, -112.42627°E
DRILLING METHOD Tubex
GROUND ELEVATION 965 ft **BOREHOLE DEPTH** 56.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
965											
960	5		CLAYEY SAND (SC), light brown, fine to medium grained, slightly moist, loose, medium plasticity, trace fine gravel	AU SPT	3-4-6 (10)		7.9	30	18	12	14
955	10		SILTY CLAY (CL), light brown to brown, slightly moist, hard, medium plasticity, trace fine gravel, trace fine sand, weak lime cementation	SPT	13-29-50/5"						
950	15		White to light brown, low to medium plasticity, some gravel to cobble sized moderately to strongly lime cemented nodules from 10' to 13'	SPT	20-31-50/5"						
945	20		Brown, moist, trace gravel below 15'	R	8-20						
940	25		SILTY SAND (SM), light brown, fine grained, slightly moist, dense, no to low plasticity, trace fine gravel	SPT	9-18-25 (43)						

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 3/23/2022 **COMPLETED** 3/23/2022 **BORING LOCATION** STA 1230+00, 115' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.43682°N, -112.42627°E
DRILLING METHOD Tubex **GROUND ELEVATION** 965 ft **BOREHOLE DEPTH** 56.5 ft
RIG TYPE / # CME 75/109 **GROUNDWATER DEPTH** ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
940			SAND (SP), light brown, fine grained, moist, medium dense to very dense, non plastic, trace fine gravel	SPT	6-11-11 (22)						
935	30			SPT	7-11-13 (24)						
930	35			SPT	50/3"						
925	40			SPT	50/1"						
920	45										
915	50		SILTY CLAY (CH), brown, subangular, moist, moderately firm, medium to high plasticity, some gravel, trace fine sand Some cobbles from 45' to 46'	R	9-14						

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 3/23/2022 **COMPLETED** 3/23/2022 **BORING LOCATION** STA 1230+00, 115' R SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.43682°N, -112.42627°E

DRILLING METHOD Tubex **GROUND ELEVATION** 965 ft **BOREHOLE DEPTH** 56.5 ft

RIG TYPE / # CME 75/109 ▼ **GROUNDWATER DEPTH** ---

HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
915			SANDY CLAY (CL), brown, moist, firm, low to medium plasticity, trace fine gravel, considerable fine sand	SPT	8-11-19 (30)						
910	55		SILTY SAND (SM), light brown, fine to medium grained, moist, dense, no to low plasticity, trace fine gravel	SPT	7-15-22 (37)						

Bottom of borehole at 56.5 feet. Backfilled with soil cuttings.

BORING NUMBER B-85A

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 6/15/2022 **COMPLETED** 6/15/2022
BORING LOCATION STA 1231+80, 112' R SR 303L Cst CL
DRILLER ACS Services **DRILLED BY** M. Valdez
GPS COORDINATES 33.4373°N, -112.42631°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 968 ft **BOREHOLE DEPTH** 26.5 ft
RIG TYPE / # CME 75/BY
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 88
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND (SC), light brown to brown, subangular, medium grained, slightly moist, hard to moderately firm, high plasticity, trace to some fine gravel	AU			4.7	43	16	27	21
965				R	25-50/4"						
	5			SPT	5-7-9 (16)						
960			CLAY WITH SAND (CL), light brown, subangular, slightly moist, firm, low to medium plasticity, trace fine gravel, some fine sand								
	10			SPT	3-7-20 (27)						
955											
	15		GRAVEL WITH SILT AND SAND (GP-GM), light brown, fine grained, slightly moist, very dense, no to low plasticity, some coarse sand	SPT	11-50/4"						
950											
	20		SANDY CLAY (CL), brown, subangular, slightly moist, very firm, low plasticity, trace fine gravel, considerable fine to medium sand	SPT	8-17-20 (37)						
945											
	25										

(Continued Next Page)

Ethos Engineering s

BORING NUMBER B-85A

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 6/15/2022 **COMPLETED** 6/15/2022
BORING LOCATION STA 1231+80, 112' R SR 303L Cst CL
DRILLER ACS Services **DRILLED BY** M. Valdez
GPS COORDINATES 33.4373°N, -112.42631°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 968 ft **BOREHOLE DEPTH** 26.5 ft
RIG TYPE / # CME 75/BY
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 88
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
			SAND (SP), light brown, subangular, fine grained, slightly moist, medium dense, non plastic, trace fine gravel	SPT	7-12-15 (27)						

Bottom of borehole at 26.5 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-85B

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 6/15/2022 **COMPLETED** 6/15/2022
BORING LOCATION STA 1233+30, 112' R SR 303L Cst CL
DRILLER ACS Services **DRILLED BY** M. Valdez
GPS COORDINATES 33.4378°N, -112.42635°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 970 ft **BOREHOLE DEPTH** 25.9 ft
RIG TYPE / # CME 75/BY
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 88
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
970			CLAYEY SAND (SC), light brown to brown, subangular, fine to medium grained, slightly moist, firm to very firm, medium plasticity, some fine gravel	AU			3.1	26	15	11	29
				R	14-26						
965	5			SPT	8-20-25 (45)						
			SILTY, CLAYEY SAND (SC-SM), brown, angular, slightly moist, very firm to hard, low plasticity, some fine gravel, weak to moderate lime cementation								
960	10			SPT	10-20-24 (44)						
955	15										
				SPT	4-21-50/5"						
950	20										
			SILTY GRAVEL WITH SAND (GM), light brown, subangular, slightly moist, very dense, no to low plasticity, fine gravel, fine to medium sand	SPT	21-31-38 (69)						
945	25										

(Continued Next Page)

Ethos Engineering s

BORING NUMBER B-85B

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 6/15/2022 **COMPLETED** 6/15/2022
BORING LOCATION STA 1233+30, 112' R SR 303L Cst CL
DRILLER ACS Services **DRILLED BY** M. Valdez
GPS COORDINATES 33.4378°N, -112.42635°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 970 ft **BOREHOLE DEPTH** 25.9 ft
RIG TYPE / # CME 75/BY
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 88
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
945			SANDY CLAY (CL), light brown, subangular, slightly moist, hard, medium plasticity, trace fine gravel, considerable fine to medium sand, weak to moderate lime cementation	SPT	9-50/5"						
			Bottom of borehole at 25.9 feet. Backfilled with soil cuttings.								

BORING NUMBER B-86

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 4/20/2022 **COMPLETED** 4/20/2022
BORING LOCATION STA 1235+00, 165' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.43815°N, -112.42727°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 968 ft **BOREHOLE DEPTH** 21.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND (SC), light brown, subrounded, fine grained, slightly moist, moderately firm, low to medium plasticity, occasional gravel	SPT	6-6-8 (14)						
965				AU			7.7	33	20	13	45
	5		SILTY CLAY (CL), light brown, slightly moist, moderately firm, low to medium plasticity, trace fine gravel, trace fine sand	SPT	5-6-12 (18)						
960											
	10		SILTY, CLAYEY SAND (SC-SM), light brown, fine to medium grained, slightly moist, dense, low plasticity, trace fine gravel	SPT	11-15-21 (36)						
955											
	15		SANDY SILTY CLAY (CL), light brown, slightly moist, hard, low to medium plasticity, trace fine gravel, fine to medium sand	SPT	12-50/3"						
950											
	20		SILTY SAND (SM), light brown, subrounded, fine to medium grained, slightly moist, dense, no to low plasticity, some gravel	SPT	19-19-20 (39)						

Bottom of borehole at 21.5 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-87

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/22/2022 **COMPLETED** 3/22/2022
BORING LOCATION STA 1236+00, 130' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.43846°N, -112.42626°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 970 ft **BOREHOLE DEPTH** 16 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
970											
			CLAYEY SAND (SC), light brown, fine to medium grained, slightly moist, very firm, medium plasticity, trace fine gravel								
				SPT	14-18-21 (39)		5.9	30	16	14	36
				AU							
965	5										
			SANDY SILT (ML), light brown, slightly moist, medium dense, low to medium plasticity, trace fine gravel, considerable fine to medium sand	SPT	5-7-7 (14)						
960	10										
				SPT	16-16-11 (27)						
			SILTY SAND (SM), light brown, fine grained, slightly moist, medium dense, no to low plasticity, trace fine gravel								
955	15										
				R	13-38	111	2.4	NP	NP	NP	12

Bottom of borehole at 16.0 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-88

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 1/10/2022 **COMPLETED** 1/10/2022
BORING LOCATION STA 1240+00, 120' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.4395°N, -112.42735°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 973 ft **BOREHOLE DEPTH** 31.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
970	0		SILTY, CLAYEY SAND (SC-SM), light brown, fine grained, slightly moist, firm, low plasticity, trace fine gravel	SPT	5-6-7 (13)						
				AU							
	5		CLAYEY SAND (SC), light brown, fine grained, slightly moist to moist, moderately firm to very firm, low to medium plasticity, trace fine gravel	SPT	8-12-13 (25)						
965											
	10			R	7-12						
960											
	15			SPT	26-22-12 (34)						
955											
	20		SAND (SP), brown, fine grained, slightly moist, medium dense, non plastic, trace fine gravel Some cobbles at 20.5'	SPT	5-8-9 (17)						
950											
	25										

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Ethos Engineering s

BORING NUMBER B-88

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 1/10/2022 **COMPLETED** 1/10/2022
BORING LOCATION STA 1240+00, 120' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.4395°N, -112.42735°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 973 ft **BOREHOLE DEPTH** 31.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SAND (SP), brown, fine grained, slightly moist, medium dense, non plastic, trace fine gravel*(continued)*	SPT	22-50/2"						
945			Light brown, very dense, some gravel and cobbles below 25'								
	30		CLAYEY SAND (SC), brown, fine grained, moist, firm, medium plasticity, trace fine gravel	SPT	8-10-15 (25)						

Bottom of borehole at 31.5 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-89

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 1/13/2022 **COMPLETED** 1/13/2022
BORING LOCATION STA 1241+50, 120' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.4399°N, -112.42738°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 974 ft **BOREHOLE DEPTH** 36.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
970	5		CLAYEY SAND (SC), light brown, fine grained, slightly moist, firm, low plasticity, trace fine gravel	SPT	4-7-9 (16)						
				AU			7.7	33	20	13	45
965	10		SAND (SP), light brown, subangular, medium grained, slightly moist, loose, non plastic, some gravel	SPT	3-3-6 (9)						
960	15		SANDY CLAY (CL), light brown, moist, hard, low to medium plasticity, trace fine gravel, fine sand	R	19-45						
955	20		SAND (SP), brown, fine to medium grained, moist, dense to very dense, non plastic, trace fine gravel, trace to some cobbles	SPT	6-11-24 (35)						
				SPT	50/1"						
950	25										

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Ethos Engineering s

BORING NUMBER B-89

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 1/13/2022 **COMPLETED** 1/13/2022
BORING LOCATION STA 1241+50, 120' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.4399°N, -112.42738°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 974 ft **BOREHOLE DEPTH** 36.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY SAND (SM), light brown, fine to medium grained, slightly moist, dense, no to low plasticity, trace fine gravel	SPT	10-18-19 (37)						
945	30		SAND (SP), light brown, subangular, medium grained, moist, medium dense, non plastic, trace gravel	SPT	2-9-12 (21)						
940	35		Some cobbles at 33'								
			SILTY SAND (SM), light brown, subangular, fine to medium grained, moist, dense, no to low plasticity, some gravel	SPT	17-16-19 (35)						

Bottom of borehole at 36.5 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-90

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 1/4/2022 **COMPLETED** 1/4/2022
BORING LOCATION STA 1242+85, 170' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.44032°N, -112.42747°E
DRILLING METHOD Tubex
GROUND ELEVATION 974 ft **BOREHOLE DEPTH** 40.1 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
970	0		CLAYEY SAND (SC), brown, subangular, fine grained, moist, moderately firm to hard, medium plasticity, occasional fine gravel	AU			8.1	34	21	13	48
	5		Weak lime cementation below 5'	R	4-12						
965			Fine to medium grained, slightly moist, some gravel below 8'								
	10			SPT	50/5"						
960											
	15		SILT WITH SAND (ML), light brown to brown, subangular, slightly moist, very dense, no to low plasticity, occasional coarse gravel, fine sand	SPT	21-8-50/5"						
955			SILTY SAND (SM), light brown, subangular, fine to medium grained, slightly moist, dense to very dense, non plastic, trace gravel								
	20			SPT	10-18-24 (42)		4.7	NP	NP	NP	20
950											
	25										

(Continued Next Page)

Ethos Engineering s

BORING NUMBER B-90

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 1/4/2022 **COMPLETED** 1/4/2022
BORING LOCATION STA 1242+85, 170' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.44032°N, -112.42747°E
DRILLING METHOD Tubex
GROUND ELEVATION 974 ft **BOREHOLE DEPTH** 40.1 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY SAND (SM), light brown, subangular, fine to medium grained, slightly moist, dense to very dense, non plastic, trace gravel *(continued)* White to light brown, medium to coarse grained, some gravel from 26' to 30'	SPT	22-28-27 (55)						
945	30			SPT	10-16-29 (45)		5.9	NP	NP	NP	16
940	35		Low plasticity below 35'	SPT	10-16-21 (37)						
935	40			SPT	50/1"						

Bottom of borehole at 40.1 feet. Backfilled with soil cuttings.

Ethos Engineering, LLC.
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-91

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 1/5/2022 **COMPLETED** 1/5/2022
BORING LOCATION STA 1244+40, 165' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.44072°N, -112.42746°E
DRILLING METHOD Tubex
GROUND ELEVATION 974 ft **BOREHOLE DEPTH** 46.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
970	5		SILTY, CLAYEY SAND (SC-SM), brown, fine grained, moist, moderately firm, low plasticity, trace fine gravel	SPT	1-4-5 (9)						
				AU							
			SAND (SP), white to light brown, subangular, medium grained, slightly moist, medium dense, non plastic, some gravel	SPT	4-7-12 (19)						
965	10		CLAYEY SAND (SC), light brown, medium grained, slightly moist, very firm to hard, medium plasticity, some coarse gravel	R	9-35	97	3.8	32	21	11	15
960	15			SPT	50/2"						
955	20		SANDY SILT (ML), light brown, subangular, slightly moist, dense, non plastic, some gravel, medium to coarse sand	SPT	11-15-21 (36)			NP	NP	NP	56
			CLAY WITH SAND (CL), brown, moist, very firm, low to medium plasticity, trace fine gravel, some fine sand								
950	25										

(Continued Next Page)

Ethos Engineering, LLC.
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-91

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 1/5/2022 **COMPLETED** 1/5/2022
BORING LOCATION STA 1244+40, 165' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.44072°N, -112.42746°E
DRILLING METHOD Tubex
GROUND ELEVATION 974 ft **BOREHOLE DEPTH** 46.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY SAND (SM), light brown, fine to medium grained, slightly moist, medium dense to very dense, non plastic, trace fine gravel	SPT	15-12-14 (26)			NP	NP	NP	16
945											
	30		Some cobbles from 30' to 32'	SPT	50/5"						
			Color change to white and moderate to strong cementation below 28'								
940			SAND WITH CLAY (SP-SC), brown, fine grained, moist, very dense, low plasticity, trace fine gravel, trace cobbles								
	35			SPT	5-10-50/4"						
935											
	40			SPT	50/4"						
			CLAYEY SAND (SC), brown, fine grained, moist, very firm, low to medium plasticity, trace fine gravel								
930											
	45			SPT	9-16-22 (38)			32	20	12	33

Bottom of borehole at 46.5 feet. Backfilled with soil cuttings.

Ethos Engineering, LLC.
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-91A

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/9/2022 **COMPLETED** 9/9/2022
BORING LOCATION STA 1244+40, 160' L SR 303L Cst CL
DRILLER ACS Services **DRILLED BY** N. Zamora
GPS COORDINATES 33.44072°N, -112.42746°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 974 ft **BOREHOLE DEPTH** 11 ft
RIG TYPE / # CME-75/BY
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 88
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY SAND WITH GRAVEL (SM), light brown, subangular, coarse grained, slightly moist, dense to very dense, no to low plasticity, fine gravel	R	7-8						
				AU							
				R	14-14						
970											
	5			R	16-10						
965											
	10			R	7-10						

Bottom of borehole at 11.0 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-92

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 1/5/2022 **COMPLETED** 1/5/2022
BORING LOCATION STA 1246+00, 155' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.44114°N, -112.42745°E
DRILLING METHOD Tubex
GROUND ELEVATION 977 ft **BOREHOLE DEPTH** 51.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
975			CLAYEY SAND (SC), brown, fine to medium grained, moist to slightly moist, soft, low plasticity, trace fine gravel	SPT	2-3-4 (7)						
				AU				27	19	8	24
	5		Some fine gravel below 5'	R	5-8						
970											
	10		SILTY SAND (SM), light brown, fine to medium grained, dense to very dense, no to low plasticity, trace fine gravel, trace clay	SPT	8-20-25 (45)		4.3	30	24	6	21
965											
	15			SPT	10-50/6"						
960											
	20			SPT	15-23-39 (62)						
955											
	25										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 1/5/2022 **COMPLETED** 1/5/2022 **BORING LOCATION** STA 1246+00, 155' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.44114°N, -112.42745°E
DRILLING METHOD Tubex **GROUND ELEVATION** 977 ft **BOREHOLE DEPTH** 51.5 ft
RIG TYPE / # CME 75/109 **GROUNDWATER DEPTH** ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY SAND (SM), light brown, fine to medium grained, dense to very dense, no to low plasticity, trace fine gravel, trace clay *(continued)* Brown, moist, increased fines below 25'	SPT	14-50/5"						
950											
	30			SPT	10-22-40 (62)			32	25	7	50
945											
	35		SAND (SP), brown, fine grained, slightly moist, medium dense, non plastic, trace fine gravel	SPT	7-10-15 (25)						
940											
	40		SAND WITH SILT (SP-SM), brown, fine to medium grained, moist, very dense, no to low plasticity, some gravel, trace cobbles	SPT	9-50/5"						
935			increased cobbles at 42'								
	45		SILTY SAND (SM), brown, fine to medium grained, moist, dense, no to low plasticity, trace fine gravel, trace clay	SPT	10-18-22 (40)		11.5	NP	NP	NP	24
930											
	50										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 1/5/2022 **COMPLETED** 1/5/2022
BORING LOCATION STA 1246+00, 155' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.44114°N, -112.42745°E
DRILLING METHOD Tubex
GROUND ELEVATION 977 ft **BOREHOLE DEPTH** 51.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
			SILTY SAND (SM), brown, fine to medium grained, moist, dense, no to low plasticity, trace fine gravel, trace clay*(continued)*	SPT	10-14-17 (31)						

Bottom of borehole at 51.5 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-93

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 1/10/2022 **COMPLETED** 1/10/2022
BORING LOCATION STA 1247+40, 235' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.44155°N, -112.42768°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 978 ft **BOREHOLE DEPTH** 15.6 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
975	0		CLAYEY SAND (SC), light brown, fine grained, slightly moist, medium dense, medium plasticity, trace fine gravel	SPT	12-14-12 (26)						
				AU			2.3	30	20	10	34
	5		SAND (SP), light brown, fine to medium grained, slightly moist, loose, non plastic, some gravel	R	5-10						
970											
	10		SILTY SAND (SM), light brown, fine to medium grained, slightly moist, medium dense, low plasticity, occasional gravel	SPT	6-10-16 (26)						
965											
	15		SAND (SP), light brown, fine to medium grained, slightly moist, very dense, non plastic, occasional gravel	SPT	37-50/1"						

Bottom of borehole at 15.6 feet. Backfilled with soil cuttings.

BORING NUMBER B-94

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 1/5/2022 **COMPLETED** 1/5/2022
BORING LOCATION STA 1247+40, 145' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.44153°N, -112.42744°E
DRILLING METHOD Tubex
GROUND ELEVATION 978 ft **BOREHOLE DEPTH** 61.42 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY SAND (SM), brown, fine grained, slightly moist, very loose, no to low plasticity, occasional gravel	SPT	2-1-3 (4)						
975				AU				NP	NP	NP	11
	5		CLAYEY SAND WITH GRAVEL (SC), brown, fine to medium grained, slightly moist, firm, medium plasticity, some gravel	SPT	5-8-9 (17)			34	18	16	15
970											
	10		SAND (SP), light brown to brown, fine to medium grained, slightly moist, loose to very dense, non plastic, some gravel, some cobbles	R	3-12						
965											
	15		Some silt and increased gravel below 15'	SPT	17-26-28 (54)						
960											
	20			SPT	30-50/1"						
955			Some cobbles below 22'								
	25										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 1/5/2022 **COMPLETED** 1/5/2022 **BORING LOCATION** STA 1247+40, 145' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.44153°N, -112.42744°E
DRILLING METHOD Tubex **GROUND ELEVATION** 978 ft **BOREHOLE DEPTH** 61.42 ft
RIG TYPE / # CME 75/109 **GROUNDWATER DEPTH** ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SAND (SP), light brown to brown, fine to medium grained, slightly moist, loose to very dense, non plastic, some gravel, some cobbles*(continued)*	SPT	50/2"						
950	30		SILTY SAND (SM), brown, moist, dense to very dense, non plastic, occasional gravel	SPT	8-15-26 (41)			NP	NP	NP	42
945	35			SPT	12-40-50/4"						
940	40		CLAYEY SAND (SC), light brown, fine grained, moist, hard, low to medium plasticity, trace fine gravel, trace cobbles	SPT	50/3"						
935	45		SAND WITH SILT (SP-SM), brown, fine grained, moist, dense to very dense, non plastic, trace gravel	SPT	12-15-23 (38)						
930	50										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 1/5/2022 **COMPLETED** 1/5/2022
BORING LOCATION STA 1247+40, 145' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.44153°N, -112.42744°E
DRILLING METHOD Tubex
GROUND ELEVATION 978 ft **BOREHOLE DEPTH** 61.42 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SAND WITH SILT (SP-SM), brown, fine grained, moist, dense to very dense, non plastic, trace gravel*(continued)*	SPT	10-19-23 (42)						
925											
	55		Cobbles at 55'	SPT	15-14-21 (35)		7.0	NP	NP	NP	11
920											
	60		Some poorly graded subangular gravel below 60'	SPT	9-19-50/5"						

Bottom of borehole at 61.4 feet. Backfilled with soil cuttings.

Ethos Engineering, LLC.
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-94A

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/9/2022 **COMPLETED** 9/9/2022
BORING LOCATION STA 1247+40, 140' L SR 303L Cst CL
DRILLER ACS Services **DRILLED BY** N. Zamora
GPS COORDINATES 33.44153°N, -112.42744°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 978 ft **BOREHOLE DEPTH** 11 ft
RIG TYPE / # CME-75/BY
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 88
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY SAND WITH GRAVEL (SM), light brown, subangular, fine to coarse grained, slightly moist, moderately firm, low plasticity, some to considerable fine gravel	R	9-9						
				AU							
975			SANDY SILTY CLAY (CL-ML), light brown to brown, subangular, fine to coarse grained, slightly moist, moderately firm, low to medium plasticity, occasional fine gravel	R	6-13						
	5										
			SILTY SAND (SM), light brown, subangular, fine to medium grained, slightly moist, very firm to firm, low plasticity, some fine gravel	R	19-42						
970											
	10			R	15-21						

Bottom of borehole at 11.0 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-95

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 1/6/2022 **COMPLETED** 1/6/2022
BORING LOCATION STA 1248+90, 135' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.44196°N, -112.42742°E
DRILLING METHOD Tubex
GROUND ELEVATION 980 ft **BOREHOLE DEPTH** 66.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
980			CLAYEY SAND (SC), brown, fine to medium grained, slightly moist, moderately firm to hard, medium plasticity, some gravel	SPT	2-4-5 (9)			43	24	19	22
				AU			6.5				
975	5		Low plasticity, occasional gravel below 5'	R	17-50/5"	121	3.2				
970	10		Light brown below 10'	SPT	18-38-50/3"						
965	15			SPT	23-42-50/2"			44	24	20	47
960	20		White to light brown, trace fine gravel below 20'	SPT	31-50/5"						
955	25										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 1/6/2022 **COMPLETED** 1/6/2022 **BORING LOCATION** STA 1248+90, 135' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.44196°N, -112.42742°E
DRILLING METHOD Tubex **GROUND ELEVATION** 980 ft **BOREHOLE DEPTH** 66.5 ft
RIG TYPE / # CME 75/109 **GROUNDWATER DEPTH** ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
955			CLAYEY SAND (SC), brown, fine to medium grained, slightly moist, moderately firm to hard, medium plasticity, some gravel *(continued)*	SPT	12-50/5"						
			Brown, moist at 25'								
			Some cobbles at 28'								
950	30			SPT	8-10-13 (23)						
945	35			SPT	50/5"						
			Some cobbles at 36'								
940	40			SPT	17-9-17 (26)						
935	45		SILTY SAND (SM), brown, fine grained, moist, dense, non plastic, trace gravel	SPT	5-14-23 (37)			NP	NP	NP	33
930	50										

(Continued Next Page)

Ethos Engineering s

BORING NUMBER B-95

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 1/6/2022 **COMPLETED** 1/6/2022
BORING LOCATION STA 1248+90, 135' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.44196°N, -112.42742°E
DRILLING METHOD Tubex
GROUND ELEVATION 980 ft **BOREHOLE DEPTH** 66.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
930											
925	55		SILTY SAND (SM), brown, fine grained, moist, dense, non plastic, trace gravel*(continued)*	SPT	10-12-17 (29)						
920	60		CLAYEY SAND (SC), brown, fine grained, moist, very firm, medium to high plasticity, trace gravel	SPT	7-13-22 (35)		23.0	57	27	30	46
915	65		SAND (SP), light brown to brown, fine to medium grained, moist, very dense, non plastic, some gravel	SPT	16-17-41 (58)						
				SPT	25-50						

Bottom of borehole at 66.5 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-96

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 1/7/2022 **COMPLETED** 1/7/2022
BORING LOCATION STA 1250+30, 135' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.44236°N, -112.42742°E
DRILLING METHOD Tubex
GROUND ELEVATION 981 ft **BOREHOLE DEPTH** 66.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
980			CLAYEY SAND (SC), brown to light brown, fine grained, slightly moist, firm, low to medium plasticity, occasional fine gravel	SPT	2-6-9 (15)						15
	5			AU				36	21	15	
975			SANDY CLAY WITH GRAVEL (CL), light brown, slightly moist, very firm, medium plasticity, coarse gravel, fine sand	SPT	10-15-26 (41)			45	21	24	64
	10										
970			SAND (SP), brown to light brown, fine to medium grained, slightly moist, medium dense, non plastic, trace fine gravel, trace cobbles	SPT	11-11-13 (24)						
	15										
965			SANDY CLAY (CL), light brown, slightly moist, hard, low to medium plasticity, considerable fine to medium sand, trace fine gravel	R	42-35	108	6.3				
	20										
960			SAND (SP), light brown, fine grained, slightly moist, very dense, non plastic, trace fine gravel	SPT	7-21-50/4"						
	25										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 1/7/2022 **COMPLETED** 1/7/2022 **BORING LOCATION** STA 1250+30, 135' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.44236°N, -112.42742°E
DRILLING METHOD Tubex **GROUND ELEVATION** 981 ft **BOREHOLE DEPTH** 66.5 ft
RIG TYPE / # CME 75/109 **GROUNDWATER DEPTH** ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
955			SANDY CLAY (CL), light brown, slightly moist, hard, low to medium plasticity, considerable fine sand, trace fine gravel	SPT	50/5"						
	30										
950			SANDY SILT (ML), brown, moist, hard, low plasticity, trace fine gravel	SPT	9-14-23 (37)			27	23	4	55
	35										
945			SAND WITH SILT (SP-SM), brown to light brown, fine to medium grained, moist, medium dense, non plastic, trace fine gravel	SPT	4-10-15 (25)		4.2	NP	NP	NP	11
	40										
940			CLAYEY SAND (SC), brown, fine grained, moist, firm, low to medium plasticity, trace fine gravel, trace cobbles	SPT	7-10-14 (24)						
	45										
935			Increased plasticity below 45'	SPT	7-11-20 (31)						
	50										

(Continued Next Page)

Ethos Engineering s

BORING NUMBER B-96

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 1/7/2022 **COMPLETED** 1/7/2022
BORING LOCATION STA 1250+30, 135' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.44236°N, -112.42742°E
DRILLING METHOD Tubex
GROUND ELEVATION 981 ft **BOREHOLE DEPTH** 66.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
930			CLAYEY SAND (SC), brown, fine grained, moist, firm, low to medium plasticity, trace fine gravel, trace cobbles *(continued)*	SPT	9-14-25 (39)						
	55										
925			SILTY SAND (SM), brown, fine to medium grained, moist, dense, non plastic, trace fine gravel, some cobbles	SPT	8-20-21 (41)		8.4	NP	NP	NP	19
	60										
920			SAND WITH GRAVEL (SP), brown to light brown, subangular, fine to medium grained, slightly moist, very dense, non plastic, some gravel	SPT	15-39-50/5"						
	65										
915			Increased gravel; light brown below 65'	SPT	6-25-20 (45)						

Bottom of borehole at 66.5 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-97

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/22/2022 **COMPLETED** 3/22/2022
BORING LOCATION STA 1240+00, 190' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.43956°N, -112.42619°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 973 ft **BOREHOLE DEPTH** 10.9 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND (SC), light brown, subangular, medium to coarse grained, slightly moist, firm, medium plasticity, occasional gravel								
970				AU SPT	8-8-9 (17)		7.5	33	18	15	41
	5		SAND (SP), light brown, medium to coarse grained, slightly moist, medium dense to very dense, non plastic, trace fine gravel	SPT	7-10-11 (21)						
965											
	10		SILTY CLAY (CL), light brown, slightly moist, hard, low to medium plasticity, trace fine gravel, trace fine sand	SPT	25-50/4"						

Bottom of borehole at 10.9 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-97A

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 6/15/2022 **COMPLETED** 6/15/2022
BORING LOCATION STA 1242+70, 120' R SR 303L Cst CL
DRILLER ACS Services **DRILLED BY** M. Valdez
GPS COORDINATES 33.4403°N, -112.42652°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 974 ft **BOREHOLE DEPTH** 15.9 ft
RIG TYPE / # CME 75/BY
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 88
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND (SC), light brown to brown, subangular, fine to medium grained, moist, moderately firm to hard, medium plasticity, trace fine gravel, weak lime cementation	AU			4.7	29	15	14	43
				R	7-10						
970											
	5		Weak to moderate lime cementation below 5'	SPT	7-7-6 (13)						
965											
	10		Low to medium plasticity below 10'	SPT	3-5-6 (11)						
960											
	15		Moderate lime cementation below 15'	SPT	30-50/5"						

Bottom of borehole at 15.9 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-98

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/22/2022 **COMPLETED** 3/22/2022
BORING LOCATION STA 1243+50, 95' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.44054°N, -112.4266°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 974 ft **BOREHOLE DEPTH** 15.4 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND (SC), light brown, angular, medium to coarse grained, slightly moist, moderately firm to very firm, medium plasticity, occasional gravel								
				AU SPT	4-7-7 (14)		7.5	29	12	17	43
970	5										
				R	13-27						
965	10										
				SPT	6-18-28 (46)		6.6	29	12	17	23
960	15										
			SANDY SILT (ML), white to light brown, subangular, slightly moist, very dense, low plasticity, considerable gravel, medium to coarse sand	SPT	50/5"						

Bottom of borehole at 15.4 feet. Backfilled with soil cuttings.

BORING NUMBER B-98A

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 6/15/2022 **COMPLETED** 6/15/2022
BORING LOCATION STA 1244+50, 115' R SR 303L Cst CL
DRILLER ACS Services **DRILLED BY** M. Valdez
GPS COORDINATES 33.44082°N, -112.42657°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 977 ft **BOREHOLE DEPTH** 41.5 ft
RIG TYPE / # CME 75/BY
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 88
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
975			CLAYEY SAND (SC), brown, subangular, fine to coarse grained, slightly moist, firm, medium plasticity, trace fine gravel	AU			4.3	30	15	15	39
			Increased gravel below 2.5'	SPT	5-9-7 (16)						
	5										
970			SANDY SILTY CLAY (CL), light brown to brown, subangular, slightly moist, very firm, low plasticity, some fine gravel, considerable fine to medium sand, weak to moderate lime cementation	R	17-20						
	10			SPT	14-14-19 (33)						
965											
	15										
960			SILTY, CLAYEY SAND (SC-SM), white to light brown, subangular, fine grained, slightly moist, hard, low plasticity, some fine gravel, moderate lime cementation	SPT	14-50/5"						
	20										
955			SILTY CLAY WITH SAND (CL), light brown to brown, slightly moist, hard, low plasticity, some fine to medium sand, weak to moderate lime cementation	SPT	25-36-21 (57)						
	25										

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Ethos Engineering s

BORING NUMBER B-98A

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 6/15/2022 **COMPLETED** 6/15/2022
BORING LOCATION STA 1244+50, 115' R SR 303L Cst CL
DRILLER ACS Services **DRILLED BY** M. Valdez
GPS COORDINATES 33.44082°N, -112.42657°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 977 ft **BOREHOLE DEPTH** 41.5 ft
RIG TYPE / # CME 75/BY
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 88
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
950			SILTY, CLAYEY SAND (SC-SM), light brown, subangular, fine grained, slightly moist, very firm, low plasticity, trace fine gravel, weak lime cementation	SPT	14-16-20 (36)						
	30		Increased sand below 30'	SPT	7-11-7 (18)						
945			CLAY WITH SAND (CL), light brown, subangular, slightly moist, moderately firm to firm, low plasticity, some fine gravel, some fine to medium sand, weak lime cementation								
	35			SPT	7-8-6 (14)						
940											
	40		Decreased gravel below 40'	SPT	14-17-14 (31)						

Bottom of borehole at 41.5 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-99

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/21/2022 **COMPLETED** 3/22/2022
BORING LOCATION STA 1247+00, 110' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.4415°N, -112.42658°E
DRILLING METHOD Tubex
GROUND ELEVATION 978 ft **BOREHOLE DEPTH** 56.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
975	5		CLAYEY SAND (SC), light brown, subangular, fine to coarse grained, slightly moist, moderately firm, medium plasticity, trace gravel	SPT	4-6-7 (13)						
				AU			6.8	27	18	9	26
970	10		SILTY SAND (SM), light brown, subangular, fine to medium grained, slightly moist, very dense, non plastic, trace gravel	SPT	7-23-30 (53)						
965	15		SILTY, CLAYEY SAND (SC-SM), white to light brown, fine to medium grained, slightly moist, dense, no to low plasticity, trace fine gravel, weak lime cementation	SPT	18-19-20 (39)						
960	20		SILTY CLAY (CL), light brown, slightly moist, hard, medium plasticity, trace fine gravel, trace fine sand	SPT	8-21-31 (52)						
955	25		SAND WITH SILT (SP-SM), light brown, fine to medium grained, slightly moist, very dense, non plastic, trace fine gravel Weak lime cementation at 21.5'	SPT	12-21-34 (55)		2.6	NP	NP	NP	9

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 3/21/2022 **COMPLETED** 3/22/2022 **BORING LOCATION** STA 1247+00, 110' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.4415°N, -112.42658°E
DRILLING METHOD Tubex **GROUND ELEVATION** 978 ft **BOREHOLE DEPTH** 56.5 ft
RIG TYPE / # CME 75/109 **GROUNDWATER DEPTH** ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SAND WITH SILT (SP-SM), light brown, fine to medium grained, slightly moist, very dense, non plastic, trace fine gravel *(continued)*	SPT	50/2"						
950	30										
			CLAYEY SAND (SC), light brown, fine grained, slightly moist, firm, low plasticity, trace gravel	SPT	8-9-13 (22)						
945	35										
			SILTY SAND (SM), light brown, fine grained, slightly moist, medium dense, non plastic, trace fine gravel	SPT	9-14-15 (29)						
940	40										
			SANDY CLAY (CL), light brown to brown, subangular, moist, hard, medium plasticity, some gravel, occasional to some fine to medium sand Weak lime cementation from 41' to 43'	SPT	50/4"						
935	45										
			CLAYEY SAND (SC), brown, fine to medium grained, moist, very firm, low to medium plasticity, trace fine gravel	R	18-48	111	13.3	31	21	10	33
930	50										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/21/2022 **COMPLETED** 3/22/2022
BORING LOCATION STA 1247+00, 110' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.4415°N, -112.42658°E
DRILLING METHOD Tubex
GROUND ELEVATION 978 ft **BOREHOLE DEPTH** 56.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND (SC), brown, fine to medium grained, moist, very firm, low to medium plasticity, trace fine gravel *(continued)*	SPT	7-15-20 (35)						
925											
	55			SPT	13-12-21 (33)						

Bottom of borehole at 56.5 feet. Backfilled with soil cuttings.

BORING NUMBER B-100

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/21/2022 **COMPLETED** 3/21/2022
BORING LOCATION STA 1248+50, 110' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.44195°N, -112.42658°E
DRILLING METHOD Tubex
GROUND ELEVATION 979 ft **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND (SC), brown, moist, soft to very firm, low to medium plasticity, trace gravel, medium to coarse sand	SPT	4-3-4 (7)						
				AU			8.6	26	17	9	37
975	5			SPT	6-11-24 (35)						
970	10		Silty Sand (SM) lense from 10' to 10.5'								
			SILTY CLAY (CH), light brown, slightly moist, very firm, medium to high plasticity, trace fine gravel, trace fine sand	SPT	20-18-23 (41)						
965	15		CLAYEY SAND (SC), light brown, fine grained, slightly moist, very firm, medium plasticity, trace fine gravel	SPT	12-15-21 (36)		10.0	34	21	13	45
960	20		SILTY SAND (SM), light brown, medium to coarse grained, slightly moist to moist, very dense, non plastic, trace gravel	SPT	31-50/1"						
955	25		Weak lime cementation from 21' to 24'								

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 3/21/2022 **COMPLETED** 3/21/2022 **BORING LOCATION** STA 1248+50, 110' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.44195°N, -112.42658°E
DRILLING METHOD Tubex **GROUND ELEVATION** 979 ft **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # CME 75/109 **GROUNDWATER DEPTH** ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY SAND (SM), light brown, medium to coarse grained, slightly moist to moist, very dense, non plastic, trace gravel *(continued)*	SPT	7-9-9 (18)						
950			Fine grained, moist, medium dense below 25'								
	30		White to brown, dense below 30'	R	10-24	92	12.0	NP	NP	NP	33
945											
	35		Very dense at 35'	SPT	7-50/5"						
			Weak lime cementation below 36'								
940											
	40		CLAYEY SAND (SC), brown, fine grained, moist, very firm, low to medium plasticity, trace fine gravel	R	8-31	103	20.5	38	21	17	44
935											
	45			SPT	9-14-19 (33)						
930											
	50										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 3/21/2022 **COMPLETED** 3/21/2022 **BORING LOCATION** STA 1248+50, 110' R SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.44195°N, -112.42658°E

DRILLING METHOD Tubex **GROUND ELEVATION** 979 ft **BOREHOLE DEPTH** 61.5 ft

RIG TYPE / # CME 75/109 ▼ **GROUNDWATER DEPTH** ---

HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND (SC), brown, fine grained, moist, very firm, low to medium plasticity, trace fine gravel*(continued)*	SPT	10-15-31 (46)						
925	55		SAND (SP), light brown, subangular, fine to medium grained, slightly moist, dense, non plastic, occasional gravel	SPT	9-16-16 (32)						
920	60		CLAYEY SAND WITH GRAVEL (SC), light brown, subangular, medium to coarse grained, moist, hard, medium plasticity, considerable gravel	SPT	12-48-44 (92)						

Bottom of borehole at 61.5 feet. Backfilled with soil cuttings.

BORING NUMBER B-101

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/18/2022 **COMPLETED** 3/18/2022
BORING LOCATION STA 1250+10, 110' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.44235°N, -112.42659°E
DRILLING METHOD Tubex
GROUND ELEVATION 981 ft **BOREHOLE DEPTH** 66.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
980			CLAYEY SAND WITH GRAVEL (SC), light brown, medium to coarse grained, slightly moist, firm, low plasticity, some fine gravel	SPT	4-9-9 (18)						
				AU			4.2	25	16	9	31
	5										
975				SPT	13-16-19 (35)						
			SILTY CLAY (CL), light brown, slightly moist to moist, very firm, low to medium plasticity, trace fine gravel, trace fine sand								
	10										
970				SPT	28-18-7 (25)						
			SILTY SAND (SM), light brown, fine grained, slightly moist, medium dense to very dense, low plasticity, trace fine gravel								
	15										
			Some weak lime cementation from 15' to 20'								
965				SPT	10-18-28 (46)						
	20										
960				SPT	24-40-50/1"		9.8	35	27	8	30
	25										

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CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 3/18/2022 **COMPLETED** 3/18/2022 **BORING LOCATION** STA 1250+10, 110' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.44235°N, -112.42659°E
DRILLING METHOD Tubex **GROUND ELEVATION** 981 ft **BOREHOLE DEPTH** 66.5 ft
RIG TYPE / # CME 75/109 **GROUNDWATER DEPTH** ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
955			SILTY CLAY (CL), light brown, slightly moist, hard, medium to high plasticity, trace fine gravel, trace fine sand, moderate to strong lime cementation	SPT	50/4"						
	30										
950			SILTY SAND (SM), brown, fine grained, moist, dense, no to low plasticity, trace fine gravel	R	11-30						
	35										
945				R	9-21	98	14.2	NP	NP	NP	38
	40										
940			CLAY (CL), brown, moist, moderately firm, medium to high plasticity, trace fine gravel, trace fine sand	SPT	4-5-8 (13)						
	45		Increased sand, decreased plasticity, very firm below 45'								
935				SPT	8-16-26 (42)						
	50										

(Continued Next Page)

Ethos Engineering s

BORING NUMBER B-101

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/18/2022 **COMPLETED** 3/18/2022
BORING LOCATION STA 1250+10, 110' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.44235°N, -112.42659°E
DRILLING METHOD Tubex
GROUND ELEVATION 981 ft **BOREHOLE DEPTH** 66.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
930			CLAY (CL), brown, moist, moderately firm, medium to high plasticity, trace fine gravel, trace fine sand *(continued)*	SPT	8-16-23 (39)						
			Clayey Sand (SC) lense from 50' to 51'								
			SAND (SP), light brown, fine to medium grained, slightly moist, dense, non plastic, trace fine gravel								
	55			SPT	11-13-20 (33)						
925			CLAYEY SAND (SC), brown, fine to medium grained, moist, very firm, low to medium plasticity, trace fine gravel								
	60			SPT	8-14-16 (30)						
920			SAND (SP), light brown, subangular, medium to coarse grained, moist, medium dense to very dense, non plastic, some gravel								
	65			SPT	7-32-42 (74)						
915			Increased gravel below 60'								

Bottom of borehole at 66.5 feet. Backfilled with soil cuttings.

BORING NUMBER B-102

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 1/6/2022 **COMPLETED** 1/7/2022
BORING LOCATION STA 1251+50, 105' L SR 303L Cst CL
DRILLER Cascade **DRILLED BY** M. Villalobos
GPS COORDINATES 33.44271°N, -112.42732°E
DRILLING METHOD Roto-Sonic
GROUND ELEVATION 982 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # TSI-150CC/BB6B45
GROUNDWATER DEPTH 95 ft / Elev 887 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 77
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
980			SILTY CLAY WITH SAND (CL-ML), brown, moist, low plasticity, trace fine gravel, considerable fine to medium sand								
			Increased gravel below 3'								
	5		SAND (SP), brown, fine to medium grained, moist, medium dense, non plastic, trace fine gravel	SPT	3-5-6 (11)						
975			CLAYEY SAND (SC), brown, fine to medium grained, moist, firm to hard, low to medium plasticity, trace fine gravel, weak lime cementation	AU			11.5	32	18	14	46
	10			SPT	10-11-11 (22)						
970				AU							
	15		Some gravel below 15'	SPT AU	24-36-48 (84)		12.2	33	20	13	33
965											
	20			SPT	50/2"						
960			CLAYEY GRAVEL WITH SAND (GC), light brown, moist, low to medium plasticity, some fine to medium sand, trace cobbles, weak lime cementation	AU							
	25										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 1/6/2022 **COMPLETED** 1/7/2022 **BORING LOCATION** STA 1251+50, 105' L SR 303L Cst CL
DRILLER Cascade **DRILLED BY** M. Villalobos **GPS COORDINATES** 33.44271°N, -112.42732°E
DRILLING METHOD Roto-Sonic **GROUND ELEVATION** 982 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # TSI-150CC/BB6B45 **GROUNDWATER DEPTH** 95 ft / Elev 887 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 77 **LOGGED BY** M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SANDY CLAY (CL), brown, moist, hard, medium plasticity, occasional gravel, some fine sand, weak lime cementation	SPT	16-18-34 (52)		19.5	37	24	13	51
955											
			CLAYEY SAND (SC), brown, fine grained, moist, low to medium plasticity, trace fine gravel, weak lime cementation								
	30										
			SILTY SAND (SM), brown, fine grained, moist, dense, non plastic, trace gravel, weak lime cementation	SPT	9-13-26 (39)		13.6	NP	NP	NP	38
950				AU							
			SAND WITH SILT (SP-SM), brown, fine to medium grained, slightly moist, dense, no to low plasticity, occasional gravel	AU							
	35			SPT	7-22-50/1"						
945			Considerable gravel below 37'	AU							
			CLAYEY GRAVEL WITH SAND (GC), brown, moist, very firm, low to medium plasticity, some fine to medium sand, some cobbles	AU							
	40			SPT	15-20-18 (38)						
940											
			SANDY CLAY (CL), brown, moist, firm, medium plasticity, some fine sand	AU			28.3	39	23	16	56
	45			SPT	4-7-14 (21)						
935											
			SAND WITH CLAY (SP-SC), brown, fine to medium grained, moist, very firm, no to low plasticity, trace gravel	AU							
	50										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 1/6/2022 **COMPLETED** 1/7/2022 **BORING LOCATION** STA 1251+50, 105' L SR 303L Cst CL

DRILLER Cascade **DRILLED BY** M. Villalobos **GPS COORDINATES** 33.44271°N, -112.42732°E

DRILLING METHOD Roto-Sonic **GROUND ELEVATION** 982 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # TSI-150CC/BB6B45 **GROUNDWATER DEPTH** 95 ft / Elev 887 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 77 **LOGGED BY** M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SAND WITH CLAY (SP-SC), brown, fine to medium grained, moist, very firm, no to low plasticity, trace gravel *(continued)*	SPT	13-18-21 (39)						
930			CLAYEY SAND (SC), brown, fine to medium grained, moist, low to medium plasticity, some fine gravel	AU							
	55		SAND WITH SILT (SP-SM), dark brown to brown, medium to coarse grained, slightly moist, very firm, no to low plasticity, some gravel	SPT	15-20-18 (38)						
925			SILTY SAND WITH GRAVEL (SM), brown, subangular, medium to coarse grained, slightly moist, non plastic, some cobbles	AU			7.8	NP	NP	NP	26
	60		SAND (SP), brown, medium grained, moist, dense to very dense, non plastic, trace fine gravel	SPT	13-16-18 (34)						
920				AU							
	65			SPT	50/5"						
915				AU							
			GRAVEL WITH SAND (GP), brown, angular, moist, dense, non plastic, some cobbles, some medium to coarse sand								
	70		Increased fines from 70' to 71'	AU SPT	38-19-20 (39)						
910											
	75										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 1/6/2022 **COMPLETED** 1/7/2022 **BORING LOCATION** STA 1251+50, 105' L SR 303L Cst CL
DRILLER Cascade **DRILLED BY** M. Villalobos **GPS COORDINATES** 33.44271°N, -112.42732°E
DRILLING METHOD Roto-Sonic **GROUND ELEVATION** 982 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # TSI-150CC/BB6B45 **GROUNDWATER DEPTH** 95 ft / Elev 887 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 77 **LOGGED BY** M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			GRAVEL WITH SAND (GP), brown, angular, moist, dense, non plastic, some cobbles, some medium to coarse sand *(continued)*	SPT	48-38-36 (74)						
905			CLAYEY GRAVEL WITH SAND (GC), brown, poorly graded, subangular, moist, hard, low to medium plasticity, medium to coarse sand, some cobbles	AU							
				AU							
	80			SPT	22-38-28 (66)						
900											
			SAND WITH CLAY (SP-SC), brown, fine to medium grained, moist, firm, low to medium plasticity, occasional gravel								
	85			SPT	9-11-15 (26)						
			CLAY (CL), brown, moist to wet, medium to high plasticity, trace fine sand								
895				AU							
			SAND WITH CLAY (SP-SC), brown, fine to medium grained, moist, firm, low to medium plasticity, occasional gravel								
	90			SPT	7-13-15 (28)						
890											
	95	▼									
			SAND (SP), brown, medium to coarse grained, wet, dense, non plastic, occasional gravel	SPT	9-12-36 (48)						
885											
			CLAYEY GRAVEL WITH SAND (GC), brown, moist to very moist, medium plasticity, some fine sand	AU			23.4	45	20	25	29
	100										

(Continued Next Page)

Ethos Engineering s

BORING NUMBER B-102

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 1/6/2022 **COMPLETED** 1/7/2022
BORING LOCATION STA 1251+50, 105' L SR 303L Cst CL
DRILLER Cascade **DRILLED BY** M. Villalobos
GPS COORDINATES 33.44271°N, -112.42732°E
DRILLING METHOD Roto-Sonic
GROUND ELEVATION 982 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # TSI-150CC/BB6B45
GROUNDWATER DEPTH 95 ft / Elev 887 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 77
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
			SAND (SP), brown, medium to coarse grained, wet, dense, non plastic, occasional gravel	SPT	11-16-17 (33)						

Bottom of borehole at 101.5 feet. Backfilled with soil cuttings; grouted upper 25'.

Ethos Engineering s

BORING NUMBER B-103

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/14/2022 **COMPLETED** 3/15/2022
BORING LOCATION STA 1251+50, 105' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.44271°N, -112.42663°E
DRILLING METHOD Tubex
GROUND ELEVATION 982 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH 95 ft / Elev 887 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
980	0		CLAYEY SAND WITH GRAVEL (SC), light brown, subrounded, medium to coarse grained, slightly moist, moderately firm, low to medium plasticity, trace gravel	SPT	6-10-11 (21)						
				AU			5.5	32	22	10	24
	5		Increased sand from 5' to 6'	SPT	6-11-17 (28)						
975			SILTY CLAY (CL), light brown, slightly moist, firm, trace fine gravel, trace fine sand								
	10		SILTY SAND (SM), light brown, subangular, fine grained, slightly moist, very dense, low to medium plasticity, trace gravel	SPT	15-31-45 (76)		6.0	38	28	10	20
970											
	15			SPT	50/1"						
965			Weak lime cementation below 18'								
	20		SILTY CLAY (CL), light brown, slightly moist, hard, low to medium plasticity, trace fine gravel, trace fine sand, weak to moderate lime cementation	SPT	42-50/4"						
960											
	25										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 3/14/2022 **COMPLETED** 3/15/2022 **BORING LOCATION** STA 1251+50, 105' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.44271°N, -112.42663°E
DRILLING METHOD Tubex **GROUND ELEVATION** 982 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME 75/109 **GROUNDWATER DEPTH** 95 ft / Elev 887 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
955			SILTY CLAY (CL), light brown, slightly moist, hard, low to medium plasticity, trace fine gravel, trace fine sand, weak to moderate lime cementation*(continued)*	R	14-42						
	30		SANDY SILT (ML), brown, fine grained, moist, dense to medium dense, low plasticity, trace fine gravel	SPT	9-25-22 (47)		16.3	39	31	8	68
950											
	35			SPT	8-13-13 (26)						
945											
	40		SAND (SP), light brown, angular, medium grained, slightly moist, dense, non plastic, trace gravel	SPT	12-17-20 (37)						
940											
	45		SANDY CLAY (CL), brown, moist, hard, medium plasticity, trace fine gravel, trace fine to medium sand	SPT	50/4"						
935											
	50										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/14/2022 **COMPLETED** 3/15/2022
BORING LOCATION STA 1251+50, 105' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.44271°N, -112.42663°E
DRILLING METHOD Tubex
GROUND ELEVATION 982 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH 95 ft / Elev 887 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
930			CLAYEY SAND (SC), brown, fine to medium grained, moist, very firm, low to medium plasticity, trace fine gravel	SPT	10-13-24 (37)						
	55			SPT	10-16-32 (48)						
925											
	60		SAND WITH SILT AND GRAVEL (SP-SM), light brown, poorly graded, subangular, medium to coarse grained, moist, very dense, non plastic, trace gravel	SPT	13-24-28 (52)		8.8	NP	NP	NP	11
920											
	65		CLAYEY SAND WITH GRAVEL (SC), light brown and gray, poorly graded, angular, medium to coarse grained, slightly moist, hard, low to medium plasticity, gravel	SPT	28-21-41 (62)						
915											
	70		CLAYEY GRAVEL WITH SAND (GC), light brown and gray, poorly graded, subangular, moist, hard, low to medium plasticity, medium to coarse sand	SPT	18-40-50/5"						
910											
	75										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 3/14/2022 **COMPLETED** 3/15/2022 **BORING LOCATION** STA 1251+50, 105' R SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.44271°N, -112.42663°E

DRILLING METHOD Tubex **GROUND ELEVATION** 982 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # CME 75/109 ▼ **GROUNDWATER DEPTH** 95 ft / Elev 887 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
905	80		CLAYEY GRAVEL WITH SAND (GC), light brown and gray, poorly graded, subangular, moist, hard, low to medium plasticity, medium to coarse sand *(continued)*	SPT	32-50/4"						
900	85		GRAVELLY CLAY WITH SAND (CL), grayish brown, angular, moist, hard to very firm, medium to high plasticity, considerable gravel, some medium to coarse sand	SPT	8-50/5"						
				R	20-39	101	23.3				
895	90										
890	95		SAND (SP), brown, fine grained, moist to wet, dense, non plastic, trace fine gravel ▼	SPT	9-16-16 (32)						
885	100		CLAYEY SAND (SC), brown, fine grained, wet, firm, low plasticity, trace fine gravel	SPT	9-11-17 (28)						

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/14/2022 **COMPLETED** 3/15/2022
BORING LOCATION STA 1251+50, 105' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.44271°N, -112.42663°E
DRILLING METHOD Tubex
GROUND ELEVATION 982 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH 95 ft / Elev 887 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
			CLAYEY SAND (SC), brown, fine grained, wet, firm, low plasticity, trace fine gravel*(continued)* Sand lense (SP) from 100' to 101'	SPT	16-28-42 (70)						

Bottom of borehole at 101.5 feet. Backfilled with soil cuttings; grouted upper 25'.

BORING NUMBER B-104

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 1/10/2022 **COMPLETED** 1/11/2022
BORING LOCATION STA 1253+10, 120' L SR 303L Cst CL
DRILLER Cascade **DRILLED BY** M. Villalobos
GPS COORDINATES 33.44314°N, -112.42736°E
DRILLING METHOD Roto-Sonic
GROUND ELEVATION 981 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # TSI-150CC/BB6B45
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 77
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
980			CLAYEY SAND (SC), light brown, subangular, fine to medium grained, slightly moist, firm, low to medium plasticity, trace fine gravel								
	5		some thin sandy clay (CL) layers below 5'	SPT	8-9-8 (17)			26	17	9	20
975											
	10			SPT	18-12-16 (28)						
970				AU							
	15		SAND (SP), light brown, subangular, fine to medium grained, slightly moist, medium dense, non plastic, trace fine gravel	SPT	10-10-8 (18)						
965											
	20		SAND WITH SILT (SP-SM), light brown, fine to medium grained, slightly moist, dense, non plastic, some gravel	SPT	14-15-16 (31)						
960											
	25		CLAYEY GRAVEL WITH SAND (GC), light brown, subangular, coarse grained, slightly moist, very firm, low plasticity, considerable fine to medium sand, moderate lime cementation	AU				25	17	8	30

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 1/10/2022 **COMPLETED** 1/11/2022 **BORING LOCATION** STA 1253+10, 120' L SR 303L Cst CL

DRILLER Cascade **DRILLED BY** M. Villalobos **GPS COORDINATES** 33.44314°N, -112.42736°E

DRILLING METHOD Roto-Sonic **GROUND ELEVATION** 981 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # TSI-150CC/BB6B45 **GROUNDWATER DEPTH** ---

HAMMER TYPE Auto **HAMMER EFFICIENCY** 77 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
955			SANDY CLAY (CL), brown to light brown, slightly moist, hard, medium plasticity, trace fine gravel, fine sand, moderate to strong lime cementation	SPT	50/2"						
	30		Moist, no gravel below 30'	SPT	50/5"						
950											
	35		CLAYEY SILT (CL-ML), brown, moist, firm, low plasticity, some fine sand	SPT	4-10-19 (29)						
945											
	40		SILTY SAND (SM), light brown, fine to medium grained, slightly moist, medium dense, non plastic, trace fine gravel	AU				NP	NP	NP	42
940				SPT	8-13-16 (29)						
	45		CLAYEY SAND (SC), brown, fine grained, moist, hard, medium plasticity, weak to moderate lime cementation	AU							
935				SPT	28-49-50/5"						
	50			AU				30	18	12	46

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 1/10/2022 **COMPLETED** 1/11/2022 **BORING LOCATION** STA 1253+10, 120' L SR 303L Cst CL
DRILLER Cascade **DRILLED BY** M. Villalobos **GPS COORDINATES** 33.44314°N, -112.42736°E
DRILLING METHOD Roto-Sonic **GROUND ELEVATION** 981 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # TSI-150CC/BB6B45 **GROUNDWATER DEPTH** ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 77 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
930			SAND (SP), light brown, fine to medium grained, moist, dense, non plastic, trace fine gravel	SPT	14-19-20 (39)						
			Some silt, weak lime cementation below 53'	AU							
	55										
925			SILTY CLAY (CL), brown, moist, very firm, medium plasticity, trace fine sand	SPT	6-12-18 (30)						
	60										
920			SAND (SP), light brown, fine to medium grained, moist, dense, non plastic, trace fine gravel	SPT	19-21-16 (37)						
	65										
915			CLAYEY SAND (SC), brown, subangular, fine to medium grained, moist, very firm, low plasticity, some gravel, some cobbles	SPT	43-28-17 (45)						
	70										
910			SAND WITH GRAVEL (SP), brown, poorly graded, subangular, medium grained, moist, very dense, non plastic, considerable gravel, some cobbles	SPT	45-28-28 (56)						
	75										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 1/10/2022 **COMPLETED** 1/11/2022 **BORING LOCATION** STA 1253+10, 120' L SR 303L Cst CL

DRILLER Cascade **DRILLED BY** M. Villalobos **GPS COORDINATES** 33.44314°N, -112.42736°E

DRILLING METHOD Roto-Sonic **GROUND ELEVATION** 981 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # TSI-150CC/BB6B45 **GROUNDWATER DEPTH** ---

HAMMER TYPE Auto **HAMMER EFFICIENCY** 77 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
905			SILTY SAND (SM), light brown, subangular, fine to medium grained, slightly moist, very dense, non plastic, considerable gravel	SPT	34-50-37 (87)						
	80										
900			SANDY CLAY WITH GRAVEL (CL), dark brown, angular, moist, hard to very firm, medium to high plasticity, considerable gravel, considerable fine to medium sand	SPT	50/5"						
			Some cobbles below 83'								
	85										
895				SPT	22-18-18 (36)						
	90										
890			CLAYEY SAND (SC), brown, fine to medium grained, moist, firm to hard, medium plasticity, trace fine gravel	SPT	10-16-19 (35)						
	95										
885				SPT	6-10-15 (25)						
	100										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 1/10/2022 **COMPLETED** 1/11/2022
BORING LOCATION STA 1253+10, 120' L SR 303L Cst CL
DRILLER Cascade **DRILLED BY** M. Villalobos
GPS COORDINATES 33.44314°N, -112.42736°E
DRILLING METHOD Roto-Sonic
GROUND ELEVATION 981 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # TSI-150CC/BB6B45
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 77
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
880			CLAYEY SAND (SC), brown, fine to medium grained, moist, firm to hard, medium plasticity, trace fine gravel*(continued)*	SPT	18-40-49 (89)						

Bottom of borehole at 101.5 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-105

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/28/2022 **COMPLETED** 3/29/2022
BORING LOCATION STA 1253+00, 105' R SR 303L Cst CL
DRILLER Cascade **DRILLED BY** M. Villalobos
GPS COORDINATES 33.44312°N, -112.42662°E
DRILLING METHOD Roto-Sonic
GROUND ELEVATION 981 ft **BOREHOLE DEPTH** 101.3 ft
RIG TYPE / # TSI-150CC/BB6B45
GROUNDWATER DEPTH 95 ft / Elev 886 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 77
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
980			SILTY, CLAYEY SAND (SC-SM), light brown to brown, subangular, medium to coarse grained, slightly moist, low plasticity, some fine gravel	AU							
	5										
975			CLAYEY SAND (SC), light brown to brown, subangular, fine grained, moist to slightly moist, very firm to hard, medium plasticity, trace fine gravel, weak to moderate lime cementation	SPT	12-13-23 (36)						
	10										
970				SPT	11-19-30 (49)						
			Increased gravel; white to light brown below 12'	AU			7.2	30	18	12	20
	15			SPT	23-50/5"						
965											
			CLAYEY GRAVEL WITH SAND (GC), white to light brown, poorly graded, subangular, slightly moist, hard, medium plasticity, some fine to medium sand, moderate lime cementation	AU			7.8	28	18	10	28
	20			SPT	50/5"						
960											
			CLAYEY SAND (SC), brown, poorly graded, subangular, fine grained, moist to slightly moist, hard, medium plasticity, some gravel, weak lime cementation	AU							
	25										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 3/28/2022 **COMPLETED** 3/29/2022 **BORING LOCATION** STA 1253+00, 105' R SR 303L Cst CL

DRILLER Cascade **DRILLED BY** M. Villalobos **GPS COORDINATES** 33.44312°N, -112.42662°E

DRILLING METHOD Roto-Sonic **GROUND ELEVATION** 981 ft **BOREHOLE DEPTH** 101.3 ft

RIG TYPE / # TSI-150CC/BB6B45 **GROUNDWATER DEPTH** 95 ft / Elev 886 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 77 **LOGGED BY** M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
955			CLAYEY SAND (SC), brown, poorly graded, subangular, fine grained, moist to slightly moist, hard, medium plasticity, some gravel, weak lime cementation*(continued)*	R	50/5"						
			CLAY (CL), brown, subangular, moist, firm, medium plasticity, trace gravel, some fine sand, weak lime cementation	AU							
	30			R	7-20						
950			SAND (SP), light brown to brown, fine to medium grained, slightly moist, dense, non plastic, trace fine gravel	AU							
	35			SPT	13-17-19 (36)						
945											
			SAND WITH CLAY AND GRAVEL (SP-SC), light brown, fine grained, slightly moist to moist, hard to very firm, low to medium plasticity, some fine gravel, weak to moderate lime cementation	AU							
	40			SPT	13-50/2"						
940			Decreased cementation below 42'	AU							
	45		Increased fines below 45'	R	16-27						
935			SAND WITH GRAVEL (SP), brown to light brown, poorly graded, subrounded, fine to medium grained, slightly moist, dense, non plastic, some gravel	AU							
	50										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 3/28/2022 **COMPLETED** 3/29/2022 **BORING LOCATION** STA 1253+00, 105' R SR 303L Cst CL
DRILLER Cascade **DRILLED BY** M. Villalobos **GPS COORDINATES** 33.44312°N, -112.42662°E
DRILLING METHOD Roto-Sonic **GROUND ELEVATION** 981 ft **BOREHOLE DEPTH** 101.3 ft
RIG TYPE / # TSI-150CC/BB6B45 **GROUNDWATER DEPTH** 95 ft / Elev 886 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 77 **LOGGED BY** M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
930			SAND WITH GRAVEL (SP), brown to light brown, poorly graded, subrounded, fine to medium grained, slightly moist, dense, non plastic, some gravel *(continued)*	SPT	12-16-22 (38)						
			GRAVEL WITH SAND (GP), brown to light brown, poorly graded, subrounded, moist to slightly moist, dense to very dense, non plastic, considerable medium sand	AU							
	55			SPT	16-16-23 (39)						
925				AU							
	60			SPT	50/5"						
920			Occasional cobbles below 62'								
				AU							
	65			SPT	50/5"						
915			Increased cobbles below 67'								
				AU							
	70		SILTY GRAVEL WITH SAND (GM), gray to reddish brown, poorly graded, subangular, slightly moist, very dense, no to low plasticity, considerable medium to coarse sand	SPT	11-50/4"						
910				AU							
	75										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 3/28/2022 **COMPLETED** 3/29/2022 **BORING LOCATION** STA 1253+00, 105' R SR 303L Cst CL

DRILLER Cascade **DRILLED BY** M. Villalobos **GPS COORDINATES** 33.44312°N, -112.42662°E

DRILLING METHOD Roto-Sonic **GROUND ELEVATION** 981 ft **BOREHOLE DEPTH** 101.3 ft

RIG TYPE / # TSI-150CC/BB6B45 **GROUNDWATER DEPTH** 95 ft / Elev 886 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 77 **LOGGED BY** M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
905				SPT	25-50/2"						
			CLAYEY GRAVEL (GC), gray to dark brown, poorly graded, subrounded, moist, very firm, low to medium plasticity, some medium to coarse sand, trace cobbles								
				AU							
	80										
900				SPT	13-28-17 (45)						
			GRAVEL WITH SAND (GP), brown to reddish brown, poorly graded, very moist to wet, very dense, non plastic, some medium to coarse sand, trace cobbles								
				AU							
	85										
895				SPT	13-22-43 (65)						
			Increased sand below 87'								
				AU							
	90										
890			SAND WITH CLAY (SP-SC), light brown to brown, poorly graded, subangular, fine grained, moist, very firm, low to medium plasticity, trace gravel	SPT	6-15-17 (32)						
			SAND (SP), brown, fine grained, wet, medium dense, non plastic, trace gravel								
				AU							
	95	▼									
885				R	16-24	104	22.7				
			CLAY WITH SAND (CL), brown, poorly graded, subrounded, wet, hard, medium plasticity, some gravel, some fine to medium sand								
				AU							
	100										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/28/2022 **COMPLETED** 3/29/2022
BORING LOCATION STA 1253+00, 105' R SR 303L Cst CL
DRILLER Cascade **DRILLED BY** M. Villalobos
GPS COORDINATES 33.44312°N, -112.42662°E
DRILLING METHOD Roto-Sonic
GROUND ELEVATION 981 ft **BOREHOLE DEPTH** 101.3 ft
RIG TYPE / # TSI-150CC/BB6B45
GROUNDWATER DEPTH 95 ft / Elev 886 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 77
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
880			CLAY WITH SAND (CL), brown, poorly graded, subrounded, wet, hard, medium plasticity, some gravel, some fine to medium sand*(continued)* Sand with clay (SP-SC) lense at 100'	SPT	10-40-50/3"						

Bottom of borehole at 101.3 feet. Backfilled with soil cuttings; grouted upper 25'.

BORING NUMBER B-106

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 4/5/2022 **COMPLETED** 4/5/2022
BORING LOCATION STA 1251+70, 740' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** S. Melson
GPS COORDINATES 33.44267°N, -112.42938°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 982 ft **BOREHOLE DEPTH** 6.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			3" AC								
980			CLAYEY SAND (SC), light brown, angular, fine to medium grained, moist, firm, medium plasticity, trace gravel	SPT	5-9-9 (18)						
				AU			10.1	28	16	12	32
	5		SILTY SAND (SM), light brown, fine to medium grained, slightly moist, medium dense, non plastic, trace fine gravel	SPT	3-5-6 (11)						

Bottom of borehole at 6.5 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-107

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 4/5/2022 **COMPLETED** 4/5/2022
BORING LOCATION STA 1252+70, 615' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** S. Melson
GPS COORDINATES 33.44302°N, -112.42511°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 983 ft **BOREHOLE DEPTH** 6 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
980	5		SANDY CLAY (CL), brown, subrounded, moist, moderately firm, medium plasticity, occasional gravel, considerable medium sand	SPT	3-5-10 (15)		11.7	27	17	10	51
				AU							
				R	5-4						

Bottom of borehole at 6.0 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-108

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 1/10/2022 **COMPLETED** 1/10/2022
BORING LOCATION STA 1253+60, 205' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.44323°N, -112.42764°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 964 ft **BOREHOLE DEPTH** 16.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
960	0		CLAYEY SAND (SC), brown, fine grained, slightly moist, firm, low to medium plasticity, occasional fine to medium gravel	SPT	6-14-16 (30)						
				AU				30	18	12	42
	5		SAND (SP), brown, fine to medium grained, slightly moist, medium dense, non plastic, trace fine gravel	R	7-11						
955											
	10			SPT	9-9-8 (17)						
950											
	15		CLAYEY SAND WITH GRAVEL (SC), brown, fine grained, slightly moist, very firm, low to medium plasticity, some fine gravel	SPT	6-9-25 (34)			29	18	11	16

Bottom of borehole at 16.5 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-109

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 1/11/2022 **COMPLETED** 1/12/2022
BORING LOCATION STA 1254+20, 135' L SR 303L Cst CL
DRILLER Cascade **DRILLED BY** M. Villalobos
GPS COORDINATES 33.44348°N, -112.4273°E
DRILLING METHOD Roto-Sonic
GROUND ELEVATION 964 ft **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # TSI-150CC/BB6B45
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 77
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY SAND (SM), light brown, fine grained, slightly moist, loose, non plastic, occasional gravel								
960	5			SPT	5-4-5 (9)						
955	10		Increased gravel below 10'	SPT	4-13-16 (29)			NP	NP	NP	17
950	15			AU							
			SAND (SP), light brown, fine grained, slightly moist, very dense, non plastic, occasional fine gravel	SPT	4-33-50/4"						
945	20			SPT	35-24-41 (65)						
940	25										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 1/11/2022 **COMPLETED** 1/12/2022 **BORING LOCATION** STA 1254+20, 135' L SR 303L Cst CL
DRILLER Cascade **DRILLED BY** M. Villalobos **GPS COORDINATES** 33.44348°N, -112.4273°E
DRILLING METHOD Roto-Sonic **GROUND ELEVATION** 964 ft **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # TSI-150CC/BB6B45 **GROUNDWATER DEPTH** ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 77 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY GRAVEL WITH SAND (GC), light brown, fine grained, slightly moist, hard, medium plasticity, moderate lime cementation	SPT	10-50/1"						
935	30			AU				41	24	17	46
			SANDY CLAY (CL), brown, slightly moist, hard, medium plasticity, trace fine gravel, some fine sand, weak lime cementation	SPT	8-22-30 (52)						
930	35										
			SILTY SAND (SM), dark brown, moist, medium dense, non plastic, trace fine gravel	SPT	4-8-11 (19)						
925	40			AU				NP	NP	NP	38
			SAND (SP), light brown, fine to medium grained, moist, medium dense, no to low plasticity, trace fine gravel	SPT	12-16-12 (28)						
920	45			AU							
			SANDY CLAY (CL), brown, slightly moist to moist, very firm, low to medium plasticity, trace fine gravel, considerable fine to medium sand	SPT	5-15-20 (35)						
915	50										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 1/11/2022 **COMPLETED** 1/12/2022
BORING LOCATION STA 1254+20, 135' L SR 303L Cst CL
DRILLER Cascade **DRILLED BY** M. Villalobos
GPS COORDINATES 33.44348°N, -112.4273°E
DRILLING METHOD Roto-Sonic
GROUND ELEVATION 964 ft **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # TSI-150CC/BB6B45
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 77
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SANDY CLAY (CL), brown, slightly moist to moist, very firm, low to medium plasticity, trace fine gravel, considerable fine to medium sand*(continued)*	SPT	8-8-12 (20)						
910	55		CLAYEY SAND (SC), brown, medium grained, moist, very firm, low to medium plasticity, trace fine gravel	SPT	10-15-16 (31)						
905	60			SPT	12-14-20 (34)						

Bottom of borehole at 61.5 feet. Backfilled with soil cuttings.

BORING NUMBER B-110

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 1/12/2022 **COMPLETED** 1/12/2022
BORING LOCATION STA 1255+80, 130' L SR 303L Cst CL
DRILLER Cascade **DRILLED BY** M. Villalobos
GPS COORDINATES 33.44388°N, -112.42729°E
DRILLING METHOD Roto-Sonic
GROUND ELEVATION 964 ft **BOREHOLE DEPTH** 56.5 ft
RIG TYPE / # TSI-150CC/BB6B45
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 77
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND (SC), light brown, fine grained, slightly moist, moderately firm to firm, low to medium plasticity, trace fine gravel	AU							
960	5			SPT	16-8-8 (16)						
955	10			SPT	10-15-12 (27)						
950	15			AU				34	19	15	42
			SANDY CLAY (CL), light brown to brown, slightly moist, moderately firm to hard, low to medium plasticity, trace fine gravel, considerable fine sand, weak to moderate lime cementation	SPT	12-22-17 (39)						
945	20			SPT	32-50/3"						
940	25		Some cobbles at 23'	AU				36	23	13	72

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 1/12/2022 **COMPLETED** 1/12/2022 **BORING LOCATION** STA 1255+80, 130' L SR 303L Cst CL
DRILLER Cascade **DRILLED BY** M. Villalobos **GPS COORDINATES** 33.44388°N, -112.42729°E
DRILLING METHOD Roto-Sonic **GROUND ELEVATION** 964 ft **BOREHOLE DEPTH** 56.5 ft
RIG TYPE / # TSI-150CC/BB6B45 **GROUNDWATER DEPTH** ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 77 **LOGGED BY** S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SANDY CLAY (CL), light brown to brown, slightly moist, moderately firm to hard, low to medium plasticity, trace fine gravel, considerable fine sand, weak to moderate lime cementation *(continued)*	SPT	4-11-25 (36)						
935	30			AU							
				SPT	6-20-28 (48)						
930	35			SPT	3-5-9 (14)						
925	40			AU							
				SPT	4-14-20 (34)						
920	45		SAND (SP), light brown, medium grained, moist, dense, non plastic, trace fine gravel								
			CLAYEY SAND (SC), light brown, medium grained, moist, very firm, low plasticity, trace fine gravel	SPT	13-20-13 (33)						
915	50										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 1/12/2022 **COMPLETED** 1/12/2022
BORING LOCATION STA 1255+80, 130' L SR 303L Cst CL
DRILLER Cascade **DRILLED BY** M. Villalobos
GPS COORDINATES 33.44388°N, -112.42729°E
DRILLING METHOD Roto-Sonic
GROUND ELEVATION 964 ft **BOREHOLE DEPTH** 56.5 ft
RIG TYPE / # TSI-150CC/BB6B45
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 77
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
910	55		CLAYEY SAND (SC), light brown, medium grained, moist, very firm, low plasticity, trace fine gravel *(continued)*	SPT	10-17-21 (38)						
				SPT	15-19-26 (45)						

Bottom of borehole at 56.5 feet. Backfilled with soil cuttings.

BORING NUMBER B-111

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 1/13/2022 **COMPLETED** 1/13/2022
BORING LOCATION STA 1257+30, 135' L SR 303L Cst CL
DRILLER Cascade **DRILLED BY** M. Villalobos
GPS COORDINATES 33.4443°N, -112.42729°E
DRILLING METHOD Roto-Sonic
GROUND ELEVATION 965 ft **BOREHOLE DEPTH** 51.5 ft
RIG TYPE / # TSI-150CC/BB6B45
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 77
LOGGED BY K. Dahlen **CHECKED BY** K. Mackay

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
965			CLAYEY SAND (SC), reddish brown to light brown, poorly graded, slightly moist, firm, medium plasticity, trace fine gravel, weak lime cementation								
960	5			SPT	8-9-12 (21)						
			SILTY CLAY (CH), brown, moist, medium to high plasticity, trace fine sand, weak lime cementation								
955	10		SILTY SAND (SM), tan to light brown, fine to medium grained, slightly moist, dense to very dense, non plastic, trace fine gravel, weak lime cementation	AU			8.4	NP	NP	NP	49
				SPT	15-23-26 (49)						
950	15		Some fine gravel sized cemented nodules at 13.5'	AU							
				SPT	49-50/5"						
945	20			AU			7.3	NP	NP	NP	33
			SAND WITH SILT (SP-SM), light brown, fine to medium grained, slightly moist, dense, no to low plasticity, trace gravel	SPT	13-21-10 (31)						
940	25		SANDY CLAY (CL), grayish tan, slightly moist, hard, medium plasticity, some fine gravel, moderate lime cementation	AU							

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 1/13/2022 **COMPLETED** 1/13/2022 **BORING LOCATION** STA 1257+30, 135' L SR 303L Cst CL
DRILLER Cascade **DRILLED BY** M. Villalobos **GPS COORDINATES** 33.4443°N, -112.42729°E
DRILLING METHOD Roto-Sonic **GROUND ELEVATION** 965 ft **BOREHOLE DEPTH** 51.5 ft
RIG TYPE / # TSI-150CC/BB6B45 **GROUNDWATER DEPTH** ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 77 **LOGGED BY** K. Dahlen **CHECKED BY** K. Mackay

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
940			SANDY CLAY (CL), grayish tan, slightly moist, hard, medium plasticity, some fine gravel, moderate lime cementation *(continued)*	SPT	50/0"						
				AU							
			Weak lime cementation below 27'								
				AU							
935	30		Considerable moderately to strongly cemented gravel sized nodules from 29' to 32'	SPT	50-26-50/4"						
			Weak lime cementation and high to medium plasticity from 32' to 34.5'								
				AU				38	24	14	79
930	35		Moist, medium dense sand (SP) layer from 34.5' to 35.5'	SPT	2-4-9 (13)						
			SILTY SAND (SM), brown, fine grained, moist, dense, no to low plasticity	AU							
925	40			SPT	6-15-22 (37)						
			SAND WITH GRAVEL (SP), brown, fine to medium grained, moist, dense, non plastic, considerable fine gravel, some silt								
920	45		SILTY CLAY (CL), brown, moist, low plasticity, trace fine sand Considerable fine gravel sized cemented nodules from 44' to 45'	AU							
				SPT	4-9-22 (31)						
			SILTY SAND (SM), brown, fine grained, moist, medium dense, no to low plasticity								
915	50		Some thin sand (SP) layers	AU							

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 1/13/2022 **COMPLETED** 1/13/2022 **BORING LOCATION** STA 1257+30, 135' L SR 303L Cst CL

DRILLER Cascade **DRILLED BY** M. Villalobos **GPS COORDINATES** 33.4443°N, -112.42729°E

DRILLING METHOD Roto-Sonic **GROUND ELEVATION** 965 ft **BOREHOLE DEPTH** 51.5 ft

RIG TYPE / # TSI-150CC/BB6B45 ▼ **GROUNDWATER DEPTH** ---

HAMMER TYPE Auto **HAMMER EFFICIENCY** 77 **LOGGED BY** K. Dahlen **CHECKED BY** K. Mackay

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
915			SILTY SAND (SM), brown, fine grained, moist, medium dense, no to low plasticity*(continued)*	SPT	8-12-14 (26)						

Bottom of borehole at 51.5 feet. Backfilled with soil cuttings.

BORING NUMBER B-112

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 1/14/2022 **COMPLETED** 1/14/2022
BORING LOCATION STA 1258+90, 135' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.44469°N, -112.42728°E
DRILLING METHOD Tubex
GROUND ELEVATION 983 ft **BOREHOLE DEPTH** 41 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
980	0		CLAYEY SAND (SC), light brown, subangular, fine grained, slightly moist, firm, medium plasticity, trace gravel	SPT	5-7-10 (17)						
				AU			3.4	32	21	11	32
	5			SPT	5-9-14 (23)						
975											
	10		Moist below 10'	R	6-12						
970											
	15			SPT	10-22-50/2"			29	17	12	29
965											
	20		SAND (SP), light brown, subrounded, fine to medium grained, moist, medium dense, non plastic, trace gravel	SPT	5-8-12 (20)						
960											
	25										

(Continued Next Page)

Ethos Engineering s

BORING NUMBER B-112

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 1/14/2022 **COMPLETED** 1/14/2022
BORING LOCATION STA 1258+90, 135' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.44469°N, -112.42728°E
DRILLING METHOD Tubex
GROUND ELEVATION 983 ft **BOREHOLE DEPTH** 41 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAY WITH SAND (CL), white to light brown, slightly moist, firm to hard, low to medium plasticity, trace fine gravel, trace fine sand, weak lime cementation	SPT	50/3"						
955											
	30			SPT	6-50/2"						
950											
	35			SPT	5-9-16 (25)						
945											
	40		CLAYEY SAND (SC), brown, medium grained, moist, very firm, low to medium plasticity, trace fine gravel	R	9-32	107	8.5	37	27	10	

Bottom of borehole at 41.0 feet. Backfilled with soil cuttings.

BORING NUMBER B-113

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 1/13/2022 **COMPLETED** 1/13/2022
BORING LOCATION STA 1260+30, 140' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.44507°N, -112.42729°E
DRILLING METHOD Tubex
GROUND ELEVATION 984 ft **BOREHOLE DEPTH** 36 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
980	5		CLAYEY SAND (SC), light brown, fine grained, slightly moist, very firm, low to medium plasticity, trace fine gravel	SPT	6-18-31 (49)						
				AU			2.2	29	18	11	34
975	10		GRAVEL WITH SAND (GP), light brown, subangular, slightly moist, medium dense, non plastic, some fine sand, occasional cobbles	R	6-12						
970	15		CLAY (CL), brown, moist, soft to moderately firm, low to medium plasticity, trace fine gravel, trace fine sand	R	5-7						
965	20		CLAYEY SAND (SC), brown to light brown, subangular, fine to medium grained, moist, moderately firm to hard, low plasticity, trace gravel	SPT	4-6-8 (14)						
				SPT	6-19-50/5"						
960	25										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 1/13/2022 **COMPLETED** 1/13/2022
BORING LOCATION STA 1260+30, 140' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.44507°N, -112.42729°E
DRILLING METHOD Tubex
GROUND ELEVATION 984 ft **BOREHOLE DEPTH** 36 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SANDY SILT (ML), brown, slightly moist to moist, hard to firm, low plasticity, trace fine gravel, some fine sand, weak to strong lime cementation	SPT	50/2"						
955											
	30			SPT	7-16-50/1"						
950											
	35			R	10-21			31	25	6	63

Bottom of borehole at 36.0 feet. Backfilled with soil cuttings.

Ethos Engineering, LLC.
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-113A

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/9/2022 **COMPLETED** 9/9/2022
BORING LOCATION STA 1260+30, 135' L SR 303L Cst CL
DRILLER ACS Services **DRILLED BY** N. Zamora
GPS COORDINATES 33.44507°N, -112.42729°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 984 ft **BOREHOLE DEPTH** 11 ft
RIG TYPE / # CME-75/BY
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 88
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY GRAVEL WITH SAND (GP-GM), light brown, fine to coarse grained, slightly moist, medium dense, low plasticity, some to considerable medium to coarse sand	R	12-17						
				AU							
			SILTY SAND WITH GRAVEL (SM), light brown, subangular, medium to coarse grained, slightly moist, dense, low plasticity, some fine gravel	R	24-30						
980											
	5		SILTY, CLAYEY SAND (SC-SM), light brown, subangular, fine to coarse grained, slightly moist, soft, low plasticity, trace to some fine gravel	R	4-5						
			SANDY SILTY CLAY (CL-ML), light brown to brown, subangular, fine grained, slightly moist, firm, medium plasticity, occasional fine gravel, some to considerable fine sand								
975											
	10			R	7-14						

Bottom of borehole at 11.0 feet. Backfilled with soil cuttings.

BORING NUMBER B-114

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 1/10/2022 **COMPLETED** 1/10/2022
BORING LOCATION STA 1260+50, 210' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.44541°N, -112.42773°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 984 ft **BOREHOLE DEPTH** 16.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
980	0		CLAYEY SAND (SC), brown, fine grained, slightly moist, firm, medium plasticity, trace fine gravel	SPT	10-12-5 (17)						
				AU				31	19	12	40
	5		SAND (SP), light brown, fine grained, slightly moist, dense to medium dense, non plastic, trace fine gravel	SPT	5-11-19 (30)						
975											
	10			R	9-15						
970			SILTY SAND (SM), brown, fine grained, moist, dense, non plastic, trace fine gravel								
	15			SPT	6-12-18 (30)			NP	NP	NP	44

Bottom of borehole at 16.5 feet. Backfilled with soil cuttings.

BORING NUMBER B-115

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 6/8/2022 **COMPLETED** 6/8/2022
BORING LOCATION STA 1254+20, 105' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.4435°N, -112.42661°E
DRILLING METHOD Tubex
GROUND ELEVATION 982 ft **BOREHOLE DEPTH** 60.1 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND (SC), light brown to brown, fine to medium grained, slightly moist, firm, low plasticity, trace fine gravel, weak lime cementation								
980			Root zone from 0' to 1'	AU			6.8	30	19	11	19
	5		SAND WITH SILT (SP-SM), light brown to brown, subangular, medium grained, moist, firm, low plasticity, some fine gravel, weak lime cementation	R	12-18						
975			CLAYEY SAND (SC), light brown, subangular, fine grained, slightly moist, very firm, low to medium plasticity, trace fine gravel, weak lime cementation								
	10			SPT	16-18-30 (48)						
970			Weak to moderate lime cementation below 12'								
	15		SILTY, CLAYEY SAND (SC-SM), brown, subangular, fine to medium grained, moist, hard, low plasticity, trace fine gravel	SPT	29-50/1"						
965											
	20		CLAY WITH SAND (CL), light brown to white, subangular, fine to medium grained, slightly moist to moist, hard to moderately firm, medium plasticity, trace fine gravel, fine to medium sand, weak to moderate lime cementation	SPT	27-30-50/1"						
960											
	25										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 6/8/2022 **COMPLETED** 6/8/2022 **BORING LOCATION** STA 1254+20, 105' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.4435°N, -112.42661°E
DRILLING METHOD Tubex **GROUND ELEVATION** 982 ft **BOREHOLE DEPTH** 60.1 ft
RIG TYPE / # CME 75/109 **GROUNDWATER DEPTH** ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
955			CLAY WITH SAND (CL), light brown to white, subangular, fine to medium grained, slightly moist to moist, hard to moderately firm, medium plasticity, trace fine gravel, fine to medium sand, weak to moderate lime cementation *(continued)*	SPT	16-39-50/1"						
	30		Brown, weak to no lime cementation below 28'	R	10-26						
950											
	35		SAND (SP), light brown to brown, subangular, fine to medium grained, moist to slightly moist, very dense, non plastic, trace fine gravel	SPT	8-10-50/3"						
945											
	40		CLAY (CL), brown, subangular, moist, moderately firm, medium plasticity, trace fine gravel, trace fine sand, weak lime cementation	SPT	8-9-15 (24)						
940											
	45		CLAYEY SAND (SC), brown, fine grained, moist, very firm, low plasticity	SPT	7-11-30 (41)		14.5	28	17	11	38
935											
	50		SAND (SP), light brown, fine grained, moist, dense to very dense, non plastic, occasional fine gravel Considerable subrounded gravel below 49'								

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 6/8/2022 **COMPLETED** 6/8/2022 **BORING LOCATION** STA 1254+20, 105' R SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.4435°N, -112.42661°E

DRILLING METHOD Tubex **GROUND ELEVATION** 982 ft **BOREHOLE DEPTH** 60.1 ft

RIG TYPE / # CME 75/109 **GROUNDWATER DEPTH** ---

HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SAND (SP), light brown, fine grained, moist, dense to very dense, non plastic, occasional fine gravel*(continued)*	SPT	9-13-29 (42)						
930											
	55			SPT	8-14-23 (37)						
925											
	60			SPT	50/1"						

Bottom of borehole at 60.1 feet. Backfilled with soil cuttings.

BORING NUMBER B-116

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 6/7/2022 **COMPLETED** 6/8/2022
BORING LOCATION STA 1255+75, 100' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.44392°N, -112.42662°E
DRILLING METHOD Tubex
GROUND ELEVATION 983 ft **BOREHOLE DEPTH** 56.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND (SC), light brown to brown, medium grained, slightly moist, low plasticity, trace fine gravel Root zone from 0' to 1'								
980				AU			5.0	27	18	9	13
	5		SAND WITH SILT (SP-SM), light brown, subangular, fine to medium grained, slightly moist, medium dense, non plastic, some fine gravel	SPT	6-13-14 (27)						
975			CLAYEY SAND (SC), light brown to brown, fine grained, slightly moist to moist, hard, low to medium plasticity, trace fine gravel, weak to moderate lime cementation								
	10			SPT	25-36-41 (77)						
970											
	15			SPT	15-50/5"						
965											
	20		Moderate to strong lime cementation below 19'	R	50/6"	88	15.5				
960			SAND WITH CLAY (SP-SC), brown, subangular, fine grained, moist, low plasticity, occasional fine gravel								
	25										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 6/7/2022 **COMPLETED** 6/8/2022 **BORING LOCATION** STA 1255+75, 100' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.44392°N, -112.42662°E
DRILLING METHOD Tubex **GROUND ELEVATION** 983 ft **BOREHOLE DEPTH** 56.5 ft
RIG TYPE / # CME 75/109 **GROUNDWATER DEPTH** ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAY WITH SAND (CL), brown, subangular, moist, hard, medium plasticity, trace fine gravel, some fine sand, weak to moderate lime cementation	SPT	9-24-50/4"						
955	30										
			SILTY SAND (SM), brown, fine grained, moist, medium dense, non plastic	R	15-25	98	15.2	NP	NP	NP	44
950											
	35		SAND WITH CLAY (SP-SC), light brown to brown, subangular, medium grained, slightly moist to moist, very firm, low plasticity, trace fine gravel, weak lime cementation	SPT	8-12-20 (32)						
945	40										
			CLAY WITH SAND (CL), brown, moist, firm to very firm, medium plasticity, trace fine gravel, some fine to medium sand	SPT	3-10-20 (30)						
940	45			SPT	6-15-25 (40)						
			SAND WITH SILT (SP-SM), brown, subangular, fine to medium grained, moist, dense, low plasticity, trace fine gravel								
935	50										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 6/7/2022 **COMPLETED** 6/8/2022 **BORING LOCATION** STA 1255+75, 100' R SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.44392°N, -112.42662°E

DRILLING METHOD Tubex **GROUND ELEVATION** 983 ft **BOREHOLE DEPTH** 56.5 ft

RIG TYPE / # CME 75/109 ▼ **GROUNDWATER DEPTH** ---

HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SAND WITH SILT (SP-SM), brown, subangular, fine to medium grained, moist, dense, low plasticity, trace fine gravel *(continued)*	SPT	13-21-27 (48)						
930			SAND (SP), brown, subangular, medium grained, slightly moist, dense, non plastic, some fine gravel								
	55			SPT	17-15-18 (33)						

Bottom of borehole at 56.5 feet. Backfilled with soil cuttings.

BORING NUMBER B-117

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 6/7/2022 **COMPLETED** 6/7/2022 **BORING LOCATION** STA 1257+15, 100' R SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.44427°N, -112.42662°E

DRILLING METHOD Tubex **GROUND ELEVATION** 983 ft **BOREHOLE DEPTH** 51.5 ft

RIG TYPE / # CME 75/109 **GROUNDWATER DEPTH** ---

HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
980	0		SILTY, CLAYEY SAND (SC-SM), brown, medium grained, moist, low plasticity, trace to some gravel Root zone between 0-1'	AU							
	5		CLAYEY SAND (SC), brown to light brown, subangular, fine to medium grained, moist, moderately firm, medium plasticity, trace fine gravel, weak lime cementation	SPT	3-5-10 (15)						
975			CLAY WITH SAND (CL), brown, subangular, moist, hard, medium plasticity, trace fine gravel, some to considerable fine sand, weak lime cementation								
	10		SAND WITH CLAY AND GRAVEL (SP-SC), light brown, subangular, medium to coarse grained, slightly moist, hard, low plasticity, some fine gravel	R	17-50/4"	104	13.0				
970			Whitish brown to light brown, weak to moderate lime cementation below 12.5' Decreased gravel, brown below 13'								
	15		CLAYEY SAND (SC), brown to light brown, subangular, fine to medium grained, moist, hard to very firm, low to medium plasticity, trace fine gravel, weak to moderate lime cementation	SPT	20-45-50/4"						
965			Slightly moist below 17'								
	20			SPT	13-19-24 (43)						
960			CLAY WITH SAND (CL), brown, subangular, moist, very firm to hard, medium plasticity, trace fine gravel, some fine to medium sand, weak to moderate lime cementation								
	25										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 6/7/2022 **COMPLETED** 6/7/2022 **BORING LOCATION** STA 1257+15, 100' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.44427°N, -112.42662°E
DRILLING METHOD Tubex **GROUND ELEVATION** 983 ft **BOREHOLE DEPTH** 51.5 ft
RIG TYPE / # CME 75/109 **GROUNDWATER DEPTH** ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAY WITH SAND (CL), brown, subangular, moist, very firm to hard, medium plasticity, trace fine gravel, some fine to medium sand, weak to moderate lime cementation *(continued)*	SPT	29-41-50/5"						
955			Increased gravel, whitish brown to light brown, moderate to strong lime cementation, slightly moist below 27'								
	30		SANDY SILTY CLAY (CL-ML), brown, subangular, moist, firm, low plasticity, trace fine gravel, some to considerable fine sand, weak lime cementation	SPT	5-11-18 (29)						
950											
	35		SAND WITH SILT (SP-SM), light brown, fine grained, medium dense, non plastic	R	11-15	103	7.1	NP	NP	NP	10
945											
	40		GRAVELLY CLAY WITH SAND (CL), brown, subangular, moist, hard, low to medium plasticity, considerable gravel, some fine to medium sand, moderate to strong lime cementation	SPT	50/4"						
940											
	45		CLAY WITH SAND (CL), brown, subangular, moist, firm, low to medium plasticity, trace fine gravel, some fine sand, weak lime cementation	SPT	5-8-14 (22)						
935											
	50										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 6/7/2022 **COMPLETED** 6/7/2022
BORING LOCATION STA 1257+15, 100' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.44427°N, -112.42662°E
DRILLING METHOD Tubex
GROUND ELEVATION 983 ft **BOREHOLE DEPTH** 51.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
			SAND WITH CLAY AND GRAVEL (SP-SC), brown to light brown, subangular, medium grained, moist, very firm, some fine gravel	SPT	11-14-25 (39)						

Bottom of borehole at 51.5 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-118

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 6/6/2022 **COMPLETED** 6/6/2022
BORING LOCATION STA 1258+65, 105' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.44472°N, -112.42662°E
DRILLING METHOD Tubex
GROUND ELEVATION 983 ft **BOREHOLE DEPTH** 41.2 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY SAND (SM), brown, subangular, fine to medium grained, moist, loose to medium dense, non plastic, trace fine gravel				5.2	NP	NP	NP	
			Root zone between 0-1'	AU							19
980	5		Light brown to brown, trace weak lime cementation, slightly moist below 5'	SPT	4-3-4 (7)						
975	10		Low to medium plasticity, brown below 10'	R	8-10						
970			SAND (SP), light brown, subangular, medium grained, slightly moist, very dense, non plastic, trace fine gravel								
	15		Increased gravel below 15'	SPT	27-50/3"						
965			CLAY WITH SAND (CL), brown, subangular, moist, firm, low to medium plasticity, trace fine gravel, some fine sand, weak lime cementation								
	20			SPT	12-10-13 (23)						
960											
	25										

(Continued Next Page)

Ethos Engineering s

BORING NUMBER B-118

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 6/6/2022 **COMPLETED** 6/6/2022
BORING LOCATION STA 1258+65, 105' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.44472°N, -112.42662°E
DRILLING METHOD Tubex
GROUND ELEVATION 983 ft **BOREHOLE DEPTH** 41.2 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND (SC), brown, subangular, fine to medium grained, moist, hard, medium plasticity, trace gravel, weak to moderate lime cementation	SPT	17-42-50/3"						
955											
	30		CLAY WITH SAND (CL), dark brown to brown, subangular, moist, very firm, medium plasticity, trace fine gravel, some fine to medium sand, weak lime cementation	SPT	9-17-31 (48)						
950			SAND (SP), brown to dark brown, subangular, medium grained, slightly moist, medium dense, non plastic, trace fine gravel								
	35			SPT	6-14-15 (29)						
945			CLAY WITH SAND (CL), light brown, subangular, moist, hard, medium plasticity, trace fine gravel, some fine to medium sand, weak to moderate lime cementation								
	40			SPT	31-14-50/3"						

Bottom of borehole at 41.2 feet. Backfilled with soil cuttings.

BORING NUMBER B-119

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 6/6/2022 **COMPLETED** 6/6/2022
BORING LOCATION STA 1260+20, 100' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.4452°N, -112.42663°E
DRILLING METHOD Tubex
GROUND ELEVATION 984 ft **BOREHOLE DEPTH** 41.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY SAND (SM), brown to light brown, subangular, fine to medium grained, moist, medium dense, non plastic, trace fine gravel				6.8	NP	NP	NP	
			Root zone between 0-1'	AU							24
980	5			SPT	3-5-6 (11)						
975	10		SAND (SP), light brown, subangular, fine grained, slightly moist, medium dense, non plastic, trace gravel								
			SAND WITH SILT AND GRAVEL (SP-SM), light brown to whiteish brown, subangular, fine to medium grained, slightly moist, dense, non plastic, some fine gravel	SPT	4-8-40 (48)						
970			Increased gravel, whiteish brown to grey below 13'								
	15		Trace cobbles below 14'								
			SILTY SAND WITH GRAVEL (SM), brown to light brown, subangular, fine to medium grained, moist, very dense, non plastic, some gravel	SPT	46-50/1"						
965			Weak to moderate lime cementation below 17'								
	20		Slightly moist, whiteish brown to light brown below 18'								
			CLAYEY SAND (SC), brown, subangular, fine grained, moist, very firm, low to medium plasticity, trace fine gravel, weak to moderate lime cementation	SPT	43-18-30 (48)						
960			Low plasticity below 24'								
	25										

(Continued Next Page)

BORING NUMBER B-119

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 6/6/2022 **COMPLETED** 6/6/2022
BORING LOCATION STA 1260+20, 100' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.4452°N, -112.42663°E
DRILLING METHOD Tubex
GROUND ELEVATION 984 ft **BOREHOLE DEPTH** 41.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SAND WITH CLAY AND GRAVEL (SP-SC), brown to light brown, subangular, fine to medium grained, slightly moist, hard, low plasticity, some fine gravel, weak to moderate lime cementation	SPT	50/3"						
955			Decreased gravel, moist below 28'								
	30		CLAY WITH SAND (CL), brown, subangular, moist, very firm, medium plasticity, trace fine gravel, some fine sand, weak lime cementation	R	12-33						
950			SAND (SP), dark brown to brown, subangular, fine to medium grained, moist, dense, non plastic, trace fine gravel								
	35		Brown below 35'	SPT	7-14-17 (31)						
945											
	40		SANDY CLAY (CL), brown, subangular, moist, firm, medium plasticity, trace gravel, considerable fine sand	SPT	4-4-12 (16)						

Bottom of borehole at 41.5 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-119A

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 6/20/2022 **COMPLETED** 6/20/2022
BORING LOCATION STA 1262+70, 150' R SR 303L Cst CL
DRILLER ACS Services **DRILLED BY** M. Valdez
GPS COORDINATES 33.44579°N, -112.42648°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 985 ft **BOREHOLE DEPTH** 41.5 ft
RIG TYPE / # CME 75/BY
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 88
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
985			SILTY, CLAYEY SAND (SC-SM), brown, subangular, fine to medium grained, moist, low plasticity, trace gravel	AU			2.8	21	16	5	26
			SAND WITH GRAVEL (SP), light brown, subangular, medium to coarse grained, slightly moist, loose to very dense, non plastic, some to considerable fine gravel	R	7-9						
980	5		Some medium grained sand below 5'	SPT	1-1-4 (5)						
975	10			SPT	2-2-3 (5)						
970	15		Increased gravel below 15'	SPT	50/5"						
			SAND WITH SILT AND GRAVEL (SP-SM), light brown, slightly moist, very dense, non plastic, some to considerable gravel								
965	20			SPT	6-22-50/3"						
960	25										

(Continued Next Page)

Ethos Engineering s

BORING NUMBER B-119A

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 6/20/2022 **COMPLETED** 6/20/2022
BORING LOCATION STA 1262+70, 150' R SR 303L Cst CL
DRILLER ACS Services **DRILLED BY** M. Valdez
GPS COORDINATES 33.44579°N, -112.42648°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 985 ft **BOREHOLE DEPTH** 41.5 ft
RIG TYPE / # CME 75/BY
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 88
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
960			CLAYEY SAND (SC), brown, subangular, fine grained, moist, hard, low plasticity, trace fine gravel	SPT	10-28-50/5"						
955	30		SANDY CLAY (CL), brown, subangular, moist, hard, medium plasticity, trace fine gravel, considerable fine sand	SPT	6-15-50/5"						
950	35		SAND WITH SILT (SP-SM), light brown, subangular, fine to medium grained, slightly moist, very dense, non plastic, trace fine gravel	R	42-47						
945	40		GRAVEL WITH SAND (GP), brown to light brown, subangular, slightly moist, very dense, non plastic, considerable medium to coarse sand	SPT	17-20-21 (41)						

Bottom of borehole at 41.5 feet. Backfilled with soil cuttings.

BORING NUMBER B-119B

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 6/20/2022 **COMPLETED** 6/20/2022
BORING LOCATION STA 1264+70, 165' R SR 303L Cst CL
DRILLER ACS Services **DRILLED BY** M. Valdez
GPS COORDINATES 33.44633°N, -112.42643°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 986 ft **BOREHOLE DEPTH** 40.9 ft
RIG TYPE / # CME 75/BY
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 88
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
985			SILTY, CLAYEY SAND (SC-SM), brown, subangular, fine to medium grained, slightly moist to moist, loose, low plasticity, trace fine gravel	AU			4.7	20	16	4	26
				R	4-4						
	5										
980				SPT	2-3-5 (8)						
	10										
975			SANDY SILTY CLAY (CL-ML), brown, subangular, slightly moist, hard, low plasticity, trace fine gravel, some fine sand, weak lime cementation	SPT	27-39-14 (53)						
	15										
970			SAND WITH GRAVEL (SP), light brown, subangular, coarse grained, moist, loose, non plastic, some fine gravel	SPT	4-4-4 (8)						
			Trace cobbles below 18'								
	20										
965			SAND WITH SILT (SP-SM), light brown to whiteish brown, subangular, fine to medium grained, slightly moist, very dense, non plastic, trace to some fine gravel	SPT	28-50/5"						
	25										

(Continued Next Page)

Ethos Engineering s

BORING NUMBER B-119B

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 6/20/2022 **COMPLETED** 6/20/2022
BORING LOCATION STA 1264+70, 165' R SR 303L Cst CL
DRILLER ACS Services **DRILLED BY** M. Valdez
GPS COORDINATES 33.44633°N, -112.42643°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 986 ft **BOREHOLE DEPTH** 40.9 ft
RIG TYPE / # CME 75/BY
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 88
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
960			SAND WITH SILT (SP-SM), light brown to whiteish brown, subangular, fine to medium grained, slightly moist, very dense, non plastic, trace to some fine gravel*(continued)*	R	22-50/5"		6.9	NP	NP	NP	9
	30										
955			SILTY, CLAYEY SAND (SC-SM), light brown to white, subangular, fine grained, moist, hard, low to medium plasticity, trace gravel	SPT	35-28-28 (56)						
	35		SAND (SP), light brown, subangular, fine to medium grained, slightly moist, medium dense to very dense, non plastic, trace fine gravel								
950				SPT	8-12-16 (28)						
	40										
				SPT	6-50/5"						

Bottom of borehole at 40.9 feet. Backfilled with soil cuttings.

BORING NUMBER B-120

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 1/10/2022 **COMPLETED** 1/10/2022
BORING LOCATION STA 1265+00, 190' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.44643°N, -112.4276°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 987 ft **BOREHOLE DEPTH** 16.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
985	0		CLAYEY SAND WITH GRAVEL (SC), light brown, subangular, fine grained, slightly moist, firm, medium plasticity, occasional fine to medium gravel	SPT	3-7-13 (20)						
				AU			3.7	31	19	12	34
	5		SILTY SAND (SM), brown to light brown, fine grained, moist to slightly moist, medium dense to dense, non plastic, trace fine gravel	R	7-9						
980											
	10			SPT	5-7-10 (17)			NP	NP	NP	38
975											
	15			SPT	7-11-35 (46)						

Bottom of borehole at 16.5 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-121

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 1/10/2022 **COMPLETED** 1/10/2022
BORING LOCATION STA 1269+00, 190' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.4475°N, -112.42761°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 990 ft **BOREHOLE DEPTH** 11.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
990			CLAYEY SAND (SC), brown to dark brown, fine grained, moist, soft to firm, low to medium plasticity, trace fine gravel	SPT	4-3-4 (7)						
				AU				29	20	9	37
985	5			R	8-21						
980	10		SAND (SP), light brown to brown, subangular, fine to medium grained, slightly moist, dense, non plastic, some gravel	SPT	6-14-23 (37)						

Bottom of borehole at 11.5 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-122

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 1/10/2022 **COMPLETED** 1/10/2022
BORING LOCATION STA 1273+00, 240' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.44861°N, -112.42777°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 991 ft **BOREHOLE DEPTH** 11 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
990			CLAYEY SAND (SC), light brown, subangular, fine to medium grained, slightly moist, firm, low to medium plasticity, occasional gravel	SPT	7-13-16 (29)						
				AU				28	19	9	37
	5										
985			SAND (SP), light brown, fine grained, slightly moist, medium dense, non plastic, trace fine gravel	SPT	5-7-10 (17)						
	10										
980				R	7-9	101	0.0				

Bottom of borehole at 11.0 feet. Backfilled with soil cuttings.

BORING NUMBER B-123

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 4/25/2022 **COMPLETED** 4/25/2022
BORING LOCATION STA 1276+00, 130' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** J. Aguilar
GPS COORDINATES 33.44941°N, -112.4275°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 991 ft **BOREHOLE DEPTH** 21.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
990			SILTY SAND WITH GRAVEL (SM), light brown, subrounded, fine grained, slightly moist, medium dense, non plastic, some gravel	SPT	12-9-4 (13)						
				AU			11.0	NP	NP	NP	30
	5										
985			SILTY, CLAYEY SAND (SC-SM), light brown, subrounded, fine to medium grained, slightly moist, loose, no to low plasticity, occasional gravel	SPT	2-4-3 (7)						
	10										
980			SILTY SAND (SM), light brown, subrounded, fine to medium grained, slightly moist, medium dense to dense, non plastic, occasional gravel	SPT	4-10-11 (21)						
	15										
975				SPT	24-17-12 (29)						
	20										
970			Trace clay below 20'	SPT	8-16-20 (36)						

Bottom of borehole at 21.5 feet. Backfilled with soil cuttings.

BORING NUMBER B-124

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 4/25/2022 **COMPLETED** 4/25/2022
BORING LOCATION STA 1268+80, 190' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** J. Aguilar
GPS COORDINATES 33.44744°N, -112.42633°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 990 ft **BOREHOLE DEPTH** 21.3 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
990											
			CLAYEY SAND (SC), light brown, fine grained, slightly moist, moderately firm, medium plasticity, trace fine gravel	SPT	5-9-9 (18)						
				AU			5.4	34	23	11	38
985	5										
			SILTY SAND (SM), light brown, fine to medium grained, slightly moist, medium dense to dense, non plastic, trace fine gravel	SPT	5-5-7 (12)						
980	10										
				SPT	6-11-19 (30)						
975	15										
			SANDY SILT (ML), light brown, slightly moist, very dense, no to low plasticity, trace fine gravel, trace fine sand	SPT	40-50/1"						
970	20										
			SILTY SAND (SM), light brown, fine to medium grained, slightly moist, very dense, non plastic, trace fine gravel	SPT	17-24-50/3"						

Bottom of borehole at 21.3 feet. Backfilled with soil cuttings.

BORING NUMBER B-124A

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 6/16/2022 **COMPLETED** 6/16/2022
BORING LOCATION STA 1272+50, 105' R SR 303L Cst CL
DRILLER ACS Services **DRILLED BY** M. Valdez
GPS COORDINATES 33.44851°N, -112.42667°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 1009 ft **BOREHOLE DEPTH** 46.5 ft
RIG TYPE / # CME 75/BY
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 88
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			EMBANKMENT FILL - CLAYEY SAND (SC), brown, subangular, fine to coarse grained, moist to slightly moist, firm, medium plasticity, some fine gravel Some concrete debris								
1005	5			AU SPT	8-10-7 (17)		6.4	29	14	15	24
				SPT	7-10-10 (20)						
1000	10			R	9-9						
995	15		Decreased gravel, fine to medium sand below 15'	SPT	5-6-7 (13)		8.6	35	19	16	32
990	20		SAND WITH SILT (SP-SM), brown, subangular, fine to medium grained, slightly moist, loose to very dense, no to low plasticity, some fine gravel	SPT	4-4-3 (7)						
985	25										

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Ethos Engineering s

BORING NUMBER B-124A

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 6/16/2022 **COMPLETED** 6/16/2022
BORING LOCATION STA 1272+50, 105' R SR 303L Cst CL
DRILLER ACS Services **DRILLED BY** M. Valdez
GPS COORDINATES 33.44851°N, -112.42667°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 1009 ft **BOREHOLE DEPTH** 46.5 ft
RIG TYPE / # CME 75/BY
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 88
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SAND WITH SILT (SP-SM), brown, subangular, fine to medium grained, slightly moist, loose to very dense, no to low plasticity, some fine gravel*(continued)*	SPT	48-50/1"						
980	30		CLAY WITH SAND (CL), brown, subangular, slightly moist, moderately firm to hard, low plasticity, some fine gravel, weak lime cementation	SPT	7-10-8 (18)						
975	35		Increased gravel from 35' to 40'	R	27-50/3"						
970	40			SPT	17-23-19 (42)						
965	45		Increased clay below 45'	SPT	14-23-28 (51)						

Bottom of borehole at 46.5 feet. Backfilled with soil cuttings.

BORING NUMBER B-124B

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 6/16/2022 **COMPLETED** 6/16/2022
BORING LOCATION STA 1274+50, 100' R SR 303L Cst CL
DRILLER ACS Services **DRILLED BY** M. Valdez
GPS COORDINATES 33.44906°N, -112.42671°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 1010 ft **BOREHOLE DEPTH** 46.5 ft
RIG TYPE / # CME 75/BY
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 88
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
1010			EMBANKMENT FILL - CLAYEY SAND (SC), brown to dark brown, subangular, fine to medium grained, moist to slightly moist, moderately firm to very firm, low plasticity, some fine gravel								
				AU			7.1	27	15	12	30
				SPT	4-5-4 (9)						
1005	5										
				SPT	6-8-8 (16)						
1000	10										
				R	23-31						
995	15										
			Moderately firm, decreased gravel below 15'	SPT	4-4-5 (9)						
990	20		SANDY CLAY (CL), light brown to brown, subangular, moist, soft, low to medium plasticity, trace gravel, fine sand								
				SPT	2-3-4 (7)						
985	25										

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BORING NUMBER B-124B

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 6/16/2022 **COMPLETED** 6/16/2022
BORING LOCATION STA 1274+50, 100' R SR 303L Cst CL
DRILLER ACS Services **DRILLED BY** M. Valdez
GPS COORDINATES 33.44906°N, -112.42671°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 1010 ft **BOREHOLE DEPTH** 46.5 ft
RIG TYPE / # CME 75/BY
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 88
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
985			CLAY WITH SAND (CL), brown, subangular, moist to slightly moist, hard, medium plasticity, trace fine gravel, fine sand, weak to moderate lime cementation	SPT	14-27-37 (64)						
980	30			SPT	33-50/4"						
975	35		SAND (SP), light brown, subangular, medium grained, slightly moist, very dense, non plastic, some fine gravel	SPT	8-41-50/4"						
970	40		SANDY CLAY (CL), light brown to brown, subangular, moist, hard to very firm, low to medium plasticity, trace fine gravel, some fine to medium sand, weak lime cementation	SPT	12-23-36 (59)						
965	45			SPT	12-15-21 (36)						

Bottom of borehole at 46.5 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER B-125

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 4/25/2022 **COMPLETED** 4/25/2022
BORING LOCATION STA 1276+85, 155' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** J. Aguilar
GPS COORDINATES 33.4497°N, -112.42643°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 991 ft **BOREHOLE DEPTH** 11.5 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
990			CLAYEY SAND WITH GRAVEL (SC), light brown, rounded, fine to medium grained, slightly moist, moderately firm, medium plasticity, occasional gravel	SPT	5-7-6 (13)						
				AU			10.3	31	20	11	31
	5										
985			SILTY SAND (SM), light brown, subangular, fine to medium grained, slightly moist, loose, non plastic, trace gravel	SPT	3-4-5 (9)						
	10										
980			CLAYEY SAND (SC), brown, fine grained, moist, firm, low to medium plasticity, trace fine gravel	SPT	9-8-19 (27)						

Bottom of borehole at 11.5 feet. Backfilled with soil cuttings.

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-126

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 2/21/2024 **COMPLETED** 2/21/2024
BORING LOCATION STA 16+50, 22' R MC 85 Cst CL
DRILLER GSI **DRILLED BY** Shea K.
GPS COORDINATES 33.39565°N, -112.44299°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 896 ft **BOREHOLE DEPTH** 11 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY K. Dahlen **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
895			FILL - SILTY, CLAYEY SAND (SC-SM), fine to coarse sand, trace to some fine gravel, low plasticity, brown, slightly moist, firm	SPT	7-6-14 (20)		8	23	16	7	43
			Some coarse gravel from 2 to 4 feet.								
	5		SANDY CLAY (CL), considerable predominately fine sand, low plasticity, brown, moist, soft	SPT	2-3-2 (5)						
890				AU			12	25	15	10	62
	10			SPT	2-2-5 (7)						
885											

Bottom of borehole at 11.0 feet. Backfilled with soil cuttings.

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-127

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 2/21/2024 **COMPLETED** 2/21/2024
BORING LOCATION STA 22+60, 23' R MC 85 Cst CL
DRILLER GSI **DRILLED BY** Shea K.
GPS COORDINATES 33.39697°N, -112.44169°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 898 ft **BOREHOLE DEPTH** 16 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY K. Dahlen **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			5.5" Asphalt Concrete								
			FILL - SILTY SAND (SM), fine to medium sand, trace to some fine gravel, nonplastic, brown, moist, medium dense	SPT	6-10-16 (26)						
895											
	5		SILTY SAND (SM), fine to medium sand, occasional fine gravel, nonplastic, brown, moist, loose	SPT	2-3-3 (6)						
				AU			8	NP	NP	NP	35
890			Trace cobbles below 8'								
			SILTY CLAY (CL), trace fine to coarse sand, low plasticity, brown, moist, soft								
	10			SPT	1-3-4 (7)		19	26	19	7	89
885											
			SAND WITH SILT (SP-SM), fine grained, nonplastic, light brown, slightly moist, medium dense								
	15			SPT	4-5-7 (12)						

Bottom of borehole at 16.0 feet. Backfilled with soil cuttings and patched with cold patch AC.

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-128

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 2/21/2024 **COMPLETED** 2/21/2024
BORING LOCATION STA 31+20, 22' R MC 85 Cst CL
DRILLER GSI **DRILLED BY** Shea K.
GPS COORDINATES 33.39879°N, -112.43994°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 895 ft **BOREHOLE DEPTH** 11 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY K. Dahlen **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
895			FILL - CLAYEY SAND (SC), fine to medium sand, trace to some fine gravel, medium plasticity, brown, moist, soft	SPT	4-4-4 (8)						
			SANDY CLAY (CL), considerable fine to medium sand, low to medium plasticity, brown, moist, moderately firm	AU			15	29	14	15	63
890	5			SPT	3-6-8 (14)						
			SANDY SILT (ML), fine sand, no to low plasticity, brown, moist, soft								
885	10			SPT	2-3-4 (7)						

Bottom of borehole at 11.0 feet. Backfilled with soil cuttings.

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-129

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 11/2/2023 **COMPLETED** 11/3/2023
BORING LOCATION STA 1081+50, 50' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40075°N, -112.44317°E
DRILLING METHOD Tubex
GROUND ELEVATION 899 ft **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 40 ft / Elev 859 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAY (CL), trace predominantly fine sand, medium plasticity, brown, slightly moist, moderately firm, strong HCL reaction								
				R	8-9						
				AU			11	31	17	14	86
895				SPT	6-5-8 (13)						
	5										
			SANDY SILT (ML), predominantly fine sand, nonplastic, brown, slightly moist, moderately firm to soft, strong HCL reaction	SPT	5-4-5 (9)						
890											
	10			R	4-5	90	10	NP	NP	NP	59
885											
	15			SPT	5-3-4 (7)						
880			GRAVEL WITH SAND (GP), predominantly coarse gravel, some to considerable fine to coarse sand, subrounded to subangular, nonplastic, brown, wet, medium dense								
	20			SPT	6-13-14 (27)						
875											
	25										

(Continued Next Page)

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-129

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 11/2/2023 **COMPLETED** 11/3/2023 **BORING LOCATION** STA 1081+50, 50' R SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.40075°N, -112.44317°E

DRILLING METHOD Tubex **GROUND ELEVATION** 899 ft **BOREHOLE DEPTH** 61.5 ft

RIG TYPE / # CME-85/ 118 ▼ **GROUNDWATER DEPTH** 40 ft / Elev 859 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			GRAVEL WITH SAND (GP), predominantly coarse gravel, some to considerable fine to coarse sand, subrounded to subangular, nonplastic, brown, wet, medium dense*(continued)*	R	10-28		2	NP	NP	NP	3
870											
	30		Considerable fine to medium angular sand below 30'	SPT	21-13-28 (41)						
865											
	35		SAND (SP), considerable predominately fine to medium sand, occasional fine gravel, angular, nonplastic, brown, moist, medium dense	SPT	27-8-10 (18)						
			GRAVEL WITH SAND (GP), predominantly fine gravel, considerable predominately fine to medium sand, subrounded to subangular, nonplastic, brown, wet, medium dense								
860											
	40	▼		R	24-16						
855											
	45			SPT	10-11-14 (25)						
850											
	50										

(Continued Next Page)

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-129

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 11/2/2023 **COMPLETED** 11/3/2023
BORING LOCATION STA 1081+50, 50' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40075°N, -112.44317°E
DRILLING METHOD Tubex
GROUND ELEVATION 899 ft **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 40 ft / Elev 859 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
			GRAVEL WITH SAND (GP), predominantly medium sand, predominantly fine gravel, subrounded to subangular, nonplastic, brown, wet, dense	SPT	9-15-30 (45)		14	37	15	22	4
845	55		SAND WITH GRAVEL (SP), predominantly fine to medium sand, some fine to coarse gravel, angular, nonplastic, brown, wet, medium dense	R	19-23						
840	60		SAND (SP), occasional fine gravel, angular, fine to medium grained, nonplastic, brown, wet, medium dense	SPT	2-5-12 (17)						

Bottom of borehole at 61.5 feet. Backfilled with grout.

BORING NUMBER B-129A

Ethos Engineering, LLC

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 10/18/2024 **COMPLETED** 10/18/2024
BORING LOCATION STA 1081+10, 10' L SR 303L Cst CL
DRILLER ACS Services **DRILLED BY** J. Scalf
GPS COORDINATES 33.40069°N, -112.4436°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION _____ **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # CME-75/ 287487
GROUNDWATER DEPTH 46 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 82.9
LOGGED BY R. Bohon **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAY (CL), occasional to trace predominantly fine sand, medium plasticity, brown, slightly moist to moist, firm to moderately firm	SPT AU	7-7-9 (16)		8	34	18	16	93
				R	15-17	104	13				
	5			SPT	7-8-8 (16)						
	10		Note: color change to dark brown below 10 feet	SPT	8-7-8 (15)						
	15			R	9-15	104	21				
	20		SAND WITH SILT AND GRAVEL (SP-SM), considerable fine to coarse gravel, predominantly fine sand, subangular, nonplastic, moist, dense	SPT	11-13-19 (32)		4	NP	NP	NP	6
	25		Note: cobbles below 23 feet								

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 10/18/2024 **COMPLETED** 10/18/2024 **BORING LOCATION** STA 1081+10, 10' L SR 303L Cst CL
DRILLER ACS Services **DRILLED BY** J. Scalf **GPS COORDINATES** 33.40069°N, -112.4436°E
DRILLING METHOD Hollow Stem Auger **GROUND ELEVATION** _____ **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # CME-75/ 287487 **GROUNDWATER DEPTH** 46 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 82.9 **LOGGED BY** R. Bohon **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			GRAVEL WITH SAND (GP), predominantly coarse gravel, some to considerable fine to coarse sand, subrounded to subangular, nonplastic, brown, moist, medium dense	SPT	9-13-14 (27)						
	30			SPT	8-11-15 (26)						
	35		Note: very dense below 35 feet	SPT	13-22-28 (50)						
	40			SPT	15-32-20 (52)						
	45		SAND WITH GRAVEL (SP), considerable fine to coarse gravel, fine to coarse sand, subangular, nonplastic, dark brown, wet, medium dense	SPT	4-7-4 (11)						
	50										

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Ethos Engineering, LLC

BORING NUMBER B-129A

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 10/18/2024 **COMPLETED** 10/18/2024
BORING LOCATION STA 1081+10, 10' L SR 303L Cst CL
DRILLER ACS Services **DRILLED BY** J. Scalf
GPS COORDINATES 33.40069°N, -112.4436°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION _____ **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # CME-75/ 287487
GROUNDWATER DEPTH 46 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 82.9
LOGGED BY R. Bohon **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			GRAVEL WITH SAND (GP), considerable fine to coarse sand, fine to coarse gravel, subangular, nonplastic, dark brown, wet, medium dense	SPT	22-15-10 (25)						
	55		SAND WITH CLAY AND GRAVEL (SP-SC), considerable fine to coarse gravel, fine to coarse sand, subangular, low plasticity, dark brown, wet, very dense	SPT	17-18-22 (40)						
	60			SPT	17-22-33 (55)						

Bottom of borehole at 61.5 feet. Backfilled with soil cuttings; grouted upper 20 feet.

BORING NUMBER B-130

Ethos Engineering, LLC

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 8/20/2024 **COMPLETED** 8/20/2024
BORING LOCATION STA 1083+65, 35' R SR 303L CST CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40139°N, -112.44314°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 899 ft **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 45 ft / Elev 854 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Brown **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SANDY CLAY (CL), some to considerable predominantly fine to medium sand, occasional coarse gravel, medium plasticity, brown, slightly moist, moderately firm	SPT	5-6-7 (13)						
				AU							
895			SILTY CLAY (CL-ML), trace predominantly fine sand, low plasticity, brown, slightly moist, firm to moderately firm	SPT	5-8-9 (17)						
	5										
				SPT	4-7-8 (15)						
890											
	10			R	10-8	97	18	27	21	6	88
885											
	15			SPT	4-5-16 (21)						
880											
	20										
			GRAVEL WITH SAND (GP), predominantly fine gravel, considerable fine to coarse sand, subangular, nonplastic, light grayish brown, slightly moist, medium dense	SPT	3-5-12 (17)		3	NP	NP	NP	3
875											
	25										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 8/20/2024 **COMPLETED** 8/20/2024
BORING LOCATION STA 1083+65, 35' R SR 303L CST CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40139°N, -112.44314°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 899 ft **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 45 ft / Elev 854 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Brown **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			GRAVEL WITH SAND (GP), predominantly fine gravel, considerable fine to coarse sand, subangular, nonplastic, light grayish brown, slightly moist, medium dense*(continued)*	R	10-36						
870	30		GRAVEL WITH SAND (GP), fine to coarse gravel, considerable predominately fine to medium sand, subangular to angular, nonplastic, light grayish brown, moist to wet, very dense	SPT	4-19-50/4"						
865	35			SPT	20-50/4"						
860	40		medium dense between 40 and 50 feet	R	20-25						
855	45	▼		SPT	6-8-11 (19)						
850	50										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 8/20/2024 **COMPLETED** 8/20/2024
BORING LOCATION STA 1083+65, 35' R SR 303L CST CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40139°N, -112.44314°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 899 ft **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 45 ft / Elev 854 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Brown **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			GRAVEL WITH SAND (GP), fine to coarse gravel, considerable predominately fine to medium sand, subangular to angular, nonplastic, light grayish brown, moist to wet, very dense*(continued)*	SPT	16-25-27 (52)						
845	55		SAND (SP), predominantly fine to medium sand, trace coarse gravel, subangular, nonplastic, light grayish brown, wet, medium dense	R	6-19	129	10				
840	60		Very loose at 60 feet	SPT	1-1-1 (2)						

Bottom of borehole at 61.5 feet. Backfilled with soil cuttings; grouted upper 20 feet.

BORING NUMBER B-131

Ethos Engineering, LLC

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 8/19/2024 **COMPLETED** 8/19/2024
BORING LOCATION STA 1085+20, 75' L SR 303L CST CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40191°N, -112.44322°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 899 ft **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 49 ft / Elev 850 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Brown **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SANDY CLAY (CL), some to considerable predominantly fine to medium sand, rare coarse gravel, medium plasticity, brown, slightly moist, firm	SPT	5-8-9 (17)						
				AU							
895				SPT	6-9-11 (20)						
	5										
			CLAY (CL), occasional fine sand, medium plasticity, brown, slightly moist, moderately firm	R	7-10	80	16	37	20	17	98
890											
	10		very firm below 10 feet	SPT	11-15-26 (41)						
885											
	15		SAND (SP), predominantly fine to medium sand, occasional fine gravel, subangular, nonplastic, brown, slightly moist to moist, medium dense	SPT	5-6-6 (12)						
880											
	20		SAND WITH SILT (SP-SM), predominantly fine sand, trace fine gravel, subangular, nonplastic, light brown, slightly moist to moist, loose to medium dense	R	5-7	98	4	NP	NP	NP	8
875											
	25										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 8/19/2024 **COMPLETED** 8/19/2024
BORING LOCATION STA 1085+20, 75' L SR 303L CST CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40191°N, -112.44322°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 899 ft **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 49 ft / Elev 850 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Brown **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SAND WITH SILT (SP-SM), predominantly fine sand, trace fine gravel, subangular, nonplastic, light brown, slightly moist to moist, loose to medium dense*(continued)*	SPT	4-6-5 (11)						
870	30		GRAVEL WITH SAND (GP), considerable predominately fine to medium sand, subangular to angular, nonplastic, light grayish brown, slightly moist, medium dense to dense	SPT	4-8-11 (19)						
865	35			R	23-25	113	2				
860	40			SPT	11-13-18 (31)						
855	45		SAND WITH GRAVEL (SP), predominantly fine to medium sand, some fine to coarse gravel, subangular, nonplastic, light grayish brown, moist to wet, dense to medium dense	SPT	5-4-46 (50)						
850	50		▼								

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CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 8/19/2024 **COMPLETED** 8/19/2024
BORING LOCATION STA 1085+20, 75' L SR 303L CST CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40191°N, -112.44322°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 899 ft **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 49 ft / Elev 850 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Brown **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SAND WITH GRAVEL (SP), predominantly fine to medium sand, some fine to coarse gravel, subangular, nonplastic, light grayish brown, moist to wet, dense to medium dense *(continued)*	R	6-14						
845	55			SPT	20-23-12 (35)		16	NP	NP	NP	3
840	60		CLAYEY SAND (SC), predominantly fine to medium sand, trace coarse gravel, subangular, weak lime cementation, medium plasticity, grayish brown, wet, hard	SPT	8-17-18 (35)						

Bottom of borehole at 61.5 feet. Backfilled with soil cuttings; grouted upper 20 feet.

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-132

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 10/25/2023 **COMPLETED** 10/25/2023
BORING LOCATION STA 1086+40, 45' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40208°N, -112.44262°E
DRILLING METHOD Tubex
GROUND ELEVATION 899 ft **BOREHOLE DEPTH** 61 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 40 ft / Elev 859 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAY (CL), trace fine sand, medium plasticity, brown to light brown, slightly moist, firm, moderate HCL reaction								
				R	18-19	86	10				
				AU							
895			Strong HCL reaction below 3'	SPT	11-10-11 (21)						
	5										
			CLAY WITH SAND (CL), some predominantly fine sand, medium plasticity, brown, slightly moist to moist, moderately firm to soft, strong HCL reaction	SPT	7-4-5 (9)						
890											
	10										
				R	5-6			33	23	10	81
885											
	15										
				SPT	3-2-5 (7)						
880											
	20										
			SAND WITH GRAVEL (SP), predominantly fine to medium sand, considerable fine to coarse gravel, subrounded to subangular, nonplastic, brown, moist, medium dense	SPT	6-7-4 (11)						
875											
	25										

(Continued Next Page)

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-132

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 10/25/2023 **COMPLETED** 10/25/2023 **BORING LOCATION** STA 1086+40, 45' R SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.40208°N, -112.44262°E

DRILLING METHOD Tubex **GROUND ELEVATION** 899 ft **BOREHOLE DEPTH** 61 ft

RIG TYPE / # CME-85/ 118 ▼ **GROUNDWATER DEPTH** 40 ft / Elev 859 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			GRAVEL WITH SILT AND SAND (GP-GM), predominantly fine gravel, considerable fine to coarse sand, subrounded to subangular, nonplastic, brown, moist, medium dense	R	15-22						
870											
	30		Very dense below 30'	SPT	11-30-30 (60)		2	NP	NP	NP	6
865											
	35			SPT	20-23-30 (53)						
860											
	40	▼	GRAVEL WITH SAND (GP), fine to coarse gravel, considerable predominately fine to medium sand, subrounded to subangular, fine to coarse grained, nonplastic, brown, wet, medium dense to very dense	R	30-43						
855											
	45		Decrease to some sand from 45' to 50'	SPT	18-17-50/4"						
850											
	50										

(Continued Next Page)

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-132

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 10/25/2023 **COMPLETED** 10/25/2023
BORING LOCATION STA 1086+40, 45' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40208°N, -112.44262°E
DRILLING METHOD Tubex
GROUND ELEVATION 899 ft **BOREHOLE DEPTH** 61 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 40 ft / Elev 859 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			GRAVEL WITH SAND (GP), fine to coarse gravel, considerable predominately fine to medium sand, subrounded to subangular, fine to coarse grained, nonplastic, brown, wet, medium dense to very dense*(continued)*	SPT	18-11-13 (24)						
845	55			SPT	11-14-26 (40)						
840	60		SAND WITH GRAVEL (SP), predominantly fine to medium sand, considerable fine to coarse gravel, angular, nonplastic, brown, wet, medium dense	R	6-15						

Bottom of borehole at 61.0 feet. Backfilled with soil cuttings; grouted upper 20 feet.

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-133

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 10/27/2023 **COMPLETED** 10/27/2023
BORING LOCATION STA 1184+50, 90' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40176°N, -112.44333°E
DRILLING METHOD Tubex
GROUND ELEVATION 900 ft **BOREHOLE DEPTH** 61 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 40 ft / Elev 860 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
900			CLAY (CL), rare fine sand, medium plasticity, brown, slightly moist, moderately firm, strong HCL reaction								
				R	11-9	92	11	33	17	16	98
				AU							
895	5			SPT	6-4-6 (10)						
			SANDY CLAY (CL), considerable predominately fine sand, medium plasticity, brown to dark brown, slightly moist, moderately firm, strong HCL reaction	SPT	4-5-4 (9)						
890	10										
			SANDY SILT (ML), predominantly fine sand, nonplastic, brown, slightly moist, soft to moderately firm, strong HCL reaction	R	4-5			NP	NP	NP	56
885	15										
				SPT	3-3-12 (15)						
880	20										
			SAND WITH GRAVEL (SP), predominantly medium sand, some predominantly fine gravel, angular, nonplastic, brown, slightly moist, medium dense	SPT	1-3-19 (22)		1	NP	NP	NP	4
875	25										

(Continued Next Page)

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-133

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 10/27/2023 **COMPLETED** 10/27/2023 **BORING LOCATION** STA 1184+50, 90' L SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.40176°N, -112.44333°E

DRILLING METHOD Tubex **GROUND ELEVATION** 900 ft **BOREHOLE DEPTH** 61 ft

RIG TYPE / # CME-85/ 118 ▼ **GROUNDWATER DEPTH** 40 ft / Elev 860 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
875											
870	30		SAND WITH GRAVEL (SP), predominantly medium sand, some predominantly fine gravel, angular, nonplastic, brown, slightly moist, medium dense*(continued)*	R	15-23						
865	35		GRAVEL WITH SILT AND SAND (GP-GM), predominantly fine gravel, considerable fine to coarse sand, subangular, nonplastic, brown, moist to wet, dense to medium dense	SPT	13-16-18 (34)						
860	40	▼	Very dense at 35'	SPT	27-37-40 (77)		3	NP	NP	NP	6
855	45			R	12-20						
850	50		GRAVEL WITH SAND (GP), some fine to coarse sand, subrounded to subangular, fine to coarse grained, nonplastic, brown, wet, dense to medium dense	R	15-29						

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-133

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 10/27/2023 **COMPLETED** 10/27/2023
BORING LOCATION STA 1184+50, 90' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40176°N, -112.44333°E
DRILLING METHOD Tubex
GROUND ELEVATION 900 ft **BOREHOLE DEPTH** 61 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 40 ft / Elev 860 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
850			GRAVEL WITH SAND (GP), some fine to coarse sand, subrounded to subangular, fine to coarse grained, nonplastic, brown, wet, dense to medium dense*(continued)*	SPT	7-9-24 (33)						
845	55			SPT	9-15-15 (30)						
840	60		Increase in sand below 60'	R	13-32	120	13				

Bottom of borehole at 61.0 feet. Backfilled with grout.

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-134

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 10/25/2023 **COMPLETED** 10/26/2023 **BORING LOCATION** STA 1086+30, 60' L SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.40215°N, -112.44296°E

DRILLING METHOD Tubex **GROUND ELEVATION** 899 ft **BOREHOLE DEPTH** 61.5 ft

RIG TYPE / # CME-85/ 118 **GROUNDWATER DEPTH** 40 ft / Elev 859 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAY WITH SAND (CL), occasional fine gravel, trace predominantly fine sand, angular, low plasticity, brown, slightly moist, moderately firm, strong HCL reaction	R	14-18						
				AU			11	27	16	11	85
895				SPT	5-4-6 (10)						
	5		Fine angular sand below 5'	SPT	4-5-6 (11)						
890											
	10		SANDY CLAY (CL), some predominantly fine sand, low to medium plasticity, brown, slightly moist, soft, moderate HCL reaction	R	4-5	94	7				
885											
	15		CLAY WITH SAND (CL), some predominantly fine sand, rare fine gravel, angular, low to medium plasticity, brown, moist, soft, strong HCL reaction	SPT	3-3-5 (8)		11	28	15	13	77
880											
	20		SAND WITH GRAVEL (SP), predominantly fine to medium sand, considerable fine to coarse gravel, subrounded to subangular, nonplastic, brown, moist, medium dense to dense	SPT	7-12-9 (21)						
875											
	25										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-134

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 10/25/2023 **COMPLETED** 10/26/2023 **BORING LOCATION** STA 1086+30, 60' L SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.40215°N, -112.44296°E

DRILLING METHOD Tubex **GROUND ELEVATION** 899 ft **BOREHOLE DEPTH** 61.5 ft

RIG TYPE / # CME-85/ 118 ▼ **GROUNDWATER DEPTH** 40 ft / Elev 859 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SAND WITH GRAVEL (SP), predominantly fine to medium sand, considerable fine to coarse gravel, subrounded to subangular, nonplastic, brown, moist, medium dense to dense*(continued)*	R	35-25						
870	30										
			GRAVEL WITH SILT AND SAND (GP-GM), fine to coarse gravel, considerable predominately fine to medium sand, subangular, nonplastic, brown, moist, medium dense	SPT	13-10-13 (23)						
865	35		Wet below 35'	SPT	12-15-14 (29)						
860	40	▼									
			GRAVEL WITH SAND (GP), fine to coarse gravel, considerable fine to coarse sand, subangular, nonplastic, brown, wet, dense to medium dense	R	21-38			NP	NP	NP	3
855	45			SPT	17-18-32 (50)						
850	50										

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Ethos Engineering, LLC
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BORING NUMBER B-134

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 10/25/2023 **COMPLETED** 10/26/2023
BORING LOCATION STA 1086+30, 60' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40215°N, -112.44296°E
DRILLING METHOD Tubex
GROUND ELEVATION 899 ft **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 40 ft / Elev 859 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			GRAVEL WITH SAND (GP), fine to coarse gravel, considerable fine to coarse sand, subangular, nonplastic, brown, wet, dense to medium dense*(continued)*	SPT	14-15-12 (27)						
845	55			R	16-24						
840	60		GRAVEL WITH SILT AND SAND (GP-GM), fine to coarse gravel, considerable predominately fine to medium sand, subrounded to subangular, nonplastic, brown, wet, medium dense	SPT	1-10-10 (20)		7	NP	NP	NP	8

Bottom of borehole at 61.5 feet. Backfilled with grout.

Ethos Engineering, LLC
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BORING NUMBER B-135

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 10/11/2023 **COMPLETED** 10/12/2023
BORING LOCATION STA 1088+30, 115' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40259°N, -112.44257°E
DRILLING METHOD Tubex
GROUND ELEVATION 896 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/118
GROUNDWATER DEPTH 40 ft / Elev 856 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
895			CLAY (CL), fine sand, medium plasticity, brown, slightly moist, firm to moderately firm								
				R	10-13						
				AU							
	5			SPT	8-9-10 (19)						
890				R	9-8	87	13	30	19	11	94
	10		Moderate HCL reaction at 10'								
885				SPT	9-5-8 (13)						
	15										
880			SAND WITH GRAVEL (SP), predominantly medium sand, considerable predominately coarse gravel, angular, nonplastic, brown, moist, loose	SPT	4-4-5 (9)						
	20										
875				R	4-6			NP	NP	NP	5
	25										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-135

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 10/11/2023 **COMPLETED** 10/12/2023 **BORING LOCATION** STA 1088+30, 115' L SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.40259°N, -112.44257°E

DRILLING METHOD Tubex **GROUND ELEVATION** 896 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # CME-85/118 ▼ **GROUNDWATER DEPTH** 40 ft / Elev 856 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
870			SAND WITH GRAVEL (SP), predominantly medium sand, considerable predominately coarse gravel, angular, nonplastic, brown, moist, loose*(continued)* Medium dense below 25'	SPT	9-14-6 (20)						
	30										
865			GRAVEL WITH SILT AND SAND (GP-GM), fine to coarse gravel, considerable fine to coarse sand, subangular, brown, moist, very dense to dense	SPT	18-24-32 (56)		2	NP	NP	NP	8
	35										
860				R	15-34						
	40	▼	Wet, some fine to coarse sand below 40'								
855				SPT	33-50/5"						
	45										
850				SPT	50/5"						
	50										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-135

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 10/11/2023 **COMPLETED** 10/12/2023 **BORING LOCATION** STA 1088+30, 115' L SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.40259°N, -112.44257°E

DRILLING METHOD Tubex **GROUND ELEVATION** 896 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # CME-85/118 ▼ **GROUNDWATER DEPTH** 40 ft / Elev 856 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
845			GRAVEL WITH SILT AND SAND (GP-GM), fine to coarse gravel, considerable fine to coarse sand, subangular, brown, moist, very dense to dense*(continued)*	R	19-32						
	55										
840			Considerable fine to coarse sand below 55'	SPT	25-22-15 (37)						
	60										
835				SPT	9-18-25 (43)						
	65										
830			GRAVEL WITH SAND (GP), fine to coarse gravel, considerable predominately fine to medium sand, angular, nonplastic, brown, wet, loose	R	4-5	119	12				
	70										
825			Dense to very dense below 70'	SPT	13-26-27 (53)						
	75										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
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BORING NUMBER B-135

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 10/11/2023 **COMPLETED** 10/12/2023
BORING LOCATION STA 1088+30, 115' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40259°N, -112.44257°E
DRILLING METHOD Tubex
GROUND ELEVATION 896 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/118
GROUNDWATER DEPTH 40 ft / Elev 856 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
820			SAND WITH SILT AND GRAVEL (SP-SM), fine to coarse sand, considerable predominately fine gravel, subrounded to subangular, nonplastic, brown, wet, dense	SPT	15-25-15 (40)		1	NP	NP	NP	11
	80										
815			SAND (SP), predominantly fine to medium sand, trace fine gravel, angular, nonplastic, brown, wet, dense	SPT	19-19-21 (40)						
	85										
810				SPT	9-12-28 (40)						
	90										
805			CLAYEY SAND WITH GRAVEL (SC), fine to coarse sand, trace to some fine gravel, angular, medium plasticity, brown, wet, hard, moderate HCL reaction	SPT	19-22-34 (56)						
	95										
800				SPT	16-29-30 (59)						
	100										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
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BORING NUMBER B-135

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 10/11/2023 **COMPLETED** 10/12/2023
BORING LOCATION STA 1088+30, 115' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40259°N, -112.44257°E
DRILLING METHOD Tubex
GROUND ELEVATION 896 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/118
GROUNDWATER DEPTH 40 ft / Elev 856 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
795			SAND (SP), predominantly fine to medium sand, rare fine gravel, angular, nonplastic, brown, wet, medium dense	SPT	9-10-13 (23)						

Bottom of borehole at 101.5 feet. Backfilled with soil cuttings; grouted upper 20 feet.

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-136

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 10/12/2023 **COMPLETED** 10/13/2023
BORING LOCATION STA 1089+30, 20' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40265°N, -112.44213°E
DRILLING METHOD Tubex
GROUND ELEVATION 896 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/118
GROUNDWATER DEPTH 40 ft / Elev 856 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
895			CLAY (CL), occasional fine sand, weak lime cementation, low to medium plasticity, dark brown to brown, slightly moist, moderately firm to firm, moderate HCL reaction	SPT	3-5-11 (16)						
				AU							
				SPT	8-6-8 (14)						
	5										
890				R	9-13	103	13	28	18	10	94
	10										
885			SANDY CLAY (CL), considerable predominately fine sand, low to medium plasticity, brown, moist, firm	SPT	5-9-10 (19)						
	15										
880			SAND WITH GRAVEL (SP), considerable fine to coarse gravel, angular, medium grained, nonplastic, brown, moist, medium dense to loose	SPT	7-9-12 (21)						
	20										
875				R	3-10	97	2				
	25										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-136

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 10/12/2023 **COMPLETED** 10/13/2023
BORING LOCATION STA 1089+30, 20' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40265°N, -112.44213°E
DRILLING METHOD Tubex
GROUND ELEVATION 896 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/118
GROUNDWATER DEPTH 40 ft / Elev 856 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
870			SAND WITH GRAVEL (SP), considerable fine to coarse gravel, angular, medium grained, nonplastic, brown, moist, medium dense to loose*(continued)* Dense below 25'	SPT	8-15-16 (31)						
	30		GRAVEL WITH SAND (GP), fine to coarse gravel, considerable medium sand, subrounded to subangular, nonplastic, brown, moist, medium dense to dense								
865				SPT	9-9-8 (17)						
	35										
860				R	15-16						
	40		Very dense, wet, fine to coarse angular sand below 40'								
855				SPT	15-23-50/4"		1	NP	NP	NP	5
	45										
850				SPT	11-21-34 (55)						
	50										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-136

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 10/12/2023 **COMPLETED** 10/13/2023 **BORING LOCATION** STA 1089+30, 20' L SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.40265°N, -112.44213°E

DRILLING METHOD Tubex **GROUND ELEVATION** 896 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # CME-85/118 ▼ **GROUNDWATER DEPTH** 40 ft / Elev 856 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
845			GRAVEL WITH SAND (GP), fine to coarse gravel, considerable medium sand, subrounded to subangular, nonplastic, brown, moist, medium dense to dense*(continued)*	R	14-50/5"						
	55										
840			CLAYEY SAND WITH GRAVEL (SC), predominantly medium sand, considerable fine to coarse gravel, angular, medium plasticity, brown, wet, very stiff to hard	SPT	3-14-10 (24)		7	31	15	16	18
	60										
835			Considerable gravel below 60'	SPT	9-19-20 (39)						
	65										
830			GRAVEL WITH SAND (GP), fine to coarse gravel, considerable predominately medium sand, angular, nonplastic, brown, wet, medium dense	R	11-19			NP	NP	NP	3
	70										
825			CLAYEY SAND WITH GRAVEL (SC), fine to coarse sand, some fine to coarse gravel, angular, medium plasticity, brown, wet, very stiff to hard	SPT	5-8-10 (18)						
	75										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-136

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 10/12/2023 **COMPLETED** 10/13/2023
BORING LOCATION STA 1089+30, 20' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40265°N, -112.44213°E
DRILLING METHOD Tubex
GROUND ELEVATION 896 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/118
GROUNDWATER DEPTH 40 ft / Elev 856 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
820			CLAYEY SAND WITH GRAVEL (SC), fine to coarse sand, some fine to coarse gravel, angular, medium plasticity, brown, wet, very stiff to hard*(continued)*								
	80										
815			SAND (SP), predominantly fine to medium sand, trace fine gravel, angular, nonplastic, brown, wet, medium dense	SPT	9-9-11 (20)						
	85										
810			Occassional fine subangular gravel, predominantly medium grained angular sand below 85'	SPT	11-8-8 (16)		4	NP	NP	NP	10
	90										
805			CLAYEY SAND (SC), fine to coarse sand, trace fine gravel, angular, medium plasticity, brown, wet, very stiff	SPT	8-12-12 (24)						
	95										
800			SAND (SP), predominantly fine sand, rare fine gravel, angular, nonplastic, brown, wet, dense to medium dense	SPT	11-12-24 (36)						
	100										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-136

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 10/12/2023 **COMPLETED** 10/13/2023
BORING LOCATION STA 1089+30, 20' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40265°N, -112.44213°E
DRILLING METHOD Tubex
GROUND ELEVATION 896 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/118
GROUNDWATER DEPTH 40 ft / Elev 856 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
795			SAND (SP), predominantly fine sand, rare fine gravel, angular, nonplastic, brown, wet, dense to medium dense*(continued)*	SPT	9-9-13 (22)						

Bottom of borehole at 101.5 feet. Backfilled with soil cuttings; grouted upper 20 feet.

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-137

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 1/24/2024 **COMPLETED** 1/29/2024
BORING LOCATION STA 1089+60, 110' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40287°N, -112.44231°E
DRILLING METHOD Tubex
GROUND ELEVATION 901 ft **BOREHOLE DEPTH** 121.5 ft
RIG TYPE / # CME-85/118
GROUNDWATER DEPTH 35 ft / Elev 866 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
900			SILTY CLAY WITH SAND (CL-ML), trace to some predominantly fine sand, low plasticity, light brown, slightly moist, soft, strong HCL reaction								
				R	6-6						
				AU							
				SPT	1-3-4 (7)						
	5										
895				SPT	3-3-4 (7)						
	10		Firm below 10'	R	15-16			27	21	6	86
890											
			SAND WITH SILT (SP-SM), angular, fine to medium grained, nonplastic, grayish brown, slightly moist, medium dense								
	15										
885				SPT	5-5-6 (11)						
			Trace to some fine subangular gravel below 18'								
	20										
880			GRAVEL WITH SAND (GP), fine to coarse gravel, fine to medium sand, subrounded, nonplastic, grayish brown, slightly moist to wet, medium dense, strong HCL reaction	R	11-13						
	25										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-137

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 1/24/2024 **COMPLETED** 1/29/2024
BORING LOCATION STA 1089+60, 110' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40287°N, -112.44231°E
DRILLING METHOD Tubex
GROUND ELEVATION 901 ft **BOREHOLE DEPTH** 121.5 ft
RIG TYPE / # CME-85/118
GROUNDWATER DEPTH 35 ft / Elev 866 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
875			GRAVEL WITH SAND (GP), fine to coarse gravel, fine to medium sand, subrounded, nonplastic, grayish brown, slightly moist to wet, medium dense, strong HCL reaction *(continued)*	SPT	5-5-9 (14)						
	30			R	11-20						
870											
	35		▼ Considerable fine to medium angular sand from 34' to 38'	SPT	5-5-6 (11)						
865											
	40			SPT	5-8-10 (18)		0	NP	NP	NP	2
860											
	45		Loose below 45'	R	4-6						
855											
	50										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-137

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 1/24/2024 **COMPLETED** 1/29/2024 **BORING LOCATION** STA 1089+60, 110' L SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.40287°N, -112.44231°E

DRILLING METHOD Tubex **GROUND ELEVATION** 901 ft **BOREHOLE DEPTH** 121.5 ft

RIG TYPE / # CME-85/118 ▼ **GROUNDWATER DEPTH** 35 ft / Elev 866 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
850			GRAVEL WITH SAND (GP), fine to coarse gravel, fine to medium sand, subrounded, nonplastic, grayish brown, slightly moist to wet, medium dense, strong HCL reaction *(continued)*	R	3-8						
	55										
845			GRAVEL WITH SILT AND SAND (GP-GM), predominantly coarse gravel, some predominantly medium to coarse sand, subangular, coarse grained, nonplastic, light brown, wet, medium dense	SPT	11-11-10 (21)						
	60		CLAYEY SAND WITH GRAVEL (SC), fine to coarse sand, considerable predominately fine gravel, angular, low to medium plasticity, brown, wet, dense								
840				SPT	6-18-23 (41)		9	29	17	12	17
	65		SAND (SP), trace cobbles, occasional fine gravel, predominantly medium to coarse sand, angular, nonplastic, brown, wet, medium dense								
835				SPT	1-4-11 (15)						
	70										
830			SAND WITH SILT AND GRAVEL (SP-SM), predominantly medium sand, considerable fine to coarse gravel, angular, nonplastic, brown, wet, medium dense to dense, weak HCL reaction	SPT	16-18-12 (30)						
	75										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-137

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 1/24/2024 **COMPLETED** 1/29/2024
BORING LOCATION STA 1089+60, 110' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40287°N, -112.44231°E
DRILLING METHOD Tubex
GROUND ELEVATION 901 ft **BOREHOLE DEPTH** 121.5 ft
RIG TYPE / # CME-85/118
GROUNDWATER DEPTH 35 ft / Elev 866 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
825			SAND WITH SILT AND GRAVEL (SP-SM), predominantly medium sand, considerable fine to coarse gravel, angular, nonplastic, brown, wet, medium dense to dense, weak HCL reaction *(continued)*	SPT	9-14-14 (28)		1	NP	NP	NP	10
	80		Considerable gravel below 80'	SPT	11-11-12 (23)						
820											
	85		SILTY, CLAYEY SAND (SC-SM), medium sand, occasional fine gravel, angular, low plasticity, brown, wet, very dense to medium dense	SPT	14-27-28 (55)						
815											
	90			SPT	12-9-11 (20)						
810											
	95										
805				SPT	12-13-14 (27)		5	26	20	6	22
	100										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-137

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 1/24/2024 **COMPLETED** 1/29/2024 **BORING LOCATION** STA 1089+60, 110' L SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.40287°N, -112.44231°E

DRILLING METHOD Tubex **GROUND ELEVATION** 901 ft **BOREHOLE DEPTH** 121.5 ft

RIG TYPE / # CME-85/118 ▼ **GROUNDWATER DEPTH** 35 ft / Elev 866 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
800			SILTY, CLAYEY SAND (SC-SM), medium sand, occasional fine gravel, angular, low plasticity, brown, wet, very dense to medium dense*(continued)*	SPT	16-18-20 (38)						
	105										
795			CLAYEY SAND (SC), predominantly medium sand, subangular, medium plasticity, brown, wet, very firm	SPT	14-19-20 (39)						
	110										
790			SILTY SAND (SM), predominantly fine sand, trace fine gravel, subangular, nonplastic, brown, wet, dense	SPT	13-16-23 (39)						
	115										
785				SPT	14-16-17 (33)						
			CLAY WITH SAND (CL), some fine sand, medium plasticity, brown, wet, very stiff								
	120										
780				SPT	1-8-8 (16)						

Bottom of borehole at 121.5 feet. Backfilled with soil cuttings; grouted upper 20 feet.

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-138

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 1/18/2024 **COMPLETED** 1/23/2024
BORING LOCATION STA 1090+40, 20' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40292°N, -112.4419°E
DRILLING METHOD Tubex
GROUND ELEVATION 901 ft **BOREHOLE DEPTH** 120.5 ft
RIG TYPE / # CME-85/118
GROUNDWATER DEPTH 35 ft / Elev 866 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
900			SILTY CLAY WITH SAND (CL-ML), trace to some predominantly fine sand, low plasticity, brown, slightly moist, very soft, moderate HCL reaction								
				R	3-2						
				AU							
	5										
895			SILT (ML), occasional fine sand, nonplastic, brown, slightly moist, loose	R	6-7	99	19	NP	NP	NP	92
	10										
890				SPT	2-3-3 (6)						
			SAND WITH SILT (SP-SM), fine to medium sand, angular, nonplastic, light brown, slightly moist, very dense to dense								
	15										
885				R	6-50/5"			NP	NP	NP	9
			Some predominantly fine subangular gravel below 19'								
	20										
880				SPT	3-9-22 (31)						
			GRAVEL WITH SAND (GP), predominantly fine gravel, some to considerable fine to coarse sand, subangular, nonplastic, grayish brown, slightly moist to wet, medium dense								
	25										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-138

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 1/18/2024 **COMPLETED** 1/23/2024 **BORING LOCATION** STA 1090+40, 20' L SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.40292°N, -112.4419°E

DRILLING METHOD Tubex **GROUND ELEVATION** 901 ft **BOREHOLE DEPTH** 120.5 ft

RIG TYPE / # CME-85/118 ▼ **GROUNDWATER DEPTH** 35 ft / Elev 866 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
875			GRAVEL WITH SAND (GP), predominantly fine gravel, some to considerable fine to coarse sand, subangular, nonplastic, grayish brown, slightly moist to wet, medium dense*(continued)*	SPT	3-4-12 (16)		3	NP	NP	NP	3
			Predominantly coarse gravel from 29' to 32'								
	30		Some medium to coarse angular sand below 30'	R	21-24						
870											
	35	▼		SPT	9-9-8 (17)						
865											
			SAND WITH SILT AND GRAVEL (SP-SM), predominantly medium to coarse sand, considerable fine gravel, angular, nonplastic, brown, wet, medium dense to very loose								
	40			SPT	8-13-18 (31)						
860											
	45			SPT	4-2-8 (10)						
855											
	50										

(Continued Next Page)

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-138

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 1/18/2024 **COMPLETED** 1/23/2024 **BORING LOCATION** STA 1090+40, 20' L SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.40292°N, -112.4419°E

DRILLING METHOD Tubex **GROUND ELEVATION** 901 ft **BOREHOLE DEPTH** 120.5 ft

RIG TYPE / # CME-85/118 ▼ **GROUNDWATER DEPTH** 35 ft / Elev 866 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
850			SAND WITH SILT AND GRAVEL (SP-SM), predominantly medium to coarse sand, considerable fine gravel, angular, nonplastic, brown, wet, medium dense to very loose*(continued)*	SPT	2-1-1 (2)						
			GRAVEL WITH SILT AND SAND (GP-GM), fine gravel, some predominantly medium to coarse sand, subrounded to subangular, nonplastic, brown, wet, loose to very loose								
	55										
845				SPT	5-3-6 (9)						
	60										
840				SPT	3-1-2 (3)						
	65		Increased density to medium dense at 65'								
835				SPT	3-8-8 (16)						
			SAND WITH SILT AND GRAVEL (SP-SM), predominantly medium to coarse sand, considerable predominately coarse gravel, angular, nonplastic, dark brown, wet, very dense to dense								
	70										
830				SPT	10-30-36 (66)						
			Trace fine subangular to subrounded gravel below 73'								
	75										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-138

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 1/18/2024 **COMPLETED** 1/23/2024 **BORING LOCATION** STA 1090+40, 20' L SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.40292°N, -112.4419°E

DRILLING METHOD Tubex **GROUND ELEVATION** 901 ft **BOREHOLE DEPTH** 120.5 ft

RIG TYPE / # CME-85/118 ▼ **GROUNDWATER DEPTH** 35 ft / Elev 866 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
825	80		SAND WITH SILT AND GRAVEL (SP-SM), predominantly medium to coarse sand, considerable predominately coarse gravel, angular, nonplastic, dark brown, wet, very dense to dense*(continued)*	SPT	9-15-21 (36)						
820	85		CLAYEY SAND WITH GRAVEL (SC), fine to coarse sand, considerable fine to coarse gravel, angular, medium plasticity, brown, wet, very firm	SPT	13-13-23 (36)		8	31	17	14	23
815	90		SILTY, CLAYEY SAND WITH GRAVEL (SC-SM), fine to medium sand, some fine gravel, angular, low plasticity, light brown, wet, firm	SPT	10-13-14 (27)						
810	95		SAND (SP), fine to medium sand, rare fine gravel, angular, nonplastic, brown, wet, dense	SPT	10-18-25 (43)						
805	100		SAND WITH SILT (SP-SM), fine to medium sand, rare fine gravel, angular, nonplastic, brown, wet, very dense	SPT	28-36-31 (67)						

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-138

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 1/18/2024 **COMPLETED** 1/23/2024
BORING LOCATION STA 1090+40, 20' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40292°N, -112.4419°E
DRILLING METHOD Tubex
GROUND ELEVATION 901 ft **BOREHOLE DEPTH** 120.5 ft
RIG TYPE / # CME-85/118
GROUNDWATER DEPTH 35 ft / Elev 866 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
800			SAND (SP), fine to medium sand, angular, nonplastic, brown, wet, medium dense	SPT	11-11-11 (22)						
	105										
795			SILTY SAND (SM), predominantly medium sand, rare fine gravel, angular, nonplastic, brown, wet, very dense to dense	SPT	32-37-33 (70)		6	NP	NP	NP	14
	110		Rare fine subangular gravel below 110'								
790				SPT	10-17-27 (44)						
	115										
785				SPT	16-26-35 (61)						
	120		Increased silt below 120'								
				SPT	50/5"						

Bottom of borehole at 120.5 feet. Backfilled with soil cuttings; grouted upper 20 feet.

BORING NUMBER B-139

Ethos Engineering, LLC

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 6/20/2024 **COMPLETED** 6/25/2024
BORING LOCATION STA 1091+75, 108' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40335°N, -112.44189°E
DRILLING METHOD Tubex
GROUND ELEVATION 902 ft **BOREHOLE DEPTH** 120.9 ft
RIG TYPE / # CME-85/118
GROUNDWATER DEPTH 45 ft / Elev 857 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
900			FILL - CLAYEY SAND (SC), predominantly fine to medium sand, occasional fine gravel, angular, medium to high plasticity, light brown, slightly moist, moderate HCL reaction	SPT	9-6-7 (13)						
				AU							
			CLAY (CL), occasional fine sand, medium plasticity, light brown to brown, weak HCL reaction	SPT	3-4-4 (8)						
	5										
				R	3-5	95	20	36	19	17	96
895											
	10			SPT	3-4-7 (11)						
890			Note: low plasticity below 11.5'								
	15										
885			SAND WITH SILT (SP-SM), predominantly fine sand, trace fine to coarse gravel, angular, nonplastic, dark brown, slightly moist	SPT	2-4-5 (9)						
	20										
880			SAND WITH GRAVEL (SP), predominantly fine sand, some fine to coarse gravel, angular, nonplastic, dark brown, slightly moist	R	12-22						
	25										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 6/20/2024 **COMPLETED** 6/25/2024
BORING LOCATION STA 1091+75, 108' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40335°N, -112.44189°E
DRILLING METHOD Tubex
GROUND ELEVATION 902 ft **BOREHOLE DEPTH** 120.9 ft
RIG TYPE / # CME-85/118
GROUNDWATER DEPTH 45 ft / Elev 857 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SAND WITH GRAVEL (SP), predominantly fine sand, some fine to coarse gravel, angular, nonplastic, dark brown, slightly moist *(continued)*	SPT	1-2-8 (10)						
875			GRAVEL WITH SAND (GP), predominantly fine gravel, considerable predominately medium sand, angular to subangular, dark brown, slightly moist								
	30			SPT	8-9-11 (20)		5	NP	NP	NP	1
870											
	35		GRAVEL (GP), trace cobbles, predominantly coarse gravel, trace fine to medium sand, angular to subangular, nonplastic, gray, slightly moist	R	16-41						
865											
	40			SPT	50/5"						
860											
	45	▼	GRAVEL WITH SAND (GP), trace cobbles, predominantly coarse gravel, considerable fine to coarse sand, angular to subangular, nonplastic, brown to gray, wet	SPT	9-12-13 (25)		11	NP	NP	NP	3
855											
	50		Note: Considerable medium to coarse grained sand below 48'								

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 6/20/2024 **COMPLETED** 6/25/2024 **BORING LOCATION** STA 1091+75, 108' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.40335°N, -112.44189°E
DRILLING METHOD Tubex **GROUND ELEVATION** 902 ft **BOREHOLE DEPTH** 120.9 ft
RIG TYPE / # CME-85/118 ▼ **GROUNDWATER DEPTH** 45 ft / Elev 857 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
				R	13-14						
850			SAND (SP), predominantly medium sand, trace fine gravel, angular, nonplastic, dark brown, wet								
	55			SPT	1-1-3 (4)						
845											
	60										
			GRAVEL (GP), trace cobbles, fine to coarse gravel, rare medium sand, angular to subangular, nonplastic, dark brown to gray, wet	SPT	16-43-21 (64)						
840											
	65			R	16-32	121	13	NP	NP	NP	3
835											
	70		Note: Some to considerable medium to coarse sand below 70'	SPT	7-15-16 (31)						
830											
	75										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 6/20/2024 **COMPLETED** 6/25/2024 **BORING LOCATION** STA 1091+75, 108' L SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.40335°N, -112.44189°E

DRILLING METHOD Tubex **GROUND ELEVATION** 902 ft **BOREHOLE DEPTH** 120.9 ft

RIG TYPE / # CME-85/118 **GROUNDWATER DEPTH** 45 ft / Elev 857 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			GRAVEL (GP), trace cobbles, fine to coarse gravel, rare medium sand, angular to subangular, nonplastic, dark brown to gray, wet *(continued)*	SPT	6-13-24 (37)						
825											
	80			R	10-28						
			SAND WITH GRAVEL (SP), predominantly medium to coarse sand, some to considerable fine gravel, angular to subangular, nonplastic, dark brown, wet								
820											
	85			SPT	2-2-3 (5)						
815											
	90			SPT	17-22-24 (46)						
			SAND WITH SILT AND GRAVEL (SP-SM), predominantly fine to medium sand, trace to some predominantly coarse gravel, angular to subangular, nonplastic, dark brown, wet								
810											
	95			SPT	15-17-19 (36)		17	NP	NP	NP	11
805											
	100										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 6/20/2024 **COMPLETED** 6/25/2024
BORING LOCATION STA 1091+75, 108' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40335°N, -112.44189°E
DRILLING METHOD Tubex
GROUND ELEVATION 902 ft **BOREHOLE DEPTH** 120.9 ft
RIG TYPE / # CME-85/118
GROUNDWATER DEPTH 45 ft / Elev 857 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SAND WITH SILT AND GRAVEL (SP-SM), predominantly fine to medium sand, trace to some predominantly coarse gravel, angular to subangular, nonplastic, dark brown, wet*(continued)*	SPT	19-16-16 (32)						
800											
	105			SPT	11-15-18 (33)						
795											
	110		SAND WITH CLAY (SP-SC), predominantly medium sand, trace fine gravel, angular to subangular, nonplastic, dark brown, wet	SPT	29-17-28 (45)						
790											
	115		SAND (SP), predominantly medium sand, trace fine gravel, angular to subangular, nonplastic, dark brown, wet	SPT	29-17-28 (45)						
785											
	120			SPT	30-50/5"						

Bottom of borehole at 120.9 feet. Backfilled wtih soil cuttings; grouted upper 20 feet.

BORING NUMBER B-140

Ethos Engineering, LLC

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 6/26/2024 **COMPLETED** 6/28/2024
BORING LOCATION STA 1092+70, 10' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.4034°N, -112.44143°E
DRILLING METHOD Tubex
GROUND ELEVATION 902 ft **BOREHOLE DEPTH** 121.1 ft
RIG TYPE / # CME-85/118
GROUNDWATER DEPTH 40 ft / Elev 862 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			FILL - CLAYEY SAND (SC), predominantly fine to medium sand, occasional fine gravel, angular to subangular, medium plasticity, light brown, slightly moist, moderate HCL reaction	SPT AU	9-7-5 (12)						
900											
				SPT	4-3-3 (6)						
	5		CLAY (CL), trace fine to medium sand, occasional fine gravel, angular, medium plasticity, brown, slightly moist								
				SPT	1-2-4 (6)						
895											
			CLAY WITH SAND (CL), some to considerable predominantly fine sand, medium plasticity, brown, slightly moist to moist								
	10			R	6-8						
890											
	15			SPT	2-4-5 (9)		19	30	16	14	74
885											
	20			SPT	7-9-13 (22)						
880											
			SAND WITH GRAVEL (SP), predominantly fine sand, considerable fine to coarse gravel, subangular, nonplastic, dark brown, slightly moist								
	25										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 6/26/2024 **COMPLETED** 6/28/2024 **BORING LOCATION** STA 1092+70, 10' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.4034°N, -112.44143°E
DRILLING METHOD Tubex **GROUND ELEVATION** 902 ft **BOREHOLE DEPTH** 121.1 ft
RIG TYPE / # CME-85/118 ▼ **GROUNDWATER DEPTH** 40 ft / Elev 862 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SAND WITH GRAVEL (SP), predominantly fine sand, considerable fine to coarse gravel, subangular, nonplastic, dark brown, slightly moist*(continued)*	R	9-22						
875											
	30			SPT	7-12-10 (22)						
870											
	35		GRAVEL WITH SAND (GP), trace to some cobbles, fine to coarse gravel, some to considerable fine to coarse sand, subangular, nonplastic, dark brown, moist to wet	SPT	50/5"						
865											
	40 ▼			R	24-50/5"			NP	NP	NP	3
860											
	45			SPT	10-21-27 (48)						
855											
	50										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 6/26/2024 **COMPLETED** 6/28/2024 **BORING LOCATION** STA 1092+70, 10' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.4034°N, -112.44143°E
DRILLING METHOD Tubex **GROUND ELEVATION** 902 ft **BOREHOLE DEPTH** 121.1 ft
RIG TYPE / # CME-85/118 **GROUNDWATER DEPTH** 40 ft / Elev 862 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
				SPT	10-12-13 (25)						
850			SAND (SP), predominantly medium sand, trace fine gravel, subangular, nonplastic, dark brown, wet								
	55			R	8-20						
845											
	60			SPT	9-30-8 (38)						
840			GRAVEL WITH SAND (GP), predominantly coarse gravel, some medium to coarse sand, angular to subangular, nonplastic, dark brown, wet								
	65			SPT	5-12-10 (22)						
835											
	70		Note: Some predominately medium grained sand below 70'	SPT	6-7-7 (14)						
830			CLAYEY GRAVEL WITH SAND (GC), fine to coarse gravel, considerable fine to coarse sand, angular to subangular, low to medium plasticity, brown, wet								
	75										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 6/26/2024 **COMPLETED** 6/28/2024
BORING LOCATION STA 1092+70, 10' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.4034°N, -112.44143°E
DRILLING METHOD Tubex
GROUND ELEVATION 902 ft **BOREHOLE DEPTH** 121.1 ft
RIG TYPE / # CME-85/118
GROUNDWATER DEPTH 40 ft / Elev 862 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY GRAVEL WITH SAND (GC), fine to coarse gravel, considerable fine to coarse sand, angular to subangular, low to medium plasticity, brown, wet*(continued)*	SPT	15-41-36 (77)		8	26	18	8	12
825											
	80		SAND WITH GRAVEL (SP), predominantly medium to coarse sand, considerable fine gravel, angular to subangular, nonplastic, dark brown, wet	SPT	8-19-20 (39)						
820											
	85		SAND WITH SILT (SP-SM), predominantly fine sand, rare fine gravel, angular to subangular, nonplastic, dark brown, wet	SPT	9-11-10 (21)		16	NP	NP	NP	8
815											
	90			SPT	42-50/5"						
810											
	95			SPT	13-24-27 (51)						
805											
	100										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 6/26/2024 **COMPLETED** 6/28/2024 **BORING LOCATION** STA 1092+70, 10' L SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.4034°N, -112.44143°E

DRILLING METHOD Tubex **GROUND ELEVATION** 902 ft **BOREHOLE DEPTH** 121.1 ft

RIG TYPE / # CME-85/118 ▼ **GROUNDWATER DEPTH** 40 ft / Elev 862 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SAND WITH SILT (SP-SM), predominantly fine sand, rare fine gravel, angular to subangular, nonplastic, dark brown, wet*(continued)*	SPT	11-13-15 (28)						
800											
	105			SPT	12-20-21 (41)						
795											
	110		SILTY SAND (SM), predominantly fine sand, rare fine gravel, angular to subangular, nonplastic, dark brown, wet	SPT	10-24-41 (65)		17				
790											
	115		SAND WITH CLAY AND GRAVEL (SP-SC), predominantly medium to coarse sand, considerable coarse gravel, angular, low to medium plasticity, brown, wet	SPT	22-30-31 (61)						
785											
	120			SPT	18-25-50/1"						

Bottom of borehole at 121.1 feet. Backfilled wtih soil cuttings; grouted upper 20 feet.

BORING NUMBER B-141

Ethos Engineering, LLC

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 8/27/2024 **COMPLETED** 8/29/2024
BORING LOCATION STA 1092+92, 100' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.4036°N, -112.44164°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 901 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 45 ft / Elev 856 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Brown **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
900			CLAY (CL), trace predominantly fine sand, medium plasticity, brown, very soft	SPT	3-2-2 (4)						
				AU							
	5		Moderately firm below 5 feet	SPT	3-6-7 (13)						
895											
	10										
890			SILTY SAND TO SANDY SILT (SM), predominantly fine sand, nonplastic, light brown, moist, moderately firm	R	4-12						
	15										
885			CLAYEY SAND WITH GRAVEL (SC), some fine to coarse gravel, predominantly fine to medium sand, moderate lime cementation, medium plasticity, brown, moist, hard	SPT	10-32-35 (67)						
	20										
880			GRAVEL WITH SAND (GP), fine to coarse gravel, considerable fine to medium sand, nonplastic, light brown to brown, moist to wet, medium dense to dense	SPT	8-14-20 (34)						
	25										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 8/27/2024 **COMPLETED** 8/29/2024 **BORING LOCATION** STA 1092+92, 100' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.4036°N, -112.44164°E
DRILLING METHOD Hollow Stem Auger **GROUND ELEVATION** 901 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/ 118 ▼ **GROUNDWATER DEPTH** 45 ft / Elev 856 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Brown **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
875			GRAVEL WITH SAND (GP), fine to coarse gravel, considerable fine to medium sand, nonplastic, light brown to brown, moist to wet, medium dense to dense*(continued)*	R	7-20						
	30										
870				SPT	6-11-15 (26)						
	35										
865				SPT	5-13-15 (28)						
	40		Very dense at 40 feet								
860				R	6-50/5"						
	45	▼									
855				SPT	6-10-14 (24)						
	50										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 8/27/2024 **COMPLETED** 8/29/2024 **BORING LOCATION** STA 1092+92, 100' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.4036°N, -112.44164°E
DRILLING METHOD Hollow Stem Auger **GROUND ELEVATION** 901 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/ 118 **GROUNDWATER DEPTH** 45 ft / Elev 856 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Brown **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
850			GRAVEL WITH SAND (GP), fine to coarse gravel, considerable fine to medium sand, nonplastic, light brown to brown, moist to wet, medium dense to dense*(continued)* Very dense at 50 feet	SPT	10-37-50/2"						
	55										
845			CLAYEY SAND TO SANDY CLAY (SC), occasional coarse gravel, predominantly fine to medium sand, subangular, medium plasticity, brown, wet, stiff weak to moderate reaction to HCL.	R	15-11						
	60										
840			SAND WITH GRAVEL (SP), considerable fine to coarse gravel, fine to coarse sand, nonplastic, light brown to gray, medium dense to dense	SPT	5-15-27 (42)						
	65										
835				SPT	12-15-14 (29)						
	70										
830			GRAVEL (GP), predominantly coarse gravel, trace medium to coarse sand, brown to gray, wet, medium dense	R	13-31						
	75										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 8/27/2024 **COMPLETED** 8/29/2024 **BORING LOCATION** STA 1092+92, 100' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.4036°N, -112.44164°E
DRILLING METHOD Hollow Stem Auger **GROUND ELEVATION** 901 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/ 118 **GROUNDWATER DEPTH** 45 ft / Elev 856 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Brown **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
825			GRAVEL (GP), predominantly coarse gravel, trace medium to coarse sand, brown to gray, wet, medium dense*(continued)*	SPT	5-12-15 (27)						
	80										
820			SAND WITH GRAVEL (SP), some to considerable fine to coarse gravel, fine to coarse sand, nonplastic, light brownish gray, wet, medium dense	SPT	6-12-11 (23)						
	85										
815			Very dense below 85 feet	SPT	19-24-50/5"						
	90										
810			CLAYEY SAND WITH GRAVEL (SC), trace to some fine to coarse gravel, predominantly fine to medium sand, subangular, low to medium plasticity, light brown, wet, hard	SPT	23-22-30 (52)						
	95										
805			SAND WITH GRAVEL (SP), some fine to coarse gravel, fine to coarse sand, nonplastic, light brownish gray, wet, dense	SPT	26-21-25 (46)						
	100										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 8/27/2024 **COMPLETED** 8/29/2024
BORING LOCATION STA 1092+92, 100' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.4036°N, -112.44164°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 901 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 45 ft / Elev 856 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Brown **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
800			SAND WITH GRAVEL (SP), some fine to coarse gravel, fine to coarse sand, nonplastic, light brownish gray, wet, dense*(continued)*	SPT	8-14-19 (33)						

Bottom of borehole at 101.5 feet. Backfilled with soil cuttings; grouted upper 20 feet.

BORING NUMBER B-142

Ethos Engineering, LLC

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 8/26/2024 **COMPLETED** 8/27/2024
BORING LOCATION STA 1093+85, 10' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40365°N, -112.44119°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 901 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 45 ft / Elev 856 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Brown **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
900			SILTY CLAY (CL-ML), trace fine sand, low plasticity, brown, slightly moist to moist, soft	SPT	4-3-5 (8)						
				AU							
	5										
895				R	4-4						
	10		Firm below 10 feet	SPT	4-8-9 (17)						
890											
	15										
885			SAND (SP), rare fine gravel, predominantly fine to medium sand, subrounded to subangular, nonplastic, light brown, slightly moist, medium dense to loose	SPT	4-5-11 (16)						
	20										
880				R	4-6						
	25										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 8/26/2024 **COMPLETED** 8/27/2024 **BORING LOCATION** STA 1093+85, 10' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.40365°N, -112.44119°E
DRILLING METHOD Hollow Stem Auger **GROUND ELEVATION** 901 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/ 118 ▼ **GROUNDWATER DEPTH** 45 ft / Elev 856 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Brown **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
875			GRAVEL WITH SAND (GP), predominantly fine to coarse gravel, considerable fine to medium sand, subrounded to subangular, nonplastic, light brown, moist to wet, medium dense to dense	SPT	6-20-22 (42)						
	30			SPT	8-13-14 (27)						
870											
	35			R	6-21						
865											
	40			SPT	5-17-33 (50)						
860											
	45	▼									
855				SPT	6-6-10 (16)						
	50										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 8/26/2024 **COMPLETED** 8/27/2024 **BORING LOCATION** STA 1093+85, 10' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.40365°N, -112.44119°E
DRILLING METHOD Hollow Stem Auger **GROUND ELEVATION** 901 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/ 118 **GROUNDWATER DEPTH** 45 ft / Elev 856 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Brown **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
850			GRAVEL WITH SAND (GP), predominantly fine to coarse gravel, considerable fine to medium sand, subrounded to subangular, nonplastic, light brown, moist to wet, medium dense to dense*(continued)*	R	4-16						
	55										
845				SPT	4-8-35 (43)						
	60										
840				SPT	2-3-21 (24)						
	65										
835				R	8-15						
	70										
830			SAND (SP), occasional to trace fine to coarse gravel, predominantly fine sand, subrounded to subangular, nonplastic, light brown, medium dense	SPT	6-8-13 (21)						
	75										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 8/26/2024 **COMPLETED** 8/27/2024 **BORING LOCATION** STA 1093+85, 10' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.40365°N, -112.44119°E
DRILLING METHOD Hollow Stem Auger **GROUND ELEVATION** 901 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/ 118 **GROUNDWATER DEPTH** 45 ft / Elev 856 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Brown **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
825			SAND (SP), occasional to trace fine to coarse gravel, predominantly fine sand, subrounded to subangular, nonplastic, light brown, medium dense*(continued)* Dense below 75 feet	SPT	14-13-35 (48)						
	80										
820			GRAVEL (GP), trace predominantly fine to medium sand, fine to coarse gravel, subrounded to subangular, nonplastic, light gray to brown, wet, medium dense	R	5-17						
	85										
815			Very dense below 85 feet	SPT	31-50/1"						
	90										
810			SAND (SP), trace fine to coarse gravel, predominantly fine to medium sand, subrounded to subangular, nonplastic, light brown, wet, dense to medium dense	SPT	8-15-16 (31)						
	95										
805				SPT	14-15-19 (34)						
	100										

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CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 8/26/2024 **COMPLETED** 8/27/2024 **BORING LOCATION** STA 1093+85, 10' L SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.40365°N, -112.44119°E

DRILLING METHOD Hollow Stem Auger **GROUND ELEVATION** 901 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # CME-85/ 118 ▼ **GROUNDWATER DEPTH** 45 ft / Elev 856 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Brown **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
800			SAND (SP), trace fine to coarse gravel, predominantly fine to medium sand, subrounded to subangular, nonplastic, light brown, wet, dense to medium dense*(continued)*	SPT	3-5-7 (12)						

Bottom of borehole at 101.5 feet. Backfilled with soil cuttings; grouted upper 20 feet.

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-143

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 1/17/2024 **COMPLETED** 1/17/2024
BORING LOCATION STA 1089+30, 365' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40321°N, -112.44307°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 903 ft **BOREHOLE DEPTH** 31 ft
RIG TYPE / # CME-85/118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY CLAY WITH SAND (CL-ML), trace to some predominantly fine sand, angular, low plasticity, light brown, slightly moist, soft	R	4-4						
900				AU							
			SILTY, CLAYEY SAND (SC-SM), predominantly fine sand, low plasticity, light brown, slightly moist, moderately firm	SPT	4-5-8 (13)		17	NP	NP	NP	
	5										
			CLAY (CL), rare fine sand, medium plasticity, brown, slightly moist, moderately firm, moderate HCL reaction	SPT	4-4-5 (9)		15	32	17	15	98
895											
	10										
			SANDY SILT (ML), considerable predominately fine sand, nonplastic, brown, slightly moist, loose, weak HCL reaction	R	5-4	95	10	NP	NP	NP	57
890											
	15		Clay lense from 15' to 15.5'								
			SILTY SAND (SM), predominantly fine sand, nonplastic, grayish brown, moist, loose to medium dense	SPT	5-6-7 (13)						
885											
	20										
				R	4-5	89	5	NP	NP	NP	32
880											
	25										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-143

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 1/17/2024 **COMPLETED** 1/17/2024
BORING LOCATION STA 1089+30, 365' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40321°N, -112.44307°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 903 ft **BOREHOLE DEPTH** 31 ft
RIG TYPE / # CME-85/118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY SAND (SM), predominantly fine sand, nonplastic, grayish brown, moist, loose to medium dense*(continued)* Some fine subangular to subrounded gravel below 25'	SPT	2-7-7 (14)						
875											
	30		GRAVEL WITH SAND (GP), predominantly coarse gravel, considerable predominately medium sand, subrounded, nonplastic, dark brown, moist, medium dense	R	10-22						

Bottom of borehole at 31.0 feet. Backfilled with soil cuttings.

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-144

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 1/11/2024 **COMPLETED** 1/11/2024
BORING LOCATION STA 1101+80, 65' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40541°N, -112.43969°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 905 ft **BOREHOLE DEPTH** 41.5 ft
RIG TYPE / # CME-85/118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
905											
			SILTY CLAY WITH SAND (CL-ML), some to considerable fine sand, low plasticity, brown, slightly moist, soft, moderate HCL reaction	SPT	3-3-5 (8)						
				AU			10	22	15	7	72
				R	4-4	105	9				
900	5										
				SPT	2-2-4 (6)						
895	10										
			SILT WITH SAND (ML), some predominantly fine sand, low plasticity, brown, moist, soft to moderately firm, strong HCL reaction	SPT	2-3-4 (7)						
890	15										
				R	5-11	97	17	27	23	4	81
885	20										
			CLAYEY SAND (SC), predominantly fine sand, low plasticity, brown, slightly moist, soft, strong HCL reaction	SPT	3-2-4 (6)						
880	25										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-144

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 1/11/2024 **COMPLETED** 1/11/2024
BORING LOCATION STA 1101+80, 65' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40541°N, -112.43969°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 905 ft **BOREHOLE DEPTH** 41.5 ft
RIG TYPE / # CME-85/118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
880			SAND WITH SILT (SP-SM), predominantly medium sand, angular, nonplastic, light brown, slightly moist, loose	SPT	4-4-6 (10)		0	NP	NP	NP	5
875	30			R	3-8	94	3				
870	35		SAND WITH GRAVEL (SP), predominantly medium sand, considerable predominately coarse gravel, angular, nonplastic, brown, slightly moist to moist, medium dense to very dense	SPT	10-14-12 (26)						
865	40		Occasional clay below 40'	SPT	41-30-12 (42)						

Bottom of borehole at 41.5 feet. Backfilled with soil cuttings.

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-145

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 10/31/2023 **COMPLETED** 11/2/2023
BORING LOCATION STA 1106+70, 90' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40648°N, -112.43866°E
DRILLING METHOD Tubex
GROUND ELEVATION 906 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
905			SILTY CLAY (CL-ML), trace fine sand, low plasticity, brown, slightly moist, soft, weak HCL reaction								
				R	5-5	99	7				
				AU							
				SPT	3-2-3 (5)						
	5										
900				SPT	2-2-3 (5)						
	10		Rare fine subangular gravel below 10'	R	2-3	92	15	23	19	4	86
895											
	15										
890			SANDY CLAY (CL), some to considerable predominantly fine to medium sand, occasional fine gravel, medium plasticity, brown, moist, soft to very soft, moderate HCL reaction	SPT	2-2-3 (5)		22				
	20										
885				SPT	3-3-5 (8)						
	25										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-145

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 10/31/2023 **COMPLETED** 11/2/2023
BORING LOCATION STA 1106+70, 90' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40648°N, -112.43866°E
DRILLING METHOD Tubex
GROUND ELEVATION 906 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
880			SILTY SAND (SM), predominantly fine sand, nonplastic, brown, moist, firm	R	4-21			NP	NP	NP	49
	30										
875			GRAVEL WITH SILT AND SAND (GP-GM), fine to coarse gravel, considerable fine to coarse sand, subangular, nonplastic, brown, moist, medium dense, moderate HCL reaction	SPT	2-2-15 (17)						
	35										
870			Very dense below 35'	SPT	20-31-21 (52)		5	NP	NP	NP	6
	40										
865				R	34-50/4"						
	45										
860			Wet below 45'	SPT	48-43-50 (93)						
	50										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-145

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 10/31/2023 **COMPLETED** 11/2/2023 **BORING LOCATION** STA 1106+70, 90' L SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.40648°N, -112.43866°E

DRILLING METHOD Tubex **GROUND ELEVATION** 906 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # CME-85/118 **GROUNDWATER DEPTH** ---

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
855			GRAVEL WITH SILT AND SAND (GP-GM), fine to coarse gravel, considerable fine to coarse sand, subangular, nonplastic, brown, moist, medium dense, moderate HCL reaction*(continued)*	SPT	13-21-35 (56)						
	55			R	30-50			NP	NP	NP	6
850											
	60										
845				SPT	7-14-29 (43)						
	65										
840			SAND WITH GRAVEL (SP), predominantly fine to coarse sand, considerable fine to coarse gravel, angular, nonplastic, brown, wet, very dense	SPT	6-25-45 (70)						
	70										
835			SAND (SP), predominantly medium sand, trace predominantly fine gravel, subrounded to subangular, nonplastic, brown, wet, medium dense	SPT	11-14-15 (29)						
	75										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-145

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 10/31/2023 **COMPLETED** 11/2/2023
BORING LOCATION STA 1106+70, 90' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40648°N, -112.43866°E
DRILLING METHOD Tubex
GROUND ELEVATION 906 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
830			SAND WITH SILT (SP-SM), fine to coarse sand, occasional fine gravel, angular, nonplastic, brown, wet, medium dense to very dense	SPT	7-6-10 (16)		20	38	14	24	1
	80										
825				SPT	14-24-28 (52)						
	85										
820			SAND WITH GRAVEL (SP), fine to coarse sand, considerable fine to coarse gravel, angular, nonplastic, brown, wet, medium dense	SPT	3-4-15 (19)						
	90										
815			SAND WITH SILT (SP-SM), predominantly fine to medium sand, rare fine gravel, angular, nonplastic, brown, wet, medium dense	SPT	12-17-11 (28)						
	95										
810				SPT	12-11-15 (26)						
	100										

(Continued Next Page)

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-145

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 10/31/2023 **COMPLETED** 11/2/2023
BORING LOCATION STA 1106+70, 90' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40648°N, -112.43866°E
DRILLING METHOD Tubex
GROUND ELEVATION 906 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
805			SAND (SP), predominantly fine to medium sand, occasional fine gravel, angular, nonplastic, brown, wet, medium dense	SPT	14-14-13 (27)						

Bottom of borehole at 101.5 feet. Backfilled with soil cuttings; grouted upper 20 feet.

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-146

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 1/9/2024 **COMPLETED** 1/11/2024 **BORING LOCATION** STA 1107+50, CL SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.40648°N, -112.43827°E

DRILLING METHOD Tubex **GROUND ELEVATION** 907 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # CME-85/118 ▼ **GROUNDWATER DEPTH** 40 ft / Elev 867 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
905	0		SANDY SILT (ML), considerable predominately fine sand, occasional fine gravel, nonplastic, brown, moist, soft, strong HCL reaction	SPT	2-3-2 (5)						
				AU							
	5										
			SANDY SILT (ML), considerable fine sand, nonplastic, brown, moist, very soft to soft	R	3-2	97	11				
900											
	10			SPT	2-2-3 (5)						
895											
	15										
			CLAY (CL), trace fine sand, medium plasticity, brown, moist, very soft, strong HCL reaction	R	3-4			32	18	14	92
890											
	20										
			SANDY CLAY (CL), considerable predominately fine sand, rare fine gravel, medium plasticity, brown, moist, moderately firm, moderate HCL reaction	SPT	4-5-6 (11)						
885											
	25										

(Continued Next Page)

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-146

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 1/9/2024 **COMPLETED** 1/11/2024 **BORING LOCATION** STA 1107+50, CL SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.40648°N, -112.43827°E

DRILLING METHOD Tubex **GROUND ELEVATION** 907 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # CME-85/118 ▼ **GROUNDWATER DEPTH** 40 ft / Elev 867 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SAND WITH CLAY (SP-SC), predominantly medium sand, occasional fine gravel, angular, low plasticity, brown, moist, loose, weak HCL reaction	R	7-7						
880											
	30		SAND WITH SILT (SP-SM), fine to medium sand, rare fine gravel, angular, nonplastic, brown, moist, medium dense	SPT	3-6-8 (14)		0	NP	NP	NP	7
875											
	35		GRAVEL WITH SAND (GP), predominantly coarse gravel, some predominantly medium to coarse sand, trace cobbles, subrounded to subangular, nonplastic, grayish brown, slightly moist, medium dense Considerable cobbles from 35' to 37'	R	6-17						
870											
	40	▼	SAND WITH SILT (SP-SM), predominantly fine to medium sand, some fine gravel, angular, nonplastic, brown, wet, loose	SPT	13-5-5 (10)						
865											
	45			R	8-6						
860											
	50										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-146

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 1/9/2024 **COMPLETED** 1/11/2024 **BORING LOCATION** STA 1107+50, CL SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.40648°N, -112.43827°E

DRILLING METHOD Tubex **GROUND ELEVATION** 907 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # CME-85/118 ▼ **GROUNDWATER DEPTH** 40 ft / Elev 867 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SAND WITH SILT (SP-SM), predominantly fine to medium sand, some fine gravel, angular, nonplastic, brown, wet, loose*(continued)* Dense below 50'	SPT	9-17-16 (33)						
855			GRAVEL WITH SILT (GP-GM), fine gravel, trace predominantly medium sand, subrounded to subangular, nonplastic, brown with black, wet								
	55		GRAVEL WITH SILT (GP-GM), fine to coarse gravel, considerable fine to coarse sand, subangular, nonplastic, brown, wet, very dense	SPT	35-38-50/4"		0	NP	NP	NP	8
850											
	60			SPT	17-23-31 (54)						
845			Considerable sand below 63'								
	65		CLAYEY GRAVEL WITH SAND (GC), predominantly fine gravel, predominantly fine sand, subangular, medium plasticity, light brown, wet, firm, strong HCL reaction	SPT	7-4-12 (16)		0	34	20	14	33
840											
	70		SAND (SP), predominantly fine to medium sand, nonplastic, brown, wet, medium dense	SPT	9-9-19 (28)						
835											
	75										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-146

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 1/9/2024 **COMPLETED** 1/11/2024 **BORING LOCATION** STA 1107+50, CL SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.40648°N, -112.43827°E

DRILLING METHOD Tubex **GROUND ELEVATION** 907 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # CME-85/118 ▼ **GROUNDWATER DEPTH** 40 ft / Elev 867 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SAND (SP), predominantly fine to medium sand, nonplastic, brown, wet, medium dense*(continued)*	SPT	6-20-29 (49)						
830			SAND WITH SILT AND GRAVEL (SP-SM), predominantly medium sand, some to considerable predominantly fine gravel, subrounded to subangular, nonplastic, brown, wet, medium dense to dense								
	80			SPT	4-9-21 (30)		1	NP	NP	NP	9
825											
	85			SPT	7-9-22 (31)						
820			SAND WITH SILT (SP-SM), fine to medium sand, rare fine gravel, angular, fine to medium grained, nonplastic, brown, wet, loose								
	90			SPT	2-3-9 (12)						
815											
	95		Very dense to dense below 95'	SPT	31-35-40 (75)						
810											
	100										

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Ethos Engineering, LLC
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Tempe, AZ 85284

BORING NUMBER B-146

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 1/9/2024 **COMPLETED** 1/11/2024
BORING LOCATION STA 1107+50, CL SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40648°N, -112.43827°E
DRILLING METHOD Tubex
GROUND ELEVATION 907 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/118
GROUNDWATER DEPTH 40 ft / Elev 867 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SAND WITH SILT (SP-SM), fine to medium sand, rare fine gravel, angular, fine to medium grained, nonplastic, brown, wet, loose*(continued)*	SPT	17-19-25 (44)						

Bottom of borehole at 101.5 feet. Backfilled with soil cuttings; grouted upper 20 feet.

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-147

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 11/28/2023 **COMPLETED** 11/29/2023
BORING LOCATION STA 1107+85, 95' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40669°N, -112.43842°E
DRILLING METHOD Tubex
GROUND ELEVATION 905 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/118
GROUNDWATER DEPTH 40 ft / Elev 865 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
905			SILTY CLAY (CL-ML), trace fine sand, low plasticity, brown, moist, very soft, weak HCL reaction	SPT	2-1-3 (4)						
				SPT	2-2-2 (4)						
900	5		SANDY SILT (ML), considerable predominately fine sand, nonplastic, brown, moist, very soft to soft	R	3-3	97	13	NP	NP	NP	62
895	10			SPT	1-2-4 (6)						
890	15		CLAY (CL), occasional fine sand, medium plasticity, brown, moist, very soft Weak cementation nodules	R	2-3			35	21	14	93
885	20		SANDY SILTY CLAY (CL-ML), considerable predominately fine to medium sand, rare fine gravel, subangular, low plasticity, brown, moist, very soft	SPT	1-1-2 (3)						
880	25										

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Ethos Engineering, LLC
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Tempe, AZ 85284

BORING NUMBER B-147

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 11/28/2023 **COMPLETED** 11/29/2023 **BORING LOCATION** STA 1107+85, 95' L SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.40669°N, -112.43842°E

DRILLING METHOD Tubex **GROUND ELEVATION** 905 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # CME-85/118 ▼ **GROUNDWATER DEPTH** 40 ft / Elev 865 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
880											
			GRAVEL WITH SILT AND SAND (GP-GM), predominantly fine gravel, considerable fine to coarse sand, subangular to angular, nonplastic, light brown, slightly moist to wet, medium dense to very dense	SPT	25-50/3"						
875	30			SPT	2-8-11 (19)						
870	35			SPT	8-23-20 (43)		6	NP	NP	NP	8
865	40		▼	R	16-29						
			GRAVEL WITH SILT AND SAND (GP-GM), predominantly coarse gravel, considerable predominately medium to coarse sand, subrounded, nonplastic, brown, wet, medium dense to very dense	AU							
860	45			SPT	11-12-7 (19)						
			SAND (SP), predominantly fine to medium sand, trace coarse gravel, subangular, nonplastic, brown, moist								
855	50										

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Ethos Engineering, LLC
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Tempe, AZ 85284

BORING NUMBER B-147

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 11/28/2023 **COMPLETED** 11/29/2023 **BORING LOCATION** STA 1107+85, 95' L SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.40669°N, -112.43842°E

DRILLING METHOD Tubex **GROUND ELEVATION** 905 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # CME-85/118 ▼ **GROUNDWATER DEPTH** 40 ft / Elev 865 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
855											
			GRAVEL WITH SAND (GP), fine to coarse gravel, considerable fine to medium sand, subrounded, coarse grained, nonplastic, brown, wet, very dense	SPT	16-28-39 (67)						
850	55			SPT	12-21-33 (54)						
845	60		Increased sand below 60'	SPT	9-17-22 (39)						
840	65		SAND WITH GRAVEL (SP), predominantly medium sand, fine to coarse gravel, subrounded, nonplastic, brown, wet, medium dense	R	13-14		10	34	16	18	2
835	70			SPT	12-16-17 (33)						
830	75										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-147

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 11/28/2023 **COMPLETED** 11/29/2023 **BORING LOCATION** STA 1107+85, 95' L SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.40669°N, -112.43842°E

DRILLING METHOD Tubex **GROUND ELEVATION** 905 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # CME-85/118 **GROUNDWATER DEPTH** 40 ft / Elev 865 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
830											
			SAND WITH GRAVEL (SP), predominantly medium sand, fine to coarse gravel, subrounded, nonplastic, brown, wet, medium dense*(continued)*	SPT	7-14-20 (34)						
825	80			SPT	2-9-18 (27)		12	NP	NP	NP	1
820	85		SAND WITH CLAY AND GRAVEL (SP-SC), predominantly medium to coarse sand, some coarse gravel, angular, medium plasticity, brown, wet, firm, weak HCL reaction	SPT	12-13-15 (28)						
815	90		SAND (SP), predominantly medium to coarse sand, angular, nonplastic, brown to grayish brown, wet, very dense	SPT	19-20-32 (52)						
810	95		SAND WITH SILT (SP-SM), predominantly fine to medium sand, occasional fine gravel, subangular, nonplastic, brown to light brown, wet, dense, weak HCL reaction	SPT	24-22-22 (44)						
805	100										

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Ethos Engineering, LLC
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BORING NUMBER B-147

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 11/28/2023 **COMPLETED** 11/29/2023
BORING LOCATION STA 1107+85, 95' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40669°N, -112.43842°E
DRILLING METHOD Tubex
GROUND ELEVATION 905 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/118
GROUNDWATER DEPTH 40 ft / Elev 865 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
805			SAND WITH SILT (SP-SM), predominantly fine to medium sand, occasional fine gravel, subangular, nonplastic, brown to light brown, wet, dense, weak HCL reaction*(continued)*	SPT	11-12-14 (26)						

Bottom of borehole at 101.5 feet. Backfilled with soil cuttings; grouted upper 20 feet.

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-148

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 10/4/2023 **COMPLETED** 10/6/2023
BORING LOCATION STA 1108+60, CL SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40669°N, -112.43804°E
DRILLING METHOD Tubex
GROUND ELEVATION 906 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/118
GROUNDWATER DEPTH 45 ft / Elev 861 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
905			SANDY SILT (ML), considerable predominately fine sand, low plasticity, brown, slightly moist to moist, very soft								
				R	2-2	102	17				
				AU			12	20	17	3	66
				SPT	1-1-2 (3)						
	5										
900				SPT	1-1-2 (3)						
	10										
895			SILTY SAND (SM), predominantly fine sand, nonplastic, brown, slightly moist to moist, loose to medium dense	R	3-4			NP	NP	NP	22
	15										
890				SPT	2-4-6 (10)						
	20										
885				SPT	3-5-7 (12)		11	NP	NP	NP	33
	25										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-148

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 10/4/2023 **COMPLETED** 10/6/2023 **BORING LOCATION** STA 1108+60, CL SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.40669°N, -112.43804°E

DRILLING METHOD Tubex **GROUND ELEVATION** 906 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # CME-85/118 ▼ **GROUNDWATER DEPTH** 45 ft / Elev 861 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
880			SILTY SAND (SM), predominantly fine sand, nonplastic, brown, slightly moist to moist, loose to medium dense*(continued)*	R	2-3	95	28				
	30										
875			Medium dense below 30'	SPT	3-4-17 (21)		4				
	35										
870			GRAVEL WITH SAND (GP), fine to coarse gravel, considerable fine to coarse sand, subrounded to subangular, nonplastic, brown, moist to wet, very dense	SPT	15-26-50/5"						
	40										
865			Medium dense below 40'	R	13-17						
	45	▼									
860				SPT	17-16-12 (28)		4	NP	NP	NP	3
	50										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-148

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 10/4/2023 **COMPLETED** 10/6/2023 **BORING LOCATION** STA 1108+60, CL SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.40669°N, -112.43804°E

DRILLING METHOD Tubex **GROUND ELEVATION** 906 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # CME-85/118 ▼ **GROUNDWATER DEPTH** 45 ft / Elev 861 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
855			SAND WITH GRAVEL (SP), predominantly fine to medium sand, considerable predominately fine gravel, angular, nonplastic, brown, wet, medium dense	SPT	10-10-17 (27)						
	55										
850				SPT	2-6-9 (15)						
	60										
845			GRAVEL WITH SAND (GP), fine to coarse gravel, considerable fine to coarse sand, subrounded to subangular, nonplastic, brown, wet, dense	SPT	11-14-24 (38)						
	65										
840			SAND WITH GRAVEL (SP), predominantly medium sand, trace to some predominantly fine gravel, angular, nonplastic, brown, wet, medium dense to dense	SPT	5-14-15 (29)						
	70										
835			Considerable gravel below 70'	SPT	8-17-25 (42)		11				2
	75										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-148

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 10/4/2023 **COMPLETED** 10/6/2023 **BORING LOCATION** STA 1108+60, CL SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.40669°N, -112.43804°E

DRILLING METHOD Tubex **GROUND ELEVATION** 906 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # CME-85/118 ▼ **GROUNDWATER DEPTH** 45 ft / Elev 861 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
830			SAND WITH GRAVEL (SP), predominantly medium sand, trace to some predominantly fine gravel, angular, nonplastic, brown, wet, medium dense to dense*(continued)*	SPT	11-19-23 (42)						
	80		Switched to mud rotary at 80'								
825				SPT	17-21-18 (39)						
	85		Medium dense below 85'								
820				SPT	12-11-10 (21)						
	90		SAND WITH SILT (SP-SM), predominantly fine to medium sand, occasional fine gravel, subrounded, nonplastic, brown, wet, medium dense	SPT	21-11-15 (26)		17	NP	NP	NP	11
815			Gravel lense at 91.5'								
	95										
810				SPT	11-12-11 (23)						
	100										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-148

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 10/4/2023 **COMPLETED** 10/6/2023
BORING LOCATION STA 1108+60, CL SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40669°N, -112.43804°E
DRILLING METHOD Tubex
GROUND ELEVATION 906 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/118
GROUNDWATER DEPTH 45 ft / Elev 861 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
805			CLAY (CL), trace fine sand, high plasticity, light brown, slightly moist, moderately firm	SPT	10-4-8 (12)						

Bottom of borehole at 101.5 feet. Backfilled with soil cuttings; grouted upper 20 feet.

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-148

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 10/4/2023 **COMPLETED** 10/6/2023
BORING LOCATION STA 1108+60, CL SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40669°N, -112.43804°E
DRILLING METHOD Tubex
GROUND ELEVATION 906 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/118
GROUNDWATER DEPTH 45 ft / Elev 861 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
905			SANDY SILT (ML), considerable predominately fine sand, low plasticity, brown, slightly moist to moist, very soft								
				R	2-2	102	17				
				AU			12	20	17	3	66
				SPT	1-1-2 (3)						
	5										
900				SPT	1-1-2 (3)						
	10										
895			SILTY SAND (SM), predominantly fine sand, nonplastic, brown, slightly moist to moist, loose to medium dense	R	3-4			NP	NP	NP	22
	15										
890				SPT	2-4-6 (10)						
	20										
885				SPT	3-5-7 (12)		11	NP	NP	NP	33
	25										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-148

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 10/4/2023 **COMPLETED** 10/6/2023 **BORING LOCATION** STA 1108+60, CL SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.40669°N, -112.43804°E

DRILLING METHOD Tubex **GROUND ELEVATION** 906 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # CME-85/118 ▼ **GROUNDWATER DEPTH** 45 ft / Elev 861 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
880			SILTY SAND (SM), predominantly fine sand, nonplastic, brown, slightly moist to moist, loose to medium dense*(continued)*	R	2-3	95	28				
	30										
875			Medium dense below 30'	SPT	3-4-17 (21)		4				
	35										
870			GRAVEL WITH SAND (GP), fine to coarse gravel, considerable fine to coarse sand, subrounded to subangular, nonplastic, brown, moist to wet, very dense	SPT	15-26-50/5"						
	40										
865			Medium dense below 40'	R	13-17						
	45	▼									
860				SPT	17-16-12 (28)		4	NP	NP	NP	3
	50										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-148

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 10/4/2023 **COMPLETED** 10/6/2023 **BORING LOCATION** STA 1108+60, CL SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.40669°N, -112.43804°E

DRILLING METHOD Tubex **GROUND ELEVATION** 906 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # CME-85/118 ▼ **GROUNDWATER DEPTH** 45 ft / Elev 861 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
855			SAND WITH GRAVEL (SP), predominantly fine to medium sand, considerable predominately fine gravel, angular, nonplastic, brown, wet, medium dense	SPT	10-10-17 (27)						
	55										
850				SPT	2-6-9 (15)						
	60										
845			GRAVEL WITH SAND (GP), fine to coarse gravel, considerable fine to coarse sand, subrounded to subangular, nonplastic, brown, wet, dense	SPT	11-14-24 (38)						
	65										
840			SAND WITH GRAVEL (SP), predominantly medium sand, trace to some predominantly fine gravel, angular, nonplastic, brown, wet, medium dense to dense	SPT	5-14-15 (29)						
	70										
835			Considerable gravel below 70'	SPT	8-17-25 (42)		11				2
	75										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-148

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 10/4/2023 **COMPLETED** 10/6/2023 **BORING LOCATION** STA 1108+60, CL SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.40669°N, -112.43804°E

DRILLING METHOD Tubex **GROUND ELEVATION** 906 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # CME-85/118 ▼ **GROUNDWATER DEPTH** 45 ft / Elev 861 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
830			SAND WITH GRAVEL (SP), predominantly medium sand, trace to some predominantly fine gravel, angular, nonplastic, brown, wet, medium dense to dense*(continued)*	SPT	11-19-23 (42)						
	80		Switched to mud rotary at 80'								
825				SPT	17-21-18 (39)						
	85		Medium dense below 85'								
820				SPT	12-11-10 (21)						
	90		SAND WITH SILT (SP-SM), predominantly fine to medium sand, occasional fine gravel, subrounded, nonplastic, brown, wet, medium dense	SPT	21-11-15 (26)		17	NP	NP	NP	11
815			Gravel lense at 91.5'								
	95										
810				SPT	11-12-11 (23)						
	100										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-148

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 10/4/2023 **COMPLETED** 10/6/2023
BORING LOCATION STA 1108+60, CL SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40669°N, -112.43804°E
DRILLING METHOD Tubex
GROUND ELEVATION 906 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/118
GROUNDWATER DEPTH 45 ft / Elev 861 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
805			CLAY (CL), trace fine sand, high plasticity, light brown, slightly moist, moderately firm	SPT	10-4-8 (12)						

Bottom of borehole at 101.5 feet. Backfilled with soil cuttings; grouted upper 20 feet.

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-149

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 11/30/2023 **COMPLETED** 11/30/2023
BORING LOCATION STA 1111+00, 80' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40735°N, -112.43772°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 906 ft **BOREHOLE DEPTH** 40.2 ft
RIG TYPE / # CME-85/118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
905			SANDY SILT (ML), considerable predominately fine sand, low plasticity, brown, very soft, weak HCL reaction 6" Top Soil	R	3-4						
				AU							
			SILTY SAND (SM), predominantly fine to medium sand, rare fine gravel, subangular, nonplastic, brown, very loose, weak HCL reaction	SPT	2-1-1 (2)						
	5										
900				SPT	1-1-1 (2)						
	10			R	3-3	110	8	NP	NP	NP	27
895											
			CLAY WITH SAND (CL), some predominantly fine sand, medium plasticity, brown, moist, very soft to moderately firm, weak HCL reaction								
	15			SPT	0-1-1 (2)						
890											
	20		Trace fine subangular gravel, trace fine sand below 20'	R	7-7	99	26	34	19	15	77
885											
	25										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-149

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 11/30/2023 **COMPLETED** 11/30/2023
BORING LOCATION STA 1111+00, 80' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40735°N, -112.43772°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 906 ft **BOREHOLE DEPTH** 40.2 ft
RIG TYPE / # CME-85/118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
880			CLAY WITH SAND (CL), some predominantly fine sand, medium plasticity, brown, moist, very soft to moderately firm, weak HCL reaction*(continued)*	SPT	2-3-2 (5)						
	30		CLAYEY SAND WITH GRAVEL (SC), predominantly fine to medium sand, some coarse gravel, subangular, medium plasticity, brown to light brown, moist, very firm, weak HCL reaction	SPT	5-19-21 (40)						
875											
	35		GRAVEL WITH SILT AND SAND (GP-GM), fine to coarse gravel, considerable predominately fine to medium sand, subangular, nonplastic, gray to light brown, slightly moist, hard, moderate HCL reaction Hard drilling from 33' to 35'	SPT	18-29-33 (62)						
870											
	40		Strong lime cementation at 40'	SPT	50/2"						

Bottom of borehole at 40.2 feet. Backfilled with soil cuttings.

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-150

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 11/30/2023 **COMPLETED** 11/30/2023
BORING LOCATION STA 1115+90, 70' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40835°N, -112.43662°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 908 ft **BOREHOLE DEPTH** 21.5 ft
RIG TYPE / # CME-85/118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILT WITH SAND (ML), some predominantly fine sand, nonplastic, brown, moist, very soft, weak HCL reaction								
				SPT	1-2-1 (3)						
905				AU			32	NP	NP	NP	75
				SPT	1-1-1 (2)						
	5										
				R	3-4	107	16				
900											
			SANDY SILT (ML), considerable predominately fine sand, subangular, nonplastic, brown, moist, soft to firm, weak HCL reaction								
	10			SPT	1-2-3 (5)						
895											
	15			R	8-19	100	9	NP	NP	NP	50
890											
	20		SILTY SAND (SM), predominantly fine to medium sand, subangular, nonplastic, brown, moist, medium dense, weak HCL reaction	SPT	3-5-9 (14)						

Bottom of borehole at 21.5 feet. Backfilled with soil cuttings.

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-151

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 10/10/2023 **COMPLETED** 10/10/2023
BORING LOCATION STA 1121+00, 85' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40942°N, -112.43555°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 911 ft **BOREHOLE DEPTH** 21 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
910			SILTY, CLAYEY SAND (SC-SM), predominantly fine to medium sand, trace fine to coarse gravel, angular, low plasticity, brown, slightly moist, loose								
				SPT	3-2-3 (5)						
				AU							
				SPT	2-3-4 (7)						
	5										
905				R	4-6	98	4				
	10		Moderate HCL reaction at 10'								
900				SPT	1-3-3 (6)						
	15										
895				SPT	2-3-4 (7)						
	20										
890			Predominate fine sand below 20'	R	6-9	96	16				

Bottom of borehole at 21.0 feet. Backfilled with soil cuttings.

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-152

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/29/2023 **COMPLETED** 9/29/2023
BORING LOCATION STA 1125+60, 70' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41035°N, -112.43453°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 914 ft **BOREHOLE DEPTH** 21 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY, CLAYEY SAND (SC-SM), predominantly fine to medium sand, trace fine gravel, angular, nonplastic, brown, slightly moist, medium dense to loose								
				SPT	8-11-14 (25)						
				AU							
910				SPT	7-7-4 (11)						
	5										
				R	2-5						
905											
	10		SANDY SILTY CLAY (CL-ML), considerable predominately fine to medium sand, angular, low plasticity, brown, slightly moist, firm to moderately firm	SPT	8-11-15 (26)		4	21	17	4	60
900											
	15			SPT	6-11-11 (22)						
895											
	20			R	6-8	102	8				

Bottom of borehole at 21.0 feet. Backfilled with soil cuttings.

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-153

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/29/2023 **COMPLETED** 9/29/2023
BORING LOCATION STA 1128+60, 4' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41084°N, -112.43369°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 914 ft **BOREHOLE DEPTH** 11.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY SAND (SM), predominantly medium sand, trace fine gravel, angular, nonplastic, brown, slightly moist, medium dense, strong HCL reaction								
				SPT	10-10-12 (22)						
				AU							
910				SPT	9-13-14 (27)						
	5										
				R	9-11	102	4				
905											
	10			SPT	6-10-12 (22)						

Bottom of borehole at 11.5 feet. Backfilled with soil cuttings.

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-154

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/29/2023 **COMPLETED** 9/29/2023
BORING LOCATION STA 1131+50, 85' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41153°N, -112.43336°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 918 ft **BOREHOLE DEPTH** 21 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY SAND (SM), predominantly fine to medium sand, occasional fine gravel, angular, nonplastic, brown, slightly moist, medium dense, weak HCL reaction								
				SPT	8-6-6 (12)						
915				AU			2	NP	NP	NP	32
				SPT	5-5-6 (11)						
	5										
			SILTY SAND (SM), predominantly fine to medium sand, trace predominantly fine gravel, angular, nonplastic, brown, slightly moist, loose, weak HCL reaction	R	5-6	109	3				
910											
	10										
			SAND WITH SILT (SP-SM), predominantly fine to medium sand, occasional fine gravel, angular, nonplastic, light brown to brown, slightly moist, loose to medium dense, weak HCL reaction	SPT	2-2-4 (6)						
905											
	15		Rare fine subangular gravel below 15'	SPT	3-4-7 (11)		2	NP	NP	NP	10
900											
	20										
			CLAYEY SAND (SC), predominantly fine sand, rare fine gravel, angular, low plasticity, brown, slightly moist, moderately firm, weak HCL reaction	R	5-10	93	21				

Bottom of borehole at 21.0 feet. Backfilled with soil cuttings.

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-155

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/29/2023 **COMPLETED** 9/29/2023
BORING LOCATION STA 1133+50, 40' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41177°N, -112.43257°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 918 ft **BOREHOLE DEPTH** 21 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY SAND (SM), predominantly fine to medium sand, occasional fine gravel, angular, nonplastic, brown, slightly moist, dense, weak HCL reaction								
				SPT	7-16-18 (34)						
915				AU							
			SANDY SILT (ML), considerable predominately fine to medium sand, rare fine gravel, angular, nonplastic, brown, slightly moist, moderately firm to soft, weak HCL reaction	SPT	6-6-8 (14)						
	5										
				R	9-11	98	4	21	18	3	57
910											
	10			SPT	2-2-5 (7)						
905											
	15			SPT	2-3-6 (9)						
900											
	20		Coarse angular sand below 20'	R	5-7						

Bottom of borehole at 21.0 feet. Backfilled with soil cuttings.

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-156

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 10/2/2023 **COMPLETED** 10/2/2023
BORING LOCATION STA 1136+45, 85' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.4126°N, -112.43223°E
DRILLING METHOD Tubex
GROUND ELEVATION 922 ft **BOREHOLE DEPTH** 56 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 55 ft / Elev 867 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
920	0		SILTY, CLAYEY SAND (SC-SM), predominantly fine to medium sand, occasional fine gravel, angular, moderate lime cementation, low plasticity, brown, slightly moist, firm to very firm, strong HCL reaction	SPT	15-13-15 (28)						
				AU							
	5			SPT	13-16-20 (36)						
				SPT	10-10-13 (23)						
915											
	10										
910			SAND WITH SILT AND GRAVEL (SP-SM), predominantly fine to medium sand, trace to some fine gravel, angular, nonplastic, brown, slightly moist, loose, weak HCL reaction	R	6-8		1	NP	NP	NP	7
	15										
905			CLAYEY SAND (SC), predominantly fine to medium sand, occasional fine gravel, angular, moderate lime cementation, medium plasticity, brown, slightly moist, firm, moderate HCL reaction	SPT	4-9-20 (29)						
	20										
900			CLAYEY SAND WITH GRAVEL (SC), predominantly fine to medium sand, some fine to coarse gravel, angular, medium plasticity, brown to tan, slightly moist, firm to hard, moderate HCL reaction	SPT	6-8-10 (18)						
	25										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-156

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 10/2/2023 **COMPLETED** 10/2/2023 **BORING LOCATION** STA 1136+45, 85' L SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.4126°N, -112.43223°E

DRILLING METHOD Tubex **GROUND ELEVATION** 922 ft **BOREHOLE DEPTH** 56 ft

RIG TYPE / # CME-85/ 118 ▼ **GROUNDWATER DEPTH** 55 ft / Elev 867 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
895	30		CLAYEY SAND WITH GRAVEL (SC), predominantly fine to medium sand, some fine to coarse gravel, angular, medium plasticity, brown to tan, slightly moist, firm to hard, moderate HCL reaction*(continued)*	R	50/1"						
890	35		SANDY CLAY (CL), considerable predominately fine sand, medium plasticity, brown, slightly moist, very firm to firm	SPT	8-12-20 (32)						
885	40			SPT	7-12-15 (27)						
880	45		CLAY (CH), trace predominantly fine sand, high plasticity, brown, slightly moist, soft to firm	R	3-5	84	28	66	23	43	90
875	50			SPT	5-10-16 (26)						

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Ethos Engineering, LLC
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Tempe, AZ 85284

BORING NUMBER B-156

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 10/2/2023 **COMPLETED** 10/2/2023
BORING LOCATION STA 1136+45, 85' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.4126°N, -112.43223°E
DRILLING METHOD Tubex
GROUND ELEVATION 922 ft **BOREHOLE DEPTH** 56 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 55 ft / Elev 867 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
870			CLAYEY SAND (SC), predominantly fine to coarse sand, occasional fine gravel, angular, medium plasticity, brown, wet, very firm to moderately firm	SPT	7-17-24 (41)						
	55			R	7-16						

Bottom of borehole at 56.0 feet. Backfilled with soil cuttings; grouted upper 20 feet.

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-157

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 10/9/2023 **COMPLETED** 10/9/2023
BORING LOCATION STA 1138+90 125' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41273°N, -112.43119°E
DRILLING METHOD Tubex
GROUND ELEVATION 922 ft **BOREHOLE DEPTH** 61 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 60 ft / Elev 862 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
920			SILTY, CLAYEY SAND (SC-SM), predominantly fine to medium sand, occasional predominantly fine gravel, angular, low plasticity, brown, slightly moist, very firm, strong HCL reaction	R	8-8						
				AU			4	23	19	4	42
	5			SPT	7-7-6 (13)						
915			SAND WITH SILT AND GRAVEL (SP-SM), predominantly fine to medium sand, some fine gravel, angular, nonplastic, brown, slightly moist, dense, strong HCL reaction	SPT	5-7-7 (14)						
	10			R	24-37						
910											
	15										
905			CLAYEY SAND (SC), predominantly fine to medium sand, trace fine gravel, angular, medium plasticity, brown, slightly moist, firm	SPT	11-10-13 (23)		8				
	20										
900			CLAYEY SAND (SC), fine to coarse sand, occasional fine gravel, angular, medium plasticity, brown to light brown, slightly moist, firm to hard	SPT	8-9-11 (20)						
	25										

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Ethos Engineering, LLC
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Tempe, AZ 85284

BORING NUMBER B-157

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 10/9/2023 **COMPLETED** 10/9/2023 **BORING LOCATION** STA 1138+90 125' R SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.41273°N, -112.43119°E

DRILLING METHOD Tubex **GROUND ELEVATION** 922 ft **BOREHOLE DEPTH** 61 ft

RIG TYPE / # CME-85/ 118 ▼ **GROUNDWATER DEPTH** 60 ft / Elev 862 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
895	30		CLAYEY SAND (SC), fine to coarse sand, occasional fine gravel, angular, medium plasticity, brown to light brown, slightly moist, firm to hard*(continued)*	R	50/2"						
890	35		SANDY CLAY (CL), considerable predominately fine sand, medium plasticity, brown, slightly moist, hard to firm	SPT	6-11-50/3"						
885	40		Weakly cemented below 35'	SPT	8-10-16 (26)		19	31	17	14	58
880	45		CLAY (CH), trace predominantly fine sand, high plasticity, brown, slightly moist, very firm to soft, moderate HCL reaction	R	2-5	78	42				
875	50			SPT	7-14-20 (34)						

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-157

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 10/9/2023 **COMPLETED** 10/9/2023
BORING LOCATION STA 1138+90 125' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41273°N, -112.43119°E
DRILLING METHOD Tubex
GROUND ELEVATION 922 ft **BOREHOLE DEPTH** 61 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 60 ft / Elev 862 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
870			CLAYEY SAND (SC), predominantly medium sand, angular, medium plasticity, brown, moist, firm	SPT	9-14-16 (30)		7				
	55			SPT	10-11-12 (23)		14	32	17	15	18
865											
	60		SANDY CLAY (CL), considerable predominately fine to medium sand, occasional fine gravel, medium plasticity, brown, wet, very stiff	R	11-18	106	20				

Bottom of borehole at 61.0 feet. Backfilled with soil cuttings; grouted upper 20 feet.

Ethos Engineering, LLC
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Tempe, AZ 85284

BORING NUMBER B-158

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 8/28/2023 **COMPLETED** 8/29/2023
BORING LOCATION STA 1141+50, 95' L SR 303L Cst CL
DRILLER Yellow Jacket **DRILLED BY** Diego
GPS COORDINATES 33.41367°N, -112.43116°E
DRILLING METHOD Sonic
GROUND ELEVATION 926 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # Terrasonic/ 130
GROUNDWATER DEPTH 65 ft / Elev 861 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 96
LOGGED BY M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
925			SILTY, CLAYEY SAND (SC-SM), medium to coarse sand, occasional fine gravel, angular, low plasticity, light brown to brown, slightly moist, very firm, strong HCL reaction	SPT	9-14-17 (31)						
			CLAYEY SAND WITH GRAVEL (SC), predominantly medium to coarse sand, some fine gravel, subangular, low to medium plasticity, brown, slightly moist, firm, moderate HCL reaction	AU							
	5										
920			SILTY SAND (SM), predominantly medium to coarse sand, trace fine gravel, subangular, nonplastic, brown to white, slightly moist, medium dense	SPT	4-11-6 (17)						
			SILTY, CLAYEY SAND (SC-SM), predominantly fine to medium sand, rare fine gravel, angular, low plasticity, brown, slightly moist, soft, moderate HCL reaction	AU							
			Considerable fine subangular gravel below 13'								
	10										
915				SPT	2-2-3 (5)		2	21	15	6	39
			SANDY CLAY WITH GRAVEL (CL), some fine gravel, moderate lime cementation, medium plasticity, light brown, slightly moist, moderate HCL reaction	AU							
	15										
910			SAND WITH SILT AND GRAVEL (SP-SM), medium to coarse sand, some fine gravel, angular, nonplastic, light brown to whitish brown, slightly moist, medium dense	SPT	2-2-23 (25)						
			CLAYEY SAND WITH GRAVEL (SC), fine sand, some fine gravel, subrounded to subangular, strong lime cementation, medium plasticity, white to whitish tan, slightly moist, strong HCL reaction	AU							
				AU							
			CLAYEY SAND WITH GRAVEL (SC), fine sand, some fine gravel, subrounded to subangular, weak lime cementation, medium plasticity, brown, moist, weak HCL reaction								
	20										
905			SANDY CLAY (CL), considerable predominately fine sand, occasional fine gravel, medium plasticity, brown, moist, very firm, weak HCL reaction	SPT	4-17-18 (35)		20	39	22	17	57
	25										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-158

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 8/28/2023 **COMPLETED** 8/29/2023 **BORING LOCATION** STA 1141+50, 95' L SR 303L Cst CL

DRILLER Yellow Jacket **DRILLED BY** Diego **GPS COORDINATES** 33.41367°N, -112.43116°E

DRILLING METHOD Sonic **GROUND ELEVATION** 926 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # Terrasonic/ 130 **GROUNDWATER DEPTH** 65 ft / Elev 861 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 96 **LOGGED BY** M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
900			SILTY, CLAYEY SAND (SC-SM), medium to coarse sand, occasional fine gravel, angular, low plasticity, brown, moist, very firm	SPT	13-14-17 (31)						
			CLAYEY SAND WITH GRAVEL (SC), fine sand, some fine gravel, subrounded, medium plasticity, white, moist, hard	AU							
	30		SILTY, CLAYEY SAND (SC-SM), medium to coarse sand, occasional fine gravel, angular, low plasticity, brown, moist, hard	R	30-49	109	14				
895											
			SILTY, CLAYEY SAND (SC-SM), predominantly fine sand, occasional fine gravel, angular, low plasticity, brown, moist, firm								
	35			SPT	9-9-11 (20)						
890				AU							
	40										
			SANDY CLAY (CL), considerable fine sand, medium plasticity, brown, moist, moderately firm	SPT	9-5-8 (13)						
885				AU							
	45										
			SANDY CLAY (CL), considerable predominately fine sand, medium plasticity, brown, moist, hard	R	18-48			36	22	14	54
880											
			CLAYEY SAND WITH GRAVEL (SC), fine to medium sand, some fine gravel, subangular, low to medium plasticity, brown, moist, firm								
	50										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-158

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 8/28/2023 **COMPLETED** 8/29/2023 **BORING LOCATION** STA 1141+50, 95' L SR 303L Cst CL

DRILLER Yellow Jacket **DRILLED BY** Diego **GPS COORDINATES** 33.41367°N, -112.43116°E

DRILLING METHOD Sonic **GROUND ELEVATION** 926 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # Terrasonic/ 130 **GROUNDWATER DEPTH** 65 ft / Elev 861 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 96 **LOGGED BY** M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
875			CLAYEY SAND WITH GRAVEL (SC), fine to medium sand, some fine gravel, subangular, low to medium plasticity, brown, moist, firm *(continued)*	SPT	9-7-8 (15)						
			SANDY CLAY WITH GRAVEL (CL), some fine gravel, medium plasticity, brown, moist, very firm	AU							
	55										
870				SPT	4-9-23 (32)						
			SILTY, CLAYEY SAND (SC-SM), medium to coarse sand, occasional fine gravel, angular, low plasticity, brown, moist, hard	AU							
	60										
865				R	45-46	97	38				
			CLAYEY SAND (SC), fine to medium sand, occasional fine gravel, angular, medium plasticity, brown, moist, hard	AU							
			SAND (SP), fine to medium sand, rare fine gravel, subangular, nonplastic, brown, wet, medium dense	AU			16	NP	NP	NP	2
	65	▼									
860				SPT	8-11-16 (27)						
			GRAVEL WITH SILT AND SAND (GP-GM), predominantly coarse gravel, considerable predominately medium to coarse sand, subangular, nonplastic, light brown, wet, medium dense	AU							
	70										
855				SPT	6-11-12 (23)						
			CLAY WITH SAND (CL), rare fine gravel, medium plasticity, brown to reddish brown, wet, very soft	AU							
	75										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-158

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 8/28/2023 **COMPLETED** 8/29/2023
BORING LOCATION STA 1141+50, 95' L SR 303L Cst CL
DRILLER Yellow Jacket **DRILLED BY** Diego
GPS COORDINATES 33.41367°N, -112.43116°E
DRILLING METHOD Sonic
GROUND ELEVATION 926 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # Terrasonic/ 130
GROUNDWATER DEPTH 65 ft / Elev 861 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 96
LOGGED BY M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
850			GRAVEL WITH SAND (GP), predominantly coarse gravel, considerable predominately medium to coarse sand, subrounded to subangular, nonplastic, brown, wet, very loose *(continued)*	R	3-2	118	10				
				AU							
			GRAVEL WITH CLAY AND SAND (GP-GC), coarse gravel, considerable predominately medium to coarse sand, subangular, medium plasticity, brown to reddish brown, wet, very loose, weak HCL reaction	AU							
			SAND WITH GRAVEL (SP), predominantly fine to medium sand, considerable fine gravel, subangular, nonplastic, brown, wet, dense	AU							
			CLAY WITH SAND (CL), trace fine gravel, medium plasticity, brown to reddish brown, wet, very stiff, weak HCL reaction								
	80		SAND WITH GRAVEL (SP), fine to medium sand, considerable fine gravel, subangular, nonplastic, brown, wet, dense	SPT	19-20-13 (33)						
845			CLAY (CH), rare fine gravel, high plasticity, brown, wet, stiff, weak HCL reaction								
				AU							
			GRAVEL WITH SAND (GP), coarse gravel, considerable predominately medium sand, subrounded, nonplastic, brown, wet, loose	AU							
	85			SPT	3-2-3 (5)						
840											
	90		SAND (SP), predominantly medium sand, trace fine gravel, subangular, nonplastic, brown, wet, medium dense	SPT	34-13-15 (28)						
835											
				AU							
	95			SPT	6-12-16 (28)						
830											
			SAND WITH GRAVEL (SP), predominantly medium to coarse sand, some coarse gravel, angular, nonplastic, brown, wet, medium dense	AU							
	100										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-158

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 8/28/2023 **COMPLETED** 8/29/2023
BORING LOCATION STA 1141+50, 95' L SR 303L Cst CL
DRILLER Yellow Jacket **DRILLED BY** Diego
GPS COORDINATES 33.41367°N, -112.43116°E
DRILLING METHOD Sonic
GROUND ELEVATION 926 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # Terrasonic/ 130
GROUNDWATER DEPTH 65 ft / Elev 861 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 96
LOGGED BY M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
825			SAND WITH GRAVEL (SP), predominantly medium to coarse sand, some coarse gravel, angular, nonplastic, brown, wet, medium dense*(continued)*	SPT	16-13-16 (29)						

Bottom of borehole at 101.5 feet. Backfilled with soil cuttings; grouted upper 20 feet.

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-159

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 8/22/2023 **COMPLETED** 8/24/2023 **BORING LOCATION** STA 1142+40, CL SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.41367°N, -112.43077°E

DRILLING METHOD Tubex **GROUND ELEVATION** 927 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # CME-85/ 118 **GROUNDWATER DEPTH** 60 ft / Elev 867 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY, CLAYEY SAND (SC-SM), predominantly medium sand, trace fine gravel, angular, low plasticity, light brown to white, soft to moderately firm, moderate HCL reaction								
925				SPT	10-5-7 (12)						
				AU							
				R	3-4	104	3	24	7	17	20
	5										
			CLAYEY SAND (SC), occasional fine gravel, subangular, medium plasticity, light brown, slightly moist, moderately firm, weak HCL reaction	SPT	4-6-9 (15)						
920											
	10		SILTY, CLAYEY SAND WITH GRAVEL (SC-SM), fine to medium sand, some fine gravel, subrounded, low plasticity, light brown to light tan, slightly moist, medium dense, weak HCL reaction	SPT	14-11-9 (20)						
915											
			Lense of cobble and gravel at 14'								
	15										
			CLAYEY SAND WITH GRAVEL (SC), some fine gravel, subangular, moderate lime cementation, medium plasticity, light brown to whitish brown, slightly moist, hard, moderate HCL reaction	SPT	15-34-50/4"						
910											
			Considerable fine subangular gravel below 18'								
			Cobble lense at 19'								
	20			SPT	50/2"						
905											
			CLAYEY SAND (SC), predominantly fine sand, rare fine gravel, subangular, medium plasticity, brown, moist, firm								
	25										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-159

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 8/22/2023 **COMPLETED** 8/24/2023 **BORING LOCATION** STA 1142+40, CL SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.41367°N, -112.43077°E

DRILLING METHOD Tubex **GROUND ELEVATION** 927 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # CME-85/ 118 **GROUNDWATER DEPTH** 60 ft / Elev 867 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND (SC), predominantly fine sand, rare fine gravel, subangular, medium plasticity, brown, moist, firm*(continued)*	R	14-18			35	21	14	25
900											
	30		CLAYEY SAND (SC), fine to medium sand, occasional fine gravel, subangular, medium plasticity, brown, slightly moist, firm	SPT	12-9-14 (23)						
895											
	35		CLAYEY SAND (SC), predominantly fine sand, trace fine gravel, subangular, moderate lime cementation, medium plasticity, brown, moist, hard, moderate HCL reaction	SPT	7-50/1"						
			Some coarse angular gravel from 36' to 38'								
890											
	40		Firm, no cementation, weak HCl reaction below 40'	R	10-18	102	19				
885											
			Lense of cobbles and gravel from 42' to 43.5'								
	45		CLAY WITH SAND (CL), some predominantly fine sand, rare fine gravel, medium to high plasticity, brown, moist, very firm	SPT	11-19-22 (41)						
880											
	50										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-159

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 8/22/2023 **COMPLETED** 8/24/2023 **BORING LOCATION** STA 1142+40, CL SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.41367°N, -112.43077°E

DRILLING METHOD Tubex **GROUND ELEVATION** 927 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # CME-85/ 118 ▼ **GROUNDWATER DEPTH** 60 ft / Elev 867 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAY WITH SAND (CL), some predominantly fine sand, rare fine gravel, medium to high plasticity, brown, moist, very firm *(continued)*	R	30-30	86	35	48	22	26	80
875											
	55										
			SAND WITH SILT AND GRAVEL (SP-SM), predominantly medium to coarse sand, some fine gravel, angular, nonplastic, brown, moist, dense	SPT	11-13-20 (33)						
870											
			SAND WITH CLAY (SP-SC), predominantly medium to coarse sand, occasional fine gravel, angular, medium plasticity, brown, wet, medium dense								
	60		▼	SPT	9-9-14 (23)						
865											
	65										
			SAND WITH SILT (SP-SM), fine to medium sand, rare fine gravel, angular, nonplastic, brown, wet, medium dense	R	6-19	111	15	NP	NP	NP	9
860											
	70										
			SAND WITH SILT (SP-SM), predominantly medium to coarse sand, trace fine gravel, angular, nonplastic, light brown to brown, wet	SPT	6-6-10 (16)						
855											
	75										

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Ethos Engineering, LLC
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Tempe, AZ 85284

BORING NUMBER B-159

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 8/22/2023 **COMPLETED** 8/24/2023 **BORING LOCATION** STA 1142+40, CL SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.41367°N, -112.43077°E

DRILLING METHOD Tubex **GROUND ELEVATION** 927 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # CME-85/ 118 ▼ **GROUNDWATER DEPTH** 60 ft / Elev 867 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
850			SAND WITH SILT (SP-SM), predominantly medium to coarse sand, trace fine gravel, angular, nonplastic, brown, wet, medium dense, weak HCL reaction	SPT	11-13-12 (25)						
	80		Very loose below 80'	R	2-2						
845											
	85		SAND (SP), predominantly medium to coarse sand, rare fine gravel, angular, nonplastic, brown to tan, wet, very loose to loose	SPT	2-1-1 (2)						
840											
	90			SPT	1-1-7 (8)						
835											
	95		SAND WITH CLAY (SP-SC), rare fine gravel, angular, low plasticity, brown, wet, medium dense	SPT	9-12-17 (29)						
830											
	100										

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Ethos Engineering, LLC
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BORING NUMBER B-159

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 8/22/2023 **COMPLETED** 8/24/2023
BORING LOCATION STA 1142+40, CL SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41367°N, -112.43077°E
DRILLING METHOD Tubex
GROUND ELEVATION 927 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 60 ft / Elev 867 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SAND WITH CLAY (SP-SC), rare fine gravel, angular, low plasticity, brown, wet, medium dense*(continued)*	SPT	11-12-14 (26)						

Bottom of borehole at 101.5 feet. Backfilled with soil cuttings; grouted upper 20 feet.

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-160

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/7/2023 **COMPLETED** 9/8/2023
BORING LOCATION STA 1142+156, 110' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41383°N, -112.43105°E
DRILLING METHOD Tubex
GROUND ELEVATION 927 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 65 ft / Elev 862 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
925			SILTY, CLAYEY SAND WITH GRAVEL (SC-SM), predominantly medium to coarse sand, some fine gravel, angular, low plasticity, light brown to brown, slightly moist, moderately firm, moderate HCL reaction	SPT	8-7-6 (13)						
				AU							
	5		SILTY GRAVEL WITH SAND (GM), fine gravel, considerable fine to coarse sand, subrounded to subangular, nonplastic, light brown, slightly moist, loose, moderate HCL reaction	SPT	4-4-5 (9)						
920			SILTY SAND (SM), fine to medium sand, trace fine to coarse gravel, subangular, nonplastic, light brown, slightly moist, medium dense, weak HCL reaction	SPT	8-12-13 (25)						
	10		SILTY, CLAYEY GRAVEL WITH SAND (GC), fine gravel, considerable fine to coarse sand, subrounded to subangular, low plasticity, light brown, slightly moist, firm, moderate HCL reaction	SPT	6-8-9 (17)						
915	15		CLAYEY SAND WITH GRAVEL (SC), predominantly fine to medium sand, some fine to coarse gravel, subangular, medium plasticity, light brown to brown, slightly moist, very firm, weak HCL reaction	R	19-50/5"	100	11				
910											
	20		CLAYEY SAND (SC), considerable predominately fine sand, trace fine gravel, angular, medium plasticity, light brown to brown, slightly moist, hard, weak HCL reaction	SPT	15-28-34 (62)		15	35	20	15	50
905											
	25										

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BORING NUMBER B-160

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 9/7/2023 **COMPLETED** 9/8/2023 **BORING LOCATION** STA 1142+156, 110' L SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.41383°N, -112.43105°E

DRILLING METHOD Tubex **GROUND ELEVATION** 927 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # CME-85/ 118 ▼ **GROUNDWATER DEPTH** 65 ft / Elev 862 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
900			CLAYEY SAND (SC), considerable predominately fine sand, trace fine gravel, angular, medium plasticity, light brown to brown, slightly moist, hard, weak HCL reaction*(continued)*	SPT	8-27-32 (59)						
	30		CLAYEY SAND (SC), fine to coarse sand, trace fine gravel, subangular, low to medium plasticity, brown, slightly moist, firm	R	11-21	106	11				
895											
	35		CLAYEY SAND (SC), predominantly fine sand, angular, low to medium plasticity, brown, slightly moist, very firm	SPT	12-20-27 (47)		14	30	22	8	41
890											
	40		CLAYEY SAND (SC), predominantly fine sand, rare fine gravel, angular, medium plasticity, brown, slightly moist, firm to moderately firm	SPT	5-9-14 (23)						
885											
	45		Rare fine subangular gravel below 45'	R	9-14	102	14				
880											
	50										

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Tempe, AZ 85284

BORING NUMBER B-160

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 9/7/2023 **COMPLETED** 9/8/2023 **BORING LOCATION** STA 1142+156, 110' L SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.41383°N, -112.43105°E

DRILLING METHOD Tubex **GROUND ELEVATION** 927 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # CME-85/ 118 ▼ **GROUNDWATER DEPTH** 65 ft / Elev 862 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND (SC), predominantly fine sand, rare fine gravel, angular, medium plasticity, brown, slightly moist, firm to moderately firm *(continued)* Very firm below 50'	SPT	6-13-22 (35)						
875											
	55		SAND WITH CLAY (SP-SC), fine to coarse sand, rare fine gravel, angular, medium plasticity, brown, moist, very firm	SPT	11-19-26 (45)						
870											
	60		SILTY SAND (SM), predominantly medium sand, occasional fine gravel, angular, nonplastic, brown, moist, medium dense	R	10-14			NP	NP	NP	13
865											
	65 ▼		CLAYEY SAND WITH GRAVEL (SC), predominantly medium to coarse sand, some fine gravel, angular, medium plasticity, brown, wet, very stiff	SPT	4-10-10 (20)						
860			SAND WITH SILT (SP-SM), fine to coarse sand, occasional fine gravel, angular, nonplastic, brown, wet, medium dense								
	70			SPT	5-10-20 (30)						
855											
	75										

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PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/7/2023 **COMPLETED** 9/8/2023
BORING LOCATION STA 1142+156, 110' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41383°N, -112.43105°E
DRILLING METHOD Tubex
GROUND ELEVATION 927 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 65 ft / Elev 862 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
850	80		CLAYEY SAND WITH GRAVEL (SC), fine to coarse sand, some fine gravel, angular, medium plasticity, brown, wet, very stiff	SPT	12-8-10 (18)						
845	85		SAND (SP), fine to coarse sand, rare coarse gravel, angular, nonplastic, brown, wet, medium dense	SPT	10-14-14 (28)						
840	90		SAND WITH CLAY AND GRAVEL (SP-SC), well graded sand, predominantly fine gravel, subrounded to subangular, medium plasticity, brown, wet, very firm to hard	SPT	18-15-20 (35)		18	33	16	17	6
835	95			SPT	25-25-32 (57)						
830	100		SANDY CLAY (CL), occasional fine gravel, high plasticity, brown, wet, very stiff	SPT	8-13-14 (27)						

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Ethos Engineering, LLC
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PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/7/2023 **COMPLETED** 9/8/2023
BORING LOCATION STA 1142+156, 110' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41383°N, -112.43105°E
DRILLING METHOD Tubex
GROUND ELEVATION 927 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 65 ft / Elev 862 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
			CLAYEY SAND (SC), predominantly medium to coarse sand, rare fine gravel, angular, medium plasticity, brown, wet, very stiff	SPT	12-13-13 (26)						

Bottom of borehole at 101.5 feet. Backfilled with soil cuttings; grouted upper 20 feet.

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-161

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 8/29/2023 **COMPLETED** 8/31/2023
BORING LOCATION STA 1143+10, 5' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41383°N, -112.43059°E
DRILLING METHOD Tubex
GROUND ELEVATION 927 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 60 ft / Elev 867 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
925			CLAYEY SAND (SC), predominantly fine sand, rare fine gravel, subrounded, low plasticity, light brown, slightly moist, firm	SPT	18-13-8 (21)						
				AU							
	5			SPT	12-13-15 (28)						
				R	21-19	96	4	27	18	9	29
920			Weak HCL reaction and weak lime cementation below 6'								
	10			SPT	11-12-15 (27)						
915											
	15										
910			SILTY, CLAYEY SAND (SC-SM), predominantly fine sand, trace coarse gravel, subrounded to subangular, low plasticity, light brown, slightly moist, hard, weak HCL reaction	SPT	38-50/5"						
			Gravel lense at 18'								
	20			R	50/3"						
905											
	25		Gravel lense between 24' and 25'								

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CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 8/29/2023 **COMPLETED** 8/31/2023 **BORING LOCATION** STA 1143+10, 5' L SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.41383°N, -112.43059°E

DRILLING METHOD Tubex **GROUND ELEVATION** 927 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # CME-85/ 118 **GROUNDWATER DEPTH** 60 ft / Elev 867 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SANDY CLAY (CL), predominantly fine sand, weak lime cementation, medium plasticity, brown, moist, firm, weak HCL reaction	SPT	40-13-17 (30)		9	31	21	10	61
900											
	30		CLAYEY SAND (SC), predominantly fine sand, trace coarse gravel, subrounded, low to medium plasticity, light brown, slightly moist to moist, firm	R	10-21	102	12				
895											
	35		Rare gravel below 35'	SPT	8-11-18 (29)						
890			Gravel lense between 37' and 38'								
	40		SANDY CLAY (CL), some predominantly fine sand, rare fine gravel, medium plasticity, brown, moist, firm	SPT	4-9-11 (20)						
885											
	45		CLAYEY SAND (SC), predominantly fine sand, low plasticity, light brown, slightly moist, firm	R	9-15			30	22	8	37
880											
	50										

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BORING NUMBER B-161

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 8/29/2023 **COMPLETED** 8/31/2023 **BORING LOCATION** STA 1143+10, 5' L SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.41383°N, -112.43059°E

DRILLING METHOD Tubex **GROUND ELEVATION** 927 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # CME-85/ 118 **GROUNDWATER DEPTH** 60 ft / Elev 867 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SANDY CLAY (CL), rare fine gravel, medium plasticity, brown, moist, moderately firm to hard, weak HCL reaction	SPT	4-8-3 (11)						
875											
	55			SPT	40-30-27 (57)						
870											
			Sand lense at 58'								
	60		SILTY SAND WITH GRAVEL (SM), predominantly coarse sand, some coarse gravel, subangular, nonplastic, dark brown, wet, dense	SPT	10-17-24 (41)						
865											
	65			SPT	1-8-9 (17)						
860			SILTY, CLAYEY SAND (SC-SM), fine to medium sand, trace fine gravel, subrounded to subangular, low plasticity, brown, wet, very stiff								
			SAND WITH SILT (SP-SM), predominantly coarse sand, rare fine gravel, angular, nonplastic, brown, wet, medium dense								
	70			SPT	1-3-12 (15)						
855											
	75										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-161

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 8/29/2023 **COMPLETED** 8/31/2023
BORING LOCATION STA 1143+10, 5' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41383°N, -112.43059°E
DRILLING METHOD Tubex
GROUND ELEVATION 927 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 60 ft / Elev 867 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SAND WITH SILT (SP-SM), predominantly medium sand, trace predominantly fine gravel, angular, nonplastic, brown, wet, medium dense	SPT	3-8-13 (21)		10	NP	NP	NP	11
850											
	80		Rare gravel below 80'	SPT	1-5-10 (15)						
845											
	85		SAND WITH CLAY AND GRAVEL (SP-SC), predominantly fine to medium sand, predominantly fine gravel, subangular, low plasticity, brown, wet, hard	SPT	21-42-32 (74)						
840											
	90		GRAVEL WITH SAND (GP), predominantly fine gravel, considerable fine to medium sand, subrounded to subangular, nonplastic, brown, wet, very dense	SPT	25-34-34 (68)						
835											
	95		SAND WITH CLAY (SP-SC), predominantly medium to coarse sand, occasional fine gravel, angular, low plasticity, brown, wet, dense	SPT	15-22-23 (45)						
830											
	100										

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PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 8/29/2023 **COMPLETED** 8/31/2023
BORING LOCATION STA 1143+10, 5' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41383°N, -112.43059°E
DRILLING METHOD Tubex
GROUND ELEVATION 927 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 60 ft / Elev 867 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
			GRAVEL WITH CLAY AND SAND (GP-GC), coarse gravel, some medium to coarse sand, subangular, low plasticity, brown, wet, dense	SPT	22-26-23 (49)						

Bottom of borehole at 101.5 feet. Backfilled with soil cuttings; grouted upper 20 feet.

Ethos Engineering, LLC
9180 S. Kyrene Road, Suite 104
Tempe, AZ 85284

BORING NUMBER B-162

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/11/2023 **COMPLETED** 9/12/2023
BORING LOCATION STA 1143+20, 100' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41404°N, -112.43082°E
DRILLING METHOD Tubex
GROUND ELEVATION 927 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 65 ft / Elev 862 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
925	0		SILTY SAND (SM), predominantly fine to medium sand, occasional fine gravel, angular, nonplastic, brown, slightly moist, firm to moderately firm	SPT	6-8-8 (16)		2	NP	NP	NP	36
				AU							
	5			SPT	6-5-7 (12)						
				SPT	8-6-7 (13)						
920											
	10										
915			CLAYEY SAND (SC), fine to coarse sand, occasional fine to coarse gravel, angular, medium plasticity, brown, slightly moist, moderately firm	SPT	5-5-6 (11)						
	15										
			CLAYEY SAND WITH GRAVEL (SC), fine to coarse sand, fine to coarse gravel, angular, medium plasticity, brown, slightly moist, hard	SPT	50/5"		13	40	25	15	25
910											
	20										
			CLAYEY GRAVEL WITH SAND (GC), predominantly fine gravel, considerable fine to coarse sand, subrounded to subangular, moderate lime cementation, medium plasticity, brown, moist, hard, moderate HCL reaction	SPT	9-50/5"						
905											
	25										

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Ethos Engineering, LLC
9180 S. Kyrene Road, Suite 104
Tempe, AZ 85284

BORING NUMBER B-162

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/11/2023 **COMPLETED** 9/12/2023
BORING LOCATION STA 1143+20, 100' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41404°N, -112.43082°E
DRILLING METHOD Tubex
GROUND ELEVATION 927 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 65 ft / Elev 862 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
900			SANDY CLAY (CL), considerable predominately fine to medium sand, rare fine gravel, angular, medium plasticity, brown, moist, firm	SPT	7-9-12 (21)						
	30		CLAYEY SAND (SC), predominantly fine sand, occasional fine gravel, angular, low to medium plasticity, brown, moist, very firm to firm	SPT	9-13-15 (28)						
895											
	35			R	23-25			29	20	9	32
890											
	40			SPT	5-9-15 (24)						
885											
	45		Hard at 45'	SPT	10-11-50/4"						
880											
	50										

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BORING NUMBER B-162

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/11/2023 **COMPLETED** 9/12/2023
BORING LOCATION STA 1143+20, 100' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41404°N, -112.43082°E
DRILLING METHOD Tubex
GROUND ELEVATION 927 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 65 ft / Elev 862 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND (SC), predominantly fine sand, occasional fine gravel, angular, low to medium plasticity, brown, moist, very firm to firm *(continued)*	R	10-17	111	10				
875											
	55			SPT	11-14-22 (36)						
870											
	60		SILTY SAND (SM), fine to coarse sand, rare fine gravel, angular, nonplastic, brown, moist to wet, medium dense	SPT	10-12-16 (28)						
865											
	65		▼ CLAYEY SAND (SC), fine to coarse sand, rare fine gravel, angular, medium plasticity, brown, wet, stiff	R	9-11	99	16				
860											
	70		CLAY WITH SAND (CH), trace fine to medium sand, occasional to trace fine gravel, high plasticity, brown, wet, very stiff	SPT	1-1-17 (18)		36	55	21	34	79
855											
	75										

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Ethos Engineering, LLC
9180 S. Kyrene Road, Suite 104
Tempe, AZ 85284

BORING NUMBER B-162

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/11/2023 **COMPLETED** 9/12/2023
BORING LOCATION STA 1143+20, 100' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41404°N, -112.43082°E
DRILLING METHOD Tubex
GROUND ELEVATION 927 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 65 ft / Elev 862 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
850	80		SAND WITH SILT AND GRAVEL (SP-SM), predominantly medium to coarse sand, considerable fine to coarse gravel, subangular, nonplastic, brown, wet, dense	SPT	7-11-21 (32)						
845	85		GRAVEL WITH SILT AND SAND (GP-GM), fine to coarse gravel, considerable medium to coarse sand, subrounded to subangular, nonplastic, brown, wet, medium dense to dense	SPT	20-12-12 (24)						
840	90		Fine to medium angular sand below 85'	SPT	18-20-15 (35)						
835	95		Fine to coarse angular sand below 90'	SPT	24-22-15 (37)						
830	100		GRAVEL WITH CLAY AND SAND (GP-GC), fine to coarse gravel, considerable fine to medium sand, subrounded to subangular, low plasticity, brown, wet, hard	SPT	12-16-20 (36)						

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BORING NUMBER B-162

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/11/2023 **COMPLETED** 9/12/2023
BORING LOCATION STA 1143+20, 100' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41404°N, -112.43082°E
DRILLING METHOD Tubex
GROUND ELEVATION 927 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 65 ft / Elev 862 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
			SAND WITH GRAVEL (SP), fine to medium sand, some fine gravel, angular, nonplastic, brown, wet, medium dense	SPT	13-12-16 (28)						

Bottom of borehole at 101.5 feet. Backfilled with soil cuttings; grouted upper 20 feet.

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-163

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 9/1/2023 **COMPLETED** 9/6/2023 **BORING LOCATION** STA 1144+00,10' L SR 303L Cst CL

DRILLER Yellow Jacket **DRILLED BY** Diego / Roger **GPS COORDINATES** 33.41403°N, -112.43041°E

DRILLING METHOD Sonic **GROUND ELEVATION** 928 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # Terrasonic/ 130 **GROUNDWATER DEPTH** 60 ft / Elev 868 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 96 **LOGGED BY** M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SANDY CLAY (CL), considerable predominately fine sand, trace fine gravel, medium plasticity, light brown to tan, slightly moist, moderately firm, moderate HCL reaction	SPT	4-6-8 (14)						
925			SILTY, CLAYEY SAND (SC-SM), fine to medium sand, some coarse gravel, subangular, weak lime cementation, low plasticity, light tan to white, slightly moist, moderate HCL reaction								
	5		SANDY SILTY CLAY WITH GRAVEL (CL-ML), considerable fine to medium sand, some fine gravel, low plasticity, light brown, slightly moist, moderately firm, weak HCL reaction	SPT	6-7-4 (11)						
			Considerable coarse subangular gravel, moderate HCl reaction below 6.5'	AU							
920			CLAYEY SAND WITH GRAVEL (SC), fine to medium sand, some fine gravel, subangular, weak lime cementation, medium plasticity, light brown to whitish brown, slightly moist, moderate HCL reaction	AU							
	10		Brown and moist below 9'								
			SILTY SAND (SM), predominantly fine sand, rare fine gravel, subangular, nonplastic, light brown to gray, slightly moist, firm, weak HCL reaction	R	7-21	102	10	NP	NP	NP	15
915			CLAYEY SAND (SC), fine sand, trace fine gravel, subangular, moderate lime cementation, medium plasticity, light brown, slightly moist, weak HCL reaction								
			Moist, brown and moderately cemented below 14'								
	15		SILTY, CLAYEY SAND WITH GRAVEL (SC-SM), fine to medium sand, considerable coarse gravel, subangular, weak lime cementation, low plasticity, light brown to whitish brown, slightly moist, firm, weak HCL reaction	AU							
				SPT	10-15-24 (39)						
910			CLAYEY SAND WITH GRAVEL (SC), fine to medium sand, some fine gravel, subangular, weak lime cementation, medium plasticity, brown, moist, very firm to hard, weak HCL reaction								
			Considerable coarse gravel, moderate lime cementation and strong hcl reaction below 17'								
	20		White, slightly moist, strongly cemented and strong HCl reaction below 19'	SPT	29-28-30 (58)						
905											
	25			AU			5	27	14	13	15

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-163

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 9/1/2023 **COMPLETED** 9/6/2023 **BORING LOCATION** STA 1144+00,10' L SR 303L Cst CL

DRILLER Yellow Jacket **DRILLED BY** Diego / Roger **GPS COORDINATES** 33.41403°N, -112.43041°E

DRILLING METHOD Sonic **GROUND ELEVATION** 928 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # Terrasonic/ 130 ▼ **GROUNDWATER DEPTH** 60 ft / Elev 868 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 96 **LOGGED BY** M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY GRAVEL (GC), predominantly coarse gravel, trace predominantly fine sand, strong lime cementation, low to medium plasticity, white, slightly moist, hard, strong HCL reaction *(continued)*	R	50/2"						
900			CLAYEY SAND (SC), predominantly fine to medium sand, occasional fine gravel, subangular, low plasticity, brown, moist, firm	AU							
	30			SPT	15-11-14 (25)						
			CLAY WITH SAND (CH), some to considerable predominantly fine sand, subangular, weak lime cementation, high plasticity, brown, moist, firm	AU							
895											
	35			SPT	5-7-14 (21)						
890											
	40			R	14-18			58	25	33	76
885											
	45			SPT	7-8-30 (38)						
880			CLAYEY GRAVEL WITH SAND (GC), predominantly coarse gravel, some fine sand, angular, strong lime cementation, medium plasticity, light brown to whitish brown, slightly moist, strong HCL reaction	AU							
	50										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-163

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 9/1/2023 **COMPLETED** 9/6/2023 **BORING LOCATION** STA 1144+00,10' L SR 303L Cst CL

DRILLER Yellow Jacket **DRILLED BY** Diego / Roger **GPS COORDINATES** 33.41403°N, -112.43041°E

DRILLING METHOD Sonic **GROUND ELEVATION** 928 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # Terrasonic/ 130 **GROUNDWATER DEPTH** 60 ft / Elev 868 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 96 **LOGGED BY** M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
		CLAYEY SAND (SC), fine sand, trace fine gravel, subangular, weak lime cementation, medium plasticity, light brown to brown, slightly moist, hard, weak HCL reaction	SPT	7-7-50/3"						
875		CLAYEY GRAVEL WITH SAND (GC), coarse gravel, considerable fine sand, subangular, strong lime cementation, medium plasticity, light brown to whitish brown, slightly moist, strong HCL reaction	AU							
		CLAY WITH SAND (CL), considerable fine sand, occasional fine gravel, medium plasticity, brown, moist, weak HCL reaction	AU							
	55	Gravel lense at 54.5'								
		SANDY SILTY CLAY (CL-ML), considerable fine sand, occasional fine gravel, low plasticity, brown, slightly moist to moist, hard	R	50/4"						
			AU							
870		SILTY SAND (SM), predominantly fine to medium sand, rare fine gravel, angular, nonplastic, brown, moist to wet, firm	AU							
	60	▼	SPT	6-8-12 (20)						
		SILTY SAND (SM), predominantly fine sand, rare fine gravel, angular, nonplastic, brown, wet, medium dense	AU			17	NP	NP	NP	18
865										
	65		SPT	3-7-8 (15)						
860										
	70		SPT	2-8-13 (21)						
855										
	75									

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-163

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 9/1/2023 **COMPLETED** 9/6/2023 **BORING LOCATION** STA 1144+00,10' L SR 303L Cst CL

DRILLER Yellow Jacket **DRILLED BY** Diego / Roger **GPS COORDINATES** 33.41403°N, -112.43041°E

DRILLING METHOD Sonic **GROUND ELEVATION** 928 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # Terrasonic/ 130 **GROUNDWATER DEPTH** 60 ft / Elev 868 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 96 **LOGGED BY** M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SAND (SP), rare fine gravel, subrounded to subangular, nonplastic, light brown to brown, wet, medium dense	SPT	7-18-10 (28)						
850											
	80			SPT	7-7-9 (16)						
845			GRAVEL WITH SILT AND SAND (GP-GM), predominantly coarse gravel, considerable medium to coarse sand, subrounded to subangular, nonplastic, brown, wet, medium dense to loose	AU							
	85			SPT	6-8-10 (18)						
840											
	90			SPT	4-5-5 (10)						
835											
	95		SAND (SP), fine to medium sand, trace coarse gravel, subangular, nonplastic, brown, wet	AU							
			GRAVEL WITH SAND (GP), coarse gravel, considerable medium to coarse sand, subrounded, nonplastic, brown, wet, medium dense	SPT	6-11-15 (26)						
830			SAND (SP), fine to medium sand, poorly graded coarse gravel, subrounded to subangular, nonplastic, brown, wet	AU							
	100										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-163

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/1/2023 **COMPLETED** 9/6/2023
BORING LOCATION STA 1144+00,10' L SR 303L Cst CL
DRILLER Yellow Jacket **DRILLED BY** Diego / Roger
GPS COORDINATES 33.41403°N, -112.43041°E
DRILLING METHOD Sonic
GROUND ELEVATION 928 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # Terrasonic/ 130
GROUNDWATER DEPTH 60 ft / Elev 868 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 96
LOGGED BY M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
			SAND WITH GRAVEL (SP), fine to medium sand, some coarse gravel, subrounded to subangular, nonplastic, brown, wet, medium dense	SPT	6-7-7 (14)						

Bottom of borehole at 101.5 feet. Backfilled with soil cuttings; grouted upper 20 feet.

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-164

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 8/30/2023 **COMPLETED** 9/1/2023
BORING LOCATION STA 1143+85, 165' R SR 303L Cst CL
DRILLER Yellow Jacket **DRILLED BY** Diego
GPS COORDINATES 33.4137°N, -112.43004°E
DRILLING METHOD Sonic
GROUND ELEVATION 928 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # Terrasonic/ 130
GROUNDWATER DEPTH 65 ft / Elev 863 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 96
LOGGED BY M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
925			SILTY, CLAYEY GRAVEL WITH SAND (GC), considerable medium to coarse sand, subangular, low plasticity, brown, slightly moist, dense	SPT	12-21-13 (34)						
			SILTY, CLAYEY SAND WITH GRAVEL (SC-SM), predominantly medium sand, trace fine gravel, angular, low plasticity, light brown to brown, slightly moist, firm, weak HCL reaction	AU							
	5			SPT	11-8-13 (21)						
920											
			SILTY, CLAYEY GRAVEL WITH SAND (GC), predominantly coarse gravel, considerable predominately fine to medium sand, subangular, weak lime cementation, low plasticity, white, slightly moist, medium dense	AU			5	24	18	6	22
	10			R	25-14	122	11				
			SAND WITH SILT (SP-SM), fine to medium sand, some fine gravel, subangular, nonplastic, light brown to whitish brown, slightly moist, dense	AU							
915											
			SILTY, CLAYEY GRAVEL WITH SAND (GC), some medium to coarse sand, subangular, low plasticity, light brown to light tan, slightly moist, hard, weak HCL reaction	AU							
	15			SPT	50/5"						
			SANDY SILTY CLAY (CL-ML), occasional fine gravel, some predominantly medium to coarse sand, low plasticity, brown, slightly moist, hard, moderate HCL reaction	AU							
910											
			CLAYEY GRAVEL WITH SAND (GC), predominantly coarse gravel, considerable medium to coarse sand, subangular, weak lime cementation, medium plasticity, light brown to tan, moist, moderately firm, weak HCL reaction								
	20			SPT	5-7-6 (13)						
905											
			CLAYEY SAND (SC), predominantly fine sand, angular, weak lime cementation, medium plasticity, brown, moist, hard to firm, moderate HCL reaction	AU							
	25										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-164

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 8/30/2023 **COMPLETED** 9/1/2023 **BORING LOCATION** STA 1143+85, 165' R SR 303L Cst CL

DRILLER Yellow Jacket **DRILLED BY** Diego **GPS COORDINATES** 33.4137°N, -112.43004°E

DRILLING METHOD Sonic **GROUND ELEVATION** 928 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # Terrasonic/ 130 **GROUNDWATER DEPTH** 65 ft / Elev 863 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 96 **LOGGED BY** M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND (SC), predominantly fine sand, angular, weak lime cementation, medium plasticity, brown, moist, hard to firm, moderate HCL reaction*(continued)*	R	33-49			33	19	14	26
900											
	30		White, slightly moist and strongly cemented from 29' to 29.5'	SPT	7-11-14 (25)						
895											
	35		White, slightly moist and strongly cemented from 34' to 35'	SPT	4-9-10 (19)						
890				AU							
	40			R	50-50	105	17	24	17	7	45
			Gravel lense from 41' to 42'								
885											
	45			SPT	7-24-18 (42)						
880											
			Gravel lense from 48' to 49'								
	50										

(Continued Next Page)

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-164

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 8/30/2023 **COMPLETED** 9/1/2023 **BORING LOCATION** STA 1143+85, 165' R SR 303L Cst CL

DRILLER Yellow Jacket **DRILLED BY** Diego **GPS COORDINATES** 33.4137°N, -112.43004°E

DRILLING METHOD Sonic **GROUND ELEVATION** 928 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # Terrasonic/ 130 **GROUNDWATER DEPTH** 65 ft / Elev 863 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 96 **LOGGED BY** M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND (SC), predominantly fine sand, angular, weak lime cementation, medium plasticity, brown, moist, hard to firm, moderate HCL reaction*(continued)*	SPT	15-13-6 (19)						
			Occassional cobbles below 51.5'								
875											
			White, slightly moist and strongly cemented at 54'								
	55			R	50/3"						
			SANDY CLAY (CL), considerable fine sand, low plasticity, brown, moist, moderately firm, weak HCL reaction								
				AU			15	26	18	8	60
870											
	60			SPT	12-7-8 (15)						
865											
	65		▼ SILTY SAND (SM), predominantly medium to coarse sand, occasional fine gravel, angular, nonplastic, brown, wet, medium dense	SPT	5-11-15 (26)						
860			SILTY GRAVEL WITH SAND (GM), fine gravel, considerable medium to coarse sand, subangular, nonplastic, brown, wet, medium dense								
	70		SILTY SAND (SM), medium to coarse sand, occasional fine gravel, angular, nonplastic, brown, wet, medium dense	R	7-14						
855											
	75										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-164

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 8/30/2023 **COMPLETED** 9/1/2023 **BORING LOCATION** STA 1143+85, 165' R SR 303L Cst CL

DRILLER Yellow Jacket **DRILLED BY** Diego **GPS COORDINATES** 33.4137°N, -112.43004°E

DRILLING METHOD Sonic **GROUND ELEVATION** 928 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # Terrasonic/ 130 **GROUNDWATER DEPTH** 65 ft / Elev 863 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 96 **LOGGED BY** M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY SAND (SM), medium to coarse sand, occasional fine gravel, angular, nonplastic, brown, wet, medium dense*(continued)*	SPT	5-12-16 (28)						
850				AU							
			GRAVELLY CLAY WITH SAND (CL), considerable fine gravel, some predominantly medium to coarse sand, medium plasticity, brown, wet, very stiff								
	80			AU							
				SPT	4-8-8 (16)						
			GRAVEL WITH SILT AND SAND (GP-GM), fine gravel, considerable medium to coarse sand, subangular, nonplastic, brown, wet, dense to very dense								
845				AU							
	85		Fine to coarse subangular sand below 85'	SPT	17-19-19 (38)						
840											
	90			R	46-50/5"	115	16				
835											
	95		SAND WITH GRAVEL (SP), medium to coarse sand, considerable coarse gravel, angular, nonplastic, brown, wet, very dense	SPT	22-34-23 (57)						
830			SILTY, CLAYEY SAND WITH GRAVEL (SC-SM), fine to medium sand, some predominantly coarse gravel, subangular, low plasticity, brown, moist to wet								
	100										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-164

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 8/30/2023 **COMPLETED** 9/1/2023
BORING LOCATION STA 1143+85, 165' R SR 303L Cst CL
DRILLER Yellow Jacket **DRILLED BY** Diego
GPS COORDINATES 33.4137°N, -112.43004°E
DRILLING METHOD Sonic
GROUND ELEVATION 928 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # Terrasonic/ 130
GROUNDWATER DEPTH 65 ft / Elev 863 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 96
LOGGED BY M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
			SAND WITH GRAVEL (SP), medium to coarse sand, some coarse gravel, angular, nonplastic, brown, wet, dense	SPT	10-21-22 (43)						

Bottom of borehole at 101.5 feet. Backfilled with soil cuttings; grouted upper 20 feet.

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-165

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 8/25/2023 **COMPLETED** 8/28/2023 **BORING LOCATION** STA 1144+50, 160' R SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.41385°N, -112.42989°E

DRILLING METHOD Tubex **GROUND ELEVATION** 928 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # CME-85/ 118 **GROUNDWATER DEPTH** 65 ft / Elev 863 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** M. Meza / P. Oliden **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SANDY SILTY CLAY (CL-ML), occasional fine gravel, considerable fine sand, low plasticity, light brown, slightly moist, firm to moderately firm, weak HCL reaction	SPT	7-10-11 (21)						
				AU							
925			Medium angular sand below 3'	SPT	6-6-7 (13)						
	5										
			SAND WITH SILT AND GRAVEL (SP-SM), predominantly medium sand, trace to some fine gravel, angular, nonplastic, light brown to tan, slightly moist, medium dense	R	7-8	95	2	NP	NP	NP	9
			Increased fine angular gravel below 7'								
920											
	10		Coarse angular sand below 10'	SPT	6-8-22 (30)						
915											
			Occassional cobbles and considerable predominately coarse gravel below 14'								
	15		Very dense below 15'	SPT	50/5"						
910			GRAVEL WITH SILT AND SAND (GP-GM), predominantly coarse gravel, considerable medium to coarse sand, subangular, nonplastic, light tan to white, slightly moist, weak HCL reaction								
	20		CLAYEY SAND (SC), predominantly fine sand, trace fine gravel, subangular, moderate lime cementation, medium plasticity, light brown to whitish brown, slightly moist, hard, moderate HCL reaction	R	18-50/2"						
905											
	25		Brown and moist below 24'								

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-165

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 8/25/2023 **COMPLETED** 8/28/2023 **BORING LOCATION** STA 1144+50, 160' R SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.41385°N, -112.42989°E

DRILLING METHOD Tubex **GROUND ELEVATION** 928 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # CME-85/ 118 **GROUNDWATER DEPTH** 65 ft / Elev 863 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** M. Meza / P. Oliden **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY, CLAYEY SAND (SC-SM), predominantly fine sand, rare fine gravel, angular, low plasticity, brown, slightly moist, firm, weak HCL reaction	SPT	7-10-17 (27)						
900											
	30			SPT	6-8-14 (22)						
895			CLAYEY GRAVEL WITH SAND (GC), fine gravel, considerable fine to coarse sand, subangular, medium plasticity, brown, moist, hard, weak HCL reaction								
	35			SPT	50/2"						
890			SANDY SILTY CLAY (CL-ML), occasional fine gravel, considerable fine sand, low plasticity, brown, moist								
	40		SILTY SAND (SM), predominantly fine sand, occasional fine gravel, angular, nonplastic, brown, moist, dense	SPT	11-13-20 (33)		7	NP	NP	NP	17
885											
	45		CLAYEY GRAVEL WITH SAND (GC), fine gravel, considerable fine sand, angular, medium plasticity, light brown to brown, slightly moist, hard, weak HCL reaction	SPT	50/4"						
880			Brown and moist below 48'								
	50										

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Tempe, AZ 85284

BORING NUMBER B-165

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 8/25/2023 **COMPLETED** 8/28/2023 **BORING LOCATION** STA 1144+50, 160' R SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.41385°N, -112.42989°E

DRILLING METHOD Tubex **GROUND ELEVATION** 928 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # CME-85/ 118 **GROUNDWATER DEPTH** 65 ft / Elev 863 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** M. Meza / P. Oliden **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND (SC), trace fine gravel, angular, medium plasticity, brown, wet, very firm, moderate HCL reaction	R	50/4"						
875			Subangular coarse gravel lense at 52'								
			Strongly cemented from 53' to 54'								
	55		Firm and slightly moist below 55'	SPT	10-5-10 (15)						
870											
	60		SANDY CLAY (CL), rare fine gravel, considerable fine sand, weak lime cementation, medium plasticity, brown, wet, very firm, moderate HCL reaction	SPT	17-15-20 (35)						
865											
	65	▼	SILTY SAND WITH GRAVEL (SM), medium to coarse sand, some fine gravel, angular, nonplastic, brown, wet, medium dense	SPT	7-9-12 (21)						
860											
			SILTY SAND (SM), predominantly medium sand, subangular, nonplastic, dark brown, wet, medium dense								
	70			SPT	5-7-8 (15)		20	NP	NP	NP	29
855											
	75										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-165

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 8/25/2023 **COMPLETED** 8/28/2023
BORING LOCATION STA 1144+50, 160' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41385°N, -112.42989°E
DRILLING METHOD Tubex
GROUND ELEVATION 928 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 65 ft / Elev 863 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY M. Meza / P. Oliden **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY SAND (SM), predominantly medium sand, subangular, nonplastic, dark brown, wet, medium dense*(continued)*	SPT	4-6-12 (18)						
850											
	80		Medium to coarse sand below 80'	SPT	2-5-10 (15)						
845											
	85			SPT	2-7-8 (15)						
840											
	90			SPT	4-13-17 (30)						
835											
	95		Coarse sand below 95'	SPT	4-12-20 (32)						
830											
	100										

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Ethos Engineering, LLC
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BORING NUMBER B-165

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 8/25/2023 **COMPLETED** 8/28/2023
BORING LOCATION STA 1144+50, 160' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41385°N, -112.42989°E
DRILLING METHOD Tubex
GROUND ELEVATION 928 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 65 ft / Elev 863 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY M. Meza / P. Oliden **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
			SILTY SAND (SM), predominantly medium sand, subangular, nonplastic, dark brown, wet, medium dense*(continued)* Trace coarse subrounded gravel below 100'	SPT	3-9-20 (29)						

Bottom of borehole at 101.5 feet. Backfilled with soil cuttings; grouted upper 20 feet.

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-166

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/6/2023 **COMPLETED** 9/7/2023
BORING LOCATION STA 1145+60, 170' R SR 303L Cst CL
DRILLER Yellow Jacket **DRILLED BY** Roger
GPS COORDINATES 33.41403°N, -112.42963°E
DRILLING METHOD Sonic
GROUND ELEVATION 930 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # Terrasonic/ 130
GROUNDWATER DEPTH 70 ft / Elev 860 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 96
LOGGED BY M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
930			SANDY CLAY WITH GRAVEL (CL), some coarse gravel, considerable fine to medium sand, medium plasticity, light brown, slightly moist, firm, moderate HCL reaction	SPT	8-8-9 (17)						
925	5		SILTY, CLAYEY SAND WITH GRAVEL (SC-SM), fine to medium sand, some coarse gravel, subangular, low plasticity, light brown, slightly moist, firm, weak HCL reaction	SPT	9-11-18 (29)						
920	10		SAND WITH SILT AND GRAVEL (SP-SM), predominantly medium to coarse sand, some fine gravel, angular, nonplastic, light brown, slightly moist, firm, weak HCL reaction	SPT	3-9-7 (16)						
915	15		SANDY SILT (ML), considerable fine sand, rare fine gravel, subangular, nonplastic, light brown, slightly moist, very firm, weak HCL reaction	AU							
				R	22-30			NP	NP	NP	65
910	20		CLAYEY GRAVEL WITH SAND (GC), predominantly coarse gravel, some fine sand, subrounded, strong lime cementation, medium plasticity, white, moist, hard, moderate HCL reaction	AU							
				SPT	50/3"						
905	25		CLAYEY SAND (SC), predominantly fine sand, rare fine gravel, subangular, low to medium plasticity, brown, moist, hard	AU			12	28	20	8	46

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-166

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 9/6/2023 **COMPLETED** 9/7/2023 **BORING LOCATION** STA 1145+60, 170' R SR 303L Cst CL

DRILLER Yellow Jacket **DRILLED BY** Roger **GPS COORDINATES** 33.41403°N, -112.42963°E

DRILLING METHOD Sonic **GROUND ELEVATION** 930 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # Terrasonic/ 130 **GROUNDWATER DEPTH** 70 ft / Elev 860 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 96 **LOGGED BY** M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
905			CLAYEY SAND WITH GRAVEL (SC), predominantly fine sand, some fine gravel, subangular, medium plasticity, brown, slightly moist, firm, weak HCL reaction	SPT	5-6-12 (18)						
				AU							
900	30		SILTY, CLAYEY SAND WITH GRAVEL (SC-SM), predominantly fine sand, some fine gravel, subangular, low plasticity, brown, slightly moist, firm, weak HCL reaction	R	11-30	109	15				
895	35		CLAYEY SAND WITH GRAVEL (SC), fine to medium sand, some coarse gravel, subangular, weak lime cementation, medium plasticity, light brown, slightly moist, firm, moderate HCL reaction	SPT	10-17-10 (27)						
				AU							
890	40		SILTY, CLAYEY SAND WITH GRAVEL (SC-SM), predominantly fine sand, trace fine gravel, subangular, low plasticity, brown, slightly moist, hard, weak HCL reaction	SPT	11-30-50 (80)						
			SILTY SAND (SM), fine sand, weak lime cementation, nonplastic, brown, slightly moist, firm, moderate HCL reaction	AU							
885	45			R	13-30	116	14	NP	NP	NP	38
			SANDY CLAY (CL), trace fine gravel, considerable fine sand, moderate lime cementation, medium plasticity, brown to light brown, slightly moist, moderate HCL reaction	AU							
880	50		CLAY (CL), rare fine gravel, occasional fine sand, medium plasticity, brown, moist, weak HCL reaction	AU							

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-166

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 9/6/2023 **COMPLETED** 9/7/2023 **BORING LOCATION** STA 1145+60, 170' R SR 303L Cst CL

DRILLER Yellow Jacket **DRILLED BY** Roger **GPS COORDINATES** 33.41403°N, -112.42963°E

DRILLING METHOD Sonic **GROUND ELEVATION** 930 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # Terrasonic/ 130 ▼ **GROUNDWATER DEPTH** 70 ft / Elev 860 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 96 **LOGGED BY** M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
880			SANDY CLAY (CL), occasional fine gravel, considerable fine sand, medium plasticity, brown, slightly moist, very firm, weak HCL reaction	SPT	8-13-21 (34)						
875	55		SILTY SAND WITH GRAVEL (SM), fine to medium sand, some coarse gravel, subangular, nonplastic, brown, slightly moist, weak HCL reaction	AU							
			CLAYEY SAND (SC), fine sand, trace fine gravel, subangular, medium plasticity, brown, moist, hard, weak HCL reaction	SPT	9-50/5"						
870	60		CLAY WITH SAND (CL), rare fine gravel, some to considerable predominantly fine sand, medium plasticity, brown, moist, very firm, weak HCL reaction	SPT	4-10-21 (31)		22	32	20	12	73
865	65			R	11-25	99	25				
			GRAVEL WITH SAND (GP), coarse gravel, considerable predominately medium sand, subrounded, nonplastic, brown, moist	AU							
860	70		CLAYEY GRAVEL WITH SAND (GC), coarse gravel, some fine to medium sand, subangular, medium plasticity, brown, moist, very firm, weak HCL reaction	AU							
			▼ SAND WITH CLAY AND GRAVEL (SP-SC), fine to medium sand, some fine gravel, angular, medium plasticity, brown, wet, hard, weak HCL reaction	SPT	29-26-24 (50)						
855	75		SAND WITH SILT AND GRAVEL (SP-SM), predominantly fine to medium sand, trace to some fine to coarse gravel, subangular, nonplastic, brown, wet, very loose to medium dense, weak HCL reaction	AU			14	NP	NP	NP	7

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-166

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 9/6/2023 **COMPLETED** 9/7/2023 **BORING LOCATION** STA 1145+60, 170' R SR 303L Cst CL

DRILLER Yellow Jacket **DRILLED BY** Roger **GPS COORDINATES** 33.41403°N, -112.42963°E

DRILLING METHOD Sonic **GROUND ELEVATION** 930 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # Terrasonic/ 130 **GROUNDWATER DEPTH** 70 ft / Elev 860 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 96 **LOGGED BY** M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
855											
			SAND WITH SILT AND GRAVEL (SP-SM), predominantly fine to medium sand, trace to some fine to coarse gravel, subangular, nonplastic, brown, wet, very loose to medium dense, weak HCL reaction*(continued)*	R	2-2						
850	80			SPT	4-8-11 (19)						
			SAND WITH SILT AND GRAVEL (SP-SM), fine to medium sand, considerable coarse gravel, subangular, nonplastic, brown, wet, medium dense, weak HCL reaction Brown, medium plasticity clay lense from 84' to 84.5'	AU							
845	85		GRAVEL WITH SILT AND SAND (GP-GM), predominantly coarse gravel, considerable medium to coarse sand, subrounded to subangular, nonplastic, brown, wet, loose Reddish brown to brown, medium plasticity clay lense from 88' to 88.5'	SPT AU	4-4-5 (9)						
840	90		SAND WITH GRAVEL (SP), medium sand, some coarse gravel, subangular, nonplastic, brown, wet, loose	SPT	3-3-3 (6)						
			GRAVEL WITH SAND (GP), predominantly coarse gravel, considerable medium to coarse sand, subrounded, nonplastic, brown, wet, loose	AU							
835	95			SPT	3-4-5 (9)						
			CLAYEY SAND WITH GRAVEL (SC), predominantly medium sand, some coarse gravel, subrounded, medium plasticity, brown, wet	AU							
830	100		CLAY (CL), rare fine gravel, trace fine sand, medium plasticity, brown, wet	AU							

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-166

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/6/2023 **COMPLETED** 9/7/2023
BORING LOCATION STA 1145+60, 170' R SR 303L Cst CL
DRILLER Yellow Jacket **DRILLED BY** Roger
GPS COORDINATES 33.41403°N, -112.42963°E
DRILLING METHOD Sonic
GROUND ELEVATION 930 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # Terrasonic/ 130
GROUNDWATER DEPTH 70 ft / Elev 860 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 96
LOGGED BY M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
830			SAND (SP), fine to medium sand, trace fine gravel, subangular, nonplastic, brown, wet, loose	SPT	3-4-4 (8)						

Bottom of borehole at 101.5 feet. Backfilled with soil cuttings; grouted upper 20 feet.

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-167

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 10/24/2023 **COMPLETED** 10/24/2023
BORING LOCATION STA 1146+50, 150' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41422°N, -112.42953°E
DRILLING METHOD Tubex
GROUND ELEVATION 931 ft **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
930			SILTY, CLAYEY SAND WITH GRAVEL (SC-SM), predominantly fine to medium sand, some fine gravel, angular, low plasticity, brown, slightly moist, firm, moderate HCL reaction	R	13-14						
				AU							
			SILTY SAND WITH GRAVEL (SM), predominantly fine to medium sand, some fine gravel, angular, nonplastic, brown, slightly moist, loose, weak HCL reaction	SPT	6-5-5 (10)						
	5										
925			SAND WITH SILT (SP-SM), predominantly fine sand, occasional fine gravel, angular, nonplastic, brown, slightly moist, loose to medium dense, weak HCL reaction	SPT	6-5-6 (11)						
	10			R	3-6	103	2	NP	NP	NP	11
920											
	15										
915				SPT	3-5-6 (11)						
	20										
910			SANDY CLAY (CH), some to considerable predominantly fine to medium sand, occasional fine gravel, angular, high plasticity, light brown to tan, slightly moist, hard, strong HCL reaction	SPT	21-26-50/4"						
	25										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-167

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 10/24/2023 **COMPLETED** 10/24/2023
BORING LOCATION STA 1146+50, 150' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41422°N, -112.42953°E
DRILLING METHOD Tubex
GROUND ELEVATION 931 ft **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
905			CLAYEY SAND (SC), predominantly fine sand, medium plasticity, brown, slightly moist, moderately firm to firm, weak HCL reaction	R	8-20	103	13	31	18	13	31
	30			SPT	4-11-12 (23)						
900											
	35			SPT	2-3-8 (11)		18				
895											
	40		Hard at 40'	R	50/4"						
890											
	45			SPT	3-15-16 (31)						
885											
	50										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-167

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 10/24/2023 **COMPLETED** 10/24/2023
BORING LOCATION STA 1146+50, 150' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41422°N, -112.42953°E
DRILLING METHOD Tubex
GROUND ELEVATION 931 ft **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
880			CLAYEY SAND (SC), predominantly fine sand, medium plasticity, brown, slightly moist, moderately firm to firm, weak HCL reaction *(continued)*	R	12-22	106	15				
	55		Moderate HCl reaction at 55'	SPT	50/5"						
875											
	60										
870			SANDY CLAY WITH GRAVEL (CL), some fine to coarse sand, some predominantly fine gravel, angular, medium plasticity, brown, moist, very firm, moderate HCL reaction	SPT	24-26-22 (48)		24	36	19	17	63

Bottom of borehole at 61.5 feet. Backfilled with soil cuttings.

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-168

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/5/2023 **COMPLETED** 9/5/2023
BORING LOCATION STA 1148+40, 100' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41511°N, -112.42967°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 933 ft **BOREHOLE DEPTH** 36.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY, CLAYEY SAND WITH GRAVEL (SC-SM), predominantly fine to medium sand, some fine to coarse gravel, subangular, low plasticity, brown to light brown, slightly moist, firm to very firm, moderate HCL reaction	SPT	8-8-9 (17)		2	22	16	6	25
930				AU							
			Moderately firm at 3'	R	6-9						
	5										
				SPT	6-13-11 (24)						
925											
	10										
				SPT	16-16-17 (33)						
920											
	15										
			Moderately firm at 15'	R	5-8						
915											
	20										
			SANDY CLAY WITH GRAVEL (CL), some predominantly fine gravel, some fine to coarse sand, medium plasticity, brown to light brown, slightly moist, hard, weak HCL reaction	SPT	50/5"						
910											
	25										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-168

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/5/2023 **COMPLETED** 9/5/2023
BORING LOCATION STA 1148+40, 100' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41511°N, -112.42967°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 933 ft **BOREHOLE DEPTH** 36.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND (SC), predominantly fine sand, angular, medium plasticity, brown to light brown, slightly moist, firm, weak HCL reaction	SPT	7-9-15 (24)						
905											
	30		Moderately firm, rare fine angular gravel and no HCL reaction at 30'	R	5-9	88	22	34	18	16	40
900											
	35			SPT	5-5-12 (17)						

Bottom of borehole at 36.5 feet. Backfilled with soil cuttings.

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-169

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 10/24/2023 **COMPLETED** 10/24/2023
BORING LOCATION STA 1149+15, 180' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41476°N, -112.42886°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 931 ft **BOREHOLE DEPTH** 36.3 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
930			SILTY, CLAYEY SAND WITH GRAVEL (SC-SM), predominantly fine to medium sand, some fine gravel, angular, medium plasticity, brown, slightly moist, moderately firm, moderate HCL reaction	SPT	7-7-8 (15)						
				AU							
			GRAVEL WITH CLAY AND SAND (GP-GC), predominantly coarse gravel, trace to some fine to coarse sand, angular, medium plasticity, brown, slightly moist, moderately firm, weak HCL reaction	R	5-9		8	40	22	18	10
	5										
925				SPT	6-5-6 (11)						
	10										
920			SAND WITH SILT (SP-SM), predominantly fine to medium sand, trace coarse gravel, angular, nonplastic, brown, slightly moist, medium dense to dense, weak HCL reaction	R	19-18						
	15										
915				SPT	14-18-21 (39)						
	20										
910			SILTY SAND WITH GRAVEL (SM), predominantly fine to medium sand, some fine to coarse gravel, angular, nonplastic, brown, slightly moist, very dense, weak HCL reaction	SPT	28-20-45 (65)						
	25										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-169

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 10/24/2023 **COMPLETED** 10/24/2023
BORING LOCATION STA 1149+15, 180' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41476°N, -112.42886°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 931 ft **BOREHOLE DEPTH** 36.3 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
905			SILTY SAND (SM), predominantly medium sand, rare fine gravel, subangular, nonplastic, brown, slightly moist, very dense, moderate HCL reaction	R	50/5"	110	2	NP	NP	NP	13
	30										
900				SPT	10-12-17 (29)						
	35										
895			CLAYEY SAND (SC), predominantly fine to medium sand, occasional fine gravel, angular, medium plasticity, brown, slightly moist, hard, moderate HCL reaction	SPT	6-10-50/4"		15				

Bottom of borehole at 36.3 feet. Backfilled with soil cuttings.

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-170

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/5/2023 **COMPLETED** 9/5/2023
BORING LOCATION STA 1152+50, 100' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41601°N, -112.42892°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 934 ft **BOREHOLE DEPTH** 36 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY SAND (SM), predominantly fine to medium sand, occasional fine gravel, subangular, nonplastic, light brown to brown, slightly moist, moderately firm, moderate HCL reaction	SPT	8-6-8 (14)		1	NP	NP	NP	26
				AU							
930	5		SILTY SAND (SM), predominantly fine to medium sand, some fine gravel, subrounded to subangular, nonplastic, light brown to brown, slightly moist, moderately firm, moderate HCL reaction	SPT	3-6-6 (12)						
				R	8-10						
925	10			SPT	4-5-8 (13)						
920	15		SAND WITH SILT (SP-SM), predominantly medium to coarse sand, trace fine gravel, subrounded to subangular, nonplastic, light brown to tan, slightly moist, medium dense	SPT	3-13-14 (27)		2				
915	20		SANDY CLAY WITH GRAVEL (CH), some predominantly fine gravel, some fine to coarse sand, high plasticity, light brown to brown, slightly moist, hard, moderate HCL reaction	SPT	19-39-50/1"						
910	25										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-170

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/5/2023 **COMPLETED** 9/5/2023
BORING LOCATION STA 1152+50, 100' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41601°N, -112.42892°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 934 ft **BOREHOLE DEPTH** 36 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SANDY CLAY WITH GRAVEL (CH), some predominantly fine gravel, some fine to coarse sand, high plasticity, light brown to brown, slightly moist, hard, moderate HCL reaction *(continued)*	SPT	12-9-14 (23)		28	64	22	42	54
905	30		CLAYEY SAND (SC), predominantly fine to medium sand, rare fine gravel, angular, medium plasticity, brown to dark brown, slightly moist, very firm	SPT	16-19-27 (46)						
900	35		SILTY SAND WITH GRAVEL (SM), predominantly medium to coarse sand, considerable fine to coarse gravel, no to low plasticity, brown to blackish brown, slightly moist, firm, weak HCL reaction	R	19-25	99	9				

Bottom of borehole at 36.0 feet. Backfilled with soil cuttings.

Ethos Engineering, LLC
9180 S. Kyrene Road, Suite 104
Tempe, AZ 85284

BORING NUMBER B-171

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/28/2023 **COMPLETED** 9/28/2023
BORING LOCATION STA 1156+60, CL SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41682°N, -112.42798°E
DRILLING METHOD Tubex
GROUND ELEVATION 933 ft **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY SAND (SM), predominantly fine to medium sand, occasional fine gravel, angular, low plasticity, brown, slightly moist, soft, moderate HCL reaction	AU R	5-6	97	4 6	20	17	3	37
930											
			Increase in fine subangular gravel below 3'	SPT	4-3-5 (8)						
	5										
			SILTY SAND (SM), fine to coarse sand, trace fine gravel, angular, nonplastic, light brown to tan, slightly moist, very dense, weak HCL reaction	SPT	14-19-37 (56)						
925											
	10										
			SILTY SAND WITH GRAVEL (SM), fine to coarse sand, considerable predominately fine gravel, angular, nonplastic, brown to light brown, slightly moist, medium dense, weak HCL reaction	R	13-21	114	2				
920											
	15										
			SILTY SAND (SM), predominantly fine to medium sand, occasional coarse gravel, angular, nonplastic, brown, slightly moist, very dense	SPT	8-50/1"						
			CLAYEY SAND WITH GRAVEL (SC), fine to coarse sand, considerable fine to coarse gravel, angular, low to medium plasticity, tan to white, slightly moist, very dense, strong HCL reaction								
915											
	20			SPT	50/5"						
910											
	25										

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Ethos Engineering, LLC
9180 S. Kyrene Road, Suite 104
Tempe, AZ 85284

BORING NUMBER B-171

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/28/2023 **COMPLETED** 9/28/2023
BORING LOCATION STA 1156+60, CL SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41682°N, -112.42798°E
DRILLING METHOD Tubex
GROUND ELEVATION 933 ft **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SANDY CLAY (CH), some to considerable predominantly fine sand, trace predominantly fine gravel, angular, high plasticity, brown, slightly moist, firm, moderate HCL reaction	R	11-19	94	23	52	21	31	60
905											
	30			SPT	6-12-16 (28)						
900											
	35			SPT	6-12-14 (26)						
895											
	40			R	9-13						
890											
	45		SANDY CLAY (CL), predominantly fine sand, rare fine gravel, angular, medium plasticity, brown, slightly moist to moist, moderately firm	SPT	5-6-8 (14)		24	38	19	19	53
885											
	50										

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Ethos Engineering, LLC
9180 S. Kyrene Road, Suite 104
Tempe, AZ 85284

BORING NUMBER B-171

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/28/2023 **COMPLETED** 9/28/2023
BORING LOCATION STA 1156+60, CL SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41682°N, -112.42798°E
DRILLING METHOD Tubex
GROUND ELEVATION 933 ft **BOREHOLE DEPTH** 61.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SANDY CLAY (CL), predominantly fine sand, rare fine gravel, angular, medium plasticity, brown, slightly moist to moist, moderately firm *(continued)*	SPT	3-6-9 (15)						
880											
	55		CLAYEY SAND (SC), predominantly fine to medium sand, rare fine gravel, angular, medium plasticity, brown to light brown, moist, firm	R	13-21	99	19				
875											
	60		Increase to some gravel at 60'	SPT	9-10-12 (22)						

Bottom of borehole at 61.5 feet. Backfilled with soil cuttings.

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-172

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/21/2023 **COMPLETED** 9/22/2023
BORING LOCATION STA 1155+25, 230' R SR 303L Cst CL
DRILLER Yellow Jacket **DRILLED BY** Z. Dotan
GPS COORDINATES 33.41612°N, -112.42758°E
DRILLING METHOD Sonic
GROUND ELEVATION 931 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # Terrasonic/ 130
GROUNDWATER DEPTH 65 ft / Elev 866 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 96
LOGGED BY M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
930			SANDY SILT (ML), trace fine gravel, considerable fine sand, low plasticity, light brown to light tan, slightly moist, soft to moderately firm, weak HCL reaction	SPT	5-3-3 (6)						
	5			SPT	7-5-8 (13)						
925			SILTY SAND (SM), predominantly fine sand, trace fine gravel, subangular, low plasticity, brown to light brown, slightly moist, moderately firm, weak HCL reaction								
			SILTY SAND WITH GRAVEL (SM), fine sand, some fine gravel, subangular, low plasticity, light brown to whitish brown, slightly moist, moderate HCL reaction								
	10										
920			SILTY SAND (SM), predominantly fine sand, rare fine gravel, subangular, nonplastic, light tan to whitish brown, slightly moist, medium dense, weak HCL reaction	R	10-12	103	4	NP	NP	NP	24
			SANDY CLAY (CL), considerable predominately fine sand, trace predominantly coarse gravel, subangular, moderate lime cementation, medium plasticity, light tan to whitish brown, slightly moist, hard, moderate HCL reaction	AU							
	15			SPT	11-30-50 (80)						
915											
	20		Moist and light brown below 20'	SPT	20-20-50/5"						
910			SANDY CLAY (CL), trace fine gravel, considerable fine sand, moderate lime cementation, medium plasticity, brown, slightly moist, moderate HCL reaction	AU							
	25										

(Continued Next Page)

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-172

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 9/21/2023 **COMPLETED** 9/22/2023 **BORING LOCATION** STA 1155+25, 230' R SR 303L Cst CL

DRILLER Yellow Jacket **DRILLED BY** Z. Dotan **GPS COORDINATES** 33.41612°N, -112.42758°E

DRILLING METHOD Sonic **GROUND ELEVATION** 931 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # Terrasonic/ 130 ▼ **GROUNDWATER DEPTH** 65 ft / Elev 866 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 96 **LOGGED BY** M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
905			CLAY WITH SAND (CL), some to considerable predominantly fine sand, weak lime cementation, medium plasticity, brown, moist, moderately firm to firm, moderate HCL reaction	R	8-12	96	25	45	21	24	71
	30		Occassional fine subrounded gravel, no cementation and HCL reaction below 30'	SPT	10-11-17 (28)						
900											
	35		CLAYEY SAND WITH GRAVEL (SC), predominantly fine sand, some fine gravel, subangular, weak lime cementation, medium plasticity, light brown to brown, slightly moist, firm, weak HCL reaction	SPT	4-7-9 (16)						
895			Considerable coarse subangular gravel below 37'	AU							
	40		SILTY SAND (SM), rare fine gravel, predominantly fine sand, nonplastic, brown, moist, moderately firm, weak HCL reaction	AU							
890				R	6-8			NP	NP	NP	25
	45		SAND WITH SILT (SP-SM), fine sand, trace fine gravel, subangular, nonplastic, brown, moist	AU							
885			CLAY WITH SAND (CL), occasional fine gravel, some fine sand, medium plasticity, brown, moist, moderately firm	SPT	4-4-7 (11)						
	50		CLAYEY SAND (SC), predominantly fine sand, occasional fine gravel, subrounded, low plasticity, brown, slightly moist, moderately firm								

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-172

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 9/21/2023 **COMPLETED** 9/22/2023 **BORING LOCATION** STA 1155+25, 230' R SR 303L Cst CL

DRILLER Yellow Jacket **DRILLED BY** Z. Dotan **GPS COORDINATES** 33.41612°N, -112.42758°E

DRILLING METHOD Sonic **GROUND ELEVATION** 931 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # Terrasonic/ 130 **GROUNDWATER DEPTH** 65 ft / Elev 866 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 96 **LOGGED BY** M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
880			CLAYEY SAND (SC), predominantly fine sand, occasional fine gravel, subrounded, low plasticity, brown, slightly moist, moderately firm *(continued)*	SPT	3-4-6 (10)						
				AU							
			Brown to grayish browne below 53.5'								
	55		Trace fine subrounded gravel below 55'	R	12-18	109	12				
875			SILTY SAND (SM), predominantly fine sand, rare fine gravel, subangular, nonplastic, tannish brown to grayish brown, slightly moist, firm	AU				NP	NP	NP	21
			CLAYEY SAND WITH GRAVEL (SC), predominantly medium sand, some coarse gravel, subangular, medium plasticity, grayish tan, slightly moist								
	60										
870			CLAYEY SAND (SC), predominantly fine sand, occasional fine gravel, subrounded, medium plasticity, brownish, slightly moist to moist, firm	SPT	6-7-10 (17)						
				AU							
	65	▼									
865			GRAVELLY CLAY WITH SAND (CL), considerable predominately coarse gravel, some coarse sand, medium plasticity, grayish brown to brown, moist, stiff	R	9-11	116	16				
			CLAYEY GRAVEL WITH SAND (GC), predominantly coarse gravel, considerable fine sand, subrounded to subangular, low plasticity, grayish brown, wet								
	70										
860			CLAYEY SAND WITH GRAVEL (SC), predominantly medium to coarse sand, considerable fine to coarse gravel, subrounded, low plasticity, grayish brown, wet, hard	SPT	19-20-23 (43)						
			CLAYEY SAND (SC), predominantly medium sand, rare fine gravel, subrounded, medium plasticity, grayish brown, wet, moderately firm								
	75										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-172

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 9/21/2023 **COMPLETED** 9/22/2023 **BORING LOCATION** STA 1155+25, 230' R SR 303L Cst CL

DRILLER Yellow Jacket **DRILLED BY** Z. Dotan **GPS COORDINATES** 33.41612°N, -112.42758°E

DRILLING METHOD Sonic **GROUND ELEVATION** 931 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # Terrasonic/ 130 **GROUNDWATER DEPTH** 65 ft / Elev 866 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 96 **LOGGED BY** M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
855			CLAYEY SAND (SC), predominantly medium sand, rare fine gravel, subrounded, medium plasticity, grayish brown, wet, moderately firm*(continued)*	SPT	4-4-5 (9)			41	18	23	29
	80										
850				SPT	4-9-6 (15)						
			SANDY CLAY (CL), occasional coarse gravel, considerable fine sand, high plasticity, reddish gray to reddish brown, wet								
	85										
845			CLAYEY SAND WITH GRAVEL (SC), fine sand, considerable coarse gravel, subrounded, low plasticity, grayish brown to gray, wet, stiff	SPT	4-5-7 (12)						
			Reddish brown to brown below 87'	AU							
	90										
840			GRAVEL WITH SILT AND SAND (GP-GM), predominantly coarse gravel, considerable fine sand, subrounded, nonplastic, grayish, wet, very loose	SPT AU	2-2-2 (4)						
			SAND WITH SILT AND GRAVEL (SP-SM), predominantly fine to medium sand, considerable predominately coarse gravel, subrounded, nonplastic, grayish brown to brown, wet	AU							
			Clay lense at 94'								
	95										
835			SAND WITH GRAVEL (SP), fine to medium sand, considerable coarse gravel, subrounded, nonplastic, grayish brown to brown, wet	SPT	5-4-9 (13)						
			CLAYEY SAND WITH GRAVEL (SC), predominantly medium to coarse sand, considerable predominately coarse gravel, subangular, medium plasticity, grayish brown to brown, wet	AU							
	100										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-172

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/21/2023 **COMPLETED** 9/22/2023
BORING LOCATION STA 1155+25, 230' R SR 303L Cst CL
DRILLER Yellow Jacket **DRILLED BY** Z. Dotan
GPS COORDINATES 33.41612°N, -112.42758°E
DRILLING METHOD Sonic
GROUND ELEVATION 931 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # Terrasonic/ 130
GROUNDWATER DEPTH 65 ft / Elev 866 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 96
LOGGED BY M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
830			SAND WITH GRAVEL (SP), predominantly fine to medium sand, some fine gravel, subangular, nonplastic, brown, wet	SPT	2-2-2 (4)						

Bottom of borehole at 101.5 feet. Backfilled with soil cuttings; grouted upper 20 feet.

BORING NUMBER B-173

Ethos Engineering, LLC

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/19/2023 **COMPLETED** 9/20/2023
BORING LOCATION STA 1157+10, 230' R SR 303L Cst CL
DRILLER Yellow Jacket **DRILLED BY** Z. Dotan
GPS COORDINATES 33.41666°N, -112.42725°E
DRILLING METHOD Sonic
GROUND ELEVATION 932 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # Terrasonic/ 130
GROUNDWATER DEPTH 70 ft / Elev 862 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 96
LOGGED BY M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
930			SILTY SAND (SM), rare fine gravel, predominantly fine sand, nonplastic, slightly moist, moderate HCL reaction, light brown to brown	SPT	1-1-1 (2)						
			Brown below 2'								
			Moist below 3'								
	5			R	4-3	107	5.0	NP	NP	NP	27
925			SILTY SAND WITH GRAVEL (SM), predominantly medium sand, some fine gravel, subangular, low plasticity, slightly moist, weak HCL reaction, light brown to tan	AU							
	10		SILTY SAND WITH GRAVEL (SM), fine to medium sand, some fine gravel, subangular, low plasticity, slightly moist, moderate HCL reaction, brown	SPT	4-4-3 (7)						
920			SANDY CLAY (CL), some predominantly fine to medium sand, trace fine gravel, subangular, medium plasticity, slightly moist, weak lime cementation, moderate HCL reaction, light tan to whitish brown	AU			14.0	34	22	12	52
	15			SPT	12-17-14 (31)						
915											
	20		CLAY WITH SAND (CL), occasional predominantly coarse gravel, trace to some fine sand, medium plasticity, moist, weak lime cementation, moderate HCL reaction, brown	R	25-38			42	25	17	78
910											
	25			AU							

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 9/19/2023 **COMPLETED** 9/20/2023 **BORING LOCATION** STA 1157+10, 230' R SR 303L Cst CL
DRILLER Yellow Jacket **DRILLED BY** Z. Dotan **GPS COORDINATES** 33.41666°N, -112.42725°E
DRILLING METHOD Sonic **GROUND ELEVATION** 932 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # Terrasonic/ 130 **GROUNDWATER DEPTH** 70 ft / Elev 862 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 96 **LOGGED BY** M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
905	30		CLAY WITH SAND (CL), occasional predominantly coarse gravel, trace to some fine sand, medium plasticity, moist, weak lime cementation, moderate HCL reaction, brown *(continued)*	SPT	9-14-22 (36)						
900	35		SANDY CLAY (CL), occasional fine gravel, considerable fine sand, medium plasticity, moist, weak lime cementation, moderate HCL reaction, light brown to brown	SPT	9-12-18 (30)						
				R	11-15	107	14.0				
895	40		SILTY SAND (SM), fine sand, occasional fine gravel, subrounded, low plasticity, moist, weak HCL reaction, brown	AU							
890	45		SAND WITH SILT AND GRAVEL (SP-SM), fine to medium sand, some fine gravel, subangular, nonplastic, moist, brown to light brown	SPT	8-10-10 (20)						
				AU							
885	50		SILTY SAND WITH GRAVEL (SM), fine to medium sand, some coarse gravel, subrounded, nonplastic, moist, brown	SPT	10-25-15 (40)						
			SILTY SAND (SM), predominantly fine sand, subangular, nonplastic, moist, brown	AU			9.0	NP	NP	NP	29
			Slightly moist and light brown to brown below 48'								

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 9/19/2023 **COMPLETED** 9/20/2023 **BORING LOCATION** STA 1157+10, 230' R SR 303L Cst CL
DRILLER Yellow Jacket **DRILLED BY** Z. Dotan **GPS COORDINATES** 33.41666°N, -112.42725°E
DRILLING METHOD Sonic **GROUND ELEVATION** 932 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # Terrasonic/ 130 **GROUNDWATER DEPTH** 70 ft / Elev 862 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 96 **LOGGED BY** M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND WITH GRAVEL (SC), predominantly fine to medium sand, some fine gravel, subangular, medium plasticity, moist, brown	R	27-20						
880			SAND WITH SILT AND GRAVEL (SM), predominantly fine to medium sand, considerable coarse gravel, subangular, nonplastic, moist, brown to light brown	AU							
	55		CLAYEY SAND (SC), fine to medium sand, trace predominantly fine gravel, subrounded, medium plasticity, moist, weak lime cementation, brown	SPT AU	9-10-7 (17)						
875			Occasional fine subangular gravel below 57'	AU			15.0	33	18	15	38
	60			SPT	10-15-16 (31)						
870			SAND WITH SILT AND GRAVEL (SP-SM), predominantly fine to medium sand, some fine gravel, subangular, nonplastic, moist, brown	AU							
			SAND WITH CLAY AND GRAVEL (SP-SC), fine to medium sand, some coarse gravel, subangular, medium plasticity, moist, brown	AU							
	65			R	30-50	114	16.0				
865			Considerable coarse subrouned gravel below 68'								
	70		CLAYEY GRAVEL WITH SAND (GC), coarse gravel, considerable medium sand, subrounded, medium plasticity, wet, brown to grayish brown	SPT AU	10-16-20 (36)						
860			GRAVEL WITH CLAY AND SAND (GP-GC), predominantly coarse gravel, considerable medium sand, subrounded, low plasticity, wet, brown to grayish brown	AU							
	75										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 9/19/2023 **COMPLETED** 9/20/2023 **BORING LOCATION** STA 1157+10, 230' R SR 303L Cst CL
DRILLER Yellow Jacket **DRILLED BY** Z. Dotan **GPS COORDINATES** 33.41666°N, -112.42725°E
DRILLING METHOD Sonic **GROUND ELEVATION** 932 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # Terrasonic/ 130 **GROUNDWATER DEPTH** 70 ft / Elev 862 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 96 **LOGGED BY** M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
855			CLAY WITH SAND (CL), trace fine gravel, some fine sand, medium plasticity, wet, moderate lime cementation, moderate HCL reaction, brown	SPT	10-17-16 (33)						
	80		GRAVEL WITH SAND (GP), fine gravel, considerable medium to coarse sand, subangular, nonplastic, wet, brown	AU							
				R	3-4						
850			CLAYEY SAND WITH GRAVEL (SC), predominantly medium to coarse sand, considerable predominately fine gravel, subangular, medium plasticity, wet, brown	AU			1.0	37	19	18	19
	85		SAND WITH GRAVEL (SP), predominantly medium to coarse sand, considerable coarse gravel, subangular, nonplastic, wet, brown	SPT	1-2-2 (4)						
845											
	90		Dense below 90'	SPT	26-20-14 (34)						
840			CLAYEY SAND WITH GRAVEL (SC), fine to medium sand, considerable coarse gravel, subangular, medium plasticity, wet, brown	AU							
			GRAVEL WITH CLAY AND SAND (GP-GC), fine gravel, considerable fine to medium sand, subangular, medium plasticity, wet, brown	AU							
	95		SAND WITH GRAVEL (SP), fine to medium sand, trace fine gravel, subangular, nonplastic, wet, brown	AU	9-10-16 (26)						
				SPT							
835			CLAY WITH SAND (CL), trace fine gravel, some fine to medium sand, medium plasticity, moist, brown	AU							
			CLAYEY GRAVEL WITH SAND (GC), coarse gravel, considerable medium sand, subrounded, medium plasticity, moist, brown to tannish brown	AU							
	100		SAND WITH CLAY AND GRAVEL (SP-SC), fine to medium sand, considerable coarse gravel, subangular, medium plasticity, wet, brown	AU							

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CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 9/19/2023 **COMPLETED** 9/20/2023 **BORING LOCATION** STA 1157+10, 230' R SR 303L Cst CL

DRILLER Yellow Jacket **DRILLED BY** Z. Dotan **GPS COORDINATES** 33.41666°N, -112.42725°E

DRILLING METHOD Sonic **GROUND ELEVATION** 932 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # Terrasonic/ 130 ▼ **GROUNDWATER DEPTH** 70 ft / Elev 862 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 96 **LOGGED BY** M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SAND WITH CLAY AND GRAVEL (SP-SC), fine to medium sand, considerable coarse gravel, subangular, medium plasticity, wet, brown *(continued)*	SPT	3-3-3 (6)						

Bottom of borehole at 101.5 feet. Backfilled with soil cuttings; grouted upper 20 feet

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-174

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 10/2/2023 **COMPLETED** 10/3/2023
BORING LOCATION STA 1159+40, 230' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41722°N, -112.42694°E
DRILLING METHOD Tubex
GROUND ELEVATION 934 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 65 ft / Elev 869 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SANDY SILT (ML), considerable predominately fine sand, angular, nonplastic, brown, slightly moist, moderately firm, moderate HCL reaction								
				R	12-11	93	3	NP	NP	NP	65
				AU							
930			SILTY SAND (SM), fine to coarse sand, occasional fine gravel, angular, nonplastic, brown to light brown, slightly moist, loose to medium dense, weak HCL reaction	SPT	3-4-4 (8)						
	5		Trace Fine subangular gravel below 5'	SPT	5-9-9 (18)						
925											
	10		SANDY SILT (ML), considerable predominately fine sand, angular, nonplastic, brown to light brown, slightly moist, firm	R	12-17			NP	NP	NP	57
			SILTY SAND WITH GRAVEL (SM), fine to coarse sand, considerable fine to coarse gravel, angular, nonplastic, brown, slightly moist, very dense, moderate HCL reaction								
920											
	15			SPT	50/2"						
915											
	20		Strongly cemented below 20'	SPT	50/4"						
910											
	25										

(Continued Next Page)

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-174

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 10/2/2023 **COMPLETED** 10/3/2023
BORING LOCATION STA 1159+40, 230' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41722°N, -112.42694°E
DRILLING METHOD Tubex
GROUND ELEVATION 934 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 65 ft / Elev 869 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND WITH GRAVEL (SC), predominantly fine sand, some fine to coarse gravel, angular, medium plasticity, brown, slightly moist, firm, strong HCL reaction	R	12-13	98	11	33	20	13	43
905	30		Hard at 30'	SPT	50/2"						
900	35			SPT	5-12-16 (28)						
895	40		SAND WITH SILT (SP-SM), predominantly fine sand, rare fine gravel, angular, nonplastic, brown, slightly moist, medium dense to dense	R	7-13			NP	NP	NP	9
890	45			SPT	14-17-14 (31)						
885	50										

(Continued Next Page)

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-174

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 10/2/2023 **COMPLETED** 10/3/2023
BORING LOCATION STA 1159+40, 230' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41722°N, -112.42694°E
DRILLING METHOD Tubex
GROUND ELEVATION 934 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 65 ft / Elev 869 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			GRAVEL WITH CLAY AND SAND (GP-GC), predominantly medium sand, predominantly fine gravel, subangular, medium plasticity, brown, slightly moist, hard to firm	SPT	30-50/4"						
880	55			SPT	26-24-30 (54)						
875	60			R	16-29		9	36	20	16	8
870	65		Wet below 65'	SPT	13-18-30 (48)						
865	70		SAND WITH CLAY (SP-SC), fine to coarse sand, occasional fine to coarse gravel, angular, low plasticity, brown, wet, dense	SPT	12-18-22 (40)						
860	75										

(Continued Next Page)

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-174

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 10/2/2023 **COMPLETED** 10/3/2023 **BORING LOCATION** STA 1159+40, 230' R SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.41722°N, -112.42694°E

DRILLING METHOD Tubex **GROUND ELEVATION** 934 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # CME-85/ 118 ▼ **GROUNDWATER DEPTH** 65 ft / Elev 869 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND (SC), predominantly medium sand, trace fine gravel, angular, medium plasticity, brown, wet, hard	R	38-35	109	18	39	19	20	36
855	80		CLAYEY SAND (SC), predominantly fine to medium sand, occasional fine gravel, angular, medium plasticity, brown, wet, firm	SPT	10-12-10 (22)						
850	85			SPT	2-7-13 (20)						
845	90		CLAYEY SAND WITH GRAVEL (SC), fine to coarse sand, some fine gravel, angular, medium plasticity, brown, wet, very stiff to hard	SPT	13-18-22 (40)						
840	95			SPT	14-15-12 (27)						
835	100										

(Continued Next Page)

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-174

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 10/2/2023 **COMPLETED** 10/3/2023
BORING LOCATION STA 1159+40, 230' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41722°N, -112.42694°E
DRILLING METHOD Tubex
GROUND ELEVATION 934 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 65 ft / Elev 869 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND WITH GRAVEL (SC), fine to coarse sand, some fine gravel, angular, medium plasticity, brown, wet, very stiff to hard*(continued)*	SPT	14-13-6 (19)						

Bottom of borehole at 101.5 feet. Backfilled with soil cuttings; grouted upper 20 feet.

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-175

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/15/2023 **COMPLETED** 9/18/2023
BORING LOCATION STA 1157+80, 95' L SR 303L Cst CL
DRILLER Yellow Jacket **DRILLED BY** Z. Dotan
GPS COORDINATES 33.41723°N, -112.42808°E
DRILLING METHOD Sonic
GROUND ELEVATION 934 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # Terrasonic/ 130
GROUNDWATER DEPTH 70 ft / Elev 864 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 96
LOGGED BY M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SANDY SILTY CLAY (CL-ML), occasional fine gravel, considerable fine sand, low plasticity, light tannish black to light tan, slightly moist, soft, moderate HCL reaction	R	3-7						
930	5		SILTY SAND WITH GRAVEL (SM), predominantly fine sand, some coarse gravel, subrounded, low plasticity, tannish gray, slightly moist, moderately firm, moderate HCL reaction	SPT	4-5-5 (10)						
			SAND WITH SILT AND GRAVEL (SP-SM), predominantly medium to coarse sand, some fine to coarse gravel, subangular, nonplastic, tannish gray, slightly moist, moderately firm, weak HCL reaction	AU							
925	10			SPT	3-5-6 (11)						
			Coarse subrounded sand and some fine to coarse subangular to angular gravel								
920	15		CLAYEY GRAVEL WITH SAND (GC), predominantly coarse gravel, considerable fine to medium sand, subangular, medium plasticity, brownish gray to light tan, slightly moist, very soft, moderate HCL reaction	R AU	3-3						
			CLAYEY SAND WITH GRAVEL (SC), predominantly coarse sand, considerable fine gravel, subangular, medium plasticity, brownish gray to light tan, slightly moist, moderate HCL reaction								
915	20		CLAYEY GRAVEL WITH SAND (GC), predominantly coarse gravel, some fine sand, subrounded to subangular, medium plasticity, tan to light grayish, slightly moist, moderate HCL reaction	AU							
			SILTY SAND (SM), predominantly fine to medium sand, trace fine to coarse gravel, subrounded, nonplastic, brown to grayish tan, slightly moist, very soft, moderate HCL reaction	SPT	2-2-2 (4)		2	NP	NP	NP	13
			GRAVEL WITH CLAY AND SAND (GP-GC), predominantly coarse gravel, considerable medium sand, subangular, medium plasticity, brown to tan, slightly moist, moderate HCL reaction	AU							
910	25		CLAYEY SAND WITH GRAVEL (SC), predominantly fine sand, considerable predominately fine gravel, subangular, medium plasticity, brown, moist, weak HCL reaction	AU			9	31	17	14	40

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-175

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 9/15/2023 **COMPLETED** 9/18/2023 **BORING LOCATION** STA 1157+80, 95' L SR 303L Cst CL

DRILLER Yellow Jacket **DRILLED BY** Z. Dotan **GPS COORDINATES** 33.41723°N, -112.42808°E

DRILLING METHOD Sonic **GROUND ELEVATION** 934 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # Terrasonic/ 130 ▼ **GROUNDWATER DEPTH** 70 ft / Elev 864 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 96 **LOGGED BY** M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
905	30		CLAY (CL), occasional fine gravel, some fine sand, medium plasticity, brown, moist, hard, weak HCL reaction	SPT	20-50/5"						
900	35		GRAVELLY CLAY WITH SAND (CL), some to considerable coarse gravel, trace to some fine sand, medium plasticity, brown, moist, firm, weak HCL reaction	R	18-24						
895	40		CLAYEY SAND (SC), fine to medium sand, occasional fine gravel, subangular, medium plasticity, brown, moist, moderately firm, moderate HCL reaction	SPT	4-5-9 (14)						
890	45		Weak HCL reaction at 40'	SPT	4-4-9 (13)						
885	50		CLAY WITH SAND (CL), some to considerable predominantly fine sand, medium plasticity, brown, moist, moderately firm, weak HCL reaction	SPT	5-6-8 (14)		24	36	16	20	75

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-175

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 9/15/2023 **COMPLETED** 9/18/2023 **BORING LOCATION** STA 1157+80, 95' L SR 303L Cst CL

DRILLER Yellow Jacket **DRILLED BY** Z. Dotan **GPS COORDINATES** 33.41723°N, -112.42808°E

DRILLING METHOD Sonic **GROUND ELEVATION** 934 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # Terrasonic/ 130 ▼ **GROUNDWATER DEPTH** 70 ft / Elev 864 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 96 **LOGGED BY** M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAY WITH SAND (CL), some to considerable predominantly fine sand, medium plasticity, brown, moist, moderately firm, weak HCL reaction*(continued)*	R	9-11						
880			CLAYEY SAND (SC), predominantly fine sand, occasional fine gravel, subangular, medium plasticity, brown, moist, firm	AU							
	55			SPT	8-12-12 (24)						
875			CLAY WITH SAND (CL), trace fine sand, rare fine gravel, medium plasticity, brown, moist to wet, firm	AU							
	60			SPT	6-8-8 (16)						
870			CLAYEY SAND (SC), fine sand, trace fine gravel, subrounded, low plasticity, brown, moist	AU							
	65		CLAYEY GRAVEL WITH SAND (GC), predominantly coarse gravel, some fine to medium sand, subrounded, medium plasticity, brown, wet to moist, very firm	R AU	13-30						
865			Considerable medium subangular sand below 69'								
	70		▼ SAND WITH GRAVEL (SP), fine to medium sand, considerable coarse gravel, subangular, nonplastic, brown, wet, dense	SPT AU	9-18-30 (48)						
860			CLAYEY SAND WITH GRAVEL (SC), fine to medium sand, considerable coarse gravel, subangular, medium plasticity, brown, wet, hard	AU							
	75										

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Ethos Engineering, LLC
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Tempe, AZ 85284

BORING NUMBER B-175

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 9/15/2023 **COMPLETED** 9/18/2023 **BORING LOCATION** STA 1157+80, 95' L SR 303L Cst CL

DRILLER Yellow Jacket **DRILLED BY** Z. Dotan **GPS COORDINATES** 33.41723°N, -112.42808°E

DRILLING METHOD Sonic **GROUND ELEVATION** 934 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # Terrasonic/ 130 **GROUNDWATER DEPTH** 70 ft / Elev 864 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 96 **LOGGED BY** M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND WITH GRAVEL (SC), fine to medium sand, considerable coarse gravel, subangular, medium plasticity, brown, wet, hard *(continued)*	SPT	10-28-34 (62)						
			CLAYEY GRAVEL WITH SAND (GC), predominantly coarse gravel, some medium sand, subrounded, medium plasticity, brown, wet, weak HCL reaction	AU							
855											
	80		GRAVEL WITH CLAY AND SAND (GP-GC), predominantly coarse gravel, considerable medium to coarse sand, subrounded, medium plasticity, brown to grayish tan, wet, medium stiff	AU							
				SPT	4-3-3 (6)						
			CLAYEY SAND WITH GRAVEL (SC), some fine to coarse gravel, fine to coarse sand, medium plasticity, brown, wet, weak HCL reaction	AU			16	41	17	24	43
850											
	85		SAND WITH GRAVEL (SP), fine to medium sand, some coarse gravel, subangular, nonplastic, brown, wet, loose	SPT AU	2-2-4 (6)						
845											
	90			SPT AU	3-2-3 (5)						
840											
	95		GRAVEL WITH CLAY AND SAND (GP-GC), predominantly coarse gravel, some medium to coarse sand, subrounded, medium plasticity, brown, wet, stiff	SPT AU	4-6-4 (10)						
			GRAVELLY CLAY WITH SAND (CL), considerable coarse gravel, trace medium sand, medium plasticity, brown, wet	AU							
835											
	100										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-175

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/15/2023 **COMPLETED** 9/18/2023
BORING LOCATION STA 1157+80, 95' L SR 303L Cst CL
DRILLER Yellow Jacket **DRILLED BY** Z. Dotan
GPS COORDINATES 33.41723°N, -112.42808°E
DRILLING METHOD Sonic
GROUND ELEVATION 934 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # Terrasonic/ 130
GROUNDWATER DEPTH 70 ft / Elev 864 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 96
LOGGED BY M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
			SAND WITH GRAVEL (SP), predominantly medium to coarse sand, some coarse gravel, subangular, nonplastic, brown, wet, loose	SPT	4-3-4 (7)						

Bottom of borehole at 101.5 feet. Backfilled with soil cuttings; grouted upper 20 feet.

Ethos Engineering, LLC
9180 S. Kyrene Road, Suite 104
Tempe, AZ 85284

BORING NUMBER B-176

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/14/2023 **COMPLETED** 9/15/2023
BORING LOCATION STA 1157+80, 5' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41712°N, -112.42779°E
DRILLING METHOD Tubex
GROUND ELEVATION 933 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 70 ft / Elev 863 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
930	0		SILTY CLAY WITH SAND (CL-ML), some fine to medium sand, rare fine gravel, subangular, moderate lime cementation, low plasticity, brown, slightly moist, very firm to moderately firm, strong HCL reaction	SPT	8-8-10 (18)		4	24	18	6	77
				AU							
	5			SPT	13-12-19 (31)						
				SPT	9-6-6 (12)						
925	10										
920	15		SAND (SP), fine to coarse sand, trace fine gravel, subangular, nonplastic, brown, slightly moist, loose, moderate HCL reaction	SPT	3-4-4 (8)						
915	20		CLAYEY SAND WITH GRAVEL (SC), fine to coarse sand, considerable predominately fine gravel, subangular, moderate lime cementation, medium plasticity, light brown to tan, slightly moist, very firm to firm, moderate HCL reaction	R	21-50/4"						
				SPT	21-35-50/4"						
910	25										

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Ethos Engineering, LLC
9180 S. Kyrene Road, Suite 104
Tempe, AZ 85284

BORING NUMBER B-176

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/14/2023 **COMPLETED** 9/15/2023
BORING LOCATION STA 1157+80, 5' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41712°N, -112.42779°E
DRILLING METHOD Tubex
GROUND ELEVATION 933 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 70 ft / Elev 863 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND (SC), predominantly fine sand, angular, medium plasticity, brown, slightly moist, very firm to firm	SPT	12-13-20 (33)						
905											
	30			R	23-30			40	22	18	49
900											
	35			SPT	6-6-15 (21)						
895											
	40		CLAYEY SAND (SC), predominantly fine to medium sand, rare fine gravel, angular, medium plasticity, brown, moist, moderately firm	SPT	6-6-6 (12)						
890											
	45		CLAY WITH SAND (CH), trace to some predominantly fine sand, high plasticity, brown, moist, very soft	R	2-3	101	17	58	23	35	84
885											
	50										

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Ethos Engineering, LLC
9180 S. Kyrene Road, Suite 104
Tempe, AZ 85284

BORING NUMBER B-176

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/14/2023 **COMPLETED** 9/15/2023
BORING LOCATION STA 1157+80, 5' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41712°N, -112.42779°E
DRILLING METHOD Tubex
GROUND ELEVATION 933 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 70 ft / Elev 863 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAY WITH SAND (CH), trace to some predominantly fine sand, high plasticity, brown, moist, very soft *(continued)*								
880			Moderately firm below 50'	SPT	3-5-8 (13)						
	55										
			CLAYEY SAND (SC), predominantly fine to medium sand, trace fine gravel, angular, medium plasticity, brown, moist, very firm to firm	SPT	15-11-20 (31)						
875											
	60			R	17-22	101	8				
870											
	65										
			SAND WITH CLAY (SP-SC), fine to coarse sand, occasional fine gravel, angular, medium plasticity, brown, wet, firm	SPT	10-12-18 (30)						
865											
	70		▼	SPT	13-8-17 (25)						
860											
	75										

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Ethos Engineering, LLC
9180 S. Kyrene Road, Suite 104
Tempe, AZ 85284

BORING NUMBER B-176

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/14/2023 **COMPLETED** 9/15/2023
BORING LOCATION STA 1157+80, 5' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41712°N, -112.42779°E
DRILLING METHOD Tubex
GROUND ELEVATION 933 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 70 ft / Elev 863 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SAND WITH CLAY (SP-SC), fine to coarse sand, occasional fine gravel, angular, medium plasticity, brown, wet, firm *(continued)* Hard below 75'	SPT	22-29-38 (67)						
855	80										
			CLAYEY GRAVEL WITH SAND (GC), predominantly fine gravel, predominantly medium sand, subrounded to subangular, medium plasticity, brown, wet, very firm	SPT	7-16-16 (32)		14	42	19	23	13
850	85										
			SAND (SP), fine to coarse sand, occasional fine gravel, angular, nonplastic, brown, wet, medium dense	SPT	3-6-18 (24)						
845	90										
			GRAVEL WITH SAND (GP), fine gravel, considerable fine to coarse sand, subrounded to subangular, nonplastic, brown, wet, very dense	SPT	10-24-28 (52)						
840	95										
				SPT	15-18-22 (40)						
835	100										

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Ethos Engineering, LLC
9180 S. Kyrene Road, Suite 104
Tempe, AZ 85284

BORING NUMBER B-176

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/14/2023 **COMPLETED** 9/15/2023
BORING LOCATION STA 1157+80, 5' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41712°N, -112.42779°E
DRILLING METHOD Tubex
GROUND ELEVATION 933 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 70 ft / Elev 863 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
			CLAYEY SAND WITH GRAVEL (SC), fine to coarse sand, some fine to coarse gravel, angular, medium plasticity, brown, wet, very stiff	SPT	7-15-11 (26)						

Bottom of borehole at 101.5 feet. Backfilled with soil cuttings; grouted upper 20 feet.

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-177

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/5/2023 **COMPLETED** 9/5/2023
BORING LOCATION STA 1158+75, 160' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41753°N, -112.42817°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 935 ft **BOREHOLE DEPTH** 20.9 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
935			CLAYEY SAND WITH GRAVEL (SC), medium to coarse sand, some fine to coarse gravel, angular, medium plasticity, brown, slightly moist, firm, moderate HCL reaction	AU SPT	7-12-10 (22)						
930	5		SANDY CLAY (CL), rare fine gravel, considerable predominately fine sand, subangular, low plasticity, brown, slightly moist, moderately firm to firm, moderate HCL reaction	SPT	4-6-9 (15)						
				SPT	8-12-17 (29)		4	28	19	9	59
925	10										
			SAND WITH SILT (SP-SM), predominantly fine to medium sand, trace predominantly fine gravel, angular, nonplastic, light brown to brown, slightly moist, loose	R	4-8						
920	15										
			Very dense below 15'	SPT	4-5-50/2"		3	NP	NP	NP	8
915	20										
			SANDY CLAY WITH GRAVEL (CL), trace predominantly fine gravel, considerable medium to coarse sand, subangular, moderate lime cementation, medium plasticity, light brown to tan, slightly moist, hard, weak HCL reaction	SPT	44-50/5"						

Bottom of borehole at 20.9 feet. Backfilled with soil cuttings.

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-178

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/18/2023 **COMPLETED** 9/19/2023
BORING LOCATION STA 1158+75, 35' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.4174°N, -112.4278°E
DRILLING METHOD Tubex
GROUND ELEVATION 934 ft **BOREHOLE DEPTH** 101 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 70 ft / Elev 864 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND (SC), predominantly fine to medium sand, occasional fine gravel, angular, low plasticity, brown, slightly moist, moderately firm, moderate HCL reaction	R	12-13						
				AU							
930				SPT	5-6-5 (11)						
	5										
				SPT	10-7-8 (15)						
			SAND (SP), predominantly medium sand, trace predominantly fine gravel, subangular, nonplastic, brown, slightly moist, loose, weak HCL reaction								
925											
	10			R	3-9	103	2	NP	NP	NP	3
920											
	15										
			SILTY SAND WITH GRAVEL (SM), fine to coarse sand, some fine gravel, angular, nonplastic, brown, slightly moist, hard, moderate HCL reaction	SPT	20-19-46 (65)						
915											
	20										
			SILTY GRAVEL WITH SAND (GM), predominantly fine gravel, considerable fine to coarse sand, subangular, nonplastic, brown, slightly moist, hard, weak HCL reaction	SPT	50/4"						
910											
	25										

(Continued Next Page)

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-178

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 9/18/2023 **COMPLETED** 9/19/2023 **BORING LOCATION** STA 1158+75, 35' L SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.4174°N, -112.4278°E

DRILLING METHOD Tubex **GROUND ELEVATION** 934 ft **BOREHOLE DEPTH** 101 ft

RIG TYPE / # CME-85/ 118 ▼ **GROUNDWATER DEPTH** 70 ft / Elev 864 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY GRAVEL WITH SAND (GM), predominantly fine gravel, considerable fine to coarse sand, subangular, nonplastic, brown, slightly moist, hard, weak HCL reaction*(continued)*	R	50/2"						
905	30		SANDY CLAY (CH), considerable predominately fine sand, angular, high plasticity, brown, slightly moist, very firm to firm, moderate HCL reaction	SPT	4-11-24 (35)		32	69	30	39	57
900	35			SPT	5-9-11 (20)						
895	40		CLAYEY SAND (SC), predominantly fine to medium sand, trace fine gravel, angular, medium plasticity, brown, slightly moist, moderately firm	R	5-11	97	6				
890	45		CLAYEY SAND WITH GRAVEL (SC), fine to coarse sand, some fine gravel, angular, medium plasticity, brown, slightly moist, very firm	SPT	7-11-22 (33)						
885	50										

(Continued Next Page)

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-178

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 9/18/2023 **COMPLETED** 9/19/2023 **BORING LOCATION** STA 1158+75, 35' L SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.4174°N, -112.4278°E

DRILLING METHOD Tubex **GROUND ELEVATION** 934 ft **BOREHOLE DEPTH** 101 ft

RIG TYPE / # CME-85/ 118 ▼ **GROUNDWATER DEPTH** 70 ft / Elev 864 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SANDY CLAY (CL), considerable fine to medium sand, rare coarse gravel, angular, medium plasticity, brown, slightly moist, firm	SPT	9-7-14 (21)						
880	55			R	16-21						
875	60		SAND WITH CLAY (SP-SC), fine to coarse sand, trace fine gravel, angular, medium plasticity, brown, slightly moist, very firm	SPT	9-16-16 (32)						
870	65		SAND WITH CLAY AND GRAVEL (SP-SC), predominantly medium sand, trace to some fine to coarse gravel, subangular, medium plasticity, brown, moist, very firm	SPT	9-20-27 (47)		13	41	22	19	11
865	70	▼	SAND WITH CLAY (SP-SC), fine to coarse sand, trace fine gravel, angular, medium plasticity, brown, wet, very firm	R	15-36	104	20				
860	75										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-178

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/18/2023 **COMPLETED** 9/19/2023
BORING LOCATION STA 1158+75, 35' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.4174°N, -112.4278°E
DRILLING METHOD Tubex
GROUND ELEVATION 934 ft **BOREHOLE DEPTH** 101 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 70 ft / Elev 864 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SAND WITH GRAVEL (SP), fine to coarse sand, considerable fine to coarse gravel, angular, nonplastic, brown, wet, medium dense	SPT	5-10-16 (26)						
855	80			SPT	8-15-14 (29)						
850	85		SAND WITH GRAVEL (SP), predominantly medium to coarse sand, some fine gravel, angular, nonplastic, brown, wet, dense	SPT	7-14-18 (32)						
845	90		SAND (SP), predominantly fine to medium sand, trace fine gravel, angular, nonplastic, brown, wet, medium dense	SPT	3-6-10 (16)						
840	95		SAND WITH GRAVEL (SP), fine to coarse sand, considerable fine to coarse gravel, angular, nonplastic, brown, wet, dense	SPT	9-21-22 (43)						
835	100										

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Ethos Engineering, LLC
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Tempe, AZ 85284

BORING NUMBER B-178

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/18/2023 **COMPLETED** 9/19/2023
BORING LOCATION STA 1158+75, 35' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.4174°N, -112.4278°E
DRILLING METHOD Tubex
GROUND ELEVATION 934 ft **BOREHOLE DEPTH** 101 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 70 ft / Elev 864 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
			SAND WITH CLAY AND GRAVEL (SP-SC), fine to coarse sand, considerable fine to coarse gravel, angular, medium plasticity, brown, moist to wet, very stiff, weak HCL reaction	R	8-25	105	21				

Bottom of borehole at 101.0 feet. Backfilled with soil cuttings; grouted upper 20 feet.

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-179

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/19/2023 **COMPLETED** 9/20/2023
BORING LOCATION STA 1159+75, 100' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.4177°N, -112.42786°E
DRILLING METHOD Tubex
GROUND ELEVATION 934 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 65 ft / Elev 869 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND (SC), predominantly fine to medium sand, occasional fine gravel, angular, low plasticity, brown, slightly moist, firm, moderate HCL reaction	R	11-12	100	4	25	16	9	49
				AU							
930				SPT	7-9-11 (20)						
	5										
				SPT	12-10-12 (22)						
925											
	10		SAND WITH SILT AND GRAVEL (SP-SM), predominantly medium sand, some fine gravel, subangular, nonplastic, brown, slightly moist, loose	R	3-9			NP	NP	NP	7
920											
	15		Very dense below 15'	SPT	13-28-25 (53)						
915											
	20		CLAYEY GRAVEL WITH SAND (GC), predominantly fine gravel, considerable fine to coarse sand, subangular, low plasticity, light tan, slightly moist, hard, moderate HCL reaction	SPT	24-50/4"						
910											
	25										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-179

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 9/19/2023 **COMPLETED** 9/20/2023 **BORING LOCATION** STA 1159+75, 100' L SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.4177°N, -112.42786°E

DRILLING METHOD Tubex **GROUND ELEVATION** 934 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # CME-85/ 118 ▼ **GROUNDWATER DEPTH** 65 ft / Elev 869 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
905	30		SAND (SP), predominantly fine to medium sand, occasional coarse gravel, angular, nonplastic, brown, slightly moist, dense	SPT	11-18-19 (37)						
900	35		SAND WITH GRAVEL (SP), predominantly fine to medium sand, considerable fine to coarse gravel, angular, nonplastic, brown, slightly moist, very dense	R	50/5"						
895	40		SANDY CLAY (CL), considerable predominately fine sand, angular, medium plasticity, brown, slightly moist, firm	SPT	4-8-12 (20)		20	35	20	15	66
890	45			SPT	5-13-17 (30)						
885	50		CLAYEY SAND (SC), predominantly fine gravel, medium plasticity, brown, slightly moist to moist, moderately firm to firm	R	10-11	101	19	37	19	18	46

(Continued Next Page)

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-179

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 9/19/2023 **COMPLETED** 9/20/2023 **BORING LOCATION** STA 1159+75, 100' L SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.4177°N, -112.42786°E

DRILLING METHOD Tubex **GROUND ELEVATION** 934 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # CME-85/ 118 ▼ **GROUNDWATER DEPTH** 65 ft / Elev 869 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND (SC), predominantly fine gravel, medium plasticity, brown, slightly moist to moist, moderately firm to firm *(continued)*	SPT	2-7-9 (16)						
880	55		SAND WITH CLAY (SP-SC), predominantly fine to medium sand, rare fine gravel, angular, medium plasticity, brown, moist, very firm	SPT	6-13-18 (31)						
875	60		SAND WITH CLAY (SP-SC), fine to coarse sand, rare, angular, medium plasticity, brown, moist, moderately firm	R	6-15						
870	65		▼ Wet, very firm and rare fine subangular gravel at 65'	SPT	13-17-20 (37)						
865	70		Wet, occassional fine subangular gravel at 70'	SPT	10-12-16 (28)						
860	75										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-179

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/19/2023 **COMPLETED** 9/20/2023
BORING LOCATION STA 1159+75, 100' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.4177°N, -112.42786°E
DRILLING METHOD Tubex
GROUND ELEVATION 934 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 65 ft / Elev 869 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SAND WITH GRAVEL (SP), fine to coarse sand, considerable predominately fine gravel, subrounded to subangular, nonplastic, brown, wet, dense	SPT	12-20-22 (42)		14	NP	NP	NP	5
855	80		SAND WITH GRAVEL (SP), predominantly medium to coarse sand, considerable fine to coarse gravel, angular, nonplastic, brown, wet, dense	SPT	3-13-18 (31)						
850	85		GRAVEL WITH CLAY AND SAND (GP-GC), fine to coarse gravel, considerable predominately medium to coarse sand, subrounded to subangular, medium plasticity, brown, wet, medium dense	SPT	7-10-17 (27)						
845	90			SPT	3-7-9 (16)						
840	95		SAND (SP), fine to coarse sand, occasional fine gravel, angular, nonplastic, brown, wet, very dense	SPT	12-28-34 (62)						
835	100										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-179

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/19/2023 **COMPLETED** 9/20/2023
BORING LOCATION STA 1159+75, 100' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.4177°N, -112.42786°E
DRILLING METHOD Tubex
GROUND ELEVATION 934 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 65 ft / Elev 869 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SAND WITH GRAVEL (SP), predominantly medium to coarse sand, considerable fine to coarse gravel, angular, nonplastic, brown, wet, dense	SPT	16-22-19 (41)						

Bottom of borehole at 101.5 feet. Backfilled with soil cuttings; grouted upper 20 feet.

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-180

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/14/2023 **COMPLETED** 9/15/2023
BORING LOCATION STA 1159+75, 5' L SR 303L Cst CL
DRILLER Yellow Jacket **DRILLED BY** Z. Dotan
GPS COORDINATES 33.41762°N, -112.42758°E
DRILLING METHOD Sonic
GROUND ELEVATION 934 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # Terrasonic/ 130
GROUNDWATER DEPTH 70 ft / Elev 864 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 96
LOGGED BY M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SANDY CLAY (CL), considerable fine to medium sand, rare fine gravel, low plasticity, tannish brown to light brown, slightly moist, moderately firm	SPT	3-5-7 (12)		3	26	16	10	69
930											
	5			AU							
			SANDY SILT (ML), trace fine gravel, considerable fine sand, low plasticity, tannish brown to whitish brown, slightly moist, firm	R	10-17						
			SAND WITH SILT AND GRAVEL (SP-SM), predominantly medium to coarse sand, some fine gravel, subangular, nonplastic, tannish brown to whitish brown, slightly moist, very firm, weak HCL reaction	AU							
925											
	10			SPT	10-15-21 (36)						
			SAND WITH GRAVEL (SP), predominantly medium to coarse sand, some fine gravel, angular, nonplastic, brown to light reddish brown, slightly moist	AU							
920											
	15		CLAYEY SAND WITH GRAVEL (SC), predominantly fine to medium sand, some fine gravel, subangular, moderate lime cementation, medium plasticity, tannish white to whitish brown, slightly moist, hard, moderate HCL reaction	SPT	50/4"						
				AU							
			SANDY CLAY (CL), considerable predominately fine sand, occasional fine gravel, moderate lime cementation, low to medium plasticity, gray to whitish gray, slightly moist, hard, moderate HCL reaction	AU			4	30	14	16	61
915											
	20			R	50/4"						
910											
	25		SILTY, CLAYEY SAND (SC-SM), predominantly fine to medium sand, trace fine gravel, subangular, low plasticity, brown, moist, weak HCL reaction	AU							

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-180

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/14/2023 **COMPLETED** 9/15/2023
BORING LOCATION STA 1159+75, 5' L SR 303L Cst CL
DRILLER Yellow Jacket **DRILLED BY** Z. Dotan
GPS COORDINATES 33.41762°N, -112.42758°E
DRILLING METHOD Sonic
GROUND ELEVATION 934 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # Terrasonic/ 130
GROUNDWATER DEPTH 70 ft / Elev 864 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 96
LOGGED BY M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND (SC), fine to medium sand, occasional fine gravel, subangular, medium plasticity, white to whitish tan, slightly moist, hard, moderate HCL reaction	SPT	50/4"		11	33	14	19	35
				AU							
			SANDY CLAY (CL), considerable fine sand, rare fine gravel, medium plasticity, brown, moist, hard to firm, moderate HCL reaction	AU							
905											
	30			SPT	50/4"						
900											
	35			R	10-20						
			CLAYEY SAND (SC), fine to medium sand, rare fine gravel, medium plasticity, brown, slightly moist	AU							
895											
	40		CLAYEY SAND WITH GRAVEL (SC), predominantly fine sand, some fine gravel, subangular, medium plasticity, brown, moist, firm, weak HCL reaction	SPT	8-8-12 (20)						
890											
	45		SAND WITH CLAY AND GRAVEL (SP-SC), predominantly fine to medium sand, some fine gravel, subangular, medium plasticity, brown to light brown, slightly moist, firm, weak HCL reaction	SPT	12-12-13 (25)						
			SAND WITH GRAVEL (SP), predominantly fine to medium sand, considerable coarse gravel, subangular, nonplastic, light brown, slightly moist	AU							
885											
	50										

(Continued Next Page)

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-180

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 9/14/2023 **COMPLETED** 9/15/2023 **BORING LOCATION** STA 1159+75, 5' L SR 303L Cst CL

DRILLER Yellow Jacket **DRILLED BY** Z. Dotan **GPS COORDINATES** 33.41762°N, -112.42758°E

DRILLING METHOD Sonic **GROUND ELEVATION** 934 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # Terrasonic/ 130 ▼ **GROUNDWATER DEPTH** 70 ft / Elev 864 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 96 **LOGGED BY** M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND WITH GRAVEL (SC), predominantly coarse sand, some coarse gravel, subangular, medium plasticity, grayish brown to reddish brown, moist, very firm	R	30-34						
880			GRAVEL WITH CLAY AND SAND (GP-GC), fine to coarse gravel, considerable fine to coarse sand, subrounded to subangular, medium plasticity, light brown to grayish brown, moist, hard								
	55			SPT	20-30-31 (61)		8	30	18	12	11
875			Gravel lense at 58.5'								
	60		GRAVELLY CLAY WITH SAND (CL), some fine sand, considerable coarse gravel, medium plasticity, brown to reddish brown, slightly moist, firm, weak HCL reaction	SPT	9-10-17 (27)						
			SAND WITH CLAY (SP-SC), predominantly fine sand, trace coarse gravel, subrounded to subangular, low plasticity, brown to grayish brown, slightly moist, firm								
870											
	65			R	17-17						
			CLAYEY SAND (SC), predominantly fine gravel, trace fine gravel, subrounded to subangular, low plasticity, brown to grayish brown, slightly moist, firm								
865											
	70	▼		SPT	10-9-18 (27)						
			SILTY CLAY WITH SAND (CL-ML), some medium sand, trace coarse gravel, low plasticity, brown, wet	AU							
860			SAND WITH CLAY AND GRAVEL (SP-SC), predominantly medium to coarse sand, considerable coarse gravel, subangular, low plasticity, brown to gray, wet	AU							
	75										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-180

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/14/2023 **COMPLETED** 9/15/2023
BORING LOCATION STA 1159+75, 5' L SR 303L Cst CL
DRILLER Yellow Jacket **DRILLED BY** Z. Dotan
GPS COORDINATES 33.41762°N, -112.42758°E
DRILLING METHOD Sonic
GROUND ELEVATION 934 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # Terrasonic/ 130
GROUNDWATER DEPTH 70 ft / Elev 864 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 96
LOGGED BY M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			GRAVELLY CLAY (CL), trace fine sand, some fine gravel, medium plasticity, brown to tannish brown, slightly moist to moist, hard to stiff, moderate HCL reaction	SPT	9-14-19 (33)						
855	80			SPT	2-2-6 (8)						
			SAND WITH CLAY AND GRAVEL (SP-SC), predominantly fine sand, some coarse gravel, subrounded, low plasticity, tan to tannish gray, wet, weak HCL reaction	AU							
850	85		CLAYEY SAND WITH GRAVEL (SC), fine to medium sand, considerable coarse gravel, subangular to angular, low plasticity, brown to tannish brown, slightly moist to moist	AU							
			SAND WITH CLAY AND GRAVEL (SP-SC), predominantly medium to coarse sand, considerable coarse gravel, subrounded, low plasticity, grayish brown, wet, very stiff to hard	SPT	6-6-12 (18)						
845	90			SPT	17-19-12 (31)						
840	95			SPT	12-24-28 (52)						
835	100										

(Continued Next Page)

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-180

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/14/2023 **COMPLETED** 9/15/2023
BORING LOCATION STA 1159+75, 5' L SR 303L Cst CL
DRILLER Yellow Jacket **DRILLED BY** Z. Dotan
GPS COORDINATES 33.41762°N, -112.42758°E
DRILLING METHOD Sonic
GROUND ELEVATION 934 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # Terrasonic/ 130
GROUNDWATER DEPTH 70 ft / Elev 864 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 96
LOGGED BY M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
			SAND (SP), fine to medium sand, trace fine gravel, subangular, nonplastic, brown, wet, loose	SPT	3-3-3 (6)						

Bottom of borehole at 101.5 feet. Backfilled with soil cuttings; grouted upper 20 feet.

Ethos Engineering, LLC
9180 S. Kyrene Road, Suite 104
Tempe, AZ 85284

BORING NUMBER B-181

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/21/2023 **COMPLETED** 9/22/2023
BORING LOCATION STA 1160+60, 40' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41787°N, -112.42757°E
DRILLING METHOD Tubex
GROUND ELEVATION 934 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 70 ft / Elev 864 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SANDY CLAY (CL), considerable predominately fine to medium sand, rare fine gravel, angular, low to medium plasticity, brown, slightly moist, moderately firm to firm, strong HCL reaction	R	5-21		5	27	16	11	53
				SPT	12-8-14 (22)						
930				AU							
	5										
				SPT	7-7-6 (13)						
925											
	10										
			SAND WITH SILT AND GRAVEL (SP-SM), fine to coarse sand, some fine to coarse gravel, angular, nonplastic, brown to light reddish brown, slightly moist, medium dense, weak HCL reaction	R	14-21	104	4				
920											
	15										
			CLAYEY SAND WITH GRAVEL (SC), predominantly fine to medium sand, considerable predominately fine gravel, angular, medium plasticity, brown, slightly moist, hard, moderate HCL reaction	SPT	25-50/5"		7	35	21	14	26
915											
	20			SPT	50/5"						
910											
	25										

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Ethos Engineering, LLC
9180 S. Kyrene Road, Suite 104
Tempe, AZ 85284

BORING NUMBER B-181

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/21/2023 **COMPLETED** 9/22/2023
BORING LOCATION STA 1160+60, 40' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41787°N, -112.42757°E
DRILLING METHOD Tubex
GROUND ELEVATION 934 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 70 ft / Elev 864 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND (SC), fine to medium sand, rare fine to coarse gravel, angular, medium plasticity, brown, slightly moist, firm, weak HCL reaction	R	16-25	95	21				
905											
	30			SPT	8-11-19 (30)						
900											
	35		SILTY SAND (SM), predominantly fine to medium sand, rare fine gravel, angular, nonplastic, brown, slightly moist, dense to medium dense	SPT	14-16-26 (42)						
895											
	40			R	8-10			NP	NP	NP	29
890											
	45		SAND WITH SILT (SP-SM), fine to coarse sand, occasional fine gravel, angular, nonplastic, brown, slightly moist, dense	SPT	10-16-19 (35)						
885											
	50										

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PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/21/2023 **COMPLETED** 9/22/2023
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DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41787°N, -112.42757°E
DRILLING METHOD Tubex
GROUND ELEVATION 934 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 70 ft / Elev 864 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND WITH GRAVEL (SC), fine to coarse sand, considerable predominately fine gravel, subangular, low to medium plasticity, brown, slightly moist, firm to very firm	SPT	15-12-16 (28)						
880	55			R	22-33		8	28	20	8	14
875	60			SPT	20-21-20 (41)						
870	65		SAND WITH SILT (SP-SM), predominantly medium sand, trace fine gravel, angular, nonplastic, brown, wet, very dense to dense	SPT	14-29-22 (51)		19	NP	NP	NP	7
865	70		▼	R	15-30						
860	75										

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Ethos Engineering, LLC
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PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/21/2023 **COMPLETED** 9/22/2023
BORING LOCATION STA 1160+60, 40' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41787°N, -112.42757°E
DRILLING METHOD Tubex
GROUND ELEVATION 934 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 70 ft / Elev 864 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SAND WITH SILT AND GRAVEL (SP-SM), predominantly medium to coarse sand, some fine gravel, angular, nonplastic, brown, wet, dense	SPT	8-19-29 (48)						
855	80										
			CLAYEY SAND (SC), fine sand, rare fine gravel, angular, medium plasticity, brown, wet, stiff	SPT	2-7-5 (12)						
850	85										
			SAND (SP), fine to coarse sand, occasional fine gravel, angular, nonplastic, brown, wet, dense	SPT	7-19-19 (38)						
845	90			SPT	8-18-20 (38)						
840	95			SPT	16-16-32 (48)						
835	100										

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PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/21/2023 **COMPLETED** 9/22/2023
BORING LOCATION STA 1160+60, 40' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
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DRILLING METHOD Tubex
GROUND ELEVATION 934 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 70 ft / Elev 864 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
			SAND (SP), fine to coarse sand, occasional fine gravel, angular, nonplastic, brown, wet, dense*(continued)*	SPT	20-22-23 (45)						

Bottom of borehole at 101.5 feet. Backfilled with soil cuttings; grouted upper 20 feet.

Ethos Engineering, LLC
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Tempe, AZ 85284

BORING NUMBER B-182

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/12/2023 **COMPLETED** 9/13/2023
BORING LOCATION STA 1161+60, 90' L SR 303L Cst CL
DRILLER Yellow Jacket **DRILLED BY** Z. Dotan
GPS COORDINATES 33.41817°N, -112.42763°E
DRILLING METHOD Sonic
GROUND ELEVATION 935 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # Terrasonic/ 130
GROUNDWATER DEPTH 70 ft / Elev 865 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 96
LOGGED BY M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
935			SANDY SILTY CLAY (CL-ML), occasional fine gravel, considerable fine sand, low plasticity, light brown to brown, slightly moist, moderately firm to soft, weak HCL reaction	SPT	3-3-7 (10)						
930	5		Trace fine subangular gravel below 5'	R AU	2-7						
			SILTY, CLAYEY SAND WITH GRAVEL (SC-SM), fine to medium sand, some fine gravel, subangular, low plasticity, light brown to brown, slightly moist, weak HCL reaction	AU							
925	10		SILTY SAND (SM), fine to medium sand, occasional fine gravel, subangular, nonplastic, light brown, slightly moist, hard	SPT	5-20-50/2"		3	NP	NP	NP	37
			Brown below 12'								
920	15		SAND WITH SILT AND GRAVEL (SP-SM), predominantly fine to medium sand, considerable fine gravel, subangular, weak lime cementation, low plasticity, light brown, slightly moist, soft, weak HCL reaction	AU							
				R	5-7						
915	20		CLAYEY GRAVEL WITH SAND (GC), predominantly fine gravel, considerable fine to coarse sand, subangular, moderate lime cementation, medium plasticity, white to whitish brown, slightly moist, hard, moderate HCL reaction Light brown to whitish brown below 17'	AU							
			Brown and moist below 20'	SPT	50/4"						
			Whitish brown to white and slightly moist below 21.5								
910	25			AU							

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Ethos Engineering, LLC
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BORING NUMBER B-182

CLIENT AZTEC Engineering Group, Inc.
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PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/12/2023 **COMPLETED** 9/13/2023
BORING LOCATION STA 1161+60, 90' L SR 303L Cst CL
DRILLER Yellow Jacket **DRILLED BY** Z. Dotan
GPS COORDINATES 33.41817°N, -112.42763°E
DRILLING METHOD Sonic
GROUND ELEVATION 935 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # Terrasonic/ 130
GROUNDWATER DEPTH 70 ft / Elev 865 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 96
LOGGED BY M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
910			CLAYEY GRAVEL WITH SAND (GC), predominantly fine gravel, considerable fine to coarse sand, subangular, moderate lime cementation, medium plasticity, white to whitish brown, slightly moist, hard, moderate HCL reaction*(continued)*	SPT	9-17-24 (41)		13	40	21	19	29
			Brown, weak HCL reaction and no cementation below 25'								
905	30		Light brown to whitish brown, moderate HCL reaction and moderately cemented below 29'	AU							
				R	10-50						
			CLAY (CL), trace fine sand, medium to high plasticity, brown, moist, moderately firm								
900	35			SPT	3-4-7 (11)		27	48	23	25	88
895	40			SPT	5-5-7 (12)						
			CLAY WITH SAND (CL), rare fine gravel, some fine sand, medium plasticity, brown to reddish brownish, moist	AU							
890	45		SILTY SAND (SM), occasional fine gravel, subangular, low plasticity, brown, slightly moist, firm	AU							
				R	11-17						
885	50		SAND WITH SILT (SP-SM), predominantly fine sand, subangular, nonplastic, brown to light brown, slightly moist, medium dense	AU							

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Ethos Engineering, LLC
9180 S. Kyrene Road, Suite 104
Tempe, AZ 85284

BORING NUMBER B-182

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/12/2023 **COMPLETED** 9/13/2023
BORING LOCATION STA 1161+60, 90' L SR 303L Cst CL
DRILLER Yellow Jacket **DRILLED BY** Z. Dotan
GPS COORDINATES 33.41817°N, -112.42763°E
DRILLING METHOD Sonic
GROUND ELEVATION 935 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # Terrasonic/ 130
GROUNDWATER DEPTH 70 ft / Elev 865 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 96
LOGGED BY M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
885			SAND WITH SILT (SP-SM), predominantly fine sand, subangular, nonplastic, brown to light brown, slightly moist, medium dense*(continued)*	SPT	10-10-11 (21)		5	NP	NP	NP	11
880	55		SILTY SAND (SM), fine sand, occasional fine gravel, subangular, low plasticity, brown, slightly moist	AU							
			SAND WITH GRAVEL (SP), predominantly medium sand, some predominantly coarse gravel, subangular, nonplastic, brown to light brown, slightly moist, dense	SPT	9-20-24 (44)						
			CLAY WITH SAND (CL), trace fine gravel, some fine to medium sand, medium plasticity, brown, moist	AU							
875	60		SAND WITH CLAY (SP-SC), fine to medium sand, occasional fine gravel, subangular, low plasticity, brown, moist	AU							
			SANDY CLAY (CL), trace fine gravel, considerable fine sand, medium plasticity, brown, moist, firm	R	19-20						
			SAND WITH CLAY (SP-SC), occasional fine gravel, subangular, medium plasticity, brown, moist	AU							
870	65		CLAYEY SAND WITH GRAVEL (SC), fine sand, some fine gravel, subangular, medium plasticity, brown, moist, firm								
				SPT	9-12-17 (29)						
865	70	▼									
			SAND WITH CLAY (SP-SC), fine to medium sand, occasional fine gravel, subangular, medium plasticity, brown, wet, hard	SPT	12-17-16 (33)						
				AU							
860	75										

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Ethos Engineering, LLC
9180 S. Kyrene Road, Suite 104
Tempe, AZ 85284

BORING NUMBER B-182

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 9/12/2023 **COMPLETED** 9/13/2023 **BORING LOCATION** STA 1161+60, 90' L SR 303L Cst CL

DRILLER Yellow Jacket **DRILLED BY** Z. Dotan **GPS COORDINATES** 33.41817°N, -112.42763°E

DRILLING METHOD Sonic **GROUND ELEVATION** 935 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # Terrasonic/ 130 **GROUNDWATER DEPTH** 70 ft / Elev 865 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 96 **LOGGED BY** M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
860			CLAY WITH SAND (CL), occasional fine gravel, some fine to medium sand, medium plasticity, brown, moist, hard *(continued)*	SPT	9-31-41 (72)						
			GRAVELLY CLAY WITH SAND (CL), some coarse gravel, some fine to medium sand, moderate lime cementation, medium plasticity, brown to reddish brown, moist, moderate HCL reaction	AU							
855	80		SAND (SP), fine to medium sand, trace fine gravel, subrounded to subangular, nonplastic, brown, wet, medium dense	SPT	4-8-11 (19)						
			Reddish brown to brown clay lense at 83'								
850	85		CLAYEY GRAVEL WITH SAND (GC), predominantly coarse gravel, some medium sand, subrounded, moderate lime cementation, medium plasticity, brown to reddish brown, moist, hard, moderate HCL reaction	SPT	9-50/5"						
				AU							
			SAND (SP), fine to medium sand, occasional coarse gravel, subangular, nonplastic, brown, wet, very dense	AU							
845	90			SPT	9-19-50/5"						
			GRAVEL WITH CLAY AND SAND (GC), predominantly coarse gravel, some fine to medium sand, subrounded, moderate lime cementation, medium plasticity, brown to reddish brown, wet, moderate HCL reaction	AU							
840	95		SAND (SP), fine to medium sand, trace coarse gravel, subangular, nonplastic, brown, wet, loose to medium dense	SPT	2-2-3 (5)						
835	100										

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Ethos Engineering, LLC
9180 S. Kyrene Road, Suite 104
Tempe, AZ 85284

BORING NUMBER B-182

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/12/2023 **COMPLETED** 9/13/2023
BORING LOCATION STA 1161+60, 90' L SR 303L Cst CL
DRILLER Yellow Jacket **DRILLED BY** Z. Dotan
GPS COORDINATES 33.41817°N, -112.42763°E
DRILLING METHOD Sonic
GROUND ELEVATION 935 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # Terrasonic/ 130
GROUNDWATER DEPTH 70 ft / Elev 865 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 96
LOGGED BY M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
835			SAND (SP), fine to medium sand, trace coarse gravel, subangular, nonplastic, brown, wet, loose to medium dense*(continued)*	SPT	5-5-10 (15)						

Bottom of borehole at 101.5 feet. Backfilled with soil cuttings; grouted upper 20 feet.

Ethos Engineering, LLC
9180 S. Kyrene Road, Suite 104
Tempe, AZ 85284

BORING NUMBER B-183

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/25/2023 **COMPLETED** 9/26/2023
BORING LOCATION STA 1161+60, CL SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41809°N, -112.42734°E
DRILLING METHOD Tubex
GROUND ELEVATION 934 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 65 ft / Elev 869 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND (SC), predominantly fine to medium sand, some fine gravel, angular, low plasticity, brown, slightly moist, moderately firm, weak HCL reaction								
				R	8-12		3	21	13	8	48
				AU							
930				SPT	5-5-5 (10)						
	5										
				SPT	10-7-8 (15)						
925											
	10		SILTY SAND (SM), predominantly medium sand, rare fine gravel, angular, nonplastic, brown to light tan, slightly moist, dense	R	27-31		4	NP	NP	NP	15
920											
	15			SPT	40-50/2"						
			SILTY SAND WITH GRAVEL (SM), fine to coarse sand, considerable predominately fine gravel, angular, medium plasticity, red to light brown, slightly moist, hard, weak HCL reaction								
915											
	20			SPT	50/4"		11	34	26	8	27
910											
	25										

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Ethos Engineering, LLC
9180 S. Kyrene Road, Suite 104
Tempe, AZ 85284

BORING NUMBER B-183

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/25/2023 **COMPLETED** 9/26/2023
BORING LOCATION STA 1161+60, CL SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41809°N, -112.42734°E
DRILLING METHOD Tubex
GROUND ELEVATION 934 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 65 ft / Elev 869 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
905	30		CLAYEY GRAVEL WITH SAND (GC), fine to coarse gravel, considerable fine to coarse sand, angular, medium plasticity, brown to light brown, slightly moist, hard, weak HCL reaction	R	10-50/5"						
900	35		CLAY (CL), trace fine sand, angular, medium plasticity, brown, slightly moist, hard to firm, moderate HCL reaction	SPT	15-50/2"						
				SPT	6-9-16 (25)		25	43	25	18	89
895	40			R	9-16	101	6				
890	45										
885	50		SAND WITH SILT (SP-SM), fine to coarse sand, rare fine gravel, angular, nonplastic, brown, slightly moist, dense	SPT	9-16-17 (33)						

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Ethos Engineering, LLC
9180 S. Kyrene Road, Suite 104
Tempe, AZ 85284

BORING NUMBER B-183

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/25/2023 **COMPLETED** 9/26/2023
BORING LOCATION STA 1161+60, CL SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41809°N, -112.42734°E
DRILLING METHOD Tubex
GROUND ELEVATION 934 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 65 ft / Elev 869 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SAND WITH SILT AND GRAVEL (SP-SM), fine to coarse sand, some fine to coarse gravel, angular, nonplastic, brown, slightly moist, very dense	SPT	13-27-35 (62)						
880	55		SAND WITH SILT AND GRAVEL (SP-SM), predominantly fine sand, considerable fine to coarse sand, subangular, nonplastic, brown, slightly moist, very dense	R	19-50/4"	114	4	NP	NP	NP	5
875	60		SAND WITH SILT AND GRAVEL (SP-SM), fine to coarse sand, some fine gravel, subangular, nonplastic, brown, moist, dense	SPT	9-16-17 (33)						
870	65	▼	SAND WITH SILT (SP-SM), fine to coarse sand, occasional fine gravel, angular, nonplastic, brown, wet, medium dense	SPT	8-10-17 (27)						
865	70		SAND WITH SILT AND GRAVEL (SP-SM), fine to coarse sand, considerable fine gravel, subangular, nonplastic, brown, wet, dense to medium dense	R	22-31	119	14				
860	75										

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Ethos Engineering, LLC
9180 S. Kyrene Road, Suite 104
Tempe, AZ 85284

BORING NUMBER B-183

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/25/2023 **COMPLETED** 9/26/2023
BORING LOCATION STA 1161+60, CL SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41809°N, -112.42734°E
DRILLING METHOD Tubex
GROUND ELEVATION 934 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 65 ft / Elev 869 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SAND WITH SILT AND GRAVEL (SP-SM), fine to coarse sand, considerable fine gravel, subangular, nonplastic, brown, wet, dense to medium dense*(continued)*								
855				SPT	16-15-25 (40)						
	80										
				SPT	12-14-16 (30)						
850											
	85		SAND (SP), fine to medium sand, rare coarse gravel, angular, nonplastic, brown, wet, dense to medium dense								
				SPT	2-12-22 (34)						
845											
	90										
				SPT	6-9-11 (20)						
840											
	95										
				SPT	30-24-25 (49)						
835											
	100										

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Ethos Engineering, LLC
9180 S. Kyrene Road, Suite 104
Tempe, AZ 85284

BORING NUMBER B-183

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/25/2023 **COMPLETED** 9/26/2023
BORING LOCATION STA 1161+60, CL SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41809°N, -112.42734°E
DRILLING METHOD Tubex
GROUND ELEVATION 934 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 65 ft / Elev 869 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
			SAND (SP), fine to medium sand, rare coarse gravel, angular, nonplastic, brown, wet, dense to medium dense*(continued)*	SPT	7-8-11 (19)						

Bottom of borehole at 101.5 feet. Backfilled with soil cuttings; grouted upper 20 feet.

Ethos Engineering, LLC
9180 S. Kyrene Road, Suite 104
Tempe, AZ 85284

BORING NUMBER B-184

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/26/2023 **COMPLETED** 9/27/2023
BORING LOCATION STA 1162+55, 125' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41844°N, -112.42763°E
DRILLING METHOD Tubex
GROUND ELEVATION 935 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 70 ft / Elev 865 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
935			SANDY CLAY (CL), considerable predominately fine to medium sand, angular, low plasticity, brown, slightly moist, firm, moderate HCL reaction								
				R	12-17	96	6	24	16	8	63
				AU							
			SILTY, CLAYEY SAND WITH GRAVEL (SC-SM), fine to coarse sand, some fine gravel, angular, low plasticity, brown, slightly moist, firm to moderately firm, moderate HCL reaction	SPT	6-8-11 (19)						
930	5										
				SPT	5-4-5 (9)						
925	10										
			SILTY SAND (SM), predominantly medium sand, occasional fine gravel, angular, nonplastic, brown, slightly moist, very firm	R	22-39	114	4				
920	15										
			Hard below 15'	SPT	50/4"						
915	20										
			CLAYEY GRAVEL WITH SAND (GC), predominantly coarse gravel, considerable predominately fine to medium sand, angular, medium plasticity, brown, slightly moist, hard to very firm	SPT	50/3"						
910	25										

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Ethos Engineering, LLC
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Tempe, AZ 85284

BORING NUMBER B-184

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/26/2023 **COMPLETED** 9/27/2023
BORING LOCATION STA 1162+55, 125' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41844°N, -112.42763°E
DRILLING METHOD Tubex
GROUND ELEVATION 935 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 70 ft / Elev 865 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
910											
			CLAYEY GRAVEL WITH SAND (GC), predominantly coarse gravel, considerable predominately fine to medium sand, angular, medium plasticity, brown, slightly moist, hard to very firm *(continued)*	R	40-31		7	31	19	12	26
905	30										
				SPT	46-40-50/4"						
900	35										
			SILT WITH SAND (ML), considerable fine sand, angular, low to medium plasticity, brown, slightly moist, firm	SPT	4-10-14 (24)						
895	40										
				R	9-20	94	16	30	23	7	71
890	45										
			SAND WITH SILT (SP-SM), fine to coarse sand, trace fine gravel, angular, nonplastic, brown, slightly moist, dense to medium dense	SPT	16-23-22 (45)						
885	50										

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Ethos Engineering, LLC
9180 S. Kyrene Road, Suite 104
Tempe, AZ 85284

BORING NUMBER B-184

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 9/26/2023 **COMPLETED** 9/27/2023 **BORING LOCATION** STA 1162+55, 125' L SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.41844°N, -112.42763°E

DRILLING METHOD Tubex **GROUND ELEVATION** 935 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # CME-85/ 118 ▼ **GROUNDWATER DEPTH** 70 ft / Elev 865 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
885											
			SAND WITH SILT (SP-SM), fine to coarse sand, trace fine gravel, angular, nonplastic, brown, slightly moist, dense to medium dense*(continued)*	SPT	5-10-15 (25)						
880	55			R	12-28	100	14				
875	60			SPT	5-14-19 (33)						
870	65										
			SILTY, CLAYEY SAND WITH GRAVEL (SC-SM), predominantly fine to medium sand, considerable predominately fine gravel, angular, low plasticity, brown, moist, very firm	SPT	6-8-25 (33)		14	26	19	7	16
865	70		▼								
			CLAYEY GRAVEL WITH SAND (GC), fine to coarse gravel, considerable fine to coarse sand, angular, medium plasticity, brown, wet, hard	R	17-31	118	19				
860	75										

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Ethos Engineering, LLC
9180 S. Kyrene Road, Suite 104
Tempe, AZ 85284

BORING NUMBER B-184

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/26/2023 **COMPLETED** 9/27/2023
BORING LOCATION STA 1162+55, 125' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41844°N, -112.42763°E
DRILLING METHOD Tubex
GROUND ELEVATION 935 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 70 ft / Elev 865 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
860											
855	80		CLAYEY SAND WITH GRAVEL (SC), fine to coarse sand, some fine gravel, angular, medium plasticity, brown, wet, hard	SPT	13-30-20 (50)						
850	85		SAND WITH SILT (SP-SM), fine to coarse sand, rare fine gravel, angular, nonplastic, brown, wet, medium dense to dense	SPT	9-8-10 (18)						
845	90			SPT	5-10-13 (23)						
840	95			SPT	18-24-21 (45)						
835	100			SPT	14-14-13 (27)						

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Ethos Engineering, LLC
9180 S. Kyrene Road, Suite 104
Tempe, AZ 85284

BORING NUMBER B-184

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/26/2023 **COMPLETED** 9/27/2023
BORING LOCATION STA 1162+55, 125' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41844°N, -112.42763°E
DRILLING METHOD Tubex
GROUND ELEVATION 935 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 70 ft / Elev 865 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
835			SAND WITH SILT (SP-SM), fine to coarse sand, rare fine gravel, angular, nonplastic, brown, wet, medium dense to dense*(continued)*	SPT	13-15-18 (33)						

Bottom of borehole at 101.5 feet. Backfilled with soil cuttings; grouted upper 20 feet.

Ethos Engineering, LLC
9180 S. Kyrene Road, Suite 104
Tempe, AZ 85284

BORING NUMBER B-185

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/25/2023 **COMPLETED** 9/27/2023
BORING LOCATION STA 1162+55, CL SR 303L Cst CL
DRILLER Yellow Jacket **DRILLED BY** Z. Dotan
GPS COORDINATES 33.41834°N, -112.42729°E
DRILLING METHOD Sonic
GROUND ELEVATION 934 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # Terrasonic/ 130
GROUNDWATER DEPTH 65 ft / Elev 869 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 96
LOGGED BY K. Baker **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SANDY CLAY (CL), trace coarse gravel, considerable fine sand, medium plasticity, light gray to tan, slightly moist, moderately firm, weak HCL reaction	SPT	3-7-8 (15)						
930	5			SPT	4-5-7 (12)						
			SANDY CLAY WITH GRAVEL (CL), some coarse gravel, some fine sand, low plasticity, brownish tan to tan, slightly moist, moderate HCL reaction								
925			CLAYEY GRAVEL WITH SAND (GC), predominantly coarse gravel, considerable fine sand, subrounded, low plasticity, light tan to gray, slightly moist, moderate HCL reaction	AU							
	10		CLAYEY SAND WITH GRAVEL (SC), predominantly medium sand, considerable fine to coarse gravel, subrounded to subangular, medium plasticity, light tan to gray, slightly moist, firm, weak HCL reaction Clay lense at 10'	R	5-24						
				AU							
920	15		SANDY CLAY WITH GRAVEL (CL), considerable coarse gravel, considerable fine sand, medium plasticity, light tan, slightly moist, hard, weak HCL reaction	SPT	4-50/5"						
915			CLAYEY SAND WITH GRAVEL (SC), predominantly fine sand, some predominantly fine gravel, subangular, low to medium plasticity, light gray, slightly moist, moderate HCL reaction	AU			8	28	15	13	45
	20		CLAYEY SAND (SC), occasional fine gravel, subrounded, medium plasticity, tannish gray, moist, hard	SPT	50/5"						
			SANDY SILT WITH GRAVEL (ML), some fine gravel, some fine sand, low plasticity, brown, slightly moist, weak HCL reaction	AU							
			GRAVELLY CLAY (CL), considerable coarse gravel, trace fine sand, medium plasticity, white to gray, slightly moist, moderate HCL reaction	AU							
910	25		SAND WITH CLAY (SP-SC), trace fine gravel, subrounded, medium plasticity, brown, slightly moist, weak HCL reaction								

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Ethos Engineering, LLC
9180 S. Kyrene Road, Suite 104
Tempe, AZ 85284

BORING NUMBER B-185

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 9/25/2023 **COMPLETED** 9/27/2023 **BORING LOCATION** STA 1162+55, CL SR 303L Cst CL

DRILLER Yellow Jacket **DRILLED BY** Z. Dotan **GPS COORDINATES** 33.41834°N, -112.42729°E

DRILLING METHOD Sonic **GROUND ELEVATION** 934 ft **BOREHOLE DEPTH** 101.5 ft

RIG TYPE / # Terrasonic/ 130 **GROUNDWATER DEPTH** 65 ft / Elev 869 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 96 **LOGGED BY** K. Baker **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			GRAVELLY CLAY (CL), considerable coarse gravel, medium plasticity, whitish tan, slightly moist, hard, moderate HCL reaction	R	15-25	109	14				
				AU							
			GRAVELLY SILT (ML), trace fine sand, some fine gravel, low plasticity, light brown to brownish, slightly moist to moist, weak HCL reaction	AU							
905											
	30		CLAYEY SAND WITH GRAVEL (SC), predominantly fine sand, considerable fine to coarse gravel, subangular, medium plasticity, light brown, slightly moist to moist, hard, weak HCL reaction	SPT	50/5"						
			CLAYEY GRAVEL WITH SAND (GC), fine to coarse gravel, some fine to coarse sand, medium plasticity, white to light tan, slightly moist to moist, moderate HCL reaction	AU			9	34	16	18	46
			SANDY CLAY (CL), considerable fine sand, medium plasticity, brown to tannish brown, slightly moist to moist	AU							
900											
	35		SAND WITH CLAY AND GRAVEL (SP-SC), fine to coarse sand, considerable fine gravel, subangular, low plasticity, brown to tan, slightly moist to moist, firm, moderate HCL reaction	SPT	7-11-12 (23)						
			SILTY CLAY WITH SAND (CL-ML), trace fine gravel, trace fine sand, low plasticity, brown, slightly moist to moist								
895			SAND WITH SILT (SP-SM), fine to medium sand, trace coarse gravel, subrounded, nonplastic, grayish brown, slightly moist, firm								
	40			R	29-35	78	10				
			SAND WITH SILT AND GRAVEL (SP-SM), fine to coarse sand, considerable fine gravel, subangular, nonplastic, brown, slightly moist								
890			SAND WITH SILT (SP-SM), fine to medium sand, trace fine gravel, subangular, nonplastic, tan to brown, slightly moist								
	45		SANDY SILT WITH GRAVEL (ML), trace fine gravel, considerable fine to medium sand, low plasticity, grayish tan to brown, slightly moist, very firm, moderate HCL reaction	SPT	15-21-15 (36)						
885			SAND WITH SILT (SP-SM), fine to coarse sand, trace fine to coarse gravel, subangular, nonplastic, gray to grayish brown, slightly moist, very dense								
	50										

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Ethos Engineering, LLC
9180 S. Kyrene Road, Suite 104
Tempe, AZ 85284

BORING NUMBER B-185

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/25/2023 **COMPLETED** 9/27/2023
BORING LOCATION STA 1162+55, CL SR 303L Cst CL
DRILLER Yellow Jacket **DRILLED BY** Z. Dotan
GPS COORDINATES 33.41834°N, -112.42729°E
DRILLING METHOD Sonic
GROUND ELEVATION 934 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # Terrasonic/ 130
GROUNDWATER DEPTH 65 ft / Elev 869 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 96
LOGGED BY K. Baker **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
				SPT	25-50/5"						
			SAND WITH GRAVEL (SP), fine to coarse sand, considerable fine to coarse gravel, subangular, nonplastic, gray to grayish brown, slightly moist								
880											
	55		GRAVEL WITH CLAY AND SAND (GP-GC), predominantly fine gravel, considerable predominately fine sand, subangular, medium plasticity, gray to grayish brown, slightly moist, very firm	R	42-45			31	21	10	10
			GRAVEL WITH SAND (GP), fine to coarse gravel, considerable medium sand, subrounded to subangular, nonplastic, gray, slightly moist	AU							
875			SAND WITH SILT AND GRAVEL (SP-SM), fine to coarse sand, considerable fine gravel, subangular, nonplastic, gray to reddish brown, slightly moist	AU							
	60		SAND WITH CLAY AND GRAVEL (SP-SC), fine to coarse sand, considerable fine gravel, subangular, medium plasticity, gray to reddish brown, slightly moist, very firm	SPT	18-17-15 (32)						
			SAND WITH CLAY (SP-SC), fine to coarse sand, trace fine gravel, subangular, medium plasticity, brown to reddish brown, slightly moist, very firm								
870											
	65	▼		SPT	14-14-17 (31)						
			SANDY CLAY (CL), considerable predominately fine sand, trace fine gravel, subrounded, medium plasticity, brown, slightly moist, very stiff								
865											
	70			R	13-24						
			SILTY, CLAYEY SAND (SC-SM), predominantly fine to medium sand, trace fine gravel, subangular, low plasticity, brown, slightly moist	AU			1	23	16	7	23
860			CLAYEY GRAVEL WITH SAND (GC), predominantly coarse gravel, considerable medium to coarse sand, subangular, medium plasticity, grayish brown, moist, stiff to hard								
	75										

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Ethos Engineering, LLC
9180 S. Kyrene Road, Suite 104
Tempe, AZ 85284

BORING NUMBER B-185

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 9/25/2023 **COMPLETED** 9/27/2023 **BORING LOCATION** STA 1162+55, CL SR 303L Cst CL
DRILLER Yellow Jacket **DRILLED BY** Z. Dotan **GPS COORDINATES** 33.41834°N, -112.42729°E
DRILLING METHOD Sonic **GROUND ELEVATION** 934 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # Terrasonic/ 130 **GROUNDWATER DEPTH** 65 ft / Elev 869 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 96 **LOGGED BY** K. Baker **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY GRAVEL WITH SAND (GC), predominantly coarse gravel, considerable medium to coarse sand, subangular, medium plasticity, grayish brown, moist, stiff to hard *(continued)*	SPT	4-6-7 (13)						
855	80			SPT	3-17-21 (38)						
			SANDY CLAY WITH GRAVEL (CL), some predominantly medium to coarse sand, some predominantly coarse gravel, subangular, medium plasticity, grayish brown to brown, moist	AU							
850	85										
			SAND WITH SILT AND GRAVEL (SP-SM), fine to medium sand, considerable predominately coarse gravel, subrounded, low plasticity, grayish brown, moist to wet, hard	SPT	7-8-7 (15)						
845	90			SPT	8-10-21 (31)						
840	95		CLAYEY SAND WITH GRAVEL (SC), predominantly medium sand, considerable coarse gravel, subrounded, medium plasticity, grayish brown, wet								
			SAND WITH GRAVEL (SP), fine to coarse sand, considerable predominately coarse gravel, subrounded, nonplastic, gray, wet, medium dense to dense	SPT	5-9-15 (24)						
835	100										

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Ethos Engineering, LLC
9180 S. Kyrene Road, Suite 104
Tempe, AZ 85284

BORING NUMBER B-185

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/25/2023 **COMPLETED** 9/27/2023
BORING LOCATION STA 1162+55, CL SR 303L Cst CL
DRILLER Yellow Jacket **DRILLED BY** Z. Dotan
GPS COORDINATES 33.41834°N, -112.42729°E
DRILLING METHOD Sonic
GROUND ELEVATION 934 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # Terrasonic/ 130
GROUNDWATER DEPTH 65 ft / Elev 869 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 96
LOGGED BY K. Baker **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
			SAND WITH GRAVEL (SP), fine to coarse sand, considerable predominately coarse gravel, subrounded, nonplastic, gray, wet, medium dense to dense*(continued)*	SPT	20-30-15 (45)						

Bottom of borehole at 101.5 feet. Backfilled with soil cuttings; grouted upper 20 feet.

Ethos Engineering, LLC
9180 S. Kyrene Road, Suite 104
Tempe, AZ 85284

BORING NUMBER B-186

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/8/2023 **COMPLETED** 9/11/2023
BORING LOCATION STA 1163+45, 80' L SR 303L Cst CL
DRILLER Yellow Jacket **DRILLED BY** Roger
GPS COORDINATES 33.41864°N, -112.42741°E
DRILLING METHOD Sonic
GROUND ELEVATION 934 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # Terrasonic/ 130
GROUNDWATER DEPTH 80 ft / Elev 854 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 96
LOGGED BY M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SANDY CLAY (CL), trace fine gravel, considerable fine sand, medium plasticity, light brown to brown, slightly moist, firm, none HCL reaction	SPT	2-10-11 (21)						
930			Occassional subrounded to subangular fine gravel below 3'								
	5		Light brown below 5'	SPT	2-8-10 (18)						
			CLAYEY SAND (SC), fine to medium sand, trace fine gravel, subangular, weak lime cementation, medium plasticity, light brown to whitish brown, slightly moist, weak HCL reaction	AU							
925			SILTY SAND WITH GRAVEL (SM), predominantly fine sand, some to considerable fine to coarse gravel, subrounded, moderate lime cementation, nonplastic, light tan to whitish brown, slightly moist, hard, strong HCL reaction	AU			6	NP	NP	NP	36
	10			R	9-50	95	7				
			SANDY CLAY (CL), occasional fine gravel, considerable fine sand, medium plasticity, brown, slightly moist, weak HCL reaction	AU							
920			SILTY SAND WITH GRAVEL (SM), fine to medium sand, some fine gravel, subangular, low plasticity, light brown to grayish brown, slightly moist	AU							
	15		CLAYEY GRAVEL WITH SAND (GC), predominantly coarse gravel, some fine sand, subrounded, medium plasticity, brown to whitish brown, slightly moist, hard, moderate HCL reaction	SPT	19-50/5"						
				AU							
915											
	20		Brown and moist below 19.5'								
			CLAYEY SAND (SC), predominantly fine sand, trace fine gravel, subangular, weak lime cementation, medium plasticity, brown, moist, hard, weak HCL reaction	SPT	50/4"						
				AU							
910											
	25		SILTY SAND (SM), predominantly fine sand, subangular, low plasticity, brown, moist, firm, weak HCL reaction								

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Ethos Engineering, LLC
9180 S. Kyrene Road, Suite 104
Tempe, AZ 85284

BORING NUMBER B-186

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 9/8/2023 **COMPLETED** 9/11/2023 **BORING LOCATION** STA 1163+45, 80' L SR 303L Cst CL
DRILLER Yellow Jacket **DRILLED BY** Roger **GPS COORDINATES** 33.41864°N, -112.42741°E
DRILLING METHOD Sonic **GROUND ELEVATION** 934 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # Terrasonic/ 130 **GROUNDWATER DEPTH** 80 ft / Elev 854 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 96 **LOGGED BY** M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY SAND (SM), predominantly fine sand, subangular, low plasticity, brown, moist, firm, weak HCL reaction *(continued)*	R	12-27			24	22	2	41
905			Light brown and slightly moist below 27.5'								
	30		CLAYEY SAND (SC), predominantly fine sand, trace fine gravel, subrounded, weak lime cementation, medium plasticity, brown to light brown, slightly moist, hard, weak HCL reaction	SPT	22-50/5"						
900											
	35		CLAY WITH SAND (CL), some predominantly fine sand, weak lime cementation, medium plasticity, brown, moist, firm, weak HCL reaction	SPT	4-7-10 (17)		2	36	22	14	80
895											
	40		SAND WITH SILT (SP-SM), fine to medium sand, occasional fine gravel, subangular, nonplastic, brown, slightly moist, medium dense	R	12-18	100	11				
890											
	45		SAND WITH CLAY AND GRAVEL (SP-SC), fine to medium sand, some fine gravel, subangular, low plasticity, brown, moist, firm	SPT	16-15-14 (29)						
885											
	50										

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Ethos Engineering, LLC
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Tempe, AZ 85284

BORING NUMBER B-186

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/8/2023 **COMPLETED** 9/11/2023
BORING LOCATION STA 1163+45, 80' L SR 303L Cst CL
DRILLER Yellow Jacket **DRILLED BY** Roger
GPS COORDINATES 33.41864°N, -112.42741°E
DRILLING METHOD Sonic
GROUND ELEVATION 934 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # Terrasonic/ 130
GROUNDWATER DEPTH 80 ft / Elev 854 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 96
LOGGED BY M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY SAND (SM), fine sand, trace fine gravel, subangular, low plasticity, brown, moist, very firm	SPT	15-15-20 (35)						
			SAND WITH SILT (SP-SM), fine to medium sand, trace fine gravel, subangular, nonplastic, brown, moist, dense	AU							
880											
	55			R	11-31						
			CLAYEY SAND (SC), fine sand, rare fine gravel, subrounded to subangular, medium plasticity, brown, moist	AU							
875											
	60		SAND WITH GRAVEL (SP), predominantly medium sand, considerable coarse gravel, subangular, nonplastic, gray to light gray, slightly moist, medium dense	SPT	5-7-8 (15)						
			CLAYEY SAND (SC), fine sand, rare fine gravel, subangular, medium plasticity, brown, moist	AU							
870											
	65		SILTY SAND (SM), fine to medium sand, occasional fine gravel, subangular, low plasticity, brown, moist, very firm	SPT	11-20-17 (37)						
			CLAYEY SAND WITH GRAVEL (SC), fine to coarse sand, considerable predominately fine gravel, subrounded, medium plasticity, brown, moist, hard	AU			2	34	20	14	28
865											
	70		Medium subrounded sand below 70'	SPT	15-25-42 (67)						
860											
	75										

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BORING NUMBER B-186

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/8/2023 **COMPLETED** 9/11/2023
BORING LOCATION STA 1163+45, 80' L SR 303L Cst CL
DRILLER Yellow Jacket **DRILLED BY** Roger
GPS COORDINATES 33.41864°N, -112.42741°E
DRILLING METHOD Sonic
GROUND ELEVATION 934 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # Terrasonic/ 130
GROUNDWATER DEPTH 80 ft / Elev 854 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 96
LOGGED BY M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY, CLAYEY SAND WITH GRAVEL (SC-SM), fine to medium sand, considerable fine gravel, subangular, low plasticity, brown, moist, firm	R	15-17						
855											
	80		SAND WITH CLAY AND GRAVEL (SP-SC), predominantly medium to coarse sand, considerable fine gravel, angular, medium plasticity, brown, wet, hard	SPT	8-19-15 (34)						
			CLAYEY GRAVEL WITH SAND (GC), predominantly fine gravel, considerable predominately fine to medium sand, subrounded, medium plasticity, brown, wet	AU			2	37	20	17	16
850											
	85		SAND (SP), fine to medium sand, occasional coarse gravel, subangular, nonplastic, brown, wet, medium dense	SPT	5-8-8 (16)						
				AU							
845											
	90			SPT	3-10-13 (23)						
			GRAVEL WITH SAND (GP), predominantly coarse gravel, considerable fine to medium sand, subrounded, nonplastic, brown, wet, medium dense	AU							
840											
	95			SPT	3-3-7 (10)						
			CLAY WITH SAND (CL), trace fine gravel, some fine to medium sand, medium plasticity, brown, wet	SPT							
835											
	100										

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Ethos Engineering, LLC
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Tempe, AZ 85284

BORING NUMBER B-186

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/8/2023 **COMPLETED** 9/11/2023
BORING LOCATION STA 1163+45, 80' L SR 303L Cst CL
DRILLER Yellow Jacket **DRILLED BY** Roger
GPS COORDINATES 33.41864°N, -112.42741°E
DRILLING METHOD Sonic
GROUND ELEVATION 934 ft **BOREHOLE DEPTH** 101.5 ft
RIG TYPE / # Terrasonic/ 130
GROUNDWATER DEPTH 80 ft / Elev 854 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 96
LOGGED BY M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SAND WITH GRAVEL (SP), fine to medium sand, considerable coarse gravel, subangular, nonplastic, brown, wet, medium dense*(continued)*	SPT	3-4-7 (11)						

Bottom of borehole at 101.5 feet. Backfilled with soil cuttings; grouted upper 20 feet.

Ethos Engineering, LLC
9180 S. Kyrene Road, Suite 104
Tempe, AZ 85284

BORING NUMBER B-187

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/13/2023 **COMPLETED** 9/13/2023
BORING LOCATION STA 1165+00, 90' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41905°N, -112.4273°E
DRILLING METHOD Tubex
GROUND ELEVATION 935 ft **BOREHOLE DEPTH** 81.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 65 ft / Elev 870 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
935											
			SANDY SILTY CLAY (CL-ML), considerable predominately fine sand, weak lime cementation, low plasticity, brown, slightly moist, firm, weak HCL reaction	SPT	8-8-9 (17)		3	21	16	5	62
				AU							
930	5			SPT	8-8-10 (18)						
			SILTY, CLAYEY SAND (SC-SM), fine to medium sand, occasional fine gravel, angular, weak lime cementation, low plasticity, brown, slightly moist, moderately firm, weak HCL reaction	SPT	7-7-7 (14)						
925	10										
			SILTY SAND (SM), predominantly fine to medium sand, trace fine gravel, subrounded to subangular, nonplastic, brown, slightly moist, medium dense, weak HCL reaction	R	4-16	110	3	NP	NP	NP	27
920	15										
			Predominately fine grained sand and moderate HCL reaction below 15'	SPT	13-8-15 (23)						
915	20										
			Very dense at 20'	SPT	50/5"						
910	25										

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Ethos Engineering, LLC
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Tempe, AZ 85284

BORING NUMBER B-187

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/13/2023 **COMPLETED** 9/13/2023
BORING LOCATION STA 1165+00, 90' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41905°N, -112.4273°E
DRILLING METHOD Tubex
GROUND ELEVATION 935 ft **BOREHOLE DEPTH** 81.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 65 ft / Elev 870 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
910			SILTY SAND (SM), predominantly fine to medium sand, trace fine gravel, subrounded to subangular, nonplastic, brown, slightly moist, medium dense, weak HCL reaction*(continued)*	R	13-30	101	8	NP	NP	NP	22
			Medium dense at 25'								
905	30		Very dense at 30'	SPT	50/4"						
900	35		CLAYEY SAND (SC), fine to medium sand, rare fine gravel, angular, medium plasticity, brown, slightly moist, firm	SPT	3-5-12 (17)						
895	40		SAND WITH SILT (SP-SM), predominantly fine sand, trace fine gravel, angular, nonplastic, brown, slightly moist, medium dense to dense	R	13-18	99	11				
890	45			SPT	5-15-15 (30)		5	NP	NP	NP	11
885	50										

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Ethos Engineering, LLC
9180 S. Kyrene Road, Suite 104
Tempe, AZ 85284

BORING NUMBER B-187

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/13/2023 **COMPLETED** 9/13/2023
BORING LOCATION STA 1165+00, 90' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41905°N, -112.4273°E
DRILLING METHOD Tubex
GROUND ELEVATION 935 ft **BOREHOLE DEPTH** 81.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 65 ft / Elev 870 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
885											
880	55		SAND WITH SILT (SP-SM), predominantly fine sand, trace fine gravel, angular, nonplastic, brown, slightly moist, medium dense to dense*(continued)*	SPT	6-12-19 (31)						
875	60		SAND WITH SILT AND GRAVEL (SP-SM), fine to coarse sand, considerable fine to coarse gravel, angular, nonplastic, brown, slightly moist, dense	R	23-29	103	5				
870	65		GRAVEL WITH SILT AND SAND (GP-GM), fine to coarse gravel, considerable fine to coarse sand, subrounded to subangular, nonplastic, brown, slightly moist, very dense	SPT	9-26-27 (53)						
865	70		CLAYEY SAND (SC), predominantly fine to medium sand, rare fine gravel, angular, medium plasticity, brown, wet, hard	SPT	16-11-20 (31)						
860	75		SILTY SAND (SM), predominantly fine to medium sand, rare fine gravel, angular, nonplastic, brown, wet, medium dense	R	14-18	106	17	NP	NP	NP	41

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9180 S. Kyrene Road, Suite 104
Tempe, AZ 85284

BORING NUMBER B-187

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/13/2023 **COMPLETED** 9/13/2023
BORING LOCATION STA 1165+00, 90' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41905°N, -112.4273°E
DRILLING METHOD Tubex
GROUND ELEVATION 935 ft **BOREHOLE DEPTH** 81.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 65 ft / Elev 870 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
860			GRAVEL WITH SILT AND SAND (GP-GM), predominantly fine gravel, considerable fine to coarse sand, subangular, nonplastic, brown, wet, very dense	SPT	14-28-30 (58)						
855	80		SAND WITH SILT AND GRAVEL (SP-SM), predominantly medium to coarse sand, considerable fine gravel, angular, nonplastic, brown, wet, dense	SPT	8-11-20 (31)						

Bottom of borehole at 81.5 feet. Backfilled with soil cuttings; grouted upper 20 feet.

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-188

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/5/2023 **COMPLETED** 9/6/2023
BORING LOCATION STA 1166+50, 90' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41945°N, -112.4272°E
DRILLING METHOD Tubex
GROUND ELEVATION 935 ft **BOREHOLE DEPTH** 81.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 65 ft / Elev 870 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
935			SANDY CLAY (CL), trace fine gravel, some predominantly medium to coarse sand, medium plasticity, brown, slightly moist, firm, strong HCL reaction	AU SPT	8-9-11 (20)		7				
930	5		SILTY, CLAYEY SAND (SC-SM), predominantly fine to medium sand, rare fine gravel, subrounded, low plasticity, brown, slightly moist, firm to moderately firm, moderate HCL reaction	SPT	11-8-13 (21)						
				SPT	6-5-6 (11)		3	22	17	5	47
925	10										
				SPT	3-9-9 (18)						
920	15										
			SILTY, CLAYEY SAND WITH GRAVEL (SC-SM), predominantly medium sand, some predominantly fine gravel, angular, low plasticity, light brown, slightly moist, hard, weak HCL reaction	SPT	7-40-50/3"		4	25	19	6	16
915	20										
				R	50/5"						
910	25										

(Continued Next Page)

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-188

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 9/5/2023 **COMPLETED** 9/6/2023 **BORING LOCATION** STA 1166+50, 90' L SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.41945°N, -112.4272°E

DRILLING METHOD Tubex **GROUND ELEVATION** 935 ft **BOREHOLE DEPTH** 81.5 ft

RIG TYPE / # CME-85/ 118 **GROUNDWATER DEPTH** 65 ft / Elev 870 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
910											
			SILTY, CLAYEY SAND WITH GRAVEL (SC-SM), predominantly medium sand, some predominantly fine gravel, angular, low plasticity, light brown, slightly moist, hard, weak HCL reaction *(continued)*	SPT	50/3"						
905	30			R	50/2"						
900	35										
			SILTY SAND (SM), predominantly fine to medium sand, rare fine gravel, angular, nonplastic, brown, slightly moist, firm	SPT	8-10-12 (22)						
895	40										
				SPT	8-10-12 (22)						
890	45										
				R	11-18			NP	NP	NP	17
885	50										

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-188

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 9/5/2023 **COMPLETED** 9/6/2023 **BORING LOCATION** STA 1166+50, 90' L SR 303L Cst CL

DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.41945°N, -112.4272°E

DRILLING METHOD Tubex **GROUND ELEVATION** 935 ft **BOREHOLE DEPTH** 81.5 ft

RIG TYPE / # CME-85/ 118 ▼ **GROUNDWATER DEPTH** 65 ft / Elev 870 ft

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
885											
880	55		SILTY GRAVEL WITH SAND (GM), predominantly fine gravel, considerable fine to coarse sand, subangular, low plasticity, brown, slightly moist, dense	SPT	4-11-25 (36)						
875	60		CLAYEY SAND (SC), predominantly fine to medium sand, angular, medium plasticity, brown, wet, firm to very firm	SPT	14-19-21 (40)						
				R	10-20	100	13	31	17	14	19
870	65		▼								
				SPT	10-12-16 (28)						
865	70										
860	75		GRAVEL WITH SILT AND SAND (GP-GM), predominantly fine gravel, considerable fine to coarse sand, subrounded to subangular, nonplastic, brown, wet, very dense to dense	SPT	12-25-28 (53)						

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Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER B-188

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/5/2023 **COMPLETED** 9/6/2023
BORING LOCATION STA 1166+50, 90' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.41945°N, -112.4272°E
DRILLING METHOD Tubex
GROUND ELEVATION 935 ft **BOREHOLE DEPTH** 81.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH 65 ft / Elev 870 ft
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
860											
			GRAVEL WITH SILT AND SAND (GP-GM), predominantly fine gravel, considerable fine to coarse sand, subrounded to subangular, nonplastic, brown, wet, very dense to dense*(continued)*	SPT	12-10-23 (33)						
855	80										
			CLAYEY SAND WITH GRAVEL (SC), fine to coarse sand, some predominantly fine gravel, high plasticity, brown, wet, very stiff, weak HCL reaction	SPT	7-7-14 (21)		37	55	21	34	49

Bottom of borehole at 81.5 feet. Backfilled with soil cuttings; grouted upper 20 feet.

Ethos Engineering, LLC
9180 S. Kyrene Road, Suite 104
Tempe, AZ 85284

BORING NUMBER B-190

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 8/21/2023 **COMPLETED** 8/21/2023
BORING LOCATION STA 1210+90, 125' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.431351°N, -112.42707°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 964 ft **BOREHOLE DEPTH** 21.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND (SC), predominantly fine to medium sand, angular, weak lime cementation, low plasticity, light brown to brown, slightly moist, firm	SPT	7-7-10 (17)		5	25	16	9	36
				AU							
960			Trace predominately fine grained angular gravel below 3'	R	8-9	110	2				
	5										
			SILTY, CLAYEY SAND (SC-SM), predominantly fine to medium sand, trace fine to coarse gravel, angular, weak lime cementation, low plasticity, light brown to brown, slightly moist, moderately firm	SPT	4-5-8 (13)						
955											
	10										
			CLAYEY SAND (SC), fine to medium sand, trace fine gravel, subangular, weak lime cementation, medium plasticity, light brown to brown, slightly moist, hard, weak HCL reaction	SPT	27-37-29 (66)						
950											
	15										
			CLAYEY SAND WITH GRAVEL (SC), fine to coarse sand, some fine gravel, subangular, moderate lime cementation, medium plasticity, light brown to whitish brown, slightly moist, hard, moderate HCL reaction	SPT	22-20-43 (63)		10	34	23	11	38
945											
	20		SANDY CLAY (CL), trace fine gravel, considerable fine to medium sand, weak lime cementation, medium plasticity, brown, slightly moist, firm, weak HCL reaction	SPT	4-6-18 (24)						

Bottom of borehole at 21.5 feet. Backfilled with soil cuttings.

Ethos Engineering, LLC
9180 S. Kyrene Road, Suite 104
Tempe, AZ 85284

BORING NUMBER B-191

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 8/21/2023 **COMPLETED** 8/21/2023
BORING LOCATION STA 1212+40, 165' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.43144°N, -112.42612°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 965 ft **BOREHOLE DEPTH** 21.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
965											
			CLAYEY SAND WITH GRAVEL (SC), predominantly fine to medium sand, some fine gravel, angular, low plasticity, brown, slightly moist, very soft to soft, moderate HCL reaction	SPT	3-2-2 (4)						
				AU							
			Considerable gravel lense from 3' to 4'	SPT	3-3-2 (5)						
960	5										
			SILTY, CLAYEY SAND (SC-SM), predominantly medium sand, occasional fine gravel, angular, low plasticity, brown, slightly moist, very soft, weak HCL reaction	R	2-2	110	7	21	16	5	19
955	10										
			SILTY, CLAYEY SAND WITH GRAVEL (SC-SM), fine to coarse sand, some fine to coarse gravel, subangular, weak lime cementation, low plasticity, light brown to whitish brown, slightly moist, firm, weak HCL reaction	SPT	2-8-10 (18)						
950	15		Hard and considerable fine to coarse gravel below 15'	SPT	50/4"						
945	20										
			CLAYEY SAND (SC), predominantly fine sand, low to medium plasticity, brown, slightly moist, hard	SPT	14-26-27 (53)		7	29	20	9	39

Bottom of borehole at 21.5 feet. Backfilled with soil cuttings.

Ethos Engineering, LLC
9180 S. Kyrene Road, Suite 104
Tempe, AZ 85284

BORING NUMBER B-192

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 8/21/2023 **COMPLETED** 8/21/2023
BORING LOCATION STA 1231+70, 110' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.43729°N, -112.42627°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 970 ft **BOREHOLE DEPTH** 21.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
970			4" Landscape Gravel								
			CLAYEY SAND (SC), predominantly fine sand, trace fine gravel, subangular, weak lime cementation, low plasticity, light brown to brown, slightly moist, very firm to hard, weak HCL reaction	SPT	11-13-19 (32)						
				AU							
965	5			SPT	26-31-28 (59)						
			SILTY SAND (SM), predominantly fine sand, occasional fine gravel, angular, nonplastic, light brown to brown, slightly moist, firm	R	12-14	107	3	NP	NP	NP	19
960	10		SILTY SAND WITH GRAVEL (SM), predominantly fine sand, some predominantly coarse gravel, subrounded, nonplastic, light brown to whitish brown, slightly moist, hard	SPT	50/3"						
955	15		SILTY SAND (SM), predominantly medium to coarse sand, some fine gravel, subangular, nonplastic, brown brown, slightly moist, hard, moderate HCL reaction	SPT	50/5"						
950	20		SILTY SAND (SM), predominantly fine sand, weak lime cementation, nonplastic, brown, slightly moist, very firm, weak HCL reaction	SPT	12-17-25 (42)		13	NP	NP	NP	50

Bottom of borehole at 21.5 feet. Backfilled with soil cuttings.

Ethos Engineering, LLC
9180 S. Kyrene Road, Suite 104
Tempe, AZ 85284

BORING NUMBER B-193

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 8/21/2023 **COMPLETED** 8/21/2023
BORING LOCATION STA 1233+40, 105' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.437716°N, -112.42636°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 972 ft **BOREHOLE DEPTH** 21.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			4" Landscaping Gravel								
970			CLAYEY SAND (SC), predominantly fine to medium sand, trace to some predominantly fine gravel, subangular, weak lime cementation, medium plasticity, light brown, slightly moist, firm to moderately firm, moderate HCL reaction	SPT	10-18-12 (30)						
				AU							
				R	11-12			32	18	14	31
	5										
			Very firm, whitish brown to light brown and weak HCL reaction below 5'	SPT	15-21-18 (39)						
965											
			SILTY SAND (SM), predominantly fine to medium sand, rare fine gravel, subangular, nonplastic, light brown, slightly moist, firm								
	10			SPT	16-13-16 (29)						
960											
	15		Hard below 15'	SPT	30-38-50/4"		6	NP	NP	NP	38
955											
			SILTY SAND (SM), predominantly fine sand, weak lime cementation, nonplastic, light brown, slightly moist, firm, moderate HCL reaction								
	20			SPT	9-18-11 (29)		4				

Bottom of borehole at 21.5 feet. Backfilled with soil cuttings.

Ethos Engineering, LLC
9180 S. Kyrene Road, Suite 104
Tempe, AZ 85284

BORING NUMBER B-194

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/29/2023 **COMPLETED** 9/29/2023
BORING LOCATION STA 1262+25, 145' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.44565°N, -112.42651°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 984 ft **BOREHOLE DEPTH** 41 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SILTY SAND (SM), predominantly fine sand, occasional coarse gravel, angular, nonplastic, brown, slightly moist, loose to medium dense, weak HCL reaction								
				AU	3-5-5 (10)						
980				SPT	4-3-4 (7)						
	5			R	5-7	94	13	NP	NP	NP	43
975											
	10			SPT	9-5-6 (11)						
970											
	15		SILTY, CLAYEY SAND (SC-SM), fine to medium sand, occasional coarse gravel, angular, low plasticity, brown, slightly moist, hard, weak HCL reaction	SPT	17-50/5"						
965											
	20		SAND WITH GRAVEL (SP), predominantly fine to medium sand, trace to some fine to coarse gravel, angular, nonplastic, brown, slightly moist, dense, weak HCL reaction	R	23-33						
960											
	25										

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Ethos Engineering, LLC
9180 S. Kyrene Road, Suite 104
Tempe, AZ 85284

BORING NUMBER B-194

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/29/2023 **COMPLETED** 9/29/2023
BORING LOCATION STA 1262+25, 145' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.44565°N, -112.42651°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 984 ft **BOREHOLE DEPTH** 41 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND (SC), predominantly fine to medium sand, angular, medium plasticity, light brown, slightly moist, very firm to hard, weak HCL reaction	SPT	37-50/2"						
955	30			SPT	11-21-27 (48)		20	37	19	18	46
950	35			SPT	13-24-26 (50)						
945	40		SAND WITH SILT AND GRAVEL (SP-SM), predominantly fine to medium sand, some fine to coarse gravel, angular, nonplastic, brown to light brown, slightly moist, dense, weak HCL reaction	R	16-30						

Bottom of borehole at 41.0 feet. Backfilled with soil cuttings.

Ethos Engineering, LLC
9180 S. Kyrene Road, Suite 104
Tempe, AZ 85284

BORING NUMBER B-195

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/29/2023 **COMPLETED** 9/29/2023
BORING LOCATION STA 1263+75, 155' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.44609°N, -112.42647°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 985 ft **BOREHOLE DEPTH** 36.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
985											
			SILTY SAND (SM), predominantly fine to medium sand, trace fine gravel, angular, nonplastic, brown, slightly moist, loose to medium dense, strong HCL reaction	AU SPT	2-4-4 (8)						
			Some fine gravel and weak HCL reaction below 3'	SPT	2-2-3 (5)						
980	5										
				R	10-18	104	4				
975	10										
			SANDY SILTY CLAY (CL-ML), considerable predominately fine sand, low plasticity, brown, slightly moist, firm, moderate HCL reaction	SPT	10-11-10 (21)		11	24	17	7	50
970	15										
			CLAYEY SAND (SC), predominantly fine to medium sand, trace fine gravel, angular, medium plasticity, brown to tan, slightly moist, firm, strong HCL reaction	SPT	5-8-10 (18)						
965	20										
				R	7-21		10	33	17	16	36
960	25										

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Ethos Engineering, LLC
9180 S. Kyrene Road, Suite 104
Tempe, AZ 85284

BORING NUMBER B-195

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/29/2023 **COMPLETED** 9/29/2023
BORING LOCATION STA 1263+75, 155' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.44609°N, -112.42647°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 985 ft **BOREHOLE DEPTH** 36.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
960			CLAYEY SAND (SC), predominantly fine to medium sand, trace fine gravel, angular, medium plasticity, brown to tan, slightly moist, firm, strong HCL reaction *(continued)* Hard at 25'	SPT	50/5"						
955	30		Firm below 30'	R	15-19						
950	35		Hard below 35'	SPT	12-30-30 (60)						

Bottom of borehole at 36.5 feet. Backfilled with soil cuttings.

Ethos Engineering, LLC
9180 S. Kyrene Road, Suite 104
Tempe, AZ 85284

BORING NUMBER B-196

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/28/2023 **COMPLETED** 9/28/2023
BORING LOCATION STA 1265+35, 165' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.44652°N, -112.42643°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 985 ft **BOREHOLE DEPTH** 31.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
985			CLAYEY SAND (SC), fine to coarse sand, trace fine gravel, angular, medium plasticity, brown, slightly moist, moderately firm to soft, weak HCL reaction	AU SPT	6-6-5 (11)						
				SPT	3-3-4 (7)						
980	5			SPT	3-3-2 (5)						
975	10			R	11-13	105	6				
970	15			SPT	4-8-9 (17)						
965	20		SILTY, CLAYEY SAND (SC-SM), predominantly fine to medium sand, occasional coarse gravel, angular, low plasticity, brown, slightly moist, firm, weak HCL reaction	SPT	22-50/1"						
960	25		CLAYEY SAND (SC), predominantly fine sand, angular, moderate lime cementation, medium plasticity, light brown to tan, slightly moist, hard, moderate HCL reaction								

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Ethos Engineering, LLC
9180 S. Kyrene Road, Suite 104
Tempe, AZ 85284

BORING NUMBER B-196

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 9/28/2023 **COMPLETED** 9/28/2023
BORING LOCATION STA 1265+35, 165' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.44652°N, -112.42643°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 985 ft **BOREHOLE DEPTH** 31.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
960			CLAYEY SAND (SC), predominantly fine sand, angular, moderate lime cementation, medium plasticity, light brown to tan, slightly moist, hard, moderate HCL reaction*(continued)* Firm below 25'	R	11-26	97	16	36	22	14	43
955	30		Hard and weakly cemented below 30'	SPT	12-19-35 (54)						

Bottom of borehole at 31.5 feet. Backfilled with soil cuttings.

BORING NUMBER B-196A

Ethos Engineering, LLC

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 10/15/2024 **COMPLETED** 10/15/2024
BORING LOCATION STA 1266+90, 210' R SR 303L Cst CL
DRILLER ACS Services **DRILLED BY** J. Alster
GPS COORDINATES 33.44695°N, -112.42626°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION _____ **BOREHOLE DEPTH** 30.3 ft
RIG TYPE / # CME-75/ 154927
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86.3
LOGGED BY M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAY WITH SAND (CL), some predominantly fine sand, rare fine gravel, subangular, low to medium plasticity, light brown to brown, slightly moist, moderately firm to firm	SPT AU	8-12-8 (20)		5	25	17	8	70
				SPT	4-5-7 (12)						
	5		CLAYEY SAND (SC), occasional fine gravel, predominantly fine to medium sand, subangular, low to medium plasticity, light brown to brown, slightly moist, soft	R	5-8	112	5	27	15	12	18
	10		SANDY CLAY (CL), rare fine gravel, considerable predominately fine sand, subangular, medium plasticity, brown to gray, slightly moist, hard	SPT	10-31-50/4"						
	15		CLAYEY SAND (SC), occasional fine gravel, predominantly fine to medium sand, subangular, low to medium plasticity, light brown to brown, slightly moist, hard	SPT	39-50/5"						
	20		SANDY CLAY (CL), rare fine gravel, considerable predominately fine sand, subangular, medium plasticity, brown to gray, slightly moist, hard	SPT	50/4"						
	25										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 10/15/2024 **COMPLETED** 10/15/2024 **BORING LOCATION** STA 1266+90, 210' R SR 303L Cst CL

DRILLER ACS Services **DRILLED BY** J. Alster **GPS COORDINATES** 33.44695°N, -112.42626°E

DRILLING METHOD Hollow Stem Auger **GROUND ELEVATION** _____ **BOREHOLE DEPTH** 30.3 ft

RIG TYPE / # CME-75/ 154927 **GROUNDWATER DEPTH** ---

HAMMER TYPE Auto **HAMMER EFFICIENCY** 86.3 **LOGGED BY** M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SANDY CLAY (CL), rare fine gravel, considerable predominately fine sand, subangular, medium plasticity, brown to gray, slightly moist, hard*(continued)*	SPT	11-26-29 (55)						
	30		Strong lime cementation at 30 feet	SPT	50/4"						

Bottom of borehole at 30.3 feet. Backfilled with soil cuttings.

BORING NUMBER B-196B

Ethos Engineering, LLC

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 10/15/2024 **COMPLETED** 10/15/2024
BORING LOCATION STA 1268+00, 210' R SR 303L Cst CL
DRILLER ACS Services **DRILLED BY** J. Alster
GPS COORDINATES 33.44725°N, -112.42625°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION _____ **BOREHOLE DEPTH** 31.5 ft
RIG TYPE / # CME-75/ 154927
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86.3
LOGGED BY R. Bohon **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAYEY SAND (SC), trace fine gravel, predominantly fine to medium sand, subangular, medium plasticity, brown, slightly moist, moderately firm to firm	AU SPT	8-10-12 (22)						
				R	7-10	105	4	35	19	16	19
	5										
			CLAYEY SAND WITH GRAVEL (SC), considerable predominately fine gravel, predominantly medium sand, subrounded to subangular, low plasticity, brown, slightly moist to moist, very firm to hard	SPT	8-10-29 (39)		4				14
	10			SPT	18-38-22 (60)						
	15		SILTY GRAVEL WITH SAND (GM), predominantly fine gravel, considerable predominately medium to coarse sand, subangular, nonplastic, brown, slightly moist to moist, very dense	SPT	34-50/4"						
	20		CLAYEY SAND (SC), rare to occasional fine gravel, predominantly fine sand, subangular, moderate lime cementation, medium plasticity, brown, slightly moist to moist, hard	SPT	19-50/5"						
	25										

(Continued Next Page)

Ethos Engineering, LLC

BORING NUMBER B-196B

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 10/15/2024 **COMPLETED** 10/15/2024
BORING LOCATION STA 1268+00, 210' R SR 303L Cst CL
DRILLER ACS Services **DRILLED BY** J. Alster
GPS COORDINATES 33.44725°N, -112.42625°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION _____ **BOREHOLE DEPTH** 31.5 ft
RIG TYPE / # CME-75/ 154927
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86.3
LOGGED BY R. Bohon **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			SANDY CLAY (CL), rare fine gravel, considerable predominately fine sand, subangular, moderate lime cementation, medium plasticity, brown, moist, very firm	SPT	7-18-17 (35)						
	30		Increased sand content, low plasticity and weak lime cementation below 30 feet	SPT	11-19-30 (49)						

Bottom of borehole at 31.5 feet. Backfilled with soil cuttings.

BORING NUMBER B-196C

Ethos Engineering, LLC

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 10/18/2024 **COMPLETED** 10/18/2024
BORING LOCATION STA 1270+00, 210' R SR 303L Cst CL
DRILLER ACS Services **DRILLED BY** J. Scalf
GPS COORDINATES 33.44782°N, -112.42628°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION _____ **BOREHOLE DEPTH** 20.9 ft
RIG TYPE / # CME-75/ 287487
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 82.9
LOGGED BY R. Bohon **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
	0		SANDY CLAY (CL), occasional fine to coarse gravel, considerable fine to coarse sand, subangular, medium plasticity, light brown, slightly moist, moderately firm to firm	SPT	10-8-9 (17)						
				SPT	7-7-7 (14)						
	5		CLAYEY SAND (SC), rare to occasional fine gravel, predominantly fine to medium sand, subangular, medium plasticity, light brown, slightly moist to moist, firm	R	14-13	102	6	34	22	12	
	10		soft and low to medium plasticity below 10 feet	SPT	3-4-4 (8)		7	27	18	9	20
	15		hard and strong lime cementation below 15 feet	R	50	114	9				
	20			SPT	29-50/5"						

Bottom of borehole at 20.9 feet. Backfilled with soil cuttings.

BORING NUMBER B-196D

Ethos Engineering, LLC

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 10/15/2024 **COMPLETED** 10/15/2024
BORING LOCATION STA 1271+50, 210' R SR 303L Cst CL
DRILLER ACS Services **DRILLED BY** J. Alster
GPS COORDINATES 33.44824°N, -112.42631°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION _____ **BOREHOLE DEPTH** 16.5 ft
RIG TYPE / # CME-75/ 154927
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86.3
LOGGED BY R. Bohon **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
			CLAYEY SAND WITH GRAVEL (SC), some to considerable fine to coarse gravel, predominantly fine to medium sand, subangular, weak lime cementation, medium plasticity, brown, moist, firm to moderately firm	R	12-17	123	10	34	16	18	38
				AU			9				
				SPT	7-6-10 (16)						
	5		Note: decrease in gravel content to occassional to trace below 5 feet.	SPT	6-5-5 (10)						
	10		SILTY, CLAYEY SAND (SC-SM), occasional fine gravel, predominantly medium sand, subangular, low plasticity, brown, moist, firm	R	12-20	117	9	35	16	19	31
	15		CLAYEY SAND WITH GRAVEL (SC), some to considerable fine to coarse gravel, predominantly fine to medium sand, subangular, weak lime cementation, medium plasticity, brown, slightly moist, hard	SPT	6-20-44 (64)						

Bottom of borehole at 16.5 feet. Backfilled with soil cuttings.

BORING NUMBER B-197

Ethos Engineering, LLC

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 10/30/2023 **COMPLETED** 10/30/2023
BORING LOCATION STA 1271+70, 85' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.44826°N, -112.42673°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 988 ft **BOREHOLE DEPTH** 21.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			FILL - CLAYEY SAND (SC), predominantly fine to medium sand, trace fine gravel, angular, low plasticity, slightly moist, strong HCL reaction, brown								
				R	12-31	106	8.0				
985				AU							
				SPT	8-6-8 (14)						
	5										
				SPT	5-5-5 (10)						
			NATIVE - CLAYEY SAND (SC), predominantly fine to medium sand, trace fine gravel, angular, low plasticity, slightly moist, strong HCL reaction, brown								
980											
	10			R	19-11			27	17	10	44
975											
	15		Occassional fine subangular gravel below 15'	SPT	3-5-10 (15)						
970											
	20		SILTY SAND (SM), predominantly fine to medium sand, angular, nonplastic, slightly moist, brown	SPT	5-7-11 (18)		8.0	NP	NP	NP	26

Bottom of borehole at 21.5 feet. Backfilled with soil cuttings

BORING NUMBER B-198

Ethos Engineering, LLC

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 10/30/2023 **COMPLETED** 10/30/2023
BORING LOCATION STA 1273+45, 85' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.44875°N, -112.42674°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 990 ft **BOREHOLE DEPTH** 31.4 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
990			FILL - CLAYEY SAND (SC), predominantly fine to medium sand, occasional fine gravel, angular, low to medium plasticity, slightly moist, moderate lime cementation, moderate HCL reaction, brown								
				R	10-15	109	7.0				
				AU							
				SPT	5-5-5 (10)						
985	5										
				SPT	6-7-11 (18)						
980	10		NATIVE - CLAYEY SAND (SC), predominantly fine to medium sand, occasional fine gravel, angular, low to medium plasticity, slightly moist, moderate lime cementation, moderate HCL reaction, brown								
				R	8-13	106	8.0	29	16	13	37
975	15										
			SILTY SAND WITH GRAVEL (SM), predominantly fine to medium sand, some fine gravel, angular, nonplastic, slightly moist, moderate lime cementation, moderate HCL reaction, brown	SPT	35-31-21 (52)						
970	20										
			Uncemented with weak HCL reaction below 20'	SPT	11-9-11 (20)		7.0				
965	25										

(Continued Next Page)

Ethos Engineering, LLC

BORING NUMBER B-198

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 10/30/2023 **COMPLETED** 10/30/2023
BORING LOCATION STA 1273+45, 85' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.44875°N, -112.42674°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 990 ft **BOREHOLE DEPTH** 31.4 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
965			SANDY CLAY (CL), considerable predominately fine sand, low plasticity, slightly moist, weak lime cementation, moderate HCL reaction, brown	R	16-13	97	20.0	24	16	8	64
960	30		Hard and moderate cementation below 30'	SPT	27-37-50/5"						

Bottom of borehole at 31.4 feet. Backfilled with soil cuttings

BORING NUMBER B-199

Ethos Engineering, LLC

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 10/30/2023 **COMPLETED** 10/30/2023
BORING LOCATION STA 1275+15, 90' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.44924°N, -112.42676°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 991 ft **BOREHOLE DEPTH** 40.9 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
990			FILL - CLAYEY SAND WITH GRAVEL (SC), predominantly fine to medium sand, considerable predominately fine gravel, angular, low to medium plasticity, slightly moist, strong HCL reaction, brown								
				R	21-20	116	6.0				
				AU			6.0	28	15	13	24
				SPT	4-11-15 (26)						
	5										
985				SPT	12-19-27 (46)						
	10		NATIVE - CLAYEY SAND WITH GRAVEL (SC), predominantly fine to medium sand, considerable predominately fine gravel, angular, low to medium plasticity, slightly moist, strong HCL reaction, brown	R	12-16						
980											
	15										
975				SPT	4-6-16 (22)						
	20										
970			SILTY SAND WITH GRAVEL (SM), fine to coarse sand, some fine gravel, angular, nonplastic, strong HCL reaction	SPT	14-16-11 (27)		7.0	NP	NP	NP	40
	25										

(Continued Next Page)

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ
DATE STARTED 10/30/2023 **COMPLETED** 10/30/2023 **BORING LOCATION** STA 1275+15, 90' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler **GPS COORDINATES** 33.44924°N, -112.42676°E
DRILLING METHOD Hollow Stem Auger **GROUND ELEVATION** 991 ft **BOREHOLE DEPTH** 40.9 ft
RIG TYPE / # CME-85/ 118 **GROUNDWATER DEPTH** ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86 **LOGGED BY** J. Miller **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
965			SILTY SAND WITH GRAVEL (SM), fine to coarse sand, some fine gravel, angular, nonplastic, strong HCL reaction *(continued)*	R	17-25	109	6.0				
	30										
960			SANDY CLAY (CL), considerable predominately fine sand, rare fine gravel, angular, medium plasticity, slightly moist, moderate HCL reaction, brown	SPT	9-12-19 (31)						
	35										
955				SPT	14-18-26 (44)		16.0	35	22	13	59
	40										
			SAND (SW), fine to coarse sand, rare fine gravel, angular, nonplastic, slightly moist, strong HCL reaction, light brown	R	25-50/5"	103	6.0				

Bottom of borehole at 40.9 feet. Backfilled with soil cuttings

Ethos Engineering s

BORING NUMBER C-1

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED _____ **COMPLETED** _____
BORING LOCATION STA 1147+50, 498' R SR 303L Cst CL
DRILLER _____ **DRILLED BY** _____
GPS COORDINATES 33.41383°N, -112.4284°E
DRILLING METHOD _____
GROUND ELEVATION _____ **BOREHOLE DEPTH** 2 ft
RIG TYPE / # _____
GROUNDWATER DEPTH ---
HAMMER TYPE _____ **HAMMER EFFICIENCY** _____
LOGGED BY _____ **CHECKED BY** _____

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	

Ethos Engineering s

BORING NUMBER C-2

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED _____ **COMPLETED** _____
BORING LOCATION STA 1150+00, 995'R SR 303L Cst CL
DRILLER _____ **DRILLED BY** _____
GPS COORDINATES 33.41344°N, -112.42667°E
DRILLING METHOD _____
GROUND ELEVATION _____ **BOREHOLE DEPTH** 2 ft
RIG TYPE / # _____
GROUNDWATER DEPTH ---
HAMMER TYPE _____ **HAMMER EFFICIENCY** _____
LOGGED BY _____ **CHECKED BY** _____

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	

Ethos Engineering s

BORING NUMBER P-1

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/25/2022 **COMPLETED** 3/25/2022
BORING LOCATION STA 1094+50, 210' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40422°N, -112.44208°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 900 ft **BOREHOLE DEPTH** 10 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
900			CLAY (CL), brown, slightly moist, low to medium plasticity, trace fine gravel, trace fine sand	AU			14.6	34	18	16	94
895	5			AU							
				AU							
890	10										

Bottom of borehole at 10.0 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER P-2

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/25/2022 **COMPLETED** 3/25/2022
BORING LOCATION STA 1095+50, 550' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40503°N, -112.44237°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 900 ft **BOREHOLE DEPTH** 10 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
900			CLAY (CL), brown, slightly moist, low to medium plasticity, trace fine gravel, trace fine sand	AU			11.9	29	20	9	95
895	5			AU							
				AU							
890	10										

Bottom of borehole at 10.0 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER P-3

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 3/25/2022 **COMPLETED** 3/25/2022
BORING LOCATION STA 1100+50, 260' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.40576°N, -112.44065°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 900 ft **BOREHOLE DEPTH** 10 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY S. Hadziefendic **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
900			SILTY CLAY WITH SAND (CL-ML), brown, slightly moist, low to medium plasticity, trace fine gravel, some fine sand	AU			9.4	25	7	18	82
895	5			AU							
				AU							
890	10										

Bottom of borehole at 10.0 feet. Backfilled with soil cuttings.

BORING NUMBER P-4

Ethos Engineering s

CLIENT AZTEC Engineering Group, Inc. **PROJECT NAME** SR 303L - MC 85 to Van Buren Street

PROJECT NUMBER 2021037 **PROJECT LOCATION** Goodyear, AZ

DATE STARTED 8/10/2022 **COMPLETED** 8/10/2022 **BORING LOCATION** STA 1097+45, 845' L SR 303L Cst CL

DRILLER GSI **DRILLED BY** J. Aguilar **GPS COORDINATES** 33.4044°N, -112.44324°E

DRILLING METHOD Hollow Stem Auger **GROUND ELEVATION** 900 ft **BOREHOLE DEPTH** 20 ft

RIG TYPE / # CME 75/109 **GROUNDWATER DEPTH** ---

HAMMER TYPE Auto **HAMMER EFFICIENCY** 92 **LOGGED BY** M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
900			SILTY CLAY (CL-ML), dark brown to brown, subangular, moist, low plasticity, occasional to trace fine gravel, trace fine to medium sand								
895	5		SAND (SP), light brown to brown, subangular, moist, non plastic, trace to some gravel, predominantly medium sand								
890	10		SANDY SILTY CLAY (CL-ML), brown, subangular, moist, moderately firm, low plasticity, trace fine gravel, some to considerable fine sand	SPT	3-4-5 (9)						
			Note: Some thin sand (SP) lenses below 10'	SPT	3-4-5 (9)						
885	15		CLAY WITH SAND (CL), brown, subangular, moist, moderately firm, medium plasticity, occasional fine gravel, trace to some fine sand	SPT	3-5-10 (15)						
			SAND (SP), light brown to brown, subangular, moist to slightly moist, medium dense, non plastic, trace fine gravel, predominantly fine to medium sand	SPT	4-9-6 (15)						
880	20										

Bottom of borehole at 20.0 feet. Backfilled with soil cuttings.

Ethos Engineering s

BORING NUMBER P-5

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 8/10/2022 **COMPLETED** 8/10/2022
BORING LOCATION STA 1105+60, 610' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** J. Aguilar
GPS COORDINATES 33.4061°N, -112.44068°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 900 ft **BOREHOLE DEPTH** 20 ft
RIG TYPE / # CME 75/109
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 92
LOGGED BY M. Meza **CHECKED BY** K. Dahlen

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
900			SILTY CLAY WITH SAND (CL-ML), dark brown to brown, subangular, moist, low to medium plasticity, trace fine gravel, trace to some fine to medium sand								
895	5		SANDY CLAY (CL), brown, subangular, moist, firm to moderately firm, medium plasticity, trace fine gravel, considerable fine sand	SPT	2-2-3 (5)						
890	10			SPT	4-7-7 (14)						
885	15		Note: Some thin sand (SP) lenses	SPT	7-9-9 (18)						
			CLAY WITH SAND (CL), brown, subangular, moist, firm, medium to high plasticity, trace fine gravel, trace to some fine sand	SPT	6-8-9 (17)						
880	20										

Bottom of borehole at 20.0 feet. Backfilled with soil cuttings.

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER P-6

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 11/27/2023 **COMPLETED** 11/27/2023
BORING LOCATION STA 1069+00, 165' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.39776°N, -112.44154°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 896 ft **BOREHOLE DEPTH** 16.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
895			CLAY (CL), trace predominantly fine sand, rare fine gravel, medium plasticity, brown, moist, very soft								
				AU SPT	1-2-2 (4)		19	36	17	19	87
	5										
890				SPT	2-2-2 (4)						
			SILT WITH SAND (ML), some predominantly fine sand, low plasticity, brown, moist to wet, very soft								
	10										
885				SPT	1-1-1 (2)		29	26	22	4	77
	15										
880			SAND WITH SILT AND GRAVEL (SP-SM), predominantly fine to medium sand, considerable coarse gravel, subrounded to subangular, nonplastic, brown, moist, medium dense	SPT	4-5-7 (12)						

Bottom of borehole at 16.5 feet. Backfilled with soil cuttings.

Ethos Engineering, LLC

BORING NUMBER P-06A

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 7/3/2024 **COMPLETED** 7/3/2024
BORING LOCATION STA 1069+00, 210' L SR 303L CST CL
DRILLER Ethos **DRILLED BY** J. Brown
GPS COORDINATES 33.39767°N, -112.44163°E
DRILLING METHOD Hand Auger
GROUND ELEVATION 896 ft **BOREHOLE DEPTH** 2 ft
RIG TYPE / #
GROUNDWATER DEPTH ---
HAMMER TYPE NA **HAMMER EFFICIENCY** NA
LOGGED BY J. Brown **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
								LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
895			SILTY, CLAYEY SAND (SC-SM), predominantly fine to medium sand, occasional predominantly fine gravel, low plasticity, brown	AU			2	19	14	5	46

Bottom of borehole at 2.0 feet. Backfilled with soil cuttings.

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER P-7

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 11/27/2023 **COMPLETED** 11/27/2023
BORING LOCATION STA 1070+80, 95' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.39864°N, -112.44153°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 895 ft **BOREHOLE DEPTH** 16.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
895			CLAY (CL), trace fine sand, medium plasticity, brown to dark brown, moist, very soft, moderate HCL reaction 6 inches of Topsoil with heavy roots								
				SPT AU	2-2-2 (4)		18	37	17	20	89
890	5			SPT	1-2-1 (3)						
885	10		SILTY SAND (SM), predominantly fine sand, occasional to trace predominantly coarse gravel, subangular, nonplastic, brown, moist to slightly moist, medium dense to dense, weak HCL reaction	SPT	6-5-7 (12)		7	NP	NP	NP	18
880	15		Increased fine to coarse subrounded gravel below 14'	SPT	5-17-25 (42)						

Bottom of borehole at 16.5 feet. Backfilled with soil cuttings.

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER P-8

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 11/27/2023 **COMPLETED** 11/27/2023
BORING LOCATION STA 1072+40, 240' L SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.39812°N, -112.44258°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 896 ft **BOREHOLE DEPTH** 16.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
895			CLAY (CL), trace predominantly fine sand, medium plasticity, brown, moist, very soft to soft, moderate HCL reaction								
				AU SPT	1-2-2 (4)		20	36	17	19	90
	5										
890				SPT	1-2-3 (5)						
			SILTY SAND (SM), predominantly fine sand, nonplastic, brown, moist, soft, weak HCL reaction								
	10										
885				SPT	1-3-5 (8)		12	NP	NP	NP	35
			SAND WITH SILT AND GRAVEL (SP-SM), predominantly fine to medium sand, considerable coarse gravel, angular, nonplastic, light brown to brown, moist, medium dense								
	15										
880				SPT	11-13-15 (28)						

Bottom of borehole at 16.5 feet. Backfilled with soil cuttings.

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER P-9

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 11/27/2023 **COMPLETED** 11/27/2023
BORING LOCATION STA 1074+75, 60' R SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.39918°N, -112.44252°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 895 ft **BOREHOLE DEPTH** 16.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
895			CLAY (CL), occasional fine sand, medium plasticity, brown, moist, soft to very soft, weak HCL reaction								
				AU SPT	2-4-4 (8)		17	38	16	22	94
890	5			SPT	2-1-1 (2)						
			SILTY SAND (SM), predominantly fine sand, nonplastic, brown, moist, moderately firm								
885	10			SPT	2-4-5 (9)		11	NP	NP	NP	30
			SAND WITH SILT AND GRAVEL (SP-SM), predominantly fine to medium sand, some fine gravel, subangular, nonplastic, brown, moist, dense								
880	15			SPT	6-18-21 (39)						

Bottom of borehole at 16.5 feet. Backfilled with soil cuttings.

Ethos Engineering, LLC
9180 S Kyrene Rd, #104
Tempe, AZ 85284

BORING NUMBER P-10

CLIENT AZTEC Engineering Group, Inc.
PROJECT NAME SR 303L - MC 85 to Van Buren Street
PROJECT NUMBER 2021037
PROJECT LOCATION Goodyear, AZ
DATE STARTED 11/27/2023 **COMPLETED** 11/27/2023
BORING LOCATION STA 1075+00, 290' SR 303L Cst CL
DRILLER GSI **DRILLED BY** C. Fiesler
GPS COORDINATES 33.39862°N, -112.44346°E
DRILLING METHOD Hollow Stem Auger
GROUND ELEVATION 893 ft **BOREHOLE DEPTH** 16.5 ft
RIG TYPE / # CME-85/ 118
GROUNDWATER DEPTH ---
HAMMER TYPE Auto **HAMMER EFFICIENCY** 86
LOGGED BY M. Meza **CHECKED BY** D. Frechette

ELEVATION (ft)	DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE	BLOW COUNTS (N VALUE)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
			CLAY (CL), trace predominantly fine sand, medium plasticity, brown, moist, very soft, weak HCL reaction 6 inches of Topsoil								
890				AU SPT	1-1-3 (4)		17	37	18	19	87
	5			SPT	1-1-2 (3)						
885											
	10		SILTY SAND (SM), predominantly fine to medium sand, occasional fine gravel, subangular to angular, nonplastic, brown, moist, medium dense, weak HCL reaction	SPT	2-4-7 (11)						
880											
	15		SAND WITH SILT AND GRAVEL (SP-SM), predominantly fine to medium sand, considerable predominately fine gravel, subrounded, nonplastic, light brown, slightly moist to moist, dense, weak HCL reaction	SPT	15-20-18 (38)		7	NP	NP	NP	21

Bottom of borehole at 16.5 feet. Backfilled with soil cuttings.

APPENDIX B

Laboratory Test Results

TABLE B-1: SUMMARY OF LABORATORY TEST RESULTS

Boring Number	Sample Depth (feet)		Stationing (feet)	CST CL Offset (feet)	USCS/Group Symbol (ASTM D2487)	Percent Fines (minus #200) (ASTM C136)	Liquid Limit (ASTM D4318)	Plasticity Index (ASTM D4318)	Moisture Content (%) (ASTM D2216/T265)	In-Place Dry Density (pcf) (ASTM D2937)	Optimum Moisture Content (%)[1] (ASTM D698A)	Maximum Dry Density (pcf)[1] (ASTM D698A)	Expansion (%) (ASTM D4546)	Consolidation (%) (ASTM D2435)	Direct Shear (ASTM D3080)	R-Value (ASTM D2844)	pH (AZ 236)	Resistivity (ohm-cm) (AZ 236)	Sulfates (ppm) (AZ 733)	Chlorides (ppm) (AZ 736)	ADOT Topsoil Suite
	Begin	End																			
B-2	0.0	5.0	1148+00	270 L	SC-SM	40.6	26	7	4.3												
B-2	5.0	6.5	1148+00	270 L	SM	26.9	NV	NP	3.0												
B-3	0.0	5.0	1153+50	735 R	SM	35.8	21	3	3.5							69					
B-4	0.0	5.0	1155+00	450 R	SM	41.1	20	2	3.6												
B-5	0.0	5.0	1155+40	255 L	SC-SM	20	24	6	3.5								8.56	1,016	594	211	
B-6	0.0	5.0	1159+50	285 R	SM	14.6	NV	NP	1.0												
B-6	35.0	36.0	1159+50	285 R											X						
B-7	0.0	5.0	1160+75	110 L	SC	41.9	26	8	4.1							49					
B-7A	0.0	2.5	1162+30	102 L							11.6	121.5									
B-7A	0.0	5.0	1162+30	102 L	SC-SM	48	26	7	2.4												
B-8	0.0	5.0	1164+25	160 L	CL	64.7	24	8	3.8				1.5								
B-9	0.0	5.0	1165+60	170 L	CL-ML	59.5	24	7	3.9		12.4	120.1	2.4				8.2	609	12	221	
B-9	10.0	11.5	1165+60	170 L			NV	NP	2.7												
B-9	15.0	16.0	1165+60	170 L	SM	30.9	NV	NP	2.4	115.8											
B-9	35.0	36.0	1165+60	170 L	CL	91.7	48	21	33.0	86.8											
B-9	50.0	51.5	1165+60	170 L					28.4												
B-9	75.0	76.5	1165+60	170 L					17.5												
B-10	0.0	5.0	1167+00	155 L	SC-SM	45.8	23	5	3.4												
B-10	15.0	16.0	1167+00	155 L	SC	17.6	30	8	3.2	104.5											
B-10	40.0	41.0	1167+00	155 L											X						
B-10	45.0	46.5	1167+00	155 L	SC	18.3	47	23	3.5												
B-11	10.0	11.0	1168+80	150 L	SP	4.8	NV	NP	0.4												
B-11	30.0	31.5	1168+80	150 L	CL	60	41	20	24.9												
B-12	0.0	5.0	1170+60	125 L	SC-SM	42.3	24	6	3.1												

TABLE B-1: SUMMARY OF LABORATORY TEST RESULTS

Boring Number	Sample Depth (feet)		Stationing (feet)	CST CL Offset (feet)	USCS/Group Symbol (ASTM D2487)	Percent Fines (minus #200) (ASTM C136)	Liquid Limit (ASTM D4318)	Plasticity Index (ASTM D4318)	Moisture Content (%) (ASTM D2216/T265)	In-Place Dry Density (pcf) (ASTM D2937)	Optimum Moisture Content (%)[1] (ASTM D698A)	Maximum Dry Density (pcf)[1] (ASTM D698A)	Expansion (%) (ASTM D4546)	Consolidation (%) (ASTM D2435)	Direct Shear (ASTM D3080)	R-Value (ASTM D2844)	pH (AZ 236)	Resistivity (ohm-cm) (AZ 236)	Sulfates (ppm) (AZ 733)	Chlorides (ppm) (AZ 736)	ADOT Topsoil Suite
	Begin	End																			
B-12	15.0	16.0	1170+60	125 L	SP-SM	8.1	NV	NP	3.5	107.6											
B-12	35.0	36.0	1170+60	125 L											X						
B-13	0.0	5.0	1160+70	250 R	ML	52.3	NV	NP	12.6		13.1	120.7	1.7				8.62	1,286	383	372	
B-13	5.0	6.0	1160+70	250 R										X							
B-13	35.0	36.0	1160+70	250 R											X						
B-14	0.0	5.0	1161+65	220 R	SM	29.9	NV	NP	6.7												
B-14	5.0	6.0	1161+65	220 R					17.6	109.2				X							
B-14	10.0	11.5	1161+65	220 R	SP-SM	11.8	NV	NP	6.5												
B-15	0.0	1.0	1162+90	165 R					6.3	113.6											
B-15	0.0	5.0	1162+90	165 R	SC-SM	46.8	22	6	8.5		11.8	122.8	0.6								
B-15	35.0	36.0	1162+90	165 R	CH	63.8	51	30							X						
B-16	0.0	5.0	1164+10	150 R	SM	39.6	NV	NP	7.6								8.5	474	401	967	
B-16	20.0	21.5	1164+10	150 R	SP-SM	7.1	NV	NP	3.4												
B-16	40.0	41.5	1164+10	150 R	SM	21.3	NV	NP	9.7												
B-17	0.0	5.0	1165+50	170 R	ML	56.1	NV	NP	10.8												
B-17	20.0	21.5	1165+50	170 R	SP-SM	7.6	NV	NP	2.8												
B-17	45.0	46.5	1165+50	170 R	SP-SM	5.8	NV	NP	3.1												
B-17	50.0	51.0	1165+50	170 R	SP	4.8	NV	NP	8.4	110.1											
B-18	0.0	5.0	1167+00	160 R	CL	54.8	24	9	11.1				0.9								
B-18	5.0	6.0	1167+00	160 R										X							
B-18	30.0	31.5	1167+00	160 R	CL	50.7	34	12	23.4												
B-18	35.0	36.0	1167+00	160 R											X						
B-19	0.0	5.0	1168+30	160 R	SM	18.1	NV	NP	4.9		10.4	125.5									
B-19	5.0	6.0												X							

TABLE B-1: SUMMARY OF LABORATORY TEST RESULTS

Boring Number	Sample Depth (feet)		Stationing (feet)	CST CL Offset (feet)	USCS/Group Symbol (ASTM D2487)	Percent Fines (minus #200) (ASTM C136)	Liquid Limit (ASTM D4318)	Plasticity Index (ASTM D4318)	Moisture Content (%) (ASTM D2216/T265)	In-Place Dry Density (pcf) (ASTM D2937)	Optimum Moisture Content (%)[1] (ASTM D698A)	Maximum Dry Density (pcf)[1] (ASTM D698A)	Expansion (%) (ASTM D4546)	Consolidation (%) (ASTM D2435)	Direct Shear (ASTM D3080)	R-Value (ASTM D2844)	pH (AZ 236)	Resistivity (ohm-cm) (AZ 236)	Sulfates (ppm) (AZ 733)	Chlorides (ppm) (AZ 736)	ADOT Topsoil Suite
	Begin	End																			
B-20	0.0	5.0	1169+90	145 R	SM	29.2	NV	NP	6.7												
B-20	10.0	11.5	1169+90	145 R	SC	23.4	30	18	8.3												
B-20	25.0	26.0	1169+90	145 R											X						
B-21	0.0	5.0	1171+00	140 R													9.41	2,166	240	39	
B-22	0.0	5.0	1171+70	145 L	SC-SM	24.5	21	5	3.1												
B-22	15.0	16.0	1171+70	145 L	SP	3	NV	NP	2.3	111.6											
B-22	30.0	31.5	1171+70	145 L	SC-SM	43.2	28	7	13.5												
B-22	35.0	36.0	1171+70	145 L											X						
B-22	40.0	41.5	1171+70	145 L	CL	88.7	44	22	31.4												
B-23	0.0	5.0	1171+80	30 R	SM	39.5	NV	NP	8.6												
B-23	30.0	31.0	1171+80	30 R											X						
B-23	35.0	36.5	1171+80	30 R	ML	71.8	35	8	21.7												
B-23	55.0	56.5	1171+80	30 R	SM	12.1	NV	NP	9.4												
B-24	7.5	10.0	1172+90	125 L	SC	33.7	25	9	9.0												
B-24	17.5	20.0	1172+90	125 L	SM	15.1	NV	NP	3.5												
B-24	25.0	26.0	1172+90	125 L					8.1	94.1											
B-24	40.0	41.0	1172+90	125 L											X						
B-24	52.5	55.0	1172+90	125 L	CL	55.2	39	19	23.2												
B-24	55.0	56.0	1172+90	125 L					20.7	104.3											
B-25	7.5	10.0	1172+90	125 R	ML	53	NV	NP	1.2												
B-25	22.5	25.0	1172+90	125 R	GC	36.9	42	22	16.4												
B-25	30.0	31.0	1172+90	125 R					10.9	107.3											
B-25	37.5	40.0	1172+90	125 R	CL	83.6	35	14	2.4												
B-25	40.0	41.0	1172+90	125 R											X						

TABLE B-1: SUMMARY OF LABORATORY TEST RESULTS

Boring Number	Sample Depth (feet)		Stationing (feet)	CST CL Offset (feet)	USCS/Group Symbol (ASTM D2487)	Percent Fines (minus #200) (ASTM C136)	Liquid Limit (ASTM D4318)	Plasticity Index (ASTM D4318)	Moisture Content (%) (ASTM D2216/T265)	In-Place Dry Density (pcf) (ASTM D2937)	Optimum Moisture Content (%)[1] (ASTM D698A)	Maximum Dry Density (pcf)[1] (ASTM D698A)	Expansion (%) (ASTM D4546)	Consolidation (%) (ASTM D2435)	Direct Shear (ASTM D3080)	R-Value (ASTM D2844)	pH (AZ 236)	Resistivity (ohm-cm) (AZ 236)	Sulfates (ppm) (AZ 733)	Chlorides (ppm) (AZ 736)	ADOT Topsoil Suite
	Begin	End																			
B-26	0.0	5.0	1174+00	135 L	CL	58.3	25	8	8.0		12.7	118.7	3.0								
B-26	15.0	16.0	1174+00	135 L											X						
B-26	20.0	21.5	1174+00	135 L	SP-SM	8.9	NV	NP	2.6												
B-26	30.0	31.5	1174+00	135 L	SC-SM	34.9	28	6	13.3												
B-26	55.0	56.5	1174+00	135 L	CL	69.1	38	17	24.7												
B-27	7.5	10.0	1174+00	105 R	CL-ML	55.3	21	4	6.2								8.49	880	20	176	
B-27	12.5	15.0	1174+00	105 R	SC-SM	12.5	24	7	3.8												
B-27	22.5	25.0	1174+00	105 R	SC	37.2	32	15	6.6								8.63	1,151	10	61	
B-27	37.5	40.0	1174+00	105 R	SC	46.5	50	23	21.1												
B-28	0.0	5.0	1173+00	870 L	SM	21.9	23	3	7.9												
B-29	0.0	5.0	1173+75	710 R	SC-SM	45.7	24	4	12.5												
B-30	0.0	5.0	1175+50	140 L	SC-SM	33.4	26	7	4.2												
B-30	5.0	6.0	1175+50	140 L										X							
B-30	25.0	26.5	1175+50	140 L	SC	43	41	20	16.9												
B-30	40.0	41.0	1175+50	140 L	SC	38.1	38	15	19.9												
B-30	50.0	51.0	1175+50	140 L					24.3	95.1											
B-31	0.0	5.0	1176+90	125 L	SC	45.4	26	9	4.6								8.4	339	68	651	
B-31	10.0	11.0	1176+90	125 L											X						
B-31	20.0	21.5	1176+90	125 L	SC	19.1	28	8	6.7												
B-31	40.0	41.0	1176+90	125 L	SC	37.8	46	24	23.5	96.2											
B-32	0.0	5.0	1178+30	125 L	SC	33.1	31	9	4.7												
B-32	10.0	11.0	1178+30	125 L										X							
B-32	15.0	16.5	1178+30	125 L	SM	15.9	NV	NP	4.8												
B-32	45.0	46.0	1178+30	125 L	CL	71.7	41	19	31.1	87.7											

TABLE B-1: SUMMARY OF LABORATORY TEST RESULTS

Boring Number	Sample Depth (feet)		Stationing (feet)	CST CL Offset (feet)	USCS/Group Symbol (ASTM D2487)	Percent Fines (minus #200) (ASTM C136)	Liquid Limit (ASTM D4318)	Plasticity Index (ASTM D4318)	Moisture Content (%) (ASTM D2216/T265)	In-Place Dry Density (pcf) (ASTM D2937)	Optimum Moisture Content (%)[1] (ASTM D698A)	Maximum Dry Density (pcf)[1] (ASTM D698A)	Expansion (%) (ASTM D4546)	Consolidation (%) (ASTM D2435)	Direct Shear (ASTM D3080)	R-Value (ASTM D2844)	pH (AZ 236)	Resistivity (ohm-cm) (AZ 236)	Sulfates (ppm) (AZ 733)	Chlorides (ppm) (AZ 736)	ADOT Topsoil Suite
	Begin	End																			
B-33	0.0	5.0	1179+70	130 L	SC	44.3	28	8	3.7							69					
B-33	10.0	11.5	1179+70	130 L	SM	21	NV	NP	5.0												
B-33	35.0	36.5	1179+70	130 L	SC-SM	38.9	25	4	9.5												
B-33	45.0	46.0	1179+70	130 L					16.7	90.8											
B-34	0.0	5.0	1181+00	130 L	SC-SM	41.8	27	7	4.0								8.82	1,354	5	58	
B-34	20.0	21.5	1181+00	130 L	SM	36.9	NV	NP	4.5	110.0											
B-34	30.0	31.5	1181+00	130 L	SC	18.1	30	11	9.1												
B-34	40.0	40.8	1181+00	130 L					22.2	91.3											
B-35	0.0	5.0	1182+50	115 L	CL-ML	56.8	26	7	5.2		12.5	119.1	1.9								
B-35	5.0	6.0	1182+50	115 L										X							
B-35A	0.0	2.5	1184+00	115 L	SC-SM	41.2	23	6	2.1		10.5	123.2									
B-35A	5.0	6.0	1184+00	115 L					2.0	117.9											
B-35B	2.0	4.0	1185+50	115 L	CL	54.1	28	10	3.9												
B-36	0.0	5.0	1175+50	120 R	CL	59.5	27	11	9.2				2.0								
B-36	15.0	16.0	1175+50	120 R	SM	35.3	NV	NP	5.4												
B-36	20.0	21.5	1175+50	120 R	SP-SM	10.4	NV	NP	4.4												
B-36	30.0	31.5	1175+50	120 R	SM	19.5	NV	NP	6.9												
B-37	0.0	5.0	1177+00	120 R	SC	48.1	25	10	7.2								8.36	745	238	223	
B-37	15.0	16.0	1177+00	120 R	SM	15.9	30	7	4.8												
B-37	25.0	25.5	1177+00	120 R					10.9	101.5											
B-37	35.0	35.8	1177+00	120 R	SC	27.8	44	21	25.7	86.6											
B-38	0.0	5.0	1178+50	125 R	CL	59.4	30	14	9.1							63					
B-38	15.0	16.5	1178+50	125 R	SM	18	22	3	4.9												
B-38	30.0	31.5	1178+50	125 R	SM	41.2	NV	NP	7.9												

TABLE B-1: SUMMARY OF LABORATORY TEST RESULTS

Boring Number	Sample Depth (feet)		Stationing (feet)	CST CL Offset (feet)	USCS/Group Symbol (ASTM D2487)	Percent Fines (minus #200) (ASTM C136)	Liquid Limit (ASTM D4318)	Plasticity Index (ASTM D4318)	Moisture Content (%) (ASTM D2216/T265)	In-Place Dry Density (pcf) (ASTM D2937)	Optimum Moisture Content (%)[1] (ASTM D698A)	Maximum Dry Density (pcf)[1] (ASTM D698A)	Expansion (%) (ASTM D4546)	Consolidation (%) (ASTM D2435)	Direct Shear (ASTM D3080)	R-Value (ASTM D2844)	pH (AZ 236)	Resistivity (ohm-cm) (AZ 236)	Sulfates (ppm) (AZ 733)	Chlorides (ppm) (AZ 736)	ADOT Topsoil Suite
	Begin	End																			
B-38	40.0	40.4	1178+50	125 R					15.8	91.8											
B-39	0.0	5.0	1180+00	125 R	CL	53	29	11	10.0				1.5								
B-39	15.0	16.5	1180+00	125 R	SC	18.2	25	8	5.9												
B-39	30.0	31.0	1180+00	125 R	ML	56.1	42	16	21.8	103.3											
B-40	0.0	5.0	1181+50	125 R	CL	51.5	27	10	10.3		14.1	117.5	2.4								
B-40	5.0	6.0	1181+50	125 R										X							
B-40	10.0	11.5	1181+50	125 R	SC-SM	43.9	24	7	9.6												
B-41	0.0	5.0	1183+00	90 R	SC	43.9	28	11	8.0								8.25	339	194	657	
B-41	15.0	16.5	1183+00	90 R	ML	55	34	7	11.0												
B-42	0.0	5.0	1184+50	90 R	SC	46.8	27	9	9.5							61					
B-42	10.0	11.0	1184+50	90 R										X							
B-42	20.0	21.5	1184+50	90 R	SM	12.1	NV	NP	3.8												
B-43	0.0	5.0	1186+00	90 R	SC	48	28	10	10.0												
B-43	10.0	10.5	1186+00	90 R					9.5	95.5											
B-43	15.0	16.5	1186+00	90 R	SM	38.6	29	3	7.7												
B-44	0.0	5.0	1187+50	90 R	SC	43.7	26	8	9.2								7.97	474	302	362	
B-44	15.0	16.5	1187+50	90 R	ML	64.2	42	13	13.3												
B-44	25.0	26.5	1187+50	90 R	SM	15.1	NV	NP	6.0												
B-45	0.0	5.0	1189+00	90 R	CL	52.8	28	10	9.9		12.1	117.1	3.1								
B-45	5.0	6.0	1189+00	90 R										X							
B-45	15.0	16.5	1189+00	90 R	SM	47.9	NV	NP	9.0												
B-46	0.0	5.0	1190+50	95 R	CL	51.5	29	11	8.8		12.3	122.4	3.3								
B-46	10.0	11.3	1190+50	95 R	CL	51.3	46	22	9.9												
B-47	0.0	5.0	1192+00	90 R	CL	56.8	28	10	8.7				2.7								

TABLE B-1: SUMMARY OF LABORATORY TEST RESULTS

Boring Number	Sample Depth (feet)		Stationing (feet)	CST CL Offset (feet)	USCS/Group Symbol (ASTM D2487)	Percent Fines (minus #200) (ASTM C136)	Liquid Limit (ASTM D4318)	Plasticity Index (ASTM D4318)	Moisture Content (%) (ASTM D2216/T265)	In-Place Dry Density (pcf) (ASTM D2937)	Optimum Moisture Content (%)[1] (ASTM D698A)	Maximum Dry Density (pcf)[1] (ASTM D698A)	Expansion (%) (ASTM D4546)	Consolidation (%) (ASTM D2435)	Direct Shear (ASTM D3080)	R-Value (ASTM D2844)	pH (AZ 236)	Resistivity (ohm-cm) (AZ 236)	Sulfates (ppm) (AZ 733)	Chlorides (ppm) (AZ 736)	ADOT Topsoil Suite
	Begin	End																			
B-47	3.0	4.0	1192+00	90 R										X							
B-48	5.0	6.0	1193+50	95 R										X							
B-49	0.0	5.0	1195+00	90 R	SC	49.7	30	12	9.2												
B-49	10.0	11.5	1195+00	90 R	SC	41.8	42	19	11.8												
B-50	0.0	5.0	1196+50	90 R	SC	37.1	29	10	9.2		13.7	118.3	0.8								
B-50	3.0	4.0	1196+50	90 R										X							
B-50	20.0	21.5	1196+50	90 R	SC	26.3	39	15	12.6												
B-51	0.0	5.0	1198+00	120 R	SC-SM	48.7	25	5	3.3												
B-51	10.0	10.1	1198+00	120 R	SM	26.8	NV	NP	4.5												
B-51	10.0	10.9	1198+00	120 R					6.7	109.6											
B-52	0.0	5.0	1199+80	85 R	CL	75.1	27	8	5.4		12.9	115.7	1.4				8.67	880	230	28	
B-52	10.0	11.5	1199+80	85 R	CL	76.3	37	16	8.1												
B-53	0.0	5.0	1201+00	90 R	SC	28.1	27	10	3.2												
B-54	0.0	5.0	1202+50	90 R	SC	28	30	10	3.5		11.8	123.6	0.2								
B-54	15.0	16.0	1202+50	90 R										X							
B-54	20.0	21.5	1202+50	90 R	SM	46.5	49	18	22.4												
B-55	0.0	5.0	1204+00	90 R	CL	53.7	29	11	8.1		13.8	118.3	1.9								
B-56	0.0	5.0	1205+50	90 R	SC	40.1	31	14	7.4												
B-56	10.0	11.5	1205+50	90 R	SC	37.5	37	13	9.9												
B-57	0.0	5.0	1207+00	100 R	SC	37.9	30	12	7.9								8.69	880	306	176	
B-57	5.0	6.5	1207+00	100 R	SP-SM	9.6	NV	NP	3.4												
B-58	0.0	5.0	1189+50	140 L	SC-SM	44.8	26	6	3.1								8.79	1,354	9	74	
B-58	10.0	11.5	1189+50	140 L	SC	48.6	38	15	7.8												
B-59	0.0	5.0	1194+00	130 L	CL	74.3	27	8	5.3												

TABLE B-1: SUMMARY OF LABORATORY TEST RESULTS

Boring Number	Sample Depth (feet)		Stationing (feet)	CST CL Offset (feet)	USCS/Group Symbol (ASTM D2487)	Percent Fines (minus #200) (ASTM C136)	Liquid Limit (ASTM D4318)	Plasticity Index (ASTM D4318)	Moisture Content (%) (ASTM D2216/T265)	In-Place Dry Density (pcf) (ASTM D2937)	Optimum Moisture Content (%)[1] (ASTM D698A)	Maximum Dry Density (pcf)[1] (ASTM D698A)	Expansion (%) (ASTM D4546)	Consolidation (%) (ASTM D2435)	Direct Shear (ASTM D3080)	R-Value (ASTM D2844)	pH (AZ 236)	Resistivity (ohm-cm) (AZ 236)	Sulfates (ppm) (AZ 733)	Chlorides (ppm) (AZ 736)	ADOT Topsoil Suite
	Begin	End																			
B-59	10.0	11.5	1194+00	130 L	CL	64.9	36	15	8.8												
B-60	0.0	5.0	1200+00	130 L	SC	42	29	11	4.1								8.6	745	692	823	
B-61	15.0	16.5	1205+00	135 L	ML	50	NV	NP	8.4												
B-62	0.0	5.0	1210+00	140 L	SC-SM	17.1	23	5	2.7												
B-62	10.0	11.5	1210+00	140 L	SC	39.5	35	15	7.3												
B-63	0.0	5.0	1214+50	165 L	SC	40	27	10	5.0								8.52	406	321	603	
B-63	10.0	11.5	1214+50	165 L	SP-SM	8.7	NV	NP	3.2												
B-64	10.0	11.5	1216+50	175 L	SM	17.7	NV	NP	6.6												
B-64	24.0	25.0	1216+50	175 L											X						
B-66	0.0	5.0	1216+00	170 R	CL	70.6	31	11	14.4												
B-66	5.0	6.0	1216+00	170 R										X							
B-67	10.0	11.5	1219+00	140 L	SC	16.3	28	9	8.0												
B-67	45.0	46.0	1219+00	140 L					11.3	107.0											
B-68	0.0	5.0	1220+50	135 L	CL	60.5	28	9	9.7												
B-68	15.0	16.5	1220+50	135 L			38	16													
B-68	25.0	26.0	1220+50	135 L											X						
B-68	45.0	46.0	1220+50	135 L					9.9	113.4											
B-69	1.0	4.0	1222+00	145 L	SC	43.3	27	10	5.5		11.9	124.5	0.2								
B-69	20.0	21.5	1222+00	145 L	SM	47.2	48	20	24.6												
B-69	30.0	31.0	1222+00	145 L	SP-SM	8.9	NV	NP	3.6	108.6											
B-70	1.0	5.0	1224+00	140 L	SC	27.5	34	17	9.0								8.94	812	71	46	
B-70	17.5	20.0	1224+00	140 L	SC	41.3	32	11	11.5												
B-70	35.0	35.9	1224+00	140 L					10.0	114.1											
B-70	42.5	45.0	1224+00	140 L	GC	29.9	33	17	11.0												

TABLE B-1: SUMMARY OF LABORATORY TEST RESULTS

Boring Number	Sample Depth (feet)		Stationing (feet)	CST CL Offset (feet)	USCS/Group Symbol (ASTM D2487)	Percent Fines (minus #200) (ASTM C136)	Liquid Limit (ASTM D4318)	Plasticity Index (ASTM D4318)	Moisture Content (%) (ASTM D2216/T265)	In-Place Dry Density (pcf) (ASTM D2937)	Optimum Moisture Content (%)[1] (ASTM D698A)	Maximum Dry Density (pcf)[1] (ASTM D698A)	Expansion (%) (ASTM D4546)	Consolidation (%) (ASTM D2435)	Direct Shear (ASTM D3080)	R-Value (ASTM D2844)	pH (AZ 236)	Resistivity (ohm-cm) (AZ 236)	Sulfates (ppm) (AZ 733)	Chlorides (ppm) (AZ 736)	ADOT Topsoil Suite
	Begin	End																			
B-71	0.0	5.0	1222+30	110 R	SC	33.0	29	11	3.5												
B-71	20.0	21.0	1222+30	110 R											X						
B-71	25.0	26.5	1222+30	110 R	CL	60.6	32	9	10.7												
B-72	5.0	6.5	1223+80	110 R	SC	15.4	28	10	4.2												
B-72	15.0	15.9	1223+80	110 R					10.0	94.7											
B-72	30.0	31.5	1223+80	110 R	SM	24.3	NV	NP	4.8												
B-72	50.0	51.5	1223+80	110 R	SM	19.1	NV	NP	5.7												
B-73	17.5	20.0	1224+60	128 L	SM	45.2	NV	NP	8.4												
B-73	30.0	31.0	1224+60	128 L											X						
B-73	42.5	45.0	1224+60	128 L	SC	20.8	28	9	8.5												
B-73	50.0	51.0	1224+60	128 L	SM	12.2	NV	NP	15.4	113.1											
B-73	65.0	66.0	1224+60	128 L					13.6	106.9											
B-73	85.0	86.0	1224+60	128 L	SM	31.3	34	10	13.7	120.3											
B-74	0.0	5.0	1224+60	40 R	SC		29	11	2.8												
B-74	10.0	10.11	1224+60	40 R			33	7													
B-74	30.0	31.5	1224+60	40 R	SM	41.2	NV	NP	6.6												
B-74	60.0	61.4	1224+60	40 R	SM	38.1	NV	NP	11.0												
B-75	7.5	10.0	1225+75	10 L	SM	16	NV	NP	5.7								8.78	1,151	84	47	
B-75	17.5	20.0	1225+75	10 L	CL-ML	54.9	29	7	15.1										561	287	
B-75	20.0	21.0	1225+75	10 L											X						
B-75	22.5	25.0	1225+75	10 L	SC	24.3	25	9	8.3												
B-75	40.0	41.0	1225+75	10 L					11.7	115.5											
B-75	55.0	56.0	1225+75	10 L											X						
B-76	10.0	11.5	1225+75	110 R	SC	30.8	37	16	10.3												

TABLE B-1: SUMMARY OF LABORATORY TEST RESULTS

Boring Number	Sample Depth (feet)		Stationing (feet)	CST CL Offset (feet)	USCS/Group Symbol (ASTM D2487)	Percent Fines (minus #200) (ASTM C136)	Liquid Limit (ASTM D4318)	Plasticity Index (ASTM D4318)	Moisture Content (%) (ASTM D2216/T265)	In-Place Dry Density (pcf) (ASTM D2937)	Optimum Moisture Content (%)[1] (ASTM D698A)	Maximum Dry Density (pcf)[1] (ASTM D698A)	Expansion (%) (ASTM D4546)	Consolidation (%) (ASTM D2435)	Direct Shear (ASTM D3080)	R-Value (ASTM D2844)	pH (AZ 236)	Resistivity (ohm-cm) (AZ 236)	Sulfates (ppm) (AZ 733)	Chlorides (ppm) (AZ 736)	ADOT Topsoil Suite
	Begin	End																			
B-76	20.0	21.5	1225+75	110 R	ML		32	7	14.3												
B-76	30.0	31.5	1225+75	110 R	ML	69.4	33	8	16.3												
B-76	55.0	56.0	1225+75	110 R	SM	34.4	NV	NP	12.9	96.6											
B-76	80.0	81.0	1225+75	110 R					14.6	117.8											
B-77	0.0	5.0	1227+00	125 L	SC	36.9	28	9	9.7												
B-77	12.5	15.0	1227+00	125 L	SC	40.1	30	11	8.6								8.58	2,099			
B-77	28.5	30.0	1227+00	125 L	CL	57.7	42	20	20.3										9	12	
B-77	40.0	41.0	1227+00	125 L											X						
B-77	47.5	50.0	1227+00	125 L															7	28	
B-77	55.0	56.0	1227+00	125 L	SM	12.7	NV	NP	8.4	111.4											
B-78	0.0	5.0	1227+00	95 R	SP-SM	11.8	NV	NP	7.3												
B-78	15.0	16.5	1227+00	95 R	SC	48.1	45	23	11.8												
B-78	30.0	31.5	1227+00	95 R	SM	13.6	NV	NP	6.3												
B-78	65.0	66.0	1227+00	95 R											X						
B-79	0.0	5.0	1226+00	890 L	SC	33.9	27	10	9.4												
B-80	0.0	5.0	1225+50	800 R	CL	56.9	27	10	9.9		12.9	118.8	2.0								
B-80	10.0	11.0	1225+50	800 R											X						
B-83	0.0	5.0	1231+40	135 L	SC	27.1	26	8	3.9												
B-83	10.0	11.0	1231+40	135 L										X							
B-83	40.0	41.0	1231+40	135 L											X						
B-84	0.0	5.0	1228+50	115 R	SC	16.6	33	12	7.2												
B-84	16.0	17.5	1228+50	115 R	ML	54.6	NV	NP	9.5												
B-84	35.0	36.5	1228+50	115 R	CL-ML	56.8	27	6	13.4												
B-85	0.0	5.0	1230+00	115 R	SC	13.8	30	12	7.9												

TABLE B-1: SUMMARY OF LABORATORY TEST RESULTS

Boring Number	Sample Depth (feet)		Stationing (feet)	CST CL Offset (feet)	USCS/Group Symbol (ASTM D2487)	Percent Fines (minus #200) (ASTM C136)	Liquid Limit (ASTM D4318)	Plasticity Index (ASTM D4318)	Moisture Content (%) (ASTM D2216/T265)	In-Place Dry Density (pcf) (ASTM D2937)	Optimum Moisture Content (%)[1] (ASTM D698A)	Maximum Dry Density (pcf)[1] (ASTM D698A)	Expansion (%) (ASTM D4546)	Consolidation (%) (ASTM D2435)	Direct Shear (ASTM D3080)	R-Value (ASTM D2844)	pH (AZ 236)	Resistivity (ohm-cm) (AZ 236)	Sulfates (ppm) (AZ 733)	Chlorides (ppm) (AZ 736)	ADOT Topsoil Suite
	Begin	End																			
B-85	15.0	16.0	1230+00	115 R										X							
B-85	45.0	46.0	1230+00	115 R											X						
B-85A	0.0	2.5	1231+80	112 R	SC	21.4	43	27	4.7		10.2	125.2			X						
B-85B	0.0	2.5	1233+30	112 R	SC	28.6	26	11	3.1												
B-85B	2.5	3.5	1233+30	112 R											X						
B-87	0.0	5.0	1236+00	130 R	SC	35.6	30	14	5.9												
B-87	15.0	16.0	1236+00	130 R	SM	12.1	NV	NP	2.4	111.2											
B-89	0.0	5.0	1241+50	120 L	SC	44.7	33	13	7.7		13.2	117.3	0.9								
B-90	0.0	5.0	1242+85	170 L	SC	48.1	34	13	8.1												
B-90	5.0	6.0	1242+85	170 L										X							
B-90	20.0	21.5	1242+85	170 L	SM	20.1	NV	NP	4.7												
B-90	30.0	31.5	1242+85	170 L	SM	16.3	NV	NP	5.9												
B-91	5.0	6.0	1244+40	165 L											X						
B-91	10.0	11.0	1244+40	165 L	SC	14.9	32	11	3.8	96.67											
B-91	20.0	21.5	1244+40	165 L	ML	55.7	NV	NP													
B-91	25.0	26.5	1244+40	165 L	SM	15.6	NV	NP													
B-91	45.0	46.5	1244+40	165 L	SC	33.2	32	12													
B-91A	5.0	6.0	1244+40	160 L										X							
B-92	0.0	5.0	1246+00	155 L	SC	23.6	27	8								63					
B-92	5.0	6.0	1246+00	155 L										X							
B-92	10.0	11.5	1246+00	155 L	SM	20.7	30	6	4.3												
B-92	30.0	31.5	1246+00	155 L	SM	49.7	32	7													
B-92	45.0	46.5	1246+00	155 L	SM	24.4	NV	NP	11.5												
B-93	0.0	5.0	1247+40	235 L	SC	33.5	30	10	2.3												

TABLE B-1: SUMMARY OF LABORATORY TEST RESULTS

Boring Number	Sample Depth (feet)		Stationing (feet)	CST CL Offset (feet)	USCS/Group Symbol (ASTM D2487)	Percent Fines (minus #200) (ASTM C136)	Liquid Limit (ASTM D4318)	Plasticity Index (ASTM D4318)	Moisture Content (%) (ASTM D2216/T265)	In-Place Dry Density (pcf) (ASTM D2937)	Optimum Moisture Content (%)[1] (ASTM D698A)	Maximum Dry Density (pcf)[1] (ASTM D698A)	Expansion (%) (ASTM D4546)	Consolidation (%) (ASTM D2435)	Direct Shear (ASTM D3080)	R-Value (ASTM D2844)	pH (AZ 236)	Resistivity (ohm-cm) (AZ 236)	Sulfates (ppm) (AZ 733)	Chlorides (ppm) (AZ 736)	ADOT Topsoil Suite
	Begin	End																			
B-94	0.0	5.0	1247+40	145 L	SM	28.7	NV	NP								73	8.03	677	10	63	
B-94	2.5	3.5	1247+40	145 L																	
B-94	5.0	6.0	1247+40	145 L	SC	15.2	34	16						X							
B-94	10.0	11.0	1247+40	145 L										X							
B-94	30.0	31.5	1247+40	145 L	SM	42.1	NV	NP													
B-94	55.0	56.5	1247+40	145 L	SP-SM	11.0	NV	NP	7.0												
B-95	0.0	5.0	1248+90	135 L	SC	22	43	19	6.5												
B-95	5.0	5.9	1248+90	135 L					3.2	121.19											
B-95	15.0	16.2	1248+90	135 L	SC	46.8	44	20													
B-95	45.0	46.5	1248+90	135 L	SM	33	NV	NP													
B-95	55.0	56.5	1248+90	135 L	SC	45.6	57	30	23.0												
B-96	0.0	5.0	1250+30	135 L	SC	14.9	36	15									8.69	2,573	7	32	
B-96	5.0	6.0	1250+30	135 L	CL	64.1	45	24													
B-96	15.0	16.0	1250+30	135 L					6.3	108.21											
B-96	30.0	31.5	1250+30	135 L	ML	54.9	27	4													
B-96	35.0	36.5	1250+30	135 L	SP-SM	11.3	NV	NP	4.2												
B-96	55.0	56.5	1250+30	135 L	SM	18.6	NV	NP	8.4												
B-97	0.0	5.0	1240+00	190 R	SC	41.2	33	15	7.5		13.0	120.0	1.7								
B-97A	0.0	2.5	1242+70	120 R	SC	42.8	29	14	4.7		8.9	127.2									
B-97A	2.5	3.5	1242+70	120 R										X							
B-98	0.0	5.0	1243+50	95 R	SC	42.8	29	12	7.5								9.03	1,625	6	22	
B-98	5.0	6.0	1243+50	95 R										X							
B-98	10.0	11.5	1243+50	95 R	SC	22.9	29	12	6.6												
B-98A	0.0	2.5	1244+50	115 R	SC	39	30	15	4.3												

TABLE B-1: SUMMARY OF LABORATORY TEST RESULTS

Boring Number	Sample Depth (feet)		Stationing (feet)	CST CL Offset (feet)	USCS/Group Symbol (ASTM D2487)	Percent Fines (minus #200) (ASTM C136)	Liquid Limit (ASTM D4318)	Plasticity Index (ASTM D4318)	Moisture Content (%) (ASTM D2216/T265)	In-Place Dry Density (pcf) (ASTM D2937)	Optimum Moisture Content (%)[1] (ASTM D698A)	Maximum Dry Density (pcf)[1] (ASTM D698A)	Expansion (%) (ASTM D4546)	Consolidation (%) (ASTM D2435)	Direct Shear (ASTM D3080)	R-Value (ASTM D2844)	pH (AZ 236)	Resistivity (ohm-cm) (AZ 236)	Sulfates (ppm) (AZ 733)	Chlorides (ppm) (AZ 736)	ADOT Topsoil Suite
	Begin	End																			
B-99	0.0	5.0	1247+00	110 R	SC	25.9	27	9	6.8												
B-99	20.0	21.5	1247+00	110 R	SP-SM	9.2	NV	NP	2.6												
B-99	45.0	46.0	1247+00	110 R	SC	32.6	31	10	13.3	110.8											
B-100	0.0	5.0	1248+50	110 R	SC	36.9	26	9	8.6		12.3	126.3	1.5								
B-100	15.0	16.5	1248+50	110 R	SC	45.1	34	13	10.0												
B-100	30.0	31.0	1248+50	110 R	SM	33.1	NV	NP	12.0	92.2											
B-100	40.0	41.0	1248+50	110 R	SC	44.2	38	17	20.5	103.1											
B-101	0.0	5.0	1250+10	110 R	SC	30.8	25	9	4.2								8.42	1,016	9	175	
B-101	20.0	21.5	1250+10	110 R	SM	30.4	35	8	9.8												
B-101	30.0	31.0	1250+10	110 R											X						
B-101	35.0	36.0	1250+10	110 R	SM	37.8	NV	NP	14.2	98.4											
B-102	7.5	10.0	1251+50	105 L	SC	45.8	32	14	11.5												
B-102	15.0	17.5	1251+50	105 L	SC	32.6	33	13	12.2												
B-102	25.0	26.5	1251+50	105 L	CL	51.2	37	13	19.5												
B-102	30.0	31.5	1251+50	105 L	SM	37.8	NV	NP	13.6								8.86	1,693	6	73	
B-102	42.5	45.0	1251+50	105 L	CL	56.1	39	16	28.3												
B-102	57.5	60.0	1251+50	105 L	SM	26	NV	NP	7.8								9.14	2,031	7	17	
B-102	97.5	100.0	1251+50	105 L	GC	29.4	45	25	23.4												
B-103	0.0	5.0	1251+50	105 R	SC	24	32	10	5.5												
B-103	10.0	11.0	1251+50	105 R	SM	19.5	38	10	6.0												
B-103	25.0	26.0	1251+50	105 R											X						
B-103	30.0	31.5	1251+50	105 R	ML	67.9	39	8	16.3												
B-103	60.0	61.5	1251+50	105 R	SP-SM	11.2	NV	NP	8.8												
B-103	85.0	86.0	1251+50	105 R					23.3	100.5											

TABLE B-1: SUMMARY OF LABORATORY TEST RESULTS

Boring Number	Sample Depth (feet)		Stationing (feet)	CST CL Offset (feet)	USCS/Group Symbol (ASTM D2487)	Percent Fines (minus #200) (ASTM C136)	Liquid Limit (ASTM D4318)	Plasticity Index (ASTM D4318)	Moisture Content (%) (ASTM D2216/T265)	In-Place Dry Density (pcf) (ASTM D2937)	Optimum Moisture Content (%)[1] (ASTM D698A)	Maximum Dry Density (pcf)[1] (ASTM D698A)	Expansion (%) (ASTM D4546)	Consolidation (%) (ASTM D2435)	Direct Shear (ASTM D3080)	R-Value (ASTM D2844)	pH (AZ 236)	Resistivity (ohm-cm) (AZ 236)	Sulfates (ppm) (AZ 733)	Chlorides (ppm) (AZ 736)	ADOT Topsoil Suite
	Begin	End																			
B-104	5.0	6.5	1253+10	120 L	SC	20.4	26	9													
B-104	22.5	25.0	1253+10	120 L	GC	30.2	25	8									8.8	1,896	6	17	
B-104	37.5	40.0	1253+10	120 L	SM	42.1	NV	NP													
B-104	47.5	50.0	1253+10	120 L	SC	46	30	12											7	49	
B-105	12.5	15.0	1253+00	105 R	SC	19.9	30	12	7.2												
B-105	17.5	20.0	1253+00	105 R	GC	23.3	28	10	7.8												
B-105	30.0	31.0	1253+00	105 R											X						
B-105	45.0	46.0	1253+00	105 R											X						
B-105	95.0	96.0	1253+00	105 R					22.7	103.9											
B-106	0.0	5.0	1251+70	740 L	SC	31.9	28	12	10.1												
B-107	0.0	5.0	1252+70	615 R	CL	50.6	27	10	11.7		12.7	124.4	2.4								
B-108	0.0	5.0	1253+60	205 L	SC	41.8	30	12									8.56	745	13	203	
B-108	5.0	6.0	1253+60	205 L											X						
B-108	15.0	16.5	1253+60	205 L	SC	15.6	29	11													
B-109	10.0	15.0	1254+20	135 L	SM	16.7	NV	NP													
B-109	27.5	30.0	1254+20	135 L	GC	45.5	41	17													
B-109	37.5	40.0	1254+20	135 L	SM	37.9	NV	NP													
B-110	12.5	15.0	1255+80	130 L	SC	41.5	34	15													
B-110	22.5	25.0	1255+80	130 L	CL	71.7	36	13													
B-111	7.5	10.0	1257+30	135 L	SM	49.2	NV	NP	8.4												
B-111	17.5	20.0	1257+30	135 L	SM	32.9	NV	NP	7.3												
B-111	32.5	35.0	1257+30	135 L	CL	79	38	14													
B-112	0.0	5.0	1258+90	135 L	SC	34.8	32	11	3.4		12.9	117.5	1.3								
B-112	10.0	11.0	1258+90	135 L											X						

TABLE B-1: SUMMARY OF LABORATORY TEST RESULTS

Boring Number	Sample Depth (feet)		Stationing (feet)	CST CL Offset (feet)	USCS/Group Symbol (ASTM D2487)	Percent Fines (minus #200) (ASTM C136)	Liquid Limit (ASTM D4318)	Plasticity Index (ASTM D4318)	Moisture Content (%) (ASTM D2216/T265)	In-Place Dry Density (pcf) (ASTM D2937)	Optimum Moisture Content (%)[1] (ASTM D698A)	Maximum Dry Density (pcf)[1] (ASTM D698A)	Expansion (%) (ASTM D4546)	Consolidation (%) (ASTM D2435)	Direct Shear (ASTM D3080)	R-Value (ASTM D2844)	pH (AZ 236)	Resistivity (ohm-cm) (AZ 236)	Sulfates (ppm) (AZ 733)	Chlorides (ppm) (AZ 736)	ADOT Topsoil Suite
	Begin	End																			
B-112	15.0	16.2	1258+90	135 L	SC	28.8	29	12													
B-112	40.0	41.0	1258+90	135 L			37	10	8.5	106.6											
B-113	0.0	5.0	1260+30	140 L	SC	34.4	29	11	2.2		11.6	125.3	1.2				8.98	2,370	6	58	
B-113	5.0	6.0	1260+30	140 L										X							
B-113	10.0	11.0	1260+30	140 L											X						
B-113	35.0	36.0	1260+30	140 L	ML	63.2	31	6	18.9	86.7											
B-113A	5.0	6.0	1260+30	135 L										X							
B-114	0.0	5.0	1260+50	210 L	SC	40.3	31	12			12.7	115.9	1.6								
B-114	10.0	11.0	1260+50	210 L					14.3	108.3											
B-114	15.0	16.5	1260+50	210 L	SM	43.9	NV	NP													
B-115	0.0	5.0	1254+20	105 R	SC	19.2	30	11	6.8												
B-115	5.0	6.0	1254+20	105 R										X							
B-115	30.0	31.0	1254+20	105 R											X						
B-115	45.0	46.5	1254+20	105 R	SC	37.5	28	11	14.5												
B-116	0.0	5.0	1255+75	100 R													9.47	4,536	193	22	
B-116	20.0	20.5	1255+75	100 R					15.5	88.3											
B-116	30.0	31.0	1255+75	100 R	SM	44.4	NV	NP	15.2	98.0											
B-117	10.0	10.8	1257+15	100 R					13.0	103.5											
B-117	35.0	36.0	1257+15	100 R	SP-SM	9.8	NV	NP	7.1	103.0											
B-118	0.0	5.0	1258+65	105 R	SM	19.2	NV	NP	5.2												
B-118	10.0	11.0	1258+65	105 R										X							
B-119	0.0	5.0	1260+20	100 R													9.41	5,890	139	21	
B-119	2.5	3.5	1260+20	100 R					4.8	113.9											
B-119	25.0	25.9	1260+20	100 R					6.9	91.5											

TABLE B-1: SUMMARY OF LABORATORY TEST RESULTS

Boring Number	Sample Depth (feet)		Stationing (feet)	CST CL Offset (feet)	USCS/Group Symbol (ASTM D2487)	Percent Fines (minus #200) (ASTM C136)	Liquid Limit (ASTM D4318)	Plasticity Index (ASTM D4318)	Moisture Content (%) (ASTM D2216/T265)	In-Place Dry Density (pcf) (ASTM D2937)	Optimum Moisture Content (%)[1] (ASTM D698A)	Maximum Dry Density (pcf)[1] (ASTM D698A)	Expansion (%) (ASTM D4546)	Consolidation (%) (ASTM D2435)	Direct Shear (ASTM D3080)	R-Value (ASTM D2844)	pH (AZ 236)	Resistivity (ohm-cm) (AZ 236)	Sulfates (ppm) (AZ 733)	Chlorides (ppm) (AZ 736)	ADOT Topsoil Suite
	Begin	End																			
B-119	30.0	31.0	1260+20	100 R											X						
B-119A	0.0	2.5	1262+70	150 R	SC-SM	25.7	21	5	2.8		10.1	127.4									
B-119A	2.5	3.5	1262+70	150 R											X						
B-119B	0.0	2.5	1264+70	165 R	SC-SM	26.3	20	4	4.7												
B-119B	25.0	25.1	1264+70	165 R	SP-SM	9.1	NV	NP	6.9												
B-120	0.0	5.0	1265+00	190 L	SC	34.2	31	12	3.7												
B-120	10.0	11.5	1265+00	190 L	SM	37.5	NV	NP							X						
B-121	0.0	5.0	1269+00	190 L	SC	37.1	29	9									9.04	2,031	6	6	
B-121	5.0	6.0	1269+00	190 L										X							
B-122	0.0	5.0	1273+00	240 L	SC	37.2	28	9													
B-122	10.0	11.0	1273+00	240 L					2.1	100.6											
B-123	0.0	5.0	1276+00	130 L	SM	30.1	NV	NP	11.0								9.17	4,536	4	3	
B-124	0.0	5.0	1268+80	190 R	SC	38.3	34	11	5.4		13.1	117.8	1.5								
B-124A	0.0	2.5	1272+50	105 R	SC	23.7	29	15	6.4		7.3	130.9									
B-124A	10.0	11.0	1272+50	105 R											X						
B-124A	15.0	16.5	1272+50	105 R	SC	32.4	35	16	8.6												
B-124B	1.0	5.0	1274+50	100 R	SC	30.4	27	12	7.1		11.3	122.3			X						
B-124B	10.0	11.0	1274+50	100 R										X							
B-125	0.0	5.0	1276+85	155 R	SC	31.2	31	11	10.3												
B-126	0.0	1.5	1065+90	1150 R	SC-SM	43	23	7	7.8												
B-126	5.0	9.0	1065+90	1150 R	CL	62	25	10	11.7								8.9	1,080			
B-127	5.0	9.0	1072+10	1150 R	SM	35	NV	NP	7.8												
B-127	9.5	11.0	1072+10	1150 R	CL-ML	89	26	7	18.7												
B-128	1.0	4.0	1080+65	1150 R	CL	63	29	15	15.3		15.7	110.7				9					

TABLE B-1: SUMMARY OF LABORATORY TEST RESULTS

Boring Number	Sample Depth (feet)		Stationing (feet)	CST CL Offset (feet)	USCS/Group Symbol (ASTM D2487)	Percent Fines (minus #200) (ASTM C136)	Liquid Limit (ASTM D4318)	Plasticity Index (ASTM D4318)	Moisture Content (%) (ASTM D2216/T265)	In-Place Dry Density (pcf) (ASTM D2937)	Optimum Moisture Content (%)[1] (ASTM D698A)	Maximum Dry Density (pcf)[1] (ASTM D698A)	Expansion (%) (ASTM D4546)	Consolidation (%) (ASTM D2435)	Direct Shear (ASTM D3080)	R-Value (ASTM D2844)	pH (AZ 236)	Resistivity (ohm-cm) (AZ 236)	Sulfates (ppm) (AZ 733)	Chlorides (ppm) (AZ 736)	ADOT Topsoil Suite
	Begin	End																			
B-129	0.0	5.0	1081+50	50 R	CL	86	31	14	10.5										64	110	
B-129	10.0	11.0	1081+50	50 R	ML	59	NV	NP	9.6	89.8				X							
B-129	25.0	26.0	1081+50	50 R	GP	2.9	NV	NP	2.4												
B-129	50.0	51.5	1081+50	50 R	GP	3.6	37	22	14.0												
B-129A	0.0	4.0	1081+10	10 L	CL	93	34	16	8.4										18	314	
B-129A	3.0	4.0	1081+10	10 L					12.6	104.3											
B-129A	15.0	16.0	1081+10	10 L					21.4	103.6											
B-129A	20.0	21.5	1081+10	10 L	SP-SM	6.2	NV	NP	3.7												
B-130	10.0	11.0	1083+65	35 R	CL-ML	87.7	27	6	17.8	96.8				X							
B-130	20.0	21.5	1083+65	35 R	GP	3.2	NV	NP	2.5												
B-130	55.0	56.0	1083+65	35 R					10.3	129.4											
B-131	5.0	6.0	1085+20	75 L	CL	98	37	17	15.8	80.3				X							
B-131	20.0	21.0	1085+20	75 L	SP-SM	8.4	NV	NP	4.0	97.8											
B-131	35.0	36.0	1085+20	75 L					2.4	113.1											
B-131	55.0	56.5	1085+20	75 L	SP	3.1	NV	NP	15.5												
B-132	1.0	2.0	1086+40	45 R					9.6	86.1											
B-132	10.0	11.0	1086+40	45 R	CL	81	33	10							X						
B-132	30.0	31.5	1086+40	45 R	GP-GM	5.5	NV	NP	2.3												
B-133	1.0	2.0	1084+50	90 L	CL	98	33	16	10.7	91.9				X							
B-133	10.0	11.0	1084+50	90 L	ML	56	NV	NP							X						
B-133	20.0	21.5	1084+50	90 L	SP	4.3	NV	NP	0.7												
B-133	35.0	36.5	1084+50	90 L	GP-GM	6.2	NV	NP	3.3												
B-133	60.0	61.0	1084+50	90 L					12.8	119.9											
B-134	0.0	5.0	1086+30	60 L	CL	85	27	11	11.2												

TABLE B-1: SUMMARY OF LABORATORY TEST RESULTS

Boring Number	Sample Depth (feet)		Stationing (feet)	CST CL Offset (feet)	USCS/Group Symbol (ASTM D2487)	Percent Fines (minus #200) (ASTM C136)	Liquid Limit (ASTM D4318)	Plasticity Index (ASTM D4318)	Moisture Content (%) (ASTM D2216/T265)	In-Place Dry Density (pcf) (ASTM D2937)	Optimum Moisture Content (%)[1] (ASTM D698A)	Maximum Dry Density (pcf)[1] (ASTM D698A)	Expansion (%) (ASTM D4546)	Consolidation (%) (ASTM D2435)	Direct Shear (ASTM D3080)	R-Value (ASTM D2844)	pH (AZ 236)	Resistivity (ohm-cm) (AZ 236)	Sulfates (ppm) (AZ 733)	Chlorides (ppm) (AZ 736)	ADOT Topsoil Suite
	Begin	End																			
B-134	10.0	11.0	1086+30	60 L					6.9	93.8											
B-134	15.0	16.5	1086+30	60 L	CL	77	28	13	11.1												
B-134	40.0	41.0	1086+30	60 L	GP	3.1	NV	NP							X						
B-134	60.0	61.5	1086+30	60 L	GP-GM	7.7	NV	NP	7.0												
B-135	5.0	6.0	1088+30	115 L	CL	94	30	11	12.8	87.2				X							
B-135	20.0	21.0	1088+30	115 L	SP	4.9	NV	NP							X						
B-135	30.0	31.5	1088+30	115 L	GP-GM	7.6	NV	NP	2.3												
B-135	55.0	56.5	1088+30	115 L															14	204	
B-135	65.0	66.0	1088+30	115 L					12.3	119.2											
B-135	75.0	76.5	1088+30	115 L	SP-SM	11	NV	NP	0.5												
B-136	5.0	6.0	1089+30	20 L	CL	94	28	10	13.0	102.6											
B-136	20.0	21.0	1089+30	20 L					2.4	97.3											
B-136	30.0	31.5	1089+30	20 L															9	55	
B-136	40.0	41.3	1089+30	20 L	GP	4.9	NV	NP	0.8												
B-136	55.0	56.5	1089+30	20 L	SC	18	31	16	6.5												
B-136	65.0	66.0	1089+30	20 L	GP	3.4	NV	NP							X						
B-136	85.0	86.5	1089+30	20 L	SP-SM	9.5	NV	NP	4.0												
B-137	5.0	6.5	1089+60	110 L															1,011	59	
B-137	10.0	11.0	1089+60	110 L	CL-ML	86	27	6							X						
B-137	40.0	41.5	1089+60	110 L	GP	2.2	NV	NP	0.4												
B-137	60.0	61.5	1089+60	110 L	SC	17	29	12	9.2												
B-137	75.0	76.5	1089+60	110 L	SP-SM	10	NV	NP	0.8												
B-137	95.0	96.5	1089+60	110 L	SC-SM	22	26	6	4.9												
B-138	5.0	6.0	1090+40	20 L	ML	92	NV	NP	18.7	98.9				X							

TABLE B-1: SUMMARY OF LABORATORY TEST RESULTS

Boring Number	Sample Depth (feet)		Stationing (feet)	CST CL Offset (feet)	USCS/Group Symbol (ASTM D2487)	Percent Fines (minus #200) (ASTM C136)	Liquid Limit (ASTM D4318)	Plasticity Index (ASTM D4318)	Moisture Content (%) (ASTM D2216/T265)	In-Place Dry Density (pcf) (ASTM D2937)	Optimum Moisture Content (%)[1] (ASTM D698A)	Maximum Dry Density (pcf)[1] (ASTM D698A)	Expansion (%) (ASTM D4546)	Consolidation (%) (ASTM D2435)	Direct Shear (ASTM D3080)	R-Value (ASTM D2844)	pH (AZ 236)	Resistivity (ohm-cm) (AZ 236)	Sulfates (ppm) (AZ 733)	Chlorides (ppm) (AZ 736)	ADOT Topsoil Suite
	Begin	End																			
B-138	15.0	16.0	1090+40	20 L	SP-SM	8.6	NV	NP							X						
B-138	25.0	26.5	1090+40	20 L	GP	3.4	NV	NP	2.6												
B-138	75.0	76.5	1090+40	20 L															64	188	
B-138	80.0	81.5	1090+40	20 L	SC	23	31	14	7.6												
B-138	105.0	106.5	1090+40	20 L	SM	14	NV	NP	5.5												
B-139	5.0	6.0	1091+50	110 L	CL	96	36	17	20.4	94.6					X						
B-139	15.0	16.5	1091+50	110 L															6	48	
B-139	30.0	31.5	1091+50	110 L	GP	1	NV	NP	4.9												
B-139	45.0	46.5	1091+50	110 L	GP	3	NV	NP	11.3												
B-139	65.0	66.0	1091+50	110 L	SP	3	NV	NP	13.0	120.6											
B-139	95.0	96.5	1091+50	110 L	SP-SM	11	NV	NP	16.6												
B-140	15.0	16.5	1092+70	10 L	CL	74	30	14	18.5												
B-140	30.0	31.5	1092+70	10 L															3	10	
B-140	40.0	40.8	1092+70	10 L	GP	3	NV	NP							X						
B-140	75.0	76.5	1092+70	10 L	GC	12	26	8	7.8												
B-140	85.0	86.5	1092+70	10 L	SP-SM	8	NV	NP	15.6												
B-140	110.0	111.5	1092+70	10 L	SM	18	NV	NP	16.9												
B-141	0.0	4.5	1092+65	110 L	CL	92	31	13	19.4												
B-141	10.0	11.0	1092+65	110 L	SM	50	NV	NP	14.1	93.2				X							
B-141	15.0	16.5	1092+65	110 L					13.0												
B-141	20.0	21.5	1092+65	110 L					5.6												
B-141	55.0	56.0	1092+65	110 L	SC	50	44	27	27.8	94.3											
B-141	90.0	90.9	1092+65	110 L	SC	20	29	12	17.8												
B-142	5.0	6.0	1093+85	10 L	CL-ML	92	26	7	17.6	99.0				X							

TABLE B-1: SUMMARY OF LABORATORY TEST RESULTS

Boring Number	Sample Depth (feet)		Stationing (feet)	CST CL Offset (feet)	USCS/Group Symbol (ASTM D2487)	Percent Fines (minus #200) (ASTM C136)	Liquid Limit (ASTM D4318)	Plasticity Index (ASTM D4318)	Moisture Content (%) (ASTM D2216/T265)	In-Place Dry Density (pcf) (ASTM D2937)	Optimum Moisture Content (%)[1] (ASTM D698A)	Maximum Dry Density (pcf)[1] (ASTM D698A)	Expansion (%) (ASTM D4546)	Consolidation (%) (ASTM D2435)	Direct Shear (ASTM D3080)	R-Value (ASTM D2844)	pH (AZ 236)	Resistivity (ohm-cm) (AZ 236)	Sulfates (ppm) (AZ 733)	Chlorides (ppm) (AZ 736)	ADOT Topsoil Suite
	Begin	End																			
B-142	20.0	21.0	1093+85	10 L					3.8	101.0											
B-143	3.0	4.5	1089+30	365 L					17.4												
B-143	5.0	6.5	1089+30	365 L	CL	98	32	15	15.4												
B-143	10.0	11.0	1089+30	365 L	ML	57	NV	NP	10.3	94.5				X							
B-143	20.0	21.0	1089+30	365 L	SM	32	NV	NP	5.0	89.4											
B-144	0.5	5.0	1101+80	65 L	CL-ML	72	22	7	9.9												
B-144	3.0	4.0	1101+80	65 L					8.5	105.4				X							
B-144	15.0	16.0	1101+80	65 L	ML	81.2	27	4	16.8	96.8											
B-144	25.0	26.5	1101+80	65 L	SP-SM	5.0	NV	NP	0.2												
B-144	30.0	31.0	1101+80	65 L					2.8	94.2											
B-145	1.0	2.0	1106+70	90 L					7.0	98.9											
B-145	10.0	11.0	1106+70	90 L	CL-ML	86	23	4	15.1	92.3											
B-145	15.0	16.5	1106+70	90 L					21.7												
B-145	20.0	21.5	1106+70	90 L															58	77	
B-145	25.0	26.0	1106+70	90 L	SM	49	NV	NP							X						
B-145	35.0	36.5	1106+70	90 L	GP-GM	6.4	NV	NP	4.5												
B-145	55.0	56.0	1106+70	90 L	GP-GM	6	NV	NP							X						
B-145	75.0	76.5	1106+70	90 L	SP	1	38	24	20.3												
B-146	5.0	6.0	1107+50	CST CL					11.4	97.3											
B-146	15.0	16.0	1107+50	CST CL	CL	92	32	14							X						
B-146	30.0	31.5	1107+50	CST CL	SP-SM	6.6	NV	NP	0.1												
B-146	50.0	51.5	1107+50	CST CL															33	75	
B-146	55.0	56.5	1107+50	CST CL	GP-GM	7.9	NV	NP	0.4												
B-146	65.0	66.5	1107+50	CST CL	GC	33	34	14	0.2												

TABLE B-1: SUMMARY OF LABORATORY TEST RESULTS

Boring Number	Sample Depth (feet)		Stationing (feet)	CST CL Offset (feet)	USCS/Group Symbol (ASTM D2487)	Percent Fines (minus #200) (ASTM C136)	Liquid Limit (ASTM D4318)	Plasticity Index (ASTM D4318)	Moisture Content (%) (ASTM D2216/T265)	In-Place Dry Density (pcf) (ASTM D2937)	Optimum Moisture Content (%)[1] (ASTM D698A)	Maximum Dry Density (pcf)[1] (ASTM D698A)	Expansion (%) (ASTM D4546)	Consolidation (%) (ASTM D2435)	Direct Shear (ASTM D3080)	R-Value (ASTM D2844)	pH (AZ 236)	Resistivity (ohm-cm) (AZ 236)	Sulfates (ppm) (AZ 733)	Chlorides (ppm) (AZ 736)	ADOT Topsoil Suite
	Begin	End																			
B-146	80.0	81.5	1107+50	CST CL	SP-SM	9.3	NV	NP	0.6												
B-147	5.0	6.0	1107+85	95 L	ML	62	NV	NP	13.1	97.0				X							
B-147	15.0	16.0	1107+85	95 L	CL	93	35	14							X						
B-147	25.0	26.5	1107+85	95 L															22	320	
B-147	35.0	36.5	1107+85	95 L	GP-GM	8	NV	NP	6.4												
B-147	65.0	66.0	1107+85	95 L	SP	1.9	34	18	10.3												
B-147	80.0	81.5	1107+85	95 L	SP	0.5	NV	NP	11.7												
B-148	0.0	5.0	1108+60	CST CL	ML	66	20	3	12.0										19	113	
B-148	1.0	2.0	1108+60	CST CL					16.7	101.6											
B-148	10.0	11.0	1108+60	CST CL	SM	22	NV	NP							X						
B-148	20.0	21.5	1108+60	CST CL	SM	33	NV	NP	11.2												
B-148	25.0	26.0	1108+60	CST CL					28.1	94.9											
B-148	30.0	31.5	1108+60	CST CL					3.6												
B-148	45.0	46.5	1108+60	CST CL	GP	2.8	NV	NP	3.6												
B-148	70.0	71.5	1108+60	CST CL	SP	2.1	28	9	11.0												
B-148	90.0	91.5	1108+60	CST CL	SP-SM	11	NV	NP	17.1												
B-149	10.0	11.0	1111+00	80 L	SM	27	NV	NP	7.8	110.2											
B-149	20.0	21.0	1111+00	80 L	CL	77	34	15	26.1	99.3											
B-150	0.5	5.0	1115+90	70 L	ML	75	NV	NP	31.6												
B-150	5.0	6.0	1115+90	70 L					16.0	107.4				X							
B-150	15.0	16.0	1115+90	70 L	ML	50	NV	NP	8.5	100.4											
B-151-153A	0.0	5.0	---	---	SC-SM	32	22	6	2.8								8.2	510	293	448	
B-151-153B	0.0	5.0	---	---	SM	13	NV	NP	2.9								8.8	4,270	83	29	
B-151	5.0	6.0	1121+00	85 L					3.7	97.5				X							

TABLE B-1: SUMMARY OF LABORATORY TEST RESULTS

Boring Number	Sample Depth (feet)		Stationing (feet)	CST CL Offset (feet)	USCS/Group Symbol (ASTM D2487)	Percent Fines (minus #200) (ASTM C136)	Liquid Limit (ASTM D4318)	Plasticity Index (ASTM D4318)	Moisture Content (%) (ASTM D2216/T265)	In-Place Dry Density (pcf) (ASTM D2937)	Optimum Moisture Content (%)[1] (ASTM D698A)	Maximum Dry Density (pcf)[1] (ASTM D698A)	Expansion (%) (ASTM D4546)	Consolidation (%) (ASTM D2435)	Direct Shear (ASTM D3080)	R-Value (ASTM D2844)	pH (AZ 236)	Resistivity (ohm-cm) (AZ 236)	Sulfates (ppm) (AZ 733)	Chlorides (ppm) (AZ 736)	ADOT Topsoil Suite
	Begin	End																			
B-151	20.0	21.0	1121+00	85 L					16.3	96.0											
B-152	10.0	11.5	1125+60	70 L	CL-ML	60	21	4	4.0												
B-152	20.0	21.0	1125+60	70 L					7.8	102.2											
B-153	5.0	6.0	1128+60	4 R					3.6	102.4											
B-154	0.0	5.0	1131+50	85 L	SM	32	NV	NP	1.8												
B-154	5.0	6.0	1131+50	85 L					2.8	109.0											
B-154	15.0	16.5	1131+50	85 L	SP-SM	9.7	NV	NP	2.2												
B-154	20.0	21.0	1131+50	85 L					21.4	93.2											
B-155	5.0	6.0	1133+50	40 R	ML	57	21	3	4.0	98.1				X							
B-156	10.0	11.0	1136+45	85 L	SP-SM	7	NV	NP	0.9					X							
B-156	40.0	41.0	1136+45	85 L	CH	90	66	43	27.9	83.6											
B-157	0.0	5.0	1138+90	125 R	SC-SM	42	23	4	4.4		11.5	120.9					8.3	1,020	76	231	
B-157	15.0	16.5	1138+90	125 R					7.5												
B-157	35.0	36.5	1138+90	125 R	CL	58	31	14	18.5												
B-157	40.0	41.0	1138+90	125 R					41.7	77.7											
B-157	50.0	51.5	1138+90	125 R					7.1												
B-157	55.0	56.5	1138+90	125 R	SC	18	32	15	13.7												
B-157	60.0	61.0	1138+90	125 R					20.2	106.3											
B-158	5.0	6.5	1141+50	95 L															9	143	
B-158	10.0	11.5	1141+50	95 L	SC-SM	39	21	6	2.4												
B-158	20.0	21.5	1141+50	95 L	CL	57	39	17	19.9												
B-158	30.0	31.0	1141+50	95 L					14.0	108.8											
B-158	45.0	46.5	1141+50	95 L	CL	54	36	14							X						
B-158	60.0	61.5	1141+50	95 L					38.3	97.2											

TABLE B-1: SUMMARY OF LABORATORY TEST RESULTS

Boring Number	Sample Depth (feet)		Stationing (feet)	CST CL Offset (feet)	USCS/Group Symbol (ASTM D2487)	Percent Fines (minus #200) (ASTM C136)	Liquid Limit (ASTM D4318)	Plasticity Index (ASTM D4318)	Moisture Content (%) (ASTM D2216/T265)	In-Place Dry Density (pcf) (ASTM D2937)	Optimum Moisture Content (%)[1] (ASTM D698A)	Maximum Dry Density (pcf)[1] (ASTM D698A)	Expansion (%) (ASTM D4546)	Consolidation (%) (ASTM D2435)	Direct Shear (ASTM D3080)	R-Value (ASTM D2844)	pH (AZ 236)	Resistivity (ohm-cm) (AZ 236)	Sulfates (ppm) (AZ 733)	Chlorides (ppm) (AZ 736)	ADOT Topsoil Suite
	Begin	End																			
B-158	63.0	64.0	1141+50	95 L	SP	1.9	NV	NP	15.6												
B-158	75.0	76.5	1141+50	95 L					9.8	117.6											
B-159	3.0	4.0	1142+40	CST CL	SC-SM	20	24	7	3.0	104.1				X							
B-159	25.0	26.0	1142+40	CST CL	SC	25	35	14							X						
B-159	40.0	41.0	1142+40	CST CL					19.1	102.0											
B-159	50.0	51.0	1142+40	CST CL	CL	80	48	26	35.3	85.5											
B-159	55.0	56.5	1142+40	CST CL															253	180	
B-159	65.0	66.0	1142+40	CST CL	SP-SM	9	NV	NP	14.9	110.9											
B-160	15.0	16.0	1142+15	110 L					11.4	99.6											
B-160	20.0	21.5	1142+15	110 L	SC	50	35	15	14.7												
B-160	30.0	31.0	1142+15	110 L					11.0	105.9											
B-160	35.0	36.5	1142+15	110 L	SC	41	30	8	14.4												
B-160	45.0	46.0	1142+15	110 L					13.8	101.5											
B-160	60.0	61.0	1142+15	110 L	SM	13	NV	NP							X						
B-160	75.0	76.5	1142+15	110 L															458	347	
B-160	85.0	86.5	1142+15	110 L	SP-SC	6.3	33	17	17.9												
B-161	5.0	6.0	1143+10	5 L	SC	29	27	9	3.6	95.6				X							
B-161	25.0	26.5	1143+10	5 L	CL	61	31	10	9.4												
B-161	30.0	31.0	1143+10	5 L					12.0	101.5											
B-161	35.0	36.5	1143+10	5 L															210	132	
B-161	45.0	46.0	1143+10	5 L	SC	37	30	8							X						
B-161	75.0	76.5	1143+10	5 L	SP-SM	11	NV	NP	10.4												
B-162	0.0	5.0	1143+20	100 L	SM	36	NV	NP	2.1												
B-162	15.0	16.0	1143+20	100 L	SC	25	40	15	13.1												

TABLE B-1: SUMMARY OF LABORATORY TEST RESULTS

Boring Number	Sample Depth (feet)		Stationing (feet)	CST CL Offset (feet)	USCS/Group Symbol (ASTM D2487)	Percent Fines (minus #200) (ASTM C136)	Liquid Limit (ASTM D4318)	Plasticity Index (ASTM D4318)	Moisture Content (%) (ASTM D2216/T265)	In-Place Dry Density (pcf) (ASTM D2937)	Optimum Moisture Content (%)[1] (ASTM D698A)	Maximum Dry Density (pcf)[1] (ASTM D698A)	Expansion (%) (ASTM D4546)	Consolidation (%) (ASTM D2435)	Direct Shear (ASTM D3080)	R-Value (ASTM D2844)	pH (AZ 236)	Resistivity (ohm-cm) (AZ 236)	Sulfates (ppm) (AZ 733)	Chlorides (ppm) (AZ 736)	ADOT Topsoil Suite
	Begin	End																			
B-162	20.0	21.0	1143+20	100 L															309	349	
B-162	35.0	36.0	1143+20	100 L	SC	32	29	9							X						
B-162	50.0	51.0	1143+20	100 L					9.8	110.8											
B-162	65.0	66.0	1143+20	100 L					15.7	99.1											
B-162	70.0	71.5	1143+20	100 L	CH	79	55	34	35.5												
B-163	10.0	11.5	1144+00	10 L	SM	15	NV	NP	10.2	102.0				X							
B-163	24.0	25.0	1144+00	10 L	GC	15	27	13	5.2												
B-163	40.0	41.0	1144+00	10 L	CH	76	58	33							X						
B-163	45.0	46.5	1144+00	10 L															261	299	
B-163	61.5	63.0	1144+00	10 L	SM	18	NV	NP	16.7												
B-164	8.5	10.0	1143+85	165 R	GC-GM	22	24	6	4.7												
B-164	10.0	11.5	1143+85	165 R					10.9	122.2											
B-164	25.0	26.5	1143+85	165 R	SC	26	33	14							X						
B-164	40.0	41.5	1143+85	165 R	SC-SM	45	24	7	16.8	104.6											
B-164	57.0	58.0	1143+85	165 R	CL	60	26	8	15.3												
B-164	65.0	66.5	1143+85	165 R															125	220	
B-164	90.0	91.5	1143+85	165 R					16.2	115.3											
B-165	5.0	6.0	1144+50	160 R	SP-SM	9	NV	NP	2.4	95.4				X							
B-165	40.0	41.5	1144+50	160 R	SM	17	NV	NP	6.7												
B-165	70.0	71.5	1144+50	160 R	SM	29	NV	NP	19.7												
B-166	15.0	16.0	1145+60	170 R	ML	65	NV	NP							X						
B-166	22.0	23.0	1145+60	170 R	SC	46	28	8	12.3												
B-166	28.0	30.0	1145+60	170 R															1,437	103	
B-166	30.0	31.0	1145+60	170 R					14.9	109.0											

TABLE B-1: SUMMARY OF LABORATORY TEST RESULTS

Boring Number	Sample Depth (feet)		Stationing (feet)	CST CL Offset (feet)	USCS/Group Symbol (ASTM D2487)	Percent Fines (minus #200) (ASTM C136)	Liquid Limit (ASTM D4318)	Plasticity Index (ASTM D4318)	Moisture Content (%) (ASTM D2216/T265)	In-Place Dry Density (pcf) (ASTM D2937)	Optimum Moisture Content (%)[1] (ASTM D698A)	Maximum Dry Density (pcf)[1] (ASTM D698A)	Expansion (%) (ASTM D4546)	Consolidation (%) (ASTM D2435)	Direct Shear (ASTM D3080)	R-Value (ASTM D2844)	pH (AZ 236)	Resistivity (ohm-cm) (AZ 236)	Sulfates (ppm) (AZ 733)	Chlorides (ppm) (AZ 736)	ADOT Topsoil Suite
	Begin	End																			
B-166	45.0	46.0	1145+60	170 R	SM	38	NV	NP	14.3	115.6											
B-166	60.0	61.5	1145+60	170 R	CL	73	32	12	21.5												
B-166	65.0	66.0	1145+60	170 R					25.0	98.8											
B-166	72.0	73.0	1145+60	170 R	SP-SM	7.1	NV	NP	14.3												
B-167	0.0	5.0	1146+50	150 R															105	326	
B-167	10.0	11.0	1146+50	150 R	SP-SM	11	NV	NP	1.5	102.7				X	X						
B-167	25.0	26.0	1146+50	150 R	SC	31	31	13	13.1	103.3											
B-167	35.0	36.5	1146+50	150 R			NV	NP	17.6												
B-167	50.0	51.0	1146+50	150 R					14.5	106.3											
B-167	60.0	61.5	1146+50	150 R	CL	63	36	17	24.1												
B-168	0.0	5.0	1148+40	100 L	SC-SM	25	22	6	1.6								8.6	2,030			
B-168	30.0	31.0	1148+40	100 L	SC	40	34	16	21.8	87.9											
B-169	3.0	4.0	1149+15	180 R	GP-GC	10	40	18	7.7					X							
B-169	25.0	25.5	1149+15	180 R	SM	13	NV	NP	1.8	110.2											
B-169	35.0	36.3	1149+15	180 R			NV	NP	15.4												
B-170	0.0	5.0	1152+50	100 L	SM	26	NV	NP	1.2												
B-170	15.0	16.5	1152+50	100 L			NV	NP	1.5												
B-170	25.0	26.5	1152+50	100 L	CH	54	64	42	27.6												
B-170	35.0	36.0	1152+50	100 L					8.5	99.4											
B-171	0.0	3.0	1156+60	CST CL	SM	37	20	3	3.5		9.6	126.3									
B-171	1.0	2.0	1156+60	CST CL					6.3	96.6				X							
B-171	10.0	11.0	1156+60	CST CL					2.0	113.9											
B-171	25.0	26.0	1156+60	CST CL	CH	60	52	31	23.4	93.5											
B-171	45.0	46.5	1156+60	CST CL	CL	53	38	19	24.0												

TABLE B-1: SUMMARY OF LABORATORY TEST RESULTS

Boring Number	Sample Depth (feet)		Stationing (feet)	CST CL Offset (feet)	USCS/Group Symbol (ASTM D2487)	Percent Fines (minus #200) (ASTM C136)	Liquid Limit (ASTM D4318)	Plasticity Index (ASTM D4318)	Moisture Content (%) (ASTM D2216/T265)	In-Place Dry Density (pcf) (ASTM D2937)	Optimum Moisture Content (%)[1] (ASTM D698A)	Maximum Dry Density (pcf)[1] (ASTM D698A)	Expansion (%) (ASTM D4546)	Consolidation (%) (ASTM D2435)	Direct Shear (ASTM D3080)	R-Value (ASTM D2844)	pH (AZ 236)	Resistivity (ohm-cm) (AZ 236)	Sulfates (ppm) (AZ 733)	Chlorides (ppm) (AZ 736)	ADOT Topsoil Suite
	Begin	End																			
B-171	55.0	56.0	1156+60	CST CL					18.9	98.5											
B-172	10.0	11.0	1155+25	230 R	SM	24	NV	NP	3.7	103.2				X							
B-172	25.0	26.0	1155+25	230 R	CL	71	45	24	24.8	95.7											
B-172	40.0	41.0	1155+25	230 R	SM	25	NV	NP													
B-172	55.0	56.0	1155+25	230 R					11.6	108.7											
B-172	65.0	66.0	1155+25	230 R					15.7	116.1											
B-172	56.5	58.5	1155+25	230 R	SM	21	NV	NP	8.9												
B-172	75.0	76.0	1155+25	230 R	SC	29	41	23	0.4												
B-173	5.0	6.0	1157+10	230 R	SM	27	NV	NP	5.2	107.1				X							
B-173	11.5	13.0	1157+10	230 R	CL	52	34	12	13.9												
B-173	20.0	21.0	1157+10	230 R	CL	78	42	17							X						
B-173	35.0	36.0	1157+10	230 R					13.7	107.1											
B-173	46.0	48.0	1157+10	230 R	SM	29	NV	NP	8.6												
B-173	57.0	58.5	1157+10	230 R	SC	38	33	15	14.5												
B-173	62.0	63.5	1157+10	230 R															14	202	
B-173	65.0	66.0	1157+10	230 R					16.1	113.9											
B-173	80.5	82.0	1157+10	230 R	SC	19	37	18	1.0												
B-174	1.0	2.0	1159+40	230 R	ML	65	NV	NP	3.1	92.7				X							
B-174	5.0	6.5	1159+40	230 R															56	709	
B-174	10.0	11.0	1159+40	230 R	ML	57	NV	NP							X						
B-174	25.0	26.0	1159+40	230 R	SC	43	33	13	11.4	98.3											
B-174	40.0	41.0	1159+40	230 R	SP-SM	9.1	NV	NP							X						
B-174	60.0	61.0	1159+40	230 R	GP-GC	7.6	36	16	9.2												
B-174	75.0	76.0	1159+40	230 R	SC	36	39	20	17.8	109.0											

TABLE B-1: SUMMARY OF LABORATORY TEST RESULTS

Boring Number	Sample Depth (feet)		Stationing (feet)	CST CL Offset (feet)	USCS/Group Symbol (ASTM D2487)	Percent Fines (minus #200) (ASTM C136)	Liquid Limit (ASTM D4318)	Plasticity Index (ASTM D4318)	Moisture Content (%) (ASTM D2216/T265)	In-Place Dry Density (pcf) (ASTM D2937)	Optimum Moisture Content (%)[1] (ASTM D698A)	Maximum Dry Density (pcf)[1] (ASTM D698A)	Expansion (%) (ASTM D4546)	Consolidation (%) (ASTM D2435)	Direct Shear (ASTM D3080)	R-Value (ASTM D2844)	pH (AZ 236)	Resistivity (ohm-cm) (AZ 236)	Sulfates (ppm) (AZ 733)	Chlorides (ppm) (AZ 736)	ADOT Topsoil Suite
	Begin	End																			
B-175	15.0	17.0	1157+80	95 L															359	183	
B-175	20.0	21.5	1157+80	95 L	SM	13	NV	NP	1.8												
B-175	23.5	25.0	1157+80	95 L	SC	40	31	14	9.1												
B-175	45.0	46.5	1157+80	95 L	CL	75	36	20	23.6												
B-175	83.0	84.0	1157+80	95 L	SC	43	41	24	15.8												
B-176	0.0	5.0	1157+80	5 R	CL-ML	77	24	6	3.5												
B-176	30.0	31.0	1157+80	5 R	SC	49	40	18							X						
B-176	45.0	46.0	1157+80	5 R	CH	84	58	35	16.8	100.8				X							
B-176	60.0	61.0	1157+80	5 R					8.2	101.4											
B-176	65.0	66.5	1157+80	5 R															4	38	
B-176	80.0	81.5	1157+80	5 R	SC	13	42	23	14.4												
B-177	5.0	6.5	1158+75	160 L	CL	59	28	9	4.2												
B-177	15.0	16.5	1158+75	160 L	SP-SM	8.3	NV	NP	2.6												
B-178	10.0	11.0	1158+75	35 L	SP	3	NV	NP	1.8	103.3				X							
B-178	30.0	31.5	1158+75	35 L	CH	57	69	39	32.1												
B-178	40.0	41.0	1158+75	35 L					5.6	96.7											
B-178	50.0	51.5	1158+75	35 L															317	276	
B-178	65.0	66.5	1158+75	35 L	SP-SC	11	41	19	13.0												
B-178	70.0	71.0	1158+75	35 L					19.6	104.4											
B-178	100.0	101.0	1158+75	35 L					21.2	105.2											
B-179	0.0	1.0	1159+75	100 L	SC	49	25	9	4.3	99.5				X							
B-179	10.0	11.0	1159+75	100 L	SP-SM	7	NV	NP							X						
B-179	35.0	36.5	1159+75	100 L	CL	66	35	15	20.3												
B-179	45.0	46.0	1159+75	100 L	SC	46	37	18	19.2	100.8											

TABLE B-1: SUMMARY OF LABORATORY TEST RESULTS

Boring Number	Sample Depth (feet)		Stationing (feet)	CST CL Offset (feet)	USCS/Group Symbol (ASTM D2487)	Percent Fines (minus #200) (ASTM C136)	Liquid Limit (ASTM D4318)	Plasticity Index (ASTM D4318)	Moisture Content (%) (ASTM D2216/T265)	In-Place Dry Density (pcf) (ASTM D2937)	Optimum Moisture Content (%)[1] (ASTM D698A)	Maximum Dry Density (pcf)[1] (ASTM D698A)	Expansion (%) (ASTM D4546)	Consolidation (%) (ASTM D2435)	Direct Shear (ASTM D3080)	R-Value (ASTM D2844)	pH (AZ 236)	Resistivity (ohm-cm) (AZ 236)	Sulfates (ppm) (AZ 733)	Chlorides (ppm) (AZ 736)	ADOT Topsoil Suite
	Begin	End																			
B-179	75.0	76.5	1159+75	100 L	SP	5	NV	NP	13.7												
B-180	0.0	1.5	1159+75	5 L	CL	69	26	10	2.5												
B-180	16.5	18.5	1159+75	5 L	CL	61	30	16	4.1												
B-180	25.0	26.5	1159+75	5 L	SC	35	33	19	11.3												
B-180	55.0	56.5	1159+75	5 L	GP-GC	11	30	12	7.5												
B-180	60.0	61.5	1159+75	5 L															172	140	
B-181	0.0	5.0	1160+60	40 L	CL	53	27	11	5.1												
B-181	10.0	11.0	1160+60	40 L					4.1	104.1											
B-181	15.0	15.9	1160+60	40 L	SC	26	35	14	6.9												
B-181	25.0	26.0	1160+60	40 L					21.1	94.9											
B-181	30.0	31.5	1160+60	40 L															906	675	
B-181	40.0	41.0	1160+60	40 L	SM	29	NV	NP							X						
B-181	55.0	56.0	1160+60	40 L	SC	14	28	8	8.3												
B-181	65.0	66.5	1160+60	40 L	SP-SM	6.5	NV	NP	18.7												
B-182	6.0	7.5	1161+60	90 L															818	290	
B-182	10.0	11.0	1161+60	90 L	SM	37	NV	NP	2.5												
B-182	25.0	26.5	1161+60	90 L	GC	29	40	19	13.3												
B-182	35.0	36.5	1161+60	90 L	CL	88	48	25	26.6												
B-182	50.0	51.5	1161+60	90 L	SP-SM	11.0	NV	NP	4.5												
B-183	1.0	2.0	1161+60	CST CL	SC	48	21	8	3.2					X							
B-183	10.0	11.0	1161+60	CST CL	SM	15	NV	NP	3.7						X						
B-183	20.0	20.3	1161+60	CST CL	SM	27	34	8	10.8												
B-183	35.0	36.5	1161+60	CST CL	CL	89	43	18	25.0												
B-183	40.0	41.0	1161+60	CST CL					5.7	101.0											

TABLE B-1: SUMMARY OF LABORATORY TEST RESULTS

Boring Number	Sample Depth (feet)		Stationing (feet)	CST CL Offset (feet)	USCS/Group Symbol (ASTM D2487)	Percent Fines (minus #200) (ASTM C136)	Liquid Limit (ASTM D4318)	Plasticity Index (ASTM D4318)	Moisture Content (%) (ASTM D2216/T265)	In-Place Dry Density (pcf) (ASTM D2937)	Optimum Moisture Content (%)[1] (ASTM D698A)	Maximum Dry Density (pcf)[1] (ASTM D698A)	Expansion (%) (ASTM D4546)	Consolidation (%) (ASTM D2435)	Direct Shear (ASTM D3080)	R-Value (ASTM D2844)	pH (AZ 236)	Resistivity (ohm-cm) (AZ 236)	Sulfates (ppm) (AZ 733)	Chlorides (ppm) (AZ 736)	ADOT Topsoil Suite
	Begin	End																			
B-183	55.0	56.0	1161+60	CST CL	SP-SM	5.1	NV	NP	4.3	114.3											
B-183	70.0	71.0	1161+60	CST CL					14.0	118.9											
B-183	75.0	76.5	1161+60	CST CL															96	195	
B-184	1.0	2.0	1162+55	125 L	CL	63	24	8	6.2	96.4				X							
B-184	10	11.0	1162+55	125 L					3.9	113.7											
B-184	25	26.0	1162+55	125 L	GC	26	31	12	6.8						X						
B-184	40.0	41.0	1162+55	125 L	ML	71	30	7	15.8	93.6											
B-184	55.0	56.0	1162+55	125 L					14.2	99.7											
B-184	65.0	66.5	1162+55	125 L	SC-SM	16	26	7	14.2												
B-184	70.0	71.0	1162+55	125 L					19.2	118.3											
B-185	18.0	19.0	1162+55	CST CL	SC	45	28	13	7.5												
B-185	25.0	26.5	1162+55	CST CL					13.9	108.7											
B-185	31.0	32.0	1162+55	CST CL	GC	46	34	18	8.8												
B-185	32.0	33.0	1162+55	CST CL															419	676	
B-185	40.0	41.5	1162+55	CST CL					10.3	78.1											
B-185	55.0	56.0	1162+55	CST CL	GP-GC	9.6	31	10							X						
B-185	72.0	73.0	1162+55	CST CL	SC-SM	23	23	7	0.8												
B-186	8.5	9.5	1163+45	80 L	SM	36	NV	NP	5.9												
B-186	10.0	11.0	1163+45	80 L					6.9	94.8											
B-186	25.0	26.0	1163+45	80 L	SM	41	24	2							X						
B-186	35.0	36.5	1163+45	80 L	CL	80	36	14	1.9												
B-186	40.0	41.0	1163+45	80 L					10.7	99.9											
B-186	45.0	46.5	1163+45	80 L															90	88	
B-186	66.0	67.0	1163+45	80 L	SC	28	34	14	1.8												

TABLE B-1: SUMMARY OF LABORATORY TEST RESULTS

Boring Number	Sample Depth (feet)		Stationing (feet)	CST CL Offset (feet)	USCS/Group Symbol (ASTM D2487)	Percent Fines (minus #200) (ASTM C136)	Liquid Limit (ASTM D4318)	Plasticity Index (ASTM D4318)	Moisture Content (%) (ASTM D2216/T265)	In-Place Dry Density (pcf) (ASTM D2937)	Optimum Moisture Content (%)[1] (ASTM D698A)	Maximum Dry Density (pcf)[1] (ASTM D698A)	Expansion (%) (ASTM D4546)	Consolidation (%) (ASTM D2435)	Direct Shear (ASTM D3080)	R-Value (ASTM D2844)	pH (AZ 236)	Resistivity (ohm-cm) (AZ 236)	Sulfates (ppm) (AZ 733)	Chlorides (ppm) (AZ 736)	ADOT Topsoil Suite
	Begin	End																			
B-186	82.0	84.0	1163+45	80 L	GC	16	37	17	1.7												
B-187	0.0	5.0	1165+00	90 L	CL-ML	62	21	5	3.0		11.7	118.3							304	336	
B-187	10.0	11.0	1165+00	90 L	SM	27	NV	NP	3.0	109.5				X							
B-187	25.0	26.0	1165+00	90 L	SM	22	NV	NP	7.6	100.6											
B-187	40.0	41.0	1165+00	90 L					11.2	99.1											
B-187	45.0	46.5	1165+00	90 L	SP-SM	11	NV	NP	4.6												
B-187	55.0	56.0	1165+00	90 L					5.2	102.9											
B-187	70.0	71.0	1165+00	90 L	SM	41	NV	NP	17.4	105.7											
B-188	1.0	2.5	1166+50	90 L					7.2												
B-188	5.0	6.5	1166+50	90 L	SC-SM	47	22	5	3.3												
B-188	15.0	16.3	1166+50	90 L	SC-SM	16	25	6	3.7												
B-188	45.0	46.0	1166+50	90 L	SM	17	NV	NP							X						
B-188	60.0	61.0	1166+50	90 L	SC	19	31	14	12.6	100.2											
B-188	80.0	81.5	1166+50	90 L	SC	49	55	34	36.5												
B-189	5.0	6.0	1166+65	185 R	SP	3.4	NV	NP	3.9	97.2				X							
B-189	25.0	26.0	1166+65	185 R					9.6	101.6											
B-189	30.0	31.5	1166+65	185 R	CL	59	39	18	26.7												
B-189	40.0	41.0	1166+65	185 R					9.3	97.7											
B-190	0.0	5.0	1210+90	125 L	SC	36	25	9	5.0										29	97	
B-190	3.0	4.0	1210+90	125 L					1.6	109.6											
B-190	15.0	16.5	1210+90	125 L	SC	38	34	11	9.9												
B-191	5.0	6.0	1212+40	165 R	SC-SM	19	21	5	7.3	109.6				X							
B-191	20.0	21.5	1212+40	165 R	SC	39	29	9	7.4												
B-192	5.0	6.0	1231+70	110 R	SM	19	NV	NP	3.4	106.5				X							

TABLE B-1: SUMMARY OF LABORATORY TEST RESULTS

Boring Number	Sample Depth (feet)		Stationing (feet)	CST CL Offset (feet)	USCS/Group Symbol (ASTM D2487)	Percent Fines (minus #200) (ASTM C136)	Liquid Limit (ASTM D4318)	Plasticity Index (ASTM D4318)	Moisture Content (%) (ASTM D2216/T265)	In-Place Dry Density (pcf) (ASTM D2937)	Optimum Moisture Content (%)[1] (ASTM D698A)	Maximum Dry Density (pcf)[1] (ASTM D698A)	Expansion (%) (ASTM D4546)	Consolidation (%) (ASTM D2435)	Direct Shear (ASTM D3080)	R-Value (ASTM D2844)	pH (AZ 236)	Resistivity (ohm-cm) (AZ 236)	Sulfates (ppm) (AZ 733)	Chlorides (ppm) (AZ 736)	ADOT Topsoil Suite
	Begin	End																			
B-192	20.0	21.5	1231+70	110 R	SM	50	NV	NP	13.1												
B-193	3.0	4.0	1233+40	105 R	SC	31	32	14							X						
B-193	15.0	16.5	1233+40	105 R	SM	38	NV	NP	6.2												
B-193	20.0	21.5	1233+40	105 R					3.8												
B-194	5.0	6.0	1262+25	145 R	SM	43	NV	NP	13.2	94.1				X							
B-194	30.0	31.5	1262+25	145 R	SC	46	37	18	20.0												
B-195	5.0	6.0	1263+75	155 R					4.3	104.3											
B-195	10.0	11.5	1263+75	155 R	CL-ML	50	24	7	10.5												
B-195	20.0	21.0	1263+75	155 R	SC	36	33	16	9.6												
B-196	10.0	11.0	1265+35	165 R					5.7	105.2				X							
B-196	25.0	26.0	1265+35	165 R	SC	43	36	14	15.5	96.9											
B-196A	0.0	4.0	1266+90	210 R	CL	70	25	8	5.0										10	102	
B-196A	5.0	6.0	1266+90	210 R	SC	17.8	27	12	4.6	111.8				X							
B-196B	3.0	4.0	1268+00	210 R	SC	18.9	35	16	3.9	105.2				X							
B-196B	5.0	6.5	1268+00	210 R		13.6			3.5												
B-196C	3.0	4.5	1270+00	210 R															47	121	
B-196C	5.0	6.0	1270+00	210 R	SC	23	34	12	6.3	101.6				X	X						
B-196C	10.0	11.5	1270+00	210 R	SC	20	27	9	6.7												
B-196C	15.0	15.5	1270+00	210 R					8.6	114.4											
B-196D	0.0	4.0	1271+50	210 R	SC	37.5	34	18	8.8												
B-196D	1.0	2.0	1271+50	210 R					9.7	122.5					X						
B-196D	10.0	11.0	1271+50	210 R	SC	30.9	35	19	9.2	117.2											
B-197	1.0	2.0	1271+70	85 R					7.5	105.5											
B-197	10.0	11.0	1271+70	85 R	SC	44	27	10							X						

TABLE B-1: SUMMARY OF LABORATORY TEST RESULTS

Boring Number	Sample Depth (feet)		Stationing (feet)	CST CL Offset (feet)	USCS/Group Symbol (ASTM D2487)	Percent Fines (minus #200) (ASTM C136)	Liquid Limit (ASTM D4318)	Plasticity Index (ASTM D4318)	Moisture Content (%) (ASTM D2216/T265)	In-Place Dry Density (pcf) (ASTM D2937)	Optimum Moisture Content (%)[1] (ASTM D698A)	Maximum Dry Density (pcf)[1] (ASTM D698A)	Expansion (%) (ASTM D4546)	Consolidation (%) (ASTM D2435)	Direct Shear (ASTM D3080)	R-Value (ASTM D2844)	pH (AZ 236)	Resistivity (ohm-cm) (AZ 236)	Sulfates (ppm) (AZ 733)	Chlorides (ppm) (AZ 736)	ADOT Topsoil Suite
	Begin	End																			
B-197	20.0	21.5	1271+70	85 R	SM	26	NV	NP	7.8												
B-198	1.0	2.0	1273+45	85 R					7.4	108.6											
B-198	10.0	11.0	1273+45	85 R	SC	37	29	13	7.5	106.4				X							
B-198	20.0	21.5	1273+45	85 R					6.9												
B-198	25.0	26.0	1273+45	85 R	CL	64	24	8	19.8	97.1											
B-199	0.0	5.0	1275+15	90 R	SC	24	28	13	6.1												
B-199	1.0	2.0	1275+15	90 R					6.3	115.8									23	84	
B-199	20.0	21.5	1275+15	90 R	SM	40	NV	NP	6.6												
B-199	25.0	26.0	1275+15	90 R					6.4	108.5											
B-199	35.0	36.5	1275+15	90 R	CL	59	35	13	16.1												
B-199	40.0	40.9	1275+15	90 R					6.1	102.8											
P-1	0.0	5.0	1094+50	210 L	CL	94.1	34	16	14.6								8.56	677	428	308	
P-2	0.0	5.0	1095+50	550 L	CL	95.1	29	9	11.9		17.7	107.9									
P-3	0.0	5.0	1100+50	260 L	CL-ML	81.9	25	7	9.4												
P-6	0.5	5.0	1069+00	165 L	CL	87	36	19	18.9		17.6	105.9					8.3	550			
P-6A	0.0	2.0	1069+00	210 L	SC-SM	45.5	19	5	1.5		8.9	124.2	0.6								
P-6	10.0	11.5	1069+00	165 L	ML	77	26	4	28.6												
P-7	0.5	5.0	1070+80	95 R	CL	89	37	20	18.3		19.8	103.0					8.4	410			
P-7	10.0	11.5	1070+80	95 R	SM	18	NV	NP	6.6												
P-8	0.5	5.0	1072+40	240 L	CL	90	36	19	19.6		18.7	103.5					8.3	450			
P-8	10.0	11.5	1072+40	240 L	SM	35	NV	NP	11.8												
P-9	0.5	5.0	1074+75	60 R	CL	94	38	22	17.4		22.5	103.3					8.5	400			
P-9	10.0	11.5	1074+75	60 R	SM	30	NV	NP	10.7												
P-10	0.5	5.0	1075+00	290 R	CL	87	37	19	17.1								8.4	410			

TABLE B-1: SUMMARY OF LABORATORY TEST RESULTS

Boring Number	Sample Depth (feet)		Stationing (feet)	CST CL Offset (feet)	USCS/Group Symbol (ASTM D2487)	Percent Fines (minus #200) (ASTM C136)	Liquid Limit (ASTM D4318)	Plasticity Index (ASTM D4318)	Moisture Content (%) (ASTM D2216/T265)	In-Place Dry Density (pcf) (ASTM D2937)	Optimum Moisture Content (%)[1] (ASTM D698A)	Maximum Dry Density (pcf)[1] (ASTM D698A)	Expansion (%) (ASTM D4546)	Consolidation (%) (ASTM D2435)	Direct Shear (ASTM D3080)	R-Value (ASTM D2844)	pH (AZ 236)	Resistivity (ohm-cm) (AZ 236)	Sulfates (ppm) (AZ 733)	Chlorides (ppm) (AZ 736)	ADOT Topsoil Suite
	Begin	End																			
P-10	15.0	16.5	1075+00	290 R	SM	21	NV	NP	6.8												
S-1																					X
S-2																					X
S-3																					X
S-4																					X
S-5																					X
S-6																					X
Average						**37.3**	**---**	**---**	**10.1**	**102.8**	**12.8**	**119.2**	**1.7**	**---**	**---**	**57.0**	**8.7**	**1422**	**185**	**205**	**---**
Standard Deviation						**23.5**	**---**	**---**	**7.0**	**9.1**	**2.9**	**6.7**	**0.8**	**---**	**---**	**19.4**	**0.3**	**1244**	**263**	**209**	**---**
Maximum						**98**	**69**	**43**	**41.7**	**129.4**	**22.5**	**130.9**	**3.3**	**---**	**---**	**73**	**9.5**	**5890**	**1437**	**967**	**---**
Minimum						**0.5**	**NV**	**NP**	**0.1**	**77.7**	**7.3**	**103.0**	**0.2**	**---**	**---**	**9**	**8.0**	**339**	**3**	**3**	**---**
Count						**542**	**550**	**550**	**603**	**197**	**40**	**40**	**28**	**70**	**78**	**8**	**44**	**44**	**77**	**77**	**6**

Notes: pcf = pounds per cubic foot; ohm-cm = ohm-centimeters; ppm = parts per million

1) Values do not include rock correction.

2) SR 303L Cst CL Station & Offset

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1584-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/7/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-2 @ 0.0 - 5.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	1	99	
1/2"	0	99	
3/8"	1	98	
1/4"	2	96	
#4	2	94	
#8	5	89	
#10	1	88	
#16	6	82	
#30	10	72	
#40	5	67	
#50	6	61	
#100	10	51	
#200	11	40.6	

Liquid Limit (AASHTO T-89)	26
Plastic Limit (AASHTO T-90)	19
Plasticity Index (AASHTO T-90)	7
Moisture Content (AASHTO T-265)	4.3
USCS Soil Classification	SC-SM

Group Name (ASTM D2487)
Silty, clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1584-2	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/7/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-2 @ 5.0 - 6.5'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	1	99	
#4	1	98	
#8	3	95	
#10	1	94	
#16	5	89	
#30	14	75	
#40	10	65	
#50	10	55	
#100	16	38	
#200	11	26.9	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	3.0
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-2245-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/29/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-3 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	1	99	
3/4"	1	99	
1/2"	1	98	
3/8"	1	97	
1/4"	1	96	
#4	1	95	
#8	3	91	
#10	1	90	
#16	9	81	
#30	12	69	
#40	7	62	
#50	8	54	
#100	11	43	
#200	7	35.8	

Liquid Limit (AASHTO T-89)	21
Plastic Limit (AASHTO T-90)	18
Plasticity Index (AASHTO T-90)	3
Moisture Content (AASHTO T-265)	3.5
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-2245-2	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/29/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-4 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	99	
1/4"	0	99	
#4	0	99	
#8	1	98	
#10	1	97	
#16	6	91	
#30	15	76	
#40	8	68	
#50	7	60	
#100	10	50	
#200	9	41.1	

Liquid Limit (AASHTO T-89)	20
Plastic Limit (AASHTO T-90)	18
Plasticity Index (AASHTO T-90)	2
Moisture Content (AASHTO T-265)	3.6
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1584-3	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/7/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-5 @ 0.0 -5.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	4	96	
3/4"	3	93	
1/2"	4	88	
3/8"	2	86	
1/4"	4	82	
#4	4	78	
#8	9	69	
#10	2	67	
#16	8	58	
#30	13	46	
#40	7	39	
#50	6	33	
#100	8	25	
#200	5	20.0	

Liquid Limit (AASHTO T-89)	24
Plastic Limit (AASHTO T-90)	18
Plasticity Index (AASHTO T-90)	6
Moisture Content (AASHTO T-265)	3.5
USCS Soil Classification	SC-SM

Group Name (ASTM D2487)
Silty, clayey SAND with gravel

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-2316-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	5/3/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-6 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	1	98	
#4	2	97	
#8	3	94	
#10	1	93	
#16	9	84	
#30	19	66	
#40	16	50	
#50	16	33	
#100	15	19	
#200	4	14.6	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	1.0
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1584-4	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/7/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-7 @ 0.0 - 5.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	1	99	
1/2"	1	98	
3/8"	1	97	
1/4"	1	96	
#4	1	95	
#8	3	92	
#10	1	91	
#16	5	87	
#30	10	76	
#40	7	70	
#50	7	63	
#100	12	52	
#200	10	41.9	

Liquid Limit (AASHTO T-89)	26
Plastic Limit (AASHTO T-90)	18
Plasticity Index (AASHTO T-90)	8
Moisture Content (AASHTO T-265)	4.1
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-3004-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	6/27/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B7A @ 0.0 - 2.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	99	
1/2"	1	99	
3/8"	1	98	
1/4"	2	96	
#4	1	95	
#8	4	91	
#10	2	90	
#16	6	83	
#30	9	74	
#40	5	70	
#50	5	65	
#100	7	58	
#200	10	48.0	

Liquid Limit (AASHTO T-89)	26
Plastic Limit (AASHTO T-90)	19
Plasticity Index (AASHTO T-90)	7
Moisture Content (AASHTO T-265)	2.4
USCS Soil Classification	SC-SM

Group Name (ASTM D2487)
Silty, clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-3009-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	6/29/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-8 @ 0.0 -5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	1	99	
#10	0	99	
#16	3	96	
#30	7	89	
#40	4	85	
#50	4	81	
#100	7	74	
#200	9	64.7	

Liquid Limit (AASHTO T-89)	24
Plastic Limit (AASHTO T-90)	16
Plasticity Index (AASHTO T-90)	8
Moisture Content (AASHTO T-265)	3.8
USCS Soil Classification	CL

Group Name (ASTM D2487)
Sandy lean CLAY

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1582-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/2/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B-9 @ 0.0 - 5.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	99	
#4	0	99	
#8	2	97	
#10	1	96	
#16	5	92	
#30	8	84	
#40	5	79	
#50	5	75	
#100	8	67	
#200	8	59.5	

Liquid Limit (AASHTO T-89)	24
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	7
Moisture Content (AASHTO T-265)	3.9
USCS Soil Classification	CL-ML

Group Name (ASTM D2487)
Sandy SILTY CLAY

Dylan Ward

Dylan Ward

Laboratory Manager

Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1582-2	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/1/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B-9 @ 10.0 -11.5'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	-	-	
3"	-	-	
2 1/2"	-	-	
2"	-	-	
1 1/2"	-	-	
1"	-	-	
3/4"	-	-	
1/2"	-	-	
3/8"	-	-	
1/4"	-	-	
#4	-	-	
#8	-	-	
#10	-	-	
#16	-	-	
#30	-	-	
#40	-	-	
#50	-	-	
#100	-	-	
#200	-	-	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	2.7
USCS Soil Classification	-

Group Name (ASTM D2487)
-

Sieve material was contaminated during testing.

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1582-3	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/2/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-9 @ 15.0 - 16.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	9	91	
3/8"	2	89	
1/4"	6	83	
#4	5	78	
#8	9	69	
#10	1	68	
#16	5	62	
#30	10	52	
#40	4	48	
#50	4	44	
#100	7	36	
#200	5	30.9	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	2.4
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND with gravel

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1582-4	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/2/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-9 @ 35.0 - 36.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	0	100	
#40	0	99	
#50	1	98	
#100	3	95	
#200	4	91.7	

Liquid Limit (AASHTO T-89)	48
Plastic Limit (AASHTO T-90)	27
Plasticity Index (AASHTO T-90)	21
Moisture Content (AASHTO T-265)	33.0
USCS Soil Classification	CL

Group Name (ASTM D2487)
Lean CLAY

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1582-5	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/1/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-9 @ 50.0 - 51.5'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	-	-	
3"	-	-	
2 1/2"	-	-	
2"	-	-	
1 1/2"	-	-	
1"	-	-	
3/4"	-	-	
1/2"	-	-	
3/8"	-	-	
1/4"	-	-	
#4	-	-	
#8	-	-	
#10	-	-	
#16	-	-	
#30	-	-	
#40	-	-	
#50	-	-	
#100	-	-	
#200	-	-	

Liquid Limit (AASHTO T-89)	-
Plastic Limit (AASHTO T-90)	-
Plasticity Index (AASHTO T-90)	-
Moisture Content (AASHTO T-265)	28.4
USCS Soil Classification	-

Group Name (ASTM D2487)
-

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1582-6	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/1/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-9 @ 75.0 - 76.5'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	-	-	
3"	-	-	
2 1/2"	-	-	
2"	-	-	
1 1/2"	-	-	
1"	-	-	
3/4"	-	-	
1/2"	-	-	
3/8"	-	-	
1/4"	-	-	
#4	-	-	
#8	-	-	
#10	-	-	
#16	-	-	
#30	-	-	
#40	-	-	
#50	-	-	
#100	-	-	
#200	-	-	

Liquid Limit (AASHTO T-89)	-
Plastic Limit (AASHTO T-90)	-
Plasticity Index (AASHTO T-90)	-
Moisture Content (AASHTO T-265)	17.5
USCS Soil Classification	-

Group Name (ASTM D2487)
-

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1802-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/25/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B-10 @ 0.0 - 5.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	1	99	
#4	1	98	
#8	3	95	
#10	1	94	
#16	7	87	
#30	10	77	
#40	6	71	
#50	6	65	
#100	10	55	
#200	9	45.8	

Liquid Limit (AASHTO T-89)	23
Plastic Limit (AASHTO T-90)	18
Plasticity Index (AASHTO T-90)	5
Moisture Content (AASHTO T-265)	3.4
USCS Soil Classification	SC-SM

Group Name (ASTM D2487)
Silty, clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1802-2	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/25/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B-10 @ 15.0 - 16.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	1	99	
#4	8	91	
#8	20	71	
#10	8	63	
#16	13	51	
#30	14	36	
#40	7	29	
#50	5	24	
#100	4	20	
#200	2	17.6	

Liquid Limit (AASHTO T-89)	30
Plastic Limit (AASHTO T-90)	22
Plasticity Index (AASHTO T-90)	8
Moisture Content (AASHTO T-265)	3.2
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1802-4	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/25/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B-10 @ 45.0 - 46.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	5	95	
3/4"	4	91	
1/2"	5	86	
3/8"	2	84	
1/4"	2	82	
#4	2	81	
#8	14	66	
#10	4	62	
#16	12	50	
#30	13	37	
#40	5	32	
#50	8	23	
#100	3	20	
#200	2	18.3	

Liquid Limit (AASHTO T-89)	47
Plastic Limit (AASHTO T-90)	24
Plasticity Index (AASHTO T-90)	23
Moisture Content (AASHTO T-265)	3.5
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND with gravel

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1582-7	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/2/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-11 @ 10.0 - 11.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	5	95	
#4	3	93	
#8	12	81	
#10	4	77	
#16	18	59	
#30	27	33	
#40	10	22	
#50	8	15	
#100	7	7	
#200	3	4.8	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	0.4
USCS Soil Classification	SP

Group Name (ASTM D2487)
Poorly graded SAND

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1582-8	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/4/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B-11 @ 30.0 - 31.5'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	1	99	
#10	0	99	
#16	0	99	
#30	1	98	
#40	1	97	
#50	2	96	
#100	10	85	
#200	25	60.0	

Liquid Limit (AASHTO T-89)	41
Plastic Limit (AASHTO T-90)	21
Plasticity Index (AASHTO T-90)	20
Moisture Content (AASHTO T-265)	24.9
USCS Soil Classification	CL

Group Name (ASTM D2487)
Sandy lean CLAY

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1456-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/17/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-12 @ 0.0 - 5.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	1	99	
3/4"	0	99	
1/2"	1	99	
3/8"	0	99	
1/4"	1	98	
#4	1	97	
#8	3	94	
#10	1	93	
#16	5	88	
#30	10	78	
#40	7	71	
#50	7	64	
#100	12	52	
#200	9	42.3	

Liquid Limit (AASHTO T-89)	24
Plastic Limit (AASHTO T-90)	18
Plasticity Index (AASHTO T-90)	6
Moisture Content (AASHTO T-265)	3.1
USCS Soil Classification	SC-SM

Group Name (ASTM D2487)
Silty, clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1456-2	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/21/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-12 @ 15.0 - 16.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	4	96	
1/2"	0	96	
3/8"	2	95	
1/4"	2	93	
#4	2	91	
#8	8	83	
#10	3	79	
#16	18	61	
#30	30	31	
#40	9	22	
#50	5	17	
#100	6	12	
#200	3	8.1	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	3.5
USCS Soil Classification	SP-SM

Group Name (ASTM D2487)
Poorly graded SAND with silt

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-2240-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/28/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-13 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	99	
1/4"	1	99	
#4	0	99	
#8	1	98	
#10	0	97	
#16	4	94	
#30	5	89	
#40	3	86	
#50	4	82	
#100	14	68	
#200	16	52.3	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	12.6
USCS Soil Classification	ML

Group Name (ASTM D2487)
Sandy SILT

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-2237-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/27/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-14 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	1	99	
1/4"	2	98	
#4	2	96	
#8	5	91	
#10	2	90	
#16	9	81	
#30	16	65	
#40	9	56	
#50	8	48	
#100	11	37	
#200	7	29.9	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	6.7
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-2237-3	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/27/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-14 @ 10.0 - 11.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	3	97	
1/2"	0	97	
3/8"	1	96	
1/4"	1	95	
#4	1	93	
#8	5	89	
#10	1	88	
#16	7	80	
#30	18	63	
#40	16	47	
#50	16	31	
#100	15	16	
#200	4	11.8	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	6.5
USCS Soil Classification	SP-SM

Group Name (ASTM D2487)
Poorly graded SAND with silt

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-2142-4	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/28/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-15 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	99	
1/4"	1	99	
#4	1	98	
#8	3	96	
#10	1	95	
#16	5	90	
#30	10	79	
#40	7	72	
#50	7	65	
#100	11	55	
#200	8	46.8	

Liquid Limit (AASHTO T-89)	22
Plastic Limit (AASHTO T-90)	16
Plasticity Index (AASHTO T-90)	6
Moisture Content (AASHTO T-265)	8.5
USCS Soil Classification	SC-SM

Group Name (ASTM D2487)
Silty, clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

LABORATORY SERVICES REPORT

Report Number: 65201093.0009
Service Date: 05/09/22
Report Date: 05/13/22
Task:

Terracon
4685 S Ash Ave, Ste H-4
Tempe, AZ 85282-6767
480-897-8200

Client

ACS Services LLC
Attn: Dylan Ward
2235 W Broadway Rd
Mesa, AZ 85202-1003

Project

ACS On-Call Testing
In House - Terracon Tempe Lab
Tempe, AZ

Project No. 65201093

Material Description: Sandy Fat Clay
Sample Location: B-15 @ 35'-36'
Lab Number: 22-2142-6

Sieve Analysis ASTM C136/C117		
Sieve Size	Percent Passing	Specs
8"	100.0	
6"	100.0	
4"	100.0	
3"	100.0	
2"	100.0	
1-1/2"	100.0	
1"	100.0	
3/4"	100.0	
1/2"	100.0	
3/8"	100.0	
1/4"	99.7	
#4	99.7	
#8	98.8	
#10	98.7	
#16	98.0	
#30	95.4	
#40	92.7	
#50	87.9	
#100	76.2	
#200	63.8	

Plasticity Index		
ASTM D4318		Specs
Liquid Limit	51	
Plastic Limit	21	
Plasticity Index	30	

U.S.C.S. CH
Sandy fat clay

Services:
Terracon Rep: Joseph Menezes
Reported To:
Contractor:

Report Distribution
(1) ACS Services LLC, Dylan Ward

Reviewed By: Michael Peters
Laboratory Supervisor

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-2142-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/28/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-16 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	1	99	
#4	1	99	
#8	2	96	
#10	1	95	
#16	4	91	
#30	10	81	
#40	8	73	
#50	9	64	
#100	15	49	
#200	9	39.6	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	7.6
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-2142-2	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/27/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-16 @ 20.0 -21.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	3	97	
3/8"	1	97	
1/4"	1	95	
#4	1	94	
#8	3	91	
#10	1	90	
#16	8	82	
#30	25	58	
#40	17	40	
#50	15	25	
#100	14	11	
#200	4	7.1	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	3.4
USCS Soil Classification	SP-SM

Group Name (ASTM D2487)
Poorly graded SAND with silt

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-2142-3	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/27/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-16 @ 40.0 - 41.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	1	99	
#10	0	99	
#16	2	97	
#30	13	84	
#40	18	66	
#50	18	48	
#100	18	30	
#200	8	21.3	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	9.7
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-2130-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/27/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-17 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	99	
#8	1	98	
#10	1	98	
#16	4	93	
#30	8	86	
#40	4	81	
#50	5	77	
#100	10	67	
#200	11	56.1	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	10.8
USCS Soil Classification	ML

Group Name (ASTM D2487)
Sandy SILT

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-2130-2	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/27/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-17 @ 20.0 - 21.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	3	97	
1/2"	9	88	
3/8"	4	84	
1/4"	6	78	
#4	3	75	
#8	9	66	
#10	2	64	
#16	13	51	
#30	18	33	
#40	9	24	
#50	7	18	
#100	7	11	
#200	3	7.6	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	2.8
USCS Soil Classification	SP-SM

Group Name (ASTM D2487)
Poorly graded SAND with silt and gravel

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-2130-3	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/27/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-17 @ 45.0 - 46.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	2	98	
3/8"	1	98	
1/4"	3	95	
#4	3	92	
#8	10	83	
#10	4	79	
#16	19	60	
#30	27	33	
#40	10	23	
#50	8	15	
#100	7	9	
#200	3	5.8	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	3.1
USCS Soil Classification	SP-SM

Group Name (ASTM D2487)
Poorly graded SAND with silt

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-2130-4	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/28/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-17 @ 50.0 - 51.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	21	79	
#10	3	76	
#16	18	58	
#30	23	35	
#40	11	24	
#50	8	16	
#100	8	8	
#200	3	4.8	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	8.4
USCS Soil Classification	SP

Group Name (ASTM D2487)
Poorly graded SAND

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-2130-5	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/27/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-18 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	1	99	
#4	1	99	
#8	2	97	
#10	0	96	
#16	6	91	
#30	9	82	
#40	5	77	
#50	5	71	
#100	9	63	
#200	8	54.8	

Liquid Limit (AASHTO T-89)	24
Plastic Limit (AASHTO T-90)	15
Plasticity Index (AASHTO T-90)	9
Moisture Content (AASHTO T-265)	11.1
USCS Soil Classification	CL

Group Name (ASTM D2487)
Sandy lean CLAY

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-2130-7	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/27/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-18 @ 30.0 - 31.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	1	98	
#40	1	97	
#50	2	95	
#100	14	81	
#200	30	50.7	

Liquid Limit (AASHTO T-89)	34
Plastic Limit (AASHTO T-90)	22
Plasticity Index (AASHTO T-90)	12
Moisture Content (AASHTO T-265)	23.4
USCS Soil Classification	CL

Group Name (ASTM D2487)
Sandy lean CLAY

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-3002-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	6/27/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B19 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	99	
#8	2	97	
#10	1	96	
#16	11	85	
#30	26	59	
#40	14	45	
#50	11	34	
#100	11	23	
#200	5	18.1	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	4.9
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-3002-3	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	6/27/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B20 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	1	99	
#4	1	98	
#8	3	95	
#10	1	94	
#16	5	89	
#30	13	77	
#40	9	68	
#50	10	58	
#100	17	40	
#200	11	29.2	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	6.7
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-3002-4	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	6/27/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B20 @ 10.0 - 11.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	4	96	
#10	2	94	
#16	10	85	
#30	25	60	
#40	13	47	
#50	9	38	
#100	10	28	
#200	5	23.4	

Liquid Limit (AASHTO T-89)	30
Plastic Limit (AASHTO T-90)	12
Plasticity Index (AASHTO T-90)	18
Moisture Content (AASHTO T-265)	8.3
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-3002-6	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	6/27/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B21 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	99	
#30	2	97	
#40	3	95	
#50	5	89	
#100	18	71	
#200	21	50.6	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	8.2
USCS Soil Classification	ML

Group Name (ASTM D2487)
Sandy SILT

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1654-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/8/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B-22 @ 0.0 - 5.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	1	99	
3/8"	1	98	
1/4"	2	96	
#4	2	93	
#8	8	85	
#10	2	83	
#16	11	72	
#30	17	56	
#40	10	46	
#50	9	38	
#100	9	29	
#200	4	24.5	

Liquid Limit (AASHTO T-89)	21
Plastic Limit (AASHTO T-90)	16
Plasticity Index (AASHTO T-90)	5
Moisture Content (AASHTO T-265)	3.1
USCS Soil Classification	SC-SM

Group Name (ASTM D2487)
Silty, clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1654-2	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/9/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-22 @ 15.0 - 16.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	2	98	
3/8"	2	95	
1/4"	4	91	
#4	4	87	
#8	9	78	
#10	3	75	
#16	14	61	
#30	31	30	
#40	13	18	
#50	7	11	
#100	5	5	
#200	2	3.0	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	2.3
USCS Soil Classification	SP

Group Name (ASTM D2487)
Poorly graded SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1654-3	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/8/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B-22 @ 30.0 - 31.5'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	1	99	
#4	0	99	
#8	1	98	
#10	0	98	
#16	1	97	
#30	3	94	
#40	2	91	
#50	5	87	
#100	27	60	
#200	17	43.2	

Liquid Limit (AASHTO T-89)	28
Plastic Limit (AASHTO T-90)	21
Plasticity Index (AASHTO T-90)	7
Moisture Content (AASHTO T-265)	13.5
USCS Soil Classification	SC-SM

Group Name (ASTM D2487)
Silty, clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1654-5	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/8/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B-22 @ 40.0 - 41.5'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	0	100	
#40	0	100	
#50	1	99	
#100	4	94	
#200	5	88.7	

Liquid Limit (AASHTO T-89)	44
Plastic Limit (AASHTO T-90)	22
Plasticity Index (AASHTO T-90)	22
Moisture Content (AASHTO T-265)	31.4
USCS Soil Classification	CL

Group Name (ASTM D2487)
Lean CLAY

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-2131-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/27/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-23 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	1	99	
3/4"	0	99	
1/2"	0	99	
3/8"	0	99	
1/4"	1	98	
#4	1	97	
#8	3	94	
#10	1	94	
#16	8	86	
#30	11	75	
#40	7	68	
#50	7	60	
#100	12	48	
#200	9	39.5	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	8.6
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-2131-3	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/27/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-23 @ 35.0 - 36.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	1	99	
#4	0	99	
#8	1	98	
#10	0	98	
#16	1	97	
#30	4	93	
#40	3	90	
#50	3	86	
#100	6	81	
#200	9	71.8	

Liquid Limit (AASHTO T-89)	35
Plastic Limit (AASHTO T-90)	27
Plasticity Index (AASHTO T-90)	8
Moisture Content (AASHTO T-265)	21.7
USCS Soil Classification	ML

Group Name (ASTM D2487)
SILT with sand

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-2131-4	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/27/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-23 @ 55.0 - 56.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	2	98	
1/2"	6	92	
3/8"	4	87	
1/4"	3	85	
#4	2	83	
#8	3	80	
#10	1	80	
#16	6	73	
#30	22	52	
#40	14	38	
#50	11	27	
#100	10	17	
#200	5	12.1	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	9.4
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND with gravel

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1942-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/6/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-24 @ 7.5 - 10.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	2	98	
1/2"	3	95	
3/8"	1	94	
1/4"	2	92	
#4	2	89	
#8	5	84	
#10	1	83	
#16	8	76	
#30	13	63	
#40	7	56	
#50	6	49	
#100	9	40	
#200	7	33.7	

Liquid Limit (AASHTO T-89)	25
Plastic Limit (AASHTO T-90)	16
Plasticity Index (AASHTO T-90)	9
Moisture Content (AASHTO T-265)	9.0
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1942-2	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/7/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-24 @ 17.5 - 20.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	3	97	
1/2"	15	82	
3/8"	4	78	
1/4"	4	74	
#4	2	72	
#8	6	65	
#10	1	64	
#16	7	57	
#30	15	42	
#40	7	35	
#50	6	29	
#100	8	21	
#200	6	15.1	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	3.5
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND with gravel

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1942-5	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/6/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-24 @ 52.5 - 55.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	3	97	
#10	0	97	
#16	2	94	
#30	4	90	
#40	4	86	
#50	5	82	
#100	12	69	
#200	14	55.2	

Liquid Limit (AASHTO T-89)	39
Plastic Limit (AASHTO T-90)	20
Plasticity Index (AASHTO T-90)	19
Moisture Content (AASHTO T-265)	23.2
USCS Soil Classification	CL

Group Name (ASTM D2487)
Sandy lean CLAY

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1942-7	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/7/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-25 @ 7.5 - 10.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	1	99	
1/2"	0	99	
3/8"	0	99	
1/4"	0	99	
#4	0	99	
#8	6	93	
#10	1	92	
#16	4	88	
#30	8	79	
#40	5	74	
#50	5	70	
#100	9	61	
#200	8	53.0	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	1.2
USCS Soil Classification	ML

Group Name (ASTM D2487)
Sandy SILT

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1942-8	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/6/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-25 @ 22.5 - 25.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	4	96	
1/2"	6	90	
3/8"	7	83	
1/4"	11	72	
#4	6	66	
#8	7	59	
#10	1	57	
#16	3	54	
#30	3	51	
#40	4	46	
#50	1	45	
#100	3	42	
#200	5	36.9	

Liquid Limit (AASHTO T-89)	42
Plastic Limit (AASHTO T-90)	20
Plasticity Index (AASHTO T-90)	22
Moisture Content (AASHTO T-265)	16.4
USCS Soil Classification	GC

Group Name (ASTM D2487)
Clayey GRAVEL with sand

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1942-10	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/7/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-25 @ 37.5 - 40.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	1	99	
#40	1	99	
#50	1	97	
#100	4	93	
#200	10	83.6	

Liquid Limit (AASHTO T-89)	35
Plastic Limit (AASHTO T-90)	21
Plasticity Index (AASHTO T-90)	14
Moisture Content (AASHTO T-265)	2.4
USCS Soil Classification	CL

Group Name (ASTM D2487)
Lean CLAY with sand

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1655-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/10/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-26 @ 0.0 - 5.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	1	99	
1/2"	1	98	
3/8"	0	98	
1/4"	1	97	
#4	1	97	
#8	3	94	
#10	0	93	
#16	3	90	
#30	7	83	
#40	5	78	
#50	5	73	
#100	8	65	
#200	7	58.3	

Liquid Limit (AASHTO T-89)	25
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	8
Moisture Content (AASHTO T-265)	8.0
USCS Soil Classification	CL

Group Name (ASTM D2487)
Sandy lean CLAY

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1655-3	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/10/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-26 @ 20.0 - 21.5'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	1	99	
1/4"	1	99	
#4	1	98	
#8	4	94	
#10	2	91	
#16	16	75	
#30	35	40	
#40	13	27	
#50	7	20	
#100	7	13	
#200	4	8.9	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	2.6
USCS Soil Classification	SP-SM

Group Name (ASTM D2487)
Poorly graded SAND with silt

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1655-4	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/10/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-26 @ 30.0 - 31.5'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	2	98	
3/8"	1	97	
1/4"	1	96	
#4	0	96	
#8	1	95	
#10	0	95	
#16	1	94	
#30	2	92	
#40	2	90	
#50	5	85	
#100	26	59	
#200	24	34.9	

Liquid Limit (AASHTO T-89)	28
Plastic Limit (AASHTO T-90)	22
Plasticity Index (AASHTO T-90)	6
Moisture Content (AASHTO T-265)	13.3
USCS Soil Classification	SC-SM

Group Name (ASTM D2487)
Silty, clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1655-5	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/10/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-26 @ 55.0 - 56.5'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	1	99	
#40	1	98	
#50	3	95	
#100	10	85	
#200	16	69.1	

Liquid Limit (AASHTO T-89)	38
Plastic Limit (AASHTO T-90)	21
Plasticity Index (AASHTO T-90)	17
Moisture Content (AASHTO T-265)	24.7
USCS Soil Classification	CL

Group Name (ASTM D2487)
Sandy lean CLAY

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1658-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/14/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-27 @ 7.5 - 10.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	99	
#10	0	99	
#16	1	98	
#30	2	96	
#40	2	93	
#50	5	88	
#100	17	71	
#200	15	55.3	

Liquid Limit (AASHTO T-89)	21
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	4
Moisture Content (AASHTO T-265)	6.2
USCS Soil Classification	CL-ML

Group Name (ASTM D2487)
Sandy SILTY CLAY

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1658-2	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/16/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B-27 @ 12.5 - 15.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	2	98	
3/4"	4	94	
1/2"	7	86	
3/8"	6	80	
1/4"	10	70	
#4	9	62	
#8	15	47	
#10	3	45	
#16	7	37	
#30	7	31	
#40	3	27	
#50	4	23	
#100	7	17	
#200	4	12.5	

Liquid Limit (AASHTO T-89)	24
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	7
Moisture Content (AASHTO T-265)	3.8
USCS Soil Classification	SC-SM

Group Name (ASTM D2487)
Silty, clayey SAND with gravel

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1658-3	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/14/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B-27 @ 22.5 - 25.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	3	97	
1"	4	93	
3/4"	3	90	
1/2"	5	85	
3/8"	5	80	
1/4"	5	75	
#4	4	72	
#8	6	65	
#10	1	64	
#16	3	61	
#30	4	58	
#40	2	56	
#50	2	53	
#100	7	47	
#200	9	37.2	

Liquid Limit (AASHTO T-89)	32
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	15
Moisture Content (AASHTO T-265)	6.6
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND with gravel

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1658-4	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/16/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B-27 @ 37.5 - 40.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	3	97	
1/2"	4	93	
3/8"	1	92	
1/4"	4	88	
#4	2	86	
#8	10	77	
#10	2	75	
#16	5	70	
#30	5	65	
#40	2	63	
#50	2	61	
#100	6	55	
#200	9	46.5	

Liquid Limit (AASHTO T-89)	50
Plastic Limit (AASHTO T-90)	27
Plasticity Index (AASHTO T-90)	23
Moisture Content (AASHTO T-265)	21.1
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-2246-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/29/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-28 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	1	99	
3/4"	0	99	
1/2"	2	97	
3/8"	2	95	
1/4"	3	92	
#4	3	89	
#8	6	83	
#10	1	82	
#16	8	74	
#30	12	62	
#40	9	53	
#50	10	43	
#100	14	29	
#200	7	21.9	

Liquid Limit (AASHTO T-89)	23
Plastic Limit (AASHTO T-90)	20
Plasticity Index (AASHTO T-90)	3
Moisture Content (AASHTO T-265)	7.9
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-2246-2	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/29/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-29 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	1	99	
3/4"	2	97	
1/2"	4	93	
3/8"	2	91	
1/4"	4	87	
#4	2	85	
#8	6	80	
#10	1	79	
#16	4	75	
#30	7	67	
#40	4	63	
#50	4	59	
#100	7	52	
#200	7	45.7	

Liquid Limit (AASHTO T-89)	24
Plastic Limit (AASHTO T-90)	20
Plasticity Index (AASHTO T-90)	4
Moisture Content (AASHTO T-265)	12.5
USCS Soil Classification	SC-SM

Group Name (ASTM D2487)
Silty, clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1414-9	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/16/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B-30 @ 0.0 - 5.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T-27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	4	96	
3/8"	2	94	
1/4"	3	91	
#4	3	88	
#8	6	82	
#10	2	80	
#16	7	73	
#30	12	61	
#40	6	55	
#50	6	49	
#100	9	40	
#200	7	33.4	

Liquid Limit (AASHTO T-89)	26
Plastic Limit (AASHTO T-90)	19
Plasticity Index (AASHTO T-90)	7
Moisture Content (AASHTO T-265)	4.2
USCS Soil Classification	SC-SM

Group Name (ASTM D2487)
Silty, clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1414-11	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/17/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B-30 @ 25.0 - 26.5'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T-27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	4	96	
1/2"	2	94	
3/8"	2	93	
1/4"	2	91	
#4	1	90	
#8	2	88	
#10	0	88	
#16	1	87	
#30	1	86	
#40	1	86	
#50	3	83	
#100	22	61	
#200	18	43.0	

Liquid Limit (AASHTO T-89)	41
Plastic Limit (AASHTO T-90)	21
Plasticity Index (AASHTO T-90)	20
Moisture Content (AASHTO T-265)	16.9
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1414-12	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/17/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B-30 @ 40.0 - 41.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T-27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	1	99	
1/4"	1	99	
#4	0	98	
#8	1	97	
#10	0	97	
#16	3	94	
#30	12	83	
#40	9	73	
#50	10	63	
#100	15	48	
#200	10	38.1	

Liquid Limit (AASHTO T-89)	38
Plastic Limit (AASHTO T-90)	23
Plasticity Index (AASHTO T-90)	15
Moisture Content (AASHTO T-265)	19.9
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1414-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/17/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B-31 @ 0.0 - 5.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T-27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	1	99	
#4	1	98	
#8	4	95	
#10	1	93	
#16	5	88	
#30	12	76	
#40	7	70	
#50	7	63	
#100	10	53	
#200	7	45.4	

Liquid Limit (AASHTO T-89)	26
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	9
Moisture Content (AASHTO T-265)	4.6
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1414-3	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/17/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B-31 @ 20.0 - 21.5'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T-27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	4	96	
1/2"	5	91	
3/8"	2	90	
1/4"	2	87	
#4	1	86	
#8	3	83	
#10	1	82	
#16	5	77	
#30	14	63	
#40	10	53	
#50	10	43	
#100	15	28	
#200	9	19.1	

Liquid Limit (AASHTO T-89)	28
Plastic Limit (AASHTO T-90)	20
Plasticity Index (AASHTO T-90)	8
Moisture Content (AASHTO T-265)	6.7
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1414-4	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/16/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B-31 @ 40.0 - 41.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T-27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	1	99	
#30	7	93	
#40	7	86	
#50	10	76	
#100	21	55	
#200	17	37.8	

Liquid Limit (AASHTO T-89)	46
Plastic Limit (AASHTO T-90)	22
Plasticity Index (AASHTO T-90)	24
Moisture Content (AASHTO T-265)	23.5
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1414-5	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/16/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B-32 @ 0.0 - 5.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T-27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	1	99	
3/8"	1	98	
1/4"	3	95	
#4	2	94	
#8	6	87	
#10	2	85	
#16	7	78	
#30	13	65	
#40	7	57	
#50	7	51	
#100	10	41	
#200	7	33.1	

Liquid Limit (AASHTO T-89)	31
Plastic Limit (AASHTO T-90)	22
Plasticity Index (AASHTO T-90)	9
Moisture Content (AASHTO T-265)	4.7
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1414-7	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/16/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B-32 @ 15.0 - 16.5'	Reviewed By:	Dylan Ward

ieve Analysis (ASTM C-136 / AASHTO T-27 / ARIZ 20

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	5	95	
3/4"	0	95	
1/2"	1	94	
3/8"	0	94	
1/4"	1	93	
#4	1	92	
#8	2	90	
#10	0	90	
#16	1	89	
#30	8	81	
#40	11	70	
#50	17	53	
#100	26	27	
#200	11	15.9	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	4.8
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1414-8	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/17/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B-32 @ 45.0 - 46.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T-27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	0	100	
#40	1	98	
#50	3	96	
#100	10	86	
#200	14	71.7	

Liquid Limit (AASHTO T-89)	41
Plastic Limit (AASHTO T-90)	22
Plasticity Index (AASHTO T-90)	19
Moisture Content (AASHTO T-265)	31.1
USCS Soil Classification	CL

Group Name (ASTM D2487)
Lean CLAY with sand

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1414-14	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/16/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B-33 @ 0.0 - 5.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T-27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	1	99	
1/4"	1	98	
#4	1	97	
#8	4	93	
#10	1	92	
#16	5	87	
#30	9	78	
#40	6	72	
#50	7	66	
#100	12	54	
#200	10	44.3	

Liquid Limit (AASHTO T-89)	28
Plastic Limit (AASHTO T-90)	20
Plasticity Index (AASHTO T-90)	8
Moisture Content (AASHTO T-265)	3.7
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1414-16	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/18/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B-33 @ 10.0 - 11.5'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T-27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	2	98	
1/2"	4	94	
3/8"	3	91	
1/4"	4	87	
#4	2	85	
#8	4	80	
#10	1	80	
#16	2	78	
#30	7	71	
#40	7	64	
#50	10	54	
#100	20	34	
#200	13	21.0	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	5.0
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND with gravel

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1414-17	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/18/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B-33 @ 35.0 - 36.5'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	99	
#8	1	99	
#10	0	98	
#16	2	97	
#30	9	88	
#40	7	81	
#50	8	73	
#100	19	54	
#200	15	38.9	

Liquid Limit (AASHTO T-89)	25
Plastic Limit (AASHTO T-90)	21
Plasticity Index (AASHTO T-90)	4
Moisture Content (AASHTO T-265)	9.5
USCS Soil Classification	SC-SM

Group Name (ASTM D2487)
Silty, clayey SAND

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1414-19	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/16/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B-34 @ 0.0 - 5.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T-27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	1	98	
1/4"	2	96	
#4	2	94	
#8	6	88	
#10	2	86	
#16	7	79	
#30	9	70	
#40	5	65	
#50	5	60	
#100	9	51	
#200	9	41.8	

Liquid Limit (AASHTO T-89)	27
Plastic Limit (AASHTO T-90)	20
Plasticity Index (AASHTO T-90)	7
Moisture Content (AASHTO T-265)	4.0
USCS Soil Classification	SC-SM

Group Name (ASTM D2487)
Silty, clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1414-20	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/18/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-34 @ 20.0 - 21.5'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T-27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	0	
3"	0	0	
2 1/2"	0	0	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	4	96	
1/2"	4	92	
3/8"	3	89	
1/4"	4	85	
#4	3	82	
#8	4	78	
#10	1	77	
#16	3	74	
#30	8	66	
#40	6	60	
#50	7	52	
#100	10	42	
#200	5	36.9	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	4.5
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND with gravel

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1414-21	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/20/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B-34 @ 30.0 - 31.5'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T-27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	6	94	
3/4"	0	94	
1/2"	2	92	
3/8"	1	91	
1/4"	1	90	
#4	1	89	
#8	2	87	
#10	1	86	
#16	4	83	
#30	18	64	
#40	16	49	
#50	13	36	
#100	12	24	
#200	6	18.1	

Liquid Limit (AASHTO T-89)	30
Plastic Limit (AASHTO T-90)	19
Plasticity Index (AASHTO T-90)	11
Moisture Content (AASHTO T-265)	9.1
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1414-23	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/18/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-35 @ 0.0 - 5.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T-27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	1	99	
3/4"	0	99	
1/2"	1	98	
3/8"	1	98	
1/4"	2	96	
#4	1	95	
#8	2	93	
#10	1	92	
#16	4	89	
#30	8	81	
#40	4	77	
#50	5	72	
#100	8	65	
#200	8	56.8	

Liquid Limit (AASHTO T-89)	26
Plastic Limit (AASHTO T-90)	19
Plasticity Index (AASHTO T-90)	7
Moisture Content (AASHTO T-265)	5.2
USCS Soil Classification	CL-ML

Group Name (ASTM D2487)
Sandy SILTY CLAY

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-3003-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	6/27/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B35A @ 0.0 - 2.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	1	99	
1/4"	1	98	
#4	1	96	
#8	4	92	
#10	2	90	
#16	8	82	
#30	12	70	
#40	6	63	
#50	6	57	
#100	9	49	
#200	8	41.2	

Liquid Limit (AASHTO T-89)	23
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	6
Moisture Content (AASHTO T-265)	2.1
USCS Soil Classification	SC-SM

Group Name (ASTM D2487)
Silty, clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-3003-3	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	6/27/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B35B @ 2.0 - 4.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	1	99	
3/8"	0	99	
1/4"	1	98	
#4	0	98	
#8	3	95	
#10	1	94	
#16	4	90	
#30	6	84	
#40	4	79	
#50	5	75	
#100	9	65	
#200	11	54.1	

Liquid Limit (AASHTO T-89)	28
Plastic Limit (AASHTO T-90)	18
Plasticity Index (AASHTO T-90)	10
Moisture Content (AASHTO T-265)	3.9
USCS Soil Classification	CL

Group Name (ASTM D2487)
Sandy lean CLAY

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1656-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/11/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-36 @ 0.0 - 5.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	99	
3/8"	0	99	
1/4"	1	98	
#4	1	97	
#8	2	96	
#10	1	95	
#16	5	90	
#30	8	82	
#40	5	78	
#50	5	73	
#100	8	66	
#200	6	59.5	

Liquid Limit (AASHTO T-89)	27
Plastic Limit (AASHTO T-90)	16
Plasticity Index (AASHTO T-90)	11
Moisture Content (AASHTO T-265)	9.2
USCS Soil Classification	CL

Group Name (ASTM D2487)
Sandy lean CLAY

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1656-2	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/13/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B-36 @ 15.0 - 16.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	1	99	
#8	0	99	
#10	0	99	
#16	1	98	
#30	2	96	
#40	3	93	
#50	5	88	
#100	26	63	
#200	28	35.3	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	5.4
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1656-3	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/10/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-36 @ 20.0 - 21.5'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	2	98	
1/2"	2	96	
3/8"	1	95	
1/4"	1	93	
#4	0	93	
#8	2	92	
#10	1	91	
#16	2	89	
#30	11	78	
#40	13	65	
#50	19	47	
#100	27	20	
#200	9	10.4	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	4.4
USCS Soil Classification	SP-SM

Group Name (ASTM D2487)
Poorly graded SAND with silt

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1656-4	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/10/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-36 @ 30.0 - 31.5'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	1	99	
#40	6	93	
#50	17	77	
#100	38	38	
#200	19	19.5	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	6.9
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1656-5	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/13/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-37 @ 0.0 - 5.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	2	98	
3/8"	1	97	
1/4"	2	96	
#4	2	94	
#8	4	90	
#10	1	89	
#16	5	84	
#30	9	75	
#40	6	69	
#50	6	63	
#100	9	54	
#200	6	48.1	

Liquid Limit (AASHTO T-89)	25
Plastic Limit (AASHTO T-90)	15
Plasticity Index (AASHTO T-90)	10
Moisture Content (AASHTO T-265)	7.2
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1656-6	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/10/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-37 @ 15.0 - 16.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	9	91	
3/4"	0	91	
1/2"	2	89	
3/8"	1	88	
1/4"	2	87	
#4	2	85	
#8	8	78	
#10	3	74	
#16	14	60	
#30	23	37	
#40	7	30	
#50	5	25	
#100	6	20	
#200	4	15.9	

Liquid Limit (AASHTO T-89)	30
Plastic Limit (AASHTO T-90)	23
Plasticity Index (AASHTO T-90)	7
Moisture Content (AASHTO T-265)	4.8
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1656-8	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/15/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-37 @ 35.0 - 35.10'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	2	98	
#40	5	93	
#50	11	82	
#100	29	53	
#200	25	27.8	

Liquid Limit (AASHTO T-89)	44
Plastic Limit (AASHTO T-90)	23
Plasticity Index (AASHTO T-90)	21
Moisture Content (AASHTO T-265)	25.7
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1656-9	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/10/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-38 @ 0.0 - 5.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	1	99	
#4	0	99	
#8	3	96	
#10	1	95	
#16	5	90	
#30	8	82	
#40	4	78	
#50	4	73	
#100	7	66	
#200	6	59.4	

Liquid Limit (AASHTO T-89)	30
Plastic Limit (AASHTO T-90)	16
Plasticity Index (AASHTO T-90)	14
Moisture Content (AASHTO T-265)	9.1
USCS Soil Classification	CL

Group Name (ASTM D2487)
Sandy lean CLAY

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1656-11	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/11/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-38 @ 15.0 - 16.5'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	2	98	
3/8"	4	95	
1/4"	4	91	
#4	2	89	
#8	9	79	
#10	3	77	
#16	9	68	
#30	12	56	
#40	7	50	
#50	9	41	
#100	15	27	
#200	9	18.0	

Liquid Limit (AASHTO T-89)	22
Plastic Limit (AASHTO T-90)	19
Plasticity Index (AASHTO T-90)	3
Moisture Content (AASHTO T-265)	4.9
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1656-12	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/4/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-38 @ 30.0 - 31.5'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	1	99	
#8	1	98	
#10	1	98	
#16	3	95	
#30	14	81	
#40	12	69	
#50	12	58	
#100	12	45	
#200	4	41.2	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	7.9
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1657-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/15/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-39 @ 0.0 - 5.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	1	99	
3/8"	1	98	
1/4"	2	97	
#4	1	96	
#8	3	93	
#10	1	91	
#16	6	85	
#30	9	76	
#40	5	71	
#50	5	67	
#100	7	59	
#200	6	53.0	

Liquid Limit (AASHTO T-89)	29
Plastic Limit (AASHTO T-90)	18
Plasticity Index (AASHTO T-90)	11
Moisture Content (AASHTO T-265)	10.0
USCS Soil Classification	CL

Group Name (ASTM D2487)
Sandy lean CLAY

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1657-2	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/11/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-39 @ 15.0 - 16.5'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	1	99	
#8	5	94	
#10	2	92	
#16	8	84	
#30	21	64	
#40	14	50	
#50	13	37	
#100	14	23	
#200	5	18.2	

Liquid Limit (AASHTO T-89)	25
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	8
Moisture Content (AASHTO T-265)	5.9
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1657-3	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/4/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-39 @ 30.0 -31.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	4	96	
1/4"	1	95	
#4	1	94	
#8	1	94	
#10	0	94	
#16	0	93	
#30	1	93	
#40	1	92	
#50	1	91	
#100	9	82	
#200	26	56.1	

Liquid Limit (AASHTO T-89)	42
Plastic Limit (AASHTO T-90)	26
Plasticity Index (AASHTO T-90)	16
Moisture Content (AASHTO T-265)	21.8
USCS Soil Classification	ML

Group Name (ASTM D2487)
Sandy SILT

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1657-4	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/14/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-40 @ 0.0 - 5.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	99	
1/2"	1	98	
3/8"	1	98	
1/4"	2	96	
#4	1	95	
#8	4	91	
#10	1	89	
#16	5	84	
#30	8	76	
#40	5	71	
#50	5	66	
#100	8	58	
#200	7	51.5	

Liquid Limit (AASHTO T-89)	27
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	10
Moisture Content (AASHTO T-265)	10.3
USCS Soil Classification	CL

Group Name (ASTM D2487)
Sandy lean CLAY

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1657-6	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/11/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-40 @ 10.0 - 11.5'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	1	99	
1/4"	2	98	
#4	1	97	
#8	4	93	
#10	1	92	
#16	6	86	
#30	11	75	
#40	7	68	
#50	7	61	
#100	10	51	
#200	7	43.9	

Liquid Limit (AASHTO T-89)	24
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	7
Moisture Content (AASHTO T-265)	9.6
USCS Soil Classification	SC-SM

Group Name (ASTM D2487)
Silty, clayey SAND

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1657-7	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/14/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-41 @ 0.0 -5.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	1	99	
1/2"	2	97	
3/8"	2	95	
1/4"	3	92	
#4	2	90	
#8	3	87	
#10	1	86	
#16	6	80	
#30	10	70	
#40	5	64	
#50	5	59	
#100	8	51	
#200	7	43.9	

Liquid Limit (AASHTO T-89)	28
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	11
Moisture Content (AASHTO T-265)	8.0
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1657-9	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/11/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-41 @ 15.0 - 16.5'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	2	98	
#10	1	97	
#16	3	94	
#30	4	90	
#40	3	87	
#50	4	83	
#100	12	71	
#200	16	55.0	

Liquid Limit (AASHTO T-89)	34
Plastic Limit (AASHTO T-90)	27
Plasticity Index (AASHTO T-90)	7
Moisture Content (AASHTO T-265)	11.0
USCS Soil Classification	ML

Group Name (ASTM D2487)
Sandy SILT

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1657-10	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/14/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B-42 @ 0.0 - 5.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	2	98	
3/8"	1	97	
1/4"	1	96	
#4	1	95	
#8	3	92	
#10	1	91	
#16	6	85	
#30	11	74	
#40	6	68	
#50	5	63	
#100	9	54	
#200	8	46.8	

Liquid Limit (AASHTO T-89)	27
Plastic Limit (AASHTO T-90)	18
Plasticity Index (AASHTO T-90)	9
Moisture Content (AASHTO T-265)	9.5
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1657-12	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/11/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-42 @ 20.0 -21.5'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	99	
1/4"	1	98	
#4	1	98	
#8	3	95	
#10	1	94	
#16	5	90	
#30	13	77	
#40	13	64	
#50	17	47	
#100	25	22	
#200	9	12.1	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	3.8
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1657-13	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/16/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-43 @ 0.0 - 5.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	99	
1/2"	1	98	
3/8"	1	98	
1/4"	2	96	
#4	1	95	
#8	4	90	
#10	1	89	
#16	6	83	
#30	10	73	
#40	5	68	
#50	5	63	
#100	8	55	
#200	7	48.0	

Liquid Limit (AASHTO T-89)	28
Plastic Limit (AASHTO T-90)	18
Plasticity Index (AASHTO T-90)	10
Moisture Content (AASHTO T-265)	10.0
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1657-15	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/17/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-43 @ 15.0 - 16.5'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	99	
#8	2	98	
#10	1	97	
#16	2	95	
#30	3	92	
#40	2	90	
#50	4	87	
#100	23	64	
#200	25	38.6	

Liquid Limit (AASHTO T-89)	29
Plastic Limit (AASHTO T-90)	26
Plasticity Index (AASHTO T-90)	3
Moisture Content (AASHTO T-265)	7.7
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1657-16	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/17/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-44 @ 0.0 - 5.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	2	98	
1/2"	1	97	
3/8"	1	96	
1/4"	2	94	
#4	1	93	
#8	5	87	
#10	1	86	
#16	6	80	
#30	10	70	
#40	5	64	
#50	5	59	
#100	8	51	
#200	7	43.7	

Liquid Limit (AASHTO T-89)	26
Plastic Limit (AASHTO T-90)	18
Plasticity Index (AASHTO T-90)	8
Moisture Content (AASHTO T-265)	9.2
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1657-17	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/17/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-44 @ 15.0 - 16.5'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	2	98	
#10	1	97	
#16	2	95	
#30	4	91	
#40	3	89	
#50	4	85	
#100	11	74	
#200	10	64.2	

Liquid Limit (AASHTO T-89)	42
Plastic Limit (AASHTO T-90)	29
Plasticity Index (AASHTO T-90)	13
Moisture Content (AASHTO T-265)	13.3
USCS Soil Classification	ML

Group Name (ASTM D2487)
Sandy SILT

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1657-18	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/17/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-44 @ 25.0 - 26.5'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	17	83	
3/4"	0	83	
1/2"	0	83	
3/8"	0	83	
1/4"	0	83	
#4	0	83	
#8	1	82	
#10	0	81	
#16	1	80	
#30	6	74	
#40	7	67	
#50	13	53	
#100	26	27	
#200	12	15.1	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	6.0
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND with gravel

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1657-19	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/17/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-45 @ 0.0 - 5.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	1	99	
1/2"	0	99	
3/8"	1	98	
1/4"	1	97	
#4	1	96	
#8	4	92	
#10	1	91	
#16	5	85	
#30	8	77	
#40	5	72	
#50	5	68	
#100	8	60	
#200	7	52.8	

Liquid Limit (AASHTO T-89)	28
Plastic Limit (AASHTO T-90)	18
Plasticity Index (AASHTO T-90)	10
Moisture Content (AASHTO T-265)	9.9
USCS Soil Classification	CL

Group Name (ASTM D2487)
Sandy lean CLAY

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1657-21	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/17/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-45 @ 15.0 - 16.5'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	4	96	
1/2"	3	93	
3/8"	1	92	
1/4"	2	90	
#4	1	89	
#8	3	86	
#10	1	85	
#16	3	82	
#30	3	79	
#40	2	78	
#50	3	75	
#100	11	64	
#200	16	47.9	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	9.0
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1978-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/27/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-46 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	1	99	
1/2"	1	98	
3/8"	1	97	
1/4"	2	96	
#4	1	94	
#8	4	91	
#10	1	90	
#16	6	84	
#30	9	75	
#40	5	70	
#50	5	66	
#100	7	58	
#200	7	51.5	

Liquid Limit (AASHTO T-89)	29
Plastic Limit (AASHTO T-90)	18
Plasticity Index (AASHTO T-90)	11
Moisture Content (AASHTO T-265)	8.8
USCS Soil Classification	CL

Group Name (ASTM D2487)
Sandy lean CLAY

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1978-2	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/27/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-46 @ 10.0 - 11.3	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	2	98	
1/2"	0	98	
3/8"	0	98	
1/4"	0	98	
#4	2	96	
#8	7	89	
#10	1	88	
#16	4	84	
#30	5	79	
#40	3	76	
#50	3	73	
#100	9	64	
#200	13	51.3	

Liquid Limit (AASHTO T-89)	46
Plastic Limit (AASHTO T-90)	24
Plasticity Index (AASHTO T-90)	22
Moisture Content (AASHTO T-265)	9.9
USCS Soil Classification	CL

Group Name (ASTM D2487)
Sandy lean CLAY

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1978-3	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/27/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-47 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	1	99	
1/2"	1	99	
3/8"	1	98	
1/4"	2	96	
#4	1	95	
#8	3	92	
#10	1	91	
#16	4	87	
#30	8	79	
#40	4	75	
#50	4	71	
#100	7	64	
#200	7	56.8	

Liquid Limit (AASHTO T-89)	28
Plastic Limit (AASHTO T-90)	18
Plasticity Index (AASHTO T-90)	10
Moisture Content (AASHTO T-265)	8.7
USCS Soil Classification	CL

Group Name (ASTM D2487)
Sandy lean CLAY

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1957-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/19/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-49 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	1	99	
3/8"	1	98	
1/4"	2	96	
#4	1	95	
#8	4	91	
#10	1	90	
#16	6	84	
#30	10	73	
#40	5	68	
#50	5	64	
#100	7	56	
#200	6	49.7	

Liquid Limit (AASHTO T-89)	30
Plastic Limit (AASHTO T-90)	18
Plasticity Index (AASHTO T-90)	12
Moisture Content (AASHTO T-265)	9.2
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1957-2	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/19/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-49 @ 10.0 - 11.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	2	98	
3/8"	2	96	
1/4"	2	94	
#4	2	91	
#8	7	84	
#10	2	82	
#16	4	78	
#30	6	72	
#40	3	69	
#50	4	65	
#100	11	54	
#200	12	41.8	

Liquid Limit (AASHTO T-89)	42
Plastic Limit (AASHTO T-90)	23
Plasticity Index (AASHTO T-90)	19
Moisture Content (AASHTO T-265)	11.8
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1957-3	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/19/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-50 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	1	99	
1/2"	2	97	
3/8"	1	96	
1/4"	3	93	
#4	2	91	
#8	4	87	
#10	1	86	
#16	7	79	
#30	13	66	
#40	6	60	
#50	6	54	
#100	9	45	
#200	8	37.1	

Liquid Limit (AASHTO T-89)	29
Plastic Limit (AASHTO T-90)	19
Plasticity Index (AASHTO T-90)	10
Moisture Content (AASHTO T-265)	9.2
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1957-5	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/19/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-50 @ 20.0 -21.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	6	94	
3/4"	3	91	
1/2"	4	87	
3/8"	2	85	
1/4"	4	80	
#4	3	77	
#8	6	71	
#10	2	69	
#16	5	65	
#30	8	57	
#40	4	52	
#50	6	47	
#100	12	35	
#200	9	26.3	

Liquid Limit (AASHTO T-89)	39
Plastic Limit (AASHTO T-90)	24
Plasticity Index (AASHTO T-90)	15
Moisture Content (AASHTO T-265)	12.6
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND with gravel

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1414-25	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/18/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-51 @ 0.0 - 5.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T-27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	1	99	
3/8"	0	99	
1/4"	1	98	
#4	1	97	
#8	3	94	
#10	1	93	
#16	7	86	
#30	11	75	
#40	5	69	
#50	5	64	
#100	8	57	
#200	8	48.7	

Liquid Limit (AASHTO T-89)	25
Plastic Limit (AASHTO T-90)	20
Plasticity Index (AASHTO T-90)	5
Moisture Content (AASHTO T-265)	3.3
USCS Soil Classification	SC-SM

Group Name (ASTM D2487)
Silty, clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1414-26	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/18/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-51 @ 10.0 - 10.11	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T-27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	6	94	
3/4"	3	90	
1/2"	10	81	
3/8"	3	78	
1/4"	7	71	
#4	4	66	
#8	10	57	
#10	2	55	
#16	5	50	
#30	6	45	
#40	3	42	
#50	3	39	
#100	6	33	
#200	6	26.8	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	4.5
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND with gravel

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1456-10	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/16/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B-52 @ 0.0 - 5.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	1	99	
1/4"	0	98	
#4	1	98	
#8	1	97	
#10	0	96	
#16	2	94	
#30	4	90	
#40	2	87	
#50	2	85	
#100	4	81	
#200	6	75.1	

Liquid Limit (AASHTO T-89)	27
Plastic Limit (AASHTO T-90)	19
Plasticity Index (AASHTO T-90)	8
Moisture Content (AASHTO T-265)	5.4
USCS Soil Classification	CL

Group Name (ASTM D2487)
Lean CLAY with sand

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1456-11	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/17/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-52 @ 10.0 - 11.5'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	1	99	
#10	0	99	
#16	1	97	
#30	4	93	
#40	3	91	
#50	3	88	
#100	5	82	
#200	6	76.3	

Liquid Limit (AASHTO T-89)	37
Plastic Limit (AASHTO T-90)	21
Plasticity Index (AASHTO T-90)	16
Moisture Content (AASHTO T-265)	8.1
USCS Soil Classification	CL

Group Name (ASTM D2487)
Lean CLAY with sand

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1456-7	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/17/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-53 @ 0.0 -5.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	2	98	
3/4"	3	95	
1/2"	2	93	
3/8"	1	92	
1/4"	3	89	
#4	3	86	
#8	6	80	
#10	2	79	
#16	7	72	
#30	16	56	
#40	9	47	
#50	7	40	
#100	7	33	
#200	5	28.1	

Liquid Limit (AASHTO T-89)	27
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	10
Moisture Content (AASHTO T-265)	3.2
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1456-4	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/17/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-54 @ 0.0 - 5.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	1	99	
3/4"	0	99	
1/2"	2	97	
3/8"	2	95	
1/4"	4	92	
#4	3	89	
#8	9	80	
#10	3	77	
#16	10	67	
#30	12	55	
#40	6	49	
#50	6	43	
#100	8	35	
#200	7	28.0	

Liquid Limit (AASHTO T-89)	30
Plastic Limit (AASHTO T-90)	20
Plasticity Index (AASHTO T-90)	10
Moisture Content (AASHTO T-265)	3.5
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1456-6	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/18/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-54 @ 20.0 - 21.5'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	5	95	
3/8"	4	90	
1/4"	5	86	
#4	3	82	
#8	4	79	
#10	1	78	
#16	2	76	
#30	5	70	
#40	3	67	
#50	4	63	
#100	8	55	
#200	8	46.5	

Liquid Limit (AASHTO T-89)	49
Plastic Limit (AASHTO T-90)	31
Plasticity Index (AASHTO T-90)	18
Moisture Content (AASHTO T-265)	22.4
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND with gravel

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1958-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/19/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-55 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	1	99	
3/4"	1	98	
1/2"	1	97	
3/8"	1	96	
1/4"	1	95	
#4	1	95	
#8	4	91	
#10	1	90	
#16	6	84	
#30	10	74	
#40	5	70	
#50	4	65	
#100	6	59	
#200	6	53.7	

Liquid Limit (AASHTO T-89)	29
Plastic Limit (AASHTO T-90)	18
Plasticity Index (AASHTO T-90)	11
Moisture Content (AASHTO T-265)	8.1
USCS Soil Classification	CL

Group Name (ASTM D2487)
Sandy lean CLAY

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1958-3	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/19/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-56 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	1	99	
1/2"	2	97	
3/8"	1	97	
1/4"	2	94	
#4	2	93	
#8	5	87	
#10	2	85	
#16	9	76	
#30	12	64	
#40	6	58	
#50	5	53	
#100	7	46	
#200	5	40.1	

Liquid Limit (AASHTO T-89)	31
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	14
Moisture Content (AASHTO T-265)	7.4
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1958-4	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/19/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-56 @ 10.0 - 11.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	2	98	
1/2"	3	95	
3/8"	2	93	
1/4"	5	87	
#4	4	83	
#8	13	70	
#10	2	68	
#16	6	62	
#30	7	55	
#40	3	52	
#50	3	49	
#100	5	44	
#200	7	37.5	

Liquid Limit (AASHTO T-89)	37
Plastic Limit (AASHTO T-90)	24
Plasticity Index (AASHTO T-90)	13
Moisture Content (AASHTO T-265)	9.9
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND with gravel

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1958-5	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/19/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-57 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	3	97	
3/8"	2	95	
1/4"	4	91	
#4	3	89	
#8	5	84	
#10	1	82	
#16	7	75	
#30	11	64	
#40	6	58	
#50	6	52	
#100	8	44	
#200	6	37.9	

Liquid Limit (AASHTO T-89)	30
Plastic Limit (AASHTO T-90)	18
Plasticity Index (AASHTO T-90)	12
Moisture Content (AASHTO T-265)	7.9
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1958-6	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/19/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-57 @ 5.0 - 6.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	3	97	
1/2"	2	96	
3/8"	3	93	
1/4"	3	90	
#4	2	88	
#8	7	81	
#10	2	79	
#16	10	69	
#30	20	49	
#40	14	35	
#50	11	24	
#100	10	13	
#200	4	9.6	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	3.4
USCS Soil Classification	SP-SM

Group Name (ASTM D2487)
Poorly graded SAND with silt

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-2241-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/27/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-58 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	1	99	
3/8"	1	98	
1/4"	2	97	
#4	1	96	
#8	5	91	
#10	1	90	
#16	6	83	
#30	11	73	
#40	6	67	
#50	6	61	
#100	9	53	
#200	8	44.8	

Liquid Limit (AASHTO T-89)	26
Plastic Limit (AASHTO T-90)	20
Plasticity Index (AASHTO T-90)	6
Moisture Content (AASHTO T-265)	3.1
USCS Soil Classification	SC-SM

Group Name (ASTM D2487)
Silty, clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-2241-2	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/27/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-58 @ 10.0 - 11.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	4	96	
3/8"	4	92	
1/4"	1	91	
#4	2	89	
#8	8	81	
#10	2	79	
#16	3	76	
#30	5	71	
#40	2	69	
#50	3	66	
#100	7	59	
#200	10	48.6	

Liquid Limit (AASHTO T-89)	38
Plastic Limit (AASHTO T-90)	23
Plasticity Index (AASHTO T-90)	15
Moisture Content (AASHTO T-265)	7.8
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1979-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/26/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-59 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	1	99	
3/8"	0	98	
1/4"	1	98	
#4	1	97	
#8	1	96	
#10	0	96	
#16	2	93	
#30	4	89	
#40	3	86	
#50	3	84	
#100	4	80	
#200	6	74.3	

Liquid Limit (AASHTO T-89)	27
Plastic Limit (AASHTO T-90)	19
Plasticity Index (AASHTO T-90)	8
Moisture Content (AASHTO T-265)	5.3
USCS Soil Classification	CL

Group Name (ASTM D2487)
Lean CLAY with sand

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1979-2	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/26/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-59 @ 10.0 - 11.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	1	99	
#4	1	98	
#8	1	97	
#10	2	95	
#16	2	94	
#30	1	93	
#40	2	90	
#50	2	88	
#100	9	79	
#200	14	64.9	

Liquid Limit (AASHTO T-89)	36
Plastic Limit (AASHTO T-90)	21
Plasticity Index (AASHTO T-90)	15
Moisture Content (AASHTO T-265)	8.8
USCS Soil Classification	CL

Group Name (ASTM D2487)
Sandy lean CLAY

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1979-3	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/26/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-60 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	1	99	
3/8"	1	99	
1/4"	1	98	
#4	1	97	
#8	2	94	
#10	1	93	
#16	5	89	
#30	12	77	
#40	7	70	
#50	6	63	
#100	10	53	
#200	11	42.0	

Liquid Limit (AASHTO T-89)	29
Plastic Limit (AASHTO T-90)	18
Plasticity Index (AASHTO T-90)	11
Moisture Content (AASHTO T-265)	4.1
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1979-4	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/27/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-61 @ 15.0 - 16.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	99	
#4	0	99	
#8	1	99	
#10	0	98	
#16	1	97	
#30	1	96	
#40	1	95	
#50	2	93	
#100	15	78	
#200	28	50.0	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	8.4
USCS Soil Classification	ML

Group Name (ASTM D2487)
Sandy SILT

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1979-5	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/27/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-62 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	3	97	
3/4"	5	93	
1/2"	5	88	
3/8"	3	85	
1/4"	5	81	
#4	3	77	
#8	6	71	
#10	2	69	
#16	8	61	
#30	14	47	
#40	8	39	
#50	8	32	
#100	10	22	
#200	5	17.1	

Liquid Limit (AASHTO T-89)	23
Plastic Limit (AASHTO T-90)	18
Plasticity Index (AASHTO T-90)	5
Moisture Content (AASHTO T-265)	2.7
USCS Soil Classification	SC-SM

Group Name (ASTM D2487)
Silty, clayey SAND with gravel

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1979-6	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/27/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-62 @ 10.0 - 11.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	4	96	
3/4"	1	95	
1/2"	4	91	
3/8"	1	90	
1/4"	2	89	
#4	2	87	
#8	9	78	
#10	1	77	
#16	4	72	
#30	6	66	
#40	4	62	
#50	4	58	
#100	9	49	
#200	9	39.5	

Liquid Limit (AASHTO T-89)	35
Plastic Limit (AASHTO T-90)	20
Plasticity Index (AASHTO T-90)	15
Moisture Content (AASHTO T-265)	7.3
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1979-7	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/27/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-63 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	1	99	
1/2"	2	97	
3/8"	2	95	
1/4"	4	91	
#4	3	89	
#8	6	82	
#10	2	81	
#16	6	75	
#30	9	66	
#40	6	60	
#50	5	55	
#100	8	47	
#200	7	40.0	

Liquid Limit (AASHTO T-89)	27
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	10
Moisture Content (AASHTO T-265)	5.0
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1979-8	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/27/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-63 @ 10.0 - 11.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	3	97	
1/2"	4	93	
3/8"	3	91	
1/4"	4	87	
#4	3	83	
#8	12	71	
#10	3	68	
#16	16	51	
#30	22	29	
#40	8	21	
#50	5	16	
#100	5	11	
#200	3	8.7	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	3.2
USCS Soil Classification	SP-SM

Group Name (ASTM D2487)
Poorly graded SAND with silt and gravel

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1979-9	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/27/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-64 @ 10.0 - 11.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	1	99	
1/4"	2	96	
#4	2	95	
#8	4	90	
#10	1	89	
#16	6	83	
#30	15	68	
#40	10	58	
#50	12	46	
#100	19	27	
#200	9	17.7	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	6.6
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1959-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/25/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-66 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	99	
3/8"	0	99	
1/4"	0	99	
#4	0	99	
#8	1	97	
#10	0	97	
#16	2	95	
#30	4	91	
#40	2	88	
#50	3	86	
#100	6	80	
#200	9	70.6	

Liquid Limit (AASHTO T-89)	31
Plastic Limit (AASHTO T-90)	20
Plasticity Index (AASHTO T-90)	11
Moisture Content (AASHTO T-265)	14.4
USCS Soil Classification	CL

Group Name (ASTM D2487)
Lean CLAY with sand

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-2132-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/28/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-67 @ 10.0 - 11.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	1	98	
#4	4	94	
#8	3	92	
#10	1	91	
#16	6	85	
#30	16	68	
#40	13	55	
#50	14	41	
#100	17	24	
#200	8	16.3	

Liquid Limit (AASHTO T-89)	28
Plastic Limit (AASHTO T-90)	19
Plasticity Index (AASHTO T-90)	9
Moisture Content (AASHTO T-265)	8.0
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-2132-3	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/28/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-68 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	1	99	
#4	1	98	
#8	2	96	
#10	1	95	
#16	5	89	
#30	9	80	
#40	4	76	
#50	4	72	
#100	6	66	
#200	5	60.5	

Liquid Limit (AASHTO T-89)	28
Plastic Limit (AASHTO T-90)	19
Plasticity Index (AASHTO T-90)	9
Moisture Content (AASHTO T-265)	9.7
USCS Soil Classification	CL

Group Name (ASTM D2487)
Sandy lean CLAY

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-2132-4	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	5/4/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-68 @ 15.0 - 16.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	-	-	
3"	-	-	
2 1/2"	-	-	
2"	-	-	
1 1/2"	-	-	
1"	-	-	
3/4"	-	-	
1/2"	-	-	
3/8"	-	-	
1/4"	-	-	
#4	-	-	
#8	-	-	
#10	-	-	
#16	-	-	
#30	-	-	
#40	-	-	
#50	-	-	
#100	-	-	
#200	-	-	

Liquid Limit (AASHTO T-89)	38
Plastic Limit (AASHTO T-90)	22
Plasticity Index (AASHTO T-90)	16
Moisture Content (AASHTO T-265)	-
USCS Soil Classification	-

Group Name (ASTM D2487)
-

*Moisture Sample Dropped. Sieve Percent Passing Could Not Be Calculated

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1803-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/28/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-69 @ 1.0 - 4.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	1	99	
1/4"	3	95	
#4	3	93	
#8	8	84	
#10	2	83	
#16	8	74	
#30	11	63	
#40	5	58	
#50	4	54	
#100	6	48	
#200	5	43.3	

Liquid Limit (AASHTO T-89)	27
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	10
Moisture Content (AASHTO T-265)	5.5
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1803-4	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/18/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-69 @ 20.0 - 21.5'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	6	94	
#10	2	92	
#16	6	86	
#30	9	78	
#40	5	73	
#50	5	67	
#100	9	58	
#200	11	47.2	

Liquid Limit (AASHTO T-89)	48
Plastic Limit (AASHTO T-90)	28
Plasticity Index (AASHTO T-90)	20
Moisture Content (AASHTO T-265)	24.6
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1803-5	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/18/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-69 @ 30.0 - 31.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	1	99	
#10	1	98	
#16	5	93	
#30	22	71	
#40	17	54	
#50	17	37	
#100	20	17	
#200	8	8.9	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	3.6
USCS Soil Classification	SP-SM

Group Name (ASTM D2487)
Poorly graded SAND with silt

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1803-6	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/18/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-70 @ 1.0 -5.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	1	99	
3/4"	0	99	
1/2"	2	97	
3/8"	2	96	
1/4"	4	91	
#4	3	88	
#8	8	80	
#10	3	78	
#16	11	67	
#30	14	53	
#40	7	46	
#50	6	40	
#100	7	32	
#200	5	27.5	

Liquid Limit (AASHTO T-89)	34
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	17
Moisture Content (AASHTO T-265)	9.0
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1803-7	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/18/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-70 @ 17.5 - 20.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	3	97	
1/2"	7	89	
3/8"	5	84	
1/4"	8	76	
#4	4	72	
#8	7	65	
#10	2	64	
#16	5	58	
#30	5	53	
#40	2	51	
#50	2	49	
#100	3	46	
#200	5	41.3	

Liquid Limit (AASHTO T-89)	32
Plastic Limit (AASHTO T-90)	21
Plasticity Index (AASHTO T-90)	11
Moisture Content (AASHTO T-265)	11.5
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND with gravel

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1803-9	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/18/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-70 @ 42.5 - 45.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	2	98	
3/4"	8	90	
1/2"	10	80	
3/8"	6	74	
1/4"	9	65	
#4	4	61	
#8	5	56	
#10	1	54	
#16	4	51	
#30	5	46	
#40	3	42	
#50	3	40	
#100	5	35	
#200	5	29.9	

Liquid Limit (AASHTO T-89)	33
Plastic Limit (AASHTO T-90)	16
Plasticity Index (AASHTO T-90)	17
Moisture Content (AASHTO T-265)	11.0
USCS Soil Classification	GC

Group Name (ASTM D2487)
Clayey GRAVEL with sand

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-2084-5	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/28/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-71 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	1	99	
1/4"	3	97	
#4	2	95	
#8	6	88	
#10	2	86	
#16	8	79	
#30	13	66	
#40	7	58	
#50	7	51	
#100	10	41	
#200	8	33.0	

Liquid Limit (AASHTO T-89)	29
Plastic Limit (AASHTO T-90)	18
Plasticity Index (AASHTO T-90)	11
Moisture Content (AASHTO T-265)	3.5
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-2084-7	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/28/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-71 @ 25.0 - 26.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	0	100	
#40	1	99	
#50	2	97	
#100	11	86	
#200	25	60.6	

Liquid Limit (AASHTO T-89)	32
Plastic Limit (AASHTO T-90)	23
Plasticity Index (AASHTO T-90)	9
Moisture Content (AASHTO T-265)	10.7
USCS Soil Classification	CL

Group Name (ASTM D2487)
Sandy lean CLAY

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-2084-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/28/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-72 @ 5.0 - 6.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	1	98	
1/4"	2	97	
#4	1	96	
#8	3	93	
#10	1	92	
#16	8	84	
#30	19	65	
#40	14	51	
#50	14	38	
#100	15	23	
#200	7	15.4	

Liquid Limit (AASHTO T-89)	28
Plastic Limit (AASHTO T-90)	18
Plasticity Index (AASHTO T-90)	10
Moisture Content (AASHTO T-265)	4.2
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-2084-3	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/28/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-72 @ 30.0 - 31.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	1	99	
#10	0	99	
#16	2	97	
#30	6	91	
#40	9	83	
#50	15	67	
#100	29	38	
#200	14	24.3	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	4.8
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-2084-4	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/28/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-72 @ 50.0 - 51.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	1	99	
#30	5	94	
#40	11	84	
#50	16	67	
#100	34	33	
#200	14	19.1	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	5.7
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1804-7	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/5/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B73 @ 17.5 - 20.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	99	
1/4"	0	99	
#4	0	98	
#8	3	96	
#10	1	95	
#16	3	93	
#30	7	85	
#40	5	80	
#50	7	73	
#100	14	59	
#200	14	45.2	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	8.4
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1804-9	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/5/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B73 @ 42.5 - 45.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	1	99	
3/4"	1	97	
1/2"	1	96	
3/8"	1	96	
1/4"	1	94	
#4	1	94	
#8	2	91	
#10	1	90	
#16	6	85	
#30	24	61	
#40	15	45	
#50	10	35	
#100	9	26	
#200	5	20.8	

Liquid Limit (AASHTO T-89)	28
Plastic Limit (AASHTO T-90)	19
Plasticity Index (AASHTO T-90)	9
Moisture Content (AASHTO T-265)	8.5
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1804-10	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/6/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B73 @ 50.0 - 51.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	1	99	
#10	1	98	
#16	2	96	
#30	4	92	
#40	6	86	
#50	16	70	
#100	37	33	
#200	21	12.2	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	15.4
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1804-12	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/6/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B73 @ 85.0 - 86.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	3	97	
3/4"	12	85	
1/2"	4	81	
3/8"	3	78	
1/4"	4	74	
#4	3	71	
#8	7	64	
#10	1	63	
#16	7	56	
#30	10	46	
#40	5	41	
#50	3	37	
#100	3	34	
#200	3	31.3	

Liquid Limit (AASHTO T-89)	34
Plastic Limit (AASHTO T-90)	24
Plasticity Index (AASHTO T-90)	10
Moisture Content (AASHTO T-265)	13.7
USCS Soil Classification	SM

Group Name (ASTM D2487)

Silty SAND with gravel

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-2083-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/28/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-74 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	1	99	
1/4"	3	96	
#4	2	94	
#8	6	88	
#10	2	86	
#16	9	77	
#30	19	58	
#40	11	46	
#50	11	36	
#100	13	22	
#200	7	15.5	

Liquid Limit (AASHTO T-89)	29
Plastic Limit (AASHTO T-90)	18
Plasticity Index (AASHTO T-90)	11
Moisture Content (AASHTO T-265)	2.8
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-2083-2	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	5/3/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-74 @ 10.0 - 10.11	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	-	-	
3"	-	-	
2 1/2"	-	-	
2"	-	-	
1 1/2"	-	-	
1"	-	-	
3/4"	-	-	
1/2"	-	-	
3/8"	-	-	
1/4"	-	-	
#4	-	-	
#8	-	-	
#10	-	-	
#16	-	-	
#30	-	-	
#40	-	-	
#50	-	-	
#100	-	-	
#200	-	-	

Liquid Limit (AASHTO T-89)	33
Plastic Limit (AASHTO T-90)	26
Plasticity Index (AASHTO T-90)	7
Moisture Content (AASHTO T-265)	-
USCS Soil Classification	-

Group Name (ASTM D2487)
-

*Moisture Sample Dropped. Sieve Percent Passing Could Not Be Calculated

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-2083-3	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/28/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-74 @ 30.0 - 31.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	1	99	
#30	3	96	
#40	4	92	
#50	8	84	
#100	24	60	
#200	19	41.2	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	6.6
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-2083-4	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/28/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-74 @ 60.0 - 61.4	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	3	97	
1/2"	5	92	
3/8"	2	90	
1/4"	2	87	
#4	1	86	
#8	1	85	
#10	0	85	
#16	1	84	
#30	1	83	
#40	1	82	
#50	3	79	
#100	18	60	
#200	22	38.1	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	11.0
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1850-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/5/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-75 @ 7.5 -10.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	1	99	
1/2"	4	94	
3/8"	3	91	
1/4"	5	87	
#4	2	85	
#8	4	81	
#10	1	79	
#16	8	72	
#30	15	57	
#40	11	46	
#50	11	35	
#100	13	22	
#200	6	16.0	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	5.7
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND with gravel

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1850-2	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/5/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-75 @ 17.5 - 20.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	5	95	
3/4"	2	92	
1/2"	5	88	
3/8"	3	84	
1/4"	5	79	
#4	2	77	
#8	4	73	
#10	1	72	
#16	3	69	
#30	3	66	
#40	2	65	
#50	2	63	
#100	3	61	
#200	6	54.9	

Liquid Limit (AASHTO T-89)	29
Plastic Limit (AASHTO T-90)	22
Plasticity Index (AASHTO T-90)	7
Moisture Content (AASHTO T-265)	15.1
USCS Soil Classification	CL-ML

Group Name (ASTM D2487)
Gravelly SILTY CLAY with sand

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1850-4	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/5/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-75 @ 22.5 - 25.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	1	99	
3/4"	1	97	
1/2"	3	95	
3/8"	4	91	
1/4"	6	85	
#4	3	82	
#8	4	78	
#10	1	77	
#16	5	72	
#30	11	61	
#40	7	54	
#50	8	46	
#100	13	33	
#200	9	24.3	

Liquid Limit (AASHTO T-89)	25
Plastic Limit (AASHTO T-90)	16
Plasticity Index (AASHTO T-90)	9
Moisture Content (AASHTO T-265)	8.3
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND with gravel

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1850-7	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/6/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-76 @ 10.0 - 11.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	4	96	
3/4"	0	96	
1/2"	12	85	
3/8"	5	79	
1/4"	7	72	
#4	4	69	
#8	10	59	
#10	2	57	
#16	6	51	
#30	6	45	
#40	3	43	
#50	3	40	
#100	4	36	
#200	5	30.8	

Liquid Limit (AASHTO T-89)	37
Plastic Limit (AASHTO T-90)	21
Plasticity Index (AASHTO T-90)	16
Moisture Content (AASHTO T-265)	10.3
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND with gravel

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1850-8	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/6/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-76 @ 20.0 - 21.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	1	99	
1/2"	4	95	
3/8"	1	94	
1/4"	2	92	
#4	1	91	
#8	0	-	
#10	0	-	
#16	0	-	
#30	0	-	
#40	0	-	
#50	0	-	
#100	0	-	
#200	0	-	

Liquid Limit (AASHTO T-89)	32
Plastic Limit (AASHTO T-90)	25
Plasticity Index (AASHTO T-90)	7
Moisture Content (AASHTO T-265)	14.3
USCS Soil Classification	ML

Group Name (ASTM D2487)
SILT

*Fine Sieve was dropped before sample could be sieved. There was no extra material to re-run.

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1850-9	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/6/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-76 @ 30.0 - 31.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	5	95	
1/2"	2	93	
3/8"	2	91	
1/4"	3	88	
#4	1	87	
#8	1	86	
#10	0	85	
#16	1	84	
#30	1	83	
#40	1	83	
#50	1	82	
#100	4	78	
#200	8	69.4	

Liquid Limit (AASHTO T-89)	33
Plastic Limit (AASHTO T-90)	25
Plasticity Index (AASHTO T-90)	8
Moisture Content (AASHTO T-265)	16.3
USCS Soil Classification	ML

Group Name (ASTM D2487)
Sandy SILT

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1850-10	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/6/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-76 @ 55.0 - 56.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	99	
#30	1	98	
#40	2	96	
#50	4	91	
#100	23	69	
#200	34	34.4	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	12.9
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1804-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/5/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B77 @ 0.0 - 5.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	1	99	
1/2"	2	97	
3/8"	1	96	
1/4"	2	94	
#4	2	93	
#8	4	88	
#10	1	87	
#16	6	81	
#30	12	69	
#40	7	62	
#50	7	55	
#100	11	45	
#200	8	36.9	

Liquid Limit (AASHTO T-89)	28
Plastic Limit (AASHTO T-90)	19
Plasticity Index (AASHTO T-90)	9
Moisture Content (AASHTO T-265)	9.7
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1804-2	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/5/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B77 @ 12.5 - 15.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	7	93	
3/4"	5	88	
1/2"	5	83	
3/8"	3	80	
1/4"	5	75	
#4	3	72	
#8	6	66	
#10	1	65	
#16	3	62	
#30	5	57	
#40	3	54	
#50	3	51	
#100	5	45	
#200	5	40.1	

Liquid Limit (AASHTO T-89)	30
Plastic Limit (AASHTO T-90)	19
Plasticity Index (AASHTO T-90)	11
Moisture Content (AASHTO T-265)	8.6
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND with gravel

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1804-3	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/4/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B77 @ 28.5 - 30.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	7	93	
3/4"	2	91	
1/2"	3	87	
3/8"	2	85	
1/4"	4	81	
#4	2	79	
#8	3	76	
#10	1	75	
#16	2	73	
#30	2	70	
#40	1	69	
#50	1	68	
#100	4	64	
#200	6	57.7	

Liquid Limit (AASHTO T-89)	42
Plastic Limit (AASHTO T-90)	22
Plasticity Index (AASHTO T-90)	20
Moisture Content (AASHTO T-265)	20.3
USCS Soil Classification	CL

Group Name (ASTM D2487)
Gravelly lean CLAY with sand

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1804-6	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/6/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B77 @ 55.0 - 56.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	1	99	
#10	0	99	
#16	1	99	
#30	3	95	
#40	6	90	
#50	15	75	
#100	38	37	
#200	24	12.7	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	8.4
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1977-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/26/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-78 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	1	99	
1/2"	1	98	
3/8"	1	96	
1/4"	3	94	
#4	3	91	
#8	7	83	
#10	3	81	
#16	15	66	
#30	25	41	
#40	11	30	
#50	7	23	
#100	7	16	
#200	4	11.8	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	7.3
USCS Soil Classification	SP-SM

Group Name (ASTM D2487)
Poorly graded SAND with silt

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1977-2	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/26/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-78 @ 15.0 - 16.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	6	94	
3/4"	2	92	
1/2"	4	88	
3/8"	1	87	
1/4"	3	84	
#4	1	83	
#8	2	82	
#10	0	81	
#16	2	80	
#30	2	78	
#40	1	76	
#50	2	74	
#100	8	67	
#200	19	48.1	

Liquid Limit (AASHTO T-89)	45
Plastic Limit (AASHTO T-90)	22
Plasticity Index (AASHTO T-90)	23
Moisture Content (AASHTO T-265)	11.8
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND with gravel

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1977-3	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/26/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-78 @ 30.0 - 31.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	1	99	
#10	0	98	
#16	1	97	
#30	5	92	
#40	6	85	
#50	12	73	
#100	42	31	
#200	18	13.6	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	6.3
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-2081	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/28/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-79 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	1	99	
1/2"	2	98	
3/8"	1	96	
1/4"	3	94	
#4	2	92	
#8	4	87	
#10	1	86	
#16	9	77	
#30	12	65	
#40	6	59	
#50	6	53	
#100	11	42	
#200	8	33.9	

Liquid Limit (AASHTO T-89)	27
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	10
Moisture Content (AASHTO T-265)	9.4
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-2081	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/28/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-79 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	1	99	
1/2"	2	98	
3/8"	1	96	
1/4"	3	94	
#4	2	92	
#8	4	87	
#10	1	86	
#16	9	77	
#30	12	65	
#40	6	59	
#50	6	53	
#100	11	42	
#200	8	33.9	

Liquid Limit (AASHTO T-89)	27
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	10
Moisture Content (AASHTO T-265)	9.4
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1803-10	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/28/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-80 @ 0.0 - 5.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	1	99	
3/8"	0	99	
1/4"	1	98	
#4	1	97	
#8	2	95	
#10	1	94	
#16	5	90	
#30	8	81	
#40	5	77	
#50	5	72	
#100	8	64	
#200	8	56.9	

Liquid Limit (AASHTO T-89)	27
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	10
Moisture Content (AASHTO T-265)	9.9
USCS Soil Classification	CL

Group Name (ASTM D2487)
Sandy lean CLAY

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-2238-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/27/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-83 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	1	99	
3/8"	1	99	
1/4"	2	97	
#4	2	95	
#8	5	90	
#10	2	89	
#16	8	80	
#30	17	63	
#40	9	54	
#50	8	46	
#100	11	35	
#200	8	27.1	

Liquid Limit (AASHTO T-89)	26
Plastic Limit (AASHTO T-90)	18
Plasticity Index (AASHTO T-90)	8
Moisture Content (AASHTO T-265)	3.9
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1943-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/21/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-84 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	1	99	
3/4"	1	97	
1/2"	3	94	
3/8"	2	92	
1/4"	4	88	
#4	3	86	
#8	7	78	
#10	2	76	
#16	12	64	
#30	17	47	
#40	8	39	
#50	7	32	
#100	9	23	
#200	7	16.6	

Liquid Limit (AASHTO T-89)	33
Plastic Limit (AASHTO T-90)	21
Plasticity Index (AASHTO T-90)	12
Moisture Content (AASHTO T-265)	7.2
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1943-2	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/21/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-84 @ 16.0 - 17.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	0	100	
#40	1	99	
#50	2	97	
#100	14	83	
#200	29	54.6	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	9.5
USCS Soil Classification	ML

Group Name (ASTM D2487)
Sandy SILT

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1943-3	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/21/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-84 @ 35.0 - 36.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	2	97	
#40	3	94	
#50	5	89	
#100	13	76	
#200	20	56.8	

Liquid Limit (AASHTO T-89)	27
Plastic Limit (AASHTO T-90)	21
Plasticity Index (AASHTO T-90)	6
Moisture Content (AASHTO T-265)	13.4
USCS Soil Classification	CL-ML

Group Name (ASTM D2487)
Sandy SILTY CLAY

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1943-4	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/21/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-85 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	1	99	
1/2"	3	96	
3/8"	2	95	
1/4"	2	93	
#4	1	91	
#8	3	88	
#10	1	86	
#16	8	79	
#30	16	62	
#40	11	51	
#50	12	39	
#100	17	22	
#200	8	13.8	

Liquid Limit (AASHTO T-89)	30
Plastic Limit (AASHTO T-90)	18
Plasticity Index (AASHTO T-90)	12
Moisture Content (AASHTO T-265)	7.9
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-3007-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	6/27/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B85A @ 0.0 - 2.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	2	98	
1"	1	97	
3/4"	1	96	
1/2"	1	95	
3/8"	1	94	
1/4"	3	92	
#4	3	89	
#8	12	78	
#10	4	73	
#16	15	58	
#30	18	40	
#40	6	34	
#50	4	30	
#100	5	25	
#200	4	21.4	

Liquid Limit (AASHTO T-89)	43
Plastic Limit (AASHTO T-90)	16
Plasticity Index (AASHTO T-90)	27
Moisture Content (AASHTO T-265)	4.7
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-3007-3	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	6/27/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B85B @ 0.0 - 2.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	1	98	
1/2"	6	92	
3/8"	5	88	
1/4"	6	82	
#4	4	78	
#8	6	72	
#10	1	71	
#16	6	65	
#30	11	54	
#40	6	48	
#50	5	43	
#100	8	35	
#200	6	28.6	

Liquid Limit (AASHTO T-89)	26
Plastic Limit (AASHTO T-90)	15
Plasticity Index (AASHTO T-90)	11
Moisture Content (AASHTO T-265)	3.1
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND with gravel

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1943-7	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/21/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-87 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	2	98	
1/2"	2	96	
3/8"	1	95	
1/4"	3	92	
#4	2	90	
#8	6	84	
#10	2	82	
#16	7	75	
#30	11	64	
#40	6	58	
#50	6	52	
#100	9	43	
#200	8	35.6	

Liquid Limit (AASHTO T-89)	30
Plastic Limit (AASHTO T-90)	16
Plasticity Index (AASHTO T-90)	14
Moisture Content (AASHTO T-265)	5.9
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1943-8	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/7/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-87 @ 15.0 - 16.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	1	99	
#10	0	99	
#16	6	93	
#30	27	66	
#40	18	48	
#50	14	34	
#100	15	19	
#200	7	12.1	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	2.4
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1583-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/11/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B-89 @ 0.0 - 5.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	1	99	
1/2"	1	99	
3/8"	1	98	
1/4"	2	96	
#4	2	94	
#8	7	87	
#10	2	85	
#16	9	76	
#30	10	65	
#40	5	61	
#50	4	57	
#100	6	50	
#200	6	44.7	

Liquid Limit (AASHTO T-89)	33
Plastic Limit (AASHTO T-90)	20
Plasticity Index (AASHTO T-90)	13
Moisture Content (AASHTO T-265)	7.7
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1057-1	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/20/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B - 90 @ 0.0' - 5.0'	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	1	99	
#4	1	97	
#8	6	92	
#10	1	90	
#16	6	85	
#30	9	76	
#40	5	71	
#50	5	67	
#100	9	58	
#200	10	48.1	

Liquid Limit (AASHTO T-89)	34
Plastic Limit (AASHTO T-90)	21
Plasticity Index (AASHTO T-90)	13
Moisture Content (AASHTO T-255)	8.1
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1057-3	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/20/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B - 90 @ 20.0' - 21.5'	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	1	99	
3/8"	1	98	
1/4"	1	98	
#4	0	97	
#8	3	95	
#10	1	94	
#16	6	87	
#30	13	74	
#40	9	65	
#50	11	53	
#100	20	33	
#200	13	20.1	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-255)	4.7
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1057-4	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/24/2022
Project City	Goodyear	Tested By:	Keagan Mayfield
Sample Location:	B - 90 @ 30.0' - 31.5'	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	1	99	
#30	2	97	
#40	6	90	
#50	18	72	
#100	40	32	
#200	16	16.3	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-255)	5.9
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1057-5	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/21/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B - 91 @ 10.0' - 11.0'	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	3	97	
1/4"	7	90	
#4	4	86	
#8	11	76	
#10	3	73	
#16	9	64	
#30	15	49	
#40	7	42	
#50	7	35	
#100	13	23	
#200	8	14.9	

Liquid Limit (AASHTO T-89)	32
Plastic Limit (AASHTO T-90)	21
Plasticity Index (AASHTO T-90)	11
Moisture Content (AASHTO T-255)	
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1057-6	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/24/2022
Project City	Goodyear	Tested By:	Keagan Mayfield
Sample Location:	B - 91 @ 20.0' - 21.5'	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	99	
#16	1	98	
#30	4	94	
#40	4	90	
#50	5	85	
#100	12	73	
#200	17	55.7	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-255)	
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	ML

Group Name (ASTM D2487)
Sandy SILT

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1057-7	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/24/2022
Project City	Goodyear	Tested By:	Keagan Mayfield
Sample Location:	B - 91 @ 25.0' - 26.5'	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	1	99	
#10	0	99	
#16	3	96	
#30	14	82	
#40	13	70	
#50	15	54	
#100	26	28	
#200	13	15.6	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-255)	
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1057-8	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/21/2022
Project City	Goodyear	Tested By:	James Karl
Sample Location:	B - 91 @ 45.0' - 46.5'	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	1	99	
#4	0	99	
#8	1	98	
#10	0	98	
#16	1	97	
#30	10	86	
#40	12	75	
#50	14	61	
#100	19	43	
#200	9	33.2	

Liquid Limit (AASHTO T-89)	32
Plastic Limit (AASHTO T-90)	20
Plasticity Index (AASHTO T-90)	12
Moisture Content (AASHTO T-255)	
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1057-9	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/24/2022
Project City	Goodyear	Tested By:	James Karl
Sample Location:	B - 92 @ 0.0' - 5.0'	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	2	98	
#4	2	95	
#8	9	86	
#10	4	83	
#16	13	70	
#30	18	52	
#40	7	44	
#50	6	38	
#100	8	30	
#200	6	23.6	

Liquid Limit (AASHTO T-89)	27
Plastic Limit (AASHTO T-90)	19
Plasticity Index (AASHTO T-90)	8
Moisture Content (AASHTO T-255)	
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1057-11	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/23/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B - 92 @ 10.0' - 11.5'	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	1	99	
3/8"	0	99	
1/4"	2	97	
#4	1	96	
#8	4	92	
#10	2	90	
#16	7	84	
#30	19	65	
#40	11	54	
#50	10	44	
#100	14	30	
#200	9	20.7	

Liquid Limit (AASHTO T-89)	30
Plastic Limit (AASHTO T-90)	24
Plasticity Index (AASHTO T-90)	6
Moisture Content (AASHTO T-255)	4.3
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1057-12	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/21/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B - 92 @ 30.0' - 31.5'	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	1	99	
#30	3	96	
#40	3	93	
#50	5	88	
#100	15	73	
#200	23	49.7	

Liquid Limit (AASHTO T-89)	32
Plastic Limit (AASHTO T-90)	25
Plasticity Index (AASHTO T-90)	7
Moisture Content (AASHTO T-255)	
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1057-13	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/20/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B - 92 @ 45.0' - 46.5'	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	1	99	
1/4"	0	99	
#4	0	99	
#8	1	98	
#10	0	98	
#16	1	96	
#30	7	89	
#40	10	79	
#50	18	61	
#100	27	34	
#200	9	24.4	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-255)	11.5
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1583-4	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/10/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B-93 @ 0.0 5.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	3	97	
3/4"	2	95	
1/2"	2	93	
3/8"	2	91	
1/4"	3	88	
#4	3	85	
#8	6	79	
#10	2	77	
#16	7	70	
#30	11	59	
#40	5	53	
#50	5	48	
#100	8	40	
#200	6	33.5	

Liquid Limit (AASHTO T-89)	30
Plastic Limit (AASHTO T-90)	20
Plasticity Index (AASHTO T-90)	10
Moisture Content (AASHTO T-265)	2.3
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1057-14	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/20/2022
Project City	Goodyear	Tested By:	Keagan Mayfield
Sample Location:	B - 94 @ 0.0' - 5.0'	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	1	98	
#4	1	97	
#8	10	87	
#10	2	84	
#16	9	75	
#30	15	60	
#40	7	54	
#50	6	47	
#100	11	36	
#200	8	28.7	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-255)	
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1057-15	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/25/2022
Project City	Goodyear	Tested By:	Alexandra Simard
Sample Location:	B - 94 @ 5.0' - 6.0'	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	1	99	
1/2"	6	93	
3/8"	3	90	
1/4"	7	83	
#4	4	80	
#8	9	71	
#10	2	69	
#16	7	62	
#30	16	46	
#40	8	38	
#50	7	31	
#100	10	22	
#200	7	15.2	

Liquid Limit (AASHTO T-89)	34
Plastic Limit (AASHTO T-90)	18
Plasticity Index (AASHTO T-90)	16
Moisture Content (AASHTO T-255)	
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND with gravel

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1057-17	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/22/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B - 94 @ 30.0' - 31.5'	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	1	98	
#40	2	96	
#50	6	91	
#100	24	66	
#200	24	42.1	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-255)	
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1057-18	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/22/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B - 94 @ 55.0' - 56.5'	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	11	89	
3/4"	0	89	
1/2"	4	85	
3/8"	1	84	
1/4"	3	81	
#4	1	80	
#8	3	77	
#10	1	76	
#16	6	70	
#30	20	49	
#40	14	35	
#50	11	24	
#100	10	15	
#200	4	11.0	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-255)	7.0
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SP-SM

Group Name (ASTM D2487)
Poorly graded SAND with silt and gravel

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1057-19	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/24/2022
Project City	Goodyear	Tested By:	Keagan Mayfield
Sample Location:	B - 95 @ 0.0' - 5.0'	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	1	98	
1/4"	4	94	
#4	5	89	
#8	10	79	
#10	3	76	
#16	11	64	
#30	17	47	
#40	7	40	
#50	5	35	
#100	7	27	
#200	5	22.0	

Liquid Limit (AASHTO T-89)	43
Plastic Limit (AASHTO T-90)	24
Plasticity Index (AASHTO T-90)	19
Moisture Content (AASHTO T-255)	6.5
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1057-21	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/23/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B - 95 @ 15.0' - 16' 2"	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	5	95	
#10	1	94	
#16	3	90	
#30	8	82	
#40	6	77	
#50	7	70	
#100	12	58	
#200	11	46.8	

Liquid Limit (AASHTO T-89)	44
Plastic Limit (AASHTO T-90)	24
Plasticity Index (AASHTO T-90)	20
Moisture Content (AASHTO T-255)	
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1057-23	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/20/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B - 95 @ 45.0' - 46.5'	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	1	99	
#8	3	96	
#10	1	95	
#16	3	92	
#30	8	83	
#40	8	76	
#50	11	65	
#100	20	44	
#200	11	33.0	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-255)	
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1057-24	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/23/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B - 95 @ 55.0' - 56.5'	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	4	96	
1/2"	3	94	
3/8"	2	92	
1/4"	1	91	
#4	0	91	
#8	1	90	
#10	0	89	
#16	2	88	
#30	7	80	
#40	6	74	
#50	7	67	
#100	12	55	
#200	10	45.6	

Liquid Limit (AASHTO T-89)	57
Plastic Limit (AASHTO T-90)	27
Plasticity Index (AASHTO T-90)	30
Moisture Content (AASHTO T-255)	23.0
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1057-25	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/24/2022
Project City	Goodyear	Tested By:	James Karl
Sample Location:	B - 96 @ 0.0' - 5.0'	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	1	99	
1/4"	3	96	
#4	3	93	
#8	16	78	
#10	5	73	
#16	16	58	
#30	17	41	
#40	7	33	
#50	5	28	
#100	7	21	
#200	6	14.9	

Liquid Limit (AASHTO T-89)	36
Plastic Limit (AASHTO T-90)	21
Plasticity Index (AASHTO T-90)	15
Moisture Content (AASHTO T-255)	
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1057-26	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/21/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B - 96 @ 5.0' - 6.0'	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	5	95	
3/4"	7	88	
1/2"	1	87	
3/8"	0	86	
1/4"	2	85	
#4	1	83	
#8	2	81	
#10	1	81	
#16	2	79	
#30	3	76	
#40	1	75	
#50	1	74	
#100	3	71	
#200	7	64.1	

Liquid Limit (AASHTO T-89)	45
Plastic Limit (AASHTO T-90)	21
Plasticity Index (AASHTO T-90)	24
Moisture Content (AASHTO T-255)	
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	CL

Group Name (ASTM D2487)
Sandy lean CLAY with gravel

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1057-28	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/21/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B - 96 @ 30.0' - 31.5'	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	1	99	
#40	2	97	
#50	4	93	
#100	15	78	
#200	23	54.9	

Liquid Limit (AASHTO T-89)	27
Plastic Limit (AASHTO T-90)	23
Plasticity Index (AASHTO T-90)	4
Moisture Content (AASHTO T-255)	
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	ML

Group Name (ASTM D2487)
Sandy SILT

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1057-29	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/20/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B - 96 @ 35.0' - 36.5'	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	2	98	
3/8"	1	98	
1/4"	1	97	
#4	1	96	
#8	3	94	
#10	1	93	
#16	4	89	
#30	12	77	
#40	15	62	
#50	19	43	
#100	23	20	
#200	8	11.3	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-255)	4.2
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SP-SM

Group Name (ASTM D2487)
Poorly graded SAND with silt

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1057-30	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/24/2022
Project City	Goodyear	Tested By:	Keagan Mayfield
Sample Location:	B - 96 @ 55.0' - 56.5'	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	2	98	
1/2"	1	97	
3/8"	1	96	
1/4"	1	95	
#4	1	94	
#8	4	90	
#10	1	89	
#16	3	86	
#30	10	76	
#40	9	67	
#50	12	55	
#100	26	29	
#200	10	18.6	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-255)	8.4
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1944-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/21/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-97 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	1	99	
3/4"	1	99	
1/2"	1	98	
3/8"	2	96	
1/4"	2	94	
#4	2	92	
#8	4	88	
#10	1	87	
#16	6	81	
#30	11	71	
#40	6	65	
#50	6	59	
#100	9	50	
#200	9	41.2	

Liquid Limit (AASHTO T-89)	33
Plastic Limit (AASHTO T-90)	18
Plasticity Index (AASHTO T-90)	15
Moisture Content (AASHTO T-265)	7.5
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-3005-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	6/27/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B97A @ 0.0 - 2.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	1	99	
3/4"	0	99	
1/2"	3	96	
3/8"	3	93	
1/4"	5	88	
#4	2	87	
#8	4	82	
#10	1	81	
#16	5	76	
#30	9	67	
#40	5	62	
#50	5	58	
#100	8	50	
#200	7	42.8	

Liquid Limit (AASHTO T-89)	29
Plastic Limit (AASHTO T-90)	15
Plasticity Index (AASHTO T-90)	14
Moisture Content (AASHTO T-265)	4.7
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1944-2	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/21/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-98 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	2	98	
1/2"	2	96	
3/8"	2	94	
1/4"	3	91	
#4	2	89	
#8	5	84	
#10	1	83	
#16	6	78	
#30	9	68	
#40	5	63	
#50	5	58	
#100	8	50	
#200	7	42.8	

Liquid Limit (AASHTO T-89)	29
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	12
Moisture Content (AASHTO T-265)	7.5
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1944-4	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/22/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-98 @ 10.0 - 11.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	3	97	
3/4"	0	97	
1/2"	1	96	
3/8"	1	95	
1/4"	4	91	
#4	3	88	
#8	11	77	
#10	2	75	
#16	6	69	
#30	10	59	
#40	7	52	
#50	8	45	
#100	13	32	
#200	9	22.9	

Liquid Limit (AASHTO T-89)	29
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	12
Moisture Content (AASHTO T-265)	6.6
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-3005-3	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	6/27/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B98A @ 0.0 -2.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	1	99	
1/2"	2	97	
3/8"	2	95	
1/4"	2	93	
#4	1	92	
#8	11	81	
#10	1	79	
#16	6	73	
#30	10	63	
#40	5	58	
#50	5	53	
#100	7	46	
#200	7	39.0	

Liquid Limit (AASHTO T-89)	30
Plastic Limit (AASHTO T-90)	15
Plasticity Index (AASHTO T-90)	15
Moisture Content (AASHTO T-265)	4.3
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1944-5	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/21/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-99 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	2	98	
3/4"	3	95	
1/2"	6	89	
3/8"	3	86	
1/4"	5	81	
#4	3	78	
#8	4	73	
#10	1	72	
#16	7	65	
#30	12	53	
#40	7	47	
#50	6	41	
#100	9	32	
#200	6	25.9	

Liquid Limit (AASHTO T-89)	27
Plastic Limit (AASHTO T-90)	18
Plasticity Index (AASHTO T-90)	9
Moisture Content (AASHTO T-265)	6.8
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND with gravel

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1944-6	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/22/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-99 @ 20.0 - 21.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	1	99	
1/4"	1	99	
#4	1	97	
#8	5	92	
#10	2	90	
#16	11	80	
#30	26	54	
#40	15	39	
#50	12	27	
#100	12	15	
#200	6	9.2	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	2.6
USCS Soil Classification	SP-SM

Group Name (ASTM D2487)
Poorly graded SAND with silt

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1944-7	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/7/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-99 @ 45.0 - 46.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	2	98	
#10	1	97	
#16	3	95	
#30	12	82	
#40	11	71	
#50	12	59	
#100	16	43	
#200	10	32.6	

Liquid Limit (AASHTO T-89)	31
Plastic Limit (AASHTO T-90)	21
Plasticity Index (AASHTO T-90)	10
Moisture Content (AASHTO T-265)	13.3
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1849-5	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/5/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-100 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	1	99	
3/4"	1	98	
1/2"	3	94	
3/8"	3	91	
1/4"	5	86	
#4	3	83	
#8	5	78	
#10	1	77	
#16	6	71	
#30	10	61	
#40	5	56	
#50	5	51	
#100	8	43	
#200	6	36.9	

Liquid Limit (AASHTO T-89)	26
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	9
Moisture Content (AASHTO T-265)	8.6
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND with gravel

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1849-6	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/5/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-100 @ 15.0 - 16.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	1	99	
#4	0	99	
#8	1	97	
#10	1	97	
#16	3	94	
#30	8	86	
#40	7	79	
#50	7	72	
#100	12	60	
#200	15	45.1	

Liquid Limit (AASHTO T-89)	34
Plastic Limit (AASHTO T-90)	21
Plasticity Index (AASHTO T-90)	13
Moisture Content (AASHTO T-265)	10.0
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1849-7	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/6/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-100 @ 30.0 - 31.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	1	99	
#10	0	98	
#16	2	96	
#30	4	92	
#40	4	89	
#50	6	82	
#100	21	61	
#200	28	33.1	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	12.0
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1849-8	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/6/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-100 @ 40.0 - 41.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	1	99	
#10	0	99	
#16	1	99	
#30	5	94	
#40	6	88	
#50	8	79	
#100	19	60	
#200	16	44.2	

Liquid Limit (AASHTO T-89)	38
Plastic Limit (AASHTO T-90)	21
Plasticity Index (AASHTO T-90)	17
Moisture Content (AASHTO T-265)	20.5
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1849-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/5/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-101 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	1	99	
3/4"	1	98	
1/2"	3	96	
3/8"	3	93	
1/4"	5	88	
#4	3	85	
#8	4	80	
#10	1	79	
#16	8	72	
#30	12	59	
#40	7	52	
#50	6	46	
#100	9	37	
#200	6	30.8	

Liquid Limit (AASHTO T-89)	25
Plastic Limit (AASHTO T-90)	16
Plasticity Index (AASHTO T-90)	9
Moisture Content (AASHTO T-265)	4.2
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND with gravel

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1849-2	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/5/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-101 @ 20.0 -21.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	1	99	
1/2"	2	96	
3/8"	1	95	
1/4"	5	90	
#4	3	87	
#8	6	81	
#10	1	80	
#16	4	76	
#30	5	71	
#40	3	68	
#50	4	64	
#100	13	51	
#200	21	30.4	

Liquid Limit (AASHTO T-89)	35
Plastic Limit (AASHTO T-90)	27
Plasticity Index (AASHTO T-90)	8
Moisture Content (AASHTO T-265)	9.8
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1849-4	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/6/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-101 @ 35.0 - 36.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	1	99	
#10	0	99	
#16	1	98	
#30	5	93	
#40	5	88	
#50	8	81	
#100	22	58	
#200	21	37.8	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	14.2
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1057-31	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/20/2022
Project City	Goodyear	Tested By:	Keagan Mayfield
Sample Location:	B - 102 @ 7.5' - 10.0'	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	1	99	
#10	0	99	
#16	2	97	
#30	7	90	
#40	6	85	
#50	7	78	
#100	15	63	
#200	17	45.8	

Liquid Limit (AASHTO T-89)	32
Plastic Limit (AASHTO T-90)	18
Plasticity Index (AASHTO T-90)	14
Moisture Content (AASHTO T-255)	11.5
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1057-32	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/24/2022
Project City	Goodyear	Tested By:	Keagan Mayfield
Sample Location:	B - 102 @ 15.0' - 17.5'	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	2	98	
3/4"	5	93	
1/2"	6	87	
3/8"	6	81	
1/4"	8	73	
#4	5	68	
#8	6	61	
#10	1	60	
#16	3	57	
#30	4	53	
#40	3	50	
#50	3	47	
#100	7	40	
#200	8	32.6	

Liquid Limit (AASHTO T-89)	33
Plastic Limit (AASHTO T-90)	20
Plasticity Index (AASHTO T-90)	13
Moisture Content (AASHTO T-255)	12.2
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND with gravel

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1057-33	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/24/2022
Project City	Goodyear	Tested By:	Keagan Mayfield
Sample Location:	B - 102 @ 25.0' - 26.5'	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	3	97	
3/8"	2	95	
1/4"	2	93	
#4	1	92	
#8	3	89	
#10	1	89	
#16	1	87	
#30	3	85	
#40	2	82	
#50	4	79	
#100	13	65	
#200	14	51.2	

Liquid Limit (AASHTO T-89)	37
Plastic Limit (AASHTO T-90)	24
Plasticity Index (AASHTO T-90)	13
Moisture Content (AASHTO T-255)	19.5
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	CL

Group Name (ASTM D2487)
Sandy lean CLAY

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1057-34	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/20/2022
Project City	Goodyear	Tested By:	Keagan Mayfield
Sample Location:	B - 102 @ 30.0' - 31.5'	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	99	
#10	0	99	
#16	1	98	
#30	3	96	
#40	4	92	
#50	8	84	
#100	24	59	
#200	22	37.8	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-255)	13.6
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1057-35	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/24/2022
Project City	Goodyear	Tested By:	James Karl
Sample Location:	B - 102 @ 42.5' - 45.0'	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	1	99	
#10	0	99	
#16	2	97	
#30	5	92	
#40	5	88	
#50	6	81	
#100	13	69	
#200	13	56.1	

Liquid Limit (AASHTO T-89)	39
Plastic Limit (AASHTO T-90)	23
Plasticity Index (AASHTO T-90)	16
Moisture Content (AASHTO T-255)	28.3
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	CL

Group Name (ASTM D2487)
Sandy lean CLAY

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1057-36	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/19/2022
Project City	Goodyear	Tested By:	Keagan Mayfield
Sample Location:	B - 102 @ 57.5' - 60.0'	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	1	99	
3/8"	0	98	
1/4"	1	98	
#4	0	97	
#8	0	97	
#10	0	97	
#16	1	96	
#30	4	92	
#40	9	83	
#50	18	64	
#100	28	36	
#200	10	26.0	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-255)	7.8
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1057-37	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/20/2022
Project City	Goodyear	Tested By:	Keagan Mayfield
Sample Location:	B - 102 @ 97.5' - 100.0'	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	2	98	
3/4"	5	93	
1/2"	18	75	
3/8"	8	67	
1/4"	7	60	
#4	3	57	
#8	4	53	
#10	1	51	
#16	3	49	
#30	5	44	
#40	3	41	
#50	3	38	
#100	5	33	
#200	3	29.4	

Liquid Limit (AASHTO T-89)	45
Plastic Limit (AASHTO T-90)	20
Plasticity Index (AASHTO T-90)	25
Moisture Content (AASHTO T-255)	23.4
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	GC

Group Name (ASTM D2487)
Clayey GRAVEL with sand

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1848-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/4/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-103 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	5	95	
3/4"	2	93	
1/2"	3	90	
3/8"	3	88	
1/4"	4	84	
#4	3	81	
#8	6	75	
#10	2	73	
#16	9	65	
#30	12	53	
#40	7	47	
#50	6	40	
#100	9	31	
#200	7	24.0	

Liquid Limit (AASHTO T-89)	32
Plastic Limit (AASHTO T-90)	22
Plasticity Index (AASHTO T-90)	10
Moisture Content (AASHTO T-265)	5.5
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND with gravel

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1848-2	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/4/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-103 @ 10.0 - 11.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	5	95	
3/4"	0	95	
1/2"	1	94	
3/8"	1	93	
1/4"	1	93	
#4	1	92	
#8	2	90	
#10	1	89	
#16	3	86	
#30	12	74	
#40	12	62	
#50	14	48	
#100	17	31	
#200	11	19.5	

Liquid Limit (AASHTO T-89)	38
Plastic Limit (AASHTO T-90)	28
Plasticity Index (AASHTO T-90)	10
Moisture Content (AASHTO T-265)	6.0
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1848-4	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/4/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-103 @ 30.0 - 31.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	1	99	
1/2"	0	99	
3/8"	0	99	
1/4"	0	99	
#4	0	99	
#8	1	98	
#10	0	97	
#16	1	97	
#30	2	95	
#40	2	93	
#50	2	91	
#100	8	82	
#200	14	67.9	

Liquid Limit (AASHTO T-89)	39
Plastic Limit (AASHTO T-90)	31
Plasticity Index (AASHTO T-90)	8
Moisture Content (AASHTO T-265)	16.3
USCS Soil Classification	ML

Group Name (ASTM D2487)
Sandy SILT

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1848-5	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/4/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-103 @ 60.0 - 61.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	6	94	
3/4"	1	93	
1/2"	10	83	
3/8"	3	79	
1/4"	7	72	
#4	4	69	
#8	7	62	
#10	1	61	
#16	7	54	
#30	15	39	
#40	9	30	
#50	7	23	
#100	7	16	
#200	5	11.2	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	8.8
USCS Soil Classification	SP-SM

Group Name (ASTM D2487)
Poorly graded SAND with silt and gravel

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1127-1	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/28/2022
Project City	Goodyear	Tested By:	Keagam Mayfield
Sample Location:	B - 104 @ 5.0' - 6.5'	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	3	97	
3/8"	0	97	
1/4"	2	95	
#4	2	92	
#8	8	84	
#10	2	82	
#16	9	73	
#30	17	56	
#40	9	47	
#50	8	38	
#100	11	27	
#200	7	20.4	

Liquid Limit (AASHTO T-89)	26
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	9
Moisture Content (AASHTO T-255)	
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1127-2	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/28/2022
Project City	Goodyear	Tested By:	Keagan Mayfield
Sample Location:	B - 104 @ 22.5' - 25.0'	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	4	96	
1 1/2"	3	93	
1"	5	87	
3/4"	5	83	
1/2"	8	75	
3/8"	5	70	
1/4"	7	63	
#4	3	60	
#8	6	54	
#10	1	53	
#16	3	51	
#30	3	47	
#40	2	45	
#50	3	42	
#100	6	36	
#200	6	30.2	

Liquid Limit (AASHTO T-89)	25
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	8
Moisture Content (AASHTO T-255)	
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	GC

Group Name (ASTM D2487)
Clayey GRAVEL with sand

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1127-3	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/31/2022
Project City	Goodyear	Tested By:	James Karl
Sample Location:	B - 104 @ 37.5' - 40.0'	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	1	99	
#10	0	98	
#16	2	96	
#30	8	88	
#40	7	82	
#50	8	74	
#100	16	57	
#200	15	42.1	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-255)	
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1127-4	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/27/2022
Project City	Goodyear	Tested By:	Keagan Mayfield
Sample Location:	B - 104 @ 47.5' - 50.0'	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	1	99	
#4	1	98	
#8	1	97	
#10	0	97	
#16	1	96	
#30	4	92	
#40	6	86	
#50	9	77	
#100	19	58	
#200	12	46.0	

Liquid Limit (AASHTO T-89)	30
Plastic Limit (AASHTO T-90)	18
Plasticity Index (AASHTO T-90)	12
Moisture Content (AASHTO T-255)	
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1960-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	5/5/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-105 @ 12.5 - 15.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	8	92	
3/4"	4	87	
1/2"	5	83	
3/8"	2	80	
1/4"	5	75	
#4	5	70	
#8	16	55	
#10	2	52	
#16	6	46	
#30	7	39	
#40	4	35	
#50	4	31	
#100	6	25	
#200	5	19.9	

Liquid Limit (AASHTO T-89)	30
Plastic Limit (AASHTO T-90)	18
Plasticity Index (AASHTO T-90)	12
Moisture Content (AASHTO T-265)	7.2
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND with gravel

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1960-2	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	5/5/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-105 @ 17.5 - 20.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	45	55	
3/4"	1	53	
1/2"	4	50	
3/8"	2	48	
1/4"	2	46	
#4	1	44	
#8	4	41	
#10	1	40	
#16	2	39	
#30	2	37	
#40	1	36	
#50	2	34	
#100	4	30	
#200	6	23.3	

Liquid Limit (AASHTO T-89)	28
Plastic Limit (AASHTO T-90)	18
Plasticity Index (AASHTO T-90)	10
Moisture Content (AASHTO T-265)	7.8
USCS Soil Classification	GC

Group Name (ASTM D2487)
Clayey GRAVEL with sand

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-2082-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/28/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-106 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	2	98	
3/8"	2	97	
1/4"	3	93	
#4	3	90	
#8	7	83	
#10	2	81	
#16	8	73	
#30	12	61	
#40	7	54	
#50	7	47	
#100	9	38	
#200	6	31.9	

Liquid Limit (AASHTO T-89)	28
Plastic Limit (AASHTO T-90)	16
Plasticity Index (AASHTO T-90)	12
Moisture Content (AASHTO T-265)	10.1
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-2082-2	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/28/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-107 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	99	
1/4"	1	98	
#4	1	98	
#8	3	95	
#10	1	93	
#16	11	83	
#30	12	70	
#40	5	65	
#50	5	61	
#100	6	55	
#200	5	50.6	

Liquid Limit (AASHTO T-89)	27
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	10
Moisture Content (AASHTO T-265)	11.7
USCS Soil Classification	CL

Group Name (ASTM D2487)
Sandy lean CLAY

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1128-1	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/25/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B - 108 @ 0.0' - 5.0'	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	1	99	
1/2"	2	98	
3/8"	1	96	
1/4"	2	94	
#4	1	93	
#8	5	88	
#10	1	87	
#16	5	81	
#30	10	71	
#40	6	66	
#50	6	60	
#100	10	50	
#200	8	41.8	

Liquid Limit (AASHTO T-89)	30
Plastic Limit (AASHTO T-90)	18
Plasticity Index (AASHTO T-90)	12
Moisture Content (AASHTO T-255)	
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1128-3	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/31/2022
Project City	Goodyear	Tested By:	Keagan Mayfield
Sample Location:	B - 108 @ 15.0' - 16.5'	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	4	96	
1/2"	3	93	
3/8"	3	90	
1/4"	3	86	
#4	2	84	
#8	8	77	
#10	2	75	
#16	8	67	
#30	18	49	
#40	9	39	
#50	8	32	
#100	10	22	
#200	6	15.6	

Liquid Limit (AASHTO T-89)	29
Plastic Limit (AASHTO T-90)	18
Plasticity Index (AASHTO T-90)	11
Moisture Content (AASHTO T-255)	
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND with gravel

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1128-4	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/31/2022
Project City	Goodyear	Tested By:	Keagan Mayfield
Sample Location:	B - 109 @ 10.0' - 15.0'	Reviewed By:	Andrew Jamrogiewcz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	9	91	
1"	4	87	
3/4"	5	82	
1/2"	3	79	
3/8"	3	76	
1/4"	3	73	
#4	2	71	
#8	6	65	
#10	1	64	
#16	5	59	
#30	15	44	
#40	8	36	
#50	6	29	
#100	8	22	
#200	5	16.7	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-255)	
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND with gravel

Andrew Jamrogiewcz
Project Manager

Andrew Jamrogiewcz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1128-5	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/17/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B - 109 @ 27.5' - 30.0'	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	6	94	
3/4"	6	88	
1/2"	7	81	
3/8"	5	76	
1/4"	6	70	
#4	2	68	
#8	3	65	
#10	1	64	
#16	2	62	
#30	3	60	
#40	1	58	
#50	2	57	
#100	5	52	
#200	7	45.5	

Liquid Limit (AASHTO T-89)	41
Plastic Limit (AASHTO T-90)	24
Plasticity Index (AASHTO T-90)	17
Moisture Content (AASHTO T-255)	
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	GC

Group Name (ASTM D2487)
Clayey GRAVEL with sand

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1128-6	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/17/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B - 109 @ 37.5' - 40.0'	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	99	
#10	0	99	
#16	1	98	
#30	5	93	
#40	4	88	
#50	7	81	
#100	24	57	
#200	19	37.9	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-255)	
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1128-8	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/17/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B - 110 @ 12.5' - 15.0'	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	1	99	
3/4"	1	98	
1/2"	5	92	
3/8"	6	87	
1/4"	8	78	
#4	5	73	
#8	6	67	
#10	1	65	
#16	3	62	
#30	4	58	
#40	2	56	
#50	3	53	
#100	5	48	
#200	6	41.5	

Liquid Limit (AASHTO T-89)	34
Plastic Limit (AASHTO T-90)	19
Plasticity Index (AASHTO T-90)	15
Moisture Content (AASHTO T-255)	
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND with gravel

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1128-9	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/17/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B - 110 @ 22.5' - 25.0'	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	4	96	
3/4"	2	95	
1/2"	0	94	
3/8"	1	94	
1/4"	1	93	
#4	1	92	
#8	1	91	
#10	0	91	
#16	0	91	
#30	1	90	
#40	1	89	
#50	1	88	
#100	4	84	
#200	12	71.7	

Liquid Limit (AASHTO T-89)	36
Plastic Limit (AASHTO T-90)	23
Plasticity Index (AASHTO T-90)	13
Moisture Content (AASHTO T-255)	
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	CL

Group Name (ASTM D2487)
Lean CLAY with sand

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1128-20	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/17/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B - 111 @ 7.5' - 10.0'	Reviewed By:	Andrew Jamrogiewcz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	1	99	
3/4"	0	99	
1/2"	1	98	
3/8"	1	97	
1/4"	2	94	
#4	1	93	
#8	1	92	
#10	0	91	
#16	2	89	
#30	3	86	
#40	3	83	
#50	4	79	
#100	14	65	
#200	16	49.2	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-255)	8.4
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Andrew Jamrogiewcz
Project Manager

Andrew Jamrogiewcz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1128-21	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/17/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B - 111 @ 17.5' - 20.0'	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	1	99	
#4	1	98	
#8	3	95	
#10	1	94	
#16	5	89	
#30	11	78	
#40	8	70	
#50	10	60	
#100	17	44	
#200	11	32.9	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-255)	7.3
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1128-22	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/17/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B - 111 @ 32.5' - 35.0'	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	2	98	
#40	1	96	
#50	2	95	
#100	4	91	
#200	12	79.0	

Liquid Limit (AASHTO T-89)	38
Plastic Limit (AASHTO T-90)	24
Plasticity Index (AASHTO T-90)	14
Moisture Content (AASHTO T-255)	
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	CL

Group Name (ASTM D2487)
Lean CLAY with sand

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1583-6	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/10/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B-112 @ 0.0 - 5.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	1	99	
1/4"	2	97	
#4	2	94	
#8	6	88	
#10	2	86	
#16	10	76	
#30	13	64	
#40	7	57	
#50	6	51	
#100	9	42	
#200	7	34.8	

Liquid Limit (AASHTO T-89)	32
Plastic Limit (AASHTO T-90)	21
Plasticity Index (AASHTO T-90)	11
Moisture Content (AASHTO T-265)	3.4
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1146-3	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/24/2022
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B - 112 @ 15.0' - 16'2"	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	2	98	
3/8"	1	97	
1/4"	3	94	
#4	2	92	
#8	9	83	
#10	2	81	
#16	6	75	
#30	10	66	
#40	7	59	
#50	8	51	
#100	12	39	
#200	10	28.8	

Liquid Limit (AASHTO T-89)	29
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	12
Moisture Content (AASHTO T-255)	
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1146-4	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/31/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B - 112 @ 40.0' - 41.0'	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"			
3"			
2 1/2"			
2"			
1 1/2"			
1"			
3/4"			
1/2"			
3/8"			
1/4"			
#4			
#8			
#10			
#16			
#30			
#40			
#50			
#100			
#200			

Liquid Limit (AASHTO T-89)	37
Plastic Limit (AASHTO T-90)	27
Plasticity Index (AASHTO T-90)	10
Moisture Content (AASHTO T-255)	
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	

Group Name (ASTM D2487)

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1583-9	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/10/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B-113 @ 0.0 - 5.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	10	90	
#10	2	88	
#16	8	79	
#30	12	67	
#40	7	60	
#50	7	53	
#100	11	42	
#200	8	34.4	

Liquid Limit (AASHTO T-89)	29
Plastic Limit (AASHTO T-90)	18
Plasticity Index (AASHTO T-90)	11
Moisture Content (AASHTO T-265)	2.2
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1583-12	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/10/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B-113 @ 35.0 - 36.0'	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	2	98	
#10	1	97	
#16	3	94	
#30	4	91	
#40	2	89	
#50	2	86	
#100	7	79	
#200	15	63.2	

Liquid Limit (AASHTO T-89)	31
Plastic Limit (AASHTO T-90)	25
Plasticity Index (AASHTO T-90)	6
Moisture Content (AASHTO T-265)	18.9
USCS Soil Classification	ML

Group Name (ASTM D2487)
Sandy SILT

*Testing sizes reduced from standard minimums due to lack of material

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1128-10	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/31/2022
Project City	Goodyear	Tested By:	Keagan Mayfield
Sample Location:	B - 114 @ 0.0' - 5.0'	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	2	98	
3/8"	1	97	
1/4"	2	95	
#4	2	93	
#8	5	88	
#10	2	87	
#16	7	80	
#30	11	69	
#40	5	63	
#50	5	58	
#100	9	49	
#200	9	40.3	

Liquid Limit (AASHTO T-89)	31
Plastic Limit (AASHTO T-90)	19
Plasticity Index (AASHTO T-90)	12
Moisture Content (AASHTO T-255)	
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1128-12	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/27/2022
Project City	Goodyear	Tested By:	Keagan Mayfield
Sample Location:	B - 114 @ 15.0' - 16.5'	Reviewed By:	Andrew Jamrogiewcz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	2	98	
3/8"	1	97	
1/4"	1	96	
#4	0	96	
#8	2	94	
#10	1	93	
#16	2	91	
#30	5	86	
#40	4	82	
#50	6	77	
#100	17	60	
#200	16	43.9	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-255)	
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Andrew Jamrogiewcz
Project Manager

Andrew Jamrogiewcz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-2842-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	6/21/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-115 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	1	99	
1/4"	2	97	
#4	2	95	
#8	7	88	
#10	3	85	
#16	10	75	
#30	19	56	
#40	11	44	
#50	10	35	
#100	11	24	
#200	5	19.2	

Liquid Limit (AASHTO T-89)	30
Plastic Limit (AASHTO T-90)	19
Plasticity Index (AASHTO T-90)	11
Moisture Content (AASHTO T-265)	6.8
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-2842-4	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	6/21/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-115 @ 45 - 46.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	1	99	
#30	5	94	
#40	10	84	
#50	18	66	
#100	21	45	
#200	8	37.5	

Liquid Limit (AASHTO T-89)	28
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	11
Moisture Content (AASHTO T-265)	14.5
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-2842-5	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	6/21/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-116 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	1	99	
1/4"	2	97	
#4	1	96	
#8	5	91	
#10	2	88	
#16	12	76	
#30	27	49	
#40	14	35	
#50	10	25	
#100	9	16	
#200	4	12.6	

Liquid Limit (AASHTO T-89)	27
Plastic Limit (AASHTO T-90)	18
Plasticity Index (AASHTO T-90)	9
Moisture Content (AASHTO T-265)	5.0
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-2842-7	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	6/21/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-116 @ 30 - 31	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	1	99	
#10	0	99	
#16	1	97	
#30	4	93	
#40	4	90	
#50	6	84	
#100	18	66	
#200	21	44.4	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	15.2
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-2842-9	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	6/21/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-117 @ 35 - 36	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	1	98	
#30	11	87	
#40	13	73	
#50	19	54	
#100	33	22	
#200	12	9.8	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	7.1
USCS Soil Classification	SP-SM

Group Name (ASTM D2487)
Poorly graded SAND with silt

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-2842-10	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	6/21/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-118 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	1	99	
1/4"	2	97	
#4	2	95	
#8	6	89	
#10	2	88	
#16	9	79	
#30	16	63	
#40	10	53	
#50	11	42	
#100	16	26	
#200	7	19.2	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	5.2
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-2842-12	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	6/21/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-119 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	1	99	
3/8"	2	98	
1/4"	4	93	
#4	3	91	
#8	6	84	
#10	2	82	
#16	7	75	
#30	11	64	
#40	7	58	
#50	8	50	
#100	15	35	
#200	11	23.9	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	6.8
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-3008-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	6/29/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B119A @ 0.0 - 2.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	1	99	
1/2"	1	98	
3/8"	1	97	
1/4"	2	95	
#4	2	93	
#8	9	83	
#10	2	81	
#16	13	68	
#30	16	53	
#40	6	46	
#50	6	41	
#100	8	32	
#200	6	25.7	

Liquid Limit (AASHTO T-89)	21
Plastic Limit (AASHTO T-90)	16
Plasticity Index (AASHTO T-90)	5
Moisture Content (AASHTO T-265)	2.8
USCS Soil Classification	SC-SM

Group Name (ASTM D2487)
Silty, clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-3008-4	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	6/29/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B119B @ 0.0 - 2.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	1	99	
3/4"	2	98	
1/2"	3	95	
3/8"	1	94	
1/4"	2	92	
#4	2	90	
#8	6	85	
#10	1	83	
#16	8	75	
#30	15	60	
#40	8	51	
#50	8	44	
#100	10	33	
#200	7	26.3	

Liquid Limit (AASHTO T-89)	20
Plastic Limit (AASHTO T-90)	16
Plasticity Index (AASHTO T-90)	4
Moisture Content (AASHTO T-265)	4.7
USCS Soil Classification	SC-SM

Group Name (ASTM D2487)
Silty, clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-3008-6	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	6/30/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B119B @ 25.0 - 25.11	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	1	99	
1/2"	4	95	
3/8"	1	94	
1/4"	3	91	
#4	1	89	
#8	2	88	
#10	0	87	
#16	2	85	
#30	15	70	
#40	17	53	
#50	15	37	
#100	20	17	
#200	8	9.1	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	6.9
USCS Soil Classification	SP-SM

Group Name (ASTM D2487)
Poorly graded SAND with silt

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1128-13	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/26/2022
Project City	Goodyear	Tested By:	Keagan Mayfield
Sample Location:	B - 120 @ 0.0' - 5.0'	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	4	96	
3/8"	3	93	
1/4"	4	89	
#4	3	85	
#8	7	79	
#10	2	77	
#16	6	71	
#30	9	62	
#40	5	57	
#50	5	53	
#100	9	44	
#200	9	34.2	

Liquid Limit (AASHTO T-89)	31
Plastic Limit (AASHTO T-90)	19
Plasticity Index (AASHTO T-90)	12
Moisture Content (AASHTO T-255)	3.7
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND with gravel

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1128-15	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/26/2022
Project City	Goodyear	Tested By:	Keagan Mayfield
Sample Location:	B - 120 @ 10.0' - 11.5'	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	5	95	
3/4"	0	95	
1/2"	3	92	
3/8"	0	91	
1/4"	1	91	
#4	1	90	
#8	2	88	
#10	0	88	
#16	2	86	
#30	3	82	
#40	3	80	
#50	5	75	
#100	20	54	
#200	17	37.5	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-255)	
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1128-16	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/26/2022
Project City	Goodyear	Tested By:	James Karl
Sample Location:	B - 121 @ 0.0' - 5.0'	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	1	99	
3/4"	1	98	
1/2"	3	95	
3/8"	2	93	
1/4"	4	89	
#4	2	87	
#8	7	79	
#10	2	78	
#16	7	71	
#30	9	62	
#40	5	57	
#50	4	53	
#100	8	45	
#200	8	37.1	

Liquid Limit (AASHTO T-89)	29
Plastic Limit (AASHTO T-90)	20
Plasticity Index (AASHTO T-90)	9
Moisture Content (AASHTO T-255)	
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1128-18	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	1/25/2022
Project City	Goodyear	Tested By:	Fernando Montero
Sample Location:	B - 122 @ 0.0' - 5.0'	Reviewed By:	Andrew Jamrogiewcz, P.E.

Sieve Analysis (ASTM C-139 / AASHTO T-27)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	2	98	
1/2"	3	95	
3/8"	1	94	
1/4"	3	90	
#4	2	88	
#8	6	83	
#10	1	81	
#16	5	76	
#30	9	67	
#40	5	62	
#50	5	57	
#100	10	48	
#200	10	37.2	

Liquid Limit (AASHTO T-89)	28
Plastic Limit (AASHTO T-90)	19
Plasticity Index (AASHTO T-90)	9
Moisture Content (AASHTO T-255)	
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Andrew Jamrogiewcz
Project Manager

Andrew Jamrogiewcz
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-2242-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/29/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-123 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	5	95	
3/4"	2	93	
1/2"	3	90	
3/8"	2	88	
1/4"	3	85	
#4	3	82	
#8	5	77	
#10	2	75	
#16	11	64	
#30	13	51	
#40	5	46	
#50	4	41	
#100	6	35	
#200	5	30.1	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	11.0
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND with gravel

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-2242-2	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/29/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-124 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	1	99	
3/4"	0	99	
1/2"	1	98	
3/8"	1	97	
1/4"	3	94	
#4	3	91	
#8	6	86	
#10	2	84	
#16	9	76	
#30	13	63	
#40	5	58	
#50	5	53	
#100	7	46	
#200	8	38.3	

Liquid Limit (AASHTO T-89)	34
Plastic Limit (AASHTO T-90)	23
Plasticity Index (AASHTO T-90)	11
Moisture Content (AASHTO T-265)	5.4
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-3006-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	6/27/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B124A @ 0.0 - 2.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	1	99	
3/4"	1	98	
1/2"	6	92	
3/8"	6	86	
1/4"	7	78	
#4	3	75	
#8	9	66	
#10	3	63	
#16	8	55	
#30	10	45	
#40	5	40	
#50	5	36	
#100	7	29	
#200	5	23.7	

Liquid Limit (AASHTO T-89)	29
Plastic Limit (AASHTO T-90)	14
Plasticity Index (AASHTO T-90)	15
Moisture Content (AASHTO T-265)	6.4
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND with gravel

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-3006-3	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	6/27/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B124A @ 15.0 - 16.5	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	4	96	
3/8"	1	95	
1/4"	2	93	
#4	3	91	
#8	9	82	
#10	2	80	
#16	9	71	
#30	15	56	
#40	6	50	
#50	5	45	
#100	7	38	
#200	6	32.4	

Liquid Limit (AASHTO T-89)	35
Plastic Limit (AASHTO T-90)	19
Plasticity Index (AASHTO T-90)	16
Moisture Content (AASHTO T-265)	8.6
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-3006-4	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	6/27/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B124B @ 1.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	1	99	
3/4"	2	97	
1/2"	4	93	
3/8"	3	90	
1/4"	5	85	
#4	2	83	
#8	8	75	
#10	2	73	
#16	7	66	
#30	10	56	
#40	5	51	
#50	5	46	
#100	8	37	
#200	7	30.4	

Liquid Limit (AASHTO T-89)	27
Plastic Limit (AASHTO T-90)	15
Plasticity Index (AASHTO T-90)	12
Moisture Content (AASHTO T-265)	7.1
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND with gravel

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	22-2242-3	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/29/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	B-125 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	3	97	
1/2"	6	92	
3/8"	3	89	
1/4"	5	84	
#4	3	80	
#8	5	75	
#10	1	74	
#16	8	66	
#30	11	56	
#40	5	50	
#50	5	45	
#100	8	37	
#200	6	31.2	

Liquid Limit (AASHTO T-89)	31
Plastic Limit (AASHTO T-90)	20
Plasticity Index (AASHTO T-90)	11
Moisture Content (AASHTO T-265)	10.3
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND with gravel

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1955-1	Supplier:	-
Client:	Ethos	Sample Date:	2/26/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/8/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-126 @ 0.0 - 1.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	1	99	
1/2"	4	94	
3/8"	2	93	
1/4"	5	88	
#4	2	85	
#8	8	77	
#10	1	76	
#16	4	72	
#30	7	65	
#40	4	61	
#50	5	56	
#100	7	49	
#200	6	43	

Liquid Limit (AASHTO T-89)	23
Plastic Limit (AASHTO T-90)	16
Plasticity Index (AASHTO T-90)	7
Moisture Content (AASHTO T-265)	7.8
USCS Soil Classification	SC-SM

Group Name (ASTM D2487)
Silty, clayey SAND

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1955-2	Supplier:	-
Client:	Ethos	Sample Date:	2/26/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/8/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-126 @ 5.0 - 9.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	1	99	
3/4"	0	98	
1/2"	1	98	
3/8"	0	97	
1/4"	1	96	
#4	1	96	
#8	3	93	
#10	1	92	
#16	3	90	
#30	5	85	
#40	3	82	
#50	4	78	
#100	7	71	
#200	9	62	

Liquid Limit (AASHTO T-89)	25
Plastic Limit (AASHTO T-90)	15
Plasticity Index (AASHTO T-90)	10
Moisture Content (AASHTO T-265)	11.7
USCS Soil Classification	CL

Group Name (ASTM D2487)
Sandy lean CLAY

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1955-3	Supplier:	-
Client:	Ethos	Sample Date:	2/26/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/8/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-127 @ 5.0 - 9.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	1	99	
1/2"	1	98	
3/8"	0	98	
1/4"	2	96	
#4	2	94	
#8	3	90	
#10	1	89	
#16	3	87	
#30	10	77	
#40	9	68	
#50	10	58	
#100	16	41	
#200	7	35	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	7.8
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1955-4	Supplier:	-
Client:	Ethos	Sample Date:	2/26/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/8/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-127 @ 9.5 - 11.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	2	98	
#10	1	98	
#16	1	97	
#30	1	96	
#40	1	95	
#50	1	94	
#100	2	92	
#200	3	89	

Liquid Limit (AASHTO T-89)	26
Plastic Limit (AASHTO T-90)	19
Plasticity Index (AASHTO T-90)	7
Moisture Content (AASHTO T-265)	18.7
USCS Soil Classification	CL-ML

Group Name (ASTM D2487)
SILTY CLAY

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1955-5	Supplier:	-
Client:	Ethos	Sample Date:	2/26/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	3/8/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-128 @ 1.0 - 4.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	1	99	
3/8"	0	99	
1/4"	1	98	
#4	1	97	
#8	3	94	
#10	1	93	
#16	3	90	
#30	5	85	
#40	3	82	
#50	3	79	
#100	8	72	
#200	9	63	

Liquid Limit (AASHTO T-89)	29
Plastic Limit (AASHTO T-90)	14
Plasticity Index (AASHTO T-90)	15
Moisture Content (AASHTO T-265)	15.3
USCS Soil Classification	CL

Group Name (ASTM D2487)
Sandy lean CLAY

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1149-1	Supplier:	-
Client:	Ethos	Sample Date:	12/18/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	1/18/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-129 @ 0.0 - 5.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	2	98	
#40	2	96	
#50	2	94	
#100	4	91	
#200	5	86	

Liquid Limit (AASHTO T-89)	31
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	14
Moisture Content (AASHTO T-265)	10.5
USCS Soil Classification	CL

Group Name (ASTM D2487)
Lean CLAY

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1149-2	Supplier:	-
Client:	Ethos	Sample Date:	12/18/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	1/18/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-129 @ 10.0 - 11.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	1	99	
#40	2	98	
#50	2	95	
#100	8	88	
#200	29	59	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	9.6
USCS Soil Classification	ML

Group Name (ASTM D2487)
Sandy SILT

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1149-3	Supplier:	-
Client:	Ethos	Sample Date:	12/18/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	1/18/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-129 @ 25.0 - 26.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	32	68	
3/4"	15	53	
1/2"	8	45	
3/8"	7	38	
1/4"	6	32	
#4	3	29	
#8	4	25	
#10	1	24	
#16	2	22	
#30	5	17	
#40	4	13	
#50	4	8	
#100	4	4	
#200	2	2.9	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	2.4
USCS Soil Classification	GP

Group Name (ASTM D2487)
Poorly graded GRAVEL with sand

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1149-4	Supplier:	-
Client:	Ethos	Sample Date:	12/18/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	1/18/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-129 @ 50.0 - 51.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	11	89	
3/4"	7	82	
1/2"	15	67	
3/8"	5	63	
1/4"	8	55	
#4	4	51	
#8	7	44	
#10	2	42	
#16	9	34	
#30	16	18	
#40	5	13	
#50	3	10	
#100	4	6	
#200	3	3.6	

Liquid Limit (AASHTO T-89)	37
Plastic Limit (AASHTO T-90)	15
Plasticity Index (AASHTO T-90)	22
Moisture Content (AASHTO T-265)	14.0
USCS Soil Classification	GP

Group Name (ASTM D2487)
Poorly graded GRAVEL with sand

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-5286-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/23/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B129A @ 0 - 4	Reviewed By:	Keagen Mayfield

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	0	99	
#40	1	99	
#50	0	98	
#100	2	97	
#200	3	93	

Liquid Limit (ASTM D4318)	34
Plastic Limit (ASTM D4318)	18
Plasticity Index (ASTM D4318)	16
Moisture Content (ASTM D2216)	8.4
USCS Soil Classification	CL

Group Name (ASTM D2487)
Lean CLAY

Keagen Mayfield
Laboratory Manager

Keagen Mayfield
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-5286-4	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	Colin Eggebrecht
Project City	Goodyear	Tested By:	0.434782609
Sample Location:	B129A @ 20 - 21.5	Reviewed By:	Keagen Mayfield

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	7	93	
3/4"	14	79	
1/2"	6	73	
3/8"	7	66	
1/4"	9	57	
#4	2	55	
#8	7	48	
#10	0	48	
#16	4	44	
#30	14	30	
#40	10	20	
#50	5	15	
#100	6	9	
#200	3	6.2	

Liquid Limit (ASTM D4318)	
Plastic Limit (ASTM D4318)	
Plasticity Index (ASTM D4318)	NP
Moisture Content (ASTM D2216)	3.7
USCS Soil Classification	SP-SM

Group Name (ASTM D2487)
Poorly graded SAND with silt and gravel

Testing sizes reduced from standard minimums due to lack of material

Keagen Mayfield
Laboratory Manager

Keagen Mayfield
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-4605-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	9/4/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-130 @ 10.0 - 11.0	Reviewed By:	Keagen Mayfield

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	1	99	
#40	1	99	
#50	1	98	
#100	2	96	
#200	9	87.7	

Liquid Limit (ASTM D4318)	27
Plastic Limit (ASTM D4318)	21
Plasticity Index (ASTM D4318)	6
Moisture Content (ASTM D2216)	17.8
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	CL-ML

Group Name (ASTM D2487)
SILTY CLAY

Testing sizes reduced from standard minimums due to lack of material

Keagen Mayfield
Laboratory Manager

Keagen Mayfield
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-4605-2	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	9/11/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-130 @ 20.0-21.5	Reviewed By:	Keagen Mayfield

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	4	96	
3/4"	7	89	
1/2"	26	64	
3/8"	11	53	
1/4"	7	46	
#4	5	41	
#8	8	32	
#10	3	30	
#16	5	25	
#30	8	18	
#40	5	13	
#50	3	10	
#100	4	6	
#200	3	3.2	

Liquid Limit (ASTM D4318)	
Plastic Limit (ASTM D4318)	
Plasticity Index (ASTM D4318)	NP
Moisture Content (ASTM D2216)	2.5
USCS Soil Classification	GP

Group Name (ASTM D2487)
Poorly graded GRAVEL with sand

Testing sizes reduced from standard minimums due to lack of material

Keagen Mayfield
Laboratory Manager

Keagen Mayfield
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-4605-5	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	9/4/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-131 @ 5.0 - 6.0	Reviewed By:	Keagen Mayfield

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	0	100	
#40	0	100	
#50	0	100	
#100	1	99	
#200	1	98.0	

Liquid Limit (ASTM D4318)	37
Plastic Limit (ASTM D4318)	20
Plasticity Index (ASTM D4318)	17
Moisture Content (ASTM D2216)	15.8
USCS Soil Classification	CL

Group Name (ASTM D2487)
Lean CLAY

Testing sizes reduced from standard minimums due to lack of material

Keagen Mayfield
Laboratory Manager

Keagen Mayfield
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-4605-6	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	9/4/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-131 @ 20.0 - 21.0	Reviewed By:	Keagen Mayfield

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	3	97	
3/8"	2	95	
1/4"	3	92	
#4	2	91	
#8	3	88	
#10	0	88	
#16	1	86	
#30	9	77	
#40	12	65	
#50	17	49	
#100	28	20	
#200	12	8.4	

Liquid Limit (ASTM D4318)	
Plastic Limit (ASTM D4318)	
Plasticity Index (ASTM D4318)	NP
Moisture Content (ASTM D2216)	4.0
USCS Soil Classification	SP-SM

Group Name (ASTM D2487)
Poorly graded SAND with silt

Testing sizes reduced from standard minimums due to lack of material

Keagen Mayfield
Laboratory Manager

Keagen Mayfield
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-4605-8	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	9/12/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-131 @ 55.0 -56.5	Reviewed By:	Keagen Mayfield

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	6	94	
1/2"	9	85	
3/8"	2	83	
1/4"	4	79	
#4	3	76	
#8	7	69	
#10	3	66	
#16	8	58	
#30	13	45	
#40	7	38	
#50	9	30	
#100	20	10	
#200	6	3.1	

Liquid Limit (ASTM D4318)	
Plastic Limit (ASTM D4318)	
Plasticity Index (ASTM D4318)	NP
Moisture Content (ASTM D2216)	15.5
USCS Soil Classification	SP

Group Name (ASTM D2487)
Poorly graded SAND with gravel

Testing sizes reduced from standard minimums due to lack of material

Keagen Mayfield
Laboratory Manager

Keagen Mayfield
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1142-3	Supplier:	-
Client:	Ethos	Sample Date:	1/17/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/7/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-132 @ 30.0 - 31.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	4	96	
3/4"	14	82	
1/2"	3	79	
3/8"	29	50	
1/4"	10	40	
#4	5	36	
#8	6	29	
#10	2	27	
#16	4	24	
#30	5	19	
#40	3	16	
#50	3	13	
#100	5	8	
#200	2	5.5	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	2.3
USCS Soil Classification	GP-GM

Group Name (ASTM D2487)
Poorly graded GRAVEL with silt and sand

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil

JOB NO: 17-2023-4239
WORK ORDER NO: 52
DATE ASSIGNED: 2/5/24

MECHANICAL SIEVE ANALYSIS (ASTM C136/C117) PLASTICITY INDEX (ASTM D4318)
GROUP SYMBOL, USCS (ASTM D2487)

PERCENT PASSING BY WEIGHT

				Silt or	SAND								GRAVEL									COBBLES	
				Clay	Fine			Medium			Coarse		Fine				Coarse						
Location & Depth	USCS	LL	PI	#200	#100	#50	#40	#30	#16	#10	#8	#4	1/4"	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	3"	6"	Lab #
B-132 (10.0-11.0')	CL	33	10	81	91	96	98	99	100	100	100	100	100	100	100	100	100	100	100	100	100	100	24-2441-01
B-134 (40.0-41.0')	GP	NV	NP	3.1	5	11	17	21	26	28	29	34	37	43	51	61	67	70	78	100	100	100	24-2441-02
B-133 (10.0-11.0')	ML	NV	NP	56	82	96	99	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	24-2441-03
B-135 (20.0-21.0')	SP	NV	NP	4.9	7	14	29	51	68	69	69	71	71	73	74	75	76	76	76	100	100	100	24-2441-04
B-136 (65.0-66.0')	GP	NV	NP	3.4	5	8	10	16	29	35	36	39	40	43	45	66	87	100	100	100	100	100	24-2441-05

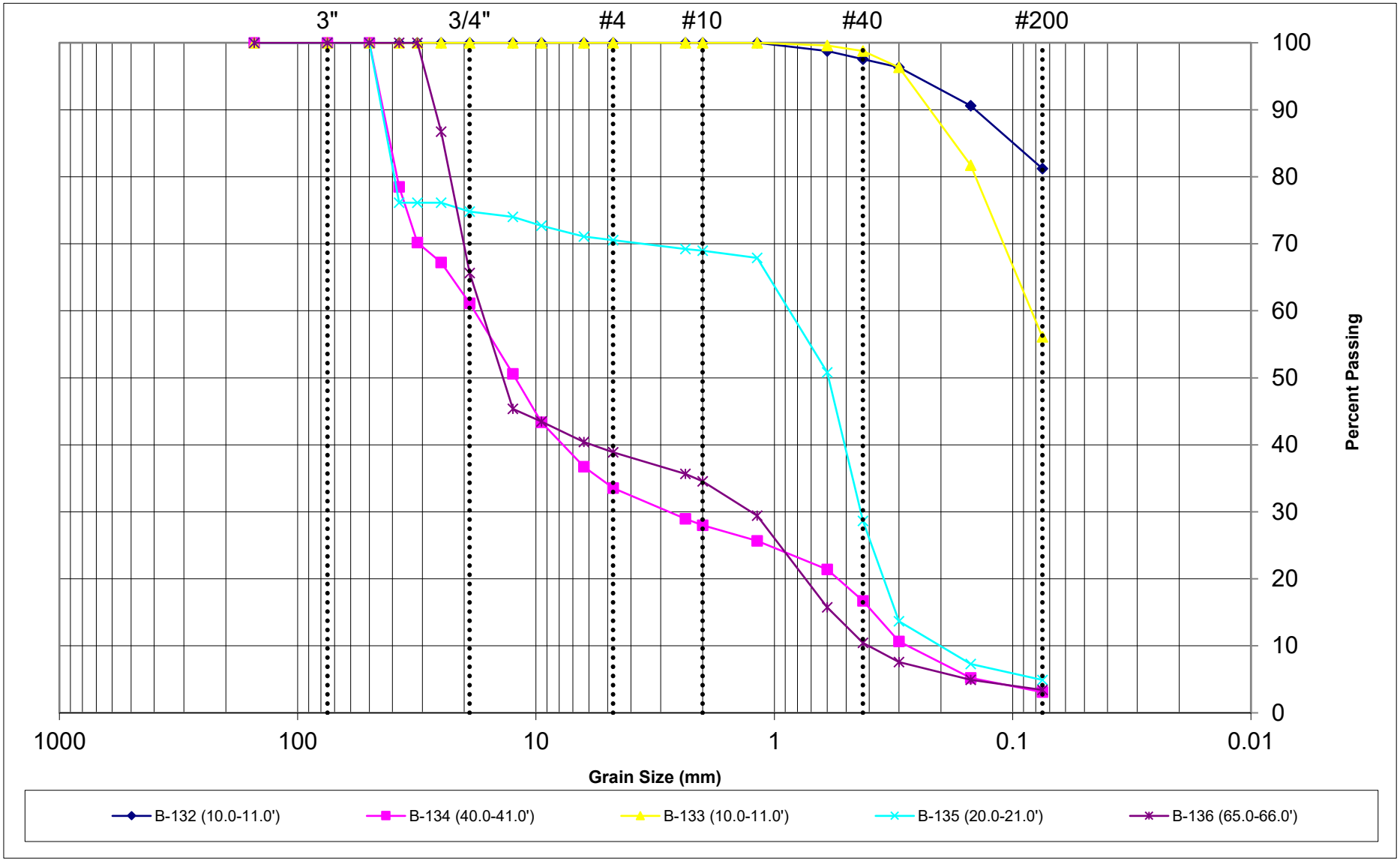
WSP USA
3630 E Wier Ave.
Phoenix, AZ 85040

REVIEWED BY

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil

JOB NO: 17-2023-4239
WORK ORDER NO: 52
DATE ASSIGNED: 2/5/24

MECHANICAL SIEVE ANALYSIS GRAPHS



ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1143-6	Supplier:	-
Client:	Ethos	Sample Date:	1/17/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/11/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-133 @ 1.0 - 2.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	0	100	
#40	0	100	
#50	0	99	
#100	0	99	
#200	2	98	

Liquid Limit (AASHTO T-89)	33
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	16
Moisture Content (AASHTO T-265)	10.7
USCS Soil Classification	CL

Group Name (ASTM D2487)
Lean CLAY

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1143-8	Supplier:	-
Client:	Ethos	Sample Date:	1/17/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/9/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-133 @ 20.0 - 21.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	6	94	
3/4"	0	94	
1/2"	5	89	
3/8"	4	85	
1/4"	6	79	
#4	3	77	
#8	6	71	
#10	2	69	
#16	5	64	
#30	29	35	
#40	12	23	
#50	6	17	
#100	8	8	
#200	4	4.3	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	0.7
USCS Soil Classification	SP

Group Name (ASTM D2487)
Poorly graded SAND with gravel

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1143-9	Supplier:	-
Client:	Ethos	Sample Date:	1/17/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/9/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-133 @ 35.0 - 36.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	12	88	
3/4"	6	82	
1/2"	15	67	
3/8"	9	58	
1/4"	9	49	
#4	5	44	
#8	11	33	
#10	2	31	
#16	6	25	
#30	5	20	
#40	2	18	
#50	4	14	
#100	5	9	
#200	3	6.2	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	3.3
USCS Soil Classification	GP-GM

Group Name (ASTM D2487)
Poorly graded GRAVEL with silt and sand

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1143-1	Supplier:	-
Client:	Ethos	Sample Date:	1/17/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/11/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-134 @ 0.0 - 5.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	99	
1/4"	2	98	
#4	2	96	
#8	0	96	
#10	0	96	
#16	0	96	
#30	0	96	
#40	0	95	
#50	1	95	
#100	2	93	
#200	8	85	

Liquid Limit (AASHTO T-89)	27
Plastic Limit (AASHTO T-90)	16
Plasticity Index (AASHTO T-90)	11
Moisture Content (AASHTO T-265)	11.2
USCS Soil Classification	CL

Group Name (ASTM D2487)
Leam Clay with sand

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1143-3	Supplier:	-
Client:	Ethos	Sample Date:	1/17/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/11/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-134 @ 15.0 - 16.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	2	98	
#4	1	97	
#8	2	94	
#10	1	94	
#16	2	92	
#30	2	90	
#40	1	90	
#50	1	89	
#100	3	86	
#200	9	77	

Liquid Limit (AASHTO T-89)	28
Plastic Limit (AASHTO T-90)	15
Plasticity Index (AASHTO T-90)	13
Moisture Content (AASHTO T-265)	11.1
USCS Soil Classification	CL

Group Name (ASTM D2487)
Lean CLAY with sand

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1143-5	Supplier:	-
Client:	Ethos	Sample Date:	1/17/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/9/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-134 @ 60.0 - 61.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	11	89	
3/4"	16	72	
1/2"	10	62	
3/8"	7	56	
1/4"	6	49	
#4	6	44	
#8	4	40	
#10	1	38	
#16	4	34	
#30	11	23	
#40	5	18	
#50	4	14	
#100	5	9	
#200	2	7.7	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	7.0
USCS Soil Classification	GP-GM

Group Name (ASTM D2487)
Poorly graded GRAVEL with silt and sand

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1150-1	Supplier:	-
Client:	Ethos	Sample Date:	1/17/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/9/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-135 @ 5.0 - 6.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	1	99	
#40	0	99	
#50	0	98	
#100	2	97	
#200	3	94	

Liquid Limit (AASHTO T-89)	30
Plastic Limit (AASHTO T-90)	19
Plasticity Index (AASHTO T-90)	11
Moisture Content (AASHTO T-265)	12.8
USCS Soil Classification	CL

Group Name (ASTM D2487)
Lean CLAY

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1150-3	Supplier:	-
Client:	Ethos	Sample Date:	1/17/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/6/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-135 @ 30.0 - 31.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	17	83	
3/4"	11	72	
1/2"	9	63	
3/8"	7	57	
1/4"	9	48	
#4	3	45	
#8	7	37	
#10	2	36	
#16	4	32	
#30	6	26	
#40	5	21	
#50	5	17	
#100	6	11	
#200	3	7.6	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	2.3
USCS Soil Classification	GP-GM

Group Name (ASTM D2487)
Poorly graded GRAVEL with silt and sand

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1150-6	Supplier:	-
Client:	Ethos	Sample Date:	1/17/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/9/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-135 @ 75.0 - 76.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	2	98	
1/2"	7	91	
3/8"	8	83	
1/4"	12	71	
#4	5	66	
#8	12	54	
#10	2	52	
#16	5	47	
#30	6	41	
#40	7	34	
#50	8	26	
#100	10	16	
#200	5	11	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	0.5
USCS Soil Classification	SP-SM

Group Name (ASTM D2487)
Poorly graded SAND with silt and gravel

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1151-1	Supplier:	-
Client:	Ethos	Sample Date:	1/17/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/9/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-136 @ 5.0 - 6.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	0	100	
#40	0	100	
#50	0	99	
#100	1	98	
#200	4	94	

Liquid Limit (AASHTO T-89)	28
Plastic Limit (AASHTO T-90)	18
Plasticity Index (AASHTO T-90)	10
Moisture Content (AASHTO T-265)	13.0
USCS Soil Classification	CL

Group Name (ASTM D2487)
Lean CLAY

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1151-4	Supplier:	-
Client:	Ethos	Sample Date:	1/17/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/7/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-136 @ 40.0 - 41.3	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	18	82	
3/4"	9	72	
1/2"	8	64	
3/8"	8	57	
1/4"	9	48	
#4	5	42	
#8	9	33	
#10	2	31	
#16	5	26	
#30	8	18	
#40	4	14	
#50	3	12	
#100	4	8	
#200	3	4.9	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	0.8
USCS Soil Classification	GP

Group Name (ASTM D2487)
Poorly graded GRAVEL with sand

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1151-5	Supplier:	-
Client:	Ethos	Sample Date:	1/17/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/7/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-136 @ 55.0 - 56.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	8	92	
3/4"	8	84	
1/2"	7	77	
3/8"	3	74	
1/4"	4	70	
#4	3	67	
#8	4	63	
#10	1	62	
#16	6	56	
#30	17	39	
#40	8	31	
#50	5	26	
#100	5	21	
#200	2	18	

Liquid Limit (AASHTO T-89)	31
Plastic Limit (AASHTO T-90)	15
Plasticity Index (AASHTO T-90)	16
Moisture Content (AASHTO T-265)	6.5
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND with gravel

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1151-7	Supplier:	-
Client:	Ethos	Sample Date:	1/17/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/8/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-136 @ 85.0 - 86.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	1	99	
3/8"	1	98	
1/4"	2	96	
#4	2	94	
#8	5	89	
#10	2	87	
#16	10	78	
#30	26	52	
#40	17	35	
#50	14	21	
#100	8	13	
#200	3	9.5	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	4.0
USCS Soil Classification	SP-SM

Group Name (ASTM D2487)
Poorly graded SAND with silt

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1587-3	Supplier:	-
Client:	Ethos	Sample Date:	2/8/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/28/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-137 @ 40.0 - 41.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	12	88	
3/4"	13	75	
1/2"	12	64	
3/8"	5	59	
1/4"	7	52	
#4	3	49	
#8	6	43	
#10	2	42	
#16	4	38	
#30	9	29	
#40	6	23	
#50	9	14	
#100	9	4	
#200	2	2.2	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	0.4
USCS Soil Classification	GP

Group Name (ASTM D2487)
Poorly graded GRAVEL with sand

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1587-4	Supplier:	-
Client:	Ethos	Sample Date:	2/8/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/28/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-137 @ 60.0 - 61.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	4	96	
3/4"	6	90	
1/2"	4	86	
3/8"	5	81	
1/4"	7	74	
#4	4	70	
#8	10	60	
#10	2	57	
#16	7	50	
#30	10	41	
#40	6	34	
#50	6	28	
#100	7	21	
#200	4	17	

Liquid Limit (AASHTO T-89)	29
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	12
Moisture Content (AASHTO T-265)	9.2
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND with gravel

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1587-5	Supplier:	-
Client:	Ethos	Sample Date:	2/8/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/28/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-137 @ 75.0 - 76.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	13	87	
3/4"	4	84	
1/2"	0	84	
3/8"	3	80	
1/4"	6	74	
#4	3	72	
#8	6	65	
#10	2	64	
#16	6	57	
#30	14	43	
#40	12	31	
#50	11	20	
#100	6	13	
#200	3	10	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	0.8
USCS Soil Classification	SP-SM

Group Name (ASTM D2487)
Poorly graded SAND with silt and gravel

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1587-6	Supplier:	-
Client:	Ethos	Sample Date:	2/8/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/28/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-137 @ 95.0 - 96.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	1	99	
1/4"	2	97	
#4	1	96	
#8	6	91	
#10	1	89	
#16	7	83	
#30	20	63	
#40	15	48	
#50	13	35	
#100	9	26	
#200	4	22	

Liquid Limit (AASHTO T-89)	26
Plastic Limit (AASHTO T-90)	20
Plasticity Index (AASHTO T-90)	6
Moisture Content (AASHTO T-265)	4.9
USCS Soil Classification	SC-SM

Group Name (ASTM D2487)
Silty, clayey SAND

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil

JOB NO: 17-2023-4239
WORK ORDER NO: 56
DATE ASSIGNED: 2/19/24

MECHANICAL SIEVE ANALYSIS (ASTM C136/C117) PLASTICITY INDEX (ASTM D4318)
GROUP SYMBOL, USCS (ASTM D2487)

PERCENT PASSING BY WEIGHT

				Silt or	SAND								GRAVEL									COBBLES	
				Clay	Fine			Medium			Coarse		Fine				Coarse						
Location & Depth	USCS	LL	PI	#200	#100	#50	#40	#30	#16	#10	#8	#4	1/4"	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	3"	6"	Lab #
B-146 (15.0-16.0')	CL	32	14	92	98	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	24-2492-01
B-137 (10.0-11.0')	CL-ML	27	6	86	95	98	99	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	24-2492-02
B-138 (15.0-16.0')	SP-SM	NV	NP	8.6	18	43	61	79	98	99	99	100	100	100	100	100	100	100	100	100	100	100	24-2492-03

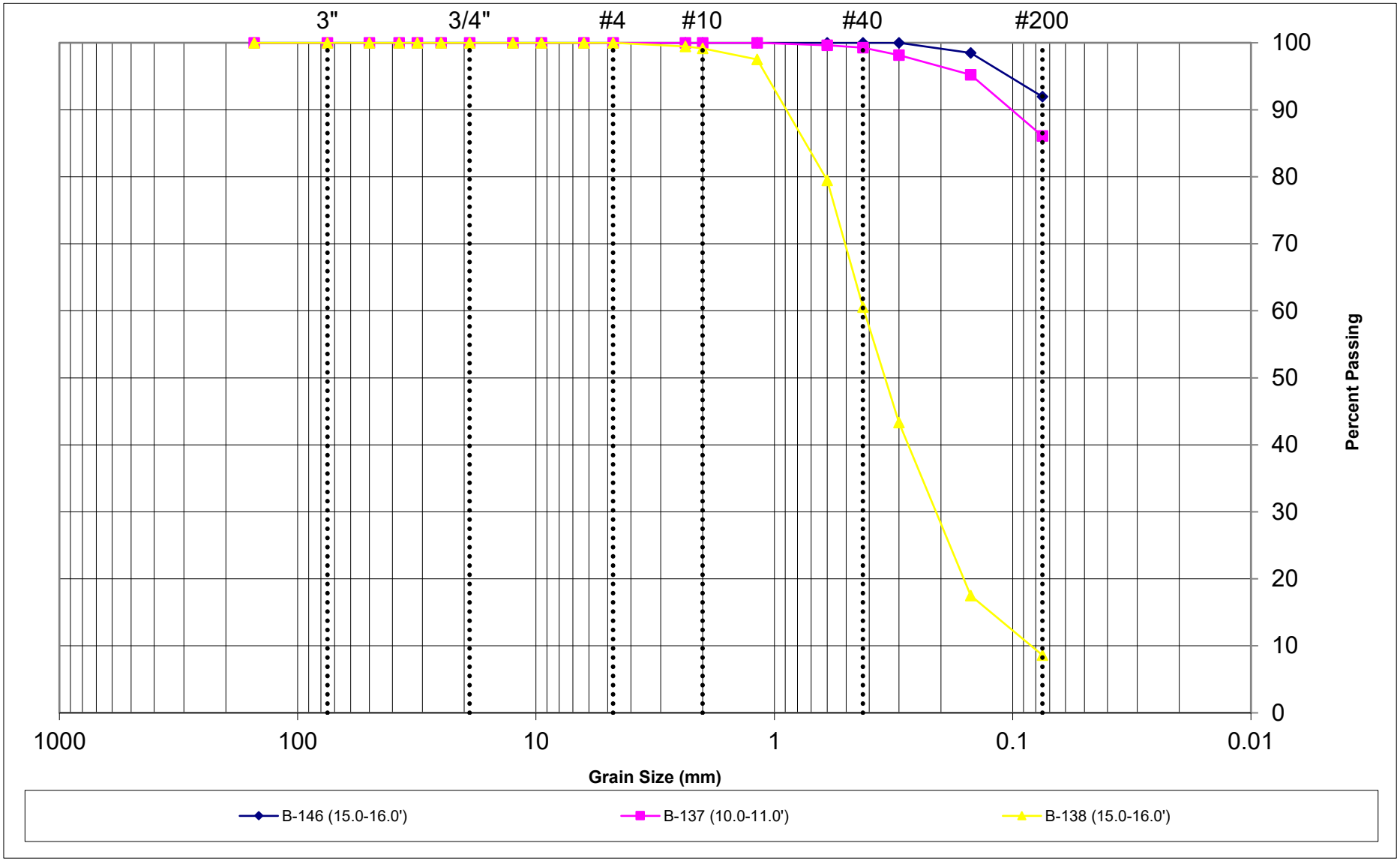
WSP USA
3630 E Wier Ave.
Phoenix, AZ 85040

REVIEWED BY

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil

JOB NO: 17-2023-4239
WORK ORDER NO: 56
DATE ASSIGNED: 2/19/24

MECHANICAL SIEVE ANALYSIS GRAPHS



ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1588-1	Supplier:	-
Client:	Ethos	Sample Date:	2/8/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/28/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-138 @ 5.0 - 6.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	0	100	
#40	0	99	
#50	0	99	
#100	1	98	
#200	6	92	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	18.7
USCS Soil Classification	ML

Group Name (ASTM D2487)
SILT

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1588-3	Supplier:	-
Client:	Ethos	Sample Date:	2/8/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/28/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-138 @ 25.0 - 26.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	10	90	
3/4"	13	77	
1/2"	24	53	
3/8"	12	41	
1/4"	9	32	
#4	4	28	
#8	5	23	
#10	1	22	
#16	3	19	
#30	5	14	
#40	3	10	
#50	3	7	
#100	3	5	
#200	1	3.4	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	2.6
USCS Soil Classification	GP

Group Name (ASTM D2487)
Poorly graded GRAVEL with sand

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1588-6	Supplier:	-
Client:	Ethos	Sample Date:	2/8/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/28/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-138 @ 80.0 - 81.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	9	91	
3/4"	5	86	
1/2"	8	78	
3/8"	5	73	
1/4"	5	68	
#4	3	65	
#8	7	58	
#10	2	56	
#16	6	50	
#30	8	42	
#40	5	37	
#50	5	32	
#100	5	28	
#200	4	23	

Liquid Limit (AASHTO T-89)	31
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	14
Moisture Content (AASHTO T-265)	7.6
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND with gravel

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1588-7	Supplier:	-
Client:	Ethos	Sample Date:	2/8/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/28/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-138 @ 105.0 - 106.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	1	99	
1/4"	1	98	
#4	1	97	
#8	9	87	
#10	4	84	
#16	19	65	
#30	22	43	
#40	9	34	
#50	8	26	
#100	8	18	
#200	4	14	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	5.5
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-3864-3	Supplier:	-
Client:	Ethos	Sample Date:	7/8/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	7/10/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-139 @ 30.0 - 31.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	11	89	
3/4"	0	89	
1/2"	17	72	
3/8"	11	61	
1/4"	16	45	
#4	8	37	
#8	9	27	
#10	1	27	
#16	5	22	
#30	12	10	
#40	4	5	
#50	2	4	
#100	2	2	
#200	1	1.3	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	4.9
USCS Soil Classification	GP

Group Name (ASTM D2487)
Poorly graded GRAVEL with sand

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-3864-4	Supplier:	-
Client:	Ethos	Sample Date:	7/8/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	7/10/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-139 @ 45.0 - 46.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	27	73	
3/4"	24	49	
1/2"	5	44	
3/8"	4	41	
1/4"	6	35	
#4	4	31	
#8	6	25	
#10	1	24	
#16	4	20	
#30	6	14	
#40	5	9	
#50	3	7	
#100	3	4	
#200	2	2.6	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	11.3
USCS Soil Classification	GP

Group Name (ASTM D2487)
Poorly graded GRAVEL with sand

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-3864-5	Supplier:	-
Client:	Ethos	Sample Date:	7/8/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	7/10/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-139 @ 65.0 - 66.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	14	86	
3/4"	8	78	
1/2"	2	76	
3/8"	9	67	
1/4"	8	60	
#4	4	56	
#8	11	45	
#10	4	42	
#16	11	31	
#30	17	14	
#40	4	10	
#50	3	7	
#100	3	4	
#200	1	2.8	

Liquid Limit (AASHTO T-89)	28
Plastic Limit (AASHTO T-90)	20
Plasticity Index (AASHTO T-90)	8
Moisture Content (AASHTO T-265)	12.6
USCS Soil Classification	SP

Group Name (ASTM D2487)
Poorly graded SAND with gravel

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-3864-7	Supplier:	-
Client:	Ethos	Sample Date:	7/8/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	7/10/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-139 @ 95.0 - 96.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	8	92	
3/4"	6	87	
1/2"	1	85	
3/8"	0	85	
1/4"	1	83	
#4	1	83	
#8	1	81	
#10	0	81	
#16	2	78	
#30	14	64	
#40	18	46	
#50	18	28	
#100	13	15	
#200	4	11	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	16.6
USCS Soil Classification	SP-SM

Group Name (ASTM D2487)
Poorly graded SAND with silt and gravel

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil

JOB NO: 17-2023-4239
WORK ORDER NO: 78
DATE ASSIGNED: 7/12/24

MECHANICAL SIEVE ANALYSIS (ASTM C136/C117) PLASTICITY INDEX (ASTM D4318)
GROUP SYMBOL, USCS (ASTM D2487)

PERCENT PASSING BY WEIGHT

				Silt or	SAND								GRAVEL									COBBLES	
				Clay	Fine			Medium			Coarse		Fine				Coarse						
Location & Depth	USCS	LL	PI	#200	#100	#50	#40	#30	#16	#10	#8	#4	1/4"	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	3"	6"	Lab #
B-139 (5.0-6.0')	CL	36	17	96	99	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	24-3226-01
B-140 (40.0-40'9")	GP	NV	NP	3.4	5	7	9	12	17	20	21	29	33	44	51	64	78	86	86	100	100	100	24-3226-02

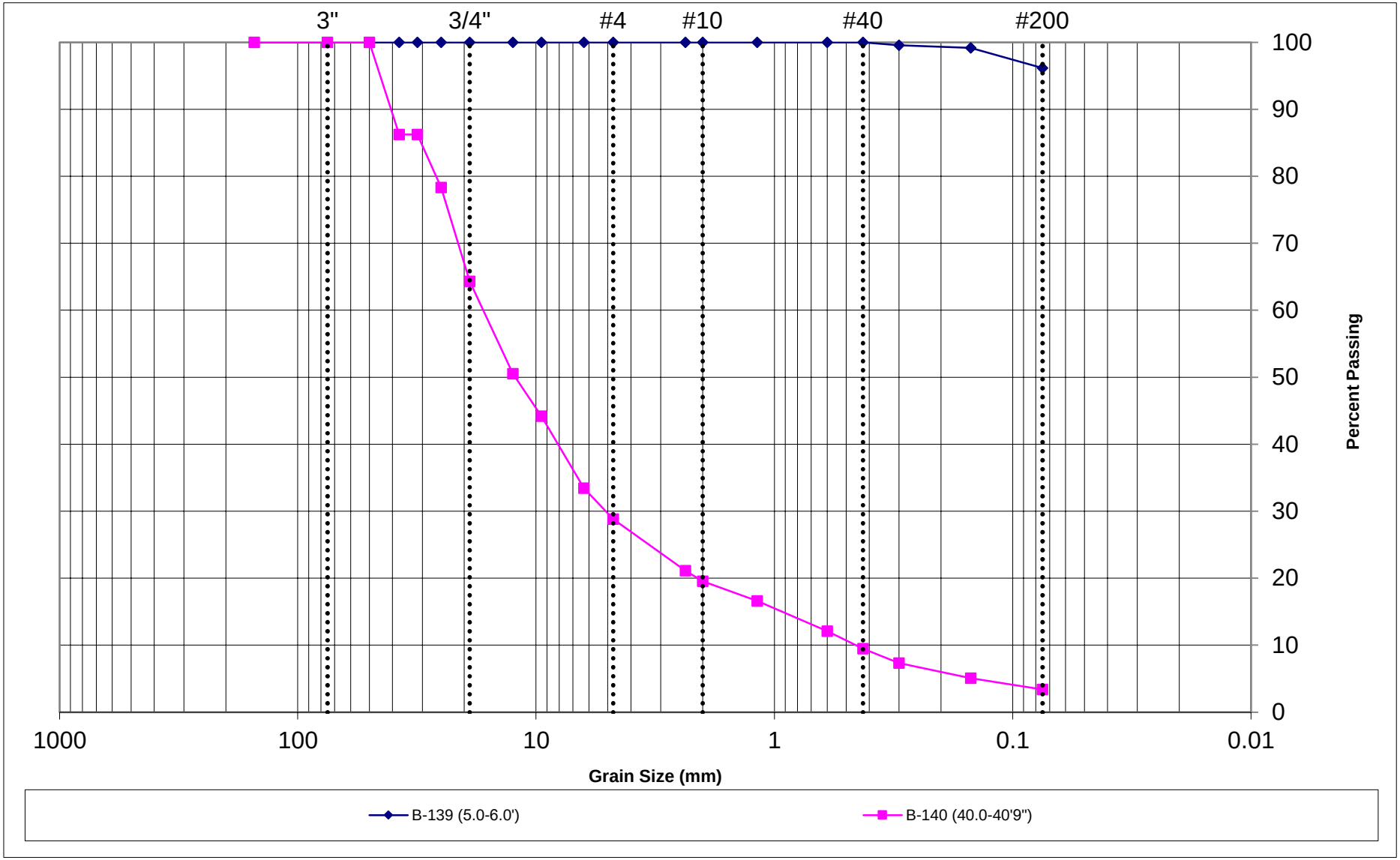
WSP USA
3630 E Wier Ave.
Phoenix, AZ 85040

REVIEWED BY 07/26/24

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil

JOB NO: 17-2023-4239
WORK ORDER NO: 78
DATE ASSIGNED: 7/12/24

MECHANICAL SIEVE ANALYSIS GRAPHS



ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-3865-1	Supplier:	-
Client:	Ethos	Sample Date:	7/8/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	7/11/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-140 @ 15.0 - 16.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	99	
#30	1	98	
#40	1	97	
#50	1	96	
#100	7	89	
#200	14	74	

Liquid Limit (AASHTO T-89)	30
Plastic Limit (AASHTO T-90)	16
Plasticity Index (AASHTO T-90)	14
Moisture Content (AASHTO T-265)	18.5
USCS Soil Classification	CL

Group Name (ASTM D2487)
Lean CLAY with sand

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-3865-4	Supplier:	-
Client:	Ethos	Sample Date:	7/8/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	7/11/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-140 @ 75.0 - 76.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	15	85	
3/4"	15	71	
1/2"	8	63	
3/8"	7	56	
1/4"	6	51	
#4	2	49	
#8	6	42	
#10	1	41	
#16	5	36	
#30	7	29	
#40	4	25	
#50	4	21	
#100	6	15	
#200	3	12	

Liquid Limit (AASHTO T-89)	26
Plastic Limit (AASHTO T-90)	18
Plasticity Index (AASHTO T-90)	8
Moisture Content (AASHTO T-265)	7.8
USCS Soil Classification	GC

Group Name (ASTM D2487)
Clayey GRAVEL with sand

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-3865-5	Supplier:	-
Client:	Ethos	Sample Date:	7/8/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	7/11/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-140 @ 85.0 - 86.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	1	99	
1/4"	0	99	
#4	0	99	
#8	2	97	
#10	1	96	
#16	3	94	
#30	10	84	
#40	18	65	
#50	24	42	
#100	28	13	
#200	5	8.0	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	15.6
USCS Soil Classification	SP-SM

Group Name (ASTM D2487)
Poorly graded SAND with silt

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-3865-6	Supplier:	-
Client:	Ethos	Sample Date:	7/8/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	7/11/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-140 @ 110.0 - 111.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	1	99	
1/4"	0	99	
#4	0	99	
#8	1	98	
#10	0	98	
#16	1	97	
#30	4	93	
#40	9	84	
#50	22	62	
#100	35	27	
#200	9	18	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	16.9
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-4603-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	9/4/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-141 @ 0.0 - 4.5	Reviewed By:	Keagen Mayfield

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	0	100	
#40	0	99	
#50	0	99	
#100	1	98	
#200	5	92	

Liquid Limit (ASTM D4318)	31
Plastic Limit (ASTM D4318)	18
Plasticity Index (ASTM D4318)	13
Moisture Content (ASTM D2216)	19.4
USCS Soil Classification	CL

Group Name (ASTM D2487)
Lean CLAY

Keagen Mayfield
Laboratory Manager

Keagen Mayfield
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-4603-2	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	9/4/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-141 @ 10.0 - 11.0	Reviewed By:	Keagen Mayfield

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	1	99	
#40	1	98	
#50	2	96	
#100	11	86	
#200	36	49.5	

Liquid Limit (ASTM D4318)	
Plastic Limit (ASTM D4318)	
Plasticity Index (ASTM D4318)	NP
Moisture Content (ASTM D2216)	14.1
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Testing sizes reduced from standard minimums due to lack of material

Keagen Mayfield
Laboratory Manager

Keagen Mayfield
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-4603-3	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	9/3/2024
Project City	Goodyear	Tested By:	Colin Eggebrecht
Sample Location:	B-141 @ 15.0 - 16.5	Reviewed By:	Keagen Mayfield

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"			
3"			
2 1/2"			
2"			
1 1/2"			
1"			
3/4"			
1/2"			
3/8"			
1/4"			
#4			
#8			
#10			
#16			
#30			
#40			
#50			
#100			
#200			

Liquid Limit (ASTM D4318)	
Plastic Limit (ASTM D4318)	
Plasticity Index (ASTM D4318)	
Moisture Content (ASTM D2216)	13.0
USCS Soil Classification	

Group Name (ASTM D2487)

Keagen Mayfield
Laboratory Manager

Keagen Mayfield
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-4603-4	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	9/3/2024
Project City	Goodyear	Tested By:	Colin Eggebrecht
Sample Location:	B-141 @ 20.0 - 21.5	Reviewed By:	Keagen Mayfield

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"			
3"			
2 1/2"			
2"			
1 1/2"			
1"			
3/4"			
1/2"			
3/8"			
1/4"			
#4			
#8			
#10			
#16			
#30			
#40			
#50			
#100			
#200			

Liquid Limit (ASTM D4318)	
Plastic Limit (ASTM D4318)	
Plasticity Index (ASTM D4318)	
Moisture Content (ASTM D2216)	5.6
USCS Soil Classification	

Group Name (ASTM D2487)

Testing sizes reduced from standard minimums due to lack of material

Keagen Mayfield
Laboratory Manager

Keagen Mayfield
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-4603-5	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	9/4/2024
Project City	Goodyear	Tested By:	Colin Eggebrecht
Sample Location:	B-141 @ 55.0 - 56.0	Reviewed By:	Keagen Mayfield

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	7	93	
3/4"	0	93	
1/2"	0	93	
3/8"	0	93	
1/4"	0	93	
#4	0	93	
#8	1	91	
#10	0	91	
#16	2	90	
#30	9	81	
#40	9	72	
#50	9	64	
#100	9	55	
#200	5	50	

Liquid Limit (ASTM D4318)	44
Plastic Limit (ASTM D4318)	17
Plasticity Index (ASTM D4318)	27
Moisture Content (ASTM D2216)	27.8
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Keagen Mayfield
Laboratory Manager

Keagen Mayfield
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-4603-6	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	9/4/2024
Project City	Goodyear	Tested By:	Colin Eggebrecht
Sample Location:	B-141 @ 90.0 - 90.9	Reviewed By:	Keagen Mayfield

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	7	93	
1/2"	2	91	
3/8"	1	90	
1/4"	4	87	
#4	3	84	
#8	4	80	
#10	2	78	
#16	7	71	
#30	18	53	
#40	4	50	
#50	18	32	
#100	7	25	
#200	5	20	

Liquid Limit (ASTM D4318)	29
Plastic Limit (ASTM D4318)	17
Plasticity Index (ASTM D4318)	12
Moisture Content (ASTM D2216)	17.8
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND with gravel

Testing sizes reduced from standard minimums due to lack of material

Keagen Mayfield
Laboratory Manager

Keagen Mayfield
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-4604-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	9/4/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-142 @ 5.0 - 6.0	Reviewed By:	Keagan Mayfield

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	0	100	
#40	0	100	
#50	0	100	
#100	1	99	
#200	8	91.5	

Liquid Limit (ASTM D4318)	26
Plastic Limit (ASTM D4318)	19
Plasticity Index (ASTM D4318)	7
Moisture Content (ASTM D2216)	17.6
USCS Soil Classification	CL-ML

Group Name (ASTM D2487)
SILTY CLAY

Keagan Mayfield
Laboratory Manager

Keagan Mayfield
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1584-1	Supplier:	-
Client:	Ethos	Sample Date:	2/8/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/28/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-143 @ 3.0 - 4.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"			
3"			
2 1/2"			
2"			
1 1/2"			
1"			
3/4"			
1/2"			
3/8"			
1/4"			
#4			
#8			
#10			
#16			
#30			
#40			
#50			
#100			
#200			

Liquid Limit (ASTM D4318)	
Plastic Limit (ASTM D4318)	
Plasticity Index (ASTM D4318)	NP
Moisture Content (ASTM D2216)	17.4
USCS Soil Classification	#DIV/0!

Group Name (ASTM D2487)
#DIV/0!

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1584-1	Supplier:	-
Client:	Ethos	Sample Date:	2/8/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/28/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-143 @ 3.0 - 4.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"			
3"			
2 1/2"			
2"			
1 1/2"			
1"			
3/4"			
1/2"			
3/8"			
1/4"			
#4			
#8			
#10			
#16			
#30			
#40			
#50			
#100			
#200			

Liquid Limit (ASTM D4318)	
Plastic Limit (ASTM D4318)	
Plasticity Index (ASTM D4318)	
Moisture Content (ASTM D2216)	17.4

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1584-2	Supplier:	-
Client:	Ethos	Sample Date:	2/8/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/28/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-143 @ 5.0 - 6.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	0	100	
#40	0	100	
#50	0	100	
#100	1	99	
#200	1	98	

Liquid Limit (AASHTO T-89)	32
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	15
Moisture Content (AASHTO T-265)	15.4
USCS Soil Classification	CL

Group Name (ASTM D2487)
Lean CLAY

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1584-3	Supplier:	-
Client:	Ethos	Sample Date:	2/8/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/28/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-143 @ 10.0 - 11.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	1	99	
#40	1	99	
#50	1	98	
#100	8	89	
#200	32	57	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	10.3
USCS Soil Classification	ML

Group Name (ASTM D2487)
Sandy SILT

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1584-4	Supplier:	-
Client:	Ethos	Sample Date:	2/8/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/28/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-143 @ 20.0 - 21.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	99	
#30	2	97	
#40	11	86	
#50	30	56	
#100	15	41	
#200	9	32	

Liquid Limit (ASTM D4318)	
Plastic Limit (ASTM D4318)	
Plasticity Index (ASTM D4318)	NP
Moisture Content (ASTM D2216)	5.0
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1585-1	Supplier:	-
Client:	Ethos	Sample Date:	2/8/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/28/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-144 @ 0.5 - 5.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	1	99	
#40	1	99	
#50	2	96	
#100	11	85	
#200	13	72	

Liquid Limit (AASHTO T-89)	22
Plastic Limit (AASHTO T-90)	15
Plasticity Index (AASHTO T-90)	7
Moisture Content (AASHTO T-265)	9.9
USCS Soil Classification	CL-ML

Group Name (ASTM D2487)
SILTY CLAY with sand

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1585-3	Supplier:	-
Client:	Ethos	Sample Date:	2/8/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/28/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-144 @ 15.0 - 16.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	1	99	
#40	0	99	
#50	0	99	
#100	1	98	
#200	17	81.2	

Liquid Limit (AASHTO T-89)	27
Plastic Limit (AASHTO T-90)	23
Plasticity Index (AASHTO T-90)	4
Moisture Content (AASHTO T-265)	16.8
USCS Soil Classification	ML

Group Name (ASTM D2487)
SILT with sand

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1585-4	Supplier:	-
Client:	Ethos	Sample Date:	2/8/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/28/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-144 @ 25.0 - 26.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	2	98	
3/8"	1	97	
1/4"	2	95	
#4	1	94	
#8	4	89	
#10	2	88	
#16	7	81	
#30	29	52	
#40	18	35	
#50	13	21	
#100	12	10	
#200	5	5.0	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	0.2
USCS Soil Classification	SP-SM

Group Name (ASTM D2487)
Poorly graded SAND with silt

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1147-2	Supplier:	-
Client:	Ethos	Sample Date:	1/11/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	1/15/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-145 @ 10.0 - 11.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	0	100	
#40	0	100	
#50	0	100	
#100	3	97	
#200	11	86	

Liquid Limit (ASTM D4318)	23
Plastic Limit (ASTM D4318)	19
Plasticity Index (ASTM D4318)	4
Moisture Content (ASTM D2216)	15.1
USCS Soil Classification	CL-ML

Group Name (ASTM D2487)
SILTY CLAY

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1147-3	Supplier:	-
Client:	Ethos	Sample Date:	1/11/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	1/15/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-145 @ 15.0 - 16.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"			
3"			
2 1/2"			
2"			
1 1/2"			
1"			
3/4"			
1/2"			
3/8"			
1/4"			
#4			
#8			
#10			
#16			
#30			
#40			
#50			
#100			
#200			

Liquid Limit (ASTM D4318)	
Plastic Limit (ASTM D4318)	
Plasticity Index (ASTM D4318)	
Moisture Content (ASTM D2216)	21.7
USCS Soil Classification	

Group Name (ASTM D2487)

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1147-6	Supplier:	-
Client:	Ethos	Sample Date:	1/11/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	1/15/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-145 @ 35.0 - 36.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	24	76	
1/2"	13	63	
3/8"	7	55	
1/4"	10	45	
#4	5	40	
#8	7	33	
#10	1	32	
#16	3	29	
#30	5	23	
#40	3	20	
#50	3	17	
#100	7	10	
#200	4	6.4	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	4.5
USCS Soil Classification	GP-GM

Group Name (ASTM D2487)
Poorly graded GRAVEL with silt and sand

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1147-8	Supplier:	-
Client:	Ethos	Sample Date:	1/11/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	1/16/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-145 @ 75.0 - 76.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	1	99	
1/2"	2	97	
3/8"	4	93	
1/4"	1	92	
#4	1	90	
#8	10	80	
#10	4	76	
#16	14	62	
#30	23	39	
#40	16	23	
#50	10	13	
#100	7	5	
#200	4	1.0	

Liquid Limit (AASHTO T-89)	38
Plastic Limit (AASHTO T-90)	14
Plasticity Index (AASHTO T-90)	24
Moisture Content (AASHTO T-265)	20.3
USCS Soil Classification	SP

Group Name (ASTM D2487)
Poorly graded SAND

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil

JOB NO: 17-2023-4239
WORK ORDER NO: 44
DATE ASSIGNED: 1/18/24

MECHANICAL SIEVE ANALYSIS (ASTM C136/C117) PLASTICITY INDEX (ASTM D4318)
GROUP SYMBOL, USCS (ASTM D2487)

PERCENT PASSING BY WEIGHT

				Silt or	SAND								GRAVEL									COBBLES	
				Clay	Fine			Medium			Coarse		Fine				Coarse						
Location & Depth	USCS	LL	PI	#200	#100	#50	#40	#30	#16	#10	#8	#4	1/4"	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	3"	6"	Lab #
B-147 (15.0-16.0')	CL	35	14	93	97	98	98	99	100	100	100	100	100	100	100	100	100	100	100	100	100	100	24-2360-01
B-145 (25.0-26.0')	SM	NV	NP	49	76	86	88	91	97	98	99	100	100	100	100	100	100	100	100	100	100	100	24-2360-02
B-145 (55.0-56.0')	GP-GM	NV	NP	6.4	9	15	20	25	31	35	36	43	47	54	60	72	85	100	100	100	100	100	24-2360-03
B-148 (10.0-11.0')	SM	NV	NP	22	47	86	95	97	99	100	100	100	100	100	100	100	100	100	100	100	100	100	24-2360-04

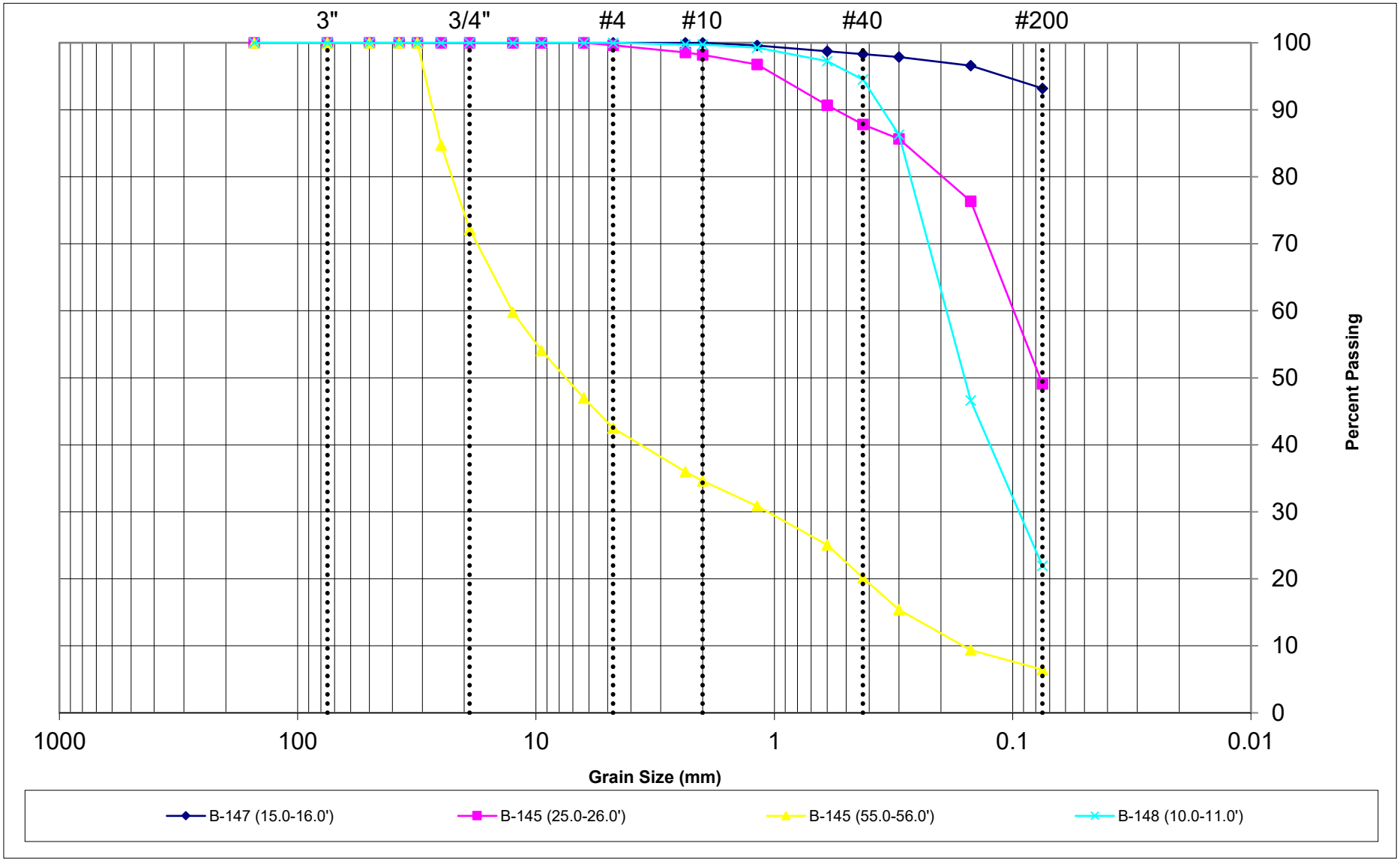
WSP USA
3630 E Wier Ave.
Phoenix, AZ 85040

REVIEWED BY

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil

JOB NO: 17-2023-4239
WORK ORDER NO: 44
DATE ASSIGNED: 1/18/24

MECHANICAL SIEVE ANALYSIS GRAPHS



ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1586-3	Supplier:	-
Client:	Ethos	Sample Date:	2/8/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/28/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-146 @ 30.0 - 31.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	99	
#4	0	99	
#8	0	99	
#10	0	99	
#16	1	98	
#30	13	85	
#40	20	65	
#50	23	42	
#100	25	16	
#200	10	6.6	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	0.1
USCS Soil Classification	SP-SM

Group Name (ASTM D2487)
Poorly graded SAND with silt

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1586-5	Supplier:	-
Client:	Ethos	Sample Date:	2/8/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/28/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-146 @ 55.0 -56.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	9	91	
3/4"	15	76	
1/2"	10	66	
3/8"	6	60	
1/4"	8	52	
#4	4	48	
#8	7	41	
#10	1	39	
#16	4	35	
#30	5	30	
#40	4	26	
#50	6	20	
#100	7	13	
#200	5	7.9	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	0.4
USCS Soil Classification	GP-GM

Group Name (ASTM D2487)
Poorly graded GRAVEL with silt and sand

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1586-6	Supplier:	-
Client:	Ethos	Sample Date:	2/8/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/28/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-146 @ 65.0 - 66.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	6	94	
3/8"	10	83	
1/4"	8	76	
#4	11	65	
#8	2	63	
#10	1	63	
#16	1	61	
#30	3	58	
#40	2	57	
#50	1	56	
#100	6	50	
#200	16	33	

Liquid Limit (AASHTO T-89)	34
Plastic Limit (AASHTO T-90)	20
Plasticity Index (AASHTO T-90)	14
Moisture Content (AASHTO T-265)	0.2
USCS Soil Classification	GC

Group Name (ASTM D2487)
Clayey GRAVEL with sand

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1586-7	Supplier:	-
Client:	Ethos	Sample Date:	2/8/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/28/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-146 @ 80.0 - 81.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	4	96	
1/2"	6	91	
3/8"	6	84	
1/4"	6	78	
#4	3	75	
#8	11	64	
#10	4	60	
#16	12	48	
#30	14	33	
#40	5	28	
#50	4	24	
#100	10	14	
#200	5	9.3	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	0.6
USCS Soil Classification	SP-SM

Group Name (ASTM D2487)
Poorly graded SAND with silt and gravel

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1139-1	Supplier:	-
Client:	Ethos	Sample Date:	12/18/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	1/15/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-147 @ 5.0 - 6.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	1	99	
#40	1	99	
#50	2	97	
#100	11	86	
#200	24	62	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	13.1
USCS Soil Classification	ML

Group Name (ASTM D2487)
Sandy SILT

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1139-4	Supplier:	-
Client:	Ethos	Sample Date:	12/18/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	1/15/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-147 @ 35.0 - 36.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	11	89	
1/2"	17	73	
3/8"	7	66	
1/4"	12	54	
#4	6	48	
#8	11	37	
#10	2	35	
#16	5	30	
#30	8	22	
#40	3	19	
#50	2	16	
#100	5	12	
#200	4	8.0	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	6.4
USCS Soil Classification	GP-GM

Group Name (ASTM D2487)
Poorly graded GRAVEL with silt and sand

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1139-5	Supplier:	-
Client:	Ethos	Sample Date:	12/18/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	1/16/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-147 @ 65.0 - 66.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	8	92	
3/4"	12	80	
1/2"	12	68	
3/8"	6	62	
1/4"	7	56	
#4	4	52	
#8	8	44	
#10	3	41	
#16	8	32	
#30	14	19	
#40	8	11	
#50	4	7	
#100	3	4	
#200	2	1.9	

Liquid Limit (AASHTO T-89)	34
Plastic Limit (AASHTO T-90)	16
Plasticity Index (AASHTO T-90)	18
Moisture Content (AASHTO T-265)	10.3
USCS Soil Classification	SP

Group Name (ASTM D2487)
Poorly graded SAND with gravel

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1148-1	Supplier:	-
Client:	Ethos	Sample Date:	12/18/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	1/18/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-148 @ 0.0 - 5.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	99	
#10	0	99	
#16	0	99	
#30	1	98	
#40	2	96	
#50	3	94	
#100	11	83	
#200	16	66	

Liquid Limit (AASHTO T-89)	20
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	3
Moisture Content (AASHTO T-265)	12.0
USCS Soil Classification	ML

Group Name (ASTM D2487)
Sandy SILT

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1148-4	Supplier:	-
Client:	Ethos	Sample Date:	12/18/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	1/18/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-148 @ 20.0 - 21.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	1	99	
#30	6	93	
#40	9	84	
#50	14	70	
#100	21	50	
#200	17	33	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	11.2
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1148-6	Supplier:	-
Client:	Ethos	Sample Date:	12/18/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	1/18/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-148 @ 30.0 - 31.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"			
3"			
2 1/2"			
2"			
1 1/2"			
1"			
3/4"			
1/2"			
3/8"			
1/4"			
#4			
#8			
#10			
#16			
#30			
#40			
#50			
#100			
#200			

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	
Moisture Content (AASHTO T-265)	3.6
USCS Soil Classification	

Group Name (ASTM D2487)

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1148-7	Supplier:	-
Client:	Ethos	Sample Date:	12/18/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	1/18/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-148 @ 45.0 - 46.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	9	91	
3/4"	15	76	
1/2"	20	56	
3/8"	1	55	
1/4"	9	46	
#4	5	41	
#8	7	34	
#10	2	32	
#16	4	29	
#30	7	22	
#40	5	16	
#50	4	13	
#100	6	7	
#200	4	2.8	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	3.6
USCS Soil Classification	GP

Group Name (ASTM D2487)
Poorly graded GRAVEL with sand

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1148-8	Supplier:	-
Client:	Ethos	Sample Date:	12/18/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	1/18/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-148 @ 70.0 - 71.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	7	93	
1/2"	19	74	
3/8"	2	72	
1/4"	8	64	
#4	5	59	
#8	12	47	
#10	3	44	
#16	10	34	
#30	16	18	
#40	6	12	
#50	4	9	
#100	4	4	
#200	2	2.1	

Liquid Limit (AASHTO T-89)	28
Plastic Limit (AASHTO T-90)	19
Plasticity Index (AASHTO T-90)	9
Moisture Content (AASHTO T-265)	11.0
USCS Soil Classification	SP

Group Name (ASTM D2487)
Poorly graded SAND with gravel

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1148-9	Supplier:	-
Client:	Ethos	Sample Date:	12/18/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	1/18/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-148 @ 90.0 - 91.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	3	97	
#4	4	94	
#8	9	85	
#10	3	82	
#16	5	77	
#30	11	66	
#40	17	48	
#50	19	29	
#100	14	15	
#200	4	11	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	17.1
USCS Soil Classification	SP-SM

Group Name (ASTM D2487)
Poorly graded SAND with silt

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1139-6	Supplier:	-
Client:	Ethos	Sample Date:	12/18/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	1/16/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-147 @ 80.0 - 81.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	7	93	
1/2"	24	70	
3/8"	5	65	
1/4"	7	57	
#4	5	53	
#8	12	40	
#10	3	37	
#16	8	29	
#30	10	19	
#40	4	15	
#50	4	11	
#100	8	3	
#200	3	0.5	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	11.7
USCS Soil Classification	SP

Group Name (ASTM D2487)
Poorly graded SAND with gravel

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1140-1	Supplier:	-
Client:	Ethos	Sample Date:	12/18/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	1/18/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-149 @ 10.0 - 11.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	99	
#8	2	97	
#10	1	96	
#16	7	89	
#30	17	72	
#40	10	62	
#50	13	49	
#100	13	35	
#200	8	27	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	7.8
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1140-2	Supplier:	-
Client:	Ethos	Sample Date:	12/18/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	1/18/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-149 @ 20.0 - 21.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	2	98	
1/2"	5	93	
3/8"	4	89	
1/4"	4	85	
#4	1	84	
#8	2	82	
#10	0	82	
#16	0	81	
#30	1	81	
#40	0	80	
#50	0	80	
#100	1	79	
#200	2	77	

Liquid Limit (AASHTO T-89)	34
Plastic Limit (AASHTO T-90)	19
Plasticity Index (AASHTO T-90)	15
Moisture Content (AASHTO T-265)	26.0
USCS Soil Classification	CL

Group Name (ASTM D2487)
Lean CLAY with gravel

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1140-3	Supplier:	-
Client:	Ethos	Sample Date:	12/18/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	1/18/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-150 @ 0.5 - 5.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	1	99	
#40	1	99	
#50	1	98	
#100	6	92	
#200	17	75	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	31.6
USCS Soil Classification	ML

Group Name (ASTM D2487)
SILT with sand

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5851-3	Supplier:	-
Client:	Ethos	Sample Date:	12/13/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	1/10/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-152 @ 10.0 - 11.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	1	99	
#4	0	99	
#8	1	99	
#10	1	98	
#16	4	94	
#30	8	86	
#40	4	82	
#50	4	79	
#100	6	72	
#200	12	60	

Liquid Limit (AASHTO T-89)	21
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	4
Moisture Content (AASHTO T-265)	4.0
USCS Soil Classification	CL-ML

Group Name (ASTM D2487)
Sandy SILTY CLAY

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-5851-6	Supplier:	-
Client:	Ethos	Sample Date:	12/13/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/14/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-151-153 A	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	3	97	
1/2"	2	95	
3/8"	1	94	
1/4"	1	93	
#4	2	91	
#8	5	86	
#10	2	84	
#16	7	77	
#30	13	64	
#40	7	57	
#50	7	50	
#100	11	40	
#200	7	32	

Liquid Limit (AASHTO T-89)	22
Plastic Limit (AASHTO T-90)	16
Plasticity Index (AASHTO T-90)	6
Moisture Content (AASHTO T-265)	2.8
USCS Soil Classification	SC-SM

Group Name (ASTM D2487)
Silty, clayey SAND

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-5851-7	Supplier:	-
Client:	Ethos	Sample Date:	12/13/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/14/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-151-153 B	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	4	96	
1/2"	4	93	
3/8"	2	91	
1/4"	4	87	
#4	4	83	
#8	11	72	
#10	4	68	
#16	12	56	
#30	16	39	
#40	8	31	
#50	6	25	
#100	7	18	
#200	4	13	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	2.9
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND with gravel

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1140-5	Supplier:	-
Client:	Ethos	Sample Date:	12/18/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	1/18/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-150 @ 15.0 - 16.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	99	
#10	0	99	
#16	1	97	
#30	5	93	
#40	5	88	
#50	5	82	
#100	13	70	
#200	20	50	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	8.5
USCS Soil Classification	ML

Group Name (ASTM D2487)
Sandy SILT

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5852-1	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	12/20/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-154 @ 0.0 - 5.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	1	99	
1/4"	1	98	
#4	1	97	
#8	4	93	
#10	2	91	
#16	10	80	
#30	15	65	
#40	7	58	
#50	9	49	
#100	10	39	
#200	7	32	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	1.8
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5852-3	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	12/20/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-154 @ 15.0 - 16.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	1	99	
#8	2	98	
#10	1	97	
#16	7	90	
#30	26	64	
#40	17	47	
#50	18	29	
#100	14	15	
#200	5	9.7	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	2.2
USCS Soil Classification	SP-SM

Group Name (ASTM D2487)
Poorly graded SAND with silt

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5853-1	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	12/20/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-156 @ 10.0 - 11.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	2	98	
3/8"	3	95	
1/4"	6	88	
#4	4	84	
#8	6	78	
#10	2	77	
#16	8	69	
#30	15	53	
#40	9	45	
#50	13	32	
#100	19	13	
#200	6	7.0	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	0.9
USCS Soil Classification	SP-SM

Group Name (ASTM D2487)
Poorly graded SAND with silt and gravel

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5853-2	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	12/20/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-156 @ 40.0 - 41.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	99	
#30	0	99	
#40	0	99	
#50	1	98	
#100	4	94	
#200	5	90	

Liquid Limit (AASHTO T-89)	66
Plastic Limit (AASHTO T-90)	23
Plasticity Index (AASHTO T-90)	43
Moisture Content (AASHTO T-265)	27.9
USCS Soil Classification	CH

Group Name (ASTM D2487)
Fat CLAY

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5853-3	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	12/21/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-157 @ 0.0 - 5.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	1	99	
3/4"	0	99	
1/2"	0	99	
3/8"	0	99	
1/4"	1	97	
#4	1	96	
#8	3	92	
#10	1	91	
#16	5	86	
#30	9	76	
#40	5	71	
#50	8	63	
#100	11	52	
#200	9	42	

Liquid Limit (AASHTO T-89)	23
Plastic Limit (AASHTO T-90)	19
Plasticity Index (AASHTO T-90)	4
Moisture Content (AASHTO T-265)	4.4
USCS Soil Classification	SC-SM

Group Name (ASTM D2487)
Silty, clayey SAND

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5853-4	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	12/20/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-157 @ 15.0 - 16.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"			
3"			
2 1/2"			
2"			
1 1/2"			
1"			
3/4"			
1/2"			
3/8"			
1/4"			
#4			
#8			
#10			
#16			
#30			
#40			
#50			
#100			
#200			

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	
Moisture Content (AASHTO T-265)	7.5
USCS Soil Classification	

Group Name (ASTM D2487)

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5853-5	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	12/20/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-157 @ 35.0 - 36.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	0	100	
#40	0	99	
#50	2	98	
#100	18	80	
#200	22	58	

Liquid Limit (AASHTO T-89)	31
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	14
Moisture Content (AASHTO T-265)	18.5
USCS Soil Classification	CL

Group Name (ASTM D2487)
Sandy lean CLAY

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5853-7	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	1/5/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-157 @ 50.0 - 51.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"			
3"			
2 1/2"			
2"			
1 1/2"			
1"			
3/4"			
1/2"			
3/8"			
1/4"			
#4			
#8			
#10			
#16			
#30			
#40			
#50			
#100			
#200			

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	
Moisture Content (AASHTO T-265)	7.1
USCS Soil Classification	

Group Name (ASTM D2487)

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5853-8	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	12/20/2023
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-157 @ 55.0 - 56.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	7	93	
#10	2	91	
#16	12	79	
#30	27	52	
#40	10	42	
#50	9	33	
#100	9	24	
#200	6	18	

Liquid Limit (AASHTO T-89)	32
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	15
Moisture Content (AASHTO T-265)	13.7
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5852-5	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	12/20/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-155 @ 5.0 - 6.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	1	99	
#4	0	99	
#8	1	99	
#10	1	98	
#16	4	94	
#30	7	87	
#40	4	83	
#50	6	77	
#100	8	69	
#200	11	57	

Liquid Limit (AASHTO T-89)	21
Plastic Limit (AASHTO T-90)	18
Plasticity Index (AASHTO T-90)	3
Moisture Content (AASHTO T-265)	4.0
USCS Soil Classification	ML

Group Name (ASTM D2487)
Sandy SILT

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	23-4582-2	Supplier:	-
Client:	Ethos	Sample Date:	9/26/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/4/2023
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-158 @ 10.0 - 11.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	1	99	
1/4"	1	98	
#4	0	98	
#8	2	96	
#10	1	94	
#16	7	87	
#30	14	73	
#40	9	64	
#50	7	57	
#100	10	46	
#200	8	39	

Liquid Limit (AASHTO T-89)	21
Plastic Limit (AASHTO T-90)	15
Plasticity Index (AASHTO T-90)	6
Moisture Content (AASHTO T-265)	2.4
USCS Soil Classification	SC-SM

Group Name (ASTM D2487)
Silty, clayey SAND

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	23-4582-3	Supplier:	-
Client:	Ethos	Sample Date:	9/26/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/4/2023
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-158 @ 20.0 - 21.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	2	98	
3/8"	1	97	
1/4"	2	95	
#4	1	95	
#8	4	91	
#10	1	90	
#16	3	87	
#30	4	83	
#40	3	80	
#50	4	76	
#100	7	69	
#200	12	57	

Liquid Limit (AASHTO T-89)	39
Plastic Limit (AASHTO T-90)	22
Plasticity Index (AASHTO T-90)	17
Moisture Content (AASHTO T-265)	19.9
USCS Soil Classification	CL

Group Name (ASTM D2487)
Sandy lean CLAY

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	23-4582-7	Supplier:	-
Client:	Ethos	Sample Date:	9/26/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/4/2023
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-158 @ 63.0 - 64.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	99	
1/4"	0	99	
#4	0	99	
#8	1	97	
#10	0	97	
#16	4	93	
#30	20	73	
#40	21	52	
#50	24	28	
#100	19	9	
#200	7	1.9	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	15.6
USCS Soil Classification	SP

Group Name (ASTM D2487)
Poorly graded SAND

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil

JOB NO: 17-2023-4239
WORK ORDER NO: 11
DATE ASSIGNED: 10/18/23

MECHANICAL SIEVE ANALYSIS (ASTM C136/C117) PLASTICITY INDEX (ASTM D4318)
GROUP SYMBOL, USCS (ASTM D2487)

PERCENT PASSING BY WEIGHT

				Silt or	SAND								GRAVEL									COBBLES	
				Clay	Fine			Medium			Coarse		Fine				Coarse						
Location & Depth	USCS	LL	PI	#200	#100	#50	#40	#30	#16	#10	#8	#4	1/4"	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	3"	6"	Lab #
B-161 (45.0-46.0')	SC	30	8	37	68	92	97	99	100	100	100	100	100	100	100	100	100	100	100	100	100	100	23-2046-04
B-166 (15.0-16.0')	ML	NV	NP	65	90	97	98	98	98	99	99	99	100	100	100	100	100	100	100	100	100	100	23-2046-02
B-158 (45.0-46.5')	CL	36	14	54	72	86	92	96	99	100	100	100	100	100	100	100	100	100	100	100	100	100	23-2046-03
B-164 (25.0-26.5')	SC	33	14	26	37	62	83	93	98	99	99	100	100	100	100	100	100	100	100	100	100	100	23-2046-04
B-159 (25.0-26.0')	SC	35	14	25	39	59	72	84	95	97	97	98	99	99	100	100	100	100	100	100	100	100	23-2046-05
B-160 (60.0-61.0')	SM	NV	NP	13	17	26	44	72	91	93	94	95	96	97	98	100	100	100	100	100	100	100	23-2046-06
B-162 (35.0-36.0')	SC	29	9	32	45	64	75	83	90	92	92	94	95	95	97	100	100	100	100	100	100	100	23-2046-07

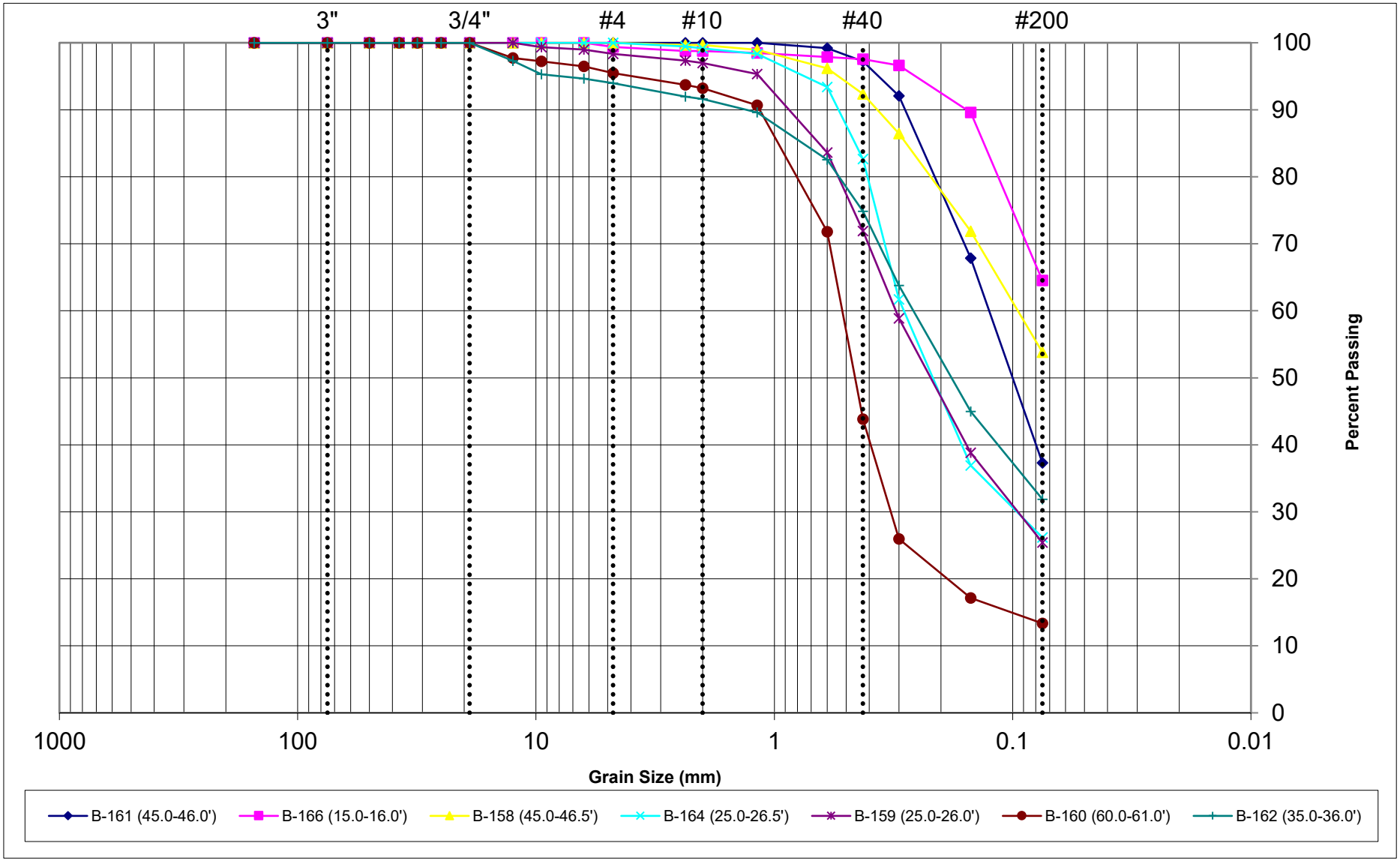
WSP USA
3630 E Wier Ave.
Phoenix, AZ 85040

REVIEWED BY

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil

JOB NO: 17-2023-4239
WORK ORDER NO: 11
DATE ASSIGNED: 10/18/23

MECHANICAL SIEVE ANALYSIS GRAPHS



ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	23-4643-1	Supplier:	-
Client:	Ethos	Sample Date:	9/26/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/4/2023
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-159 @ 3.0 - 4.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	2	98	
3/8"	1	97	
1/4"	2	94	
#4	3	91	
#8	10	81	
#10	3	78	
#16	10	68	
#30	16	52	
#40	8	44	
#50	9	35	
#100	10	25	
#200	5	20	

Liquid Limit (AASHTO T-89)	24
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	7
Moisture Content (AASHTO T-265)	3.0
USCS Soil Classification	SC-SM

Group Name (ASTM D2487)
Silty, clayey SAND

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	23-4643-4	Supplier:	-
Client:	Ethos	Sample Date:	9/26/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/4/2023
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-159 @ 50.0 - 51.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	1	99	
3/8"	0	99	
1/4"	0	98	
#4	0	98	
#8	0	98	
#10	0	98	
#16	0	98	
#30	1	97	
#40	1	96	
#50	2	95	
#100	6	89	
#200	9	80	

Liquid Limit (AASHTO T-89)	48
Plastic Limit (AASHTO T-90)	22
Plasticity Index (AASHTO T-90)	26
Moisture Content (AASHTO T-265)	35.3
USCS Soil Classification	CL

Group Name (ASTM D2487)
Lean CLAY with sand

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	23-4643-7	Supplier:	-
Client:	Ethos	Sample Date:	9/26/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/4/2023
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-159 @ 65.0 - 66.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	1	99	
3/8"	0	99	
1/4"	0	99	
#4	0	99	
#8	1	99	
#10	0	98	
#16	3	96	
#30	17	78	
#40	19	59	
#50	19	40	
#100	25	15	
#200	6	9.0	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	14.9
USCS Soil Classification	SP-SM

Group Name (ASTM D2487)
Poorly graded SAND with silt

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	23-4644-2	Supplier:	-
Client:	Ethos	Sample Date:	9/26/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/4/2023
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-160 @ 20.0 - 21.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	2	98	
1/4"	5	93	
#4	3	90	
#8	3	87	
#10	1	86	
#16	3	83	
#30	3	80	
#40	2	78	
#50	3	75	
#100	9	66	
#200	16	50	

Liquid Limit (AASHTO T-89)	35
Plastic Limit (AASHTO T-90)	20
Plasticity Index (AASHTO T-90)	15
Moisture Content (AASHTO T-265)	14.7
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	23-4644-4	Supplier:	-
Client:	Ethos	Sample Date:	9/26/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/4/2023
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-160 @ 35.0 - 36.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	1	99	
#10	0	99	
#16	1	97	
#30	5	92	
#40	5	87	
#50	11	76	
#100	23	53	
#200	12	41	

Liquid Limit (AASHTO T-89)	30
Plastic Limit (AASHTO T-90)	22
Plasticity Index (AASHTO T-90)	8
Moisture Content (AASHTO T-265)	14.4
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	23-4644-8	Supplier:	-
Client:	Ethos	Sample Date:	9/26/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/4/2023
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-160 @ 85.0 - 86.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	9	91	
1/2"	11	80	
3/8"	10	70	
1/4"	8	62	
#4	4	57	
#8	8	49	
#10	2	47	
#16	8	39	
#30	12	27	
#40	6	21	
#50	4	16	
#100	6	10	
#200	4	6.3	

Liquid Limit (AASHTO T-89)	33
Plastic Limit (AASHTO T-90)	16
Plasticity Index (AASHTO T-90)	17
Moisture Content (AASHTO T-265)	17.9
USCS Soil Classification	SP-SC

Group Name (ASTM D2487)
Poorly graded SAND with clay and gravel

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-4579-1	Supplier:	-
Client:	Ethos	Sample Date:	9/26/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/4/2023
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-161 @ 5.0 - 6.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	1	99	
#4	2	97	
#8	3	94	
#10	1	93	
#16	5	88	
#30	10	78	
#40	6	72	
#50	11	61	
#100	20	42	
#200	12	29	

Liquid Limit (AASHTO T-89)	27
Plastic Limit (AASHTO T-90)	18
Plasticity Index (AASHTO T-90)	9
Moisture Content (AASHTO T-265)	3.6
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-4579-2	Supplier:	-
Client:	Ethos	Sample Date:	9/26/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/4/2023
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-161 @ 25.0 - 26.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	1	99	
#10	0	99	
#16	1	99	
#30	3	96	
#40	3	94	
#50	5	89	
#100	13	76	
#200	14	61	

Liquid Limit (ASTM D4318)	31
Plastic Limit (ASTM D4318)	21
Plasticity Index (ASTM D4318)	10
Moisture Content (ASTM D2216)	9.4
USCS Soil Classification	CL

Group Name (ASTM D2487)
Sandy lean CLAY

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-4579-6	Supplier:	-
Client:	Ethos	Sample Date:	9/26/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/4/2023
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-161 @ 75.0 - 76.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	3	97	
3/4"	0	97	
1/2"	2	94	
3/8"	3	91	
1/4"	3	88	
#4	2	86	
#8	7	79	
#10	2	77	
#16	11	66	
#30	18	48	
#40	15	33	
#50	12	21	
#100	8	14	
#200	3	11	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	10.4
USCS Soil Classification	SP-SM

Group Name (ASTM D2487)
Poorly graded SAND with silt

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	23-4645-1	Supplier:	-
Client:	Ethos	Sample Date:	9/26/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/4/2023
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-162 @ 0.0 - 5.0	Reviewed By:	Fernanod Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	1	99	
3/8"	1	98	
1/4"	2	96	
#4	1	95	
#8	4	91	
#10	1	90	
#16	7	82	
#30	12	71	
#40	6	65	
#50	9	56	
#100	12	44	
#200	8	36	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	2.1
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Fernanod Montero
Laboratory Manager

Fernanod Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	23-4645-2	Supplier:	-
Client:	Ethos	Sample Date:	9/26/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/4/2023
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-162 @ 15.0 - 16.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	3	97	
3/4"	11	86	
1/2"	5	81	
3/8"	5	76	
1/4"	7	69	
#4	4	65	
#8	10	55	
#10	2	53	
#16	6	47	
#30	5	42	
#40	2	40	
#50	3	37	
#100	6	31	
#200	6	25	

Liquid Limit (AASHTO T-89)	40
Plastic Limit (AASHTO T-90)	25
Plasticity Index (AASHTO T-90)	15
Moisture Content (AASHTO T-265)	13.1
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND with gravel

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	23-4645-7	Supplier:	-
Client:	Ethos	Sample Date:	9/26/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/4/2023
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-162 @ 70.0 - 71.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	1	99	
#4	7	92	
#8	0	92	
#10	0	92	
#16	1	91	
#30	2	88	
#40	2	86	
#50	3	83	
#100	3	80	
#200	2	79	

Liquid Limit (AASHTO T-89)	55
Plastic Limit (AASHTO T-90)	21
Plasticity Index (AASHTO T-90)	34
Moisture Content (AASHTO T-265)	35.5
USCS Soil Classification	CH

Group Name (ASTM D2487)
Fat CLAY with sand

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-4580-1	Supplier:	-
Client:	Ethos	Sample Date:	9/26/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/4/2023
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-163 @ 10.0 - 11.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	1	99	
#4	1	98	
#8	2	97	
#10	1	96	
#16	3	93	
#30	7	86	
#40	7	79	
#50	17	62	
#100	34	28	
#200	13	15	

Liquid Limit (ASTM D4318)	
Plastic Limit (ASTM D4318)	
Plasticity Index (ASTM D4318)	NP
Moisture Content (ASTM D2216)	10.2
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-4580-2	Supplier:	-
Client:	Ethos	Sample Date:	9/26/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/4/2023
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-163 @ 24.0 - 25.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	47	53	
2 1/2"	0	53	
2"	0	53	
1 1/2"	14	39	
1"	5	33	
3/4"	2	32	
1/2"	4	28	
3/8"	1	27	
1/4"	1	26	
#4	1	25	
#8	1	24	
#10	0	24	
#16	0	23	
#30	1	23	
#40	0	22	
#50	1	21	
#100	4	18	
#200	3	15	

Liquid Limit (AASHTO T-89)	27
Plastic Limit (AASHTO T-90)	14
Plasticity Index (AASHTO T-90)	13
Moisture Content (AASHTO T-265)	5.2
USCS Soil Classification	GC

Group Name (ASTM D2487)
Clayey GRAVEL

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-4580-5	Supplier:	-
Client:	Ethos	Sample Date:	9/26/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/4/2023
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-163 @ 61.5 - 63.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	1	99	
1/2"	0	99	
3/8"	0	99	
1/4"	0	99	
#4	0	99	
#8	0	98	
#10	0	98	
#16	1	97	
#30	6	92	
#40	11	81	
#50	20	60	
#100	31	30	
#200	11	18	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	16.7
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil

JOB NO: 17-2023-4239
WORK ORDER NO: 8
DATE ASSIGNED: 10/6/23

MECHANICAL SIEVE ANALYSIS (ASTM C136/C117) PLASTICITY INDEX (ASTM D4318)
GROUP SYMBOL, USCS (ASTM D2487)

PERCENT PASSING BY WEIGHT

				Silt or	SAND								GRAVEL									COBBLES	
				Clay	Fine			Medium			Coarse		Fine				Coarse						
Location & Depth	USCS	LL	PI	#200	#100	#50	#40	#30	#16	#10	#8	#4	1/4"	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	3"	6"	Lab #
B-163 (40.0-41.0')	CH	58	33	76	86	95	97	99	100	100	100	100	100	100	100	100	100	100	100	100	100	100	23-1972

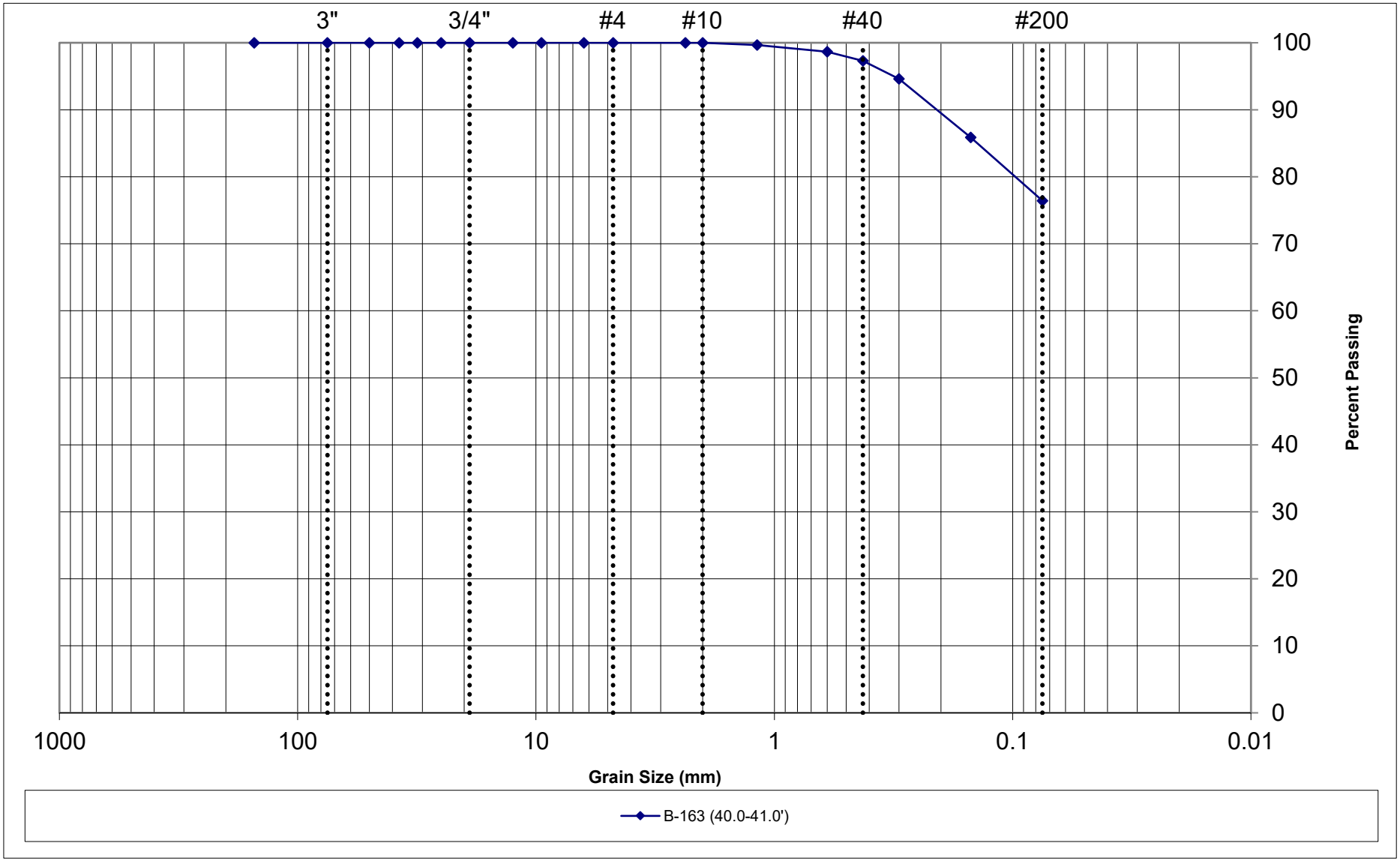
WSP USA
3630 E Wier Ave.
Phoenix, AZ 85040

REVIEWED BY

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil

JOB NO: 17-2023-4239
WORK ORDER NO: 8
DATE ASSIGNED: 10/6/23

MECHANICAL SIEVE ANALYSIS GRAPHS



ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	23-4642-1	Supplier:	-
Client:	Ethos	Sample Date:	9/26/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/4/2023
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-164 @ 8.5 - 10.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	14	86	
1"	8	78	
3/4"	10	68	
1/2"	7	61	
3/8"	5	57	
1/4"	3	53	
#4	2	51	
#8	3	48	
#10	1	48	
#16	2	45	
#30	3	42	
#40	3	39	
#50	4	35	
#100	7	28	
#200	6	22	

Liquid Limit (AASHTO T-89)	24
Plastic Limit (AASHTO T-90)	18
Plasticity Index (AASHTO T-90)	6
Moisture Content (AASHTO T-265)	4.7
USCS Soil Classification	GC-GM

Group Name (ASTM D2487)
Silty, clayey GRAVEL with sand

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	23-4642-4	Supplier:	-
Client:	Ethos	Sample Date:	9/26/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/4/2023
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-164 @ 40.0 - 41.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	1	99	
#40	2	97	
#50	6	90	
#100	24	66	
#200	21	45	

Liquid Limit (AASHTO T-89)	24
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	7
Moisture Content (AASHTO T-265)	0.9
USCS Soil Classification	SC-SM

Group Name (ASTM D2487)
Silty, clayey SAND

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	23-4642-5	Supplier:	-
Client:	Ethos	Sample Date:	9/26/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/4/2023
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-164 @ 57.0 - 58.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	99	
#10	0	99	
#16	0	99	
#30	0	99	
#40	1	98	
#50	2	96	
#100	15	81	
#200	21	60	

Liquid Limit (AASHTO T-89)	26
Plastic Limit (AASHTO T-90)	18
Plasticity Index (AASHTO T-90)	8
Moisture Content (AASHTO T-265)	15.3
USCS Soil Classification	CL

Group Name (ASTM D2487)
Sandy lean CLAY

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	23-4646-1	Supplier:	-
Client:	Ethos	Sample Date:	9/26/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/4/2023
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-165 @ 5.0 - 6.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	2	98	
#10	1	97	
#16	13	83	
#30	35	48	
#40	16	32	
#50	10	22	
#100	10	12	
#200	3	9.0	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	2.4
USCS Soil Classification	SP-SM

Group Name (ASTM D2487)
Poorly graded SAND with silt

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	23-4646-2	Supplier:	-
Client:	Ethos	Sample Date:	9/26/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/4/2023
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-165 @ 40.0 - 41.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	2	98	
1/2"	0	98	
3/8"	0	98	
1/4"	0	97	
#4	0	97	
#8	0	97	
#10	0	97	
#16	0	97	
#30	3	94	
#40	8	86	
#50	28	58	
#100	31	27	
#200	11	17	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	6.7
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soil
ACS Lab #	23-4646-3	Supplier:	-
Client:	Ethos	Sample Date:	9/26/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/4/2023
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-165 @ 70.0 - 71.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	1	99	
#10	0	99	
#16	3	96	
#30	20	76	
#40	26	50	
#50	7	43	
#100	10	34	
#200	5	29	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	19.7
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-4581-2	Supplier:	-
Client:	Ethos	Sample Date:	9/26/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/4/2023
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-166 @ 22.0 - 23.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	1	99	
1/2"	1	97	
3/8"	0	97	
1/4"	0	97	
#4	0	97	
#8	1	96	
#10	0	96	
#16	1	94	
#30	5	89	
#40	3	85	
#50	5	80	
#100	17	63	
#200	17	46	

Liquid Limit (AASHTO T-89)	28
Plastic Limit (AASHTO T-90)	20
Plasticity Index (AASHTO T-90)	8
Moisture Content (AASHTO T-265)	12.3
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-4581-5	Supplier:	-
Client:	Ethos	Sample Date:	9/26/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/4/2023
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-166 @ 45.0 - 46.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	1	99	
#40	3	95	
#50	8	87	
#100	31	57	
#200	19	38	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	14.3
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-4581-6	Supplier:	-
Client:	Ethos	Sample Date:	9/26/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/4/2023
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-166 @ 60.0 - 61.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	1	99	
#8	1	98	
#10	1	98	
#16	1	97	
#30	2	95	
#40	1	94	
#50	1	93	
#100	6	87	
#200	14	73	

Liquid Limit (AASHTO T-89)	32
Plastic Limit (AASHTO T-90)	20
Plasticity Index (AASHTO T-90)	12
Moisture Content (AASHTO T-265)	21.5
USCS Soil Classification	CL

Group Name (ASTM D2487)
Lean CLAY with sand

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-4581-8	Supplier:	-
Client:	Ethos	Sample Date:	9/26/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/4/2023
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-166 @ 72.0 - 73.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	6	94	
1/2"	2	92	
3/8"	2	90	
1/4"	3	87	
#4	1	85	
#8	4	81	
#10	1	80	
#16	4	76	
#30	14	62	
#40	15	47	
#50	20	27	
#100	14	13	
#200	6	7.1	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	14.3
USCS Soil Classification	SP-SM

Group Name (ASTM D2487)
Poorly graded SAND with silt

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5841-3	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	12/21/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-167 @ 25.0 - 26.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	2	98	
#40	3	95	
#50	8	87	
#100	32	54	
#200	23	31	

Liquid Limit (AASHTO T-89)	31
Plastic Limit (AASHTO T-90)	18
Plasticity Index (AASHTO T-90)	13
Moisture Content (AASHTO T-265)	13.1
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5841-4	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	12/19/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-167 @ 35.0 - 36.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"			
3"			
2 1/2"			
2"			
1 1/2"			
1"			
3/4"			
1/2"			
3/8"			
1/4"			
#4			
#8			
#10			
#16			
#30			
#40			
#50			
#100			
#200			

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	
Moisture Content (AASHTO T-265)	17.6
USCS Soil Classification	

Group Name (ASTM D2487)

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5841-6	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	12/21/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-167 @ 60.0 - 61.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	5	95	
3/4"	0	95	
1/2"	7	88	
3/8"	1	87	
1/4"	3	84	
#4	2	82	
#8	3	79	
#10	1	78	
#16	2	75	
#30	2	73	
#40	1	72	
#50	1	72	
#100	2	69	
#200	6	63	

Liquid Limit (AASHTO T-89)	36
Plastic Limit (AASHTO T-90)	19
Plasticity Index (AASHTO T-90)	17
Moisture Content (AASHTO T-265)	24.1
USCS Soil Classification	CL

Group Name (ASTM D2487)
Sandy lean CLAY with gravel

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5841-7	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	12/21/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-168 @ 0.0 - 5.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	5	95	
1"	5	90	
3/4"	2	89	
1/2"	4	85	
3/8"	2	83	
1/4"	4	79	
#4	3	77	
#8	7	69	
#10	2	67	
#16	8	60	
#30	11	49	
#40	5	44	
#50	6	38	
#100	8	30	
#200	6	25	

Liquid Limit (AASHTO T-89)	22
Plastic Limit (AASHTO T-90)	16
Plasticity Index (AASHTO T-90)	6
Moisture Content (AASHTO T-265)	1.6
USCS Soil Classification	SC-SM

Group Name (ASTM D2487)
Silty, clayey SAND with gravel

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5841-8	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	12/21/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-168 @ 30.0 - 31.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	1	99	
#40	1	98	
#50	4	95	
#100	29	66	
#200	26	40	

Liquid Limit (AASHTO T-89)	34
Plastic Limit (AASHTO T-90)	18
Plasticity Index (AASHTO T-90)	16
Moisture Content (AASHTO T-265)	21.8
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil

JOB NO: 17-2023-4239
WORK ORDER NO: 35
DATE ASSIGNED: 12/22/23

MECHANICAL SIEVE ANALYSIS (ASTM C136/C117) PLASTICITY INDEX (ASTM D4318) GROUP SYMBOL, USCS (ASTM D2487)

PERCENT PASSING BY WEIGHT

				Silt or	SAND								GRAVEL									COBBLES	
				Clay	Fine			Medium			Coarse		Fine				Coarse						
Location & Depth	USCS	LL	PI	#200	#100	#50	#40	#30	#16	#10	#8	#4	1/4"	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	3"	6"	Lab #
B-167 (10.0-11.0')	SP-SM	NV	NP	11	29	56	66	73	84	89	90	95	96	98	99	100	100	100	100	100	100	100	23-2265-01
B-188 (45.0-46.0')	SM	NV	NP	17	23	38	56	75	93	96	97	98	98	99	100	100	100	100	100	100	100	100	23-2265-02
B-197 (10.0-11.0')	SC	27	10	44	51	60	64	68	76	81	82	86	88	91	93	100	100	100	100	100	100	100	23-2265-03

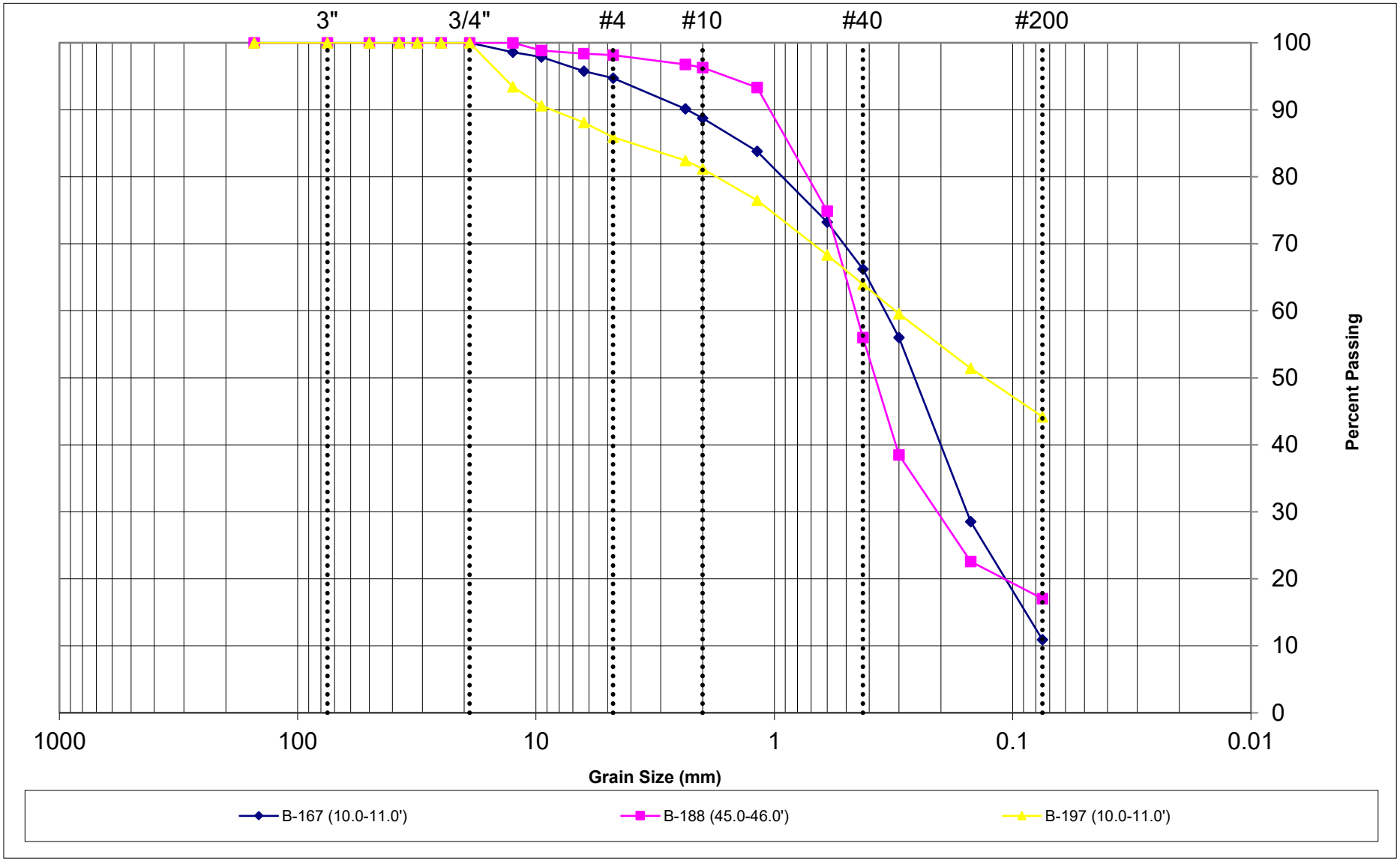
WSP USA
3630 E Wier Ave.
Phoenix, AZ 85040

REVIEWED BY

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil

JOB NO: 17-2023-4239
WORK ORDER NO: 35
DATE ASSIGNED: 12/22/23

MECHANICAL SIEVE ANALYSIS GRAPHS



ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5842-1	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	12/22/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-169 @ 3.0 - 4.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	46	54	
3/4"	7	47	
1/2"	11	36	
3/8"	5	31	
1/4"	4	28	
#4	2	25	
#8	4	22	
#10	1	21	
#16	2	18	
#30	2	16	
#40	1	15	
#50	1	14	
#100	2	12	
#200	2	10	

Liquid Limit (AASHTO T-89)	40
Plastic Limit (AASHTO T-90)	22
Plasticity Index (AASHTO T-90)	18
Moisture Content (AASHTO T-265)	7.7
USCS Soil Classification	GP-GC

Group Name (ASTM D2487)
Poorly graded GRAVEL with clay and sand

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5842-2	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	12/21/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-169 @ 25.0 - 25.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	1	99	
1/4"	1	99	
#4	1	98	
#8	4	93	
#10	2	92	
#16	11	81	
#30	22	59	
#40	12	47	
#50	13	33	
#100	14	20	
#200	7	13	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	1.8
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5842-3	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	12/22/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-169 @ 35.0 - 36.3	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"			
3"			
2 1/2"			
2"			
1 1/2"			
1"			
3/4"			
1/2"			
3/8"			
1/4"			
#4			
#8			
#10			
#16			
#30			
#40			
#50			
#100			
#200			

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	
Moisture Content (AASHTO T-265)	15.4
USCS Soil Classification	

Group Name (ASTM D2487)

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5842-4	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	12/22/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-170 @ 0.0 - 5.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	1	99	
3/8"	1	98	
1/4"	2	96	
#4	2	94	
#8	8	86	
#10	2	83	
#16	11	72	
#30	13	59	
#40	6	53	
#50	8	45	
#100	11	34	
#200	7	26	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	1.2
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5842-6	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	12/21/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-170 @ 15.0 - 16.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"			
3"			
2 1/2"			
2"			
1 1/2"			
1"			
3/4"			
1/2"			
3/8"			
1/4"			
#4			
#8			
#10			
#16			
#30			
#40			
#50			
#100			
#200			

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	
Moisture Content (AASHTO T-265)	1.5
USCS Soil Classification	

Group Name (ASTM D2487)

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5842-7	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	12/22/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-170 @ 25.0 - 26.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	4	96	
1/2"	10	86	
3/8"	0	86	
1/4"	5	81	
#4	2	78	
#8	5	73	
#10	1	71	
#16	3	68	
#30	3	65	
#40	1	64	
#50	2	62	
#100	4	58	
#200	4	54	

Liquid Limit (AASHTO T-89)	64
Plastic Limit (AASHTO T-90)	22
Plasticity Index (AASHTO T-90)	42
Moisture Content (AASHTO T-265)	27.6
USCS Soil Classification	CH

Group Name (ASTM D2487)
Sandy fat CLAY with gravel

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5843-1	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	12/22/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-171 @ 0.0 - 3.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	1	99	
1/4"	2	97	
#4	1	96	
#8	5	91	
#10	2	90	
#16	10	79	
#30	14	66	
#40	6	60	
#50	7	53	
#100	9	43	
#200	7	37	

Liquid Limit (AASHTO T-89)	20
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	3
Moisture Content (AASHTO T-265)	3.5
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5843-4	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	12/22/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-171 @ 25.0 - 26.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	4	96	
1/2"	4	93	
3/8"	2	91	
1/4"	4	87	
#4	1	86	
#8	4	83	
#10	1	82	
#16	2	80	
#30	2	79	
#40	1	78	
#50	2	76	
#100	6	70	
#200	10	60	

Liquid Limit (AASHTO T-89)	52
Plastic Limit (AASHTO T-90)	21
Plasticity Index (AASHTO T-90)	31
Moisture Content (AASHTO T-265)	23.4
USCS Soil Classification	CH

Group Name (ASTM D2487)
Sandy fat CLAY

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5843-5	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	12/22/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-171 @ 45.0 - 46.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	1	99	
#8	0	99	
#10	0	99	
#16	1	98	
#30	5	93	
#40	5	88	
#50	9	80	
#100	15	65	
#200	12	53	

Liquid Limit (AASHTO T-89)	38
Plastic Limit (AASHTO T-90)	19
Plasticity Index (AASHTO T-90)	19
Moisture Content (AASHTO T-265)	24.0
USCS Soil Classification	CL

Group Name (ASTM D2487)
Sandy lean CLAY

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5407-1	Supplier:	-
Client:	Ethos	Sample Date:	11/6/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	11/21/2023
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-172 @ 10.0 - 11.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	1	99	
#4	1	99	
#8	1	98	
#10	0	98	
#16	2	96	
#30	5	91	
#40	5	87	
#50	10	77	
#100	34	43	
#200	19	24	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	3.7
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5407-2	Supplier:	-
Client:	Ethos	Sample Date:	11/6/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	11/20/2023
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-172 @ 25.0 - 26.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	1	99	
#40	2	97	
#50	4	92	
#100	10	82	
#200	11	71	

Liquid Limit (AASHTO T-89)	45
Plastic Limit (AASHTO T-90)	21
Plasticity Index (AASHTO T-90)	24
Moisture Content (AASHTO T-265)	24.8
USCS Soil Classification	CL

Group Name (ASTM D2487)
Lean CLAY with sand

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5407-6	Supplier:	-
Client:	Ethos	Sample Date:	11/6/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	11/20/2023
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-172 @ 56.5 - 58.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	1	99	
#4	2	98	
#8	2	96	
#10	1	95	
#16	4	91	
#30	12	78	
#40	14	64	
#50	16	48	
#100	22	27	
#200	6	21	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	8.9
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5407-8	Supplier:	-
Client:	Ethos	Sample Date:	11/6/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	11/20/2023
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-172 @ 75.0 - 76.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	2	98	
#8	1	98	
#10	1	97	
#16	5	92	
#30	25	66	
#40	14	52	
#50	11	42	
#100	8	34	
#200	5	29	

Liquid Limit (AASHTO T-89)	41
Plastic Limit (AASHTO T-90)	18
Plasticity Index (AASHTO T-90)	23
Moisture Content (AASHTO T-265)	0.4
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil

JOB NO: 17-2023-4239
WORK ORDER NO: 22
DATE ASSIGNED: 11/17/23

MECHANICAL SIEVE ANALYSIS (ASTM C136/C117) PLASTICITY INDEX (ASTM D4318)
GROUP SYMBOL, USCS (ASTM D2487)

PERCENT PASSING BY WEIGHT

				Silt or	SAND								GRAVEL									COBBLES	
				Clay	Fine			Medium			Coarse		Fine				Coarse						
Location & Depth	USCS	LL	PI	#200	#100	#50	#40	#30	#16	#10	#8	#4	1/4"	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	3"	6"	Lab #
B-172 (40.0-41.0')	SM	NV	NP	25	33	55	72	84	94	97	97	99	99	99	100	100	100	100	100	100	100	100	23-2168-01
B-173 (20.0-21.0')	CL	42	17	78	85	89	90	91	93	93	93	94	94	94	94	95	100	100	100	100	100	100	23-2168-02

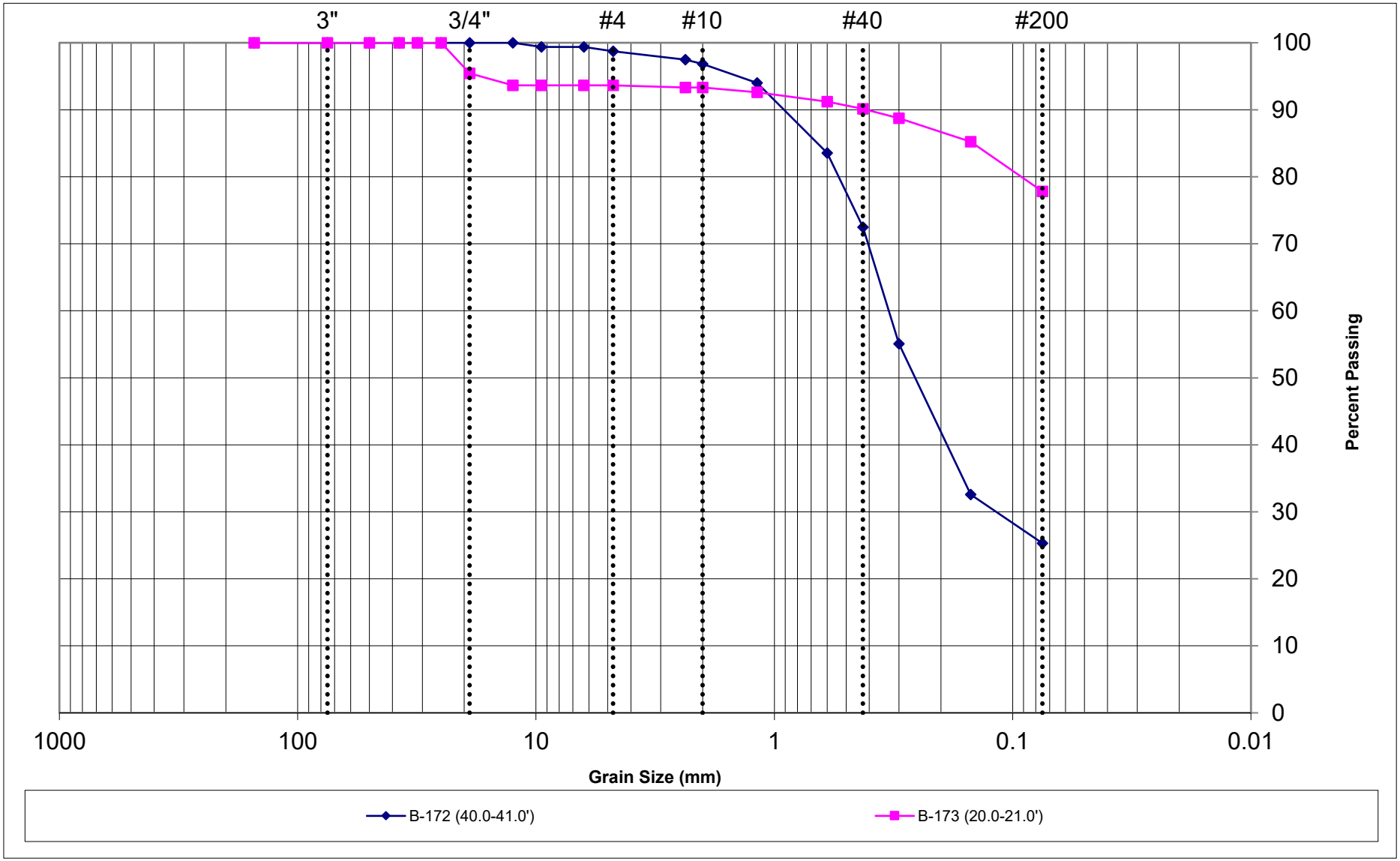
WSP USA
3630 E Wier Ave.
Phoenix, AZ 85040

REVIEWED BY

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil

JOB NO: 17-2023-4239
WORK ORDER NO: 22
DATE ASSIGNED: 11/17/23

MECHANICAL SIEVE ANALYSIS GRAPHS



ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5409-1	Supplier:	-
Client:	Ethos	Sample Date:	11/6/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	11/20/2023
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-173 @ 5.0 - 6.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	1	99	
#4	0	99	
#8	2	97	
#10	1	96	
#16	8	88	
#30	11	77	
#40	8	69	
#50	10	59	
#100	22	37	
#200	10	27	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	5.2
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5409-2	Supplier:	-
Client:	Ethos	Sample Date:	11/6/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	11/21/2023
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-173 @ 11.5 - 13.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	1	99	
1/2"	2	97	
3/8"	2	95	
1/4"	4	91	
#4	3	88	
#8	5	83	
#10	1	82	
#16	4	78	
#30	4	74	
#40	3	71	
#50	3	68	
#100	8	60	
#200	7	52	

Liquid Limit (AASHTO T-89)	34
Plastic Limit (AASHTO T-90)	22
Plasticity Index (AASHTO T-90)	12
Moisture Content (AASHTO T-265)	13.9
USCS Soil Classification	CL

Group Name (ASTM D2487)
Sandy lean CLAY

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5409-5	Supplier:	-
Client:	Ethos	Sample Date:	11/6/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	11/20/2023
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-173 @ 46.0 - 48.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	99	
#16	1	99	
#30	4	95	
#40	7	88	
#50	15	73	
#100	34	39	
#200	11	29	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	8.6
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5409-6	Supplier:	-
Client:	Ethos	Sample Date:	11/6/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	11/20/2023
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-173 @ 57.0 - 58.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	1	99	
3/8"	1	97	
1/4"	1	96	
#4	1	95	
#8	1	94	
#10	0	94	
#16	3	91	
#30	14	77	
#40	9	68	
#50	11	57	
#100	12	45	
#200	7	38	

Liquid Limit (AASHTO T-89)	33
Plastic Limit (AASHTO T-90)	18
Plasticity Index (AASHTO T-90)	15
Moisture Content (AASHTO T-265)	14.5
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5409-9	Supplier:	-
Client:	Ethos	Sample Date:	11/6/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	11/20/2023
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-173 @ 80.5 - 82.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	7	93	
3/4"	2	90	
1/2"	5	85	
3/8"	5	81	
1/4"	11	70	
#4	6	64	
#8	10	53	
#10	3	51	
#16	9	41	
#30	10	32	
#40	4	28	
#50	3	25	
#100	4	22	
#200	2	19	

Liquid Limit (AASHTO T-89)	37
Plastic Limit (AASHTO T-90)	19
Plasticity Index (AASHTO T-90)	18
Moisture Content (AASHTO T-265)	1.0
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND with gravel

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5409-1	Supplier:	-
Client:	Ethos	Sample Date:	11/6/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	11/20/2023
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-174 @ 1.0 - 2.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	2	98	
#40	1	97	
#50	3	94	
#100	12	82	
#200	17	65	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	3.1
USCS Soil Classification	ML

Group Name (ASTM D2487)
Sandy SILT

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5409-4	Supplier:	-
Client:	Ethos	Sample Date:	11/6/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	11/20/2023
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-174 @ 25.0 - 26.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	7	93	
1/2"	9	84	
3/8"	1	83	
1/4"	3	80	
#4	1	79	
#8	4	75	
#10	1	74	
#16	2	72	
#30	3	69	
#40	2	67	
#50	5	62	
#100	11	51	
#200	8	43	

Liquid Limit (AASHTO T-89)	33
Plastic Limit (AASHTO T-90)	20
Plasticity Index (AASHTO T-90)	13
Moisture Content (AASHTO T-265)	11.4
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND with gravel

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5409-6	Supplier:	-
Client:	Ethos	Sample Date:	11/6/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	11/20/2023
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-174 @ 60.0 - 61.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	13	87	
1/2"	8	79	
3/8"	16	64	
1/4"	6	57	
#4	4	54	
#8	7	46	
#10	2	44	
#16	11	33	
#30	13	20	
#40	3	17	
#50	2	15	
#100	5	10	
#200	3	7.6	

Liquid Limit (AASHTO T-89)	36
Plastic Limit (AASHTO T-90)	20
Plasticity Index (AASHTO T-90)	16
Moisture Content (AASHTO T-265)	9.2
USCS Soil Classification	GP-GC

Group Name (ASTM D2487)
Poorly graded GRAVEL with clay and sand

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5409-7	Supplier:	-
Client:	Ethos	Sample Date:	11/6/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	11/20/2023
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-174 @ 75.0 - 76.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	1	99	
3/8"	2	97	
1/4"	5	92	
#4	4	88	
#8	7	81	
#10	2	79	
#16	9	70	
#30	16	54	
#40	6	48	
#50	5	43	
#100	4	39	
#200	3	36	

Liquid Limit (AASHTO T-89)	39
Plastic Limit (AASHTO T-90)	19
Plasticity Index (AASHTO T-90)	20
Moisture Content (AASHTO T-265)	17.8
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil

JOB NO: 17-2023-4239
WORK ORDER NO: 27
DATE ASSIGNED: 11/29/23

MECHANICAL SIEVE ANALYSIS (ASTM C136/C117) PLASTICITY INDEX (ASTM D4318) GROUP SYMBOL, USCS (ASTM D2487)

PERCENT PASSING BY WEIGHT

				Silt or	SAND								GRAVEL									COBBLES	
				Clay	Fine			Medium			Coarse		Fine				Coarse						
Location & Depth	USCS	LL	PI	#200	#100	#50	#40	#30	#16	#10	#8	#4	1/4"	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	3"	6"	Lab #
B-174 (10.0-11.0')	ML	NV	NP	57	67	78	82	86	93	96	97	100	100	100	100	100	100	100	100	100	100	100	23-2189-01
B-174 (40.0-41.0')	SP-SM	NV	NP	9.1	23	60	77	89	97	98	99	99	99	100	100	100	100	100	100	100	100	100	23-2189-02

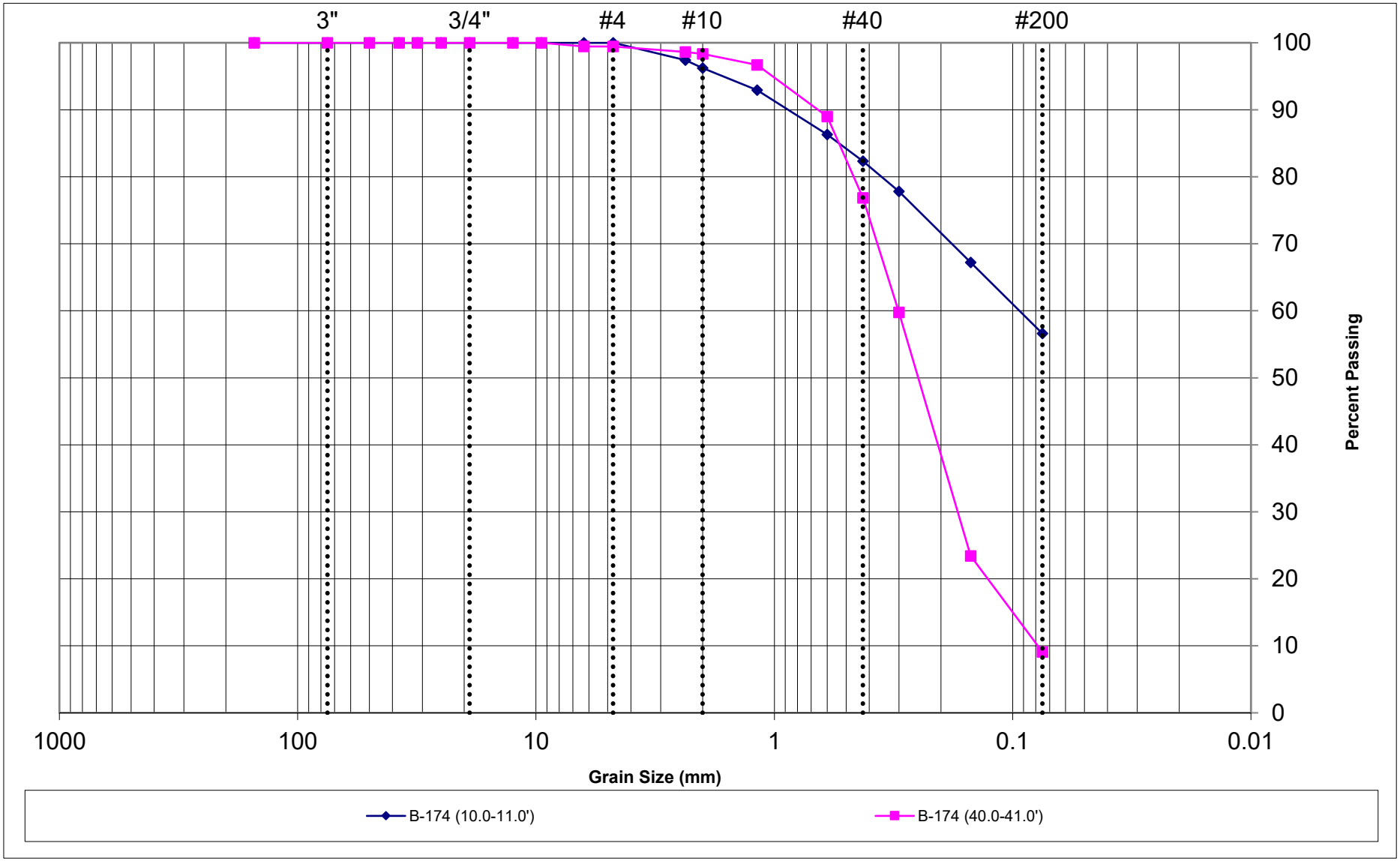
WSP USA
3630 E Wier Ave.
Phoenix, AZ 85040

REVIEWED BY

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil

JOB NO: 17-2023-4239
WORK ORDER NO: 27
DATE ASSIGNED: 11/29/23

MECHANICAL SIEVE ANALYSIS GRAPHS



ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-4760-2	Supplier:	-
Client:	Ethos	Sample Date:	10/2/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/26/2023
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B - 175 @ 20.0 - 21.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	5	95	
1/2"	1	94	
3/8"	1	94	
1/4"	4	90	
#4	2	88	
#8	7	81	
#10	2	79	
#16	11	68	
#30	18	50	
#40	10	40	
#50	11	29	
#100	11	18	
#200	5	13	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	1.8
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-4760-3	Supplier:	-
Client:	Ethos	Sample Date:	10/2/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/26/2023
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B - 175 @ 23.5 - 25.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	2	98	
3/4"	2	96	
1/2"	2	93	
3/8"	4	89	
1/4"	7	83	
#4	9	74	
#8	3	70	
#10	1	70	
#16	3	67	
#30	4	63	
#40	2	60	
#50	2	58	
#100	7	52	
#200	12	40	

Liquid Limit (AASHTO T-89)	31
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	14
Moisture Content (AASHTO T-265)	9.1
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND with gravel

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-4760-4	Supplier:	-
Client:	Ethos	Sample Date:	10/2/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/26/2023
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B - 175 @ 45.0 - 46.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	1	99	
#40	1	98	
#50	3	94	
#100	8	86	
#200	12	75	

Liquid Limit (AASHTO T-89)	36
Plastic Limit (AASHTO T-90)	16
Plasticity Index (AASHTO T-90)	20
Moisture Content (AASHTO T-265)	23.6
USCS Soil Classification	CL

Group Name (ASTM D2487)
Lean CLAY with sand

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-4760-5	Supplier:	-
Client:	Ethos	Sample Date:	10/2/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/26/2023
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B - 175 @ 83.0 - 84.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	5	95	
3/4"	4	91	
1/2"	1	90	
3/8"	3	88	
1/4"	6	82	
#4	6	76	
#8	7	69	
#10	2	68	
#16	5	63	
#30	7	55	
#40	3	52	
#50	3	49	
#100	3	46	
#200	4	43	

Liquid Limit (AASHTO T-89)	41
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	24
Moisture Content (AASHTO T-265)	15.8
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND with gravel

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-4761-1	Supplier:	-
Client:	Ethos	Sample Date:	10/2/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/7/2023
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B - 176 @ 0.0 - 5.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	1	99	
1/4"	0	99	
#4	0	99	
#8	1	98	
#10	1	97	
#16	3	95	
#30	4	91	
#40	2	88	
#50	3	86	
#100	4	82	
#200	5	77	

Liquid Limit (AASHTO T-89)	24
Plastic Limit (AASHTO T-90)	18
Plasticity Index (AASHTO T-90)	6
Moisture Content (AASHTO T-265)	3.5
USCS Soil Classification	CL-ML

Group Name (ASTM D2487)
SILTY CLAY with sand

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-4761-3	Supplier:	-
Client:	Ethos	Sample Date:	10/2/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/7/2023
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B - 176 @ 45.0 - 46.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	0	100	
#40	1	99	
#50	2	97	
#100	6	91	
#200	7	84	

Liquid Limit (AASHTO T-89)	58
Plastic Limit (AASHTO T-90)	23
Plasticity Index (AASHTO T-90)	35
Moisture Content (AASHTO T-265)	16.7
USCS Soil Classification	CH

Group Name (ASTM D2487)
Fat CLAY with sand

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-4761-6	Supplier:	-
Client:	Ethos	Sample Date:	10/2/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/7/2023
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B - 176 @ 80.0 - 81.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	4	96	
3/4"	6	90	
1/2"	13	77	
3/8"	6	71	
1/4"	8	63	
#4	4	58	
#8	9	50	
#10	2	48	
#16	9	38	
#30	11	27	
#40	5	23	
#50	3	20	
#100	4	16	
#200	3	13	

Liquid Limit (AASHTO T-89)	42
Plastic Limit (AASHTO T-90)	19
Plasticity Index (AASHTO T-90)	23
Moisture Content (AASHTO T-265)	14.4
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND with gravel

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil

JOB NO: 17-2023-4239
WORK ORDER NO: 53
DATE ASSIGNED: 2/9/24

MECHANICAL SIEVE ANALYSIS (ASTM C136/C117) PLASTICITY INDEX (ASTM D4318)
GROUP SYMBOL, USCS (ASTM D2487)

PERCENT PASSING BY WEIGHT

				Silt or	SAND								GRAVEL									COBBLES	
				Clay	Fine			Medium			Coarse		Fine				Coarse						
Location & Depth	USCS	LL	PI	#200	#100	#50	#40	#30	#16	#10	#8	#4	1/4"	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	3"	6"	Lab #
B-179 (10.0-11.0')	SP-SM	NV	NP	6.8	9	13	18	25	48	60	65	80	86	93	94	100	100	100	100	100	100	100	24-2446-01
B-176 (30.0-31.0')	SC	40	18	49	65	83	91	96	99	100	100	100	100	100	100	100	100	100	100	100	100	100	24-2446-02

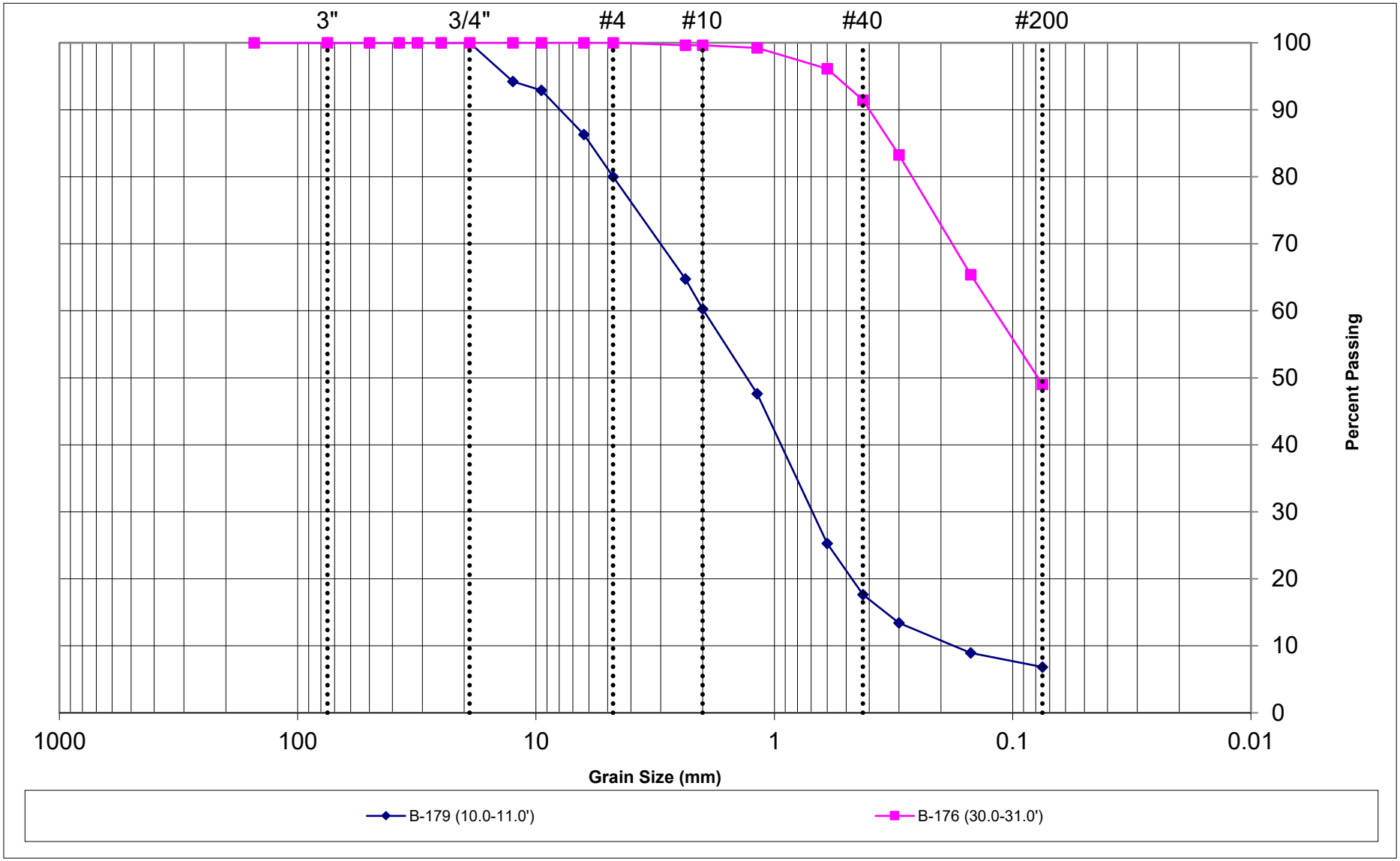
WSP USA
3630 E Wier Ave.
Phoenix, AZ 85040

REVIEWED BY

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil

JOB NO: 17-2023-4239
WORK ORDER NO: 53
DATE ASSIGNED: 2/9/24

MECHANICAL SIEVE ANALYSIS GRAPHS



ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5844-1	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	12/22/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-177@ 5.0-6.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	1	99	
#8	2	97	
#10	0	97	
#16	3	94	
#30	6	88	
#40	4	84	
#50	6	77	
#100	9	69	
#200	10	59	

Liquid Limit (AASHTO T-89)	28
Plastic Limit (AASHTO T-90)	19
Plasticity Index (AASHTO T-90)	9
Moisture Content (AASHTO T-265)	4.2
USCS Soil Classification	CL

Group Name (ASTM D2487)
Sandy lean CLAY

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5844-2	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	12/22/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-177 @ 15.0-16.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	4	96	
1/2"	2	94	
3/8"	2	92	
1/4"	2	90	
#4	1	89	
#8	4	85	
#10	2	83	
#16	8	75	
#30	23	51	
#40	12	39	
#50	12	26	
#100	13	14	
#200	5	8.3	

Liquid Limit (ASTM D4318)	
Plastic Limit (ASTM D4318)	
Plasticity Index (ASTM D4318)	NP
Moisture Content (ASTM D2216)	2.6
USCS Soil Classification	SP-SM

Group Name (ASTM D2487)
Poorly graded SAND with silt

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-4762-1	Supplier:	-
Client:	Ethos	Sample Date:	10/2/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/7/2023
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B - 178 @ 10.0 - 11.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	4	96	
1/4"	5	91	
#4	4	87	
#8	12	75	
#10	3	72	
#16	12	60	
#30	23	36	
#40	13	24	
#50	11	12	
#100	8	5	
#200	2	3.0	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	1.8
USCS Soil Classification	SP

Group Name (ASTM D2487)
Poorly graded SAND

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-4762-2	Supplier:	-
Client:	Ethos	Sample Date:	10/2/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/7/2023
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B - 178 @ 30.0 - 31.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	4	96	
#10	1	95	
#16	3	92	
#30	5	87	
#40	4	83	
#50	5	78	
#100	10	69	
#200	12	57	

Liquid Limit (AASHTO T-89)	69
Plastic Limit (AASHTO T-90)	30
Plasticity Index (AASHTO T-90)	39
Moisture Content (AASHTO T-265)	32.1
USCS Soil Classification	CH

Group Name (ASTM D2487)
Sandy fat CLAY

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-4762-6	Supplier:	-
Client:	Ethos	Sample Date:	10/2/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/7/2023
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B - 178 @ 65.0 - 66.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	5	95	
1/2"	2	93	
3/8"	2	91	
1/4"	4	87	
#4	2	85	
#8	8	77	
#10	2	75	
#16	13	62	
#30	25	37	
#40	9	29	
#50	5	24	
#100	7	16	
#200	5	11	

Liquid Limit (AASHTO T-89)	41
Plastic Limit (AASHTO T-90)	22
Plasticity Index (AASHTO T-90)	19
Moisture Content (AASHTO T-265)	13.0
USCS Soil Classification	SP-SC

Group Name (ASTM D2487)
Poorly graded SAND with clay and gravel

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-4763-1	Supplier:	-
Client:	Ethos	Sample Date:	10/2/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/7/2023
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B - 179 @ 0.0 - 1.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	2	98	
3/8"	1	98	
1/4"	1	96	
#4	1	95	
#8	3	92	
#10	2	91	
#16	9	81	
#30	10	71	
#40	4	67	
#50	5	61	
#100	7	54	
#200	6	49	

Liquid Limit (AASHTO T-89)	25
Plastic Limit (AASHTO T-90)	16
Plasticity Index (AASHTO T-90)	9
Moisture Content (AASHTO T-265)	4.3
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-4763-4	Supplier:	-
Client:	Ethos	Sample Date:	10/2/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/7/2023
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B - 179 @ 35.0 - 36.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	1	99	
3/8"	0	99	
1/4"	0	99	
#4	0	99	
#8	0	99	
#10	0	99	
#16	0	99	
#30	2	97	
#40	3	94	
#50	5	89	
#100	12	76	
#200	11	66	

Liquid Limit (AASHTO T-89)	35
Plastic Limit (AASHTO T-90)	20
Plasticity Index (AASHTO T-90)	15
Moisture Content (AASHTO T-265)	20.3
USCS Soil Classification	CL

Group Name (ASTM D2487)
Sandy lean CLAY

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-4763-5	Supplier:	-
Client:	Ethos	Sample Date:	10/2/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/7/2023
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B - 179 @ 45.0 - 46.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	1	99	
#40	1	98	
#50	4	94	
#100	27	67	
#200	21	46	

Liquid Limit (AASHTO T-89)	37
Plastic Limit (AASHTO T-90)	19
Plasticity Index (AASHTO T-90)	18
Moisture Content (AASHTO T-265)	19.2
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-4763-6	Supplier:	-
Client:	Ethos	Sample Date:	10/2/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/7/2023
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B - 179 @ 75.0 - 76.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	6	94	
1/2"	5	90	
3/8"	6	84	
1/4"	5	79	
#4	6	73	
#8	18	55	
#10	5	50	
#16	14	36	
#30	10	26	
#40	3	23	
#50	5	18	
#100	8	10	
#200	5	5.0	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	13.7
USCS Soil Classification	SP

Group Name (ASTM D2487)
Poorly graded SAND with gravel

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Coils
ACS Lab #	23-4764-1	Supplier:	-
Client:	Ethos	Sample Date:	10/2/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/27/2023
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B - 180 @ 0.0 - 1.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	99	
#4	0	99	
#8	1	98	
#10	0	98	
#16	3	94	
#30	6	88	
#40	3	85	
#50	4	81	
#100	5	76	
#200	6	69	

Liquid Limit (AASHTO T-89)	26
Plastic Limit (AASHTO T-90)	16
Plasticity Index (AASHTO T-90)	10
Moisture Content (AASHTO T-265)	2.5
USCS Soil Classification	CL

Group Name (ASTM D2487)
Sandy lean CLAY

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Coils
ACS Lab #	23-4764-2	Supplier:	-
Client:	Ethos	Sample Date:	10/2/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/27/2023
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B - 180 @ 16.5 - 18.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	1	99	
1/2"	0	98	
3/8"	1	98	
1/4"	1	97	
#4	0	97	
#8	2	94	
#10	1	94	
#16	3	91	
#30	4	87	
#40	4	83	
#50	4	79	
#100	10	69	
#200	9	61	

Liquid Limit (AASHTO T-89)	30
Plastic Limit (AASHTO T-90)	14
Plasticity Index (AASHTO T-90)	16
Moisture Content (AASHTO T-265)	4.1
USCS Soil Classification	CL

Group Name (ASTM D2487)
Sandy lean CLAY

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Coils
ACS Lab #	23-4764-3	Supplier:	-
Client:	Ethos	Sample Date:	10/2/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/27/2023
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B - 180 @ 25.0 - 26.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	3	97	
3/8"	0	97	
1/4"	0	96	
#4	0	96	
#8	1	95	
#10	0	95	
#16	2	93	
#30	10	82	
#40	14	69	
#50	12	56	
#100	14	43	
#200	7	35	

Liquid Limit (AASHTO T-89)	33
Plastic Limit (AASHTO T-90)	14
Plasticity Index (AASHTO T-90)	19
Moisture Content (AASHTO T-265)	11.3
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Coils
ACS Lab #	23-4764-4	Supplier:	-
Client:	Ethos	Sample Date:	10/2/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/27/2023
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B - 180 @ 55.0 - 56.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	8	92	
3/4"	13	78	
1/2"	10	69	
3/8"	6	63	
1/4"	9	54	
#4	4	50	
#8	9	42	
#10	2	40	
#16	6	33	
#30	8	25	
#40	4	21	
#50	3	18	
#100	4	14	
#200	3	11	

Liquid Limit (AASHTO T-89)	30
Plastic Limit (AASHTO T-90)	18
Plasticity Index (AASHTO T-90)	12
Moisture Content (AASHTO T-265)	7.5
USCS Soil Classification	GP-GC

Group Name (ASTM D2487)
Poorly graded GRAVEL with clay and sand

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-4765-1	Supplier:	-
Client:	Ethos	Sample Date:	10/2/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/8/2023
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B - 181 @ 0.0 - 5.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	1	99	
3/8"	0	99	
1/4"	1	98	
#4	0	97	
#8	2	95	
#10	1	95	
#16	5	90	
#30	8	82	
#40	6	76	
#50	5	71	
#100	10	60	
#200	7	53	

Liquid Limit (AASHTO T-89)	27
Plastic Limit (AASHTO T-90)	16
Plasticity Index (AASHTO T-90)	11
Moisture Content (AASHTO T-265)	5.1
USCS Soil Classification	CL

Group Name (ASTM D2487)
Sandy lean CLAY

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-4765-3	Supplier:	-
Client:	Ethos	Sample Date:	10/2/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/8/2023
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B - 181 @ 15.0 - 15.9	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	6	94	
1/2"	9	85	
3/8"	4	81	
1/4"	5	76	
#4	4	73	
#8	7	66	
#10	2	65	
#16	5	59	
#30	7	52	
#40	4	48	
#50	5	43	
#100	10	34	
#200	7	26	

Liquid Limit (AASHTO T-89)	35
Plastic Limit (AASHTO T-90)	21
Plasticity Index (AASHTO T-90)	14
Moisture Content (AASHTO T-265)	6.9
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND with gravel

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-4765-7	Supplier:	-
Client:	Ethos	Sample Date:	10/2/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/8/2023
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B - 181 @ 55.0 - 56.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	5	95	
3/4"	5	90	
1/2"	4	86	
3/8"	6	79	
1/4"	11	69	
#4	7	62	
#8	9	53	
#10	2	51	
#16	6	45	
#30	8	37	
#40	6	31	
#50	6	25	
#100	7	18	
#200	4	14	

Liquid Limit (AASHTO T-89)	28
Plastic Limit (AASHTO T-90)	20
Plasticity Index (AASHTO T-90)	8
Moisture Content (AASHTO T-265)	8.3
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND with gravel

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-4765-8	Supplier:	-
Client:	Ethos	Sample Date:	10/2/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/8/2023
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B - 181 @ 65.0 - 66.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	1	99	
3/8"	3	96	
1/4"	4	92	
#4	2	90	
#8	6	84	
#10	2	82	
#16	10	72	
#30	28	44	
#40	13	31	
#50	7	24	
#100	10	14	
#200	7	6.5	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	18.7
USCS Soil Classification	SP-SM

Group Name (ASTM D2487)
Poorly graded SAND with silt

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil

JOB NO: 17-2023-4239
WORK ORDER NO: 10
DATE ASSIGNED: 10/13/23

MECHANICAL SIEVE ANALYSIS (ASTM C136/C117) PLASTICITY INDEX (ASTM D4318)
GROUP SYMBOL, USCS (ASTM D2487)

PERCENT PASSING BY WEIGHT

				Silt or	SAND								GRAVEL									COBBLES	
				Clay	Fine			Medium			Coarse		Fine				Coarse						
Location & Depth	USCS	LL	PI	#200	#100	#50	#40	#30	#16	#10	#8	#4	1/4"	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	3"	6"	Lab #
B-181 (40.0-41.0')	SM	NV	NP	29	38	57	68	80	93	96	97	98	98	99	100	100	100	100	100	100	100	100	23-2029-01
B-183 (10.0-11.0')	SM	NV	NP	15	20	28	37	49	80	92	94	98	99	100	100	100	100	100	100	100	100	100	23-2029-02
B-184 (25.0-26.0')	GC	31	12	26	33	41	46	51	55	57	57	59	61	63	65	68	70	70	70	100	100	100	23-2029-03

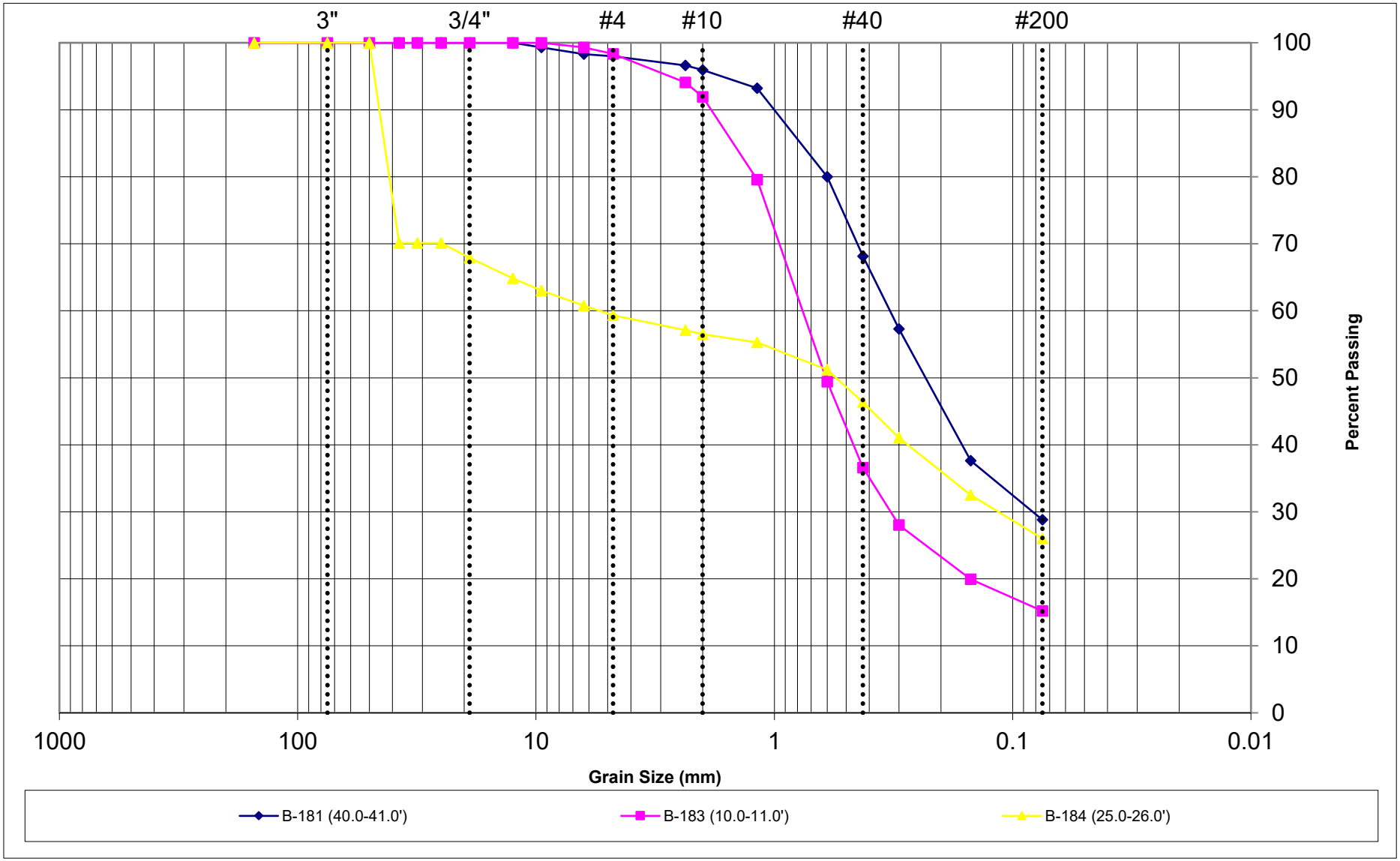
WSP USA
3630 E Wier Ave.
Phoenix, AZ 85040

REVIEWED BY

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil

JOB NO: 17-2023-4239
WORK ORDER NO: 10
DATE ASSIGNED: 10/13/23

MECHANICAL SIEVE ANALYSIS GRAPHS



ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-4766-2	Supplier:	-
Client:	Ethos	Sample Date:	10/25/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/31/2023
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-182 @ 10.0 - 11.1	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	3	97	
#4	2	95	
#8	6	90	
#10	2	87	
#16	10	77	
#30	14	63	
#40	6	57	
#50	6	51	
#100	8	43	
#200	6	37	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	2.5
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-4766-3	Supplier:	-
Client:	Ethos	Sample Date:	10/25/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/31/2023
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-182 @ 25.0 - 26.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	4	96	
1/2"	20	76	
3/8"	7	69	
1/4"	7	62	
#4	4	58	
#8	8	50	
#10	1	49	
#16	4	45	
#30	3	41	
#40	1	40	
#50	3	37	
#100	5	32	
#200	4	29	

Liquid Limit (AASHTO T-89)	40
Plastic Limit (AASHTO T-90)	21
Plasticity Index (AASHTO T-90)	19
Moisture Content (AASHTO T-265)	13.3
USCS Soil Classification	GC

Group Name (ASTM D2487)
Clayey GRAVEL with sand

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-4766-4	Supplier:	-
Client:	Ethos	Sample Date:	10/25/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/31/2023
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B - 182 @ 35.0 - 36.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	0	100	
#40	0	100	
#50	1	99	
#100	3	95	
#200	7	88	

Liquid Limit (AASHTO T-89)	48
Plastic Limit (AASHTO T-90)	23
Plasticity Index (AASHTO T-90)	25
Moisture Content (AASHTO T-265)	26.6
USCS Soil Classification	CL

Group Name (ASTM D2487)
Lean CLAY

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-4766-5	Supplier:	-
Client:	Ethos	Sample Date:	10/25/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/31/2023
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B - 182 @ 50.0 - 51.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	99	
#16	2	98	
#30	8	89	
#40	11	79	
#50	28	51	
#100	33	18	
#200	7	11	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	4.5
USCS Soil Classification	SP-SM

Group Name (ASTM D2487)
Poorly graded SAND with silt

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-4767-1	Supplier:	-
Client:	Ethos	Sample Date:	10/2/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/8/2023
Project City	Goodyear	Tested By:	James Karl
Sample Location:	B - 183 @ 1.0 - 2.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	1	99	
#10	1	98	
#16	5	93	
#30	10	83	
#40	6	78	
#50	8	70	
#100	12	58	
#200	10	48	

Liquid Limit (AASHTO T-89)	21
Plastic Limit (AASHTO T-90)	13
Plasticity Index (AASHTO T-90)	8
Moisture Content (AASHTO T-265)	3.2
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-4767-3	Supplier:	-
Client:	Ethos	Sample Date:	10/2/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/8/2023
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B - 183 @ 20.0 - 20.3	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	4	96	
1/2"	9	86	
3/8"	5	81	
1/4"	10	71	
#4	4	67	
#8	8	59	
#10	2	57	
#16	3	53	
#30	5	49	
#40	2	46	
#50	5	42	
#100	7	35	
#200	8	27	

Liquid Limit (AASHTO T-89)	34
Plastic Limit (AASHTO T-90)	26
Plasticity Index (AASHTO T-90)	8
Moisture Content (AASHTO T-265)	10.8
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND with gravel

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-4767-4	Supplier:	-
Client:	Ethos	Sample Date:	10/2/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/8/2023
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B - 183 @ 35.0 - 36.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	0	100	
#40	1	99	
#50	1	98	
#100	2	96	
#200	6	89	

Liquid Limit (AASHTO T-89)	43
Plastic Limit (AASHTO T-90)	25
Plasticity Index (AASHTO T-90)	18
Moisture Content (AASHTO T-265)	25.0
USCS Soil Classification	CL

Group Name (ASTM D2487)
Lean CLAY

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-4767-6	Supplier:	-
Client:	Ethos	Sample Date:	10/2/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/8/2023
Project City	Goodyear	Tested By:	James Karl
Sample Location:	B - 183 @ 55.0 - 56.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	6	94	
3/4"	9	85	
1/2"	10	75	
3/8"	4	70	
1/4"	4	67	
#4	2	65	
#8	4	61	
#10	1	60	
#16	3	57	
#30	8	49	
#40	10	39	
#50	14	25	
#100	16	9	
#200	4	5.1	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	4.3
USCS Soil Classification	SP-SM

Group Name (ASTM D2487)
Poorly graded SAND with silt and gravel

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-4768-1	Supplier:	-
Client:	Ethos	Sample Date:	10/2/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/8/2023
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B - 184 @ 1.0 - 2.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	4	96	
#10	1	95	
#16	6	89	
#30	7	81	
#40	3	78	
#50	4	74	
#100	5	69	
#200	6	63	

Liquid Limit (AASHTO T-89)	24
Plastic Limit (AASHTO T-90)	16
Plasticity Index (AASHTO T-90)	8
Moisture Content (AASHTO T-265)	6.2
USCS Soil Classification	CL

Group Name (ASTM D2487)
Sandy lean CLAY

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-4768-5	Supplier:	-
Client:	Ethos	Sample Date:	10/2/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/8/2023
Project City	Goodyear	Tested By:	James Karl
Sample Location:	B - 184 @ 40.0 - 41.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	0	100	
#40	0	100	
#50	0	99	
#100	3	96	
#200	24	71	

Liquid Limit (AASHTO T-89)	30
Plastic Limit (AASHTO T-90)	23
Plasticity Index (AASHTO T-90)	7
Moisture Content (AASHTO T-265)	6.2
USCS Soil Classification	ML

Group Name (ASTM D2487)
SILT with sand

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-4768-7	Supplier:	-
Client:	Ethos	Sample Date:	10/2/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/9/2023
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B - 184 @ 65.0 - 66.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	4	96	
3/4"	2	94	
1/2"	4	91	
3/8"	5	86	
1/4"	10	76	
#4	6	69	
#8	8	61	
#10	2	59	
#16	8	50	
#30	9	41	
#40	5	36	
#50	7	29	
#100	8	21	
#200	6	16	

Liquid Limit (AASHTO T-89)	26
Plastic Limit (AASHTO T-90)	19
Plasticity Index (AASHTO T-90)	7
Moisture Content (AASHTO T-265)	14.2
USCS Soil Classification	SC-SM

Group Name (ASTM D2487)
Silty, clayey SAND with gravel

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-4769-1	Supplier:	-
Client:	Ethos	Sample Date:	10/2/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/9/2023
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B - 185 @ 18.0 - 19.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	5	95	
1/2"	5	91	
3/8"	2	88	
1/4"	5	83	
#4	4	79	
#8	4	75	
#10	1	75	
#16	2	72	
#30	3	69	
#40	3	66	
#50	4	63	
#100	9	54	
#200	10	45	

Liquid Limit (AASHTO T-89)	28
Plastic Limit (AASHTO T-90)	15
Plasticity Index (AASHTO T-90)	13
Moisture Content (AASHTO T-265)	7.5
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND with gravel

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-4769-3	Supplier:	-
Client:	Ethos	Sample Date:	10/2/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/17/2023
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B - 185 @ 31.0 - 32.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	6	94	
3/4"	6	88	
1/2"	7	81	
3/8"	4	78	
1/4"	6	72	
#4	5	67	
#8	6	62	
#10	3	59	
#16	3	56	
#30	2	54	
#40	0	54	
#50	1	53	
#100	3	50	
#200	4	46	

Liquid Limit (AASHTO T-89)	34
Plastic Limit (AASHTO T-90)	16
Plasticity Index (AASHTO T-90)	18
Moisture Content (AASHTO T-265)	8.8
USCS Soil Classification	GC

Group Name (ASTM D2487)
Clayey GRAVEL with sand

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-4769-7	Supplier:	-
Client:	Ethos	Sample Date:	10/2/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/17/2023
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B - 185 @ 72.0 - 73.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	4	96	
3/8"	2	95	
1/4"	3	91	
#4	2	90	
#8	3	86	
#10	1	85	
#16	4	82	
#30	12	69	
#40	11	58	
#50	15	43	
#100	15	28	
#200	5	23	

Liquid Limit (AASHTO T-89)	23
Plastic Limit (AASHTO T-90)	16
Plasticity Index (AASHTO T-90)	7
Moisture Content (AASHTO T-265)	0.8
USCS Soil Classification	SC-SM

Group Name (ASTM D2487)
Silty, clayey SAND

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

LABORATORY SERVICES REPORT

Report Number: 65201093.0011
Service Date: 11/14/23
Report Date: 11/14/23
Task:

Terracon
4685 S Ash Ave, Ste H-4
Tempe, AZ 85282-6767
480-897-8200

Client

ACS Services LLC
Attn: Dylan Ward
2235 W Broadway Rd
Mesa, AZ 85202-1003

Project

ACS On-Call Testing
In House - Terracon Tempe Lab
Tempe, AZ

Project No. 65201093

Material Description: Poorly graded gravel with clay and sand
Sample Location: ACS Project# 2201026
Lab Number: B-185 @ 55'-56'

Sieve Analysis ASTM C136/C117		
Sieve Size	Percent Passing	MAG Specs
5"	100	
4"	100	
3"	100	
2"	100	
1-1/2"	100	
1-1/4"	100	
1"	91	
3/4"	84	
1/2"	72	
3/8"	65	
1/4"	59	
#4	54	
#8	48	
#10	47	
#16	42	
#30	28	
#40	21	
#50	17	
#100	14	
#200	9.6	

Plasticity Index		
ASTM D4318		Specs
Liquid Limit	31	
Plastic Limit	21	
Plasticity Index	10	

Services:
Terracon Rep:
Reported To:
Contractor:

Report Distribution

(1) ACS Services LLC, Dylan Ward

Reviewed By: ____

The tests were performed in general accordance with applicable ASTM, AASHTO, or DOT test methods. This report is exclusively for the use of the client indicated above and shall not be reproduced except in full without the written consent of our company. Test results transmitted herein are only applicable to the actual samples tested at the location(s) referenced and are not necessarily indicative of the properties of other apparently similar or identical materials.

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-4770-1	Supplier:	-
Client:	Ethos	Sample Date:	10/2/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/17/2023
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B - 186 @ 8.5 - 9.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	10	90	
1"	4	85	
3/4"	1	85	
1/2"	1	83	
3/8"	2	81	
1/4"	3	78	
#4	2	76	
#8	3	73	
#10	1	72	
#16	2	71	
#30	2	68	
#40	2	67	
#50	2	64	
#100	12	52	
#200	17	36	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	5.9
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND with gravel

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-4770-4	Supplier:	-
Client:	Ethos	Sample Date:	10/2/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/17/2023
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B - 186 @ 35.0 - 36.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	1	98	
#40	1	97	
#50	2	95	
#100	5	90	
#200	10	80	

Liquid Limit (AASHTO T-89)	36
Plastic Limit (AASHTO T-90)	22
Plasticity Index (AASHTO T-90)	14
Moisture Content (AASHTO T-265)	1.9
USCS Soil Classification	CL

Group Name (ASTM D2487)
Lean CLAY with sand

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-4770-7	Supplier:	-
Client:	Ethos	Sample Date:	10/2/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/17/2023
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B - 186 @ 66.0 - 67.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	7	93	
1/2"	4	89	
3/8"	3	85	
1/4"	8	78	
#4	7	71	
#8	8	63	
#10	2	61	
#16	7	54	
#30	9	45	
#40	4	41	
#50	4	37	
#100	5	32	
#200	4	28	

Liquid Limit (AASHTO T-89)	34
Plastic Limit (AASHTO T-90)	20
Plasticity Index (AASHTO T-90)	14
Moisture Content (AASHTO T-265)	1.8
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND with gravel

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-4770-8	Supplier:	-
Client:	Ethos	Sample Date:	10/2/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/17/2023
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B - 186 @ 82.0 - 84.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	1	99	
1/2"	17	81	
3/8"	17	65	
1/4"	16	49	
#4	5	44	
#8	4	40	
#10	1	39	
#16	4	36	
#30	6	30	
#40	4	26	
#50	3	24	
#100	3	20	
#200	4	16	

Liquid Limit (AASHTO T-89)	37
Plastic Limit (AASHTO T-90)	20
Plasticity Index (AASHTO T-90)	17
Moisture Content (AASHTO T-265)	1.7
USCS Soil Classification	GC

Group Name (ASTM D2487)
Clayey GRAVEL with sand

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5845-1	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	12/22/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-187 @ 0.0 - 5.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	1	99	
#10	0	99	
#16	3	96	
#30	6	90	
#40	3	87	
#50	5	82	
#100	9	73	
#200	11	62	

Liquid Limit (AASHTO T-89)	21
Plastic Limit (AASHTO T-90)	16
Plasticity Index (AASHTO T-90)	5
Moisture Content (AASHTO T-265)	3.0
USCS Soil Classification	CL-ML

Group Name (ASTM D2487)
Sandy SILTY CLAY

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5845-2	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	12/22/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-187 @ 10.0 - 11.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	2	98	
1/4"	5	94	
#4	2	92	
#8	9	82	
#10	3	80	
#16	12	68	
#30	15	53	
#40	6	48	
#50	7	41	
#100	8	33	
#200	6	27	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	3.0
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5845-3	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	12/22/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-187 @ 25.0 - 26.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	2	98	
3/8"	0	97	
1/4"	0	97	
#4	0	97	
#8	3	95	
#10	1	94	
#16	1	93	
#30	1	92	
#40	1	91	
#50	4	87	
#100	31	56	
#200	34	22	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	7.6
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5845-5	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	12/22/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-187 @ 45.0 - 46.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	9	91	
3/8"	2	90	
1/4"	2	88	
#4	0	88	
#8	1	86	
#10	0	86	
#16	2	85	
#30	11	74	
#40	14	60	
#50	22	38	
#100	21	17	
#200	6	11	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	4.6
USCS Soil Classification	SP-SM

Group Name (ASTM D2487)
Poorly graded SAND with silt

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5845-7	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	12/22/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-187 @ 70.0 - 71.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	1	99	
#8	2	97	
#10	1	97	
#16	4	92	
#30	24	69	
#40	2	66	
#50	3	64	
#100	18	46	
#200	5	41	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	17.4
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5846-1	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	12/22/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-188 @ 1.0 - 2.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"			
3"			
2 1/2"			
2"			
1 1/2"			
1"			
3/4"			
1/2"			
3/8"			
1/4"			
#4			
#8			
#10			
#16			
#30			
#40			
#50			
#100			
#200			

Liquid Limit (ASTM D4318)	
Plastic Limit (ASTM D4318)	
Plasticity Index (ASTM D4318)	
Moisture Content (ASTM D2216)	7.2
USCS Soil Classification	

Group Name (ASTM D2487)

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5846-2	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	12/22/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-188 @ 5.0 - 6.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	2	98	
1/4"	0	98	
#4	2	97	
#8	4	92	
#10	1	92	
#16	8	84	
#30	10	73	
#40	4	69	
#50	5	64	
#100	9	55	
#200	9	47	

Liquid Limit (AASHTO T-89)	22
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	5
Moisture Content (AASHTO T-265)	3.3
USCS Soil Classification	SC-SM

Group Name (ASTM D2487)
Silty, clayey SAND

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5846-3	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	12/22/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-188 @ 15.0 - 16.3	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	3	97	
1/2"	4	94	
3/8"	3	91	
1/4"	5	85	
#4	5	80	
#8	12	69	
#10	3	65	
#16	16	49	
#30	13	36	
#40	4	33	
#50	5	28	
#100	6	22	
#200	5	16	

Liquid Limit (AASHTO T-89)	25
Plastic Limit (AASHTO T-90)	19
Plasticity Index (AASHTO T-90)	6
Moisture Content (AASHTO T-265)	3.7
USCS Soil Classification	SC-SM

Group Name (ASTM D2487)
Silty, clayey SAND with gravel

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5846-5	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	12/22/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-188 @ 60 .0 - 61.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	3	96	
#40	12	85	
#50	32	53	
#100	25	28	
#200	9	19	

Liquid Limit (AASHTO T-89)	31
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	14
Moisture Content (AASHTO T-265)	12.6
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5846-6	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	12/22/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-188 @ 80 .0 -81.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	2	98	
1/2"	7	91	
3/8"	2	89	
1/4"	4	85	
#4	3	82	
#8	5	77	
#10	2	76	
#16	5	70	
#30	6	64	
#40	3	61	
#50	4	58	
#100	5	53	
#200	4	49	

Liquid Limit (AASHTO T-89)	55
Plastic Limit (AASHTO T-90)	21
Plasticity Index (AASHTO T-90)	34
Moisture Content (AASHTO T-265)	36.5
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND with gravel

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-4606-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	9/4/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-189 @ 5.0 - 6.0	Reviewed By:	Keagen Mayfield

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	1	99	
3/8"	0	99	
1/4"	0	99	
#4	1	98	
#8	6	92	
#10	3	89	
#16	15	74	
#30	27	47	
#40	14	32	
#50	13	19	
#100	13	5	
#200	2	3.4	

Liquid Limit (ASTM D4318)	
Plastic Limit (ASTM D4318)	
Plasticity Index (ASTM D4318)	NP
Moisture Content (ASTM D2216)	3.9
USCS Soil Classification	SP

Group Name (ASTM D2487)
Poorly graded SAND

Testing sizes reduced from standard minimums due to lack of material

Keagen Mayfield
Laboratory Manager

Keagen Mayfield
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-4606-3	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	9/4/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-189 @ 30.0 - 31.5	Reviewed By:	Keagen Mayfield

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	1	99	
#8	1	98	
#10	0	98	
#16	1	97	
#30	3	94	
#40	0	94	
#50	7	87	
#100	10	77	
#200	19	59	

Liquid Limit (ASTM D4318)	39
Plastic Limit (ASTM D4318)	21
Plasticity Index (ASTM D4318)	18
Moisture Content (ASTM D2216)	26.7
USCS Soil Classification	CL

Group Name (ASTM D2487)
Sandy lean CLAY

Testing sizes reduced from standard minimums due to lack of material

Keagen Mayfield
Laboratory Manager

Keagen Mayfield
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5847-1	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	1/8/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-190 @ 0.0 - 5.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	99	
1/2"	2	98	
3/8"	1	96	
1/4"	3	94	
#4	2	91	
#8	7	84	
#10	2	82	
#16	6	77	
#30	10	67	
#40	7	60	
#50	6	53	
#100	10	44	
#200	8	36	

Liquid Limit (AASHTO T-89)	25
Plastic Limit (AASHTO T-90)	16
Plasticity Index (AASHTO T-90)	9
Moisture Content (AASHTO T-265)	5.0
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5847-5	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	1/8/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-190 @ 15.0 - 16.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	5	95	
3/8"	5	90	
1/4"	8	82	
#4	4	77	
#8	5	72	
#10	2	70	
#16	4	66	
#30	8	58	
#40	3	55	
#50	3	52	
#100	6	45	
#200	7	38	

Liquid Limit (AASHTO T-89)	34
Plastic Limit (AASHTO T-90)	23
Plasticity Index (AASHTO T-90)	11
Moisture Content (AASHTO T-265)	9.9
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND with gravel

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5847-3	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	1/4/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-191 @ 5.0 - 6.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	1	99	
3/8"	2	97	
1/4"	2	95	
#4	2	94	
#8	6	87	
#10	3	85	
#16	9	76	
#30	18	57	
#40	12	45	
#50	10	35	
#100	10	26	
#200	7	19	

Liquid Limit (AASHTO T-89)	21
Plastic Limit (AASHTO T-90)	16
Plasticity Index (AASHTO T-90)	5
Moisture Content (AASHTO T-265)	7.3
USCS Soil Classification	SC-SM

Group Name (ASTM D2487)
Silty, clayey SAND

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5847-6	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	1/8/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-191 @ 20.0 - 21.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	1	99	
#40	2	97	
#50	5	92	
#100	26	66	
#200	28	39	

Liquid Limit (AASHTO T-89)	29
Plastic Limit (AASHTO T-90)	20
Plasticity Index (AASHTO T-90)	9
Moisture Content (AASHTO T-265)	7.4
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5847-4	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	1/8/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-192 @ 5.0 - 6.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	1	99	
3/8"	1	98	
1/4"	2	97	
#4	1	95	
#8	2	93	
#10	1	92	
#16	3	89	
#30	10	79	
#40	9	70	
#50	9	61	
#100	22	39	
#200	20	19	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	3.4
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5847-7	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/9/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-192 @ 20.0 - 21.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	1	99	
#40	2	97	
#50	4	93	
#100	18	75	
#200	26	50	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	13.1
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5847-1	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	1/8/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-190 @ 0.0 - 5.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	99	
1/2"	2	98	
3/8"	1	96	
1/4"	3	94	
#4	2	91	
#8	7	84	
#10	2	82	
#16	6	77	
#30	10	67	
#40	7	60	
#50	6	53	
#100	10	44	
#200	8	36	

Liquid Limit (AASHTO T-89)	25
Plastic Limit (AASHTO T-90)	16
Plasticity Index (AASHTO T-90)	9
Moisture Content (AASHTO T-265)	5.0
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5847-5	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	1/8/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-190 @ 15.0 - 16.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	5	95	
3/8"	5	90	
1/4"	8	82	
#4	4	77	
#8	5	72	
#10	2	70	
#16	4	66	
#30	8	58	
#40	3	55	
#50	3	52	
#100	6	45	
#200	7	38	

Liquid Limit (AASHTO T-89)	34
Plastic Limit (AASHTO T-90)	23
Plasticity Index (AASHTO T-90)	11
Moisture Content (AASHTO T-265)	9.9
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND with gravel

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5847-3	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	1/4/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-191 @ 5.0 - 6.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	1	99	
3/8"	2	97	
1/4"	2	95	
#4	2	94	
#8	6	87	
#10	3	85	
#16	9	76	
#30	18	57	
#40	12	45	
#50	10	35	
#100	10	26	
#200	7	19	

Liquid Limit (AASHTO T-89)	21
Plastic Limit (AASHTO T-90)	16
Plasticity Index (AASHTO T-90)	5
Moisture Content (AASHTO T-265)	7.3
USCS Soil Classification	SC-SM

Group Name (ASTM D2487)
Silty, clayey SAND

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil

JOB NO: 17-2023-4239
WORK ORDER NO: 39
DATE ASSIGNED: 1/3/24

MECHANICAL SIEVE ANALYSIS (ASTM C136/C117) PLASTICITY INDEX (ASTM D4318)
GROUP SYMBOL, USCS (ASTM D2487)

PERCENT PASSING BY WEIGHT

				Silt or	SAND								GRAVEL									COBBLES	
				Clay	Fine			Medium			Coarse		Fine				Coarse						
Location & Depth	USCS	LL	PI	#200	#100	#50	#40	#30	#16	#10	#8	#4	1/4"	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	3"	6"	Lab #
B-193 (3.0-4.0')	SC	32	14	31	41	51	57	62	71	76	78	84	86	88	92	97	100	100	100	100	100	100	24-2305

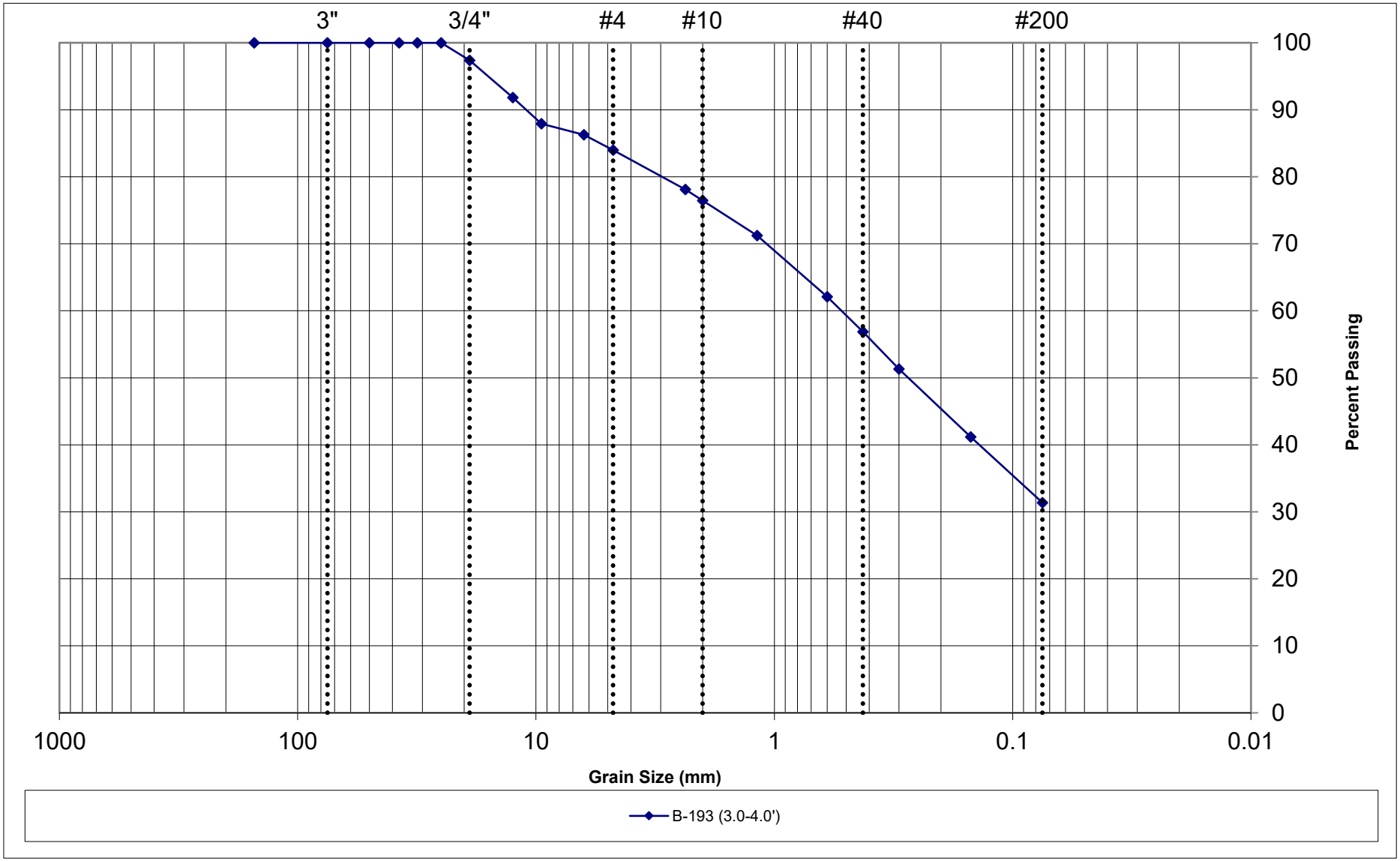
WSP USA
3630 E Wier Ave.
Phoenix, AZ 85040

REVIEWED BY

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil

JOB NO: 17-2023-4239
WORK ORDER NO: 39
DATE ASSIGNED: 1/3/24

MECHANICAL SIEVE ANALYSIS GRAPHS



ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5848-7	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/9/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-193 @ 15.0 - 16.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	1	99	
#8	7	92	
#10	2	90	
#16	5	85	
#30	9	76	
#40	5	71	
#50	6	65	
#100	12	53	
#200	15	38	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	6.2
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5848-8	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	2/9/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-193 @ 20.0 - 21.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"			
3"			
2 1/2"			
2"			
1 1/2"			
1"			
3/4"			
1/2"			
3/8"			
1/4"			
#4			
#8			
#10			
#16			
#30			
#40			
#50			
#100			
#200			

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	
Moisture Content (AASHTO T-265)	3.8

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5848-2	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	1/8/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-194 @ 5.0 - 6.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	1	99	
1/4"	3	96	
#4	1	95	
#8	4	92	
#10	1	90	
#16	5	85	
#30	8	77	
#40	4	73	
#50	6	67	
#100	11	56	
#200	13	43	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	13.2
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5848-3	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	1/8/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-194 @ 30.0 - 31.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	1	99	
#10	0	99	
#16	2	97	
#30	4	93	
#40	2	91	
#50	5	86	
#100	19	67	
#200	21	46	

Liquid Limit (AASHTO T-89)	37
Plastic Limit (AASHTO T-90)	19
Plasticity Index (AASHTO T-90)	18
Moisture Content (AASHTO T-265)	20.0
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5848-5	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	1/8/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-195 @ 10.0 - 11.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	99	
#10	0	99	
#16	1	98	
#30	4	94	
#40	3	91	
#50	6	85	
#100	16	69	
#200	19	50	

Liquid Limit (AASHTO T-89)	24
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	7
Moisture Content (AASHTO T-265)	10.5
USCS Soil Classification	CL-ML

Group Name (ASTM D2487)
Sandy SILTY CLAY

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5848-6	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	1/8/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-195 @ 20.0 - 21.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	4	96	
3/8"	1	95	
1/4"	4	92	
#4	1	90	
#8	8	82	
#10	2	80	
#16	7	73	
#30	9	64	
#40	5	60	
#50	7	53	
#100	10	44	
#200	8	36	

Liquid Limit (AASHTO T-89)	33
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	16
Moisture Content (AASHTO T-265)	9.6
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5849-2	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	12/27/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-196 @ 25.0 - 26.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	1	99	
#30	3	97	
#40	2	94	
#50	6	88	
#100	19	69	
#200	26	43	

Liquid Limit (AASHTO T-89)	36
Plastic Limit (AASHTO T-90)	22
Plasticity Index (AASHTO T-90)	14
Moisture Content (AASHTO T-265)	15.5
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-5282-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/23/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-196A @ 0 - 4	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	99	
#4	0	99	
#8	2	98	
#10	0	97	
#16	2	95	
#30	4	91	
#40	2	89	
#50	3	86	
#100	6	80	
#200	10	70.0	

Liquid Limit (ASTM D4318)	25
Plastic Limit (ASTM D4318)	17
Plasticity Index (ASTM D4318)	8
Moisture Content (ASTM D2216)	5.0
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	CL

Group Name (ASTM D2487)
Lean CLAY with sand

Keagen Mayfield
Laboratory Manager

Keagen Mayfield
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-5282-2	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/24/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-196A @ 5 - 6	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	1	99	
1/4"	2	98	
#4	1	97	
#8	7	90	
#10	2	88	
#16	10	78	
#30	19	59	
#40	10	48	
#50	10	38	
#100	13	25	
#200	7	17.8	

Liquid Limit (ASTM D4318)	27
Plastic Limit (ASTM D4318)	15
Plasticity Index (ASTM D4318)	12
Moisture Content (ASTM D2216)	4.6
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Keagen Mayfield
Laboratory Manager

Keagen Mayfield
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-5283-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/25/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-196B @ 3 - 4	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	3	97	
3/8"	1	95	
1/4"	3	92	
#4	2	90	
#8	12	78	
#10	3	75	
#16	12	62	
#30	18	44	
#40	7	38	
#50	5	32	
#100	8	25	
#200	6	18.9	

Liquid Limit (ASTM D4318)	35
Plastic Limit (ASTM D4318)	19
Plasticity Index (ASTM D4318)	16
Moisture Content (ASTM D2216)	3.9
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Keagen Mayfield
Laboratory Manager

Keagen Mayfield
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-5283-2	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/25/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-196B @ 5.0 - 6.5	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	9	91	
3/4"	0	91	
1/2"	15	76	
3/8"	7	69	
1/4"	8	61	
#4	4	57	
#8	10	47	
#10	1	46	
#16	6	40	
#30	8	31	
#40	4	27	
#50	4	24	
#100	6	18	
#200	4	13.6	

Liquid Limit (ASTM D4318)	
Plastic Limit (ASTM D4318)	
Plasticity Index (ASTM D4318)	
Moisture Content (ASTM D2216)	3.5
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	

Group Name (ASTM D2487)

Testing sizes reduced from standard minimums due to lack of material

Keagen Mayfield
Laboratory Manager

Keagen Mayfield
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-5284-3	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/24/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-196C @ 10 - 11.5	Reviewed By:	Keagen Mayfield

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	1	99	
3/8"	0	99	
1/4"	0	98	
#4	0	98	
#8	4	94	
#10	1	93	
#16	8	86	
#30	15	71	
#40	9	62	
#50	10	52	
#100	18	34	
#200	15	20	

Liquid Limit (ASTM D4318)	27
Plastic Limit (ASTM D4318)	18
Plasticity Index (ASTM D4318)	9
Moisture Content (ASTM D2216)	6.7
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Testing sizes reduced from standard minimums due to lack of material

Keagen Mayfield
Laboratory Manager

Keagen Mayfield
Signature

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ B-196C @ 5 - 6
MATERIAL: Native Soil

JOB NO: 17-2023-4239
WORK ORDER NO: 93
DATE ASSIGNED: 10/24/24

MECHANICAL SIEVE ANALYSIS (ASTM C136/C117) PLASTICITY INDEX (ASTM D4318)
GROUP SYMBOL, USCS (ASTM D2487)

PERCENT PASSING BY WEIGHT

				Silt or	SAND								GRAVEL									COBBLES	
				Clay	Fine			Medium			Coarse		Fine				Coarse						
Location & Depth	USCS	LL	PI	#200	#100	#50	#40	#30	#16	#10	#8	#4	1/4"	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	3"	6"	Lab #
ACS Lab #24-5284-2	SC	34	12	23	35	48	56	64	79	88	90	96	97	100	100	100	100	100	100	100	100	100	24-3877

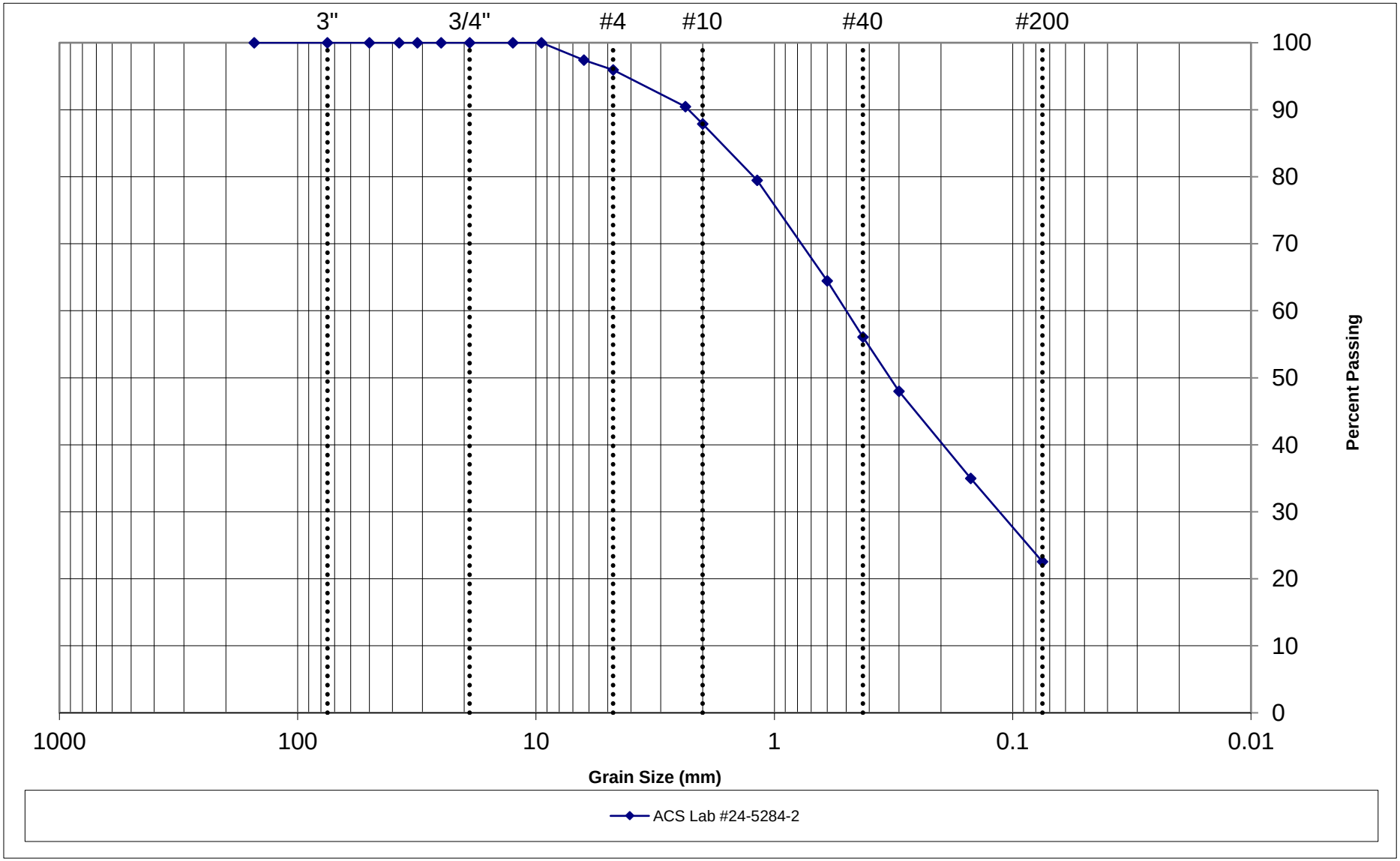
WSP USA
3630 E Wier Ave.
Phoenix, AZ 85040

REVIEWED BY _____ 11/05/24

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ B-196C @ 5 - 6
MATERIAL: Native Soil

JOB NO: 17-2023-4239
WORK ORDER NO: 93
DATE ASSIGNED: 10/24/24

MECHANICAL SIEVE ANALYSIS GRAPHS



ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-5285-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/24/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-196D @ 0 - 4	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	7	93	
1 1/2"	0	93	
1"	0	93	
3/4"	3	90	
1/2"	7	83	
3/8"	2	81	
1/4"	4	76	
#4	1	75	
#8	5	70	
#10	0	70	
#16	1	69	
#30	9	60	
#40	4	55	
#50	4	51	
#100	7	44	
#200	7	37.5	

Liquid Limit (ASTM D4318)	34
Plastic Limit (ASTM D4318)	16
Plasticity Index (ASTM D4318)	18
Moisture Content (ASTM D2216)	8.8
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND with gravel

Keagen Mayfield
Laboratory Manager

Keagen Mayfield
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-5285-3	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	10/24/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-196D @ 10 - 11	Reviewed By:	Andrew Jamrogiewicz, P.E.

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	2	98	
#4	1	97	
#8	5	92	
#10	1	91	
#16	7	84	
#30	17	67	
#40	10	57	
#50	8	49	
#100	10	39	
#200	8	30.9	

Liquid Limit (ASTM D4318)	35
Plastic Limit (ASTM D4318)	16
Plasticity Index (ASTM D4318)	19
Moisture Content (ASTM D2216)	9.2
Fractured Faces (ARIZ 212)	
Soluble Salts (ARIZ 237)	
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Keagen Mayfield
Laboratory Manager

Keagen Mayfield
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5849-5	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	12/27/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-197 @ 20.0 - 21.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	1	99	
#10	1	98	
#16	5	93	
#30	14	79	
#40	10	69	
#50	13	56	
#100	17	38	
#200	12	26	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	7.8
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5850-2	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	12/29/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-198 @ 10.0 - 11.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	1	99	
3/8"	2	97	
1/4"	2	95	
#4	1	94	
#8	4	90	
#10	1	89	
#16	7	82	
#30	12	70	
#40	6	64	
#50	8	56	
#100	11	45	
#200	8	37	

Liquid Limit (AASHTO T-89)	29
Plastic Limit (AASHTO T-90)	16
Plasticity Index (AASHTO T-90)	13
Moisture Content (AASHTO T-265)	7.5
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5850-3	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	12/29/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-198 @ 20.0 - 21.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"			
3"			
2 1/2"			
2"			
1 1/2"			
1"			
3/4"			
1/2"			
3/8"			
1/4"			
#4			
#8			
#10			
#16			
#30			
#40			
#50			
#100			
#200			

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	6.9
USCS Soil Classification	

Group Name (ASTM D2487)

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5850-4	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	12/29/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-198 @ 25.0 - 26.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	1	99	
#10	0	99	
#16	1	98	
#30	3	94	
#40	2	92	
#50	4	88	
#100	11	77	
#200	14	64	

Liquid Limit (AASHTO T-89)	24
Plastic Limit (AASHTO T-90)	16
Plasticity Index (AASHTO T-90)	8
Moisture Content (AASHTO T-265)	19.8
USCS Soil Classification	CL

Group Name (ASTM D2487)
Sandy lean CLAY

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5850-5	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	12/29/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-199 @ 0.0 - 5.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	1	99	
3/4"	3	96	
1/2"	10	86	
3/8"	6	80	
1/4"	7	72	
#4	4	68	
#8	6	63	
#10	1	61	
#16	6	55	
#30	9	46	
#40	4	41	
#50	5	36	
#100	7	29	
#200	5	24	

Liquid Limit (AASHTO T-89)	28
Plastic Limit (AASHTO T-90)	15
Plasticity Index (AASHTO T-90)	13
Moisture Content (AASHTO T-265)	6.1
USCS Soil Classification	SC

Group Name (ASTM D2487)
Clayey SAND with gravel

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5850-7	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	12/29/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	B-199 @ 20.0 - 21.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	7	93	
3/8"	4	89	
1/4"	5	84	
#4	4	80	
#8	5	74	
#10	2	72	
#16	6	66	
#30	9	57	
#40	4	53	
#50	4	49	
#100	5	44	
#200	4	40	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	6.6
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND with gravel

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	23-5850-9	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	12/29/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	B-199 @ 35.0 - 36.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	1	99	
#4	0	99	
#8	2	97	
#10	0	96	
#16	1	95	
#30	3	92	
#40	2	90	
#50	3	87	
#100	10	77	
#200	18	59	

Liquid Limit (AASHTO T-89)	35
Plastic Limit (AASHTO T-90)	22
Plasticity Index (AASHTO T-90)	13
Moisture Content (AASHTO T-265)	16.1
USCS Soil Classification	CL

Group Name (ASTM D2487)
Sandy lean CLAY

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1941-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/22/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	P-1 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	0	100	
#40	0	99	
#50	0	99	
#100	1	98	
#200	4	94.1	

Liquid Limit (AASHTO T-89)	34
Plastic Limit (AASHTO T-90)	18
Plasticity Index (AASHTO T-90)	16
Moisture Content (AASHTO T-265)	14.6
USCS Soil Classification	CL

Group Name (ASTM D2487)
Lean CLAY

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1941-2	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/22/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	P-2 @ 0.0 - 5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	0	100	
#40	0	99	
#50	0	99	
#100	1	98	
#200	3	95.1	

Liquid Limit (AASHTO T-89)	29
Plastic Limit (AASHTO T-90)	20
Plasticity Index (AASHTO T-90)	9
Moisture Content (AASHTO T-265)	11.9
USCS Soil Classification	CL

Group Name (ASTM D2487)
Lean CLAY

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Native
ACS Lab #	22-1941-3	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	4/22/2022
Project City	Goodyear	Tested By:	Brian Karl
Sample Location:	P-3 @ 0.0 -5.0	Reviewed By:	Dylan Ward

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	1	99	
#40	1	98	
#50	1	98	
#100	5	93	
#200	11	81.9	

Liquid Limit (AASHTO T-89)	25
Plastic Limit (AASHTO T-90)	18
Plasticity Index (AASHTO T-90)	7
Moisture Content (AASHTO T-265)	9.4
USCS Soil Classification	CL-ML

Group Name (ASTM D2487)
SILTY CLAY with sand

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1141-1	Supplier:	-
Client:	Ethos	Sample Date:	12/18/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	1/19/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	P-6 @ 0.5 - 5.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	1	99	
#4	1	98	
#8	0	98	
#10	0	98	
#16	0	98	
#30	1	97	
#40	1	96	
#50	1	95	
#100	2	93	
#200	7	87	

Liquid Limit (AASHTO T-89)	36
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	19
Moisture Content (AASHTO T-265)	18.9
USCS Soil Classification	CL

Group Name (ASTM D2487)
Lean CLAY

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1141-2	Supplier:	-
Client:	Ethos	Sample Date:	12/18/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	1/18/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	P-6 @ 10.0 -11.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	1	99	
#30	2	98	
#40	2	96	
#50	2	94	
#100	3	91	
#200	14	77	

Liquid Limit (AASHTO T-89)	26
Plastic Limit (AASHTO T-90)	22
Plasticity Index (AASHTO T-90)	4
Moisture Content (AASHTO T-265)	28.6
USCS Soil Classification	ML

Group Name (ASTM D2487)
SILT with sand

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-3863-1	Supplier:	-
Client:	Ethos	Sample Date:	7/8/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	7/10/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	P-06A (0.0 - 2.0)	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	1	99	
3/4"	0	99	
1/2"	1	97	
3/8"	1	97	
1/4"	1	96	
#4	1	95	
#8	2	93	
#10	1	93	
#16	3	89	
#30	9	80	
#40	7	73	
#50	7	66	
#100	10	55	
#200	10	45.5	

Liquid Limit (AASHTO T-89)	19
Plastic Limit (AASHTO T-90)	14
Plasticity Index (AASHTO T-90)	5
Moisture Content (AASHTO T-265)	1.5
USCS Soil Classification	SC-SM

Group Name (ASTM D2487)
Silty, clayey SAND

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1141-3	Supplier:	-
Client:	Ethos	Sample Date:	12/18/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	1/18/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	P-7 @ 0.5 - 5.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	99	
1/4"	0	99	
#4	0	99	
#8	0	99	
#10	0	99	
#16	0	99	
#30	1	98	
#40	0	98	
#50	1	97	
#100	2	95	
#200	6	89	

Liquid Limit (AASHTO T-89)	37
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	20
Moisture Content (AASHTO T-265)	18.3
USCS Soil Classification	CL

Group Name (ASTM D2487)
Lean CLAY

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1141-4	Supplier:	-
Client:	Ethos	Sample Date:	12/18/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	1/18/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	P-7 @ 10.0 - 11.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	6	94	
1/2"	0	94	
3/8"	0	94	
1/4"	0	94	
#4	1	93	
#8	1	93	
#10	1	92	
#16	4	89	
#30	16	72	
#40	8	64	
#50	10	54	
#100	24	30	
#200	13	18	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	6.6
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1141-5	Supplier:	-
Client:	Ethos	Sample Date:	12/18/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	1/18/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	P-8 @ 0.5 - 5.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	1	99	
#40	1	98	
#50	1	98	
#100	2	96	
#200	6	90	

Liquid Limit (AASHTO T-89)	36
Plastic Limit (AASHTO T-90)	17
Plasticity Index (AASHTO T-90)	19
Moisture Content (AASHTO T-265)	19.6
USCS Soil Classification	CL

Group Name (ASTM D2487)
Lean CLAY

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1141-6	Supplier:	-
Client:	Ethos	Sample Date:	12/18/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	1/18/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	P-8 @ 10.0 - 11.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	1	99	
#30	2	98	
#40	3	95	
#50	7	88	
#100	33	56	
#200	21	35	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	11.8
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1141-7	Supplier:	-
Client:	Ethos	Sample Date:	12/18/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	1/18/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	P-9 @ 0.5 - 5.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)			
Sieve Size	**% Retained**	**% Passed**	**Specs**
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	0	99	
#40	0	99	
#50	0	98	
#100	1	97	
#200	3	94	

Liquid Limit (AASHTO T-89)	38
Plastic Limit (AASHTO T-90)	16
Plasticity Index (AASHTO T-90)	22
Moisture Content (AASHTO T-265)	17.4
USCS Soil Classification	CL

Group Name (ASTM D2487)
Lean CLAY

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1141-8	Supplier:	-
Client:	Ethos	Sample Date:	12/18/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	1/18/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	P-9 @ 10.0 - 11.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	0	100	
#40	1	99	
#50	3	95	
#100	30	66	
#200	36	30	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	10.7
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1141-9	Supplier:	-
Client:	Ethos	Sample Date:	12/18/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	1/18/2024
Project City	Goodyear	Tested By:	Keagen Mayfield
Sample Location:	P-10 @ 0.5 - 5.0	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	1	99	
#40	1	98	
#50	1	97	
#100	3	94	
#200	7	87	

Liquid Limit (AASHTO T-89)	37
Plastic Limit (AASHTO T-90)	18
Plasticity Index (AASHTO T-90)	19
Moisture Content (AASHTO T-265)	17.1
USCS Soil Classification	CL

Group Name (ASTM D2487)
Lean CLAY

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Laboratory Soil Test Results

ACS PROJECT #	2201026	Material Type:	Soils
ACS Lab #	24-1141-10	Supplier:	-
Client:	Ethos	Sample Date:	12/18/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	1/18/2024
Project City	Goodyear	Tested By:	Mahalia Davis
Sample Location:	P-10 @ 15.0 - 16.5	Reviewed By:	Fernando Montero

Sieve Analysis (ASTM C-136 / AASHTO T 27 / ARIZ 201)

Sieve Size	% Retained	% Passed	Specs
6"	0	100	
3"	0	100	
2 1/2"	0	100	
2"	0	100	
1 1/2"	0	100	
1"	0	100	
3/4"	0	100	
1/2"	0	100	
3/8"	0	100	
1/4"	0	100	
#4	0	100	
#8	0	100	
#10	0	100	
#16	0	100	
#30	7	93	
#40	11	82	
#50	22	60	
#100	30	30	
#200	9	21	

Liquid Limit (AASHTO T-89)	
Plastic Limit (AASHTO T-90)	
Plasticity Index (AASHTO T-90)	NP
Moisture Content (AASHTO T-265)	6.8
USCS Soil Classification	SM

Group Name (ASTM D2487)
Silty SAND

Testing sizes reduced from standard minimums due to lack of material

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

ACS Services LLC

Job #	2201026	Material Type:	Native
Lab #	22-1582	Extraction Date:	N/A
Client:	Ethos	Extracted By:	Client
Project Name:	SR 303L MC 85 to Van Buren	Laboratory Test Date	3/7/2022
Project Address:	SR 303L MC 85 to Van Buren	Laboratory Tested By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Material Source:	N/A		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
22-1582-3	B-9 @ 15.0 - 16.0'	429.8	419.6	2.4%	3	565.3	135.5	115.8
22-1582-4	B-9 @ 35.0 - 36.0'	557.6	419.4	33.0%	4	734.0	176.4	86.8

ACS Services LLC

Job #	2201026	Material Type:	Native
Lab #	22-1802	Extraction Date:	N/A
Client:	Ethos	Extracted By:	Client
Project Name:	SR 303L MC 85 to Van Buren	Laboratory Test Date	3/27/2022
Project Address:	SR 303L MC 85 to Van Buren	Laboratory Tested By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Material Source:	N/A		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
22-1802-2	B10 @ 15.0-16.0	390.6	378.6	3.2%	3	525.3	134.7	104.5

ACS Services LLC

Job #	2201026	Material Type:	Native
Lab #	22-1456	Extraction Date:	N/A
Client:	Ethos	Extracted By:	Client
Project Name:	SR 303L MC 85 to Van Buren	Laboratory Test Date	2/22/2022
Project Address:	SR 303L MC 85 to Van Buren	Laboratory Tested By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Material Source:	N/A		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
22-1456-2	B-12 @ 15.0 - 16.0'	538.2	520.0	3.5%	4	719.0	180.8	107.6
22-1456-9	B-53 @ 30.0 - 31.0' (Not a ring sample)							

ACS Services LLC

Job #	2201026	Material Type:	Native
Lab #	22-2142	Extraction Date:	N/A
Client:	Ethos	Extracted By:	Client
Project Name:	SR 303L MC 85 to Van Buren	Laboratory Test Date	4/28/2022
Project Address:	SR 303L MC 85 to Van Buren	Laboratory Tested By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Material Source:	N/A		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
22-2142-5	B-15 @ 0.0 - 1.0	583.7	549.0	6.3%	4	765.9	182.2	113.6

ACS Services LLC

Job #	2201026	Material Type:	Native
Lab #	22-2130	Extraction Date:	N/A
Client:	Ethos	Extracted By:	Client
Project Name:	SR 303L MC 85 to Van Buren	Laboratory Test Date	4/28/2022
Project Address:	SR 303L MC 85 to Van Buren	Laboratory Tested By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Material Source:	N/A		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
22-2130-4	B-17 @ 50.0 - 51.0	432.7	399.0	8.4%	3	569.7	137.0	110.1

ACS Services LLC

Job #	2201026	Material Type:	Native
Lab #	22-1654	Extraction Date:	N/A
Client:	Ethos	Extracted By:	Client
Project Name:	SR 303L MC 85 to Van Buren	Laboratory Test Date	3/9/2022
Project Address:	SR 303L MC 85 to Van Buren	Laboratory Tested By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Material Source:	N/A		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
22-1654-2	B-22 @ 15.0 - 16.0'	551.6	539.0	2.3%	4	731.8	180.2	111.6

ACS Services LLC

Job #	2201026	Material Type:	Native
Lab #	22-1942	Extraction Date:	N/A
Client:	Ethos	Extracted By:	Client
Project Name:	SR 303L MC 85 to Van Buren	Laboratory Test Date	4/6/2022
Project Address:	SR 303L MC 85 to Van Buren	Laboratory Tested By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Material Source:	N/A		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
22-1942-3	B-24 @ 25-26	245.5	227.2	8.1%	2	334.4	88.9	94.1
22-1942-6	B-24 @ 55-56	608.2	503.8	20.7%	4	786.5	178.3	104.3
22-1942-9	B-25 @ 30-31	431.0	388.8	10.9%	3	565.5	134.5	107.3

ACS Services LLC

Job #	2201026	Material Type:	Native
Lab #	22-1414	Extraction Date:	N/A
Client:	Ethos	Extracted By:	Client
Project Name:	SR 303L MC 85 to Van Buren	Laboratory Test Date	1/0/1900
Project Address:	SR 303L MC 85 to Van Buren	Laboratory Tested By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Material Source:	N/A		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
22-1414-4	B-31 @ 40.0 - 41.0'	430.5	348.7	23.5%	3	566.9	136.4	96.2
22-1414-8	B-32 @ 45.0 - 46.0 '	555.3	423.7	31.1%	4	735.7	180.4	87.7
22-141-13	B-30 @ 50.0 - 51.0'	857.2	689.4	24.3%	6	1128.3	271.1	95.1
22-1414-20	B-34 @ 20.0 - 21.5'	416.4	398.6	4.5%	3	552.5	136.1	110.0
22-1414-26	B-51 @ 10.0 - 10.11'	424.0	397.2	6.7%	3	560.5	136.5	109.6
22-1414-18	B-33 @ 45.0 - 46.0'	511.7	438.6	16.7%	4	693.2	181.5	90.8
22-1414-22	B-34 @ 40.0 - 40.8'	269.6	220.6	22.2%	2	348.2	78.6	91.3

ACS Services LLC

Job #	2201026	Material Type:	Native
Lab #	22-3003	Extraction Date:	N/A
Client:	Ethos	Extracted By:	Client
Project Name:	SR 303L MC 85 to Van Buren	Laboratory Test Date	6/28/2022
Project Address:	SR 303L MC 85 to Van Buren	Laboratory Tested By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Material Source:	N/A		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
22-3003-2	B-35A @ 5.0 - 6.0	726.1	711.7	2.0%	5	952.9	226.8	117.9

ACS Services LLC

Job #	2201026	Material Type:	Native
Lab #	22-1656	Extraction Date:	N/A
Client:	Ethos	Extracted By:	Client
Project Name:	SR 303L MC 85 to Van Buren	Laboratory Test Date	3/14/2022
Project Address:	SR 303L MC 85 to Van Buren	Laboratory Tested By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Material Source:	N/A		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
22-1656-8	B-37 @ 35.0 -35.10	394.3	313.6	25.7%	3	524.4	130.1	86.6
22-1656-7	B-37 @ 25.0 - 25.5	543.7	490.4	10.9%	4	725.2	181.5	101.5
22-1656-13	B-38 @ 40 - 40.4	513.5	443.6	15.8%	4	693.9	180.4	91.8

ACS Services LLC

Job #	2201026	Material Type:	Native
Lab #	22-1657	Extraction Date:	N/A
Client:	Ethos	Extracted By:	Client
Project Name:	SR 303L MC 85 to Van Buren	Laboratory Test Date	4/1/2022
Project Address:	SR 303L MC 85 to Van Buren	Laboratory Tested By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Material Source:	N/A		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
22-1657-3	B-39 @ 30.0 - 31.0	456.0	374.4	21.8%	3	591.2	135.2	103.3
22-1657-14	B-43 @ 10.0 - 10.5	504.9	461.2	9.5%	4	682.2	177.3	95.5

ACS Services LLC

Job #	2201026	**Material Type**	Rings
Lab #	22-2132	**Extraction Date**	-
Client:	ETHOS	**Extracted By:**	Client
Project Name:	SR303L	**Laboratory Test Date:**	5/10/2022
Project Address:	-	**Laboratory Tested By:**	Brian Karl
Project City:	Goodyear	**Reviewed By:**	Dylan Ward
Material Source:	Native		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist. Content**	# Of Rings	Wet Wt'+ Rings (g)	Wt.of Rings (g)	**Dry Density (pcf)**
22-2132-2	**B-67 @ 45-46**	575.6	517.0	**11.3%**	4	755.5	179.9	**107.0**
22-2132-6	**B-68 @ 45-56**	602.1	547.8	**9.9%**	4	781.1	179.0	**113.4**

ACS Services LLC

Job #	2201026	Material Type:	Native
Lab #	22-1803	Extraction Date:	N/A
Client:	Ethos	Extracted By:	Client
Project Name:	SR 303L MC 85 to Van Buren	Laboratory Test Date	4/18/2022
Project Address:	SR 303L MC 85 to Van Buren	Laboratory Tested By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Material Source:	N/A		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
22-1803-5	B-69 @ 30 - 31	271.8	262.4	3.6%	2	363.6	91.8	108.6
22-1803-8	B-70 @ 35.0 - 35.90	454.7	413.4	10.0%	3	591.0	136.3	114.1

ACS Services LLC

Job #	2201026	Material Type:	Native
Lab #	22-2084	Extraction Date:	N/A
Client:	Ethos	Extracted By:	Client
Project Name:	SR 303L MC 85 to Van Buren	Laboratory Test Date	4/28/2022
Project Address:	SR 303L MC 85 to Van Buren	Laboratory Tested By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Material Source:	N/A		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
22-2084-2	B-72 @ 15.0 - 15.11	251.7	228.8	10.0%	2	342.3	90.6	94.7

ACS Services LLC

Job #	2201026	Material Type:	Native
Lab #	22-1804	Extraction Date:	N/A
Client:	Ethos	Extracted By:	Client
Project Name:	SR 303L MC 85 to Van Buren	Laboratory Test Date	4/5/2022
Project Address:	SR 303L MC 85 to Van Buren	Laboratory Tested By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Material Source:	N/A		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
22-1804-6	B-77 @ 55-56	583.8	538.4	8.4%	4	761.1	177.3	111.4
22-1804-10	B-73 @ 50-51	630.9	546.5	15.4%	4	811.7	180.8	113.1
22-1804-11	B-73 @ 65-66	586.9	516.6	13.6%	4	766.5	179.6	106.9
22-1804-12	B-73 @ 85-86	660.6	581.0	13.7%	4	836.1	175.5	120.3

ACS Services LLC

Job #	2201026	Material Type:	Native
Lab #	22-1850	Extraction Date:	N/A
Client:	Ethos	Extracted By:	Client
Project Name:	SR 303L MC 85 to Van Buren	Laboratory Test Date	4/6/2022
Project Address:	SR 303L MC 85 to Van Buren	Laboratory Tested By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Material Source:	N/A		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
22-1850-5	B-75 @ 40.0 - 41.0'	623.0	557.8	11.7%	4	800.0	177.0	115.5
22-1850-10	B-76 @ 55.0 - 56.0'	526.8	466.8	12.9%	4	707.4	180.6	96.6
22-1850-11	B-76 @ 80.0 - 81.0'	488.9	426.8	14.6%	3	623.2	134.3	117.8

ACS Services LLC

Job #	2201026	Material Type:	Native
Lab #	22-1943	Extraction Date:	N/A
Client:	Ethos	Extracted By:	Client
Project Name:	SR 303L MC 85 to Van Buren	Laboratory Test Date	4/6/2022
Project Address:	SR 303L MC 85 to Van Buren	Laboratory Tested By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Material Source:	N/A		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
22-1943-8	B-87 @ 15-16	550.4	537.4	2.4%	4	732.2	181.8	111.2

ACS Services LLC

Job #	2201026	Material Type:	Native
Lab #	22-1057	Extraction Date:	N/A
Client:	Ethos	Extracted By:	Client
Project Name:	SR 303L MC 85 to Van Buren	Laboratory Test Date	1/24/2022
Project Address:	SR 303L MC 85 to Van Buren	Laboratory Tested By:	Fernando Montro
Project City:	Goodyear	Reviewed By:	Andrew Jamrogiewicz, P.E.
Material Source:	N/A		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
22-1057-5	B-91 @ 10.0' - 11.0'	332.0	319.8	3.8%	2	332.0	89.6	96.67
22-1057-20	B-95 @ 5.0' - 5'11"	781.7	757.2	3.2%	4	781.7	177.3	121.19
22-1057-27	B-96 @ 15.0' - 16.0'	748.7	704.2	6.3%	4	748.7	192.9	108.21

ACS Services LLC

Job #	2201026	Material Type:	Native
Lab #	22-1944	Extraction Date:	N/A
Client:	Ethos	Extracted By:	Client
Project Name:	SR 303L MC 85 to Van Buren	Laboratory Test Date	4/6/2022
Project Address:	SR 303L MC 85 to Van Buren	Laboratory Tested By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Material Source:	N/A		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
22-1944-7	B-99 @ 45-56	606.5	535.1	13.3%	4	787.3	180.8	110.8

ACS Services LLC

Job #	2201026	Material Type:	Native
Lab #	22-1849	Extraction Date:	N/A
Client:	Ethos	Extracted By:	Client
Project Name:	SR 303L MC 85 to Van Buren	Laboratory Test Date	4/5/2022
Project Address:	SR 303L MC 85 to Van Buren	Laboratory Tested By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Material Source:	N/A		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
22-1849-4	B-101 @ 35-36	542.8	475.5	14.2%	4	718.8	176.0	98.4
22-1849-7	B-100 @ 30-31	498.6	445.3	12.0%	4	672.8	174.2	92.2
22-1849-8	B-100 @ 40-41	600.0	498.1	20.5%	4	778.8	178.8	103.1

ACS Services LLC

Job #	2201026	Material Type:	Native
Lab #	22-1848	Extraction Date:	N/A
Client:	Ethos	Extracted By:	Client
Project Name:	SR 303L MC 85 to Van Buren	Laboratory Test Date	4/5/2022
Project Address:	SR 303L MC 85 to Van Buren	Laboratory Tested By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Material Source:	N/A		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
22-1848-6	B103 @ 85.0-86.0	598.6	485.6	23.3%	4	780.2	181.6	100.5

ACS Services LLC

Job #	2201026	Material Type:	Native
Lab #	22-1960	Extraction Date:	N/A
Client:	Ethos	Extracted By:	Client
Project Name:	SR 303L MC 85 to Van Buren	Laboratory Test Date	4/6/2022
Project Address:	SR 303L MC 85 to Van Buren	Laboratory Tested By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Material Source:	N/A		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
22-1960-5	B-105 @ 95.0 - 96.0	615.6	501.7	22.7%	4	798.4	182.8	103.9

ACS Services LLC

Job #	2201026	Material Type:	Native
Lab #	22-1146	Extraction Date:	N/A
Client:	Ethos	Extracted By:	Client
Project Name:	SR 303L MC 85 to Van Buren	Laboratory Test Date	1/25/2022
Project Address:	SR 303L MC 85 to Van Buren	Laboratory Tested By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Andrew Jamrogiewicz, P.E.
Material Source:	N/A		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
22-1146-4	B-112 @ 40.0' - 41.0'	739.8	681.9	8.5%	4	739.8	181.1	106.6
22-1146-9	B-113 @ 35.0' - 36.0' - Contaminated							

ACS Services LLC

Job #	2201026	Material Type:	Native
Lab #	22-1583	Extraction Date:	N/A
Client:	Ethos	Extracted By:	Client
Project Name:	SR 303L MC 85 to Van Buren	Laboratory Test Date	3/10/2022
Project Address:	SR 303L MC 85 to Van Buren	Laboratory Tested By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Material Source:	N/A		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
22-1583-12	B-113 @ 35.0 - 36.0	249.2	209.5	18.9%	2	340.3	91.1	86.7

ACS Services LLC

Job #	2201026	Material Type:	Native
Lab #	22-1128	Extraction Date:	N/A
Client:	Ethos	Extracted By:	Client
Project Name:	SR 303L MC 85 to Van Buren	Laboratory Test Date	1/31/2022
Project Address:	SR 303L MC 85 to Van Buren	Laboratory Tested By:	Fernando Montero
Project City:	Goodyear	Reviewed By:	Andrew Jamrogiwicz, P.E.
Material Source:	N/A		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
22-1128-11	B-114 @ 10.0' - 11.0'	974.1	852.3	14.3	5	974.1	226.8	108.3
22-1128-19	B-122 @ 10.0' - 11.0'	668.9	655.2	2.1	4	668.9	172.7	100.6

ACS Services LLC

Job #	2201026	Material Type:	Native
Lab #	22-2842	Extraction Date:	N/A
Client:	Ethos	Extracted By:	Client
Project Name:	SR 303L MC 85 to Van Buren	Laboratory Test Date	6/17/2022
Project Address:	SR 303L MC 85 to Van Buren	Laboratory Tested By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Material Source:	N/A		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
22-2842-6	B-116 @ 20.0 - 20.5	369.5	320.0	15.5%	3	502.5	133.0	88.3
22-2842-7	B-116 @ 30 - 31	545.4	473.6	15.2%	4	725.3	179.9	98.0
22-2842-8	B-117 @ 10 - 10'10"	565.2	500.0	13.0%	4	738.0	172.8	103.5
22-2842-9	B-117 @ 35 - 36	533.0	497.6	7.1%	4	711.6	178.6	103.0

ACS Services LLC

Job #	2201026	Material Type:	Native
Lab #	22-3008	Extraction Date:	N/A
Client:	Ethos	Extracted By:	Client
Project Name:	SR 303L MC 85 to Van Buren	Laboratory Test Date	6/30/2022
Project Address:	SR 303L MC 85 to Van Buren	Laboratory Tested By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Material Source:	N/A		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
22-3008-2	B119 @ 2.5 - 3.5	576.3	550.1	4.8%	4	755.2	178.9	113.9
22-3008-6	B119 @ 25 - 25 11'	590.6	552.5	6.9%	5	807.6	217.0	91.5

ACS Services LLC

Job #	2201026	Material Type:	Soils
Lab #	24-1149	Extraction Date:	12/18/2024
Client:	Ethos Engineering	Extracted By:	Client
Project Name:	SR 303L, MC 85 to Van Buren	Laboratory Test Date	1/18/2024
Project Address:	-	Laboratory Tested By:	Keagen Mayfield
Project City:	Goodyear	Reviewed By:	Fernando Montero
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
24-1149-2	B-129 @ 10.0 - 11.0	356.8	325.4	9.6%	3	484.6	127.8	89.8

ACS Services LLC

Job #	2201026	Material Type:	Native
Lab #	24-5286	Extraction Date:	
Client:	Ethos	Extracted By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date	
Project Address:	MC85 to Van Buren	Laboratory Tested By:	Keagen Mayfield
Project City:	Goodyear	Reviewed By:	Andy Jamrogiewicz, P.E
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
24-5286-2	B-129A @ 3 - 4	567.7	504.1	12.6%	4	739.2	171.5	104.3
24-5286-3	B-129A @ 15 - 16	607.4	500.5	21.4%	4	779.4	172.0	103.6

ACS Services LLC

Job #	2201026	Material Type:	Native
Lab #	24-4605	Extraction Date:	-
Client:	Ethos	Extracted By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date	9/11/2024
Project Address:	MC85 to Van Buren	Laboratory Tested By:	Keagan Mayfield
Project City:	Goodyear	Reviewed By:	Keagan Mayfield
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
24-4605-1	B-130 @ 10.0 - 11.0	413.2	350.9	17.8%	3	541.7	128.5	96.8
24-4605-3	B-130 @ 40.0 - 41.0							
24-4605-4	B-130 @ 55.0 - 56.0	862.3	781.5	10.3%	5	1082.7	220.4	129.4
24-4605-5	B-131 @ 5.0 - 6.0	336.7	290.8	15.8%	3	467.4	130.7	80.3
24-4605-6	B-131 @ 20.0 - 21.0	491.1	472.4	4.0%	4	660.9	169.8	97.8
24-4605-7	B-131 @ 35.0 - 36.0	419.6	409.7	2.4%	3	550.1	130.5	113.1

ACS Services LLC

Job #	2201026	Material Type:	Soils
Lab #	24-1142	Extraction Date:	1/17/2024
Client:	Ethos Engineering	Extracted By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date	2/7/2024
Project Address:	-	Laboratory Tested By:	Mahalia Davis
Project City:	Goodyear	Reviewed By:	Fernando Montero
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
24-1142-1	B-132 @ 1.0 - 2.0	456.2	416.1	9.6%	4	629.3	173.1	86.1

ACS Services LLC

Job #	2201026	Material Type:	Soils
Lab #	24-1143	Extraction Date:	1/17/2024
Client:	Ethos Engineering	Extracted By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date	2/9/2024
Project Address:	-	Laboratory Tested By:	Mahalia Davis
Project City:	Goodyear	Reviewed By:	Fernando Montero
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
24-1143-2	B-134 @ 10.0 - 11.0	484.2	452.9	6.9%	4	660.2	176.0	93.8
24-1143-6	B-133 @ 1.0 - 2.0	368.7	333.1	10.7%	3	500.4	131.7	91.9
24-1143-10	B-133 @ 60.0 - 61.0	653.4	579.2	12.8%	4	823.4	170.0	119.9

ACS Services LLC

Job #	2201026	Material Type:	Soils
Lab #	24-1150	Extraction Date:	1/17/2024
Client:	Ethos Engineering	Extracted By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date	2/9/2024
Project Address:	-	Laboratory Tested By:	Keagen Mayfield
Project City:	Goodyear	Reviewed By:	Fernando Montero
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
24-1150-1	B-135 @ 5.0 - 6.0	356.6	316.0	12.8%	3	486.6	130.0	87.2
24-1150-5	B-135 @ 65.0 - 66.0	646.3	575.7	12.3%	4	821.9	175.6	119.2

ACS Services LLC

Job #	2201026	Material Type:	Soils
Lab #	24-1151	Extraction Date:	1/17/2024
Client:	Ethos Engineering	Extracted By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date	2/7/2024
Project Address:	-	Laboratory Tested By:	Keagen Mayfield
Project City:	Goodyear	Reviewed By:	Fernando Montero
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
24-1151-1	B-136 @ 5.0 - 6.0	560.4	495.8	13.0%	4	731.8	171.4	102.6
24-1151-2	B-136 @ 20.0 - 21.0	601.9	587.7	2.4%	5	824.2	222.3	97.3

ACS Services LLC

Job #	2201026	Material Type:	Soils
Lab #	24-1588	Extraction Date:	2/8/2024
Client:	Ethos Engineering	Extracted By:	Client
Project Name:	SR 303L, MC 85 to Van Buren	Laboratory Test Date	2/28/2024
Project Address:	-	Laboratory Tested By:	Keagen Mayfield
Project City:	Goodyear, AZ	Reviewed By:	Fernando Montero
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
24-1588-1	B-138 @ 5.0 - 6.0	425.5	358.4	18.7%	3	554.0	128.5	98.9

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil

JOB NO: 17-2023-4239
WORK ORDER NO: 78
DATE ASSIGNED: 7/12/24

DENSITY OF SOIL IN PLACE BY THE DRIVE-CYLINDER METHOD (ASTM D2937)

LAB #	BORING	MOISTURE			NUMBER OF RINGS	WET WEIGHT & RINGS (g)	WEIGHT OF RINGS (g)	DRY DENSITY (pcf)
		WET WT. (g)	DRY WT. (g)	MOISTURE CONTENT				
24-3226-01	B-139 (5.0-6.0')	281.6	233.9	20.4%	5	911.1	223.3	94.6

WSP USA
3630 E Wier Ave.
Phoenix, AZ 85040

REVIEWED BY 07/26/24

ACS Services LLC

Job #	2201026	Material Type:	Soils
Lab #	24-3864	Extraction Date:	7/8/2024
Client:	Ethos Engineering LLC	Extracted By:	Client
Project Name:	SR 303L, MC 85	Laboratory Test Date	7/10/2024
Project Address:	Ethos Project #: 2021037	Laboratory Tested By:	Mahalia Davis
Project City:	Goodyear	Reviewed By:	Fernando Montero
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
24-3864-5	B-139 @ 65.0 - 66.0	328.1	291.3	13%	2	415.3	87.2	120.6
24-3864-6	B-139 @ 80.0 - 81.0	Cancelled not a ring sample						

ACS Services LLC

Job #	2201026	Material Type:	Native
Lab #	24-4603	Extraction Date:	-
Client:	Ethos	Extracted By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date	9/12/2024
Project Address:	MC85 to Van Buren	Laboratory Tested By:	Keagan Mayfield
Project City:	Goodyear	Reviewed By:	Keagan Mayfield
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
24-4603-2	B-141 @ 10.0 - 11.0	385.4	337.8	14.1%	3	517.7	132.3	93.2
24-4603-5	B-141 @ 55.0 - 56.0	582.0	455.5	27.8%	4	757.9	175.9	94.3

ACS Services LLC

Job #	2201026	Material Type:	Native
Lab #	24-4604	Extraction Date:	-
Client:	Ethos	Extracted By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date	9/12/2024
Project Address:	MC85 to Van Buren	Laboratory Tested By:	Keagan Mayfield
Project City:	Goodyear	Reviewed By:	Keagan Mayfield
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
24-4604-1	B-142 @ 5.0-6.0	421.8	358.7	17.6%	3	551.4	129.6	99.0
24-4604-2	B-142 @ 20.0-21.0	633.4	610.0	3.8%	5	860.5	227.1	101.0

ACS Services LLC

Job #	2301832	Material Type:	Soils
Lab #	24-1584	Extraction Date:	2/8/2024
Client:	Ethos Engineering	Extracted By:	Client
Project Name:	SR303L, MC to Van Buren	Laboratory Test Date	2/28/2024
Project Address:	-	Laboratory Tested By:	Mahalia Davis
Project City:	Goodyear, AZ	Reviewed By:	Fernando Montero
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
24-1584-3	B-143 @ 10.0 - 11.0	377.8	342.5	10.3%	3	506.2	128.4	94.5
24-1584-4	B-143 @ 20.0 - 21.0	453.9	432.1	5.0%	4	626.8	172.9	89.4

ACS Services LLC

Job #	2201026	Material Type:	Soils
Lab #	24-1585	Extraction Date:	2/8/2024
Client:	Ethos Engineering	Extracted By:	Client
Project Name:	SR 303L, MC 85 to Van Buren	Laboratory Test Date	2/28/2024
Project Address:	-	Laboratory Tested By:	Mahalia Davis
Project City:	Goodyear, AZ	Reviewed By:	Fernando Montero
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
24-1585-2	B-144 @ 3.0 - 4.0	414.4	381.9	8.5%	3	547.3	132.9	105.4
24-1585-3	B-144 @ 15.0 - 16.0	545.9	467.4	16.8%	4	717.6	171.7	96.8
24-1585-5	B-144 @ 30.0 - 31.0	467.7	454.9	2.8%	4	640.3	172.6	94.2

ACS Services LLC

Job #	2201026	Material Type:	Soils
Lab #	24-1147	Extraction Date:	1/11/2024
Client:	Ethos Engineering	Extracted By:	Client
Project Name:	SR 303L MC 85 to Van Buren	Laboratory Test Date	1/16/2024
Project Address:	-	Laboratory Tested By:	Keagen Mayfield
Project City:	Goodyear	Reviewed By:	Fernando Montero
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
24-1147-1	B-145 @ 1.0 - 2.0	511.6	478.0	7.0%	4	684.2	172.6	98.9
24-1147-2	B-145 @ 10.0 - 11.0	513.0	445.8	15.1%	4	689.3	176.3	92.3

ACS Services LLC

Job #	2201026	Material Type:	Soils
Lab #	24-1586	Extraction Date:	2/8/2024
Client:	Ethos Engineering	Extracted By:	Client
Project Name:	SR 303L, MC 85 to Van Buren	Laboratory Test Date	2/28/2024
Project Address:	-	Laboratory Tested By:	Mahalia Davis
Project City:	Goodyear, AZ	Reviewed By:	Fernando Montero
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
24-1586-1	B-146 @ 5.0 - 6.0	523.8	470.0	11.4%	4	694.3	170.3	97.3

ACS Services LLC

Job #	2201026	Material Type:	Soils
Lab #	24-1139	Extraction Date:	12/18/2024
Client:	Ethos Engineering	Extracted By:	Client
Project Name:	SR 303L, MC 85 to Van Buren	Laboratory Test Date	1/16/2024
Project Address:	-	Laboratory Tested By:	Keagen Mayfield
Project City:	Goodyear	Reviewed By:	Fernando Montero
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
24-1139-1	B-147 @ 5.0 -6.0	397.5	351.6	13.1%	3	530.5	133.0	97.0

ACS Services LLC

Job #	2201026	Material Type:	Soils
Lab #	24-1148	Extraction Date:	12/18/2024
Client:	Ethos Engineering	Extracted By:	Client
Project Name:	SR 303L, MC 85 to Van Buren	Laboratory Test Date	1/18/2024
Project Address:	-	Laboratory Tested By:	Keagen Mayfield
Project City:	Goodyear	Reviewed By:	Fernando Montero
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
24-1148-2	B-148 @ 1.0 - 2.0	572.3	490.6	16.7%	4	746.4	174.1	101.6
24-1148-5	B-148 @ 25.0 - 26.0	586.9	458.3	28.1%	4	756.0	169.1	94.9

ACS Services LLC

Job #	2201026	Material Type:	Soils
Lab #	24-1140	Extraction Date:	12/18/2024
Client:	Ethos Engineering	Extracted By:	Client
Project Name:	SR 303L, MC 85 to Van Buren	Laboratory Test Date	1/18/2024
Project Address:	-	Laboratory Tested By:	Keagen Mayfield
Project City:	Goodyear	Reviewed By:	Fernando Montero
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
24-1140-1	B-149 @ 10.0 - 11.0	717.1	665.5	7.8%	5	929.7	212.6	110.2
24-1140-2	B-149 @ 20.0 - 21.0	604.9	479.8	26.1%	4	774.9	170.3	99.3
24-1140-4	B-150 @ 5.0 - 6.0	602.0	518.8	16.0%	4	774.0	172.0	107.4
24-1140-5	B-150 @ 15.0 - 16.0	525.9	484.9	8.5%	4	696.5	170.6	100.4

ACS Services LLC

Job #	2201026	Material Type:	Soils
Lab #	23-5851	Extraction Date:	12/13/2023
Client:	Ethos Engineering	Extracted By:	Client
Project Name:	SR 303L, MC 85 to Van Buren	Laboratory Test Date	1/10/2024
Project Address:	-	Laboratory Tested By:	Keagen Mayfield
Project City:	Goodyear	Reviewed By:	Fernando Montero
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
23-5851-1	B-151 @ 5.0 - 6.0	366.0	353.1	3.7%	3	497.5	131.5	97.5
23-5851-2	B-151 @ 20.0 - 21.0	539.5	464.0	16.3%	4	709.4	169.9	96.0
23-5851-4	B-152 @ 20.0-21.0	532.5	493.9	7.8%	4	706.4	173.9	102.2
23-5851-5	B-153 @ 5.0 - 6.0	512.4	494.6	3.6%	4	686.4	174.0	102.4

ACS Services LLC

Job #	2201026	Material Type:	Soils
Lab #	23-5852	Extraction Date:	12/12/2023
Client:	Ethos Engineering	Extracted By:	Client
Project Name:	Sr 303L, MC 85 to Van Buren	Laboratory Test Date	12/29/2024
Project Address:	-	Laboratory Tested By:	Mahalia Davis
Project City:	Goodyear	Reviewed By:	Fernando Montero
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
23-5852-2	B-154 @ 5.0 - 6.0	677.0	658.4	2.8%	5	893.2	216.2	109.0
23-5852-4	B-154 @ 20.0 - 21.0	683.5	562.9	21.4%	5	896.7	213.2	93.2
23-5852-5	B-155 @ 5.0 - 6.0	369.6	355.3	4.0%	3	503.3	133.7	98.1

ACS Services LLC

Job #	2201026	Material Type:	Soils
Lab #	23-5853	Extraction Date:	12/12/2023
Client:	Ethos Engineering	Extracted By:	Client
Project Name:	SR 303L, MC 85 to Van Buren	Laboratory Test Date	1/5/2024
Project Address:	-	Laboratory Tested By:	Keagen Mayfield
Project City:	Goodyear	Reviewed By:	Fernando Montero
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
23-5853-1	B-156 @ 10.0 - 11.0	Material untestable too loose						
23-5853-2	B-156 @ 40.0 - 41.0	645.6	504.9	27.9%	5	862.3	216.7	83.6
23-5853-6	B-157 @ 40.0 -41.0	531.7	375.2	41.7%	4	704.8	173.1	77.7
23-5853-9	B-157 @ 60.0 - 61.0	617.3	513.6	20.2%	4	790.2	172.9	106.3

ACS Services LLC

Job #	2201026	Material Type:	Soil
Lab #	23-4582	Extraction Date:	9/26/2023
Client:	Ethos	Extracted By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date	10/4/2023
Project Address:	MC85 to Van Buren	Laboratory Tested By:	Keagen Mayfield
Project City:	Goodyear	Reviewed By:	Fernando Montero
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
23-4582-4	B-158 @ 30.0 - 31.0	749.6	657.3	14.0%	5	976.0	226.4	108.8
23-4582-6	B-158 @ 60.0 - 61.5	811.7	587.0	38.3%	5	1040.2	228.5	97.2
23-4582-8	B-158 @ 75.0 - 76.5	779.6	709.9	9.8%	5	1005.3	225.7	117.6

ACS Services LLC

Job #	2201026	Material Type:	Soil
Lab #	23-4643	Extraction Date:	9/26/2023
Client:	Ethos	Extracted By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date	10/4/2023
Project Address:	MC85 to Van Buren	Laboratory Tested By:	Keagen Mayfield
Project City:	Goodyear	Reviewed By:	Fernando Montero
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
23-4643-1	B-159 @ 3.0 - 4.0	388.4	377.2	3.0%	3	520.4	132.0	104.1
23-4643-3	B-159 @ 40.0 - 41.0	587.1	492.9	19.1%	4	758.1	171.1	102.0
23-4643-4	B-159 @ 50.0 - 51.0	698.4	516.3	35.3%	5	918.2	219.8	85.5
23-4643-7	B-159 @ 65.0 - 66.0	615.6	535.7	14.9%	4	786.9	171.3	110.9

ACS Services LLC

Job #	2201026	Material Type:	Soil
Lab #	23-4644	Extraction Date:	9/26/2023
Client:	Ethos	Extracted By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date	10/4/2023
Project Address:	MC85 to Van Buren	Laboratory Tested By:	Keagen Mayfield
Project City:	Goodyear	Reviewed By:	Fernando Montero
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
23-4644-1	B-160 @ 15.0 - 16.0	536.3	481.4	11.4%	4	706.6	170.3	99.6
23-4644-3	B-160 @ 30.0 - 31.0	567.9	511.6	11.0%	4	738.1	170.2	105.9
23-4644-5	B-160 @ 45.0 - 46.0	557.8	490.2	13.8%	4	728.2	170.4	101.5

ACS Services LLC

Job #	2201026	Material Type:	Soils
Lab #	23-4579	Extraction Date:	9/26/2023
Client:	Ethos Engineering	Extracted By:	Client
Project Name:	SR 303L, MC 85 to Van Buren	Laboratory Test Date	10/4/2023
Project Address:	MC 85 to Van Buren	Laboratory Tested By:	Keagen Mayfield
Project City:	Goodyear	Reviewed By:	Fernando Montero
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
23-4579-1	B-161 @ 5.0 - 6.0	358.8	346.3	3.6%	3	489.6	130.8	95.6
23-4579-3	B-161 @ 30.0 - 31.0	686.6	613.1	12.0%	5	899.4	212.8	101.5

ACS Services LLC

Job #	2201026	Material Type:	Soil
Lab #	23-4645	Extraction Date:	9/26/2023
Client:	Ethos	Extracted By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date	10/4/2023
Project Address:	MC85 to Van Buren	Laboratory Tested By:	Keagen Mayfield
Project City:	Goodyear	Reviewed By:	Fernando Montero
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
23-4645-5	B-162 @ 50.0 - 51.0	734.8	669.3	9.8%	5	947.7	212.9	110.8
23-4645-6	B-162 @ 65.0 - 66.0	692.4	598.2	15.7%	5	904.5	212.1	99.1

ACS Services LLC

Job #	2201026	Material Type:	Soils
Lab #	23-4580	Extraction Date:	9/26/2023
Client:	Ethos Engineering	Extracted By:	Client
Project Name:	SR 303L, MC to Van Buren	Laboratory Test Date	10/4/2023
Project Address:	-	Laboratory Tested By:	Keagen Mayfield
Project City:	Goodyear	Reviewed By:	Fernando Montero
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
23-4580-1	B-163 @ 10.0 - 11.5	406.9	369.4	10.2%	3	537.9	131	102.0

ACS Services LLC

Job #	2201026	Material Type:	Soil
Lab #	23-4642	Extraction Date:	9/26/2023
Client:	Ethos	Extracted By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date	10/4/2023
Project Address:	MC85 to Van Buren	Laboratory Tested By:	Keagen Mayfield
Project City:	Goodyear	Reviewed By:	Fernando Montero
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
23-4642-2	B-164 @ 10.0 - 11.5	655.1	590.5	10.9%	4	833.4	178.3	122.2
23-4642-4	B-164 @ 40.0 - 41.5	737.4	631.5	16.8%	5	960.4	223.0	104.6
23-4642-7	B-164 @ 90.0 - 91.5	809.2	696.1	16.2%	5	1036.8	227.6	115.3

ACS Services LLC

Job #	2201026	Material Type:	Soil
Lab #	23-4646	Extraction Date:	9/26/2023
Client:	Ethos	Extracted By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date	10/4/2023
Project Address:	MC85 to Van Buren	Laboratory Tested By:	Keagen Mayfield
Project City:	Goodyear	Reviewed By:	Fernanod Montero
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
23-4646-1	B-165 @ 5.0 - 6.0	354.0	345.8	2.4%	3	489.8	135.8	95.4

ACS Services LLC

Job #	2201026	Material Type:	Soils
Lab #	23-4581	Extraction Date:	9/26/2023
Client:	Ethos Engineering	Extracted By:	Client
Project Name:	SR 303L, MC85 to Van Buren	Laboratory Test Date	10/4/2023
Project Address:	MC 85 to Van Buren	Laboratory Tested By:	Keagen Mayfield
Project City:	Goodyear	Reviewed By:	Fernando Montero
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
23-4581-4	B-166 @ 30.0 - 31.0	756.3	658.5	14.9%	5	977.5	221.2	109.0
23-4581-5	B-166 @ 45.0 - 46.0	638.2	558.3	14.3%	4	816.2	178.0	115.6
23-4581-7	B-166 @ 65.0 - 66.0	596.9	477.5	25.0%	4	775.8	178.9	98.8

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil

JOB NO: 17-2023-4239
WORK ORDER NO: 35
DATE ASSIGNED:

DENSITY OF SOIL IN PLACE BY THE DRIVE-CYLINDER METHOD (ASTM D2937)

LAB #	BORING	MOISTURE			NUMBER OF RINGS	WET WEIGHT & RINGS (g)	WEIGHT OF RINGS (g)	DRY DENSITY (pcf)
		WET WT. (g)	DRY WT. (g)	MOISTURE CONTENT				
23-2265-01	B-167 (10.0-11.0')	288.2	284.0	1.5%	6	1,013.2	258.1	102.7

WSP USA
3630 E Wier Ave.
Phoenix, AZ 85040

REVIEWED BY

ACS Services LLC

Job #	2201026	Material Type:	Soils
Lab #	23-5841	Extraction Date:	12/12/2023
Client:	Ethos Engineering	Extracted By:	Client
Project Name:	SR 303L, MC 85 to Van Buren	Laboratory Test Date	12/22/2024
Project Address:	-	Laboratory Tested By:	Mahalia Davis
Project City:	Goodyear	Reviewed By:	Fernando Montero
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
23-5841-3	B-167 @ 25.0 - 26.0	564.3	498.8	13.1%	4	734.8	170.5	103.3
23-5841-5	B-167 @ 50.0 - 51.0	735.2	642.1	14.5%	5	951.1	215.9	106.3
23-5841-8	B-168 @ 30.0 - 31.0	517.0	424.6	21.8%	4	693.2	176.2	87.9

ACS Services LLC

Job #	2201026	Material Type:	Soils
Lab #	23-5842	Extraction Date:	12/12/2023
Client:	Ethos Engineering	Extracted By:	Client
Project Name:	SR 303L, MC 85 to Van Buren	Laboratory Test Date	12/22/2024
Project Address:	-	Laboratory Tested By:	Keagen Mayfield
Project City:	Goodyear	Reviewed By:	Fernando Montero
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
23-5842-1	B-169 @ 3.0 - 4.0	Material too coarse to test						
23-5842-2	B-169 @ 25.0 - 25.5	542.3	532.5	1.8%	4	715.6	173.3	110.2
23-5842-8	B-170 @ 35.0 - 36.0	651.1	600.1	8.5%	5	873.5	222.4	99.4

ACS Services LLC

Job #	2201026	Material Type:	Soils
Lab #	23-5843	Extraction Date:	12/12/2023
Client:	Ethos Engineering	Extracted By:	Client
Project Name:	Sr 303L, MC 85 to Van Buren	Laboratory Test Date	12/22/2024
Project Address:	-	Laboratory Tested By:	Keagen Mayfield
Project City:	Goodyear	Reviewed By:	Fernando Montero
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
23-5843-2	B-171 @ 1.0 - 2.0	372.1	350.1	6.3%	3	499.7	127.6	96.6
23-5843-3	B-171 @ 10.0 - 11.0	561.5	550.4	2.0%	4	739.7	178.2	113.9
23-5843-4	B-171 @ 25.0 - 26.0	557.0	451.5	23.4%	4	730.6	173.6	93.5
23-5843-6	B-171 @ 55.0 - 56.0	565.5	475.7	18.9%	4	739.0	173.5	98.5

ACS Services LLC

Job #	2201026	Material Type:	Soils
Lab #	23-5407	Extraction Date:	11/6/2023
Client:	Ethos Engineering	Extracted By:	Client
Project Name:	SR 303L, MC 85 to Van Buren	Laboratory Test Date	11/21/2023
Project Address:	-	Laboratory Tested By:	Mahalia Davis
Project City:	Goodyear, AZ	Reviewed By:	Fernando Montero
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
23-5407-1	B-172 @ 10.0 - 11.0	387.7	373.9	3.7%	3	515.9	128.2	103.2
23-5407-2	B-172 @ 25.0 - 26.0	577.4	462.5	24.8%	4	748.3	170.9	95.7
23-5407-5	B-172 @ 55.0 - 56.0	732.6	656.2	11.6%	5	946.6	214.0	108.7
23-5407-7	B-172 @ 65.0 - 66.0	973.3	841.0	15.7%	6	1230.5	257.2	116.1

ACS Services LLC

Job #	2201026	Material Type:	Soils
Lab #	23-5408	Extraction Date:	11/6/2023
Client:	Ethos Engineering	Extracted By:	Client
Project Name:	SR 303l, MC 85 to Van Buren	Laboratory Test Date	11/22/2023
Project Address:	-	Laboratory Tested By:	Keagen Mayfield
Project City:	Goodyear, AZ	Reviewed By:	Fernando Montero
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
23-5408-1	B-173 @ 5.0 - 6.0	408.0	388.0	5.2%	3	535.8	127.8	107.1
23-5408-4	B-173 @ 35.0 - 36.0	735.1	646.8	13.7%	5	947.9	212.8	107.1
23-5408-8	B-173 @ 65.0 - 66.0	798.7	688.1	16.1%	5	1012.4	213.7	113.9

ACS Services LLC

Job #	2201026	Material Type:	Soils
Lab #	23-5409	Extraction Date:	11/6/2023
Client:	Ethos Engineering	Extracted By:	Client
Project Name:	SR 303L, MC 85 to Van Buren	Laboratory Test Date	11/21/2023
Project Address:	-	Laboratory Tested By:	Keagen Mayfield
Project City:	Goodyear, AZ	Reviewed By:	Fernando Montero
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
23-5409-1	B-174 @ 1.0 - 2.0	346.2	335.9	3.1%	3	480.6	134.4	92.7
23-5409-4	B-174 @ 25.0 - 26.0	529.4	475.1	11.4%	4	700.0	170.6	98.3
23-5409-6	B-174 @ 60.0 - 61.0	Material too rocky						
23-5409-7	B-174 @ 75.0 - 76.0	620.4	526.8	17.8%	4	801.5	181.1	109.0

ACS Services LLC

Job #	2201026	Material Type:	Soils
Lab #	23-4761	Extraction Date:	10/2/2023
Client:	Ethos Engineering	Extracted By:	Client
Project Name:	SR 303L, MC 85 to Van Buren	Laboratory Test Date	10/7/2023
Project Address:	-	Laboratory Tested By:	Keagen Mayfield
Project City:	Goodyear	Reviewed By:	Fernando Montero
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
23-4761-3	B - 176 @ 45.0 - 46.0	426.4	365.1	16.8%	3	559.4	133.0	100.8
23-4761-4	B - 176 @ 60.0 - 61.0	529.8	489.8	8.2%	4	700.3	170.5	101.4

ACS Services LLC

Job #	2201026	Material Type:	Soils
Lab #	23-4762	Extraction Date:	10/2/2023
Client:	Ethos Engineering	Extracted By:	Client
Project Name:	SR 303L, MC 85 to Van Buren	Laboratory Test Date	10/7/2023
Project Address:	-	Laboratory Tested By:	Keagen Mayfield
Project City:	Goodyear	Reviewed By:	Fernando Montero
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
23-4762-1	B - 178 @ 10.0 - 11.0	381.0	374.3	1.8%	3	512.0	131.0	103.3
23-4762-3	B - 178 @ 40.0 - 41.0	616.8	584.1	5.6%	5	841.8	225.0	96.7
23-4762-7	B - 178 @ 70.0 - 71.0	753.8	630.2	19.6%	5	967.8	214.0	104.4
23-4762-8	B - 178 @ 100.0 - 101.0	769.7	635.0	21.2%	5	985.9	216.2	105.2

ACS Services LLC

Job #	2201026	Material Type:	Soils
Lab #	23-4763	Extraction Date:	10/2/2023
Client:	Ethos Engineering	Extracted By:	Client
Project Name:	SR 303L, MC 85 to Van Buren	Laboratory Test Date	10/7/2023
Project Address:	-	Laboratory Tested By:	Keagen Mayfield
Project City:	Goodyear	Reviewed By:	Fernando Montero
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
23-4763-1	B - 179 @ 0.0 - 1.0	376.2	360.6	4.3%	3	501.5	125.3	99.5
23-4763-5	B - 179 @ 45.0 - 46.0	580.1	486.8	19.2%	4	750.8	170.7	100.8

ACS Services LLC

Job #	2201026	Material Type:	Soils
Lab #	23-4765	Extraction Date:	10/2/2023
Client:	Ethos Engineering	Extracted By:	Client
Project Name:	SR 303L, MC 85 to Van Buren	Laboratory Test Date	10/8/2023
Project Address:	-	Laboratory Tested By:	Mahalia Davis
Project City:	Goodyear	Reviewed By:	Fernando Montero
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
23-4765-2	B - 181 @ 10.0 - 11.0	654.4	628.8	4.1%	5	867.4	213.0	104.1
23-4765-4	B - 181 @ 25.0 - 26.0	555.3	458.5	21.1%	4	726.1	170.8	94.9

ACS Services LLC

Job #	2201026	Material Type:	Soils
Lab #	23-4767	Extraction Date:	10/2/2023
Client:	Ethos Engineering	Extracted By:	Client
Project Name:	SR 303L, MC 85 to Van Buren	Laboratory Test Date	10/8/2023
Project Address:	-	Laboratory Tested By:	James Karl
Project City:	Goodyear	Reviewed By:	Fernando Montero
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
23-4767-1	B - 183 @ 1.0 - 2.0	Material too loose in rings sample untestable.						
23-4767-5	B - 183 @ 40.0 - 41.0	515.4	487.7	5.7%	4	686.3	170.9	101.0
23-4767-6	B - 183 @ 55.0 - 56.0	432.0	414.0	4.3%	3	560.0	127.9	114.3
23-4767-7	B - 183 @ 70.0 - 71.0	655.0	574.6	14.0%	4	825.2	170.2	118.9

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil

JOB NO: 17-2023-4239
WORK ORDER NO: 10
DATE ASSIGNED: 10/13/23

MOISTURE CONTENT OF SOIL (ASTM D2216)

LAB #	BORING & DEPTH	WET WT. (gram)	DRY WT. (gram)	MOISTURE CONTENT
23-2029-02	B-183 (10.0-11.0')	421.4	406.5	3.7%
23-2029-03	B-184 (25.0-26.0')	491.9	460.6	6.8%

WSP USA
3630 E Wier Ave.
Phoenix, AZ 85040

REVIEWED BY

ACS Services LLC

Job #	2201026	Material Type:	Soils
Lab #	23-4768	Extraction Date:	10/2/2023
Client:	Eths Engineering	Extracted By:	Client
Project Name:	SR 303L, MC 85 to Van Buren	Laboratory Test Date	10/9/2023
Project Address:	-	Laboratory Tested By:	Keagen Mayfield
Project City:	Goodyear	Reviewed By:	Fernando Montero
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
23-4768-1	B - 184 @ 1.0 - 2.0	370.8	349.3	6.2%	3	498.6	127.8	96.4
23-4768-2	B - 184 @ 10.0 - 11.0	570.8	549.4	3.9%	4	741.0	170.2	113.7
23-4768-5	B - 184 @ 40.0 - 41.0	523.7	452.2	15.8%	4	694.2	170.5	93.6
23-4768-6	B - 184 @ 55.0 - 56.0	687.8	602.1	14.2%	5	900.5	212.7	99.7
23-4768-8	B - 184 @ 70.0 - 71.0	851.4	714.1	19.2%	5	1064.1	212.7	118.3

ACS Services LLC

Job #	2201026	Material Type:	Soils
Lab #	23-4769	Extraction Date:	10/2/2023
Client:	Ethos Engineering	Extracted By:	Client
Project Name:	SR 303L, MC 85 to Van Buren	Laboratory Test Date	10/17/2023
Project Address:	-	Laboratory Tested By:	Keagen Mayfield
Project City:	Goodyear	Reviewed By:	Fernando Montero
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
23-4769-2	B - 185 @ 25.0 - 26.5	598.1	525.3	13.9%	4	768.6	170.5	108.7
23-4769-5	B - 185 @ 40.0 - 41.5	417.0	378.0	10.3%	4	595.0	178.6	78.1

ACS Services LLC

Job #	2201026	Material Type:	Soils
Lab #	23-4770	Extraction Date:	10/2/2023
Client:	Ethos Engineering	Extracted By:	Client
Project Name:	SR 303L, MC 85 to Van Buren	Laboratory Test Date	10/17/2023
Project Address:	-	Laboratory Tested By:	Keagen Mayfield
Project City:	Goodyear	Reviewed By:	Fernando Montero
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
23-4770-2	B - 186 @ 10.0 - 11.0	489.6	457.9	6.9%	4	664.9	175.3	94.8
23-4770-5	B - 186 @ 40.0 - 41.0	534.7	482.8	10.7%	4	708.5	173.8	99.9

ACS Services LLC

Job #	2201026	Material Type:	Soils
Lab #	23-5845	Extraction Date:	12/12/2023
Client:	Ethos Engineering	Extracted By:	Client
Project Name:	Sr 303L, MC 85 to Van Buren	Laboratory Test Date	12/22/2024
Project Address:	-	Laboratory Tested By:	Keagen Mayfield
Project City:	Goodyear	Reviewed By:	Fernando Montero
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
23-5845-2	B-187 @ 10.0 - 11.0	408.8	396.8	3.0%	3	540.5	131.7	109.5
23-5845-3	B-187 @ 25.0 - 26.0	522.9	485.9	7.6%	4	693.0	170.1	100.6
23-5845-4	B-187 @ 40.0 - 41.0	532.0	478.6	11.2%	4	711.3	179.3	99.1
23-5845-6	B-187 @ 55.0 - 56.0	523.0	497.3	5.2%	4	693.4	170.4	102.9
23-5845-7	B-187 @ 70.0 - 71.0	599.6	510.7	17.4%	4	769.6	170.0	105.7

ACS Services LLC

Job #	2201026	Material Type:	Soils
Lab #	23-5846	Extraction Date:	12/12/2023
Client:	Ethos Engineering	Extracted By:	Client
Project Name:	SR 303L, MC 85 to Van Buren	Laboratory Test Date	12/28/2024
Project Address:	-	Laboratory Tested By:	Keagen Mayfield
Project City:	Goodyear	Reviewed By:	Fernando Montero
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
23-5846-5	B-188 @ 60.0 - 61.0	545.3	484.1	12.6%	4	724.4	179.1	100.2

ACS Services LLC

Job #	2201026	Material Type:	Native
Lab #	24-4606	Extraction Date:	-
Client:	Ethos	Extracted By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date	9/12/2024
Project Address:	MC85 to Van Buren	Laboratory Tested By:	Keagan Mayfield
Project City:	Goodyear	Reviewed By:	Keagan Mayfield
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
24-4606-1	B-189 @ 5.0 - 6.0	365.9	352.3	3.9%	3	500.2	134.3	97.2
24-4606-2	B-189 @ 25.0 - 26.0	538.3	491.0	9.6%	4	717.3	179.0	101.6
24-4606-4	B-189 @ 40.0 - 41.0	515.6	471.9	9.3%	4	685.7	170.1	97.7

ACS Services LLC

Job #	2201026	Material Type:	Soils
Lab #	23-5847	Extraction Date:	12/28/2023
Client:	Ethos Engineering	Extracted By:	Client
Project Name:	SR 303L, MC 85 to Van Buren	Laboratory Test Date	1/8/2024
Project Address:	-	Laboratory Tested By:	Keagen Mayfield
Project City:	Goodyear	Reviewed By:	Fernando Montero
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
23-5847-2	B-190 @ 3.0 - 4.0	537.6	529.3	1.6%	4	715.3	177.7	109.6
23-5847-3	B-191 @ 5.0 - 6.0	426.3	397.2	7.3%	3	560.8	134.5	109.6
23-5847-4	B-192 @ 5.0 - 6.0	399.0	385.7	3.4%	3	532.4	133.4	106.5

ACS Services LLC

Job #	2201026	Material Type:	Soils
Lab #	23-5848	Extraction Date:	12/12/2023
Client:	Ethos Engineering	Extracted By:	Client
Project Name:	SR 303L, MC to Van Buren	Laboratory Test Date	1/8/2024
Project Address:	-	Laboratory Tested By:	Keagen Mayfield
Project City:	Goodyear	Reviewed By:	Fernando Montero
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
23-5848-2	B-194 @ 5.0 - 6.0	257.5	227.4	13.2%	2	348.6	91.1	94.1
23-5848-4	B-195 @ 5.0 - 6.0	525.6	504.0	4.3%	4	701.4	175.8	104.3

ACS Services LLC

Job #	2201026	Material Type:	Soils
Lab #	23-5849	Extraction Date:	12/12/2023
Client:	Ethos Engineering	Extracted By:	Client
Project Name:	SR 303L, MC 85 to Van Buren	Laboratory Test Date	12/28/2024
Project Address:	-	Laboratory Tested By:	Keagen Mayfield
Project City:	Goodyear	Reviewed By:	Fernando Montero
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
23-5849-1	B-196 @ 10.0 - 11.0	537.0	508.2	5.7%	4	719.2	182.2	105.2
23-5849-2	B-196 @ 25.0 - 26.0	675.5	584.9	15.5%	5	889.3	213.8	96.9
23-5849-3	B-197 @ 1.0 - 2.0	685.0	637.1	7.5%	5	908.5	223.5	105.5

ACS Services LLC

Job #	2201026	Material Type:	Native
Lab #	24-5282	Extraction Date:	
Client:	Ethos	Extracted By:	
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date	10/30/2024
Project Address:	MC85 to Van Buren	Laboratory Tested By:	Keagen Mayfield
Project City:	Goodyear	Reviewed By:	Andrew Jamrogiewicz, P.E.
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
24-5282-2	B-196A @ 5-6	423.7	405.2	4.6%	3	559.8	136.1	111.8

ACS Services LLC

Job #	2201026	Material Type:	Native
Lab #	24-5283	Extraction Date:	
Client:	Ethos	Extracted By:	
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date	10/25/2024
Project Address:	MC85 to Van Buren	Laboratory Tested By:	Keagen Mayfield
Project City:	Goodyear	Reviewed By:	Andrew Jamrogiewicz, P.E.
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
24-5283-1	B-196B @ 3 - 4	396.0	381.3	3.9%	3	524.7	128.7	105.2

ACS Services LLC

Job #	2201026	Material Type:	Native
Lab #	24-5284	Extraction Date:	
Client:	Ethos	Extracted By:	
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date	10/30/2024
Project Address:	MC85 to Van Buren	Laboratory Tested By:	Keagen Mayfield
Project City:	Goodyear	Reviewed By:	Andrew Jamrogiewicz, P.E.
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
24-5284-4	B-196C @ 15 - 15.5	600.1	552.6	8.6%	4	771.5	171.4	114.4

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ B-196C @ 5 - 6
MATERIAL: Native Soil

JOB NO: 17-2023-4239
WORK ORDER NO: 93
DATE ASSIGNED: 10/24/24

DENSITY OF SOIL IN PLACE BY THE DRIVE-CYLINDER METHOD (ASTM D2937)

		MOISTURE						
LAB #	BORING	WET WT. (g)	DRY WT. (g)	MOISTURE CONTENT	NUMBER OF RINGS	WET WEIGHT & RINGS (g)	WEIGHT OF RINGS (g)	DRY DENSITY (pcf)
24-3877	B-196C @ 5 - 6 ACS Lab #24-5284-2	278.3	261.7	6.3%	6	1,040.5	257.5	101.6

WSP USA
3630 E Wier Ave.
Phoenix, AZ 85040

REVIEWED BY _____ 11/05/24

ACS Services LLC

Job #	2201026	Material Type:	Native
Lab #	24-5285	Extraction Date:	
Client:	Ethos	Extracted By:	
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date	10/25/2024
Project Address:	MC85 to Van Buren	Laboratory Tested By:	Keagen Mayfield
Project City:	Goodyear	Reviewed By:	Andrew Jamrogiewicz, P.E.
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
24-5285-2	B-196D @ 1 - 2	487.0	443.9	9.7%	3	615.7	128.7	122.5
24-5285-3	B-196D @ 10 - 11	618.3	566.3	9.2%	4	789.6	171.3	117.2

ACS Services LLC

Job #	2201026	Material Type:	Soils
Lab #	23-5850	Extraction Date:	12/12/2023
Client:	Ethos Engineering	Extracted By:	Client
Project Name:	SR 303L, MC 85 to Van Buren	Laboratory Test Date	12/29/2024
Project Address:	-	Laboratory Tested By:	Keagen Mayfield
Project City:	Goodyear	Reviewed By:	Fernando Montero
Material Source:	-		

Density of Soil in Place by the Drive-Cylinder Method (ASTM D2937)

ID #	Sample Location	Wet Wt. (g)	Moisture Dry Wt. (g)	**Moist Content**	# Of Rings	Wet Wt'+Rings (g)	Wt. of Rings (g)	**Dry Density (pcf)**
23-5850-1	B-198 @ 1.0 - 2.0	563.5	524.5	7.4%	4	734.8	171.3	108.6
23-5850-2	B-198 @ 10.0 - 11.0	414.2	385.4	7.5%	3	545.1	130.9	106.4
23-5850-4	B-198 @ 25.0 - 26.0	562.2	469.1	19.8%	4	740.2	178.0	97.1
23-5850-6	B-199 @ 1.0 - 2.0	445.9	419.6	6.3%	3	572.5	126.6	115.8
23-5850-8	B-199 @ 25.0 - 26.0	696.5	654.9	6.4%	5	909.3	212.8	108.5
23-5850-10	B-199 @ 40.0 - 40.9	658.9	620.9	6.1%	5	880.6	221.7	102.8

ACS Services LLC

Direct Shear Under Consolidated Drained Conditions
ASTM D3080-11

ACS Project #	**2201026**	Material Type:	Ring
ACS Lab #	**22-2316**	Sample Date:	-
Client Name:	**Ethos**	Sampled By:	Client
Project Name:	**SR 303L MC85 to Van Buren**	Laboratory Test Date:	44697
Project Address:	**MC85 to Van Buren**	Laboratory Test By:	Brian Karl
Project City:	**Goodyear**	Reviewed By:	Dylan Ward
Sample Source:	**B-6 @ 35-36**		

Sample Preparation: Specimen extracted from ring sample taken in the field using the labs jack. The specimen was consolidated at the normal stress until consolidation was completed prior to shearing.

Initial Parameters of Specimen

	Point 1	Point 2	Point 3
Normal Stress (ksf):	2	4	8
Dry mass (g):	105.4	115.6	114
Height (in.):	1	1	1
Diameter (in.):	2.42	2.42	2.42
Moisture (%):	25.7	24.1	20.3
Dry Density (pcf):	87.3	95.7	94.4
Saturation (%):	76	88	72
Void Ratio (%):	0.89	0.73	0.75

Final Parameters of Specimen

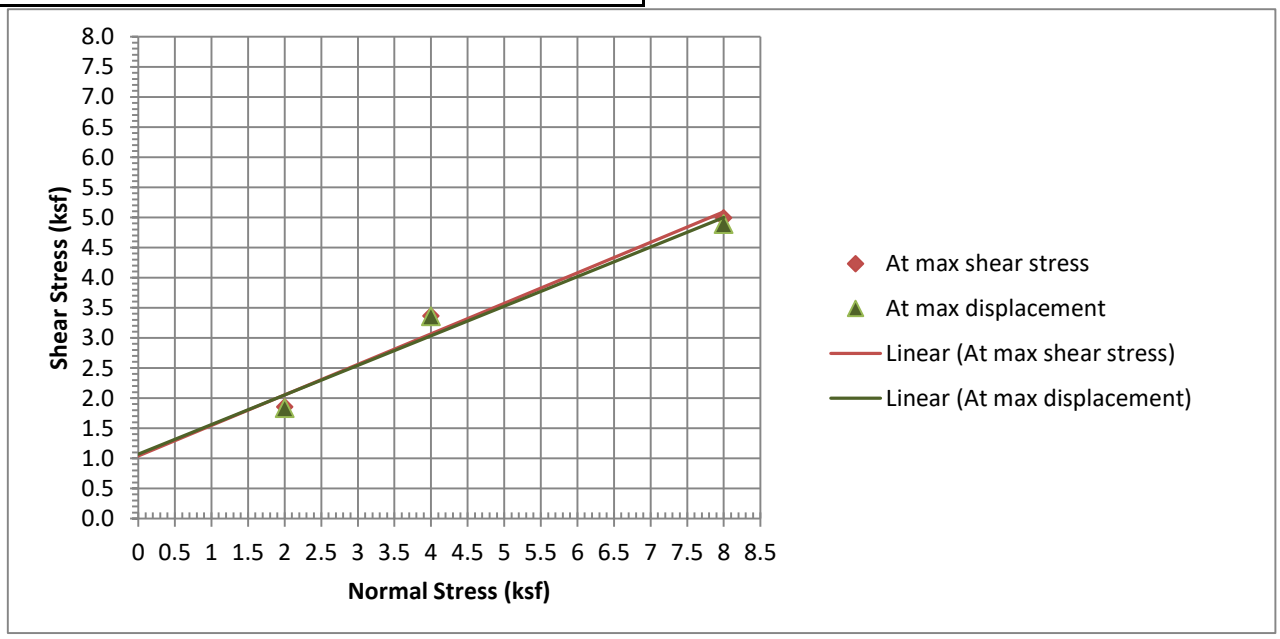
	Point 1	Point 2	Point 3
Normal Stress (ksf):	2	4	8
Dry mass (g):	105.4	115.6	114
Height (in.):	0.995	1.0019	1.0217
Diameter (in.):	2.42	2.42	2.42
Moisture (%):	25.7	24.1	20.3
Dry Density (pcf):	87.7	95.5	92.4
Saturation (%):	76	88	72
Void Ratio (%):	0.89	0.73	0.79

Results from Experimentation

	Point 1	Point 2	Point 3
Normal Stress (ksf):	2	4	8
Max. Shear Stress (ksf)	1.853	3.366	4.993
Displacement at Max Shear (in.):	-0.005	0.0019	0.0217
Shear Stress at Max Displ. (ksf):	1.835	3.359	4.890
Maximum Displacement (in.):	-0.0061	0.002	-0.0242
Rate of Deformation (in./min):	0.001	0.001	0.001

	Friction Angle	Cohesion (ksf)
At Max Shear Stress:	26.9	1.039
At Max Displacement:	26.2	1.069

Shear Device: Karol Warner Model 2001-D, Pneumatic load



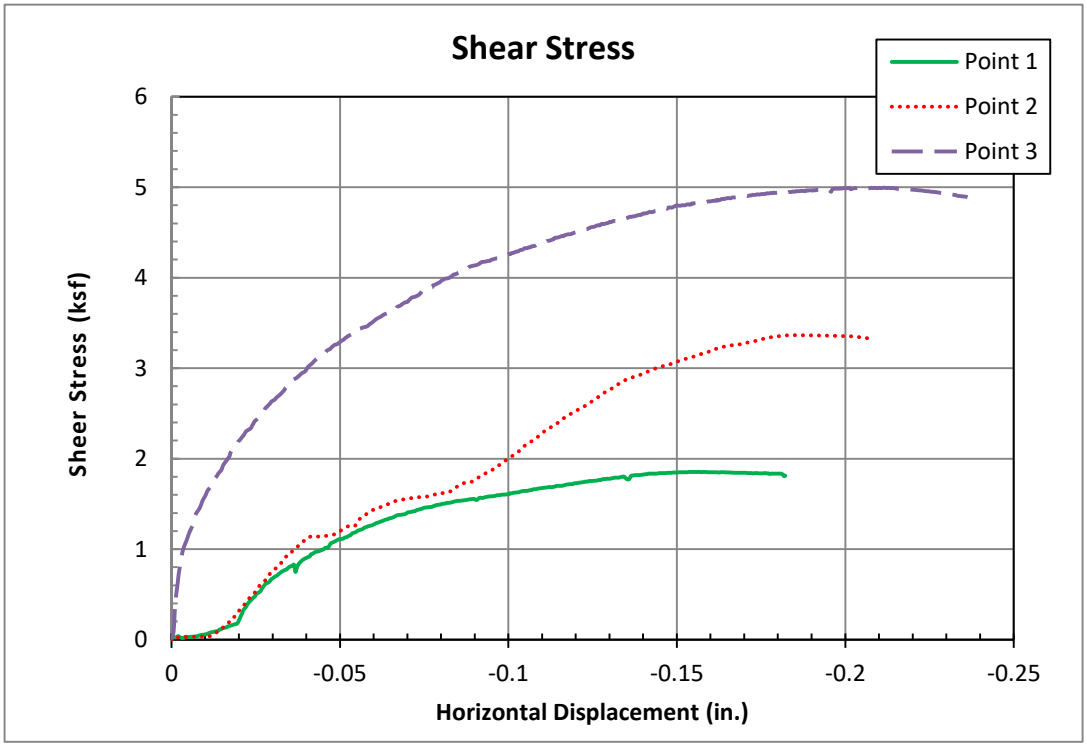
Operations Manager

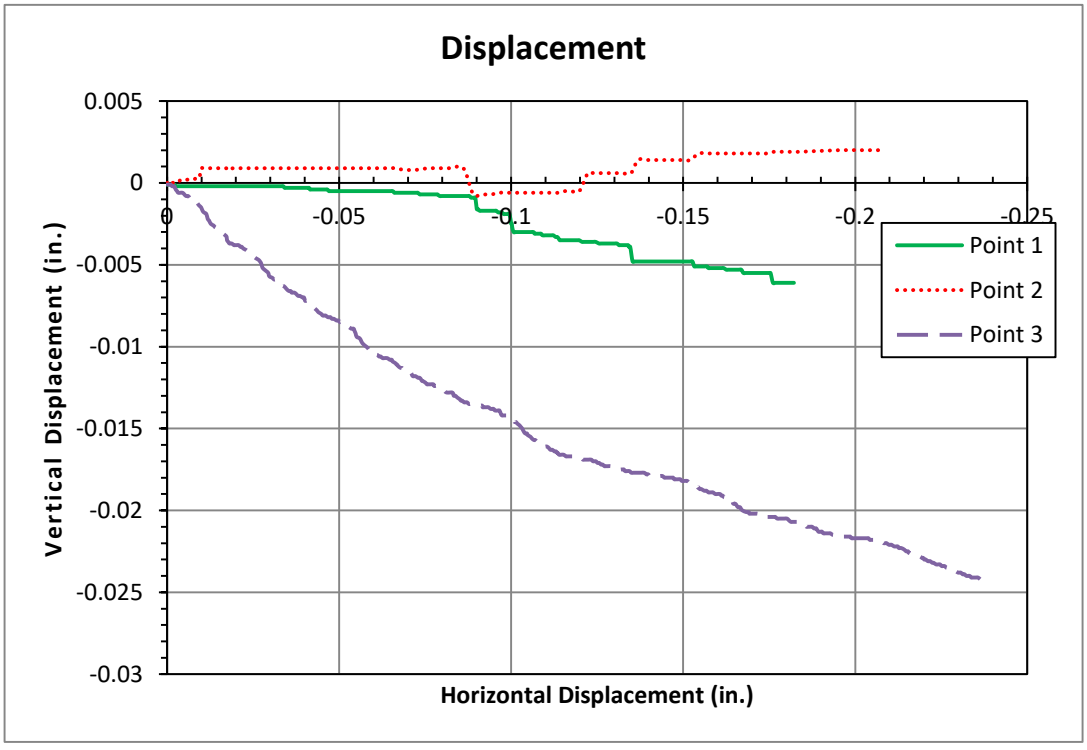
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ACS Services LLC

Direct Shear Under Consolidated Drained Conditions
ASTM D3080-11

ACS Project #	**2201026**	Material Type:	Ring
ACS Lab #	**22-2316**	Sample Date:	-
Client Name:	**Ethos**	Sampled By:	Client
Project Name:	**SR 303L MC85 to Van Buren**	Laboratory Test Date:	44697
Project Address:	**MC85 to Van Buren**	Laboratory Test By:	Brian Karl
Project City:	**Goodyear**	Reviewed By:	Dylan Ward
Sample Source:	**B-6 @ 35-36**		





Operations Manager

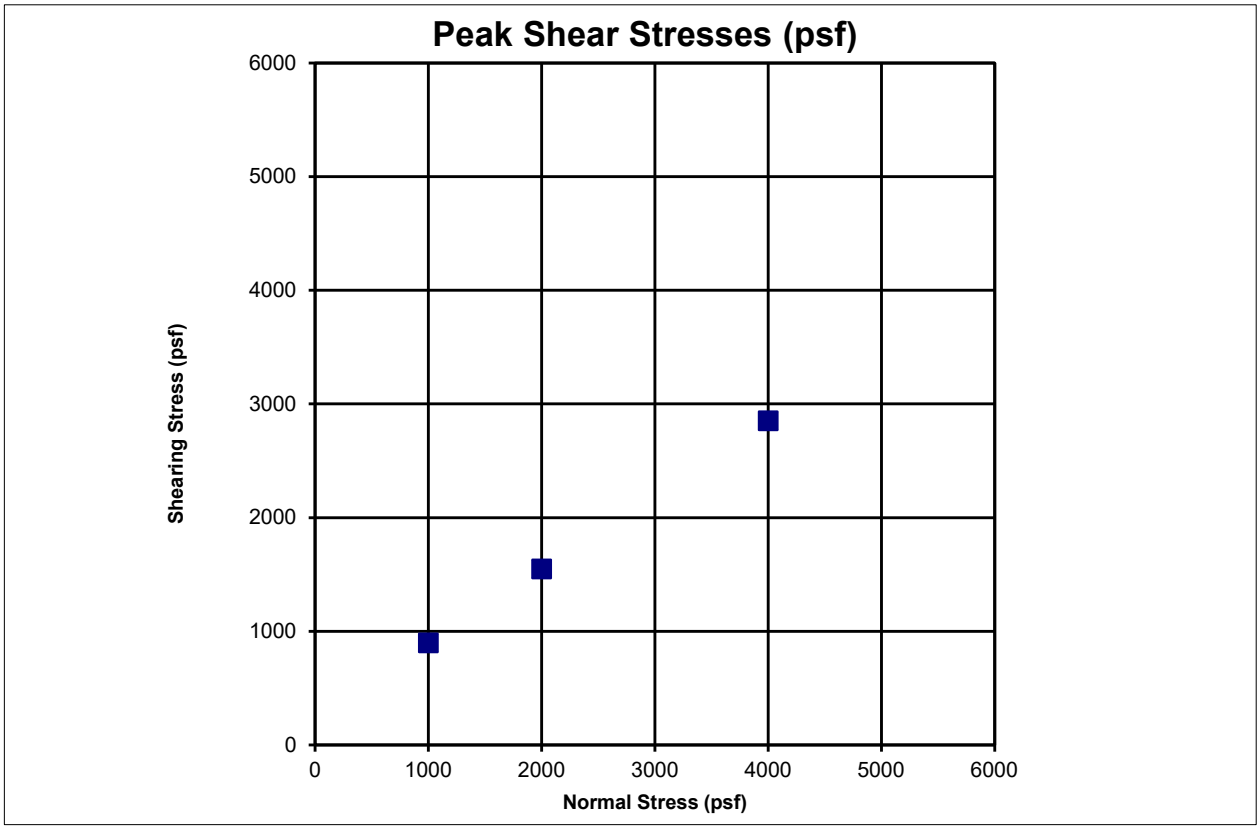
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PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: ACS Lab #22-1802-3 / B-10 (40.0-41.0')
SAMPLE PREPARATION: In Situ - 1, 2, and 4 ksf

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1302-01
DATE ASSIGNED: 4/15/2022

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.999	0.998	0.998
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.01	0.01	0.01
Direct shear point:	1	2	3
Dry mass of specimen (g):	112.5	113.4	119.8
Initial Moisture Content:	10.3%	8.7%	9.1%
Initial Wet Density (pcf):	102.8	102.1	108.3
Initial Dry Density (pcf):	93.2	93.9	99.2
Final Moisture Content:	8.7%	7.7%	7.9%
Final Wet Density (pcf):	101.4	101.3	107.3
Final Dry Density (pcf):	93.3	94.1	99.4
Normal Stress (psf):	1000	2000	4000
Maximum Shearing Stress (psf):	898	1549	2853
Vertical Deformation @ Max Shear (in):	0.254	0.301	0.284
Horizontal Deformation @ Max Shear (in):	0.050	0.138	0.102



Wood Environment & Infrastructure Solutions, Inc.
3630 E Wier Ave.
Phoenix, AZ 85040

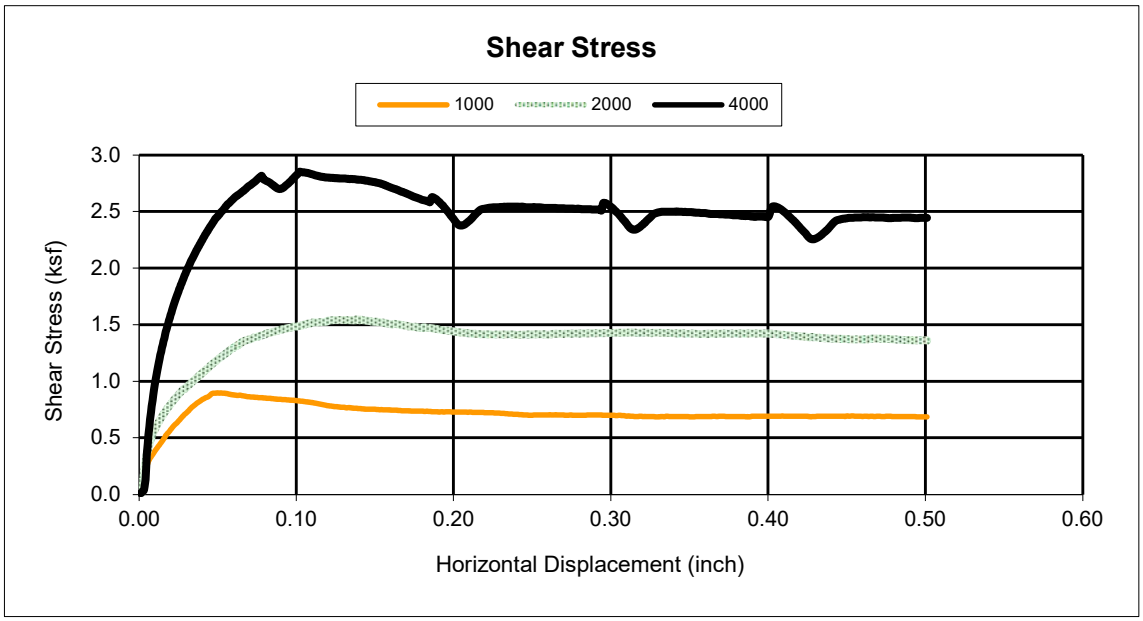
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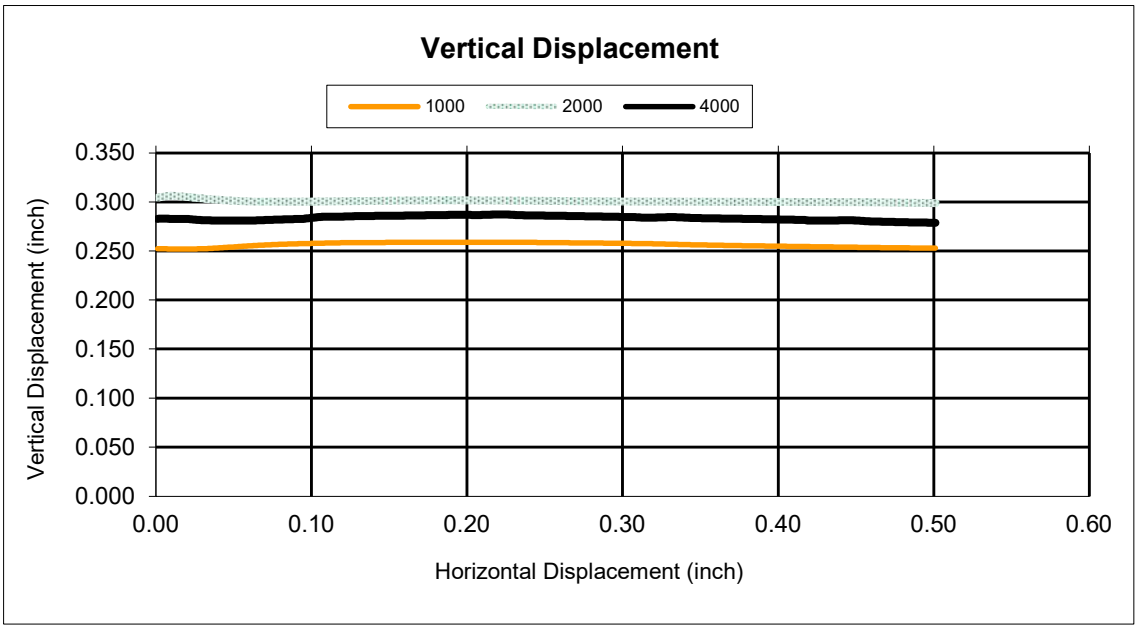
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: ACS Lab #22-1802-3 / B-10 (40.0-41.0')
SAMPLE PREPARATION: In Situ - 1, 2, and 4 ksf

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1302-01
DATE ASSIGNED: 4/15/2022

NORMAL LOADS (psf): 1000 2000 4000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





Wood Environment & Infrastructure Solutions, Inc.
3630 E Wier Ave.
Phoenix, AZ 85040

ACS Services LLC

Direct Shear Under Consolidated Drained Conditions
ASTM D3080-11

ACS Project #	**2201026**	Material Type:	Native/Geo
ACS Lab #	**22-1456**	Sample Date:	-
Client Name:	**Ethos**	Sampled By:	Client
Project Name:	**SR 303L MC85 to Van Buren**	Laboratory Test Date:	44614
Project Address:	**MC85 to Van Buren**	Laboratory Test By:	Brian Karl
Project City:	**Goodyear**	Reviewed By:	Dylan Ward
Sample Source:	**B12 @ 35.0'-36.0'**		

Sample Preparation: Specimen extracted from ring sample taken in the field using the labs jack. The specimen was consolidated at the normal stress until consolidation was completed prior to shearing.

Initial Parameters of Specimen

	Point 1	Point 2	Point 3
Normal Stress (ksf):	1	2	4
Dry mass (g):	97.7	89.7	84.9
Height (in.):	1	1	1
Diameter (in.):	2.42	2.42	2.42
Moisture (%):	36.6	39.4	41.6
Dry Density (pcf):	80.9	74.3	70.3
Saturation (%):	93	85	82
Void Ratio (%):	1.04	1.23	1.35

Final Parameters of Specimen

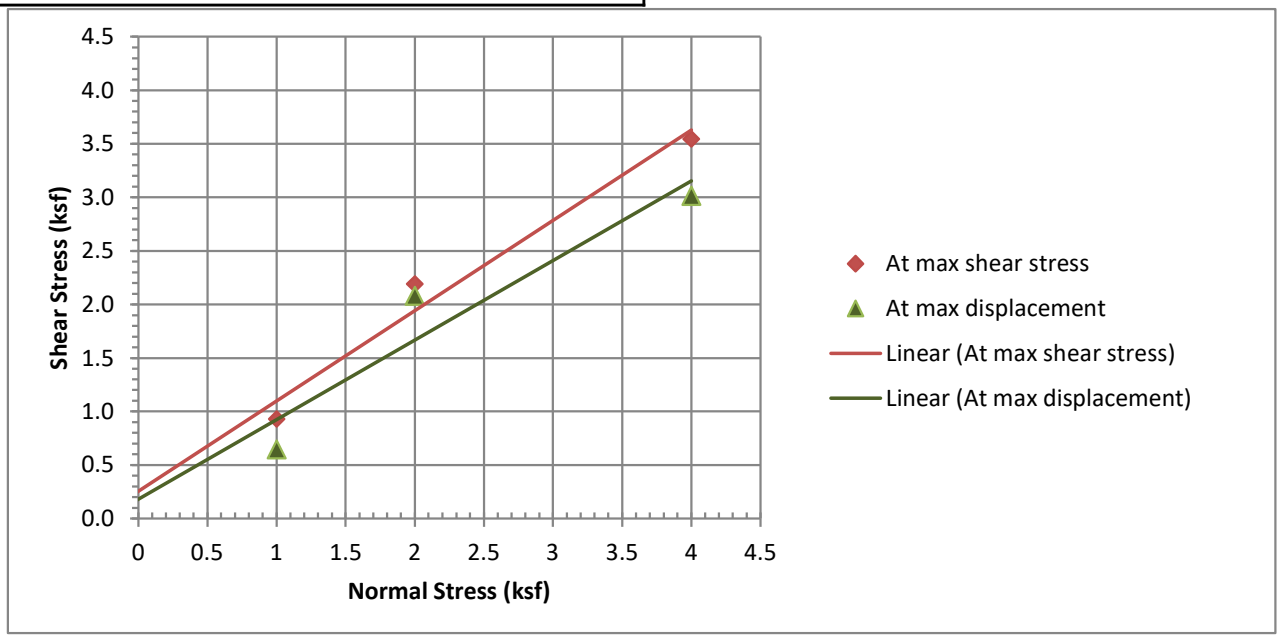
	Point 1	Point 2	Point 3
Normal Stress (ksf):	1	2	4
Dry mass (g):	97.7	89.7	84.9
Height (in.):	0.978	0.9303	0.9039
Diameter (in.):	2.42	2.42	2.42
Moisture (%):	43.9	53.4	53
Dry Density (pcf):	82.7	79.8	77.8
Saturation (%):	100	100	100
Void Ratio (%):	1.00	1.07	1.13

Results from Experimentation

	Point 1	Point 2	Point 3
Normal Stress (ksf):	1	2	4
Max. Shear Stress (ksf)	0.930	2.191	3.544
Displacement at Max Shear (in.):	-0.022	-0.0697	-0.0961
Shear Stress at Max Displ. (ksf):	0.646	2.082	3.015
Maximum Displacement (in.):	0.0028	0.0038	-0.011
Rate of Deformation (in./min):	0.001	0.001	0.001

	Friction Angle	Cohesion (ksf)
At Max Shear Stress:	40.1	0.254
At Max Displacement:	36.6	0.179

Shear Device: Karol Warner Model 2001-D, Pneumatic load



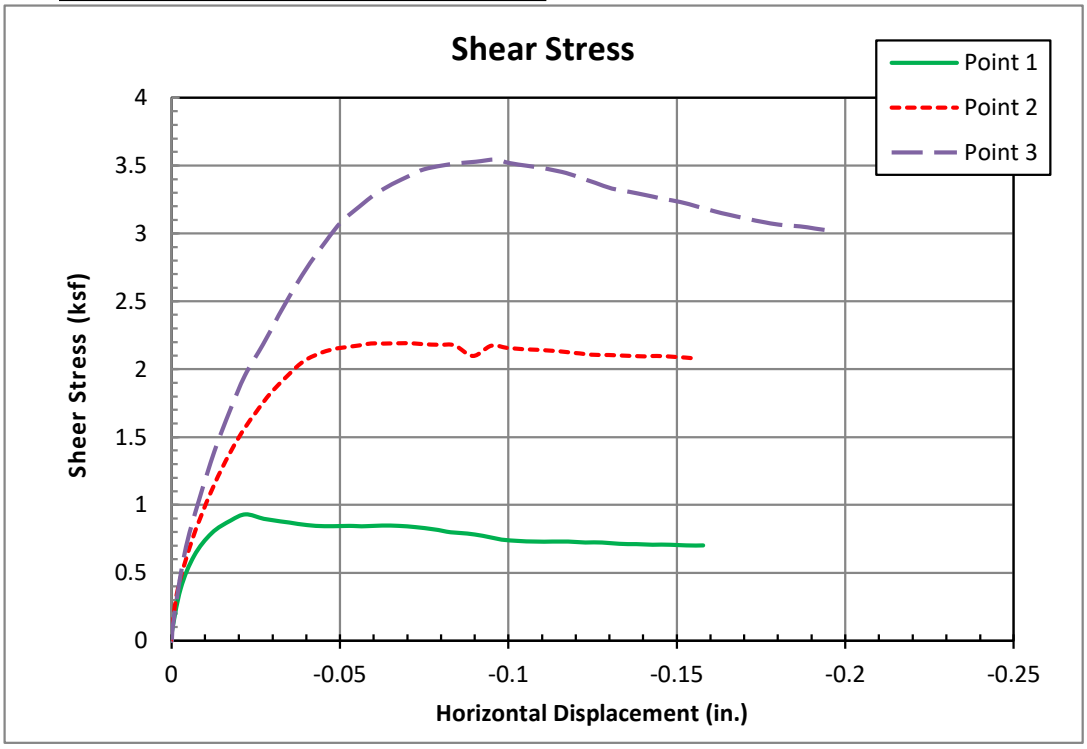
Dylan Ward
Laboratory Manager

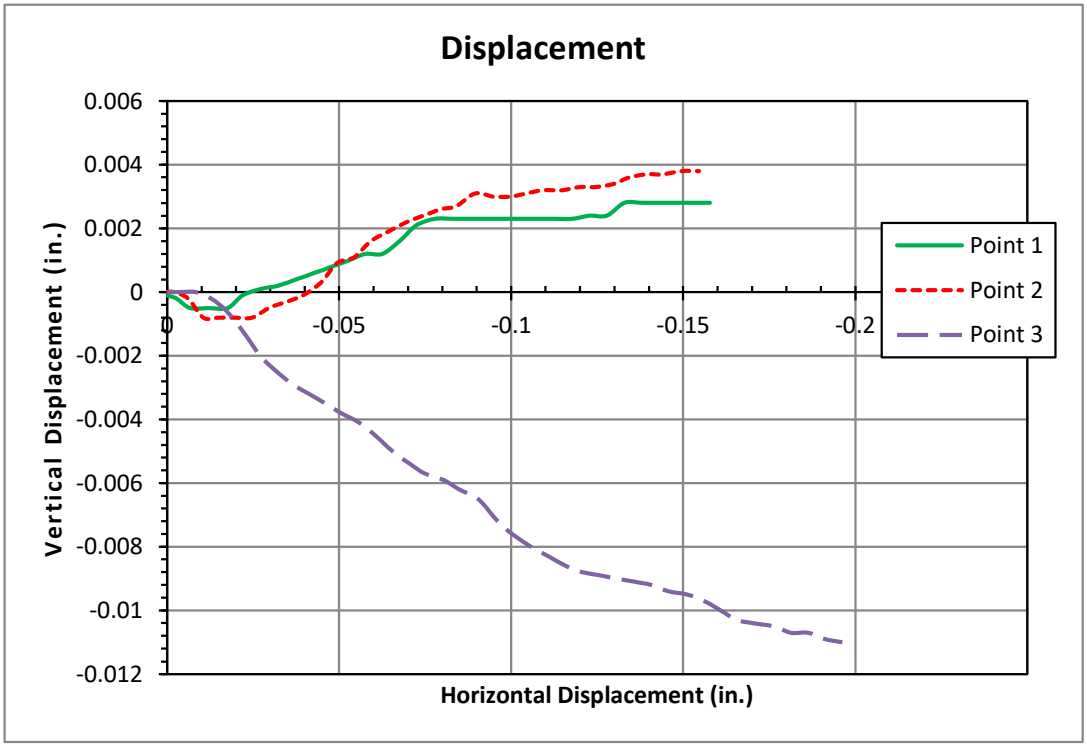
Dylan Ward
Signature

ACS Services LLC

Direct Shear Under Consolidated Drained Conditions
ASTM D3080-11

ACS Project #	**2201026**	Material Type:	Native/Geo
ACS Lab #	**22-1456**	Sample Date:	-
Client Name:	**Ethos**	Sampled By:	Client
Project Name:	**SR 303L MC85 to Van Buren**	Laboratory Test Date:	44614
Project Address:	**MC85 to Van Buren**	Laboratory Test By:	Brian Karl
Project City:	**Goodyear**	Reviewed By:	Dylan Ward
Sample Source:	**B12 @ 35.0'-36.0'**		





Dylan Ward
Laboratory Manager

Dylan Ward
Signature

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS ASTM D3080

Terracon

PROJECT:	ACS Project # 2201026	**JOB NO:**	65201093
LOCATION:	Phoenix, AZ	**WORK ORDER NO:**	65201093.0009
MATERIAL:	Clayey Sand	**LAB NO:**	22-2240-3
SAMPLE SOURCE:	B - 13 @ 35'- 36'	**DATE SAMPLED:**	05/09/22

Sample Preparation: Insitu density, material and moisture. Specimens consolidated at normal load for 30 mins. Prior to shear. Not inundated.

Initial Parameters of specimen:

	Point 1	Point 2	Point 3
Normal Stress (psf):	**2000**	**4000**	**8000**
Dry mass (g):	115.99	116.94	118.20
Height (in):	1.0000	1.0000	1.0000
Diameter (in):	2.42	2.42	2.42
Moisture, %:	23.2	23.2	23.9
Dry Density (pcf):	96.1	96.9	97.9
Saturation, %:	85	87	92
Void Ratio:	0.72	0.71	0.69

Pre- Shear Parameters of specimen:

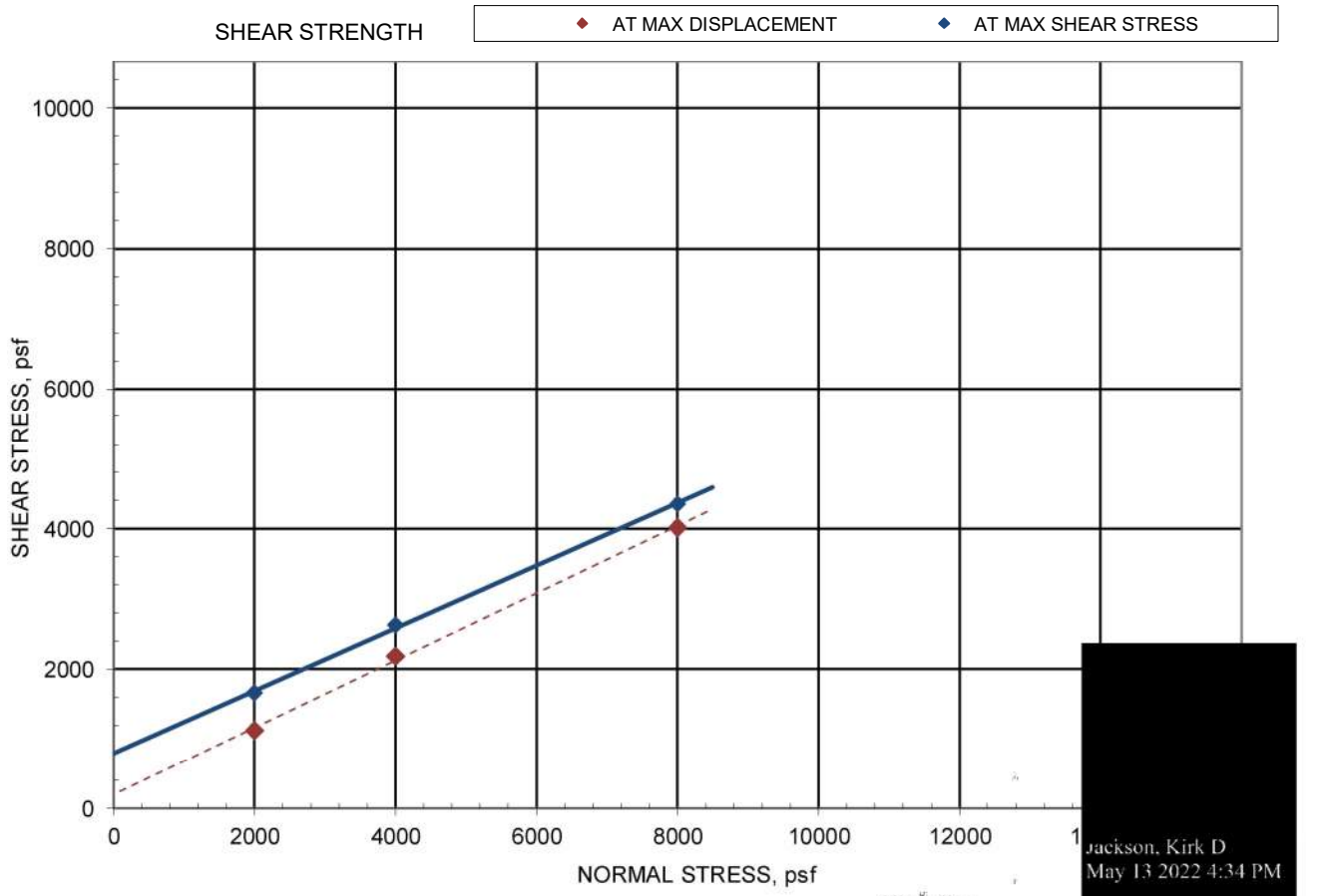
	Point 1	Point 2	Point 3
Normal Stress (psf):	**2000**	**4000**	**8000**
Dry mass (g):	115.99	116.94	118.20
Height (in):	0.9892	0.9787	0.9632
Diameter (in):	2.42	2.42	2.42
Moisture, %:	22.2	22.3	22.4
Dry Density (pcf):	97.1	99.0	101.6
Saturation, %:	84	88	94
Void Ratio:	0.70	0.67	0.63

Normal Stress (psf):	2000	4000	8000
Maximum Shear Stress, (psf):	1662	2631	4353
Displacement at Maximum Shear, (in):	0.044	0.055	0.097
Shear Stress at Max Displacement, (psf)	1124	2189	4018
Maximum Displacement, (in):	0.450	0.451	0.434
Rate of Deformation, in/min	0.0070	0.0070	0.0070

SHEAR DEVICE: Geomatic model 8914, Dead Weight load force

	FRICTION ANGLE	COHESION
AT MAX SHEAR STRESS	**24**	**801**
Specs:		
AT MAX DISPLACEMENT	26	209
Specs:		

SHEAR STRENGTH



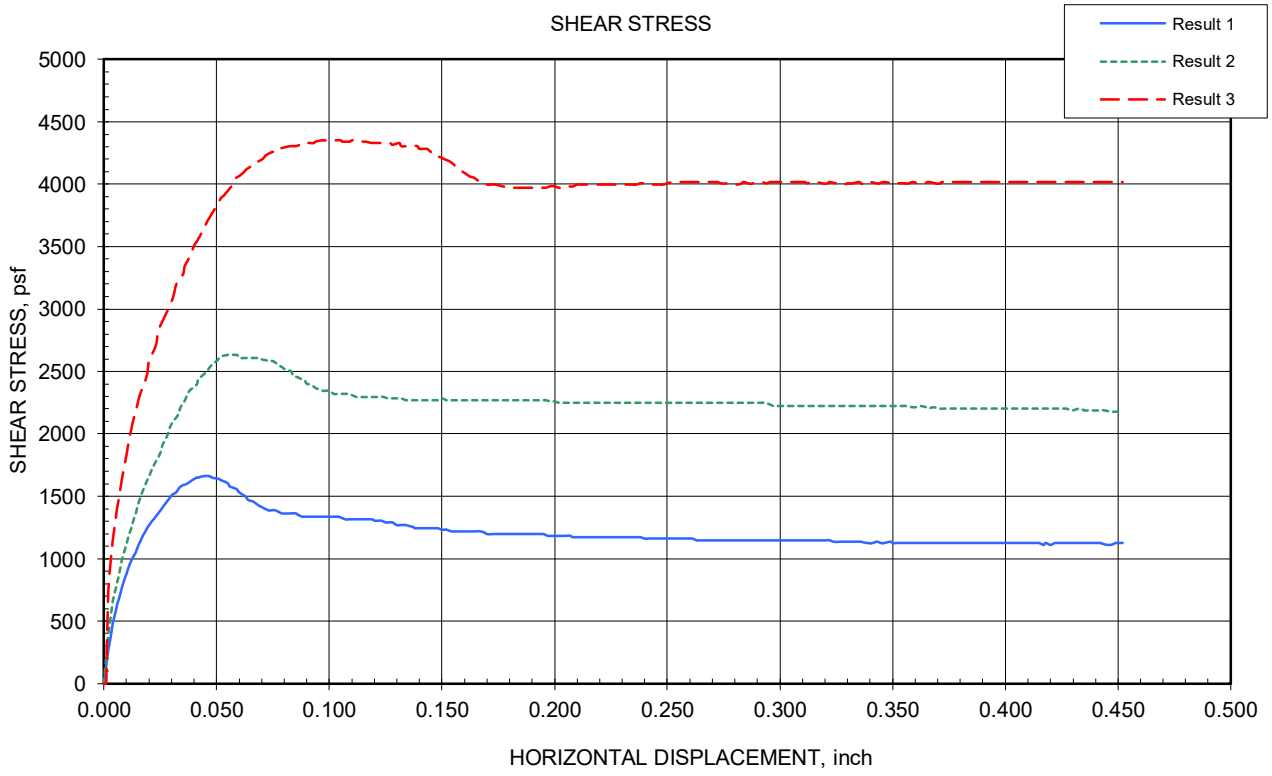
Note: The friction angle presented is applicable only to the load ranges and sample conditions tested

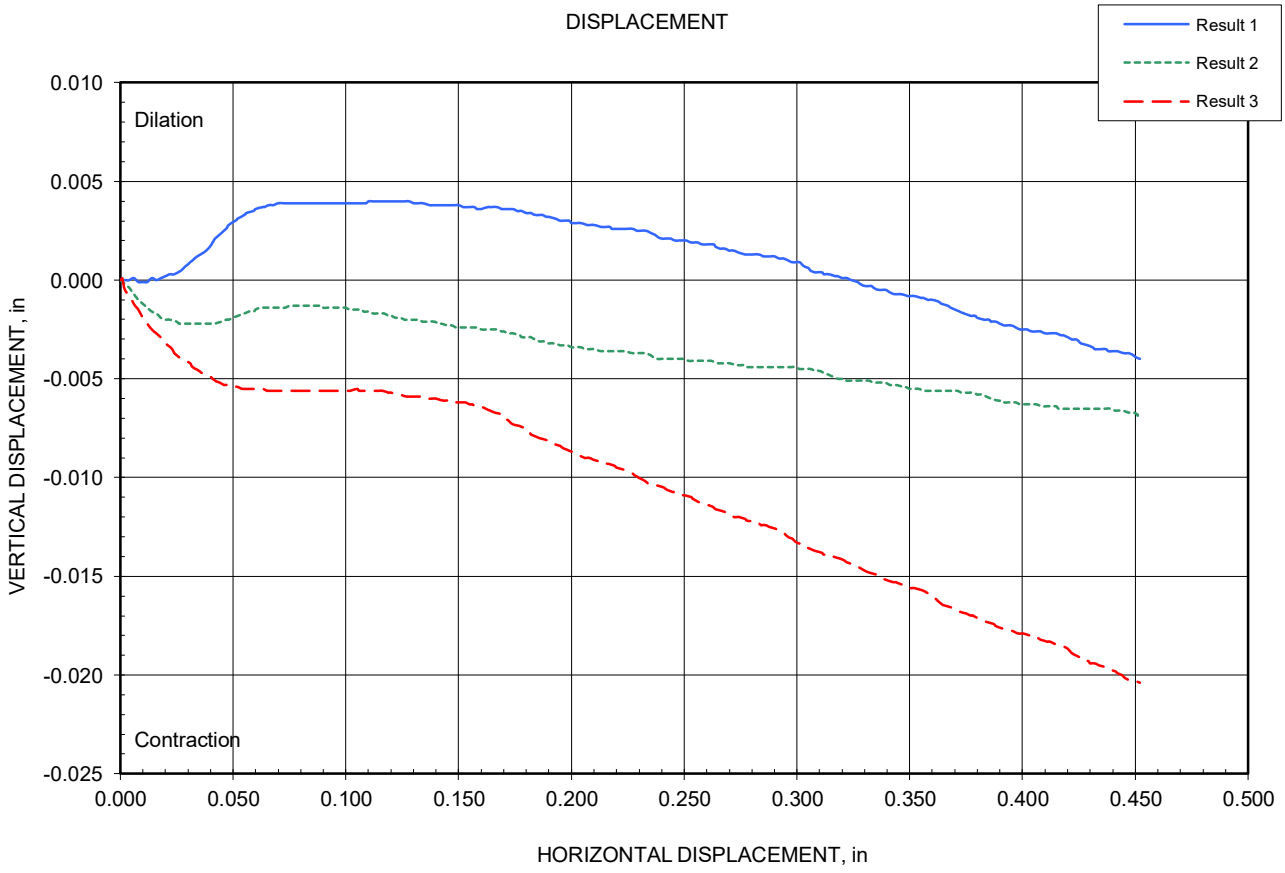
Reviewed By:

Jackson, Kirk D
May 13 2022 4:34 PM

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS ASTM D3080

PROJECT:	ACS Project # 2201026	**JOB NO:**	65201093
LOCATION:	Phoenix, AZ	**WORK ORDER NO:**	65201093.0009
MATERIAL:	Clayey Sand	**LAB NO:**	22-2240-3
SAMPLE SOURCE:	B - 13 @ 35'- 36'	**DATE SAMPLED:**	5/9/2022





DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS ASTM D3080

Terracon

PROJECT:	ACS Project # 2201026	**JOB NO:**	65201093
LOCATION:	Phoenix, AZ	**WORK ORDER NO:**	65201093.0009
MATERIAL:	Clayey Sand	**LAB NO:**	22-2142-6
SAMPLE SOURCE:	B - 15 @ 35'- 36'	**DATE SAMPLED:**	05/09/22

Sample Preparation: Insitu density, material and moisture. Specimens consolidated at normal load for 30 mins. Prior to shear. Not inundated.

Initial Parameters of specimen:

	Point 1	Point 2	Point 3
Normal Stress (psf):	**2000**	**4000**	**8000**
Dry mass (g):	98.63	101.07	101.70
Height (in):	1.0000	1.0000	1.0000
Diameter (in):	2.42	2.42	2.42
Moisture, %:	30.2	30.6	29.7
Dry Density (pcf):	81.7	83.7	84.2
Saturation, %:	78	83	82
Void Ratio:	1.03	0.98	0.96

Pre- Shear Parameters of specimen:

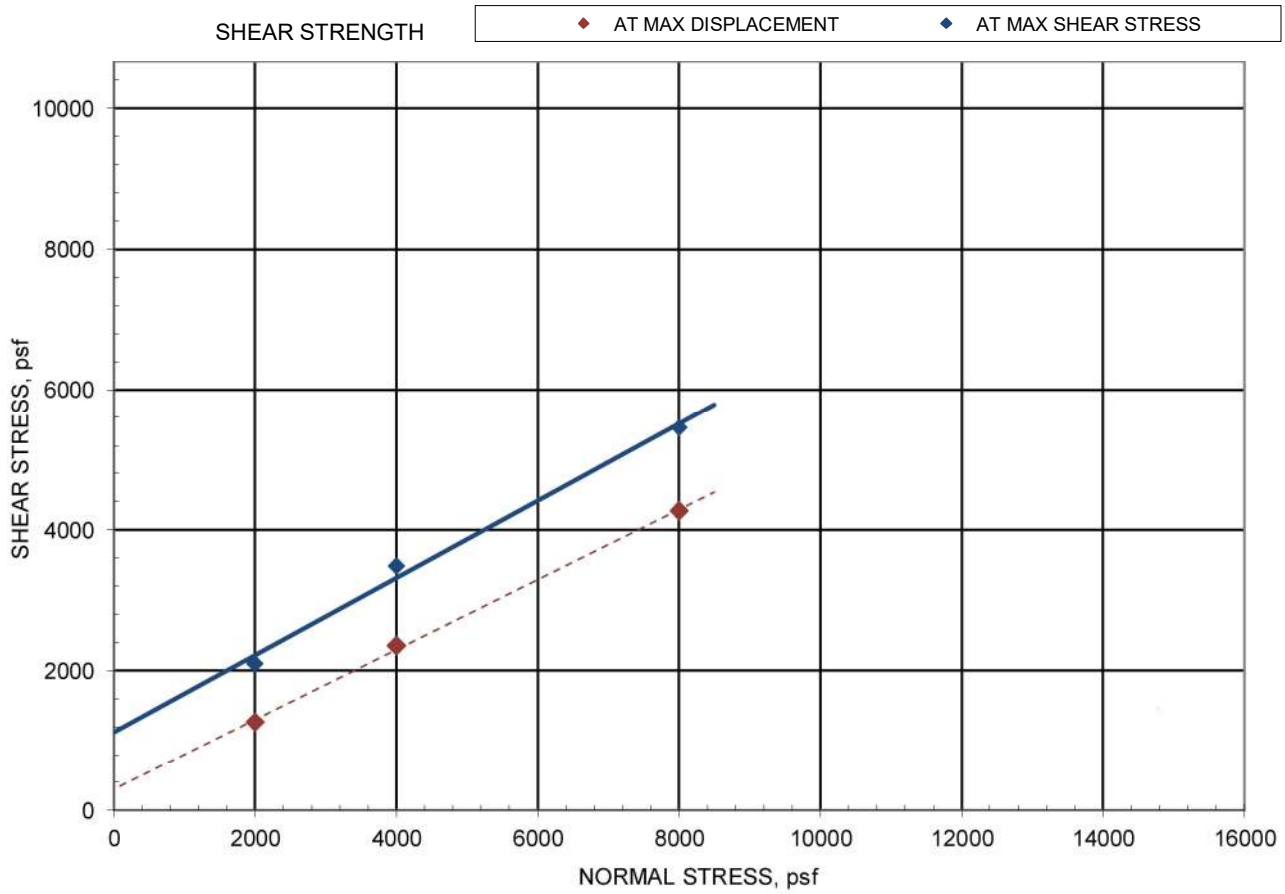
	Point 1	Point 2	Point 3
Normal Stress (psf):	**2000**	**4000**	**8000**
Dry mass (g):	98.63	101.07	101.70
Height (in):	0.9891	0.9776	0.9643
Diameter (in):	2.42	2.42	2.42
Moisture, %:	29.5	29.8	28.5
Dry Density (pcf):	82.6	85.6	87.4
Saturation, %:	78	85	84
Void Ratio:	1.00	0.93	0.89

Normal Stress (psf):	2000	4000	8000
Maximum Shear Stress, (psf):	2105	3492	5454
Displacement at Maximum Shear, (in):	0.060	0.078	0.095
Shear Stress at Max Displacement, (psf)	1268	2356	4270
Maximum Displacement, (in):	0.450	0.451	0.435
Rate of Deformation, in/min	0.0070	0.0070	0.0070

SHEAR DEVICE: Geomatic model 8914, Dead Weight load force

	FRICTION ANGLE	COHESION
AT MAX SHEAR STRESS	**29**	**1124**
Specs:		
AT MAX DISPLACEMENT	26	311
Specs:		

SHEAR STRENGTH

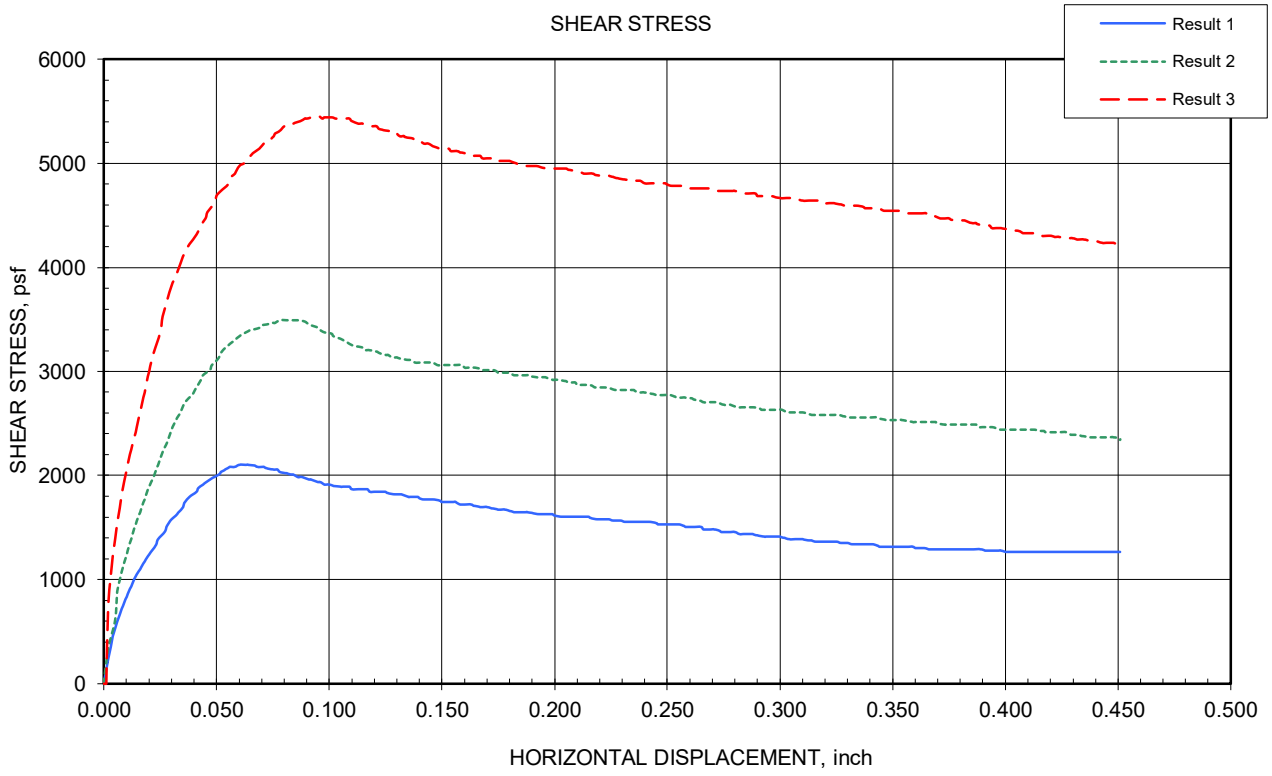


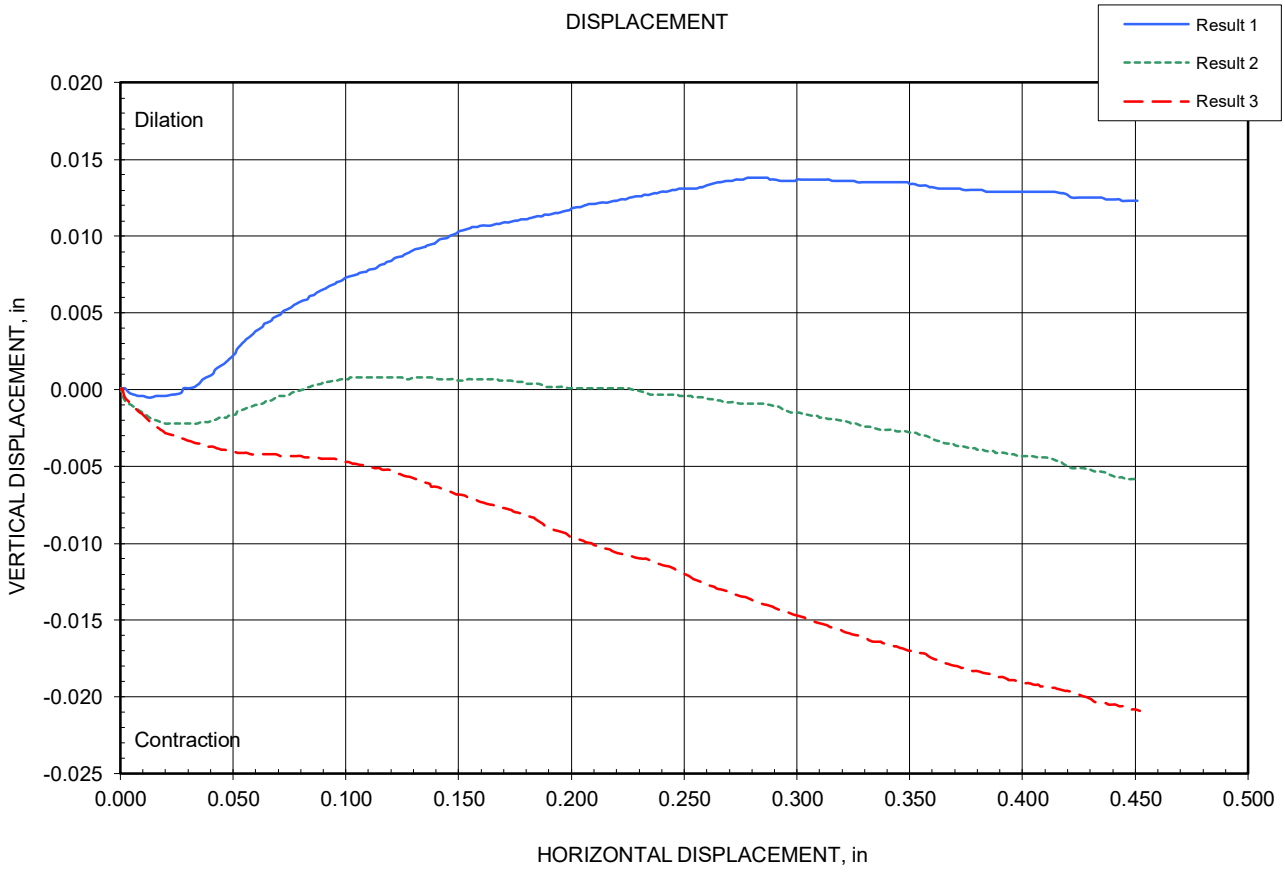
Note: The friction angle presented is applicable only to the load ranges and sample conditions tested

Reviewed By: Kirk Jackson

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS ASTM D3080

PROJECT:	ACS Project # 2201026	**JOB NO:**	65201093
LOCATION:	Phoenix, AZ	**WORK ORDER NO:**	65201093.0009
MATERIAL:	Clayey Sand	**LAB NO:**	22-2142-6
SAMPLE SOURCE:	B - 15 @ 35'- 36'	**DATE SAMPLED:**	5/9/2022



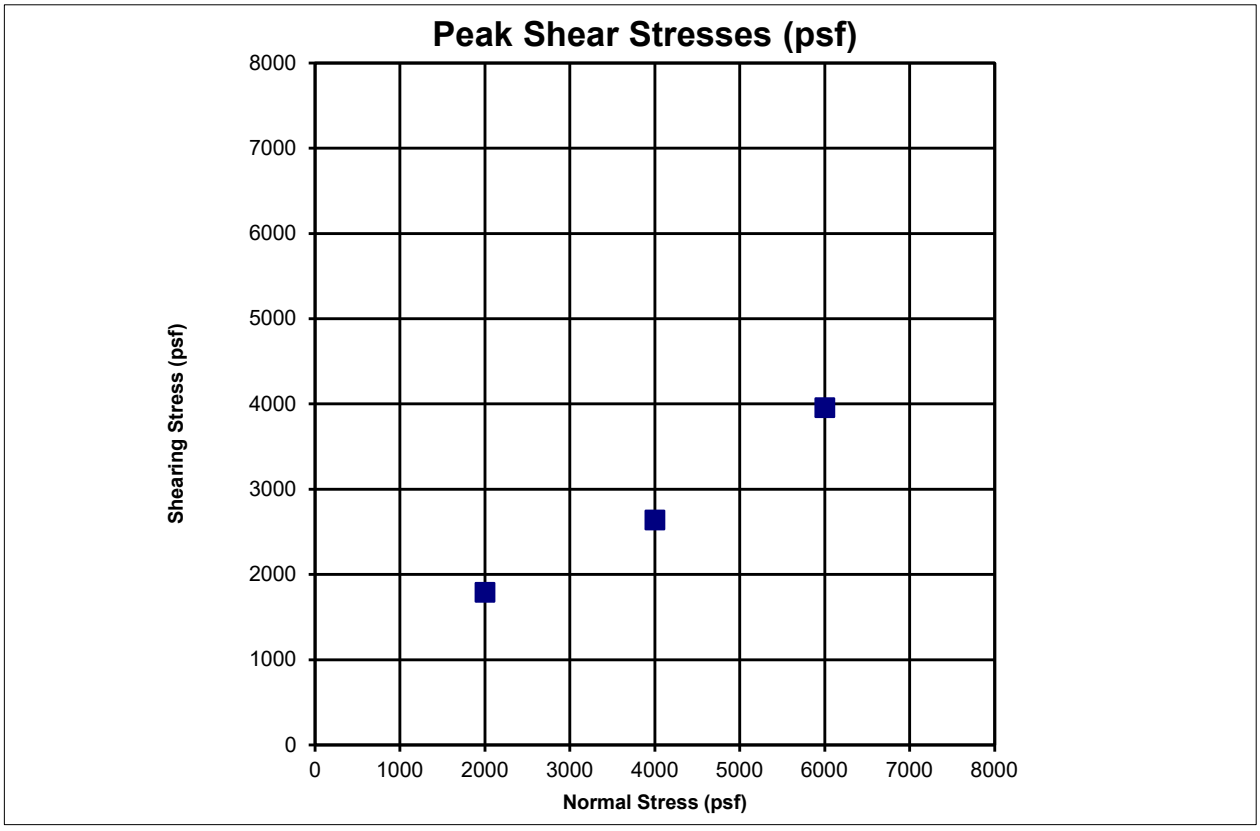


PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native
SAMPLE SOURCE: B-18 (35.0-36.0')
SAMPLE PREPARATION: In Situ - 2, 4, and 6ksf

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1366-09
DATE ASSIGNED: 5/5/2022

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.998	0.994	0.994
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.01	0.01	0.01
Direct shear point:	1	2	3
Dry mass of specimen (g):	108.1	108.3	112.6
Initial Moisture Content:	32.5%	33.1%	29.0%
Initial Wet Density (pcf):	118.6	119.4	120.3
Initial Dry Density (pcf):	89.5	89.7	93.3
Final Moisture Content:	31.2%	29.8%	27.1%
Final Wet Density (pcf):	117.7	117.2	119.2
Final Dry Density (pcf):	89.7	90.3	93.8
Normal Stress (psf):	2000	4000	6000
Maximum Shearing Stress (psf):	1789	2638	3956
Vertical Deformation @ Max Shear (in):	0.286	0.215	0.298
Horizontal Deformation @ Max Shear (in):	0.072	0.067	0.074



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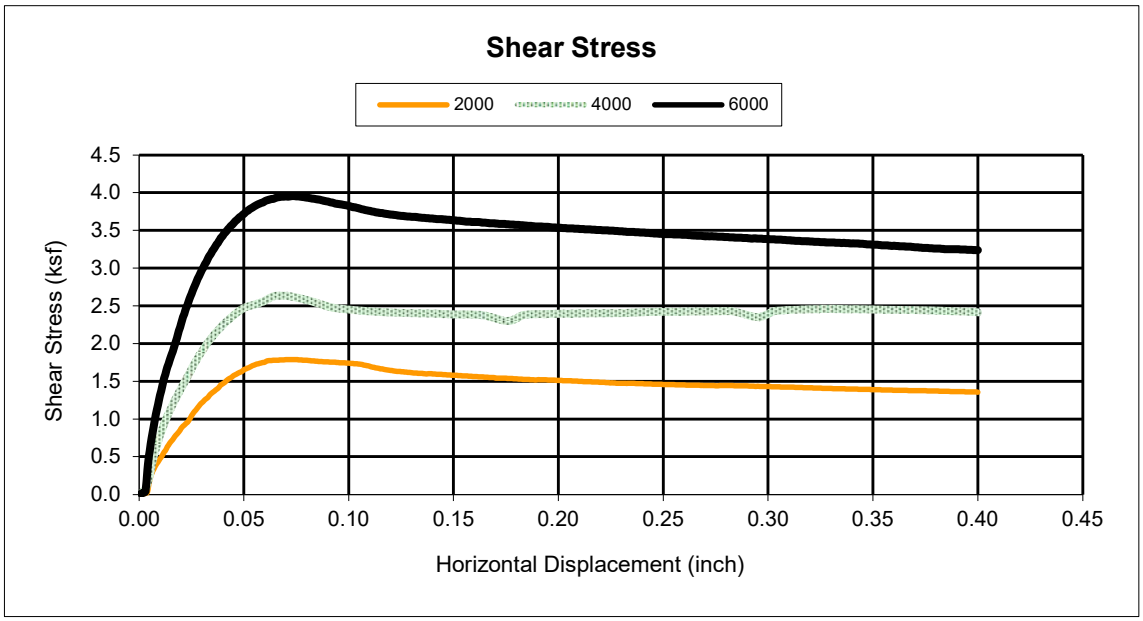
REVIEWED BY Hiram Franco

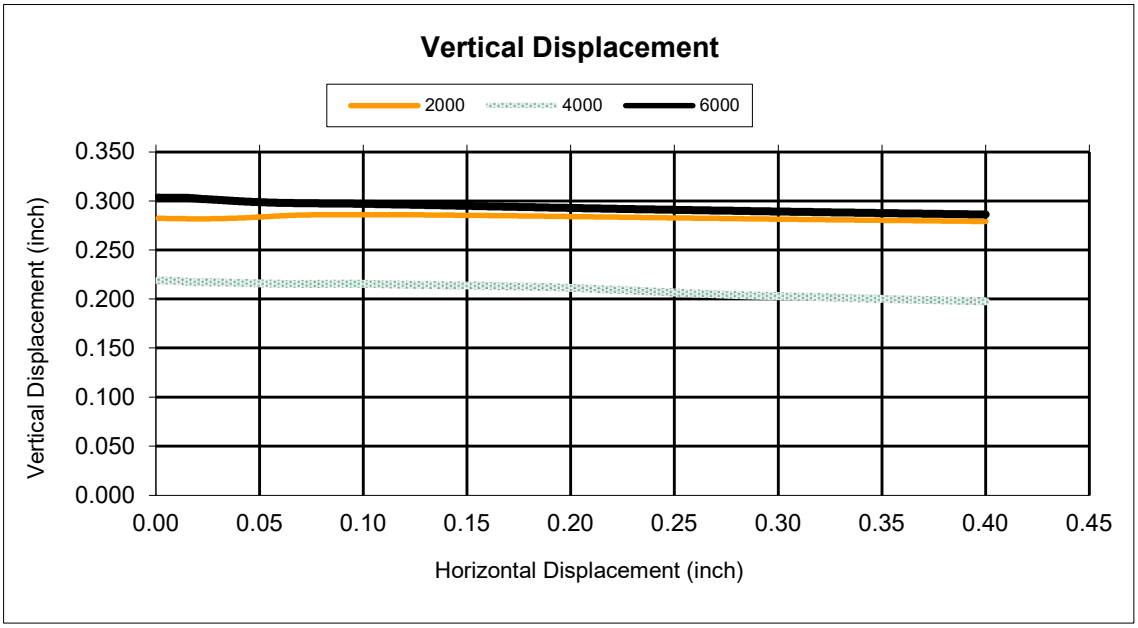
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native
SAMPLE SOURCE: B-18 (35.0-36.0')
SAMPLE PREPARATION: In Situ - 2, 4, and 6ksf

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1366-09
DATE ASSIGNED: 5/5/2022

NORMAL LOADS (psf): 2000 4000 6000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





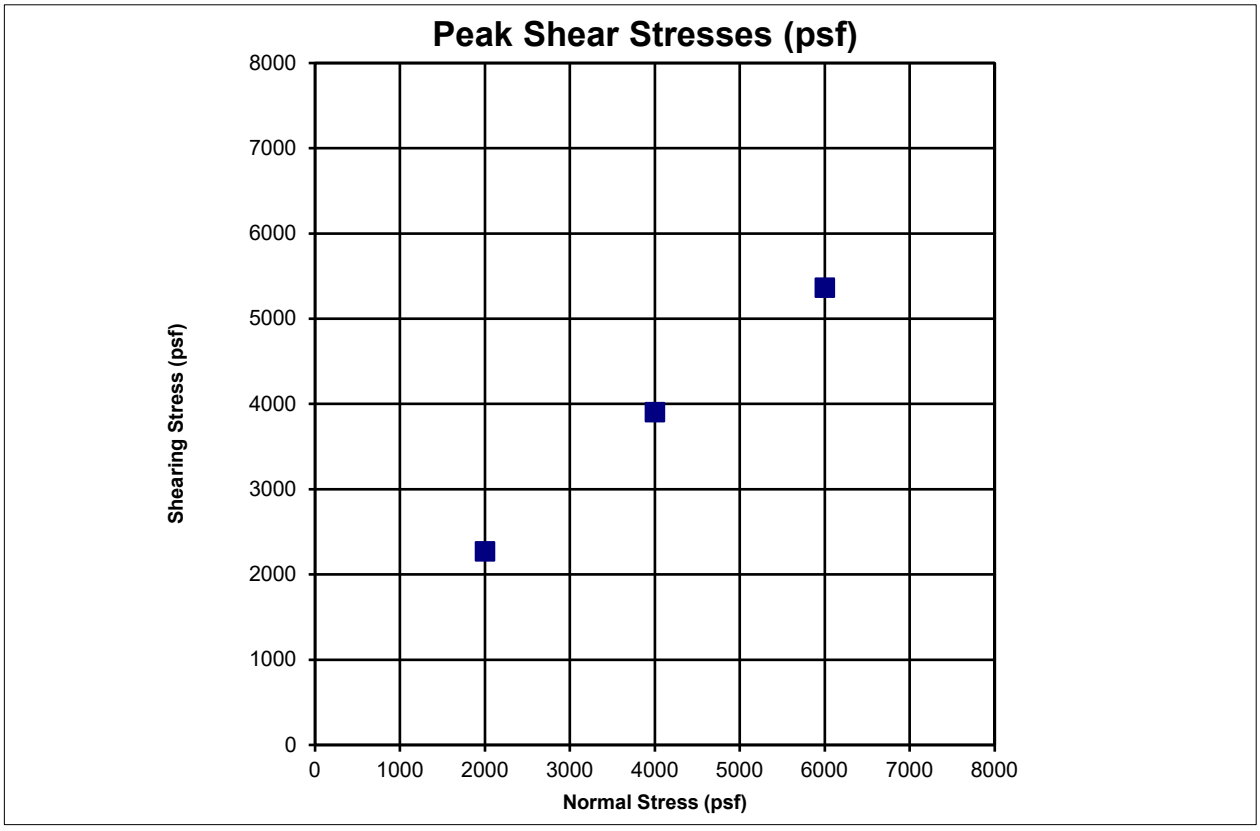
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Phoenix, AZ 85040

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native
SAMPLE SOURCE: B-20 (25.0-26.0')
SAMPLE PREPARATION: In Situ - 2, 4, and 6ksf

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1504-01
DATE ASSIGNED: 6/27/2022

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.999	0.999	0.997
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.01	0.01	0.01
Direct shear point:	1	2	3
Dry mass of specimen (g):	125.3	127.0	127.0
Initial Moisture Content:	14.4%	16.7%	17.2%
Initial Wet Density (pcf):	118.8	122.7	123.3
Initial Dry Density (pcf):	103.8	105.2	105.2
Final Moisture Content:	13.8%	15.9%	15.7%
Final Wet Density (pcf):	118.2	122.1	122.1
Final Dry Density (pcf):	103.9	105.3	105.5
Normal Stress (psf):	2000	4000	6000
Maximum Shearing Stress (psf):	2273	3903	5364
Vertical Deformation @ Max Shear (in):	0.329	0.264	0.272
Horizontal Deformation @ Max Shear (in):	0.067	0.076	0.083



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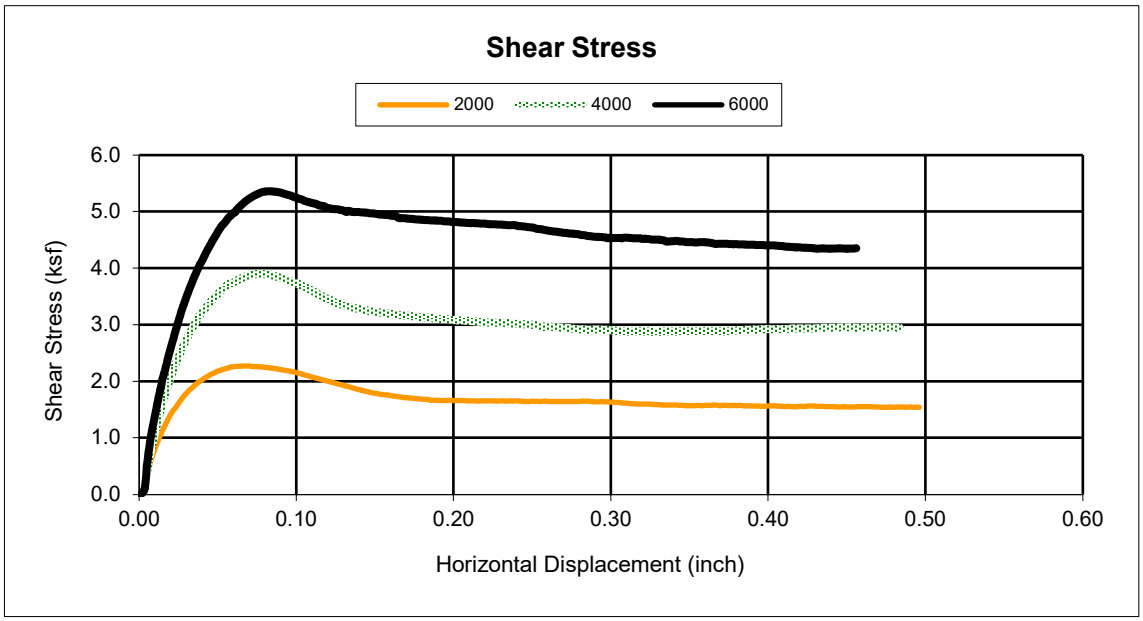
REVIEWED BY Hiram Franco

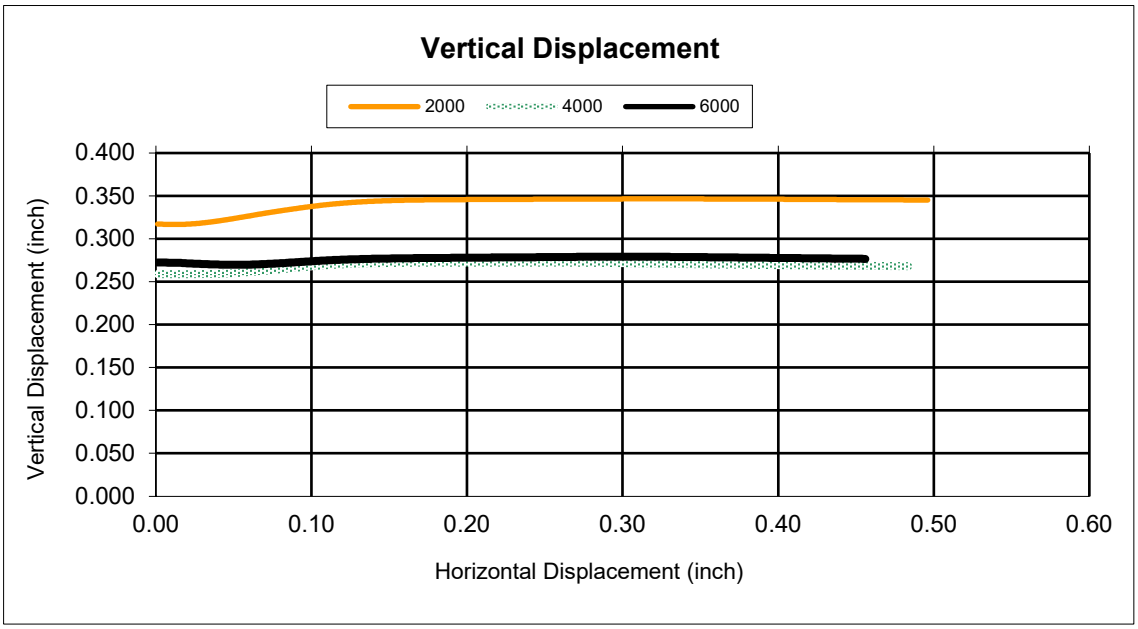
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native
SAMPLE SOURCE: B-20 (25.0-26.0')
SAMPLE PREPARATION: In Situ - 2, 4, and 6ksf

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1504-01
DATE ASSIGNED: 6/27/2022

NORMAL LOADS (psf): 2000 4000 6000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





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ACS Services LLC

Direct Shear Under Consolidated Drained Conditions
ASTM D3080-11

ACS Project #	**2201026**	Material Type:	Soil
ACS Lab #	**22-1654**	Sample Date:	-
Client Name:	**Ethos**	Sampled By:	Client (MAGS)
Project Name:	**SR 303L MC85 to Van Buren**	Laboratory Test Date:	44630
Project Address:	**MC85 to Van Buren**	Laboratory Test By:	Brian Karl
Project City:	**Goodyear**	Reviewed By:	Dylan Ward
Sample Source:	**B22 @ 35-36**		

Sample Preparation: Specimen extracted from ring sample taken in the field using the labs jack. The specimen was consolidated at the normal stress until consolidation was completed prior to shearing.

Initial Parameters of Specimen

	Point 1	Point 2	Point 3
Normal Stress (ksf):	1	2	4
Dry mass (g):	93.2	100.3	99.2
Height (in.):	1	1	1
Diameter (in.):	2.42	2.42	2.42
Moisture (%):	31	33.1	32
Dry Density (pcf):	77.2	83.1	82.1
Saturation (%):	72	89	84
Void Ratio (%):	1.14	0.99	1.01

Final Parameters of Specimen

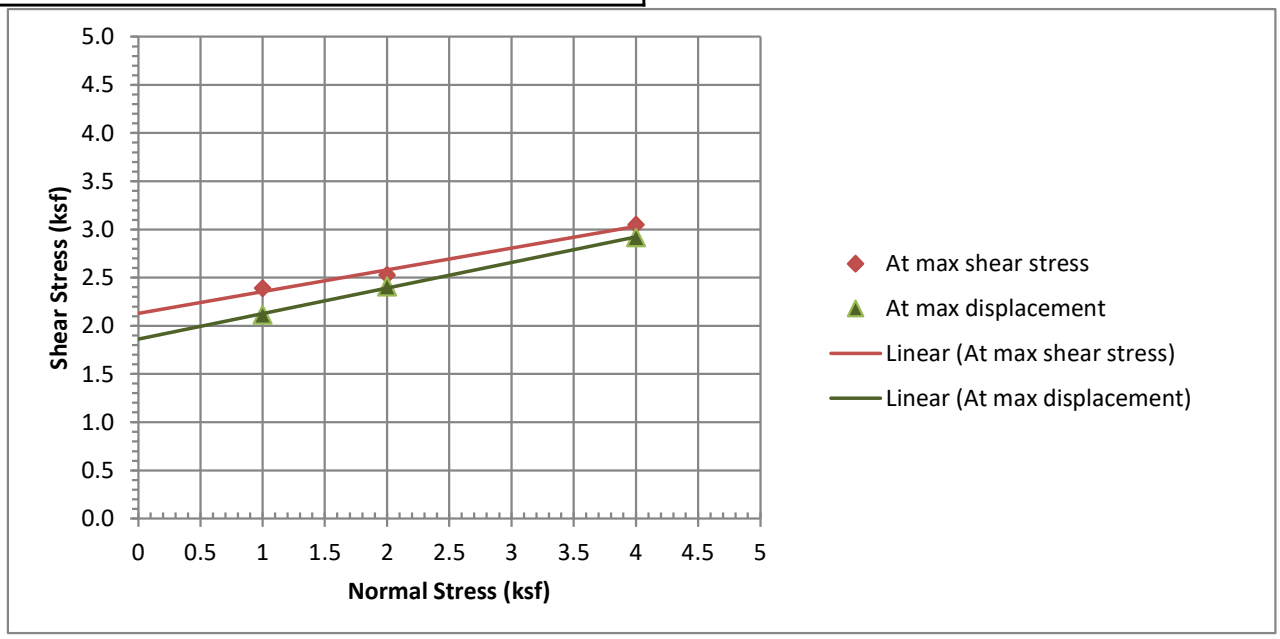
	Point 1	Point 2	Point 3
Normal Stress (ksf):	1	2	4
Dry mass (g):	93.2	100.3	99.2
Height (in.):	1.0272	0.9985	0.9961
Diameter (in.):	2.42	2.42	2.42
Moisture (%):	31	33.1	32
Dry Density (pcf):	75.1	83.2	82.5
Saturation (%):	72	89	84
Void Ratio (%):	1.20	0.99	1.01

Results from Experimentation

	Point 1	Point 2	Point 3
Normal Stress (ksf):	1	2	4
Max. Shear Stress (ksf)	2.389	2.528	3.049
Displacement at Max Shear (in.):	0.0272	-0.0015	-0.0039
Shear Stress at Max Displ. (ksf):	2.116	2.411	2.918
Maximum Displacement (in.):	0.0294	-0.0015	-0.0042
Rate of Deformation (in./min):	0.001	0.001	0.001

	Friction Angle	Cohesion (ksf)
At Max Shear Stress:	12.7	2.128
At Max Displacement:	14.9	1.863

Shear Device: Karol Warner Model 2001-D, Pneumatic load



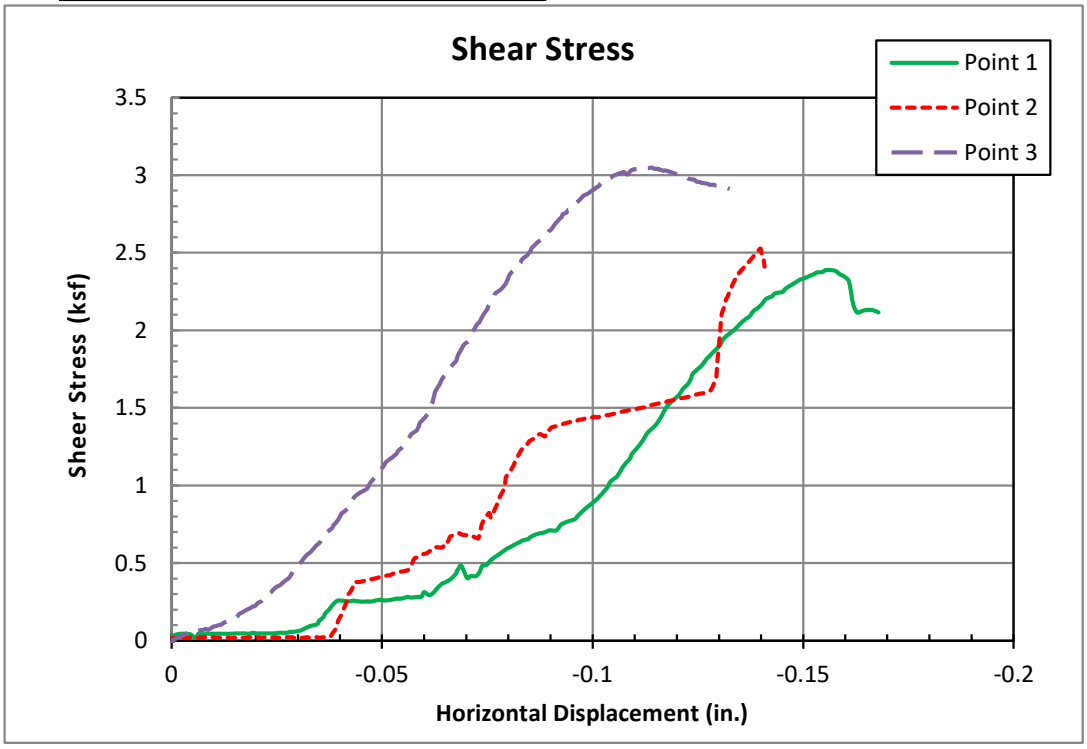
Operations Manager

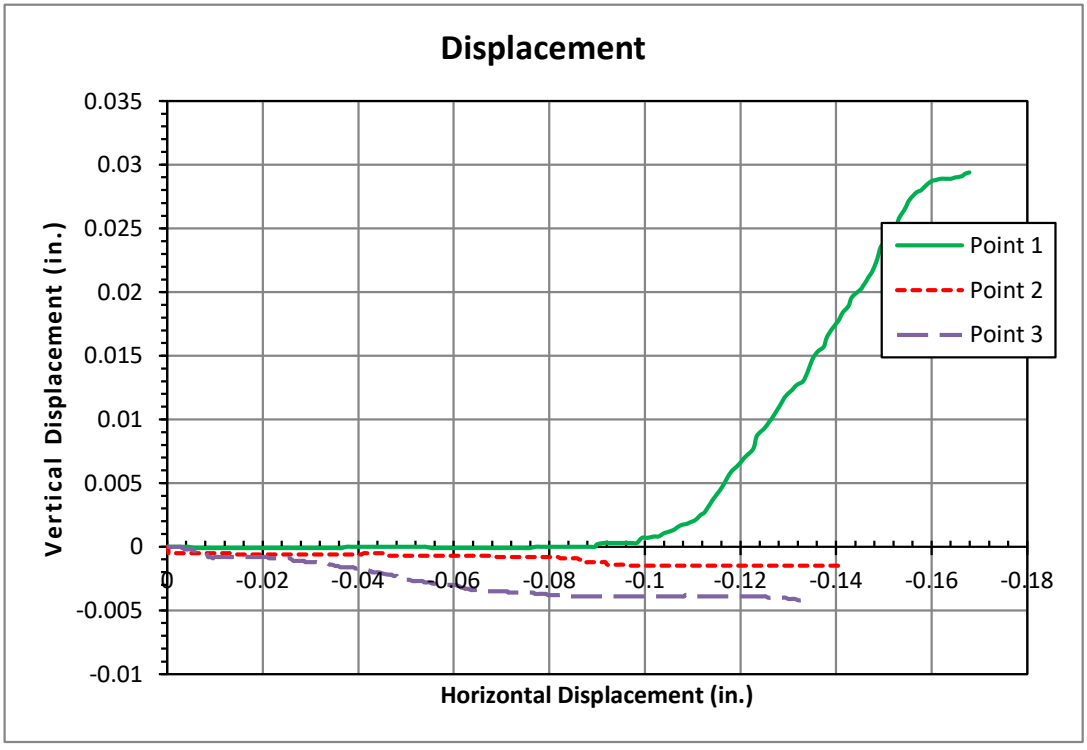
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ACS Services LLC

Direct Shear Under Consolidated Drained Conditions
ASTM D3080-11

ACS Project #	**2201026**	Material Type:	Soil
ACS Lab #	**22-1654**	Sample Date:	-
Client Name:	**Ethos**	Sampled By:	Client (MAGS)
Project Name:	**SR 303L MC85 to Van Buren**	Laboratory Test Date:	44630
Project Address:	**MC85 to Van Buren**	Laboratory Test By:	Brian Karl
Project City:	**Goodyear**	Reviewed By:	Dylan Ward
Sample Source:	**B22 @ 35-36**		





Operations Manager

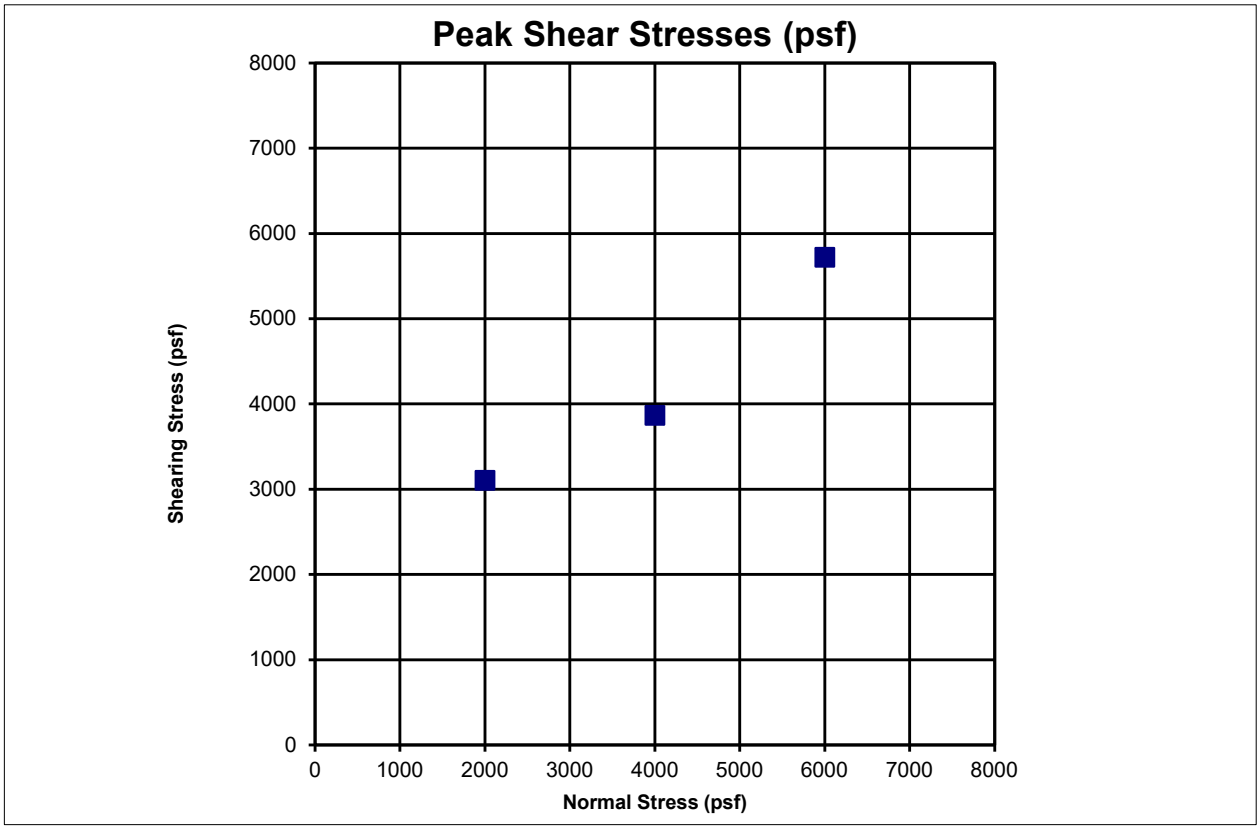
Signature

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native
SAMPLE SOURCE: B-23 (30.0-31.0')
SAMPLE PREPARATION: In Situ - 2, 4, and 6ksf

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1366-10
DATE ASSIGNED: 5/5/2022

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.997	0.996	0.996
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.01	0.01	0.01
Direct shear point:	1	2	3
Dry mass of specimen (g):	108.5	111.6	117.7
Initial Moisture Content:	30.7%	29.0%	24.9%
Initial Wet Density (pcf):	117.4	119.3	121.8
Initial Dry Density (pcf):	89.9	92.4	97.5
Final Moisture Content:	28.6%	27.8%	22.9%
Final Wet Density (pcf):	115.9	118.6	120.4
Final Dry Density (pcf):	90.2	92.8	97.9
Normal Stress (psf):	2000	4000	6000
Maximum Shearing Stress (psf):	3106	3865	5720
Vertical Deformation @ Max Shear (in):	0.287	0.228	0.319
Horizontal Deformation @ Max Shear (in):	0.091	0.075	0.166



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Phoenix, AZ 85040

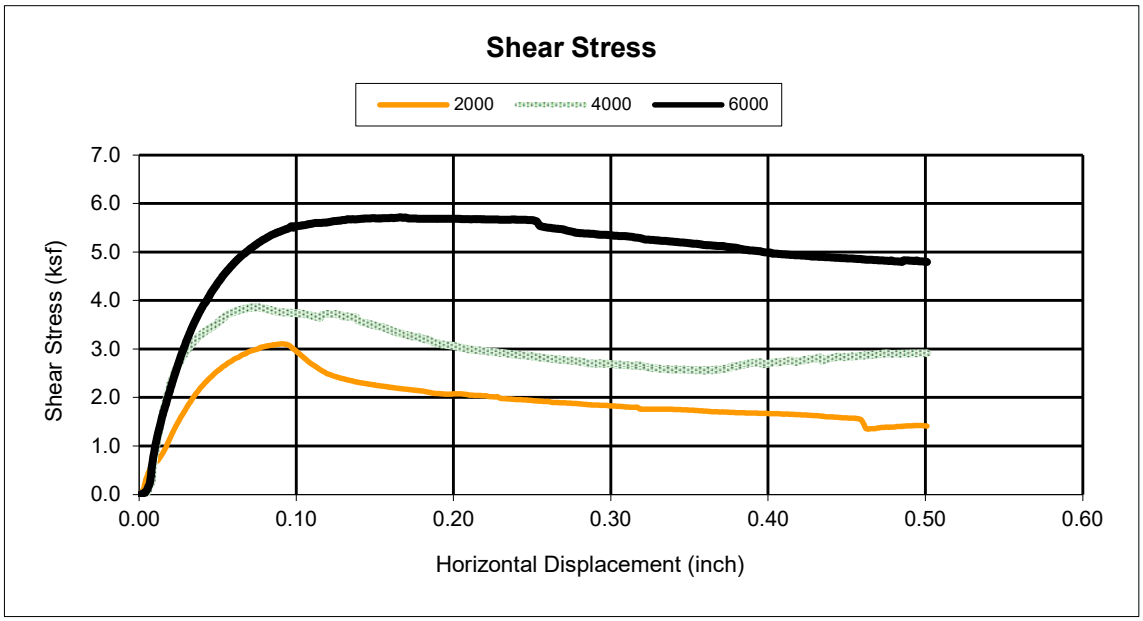
REVIEWED BY Hiram Franco

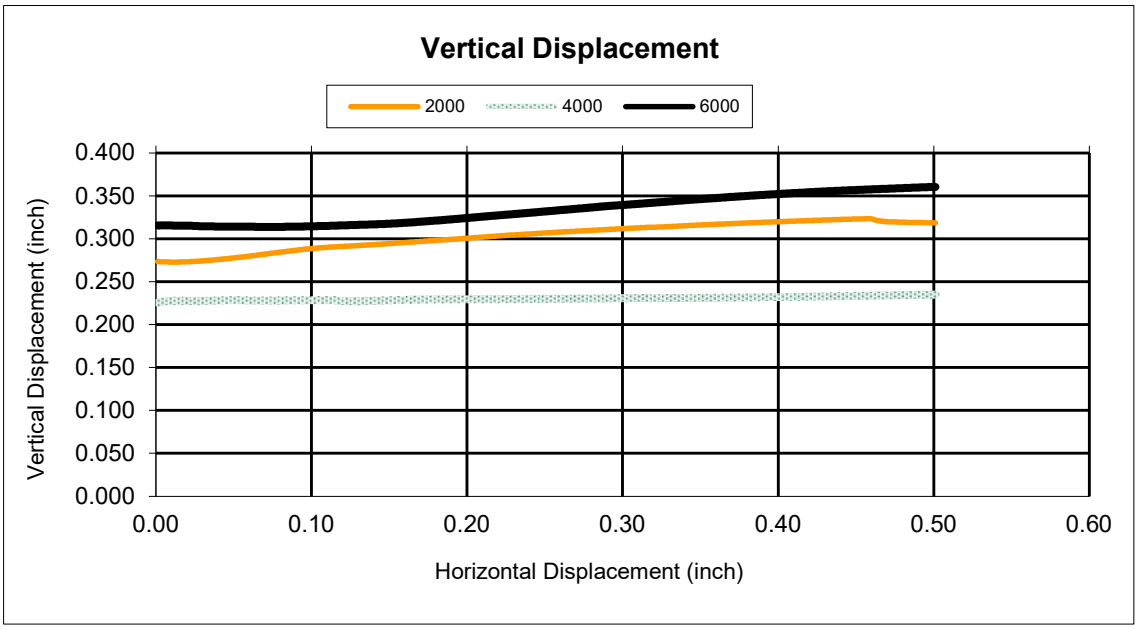
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native
SAMPLE SOURCE: B-23 (30.0-31.0')
SAMPLE PREPARATION: In Situ - 2, 4, and 6ksf

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1366-10
DATE ASSIGNED: 5/5/2022

NORMAL LOADS (psf): 2000 4000 6000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





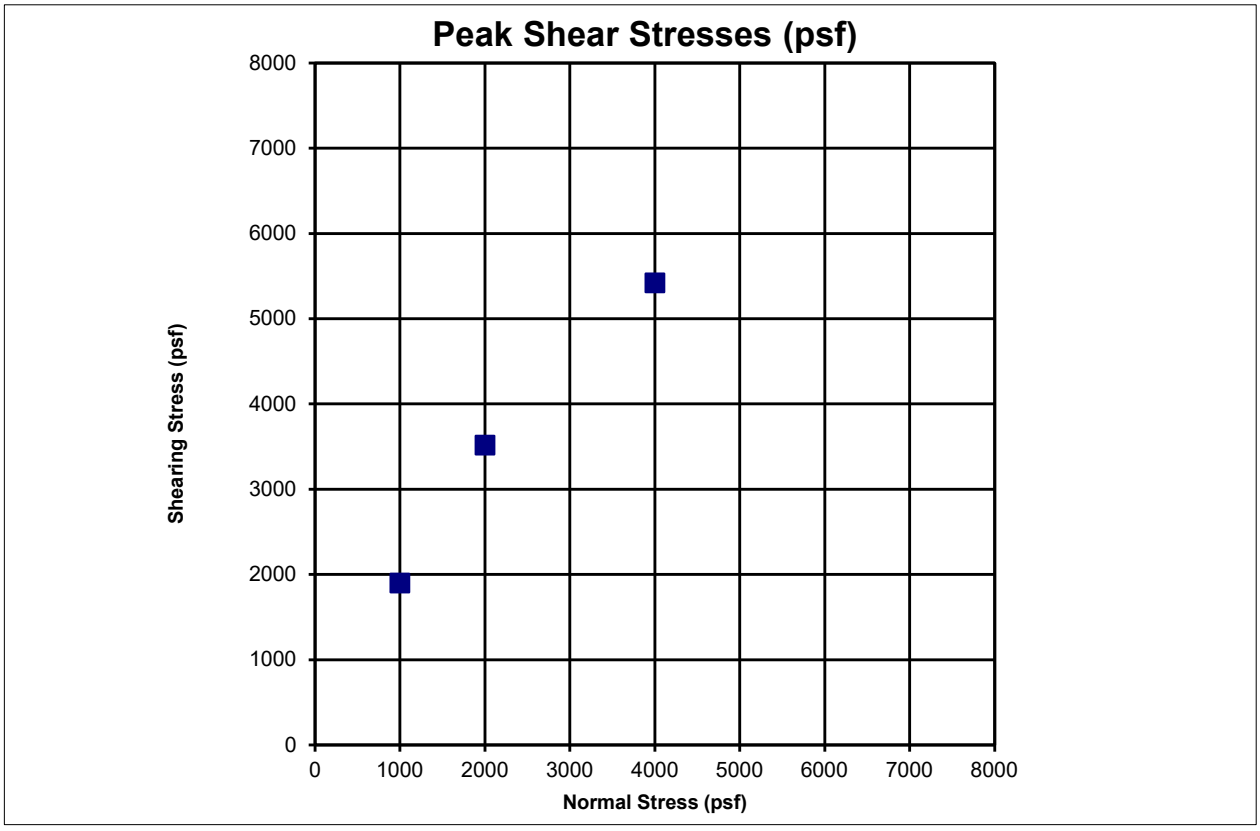
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Phoenix, AZ 85040

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native
SAMPLE SOURCE: B-24 (40.0-41.0')
SAMPLE PREPARATION: In Situ - 1, 2, and 4ksf

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1366-04
DATE ASSIGNED: 5/5/2022

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.995	0.999	0.998
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.01	0.01	0.01
Direct shear point:	1	2	3
Dry mass of specimen (g):	118.6	119.9	123.0
Initial Moisture Content:	17.7%	19.8%	19.9%
Initial Wet Density (pcf):	115.6	118.9	122.2
Initial Dry Density (pcf):	98.2	99.3	101.9
Final Moisture Content:	16.9%	18.8%	18.5%
Final Wet Density (pcf):	115.4	118.1	120.9
Final Dry Density (pcf):	98.7	99.4	102.0
Normal Stress (psf):	1000	2000	4000
Maximum Shearing Stress (psf):	1898	3519	5420
Vertical Deformation @ Max Shear (in):	0.295	0.238	0.323
Horizontal Deformation @ Max Shear (in):	0.053	0.062	0.072



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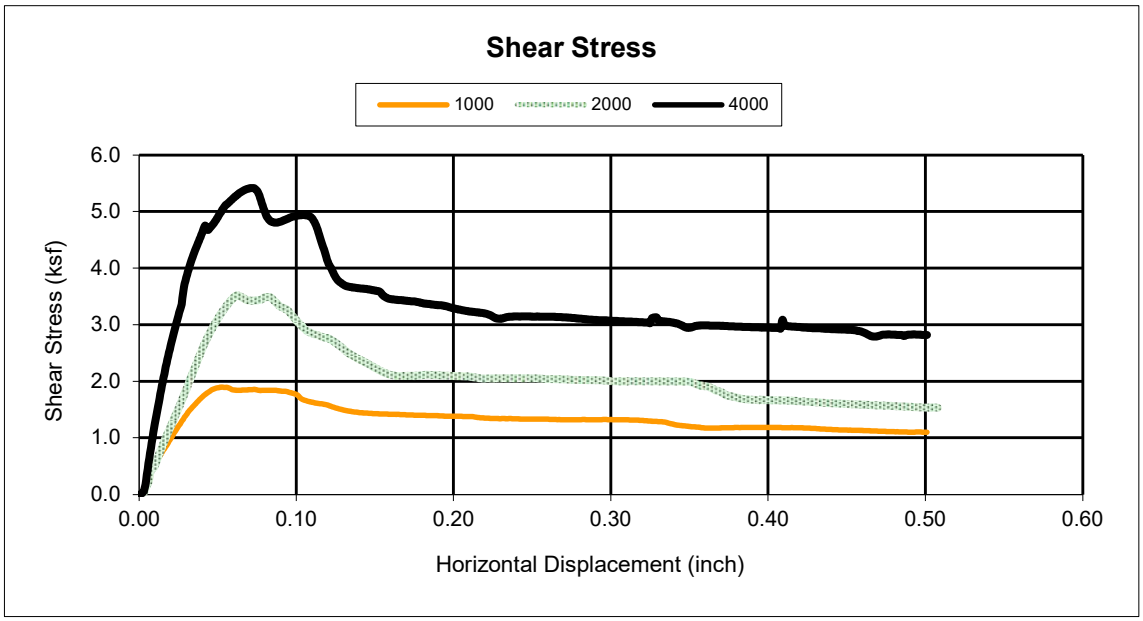
REVIEWED BY Hiram Franco

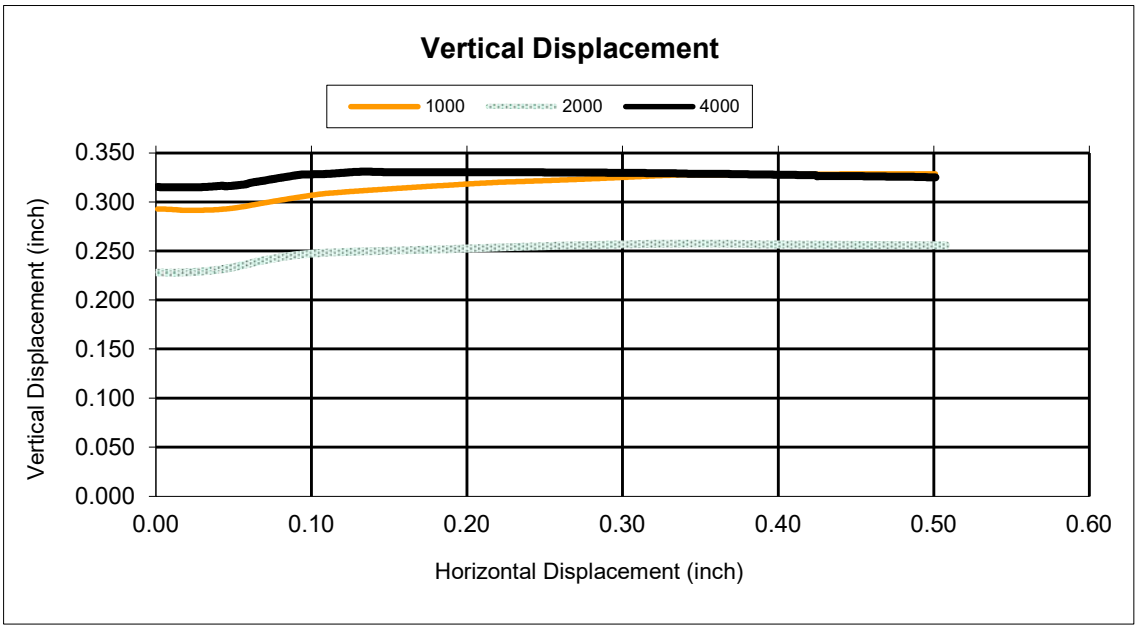
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native
SAMPLE SOURCE: B-24 (40.0-41.0')
SAMPLE PREPARATION: In Situ - 1, 2, and 4ksf

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1366-04
DATE ASSIGNED: 5/5/2022

NORMAL LOADS (psf): 1000 2000 4000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





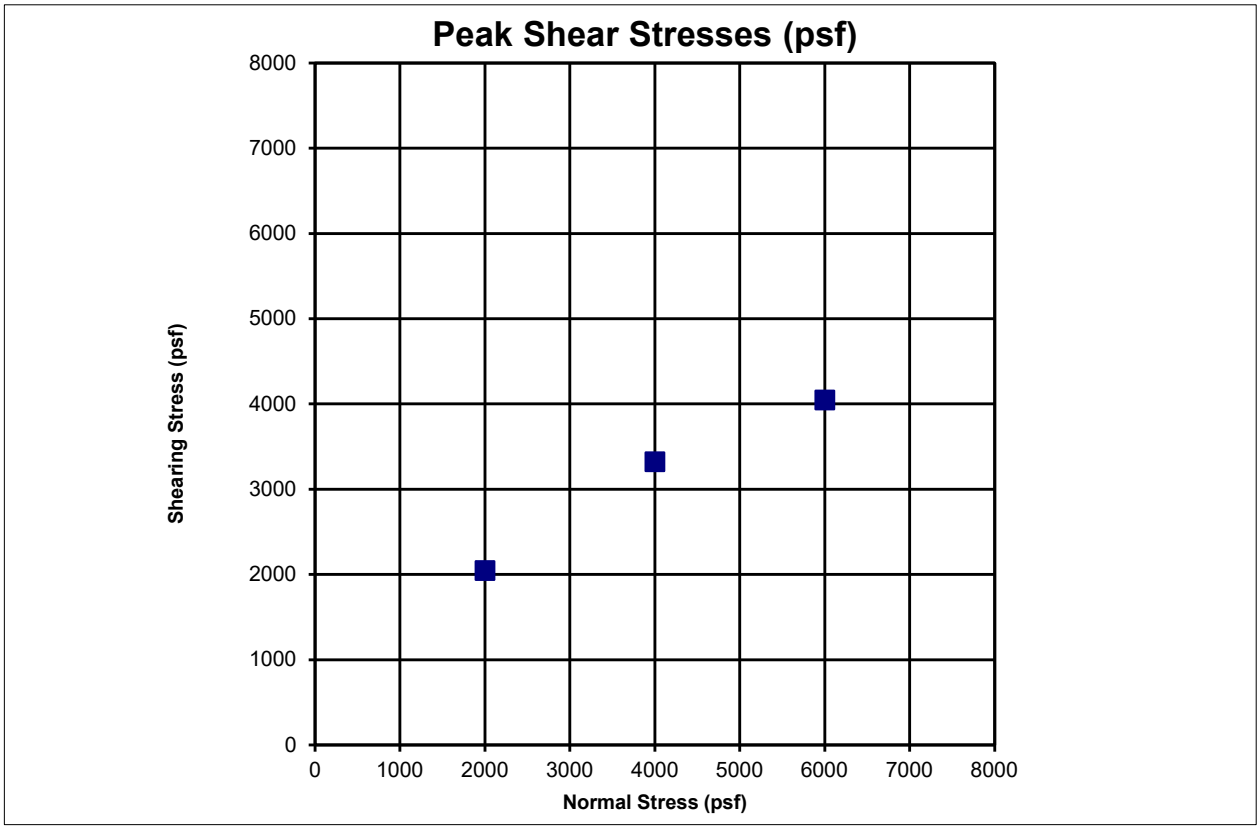
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Phoenix, AZ 85040

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native
SAMPLE SOURCE: B-25 (40.0-41.0')
SAMPLE PREPARATION: In Situ - 2, 4, and 6ksf

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1366-05
DATE ASSIGNED: 5/5/2022

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.997	0.997	0.992
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.01	0.01	0.01
Direct shear point:	1	2	3
Dry mass of specimen (g):	113.7	114.3	115.9
Initial Moisture Content:	27.4%	27.7%	27.4%
Initial Wet Density (pcf):	120.0	120.9	122.2
Initial Dry Density (pcf):	94.2	94.7	96.0
Final Moisture Content:	25.4%	25.1%	24.7%
Final Wet Density (pcf):	118.4	118.8	120.7
Final Dry Density (pcf):	94.4	95.0	96.8
Normal Stress (psf):	2000	4000	6000
Maximum Shearing Stress (psf):	2048	3321	4045
Vertical Deformation @ Max Shear (in):	0.285	0.228	0.294
Horizontal Deformation @ Max Shear (in):	0.045	0.071	0.122



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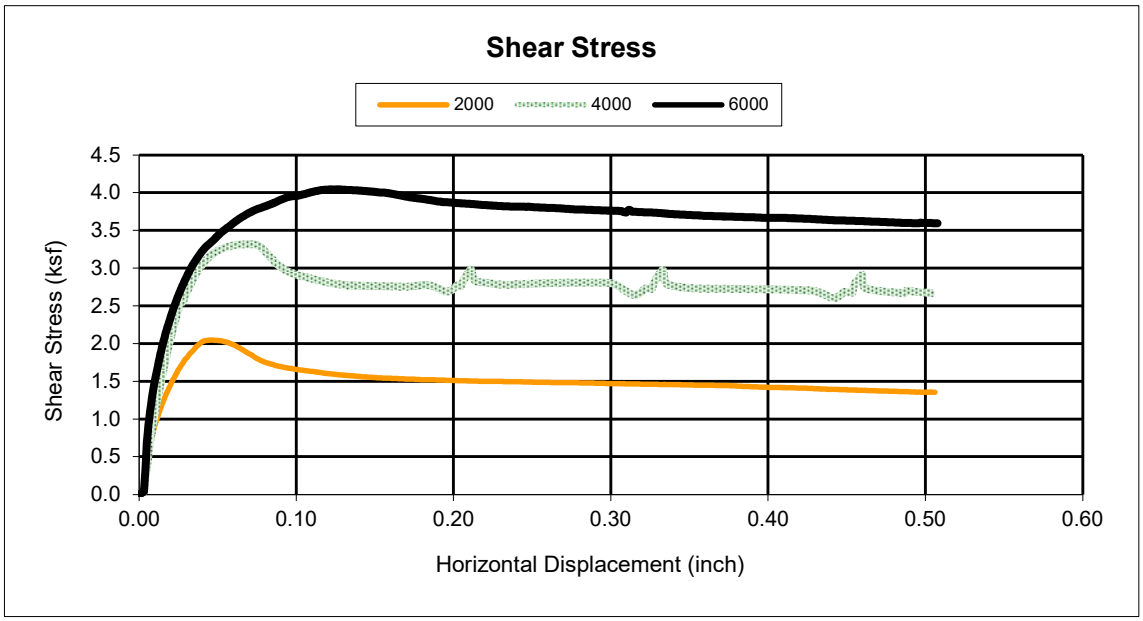
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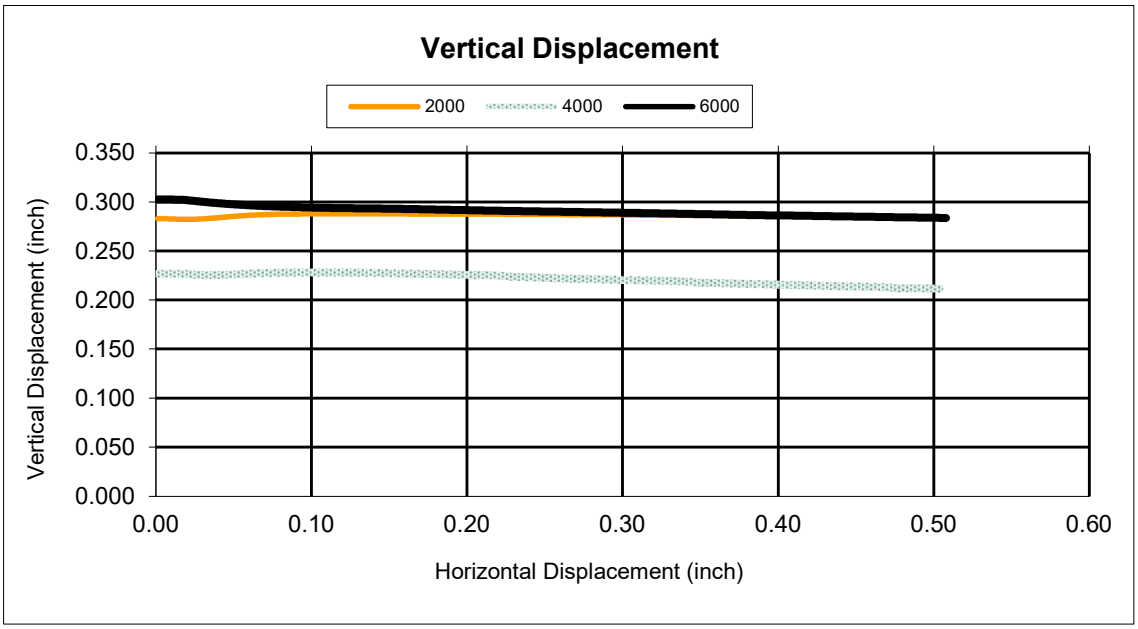
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native
SAMPLE SOURCE: B-25 (40.0-41.0')
SAMPLE PREPARATION: In Situ - 2, 4, and 6ksf

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1366-05
DATE ASSIGNED: 5/5/2022

NORMAL LOADS (psf): 2000 4000 6000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





Wood Environment & Infrastructure Solutions, Inc.
3630 E Wier Ave.
Phoenix, AZ 85040

ACS Services LLC

Direct Shear Under Consolidated Drained Conditions
ASTM D3080-11

ACS Project #	**2201026**	Material Type:	native(insitu)
ACS Lab #	**22-1655**	Sample Date:	-
Client Name:	**Ethos**	Sampled By:	Client (MAGS)
Project Name:	**SR 303L MC85 to Van Buren**	Laboratory Test Date:	Monday, April 4, 2022
Project Address:	**MC85 to Van Buren**	Laboratory Test By:	Brian Karl
Project City:	**Goodyear**	Reviewed By:	Dylan Ward
Sample Source:	**22-1655-2 B-26 @ 15.0-16.0**		

Sample Preparation: Specimen extracted from ring sample taken in the field using the labs jack. The specimen was consolidated at the normal stress until consolidation was completed prior to shearing.

Initial Parameters of Specimen

	Point 1	Point 2	Point 3
Normal Stress (ksf):	1	2	4
Dry mass (g):	117.9	117.5	118.1
Height (in.):	1	1	1
Diameter (in.):	2.42	2.42	2.42
Moisture (%):	3.4	3.5	4.1
Dry Density (pcf):	97.6	97.3	97.8
Saturation (%):	13	13	16
Void Ratio (%):	0.69	0.70	0.69

Final Parameters of Specimen

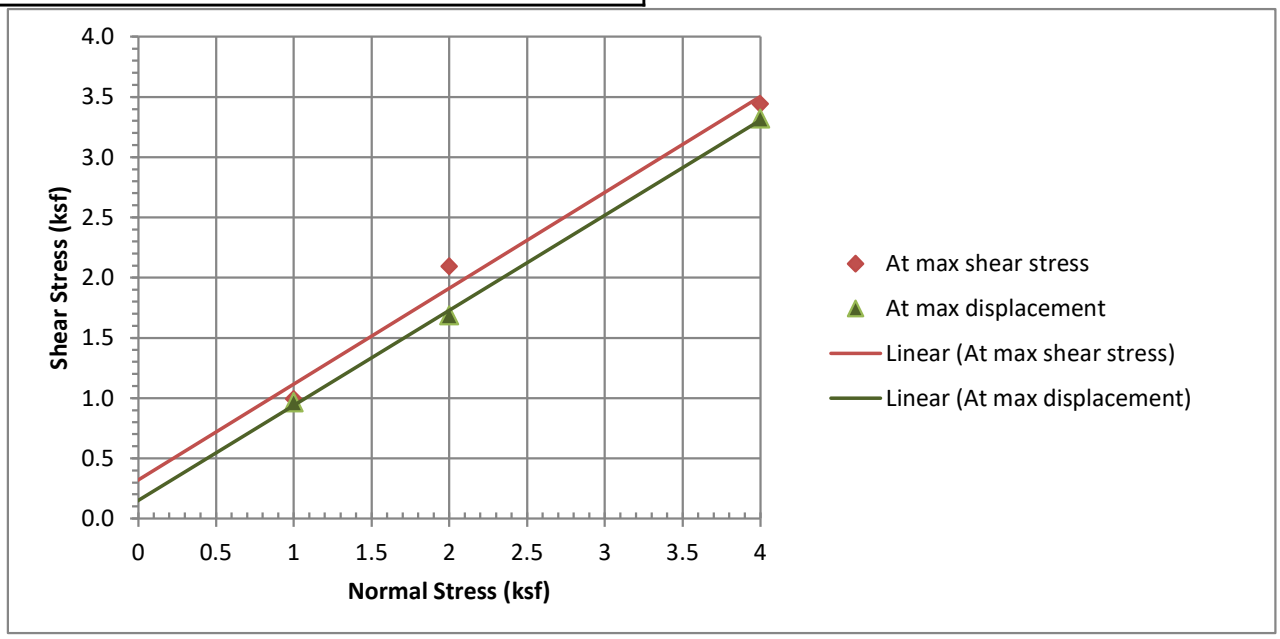
	Point 1	Point 2	Point 3
Normal Stress (ksf):	1	2	4
Dry mass (g):	117.9	117.5	118.1
Height (in.):	1.0015	1.005	0.9428
Diameter (in.):	2.42	2.42	2.42
Moisture (%):	3.4	3.5	4.1
Dry Density (pcf):	97.5	96.8	103.7
Saturation (%):	13	13	16
Void Ratio (%):	0.70	0.71	0.59

Results from Experimentation

	Point 1	Point 2	Point 3
Normal Stress (ksf):	1	2	4
Max. Shear Stress (ksf)	0.996	2.094	3.444
Displacement at Max Shear (in.):	0.0015	0.005	-0.0572
Shear Stress at Max Displ. (ksf):	0.967	1.687	3.322
Maximum Displacement (in.):	-0.0072	-0.0181	-0.059
Rate of Deformation (in./min):	0.02	0.02	0.02

Shear Device: Karol Warner Model 2001-D, Pneumatic load

	Friction Angle	Cohesion (ksf)
At Max Shear Stress:	38.5	0.321
At Max Displacement:	38.3	0.150



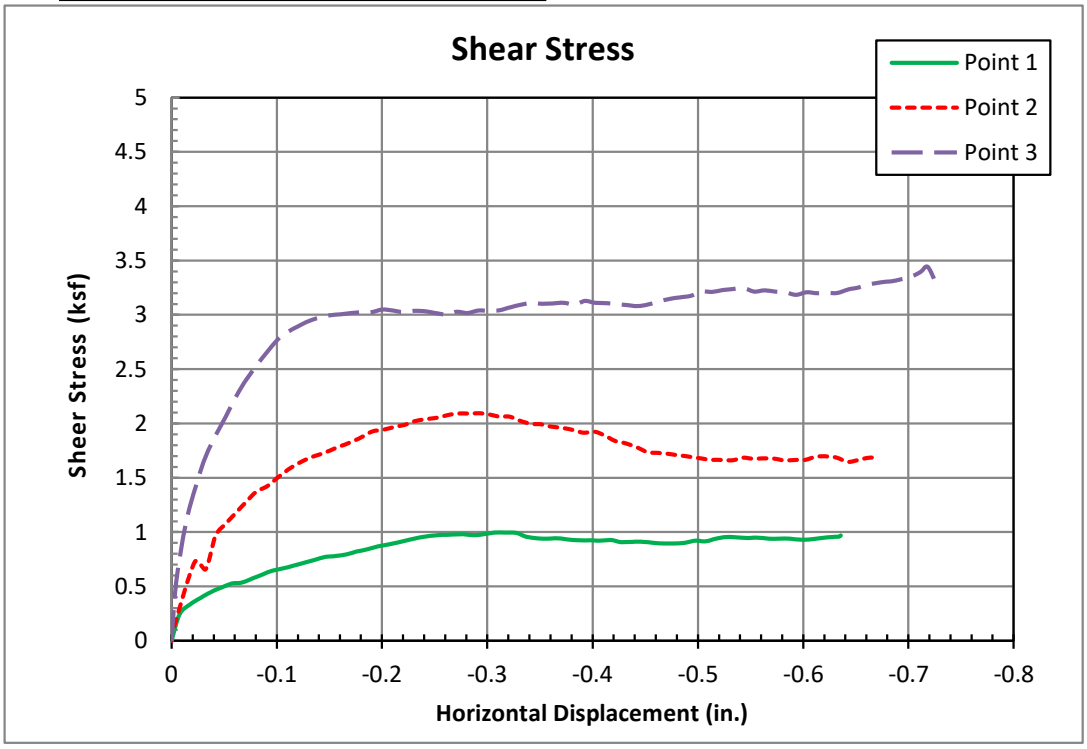
Operations Manager

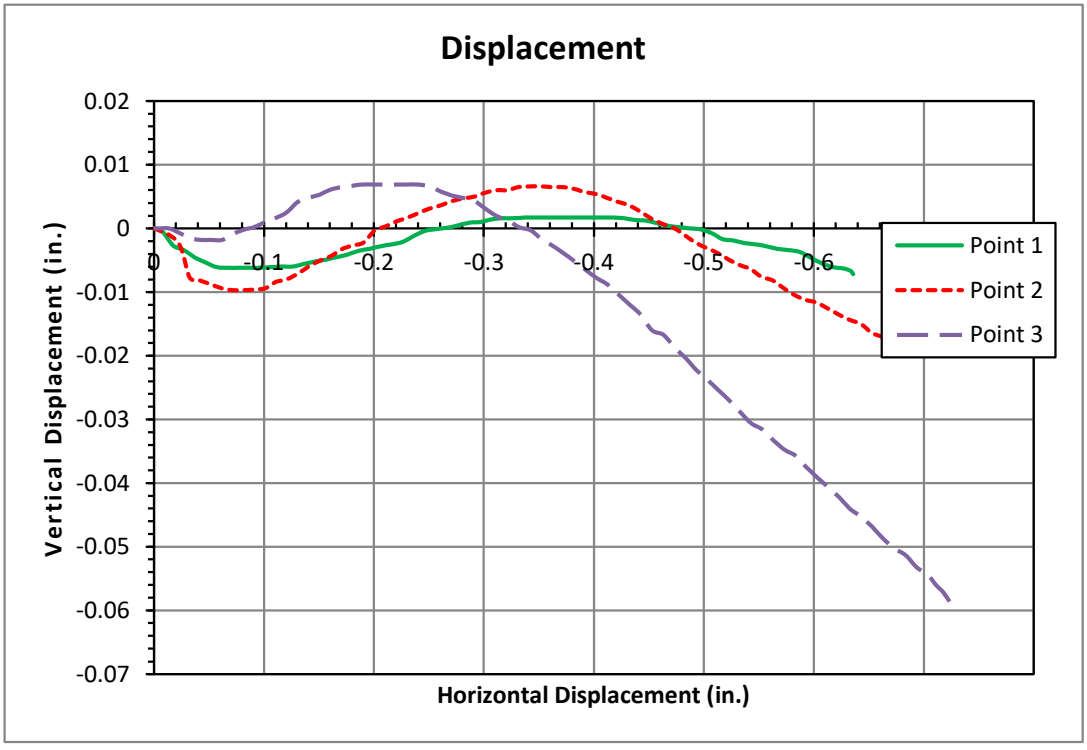
Signature

ACS Services LLC

Direct Shear Under Consolidated Drained Conditions
ASTM D3080-11

ACS Project #	**2201026**	Material Type:	native(insitu)
ACS Lab #	**22-1655**	Sample Date:	-
Client Name:	**Ethos**	Sampled By:	Client (MAGS)
Project Name:	**SR 303L MC85 to Van Buren**	Laboratory Test Date:	Monday, April 4, 2022
Project Address:	**MC85 to Van Buren**	Laboratory Test By:	Brian Karl
Project City:	**Goodyear**	Reviewed By:	Dylan Ward
Sample Source:	**22-1655-2 B-26 @ 15.0-16.0**		





Operations Manager

Signature

ACS Services LLC

Direct Shear Under Consolidated Drained Conditions
ASTM D3080-11

ACS Project #	**2201026**	Material Type:	Native
ACS Lab #	**22-1414-2**	Sample Date:	-
Client Name:	**Ethos**	Sampled By:	client
Project Name:	**SR 303L MC85 to Van Buren**	Laboratory Test Date:	44621
Project Address:	**MC85 to Van Buren**	Laboratory Test By:	Brian Karl
Project City:	**Goodyear**	Reviewed By:	Dylan Ward
Sample Source:	**B31 @ 10-11**		

Sample Preparation: Specimen extracted from ring sample taken in the field using the labs jack. The specimen was consolidated at the normal stress until consolidation was completed prior to shearing.

Initial Parameters of Specimen

	Point 1	Point 2	Point 3
Normal Stress (ksf):	1	2	4
Dry mass (g):	114.7	113.9	113.4
Height (in.):	1	1	1
Diameter (in.):	2.42	2.42	2.42
Moisture (%):	4.7	4	3.1
Dry Density (pcf):	95.0	94.3	93.9
Saturation (%):	17	14	11
Void Ratio (%):	0.74	0.75	0.76

Final Parameters of Specimen

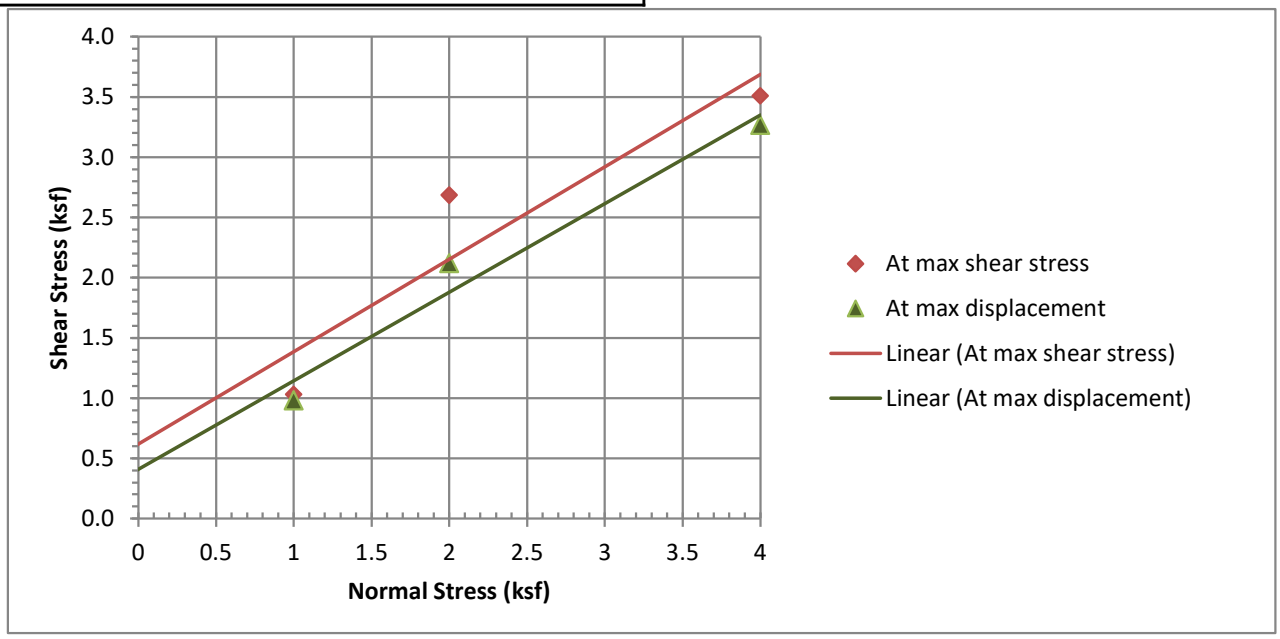
	Point 1	Point 2	Point 3
Normal Stress (ksf):	1	2	4
Dry mass (g):	114.7	113.9	113
Height (in.):	0.896	0.9157	0.7583
Diameter (in.):	2.42	2.42	2.42
Moisture (%):	4.7	4	3.1
Dry Density (pcf):	106.0	103.0	123.4
Saturation (%):	100	100	100
Void Ratio (%):	0.56	0.61	0.34

Results from Experimentation

	Point 1	Point 2	Point 3
Normal Stress (ksf):	1	2	4
Max. Shear Stress (ksf)	1.030	2.686	3.510
Displacement at Max Shear (in.):	-0.104	-0.0843	-0.2417
Shear Stress at Max Displ. (ksf):	0.982	2.119	3.268
Maximum Displacement (in.):	0.0127	0.0065	-0.0168
Rate of Deformation (in./min):	0.0033	0.0033	0.0033

	Friction Angle	Cohesion (ksf)
At Max Shear Stress:	37.5	0.618
At Max Displacement:	36.3	0.407

Shear Device: Karol Warner Model 2001-D, Pneumatic load



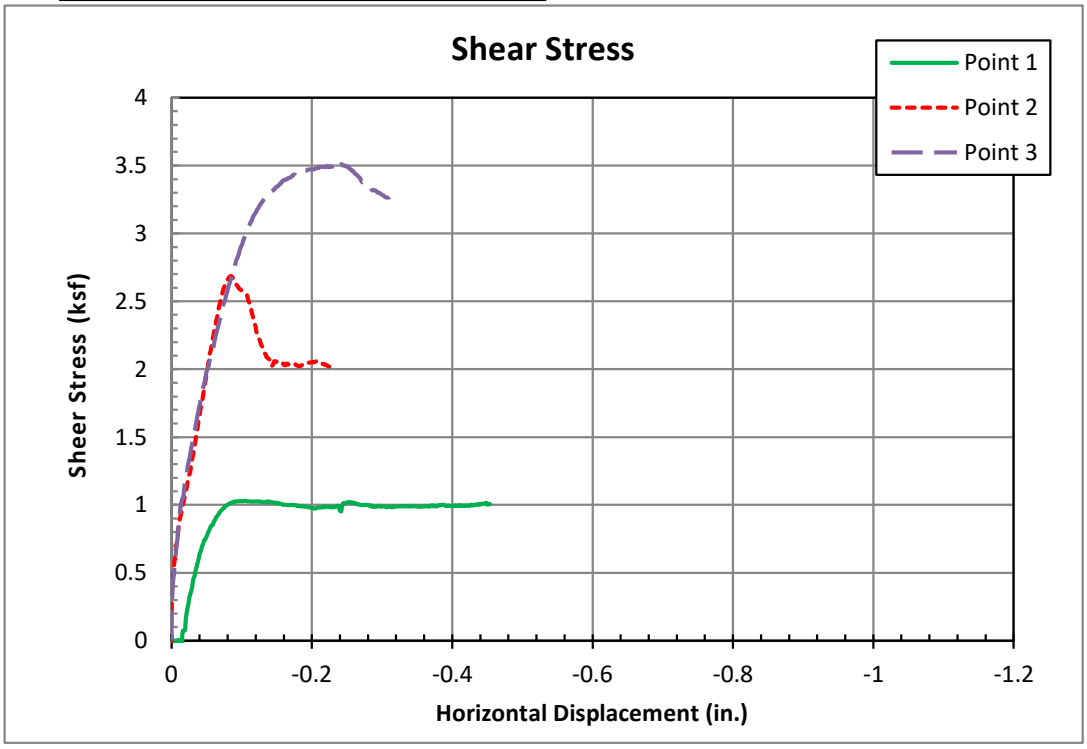
Operations Manager

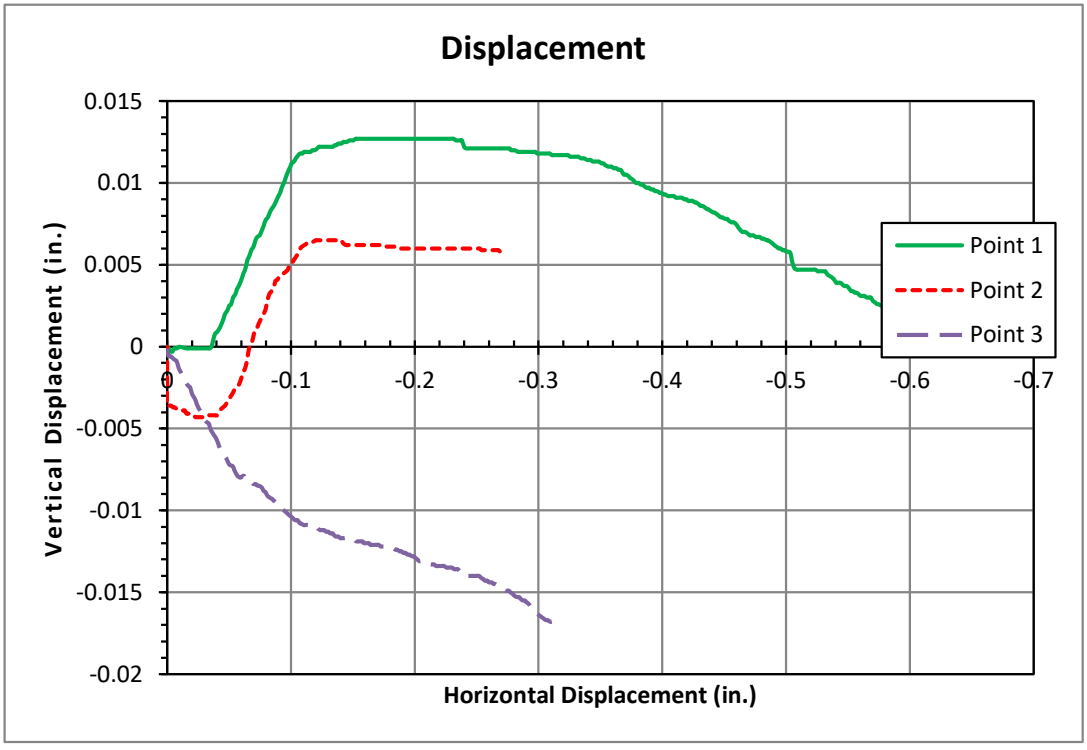
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ACS Services LLC

Direct Shear Under Consolidated Drained Conditions
ASTM D3080-11

ACS Project #	**2201026**	Material Type:	Native
ACS Lab #	**22-1414-2**	Sample Date:	-
Client Name:	**Ethos**	Sampled By:	client
Project Name:	**SR 303L MC85 to Van Buren**	Laboratory Test Date:	44621
Project Address:	**MC85 to Van Buren**	Laboratory Test By:	Brian Karl
Project City:	**Goodyear**	Reviewed By:	Dylan Ward
Sample Source:	**B31 @ 10-11**		





Operations Manager

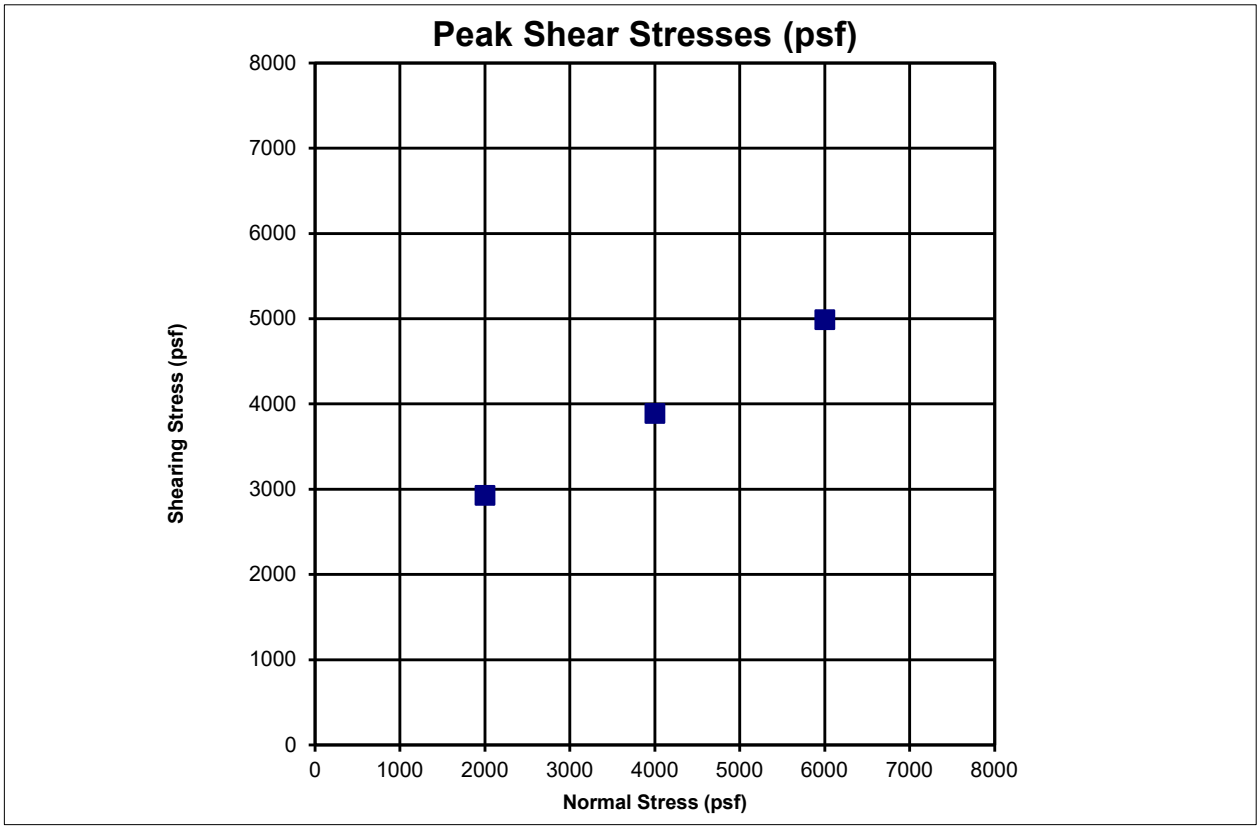
Signature

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native
SAMPLE SOURCE: B-64 (24.0-25.0')
SAMPLE PREPARATION: In Situ - 2, 4, and 6ksf

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1366-07
DATE ASSIGNED: 5/5/2022

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.998	0.997	0.994
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.01	0.01	0.01
Direct shear point:	1	2	3
Dry mass of specimen (g):	113.5	111.8	113.4
Initial Moisture Content:	16.8%	18.6%	17.2%
Initial Wet Density (pcf):	109.8	109.8	110.1
Initial Dry Density (pcf):	94.0	92.6	93.9
Final Moisture Content:	16.0%	17.7%	16.1%
Final Wet Density (pcf):	109.3	109.4	109.7
Final Dry Density (pcf):	94.2	92.9	94.5
Normal Stress (psf):	2000	4000	6000
Maximum Shearing Stress (psf):	2930	3889	4990
Vertical Deformation @ Max Shear (in):	0.285	0.245	0.310
Horizontal Deformation @ Max Shear (in):	0.060	0.088	0.081



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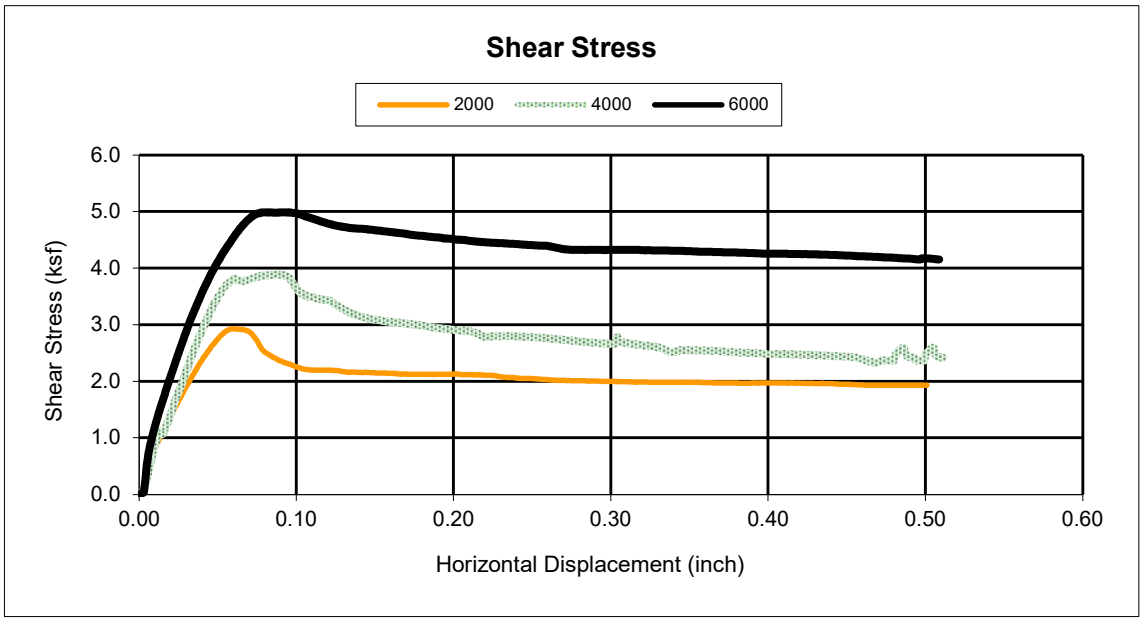
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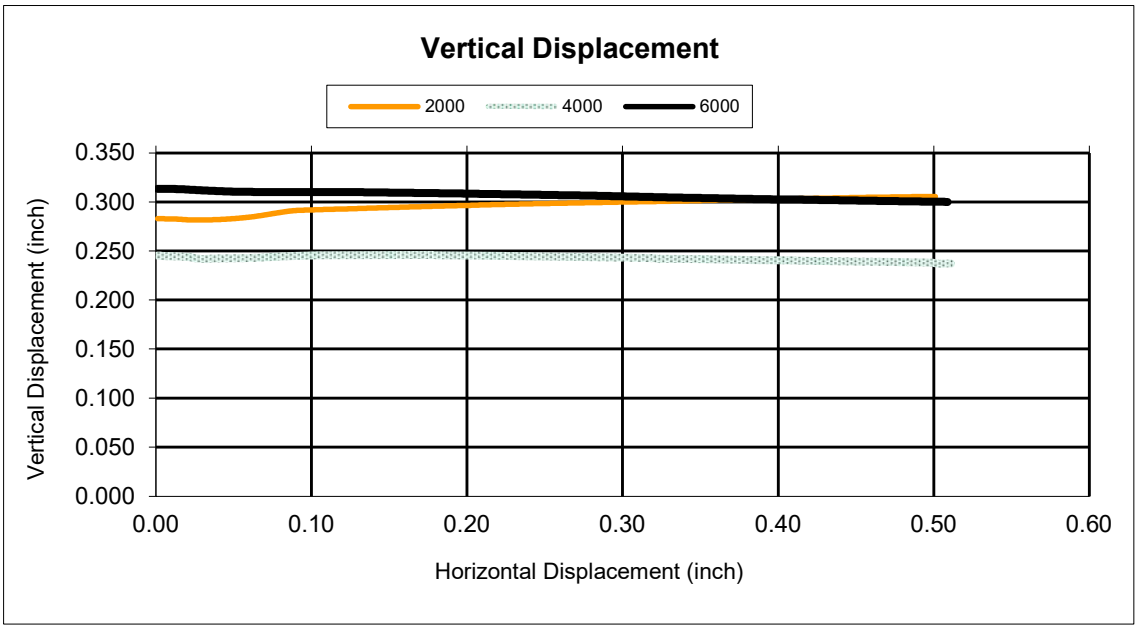
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native
SAMPLE SOURCE: B-64 (24.0-25.0')
SAMPLE PREPARATION: In Situ - 2, 4, and 6ksf

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1366-07
DATE ASSIGNED: 5/5/2022

NORMAL LOADS (psf): 2000 4000 6000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





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DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS ASTM D3080

Terracon

PROJECT:	ACS Project # 2201026	**JOB NO:**	65201093
LOCATION:	Phoenix, AZ	**WORK ORDER NO:**	65201093.0009
MATERIAL:	Silty Sand	**LAB NO:**	22-2132-5
SAMPLE SOURCE:	B - 68 @ 25'- 26'	**DATE SAMPLED:**	05/09/22

Sample Preparation: Insitu density, material and moisture. Specimens consolidated at normal load for 30 mins. Prior to shear. Not inundated.

Initial Parameters of specimen:

	Point 1	Point 2	Point 3
Normal Stress (psf):	**2000**	**4000**	**6000**
Dry mass (g):	118.17	120.49	121.89
Height (in):	1.0000	1.0000	1.0000
Diameter (in):	2.42	2.42	2.42
Moisture, %:	8.2	8.3	7.9
Dry Density (pcf):	97.9	99.8	101.0
Saturation, %:	32	33	33
Void Ratio:	0.69	0.66	0.64

Pre- Shear Parameters of specimen:

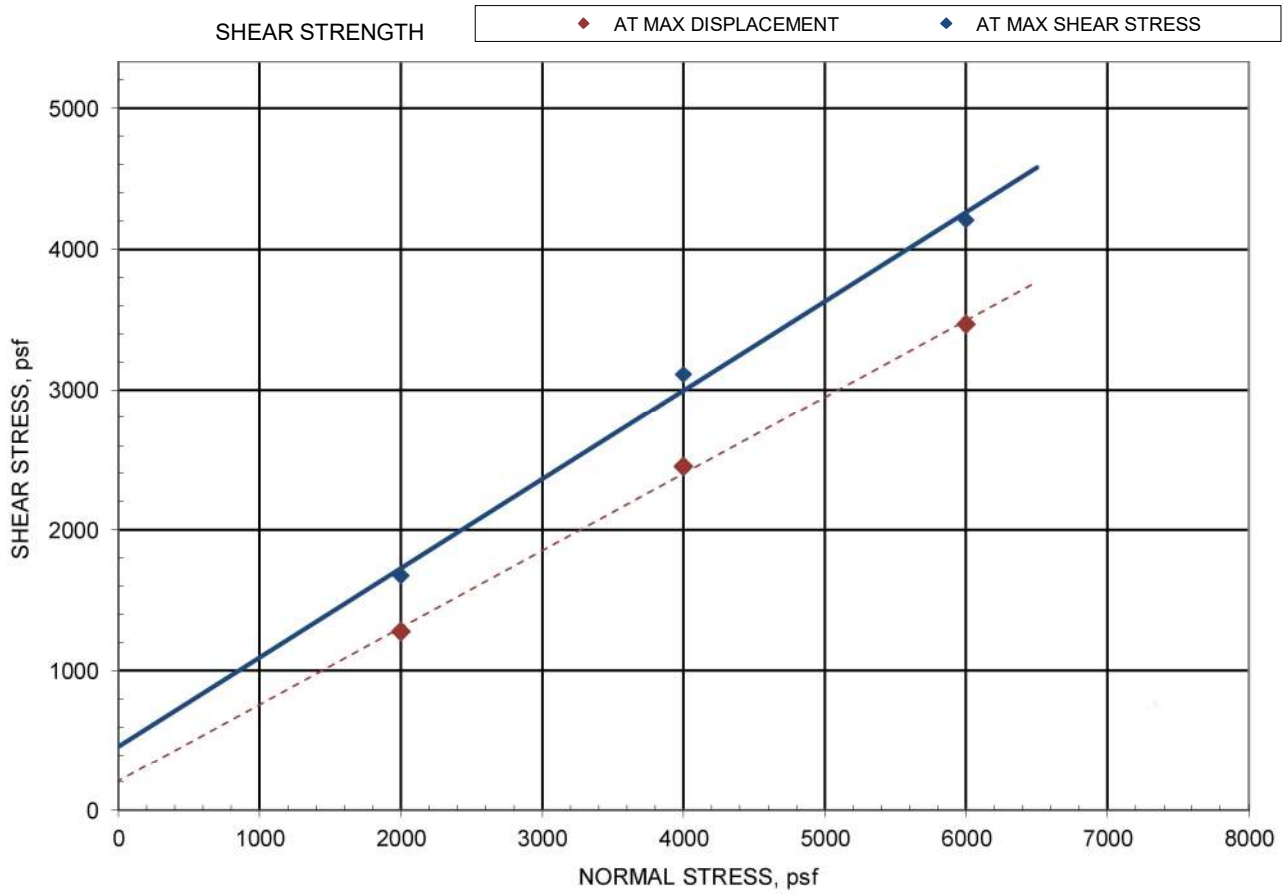
	Point 1	Point 2	Point 3
Normal Stress (psf):	**2000**	**4000**	**6000**
Dry mass (g):	118.17	120.49	121.89
Height (in):	0.9883	0.9841	0.9735
Diameter (in):	2.42	2.42	2.42
Moisture, %:	7.5	7.4	7.2
Dry Density (pcf):	99.0	101.4	103.7
Saturation, %:	30	31	32
Void Ratio:	0.67	0.63	0.60

Normal Stress (psf):	2000	4000	6000
Maximum Shear Stress, (psf):	1674	3110	4210
Displacement at Maximum Shear, (in):	0.086	0.098	0.132
Shear Stress at Max Displacement, (psf)	1280	2452	3468
Maximum Displacement, (in):	0.450	0.451	0.436
Rate of Deformation, in/min	0.0070	0.0070	0.0070

SHEAR DEVICE: Geomatic model 8914, Dead Weight load force

	FRICTION ANGLE	COHESION
AT MAX SHEAR STRESS	**32**	**462**
Specs:		
AT MAX DISPLACEMENT	29	212
Specs:		

SHEAR STRENGTH

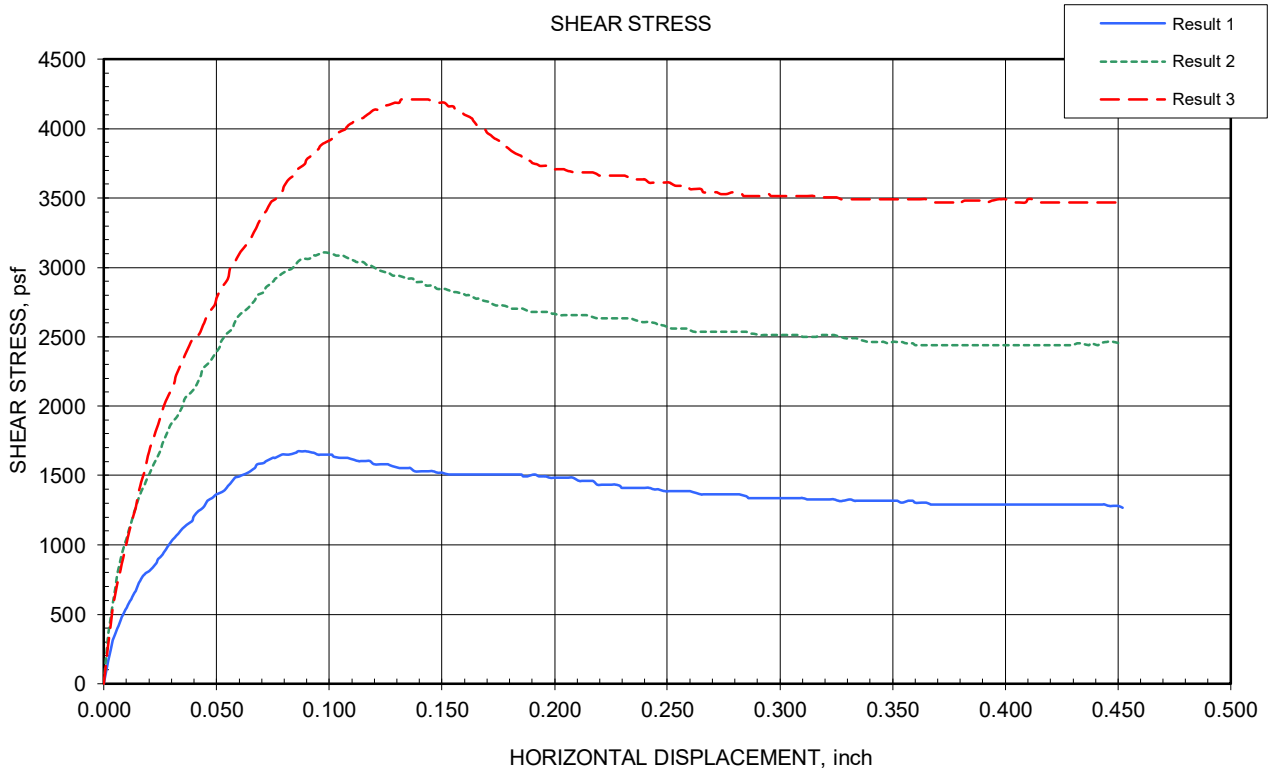


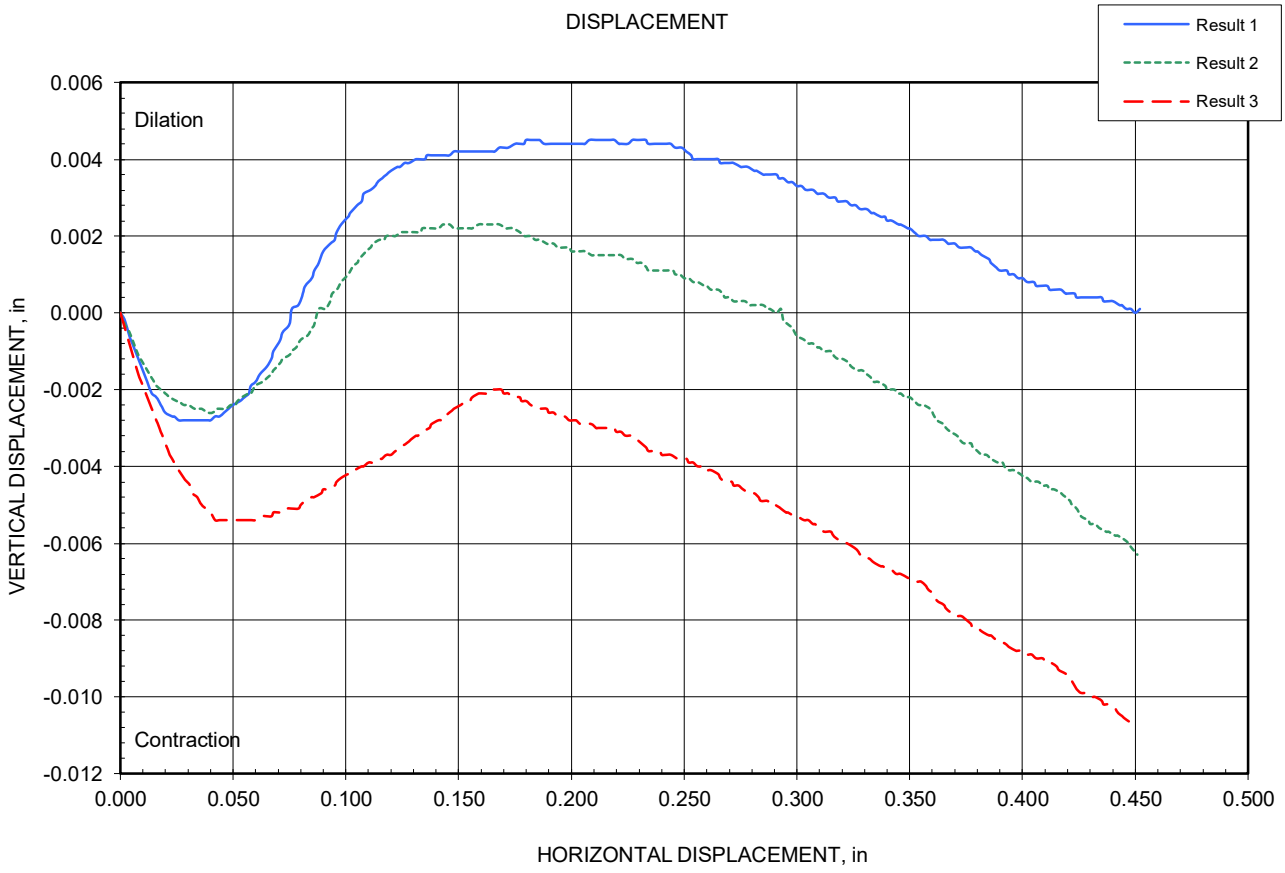
Note: The friction angle presented is applicable only to the load ranges and sample conditions tested

Reviewed By: Kirk Jackson

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS ASTM D3080

PROJECT:	ACS Project # 2201026	**JOB NO:**	65201093
LOCATION:	Phoenix, AZ	**WORK ORDER NO:**	65201093.0009
MATERIAL:	Silty Sand	**LAB NO:**	22-2132-5
SAMPLE SOURCE:	B - 68 @ 25'- 26'	**DATE SAMPLED:**	5/9/2022



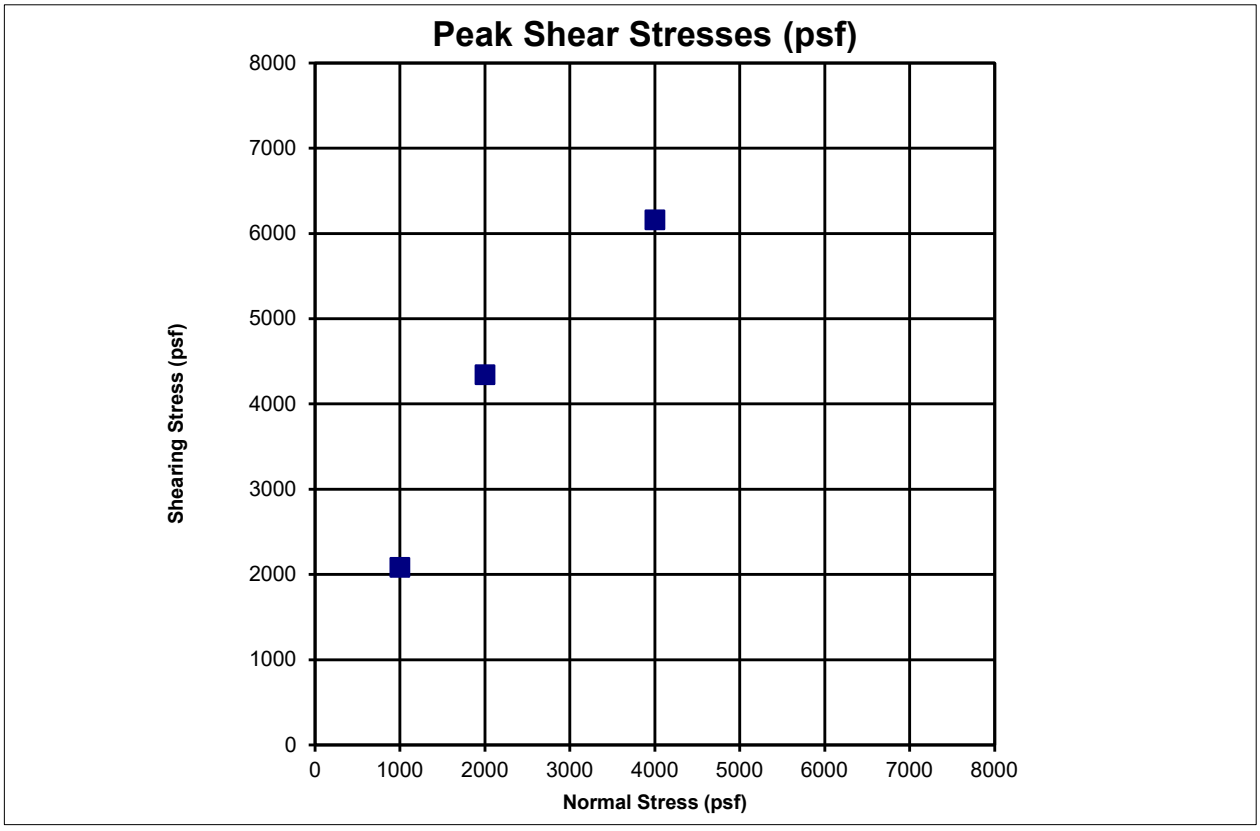


PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native
SAMPLE SOURCE: B-71 (20.0-21.0')
SAMPLE PREPARATION: In Situ - 1, 2, and 4ksf

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1366-08
DATE ASSIGNED: 5/5/2022

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.997	0.998	0.998
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.01	0.01	0.01
Direct shear point:	1	2	3
Dry mass of specimen (g):	107.9	112.4	120.2
Initial Moisture Content:	20.8%	25.9%	23.5%
Initial Wet Density (pcf):	107.9	117.2	123.0
Initial Dry Density (pcf):	89.4	93.1	99.6
Final Moisture Content:	19.7%	23.4%	21.2%
Final Wet Density (pcf):	107.3	115.1	120.9
Final Dry Density (pcf):	89.6	93.3	99.7
Normal Stress (psf):	1000	2000	4000
Maximum Shearing Stress (psf):	2084	4342	6162
Vertical Deformation @ Max Shear (in):	0.289	0.246	0.331
Horizontal Deformation @ Max Shear (in):	0.050	0.068	0.052



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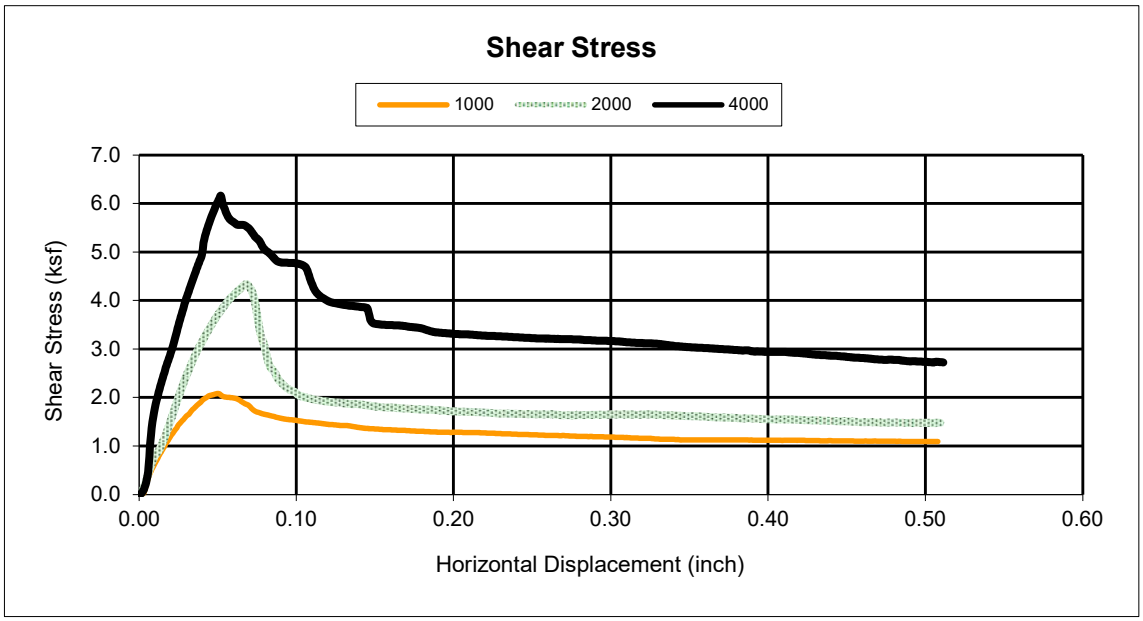
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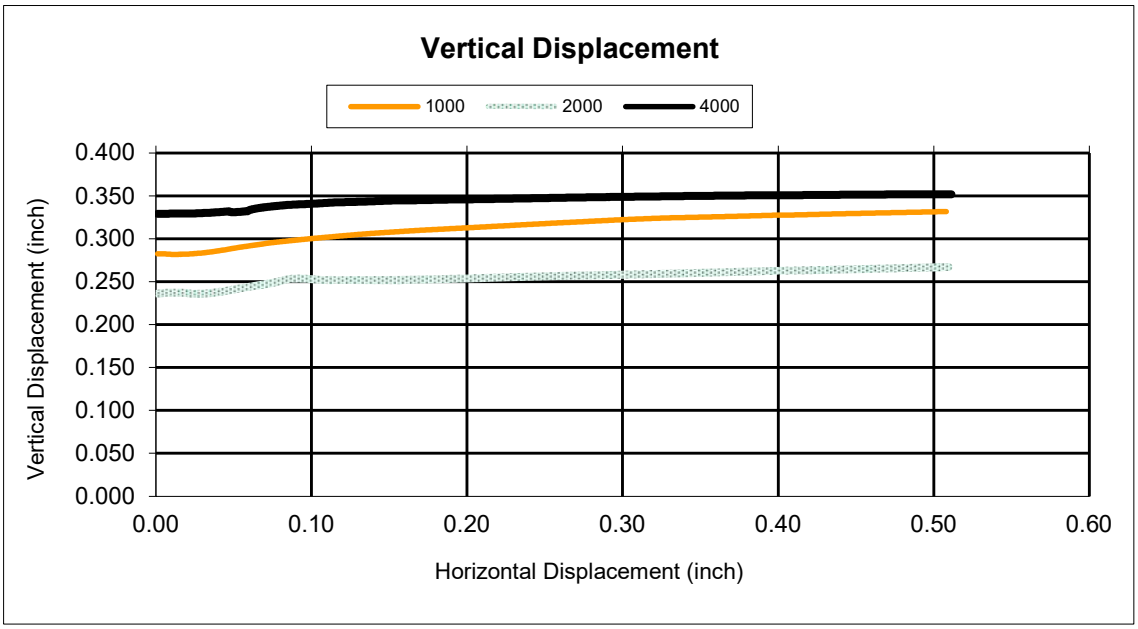
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native
SAMPLE SOURCE: B-71 (20.0-21.0')
SAMPLE PREPARATION: In Situ - 1, 2, and 4ksf

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1366-08
DATE ASSIGNED: 5/5/2022

NORMAL LOADS (psf): 1000 2000 4000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





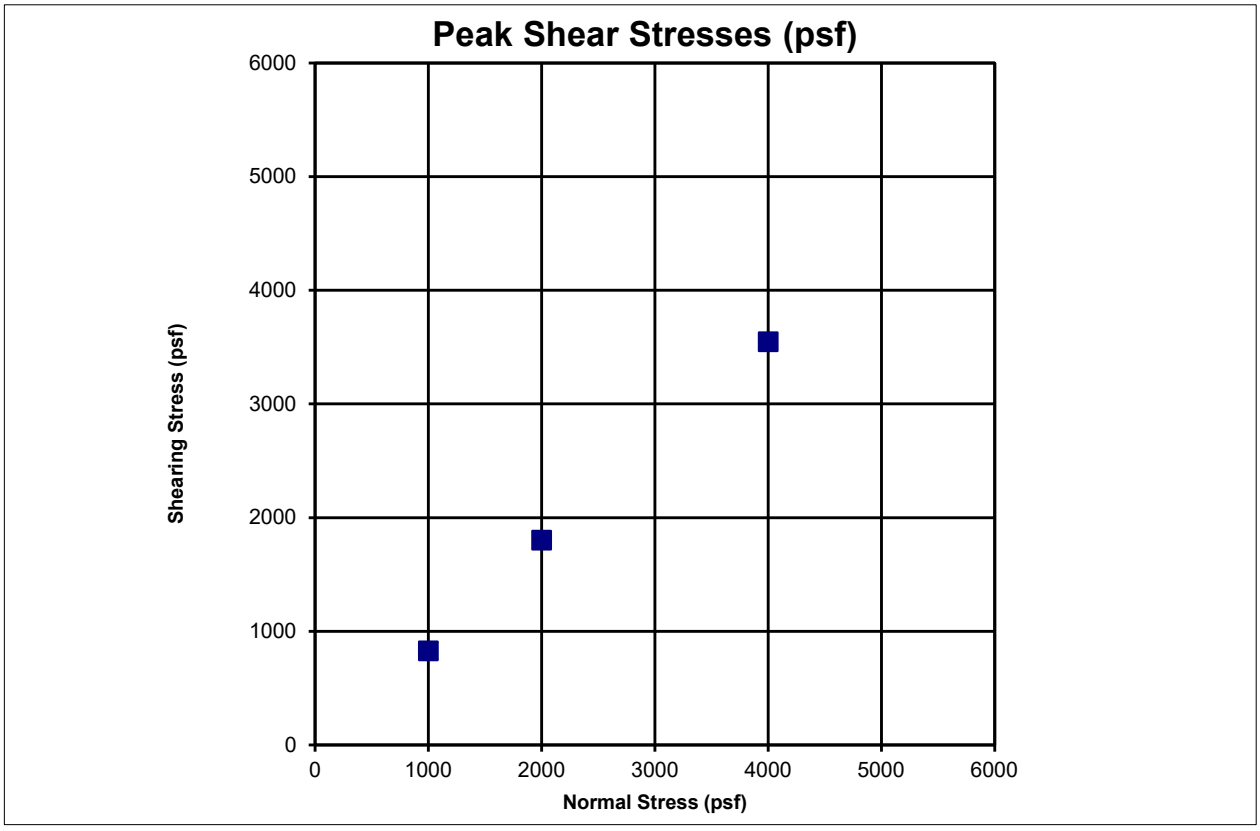
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PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: ACS Lab #22-1804-8 / B-73 (30.0-31.0')
SAMPLE PREPARATION: In Situ - 1, 2, and 4 ksf

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1302-04
DATE ASSIGNED: 4/15/2022

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.999	0.999	0.998
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.01	0.01	0.01
Direct shear point:	1	2	3
Dry mass of specimen (g):	120.3	123.0	126.7
Initial Moisture Content:	3.0%	2.8%	2.8%
Initial Wet Density (pcf):	102.6	104.8	107.8
Initial Dry Density (pcf):	99.6	101.9	104.9
Final Moisture Content:	2.0%	2.0%	1.7%
Final Wet Density (pcf):	101.7	103.9	106.9
Final Dry Density (pcf):	99.7	102.0	105.1
Normal Stress (psf):	1000	2000	4000
Maximum Shearing Stress (psf):	827	1802	3549
Vertical Deformation @ Max Shear (in):	0.241	0.239	0.299
Horizontal Deformation @ Max Shear (in):	0.101	0.082	0.093



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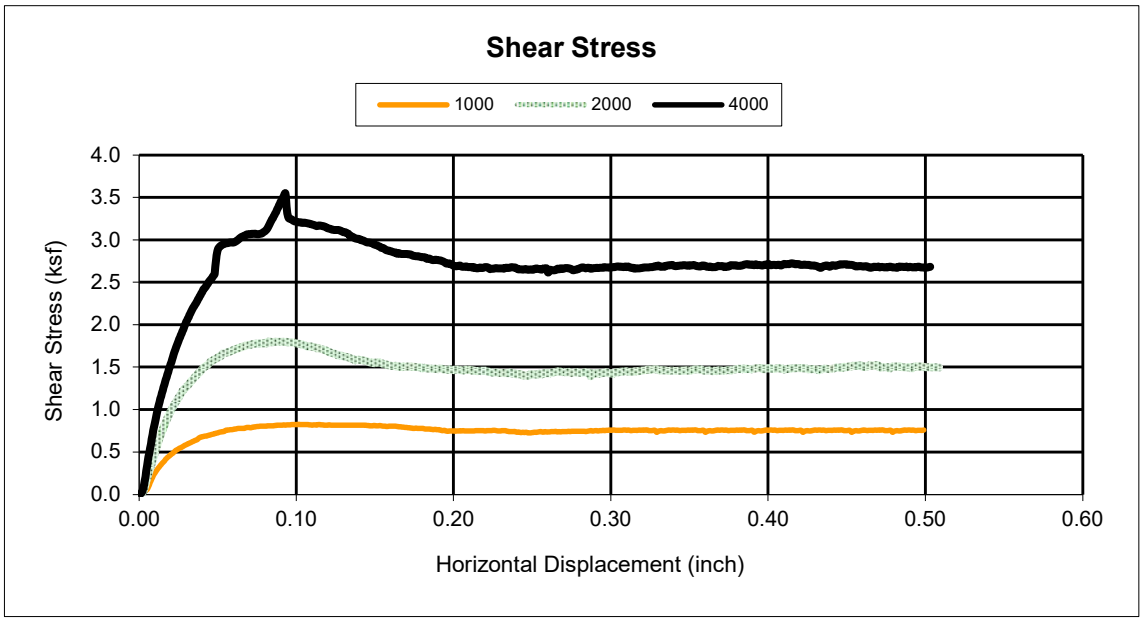
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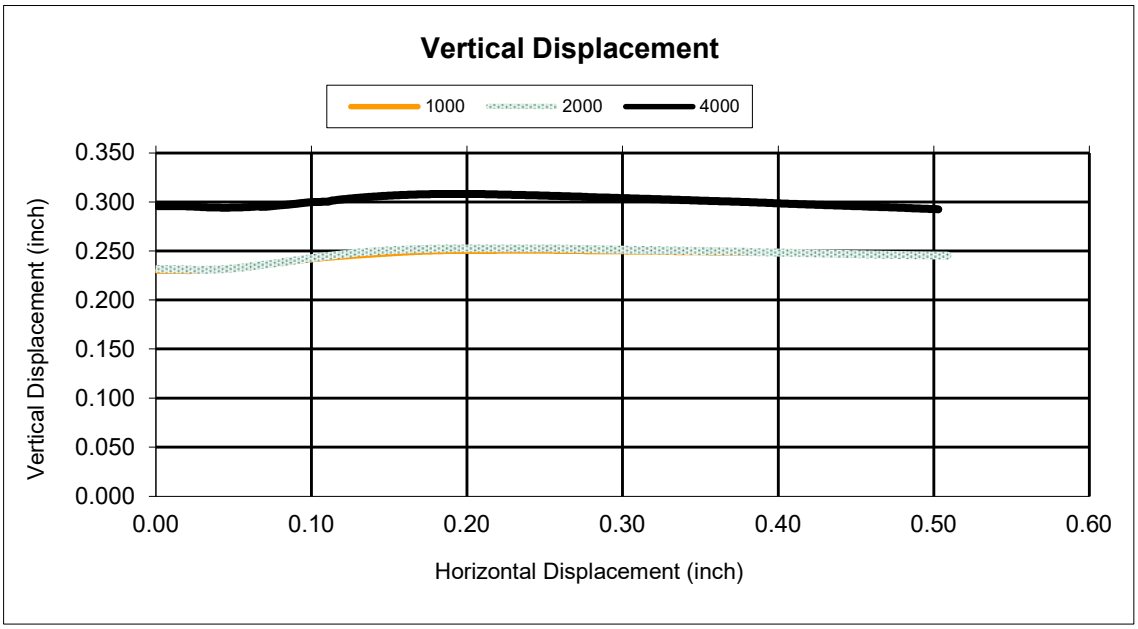
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: ACS Lab #22-1804-8 / B-73 (30.0-31.0')
SAMPLE PREPARATION: In Situ - 1, 2, and 4 ksf

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1302-04
DATE ASSIGNED: 4/15/2022

NORMAL LOADS (psf): 1000 2000 4000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





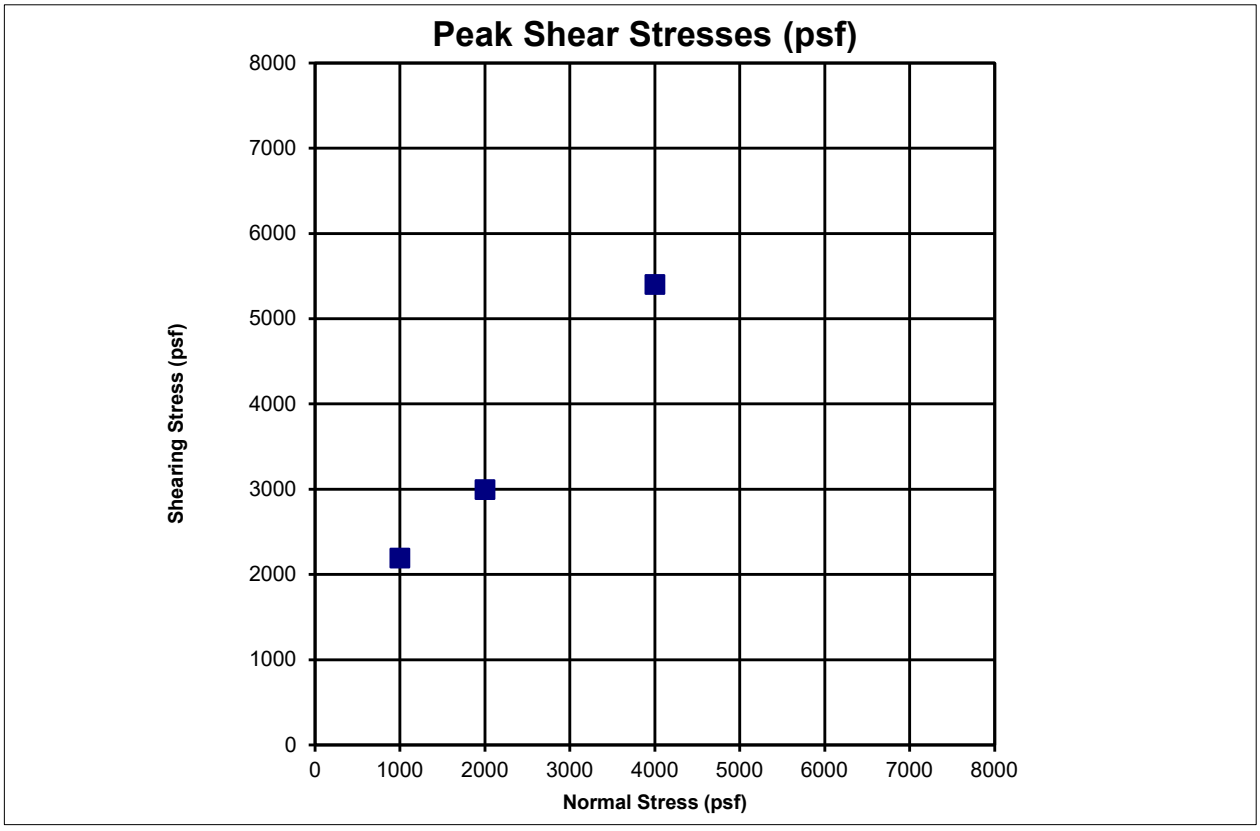
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PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native
SAMPLE SOURCE: B-75 (20.0-21.0')
SAMPLE PREPARATION: In Situ - 1, 2, and 4ksf

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1366-02
DATE ASSIGNED: 5/5/2022

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.996	0.998	0.998
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.01	0.01	0.01
Direct shear point:	1	2	3
Dry mass of specimen (g):	121.6	124.7	127.6
Initial Moisture Content:	18.8%	19.9%	17.4%
Initial Wet Density (pcf):	119.6	123.8	124.1
Initial Dry Density (pcf):	100.7	103.3	105.7
Final Moisture Content:	17.2%	19.5%	16.4%
Final Wet Density (pcf):	118.5	123.6	123.2
Final Dry Density (pcf):	101.1	103.5	105.9
Normal Stress (psf):	1000	2000	4000
Maximum Shearing Stress (psf):	2193	2994	5401
Vertical Deformation @ Max Shear (in):	0.288	0.217	0.319
Horizontal Deformation @ Max Shear (in):	0.061	0.035	0.051



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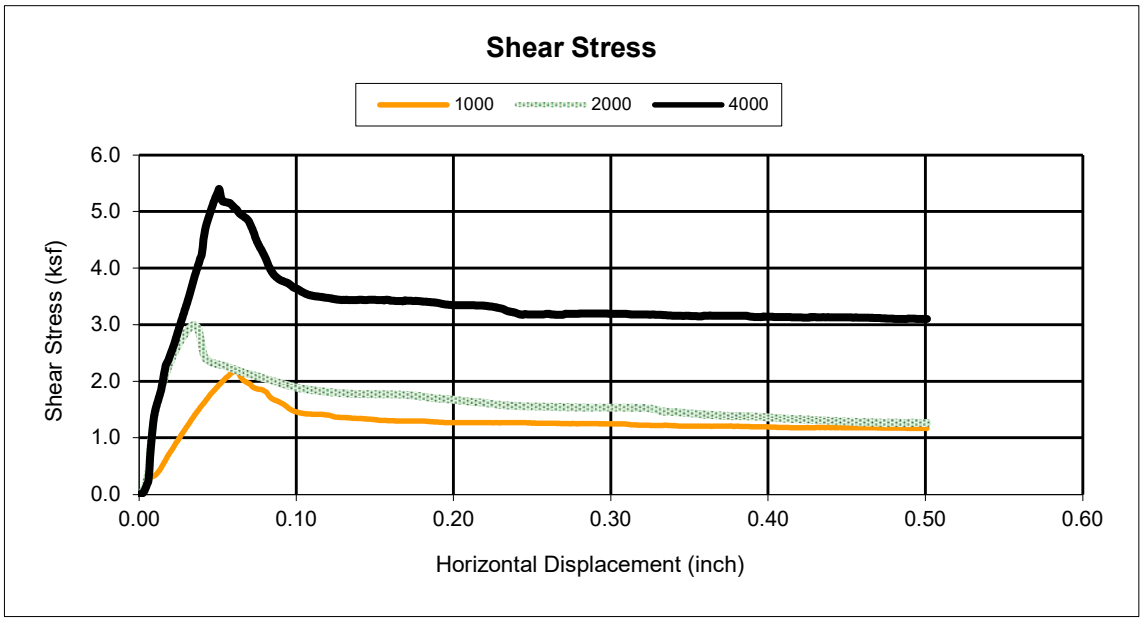
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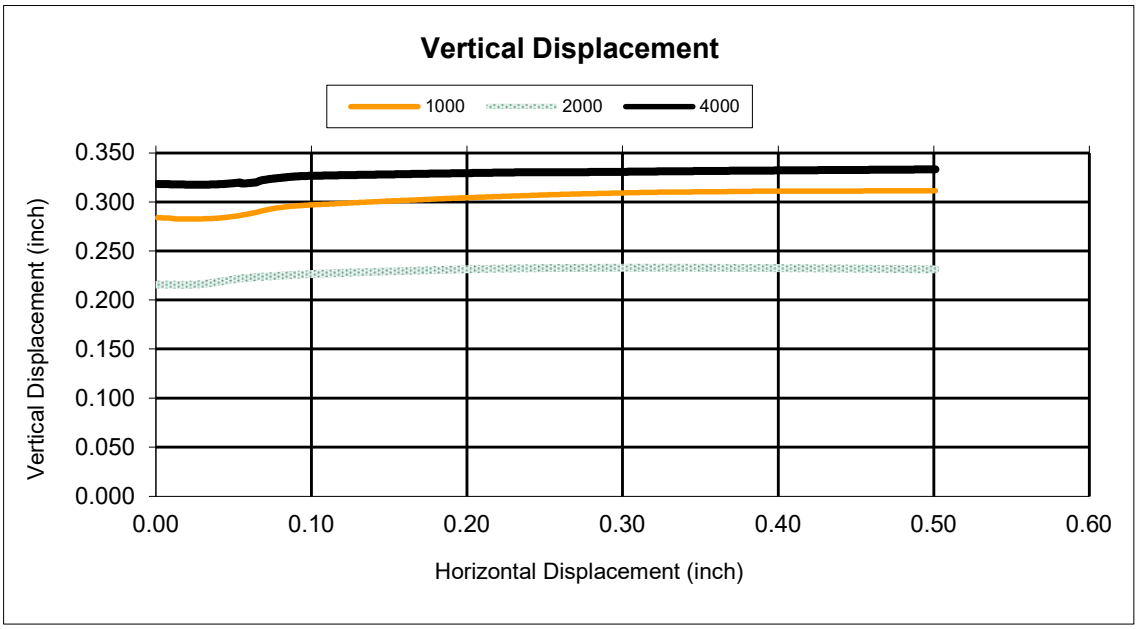
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native
SAMPLE SOURCE: B-75 (20.0-21.0')
SAMPLE PREPARATION: In Situ - 1, 2, and 4ksf

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1366-02
DATE ASSIGNED: 5/5/2022

NORMAL LOADS (psf): 1000 2000 4000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





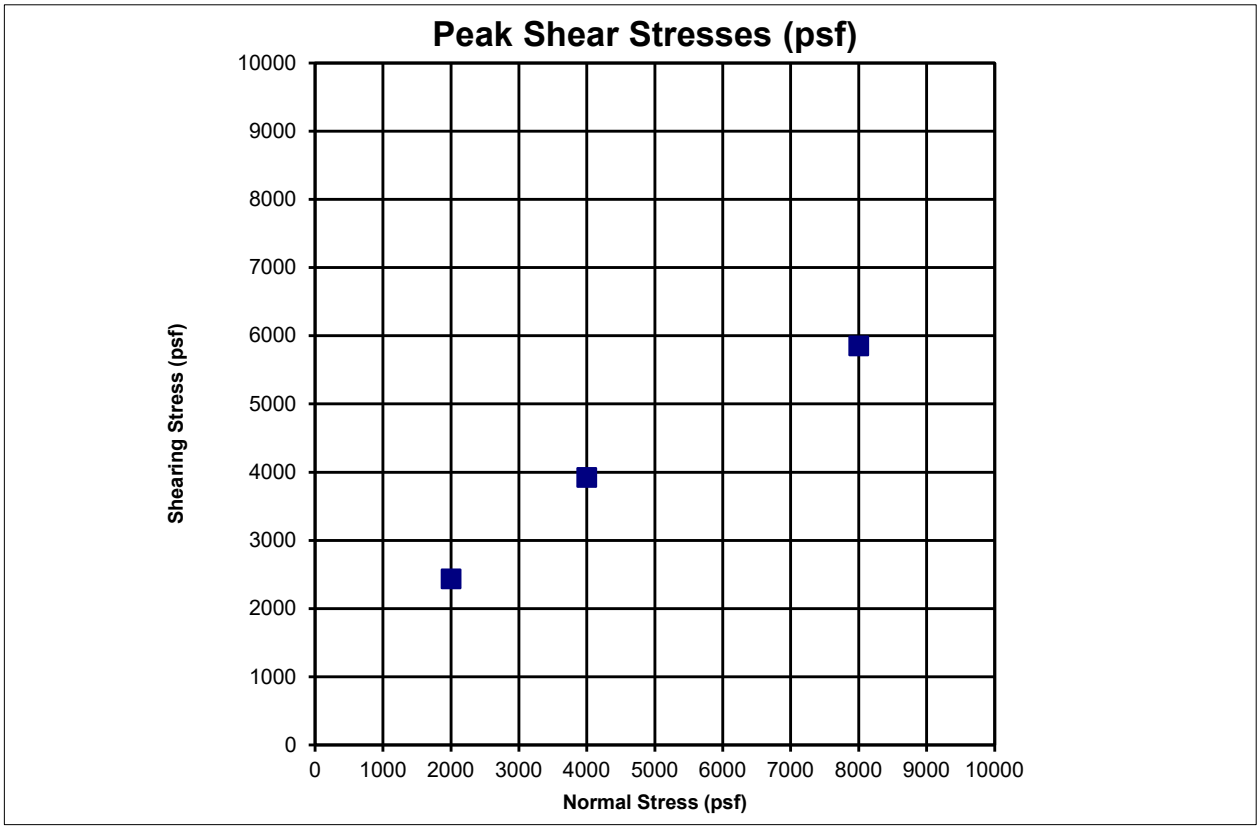
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PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native
SAMPLE SOURCE: B-75 (55.0-56.0')
SAMPLE PREPARATION: In Situ - 2, 4, and 8ksf

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1366-03
DATE ASSIGNED: 5/5/2022

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.999	0.999	0.998
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.01	0.01	0.01
Direct shear point:	1	2	3
Dry mass of specimen (g):	130.4	131.6	129.4
Initial Moisture Content:	13.2%	13.8%	16.7%
Initial Wet Density (pcf):	122.2	124.1	125.1
Initial Dry Density (pcf):	108.0	109.0	107.2
Final Moisture Content:	12.0%	13.2%	15.4%
Final Wet Density (pcf):	121.2	123.6	123.9
Final Dry Density (pcf):	108.1	109.2	107.4
Normal Stress (psf):	2000	4000	8000
Maximum Shearing Stress (psf):	2434	3924	5853
Vertical Deformation @ Max Shear (in):	0.283	0.225	0.322
Horizontal Deformation @ Max Shear (in):	0.053	0.057	0.095



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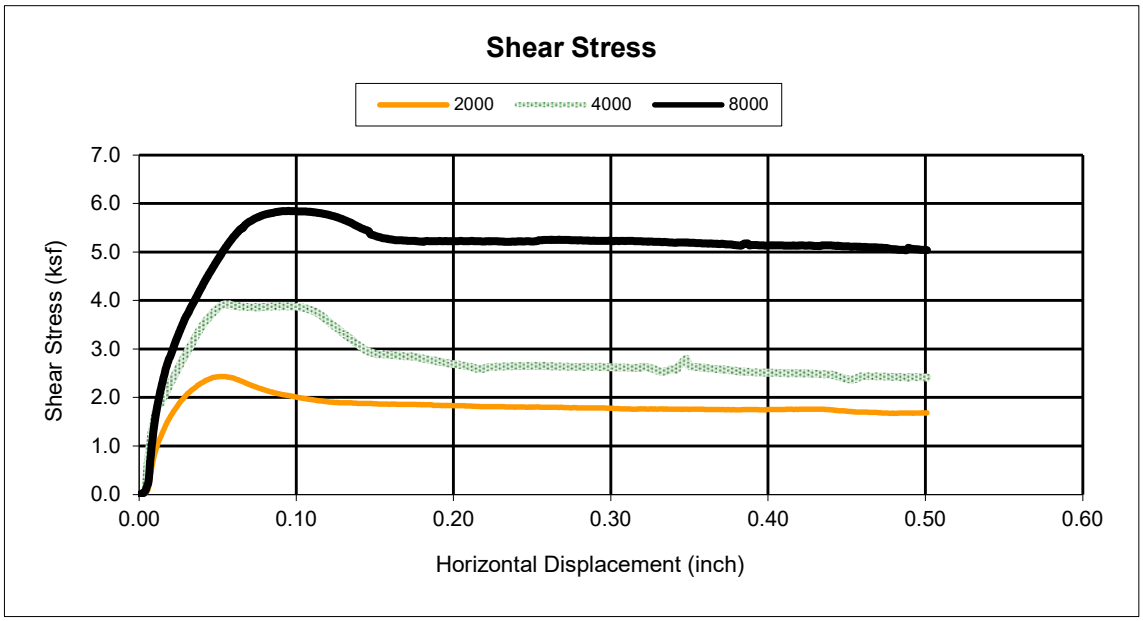
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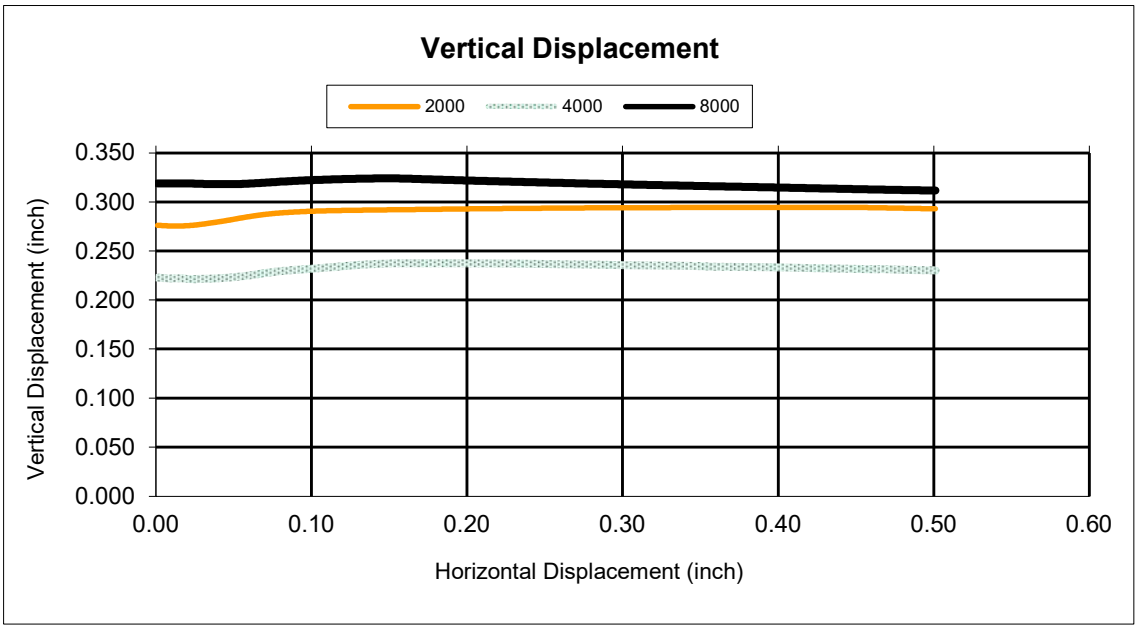
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native
SAMPLE SOURCE: B-75 (55.0-56.0')
SAMPLE PREPARATION: In Situ - 2, 4, and 8ksf

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1366-03
DATE ASSIGNED: 5/5/2022

NORMAL LOADS (psf): 2000 4000 8000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





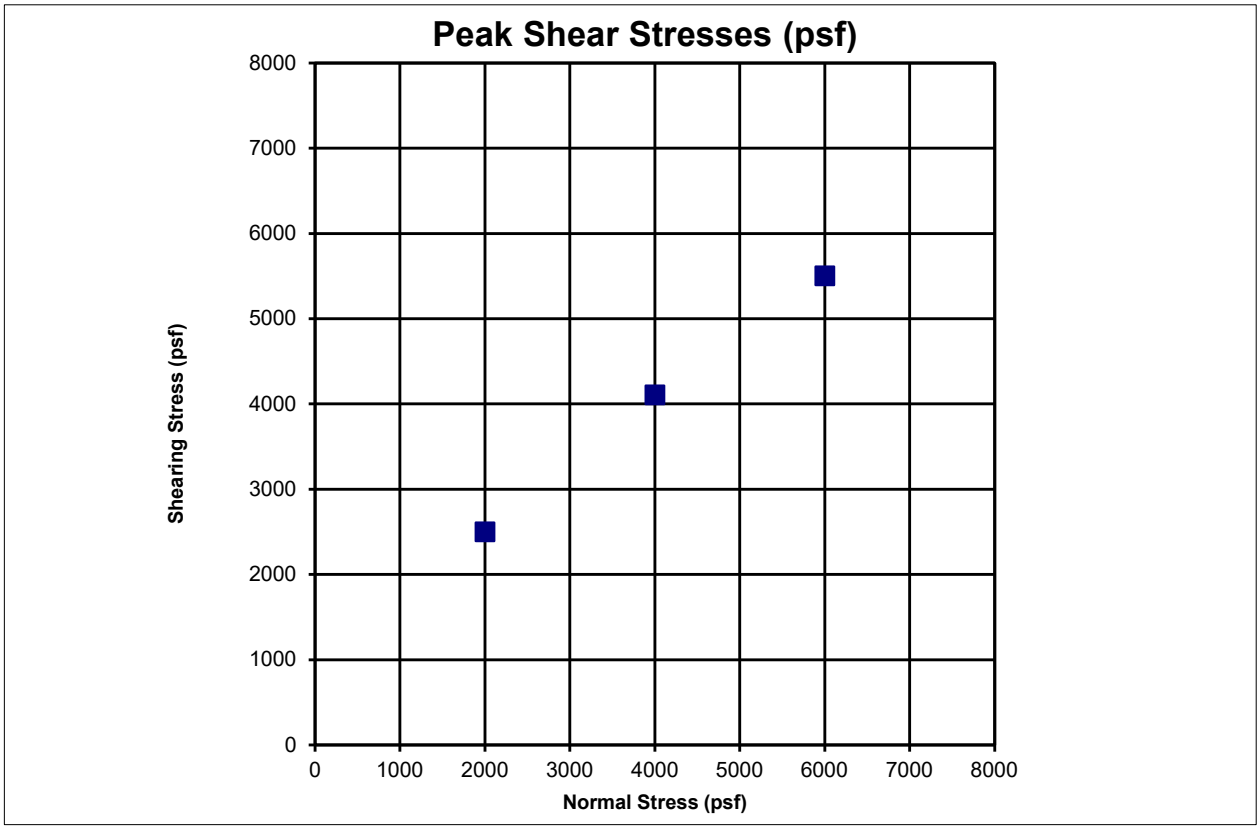
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PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: ACS Lab #22-1804-4 / B-77 (40.0-41.0')
SAMPLE PREPARATION: In Situ - 2, 4, and 6 ksf

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1302-03
DATE ASSIGNED: 4/15/2022

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.998	0.997	0.998
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.01	0.01	0.01
Direct shear point:	1	2	3
Dry mass of specimen (g):	129.2	130.7	133.4
Initial Moisture Content:	13.4%	17.3%	17.8%
Initial Wet Density (pcf):	121.3	127.0	130.1
Initial Dry Density (pcf):	107.0	108.3	110.5
Final Moisture Content:	12.5%	16.4%	16.7%
Final Wet Density (pcf):	120.7	126.3	129.3
Final Dry Density (pcf):	107.2	108.6	110.8
Normal Stress (psf):	2000	4000	6000
Maximum Shearing Stress (psf):	2499	4107	5502
Vertical Deformation @ Max Shear (in):	0.263	0.321	0.314
Horizontal Deformation @ Max Shear (in):	0.083	0.120	0.105



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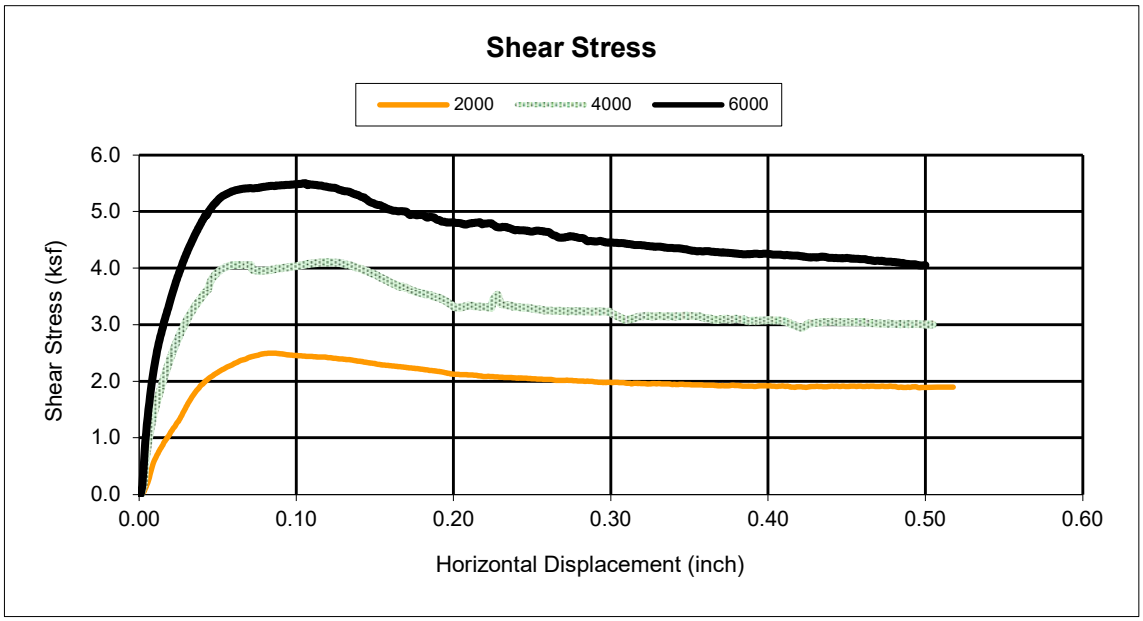
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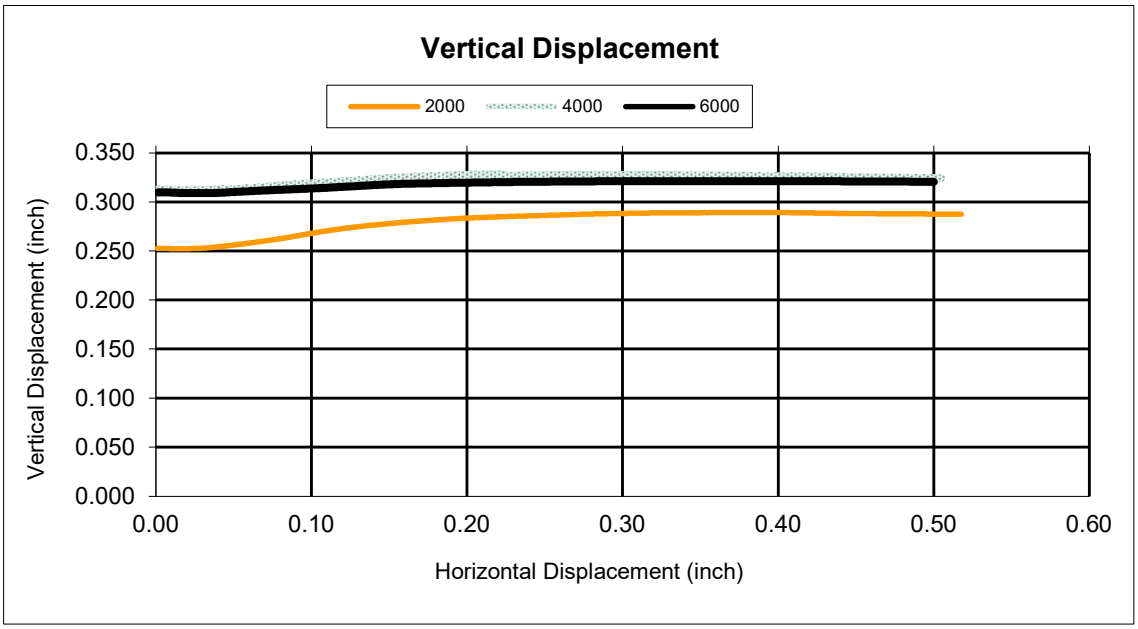
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: ACS Lab #22-1804-4 / B-77 (40.0-41.0')
SAMPLE PREPARATION: In Situ - 2, 4, and 6 ksf

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1302-03
DATE ASSIGNED: 4/15/2022

NORMAL LOADS (psf): 2000 4000 6000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





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ACS Services LLC

Direct Shear Under Consolidated Drained Conditions
ASTM D3080-11

ACS Project #	**2201026**	Material Type:	Rings
ACS Lab #	**22-1977**	Sample Date:	-
Client Name:	**Ethos**	Sampled By:	Client
Project Name:	**SR 303L MC85 to Van Buren**	Laboratory Test Date:	5/10/2022
Project Address:	**MC85 to Van Buren**	Laboratory Test By:	Brian Karl
Project City:	**Goodyear**	Reviewed By:	Dylan Ward
Sample Source:	**B78 @ 65-66**		

Sample Preparation: Specimen extracted from ring sample taken in the field using the labs jack. The specimen was consolidated at the normal stress until consolidation was completed prior to shearing.

Initial Parameters of Specimen

	Point 1	Point 2	Point 3
Normal Stress (ksf):	2	4	8
Dry mass (g):	116.5	110.5	111.2
Height (in.):	1	1	1
Diameter (in.):	2.42	2.42	2.42
Moisture (%):	18.8	20.2	19.4
Dry Density (pcf):	96.5	91.5	92.1
Saturation (%):	70	66	65
Void Ratio (%):	0.71	0.81	0.80

Final Parameters of Specimen

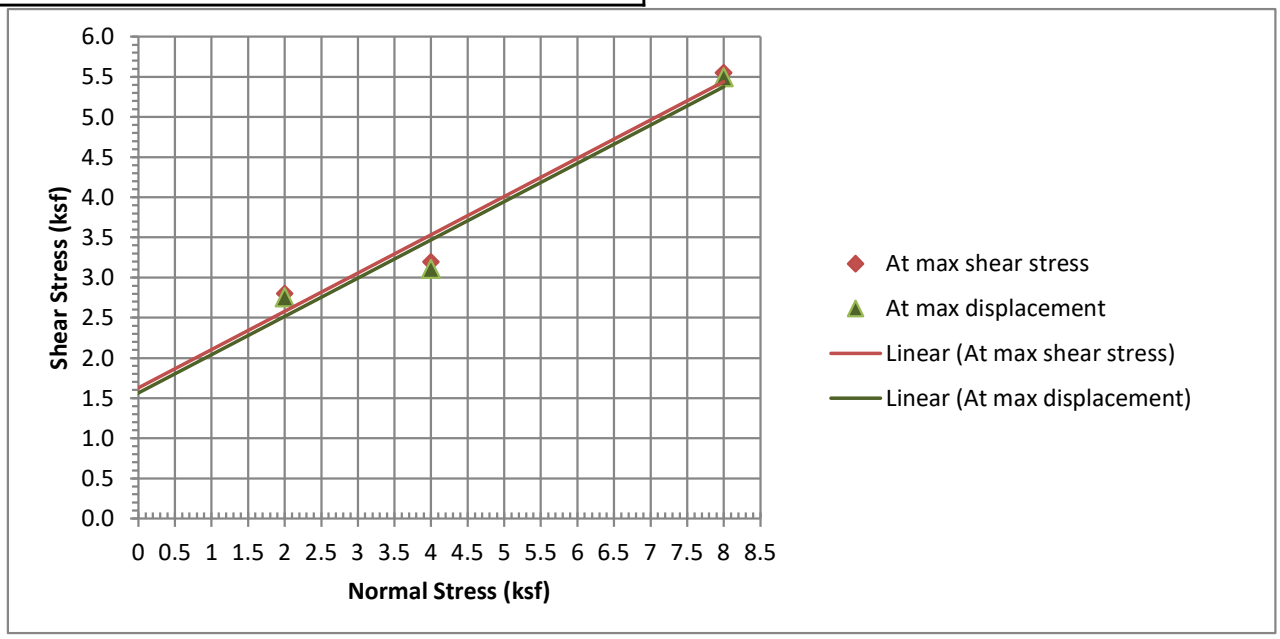
	Point 1	Point 2	Point 3
Normal Stress (ksf):	2	4	8
Dry mass (g):	116.5	110.5	111.2
Height (in.):	1.0098	1.0097	0.9839
Diameter (in.):	2.42	2.42	2.42
Moisture (%):	18.8	20.2	19.4
Dry Density (pcf):	95.5	90.6	93.6
Saturation (%):	70	52	65
Void Ratio (%):	0.73	0.82	0.77

Results from Experimentation

	Point 1	Point 2	Point 3
Normal Stress (ksf):	2	4	8
Max. Shear Stress (ksf)	2.802	3.196	5.551
Displacement at Max Shear (in.):	0.0098	0.0097	-0.0161
Shear Stress at Max Displ. (ksf):	2.755	3.109	5.494
Maximum Displacement (in.):	0.0164	-0.0112	-0.0171
Rate of Deformation (in./min):	0.001	0.001	0.001

	Friction Angle	Cohesion (ksf)
At Max Shear Stress:	25.5	1.625
At Max Displacement:	25.5	1.562

Shear Device: Karol Warner Model 2001-D, Pneumatic load



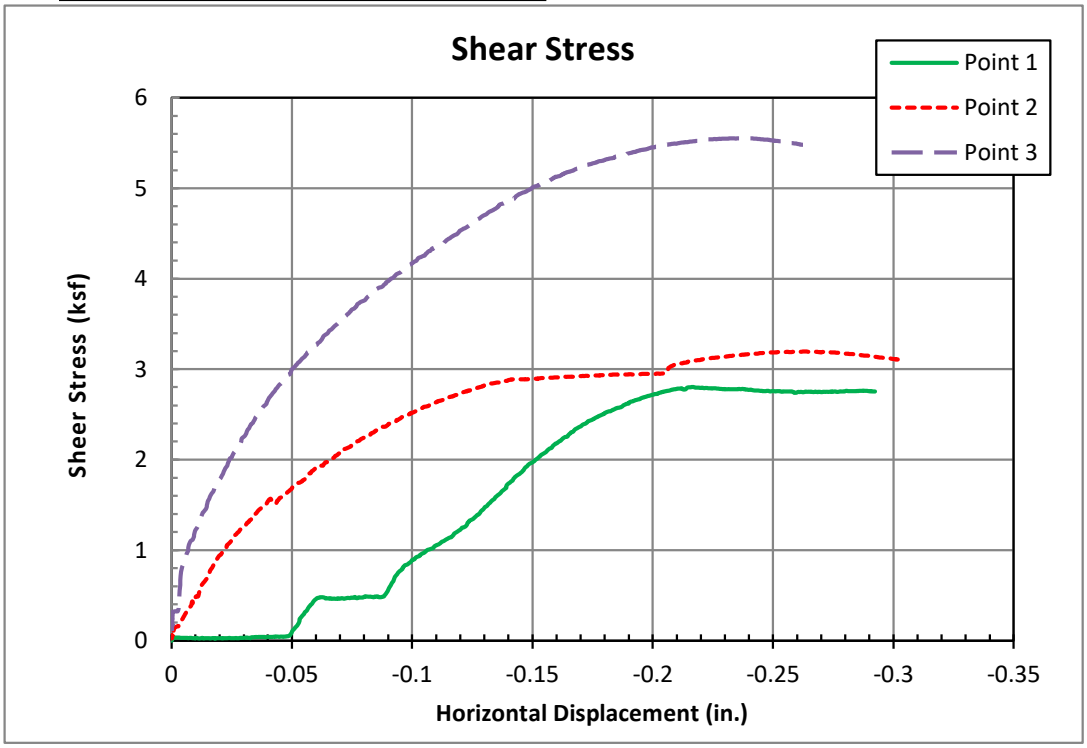
Operations Manager

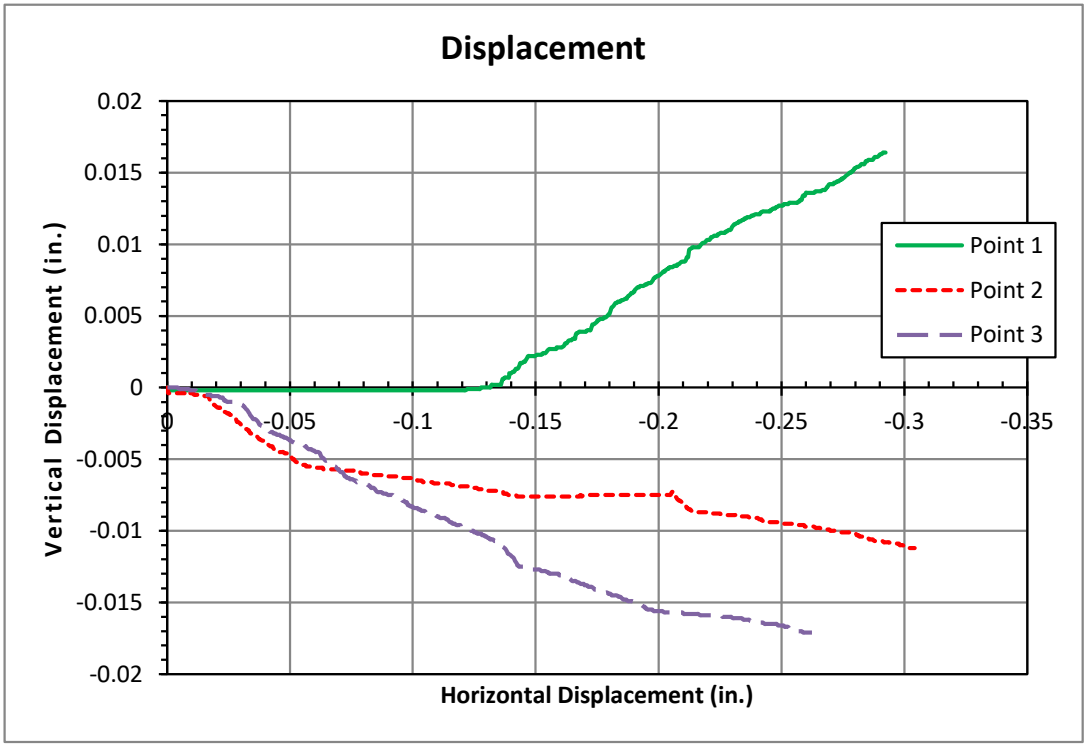
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ACS Services LLC

Direct Shear Under Consolidated Drained Conditions
ASTM D3080-11

ACS Project #	**2201026**	Material Type:	Rings
ACS Lab #	**22-1977**	Sample Date:	-
Client Name:	**Ethos**	Sampled By:	Client
Project Name:	**SR 303L MC85 to Van Buren**	Laboratory Test Date:	5/10/2022
Project Address:	**MC85 to Van Buren**	Laboratory Test By:	Brian Karl
Project City:	**Goodyear**	Reviewed By:	Dylan Ward
Sample Source:	**B78 @ 65-66**		





Operations Manager

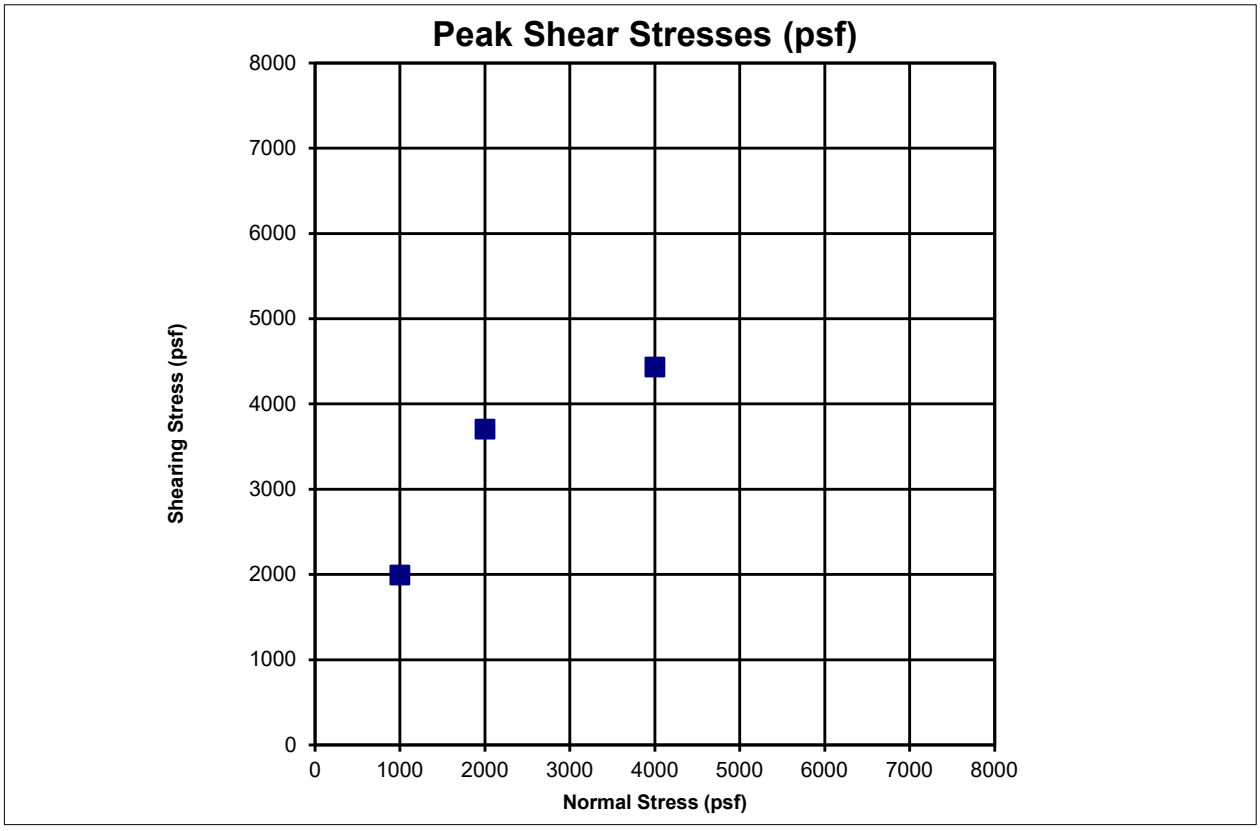
Signature

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: ACS Lab #22-1803-11 / B-80 (10.0-11.0')
SAMPLE PREPARATION: In Situ - 1, 2, and 4 ksf

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1302-02
DATE ASSIGNED: 4/15/2022

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.999	0.999	0.998
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.01	0.01	0.01
Direct shear point:	1	2	3
Dry mass of specimen (g):	127.8	135.1	121.4
Initial Moisture Content:	9.2%	10.3%	9.0%
Initial Wet Density (pcf):	115.6	123.4	109.6
Initial Dry Density (pcf):	105.8	111.9	100.5
Final Moisture Content:	7.0%	8.1%	7.2%
Final Wet Density (pcf):	113.4	121.0	108.1
Final Dry Density (pcf):	106.0	112.0	100.8
Normal Stress (psf):	1000	2000	4000
Maximum Shearing Stress (psf):	1993	3705	4432
Vertical Deformation @ Max Shear (in):	0.272	0.330	0.270
Horizontal Deformation @ Max Shear (in):	0.063	0.056	0.105



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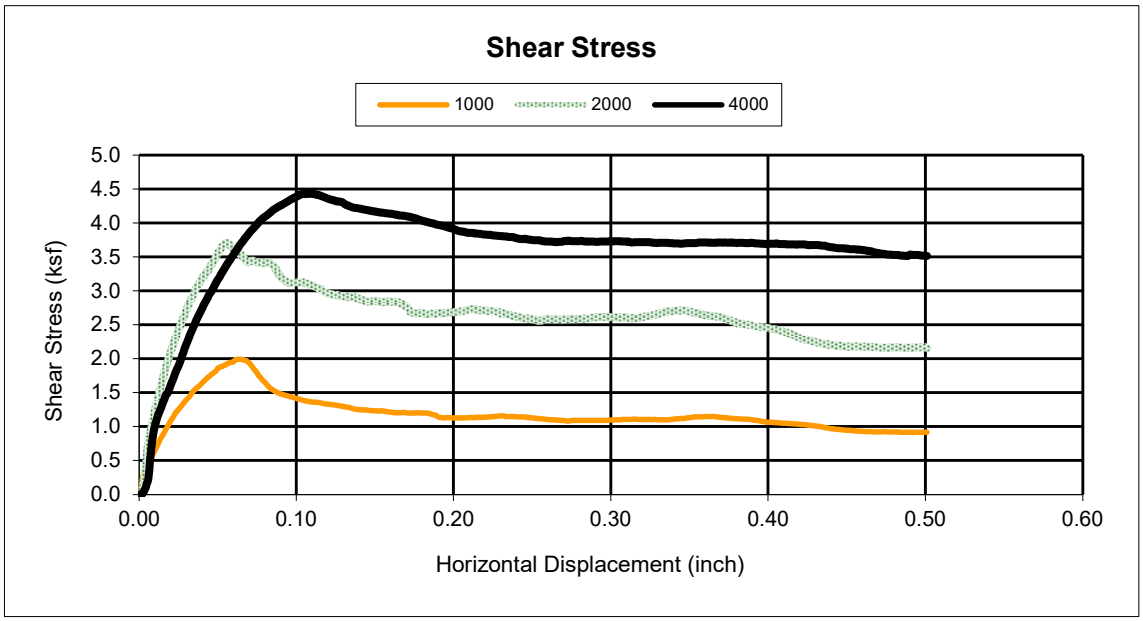
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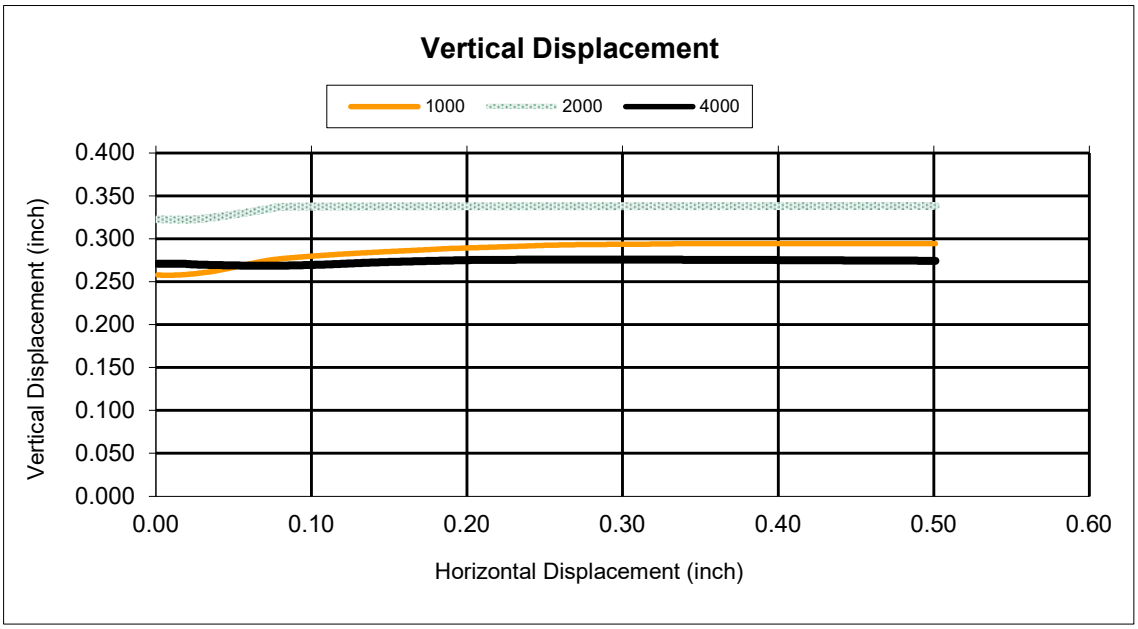
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: ACS Lab #22-1803-11 / B-80 (10.0-11.0')
SAMPLE PREPARATION: In Situ - 1, 2, and 4 ksf

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1302-02
DATE ASSIGNED: 4/15/2022

NORMAL LOADS (psf): 1000 2000 4000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





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DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS ASTM D3080

Terracon

PROJECT:	ACS Project # 2201026	**JOB NO:**	65201093.0009
LOCATION:	Phoenix, AZ	**WORK ORDER NO:**	65201093
MATERIAL:	Clayey Sand	**LAB NO:**	22-2238-3
SAMPLE SOURCE:	B - 83 @ 40'- 41'	**DATE SAMPLED:**	05/09/22

Sample Preparation: Insitu density, material and moisture. Specimens consolidated at normal load for 30 mins. Prior to shear. Not inundated.

Initial Parameters of specimen:

	Point 1	Point 2	Point 3
Normal Stress (psf):	**2000**	**4000**	**8000**
Dry mass (g):	108.27	111.91	114.31
Height (in):	1.0000	1.0000	1.0000
Diameter (in):	2.42	2.42	2.42
Moisture, %:	23.9	24.3	23.6
Dry Density (pcf):	89.7	92.7	94.7
Saturation, %:	75	82	84
Void Ratio:	0.85	0.79	0.75

Pre- Shear Parameters of specimen:

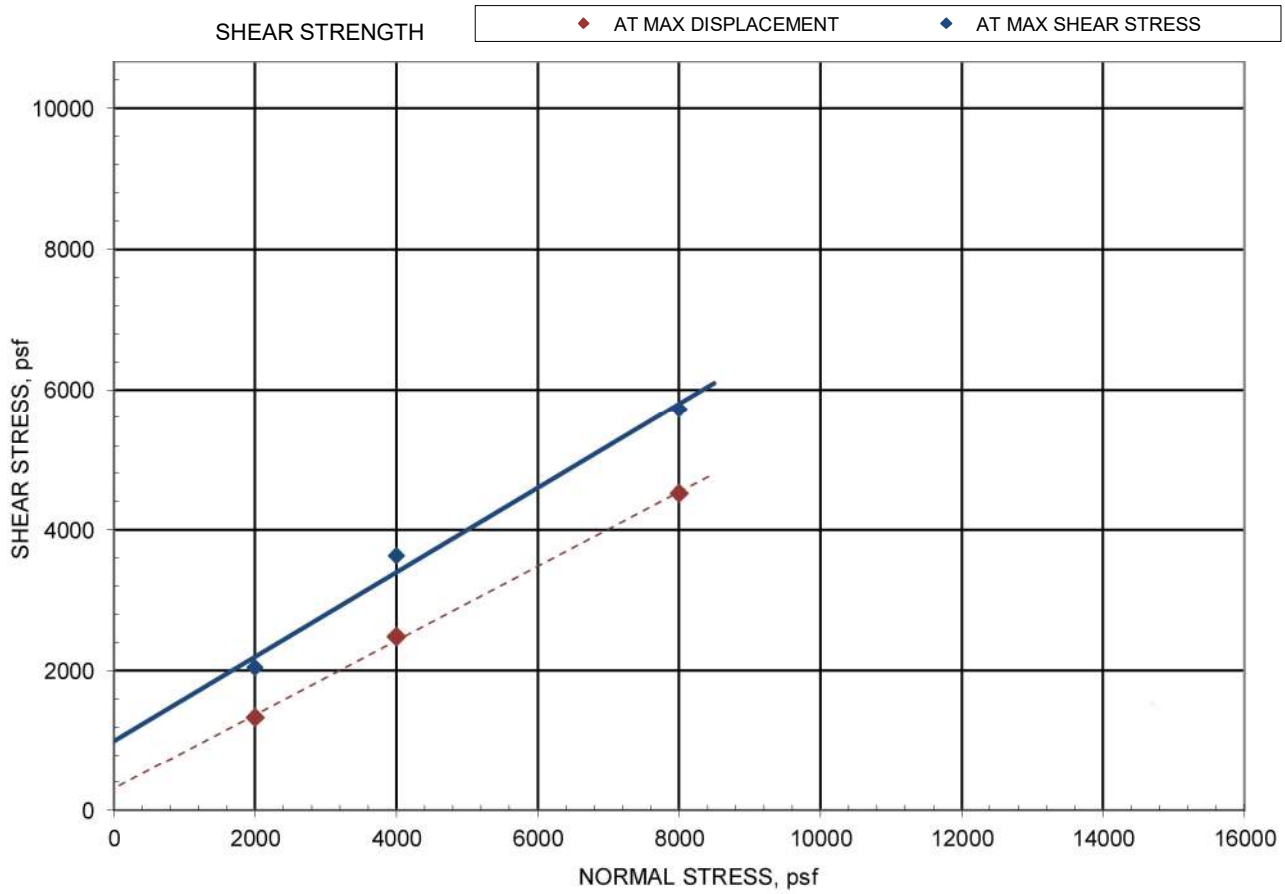
	Point 1	Point 2	Point 3
Normal Stress (psf):	**2000**	**4000**	**8000**
Dry mass (g):	108.27	111.91	114.31
Height (in):	0.9909	0.9834	0.9692
Diameter (in):	2.42	2.42	2.42
Moisture, %:	22.9	23.3	22.7
Dry Density (pcf):	90.5	94.3	97.7
Saturation, %:	73	82	87
Void Ratio:	0.83	0.76	0.69

Normal Stress (psf):	2000	4000	8000
Maximum Shear Stress, (psf):	2045	3636	5717
Displacement at Maximum Shear, (in):	0.054	0.063	0.084
Shear Stress at Max Displacement, (psf)	1339	2488	4521
Maximum Displacement, (in):	0.450	0.451	0.437
Rate of Deformation, in/min	0.0070	0.0070	0.0070

SHEAR DEVICE: Geomatic model 8914, Dead Weight load force

	FRICTION ANGLE	COHESION
AT MAX SHEAR STRESS	**31**	**1005**
Specs:		
AT MAX DISPLACEMENT	28	323
Specs:		

SHEAR STRENGTH

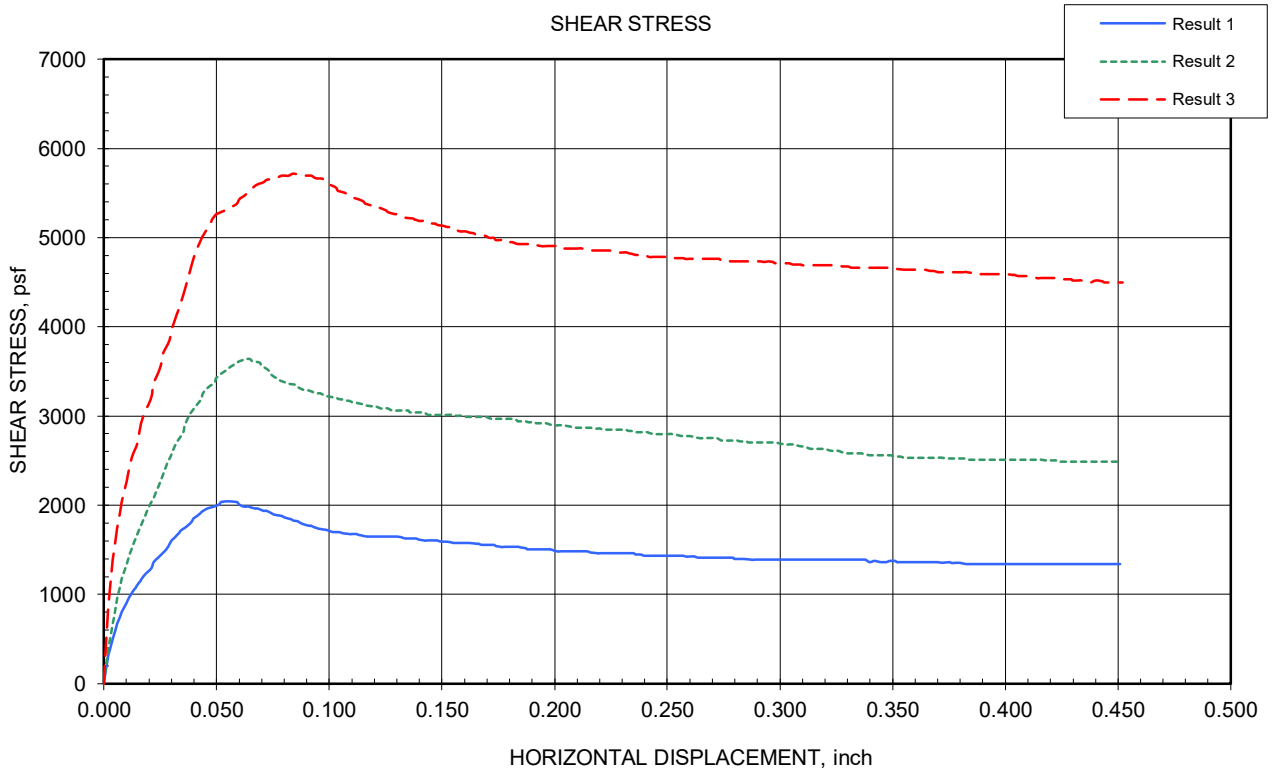


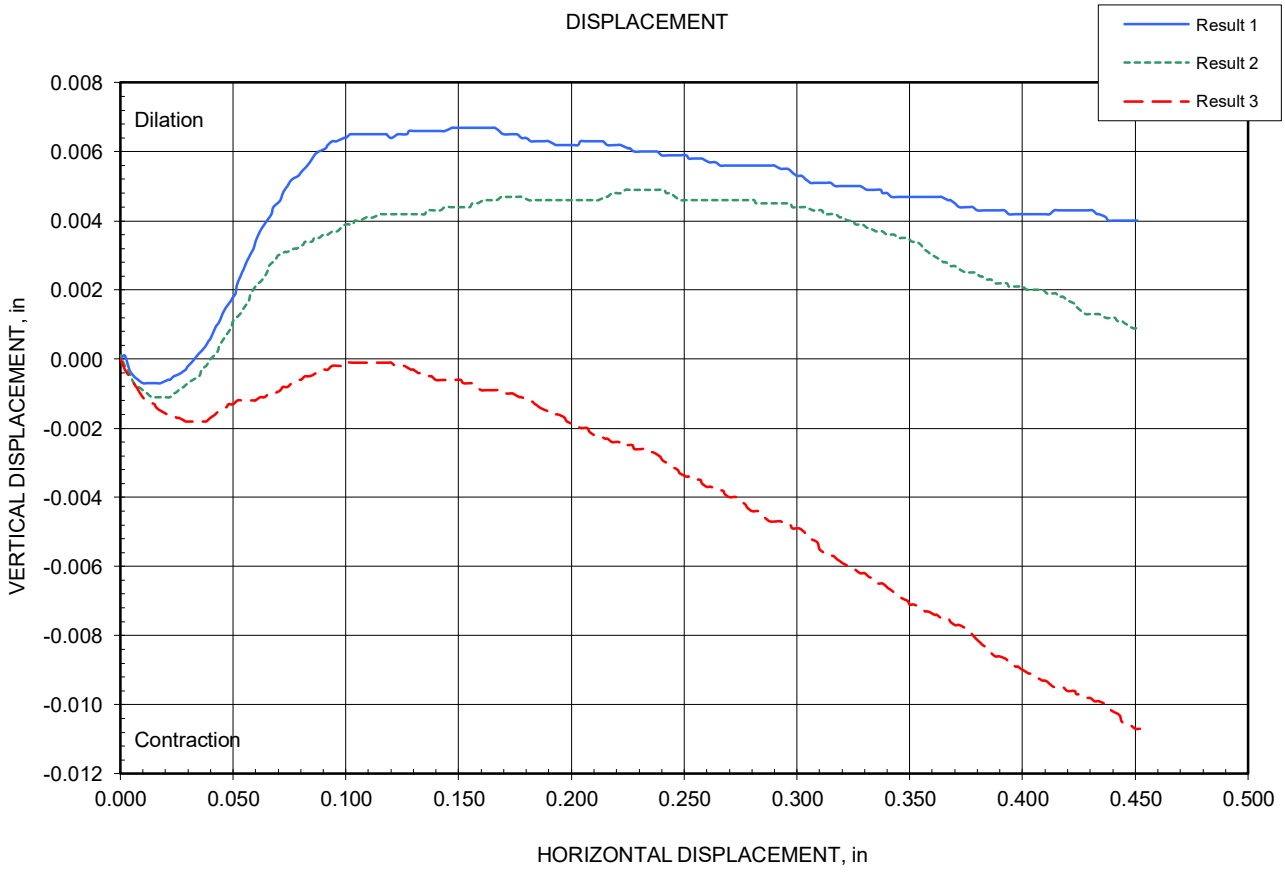
Note: The friction angle presented is applicable only to the load ranges and sample conditions tested

Reviewed By: Kirk Jackson

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS ASTM D3080

PROJECT:	ACS Project # 2201026	**JOB NO:**	65201093.0009
LOCATION:	Phoenix, AZ	**WORK ORDER NO:**	65201093
MATERIAL:	Clayey Sand	**LAB NO:**	22-2238-3
SAMPLE SOURCE:	B - 83 @ 40'- 41'	**DATE SAMPLED:**	5/9/2022



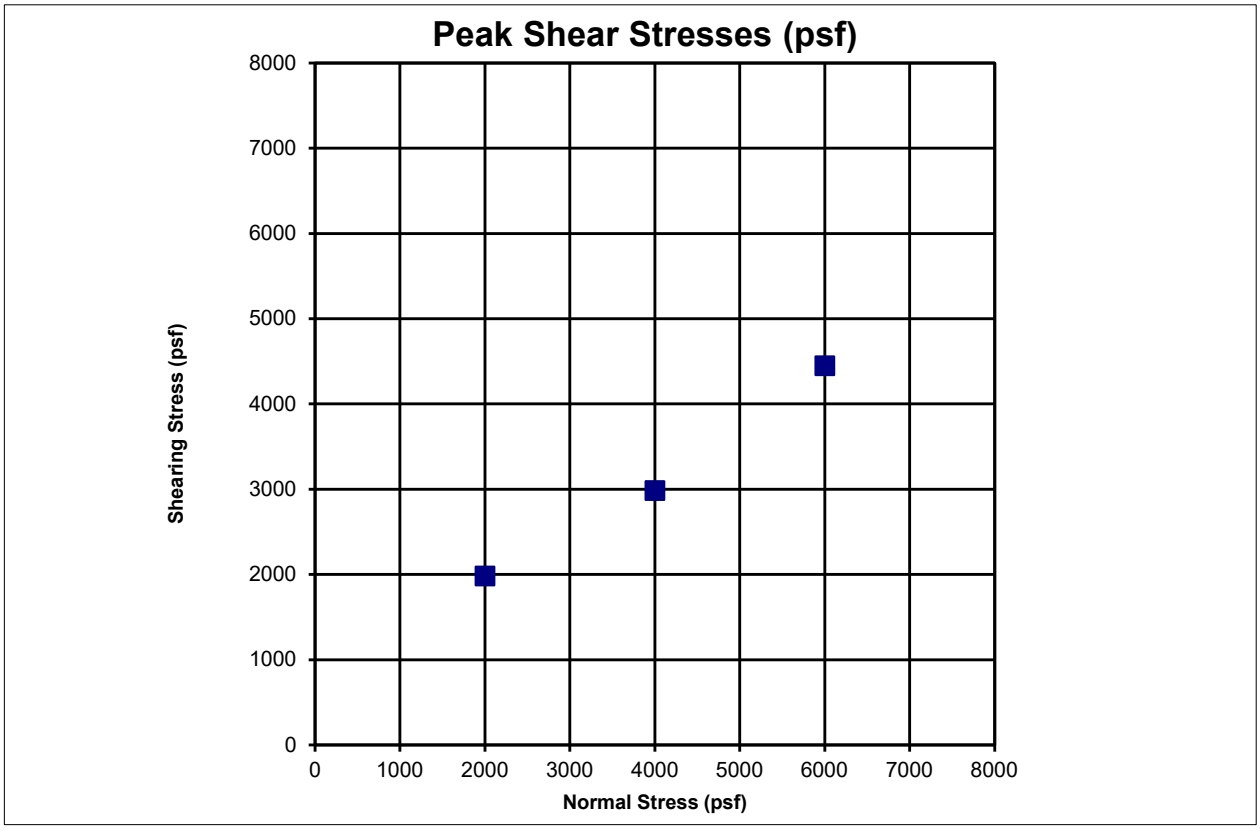


PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native
SAMPLE SOURCE: B-85 (45.0-46.0')
SAMPLE PREPARATION: In Situ - 2, 4, and 6ksf

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1366-06
DATE ASSIGNED: 5/5/2022

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.997	0.995	0.993
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.01	0.01	0.01
Direct shear point:	1	2	3
Dry mass of specimen (g):	112.2	115.1	114.2
Initial Moisture Content:	27.0%	26.9%	27.1%
Initial Wet Density (pcf):	118.0	121.0	120.2
Initial Dry Density (pcf):	92.9	95.3	94.6
Final Moisture Content:	25.9%	26.2%	25.5%
Final Wet Density (pcf):	117.4	120.9	119.5
Final Dry Density (pcf):	93.2	95.8	95.3
Normal Stress (psf):	2000	4000	6000
Maximum Shearing Stress (psf):	1984	2984	4449
Vertical Deformation @ Max Shear (in):	0.260	0.222	0.279
Horizontal Deformation @ Max Shear (in):	0.081	0.115	0.074



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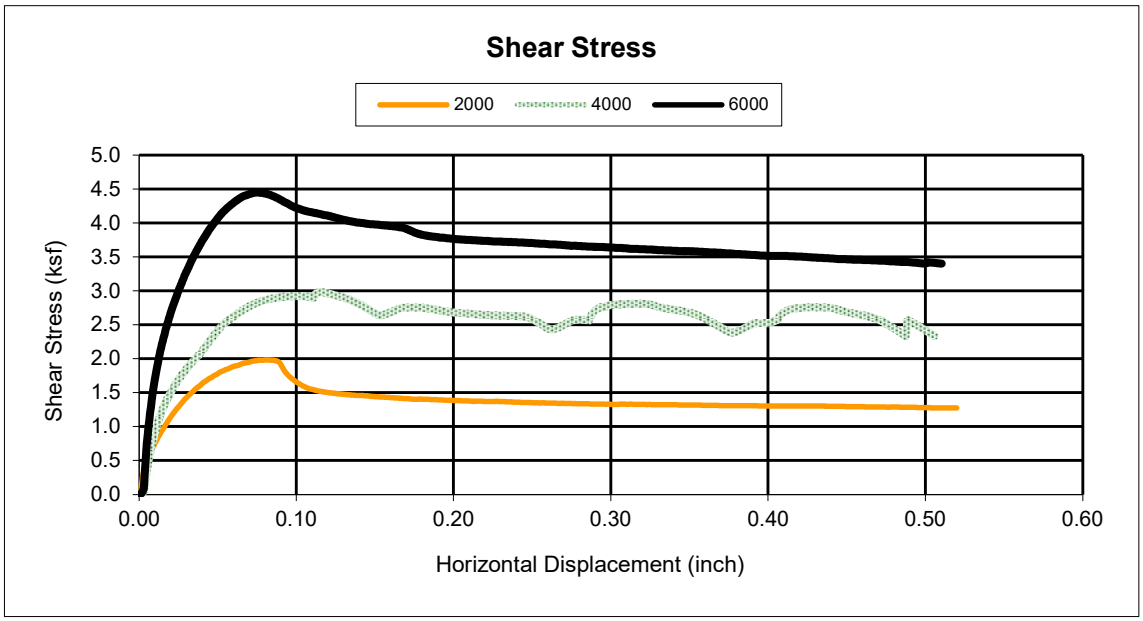
REVIEWED BY Hiram Franco

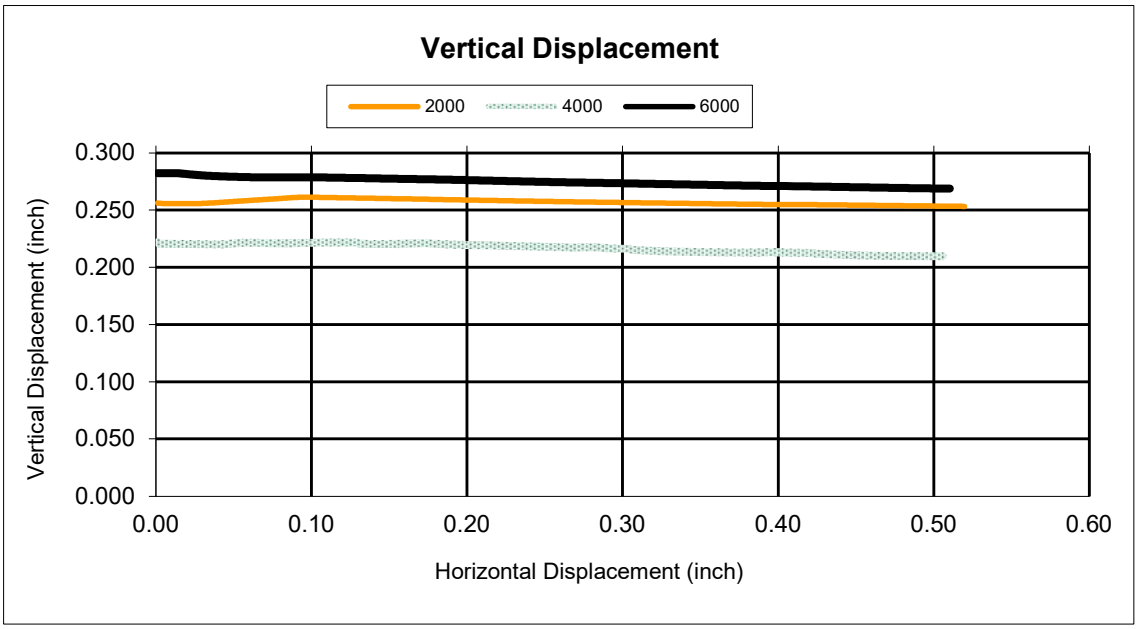
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native
SAMPLE SOURCE: B-85 (45.0-46.0')
SAMPLE PREPARATION: In Situ - 2, 4, and 6ksf

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1366-06
DATE ASSIGNED: 5/5/2022

NORMAL LOADS (psf): 2000 4000 6000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





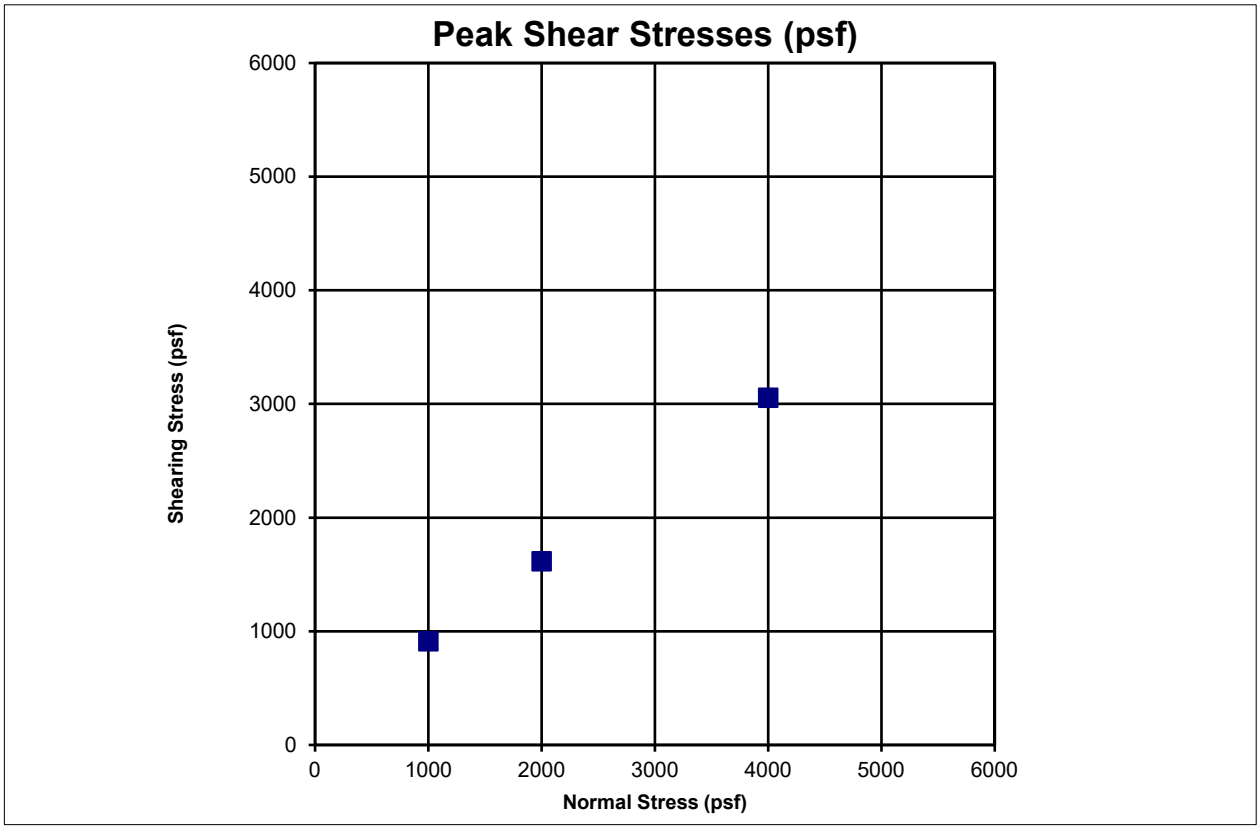
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PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native
SAMPLE SOURCE: DS-B85A (0.0-2.5')
SAMPLE PREPARATION: Saturated - 1, 2, and 4ksf

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1509-01
DATE ASSIGNED: 7/1/2022

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	1.000	0.999	0.997
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.01	0.01	0.01
Direct shear point:	1	2	3
Dry mass of specimen (g):	138.8	137.9	138.5
Initial Moisture Content:	11.9%	12.2%	13.1%
Initial Wet Density (pcf):	128.6	128.1	129.7
Initial Dry Density (pcf):	115.0	114.2	114.7
Final Moisture Content:	18.8%	19.9%	19.9%
Final Wet Density (pcf):	136.6	137.2	137.9
Final Dry Density (pcf):	115.0	114.4	115.0
Normal Stress (psf):	1000	2000	4000
Maximum Shearing Stress (psf):	912	1616	3055
Vertical Deformation @ Max Shear (in):	0.356	0.308	0.303
Horizontal Deformation @ Max Shear (in):	0.038	0.481	0.485



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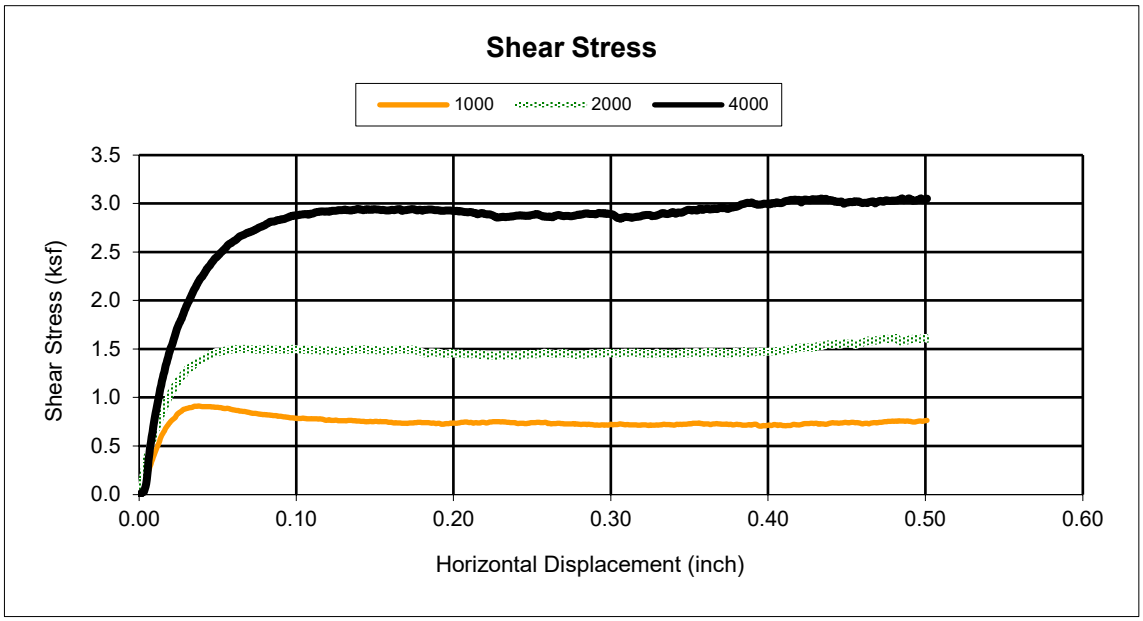
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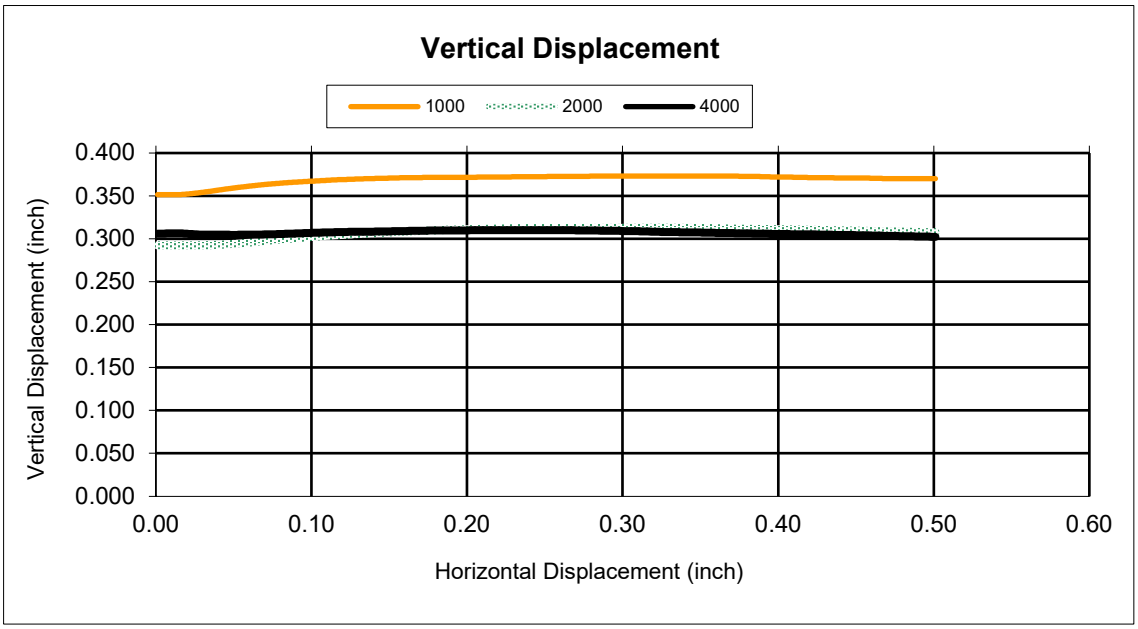
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native
SAMPLE SOURCE: DS-B85A (0.0-2.5')
SAMPLE PREPARATION: Saturated - 1, 2, and 4ksf

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1509-01
DATE ASSIGNED: 7/1/2022

NORMAL LOADS (psf): 1000 2000 4000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





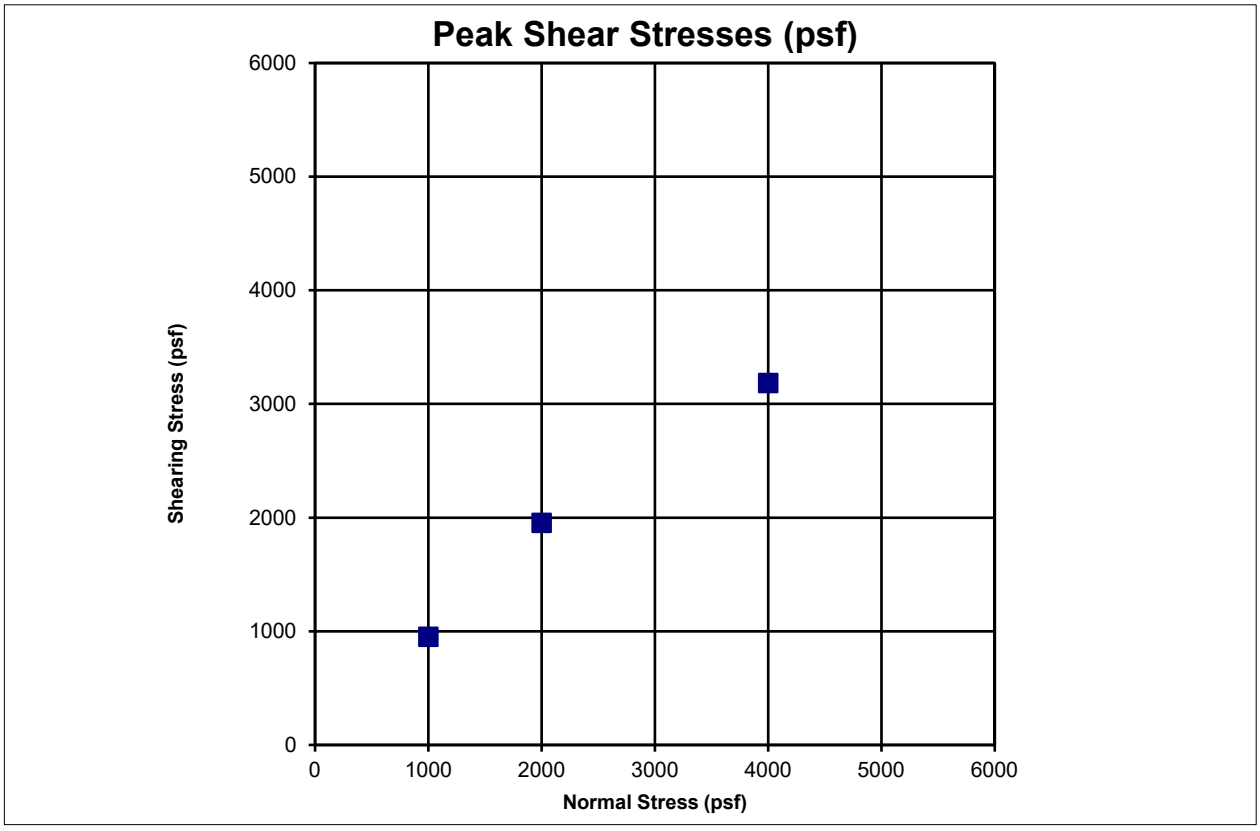
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PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native
SAMPLE SOURCE: B-85B (2.5-3.5')
SAMPLE PREPARATION: Saturated - 1, 2, and 4ksf

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1504-03
DATE ASSIGNED: 6/27/2022

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.992	0.990	0.974
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.01	0.01	0.01
Direct shear point:	1	2	3
Dry mass of specimen (g):	125.1	125.7	126.1
Initial Moisture Content:	5.4%	6.4%	7.1%
Initial Wet Density (pcf):	109.2	110.7	111.8
Initial Dry Density (pcf):	103.6	104.1	104.4
Final Moisture Content:	18.1%	17.3%	18.7%
Final Wet Density (pcf):	123.4	123.4	127.2
Final Dry Density (pcf):	104.5	105.2	107.2
Normal Stress (psf):	1000	2000	4000
Maximum Shearing Stress (psf):	953	1953	3185
Vertical Deformation @ Max Shear (in):	0.300	0.209	0.194
Horizontal Deformation @ Max Shear (in):	0.466	0.476	0.482



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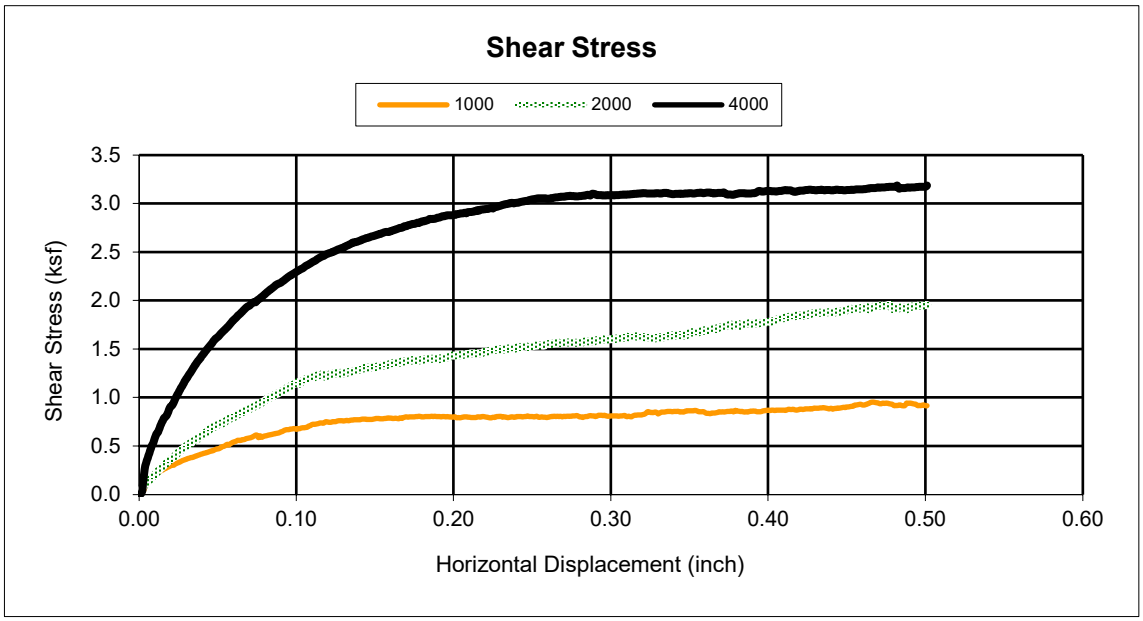
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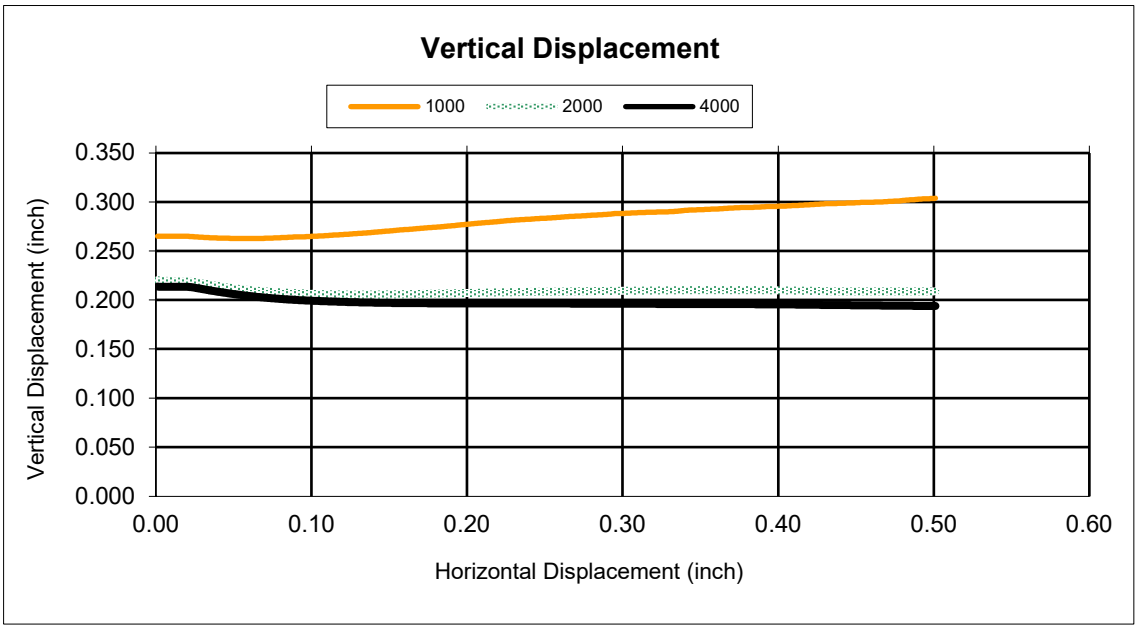
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native
SAMPLE SOURCE: B-85B (2.5-3.5')
SAMPLE PREPARATION: Saturated - 1, 2, and 4ksf

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1504-03
DATE ASSIGNED: 6/27/2022

NORMAL LOADS (psf): 1000 2000 4000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





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ACS Services LLC

Direct Shear Under Consolidated Drained Conditions
ASTM D3080-11

ACS Project #	**2201026**	Material Type:	Native
ACS Lab #	**22-1583**	Sample Date:	
Client Name:	**Ethos**	Sampled By:	Client
Project Name:	**SR 303L MC85 to Van Buren**	Laboratory Test Date:	44651
Project Address:	**MC85 to Van Buren**	Laboratory Test By:	Brian Karl
Project City:	**Goodyear**	Reviewed By:	Dylan Ward
Sample Source:	**B-91@5.0-6.0 Saturated**		

Sample Preparation: Specimen extracted from ring sample taken in the field using the labs jack. The specimen was consolidated at the normal stress until consolidation was completed prior to shearing.

Initial Parameters of Specimen

	Point 1	Point 2	Point 3
Normal Stress (ksf):	1	2	4
Dry mass (g):	113.1	111.9	100.9
Height (in.):	1	1	1
Diameter (in.):	2.42	2.42	2.42
Moisture (%):	5.9	8.1	6
Dry Density (pcf):	93.7	92.7	83.6
Saturation (%):	20	27	16
Void Ratio (%):	0.77	0.78	0.98

Final Parameters of Specimen

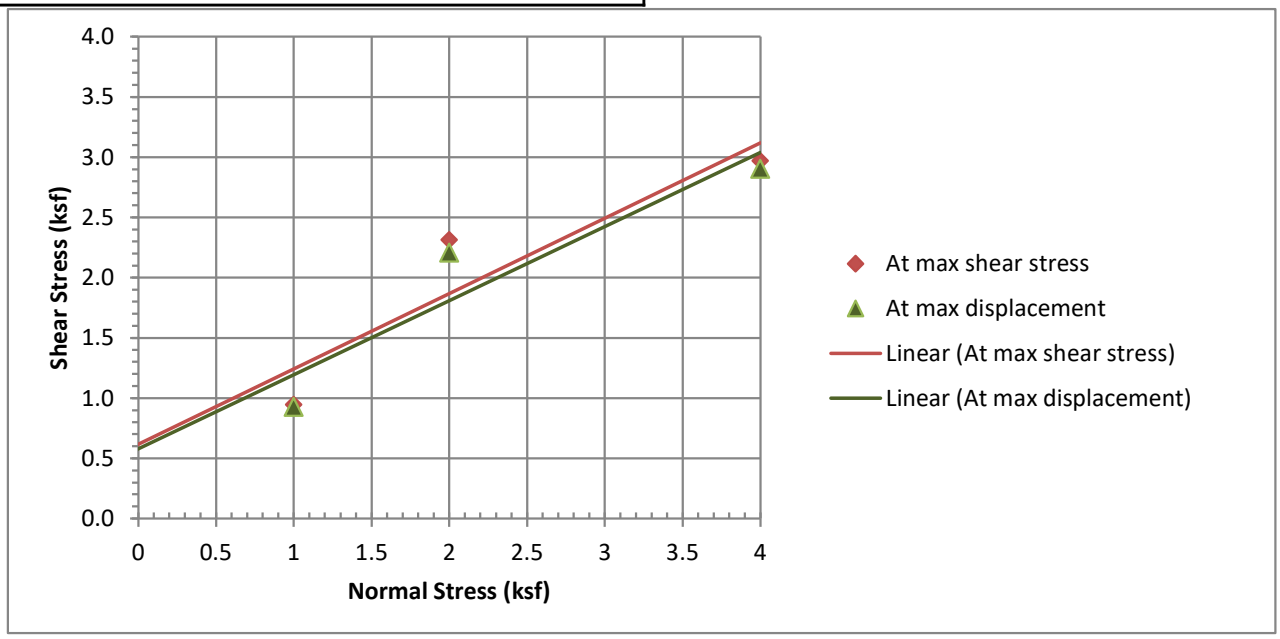
	Point 1	Point 2	Point 3
Normal Stress (ksf):	1	2	4
Dry mass (g):	113.1	111.9	100.9
Height (in.):	0.9709	0.9654	0.9592
Diameter (in.):	2.42	2.42	2.42
Moisture (%):	21.7	24.8	24.9
Dry Density (pcf):	96.5	96.0	87.1
Saturation (%):	100	100	100
Void Ratio (%):	0.71	0.72	0.90

Results from Experimentation

	Point 1	Point 2	Point 3
Normal Stress (ksf):	1	2	4
Max. Shear Stress (ksf)	0.945	2.314	2.971
Displacement at Max Shear (in.):	-0.0291	-0.0346	-0.0408
Shear Stress at Max Displ. (ksf):	0.927	2.207	2.905
Maximum Displacement (in.):	-0.0411	-0.0397	-0.0447
Rate of Deformation (in./min):	0.02	0.02	0.02

Shear Device: Karol Warner Model 2001-D, Pneumatic load

	Friction Angle	Cohesion (ksf)
At Max Shear Stress:	32.0	0.617
At Max Displacement:	31.6	0.578



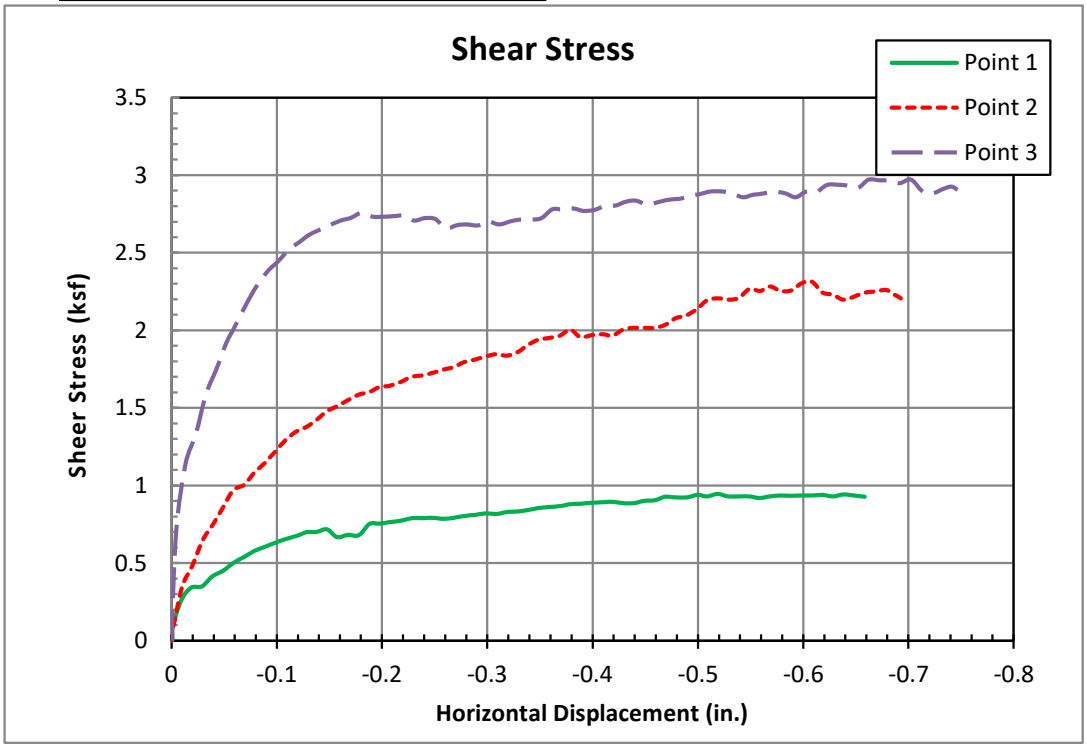
Operations Manager

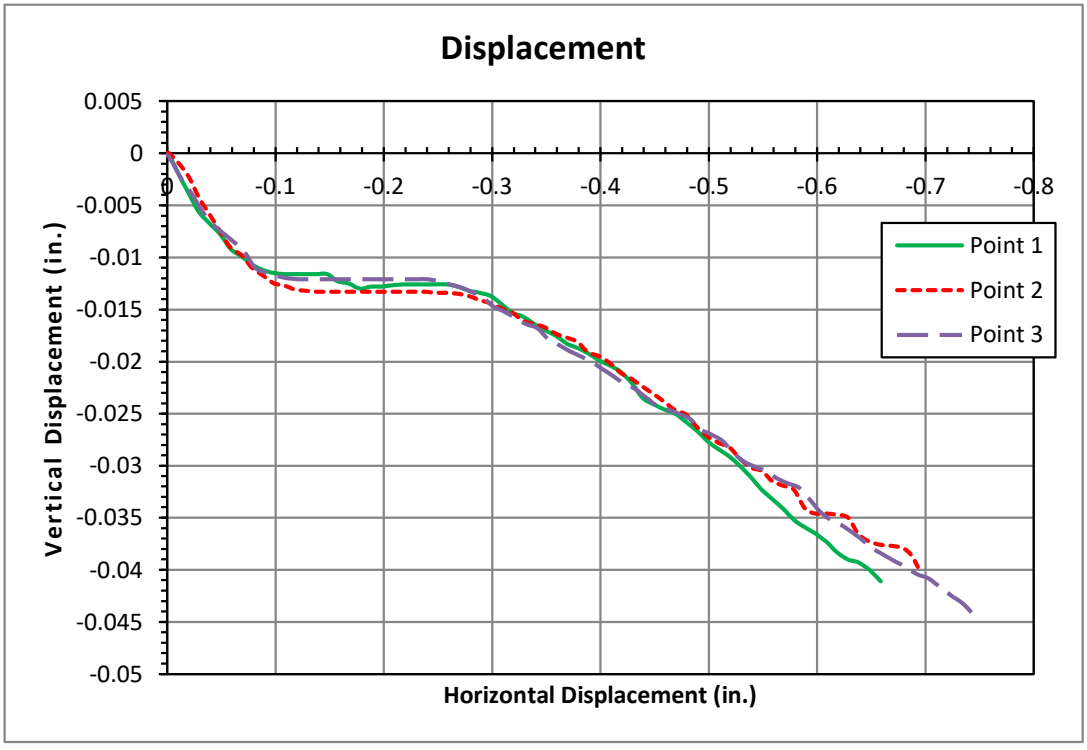
Signature

ACS Services LLC

Direct Shear Under Consolidated Drained Conditions
ASTM D3080-11

ACS Project #	**2201026**	Material Type:	Native
ACS Lab #	**22-1583**	Sample Date:	
Client Name:	**Ethos**	Sampled By:	Client
Project Name:	**SR 303L MC85 to Van Buren**	Laboratory Test Date:	44651
Project Address:	**MC85 to Van Buren**	Laboratory Test By:	Brian Karl
Project City:	**Goodyear**	Reviewed By:	Dylan Ward
Sample Source:	**B-91@5.0-6.0 Saturated**		





Operations Manager

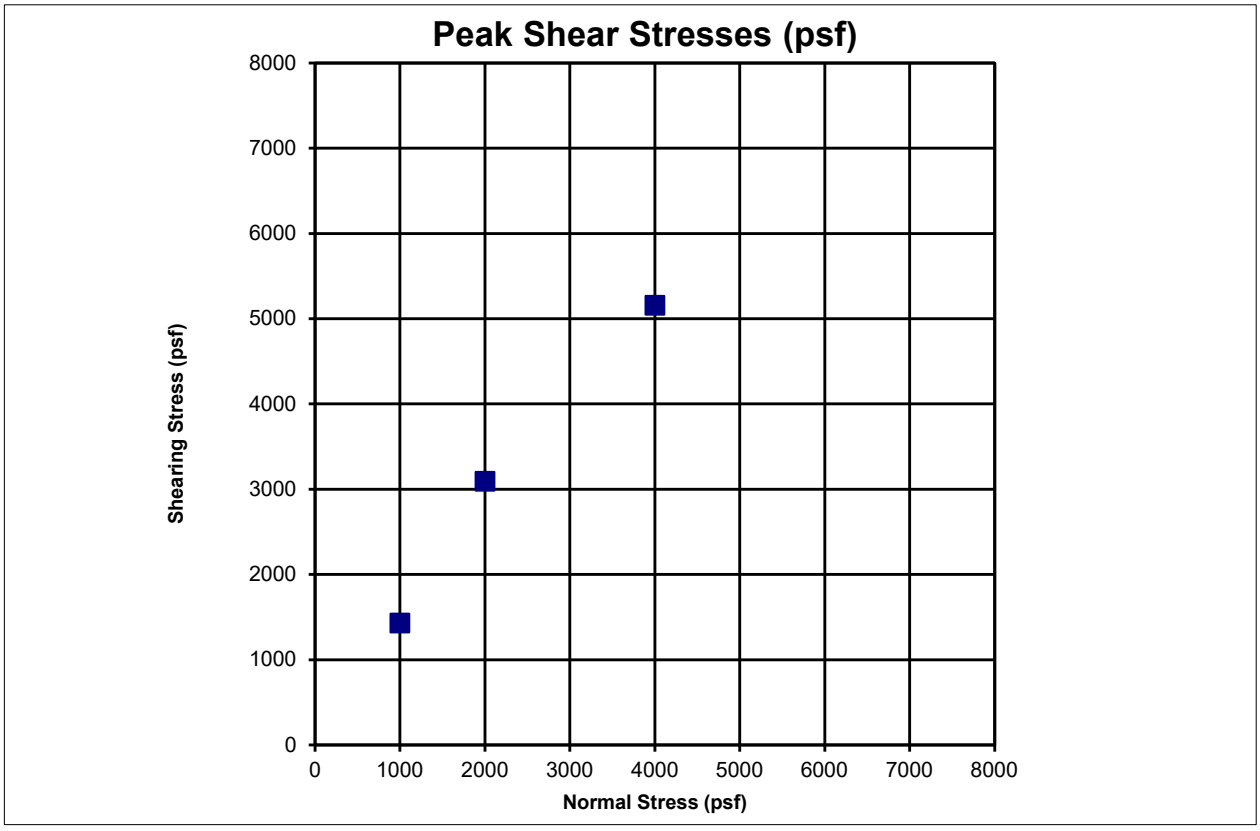
Signature

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native
SAMPLE SOURCE: B-101 (30.0-31.0')
SAMPLE PREPARATION: In Situ - 1, 2, and 4ksf

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1366-01
DATE ASSIGNED: 5/5/2022

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.998	0.999	0.999
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.01	0.01	0.01
Direct shear point:	1	2	3
Dry mass of specimen (g):	118.0	119.9	123.0
Initial Moisture Content:	11.7%	14.8%	15.9%
Initial Wet Density (pcf):	109.2	114.0	118.0
Initial Dry Density (pcf):	97.7	99.3	101.9
Final Moisture Content:	11.1%	14.1%	14.5%
Final Wet Density (pcf):	108.8	113.4	116.8
Final Dry Density (pcf):	97.9	99.4	102.0
Normal Stress (psf):	1000	2000	4000
Maximum Shearing Stress (psf):	1430	3093	5159
Vertical Deformation @ Max Shear (in):	0.269	0.244	0.322
Horizontal Deformation @ Max Shear (in):	0.028	0.087	0.058



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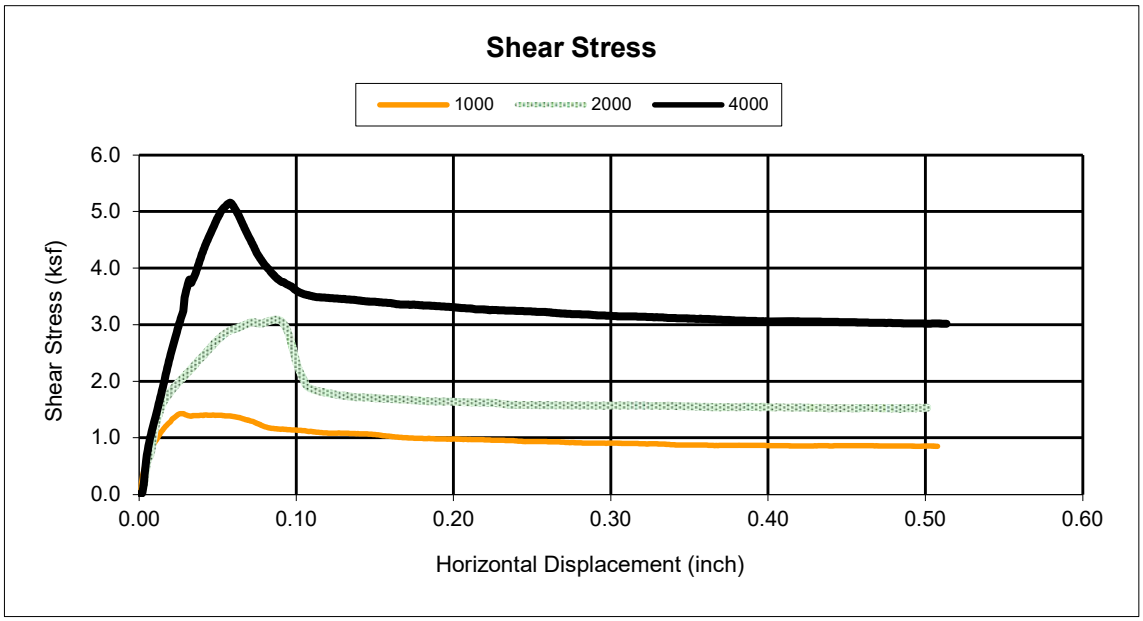
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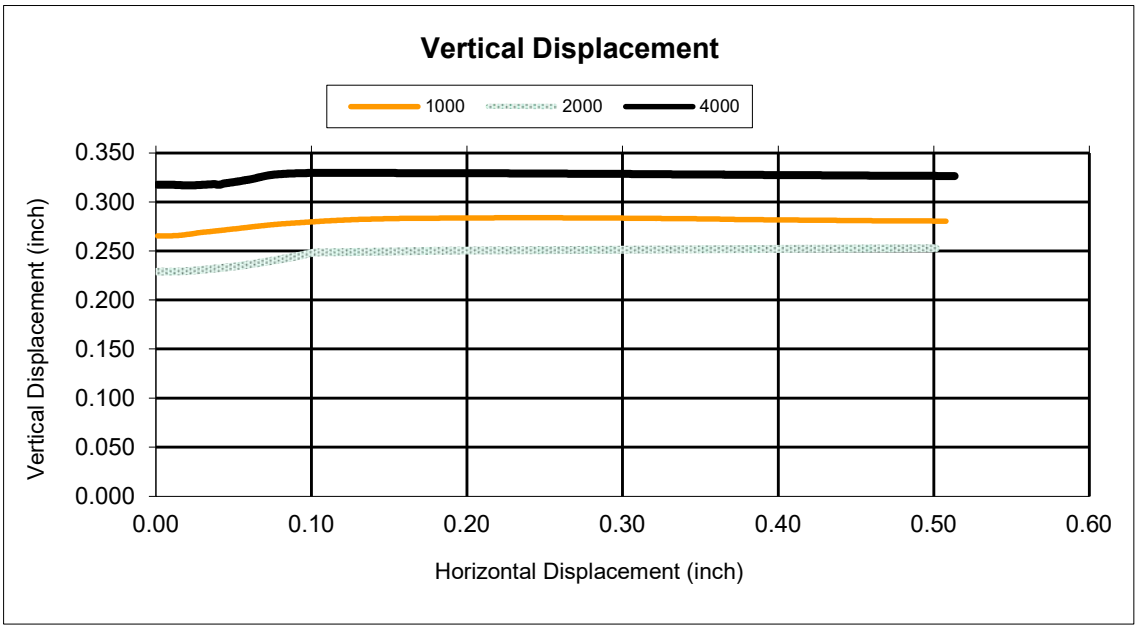
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native
SAMPLE SOURCE: B-101 (30.0-31.0')
SAMPLE PREPARATION: In Situ - 1, 2, and 4ksf

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1366-01
DATE ASSIGNED: 5/5/2022

NORMAL LOADS (psf): 1000 2000 4000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





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ACS Services LLC

Direct Shear Under Consolidated Drained Conditions
ASTM D3080-11

ACS Project #	**2201026**	Material Type:	Soil
ACS Lab #	**22-1848**	Sample Date:	3/15/2022
Client Name:	**Ethos**	Sampled By:	Client(MAGS)
Project Name:	**SR 303L MC85 to Van Buren**	Laboratory Test Date:	4/18/2022
Project Address:	**MC85 to Van Buren**	Laboratory Test By:	Brian Karl
Project City:	**Goodyear**	Reviewed By:	Dylan Ward
Sample Source:	**22-1848-3 B103@25-26 insitu**		

Sample Preparation: Specimen extracted from ring sample taken in the field using the labs jack. The specimen was consolidated at the normal stress until consolidation was completed prior to shearing.

Initial Parameters of Specimen

	Point 1	Point 2	Point 3
Normal Stress (ksf):	1	2	4
Dry mass (g):	104.3	112	108.7
Height (in.):	1	1	1
Diameter (in.):	2.42	2.42	2.42
Moisture (%):	14.4	16.3	15.5
Dry Density (pcf):	86.4	92.7	90.0
Saturation (%):	42	55	49
Void Ratio (%):	0.91	0.78	0.84

Final Parameters of Specimen

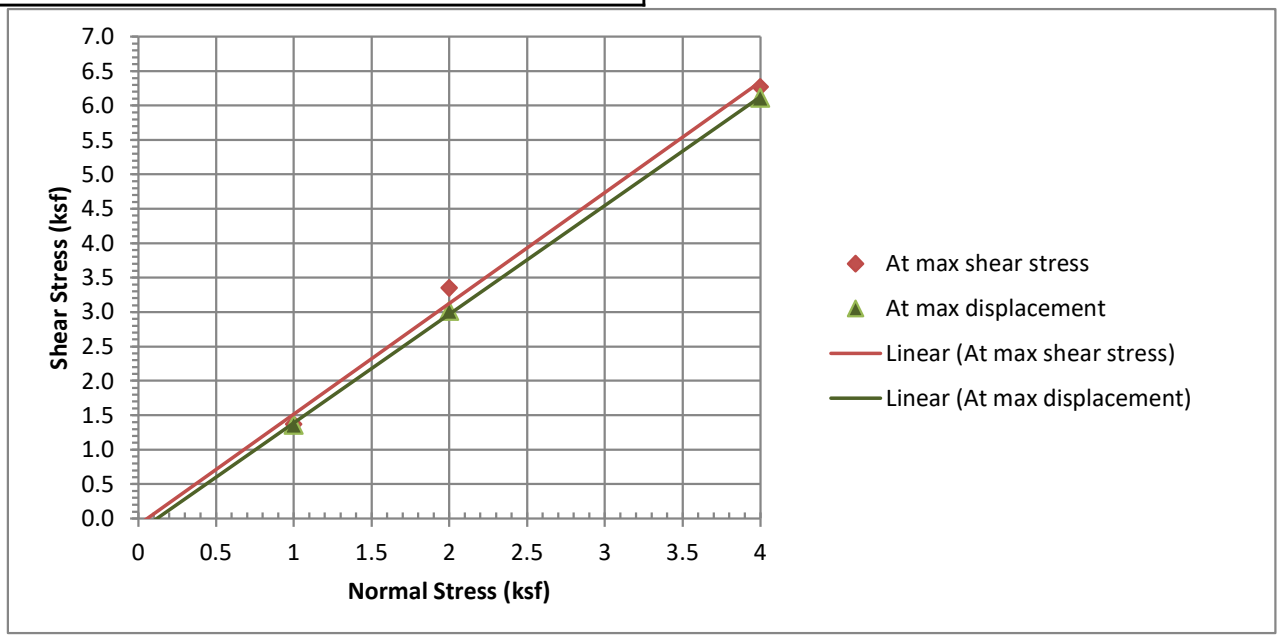
	Point 1	Point 2	Point 3
Normal Stress (ksf):	1	2	4
Dry mass (g):	104.3	112	108.7
Height (in.):	1.0059	1.0079	1.018
Diameter (in.):	2.42	2.42	2.42
Moisture (%):	14.4	16.3	15.5
Dry Density (pcf):	85.9	92.0	88.4
Saturation (%):	42	100	100
Void Ratio (%):	0.93	0.80	0.87

Results from Experimentation

	Point 1	Point 2	Point 3
Normal Stress (ksf):	1	2	4
Max. Shear Stress (ksf)	1.371	3.350	6.274
Displacement at Max Shear (in.):	0.0059	0.0079	0.018
Shear Stress at Max Displ. (ksf):	1.362	3.015	6.114
Maximum Displacement (in.):	0.0066	0.0125	0.0232
Rate of Deformation (in./min):	0.001	0.001	0.001

	Friction Angle	Cohesion (ksf)
At Max Shear Stress:	58.1	-0.091
At Max Displacement:	57.7	-0.188

Shear Device: Karol Warner Model 2001-D, Pneumatic load



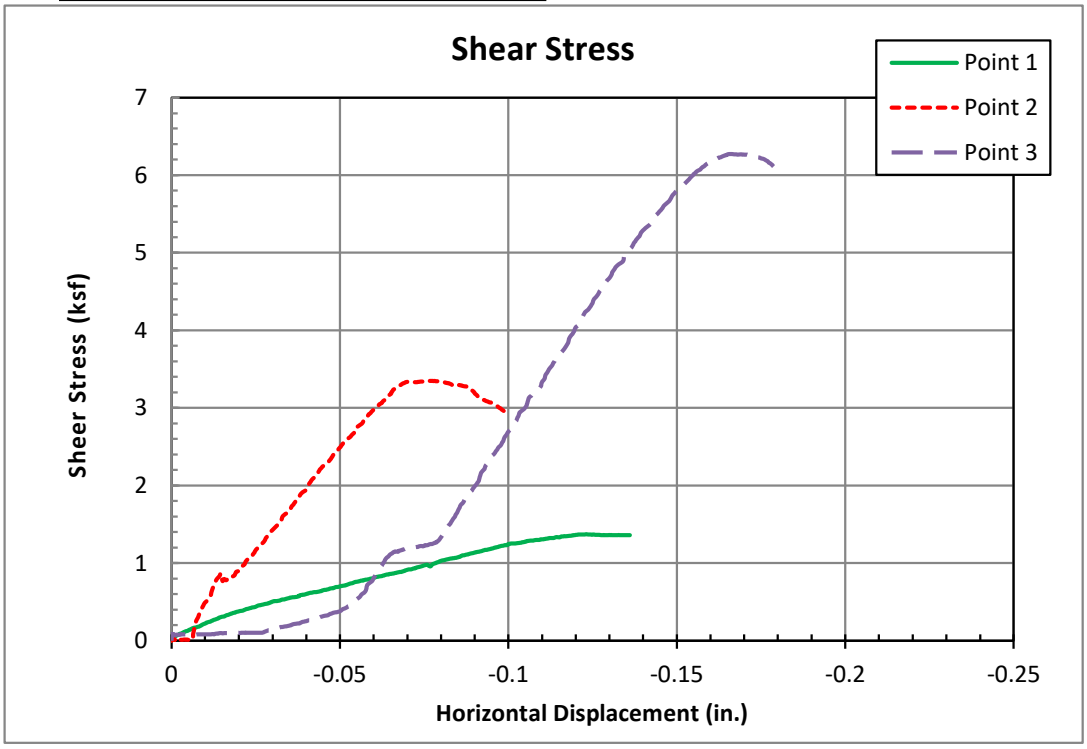
Operations Manager

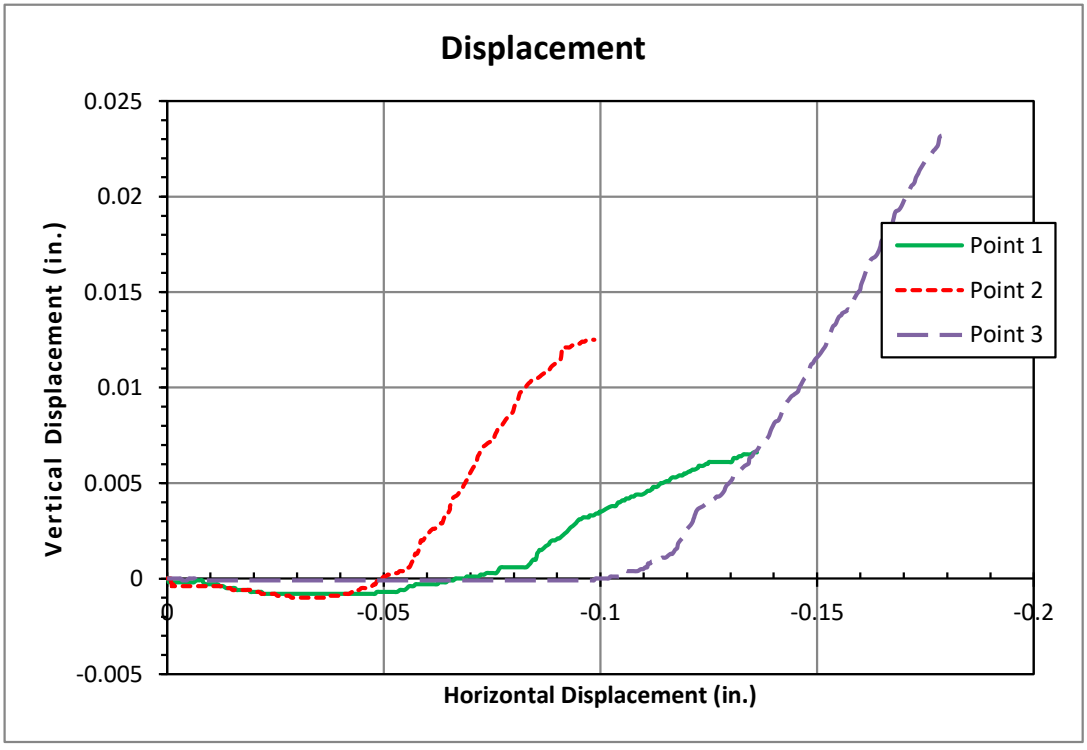
Signature

ACS Services LLC

Direct Shear Under Consolidated Drained Conditions
ASTM D3080-11

ACS Project #	**2201026**	Material Type:	Soil
ACS Lab #	**22-1848**	Sample Date:	3/15/2022
Client Name:	**Ethos**	Sampled By:	Client(MAGS)
Project Name:	**SR 303L MC85 to Van Buren**	Laboratory Test Date:	4/18/2022
Project Address:	**MC85 to Van Buren**	Laboratory Test By:	Brian Karl
Project City:	**Goodyear**	Reviewed By:	Dylan Ward
Sample Source:	**22-1848-3 B103@25-26 insitu**		





Operations Manager

Signature

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS ASTM D3080

Terracon

PROJECT:	ACS Project # 2201026	**JOB NO:**	65201093
LOCATION:	Phoenix, AZ	**WORK ORDER NO:**	65201093.0009
MATERIAL:	Clayey Sand	**LAB NO:**	22-1960-3
SAMPLE SOURCE:	B - 105 @ 30'- 31'	**DATE SAMPLED:**	05/09/22

Sample Preparation: Insitu density, material and moisture. Specimens consolidated at normal load for 30 mins. Prior to shear. Not inundated.

Initial Parameters of specimen:

	Point 1	Point 2	Point 3
Normal Stress (psf):	**2000**	**4000**	**6000**
Dry mass (g):	98.18	98.56	98.63
Height (in):	1.0000	1.0000	1.0000
Diameter (in):	2.42	2.42	2.42
Moisture, %:	36.3	36.9	36.9
Dry Density (pcf):	81.3	81.6	81.7
Saturation, %:	93	95	95
Void Ratio:	1.04	1.03	1.03

Pre- Shear Parameters of specimen:

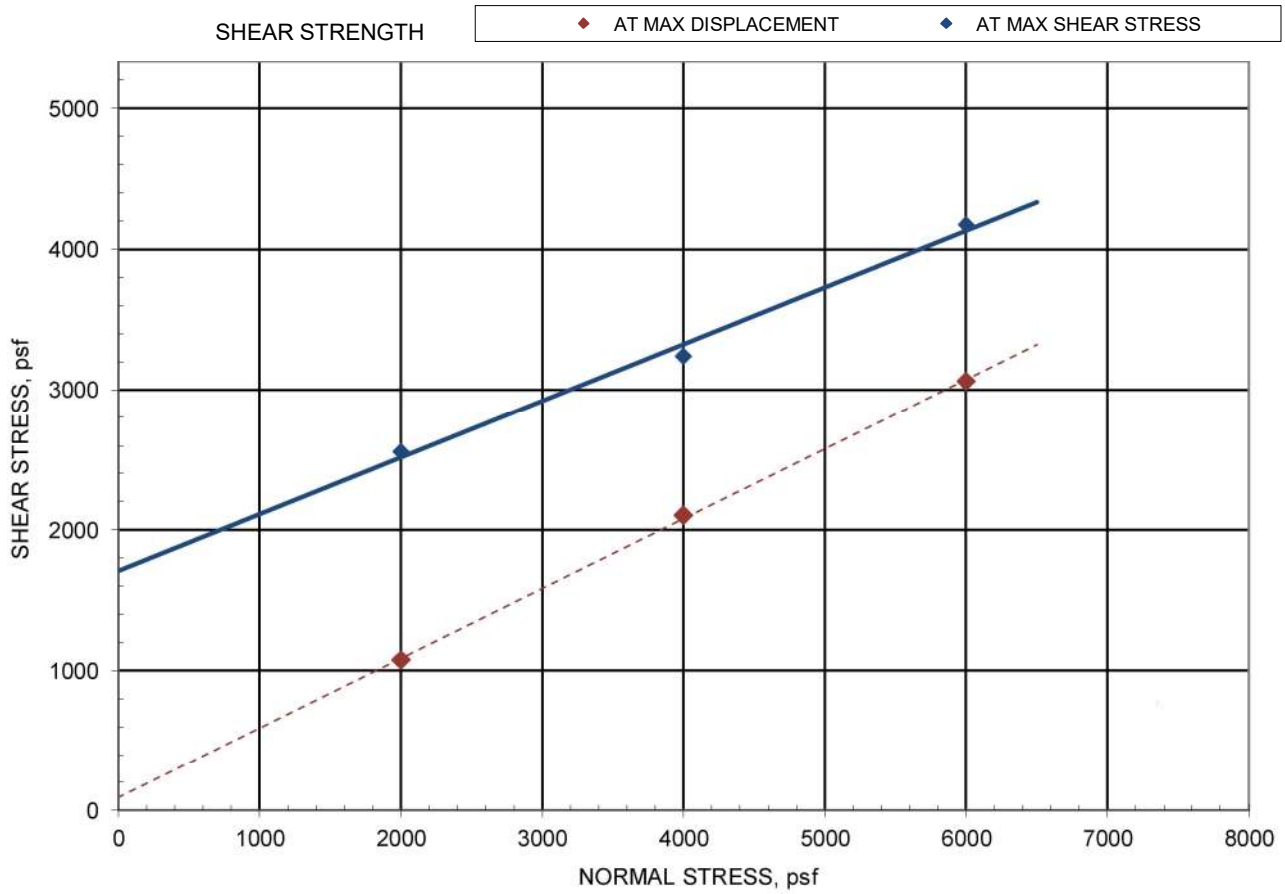
	Point 1	Point 2	Point 3
Normal Stress (psf):	**2000**	**4000**	**6000**
Dry mass (g):	98.18	98.56	98.63
Height (in):	0.9907	0.9818	0.9709
Diameter (in):	2.42	2.42	2.42
Moisture, %:	35.1	35.6	35.8
Dry Density (pcf):	82.1	83.2	84.1
Saturation, %:	92	95	98
Void Ratio:	1.02	0.99	0.97

Normal Stress (psf):	2000	4000	6000
Maximum Shear Stress, (psf):	2559	3241	4174
Displacement at Maximum Shear, (in):	0.040	0.075	0.084
Shear Stress at Max Displacement, (psf)	1076	2105	3062
Maximum Displacement, (in):	0.450	0.451	0.452
Rate of Deformation, in/min	0.0070	0.0070	0.0070

SHEAR DEVICE: Geomatic model 8914, Dead Weight load force

	FRICTION ANGLE	COHESION
AT MAX SHEAR STRESS	**22**	**1710**
Specs:		
AT MAX DISPLACEMENT	26	95
Specs:		

SHEAR STRENGTH

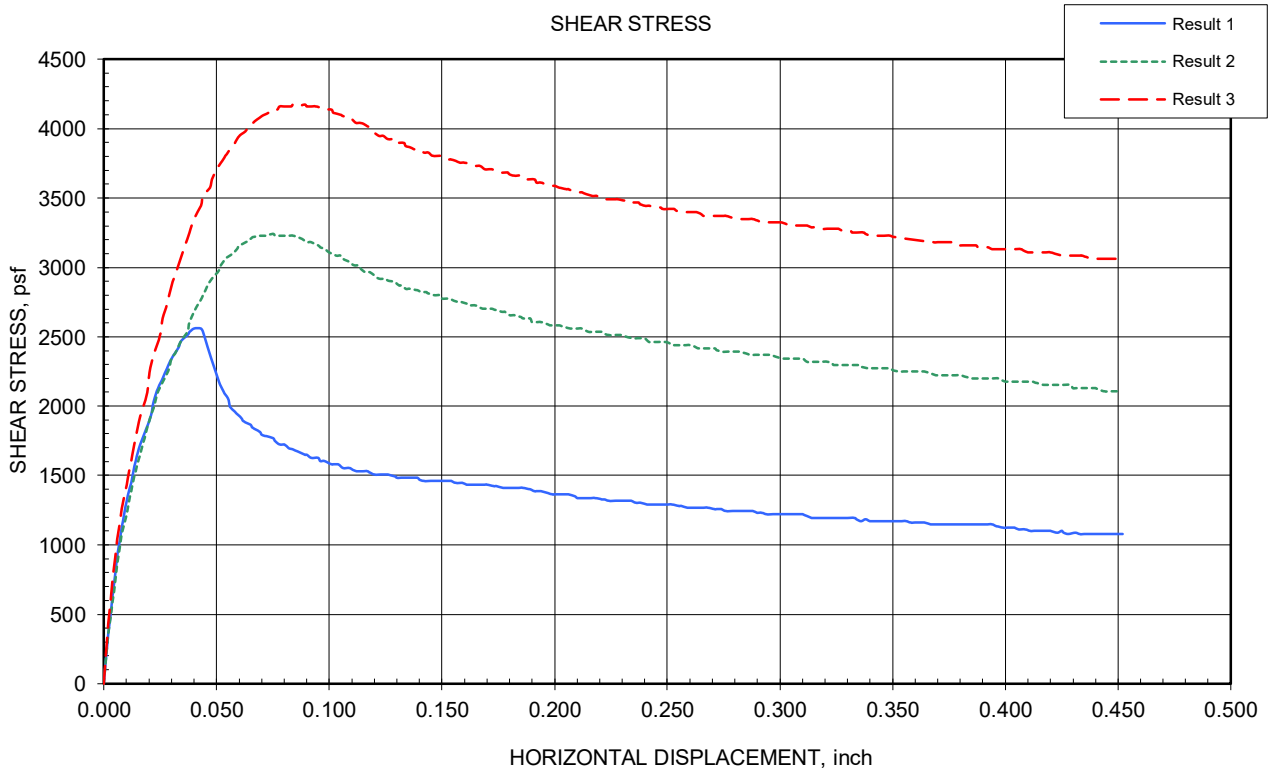


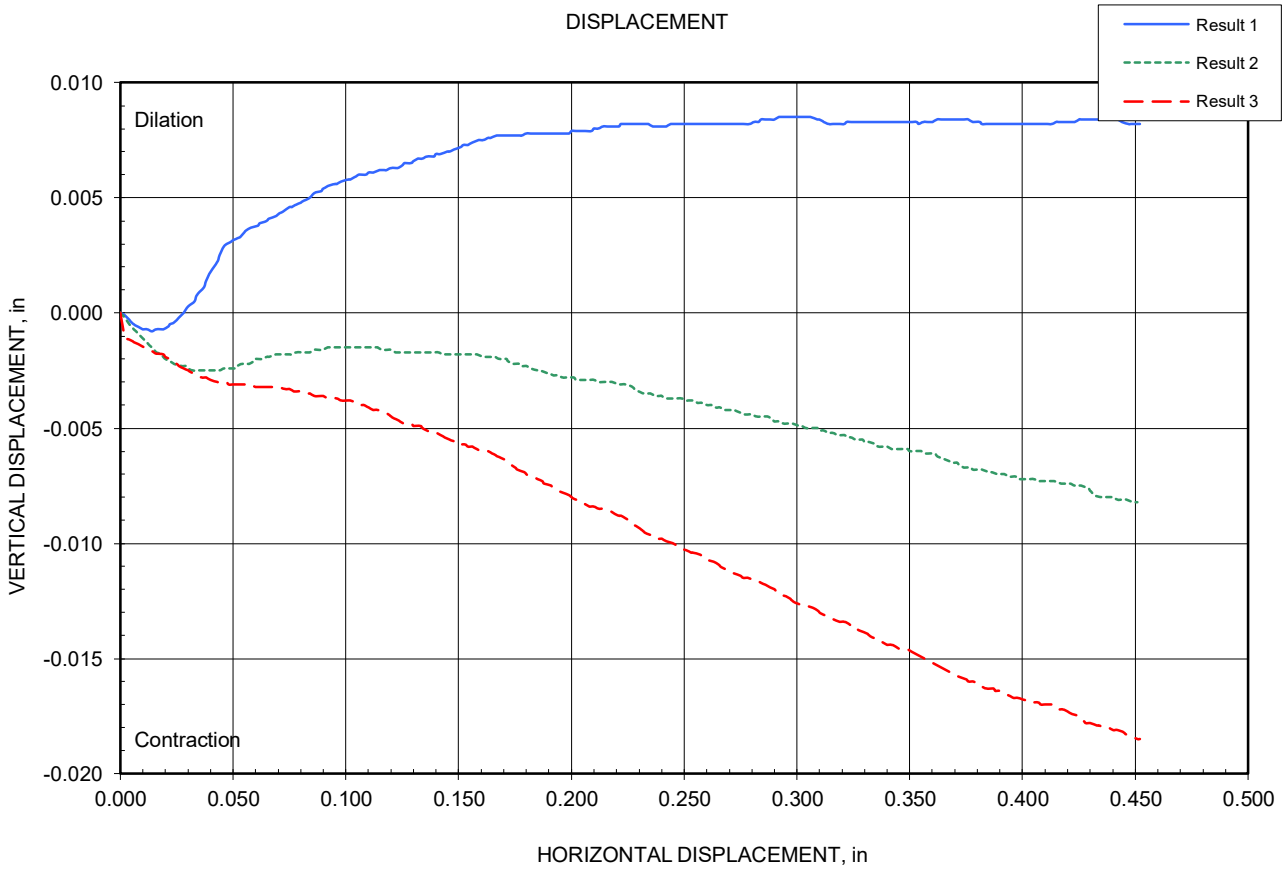
Note: The friction angle presented is applicable only to the load ranges and sample conditions tested

Reviewed By: Kirk Jackson

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS ASTM D3080

PROJECT:	ACS Project # 2201026	**JOB NO:**	65201093
LOCATION:	Phoenix, AZ	**WORK ORDER NO:**	65201093.0009
MATERIAL:	Clayey Sand	**LAB NO:**	22-1960-3
SAMPLE SOURCE:	B - 105 @ 30'- 31'	**DATE SAMPLED:**	5/9/2022





DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS ASTM D3080

Terracon

PROJECT:	ACS Project # 2201026	**JOB NO:**	65201093
LOCATION:	Phoenix, AZ	**WORK ORDER NO:**	65201093.0009
MATERIAL:	Clayey Sand	**LAB NO:**	22-1960-4
SAMPLE SOURCE:	B - 105 @ 45'- 46'	**DATE SAMPLED:**	05/09/22

Sample Preparation: Insitu density, material and moisture. Specimens consolidated at normal load for 30 mins. Prior to shear. Not inundated.

Initial Parameters of specimen:

	Point 1	Point 2	Point 3
Normal Stress (psf):	**2000**	**4000**	**8000**
Dry mass (g):	114.81	118.01	120.57
Height (in):	1.0000	1.0000	1.0000
Diameter (in):	2.42	2.42	2.42
Moisture, %:	22.0	22.6	22.3
Dry Density (pcf):	95.1	97.7	99.9
Saturation, %:	79	86	90
Void Ratio:	0.74	0.69	0.66

Pre- Shear Parameters of specimen:

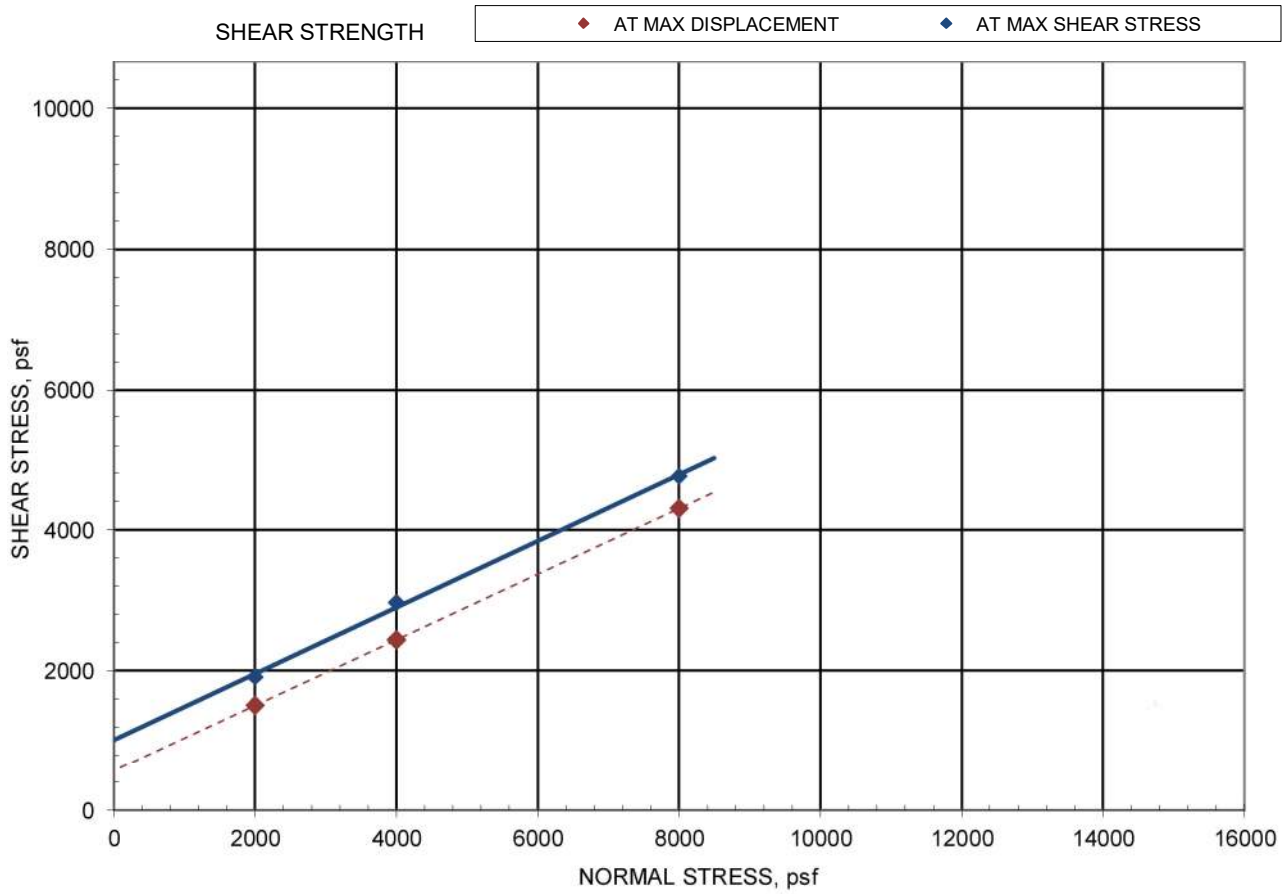
	Point 1	Point 2	Point 3
Normal Stress (psf):	**2000**	**4000**	**8000**
Dry mass (g):	114.81	118.01	120.57
Height (in):	0.9832	0.9727	0.9618
Diameter (in):	2.42	2.42	2.42
Moisture, %:	21.5	21.6	21.5
Dry Density (pcf):	96.7	100.5	103.8
Saturation, %:	80	89	96
Void Ratio:	0.71	0.65	0.59

Normal Stress (psf):	2000	4000	8000
Maximum Shear Stress, (psf):	1914	2966	4760
Displacement at Maximum Shear, (in):	0.161	0.136	0.160
Shear Stress at Max Displacement, (psf)	1507	2440	4305
Maximum Displacement, (in):	0.448	0.450	0.436
Rate of Deformation, in/min	0.0070	0.0070	0.0070

SHEAR DEVICE: Geomatic model 8914, Dead Weight load force

	FRICTION ANGLE	COHESION
AT MAX SHEAR STRESS	**25**	**1017**
Specs:		
AT MAX DISPLACEMENT	25	574.5
Specs:		

SHEAR STRENGTH

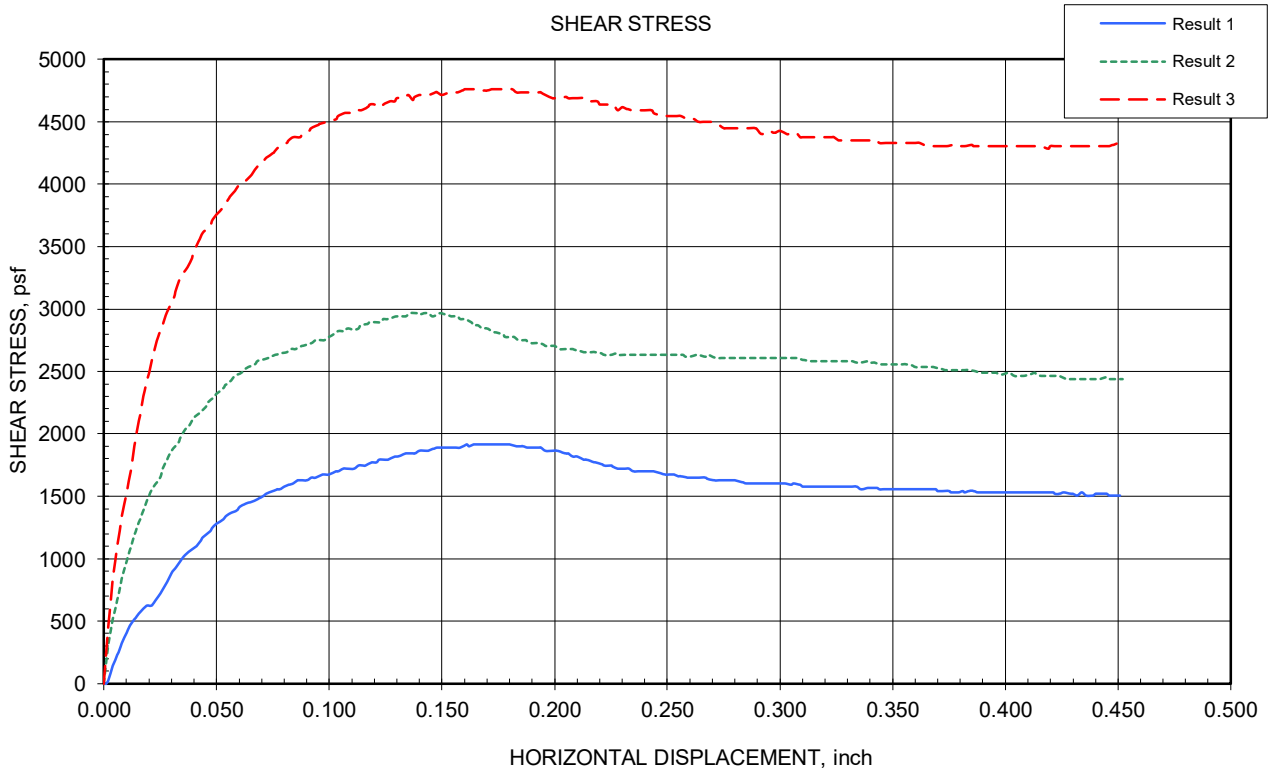


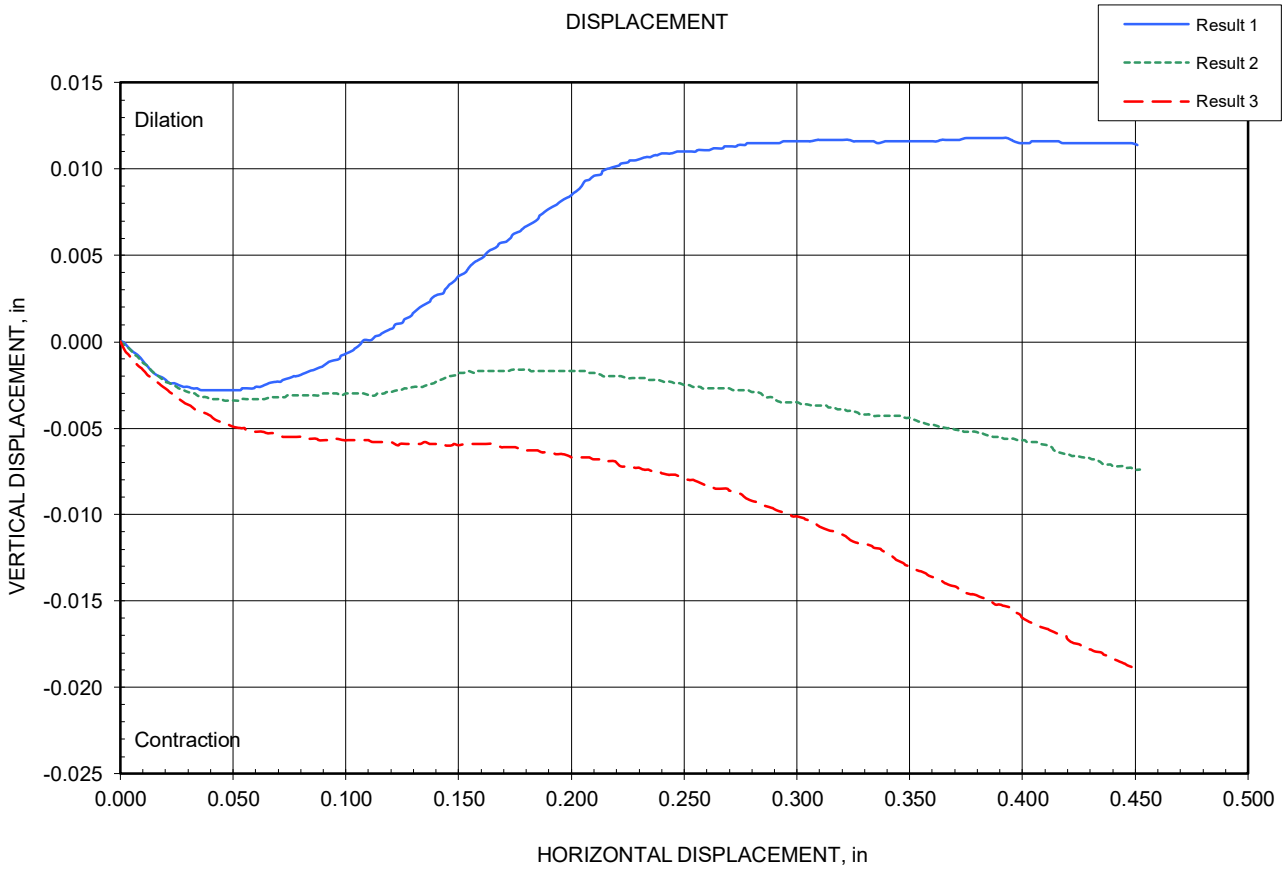
Note: The friction angle presented is applicable only to the load ranges and sample conditions tested

Reviewed By: Kirk Jackson

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS ASTM D3080

PROJECT:	ACS Project # 2201026	**JOB NO:**	65201093
LOCATION:	Phoenix, AZ	**WORK ORDER NO:**	65201093.0009
MATERIAL:	Clayey Sand	**LAB NO:**	22-1960-4
SAMPLE SOURCE:	B - 105 @ 45'- 46'	**DATE SAMPLED:**	5/9/2022





wood.

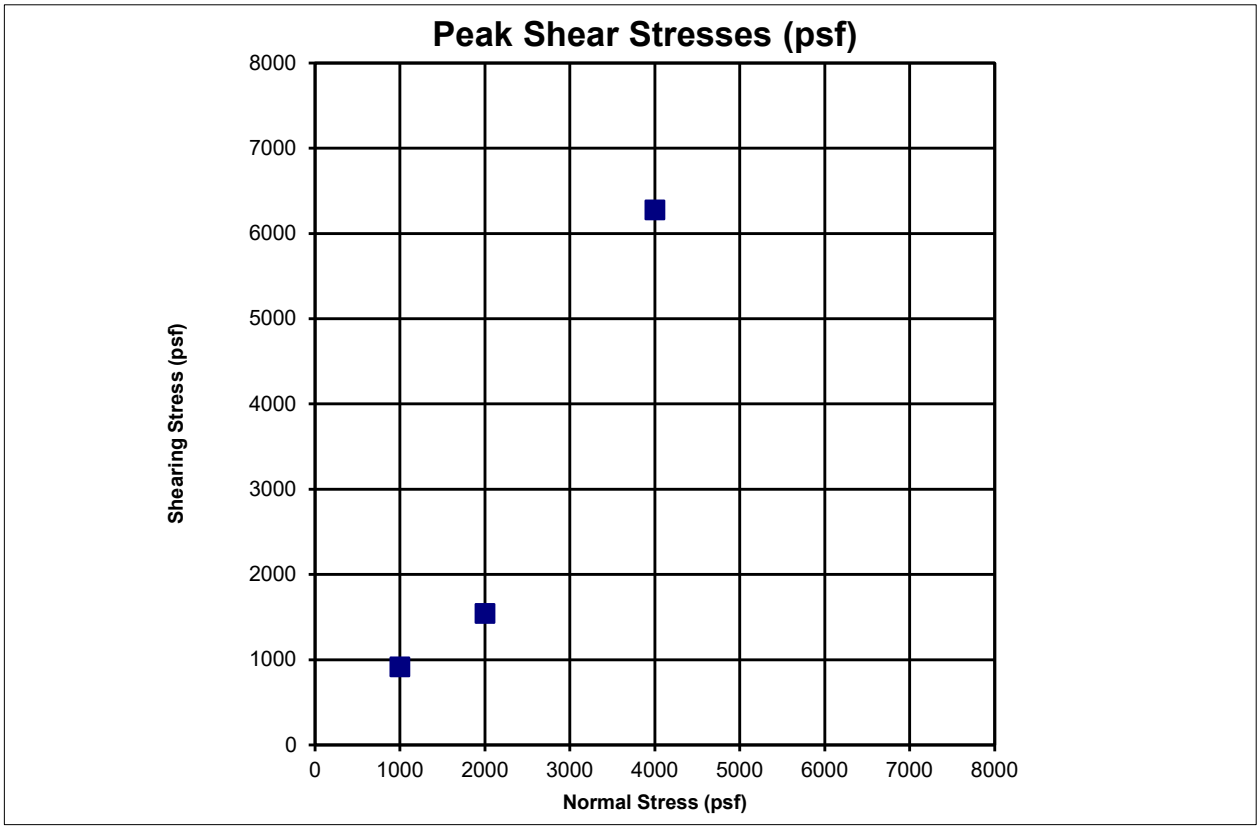
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: ACS Lab #22-1128-2 / B-108 (5.0-6.0')
SAMPLE PREPARATION: Saturated - 1, 2, and 4 ksf

B-108

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1087-01
DATE ASSIGNED: 1/26/2022

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.993	0.993	0.995
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.01	0.01	0.01
Direct shear point:	1	2	3
Dry mass of specimen (g):	122.4	122.6	135.6
Initial Moisture Content:	4.6%	4.7%	3.2%
Initial Wet Density (pcf):	106.0	106.3	116.0
Initial Dry Density (pcf):	101.4	101.5	112.3
Final Moisture Content:	18.0%	19.2%	13.7%
Final Wet Density (pcf):	120.5	122.0	128.3
Final Dry Density (pcf):	102.1	102.3	112.8
Normal Stress (psf):	1000	2000	4000
Maximum Shearing Stress (psf):	917	1542	6278
Vertical Deformation @ Max Shear (in):	0.168	0.211	0.269
Horizontal Deformation @ Max Shear (in):	0.492	0.419	0.313



Note: Point 1 and 2 had silty sand, specimen 3 had aggregate throughout.

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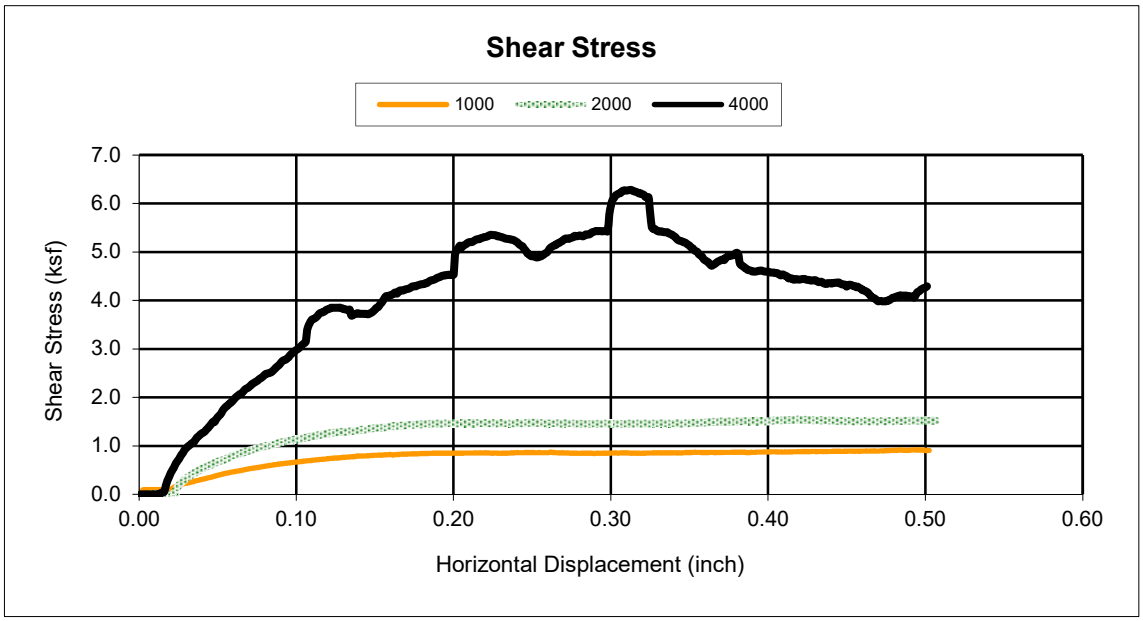
REVIEWED BY Robert Kostelny

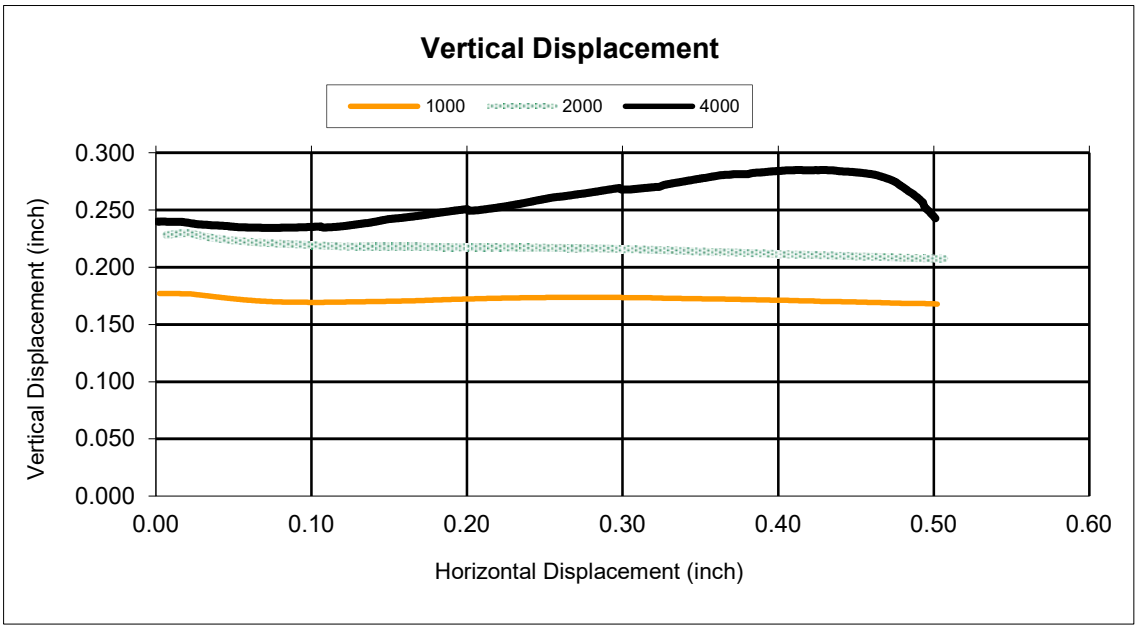
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil B-108
SAMPLE SOURCE: ACS Lab #22-1128-2 / B-108 (5.0-6.0')
SAMPLE PREPARATION: Saturated - 1, 2, and 4 ksf

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1087-01
DATE ASSIGNED: 1/26/2022

NORMAL LOADS (psf): 1000 2000 4000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





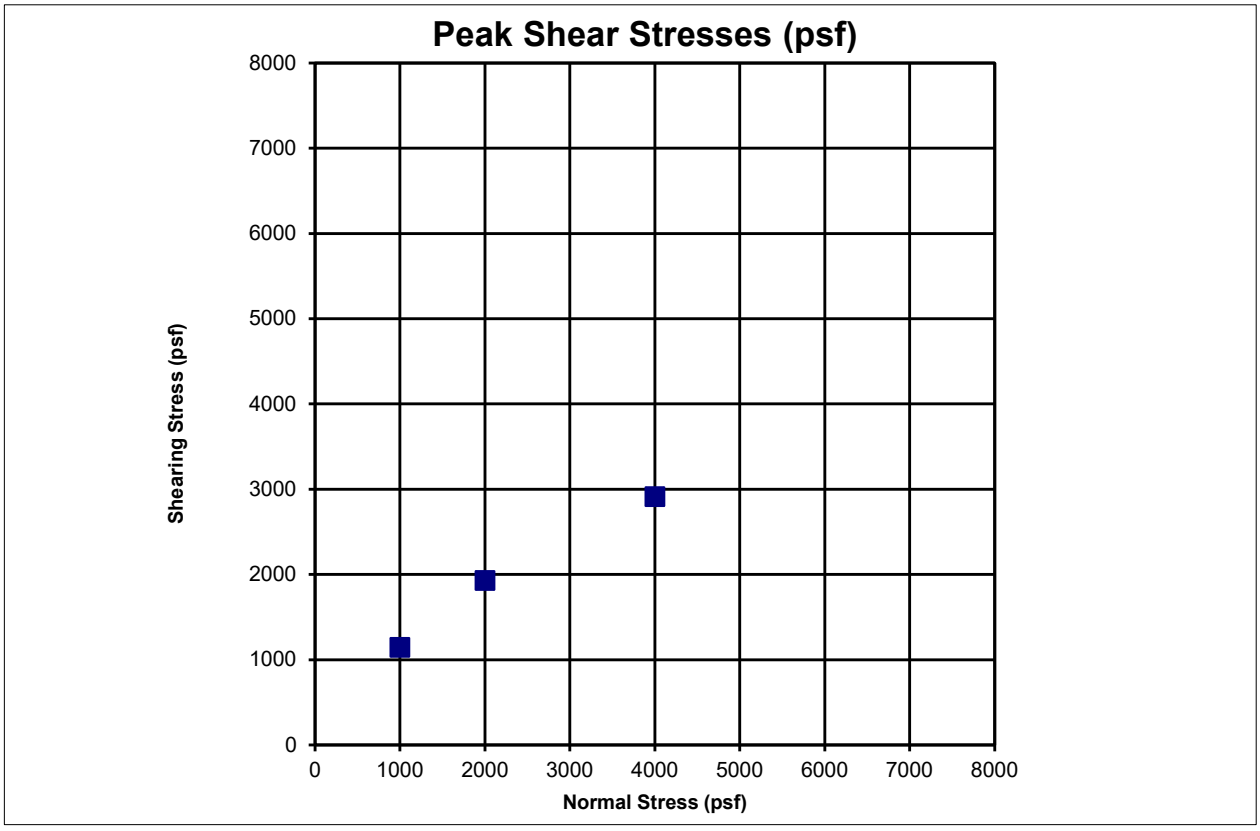
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PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: ACS Lab #22-1146-2 / B-112 (10.0-11.0')
SAMPLE PREPARATION: In Situ - 1, 2, and 4 ksf

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1088-01
DATE ASSIGNED: 1/26/2022

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.998	0.998	0.993
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.01	0.01	0.01
Direct shear point:	1	2	3
Dry mass of specimen (g):	109.8	109.4	109.7
Initial Moisture Content:	9.8%	10.8%	10.8%
Initial Wet Density (pcf):	99.9	100.4	100.6
Initial Dry Density (pcf):	90.9	90.6	90.9
Final Moisture Content:	19.1%	9.2%	24.4%
Final Wet Density (pcf):	108.6	99.1	113.9
Final Dry Density (pcf):	91.2	90.8	91.5
Normal Stress (psf):	1000	2000	4000
Maximum Shearing Stress (psf):	1144	1928	2912
Vertical Deformation @ Max Shear (in):	0.229	0.295	0.249
Horizontal Deformation @ Max Shear (in):	0.111	0.114	0.343



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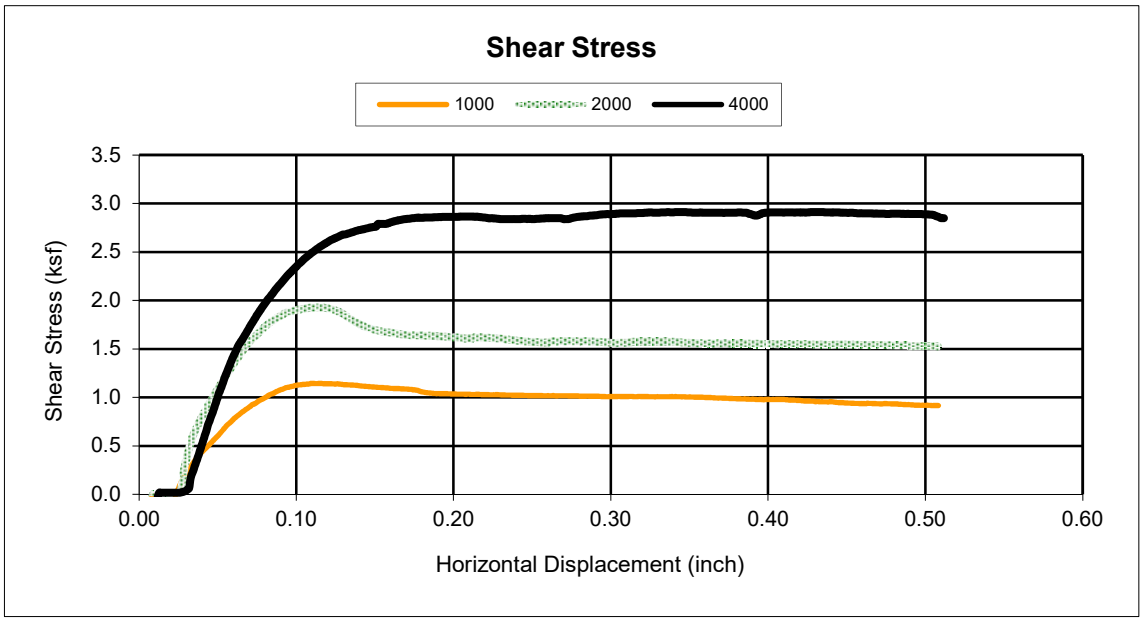
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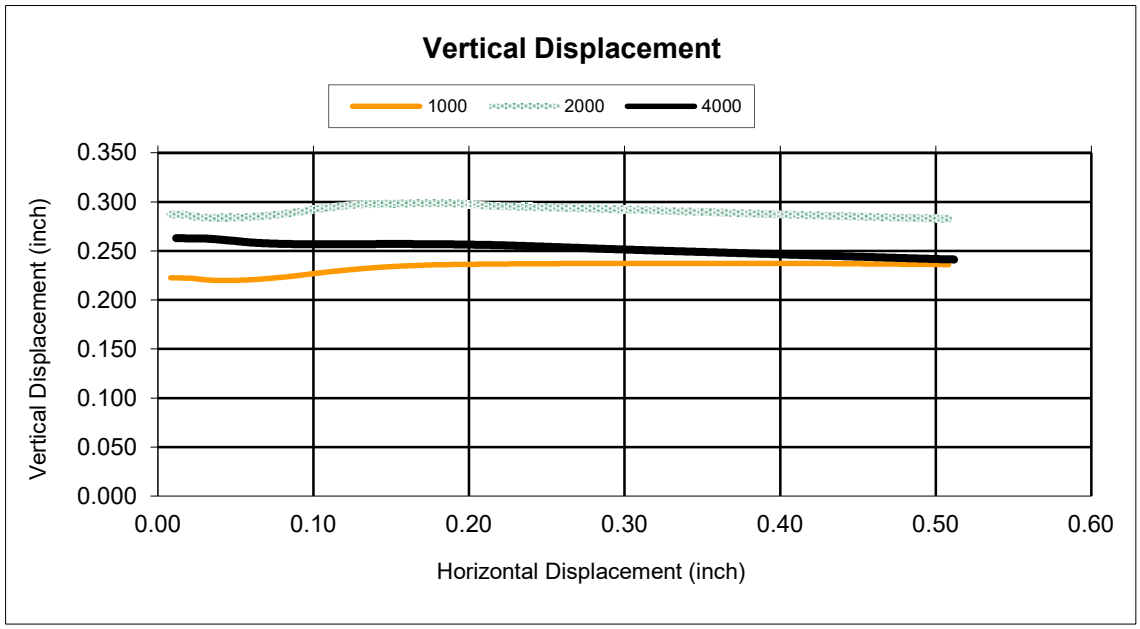
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil B-112
SAMPLE SOURCE: ACS Lab #22-1146-2 / ~~B-109~~ (10.0-11.0')
SAMPLE PREPARATION: In Situ - 1, 2, and 4 ksf

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1088-01
DATE ASSIGNED: 1/26/2022

NORMAL LOADS (psf): 1000 2000 4000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





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wood.

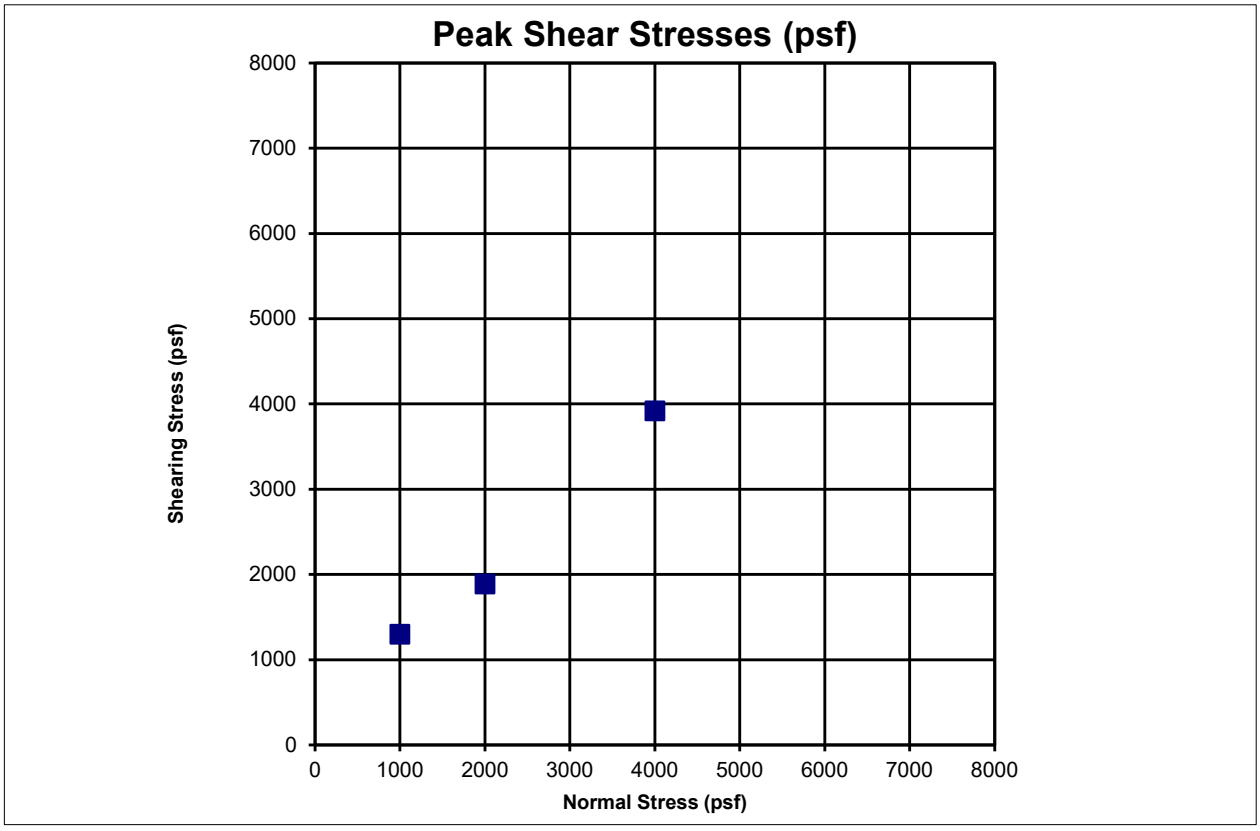
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: ACS Lab #22-1146-7 / B-113 (10.0-11.0')
SAMPLE PREPARATION: In Situ - 1, 2, and 4 ksf

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1088-02
DATE ASSIGNED: 1/26/2022

B-113

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.999	0.999	0.998
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.01	0.01	0.01
Direct shear point:	1	2	3
Dry mass of specimen (g):	109.8	110.6	114.8
Initial Moisture Content:	9.7%	9.7%	9.8%
Initial Wet Density (pcf):	99.7	100.5	104.4
Initial Dry Density (pcf):	90.9	91.6	95.1
Final Moisture Content:	8.9%	8.7%	8.7%
Final Wet Density (pcf):	99.2	99.7	103.6
Final Dry Density (pcf):	91.1	91.7	95.3
Normal Stress (psf):	1000	2000	4000
Maximum Shearing Stress (psf):	1300	1890	3921
Vertical Deformation @ Max Shear (in):	0.317	0.287	0.278
Horizontal Deformation @ Max Shear (in):	0.092	0.090	0.107



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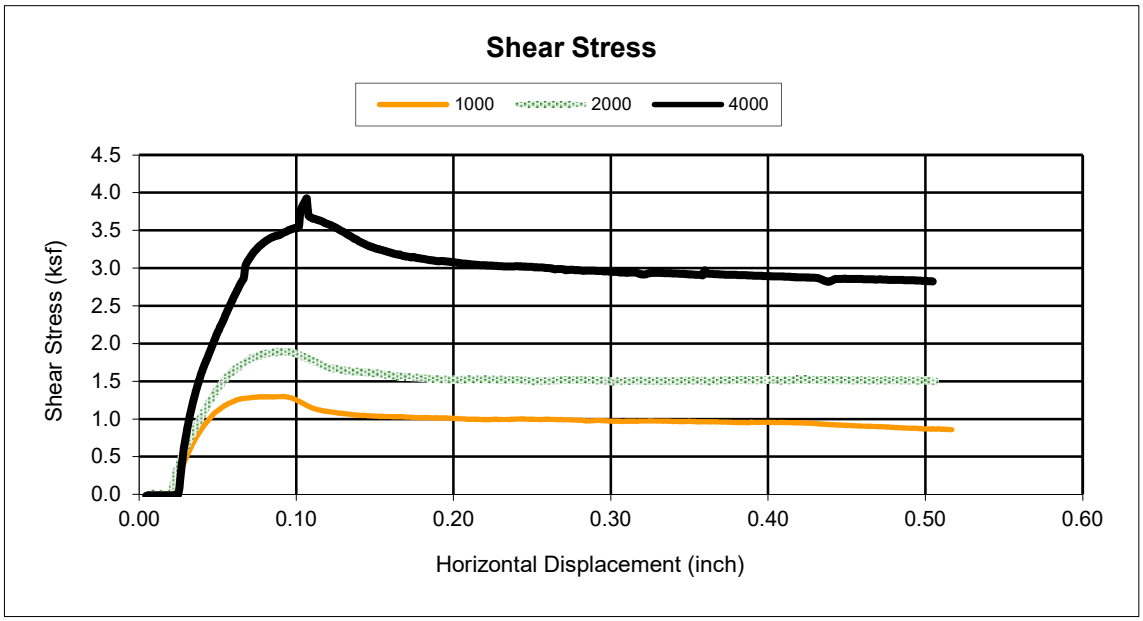
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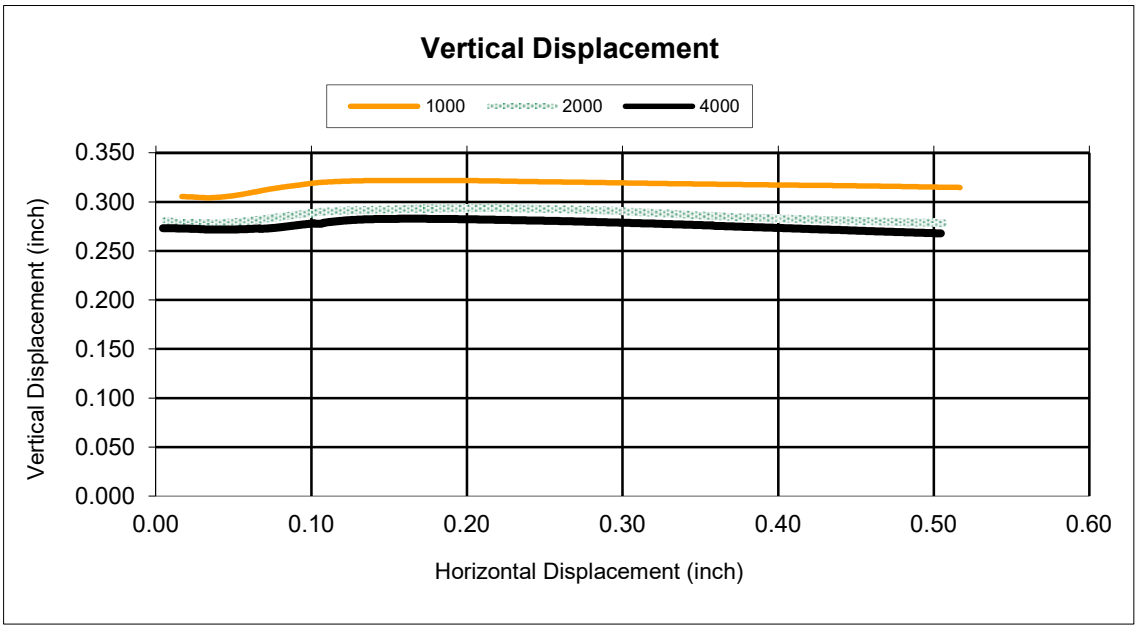
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil B-113
SAMPLE SOURCE: ACS Lab #22-1146-7 / B-113 (10.0-11.0')
SAMPLE PREPARATION: In Situ - 1, 2, and 4 ksf

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1088-02
DATE ASSIGNED: 1/26/2022

NORMAL LOADS (psf): 1000 2000 4000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





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ACS Services LLC

Direct Shear Under Consolidated Drained Conditions
ASTM D3080-11

ACS Project #	**2201026**	Material Type:	2.4.6KSF insitu
ACS Lab #	**22-2842**	Sample Date:	Friday, June 10, 2022
Client Name:	**Ethos**	Sampled By:	Client
Project Name:	**SR 303L MC85 to Van Buren**	Laboratory Test Date:	Tuesday, June 14, 2022
Project Address:	**MC85 to Van Buren**	Laboratory Test By:	Brian Karl
Project City:	**Goodyear**	Reviewed By:	Dylan Ward
Sample Source:	**B-115@30-31**		

Sample Preparation: Specimen extracted from ring sample taken in the field using the labs jack. The specimen was consolidated at the normal stress until consolidation was completed prior to shearing.

Initial Parameters of Specimen

	Point 1	Point 2	Point 3
Normal Stress (ksf):	2	4	6
Dry mass (g):	100.2	94.6	102
Height (in.):	1	1	1
Diameter (in.):	2.42	2.42	2.42
Moisture (%):	36.9	34.2	33.1
Dry Density (pcf):	83.0	78.3	84.5
Saturation (%):	98	82	92
Void Ratio (%):	0.99	1.11	0.96

Final Parameters of Specimen

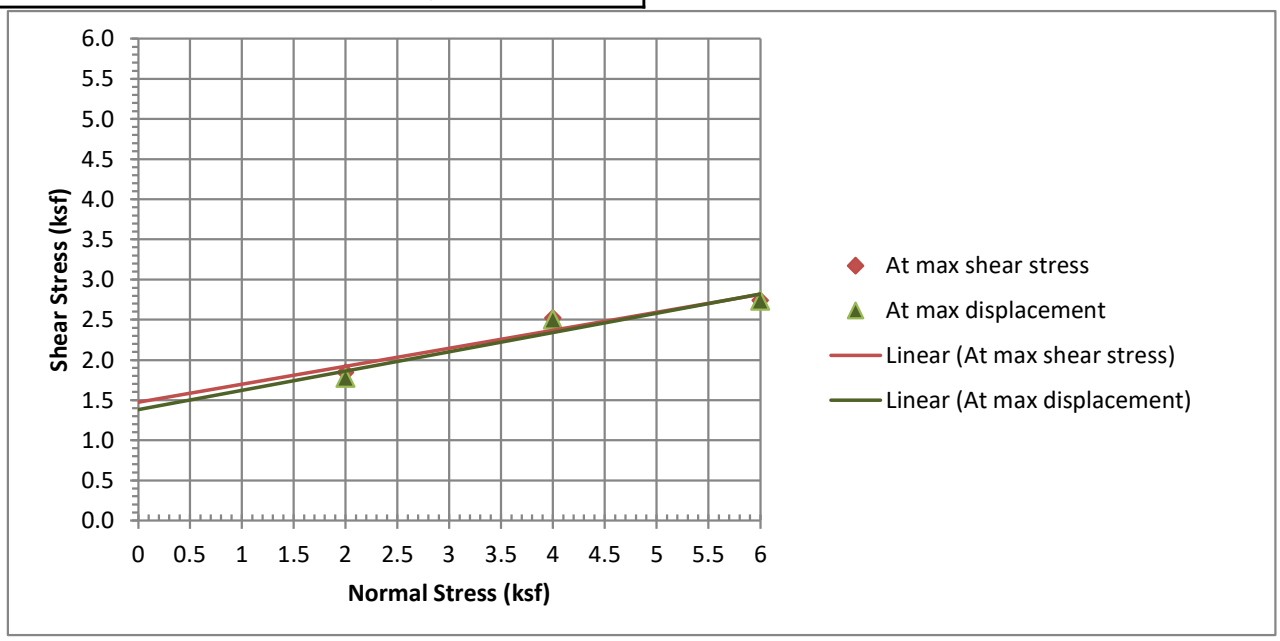
	Point 1	Point 2	Point 3
Normal Stress (ksf):	2	4	6
Dry mass (g):	100.2	94.6	102
Height (in.):	0.9984	0.9664	0.9992
Diameter (in.):	2.42	2.42	2.42
Moisture (%):	36.9	34.2	33.1
Dry Density (pcf):	83.1	81.1	84.5
Saturation (%):	98	82	92
Void Ratio (%):	0.99	1.04	0.96

Results from Experimentation

	Point 1	Point 2	Point 3
Normal Stress (ksf):	2	4	6
Max. Shear Stress (ksf)	1.844	2.523	2.739
Displacement at Max Shear (in.):	-0.0016	-0.0336	-0.0008
Shear Stress at Max Displ. (ksf):	1.778	2.505	2.739
Maximum Displacement (in.):	-0.005	-0.0365	-0.0008
Rate of Deformation (in./min):	0.001	0.001	0.001

	Friction Angle	Cohesion (ksf)
At Max Shear Stress:	12.6	1.474
At Max Displacement:	13.5	1.380

Shear Device: Karol Warner Model 2001-D, Pneumatic load



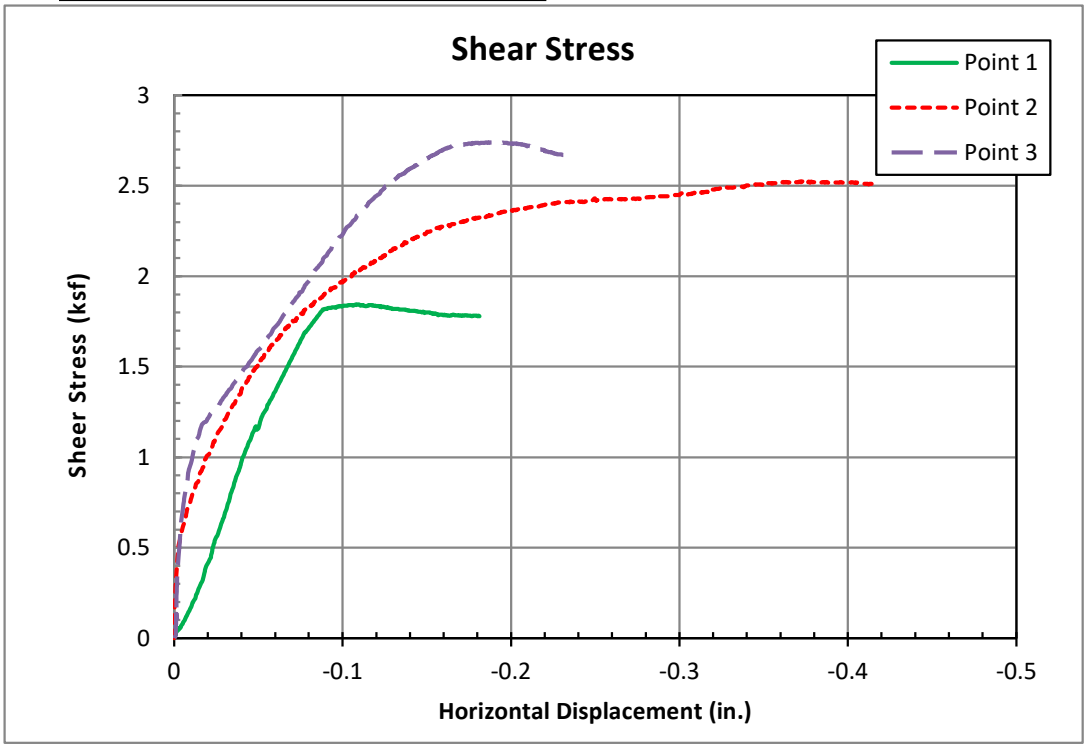
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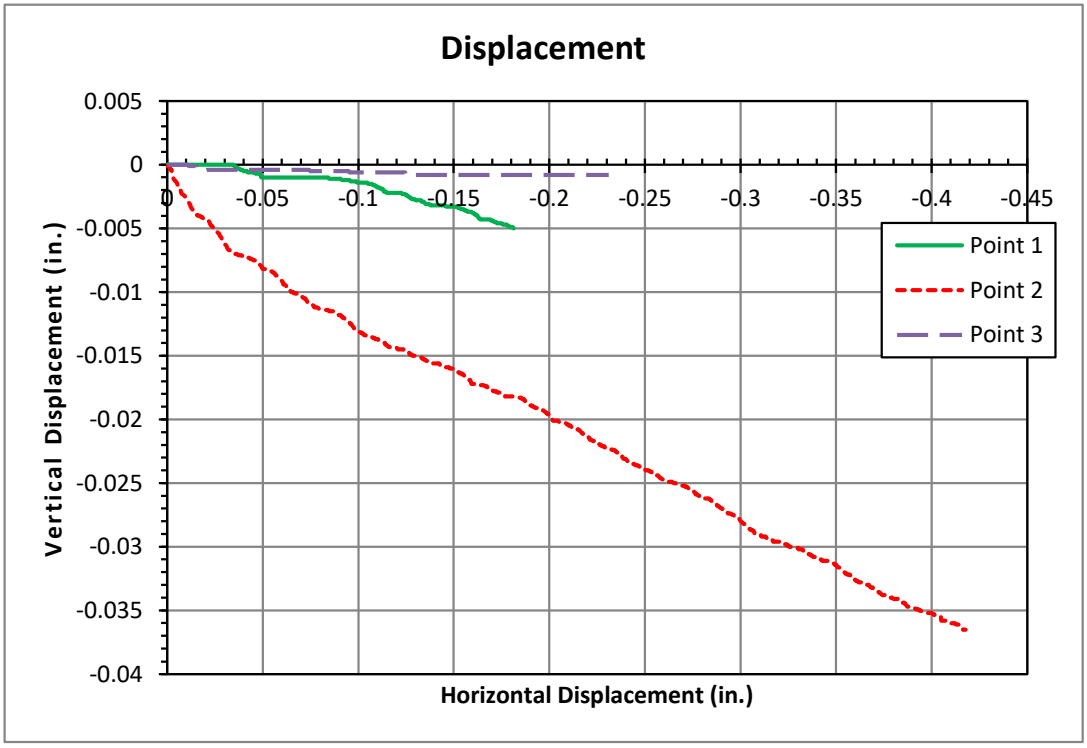
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ACS Services LLC

Direct Shear Under Consolidated Drained Conditions
ASTM D3080-11

ACS Project #	**2201026**	Material Type:	2.4.6KSF insitu
ACS Lab #	**22-2842**	Sample Date:	Friday, June 10, 2022
Client Name:	**Ethos**	Sampled By:	Client
Project Name:	**SR 303L MC85 to Van Buren**	Laboratory Test Date:	Tuesday, June 14, 2022
Project Address:	**MC85 to Van Buren**	Laboratory Test By:	Brian Karl
Project City:	**Goodyear**	Reviewed By:	Dylan Ward
Sample Source:	**B-115@30-31**		





Operations Manager

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ACS Services LLC

Direct Shear Under Consolidated Drained Conditions
ASTM D3080-11

ACS Project #	**2201026**	Material Type:	2,4,6 KSF insitu
ACS Lab #	**22-2842**	Sample Date:	Friday, June 10, 2022
Client Name:	**Ethos**	Sampled By:	Client
Project Name:	**SR 303L MC85 to Van Buren**	Laboratory Test Date:	Monday, June 20, 2022
Project Address:	**MC85 to Van Buren**	Laboratory Test By:	Brian Karl
Project City:	**Goodyear**	Reviewed By:	Dylan Ward
Sample Source:	**B-119@30-31**		

Sample Preparation: Specimen extracted from ring sample taken in the field using the labs jack. The specimen was consolidated at the normal stress until consolidation was completed prior to shearing.

Initial Parameters of Specimen

	Point 1	Point 2	Point 3
Normal Stress (ksf):	2	4	6
Dry mass (g):	104.4	94.4	98.8
Height (in.):	1	1	1
Diameter (in.):	2.42	2.42	2.42
Moisture (%):	31.4	32.5	32.5
Dry Density (pcf):	86.5	78.2	81.8
Saturation (%):	91	77	84
Void Ratio (%):	0.91	1.12	1.02

Final Parameters of Specimen

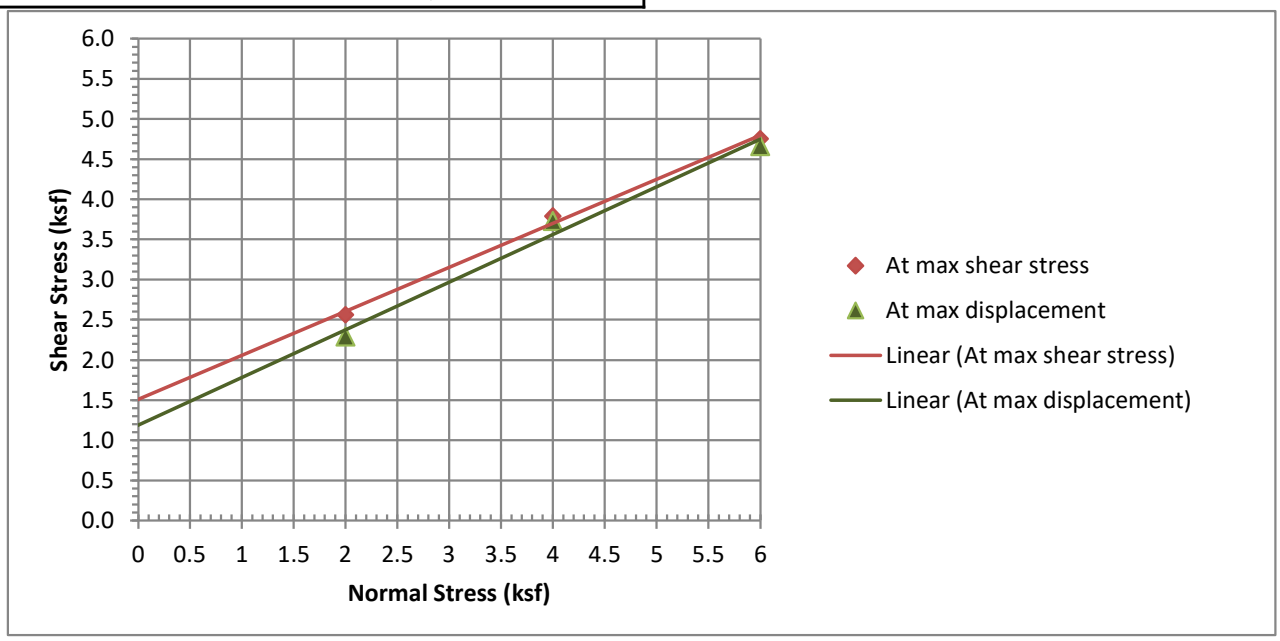
	Point 1	Point 2	Point 3
Normal Stress (ksf):	2	4	6
Dry mass (g):	104.4	94.4	98.8
Height (in.):	0.9997	0.9833	0.9936
Diameter (in.):	2.42	2.42	2.42
Moisture (%):	31.4	32.5	32.5
Dry Density (pcf):	86.5	79.5	82.3
Saturation (%):	91	77	84
Void Ratio (%):	0.91	1.08	1.01

Results from Experimentation

	Point 1	Point 2	Point 3
Normal Stress (ksf):	2	4	6
Max. Shear Stress (ksf)	2.561	3.791	4.752
Displacement at Max Shear (in.):	-0.0003	-0.0167	-0.0064
Shear Stress at Max Displ. (ksf):	2.292	3.729	4.665
Maximum Displacement (in.):	0.0027	-0.0172	-0.0085
Rate of Deformation (in./min):	0.001	0.001	0.001

Shear Device: Karol Warner Model 2001-D, Pneumatic load

	Friction Angle	Cohesion (ksf)
At Max Shear Stress:	28.7	1.510
At Max Displacement:	30.7	1.189



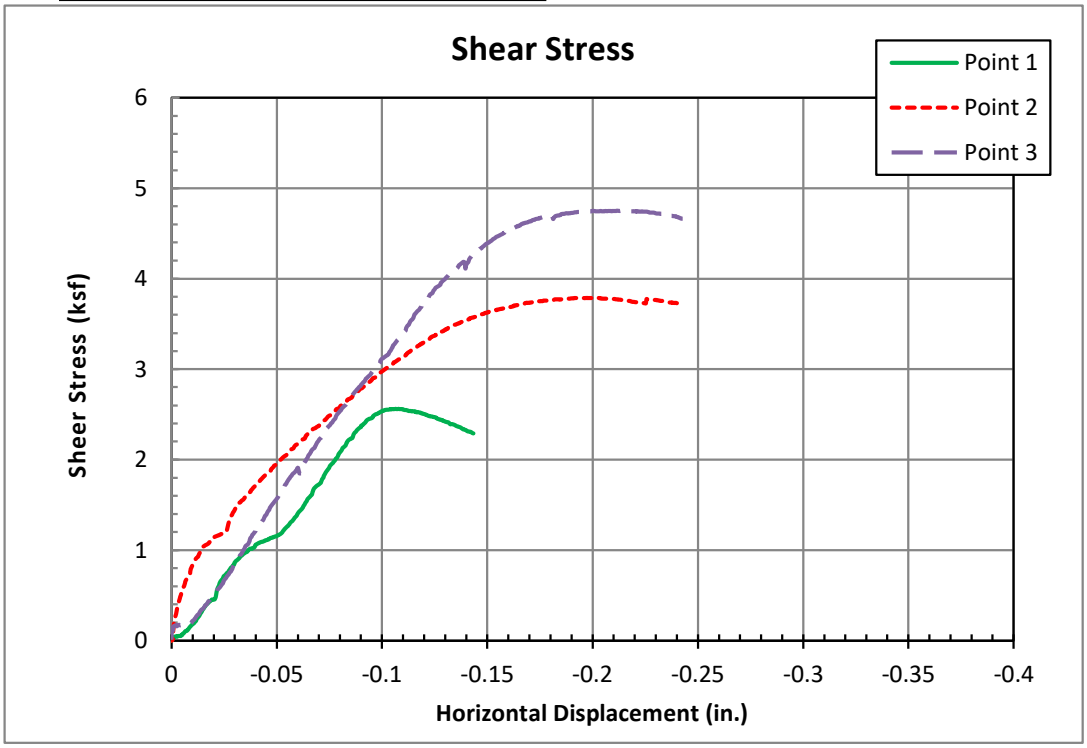
Operations Manager

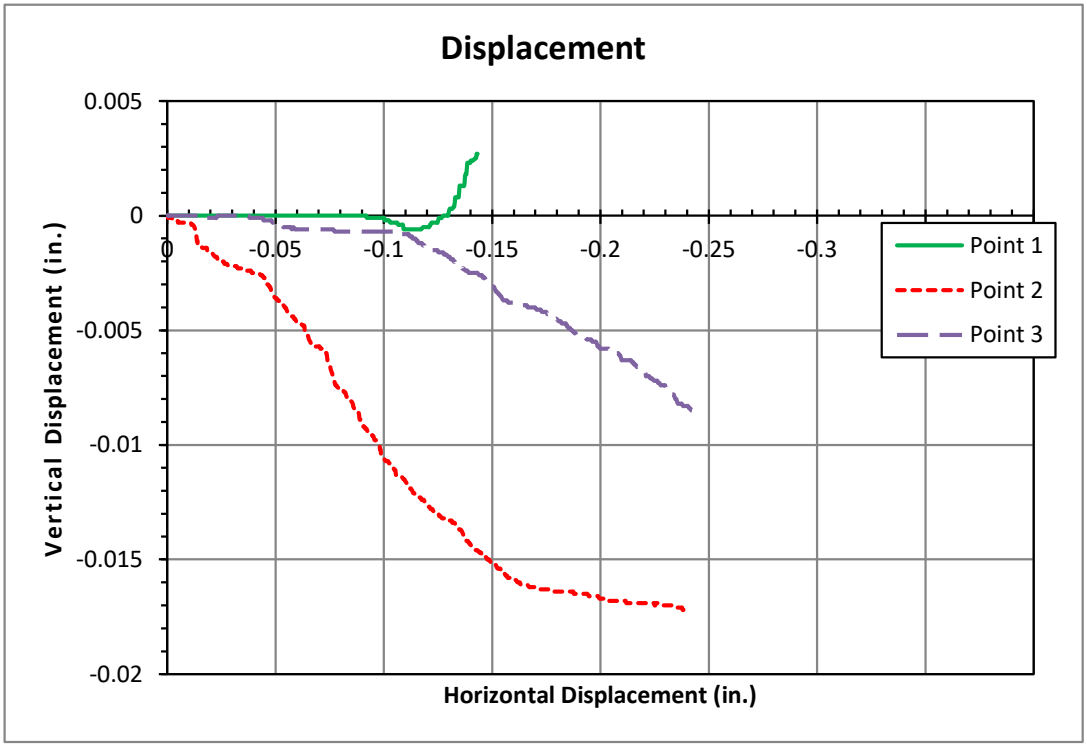
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ACS Services LLC

Direct Shear Under Consolidated Drained Conditions
ASTM D3080-11

ACS Project #	**2201026**	Material Type:	2,4,6 KSF insitu
ACS Lab #	**22-2842**	Sample Date:	Friday, June 10, 2022
Client Name:	**Ethos**	Sampled By:	Client
Project Name:	**SR 303L MC85 to Van Buren**	Laboratory Test Date:	Monday, June 20, 2022
Project Address:	**MC85 to Van Buren**	Laboratory Test By:	Brian Karl
Project City:	**Goodyear**	Reviewed By:	Dylan Ward
Sample Source:	**B-119@30-31**		





Operations Manager

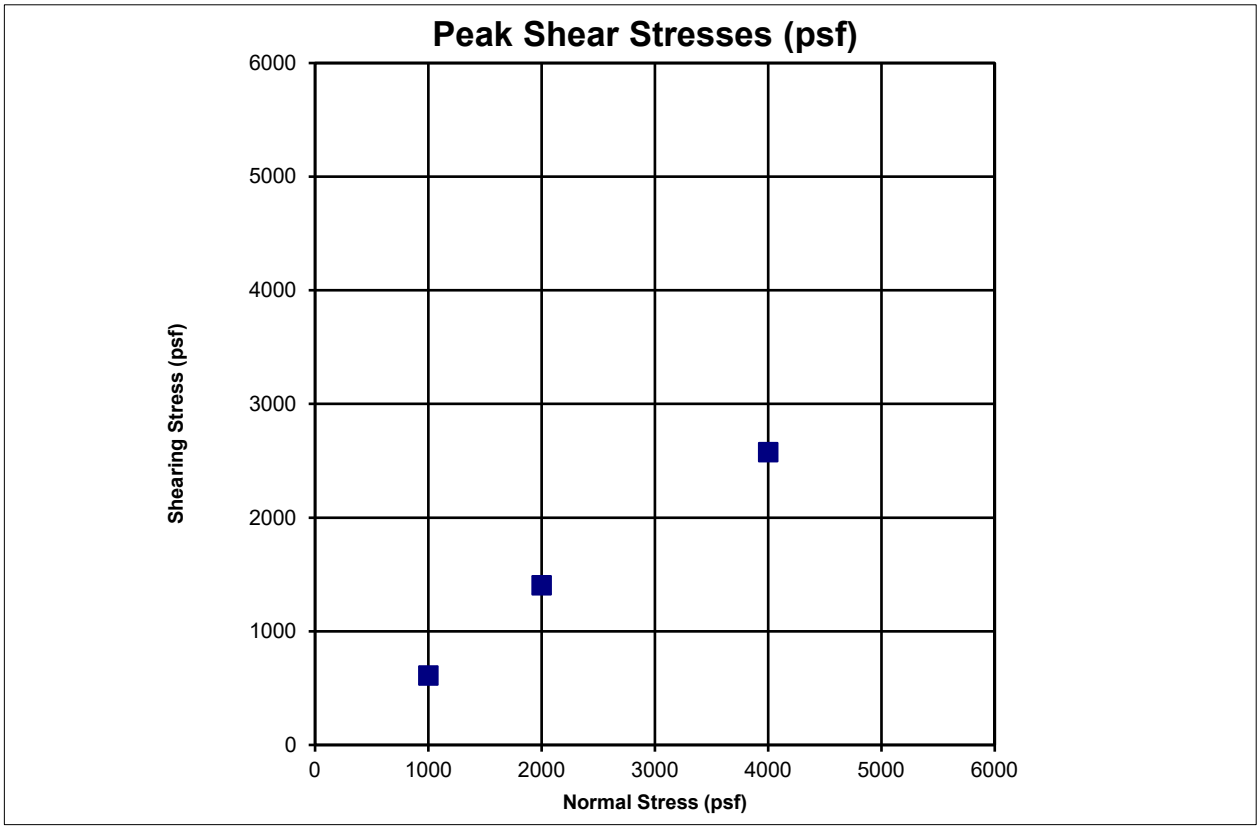
Signature

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native
SAMPLE SOURCE: B-119A (2.5-3.5')
SAMPLE PREPARATION: Saturated - 1, 2, and 4ksf

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1504-04
DATE ASSIGNED: 6/27/2022

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.999	0.998	0.997
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.01	0.01	0.01
Direct shear point:	1	2	3
Dry mass of specimen (g):	128.2	127.2	133.1
Initial Moisture Content:	10.6%	12.0%	11.0%
Initial Wet Density (pcf):	117.4	118.0	122.3
Initial Dry Density (pcf):	106.2	105.4	110.2
Final Moisture Content:	19.5%	19.2%	18.3%
Final Wet Density (pcf):	127.0	125.8	130.8
Final Dry Density (pcf):	106.3	105.6	110.6
Normal Stress (psf):	1000	2000	4000
Maximum Shearing Stress (psf):	611	1404	2576
Vertical Deformation @ Max Shear (in):	0.331	0.245	0.279
Horizontal Deformation @ Max Shear (in):	0.081	0.485	0.272



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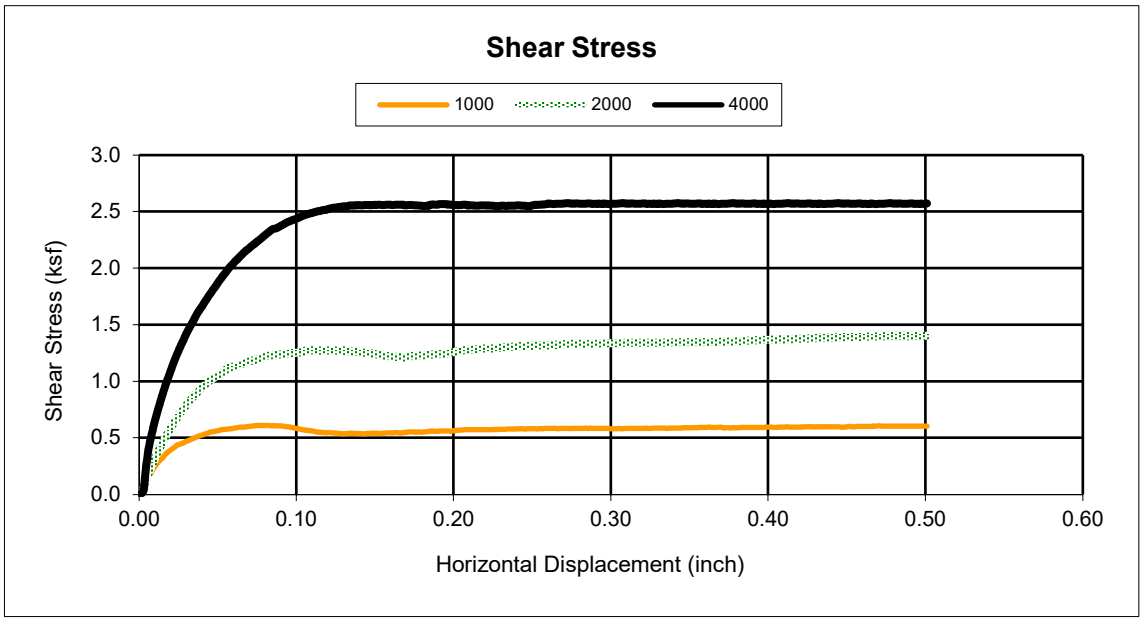
REVIEWED BY Hiram Franco

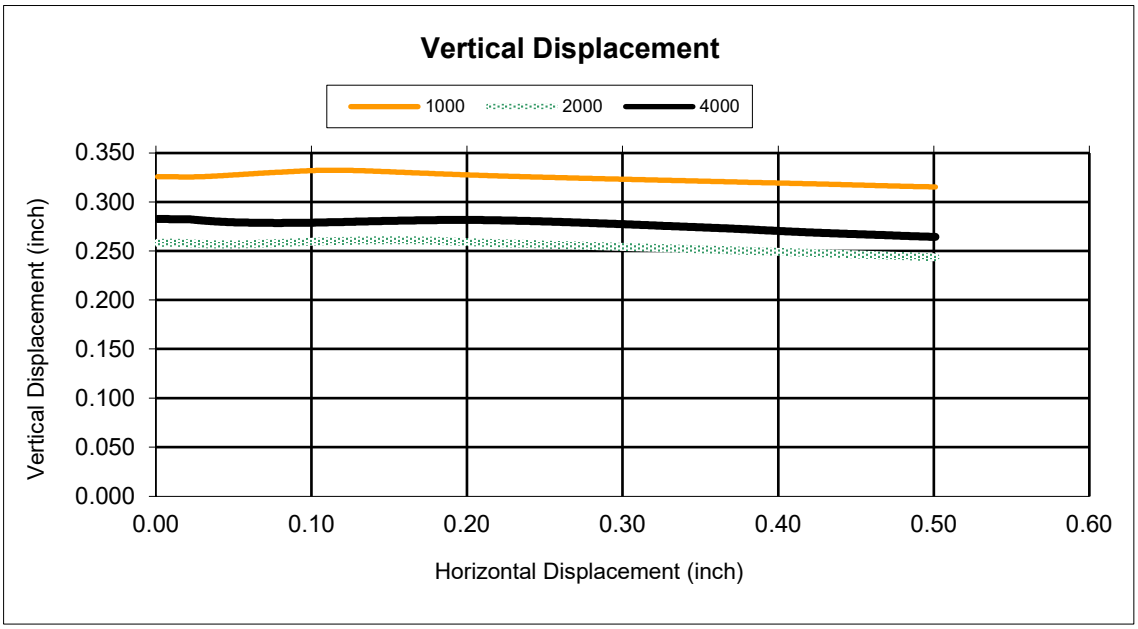
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native
SAMPLE SOURCE: B-119A (2.5-3.5')
SAMPLE PREPARATION: Saturated - 1, 2, and 4ksf

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1504-04
DATE ASSIGNED: 6/27/2022

NORMAL LOADS (psf): 1000 2000 4000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





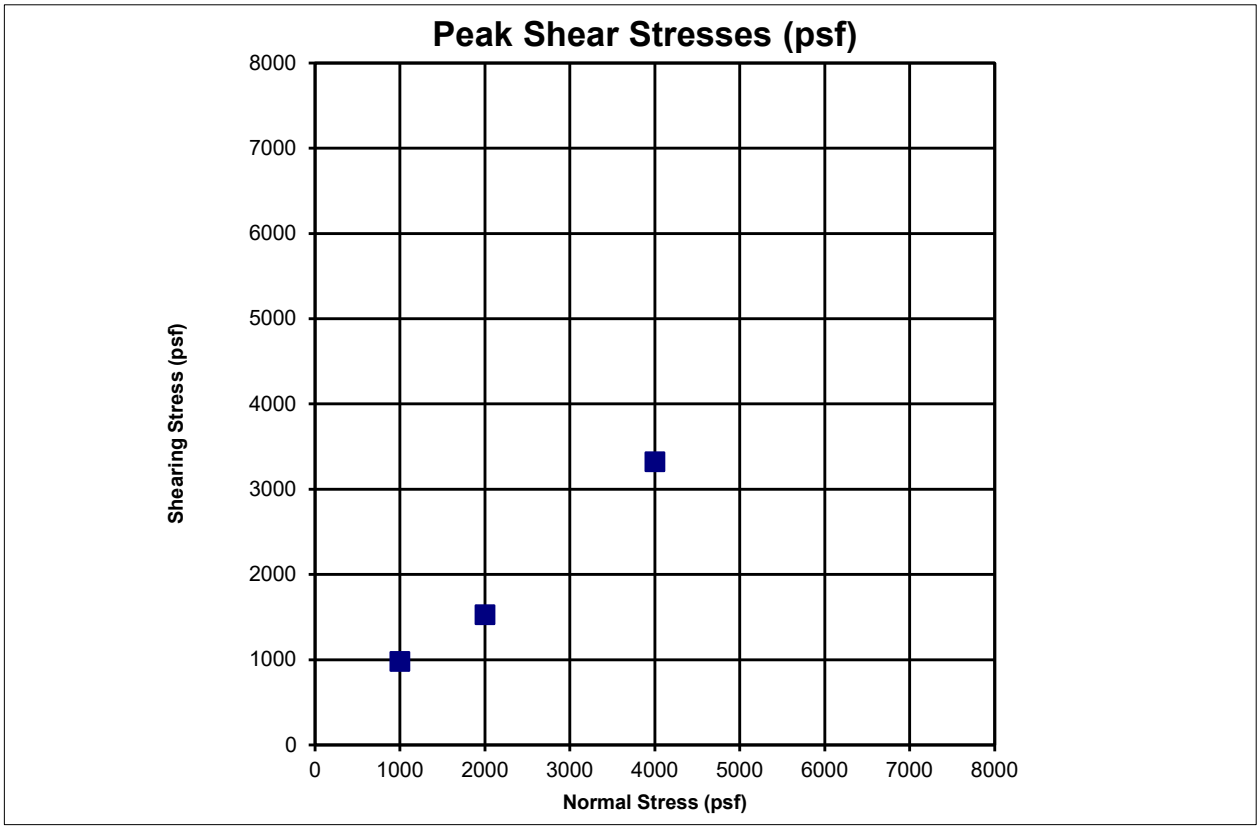
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PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: ACS Lab #22-1128-14 / B-120 (10.0-11.5')
SAMPLE PREPARATION: Saturated - 1, 2, and 4 ksf

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1087-02
DATE ASSIGNED: 1/26/2022

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.995	0.996	0.992
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.01	0.01	0.01
Direct shear point:	1	2	3
Dry mass of specimen (g):	122.5	128.9	127.7
Initial Moisture Content:	4.0%	3.3%	3.8%
Initial Wet Density (pcf):	105.5	110.2	109.7
Initial Dry Density (pcf):	101.5	106.8	105.8
Final Moisture Content:	19.3%	17.1%	18.6%
Final Wet Density (pcf):	121.6	125.5	126.5
Final Dry Density (pcf):	101.9	107.2	106.6
Normal Stress (psf):	1000	2000	4000
Maximum Shearing Stress (psf):	980	1527	3322
Vertical Deformation @ Max Shear (in):	0.182	0.233	0.202
Horizontal Deformation @ Max Shear (in):	0.501	0.502	0.263



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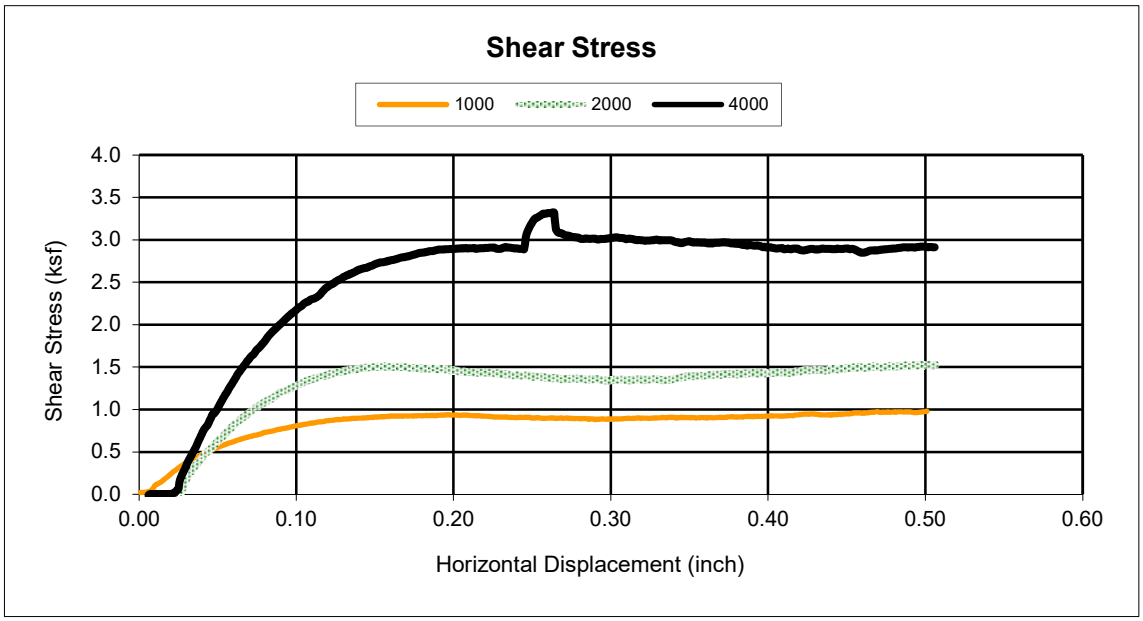
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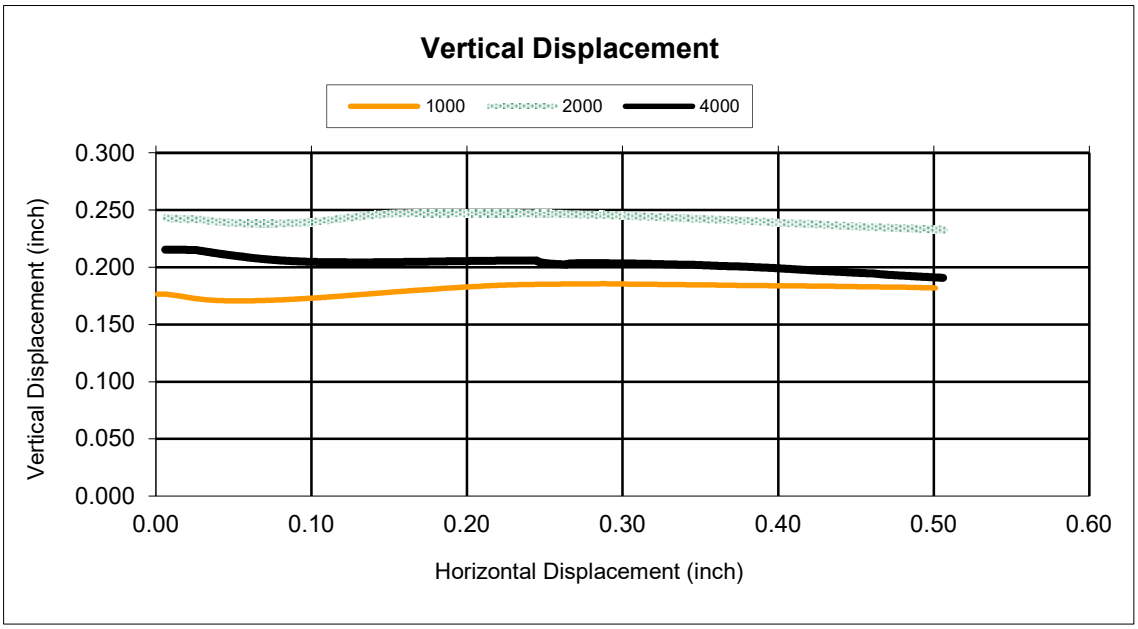
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil B-120
SAMPLE SOURCE: ACS Lab #22-1128-14 / ~~B-XXX~~ (10.0-11.5')
SAMPLE PREPARATION: Saturated - 1, 2, and 4 ksf

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1087-02
DATE ASSIGNED: 1/26/2022

NORMAL LOADS (psf): 1000 2000 4000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





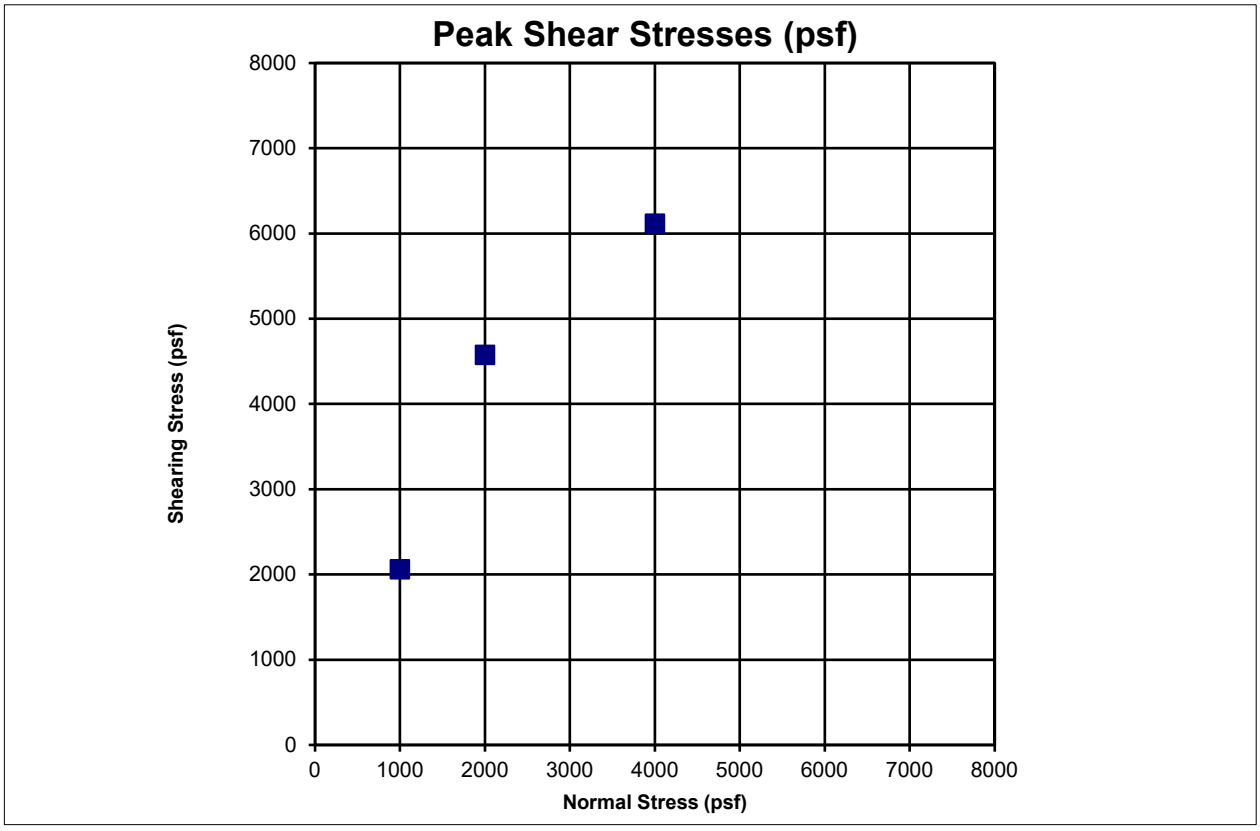
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PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native
SAMPLE SOURCE: B-124A (10.0-11.0')
SAMPLE PREPARATION: In Situ - 1, 2, and 4ksf

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1504-02
DATE ASSIGNED: 6/27/2022

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.999	0.999	0.998
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.01	0.01	0.01
Direct shear point:	1	2	3
Dry mass of specimen (g):	122.3	136.0	137.9
Initial Moisture Content:	7.5%	7.2%	7.2%
Initial Wet Density (pcf):	108.9	120.8	122.4
Initial Dry Density (pcf):	101.3	112.6	114.2
Final Moisture Content:	6.9%	6.5%	5.9%
Final Wet Density (pcf):	108.4	120.1	121.1
Final Dry Density (pcf):	101.4	112.8	114.4
Normal Stress (psf):	1000	2000	4000
Maximum Shearing Stress (psf):	2060	4577	6114
Vertical Deformation @ Max Shear (in):	0.294	0.281	0.309
Horizontal Deformation @ Max Shear (in):	0.072	0.069	0.062



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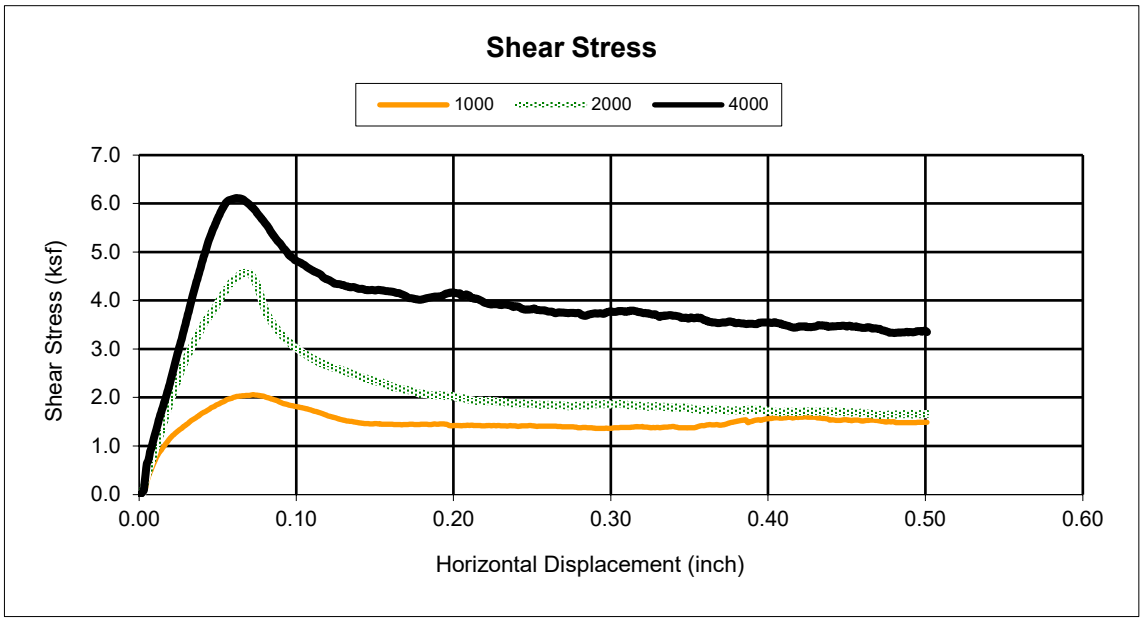
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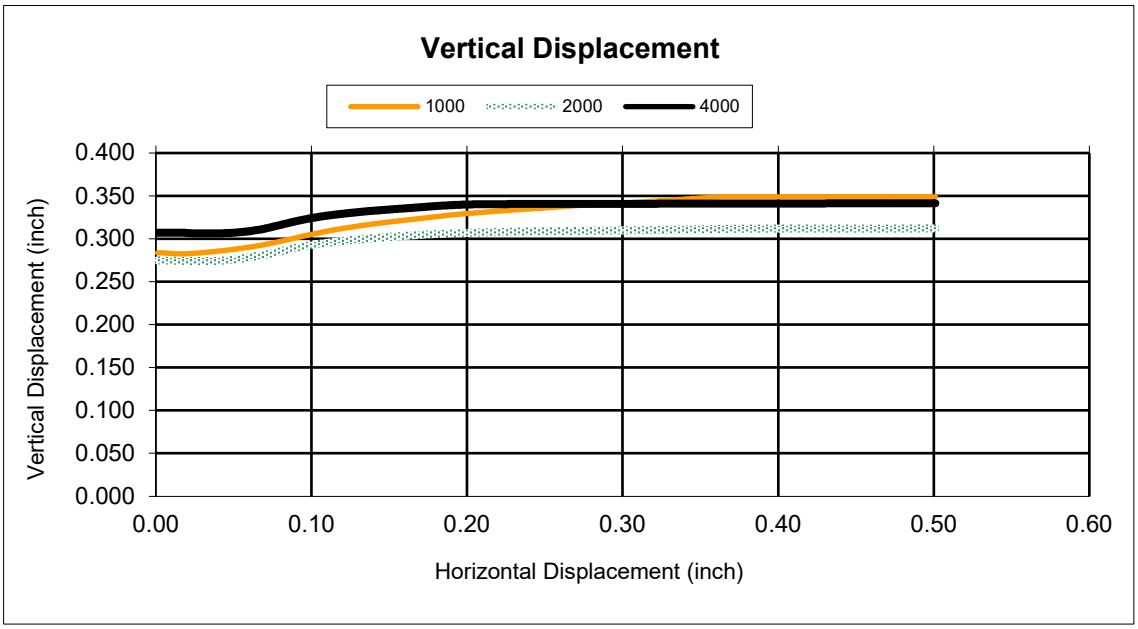
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native
SAMPLE SOURCE: B-124A (10.0-11.0')
SAMPLE PREPARATION: In Situ - 1, 2, and 4ksf

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1504-02
DATE ASSIGNED: 6/27/2022

NORMAL LOADS (psf): 1000 2000 4000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





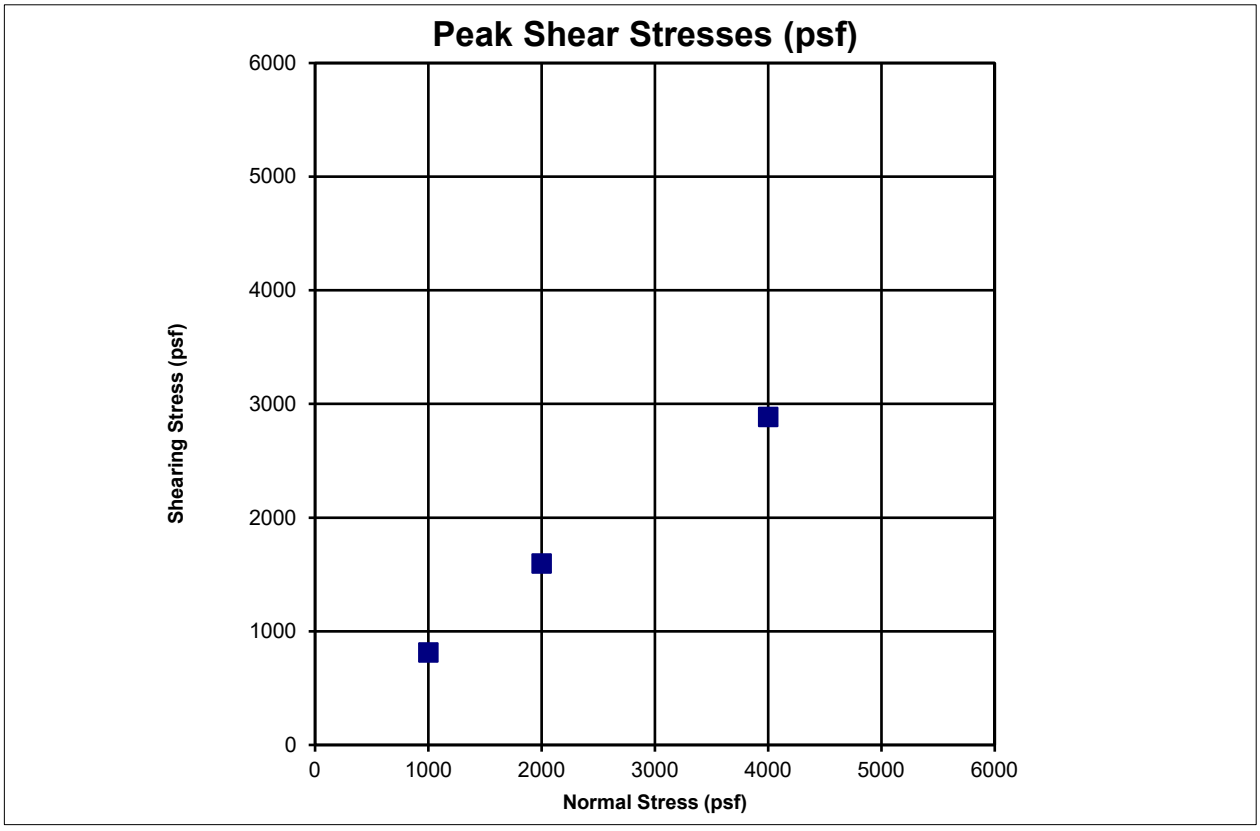
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PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native
SAMPLE SOURCE: DS-B124B (1.0-5.0')
SAMPLE PREPARATION: Saturated - 1, 2, and 4ksf

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1509-02
DATE ASSIGNED: 7/1/2022

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.997	0.995	0.985
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.01	0.01	0.01
Direct shear point:	1	2	3
Dry mass of specimen (g):	124.2	123.5	123.7
Initial Moisture Content:	14.9%	15.6%	15.5%
Initial Wet Density (pcf):	118.2	118.3	118.4
Initial Dry Density (pcf):	102.9	102.3	102.5
Final Moisture Content:	20.5%	20.3%	19.7%
Final Wet Density (pcf):	124.2	123.7	124.5
Final Dry Density (pcf):	103.1	102.8	104.0
Normal Stress (psf):	1000	2000	4000
Maximum Shearing Stress (psf):	814	1596	2885
Vertical Deformation @ Max Shear (in):	0.301	0.209	0.211
Horizontal Deformation @ Max Shear (in):	0.500	0.495	0.442



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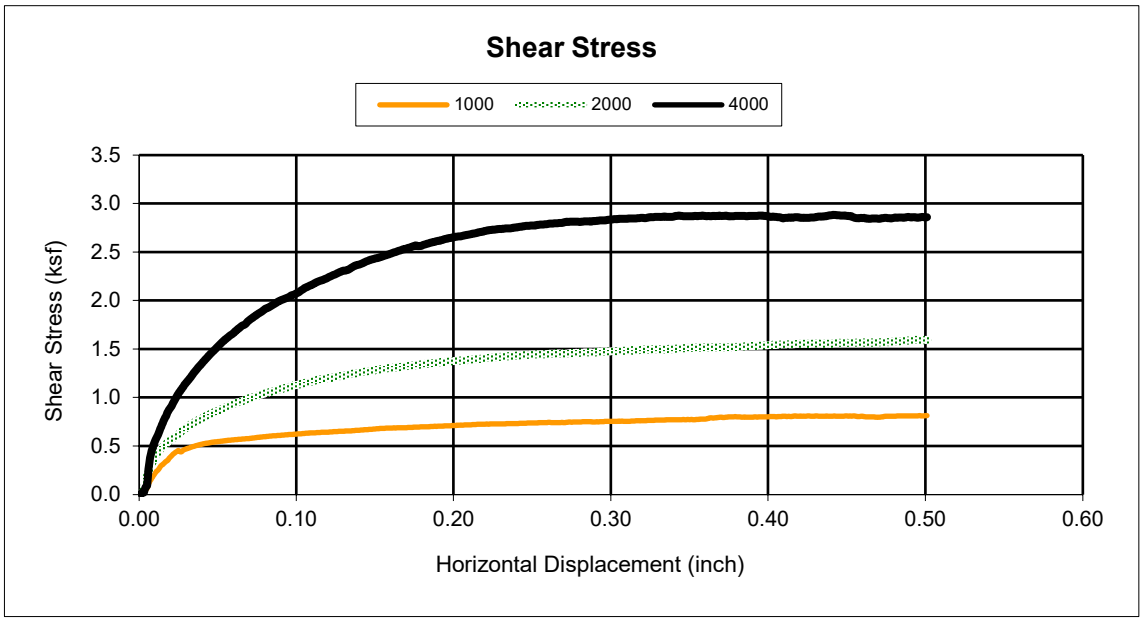
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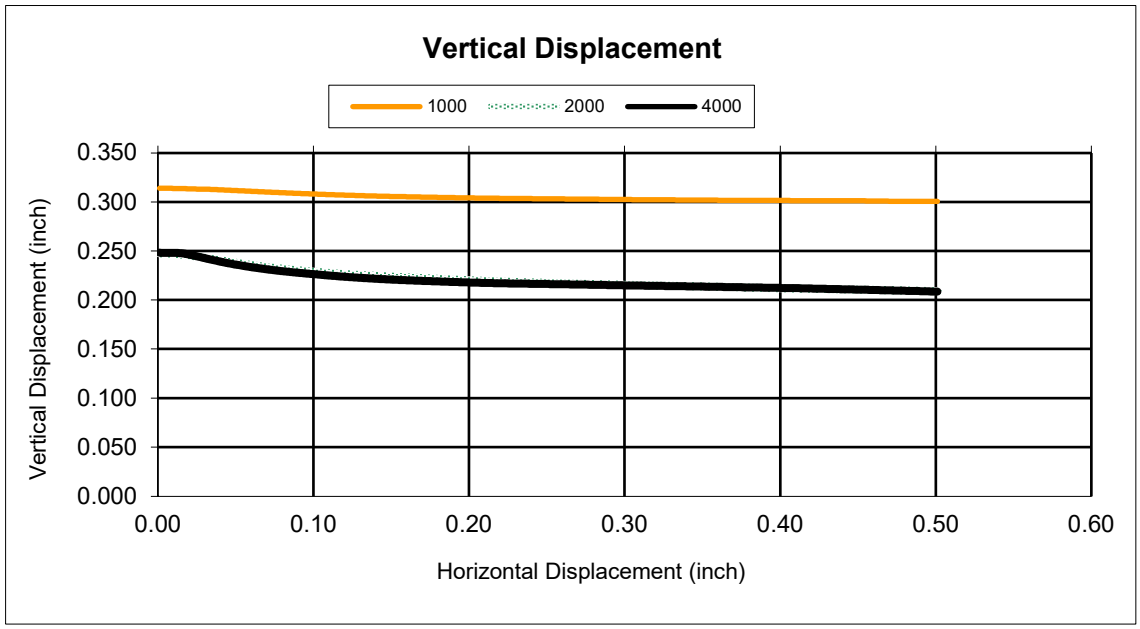
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native
SAMPLE SOURCE: DS-B124B (1.0-5.0')
SAMPLE PREPARATION: Saturated - 1, 2, and 4ksf

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1509-02
DATE ASSIGNED: 7/1/2022

NORMAL LOADS (psf): 1000 2000 4000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





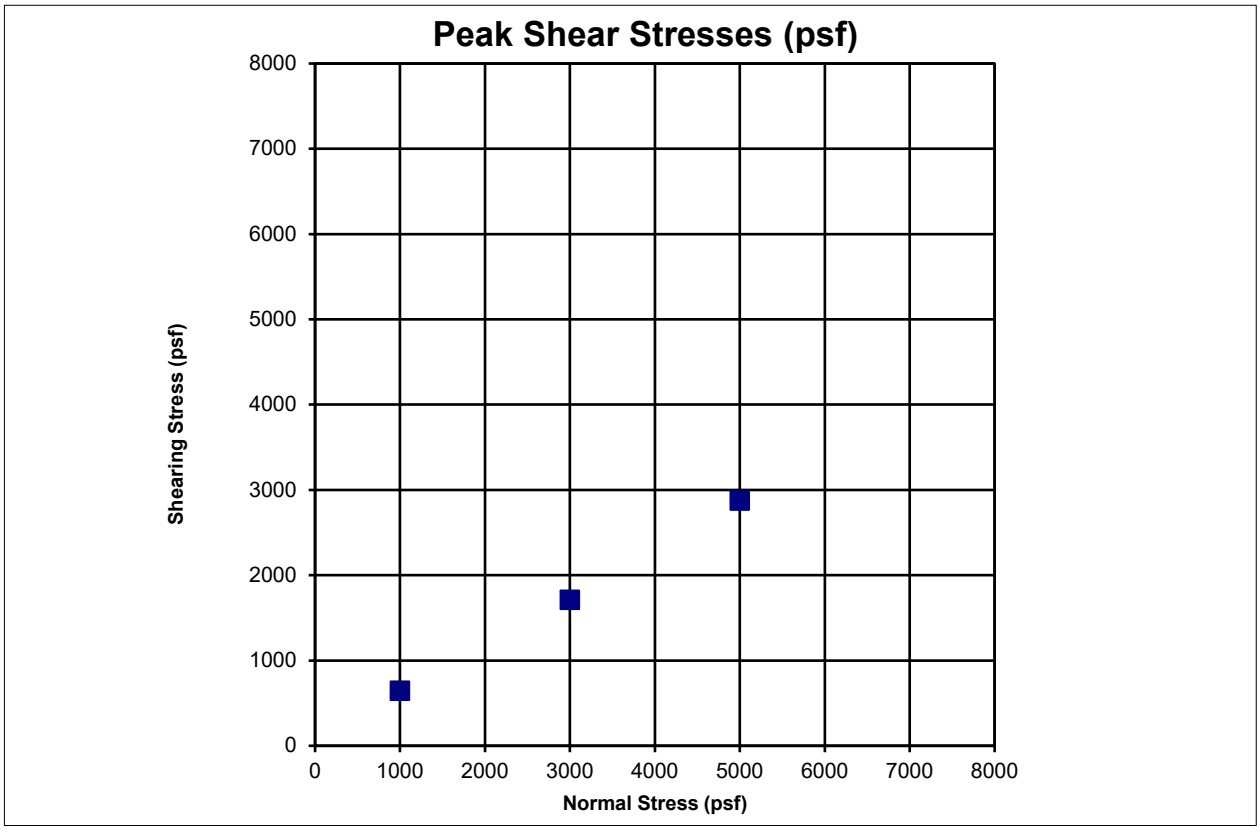
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PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-132 (10.0-11.0')
SAMPLE PREPARATION: Saturated - 1, 3, and 5 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 52
LAB NO: 24-2441-01
DATE ASSIGNED: 2/5/2024

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.990	0.987	0.984
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.005	0.005	0.005
Direct shear point:	1	2	3
Dry mass of specimen (g):	106.9	106.5	107.5
Initial Moisture Content:	20.8%	22.1%	23.0%
Initial Wet Density (pcf):	106.9	107.7	109.5
Initial Dry Density (pcf):	88.5	88.2	89.0
Final Moisture Content:	35.3%	31.4%	35.0%
Final Wet Density (pcf):	121.0	117.4	122.2
Final Dry Density (pcf):	89.5	89.4	90.5
Normal Stress (psf):	1000	3000	5000
Maximum Shearing Stress (psf):	645	1713	2876
Vertical Deformation @ Max Shear (in):	0.305	0.257	0.316
Horizontal Deformation @ Max Shear (in):	0.295	0.317	0.225



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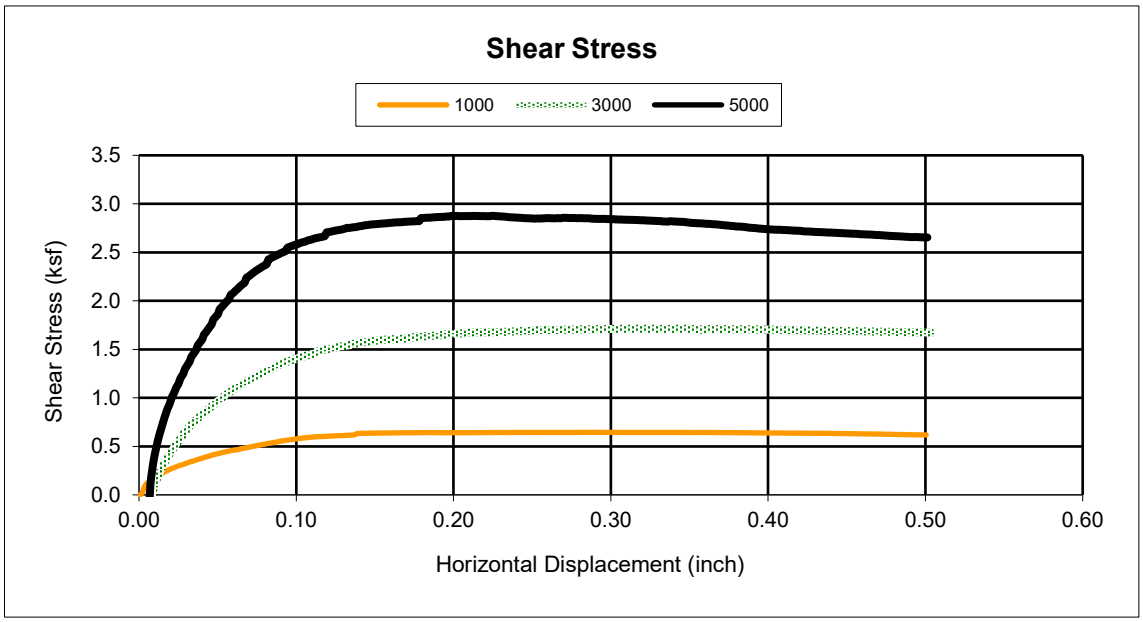
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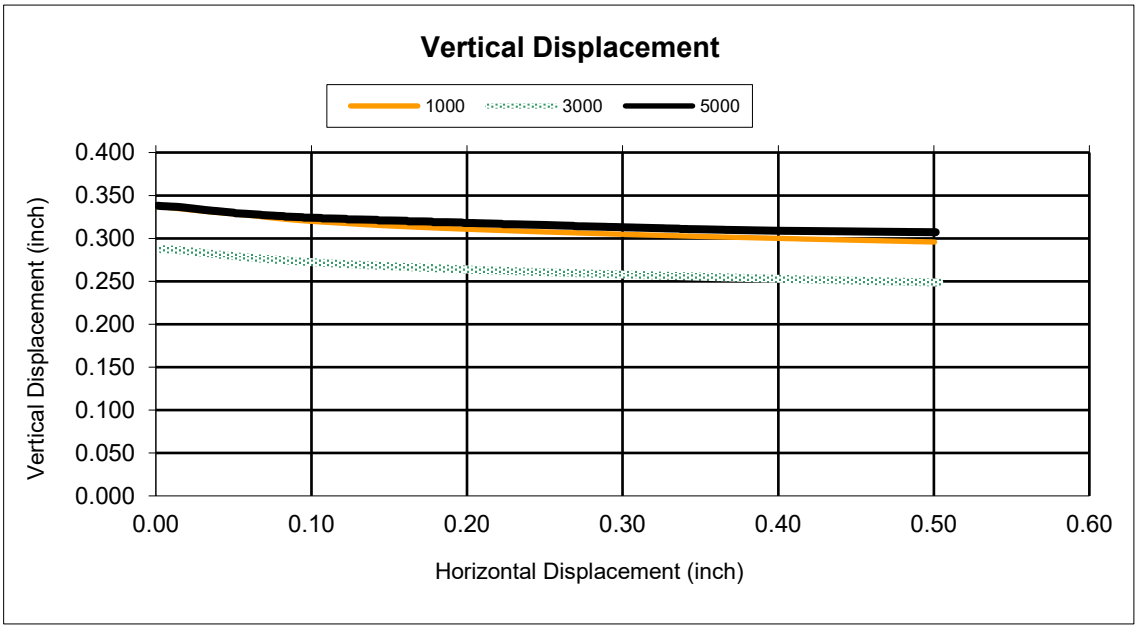
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-132 (10.0-11.0')
SAMPLE PREPARATION: Saturated - 1, 3, and 5 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 52
LAB NO: 24-2441-01
DATE ASSIGNED: 2/5/2024

NORMAL LOADS (psf): 1000 3000 5000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





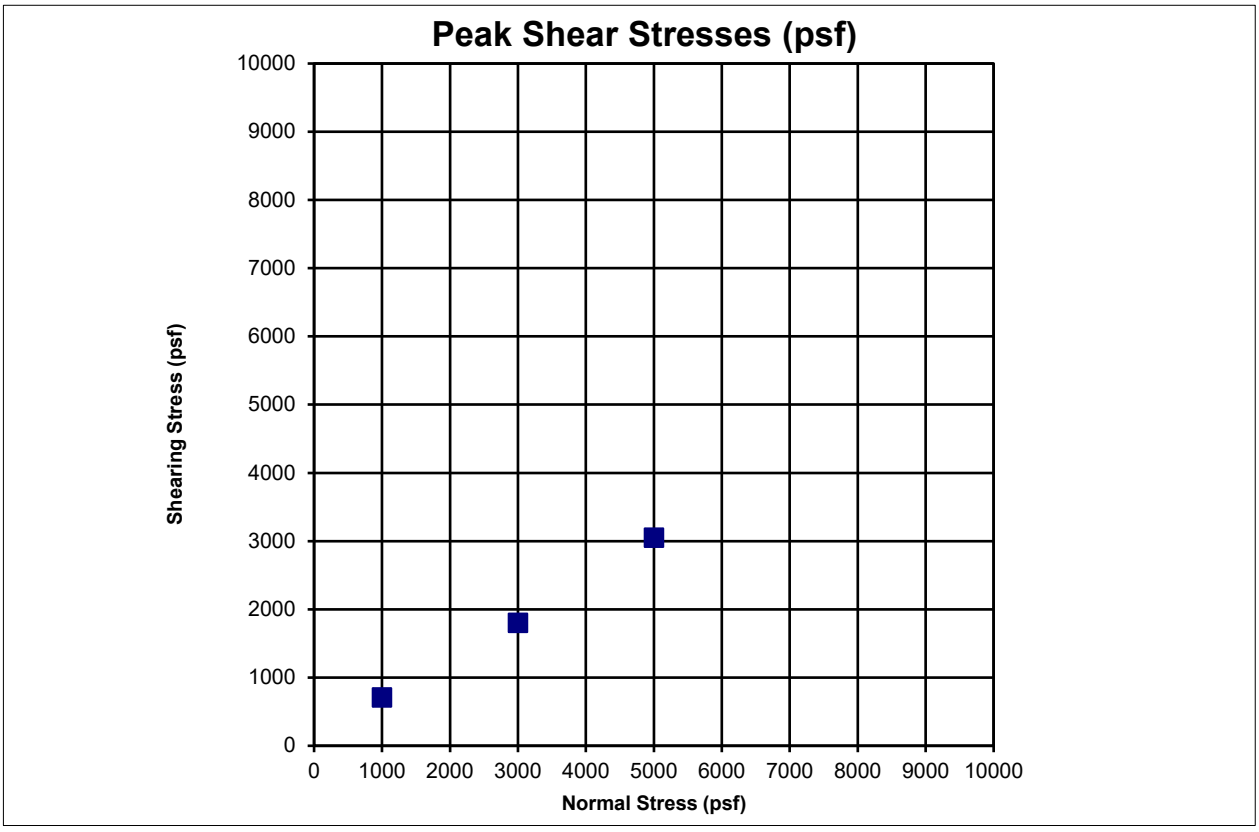
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PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-133 (10.0-11.0')
SAMPLE PREPARATION: Saturated - 1, 3, and 5 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 52
LAB NO: 24-2441-03
DATE ASSIGNED: 2/5/2024

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	1.000	1.000	0.978
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.005	0.005	0.005
Direct shear point:	1	2	3
Dry mass of specimen (g):	104.1	103.1	109.7
Initial Moisture Content:	13.7%	15.4%	16.7%
Initial Wet Density (pcf):	98.1	98.6	106.0
Initial Dry Density (pcf):	86.2	85.4	90.9
Final Moisture Content:	32.2%	31.8%	26.3%
Final Wet Density (pcf):	114.0	112.6	117.4
Final Dry Density (pcf):	86.2	85.4	92.9
Normal Stress (psf):	1000	3000	5000
Maximum Shearing Stress (psf):	707	1804	3051
Vertical Deformation @ Max Shear (in):	0.324	0.239	0.215
Horizontal Deformation @ Max Shear (in):	0.169	0.500	0.381



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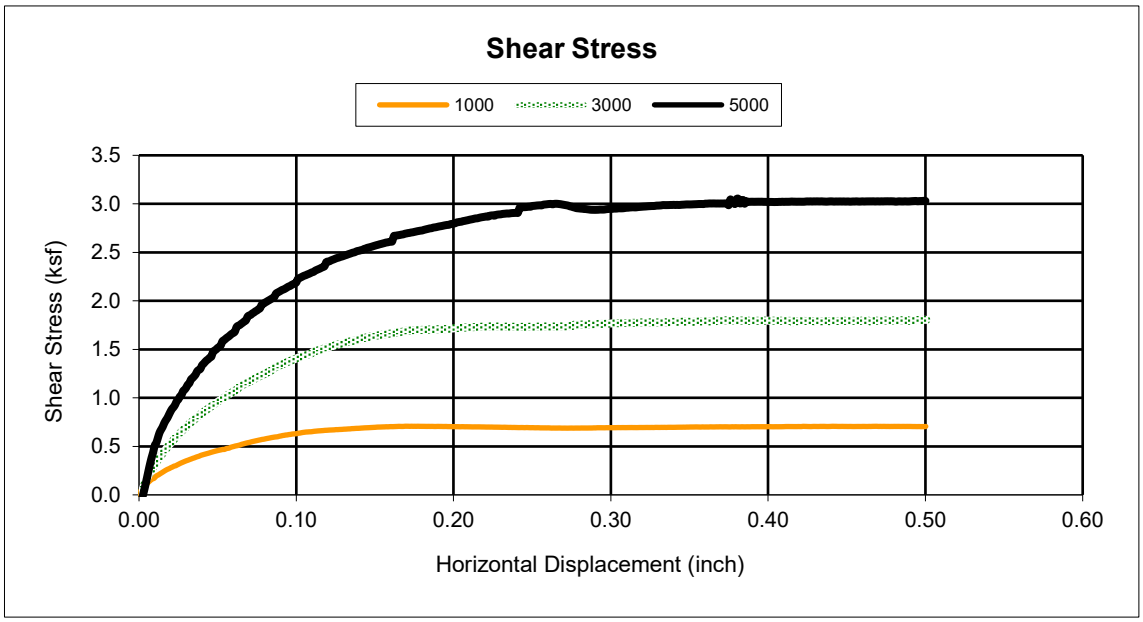
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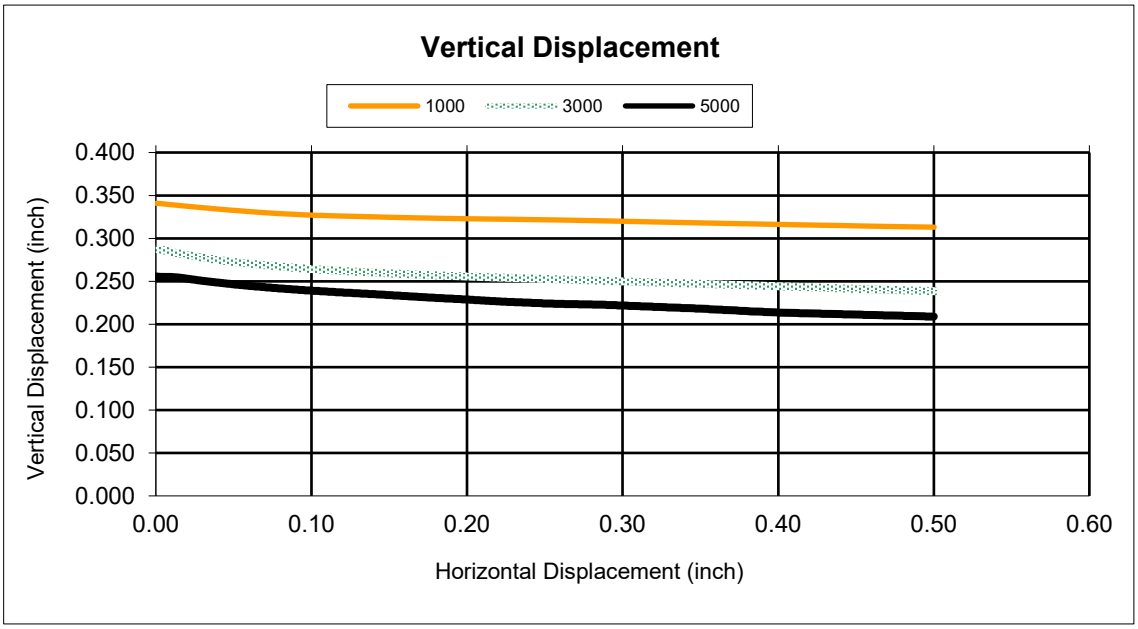
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-133 (10.0-11.0')
SAMPLE PREPARATION: Saturated - 1, 3, and 5 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 52
LAB NO: 24-2441-03
DATE ASSIGNED: 2/5/2024

NORMAL LOADS (psf): 1000 3000 5000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





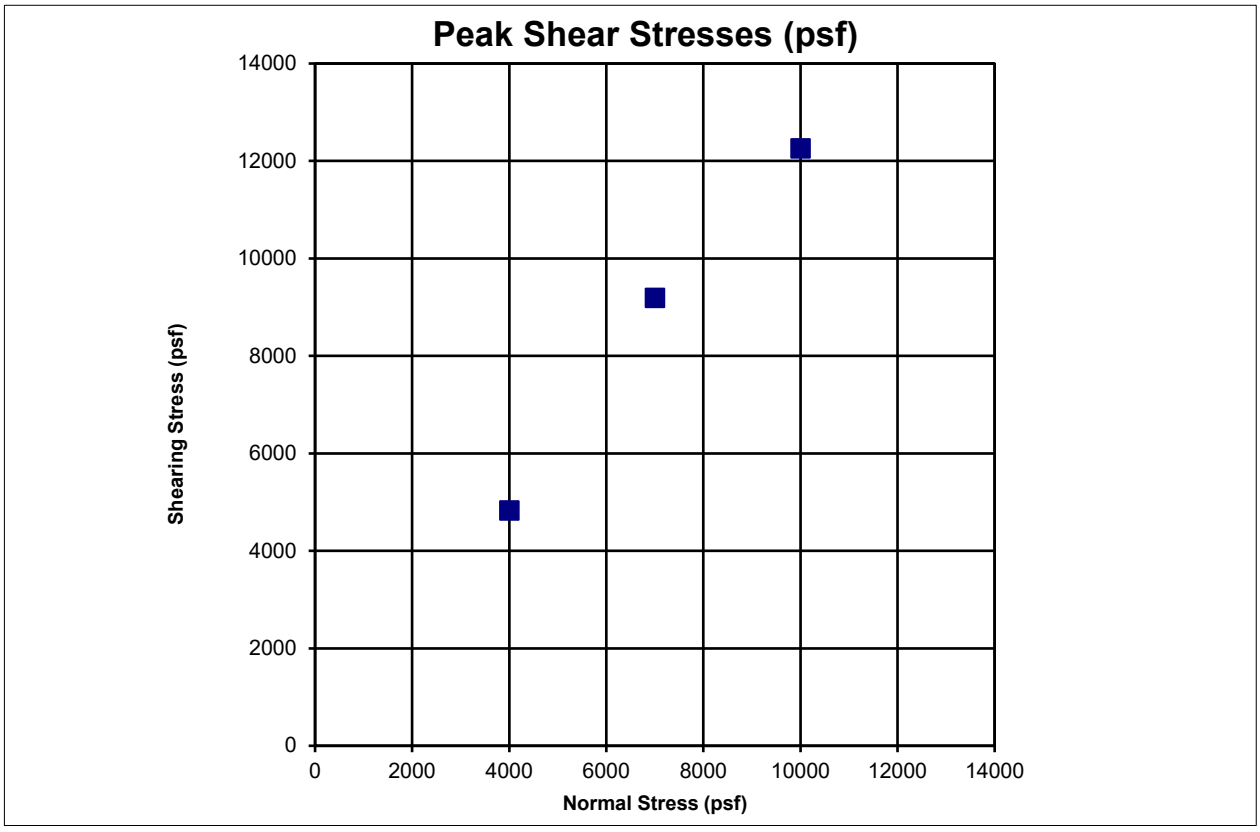
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PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-134 (40.0-41.0')
SAMPLE PREPARATION: Saturated - 4, 7, and 10 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 52
LAB NO: 24-2441-02
DATE ASSIGNED: 2/5/2024

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.996	0.996	0.995
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.005	0.005	0.005
Direct shear point:	1	2	3
Dry mass of specimen (g):	122.6	129.1	136.2
Initial Moisture Content:	9.8%	10.1%	10.0%
Initial Wet Density (pcf):	111.5	117.7	124.1
Initial Dry Density (pcf):	101.5	106.9	112.8
Final Moisture Content:	18.1%	14.4%	14.2%
Final Wet Density (pcf):	120.4	122.8	129.5
Final Dry Density (pcf):	102.0	107.3	113.4
Normal Stress (psf):	4000	7000	10000
Maximum Shearing Stress (psf):	4828	9194	12258
Vertical Deformation @ Max Shear (in):	0.325	0.327	0.386
Horizontal Deformation @ Max Shear (in):	0.501	0.328	0.493



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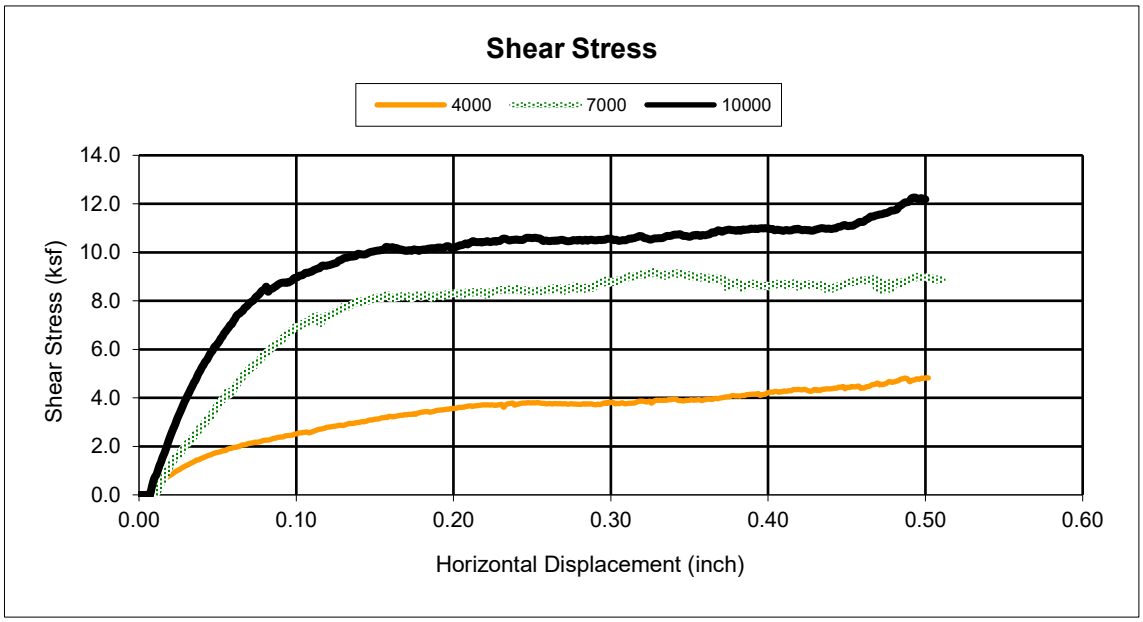
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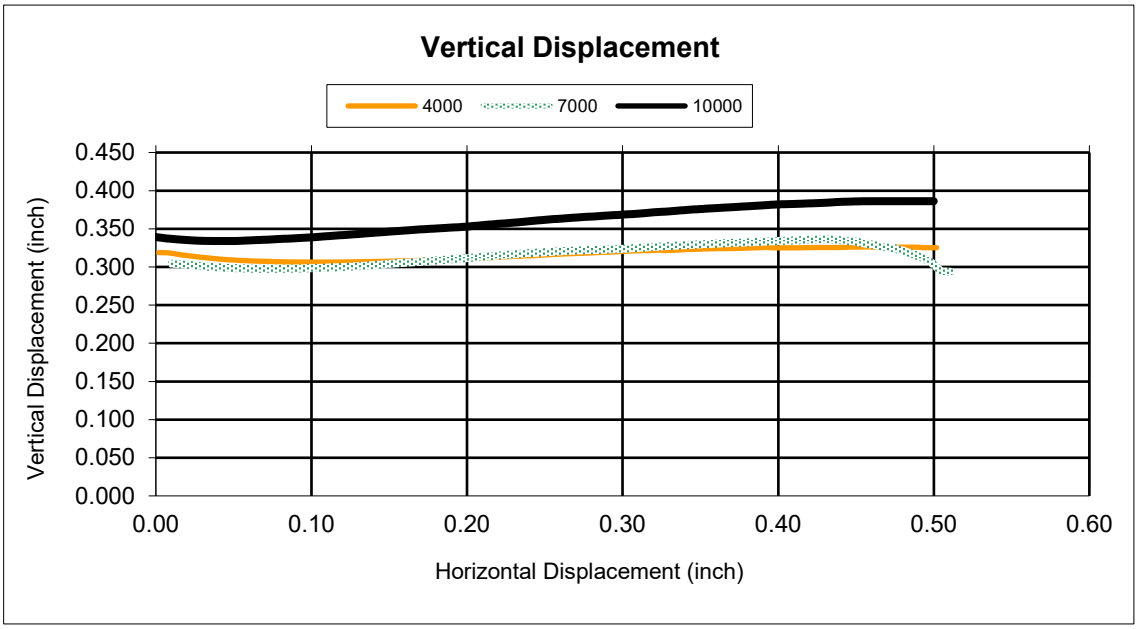
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-134 (40.0-41.0')
SAMPLE PREPARATION: Saturated - 4, 7, and 10 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 52
LAB NO: 24-2441-02
DATE ASSIGNED: 2/5/2024

NORMAL LOADS (psf): 4000 7000 10000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





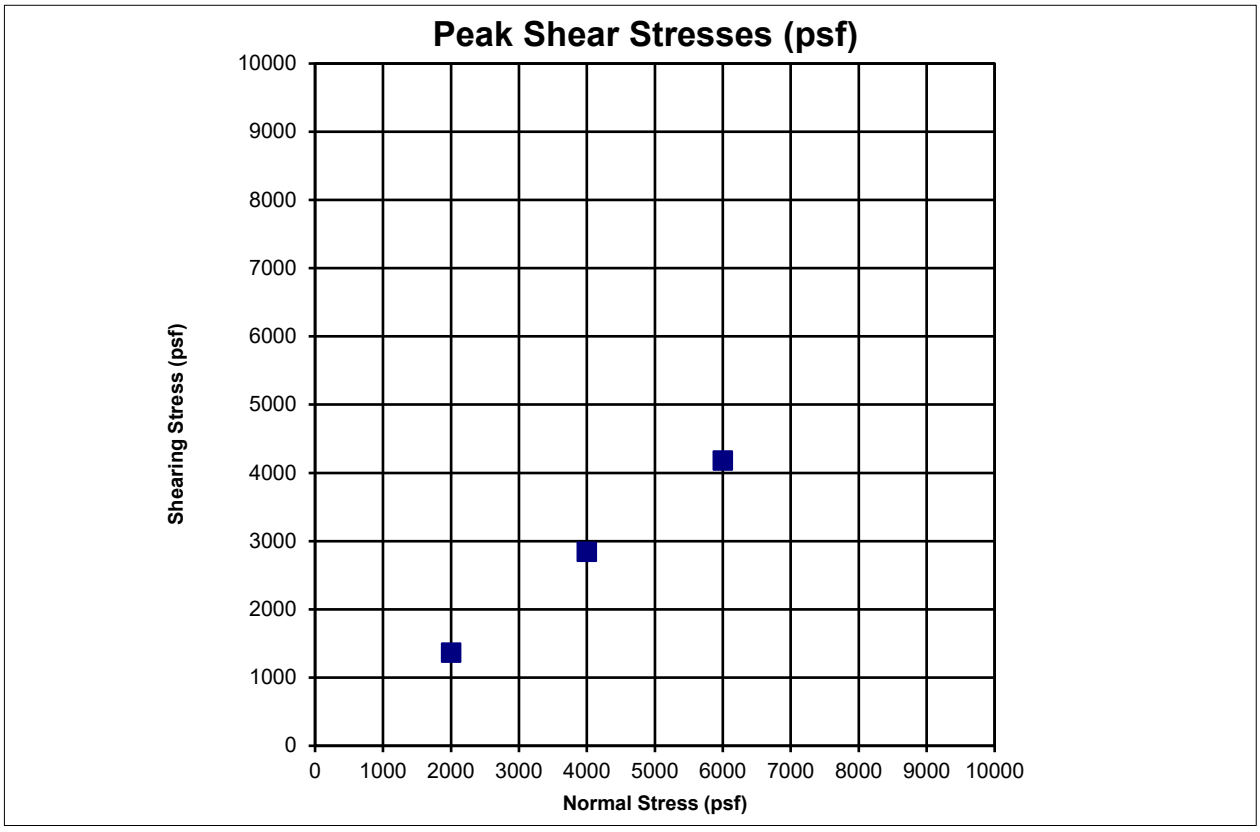
WSP USA
3630 E Wier Ave.
Phoenix, AZ 85040

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-135 (20.0-21.0')
SAMPLE PREPARATION: Saturated - 2, 4, and 6 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 52
LAB NO: 24-2441-04
DATE ASSIGNED: 2/5/2024

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.992	0.994	0.996
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.005	0.005	0.005
Direct shear point:	1	2	3
Dry mass of specimen (g):	108.0	112.4	112.8
Initial Moisture Content:	6.9%	3.1%	3.5%
Initial Wet Density (pcf):	95.7	96.0	96.7
Initial Dry Density (pcf):	89.5	93.1	93.4
Final Moisture Content:	28.3%	24.6%	22.2%
Final Wet Density (pcf):	115.7	116.7	114.6
Final Dry Density (pcf):	90.2	93.6	93.8
Normal Stress (psf):	2000	4000	6000
Maximum Shearing Stress (psf):	1365	2846	4183
Vertical Deformation @ Max Shear (in):	0.310	0.257	0.318
Horizontal Deformation @ Max Shear (in):	0.479	0.484	0.145



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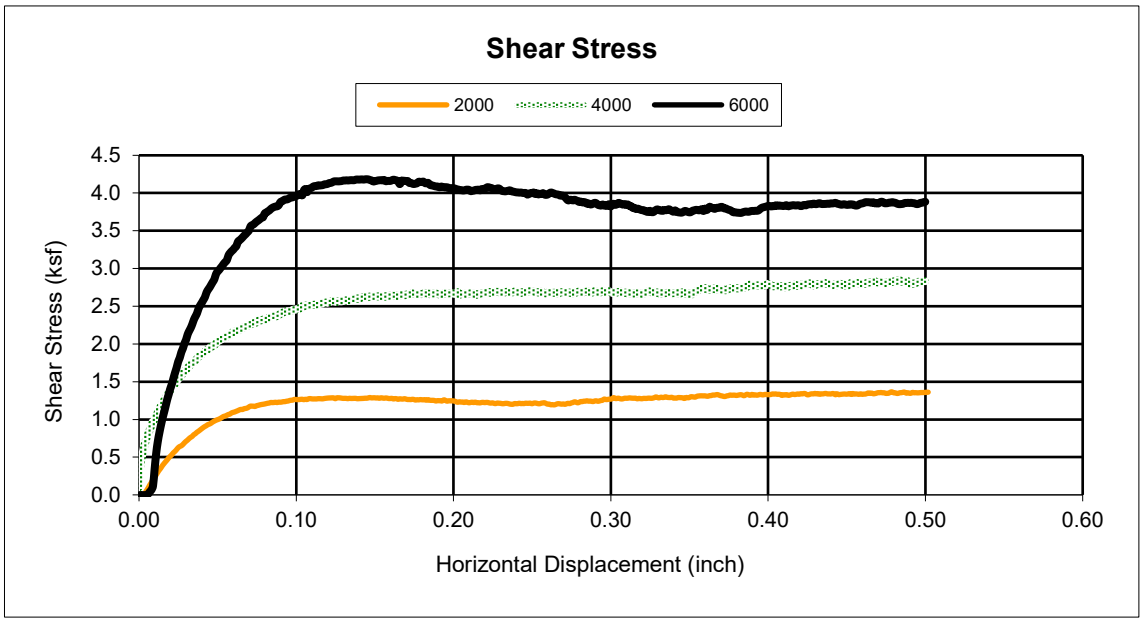
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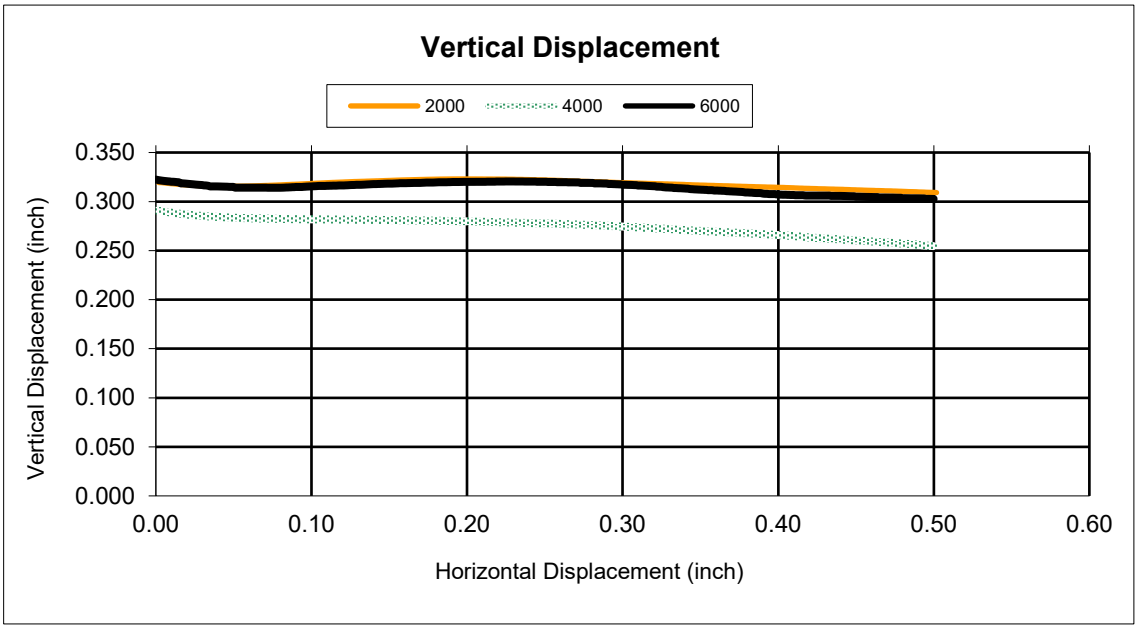
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-135 (20.0-21.0')
SAMPLE PREPARATION: Saturated - 2, 4, and 6 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 52
LAB NO: 24-2441-04
DATE ASSIGNED: 2/5/2024

NORMAL LOADS (psf): 2000 4000 6000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





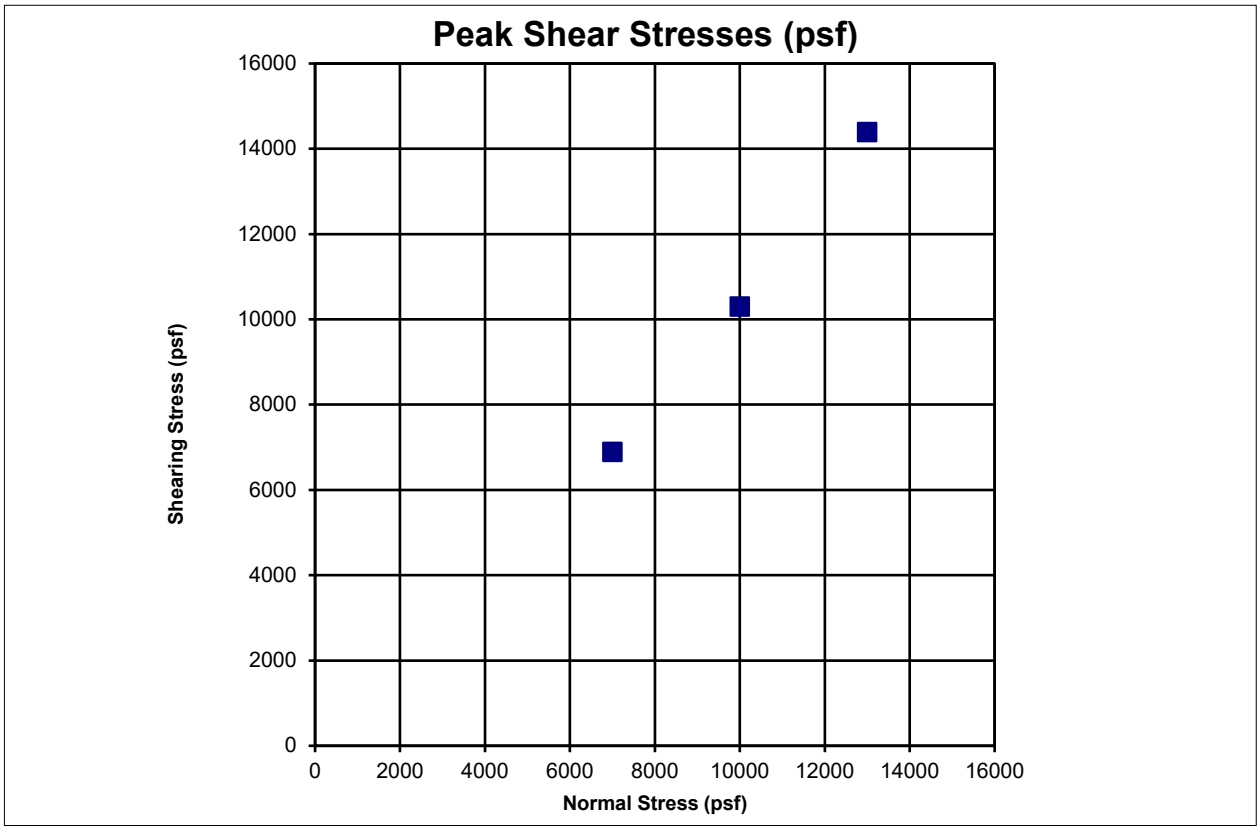
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PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-136 (65.0-66.0')
SAMPLE PREPARATION: Saturated - 7, 10, and 13 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 52
LAB NO: 24-2441-05
DATE ASSIGNED: 2/5/2024

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.998	0.998	0.998
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.005	0.005	0.005
Direct shear point:	1	2	3
Dry mass of specimen (g):	130.8	132.5	142.2
Initial Moisture Content:	8.1%	10.6%	12.4%
Initial Wet Density (pcf):	117.1	121.3	132.4
Initial Dry Density (pcf):	108.3	109.7	117.8
Final Moisture Content:	16.4%	16.7%	19.5%
Final Wet Density (pcf):	126.4	128.4	141.1
Final Dry Density (pcf):	108.5	110.0	118.1
Normal Stress (psf):	7000	10000	13000
Maximum Shearing Stress (psf):	6891	10301	14390
Vertical Deformation @ Max Shear (in):	0.362	0.357	0.385
Horizontal Deformation @ Max Shear (in):	0.218	0.385	0.171



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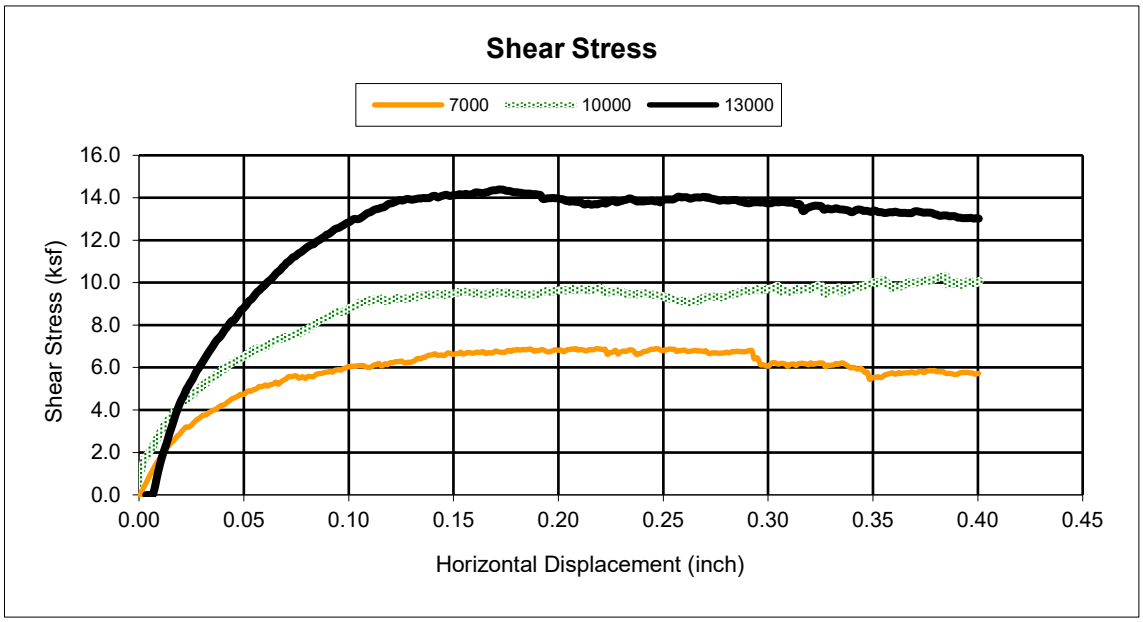
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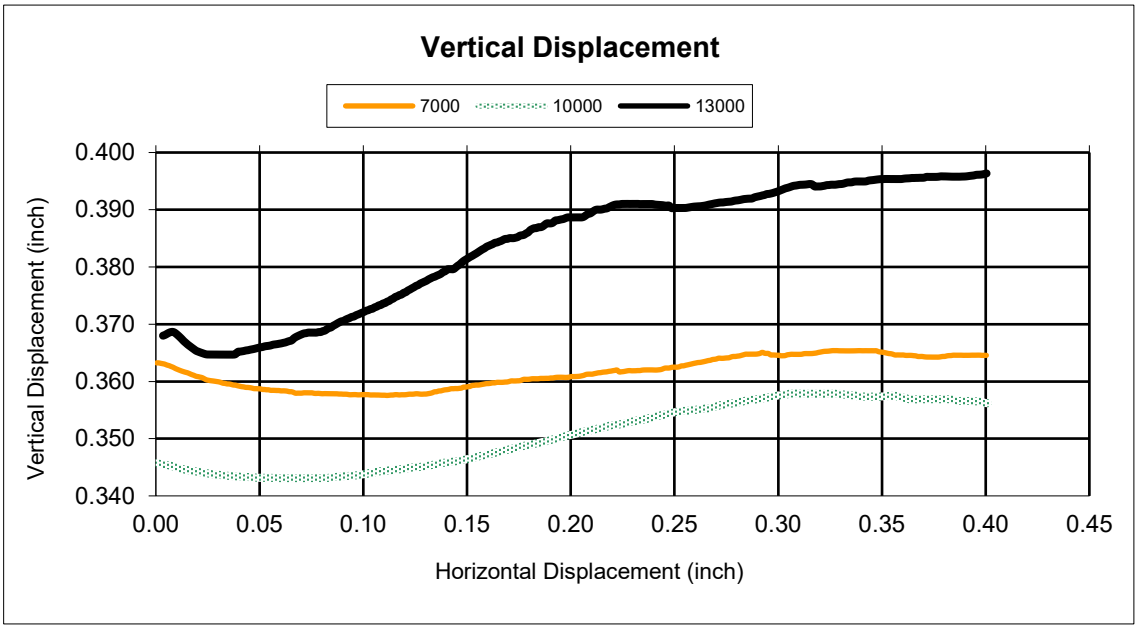
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-136 (65.0-66.0')
SAMPLE PREPARATION: Saturated - 7, 10, and 13 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 52
LAB NO: 24-2441-05
DATE ASSIGNED: 2/5/2024

NORMAL LOADS (psf): 7000 10000 13000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





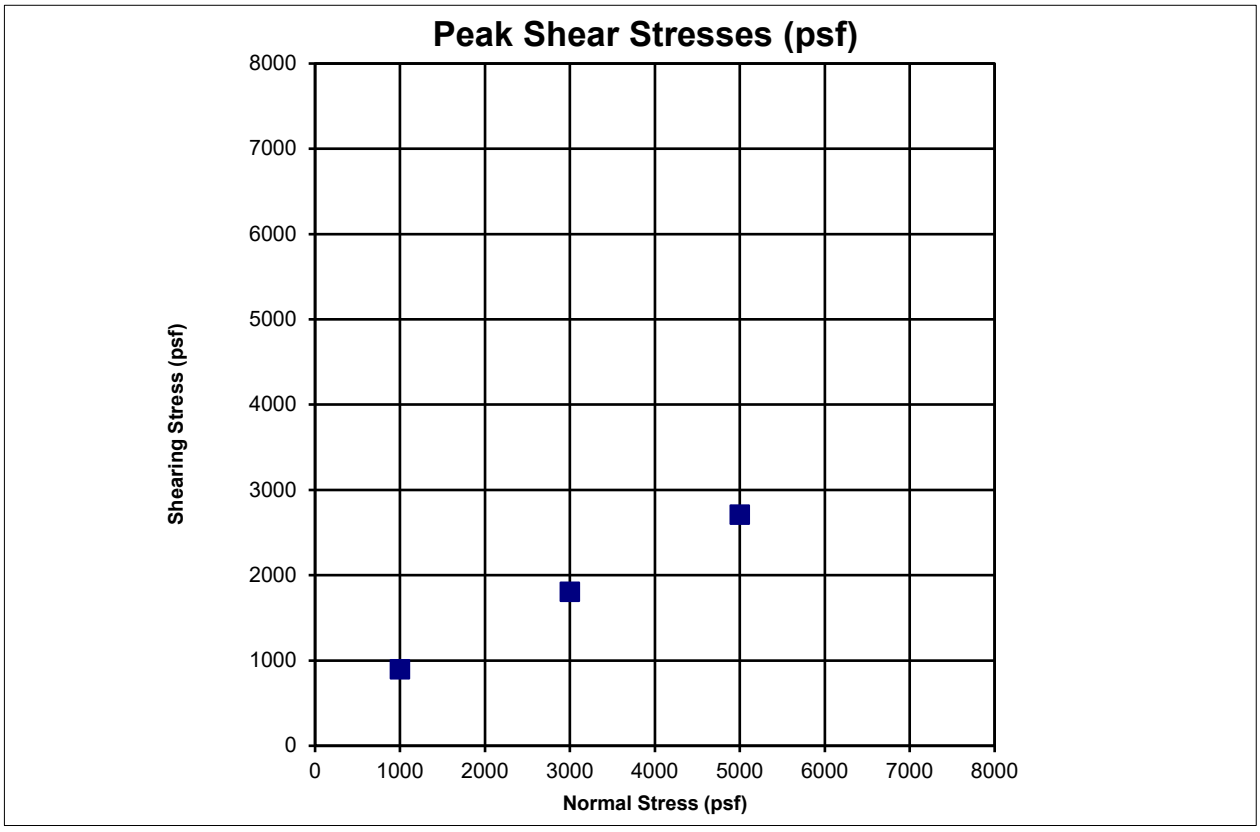
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PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-137 (10.0-11.0')
SAMPLE PREPARATION: Saturated - 1, 3, and 5 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 56
LAB NO: 24-2492-02
DATE ASSIGNED: 2/19/2024

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.992	0.988	0.988
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.001	0.001	0.001
Direct shear point:	1	2	3
Dry mass of specimen (g):	96.6	99.5	104.1
Initial Moisture Content:	22.0%	22.1%	23.6%
Initial Wet Density (pcf):	97.7	100.6	106.6
Initial Dry Density (pcf):	80.0	82.4	86.2
Final Moisture Content:	40.0%	36.4%	35.0%
Final Wet Density (pcf):	112.9	113.8	117.8
Final Dry Density (pcf):	80.7	83.4	87.3
Normal Stress (psf):	1000	3000	5000
Maximum Shearing Stress (psf):	896	1807	2711
Vertical Deformation @ Max Shear (in):	0.362	0.229	0.186
Horizontal Deformation @ Max Shear (in):	0.115	0.500	0.491



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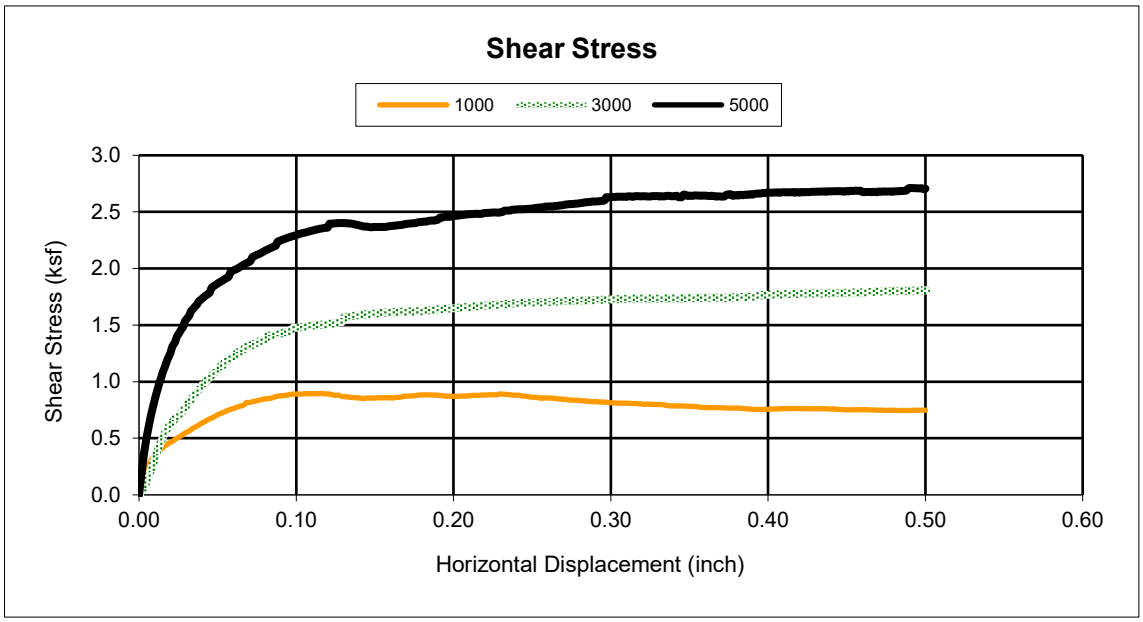
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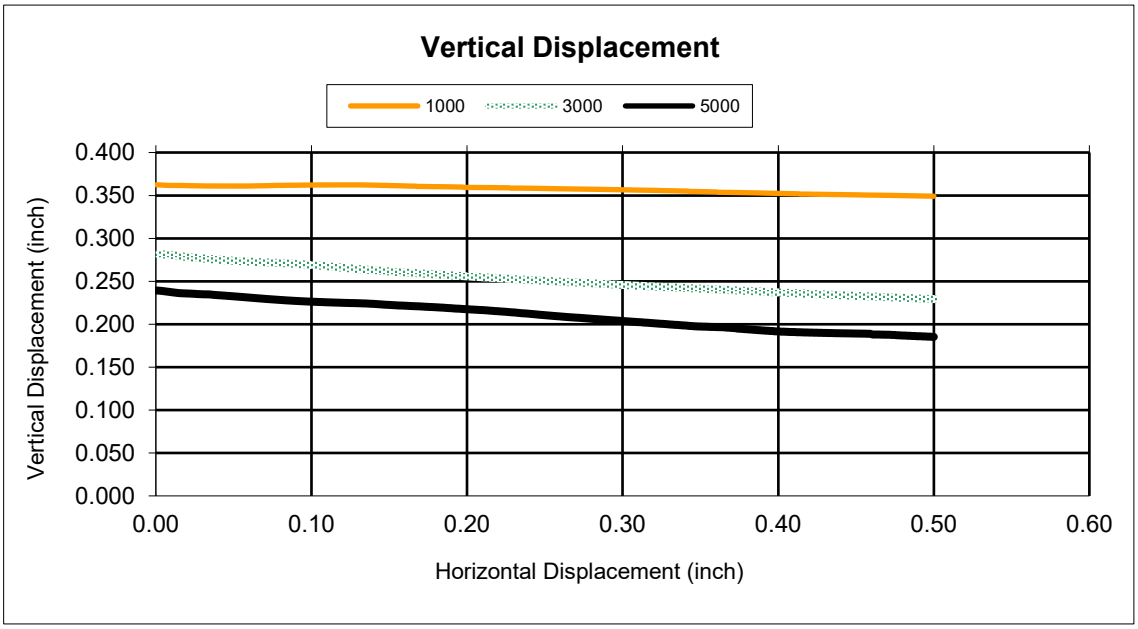
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-137 (10.0-11.0')
SAMPLE PREPARATION: Saturated - 1, 3, and 5 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 56
LAB NO: 24-2492-02
DATE ASSIGNED: 2/19/2024

NORMAL LOADS (psf): 1000 3000 5000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





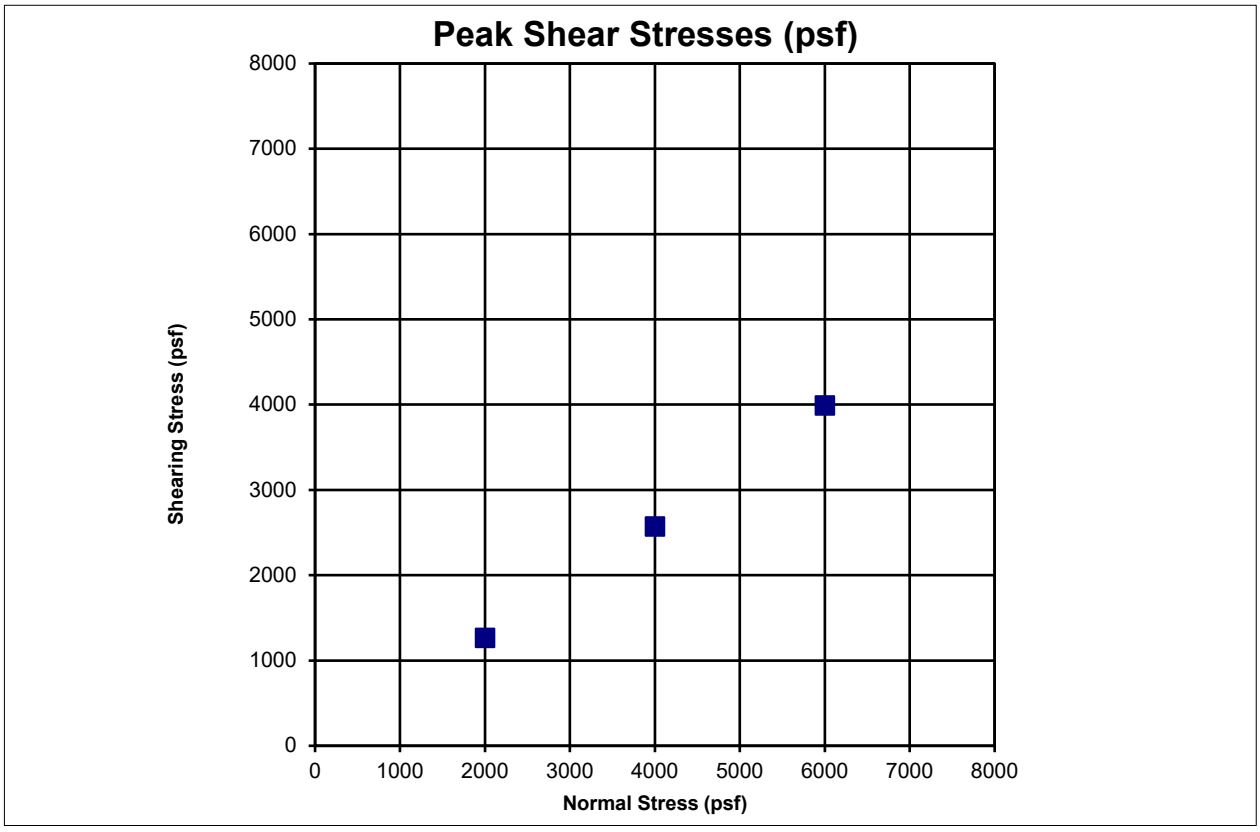
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PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-138 (15.0-16.0')
SAMPLE PREPARATION: Saturated - 2, 4, and 6 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 56
LAB NO: 24-2492-03
DATE ASSIGNED: 2/19/2024

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.992	0.987	0.987
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.001	0.001	0.001
Direct shear point:	1	2	3
Dry mass of specimen (g):	112.2	111.8	112.4
Initial Moisture Content:	8.6%	9.5%	10.2%
Initial Wet Density (pcf):	101.0	101.4	102.6
Initial Dry Density (pcf):	92.9	92.6	93.1
Final Moisture Content:	27.1%	26.3%	25.4%
Final Wet Density (pcf):	119.1	118.4	118.3
Final Dry Density (pcf):	93.7	93.8	94.3
Normal Stress (psf):	2000	4000	6000
Maximum Shearing Stress (psf):	1264	2572	3991
Vertical Deformation @ Max Shear (in):	0.351	0.291	0.305
Horizontal Deformation @ Max Shear (in):	0.081	0.171	0.142



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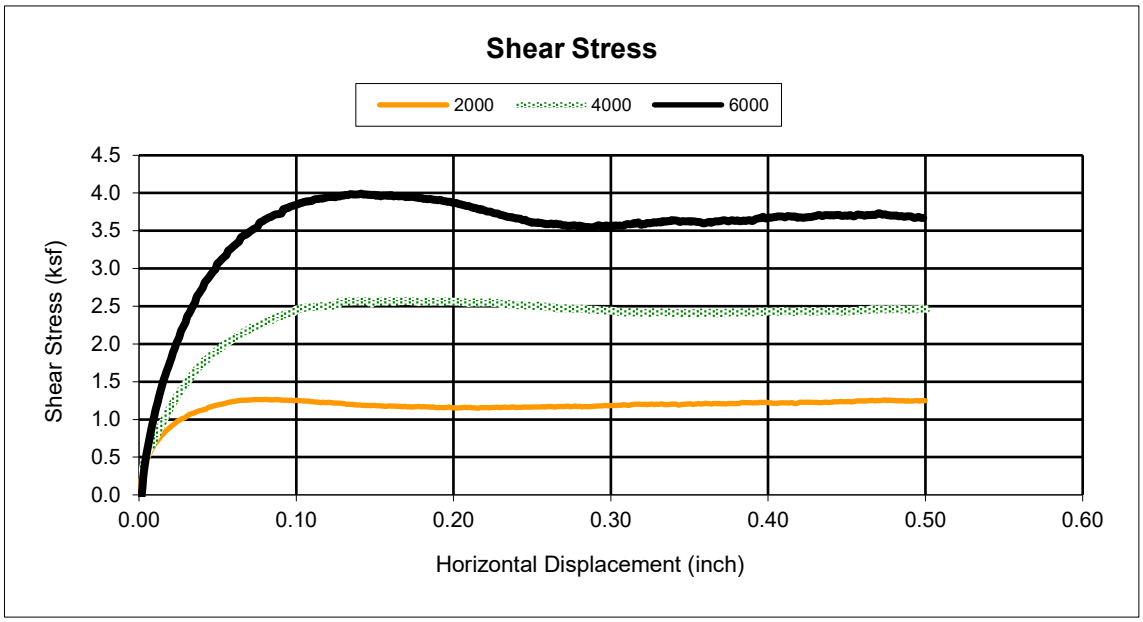
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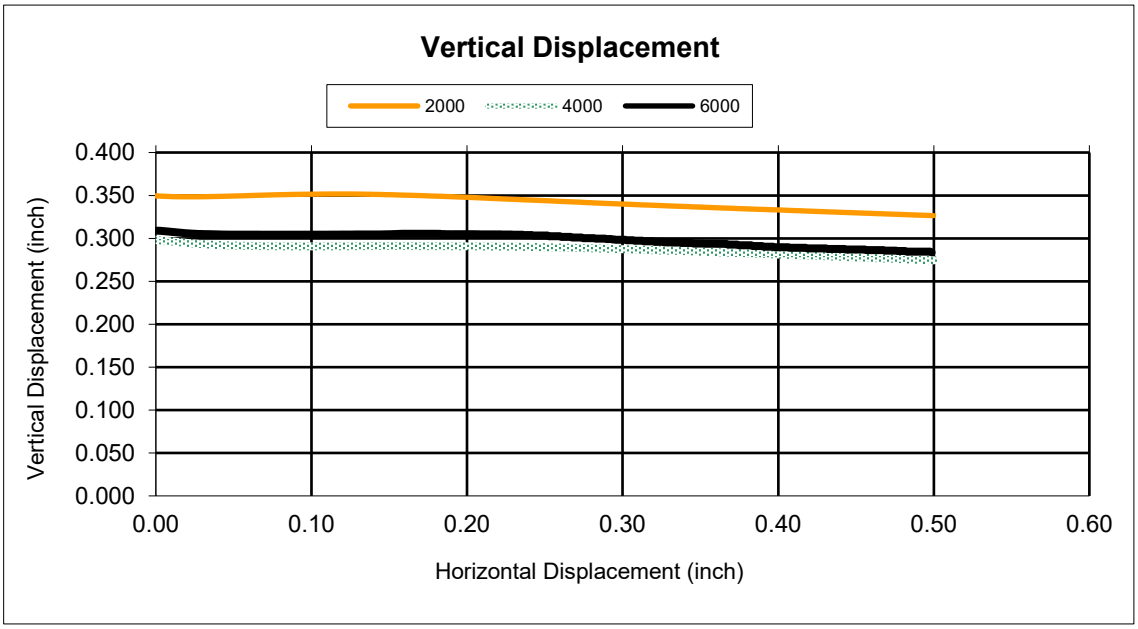
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-138 (15.0-16.0')
SAMPLE PREPARATION: Saturated - 2, 4, and 6 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 56
LAB NO: 24-2492-03
DATE ASSIGNED: 2/19/2024

NORMAL LOADS (psf): 2000 4000 6000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





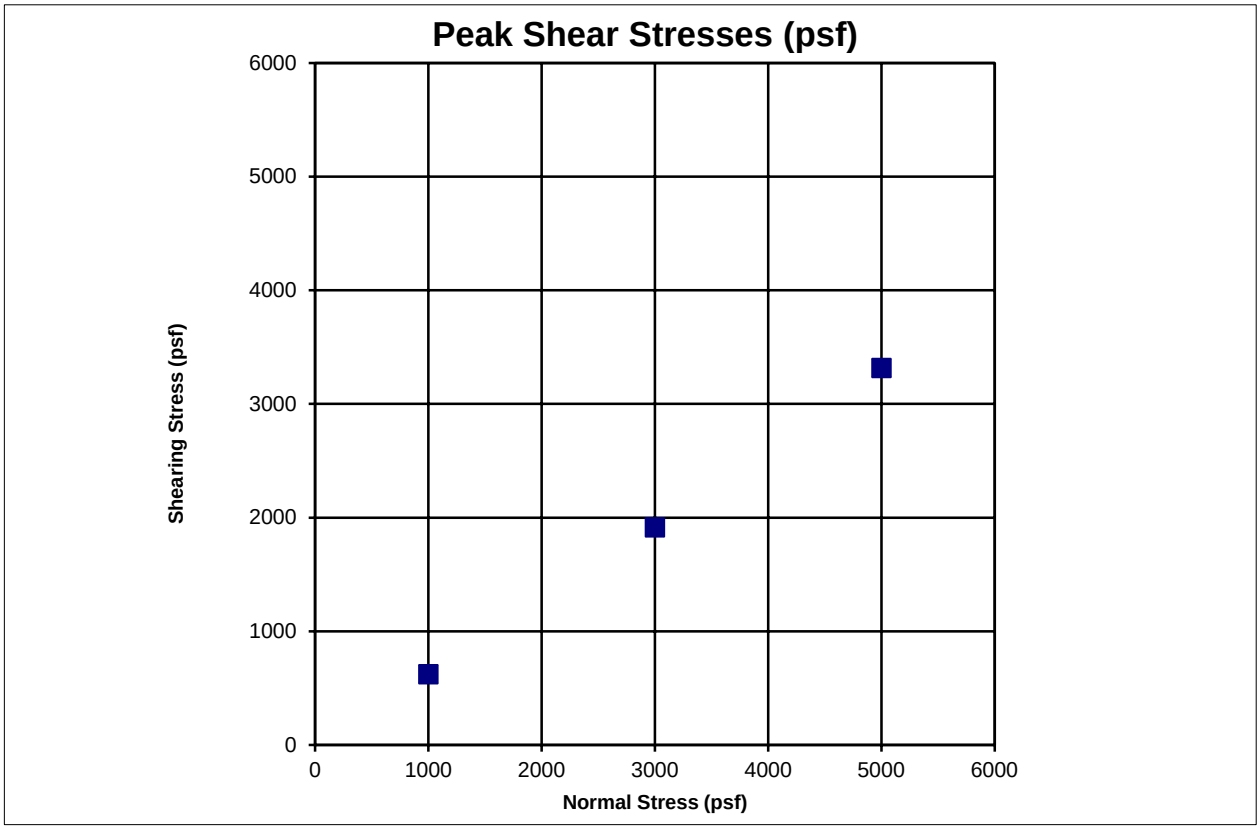
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Phoenix, AZ 85040

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-139 (5.0-6.0') **SAMPLE**
PREPARATION: Saturated - 1, 3, and 5 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 78
LAB NO: 24-3226-01
DATE ASSIGNED: 7/12/2024

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.998	0.990	0.985
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.001	0.001	0.001
Direct shear point:	1	2	3
Dry mass of specimen (g):	105.0	105.7	115.2
Initial Moisture Content:	22.3%	28.9%	22.2%
Initial Wet Density (pcf):	106.3	112.8	116.6
Initial Dry Density (pcf):	87.0	87.5	95.4
Final Moisture Content:	35.5%	36.1%	30.7%
Final Wet Density (pcf):	118.1	120.4	126.6
Final Dry Density (pcf):	87.1	88.5	96.8
Normal Stress (psf):	1000	3000	5000
Maximum Shearing Stress (psf):	622	1915	3318
Vertical Deformation @ Max Shear (in):	0.161	0.171	0.140
Horizontal Deformation @ Max Shear (in):	0.381	0.151	0.369



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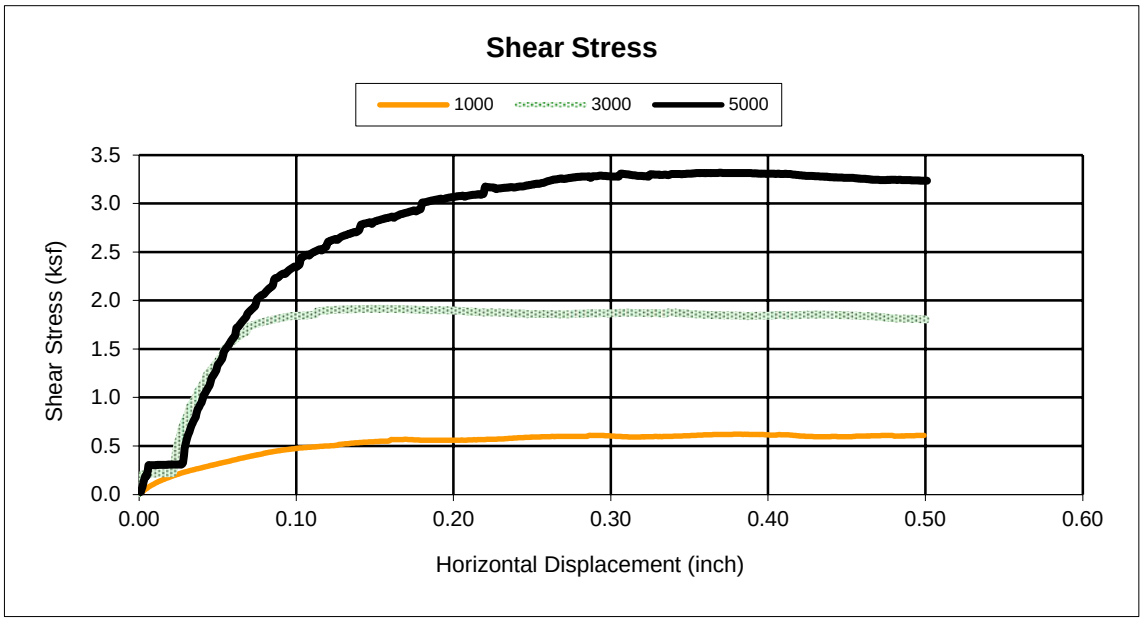
REVIEWED BY 07/26/24

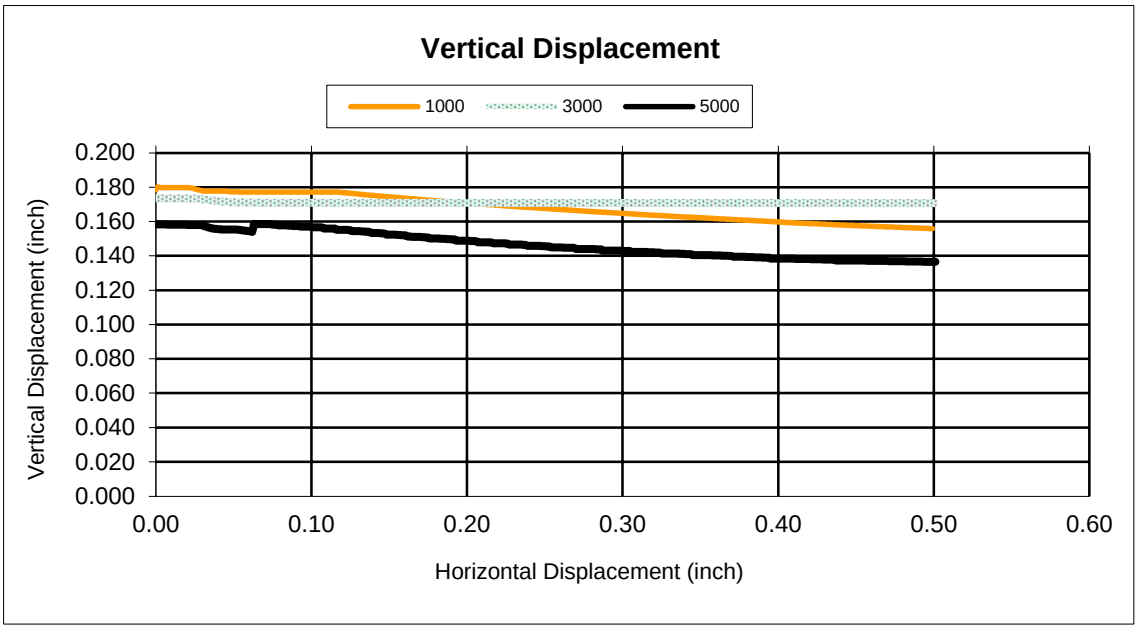
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-139 (5.0-6.0')
SAMPLE PREPARATION: Saturated - 1, 3, and 5 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 78
LAB NO: 24-3226-01
DATE ASSIGNED: 7/12/2024

NORMAL LOADS (psf): 1000 3000 5000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





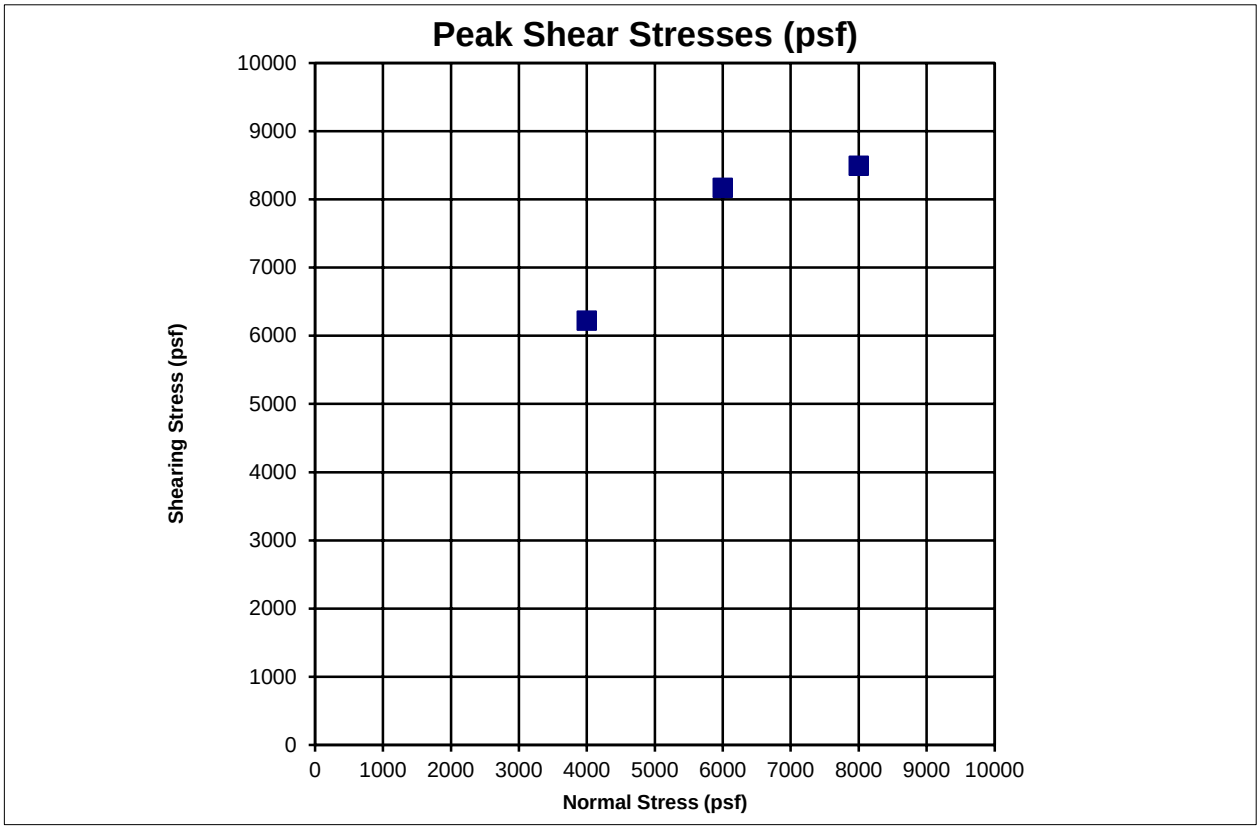
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PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-140 (40.0-40'9")
SAMPLE PREPARATION: Saturated - 4, 6, and 8 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 78
LAB NO: 24-3226-02
DATE ASSIGNED: 7/12/2024

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.994	1.000	0.994
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.001	0.001	0.001
Direct shear point:	1	2	3
Dry mass of specimen (g):	132.8	134.7	141.2
Initial Moisture Content:	2.9%	3.6%	3.9%
Initial Wet Density (pcf):	113.2	115.6	121.5
Initial Dry Density (pcf):	110.0	111.6	116.9
Final Moisture Content:	14.7%	16.0%	13.2%
Final Wet Density (pcf):	127.0	129.5	133.2
Final Dry Density (pcf):	110.7	111.6	117.6
Normal Stress (psf):	4000	6000	8000
Maximum Shearing Stress (psf):	6224	8169	8491
Vertical Deformation @ Max Shear (in):	0.339	0.218	0.275
Horizontal Deformation @ Max Shear (in):	0.261	0.319	0.168



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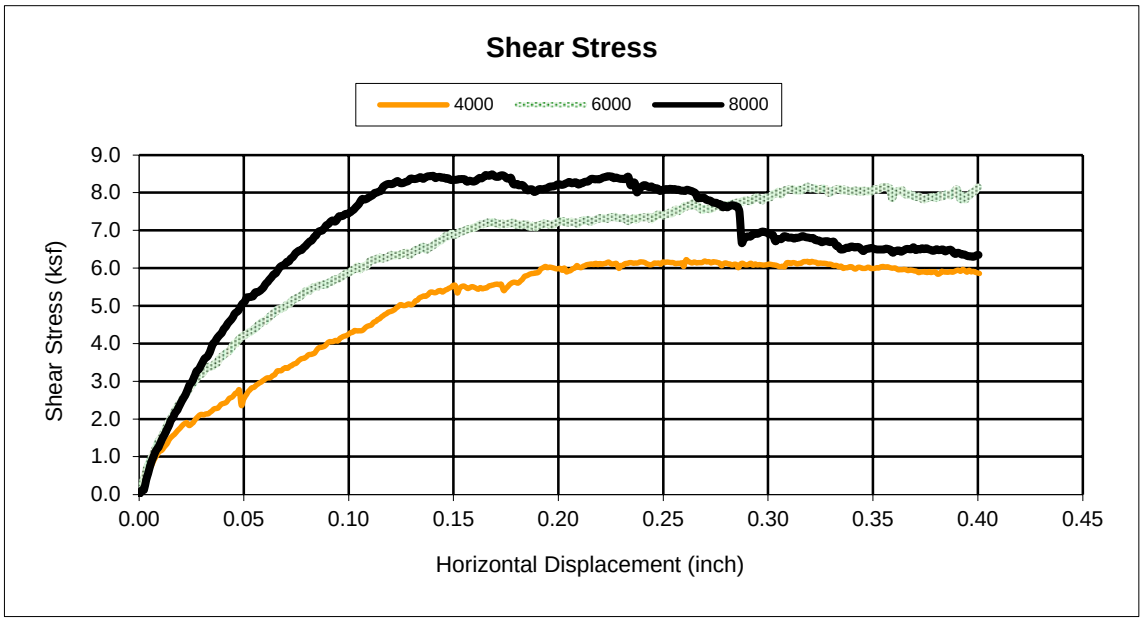
REVIEWED BY 07/26/24

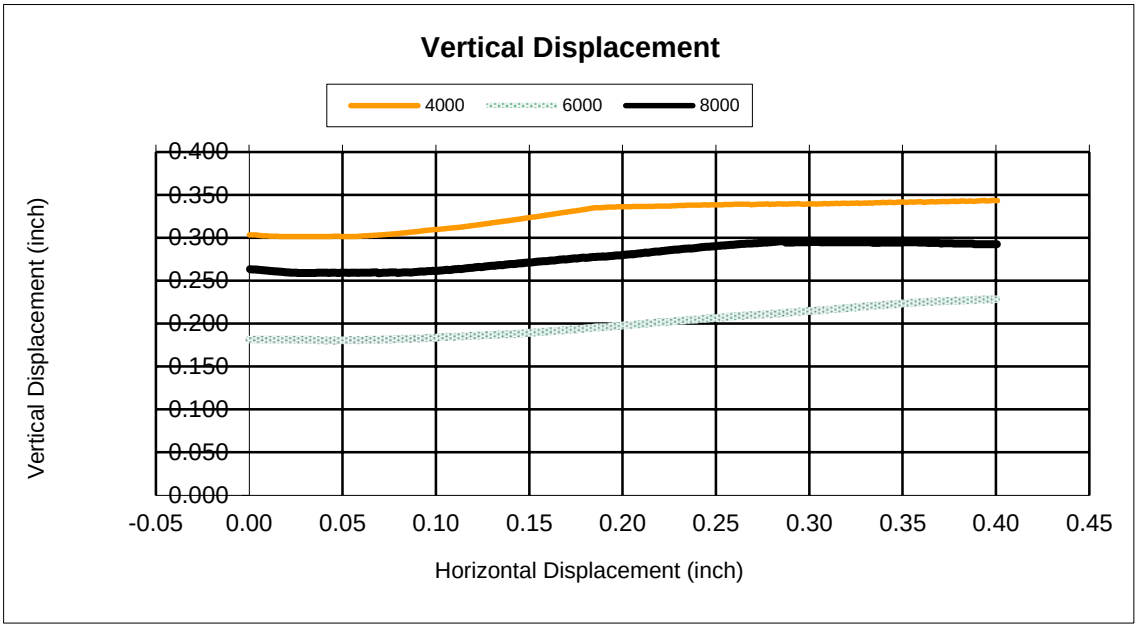
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-140 (40.0-40'9")
SAMPLE PREPARATION: Saturated - 4, 6, and 8 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 78
LAB NO: 24-3226-02
DATE ASSIGNED: 7/12/2024

NORMAL LOADS (psf): 4000 6000 8000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





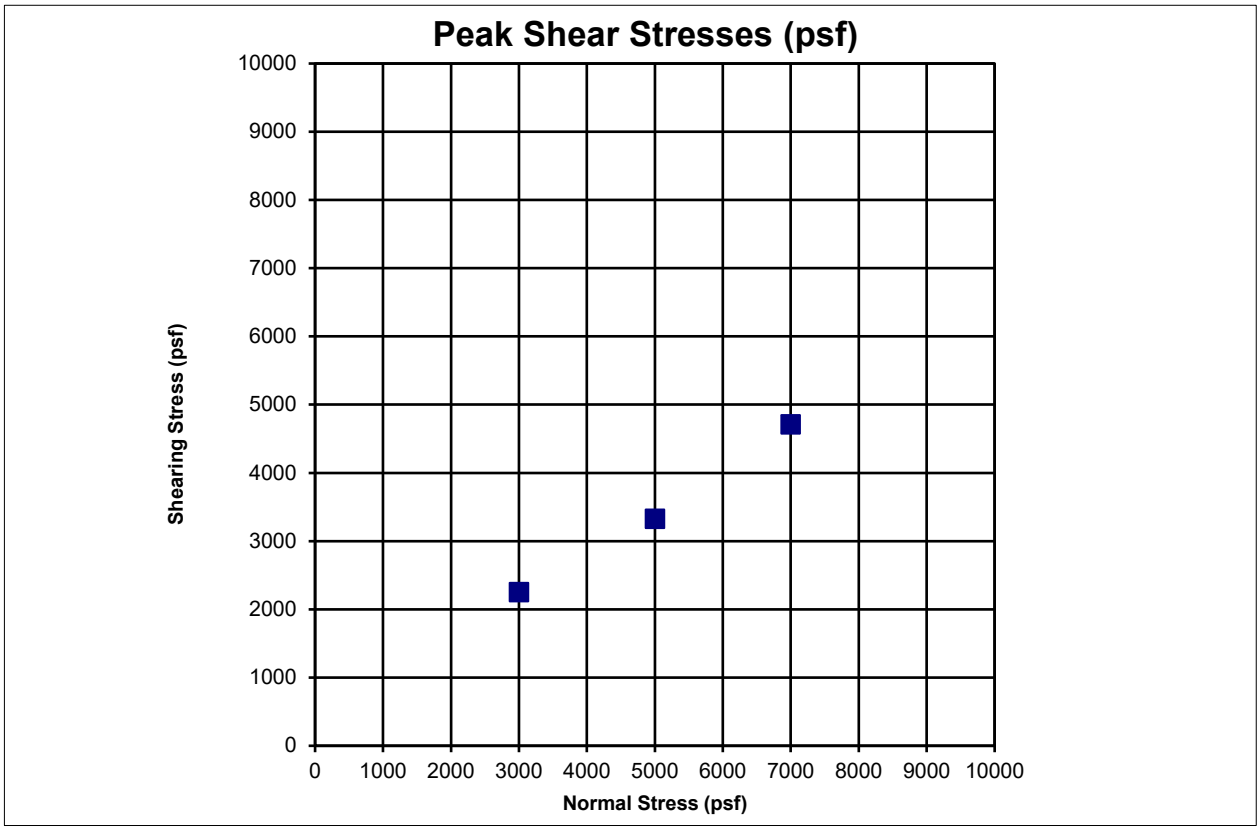
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Phoenix, AZ 85040

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-145 (25.0-26.0')
SAMPLE PREPARATION: Saturated - 3, 5, and 7 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 44
LAB NO: 24-2360-02
DATE ASSIGNED: 1/18/2024

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.984	0.991	0.994
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.005	0.005	0.005
Direct shear point:	1	2	3
Dry mass of specimen (g):	118.1	121.1	126.7
Initial Moisture Content:	27.3%	25.8%	21.4%
Initial Wet Density (pcf):	124.6	126.1	127.4
Initial Dry Density (pcf):	97.8	100.3	104.9
Final Moisture Content:	32.0%	29.5%	26.8%
Final Wet Density (pcf):	131.2	131.1	133.8
Final Dry Density (pcf):	99.4	101.2	105.6
Normal Stress (psf):	3000	5000	7000
Maximum Shearing Stress (psf):	2254	3325	4712
Vertical Deformation @ Max Shear (in):	0.317	0.268	0.333
Horizontal Deformation @ Max Shear (in):	0.136	0.218	0.115



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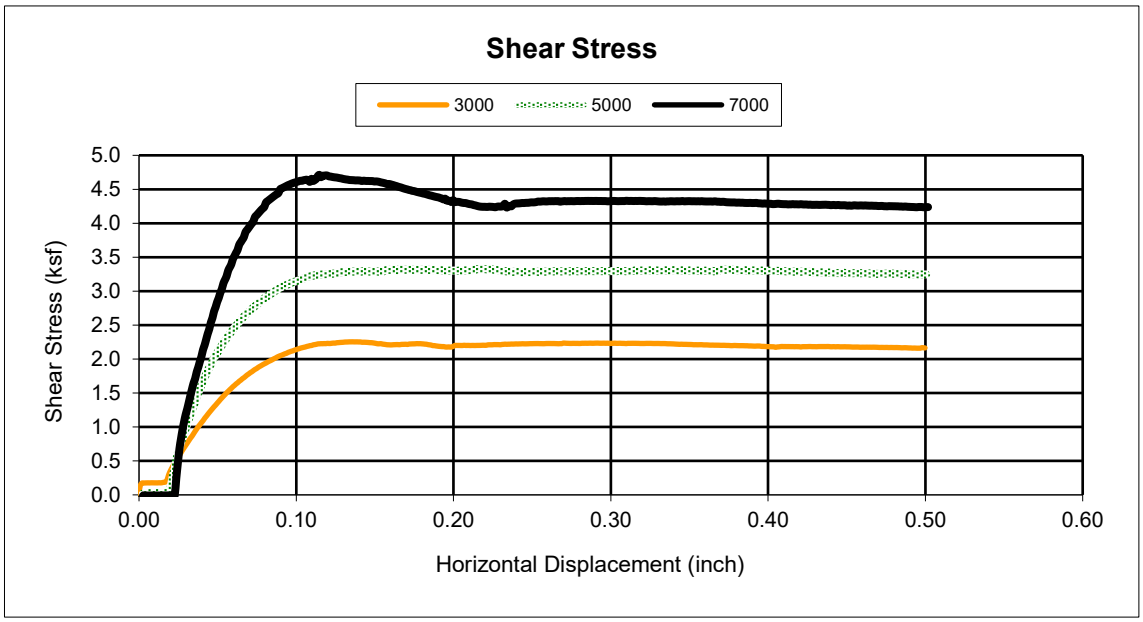
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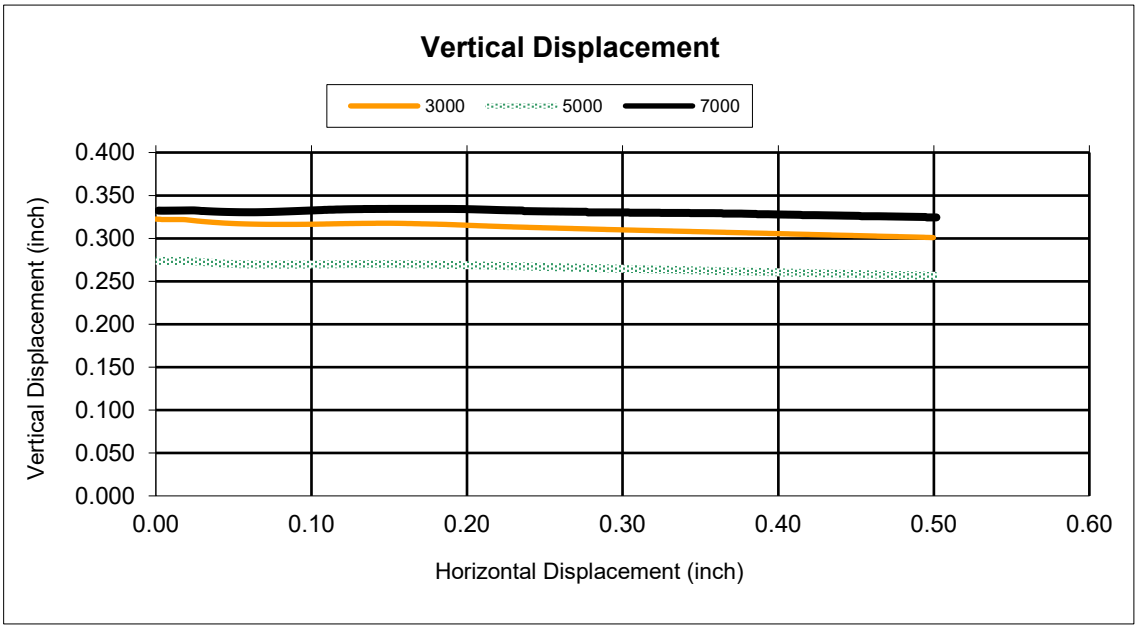
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-145 (25.0-26.0')
SAMPLE PREPARATION: Saturated - 3, 5, and 7 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 44
LAB NO: 24-2360-02
DATE ASSIGNED: 1/18/2024

NORMAL LOADS (psf): 3000 5000 7000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





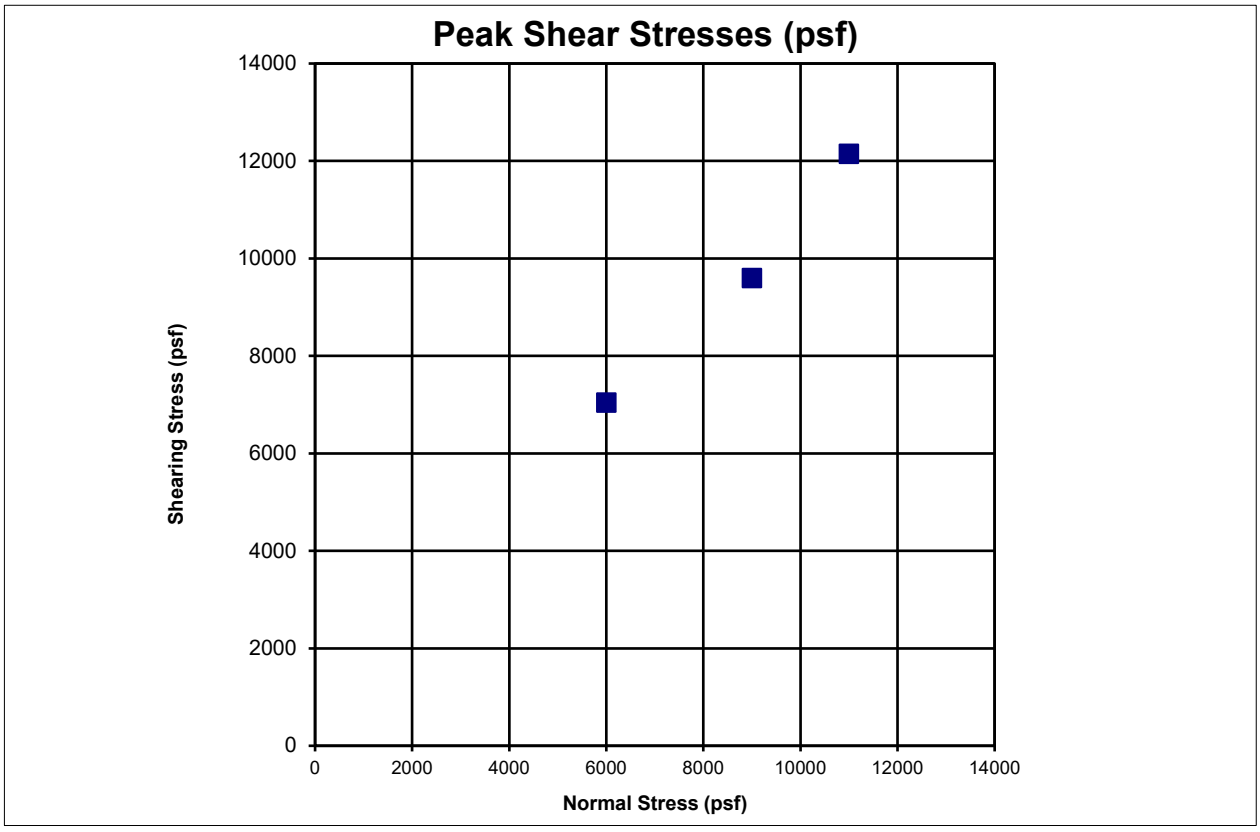
WSP USA
3630 E Wier Ave.
Phoenix, AZ 85040

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-145 (55.0-56.0')
SAMPLE PREPARATION: Saturated - 6, 9, and 11 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 44
LAB NO: 24-2360-03
DATE ASSIGNED: 1/18/2024

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.997	0.997	0.996
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.005	0.005	0.005
Direct shear point:	1	2	3
Dry mass of specimen (g):	143.8	142.8	147.2
Initial Moisture Content:	10.9%	11.1%	12.6%
Initial Wet Density (pcf):	132.1	131.4	137.2
Initial Dry Density (pcf):	119.1	118.3	121.9
Final Moisture Content:	15.8%	17.6%	17.2%
Final Wet Density (pcf):	138.3	139.6	143.5
Final Dry Density (pcf):	119.4	118.6	122.4
Normal Stress (psf):	6000	9000	11000
Maximum Shearing Stress (psf):	7044	9595	12145
Vertical Deformation @ Max Shear (in):	0.344	0.325	0.317
Horizontal Deformation @ Max Shear (in):	0.000	0.168	0.198



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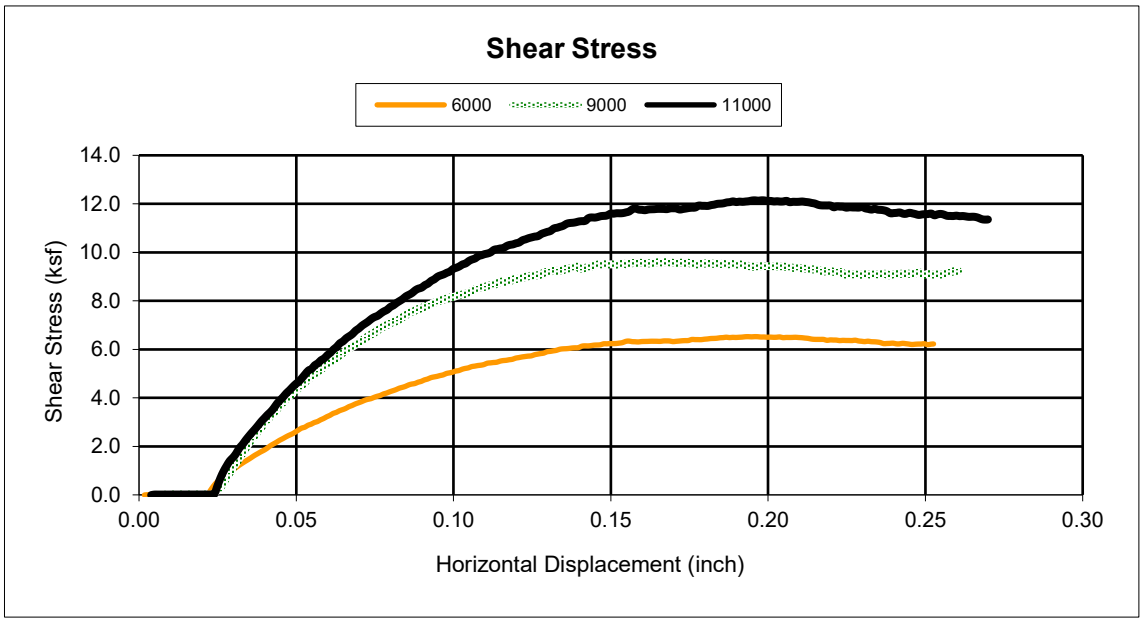
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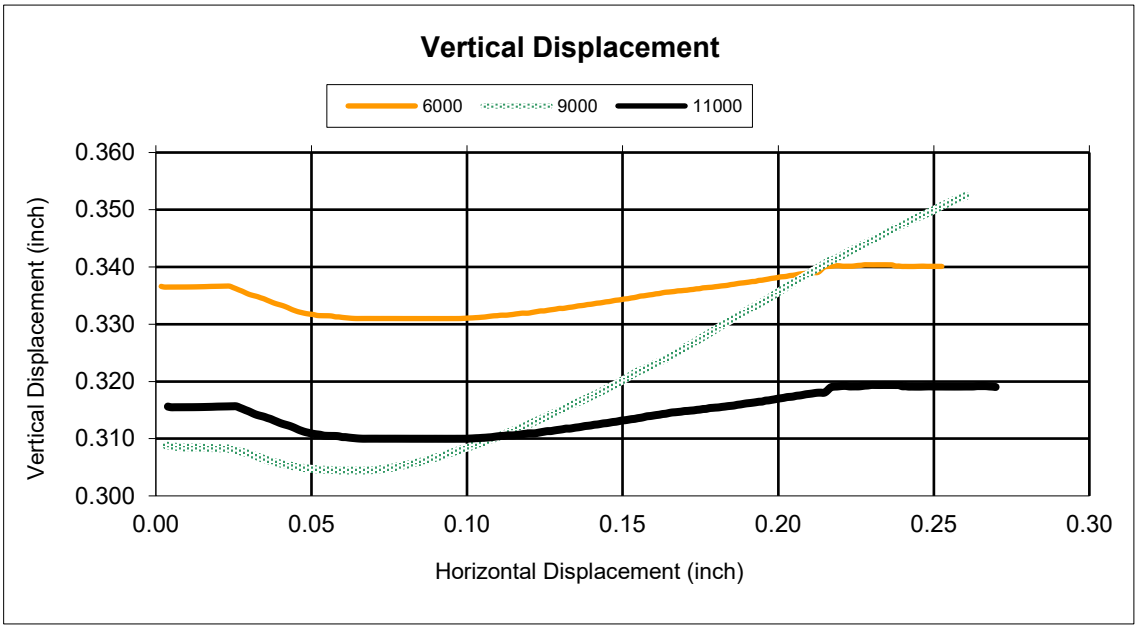
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-145 (55.0-56.0')
SAMPLE PREPARATION: Saturated - 6, 9, and 11 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 44
LAB NO: 24-2360-03
DATE ASSIGNED: 1/18/2024

NORMAL LOADS (psf): 6000 9000 11000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





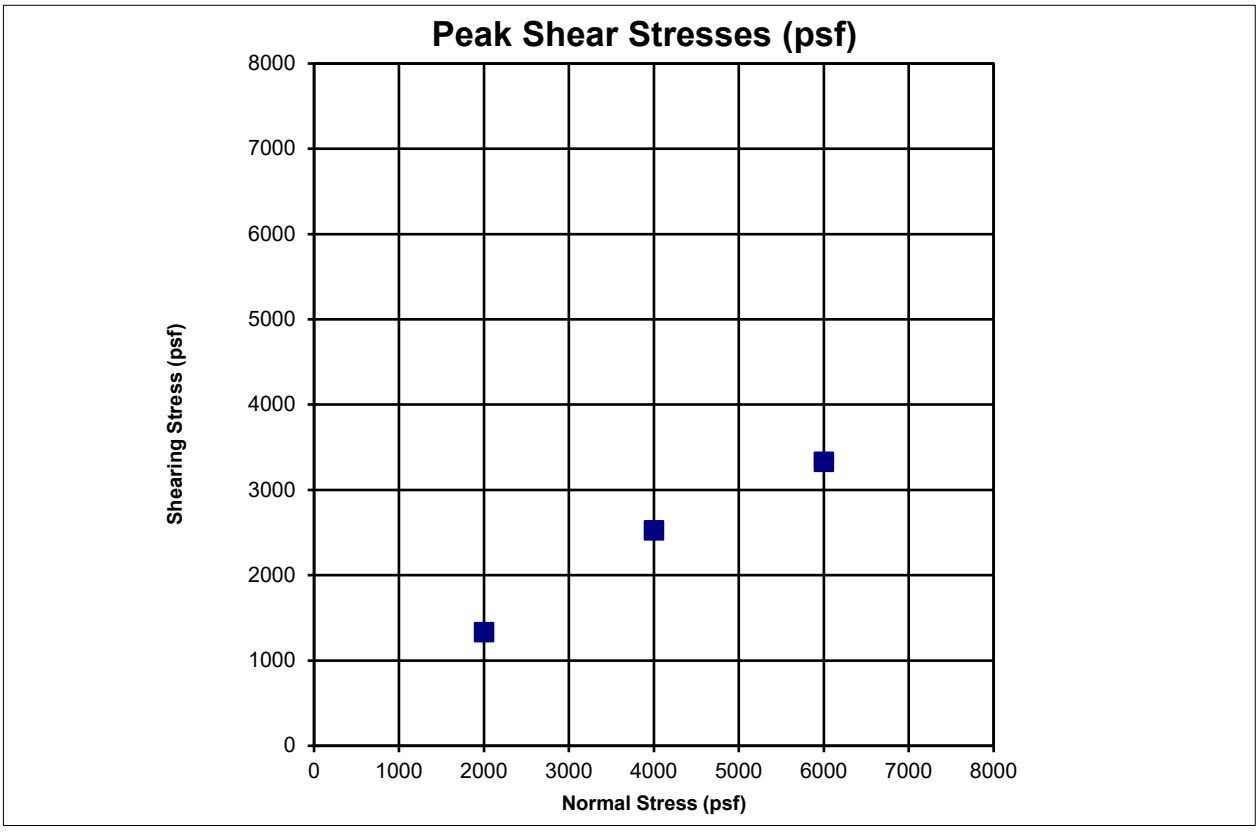
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PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-146 (15.0-16.0')
SAMPLE PREPARATION: Saturated - 2, 4, and 6 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 56
LAB NO: 24-2492-01
DATE ASSIGNED: 2/19/2024

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.989	0.972	0.982
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.001	0.001	0.001
Direct shear point:	1	2	3
Dry mass of specimen (g):	110.7	110.0	109.3
Initial Moisture Content:	17.0%	20.2%	21.0%
Initial Wet Density (pcf):	107.3	109.5	109.6
Initial Dry Density (pcf):	91.7	91.1	90.5
Final Moisture Content:	29.0%	26.5%	26.6%
Final Wet Density (pcf):	119.6	118.7	116.7
Final Dry Density (pcf):	92.7	93.8	92.2
Normal Stress (psf):	2000	4000	6000
Maximum Shearing Stress (psf):	1333	2527	3331
Vertical Deformation @ Max Shear (in):	0.240	0.183	0.220
Horizontal Deformation @ Max Shear (in):	0.500	0.435	0.325



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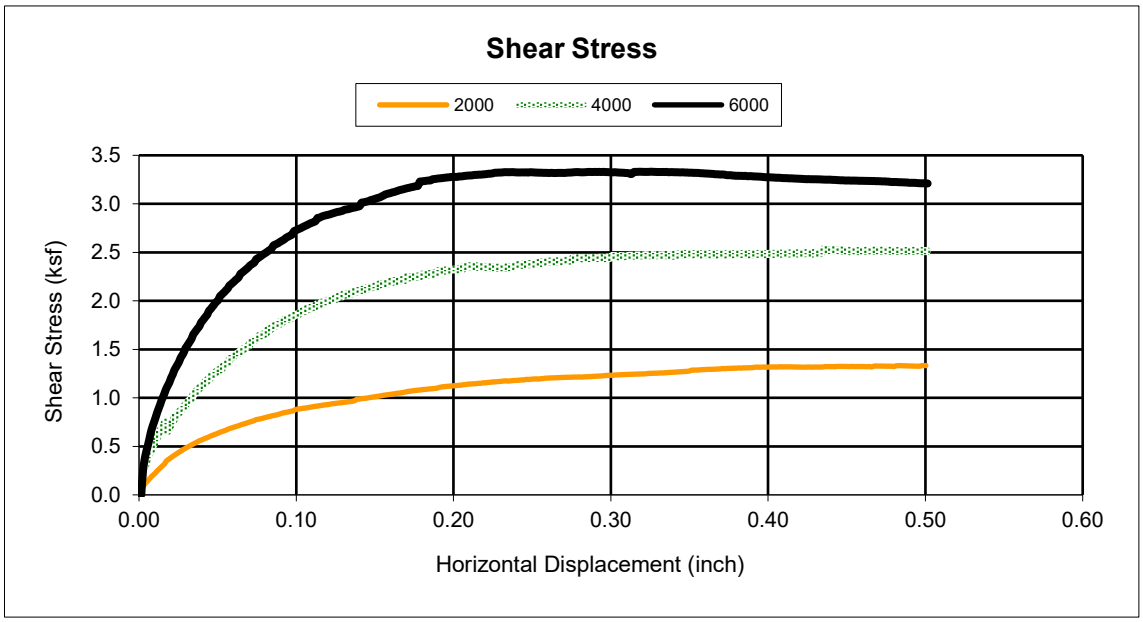
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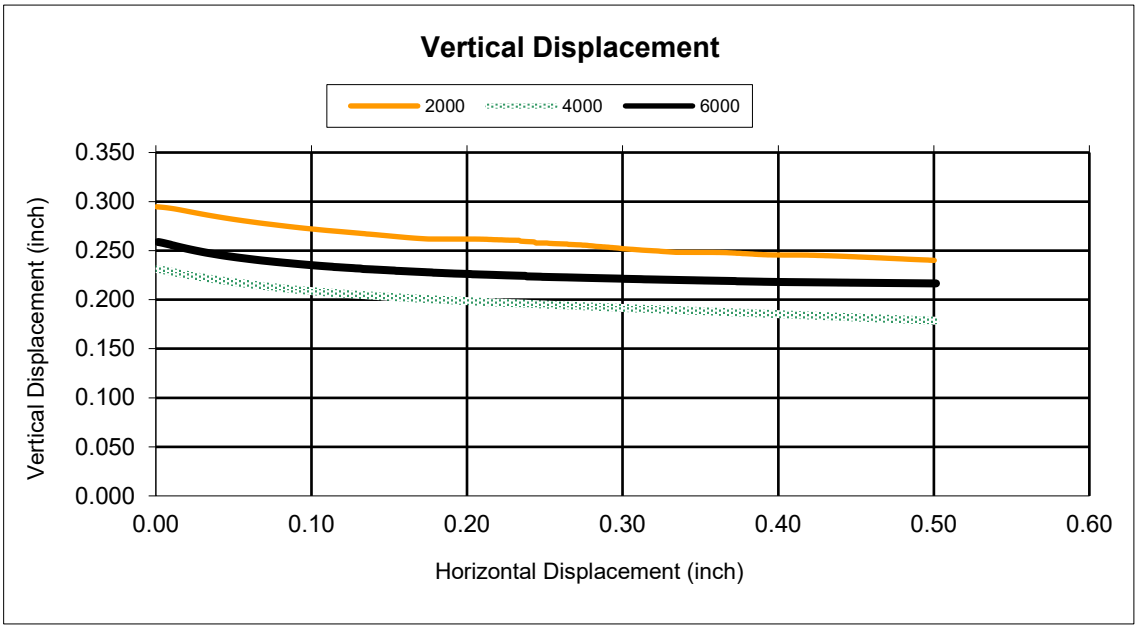
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-146 (15.0-16.0')
SAMPLE PREPARATION: Saturated - 2, 4, and 6 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 56
LAB NO: 24-2492-01
DATE ASSIGNED: 2/19/2024

NORMAL LOADS (psf): 2000 4000 6000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





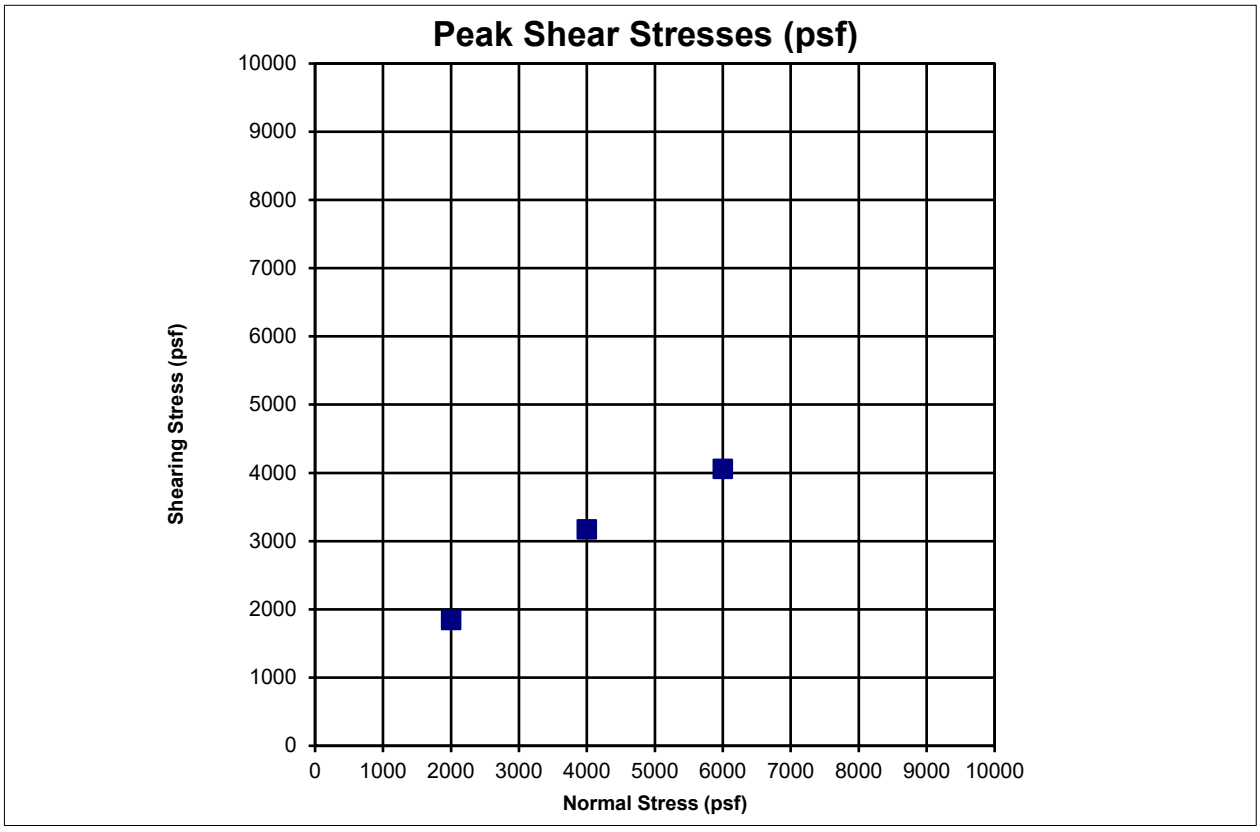
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Phoenix, AZ 85040

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-147 (15-16')
SAMPLE PREPARATION: Saturated - 2, 4, and 6 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 44
LAB NO: 24-2360-01
DATE ASSIGNED: 1/18/2024

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.991	0.982	0.974
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.005	0.005	0.005
Direct shear point:	1	2	3
Dry mass of specimen (g):	112.3	113.3	113.3
Initial Moisture Content:	30.0%	29.6%	29.7%
Initial Wet Density (pcf):	120.9	121.6	121.8
Initial Dry Density (pcf):	93.0	93.8	93.8
Final Moisture Content:	35.6%	34.1%	35.6%
Final Wet Density (pcf):	127.3	128.1	130.6
Final Dry Density (pcf):	93.8	95.6	96.3
Normal Stress (psf):	2000	4000	6000
Maximum Shearing Stress (psf):	1844	3172	4057
Vertical Deformation @ Max Shear (in):	-0.007	-0.024	-0.040
Horizontal Deformation @ Max Shear (in):	0.102	0.293	0.419



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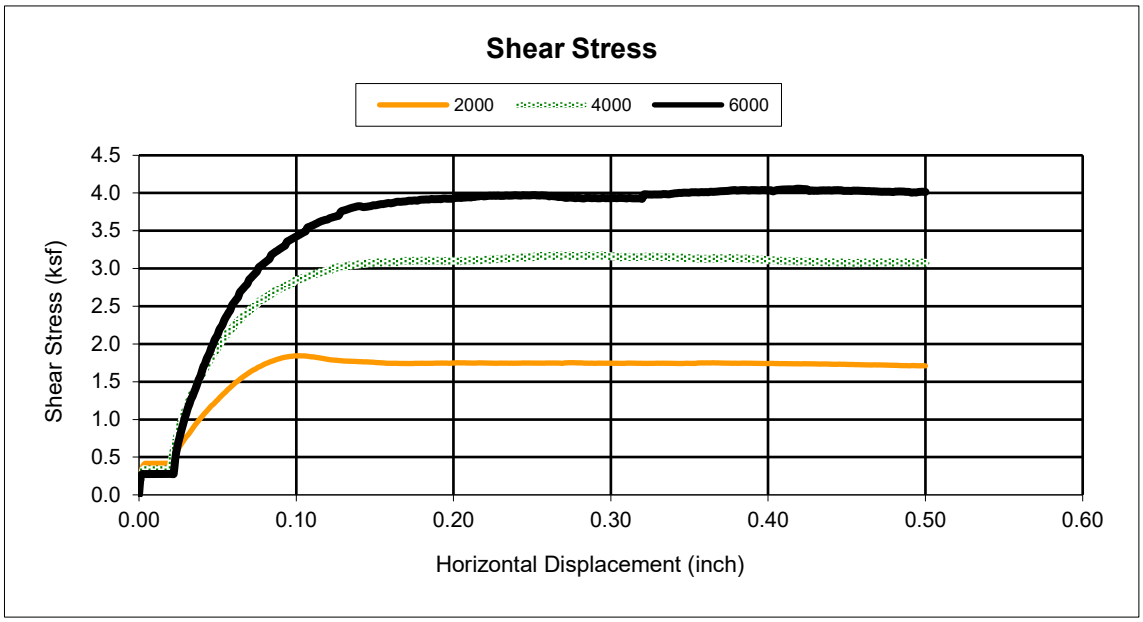
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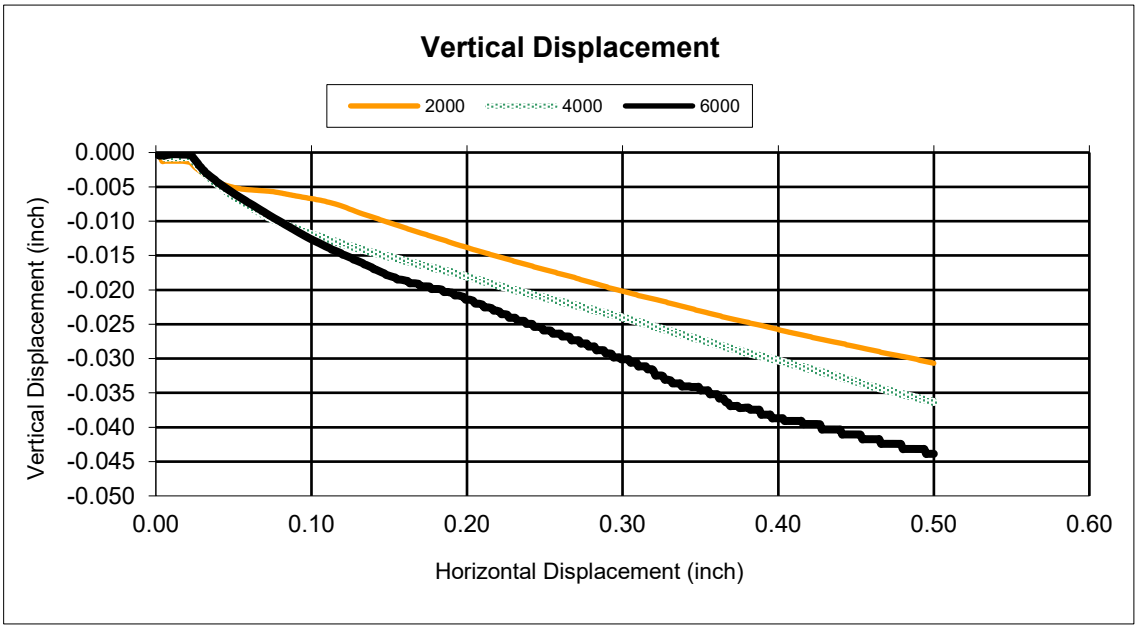
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-147 (15-16')
SAMPLE PREPARATION: Saturated - 2, 4, and 6 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 44
LAB NO: 24-2360-01
DATE ASSIGNED: 1/18/2024

NORMAL LOADS (psf): 2000 4000 6000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





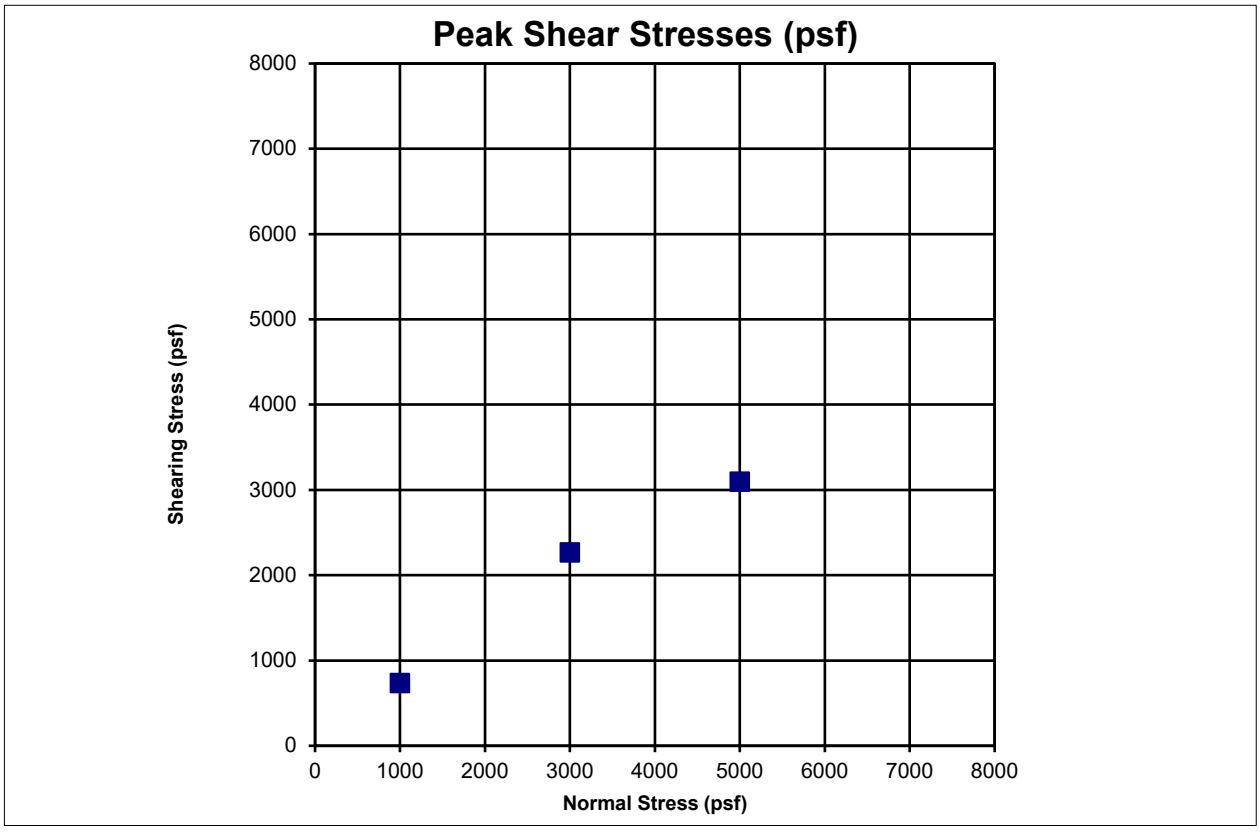
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3630 E Wier Ave.
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PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-148 (10.0-11.0')
SAMPLE PREPARATION: Saturated - 1, 3, and 5 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 44
LAB NO: 24-2360-04
DATE ASSIGNED: 1/18/2024

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.994	0.990	0.846
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.005	0.005	0.005
Direct shear point:	1	2	3
Dry mass of specimen (g):	114.7	118.5	116.6
Initial Moisture Content:	7.0%	6.6%	7.2%
Initial Wet Density (pcf):	101.6	104.6	103.5
Initial Dry Density (pcf):	95.0	98.1	96.6
Final Moisture Content:	27.6%	24.1%	25.0%
Final Wet Density (pcf):	121.9	123.0	142.7
Final Dry Density (pcf):	95.6	99.1	114.2
Normal Stress (psf):	1000	3000	5000
Maximum Shearing Stress (psf):	737	2268	3098
Vertical Deformation @ Max Shear (in):	0.307	0.283	0.291
Horizontal Deformation @ Max Shear (in):	0.487	0.211	0.439



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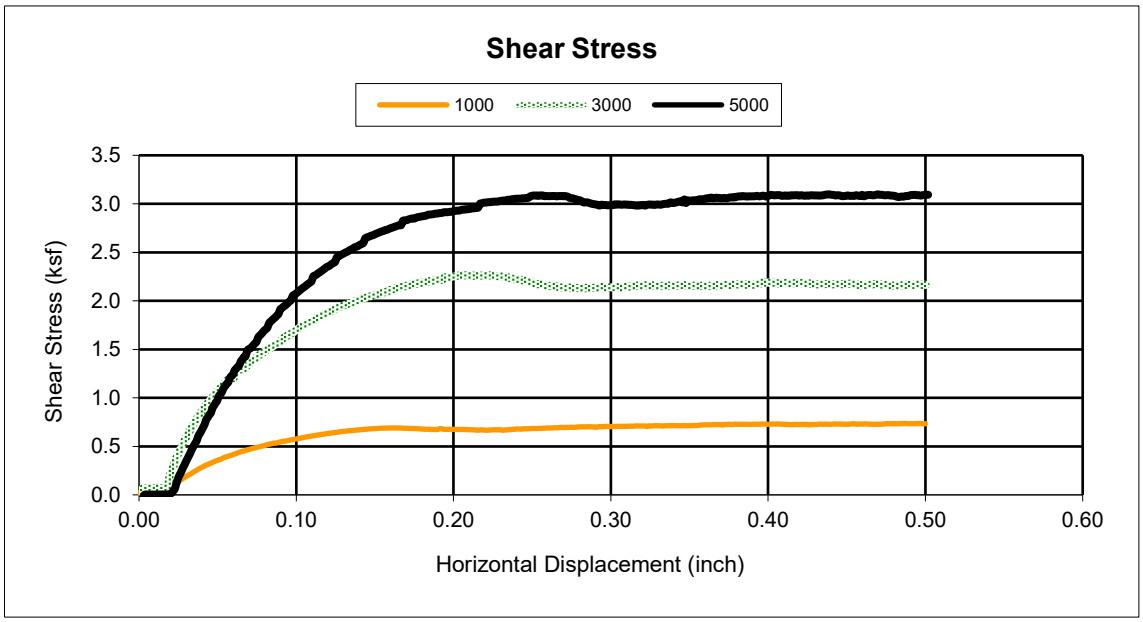
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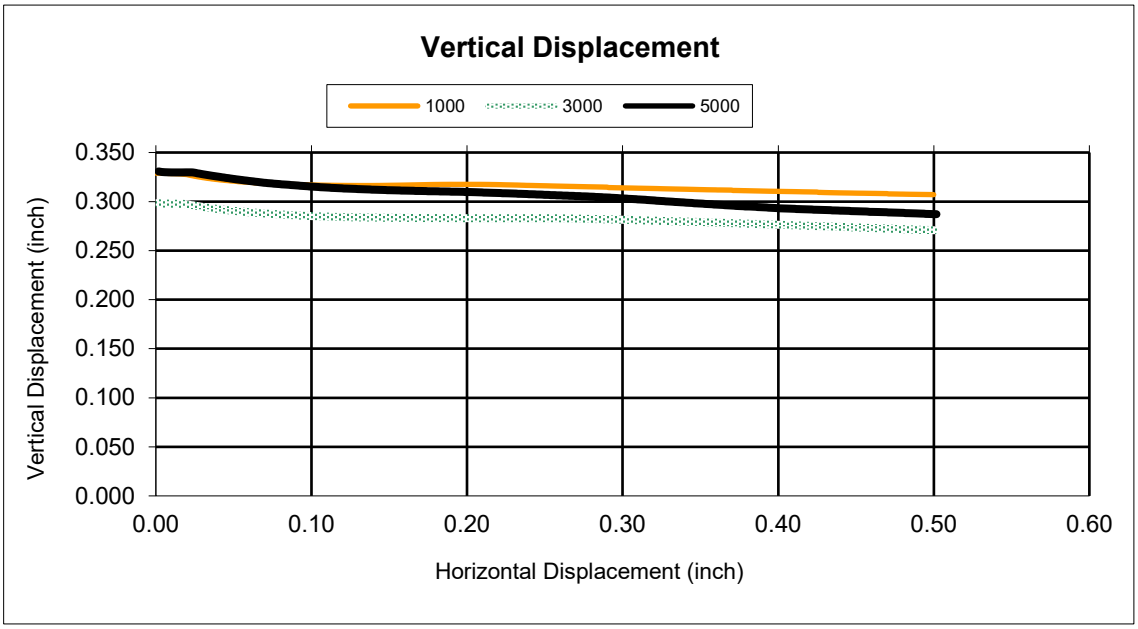
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-148 (10.0-11.0')
SAMPLE PREPARATION: Saturated - 1, 3, and 5 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 44
LAB NO: 24-2360-04
DATE ASSIGNED: 1/18/2024

NORMAL LOADS (psf): 1000 3000 5000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





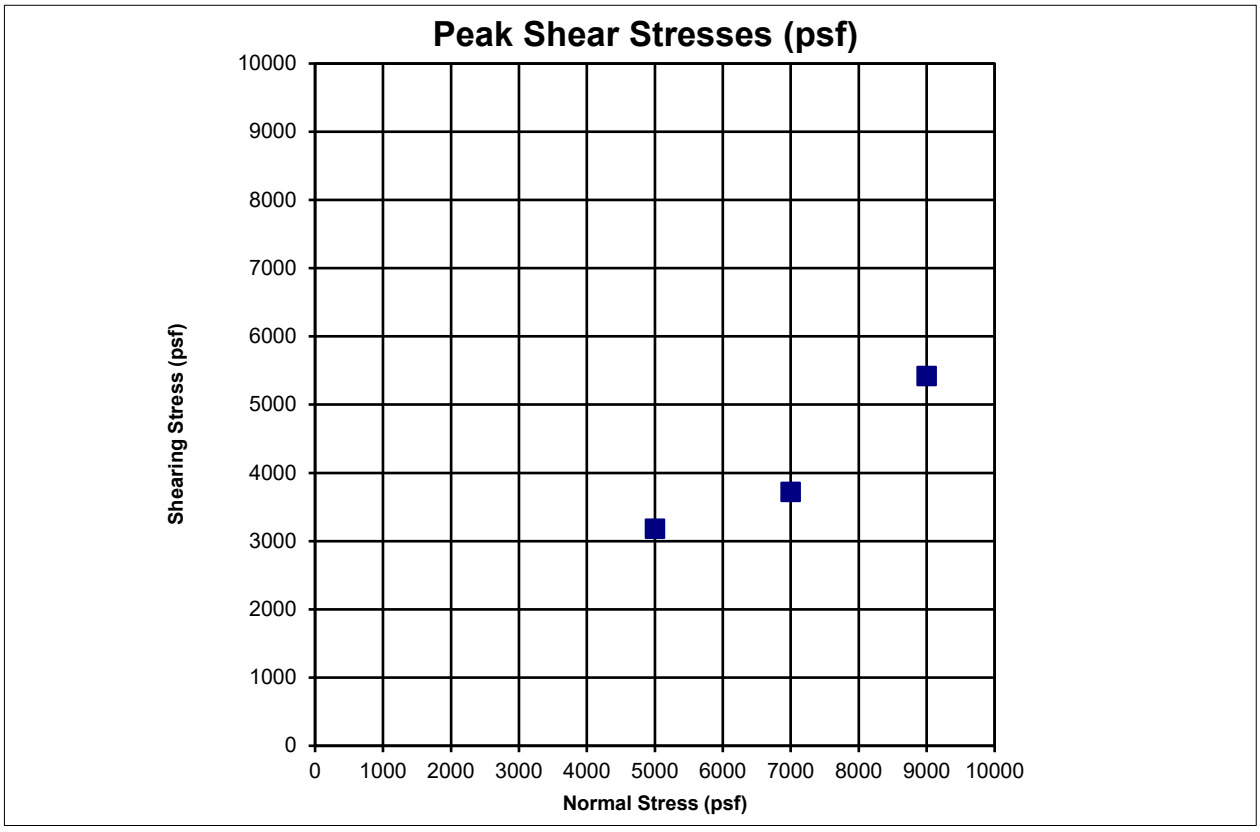
WSP USA
3630 E Wier Ave.
Phoenix, AZ 85040

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-158 (45.0-46.5')
SAMPLE PREPARATION: Saturated - 5, 7, and 9 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 11
LAB NO: 23-2046-03
DATE ASSIGNED: 10/18/2023

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.985	0.990	0.977
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.005	0.005	0.005
Direct shear point:	1	2	3
Dry mass of specimen (g):	116.8	120.2	117.8
Initial Moisture Content:	25.2%	24.1%	24.6%
Initial Wet Density (pcf):	121.1	123.6	121.6
Initial Dry Density (pcf):	96.7	99.6	97.6
Final Moisture Content:	31.3%	31.6%	35.7%
Final Wet Density (pcf):	129.0	132.4	135.6
Final Dry Density (pcf):	98.3	100.6	99.9
Normal Stress (psf):	5000	7000	9000
Maximum Shearing Stress (psf):	3181	3720	5420
Vertical Deformation @ Max Shear (in):	0.298	0.269	0.212
Horizontal Deformation @ Max Shear (in):	0.132	0.124	0.179



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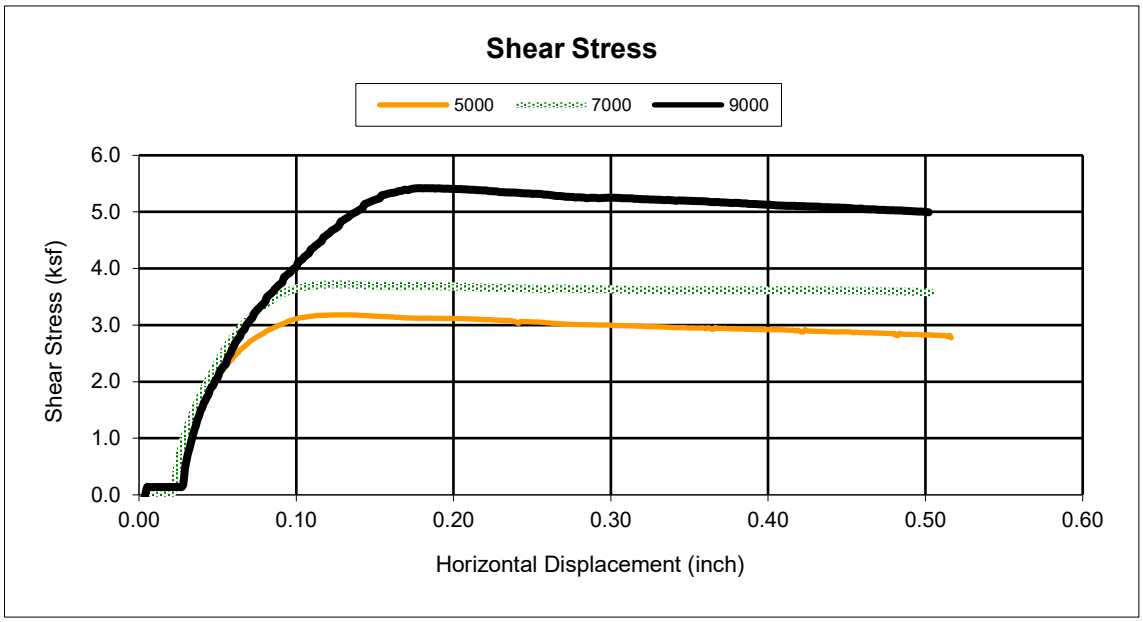
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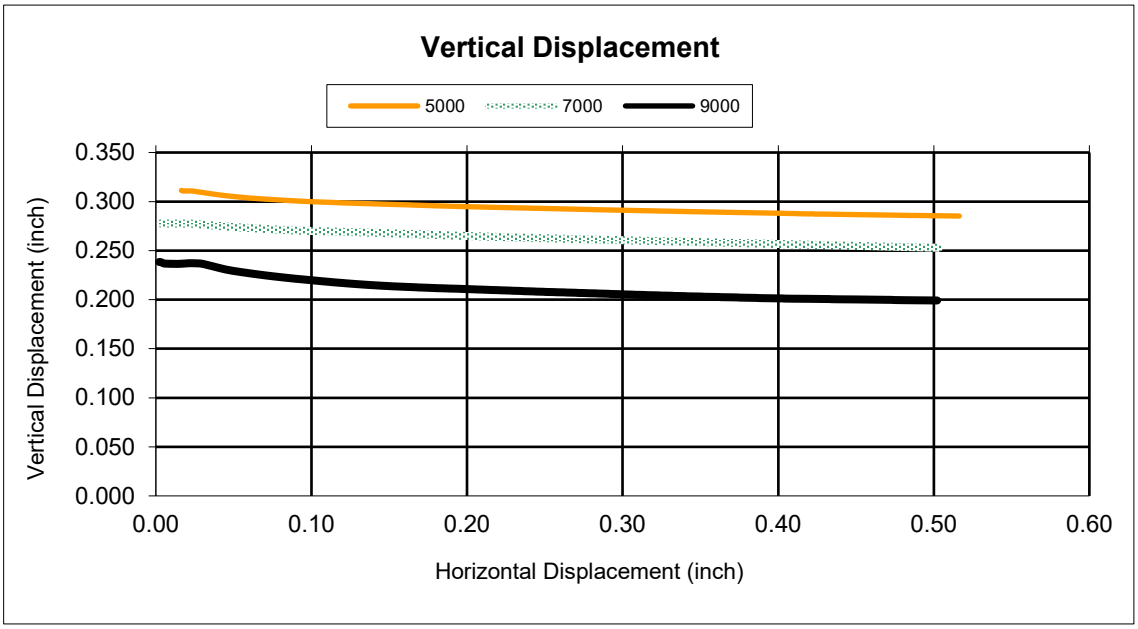
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-158 (45.0-46.5')
SAMPLE PREPARATION: Saturated - 5, 7, and 9 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 11
LAB NO: 23-2046-03
DATE ASSIGNED: 10/18/2023

NORMAL LOADS (psf): 5000 7000 9000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





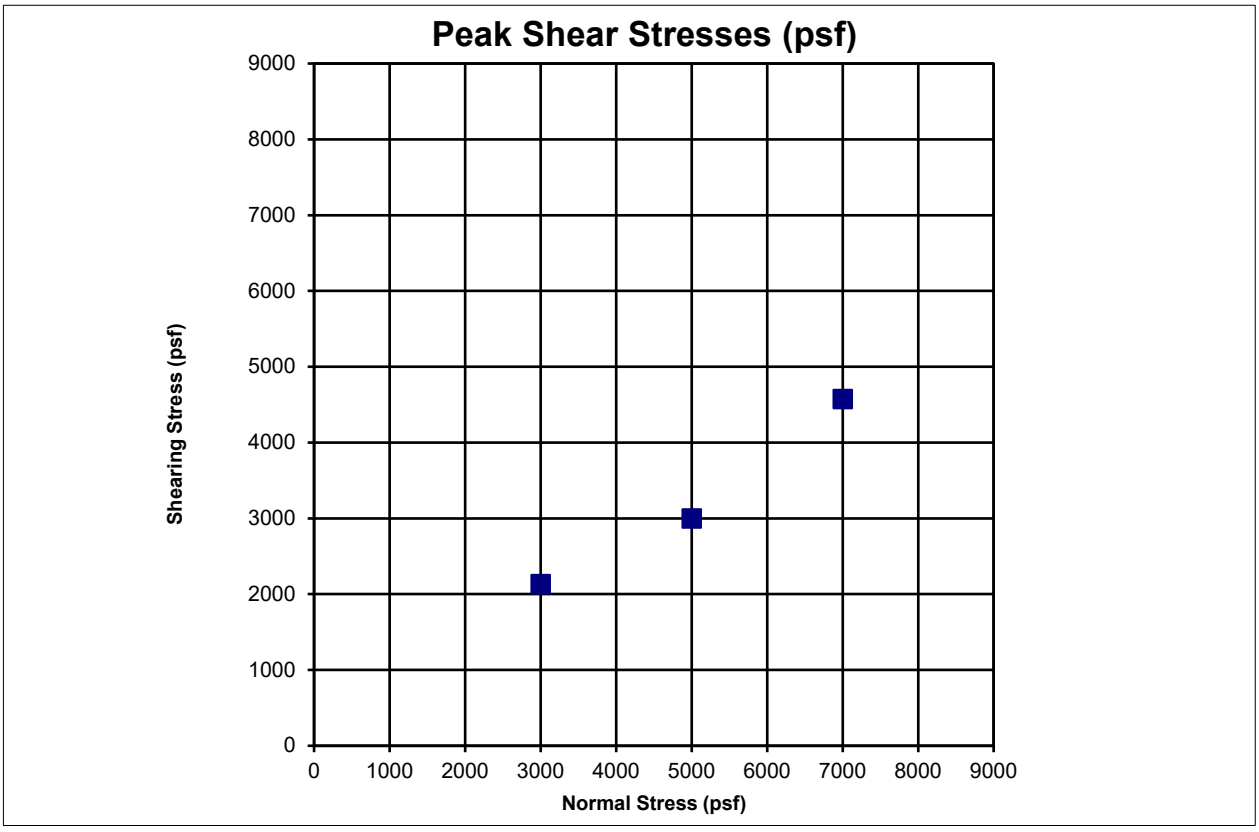
WSP USA
3630 E Wier Ave.
Phoenix, AZ 85040

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-159 (25.0-26.0')
SAMPLE PREPARATION: Saturated - 3, 5, and 7 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 11
LAB NO: 23-2046-05
DATE ASSIGNED: 10/18/2023

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.991	0.970	0.970
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.018	0.018	0.018
Direct shear point:	1	2	3
Dry mass of specimen (g):	120.6	122.8	121.6
Initial Moisture Content:	9.2%	10.4%	10.4%
Initial Wet Density (pcf):	109.1	112.3	111.2
Initial Dry Density (pcf):	99.9	101.7	100.7
Final Moisture Content:	24.8%	27.0%	28.3%
Final Wet Density (pcf):	125.8	133.1	133.2
Final Dry Density (pcf):	100.8	104.8	103.8
Normal Stress (psf):	3000	5000	7000
Maximum Shearing Stress (psf):	2134	2998	4574
Vertical Deformation @ Max Shear (in):	0.298	0.251	0.193
Horizontal Deformation @ Max Shear (in):	0.135	0.211	0.496



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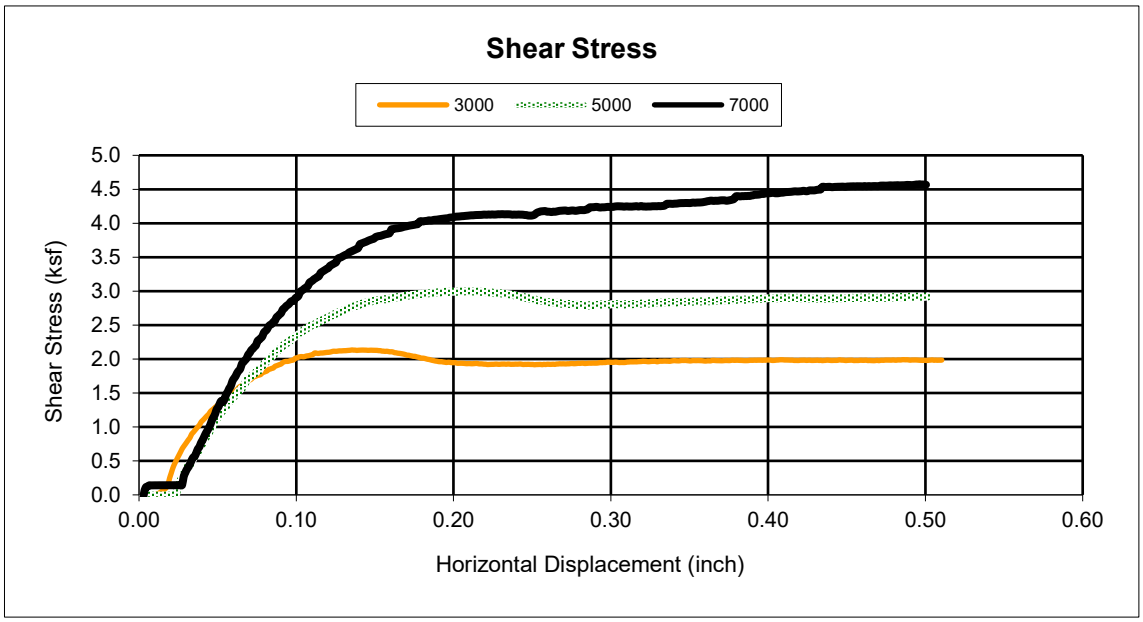
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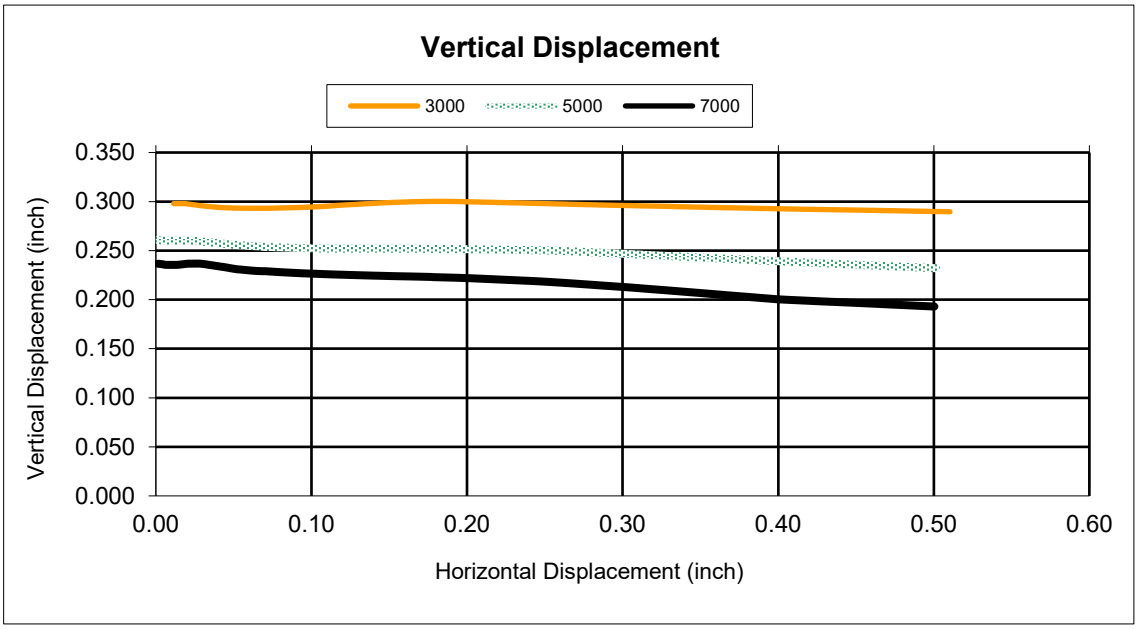
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-159 (25.0-26.0')
SAMPLE PREPARATION: Saturated - 3, 5, and 7 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 11
LAB NO: 23-2046-05
DATE ASSIGNED: 10/18/2023

NORMAL LOADS (psf): 3000 5000 7000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





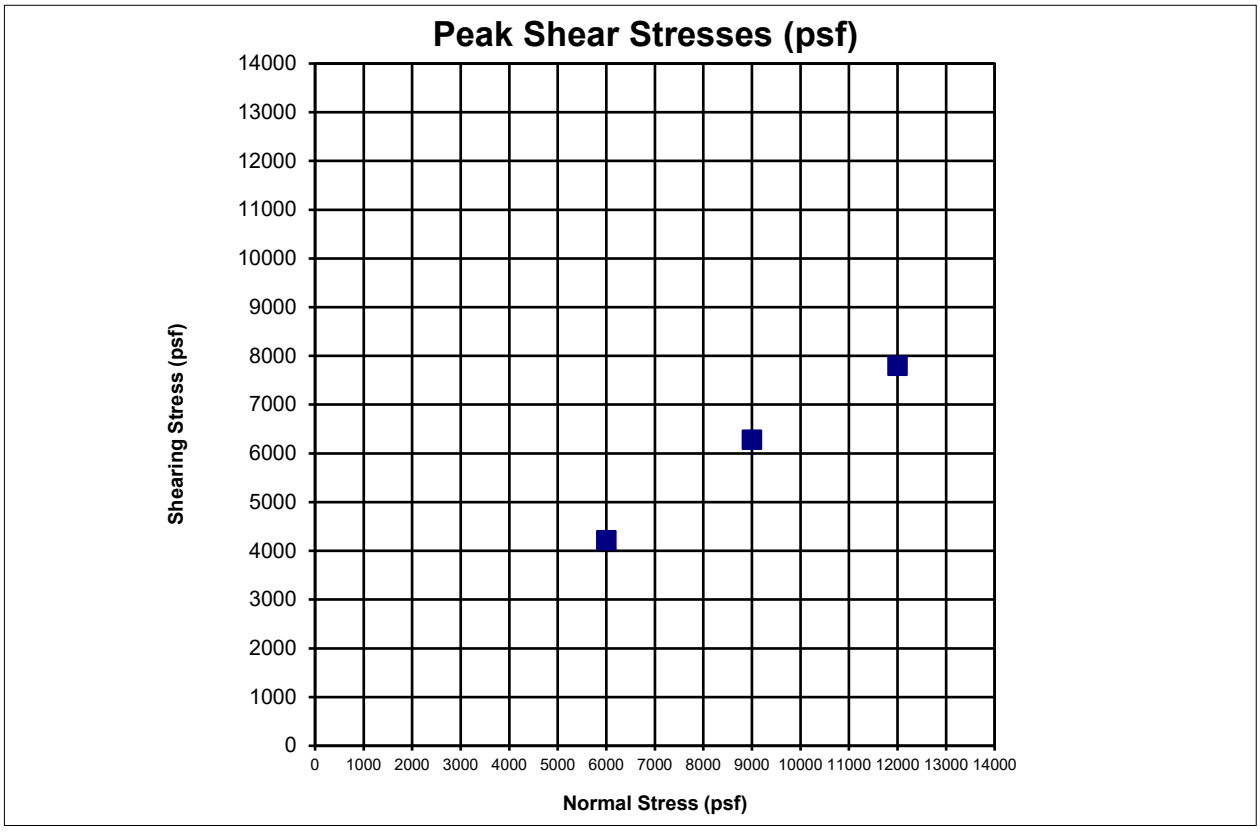
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3630 E Wier Ave.
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PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-160 (60.0-61.0')
SAMPLE PREPARATION: Saturated - 6, 9, and 12 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 11
LAB NO: 23-2046-06
DATE ASSIGNED: 10/18/2023

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.992	0.993	0.994
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.018	0.018	0.018
Direct shear point:	1	2	3
Dry mass of specimen (g):	116.6	120.6	121.2
Initial Moisture Content:	18.7%	19.8%	18.8%
Initial Wet Density (pcf):	114.6	119.7	119.3
Initial Dry Density (pcf):	96.6	99.9	100.4
Final Moisture Content:	25.5%	23.6%	24.9%
Final Wet Density (pcf):	122.1	124.3	126.2
Final Dry Density (pcf):	97.3	100.6	101.0
Normal Stress (psf):	6000	9000	12000
Maximum Shearing Stress (psf):	4216	6283	7797
Vertical Deformation @ Max Shear (in):	0.288	0.264	0.266
Horizontal Deformation @ Max Shear (in):	0.156	0.172	0.159



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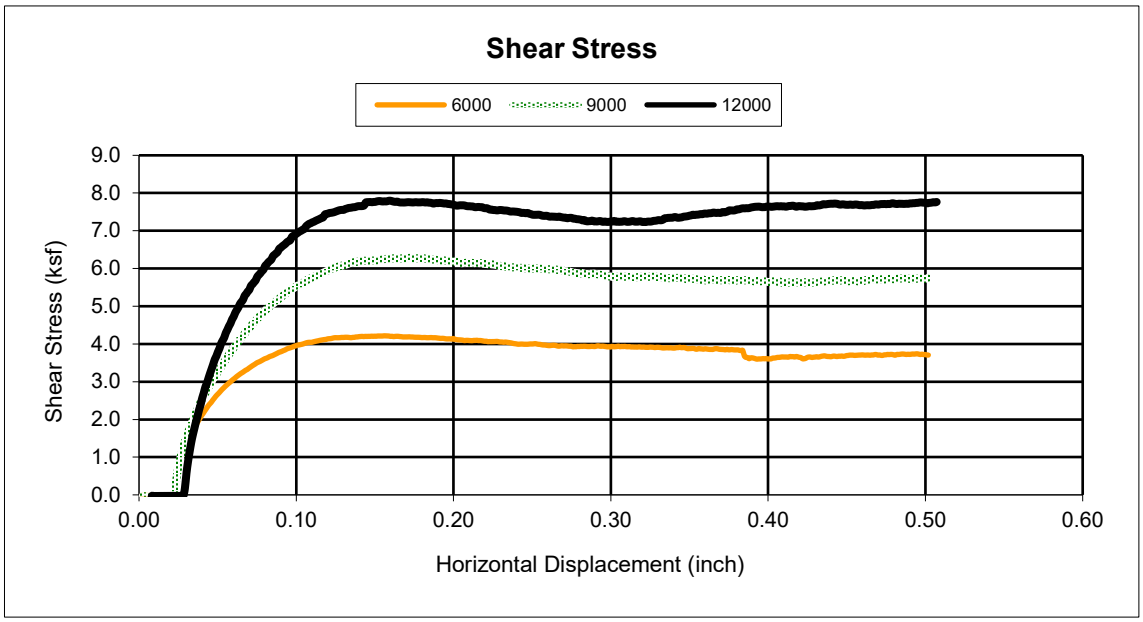
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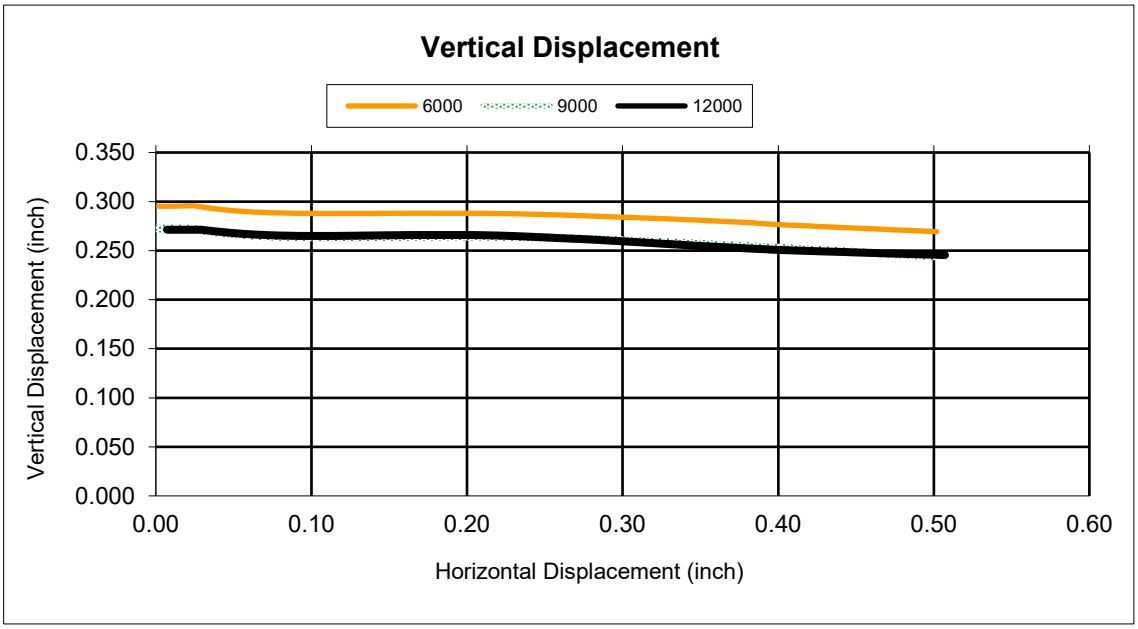
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-160 (60.0-61.0')
SAMPLE PREPARATION: Saturated - 6, 9, and 12 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 11
LAB NO: 23-2046-06
DATE ASSIGNED: 10/18/2023

NORMAL LOADS (psf): 6000 9000 12000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





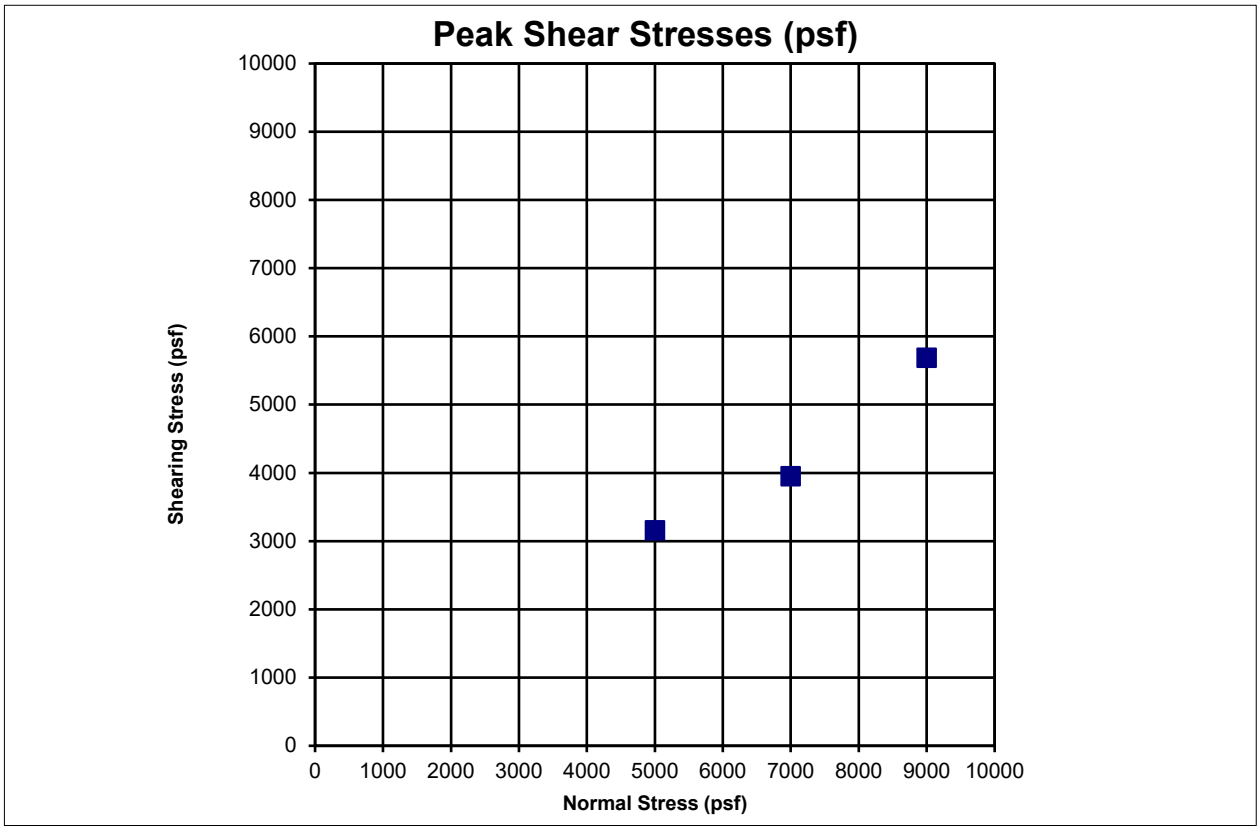
WSP USA
3630 E Wier Ave.
Phoenix, AZ 85040

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-161 (45.0-46.0')
SAMPLE PREPARATION: Saturated - 5, 7, and 9 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 11
LAB NO: 23-2046-01
DATE ASSIGNED: 10/18/2023

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.986	0.984	0.987
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.001	0.001	0.001
Direct shear point:	1	2	3
Dry mass of specimen (g):	108.9	112.8	114.6
Initial Moisture Content:	22.3%	22.6%	21.8%
Initial Wet Density (pcf):	110.3	114.5	115.6
Initial Dry Density (pcf):	90.2	93.4	94.9
Final Moisture Content:	31.9%	29.3%	29.0%
Final Wet Density (pcf):	120.6	122.9	124.1
Final Dry Density (pcf):	91.5	95.0	96.2
Normal Stress (psf):	5000	7000	9000
Maximum Shearing Stress (psf):	3157	3952	5689
Vertical Deformation @ Max Shear (in):	0.248	0.275	0.222
Horizontal Deformation @ Max Shear (in):	0.146	0.161	0.120



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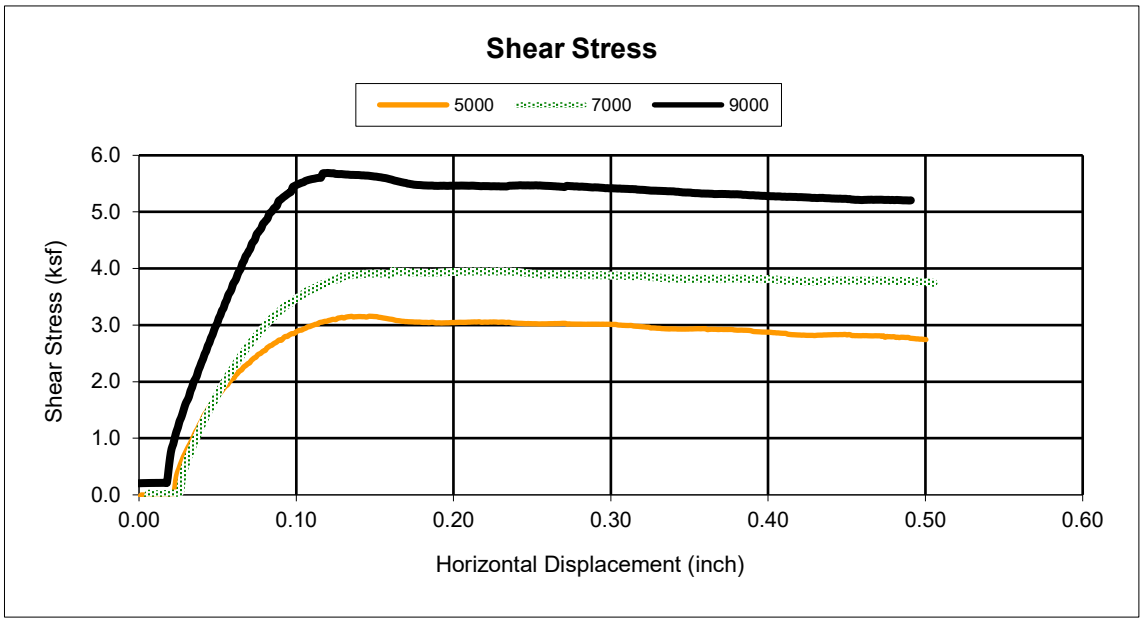
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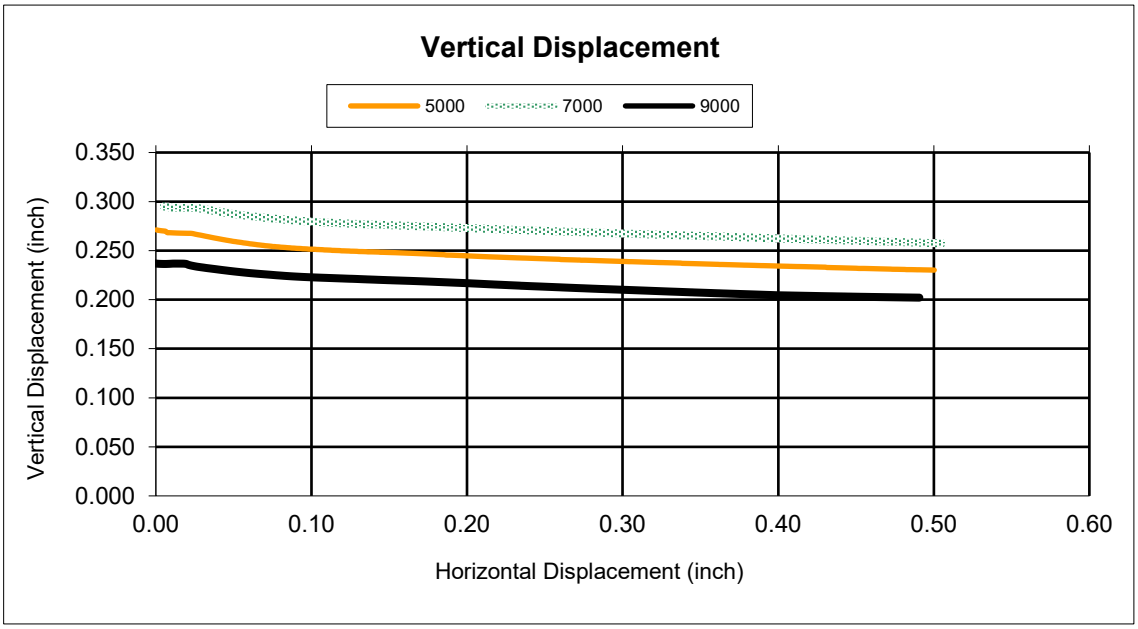
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-161 (45.0-46.0')
SAMPLE PREPARATION: Saturated - 5, 7, and 9 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 11
LAB NO: 23-2046-01
DATE ASSIGNED: 10/18/2023

NORMAL LOADS (psf): 5000 7000 9000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





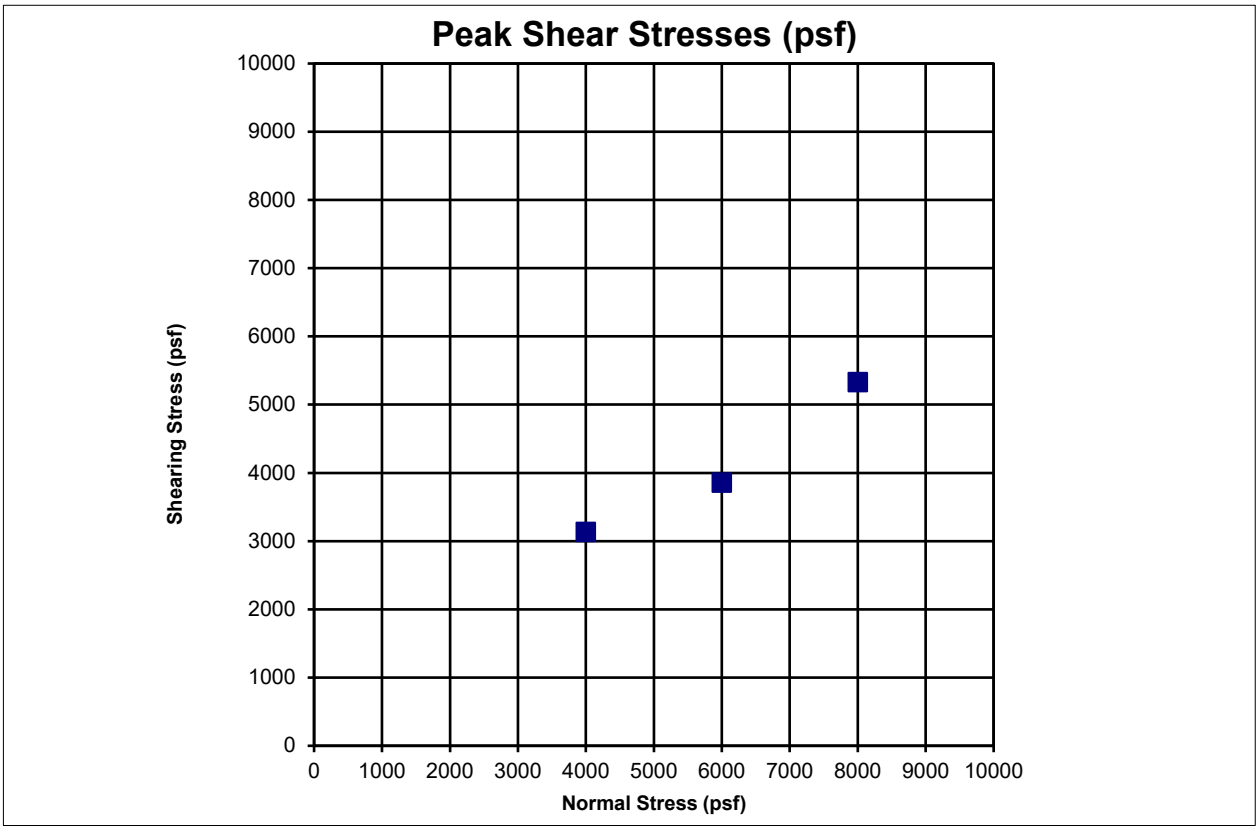
WSP USA
3630 E Wier Ave.
Phoenix, AZ 85040

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-162 (35.0-36.0')
SAMPLE PREPARATION: Saturated - 4, 6, and 8 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 11
LAB NO: 23-2046-07
DATE ASSIGNED: 10/18/2023

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.970	0.984	0.992
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.007	0.007	0.007
Direct shear point:	1	2	3
Dry mass of specimen (g):	111.9	116.8	116.2
Initial Moisture Content:	20.6%	20.0%	24.3%
Initial Wet Density (pcf):	111.8	116.1	119.6
Initial Dry Density (pcf):	92.7	96.7	96.2
Final Moisture Content:	33.4%	32.4%	35.3%
Final Wet Density (pcf):	127.5	130.1	131.3
Final Dry Density (pcf):	95.6	98.3	97.0
Normal Stress (psf):	4000	6000	8000
Maximum Shearing Stress (psf):	3134	3858	5330
Vertical Deformation @ Max Shear (in):	0.268	0.267	0.267
Horizontal Deformation @ Max Shear (in):	0.154	0.177	0.164



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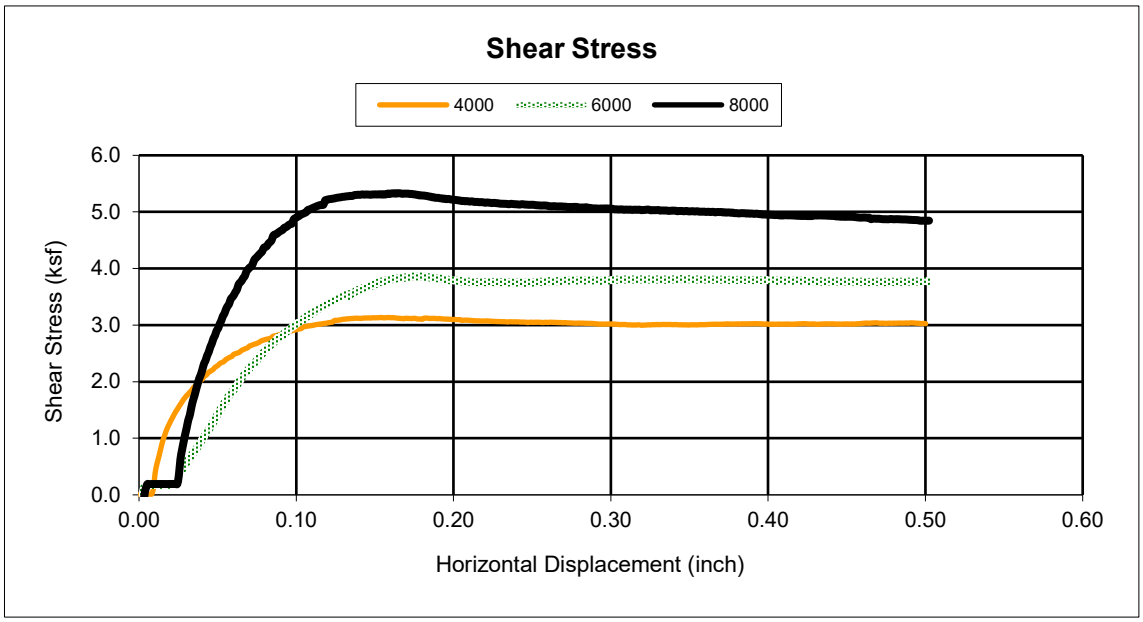
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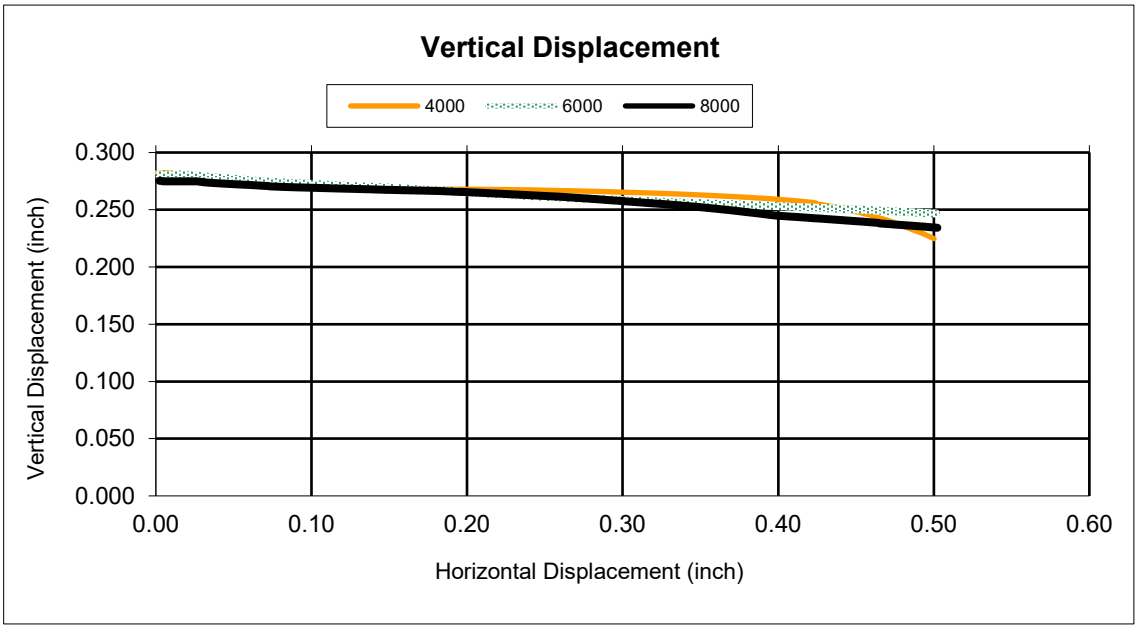
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-162 (35.0-36.0')
SAMPLE PREPARATION: Saturated - 4, 6, and 8 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 11
LAB NO: 23-2046-07
DATE ASSIGNED: 10/18/2023

NORMAL LOADS (psf): 4000 6000 8000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





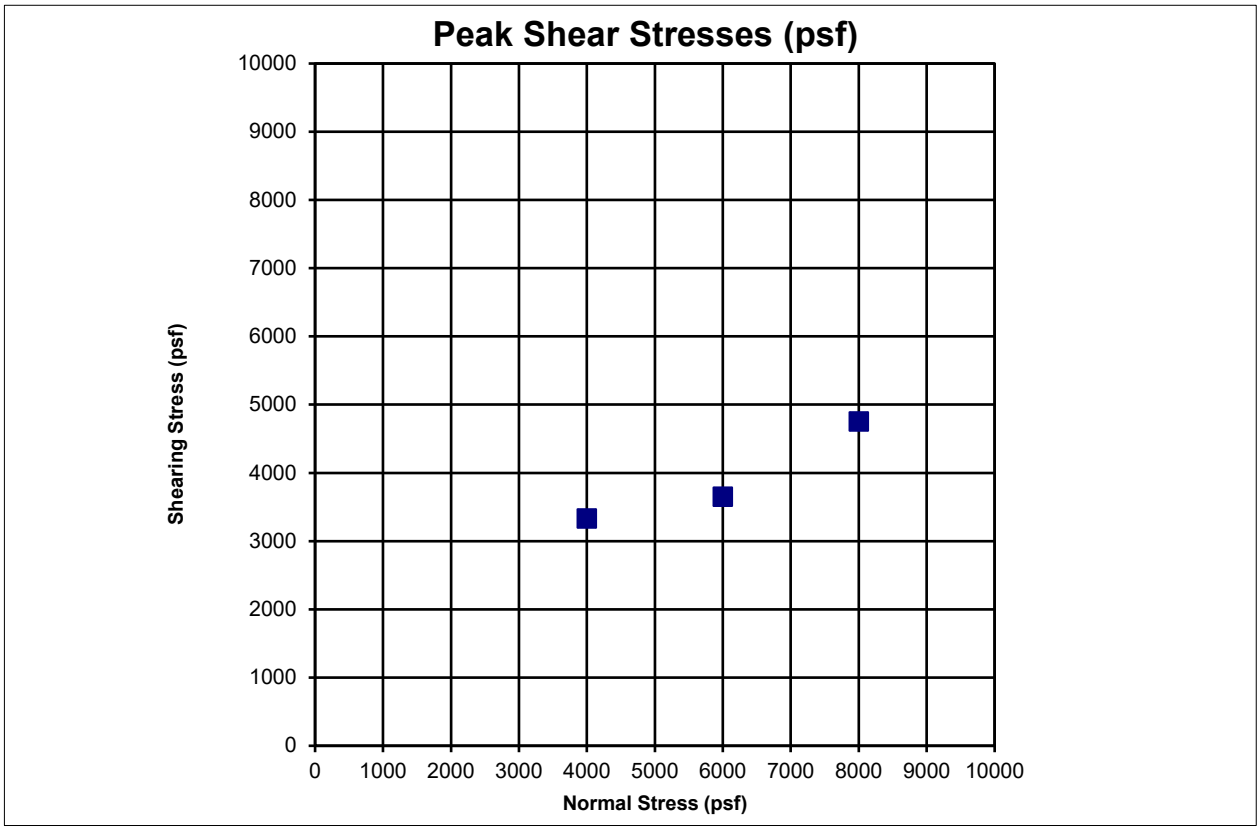
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Phoenix, AZ 85040

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-163 (40.0-41.0')
SAMPLE PREPARATION: Saturated - 4, 6, and 8 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 8
LAB NO: 23-1972
DATE ASSIGNED: 10/6/2023

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.994	0.992	0.984
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.005	0.005	0.005
Direct shear point:	1	2	3
Dry mass of specimen (g):	115.5	110.9	122.6
Initial Moisture Content:	23.8%	29.5%	21.0%
Initial Wet Density (pcf):	118.4	118.9	122.9
Initial Dry Density (pcf):	95.7	91.9	101.5
Final Moisture Content:	35.1%	40.0%	33.7%
Final Wet Density (pcf):	130.0	129.7	137.9
Final Dry Density (pcf):	96.2	92.6	103.2
Normal Stress (psf):	4000	6000	8000
Maximum Shearing Stress (psf):	3333	3650	4755
Vertical Deformation @ Max Shear (in):	0.323	0.307	0.250
Horizontal Deformation @ Max Shear (in):	0.061	0.119	0.204



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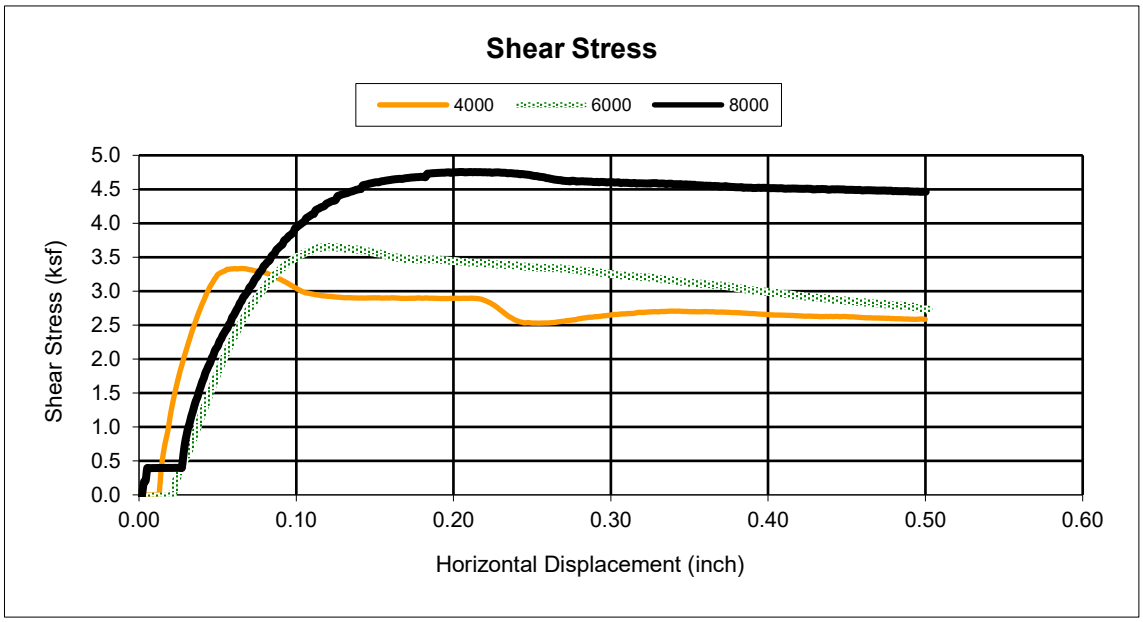
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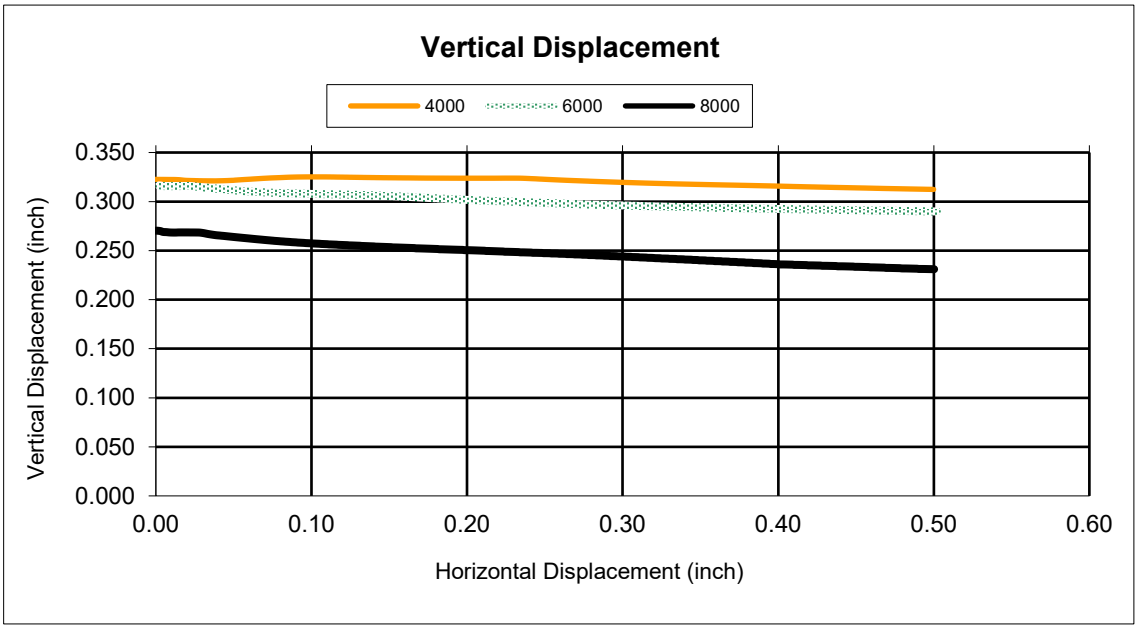
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-163 (40.0-41.0')
SAMPLE PREPARATION: Saturated - 4, 6, and 8 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 8
LAB NO: 23-1972
DATE ASSIGNED: 10/6/2023

NORMAL LOADS (psf): 4000 6000 8000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





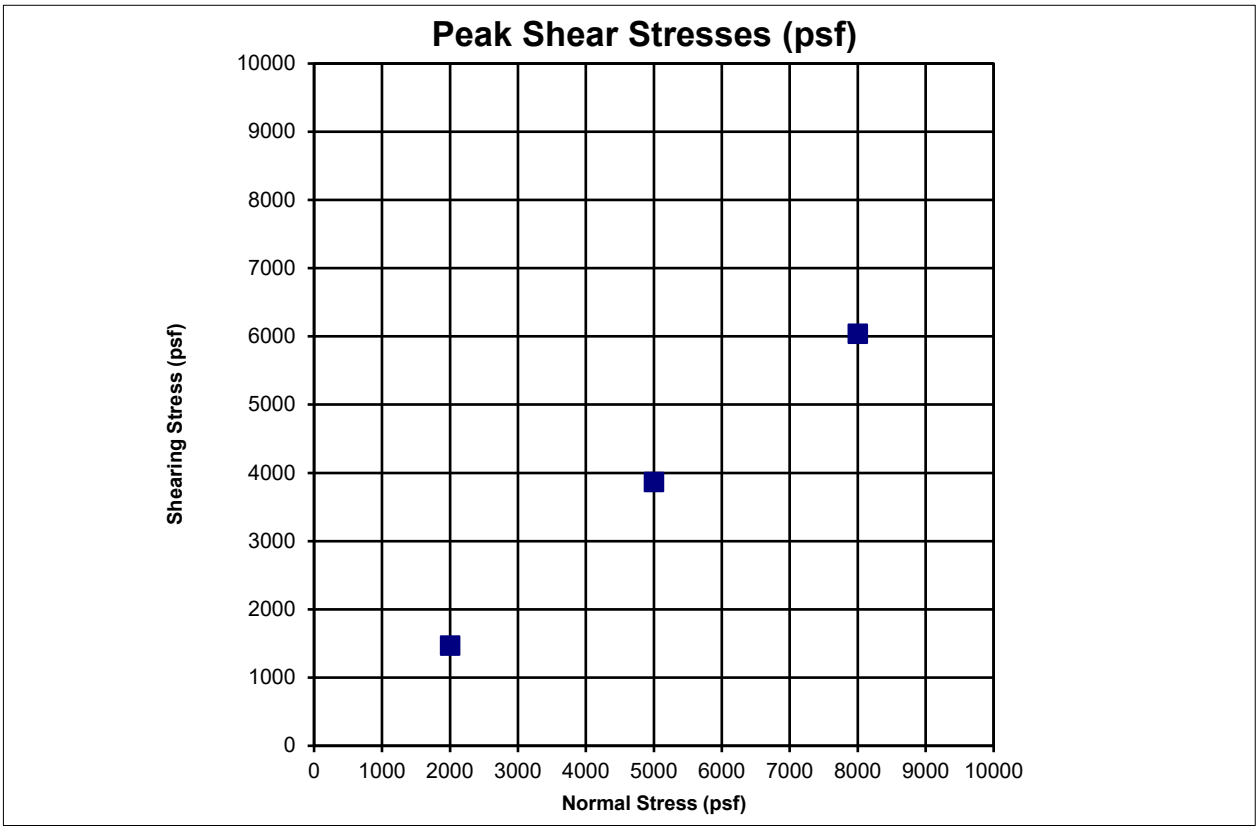
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PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-164 (25.0-26.5')
SAMPLE PREPARATION: Saturated - 2, 5, and 8 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 11
LAB NO: 23-2046-04
DATE ASSIGNED: 10/18/2023

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.996	0.994	0.947
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.005	0.005	0.005
Direct shear point:	1	2	3
Dry mass of specimen (g):	132.2	130.8	133.5
Initial Moisture Content:	12.4%	12.5%	13.9%
Initial Wet Density (pcf):	123.1	121.8	126.0
Initial Dry Density (pcf):	109.5	108.3	110.6
Final Moisture Content:	24.2%	25.9%	29.1%
Final Wet Density (pcf):	136.5	137.3	150.8
Final Dry Density (pcf):	109.9	109.0	116.8
Normal Stress (psf):	2000	5000	8000
Maximum Shearing Stress (psf):	1468	3868	6038
Vertical Deformation @ Max Shear (in):	0.328	0.284	0.295
Horizontal Deformation @ Max Shear (in):	0.102	0.105	0.098



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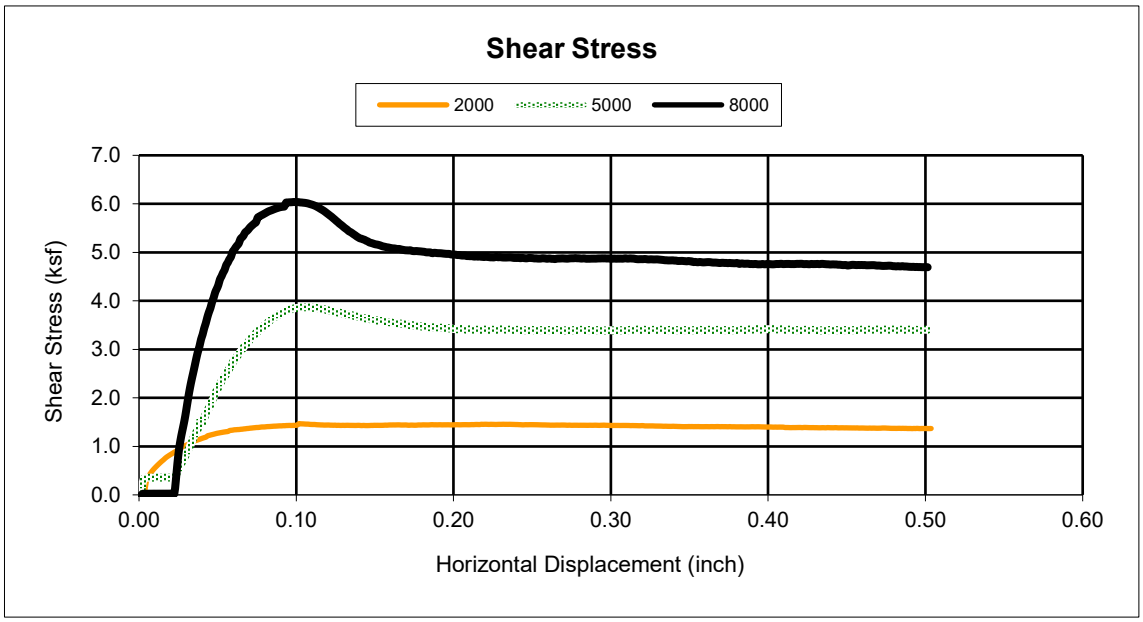
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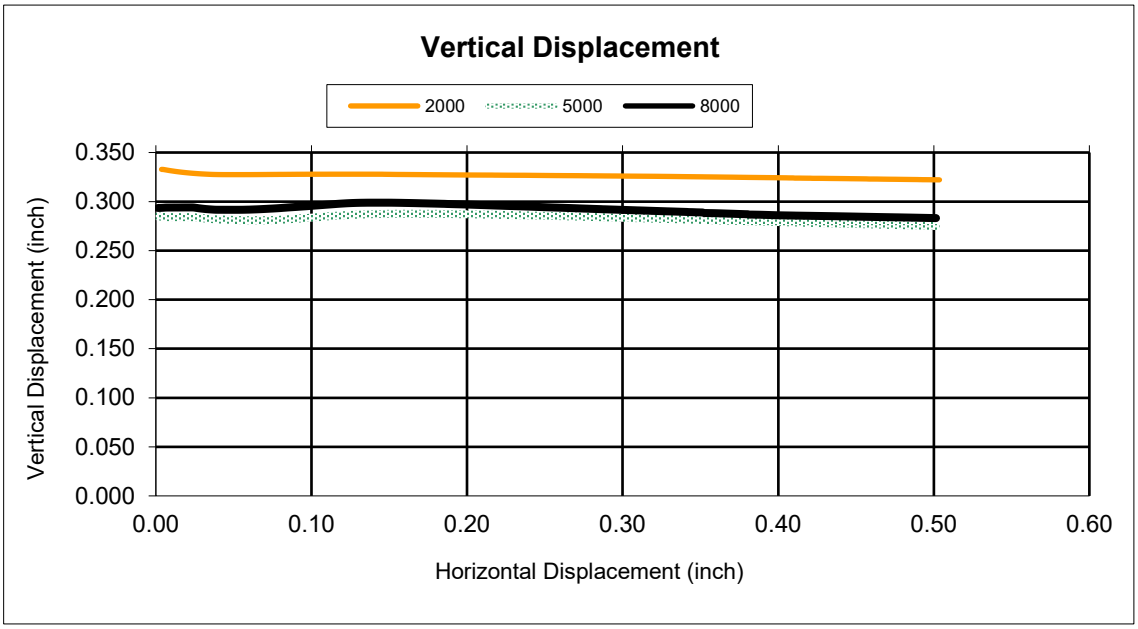
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-164 (25.0-26.5')
SAMPLE PREPARATION: Saturated - 2, 5, and 8 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 11
LAB NO: 23-2046-04
DATE ASSIGNED: 10/18/2023

NORMAL LOADS (psf): 2000 5000 8000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





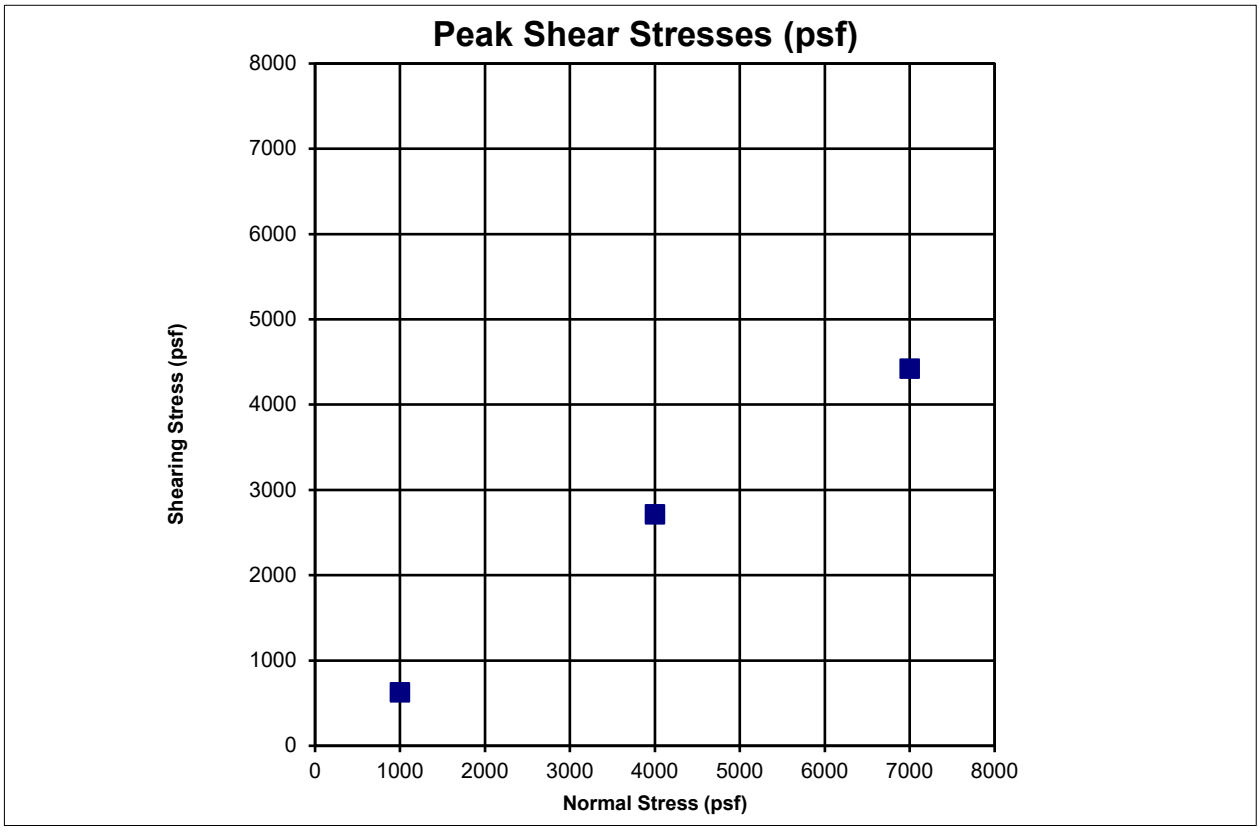
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3630 E Wier Ave.
Phoenix, AZ 85040

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-166 (15.0-16.0')
SAMPLE PREPARATION: Saturated - 1, 4, and 7 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 11
LAB NO: 23-2046-02
DATE ASSIGNED: 10/18/2023

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.979	0.973	0.963
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.008	0.008	0.008
Direct shear point:	1	2	3
Dry mass of specimen (g):	125.6	126.2	130.7
Initial Moisture Content:	9.0%	8.6%	9.7%
Initial Wet Density (pcf):	113.4	113.6	118.8
Initial Dry Density (pcf):	104.0	104.5	108.3
Final Moisture Content:	26.9%	30.0%	27.5%
Final Wet Density (pcf):	134.8	139.6	143.3
Final Dry Density (pcf):	106.2	107.4	112.4
Normal Stress (psf):	1000	4000	7000
Maximum Shearing Stress (psf):	628	2713	4422
Vertical Deformation @ Max Shear (in):	0.327	0.286	0.249
Horizontal Deformation @ Max Shear (in):	0.498	0.499	0.359



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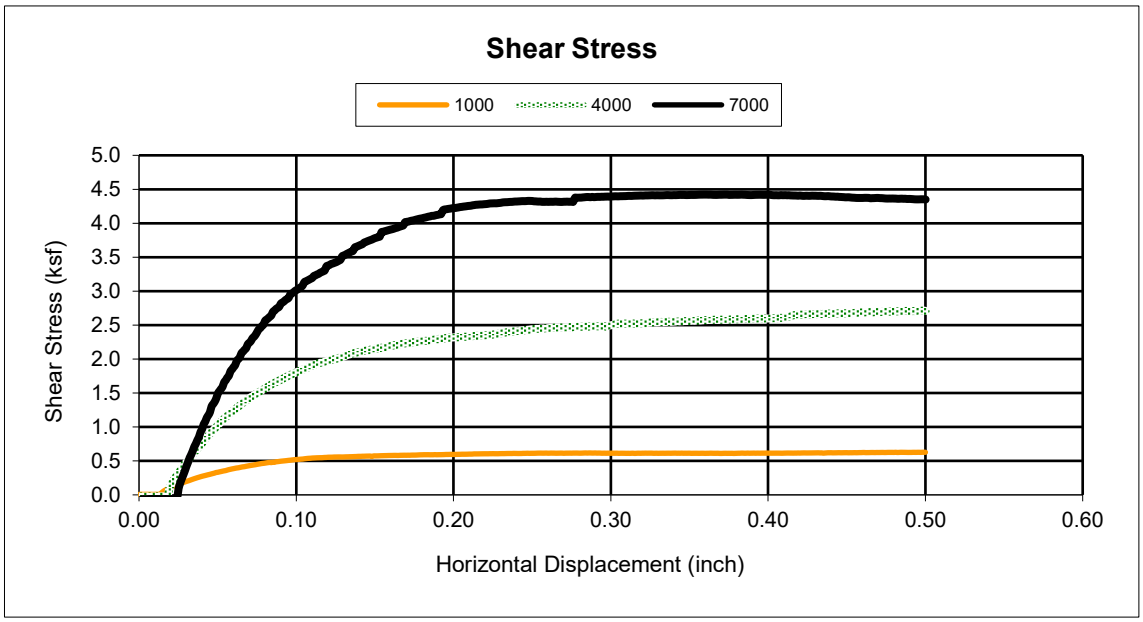
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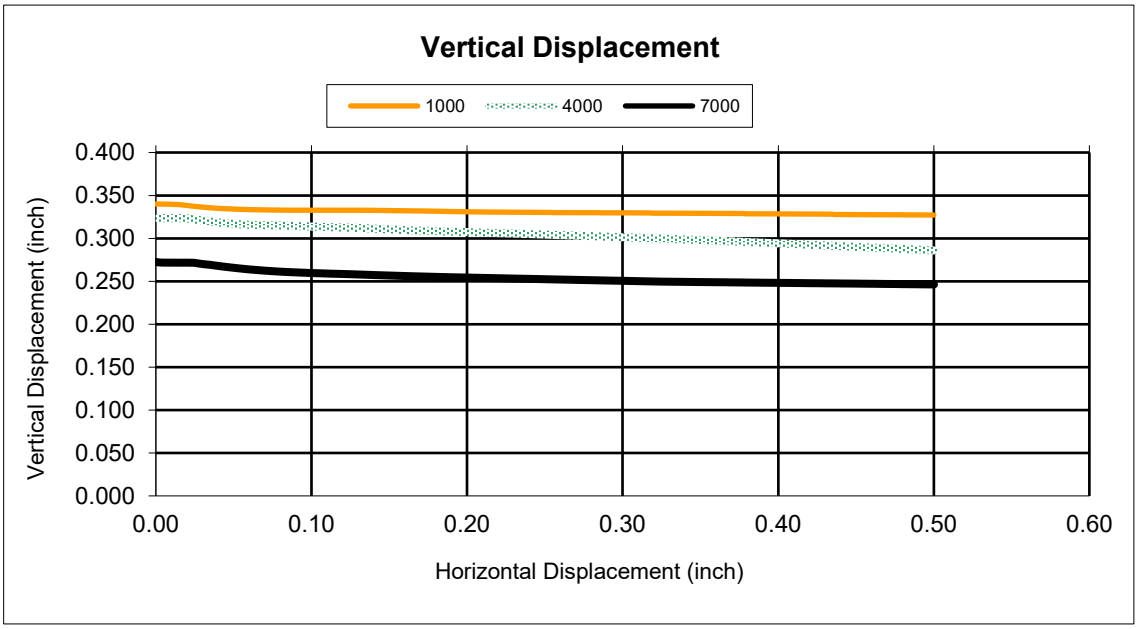
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-166 (15.0-16.0')
SAMPLE PREPARATION: Saturated - 1, 4, and 7 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 11
LAB NO: 23-2046-02
DATE ASSIGNED: 10/18/2023

NORMAL LOADS (psf): 1000 4000 7000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





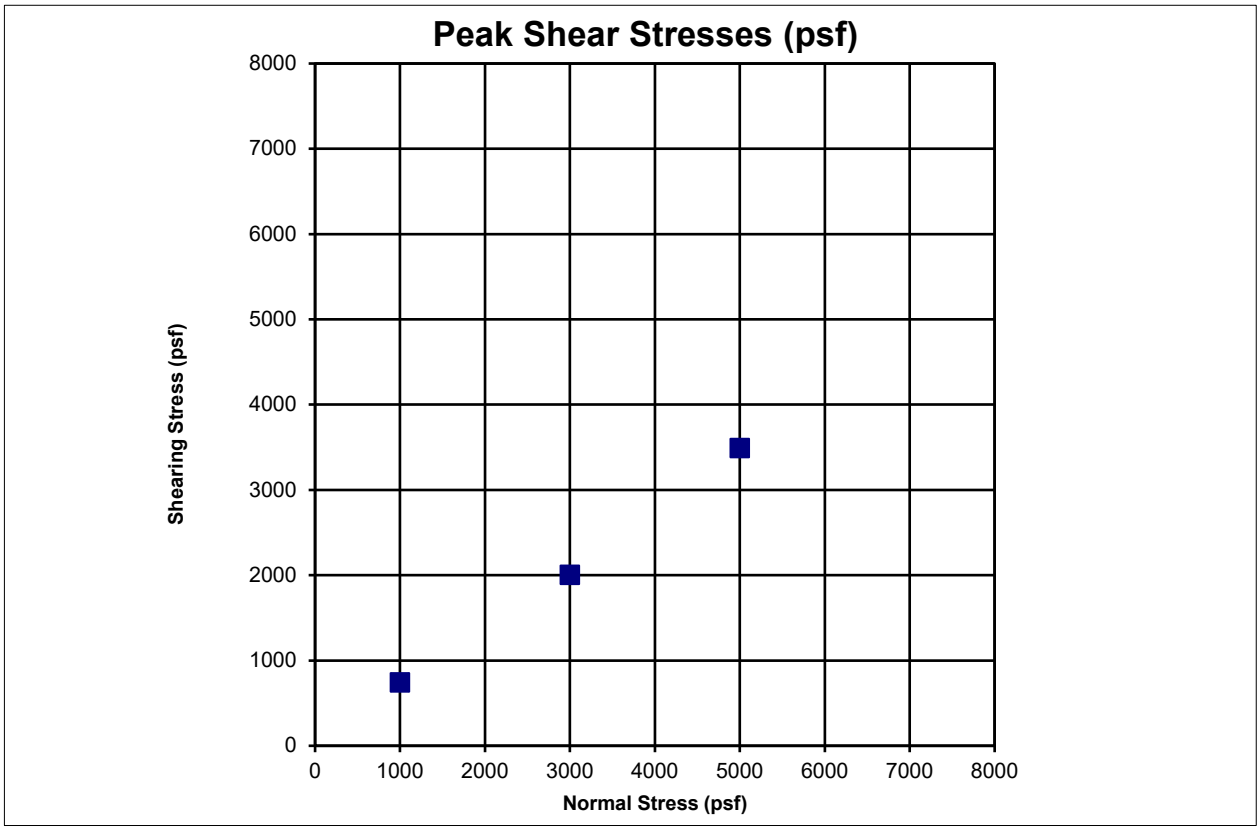
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3630 E Wier Ave.
Phoenix, AZ 85040

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-167 (10.0-11.0')
SAMPLE PREPARATION: Saturated 1, 3, 5 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 35
LAB NO: 23-2265-01
DATE ASSIGNED: 12/22/2023

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.994	0.995	0.992
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.01	0.01	0.01
Direct shear point:	1	2	3
Dry mass of specimen (g):	114.4	116.9	117.3
Initial Moisture Content:	3.3%	3.8%	3.2%
Initial Wet Density (pcf):	97.9	100.5	100.3
Initial Dry Density (pcf):	94.8	96.8	97.2
Final Moisture Content:	24.0%	24.6%	24.9%
Final Wet Density (pcf):	118.3	121.2	122.3
Final Dry Density (pcf):	95.3	97.3	97.9
Normal Stress (psf):	1000	3000	5000
Maximum Shearing Stress (psf):	744	2004	3493
Vertical Deformation @ Max Shear (in):	0.271	0.295	0.275
Horizontal Deformation @ Max Shear (in):	0.134	0.167	0.229



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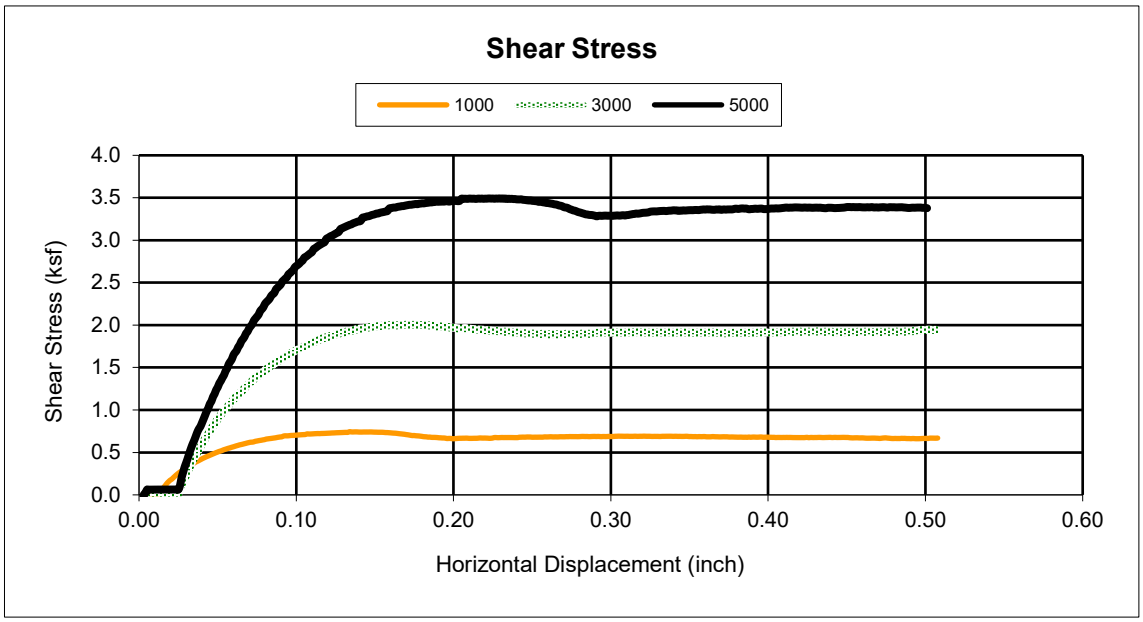
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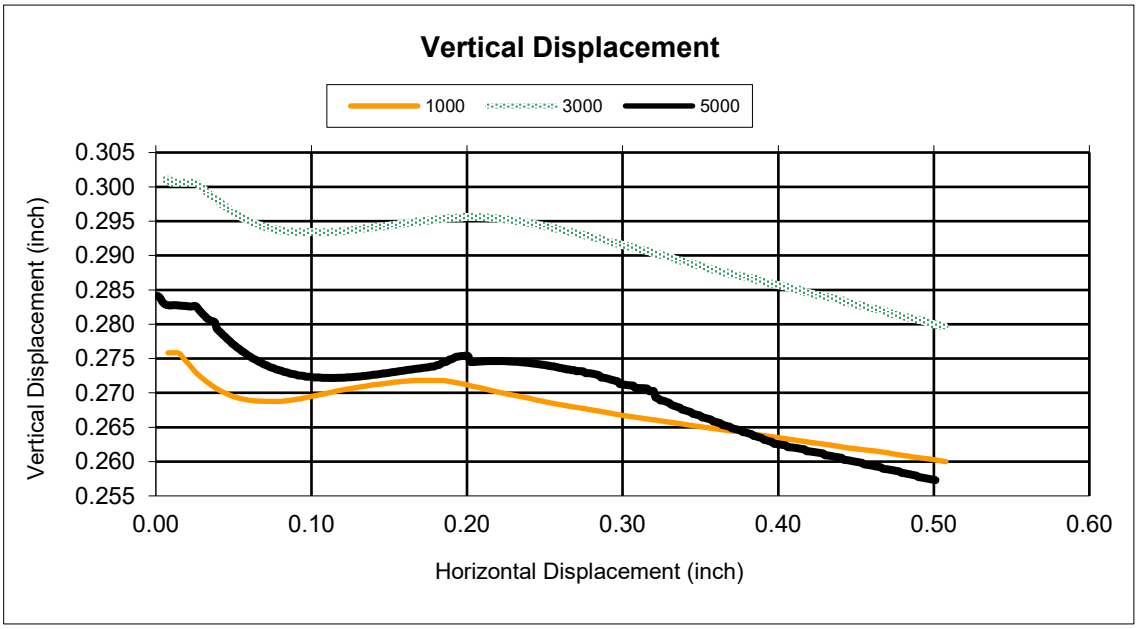
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-167 (10.0-11.0')
SAMPLE PREPARATION: Saturated 1, 3, 5 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 35
LAB NO: 23-2265-01
DATE ASSIGNED: 12/22/2023

NORMAL LOADS (psf): 1000 3000 5000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





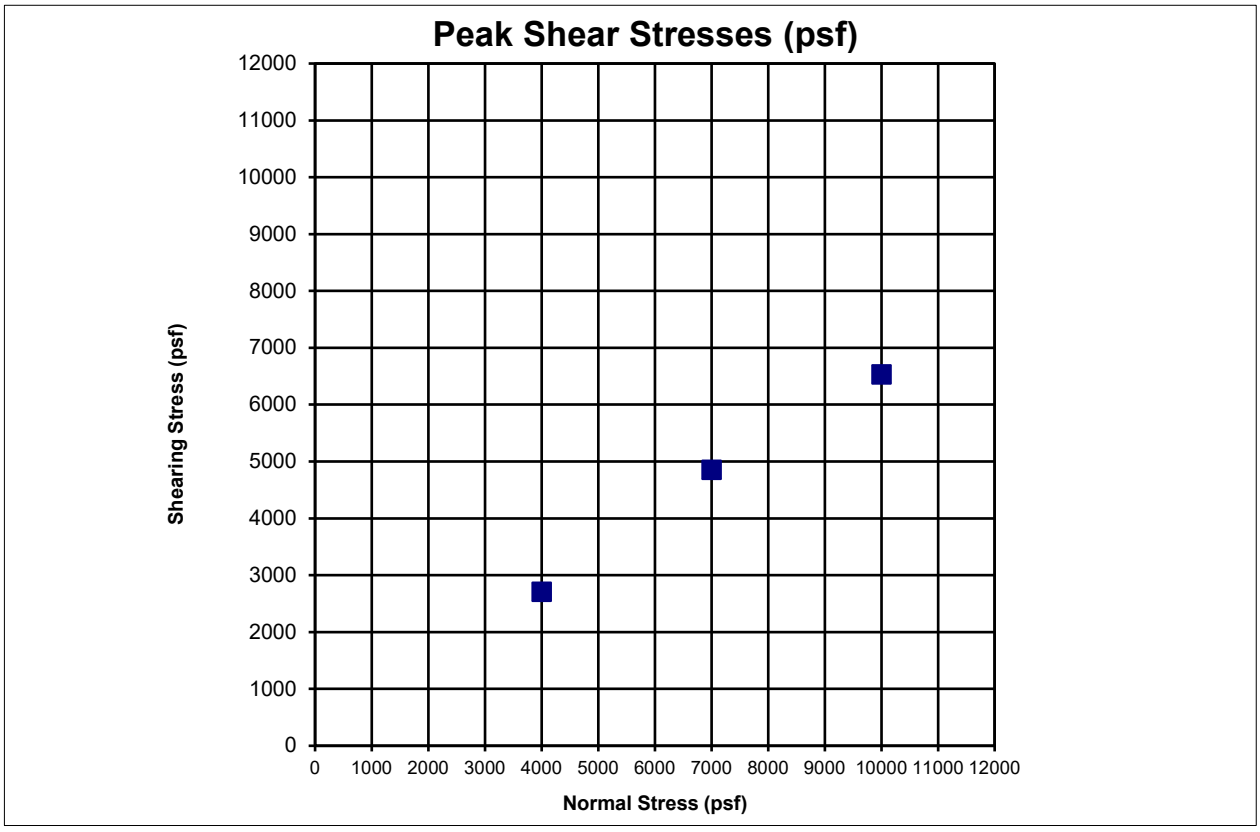
WSP USA
3630 E Wier Ave.
Phoenix, AZ 85040

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-172 (40.0-41.0')
SAMPLE PREPARATION: Saturated - 4, 7, and 10 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 22
LAB NO: 23-2168-01
DATE ASSIGNED: 11/17/2023

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.993	0.975	0.987
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.005	0.005	0.005
Direct shear point:	1	2	3
Dry mass of specimen (g):	116.1	117.9	119.7
Initial Moisture Content:	8.5%	9.1%	9.2%
Initial Wet Density (pcf):	104.4	106.5	108.3
Initial Dry Density (pcf):	96.2	97.7	99.1
Final Moisture Content:	25.0%	24.1%	23.6%
Final Wet Density (pcf):	121.1	124.3	124.1
Final Dry Density (pcf):	96.9	100.2	100.5
Normal Stress (psf):	4000	7000	10000
Maximum Shearing Stress (psf):	2710	4856	6530
Vertical Deformation @ Max Shear (in):	0.243	0.276	0.279
Horizontal Deformation @ Max Shear (in):	0.173	0.239	0.182



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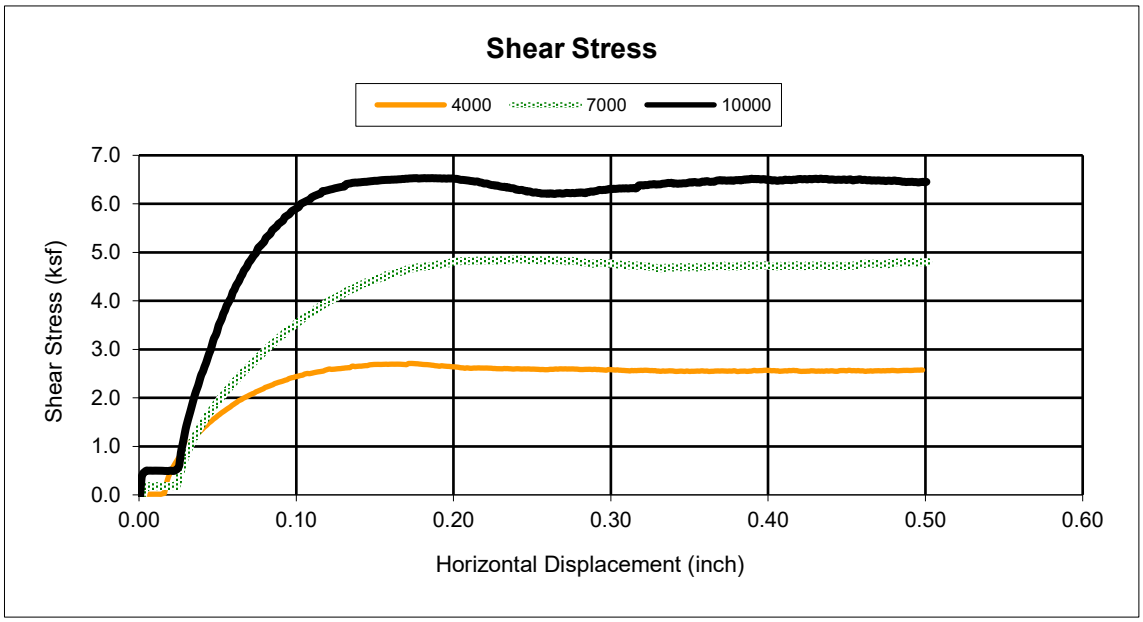
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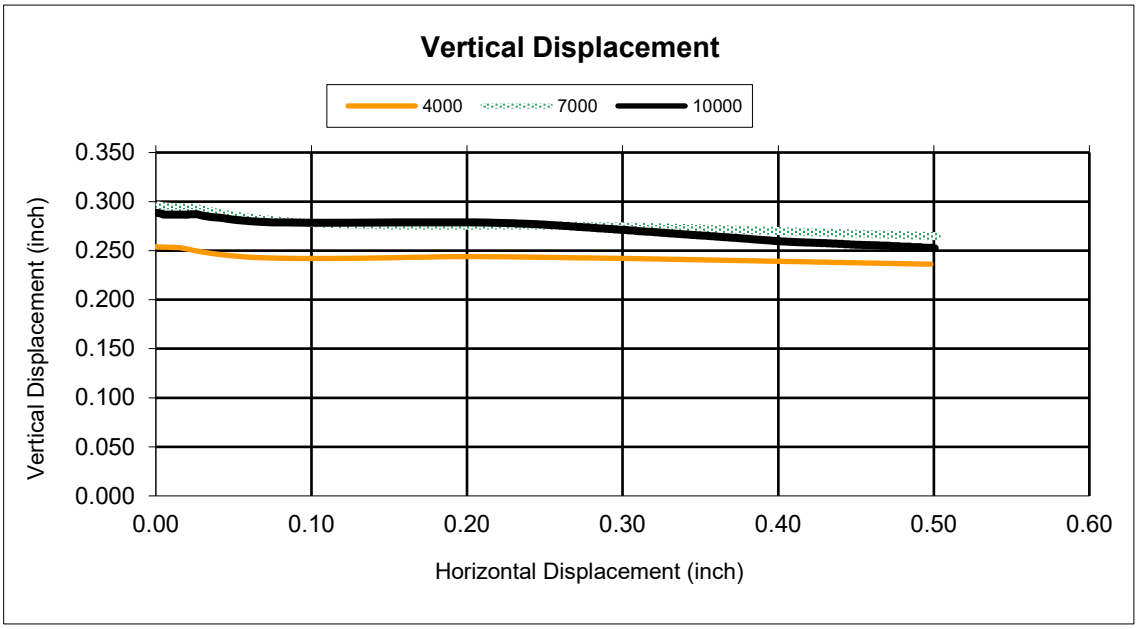
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-172 (40.0-41.0')
SAMPLE PREPARATION: Saturated - 4, 7, and 10 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 22
LAB NO: 23-2168-01
DATE ASSIGNED: 11/17/2023

NORMAL LOADS (psf): 4000 7000 10000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





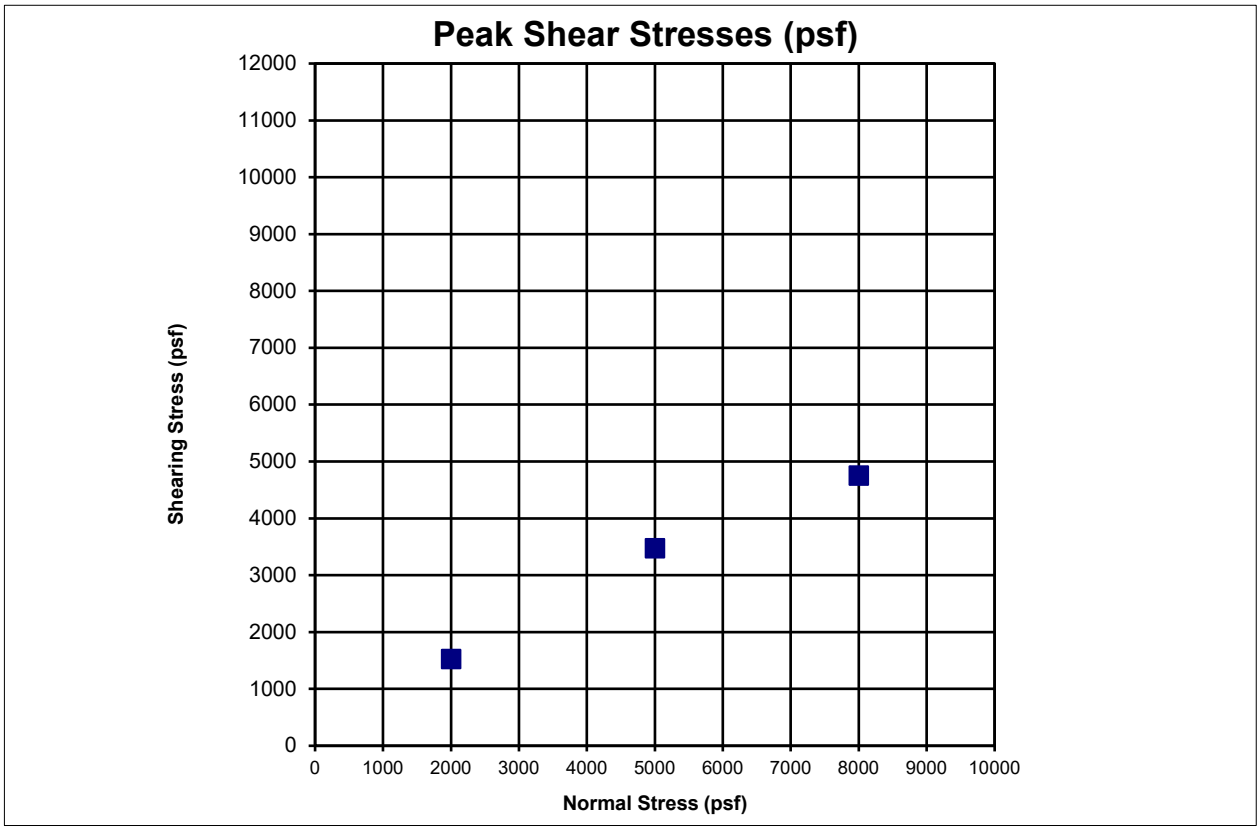
WSP USA
3630 E Wier Ave.
Phoenix, AZ 85040

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-173 (20.0-21.0')
SAMPLE PREPARATION: Saturated - 2, 5, and 8 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 22
LAB NO: 23-2168-02
DATE ASSIGNED: 11/17/2023

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.986	0.977	0.984
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.001	0.001	0.001
Direct shear point:	1	2	3
Dry mass of specimen (g):	110.8	112.5	115.3
Initial Moisture Content:	15.9%	20.7%	20.7%
Initial Wet Density (pcf):	106.3	112.5	115.3
Initial Dry Density (pcf):	91.8	93.2	95.5
Final Moisture Content:	31.5%	33.9%	34.1%
Final Wet Density (pcf):	122.4	127.6	130.1
Final Dry Density (pcf):	93.1	95.4	97.0
Normal Stress (psf):	2000	5000	8000
Maximum Shearing Stress (psf):	1524	3476	4753
Vertical Deformation @ Max Shear (in):	0.271	0.250	0.265
Horizontal Deformation @ Max Shear (in):	0.147	0.175	0.301



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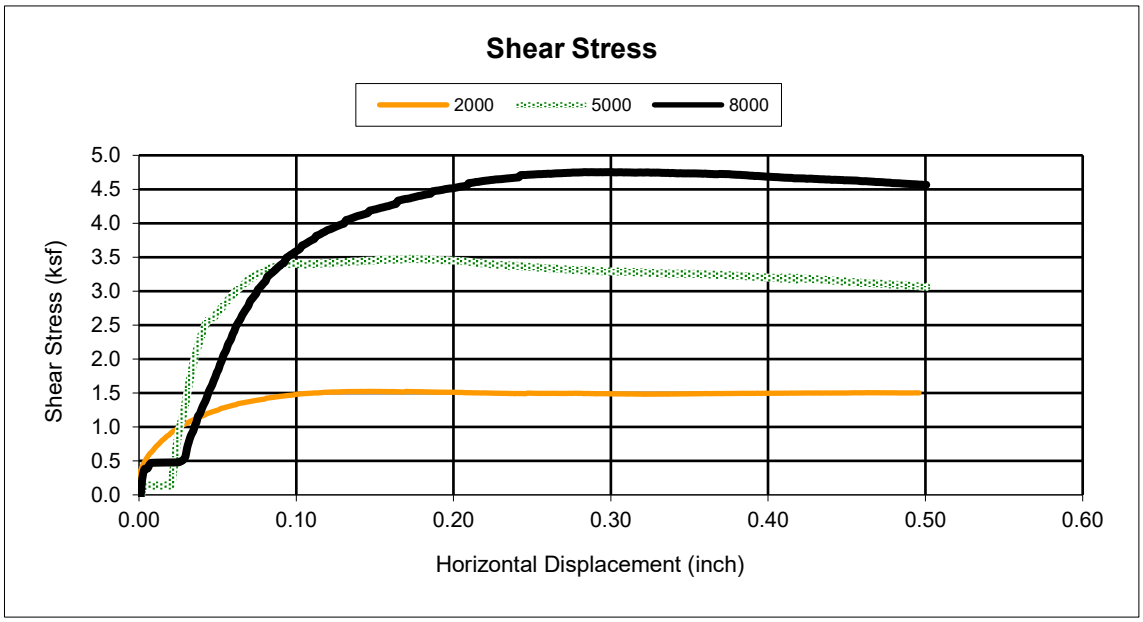
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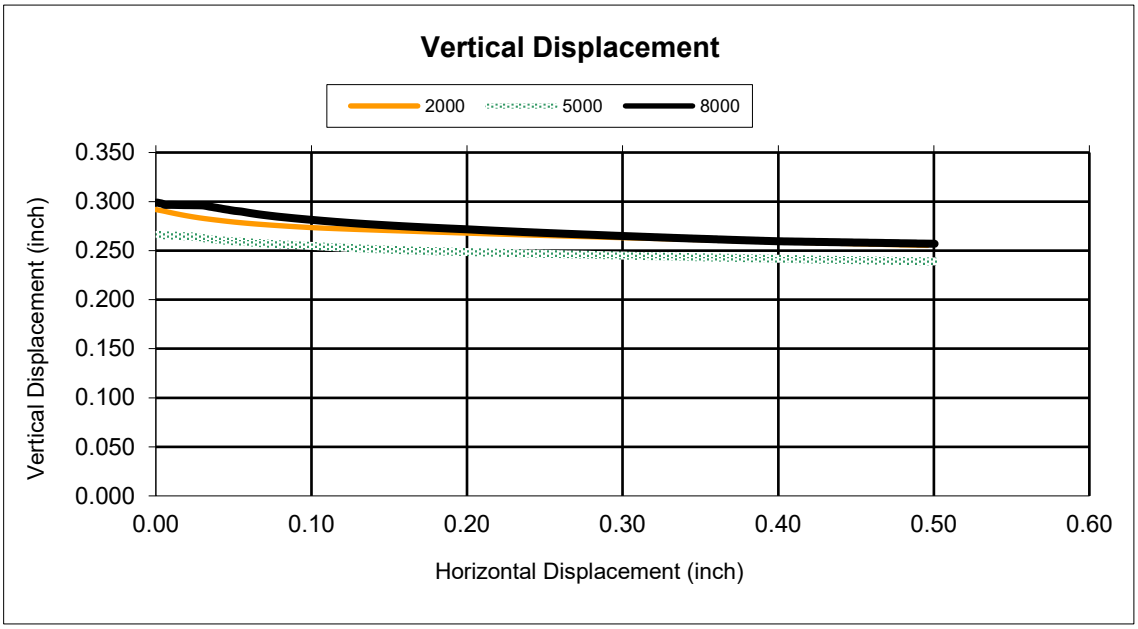
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-173 (20.0-21.0')
SAMPLE PREPARATION: Saturated - 2, 5, and 8 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 22
LAB NO: 23-2168-02
DATE ASSIGNED: 11/17/2023

NORMAL LOADS (psf): 2000 5000 8000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





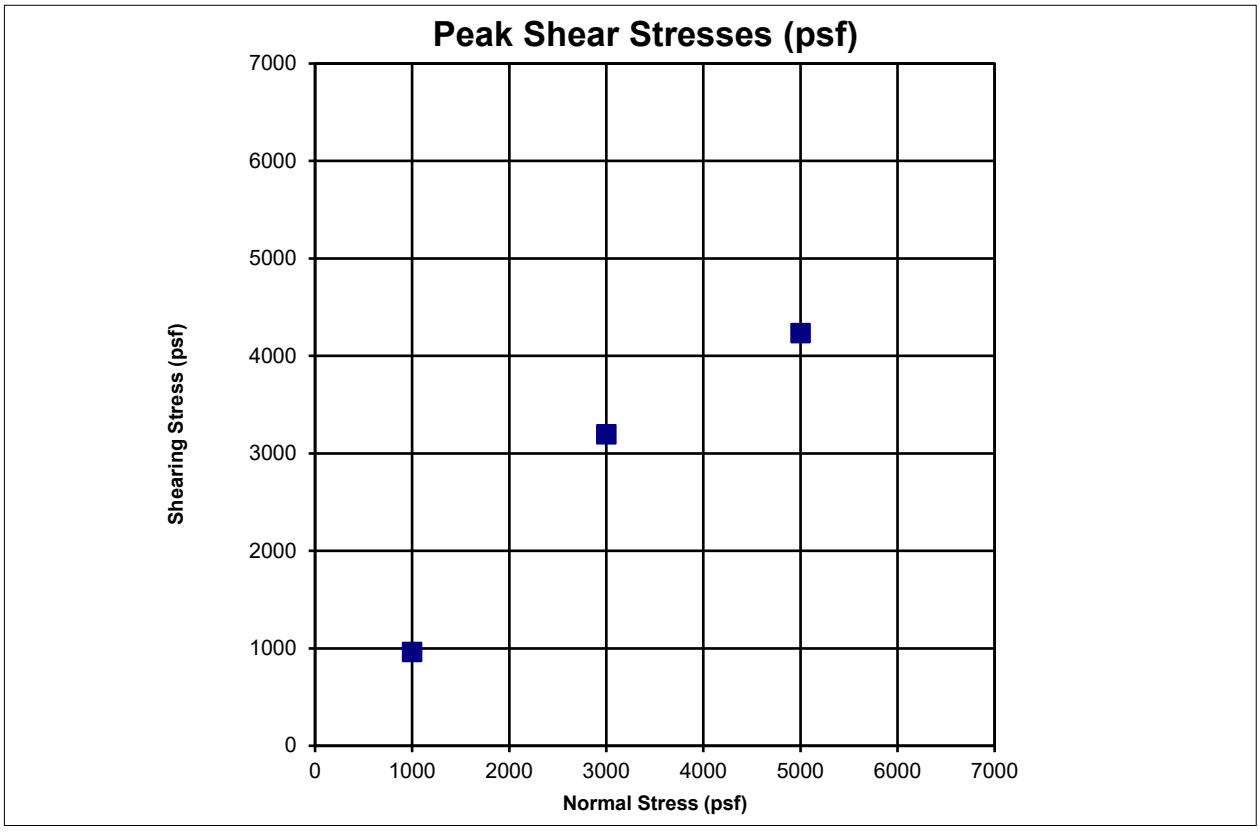
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PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-174 (10.0-11.0')
SAMPLE PREPARATION: Saturated - 1, 2, and 4 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 27
LAB NO: 23-2189-01
DATE ASSIGNED: 11/29/2023

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.990	0.933	0.941
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.005	0.005	0.005
Direct shear point:	1	2	3
Dry mass of specimen (g):	121.7	125.4	127.0
Initial Moisture Content:	10.6%	9.2%	11.1%
Initial Wet Density (pcf):	111.5	113.4	116.9
Initial Dry Density (pcf):	100.8	103.9	105.2
Final Moisture Content:	26.1%	21.5%	23.1%
Final Wet Density (pcf):	128.4	135.2	137.7
Final Dry Density (pcf):	101.8	111.3	111.8
Normal Stress (psf):	1000	3000	5000
Maximum Shearing Stress (psf):	962	3195	4236
Vertical Deformation @ Max Shear (in):	0.247	0.225	0.218
Horizontal Deformation @ Max Shear (in):	0.132	0.388	0.291



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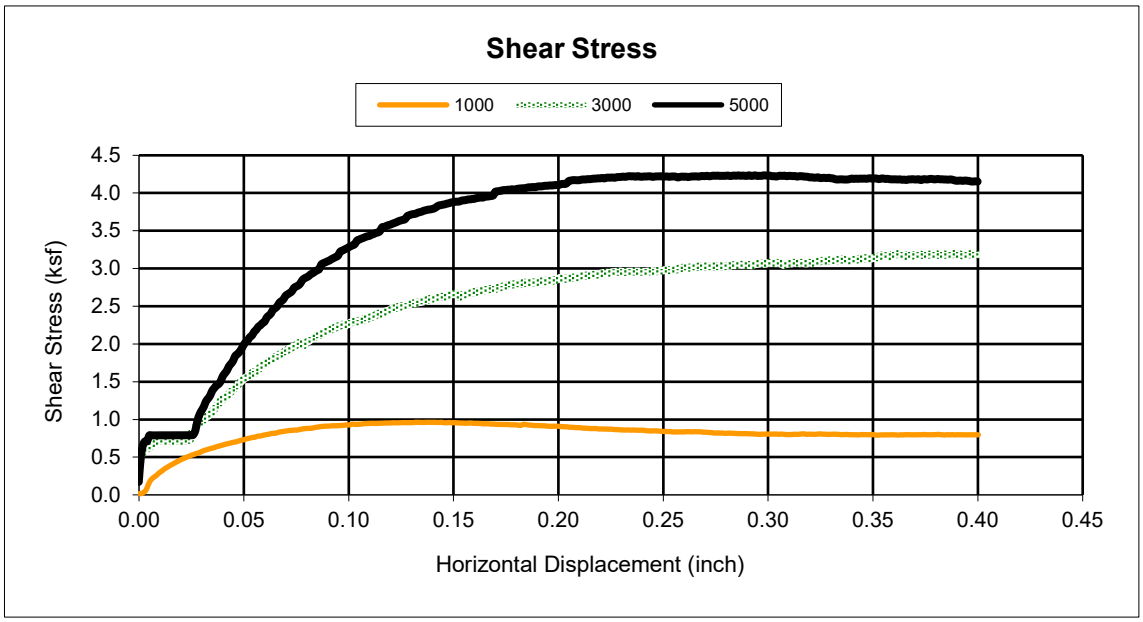
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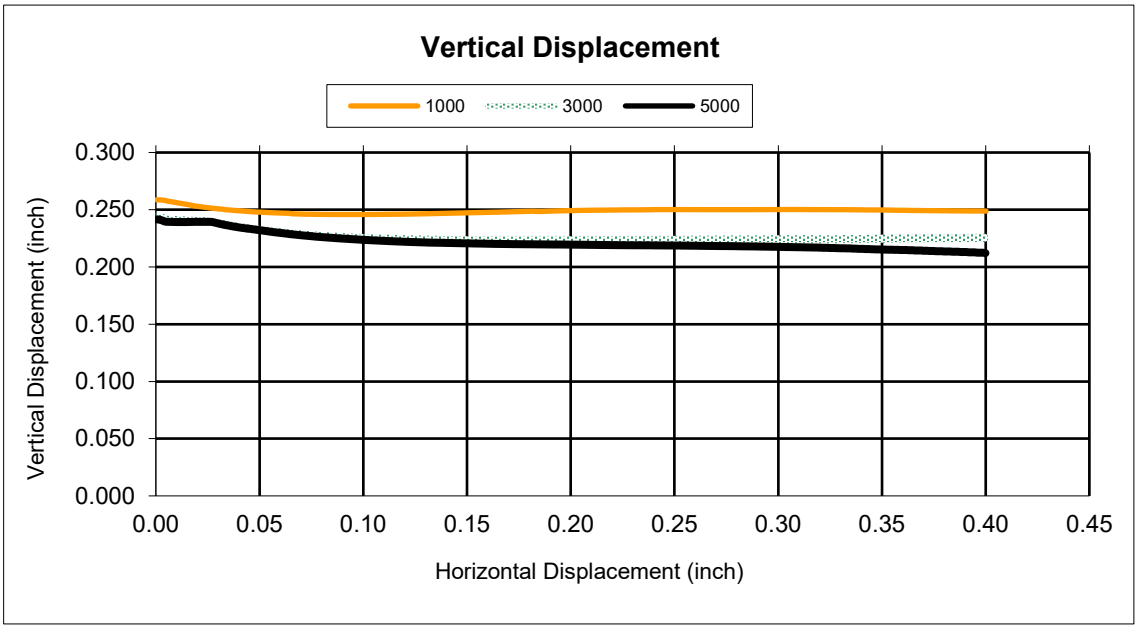
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-174 (10.0-11.0')
SAMPLE PREPARATION: Saturated - 1, 2, and 4 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 27
LAB NO: 23-2189-01
DATE ASSIGNED: 11/29/2023

NORMAL LOADS (psf): 1000 3000 5000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





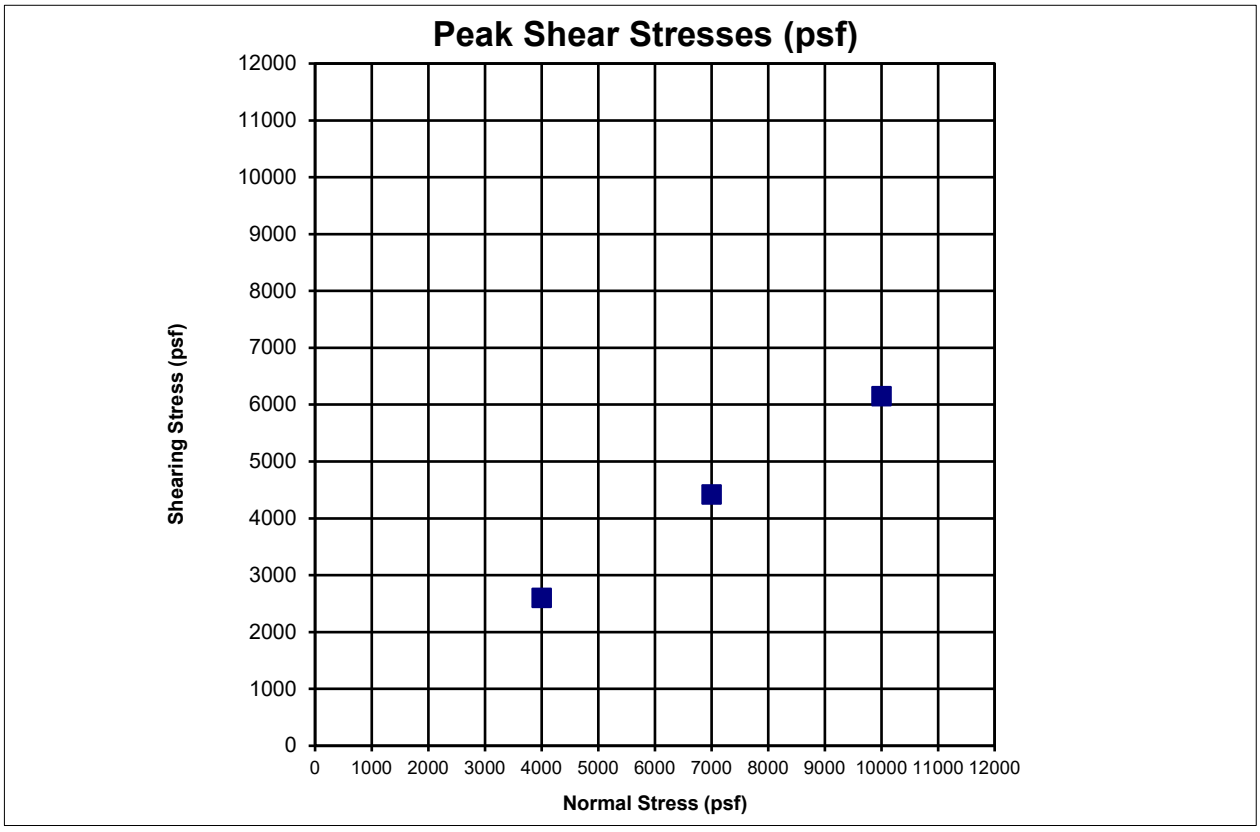
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PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-174 (40-41.0')
SAMPLE PREPARATION: Saturated - 4, 7, and 10 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 27
LAB NO: 23-2189-02
DATE ASSIGNED: 11/29/2023

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.981	0.974	0.978
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.005	0.005	0.005
Direct shear point:	1	2	3
Dry mass of specimen (g):	112.4	113.9	115.6
Initial Moisture Content:	8.2%	8.0%	7.8%
Initial Wet Density (pcf):	100.7	101.9	103.2
Initial Dry Density (pcf):	93.1	94.3	95.7
Final Moisture Content:	27.3%	25.9%	24.9%
Final Wet Density (pcf):	120.8	122.0	122.3
Final Dry Density (pcf):	94.9	96.9	97.9
Normal Stress (psf):	4000	7000	10000
Maximum Shearing Stress (psf):	2599	4423	6151
Vertical Deformation @ Max Shear (in):	0.244	0.225	0.238
Horizontal Deformation @ Max Shear (in):	0.401	0.396	0.238



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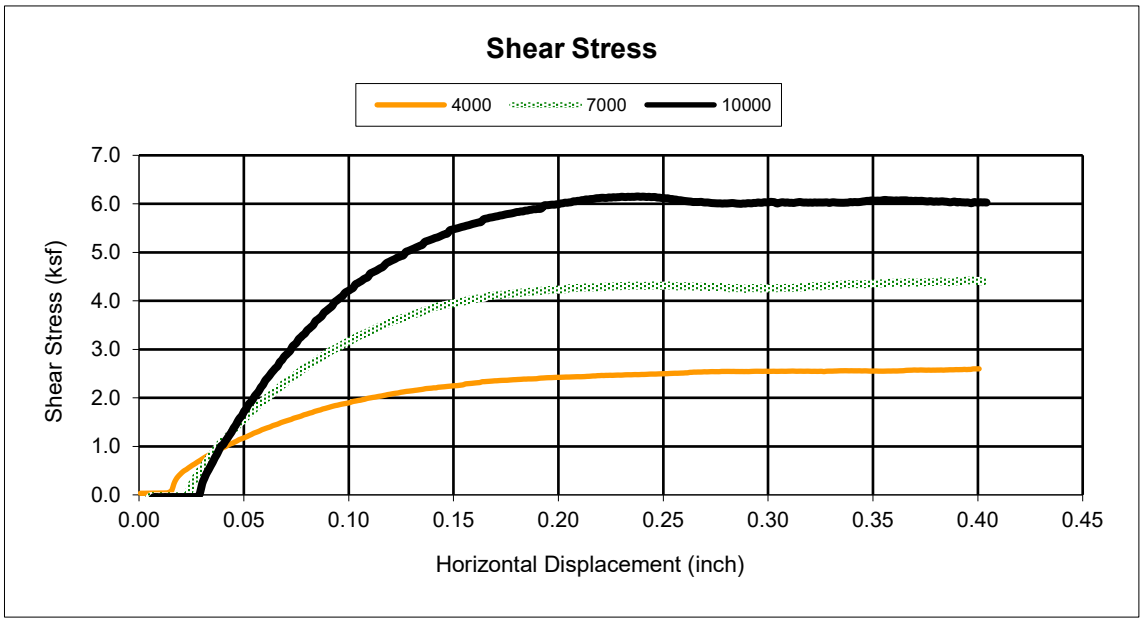
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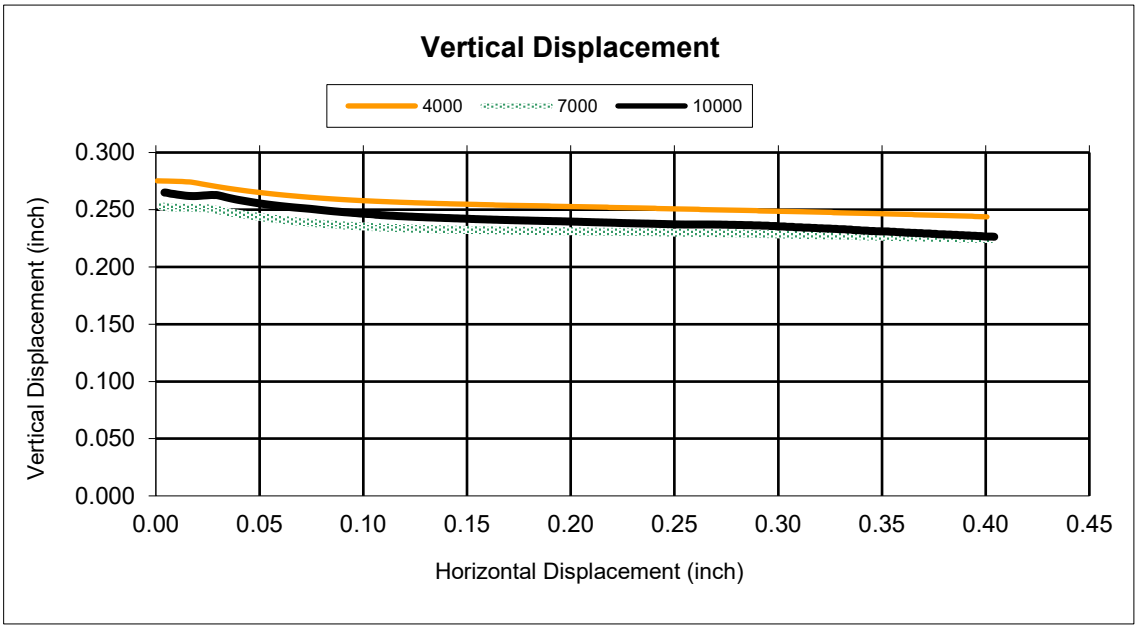
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-174 (40-41.0')
SAMPLE PREPARATION: Saturated - 4, 7, and 10 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 27
LAB NO: 23-2189-02
DATE ASSIGNED: 11/29/2023

NORMAL LOADS (psf): 4000 7000 10000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





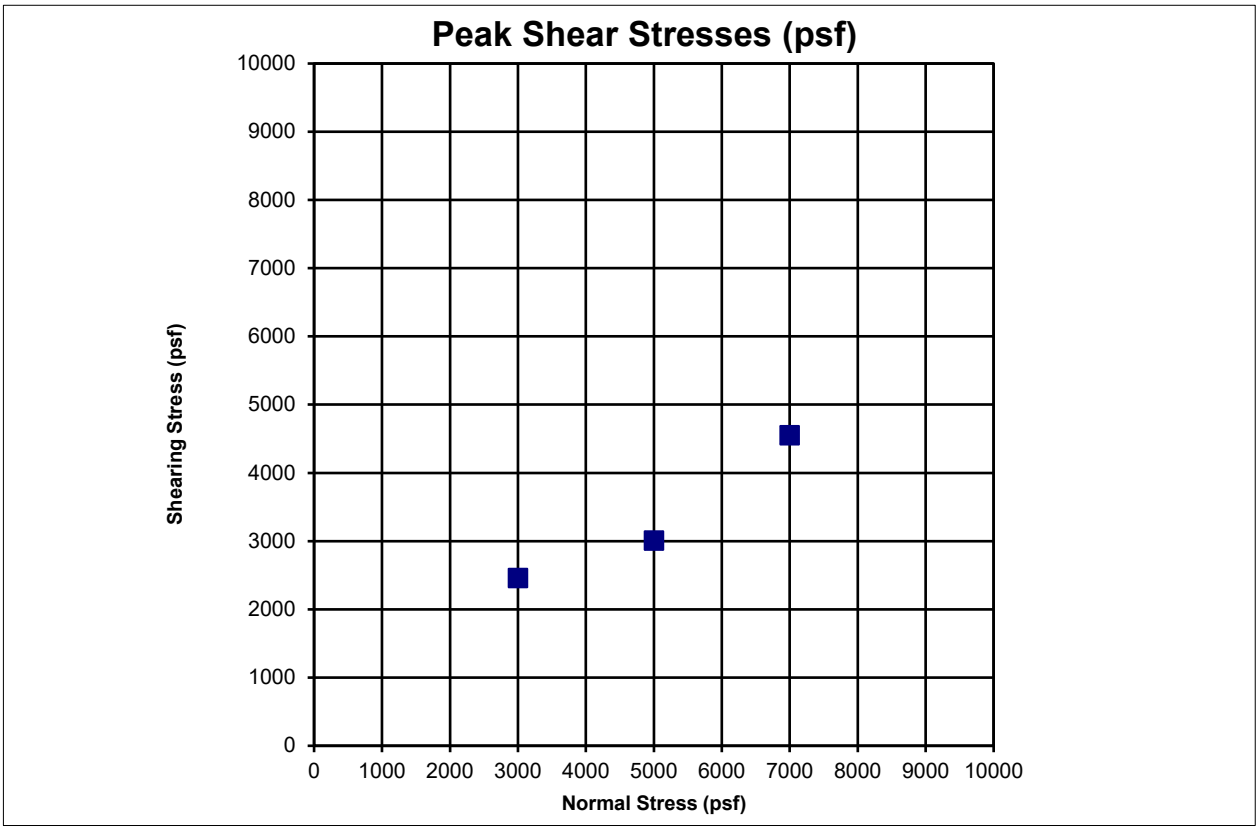
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PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-176 (30.0-31.0')
SAMPLE PREPARATION: Saturated - 3, 5, and 7 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 53
LAB NO: 24-2446-02
DATE ASSIGNED: 2/9/2024

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.993	0.995	0.996
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.01	0.01	0.01
Direct shear point:	1	2	3
Dry mass of specimen (g):	91.1	118.3	108.3
Initial Moisture Content:	40.4%	19.2%	28.5%
Initial Wet Density (pcf):	105.9	116.8	115.3
Initial Dry Density (pcf):	75.5	98.0	89.7
Final Moisture Content:	58.0%	32.9%	41.2%
Final Wet Density (pcf):	120.0	130.8	127.2
Final Dry Density (pcf):	76.0	98.5	90.1
Normal Stress (psf):	3000	5000	7000
Maximum Shearing Stress (psf):	2459	3007	4550
Vertical Deformation @ Max Shear (in):	0.306	0.338	0.349
Horizontal Deformation @ Max Shear (in):	0.279	0.198	0.172



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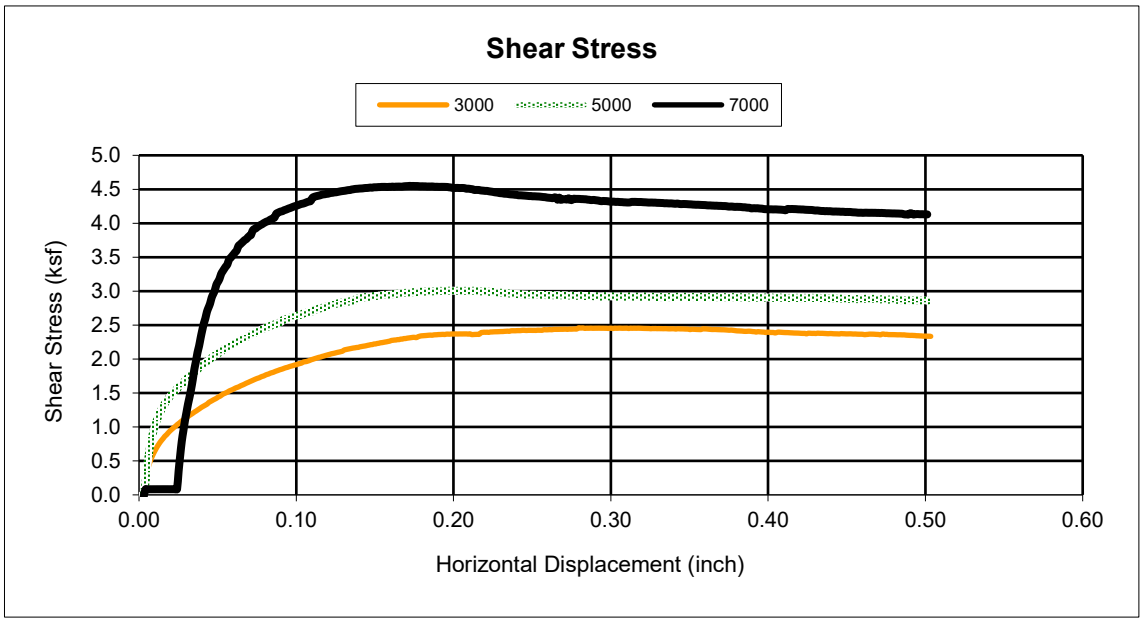
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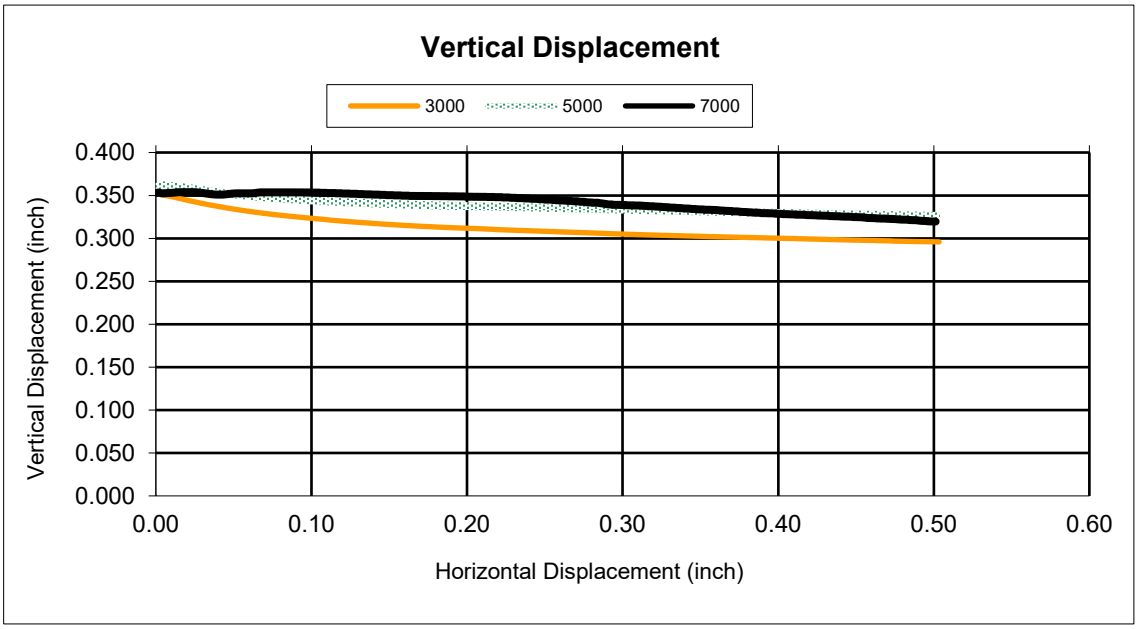
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-176 (30.0-31.0')
SAMPLE PREPARATION: Saturated - 3, 5, and 7 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 53
LAB NO: 24-2446-02
DATE ASSIGNED: 2/9/2024

NORMAL LOADS (psf): 3000 5000 7000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





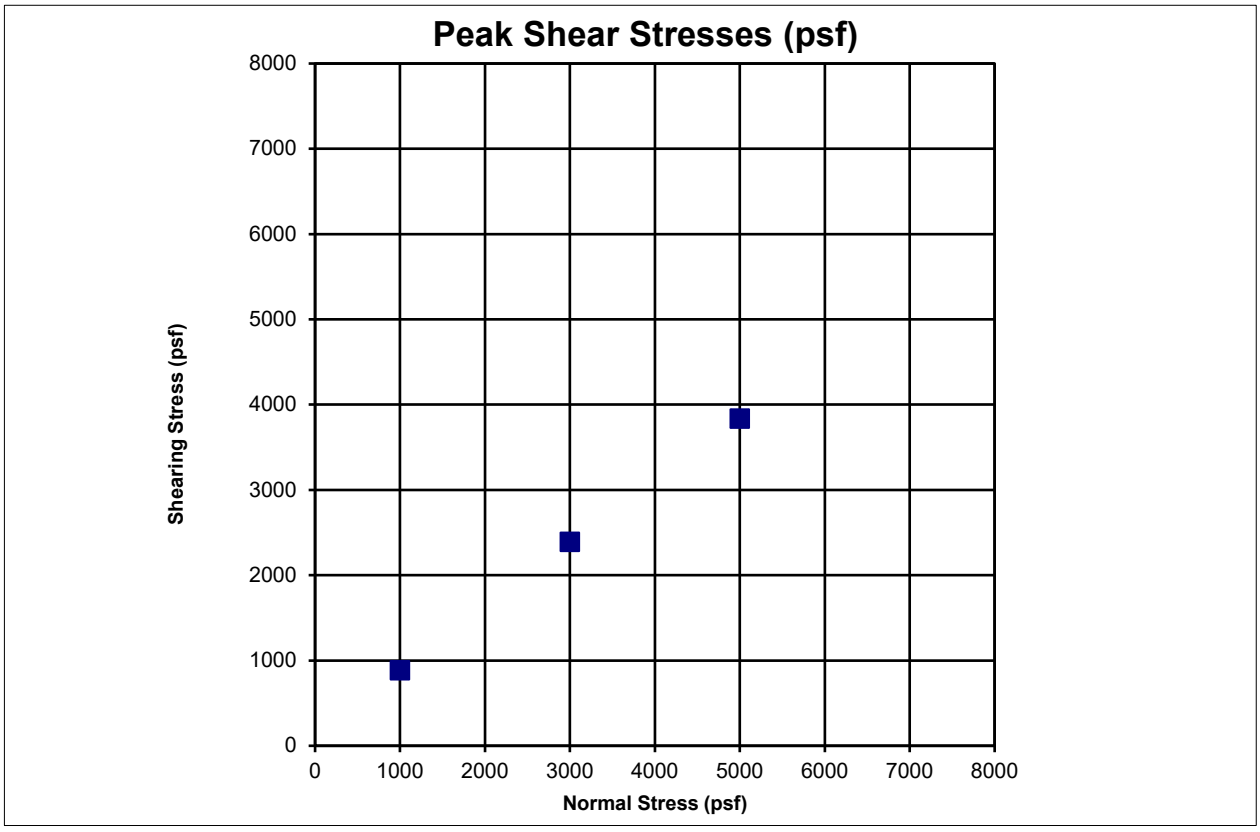
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PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-179 (10.0-11.0')
SAMPLE PREPARATION: Saturated - 1, 3, and 5 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 53
LAB NO: 24-2446-01
DATE ASSIGNED: 2/9/2024

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.987	0.991	0.994
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.01	0.01	0.01
Direct shear point:	1	2	3
Dry mass of specimen (g):	121.4	124.4	121.8
Initial Moisture Content:	2.6%	3.5%	2.6%
Initial Wet Density (pcf):	103.1	106.7	103.5
Initial Dry Density (pcf):	100.5	103.0	100.9
Final Moisture Content:	22.2%	21.2%	21.6%
Final Wet Density (pcf):	124.5	126.1	123.5
Final Dry Density (pcf):	101.9	104.0	101.5
Normal Stress (psf):	1000	3000	5000
Maximum Shearing Stress (psf):	885	2393	3836
Vertical Deformation @ Max Shear (in):	0.332	0.278	0.297
Horizontal Deformation @ Max Shear (in):	0.170	0.201	0.227



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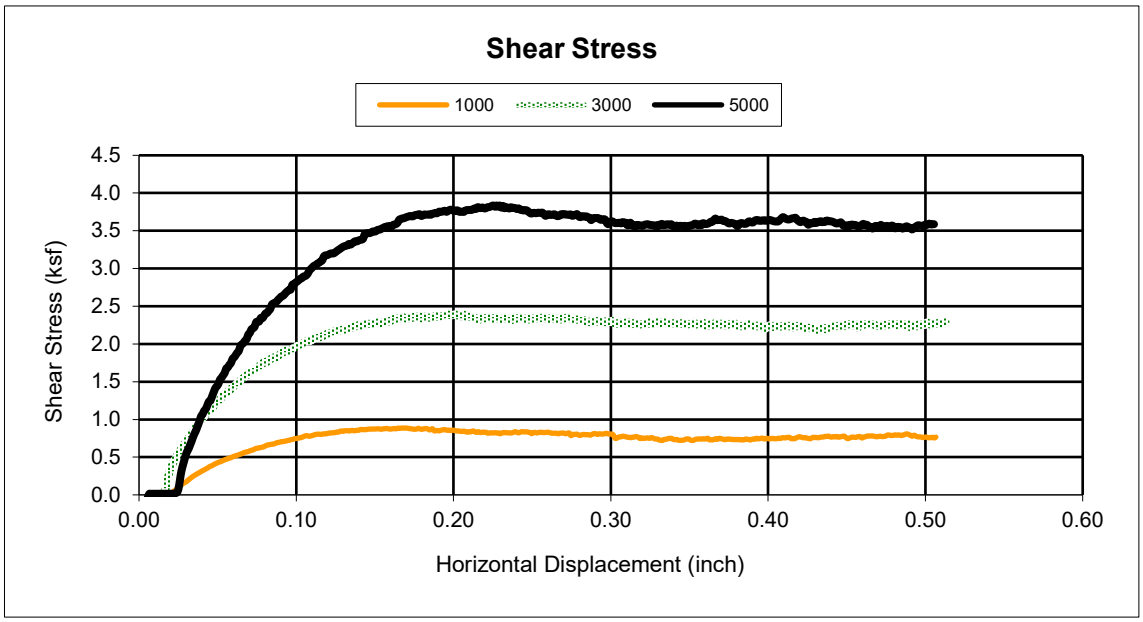
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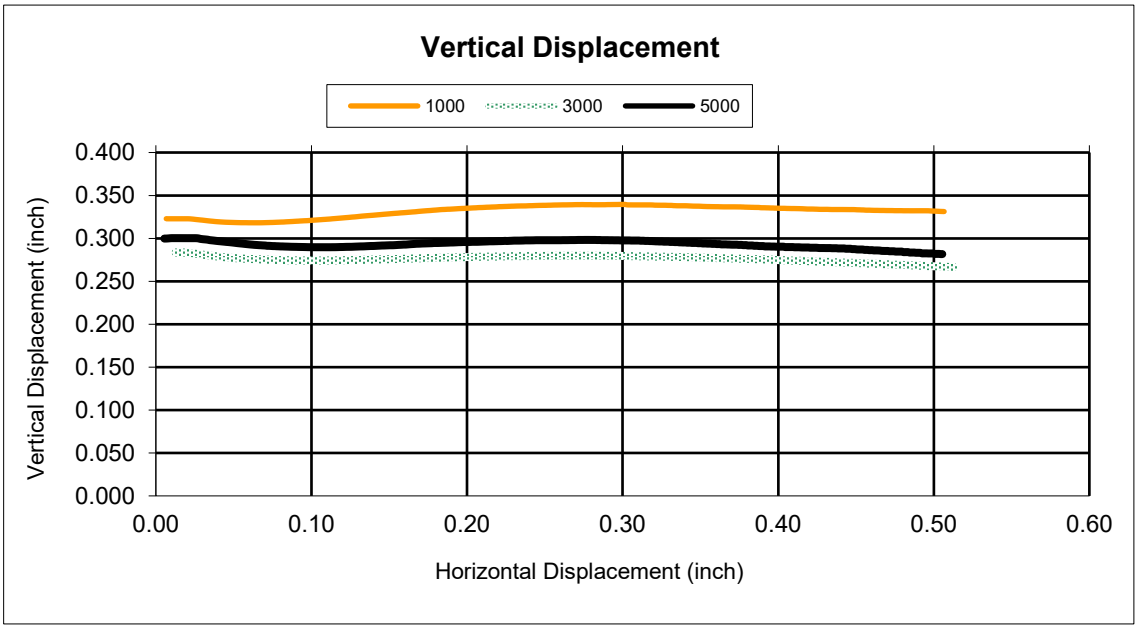
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-179 (10.0-11.0')
SAMPLE PREPARATION: Saturated - 1, 3, and 5 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 53
LAB NO: 24-2446-01
DATE ASSIGNED: 2/9/2024

NORMAL LOADS (psf): 1000 3000 5000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





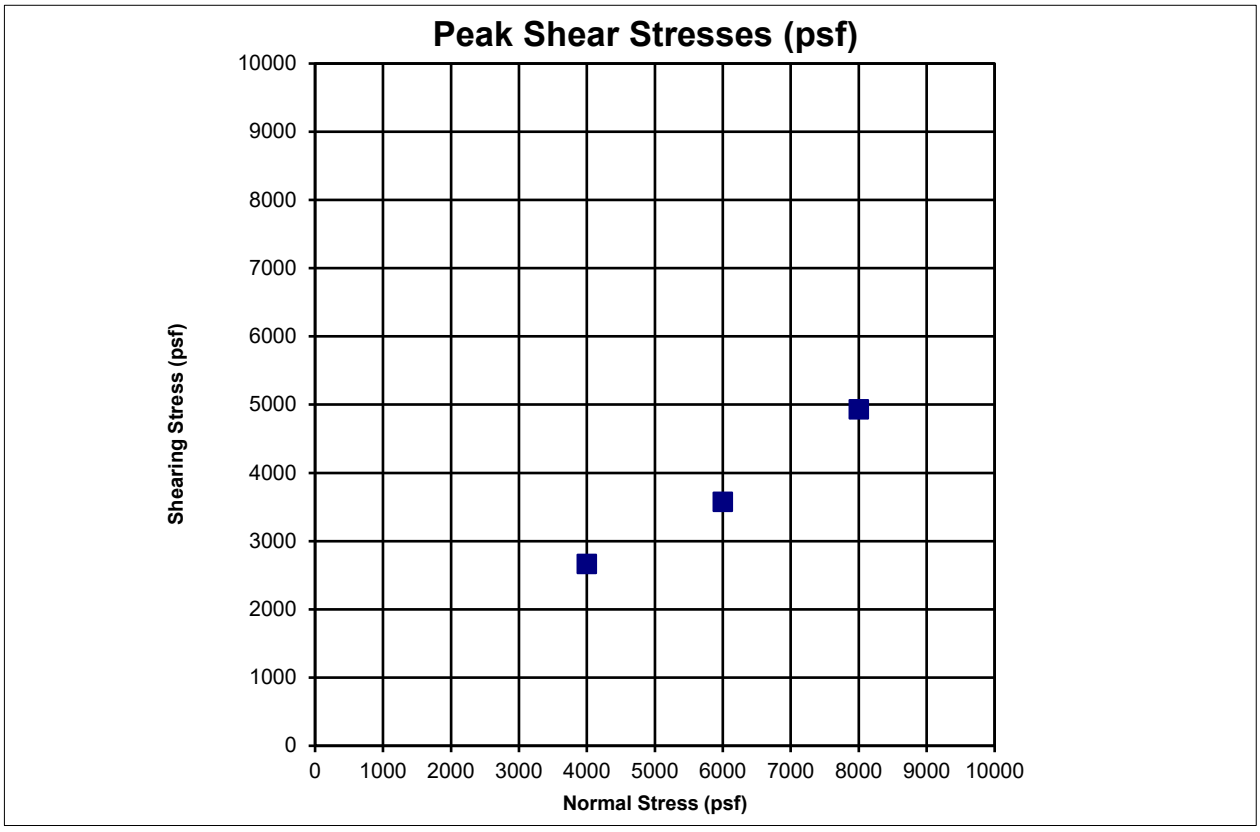
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PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-181 (40.0-41.0')
SAMPLE PREPARATION: Saturated - 4, 6, and 8 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 10
LAB NO: 23-2029-01
DATE ASSIGNED: 10/13/2023

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.975	0.981	0.979
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.008	0.008	0.008
Direct shear point:	1	2	3
Dry mass of specimen (g):	108.2	109.8	114.5
Initial Moisture Content:	9.2%	8.9%	7.9%
Initial Wet Density (pcf):	97.9	99.1	102.3
Initial Dry Density (pcf):	89.6	90.9	94.8
Final Moisture Content:	26.5%	28.2%	25.9%
Final Wet Density (pcf):	116.4	118.9	122.0
Final Dry Density (pcf):	92.0	92.8	96.8
Normal Stress (psf):	4000	6000	8000
Maximum Shearing Stress (psf):	2664	3576	4931
Vertical Deformation @ Max Shear (in):	0.234	0.276	0.204
Horizontal Deformation @ Max Shear (in):	0.491	0.399	0.398



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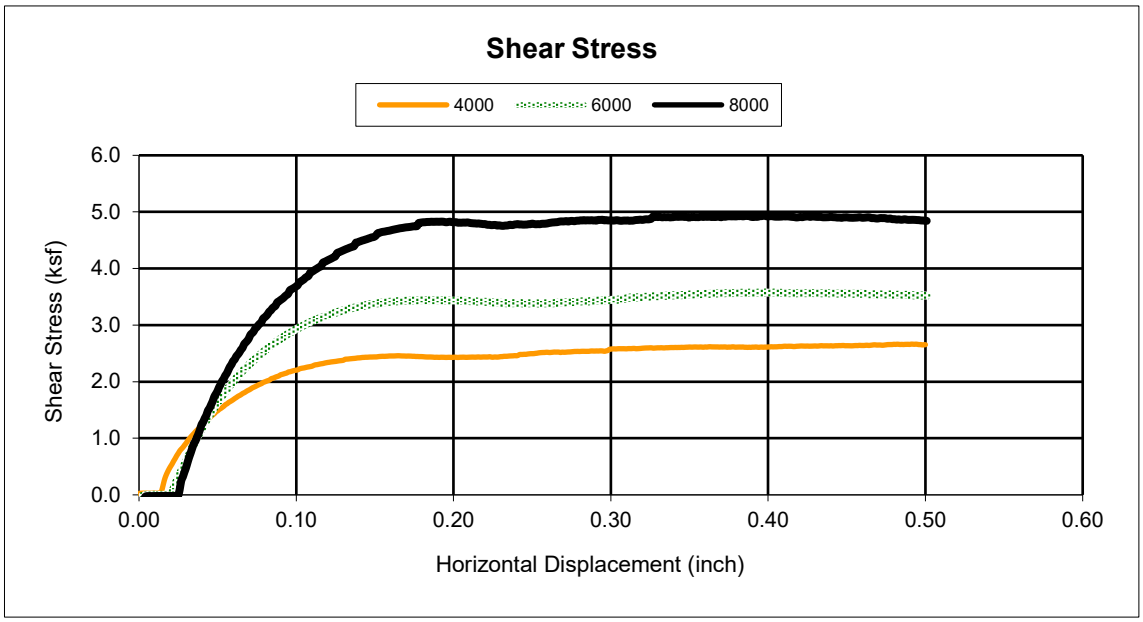
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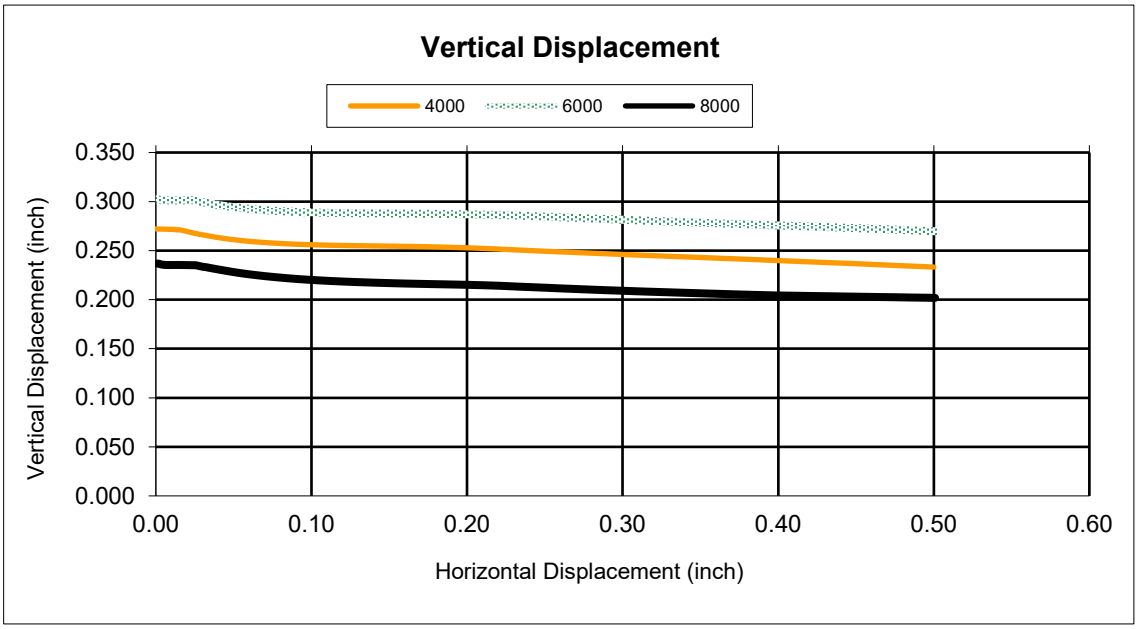
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-181 (40.0-41.0')
SAMPLE PREPARATION: Saturated - 4, 6, and 8 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 10
LAB NO: 23-2029-01
DATE ASSIGNED: 10/13/2023

NORMAL LOADS (psf): 4000 6000 8000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





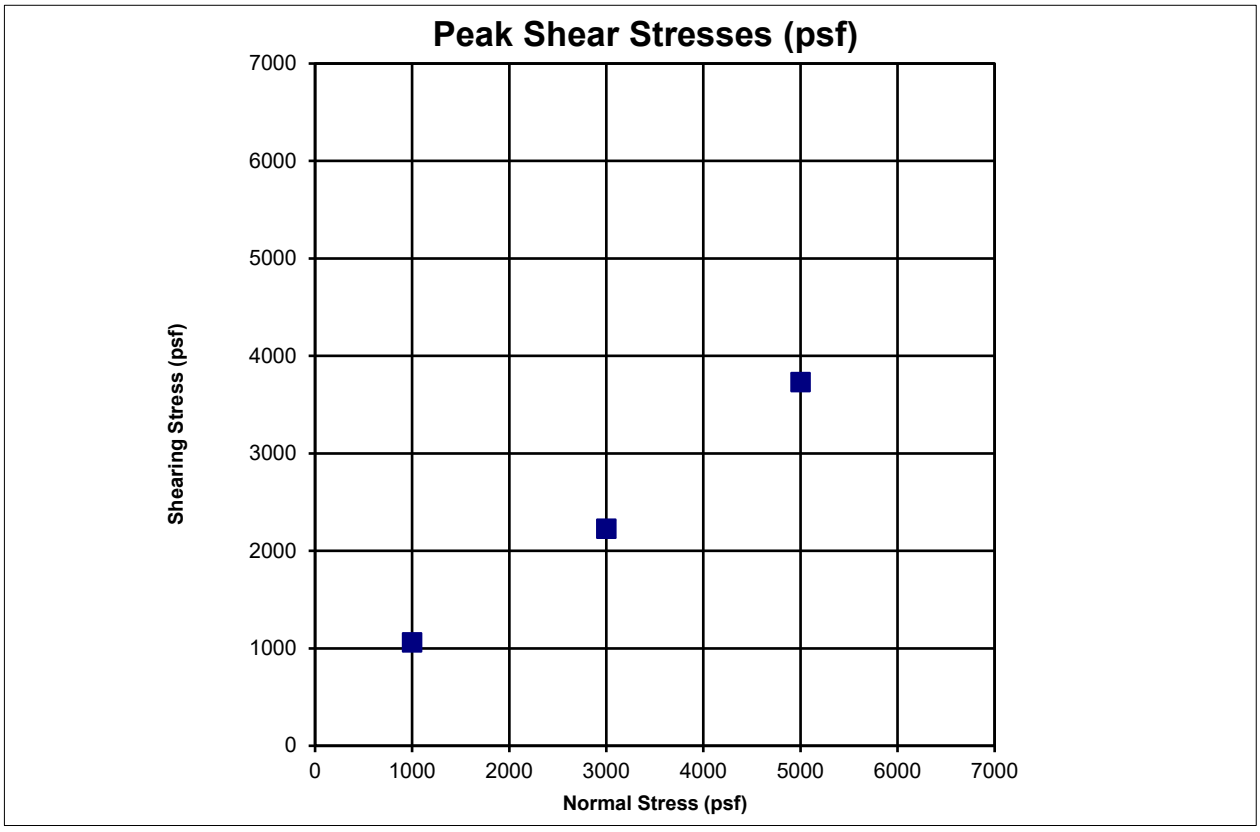
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PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-183 (10.0-11.0')
SAMPLE PREPARATION: Saturated - 1, 3, and 5 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 10
LAB NO: 23-2029-02
DATE ASSIGNED: 10/13/2023

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.989	0.980	0.991
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.01	0.01	0.01
Direct shear point:	1	2	3
Dry mass of specimen (g):	117.6	117.8	121.2
Initial Moisture Content:	5.6%	5.9%	4.9%
Initial Wet Density (pcf):	102.9	103.3	105.3
Initial Dry Density (pcf):	97.4	97.6	100.4
Final Moisture Content:	24.7%	27.2%	24.2%
Final Wet Density (pcf):	122.9	126.7	125.8
Final Dry Density (pcf):	98.5	99.5	101.3
Normal Stress (psf):	1000	3000	5000
Maximum Shearing Stress (psf):	1061	2227	3733
Vertical Deformation @ Max Shear (in):	0.320	0.242	0.234
Horizontal Deformation @ Max Shear (in):	0.177	0.185	0.172



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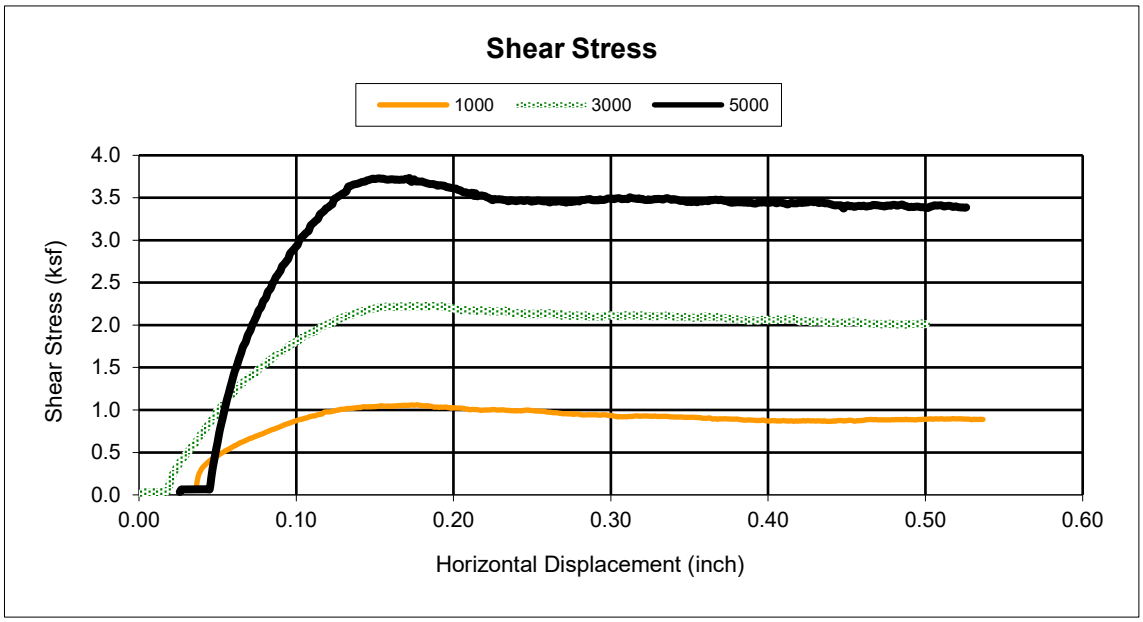
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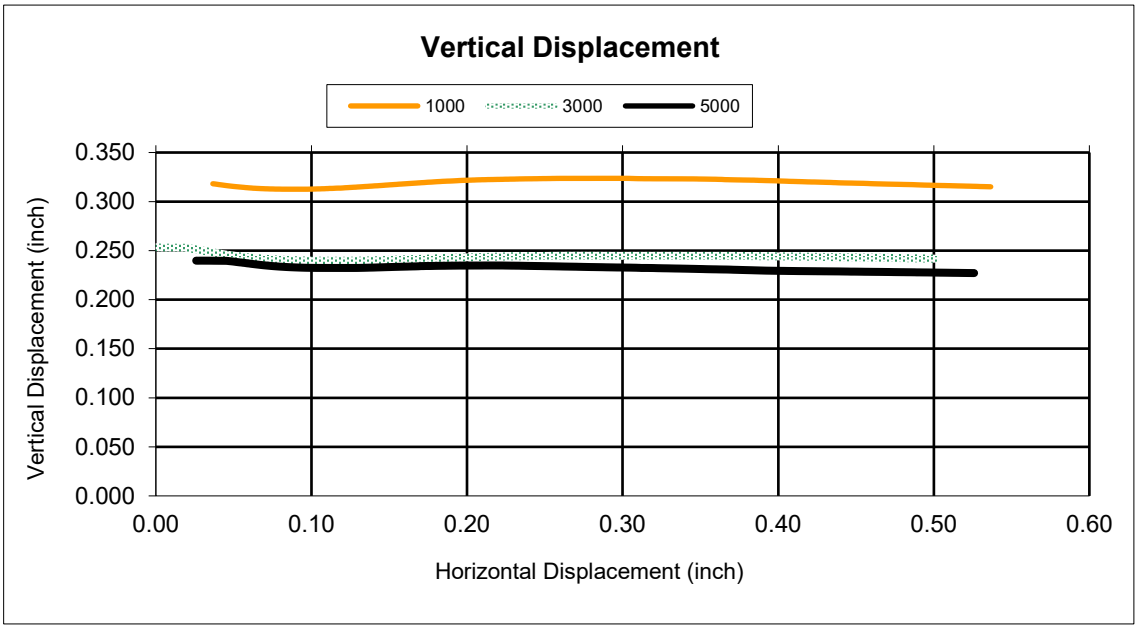
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-183 (10.0-11.0')
SAMPLE PREPARATION: Saturated - 1, 3, and 5 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 10
LAB NO: 23-2029-02
DATE ASSIGNED: 10/13/2023

NORMAL LOADS (psf): 1000 3000 5000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





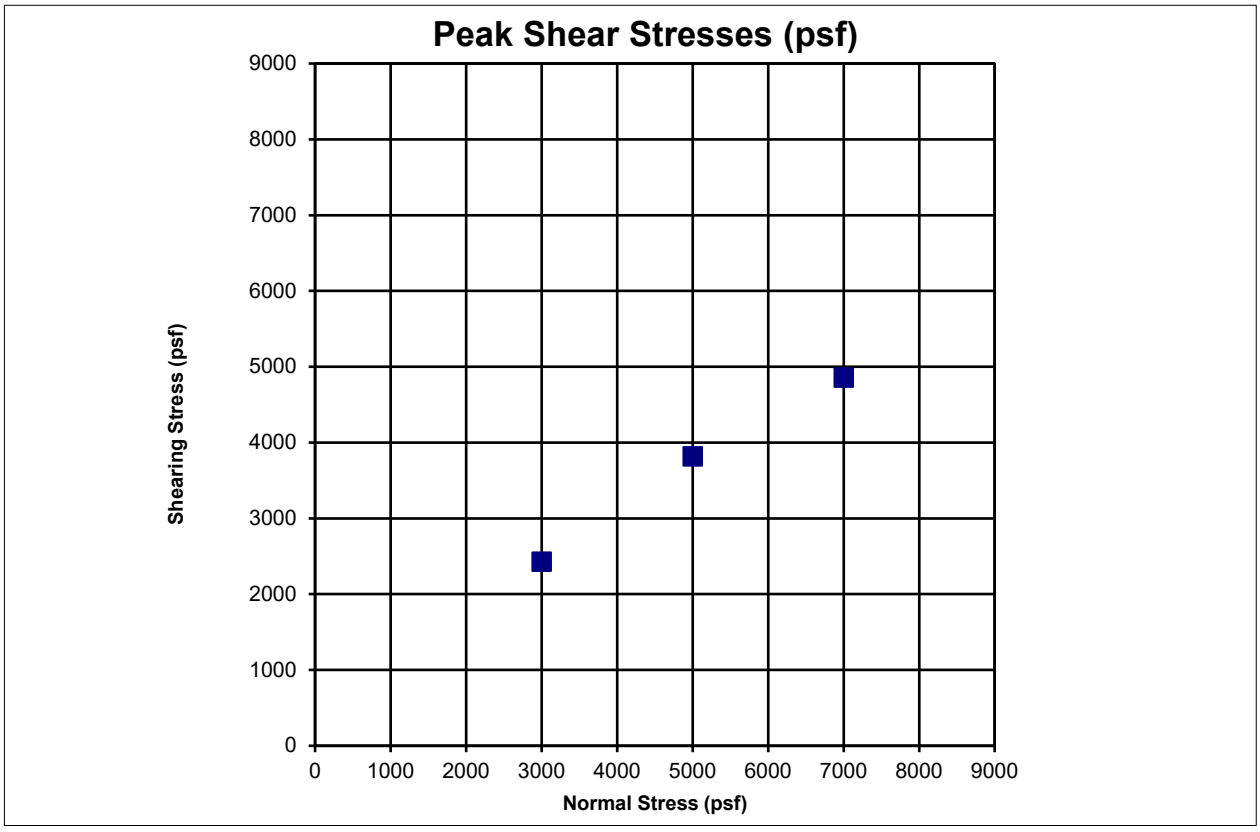
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PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-184 (25.0-26.0')
SAMPLE PREPARATION: Saturated - 3, 5, and 7 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 10
LAB NO: 23-2029-03
DATE ASSIGNED: 10/13/2023

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.934	0.961	0.976
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.01	0.01	0.01
Direct shear point:	1	2	3
Dry mass of specimen (g):	112.5	126.3	132.0
Initial Moisture Content:	12.8%	9.8%	10.4%
Initial Wet Density (pcf):	105.1	114.9	120.7
Initial Dry Density (pcf):	93.2	104.6	109.3
Final Moisture Content:	27.2%	24.7%	24.2%
Final Wet Density (pcf):	127.0	135.7	139.2
Final Dry Density (pcf):	99.8	108.8	112.0
Normal Stress (psf):	3000	5000	7000
Maximum Shearing Stress (psf):	2430	3816	4858
Vertical Deformation @ Max Shear (in):	0.217	0.241	0.248
Horizontal Deformation @ Max Shear (in):	0.461	0.143	0.144



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Phoenix, AZ 85040

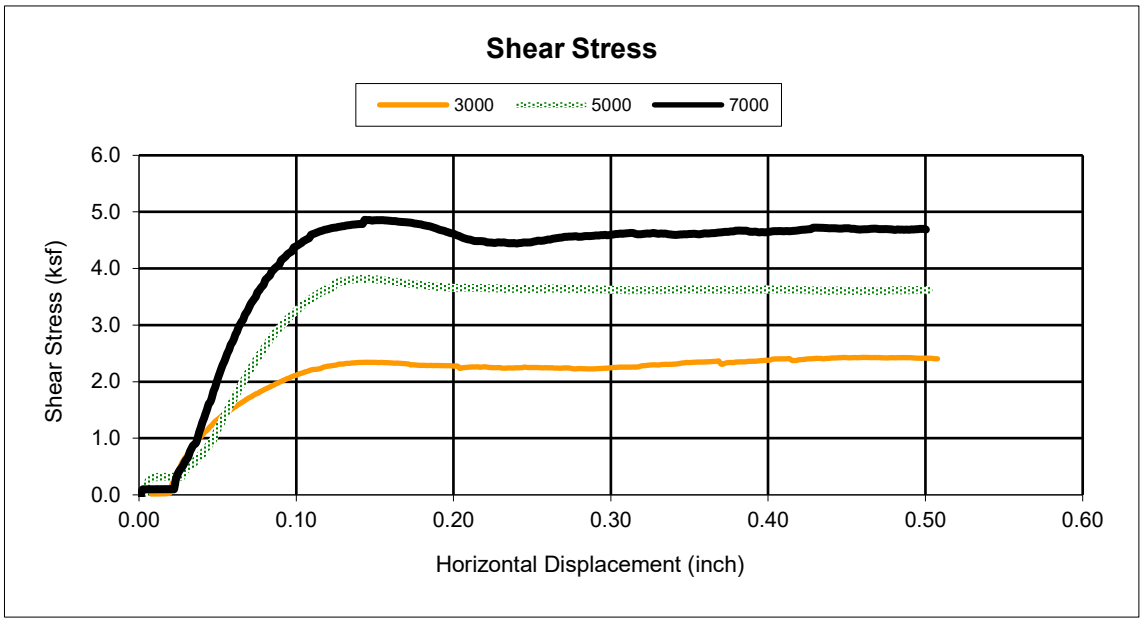
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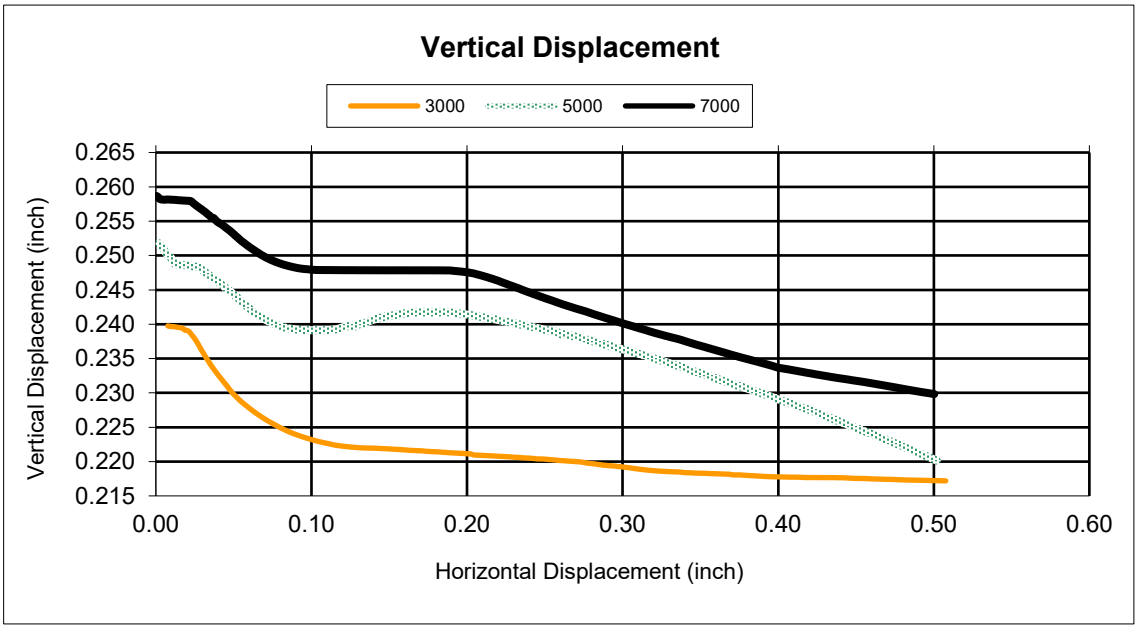
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-184 (25.0-26.0')
SAMPLE PREPARATION: Saturated - 3, 5, and 7 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 10
LAB NO: 23-2029-03
DATE ASSIGNED: 10/13/2023

NORMAL LOADS (psf): 3000 5000 7000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





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DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS ASTM D3080

PROJECT:	ACS Services LLC	**JOB NO:**	65201093
LOCATION:	Phoenix, AZ	**WORK ORDER NO:**	0
MATERIAL:	Clayey Sand	**LAB NO:**	B-185 @55.0'-56.0'
SAMPLE SOURCE:	B-185 @55.0'-56.0'	**DATE SAMPLED:**	10/31/23

Sample Preparation: Insitu density, material and moisture. Specimens consolidated at normal load for 30 mins. Prior to shear. Specimens not inundated.

Initial Parameters of specimen:

	Point 1	Point 2	Point 3
Normal Stress (psf):	**6000**	**9000**	**12000**
Dry mass (g):	135.78	135.61	137.33
Height (in):	1.0000	1.0000	1.0000
Diameter (in):	2.42	2.42	2.42
Moisture, %:	7.0	6.6	6.7
Dry Density (pcf):	112.5	112.3	113.7
Saturation, %:	39	37	39
Void Ratio:	0.47	0.47	0.46

Pre- Shear Parameters of specimen:

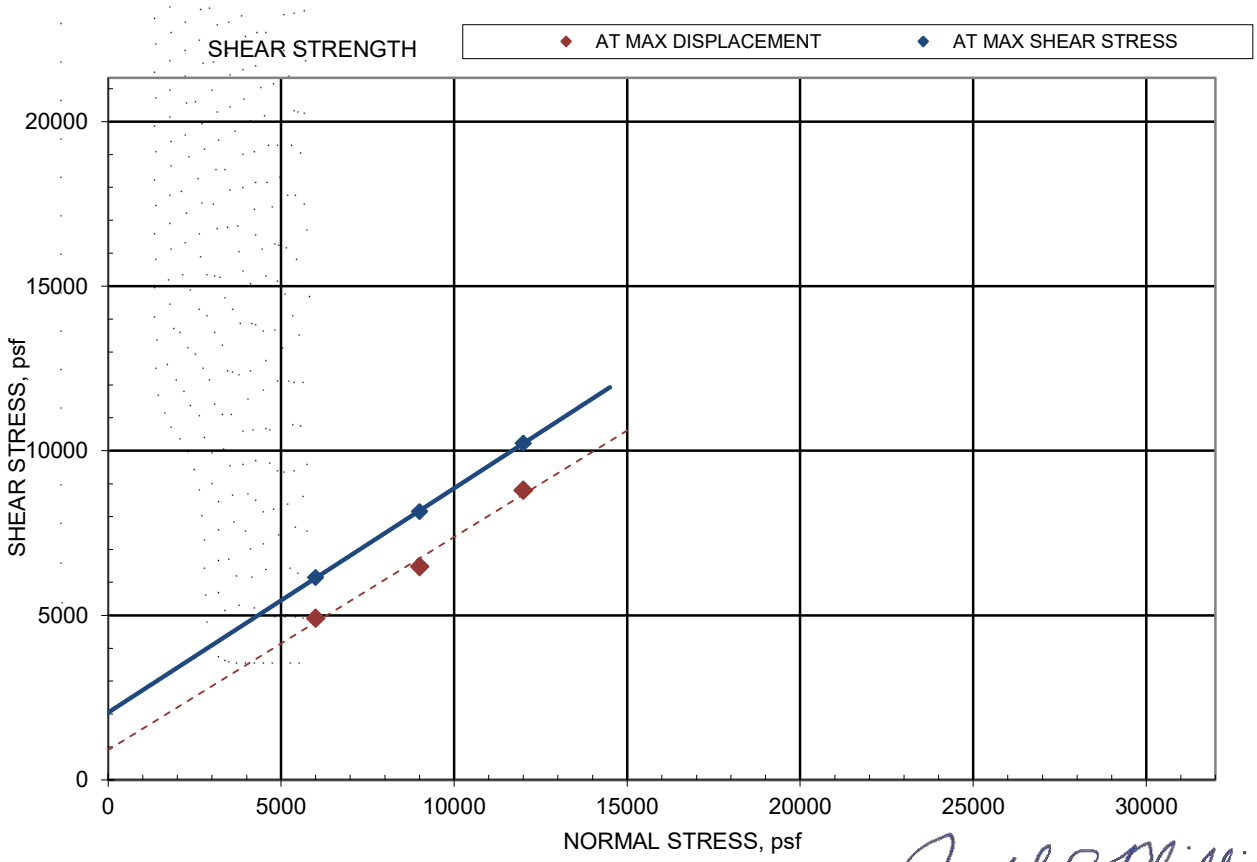
	Point 1	Point 2	Point 3
Normal Stress (psf):	**6000**	**9000**	**12000**
Dry mass (g):	135.78	135.61	137.33
Height (in):	0.9614	0.9502	0.943
Diameter (in):	2.42	2.42	2.42
Moisture, %:	6.2	5.7	5.7
Dry Density (pcf):	117.0	118.2	120.6
Saturation, %:	40	38	40
Void Ratio:	0.41	0.40	0.37

Normal Stress (psf):	6000	9000	12000
Maximum Shear Stress, (psf):	6147	8156	10237
Displacement at Maximum Shear, (in):	0.227	0.161	0.253
Shear Stress at Max Displacement, (psf)	4915	6482	8802
Maximum Displacement, (in):	0.449	0.451	0.451
Rate of Deformation, in/min	0.01	0.01	0.01

	FRICTION ANGLE	COHESION
AT MAX SHEAR STRESS	**34**	**2045**
Specs:		
AT MAX DISPLACEMENT	33	903
Specs:		

SHEAR DEVICE: Geomatic model 8914, Dead Weight load force

SPECIFIC GRAVITY: Specific gravity assumed: 2.651

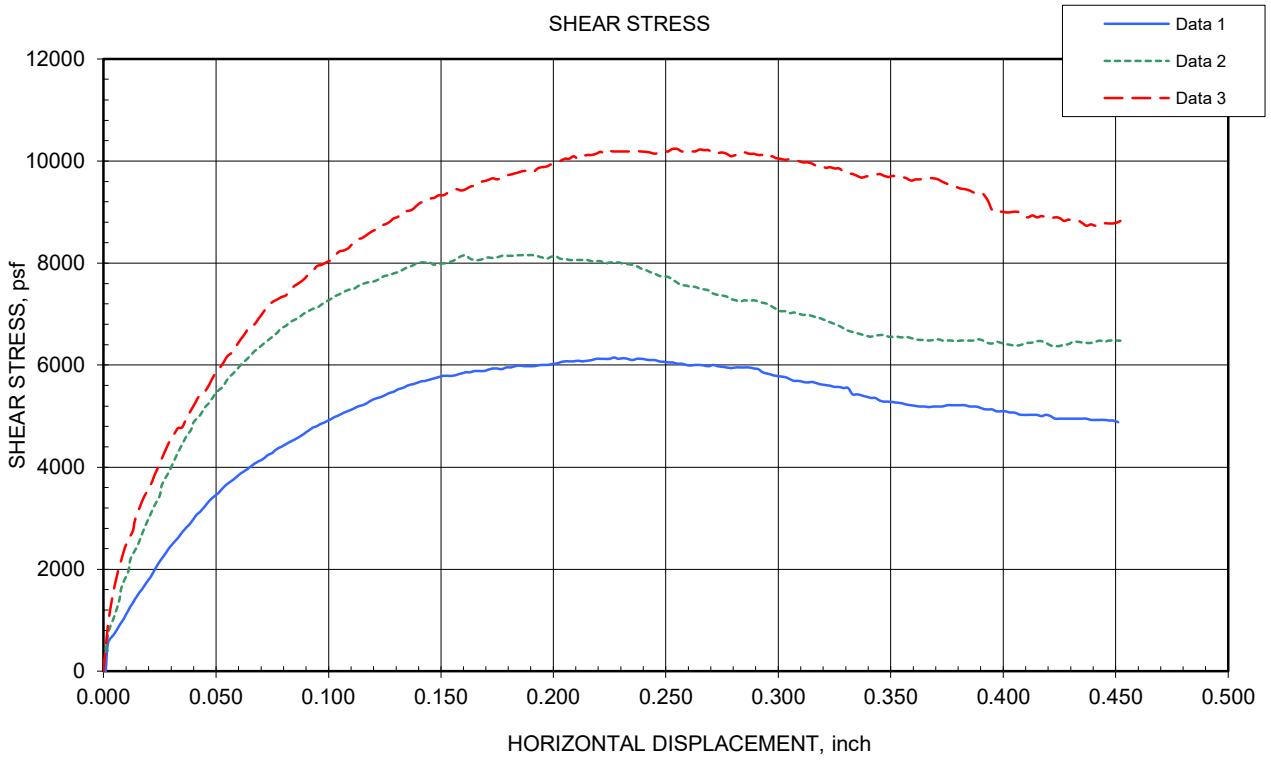


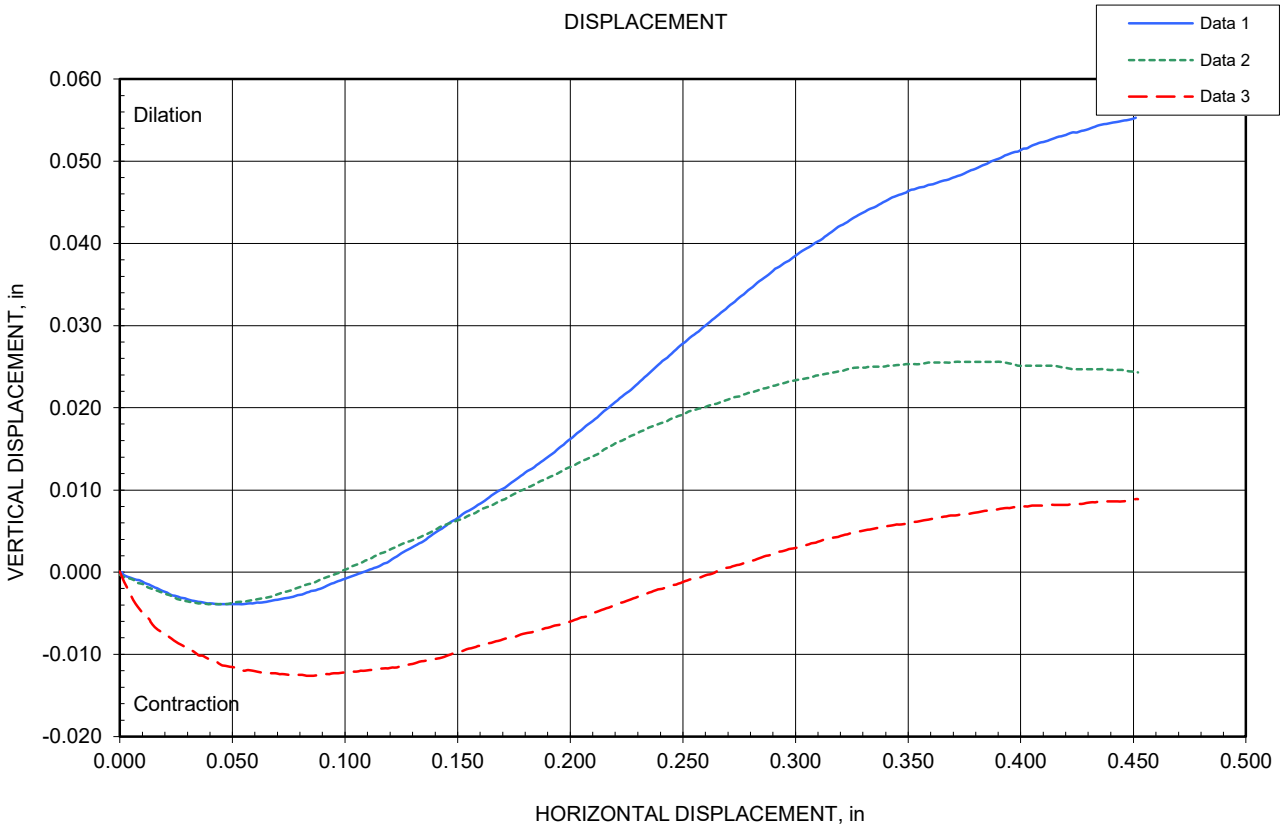
Note: The friction angle presented is applicable only to the load ranges and sample conditions tested

Reviewed By: Joseph A. Phillips

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS ASTM D3080

PROJECT:	ACS Services LLC	**JOB NO:**	65201093
LOCATION:	Phoenix, AZ	**WORK ORDER NO:**	
MATERIAL:	Clayey Sand	**LAB NO:**	B-185 @55.0'-56.0'
SAMPLE SOURCE:	B-185 @55.0'-56.0'	**DATE SAMPLED:**	10/31/23





DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS ASTM D3080

PROJECT:	ACS Services LLC	**JOB NO:**	65201093
LOCATION:	Phoenix, AZ	**WORK ORDER NO:**	0
MATERIAL:	Clayey Sand	**LAB NO:**	B-186 @25.0'-26.0'
SAMPLE SOURCE:	B-186 @25.0'-26.0'	**DATE SAMPLED:**	10/31/23

Sample Preparation: Insitu density, material and moisture. Specimens consolidated at normal load for 30 mins. Prior to shear. Specimens inundated.

Initial Parameters of specimen:

	Point 1	Point 2	Point 3
Normal Stress (psf):	**3000**	**5000**	**7000**
Dry mass (g):	132.32	131.29	130.98
Height (in):	1.0000	1.0000	1.0000
Diameter (in):	2.42	2.42	2.42
Moisture, %:	9.8	10.6	9.7
Dry Density (pcf):	109.6	108.7	108.5
Saturation, %:	51	54	49
Void Ratio:	0.51	0.52	0.53

Pre- Shear Parameters of specimen:

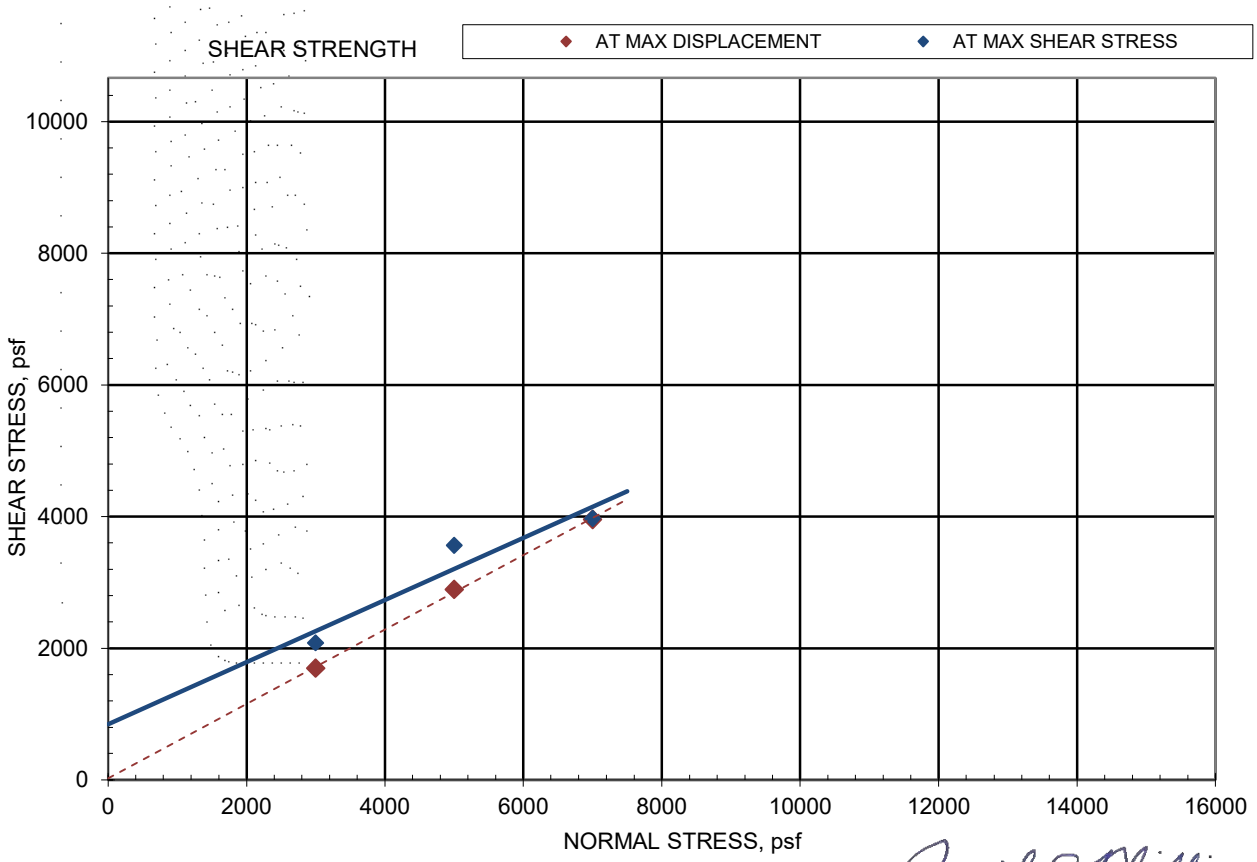
	Point 1	Point 2	Point 3
Normal Stress (psf):	**3000**	**5000**	**7000**
Dry mass (g):	132.32	131.29	130.98
Height (in):	0.9464	0.9543	0.8736
Diameter (in):	2.42	2.42	2.42
Moisture, %:	16.2	17.1	12.6
Dry Density (pcf):	115.8	114.0	124.2
Saturation, %:	100	100	100
Void Ratio:	0.43	0.45	0.33

Normal Stress (psf):	3000	5000	7000
Maximum Shear Stress, (psf):	2081	3564	3971
Displacement at Maximum Shear, (in):	0.074	0.086	0.406
Shear Stress at Max Displacement, (psf)	1698	2894	3959
Maximum Displacement, (in):	0.450	0.450	0.450
Rate of Deformation, in/min	0.005	0.005	0.005

SHEAR DEVICE: Geomatic model 8914, Dead Weight load force

SPECIFIC GRAVITY: Specific gravity assumed: 2.651

	FRICTION ANGLE	COHESION
AT MAX SHEAR STRESS	**25**	**843**
Specs:		
AT MAX DISPLACEMENT	29	24
Specs:		

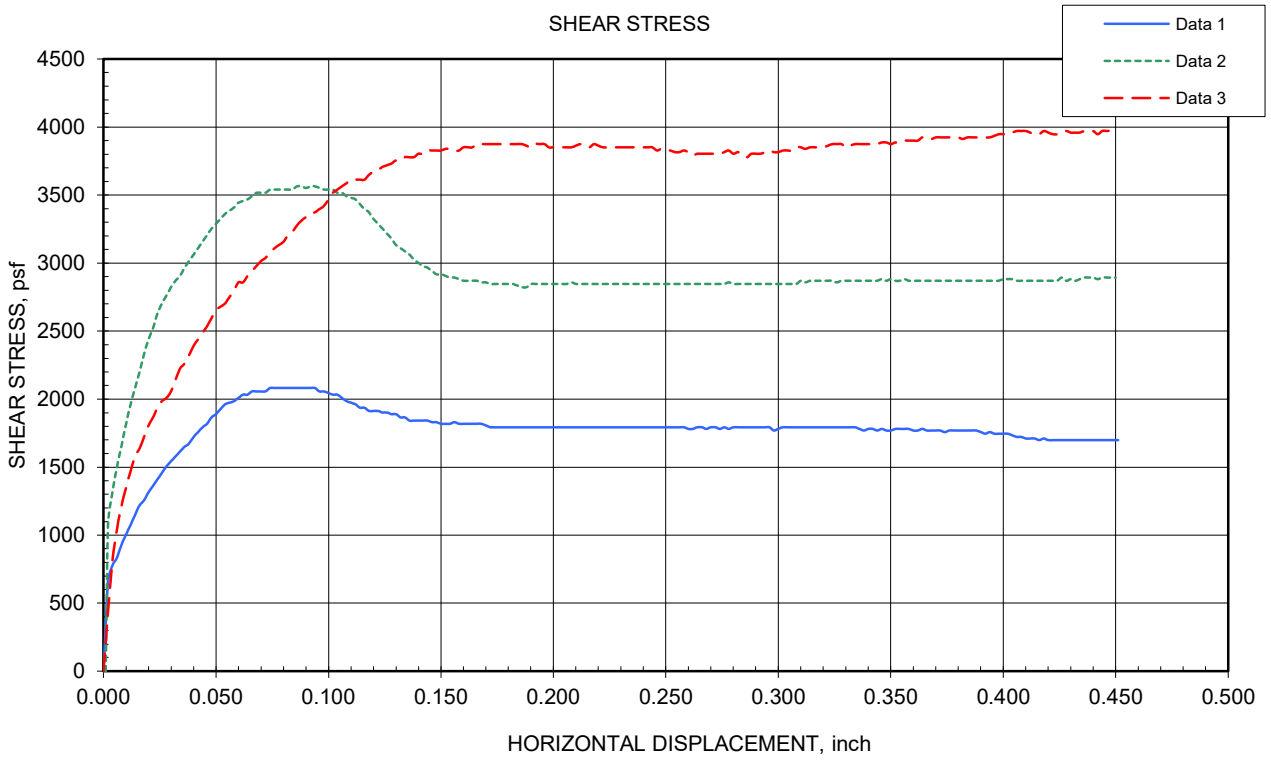


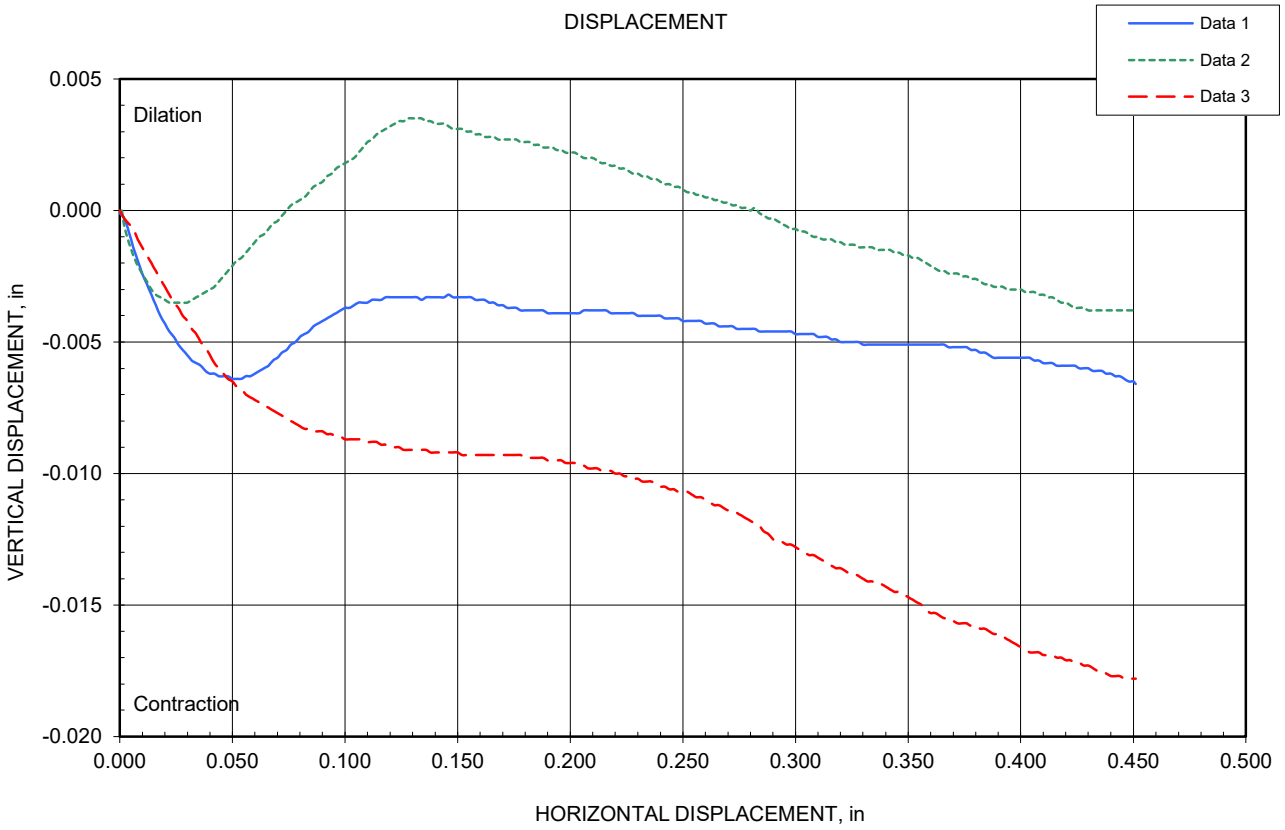
Note: The friction angle presented is applicable only to the load ranges and sample conditions tested

Reviewed By: Joseph A. Phillips

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS ASTM D3080

PROJECT:	ACS Services LLC	**JOB NO:**	65201093
LOCATION:	Phoenix, AZ	**WORK ORDER NO:**	
MATERIAL:	Clayey Sand	**LAB NO:**	B-186 @25.0'-26.0'
SAMPLE SOURCE:	B-186 @25.0'-26.0'	**DATE SAMPLED:**	10/31/23



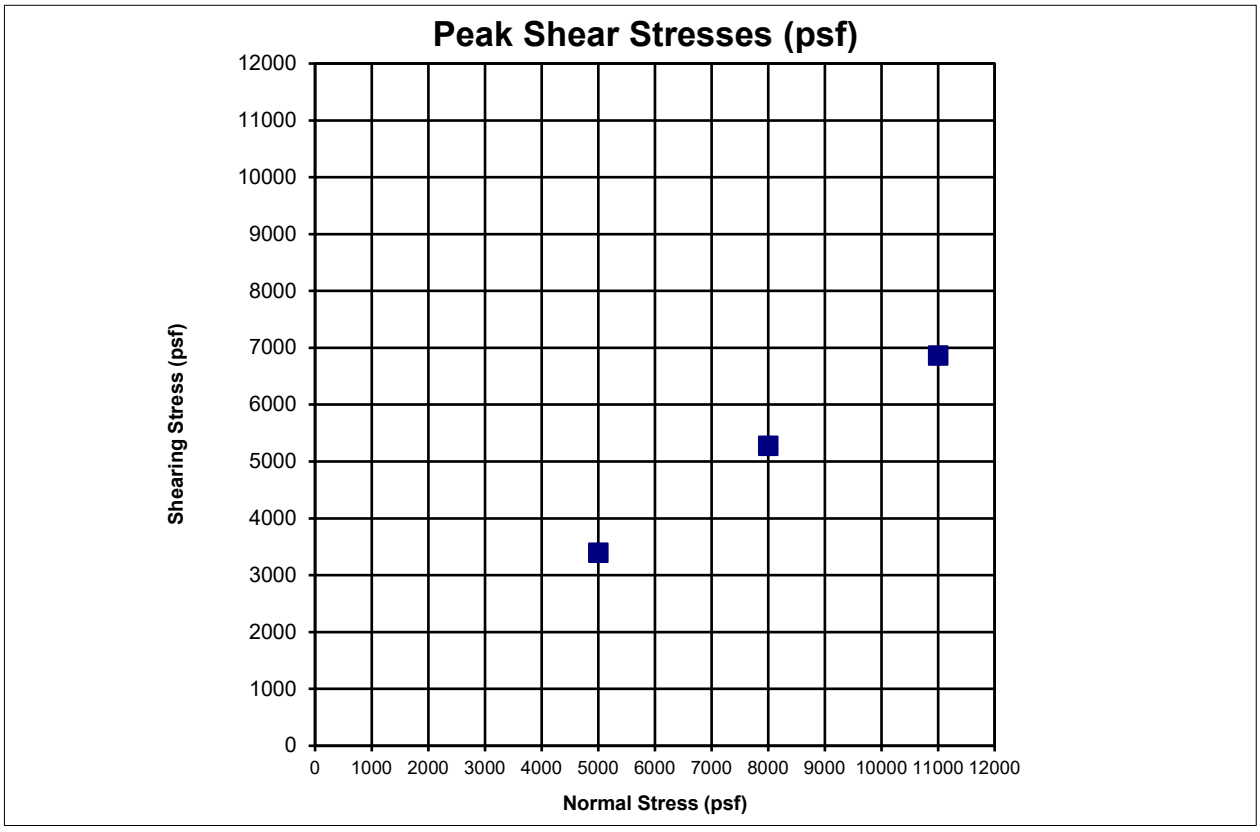


PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-188 (45.0-46.0')
SAMPLE PREPARATION: Saturated 5, 8, 11 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 35
LAB NO: 23-2265-02
DATE ASSIGNED: 12/22/2023

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.987	0.991	0.988
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.01	0.01	0.01
Direct shear point:	1	2	3
Dry mass of specimen (g):	118.1	117.5	119.3
Initial Moisture Content:	5.8%	4.9%	5.9%
Initial Wet Density (pcf):	103.5	102.1	104.6
Initial Dry Density (pcf):	97.8	97.3	98.8
Final Moisture Content:	28.2%	24.7%	24.9%
Final Wet Density (pcf):	127.0	122.4	124.9
Final Dry Density (pcf):	99.1	98.2	100.0
Normal Stress (psf):	5000	8000	11000
Maximum Shearing Stress (psf):	3396	5276	6863
Vertical Deformation @ Max Shear (in):	0.265	0.274	0.242
Horizontal Deformation @ Max Shear (in):	0.147	0.173	0.187



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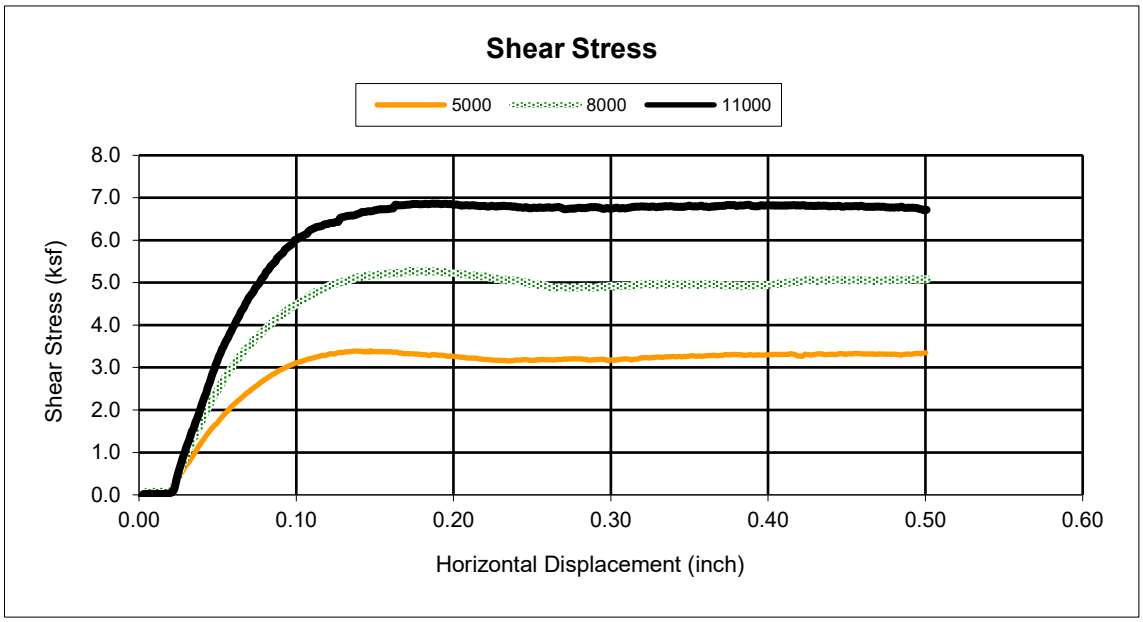
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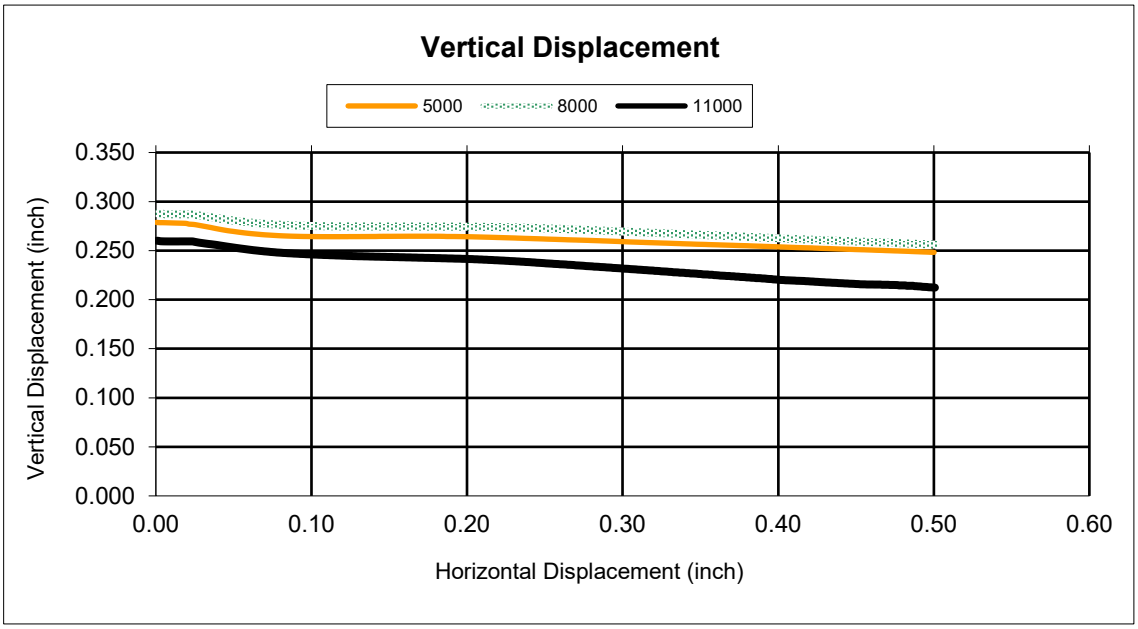
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-188 (45.0-46.0')
SAMPLE PREPARATION: Saturated 5, 8, 11 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 35
LAB NO: 23-2265-02
DATE ASSIGNED: 12/22/2023

NORMAL LOADS (psf): 5000 8000 11000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





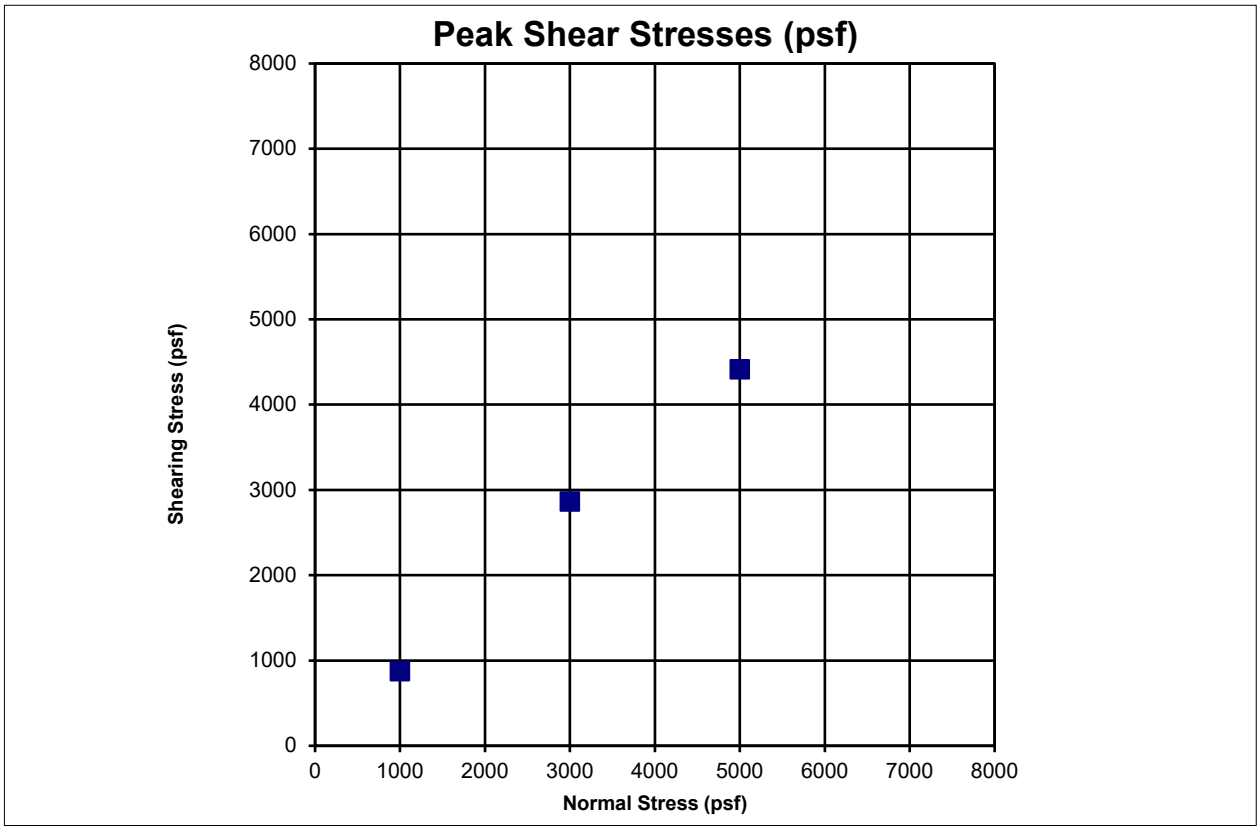
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Phoenix, AZ 85040

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-193 (3.0-4.0')
SAMPLE PREPARATION: Saturated 1, 3, 5 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 39
LAB NO: 24-2305
DATE ASSIGNED: 1/3/2024

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.990	0.939	0.956
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.005	0.005	0.005
Direct shear point:	1	2	3
Dry mass of specimen (g):	135.9	127.2	134.7
Initial Moisture Content:	5.2%	5.0%	5.0%
Initial Wet Density (pcf):	118.4	110.6	117.1
Initial Dry Density (pcf):	112.6	105.4	111.6
Final Moisture Content:	22.4%	20.4%	19.6%
Final Wet Density (pcf):	139.3	135.2	139.6
Final Dry Density (pcf):	113.8	112.2	116.7
Normal Stress (psf):	1000	3000	5000
Maximum Shearing Stress (psf):	876	2863	4416
Vertical Deformation @ Max Shear (in):	0.342	0.221	0.262
Horizontal Deformation @ Max Shear (in):	0.153	0.451	0.239



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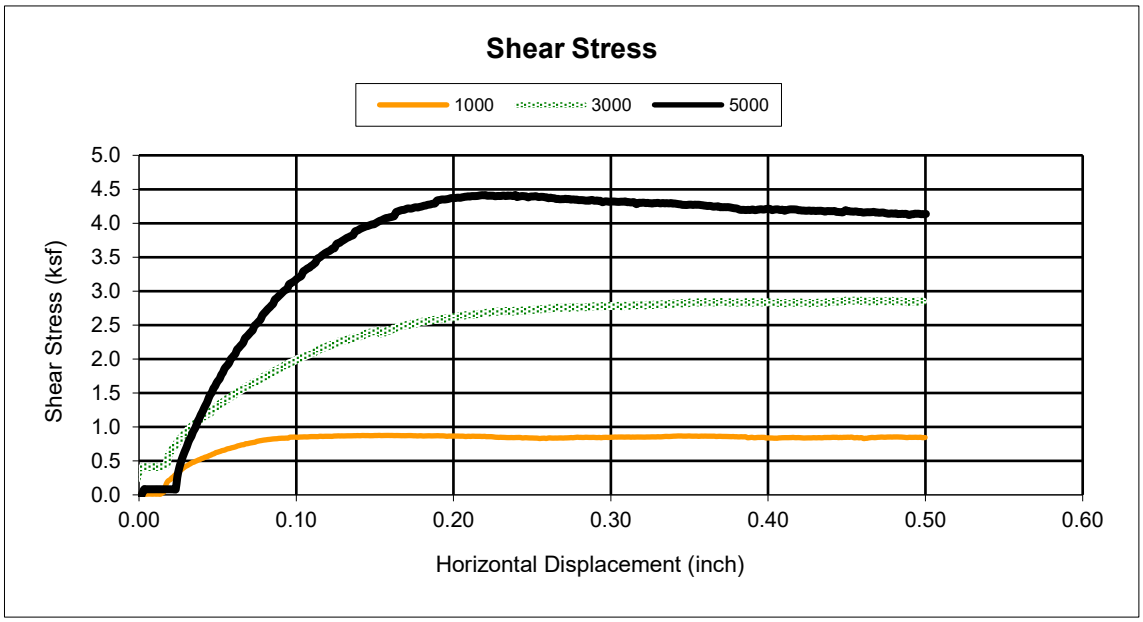
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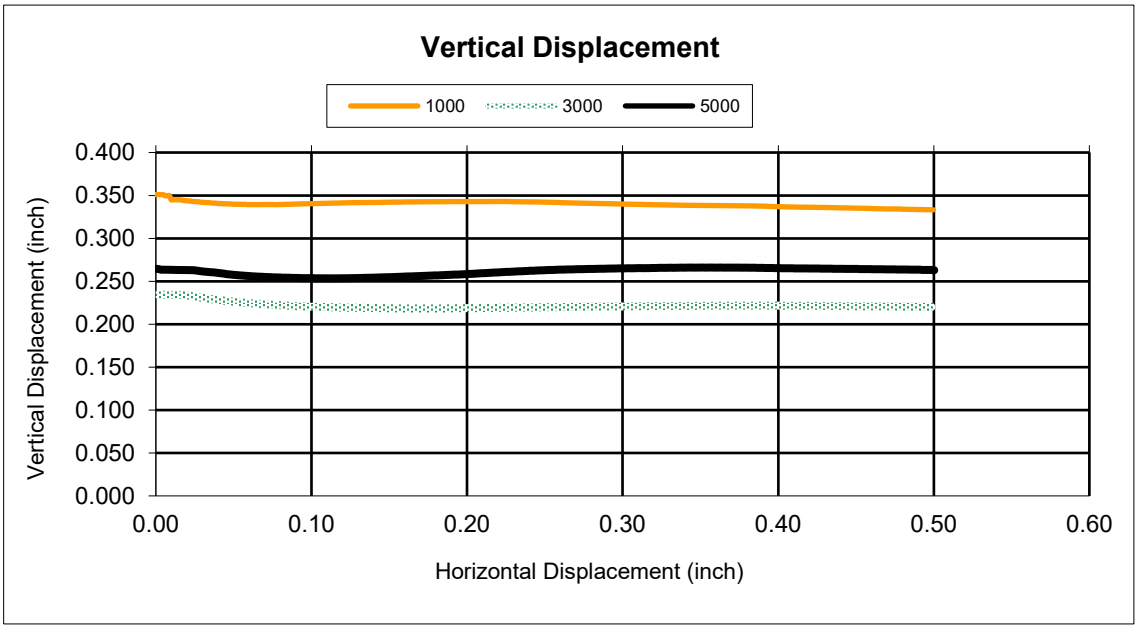
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-193 (3.0-4.0')
SAMPLE PREPARATION: Saturated 1, 3, 5 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 39
LAB NO: 24-2305
DATE ASSIGNED: 1/3/2024

NORMAL LOADS (psf): 1000 3000 5000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





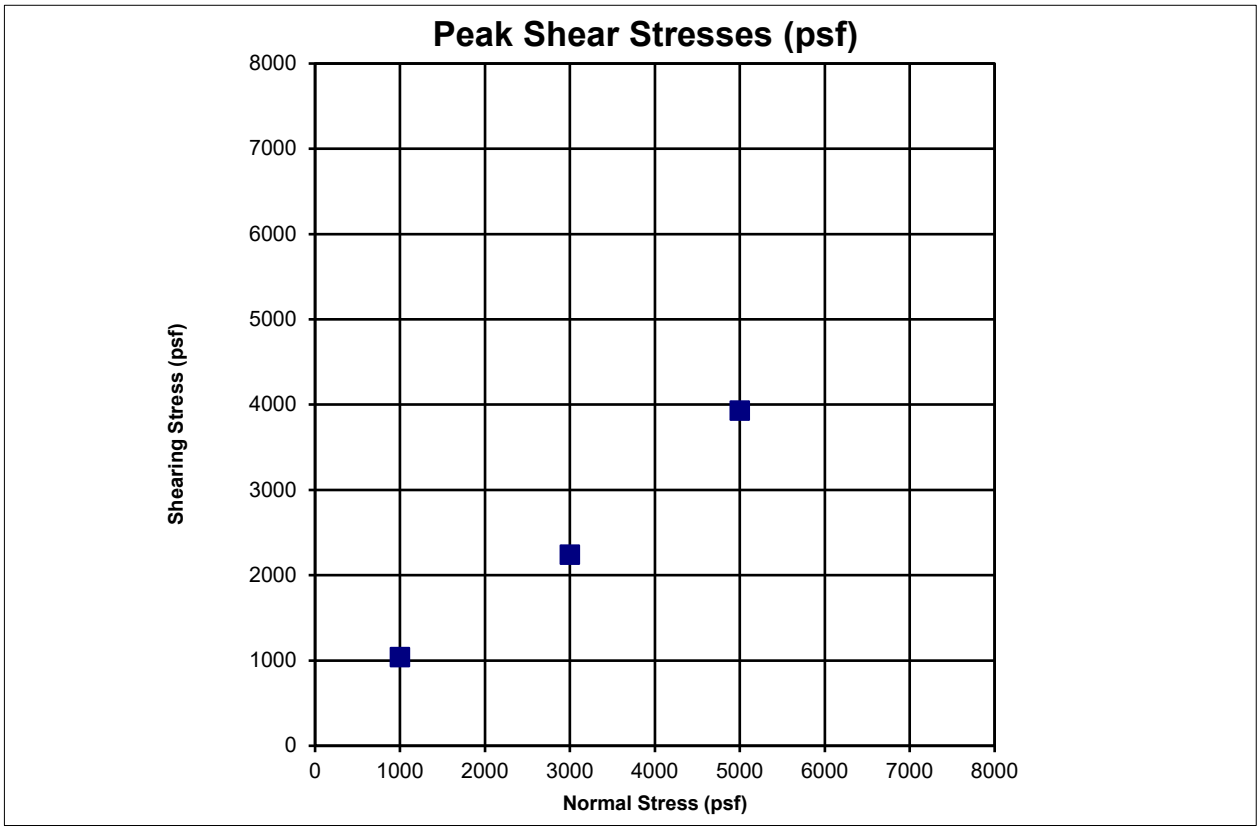
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Phoenix, AZ 85040

PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-197 (10.0-11.0')
SAMPLE PREPARATION: Saturated 1, 3, 5 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 35
LAB NO: 23-2265-03
DATE ASSIGNED: 12/22/2023

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	0.969	0.927	0.925
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.005	0.005	0.005
Direct shear point:	1	2	3
Dry mass of specimen (g):	120.0	120.7	122.9
Initial Moisture Content:	6.8%	9.4%	7.6%
Initial Wet Density (pcf):	106.2	109.3	109.5
Initial Dry Density (pcf):	99.4	100.0	101.8
Final Moisture Content:	21.3%	20.5%	21.6%
Final Wet Density (pcf):	124.4	129.9	133.8
Final Dry Density (pcf):	102.6	107.8	110.1
Normal Stress (psf):	1000	3000	5000
Maximum Shearing Stress (psf):	1039	2241	3930
Vertical Deformation @ Max Shear (in):	0.242	0.181	0.220
Horizontal Deformation @ Max Shear (in):	0.484	0.502	0.328



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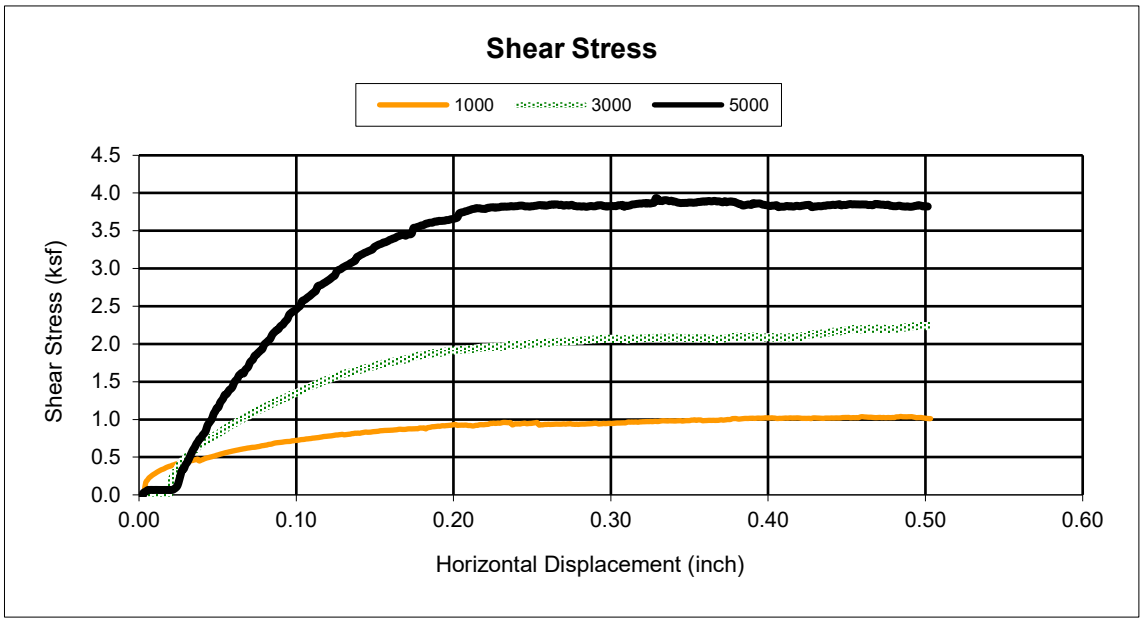
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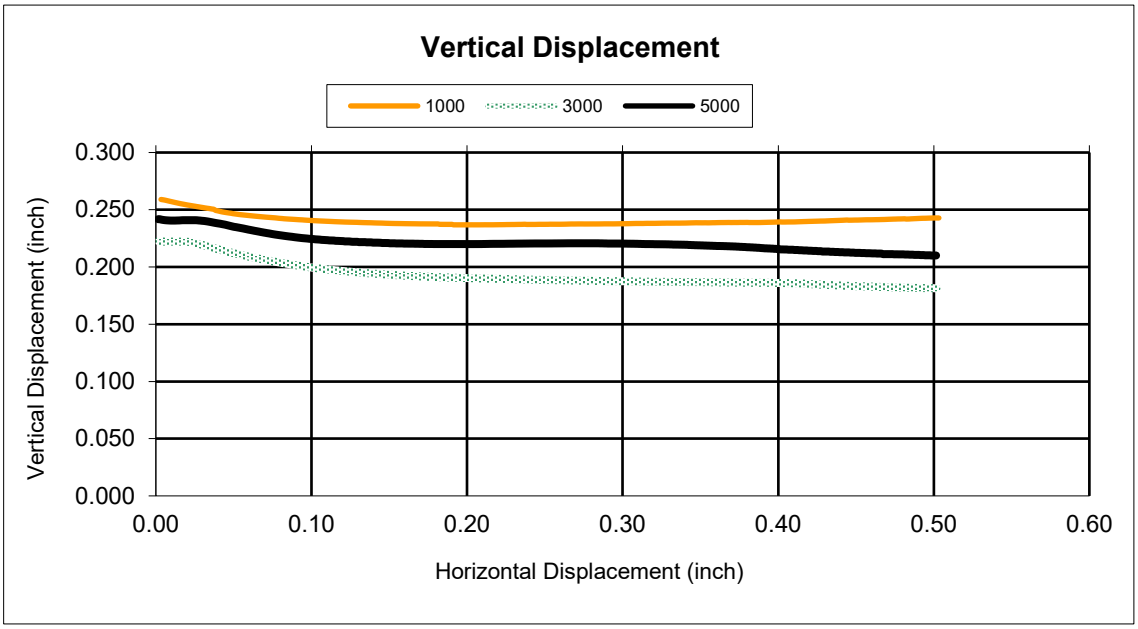
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-197 (10.0-11.0')
SAMPLE PREPARATION: Saturated 1, 3, 5 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 35
LAB NO: 23-2265-03
DATE ASSIGNED: 12/22/2023

NORMAL LOADS (psf): 1000 3000 5000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





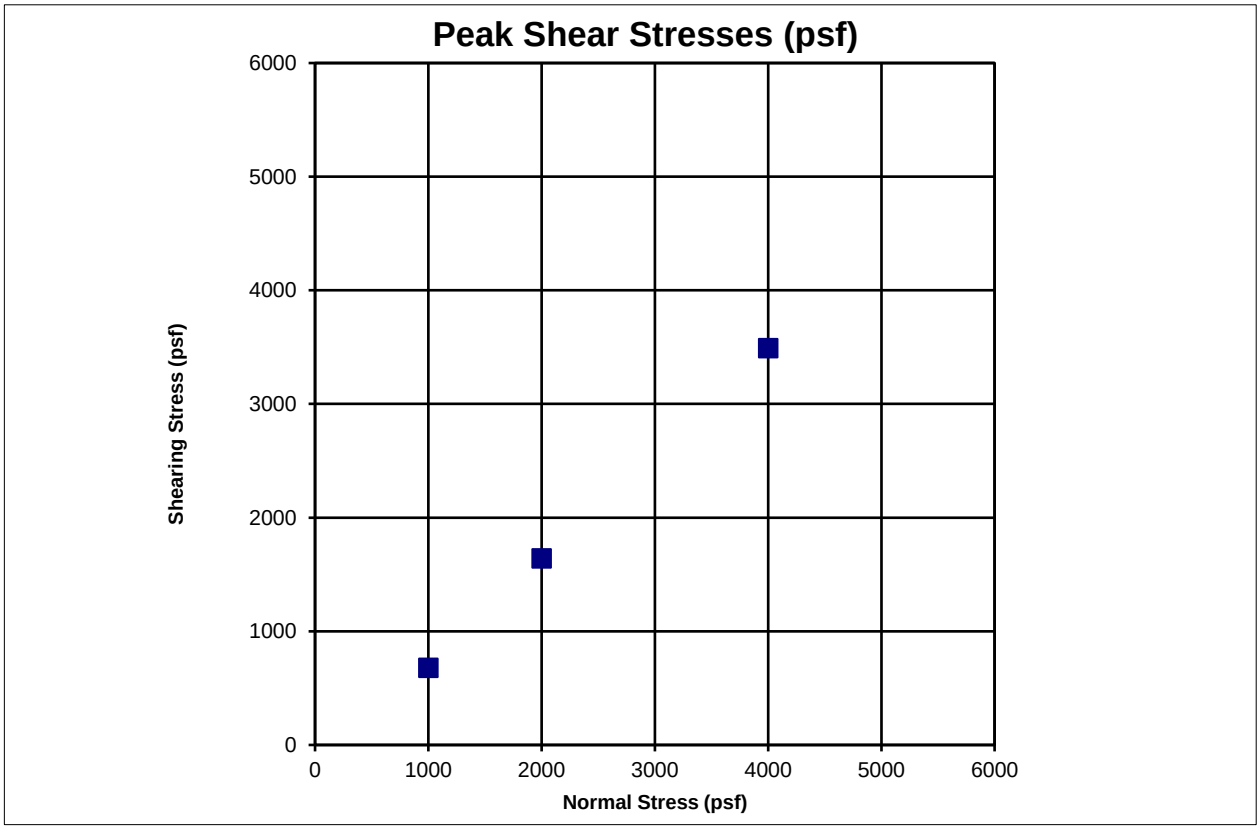
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PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ B-196C @ 5 - 6
MATERIAL: Native Soil
SAMPLE SOURCE: ACS Lab #24-5284-2
SAMPLE PREPARATION: Saturated - 1, 2, and 4 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 93
LAB NO: 24-3877
DATE ASSIGNED: 10/24/2024

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)

Initial thickness of specimen (in.):	1.00	1.00	1.00
Initial diameter of specimen (in.):	2.42	2.42	2.42
Final thickness before shear (in.):	1.020	0.987	1.021
Shearing device used:	Humboldt Automated Shear Test System by Trautwein Soil Testing Equipment		
Rate of deformation (in/min):	0.001	0.001	0.001
Direct shear point:	1	2	3
Dry mass of specimen (g):	114.2	114.8	116.8
Initial Moisture Content:	9.7%	9.6%	7.6%
Initial Wet Density (pcf):	103.8	104.2	104.1
Initial Dry Density (pcf):	94.6	95.1	96.7
Final Moisture Content:	33.7%	33.3%	30.0%
Final Wet Density (pcf):	124.0	128.4	123.2
Final Dry Density (pcf):	92.7	96.4	94.8
Normal Stress (psf):	1000	2000	4000
Maximum Shearing Stress (psf):	678	1641	3491
Vertical Deformation @ Max Shear (in):	0.234	0.164	0.213
Horizontal Deformation @ Max Shear (in):	0.086	0.106	0.122



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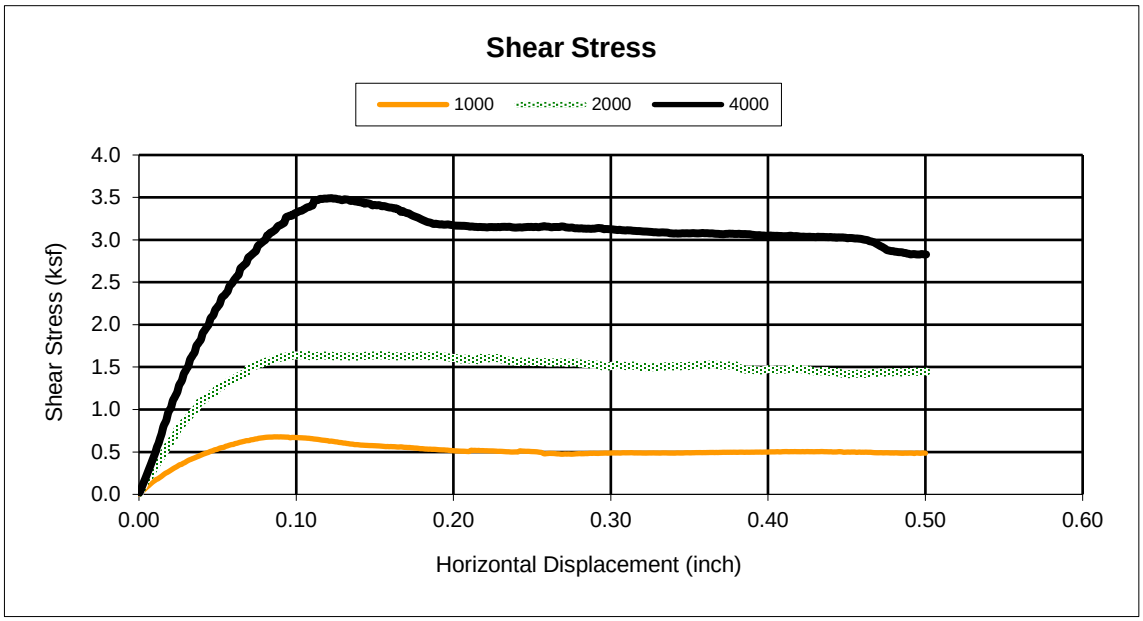
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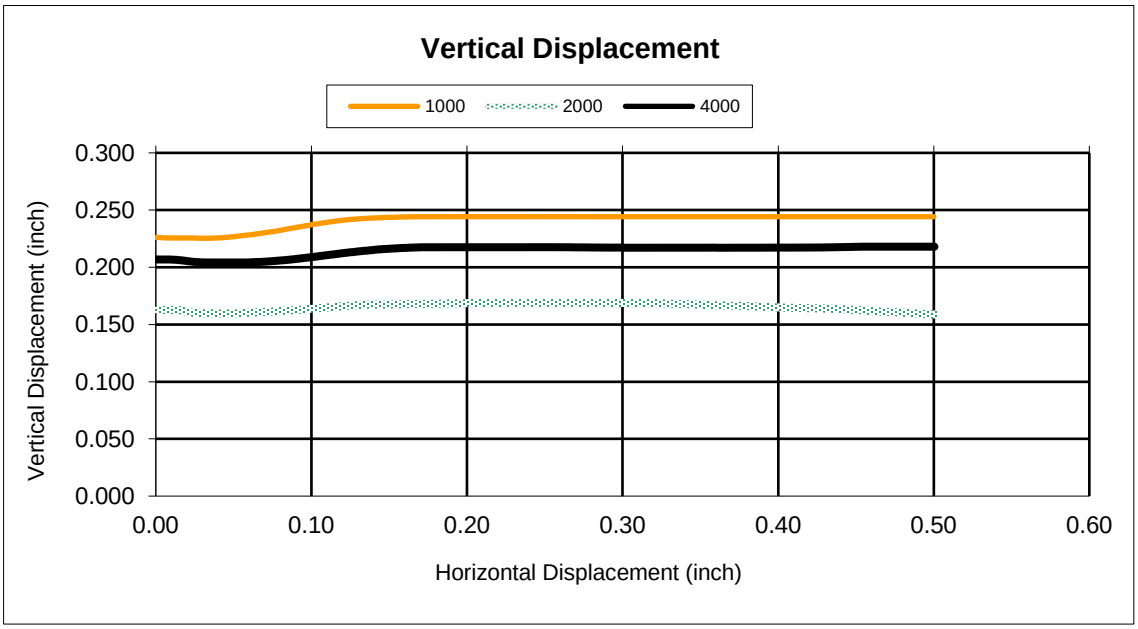
PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ B-196C @ 5 - 6
MATERIAL: Native Soil
SAMPLE SOURCE: ACS Lab #24-5284-2
SAMPLE PREPARATION: Saturated - 1, 2, and 4 ksf

JOB NO: 17-2023-4239
WORK ORDER NO: 93
LAB NO: 24-3877
DATE ASSIGNED: 10/24/2024

NORMAL LOADS (psf): 1000 2000 4000

DIRECT SHEAR TEST OF SOILS UNDER CONSOLIDATED DRAINED CONDITIONS (ASTM D3080)





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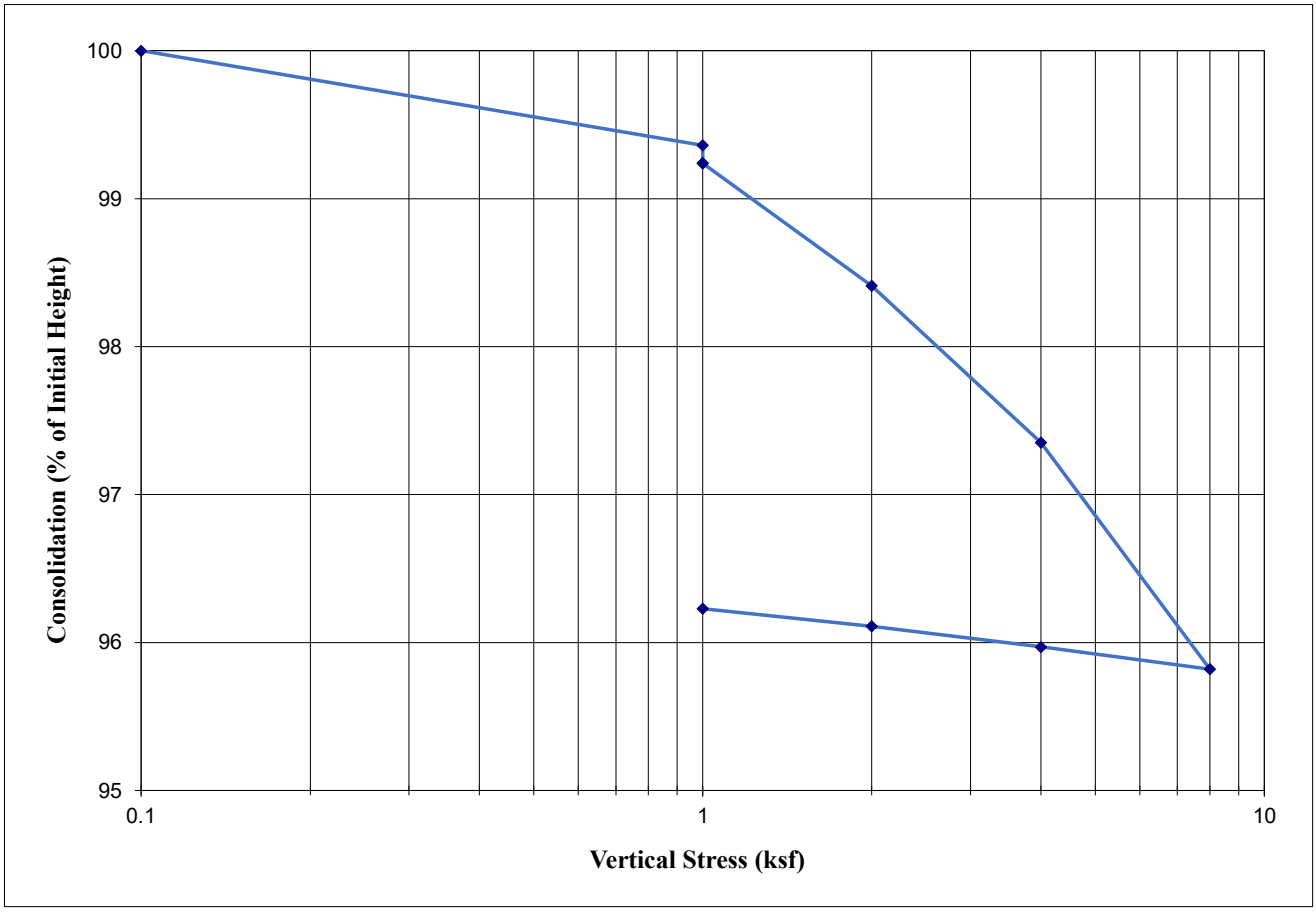
ACS Services LLC

ENGINEERING DESIGN • MATERIAL TESTING • CONSTRUCTION INSPECTION

* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**22-2240-2**	Material Type:	Soil
Client:	Ethos	Date of Extraction:	-
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	4/28/2022
Project City:	Goodyear	Lab Tested By:	Brian Karl
Sample Location:	B-13 @ 5.0 - 6.0	Reviewed By:	Dylan Ward

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.48
INITIAL MOISTURE CONTENT	7.7%	FINAL MOISTURE CONTENT	15.8%
INITIAL DRY DENSITY(pcf)	108.8	FINAL DRY DENSITY(pcf)	111.7
INITIAL DEGREE OF SATURATION	39%	FINAL DEGREE OF SATURATION	87%
INITIAL VOID RATIO	0.5	FINAL VOID RATIO	0.5
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	1 ksf



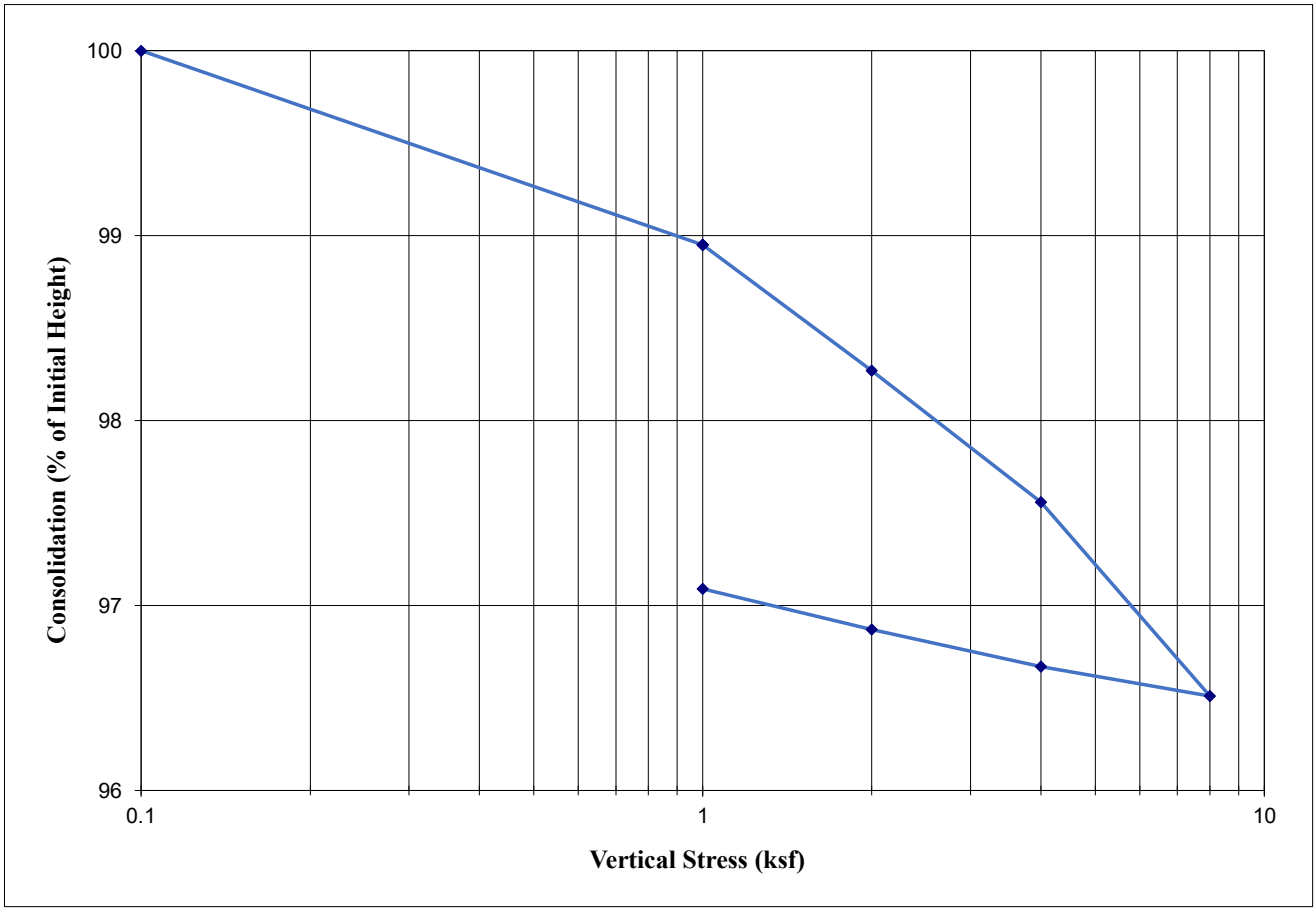
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**22-2237-2**	Material Type:	Soil
Client:	Ethos	Date of Extraction:	-
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	4/28/2022
Project City:	Goodyear	Lab Tested By:	Brian Karl
Sample Location:	B-14 @ 5.0 - 6.0	Reviewed By:	Dylan Ward

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.49
INITIAL MOISTURE CONTENT	16.9%	FINAL MOISTURE CONTENT	17.6%
INITIAL DRY DENSITY(pcf)	109.2	FINAL DRY DENSITY(pcf)	111.9
INITIAL DEGREE OF SATURATION	87%	FINAL DEGREE OF SATURATION	97%
INITIAL VOID RATIO	0.5	FINAL VOID RATIO	0.5
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	1 ksf



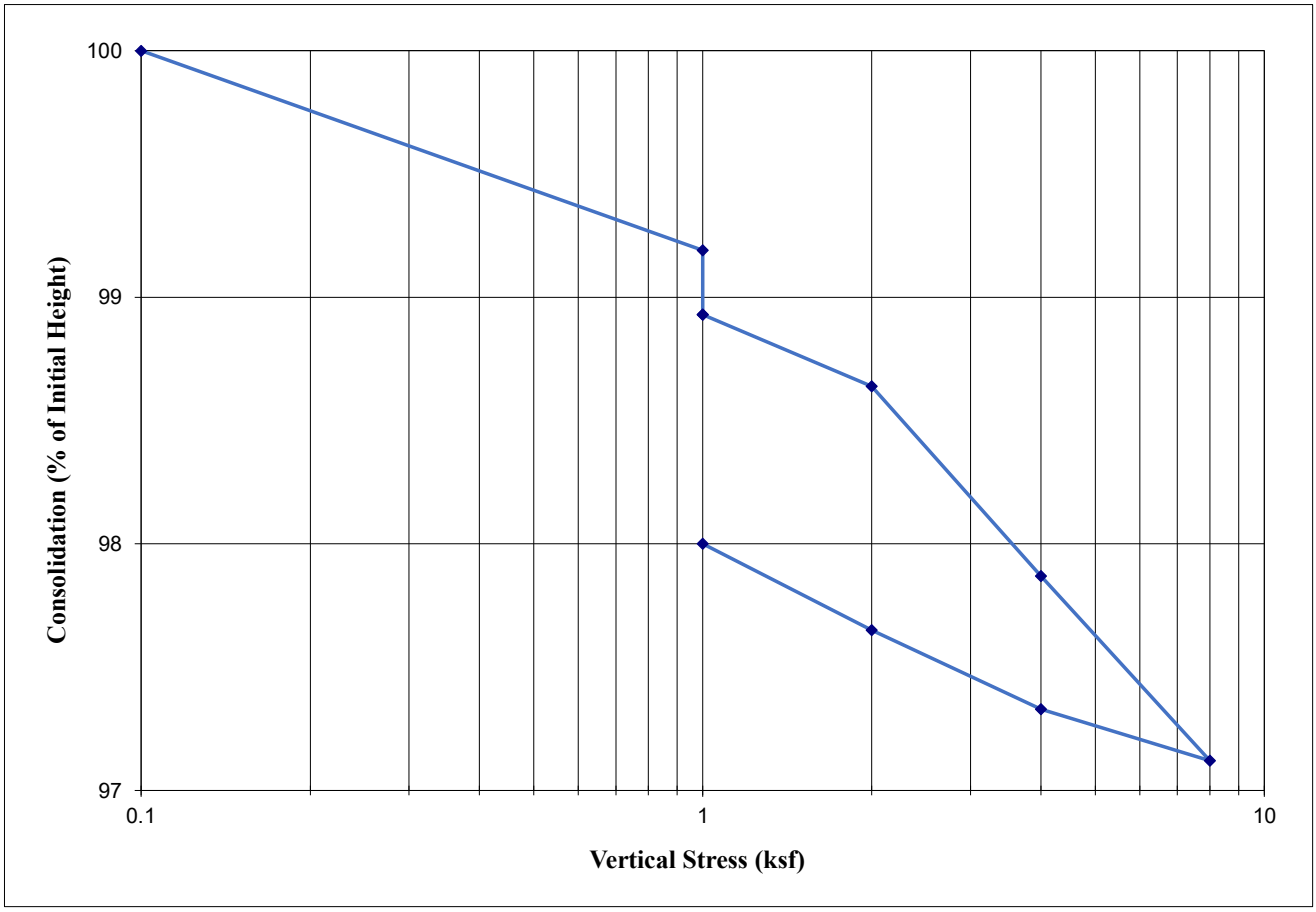
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**22-1943-5**	Material Type:	Native
Client:	Ethos	Date of Extraction:	-
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	5/6/2022
Project City:	Goodyear	Lab Tested By:	Brian Karl
Sample Location:	B-85 @ 15.0 - 16.0	Reviewed By:	Dylan Ward

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.51
INITIAL MOISTURE CONTENT	21.8%	FINAL MOISTURE CONTENT	28.9%
INITIAL DRY DENSITY(pcf)	91.8	FINAL DRY DENSITY(pcf)	93.8
INITIAL DEGREE OF SATURATION	72%	FINAL DEGREE OF SATURATION	100%
INITIAL VOID RATIO	0.8	FINAL VOID RATIO	0.8
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	1 ksf



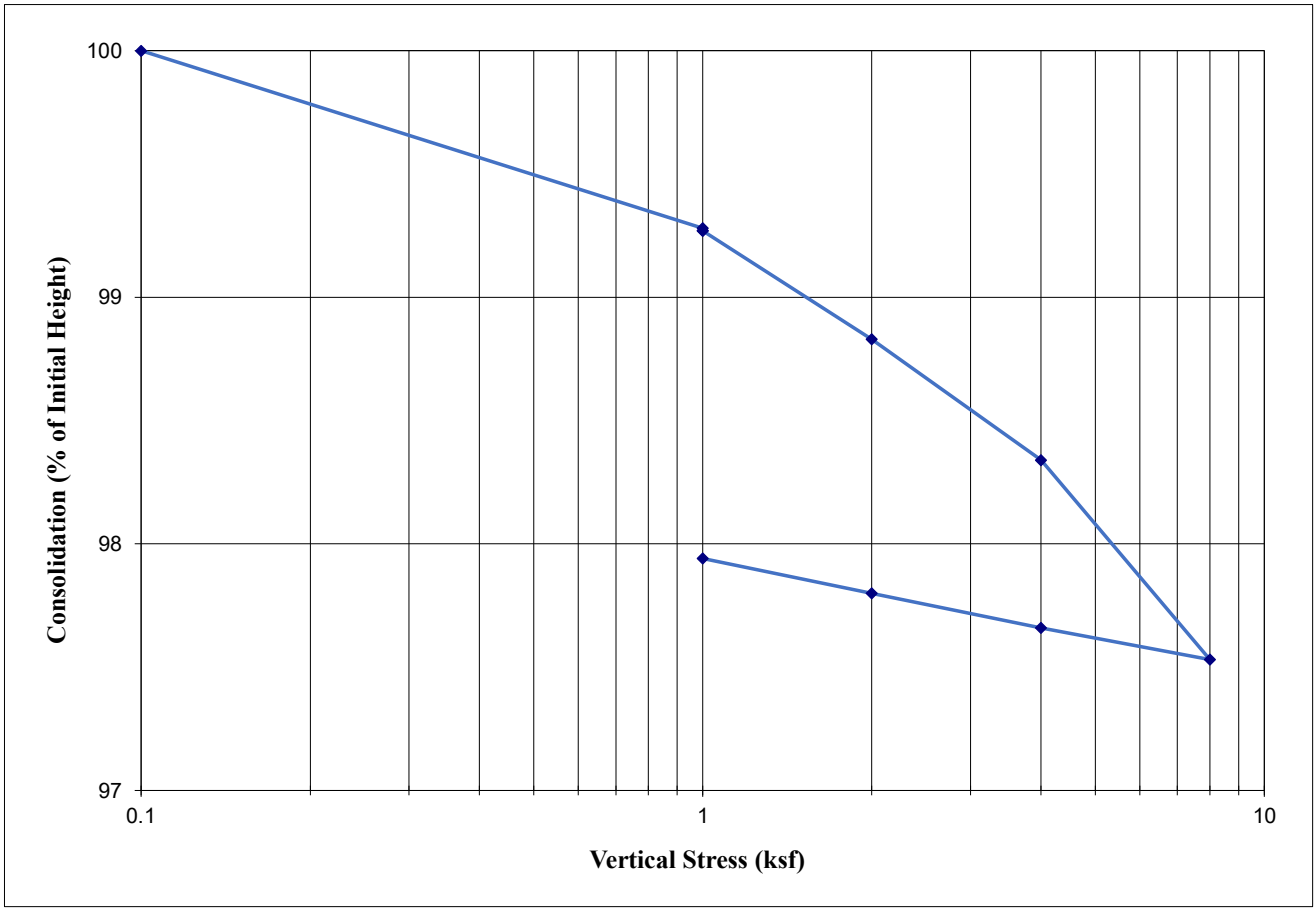
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**22-2130-6**	Material Type:	Soil
Client:	Ethos	Date of Extraction:	-
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	4/28/2022
Project City:	Goodyear	Lab Tested By:	Brian Karl
Sample Location:	B-18 @ 5.0 - 6.0	Reviewed By:	Dylan Ward

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.53
INITIAL MOISTURE CONTENT	14.5%	FINAL MOISTURE CONTENT	16.4%
INITIAL DRY DENSITY(pcf)	109.3	FINAL DRY DENSITY(pcf)	111.1
INITIAL DEGREE OF SATURATION	75%	FINAL DEGREE OF SATURATION	89%
INITIAL VOID RATIO	0.5	FINAL VOID RATIO	0.5
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	1 ksf



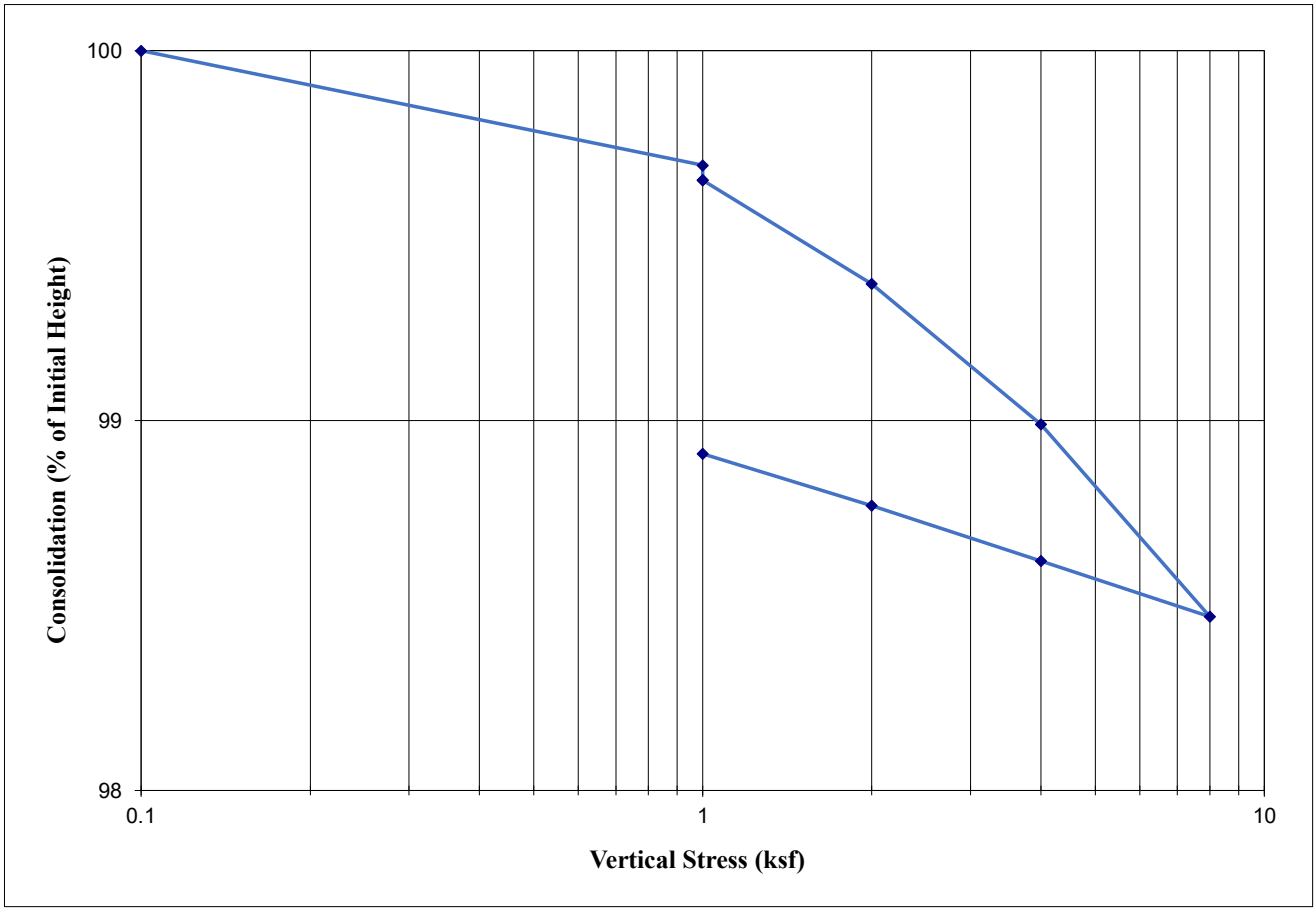
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**22-3002-2**	Material Type:	Soil
Client:	Ethos	Date of Extraction:	-
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	6/30/2022
Project City:	Goodyear	Lab Tested By:	Brian Karl
Sample Location:	B19 @ 5.0 - 6.0	Reviewed By:	Dylan Ward

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.56
INITIAL MOISTURE CONTENT	23.7%	FINAL MOISTURE CONTENT	25.6%
INITIAL DRY DENSITY(pcf)	91.4	FINAL DRY DENSITY(pcf)	92.3
INITIAL DEGREE OF SATURATION	78%	FINAL DEGREE OF SATURATION	86%
INITIAL VOID RATIO	0.8	FINAL VOID RATIO	0.8
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	1 ksf



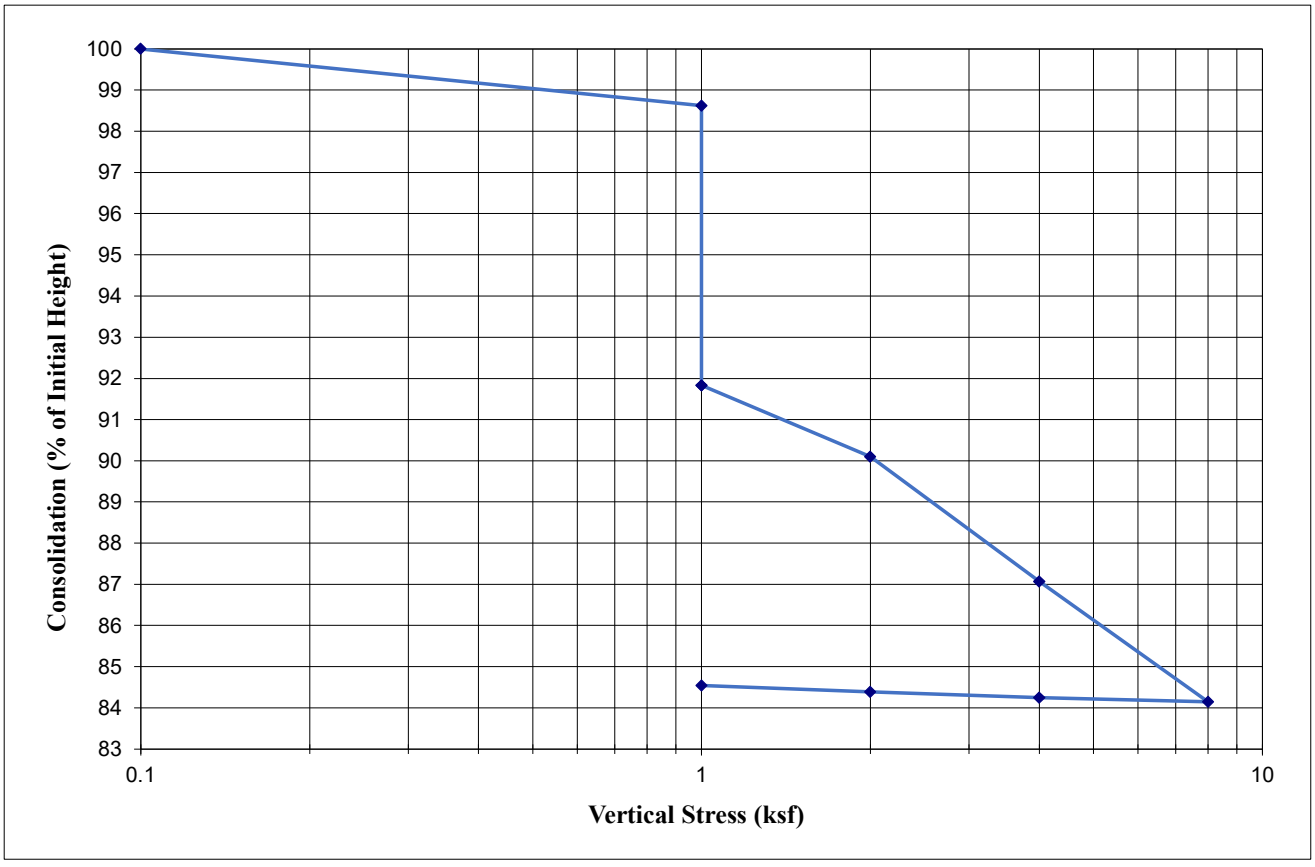
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**22-1414-10**	Material Type:	Native
Client:	Ethos	Date of Extraction:	-
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	2/16/2022
Project City:	Goodyear	Lab Tested By:	Fernando Montero
Sample Location:	B-30 @ 5.0 - 6.0'	Reviewed By:	Dylan Ward

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.01
INITIAL MOISTURE CONTENT	5.1%	FINAL MOISTURE CONTENT	17.3%
INITIAL DRY DENSITY(pcf)	92.3	FINAL DRY DENSITY(pcf)	106.0
INITIAL DEGREE OF SATURATION	17%	FINAL DEGREE OF SATURATION	82%
INITIAL VOID RATIO	0.8	FINAL VOID RATIO	0.6
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	1 ksf



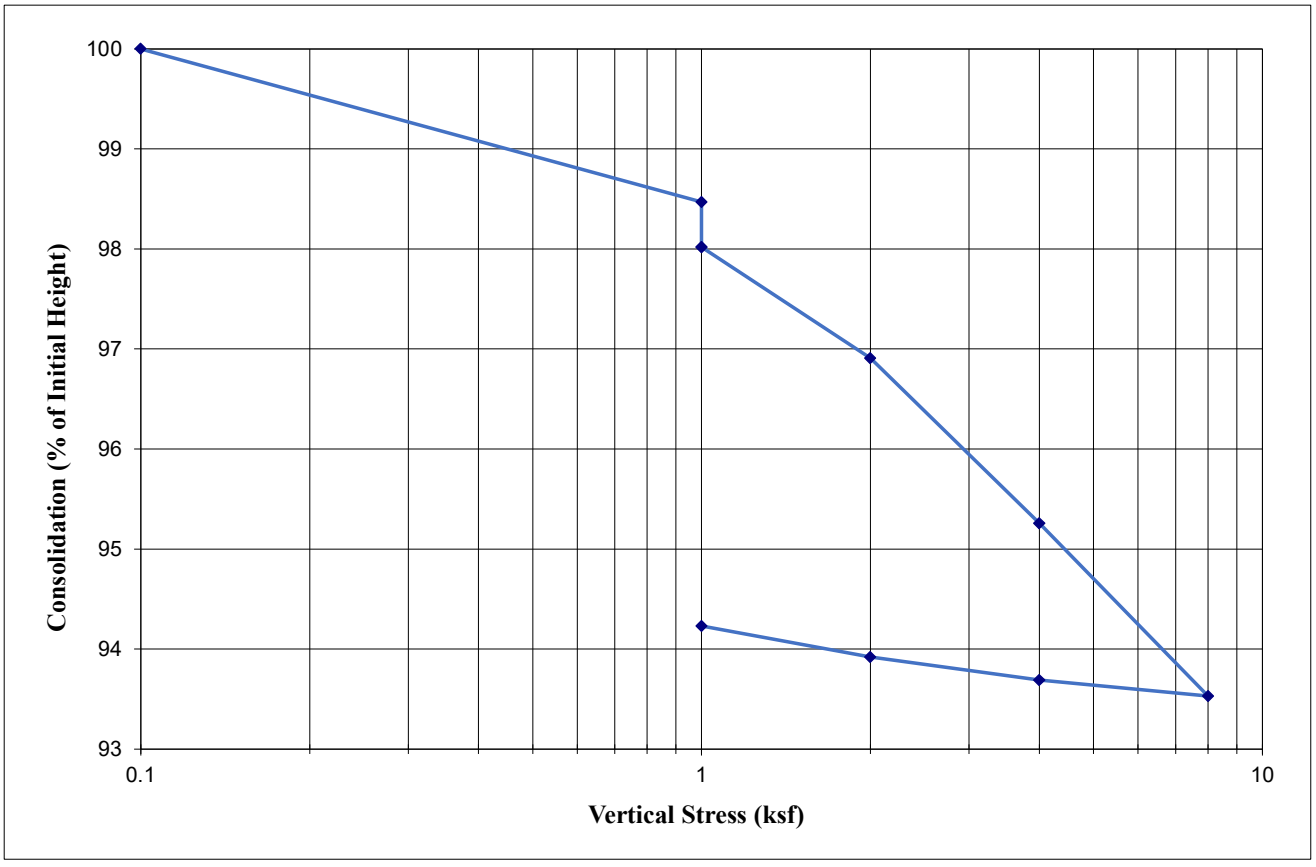
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**22-1414-6**	Material Type:	Native
Client:	Ethos	Date of Extraction:	-
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	2/16/2022
Project City:	Goodyear	Lab Tested By:	Fernando Montero
Sample Location:	B-32 @ 10.0 - 11.0'	Reviewed By:	Dylan Ward

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.39
INITIAL MOISTURE CONTENT	7.0%	FINAL MOISTURE CONTENT	19.1%
INITIAL DRY DENSITY(pcf)	102.3	FINAL DRY DENSITY(pcf)	107.4
INITIAL DEGREE OF SATURATION	30%	FINAL DEGREE OF SATURATION	94%
INITIAL VOID RATIO	0.6	FINAL VOID RATIO	0.5
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	1 ksf



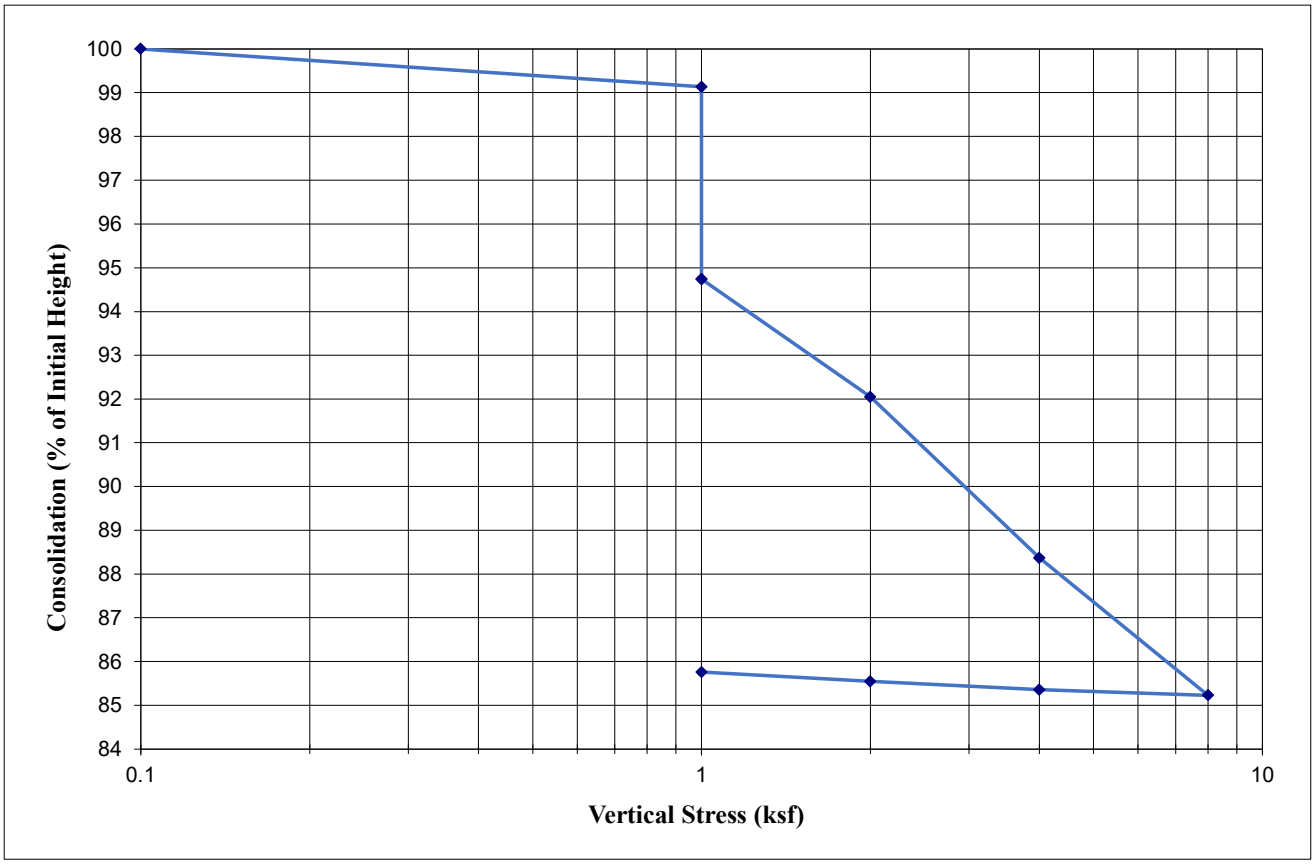
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**22-1414-24**	Material Type:	Native
Client:	Ethos	Date of Extraction:	-
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	2/16/2022
Project City:	Goodyear	Lab Tested By:	Fernando Montero
Sample Location:	B-35 @ 5.0 - 6.0'	Reviewed By:	Dylan Ward

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.07
INITIAL MOISTURE CONTENT	5.3%	FINAL MOISTURE CONTENT	19.3%
INITIAL DRY DENSITY(pcf)	92.2	FINAL DRY DENSITY(pcf)	104.3
INITIAL DEGREE OF SATURATION	18%	FINAL DEGREE OF SATURATION	87%
INITIAL VOID RATIO	0.8	FINAL VOID RATIO	0.6
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	1 ksf



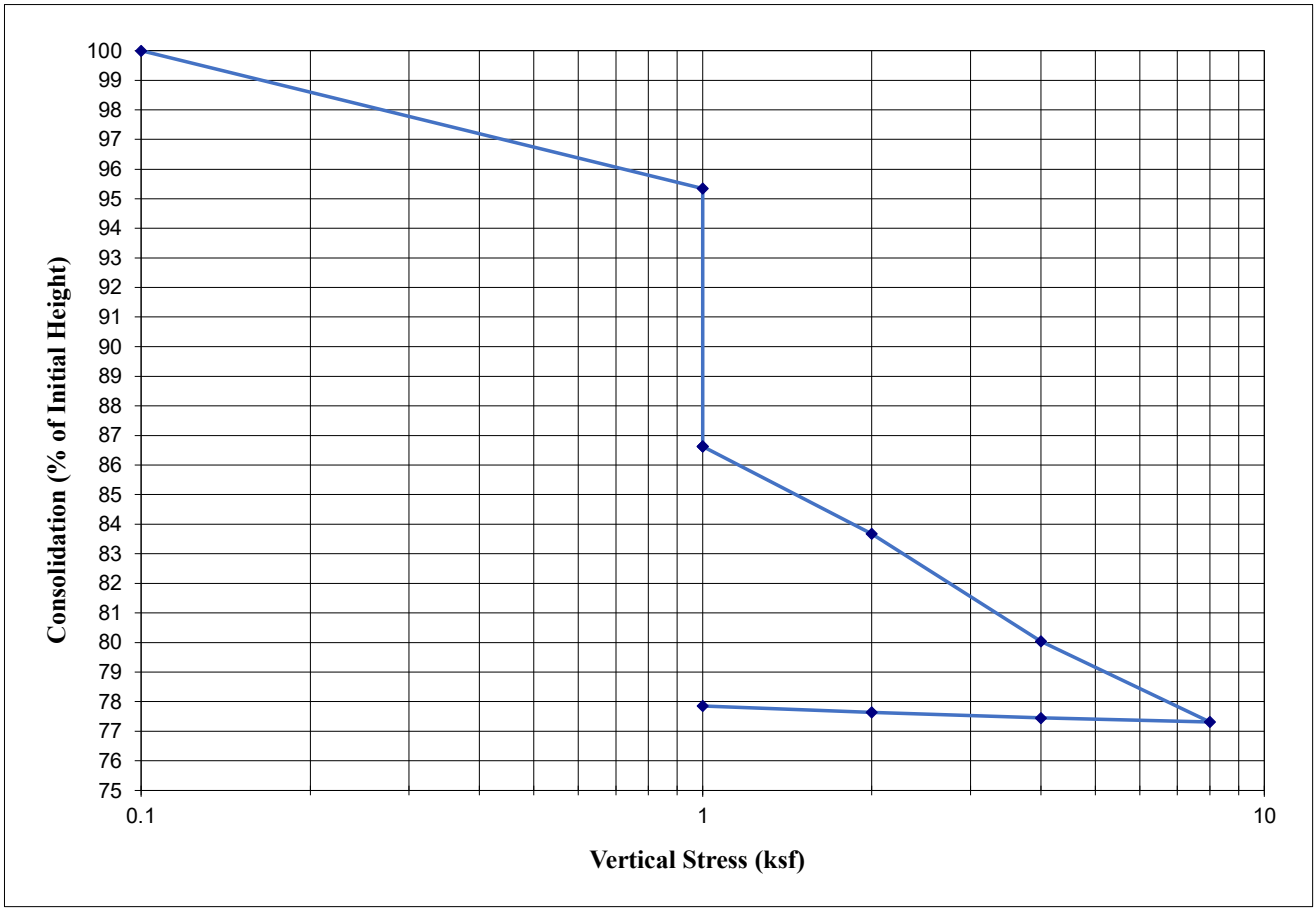
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**22-1657-5**	Material Type:	Native
Client:	Ethos	Date of Extraction:	-
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	4/4/2022
Project City:	Goodyear	Lab Tested By:	Brian Karl
Sample Location:	B-40 @ 5.0 - 6.0'	Reviewed By:	Dylan Ward

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	3.69
INITIAL MOISTURE CONTENT	11.4%	FINAL MOISTURE CONTENT	17.4%
INITIAL DRY DENSITY(pcf)	90.3	FINAL DRY DENSITY(pcf)	112.8
INITIAL DEGREE OF SATURATION	36%	FINAL DEGREE OF SATURATION	99%
INITIAL VOID RATIO	0.8	FINAL VOID RATIO	0.5
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	1 ksf



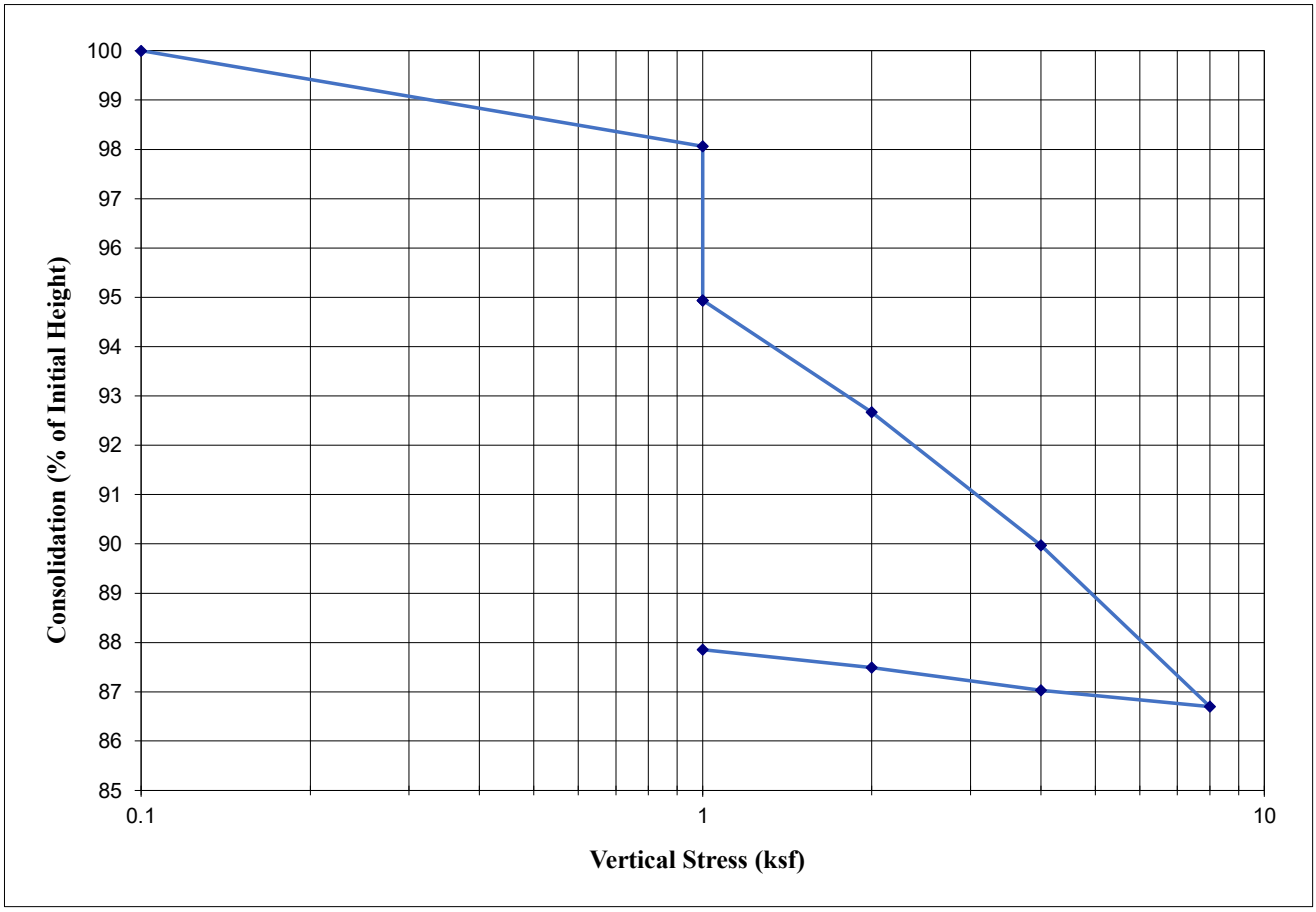
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**22-1657-11**	Material Type:	Native
Client:	Ethos	Date of Extraction:	-
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	4/4/2022
Project City:	Goodyear	Lab Tested By:	Brian Karl
Sample Location:	B-42 @ 10.0 - 11.0'	Reviewed By:	Dylan Ward

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.14
INITIAL MOISTURE CONTENT	12.3%	FINAL MOISTURE CONTENT	29.3%
INITIAL DRY DENSITY(pcf)	81.0	FINAL DRY DENSITY(pcf)	90.0
INITIAL DEGREE OF SATURATION	31%	FINAL DEGREE OF SATURATION	93%
INITIAL VOID RATIO	1.0	FINAL VOID RATIO	0.8
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	1 ksf



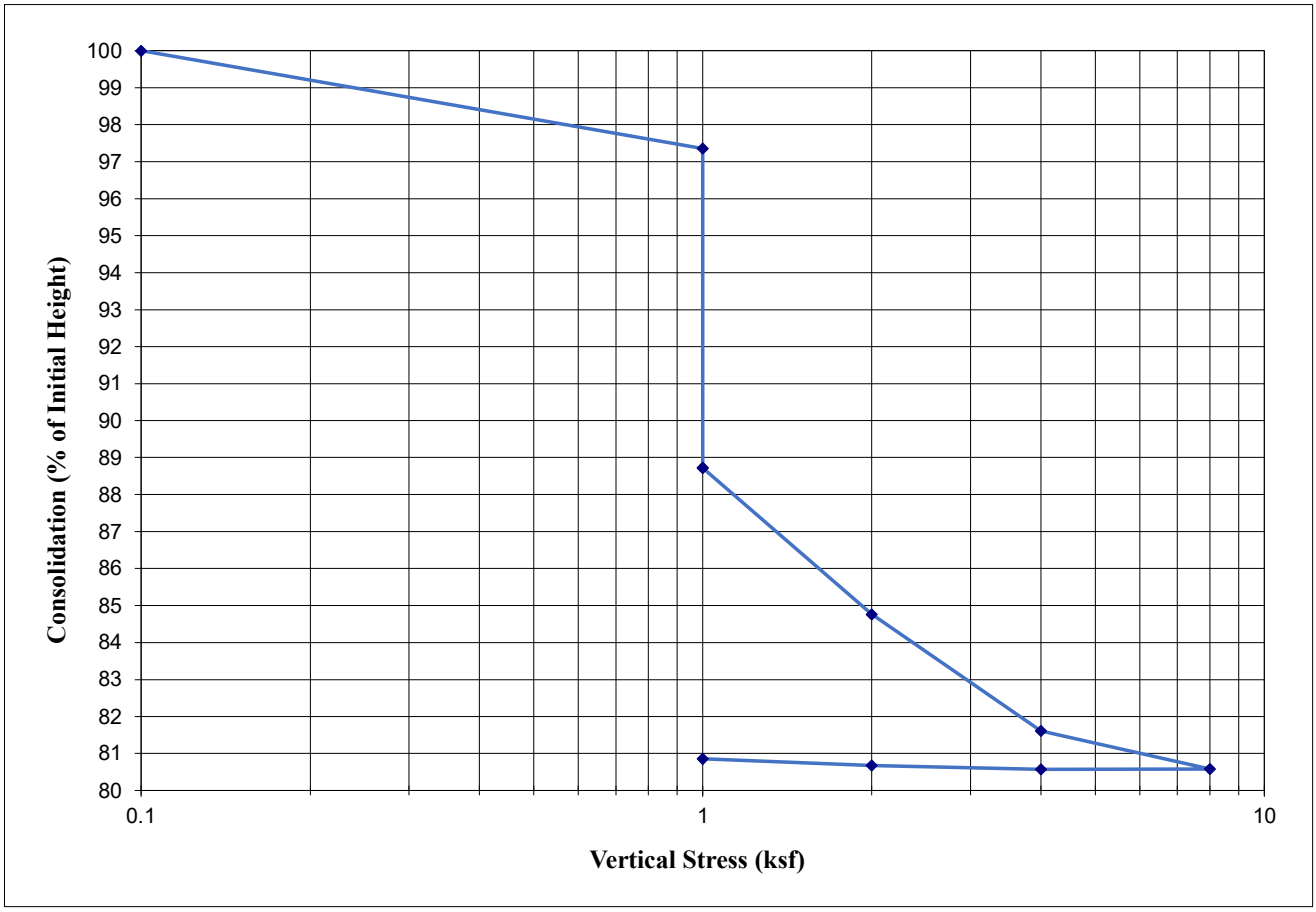
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**22-1657-20**	Material Type:	Native
Client:	Ethos	Date of Extraction:	-
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	4/4/2022
Project City:	Goodyear	Lab Tested By:	Brian Karl
Sample Location:	B-45 @ 5.0 - 6.0'	Reviewed By:	Dylan Ward

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	3.76
INITIAL MOISTURE CONTENT	9.7%	FINAL MOISTURE CONTENT	20.1%
INITIAL DRY DENSITY(pcf)	83.0	FINAL DRY DENSITY(pcf)	101.6
INITIAL DEGREE OF SATURATION	26%	FINAL DEGREE OF SATURATION	85%
INITIAL VOID RATIO	1.0	FINAL VOID RATIO	0.6
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	1 ksf



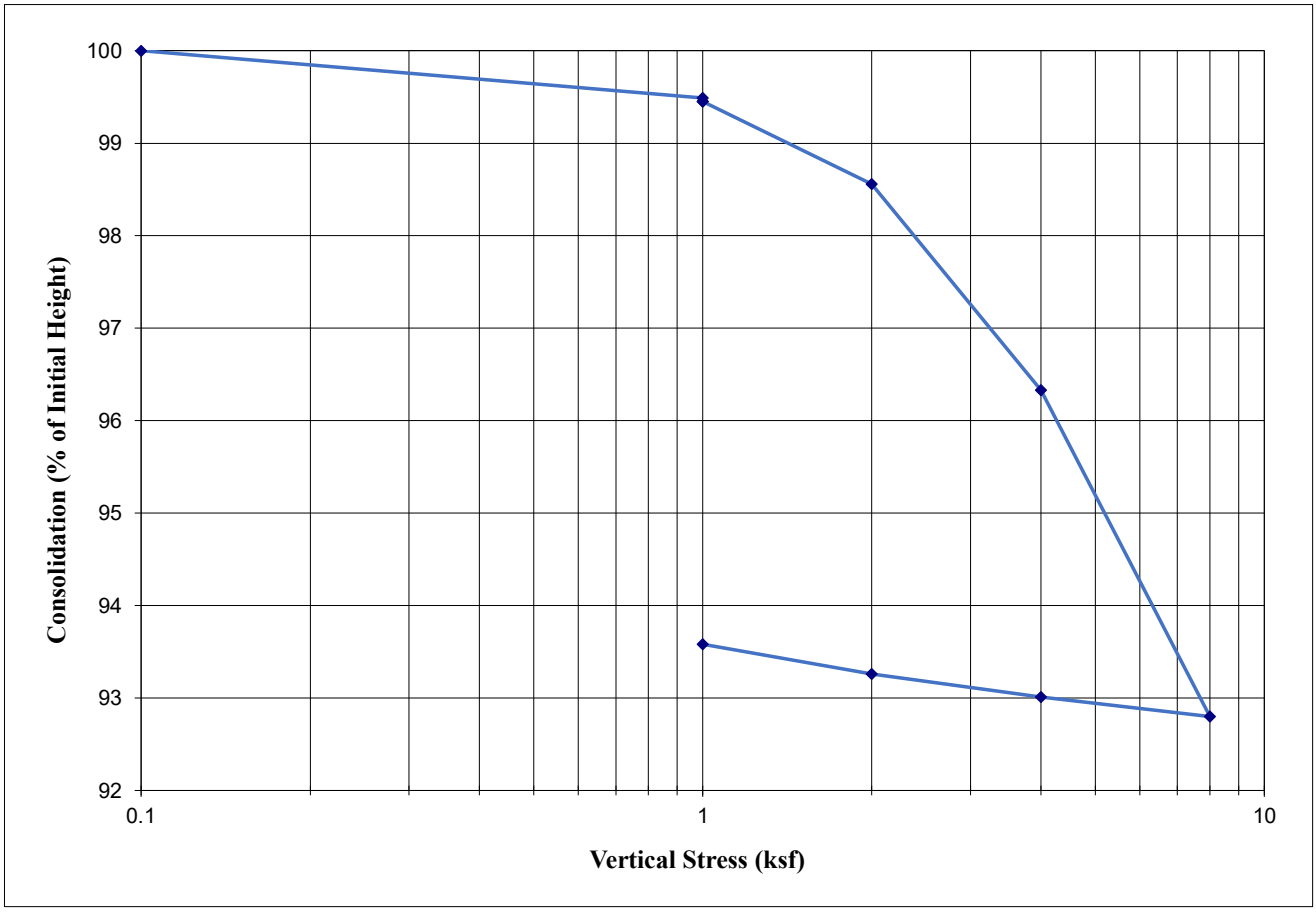
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**22-1978-4**	Material Type:	Native
Client:	Ethos	Date of Extraction:	-
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	5/6/2022
Project City:	Goodyear	Lab Tested By:	Brian Karl
Sample Location:	B-47 @ 3.0 - 4.0	Reviewed By:	Dylan Ward

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.44
INITIAL MOISTURE CONTENT	12.0%	FINAL MOISTURE CONTENT	20.2%
INITIAL DRY DENSITY(pcf)	101.8	FINAL DRY DENSITY(pcf)	105.6
INITIAL DEGREE OF SATURATION	51%	FINAL DEGREE OF SATURATION	95%
INITIAL VOID RATIO	0.6	FINAL VOID RATIO	0.6
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	1 ksf



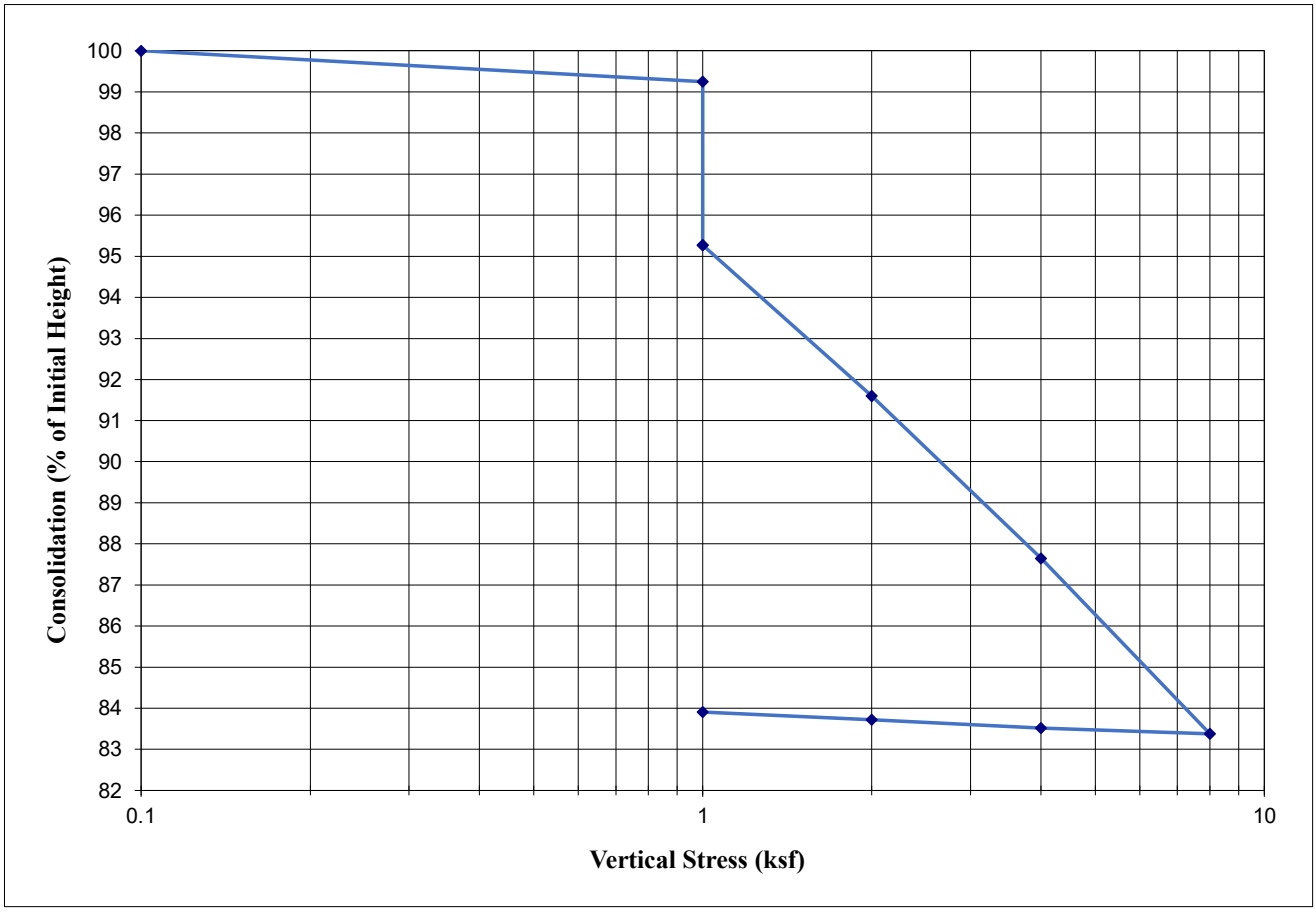
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**22-1978-6**	Material Type:	Native
Client:	Ethos	Date of Extraction:	-
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	5/6/2022
Project City:	Goodyear	Lab Tested By:	Brian Karl
Sample Location:	B-48 @ 5.0 - 6.0	Reviewed By:	Dylan Ward

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.04
INITIAL MOISTURE CONTENT	7.5%	FINAL MOISTURE CONTENT	20.9%
INITIAL DRY DENSITY(pcf)	87.0	FINAL DRY DENSITY(pcf)	99.2
INITIAL DEGREE OF SATURATION	22%	FINAL DEGREE OF SATURATION	83%
INITIAL VOID RATIO	0.9	FINAL VOID RATIO	0.7
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	1 ksf



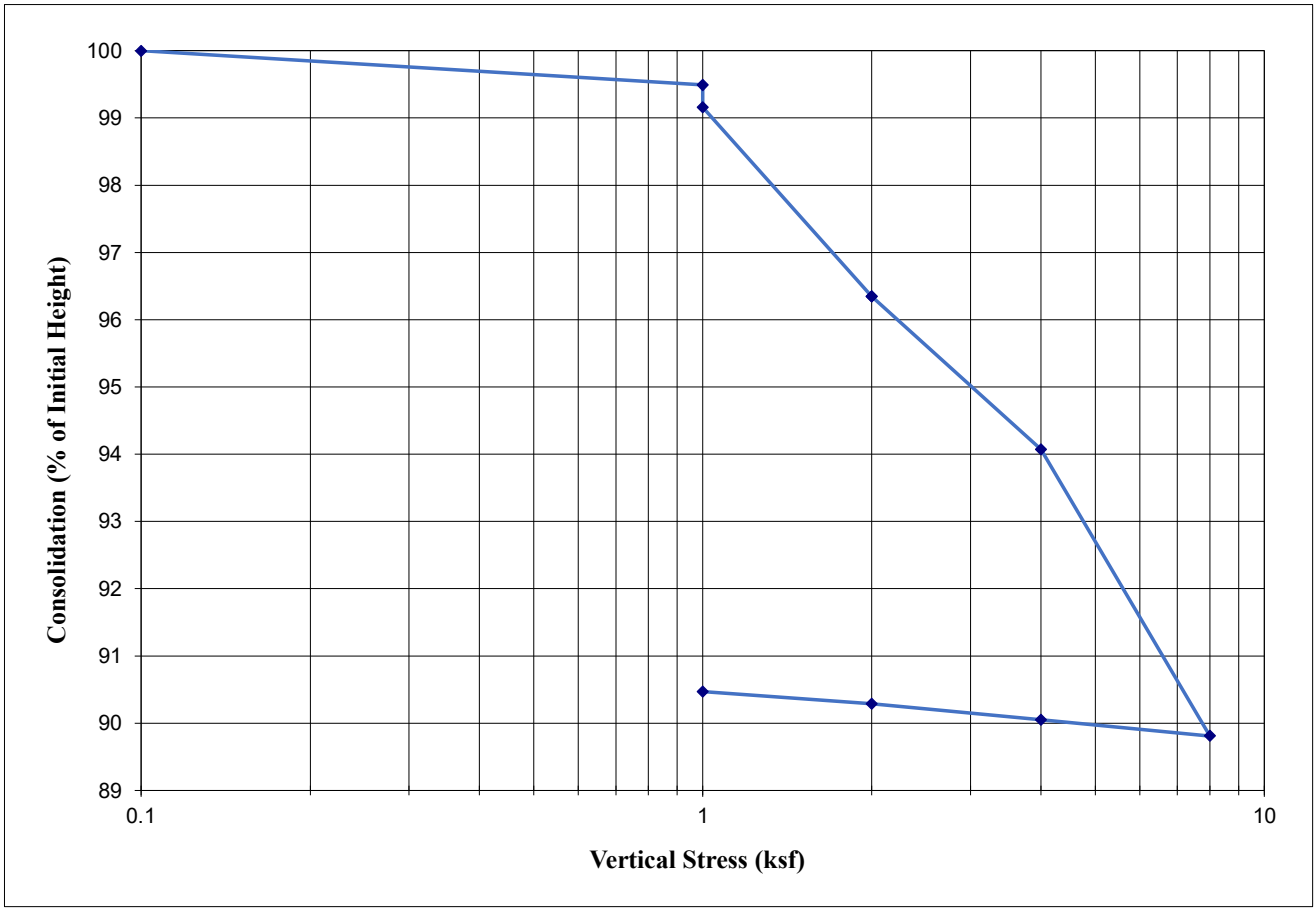
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**22-1957-4**	Material Type:	Native
Client:	Ethos	Date of Extraction:	-
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	4/22/202
Project City:	Goodyear	Lab Tested By:	Brian Karl
Sample Location:	B-50 @ 3.0 - 4.0	Reviewed By:	Dylan Ward

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.33
INITIAL MOISTURE CONTENT	10.8%	FINAL MOISTURE CONTENT	17.9%
INITIAL DRY DENSITY(pcf)	103.6	FINAL DRY DENSITY(pcf)	110.1
INITIAL DEGREE OF SATURATION	48%	FINAL DEGREE OF SATURATION	94%
INITIAL VOID RATIO	0.6	FINAL VOID RATIO	0.5
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	2 ksf



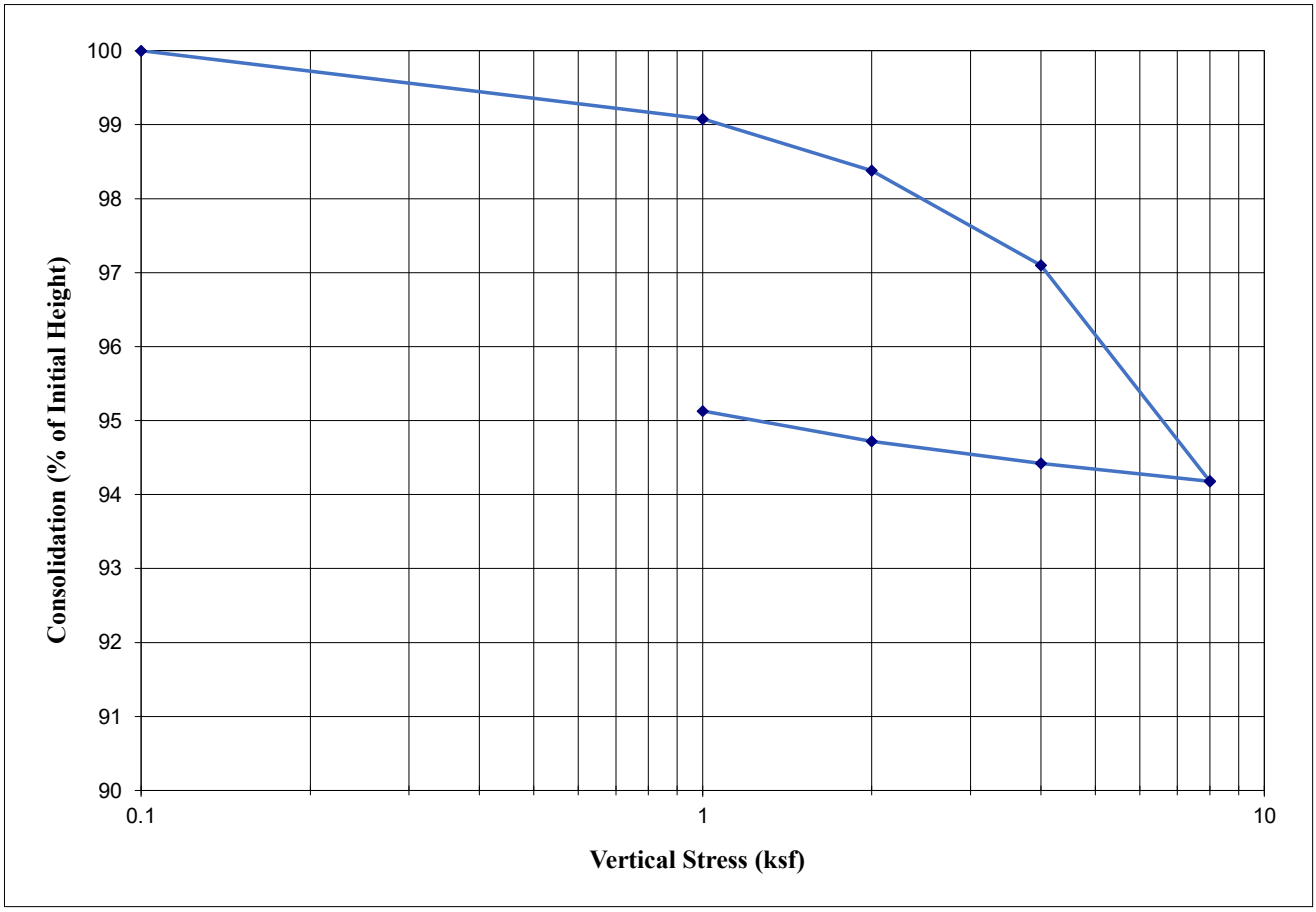
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**22-1456-5**	Material Type:	Native
Client:	Ethos	Date of Extraction:	-
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	2/23/2022
Project City:	Goodyear	Lab Tested By:	Brian Karl
Sample Location:	B-54 @ 15.0 - 16.0'	Reviewed By:	Dylan ward

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.34
INITIAL MOISTURE CONTENT	10.8%	FINAL MOISTURE CONTENT	25.3%
INITIAL DRY DENSITY(pcf)	92.4	FINAL DRY DENSITY(pcf)	98.1
INITIAL DEGREE OF SATURATION	36%	FINAL DEGREE OF SATURATION	98%
INITIAL VOID RATIO	0.8	FINAL VOID RATIO	0.7
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	8 ksf



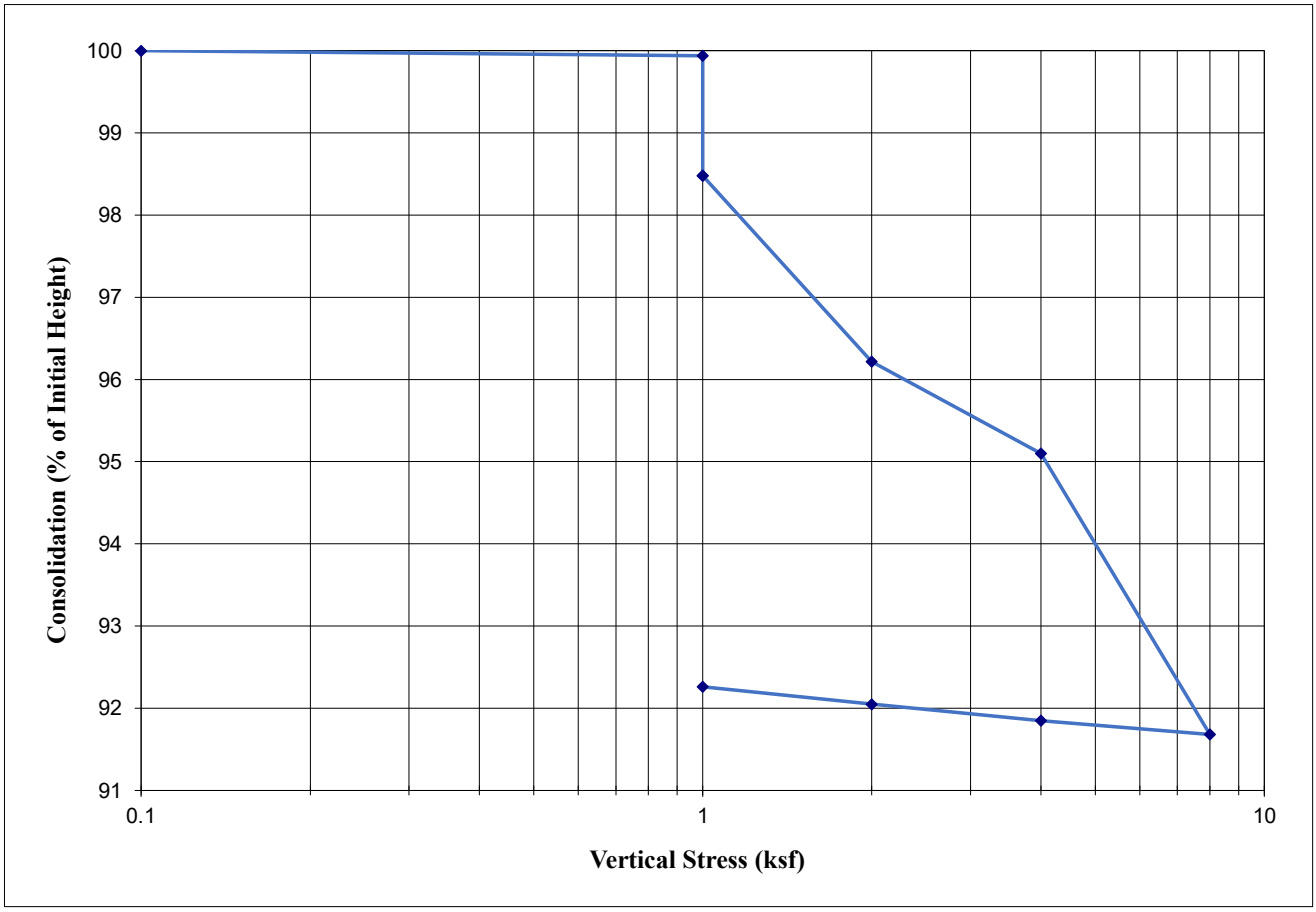
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**22-1959-2**	Material Type:	Native
Client:	Ethos	Date of Extraction:	-
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	5/6/2022
Project City:	Goodyear	Lab Tested By:	Brian Karl
Sample Location:	B-66 @ 5.0 - 6.0	Reviewed By:	Dylan Ward

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.38
INITIAL MOISTURE CONTENT	8.9%	FINAL MOISTURE CONTENT	18.0%
INITIAL DRY DENSITY(pcf)	100.9	FINAL DRY DENSITY(pcf)	106.0
INITIAL DEGREE OF SATURATION	37%	FINAL DEGREE OF SATURATION	85%
INITIAL VOID RATIO	0.6	FINAL VOID RATIO	0.6
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	1 ksf



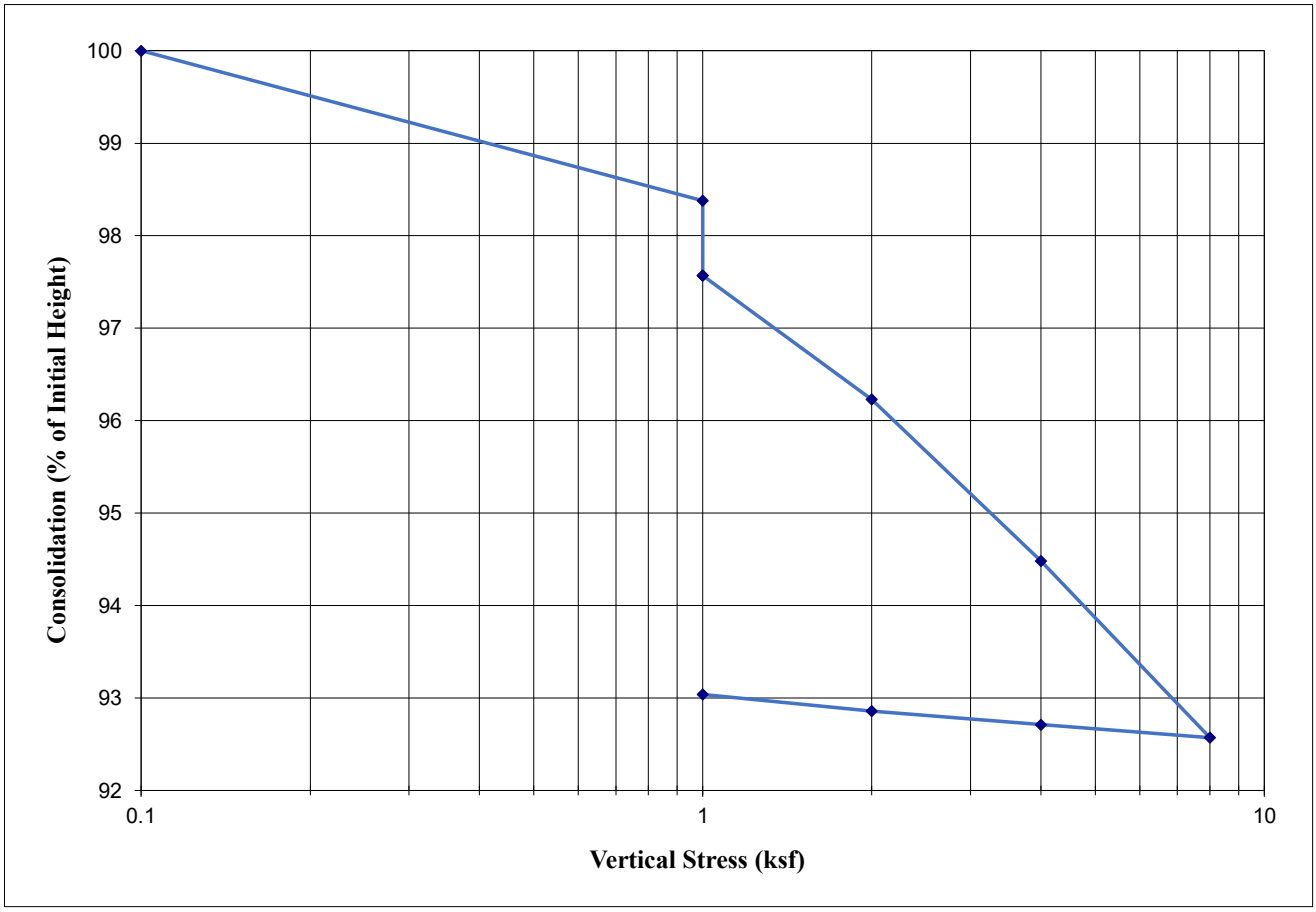
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**22-2238-2**	Material Type:	Soil
Client:	Ethos	Date of Extraction:	-
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	4/28/2022
Project City:	Goodyear	Lab Tested By:	Brian Karl
Sample Location:	B-83 @ 10.0 - 11.0	Reviewed By:	Dylan Ward

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.35
INITIAL MOISTURE CONTENT	6.3%	FINAL MOISTURE CONTENT	16.2%
INITIAL DRY DENSITY(pcf)	105.4	FINAL DRY DENSITY(pcf)	111.5
INITIAL DEGREE OF SATURATION	29%	FINAL DEGREE OF SATURATION	89%
INITIAL VOID RATIO	0.6	FINAL VOID RATIO	0.5
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	1 ksf



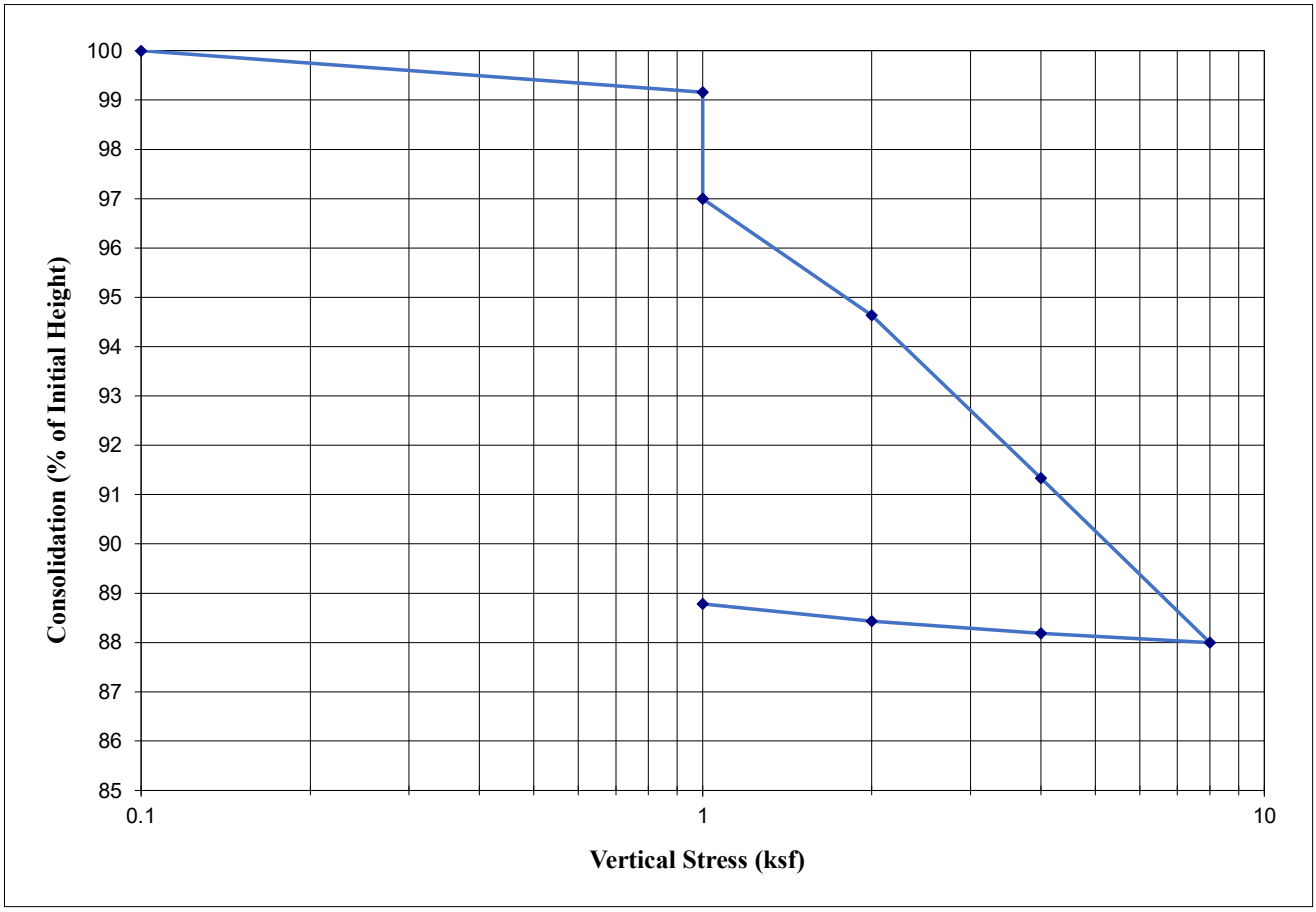
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**22-1057-2**	Material Type:	Native
Client:	Ethos	Date of Extraction:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Extracted By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Date of Lab Test:	1/22/2022
Project City:	Goodyear	Lab Tested By:	Fernando Montero
Sample Location:	B - 90 @ 5.0' - 6.0'	Reviewed By:	Andrew Jamrogiewicz, P.E.

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.21
INITIAL MOISTURE CONTENT	9.7%	FINAL MOISTURE CONTENT	21.3%
INITIAL DRY DENSITY(pcf)	93.1	FINAL DRY DENSITY(pcf)	101.9
INITIAL DEGREE OF SATURATION	33%	FINAL DEGREE OF SATURATION	91%
INITIAL VOID RATIO	0.8	FINAL VOID RATIO	0.6
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	1 ksf



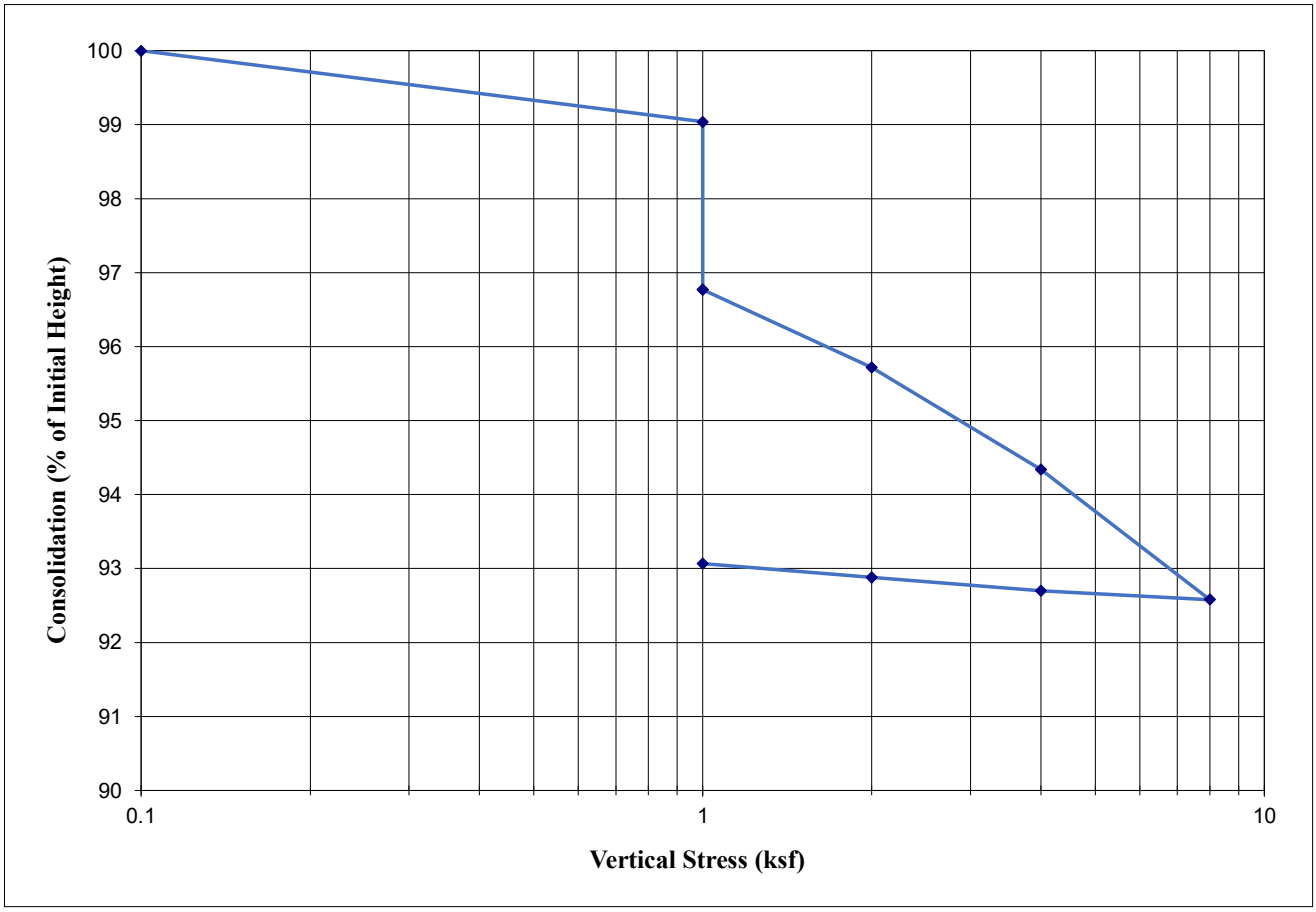
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**22-1057-10**	Material Type:	Native
Client:	Ethos	Date of Extraction:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Extracted By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Date of Lab Test:	1/21/2022
Project City:	Goodyear	Lab Tested By:	Fernando Montero
Sample Location:	B - 92 @ 5.0' - 6.0'	Reviewed By:	Andrew Jamrogiewicz, P.E.

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.34
INITIAL MOISTURE CONTENT	3.4%	FINAL MOISTURE CONTENT	15.8%
INITIAL DRY DENSITY(pcf)	102.7	FINAL DRY DENSITY(pcf)	108.8
INITIAL DEGREE OF SATURATION	15%	FINAL DEGREE OF SATURATION	80%
INITIAL VOID RATIO	0.6	FINAL VOID RATIO	0.5
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	1 ksf



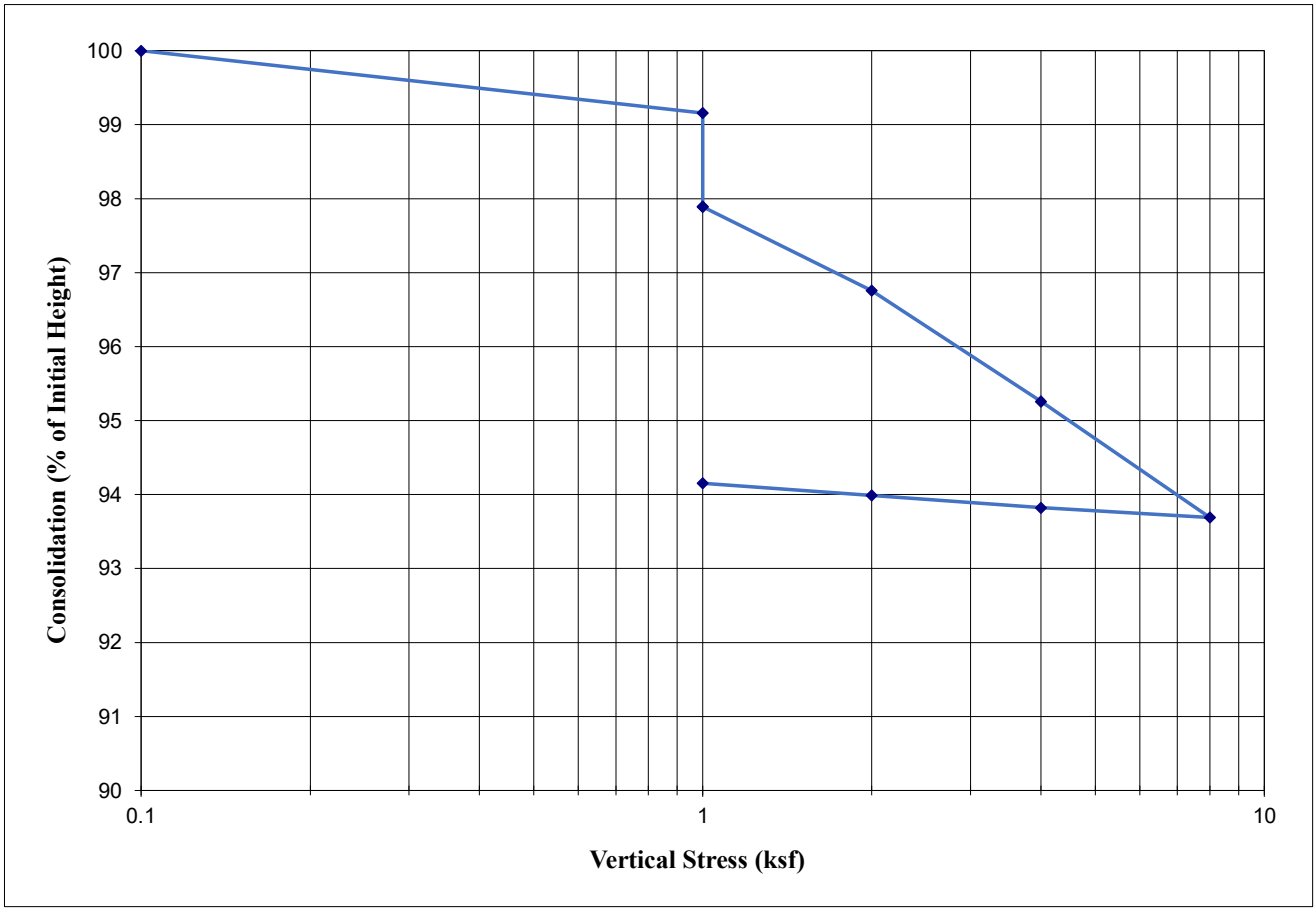
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**22-1057-16**	Material Type:	Native
Client:	Ethos	Date of Extraction:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Extracted By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Date of Lab Test:	1/22/2022
Project City:	Goodyear	Lab Tested By:	Fernando Montero
Sample Location:	B - 94 @ 10.0' - 11.5'	Reviewed By:	Andrew Jamrogiewicz, P.E.

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.39
INITIAL MOISTURE CONTENT	4.6%	FINAL MOISTURE CONTENT	16.0%
INITIAL DRY DENSITY(pcf)	104.3	FINAL DRY DENSITY(pcf)	109.5
INITIAL DEGREE OF SATURATION	21%	FINAL DEGREE OF SATURATION	83%
INITIAL VOID RATIO	0.6	FINAL VOID RATIO	0.5
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	1 ksf



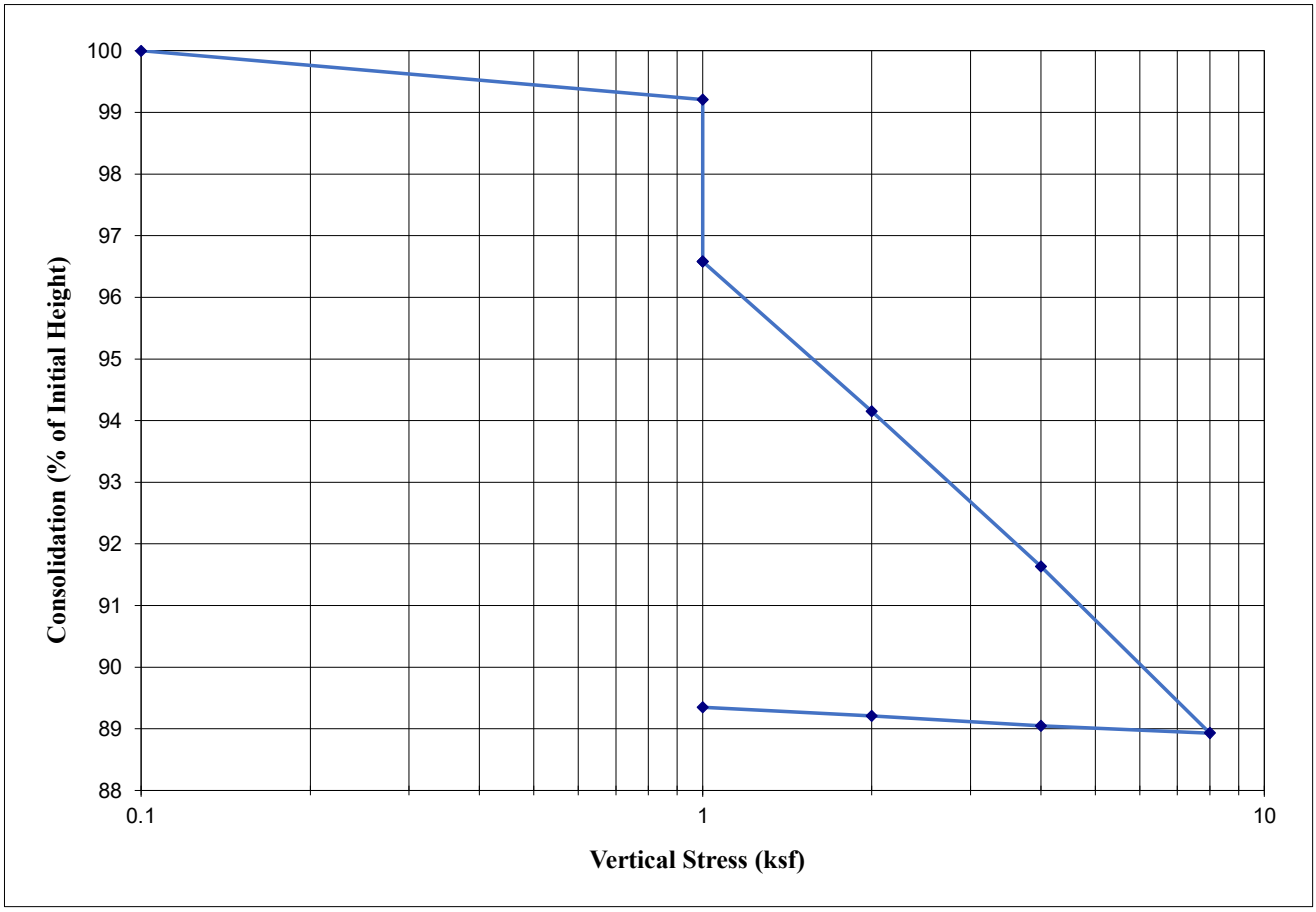
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**22-3005-2**	Material Type:	Soil
Client:	Ethos	Date of Extraction:	-
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	6/30/2022
Project City:	Goodyear	Lab Tested By:	Brian Karl
Sample Location:	B97A @ 2.5 - 3.5	Reviewed By:	Dylan Ward

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.22
INITIAL MOISTURE CONTENT	7.9%	FINAL MOISTURE CONTENT	14.1%
INITIAL DRY DENSITY(pcf)	105.2	FINAL DRY DENSITY(pcf)	114.7
INITIAL DEGREE OF SATURATION	36%	FINAL DEGREE OF SATURATION	85%
INITIAL VOID RATIO	0.6	FINAL VOID RATIO	0.4
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	1 ksf



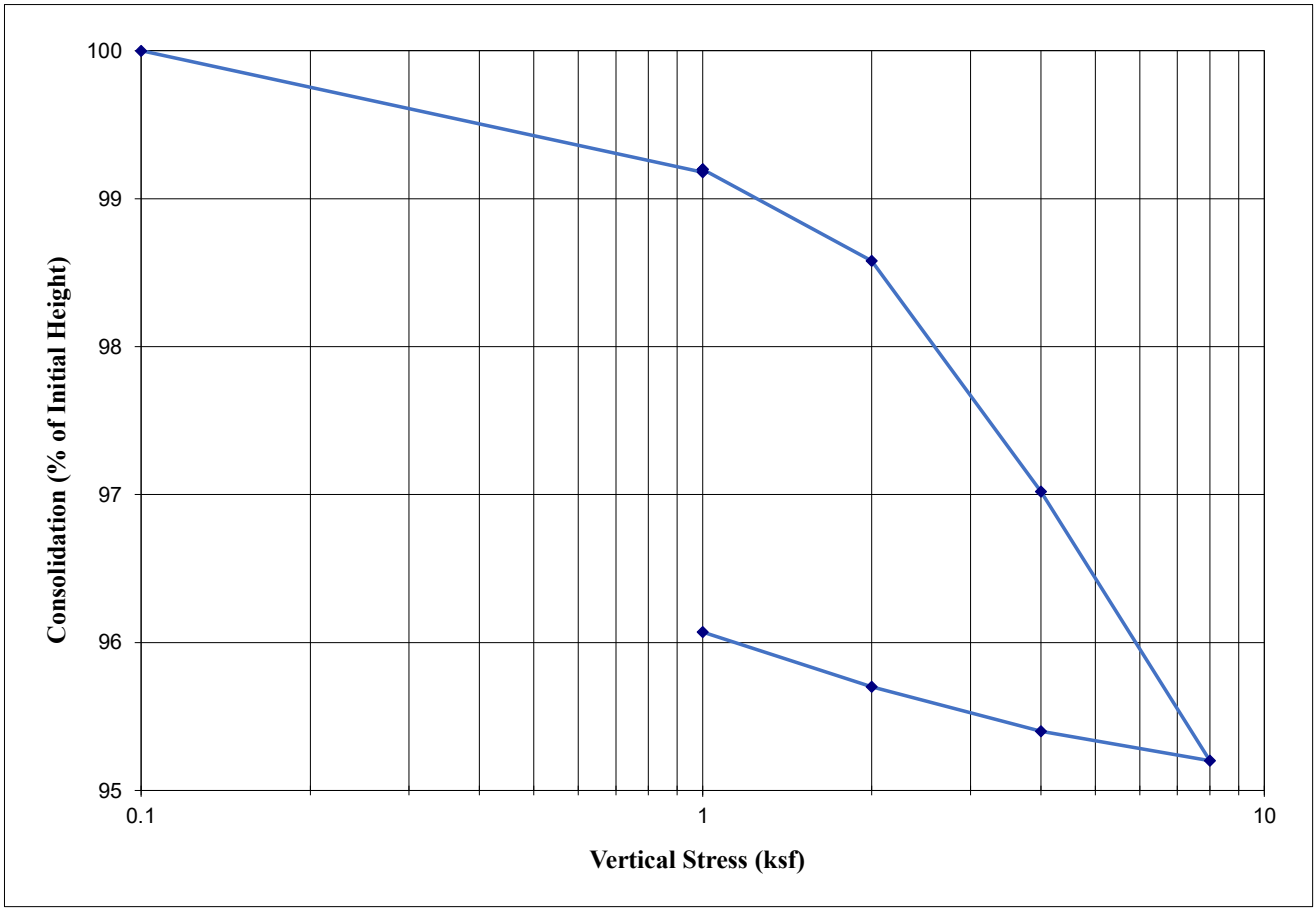
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**22-1944-3**	Material Type:	Native
Client:	Ethos	Date of Extraction:	-
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	5/5/2022
Project City:	Goodyear	Lab Tested By:	Brian Karl
Sample Location:	B-98 @ 5.0 - 6.0	Reviewed By:	Dylan Ward

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.47
INITIAL MOISTURE CONTENT	10.5%	FINAL MOISTURE CONTENT	17.8%
INITIAL DRY DENSITY(pcf)	109.0	FINAL DRY DENSITY(pcf)	112.3
INITIAL DEGREE OF SATURATION	54%	FINAL DEGREE OF SATURATION	100%
INITIAL VOID RATIO	0.5	FINAL VOID RATIO	0.5
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	1 ksf



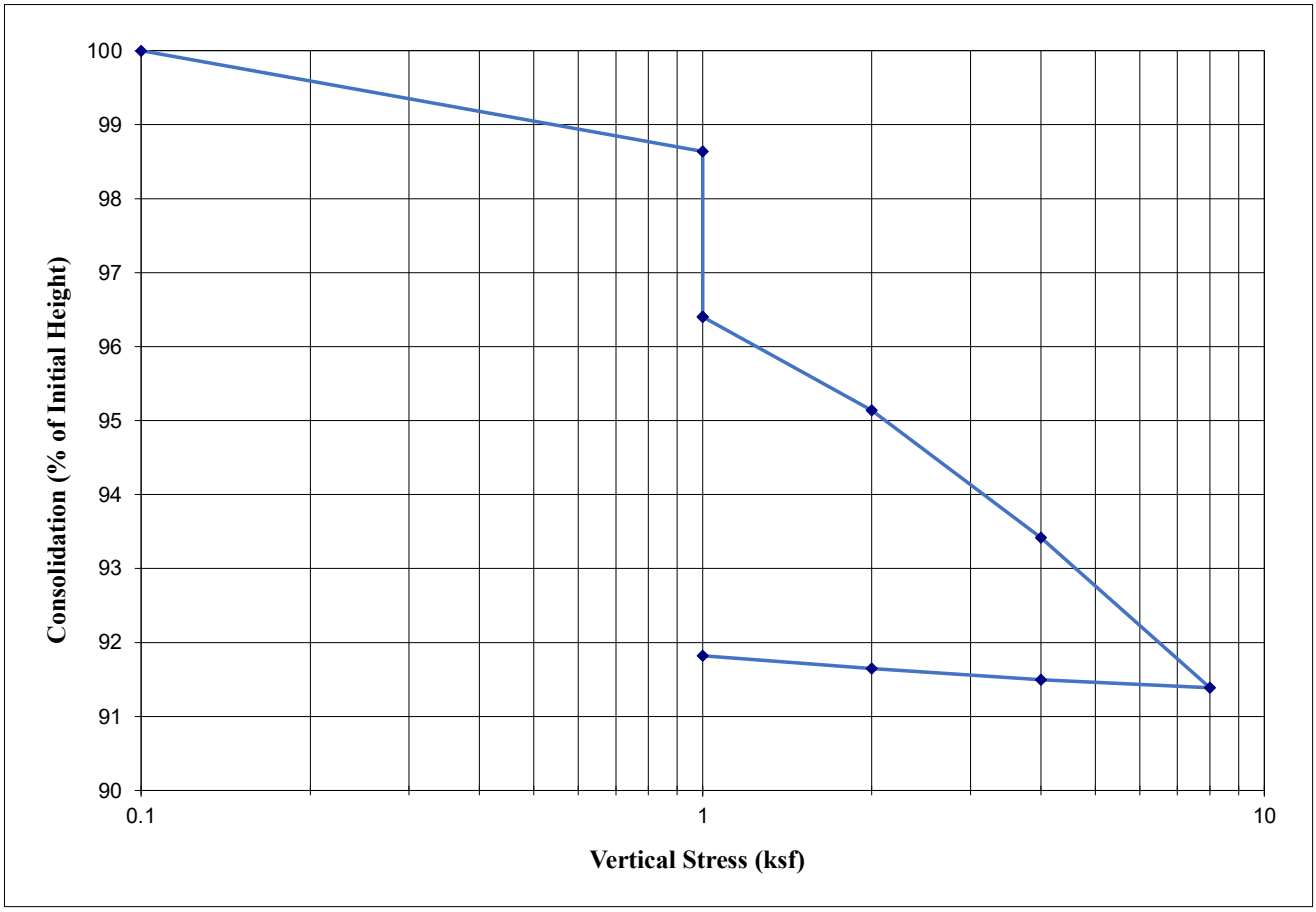
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**22-1146-6**	Material Type:	Native
Client:	Ethos	Date of Extraction:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Extracted By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Date of Lab Test:	1/27/2022
Project City:	Goodyear	Lab Tested By:	Fernando Montero
Sample Location:	B - 113 @ 5.0' - 6.0'	Reviewed By:	Andrew Jamrogiewicz, P.E.

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.30
INITIAL MOISTURE CONTENT	4.1%	FINAL MOISTURE CONTENT	14.4%
INITIAL DRY DENSITY(pcf)	107.3	FINAL DRY DENSITY(pcf)	114.8
INITIAL DEGREE OF SATURATION	20%	FINAL DEGREE OF SATURATION	87%
INITIAL VOID RATIO	0.5	FINAL VOID RATIO	0.4
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	1 ksf



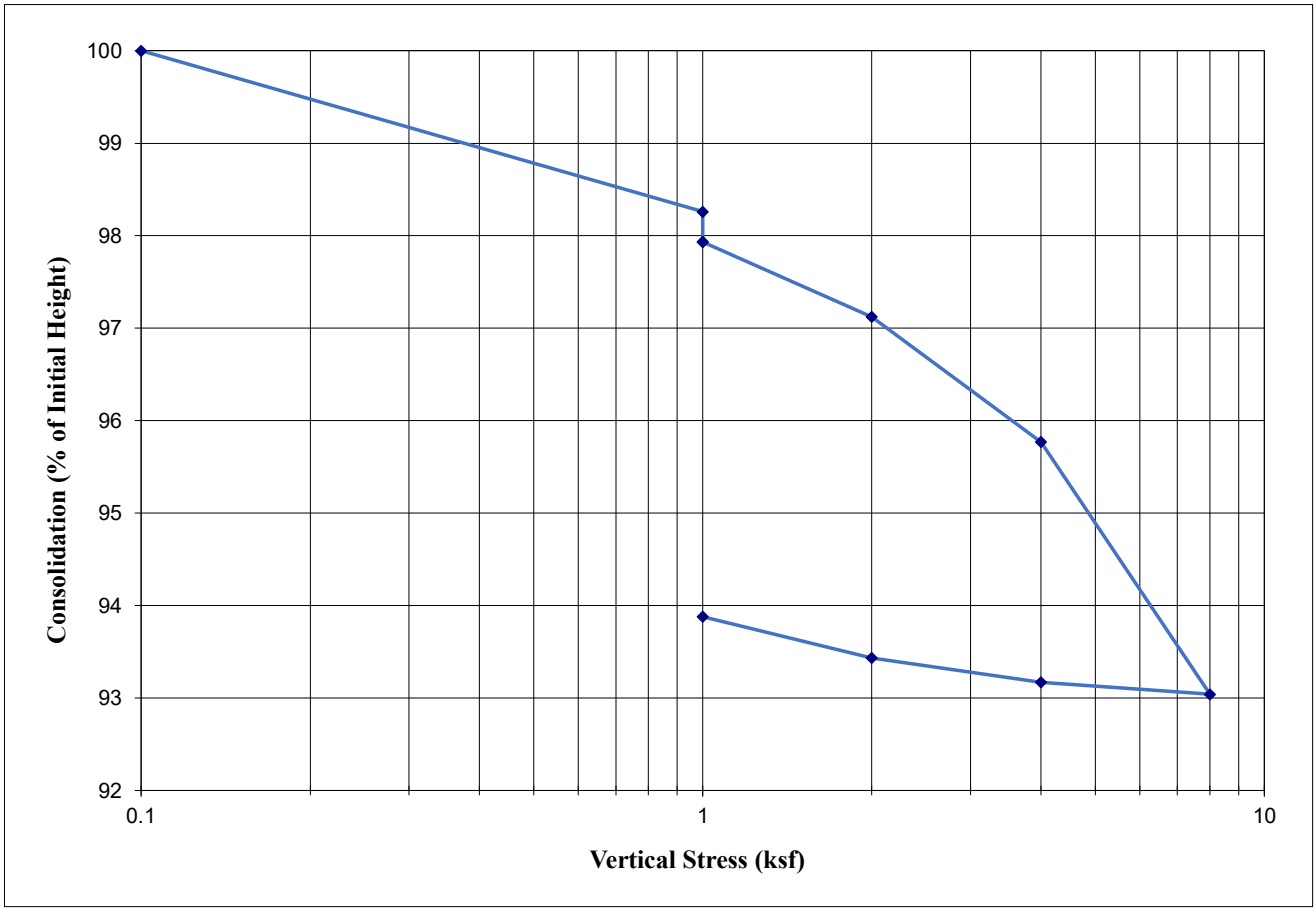
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**22-2842-2**	Material Type:	Soil
Client:	Ethos	Date of Extraction:	-
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	6/15/2022
Project City:	Goodyear	Lab Tested By:	Brian Karl
Sample Location:	B-115 @ 5.0 - 6.0	Reviewed By:	Dylan Ward

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.32
INITIAL MOISTURE CONTENT	16.8%	FINAL MOISTURE CONTENT	23.9%
INITIAL DRY DENSITY(pcf)	95.2	FINAL DRY DENSITY(pcf)	101.4
INITIAL DEGREE OF SATURATION	60%	FINAL DEGREE OF SATURATION	100%
INITIAL VOID RATIO	0.7	FINAL VOID RATIO	0.6
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	1 ksf



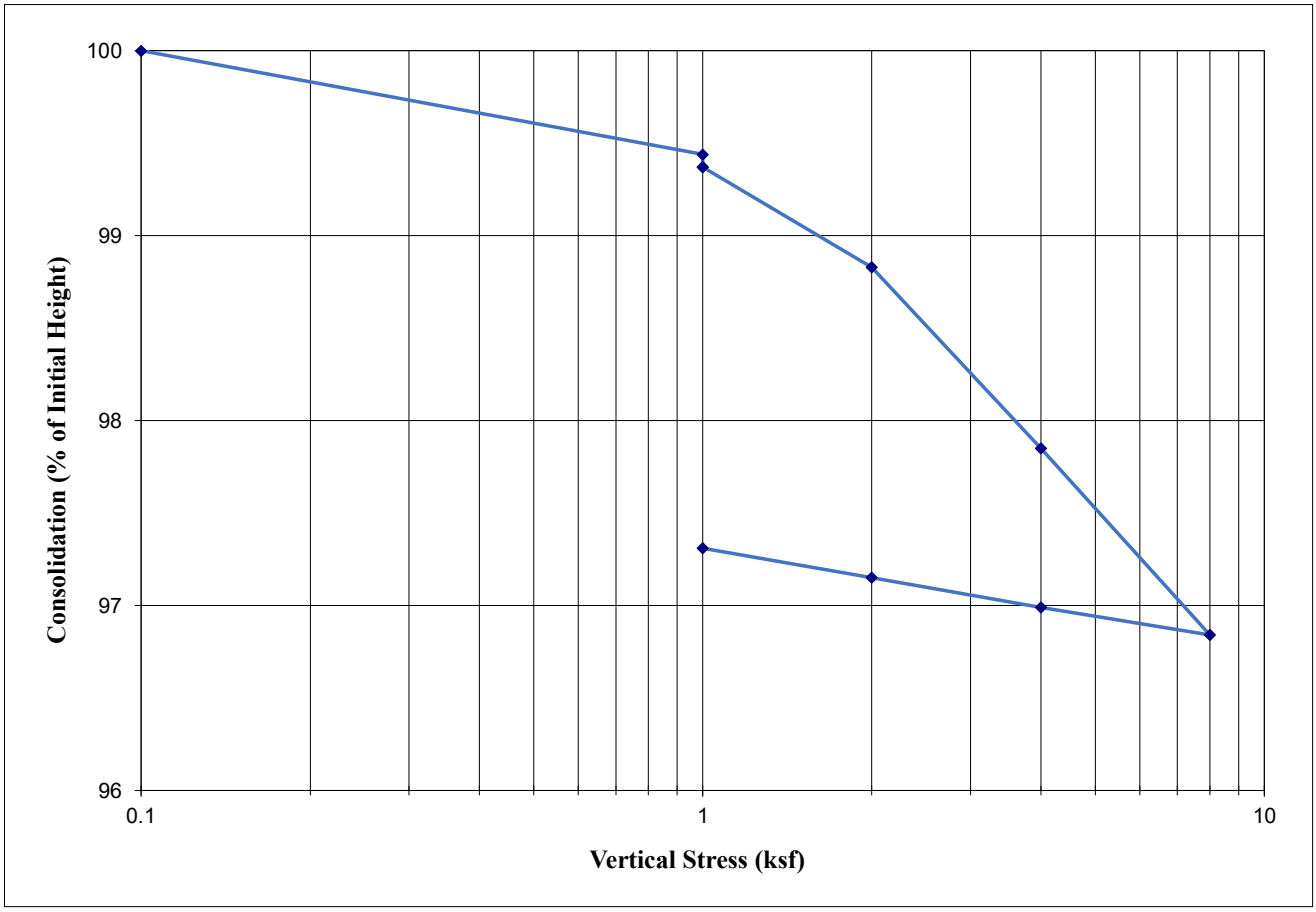
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**22-2842-11**	Material Type:	Soil
Client:	Ethos	Date of Extraction:	-
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	6/15/2022
Project City:	Goodyear	Lab Tested By:	Brian Karl
Sample Location:	B-118 @ 10 - 11	Reviewed By:	Dylan Ward

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.51
INITIAL MOISTURE CONTENT	8.2%	FINAL MOISTURE CONTENT	20.0%
INITIAL DRY DENSITY(pcf)	100.6	FINAL DRY DENSITY(pcf)	102.8
INITIAL DEGREE OF SATURATION	34%	FINAL DEGREE OF SATURATION	87%
INITIAL VOID RATIO	0.6	FINAL VOID RATIO	0.6
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	1 ksf



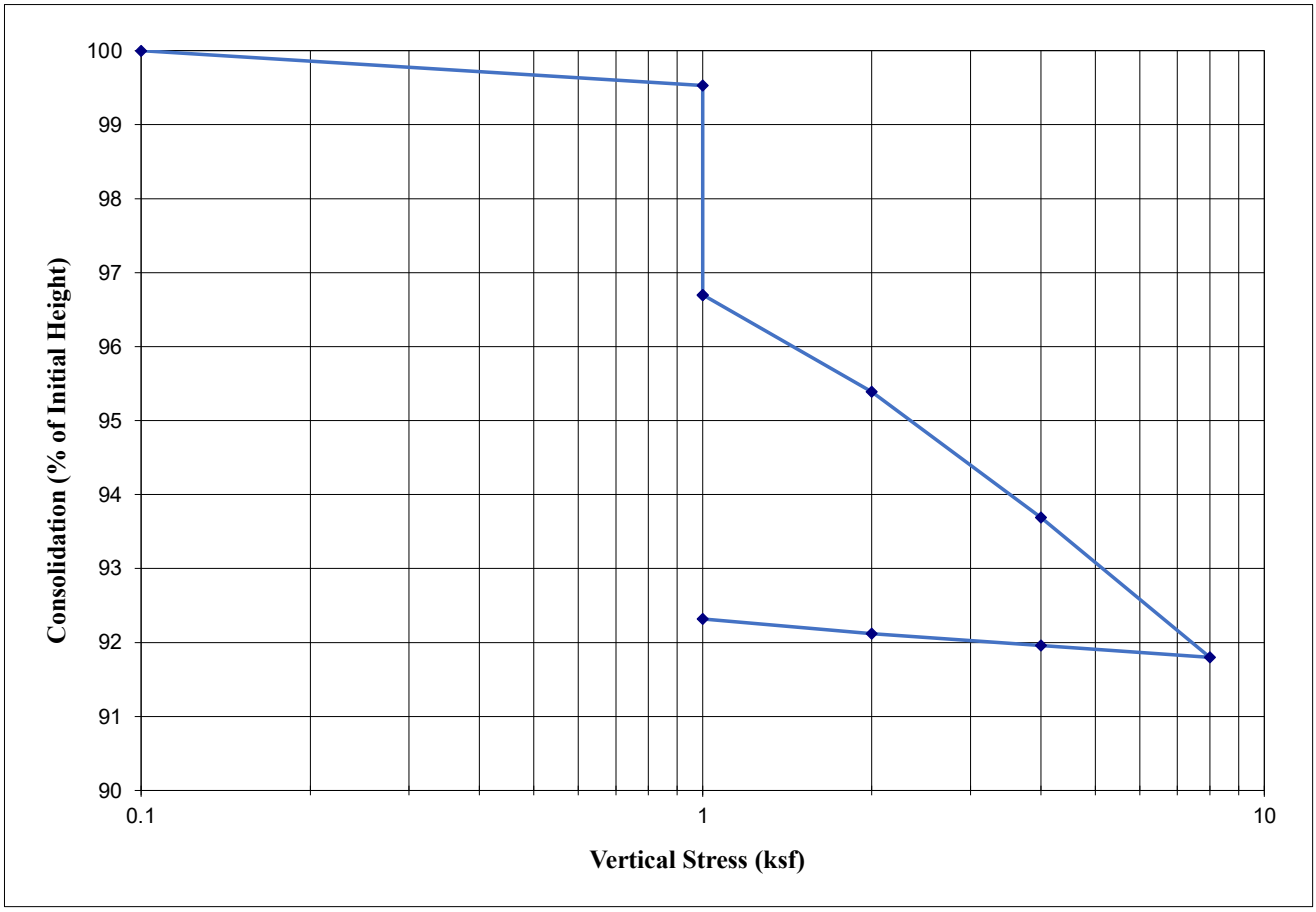
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**22-1128-17**	Material Type:	Native
Client:	Ethos	Date of Extraction:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Extracted By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Date of Lab Test:	1/28/2022
Project City:	Goodyear	Lab Tested By:	Fernando Montero
Sample Location:	B - 121 @ 5.0' - 6.0'	Reviewed By:	Andrew Jamrogiewcz, P.E.

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.31
INITIAL MOISTURE CONTENT	4.8%	FINAL MOISTURE CONTENT	15.1%
INITIAL DRY DENSITY(pcf)	103.3	FINAL DRY DENSITY(pcf)	110.2
INITIAL DEGREE OF SATURATION	21%	FINAL DEGREE OF SATURATION	80%
INITIAL VOID RATIO	0.6	FINAL VOID RATIO	0.5
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	1 ksf



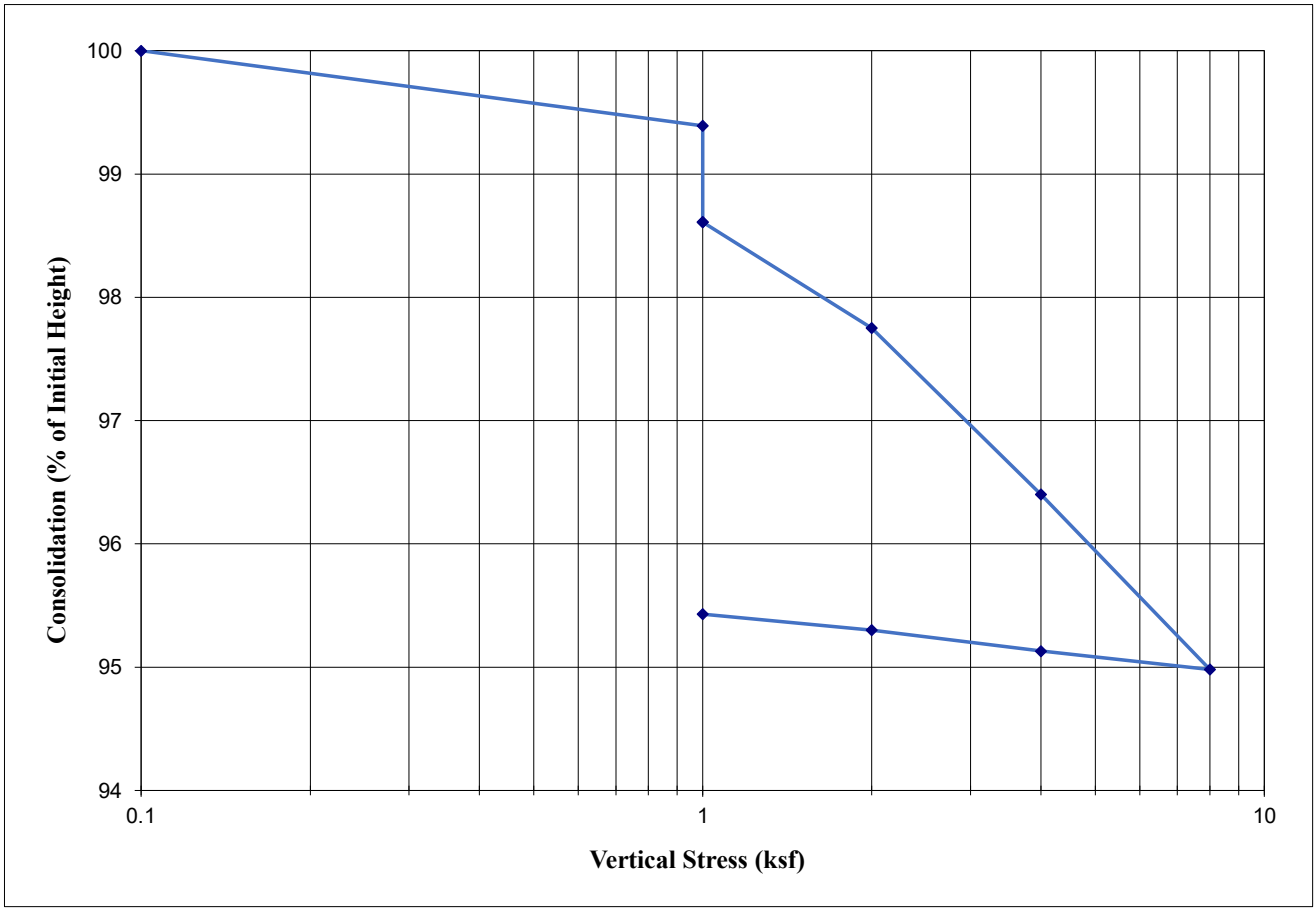
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**22-3006-5**	Material Type:	Soil
Client:	Ethos	Date of Extraction:	-
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	6/30/2022
Project City:	Goodyear	Lab Tested By:	Brian Karl
Sample Location:	B124B @ 10.0 - 11.0	Reviewed By:	Dylan Ward

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.44
INITIAL MOISTURE CONTENT	7.1%	FINAL MOISTURE CONTENT	14.9%
INITIAL DRY DENSITY(pcf)	111.4	FINAL DRY DENSITY(pcf)	115.5
INITIAL DEGREE OF SATURATION	39%	FINAL DEGREE OF SATURATION	91%
INITIAL VOID RATIO	0.5	FINAL VOID RATIO	0.4
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	1 ksf



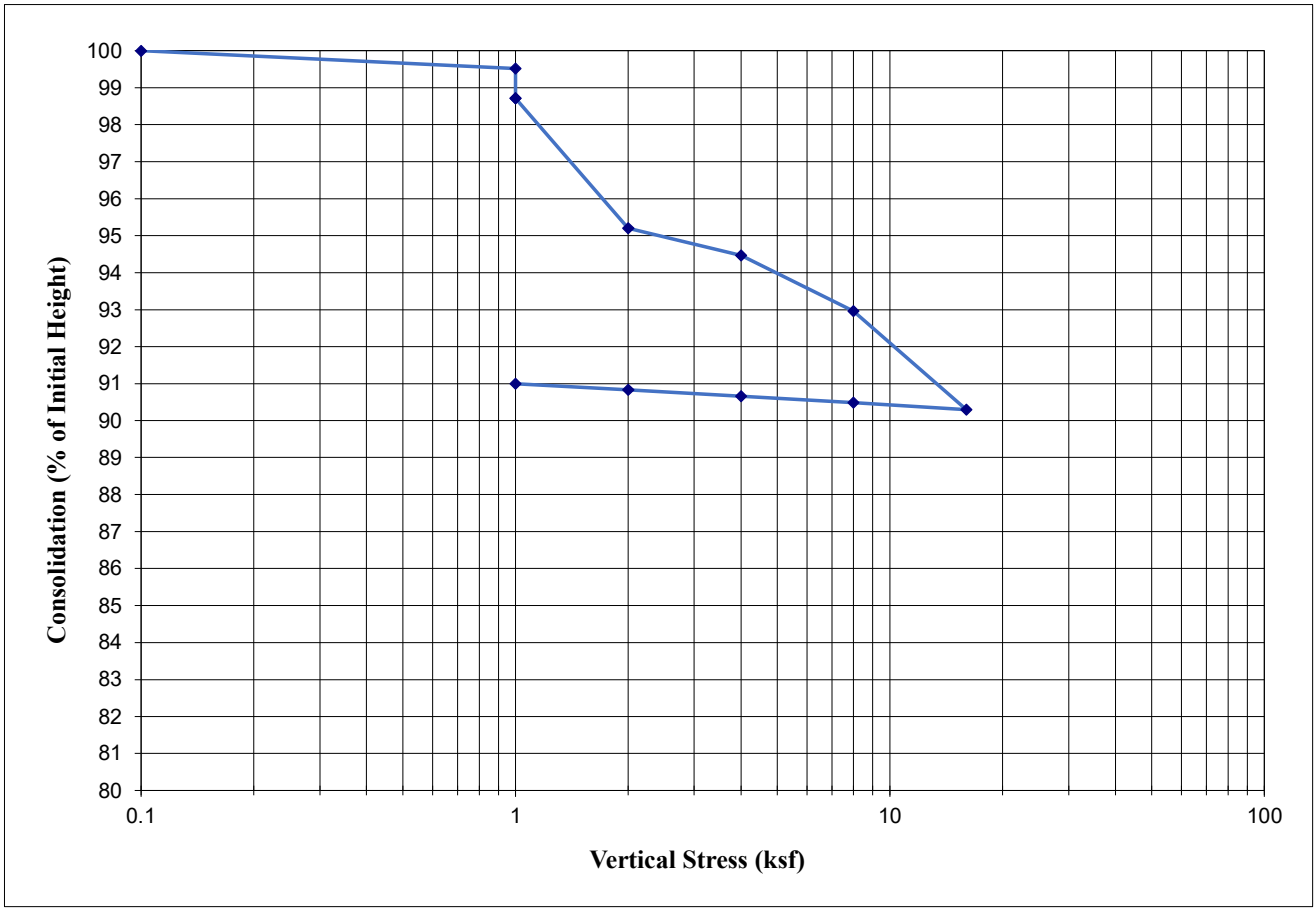
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**22-4050-1**	Material Type:	Soil
Client:	Ethos	Date of Extraction:	9/12/2022
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	9/21/2022
Project City:	Goodyear	Lab Tested By:	Fernando Montero
Sample Location:	B-91A @ 5.0 - 6.0	Reviewed By:	Adrianne Roberts

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.35
INITIAL MOISTURE CONTENT	2.6%	FINAL MOISTURE CONTENT	13.1%
INITIAL DRY DENSITY(pcf)	103.1	FINAL DRY DENSITY(pcf)	109.1
INITIAL DEGREE OF SATURATION	12%	FINAL DEGREE OF SATURATION	67%
INITIAL VOID RATIO	0.6	FINAL VOID RATIO	0.5
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	1 ksf



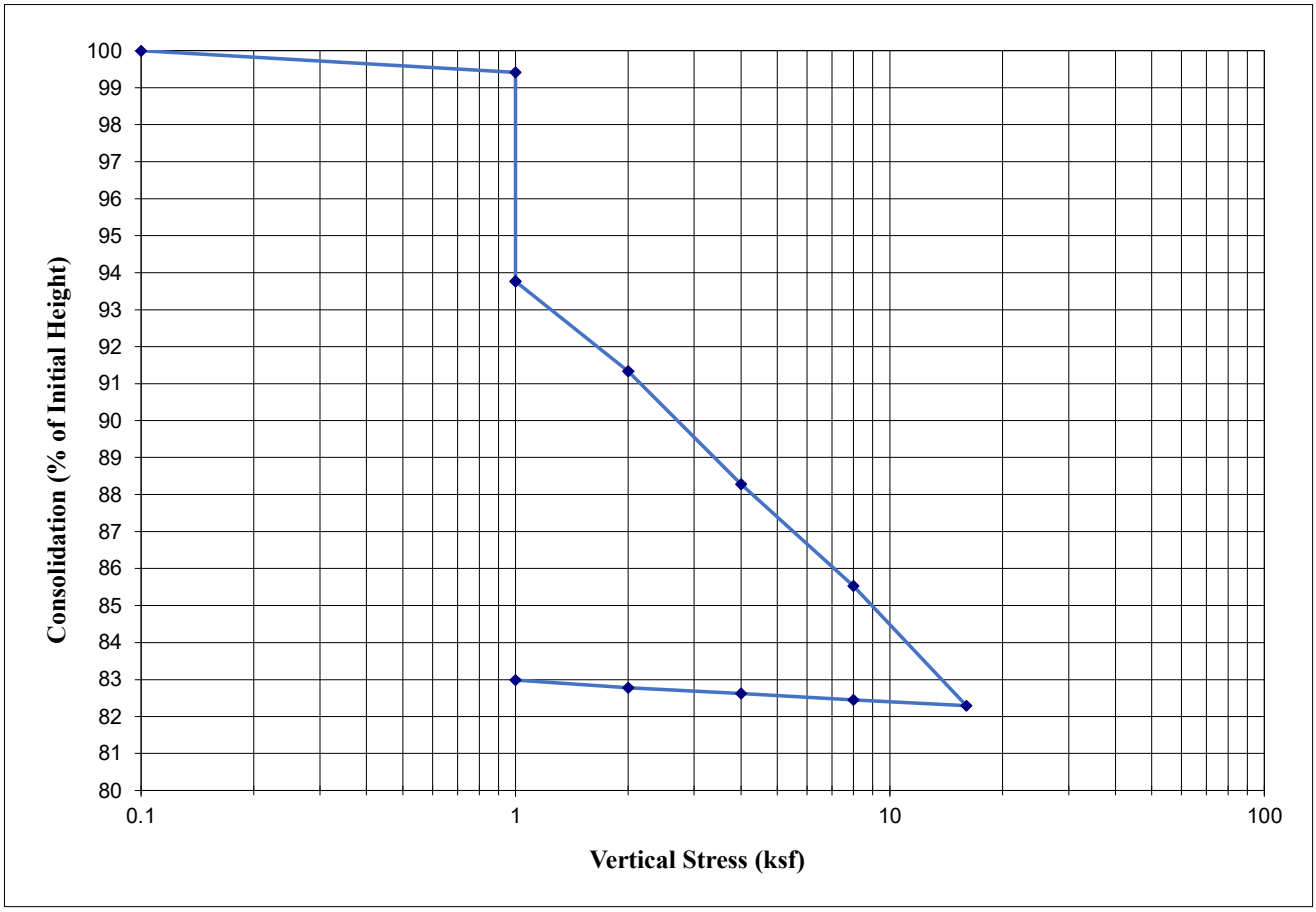
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**22-4050-4**	Material Type:	Soil
Client:	Ethos	Date of Extraction:	9/12/2022
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	9/19/2022
Project City:	Goodyear	Lab Tested By:	Fernando Montero
Sample Location:	B-94 @ 2.5 - 3.5	Reviewed By:	Adrianne Roberts

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.06
INITIAL MOISTURE CONTENT	4.3%	FINAL MOISTURE CONTENT	15.5%
INITIAL DRY DENSITY(pcf)	91.3	FINAL DRY DENSITY(pcf)	103.3
INITIAL DEGREE OF SATURATION	14%	FINAL DEGREE OF SATURATION	68%
INITIAL VOID RATIO	0.8	FINAL VOID RATIO	0.6
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	1 ksf



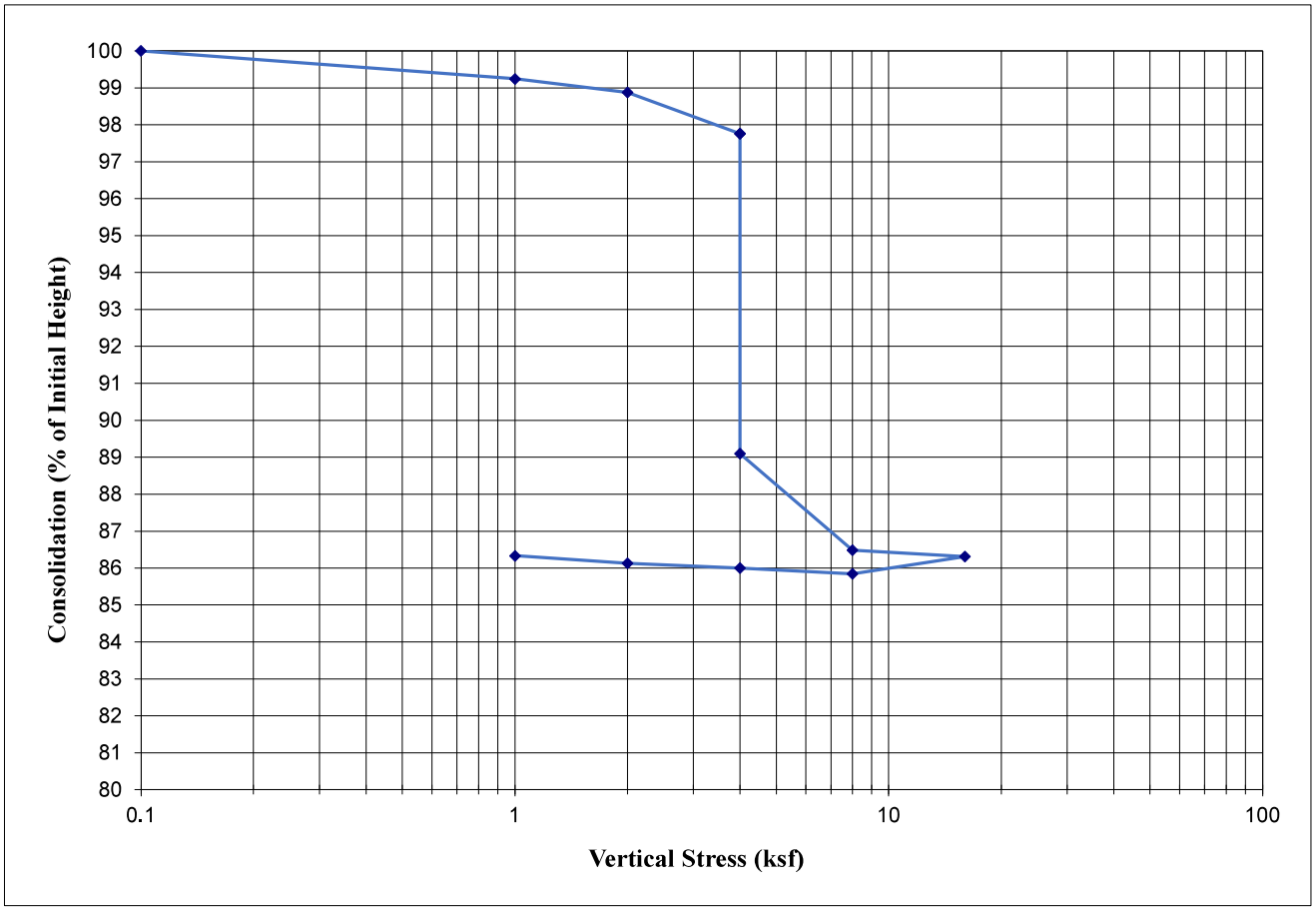
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**22-4050-5**	Material Type:	Soil
Client:	Ethos	Date of Extraction:	9/12/2022
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	9/19/2022
Project City:	Goodyear	Lab Tested By:	Fernando Montero
Sample Location:	B-94 @ 2.5 - 3.5	Reviewed By:	Adrianne Roberts

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.10
INITIAL MOISTURE CONTENT	4.8%	FINAL MOISTURE CONTENT	16.9%
INITIAL DRY DENSITY(pcf)	94.8	FINAL DRY DENSITY(pcf)	106.4
INITIAL DEGREE OF SATURATION	17%	FINAL DEGREE OF SATURATION	81%
INITIAL VOID RATIO	0.7	FINAL VOID RATIO	0.6
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	4 ksf



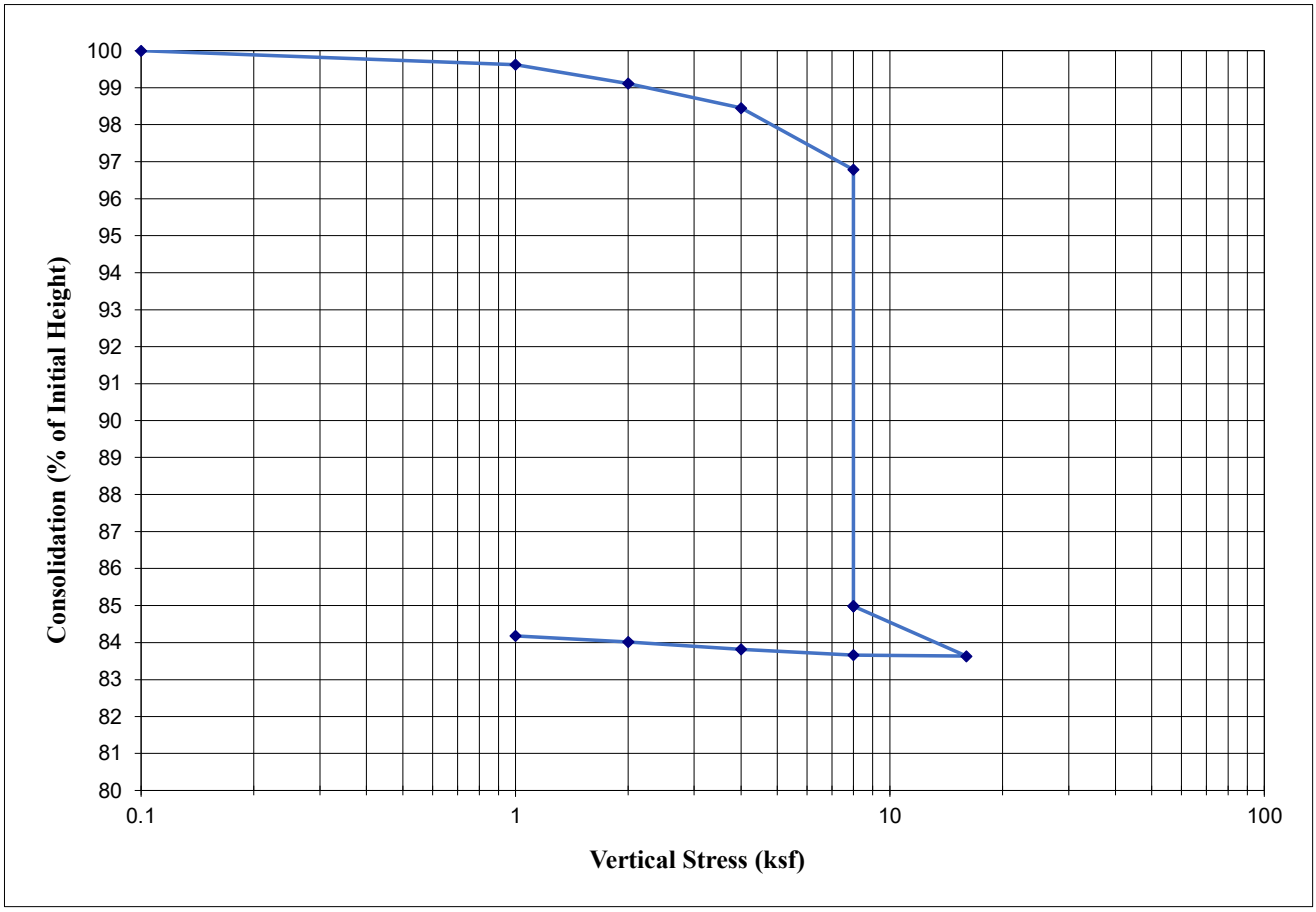
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**22-4050-6**	Material Type:	Soil
Client:	Ethos	Date of Extraction:	9/12/2022
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	9/19/2022
Project City:	Goodyear	Lab Tested By:	Fernando Montero
Sample Location:	B-94 @ 2.5 - 3.5	Reviewed By:	Adrianne Roberts

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.46
INITIAL MOISTURE CONTENT	4.7%	FINAL MOISTURE CONTENT	16.9%
INITIAL DRY DENSITY(pcf)	89.4	FINAL DRY DENSITY(pcf)	92.3
INITIAL DEGREE OF SATURATION	15%	FINAL DEGREE OF SATURATION	56%
INITIAL VOID RATIO	0.9	FINAL VOID RATIO	0.8
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	8 ksf



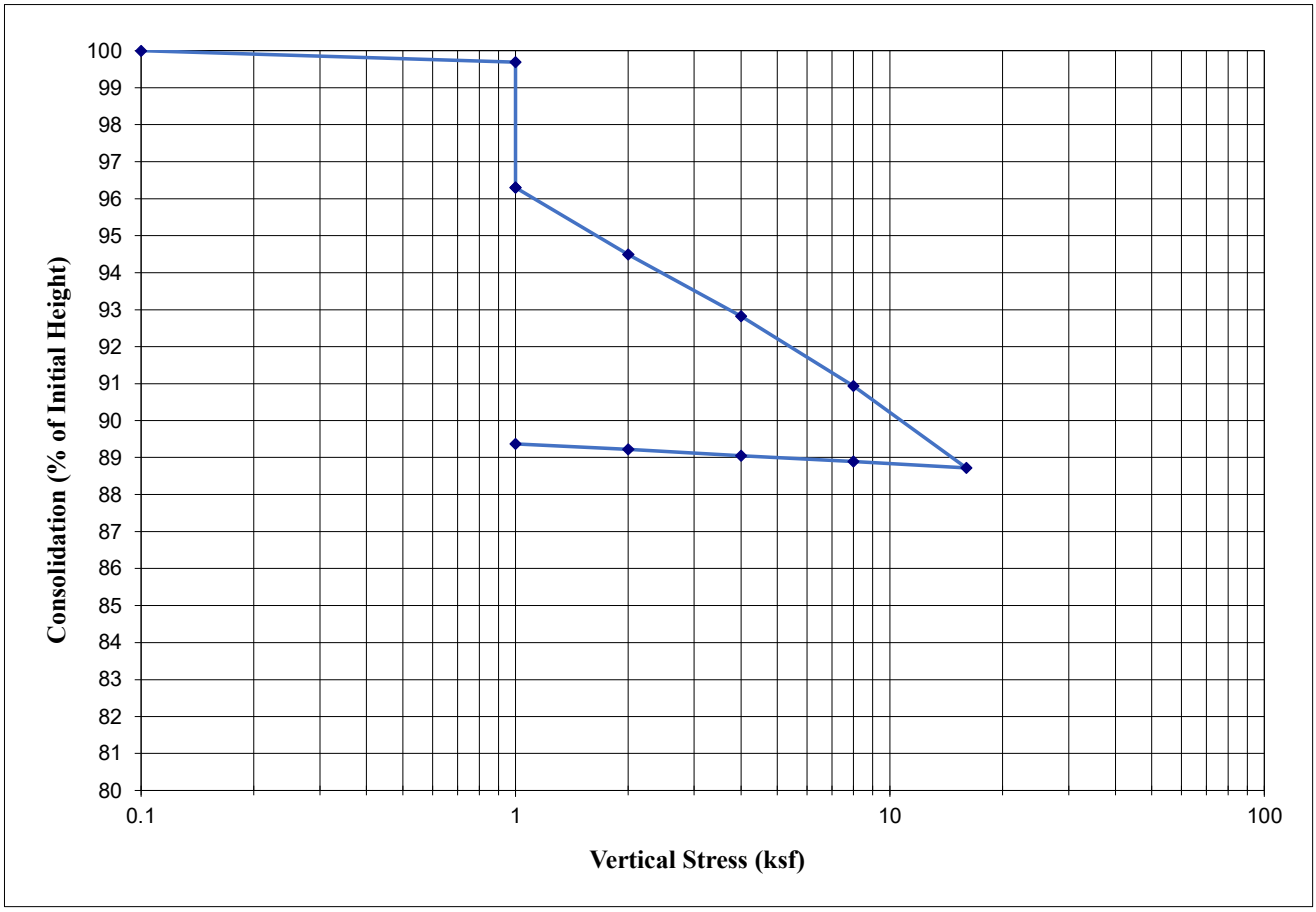
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**22-4050-7**	Material Type:	Soil
Client:	Ethos	Date of Extraction:	9/12/2022
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	9/21/2022
Project City:	Goodyear	Lab Tested By:	Fernando Montero
Sample Location:	B-113A @ 5.0 - 6.0	Reviewed By:	Adrianne Roberts

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.27
INITIAL MOISTURE CONTENT	2.9%	FINAL MOISTURE CONTENT	14.5%
INITIAL DRY DENSITY(pcf)	95.9	FINAL DRY DENSITY(pcf)	103.3
INITIAL DEGREE OF SATURATION	11%	FINAL DEGREE OF SATURATION	64%
INITIAL VOID RATIO	0.7	FINAL VOID RATIO	0.6
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	1 ksf



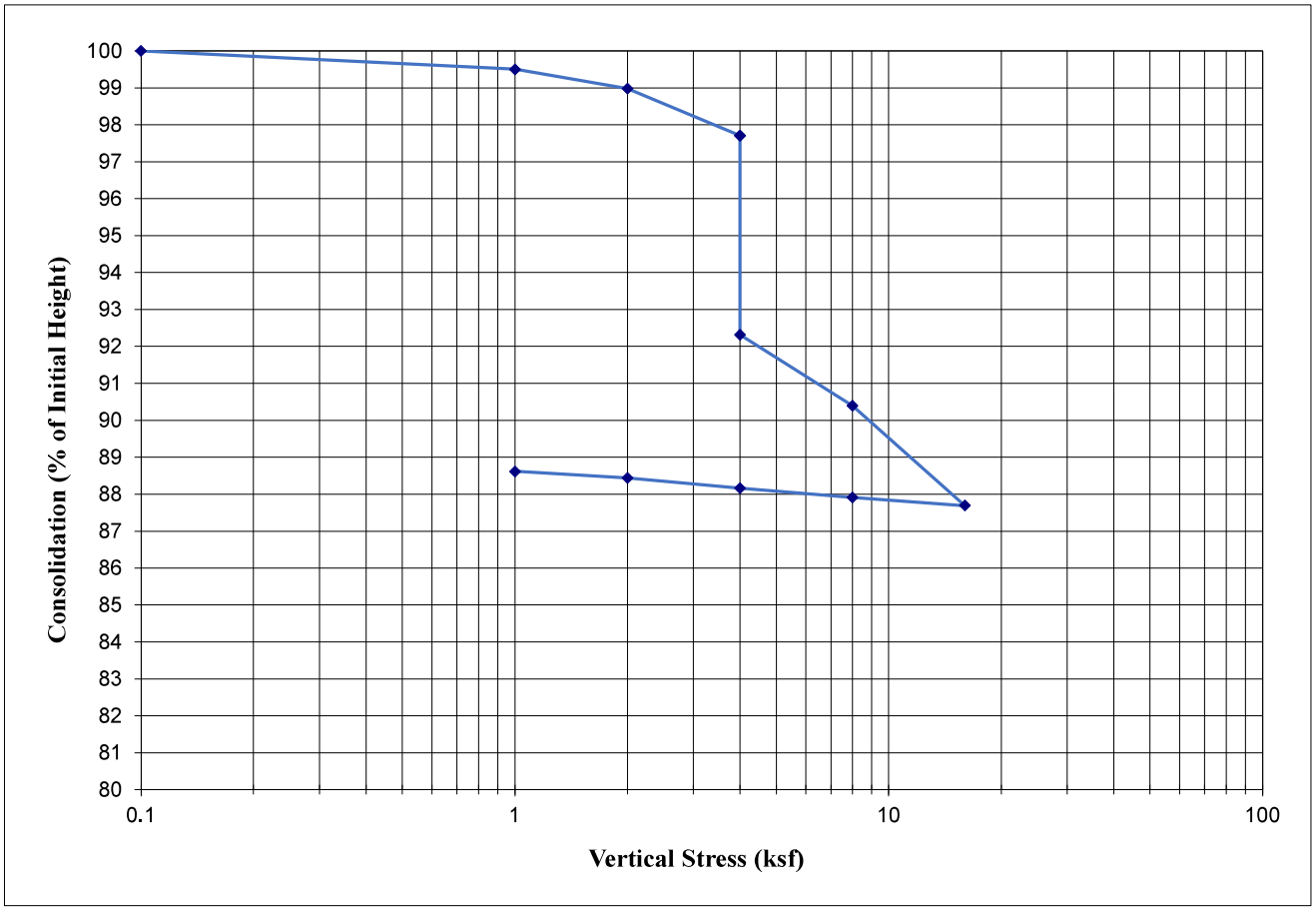
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**22-4050-8**	Material Type:	Soil
Client:	Ethos	Date of Extraction:	9/12/2022
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	9/21/2022
Project City:	Goodyear	Lab Tested By:	Fernando Montero
Sample Location:	B-113A @ 5.0 - 6.0	Reviewed By:	Adrianne Roberts

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.25
INITIAL MOISTURE CONTENT	4.2%	FINAL MOISTURE CONTENT	14.2%
INITIAL DRY DENSITY(pcf)	102.4	FINAL DRY DENSITY(pcf)	110.9
INITIAL DEGREE OF SATURATION	18%	FINAL DEGREE OF SATURATION	77%
INITIAL VOID RATIO	0.6	FINAL VOID RATIO	0.5
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	4 ksf



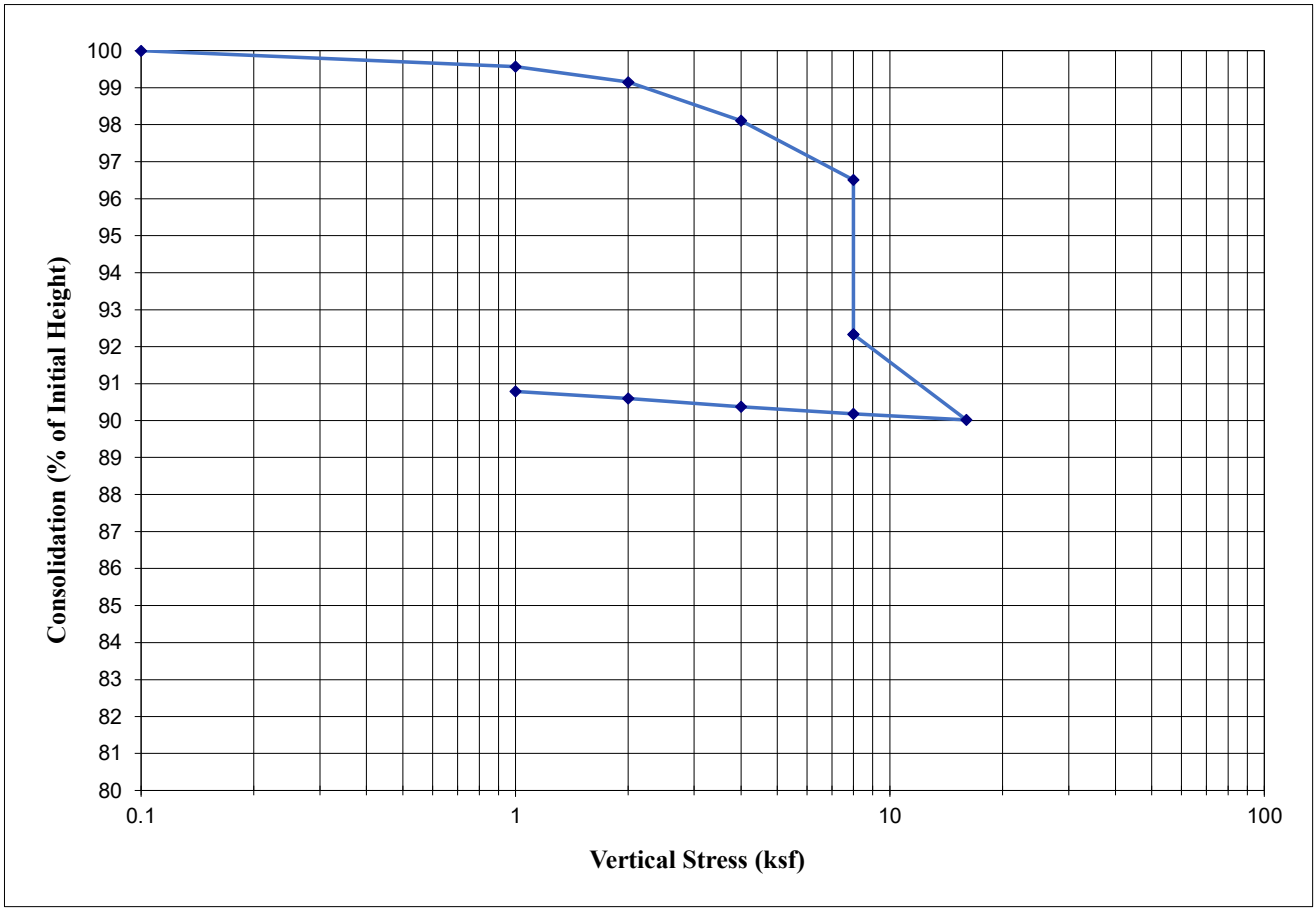
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**22-4050-9**	Material Type:	Soil
Client:	Ethos	Date of Extraction:	9/12/2022
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	9/21/2022
Project City:	Goodyear	Lab Tested By:	Fernando Montero
Sample Location:	B-113A @ 5.0 - 6.0	Reviewed By:	Adrianne Roberts

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.44
INITIAL MOISTURE CONTENT	3.1%	FINAL MOISTURE CONTENT	12.8%
INITIAL DRY DENSITY(pcf)	106.6	FINAL DRY DENSITY(pcf)	110.4
INITIAL DEGREE OF SATURATION	15%	FINAL DEGREE OF SATURATION	68%
INITIAL VOID RATIO	0.6	FINAL VOID RATIO	0.5
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	8 ksf



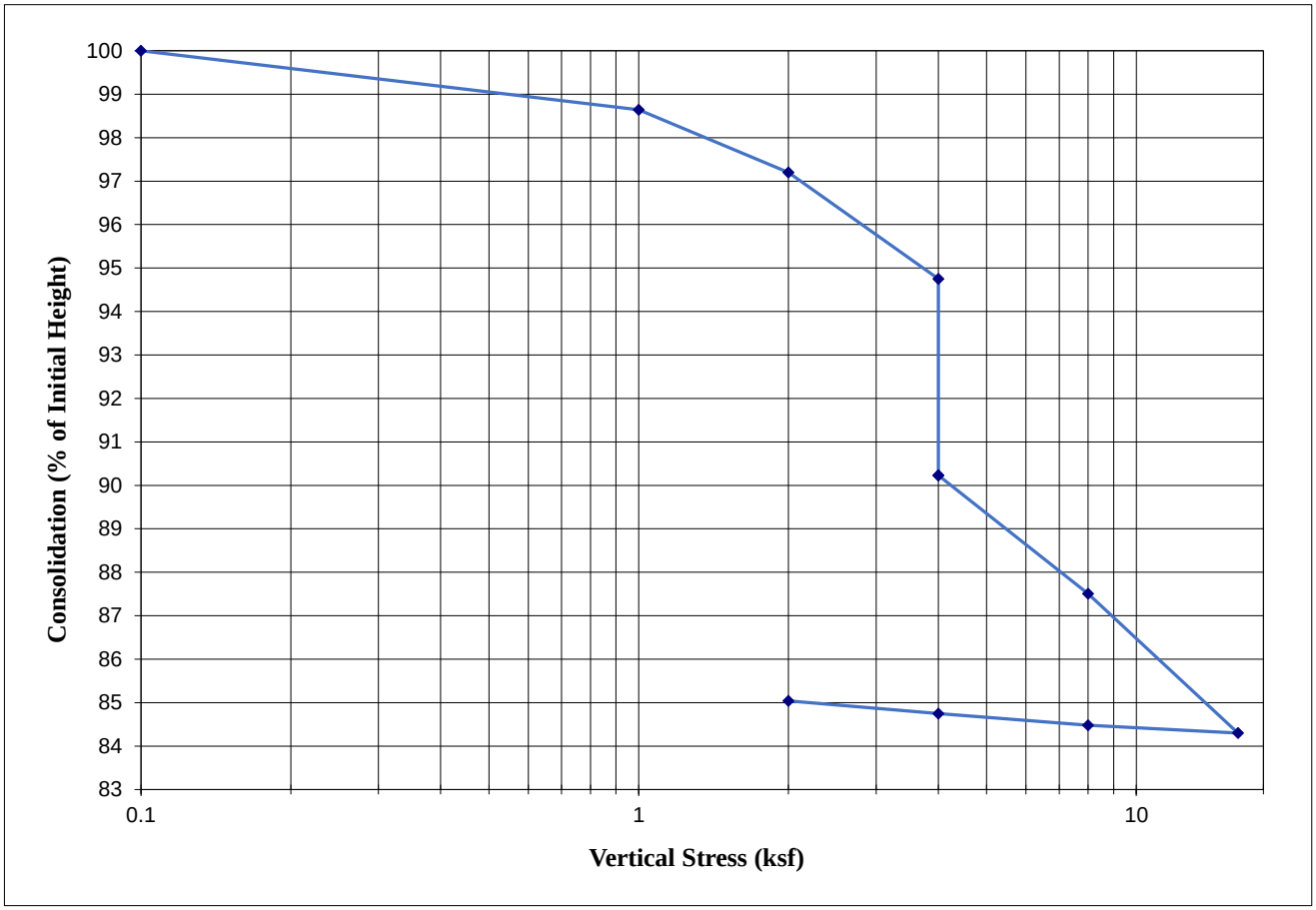
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**24-1149-2**	Material Type:	Soils
Client:	Ethos	Date of Extraction:	12/18/2024
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	1/18/2024
Project City:	Goodyear	Lab Tested By:	Keagen Mayfield
Sample Location:	B-129 @ 10.0 - 11.0	Reviewed By:	Fernando Montero

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.15
INITIAL MOISTURE CONTENT	11.1%	FINAL MOISTURE CONTENT	23.4%
INITIAL DRY DENSITY(pcf)	86.0	FINAL DRY DENSITY(pcf)	95.2
INITIAL DEGREE OF SATURATION	32%	FINAL DEGREE OF SATURATION	84%
INITIAL VOID RATIO	0.9	FINAL VOID RATIO	0.7
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	4 ksf



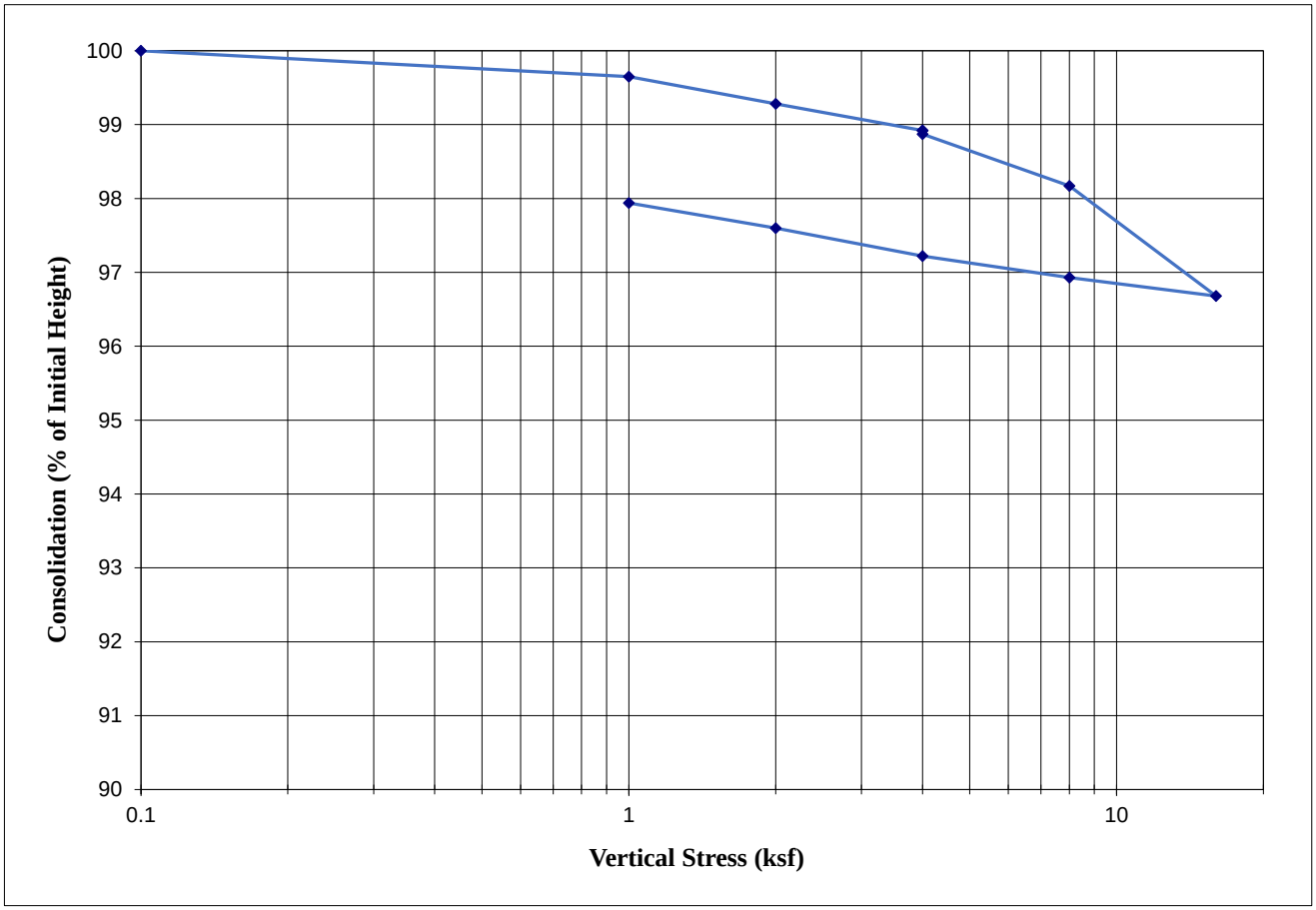
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**24-4605-1**	Material Type:	Soils
Client:	Ethos	Date of Extraction:	-
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	9/6/2024
Project City:	Goodyear	Lab Tested By:	Colin Eggebrecht
Sample Location:	B-130 @ 10.0 - 11.0	Reviewed By:	Keagen Mayfield

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.55
INITIAL MOISTURE CONTENT	14.4%	FINAL MOISTURE CONTENT	20.6%
INITIAL DRY DENSITY(pcf)	102.3	FINAL DRY DENSITY(pcf)	103.4
INITIAL DEGREE OF SATURATION	62%	FINAL DEGREE OF SATURATION	91%
INITIAL VOID RATIO	0.6	FINAL VOID RATIO	0.6
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	4 ksf



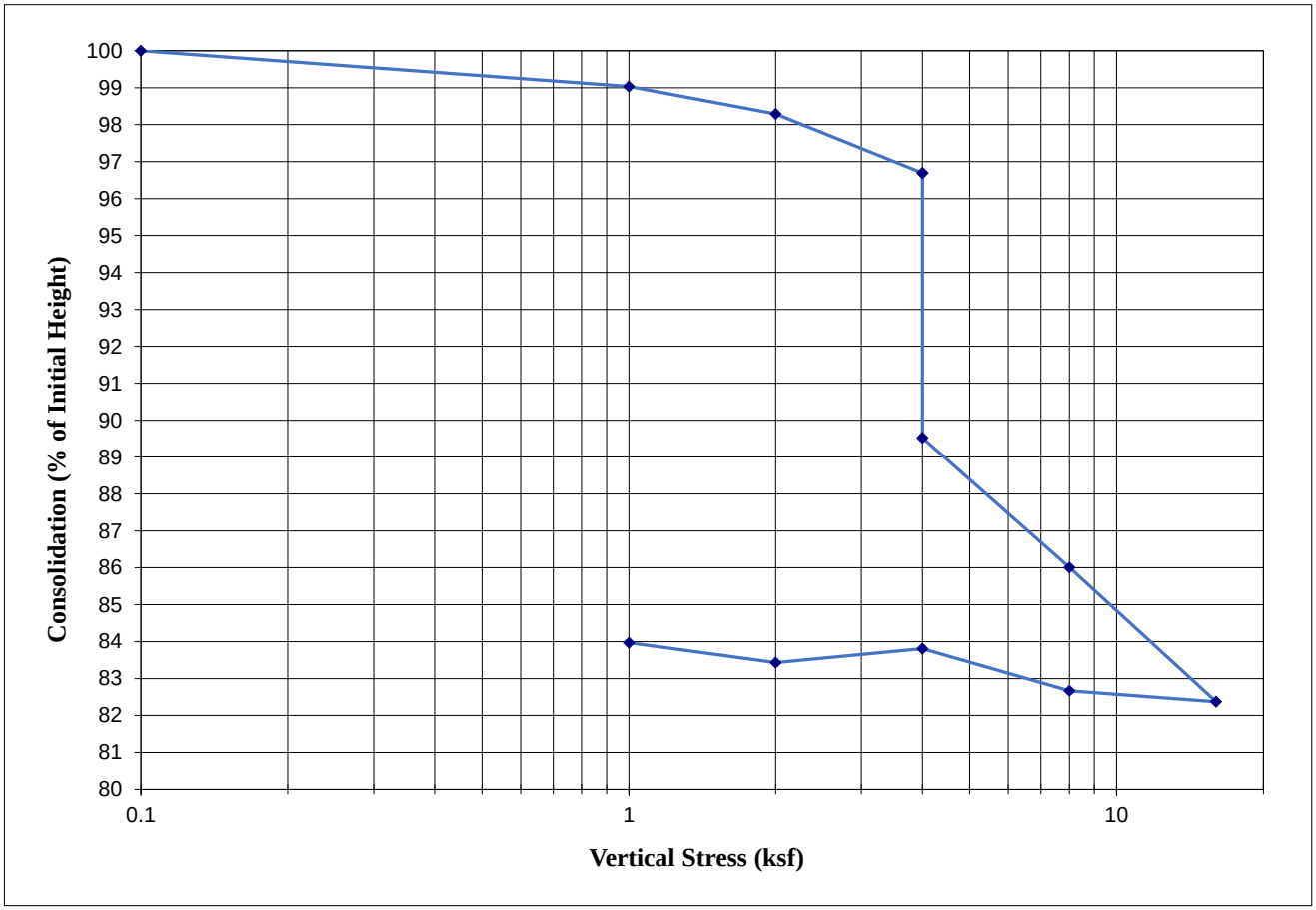
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**24-4605-5**	Material Type:	Soils
Client:	Ethos	Date of Extraction:	-
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	9/9/2024
Project City:	Goodyear	Lab Tested By:	Tyler Eggebrecht
Sample Location:	B-131 @ 5.0 - 6.0	Reviewed By:	Keagen Mayfield

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.12
INITIAL MOISTURE CONTENT	17.4%	FINAL MOISTURE CONTENT	27.3%
INITIAL DRY DENSITY(pcf)	79.7	FINAL DRY DENSITY(pcf)	89.0
INITIAL DEGREE OF SATURATION	43%	FINAL DEGREE OF SATURATION	84%
INITIAL VOID RATIO	1.1	FINAL VOID RATIO	0.9
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	4 ksf



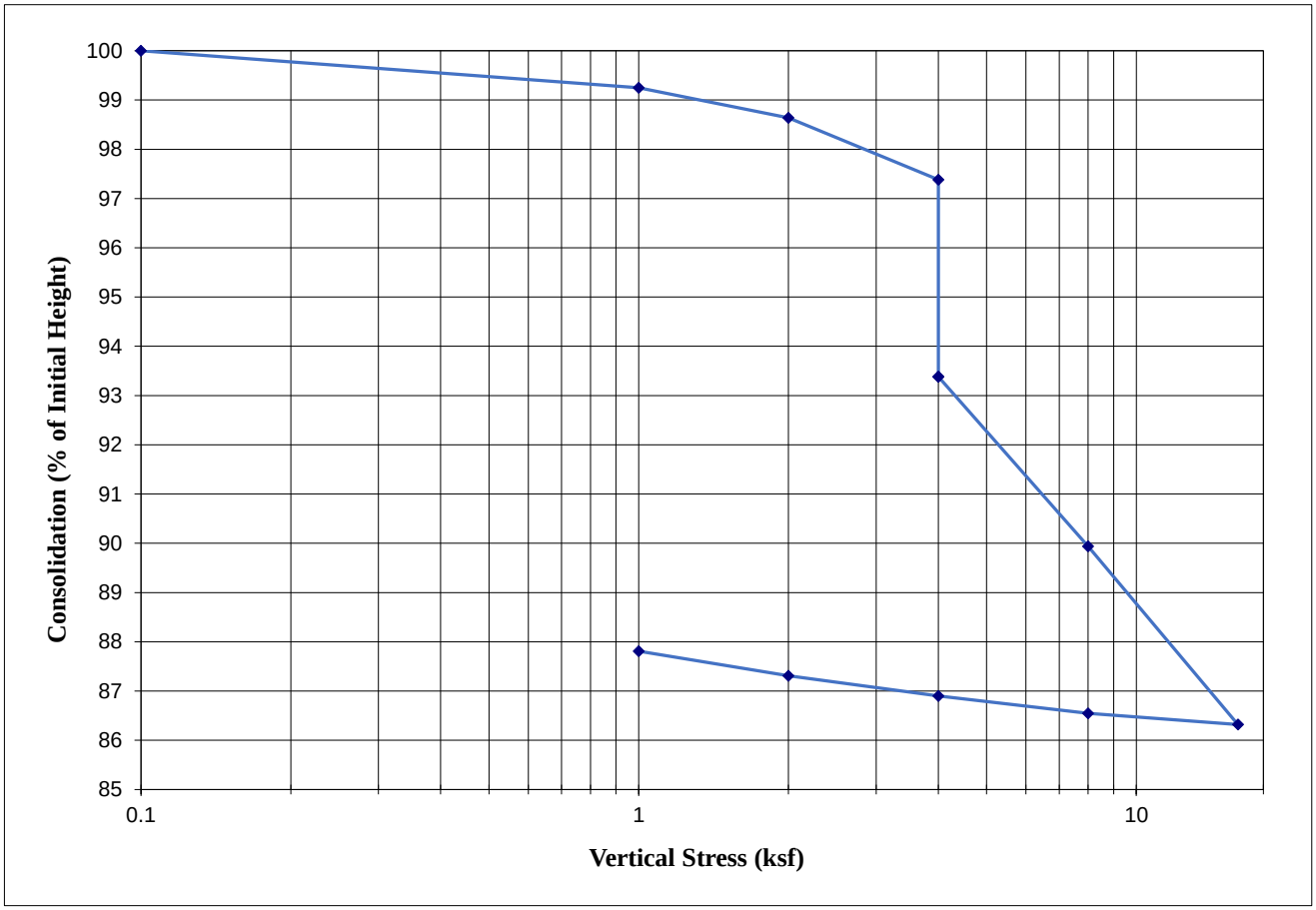
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**24-1143-6**	Material Type:	Soils
Client:	Ethos	Date of Extraction:	1/17/2024
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	2/11/2024
Project City:	Goodyear	Lab Tested By:	Keagen Mayfield
Sample Location:	B-133 @ 1.0 - 2.0	Reviewed By:	Fernando Montero

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.30
INITIAL MOISTURE CONTENT	11.8%	FINAL MOISTURE CONTENT	21.5%
INITIAL DRY DENSITY(pcf)	86.9	FINAL DRY DENSITY(pcf)	93.0
INITIAL DEGREE OF SATURATION	35%	FINAL DEGREE OF SATURATION	73%
INITIAL VOID RATIO	0.9	FINAL VOID RATIO	0.8
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	4 ksf



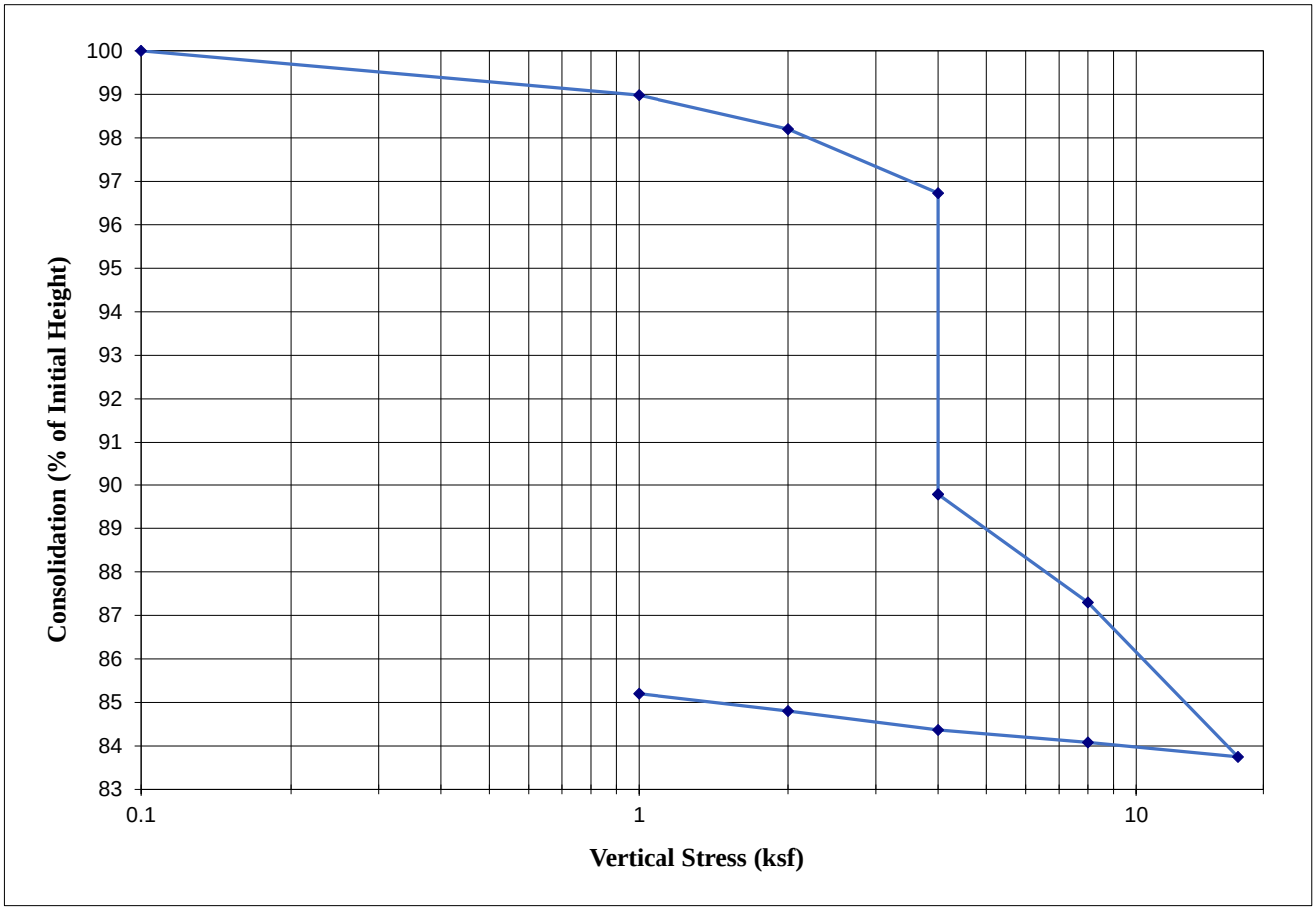
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**24-1150-1**	Material Type:	Soils
Client:	Ethos	Date of Extraction:	1/17/2024
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	2/9/2024
Project City:	Goodyear	Lab Tested By:	Keagen Mayfield
Sample Location:	B-135 @ 5.0 - 6.0	Reviewed By:	Fernando Montero

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.13
INITIAL MOISTURE CONTENT	11.6%	FINAL MOISTURE CONTENT	23.2%
INITIAL DRY DENSITY(pcf)	86.0	FINAL DRY DENSITY(pcf)	95.8
INITIAL DEGREE OF SATURATION	33%	FINAL DEGREE OF SATURATION	85%
INITIAL VOID RATIO	0.9	FINAL VOID RATIO	0.7
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	4 ksf



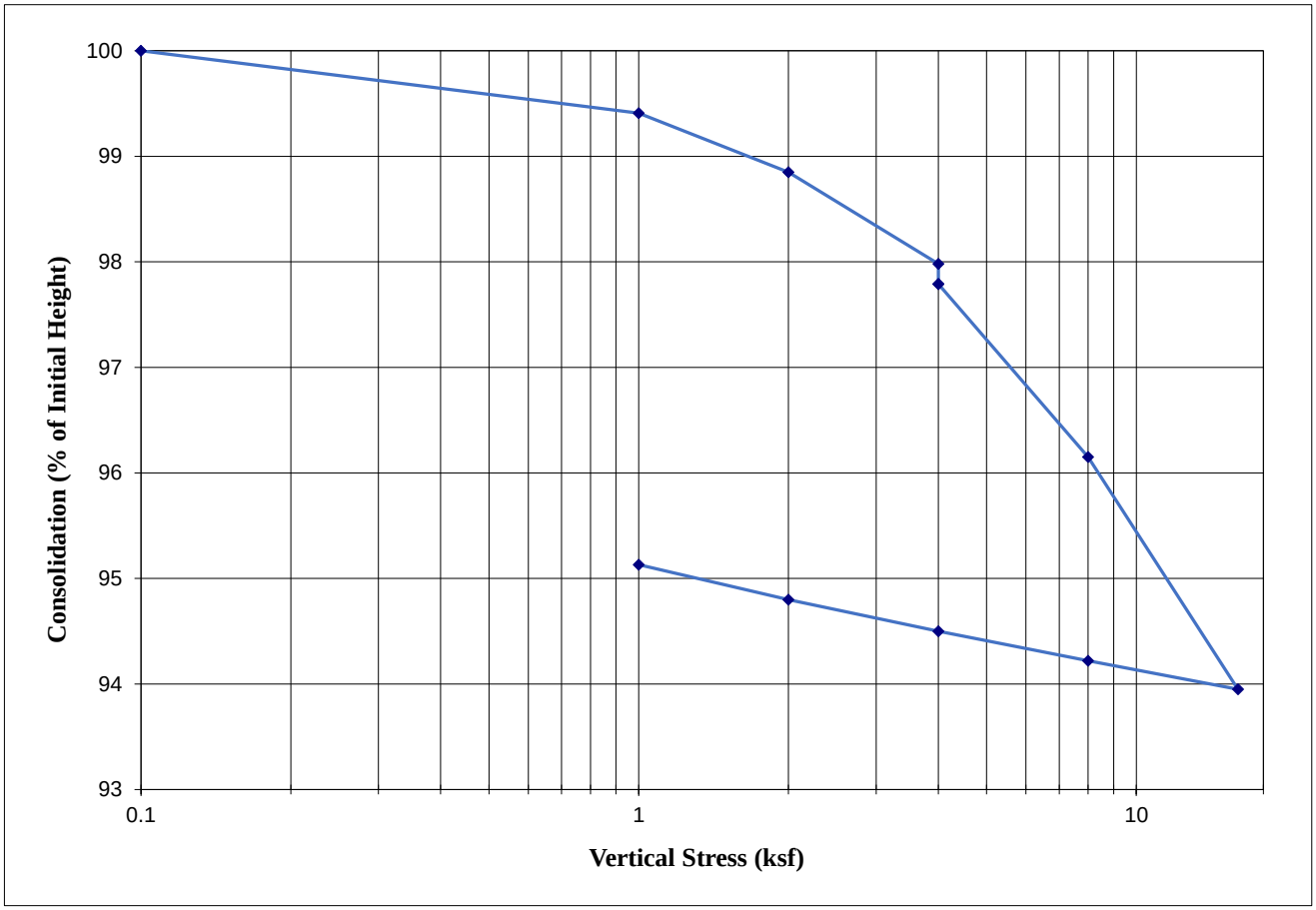
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**24-1588-1**	Material Type:	Soils
Client:	Ethos	Date of Extraction:	2/8/2024
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	2/28/2024
Project City:	Goodyear	Lab Tested By:	Mahalia Davis
Sample Location:	B-138 @ 5.0 - 6.0	Reviewed By:	Fernando Montero

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.50
INITIAL MOISTURE CONTENT	17.9%	FINAL MOISTURE CONTENT	20.3%
INITIAL DRY DENSITY(pcf)	102.1	FINAL DRY DENSITY(pcf)	104.4
INITIAL DEGREE OF SATURATION	77%	FINAL DEGREE OF SATURATION	92%
INITIAL VOID RATIO	0.6	FINAL VOID RATIO	0.6
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	4 ksf



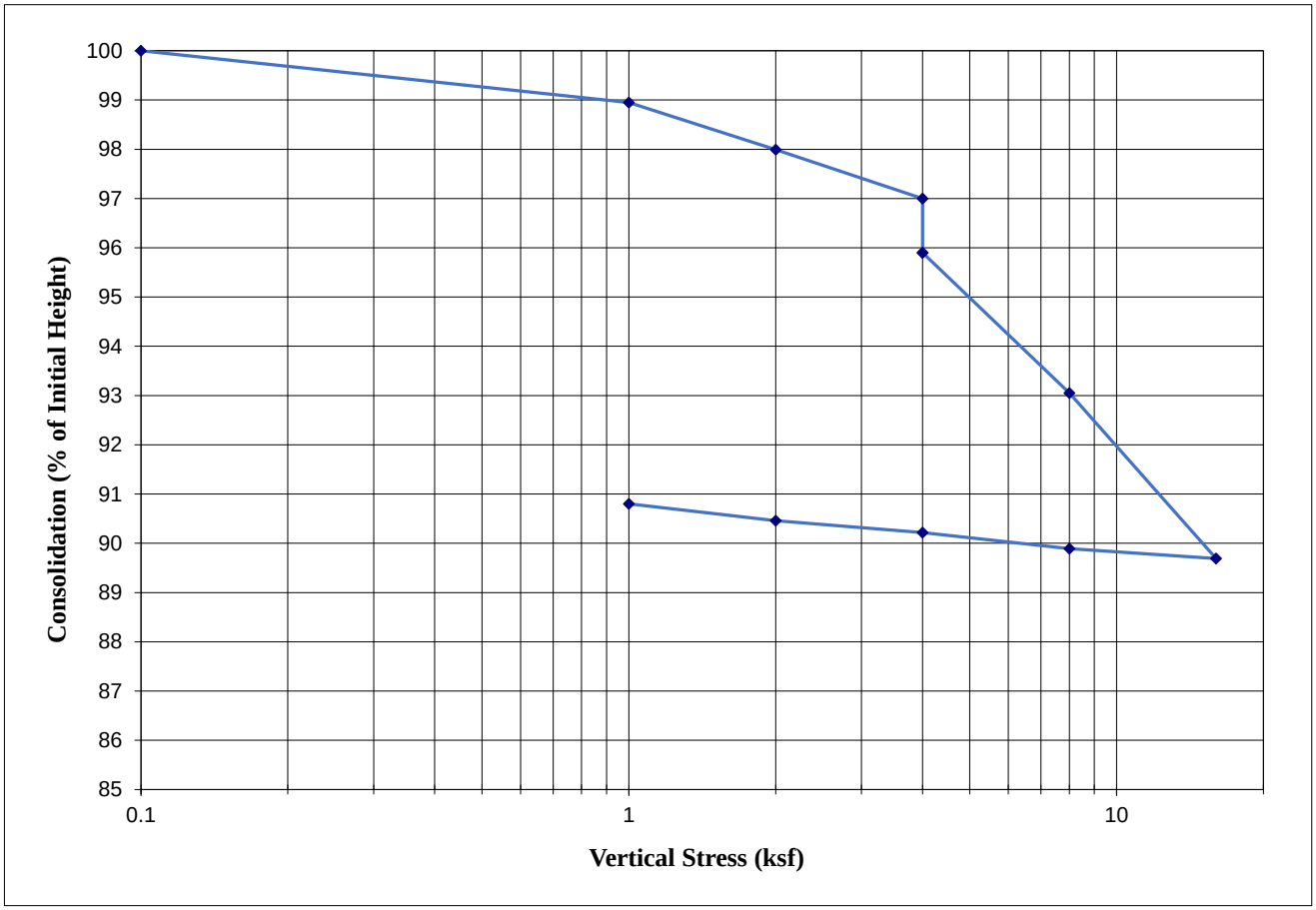
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**24-4603-2**	Material Type:	Soils
Client:	Ethos	Date of Extraction:	-
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	9/9/2024
Project City:	Goodyear	Lab Tested By:	Mahalia Davis
Sample Location:	B-141 @ 10.0 - 11.0	Reviewed By:	Keagen Mayfield

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.42
INITIAL MOISTURE CONTENT	16.4%	FINAL MOISTURE CONTENT	25.0%
INITIAL DRY DENSITY(pcf)	89.7	FINAL DRY DENSITY(pcf)	93.5
INITIAL DEGREE OF SATURATION	52%	FINAL DEGREE OF SATURATION	86%
INITIAL VOID RATIO	0.8	FINAL VOID RATIO	0.8
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	4 ksf



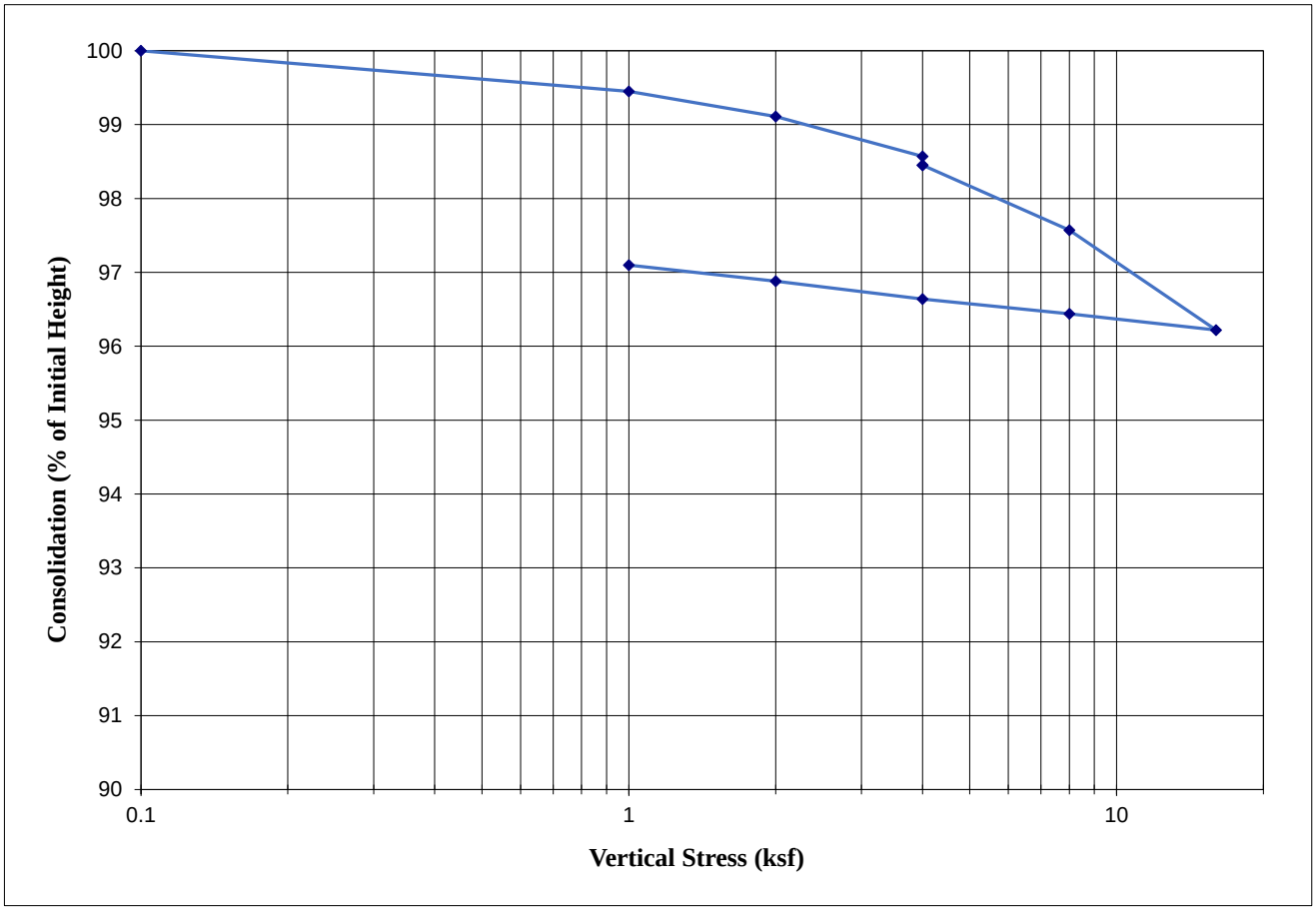
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**24-4604-1**	Material Type:	Soils
Client:	Ethos	Date of Extraction:	-
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	
Project City:	Goodyear	Lab Tested By:	
Sample Location:	B-142 @ 5.0 - 6.0	Reviewed By:	Keagan Mayfield

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.53
INITIAL MOISTURE CONTENT	15.9%	FINAL MOISTURE CONTENT	19.9%
INITIAL DRY DENSITY(pcf)	102.5	FINAL DRY DENSITY(pcf)	104.1
INITIAL DEGREE OF SATURATION	69%	FINAL DEGREE OF SATURATION	90%
INITIAL VOID RATIO	0.6	FINAL VOID RATIO	0.6
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	4 ksf



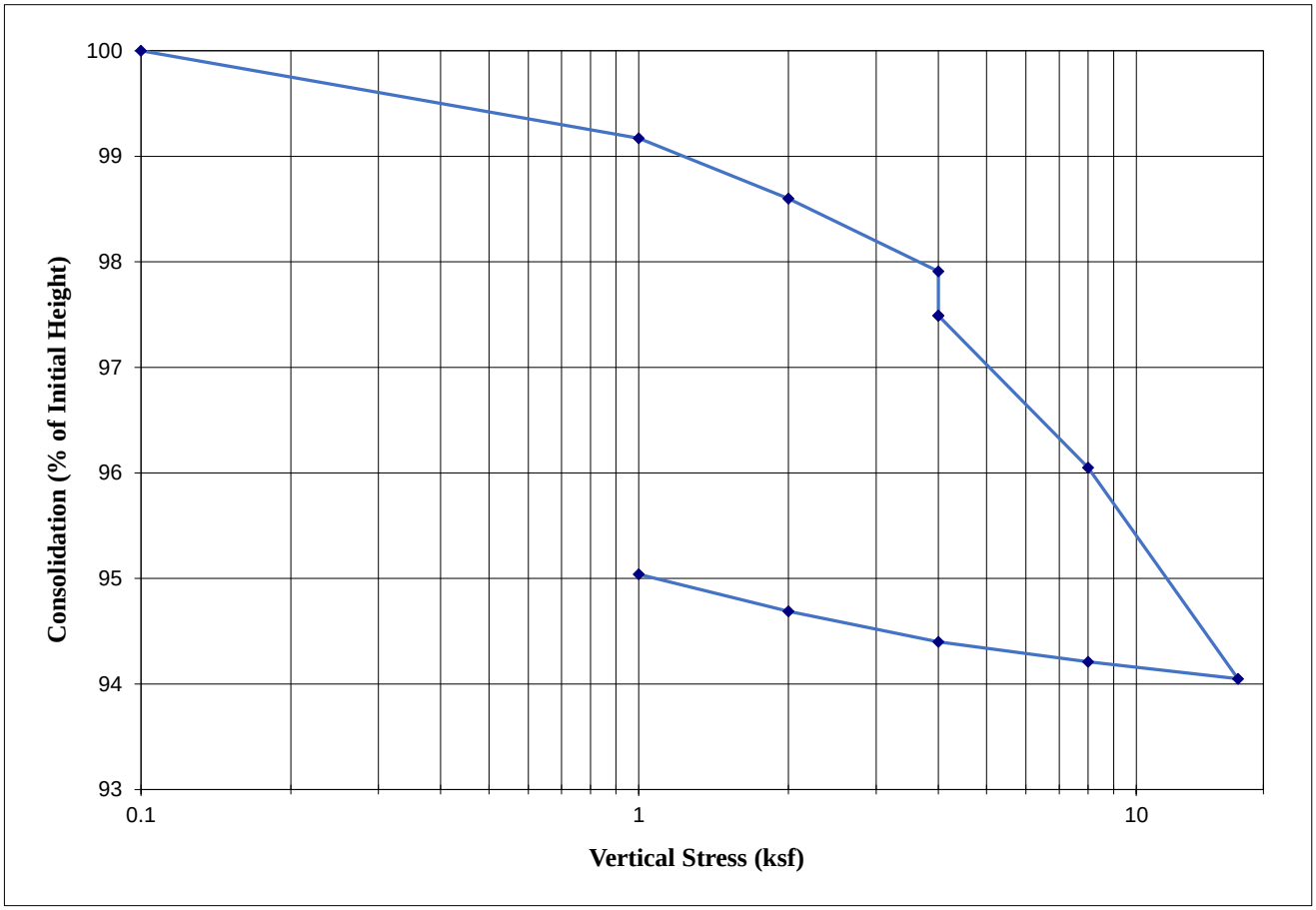
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**24-1584-3**	Material Type:	Soils
Client:	Ethos	Date of Extraction:	2/8/2024
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	2/28/2024
Project City:	Goodyear	Lab Tested By:	Keagen Mayfield
Sample Location:	B-143 @ 10.0 - 11.0	Reviewed By:	Fernando Montero

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.49
INITIAL MOISTURE CONTENT	12.1%	FINAL MOISTURE CONTENT	27.0%
INITIAL DRY DENSITY(pcf)	90.4	FINAL DRY DENSITY(pcf)	92.7
INITIAL DEGREE OF SATURATION	39%	FINAL DEGREE OF SATURATION	91%
INITIAL VOID RATIO	0.8	FINAL VOID RATIO	0.8
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	4 ksf



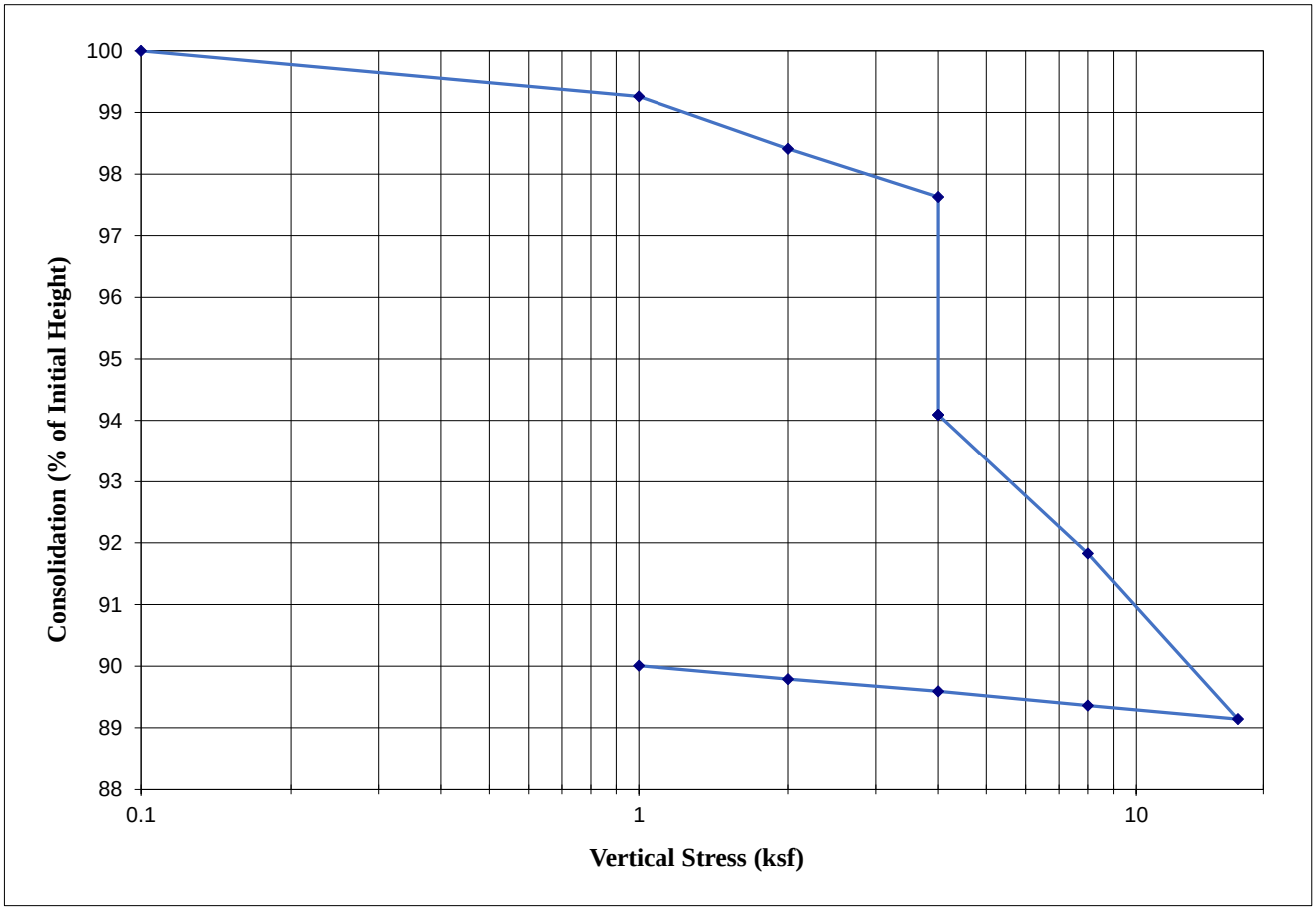
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**24-1585-2**	Material Type:	Soils
Client:	Ethos	Date of Extraction:	2/8/2024
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	2/28/2024
Project City:	Goodyear	Lab Tested By:	Keagen Mayfield
Sample Location:	B-144 @ 3.0 - 4.0	Reviewed By:	Fernando Montero

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.33
INITIAL MOISTURE CONTENT	9.2%	FINAL MOISTURE CONTENT	17.2%
INITIAL DRY DENSITY(pcf)	100.7	FINAL DRY DENSITY(pcf)	107.0
INITIAL DEGREE OF SATURATION	38%	FINAL DEGREE OF SATURATION	83%
INITIAL VOID RATIO	0.6	FINAL VOID RATIO	0.5
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	4 ksf



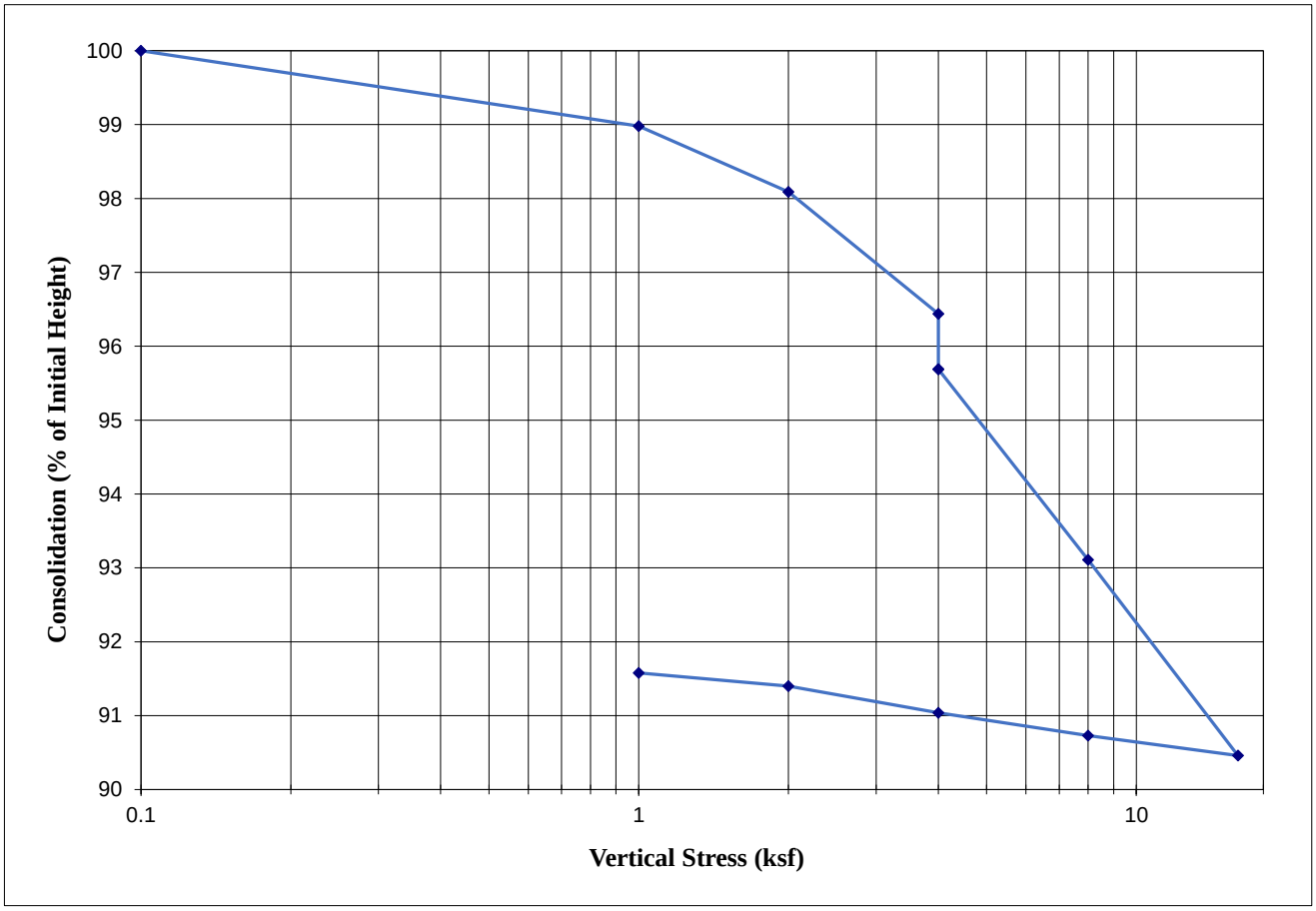
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**24-1140-4**	Material Type:	Soils
Client:	Ethos	Date of Extraction:	12/18/2024
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	1/18/2024
Project City:	Goodyear	Lab Tested By:	Mahalia Davis
Sample Location:	B-150 @ 5.0 - 6.0	Reviewed By:	Fernando Montero

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.41
INITIAL MOISTURE CONTENT	16.0%	FINAL MOISTURE CONTENT	16.5%
INITIAL DRY DENSITY(pcf)	104.2	FINAL DRY DENSITY(pcf)	108.8
INITIAL DEGREE OF SATURATION	72%	FINAL DEGREE OF SATURATION	84%
INITIAL VOID RATIO	0.6	FINAL VOID RATIO	0.5
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	4 ksf



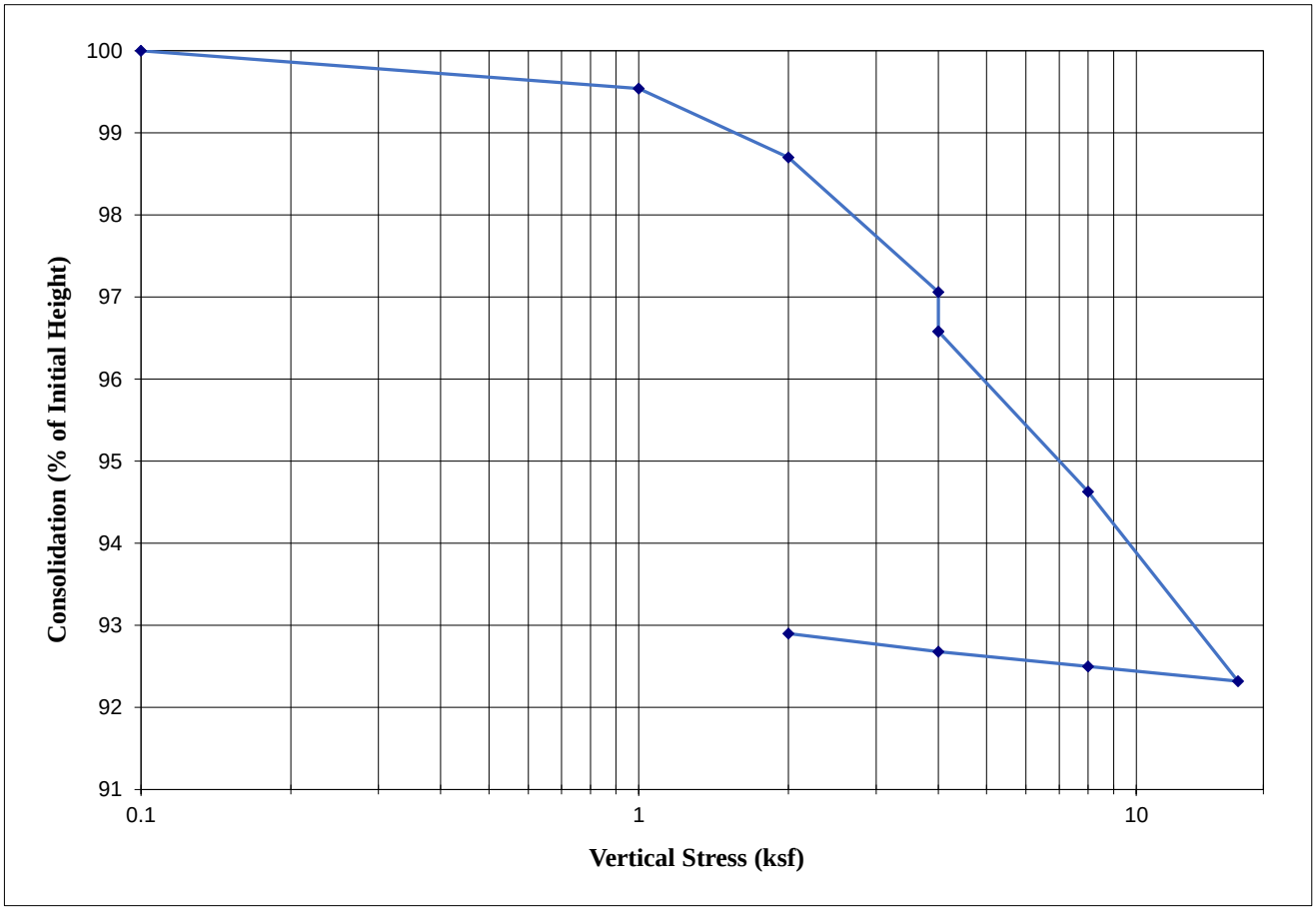
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**24-1139-1**	Material Type:	Soils
Client:	Ethos	Date of Extraction:	12/18/2024
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	1/15/2024
Project City:	Goodyear	Lab Tested By:	Keagen Mayfield
Sample Location:	B-147 @ 5.0 - 6.0	Reviewed By:	Fernando Montero

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.45
INITIAL MOISTURE CONTENT	13.9%	FINAL MOISTURE CONTENT	19.4%
INITIAL DRY DENSITY(pcf)	96.1	FINAL DRY DENSITY(pcf)	99.4
INITIAL DEGREE OF SATURATION	51%	FINAL DEGREE OF SATURATION	77%
INITIAL VOID RATIO	0.7	FINAL VOID RATIO	0.7
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	4 ksf



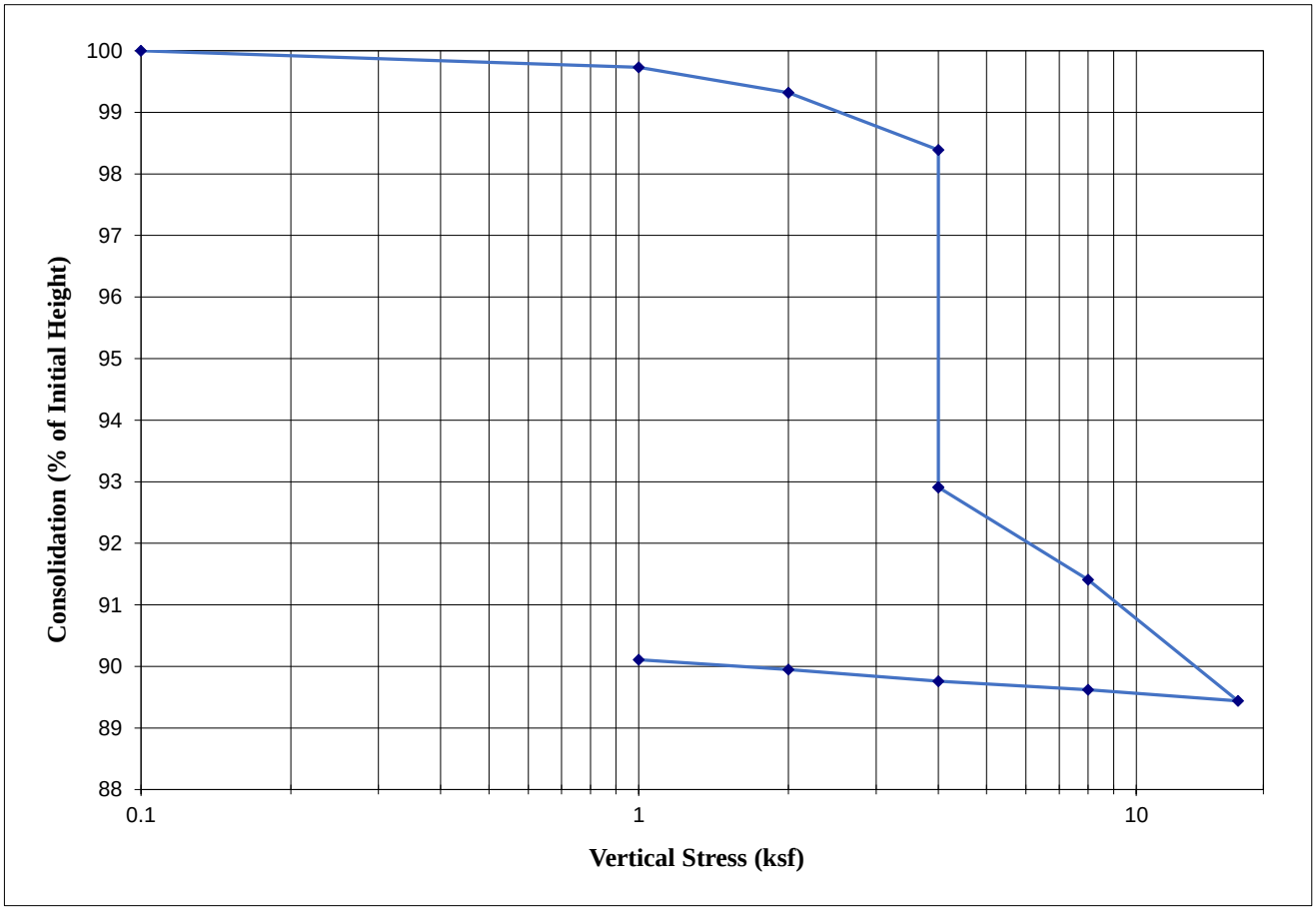
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**23-5851-1**	Material Type:	Soils
Client:	Ethos	Date of Extraction:	12/13/2023
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	1/10/2024
Project City:	Goodyear	Lab Tested By:	Keagen Mayfield
Sample Location:	B-151 @ 5.0 - 6.0	Reviewed By:	Fernando Montero

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.28
INITIAL MOISTURE CONTENT	4.2%	FINAL MOISTURE CONTENT	20.8%
INITIAL DRY DENSITY(pcf)	91.5	FINAL DRY DENSITY(pcf)	98.4
INITIAL DEGREE OF SATURATION	14%	FINAL DEGREE OF SATURATION	81%
INITIAL VOID RATIO	0.8	FINAL VOID RATIO	0.7
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	4 ksf



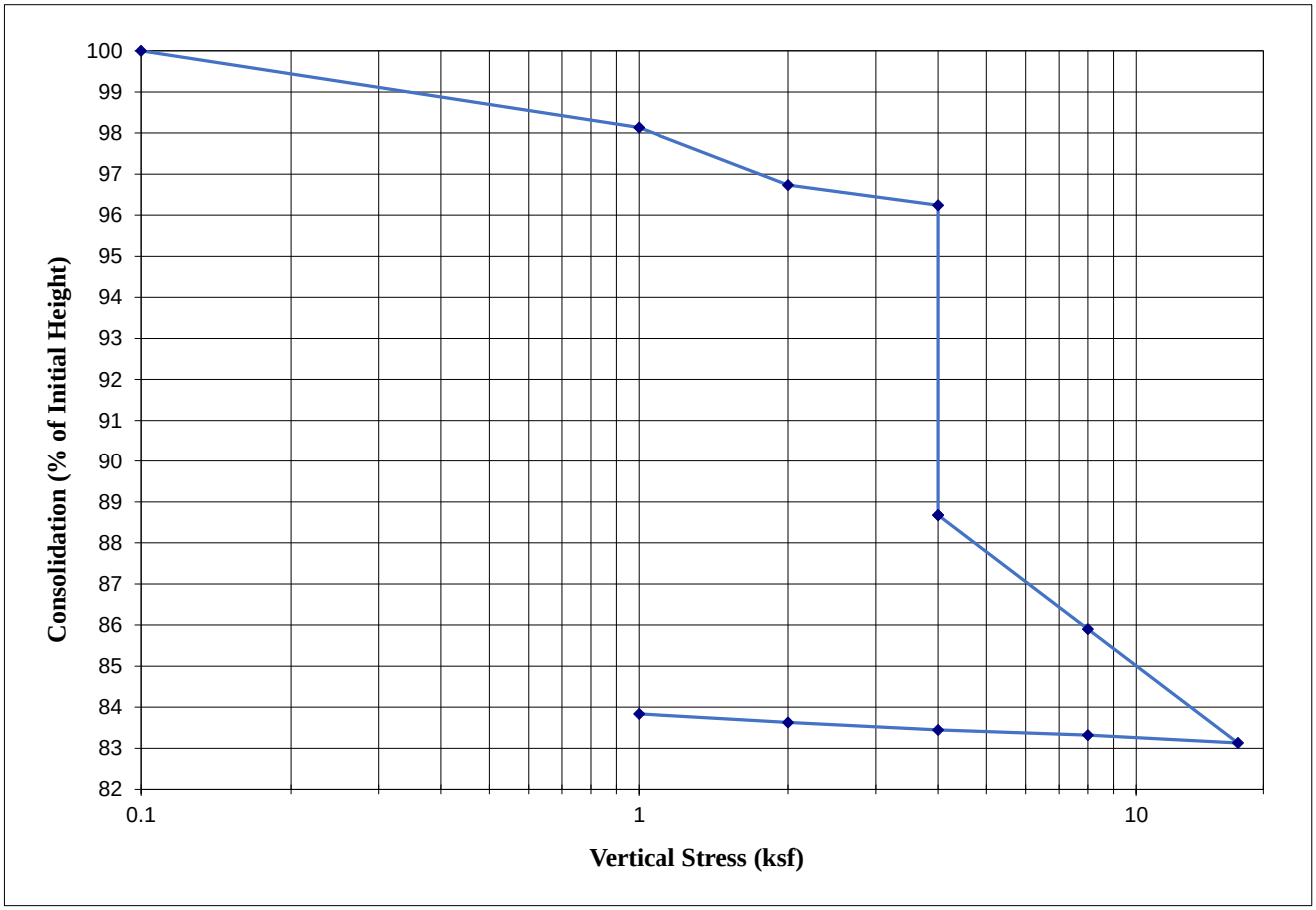
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**23-5852-5**	Material Type:	Soils
Client:	Ethos	Date of Extraction:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	12/29/2024
Project City:	Goodyear	Lab Tested By:	Mahalia Davis
Sample Location:	B-155 @ 5.0 - 6.0	Reviewed By:	Fernando Montero

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.08
INITIAL MOISTURE CONTENT	4.6%	FINAL MOISTURE CONTENT	15.9%
INITIAL DRY DENSITY(pcf)	99.7	FINAL DRY DENSITY(pcf)	112.4
INITIAL DEGREE OF SATURATION	19%	FINAL DEGREE OF SATURATION	89%
INITIAL VOID RATIO	0.7	FINAL VOID RATIO	0.5
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	4 ksf



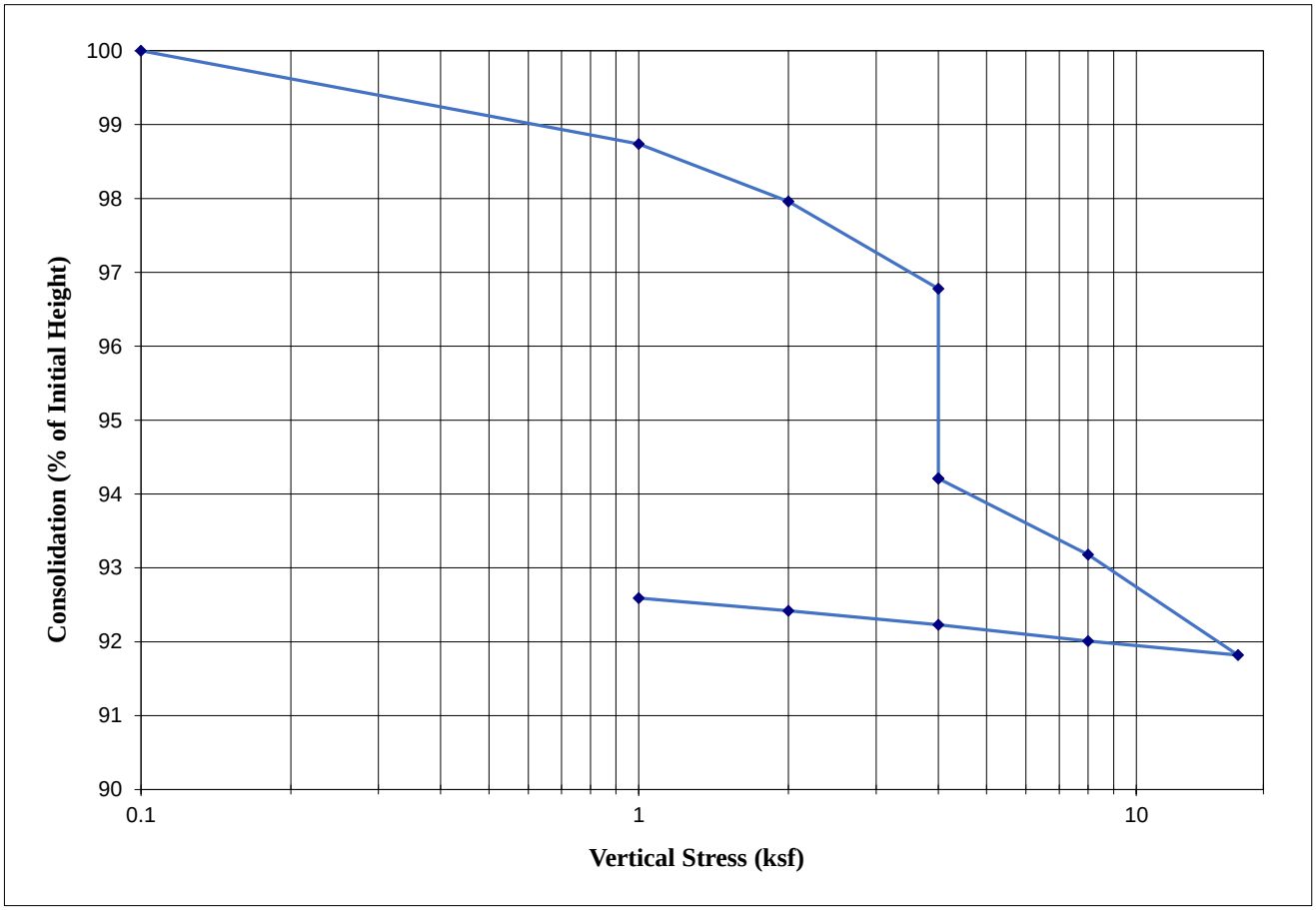
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**23-5853-1**	Material Type:	Soils
Client:	Ethos	Date of Extraction:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	1/12/2024
Project City:	Goodyear	Lab Tested By:	Keagen Mayfield
Sample Location:	B-156 @ 10.0 - 11.0	Reviewed By:	Fernando Montero

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.34
INITIAL MOISTURE CONTENT	1.9%	FINAL MOISTURE CONTENT	17.3%
INITIAL DRY DENSITY(pcf)	100.5	FINAL DRY DENSITY(pcf)	106.7
INITIAL DEGREE OF SATURATION	8%	FINAL DEGREE OF SATURATION	83%
INITIAL VOID RATIO	0.6	FINAL VOID RATIO	0.6
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	4 ksf



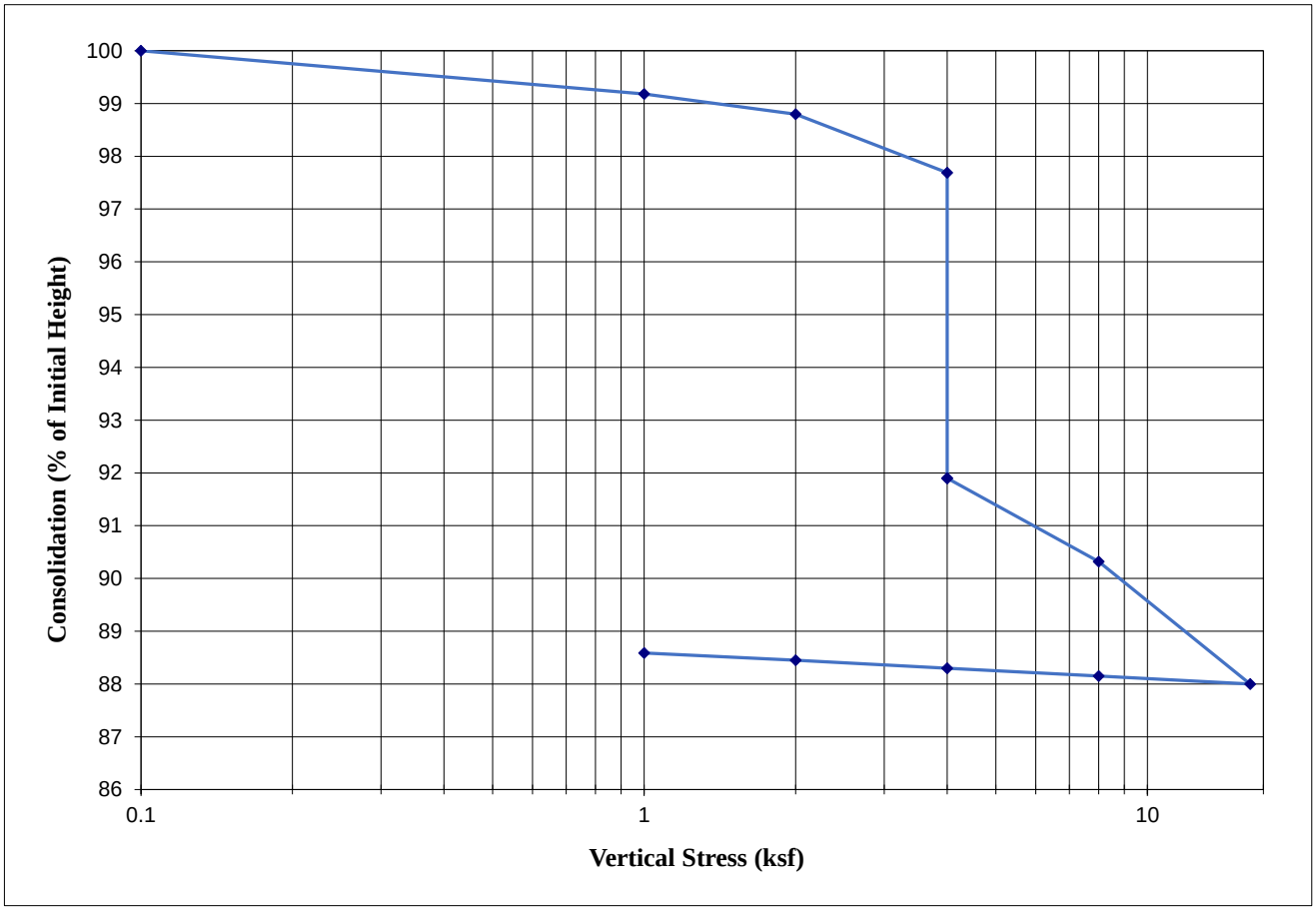
ACS Services LLC

ENGINEERING DESIGN • MATERIAL TESTING • CONSTRUCTION INSPECTION

* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**23-4643-1**	Material Type:	Soil
Client:	Ethos	Date of Extraction:	9/26/2023
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	10/4/2023
Project City:	Goodyear	Lab Tested By:	Keagen Mayfield
Sample Location:	B-159 @ 3.0 - 4.0	Reviewed By:	Fernando Montero

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.23
INITIAL MOISTURE CONTENT	3.6%	FINAL MOISTURE CONTENT	13.5%
INITIAL DRY DENSITY(pcf)	102.0	FINAL DRY DENSITY(pcf)	111.0
INITIAL DEGREE OF SATURATION	16%	FINAL DEGREE OF SATURATION	73%
INITIAL VOID RATIO	0.6	FINAL VOID RATIO	0.5
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	4 ksf



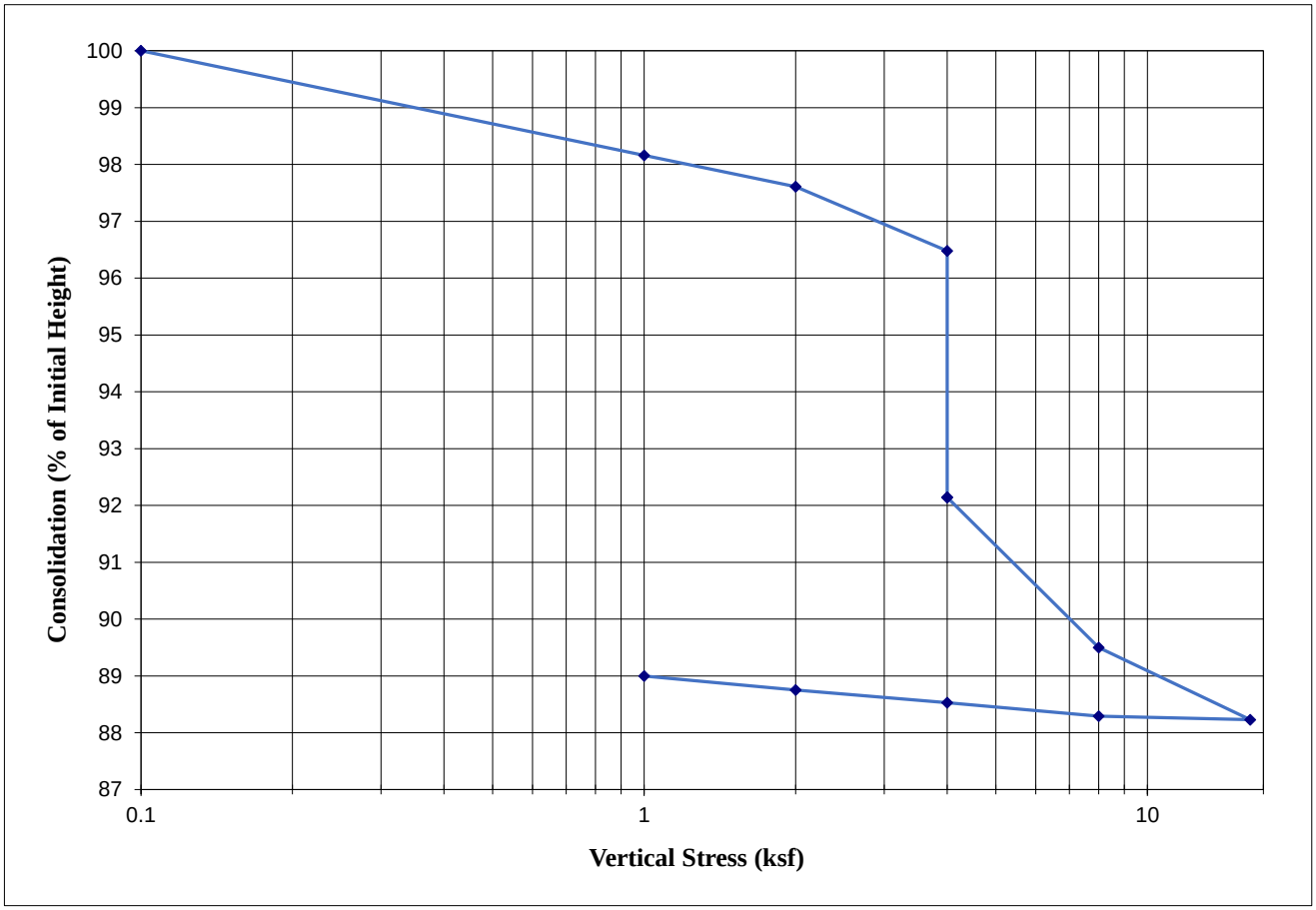
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**23-4579-1**	Material Type:	Soils
Client:	Ethos	Date of Extraction:	9/26/2023
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	10/4/2023
Project City:	Goodyear	Lab Tested By:	Keagen Mayfield
Sample Location:	B-161 @ 5.0 - 6.0	Reviewed By:	Fernando Montero

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.24
INITIAL MOISTURE CONTENT	4.2%	FINAL MOISTURE CONTENT	17.0%
INITIAL DRY DENSITY(pcf)	100.9	FINAL DRY DENSITY(pcf)	109.4
INITIAL DEGREE OF SATURATION	17%	FINAL DEGREE OF SATURATION	88%
INITIAL VOID RATIO	0.6	FINAL VOID RATIO	0.5
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	4 ksf



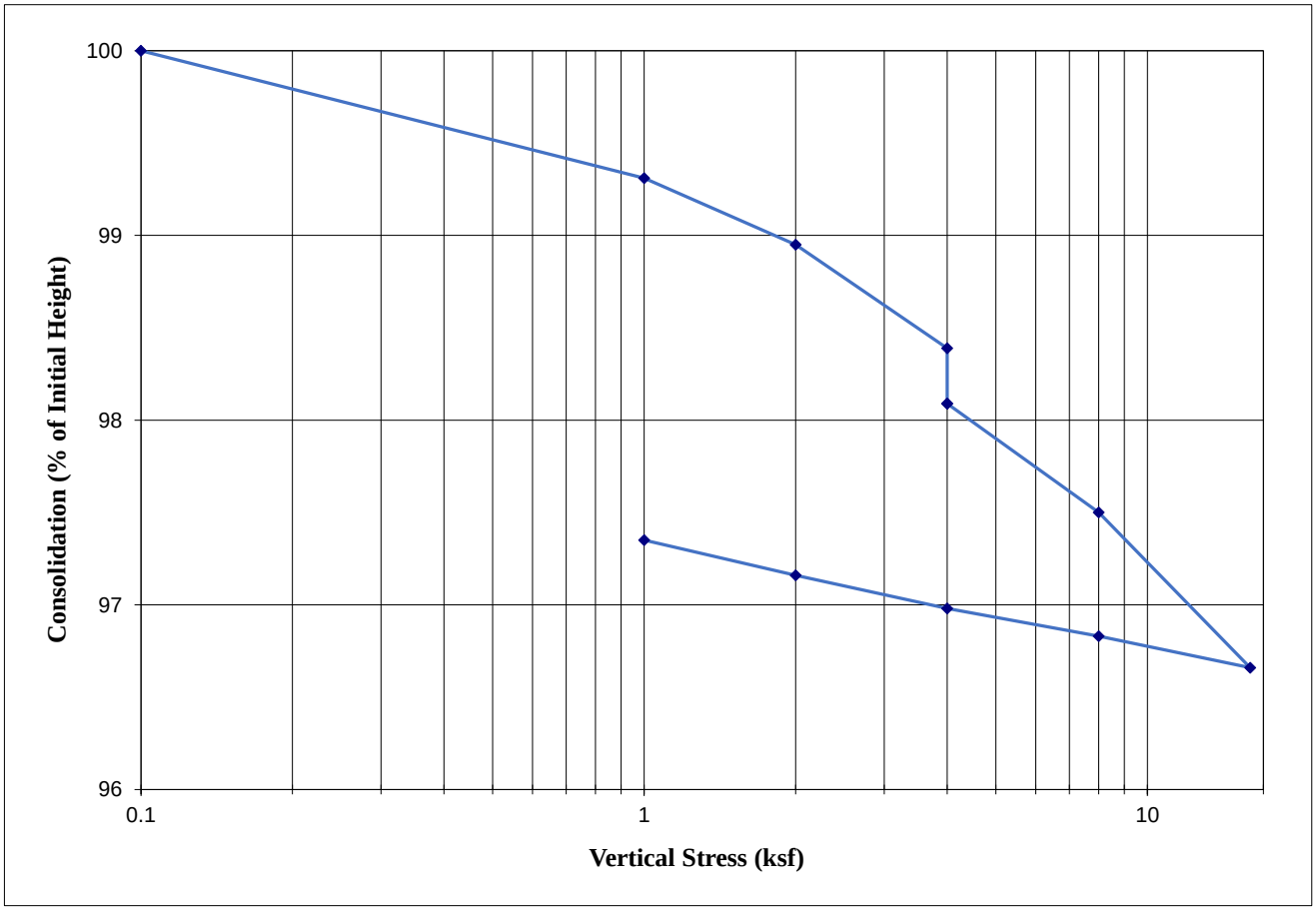
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**23-4580-1**	Material Type:	Soils
Client:	Ethos	Date of Extraction:	9/26/2023
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	10/4/2023
Project City:	Goodyear	Lab Tested By:	Keagen Mayfield
Sample Location:	B-163 @ 10.0 - 11.5	Reviewed By:	Fernando Montero

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.52
INITIAL MOISTURE CONTENT	3.2%	FINAL MOISTURE CONTENT	15.6%
INITIAL DRY DENSITY(pcf)	107.0	FINAL DRY DENSITY(pcf)	109.0
INITIAL DEGREE OF SATURATION	16%	FINAL DEGREE OF SATURATION	80%
INITIAL VOID RATIO	0.5	FINAL VOID RATIO	0.5
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	4 ksf



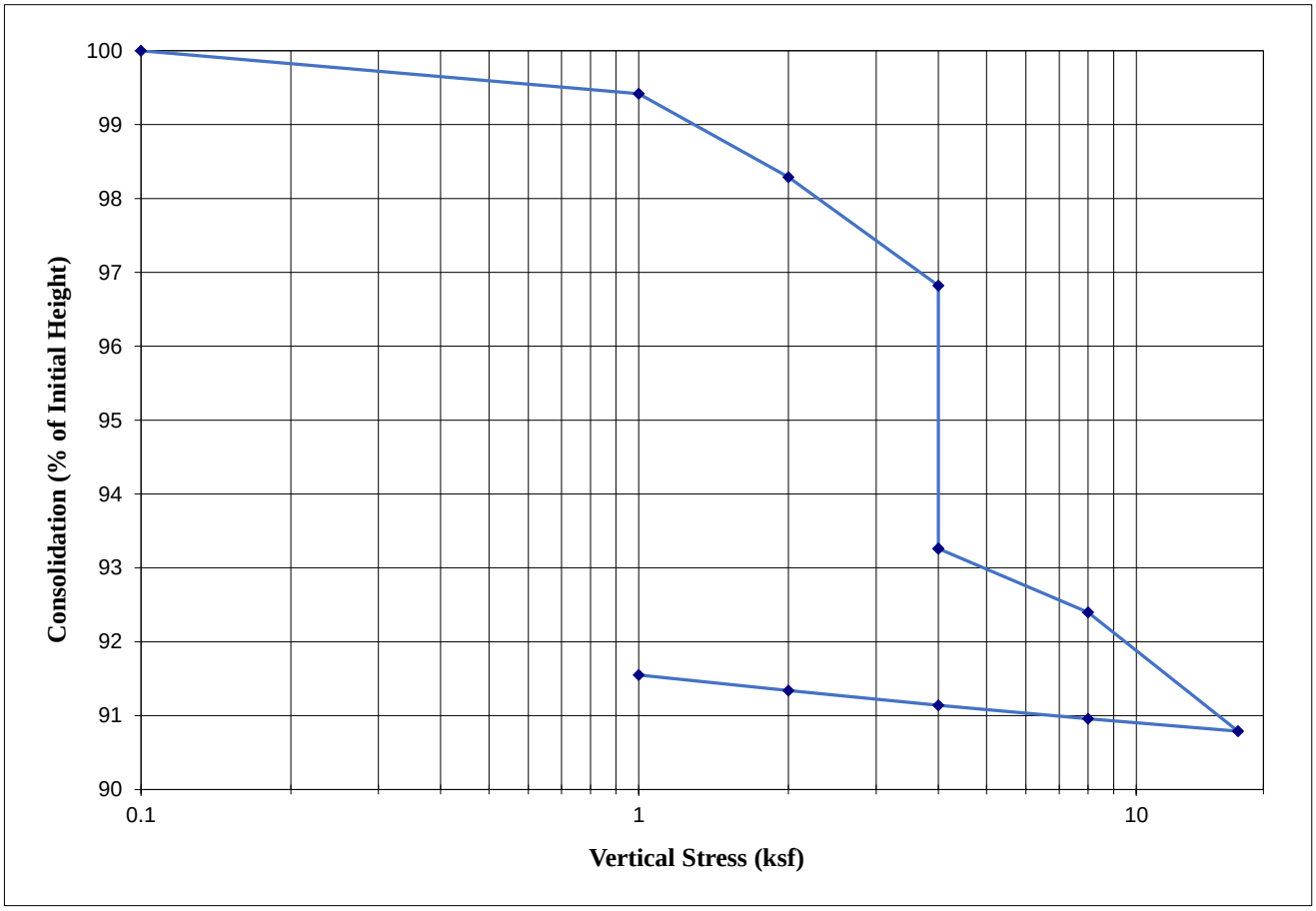
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**23-4646-1**	Material Type:	Soil
Client:	Ethos	Date of Extraction:	9/26/2023
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	10/4/2023
Project City:	Goodyear	Lab Tested By:	Keagen Mayfield
Sample Location:	B-165 @ 5.0 - 6.0	Reviewed By:	Fernando Montero

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.29
INITIAL MOISTURE CONTENT	2.2%	FINAL MOISTURE CONTENT	19.2%
INITIAL DRY DENSITY(pcf)	93.3	FINAL DRY DENSITY(pcf)	100.0
INITIAL DEGREE OF SATURATION	8%	FINAL DEGREE OF SATURATION	78%
INITIAL VOID RATIO	0.8	FINAL VOID RATIO	0.7
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	4 ksf

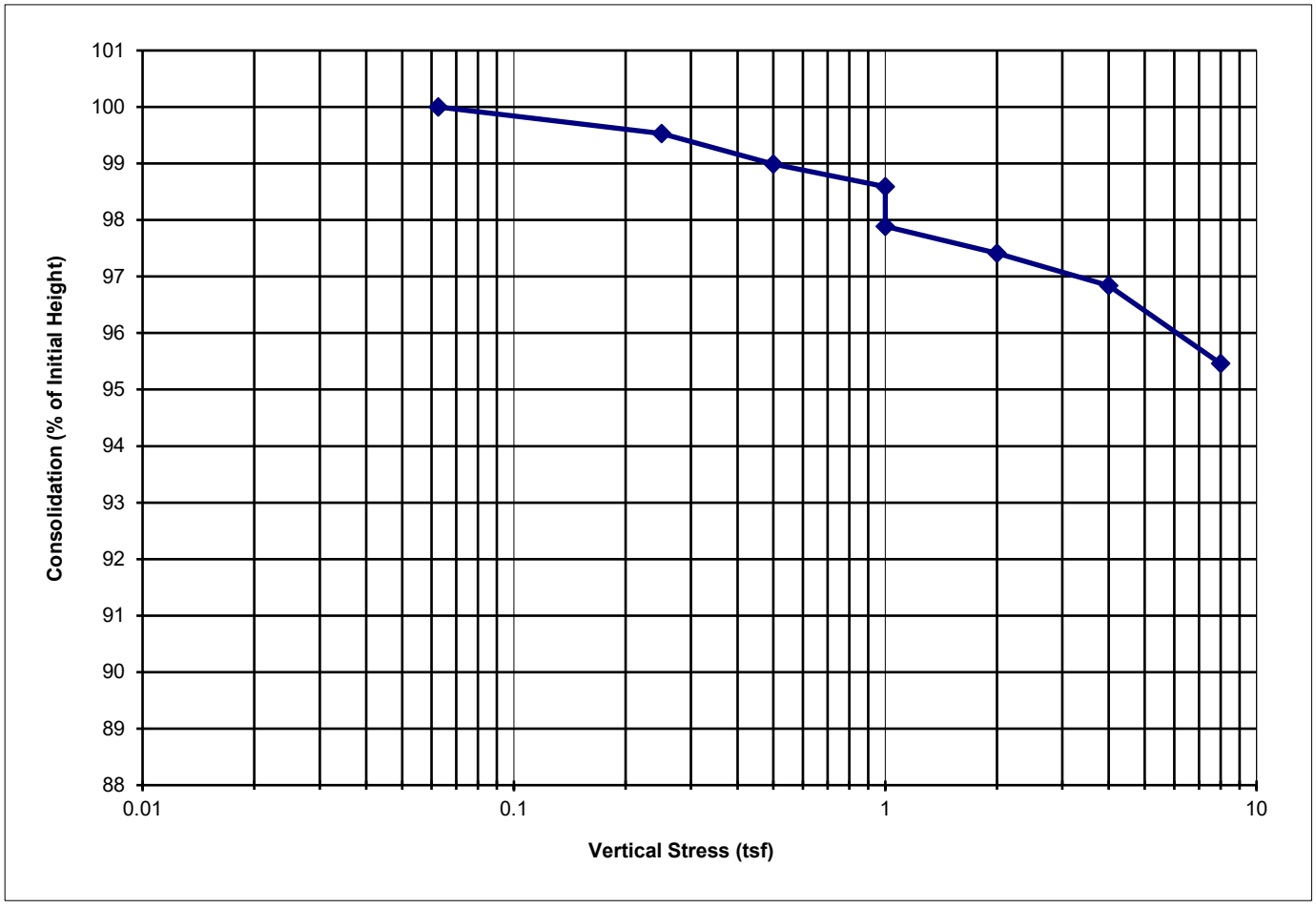


PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-167 (10.0-11.0')
SAMPLE PREP: In-situ

JOB NO: 17-2023-4239
WORK ORDER NO: 35
LAB NO: 23-2265-01
DATE ASSIGNED:

ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

INITIAL VOLUME (cu.in):	4.60	FINAL VOLUME (cu.in):	4.40
INITIAL MOISTURE CONTENT:	2.5%	FINAL MOISTURE CONTENT:	18.4%
INITIAL DRY DENSITY(pcf):	99.8	FINAL DRY DENSITY(pcf):	104.0
INITIAL DEGREE OF SATURATION:	10%	FINAL DEGREE OF SATURATION:	83%
INITIAL VOID RATIO:	0.66	FINAL VOID RATIO:	0.59
		SATURATED AT:	2 tsf



WSP USA
3630 E Wier Ave.
Phoenix, AZ 85040

REVIEWED BY

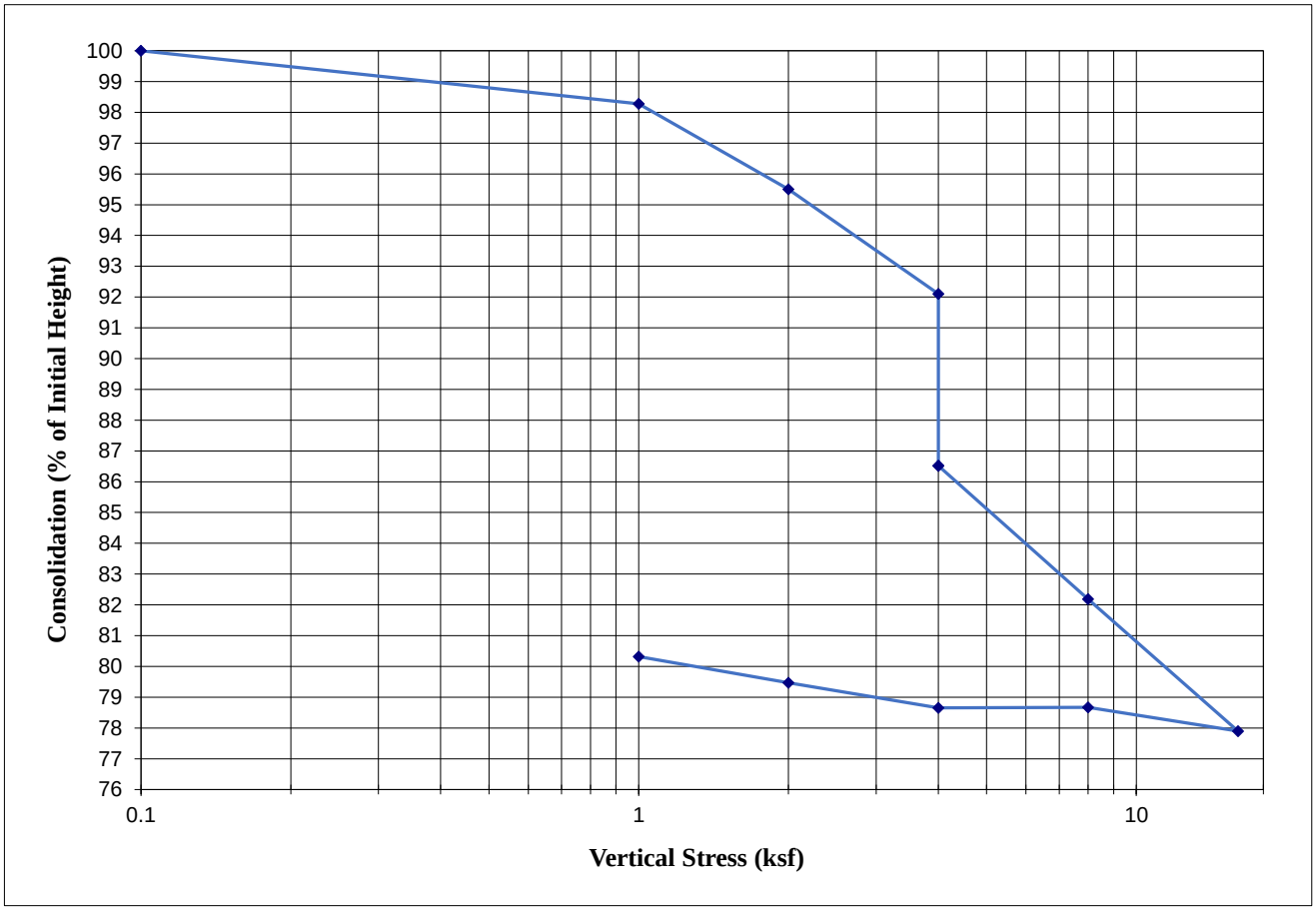
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**23-5842-1**	Material Type:	Soils
Client:	Ethos	Date of Extraction:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	12/22/2024
Project City:	Goodyear	Lab Tested By:	Mahalia Davis
Sample Location:	B-169 @ 3.0 - 4.0	Reviewed By:	Fernando Montero

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	3.98
INITIAL MOISTURE CONTENT	18.5%	FINAL MOISTURE CONTENT	28.5%
INITIAL DRY DENSITY(pcf)	75.7	FINAL DRY DENSITY(pcf)	87.5
INITIAL DEGREE OF SATURATION	41%	FINAL DEGREE OF SATURATION	85%
INITIAL VOID RATIO	1.2	FINAL VOID RATIO	0.9
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	4 ksf



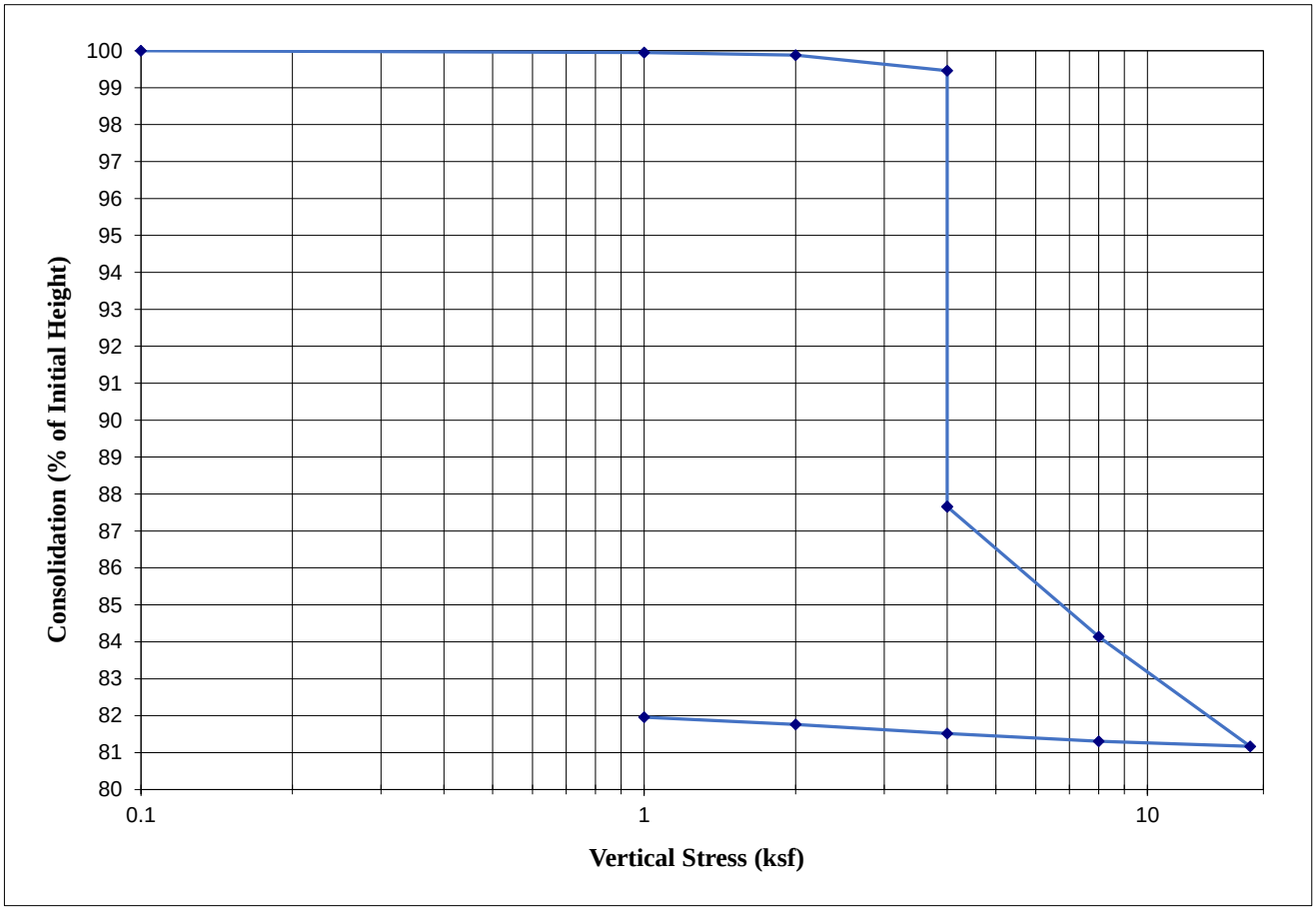
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**23-5843-2**	Material Type:	Soils
Client:	Ethos	Date of Extraction:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	12/22/2024
Project City:	Goodyear	Lab Tested By:	Keagen Mayfield
Sample Location:	B-171 @ 1.0 - 2.0	Reviewed By:	Fernando Montero

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.04
INITIAL MOISTURE CONTENT	7.2%	FINAL MOISTURE CONTENT	16.9%
INITIAL DRY DENSITY(pcf)	87.9	FINAL DRY DENSITY(pcf)	100.3
INITIAL DEGREE OF SATURATION	22%	FINAL DEGREE OF SATURATION	69%
INITIAL VOID RATIO	0.9	FINAL VOID RATIO	0.6
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	4 ksf



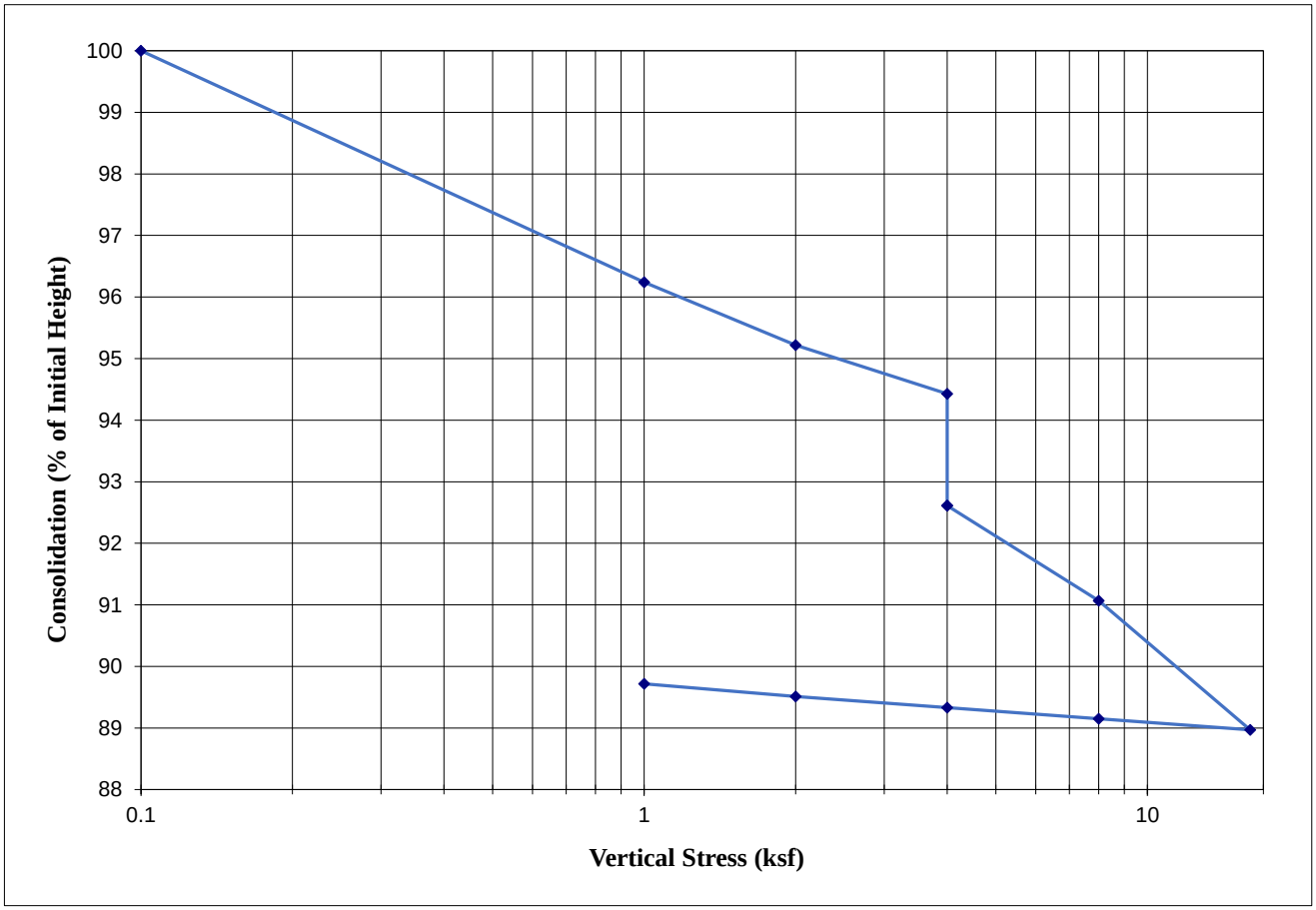
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**23-5409-1**	Material Type:	Soils
Client:	Ethos	Date of Extraction:	11/6/2023
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	11/22/2023
Project City:	Goodyear	Lab Tested By:	Keagen Mayfield
Sample Location:	B-173 @ 5.0 - 6.0	Reviewed By:	Fernando Montero

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.26
INITIAL MOISTURE CONTENT	5.9%	FINAL MOISTURE CONTENT	16.0%
INITIAL DRY DENSITY(pcf)	105.9	FINAL DRY DENSITY(pcf)	114.3
INITIAL DEGREE OF SATURATION	28%	FINAL DEGREE OF SATURATION	95%
INITIAL VOID RATIO	0.6	FINAL VOID RATIO	0.4
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	4 ksf



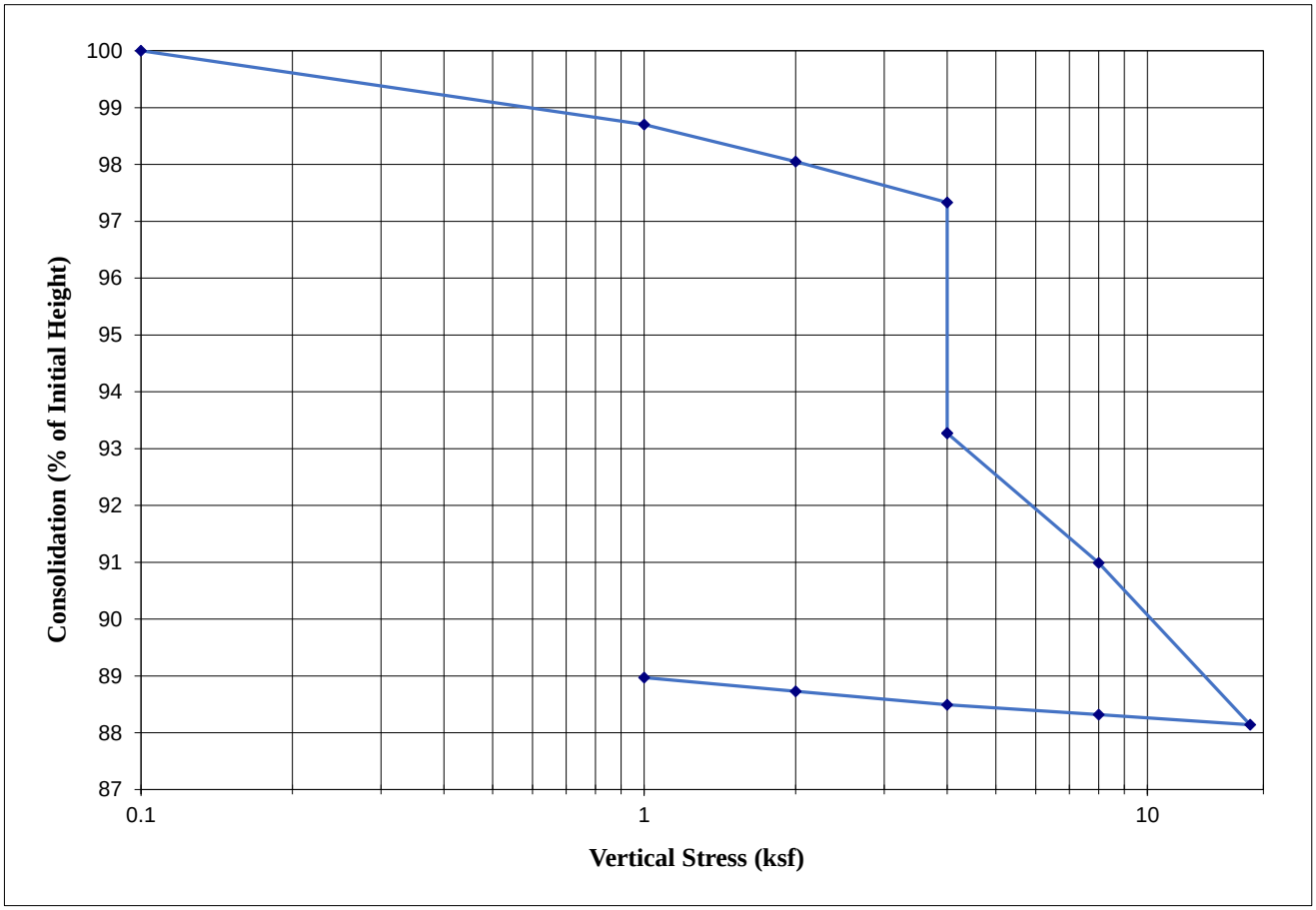
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**23-5409-1**	Material Type:	Soils
Client:	Ethos	Date of Extraction:	11/6/2023
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	11/22/2023
Project City:	Goodyear	Lab Tested By:	Mahalia Davis
Sample Location:	B-174 @ 1.0 - 2.0	Reviewed By:	Fernando Montero

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.29
INITIAL MOISTURE CONTENT	4.4%	FINAL MOISTURE CONTENT	20.3%
INITIAL DRY DENSITY(pcf)	93.2	FINAL DRY DENSITY(pcf)	99.8
INITIAL DEGREE OF SATURATION	15%	FINAL DEGREE OF SATURATION	82%
INITIAL VOID RATIO	0.8	FINAL VOID RATIO	0.7
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	4 ksf



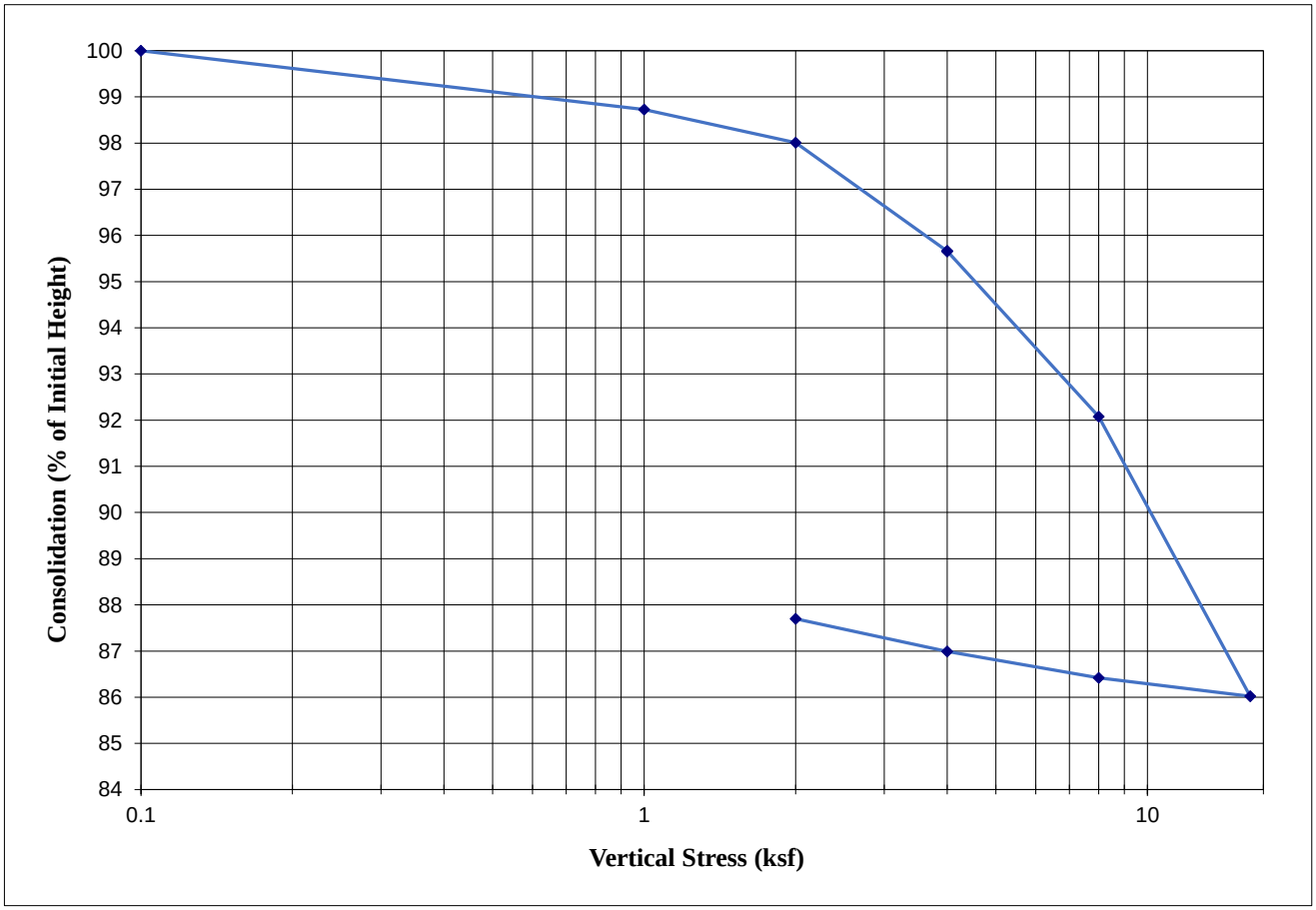
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**23-4761-3**	Material Type:	Soils
Client:	Ethos	Date of Extraction:	10/2/2023
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	10/7/2023
Project City:	Goodyear	Lab Tested By:	Keagen Mayfield
Sample Location:	B - 176 @ 45.0 - 46.0	Reviewed By:	Fernando Montero

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.40
INITIAL MOISTURE CONTENT	25.1%	FINAL MOISTURE CONTENT	37.7%
INITIAL DRY DENSITY(pcf)	74.5	FINAL DRY DENSITY(pcf)	77.9
INITIAL DEGREE OF SATURATION	55%	FINAL DEGREE OF SATURATION	89%
INITIAL VOID RATIO	1.2	FINAL VOID RATIO	1.1
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	4 ksf



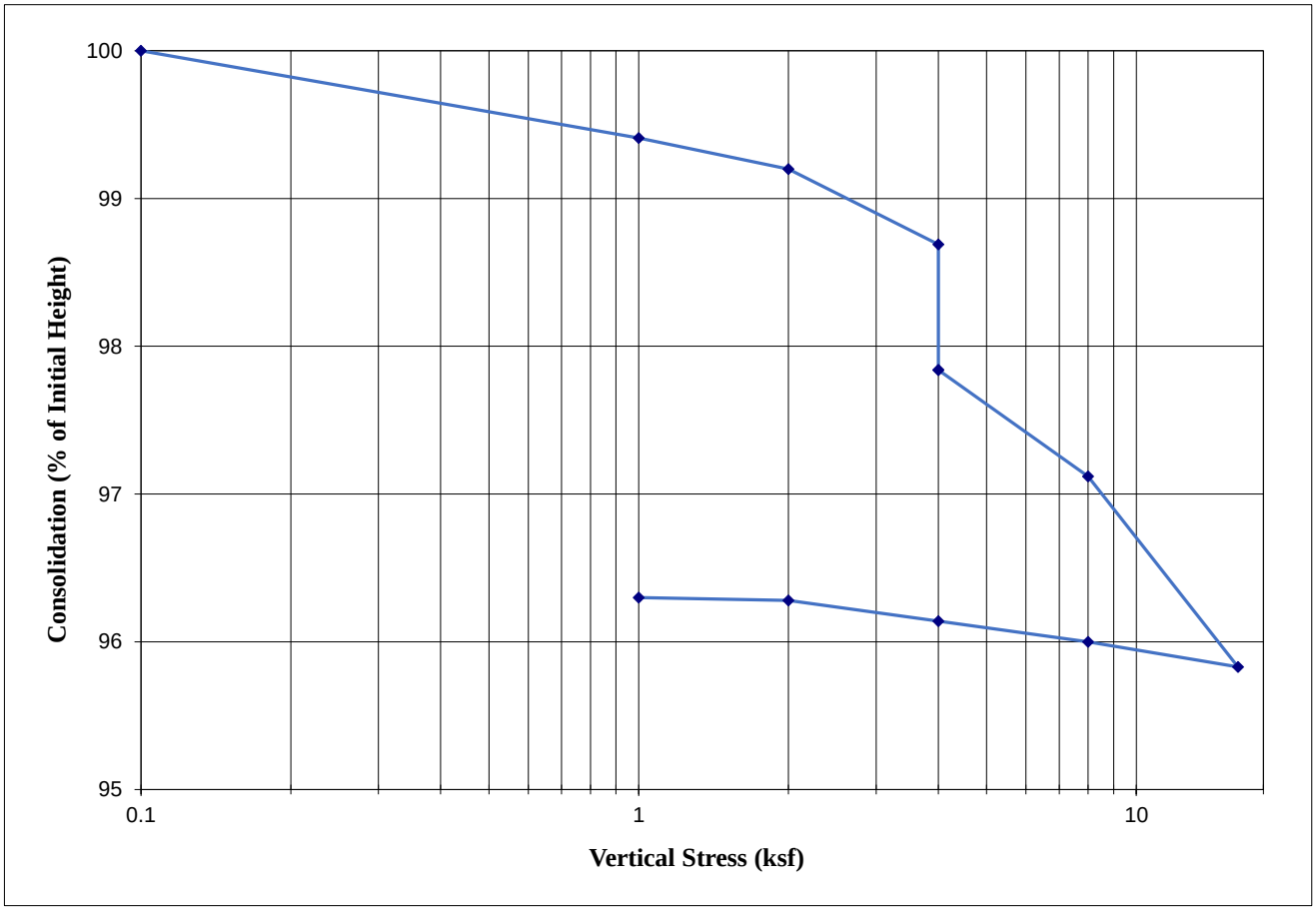
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**23-4762-1**	Material Type:	Soils
Client:	Ethos	Date of Extraction:	10/2/2023
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	10/7/2023
Project City:	Goodyear	Lab Tested By:	Keagen Mayfield
Sample Location:	B - 178 @ 10.0 - 11.0	Reviewed By:	Fernando Montero

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.50
INITIAL MOISTURE CONTENT	2.0%	FINAL MOISTURE CONTENT	17.1%
INITIAL DRY DENSITY(pcf)	106.0	FINAL DRY DENSITY(pcf)	108.3
INITIAL DEGREE OF SATURATION	9%	FINAL DEGREE OF SATURATION	86%
INITIAL VOID RATIO	0.6	FINAL VOID RATIO	0.5
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	4 ksf



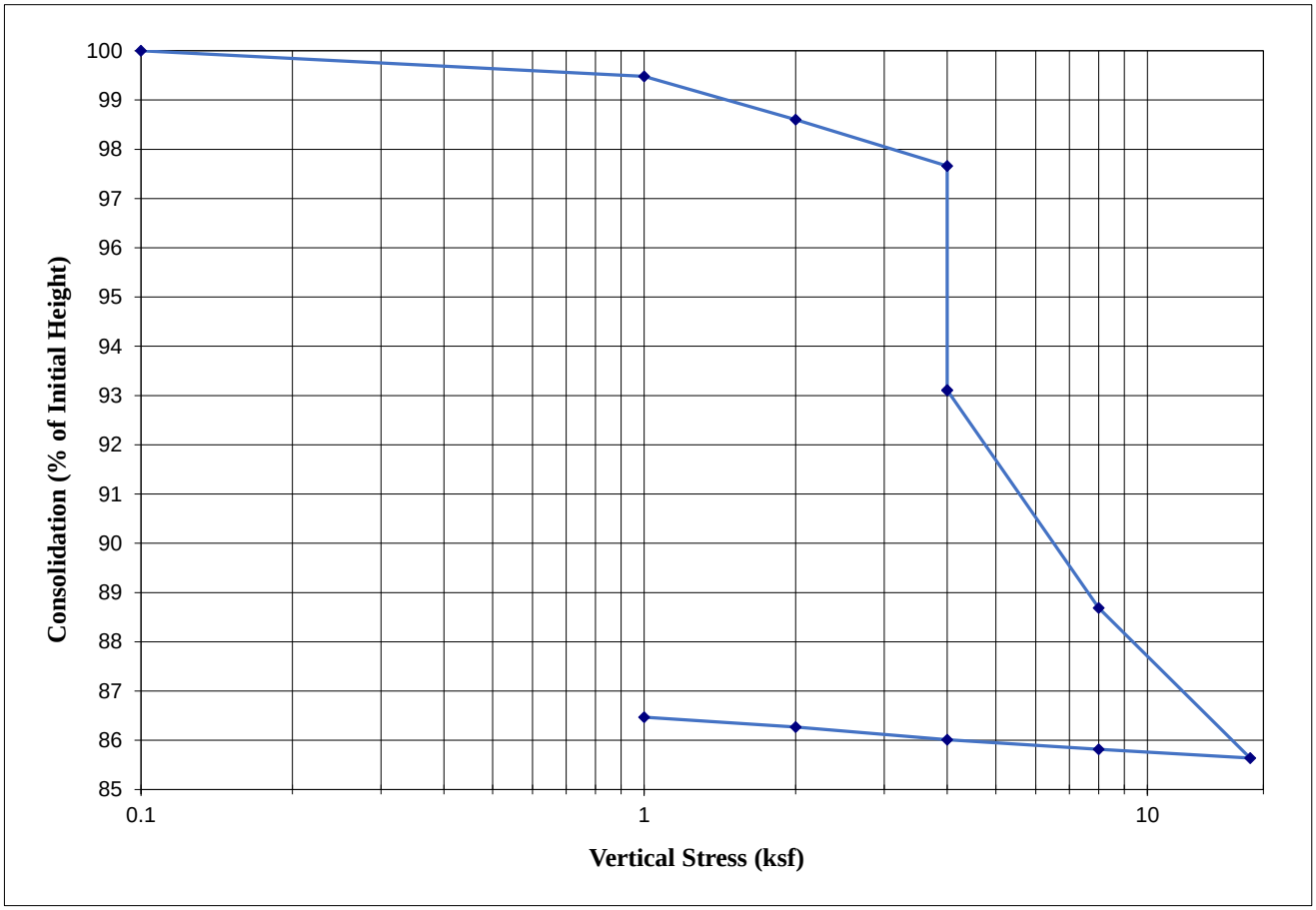
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**23-4763-1**	Material Type:	Soils
Client:	Ethos	Date of Extraction:	10/2/2023
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	10/7/2023
Project City:	Goodyear	Lab Tested By:	Keagen Mayfield
Sample Location:	B - 179 @ 0.0 - 1.0	Reviewed By:	Fernando Montero

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.29
INITIAL MOISTURE CONTENT	3.9%	FINAL MOISTURE CONTENT	13.1%
INITIAL DRY DENSITY(pcf)	95.1	FINAL DRY DENSITY(pcf)	102.1
INITIAL DEGREE OF SATURATION	14%	FINAL DEGREE OF SATURATION	56%
INITIAL VOID RATIO	0.7	FINAL VOID RATIO	0.6
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	4 ksf



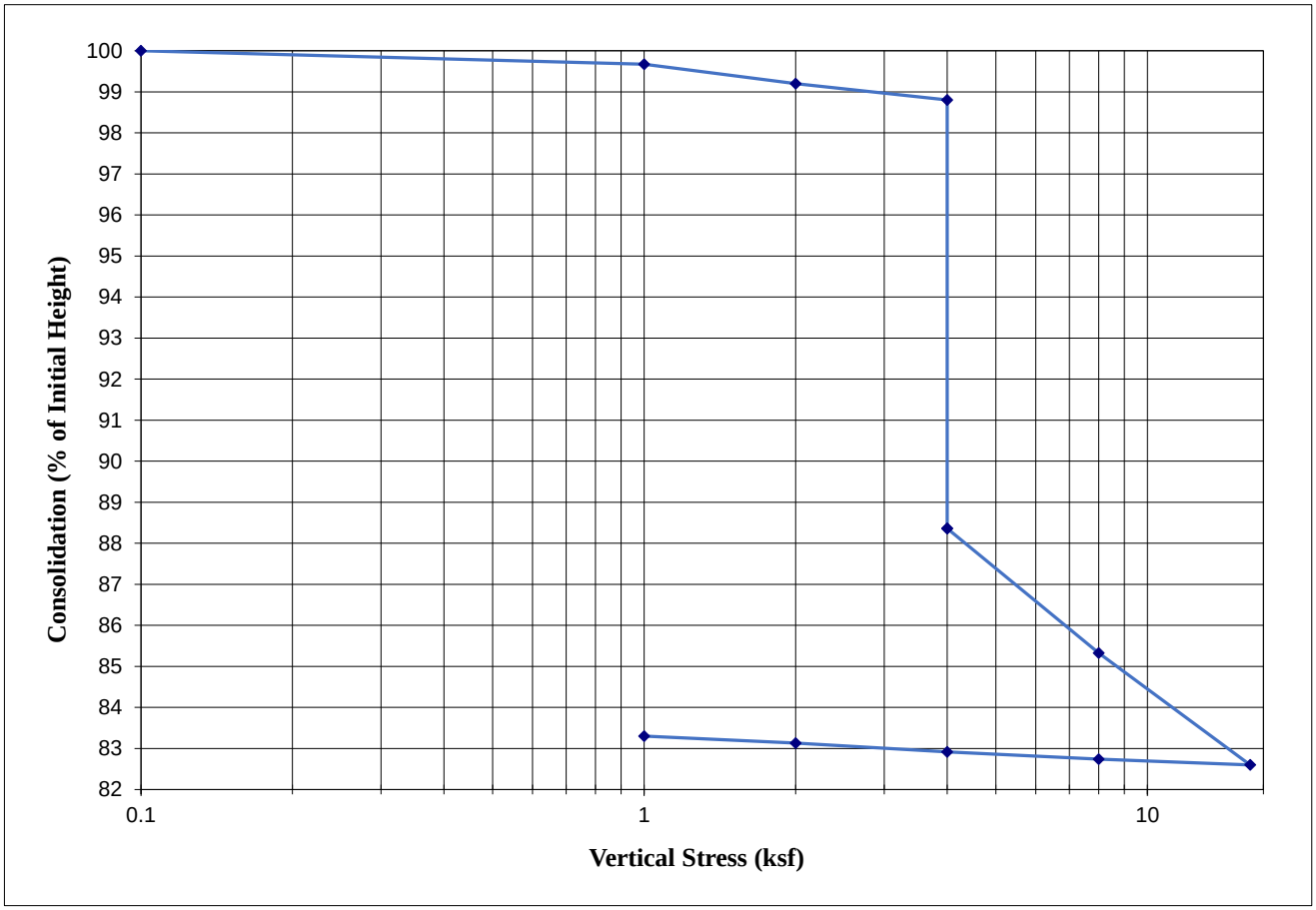
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**23-4767-1**	Material Type:	Soils
Client:	Ethos	Date of Extraction:	10/2/2023
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	10/8/2023
Project City:	Goodyear	Lab Tested By:	James Karl
Sample Location:	B - 183 @ 1.0 - 2.0	Reviewed By:	Fernando Montero

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.07
INITIAL MOISTURE CONTENT	3.8%	FINAL MOISTURE CONTENT	13.8%
INITIAL DRY DENSITY(pcf)	100.9	FINAL DRY DENSITY(pcf)	114.1
INITIAL DEGREE OF SATURATION	16%	FINAL DEGREE OF SATURATION	81%
INITIAL VOID RATIO	0.6	FINAL VOID RATIO	0.4
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	4 ksf



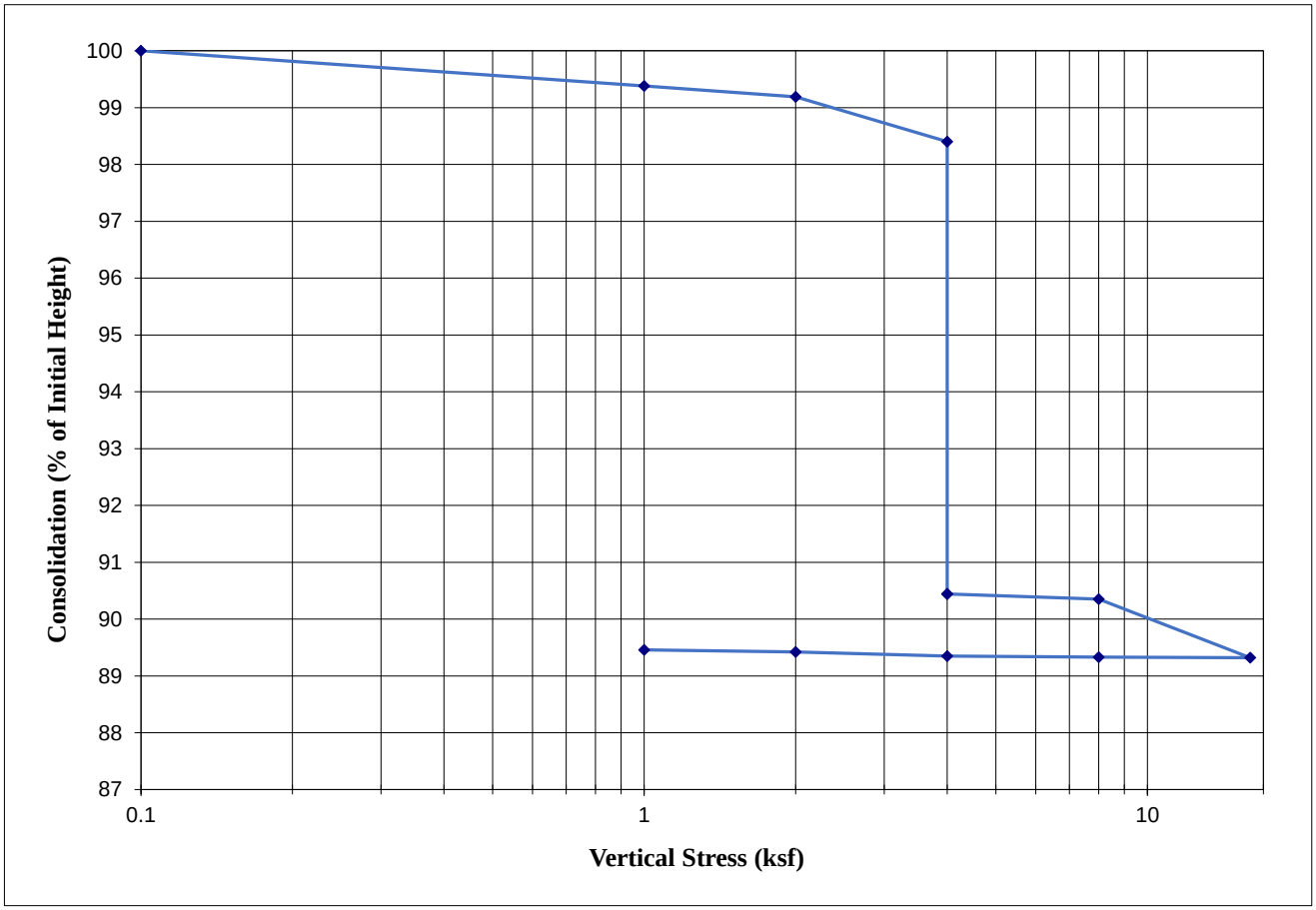
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**23-4768-1**	Material Type:	Soils
Client:	Ethos	Date of Extraction:	10/2/2023
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	10/8/2023
Project City:	Goodyear	Lab Tested By:	Keagen Mayfield
Sample Location:	B - 184 @ 1.0 - 2.0	Reviewed By:	Fernando Montero

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.16
INITIAL MOISTURE CONTENT	6.9%	FINAL MOISTURE CONTENT	21.6%
INITIAL DRY DENSITY(pcf)	93.8	FINAL DRY DENSITY(pcf)	103.7
INITIAL DEGREE OF SATURATION	24%	FINAL DEGREE OF SATURATION	96%
INITIAL VOID RATIO	0.8	FINAL VOID RATIO	0.6
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	4 ksf



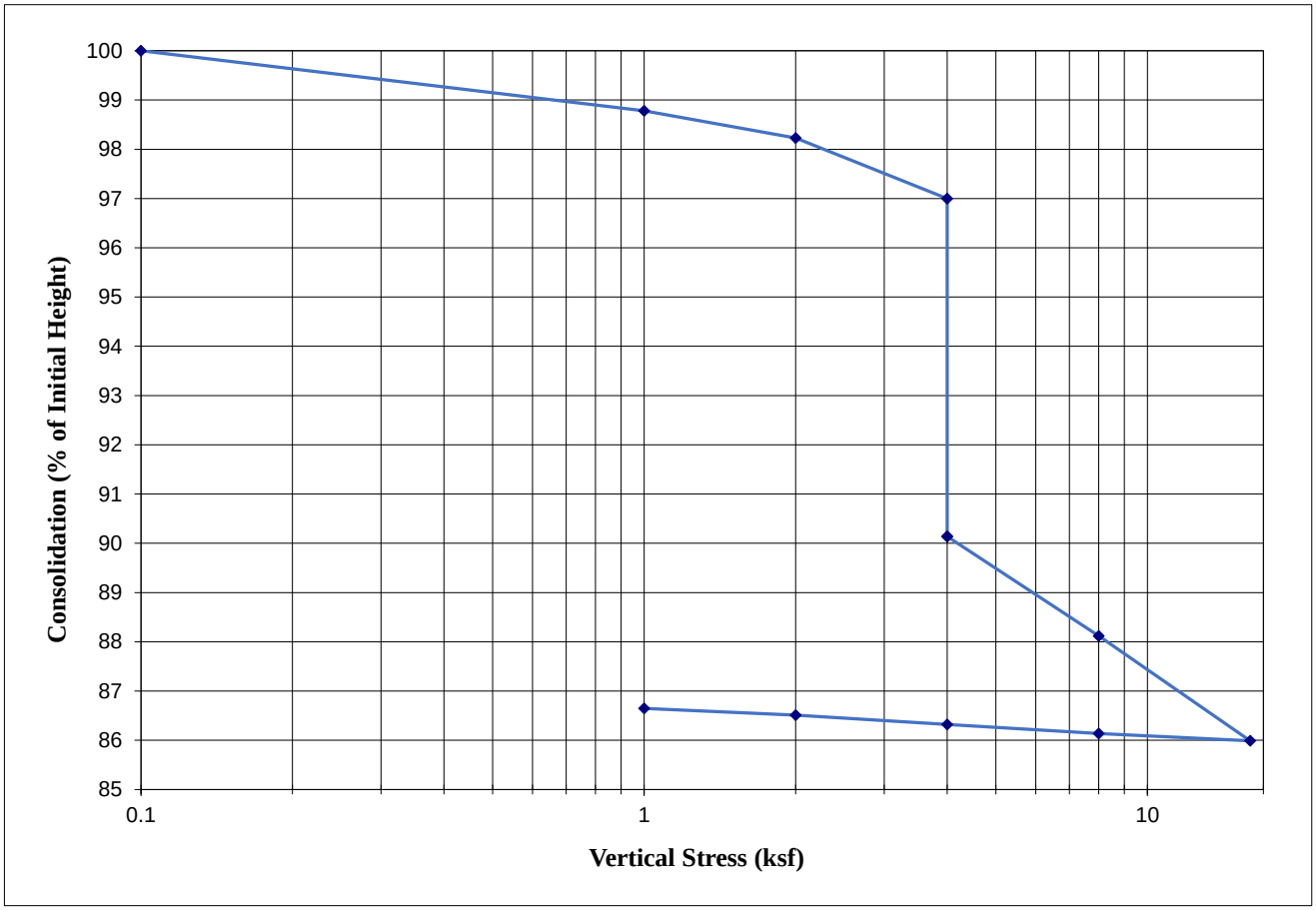
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**23-5845-2**	Material Type:	Soils
Client:	Ethos	Date of Extraction:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	12/22/2024
Project City:	Goodyear	Lab Tested By:	Keagen Mayfield
Sample Location:	B-187 @ 10.0 - 11.0	Reviewed By:	Fernando Montero

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.15
INITIAL MOISTURE CONTENT	3.4%	FINAL MOISTURE CONTENT	13.0%
INITIAL DRY DENSITY(pcf)	104.2	FINAL DRY DENSITY(pcf)	115.6
INITIAL DEGREE OF SATURATION	15%	FINAL DEGREE OF SATURATION	80%
INITIAL VOID RATIO	0.6	FINAL VOID RATIO	0.4
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	4 ksf



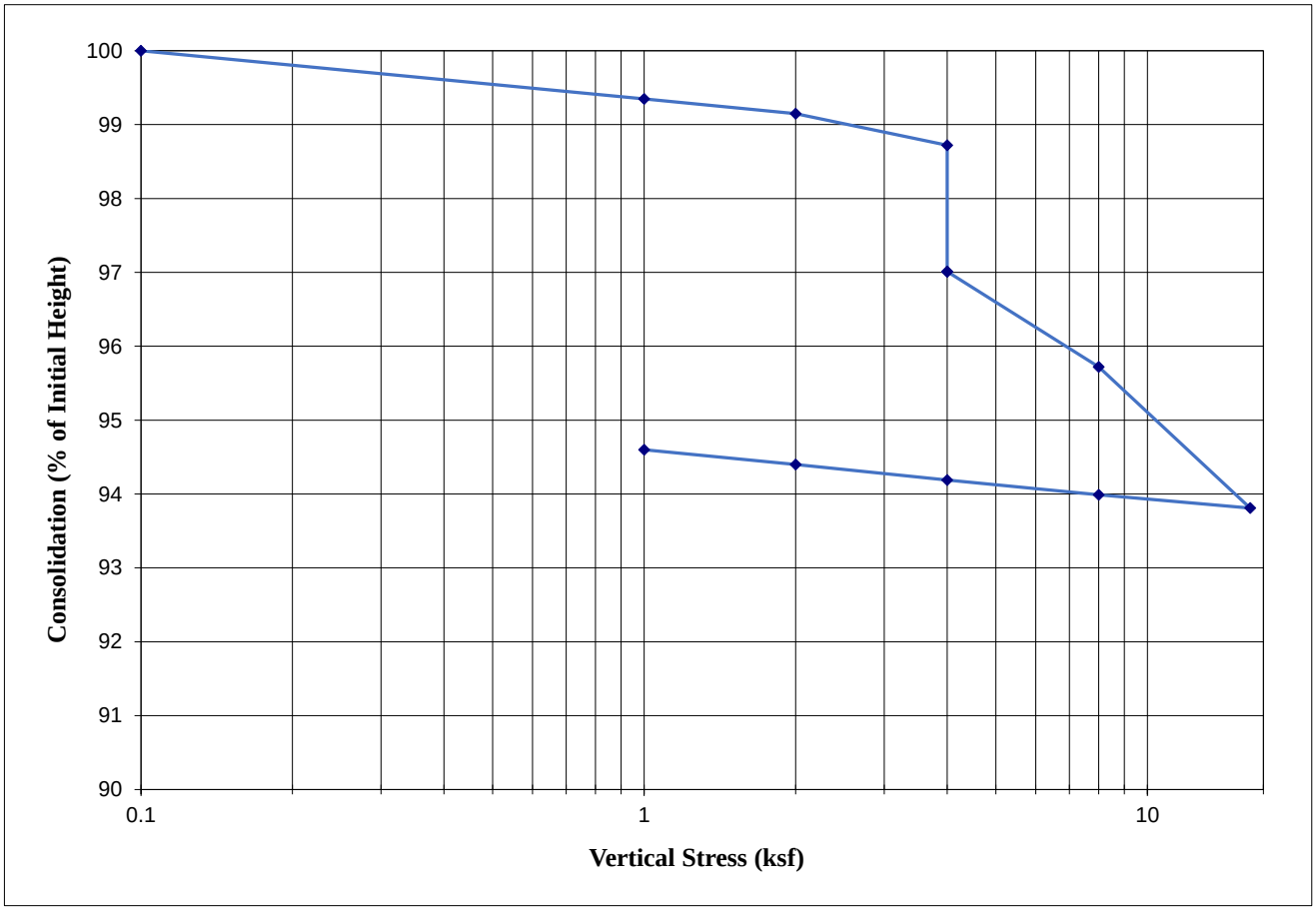
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**24-4606-1**	Material Type:	Soils
Client:	Ethos	Date of Extraction:	-
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	9/6/2024
Project City:	Goodyear	Lab Tested By:	Colin Eggebrecht
Sample Location:	B-189 @ 5.0 - 6.0	Reviewed By:	Keagen Mayfield

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.47
INITIAL MOISTURE CONTENT	3.3%	FINAL MOISTURE CONTENT	19.5%
INITIAL DRY DENSITY(pcf)	91.5	FINAL DRY DENSITY(pcf)	94.3
INITIAL DEGREE OF SATURATION	11%	FINAL DEGREE OF SATURATION	69%
INITIAL VOID RATIO	0.8	FINAL VOID RATIO	0.8
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	4 ksf



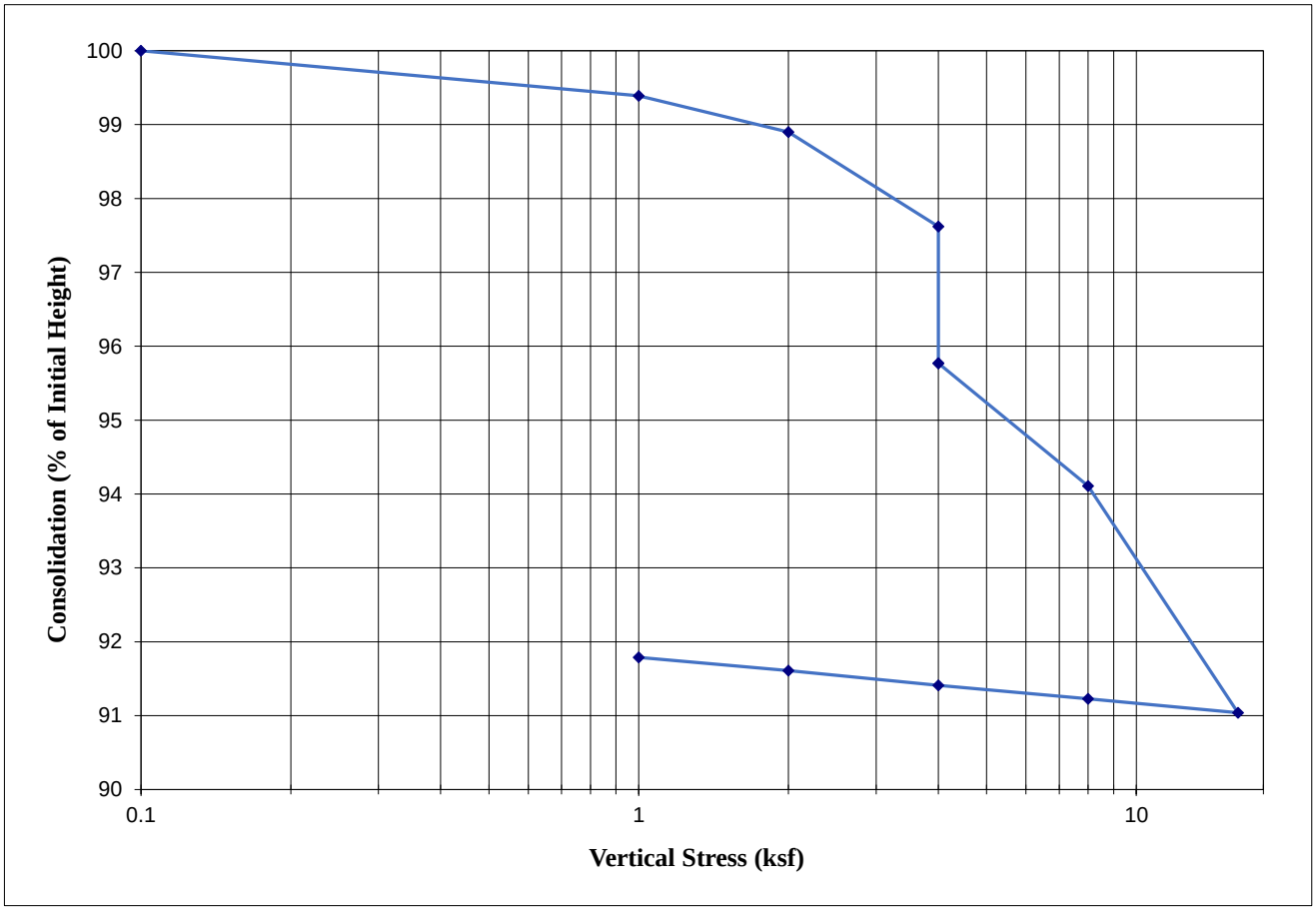
ACS Services LLC

ENGINEERING DESIGN • MATERIAL TESTING • CONSTRUCTION INSPECTION

* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**23-5847-3**	Material Type:	Soils
Client:	Ethos	Date of Extraction:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	1/8/2024
Project City:	Goodyear	Lab Tested By:	Mahalia Davis
Sample Location:	B-191 @ 5.0 - 6.0	Reviewed By:	Fernando Montero

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.41
INITIAL MOISTURE CONTENT	7.1%	FINAL MOISTURE CONTENT	13.5%
INITIAL DRY DENSITY(pcf)	106.6	FINAL DRY DENSITY(pcf)	111.2
INITIAL DEGREE OF SATURATION	34%	FINAL DEGREE OF SATURATION	74%
INITIAL VOID RATIO	0.6	FINAL VOID RATIO	0.5
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	4 ksf



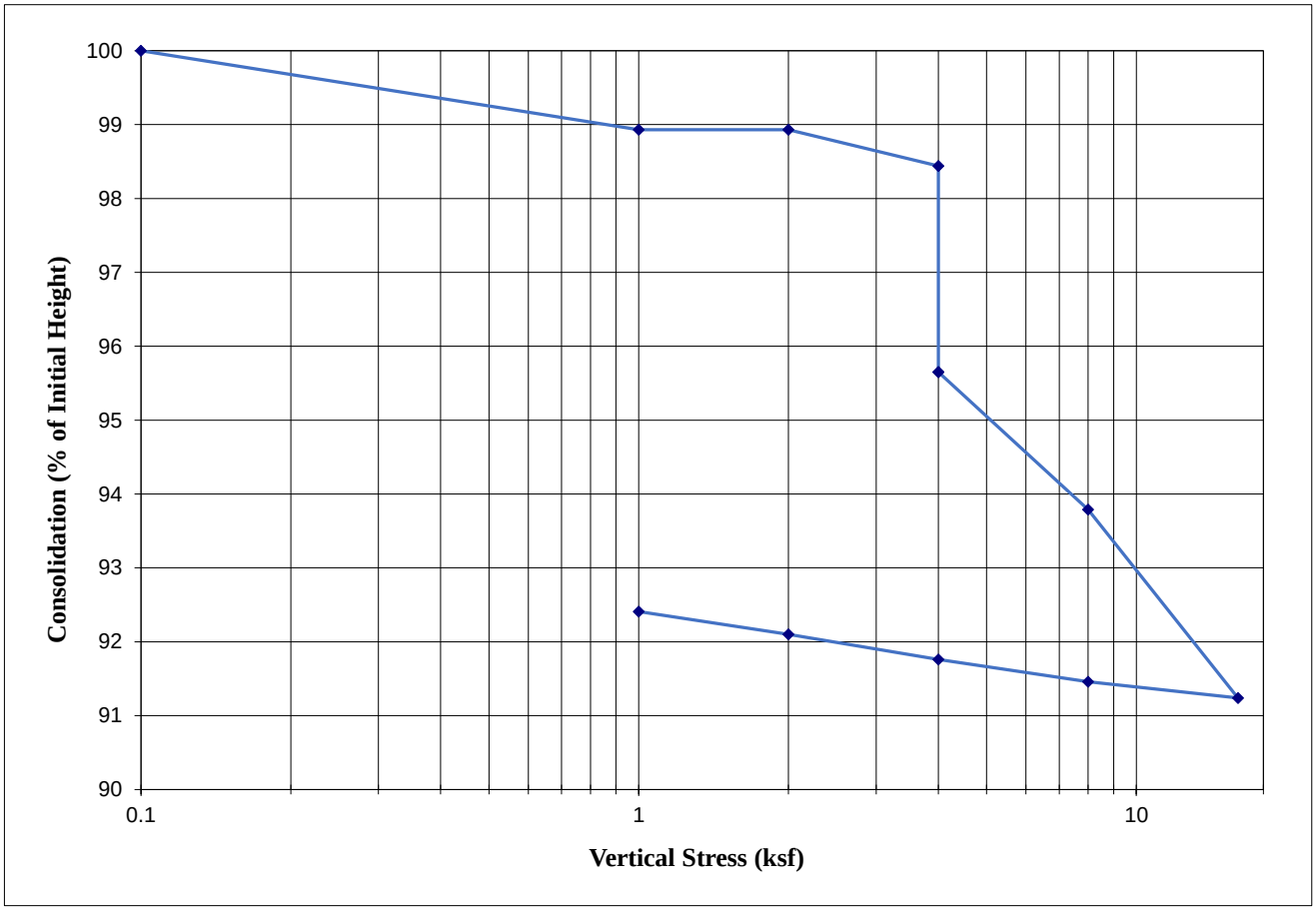
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**23-5847-4**	Material Type:	Soils
Client:	Ethos	Date of Extraction:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	1/8/2024
Project City:	Goodyear	Lab Tested By:	Keagen Mayfield
Sample Location:	B-192 @ 5.0 - 6.0	Reviewed By:	Fernando Montero

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.40
INITIAL MOISTURE CONTENT	4.7%	FINAL MOISTURE CONTENT	18.2%
INITIAL DRY DENSITY(pcf)	100.4	FINAL DRY DENSITY(pcf)	104.9
INITIAL DEGREE OF SATURATION	19%	FINAL DEGREE OF SATURATION	84%
INITIAL VOID RATIO	0.6	FINAL VOID RATIO	0.6
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	4 ksf



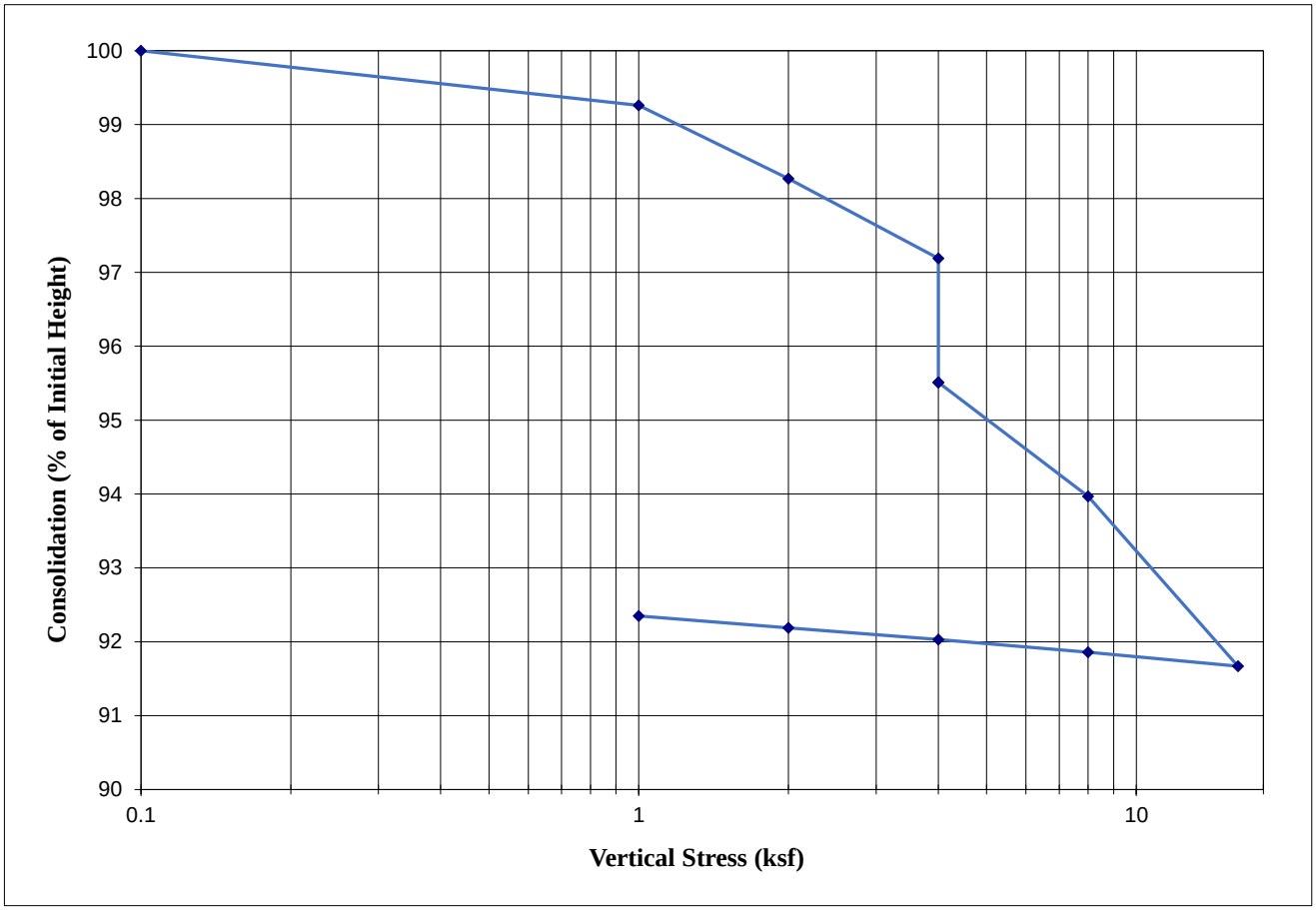
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**23-5848-2**	Material Type:	Soils
Client:	Ethos	Date of Extraction:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	1/8/2024
Project City:	Goodyear	Lab Tested By:	Keagen Mayfield
Sample Location:	B-194 @ 5.0 - 6.0	Reviewed By:	Fernando Montero

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.40
INITIAL MOISTURE CONTENT	11.5%	FINAL MOISTURE CONTENT	21.0%
INITIAL DRY DENSITY(pcf)	94.0	FINAL DRY DENSITY(pcf)	98.4
INITIAL DEGREE OF SATURATION	40%	FINAL DEGREE OF SATURATION	82%
INITIAL VOID RATIO	0.8	FINAL VOID RATIO	0.7
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	4 ksf



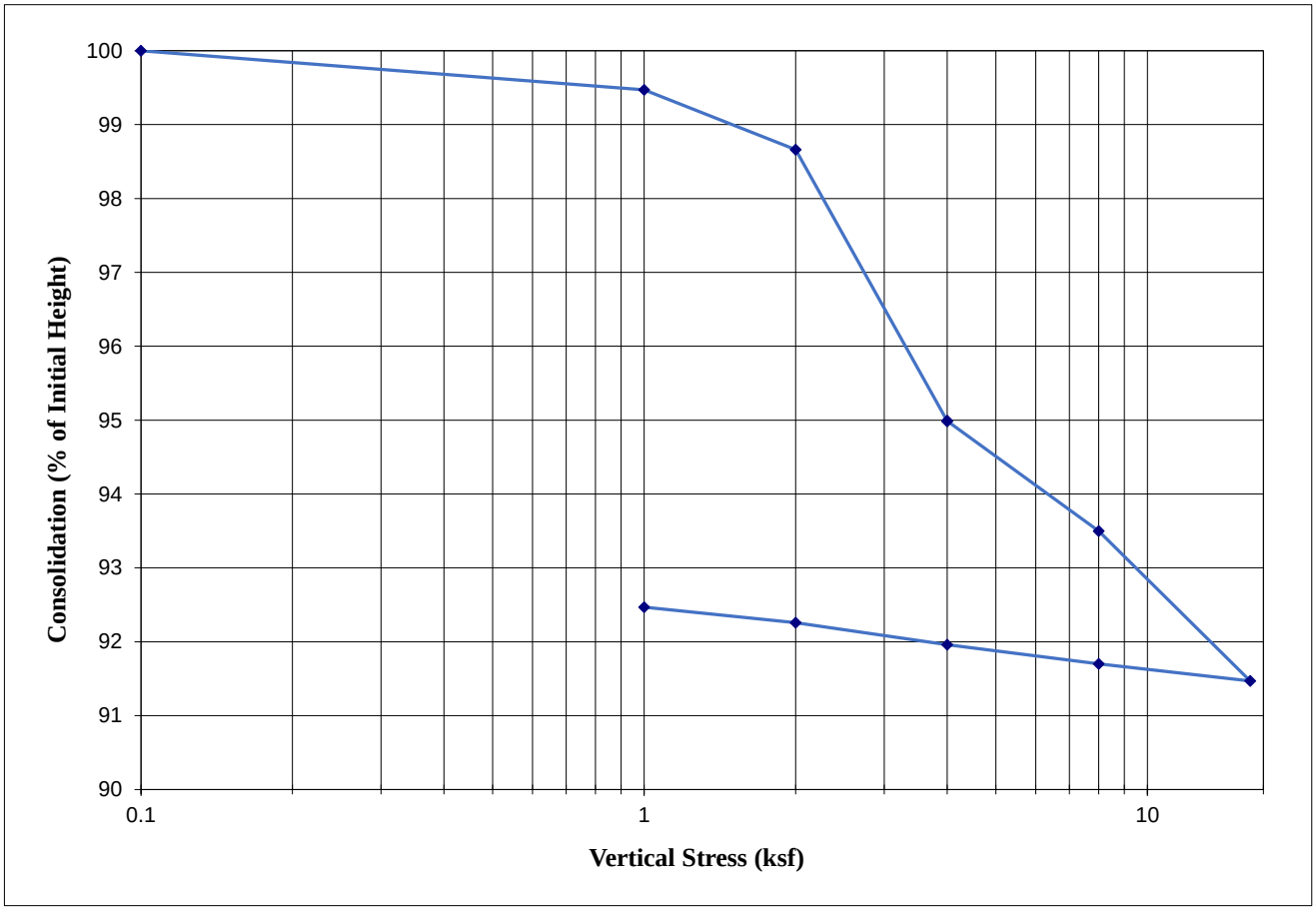
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**23-5849-1**	Material Type:	Soils
Client:	Ethos	Date of Extraction:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	12/28/2024
Project City:	Goodyear	Lab Tested By:	Mahalia Davis
Sample Location:	B-196 @ 10.0 - 11.0	Reviewed By:	Fernando Montero

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.37
INITIAL MOISTURE CONTENT	6.3%	FINAL MOISTURE CONTENT	16.9%
INITIAL DRY DENSITY(pcf)	98.8	FINAL DRY DENSITY(pcf)	104.0
INITIAL DEGREE OF SATURATION	25%	FINAL DEGREE OF SATURATION	76%
INITIAL VOID RATIO	0.7	FINAL VOID RATIO	0.6
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	4 ksf



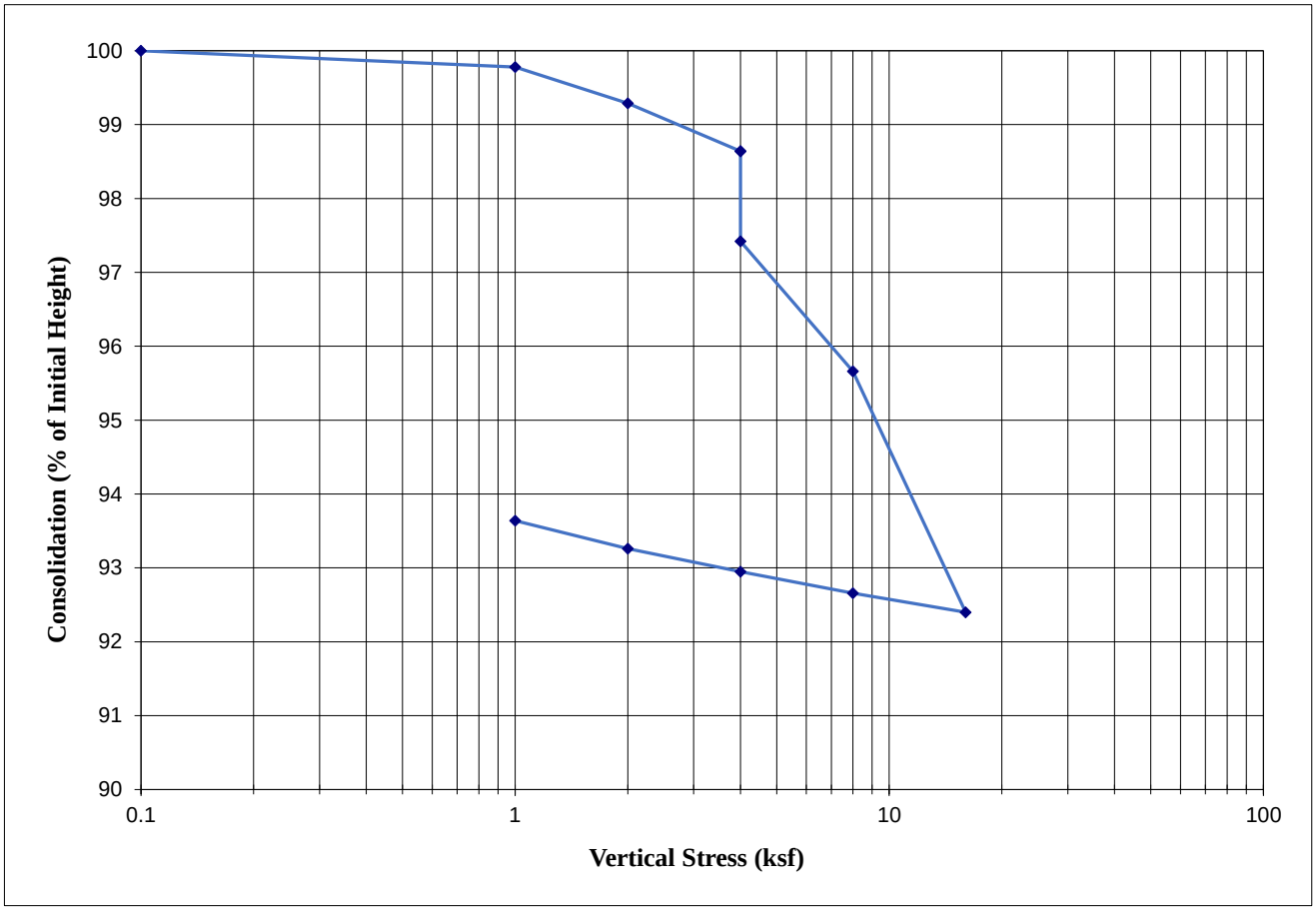
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**24-5282-2**	Material Type:	Soils
Client:	Ethos	Date of Extraction:	-
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	10/25/2024
Project City:	Goodyear	Lab Tested By:	Keagen Mayfield
Sample Location:	B-196A @ 5 - 6	Reviewed By:	Andrew Jamrogiewicz, P.E.

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.49
INITIAL MOISTURE CONTENT	8.5%	FINAL MOISTURE CONTENT	17.0%
INITIAL DRY DENSITY(pcf)	106.6	FINAL DRY DENSITY(pcf)	109.4
INITIAL DEGREE OF SATURATION	41%	FINAL DEGREE OF SATURATION	88%
INITIAL VOID RATIO	0.6	FINAL VOID RATIO	0.5
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	4 ksf



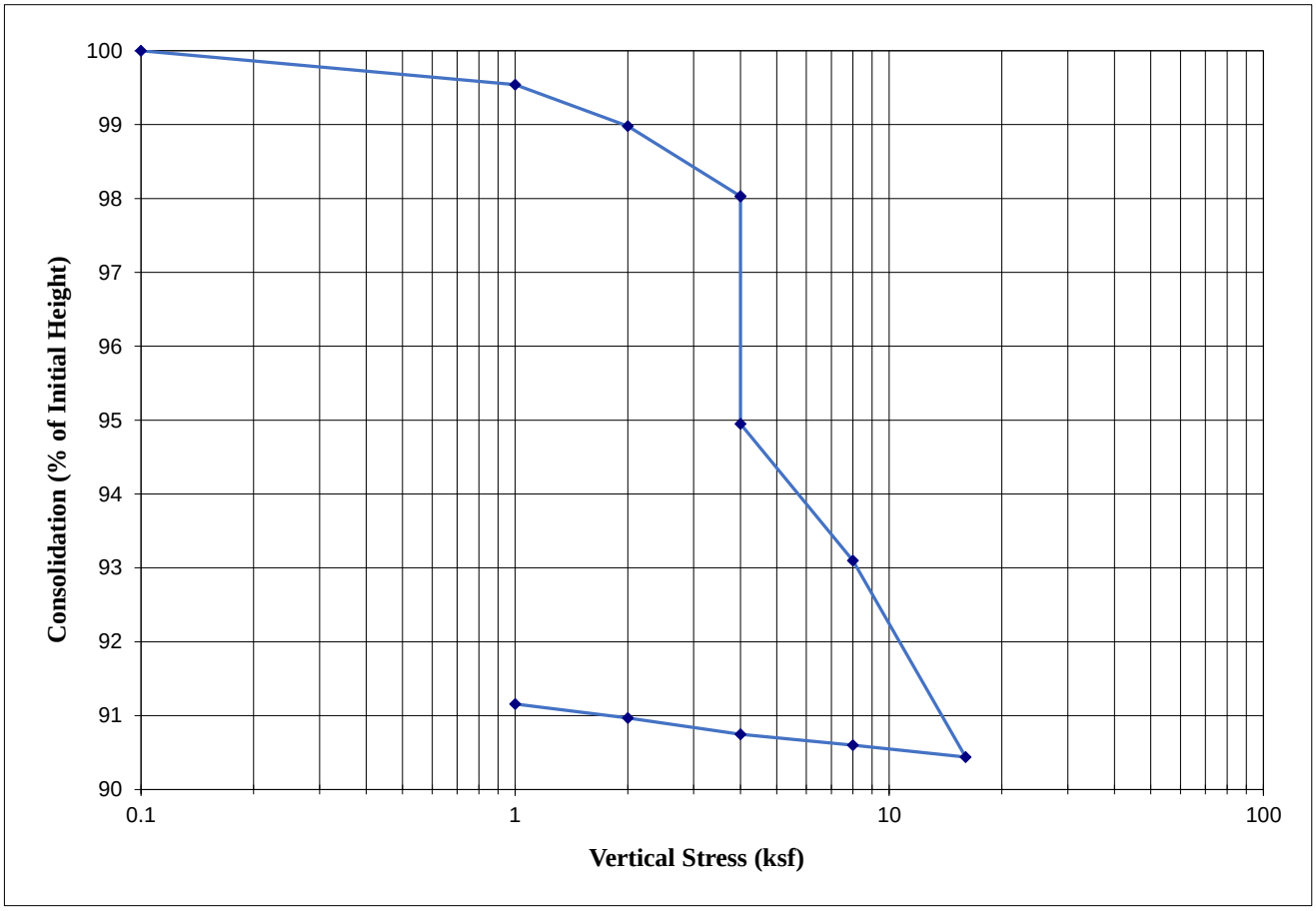
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**24-5283-1**	Material Type:	Soils
Client:	Ethos	Date of Extraction:	-
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	10/25/2024
Project City:	Goodyear	Lab Tested By:	Keagen Mayfield
Sample Location:	B-196B @ 3 - 4	Reviewed By:	Keagen Mayfield

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.37
INITIAL MOISTURE CONTENT	3.9%	FINAL MOISTURE CONTENT	14.8%
INITIAL DRY DENSITY(pcf)	104.8	FINAL DRY DENSITY(pcf)	110.4
INITIAL DEGREE OF SATURATION	18%	FINAL DEGREE OF SATURATION	78%
INITIAL VOID RATIO	0.6	FINAL VOID RATIO	0.5
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	4 ksf

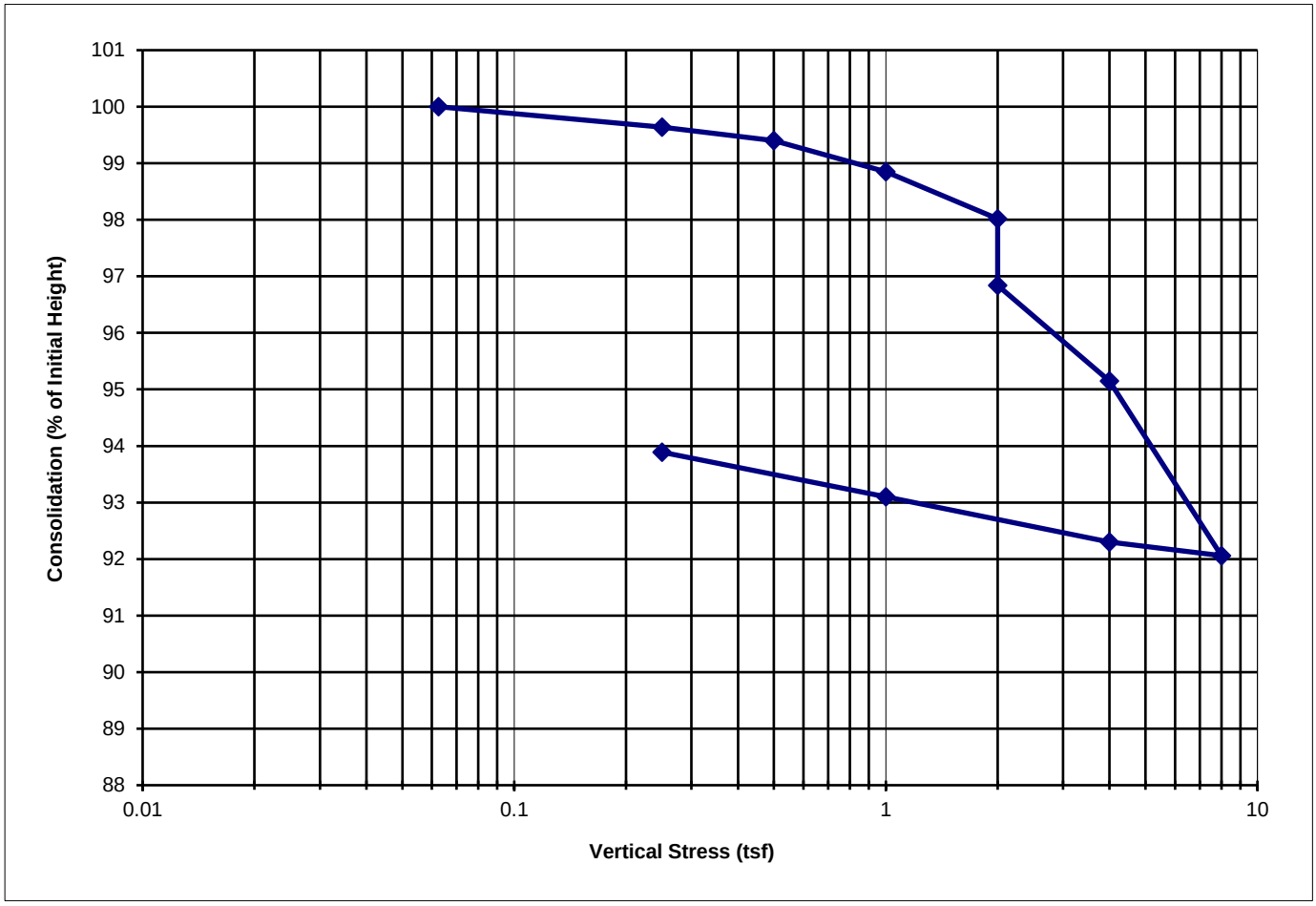


PROJECT: ACS Project #2201026
LOCATION: Mesa, AZ B-196C @ 5 - 6
MATERIAL: Native Soil
SAMPLE SOURCE: ACS Lab #24-5284-2
SAMPLE PREP: In-situ

JOB NO: 17-2023-4239
WORK ORDER NO: 93
LAB NO: 24-3877
DATE ASSIGNED: 10/24/24

ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

INITIAL VOLUME (cu.in):	4.60	FINAL VOLUME (cu.in):	4.24
INITIAL MOISTURE CONTENT:	9.6%	FINAL MOISTURE CONTENT:	23.4%
INITIAL DRY DENSITY(pcf):	95.3	FINAL DRY DENSITY(pcf):	103.0
INITIAL DEGREE OF SATURATION:	34%	FINAL DEGREE OF SATURATION:	99%
INITIAL VOID RATIO:	0.78	FINAL VOID RATIO:	0.64
		SATURATED AT:	2 tsf



WSP USA
3630 E Wier Ave.
Phoenix, AZ 85040

REVIEWED BY 11/05/24

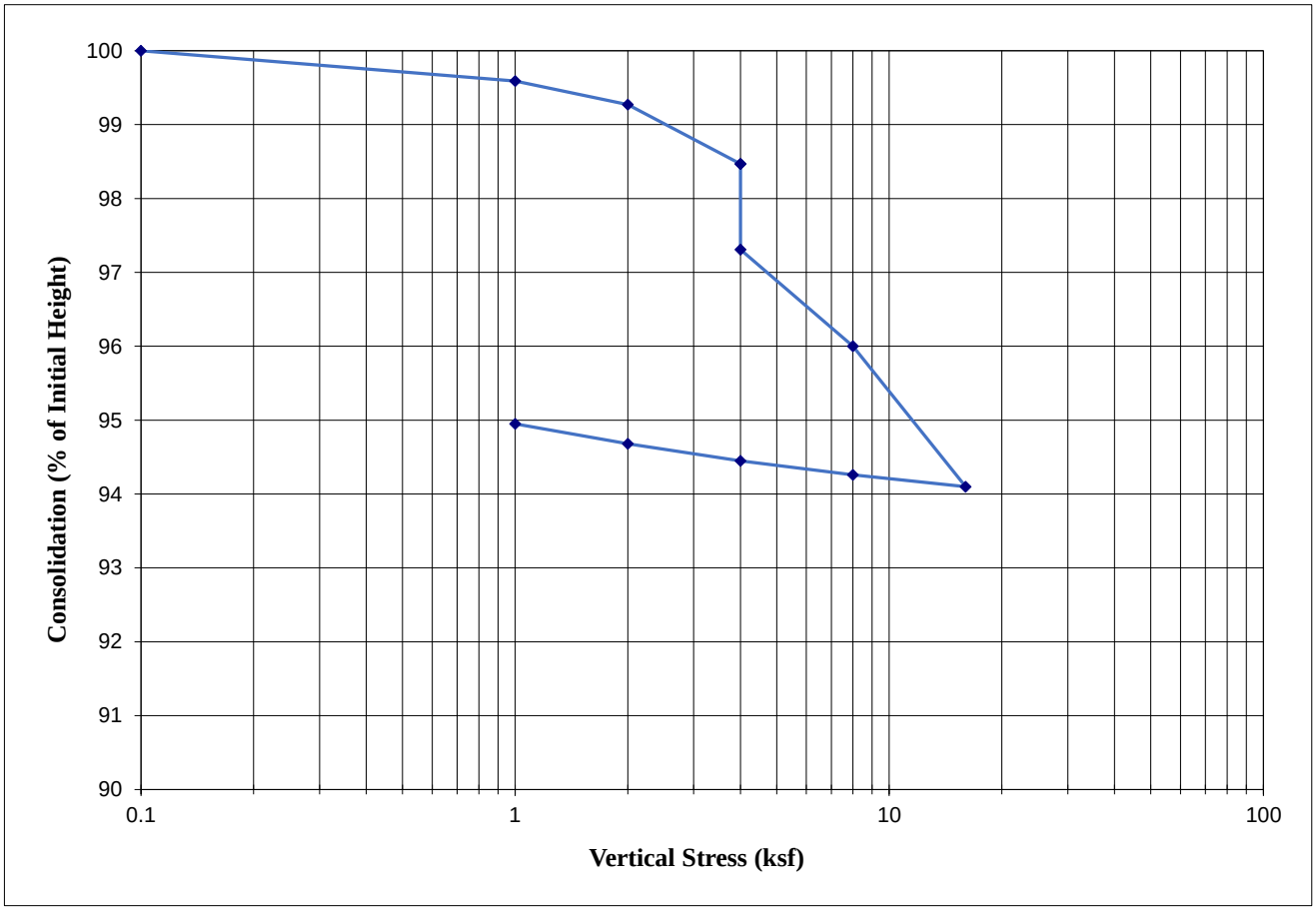
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**24-5285-2**	Material Type:	Soils
Client:	Ethos	Date of Extraction:	-
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	10/28/2024
Project City:	Goodyear	Lab Tested By:	Keagen Mayfield
Sample Location:	B-196D @ 1 - 2	Reviewed By:	Andrew Jamrogiewicz, P.E.

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.48
INITIAL MOISTURE CONTENT	10.1%	FINAL MOISTURE CONTENT	12.7%
INITIAL DRY DENSITY(pcf)	118.9	FINAL DRY DENSITY(pcf)	122.1
INITIAL DEGREE OF SATURATION	68%	FINAL DEGREE OF SATURATION	95%
INITIAL VOID RATIO	0.4	FINAL VOID RATIO	0.4
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	4 ksf



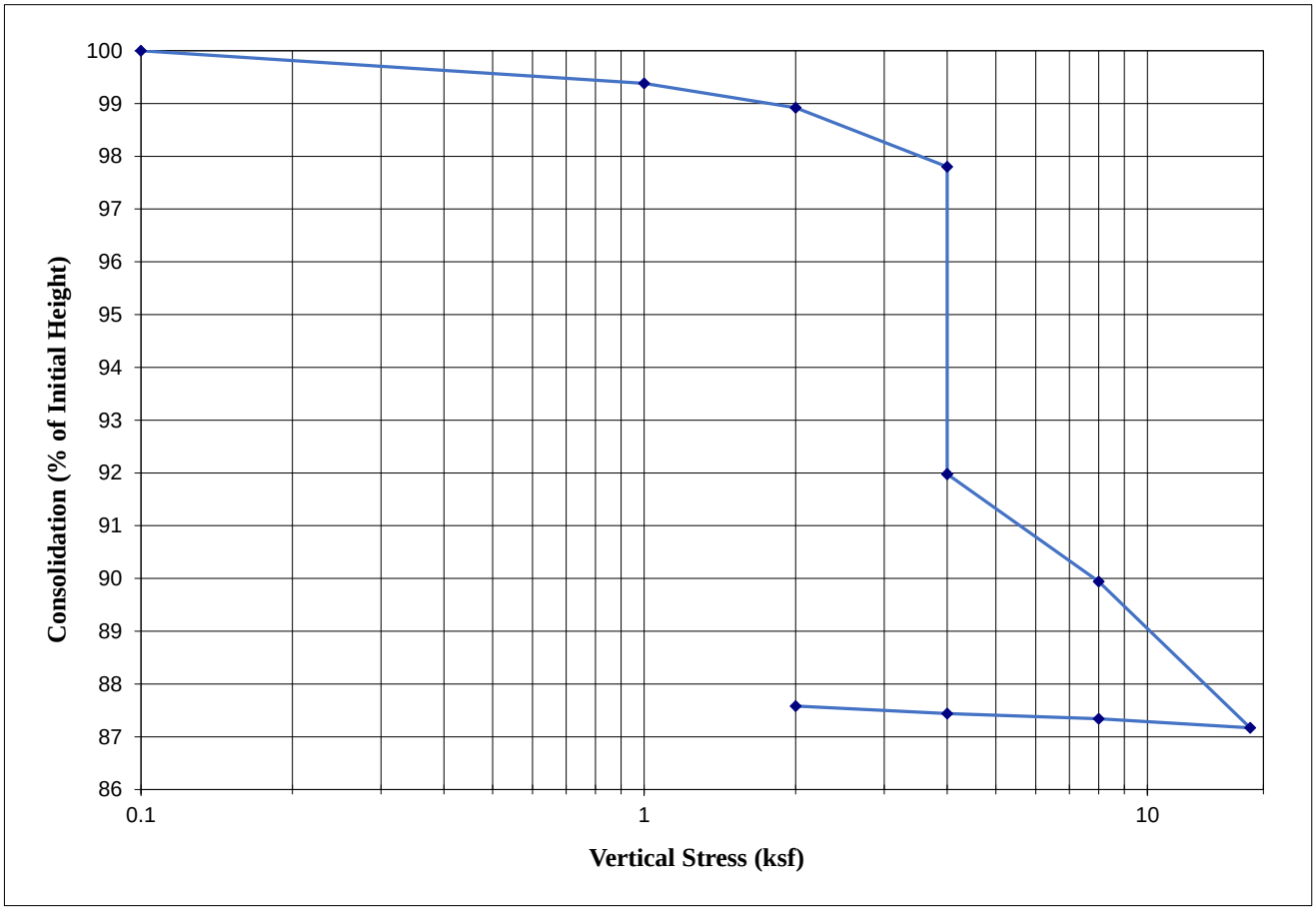
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* ONE-DIMENSIONAL CONSOLIDATION PROPERTIES OF SOILS (ASTM D2435)

ACS Project No.:	**2201026**		
Lab No.:	**23-5850-2**	Material Type:	Soils
Client:	Ethos	Date of Extraction:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Extracted By:	Client
Project Address:	MC85 to Van Buren	Date of Lab Test:	12/29/2024
Project City:	Goodyear	Lab Tested By:	Mahalia Davis
Sample Location:	B-198 @ 10.0 - 11.0	Reviewed By:	Fernando Montero

INITIAL VOLUME (cu.in)	4.60	FINAL VOLUME (cu.in)	4.24
INITIAL MOISTURE CONTENT	7.9%	FINAL MOISTURE CONTENT	13.6%
INITIAL DRY DENSITY(pcf)	106.4	FINAL DRY DENSITY(pcf)	115.6
INITIAL DEGREE OF SATURATION	38%	FINAL DEGREE OF SATURATION	84%
INITIAL VOID RATIO	0.6	FINAL VOID RATIO	0.4
ESTIMATED SPECIFIC GRAVITY	2.65	SATURATED AT	4 ksf



ACS Services LLC

Maximum Dry Density & Optimum Moisture

☑ ARIZ 225 ☐ ARIZ 245

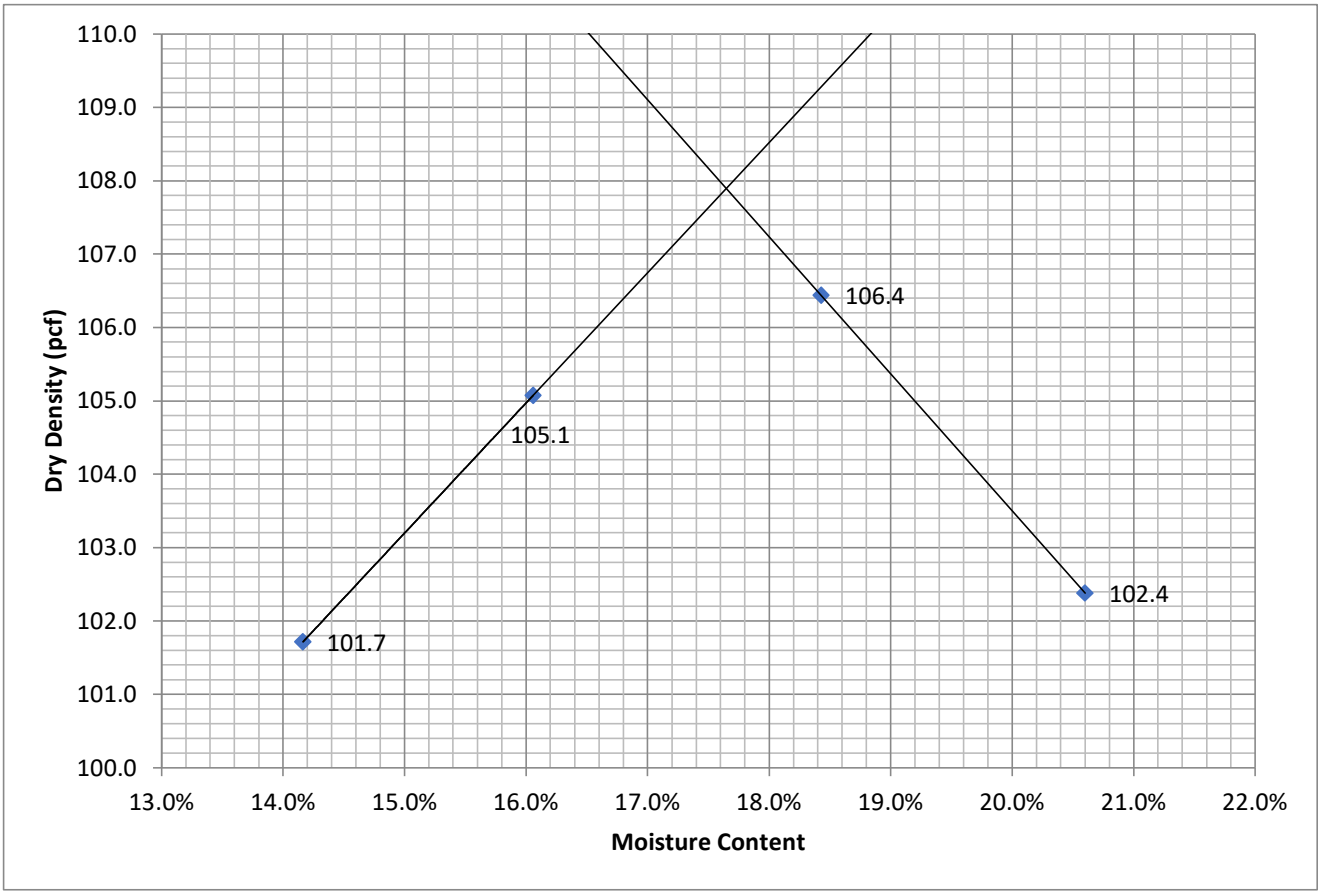
ACS Project #	2201026	Material Type:	Native
ACS Lab #	22-1941-2	Material Supplier:	-
Client Name:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Date Tested:	4/22/2022
Project City:	Goodyear	Tested By:	Brian Karl
		Reviewed By:	Dylan Ward

Sample Location: P-2 @ 0.0 - 5.0

Method: ☑ A ☐ D

Dry Density	101.7	105.1	106.4	102.4
Moisture Content	14.2%	16.1%	18.4%	20.6%

Uncorrected Dry Density	107.9	Uncorrected Moisture Content	17.7
% Rock	0	% Passing	100
Rock Corrected Dry Density	**107.9**	Rock Corrected Moisture Content	**17.7**
Specific Gravity of Oversize Aggregate	**2.600**		



Dylan Ward

Project Manager

ACS Services LLC

Maximum Dry Density & Optimum Moisture

☑ ARIZ 225 ☐ ARIZ 245

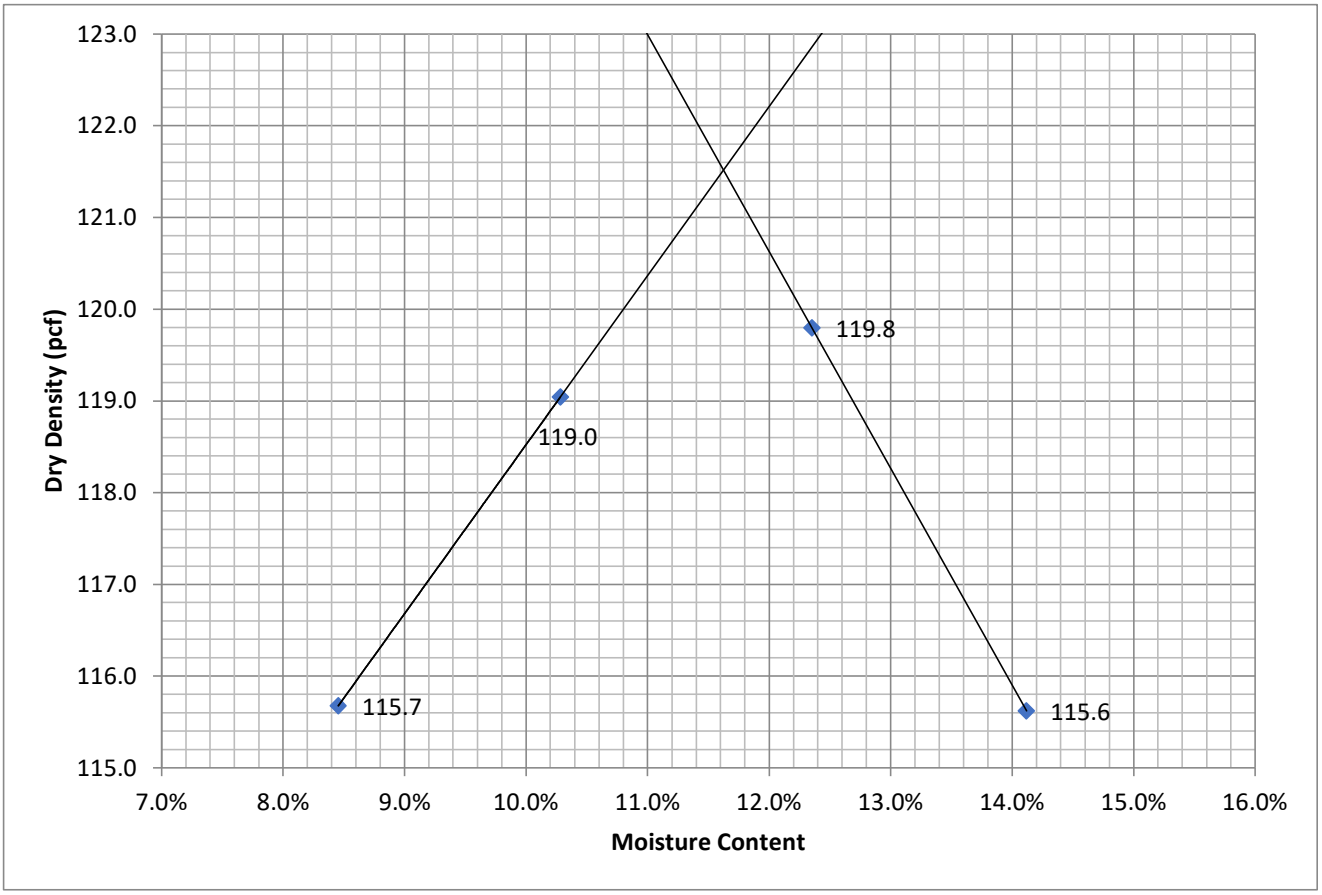
ACS Project #	2201026	Material Type:	Soil
ACS Lab #	22-3004-1	Material Supplier:	-
Client Name:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Date Tested:	6/24/2022
Project City:	Goodyear	Tested By:	Brian Karl
		Reviewed By:	Dylan Ward

Sample Location: B7A @ 0.0 - 2.5

Method: ☑ A ☐ D

Dry Density	115.7	119.0	119.8	115.6
Moisture Content	8.5%	10.3%	12.4%	14.1%

Uncorrected Dry Density	121.5	Uncorrected Moisture Content	11.6
% Rock	5	% Passing	95
Rock Corrected Dry Density	**121.5**	Rock Corrected Moisture Content	**11.6**
Specific Gravity of Oversize Aggregate	**2.600**		



Dylan Ward

Project Manager

ACS Services LLC

Maximum Dry Density & Optimum Moisture

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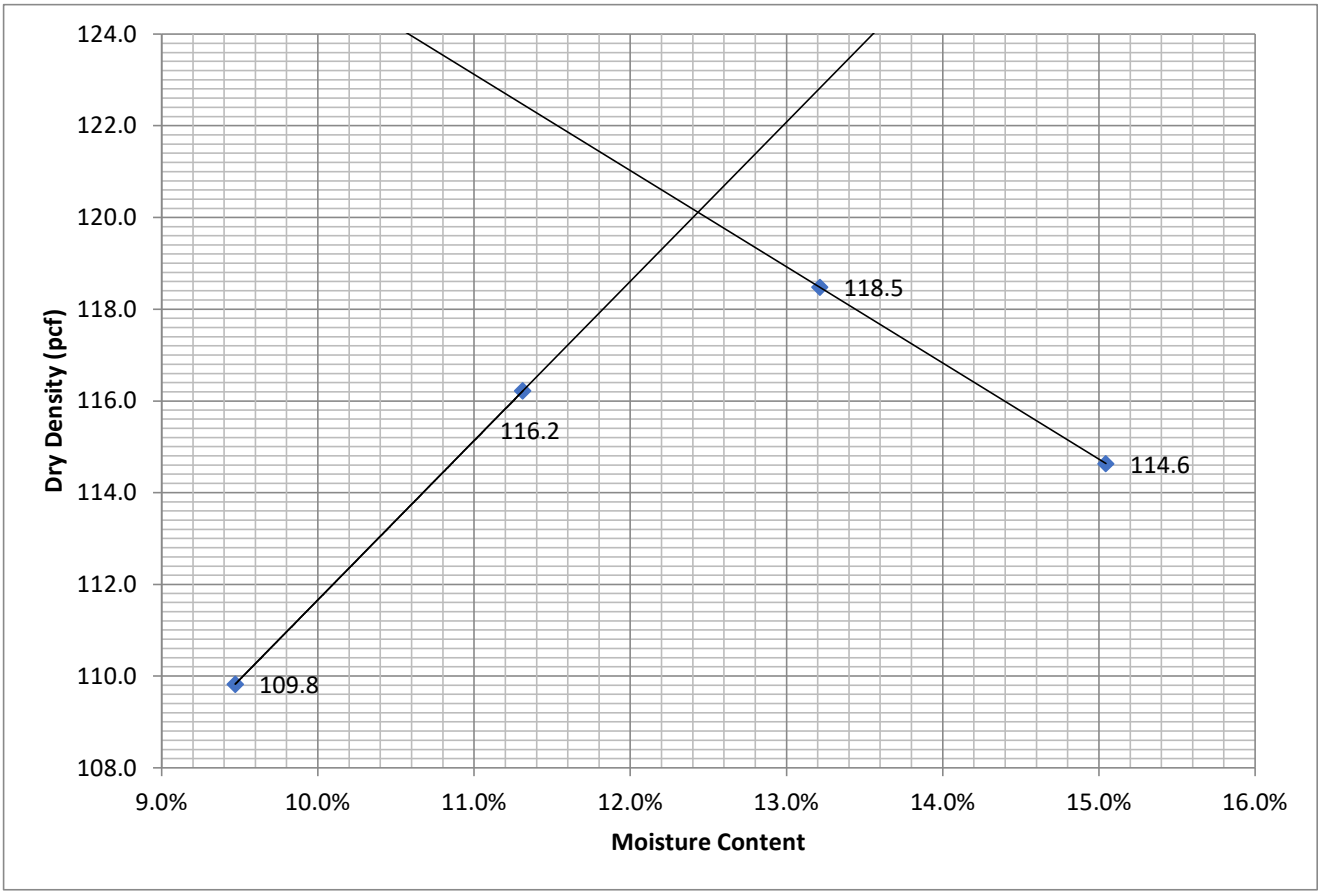
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ACS Lab #	22-1582-1	Material Supplier:	-
Client Name:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Date Tested:	3/4/2022
Project City:	Goodyear	Tested By:	Brian Karl
		Reviewed By:	Dylan Ward

Sample Location: B-9 @ 0.0 - 5.0'

Method: ☑ A ☐ D

Dry Density	109.8	116.2	118.5	114.6
Moisture Content	9.5%	11.3%	13.2%	15.0%

Uncorrected Dry Density	120.1	Uncorrected Moisture Content	12.4
% Rock	1	% Passing	99
Rock Corrected Dry Density	**120.1**	Rock Corrected Moisture Content	**12.4**
Specific Gravity of Oversize Aggregate	**2.600**		



Dylan Ward

Project Manager

ACS Services LLC

Maximum Dry Density & Optimum Moisture

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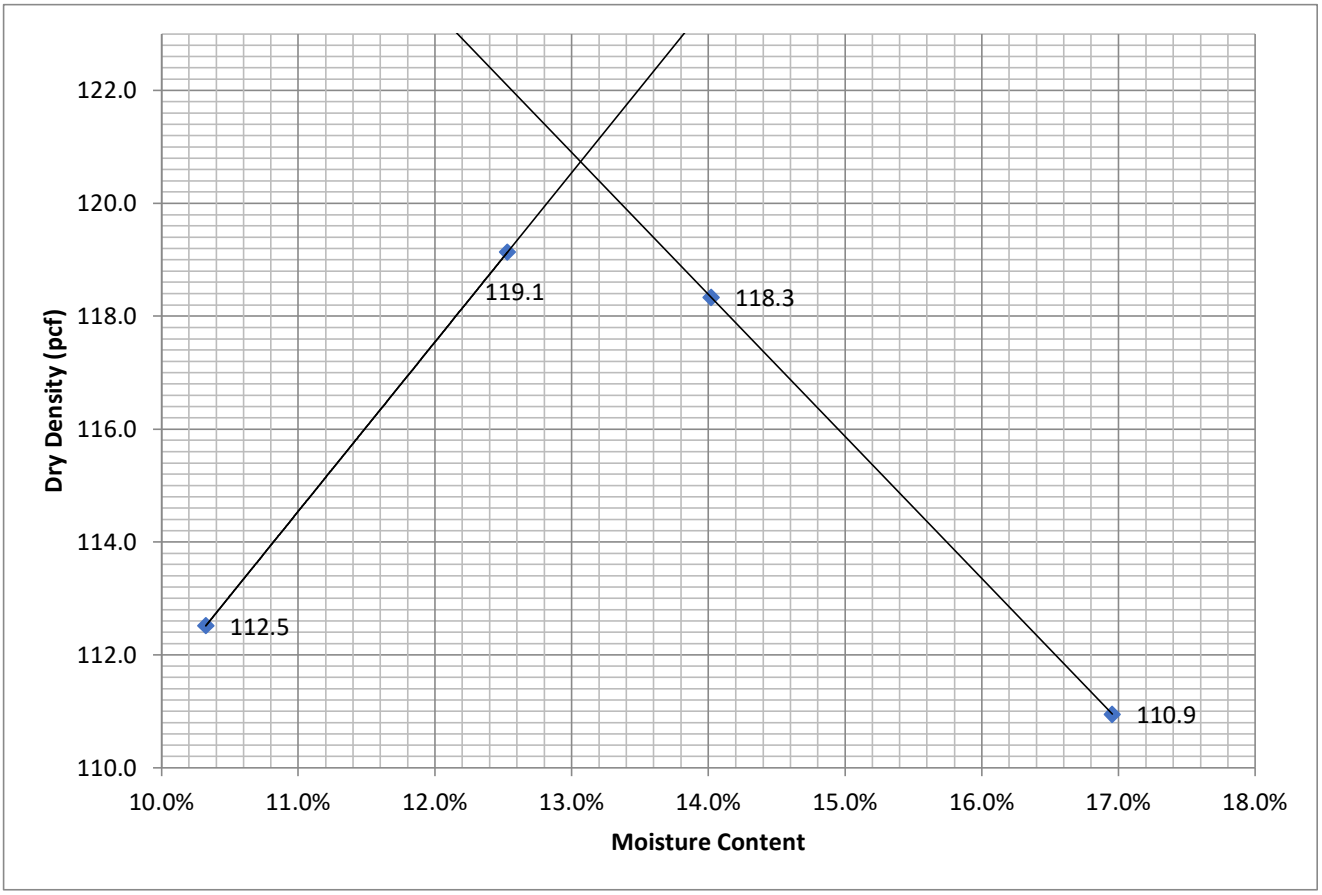
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ACS Lab #	22-2240-1	Material Supplier:	-
Client Name:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Date Tested:	5/2/2022
Project City:	Goodyear	Tested By:	Brian Karl
		Reviewed By:	Dylan Ward

Sample Location: B-13 @ 0.0 - 5.0

Method: ☑ A ☐ D

Dry Density	112.5	119.1	118.3	110.9
Moisture Content	10.3%	12.5%	14.0%	17.0%

Uncorrected Dry Density	120.7	Uncorrected Moisture Content	13.1
% Rock	1	% Passing	99
Rock Corrected Dry Density	**120.7**	Rock Corrected Moisture Content	**13.1**
Specific Gravity of Oversize Aggregate	**2.600**		



Dylan Ward

Project Manager

ACS Services LLC

Maximum Dry Density & Optimum Moisture

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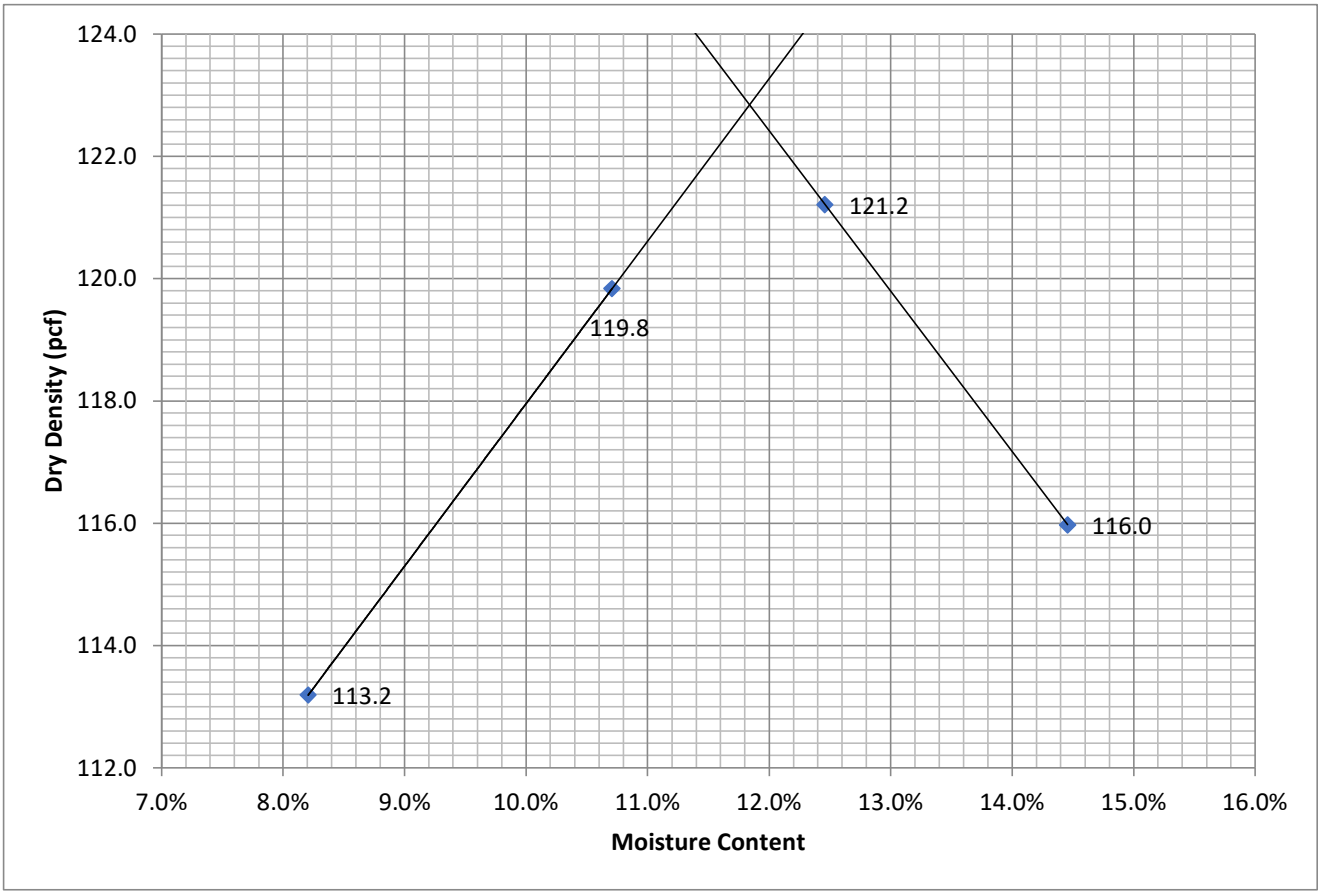
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ACS Lab #	22-2142-4	Material Supplier:	-
Client Name:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Date Tested:	4/28/2022
Project City:	Goodyear	Tested By:	Brian Karl
		Reviewed By:	Dylan Ward

Sample Location: B-15 @ 0.0 - 5.0

Method: ☑ A ☐ D

Dry Density	113.2	119.8	121.2	116.0
Moisture Content	8.2%	10.7%	12.5%	14.5%

Uncorrected Dry Density	122.8	Uncorrected Moisture Content	11.8
% Rock	2	% Passing	98
Rock Corrected Dry Density	**122.8**	Rock Corrected Moisture Content	**11.8**
Specific Gravity of Oversize Aggregate	**2.600**		



Dylan Ward

Project Manager

ACS Services LLC

Maximum Dry Density & Optimum Moisture

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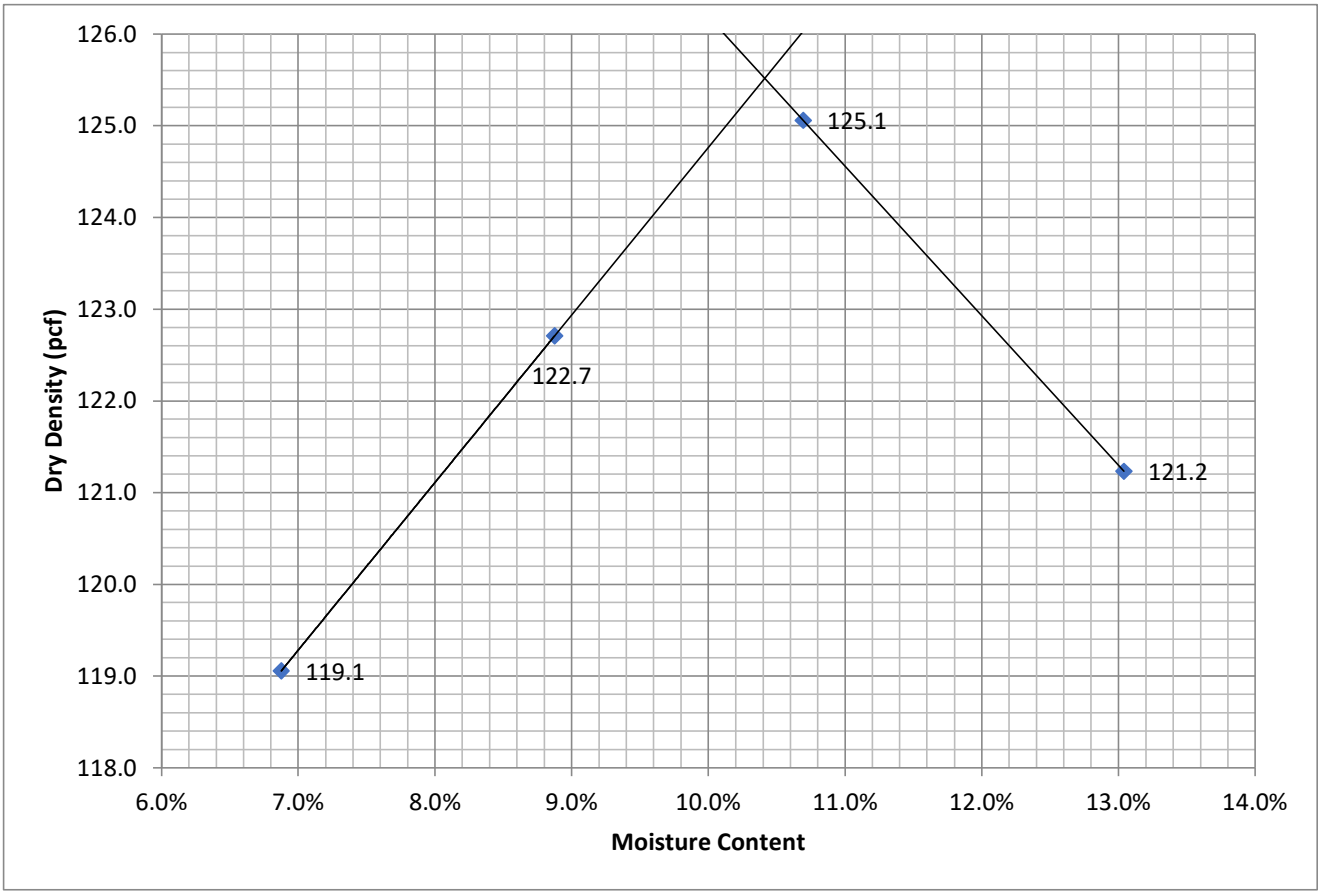
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ACS Lab #	22-3002-1	Material Supplier:	-
Client Name:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Date Tested:	6/28/2022
Project City:	Goodyear	Tested By:	Brian Karl
		Reviewed By:	Dylan Ward

Sample Location: B19 @ 0.0 - 5.0

Method: ☑ A ☐ D

Dry Density	119.1	122.7	125.1	121.2
Moisture Content	6.9%	8.9%	10.7%	13.0%

Uncorrected Dry Density	125.5	Uncorrected Moisture Content	10.4
% Rock	1	% Passing	99
Rock Corrected Dry Density	**125.5**	Rock Corrected Moisture Content	**10.4**
Specific Gravity of Oversize Aggregate	**2.600**		



Dylan Ward

Project Manager

ACS Services LLC

Maximum Dry Density & Optimum Moisture

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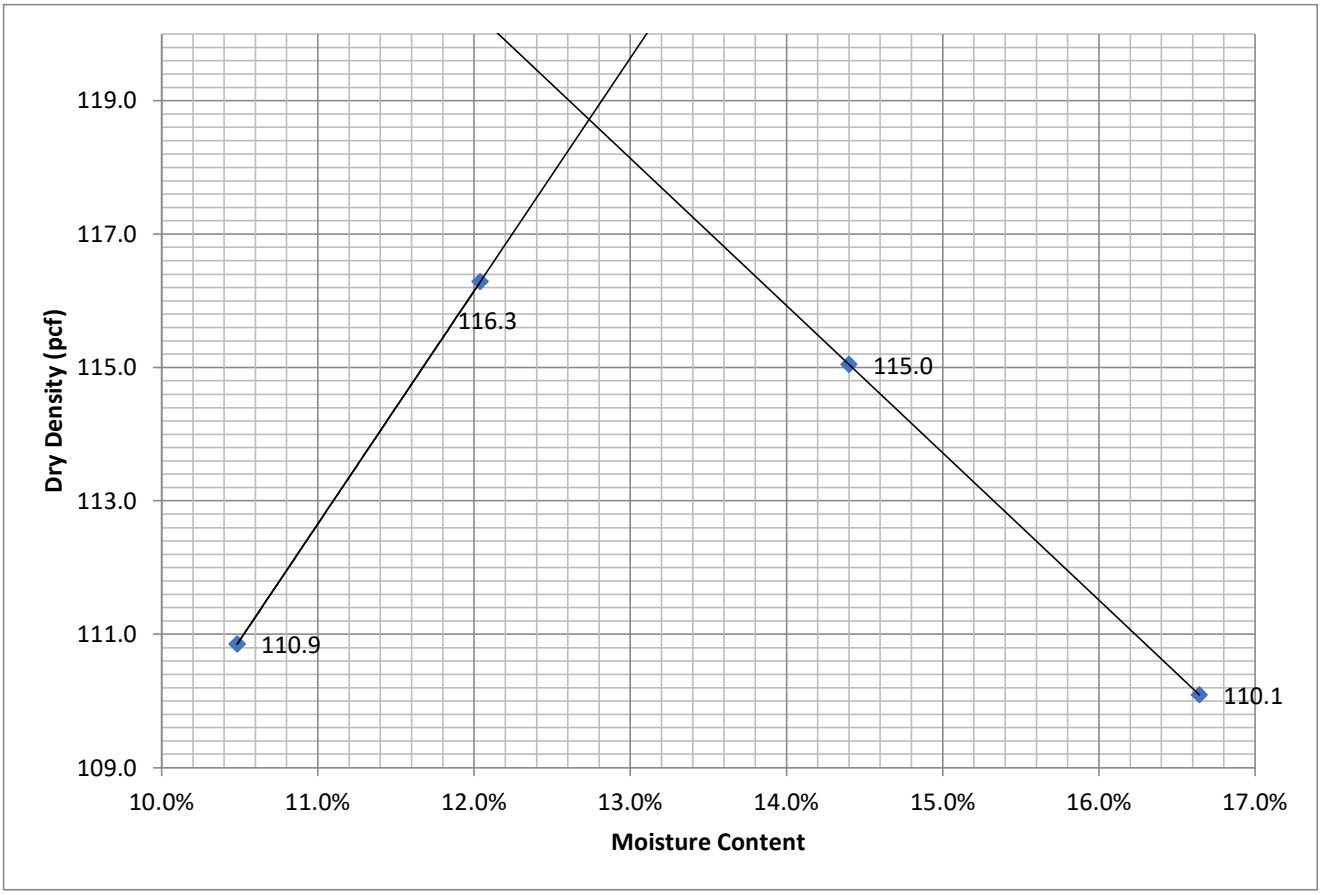
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ACS Lab #	22-1655-1	Material Supplier:	-
Client Name:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Date Tested:	3/10/2022
Project City:	Goodyear	Tested By:	Brian Karl
		Reviewed By:	Dylan Ward

Sample Location: B-26 @ 0.0 - 5.0'

Method: ☑ A ☐ D

Dry Density	110.9	116.3	115.0	110.1
Moisture Content	10.5%	12.0%	14.4%	16.6%

Uncorrected Dry Density	118.7	Uncorrected Moisture Content	12.7
% Rock	4	% Passing	96
Rock Corrected Dry Density	**118.7**	Rock Corrected Moisture Content	**12.7**
Specific Gravity of Oversize Aggregate	**2.600**		



Dylan Ward

Project Manager

ACS Services LLC

Maximum Dry Density & Optimum Moisture

☑ ARIZ 225 ☐ ARIZ 245

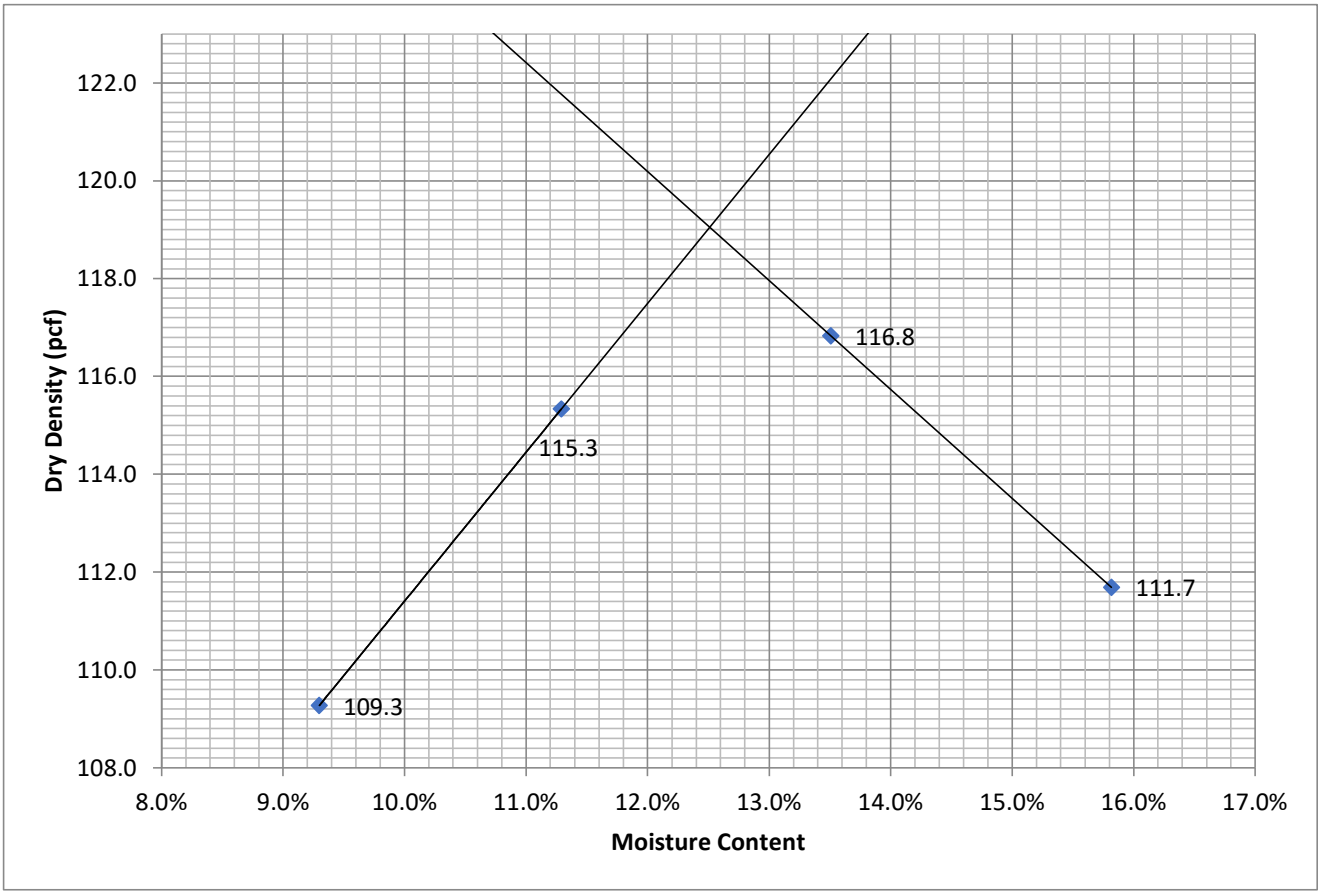
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ACS Lab #	22-1414-23	Material Supplier:	-
Client Name:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Date Tested:	2/18/2022
Project City:	Goodyear	Tested By:	Brian Karl
		Reviewed By:	Dylan Ward

Sample Location: B-35 @ 0.0 - 5.0'

Method: ☑ A ☐ D

Dry Density	109.3	115.3	116.8	111.7
Moisture Content	9.3%	11.3%	13.5%	15.8%

Uncorrected Dry Density	119.1	Uncorrected Moisture Content	12.5
% Rock	6	% Passing	94
Rock Corrected Dry Density	**119.1**	Rock Corrected Moisture Content	**12.5**
Specific Gravity of Oversize Aggregate	**2.600**		



Dylan Ward

Project Manager

ACS Services LLC

Maximum Dry Density & Optimum Moisture

☑ ARIZ 225 ☐ ARIZ 245

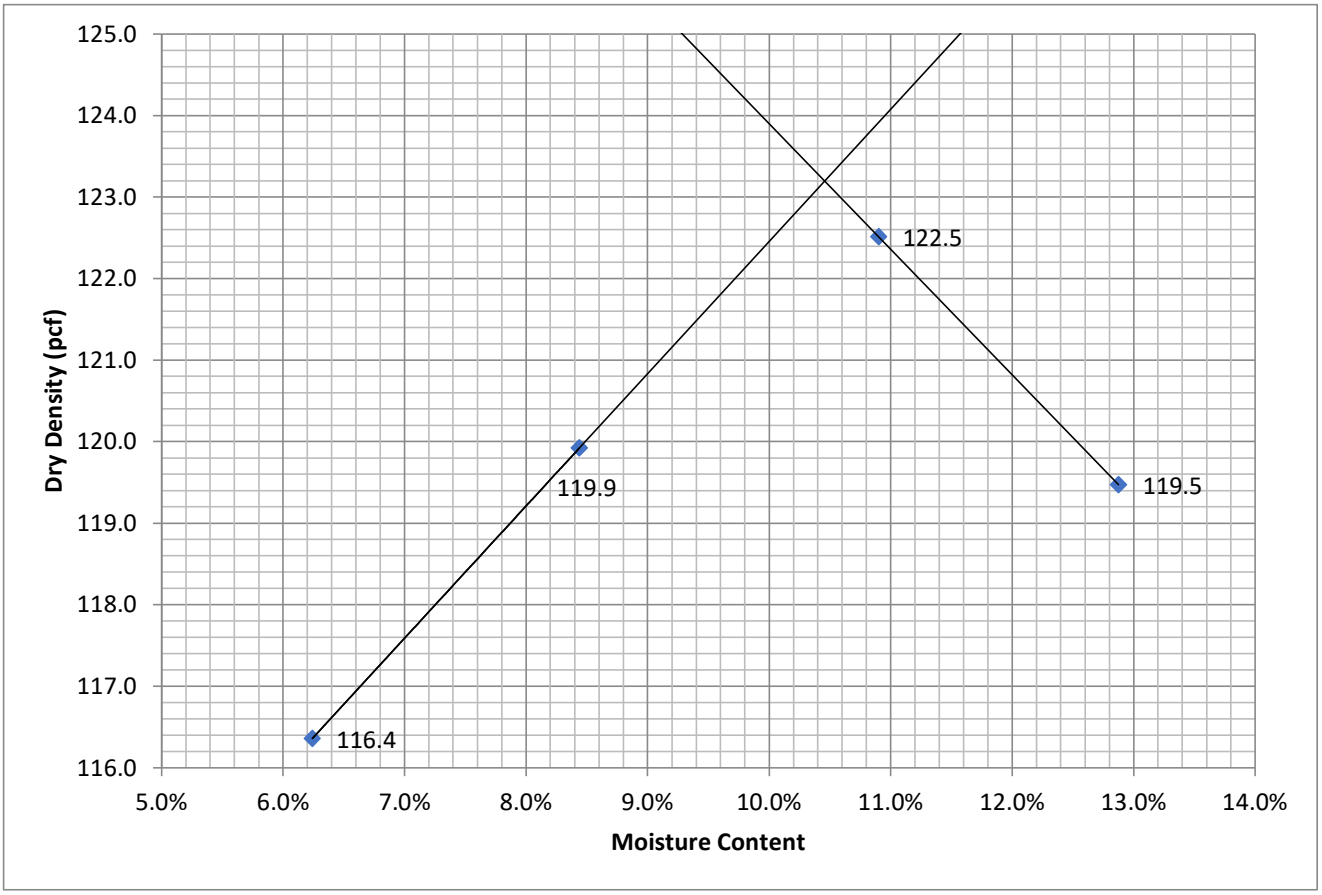
ACS Project #	2201026	Material Type:	Soil
ACS Lab #	22-3003-1	Material Supplier:	-
Client Name:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Date Tested:	6/27/2022
Project City:	Goodyear	Tested By:	Brian Karl
		Reviewed By:	Dylan Ward

Sample Location: B35A @ 0.0 - 2.5

Method: ☑ A ☐ D

Dry Density	116.4	119.9	122.5	119.5
Moisture Content	6.2%	8.4%	10.9%	12.9%

Uncorrected Dry Density	123.2	Uncorrected Moisture Content	10.5
% Rock	4	% Passing	96
Rock Corrected Dry Density	**123.2**	Rock Corrected Moisture Content	**10.5**
Specific Gravity of Oversize Aggregate	**2.600**		



Dylan Ward

Project Manager

ACS Services LLC

Maximum Dry Density & Optimum Moisture

☑ ARIZ 225 ☐ ARIZ 245

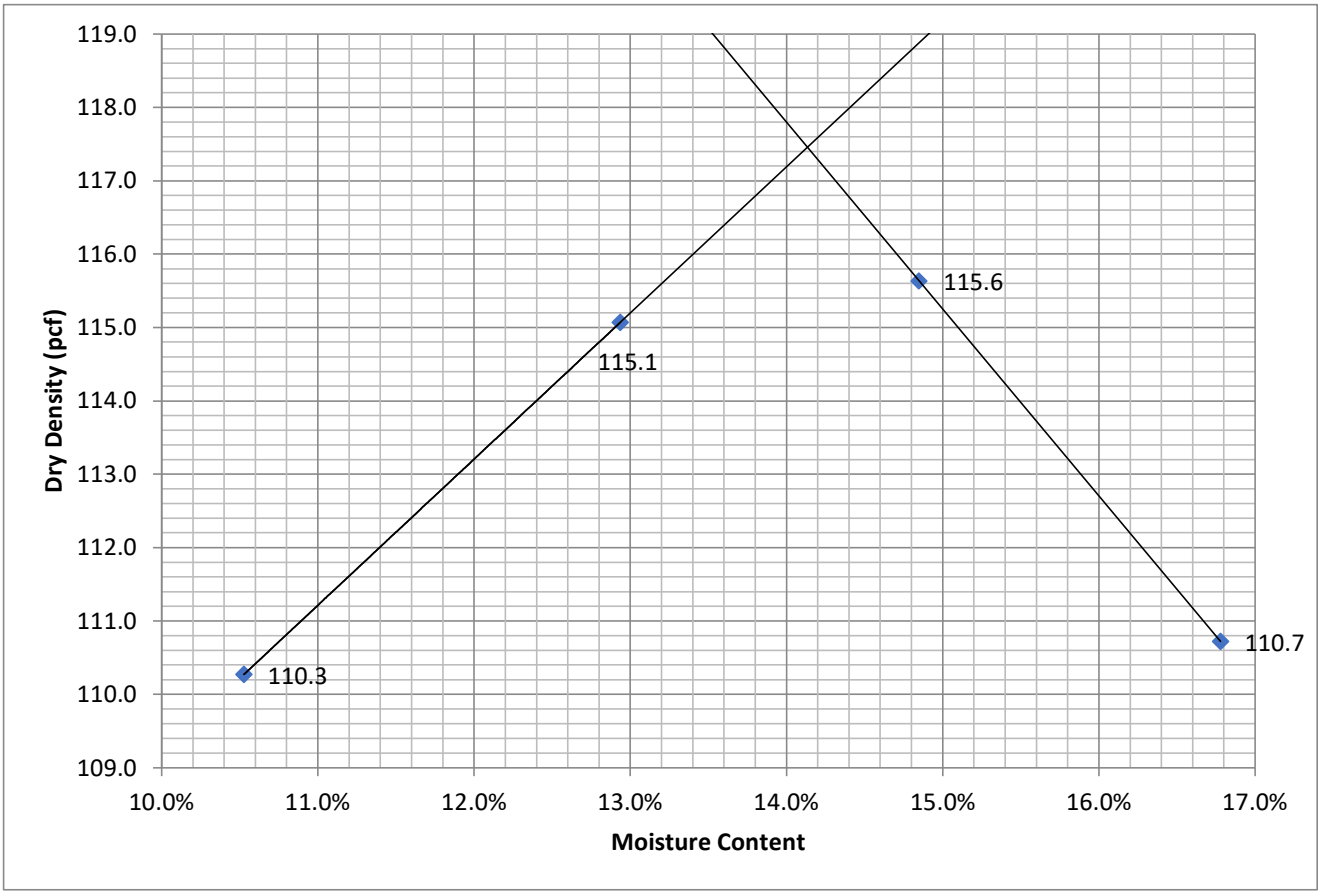
ACS Project #	2201026	Material Type:	Native
ACS Lab #	22-1657-4	Material Supplier:	-
Client Name:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Date Tested:	3/14/2022
Project City:	Goodyear	Tested By:	Brian Karl
		Reviewed By:	Dylan Ward

Sample Location: B-40 @ 0.0 - 5.0'

Method: ☑ A ☐ D

Dry Density	110.3	115.1	115.6	110.7
Moisture Content	10.5%	12.9%	14.8%	16.8%

Uncorrected Dry Density	117.5	Uncorrected Moisture Content	14.1
% Rock	6	% Passing	94
Rock Corrected Dry Density	**117.5**	Rock Corrected Moisture Content	**14.1**
Specific Gravity of Oversize Aggregate	**2.600**		



Dylan Ward

Project Manager

ACS Services LLC

Maximum Dry Density & Optimum Moisture

☑ ARIZ 225 ☐ ARIZ 245

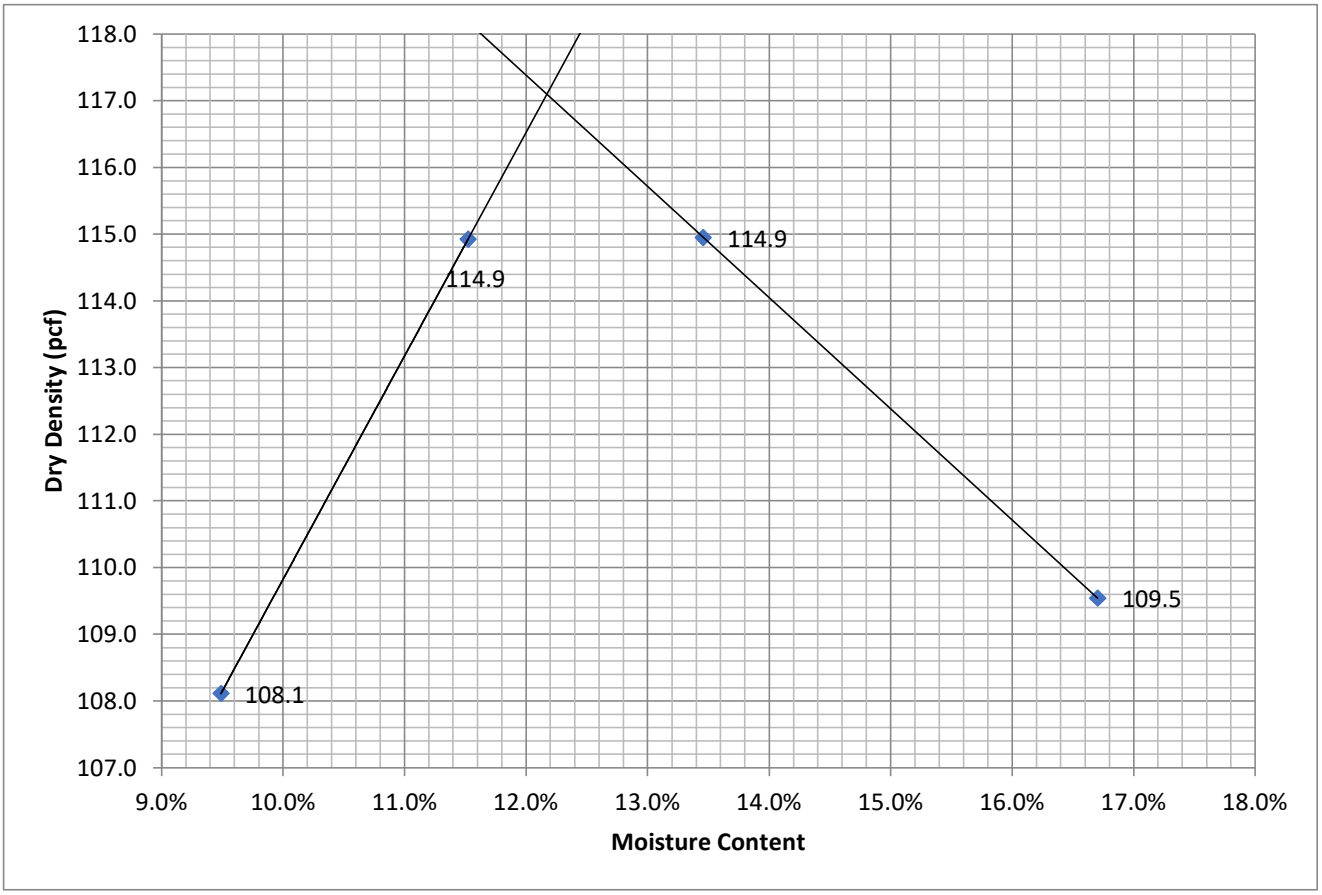
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ACS Lab #	22-1657-19	Material Supplier:	-
Client Name:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Date Tested:	3/18/2022
Project City:	Goodyear	Tested By:	Brian Karl
		Reviewed By:	Dylan Ward

Sample Location: B-45 @ 0.0 - 5.0'

Method: ☑ A ☐ D

Dry Density	108.1	114.9	114.9	109.5
Moisture Content	9.5%	11.5%	13.5%	16.7%

Uncorrected Dry Density	117.1	Uncorrected Moisture Content	12.1
% Rock	5	% Passing	95
Rock Corrected Dry Density	**117.1**	Rock Corrected Moisture Content	**12.1**
Specific Gravity of Oversize Aggregate	**2.600**		



Dylan Ward

Project Manager

ACS Services LLC

Maximum Dry Density & Optimum Moisture

☑ ARIZ 225 ☐ ARIZ 245

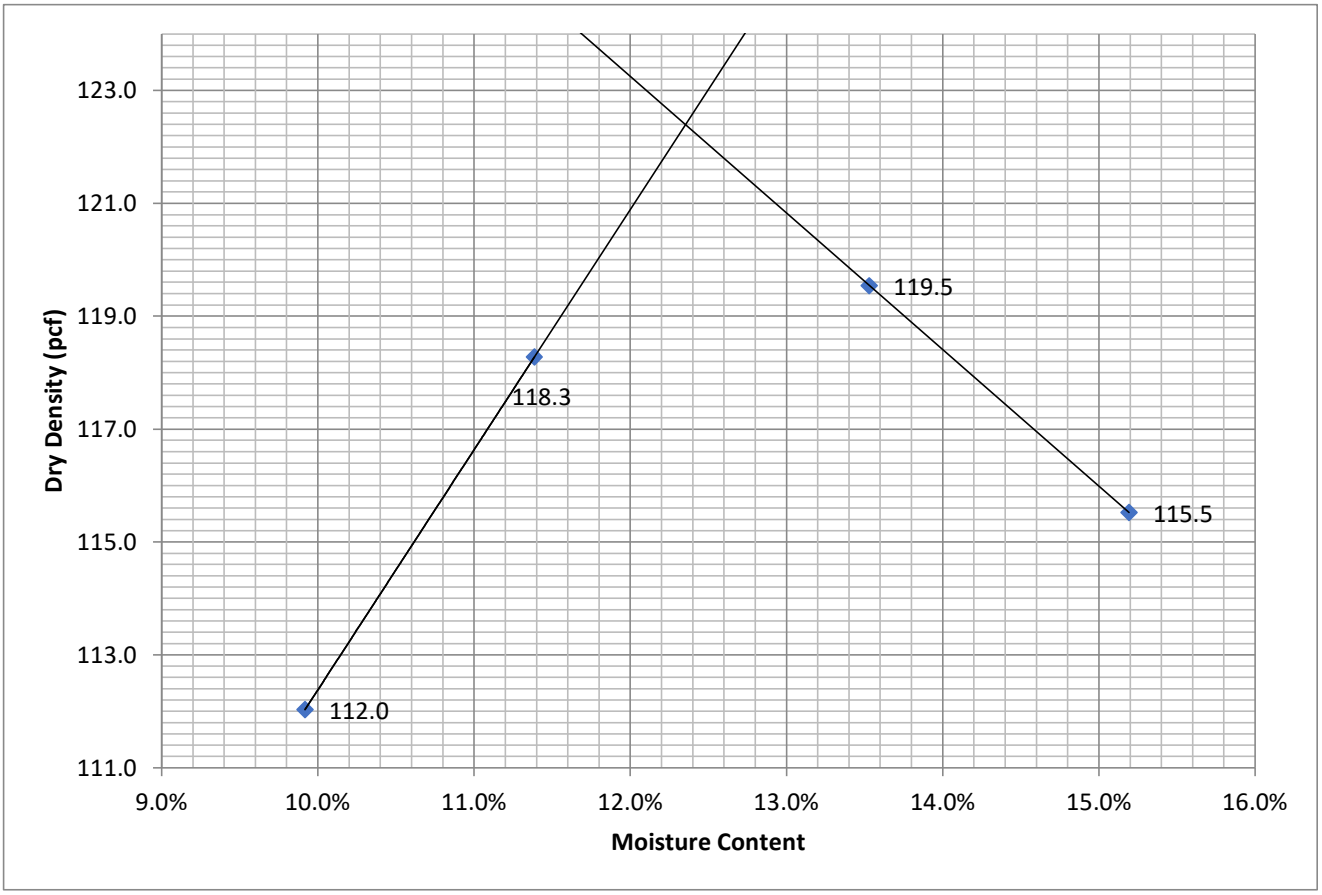
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ACS Lab #	22-1978-1	Material Supplier:	-
Client Name:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Date Tested:	4/27/202
Project City:	Goodyear	Tested By:	Brian Karl
		Reviewed By:	Dylan Ward

Sample Location: B-46 @ 0.0 - 5.0

Method: ☑ A ☐ D

Dry Density	112.0	118.3	119.5	115.5
Moisture Content	9.9%	11.4%	13.5%	15.2%

Uncorrected Dry Density	122.4	Uncorrected Moisture Content	12.3
% Rock	6	% Passing	94
Rock Corrected Dry Density	**122.4**	Rock Corrected Moisture Content	**12.3**
Specific Gravity of Oversize Aggregate	**2.600**		



Dylan Ward

Project Manager

ACS Services LLC

Maximum Dry Density & Optimum Moisture

☑ ARIZ 225 ☐ ARIZ 245

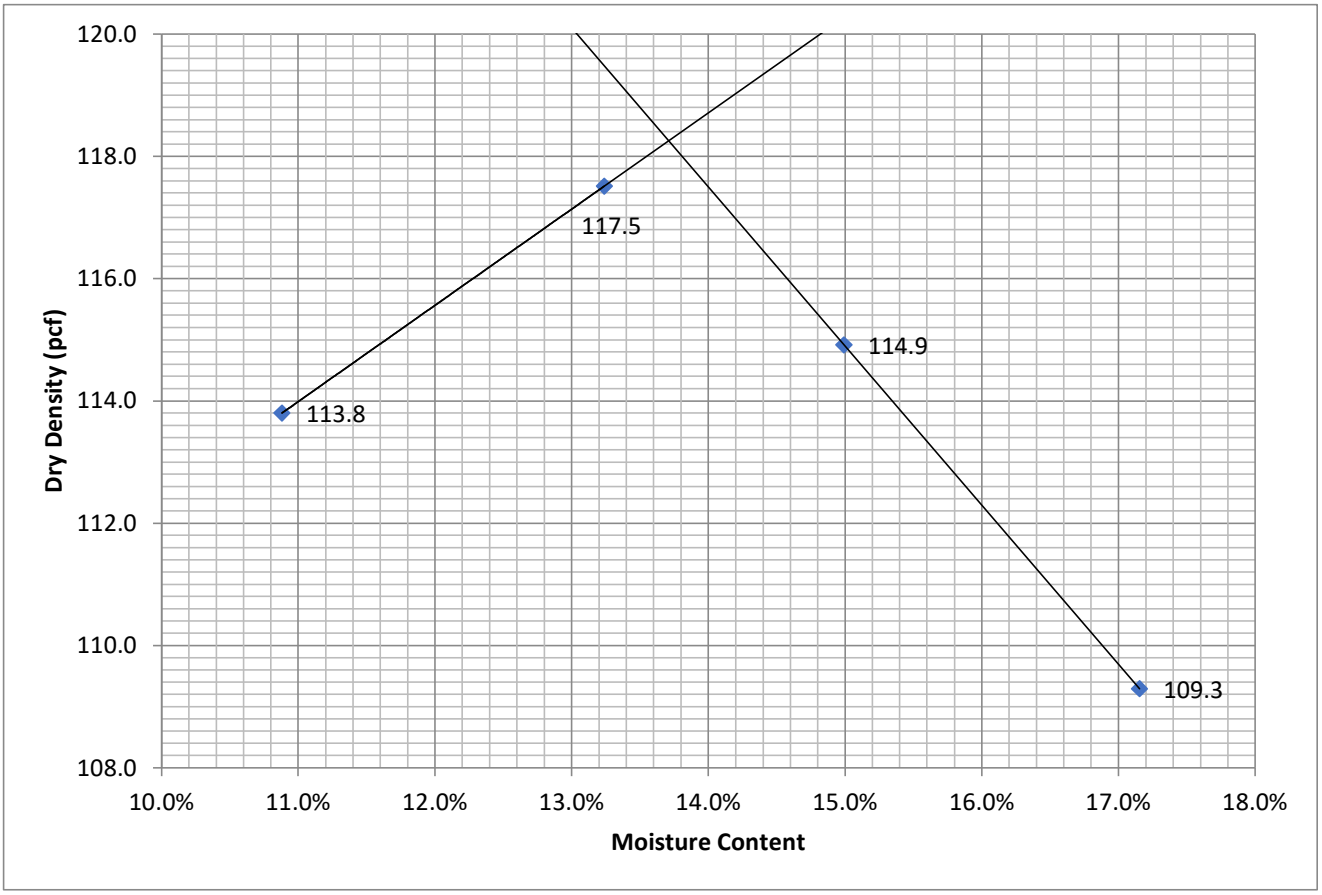
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ACS Lab #	22-1957-3	Material Supplier:	-
Client Name:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Date Tested:	4/19/2022
Project City:	Goodyear	Tested By:	Brian Karl
		Reviewed By:	Dylan Ward

Sample Location: B-50 @ 0.0 - 5.0

Method: ☑ A ☐ D

Dry Density	113.8	117.5	114.9	109.3
Moisture Content	10.9%	13.2%	15.0%	17.2%

Uncorrected Dry Density	118.3	Uncorrected Moisture Content	13.7
% Rock	10	% Passing	90
Rock Corrected Dry Density	**118.3**	Rock Corrected Moisture Content	**13.7**
Specific Gravity of Oversize Aggregate	**2.600**		



Dylan Ward

Project Manager

ACS Services LLC

Maximum Dry Density & Optimum Moisture

☑ ARIZ 225 ☐ ARIZ 245

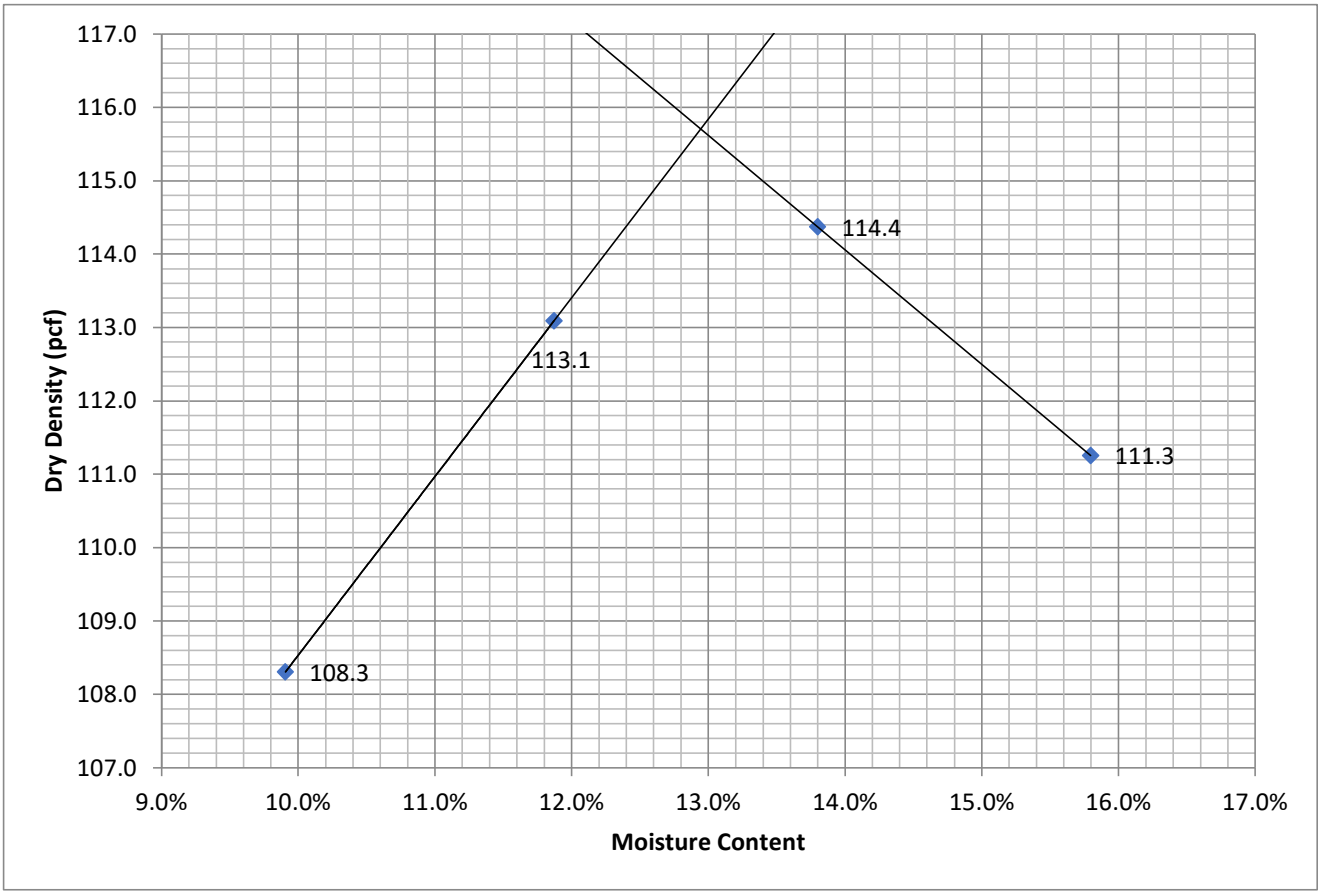
ACS Project #	2201026	Material Type:	Soil
ACS Lab #	22-3009-6	Material Supplier:	-
Client Name:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Date Tested:	6/28/2022
Project City:	Goodyear	Tested By:	Brian Karl
		Reviewed By:	Dylan Ward

Sample Location: B-52 @ 0.0 - 5.0

Method: ☑ A ☐ D

Dry Density	108.3	113.1	114.4	111.3
Moisture Content	9.9%	11.9%	13.8%	15.8%

Uncorrected Dry Density	115.7	Uncorrected Moisture Content	12.9
% Rock	3	% Passing	97
Rock Corrected Dry Density	**115.7**	Rock Corrected Moisture Content	**12.9**
Specific Gravity of Oversize Aggregate	**2.600**		



Dylan Ward

Project Manager

ACS Services LLC

Maximum Dry Density & Optimum Moisture

☑ ARIZ 225 ☐ ARIZ 245

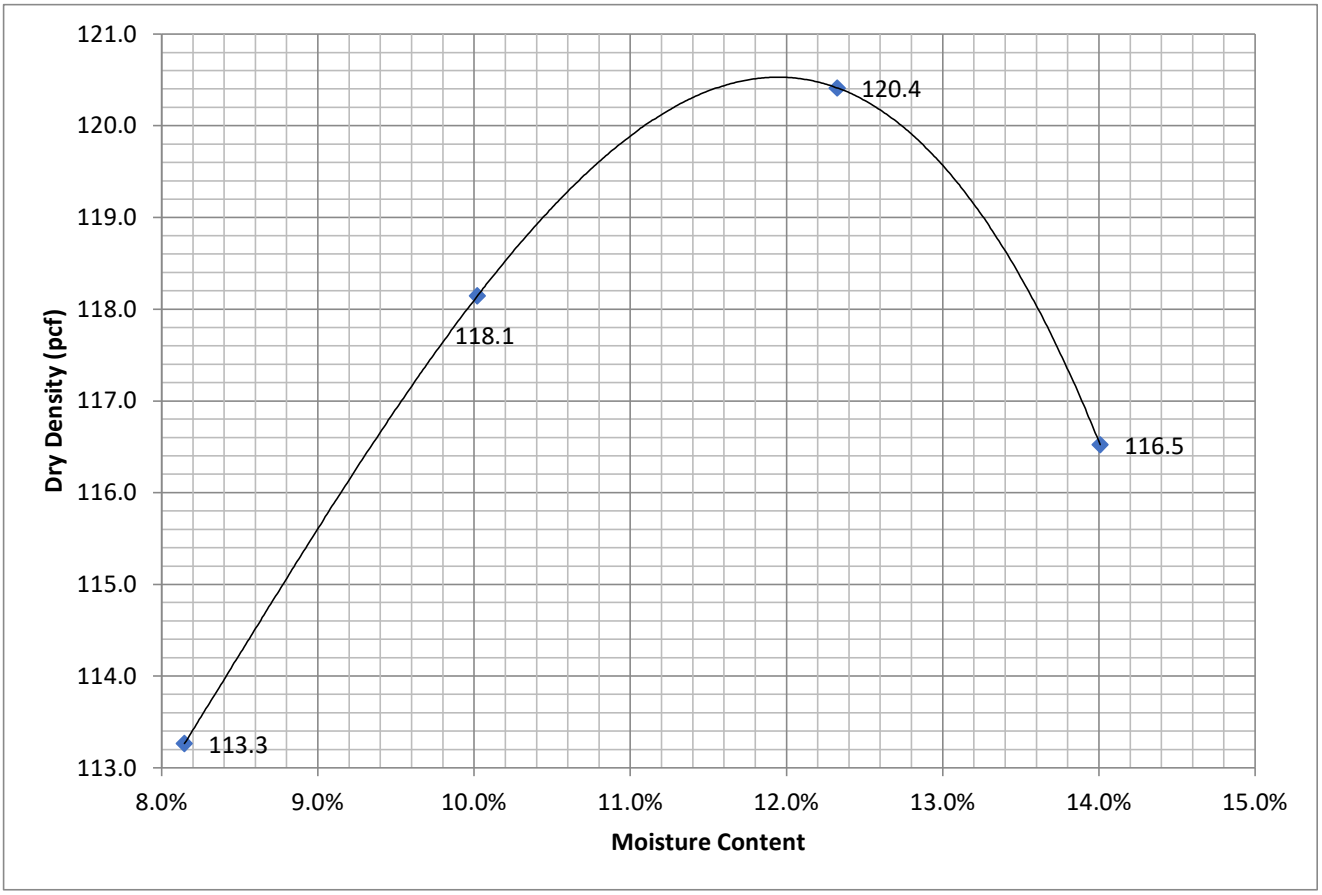
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Client Name:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Date Tested:	2/17/2022
Project City:	Goodyear	Tested By:	Brian Karl
		Reviewed By:	Dylan Ward

Sample Location: B-54 @ 0.0 - 5.0'

Method: ☑ A ☐ D

Dry Density	113.3	118.1	120.4	116.5
Moisture Content	8.1%	10.0%	12.3%	14.0%

Uncorrected Dry Density	120.5	Uncorrected Moisture Content	11.8
% Rock	12	% Passing	88
Rock Corrected Dry Density	**123.6**	Rock Corrected Moisture Content	**10.5**
Specific Gravity of Oversize Aggregate	**2.600**		



Dylan Ward

Project Manager

ACS Services LLC

Maximum Dry Density & Optimum Moisture

☑ ARIZ 225 ☐ ARIZ 245

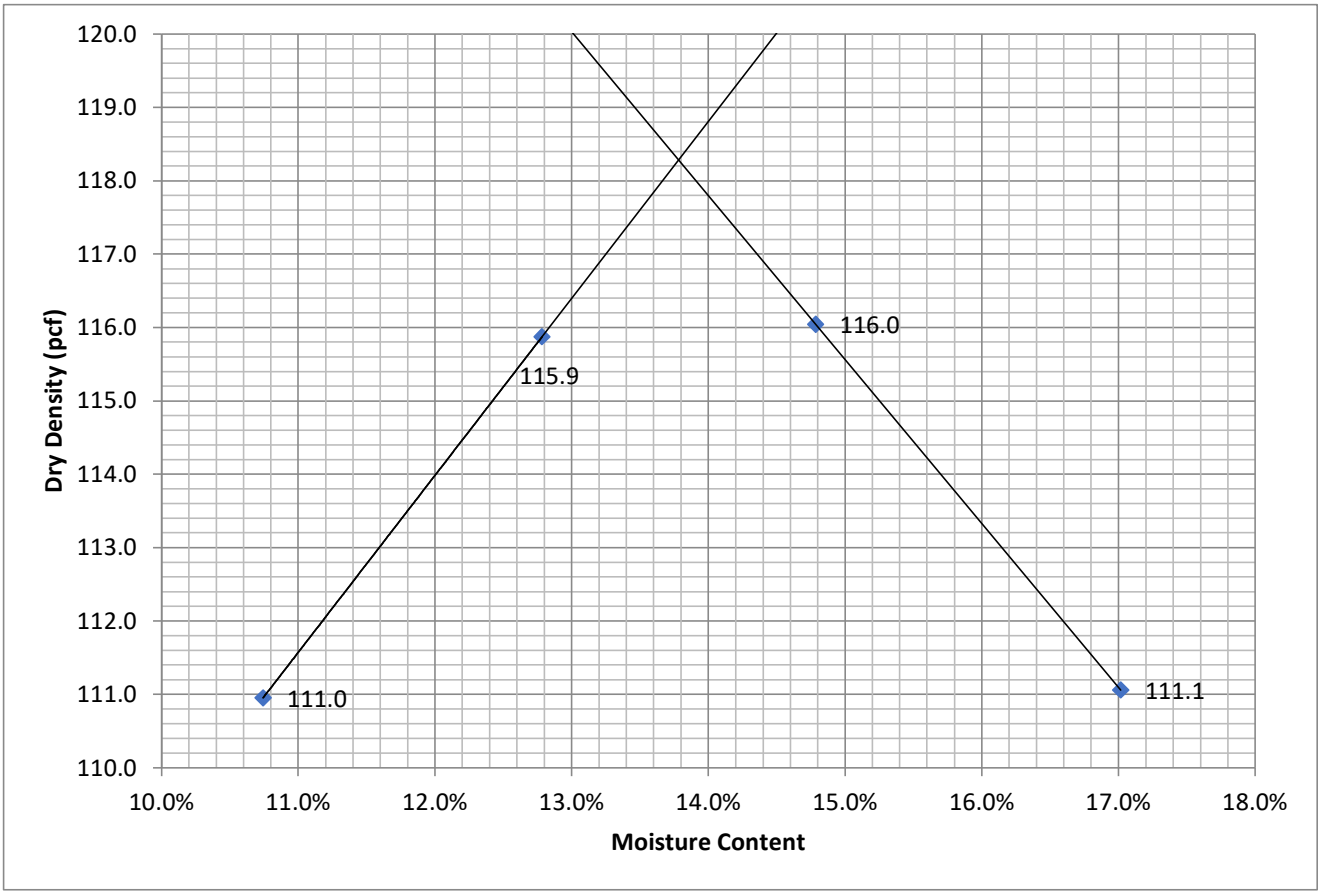
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ACS Lab #	22-1958-1	Material Supplier:	-
Client Name:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Date Tested:	4/19/2022
Project City:	Goodyear	Tested By:	Brian Karl
		Reviewed By:	Dylan Ward

Sample Location: B-55 @ 0.0 - 5.0

Method: ☑ A ☐ D

Dry Density	111.0	115.9	116.0	111.1
Moisture Content	10.7%	12.8%	14.8%	17.0%

Uncorrected Dry Density	118.3	Uncorrected Moisture Content	13.8
% Rock	5	% Passing	95
Rock Corrected Dry Density	**118.3**	Rock Corrected Moisture Content	**13.8**
Specific Gravity of Oversize Aggregate	**2.600**		



Dylan Ward

Project Manager

ACS Services LLC

Maximum Dry Density & Optimum Moisture

☑ ARIZ 225 ☐ ARIZ 245

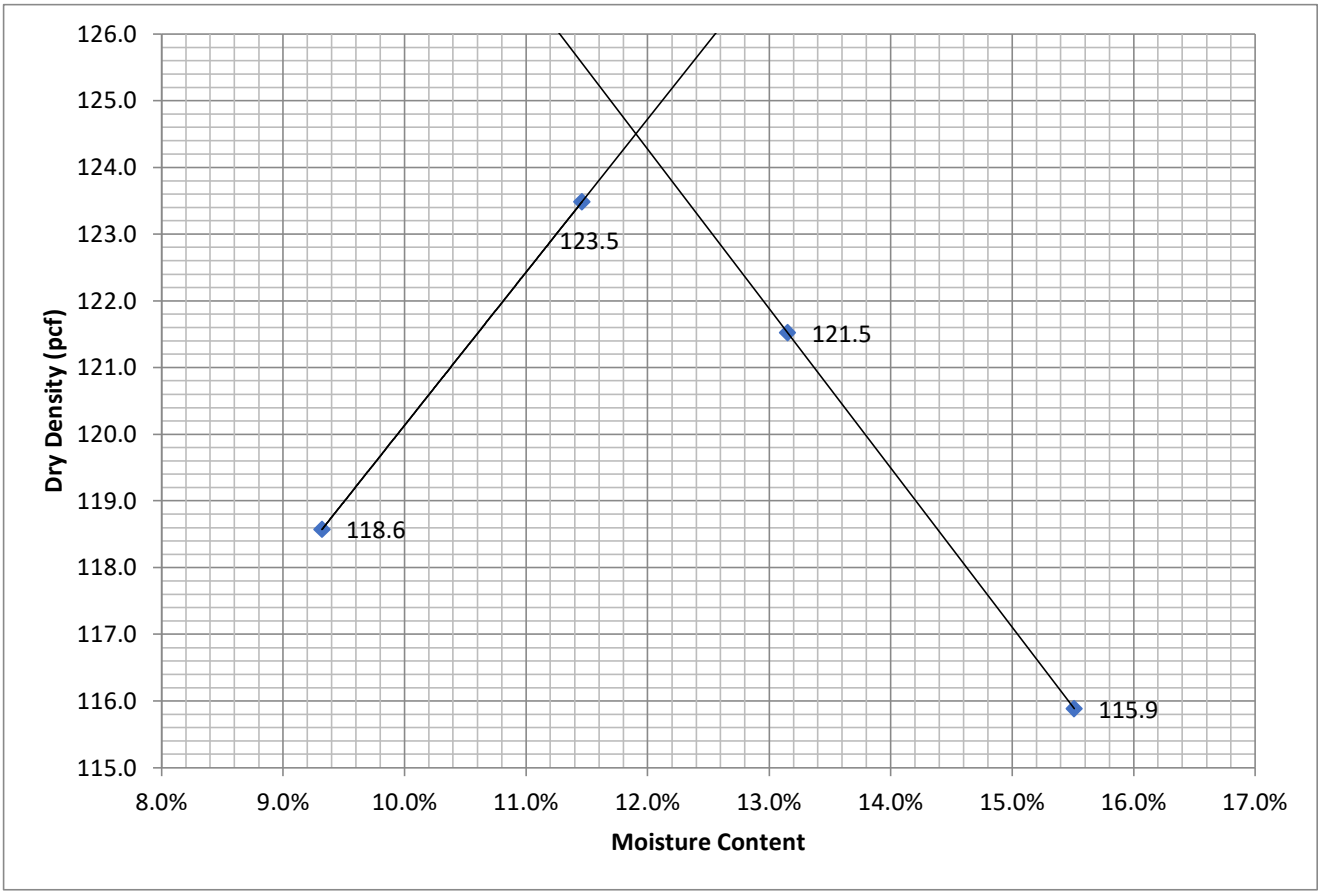
ACS Project #	2201026	Material Type:	Native
ACS Lab #	22-1803-1	Material Supplier:	-
Client Name:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Date Tested:	4/28/2022
Project City:	Goodyear	Tested By:	Brian Karl
		Reviewed By:	Dylan Ward

Sample Location: B-69 @ 1.0 - 4.0'

Method: ☑ A ☐ D

Dry Density	118.6	123.5	121.5	115.9
Moisture Content	9.3%	11.5%	13.2%	15.5%

Uncorrected Dry Density	124.5	Uncorrected Moisture Content	11.9
% Rock	7	% Passing	93
Rock Corrected Dry Density	**124.5**	Rock Corrected Moisture Content	**11.9**
Specific Gravity of Oversize Aggregate	**2.600**		



Dylan Ward

Project Manager

ACS Services LLC

Maximum Dry Density & Optimum Moisture

☑ ARIZ 225 ☐ ARIZ 245

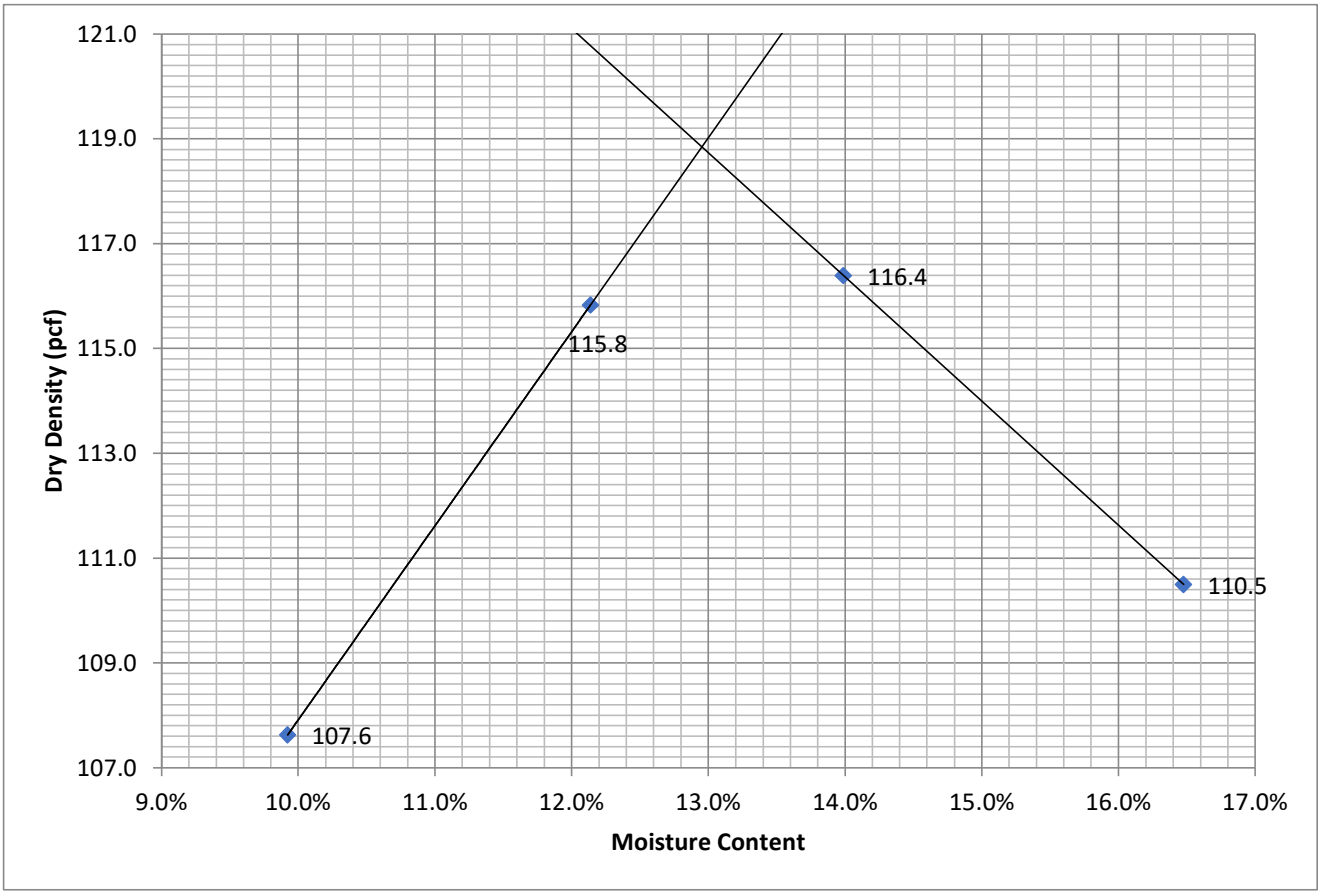
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Client Name:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Date Tested:	4/28/2022
Project City:	Goodyear	Tested By:	Brian Karl
		Reviewed By:	Dylan Ward

Sample Location: B-80 @ 0.0 - 5.0'

Method: ☑ A ☐ D

Dry Density	107.6	115.8	116.4	110.5
Moisture Content	9.9%	12.1%	14.0%	16.5%

Uncorrected Dry Density	118.8	Uncorrected Moisture Content	12.9
% Rock	4	% Passing	96
Rock Corrected Dry Density	**118.8**	Rock Corrected Moisture Content	**12.9**
Specific Gravity of Oversize Aggregate	**2.600**		



Dylan Ward

Project Manager

ACS Services LLC

Maximum Dry Density & Optimum Moisture

☑ ARIZ 225 ☐ ARIZ 245

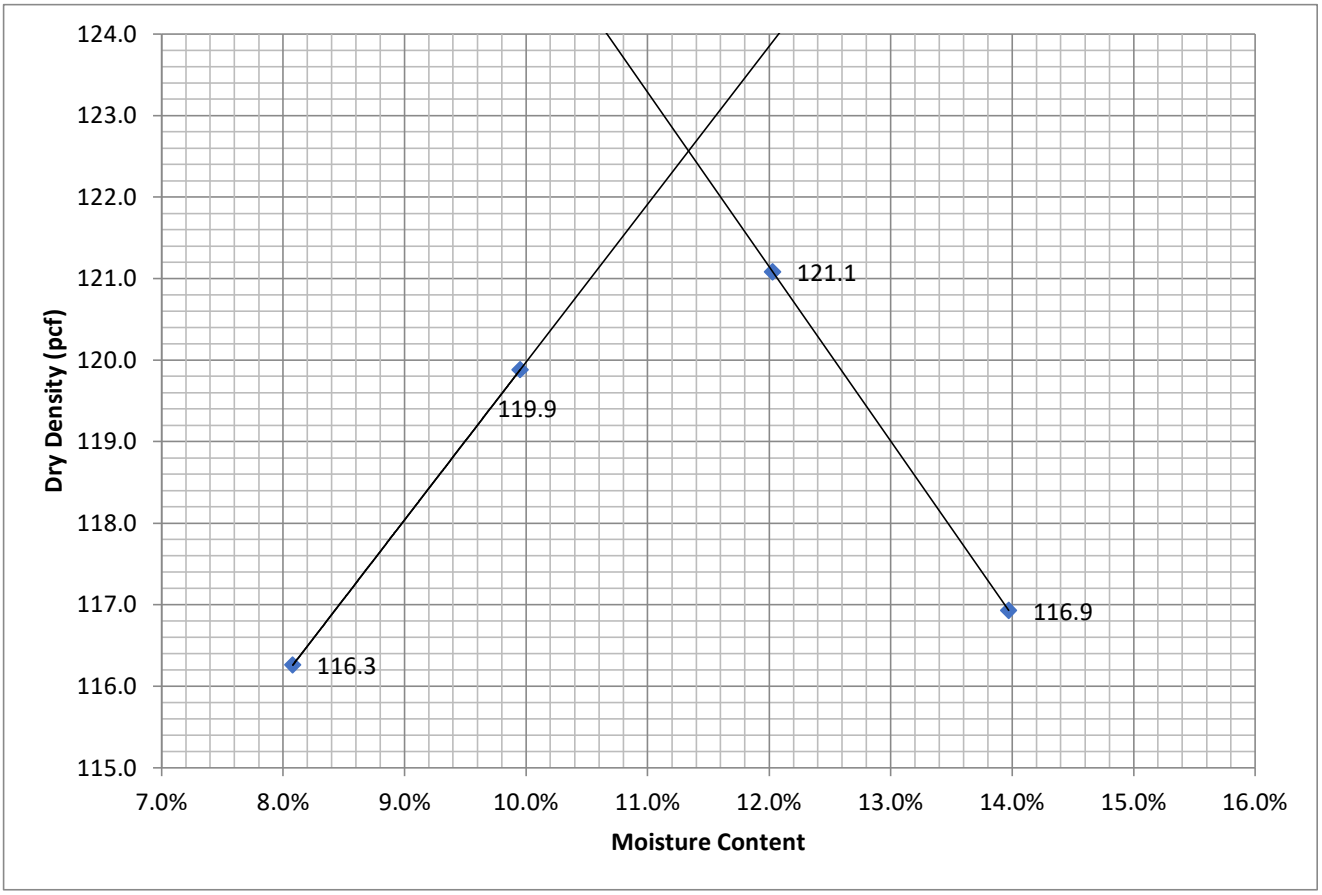
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ACS Lab #	22-3007-1	Material Supplier:	-
Client Name:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Date Tested:	6/27/2022
Project City:	Goodyear	Tested By:	Brian Karl
		Reviewed By:	Dylan Ward

Sample Location: B85A @ 0.0 - 2.5

Method: ☑ A ☐ D

Dry Density	116.3	119.9	121.1	116.9
Moisture Content	8.1%	10.0%	12.0%	14.0%

Uncorrected Dry Density	122.6	Uncorrected Moisture Content	11.3
% Rock	11	% Passing	89
Rock Corrected Dry Density	**125.2**	Rock Corrected Moisture Content	**10.2**
Specific Gravity of Oversize Aggregate	**2.600**		



Dylan Ward

Project Manager

ACS Services LLC

Maximum Dry Density & Optimum Moisture

☑ ARIZ 225 ☐ ARIZ 245

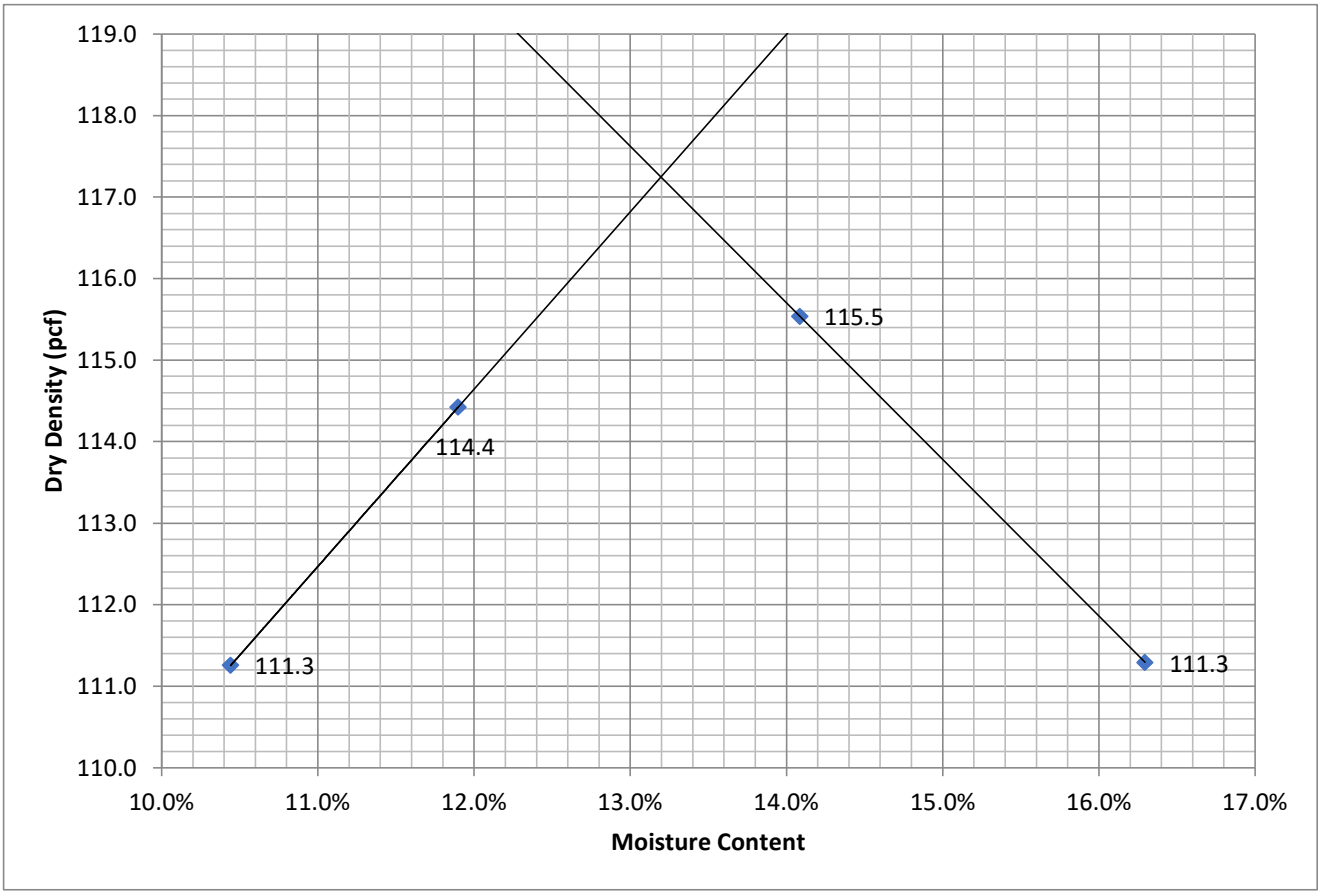
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ACS Lab #	22-1583-1	Material Supplier:	-
Client Name:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Date Tested:	3/11/2022
Project City:	Goodyear	Tested By:	Brian Karl
		Reviewed By:	Dylan Ward

Sample Location: B-89 @ 0.0 - 5.0'

Method: ☑ A ☐ D

Dry Density	111.3	114.4	115.5	111.3
Moisture Content	10.4%	11.9%	14.1%	16.3%

Uncorrected Dry Density	117.3	Uncorrected Moisture Content	13.2
% Rock	6	% Passing	94
Rock Corrected Dry Density	**117.3**	Rock Corrected Moisture Content	**13.2**
Specific Gravity of Oversize Aggregate	**2.600**		



Dylan Ward

Project Manager

ACS Services LLC

Maximum Dry Density & Optimum Moisture

☑ ARIZ 225 ☐ ARIZ 245

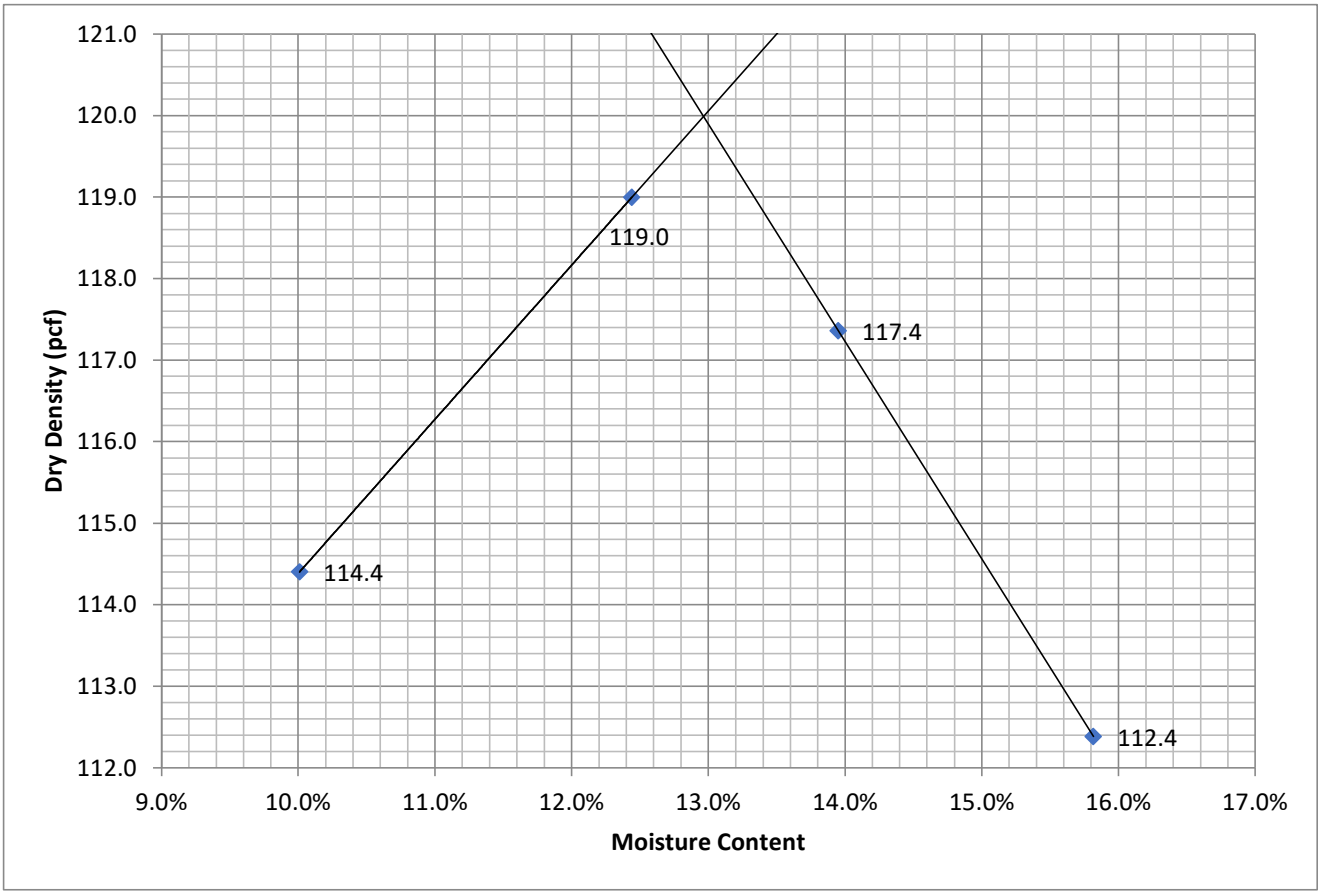
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Client Name:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Date Tested:	4/21/2022
Project City:	Goodyear	Tested By:	Brian Karl
		Reviewed By:	Dylan Ward

Sample Location: B-97 @ 0.0 - 5.0

Method: ☑ A ☐ D

Dry Density	114.4	119.0	117.4	112.4
Moisture Content	10.0%	12.4%	13.9%	15.8%

Uncorrected Dry Density	120	Uncorrected Moisture Content	13.0
% Rock	8	% Passing	92
Rock Corrected Dry Density	**120.0**	Rock Corrected Moisture Content	**13.0**
Specific Gravity of Oversize Aggregate	**2.600**		



Dylan Ward

Project Manager

ACS Services LLC

Maximum Dry Density & Optimum Moisture

☑ ARIZ 225 ☐ ARIZ 245

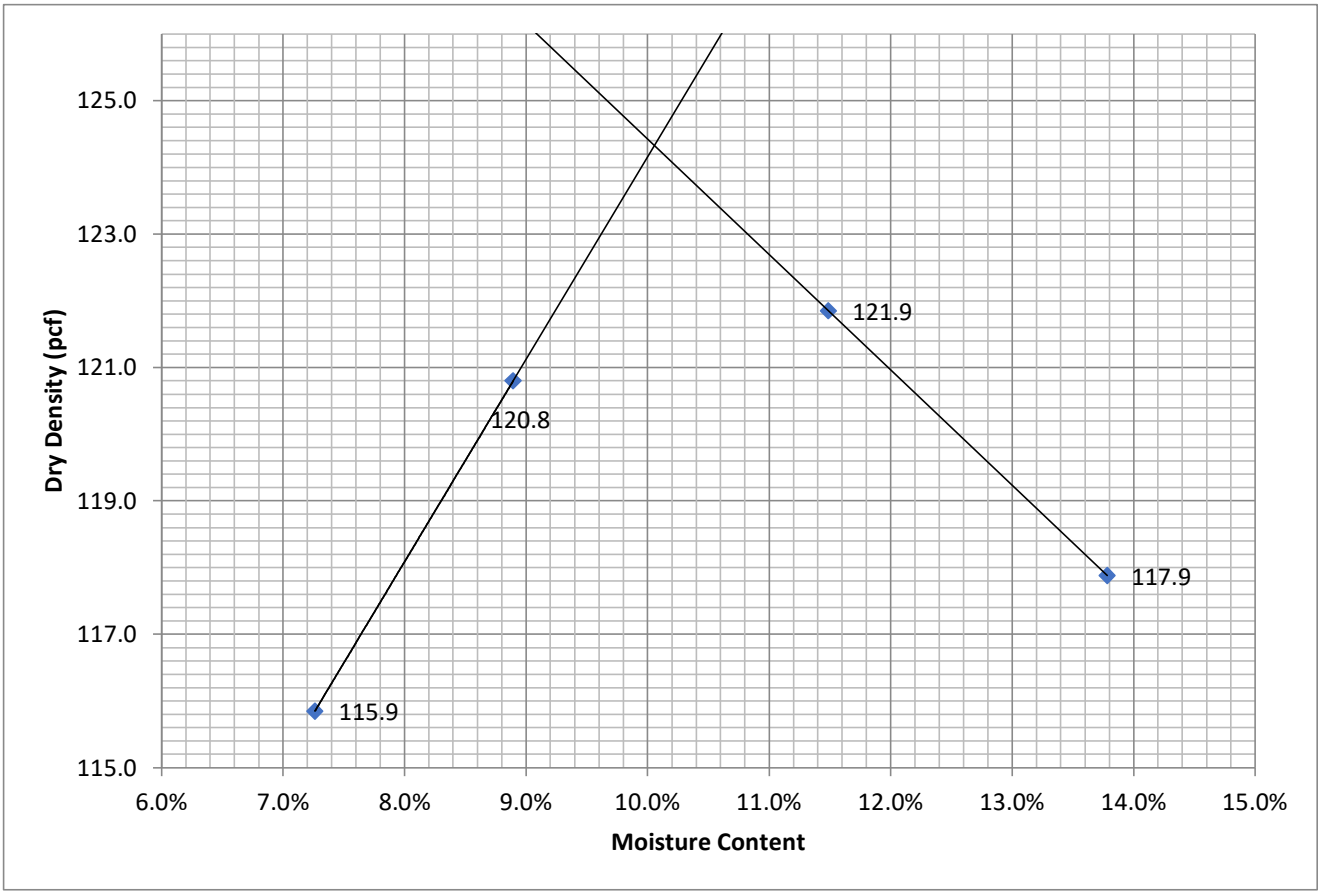
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ACS Lab #	22-3005-1	Material Supplier:	-
Client Name:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Date Tested:	6/24/2022
Project City:	Goodyear	Tested By:	Fernando Montero
		Reviewed By:	Dylan Ward

Sample Location: B97A @ 0.0 - 2.5

Method: ☑ A ☐ D

Dry Density	115.9	120.8	121.9	117.9
Moisture Content	7.3%	8.9%	11.5%	13.8%

Uncorrected Dry Density	124.3	Uncorrected Moisture Content	10.1
% Rock	13	% Passing	87
Rock Corrected Dry Density	**127.2**	Rock Corrected Moisture Content	**8.9**
Specific Gravity of Oversize Aggregate	**2.600**		



Dylan Ward

Project Manager

ACS Services LLC

Maximum Dry Density & Optimum Moisture

☑ ARIZ 225 ☐ ARIZ 245

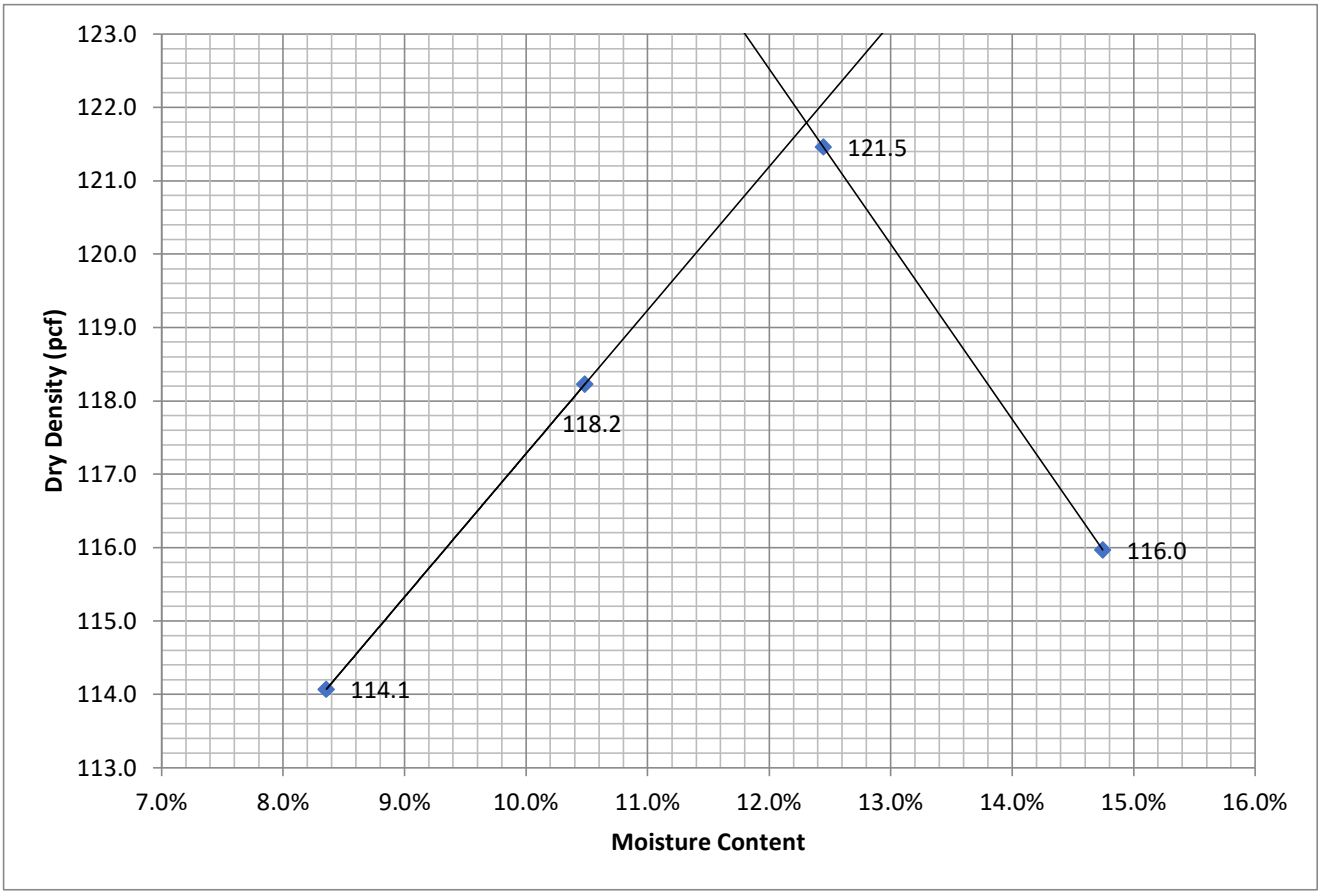
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Client Name:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Date Tested:	4/5/2022
Project City:	Goodyear	Tested By:	Brian Karl
		Reviewed By:	Dylan Ward

Sample Location: B-100 @ 0.0 - 5.0

Method: ☑ A ☐ D

Dry Density	114.1	118.2	121.5	116.0
Moisture Content	8.4%	10.5%	12.4%	14.7%

Uncorrected Dry Density	121.8	Uncorrected Moisture Content	12.3
% Rock	18	% Passing	82
Rock Corrected Dry Density	**126.3**	Rock Corrected Moisture Content	**10.2**
Specific Gravity of Oversize Aggregate	**2.600**		



Dylan Ward

Project Manager

ACS Services LLC

Maximum Dry Density & Optimum Moisture

☑ ARIZ 225 ☐ ARIZ 245

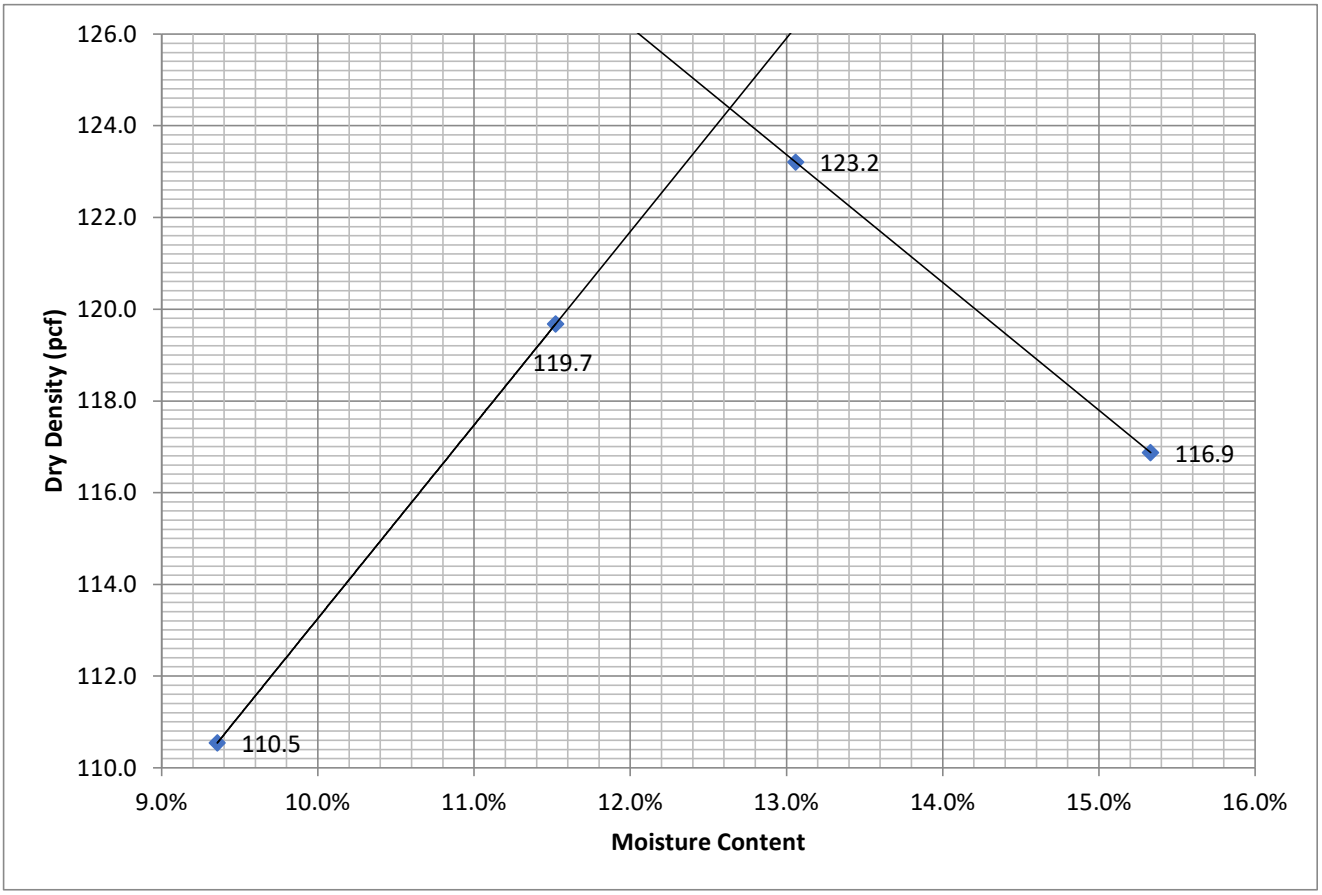
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Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Date Tested:	4/28/2022
Project City:	Goodyear	Tested By:	Brian Karl
		Reviewed By:	Dylan Ward

Sample Location: B-107 @ 0.0 - 5.0

Method: ☑ A ☐ D

Dry Density	110.5	119.7	123.2	116.9
Moisture Content	9.4%	11.5%	13.1%	15.3%

Uncorrected Dry Density	124.4	Uncorrected Moisture Content	12.7
% Rock	2	% Passing	98
Rock Corrected Dry Density	**124.4**	Rock Corrected Moisture Content	**12.7**
Specific Gravity of Oversize Aggregate	**2.600**		



Dylan Ward

Project Manager

ACS Services LLC

Maximum Dry Density & Optimum Moisture

☑ ARIZ 225 ☐ ARIZ 245

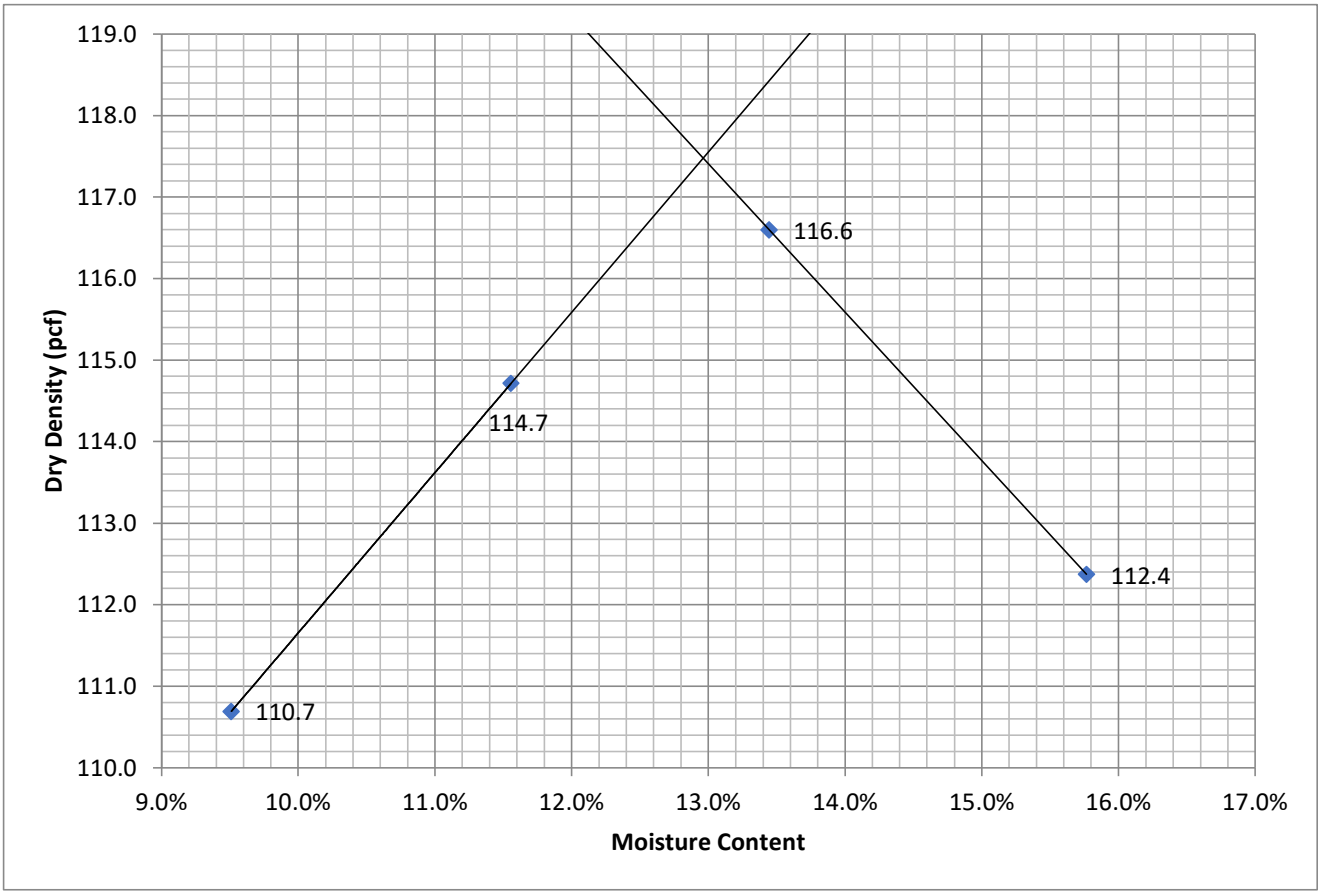
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Client Name:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Date Tested:	3/11/2022
Project City:	Goodyear	Tested By:	Brian Karl
		Reviewed By:	Dylan Ward

Sample Location: B-112 @ 0.0 - 5.0'

Method: ☑ A ☐ D

Dry Density	110.7	114.7	116.6	112.4
Moisture Content	9.5%	11.6%	13.4%	15.8%

Uncorrected Dry Density	117.5	Uncorrected Moisture Content	12.9
% Rock	6	% Passing	94
Rock Corrected Dry Density	**117.5**	Rock Corrected Moisture Content	**12.9**
Specific Gravity of Oversize Aggregate	**2.600**		



Dylan Ward

Project Manager

ACS Services LLC

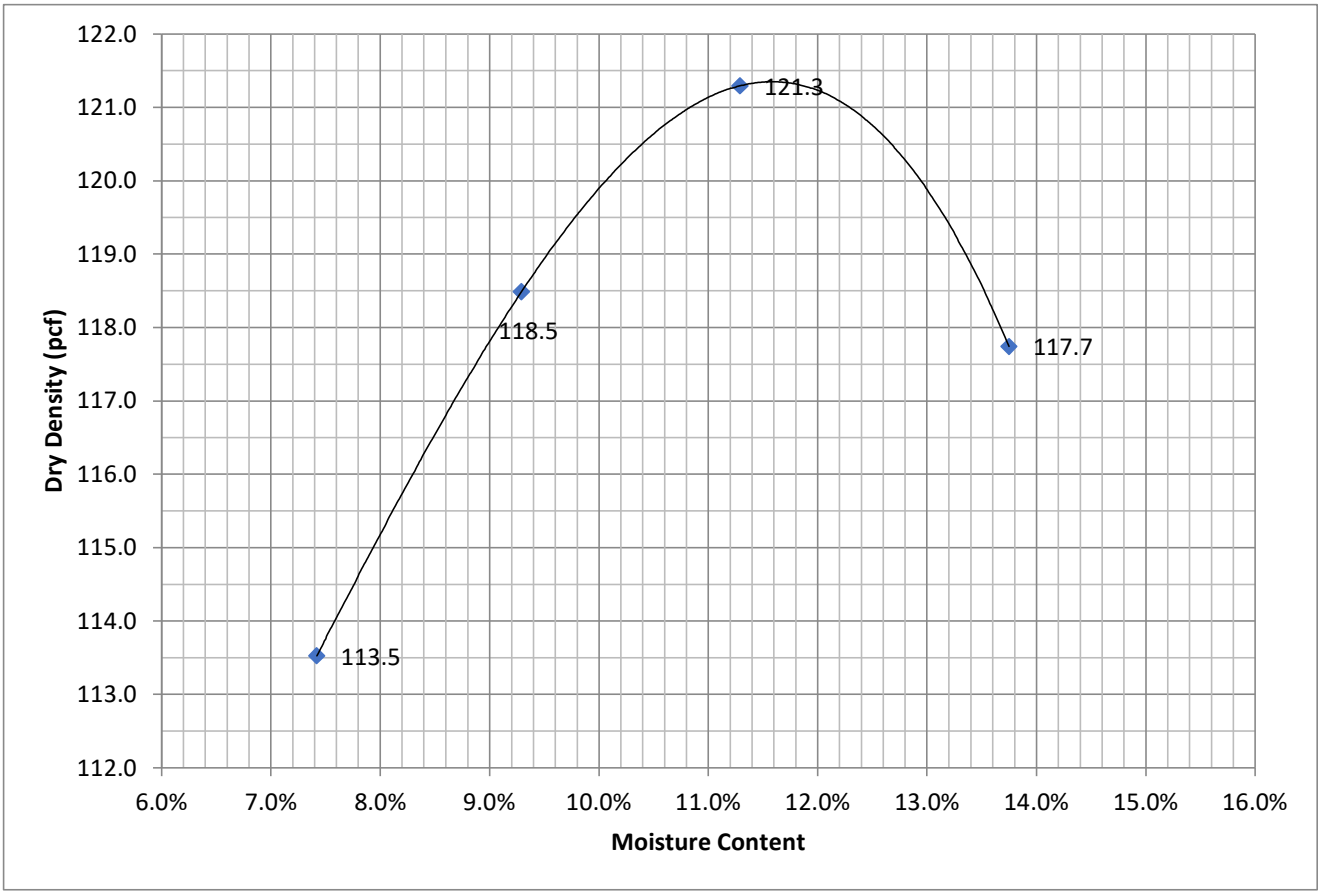
Maximum Dry Density & Optimum Moisture

☑ AASHTO T-99 | ☐ AASHTO T-180 | ☐ ASTM D-698 | ☐ ASTM D-1557

ACS Project #	2201026	Material Type:	Native
ACS Lab #	22-1146-5	Material Supplier:	-
Client Name:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Date Tested:	1/24/2022
Project City:	Goodyear	Tested By:	Mahalia Davis
		Reviewed By:	Andrew Jamrogiewicz, P.E.
Sample Location:	B - 113 @ 0.0' - 5.0'	Method:	☑ A ☐ B ☐ C ☐ D

Dry Density	113.5	118.5	121.3	117.7
Moisture Content	7.4%	9.3%	11.3%	13.7%

Uncorrected Dry Density	121.4	Uncorrected Moisture Content	11.6
% Rock	12	% Passing	88
Rock Corrected Dry Density	**125.3**	Rock Corrected Moisture Content	**10.5**
Specific Gravity of Oversize Aggregate	**2.650**		



Andrew Jamrogiewicz

Project Manager

ACS Services LLC

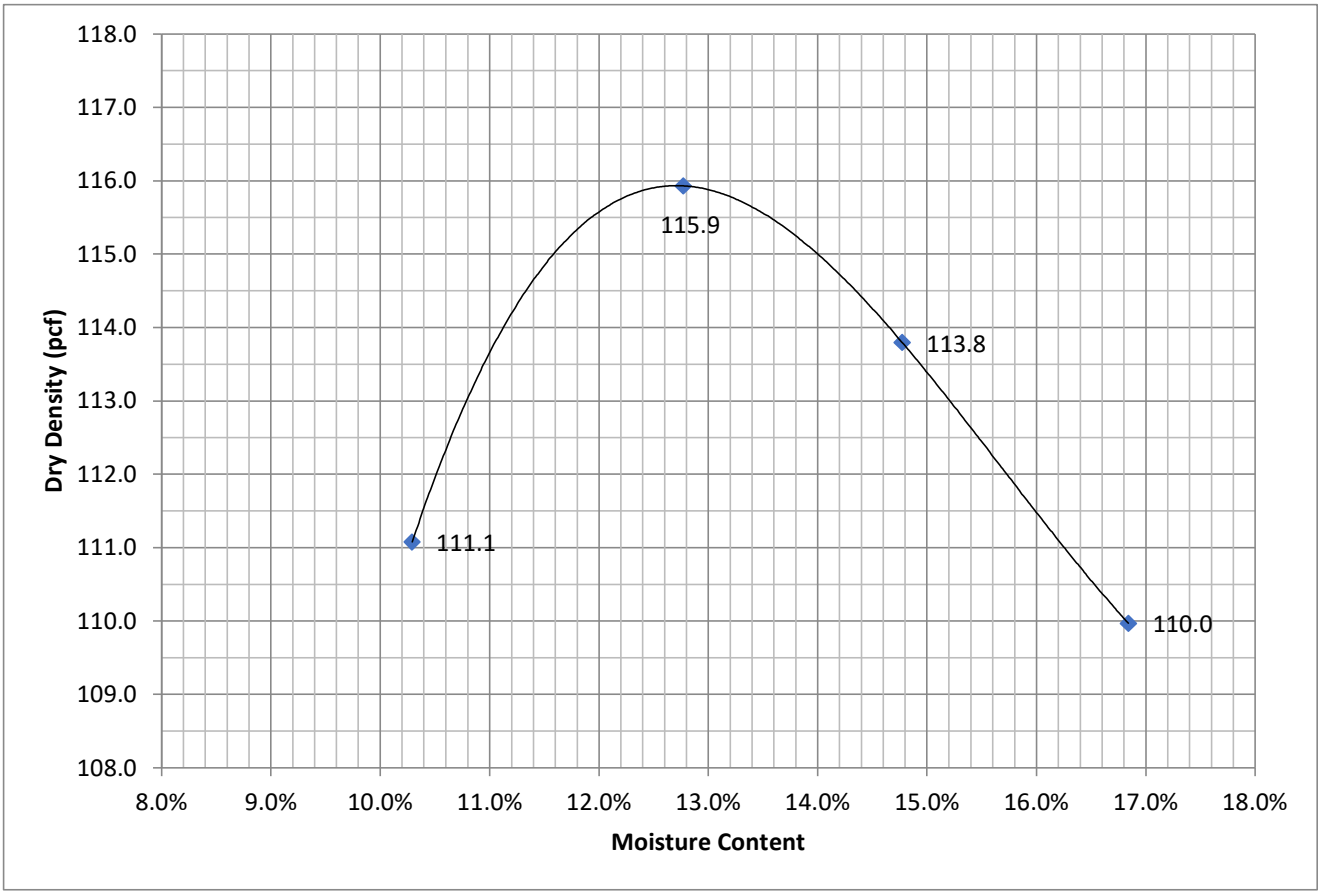
Maximum Dry Density & Optimum Moisture

☑ AASHTO T-99 | ☐ AASHTO T-180 | ☐ ASTM D-698 | ☐ ASTM D-1557

ACS Project #	2201026	Material Type:	Native
ACS Lab #	22-1128-10	Material Supplier:	-
Client Name:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Date Tested:	1/25/2022
Project City:	Goodyear	Tested By:	Colin Eggbretch
		Reviewed By:	Andrew Jamrogiewicz, P.E.
Sample Location:	B - 114 @ 0.0' - 5.0'	Method:	☑ A ☐ B ☐ C ☐ D

Dry Density	111.1	115.9	113.8	110.0
Moisture Content	10.3%	12.8%	14.8%	16.8%

Uncorrected Dry Density	115.9	Uncorrected Moisture Content	12.7
% Rock	7	% Passing	93
Rock Corrected Dry Density	**115.9**	Rock Corrected Moisture Content	**12.7**
Specific Gravity of Oversize Aggregate	**2.650**		



Andrew Jamrogiewicz

Project Manager

ACS Services LLC

Maximum Dry Density & Optimum Moisture

☑ ARIZ 225 ☐ ARIZ 245

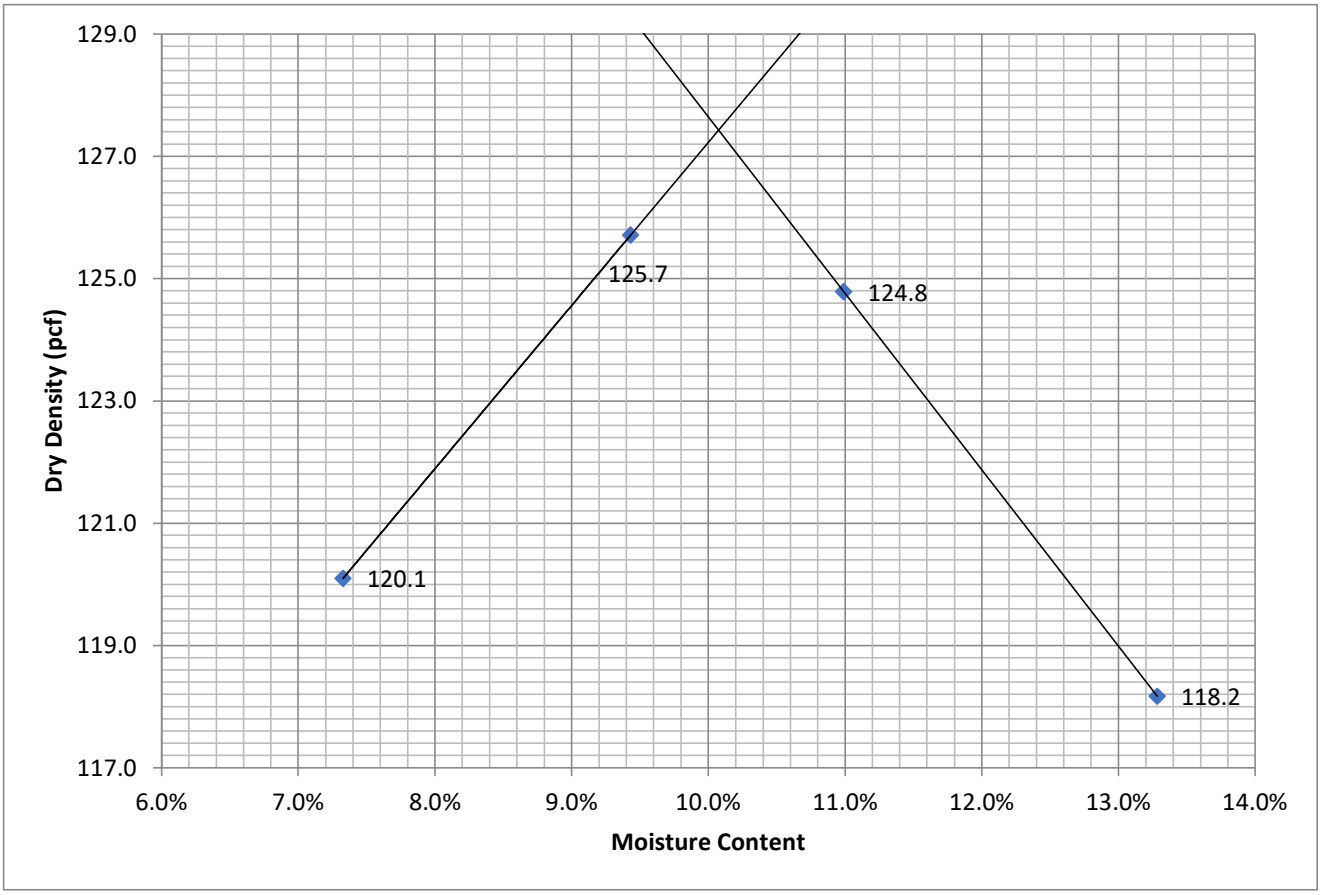
ACS Project #	2201026	Material Type:	Soil
ACS Lab #	22-3008-1	Material Supplier:	-
Client Name:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Date Tested:	6/29/2022
Project City:	Goodyear	Tested By:	Brian Karl
		Reviewed By:	Dylan Ward

Sample Location: B119A @ 0.0 - 2.5

Method: ☑ A ☐ D

Dry Density	120.1	125.7	124.8	118.2
Moisture Content	7.3%	9.4%	11.0%	13.3%

Uncorrected Dry Density	127.4	Uncorrected Moisture Content	10.1
% Rock	7	% Passing	93
Rock Corrected Dry Density	**127.4**	Rock Corrected Moisture Content	**10.1**
Specific Gravity of Oversize Aggregate	**2.600**		



Dylan Ward

Project Manager

ACS Services LLC

Maximum Dry Density & Optimum Moisture

☑ ARIZ 225 ☐ ARIZ 245

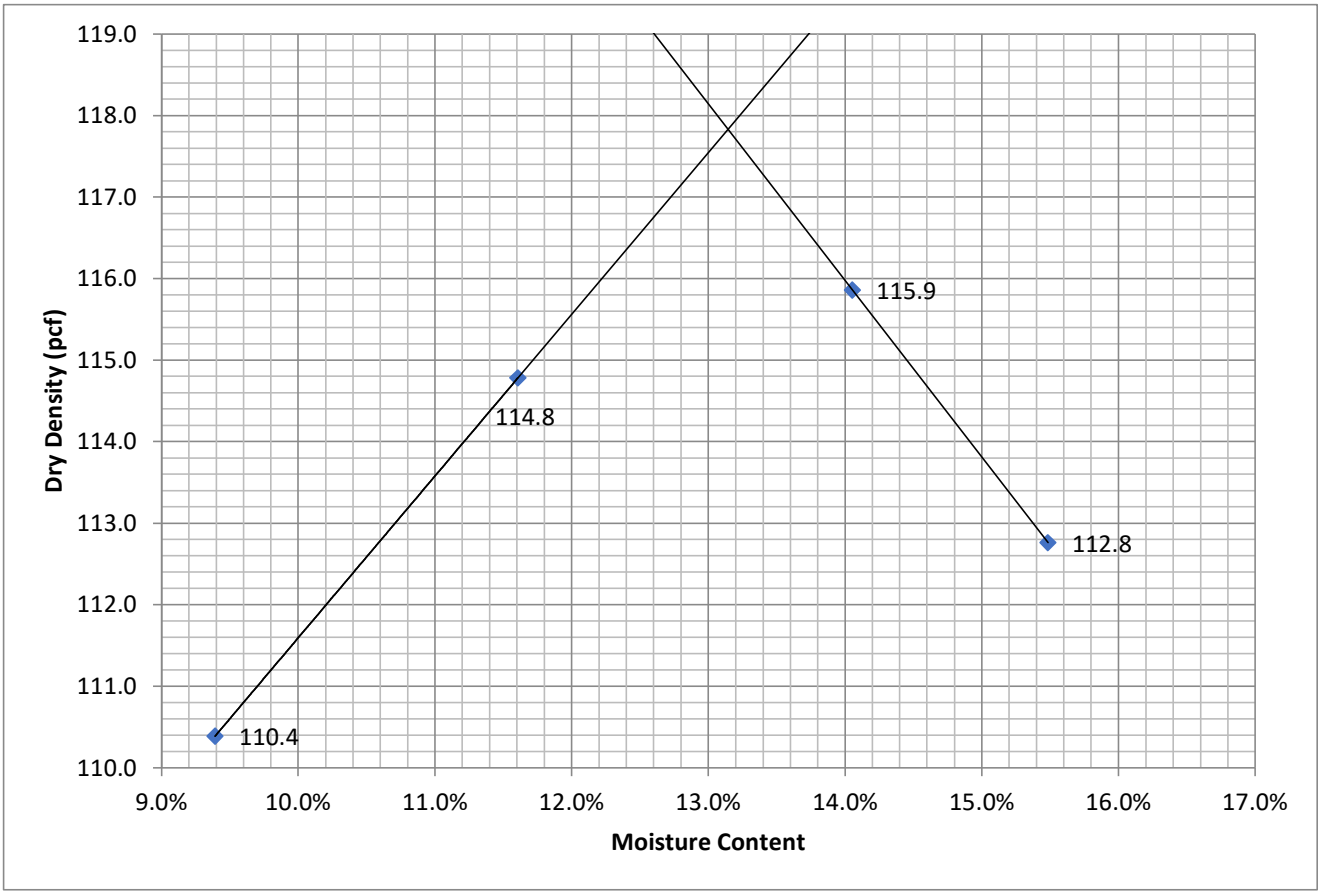
ACS Project #	2201026	Material Type:	Soil
ACS Lab #	22-2242-2	Material Supplier:	-
Client Name:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Date Tested:	5/3/2022
Project City:	Goodyear	Tested By:	Brian Karl
		Reviewed By:	Dylan Ward

Sample Location: B-124 @ 0.0 - 5.0

Method: ☑ A ☐ D

Dry Density	110.4	114.8	115.9	112.8
Moisture Content	9.4%	11.6%	14.1%	15.5%

Uncorrected Dry Density	117.8	Uncorrected Moisture Content	13.1
% Rock	8	% Passing	92
Rock Corrected Dry Density	**117.8**	Rock Corrected Moisture Content	**13.1**
Specific Gravity of Oversize Aggregate	**2.600**		



Dylan Ward

Project Manager

ACS Services LLC

Maximum Dry Density & Optimum Moisture

☑ ARIZ 225 ☐ ARIZ 245

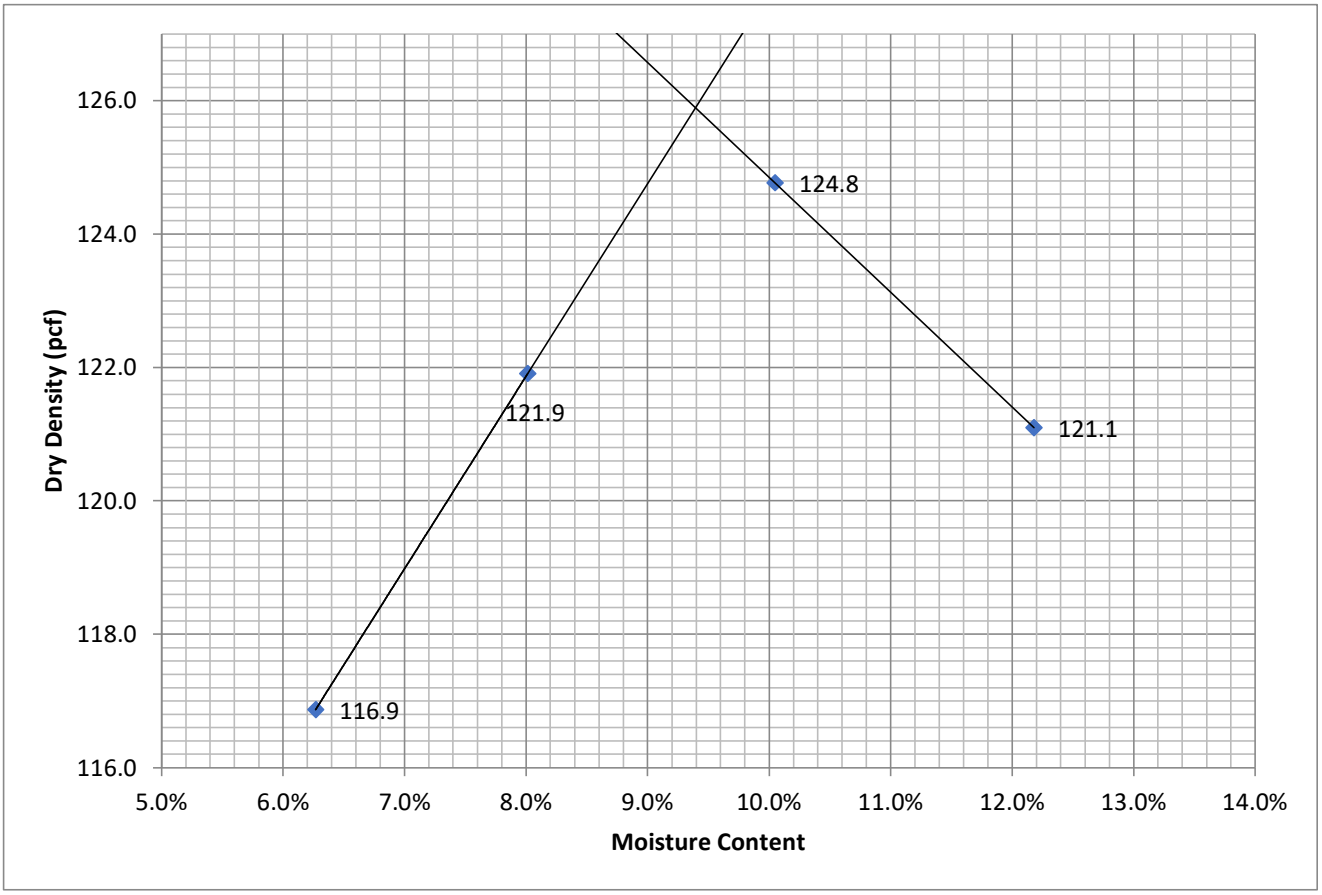
ACS Project #	2201026	Material Type:	Soil
ACS Lab #	22-3006-1	Material Supplier:	-
Client Name:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Date Tested:	6/27/2022
Project City:	Goodyear	Tested By:	Brian Karl
		Reviewed By:	Dylan Ward

Sample Location: B124A @ 0.0 - 2.5

Method: ☑ A ☐ D

Dry Density	116.9	121.9	124.8	121.1
Moisture Content	6.3%	8.0%	10.0%	12.2%

Uncorrected Dry Density	125.9	Uncorrected Moisture Content	9.4
% Rock	25	% Passing	75
Rock Corrected Dry Density	**130.9**	Rock Corrected Moisture Content	**7.3**
Specific Gravity of Oversize Aggregate	**2.600**		



Dylan Ward

Project Manager

ACS Services LLC

Maximum Dry Density & Optimum Moisture

☑ ARIZ 225 ☐ ARIZ 245

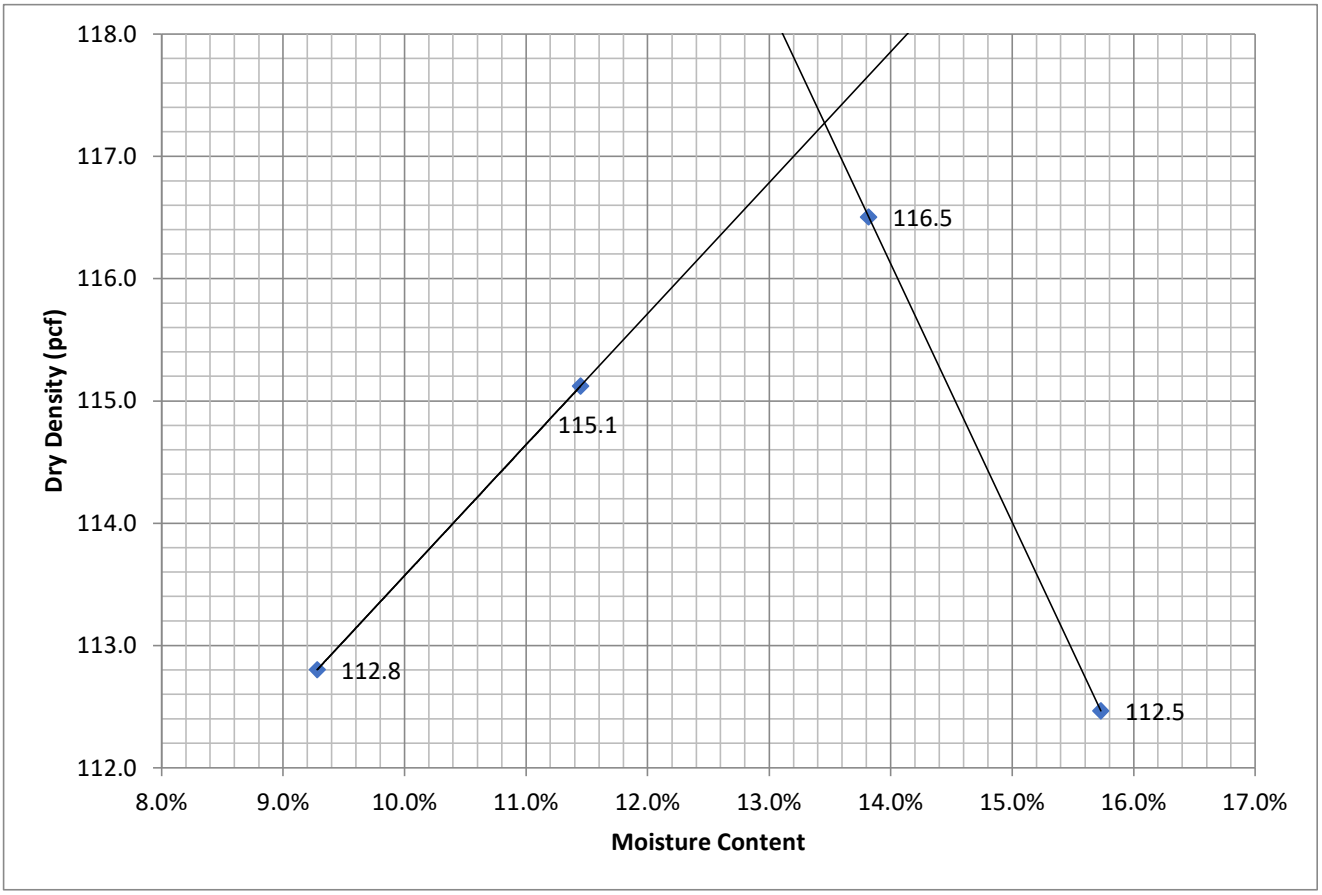
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ACS Lab #	22-3006-4	Material Supplier:	-
Client Name:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Date Tested:	6/24/2022
Project City:	Goodyear	Tested By:	Brian Karl
		Reviewed By:	Dylan Ward

Sample Location: B124B @ 1.0 - 5.0

Method: ☑ A ☐ D

Dry Density	112.8	115.1	116.5	112.5
Moisture Content	9.3%	11.4%	13.8%	15.7%

Uncorrected Dry Density	117.3	Uncorrected Moisture Content	13.5
% Rock	17	% Passing	83
Rock Corrected Dry Density	**122.3**	Rock Corrected Moisture Content	**11.3**
Specific Gravity of Oversize Aggregate	**2.600**		



Dylan Ward

Project Manager

ACS Services LLC	Maximum Dry Density & Optimum Moisture
	☐ AASHTO T 99 | ☐ AASHTO T 180 | ☑ ASTM D698 | ☐ ASTM D1557

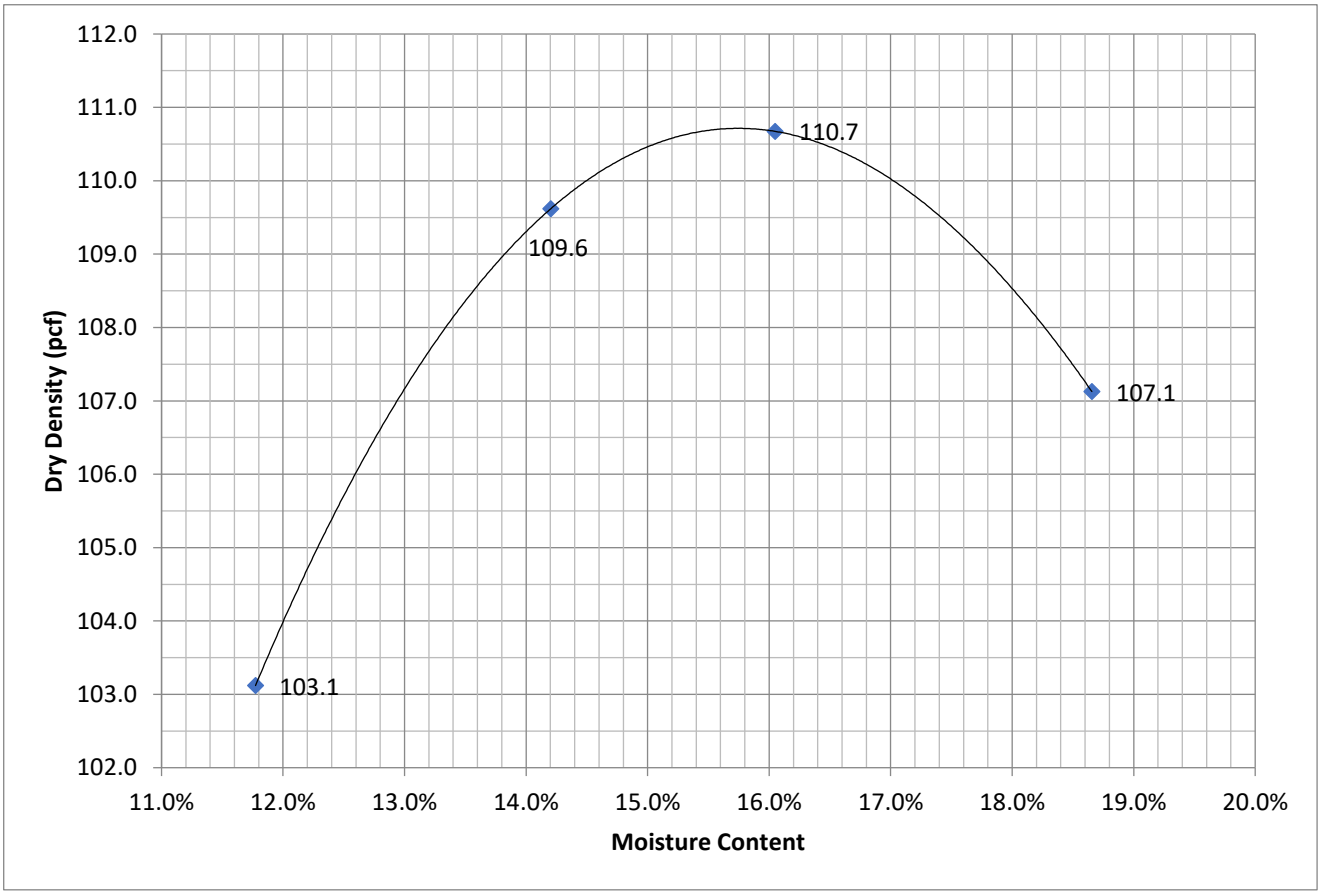
ACS Project #	2201026	Material Type:	Soils
ACS Lab #	24-1955-5	Material Supplier:	-
Client Name:	Ethos	Sample Date:	2/26/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Date Tested:	3/7/2024
Project City:	Goodyear	Tested By:	Keagen Mayfield
		Reviewed By:	Fernando Montero

Sample Location: B-128 @ 1.0 - 4.0

Method: ☑ A ☐ B ☐ C ☐ D

Dry Density	103.1	109.6	110.7	107.1
Moisture Content	11.8%	14.2%	16.0%	18.7%

Uncorrected Dry Density	110.7	Uncorrected Moisture Content	15.7
% Rock	2	% Passing	98
Rock Corrected Dry Density	**110.7**	Rock Corrected Moisture Content	**15.7**
Specific Gravity of Oversize Aggregate	**2.600**		



Fernando Montero

Project Manager

ACS Services LLC	Maximum Dry Density & Optimum Moisture
	☐ AASHTO T 99 | ☐ AASHTO T 180 | ☑ ASTM D698 ☐ ASTM D1557

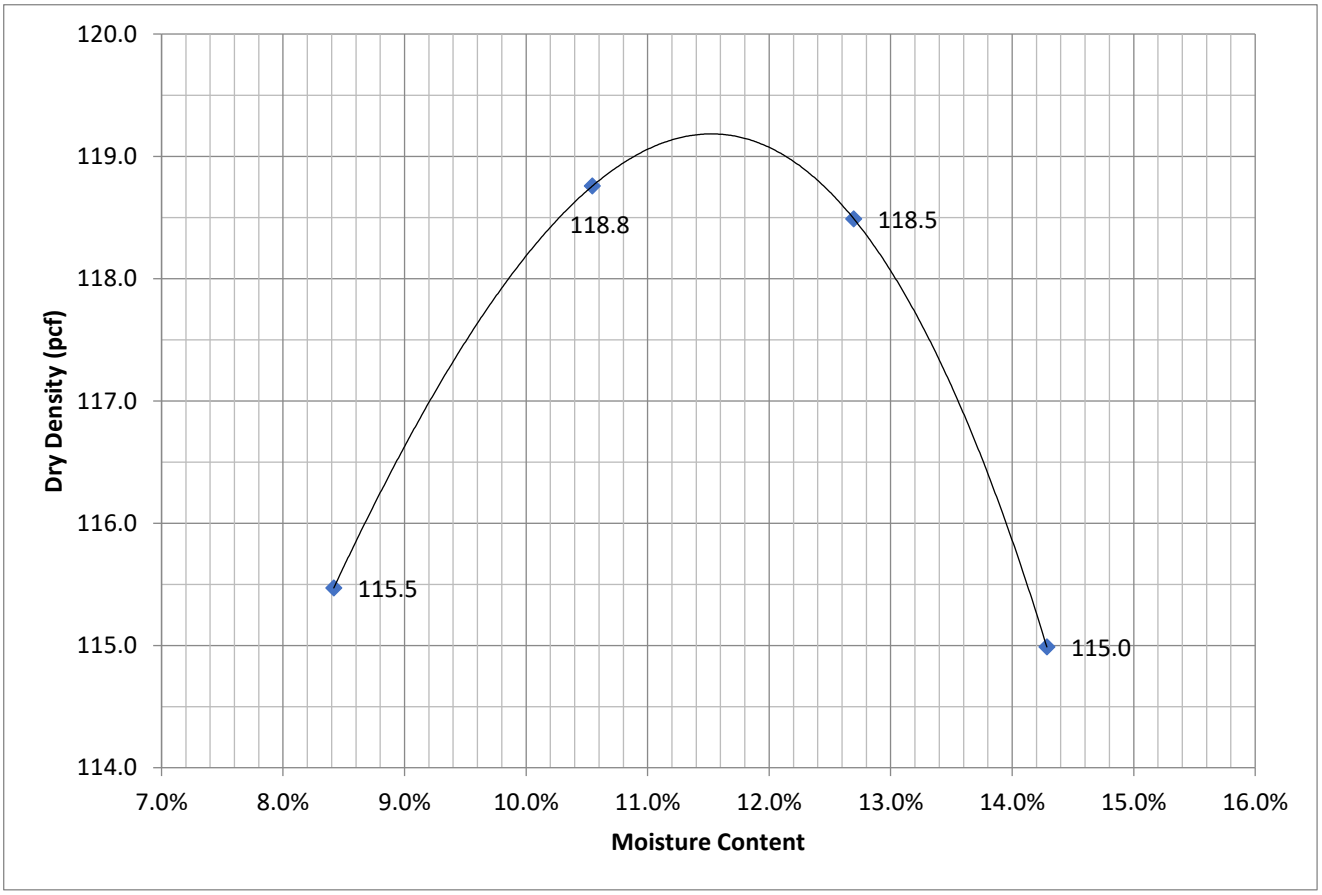
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ACS Lab #	23-5853-3	Material Supplier:	-
Client Name:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Date Tested:	1/5/2024
Project City:	Goodyear	Tested By:	Keagen Mayfield
		Reviewed By:	Fernando Montero

Sample Location: B-157 @ 0.0 - 5.0

Method: ☑ A ☐ B ☐ C ☐ D

Dry Density	115.5	118.8	118.5	115.0
Moisture Content	8.4%	10.5%	12.7%	14.3%

Uncorrected Dry Density	119.2	Uncorrected Moisture Content	11.5
% Rock	5	% Passing	95
Rock Corrected Dry Density	**120.9**	Rock Corrected Moisture Content	**10.9**
Specific Gravity of Oversize Aggregate	**2.600**		



Fernando Montero

Project Manager

ACS Services LLC

Maximum Dry Density & Optimum Moisture

☑ AASHTO T 99 | ☐ AASHTO T 180 | ☐ ASTM D698 | ☐ ASTM D1557

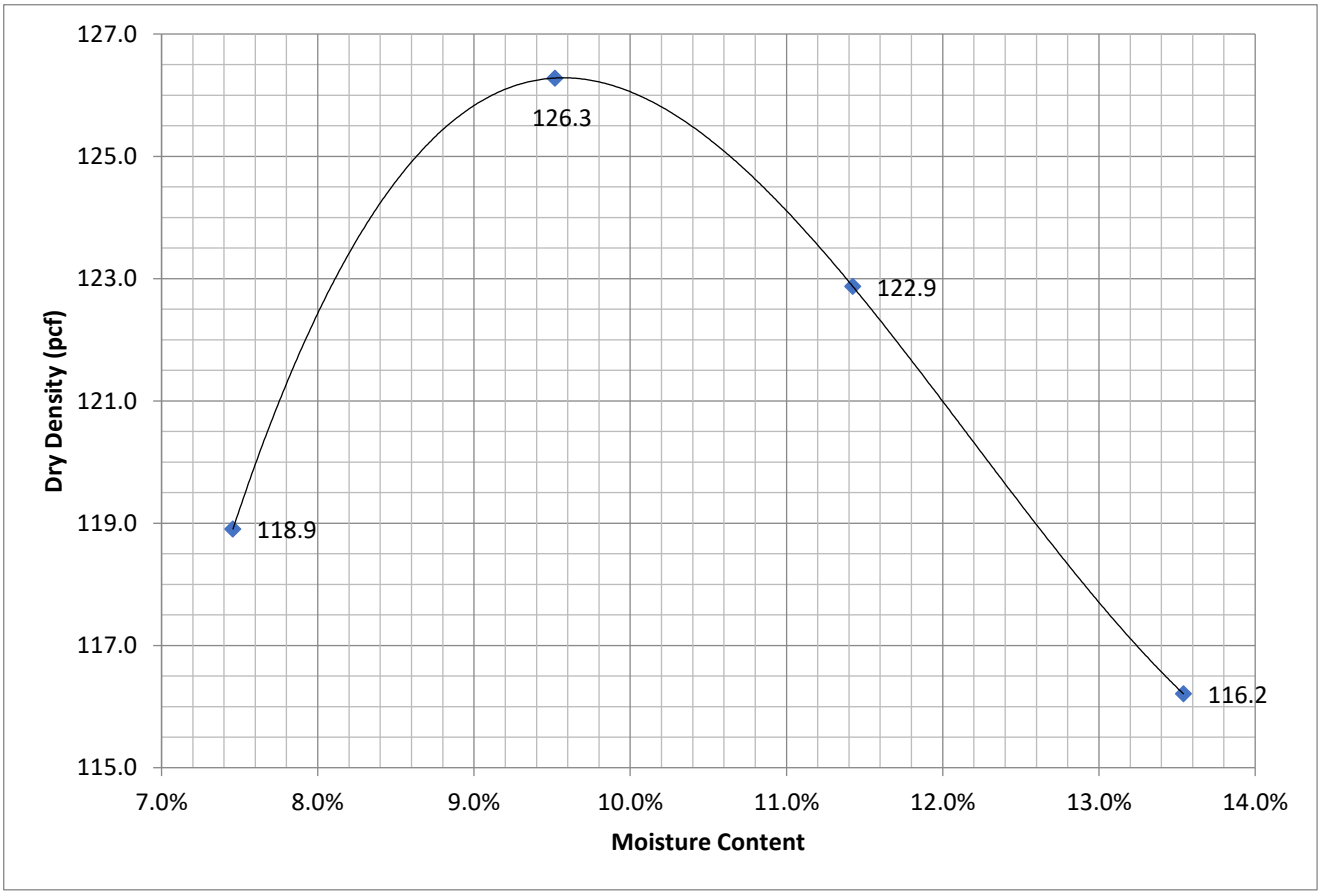
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ACS Lab #	23-5843-1	Material Supplier:	-
Client Name:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Date Tested:	1/0/1900
Project City:	Goodyear	Tested By:	0
		Reviewed By:	Fernando Montero

Sample Location: B-171 @ 0.0 - 3.0

Method: ☑ A ☐ B ☐ C ☐ D

Dry Density	118.9	126.3	122.9	116.2
Moisture Content	7.5%	9.5%	11.4%	13.5%

Uncorrected Dry Density	126.3	Uncorrected Moisture Content	9.6
% Rock	4	% Passing	96
Rock Corrected Dry Density	**126.3**	Rock Corrected Moisture Content	**9.6**
Specific Gravity of Oversize Aggregate	**2.600**		



Fernando Montero

Project Manager

ACS Services LLC

Maximum Dry Density & Optimum Moisture

☑ AASHTO T 99 | ☐ AASHTO T 180 | ☐ ASTM D698 | ☐ ASTM D1557

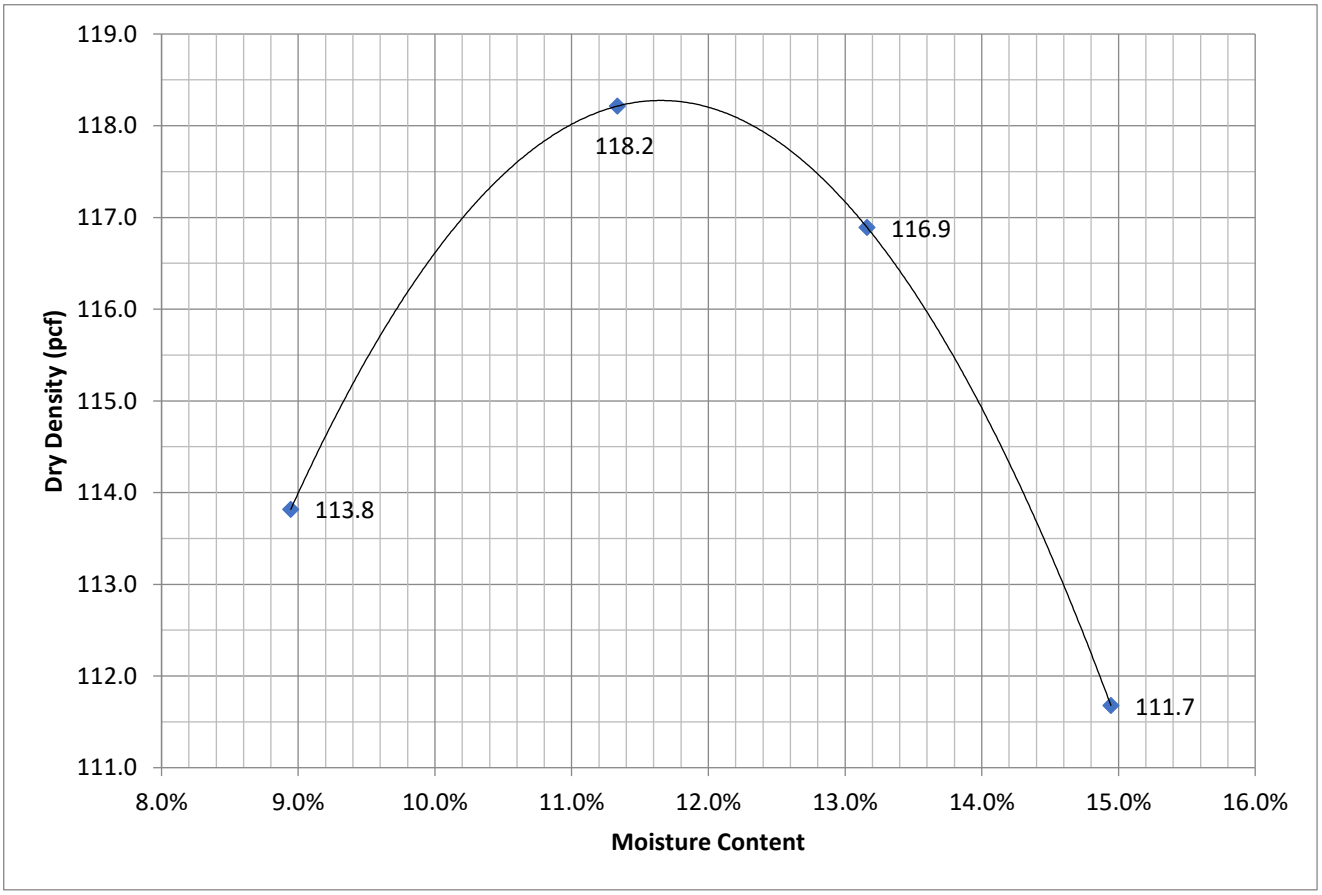
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ACS Lab #	23-5845-1	Material Supplier:	-
Client Name:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Date Tested:	12/22/2024
Project City:	Goodyear	Tested By:	Keagen Mayfield
		Reviewed By:	Fernando Montero

Sample Location: B-187 @ 0.0 - 5.0

Method: ☑ A ☐ B ☐ C ☐ D

Dry Density	113.8	118.2	116.9	111.7
Moisture Content	8.9%	11.3%	13.2%	14.9%

Uncorrected Dry Density	118.3	Uncorrected Moisture Content	11.7
% Rock	0	% Passing	100
Rock Corrected Dry Density	**118.3**	Rock Corrected Moisture Content	**11.7**
Specific Gravity of Oversize Aggregate	**2.600**		



Fernando Montero

Project Manager

ACS Services LLC

Maximum Dry Density & Optimum Moisture

☐ AASHTO T 99 | ☐ AASHTO T 180 | ☑ ASTM D698 | ☐ ASTM D1557

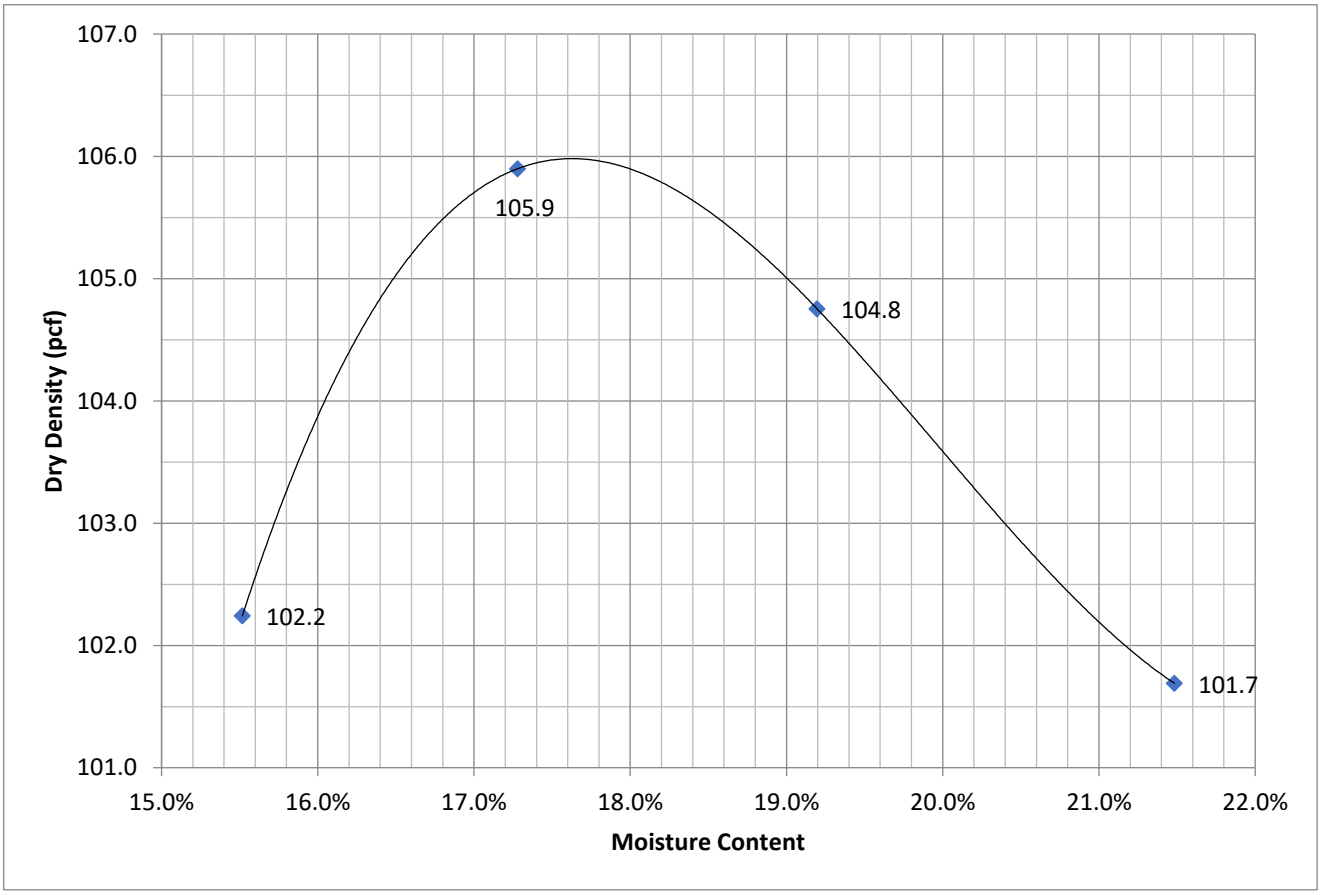
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ACS Lab #	24-1141-1	Material Supplier:	-
Client Name:	Ethos	Sample Date:	12/18/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Date Tested:	1/19/2024
Project City:	Goodyear	Tested By:	Keagen Mayfield
		Reviewed By:	Fernando Montero

Sample Location: P-6 @ 0.5 - 5.0

Method: ☑ A ☐ B ☐ C ☐ D

Dry Density	102.2	105.9	104.8	101.7
Moisture Content	15.5%	17.3%	19.2%	21.5%

Uncorrected Dry Density	105.9	Uncorrected Moisture Content	17.6
% Rock	2	% Passing	98
Rock Corrected Dry Density	**105.9**	Rock Corrected Moisture Content	**17.6**
Specific Gravity of Oversize Aggregate	**2.600**		



Fernando Montero

Project Manager

ACS Services LLC

Maximum Dry Density & Optimum Moisture

☐ AASHTO T 99 | ☐ AASHTO T 180 | ☑ ASTM D698 | ☐ ASTM D1557

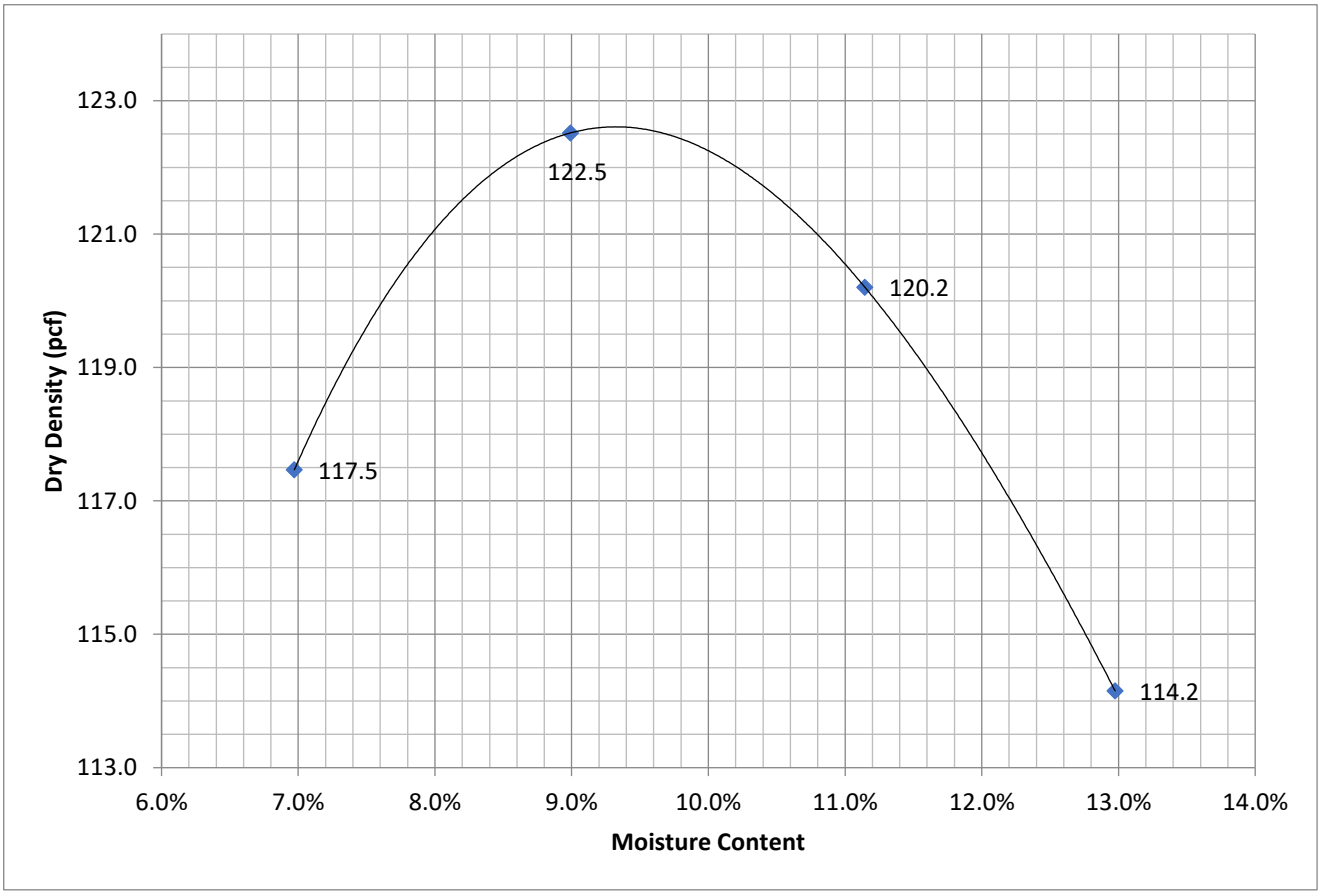
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ACS Lab #	24-3863-1	Material Supplier:	-
Client Name:	Ethos	Sample Date:	7/8/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Date Tested:	7/9/2024
Project City:	Goodyear	Tested By:	Keagen Mayfield
		Reviewed By:	Fernando Montero

Sample Location: P-06A (0.0 - 2.0)

Method: ☑ A ☐ B ☐ C ☐ D

Dry Density	117.5	122.5	120.2	114.2
Moisture Content	7.0%	9.0%	11.1%	13.0%

Uncorrected Dry Density	122.6	Uncorrected Moisture Content	9.3
% Rock	5	% Passing	95
Rock Corrected Dry Density	**124.2**	Rock Corrected Moisture Content	**8.9**
Specific Gravity of Oversize Aggregate	**2.600**		



Fernando Montero

Project Manager

ACS Services LLC	Maximum Dry Density & Optimum Moisture
	☐ AASHTO T 99 | ☐ AASHTO T 180 | ☑ ASTM D698 | ☐ ASTM D1557

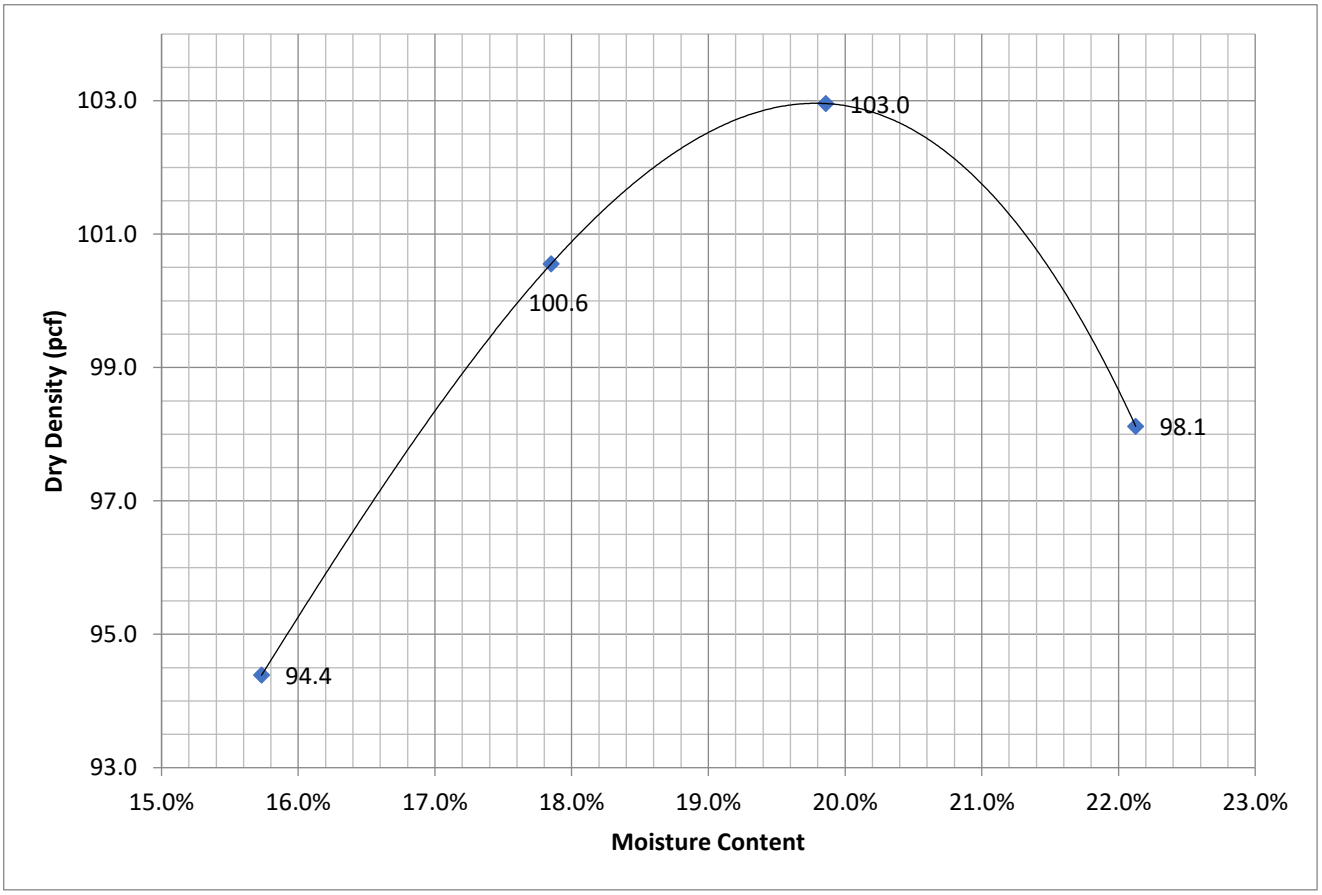
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ACS Lab #	24-1141-3	Material Supplier:	-
Client Name:	Ethos	Sample Date:	12/18/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Date Tested:	1/18/2024
Project City:	Goodyear	Tested By:	Mahalia Davis
		Reviewed By:	Fernando Montero

Sample Location: P-7 @ 0.5 - 5.0

Method: ☑ A ☐ B ☐ C ☐ D

Dry Density	94.4	100.6	103.0	98.1
Moisture Content	15.7%	17.9%	19.9%	22.1%

Uncorrected Dry Density	103	Uncorrected Moisture Content	19.8
% Rock	1	% Passing	99
Rock Corrected Dry Density	**103.0**	Rock Corrected Moisture Content	**19.8**
Specific Gravity of Oversize Aggregate	**2.600**		



Fernando Montero

Project Manager

ACS Services LLC	Maximum Dry Density & Optimum Moisture
	☐ AASHTO T 99 | ☐ AASHTO T 180 | ☑ ASTM D698 | ☐ ASTM D1557

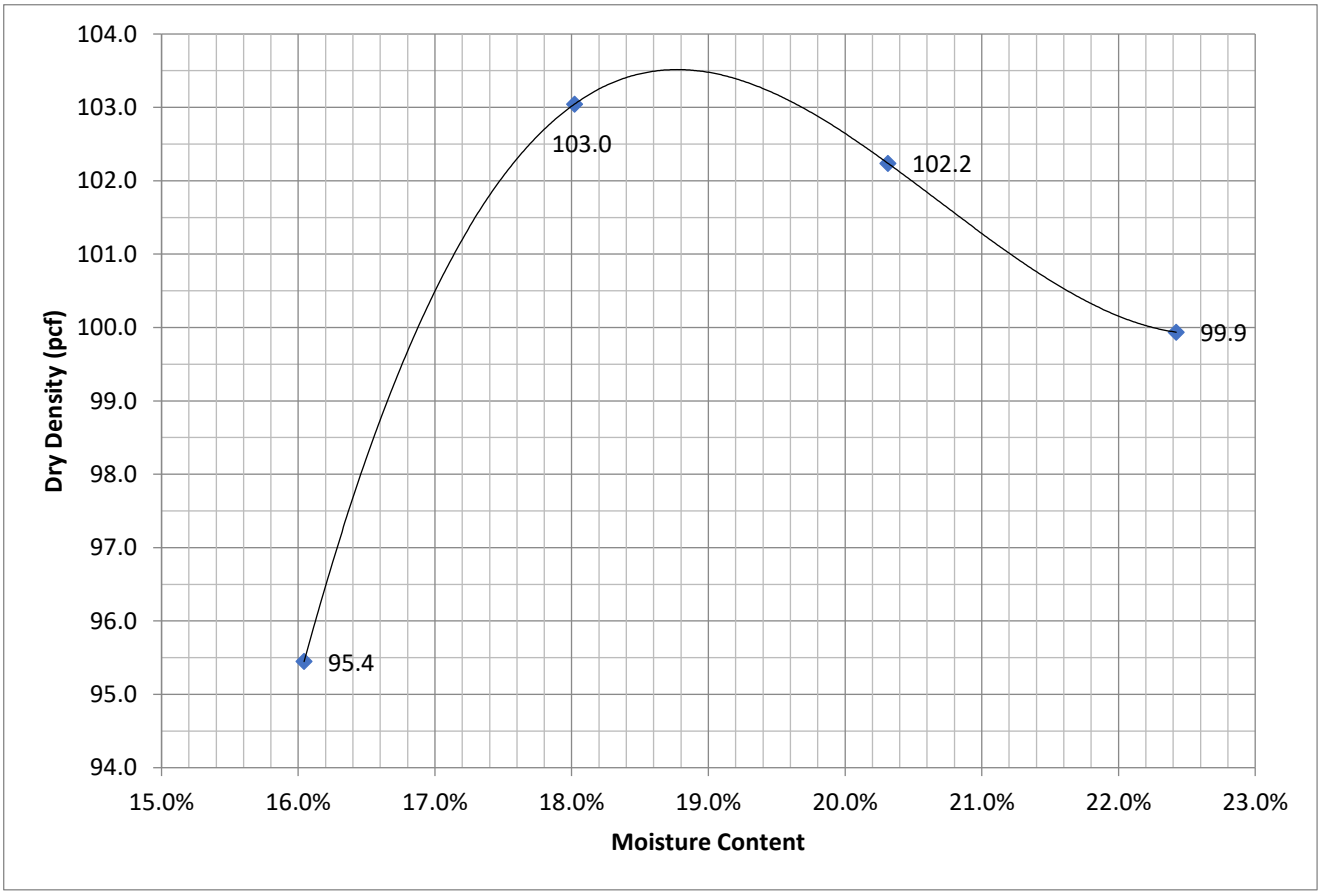
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ACS Lab #	24-1141-5	Material Supplier:	-
Client Name:	Ethos	Sample Date:	12/18/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Date Tested:	1/19/2024
Project City:	Goodyear	Tested By:	Keagen Mayfield
		Reviewed By:	Fernando Montero

Sample Location: P-8 @ 0.5 - 5.0

Method: ☑ A ☐ B ☐ C ☐ D

Dry Density	95.4	103.0	102.2	99.9
Moisture Content	16.0%	18.0%	20.3%	22.4%

Uncorrected Dry Density	103.5	Uncorrected Moisture Content	18.7
% Rock	0	% Passing	100
Rock Corrected Dry Density	**103.5**	Rock Corrected Moisture Content	**18.7**
Specific Gravity of Oversize Aggregate	**2.600**		



Fernando Montero

Project Manager

ACS Services LLC	Maximum Dry Density & Optimum Moisture
	☐ AASHTO T 99 | ☐ AASHTO T 180 | ☑ ASTM D698 | ☐ ASTM D1557

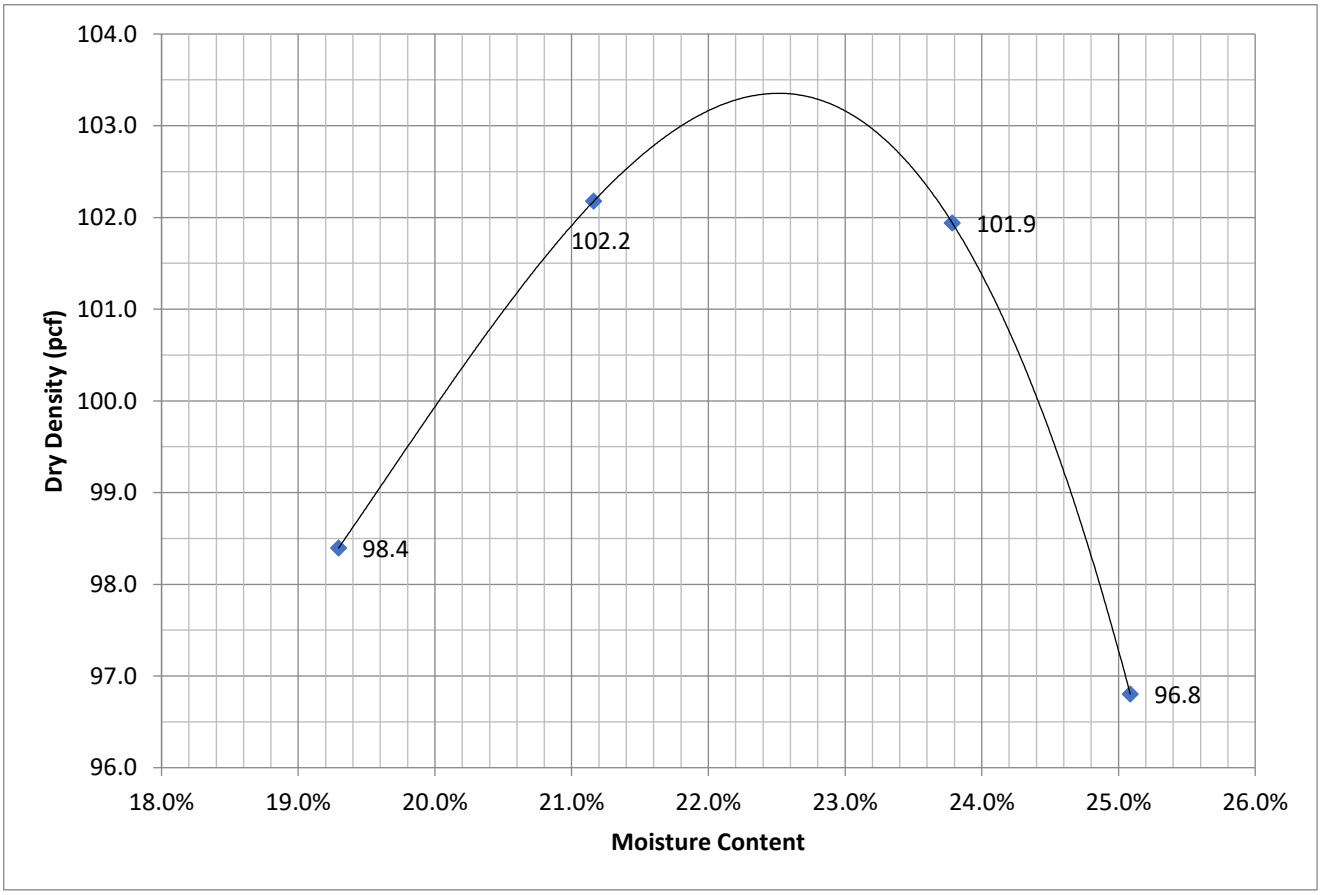
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Client Name:	Ethos	Sample Date:	12/18/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Date Tested:	1/18/2024
Project City:	Goodyear	Tested By:	Mahalia Davis
		Reviewed By:	Fernando Montero

Sample Location: P-9 @ 0.5 - 5.0

Method: ☑ A ☐ B ☐ C ☐ D

Dry Density	98.4	102.2	101.9	96.8
Moisture Content	19.3%	21.2%	23.8%	25.1%

Uncorrected Dry Density	103.3	Uncorrected Moisture Content	22.5
% Rock	0	% Passing	100
Rock Corrected Dry Density	**103.3**	Rock Corrected Moisture Content	**22.5**
Specific Gravity of Oversize Aggregate	**2.600**		



Fernando Montero

Project Manager

ACS Services LLC

Swell / Settlement Potential of Soils
ASTM D4546-03

ACS Project #	**2201026**	Material Type:	Soil
ACS Lab #	22-3009-1	Sample Date:	-
Client Name:	Ethos	Sampled By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date:	6/28/2022
Project Address:	MC85 to Van Buren	Laboratory Test By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Sample Source:	B-8 @ 0.0 -5.0		

Test Method: [ ] A [ ] B [x] C

Standard Proctor Information

Maximum Dry Density:	120.1	pcf
Optimum Moisture Content:	12.4	%

Specimen Preparation

95% of Maximum Dry Density:	114.1	pcf
-2% of Optimum Moisture Content:	10.4	%
Wet Density of Sample:	126.0	pcf
Test Weight (Wet):	152.1	g
Test Weight (Dry):	137.8	g
Moisture Sample (Wet):	102.9	g
Moisture Sample (Dry):	98.2	g
Sample Moisture Content:	4.8	%
Sample Weight (In situ):	144.4	g
Additional Moisture Needed:	7.7	ml
Ring Weight:	45.3	g
Total Weight Ring + Sample:	197.4	g
Initial Sample Saturation:	30	%

Specimen Test Data Post-Swell Test

Initial Specimen Height:		in
Final Specimen Height:		in
Final Specimen Weight:		g
Final Specimen Moisture Content:		%
Final Sample Saturation:		%

Final Wet Weight

Final Dry Weight

Swell / Settlement Potential Results

Load at Inundation (ksf)	
% Strain Before Inundation:	
% Strain After Inundation:	
Percent Heave:	

Correction Factor

Calibration Correction Factor	NONE

Corrected Swell	1.5

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

Ring Mold Information

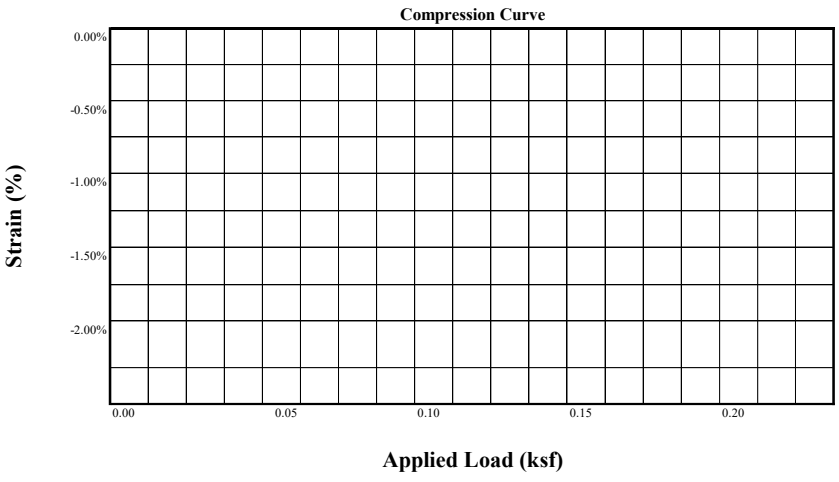
Ring Weight (g)	45.3
Ring Height (in)	1.000
Ring Diameter (in)	2.421
Ring Area (in^2)	4.604

Weight Used in Swell Test

Load Weight:	100 psf

Dial Readings During Test

Time Elapsed	Dial Reading (0.001")
0 (w/ seating pressure)	0.000
0 (w/ load applied)	0.000
30 Seconds	0.001
1 Minute	0.001
2 Minutes	0.004
4 Minutes	0.007
8 Minutes	0.011
15 Minutes	0.013
30 Minutes	0.013
1 Hour	0.014
2 Hours	0.014
4 Hours	0.014
8 Hours	0.015
15 Hours	0.015
24 Hours	0.015



ACS Services LLC

Swell / Settlement Potential of Soils
ASTM D4546-03

ACS Project #	**2201026**	Material Type:	Soil
ACS Lab #	22-3009-1	Sample Date:	-
Client Name:	Ethos	Sampled By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date:	6/29/2022
Project Address:	MC85 to Van Buren	Laboratory Test By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Sample Source:	B-8 @ 0.0 -5.0		

Test Method: [ ] A [ ] B [x] C

Standard Proctor Information

Maximum Dry Density:	120.1	pcf
Optimum Moisture Content:	12.4	%

Specimen Preparation

95% of Maximum Dry Density:	114.1	pcf
-2% of Optimum Moisture Content:	10.4	%
Wet Density of Sample:	126.0	pcf
Test Weight (Wet):	152.1	g
Test Weight (Dry):	137.8	g
Moisture Sample (Wet):	102.9	g
Moisture Sample (Dry):	98.2	g
Sample Moisture Content:	4.8	%
Sample Weight (In situ):	144.4	g
Additional Moisture Needed:	7.7	ml
Ring Weight:	45.3	g
Total Weight Ring + Sample:	197.4	g
Initial Sample Saturation:	30	%

Specimen Test Data Post-Swell Test

Initial Specimen Height:		in
Final Specimen Height:		in
Final Specimen Weight:		g
Final Specimen Moisture Content:		%
Final Sample Saturation:		%

Final Wet Weight

Final Dry Weight

Swell / Settlement Potential Results

Load at Inundation (ksf)	
% Strain Before Inundation:	
% Strain After Inundation:	
Percent Heave:	

Correction Factor

Calibration Correction Factor	NONE

Corrected Swell	1.2

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

Ring Mold Information

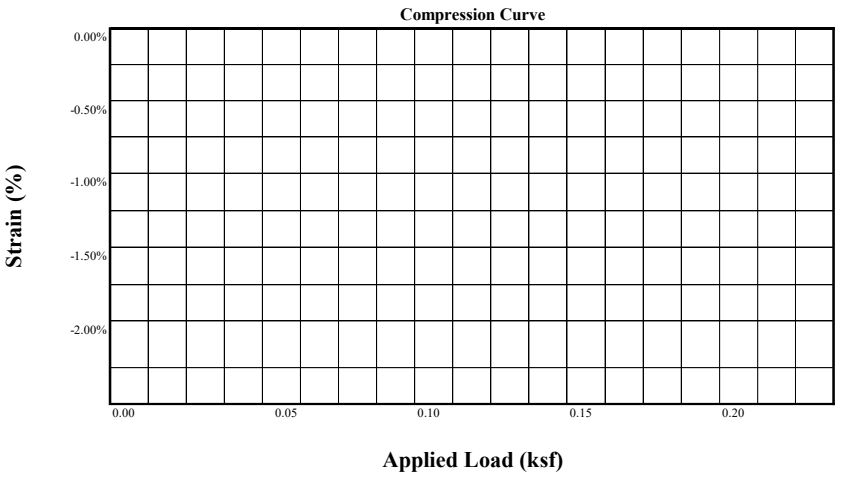
Ring Weight (g)	45.3
Ring Height (in)	1.000
Ring Diameter (in)	2.421
Ring Area (in^2)	4.604

Weight Used in Swell Test

Load Weight:	144 psf

Dial Readings During Test

Time Elapsed	Dial Reading (0.001")
0 (w/ seating pressure)	0.000
0 (w/ load applied)	0.000
30 Seconds	0.001
1 Minute	0.002
2 Minutes	0.003
4 Minutes	0.005
8 Minutes	0.008
15 Minutes	0.010
30 Minutes	0.011
1 Hour	0.012
2 Hours	0.012
4 Hours	0.012
8 Hours	0.012
15 Hours	0.012
24 Hours	0.012



ACS Services LLC

Swell / Settlement Potential of Soils
ASTM D4546-03

ACS Project #	**2201026**	Material Type:	Soil
ACS Lab #	22-3009-1	Sample Date:	-
Client Name:	Ethos	Sampled By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date:	7/5/2022
Project Address:	MC85 to Van Buren	Laboratory Test By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Sample Source:	B-8 @ 0.0 -5.0		

Test Method: [ ] A [ ] B [x] C

Standard Proctor Information

Maximum Dry Density:	120.1	pcf
Optimum Moisture Content:	12.4	%

Specimen Preparation

95% of Maximum Dry Density:	114.1	pcf
-2% of Optimum Moisture Content:	10.4	%
Wet Density of Sample:	126.0	pcf
Test Weight (Wet):	152.1	g
Test Weight (Dry):	137.8	g
Moisture Sample (Wet):	104.5	g
Moisture Sample (Dry):	99.8	g
Sample Moisture Content:	4.7	%
Sample Weight (In situ):	144.3	g
Additional Moisture Needed:	7.8	ml
Ring Weight:	44.7	g
Total Weight Ring + Sample:	196.8	g
Initial Sample Saturation:	29	%

Specimen Test Data Post-Swell Test

Initial Specimen Height:		in
Final Specimen Height:		in
Final Specimen Weight:		g
Final Specimen Moisture Content:		%
Final Sample Saturation:		%

Final Wet Weight

Final Dry Weight

Swell / Settlement Potential Results

Load at Inundation (ksf)	
% Strain Before Inundation:	
% Strain After Inundation:	
Percent Heave:	

Correction Factor

Calibration Correction Factor	NONE

Corrected Swell	1.5

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

Ring Mold Information

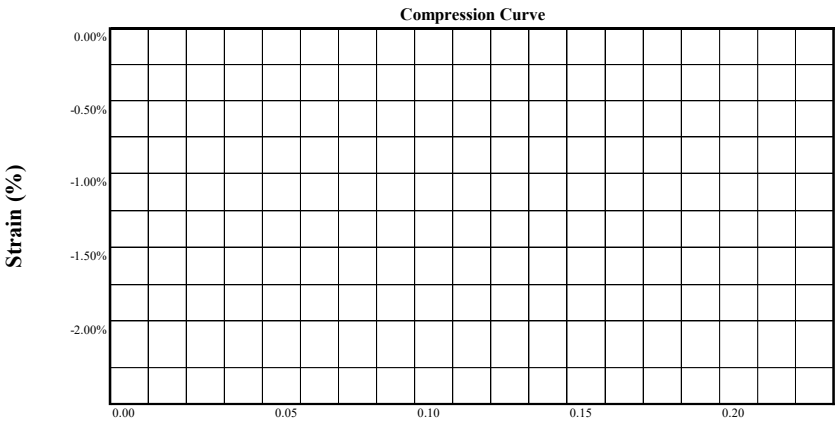
Ring Weight (g)	44.7
Ring Height (in)	1.000
Ring Diameter (in)	2.421
Ring Area (in^2)	4.604

Weight Used in Swell Test

Load Weight:	200 psf

Dial Readings During Test

Time Elapsed	Dial Reading (0.001")
0 (w/ seating pressure)	0.000
0 (w/ load applied)	0.000
30 Seconds	0.000
1 Minute	0.003
2 Minutes	0.004
4 Minutes	0.008
8 Minutes	0.011
15 Minutes	0.012
30 Minutes	0.013
1 Hour	0.013
2 Hours	0.013
4 Hours	0.014
8 Hours	-
15 Hours	-
24 Hours	0.015



ACS Services LLC

Swell / Settlement Potential of Soils
ASTM D4546-03

ACS Project #	**2201026**	Material Type:	Native
ACS Lab #	22-1582-1	Sample Date:	-
Client Name:	Ethos	Sampled By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date:	3/30/2022
Project Address:	MC85 to Van Buren	Laboratory Test By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Sample Source:	B-9 @ 0.0 - 5.0'		

Test Method: [ ] A [ ] B [x] C

Standard Proctor Information

Maximum Dry Density:	120.1	pcf
Optimum Moisture Content:	12.4	%

Specimen Preparation

95% of Maximum Dry Density:	114.1	pcf
-2% of Optimum Moisture Content:	10.4	%
Wet Density of Sample:	126.0	pcf
Test Weight (Wet):	152.1	g
Test Weight (Dry):	137.8	g
Moisture Sample (Wet):	102.2	g
Moisture Sample (Dry):	98.5	g
Sample Moisture Content:	3.8	%
Sample Weight (In situ):	142.9	g
Additional Moisture Needed:	9.2	ml
Ring Weight:	45.7	g
Total Weight Ring + Sample:	197.8	g
Initial Sample Saturation:	23	%

Specimen Test Data Post-Swell Test

Initial Specimen Height:		in
Final Specimen Height:		in
Final Specimen Weight:		g
Final Specimen Moisture Content:		%
Final Sample Saturation:		%

Final Wet Weight

Final Dry Weight

Swell / Settlement Potential Results

Load at Inundation (ksf)	
% Strain Before Inundation:	
% Strain After Inundation:	
Percent Heave:	

Correction Factor

Calibration Correction Factor	NONE

Corrected Swell	2.4

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

Ring Mold Information

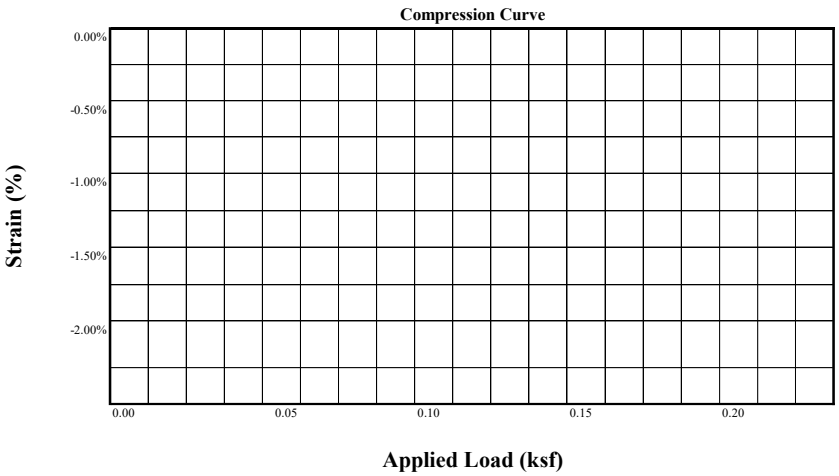
Ring Weight (g)	45.7
Ring Height (in)	1.000
Ring Diameter (in)	2.421
Ring Area (in^2)	4.604

Weight Used in Swell Test

Load Weight:	100 psf

Dial Readings During Test

Time Elapsed	Dial Reading (0.001")
0 (w/ seating pressure)	0.000
0 (w/ load applied)	0.000
30 Seconds	0.003
1 Minute	0.005
2 Minutes	0.007
4 Minutes	0.011
8 Minutes	0.016
15 Minutes	0.019
30 Minutes	0.021
1 Hour	0.022
2 Hours	0.023
4 Hours	0.024
8 Hours	0.024
15 Hours	0.024
24 Hours	0.024



ACS Services LLC

Swell / Settlement Potential of Soils
ASTM D4546-03

ACS Project #	**2201026**	Material Type:	Soil
ACS Lab #	22-2240-1	Sample Date:	-
Client Name:	Ethos	Sampled By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date:	5/12/2022
Project Address:	MC85 to Van Buren	Laboratory Test By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Sample Source:	B-13 @ 0.0 - 5.0		

Test Method: [ ] A [ ] B [x] C

Standard Proctor Information

Maximum Dry Density:	120.7	pcf
Optimum Moisture Content:	13.1	%

Specimen Preparation

95% of Maximum Dry Density:	114.7	pcf
-2% of Optimum Moisture Content:	11.1	%
Wet Density of Sample:	127.4	pcf
Test Weight (Wet):	153.8	g
Test Weight (Dry):	138.5	g
Moisture Sample (Wet):	102.0	g
Moisture Sample (Dry):	90.8	g
Sample Moisture Content:	12.3	%
Sample Weight (In situ):	155.5	g
Additional Moisture Needed:	-1.7	ml
Ring Weight:	45.1	g
Total Weight Ring + Sample:	198.9	g
Initial Sample Saturation:	78	%

Specimen Test Data Post-Swell Test

Initial Specimen Height:		in
Final Specimen Height:		in
Final Specimen Weight:		g
Final Specimen Moisture Content:		%
Final Sample Saturation:		%

Final Wet Weight

Final Dry Weight

Swell / Settlement Potential Results

Load at Inundation (ksf)	
% Strain Before Inundation:	
% Strain After Inundation:	
Percent Heave:	

Correction Factor

Calibration Correction Factor	NONE

Corrected Swell	1.7

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

Ring Mold Information

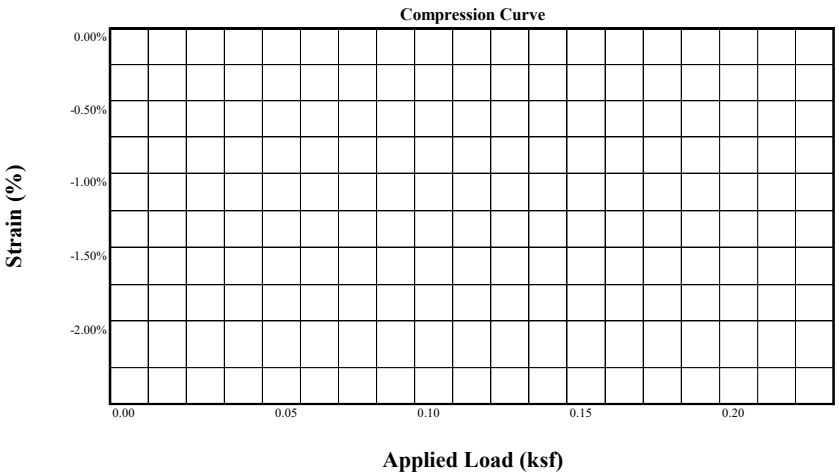
Ring Weight (g)	45.1
Ring Height (in)	1.000
Ring Diameter (in)	2.421
Ring Area (in^2)	4.604

Weight Used in Swell Test

Load Weight:	100 psf

Dial Readings During Test

Time Elapsed	Dial Reading (0.001")
0 (w/ seating pressure)	0.000
0 (w/ load applied)	0.000
30 Seconds	0.003
1 Minute	0.007
2 Minutes	0.010
4 Minutes	0.015
8 Minutes	0.017
15 Minutes	0.017
30 Minutes	0.017
1 Hour	0.017
2 Hours	0.017
4 Hours	0.017
8 Hours	0.017
15 Hours	0.017
24 Hours	0.017



ACS Services LLC

Swell / Settlement Potential of Soils
ASTM D4546-03

ACS Project #	**2201026**	Material Type:	Soil
ACS Lab #	22-2142-4	Sample Date:	-
Client Name:	Ethos	Sampled By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date:	5/9/2022
Project Address:	MC85 to Van Buren	Laboratory Test By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Sample Source:	B-15 @ 0.0 - 5.0		

Test Method: [ ] A [ ] B [x] C

Standard Proctor Information

Maximum Dry Density:	122.8	pcf
Optimum Moisture Content:	11.8	%

Specimen Preparation

95% of Maximum Dry Density:	116.7	pcf
-2% of Optimum Moisture Content:	9.8	%
Wet Density of Sample:	128.1	pcf
Test Weight (Wet):	154.7	g
Test Weight (Dry):	140.9	g
Moisture Sample (Wet):	103.1	g
Moisture Sample (Dry):	95.6	g
Sample Moisture Content:	7.8	%
Sample Weight (In situ):	151.9	g
Additional Moisture Needed:	2.8	ml
Ring Weight:	45.1	g
Total Weight Ring + Sample:	199.8	g
Initial Sample Saturation:	53	%

Specimen Test Data Post-Swell Test

Initial Specimen Height:		in
Final Specimen Height:		in
Final Specimen Weight:		g
Final Specimen Moisture Content:		%
Final Sample Saturation:		%

Final Wet Weight

Final Dry Weight

Swell / Settlement Potential Results

Load at Inundation (ksf)	
% Strain Before Inundation:	
% Strain After Inundation:	
Percent Heave:	

Correction Factor

Calibration Correction Factor	NONE

Corrected Swell	0.6

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

Ring Mold Information

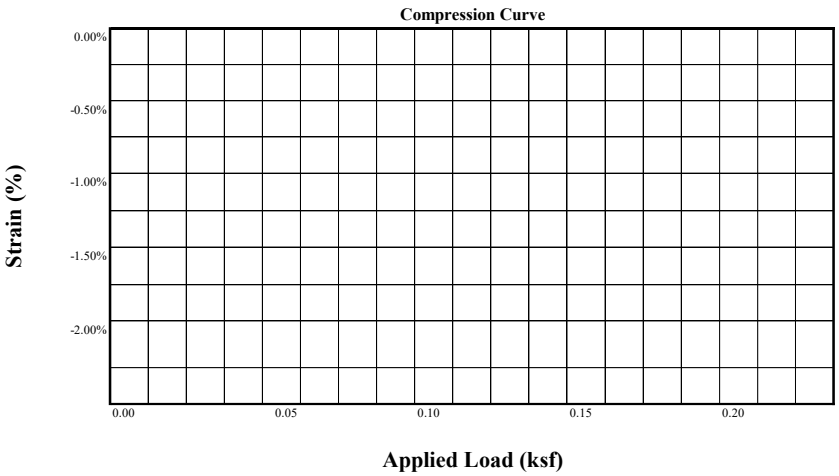
Ring Weight (g)	45.1
Ring Height (in)	1.000
Ring Diameter (in)	2.421
Ring Area (in^2)	4.604

Weight Used in Swell Test

Load Weight:	100 psf

Dial Readings During Test

Time Elapsed	Dial Reading (0.001")
0 (w/ seating pressure)	0.000
0 (w/ load applied)	0.000
30 Seconds	0.001
1 Minute	0.002
2 Minutes	0.004
4 Minutes	0.005
8 Minutes	0.005
15 Minutes	0.005
30 Minutes	0.005
1 Hour	0.006
2 Hours	0.006
4 Hours	0.006
8 Hours	0.006
15 Hours	0.006
24 Hours	0.006



ACS Services LLC

Swell / Settlement Potential of Soils
ASTM D4546-03

ACS Project #	**2201026**	Material Type:	Soil
ACS Lab #	22-3009-2	Sample Date:	-
Client Name:	Ethos	Sampled By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date:	6/28/2022
Project Address:	MC85 to Van Buren	Laboratory Test By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Sample Source:	B-18 @ 0.0 - 5.0		

Test Method: [ ] A [ ] B [x] C

Standard Proctor Information

Maximum Dry Density:	118.7	pcf
Optimum Moisture Content:	12.7	%

Specimen Preparation

95% of Maximum Dry Density:	112.8	pcf
-2% of Optimum Moisture Content:	10.7	%
Wet Density of Sample:	124.8	pcf
Test Weight (Wet):	150.7	g
Test Weight (Dry):	136.2	g
Moisture Sample (Wet):	103.2	g
Moisture Sample (Dry):	101.2	g
Sample Moisture Content:	2.0	%
Sample Weight (In situ):	138.8	g
Additional Moisture Needed:	11.9	ml
Ring Weight:	44.9	g
Total Weight Ring + Sample:	195.6	g
Initial Sample Saturation:	12	%

Specimen Test Data Post-Swell Test

Initial Specimen Height:		in
Final Specimen Height:		in
Final Specimen Weight:		g
Final Specimen Moisture Content:		%
Final Sample Saturation:		%

Final Wet Weight

Final Dry Weight

Swell / Settlement Potential Results

Load at Inundation (ksf)	
% Strain Before Inundation:	
% Strain After Inundation:	
Percent Heave:	

Correction Factor

Calibration Correction Factor	NONE

Corrected Swell	0.9

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

Ring Mold Information

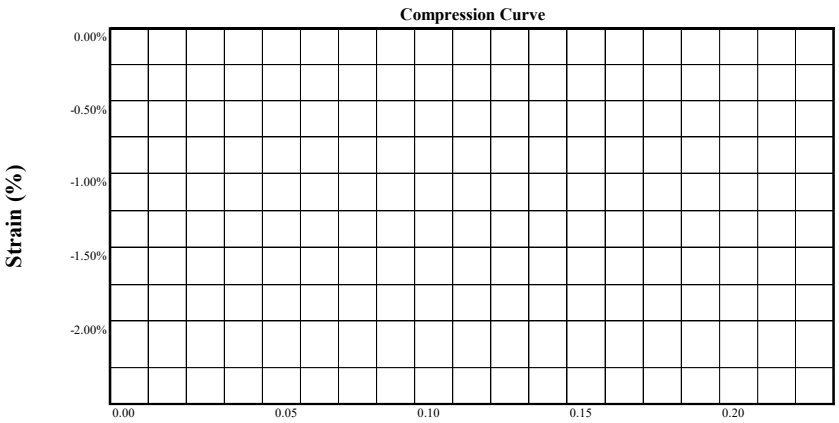
Ring Weight (g)	44.9
Ring Height (in)	1.000
Ring Diameter (in)	2.421
Ring Area (in^2)	4.604

Weight Used in Swell Test

Load Weight:	100 psf

Dial Readings During Test

Time Elapsed	Dial Reading (0.001")
0 (w/ seating pressure)	0.000
0 (w/ load applied)	0.000
30 Seconds	0.001
1 Minute	0.002
2 Minutes	0.004
4 Minutes	0.005
8 Minutes	0.006
15 Minutes	0.006
30 Minutes	0.007
1 Hour	0.008
2 Hours	0.008
4 Hours	0.008
8 Hours	0.009
15 Hours	0.009
24 Hours	0.009



ACS Services LLC

Swell / Settlement Potential of Soils
ASTM D4546-03

ACS Project #	**2201026**	Material Type:	Soil
ACS Lab #	22-3009-2	Sample Date:	-
Client Name:	Ethos	Sampled By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date:	6/29/2022
Project Address:	MC85 to Van Buren	Laboratory Test By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Sample Source:	B-18 @ 0.0 - 5.0		

Test Method: [ ] A [ ] B [x] C

Standard Proctor Information

Maximum Dry Density:	118.7	pcf
Optimum Moisture Content:	12.7	%

Specimen Preparation

95% of Maximum Dry Density:	112.8	pcf
-2% of Optimum Moisture Content:	10.7	%
Wet Density of Sample:	124.8	pcf
Test Weight (Wet):	150.7	g
Test Weight (Dry):	136.2	g
Moisture Sample (Wet):	103.2	g
Moisture Sample (Dry):	101.2	g
Sample Moisture Content:	2.0	%
Sample Weight (In situ):	138.8	g
Additional Moisture Needed:	11.9	ml
Ring Weight:	44.9	g
Total Weight Ring + Sample:	195.6	g
Initial Sample Saturation:	12	%

Specimen Test Data Post-Swell Test

Initial Specimen Height:		in
Final Specimen Height:		in
Final Specimen Weight:		g
Final Specimen Moisture Content:		%
Final Sample Saturation:		%

Final Wet Weight

Final Dry Weight

Swell / Settlement Potential Results

Load at Inundation (ksf)	
% Strain Before Inundation:	
% Strain After Inundation:	
Percent Heave:	

Correction Factor

Calibration Correction Factor	NONE

Corrected Swell	0.7

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

Ring Mold Information

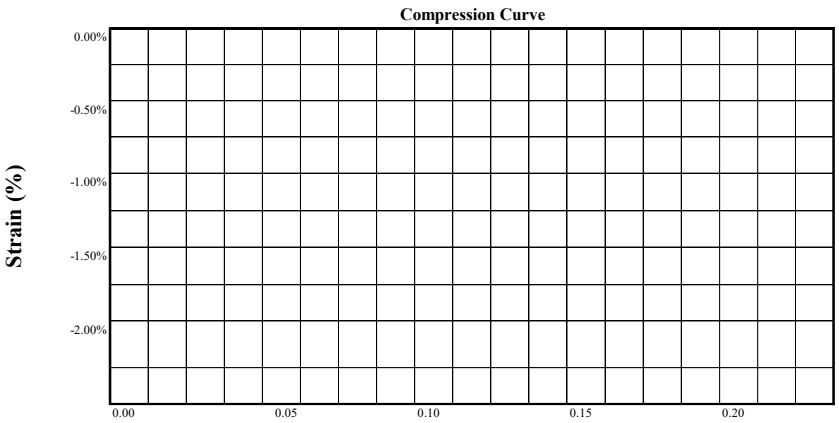
Ring Weight (g)	44.9
Ring Height (in)	1.000
Ring Diameter (in)	2.421
Ring Area (in^2)	4.604

Weight Used in Swell Test

Load Weight:	144 psf

Dial Readings During Test

Time Elapsed	Dial Reading (0.001")
0 (w/ seating pressure)	0.000
0 (w/ load applied)	0.000
30 Seconds	0.001
1 Minute	0.001
2 Minutes	0.002
4 Minutes	0.003
8 Minutes	0.004
15 Minutes	0.005
30 Minutes	0.005
1 Hour	0.005
2 Hours	0.006
4 Hours	0.006
8 Hours	0.007
15 Hours	0.007
24 Hours	0.007



ACS Services LLC

Swell / Settlement Potential of Soils
ASTM D4546-03

ACS Project #	**2201026**	Material Type:	Soil
ACS Lab #	22-3009-2	Sample Date:	-
Client Name:	Ethos	Sampled By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date:	7/5/2022
Project Address:	MC85 to Van Buren	Laboratory Test By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Sample Source:	B-18 @ 0.0 - 5.0		

Test Method: [ ] A [ ] B [x] C

Standard Proctor Information

Maximum Dry Density:	118.7	pcf
Optimum Moisture Content:	12.7	%

Specimen Preparation

95% of Maximum Dry Density:	112.8	pcf
-2% of Optimum Moisture Content:	10.7	%
Wet Density of Sample:	124.8	pcf
Test Weight (Wet):	150.7	g
Test Weight (Dry):	136.2	g
Moisture Sample (Wet):	103.3	g
Moisture Sample (Dry):	102.9	g
Sample Moisture Content:	0.4	%
Sample Weight (In situ):	136.7	g
Additional Moisture Needed:	14.0	ml
Ring Weight:	44.3	g
Total Weight Ring + Sample:	195.0	g
Initial Sample Saturation:	2	%

Specimen Test Data Post-Swell Test

Initial Specimen Height:		in
Final Specimen Height:		in
Final Specimen Weight:		g
Final Specimen Moisture Content:		%
Final Sample Saturation:		%

Final Wet Weight

Final Dry Weight

Swell / Settlement Potential Results

Load at Inundation (ksf)	
% Strain Before Inundation:	
% Strain After Inundation:	
Percent Heave:	

Correction Factor

Calibration Correction Factor	NONE

Corrected Swell	0.3

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

Ring Mold Information

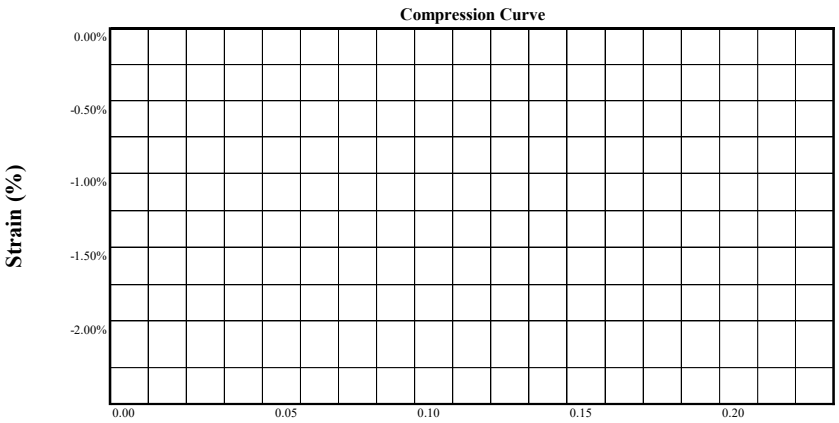
Ring Weight (g)	44.3
Ring Height (in)	1.000
Ring Diameter (in)	2.421
Ring Area (in^2)	4.604

Weight Used in Swell Test

Load Weight:	200 psf

Dial Readings During Test

Time Elapsed	Dial Reading (0.001")
0 (w/ seating pressure)	0.000
0 (w/ load applied)	0.000
30 Seconds	0.000
1 Minute	0.000
2 Minutes	0.001
4 Minutes	0.002
8 Minutes	0.002
15 Minutes	0.002
30 Minutes	0.002
1 Hour	0.002
2 Hours	0.002
4 Hours	0.002
8 Hours	0.003
15 Hours	0.003
24 Hours	0.003



ACS Services LLC

Swell / Settlement Potential of Soils
ASTM D4546-03

ACS Project #	**2201026**	Material Type:	Native
ACS Lab #	22-1655-1	Sample Date:	-
Client Name:	Ethos	Sampled By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date:	4/13/2022
Project Address:	MC85 to Van Buren	Laboratory Test By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Sample Source:	B-26 @ 0.0 - 5.0'		

Test Method: [ ] A [ ] B [x] C

Standard Proctor Information

Maximum Dry Density:	118.7	pcf
Optimum Moisture Content:	12.7	%

Specimen Preparation

95% of Maximum Dry Density:	112.8	pcf
-2% of Optimum Moisture Content:	10.7	%
Wet Density of Sample:	124.8	pcf
Test Weight (Wet):	150.7	g
Test Weight (Dry):	136.2	g
Moisture Sample (Wet):	101.9	g
Moisture Sample (Dry):	91.9	g
Sample Moisture Content:	10.9	%
Sample Weight (In situ):	151.0	g
Additional Moisture Needed:	-0.2	ml
Ring Weight:	45.1	g
Total Weight Ring + Sample:	195.8	g
Initial Sample Saturation:	65	%

Specimen Test Data Post-Swell Test

Initial Specimen Height:		in
Final Specimen Height:		in
Final Specimen Weight:		g
Final Specimen Moisture Content:		%
Final Sample Saturation:		%

Final Wet Weight

Final Dry Weight

Swell / Settlement Potential Results

Load at Inundation (ksf)	
% Strain Before Inundation:	
% Strain After Inundation:	
Percent Heave:	

Correction Factor

Calibration Correction Factor	NONE

Corrected Swell	3

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

Ring Mold Information

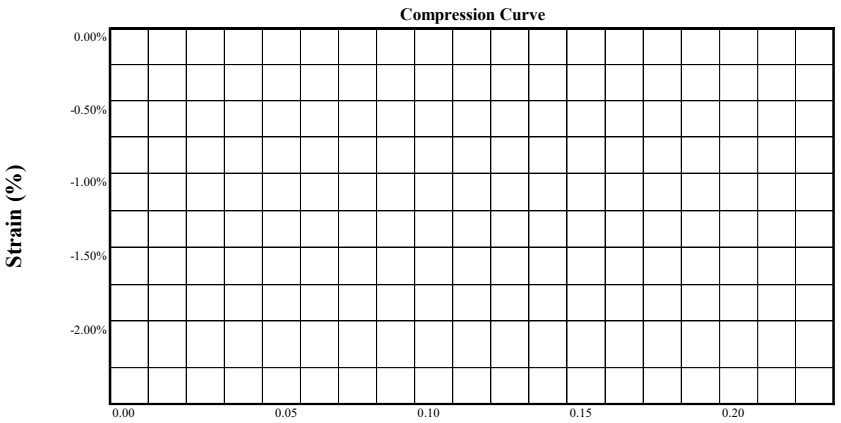
Ring Weight (g)	45.1
Ring Height (in)	1.000
Ring Diameter (in)	2.421
Ring Area (in^2)	4.604

Weight Used in Swell Test

Load Weight:	100 psf

Dial Readings During Test

Time Elapsed	Dial Reading (0.001")
0 (w/ seating pressure)	0.000
0 (w/ load applied)	0.000
30 Seconds	0.003
1 Minute	0.007
2 Minutes	0.013
4 Minutes	0.022
8 Minutes	0.028
15 Minutes	0.029
30 Minutes	0.029
1 Hour	0.030
2 Hours	0.030
4 Hours	0.030
8 Hours	0.030
15 Hours	0.030
24 Hours	0.030



ACS Services LLC

Swell / Settlement Potential of Soils
ASTM D4546-03

ACS Project #	**2201026**	Material Type:	Native
ACS Lab #	22-1414-23	Sample Date:	-
Client Name:	Ethos	Sampled By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date:	3/24/2022
Project Address:	MC85 to Van Buren	Laboratory Test By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Sample Source:	B-35 @ 0.0 - 5.0'		

Test Method: [ ] A [ ] B [x] C

Standard Proctor Information

Maximum Dry Density:	119.1	pcf
Optimum Moisture Content:	12.5	%

Specimen Preparation

95% of Maximum Dry Density:	113.1	pcf
-2% of Optimum Moisture Content:	10.5	%
Wet Density of Sample:	125.0	pcf
Test Weight (Wet):	151.0	g
Test Weight (Dry):	136.6	g
Moisture Sample (Wet):	100.0	g
Moisture Sample (Dry):	95.2	g
Sample Moisture Content:	5.0	%
Sample Weight (In situ):	143.5	g
Additional Moisture Needed:	7.5	ml
Ring Weight:	45.0	g
Total Weight Ring + Sample:	196.0	g
Initial Sample Saturation:	30	%

Specimen Test Data Post-Swell Test

Initial Specimen Height:		in
Final Specimen Height:		in
Final Specimen Weight:		g
Final Specimen Moisture Content:		%
Final Sample Saturation:		%

Final Wet Weight

Final Dry Weight

Swell / Settlement Potential Results

Load at Inundation (ksf)	
% Strain Before Inundation:	
% Strain After Inundation:	
Percent Heave:	

Correction Factor

Calibration Correction Factor	NONE

Corrected Swell	1.9

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

Ring Mold Information

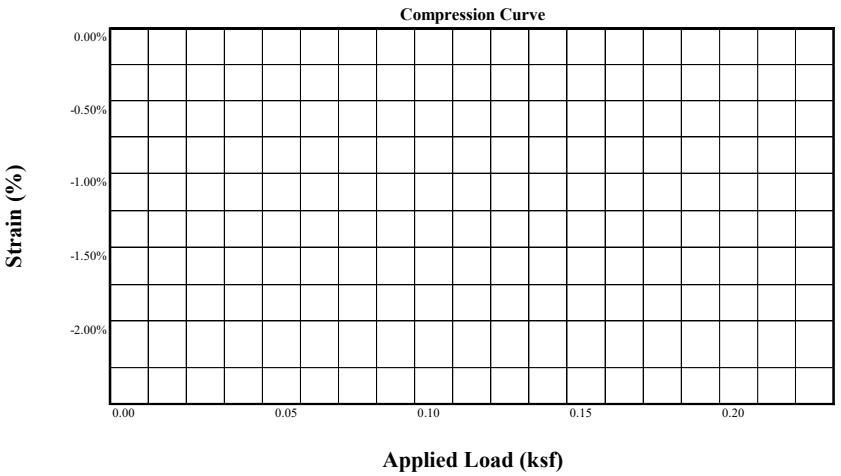
Ring Weight (g)	45.0
Ring Height (in)	1.000
Ring Diameter (in)	2.421
Ring Area (in^2)	4.604

Weight Used in Swell Test

Load Weight:	100 psf

Dial Readings During Test

Time Elapsed	Dial Reading (0.001")
0 (w/ seating pressure)	0.000
0 (w/ load applied)	0.000
30 Seconds	0.003
1 Minute	0.004
2 Minutes	0.006
4 Minutes	0.011
8 Minutes	0.016
15 Minutes	0.017
30 Minutes	0.018
1 Hour	0.018
2 Hours	0.019
4 Hours	0.019
8 Hours	0.019
15 Hours	0.019
24 Hours	0.019



ACS Services LLC

Swell / Settlement Potential of Soils
ASTM D4546-03

ACS Project #	**2201026**	Material Type:	Soil
ACS Lab #	22-3009-3	Sample Date:	-
Client Name:	Ethos	Sampled By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date:	6/28/2022
Project Address:	MC85 to Van Buren	Laboratory Test By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Sample Source:	B-36 @ 0.0 - 5.0		

Test Method: [ ] A [ ] B [x] C

Standard Proctor Information

Maximum Dry Density:	118.7	pcf
Optimum Moisture Content:	12.7	%

Specimen Preparation

95% of Maximum Dry Density:	112.8	pcf
-2% of Optimum Moisture Content:	10.7	%
Wet Density of Sample:	124.8	pcf
Test Weight (Wet):	150.7	g
Test Weight (Dry):	136.2	g
Moisture Sample (Wet):	109.1	g
Moisture Sample (Dry):	106.8	g
Sample Moisture Content:	2.2	%
Sample Weight (In situ):	139.1	g
Additional Moisture Needed:	11.6	ml
Ring Weight:	44.8	g
Total Weight Ring + Sample:	195.5	g
Initial Sample Saturation:	13	%

Specimen Test Data Post-Swell Test

Initial Specimen Height:		in
Final Specimen Height:		in
Final Specimen Weight:		g
Final Specimen Moisture Content:		%
Final Sample Saturation:		%

Final Wet Weight

Final Dry Weight

Swell / Settlement Potential Results

Load at Inundation (ksf)	
% Strain Before Inundation:	
% Strain After Inundation:	
Percent Heave:	

Correction Factor

Calibration Correction Factor	NONE

Corrected Swell	2

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

Ring Mold Information

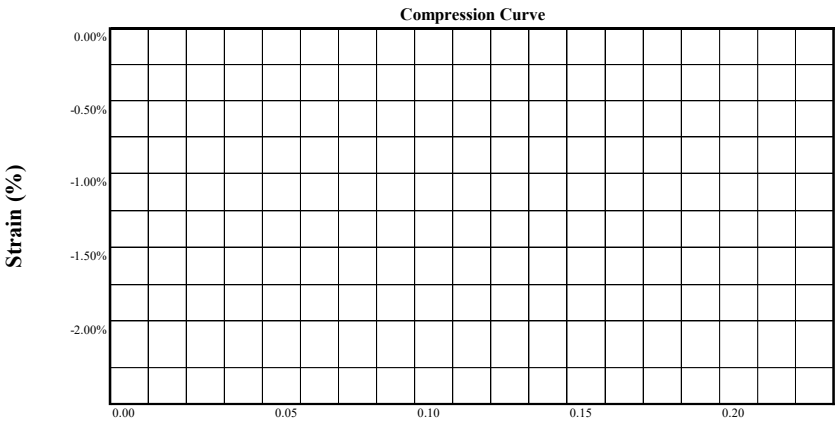
Ring Weight (g)	44.8
Ring Height (in)	1.000
Ring Diameter (in)	2.421
Ring Area (in^2)	4.604

Weight Used in Swell Test

Load Weight:	100 psf

Dial Readings During Test

Time Elapsed	Dial Reading (0.001")
0 (w/ seating pressure)	0.000
0 (w/ load applied)	0.000
30 Seconds	0.003
1 Minute	0.006
2 Minutes	0.009
4 Minutes	0.014
8 Minutes	0.015
15 Minutes	0.016
30 Minutes	0.017
1 Hour	0.018
2 Hours	0.018
4 Hours	0.018
8 Hours	0.020
15 Hours	0.020
24 Hours	0.020



ACS Services LLC

Swell / Settlement Potential of Soils
ASTM D4546-03

ACS Project #	**2201026**	Material Type:	Soil
ACS Lab #	22-3009-3	Sample Date:	-
Client Name:	Ethos	Sampled By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date:	6/29/2022
Project Address:	MC85 to Van Buren	Laboratory Test By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Sample Source:	B-36 @ 0.0 - 5.0		

Test Method: [ ] A [ ] B [x] C

Standard Proctor Information

Maximum Dry Density:	118.7	pcf
Optimum Moisture Content:	12.7	%

Specimen Preparation

95% of Maximum Dry Density:	112.8	pcf
-2% of Optimum Moisture Content:	10.7	%
Wet Density of Sample:	124.8	pcf
Test Weight (Wet):	150.7	g
Test Weight (Dry):	136.2	g
Moisture Sample (Wet):	109.1	g
Moisture Sample (Dry):	106.8	g
Sample Moisture Content:	2.2	%
Sample Weight (In situ):	139.1	g
Additional Moisture Needed:	11.6	ml
Ring Weight:	44.8	g
Total Weight Ring + Sample:	195.5	g
Initial Sample Saturation:	13	%

Specimen Test Data Post-Swell Test

Initial Specimen Height:		in
Final Specimen Height:		in
Final Specimen Weight:		g
Final Specimen Moisture Content:		%
Final Sample Saturation:		%

Final Wet Weight

Final Dry Weight

Swell / Settlement Potential Results

Load at Inundation (ksf)	
% Strain Before Inundation:	
% Strain After Inundation:	
Percent Heave:	

Correction Factor

Calibration Correction Factor	NONE

Corrected Swell	1.7

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

Ring Mold Information

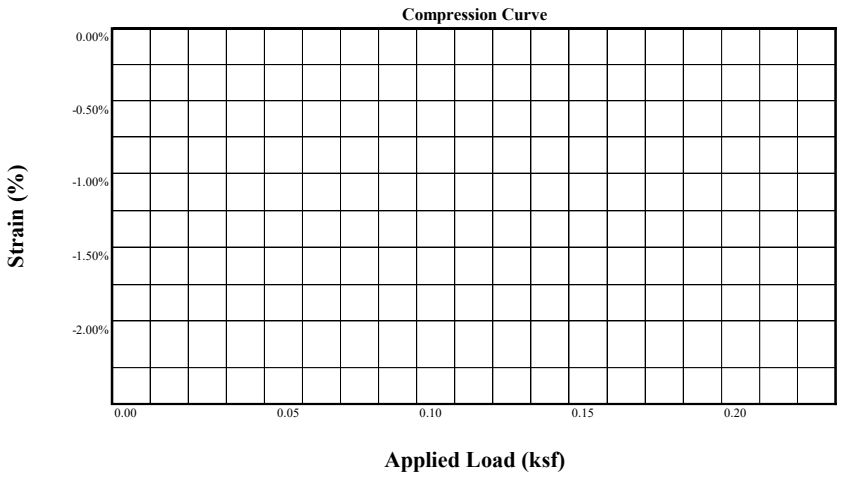
Ring Weight (g)	44.8
Ring Height (in)	1.000
Ring Diameter (in)	2.421
Ring Area (in^2)	4.604

Weight Used in Swell Test

Load Weight:	144 psf

Dial Readings During Test

Time Elapsed	Dial Reading (0.001")
0 (w/ seating pressure)	0.000
0 (w/ load applied)	0.000
30 Seconds	0.002
1 Minute	0.004
2 Minutes	0.006
4 Minutes	0.010
8 Minutes	0.012
15 Minutes	0.013
30 Minutes	0.014
1 Hour	0.015
2 Hours	0.016
4 Hours	0.016
8 Hours	0.017
15 Hours	0.017
24 Hours	0.017



ACS Services LLC

Swell / Settlement Potential of Soils
ASTM D4546-03

ACS Project #	**2201026**	Material Type:	Soil
ACS Lab #	22-3009-3	Sample Date:	-
Client Name:	Ethos	Sampled By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date:	7/5/2022
Project Address:	MC85 to Van Buren	Laboratory Test By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Sample Source:	B-36 @ 0.0 - 5.0		

Test Method: [ ] A [ ] B [x] C

Standard Proctor Information

Maximum Dry Density:	118.7	pcf
Optimum Moisture Content:	12.7	%

Specimen Preparation

95% of Maximum Dry Density:	112.8	pcf
-2% of Optimum Moisture Content:	10.7	%
Wet Density of Sample:	124.8	pcf
Test Weight (Wet):	150.7	g
Test Weight (Dry):	136.2	g
Moisture Sample (Wet):	106.0	g
Moisture Sample (Dry):	104.3	g
Sample Moisture Content:	1.6	%
Sample Weight (In situ):	138.4	g
Additional Moisture Needed:	12.3	ml
Ring Weight:	44.8	g
Total Weight Ring + Sample:	195.5	g
Initial Sample Saturation:	10	%

Specimen Test Data Post-Swell Test

Initial Specimen Height:		in
Final Specimen Height:		in
Final Specimen Weight:		g
Final Specimen Moisture Content:		%
Final Sample Saturation:		%

Final Wet Weight

Final Dry Weight

Swell / Settlement Potential Results

Load at Inundation (ksf)	
% Strain Before Inundation:	
% Strain After Inundation:	
Percent Heave:	

Correction Factor

Calibration Correction Factor	NONE

Corrected Swell	1

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

Ring Mold Information

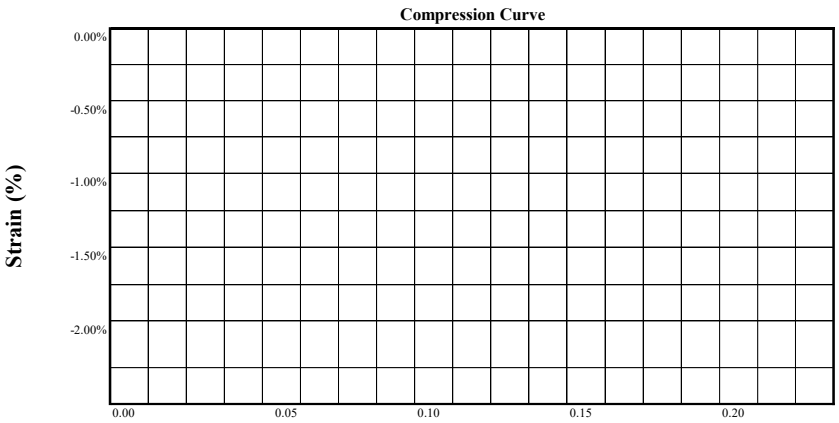
Ring Weight (g)	44.8
Ring Height (in)	1.000
Ring Diameter (in)	2.421
Ring Area (in^2)	4.604

Weight Used in Swell Test

Load Weight:	200 psf

Dial Readings During Test

Time Elapsed	Dial Reading (0.001")
0 (w/ seating pressure)	0.000
0 (w/ load applied)	0.000
30 Seconds	0.002
1 Minute	0.002
2 Minutes	0.004
4 Minutes	0.005
8 Minutes	0.007
15 Minutes	0.007
30 Minutes	0.008
1 Hour	0.008
2 Hours	0.008
4 Hours	0.008
8 Hours	0.010
15 Hours	0.010
24 Hours	0.010



ACS Services LLC

Swell / Settlement Potential of Soils
ASTM D4546-03

ACS Project #	**2201026**	Material Type:	Soil
ACS Lab #	22-3009-4	Sample Date:	-
Client Name:	Ethos	Sampled By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date:	6/28/2022
Project Address:	MC85 to Van Buren	Laboratory Test By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Sample Source:	B-39 @ 0.0 - 5.0		

Test Method: [ ] A [ ] B [x] C

Standard Proctor Information

Maximum Dry Density:	117.5	pcf
Optimum Moisture Content:	14.1	%

Specimen Preparation

95% of Maximum Dry Density:	111.6	pcf
-2% of Optimum Moisture Content:	12.1	%
Wet Density of Sample:	125.1	pcf
Test Weight (Wet):	151.1	g
Test Weight (Dry):	134.8	g
Moisture Sample (Wet):	105.8	g
Moisture Sample (Dry):	103.6	g
Sample Moisture Content:	2.1	%
Sample Weight (In situ):	137.6	g
Additional Moisture Needed:	13.4	ml
Ring Weight:	44.6	g
Total Weight Ring + Sample:	195.7	g
Initial Sample Saturation:	12	%

Specimen Test Data Post-Swell Test

Initial Specimen Height:		in
Final Specimen Height:		in
Final Specimen Weight:		g
Final Specimen Moisture Content:		%
Final Sample Saturation:		%

Final Wet Weight

Final Dry Weight

Swell / Settlement Potential Results

Load at Inundation (ksf)	
% Strain Before Inundation:	
% Strain After Inundation:	
Percent Heave:	

Correction Factor

Calibration Correction Factor	NONE

Corrected Swell	1.5

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

Ring Mold Information

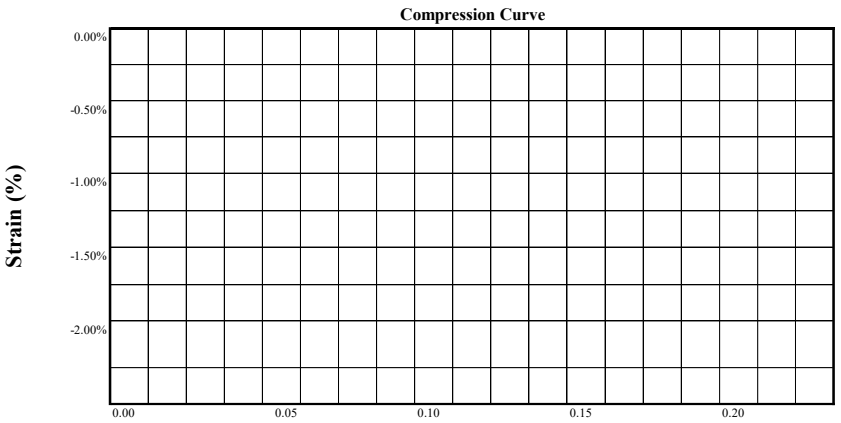
Ring Weight (g)	44.6
Ring Height (in)	1.000
Ring Diameter (in)	2.421
Ring Area (in^2)	4.604

Weight Used in Swell Test

Load Weight:	100 psf

Dial Readings During Test

Time Elapsed	Dial Reading (0.001")
0 (w/ seating pressure)	0.000
0 (w/ load applied)	0.000
30 Seconds	0.003
1 Minute	0.007
2 Minutes	0.010
4 Minutes	0.012
8 Minutes	0.013
15 Minutes	0.013
30 Minutes	0.014
1 Hour	0.014
2 Hours	0.014
4 Hours	0.015
8 Hours	0.015
15 Hours	0.015
24 Hours	0.015



ACS Services LLC

Swell / Settlement Potential of Soils
ASTM D4546-03

ACS Project #	**2201026**	Material Type:	Soil
ACS Lab #	22-3009-4	Sample Date:	-
Client Name:	Ethos	Sampled By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date:	6/29/2022
Project Address:	MC85 to Van Buren	Laboratory Test By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Sample Source:	B-39 @ 0.0 - 5.0		

Test Method: [ ] A [ ] B [x] C

Standard Proctor Information

Maximum Dry Density:	117.5	pcf
Optimum Moisture Content:	14.1	%

Specimen Preparation

95% of Maximum Dry Density:	111.6	pcf
-2% of Optimum Moisture Content:	12.1	%
Wet Density of Sample:	125.1	pcf
Test Weight (Wet):	151.1	g
Test Weight (Dry):	134.8	g
Moisture Sample (Wet):	105.8	g
Moisture Sample (Dry):	103.6	g
Sample Moisture Content:	2.1	%
Sample Weight (In situ):	137.6	g
Additional Moisture Needed:	13.4	ml
Ring Weight:	44.6	g
Total Weight Ring + Sample:	195.7	g
Initial Sample Saturation:	12	%

Specimen Test Data Post-Swell Test

Initial Specimen Height:		in
Final Specimen Height:		in
Final Specimen Weight:		g
Final Specimen Moisture Content:		%
Final Sample Saturation:		%

Final Wet Weight

Final Dry Weight

Swell / Settlement Potential Results

Load at Inundation (ksf)	
% Strain Before Inundation:	
% Strain After Inundation:	
Percent Heave:	

Correction Factor

Calibration Correction Factor	NONE

Corrected Swell	1.2

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

Ring Mold Information

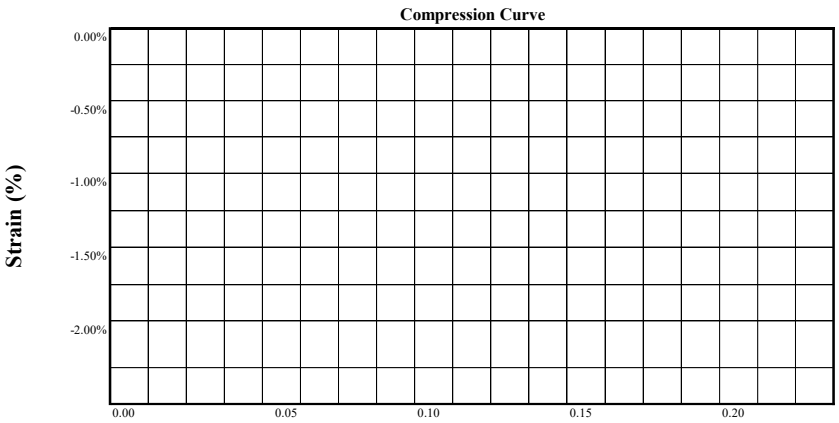
Ring Weight (g)	44.6
Ring Height (in)	1.000
Ring Diameter (in)	2.421
Ring Area (in^2)	4.604

Weight Used in Swell Test

Load Weight:	144 psf

Dial Readings During Test

Time Elapsed	Dial Reading (0.001")
0 (w/ seating pressure)	0.000
0 (w/ load applied)	0.000
30 Seconds	0.001
1 Minute	0.002
2 Minutes	0.003
4 Minutes	0.006
8 Minutes	0.008
15 Minutes	0.009
30 Minutes	0.010
1 Hour	0.010
2 Hours	0.010
4 Hours	0.010
8 Hours	-
15 Hours	-
24 Hours	0.012



ACS Services LLC

Swell / Settlement Potential of Soils
ASTM D4546-03

ACS Project #	**2201026**	Material Type:	Soil
ACS Lab #	22-3009-4	Sample Date:	-
Client Name:	Ethos	Sampled By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date:	7/5/2022
Project Address:	MC85 to Van Buren	Laboratory Test By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Sample Source:	B-39 @ 0.0 - 5.0		

Test Method: [ ] A [ ] B [x] C

Standard Proctor Information

Maximum Dry Density:	117.5	pcf
Optimum Moisture Content:	14.1	%

Specimen Preparation

95% of Maximum Dry Density:	111.6	pcf
-2% of Optimum Moisture Content:	12.1	%
Wet Density of Sample:	125.1	pcf
Test Weight (Wet):	151.1	g
Test Weight (Dry):	134.8	g
Moisture Sample (Wet):	104.8	g
Moisture Sample (Dry):	102.7	g
Sample Moisture Content:	2.0	%
Sample Weight (In situ):	137.5	g
Additional Moisture Needed:	13.6	ml
Ring Weight:	45.0	g
Total Weight Ring + Sample:	196.1	g
Initial Sample Saturation:	12	%

Specimen Test Data Post-Swell Test

Initial Specimen Height:		in
Final Specimen Height:		in
Final Specimen Weight:		g
Final Specimen Moisture Content:		%
Final Sample Saturation:		%

Final Wet Weight

Final Dry Weight

Swell / Settlement Potential Results

Load at Inundation (ksf)	
% Strain Before Inundation:	
% Strain After Inundation:	
Percent Heave:	

Correction Factor

Calibration Correction Factor	NONE

Corrected Swell	0.75

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

Ring Mold Information

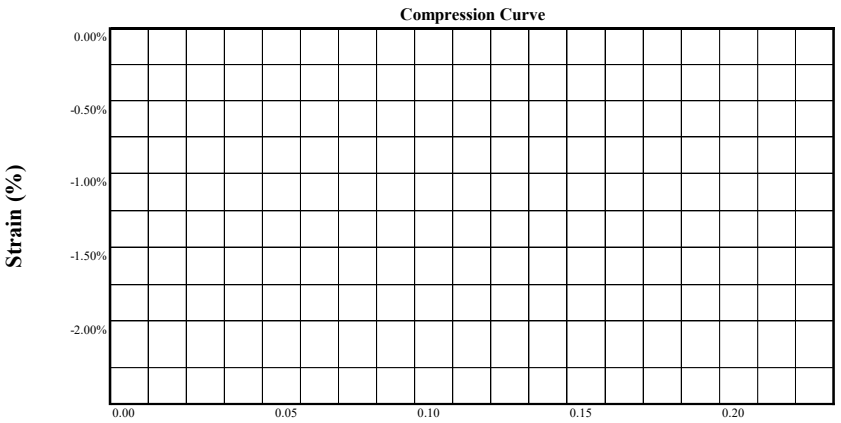
Ring Weight (g)	45.0
Ring Height (in)	1.000
Ring Diameter (in)	2.421
Ring Area (in^2)	4.604

Weight Used in Swell Test

Load Weight:	200 psf

Dial Readings During Test

Time Elapsed	Dial Reading (0.001")
0 (w/ seating pressure)	0.000
0 (w/ load applied)	0.000
30 Seconds	0.001
1 Minute	0.002
2 Minutes	0.003
4 Minutes	0.004
8 Minutes	0.006
15 Minutes	0.006
30 Minutes	0.006
1 Hour	0.007
2 Hours	0.007
4 Hours	0.007
8 Hours	0.008
15 Hours	0.008
24 Hours	0.008



ACS Services LLC

Swell / Settlement Potential of Soils
ASTM D4546-03

ACS Project #	**2201026**	Material Type:	Native
ACS Lab #	22-1657-4	Sample Date:	-
Client Name:	Ethos	Sampled By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date:	4/8/2022
Project Address:	MC85 to Van Buren	Laboratory Test By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Sample Source:	B-40 @ 0.0 - 5.0'		

Test Method: [ ] A [ ] B [x] C

Standard Proctor Information

Maximum Dry Density:	117.5	pcf
Optimum Moisture Content:	14.1	%

Specimen Preparation

95% of Maximum Dry Density:	111.6	pcf
-2% of Optimum Moisture Content:	12.1	%
Wet Density of Sample:	125.1	pcf
Test Weight (Wet):	151.1	g
Test Weight (Dry):	134.8	g
Moisture Sample (Wet):	100.0	g
Moisture Sample (Dry):	90.7	g
Sample Moisture Content:	10.3	%
Sample Weight (In situ):	148.6	g
Additional Moisture Needed:	2.5	ml
Ring Weight:	45.6	g
Total Weight Ring + Sample:	196.7	g
Initial Sample Saturation:	59	%

Specimen Test Data Post-Swell Test

Initial Specimen Height:		in
Final Specimen Height:		in
Final Specimen Weight:		g
Final Specimen Moisture Content:		%
Final Sample Saturation:		%

Final Wet Weight

Final Dry Weight

Swell / Settlement Potential Results

Load at Inundation (ksf)	
% Strain Before Inundation:	
% Strain After Inundation:	
Percent Heave:	

Correction Factor

Calibration Correction Factor	NONE

Corrected Swell	2.4

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

Ring Mold Information

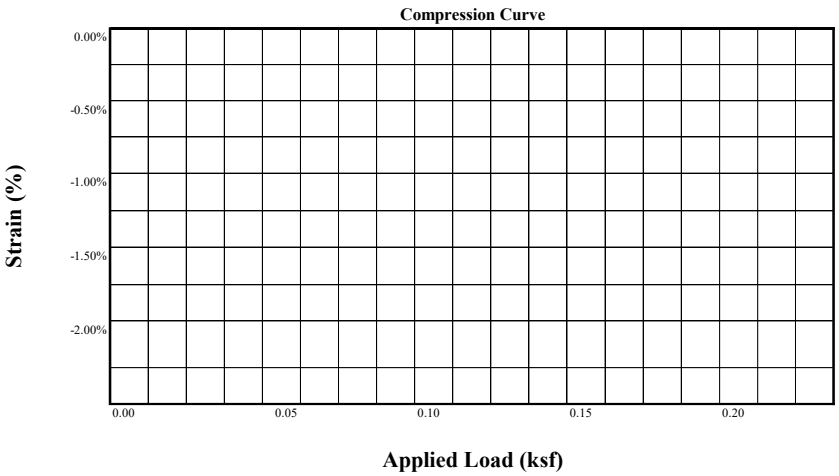
Ring Weight (g)	45.6
Ring Height (in)	1.000
Ring Diameter (in)	2.421
Ring Area (in^2)	4.604

Weight Used in Swell Test

Load Weight:	100 psf

Dial Readings During Test

Time Elapsed	Dial Reading (0.001")
0 (w/ seating pressure)	0.000
0 (w/ load applied)	0.000
30 Seconds	0.003
1 Minute	0.005
2 Minutes	0.009
4 Minutes	0.014
8 Minutes	0.019
15 Minutes	0.021
30 Minutes	0.022
1 Hour	0.022
2 Hours	0.023
4 Hours	0.023
8 Hours	0.023
15 Hours	0.023
24 Hours	0.024



ACS Services LLC

Swell / Settlement Potential of Soils
ASTM D4546-03

ACS Project #	**2201026**	Material Type:	Native
ACS Lab #	22-1657-19	Sample Date:	-
Client Name:	Ethos	Sampled By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date:	4/13/2022
Project Address:	MC85 to Van Buren	Laboratory Test By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Sample Source:	B-45 @ 0.0 - 5.0'		

Test Method: [ ] A [ ] B [x] C

Standard Proctor Information

Maximum Dry Density:	117.1	pcf
Optimum Moisture Content:	12.1	%

Specimen Preparation

95% of Maximum Dry Density:	111.2	pcf
-2% of Optimum Moisture Content:	10.1	%
Wet Density of Sample:	122.5	pcf
Test Weight (Wet):	147.9	g
Test Weight (Dry):	134.3	g
Moisture Sample (Wet):	100.0	g
Moisture Sample (Dry):	90.9	g
Sample Moisture Content:	10.0	%
Sample Weight (In situ):	147.8	g
Additional Moisture Needed:	0.1	ml
Ring Weight:	45.5	g
Total Weight Ring + Sample:	193.4	g
Initial Sample Saturation:	57	%

Specimen Test Data Post-Swell Test

Initial Specimen Height:		in
Final Specimen Height:		in
Final Specimen Weight:		g
Final Specimen Moisture Content:		%
Final Sample Saturation:		%

Final Wet Weight

Final Dry Weight

Swell / Settlement Potential Results

Load at Inundation (ksf)	
% Strain Before Inundation:	
% Strain After Inundation:	
Percent Heave:	

Correction Factor

Calibration Correction Factor	NONE

Corrected Swell	3.1

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

Ring Mold Information

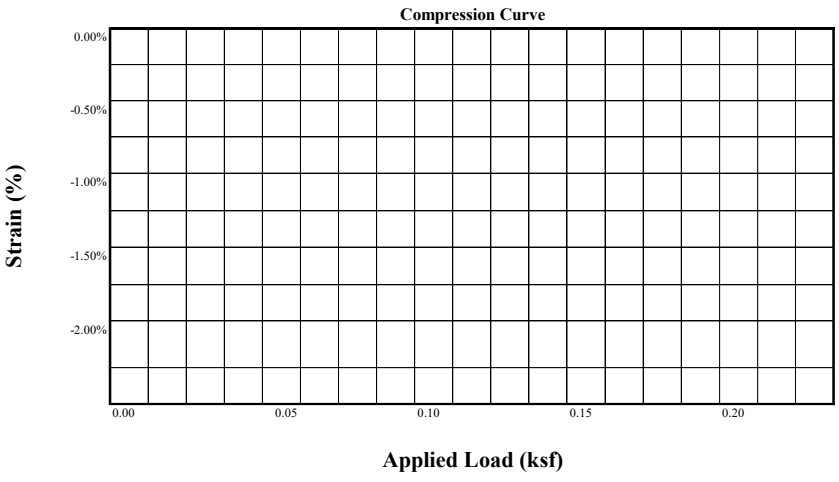
Ring Weight (g)	45.5
Ring Height (in)	1.000
Ring Diameter (in)	2.421
Ring Area (in^2)	4.604

Weight Used in Swell Test

Load Weight:	100 psf

Dial Readings During Test

Time Elapsed	Dial Reading (0.001")
0 (w/ seating pressure)	0.000
0 (w/ load applied)	0.000
30 Seconds	0.001
1 Minute	0.004
2 Minutes	0.008
4 Minutes	0.015
8 Minutes	0.025
15 Minutes	0.028
30 Minutes	0.029
1 Hour	0.030
2 Hours	0.031
4 Hours	0.031
8 Hours	0.031
15 Hours	0.031
24 Hours	0.031



ACS Services LLC

Swell / Settlement Potential of Soils
ASTM D4546-03

ACS Project #	**2201026**	Material Type:	Native
ACS Lab #	22-1978-1	Sample Date:	-
Client Name:	Ethos	Sampled By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date:	5/9/2022
Project Address:	MC85 to Van Buren	Laboratory Test By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Sample Source:	B-46 @ 0.0 - 5.0		

Test Method: [ ] A [ ] B [x] C

Standard Proctor Information

Maximum Dry Density:	122.4	pcf
Optimum Moisture Content:	12.3	%

Specimen Preparation

95% of Maximum Dry Density:	116.3	pcf
-2% of Optimum Moisture Content:	10.3	%
Wet Density of Sample:	128.3	pcf
Test Weight (Wet):	154.9	g
Test Weight (Dry):	140.4	g
Moisture Sample (Wet):	103.9	g
Moisture Sample (Dry):	95.6	g
Sample Moisture Content:	8.7	%
Sample Weight (In situ):	152.6	g
Additional Moisture Needed:	2.3	ml
Ring Weight:	44.8	g
Total Weight Ring + Sample:	199.7	g
Initial Sample Saturation:	57	%

Specimen Test Data Post-Swell Test

Initial Specimen Height:		in
Final Specimen Height:		in
Final Specimen Weight:		g
Final Specimen Moisture Content:		%
Final Sample Saturation:		%

Final Wet Weight

Final Dry Weight

Swell / Settlement Potential Results

Load at Inundation (ksf)	
% Strain Before Inundation:	
% Strain After Inundation:	
Percent Heave:	

Correction Factor

Calibration Correction Factor	NONE

Corrected Swell	3.3

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

Ring Mold Information

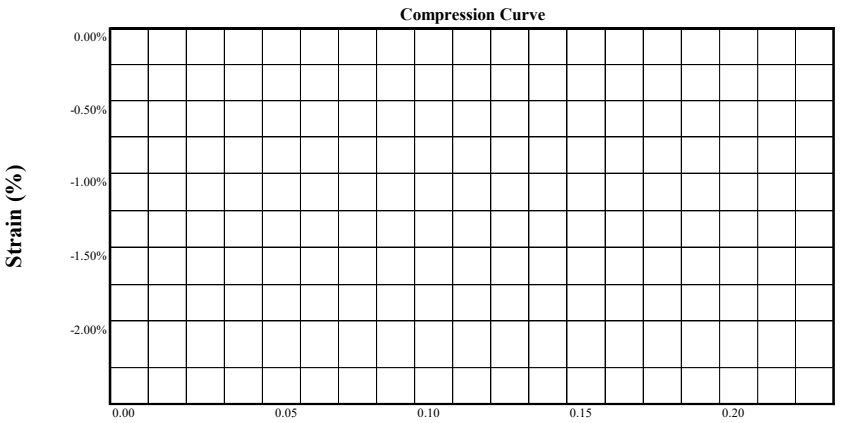
Ring Weight (g)	44.8
Ring Height (in)	1.000
Ring Diameter (in)	2.421
Ring Area (in^2)	4.604

Weight Used in Swell Test

Load Weight:	100 psf

Dial Readings During Test

Time Elapsed	Dial Reading (0.001")
0 (w/ seating pressure)	0.000
0 (w/ load applied)	0.000
30 Seconds	0.006
1 Minute	0.010
2 Minutes	0.014
4 Minutes	0.024
8 Minutes	0.024
15 Minutes	0.028
30 Minutes	0.032
1 Hour	0.032
2 Hours	0.033
4 Hours	0.033
8 Hours	0.033
15 Hours	0.033
24 Hours	0.033



ACS Services LLC

Swell / Settlement Potential of Soils
ASTM D4546-03

ACS Project #	**2201026**	Material Type:	Soil
ACS Lab #	22-3009-5	Sample Date:	-
Client Name:	Ethos	Sampled By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date:	6/30/2022
Project Address:	MC85 to Van Buren	Laboratory Test By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Sample Source:	B-47 @ 0.0 - 5.0		

Test Method: [ ] A [ ] B [x] C

Standard Proctor Information

Maximum Dry Density:	122.4	pcf
Optimum Moisture Content:	12.3	%

Specimen Preparation

95% of Maximum Dry Density:	116.3	pcf
-2% of Optimum Moisture Content:	10.3	%
Wet Density of Sample:	128.3	pcf
Test Weight (Wet):	154.9	g
Test Weight (Dry):	140.4	g
Moisture Sample (Wet):	106.1	g
Moisture Sample (Dry):	104.4	g
Sample Moisture Content:	1.6	%
Sample Weight (In situ):	142.7	g
Additional Moisture Needed:	12.2	ml
Ring Weight:	45.0	g
Total Weight Ring + Sample:	199.9	g
Initial Sample Saturation:	11	%

Specimen Test Data Post-Swell Test

Initial Specimen Height:		in
Final Specimen Height:		in
Final Specimen Weight:		g
Final Specimen Moisture Content:		%
Final Sample Saturation:		%

Final Wet Weight

Final Dry Weight

Swell / Settlement Potential Results

Load at Inundation (ksf)	
% Strain Before Inundation:	
% Strain After Inundation:	
Percent Heave:	

Correction Factor

Calibration Correction Factor	NONE

Corrected Swell	2.7

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

Ring Mold Information

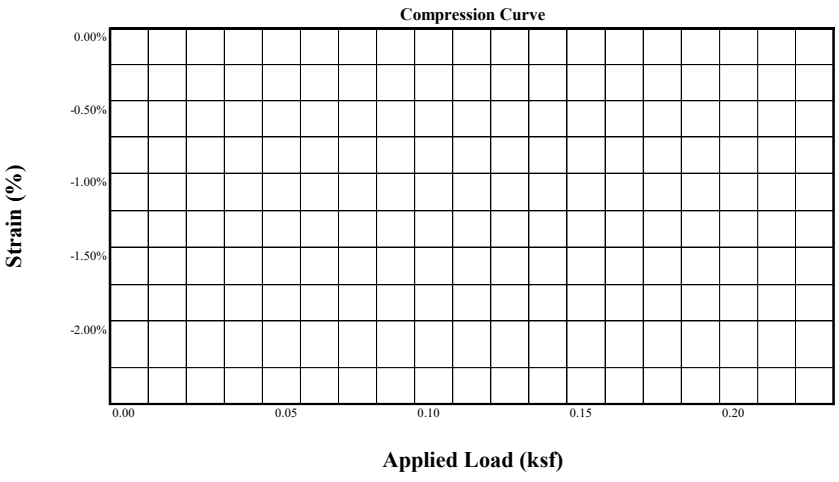
Ring Weight (g)	45.0
Ring Height (in)	1.000
Ring Diameter (in)	2.421
Ring Area (in^2)	4.604

Weight Used in Swell Test

Load Weight:	100 psf

Dial Readings During Test

Time Elapsed	Dial Reading (0.001")
0 (w/ seating pressure)	0.000
0 (w/ load applied)	0.000
30 Seconds	0.004
1 Minute	0.006
2 Minutes	0.010
4 Minutes	0.016
8 Minutes	0.020
15 Minutes	0.022
30 Minutes	0.023
1 Hour	0.024
2 Hours	0.025
4 Hours	0.026
8 Hours	0.027
15 Hours	0.027
24 Hours	0.027



ACS Services LLC

Swell / Settlement Potential of Soils
ASTM D4546-03

ACS Project #	**2201026**	Material Type:	Soil
ACS Lab #	22-3009-5	Sample Date:	-
Client Name:	Ethos	Sampled By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date:	6/29/2022
Project Address:	MC85 to Van Buren	Laboratory Test By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Sample Source:	B-47 @ 0.0 - 5.0		

Test Method: [ ] A [ ] B [x] C

Standard Proctor Information

Maximum Dry Density:	122.4	pcf
Optimum Moisture Content:	12.3	%

Specimen Preparation

95% of Maximum Dry Density:	116.3	pcf
-2% of Optimum Moisture Content:	10.3	%
Wet Density of Sample:	128.3	pcf
Test Weight (Wet):	154.9	g
Test Weight (Dry):	140.4	g
Moisture Sample (Wet):	108.5	g
Moisture Sample (Dry):	107.5	g
Sample Moisture Content:	0.9	%
Sample Weight (In situ):	141.7	g
Additional Moisture Needed:	13.2	ml
Ring Weight:	44.4	g
Total Weight Ring + Sample:	199.3	g
Initial Sample Saturation:	6	%

Specimen Test Data Post-Swell Test

Initial Specimen Height:		in
Final Specimen Height:		in
Final Specimen Weight:		g
Final Specimen Moisture Content:		%
Final Sample Saturation:		%

Final Wet Weight

Final Dry Weight

Swell / Settlement Potential Results

Load at Inundation (ksf)	
% Strain Before Inundation:	
% Strain After Inundation:	
Percent Heave:	

Correction Factor

Calibration Correction Factor	NONE

Corrected Swell	2

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

Ring Mold Information

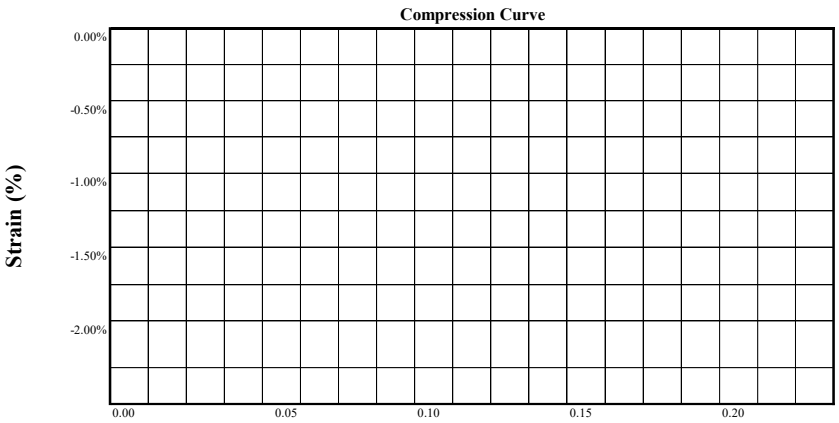
Ring Weight (g)	44.4
Ring Height (in)	1.000
Ring Diameter (in)	2.421
Ring Area (in^2)	4.604

Weight Used in Swell Test

Load Weight:	144 psf

Dial Readings During Test

Time Elapsed	Dial Reading (0.001")
0 (w/ seating pressure)	0.000
0 (w/ load applied)	0.000
30 Seconds	0.001
1 Minute	0.002
2 Minutes	0.004
4 Minutes	0.007
8 Minutes	0.011
15 Minutes	0.015
30 Minutes	0.017
1 Hour	0.018
2 Hours	0.018
4 Hours	0.019
8 Hours	0.019
15 Hours	0.020
24 Hours	0.020



ACS Services LLC

Swell / Settlement Potential of Soils
ASTM D4546-03

ACS Project #	**2201026**	Material Type:	Soil
ACS Lab #	22-3009-5	Sample Date:	-
Client Name:	Ethos	Sampled By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date:	7/6/2022
Project Address:	MC85 to Van Buren	Laboratory Test By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Sample Source:	B-47 @ 0.0 - 5.0		

Test Method: [ ] A [ ] B [x] C

Standard Proctor Information

Maximum Dry Density:	122.4	pcf
Optimum Moisture Content:	12.3	%

Specimen Preparation

95% of Maximum Dry Density:	116.3	pcf
-2% of Optimum Moisture Content:	10.3	%
Wet Density of Sample:	128.3	pcf
Test Weight (Wet):	154.9	g
Test Weight (Dry):	140.4	g
Moisture Sample (Wet):	104.0	g
Moisture Sample (Dry):	101.8	g
Sample Moisture Content:	2.2	%
Sample Weight (In situ):	143.4	g
Additional Moisture Needed:	11.4	ml
Ring Weight:	45.1	g
Total Weight Ring + Sample:	200.0	g
Initial Sample Saturation:	14	%

Specimen Test Data Post-Swell Test

Initial Specimen Height:		in
Final Specimen Height:		in
Final Specimen Weight:		g
Final Specimen Moisture Content:		%
Final Sample Saturation:		%

Final Wet Weight

Final Dry Weight

Swell / Settlement Potential Results

Load at Inundation (ksf)	
% Strain Before Inundation:	
% Strain After Inundation:	
Percent Heave:	

Correction Factor

Calibration Correction Factor	NONE

Corrected Swell	1.8

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

Ring Mold Information

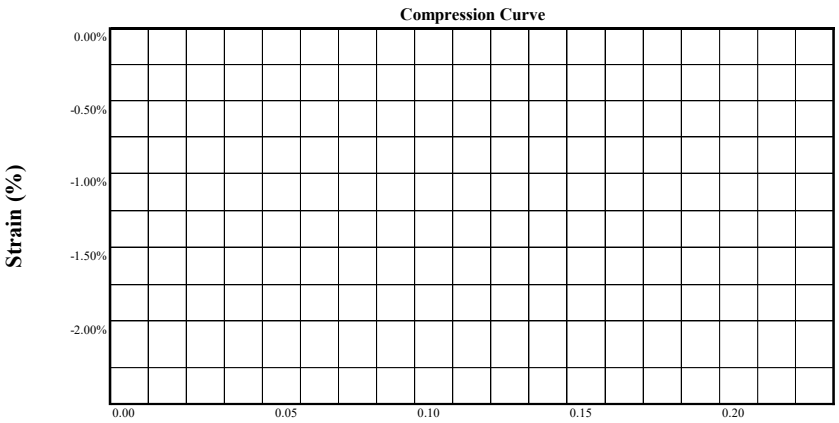
Ring Weight (g)	45.1
Ring Height (in)	1.000
Ring Diameter (in)	2.421
Ring Area (in^2)	4.604

Weight Used in Swell Test

Load Weight:	200 psf

Dial Readings During Test

Time Elapsed	Dial Reading (0.001")
0 (w/ seating pressure)	0.000
0 (w/ load applied)	0.000
30 Seconds	0.002
1 Minute	0.004
2 Minutes	0.010
4 Minutes	0.013
8 Minutes	0.014
15 Minutes	0.015
30 Minutes	0.016
1 Hour	0.016
2 Hours	0.017
4 Hours	0.018
8 Hours	0.018
15 Hours	0.018
24 Hours	0.018



ACS Services LLC

Swell / Settlement Potential of Soils
ASTM D4546-03

ACS Project #	**2201026**	Material Type:	Native
ACS Lab #	22-1957-3	Sample Date:	-
Client Name:	Ethos	Sampled By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date:	4/26/2022
Project Address:	MC85 to Van Buren	Laboratory Test By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Sample Source:	B-50 @ 0.0 - 5.0		

Test Method: [ ] A [ ] B [x] C

Standard Proctor Information

Maximum Dry Density:	118.3	pcf
Optimum Moisture Content:	13.7	%

Specimen Preparation

95% of Maximum Dry Density:	112.4	pcf
-2% of Optimum Moisture Content:	11.7	%
Wet Density of Sample:	125.5	pcf
Test Weight (Wet):	151.6	g
Test Weight (Dry):	135.7	g
Moisture Sample (Wet):	100.0	g
Moisture Sample (Dry):	90.6	g
Sample Moisture Content:	10.4	%
Sample Weight (In situ):	149.8	g
Additional Moisture Needed:	1.8	ml
Ring Weight:	45.6	g
Total Weight Ring + Sample:	197.2	g
Initial Sample Saturation:	61	%

Specimen Test Data Post-Swell Test

Initial Specimen Height:		in
Final Specimen Height:		in
Final Specimen Weight:		g
Final Specimen Moisture Content:		%
Final Sample Saturation:		%

Final Wet Weight

Final Dry Weight

Swell / Settlement Potential Results

Load at Inundation (ksf)	
% Strain Before Inundation:	
% Strain After Inundation:	
Percent Heave:	

Correction Factor

Calibration Correction Factor	NONE

Corrected Swell	0.8

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

Ring Mold Information

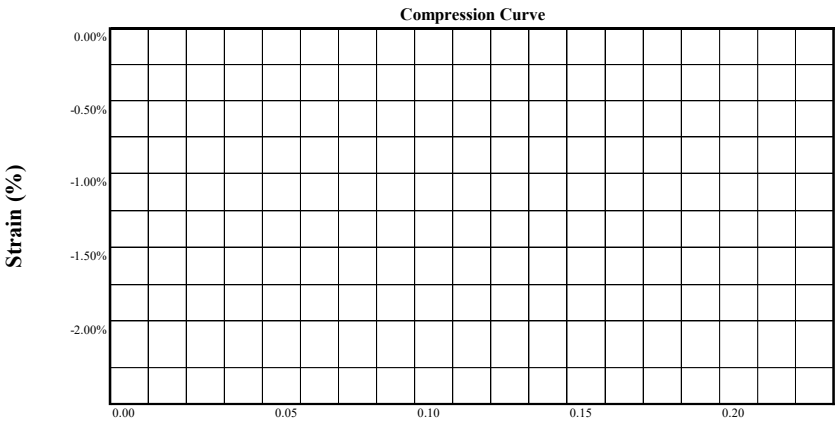
Ring Weight (g)	45.6
Ring Height (in)	1.000
Ring Diameter (in)	2.421
Ring Area (in^2)	4.604

Weight Used in Swell Test

Load Weight:	100 psf

Dial Readings During Test

Time Elapsed	Dial Reading (0.001")
0 (w/ seating pressure)	0.000
0 (w/ load applied)	0.000
30 Seconds	0.000
1 Minute	0.000
2 Minutes	0.000
4 Minutes	0.003
8 Minutes	0.005
15 Minutes	0.007
30 Minutes	0.007
1 Hour	0.008
2 Hours	0.008
4 Hours	0.008
8 Hours	0.008
15 Hours	0.008
24 Hours	0.008



ACS Services LLC

Swell / Settlement Potential of Soils
ASTM D4546-03

ACS Project #	**2201026**	Material Type:	Soil
ACS Lab #	22-3009-6	Sample Date:	-
Client Name:	Ethos	Sampled By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date:	6/29/2022
Project Address:	MC85 to Van Buren	Laboratory Test By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Sample Source:	B-52 @ 0.0 - 5.0		

Test Method: [ ] A [ ] B [x] C

Standard Proctor Information

Maximum Dry Density:	115.7	pcf
Optimum Moisture Content:	12.9	%

Specimen Preparation

95% of Maximum Dry Density:	109.9	pcf
-2% of Optimum Moisture Content:	10.9	%
Wet Density of Sample:	121.9	pcf
Test Weight (Wet):	147.2	g
Test Weight (Dry):	132.7	g
Moisture Sample (Wet):	105.8	g
Moisture Sample (Dry):	103.9	g
Sample Moisture Content:	1.8	%
Sample Weight (In situ):	135.1	g
Additional Moisture Needed:	12.0	ml
Ring Weight:	45.1	g
Total Weight Ring + Sample:	192.3	g
Initial Sample Saturation:	10	%

Specimen Test Data Post-Swell Test

Initial Specimen Height:		in
Final Specimen Height:		in
Final Specimen Weight:		g
Final Specimen Moisture Content:		%
Final Sample Saturation:		%

Final Wet Weight

Final Dry Weight

Swell / Settlement Potential Results

Load at Inundation (ksf)	
% Strain Before Inundation:	
% Strain After Inundation:	
Percent Heave:	

Correction Factor

Calibration Correction Factor	NONE

Corrected Swell	1.4

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

Ring Mold Information

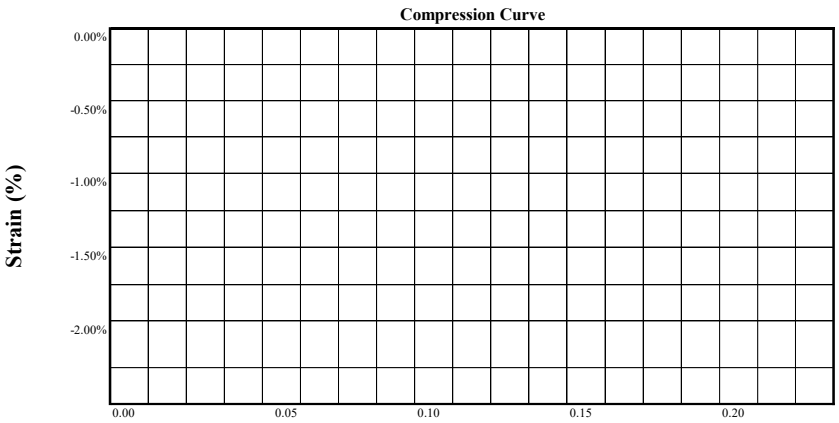
Ring Weight (g)	45.1
Ring Height (in)	1.000
Ring Diameter (in)	2.421
Ring Area (in^2)	4.604

Weight Used in Swell Test

Load Weight:	100 psf

Dial Readings During Test

Time Elapsed	Dial Reading (0.001")
0 (w/ seating pressure)	0.000
0 (w/ load applied)	0.000
30 Seconds	0.001
1 Minute	0.002
2 Minutes	0.004
4 Minutes	0.006
8 Minutes	0.009
15 Minutes	0.010
30 Minutes	0.011
1 Hour	0.011
2 Hours	0.012
4 Hours	0.012
8 Hours	0.013
15 Hours	0.014
24 Hours	0.014



ACS Services LLC

Swell / Settlement Potential of Soils
ASTM D4546-03

ACS Project #	**2201026**	Material Type:	Soil
ACS Lab #	22-3009-6	Sample Date:	-
Client Name:	Ethos	Sampled By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date:	7/6/2022
Project Address:	MC85 to Van Buren	Laboratory Test By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Sample Source:	B-52 @ 0.0 - 5.0		

Test Method: [ ] A [ ] B [x] C

Standard Proctor Information

Maximum Dry Density:	115.7	pcf
Optimum Moisture Content:	12.9	%

Specimen Preparation

95% of Maximum Dry Density:	109.9	pcf
-2% of Optimum Moisture Content:	10.9	%
Wet Density of Sample:	121.9	pcf
Test Weight (Wet):	147.2	g
Test Weight (Dry):	132.7	g
Moisture Sample (Wet):	108.0	g
Moisture Sample (Dry):	105.8	g
Sample Moisture Content:	2.1	%
Sample Weight (In situ):	135.5	g
Additional Moisture Needed:	11.7	ml
Ring Weight:	44.7	g
Total Weight Ring + Sample:	191.9	g
Initial Sample Saturation:	11	%

Specimen Test Data Post-Swell Test

Initial Specimen Height:		in
Final Specimen Height:		in
Final Specimen Weight:		g
Final Specimen Moisture Content:		%
Final Sample Saturation:		%

Final Wet Weight

Final Dry Weight

Swell / Settlement Potential Results

Load at Inundation (ksf)	
% Strain Before Inundation:	
% Strain After Inundation:	
Percent Heave:	

Correction Factor

Calibration Correction Factor	NONE

Corrected Swell	1.4

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

Ring Mold Information

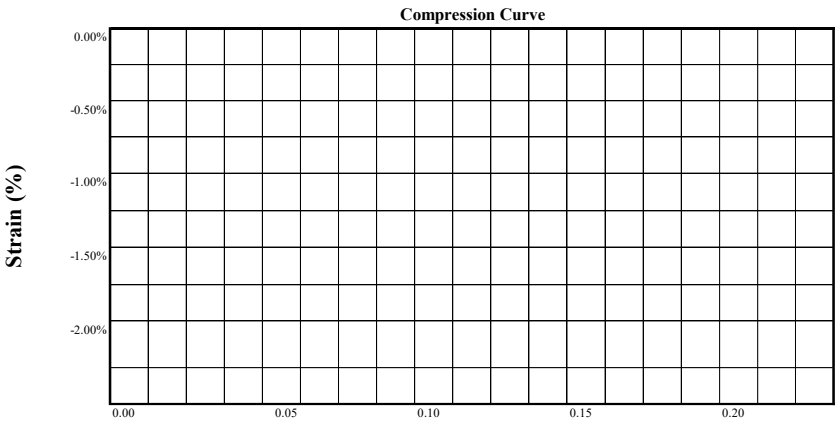
Ring Weight (g)	44.7
Ring Height (in)	1.000
Ring Diameter (in)	2.421
Ring Area (in^2)	4.604

Weight Used in Swell Test

Load Weight:	144 psf

Dial Readings During Test

Time Elapsed	Dial Reading (0.001")
0 (w/ seating pressure)	0.000
0 (w/ load applied)	0.000
30 Seconds	0.001
1 Minute	0.003
2 Minutes	0.006
4 Minutes	0.010
8 Minutes	0.011
15 Minutes	0.012
30 Minutes	0.013
1 Hour	0.013
2 Hours	0.013
4 Hours	0.013
8 Hours	0.013
15 Hours	0.014
24 Hours	0.014



ACS Services LLC

Swell / Settlement Potential of Soils
ASTM D4546-03

ACS Project #	**2201026**	Material Type:	Soil
ACS Lab #	22-3009-6	Sample Date:	-
Client Name:	Ethos	Sampled By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date:	7/6/2022
Project Address:	MC85 to Van Buren	Laboratory Test By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Sample Source:	B-52 @ 0.0 - 5.0		

Test Method: [ ] A [ ] B [x] C

Standard Proctor Information

Maximum Dry Density:	115.7	pcf
Optimum Moisture Content:	12.9	%

Specimen Preparation

95% of Maximum Dry Density:	109.9	pcf
-2% of Optimum Moisture Content:	10.9	%
Wet Density of Sample:	121.9	pcf
Test Weight (Wet):	147.2	g
Test Weight (Dry):	132.7	g
Moisture Sample (Wet):	108.0	g
Moisture Sample (Dry):	105.8	g
Sample Moisture Content:	2.1	%
Sample Weight (In situ):	135.5	g
Additional Moisture Needed:	11.7	ml
Ring Weight:	44.8	g
Total Weight Ring + Sample:	192.0	g
Initial Sample Saturation:	11	%

Specimen Test Data Post-Swell Test

Initial Specimen Height:		in
Final Specimen Height:		in
Final Specimen Weight:		g
Final Specimen Moisture Content:		%
Final Sample Saturation:		%

Final Wet Weight

Final Dry Weight

Swell / Settlement Potential Results

Load at Inundation (ksf)	
% Strain Before Inundation:	
% Strain After Inundation:	
Percent Heave:	

Correction Factor

Calibration Correction Factor	NONE

Corrected Swell	1.2

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

Ring Mold Information

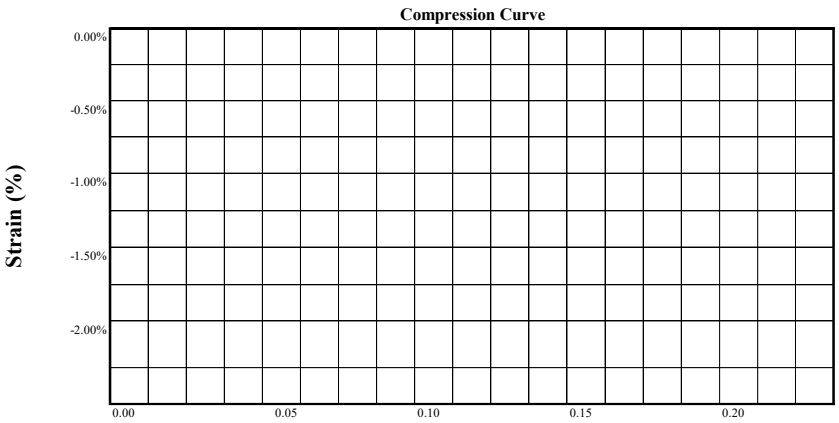
Ring Weight (g)	44.8
Ring Height (in)	1.000
Ring Diameter (in)	2.421
Ring Area (in^2)	4.604

Weight Used in Swell Test

Load Weight:	200 psf

Dial Readings During Test

Time Elapsed	Dial Reading (0.001")
0 (w/ seating pressure)	0.000
0 (w/ load applied)	0.000
30 Seconds	0.001
1 Minute	0.002
2 Minutes	0.004
4 Minutes	0.007
8 Minutes	0.008
15 Minutes	0.010
30 Minutes	0.010
1 Hour	0.011
2 Hours	0.011
4 Hours	0.012
8 Hours	-
15 Hours	-
24 Hours	0.012



ACS Services LLC

Swell / Settlement Potential of Soils
ASTM D4546-03

ACS Project #	**2201026**	Material Type:	Native
ACS Lab #	22-1456-4	Sample Date:	-
Client Name:	Ethos	Sampled By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date:	2/22/2022
Project Address:	MC85 to Van Buren	Laboratory Test By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Sample Source:	B-54 @ 0.0 - 5.0'		

Test Method: [ ] A [ ] B [x] C

Standard Proctor Information

Maximum Dry Density:	120.5	pcf
Optimum Moisture Content:	11.8	%

Specimen Preparation

95% of Maximum Dry Density:	114.5	pcf
-2% of Optimum Moisture Content:	9.8	%
Wet Density of Sample:	125.7	pcf
Test Weight (Wet):	151.8	g
Test Weight (Dry):	138.2	g
Moisture Sample (Wet):	105.0	g
Moisture Sample (Dry):	101.8	g
Sample Moisture Content:	3.1	%
Sample Weight (In situ):	142.6	g
Additional Moisture Needed:	9.2	ml
Ring Weight:	45.2	g
Total Weight Ring + Sample:	197.0	g
Initial Sample Saturation:	20	%

Specimen Test Data Post-Swell Test

Initial Specimen Height:		in
Final Specimen Height:		in
Final Specimen Weight:		g
Final Specimen Moisture Content:		%
Final Sample Saturation:		%

Final Wet Weight

Final Dry Weight

Swell / Settlement Potential Results

Load at Inundation (ksf)	
% Strain Before Inundation:	
% Strain After Inundation:	
Percent Heave:	

Correction Factor

Calibration Correction Factor	NONE

Corrected Swell	0.2

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

Ring Mold Information

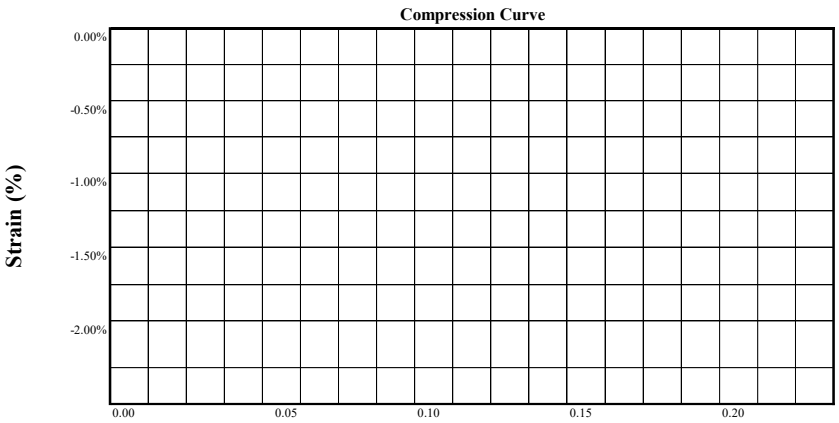
Ring Weight (g)	45.2
Ring Height (in)	1.000
Ring Diameter (in)	2.421
Ring Area (in^2)	4.604

Weight Used in Swell Test

Load Weight:	100 psf

Dial Readings During Test

Time Elapsed	Dial Reading (0.001")
0 (w/ seating pressure)	0.000
0 (w/ load applied)	0.000
30 Seconds	0.000
1 Minute	0.001
2 Minutes	0.002
4 Minutes	0.002
8 Minutes	0.002
15 Minutes	0.002
30 Minutes	0.002
1 Hour	0.002
2 Hours	0.002
4 Hours	-
8 Hours	-
15 Hours	0.002
24 Hours	0.002



ACS Services LLC

Swell / Settlement Potential of Soils
ASTM D4546-03

ACS Project #	**2201026**	Material Type:	Native
ACS Lab #	22-1958-1	Sample Date:	-
Client Name:	Ethos	Sampled By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date:	4/26/2022
Project Address:	MC85 to Van Buren	Laboratory Test By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Sample Source:	B-55 @ 0.0 - 5.0		

Test Method: [ ] A [ ] B [x] C

Standard Proctor Information

Maximum Dry Density:	118.3	pcf
Optimum Moisture Content:	13.8	%

Specimen Preparation

95% of Maximum Dry Density:	112.4	pcf
-2% of Optimum Moisture Content:	11.8	%
Wet Density of Sample:	125.6	pcf
Test Weight (Wet):	151.7	g
Test Weight (Dry):	135.7	g
Moisture Sample (Wet):	100.0	g
Moisture Sample (Dry):	91.5	g
Sample Moisture Content:	9.3	%
Sample Weight (In situ):	148.3	g
Additional Moisture Needed:	3.4	ml
Ring Weight:	45.6	g
Total Weight Ring + Sample:	197.3	g
Initial Sample Saturation:	55	%

Specimen Test Data Post-Swell Test

Initial Specimen Height:		in
Final Specimen Height:		in
Final Specimen Weight:		g
Final Specimen Moisture Content:		%
Final Sample Saturation:		%

Final Wet Weight

Final Dry Weight

Swell / Settlement Potential Results

Load at Inundation (ksf)	
% Strain Before Inundation:	
% Strain After Inundation:	
Percent Heave:	

Correction Factor

Calibration Correction Factor	NONE

Corrected Swell	1.9

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

Ring Mold Information

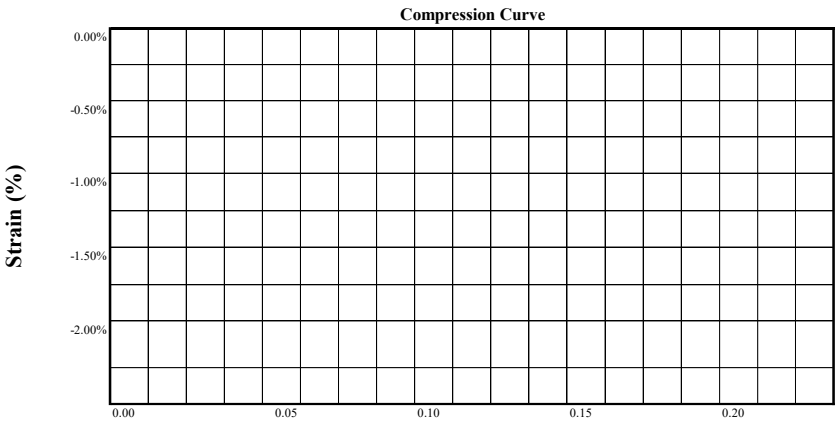
Ring Weight (g)	45.6
Ring Height (in)	1.000
Ring Diameter (in)	2.421
Ring Area (in^2)	4.604

Weight Used in Swell Test

Load Weight:	100 psf

Dial Readings During Test

Time Elapsed	Dial Reading (0.001")
0 (w/ seating pressure)	0.000
0 (w/ load applied)	0.000
30 Seconds	0.000
1 Minute	0.000
2 Minutes	0.001
4 Minutes	0.005
8 Minutes	0.010
15 Minutes	0.016
30 Minutes	0.018
1 Hour	0.018
2 Hours	0.019
4 Hours	0.019
8 Hours	0.019
15 Hours	0.019
24 Hours	0.019



ACS Services LLC

Swell / Settlement Potential of Soils
ASTM D4546-03

ACS Project #	**2201026**	Material Type:	Native
ACS Lab #	22-1803-1	Sample Date:	-
Client Name:	Ethos	Sampled By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date:	5/10/2022
Project Address:	MC85 to Van Buren	Laboratory Test By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Sample Source:	B-69 @ 1.0 - 4.0'		

Test Method: [ ] A [ ] B [x] C

Standard Proctor Information

Maximum Dry Density:	124.5	pcf
Optimum Moisture Content:	11.9	%

Specimen Preparation

95% of Maximum Dry Density:	118.3	pcf
-2% of Optimum Moisture Content:	9.9	%
Wet Density of Sample:	130.0	pcf
Test Weight (Wet):	156.9	g
Test Weight (Dry):	142.8	g
Moisture Sample (Wet):	101.6	g
Moisture Sample (Dry):	95.4	g
Sample Moisture Content:	6.5	%
Sample Weight (In situ):	152.1	g
Additional Moisture Needed:	4.9	ml
Ring Weight:	45.0	g
Total Weight Ring + Sample:	201.9	g
Initial Sample Saturation:	46	%

Specimen Test Data Post-Swell Test

Initial Specimen Height:		in
Final Specimen Height:		in
Final Specimen Weight:		g
Final Specimen Moisture Content:		%
Final Sample Saturation:		%

Final Wet Weight

Final Dry Weight

Swell / Settlement Potential Results

Load at Inundation (ksf)	
% Strain Before Inundation:	
% Strain After Inundation:	
Percent Heave:	

Correction Factor

Calibration Correction Factor	NONE

Corrected Swell	0.2

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

Ring Mold Information

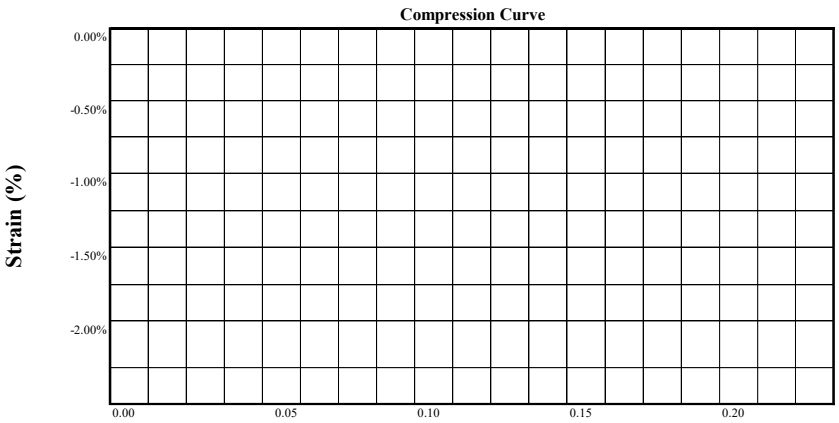
Ring Weight (g)	45.0
Ring Height (in)	1.000
Ring Diameter (in)	2.421
Ring Area (in^2)	4.604

Weight Used in Swell Test

Load Weight:	100 psf

Dial Readings During Test

Time Elapsed	Dial Reading (0.001")
0 (w/ seating pressure)	0.000
0 (w/ load applied)	0.000
30 Seconds	0.001
1 Minute	0.001
2 Minutes	0.001
4 Minutes	0.001
8 Minutes	0.002
15 Minutes	0.002
30 Minutes	0.002
1 Hour	0.002
2 Hours	0.002
4 Hours	0.002
8 Hours	0.002
15 Hours	0.002
24 Hours	0.002



ACS Services LLC

Swell / Settlement Potential of Soils
ASTM D4546-03

ACS Project #	**2201026**	Material Type:	Native
ACS Lab #	22-1803-10	Sample Date:	-
Client Name:	Ethos	Sampled By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date:	5/5/2022
Project Address:	MC85 to Van Buren	Laboratory Test By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Sample Source:	B-80 @ 0.0 - 5.0'		

Test Method: [ ] A [ ] B [x] C

Standard Proctor Information

Maximum Dry Density:	118.8	pcf
Optimum Moisture Content:	12.9	%

Specimen Preparation

95% of Maximum Dry Density:	112.9	pcf
-2% of Optimum Moisture Content:	10.9	%
Wet Density of Sample:	125.2	pcf
Test Weight (Wet):	151.1	g
Test Weight (Dry):	136.3	g
Moisture Sample (Wet):	105.0	g
Moisture Sample (Dry):	96.0	g
Sample Moisture Content:	9.4	%
Sample Weight (In situ):	149.0	g
Additional Moisture Needed:	2.1	ml
Ring Weight:	44.9	g
Total Weight Ring + Sample:	196.0	g
Initial Sample Saturation:	56	%

Specimen Test Data Post-Swell Test

Initial Specimen Height:		in
Final Specimen Height:		in
Final Specimen Weight:		g
Final Specimen Moisture Content:		%
Final Sample Saturation:		%

Final Wet Weight

Final Dry Weight

Swell / Settlement Potential Results

Load at Inundation (ksf)	
% Strain Before Inundation:	
% Strain After Inundation:	
Percent Heave:	

Correction Factor

Calibration Correction Factor	NONE

Corrected Swell	2

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

Ring Mold Information

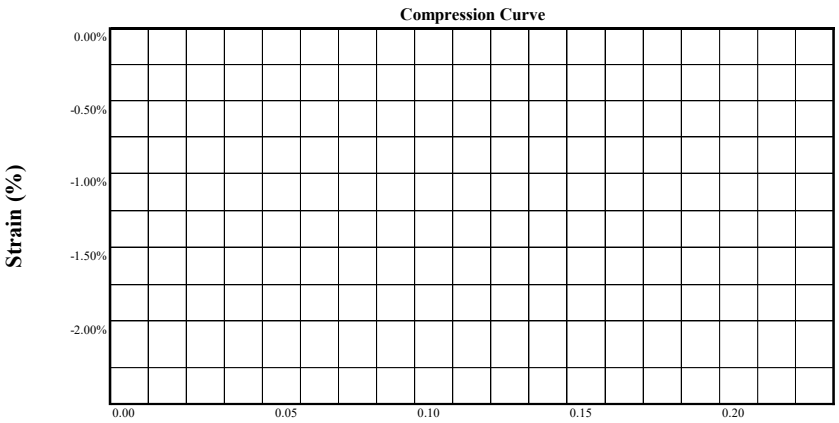
Ring Weight (g)	44.9
Ring Height (in)	1.000
Ring Diameter (in)	2.421
Ring Area (in^2)	4.604

Weight Used in Swell Test

Load Weight:	100 psf

Dial Readings During Test

Time Elapsed	Dial Reading (0.001")
0 (w/ seating pressure)	0.000
0 (w/ load applied)	0.000
30 Seconds	0.000
1 Minute	0.003
2 Minutes	0.005
4 Minutes	0.008
8 Minutes	0.016
15 Minutes	0.018
30 Minutes	0.019
1 Hour	0.020
2 Hours	0.020
4 Hours	0.020
8 Hours	0.020
15 Hours	0.020
24 Hours	0.020



ACS Services LLC

Swell / Settlement Potential of Soils
ASTM D4546-03

ACS Project #	**2201026**	Material Type:	Native
ACS Lab #	22-1583-1	Sample Date:	-
Client Name:	Ethos	Sampled By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date:	3/24/2022
Project Address:	MC85 to Van Buren	Laboratory Test By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Sample Source:	B-89 @ 0.0 - 5.0'		

Test Method: [ ] A [ ] B [x] C

Standard Proctor Information

Maximum Dry Density:	117.3	pcf
Optimum Moisture Content:	13.2	%

Specimen Preparation

95% of Maximum Dry Density:	111.4	pcf
-2% of Optimum Moisture Content:	11.2	%
Wet Density of Sample:	123.9	pcf
Test Weight (Wet):	149.6	g
Test Weight (Dry):	134.6	g
Moisture Sample (Wet):	100.0	g
Moisture Sample (Dry):	93.6	g
Sample Moisture Content:	6.8	%
Sample Weight (In situ):	143.8	g
Additional Moisture Needed:	5.9	ml
Ring Weight:	45.3	g
Total Weight Ring + Sample:	194.9	g
Initial Sample Saturation:	39	%

Specimen Test Data Post-Swell Test

Initial Specimen Height:		in
Final Specimen Height:		in
Final Specimen Weight:		g
Final Specimen Moisture Content:		%
Final Sample Saturation:		%

Final Wet Weight

Final Dry Weight

Swell / Settlement Potential Results

Load at Inundation (ksf)	
% Strain Before Inundation:	
% Strain After Inundation:	
Percent Heave:	

Correction Factor

Calibration Correction Factor	NONE

Corrected Swell	0.9

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

Ring Mold Information

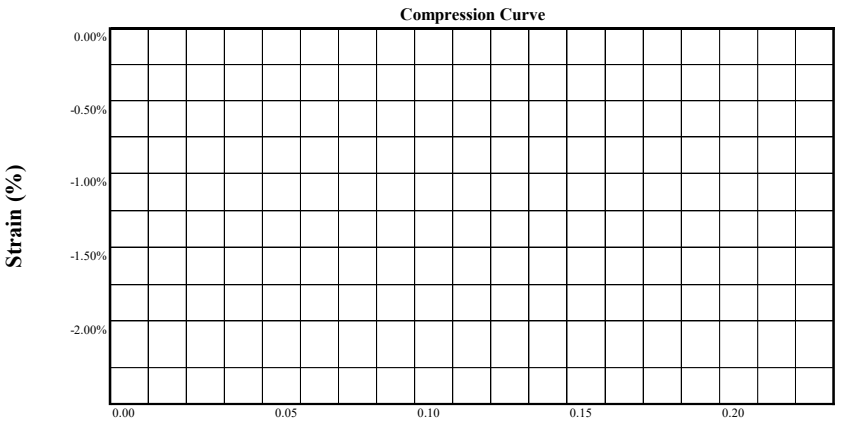
Ring Weight (g)	45.3
Ring Height (in)	1.000
Ring Diameter (in)	2.421
Ring Area (in^2)	4.604

Weight Used in Swell Test

Load Weight:	100 psf

Dial Readings During Test

Time Elapsed	Dial Reading (0.001")
0 (w/ seating pressure)	0.000
0 (w/ load applied)	0.000
30 Seconds	0.002
1 Minute	0.004
2 Minutes	0.006
4 Minutes	0.007
8 Minutes	0.008
15 Minutes	0.008
30 Minutes	0.008
1 Hour	0.009
2 Hours	0.009
4 Hours	0.009
8 Hours	0.009
15 Hours	0.009
24 Hours	0.009



ACS Services LLC

Swell / Settlement Potential of Soils
ASTM D4546-03

ACS Project #	**2201026**	Material Type:	Native
ACS Lab #	22-1944-1	Sample Date:	-
Client Name:	Ethos	Sampled By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date:	1/0/1900
Project Address:	MC85 to Van Buren	Laboratory Test By:	0
Project City:	Goodyear	Reviewed By:	Dylan Ward
Sample Source:	B-97 @ 0.0 - 5.0		

Test Method: [ ] A [ ] B [x] C

Standard Proctor Information

Maximum Dry Density:	120.0	pcf
Optimum Moisture Content:	13.0	%

Specimen Preparation

95% of Maximum Dry Density:	114.0	pcf
-2% of Optimum Moisture Content:	11.0	%
Wet Density of Sample:	126.5	pcf
Test Weight (Wet):	152.8	g
Test Weight (Dry):	137.6	g
Moisture Sample (Wet):	104.7	g
Moisture Sample (Dry):	97.7	g
Sample Moisture Content:	7.2	%
Sample Weight (In situ):	147.5	g
Additional Moisture Needed:	5.3	ml
Ring Weight:	45.1	g
Total Weight Ring + Sample:	197.9	g
Initial Sample Saturation:	44	%

Specimen Test Data Post-Swell Test

Initial Specimen Height:		in
Final Specimen Height:		in
Final Specimen Weight:		g
Final Specimen Moisture Content:		%
Final Sample Saturation:		%

Final Wet Weight

Final Dry Weight

Swell / Settlement Potential Results

Load at Inundation (ksf)	
% Strain Before Inundation:	
% Strain After Inundation:	
Percent Heave:	

Correction Factor

Calibration Correction Factor	NONE

Corrected Swell	1.7

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

Ring Mold Information

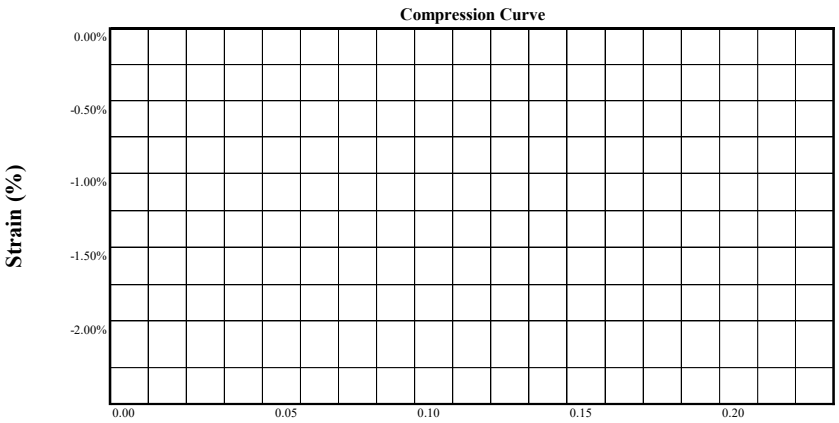
Ring Weight (g)	45.1
Ring Height (in)	1.000
Ring Diameter (in)	2.421
Ring Area (in^2)	4.604

Weight Used in Swell Test

Load Weight:	100 psf

Dial Readings During Test

Time Elapsed	Dial Reading (0.001")
0 (w/ seating pressure)	0.000
0 (w/ load applied)	0.000
30 Seconds	0.001
1 Minute	0.002
2 Minutes	0.005
4 Minutes	0.008
8 Minutes	0.011
15 Minutes	0.014
30 Minutes	0.016
1 Hour	0.016
2 Hours	0.016
4 Hours	0.016
8 Hours	0.016
15 Hours	-
24 Hours	0.017



ACS Services LLC

Swell / Settlement Potential of Soils
ASTM D4546-03

ACS Project #	**2201026**	Material Type:	Native
ACS Lab #	22-1849-5	Sample Date:	-
Client Name:	Ethos	Sampled By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date:	4/8/2022
Project Address:	MC85 to Van Buren	Laboratory Test By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Sample Source:	B-100 @ 0.0 - 5.0		

Test Method: [ ] A [ ] B [x] C

Standard Proctor Information

Maximum Dry Density:	121.8	pcf
Optimum Moisture Content:	12.3	%

Specimen Preparation

95% of Maximum Dry Density:	115.7	pcf
-2% of Optimum Moisture Content:	10.3	%
Wet Density of Sample:	127.6	pcf
Test Weight (Wet):	154.1	g
Test Weight (Dry):	139.7	g
Moisture Sample (Wet):	100.0	g
Moisture Sample (Dry):	91.7	g
Sample Moisture Content:	9.1	%
Sample Weight (In situ):	152.4	g
Additional Moisture Needed:	1.7	ml
Ring Weight:	45.5	g
Total Weight Ring + Sample:	199.6	g
Initial Sample Saturation:	59	%

Specimen Test Data Post-Swell Test

Initial Specimen Height:		in
Final Specimen Height:		in
Final Specimen Weight:		g
Final Specimen Moisture Content:		%
Final Sample Saturation:		%

Final Wet Weight

Final Dry Weight

Swell / Settlement Potential Results

Load at Inundation (ksf)	
% Strain Before Inundation:	
% Strain After Inundation:	
Percent Heave:	

Correction Factor

Calibration Correction Factor	NONE

Corrected Swell	1.5

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

Ring Mold Information

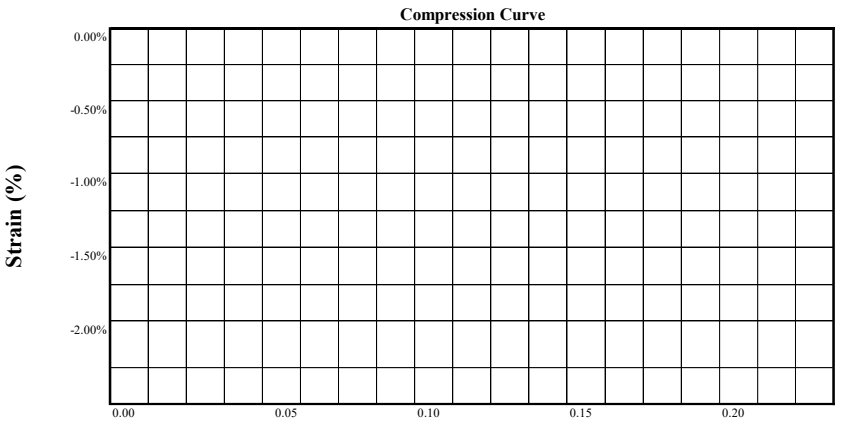
Ring Weight (g)	45.5
Ring Height (in)	1.000
Ring Diameter (in)	2.421
Ring Area (in^2)	4.604

Weight Used in Swell Test

Load Weight:	100 psf

Dial Readings During Test

Time Elapsed	Dial Reading (0.001")
0 (w/ seating pressure)	0.000
0 (w/ load applied)	0.000
30 Seconds	0.003
1 Minute	0.005
2 Minutes	0.008
4 Minutes	0.011
8 Minutes	0.013
15 Minutes	0.014
30 Minutes	0.015
1 Hour	0.015
2 Hours	0.015
4 Hours	0.015
8 Hours	0.015
15 Hours	0.015
24 Hours	0.015



ACS Services LLC

Swell / Settlement Potential of Soils
ASTM D4546-03

ACS Project #	**2201026**	Material Type:	Native
ACS Lab #	22-2082-2	Sample Date:	-
Client Name:	Ethos	Sampled By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date:	5/9/2022
Project Address:	MC85 to Van Buren	Laboratory Test By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Sample Source:	B-107 @ 0.0 - 5.0		

Test Method: [ ] A [ ] B [x] C

Standard Proctor Information

Maximum Dry Density:	124.4	pcf
Optimum Moisture Content:	12.7	%

Specimen Preparation

95% of Maximum Dry Density:	118.2	pcf
-2% of Optimum Moisture Content:	10.7	%
Wet Density of Sample:	130.8	pcf
Test Weight (Wet):	158.0	g
Test Weight (Dry):	142.7	g
Moisture Sample (Wet):	109.8	g
Moisture Sample (Dry):	98.5	g
Sample Moisture Content:	11.5	%
Sample Weight (In situ):	159.1	g
Additional Moisture Needed:	-1.1	ml
Ring Weight:	45.7	g
Total Weight Ring + Sample:	203.7	g
Initial Sample Saturation:	80	%

Specimen Test Data Post-Swell Test

Initial Specimen Height:		in
Final Specimen Height:		in
Final Specimen Weight:		g
Final Specimen Moisture Content:		%
Final Sample Saturation:		%

Final Wet Weight

Final Dry Weight

Swell / Settlement Potential Results

Load at Inundation (ksf)	
% Strain Before Inundation:	
% Strain After Inundation:	
Percent Heave:	

Correction Factor

Calibration Correction Factor	NONE

Corrected Swell	2.4

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

Ring Mold Information

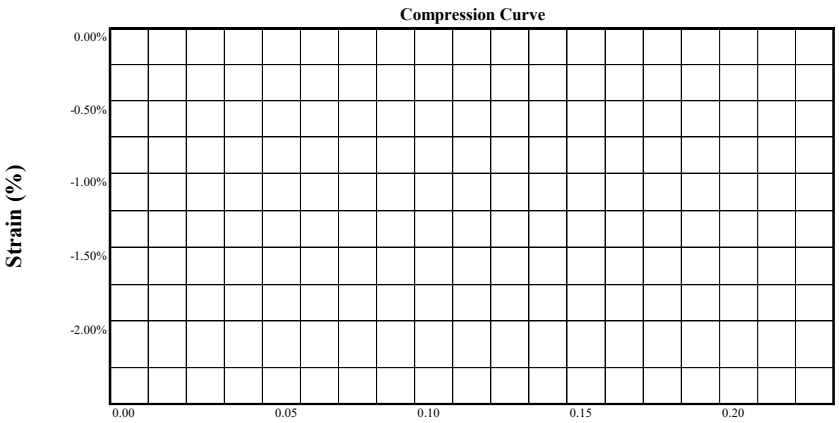
Ring Weight (g)	45.7
Ring Height (in)	1.000
Ring Diameter (in)	2.421
Ring Area (in^2)	4.604

Weight Used in Swell Test

Load Weight:	100 psf

Dial Readings During Test

Time Elapsed	Dial Reading (0.001")
0 (w/ seating pressure)	0.000
0 (w/ load applied)	0.000
30 Seconds	0.001
1 Minute	0.006
2 Minutes	0.007
4 Minutes	0.012
8 Minutes	0.018
15 Minutes	0.020
30 Minutes	0.024
1 Hour	0.024
2 Hours	0.024
4 Hours	0.024
8 Hours	0.024
15 Hours	0.024
24 Hours	0.024



ACS Services LLC

Swell / Settlement Potential of Soils
ASTM D4546-03

ACS Project #	**2201026**	Material Type:	Soil
ACS Lab #	22-3009-7	Sample Date:	-
Client Name:	Ethos	Sampled By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date:	6/29/2022
Project Address:	MC85 to Van Buren	Laboratory Test By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Sample Source:	B-107 @ 0.0 - 5.0		

Test Method: [ ] A [ ] B [x] C

Standard Proctor Information

Maximum Dry Density:	124.4	pcf
Optimum Moisture Content:	12.7	%

Specimen Preparation

95% of Maximum Dry Density:	118.2	pcf
-2% of Optimum Moisture Content:	10.7	%
Wet Density of Sample:	130.8	pcf
Test Weight (Wet):	158.0	g
Test Weight (Dry):	142.7	g
Moisture Sample (Wet):	101.9	g
Moisture Sample (Dry):	98.7	g
Sample Moisture Content:	3.2	%
Sample Weight (In situ):	147.3	g
Additional Moisture Needed:	10.6	ml
Ring Weight:	44.9	g
Total Weight Ring + Sample:	202.9	g
Initial Sample Saturation:	23	%

Specimen Test Data Post-Swell Test

Initial Specimen Height:		in
Final Specimen Height:		in
Final Specimen Weight:		g
Final Specimen Moisture Content:		%
Final Sample Saturation:		%

Final Wet Weight

Final Dry Weight

Swell / Settlement Potential Results

Load at Inundation (ksf)	
% Strain Before Inundation:	
% Strain After Inundation:	
Percent Heave:	

Correction Factor

Calibration Correction Factor	NONE

Corrected Swell	0.1

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

Ring Mold Information

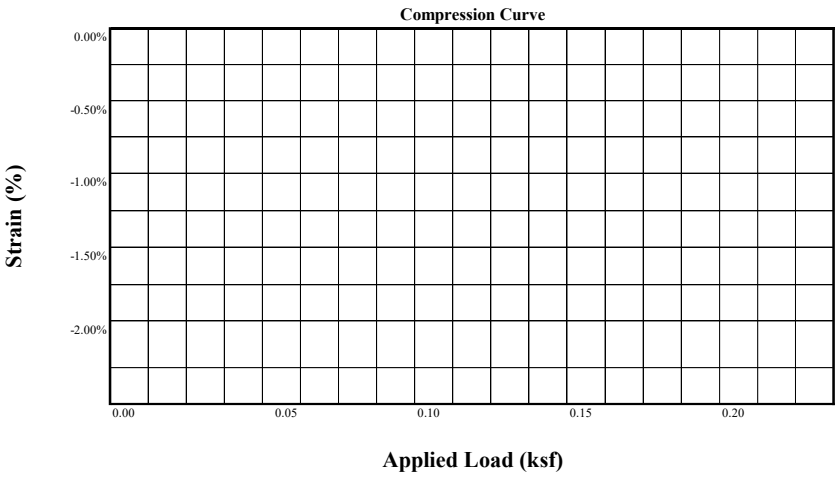
Ring Weight (g)	44.9
Ring Height (in)	1.000
Ring Diameter (in)	2.421
Ring Area (in^2)	4.604

Weight Used in Swell Test

Load Weight:	144 psf

Dial Readings During Test

Time Elapsed	Dial Reading (0.001")
0 (w/ seating pressure)	0.000
0 (w/ load applied)	0.000
30 Seconds	0.000
1 Minute	0.000
2 Minutes	0.001
4 Minutes	0.001
8 Minutes	0.001
15 Minutes	0.001
30 Minutes	0.001
1 Hour	0.001
2 Hours	0.001
4 Hours	0.001
8 Hours	0.001
15 Hours	0.001
24 Hours	0.001



ACS Services LLC

Swell / Settlement Potential of Soils
ASTM D4546-03

ACS Project #	**2201026**	Material Type:	Soil
ACS Lab #	22-3009-7	Sample Date:	-
Client Name:	Ethos	Sampled By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date:	7/6/2022
Project Address:	MC85 to Van Buren	Laboratory Test By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Sample Source:	B-107 @ 0.0 - 5.0		

Test Method: [ ] A [ ] B [x] C

Standard Proctor Information

Maximum Dry Density:	124.4	pcf
Optimum Moisture Content:	12.7	%

Specimen Preparation

95% of Maximum Dry Density:	118.2	pcf
-2% of Optimum Moisture Content:	10.7	%
Wet Density of Sample:	130.8	pcf
Test Weight (Wet):	158.0	g
Test Weight (Dry):	142.7	g
Moisture Sample (Wet):	103.8	g
Moisture Sample (Dry):	101.0	g
Sample Moisture Content:	2.8	%
Sample Weight (In situ):	146.7	g
Additional Moisture Needed:	11.3	ml
Ring Weight:	44.9	g
Total Weight Ring + Sample:	202.9	g
Initial Sample Saturation:	19	%

Specimen Test Data Post-Swell Test

Initial Specimen Height:		in
Final Specimen Height:		in
Final Specimen Weight:		g
Final Specimen Moisture Content:		%
Final Sample Saturation:		%

Final Wet Weight

Final Dry Weight

Swell / Settlement Potential Results

Load at Inundation (ksf)	
% Strain Before Inundation:	
% Strain After Inundation:	
Percent Heave:	

Correction Factor

Calibration Correction Factor	NONE

Corrected Swell	0

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

Ring Mold Information

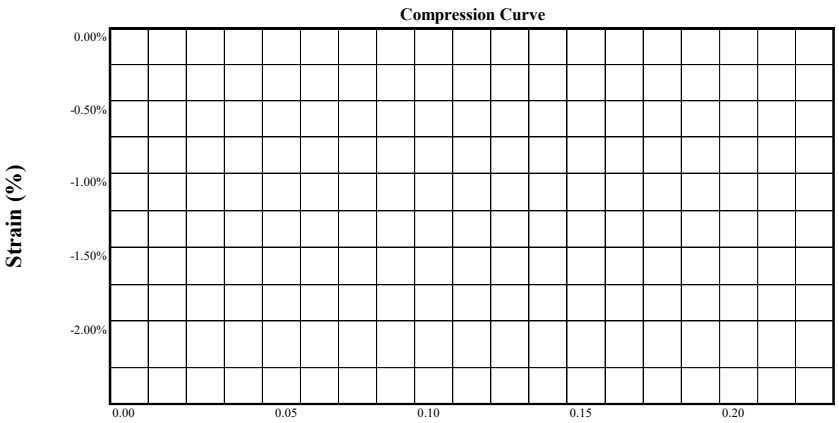
Ring Weight (g)	44.9
Ring Height (in)	1.000
Ring Diameter (in)	2.421
Ring Area (in^2)	4.604

Weight Used in Swell Test

Load Weight:	200 psf

Dial Readings During Test

Time Elapsed	Dial Reading (0.001")
0 (w/ seating pressure)	0.000
0 (w/ load applied)	0.000
30 Seconds	0.000
1 Minute	0.000
2 Minutes	0.000
4 Minutes	0.000
8 Minutes	0.000
15 Minutes	0.000
30 Minutes	0.000
1 Hour	0.000
2 Hours	0.000
4 Hours	0.000
8 Hours	0.000
15 Hours	0.000
24 Hours	0.000



ACS Services LLC

Swell / Settlement Potential of Soils
ASTM D4546-03

ACS Project #	**2201026**	Material Type:	Native
ACS Lab #	22-1583-6	Sample Date:	-
Client Name:	Ethos	Sampled By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date:	4/4/2022
Project Address:	MC85 to Van Buren	Laboratory Test By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Sample Source:	B-112 @ 0.0 - 5.0'		

Test Method: [ ] A [ ] B [x] C

Standard Proctor Information

Maximum Dry Density:	117.5	pcf
Optimum Moisture Content:	12.9	%

Specimen Preparation

95% of Maximum Dry Density:	111.6	pcf
-2% of Optimum Moisture Content:	10.9	%
Wet Density of Sample:	123.8	pcf
Test Weight (Wet):	149.5	g
Test Weight (Dry):	134.8	g
Moisture Sample (Wet):	100.0	g
Moisture Sample (Dry):	96.9	g
Sample Moisture Content:	3.2	%
Sample Weight (In situ):	139.1	g
Additional Moisture Needed:	10.4	ml
Ring Weight:	45.9	g
Total Weight Ring + Sample:	195.4	g
Initial Sample Saturation:	18	%

Specimen Test Data Post-Swell Test

Initial Specimen Height:		in
Final Specimen Height:		in
Final Specimen Weight:		g
Final Specimen Moisture Content:		%
Final Sample Saturation:		%

Final Wet Weight

Final Dry Weight

Swell / Settlement Potential Results

Load at Inundation (ksf)	
% Strain Before Inundation:	
% Strain After Inundation:	
Percent Heave:	

Correction Factor

Calibration Correction Factor	NONE

Corrected Swell	1.3

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

Ring Mold Information

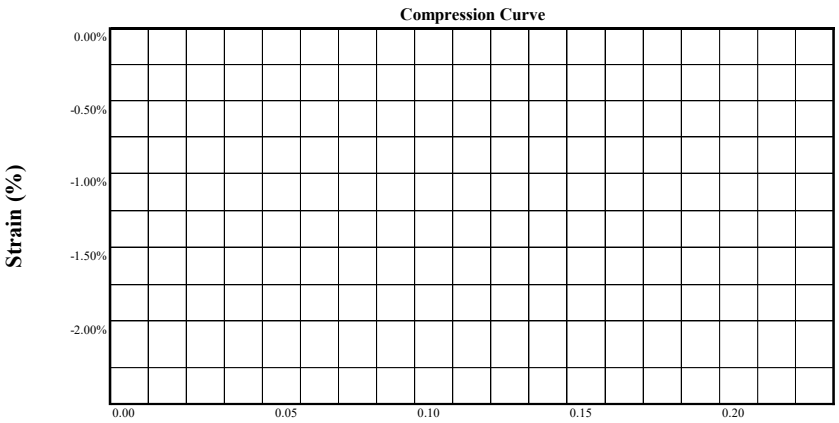
Ring Weight (g)	45.9
Ring Height (in)	1.000
Ring Diameter (in)	2.421
Ring Area (in^2)	4.604

Weight Used in Swell Test

Load Weight:	100psf

Dial Readings During Test

Time Elapsed	Dial Reading (0.001")
0 (w/ seating pressure)	0.000
0 (w/ load applied)	0.000
30 Seconds	0.001
1 Minute	0.001
2 Minutes	0.003
4 Minutes	0.004
8 Minutes	0.007
15 Minutes	0.010
30 Minutes	0.011
1 Hour	0.013
2 Hours	0.012
4 Hours	0.012
8 Hours	0.012
15 Hours	0.013
24 Hours	0.013



ACS Services LLC

Swell / Settlement Potential of Soils
ASTM D4546-03

ACS Project #	**2201026**	Material Type:	Native
ACS Lab #	22-1146-5	Sample Date:	N/A
Client Name:	Ethos	Sampled By:	Client
Project Name:	SR 303L MC 85 to Van Buren	Laboratory Test Date:	1/27/2022
Project Address:	SR 303L MC 85 to Van Buren	Laboratory Test By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Andrew Jamrogiewicz, P.E.
Sample Source:	B - 113 @ 0.0' - 5.0'		

Test Method: [ ] A [ ] B [x] C

Standard Proctor Information

Maximum Dry Density:	121.4	pcf
Optimum Moisture Content:	11.6	%

Specimen Preparation

95% of Maximum Dry Density:	115.3	pcf
-2% of Optimum Moisture Content:	9.6	%
Wet Density of Sample:	126.4	pcf
Test Weight (Wet):	152.6	g
Test Weight (Dry):	139.3	g
Moisture Sample (Wet):	117.7	g
Moisture Sample (Dry):	112.8	g
Sample Moisture Content:	4.3	%
Sample Weight (In situ):	145.3	g
Additional Moisture Needed:	7.3	ml
Ring Weight:	44.7	g
Total Weight Ring + Sample:	197.3	g
Initial Sample Saturation:	28	%

Specimen Test Data Post-Swell Test

Initial Specimen Height:		in
Final Specimen Height:		in
Final Specimen Weight:		g
Final Specimen Moisture Content:		%
Final Sample Saturation:		%

Final Wet Weight

Final Dry Weight

Swell / Settlement Potential Results

Load at Inundation (ksf)	
% Strain Before Inundation:	
% Strain After Inundation:	
Percent Heave:	

Correction Factor

Calibration Correction Factor	NONE

Corrected Swell	1.2

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

Ring Mold Information

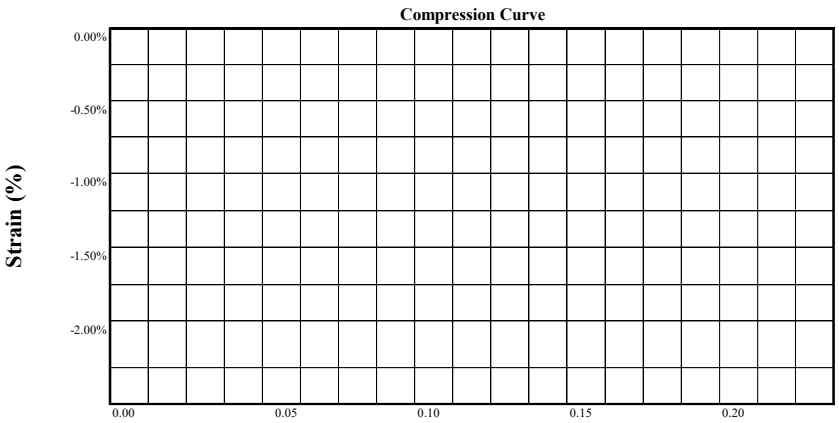
Ring Weight (g)	44.7
Ring Height (in)	1.000
Ring Diameter (in)	2.421
Ring Area (in^2)	4.604

Weight Used in Swell Test

Load Weight:	100 psf

Dial Readings During Test

Time Elapsed	Dial Reading (0.001")
0 (w/ seating pressure)	0.000
0 (w/ load applied)	0.000
30 Seconds	0.002
1 Minute	0.003
2 Minutes	0.005
4 Minutes	0.008
8 Minutes	0.010
15 Minutes	0.011
30 Minutes	0.011
1 Hour	0.012
2 Hours	0.012
4 Hours	-
8 Hours	-
15 Hours	0.012
24 Hours	0.012



ACS Services LLC

Swell / Settlement Potential of Soils
ASTM D4546-03

ACS Project #	**2201026**	Material Type:	Native
ACS Lab #	22-1128-10	Sample Date:	N/A
Client Name:	Ethos	Sampled By:	Client
Project Name:	SR 303L MC 85 to Van Buren	Laboratory Test Date:	1/27/2022
Project Address:	SR 303L MC 85 to Van Buren	Laboratory Test By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Andrew Jamrogiewicz, P.E.
Sample Source:	B - 114 @ 0.0' - 5.0'		

Test Method: [ ] A [ ] B [x] C

Standard Proctor Information

Maximum Dry Density:	115.9	pcf
Optimum Moisture Content:	12.7	%

Specimen Preparation

95% of Maximum Dry Density:	110.1	pcf
-2% of Optimum Moisture Content:	10.7	%
Wet Density of Sample:	121.9	pcf
Test Weight (Wet):	147.2	g
Test Weight (Dry):	132.9	g
Moisture Sample (Wet):	112.2	g
Moisture Sample (Dry):	106.6	g
Sample Moisture Content:	5.3	%
Sample Weight (In situ):	139.9	g
Additional Moisture Needed:	7.2	ml
Ring Weight:	44.8	g
Total Weight Ring + Sample:	192.0	g
Initial Sample Saturation:	29	%

Specimen Test Data Post-Swell Test

Initial Specimen Height:		in
Final Specimen Height:		in
Final Specimen Weight:		g
Final Specimen Moisture Content:		%
Final Sample Saturation:		%

Final Wet Weight

Final Dry Weight

Swell / Settlement Potential Results

Load at Inundation (ksf)	
% Strain Before Inundation:	
% Strain After Inundation:	
Percent Heave:	

Correction Factor

Calibration Correction Factor	NONE

Corrected Swell	1.6

Andrew Jamrogiewicz
Project Manager

Andrew Jamrogiewicz
Signature

Ring Mold Information

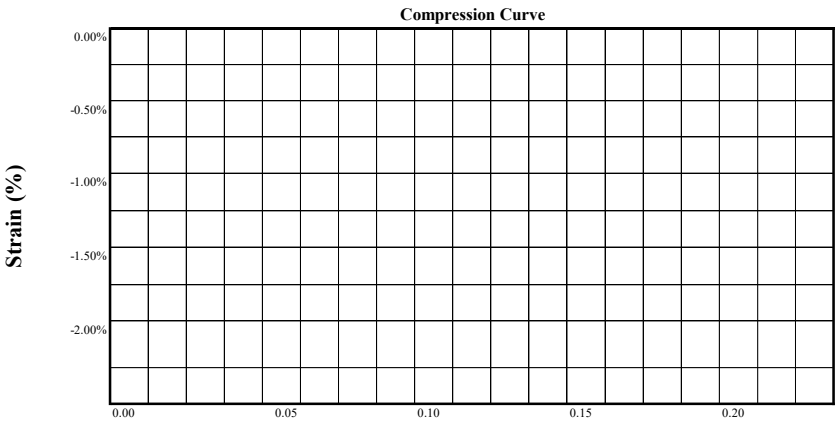
Ring Weight (g)	44.8
Ring Height (in)	1.000
Ring Diameter (in)	2.421
Ring Area (in^2)	4.604

Weight Used in Swell Test

Load Weight:	100 psf

Dial Readings During Test

Time Elapsed	Dial Reading (0.001")
0 (w/ seating pressure)	0.000
0 (w/ load applied)	0.000
30 Seconds	0.004
1 Minute	0.006
2 Minutes	0.009
4 Minutes	0.012
8 Minutes	0.014
15 Minutes	0.014
30 Minutes	0.015
1 Hour	0.015
2 Hours	0.015
4 Hours	-
8 Hours	-
15 Hours	0.016
24 Hours	0.016



ACS Services LLC

Swell / Settlement Potential of Soils
ASTM D4546-03

ACS Project #	**2201026**	Material Type:	Soil
ACS Lab #	22-2242-2	Sample Date:	-
Client Name:	Ethos	Sampled By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date:	5/10/2022
Project Address:	MC85 to Van Buren	Laboratory Test By:	Brian Karl
Project City:	Goodyear	Reviewed By:	Dylan Ward
Sample Source:	B-124 @ 0.0 - 5.0		

Test Method: [ ] A [ ] B [x] C

Standard Proctor Information

Maximum Dry Density:	117.8	pcf
Optimum Moisture Content:	13.1	%

Specimen Preparation

95% of Maximum Dry Density:	111.9	pcf
-2% of Optimum Moisture Content:	11.1	%
Wet Density of Sample:	124.3	pcf
Test Weight (Wet):	150.1	g
Test Weight (Dry):	135.1	g
Moisture Sample (Wet):	105.3	g
Moisture Sample (Dry):	99.8	g
Sample Moisture Content:	5.5	%
Sample Weight (In situ):	142.6	g
Additional Moisture Needed:	7.6	ml
Ring Weight:	45.6	g
Total Weight Ring + Sample:	195.7	g
Initial Sample Saturation:	32	%

Specimen Test Data Post-Swell Test

Initial Specimen Height:		in
Final Specimen Height:		in
Final Specimen Weight:		g
Final Specimen Moisture Content:		%
Final Sample Saturation:		%

Final Wet Weight

Final Dry Weight

Swell / Settlement Potential Results

Load at Inundation (ksf)	
% Strain Before Inundation:	
% Strain After Inundation:	
Percent Heave:	

Correction Factor

Calibration Correction Factor	NONE

Corrected Swell	1.5

Dylan Ward
Laboratory Manager

Dylan Ward
Signature

Ring Mold Information

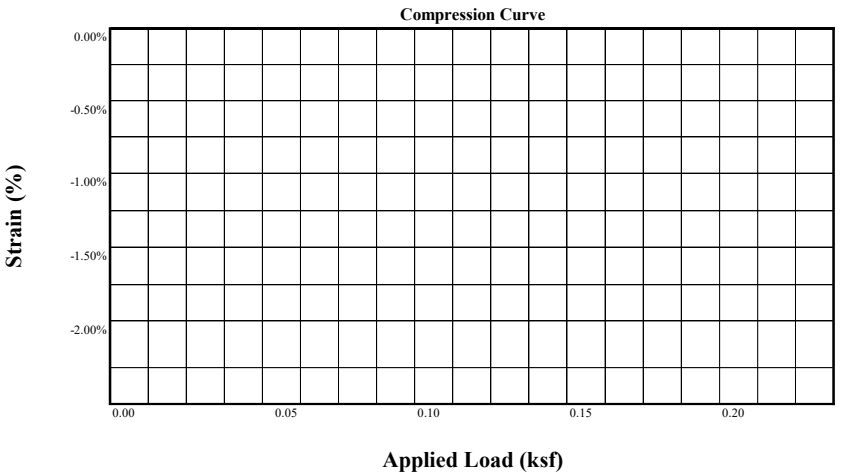
Ring Weight (g)	45.6
Ring Height (in)	1.000
Ring Diameter (in)	2.421
Ring Area (in^2)	4.604

Weight Used in Swell Test

Load Weight:	100 psf

Dial Readings During Test

Time Elapsed	Dial Reading (0.001")
0 (w/ seating pressure)	0.000
0 (w/ load applied)	0.000
30 Seconds	0.002
1 Minute	0.003
2 Minutes	0.005
4 Minutes	0.008
8 Minutes	0.012
15 Minutes	0.013
30 Minutes	0.013
1 Hour	0.013
2 Hours	0.013
4 Hours	0.015
8 Hours	0.015
15 Hours	0.015
24 Hours	0.015



ACS Services LLC

Swell / Settlement Potential of Soils
ASTM D4546-03

ACS Project #	**2201026**	Material Type:	Soils
ACS Lab #	24-3863-1	Sample Date:	7/8/2024
Client Name:	Ethos	Sampled By:	Client
Project Name:	SR 303L MC85 to Van Buren	Laboratory Test Date:	7/10/2024
Project Address:	MC85 to Van Buren	Laboratory Test By:	Mahalia Davis
Project City:	Goodyear	Reviewed By:	Fernando Montero
Sample Source:	P-06A (0.0 - 2.0)		

Test Method: [ ] A [ ] B [x] C

Standard Proctor Information

Maximum Dry Density:	122.6	pcf
Optimum Moisture Content:	9.3	%

Specimen Preparation

95% of Maximum Dry Density:	116.5	pcf
-2% of Optimum Moisture Content:	7.3	%
Wet Density of Sample:	125.0	pcf
Test Weight (Wet):	150.9	g
Test Weight (Dry):	140.6	g
Moisture Sample (Wet):	101.1	g
Moisture Sample (Dry):	100.0	g
Sample Moisture Content:	1.1	%
Sample Weight (In situ):	142.2	g
Additional Moisture Needed:	8.7	ml
Ring Weight:	45.3	g
Total Weight Ring + Sample:	196.2	g
Initial Sample Saturation:	7	%

Specimen Test Data Post-Swell Test

Initial Specimen Height:		in
Final Specimen Height:		in
Final Specimen Weight:		g
Final Specimen Moisture Content:		%
Final Sample Saturation:		%

Final Wet Weight

Final Dry Weight

Swell / Settlement Potential Results

Load at Inundation (ksf)	
% Strain Before Inundation:	
% Strain After Inundation:	
Percent Heave:	

Correction Factor

Calibration Correction Factor	NONE

Corrected Swell	0.6

Fernando Montero
Laboratory Manager

Fernando Montero
Signature

Ring Mold Information

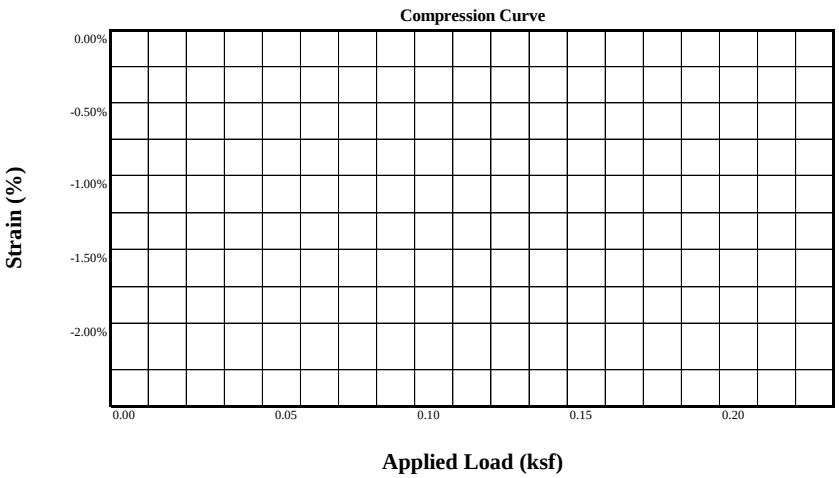
Ring Weight (g)	45.3
Ring Height (in)	1.000
Ring Diameter (in)	2.421
Ring Area (in^2)	4.604

Weight Used in Swell Test

Load Weight:	144 psf

Dial Readings During Test

Time Elapsed	Dial Reading (0.001")
0 (w/ seating pressure)	0.000
0 (w/ load applied)	0.000
30 Seconds	0.000
1 Minute	0.001
2 Minutes	0.001
4 Minutes	0.003
8 Minutes	0.004
15 Minutes	0.005
30 Minutes	0.005
1 Hour	0.005
2 Hours	0.005
4 Hours	0.006
8 Hours	0.006
15 Hours	0.006
24 Hours	0.006

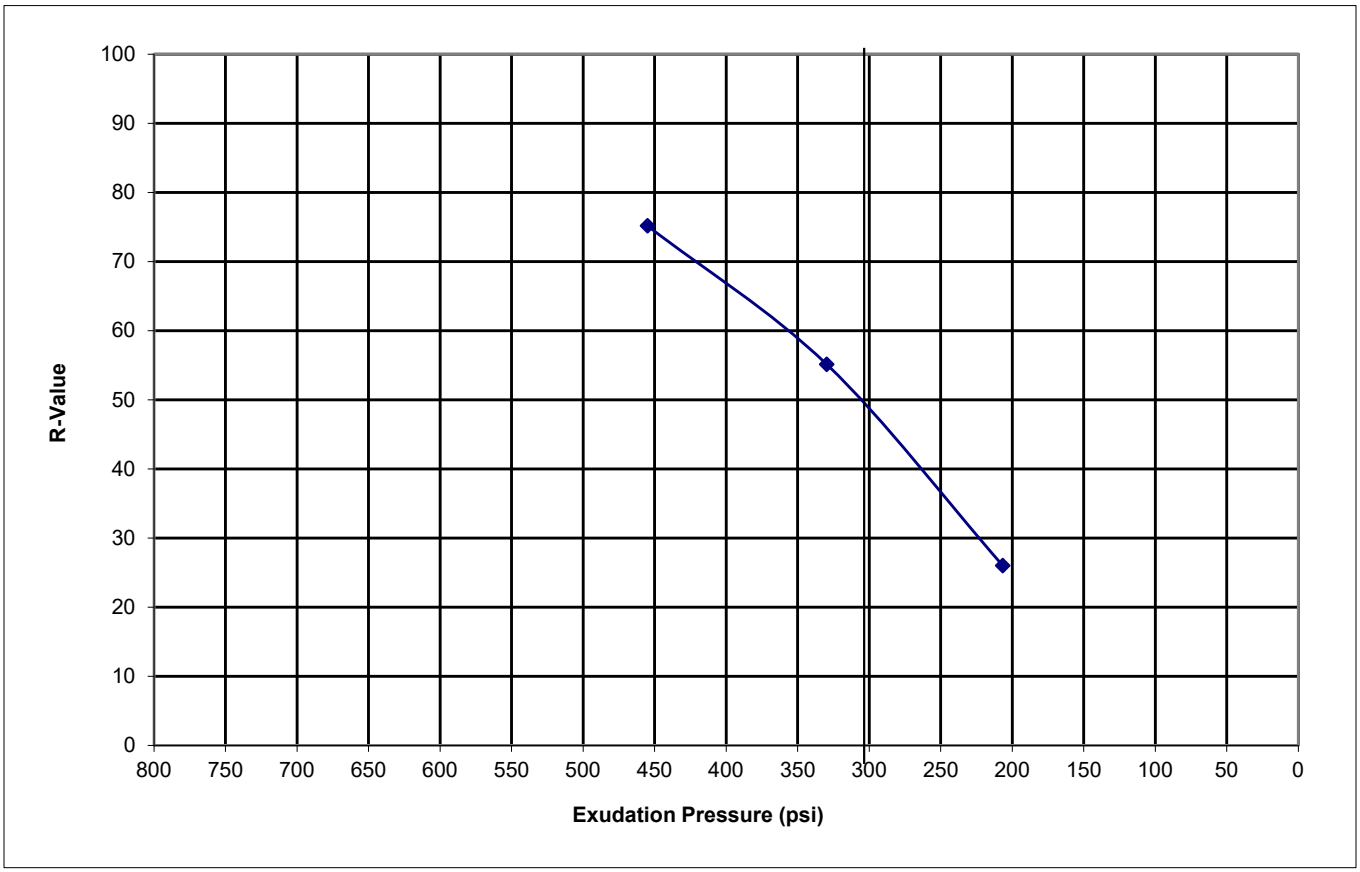


PROJECT: ACS - Lab Testing Services, Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B7 (0.0-5.0') ACS Lab No. 22-1584-4

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1224
DATE SAMPLED: 03/10/22

RESISTANCE R-VALUE AND EXPANSION PRESSURE OF COMPACTED SOILS (ASTM D2844)

SPECIMEN ID	A	B	C
Moisture Content	12.8%	12.0%	11.1%
Compaction Pressure (psi)	200	225	250
Specimen Height (inches)	2.50	2.50	2.50
Dry Density (pcf)	122.9	123.2	124.4
Horiz. Pres. @ 1000lbs (psi)	38.0	21.0	12.0
Horiz. Pres. @ 2000lbs (psi)	94.0	48.0	26.0
Displacement	5.00	4.75	4.26
Expansion Pressure (psi)	0.1	0.7	3.1
Exudation Pressure (psi)	207	330	455
R Value	26	55	75



R Value at 300 PSI = 49

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3630 E Wier Ave.
Phoenix, AZ 85040

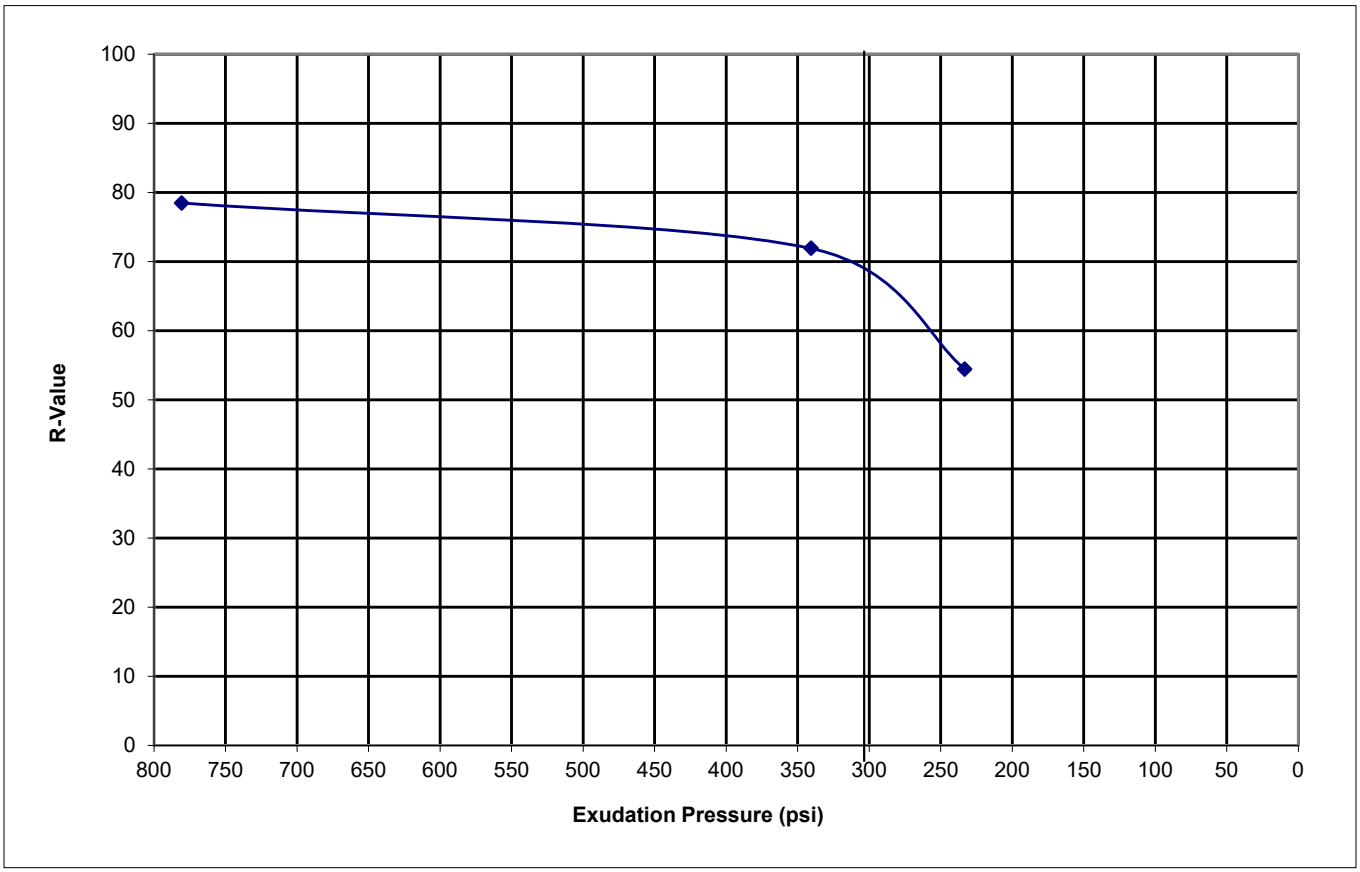
REVIEWED BY Hiram Franco

PROJECT: ACS - Lab Testing Services, Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B3 (0.0-5.0') ACS Lab No. 22-1414-14

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1163
DATE SAMPLED: 02/17/22

RESISTANCE R-VALUE AND EXPANSION PRESSURE OF COMPACTED SOILS (ASTM D2844)

SPECIMEN ID	A	B	C
Moisture Content	12.4%	12.0%	11.6%
Compaction Pressure (psi)	225	225	250
Specimen Height (inches)	2.50	2.50	2.50
Dry Density (pcf)	122.0	122.5	122.5
Horiz. Pres. @ 1000lbs (psi)	21.0	13.0	11.0
Horiz. Pres. @ 2000lbs (psi)	48.0	28.0	22.0
Displacement	4.88	4.60	4.30
Expansion Pressure (psi)	1.0	1.4	1.6
Exudation Pressure (psi)	233	341	781
R Value	54	72	78



R Value at 300 PSI = 69

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Phoenix, AZ 85040

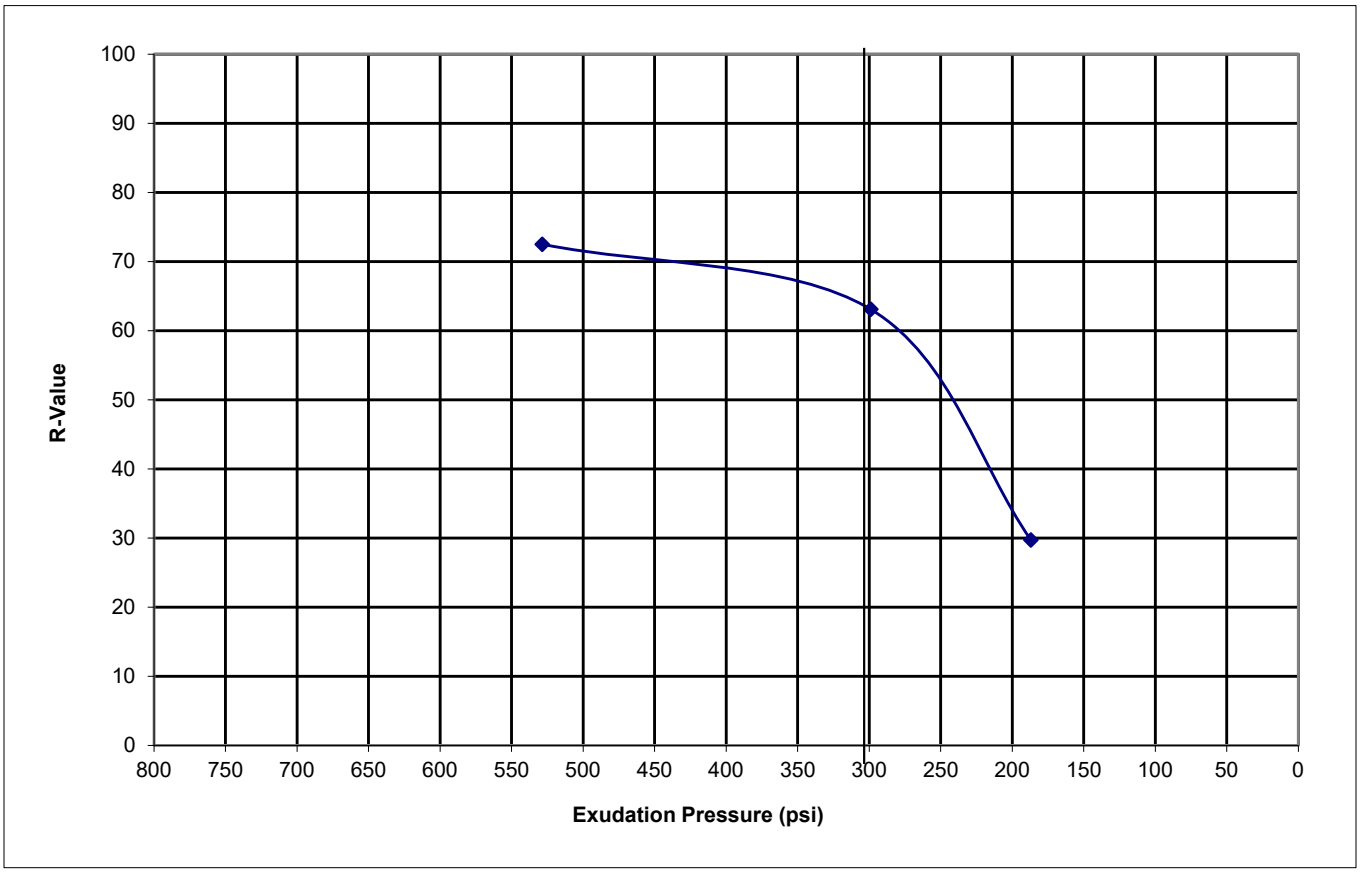
REVIEWED BY Hiram Franco

PROJECT: ACS - Lab Testing Services, Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B38 (0.0-5.0')

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1408-01
DATE SAMPLED: 05/20/22

RESISTANCE R-VALUE AND EXPANSION PRESSURE OF COMPACTED SOILS (ASTM D2844)

SPECIMEN ID	A	B	C
Moisture Content	14.5%	13.6%	12.8%
Compaction Pressure (psi)	150	150	175
Specimen Height (inches)	2.70	2.59	2.50
Dry Density (pcf)	120.2	120.8	124.3
Horiz. Pres. @ 1000lbs (psi)	37.0	19.0	15.0
Horiz. Pres. @ 2000lbs (psi)	102.0	48.0	33.0
Displacement	4.07	3.74	3.65
Expansion Pressure (psi)	0.0	0.5	4.6
Exudation Pressure (psi)	187	299	528
R Value	30	63	72



R Value at 300 PSI = 63

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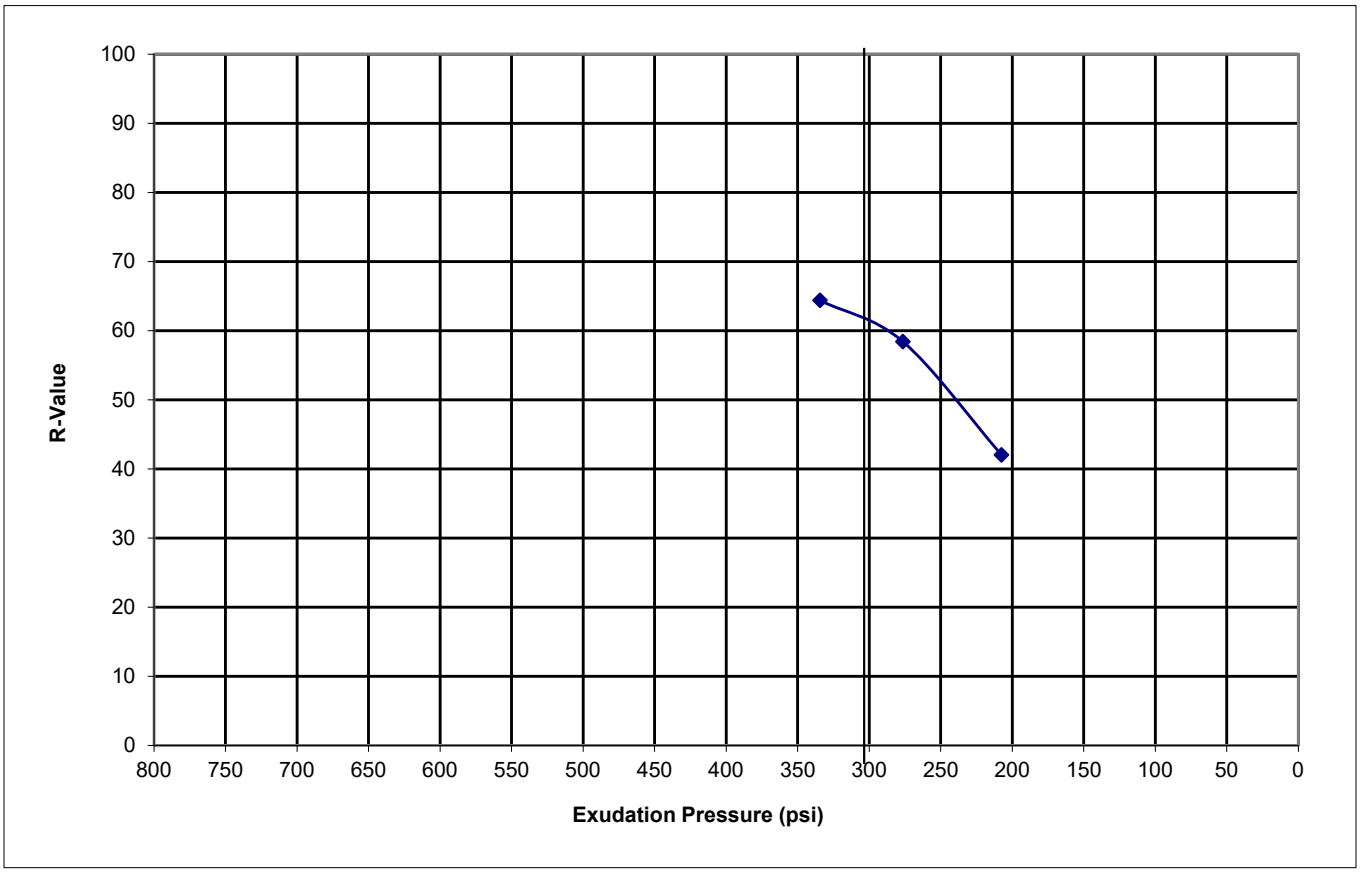
REVIEWED BY Hiram Franco

PROJECT: ACS - Lab Testing Services, Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B42 (0.0-5.0')

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1408-02
DATE SAMPLED: 05/20/22

RESISTANCE R-VALUE AND EXPANSION PRESSURE OF COMPACTED SOILS (ASTM D2844)

SPECIMEN ID	A	B	C
Moisture Content	12.6%	11.8%	10.9%
Compaction Pressure (psi)	150	150	175
Specimen Height (inches)	2.54	2.51	2.55
Dry Density (pcf)	123.8	124.7	124.4
Horiz. Pres. @ 1000lbs (psi)	27.0	17.0	15.0
Horiz. Pres. @ 2000lbs (psi)	74.0	48.0	40.0
Displacement	4.01	4.15	4.15
Expansion Pressure (psi)	0.9	2.0	8.9
Exudation Pressure (psi)	207	276	334
R Value	42	58	64



R Value at 300 PSI = 61

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Phoenix, AZ 85040

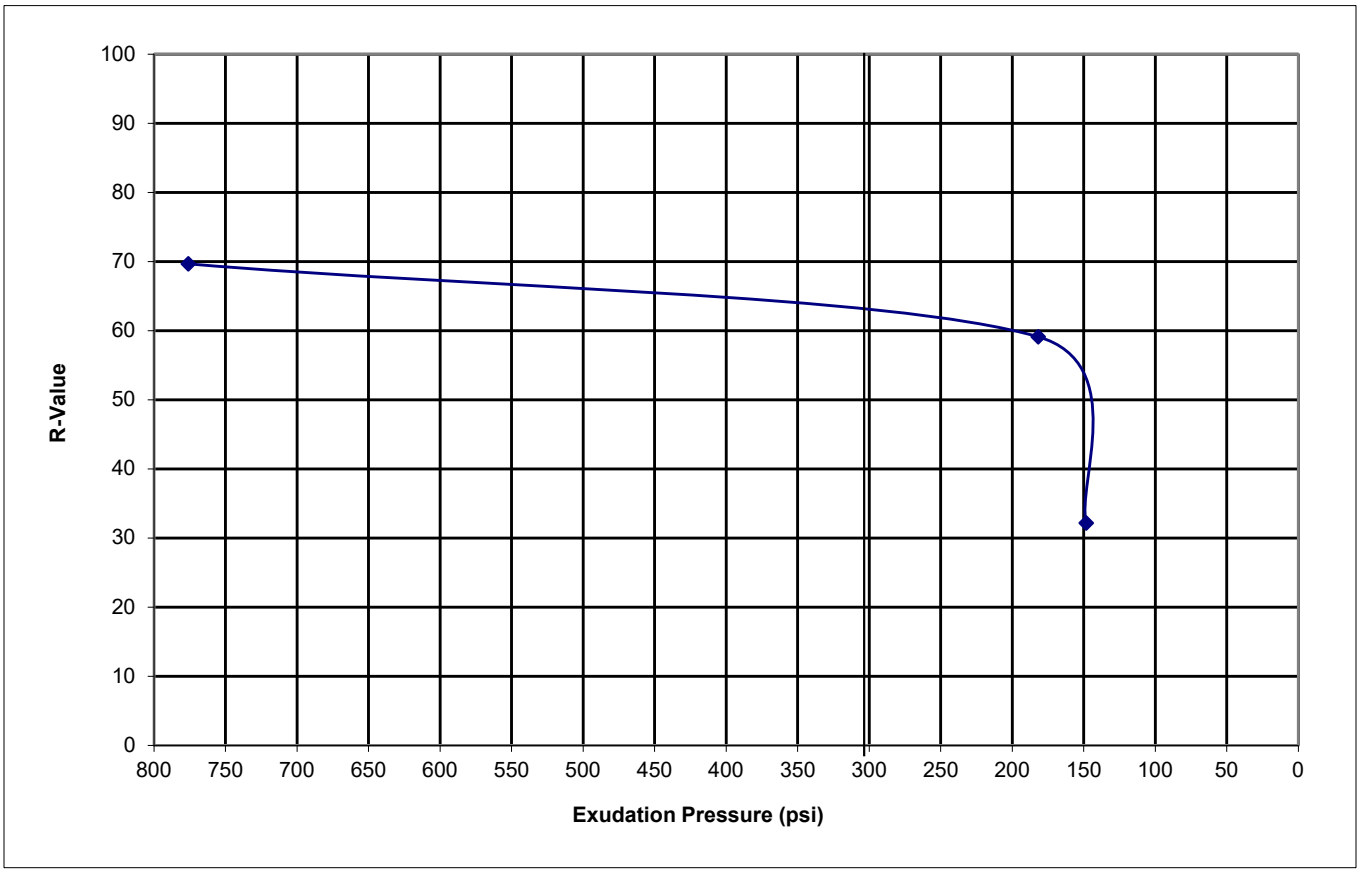
REVIEWED BY Hiram Franco

PROJECT: ACS - Lab Testing Services, Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil B-92
SAMPLE SOURCE: ACS Lab #22-1057-9 (0.0-5.0')

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1083
DATE SAMPLED: 01/19/22

RESISTANCE R-VALUE AND EXPANSION PRESSURE OF COMPACTED SOILS (ASTM D2844)

SPECIMEN ID	A	B	C
Moisture Content	11.5%	10.6%	9.3%
Compaction Pressure (psi)	175	175	200
Specimen Height (inches)	2.49	2.50	2.49
Dry Density (pcf)	123.9	124.9	126.3
Horiz. Pres. @ 1000lbs (psi)	36.0	19.0	14.0
Horiz. Pres. @ 2000lbs (psi)	88.0	45.0	31.0
Displacement	4.31	4.42	4.53
Expansion Pressure (psi)	0.0	0.4	1.3
Exudation Pressure (psi)	148	182	776
R Value	32	59	70



R Value at 300 PSI = 63

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Phoenix, AZ 85040

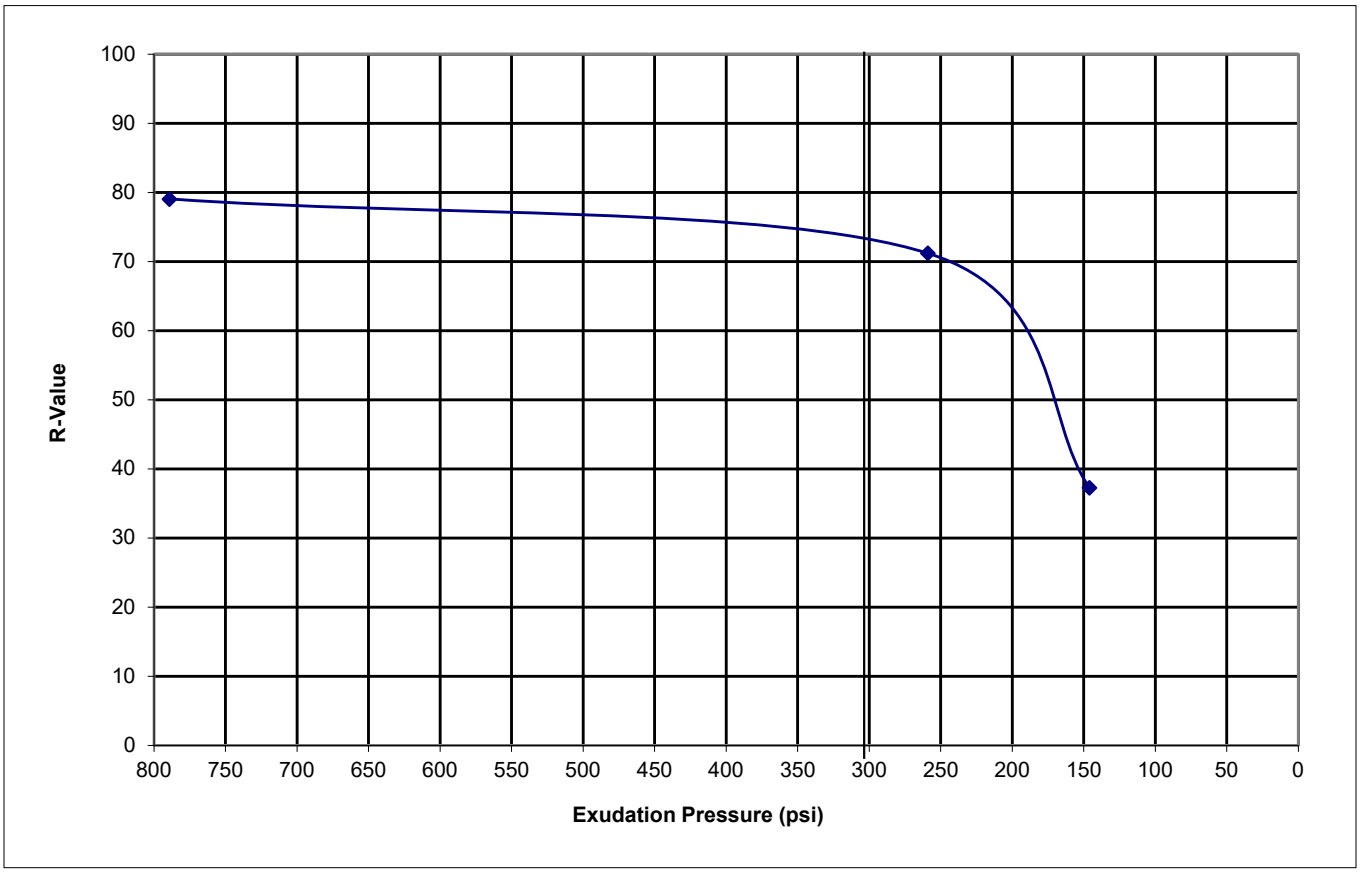
REVIEWED BY Robert Kostelny

PROJECT: ACS - Lab Testing Services, Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil B-94
SAMPLE SOURCE: ACS Lab #22-1057-14 / B-92 (0.0-5.0')
This R-value was run on -4 material only.

JOB NO: 19-2012-2017
WORK ORDER NO: N/A
LAB NO: 22-1086
DATE SAMPLED: 01/26/22

RESISTANCE R-VALUE AND EXPANSION PRESSURE OF COMPACTED SOILS (ASTM D2844)

SPECIMEN ID	A	B	C
Moisture Content	11.5%	10.6%	9.7%
Compaction Pressure (psi)	225	225	250
Specimen Height (inches)	2.52	2.50	2.52
Dry Density (pcf)	124.6	125.8	125.8
Horiz. Pres. @ 1000lbs (psi)	31.0	14.0	11.0
Horiz. Pres. @ 2000lbs (psi)	78.0	31.0	22.0
Displacement	4.43	4.21	4.16
Expansion Pressure (psi)	0.3	0.8	1.6
Exudation Pressure (psi)	146	259	789
R Value	37	71	79



R Value at 300 PSI = 73

Wood Environment & Infrastructure Solutions, Inc.
3630 E Wier Ave.
Phoenix, AZ 85040

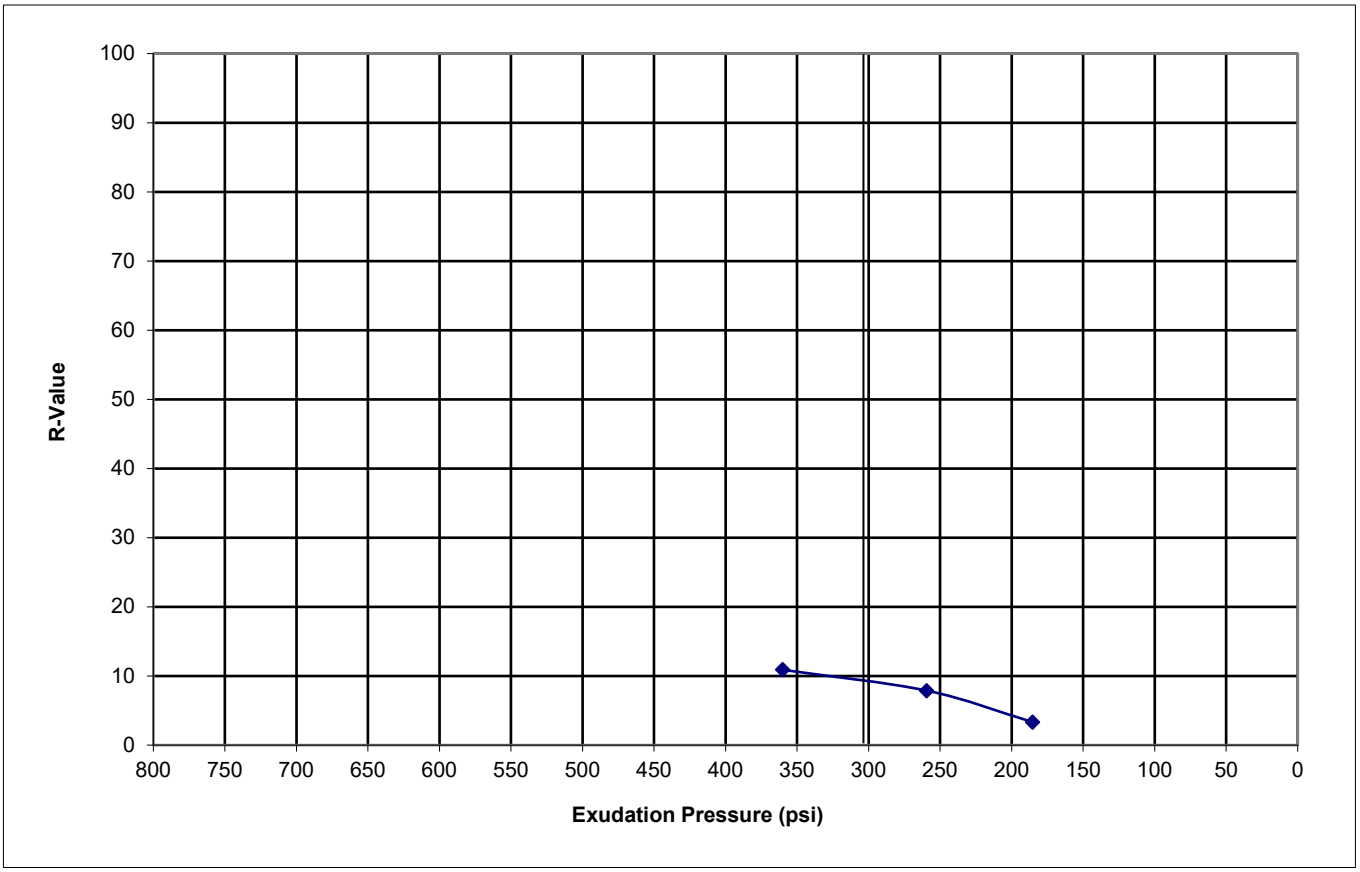
REVIEWED BY Robert Kostelny

PROJECT: ACS - Lab Testing Services, Project #2201026
LOCATION: Mesa, AZ
MATERIAL: Native Soil
SAMPLE SOURCE: B-128 (1.0-4.0') ACS Lab #24-1955-5

JOB NO: 17-2023-4239
WORK ORDER NO: 63
LAB NO: 24-2585
DATE ASSIGNED: 03/07/24

RESISTANCE R-VALUE AND EXPANSION PRESSURE OF COMPACTED SOILS (ASTM D2844)

SPECIMEN ID	A	B	C
Moisture Content	20.9%	20.0%	19.0%
Compaction Pressure (psi)	25	25	25
Specimen Height (inches)	2.50	2.55	2.60
Dry Density (pcf)	107.0	107.4	108.7
Horiz. Pres. @ 1000lbs (psi)	71.0	64.0	60.0
Horiz. Pres. @ 2000lbs (psi)	151.0	141.0	137.0
Displacement	4.32	3.94	3.78
Expansion Pressure (psi)	0.0	0.0	0.0
Exudation Pressure (psi)	185	259	360
R Value	3	8	11



R Value at 300 PSI = 9

WSP USA
3630 E Wier Ave.
Phoenix, AZ 85040

REVIEWED BY

ACS Services LLC

Soil pH and Resistivity Determination
AASHTO T-289 AASHTO T-288

Project #	2201026	Material Type:	Native
Lab #	22-1941-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	Thursday, April 28, 2022
Project City:	Goodyear	Tested By:	Brian Karl
Sample Source:	P-1 @ 0.0 - 5.0	Resistivity Box:	
		Reviewed By:	Dylan Ward

pH Reading = 8.56

P = (SBF) x R x M

Where:

SBF = Soil Box Factor, cm
R = Dial Reading, OHMS
M = Multiplier

Water Added	SBF (cm)	Dial Reading (OHMS)	Multiplier	**P** (OHM-cm)
200 mL	6.77	0.06	10000	4062
50	6.77	0.04	10000	2708
50	6.77	0.36	1000	2437
50	6.77	0.1	1000	677
50	6.77	0.12	1000	812

Brian Karl
Lab Supervisor

Dylan Ward
Laboratory Manager

ACS Services LLC

Soil pH and Resistivity Determination
AASHTO T-289 AASHTO T-288

Project #	2201026	Material Type:	Native
Lab #	22-1584-3	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	Tuesday, March 8, 2022
Project City:	Goodyear	Tested By:	Brian Karl
Sample Source:	B-5 @ 0.0 -5.0'	Resistivity Box:	
		Reviewed By:	Dylan Ward

pH Reading = 8.56

P = (SBF) x R x M

Where:

SBF = Soil Box Factor, cm
R = Dial Reading, OHMS
M = Multiplier

Water Added	SBF (cm)	Dial Reading (OHMS)	Multiplier	**P** (OHM-cm)
200 mL	6.77	0.22	1000	1489
50	6.77	0.15	1000	1016
50	6.77	0.15	1000	1016
50	6.77	0.16	1000	1083

Brian Karl
Lab Supervisor

Dylan Ward
Laboratory Manager

ACS Services LLC

Soil pH and Resistivity Determination

AASHTO T-289 AASHTO T-288

Project #	2201026	Material Type:	Native
Lab #	22-1582-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	Thursday, March 3, 2022
Project City:	Goodyear	Tested By:	Brian Karl
Sample Source:	B-9 @ 0.0 - 5.0'	Resistivity Box:	
		Reviewed By:	

pH Reading = 8.2

P = (SBF) x R x M

Where:

SBF = Soil Box Factor, cm
R = Dial Reading, OHMS
M = Multiplier

Water Added	SBF (cm)	Dial Reading (OHMS)	Multiplier	**P** (OHM-cm)
200 mL	6.77	0.19	1000	1286
50	6.77	0.11	1000	745
50	6.77	0.09	1000	609
50	6.77	0.1	1000	677

Brian Karl
Lab Supervisor

Dylan Ward
Laboratory Manager

ACS Services LLC

Soil pH and Resistivity Determination
AASHTO T-289 AASHTO T-288

Project #	2201026	Material Type:	Soil
Lab #	22-2240-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	Monday, May 2, 2022
Project City:	Goodyear	Tested By:	Brian Karl
Sample Source:	B-13 @ 0.0 - 5.0	Resistivity Box:	
		Reviewed By:	Dylan Ward

pH Reading = 8.62

P = (SBF) x R x M

Where:

SBF = Soil Box Factor, cm
R = Dial Reading, OHMS
M = Multiplier

Water Added	SBF (cm)	Dial Reading (OHMS)	Multiplier	**P** (OHM-cm)
200 mL	6.77	0.33	1000	2234
50	6.77	0.19	1000	1286
50	6.77	0.2	1000	1354

Brian Karl
Lab Supervisor

Dylan Ward
Laboratory Manager

ACS Services LLC

Soil pH and Resistivity Determination
AASHTO T-289 AASHTO T-288

Project #	2201026	Material Type:	Soil
Lab #	22-2142-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	Monday, May 2, 2022
Project City:	Goodyear	Tested By:	Brian Karl
Sample Source:	B-16 @ 0.0 - 5.0	Resistivity Box:	
		Reviewed By:	Dylan Ward

pH Reading = 8.5

P = (SBF) x R x M

Where:

SBF = Soil Box Factor, cm
R = Dial Reading, OHMS
M = Multiplier

Water Added	SBF (cm)	Dial Reading (OHMS)	Multiplier	**P** (OHM-cm)
200 mL	6.77	0.13	1000	880
50	6.77	0.09	1000	609
50	6.77	0.08	1000	542
50	6.77	0.07	1000	474
50	6.77	0.09	1000	609

Brian Karl
Lab Supervisor

Dylan Ward
Laboratory Manager

ACS Services LLC

Soil pH and Resistivity Determination
AASHTO T-289 AASHTO T-288

Project #	2201026	Material Type:	Soil
Lab #	22-3002-6	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	Tuesday, June 28, 2022
Project City:	Goodyear	Tested By:	Brian Karl
Sample Source:	B21 @ 0.0 - 5.0	Resistivity Box:	-
		Reviewed By:	Dylan Ward

pH Reading = 9.41

P = (SBF) x R x M

Where:

SBF = Soil Box Factor, cm
R = Dial Reading, OHMS
M = Multiplier

Water Added	SBF (cm)	Dial Reading (OHMS)	Multiplier	**P** (OHM-cm)
200	6.77	0.4	1000	2708
50	6.77	0.35	1000	2370
50	6.77	0.32	1000	2166
50	6.77	0.32	1000	2166
50	6.77	0.34	1000	2302

Brian Karl
Lab Supervisor

Dylan Ward
Laboratory Manager

ACS Services LLC

Soil pH and Resistivity Determination
AASHTO T-289 AASHTO T-288

Project #	2201026	Material Type:	Native
Lab #	22-1658-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	Wednesday, March 16, 2022
Project City:	Goodyear	Tested By:	Brian Karl
Sample Source:	B-27 @ 7.5 - 10.0'	Resistivity Box:	
		Reviewed By:	Dylan Ward

pH Reading = 8.49

P = (SBF) x R x M

Where:

SBF = Soil Box Factor, cm
R = Dial Reading, OHMS
M = Multiplier

Water Added	SBF (cm)	Dial Reading (OHMS)	Multiplier	**P** (OHM-cm)
200 mL	6.77	0.25	1000	1693
50	6.77	0.13	1000	880
50	6.77	0.14	1000	948

Brian Karl
Lab Supervisor

Dylan Ward
Laboratory Manager

ACS Services LLC

Soil pH and Resistivity Determination
AASHTO T-289 AASHTO T-288

Project #	2201026	Material Type:	Native
Lab #	22-1658-3	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	Wednesday, March 16, 2022
Project City:	Goodyear	Tested By:	Brian Karl
Sample Source:	B-27 @ 22.5 - 25.0'	Resistivity Box:	
		Reviewed By:	Dylan Ward

pH Reading = 8.63

P = (SBF) x R x M

Where:

SBF = Soil Box Factor, cm
R = Dial Reading, OHMS
M = Multiplier

Water Added	SBF (cm)	Dial Reading (OHMS)	Multiplier	**P** (OHM-cm)
200 mL	6.77	0.7	1000	4739
50	6.77	0.45	1000	3047
50	6.77	0.22	1000	1489
50	6.77	0.17	1000	1151
50	6.77	0.18	1000	1219

Brian Karl
Lab Supervisor

Dylan Ward
Laboratory Manager

ACS Services LLC

Soil pH and Resistivity Determination
AASHTO T-289 AASHTO T-288

Project #	2201026	Material Type:	Native
Lab #	22-1414-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	Thursday, February 17, 2022
Project City:	Goodyear	Tested By:	Brian Karl
Sample Source:	B-31 @ 0.0 - 5.0'	Resistivity Box:	
		Reviewed By:	Dylan Ward

pH Reading = 8.4

P = (SBF) x R x M

Where:

SBF = Soil Box Factor, cm
R = Dial Reading, OHMS
M = Multiplier

Water Added (mL)	SBF (cm)	Dial Reading (OHMS)	Multiplier	**P** (OHM-cm)
200	6.77	0.11	1000	745
50	6.77	0.06	1000	406
50	6.77	0.06	1000	406
50	6.77	0.06	1000	406
50	6.77	0.05	1000	339
50	6.77	0.06	1000	406

Brian Karl
Lab Supervisor

Dylan Ward
Laboratory Manager

ACS Services LLC

Soil pH and Resistivity Determination
AASHTO T-289 AASHTO T-288

Project #	2201026	Material Type:	Native
Lab #	22-1414-19	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	Sunday, February 20, 2022
Project City:	Goodyear	Tested By:	Brian Karl
Sample Source:	B-34 @ 0.0 - 5.0'	Resistivity Box:	
		Reviewed By:	Dylan Ward

pH Reading = 8.82

P = (SBF) x R x M

Where:

SBF = Soil Box Factor, cm
R = Dial Reading, OHMS
M = Multiplier

Water Added(mL)	SBF (cm)	Dial Reading (OHMS)	Multiplier	**P** (OHM-cm)
200	6.77	0.05	10000	3385
50	6.77	0.02	10000	1354
50	6.77	0.32	1000	2166

Brian Karl
Lab Supervisor

Dylan Ward
Laboratory Manager

ACS Services LLC

Soil pH and Resistivity Determination
AASHTO T-289 AASHTO T-288

Project #	2201026	Material Type:	Native
Lab #	22-1656-5	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	Tuesday, March 15, 2022
Project City:	Goodyear	Tested By:	Brian Karl
Sample Source:	B-37 @ 0.0 - 5.0'	Resistivity Box:	
		Reviewed By:	Dylan Ward

pH Reading = 8.36

P = (SBF) x R x M

Where:

SBF = Soil Box Factor, cm
R = Dial Reading, OHMS
M = Multiplier

Water Added	SBF (cm)	Dial Reading (OHMS)	Multiplier	**P** (OHM-cm)
200 mL	6.77	0.26	1000	1760
50	6.77	0.11	1000	745
50	6.77	0.11	1000	745
50	6.77	0.12	1000	812

Brian Karl
Lab Supervisor

Dylan Ward
Laboratory Manager

ACS Services LLC

Soil pH and Resistivity Determination
AASHTO T-289 AASHTO T-288

Project #	2201026	Material Type:	Native
Lab #	22-1657-7	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	Tuesday, March 15, 2022
Project City:	Goodyear	Tested By:	Brian Karl
Sample Source:	B-41 @ 0.0 -5.0'	Resistivity Box:	
		Reviewed By:	Dylan Ward

pH Reading = 8.25

P = (SBF) x R x M

Where:

SBF = Soil Box Factor, cm
R = Dial Reading, OHMS
M = Multiplier

Water Added	SBF (cm)	Dial Reading (OHMS)	Multiplier	**P** (OHM-cm)
200 mL	6.77	0.16	1000	1083
50	6.77	0.06	1000	406
50	6.77	0.05	1000	339
50	6.77	0.06	1000	406

Brian Karl
Lab Supervisor

Dylan Ward
Laboratory Manager

ACS Services LLC

Soil pH and Resistivity Determination
AASHTO T-289 AASHTO T-288

Project #	2201026	Material Type:	Native
Lab #	22-1657-16	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	Friday, March 18, 2022
Project City:	Goodyear	Tested By:	Brian Karl
Sample Source:	B-44 @ 0.0 - 5.0'	Resistivity Box:	
		Reviewed By:	Dylan Ward

pH Reading = 7.97

P = (SBF) x R x M

Where:

SBF = Soil Box Factor, cm
R = Dial Reading, OHMS
M = Multiplier

Water Added	SBF (cm)	Dial Reading (OHMS)	Multiplier	**P** (OHM-cm)
200 mL	6.77	0.13	1000	880
50	6.77	0.07	1000	474
50	6.77	0.07	1000	474
50	6.77	0.08	1000	542

Brian Karl
Lab Supervisor

Dylan Ward
Laboratory Manager

ACS Services LLC

Soil pH and Resistivity Determination
AASHTO T-289 AASHTO T-288

Project #	2201026	Material Type:	Native
Lab #	22-1456-10	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	Friday, February 18, 2022
Project City:	Goodyear	Tested By:	Brian Karl
Sample Source:	B-52 @ 0.0 - 5.0'	Resistivity Box:	
		Reviewed By:	Dylan Ward

pH Reading = 8.67

P = (SBF) x R x M

Where:

SBF = Soil Box Factor, cm
R = Dial Reading, OHMS
M = Multiplier

Water Added	SBF (cm)	Dial Reading (OHMS)	Multiplier	**P** (OHM-cm)
200	6.77	0.39	1000	2640
50	6.77	0.27	1000	1828
50	6.77	0.13	1000	880
50	6.77	0.14	1000	948

Brian Karl
Lab Supervisor

Dylan Ward
Laboratory Manager

ACS Services LLC

Soil pH and Resistivity Determination
AASHTO T-289 AASHTO T-288

Project #	2201026	Material Type:	Native
Lab #	22-1958-5	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	Thursday, April 21, 2022
Project City:	Goodyear	Tested By:	Brian Karl
Sample Source:	B-57 @ 0.0 - 5.0	Resistivity Box:	
		Reviewed By:	Dylan Ward

pH Reading = 8.69

P = (SBF) x R x M

Where:

SBF = Soil Box Factor, cm
R = Dial Reading, OHMS
M = Multiplier

Water Added	SBF (cm)	Dial Reading (OHMS)	Multiplier	**P** (OHM-cm)
200 mL	6.77	0.31	1000	2099
50	6.77	0.15	1000	1016
50	6.77	0.13	1000	880
50	6.77	0.16	1000	1083

Brian Karl
Lab Supervisor

Dylan Ward
Laboratory Manager

ACS Services LLC

Soil pH and Resistivity Determination
AASHTO T-289 AASHTO T-288

Project #	2201026	Material Type:	Soil
Lab #	22-2241-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	Thursday, April 28, 2022
Project City:	Goodyear	Tested By:	Brian Karl
Sample Source:	B-58 @ 0.0 - 5.0	Resistivity Box:	
		Reviewed By:	Dylan Ward

pH Reading = 8.79

P = (SBF) x R x M

Where:

SBF = Soil Box Factor, cm
R = Dial Reading, OHMS
M = Multiplier

Water Added	SBF (cm)	Dial Reading (OHMS)	Multiplier	**P** (OHM-cm)
200 mL	6.77	0.02	10000	1354
50	6.77	0.28	1000	1896

Brian Karl
Lab Supervisor

Dylan Ward
Laboratory Manager

ACS Services LLC

Soil pH and Resistivity Determination
AASHTO T-289 AASHTO T-288

Project #	2201026	Material Type:	Native
Lab #	22-1979-3	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	Thursday, April 28, 2022
Project City:	Goodyear	Tested By:	Brian Karl
Sample Source:	B-60 @ 0.0 - 5.0	Resistivity Box:	
		Reviewed By:	Dylan Ward

pH Reading = 8.6

P = (SBF) x R x M

Where:

SBF = Soil Box Factor, cm
R = Dial Reading, OHMS
M = Multiplier

Water Added	SBF (cm)	Dial Reading (OHMS)	Multiplier	**P** (OHM-cm)
200 mL	6.77	0.11	1000	745
50	6.77	0.26	1000	1760

Dylan Ward
Lab Supervisor

Dylan Ward
Laboratory Manager

ACS Services LLC

Soil pH and Resistivity Determination
AASHTO T-289 AASHTO T-288

Project #	2201026	Material Type:	Native
Lab #	22-1979-7	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	Thursday, April 28, 2022
Project City:	Goodyear	Tested By:	Brian Karl
Sample Source:	B-63 @ 0.0 - 5.0	Resistivity Box:	
		Reviewed By:	Dylan Ward

pH Reading = 8.52

P = (SBF) x R x M

Where:

SBF = Soil Box Factor, cm
R = Dial Reading, OHMS
M = Multiplier

Water Added	SBF (cm)	Dial Reading (OHMS)	Multiplier	**P** (OHM-cm)
200	6.77	0.12	1000	812
50	6.77	0.08	1000	542
50	6.77	0.06	1000	406
50	6.77	0.06	1000	406
50	6.77	0.06	1000	406
50	6.77	0.06	1000	406
50	6.77	0.07	1000	474

Brian Karl
Lab Supervisor

Dylan Ward
Laboratory Manager

ACS Services LLC

Soil pH and Resistivity Determination
AASHTO T-289 AASHTO T-288

Project #	2201026	Material Type:	Native
Lab #	22-1803-6	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	Friday, April 22, 2022
Project City:	Goodyear	Tested By:	Brian Karl
Sample Source:	B-70 @ 1.0 -5.0'	Resistivity Box:	
		Reviewed By:	Dylan Ward

pH Reading = 8.94

P = (SBF) x R x M

Where:

SBF = Soil Box Factor, cm
R = Dial Reading, OHMS
M = Multiplier

Water Added	SBF (cm)	Dial Reading (OHMS)	Multiplier	**P** (OHM-cm)
200 mL	6.77	0.8	1000	5416
50	6.77	0.34	1000	2302
50	6.77	0.14	1000	948
50	6.77	0.12	1000	812
50	6.77	0.13	1000	880

Brian Karl
Lab Supervisor

Dylan Ward
Laboratory Manager

ACS Services LLC

Soil pH and Resistivity Determination
AASHTO T-289 AASHTO T-288

Project #	2201026	Material Type:	Native
Lab #	22-1850-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	Wednesday, April 6, 2022
Project City:	Goodyear	Tested By:	Brian Karl
Sample Source:	B-75 @ 7.5 -10.0	Resistivity Box:	
		Reviewed By:	Dylan Ward

pH Reading = 8.78

P = (SBF) x R x M

Where:

SBF = Soil Box Factor, cm
R = Dial Reading, OHMS
M = Multiplier

Water Added	SBF (cm)	Dial Reading (OHMS)	Multiplier	**P** (OHM-cm)
200 mL	6.77	0.25	1000	1693
50	6.77	0.17	1000	1151
50	6.77	0.23	1000	1557

Brian Karl
Lab Supervisor

Dylan Ward
Laboratory Manager

ACS Services LLC

Soil pH and Resistivity Determination
AASHTO T-289 AASHTO T-288

Project #	2201026	Material Type:	Native
Lab #	22-1804-2	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	Wednesday, April 6, 2022
Project City:	Goodyear	Tested By:	Brian Karl
Sample Source:	B77 @ 12.5 - 15.0'	Resistivity Box:	
		Reviewed By:	Dylan Ward

pH Reading = 8.58

P = (SBF) x R x M

Where:

SBF = Soil Box Factor, cm
R = Dial Reading, OHMS
M = Multiplier

Water Added	SBF (cm)	Dial Reading (OHMS)	Multiplier	**P** (OHM-cm)
200 mL	6.77	0.13	10000	8801
50	6.77	0.58	1000	3927
50	6.77	0.31	1000	2099
50	6.77	0.33	1000	2234

Brian Karl
Lab Supervisor

Dylan Ward
Laboratory Manager

ACS Services LLC

Soil pH and Resistivity Determination
AASHTO T-289 AASHTO T-288

Project #	2201026	Material Type:	Native
Lab #	22-1057-14	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	Thursday, January 20, 2022
Project City:	Goodyear	Tested By:	Keagan Mayfield
Sample Source:	B - 94 @ 0.0' - 5.0'	Resistivity Box:	
		Reviewed By:	Andrew Jamrogiewicz, P.E.

pH Reading = 8.03

P = (SBF) x R x M

Where:

SBF = Soil Box Factor, cm
R = Dial Reading, OHMS
M = Multiplier

Water Added	SBF (cm)	Dial Reading (OHMS)	Multiplier	**P** (OHM-cm)
200	6.77	0.34	1000	2302
50	6.77	0.04	10000	2708
50	6.77	0.01	10000	677
50	6.77	0.01	10000	677
50	6.77	0.01	10000	677
50	6.77	0.01	10000	**677**

Dylan Ward
Lab Supervisor

Andrew Jamrogiewicz
Project Manager

ACS Services LLC

Soil pH and Resistivity Determination
AASHTO T-289 AASHTO T-288

Project #	2201026	Material Type:	Native
Lab #	22-1057-25	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	Sunday, January 23, 2022
Project City:	Goodyear	Tested By:	Fernando Montero
Sample Source:	B - 96 @ 0.0' - 5.0'	Resistivity Box:	
		Reviewed By:	Andrew Jamrogiewicz, P.E.

pH Reading = 8.69

P = (SBF) x R x M

Where:

SBF = Soil Box Factor, cm
R = Dial Reading, OHMS
M = Multiplier

Water Added	SBF (cm)	Dial Reading (OHMS)	Multiplier	**P** (OHM-cm)
200	6.77	0.45	1000	3047
50	6.77	0.39	1000	2640
50	6.77	0.38	1000	**2573**
50	6.77	0.4	1000	2708

Dylan Ward
Lab Supervisor

Andrew Jamrogiewicz
Project Manager

ACS Services LLC

Soil pH and Resistivity Determination
AASHTO T-289 AASHTO T-288

Project #	2201026	Material Type:	Native
Lab #	22-1944-2	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	Friday, April 22, 2022
Project City:	Goodyear	Tested By:	Brian Karl
Sample Source:	B-98 @ 0.0 - 5.0	Resistivity Box:	
		Reviewed By:	Dylan Ward

pH Reading = 9.03

P = (SBF) x R x M

Where:

SBF = Soil Box Factor, cm
R = Dial Reading, OHMS
M = Multiplier

Water Added	SBF (cm)	Dial Reading (OHMS)	Multiplier	**P** (OHM-cm)
200 mL	6.77	0.33	1000	2234
50	6.77	0.25	1000	1693
50	6.77	0.25	1000	1693
50	6.77	0.24	1000	1625
50	6.77	0.25	1000	1693

Brian Karl
Lab Supervisor

Dylan Ward
Laboratory Manager

ACS Services LLC

Soil pH and Resistivity Determination
AASHTO T-289 AASHTO T-288

Project #	2201026	Material Type:	Native
Lab #	22-1849-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	Wednesday, April 6, 2022
Project City:	Goodyear	Tested By:	Brian Karl
Sample Source:	B-101 @ 0.0 - 5.0	Resistivity Box:	
		Reviewed By:	Dylan Ward

pH Reading = 8.42

P = (SBF) x R x M

Where:

SBF = Soil Box Factor, cm
R = Dial Reading, OHMS
M = Multiplier

Water Added	SBF (cm)	Dial Reading (OHMS)	Multiplier	**P** (OHM-cm)
200 mL	6.77	0.27	1000	1828
50	6.77	0.17	1000	1151
50	6.77	0.15	1000	1016
50	6.77	0.17	1000	1151

Brian Karl
Lab Supervisor

Dylan Ward
Laboratory Manager

ACS Services LLC

Soil pH and Resistivity Determination
AASHTO T-289 AASHTO T-288

Project #	2201026	Material Type:	Native
Lab #	22-1057-34	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	Sunday, January 23, 2022
Project City:	Goodyear	Tested By:	Fernando Montero
Sample Source:	B - 102 @ 30.0' - 31.5'	Resistivity Box:	
		Reviewed By:	Andrew Jamrogiewicz, P.E.

pH Reading = 8.86

P = (SBF) x R x M

Where:

SBF = Soil Box Factor, cm
R = Dial Reading, OHMS
M = Multiplier

Water Added	SBF (cm)	Dial Reading (OHMS)	Multiplier	**P** (OHM-cm)
200	6.77	0.32	1000	2166
50	6.77	0.27	1000	1828
50	6.77	0.25	1000	**1693**
50	6.77	0.26	1000	1760

Dylan Ward
Lab Supervisor

Andrew Jamrogiewicz
Project Manager

ACS Services LLC

Soil pH and Resistivity Determination
AASHTO T-289 AASHTO T-288

Project #	2201026	Material Type:	Native
Lab #	22-1057-36	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	Sunday, January 23, 2022
Project City:	Goodyear	Tested By:	Fernando Montero
Sample Source:	B - 102 @ 57.5' - 60.0'	Resistivity Box:	
		Reviewed By:	Andrew Jamrogiewicz, P.E.

pH Reading = 9.14

P = (SBF) x R x M

Where:

SBF = Soil Box Factor, cm
R = Dial Reading, OHMS
M = Multiplier

Water Added	SBF (cm)	Dial Reading (OHMS)	Multiplier	**P** (OHM-cm)
100	6.77	0.17	10000	11510
50	6.77	0.07	10000	4739
50	6.77	0.03	10000	**2031**
50	6.77	0.31	1000	2099

Dylan Ward
Lab Supervisor

Andrew Jamrogiewicz
Project Manager

ACS Services LLC

Soil pH and Resistivity Determination
AASHTO T-289 AASHTO T-288

Project #	2201026	Material Type:	Native
Lab #	22-1127-2	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	Monday, January 31, 2022
Project City:	Goodyear	Tested By:	Fernando Montero
Sample Source:	B - 104 @ 22.5' - 25.0'	Resistivity Box:	
		Reviewed By:	Andrew Jamrogiewicz, P.E.

pH Reading = 8.8

P = (SBF) x R x M

Where:

SBF = Soil Box Factor, cm
R = Dial Reading, OHMS
M = Multiplier

Water Added	SBF (cm)	Dial Reading (OHMS)	Multiplier	**P** (OHM-cm)
200	6.77	0.59	1000	3994
50	6.77	0.31	1000	2099
50	6.77	0.28	1000	**1896**
50	6.77	0.29	1000	1963

Dylan Ward
Lab Supervisor

Andrew Jamrogiewicz
Project Manager

ACS Services LLC

Soil pH and Resistivity Determination
AASHTO T-289 AASHTO T-288

Project #	2201026	Material Type:	Native
Lab #	22-1128-1	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	Monday, January 31, 2022
Project City:	Goodyear	Tested By:	Alexandra Simard
Sample Source:	B - 108 @ 0.0' - 5.0'	Resistivity Box:	
		Reviewed By:	Andrew Jamrogiewicz, P.E.

pH Reading = 8.56

P = (SBF) x R x M

Where:

SBF = Soil Box Factor, cm
R = Dial Reading, OHMS
M = Multiplier

Water Added	SBF (cm)	Dial Reading (OHMS)	Multiplier	**P** (OHM-cm)
200	6.77	0.57	1000	3859
50	6.77	0.33	1000	2234
50	6.77	0.2	1000	1354
50	6.77	0.12	1000	812
50	6.77	0.12	1000	812
50	6.77	0.12	1000	812
50	6.77	0.11	1000	**745**
50	6.77	0.13	1000	880

Dylan Ward
Lab Supervisor

Andrew Jamrogiewicz
Project Manager

ACS Services LLC

Soil pH and Resistivity Determination
AASHTO T-289 AASHTO T-288

Project #	2201026	Material Type:	Native
Lab #	22-1583-9	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	Friday, March 11, 2022
Project City:	Goodyear	Tested By:	Brian Karl
Sample Source:	B-113 @ 0.0 - 5.0'	Resistivity Box:	
		Reviewed By:	Dylan Ward

pH Reading = 8.98

P = (SBF) x R x M

Where:

SBF = Soil Box Factor, cm
R = Dial Reading, OHMS
M = Multiplier

Water Added	SBF (cm)	Dial Reading (OHMS)	Multiplier	**P** (OHM-cm)
200 mL	6.77	0.83	1000	5619
50	6.77	0.45	1000	3047
50	6.77	0.35	1000	2370
50	6.77	0.36	1000	2437

Brian Karl
Lab Supervisor

Dylan Ward
Laboratory Manager

ACS Services LLC

Soil pH and Resistivity Determination
AASHTO T-289 AASHTO T-288

Project #	2201026	Material Type:	Soil
Lab #	22-2842-5	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	Monday, June 20, 2022
Project City:	Goodyear	Tested By:	Brian Karl
Sample Source:	B-116 @ 0.0 - 5.0	Resistivity Box:	-
		Reviewed By:	Dylan Ward

pH Reading = 9.47

P = (SBF) x R x M

Where:

SBF = Soil Box Factor, cm
R = Dial Reading, OHMS
M = Multiplier

Water Added	SBF (cm)	Dial Reading (OHMS)	Multiplier	**P** (OHM-cm)
200	6.77	0.1	10000	6770
50	6.77	0.67	1000	4536
50	6.77	0.7	1000	4739

Brian Karl
Lab Supervisor

Dylan Ward
Laboratory Manager

ACS Services LLC

Soil pH and Resistivity Determination
AASHTO T-289 AASHTO T-288

Project #	2201026	Material Type:	Soil
Lab #	22-2842-12	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	Monday, June 20, 2022
Project City:	Goodyear	Tested By:	Brian Karl
Sample Source:	B-119 @ 0.0 - 5.0	Resistivity Box:	-
		Reviewed By:	Dylan Ward

pH Reading = 9.41

P = (SBF) x R x M

Where:

SBF = Soil Box Factor, cm
R = Dial Reading, OHMS
M = Multiplier

Water Added	SBF (cm)	Dial Reading (OHMS)	Multiplier	**P** (OHM-cm)
200	6.77	0.95	1000	6432
50	6.77	0.87	1000	5890
50	6.77	0.1	10000	6770

Brian Karl
Lab Supervisor

Dylan Ward
Laboratory Manager

ACS Services LLC

Soil pH and Resistivity Determination
AASHTO T-289 AASHTO T-288

Project #	2201026	Material Type:	Native
Lab #	22-1128-16	Supplier:	-
Client:	Ethos	Sample Date:	N/A
Project Name:	SR 303L MC 85 to Van Buren	Sampled By:	Client
Project Address:	SR 303L MC 85 to Van Buren	Test Date:	Monday, January 31, 2022
Project City:	Goodyear	Tested By:	Alexandra Simard
Sample Source:	B - 121 @ 0.0' - 5.0'	Resistivity Box:	
		Reviewed By:	Andrew Jamrogiewicz, P.E.

pH Reading = 9.04

P = (SBF) x R x M

Where:

SBF = Soil Box Factor, cm
R = Dial Reading, OHMS
M = Multiplier

Water Added	SBF (cm)	Dial Reading (OHMS)	Multiplier	**P** (OHM-cm)
200	6.77	0.11	10000	7447
50	6.77	0.08	10000	5416
50	6.77	0.04	10000	2708
50	6.77	0.03	10000	**2031**
50	6.77	0.04	10000	2708

Dylan Ward
Lab Supervisor

Andrew Jamrogiewicz
Project Manager

ACS Services LLC

Soil pH and Resistivity Determination
AASHTO T-289 AASHTO T-288

Project #	2201026	Material Type:	Soil
Lab #	22-2242-1	Supplier:	-
Client:	Ethos	Sample Date:	-
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	Wednesday, May 4, 2022
Project City:	Goodyear	Tested By:	Brian Karl
Sample Source:	B-123 @ 0.0 - 5.0	Resistivity Box:	
		Reviewed By:	Dylan Ward

pH Reading = 9.17

P = (SBF) x R x M

Where:

SBF = Soil Box Factor, cm
R = Dial Reading, OHMS
M = Multiplier

Water Added	SBF (cm)	Dial Reading (OHMS)	Multiplier	**P** (OHM-cm)
200 mL	6.77	0.94	1000	6364
50	6.77	0.69	1000	4671
50	6.77	0.68	1000	4604
50	6.77	0.67	1000	4536
50	6.77	0.68	1000	4604

Brian Karl
Lab Supervisor

Dylan Ward
Laboratory Manager

ACS Services LLC

Soil pH and Resistivity Determination

AASHTO T-289 AASHTO T-288 / ARIZ 236

Project #	2201026	Material Type:	Soils
Lab #	24-1955-2	Supplier:	-
Client:	Ethos	Sample Date:	2/26/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	Friday, March 8, 2024
Project City:	Goodyear	Tested By:	Keagen Mayfield
Sample Source:	B-126 @ 5.0 - 9.0	Resistivity Box:	1
		Reviewed By:	Fernando Montero

pH Reading = 8.9

P = (SBF) x R x M

Where:

SBF = Soil Box Factor, cm
R = Dial Reading, OHMS
M = Multiplier

Water Added	SBF (cm)	Dial Reading (OHMS)	Multiplier	**P** (OHM-cm)
200	7.22	1.8	100	1300
50	7.22	1.5	100	1080
50	7.22	1.6	100	1160

Keagen Mayfield
Lab Supervisor

Fernando Montero
Laboratory Manager

ACS Services LLC

Soil pH and Resistivity Determination

AASHTO T-289 AASHTO T-288 / ARIZ 236

Project #	2201026	Material Type:	Soils
Lab #	24-5851-6	Supplier:	-
Client:	Ethos	Sample Date:	12/13/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	Wednesday, February 14, 2024
Project City:	Goodyear	Tested By:	Keagen Mayfield
Sample Source:	B-151-153 A	Resistivity Box:	1
		Reviewed By:	Fernando Montero

pH Reading = 8.2

P = (SBF) x R x M

Where:

SBF = Soil Box Factor, cm
R = Dial Reading, OHMS
M = Multiplier

Water Added	SBF (cm)	Dial Reading (OHMS)	Multiplier	**P** (OHM-cm)
200	6.77	9.4	10	640
50	6.77	7.7	10	520
50	6.77	7.6	10	510
50	6.77	7.6	10	510
50	6.77	7.6	10	510
50	6.77	7.7	10	520

Keagen Mayfield
Lab Supervisor

Fernando Montero
Laboratory Manager

ACS Services LLC

Soil pH and Resistivity Determination

AASHTO T-289 AASHTO T-288 / ARIZ 236

Project #	2201026	Material Type:	Soils
Lab #	24-5851-7	Supplier:	-
Client:	Ethos	Sample Date:	12/13/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	Wednesday, February 14, 2024
Project City:	Goodyear	Tested By:	Mahalia Davis
Sample Source:	B-151-153 B	Resistivity Box:	1
		Reviewed By:	Fernando Montero

pH Reading = 8.8

P = (SBF) x R x M

Where:

SBF = Soil Box Factor, cm
R = Dial Reading, OHMS
M = Multiplier

Water Added	SBF (cm)	Dial Reading (OHMS)	Multiplier	**P** (OHM-cm)
200	6.77	6.3	100	4270
50	6.77	6.7	100	4540
50	6.77	6.8	100	4600

Keagen Mayfield
Lab Supervisor

Fernando Montero
Laboratory Manager

ACS Services LLC

Soil pH and Resistivity Determination

AASHTO T-289 AASHTO T-288 / ARIZ 236

Project #	2201026	Material Type:	Soils
Lab #	23-5853-3	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	Thursday, December 26, 2024
Project City:	Goodyear	Tested By:	Mahalia Davis
Sample Source:	B-157 @ 0.0 - 5.0	Resistivity Box:	1
		Reviewed By:	Fernando Montero

pH Reading = 8.3

P = (SBF) x R x M

Where:

SBF = Soil Box Factor, cm
R = Dial Reading, OHMS
M = Multiplier

Water Added	SBF (cm)	Dial Reading (OHMS)	Multiplier	**P** (OHM-cm)
200	6.77	2.1	100	1420
50	6.77	1.5	100	1020
50	6.77	2.1	100	1420

Keagen Mayfield
Lab Supervisor

Fernando Montero
Laboratory Manager

ACS Services LLC

Soil pH and Resistivity Determination

AASHTO T-289 AASHTO T-288 / ARIZ 236

Project #	2201026	Material Type:	Soils
Lab #	23-5841-7	Supplier:	-
Client:	Ethos	Sample Date:	12/12/2023
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	Thursday, December 26, 2024
Project City:	Goodyear	Tested By:	Mahalia Davis
Sample Source:	B-168 @ 0.0 - 5.0	Resistivity Box:	1
		Reviewed By:	Fernando Montero

pH Reading = 8.6

P = (SBF) x R x M

Where:

SBF = Soil Box Factor, cm
R = Dial Reading, OHMS
M = Multiplier

Water Added	SBF (cm)	Dial Reading (OHMS)	Multiplier	**P** (OHM-cm)
200	6.77	4.2	100	2840
50	6.77	3.4	100	2300
50	6.77	3.2	100	2170
50	6.77	3.1	100	2100
50	6.77	3.00	100	2030
50	6.77	4.1	100	2780

Keagen Mayfield
Lab Supervisor

Fernando Montero
Laboratory Manager

ACS Services LLC

Soil pH and Resistivity Determination

AASHTO T-289 AASHTO T-288 / ARIZ 236

Project #	2201026	Material Type:	Soils
Lab #	24-1141-1	Supplier:	-
Client:	Ethos	Sample Date:	12/18/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	1/18/2024
Project City:	Goodyear	Tested By:	Mahalia Davis
Sample Source:	P-6 @ 0.5 - 5.0	Resistivity Box:	2
		Reviewed By:	Fernando Montero

pH Reading = 8.3

P = (SBF) x R x M

Where:

SBF = Soil Box Factor, cm
R = Dial Reading, OHMS
M = Multiplier

Water Added	SBF (cm)	Dial Reading (OHMS)	Multiplier	**P** (OHM-cm)
100	1	3.5	1000	3500
25	1	1.7	1000	1700
25	1	6.2	100	620
25	1	5.7	100	570
25	1	5.5	100	550
25	1	5.6	100	560

Keagen Mayfield
Lab Supervisor

Fernando Montero
Laboratory Manager

ACS Services LLC

Soil pH and Resistivity Determination

AASHTO T-289 AASHTO T-288 / ARIZ 236

Project #	2201026	Material Type:	Soils
Lab #	24-1141-3	Supplier:	-
Client:	Ethos	Sample Date:	12/18/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	1/18/2024
Project City:	Goodyear	Tested By:	Mahalia Davis
Sample Source:	P-7 @ 0.5 - 5.0	Resistivity Box:	1
		Reviewed By:	Fernando Montero

pH Reading = 8.4

P = (SBF) x R x M

Where:

SBF = Soil Box Factor, cm
R = Dial Reading, OHMS
M = Multiplier

Water Added	SBF (cm)	Dial Reading (OHMS)	Multiplier	**P** (OHM-cm)
200	6.77	4.0	100	2710
50	6.77	2.3	100	1560
50	6.77	1.2	100	810
50	6.77	7.5	10	510
50	6.77	6.3	10	430
50	6.77	6.0	10	410
50	6.77	6.1	10	410

Keagen Mayfield
Lab Supervisor

Fernando Montero
Laboratory Manager

ACS Services LLC

Soil pH and Resistivity Determination

AASHTO T-289 AASHTO T-288 / ARIZ 236

Project #	2201026	Material Type:	Soils
Lab #	24-1141-5	Supplier:	-
Client:	Ethos	Sample Date:	12/18/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	1/18/2024
Project City:	Goodyear	Tested By:	Mahalia Davis
Sample Source:	P-8 @ 0.5 - 5.0	Resistivity Box:	1
		Reviewed By:	Fernando Montero

pH Reading = 8.3

P = (SBF) x R x M

Where:

SBF = Soil Box Factor, cm
R = Dial Reading, OHMS
M = Multiplier

Water Added	SBF (cm)	Dial Reading (OHMS)	Multiplier	**P** (OHM-cm)
200	6.77	4.5	100	3050
50	6.77	2.5	100	1690
50	6.77	1.2	100	810
50	6.77	7.2	10	490
50	6.77	6.7	10	450
50	6.77	6.6	10	450
50	6.77	6.7	10	450

Keagen Mayfield
Lab Supervisor

Fernando Montero
Laboratory Manager

ACS Services LLC

Soil pH and Resistivity Determination

AASHTO T-289 AASHTO T-288 / ARIZ 236

Project #	2201026	Material Type:	Soils
Lab #	24-1141-7	Supplier:	-
Client:	Ethos	Sample Date:	12/18/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	Thursday, January 18, 2024
Project City:	Goodyear	Tested By:	Mahalia Davis
Sample Source:	P-9 @ 0.5 - 5.0	Resistivity Box:	1
		Reviewed By:	Fernando Montero

pH Reading = 8.5

P = (SBF) x R x M

Where:

SBF = Soil Box Factor, cm
R = Dial Reading, OHMS
M = Multiplier

Water Added	SBF (cm)	Dial Reading (OHMS)	Multiplier	**P** (OHM-cm)
200	6.77	2.4	100	1620
50	6.77	10.1	10	680
50	6.77	6.7	10	450
50	6.77	6.1	10	410
50	6.77	5.9	10	400
50	6.77	6	10	410

Keagen Mayfield
Lab Supervisor

Fernando Montero
Laboratory Manager

ACS Services LLC

Soil pH and Resistivity Determination

AASHTO T-289 AASHTO T-288 / ARIZ 236

Project #	2201026	Material Type:	Soils
Lab #	24-1141-9	Supplier:	-
Client:	Ethos	Sample Date:	12/18/2024
Project Name:	SR 303L MC85 to Van Buren	Sampled By:	Client
Project Address:	MC85 to Van Buren	Test Date:	Thursday, January 18, 2024
Project City:	Goodyear	Tested By:	Mahalia Davis
Sample Source:	P-10 @ 0.5 - 5.0	Resistivity Box:	1
		Reviewed By:	Fernando Montero

pH Reading = 8.4

P = (SBF) x R x M

Where:

SBF = Soil Box Factor, cm
R = Dial Reading, OHMS
M = Multiplier

Water Added	SBF (cm)	Dial Reading (OHMS)	Multiplier	**P** (OHM-cm)
200	6.77	1.3	100	880
50	6.77	9.4	10	640
50	6.77	6	10	410
50	6.77	6.1	10	410

Keagen Mayfield
Lab Supervisor

Fernando Montero
Laboratory Manager

MOTZZ LABORATORY, INC.

Laboratory Analysis Report

ACS Services LLC
Dylan Ward
2235 W Broadway Road
Mesa, AZ 85202

Project: 2201026
Date Received: 3/10/2022
Date Reported: 3/13/2022
PO Number: 2201026

Lab Number: 940970-1 **22-1584-3 B-9 (0-5')**

Test Parameter	Method	Result	Units	Levels
Sulfate	ARIZ 733b	12	ppm	
Chloride	ARIZ 736b	221	ppm	

Lab Number: 940970-2 **22-1582-1 B-5 (0-5)**

Test Parameter	Method	Result	Units	Levels
Sulfate	ARIZ 733b	594	ppm	
Chloride	ARIZ 736b	211	ppm	

MOTZZ LABORATORY, INC.

Laboratory Analysis Report

ACS Services LLC
Dylan Ward
2235 W Broadway Road
Mesa, AZ 85202

Project: 2201026
Date Received: 7/1/2022
Date Reported: 7/7/2022

PO Number: 2201026

Lab Number: 942662-1 **22-3002-6 B21 (0-5)**

Test Parameter	Method	Result	Units	Levels
Sulfate	ARIZ 733b	240	ppm	
Chloride	ARIZ 736b	39	ppm	

MOTZZ LABORATORY, INC.

Laboratory Analysis Report

ACS Services LLC
Dylan Ward
2235 W Broadway Road
Mesa, AZ 85202

Project: 2201026
Date Received: 3/15/2022
Date Reported: 3/17/2022
PO Number: 2201026

Lab Number: 941025-1 **22-1656-5 B-37 (0.0 - 5.0')**

Test Parameter	Method	Result	Units	Levels
Sulfate	ARIZ 733b	238	ppm	
Chloride	ARIZ 736b	223	ppm	

Lab Number: 941025-2 **22-1657-7 B-41 (0.0 - 5.0')**

Test Parameter	Method	Result	Units	Levels
Sulfate	ARIZ 733b	194	ppm	
Chloride	ARIZ 736b	657	ppm	

Lab Number: 941025-3 **22-1658-1 B27 (7.5 - 10.0')**

Test Parameter	Method	Result	Units	Levels
Sulfate	ARIZ 733b	20	ppm	
Chloride	ARIZ 736b	176	ppm	

Lab Number: 941025-4 **22-1658-3 B27 (22.5 - 25.0')**

Test Parameter	Method	Result	Units	Levels
Sulfate	ARIZ 733b	10	ppm	
Chloride	ARIZ 736b	61	ppm	

MOTZZ LABORATORY, INC.

Laboratory Analysis Report

ACS Services LLC
Dylan Ward
2235 W Broadway Road
Mesa, AZ 85202

Project: 2201026
Date Received: 2/17/2022
Date Reported: 2/21/2022

PO Number: 2201026

Lab Number: 940662-1 **22-1414-1 B-31 (0.0-5.0')**

Test Parameter	Method	Result	Units	Levels
Sulfate	ARIZ 733b	68	ppm	
Chloride	ARIZ 736b	651	ppm	

Lab Number: 940662-2 **22-1414-19 B-34 (0.0-5.0')**

Test Parameter	Method	Result	Units	Levels
Sulfate	ARIZ 733b	5	ppm	
Chloride	ARIZ 736b	58	ppm	

MOTZZ LABORATORY, INC.

Laboratory Analysis Report

ACS Services LLC
Dylan Ward
2235 W Broadway Road
Mesa, AZ 85202

Project: 2201026
Date Received: 3/22/2022
Date Reported: 3/24/2022

PO Number: 2201026

Lab Number: 941126-1 **22-1583-9 B113 (0.0-5.0')**

Test Parameter	Method	Result	Units	Levels
Sulfate	ARIZ 733b	6	ppm	
Chloride	ARIZ 736b	58	ppm	

Lab Number: 941126-2 **22-1657-16 B44 (0.0-5.0')**

Test Parameter	Method	Result	Units	Levels
Sulfate	ARIZ 733b	302	ppm	
Chloride	ARIZ 736b	362	ppm	

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Laboratory Analysis Report

ACS Services LLC
Dylan Ward
2235 W Broadway Road
Mesa, AZ 85202

Project: 2201026
Date Received: 2/17/2022
Date Reported: 2/21/2022

PO Number: 2201026

Lab Number: 940663-1 **22-1456-10 B-52 (0.0-5.0')**

Test Parameter	Method	Result	Units	Levels
Sulfate	ARIZ 733b	230	ppm	
Chloride	ARIZ 736b	28	ppm	

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Laboratory Analysis Report

ACS Services LLC
Dylan Ward
2235 W Broadway Road
Mesa, AZ 85202

Project: 2201026
Date Received: 4/26/2022
Date Reported: 5/2/2022

PO Number: 2201026

Lab Number: 941696-1 **22-1941-1 P1 (0.0-5.0)**

Test Parameter	Method	Result	Units	Levels
Sulfate	ARIZ 733b	428	ppm	
Chloride	ARIZ 736b	308	ppm	

Lab Number: 941696-2 **22-1944-2 B98 (0.0-5.0)**

Test Parameter	Method	Result	Units	Levels
Sulfate	ARIZ 733b	6	ppm	
Chloride	ARIZ 736b	22	ppm	

Lab Number: 941696-3 **22-1958-5 B57 (0.0-5.0)**

Test Parameter	Method	Result	Units	Levels
Sulfate	ARIZ 733b	306	ppm	
Chloride	ARIZ 736b	176	ppm	

MOTZZ LABORATORY, INC.

Laboratory Analysis Report

ACS Services LLC
Dylan Ward
2235 W Broadway Road
Mesa, AZ 85202

Project: 2201026
Date Received: 4/29/2022
Date Reported: 5/3/2022
PO Number:

Lab Number: 941754-1 **22-1979-3 B60@ 0.0-5.0**

Test Parameter	Method	Result	Units	Levels
Sulfate	ARIZ 733b	692	ppm	
Chloride	ARIZ 736b	823	ppm	

Lab Number: 941754-2 **22-1979-7 B63@ 0.0-5.0**

Test Parameter	Method	Result	Units	Levels
Sulfate	ARIZ 733b	321	ppm	
Chloride	ARIZ 736b	603	ppm	

Lab Number: 941754-3 **22-1942-1 B16@ 0.0-5.0**

Test Parameter	Method	Result	Units	Levels
Sulfate	ARIZ 733b	401	ppm	
Chloride	ARIZ 736b	967	ppm	

Lab Number: 941754-4 **22-1940-1 B13@ 0.0-5.0**

Test Parameter	Method	Result	Units	Levels
Sulfate	ARIZ 733b	383	ppm	
Chloride	ARIZ 736b	372	ppm	

Lab Number: 941754-5 **22-1941-1 B58@ 0.0-5.0**

Test Parameter	Method	Result	Units	Levels
Sulfate	ARIZ 733b	9	ppm	
Chloride	ARIZ 736b	74	ppm	

MOTZZ LABORATORY, INC.

Laboratory Analysis Report

ACS Services LLC
Dylan Ward
2235 W Broadway Road
Mesa, AZ 85202

Project: 2201026
Date Received: 4/20/2022
Date Reported: 4/22/2022

PO Number: 2201026

Lab Number: 941593-1 **22-1803-6 B70 (1.0-5.0)**

Test Parameter	Method	Result	Units	Levels
Sulfate	ARIZ 733b	71	ppm	
Chloride	ARIZ 736b	46	ppm	

MOTZZ LABORATORY, INC.

Laboratory Analysis Report

ACS Services LLC
Dylan Ward
2235 W Broadway Road
Mesa, AZ 85202

Project: 2201026
Date Received: 4/12/2022
Date Reported: 4/14/2022

PO Number: 2201026

Lab Number: 941452-1 **22-1850-1 B75 (7.5-10.0')**

Test Parameter	Method	Result	Units	Levels
Sulfate	ARIZ 733b	84	ppm	
Chloride	ARIZ 736b	47	ppm	

Lab Number: 941452-2 **22-1850-2 B75 (17.5-20.0')**

Test Parameter	Method	Result	Units	Levels
Sulfate	ARIZ 733b	561	ppm	
Chloride	ARIZ 736b	287	ppm	

Lab Number: 941452-3 **22-1804-2 B77 (28.5-30.0')**

Test Parameter	Method	Result	Units	Levels
Sulfate	ARIZ 733b	9	ppm	
Chloride	ARIZ 736b	12	ppm	

Lab Number: 941452-4 **22-1804-5 B77 (47.5-50.0')**

Test Parameter	Method	Result	Units	Levels
Sulfate	ARIZ 733b	7	ppm	
Chloride	ARIZ 736b	28	ppm	

Lab Number: 941452-5 **22-1849-1 B101 (0.0-5.0')**

Test Parameter	Method	Result	Units	Levels
Sulfate	ARIZ 733b	9	ppm	
Chloride	ARIZ 736b	175	ppm	

MOTZZ LABORATORY, INC.

Laboratory Analysis Report

ACS Services LLC
Dylan Ward
2235 W Broadway Road
Mesa, AZ 85202

Project: 2201026
Date Received: 1/19/2022
Date Reported: 1/21/2022

PO Number: 2201026

Lab Number: 940246-1 **22-1057-14 B-94 (0.0-5.0')**

Test Parameter	Method	Result	Units	Levels
Sulfate	ARIZ 733b	10	ppm	
Chloride	ARIZ 736b	63	ppm	

Lab Number: 940246-2 **22-1057-25 B-96 (0.0-5.0')**

Test Parameter	Method	Result	Units	Levels
Sulfate	ARIZ 733b	7	ppm	
Chloride	ARIZ 736b	32	ppm	

Lab Number: 940246-3 **22-1057-34 B-102 (30.0-31.5')**

Test Parameter	Method	Result	Units	Levels
Sulfate	ARIZ 733b	6	ppm	
Chloride	ARIZ 736b	73	ppm	

Lab Number: 940246-4 **22-1057-36 B-102 (57.5-60.0')**

Test Parameter	Method	Result	Units	Levels
Sulfate	ARIZ 733b	7	ppm	
Chloride	ARIZ 736b	17	ppm	

Lab Number: 940246-5 **22-1128-16 B-121 (0.0-5.0')**

Test Parameter	Method	Result	Units	Levels
Sulfate	ARIZ 733b	6	ppm	
Chloride	ARIZ 736b	6	ppm	

Lab Number: 940246-6 **22-1127-2 B-104 (22.5-25.0')**

Test Parameter	Method	Result	Units	Levels
Sulfate	ARIZ 733b	6	ppm	
Chloride	ARIZ 736b	17	ppm	

MOTZZ LABORATORY, INC.

Laboratory Analysis Report

ACS Services LLC
Dylan Ward
2235 W Broadway Road
Mesa, AZ 85202

Project: 2201026
Date Received: 1/19/2022
Date Reported: 1/21/2022

PO Number: 2201026

Lab Number: 940246-7 **22-1127-4 B-104 (47.5-50.0')**

Test Parameter	Method	Result	Units	Levels
Sulfate	ARIZ 733b	7	ppm	
Chloride	ARIZ 736b	49	ppm	

MOTZZ LABORATORY, INC.

Laboratory Analysis Report

ACS Services LLC
Dylan Ward
2235 W Broadway Road
Mesa, AZ 85202

Project: 2201026
Date Received: 1/28/2022
Date Reported: 2/1/2022

PO Number: 2201026

Lab Number: 940374-1 **22-1128-1 B-108 (0.0-5.0)**

Test Parameter	Method	Result	Units	Levels
Sulfate	ARIZ 733b	13	ppm	
Chloride	ARIZ 736b	203	ppm	

MOTZZ LABORATORY, INC.

Laboratory Analysis Report

ACS Services LLC
Dylan Ward
2235 W Broadway Road
Mesa, AZ 85202

Project: 2201026
Date Received: 6/21/2022
Date Reported: 6/23/2022
PO Number: 2201026

Lab Number: 942485-1 **22-2842-5 B-116 (0.0-5.0)**

Test Parameter	Method	Result	Units	Levels
Sulfate	ARIZ 733b	193	ppm	
Chloride	ARIZ 736b	22	ppm	

Lab Number: 942485-2 **22-2842-12 B-119 (0.0-5.0)**

Test Parameter	Method	Result	Units	Levels
Sulfate	ARIZ 733b	139	ppm	
Chloride	ARIZ 736b	21	ppm	

MOTZZ LABORATORY, INC.

Laboratory Analysis Report

ACS Services LLC
Dylan Ward
2235 W Broadway Road
Mesa, AZ 85202

Project: 2201026
Date Received: 5/9/2022
Date Reported: 5/12/2022

PO Number: 2201026

Lab Number: 941857-1 **22-2242-1 B123 (0.0-5.0)**

Test Parameter	Method	Result	Units	Levels
Sulfate	ARIZ 733b	4	ppm	
Chloride	ARIZ 736b	< 3	ppm	

MOTZZ LABORATORY, INC.

Report: 949743
Reported: 2/23/2024
Received: 2/19/2024
PO: 2201026

Laboratory Analysis Report

ACS Services LLC
Fernando Montero
2235 W Broadway Road
Mesa, AZ 85202

Project: 2201026

Lab Number	Sample ID	
949743-1	24-1139-3	B-147 (25-26.5')

Test Parameter

Test	*Method*	*Result*	*Units*
Sulfate	ARIZ 733b	22	ppm
Chloride	ARIZ 736b	320	ppm

Lab Number	Sample ID	
949743-2	24-1147-4	B-145 (20-21.5')

Test Parameter

Test	*Method*	*Result*	*Units*
Sulfate	ARIZ 733b	58	ppm
Chloride	ARIZ 736b	77	ppm

Lab Number	Sample ID	
949743-3	24-1149-1	B-129 (0-5')

Test Parameter

Test	*Method*	*Result*	*Units*
Sulfate	ARIZ 733b	64	ppm
Chloride	ARIZ 736b	110	ppm

MOTZZ LABORATORY, INC.

Report: 953036
Reported: 10/30/2024
Received: 10/24/2024
PO: 2201026

Laboratory Analysis Report

ACS Services LLC
Keagen Mayfield
2235 W Broadway Road
Mesa, AZ 85202

Project: 2201026

Lab Number	Sample ID	
953036-1	24-5286-1	B129A @ 0 - 4

Test Parameter

Test	*Method*	*Result*	*Units*
Sulfate	ARIZ 733b	18	ppm
Chloride	ARIZ 736b	314	ppm

MOTZZ LABORATORY, INC.

Report: 949620
Reported: 2/9/2024
Received: 2/8/2024
PO: 2201026

Laboratory Analysis Report

ACS Services LLC
F Montero
2235 W Broadway Road
Mesa, AZ 85202

Project: 2201026

Lab Number	Sample ID	
949620-1	24-1150-4	B-135 (55.0-56.5')

Test Parameter

Test	*Method*	*Result*	*Units*
Sulfate	ARIZ 733b	14	ppm
Chloride	ARIZ 736b	204	ppm

Lab Number	Sample ID	
949620-2	24-1151-3	B-136 (30.0-31.5')

Test Parameter

Test	*Method*	*Result*	*Units*
Sulfate	ARIZ 733b	9	ppm
Chloride	ARIZ 736b	55	ppm

Lab Number	Sample ID	
949620-3	24-5409-2	B-174 (5.0-6.5')

Test Parameter

Test	*Method*	*Result*	*Units*
Sulfate	ARIZ 733b	56	ppm
Chloride	ARIZ 736b	709	ppm

MOTZZ LABORATORY, INC.

Report: 949758
Reported: 2/23/2024
Received: 2/20/2024
PO: 2201026

Laboratory Analysis Report

ACS Services LLC
Fernando Montero
2235 W Broadway Road
Mesa, AZ 85202

Project: 2201026

Lab Number	Sample ID	
949758-1	24-1586-4	B-146 (50-51.5')

Test Parameter

Test	*Method*	*Result*	*Units*
Sulfate	ARIZ 733b	33	ppm
Chloride	ARIZ 736b	75	ppm

Lab Number	Sample ID	
949758-2	24-1587-1	B-137 (5-6.5')

Test Parameter

Test	*Method*	*Result*	*Units*
Sulfate	ARIZ 733b	1011	ppm
Chloride	ARIZ 736b	59	ppm

Lab Number	Sample ID	
949758-3	24-1588-5	B-138 (75-76.5')

Test Parameter

Test	*Method*	*Result*	*Units*
Sulfate	ARIZ 733b	64	ppm
Chloride	ARIZ 736b	188	ppm

MOTZZ LABORATORY, INC.

Report: 951646
Reported: 7/12/2024
Received: 7/9/2024
PO: 2201026

Laboratory Analysis Report

ACS Services LLC
Fernando Montero
2235 W Broadway Road
Mesa, AZ 85202

Project: 2201026

Lab Number	Sample ID	
951646-1	24-3864-2	B-139 @ 15-16.5'

Test Parameter

Test	*Method*	*Result*	*Units*
Sulfate	ARIZ 733b	6	ppm
Chloride	ARIZ 736b	48	ppm

MOTZZ LABORATORY, INC.

Report: 951665
Reported: 7/14/2024
Received: 7/10/2024
PO: 2201026

Laboratory Analysis Report

ACS Services LLC
Fernando Montero
2235 W Broadway Road
Mesa, AZ 85202

Project: 2201026

Lab Number	Sample ID	
951665-1	24-3865-2	B-140 @ 30-31.5'

Test Parameter

Test	*Method*	*Result*	*Units*
Sulfate	ARIZ 733b	3	ppm
Chloride	ARIZ 736b	10	ppm

MOTZZ LABORATORY, INC.

Report: 949376
Reported: 1/20/2024
Received: 1/18/2024
PO: 2302106

Laboratory Analysis Report

ACS Services LLC
F Montero
2235 W Broadway Road
Mesa, AZ 85202

Project: 2302106

Lab Number	Sample ID
949376-4	24-1148-1 B-148 (0.0 - 5.0')

Test Parameter

Test	*Method*	*Result*	*Units*
Sulfate	ARIZ 733b	19	ppm
Chloride	ARIZ 736b	113	ppm

MOTZZ LABORATORY, INC.

Report: 949672
Reported: 2/17/2024
Received: 2/13/2024
PO: 2201026

Laboratory Analysis Report

ACS Services LLC
Fernando Montero
2235 W Broadway Road
Mesa, AZ 85202

Project: 2201026

Lab Number	Sample ID	
949672-1	24-5851-6	B-151/153 A

Test Parameter

Test	*Method*	*Result*	*Units*
Sulfate	ARIZ 733b	293	ppm
Chloride	ARIZ 736b	448	ppm

Lab Number	Sample ID	
949672-2	24-5851-7	B-151/153 B

Test Parameter

Test	*Method*	*Result*	*Units*
Sulfate	ARIZ 733b	83	ppm
Chloride	ARIZ 736b	29	ppm

MOTZZ LABORATORY, INC.

Report: 949220
Reported: 1/7/2024
Received: 1/3/2024
PO: 2201026

Laboratory Analysis Report

ACS Services LLC
F Montero
2235 W Broadway Road
Mesa, AZ 85202

Project: 2201026

Lab Number	Sample ID	
949220-4	23-5853-3	B-157 @ 0-5

Test Parameter

Test	*Method*	*Result*	*Units*
Sulfate	ARIZ 733b	76	ppm
Chloride	ARIZ 736b	231	ppm

MOTZZ LABORATORY, INC.

Report: 948264
Reported: 10/3/2023
Received: 9/29/2023
PO: 2201026

Laboratory Analysis Report

ACS Services LLC
F Montero
2235 W Broadway Road
Mesa, AZ 85202

Project: 2201026

Lab Number	Sample ID	
948264-3	23-4582-1	B-158 (5.0-6.5')

Test Parameter

Test	*Method*	*Result*	*Units*
Sulfate	ARIZ 733b	9	ppm
Chloride	ARIZ 736b	143	ppm

MOTZZ LABORATORY, INC.

Report: 948471
Reported: 10/23/2023
Received: 10/19/2023
PO: 2201026

Laboratory Analysis Report

ACS Services LLC
F Montero
2235 W Broadway Road
Mesa, AZ 85202

Project: 2201026

Lab Number	Sample ID	
948471-2	23-4643-5	B-159 (55-56.5')

Test Parameter

Test	*Method*	*Result*	*Units*
Sulfate	ARIZ 733b	253	ppm
Chloride	ARIZ 736b	180	ppm

MOTZZ LABORATORY, INC.

Report: 948341
Reported: 10/10/2023
Received: 10/6/2023
PO: 2201026

Laboratory Analysis Report

ACS Services LLC
F Montero
2235 W Broadway Road
Mesa, AZ 85202

Project: 2201026

Lab Number	Sample ID	
948341-1	23-4644-7	B-160 (75.0-76.5')

Test Parameter

Test	*Method*	*Result*	*Units*
Sulfate	ARIZ 733b	458	ppm
Chloride	ARIZ 736b	347	ppm

MOTZZ LABORATORY, INC.

Report: 948264
Reported: 10/3/2023
Received: 9/29/2023
PO: 2201026

Laboratory Analysis Report

ACS Services LLC
F Montero
2235 W Broadway Road
Mesa, AZ 85202

Project: 2201026

Lab Number	Sample ID	
948264-4	23-4579-4	B-161 (35.0-36.5')

Test Parameter

Test	*Method*	*Result*	*Units*
Sulfate	ARIZ 733b	210	ppm
Chloride	ARIZ 736b	132	ppm

MOTZZ LABORATORY, INC.

Report: 948264
Reported: 10/3/2023
Received: 9/29/2023
PO: 2201026

Laboratory Analysis Report

ACS Services LLC
F Montero
2235 W Broadway Road
Mesa, AZ 85202

Project: 2201026

Lab Number	Sample ID	
948264-1	23-4645-3	B-162 (20-21')

Test Parameter

Test	*Method*	*Result*	*Units*
Sulfate	ARIZ 733b	309	ppm
Chloride	ARIZ 736b	349	ppm

MOTZZ LABORATORY, INC.

Report: 948264
Reported: 10/3/2023
Received: 9/29/2023
PO: 2201026

Laboratory Analysis Report

ACS Services LLC
F Montero
2235 W Broadway Road
Mesa, AZ 85202

Project: 2201026

Lab Number	Sample ID	
948264-5	23-4580-4	B-163 (45.0-46.5')

Test Parameter

Test	*Method*	*Result*	*Units*
Sulfate	ARIZ 733b	261	ppm
Chloride	ARIZ 736b	299	ppm

MOTZZ LABORATORY, INC.

Report: 948471
Reported: 10/23/2023
Received: 10/19/2023
PO: 2201026

Laboratory Analysis Report

ACS Services LLC
F Montero
2235 W Broadway Road
Mesa, AZ 85202

Project: 2201026

Lab Number	Sample ID	
948471-1	23-4642-6	B-164 (65.0-66.5')

Test Parameter

Test	*Method*	*Result*	*Units*
Sulfate	ARIZ 733b	125	ppm
Chloride	ARIZ 736b	220	ppm

MOTZZ LABORATORY, INC.

Report: 948264
Reported: 10/3/2023
Received: 9/29/2023
PO: 2201026

Laboratory Analysis Report

ACS Services LLC
F Montero
2235 W Broadway Road
Mesa, AZ 85202

Project: 2201026

Lab Number	Sample ID	
948264-2	23-4581-3	B-166 (28-30')

Test Parameter

Test	*Method*	*Result*	*Units*
Sulfate	ARIZ 733b	1437	ppm
Chloride	ARIZ 736b	103	ppm

MOTZZ LABORATORY, INC.

Report: 949220
Reported: 1/7/2024
Received: 1/3/2024
PO: 2201026

Laboratory Analysis Report

ACS Services LLC
F Montero
2235 W Broadway Road
Mesa, AZ 85202

Project: 2201026

Lab Number	Sample ID
949220-1	23-5845-1 B-187 @ 0.0 - 5.0

Test Parameter

Test	*Method*	*Result*	*Units*
Sulfate	ARIZ 733b	304	ppm
Chloride	ARIZ 736b	336	ppm

Lab Number	Sample ID
949220-2	23-5841-1 B-167 @ 0.0 - 5 .0

Test Parameter

Test	*Method*	*Result*	*Units*
Sulfate	ARIZ 733b	105	ppm
Chloride	ARIZ 736b	326	ppm

Lab Number	Sample ID
949220-3	23-5850-6 B-199 @ 1.0 - 2.0

Test Parameter

Test	*Method*	*Result*	*Units*
Sulfate	ARIZ 733b	23	ppm
Chloride	ARIZ 736b	84	ppm

Lab Number	Sample ID
949220-5	23-5847-1 B-190 @ 0.0 - 5.0

Test Parameter

Test	*Method*	*Result*	*Units*
Sulfate	ARIZ 733b	29	ppm
Chloride	ARIZ 736b	97	ppm

MOTZZ LABORATORY, INC.

Report: 948851
Reported: 11/29/2023
Received: 11/22/2023
PO: 2201026

Laboratory Analysis Report

ACS Services LLC
F Montero
2235 W Broadway Road
Mesa, AZ 85202

Project: 2201026

Lab Number	Sample ID
948851-1	23-5408-7 B-173 @ 62.0 - 63.5

Test Parameter

Test	*Method*	*Result*	*Units*
Sulfate	ARIZ 733b	14	ppm
Chloride	ARIZ 736b	202	ppm

MOTZZ LABORATORY, INC.

Report: 948536
Reported: 10/31/2023
Received: 10/25/2023
PO: 2201026

Laboratory Analysis Report

ACS Services LLC
F Montero
2235 W Broadway Road
Mesa, AZ 85202

Project: 2201026

Lab Number	Sample ID	
948536-1	23-4760-1	B 175 (15-17')

Test Parameter

Test	*Method*	*Result*	*Units*
Sulfate	ARIZ 733b	359	ppm
Chloride	ARIZ 736b	183	ppm

MOTZZ LABORATORY, INC.

Report: 948419
Reported: 10/16/2023
Received: 10/13/2023
PO: 2201026

Laboratory Analysis Report

ACS Services LLC
F Montero
2235 W Broadway Road
Mesa, AZ 85202

Project: 2201026

Lab Number	Sample ID	
948419-3	23-4761-5	B 176 (65.0-66.5)

Test Parameter

Test	*Method*	*Result*	*Units*
Sulfate	ARIZ 733b	4	ppm
Chloride	ARIZ 736b	38	ppm

MOTZZ LABORATORY, INC.

Report: 948419
Reported: 10/16/2023
Received: 10/13/2023
PO: 2201026

Laboratory Analysis Report

ACS Services LLC
F Montero
2235 W Broadway Road
Mesa, AZ 85202

Project: 2201026

Lab Number	Sample ID	
948419-2	23-4762-4	B 178 (50.0-51.5)

Test Parameter

Test	*Method*	*Result*	*Units*
Sulfate	ARIZ 733b	317	ppm
Chloride	ARIZ 736b	276	ppm

MOTZZ LABORATORY, INC.

Report: 948572
Reported: 11/1/2023
Received: 10/27/2023
PO: 2201026

Laboratory Analysis Report

ACS Services LLC
F Montero
2235 W Broadway Road
Mesa, AZ 85202

Project: 2201026

Lab Number	Sample ID	
948572-1	23-4764-5	B-180 (60-61.5')

Test Parameter

Test	*Method*	*Result*	*Units*
Sulfate	ARIZ 733b	172	ppm
Chloride	ARIZ 736b	140	ppm

MOTZZ LABORATORY, INC.

Report: 948419
Reported: 10/16/2023
Received: 10/13/2023
PO: 2201026

Laboratory Analysis Report

ACS Services LLC
F Montero
2235 W Broadway Road
Mesa, AZ 85202

Project: 2201026

Lab Number	Sample ID	
948419-1	23-4765-5	B-181 (30.0-31.5)

Test Parameter

Test	*Method*	*Result*	*Units*
Sulfate	ARIZ 733b	906	ppm
Chloride	ARIZ 736b	675	ppm

MOTZZ LABORATORY, INC.

Report: 948572
Reported: 11/1/2023
Received: 10/27/2023
PO: 2201026

Laboratory Analysis Report

ACS Services LLC
F Montero
2235 W Broadway Road
Mesa, AZ 85202

Project: 2201026

Lab Number	Sample ID	
948572-2	23-4766-1	B-182 (6-7.5')

Test Parameter

Test	*Method*	*Result*	*Units*
Sulfate	ARIZ 733b	818	ppm
Chloride	ARIZ 736b	290	ppm

MOTZZ LABORATORY, INC.

Report: 948419
Reported: 10/16/2023
Received: 10/13/2023
PO: 2201026

Laboratory Analysis Report

ACS Services LLC
F Montero
2235 W Broadway Road
Mesa, AZ 85202

Project: 2201026

Lab Number	Sample ID	
948419-4	23-4767-8	B 183 (75.0-76.5)

Test Parameter

Test	*Method*	*Result*	*Units*
Sulfate	ARIZ 733b	96	ppm
Chloride	ARIZ 736b	195	ppm

MOTZZ LABORATORY, INC.

Report: 948471
Reported: 10/23/2023
Received: 10/19/2023
PO: 2201026

Laboratory Analysis Report

ACS Services LLC
F Montero
2235 W Broadway Road
Mesa, AZ 85202

Project: 2201026

Lab Number	Sample ID	
948471-3	23-4769-4	B-185 (32-33')

Test Parameter

Test	*Method*	*Result*	*Units*
Sulfate	ARIZ 733b	419	ppm
Chloride	ARIZ 736b	676	ppm

MOTZZ LABORATORY, INC.

Report: 948471
Reported: 10/23/2023
Received: 10/19/2023
PO: 2201026

Laboratory Analysis Report

ACS Services LLC
F Montero
2235 W Broadway Road
Mesa, AZ 85202

Project: 2201026

Lab Number	Sample ID	
948471-4	23-4770-6	B-186 (45-46.5)

Test Parameter

Test	*Method*	*Result*	*Units*
Sulfate	ARIZ 733b	90	ppm
Chloride	ARIZ 736b	88	ppm

MOTZZ LABORATORY, INC.

Report: 953032
Reported: 10/30/2024
Received: 10/24/2024
PO: 2201026

Laboratory Analysis Report

ACS Services LLC
Keagen Mayfield
2235 W Broadway Road
Mesa, AZ 85202

Project: 2201026

Lab Number	Sample ID	
953032-1	24-5282-1	B-196A @ (0-4)

Test Parameter

Test	*Method*	*Result*	*Units*
Sulfate	ARIZ 733b	10	ppm
Chloride	ARIZ 736b	102	ppm

MOTZZ LABORATORY, INC.

Report: 953035
Reported: 10/30/2024
Received: 10/24/2024
PO: 2201026

Laboratory Analysis Report

ACS Services LLC
Keagen Mayfield
2235 W Broadway Road
Mesa, AZ 85202

Project: 2201026

Lab Number	Sample ID	
953035-1	24-5284-1	B-196C @ 3 - 4.5

Test Parameter

Test	*Method*	*Result*	*Units*
Sulfate	ARIZ 733b	47	ppm
Chloride	ARIZ 736b	121	ppm

IAS LABORATORIES

2515 East University Drive
Phoenix, AZ 85034
Office: (602) 273-7248
Fax: (602) 275-3836
www.iaslabs.com

May 16, 2022

Dahlen Keith
Dahlen Keith

Project: SR 303L, MC 85 to Van Buren

Enclosed are the results of analyses for samples received by our laboratory on 5/6/2022. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Sheri Mclane
Lab Manager

IAS Laboratories
2515 East University Drive
Phoenix, Arizona 85034
(602) 273-7248
Fax (602) 275-3836

Date Received: May 06, 2022
Work Order: 22E0120

Submitted By: Dahlen Keith
Report To: Dahlen Keith
Project: SR 303L, MC 85 to Van Buren

Sample Results

Sample Name: S1
IAS Lab ID: 22E0120-01 (Soil)

	Result	MRL	Units	Method	ADOT Limits
Chemical Properties					
Calcium Carbonate (CaCO3)	8.0	<0.1	%	ADOT Ariz 732	<8
pH	7.45	<0.01	SI	ADOT 237b	6.0-8.3
Soluble Salts	3750	<0.10	ppm	ADOT Ariz 237b	<2000
Sodium (Na)	652	<0.50	ppm	ADOT 729	<300
ESP %	6.1	<0.1	%	ADOT 729	<5.0
Physical Properties					
Plasticity Index	8	<1	#	ASTM D 4318	5-20
Liquid Limit (LL)	26	<1	#	ASTM D 4318	
Plastic Limit (PL)	18	<1	#	ASTM D 4318	
Soil Gradation - Percent Passing					
Sieve 2"	100	<0.01	%	ADOT 201c	<100%
Sieve 3/4"	100	<0.01	%	ADOT 201c	<85-100%
Sieve #40	39.6	<0.01	%	ADOT 201c	<35-100%

MRL: Minimum Reporting Limit

ND: None Detected

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
No duplication of this report is allowed, except in its entirety.

IAS Laboratories
2515 East University Drive
Phoenix, Arizona 85034
(602) 273-7248
Fax (602) 275-3836

Date Received: May 06, 2022
Work Order: 22E0120

Submitted By: Dahlen Keith
Report To: Dahlen Keith
Project: SR 303L, MC 85 to Van Buren

Sample Results

Sample Name: S2
IAS Lab ID: 22E0120-02 (Soil)

	Result	MRL	Units	Method	ADOT Limits
Chemical Properties					
Calcium Carbonate (CaCO3)	8.6	<0.1	%	ADOT Ariz 732	<8
pH	8.08	<0.01	SI	ADOT 237b	6.0-8.3
Soluble Salts	544	<0.10	ppm	ADOT Ariz 237b	<2000
Sodium (Na)	213	<0.50	ppm	ADOT 729	<300
ESP %	2.3	<0.10	%	ADOT 729	<5.0
Physical Properties					
Plasticity Index	6	<1	#	ASTM D 4318	5-20
Liquid Limit (LL)	23	<1	#	ASTM D 4318	
Plastic Limit (PL)	17	<1	#	ASTM D 4318	
Soil Gradation - Percent Passing					
Sieve 2"	100	<0.01	%	ADOT 201c	<100%
Sieve 3/4"	100	<0.01	%	ADOT 201c	<85-100%
Sieve #40	55.8	<0.01	%	ADOT 201c	<35-100%

MRL: Minimum Reporting Limit

ND: None Detected

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
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IAS Laboratories
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Phoenix, Arizona 85034
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Fax (602) 275-3836

Date Received: May 06, 2022
Work Order: 22E0120

Submitted By: Dahlen Keith
Report To: Dahlen Keith
Project: SR 303L, MC 85 to Van Buren

Sample Results

Sample Name: S3
IAS Lab ID: 22E0120-03 (Soil)

	Result	MRL	Units	Method	ADOT Limits
Chemical Properties					
Calcium Carbonate (CaCO3)	7.5	<0.1	%	ADOT Ariz 732	<8
pH	8.02	<0.01	SI	ADOT 237b	6.0-8.3
Soluble Salts	602	<0.10	ppm	ADOT Ariz 237b	<2000
Sodium (Na)	200	<0.50	ppm	ADOT 729	<300
ESP %	2.1	<0.1		ADOT 729	<5.0
Physical Properties					
Plasticity Index	6	<1	#	ASTM D 4318	5-20
Liquid Limit (LL)	28	<1	#	ASTM D 4318	
Plastic Limit (PL)	22	<1	#	ASTM D 4318	
Soil Gradation - Percent Passing					
Sieve 2"	100	<0.01	%	ADOT 201c	<100%
Sieve 3/4"	100	<0.01	%	ADOT 201c	<85-100%
Sieve #40	47.8	<0.01	%	ADOT 201c	<35-100%

MRL: Minimum Reporting Limit

ND: None Detected

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
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IAS Laboratories
2515 East University Drive
Phoenix, Arizona 85034
(602) 273-7248
Fax (602) 275-3836

Date Received: May 06, 2022
Work Order: 22E0120

Submitted By: Dahlen Keith
Report To: Dahlen Keith
Project: SR 303L, MC 85 to Van Buren

Sample Results

Sample Name: S4
IAS Lab ID: 22E0120-04 (Soil)

	Result	MRL	Units	Method	ADOT Limits
Chemical Properties					
Calcium Carbonate (CaCO3)	7.5	<0.1	%	ADOT Ariz 732	<8
pH	8.25	<0.01	SI	ADOT 237b	6.0-8.3
Soluble Salts	346	<0.10	ppm	ADOT Ariz 237b	<2000
Sodium (Na)	120	<0.50	ppm	ADOT 729	<300
ESP %	1.3	<0.50	%	ADOT 729	<5.0
Physical Properties					
Plasticity Index	4.94	<2.00	#	ASTM D 4318	5-20
Liquid Limit (LL)	26	<1	#	ASTM D 4318	
Plastic Limit (PL)	21	<1	#	ASTM D 4318	
Soil Gradation - Percent Passing					
Sieve 2"	100	<0.01	%	ADOT 201c	<100%
Sieve 3/4"	100	<0.01	%	ADOT 201c	<85-100%
Sieve #40	29.1	<0.01	%	ADOT 201c	<35-100%

MRL: Minimum Reporting Limit

ND: None Detected

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IAS Laboratories
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Phoenix, Arizona 85034
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Fax (602) 275-3836

Date Received: May 06, 2022
Work Order: 22E0120

Submitted By: Dahlen Keith
Report To: Dahlen Keith
Project: SR 303L, MC 85 to Van Buren

Sample Results

Sample Name: S5
IAS Lab ID: 22E0120-05 (Soil)

	Result	MRL	Units	Method	ADOT Limits
Chemical Properties					
Calcium Carbonate (CaCO3)	8.2	<0.1	%	ADOT Ariz 732	<8
pH	8.26	<0.01	SI	ADOT 237b	6.0-8.3
Soluble Salts	346	<0.10	ppm	ADOT Ariz 237b	<2000
Sodium (Na)	185	<0.50	ppm	ADOT 729	<300
ESP %	1.9	<0.50	%	ADOT 729	<5.0
Physical Properties					
Plasticity Index	2.76	<2.00	#	ASTM D 4318	5-20
Liquid Limit (LL)	26	<1	#	ASTM D 4318	
Plastic Limit (PL)	23	<1	#	ASTM D 4318	
Soil Gradation - Percent Passing					
Sieve 2"	100	<0.01	%	ADOT 201c	<100%
Sieve 3/4"	100	<0.01	%	ADOT 201c	<85-100%
Sieve #40	38.0	<0.01	%	ADOT 201c	<35-100%

MRL: Minimum Reporting Limit

ND: None Detected

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Phoenix, Arizona 85034
(602) 273-7248
Fax (602) 275-3836

Date Received: May 06, 2022
Work Order: 22E0120

Submitted By: Dahlen Keith
Report To: Dahlen Keith
Project: SR 303L, MC 85 to Van Buren

Sample Results

Sample Name: S6
IAS Lab ID: 22E0120-06 (Soil)

	Result	MRL	Units	Method	ADOT Limits
Chemical Properties					
Calcium Carbonate (CaCO3)	9.2	<0.1	%	ADOT Ariz 732	<8
pH	8.17	<0.01	SI	ADOT 237b	6.0-8.3
Soluble Salts	582	<0.10	ppm	ADOT Ariz 237b	<2000
Sodium (Na)	260	<0.50	ppm	ADOT 729	<300
ESP %	2.6	<0.50	%	ADOT 729	<5.0
Physical Properties					
Plasticity Index	3.50	<2.00	#	ASTM D 4318	5-20
Liquid Limit (LL)	24	<1	#	ASTM D 4318	
Plastic Limit (PL)	21	<1	#	ASTM D 4318	
Soil Gradation - Percent Passing					
Sieve 2"	100	<0.01	%	ADOT 201c	<100%
Sieve 3/4"	100	<0.01	%	ADOT 201c	<85-100%
Sieve #40	34.9	<0.01	%	ADOT 201c	<35-100%

MRL: Minimum Reporting Limit

ND: None Detected

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document.
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IAS Laboratories
2515 East University Drive
Phoenix, Arizona 85034
(602) 273-7248

Work Order: 22E0120
Client: Dahlen Keith
Project Manager: Dahlen Keith

Project: Agronomy
Project Number: SR 303L, MC 85 to Van Bu
Date Received: 05/06/2022

Soil Analysis Report

Sample Name	Lab ID	pH	Calcium (Ca) ppm	Magnesium (Mg) ppm	Sodium (Na) ppm	Potash (K) ppm	Iron (Fe) ppm	Zinc (Zn) ppm	Manganese (Mn) ppm	Copper (Cu) ppm	Molybdenum (Mo) ppm	Salinity (EC x 2) dS/m	Nitrate (NO3-N) ppm	Phosphate (PO4-P) ppm	Computed %Sodium (esp)	Sulfur (SO4-S) ppm	Boron (B) ppm	Free Lime Level
S1	22E0120-01	7.45	7340 VH	723 VH	652 VH	258 M	4.44 M	0.86 M	4.96 M	0.64 M	0.14 VH	11.73 VH	232 VH	8.81 L	6.1	131 VH	1.44 M	High
S2	22E0120-02	8.08	7250 VH	375 H	213 H	167 M	4.25 M	0.44 L	3.00 M	0.93 M	0.11 VH	1.69 L	50.6 H	5.30 L	2.3	30.9 H	1.25 M	High
S3	22E0120-03	8.02	7440 VH	392 H	200 M	219 M	4.36 M	0.99 M	1.98 M	0.87 M	0.10 VH	1.87 L	29.8 H	7.99 L	2.1	28.4 H	1.37 M	High
S4	22E0120-04	8.25	7540 VH	325 H	120 M	273 M	4.36 M	1.15 M	3.21 M	1.02 H	0.11 VH	1.08 L	15.6 M	7.53 L	1.3	37.5 H	1.32 M	High
S5	22E0120-05	8.26	7530 VH	387 H	185 M	154 M	4.01 M	0.44 L	2.03 M	0.76 M	0.11 VH	1.08 L	14.8 M	5.37 L	1.9	10.2 L	1.57 M	High
S6	22E0120-06	8.17	7650 VH	387 H	260 H	242 M	4.28 M	0.42 L	2.39 M	1.31 H	0.09 VH	1.82 L	35.1 H	5.92 L	2.6	57.0 VH	1.63 M	High

DEFINITION OF INTERPRETIVE LEVELS
VL (Very Low): Visual symptoms of a nutrient deficiency should be showing. If not corrected plant growth will continue to decline. This excludes sodium and salinity.
L (Low): Visual symptoms of a nutrient deficiency may or may not be present. If not corrected plant growth will decline. This excludes sodium and salinity.
M (Medium): Visual symptoms of a nutrient deficiency may or may not be present. Fertilization with this element should improve plant growth but yield may not increase.
H (High): From an individual element standpoint, more is not necessary. Additional fertilization may be required to balance other nutrients.
VH (Very High): From an individual element standpoint, more is not necessary. Additional fertilization may be required to balance other nutrients.

IAS Laboratories
2515 East University Drive
Phoenix, Arizona 85034
(602) 273-7248

Work Order: 22E0120
Client: Dahlen Keith
Project Manager: Dahlen Keith

Project: Agronomy
Project Number: SR 303L, MC 85 to Van Bu
Date Received: 05/06/2022

Soil Analysis Report

Sample Name	Lab ID	Depth	Organic Matter %	Cation Exchange Capacity MEQ/100G	Chloride ppm	Nickel ppm	Cobalt ppm		Soil Classification
S1	22E0120-01			12.44	1770	13.25	6.69		
S2	22E0120-02			11.44	93.4	14.90	7.41		
S3	22E0120-03			10.92	190	13.14	6.23		
S4	22E0120-04			8.42	38.2	10.49	5.07		
S5	22E0120-05			8.95	78.7	10.26	5.35		
S6	22E0120-06			8.87	71.6	10.23	5.06		

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Phoenix, Arizona 85034
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Work Order: 22E0120
Client: Dahlen Keith
Project Manager: Dahlen Keith

Project: Agronomy
Project Number: SR 303L, MC 85 to Van Bu
Date Received: 05/06/2022

Soil Analysis Report

Pounds per 1000 Sqft

Sample Name	Crop	Nitrogen N	Phosphate P2O5	Potash K2O	Magnesium Mg	Sulfur S	Iron Fe	Zinc Zn	Manganese Mn	Molybdenum Mo	Copper Cu	Boron B	Elemental Sulfur	Gypsum	Lime	Leaching of Excess Salts
S1	Landscape		2 b				0.1									Yes
S2	Landscape		2 b				0.2 f	0.1 g					10 *			
S3	Landscape		2 b				0.2 f						10 *			
S4	Landscape	1 a	2 b				0.2 f						15 *			
S5	Landscape	1 a	2 b				0.1 f	0.1 g					15 *			
S6	Landscape		2 b				0.3 f	0.1 g					10 *			

Landscape

S1

b) Incorporate 2 lbs of phosphorus per 1000 sqft and till into soil where possible. Phosphorus works best when it is closest to the roots. Phosphorus is required to make every cell in the plants (DNA and cell membrane formation) and is necessary for the plant's energy cycle (ATP synthesis).

f) Apply 0.1 lb of iron per 1000 sqft to balance the micronutrients. Plant's uptake nutrients based upon molecule size and concentration gradient. There should be ten times more iron than copper available in the soil. Iron is needed for hormone regulation.

Yes) Irrigate with extra water (flood) to push the salts down past the root zone. Landscape plants grow best with the salinity below 3 dS/m, sodium below 300 ppm, and nitrate below 80 ppm. This leaching process may need to occur twice a week for the next three weeks.

S2

b) Incorporate 2 lbs of phosphorus per 1000 sqft and till into soil where possible. Phosphorus works best when it is closest to the roots. Phosphorus is required to make every cell in the plants (DNA and cell membrane formation) and is necessary for the plant's energy cycle (ATP synthesis).

f) Apply 0.1 lb of iron per 1000 sqft to balance the micronutrients. Plant's uptake nutrients based upon molecule size and concentration gradient. There should be ten times more iron than copper available in the soil. Iron is needed for hormone regulation.

g) Apply 0.1 lb of zinc sulfate per 1000 sqft to balance the micronutrients. There should be more zinc than copper available in the soil.

*) Apply 10 lbs of elemental sulfur per 1000 sqft to reduce the soil pH, which in turn increase nutrient availability and decrease nutrient tie up in the soil.

IAS Laboratories
2515 East University Drive
Phoenix, Arizona 85034
(602) 273-7248

Work Order:	22E0120	**Project:**	Agronomy
Client:	Dahlen Keith	**Project Number:**	SR 303L, MC 85 to Van Bu
Project Manager:	Dahlen Keith	**Date Received:**	05/06/2022

S3

Soil Analysis Report

b) Incorporate 2 lbs of phosphorus per 1000 sqft and till into soil where possible. Phosphorus works best when it is closest to the roots. Phosphorus is required to make every cell in the plants (DNA and cell membrane formation) and is necessary for the plant's energy cycle (ATP synthesis).

f) Apply 0.2 lb of iron per 1000 sqft to balance the micronutrients. Plant's uptake nutrients based upon molecule size and concentration gradient. There should be ten times more iron than copper available in the soil. Iron is needed for hormone regulation.

*) Apply 10 lbs of elemental sulfur per 1000 sqft to reduce the soil pH, which in turn increase nutrient availability and decrease nutrient tie up in the soil.

S4

a) Apply 1 lbs of Nitrogen per 1000 sqft. Keep in mind that a product that contains 20% nitrogen will require you to apply 5 lbs of product for every 1 full pound of nitrogen.

b) Incorporate 2 lbs of phosphorus per 1000 sqft and till into soil where possible. Phosphorus works best when it is closest to the roots. Phosphorus is required to make every cell in the plants (DNA and cell membrane formation) and is necessary for the plant's energy cycle (ATP synthesis).

f) Apply 0.2 lb of iron per 1000 sqft to balance the micronutrients. Plant's uptake nutrients based upon molecule size and concentration gradient. There should be ten times more iron than copper available in the soil. Iron is needed for hormone regulation.

*) Apply 15 lbs of elemental sulfur per 1000 sqft to reduce the soil pH, which in turn increase nutrient availability and decrease nutrient tie up in the soil.

S5

a) Apply 1 lbs of Nitrogen per 1000 sqft. Keep in mind that a product that contains 20% nitrogen will require you to apply 5 lbs of product for every 1 full pound of nitrogen.

b) Incorporate 2 lbs of phosphorus per 1000 sqft and till into soil where possible. Phosphorus works best when it is closest to the roots. Phosphorus is required to make every cell in the plants (DNA and cell membrane formation) and is necessary for the plant's energy cycle (ATP synthesis).

f) Apply 0.2 lb of iron per 1000 sqft to balance the micronutrients. Plant's uptake nutrients based upon molecule size and concentration gradient. There should be ten times more iron than copper available in the soil. Iron is needed for hormone regulation.

g) Apply 0.1 lb of zinc sulfate per 1000 sqft to balance the micronutrients. There should be more zinc than copper available in the soil.

*) Apply 15 lbs of elemental sulfur per 1000 sqft to reduce the soil pH, which in turn increase nutrient availability and decrease nutrient tie up in the soil.

S6

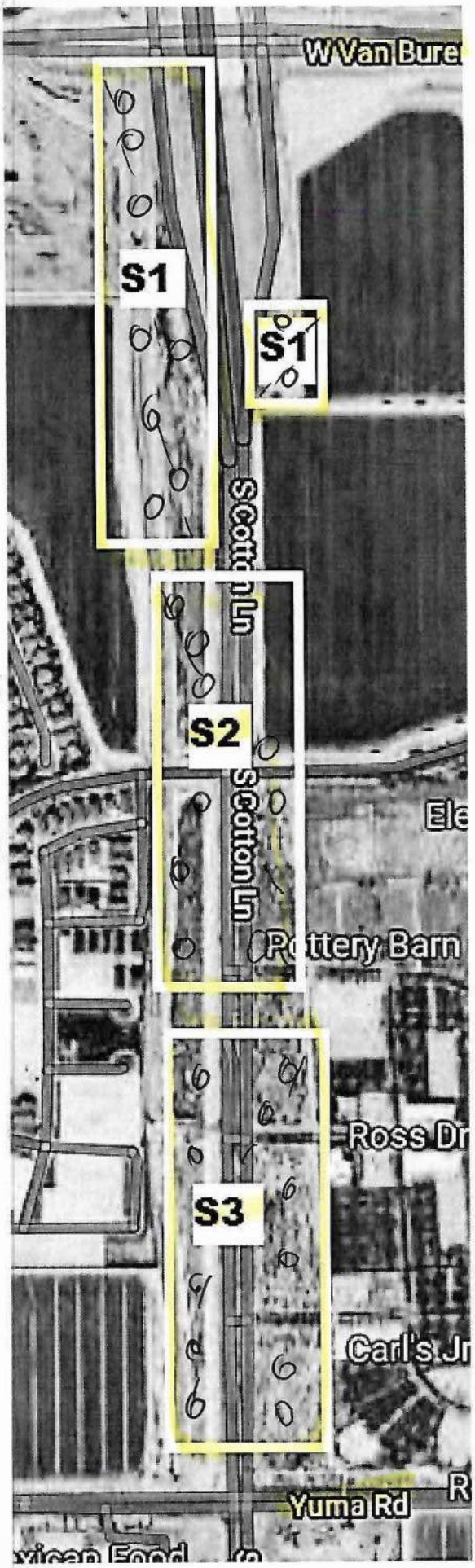
b) Incorporate 2 lbs of phosphorus per 1000 sqft and till into soil where possible. Phosphorus works best when it is closest to the roots. Phosphorus is required to make every cell in the plants (DNA and cell membrane formation) and is necessary for the plant's energy cycle (ATP synthesis).

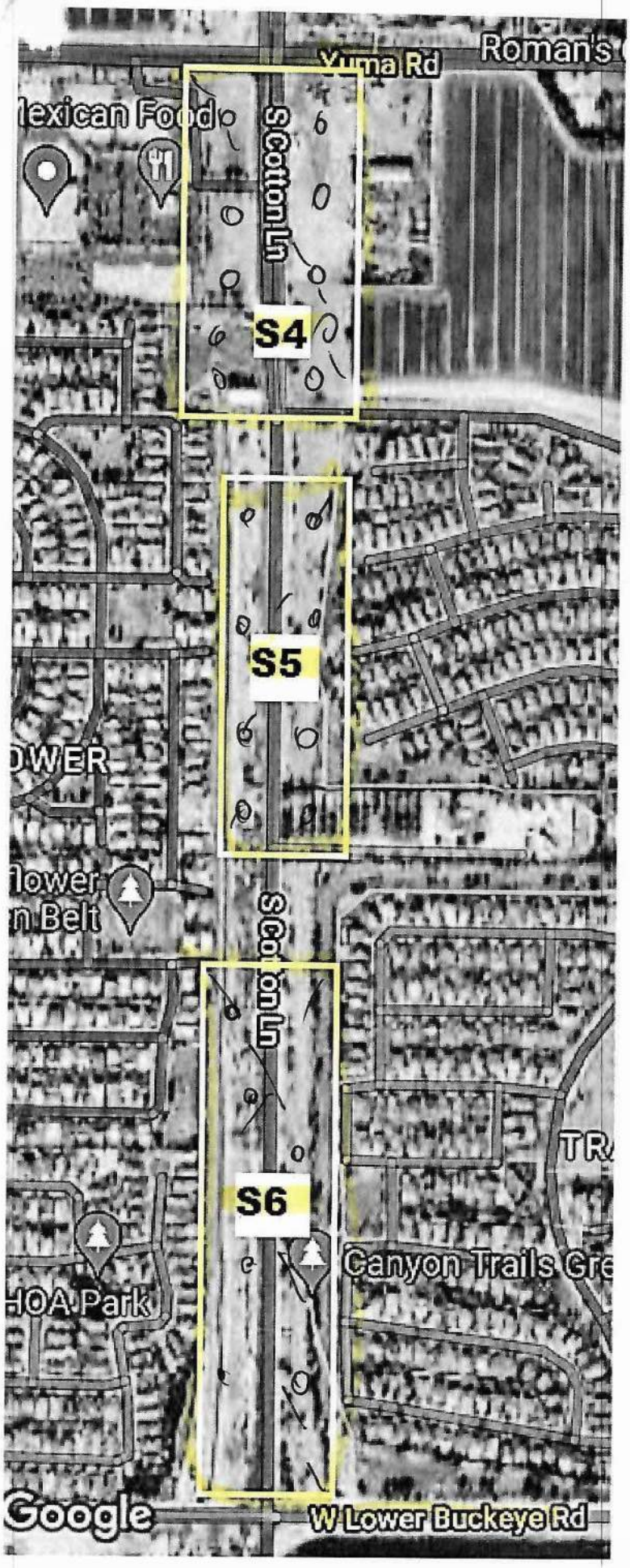
f) Apply 0.3 lb of iron per 1000 sqft to balance the micronutrients. Plant's uptake nutrients based upon molecule size and concentration gradient. There should be ten times more iron than copper available in the soil. Iron is needed for hormone regulation.

g) Apply 0.1 lb of zinc sulfate per 1000 sqft to balance the micronutrients. There should be more zinc than copper available in the soil.

*) Apply 10 lbs of elemental sulfur per 1000 sqft to reduce the soil pH, which in turn increase nutrient availability and decrease nutrient tie up in the soil.

303


W Van Bure
S1
S1
Scotton Ln
S2
Scotton Ln
Ele
Pottery Barn
Ross Dr
S3
Carl's Jr
Yuma Rd


Yuma Rd
Roman's
S Cotton Ln
S4
S5
S6
W Lower Buckeye Rd
Google

APPENDIX C

Geophysical Evaluation Results

Advantage Geophysics, Inc.
Gilbert, Arizona
San Diego, California
Portland, Oregon
www.advantagegeophysics.com

November 1, 2024

Mr. Keith Dahlen
Ethos Engineering
9180 South Kyrene Road, #104
Tempe, AZ 85284

Subject: **Geophysical Evaluation, 2-D ReMi**
State Route 303 Loop (Estrella) Alignment
MC 85 to Van Buren Street - End of Freeway (EOF)
TRACS No. 303L MA 099 H6870 01D
Federal Project No. 303-A(219)T
ADOT Contract No. 2021-006
Goodyear, AZ
Project No. 2024091

Dear Mr. Dahlen,

Advantage Geophysics, Inc. (Advantage) has performed a geophysical evaluation pertaining to the subject project located in Goodyear, Arizona. The purpose of our evaluation was to develop 2 two-dimensional roll-along refraction microtremor (2-D ReMi) shear-wave velocity profiles to be used for your estimates of potential soil settlement, and for general design and construction at the project site by others.. This report presents our methodology, equipment used, analysis, and findings from our study. Based on our communications with you, it is our understanding that the locations we evaluated represent the planned two approximate abutment locations for a new bridge or flyover to be constructed along the State Route 303L alignment. Our field services were conducted on October 23, 2024.

SCOPE OF SERVICES

Our scope of services included:

- Performance of a total of two 2-D ReMi profiles (RL-1 and RL-2) at your two designated locations.
- Compilation and geophysical analysis of the data collected.
- Preparation of this letter reporting on our methodology and findings.

SITE DESCRIPTION

The project area is located southeast of the intersection of Citrus Road and West Broadway Road and generally consists of agricultural fields (Figure 1) and ADOT owned parcels. Specifically, RL-1 was collected along the south edge of the agricultural field just north of the existing UPRR Railroad and RL-2 was collected along the north edge of Broadway Road. RL-1 and RL-2 were collected in a west-east orientation at your specified locations (Figure 2). The general locations of the seismic lines were selected by a representative of your office and adjusted when necessary to account for surface conditions. Figures 2 and 3 depict the general line locations and the site conditions in the vicinity of the traverses.

EVALUATION METHODOLOGY AND ANALYSIS

Surface waves (specifically Rayleigh waves) were recorded along RL-1 and RL-2 using the 2-D roll-along ReMi method which allows for the generation of 2-D profiles. The primary purpose of the ReMi evaluations were to characterize the seismic shear-wave velocity structure in the study areas. Unlike the conventional seismic refraction method, the surface wave methods do not require an increase of material velocity with increasing depth. Therefore, the presence of faster layers over slower layers is not a significant limitation when conducting surface wave methods. The depth of exploration is dependent on the length of the geophone array and the frequency content of the recorded signal.

The ReMi evaluation included the use of two 24-channel digital Geometrics Geode seismographs and 48 4.5-Hz vertical component geophones. For RL-1 and RL-2, the geophones were spaced 6 feet apart with a roll-along move of six channels or 36 feet. The total line length was 606 feet at RL-1 and 570 feet at RL-2. The resulting 2-D model lengths were 324 feet at RL-1 and 288 feet at RL-2. For each roll-along move at each line location, a total of 10 records, each 32 seconds in duration, were recorded with five of the files utilizing passive data collection of ambient ground vibration noise and five files utilizing an active source generated by a sledgehammer and a plastic strike plate. The active source data records included conducting hammer blows at locations 50 feet west of the seismic spreads during each roll along. The active source files collected were conducted to supplement the passive data collection. Using off-end active source supplemental data reduces the chances for indeterminant dominant phase angle of energy arriving at the seismic spread, which typically increases the accuracy of the recorded dispersion curve and ReMi model results. The recorded data was then downloaded to a field computer. The data were later processed at the office using Surface Plus 9.1 - Advanced Surface Wave Processing Software (Geogiga Technology Corp., 2020), which uses the refraction microtremor method (Louie, 2001), and other surface wave analysis methods. The program generates phase-velocity dispersion curves for each record and provides an interactive dispersion modeling tool where the users determine the best fitting model. The result is a one-dimensional (1-D) surface wave velocity model of the site at each roll-along data gather position with reported velocities roughly 85 to 95 percent of the shear wave velocity based on published studies of the ReMi method. The 1-D ReMi data is then inverted together in a robust 2-D modeling inversion process to develop a 2-D profile model for each line (Figures 4-1 and 4-2). The locations of our 2-D ReMi evaluation profiles are shown on Figure 2.

RESULTS

Table 1 and Figures 4-1 and 4-2 present the results from our evaluation. It should be noted that the ReMi method has an averaging effect along the length of the geophone array. Note that reported model lengths in Figures 4-1 and 4-2 are slightly shorter than the field traverse lengths of the lines as shown in Figure 2 and are represented by the solid lines on Figure 2, while the total traverse for each profile is shown in Figure 2 as a dashed line. This is due to the roll-along move distance, number of moves performed, and the data processing algorithm used and is a typical result. The frequency content of the collected ReMi data provided model results down to a depth of about 210 feet below ground surface (bgs) at each roll along location along each line. The weighted average IBC Vs100 values were also calculated for each roll-along data gather position of RL-1 and RL-2.

Table 1: ReMi Results

Line No.	Distance along 2-D ReMi Line (feet)	Vs100 Shear-Wave Velocity (feet/second)	Weighted Average Shear-Wave Velocity (Vs100)	Site Class (ICC, 2021)
RL-1 (W-E)	0-282	1,048	Vs=1,012 ft/s	D
	36-318	1,036		
	72-354	1,022		
	108-390	982		
	144-426	1,018		
	180-462	997		
	216-498	1,004		
	252-534	1,026		
	288-570	997		
	324-606	992		
RL-2 (W-E)	0-282	1,020	Vs=1,037 ft/s	D
	36-318	1,031		
	72-354	1,027		
	108-390	1,035		
	144-426	1,048		
	180-462	1,035		
	216-498	1,032		
	252-534	1,054		
	288-570	1,051		

LIMITATIONS

The field evaluation and geophysical analyses presented in this report have been conducted in general accordance with current practices, methods, and techniques, and the standard of care exercised by consultants performing similar tasks in the project area. The services will be performed in accordance with generally accepted professional geophysical standards and practices prevailing at the time and location of the services. No warranty, express or implied, is made regarding the conclusions and opinions presented in this document. The results of geophysical analyses are based on the interpretation of collected data, which may be subject to varying degrees of accuracy. No guaranty is made regarding the exactness of the analysis results and no warranty, express or implied, regarding the findings is made by the provider. There is no evaluation detailed enough to reveal every subsurface condition. Variations may exist and conditions not observed or described in this document may be present. Uncertainties relative to subsurface conditions can be reduced through additional subsurface exploration. Additional subsurface evaluations will be performed upon request.

This document is intended to be used only in its entirety. No portion of the document, by itself, is designed to completely represent any aspect of the project described herein. Should the reader require additional information or have questions regarding the content, interpretations presented, or completeness of this

document please contact the undersigned for clarification. This document is intended exclusively for use by the client. Any use of or reuse of the findings, conclusions, or recommendations presented herein by parties other than the client is undertaken at said parties' sole risk.

We appreciate the opportunity to be of service. Should you have questions, please contact the undersigned at your convenience.

Respectfully submitted,
Advantage Geophysics, Inc.

Mark Edwards, RG (Arizona)
Principal Geologist/Geophysicist
medwards@advantagegeophysics.com
602.499.4151

Paul Neuberger, RG (Arizona)
Senior Project Geophysicist
pneuberger@advantagegeophysics.com
443.682.2233

Attachments:

Figure 1:	Site Location Map
Figure 2:	Seismic Line Location Map
Figure 3:	Site Photographs
Figure 4-1:	ReMi Results, RL-1
Figure 4-2:	ReMi Results, RL-2

Distribution: kdahlen@ethosengineers.com

SELECTED REFERENCES

Geogiga Technology Corp., 2020, Surface Plus - Advanced Surface Wave Processing Software: Version 9.1.

Golden Software, Inc., 2022, Surfer, Surface Mapping System: Version 24.2.204.

International Code Council, 2021, International Building Code (IBC), effective date September 2021. Available at https://codes.iccsafe.org/content/IBC2021P2

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Louie, J.N., 2001, Faster, Better, Shear wave Velocity to 100 Meters Depth from Refraction Microtremor Arrays: Bulletin of the Seismological Society of America, v. 91, p. 347-364.

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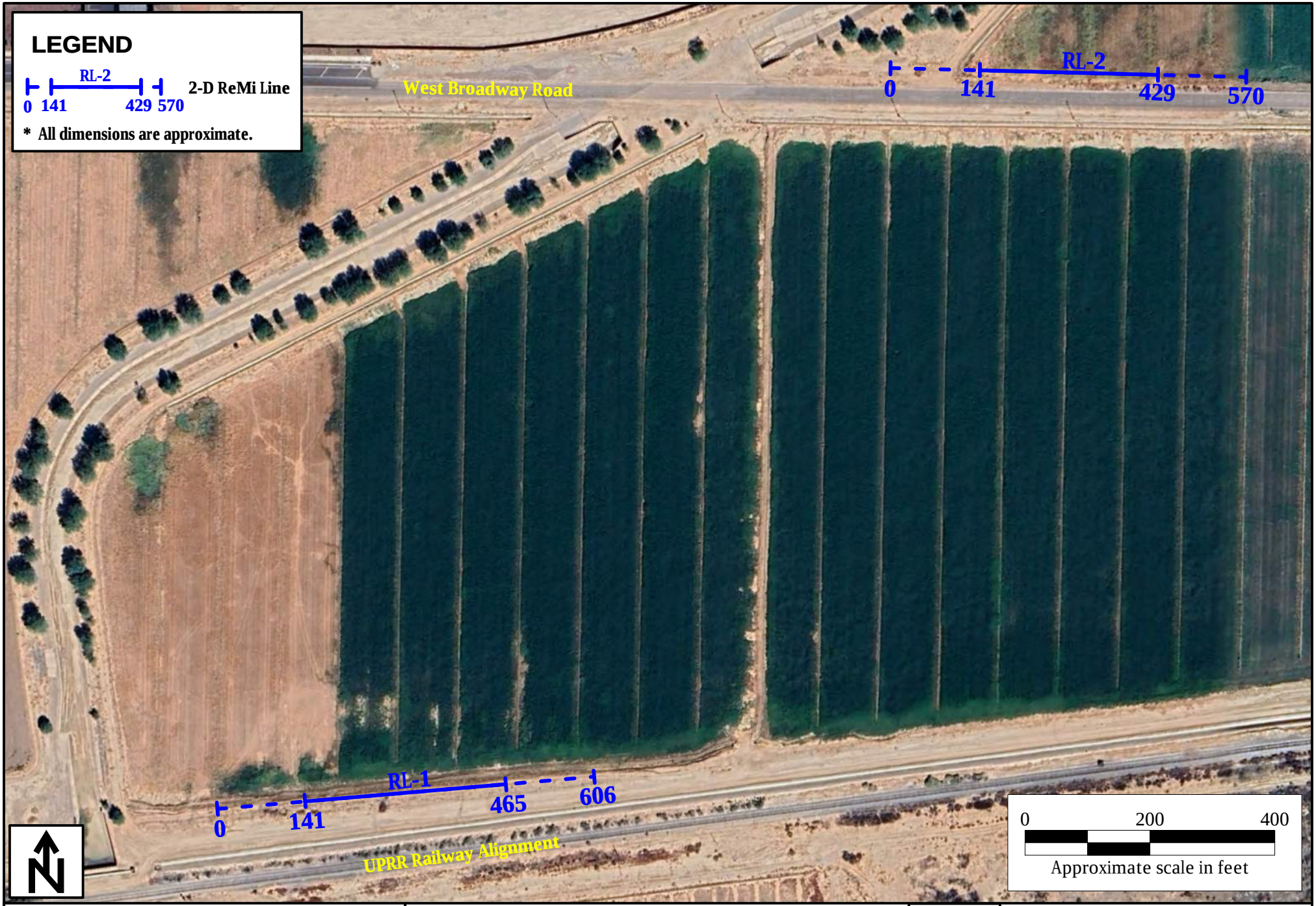
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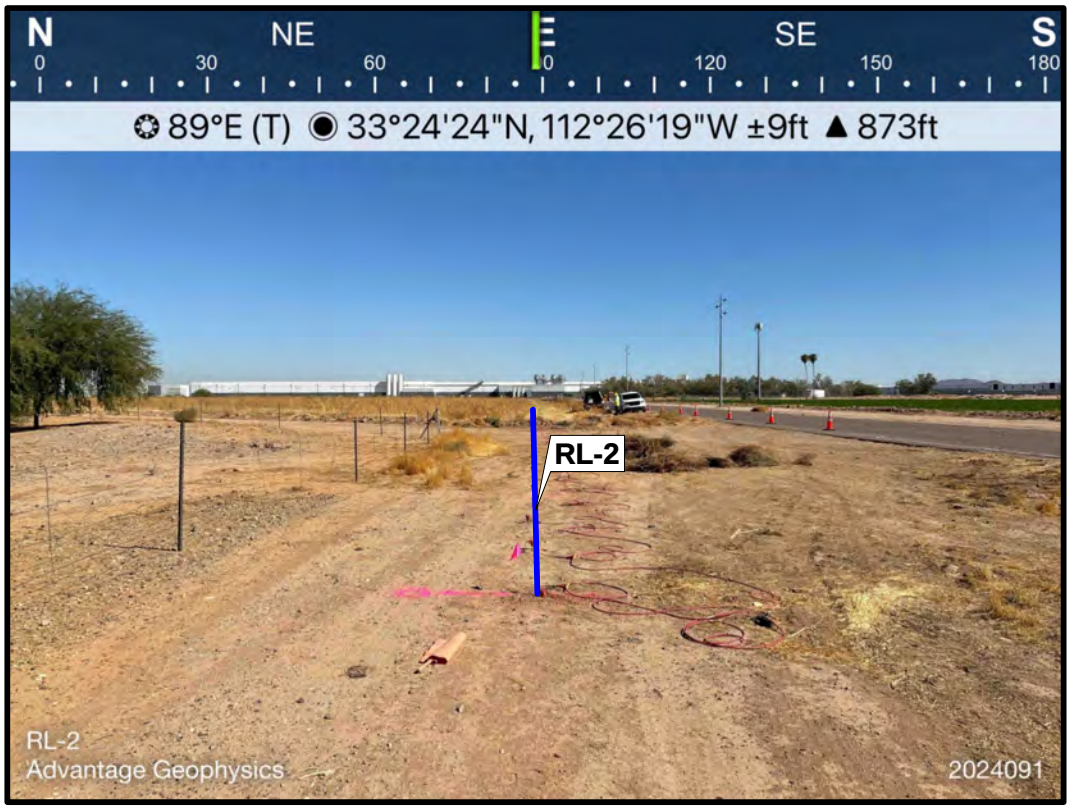


Site Location Map	State Route 303 Loop (Estrella) Alignment MC 85 to Van Buren Street - End of Freeway (EOF) Goodyear, AZ	Figure 1	Advantage GEOPHYSICS
	Project No.: 2024091	Date: 11/24	



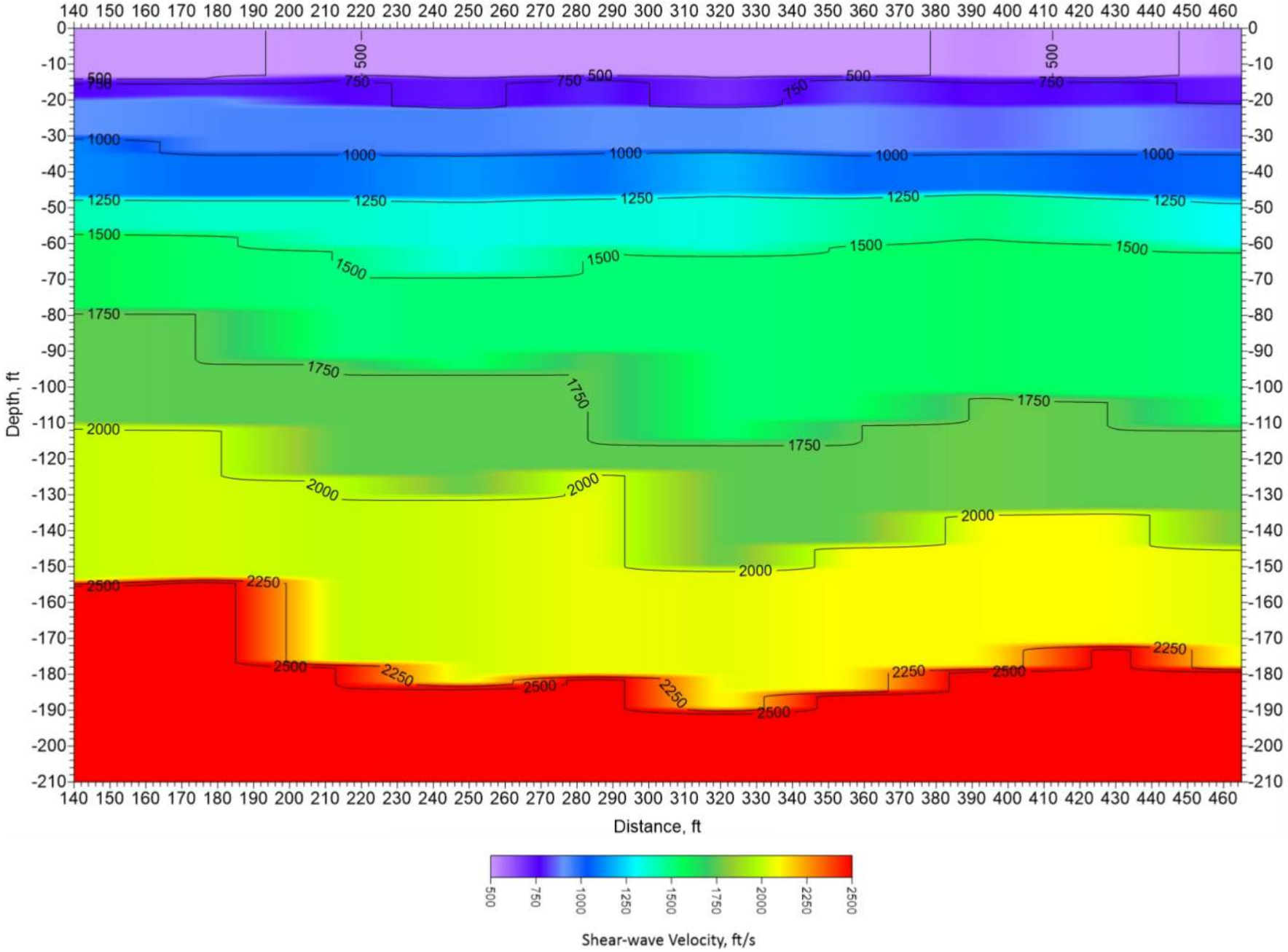
Seismic Line Location Map	State Route 303 Loop (Estrella) Alignment MC 85 to Van Buren Street - End of Freeway (EOF) Goodyear, AZ Project No.: 2024091	Figure 2 Date: 11/24	Advantage GEOPHYSICS





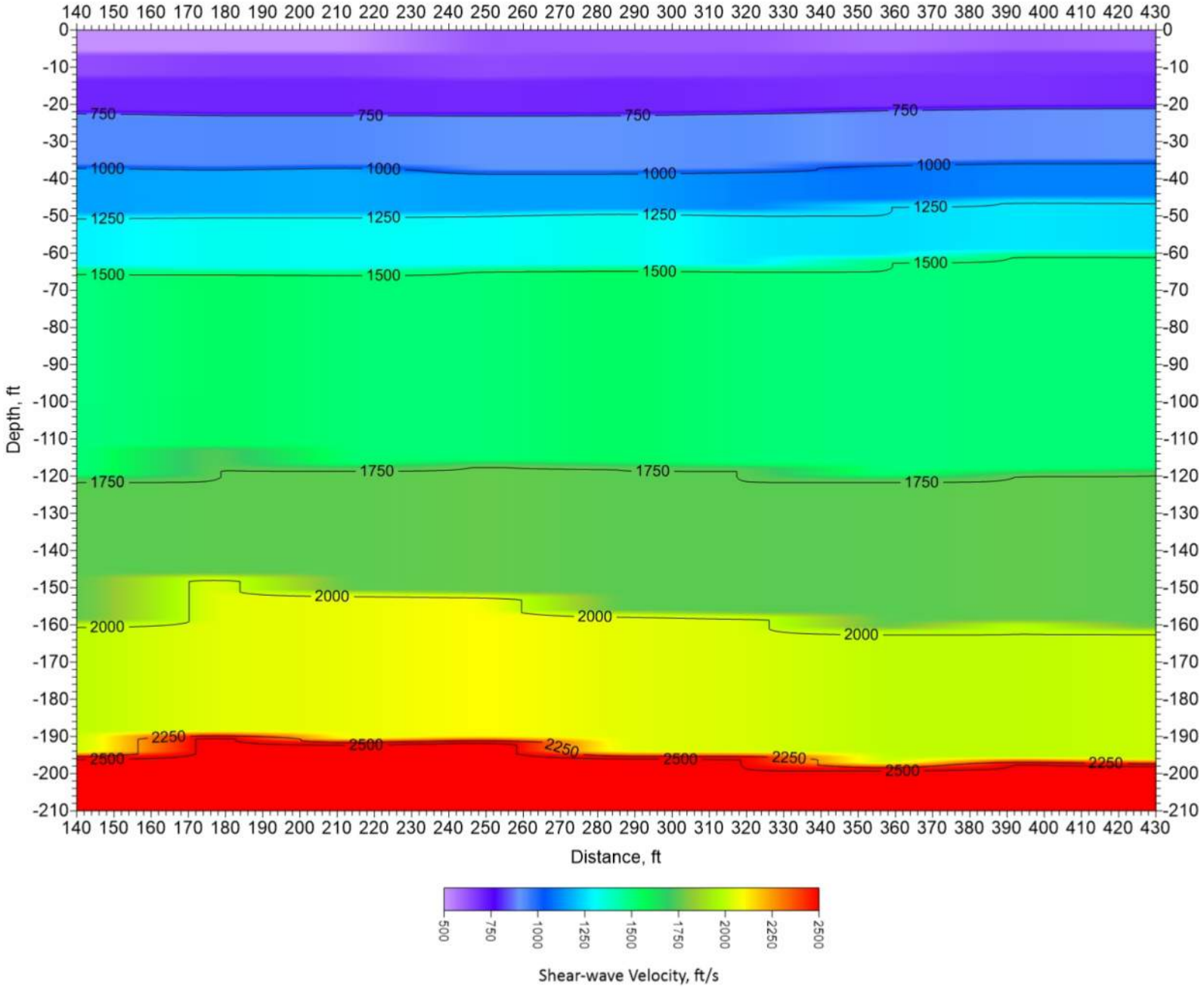
Site Photographs	State Route 303 Loop (Estrella) Alignment MC 85 to Van Buren Street - End of Freeway (EOF) Goodyear, AZ	Figure 3	Advantage GEOPHYSICS
	Project No.: 2024091	Date: 11/24	

ReMi Profile RL-1



ReMi Profile RL-1	State Route 303 Loop (Estrella) Alignment MC 85 to Van Buren Street - End of Freeway (EOF) Goodyear, AZ	Figure 4-1	Advantage GEOPHYSICS
	Project No.: 2024091	Date: 11/24	

ReMi Profile RL-2



ReMi Profile RL-2	State Route 303 Loop (Estrella) Alignment MC 85 to Van Buren Street - End of Freeway (EOF) Goodyear, AZ Project No.: 2024091	Figure 4-2 Date: 11/24	Advantage GEOPHYSICS

APPENDIX D

Infiltration Test Results

March 29, 2022 Project 2201281

Keith Dahlen, P.E.
Ethos Engineering, LLC
9180 South Kyrene Road, #104
Tempe, AZ 85284

RE: DOUBLE-RING INFILTROMETER PERCOLATION TEST REPORT
SR 303 – MC 85 to Van Buren Street
West Broadway Road & South Citrus Road
Goodyear, AZ

Dear Keith:

As requested, this firm is submitting a Double Ring Infiltrometer Percolation Test Report for the project listed above.

Double-Ring Infiltrometer Percolation Test

On March 24th and March 25th, three (3) double ring infiltrometer percolation tests were conducted in the area depicted on the attached site plan (See Figure 2). The double ring infiltrometer tests were conducted in general accordance with ASTM D 3385. The rate of water decline was measured in 15-minute time intervals to accommodate obtaining a reasonable number of readings to establish a stable infiltration rate. Refer to the attached results of the double ring infiltrometer percolation tests. Each test was performed at a depth of approximately 4 to 5 feet below the existing grade. Each test had a 1-hour presoak prior to commencement of taking readings.

The inner ring stabilized infiltration rate for P-1 was 0.047 $ft^3/hr/ft^2$ and has not been de-rated. This is equivalent to a percolation rate of approximately 0.57 inches per hour.

The inner ring stabilized infiltration rate for P-2 was 0.048 $ft^3/hr/ft^2$ and has not been de-rated. This is equivalent to a percolation rate of approximately 0.57 inches per hour.

The inner ring stabilized infiltration rate for P-3 was 0.050 $ft^3/hr/ft^2$ and has not been de-rated. This is equivalent to a percolation rate of approximately 0.60 inches per hour.

These rates are actual rates and may need to be de-rated in accordance with design requirements.

March 29, 2022
Double Ring Infiltrometer Percolation Test Report
West Broadway Road & South Citrus Road
Goodyear, AZ
Project No. 2201281

No exploratory soil test pits were excavated in conjunction with these percolation tests. It is our understanding that soil exploration to deeper depths will be accomplished by other means during a different portion of the overall project.

Should any questions arise concerning the content of this report, please feel free to contact this office at your earliest convenience.

Respectfully submitted,

ACS SERVICES LLC



Andrew Jamrogiewicz, P.E.
Engineering Department Manager

cc: (1) Addressee via email (pdf copy)



NORTH
N.T.S.

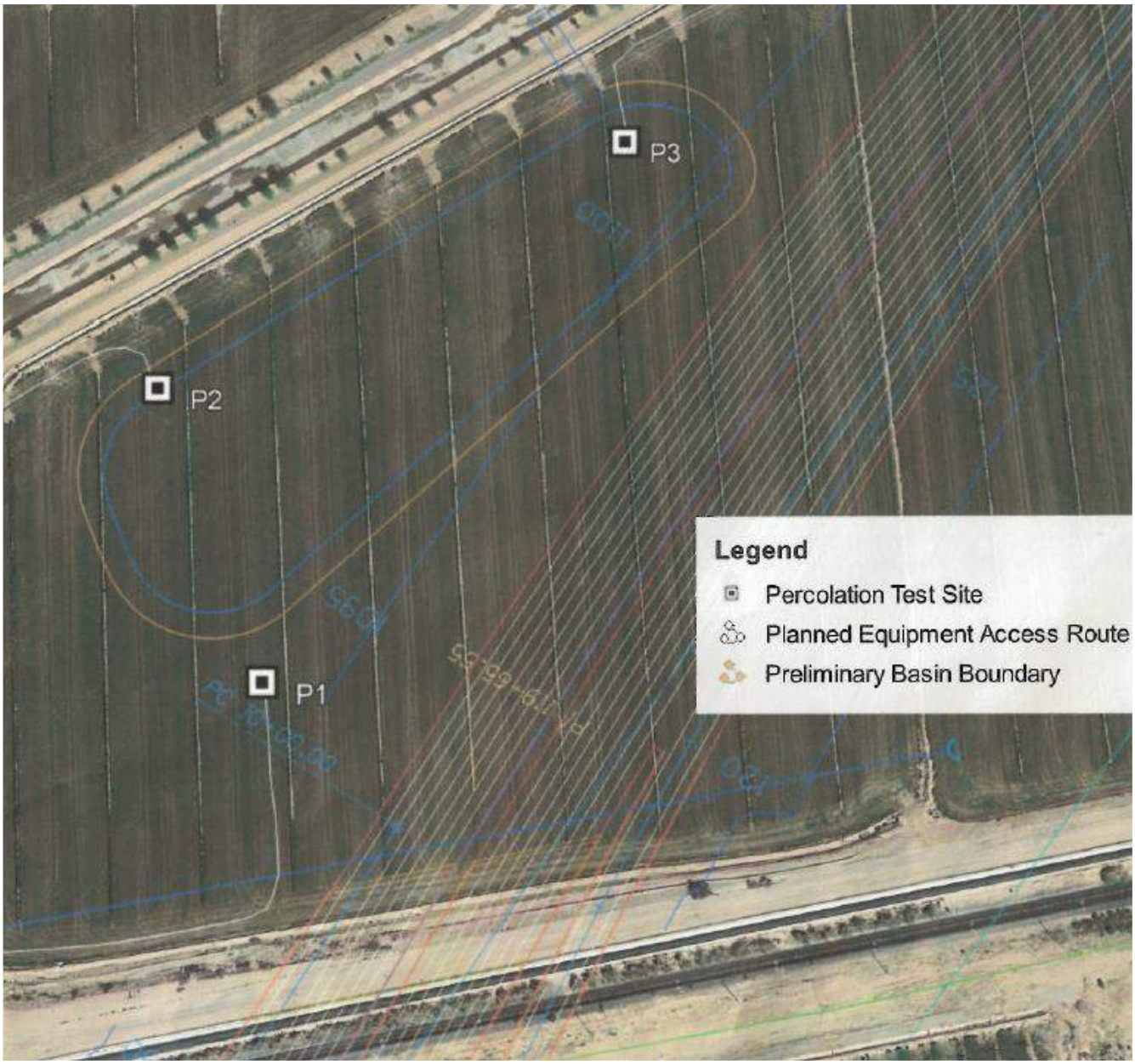
PROJECT NUMBER: 2201281

FIGURE 1

ACS SERVICES LLC
2235 W BROADWAY RD
MESA, ARIZONA 85202
(480) 968-0190
(480) 968-0156 FAX
WWW.ACSSERVICESLLC.COM

VICINITY MAP

SR 303 – MC 85 to Van Buren Street
W. Broadway Rd. & S. Citrus Rd.
Goodyear, AZ



NORTH
N.T.S.

PROJECT NUMBER: 2101561

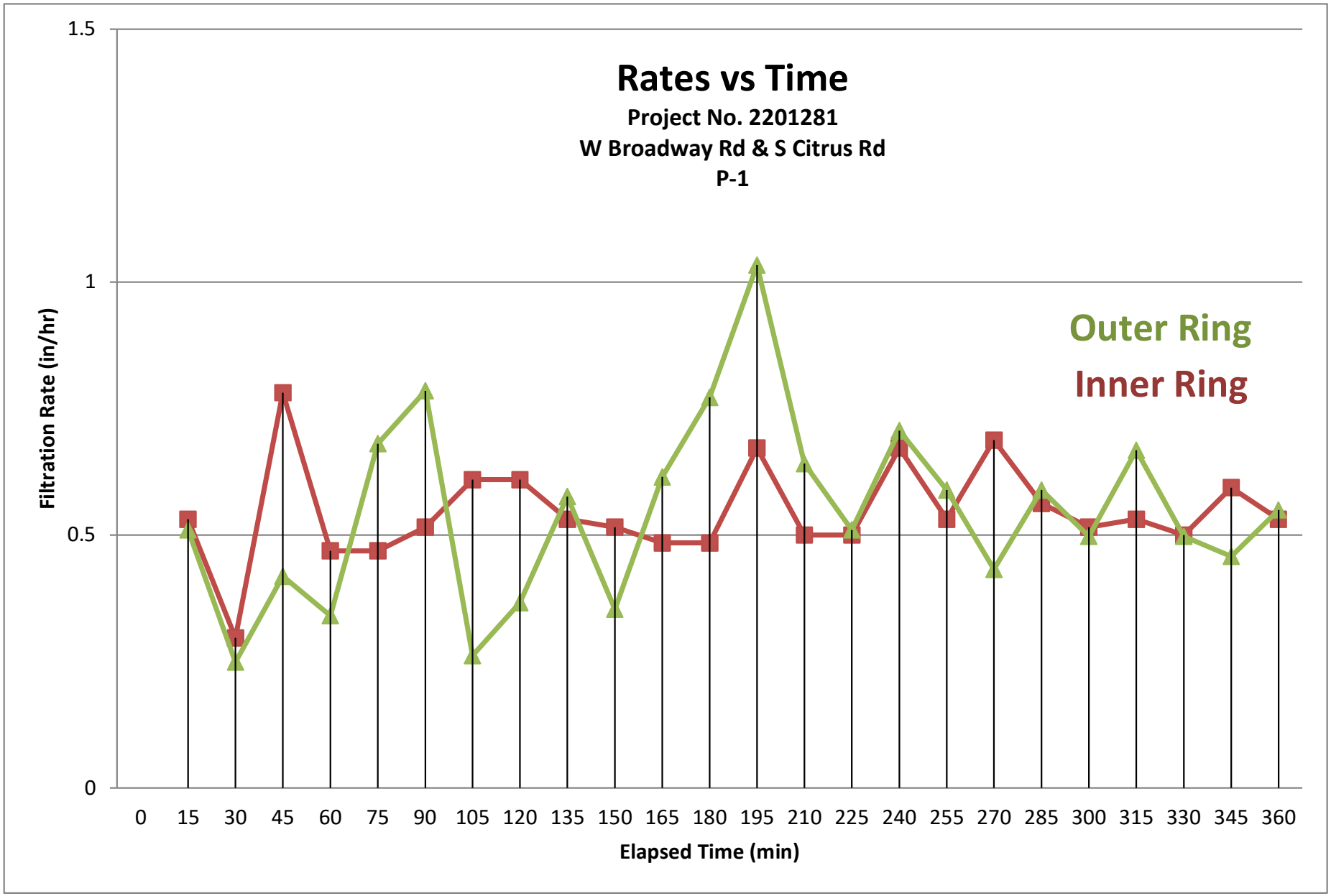
FIGURE 2A

ACS SERVICES LLC

2235 W BROADWAY RD
MESA, ARIZONA 85202
(480) 968-0190
(480) 968-0156 FAX
WWW.ACSSERVICESLLC.COM

SITE PLAN & APPROXIMATE BORING LOCATIONS

SR 303 – MC 85 to Van Buren Street
W. Broadway Rd. & S. Citrus Rd.
Goodyear, AZ


Rates vs Time
Project No. 2201281
W Broadway Rd & S Citrus Rd
P-1
Outer Ring
Inner Ring
Filtration Rate (in/hr)
1.5
1
0.5
0
0 15 30 45 60 75 90 105 120 135 150 165 180 195 210 225 240 255 270 285 300 315 330 345 360
Elapsed Time (min)

ACS SERVICES LLC

ENGINEERING DESIGN • MATERIAL TESTING • CONSTRUCTION INSPECTION

ASTM D3385

ACS Project #	2201281
Project Address	W Broadway Rd & S Citrus Rd
Site Description	Alfalfa Field
Tested by	Adrianne Roberts
Test Location	P- 1, See Site Plan
Liquid used (pH)	ACS Tap Water (7)
Depth to Water Table (ft)	N/A

Double Ring Infiltrometer - Inner and Annular Ring Constants

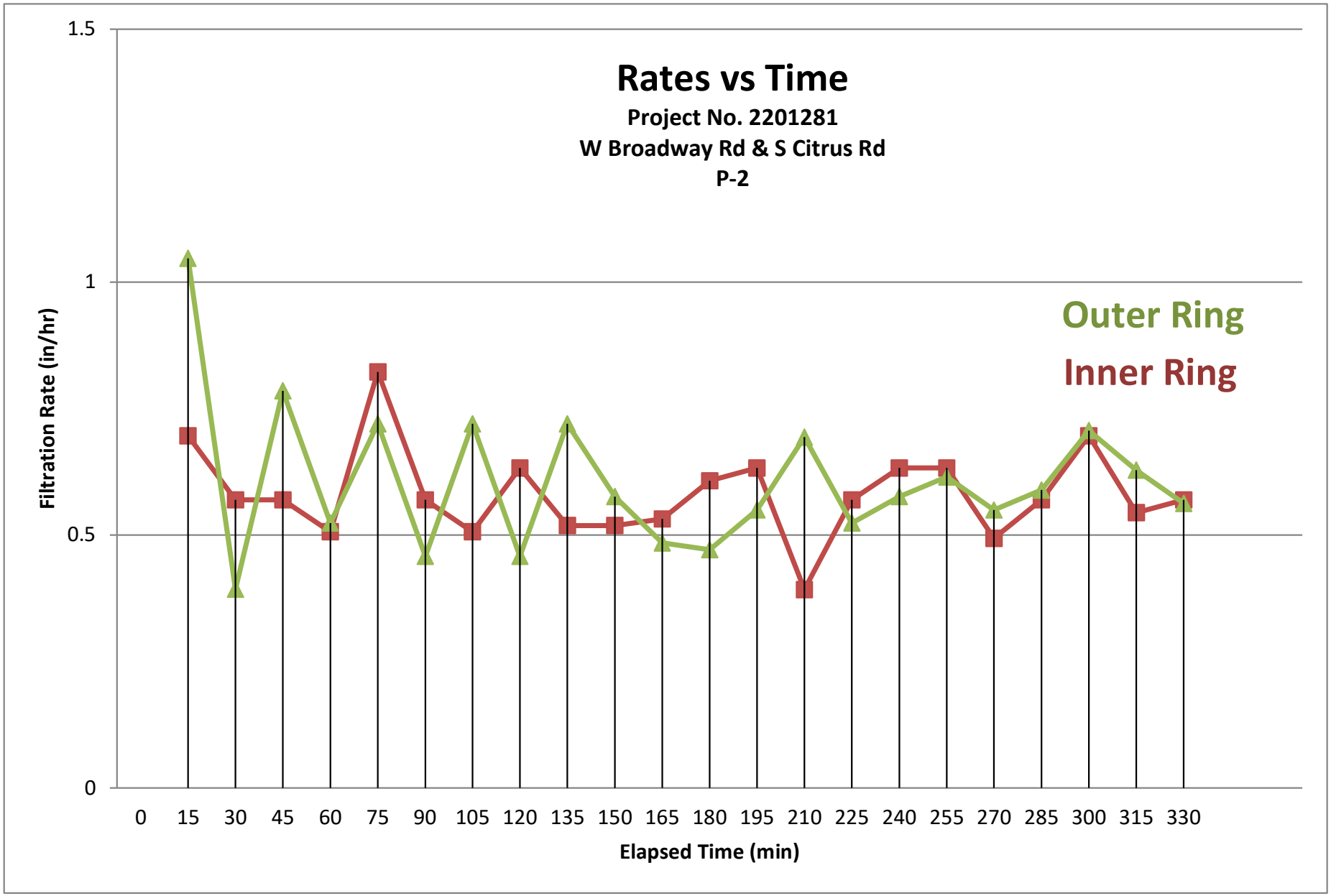
Apparatus	Diameter (cm)	Area (cm2)	Depth of Liquid in Ring (cm)	Penetration of Ring (cm)
Inner Ring	31.75	791.73	30	8
Outer Ring	60.96	2918.64	30	8

Flow Reading Constants (Graduated Cylinder Properties)

Apparatus	Diameter (cm)	Area (cm2)	Liquid Level Gauge
Graduated Cylinder Connected to Inner Ring	10	78.54	Flow Control Valve
Graduated Cylinder Connected to Annular Ring	15	176.72	Flow Control Valve

Trial #	Start of test (S) End of test (E)	Date	Time	Δ T	Flow Readings Inner Ring Reading cm	Flow Readings Inner Ring Flow cm^3	Flow Readings Outer Ring Reading cm	Flow Readings Outer Ring Flow cm^3	Rate Outer cm / hr	Rate Outer in / hr	Rate Inner cm / hr	Rate Inner in / hr	Rate Inner min / in	Rate **Inner** * $ft^3/hr/ft^2$	Change Inner %	Comments
1	S	3/24/22	11:15	15	43.8	267	44.2	689	1.30	0.51	1.35	0.53	113.0	**0.044**	n/a	
	E		11:30		40.4		40.3									
2	S	3/24/22	11:30	15	40.4	149	40.3	336	0.63	0.25	0.75	0.30	202.1	**0.025**	44%	
	E		11:45		38.5		38.4									
3	S	3/24/22	11:45	15	38.5	393	38.4	565	1.06	0.42	1.98	0.78	76.8	**0.065**	-163%	
	E		12:00		33.5		35.2									
4	S	3/24/22	12:00	15	33.5	236	35.2	459	0.86	0.34	1.19	0.47	128.0	**0.039**	40%	
	E		12:15		30.5		32.6									
5	S	3/24/22	12:15	15	30.5	236	32.6	919	1.73	0.68	1.19	0.47	128.0	**0.039**	0%	
	E		12:30		27.5		27.4									
6	S	3/24/22	12:30	15	27.5	259	27.4	1060	1.99	0.79	1.31	0.52	116.4	**0.043**	-10%	
	E		12:45		24.2		21.4									
7	S	3/24/22	12:45	15	24.2	306	21.4	353	0.66	0.26	1.55	0.61	98.5	**0.051**	-18%	
	E		1:00		20.3		19.4									
8	S	3/24/22	1:00	15	20.3	306	19.4	495	0.93	0.37	1.55	0.61	98.5	**0.051**	0%	
	E		1:15		16.4		16.6									
9	S	3/24/22	1:15	15	16.4	267	16.6	778	1.46	0.58	1.35	0.53	113.0	**0.044**	13%	
	E		1:30		13.0		12.2									
10	S	3/24/22	1:30	15	13.0	259	12.2	477	0.90	0.35	1.31	0.52	116.4	**0.043**	3%	
	E		1:45		9.7		9.5									
11	S	3/24/22	1:45	15	43.6	243	43.7	831	1.56	0.61	1.23	0.48	123.9	**0.040**	6%	
	E		2:00		40.5		39.0									
12	S	3/24/22	2:00	15	40.5	243	39.0	1043	1.96	0.77	1.23	0.48	123.9	**0.040**	0%	
	E		2:15		37.4		33.1									
13	S	3/24/22	2:15	15	37.4	338	33.1	1396	2.63	1.03	1.71	0.67	89.3	**0.056**	-39%	
	E		2:30		33.1		25.2									
14	S	3/24/22	2:30	15	33.1	251	25.2	866	1.63	0.64	1.27	0.50	120.0	**0.042**	26%	
	E		2:45		29.9		20.3									
15	S	3/24/22	2:45	15	29.9	251	20.3	689	1.30	0.51	1.27	0.50	120.0	**0.042**	0%	
	E		3:00		26.7		16.4									
16	S	3/24/22	3:00	15	26.7	338	16.4	954	1.79	0.71	1.71	0.67	89.3	**0.056**	-34%	
	E		3:15		22.4		11.0									
17	S	3/24/22	3:15	15	22.4	267	11.0	795	1.50	0.59	1.35	0.53	113.0	**0.044**	21%	
	E		3:30		19.0		6.5									
18	S	3/24/22	3:30	15	43.3	346	44.6	583	1.10	0.43	1.75	0.69	87.3	**0.057**	-29%	
	E		3:45		38.9		41.3									
19	S	3/24/22	3:45	15	38.9	283	41.3	795	1.50	0.59	1.43	0.56	106.7	**0.047**	18%	
	E		4:00		35.3		36.8									
20	S	3/24/22	4:00	15	35.3	259	36.8	672	1.26	0.50	1.31	0.52	116.4	**0.043**	8%	
	E		4:15		32.0		33.0									
21	S	3/24/22	4:15	15	32.0	267	33.0	901	1.69	0.67	1.35	0.53	113.0	**0.044**	-3%	
	E		4:30		28.6		27.9									
22	S	3/24/22	4:30	15	28.6	251	27.9	672	1.26	0.50	1.27	0.50	120.0	**0.042**	6%	
	E		4:45		25.4		24.1									
23	S	3/24/22	4:45	15	25.4	298	24.1	619	1.16	0.46	1.51	0.59	101.1	**0.049**	-19%	
	E		5:00		21.6		20.6									
24	S	3/24/22	5:00	15	21.6	267	20.6	742	1.40	0.55	1.35	0.53	113.0	**0.044**	11%	
	E		5:15		18.2		16.4									

Notes: Presoak period of one hour


Rates vs Time
Project No. 2201281
W Broadway Rd & S Citrus Rd
P-2
Outer Ring
Inner Ring
Filtration Rate (in/hr)
1.5
1
0.5
0
0 15 30 45 60 75 90 105 120 135 150 165 180 195 210 225 240 255 270 285 300 315 330
Elapsed Time (min)

ACS SERVICES LLC

ENGINEERING DESIGN • MATERIAL TESTING • CONSTRUCTION INSPECTION

ASTM D3385

ACS Project #	2201281
Project Address	W Broadway Rd & S Citrus Rd
Site Description	Alfalfa Field
Tested by	Reed Seamons
Test Location	P- 2, See Site Plan
Liquid used (pH)	ACS Tap Water (7)
Depth to Water Table (ft)	N/A

Double Ring Infiltrometer - Inner and Annular Ring Constants

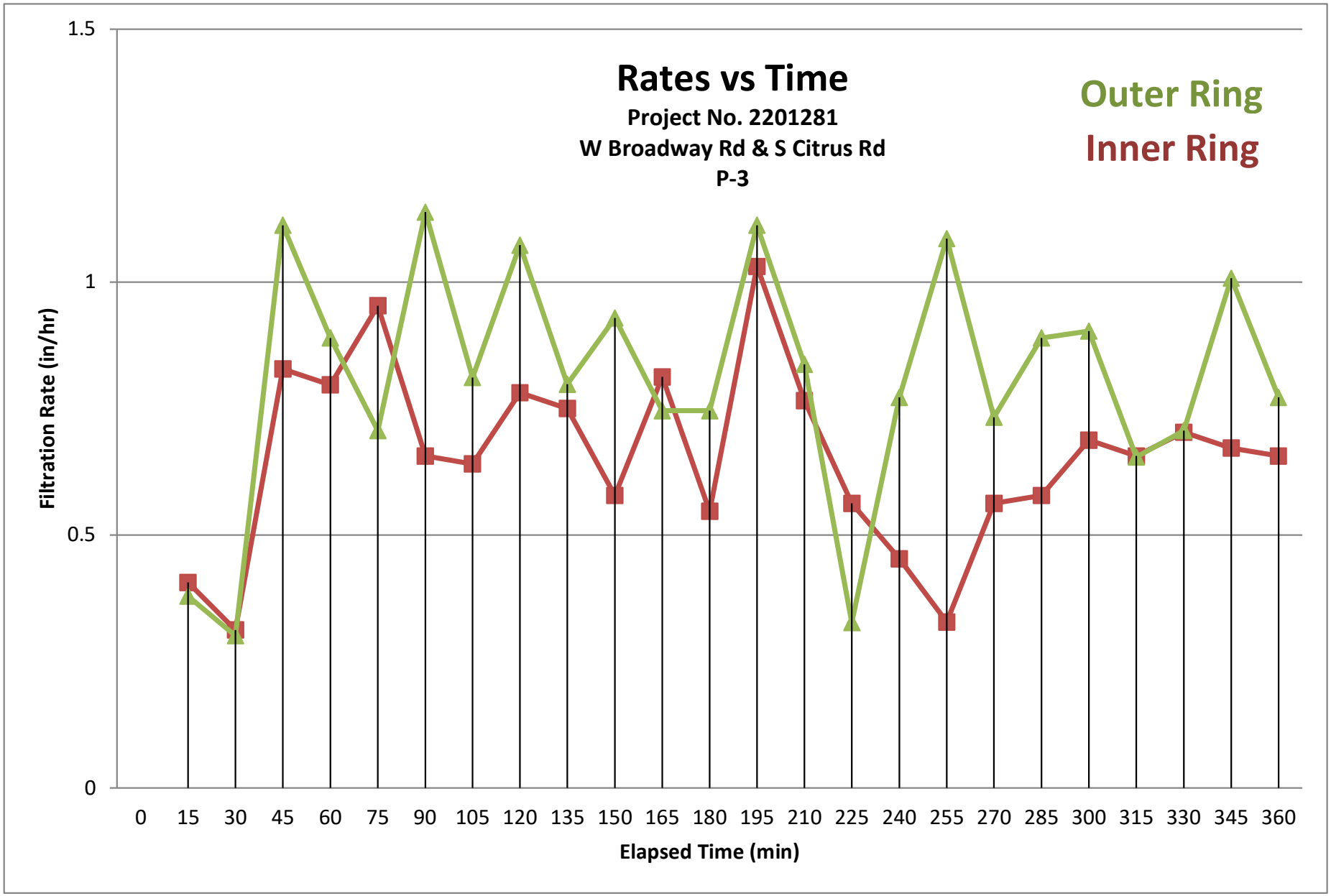
Apparatus	Diameter (cm)	Area (cm2)	Depth of Liquid in Ring (cm)	Penetration of Ring (cm)
Inner Ring	31.75	791.73	30	8
Outer Ring	60.96	2918.64	30	8

Flow Reading Constants (Graduated Cylinder Properties)

Apparatus	Diameter (cm)	Area (cm2)	Liquid Level Gauge
Graduated Cylinder Connected to Inner Ring	9	63.62	Flow Control Valve
Graduated Cylinder Connected to Annular Ring	15	176.72	Flow Control Valve

Trial #	Start of test (S) End of test (E)	Date	Time	Δ T	Flow Readings Inner Ring Reading cm	Flow Readings Inner Ring Flow cm^3	Flow Readings Outer Ring Reading cm	Flow Readings Outer Ring Flow cm^3	Rate Outer cm / hr	Rate Outer in / hr	Rate Inner cm / hr	Rate Inner in / hr	Rate Inner min / in	Rate **Inner** * $ft^3/hr/ft^2$	Change Inner %	Comments
1	S	3/25/22	10:28	15	45.5	350	43.5	1414	2.66	1.05	1.77	0.70	86.2	**0.058**	n/a	
	E		10:43		40.0		35.5									
2	S	3/25/22	10:45	15	40.0	286	35.5	530	1.00	0.39	1.45	0.57	105.4	**0.047**	18%	
	E		11:00		35.5		32.5									
3	S	3/25/22	11:02	15	35.5	286	32.5	1060	1.99	0.79	1.45	0.57	105.4	**0.047**	0%	
	E		11:17		31.0		26.5									
4	S	3/25/22	11:20	15	31.0	254	26.0	707	1.33	0.52	1.29	0.51	118.5	**0.042**	11%	
	E		11:35		27.0		22.0									
5	S	3/25/22	11:37	15	27.0	414	22.0	972	1.83	0.72	2.09	0.82	72.9	**0.069**	-63%	
	E		11:52		20.5		16.5									
6	S	3/25/22	11:54	15	20.5	286	16.5	619	1.16	0.46	1.45	0.57	105.4	**0.047**	31%	
	E		12:09		16.0		13.0									
7	S	3/25/22	12:14	15	16.0	254	13.0	972	1.83	0.72	1.29	0.51	118.5	**0.042**	11%	
	E		12:29		12.0		7.5									
8	S	3/25/22	12:30	15	12.0	318	7.5	619	1.16	0.46	1.61	0.63	94.8	**0.053**	-25%	
	E		12:45		7.0		4.0									
9	S	3/25/22	12:47	15	42.5	261	41.0	972	1.83	0.72	1.32	0.52	115.6	**0.043**	18%	
	E		1:02		38.4		35.5									
10	S	3/25/22	1:04	15	38.4	261	35.4	778	1.46	0.58	1.32	0.52	115.6	**0.043**	0%	
	E		1:19		34.3		31.0									
11	S	3/25/22	1:21	15	34.3	267	31.0	654	1.23	0.48	1.35	0.53	112.9	**0.044**	-2%	
	E		1:36		30.1		27.3									
12	S	3/25/22	1:38	15	30.1	305	27.3	636	1.20	0.47	1.54	0.61	98.8	**0.051**	-14%	
	E		1:53		25.3		23.7									
13	S	3/25/22	1:55	15	25.3	318	23.7	742	1.40	0.55	1.61	0.63	94.8	**0.053**	-4%	
	E		2:10		20.3		19.5									
14	S	3/25/22	2:13	15	19.0	197	19.5	937	1.76	0.69	1.00	0.39	153.0	**0.033**	38%	
	E		2:28		15.9		14.2									
15	S	3/25/22	2:31	15	15.9	286	14.2	707	1.33	0.52	1.45	0.57	105.4	**0.047**	-45%	
	E		2:46		11.4		10.2									
16	S	3/25/22	2:48	15	11.4	318	10.2	778	1.46	0.58	1.61	0.63	94.8	**0.053**	-11%	
	E		3:03		6.4		5.8									
17	S	3/25/22	3:05	15	35.4	318	34.5	831	1.56	0.61	1.61	0.63	94.8	**0.053**	0%	
	E		3:20		30.4		29.8									
18	S	3/25/22	3:22	15	30.4	248	29.8	742	1.40	0.55	1.25	0.49	121.6	**0.041**	22%	
	E		3:37		26.5		25.6									
19	S	3/25/22	3:39	15	26.5	286	25.6	795	1.50	0.59	1.45	0.57	105.4	**0.047**	-15%	
	E		3:54		22.0		21.1									
20	S	3/25/22	3:56	15	22.0	350	21.1	954	1.79	0.71	1.77	0.70	86.2	**0.058**	-22%	
	E		4:11		16.5		15.7									
21	S	3/25/22	4:12	15	16.5	274	15.7	848	1.60	0.63	1.38	0.54	110.3	**0.045**	22%	
	E		4:27		12.2		10.9									
22	S	3/25/22	4:28	15	12.2	286	10.9	760	1.43	0.56	1.45	0.57	105.4	**0.047**	-5%	
	E		4:43		7.7		6.6									
23	S															
	E															
24	S															
	E															

Notes: Presoak period of one hour


Rates vs Time
Project No. 2201281
W Broadway Rd & S Citrus Rd
P-3
Outer Ring
Inner Ring
Filtration Rate (in/hr)
1.5
1
0.5
0
0 15 30 45 60 75 90 105 120 135 150 165 180 195 210 225 240 255 270 285 300 315 330 345 360
Elapsed Time (min)

ACS SERVICES LLC

ENGINEERING DESIGN • MATERIAL TESTING • CONSTRUCTION INSPECTION

ASTM D3385

ACS Project #	2201281
Project Address	W Broadway Rd & S Citrus Rd
Site Description	Alfalfa Field
Tested by	Adrianne Roberts
Test Location	P- 3, See Site Plan
Liquid used (pH)	ACS Tap Water (7)
Depth to Water Table (ft)	N/A

Double Ring Infiltrometer - Inner and Annular Ring Constants

Apparatus	Diameter (cm)	Area (cm2)	Depth of Liquid in Ring (cm)	Penetration of Ring (cm)
Inner Ring	31.75	791.73	30	8
Outer Ring	60.96	2918.64	30	8

Flow Reading Constants (Graduated Cylinder Properties)

Apparatus	Diameter (cm)	Area (cm2)	Liquid Level Gauge
Graduated Cylinder Connected to Inner Ring	10	78.54	Flow Control Valve
Graduated Cylinder Connected to Annular Ring	15	176.72	Flow Control Valve

Trial #	Start of test (S) End of test (E)	Date	Time	Δ T	Flow Readings Inner Ring Reading cm	Flow Readings Inner Ring Flow cm^3	Flow Readings Outer Ring Reading cm	Flow Readings Outer Ring Flow cm^3	Rate Outer cm / hr	Rate Outer in / hr	Rate Inner cm / hr	Rate Inner in / hr	Rate Inner min / in	Rate **Inner** * $ft^3/hr/ft^2$	Change Inner %	Comments
1	S	3/25/22	11:00	15	44.5	204	44.5	512	0.96	0.38	1.03	0.41	147.7	**0.034**	n/a	
	E		11:15		41.9		41.6									
2	S	3/25/22	11:15	15	41.9	157	41.6	406	0.76	0.30	0.79	0.31	192.0	**0.026**	23%	
	E		11:30		39.9		39.3									
3	S	3/25/22	11:30	15	39.9	416	39.3	1502	2.82	1.11	2.10	0.83	72.5	**0.069**	-165%	
	E		11:45		34.6		30.8									
4	S	3/25/22	11:45	15	34.6	401	30.8	1202	2.26	0.89	2.02	0.80	75.3	**0.066**	4%	
	E		12:00		29.5		24.0									
5	S	3/25/22	12:00	15	29.5	479	24.0	954	1.79	0.71	2.42	0.95	63.0	**0.079**	-20%	
	E		12:15		23.4		18.6									
6	S	3/25/22	12:15	15	23.4	330	18.6	1537	2.89	1.14	1.67	0.66	91.4	**0.055**	31%	
	E		12:30		19.2		9.9									
7	S	3/25/22	12:30	15	42.2	322	43.0	1096	2.06	0.81	1.63	0.64	93.7	**0.053**	2%	
	E		12:45		38.1		36.8									
8	S	3/25/22	12:45	15	38.1	393	36.8	1449	2.73	1.07	1.98	0.78	76.8	**0.065**	-22%	
	E		1:00		33.1		28.6									
9	S	3/25/22	1:00	15	33.1	377	28.6	1078	2.03	0.80	1.90	0.75	80.0	**0.062**	4%	
	E		1:15		28.3		22.5									
10	S	3/25/22	1:15	15	28.3	291	22.5	1255	2.36	0.93	1.47	0.58	103.8	**0.048**	23%	
	E		1:30		24.6		15.4									
11	S	3/25/22	1:30	15	24.6	408	15.4	1007	1.89	0.75	2.06	0.81	73.9	**0.068**	-41%	
	E		1:45		19.4		9.7									
12	S	3/25/22	1:45	15	43.6	275	44.8	1007	1.89	0.75	1.39	0.55	109.7	**0.046**	33%	
	E		2:00		40.1		39.1									
13	S	3/25/22	2:00	15	40.1	518	39.1	1502	2.82	1.11	2.62	1.03	58.2	**0.086**	-89%	
	E		2:15		33.5		30.6									
14	S	3/25/22	2:15	15	33.5	385	30.6	1131	2.13	0.84	1.94	0.77	78.4	**0.064**	26%	
	E		2:30		28.6		24.2									
15	S	3/25/22	2:30	15	28.6	283	24.2	442	0.83	0.33	1.43	0.56	106.7	**0.047**	27%	
	E		2:45		25.0		21.7									
16	S	3/25/22	2:45	15	25.0	228	21.7	1043	1.96	0.77	1.15	0.45	132.4	**0.038**	19%	
	E		3:00		22.1		15.8									
17	S	3/25/22	3:00	15	22.1	165	15.8	1467	2.76	1.09	0.83	0.33	182.9	**0.027**	28%	
	E		3:15		20.0		7.5									
18	S	3/25/22	3:15	15	42.9	283	43.8	990	1.86	0.73	1.43	0.56	106.7	**0.047**	-71%	
	E		3:30		39.3		38.2									
19	S	3/25/22	3:30	15	39.3	291	38.2	1202	2.26	0.89	1.47	0.58	103.8	**0.048**	-3%	
	E		3:45		35.6		31.4									
20	S	3/25/22	3:45	15	35.6	346	31.4	1219	2.29	0.90	1.75	0.69	87.3	**0.057**	-19%	
	E		4:00		31.2		24.5									
21	S	3/25/22	4:00	15	31.2	330	24.5	884	1.66	0.65	1.67	0.66	91.4	**0.055**	5%	
	E		4:15		27.0		19.5									
22	S	3/25/22	4:15	15	27.0	353	19.5	954	1.79	0.71	1.79	0.70	85.3	**0.059**	-7%	
	E		4:30		22.5		14.1									
23	S	3/25/22	4:30	15	22.5	338	14.1	1361	2.56	1.01	1.71	0.67	89.3	**0.056**	4%	
	E		4:45		18.2		6.4									
24	S	3/25/22	4:45	15	18.2	330	6.4	1043	1.96	0.77	1.67	0.66	91.4	**0.055**	2%	
	E		5:00		14.0		0.5									

Notes: Presoak period of one hour

Test ID: P-4 6" ID PVC Pipe (Solid)
Depth: 10 feet

Time	Elapsed Time (min)	Water Depth (in)	Water Drop (in)	Percolation Rate (min/in)	Percolation Rate (in/min)
950	--	7	--		
1020	30	56	49	0.61	1.63
1050	30	106	50	0.60	1.67
1120	30	136	30	1.00	1
1120	--	20	--		
1150	30	50	30	1.00	1
1220	30	80	30	1.00	1
1250	30	110	30	1.00	1
1250	--	8	--		
120	30	38	30	1.00	1

Stabilized Rate	1.0	min/in
	1	in/min
	60	in/hr
	5	$ft^3/hr/ft^2$

Test ID: P-5 6" ID PVC Pipe (Solid)
Depth: 10 feet

Time	Elapsed Time (min)	Water Depth (in)	Water Drop (in)	Percolation Rate (min/in)	Drop (in/min)
955	--	7.25	--		
1025	30	47	39.75	0.75	1.33
1055	30	77	30	1.00	1.00
1055	--	6			
1125	30	19	13	2.31	0.43
1155	--	32	--		
1225	30	45	13	2.31	0.43
1255	30	58	13	2.31	0.43
125	30	71	13	2.31	0.43

Stabilized Rate	2.3	min/inch
	0.43	in/min
	25.8	in/hour
	2.15	$ft^3/hr/ft^2$

Project Name:	SR303L - MC 85 to Van Buren Street					Test Location/ Number:	
Project Number:	2021037					P-6	
Project Location:	Goodyear, Arizona						
Field Engineer:	M. Meza						
Coordinates:	33.39776° N, -112.44154° E						
Date:	11/27/2023						
Top of Pipe (ft):	0.0	**Pipe Diameter (in):**	10.0			**Test Type:**	Falling Head Method
Botom of Pipe (ft):	10.0	**Pipe Type:**	PVC			**Bedding Material:**	Pea Gravel
Depth of Boring (ft):	10.0	**Pipe Area (sq in):**	78.54				

Reading Number		Time (hr:min)	Elasped Time: Δ (min)	Flow Readings Pipe		Incremental Infiltration Rate	Notes
				Reading (in)	Flow ($inch^3$/hr)	(in/hr)	
1	S	12:00 PM	15	0.00	78.54	1.0	Material at the bottom of the open hole appears to be of a Sandy Silt (ML) with occasional gravel, low plasticity and moist
	E	12:15 PM		0.25			
2	S	12:15 PM	15	0.00	78.54	1.0	
	E	12:30 PM		0.25			
3	S	12:30 PM	15	0.00	78.54	1.0	
	E	12:45 PM		0.25			
4	S	12:45 PM	15	0.00	78.54	1.0	
	E	1:00 PM		0.25			
5	S	1:00 PM	30	0.00	58.91	0.8	
	E	1:30 PM		0.38			
6	S	1:30 PM	30	0.00	58.91	0.8	
	E	2:00 PM		0.38			
7	S	2:00 PM	30	0.00	39.27	0.5	
	E	2:30 PM		0.25			
8	S	2:30 PM	30	0.00	58.91	0.8	
	E	3:00 PM		0.38			
9	S	3:00 PM	30	0.00	39.27	0.5	
	E	3:30 PM		0.25			
10	S	4:00 PM	30	0.00	19.64	0.3	
	E	4:30 PM		0.13			
11	S	4:30 PM	30	0.00	19.64	0.3	
	E	5:00 PM		0.13			
12	S	5:00 PM	30	0.00	19.64	0.3	
	E	5:30 PM		0.13			

Project Name:	SR303L - MC 85 to Van Buren Street			Test Location/ Number:	
Project Number:	2021037			P-7	
Project Location:	Goodyear, Arizona				
Field Engineer:	M. Meza			ethos ENGINEERING, LLC.	
Coordinates:	33.39864° N, -112.44153° E				
Date:	11/28/2023				
Top of Pipe (ft):	0.0	**Pipe Diameter (in):**	10.0	**Test Type:**	Falling Head Method
Botom of Pipe (ft):	10.0	**Pipe Type:**	PVC	**Bedding Material:**	Pea Gravel
Depth of Boring (ft):	10.0	**Pipe Area (sq in):**	78.54		

Reading Number		Time (hr:min)	Elasped Time: Δ (min)	Flow Readings Pipe Reading (in)	Flow ($inch^3$/hr)	Incremental Infiltration Rate (in/hr)	Notes
1	S	7:00 AM	15	0.00	314.16	4.0	Material at the bottom of the open hole appears to be of a Silty Sand (SM) with occasional gravel, no plasticity and moist
	E	7:15 AM		1.00			
2	S	7:15 AM	15	0.00	314.16	4.0	
	E	7:30 AM		1.00			
3	S	7:30 AM	15	0.00	235.62	3.0	
	E	7:45 AM		0.75			
4	S	7:45 AM	15	0.00	235.62	3.0	
	E	8:00 AM		0.75			
5	S	8:00 AM	30	0.00	78.54	1.0	
	E	8:30 AM		0.50			
6	S	8:30 AM	30	0.00	39.27	0.5	
	E	9:00 AM		0.25			
7	S	9:00 AM	30	0.00	98.18	1.3	
	E	9:30 AM		0.63			
8	S	9:30 AM	30	0.00	98.18	1.3	
	E	10:00 AM		0.63			
9	S	10:00 AM	30	0.00	78.54	1.0	
	E	10:30 AM		0.50			
10	S	10:30 AM	30	0.00	39.27	0.5	
	E	11:00 AM		0.25			
11	S	11:00 AM	30	0.00	39.27	0.5	
	E	11:30 AM		0.25			
12	S	11:30 AM	30	0.00	39.27	0.5	
	E	12:00 PM		0.25			

Project Name:	SR303L - MC 85 to Van Buren Street					Test Location/ Number:	
Project Number:	2021037					P-8	
Project Location:	Goodyear, Arizona						
Field Engineer:	M. Meza						
Coordinates:	33.39812° N, -112.44258° E						
Date:	11/28/2023						
Top of Pipe (ft):	0.0	**Pipe Diameter (in):**	10.0			**Test Type:**	Falling Head Method
Botom of Pipe (ft):	10.0	**Pipe Type:**	PVC			**Bedding Material:**	Pea Gravel
Depth of Boring (ft):	10.0	**Pipe Area (sq in):**	78.54				

Reading Number		Time (hr:min)	Elasped Time: Δ (min)	Flow Readings Pipe Reading (in)	Flow (inch^3/hr)	Incremental Infiltration Rate (in/hr)	Notes
1	S	6:55 AM	15	0.00	274.89	3.5	Material at the bottom of the open hole appears to be of a Silty Sand (SM) with occasional gravel, no plasticity and moist
	E	7:10 AM		0.88			
2	S	7:10 AM	15	0.00	392.70	5.0	
	E	7:25 AM		1.25			
3	S	7:25 AM	15	0.00	274.89	3.5	
	E	7:40 AM		0.88			
4	S	7:40 AM	15	0.00	235.62	3.0	
	E	7:55 AM		0.75			
5	S	7:55 AM	30	0.00	78.54	1.0	
	E	8:25 AM		0.50			
6	S	8:25 AM	30	0.00	58.91	0.8	
	E	8:55 AM		0.38			
7	S	8:55 AM	30	0.00	98.18	1.3	
	E	9:25 AM		0.63			
8	S	9:25 AM	30	0.00	78.54	1.0	
	E	9:55 AM		0.50			
9	S	9:55 AM	30	0.00	78.54	1.0	
	E	10:25 AM		0.50			
10	S	10:25 AM	30	0.00	19.64	0.3	
	E	10:55 AM		0.13			
11	S	10:55 AM	30	0.00	19.64	0.3	
	E	11:25 AM		0.13			
12	S	11:25 AM	30	0.00	19.64	0.3	
	E	11:55 AM		0.13			

Project Name:	SR303L - MC 85 to Van Buren Street					Test Location/ Number:	
Project Number:	2021037					P-9	
Project Location:	Goodyear, Arizona						
Field Engineer:	M. Meza						
Coordinates:	33.39918° N, -112.44252° E						
Date:	11/29/2023						
Top of Pipe (ft):	0.0	**Pipe Diameter (in):**	10.0			**Test Type:**	Falling Head Method
Botom of Pipe (ft):	10.0	**Pipe Type:**	PVC			**Bedding Material:**	Pea Gravel
Depth of Boring (ft):	10.0	**Pipe Area (sq in):**	78.54				

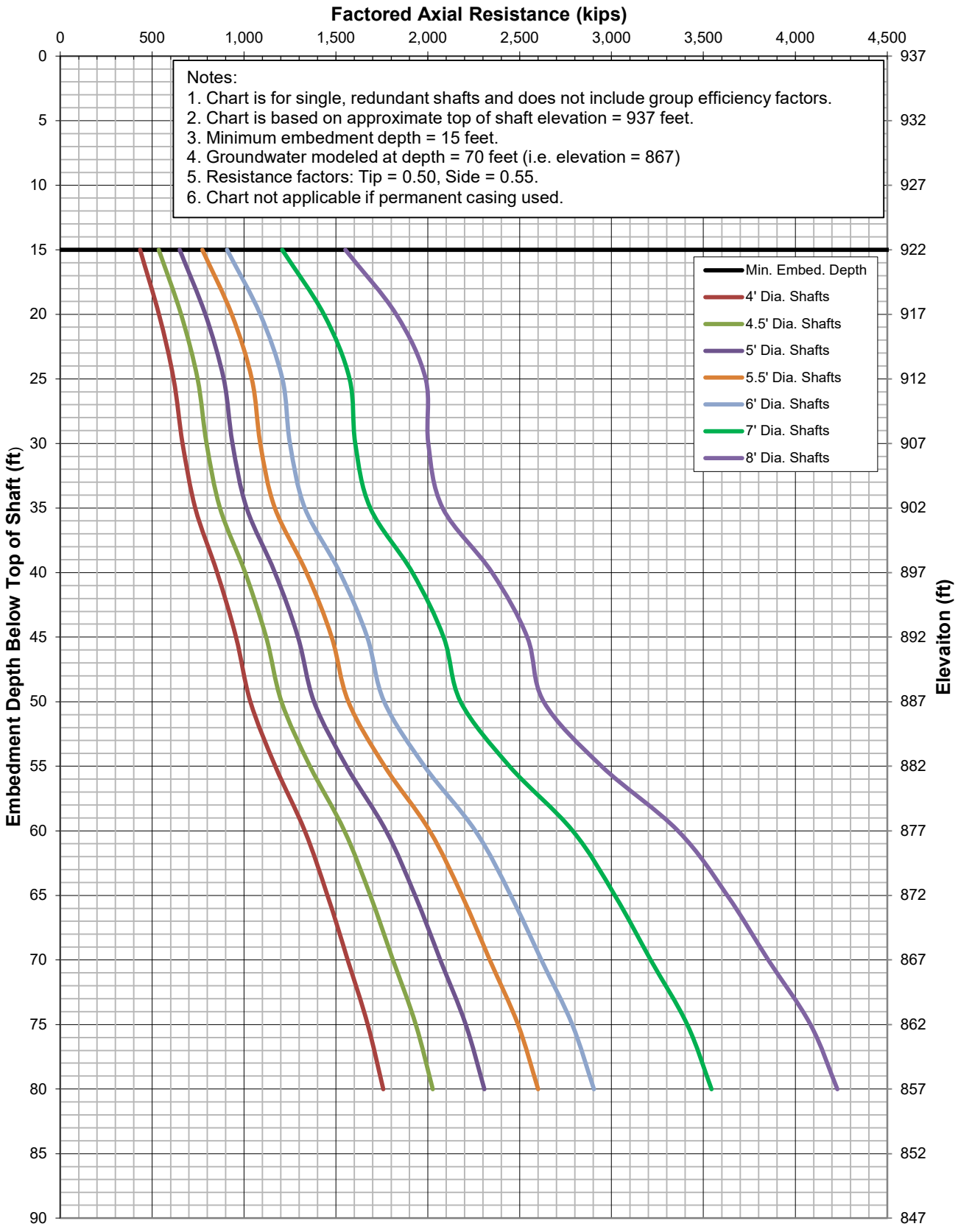
Reading Number		Time (hr:min)	Elasped Time: Δ (min)	Flow Readings Pipe		Incremental Infiltration Rate	Notes
				Reading (in)	Flow ($inch^3$/hr)	(in/hr)	
1	S	6:55 AM	15	0.00	353.43	4.5	Material at the bottom of the open hole appears to be of a Silty Sand (SM) with no plasticity and slightly moist
	E	7:10 AM		1.13			
2	S	7:10 AM	15	0.00	392.70	5.0	
	E	7:25 AM		1.25			
3	S	7:25 AM	15	0.00	196.35	2.5	
	E	7:40 AM		0.63			
4	S	7:40 AM	15	0.00	78.54	1.0	
	E	7:55 AM		0.25			
5	S	7:55 AM	30	0.00	78.54	1.0	
	E	8:25 AM		0.50			
6	S	8:25 AM	30	0.00	58.91	0.8	
	E	8:55 AM		0.38			
7	S	8:55 AM	30	0.00	98.18	1.3	
	E	9:25 AM		0.63			
8	S	9:25 AM	30	0.00	58.91	0.8	
	E	9:55 AM		0.38			
9	S	9:55 AM	30	0.00	58.91	0.8	
	E	10:25 AM		0.38			
10	S	10:25 AM	30	0.00	78.54	1.0	
	E	10:55 AM		0.50			
11	S	10:55 AM	30	0.00	58.91	0.8	
	E	11:25 AM		0.38			
12	S	11:25 AM	30	0.00	58.91	0.8	
	E	11:55 AM		0.38			

Project Name:	SR303L - MC 85 to Van Buren Street			Test Location/ Number:	
Project Number:	2021037			P-10	
Project Location:	Goodyear, Arizona				
Field Engineer:	M. Meza			ethos ENGINEERING, LLC.	
Coordinates:	33.39862° N, -112.44346° E				
Date:	11/29/2023				
Top of Pipe (ft):	0.0	**Pipe Diameter (in):**	10.0	**Test Type:**	Falling Head Method
Botom of Pipe (ft):	10.0	**Pipe Type:**	PVC	**Bedding Material:**	Pea Gravel
Depth of Boring (ft):	10.0	**Pipe Area (sq in):**	78.54		

Reading Number		Time (hr:min)	Elasped Time: Δ (min)	Flow Readings Pipe Reading (in)	Flow ($inch^3$/hr)	Incremental Infiltration Rate (in/hr)	Notes
1	S	7:00 AM	15	0.00	157.08	2.0	Material at the bottom of the open hole appears to be of a Silty Sand (SM) with occasional gravel, no plasticity and moist
	E	7:15 AM		0.50			
2	S	7:15 AM	15	0.00	196.35	2.5	
	E	7:30 AM		0.63			
3	S	7:30 AM	15	0.00	78.54	1.0	
	E	7:45 AM		0.25			
4	S	7:45 AM	15	0.00	117.81	1.5	
	E	8:00 AM		0.38			
5	S	8:00 AM	30	0.00	78.54	1.0	
	E	8:30 AM		0.50			
6	S	8:30 AM	30	0.00	58.91	0.8	
	E	9:00 AM		0.38			
7	S	9:00 AM	30	0.00	98.18	1.3	
	E	9:30 AM		0.63			
8	S	9:30 AM	30	0.00	98.18	1.3	
	E	10:00 AM		0.63			
9	S	10:00 AM	30	0.00	78.54	1.0	
	E	10:30 AM		0.50			
10	S	10:30 AM	30	0.00	39.27	0.5	
	E	11:00 AM		0.25			
11	S	11:00 AM	30	0.00	58.91	0.8	
	E	11:30 AM		0.38			
12	S	11:30 AM	30	0.00	58.91	0.8	
	E	12:00 PM		0.38			

APPENDIX E

Drilled Shaft Axial Resistance Charts



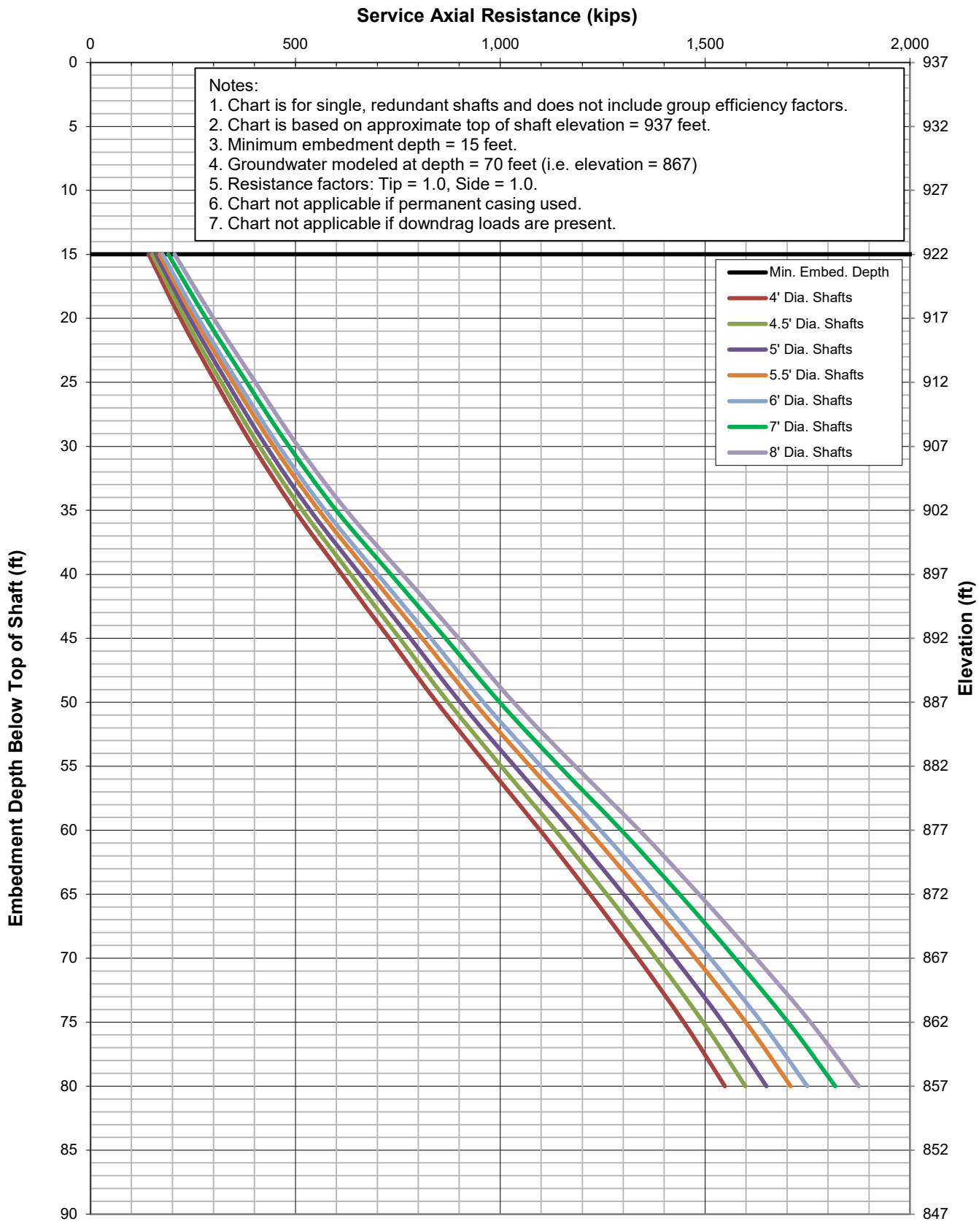
ethos ENGINEERING, LLC.	
Designer:	Date:
P. Garza	4/15/2022

DRILLED SHAFT FOUNDATION DESIGN CHART
Strength Limit Axial Resistance in Kips

SR 303L, MC 85 to Van Buren Street
Lower Buckeye Road OP
Based on Borings B-22 to B-27

Figure

E1



ethos ENGINEERING, LLC.

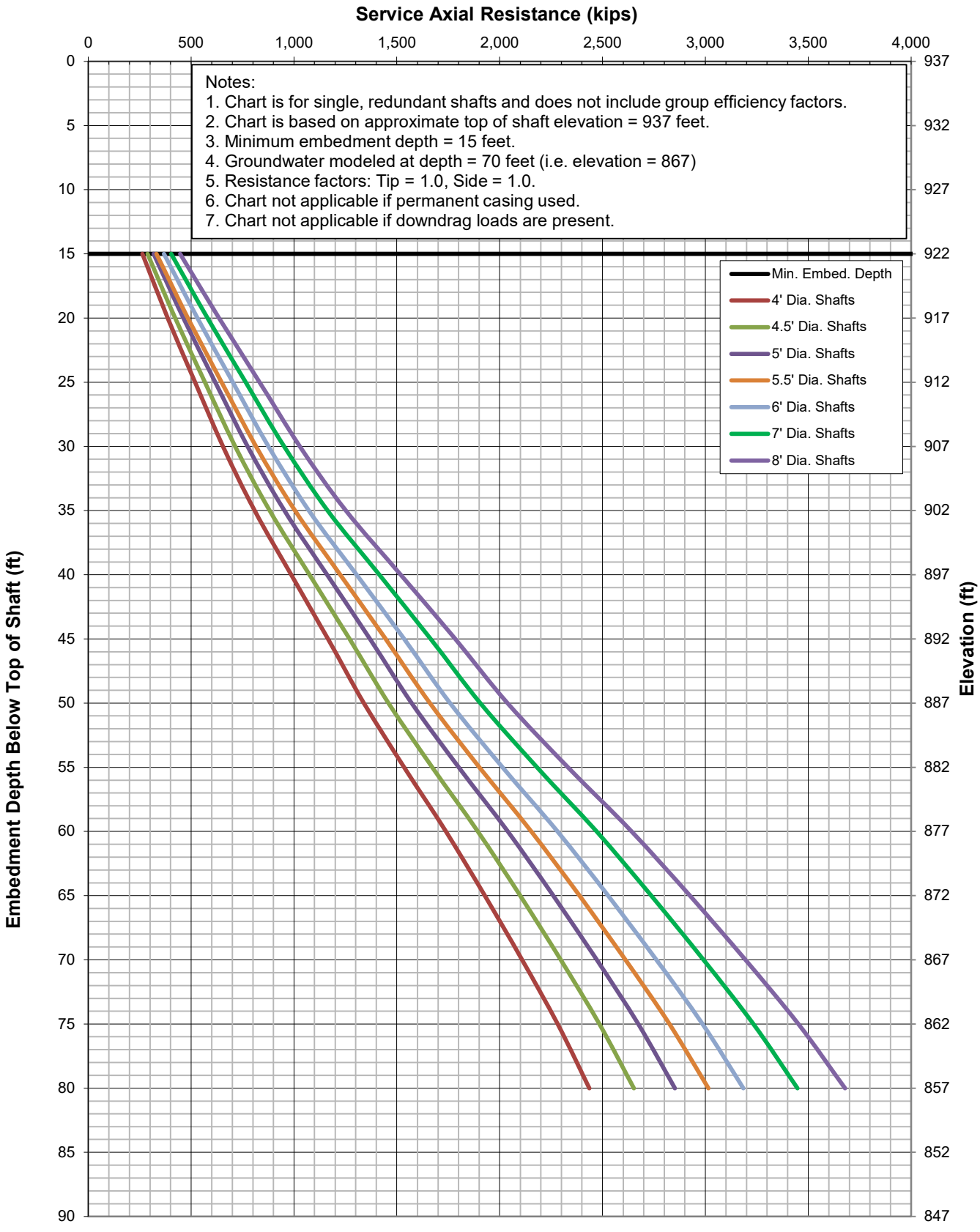
Designer:	Date:
P. Garza	4/15/2022

DRILLED SHAFT FOUNDATION DESIGN CHART
Service Limit (0.10 Inch Settlement) - Axial Resistance in Kips

SR 303L, MC 85 to Van Buren Street
Lower Buckeye Road OP
Based on Borings B-22 to B-27

Figure

E2



ethos ENGINEERING, LLC.

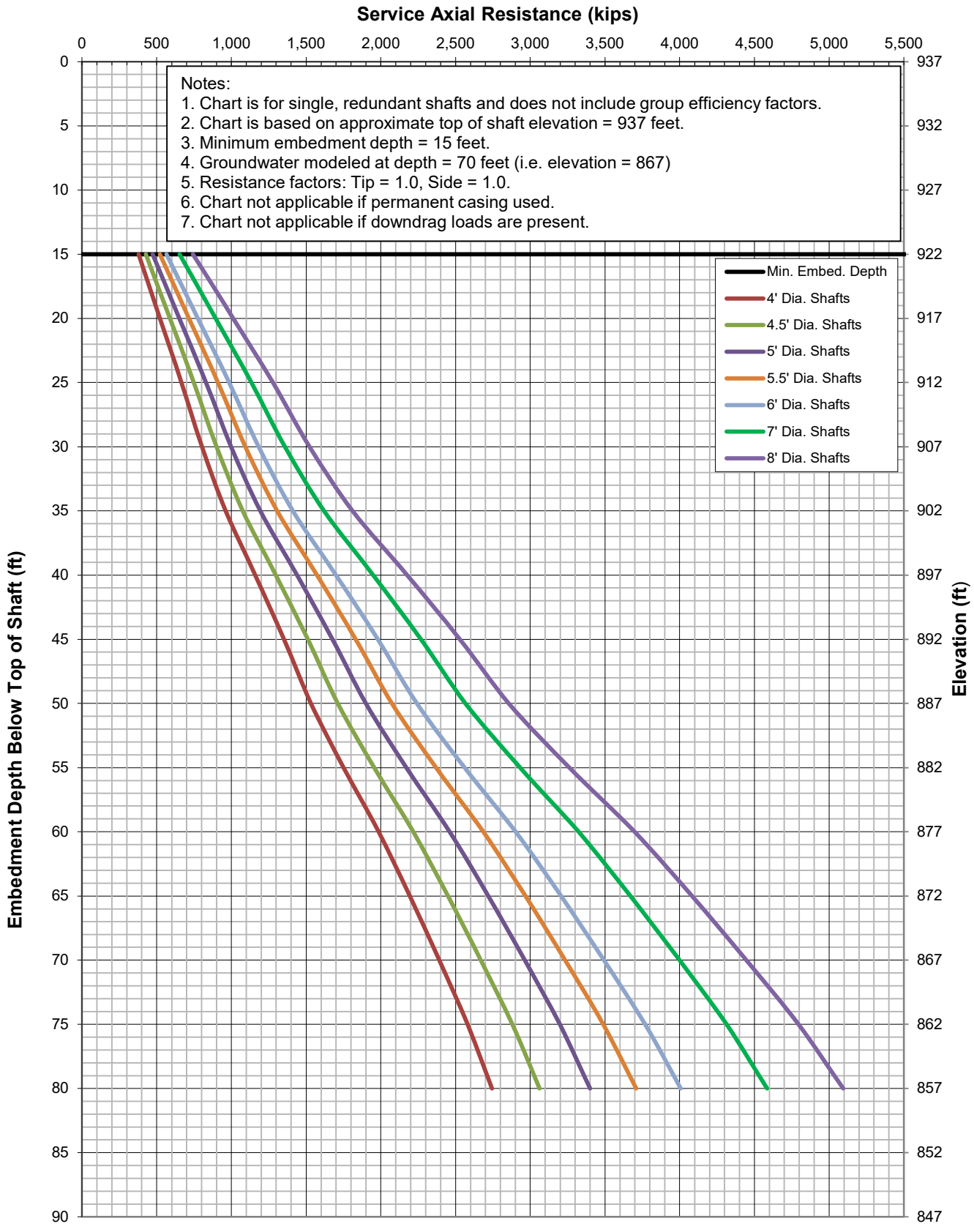
Designer:	Date:
P. Garza	4/15/2022

DRILLED SHAFT FOUNDATION DESIGN CHART
Service Limit (0.25 Inch Settlement) - Axial Resistance in Kips

SR 303L, MC 85 to Van Buren Street
Lower Buckeye Road OP
Based on Borings B-22 to B-27

Figure

E3



ethos ENGINEERING, LLC.

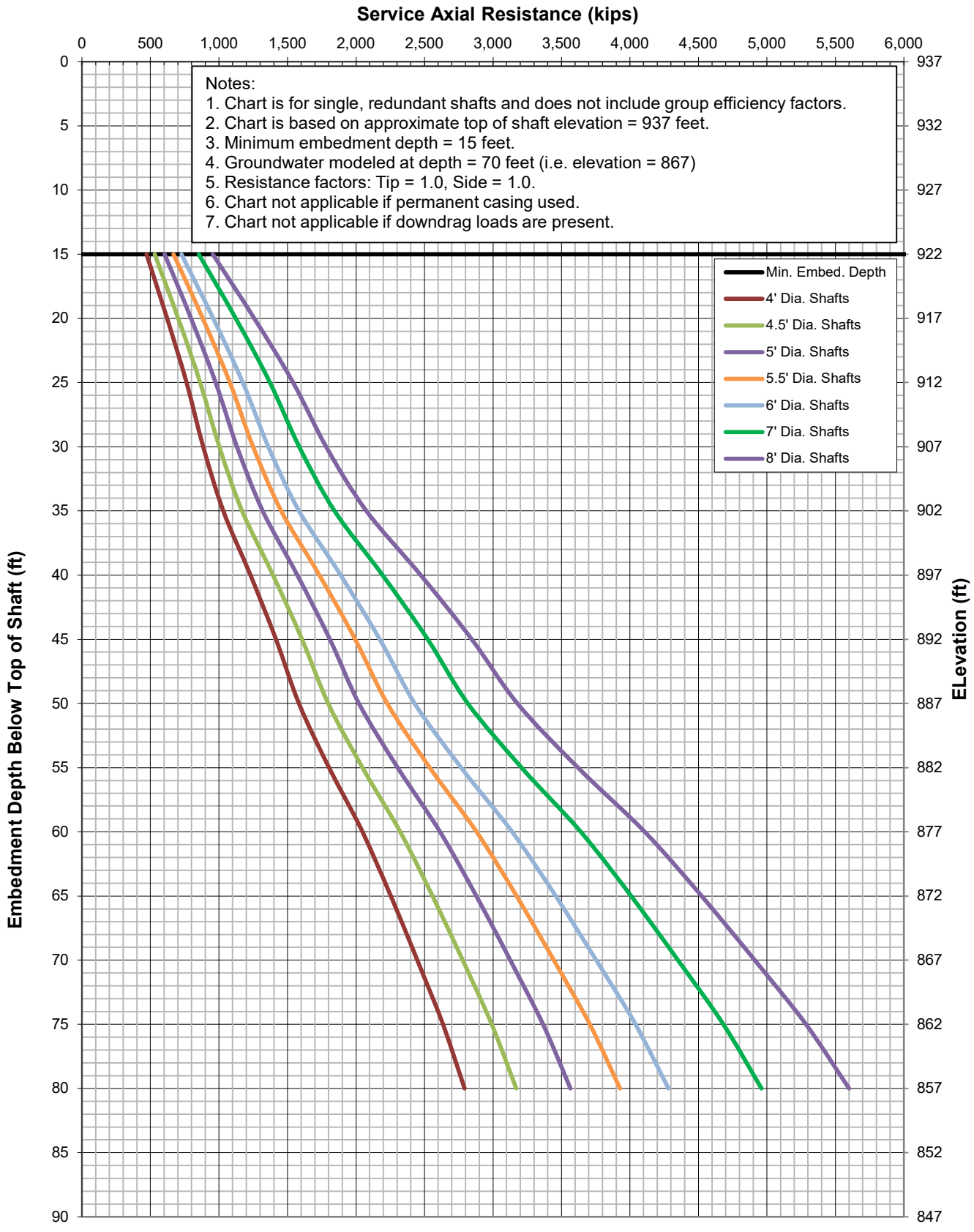
Designer:	Date:
P. Garza	4/15/2022

DRILLED SHAFT FOUNDATION DESIGN CHART
Service Limit (0.5 Inch Settlement) - Axial Resistance in Kips

SR 303L, MC 85 to Van Buren Street
Lower Buckeye Road OP
Based on Borings B-22 to B-27

Figure

E4



ethos ENGINEERING, LLC.

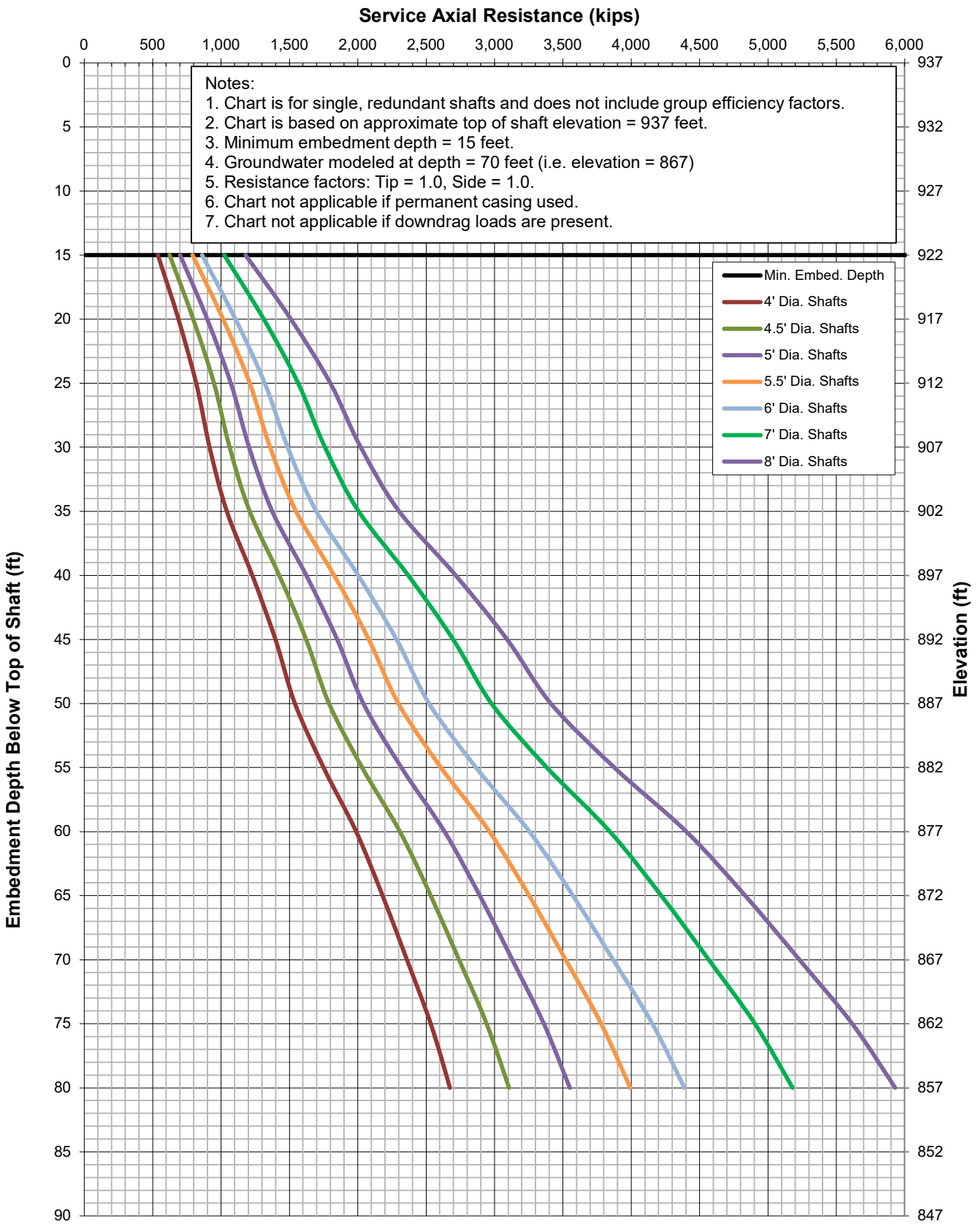
Designer:	Date:
P. Garza	4/15/2022

DRILLED SHAFT FOUNDATION DESIGN CHART
Service Limit (0.75 Inch Settlement) - Axial Resistance in Kips

SR 303L, MC 85 to Van Buren Street
Lower Buckeye Road OP
Based on Borings B-22 to B-27

Figure

E5



ethos ENGINEERING, LLC.

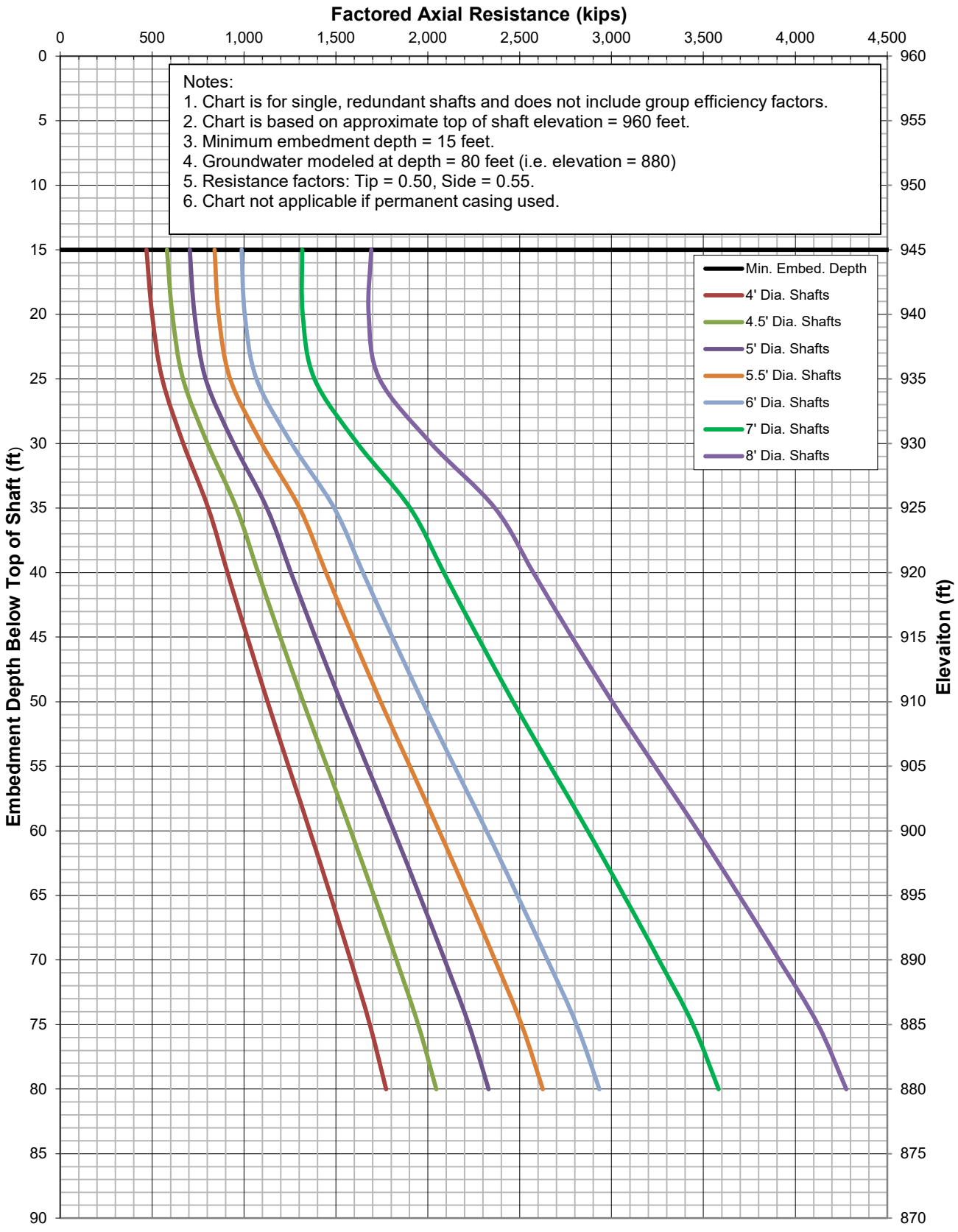
Designer:	Date:
P. Garza	4/15/2022

DRILLED SHAFT FOUNDATION DESIGN CHART
Service Limit (1.0 Inch Settlement) - Axial Resistance in Kips

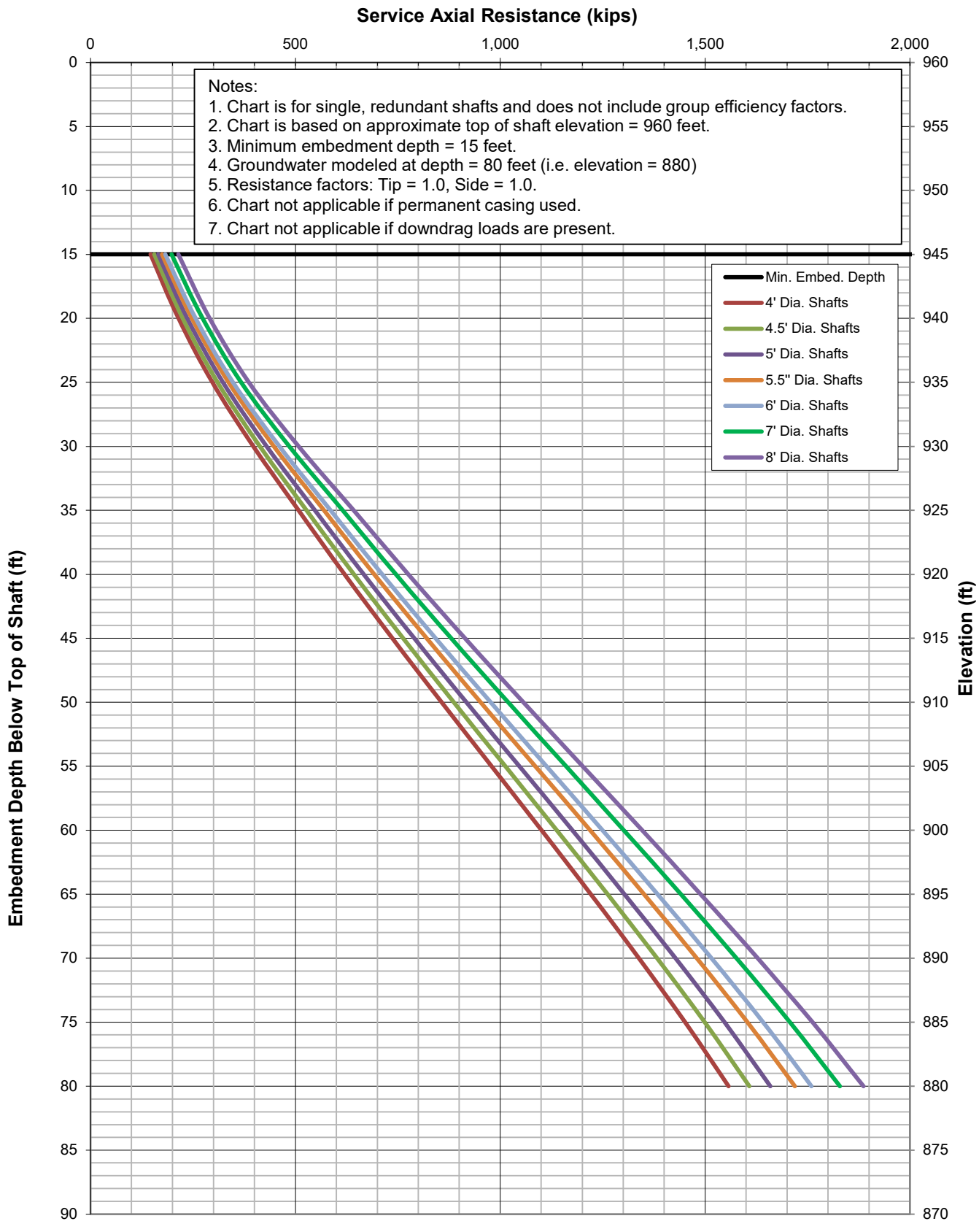
SR 303L, MC 85 to Van Buren Street
Lower Buckeye Road OP
Based on Borings B-22 to B-27

Figure

E6



ethos ENGINEERING, LLC.		**DRILLED SHAFT FOUNDATION DESIGN CHART** **Strength Limit Axial Resistance in Kips** **SR 303L, MC 85 to Van Buren Street** **Yuma Road OP** **Based on Borings B-73 to B-78**	Figure E7
Designer:	Date:		
P. Garza	4/11/2022		



ethos ENGINEERING, LLC.

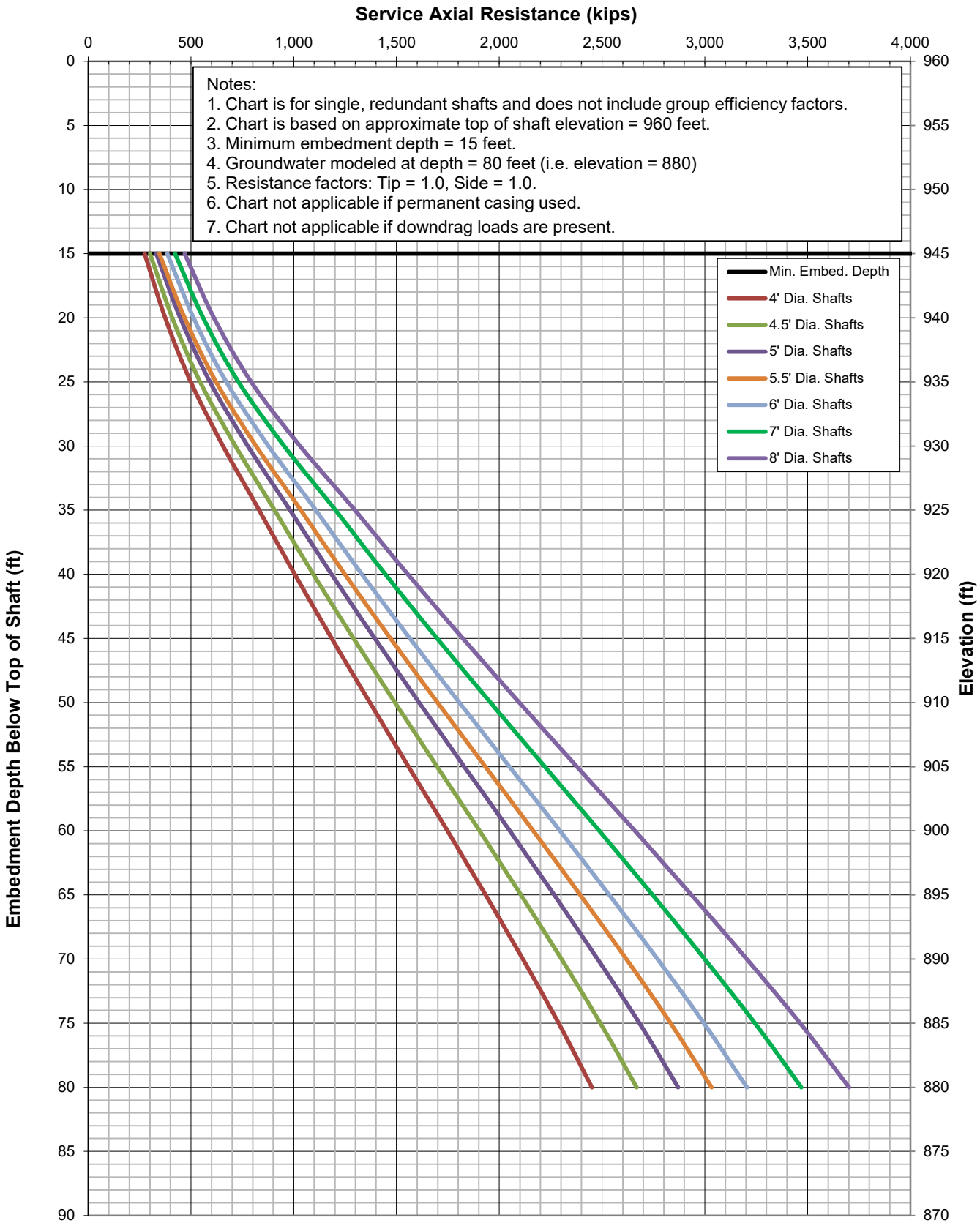
Designer:	Date:
P. Garza	4/11/2022

DRILLED SHAFT FOUNDATION DESIGN CHART
Service Limit (0.10 Inch Settlement) - Axial Resistance in Kips

SR 303L, MC 85 to Van Buren Street
Yuma Road OP
Based on Borings B-73 to B-78

Figure

E8



ethos ENGINEERING, LLC.

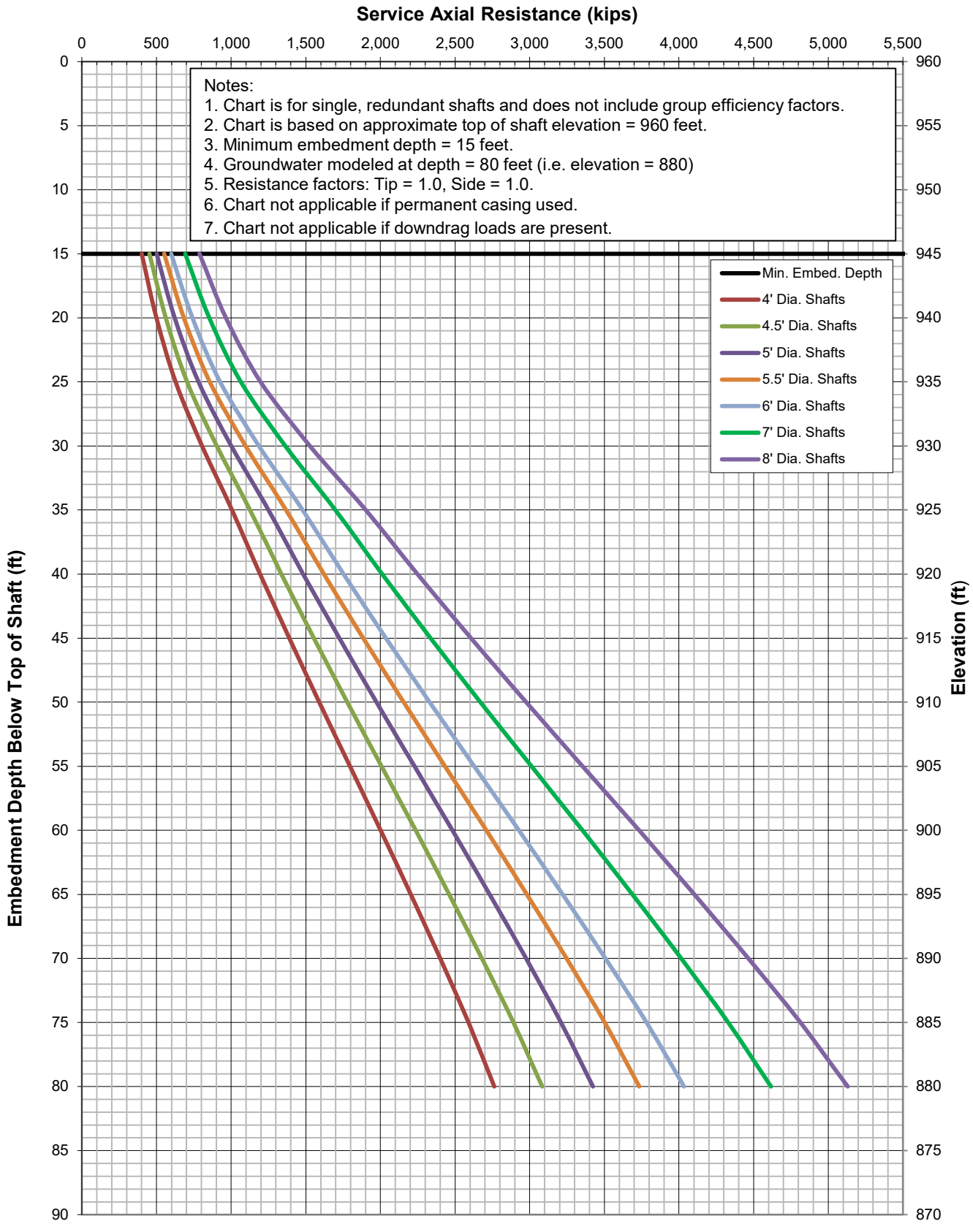
Designer:	Date:
P. Garza	4/11/2022

DRILLED SHAFT FOUNDATION DESIGN CHART
Service Limit (0.25 Inch Settlement) - Axial Resistance in Kips

SR 303L, MC 85 to Van Buren Street
Yuma Road OP
Based on Borings B-73 to B-78

Figure

E9



ethos ENGINEERING, LLC.

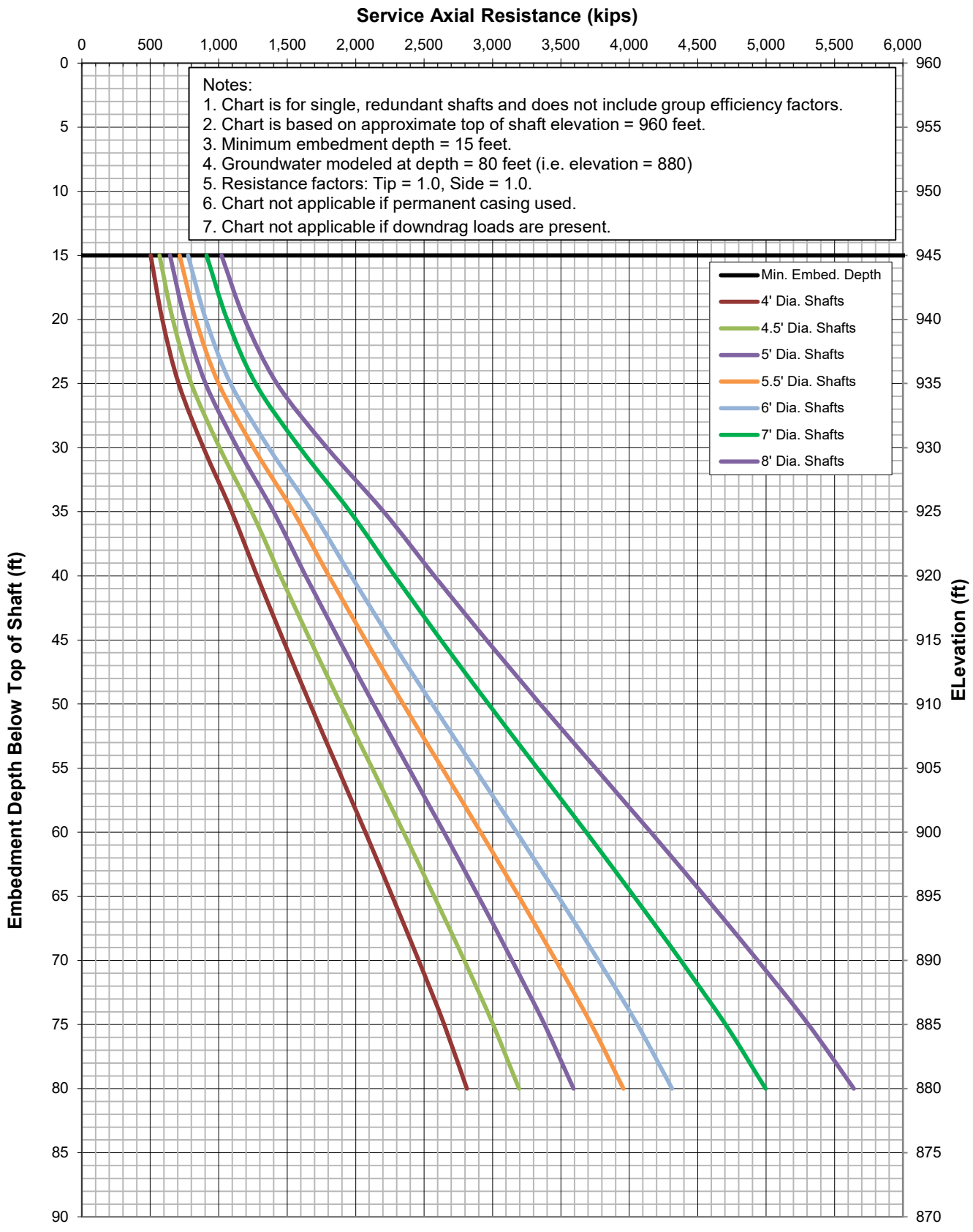
Designer:	Date:
P. Garza	4/11/2022

DRILLED SHAFT FOUNDATION DESIGN CHART
Service Limit (0.5 Inch Settlement) - Axial Resistance in Kips

SR 303L, MC 85 to Van Buren Street
Yuma Road OP
Based on Borings B-73 to B-78

Figure

E10



ethos ENGINEERING, LLC.

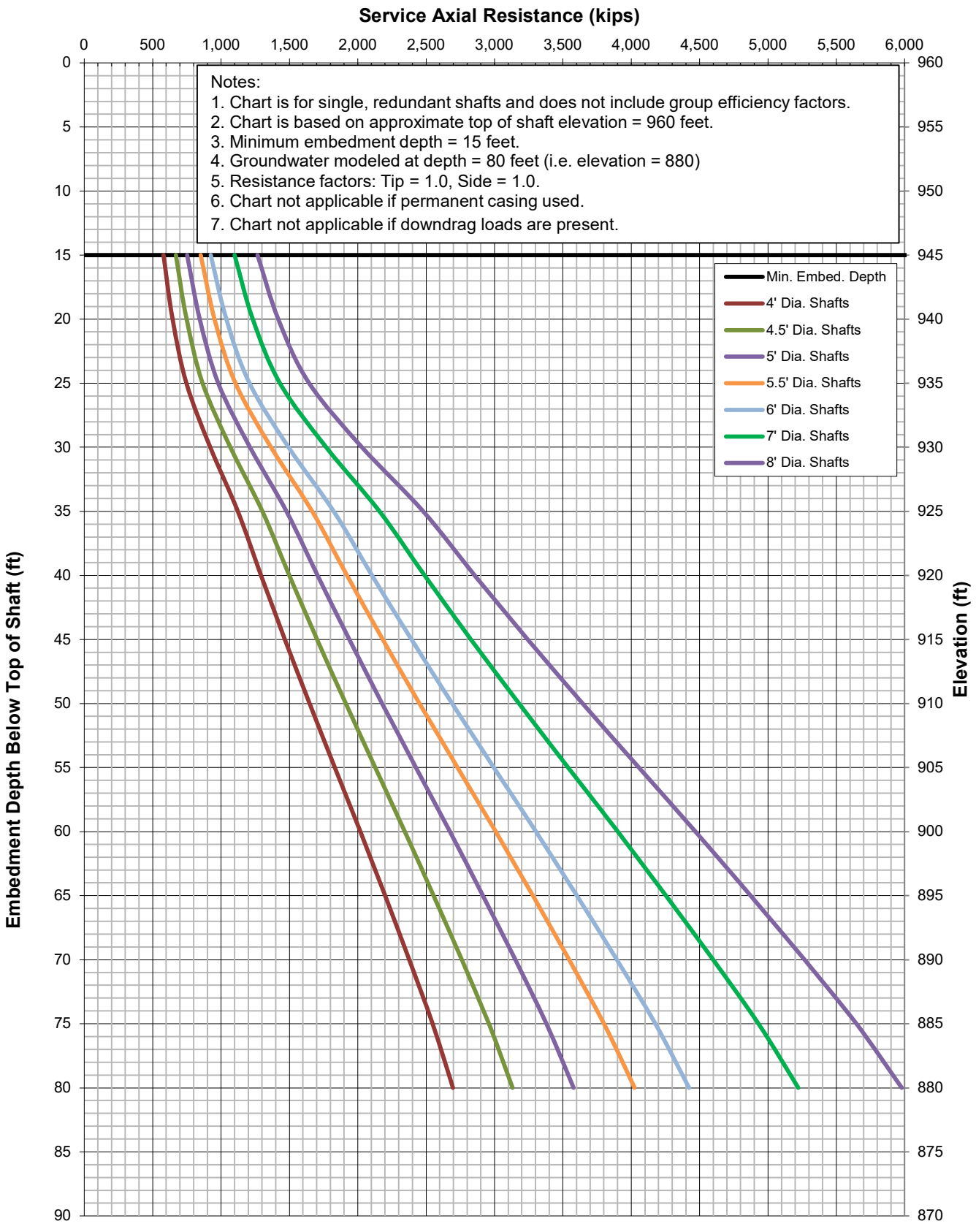
Designer:	Date:
P. Garza	4/11/2022

DRILLED SHAFT FOUNDATION DESIGN CHART
Service Limit (0.75 Inch Settlement) - Axial Resistance in Kips

SR 303L, MC 85 to Van Buren Street
Yuma Road OP
Based on Borings B-73 to B-78

Figure

E11



ethos ENGINEERING, LLC.

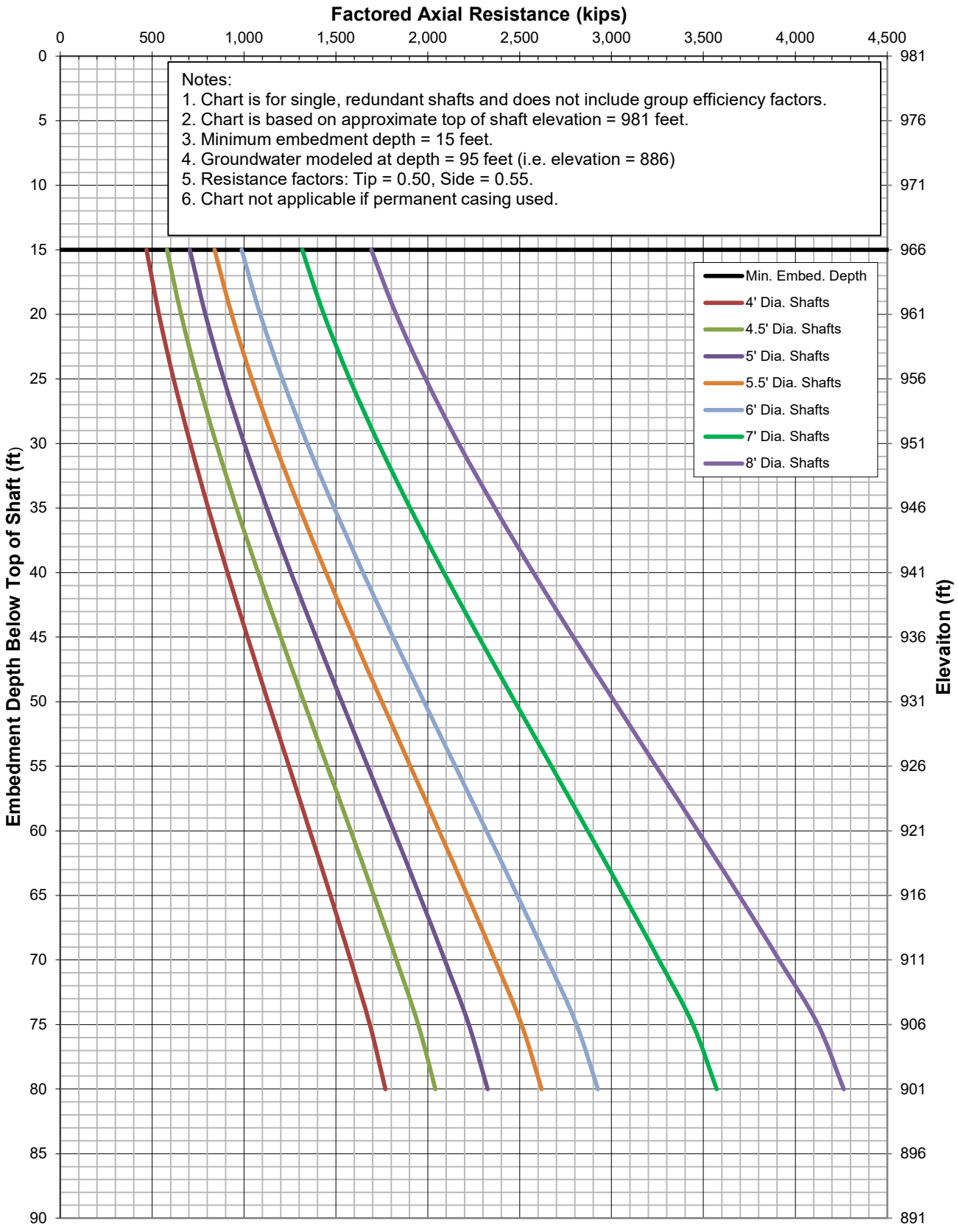
Designer:	Date:
P. Garza	4/11/2022

DRILLED SHAFT FOUNDATION DESIGN CHART
Service Limit (1.0 Inch Settlement) - Axial Resistance in Kips

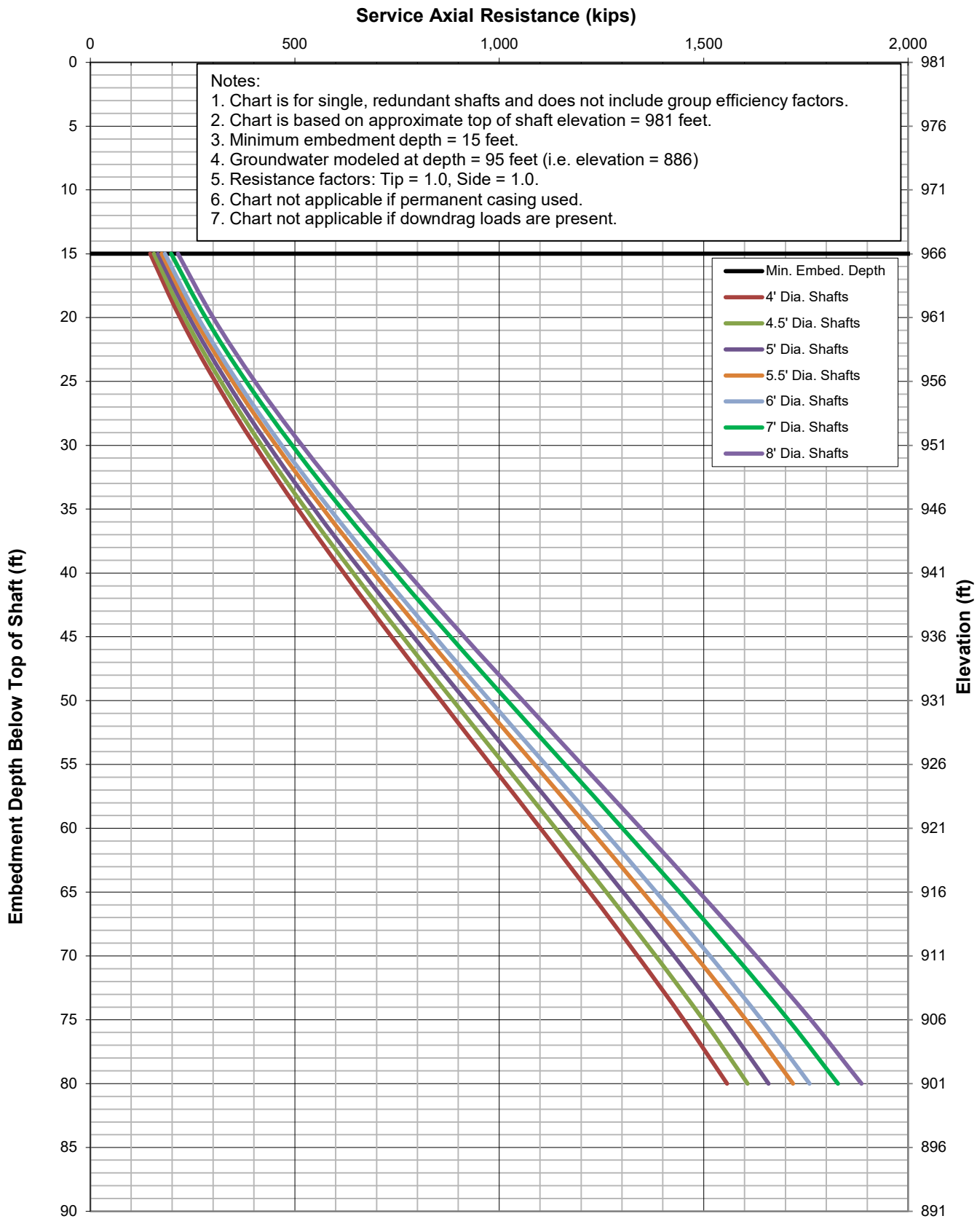
SR 303L, MC 85 to Van Buren Street
Yuma Road OP
Based on Borings B-73 to B-78

Figure

E12



ethos ENGINEERING, LLC.		**DRILLED SHAFT FOUNDATION DESIGN CHART** **Strength Limit Axial Resistance in Kips**	Figure
Designer:	Date:	**SR 303L, MC 85 to Van Buren Street** **Lilac Street OP** **Based on Borings B102, B103, B104, & B-105**	E13
P. Garza	4/1/2022		



ethos ENGINEERING, LLC.

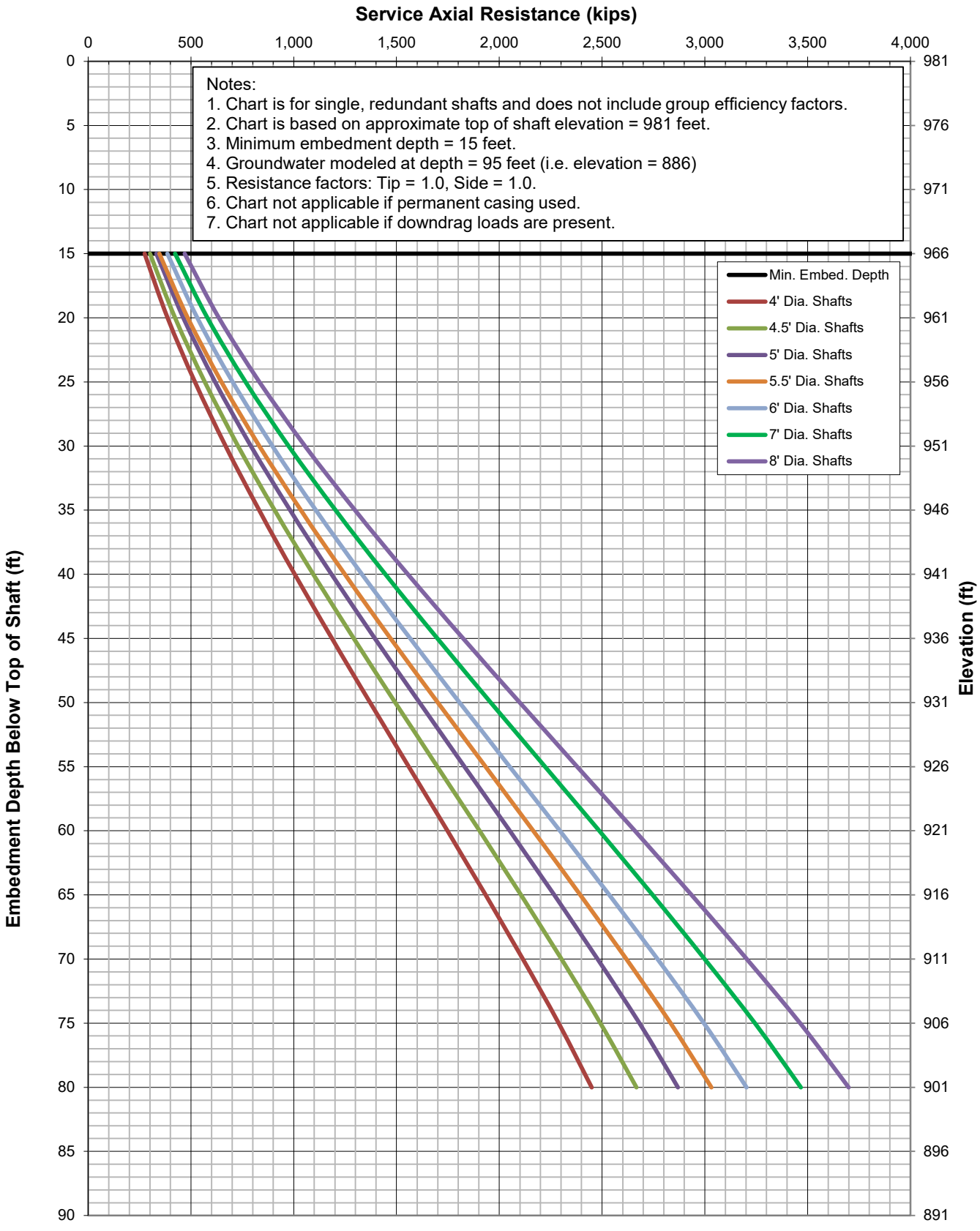
Designer:	Date:
P. Garza	4/1/2022

DRILLED SHAFT FOUNDATION DESIGN CHART
Service Limit (0.10 Inch Settlement) - Axial Resistance in Kips

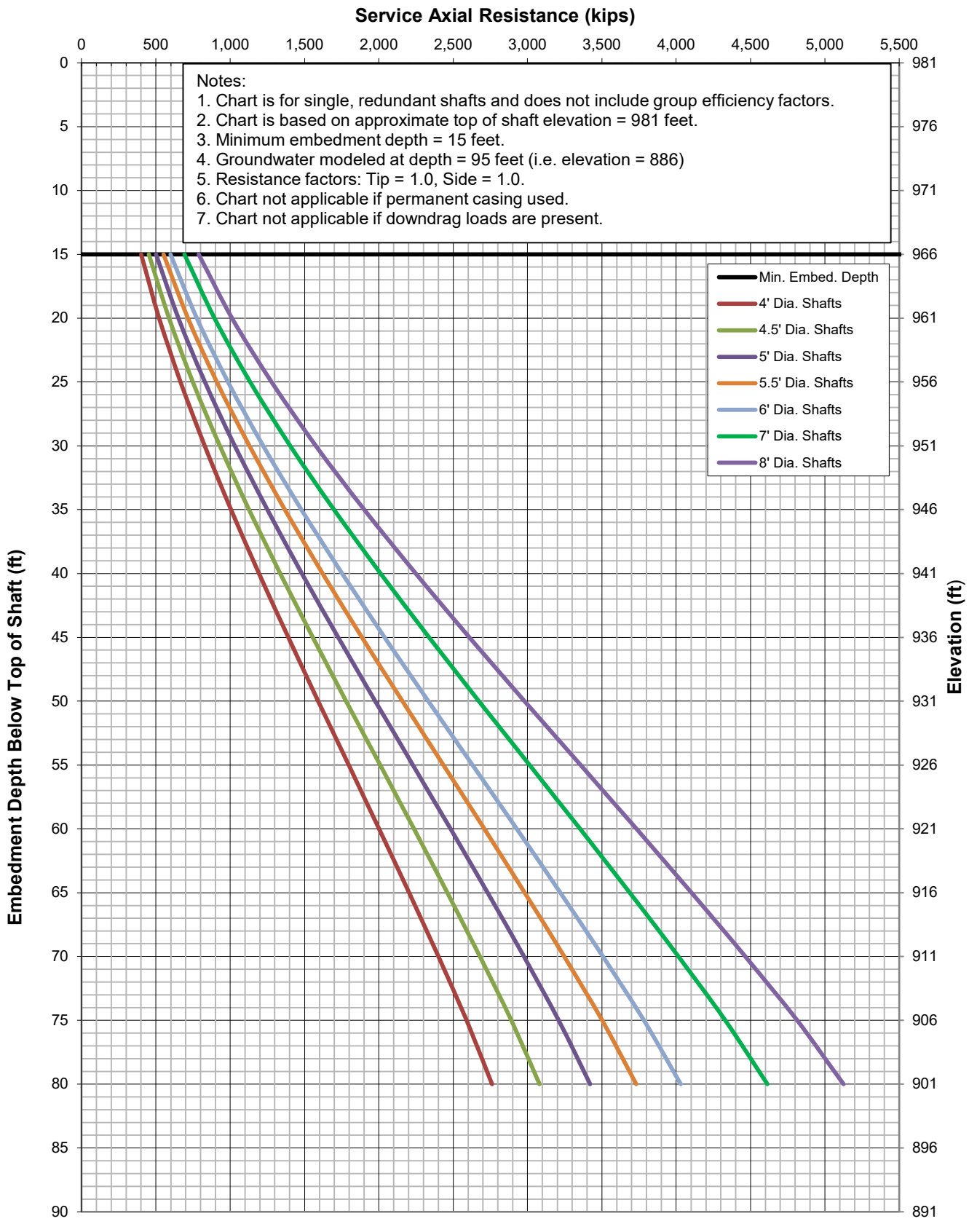
SR 303L, MC 85 to Van Buren Street
Lilac Street OP
Based on Borings B102, B103, B104, & B-105

Figure

E14



ethos ENGINEERING, LLC.	**DRILLED SHAFT FOUNDATION DESIGN CHART** **Service Limit (0.25 Inch Settlement) - Axial Resistance in Kips** **SR 303L, MC 85 to Van Buren Street** **Lilac Street OP** **Based on Borings B102, B103, B104, & B-105**	Figure E15
Designer: P. Garza / Date: 4/1/2022		



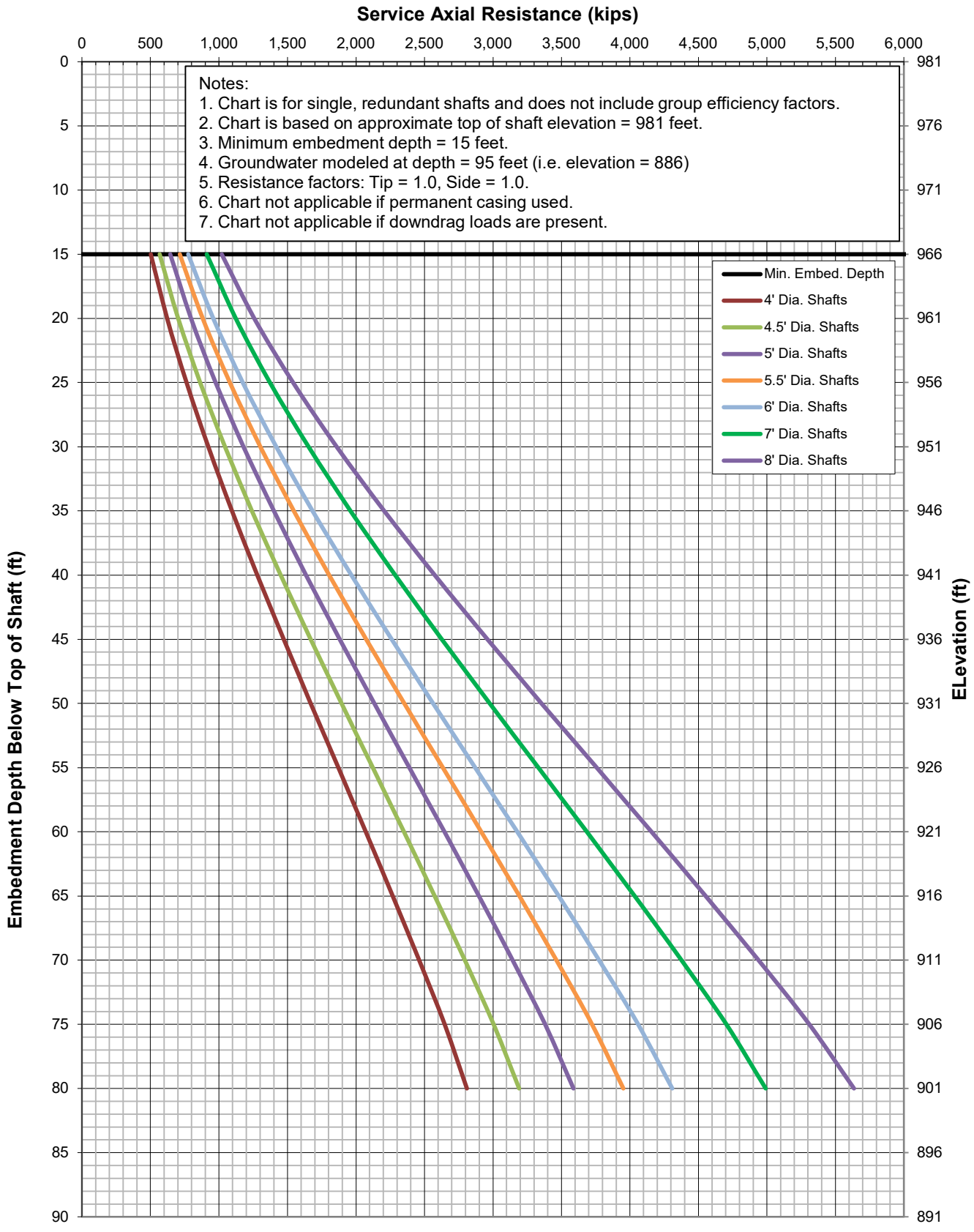
Designer:	Date:
P. Garza	4/1/2022

DRILLED SHAFT FOUNDATION DESIGN CHART
Service Limit (0.5 Inch Settlement) - Axial Resistance in Kips

SR 303L, MC 85 to Van Buren Street
Lilac Street OP
Based on Borings B102, B103, B104, & B-105

Figure

E16



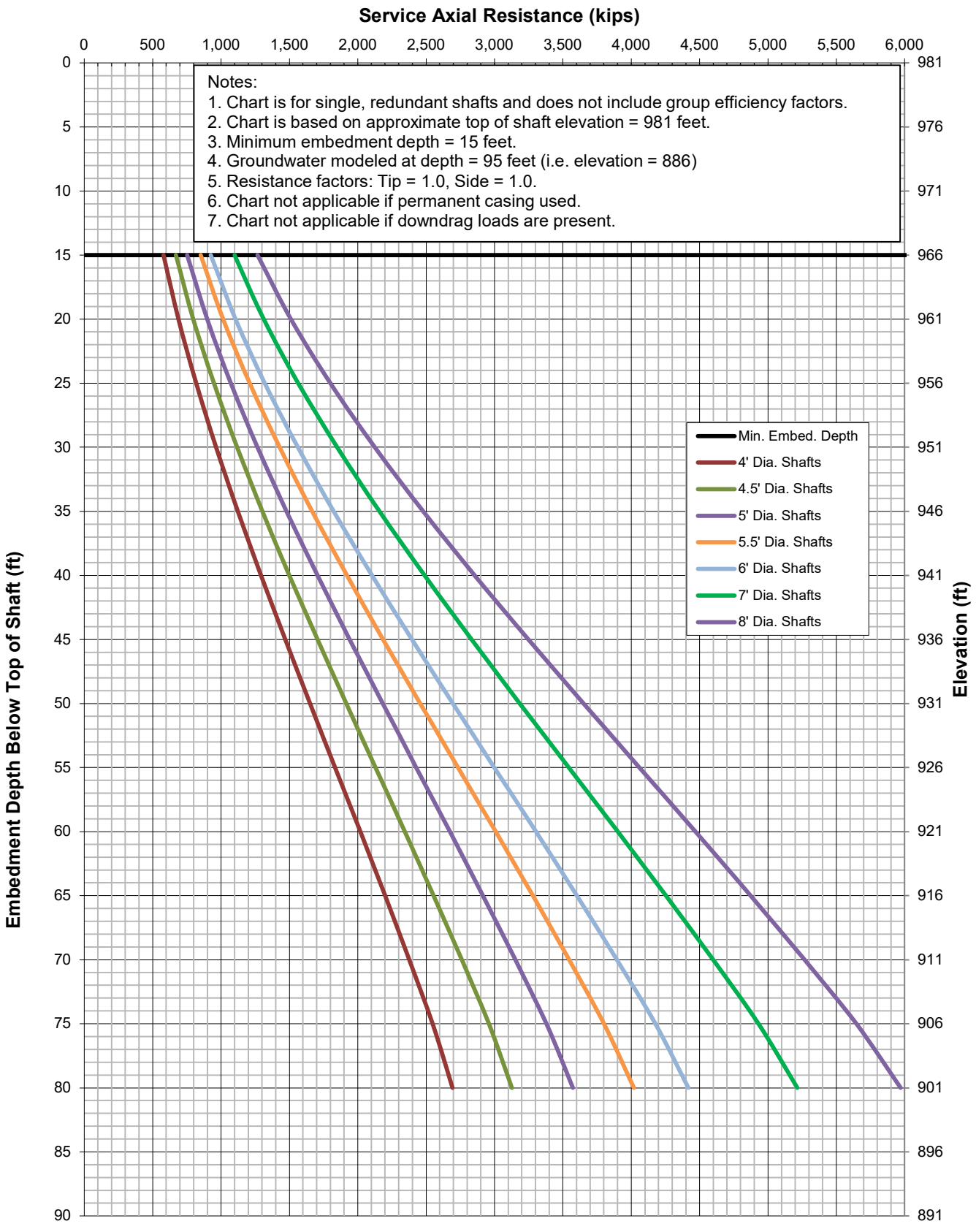
Designer:	Date:
P. Garza	4/1/2022

DRILLED SHAFT FOUNDATION DESIGN CHART
Service Limit (0.75 Inch Settlement) - Axial Resistance in Kips

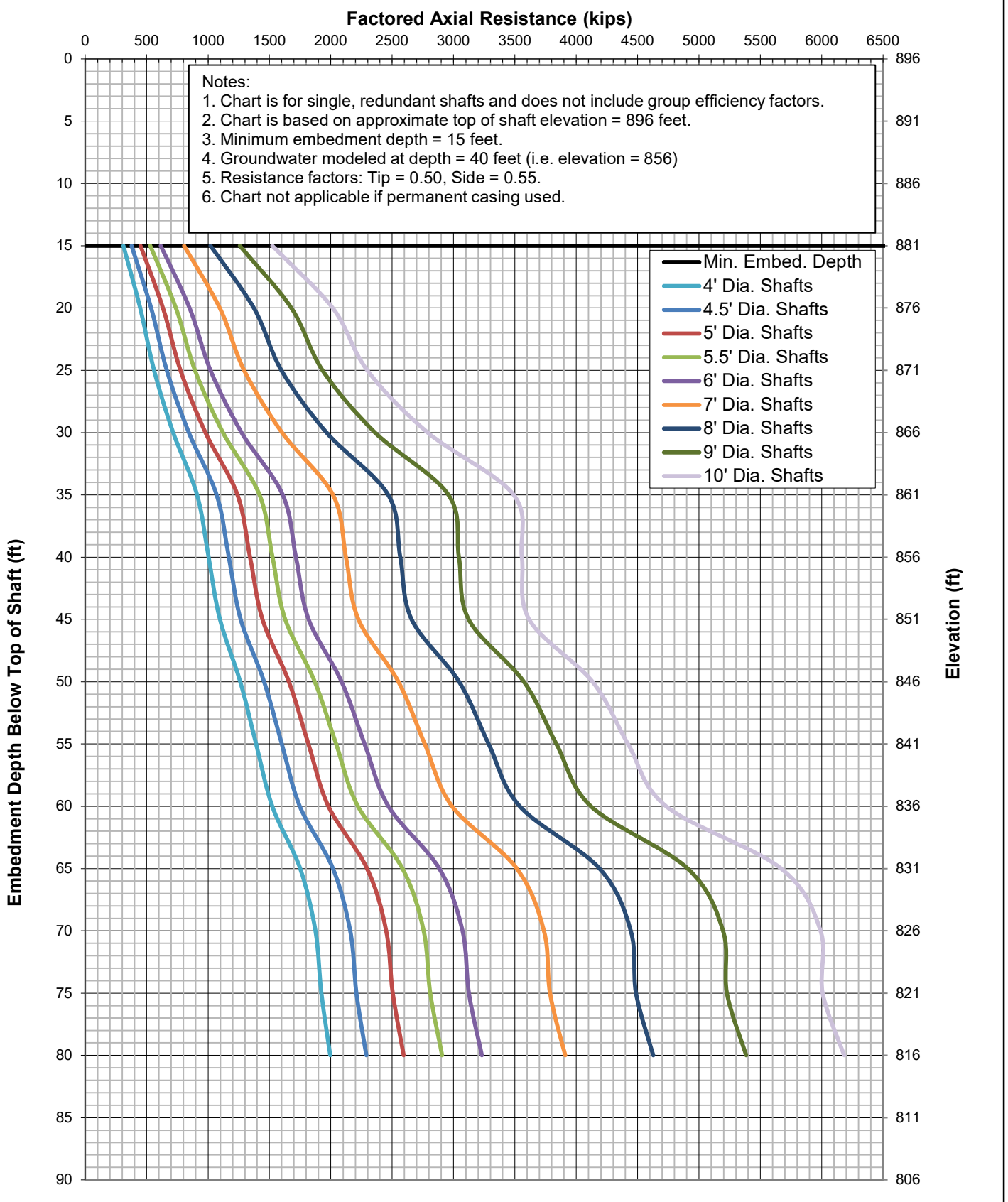
SR 303L, MC 85 to Van Buren Street
Lilac Street OP
Based on Borings B102, B103, B104, & B-105

Figure

E17



ethos ENGINEERING, LLC.	**DRILLED SHAFT FOUNDATION DESIGN CHART** **Service Limit (1.0 Inch Settlement) - Axial Resistance in Kips** **SR 303L, MC 85 to Van Buren Street** **Lilac Street OP** **Based on Borings B102, B103, B104, & B-105**	Figure E18
Designer: P. Garza / Date: 4/1/2022		



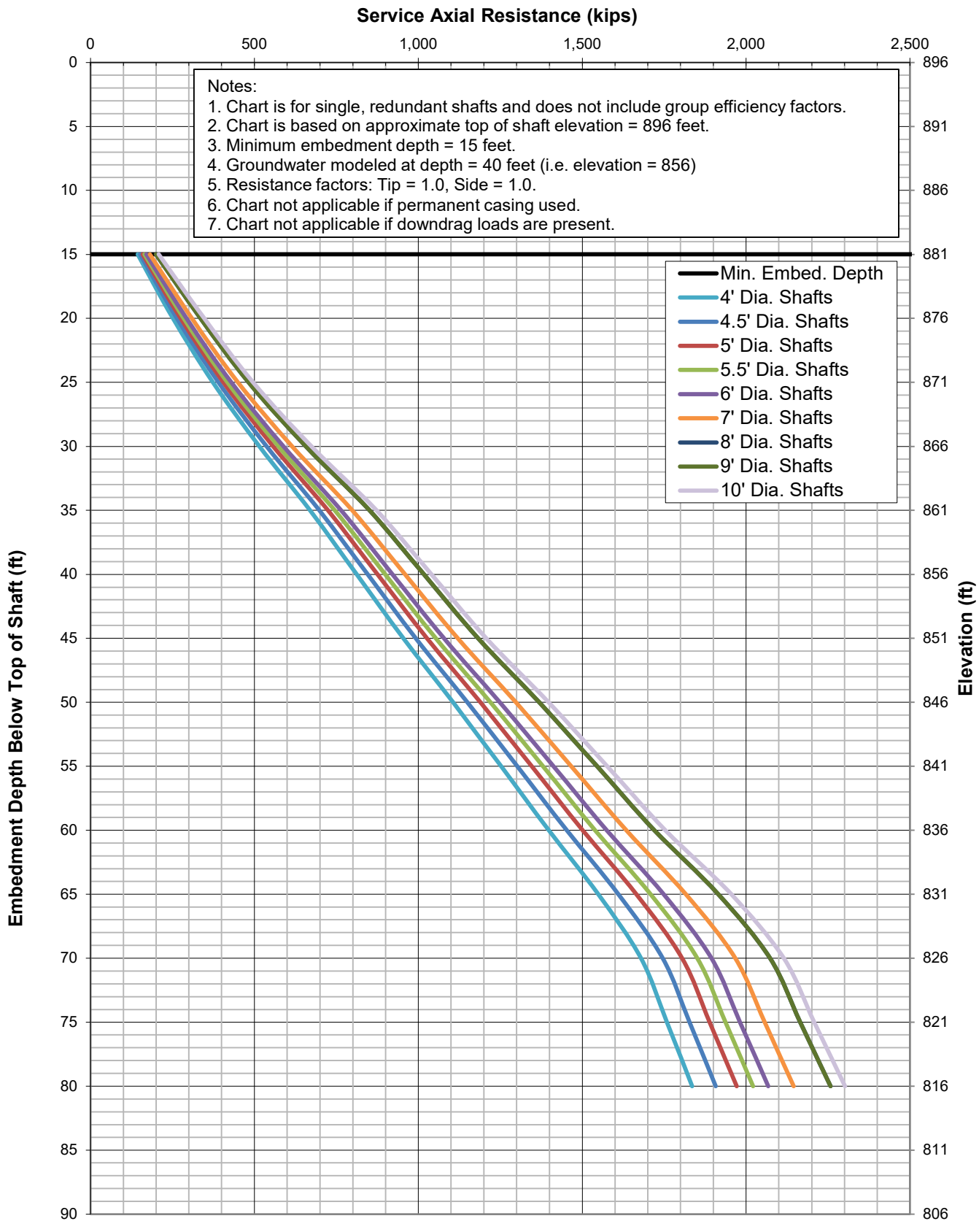
Designer:	Date:
M. Meza	6/24/2024

DRILLED SHAFT FOUNDATION DESIGN CHART
Strength Limit Axial Resistance in Kips

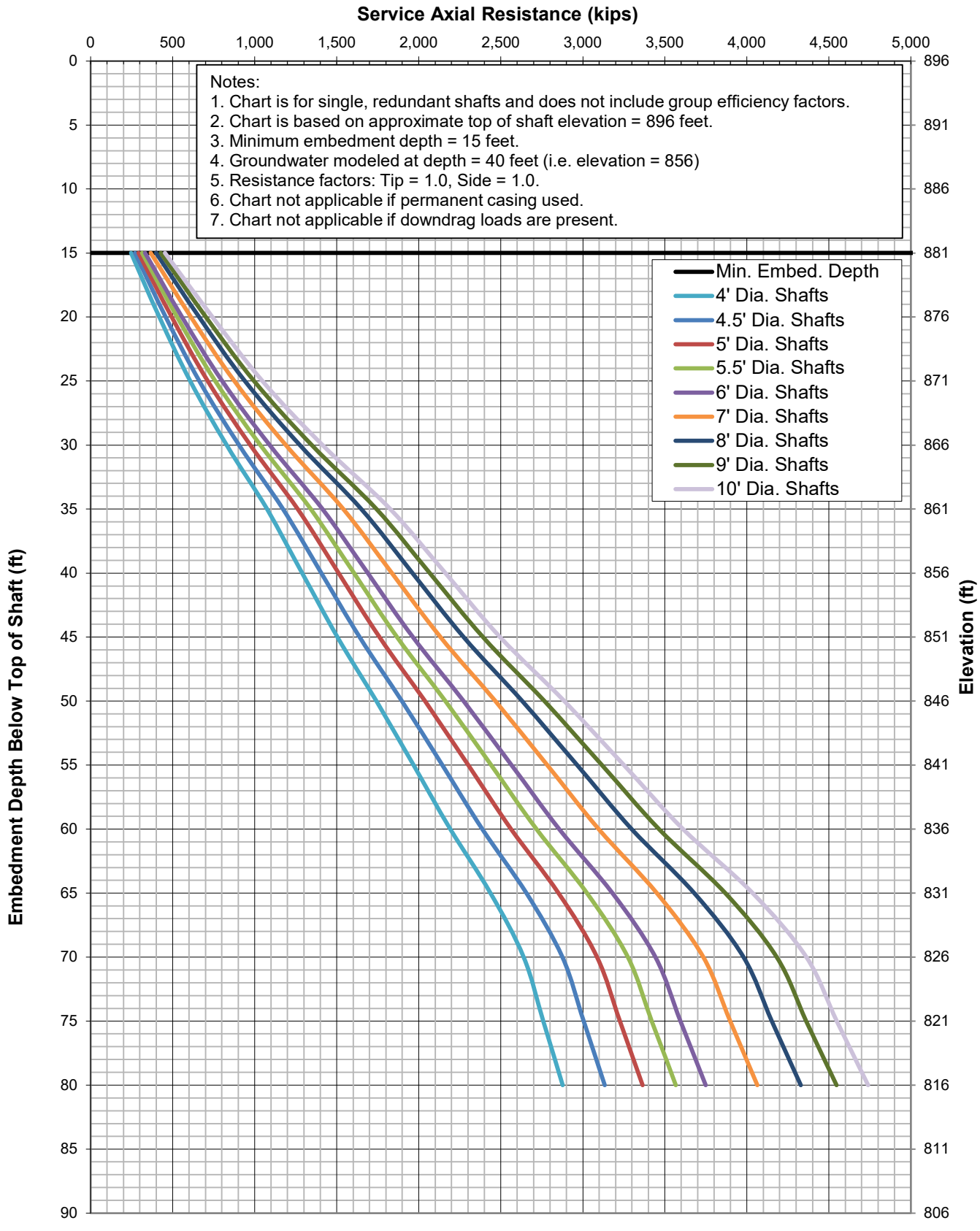
SR 303L, MC 85 to Van Buren Street
SR 303L, UPRR
Abutments

Figure

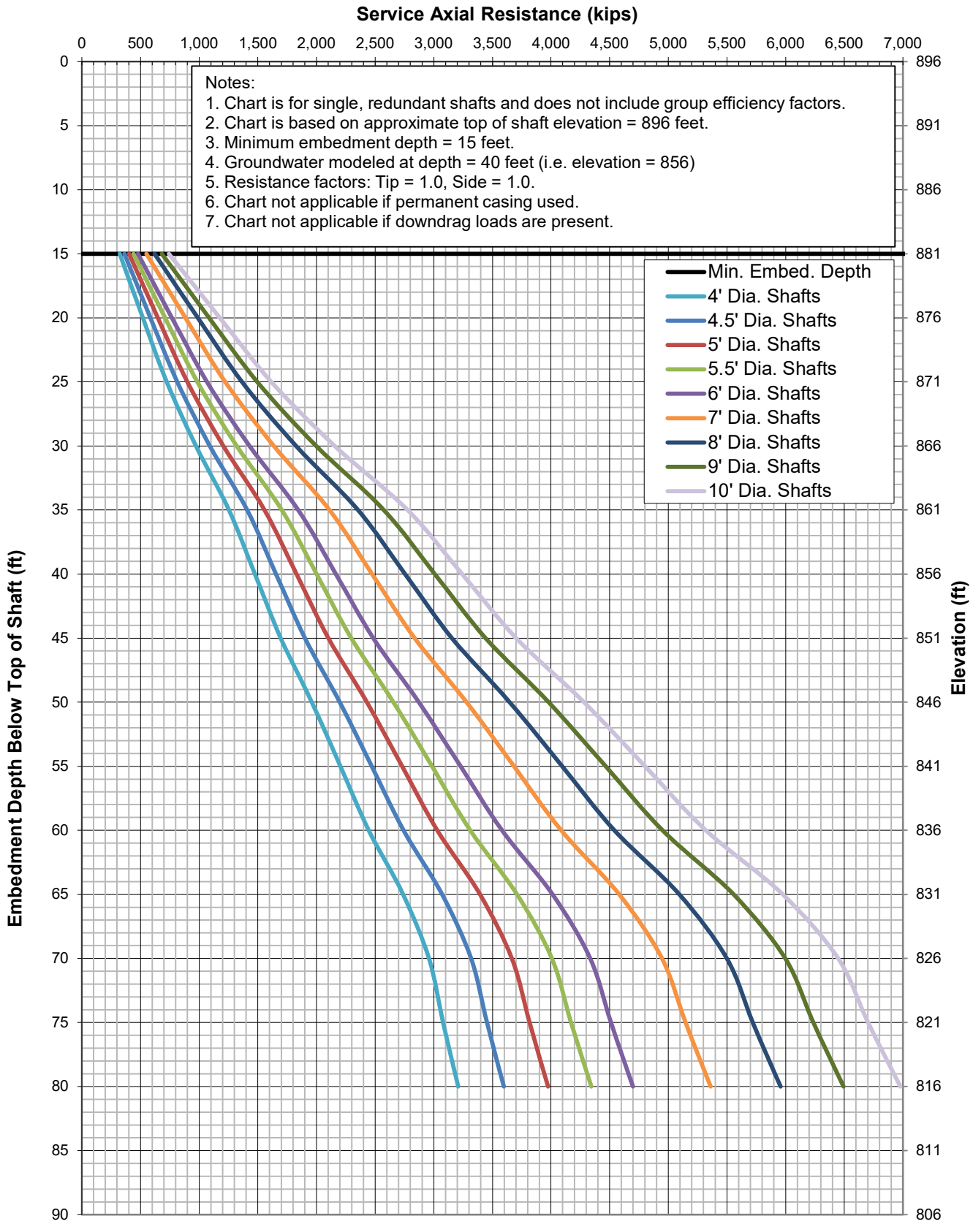
E19



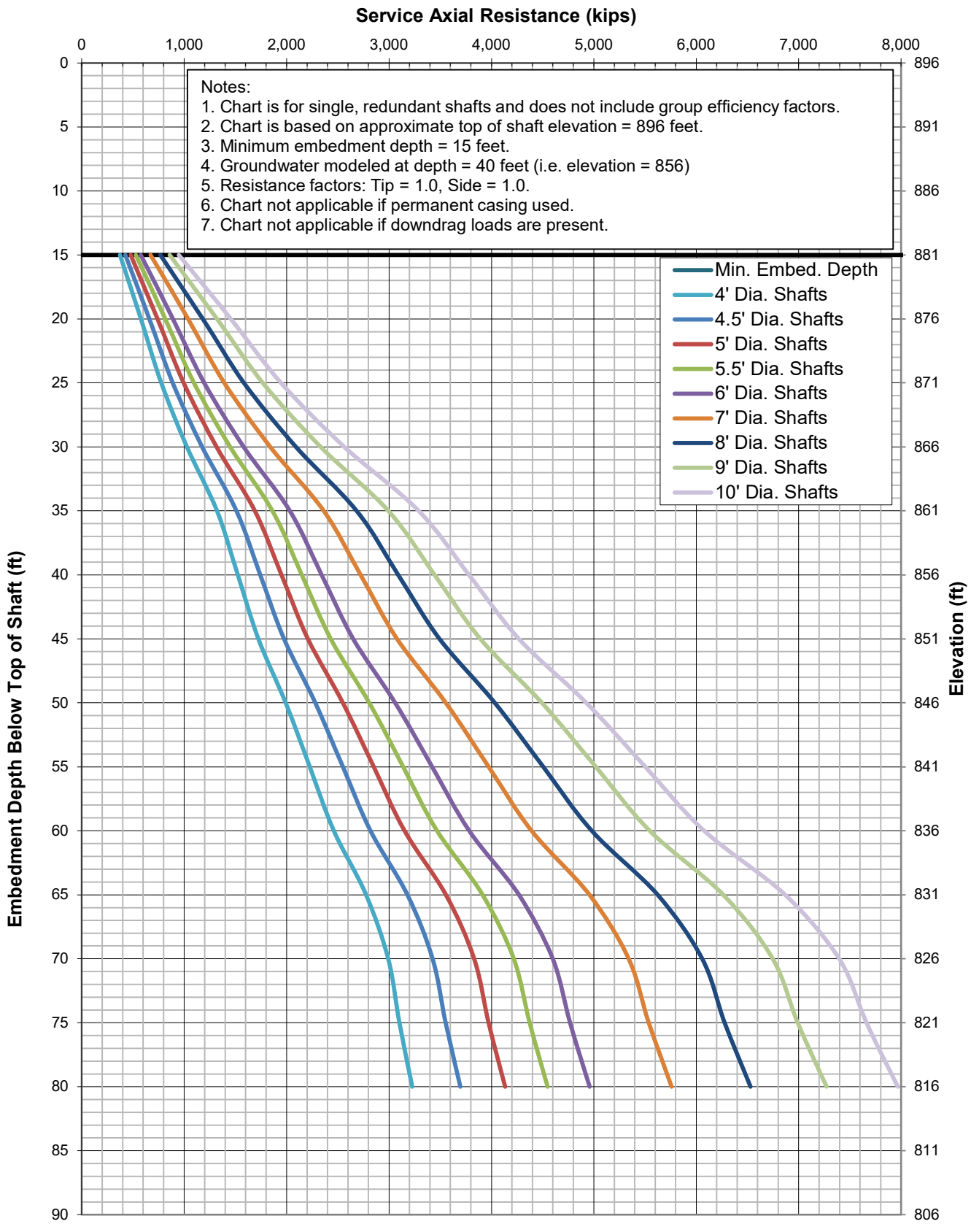
ethos ENGINEERING, LLC.		**DRILLED SHAFT FOUNDATION DESIGN CHART** **Service Limit (0.10 Inch Settlement) - Axial Resistance in Kips** **SR 303L, MC 85 to Van Buren Street** **SR 303L, UPRR** **Abutments**	Figure E20
Designer:	Date:		
M. Meza	6/24/2024		



ethos ENGINEERING, LLC.		**DRILLED SHAFT FOUNDATION DESIGN CHART** **Service Limit (0.25 Inch Settlement) - Axial Resistance in Kips** **SR 303L, MC 85 to Van Buren Street** **SR 303L, UPRR** **Abutments**	Figure E21
Designer:	Date:		
M. Meza	6/24/2024		



ethos ENGINEERING, LLC.		**DRILLED SHAFT FOUNDATION DESIGN CHART** **Service Limit (0.5 Inch Settlement) - Axial Resistance in Kips**	Figure
Designer:	Date:	**SR 303L, MC 85 to Van Buren Street** **SR 303L, UPRR** **Abutments**	E22
M. Meza	6/24/2024		



ethos ENGINEERING, LLC.

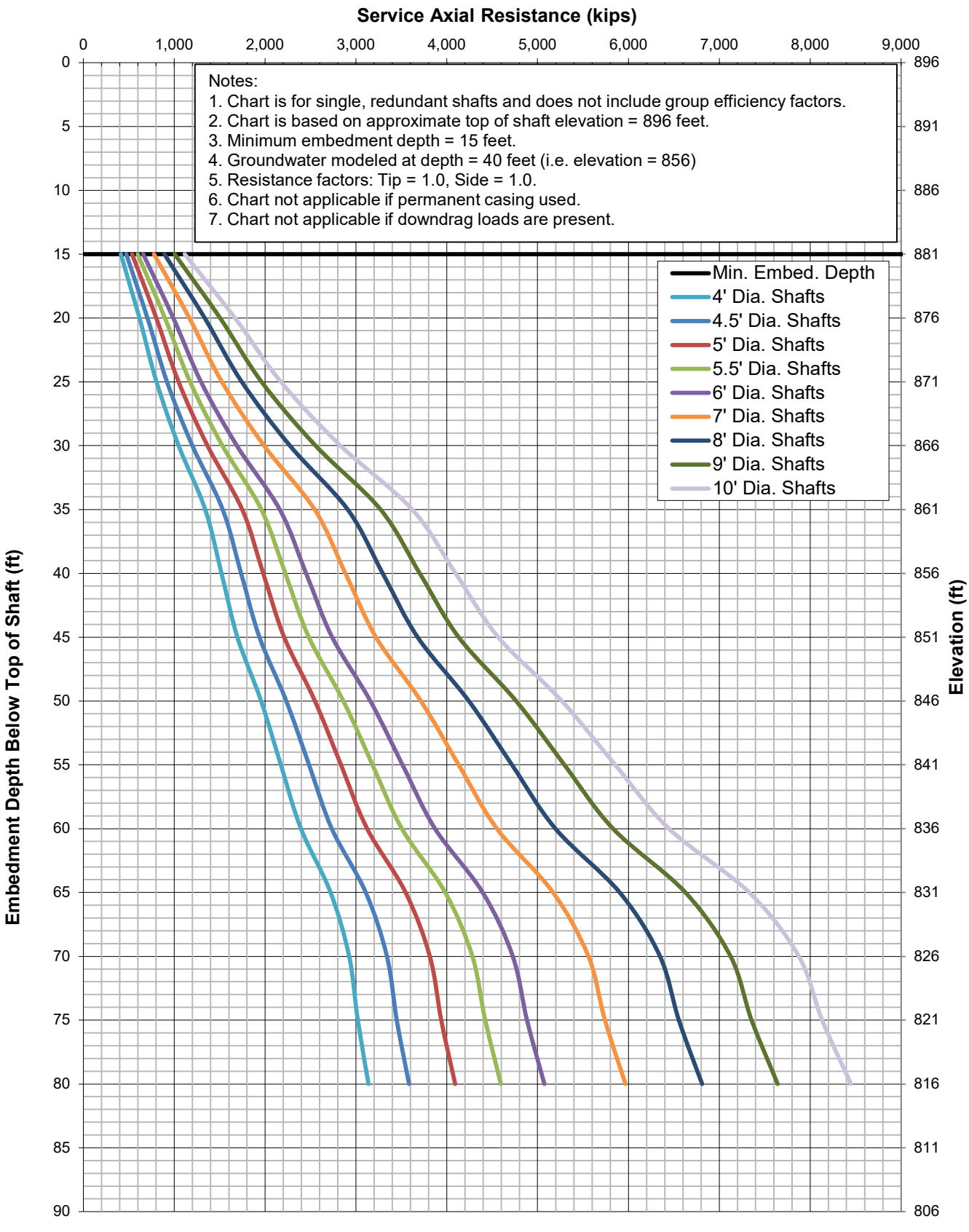
Designer:	Date:
M. Meza	6/24/2024

DRILLED SHAFT FOUNDATION DESIGN CHART
Service Limit (0.75 Inch Settlement) - Axial Resistance in Kips

SR 303L, MC 85 to Van Buren Street
SR 303L, UPRR
Abutments

Figure

E23



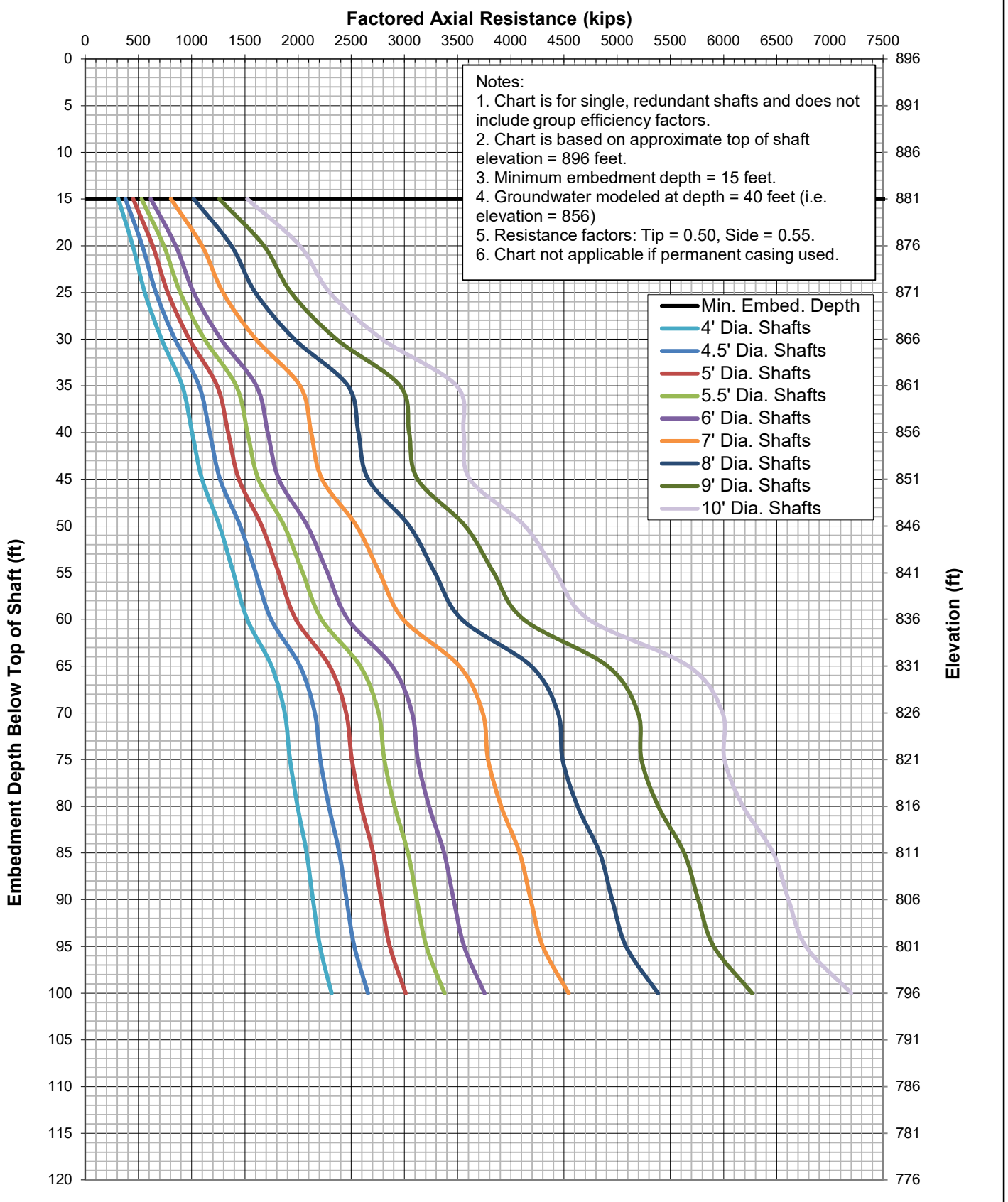
Designer:	Date:
M. Meza	6/24/2024

DRILLED SHAFT FOUNDATION DESIGN CHART
Service Limit (1 Inch Settlement) - Axial Resistance in Kips

SR 303L, MC 85 to Van Buren Street
SR 303L, UPRR
Abutments

Figure

E24



ethos ENGINEERING, LLC.

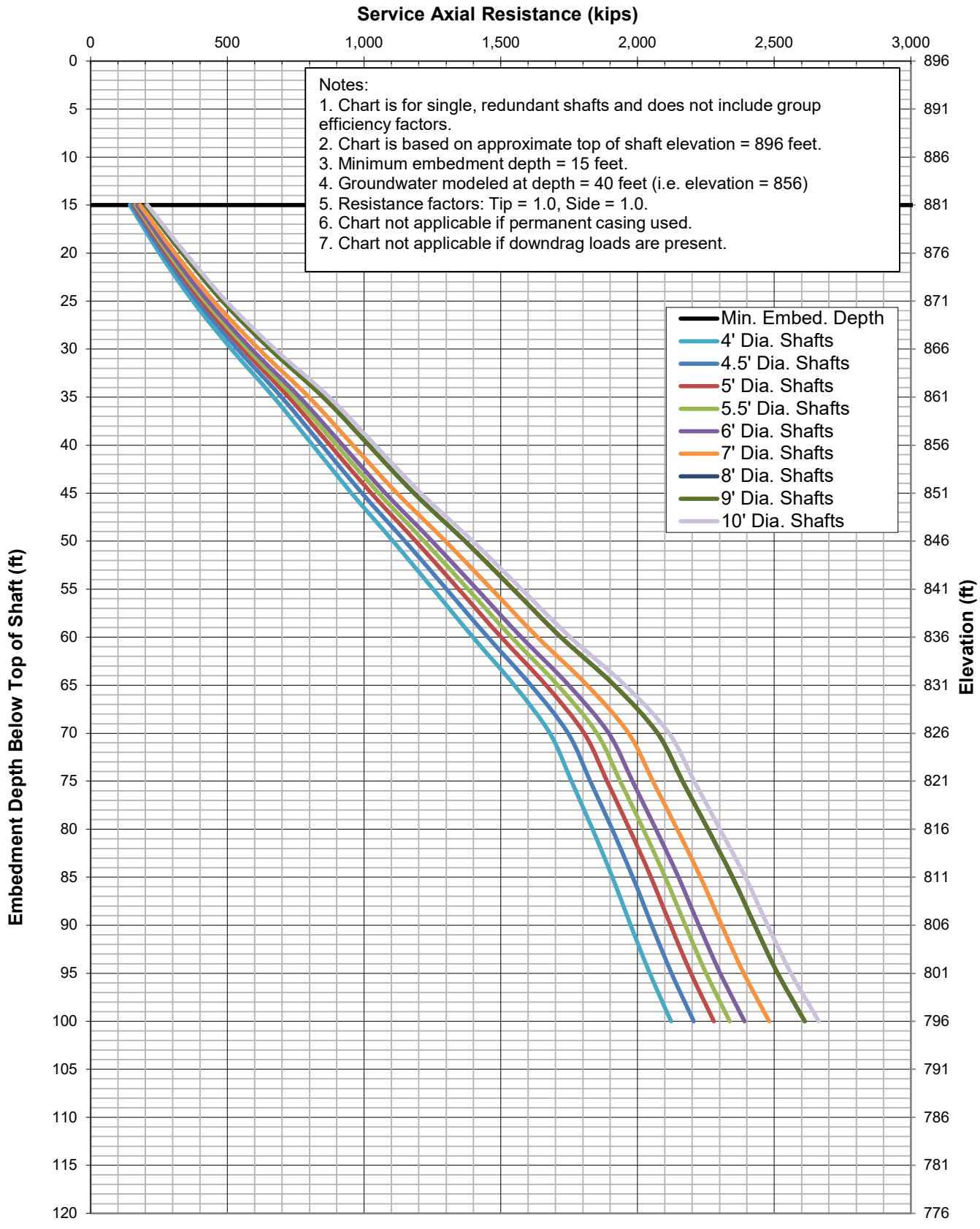
Designer:	Date:
M. Meza	6/24/2024

DRILLED SHAFT FOUNDATION DESIGN CHART
Strength Limit Axial Resistance in Kips

SR 303L, MC 85 to Van Buren Street
SR 303L, UPRR
Piers

Figure

E25



ethos ENGINEERING, LLC.

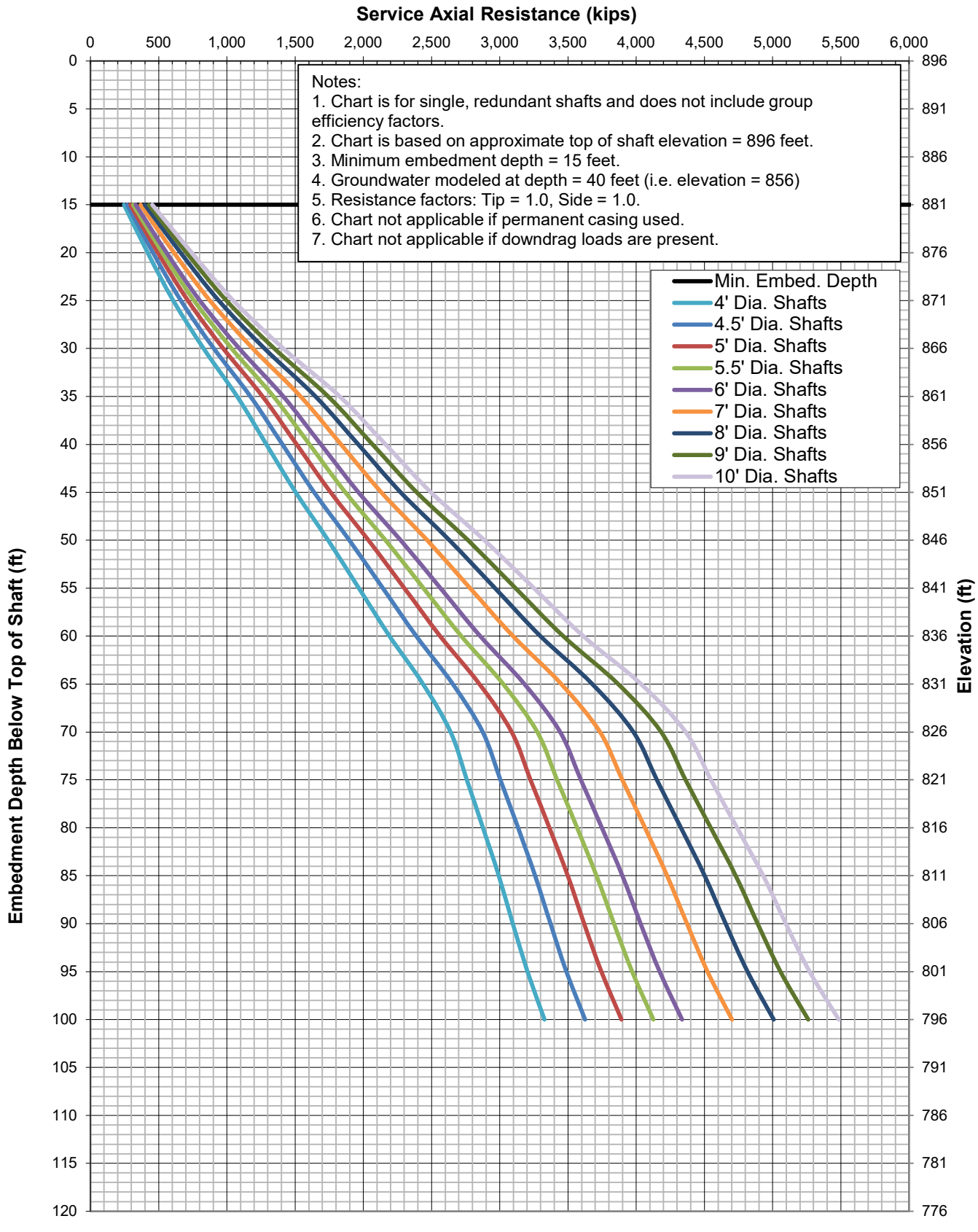
Designer:	Date:
M. Meza	6/24/2024

DRILLED SHAFT FOUNDATION DESIGN CHART
Service Limit (0.10 Inch Settlement) - Axial Resistance in Kips

SR 303L, MC 85 to Van Buren Street
SR 303L, UPRR
Piers

Figure

E26



ethos ENGINEERING, LLC.

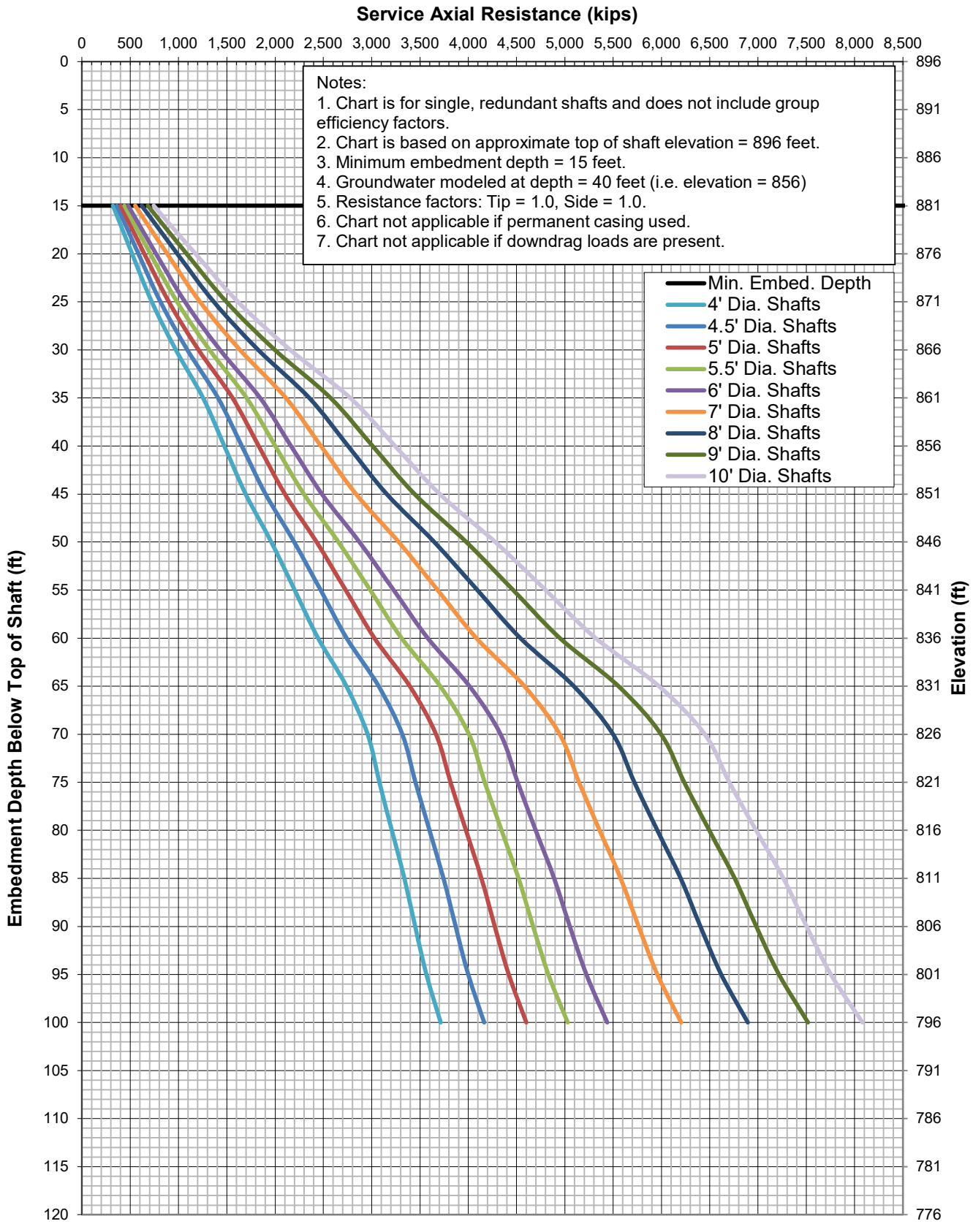
Designer:	Date:
M. Meza	6/24/2024

DRILLED SHAFT FOUNDATION DESIGN CHART
Service Limit (0.25 Inch Settlement) - Axial Resistance in Kips

SR 303L, MC 85 to Van Buren Street
SR 303L, UPRR
Piers

Figure

E27



ethos ENGINEERING, LLC.

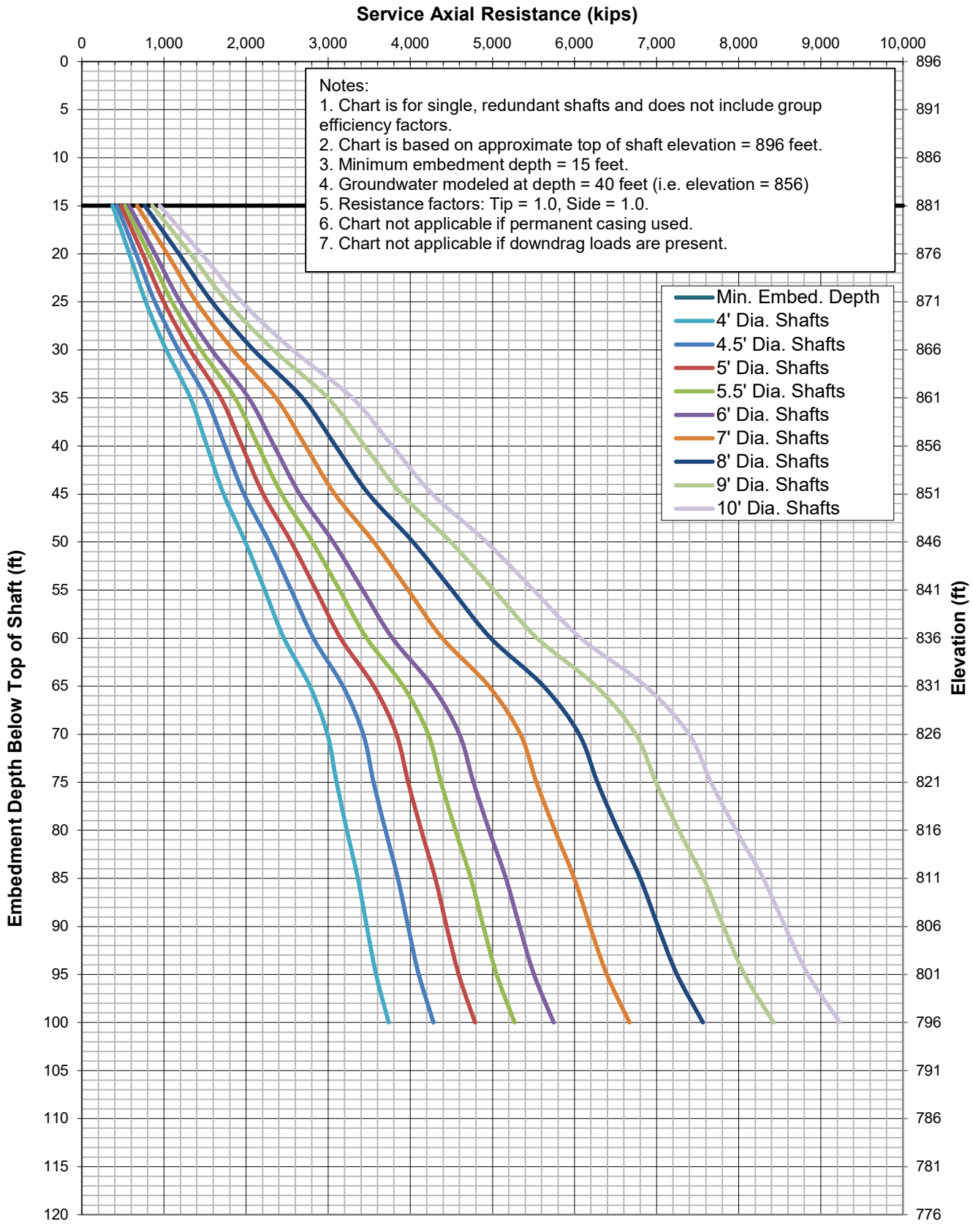
Designer:	Date:
M. Meza	6/24/2024

DRILLED SHAFT FOUNDATION DESIGN CHART
Service Limit (0.5 Inch Settlement) - Axial Resistance in Kips

SR 303L, MC 85 to Van Buren Street
SR 303L, UPRR
Piers

Figure

E28



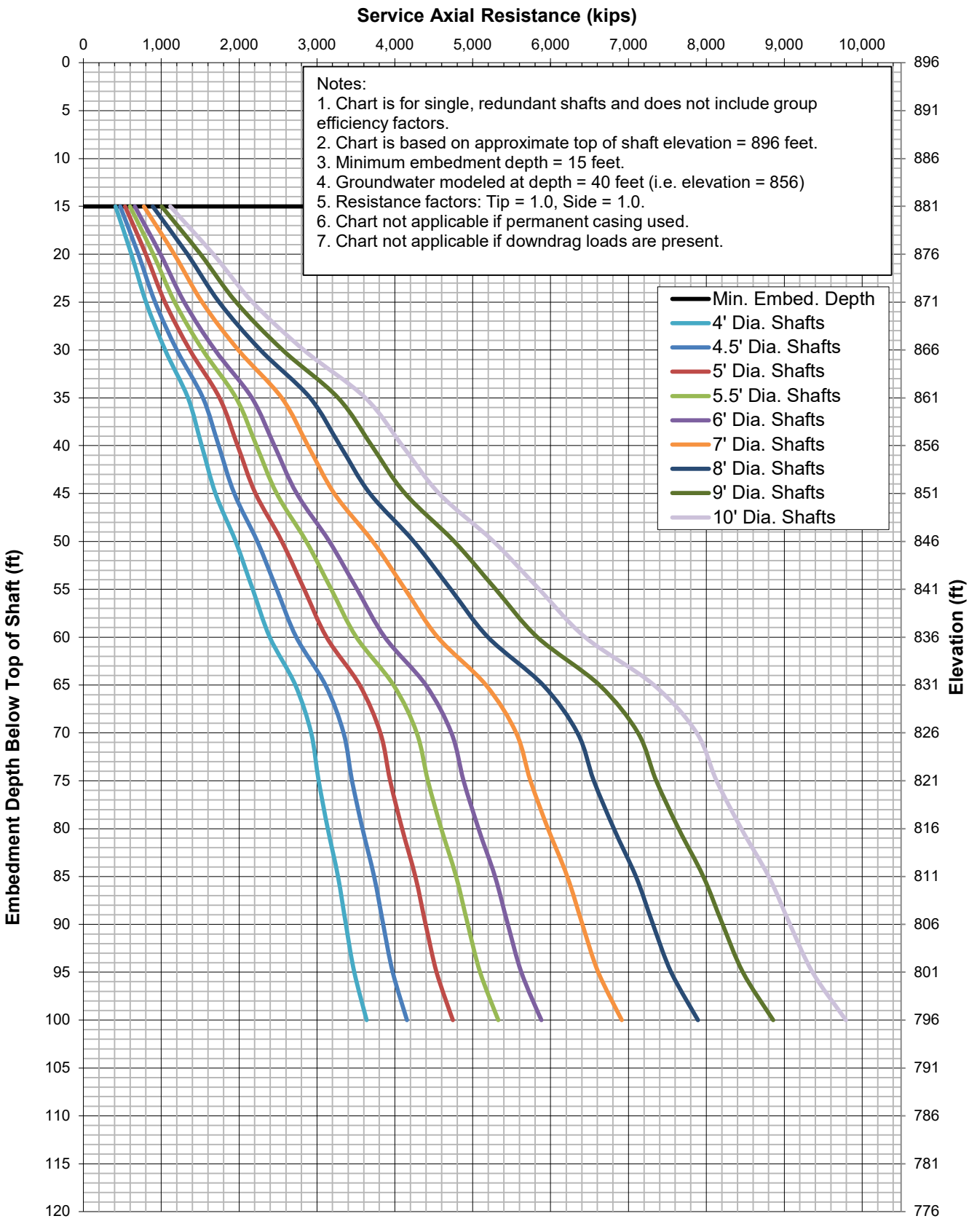
ethos ENGINEERING, LLC.	
Designer:	Date:
M. Meza	6/24/2024

DRILLED SHAFT FOUNDATION DESIGN CHART
Service Limit (0.75 Inch Settlement) - Axial Resistance in Kips

SR 303L, MC 85 to Van Buren Street
SR 303L, UPRR
Piers

Figure

E29



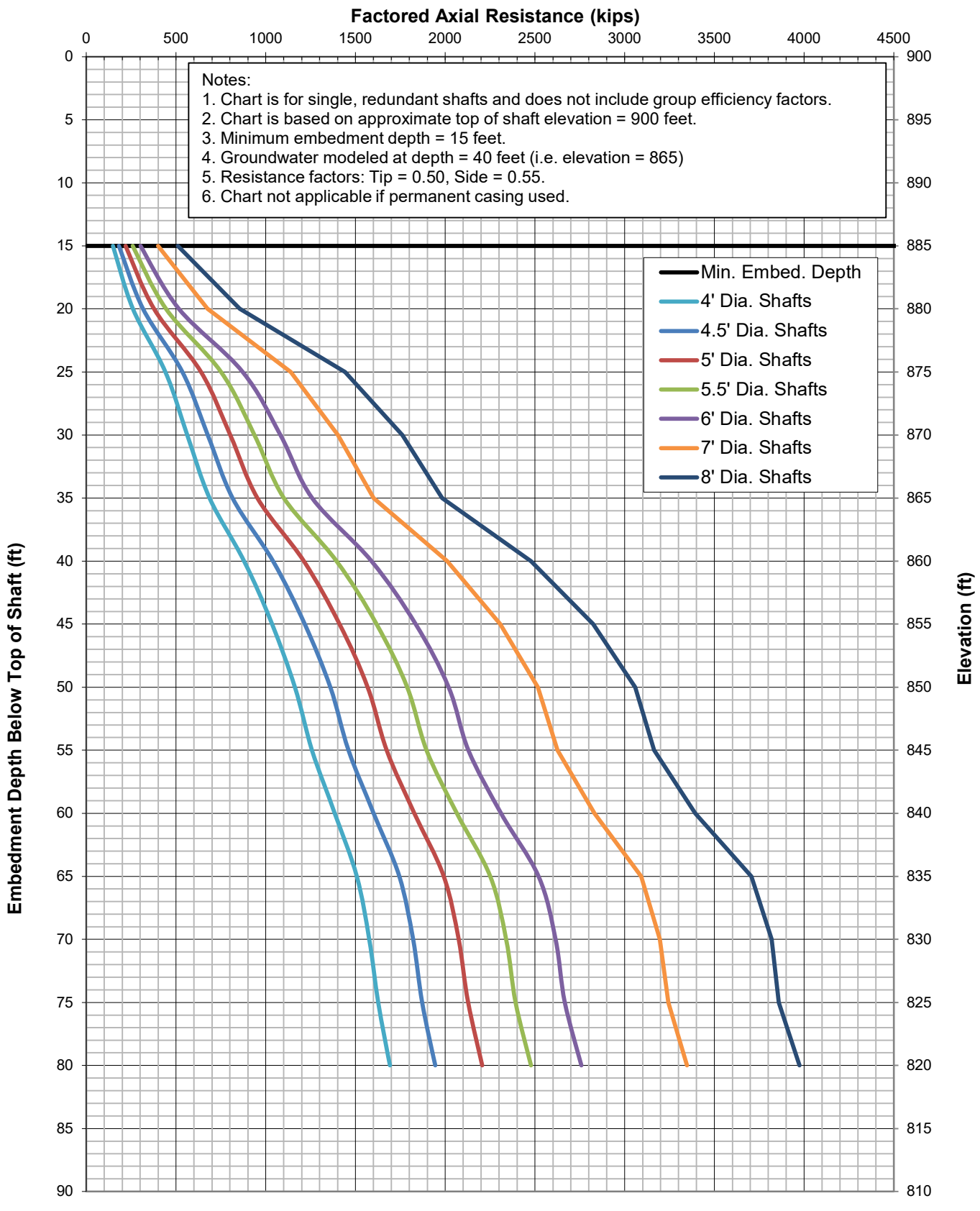
Designer:	Date:
M. Meza	6/24/2024

DRILLED SHAFT FOUNDATION DESIGN CHART
Service Limit (1 Inch Settlement) - Axial Resistance in Kips

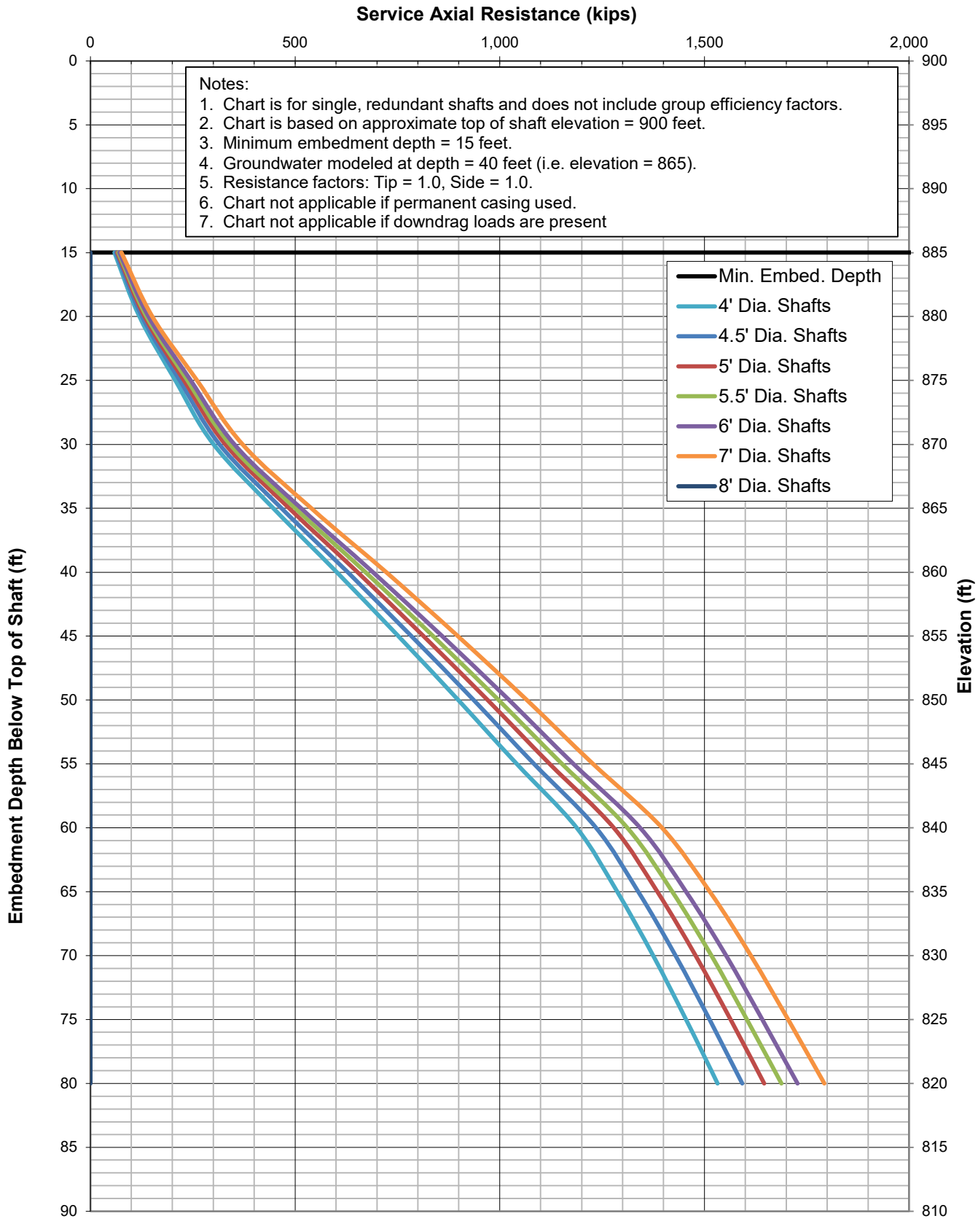
SR 303L, MC 85 to Van Buren Street
SR 303L, UPRR
Piers

Figure

E30



ethos ENGINEERING, LLC.		**DRILLED SHAFT FOUNDATION DESIGN CHART** **Strength Limit Axial Resistance in Kips** **SR 303L, MC 85 to Van Buren Street** **Broadway Road OP** **Abutments**	Figure E31
Designer:	Date:		
M. Meza	6/24/2024		



ethos ENGINEERING, LLC.

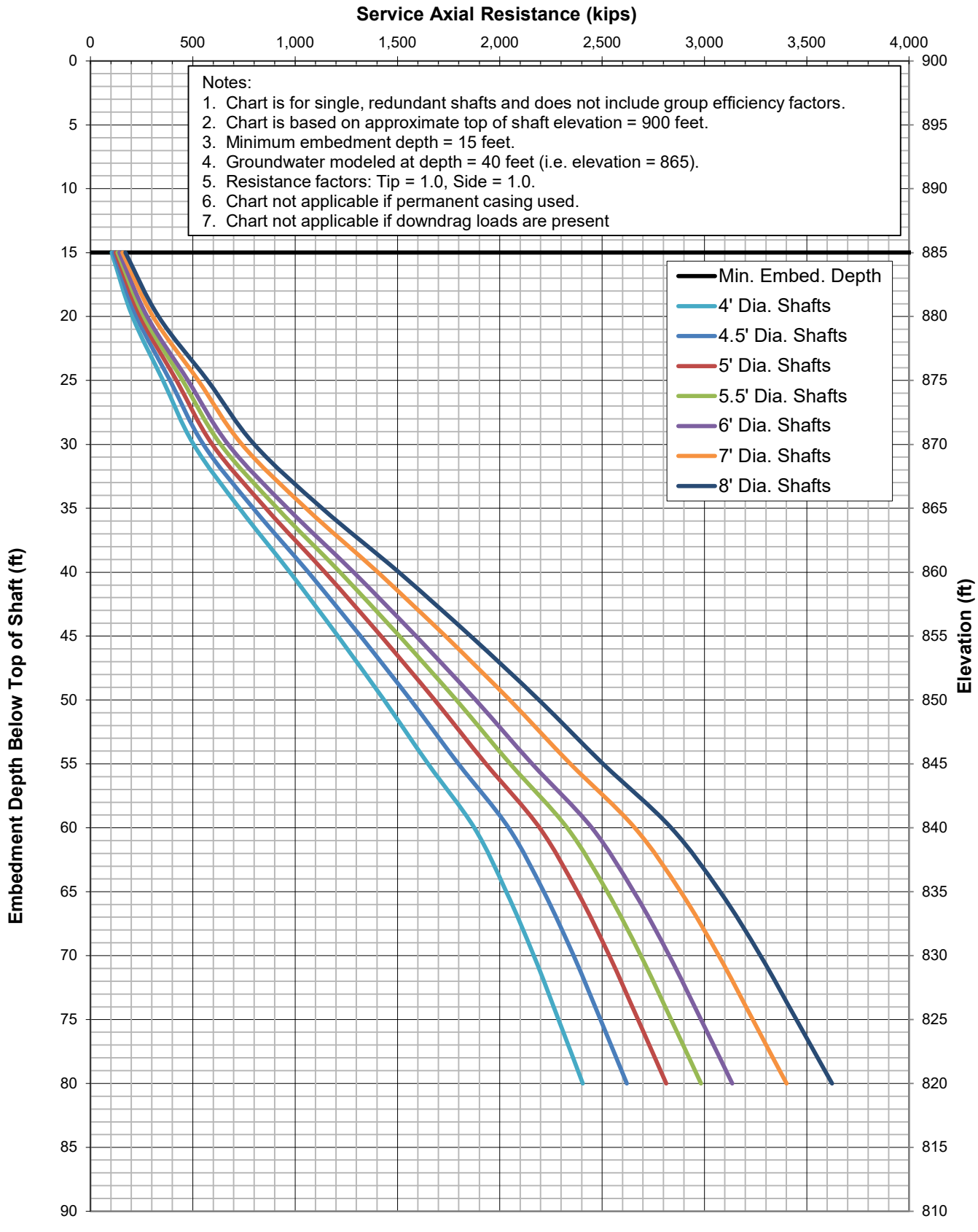
Designer:	Date:
M. Meza	6/24/2024

DRILLED SHAFT FOUNDATION DESIGN CHART
Service Limit (0.10 Inch Settlement) - Axial Resistance in Kips

SR 303L, MC 85 to Van Buren Street
Broadway Road OP
Abutments

Figure

E32



ethos ENGINEERING, LLC.

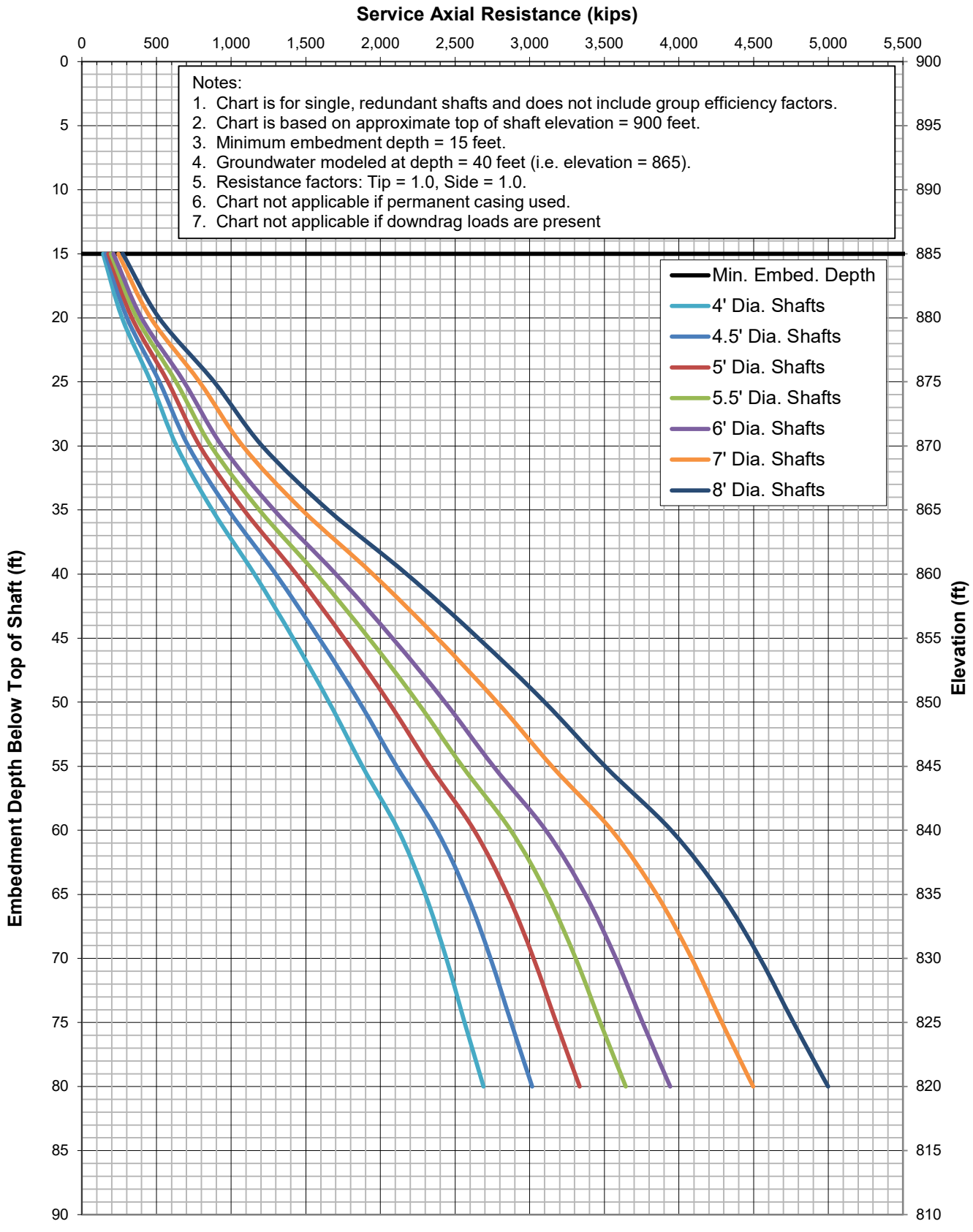
Designer:	Date:
M. Meza	6/24/2024

DRILLED SHAFT FOUNDATION DESIGN CHART
Service Limit (0.25 Inch Settlement) - Axial Resistance in Kips

SR 303L, MC 85 to Van Buren Street
Broadway Road OP
Abutments

Figure

E33



ethos ENGINEERING, LLC.

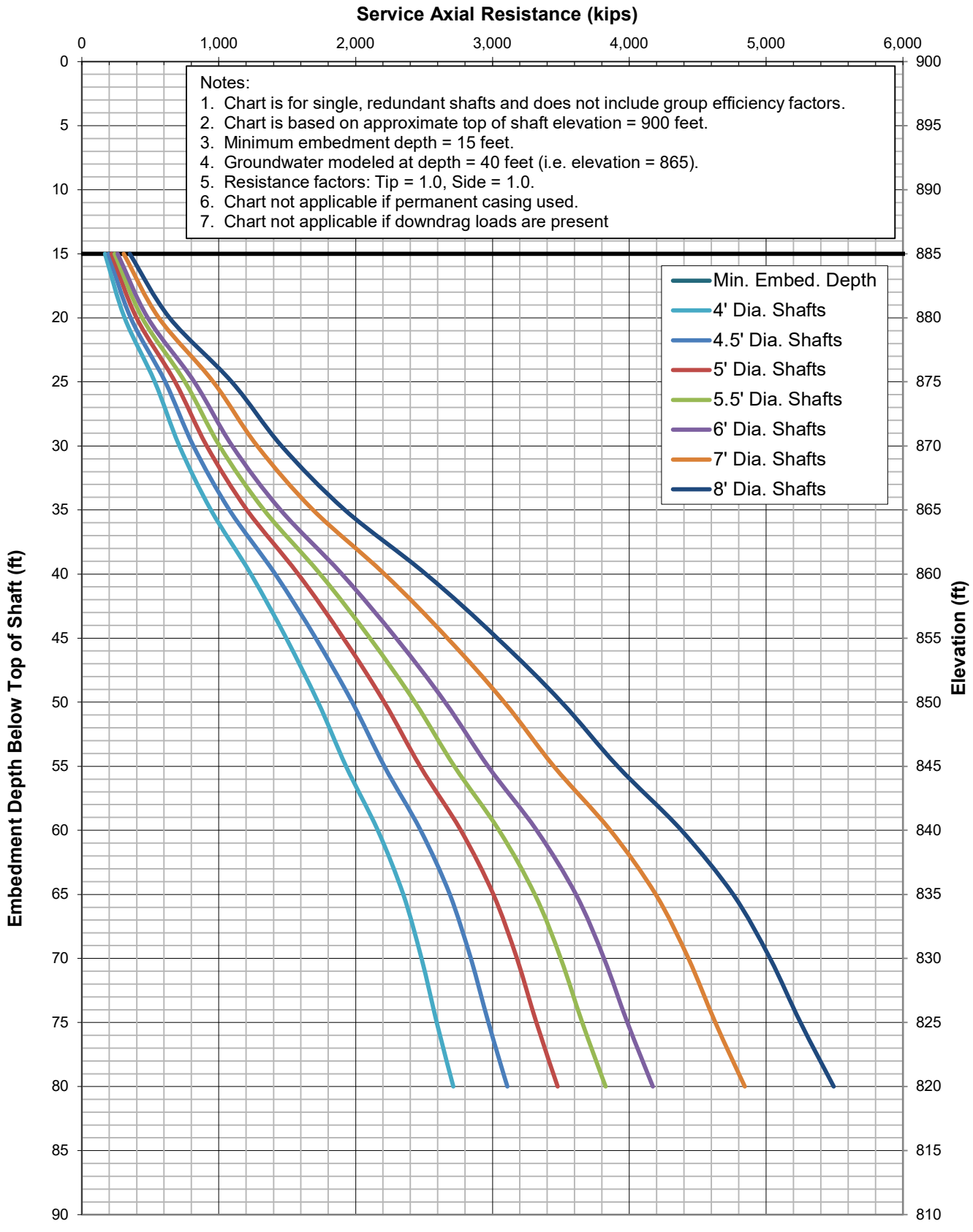
Designer:	Date:
M. Meza	6/24/2024

DRILLED SHAFT FOUNDATION DESIGN CHART
Service Limit (0.5 Inch Settlement) - Axial Resistance in Kips

SR 303L, MC 85 to Van Buren Street
Broadway Road OP
Abutments

Figure

E34



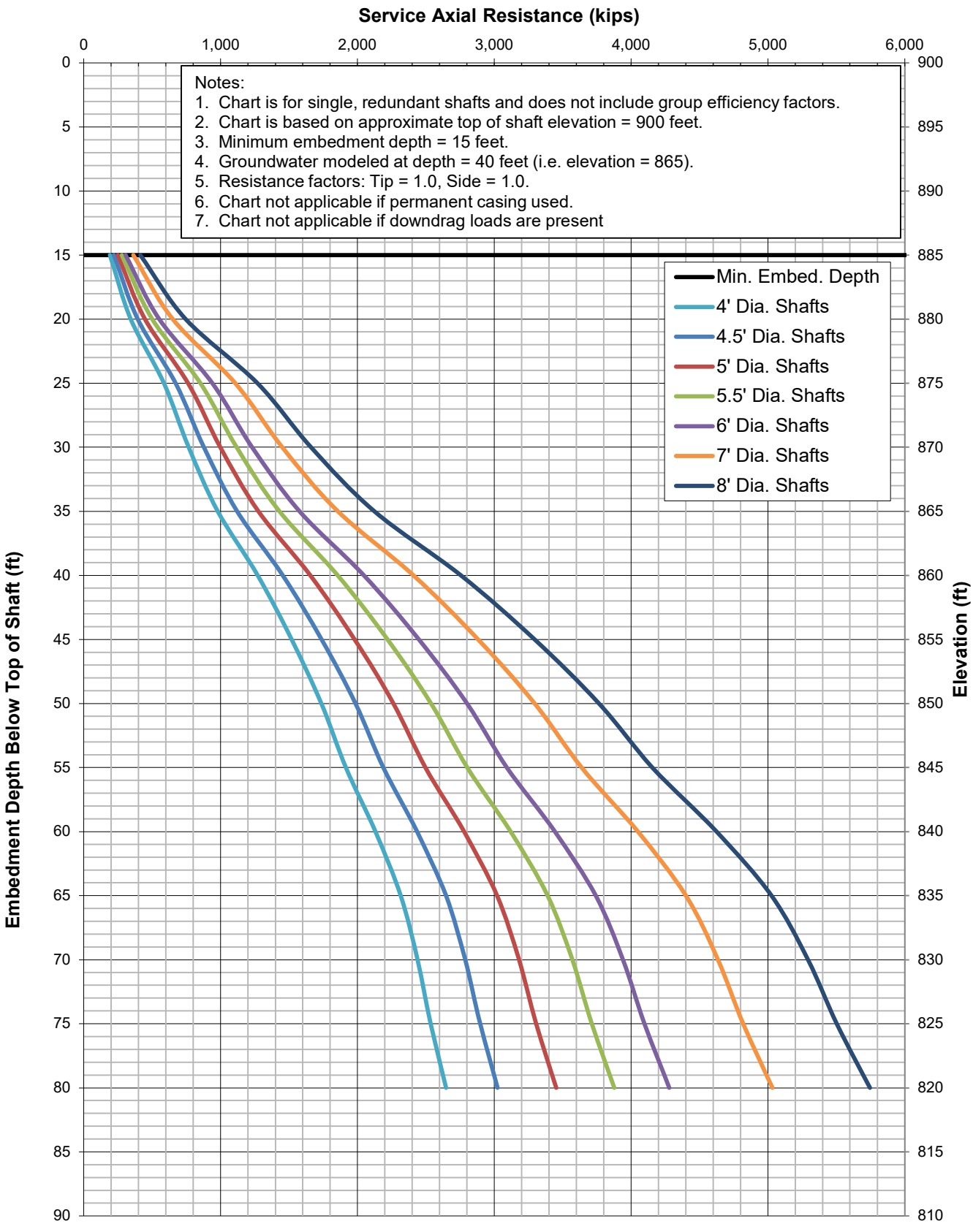
ethos ENGINEERING, LLC.	
Designer:	Date:
M. Meza	6/24/2024

DRILLED SHAFT FOUNDATION DESIGN CHART
Service Limit (0.75 Inch Settlement) - Axial Resistance in Kips

SR 303L, MC 85 to Van Buren Street
Broadway Road OP
Abutments

Figure

E35



ethos ENGINEERING, LLC.

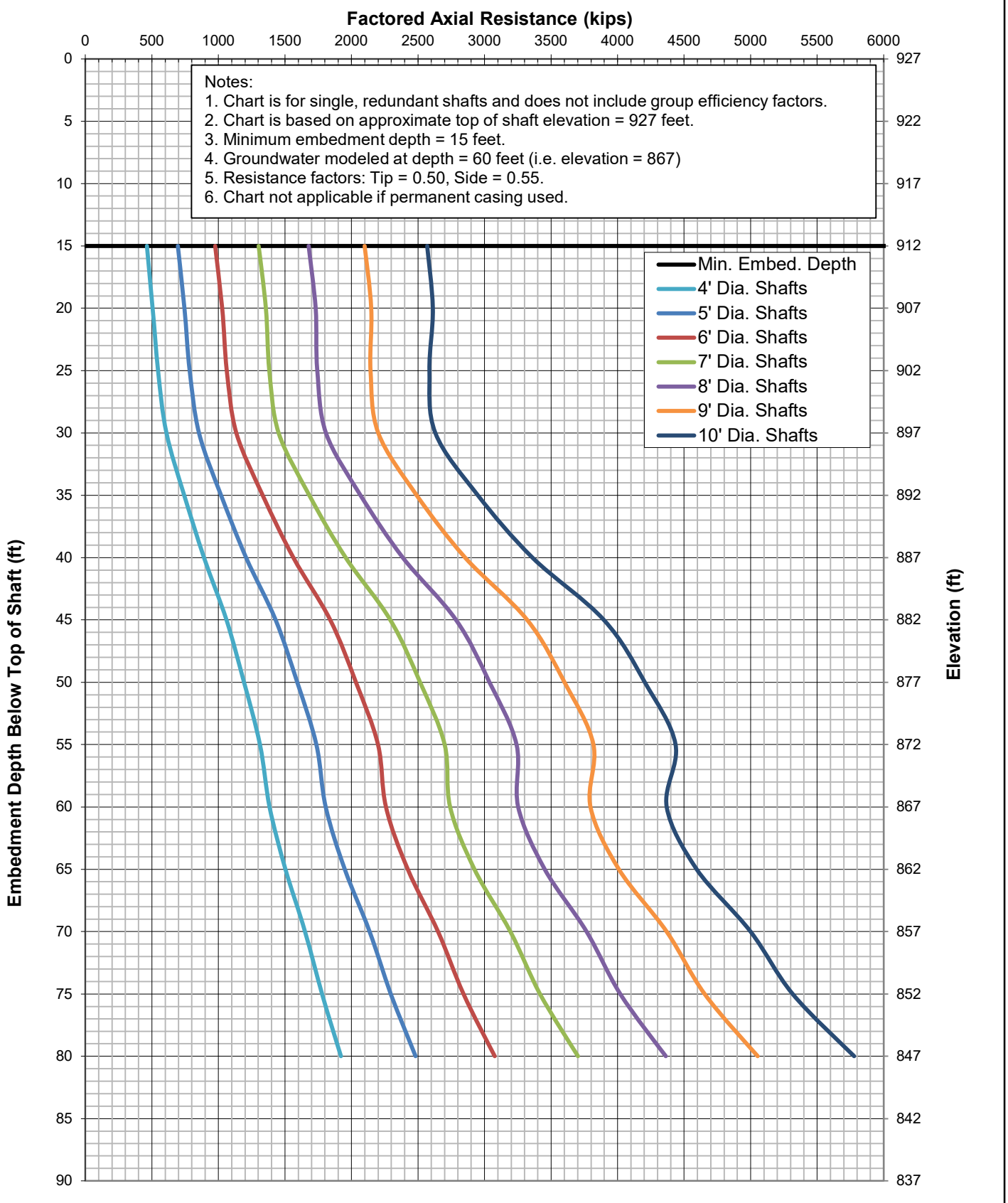
Designer:	Date:
M. Meza	6/24/2024

DRILLED SHAFT FOUNDATION DESIGN CHART
Service Limit (1 Inch Settlement) - Axial Resistance in Kips

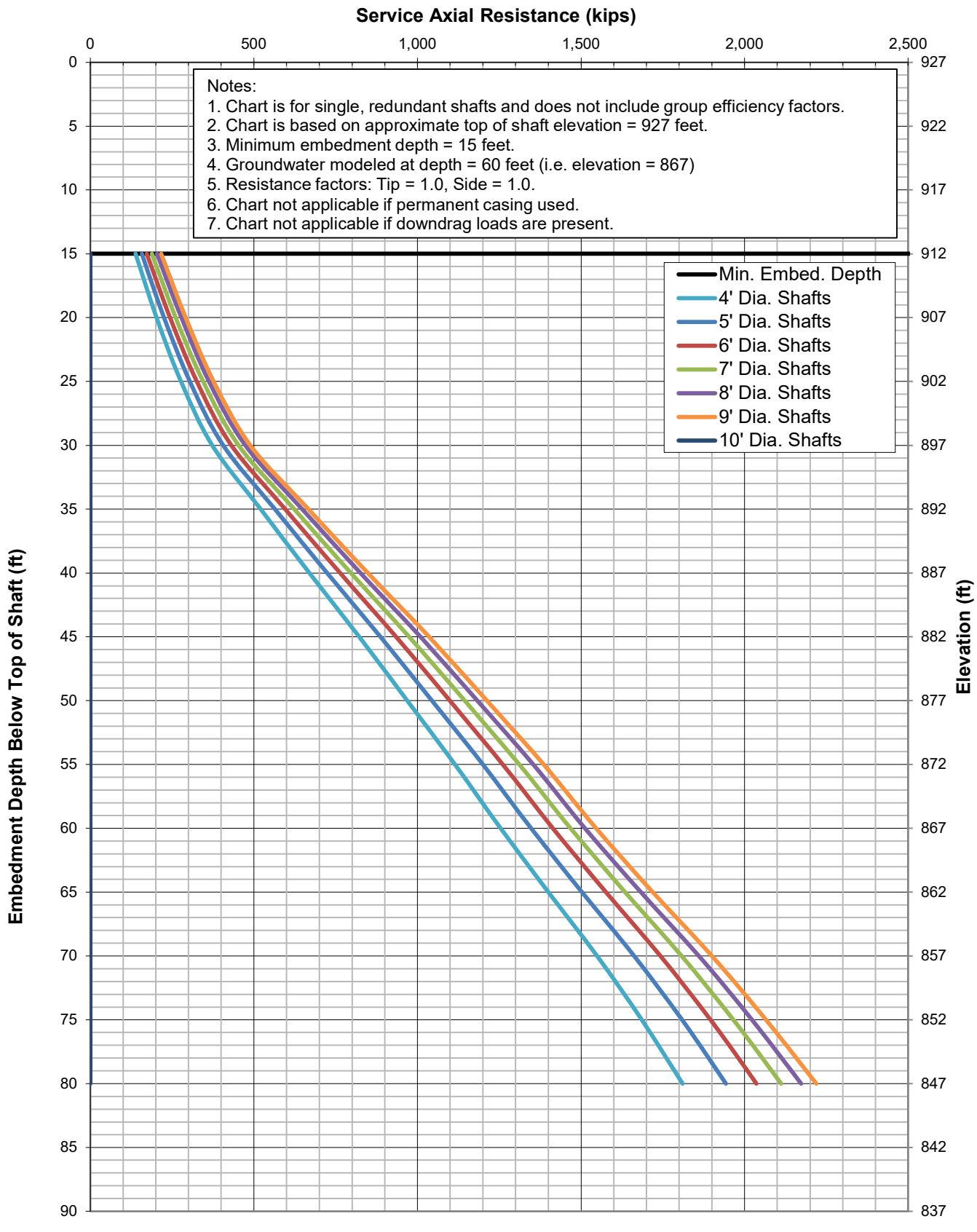
SR 303L, MC 85 to Van Buren Street
Broadway Road OP
Abutments

Figure

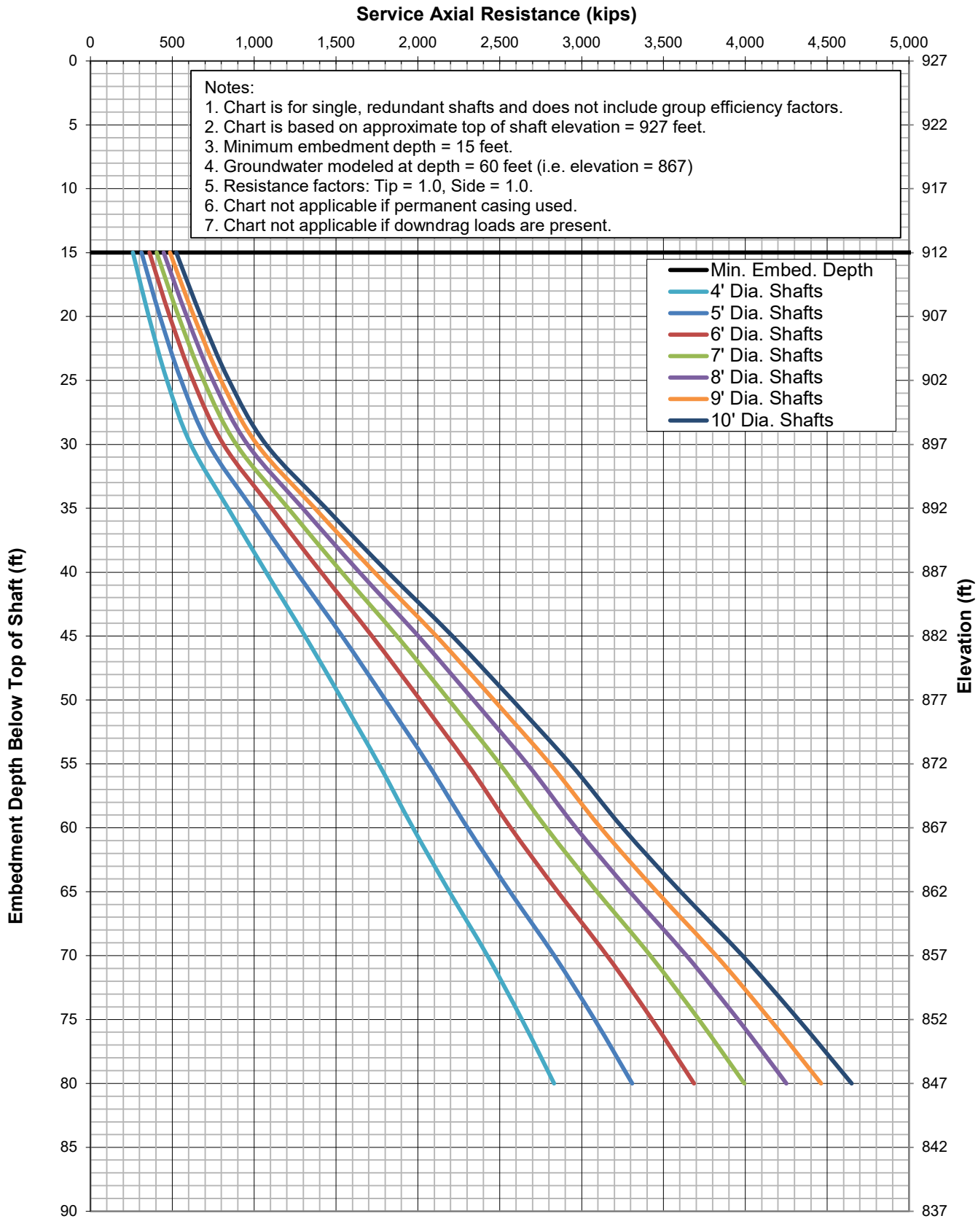
E36



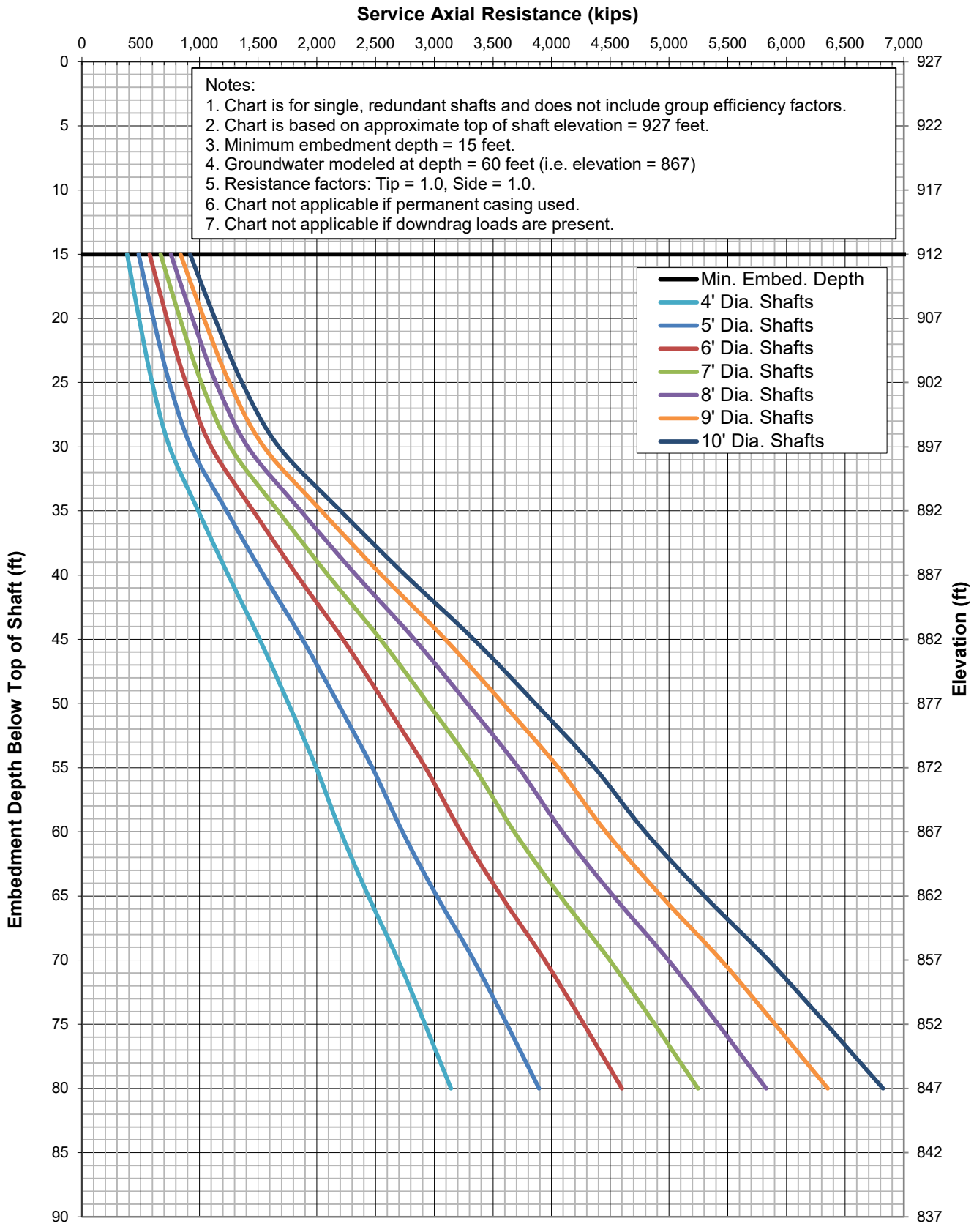
ethos ENGINEERING, LLC.		**DRILLED SHAFT FOUNDATION DESIGN CHART** **Strength Limit Axial Resistance in Kips** **SR 303L, MC 85 to Van Buren Street** **SR 303L, Mainline over Elwood** **Abuments and Pier**	Figure E37
Designer:	Date:		
M. Meza	7/16/2024		



ethos ENGINEERING, LLC.	**DRILLED SHAFT FOUNDATION DESIGN CHART** **Service Limit (0.10 Inch Settlement) - Axial Resistance in Kips**	Figure E38
Designer: M. Meza / Date: 7/16/2024	**SR 303L, MC 85 to Van Buren Street** **SR 303L, Mainline over Elwood** **Abuments and Pier**	



ethos ENGINEERING, LLC.		**DRILLED SHAFT FOUNDATION DESIGN CHART** **Service Limit (0.25 Inch Settlement) - Axial Resistance in Kips** **SR 303L, MC 85 to Van Buren Street** **SR 303L, Mainline over Elwood** **Abuments and Pier**	Figure E39
Designer:	Date:		
M. Meza	7/16/2024		



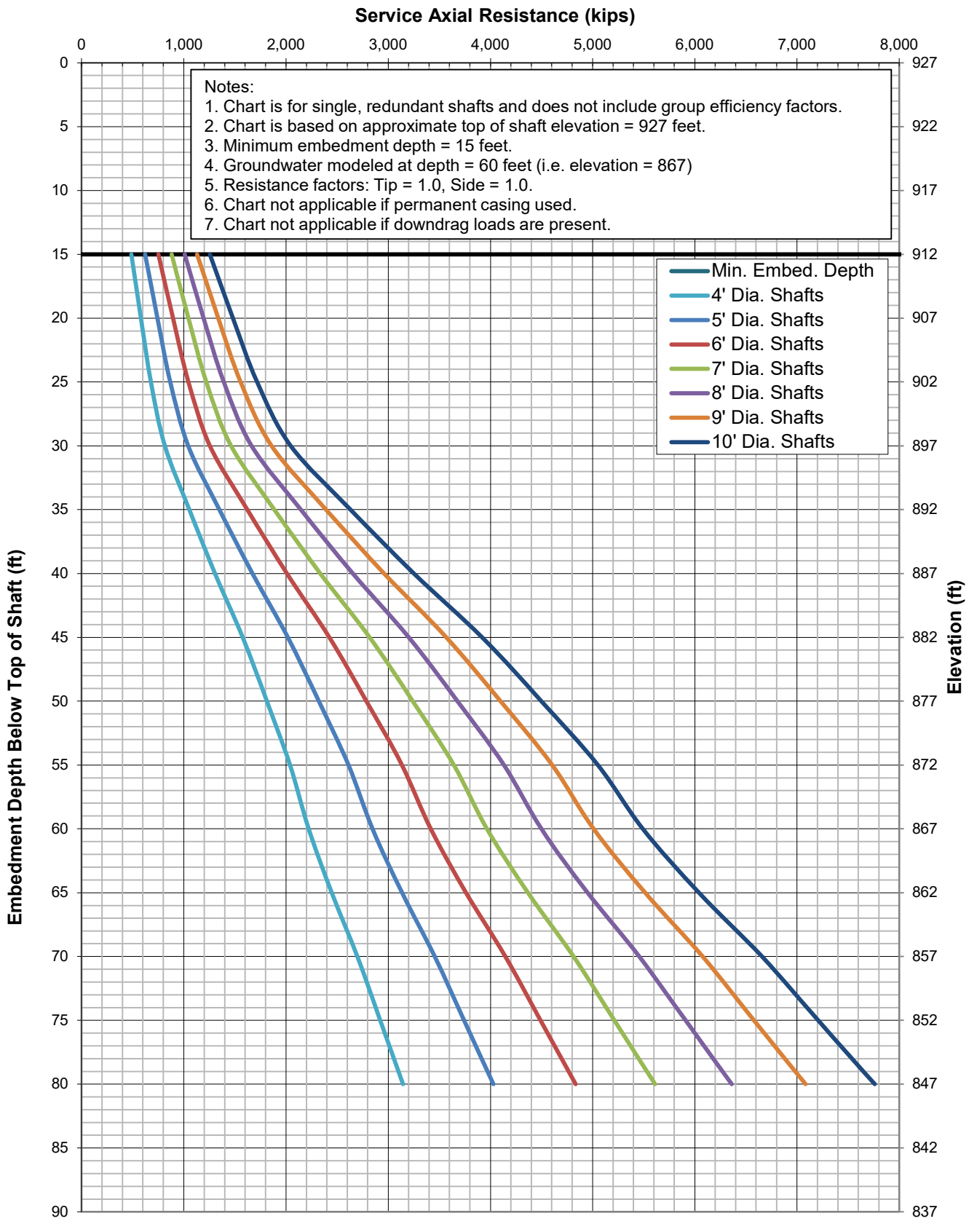
Designer:	Date:
M. Meza	7/16/2024

DRILLED SHAFT FOUNDATION DESIGN CHART
Service Limit (0.5 Inch Settlement) - Axial Resistance in Kips

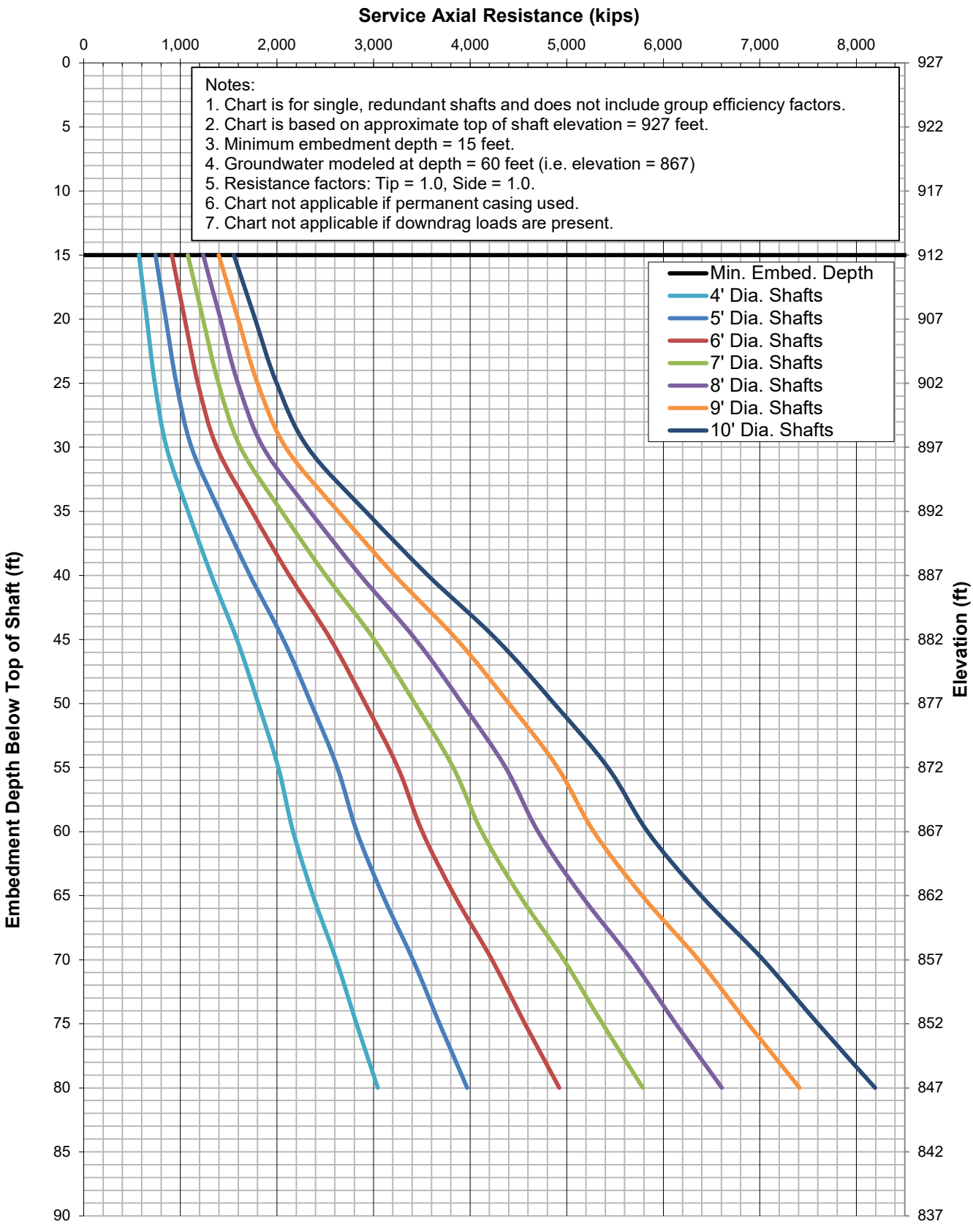
SR 303L, MC 85 to Van Buren Street
SR 303L, Mainline over Elwood
Abuments and Pier

Figure

E40



ethos ENGINEERING, LLC.	**DRILLED SHAFT FOUNDATION DESIGN CHART** **Service Limit (0.75 Inch Settlement) - Axial Resistance in Kips** **SR 303L, MC 85 to Van Buren Street** **SR 303L, Mainline over Elwood Abuments and Pier**
Designer: M. Meza Date: 7/16/2024	Figure E41



ethos ENGINEERING, LLC.

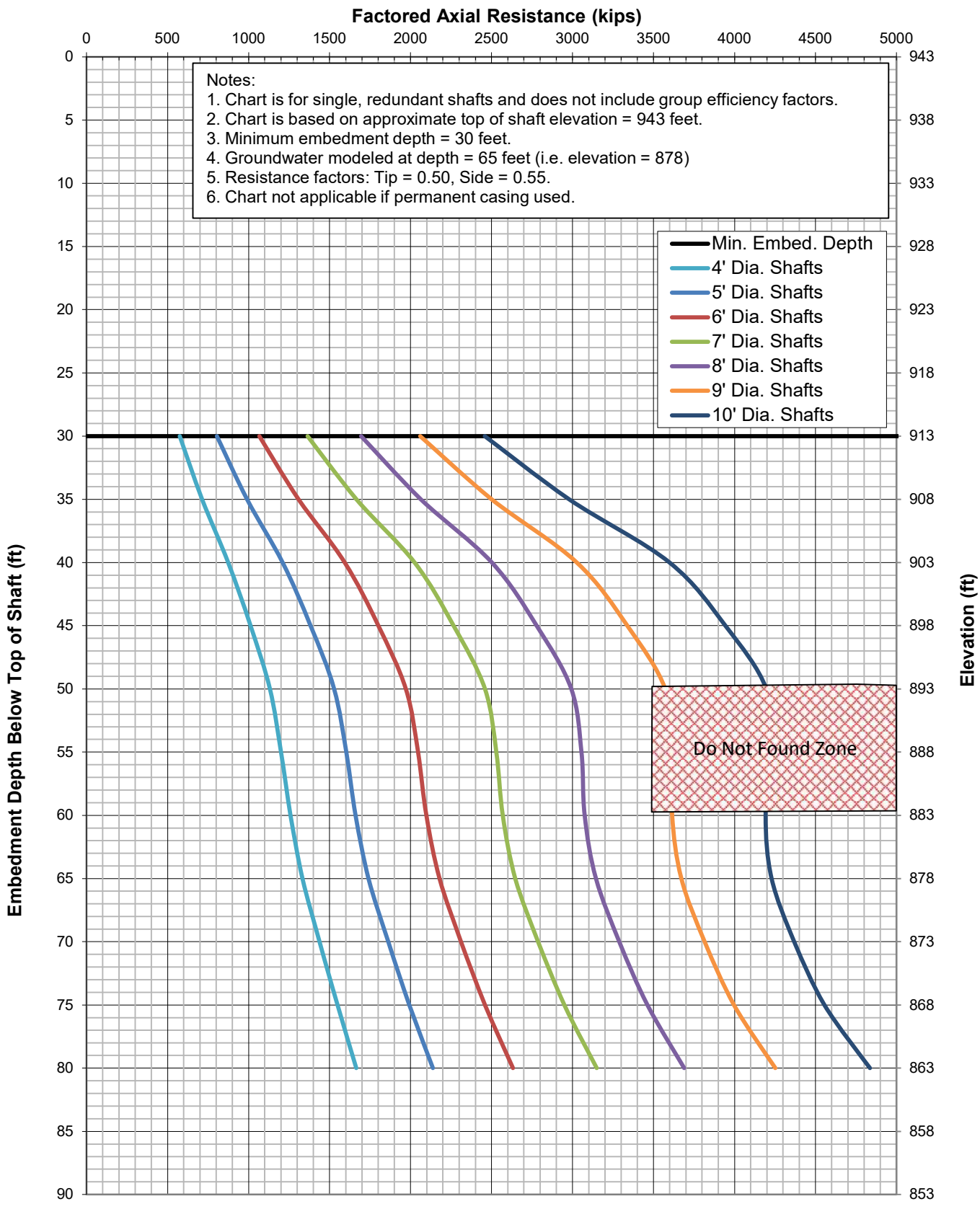
Designer:	Date:
M. Meza	7/16/2024

DRILLED SHAFT FOUNDATION DESIGN CHART
Service Limit (1 Inch Settlement) - Axial Resistance in Kips

SR 303L, MC 85 to Van Buren Street
SR 303L, Mainline over Elwood
Abuments and Pier

Figure

E42



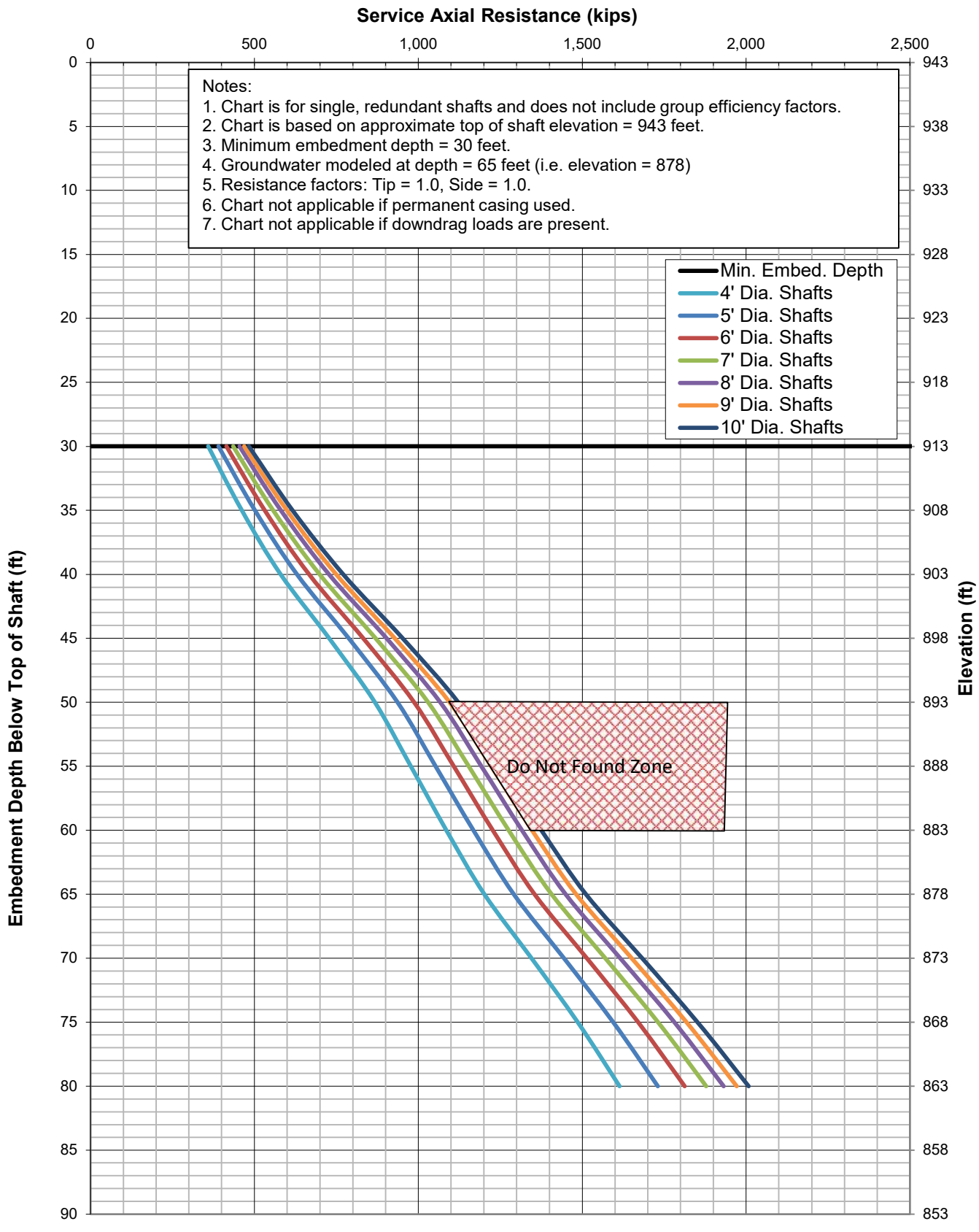
Designer:	Date:
M. Meza	7/16/2024

DRILLED SHAFT FOUNDATION DESIGN CHART
Strength Limit Axial Resistance in Kips

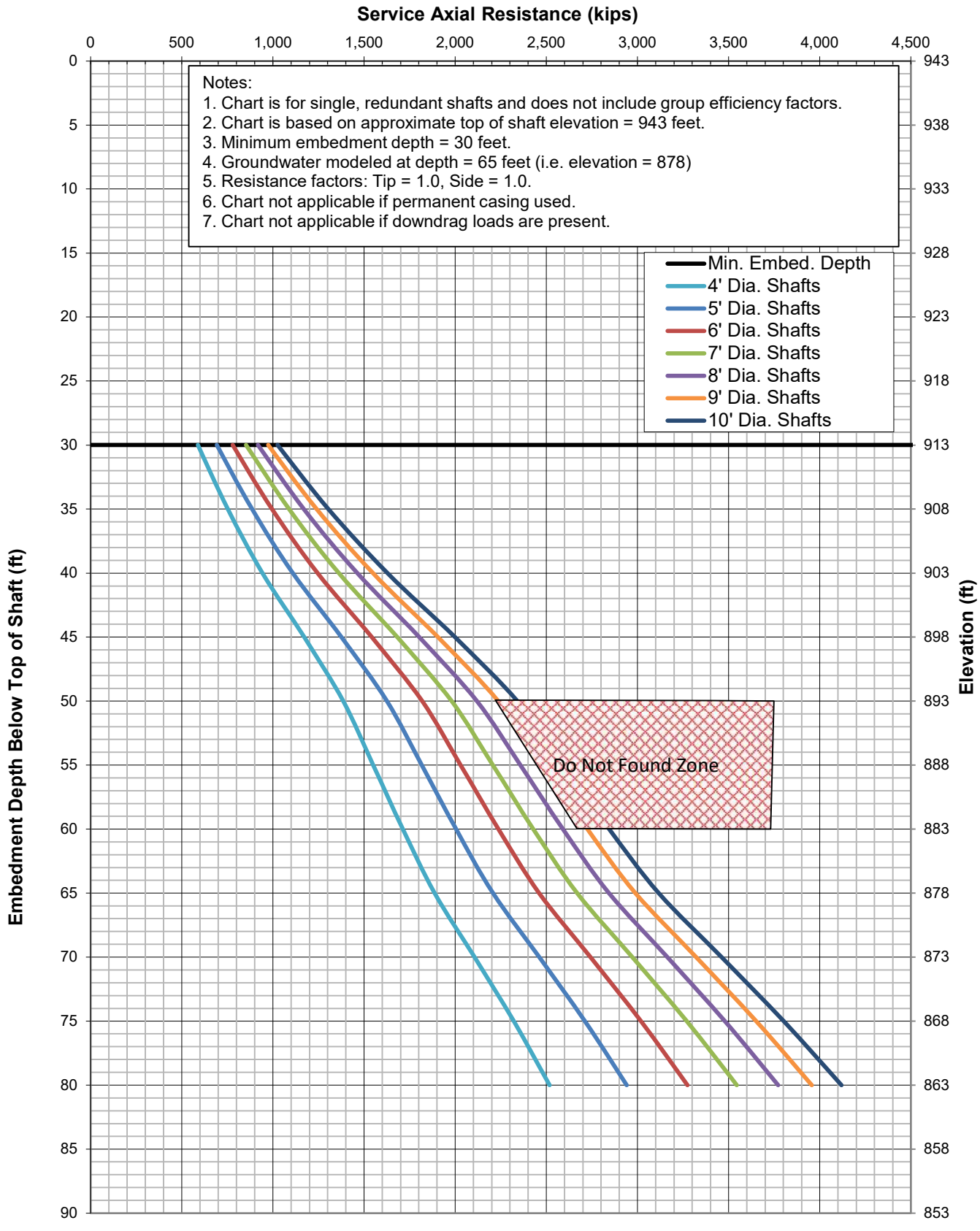
SR 303L, MC 85 to Van Buren Street
Lower Buckeye Ramp B over Elwood
Abutment Shafts

Figure

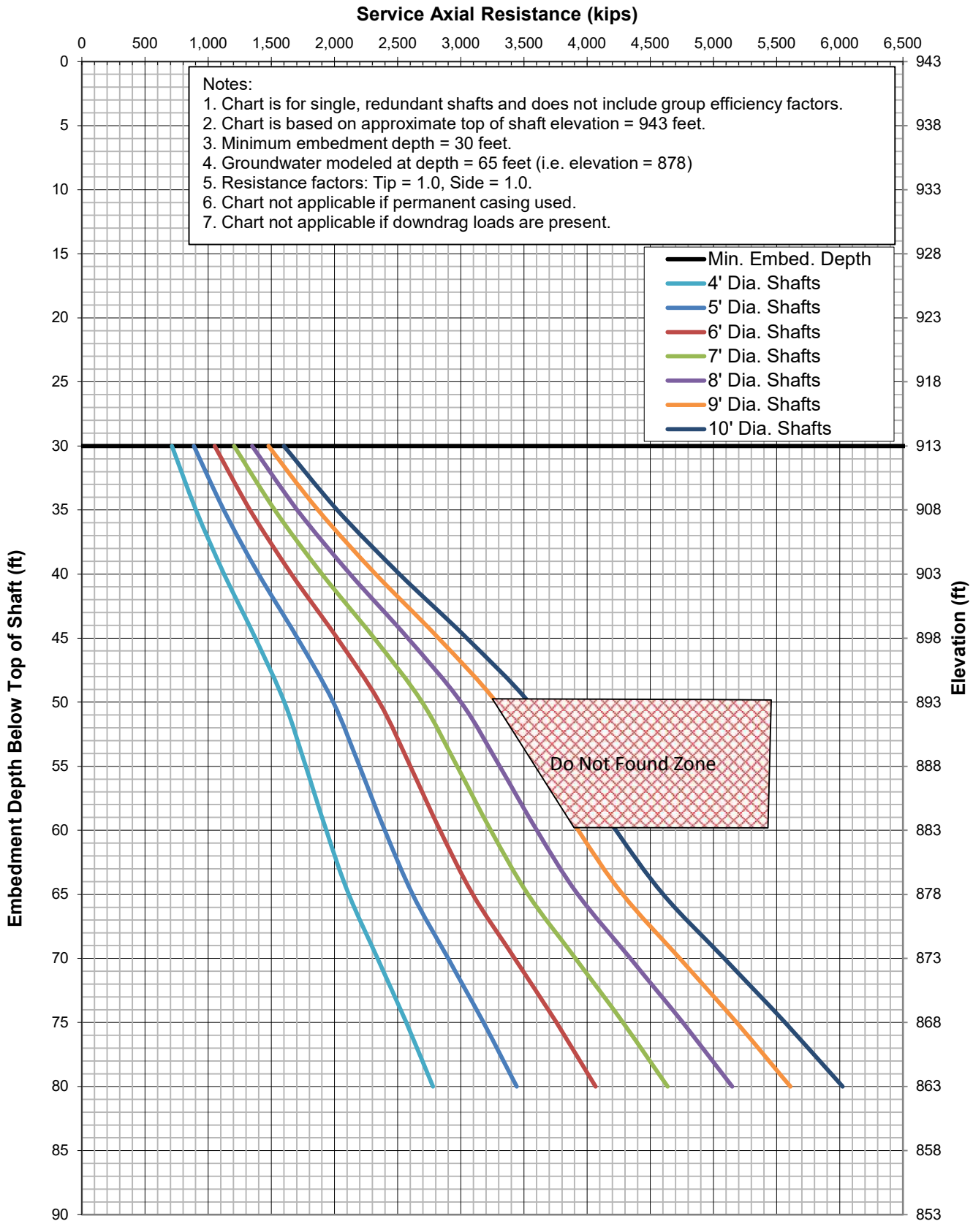
E43



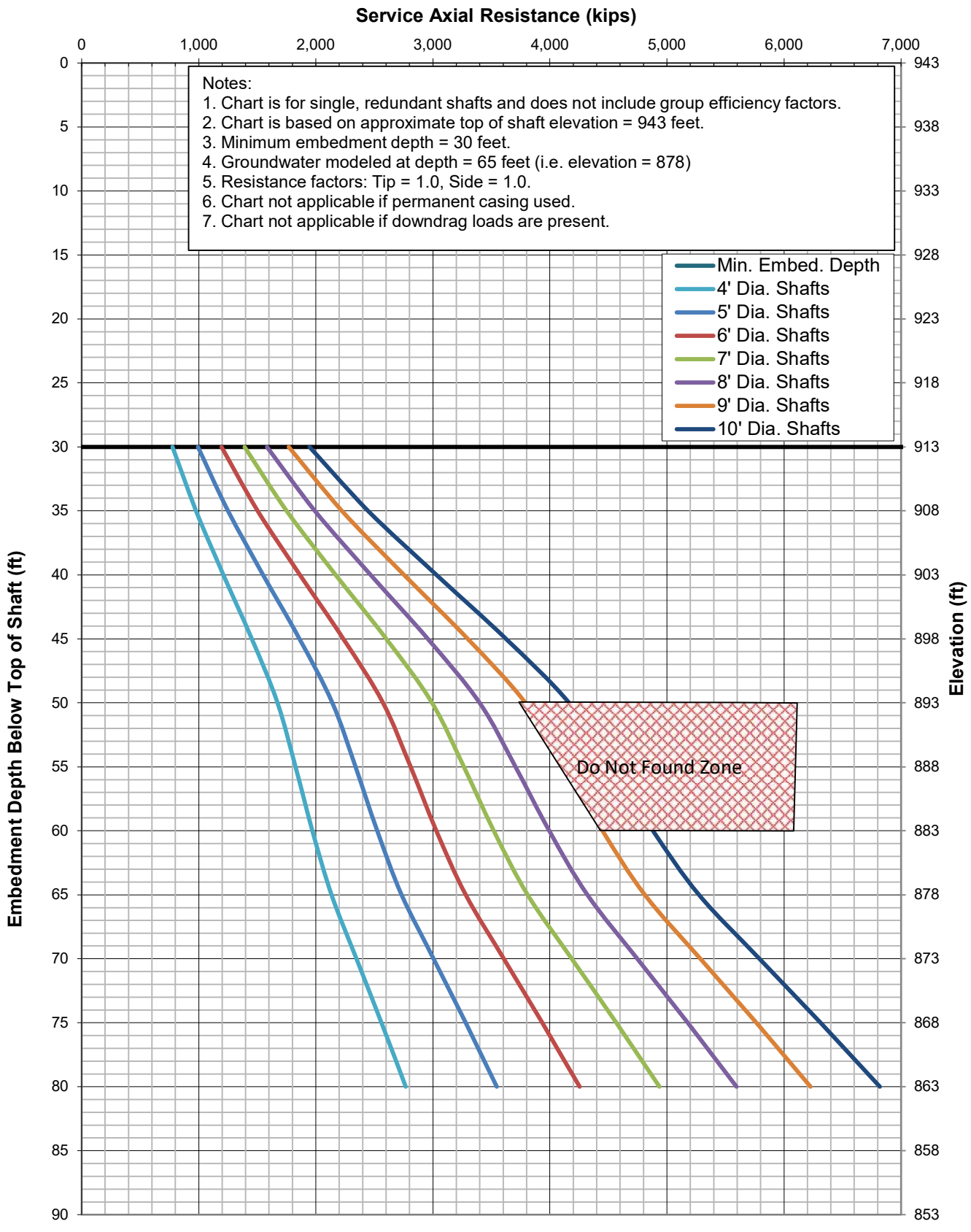
ethos ENGINEERING, LLC.		**DRILLED SHAFT FOUNDATION DESIGN CHART** **Service Limit (0.10 Inch Settlement) - Axial Resistance in Kips**	Figure E44
Designer:	Date:	**SR 303L, MC 85 to Van Buren Street** **Lower Buckeye Ramp B over Elwood** **Abutment Shafts**	
M. Meza	7/16/2024		



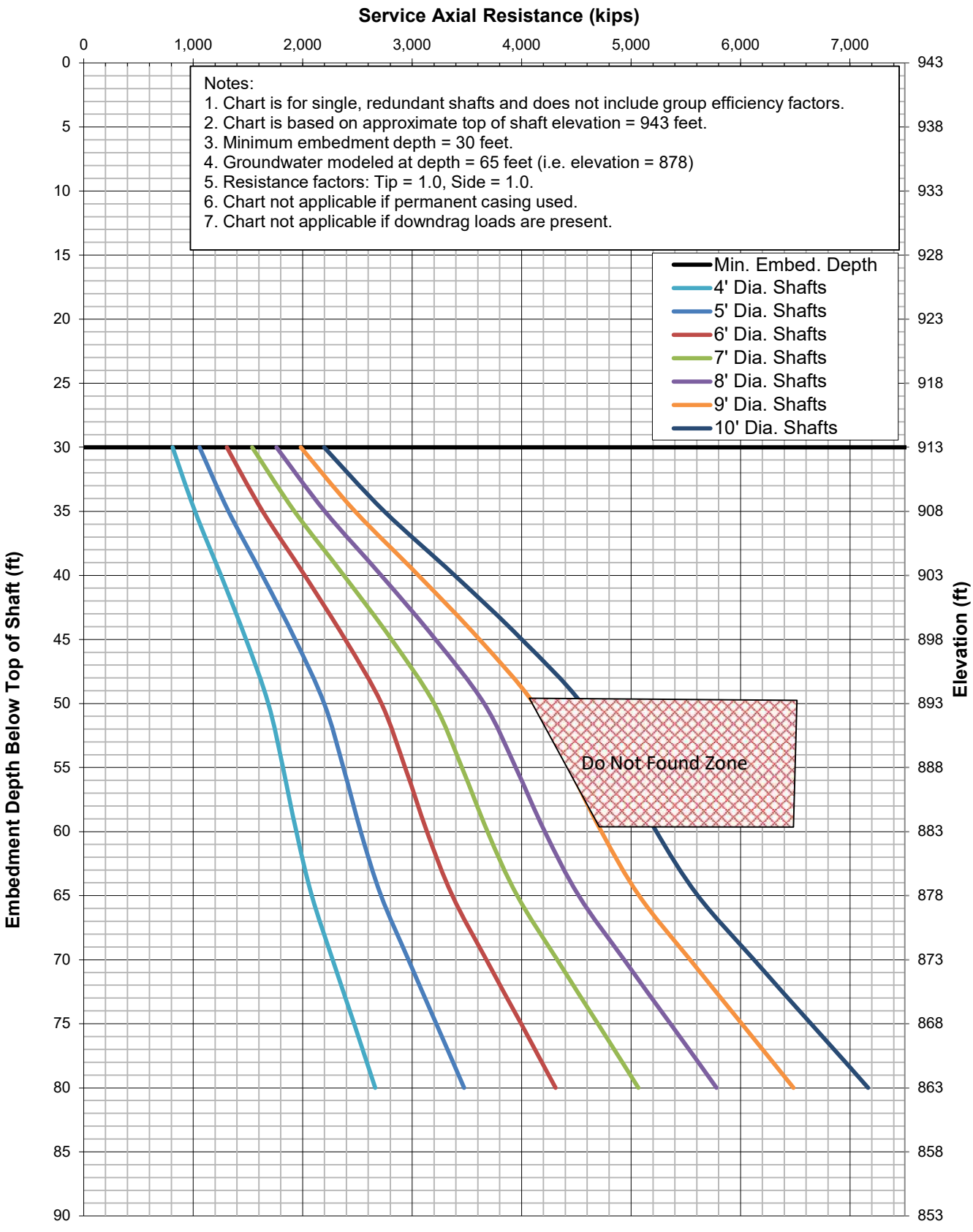
ethos ENGINEERING, LLC.	**DRILLED SHAFT FOUNDATION DESIGN CHART** **Service Limit (0.25 Inch Settlement) - Axial Resistance in Kips**	Figure E45
Designer: M. Meza / Date: 7/16/2024	**SR 303L, MC 85 to Van Buren Street** **Lower Buckeye Ramp B over Elwood** **Abutment Shafts**	



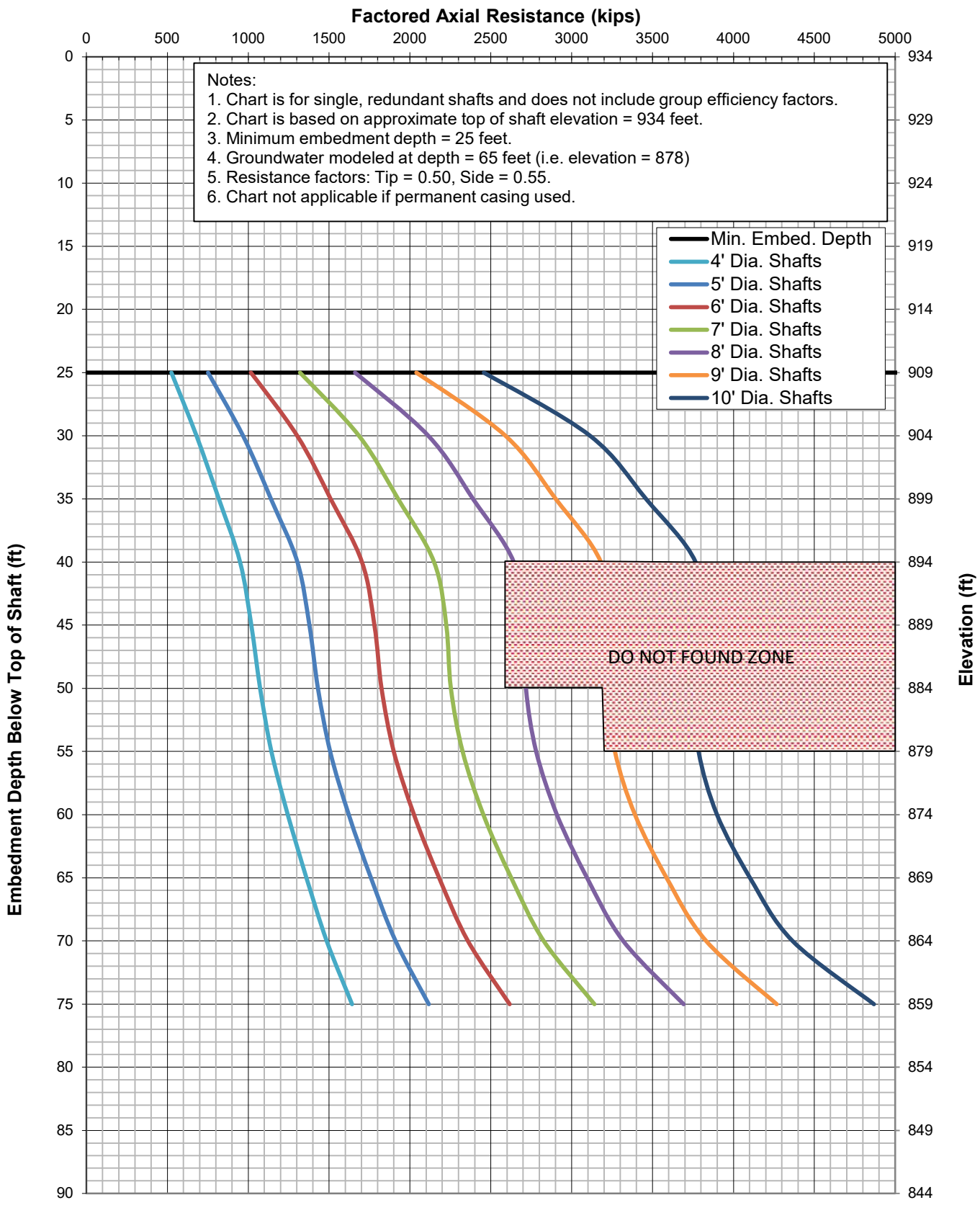
ethos ENGINEERING, LLC.	**DRILLED SHAFT FOUNDATION DESIGN CHART** **Service Limit (0.5 Inch Settlement) - Axial Resistance in Kips**	Figure E46
Designer: M. Meza / Date: 7/16/2024	**SR 303L, MC 85 to Van Buren Street** **Lower Buckeye Ramp B over Elwood** **Abutment Shafts**	



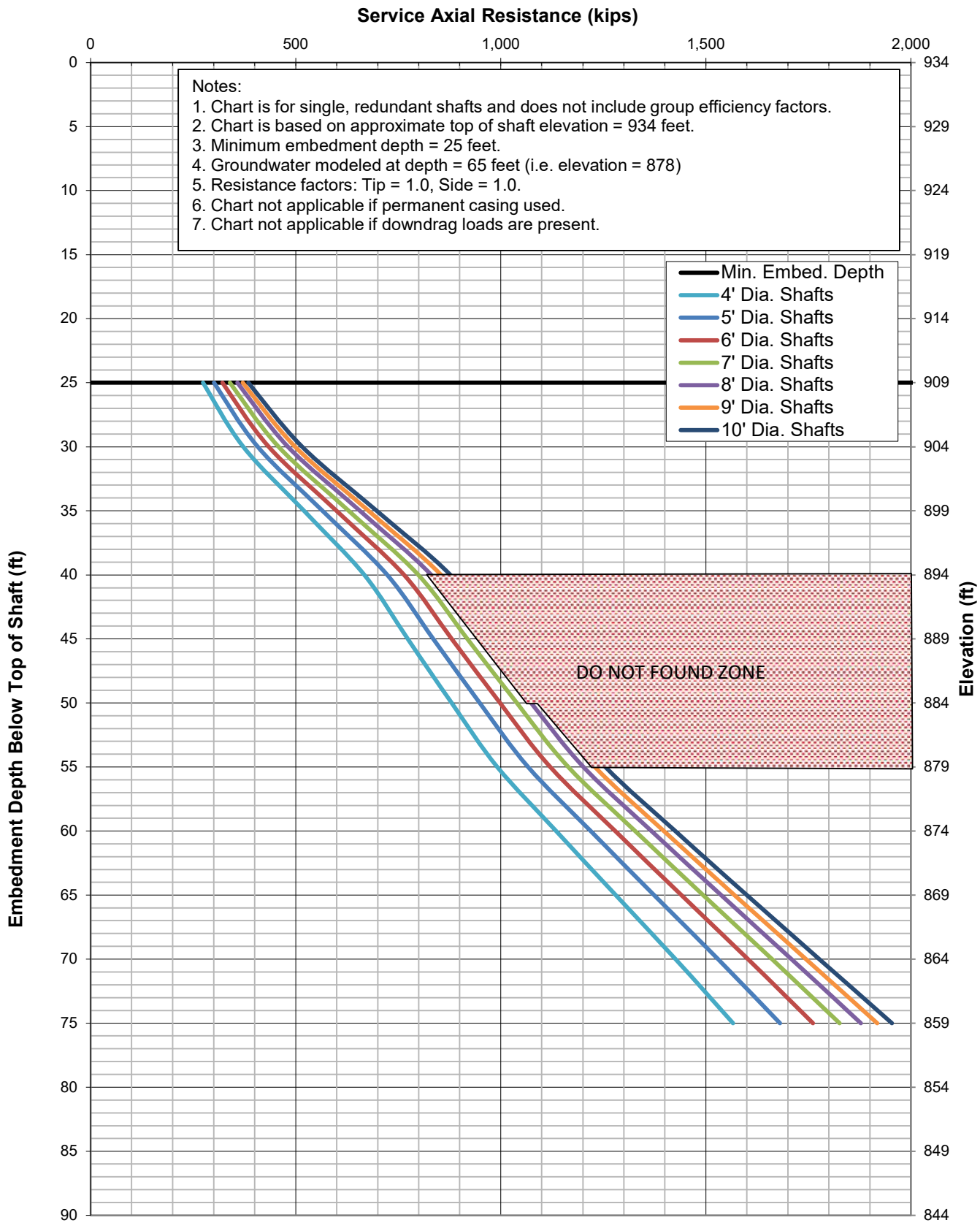
ethos ENGINEERING, LLC.		**DRILLED SHAFT FOUNDATION DESIGN CHART** **Service Limit (0.75 Inch Settlement) - Axial Resistance in Kips**	Figure E47
Designer:	Date:	**SR 303L, MC 85 to Van Buren Street** **Lower Buckeye Ramp B over Elwood** **Abutment Shafts**	
M. Meza	7/16/2024		



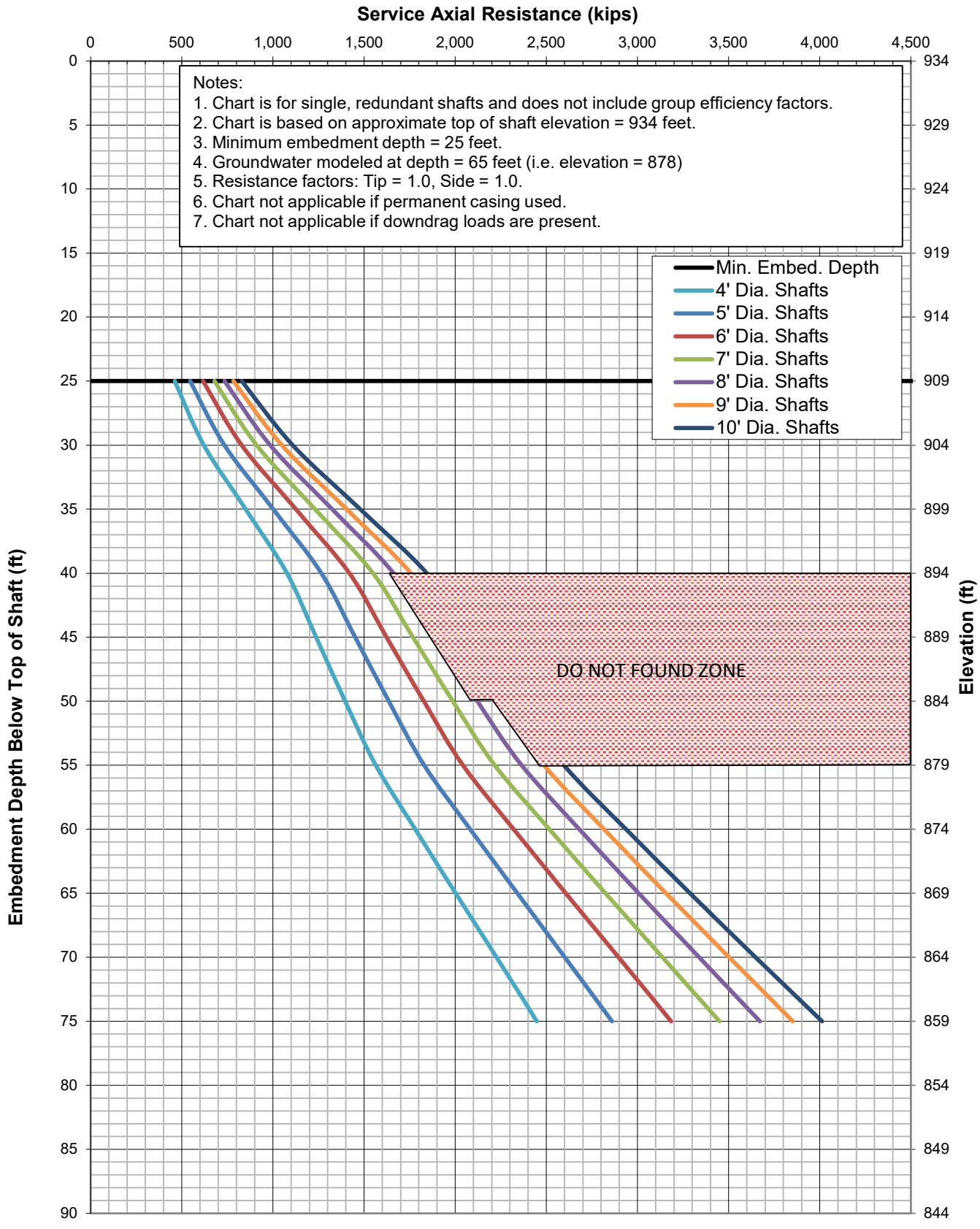
ethos ENGINEERING, LLC.		**DRILLED SHAFT FOUNDATION DESIGN CHART** **Service Limit (1 Inch Settlement) - Axial Resistance in Kips**	Figure
Designer:	Date:	**SR 303L, MC 85 to Van Buren Street** **Lower Buckeye Ramp B over Elwood** **Abutment Shafts**	E48
M. Meza	7/16/2024		



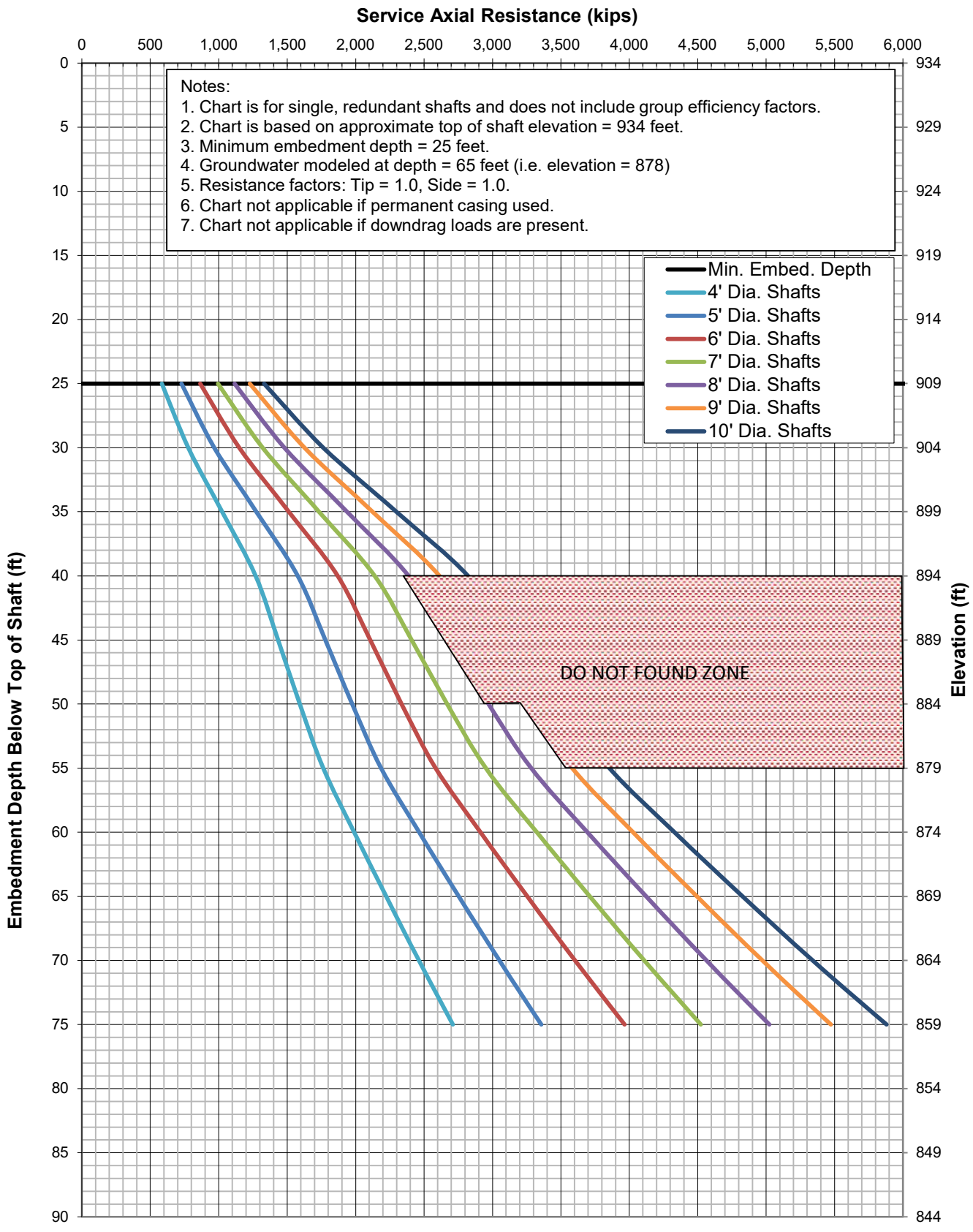
ethos ENGINEERING, LLC.		**DRILLED SHAFT FOUNDATION DESIGN CHART** **Strength Limit Axial Resistance in Kips**	Figure
Designer:	Date:	**SR 303L, MC 85 to Van Buren Street** **Lower Buckeye Ramp B over Elwood** **Center Pier**	E49
M. Meza	7/16/2024		



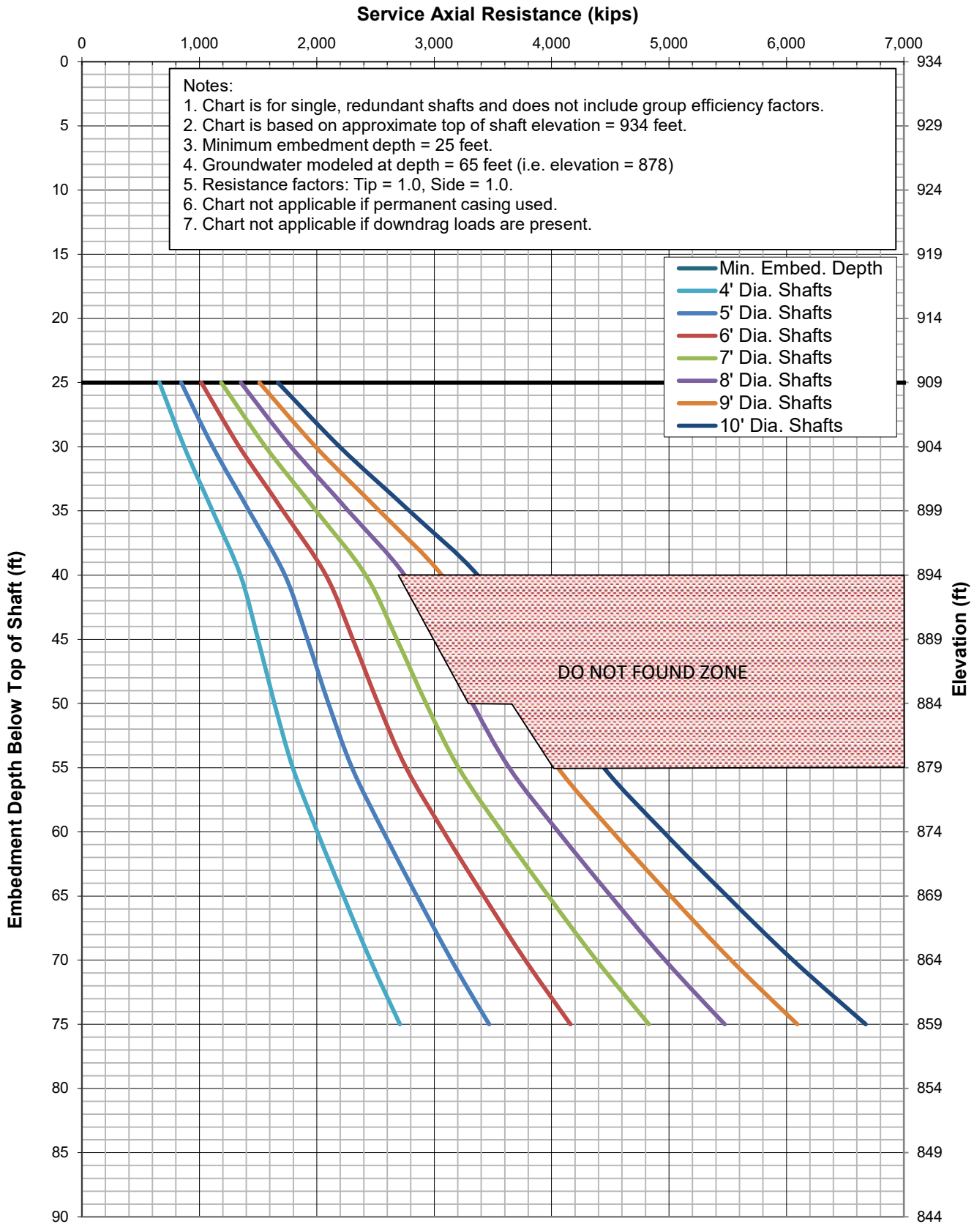
ethos ENGINEERING, LLC.		**DRILLED SHAFT FOUNDATION DESIGN CHART** **Service Limit (0.10 Inch Settlement) - Axial Resistance in Kips**	Figure E50
Designer:	Date:	**SR 303L, MC 85 to Van Buren Street** **Lower Buckeye Ramp B over Elwood** **Center Pier**	
M. Meza	7/16/2024		



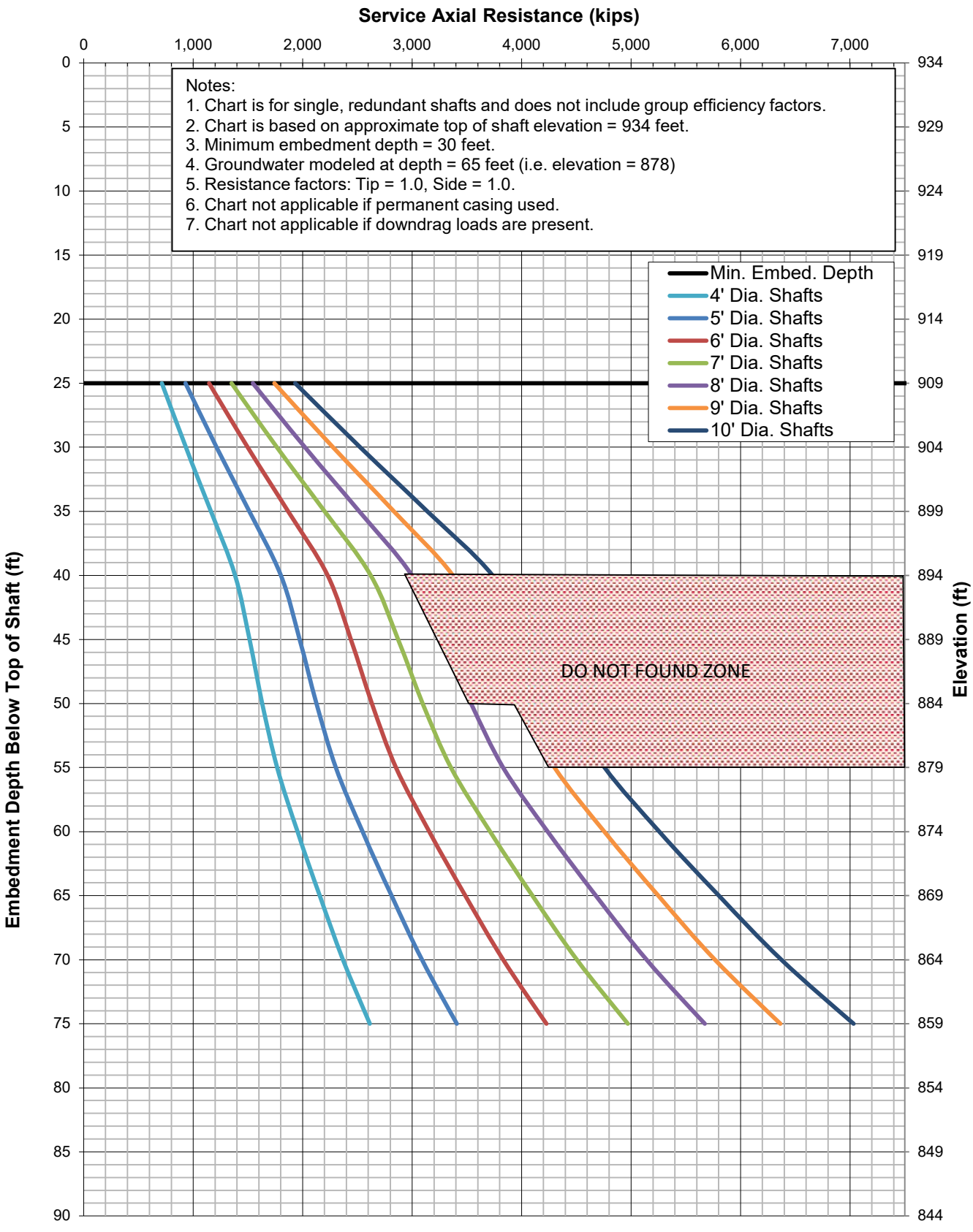
ethos ENGINEERING, LLC.	**DRILLED SHAFT FOUNDATION DESIGN CHART** **Service Limit (0.25 Inch Settlement) - Axial Resistance in Kips** **SR 303L, MC 85 to Van Buren Street** **Lower Buckeye Ramp B over Elwood** **Center Pier**	Figure E51
Designer: M. Meza Date: 7/16/2024		



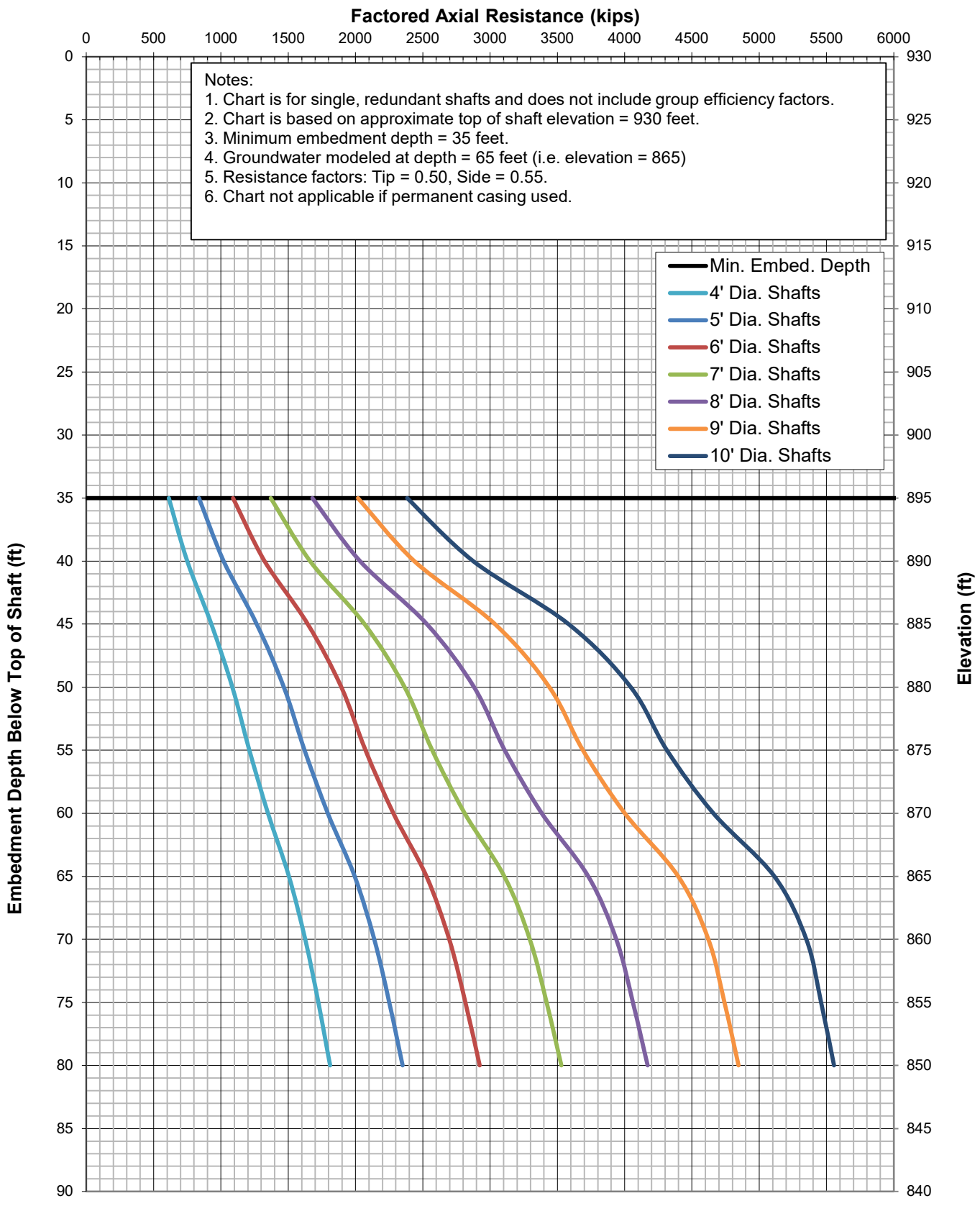
ethos ENGINEERING, LLC.		**DRILLED SHAFT FOUNDATION DESIGN CHART** **Service Limit (0.5 Inch Settlement) - Axial Resistance in Kips**	Figure
Designer:	Date:	**SR 303L, MC 85 to Van Buren Street** **Lower Buckeye Ramp B over Elwood** **Center Pier**	E52
M. Meza	7/16/2024		



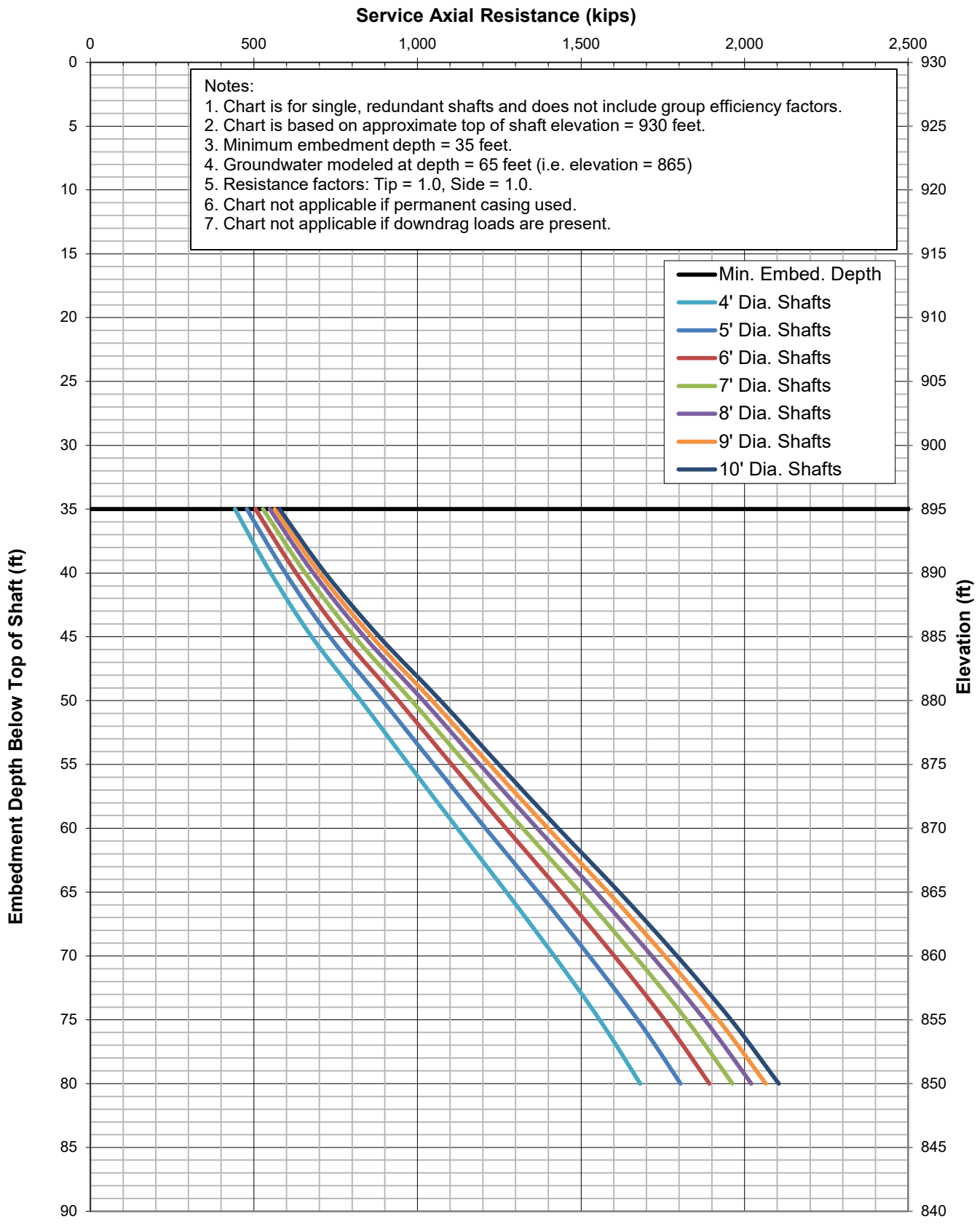
ethos ENGINEERING, LLC.	**DRILLED SHAFT FOUNDATION DESIGN CHART** **Service Limit (0.75 Inch Settlement) - Axial Resistance in Kips** **SR 303L, MC 85 to Van Buren Street** **Lower Buckeye Ramp B over Elwood** **Center Pier**
Designer: M. Meza Date: 7/16/2024	Figure E53



ethos ENGINEERING, LLC.		**DRILLED SHAFT FOUNDATION DESIGN CHART** **Service Limit (1 Inch Settlement) - Axial Resistance in Kips**	Figure E54
Designer:	Date:	**SR 303L, MC 85 to Van Buren Street** **Lower Buckeye Ramp B over Elwood** **Center Pier**	
M. Meza	7/16/2024		



ethos ENGINEERING, LLC.		**DRILLED SHAFT FOUNDATION DESIGN CHART** **Strength Limit Axial Resistance in Kips** **SR 303L, MC 85 to Van Buren Street** **SR 303L, Mainline Over Ramps** **Abutments and Piers**	Figure E55
Designer:	Date:		
M. Meza	7/9/2024		



ethos ENGINEERING, LLC.

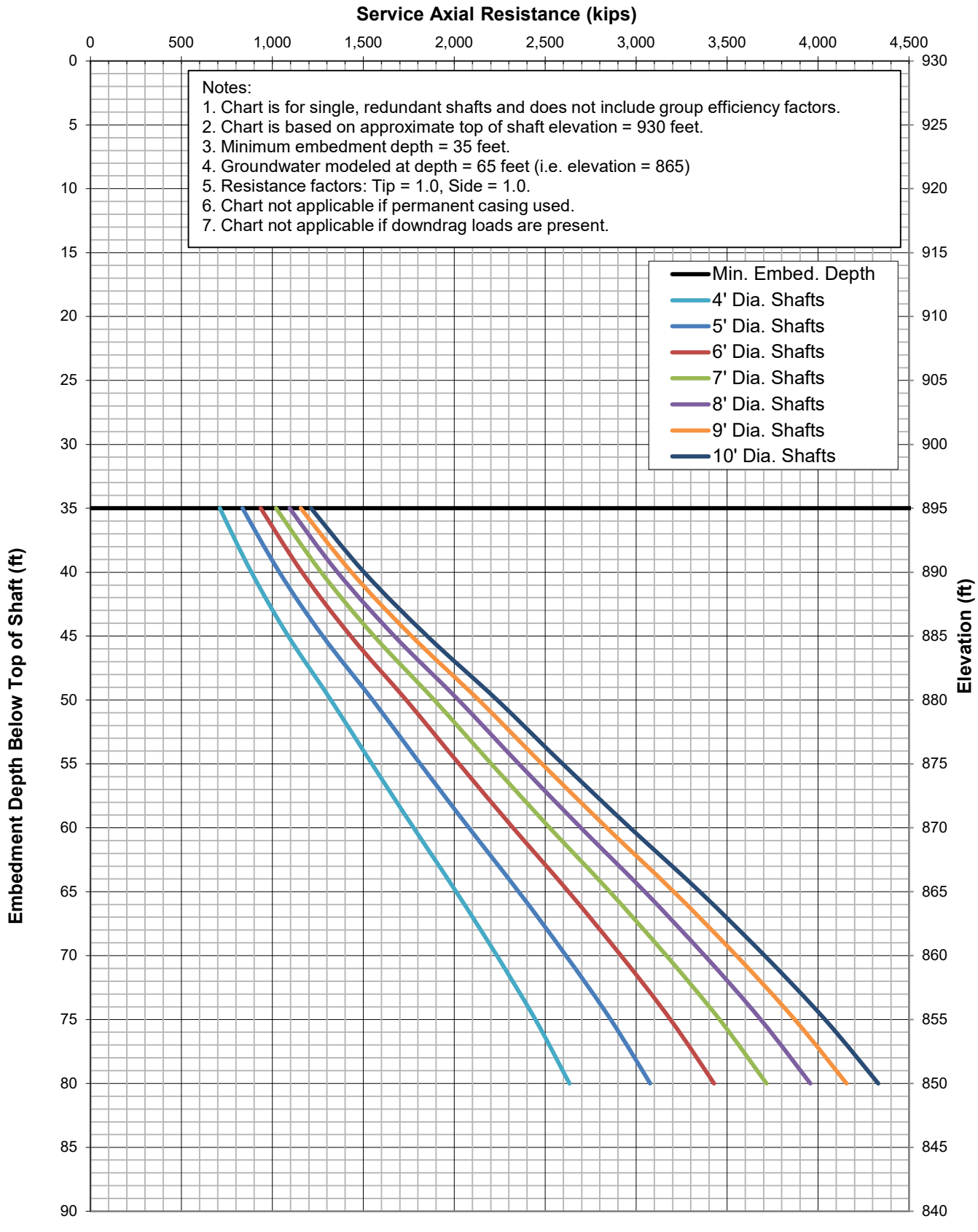
Designer:	Date:
M. Meza	7/9/2024

DRILLED SHAFT FOUNDATION DESIGN CHART
Service Limit (0.10 Inch Settlement) - Axial Resistance in Kips

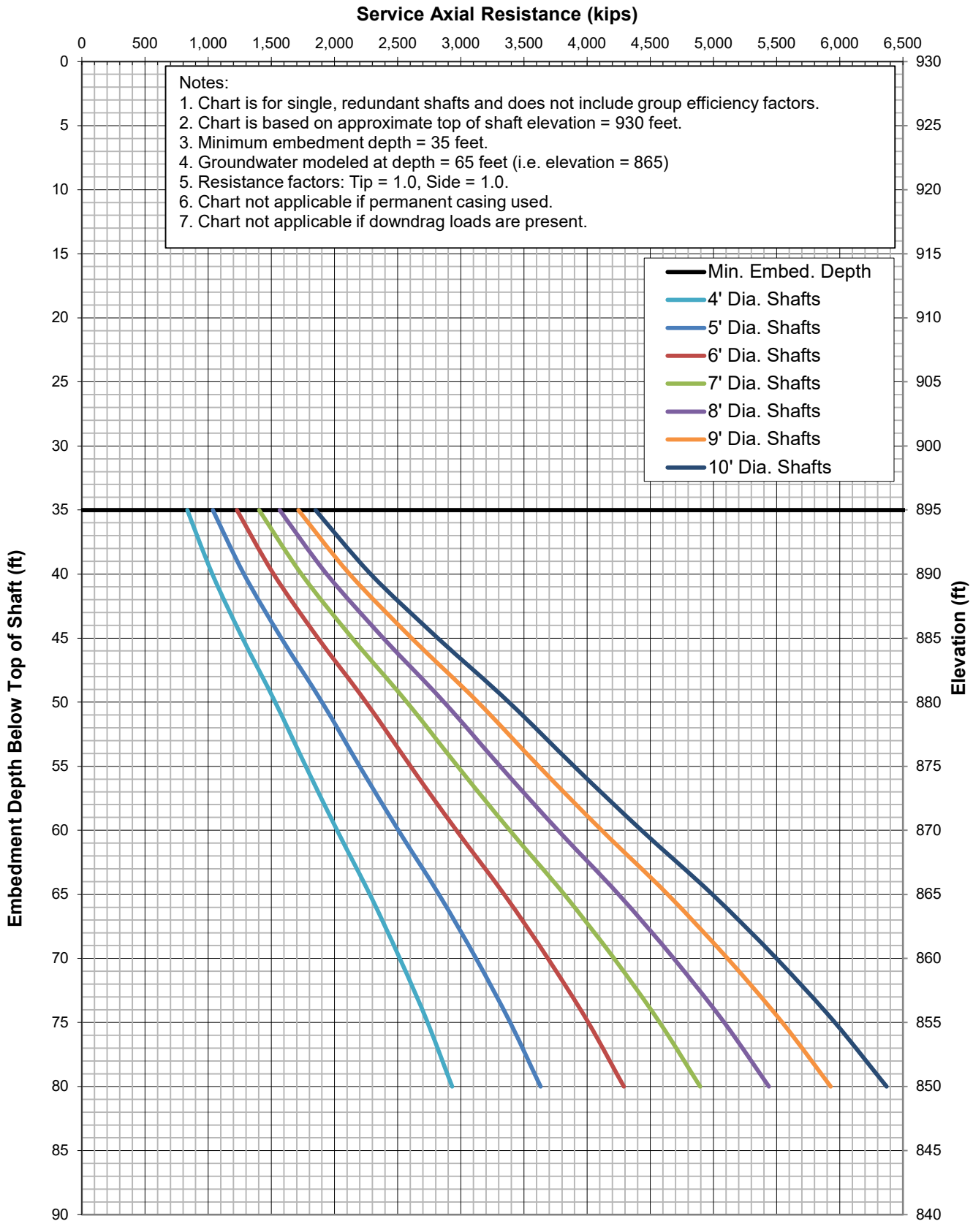
SR 303L, MC 85 to Van Buren Street
SR 303L, Mainline Over Ramps
Abutments and Piers

Figure

E56



ethos ENGINEERING, LLC.		**DRILLED SHAFT FOUNDATION DESIGN CHART** **Service Limit (0.25 Inch Settlement) - Axial Resistance in Kips**	Figure E57
Designer:	Date:	**SR 303L, MC 85 to Van Buren Street** **SR 303L, Mainline Over Ramps** **Abutments and Piers**	
M. Meza	7/9/2024		



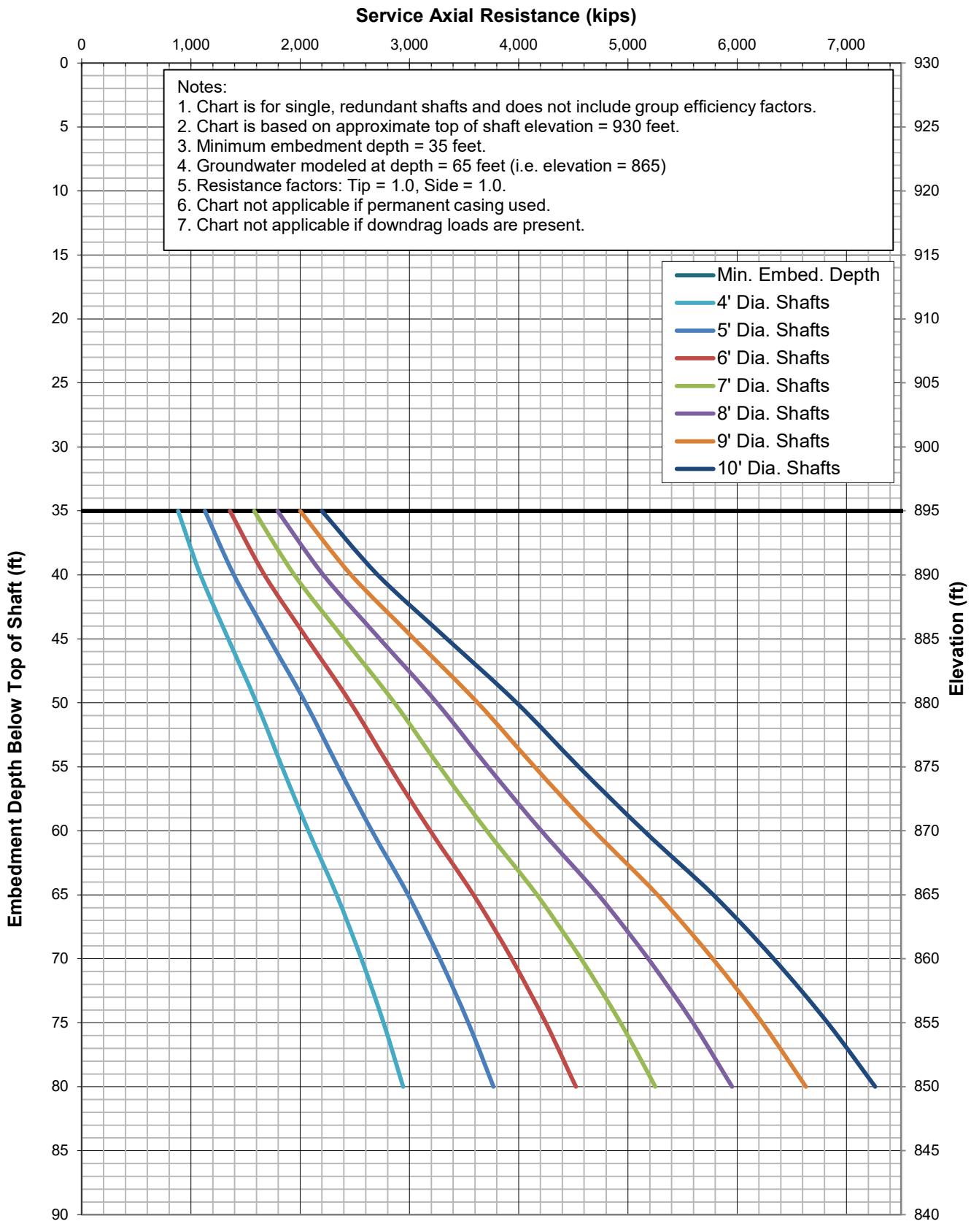
Designer:	Date:
M. Meza	7/9/2024

DRILLED SHAFT FOUNDATION DESIGN CHART
Service Limit (0.5 Inch Settlement) - Axial Resistance in Kips

SR 303L, MC 85 to Van Buren Street
SR 303L, Mainline Over Ramps
Abutments and Piers

Figure

E58



ethos ENGINEERING, LLC.

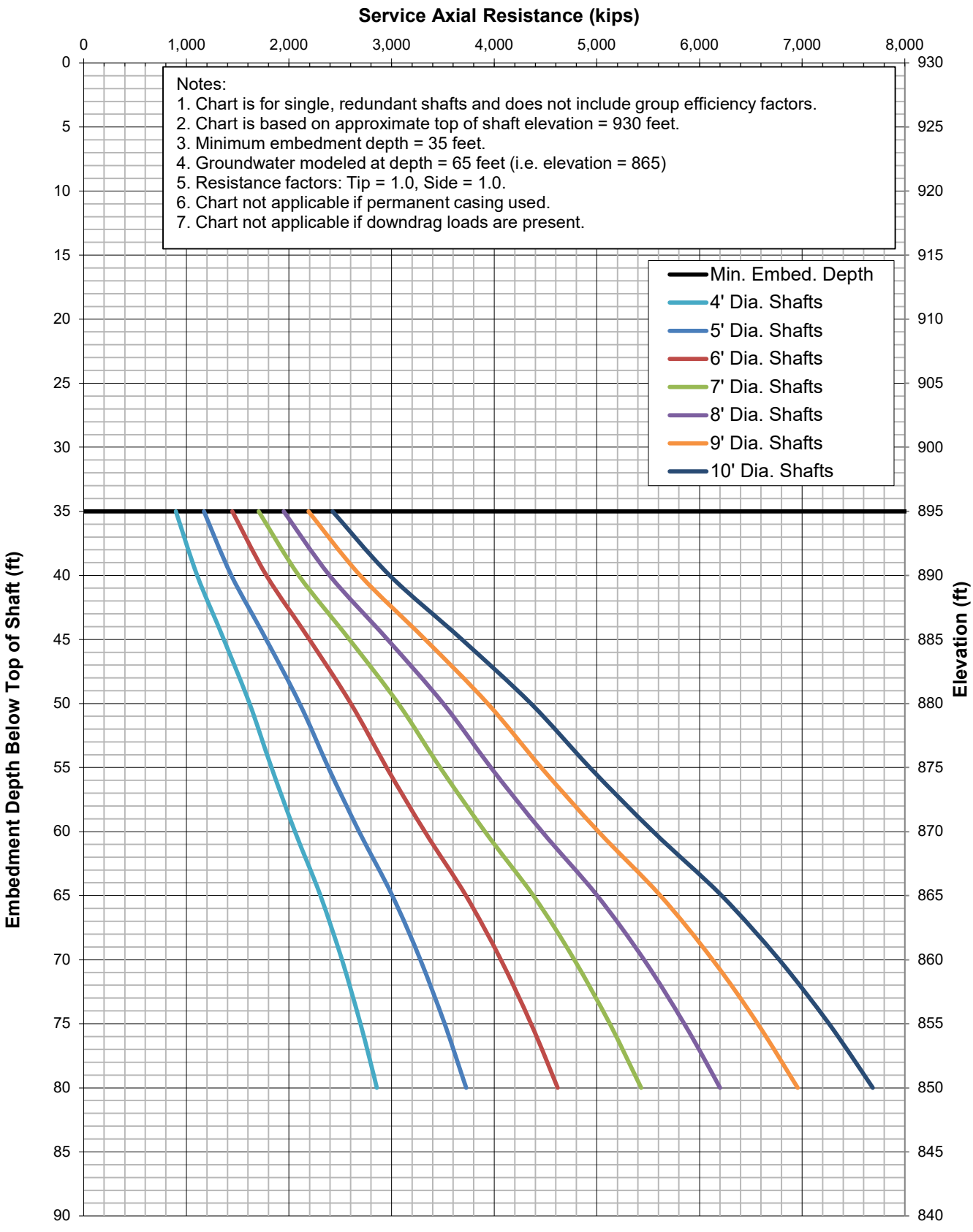
Designer:	Date:
M. Meza	7/9/2024

DRILLED SHAFT FOUNDATION DESIGN CHART
Service Limit (0.75 Inch Settlement) - Axial Resistance in Kips

SR 303L, MC 85 to Van Buren Street
SR 303L, Mainline Over Ramps
Abutments and Piers

Figure

E59



ethos ENGINEERING, LLC.

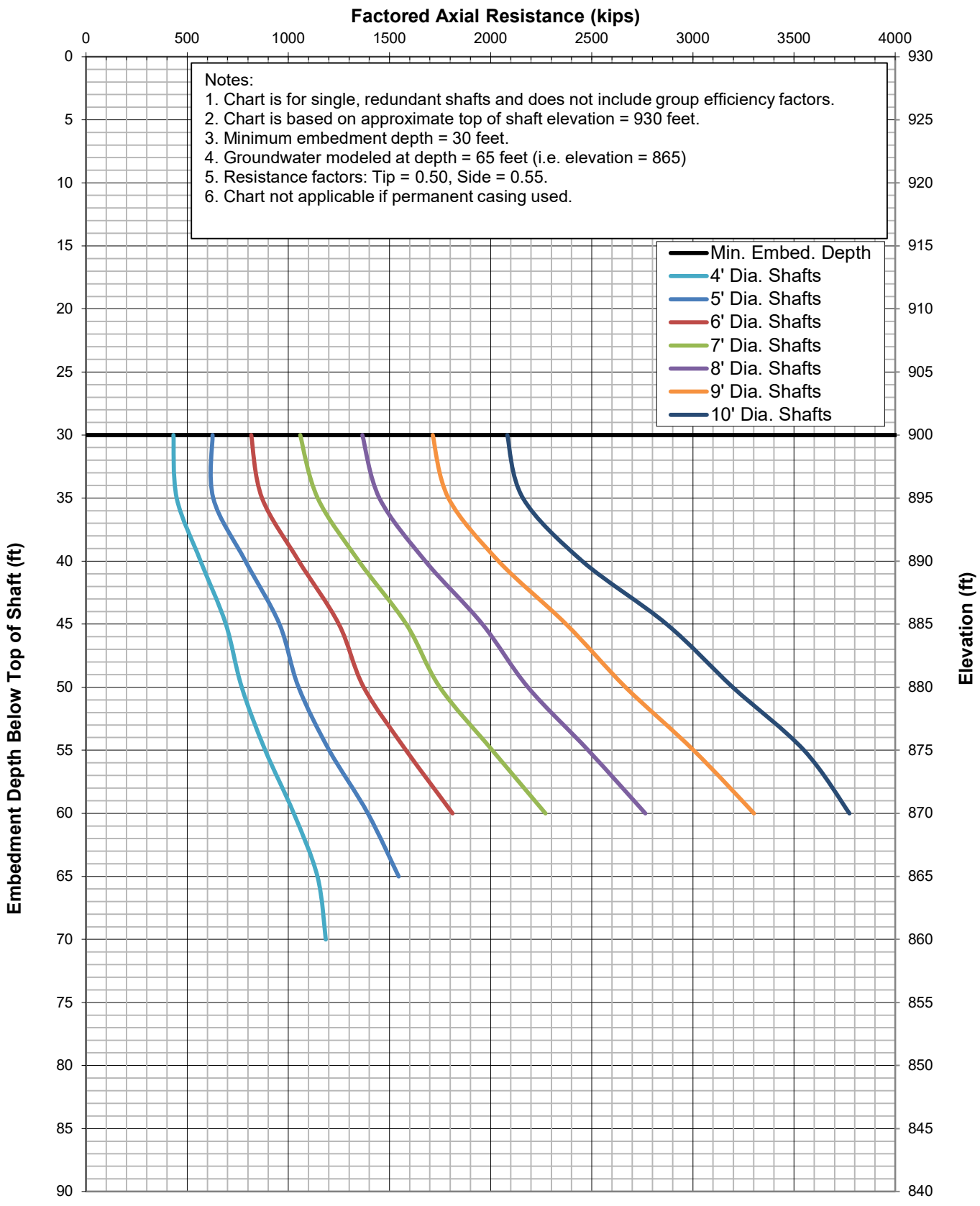
Designer:	Date:
M. Meza	7/9/2024

DRILLED SHAFT FOUNDATION DESIGN CHART
Service Limit (1 Inch Settlement) - Axial Resistance in Kips

SR 303L, MC 85 to Van Buren Street
SR 303L, Mainline Over Ramps
Abutments and Piers

Figure

E60



ethos ENGINEERING, LLC.

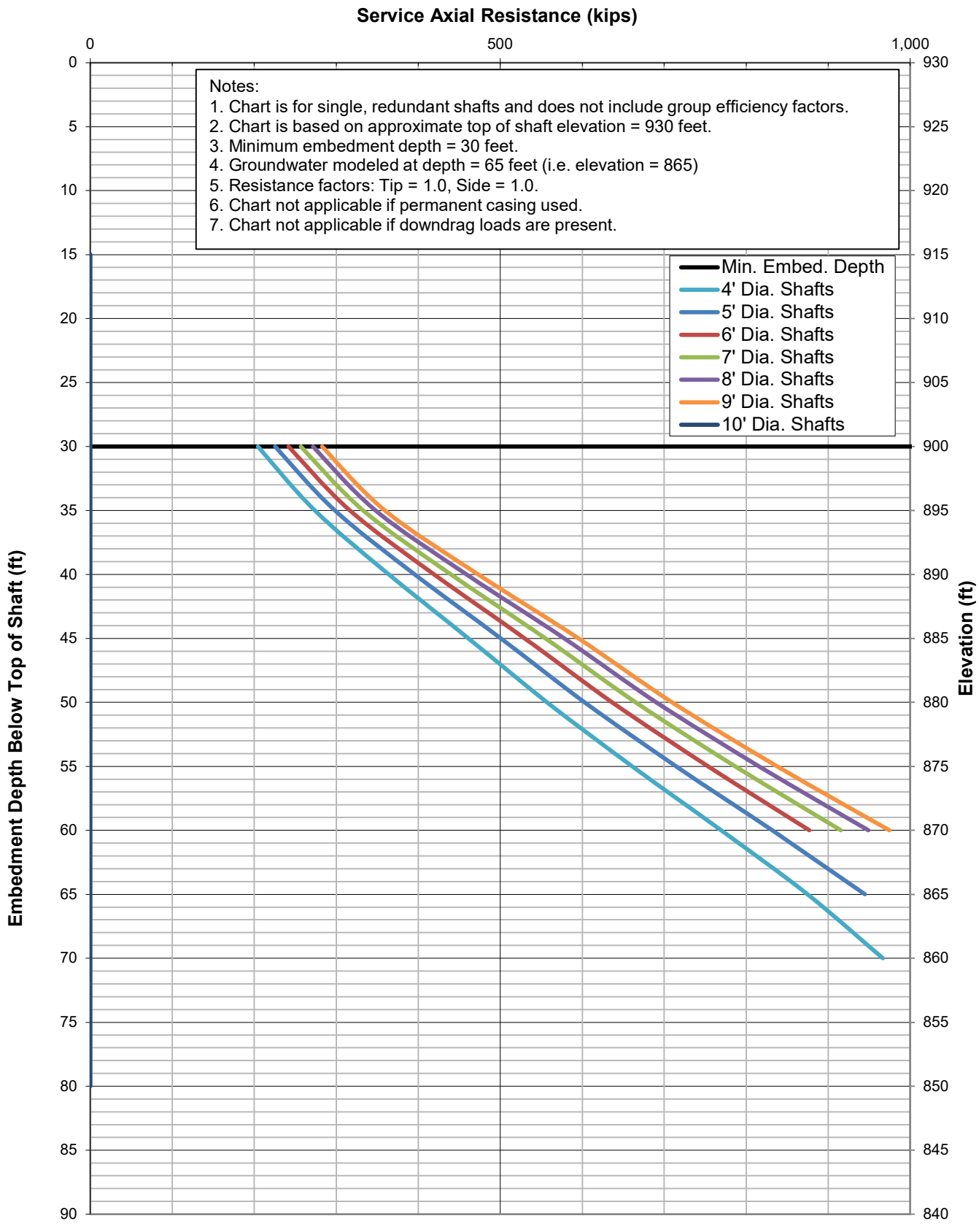
Designer:	Date:
M. Meza	6/24/2024

DRILLED SHAFT FOUNDATION DESIGN CHART
Strength Limit Axial Resistance in Kips

SR 303L, MC 85 to Van Buren Street
Lower Buckeye Ramp B Over Elwood Ramp D
Abutments

Figure

E61



ethos ENGINEERING, LLC.

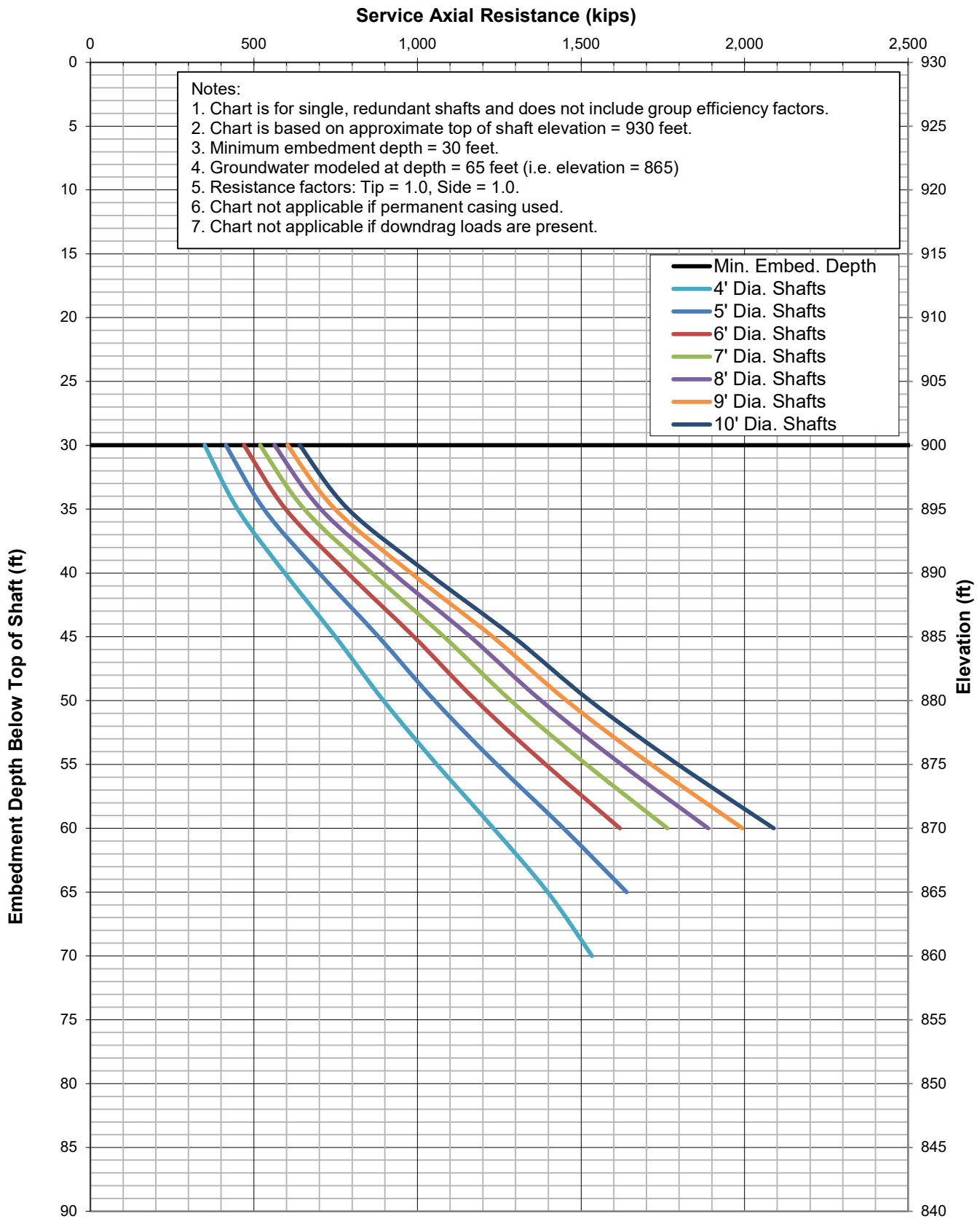
Designer:	Date:
M. Meza	6/24/2024

DRILLED SHAFT FOUNDATION DESIGN CHART
Service Limit (0.10 Inch Settlement) - Axial Resistance in Kips

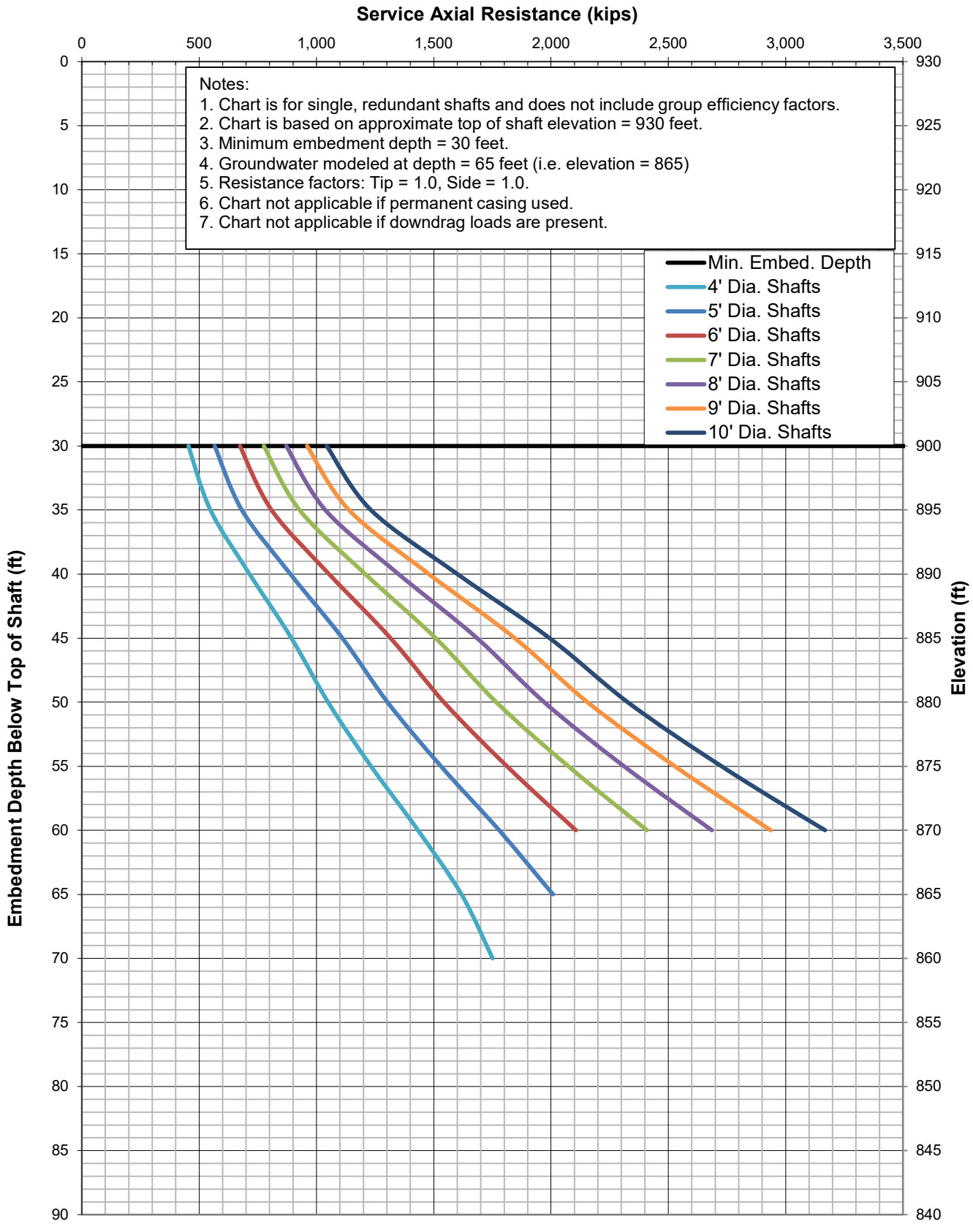
SR 303L, MC 85 to Van Buren Street
Lower Buckeye Ramp B Over Elwood Ramp D
Abutments

Figure

E62



ethos ENGINEERING, LLC.		**DRILLED SHAFT FOUNDATION DESIGN CHART** **Service Limit (0.25 Inch Settlement) - Axial Resistance in Kips**	Figure
Designer:	Date:	**SR 303L, MC 85 to Van Buren Street** **Lower Buckeye Ramp B Over Elwood Ramp D** **Abutments**	E63
M. Meza	6/24/2024		



ethos ENGINEERING, LLC.

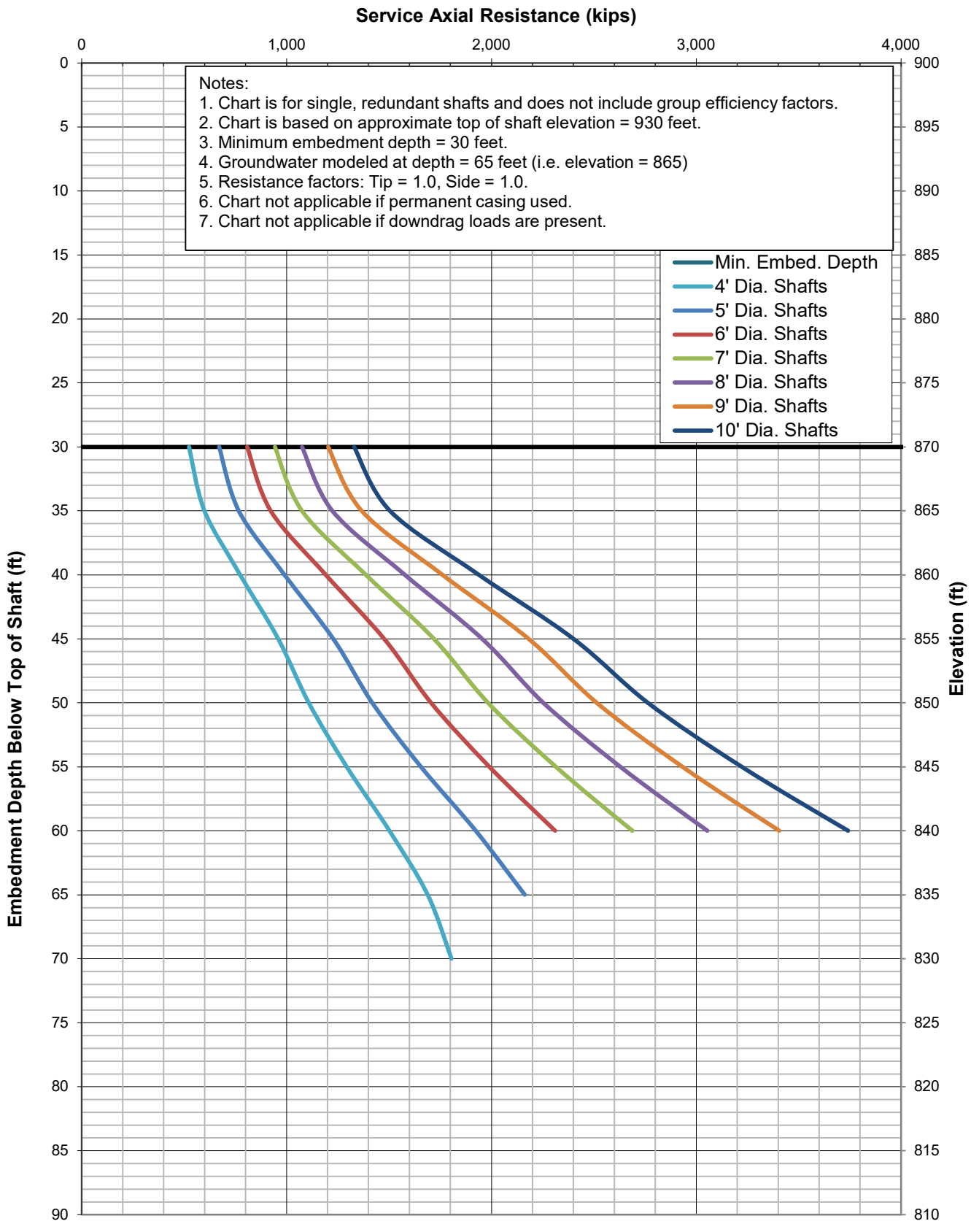
Designer:	Date:
M. Meza	6/24/2024

DRILLED SHAFT FOUNDATION DESIGN CHART
Service Limit (0.5 Inch Settlement) - Axial Resistance in Kips

SR 303L, MC 85 to Van Buren Street
Lower Buckeye Ramp B Over Elwood Ramp D
Abutments

Figure

E64



ethos ENGINEERING, LLC.

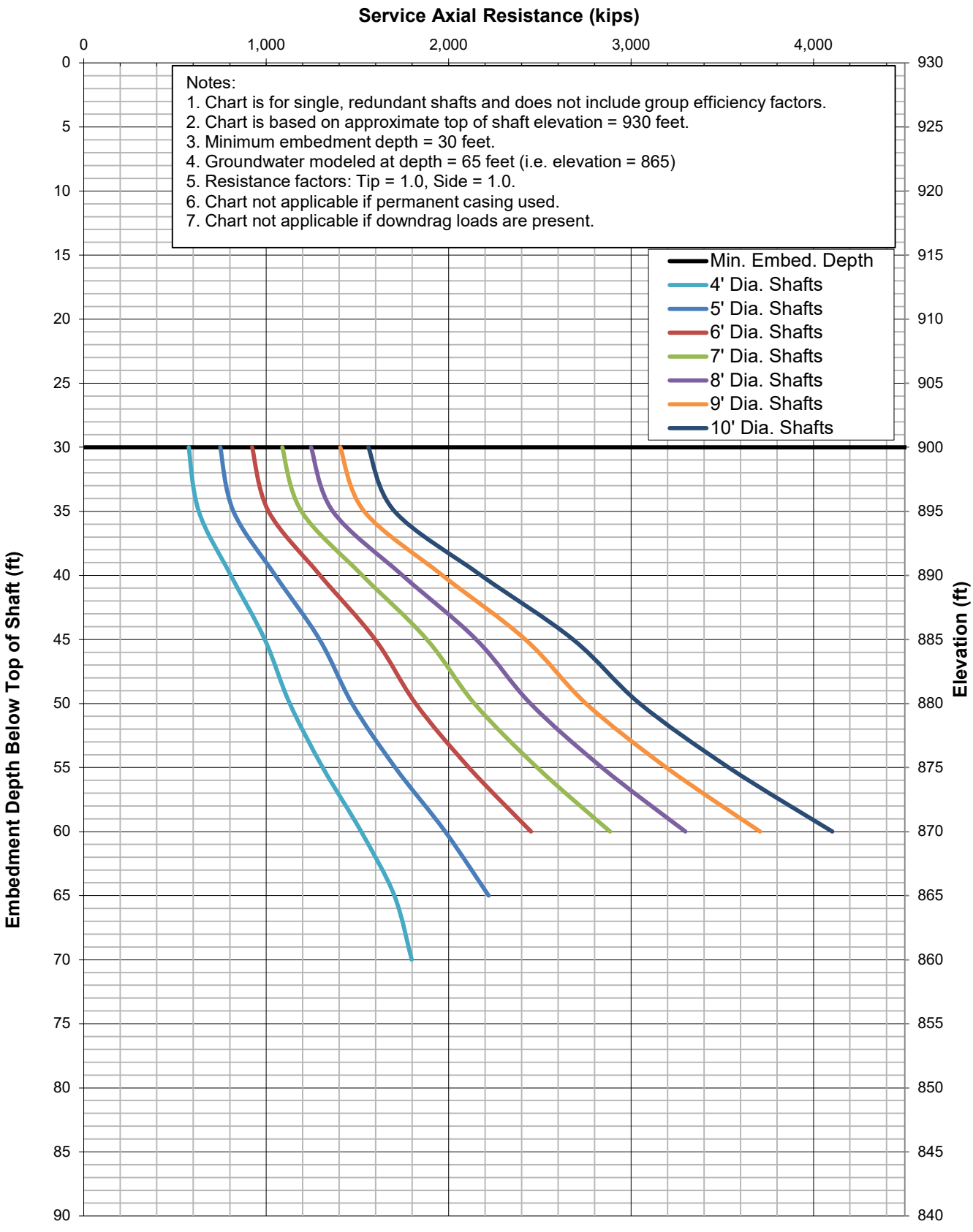
Designer:	Date:
M. Meza	6/24/2024

DRILLED SHAFT FOUNDATION DESIGN CHART
Service Limit (0.75 Inch Settlement) - Axial Resistance in Kips

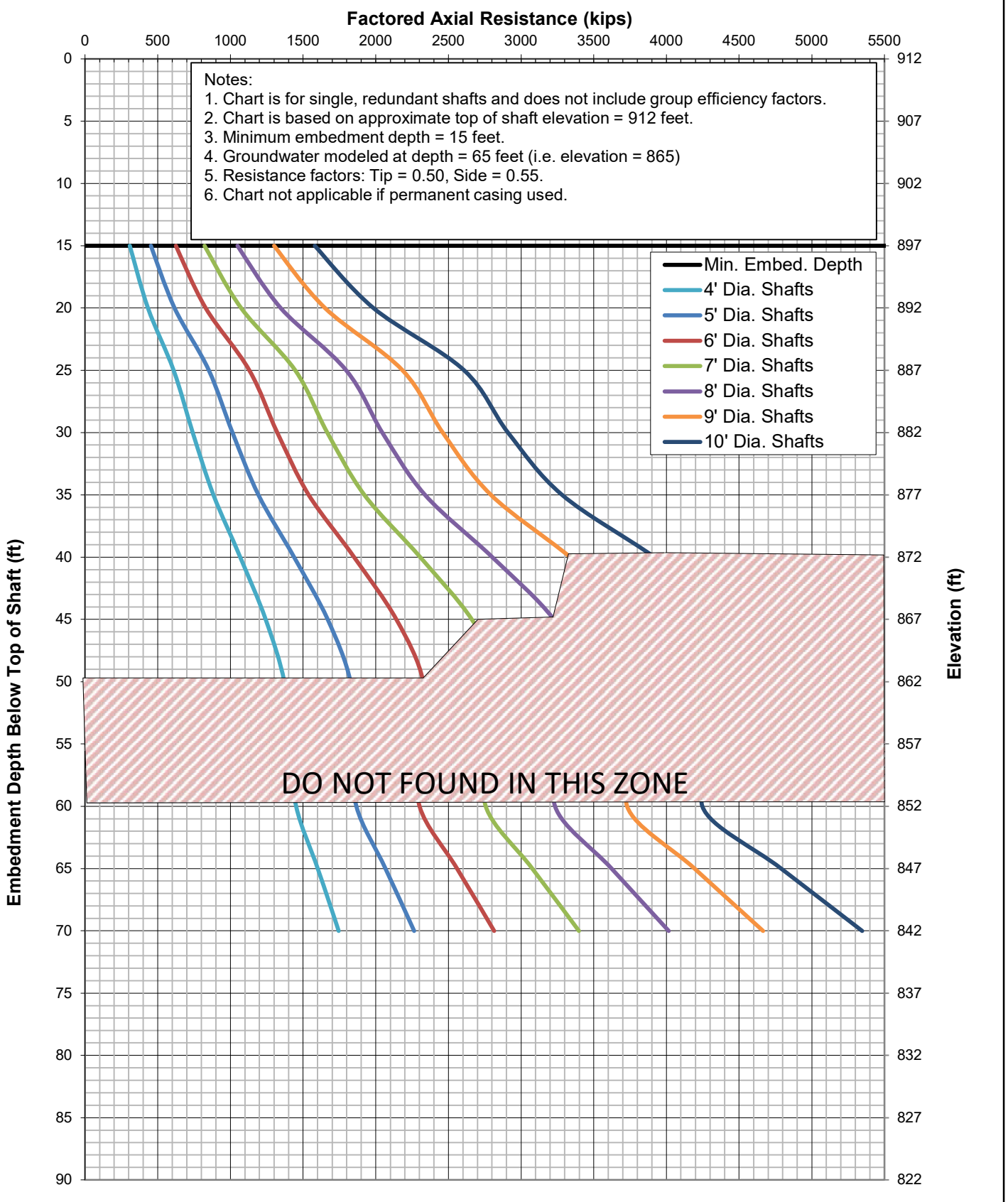
SR 303L, MC 85 to Van Buren Street
Lower Buckeye Ramp B Over Elwood Ramp D
Abutments

Figure

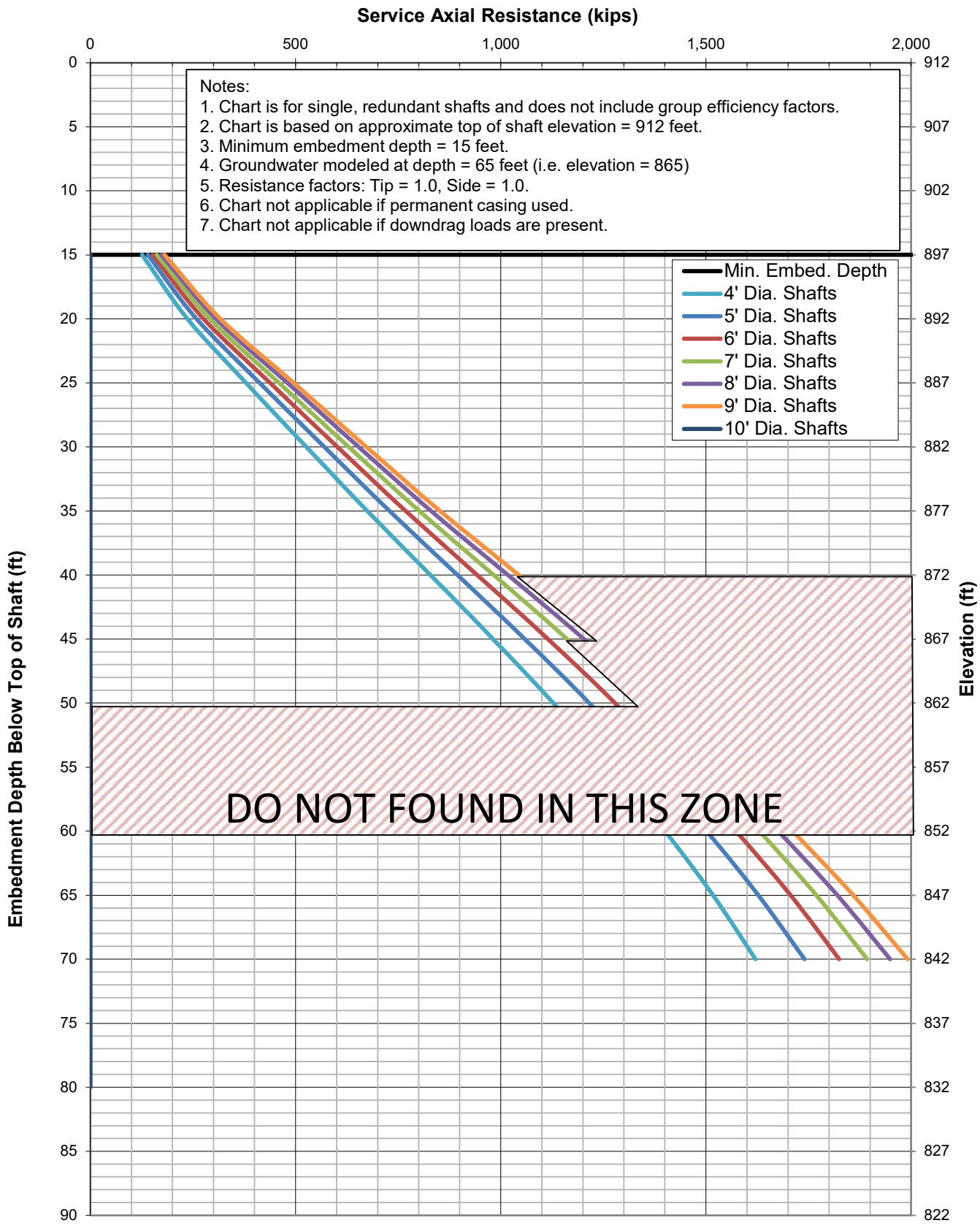
E65



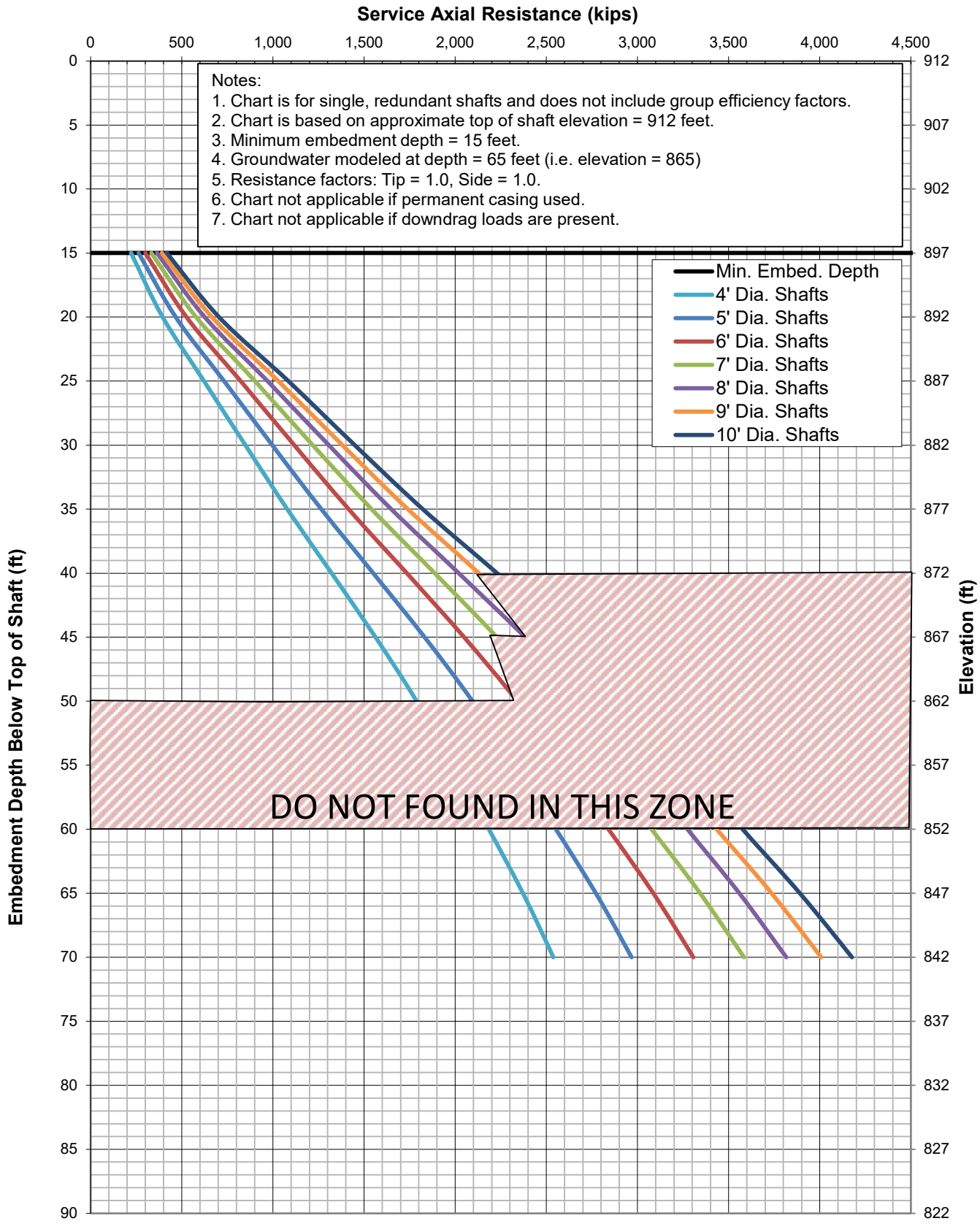
ethos ENGINEERING, LLC.		**DRILLED SHAFT FOUNDATION DESIGN CHART** **Service Limit (1 Inch Settlement) - Axial Resistance in Kips**	Figure
Designer:	Date:	**SR 303L, MC 85 to Van Buren Street** **Lower Buckeye Ramp B Over Elwood Ramp D** **Abutments**	E66
M. Meza	6/24/2024		



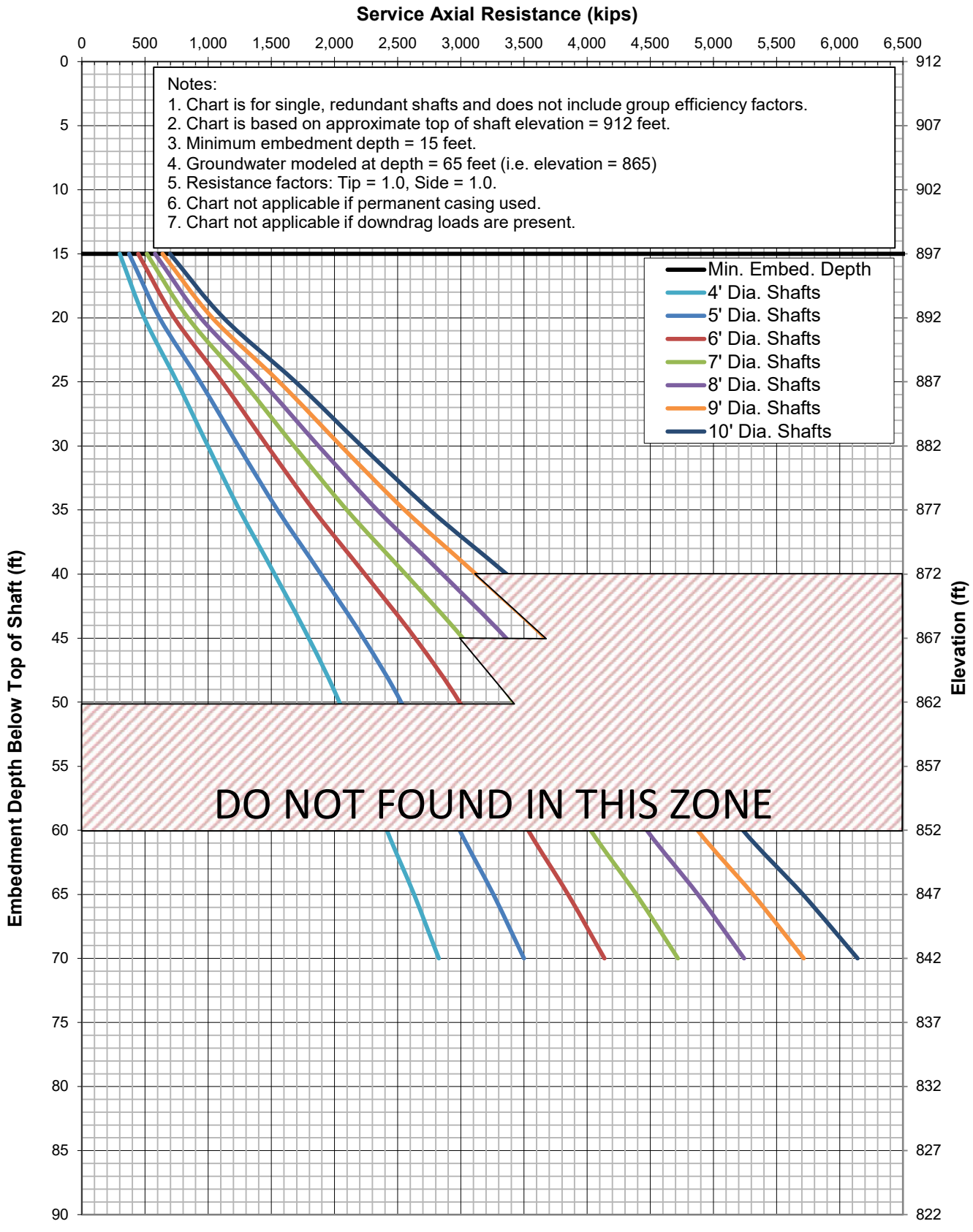
ethos ENGINEERING, LLC.		**DRILLED SHAFT FOUNDATION DESIGN CHART** **Strength Limit Axial Resistance in Kips**	Figure
Designer:	Date:	**SR 303L, MC 85 to Van Buren Street** **Lower Buckeye Ramp B Over Elwood Ramp D** **Center Pier**	E67
M. Meza	6/24/2024		



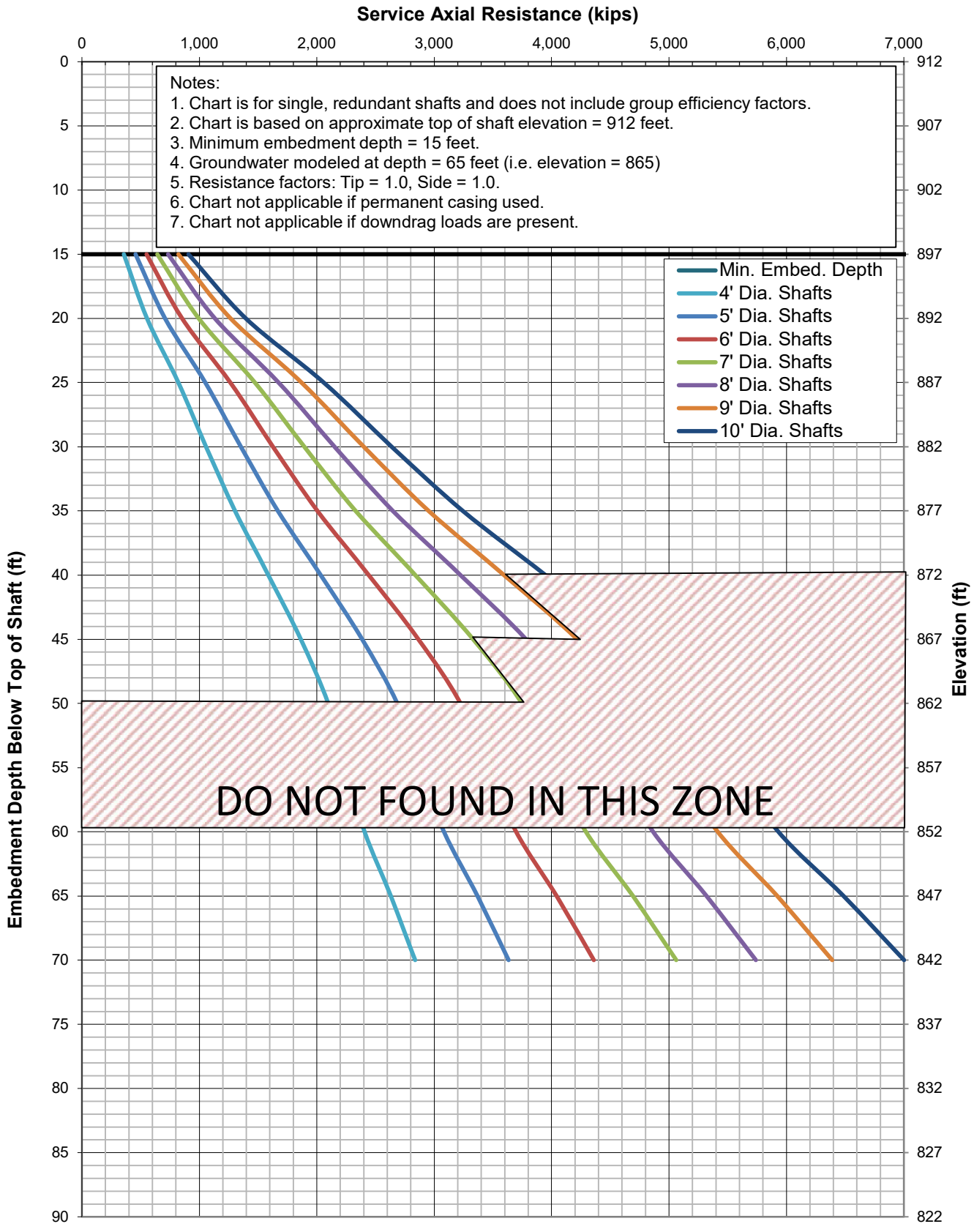
ethos ENGINEERING, LLC.		**DRILLED SHAFT FOUNDATION DESIGN CHART** **Service Limit (0.10 Inch Settlement) - Axial Resistance in Kips**	Figure
Designer:	Date:	**SR 303L, MC 85 to Van Buren Street** **Lower Buckeye Ramp B Over Elwood Ramp D** **Center Pier**	E68
M. Meza	6/24/2024		



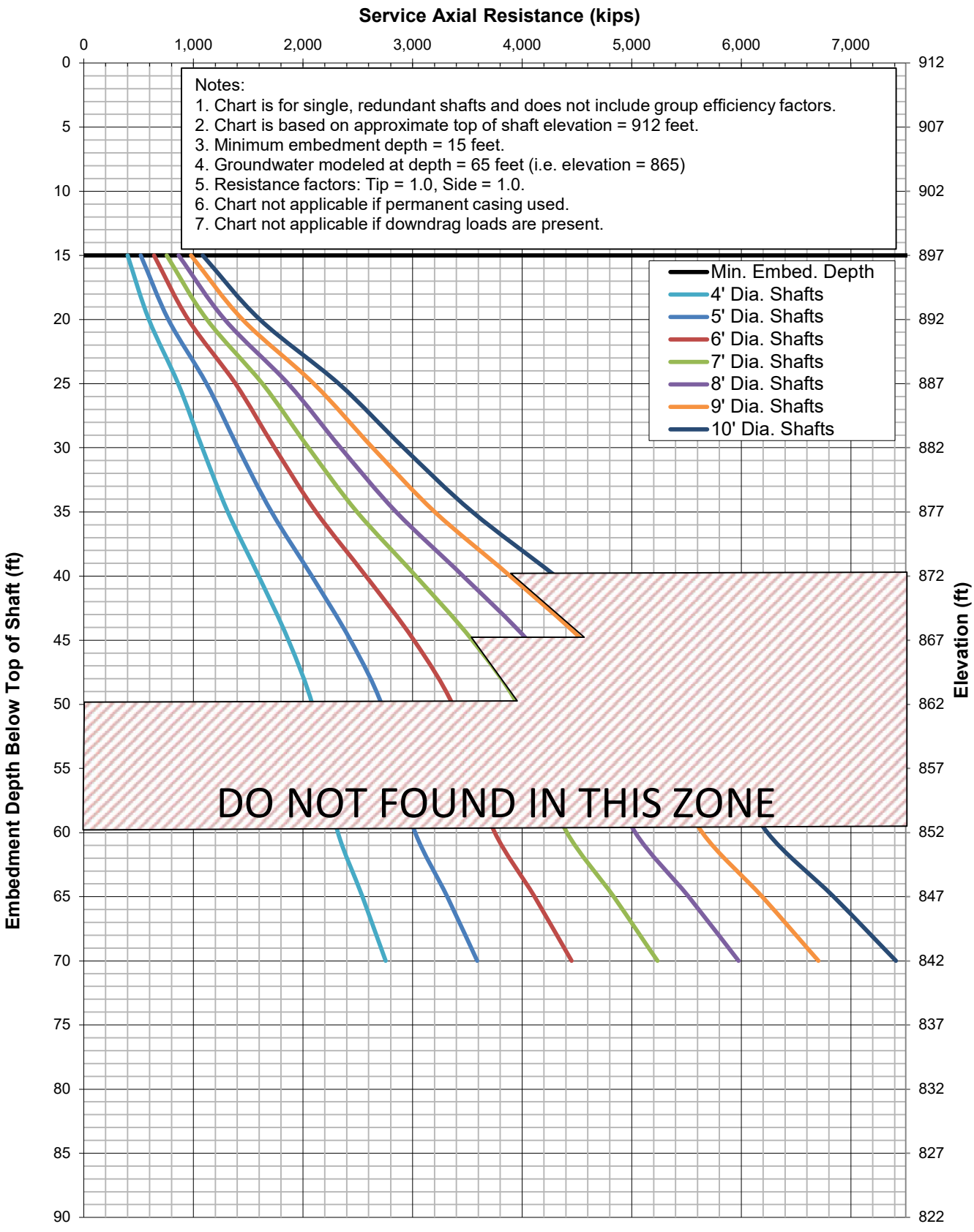
ethos ENGINEERING, LLC.	**DRILLED SHAFT FOUNDATION DESIGN CHART** **Service Limit (0.25 Inch Settlement) - Axial Resistance in Kips** **SR 303L, MC 85 to Van Buren Street** **Lower Buckeye Ramp B Over Elwood Ramp D** **Center Pier**	Figure E69
Designer: M. Meza Date: 6/24/2024		



ethos ENGINEERING, LLC.		**DRILLED SHAFT FOUNDATION DESIGN CHART** **Service Limit (0.5 Inch Settlement) - Axial Resistance in Kips**	Figure
Designer:	Date:	**SR 303L, MC 85 to Van Buren Street** **Lower Buckeye Ramp B Over Elwood Ramp D** **Center Pier**	E70
M. Meza	6/24/2024		



ethos ENGINEERING, LLC.		**DRILLED SHAFT FOUNDATION DESIGN CHART** **Service Limit (0.75 Inch Settlement) - Axial Resistance in Kips**	Figure
Designer:	Date:	**SR 303L, MC 85 to Van Buren Street** **Lower Buckeye Ramp B Over Elwood Ramp D** **Center Pier**	E71
M. Meza	6/24/2024		



ethos ENGINEERING, LLC.

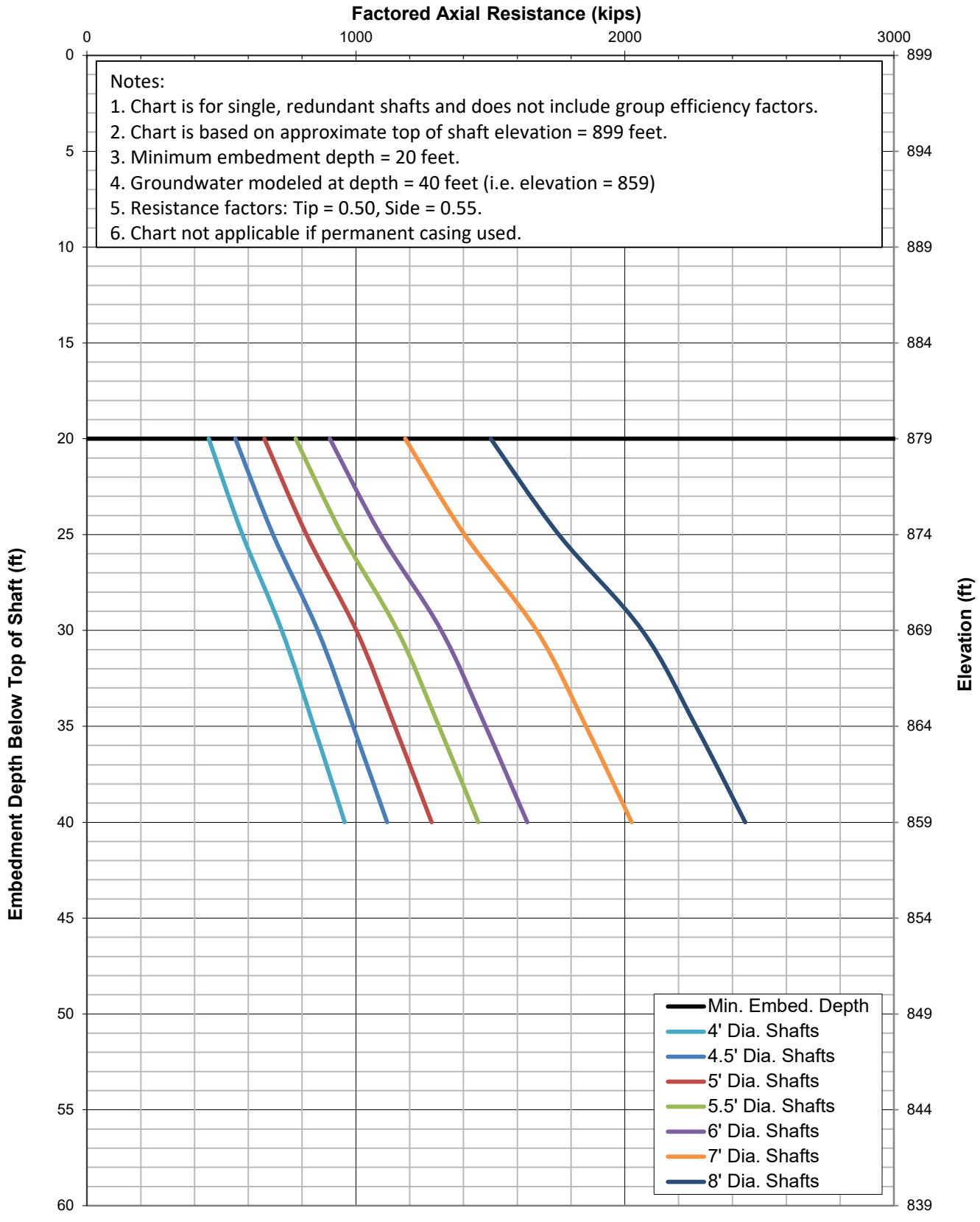
Designer:	Date:
M. Meza	6/24/2024

DRILLED SHAFT FOUNDATION DESIGN CHART
Service Limit (1 Inch Settlement) - Axial Resistance in Kips

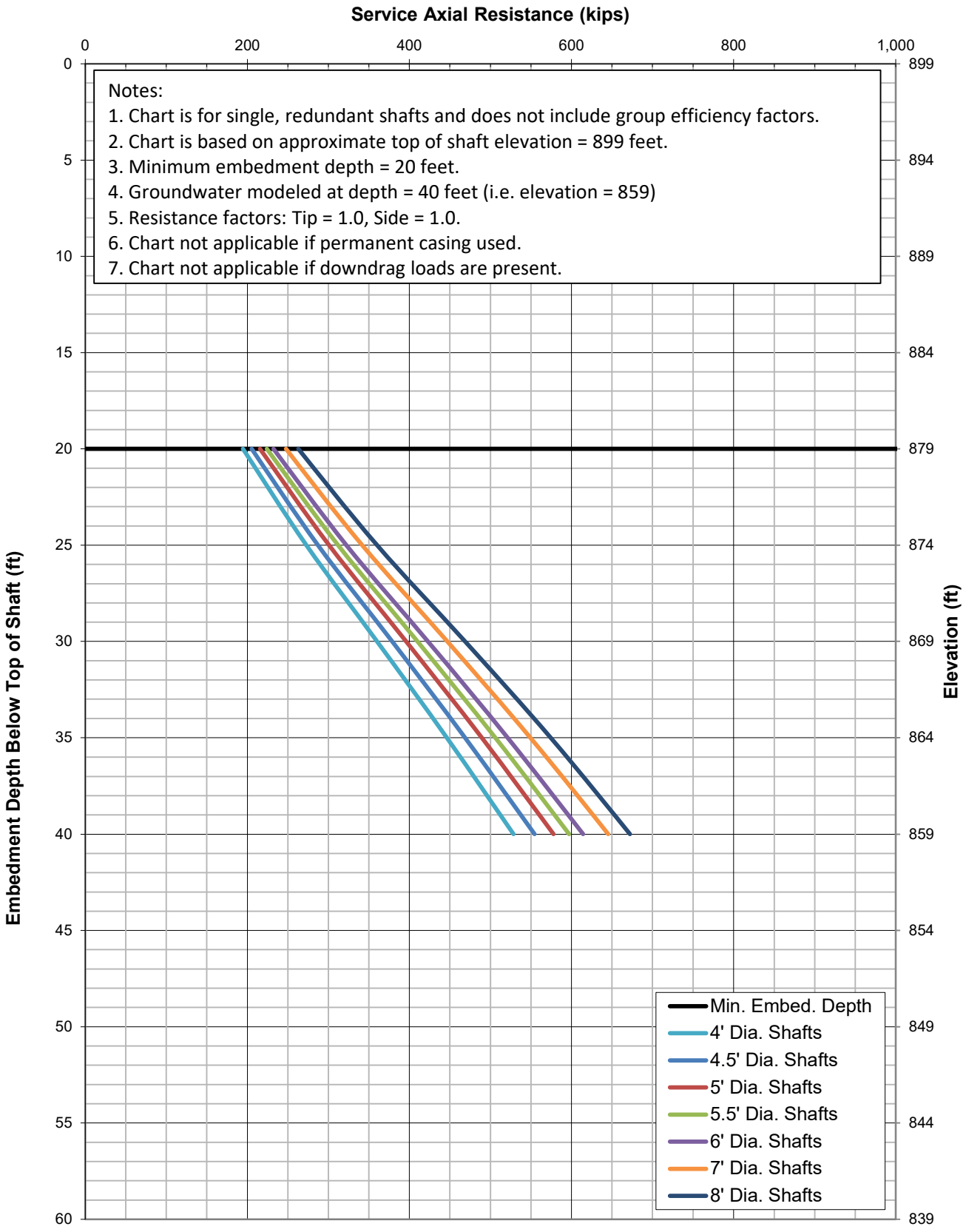
SR 303L, MC 85 to Van Buren Street
Lower Buckeye Ramp B Over Elwood Ramp D
Center Pier

Figure

E72



ethos ENGINEERING, LLC.		**DRILLED SHAFT FOUNDATION DESIGN CHART** **Strength Limit Axial Resistance in Kips** **SR 303L, MC 85 to Van Buren Street** **Atlanta Avenue OP** **Open-frame Structure**	Figure E73
Designer:	Date:		
K. Mackay	11/12/2024		



ethos ENGINEERING, LLC.

Designer:	Date:
K. Mackay	11/12/2024

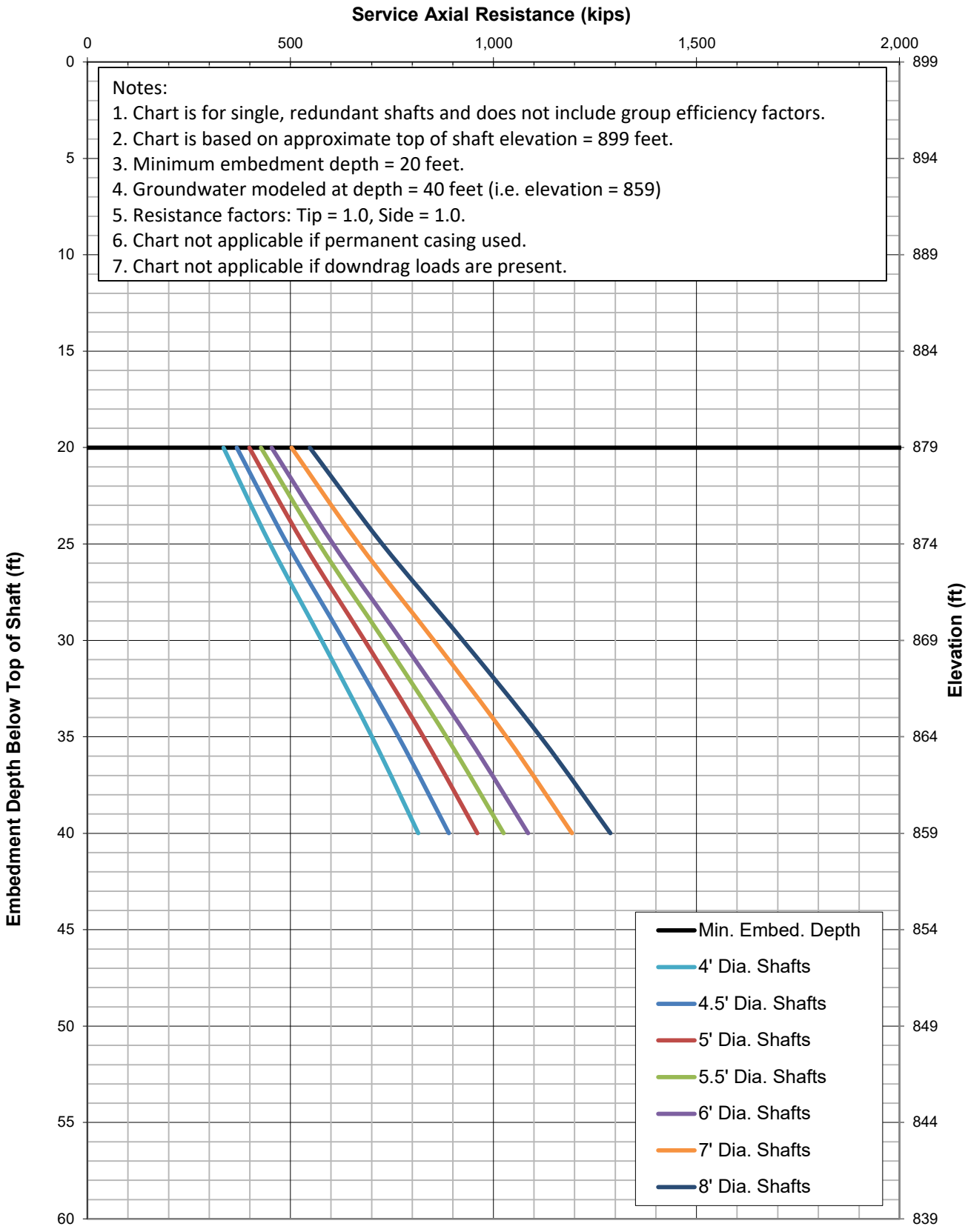
DRILLED SHAFT FOUNDATION DESIGN CHART
Service Limit (0.10-Inch Settlement) - Axial Resistance in Kips

SR 303L, MC 85 to Van Buren Street

Atlanta Avenue OP
Open-frame Structure

Figure

E74



ethos ENGINEERING, LLC.

Designer:	Date:
K. Mackay	11/12/2024

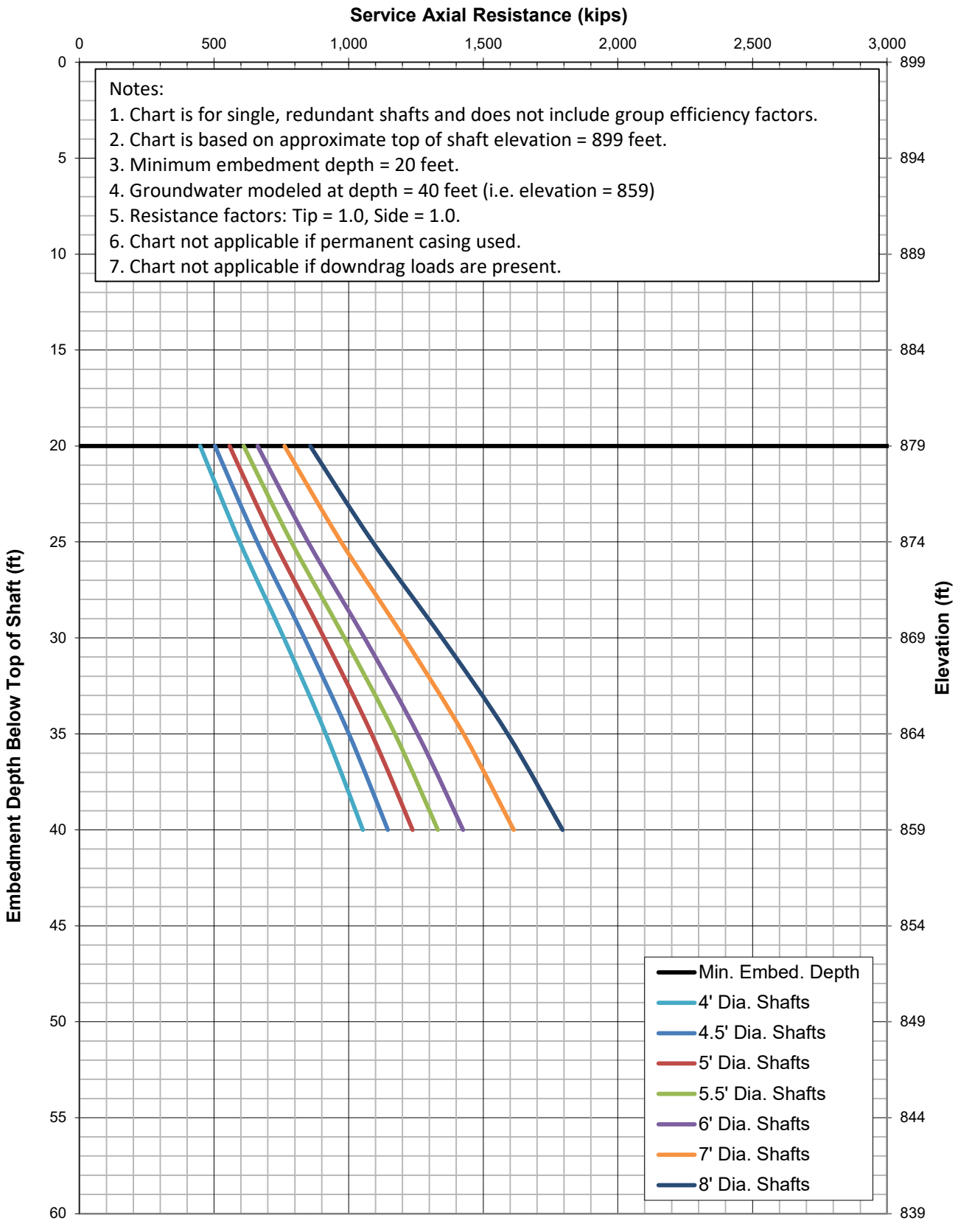
DRILLED SHAFT FOUNDATION DESIGN CHART
Service Limit (0.25-Inch Settlement) - Axial Resistance in Kips

SR 303L, MC 85 to Van Buren Street

Atlanta Avenue OP
Open-frame Structure

Figure

E75



ethos ENGINEERING, LLC.

Designer:	Date:
K. Mackay	11/12/2024

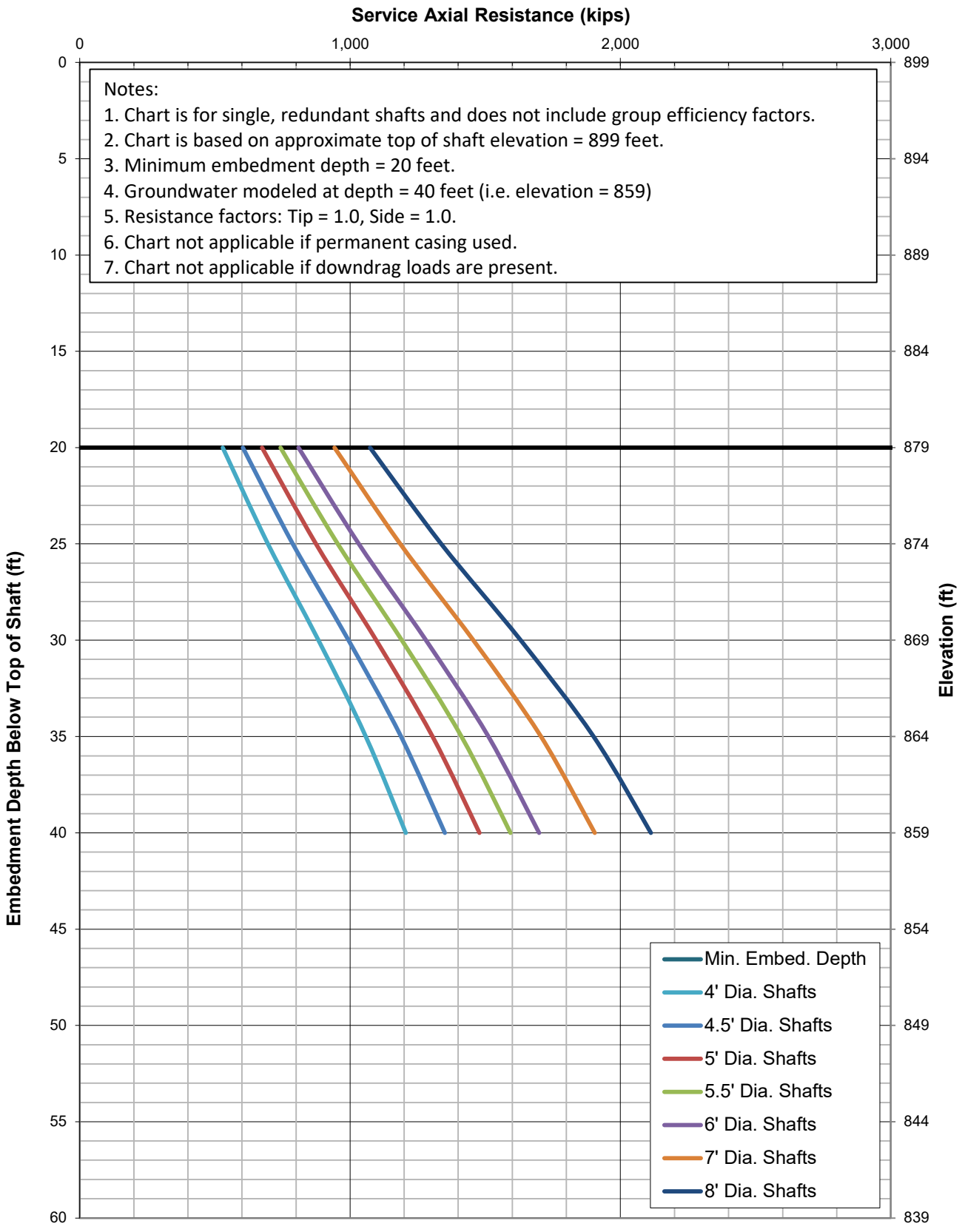
DRILLED SHAFT FOUNDATION DESIGN CHART
Service Limit (0.5-Inch Settlement) - Axial Resistance in Kips

SR 303L, MC 85 to Van Buren Street

Atlanta Avenue OP
Open-frame Structure

Figure

E76



ethos ENGINEERING, LLC.

Designer:	Date:
K. Mackay	11/12/2024

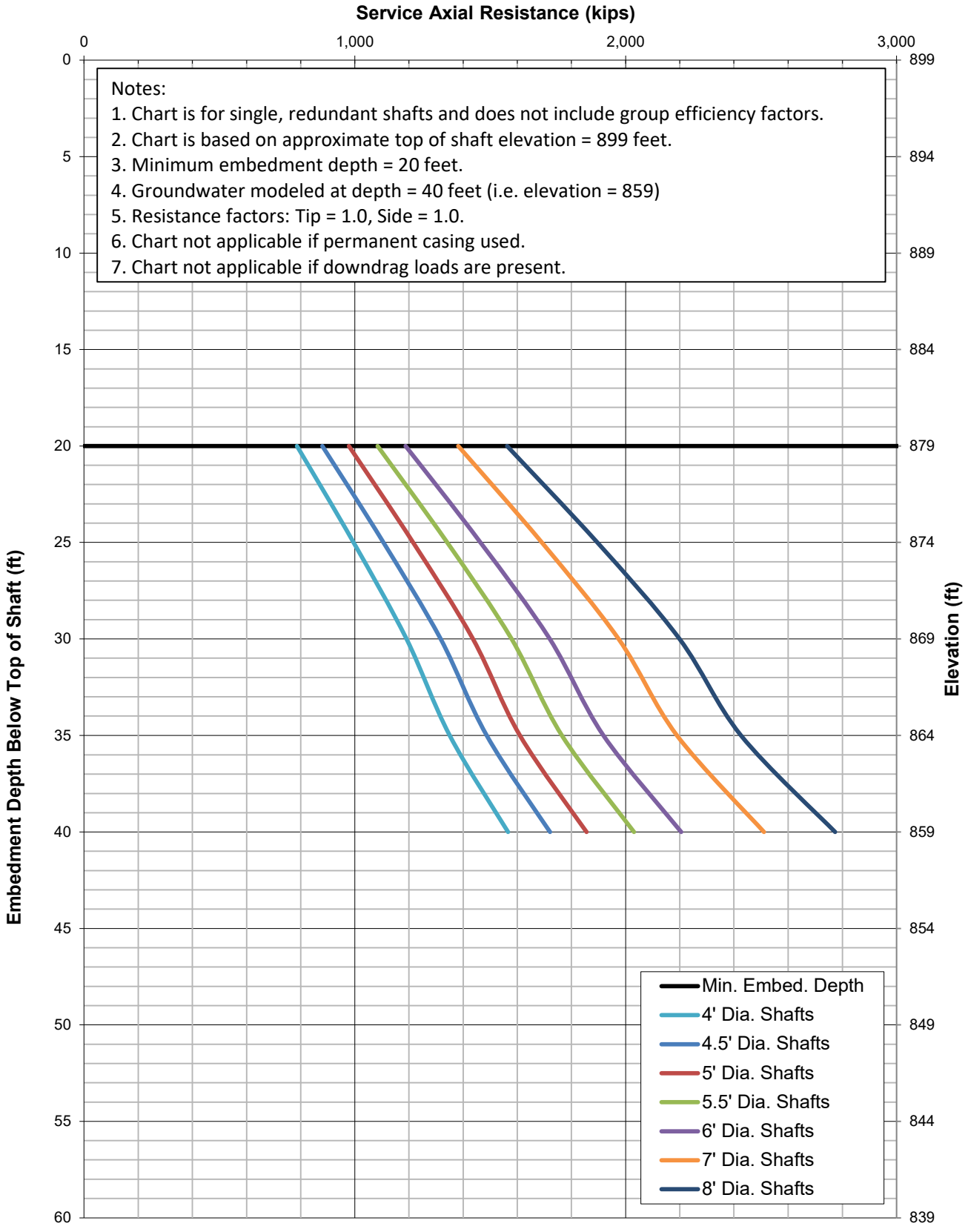
DRILLED SHAFT FOUNDATION DESIGN CHART
Service Limit (0.75-Inch Settlement) - Axial Resistance in Kips

SR 303L, MC 85 to Van Buren Street

Atlanta Avenue OP
Open-frame Structure

Figure

E77



ethos ENGINEERING, LLC.

Designer:	Date:
K. Mackay	11/12/2024

DRILLED SHAFT FOUNDATION DESIGN CHART
Service Limit (1 Inch Settlement) - Axial Resistance in Kips

SR 303L, MC 85 to Van Buren Street

Atlanta Avenue OP
Open-frame Structure

Figure

E78

APPENDIX F

Spread Footing Factored Bearing Resistance Charts

Figure F1 - Yuma Road OP

Footing Length = 80 ft, Depth of Embedment = 10.0 ft

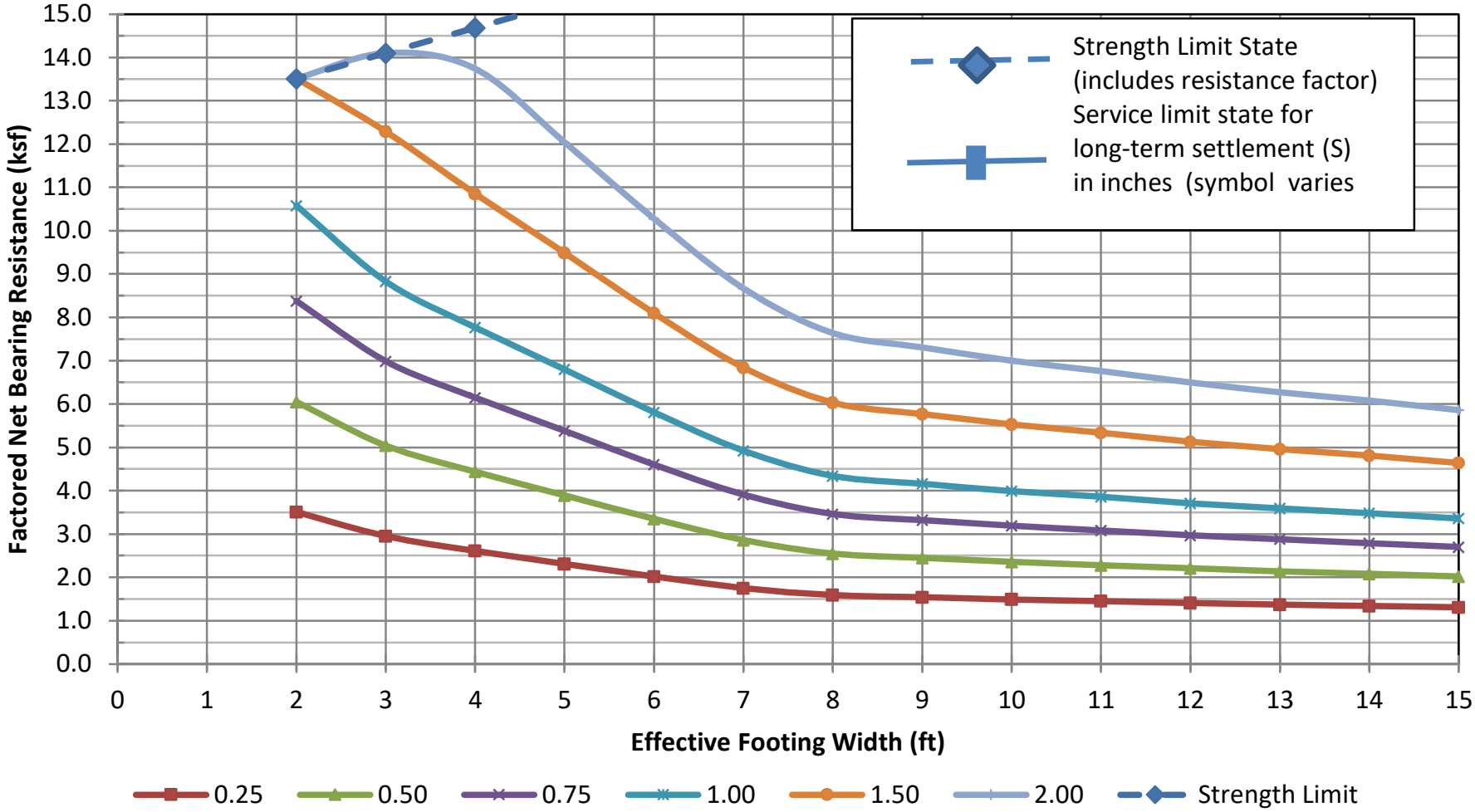


Figure F2 - Retaining Walls - Level Ground

RW-1171-RT and -LT, RW-1175-RT and -LT, RW-1224-RT and -LT, RW-NBFR-26-RT, RW-NBFR-47-RT

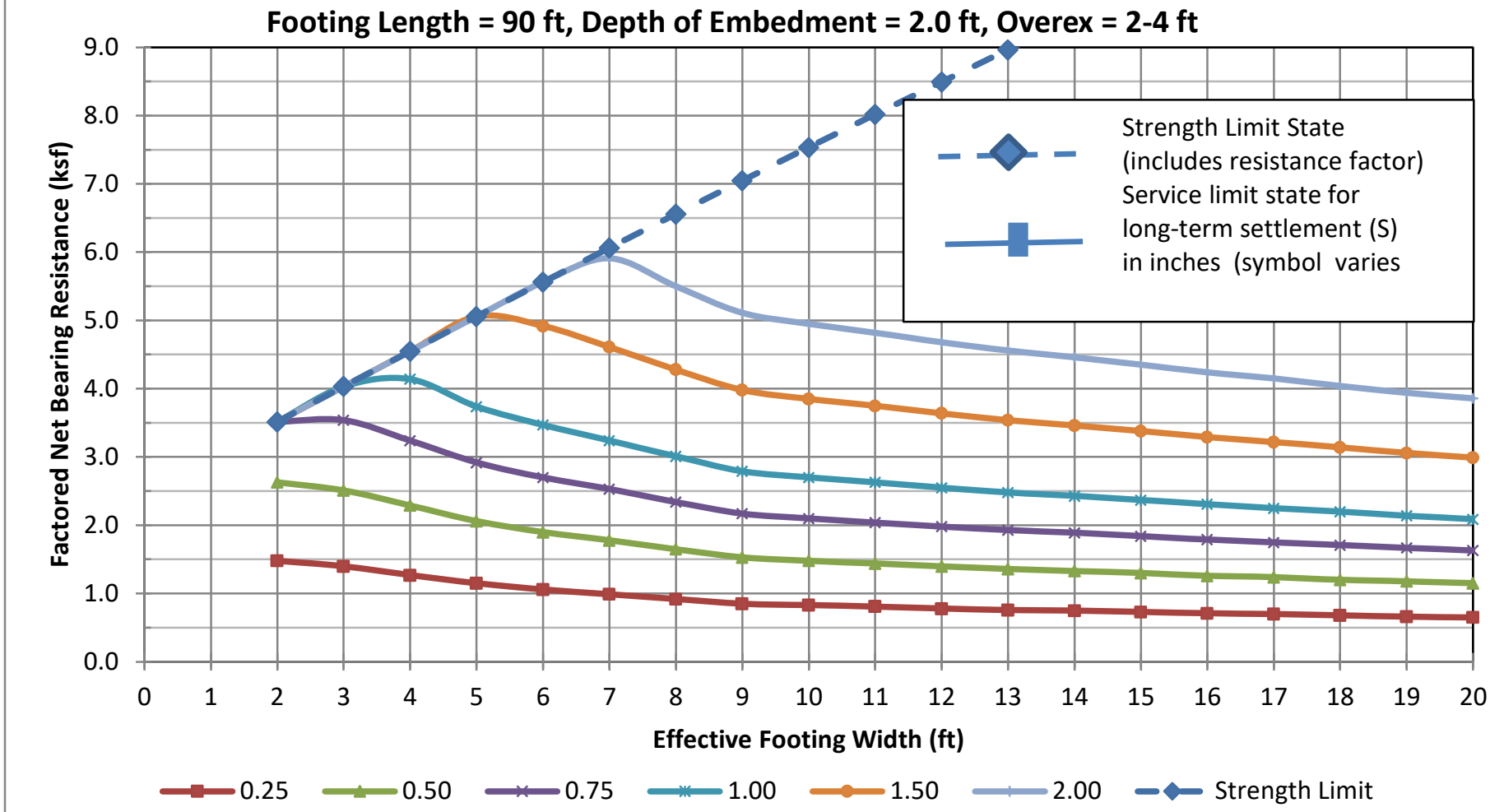


Figure F3 - Retaining Walls - Sloping Ground

RW-1171-RT and -LT, RW-1175-RT and -LT, RW-1224-RT and -LT, RW-NBFR-26-RT, RW-NBFR-47-RT

Footing Length = 90 ft, Overex = 2 - 4 ft

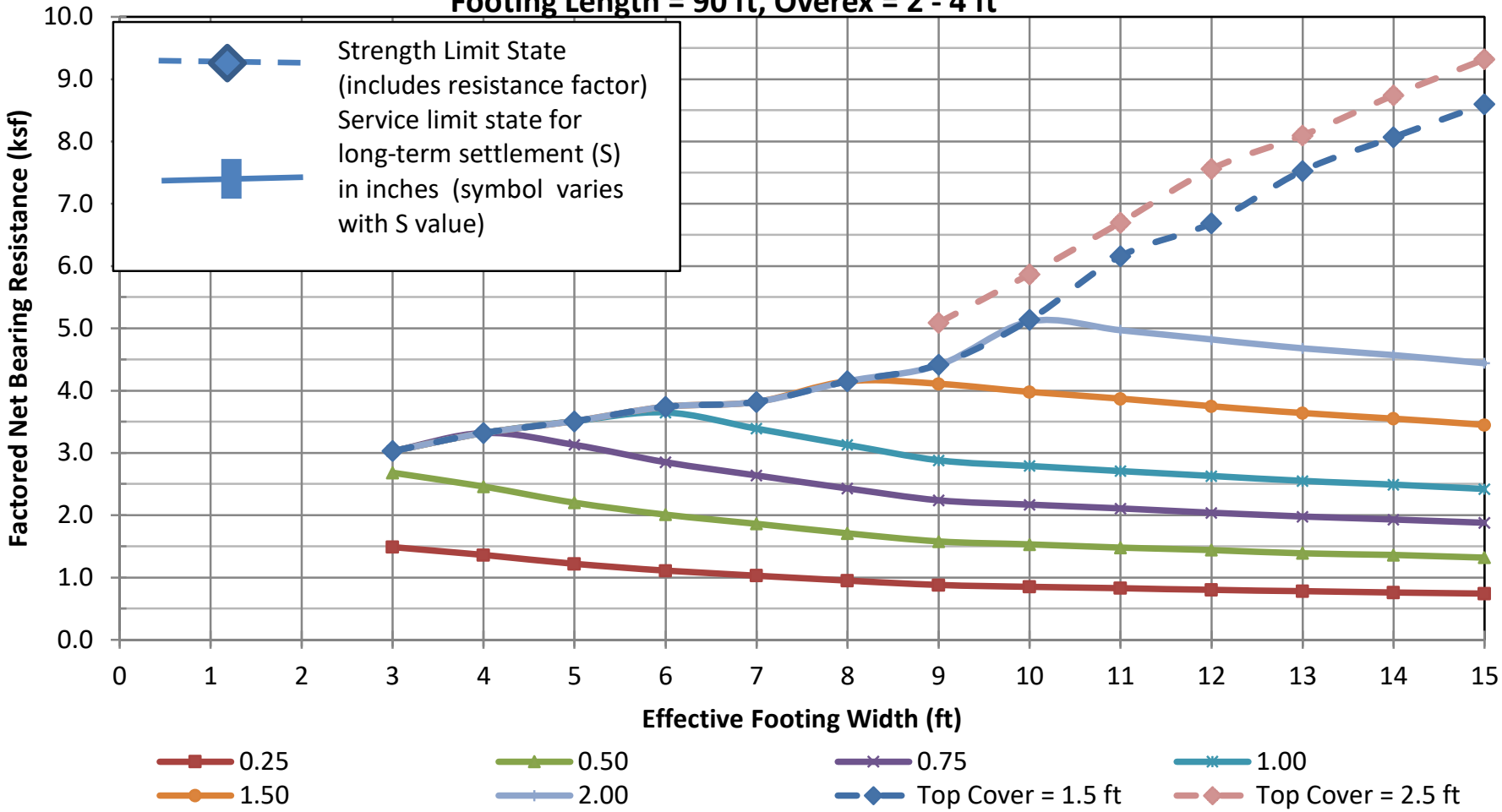


Figure F4
Retaining Walls RW-1107 and RW-1108 - Level Ground
Footing Length = 90 ft, Depth of Embedment = 4 ft - HEIC Improvements

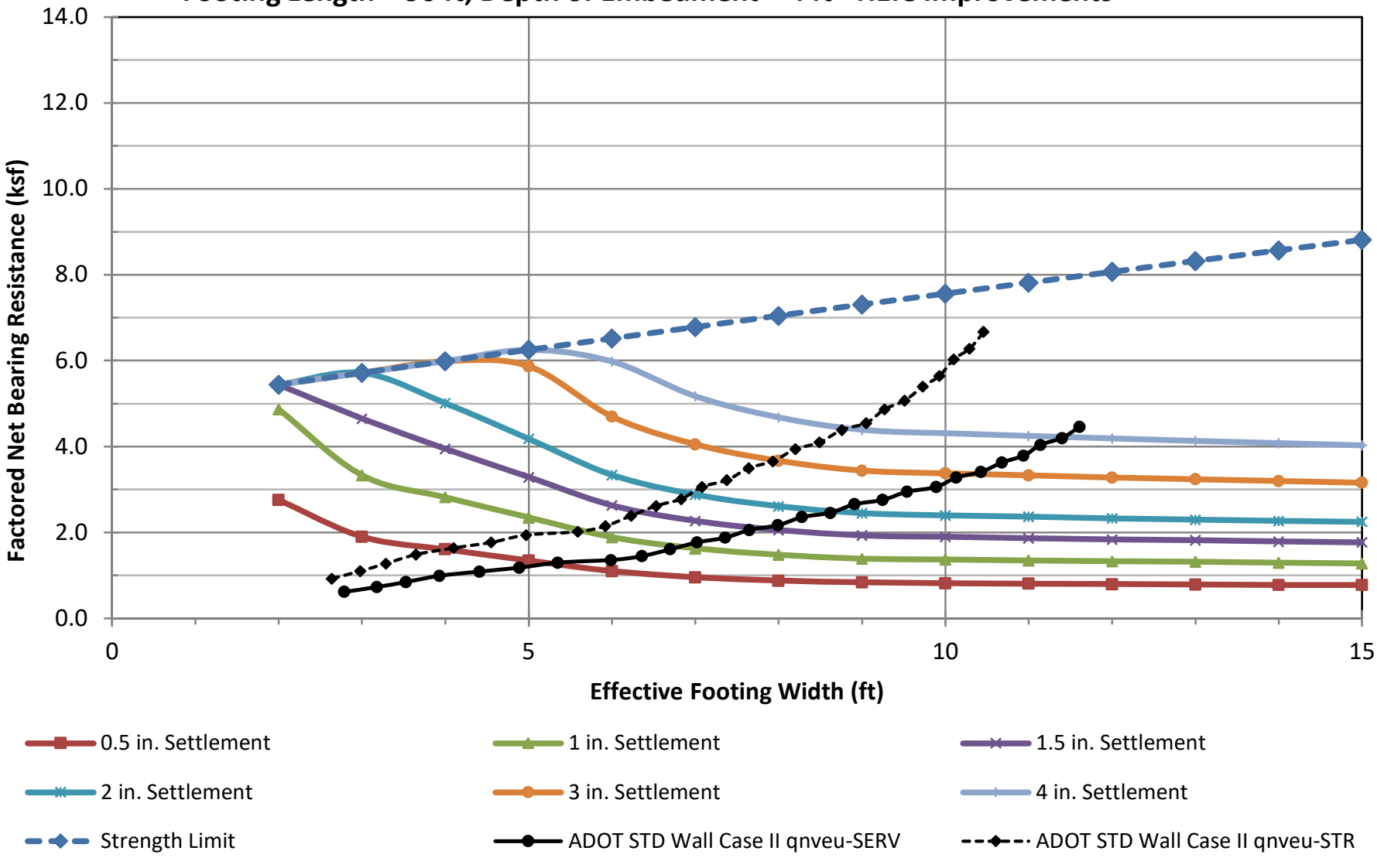


Figure F5
UPRR Walls - Level Ground
(RW-1084-RT, RW-1088-LT, RW-1089-RT, RW-1093-LT, & RW-1094-RT)
Footing Length = 90 ft, Depth of Embedment = 5 ft w/ HEIC

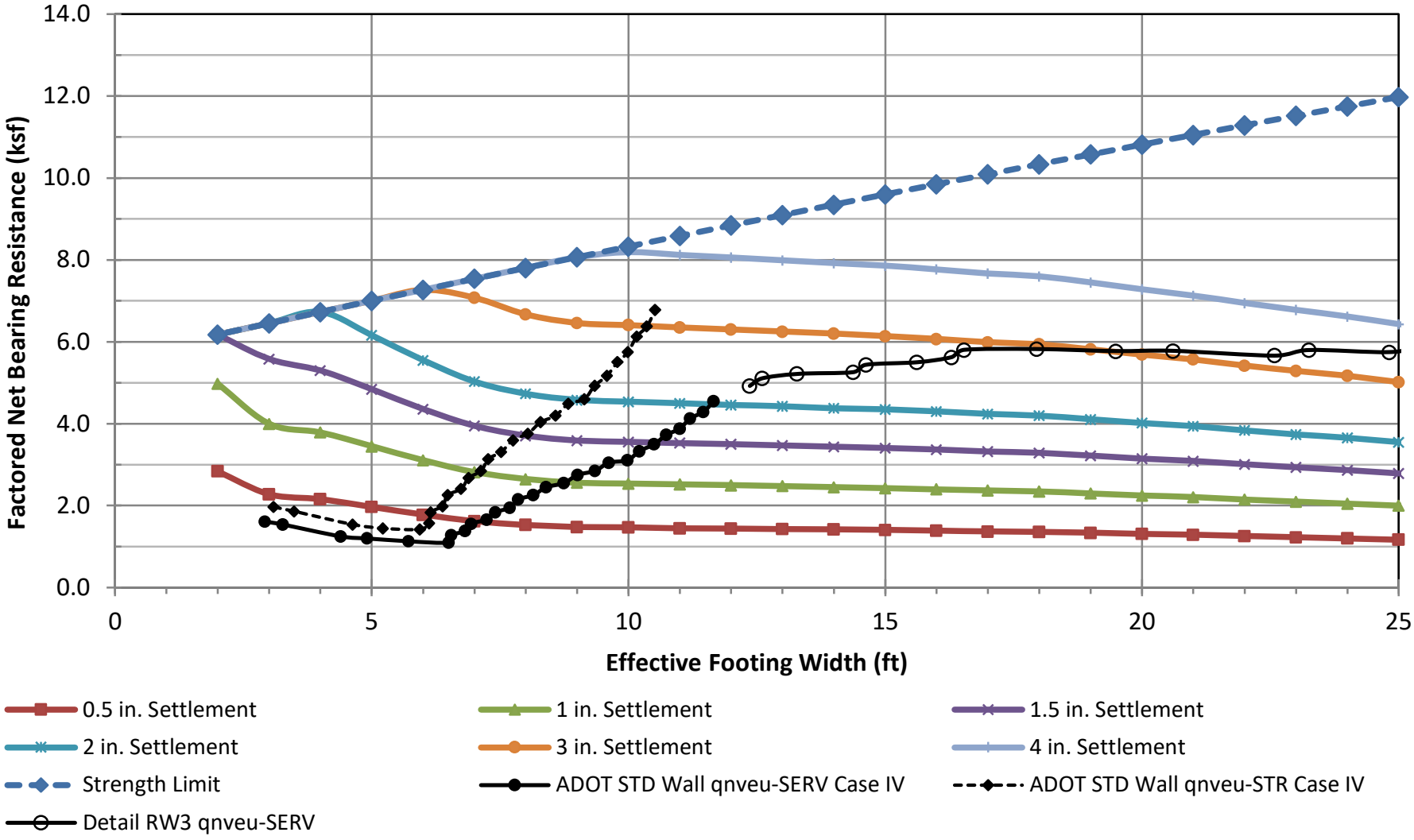


Figure F6

UPRR Walls - Level Ground

(RW-1084-RT, RW-1088-LT, RW-1089-RT, RW-1093-LT, & RW-1094-RT)

Footing Length = 90 ft, Depth of Embedment = 10 ft w/ HEIC

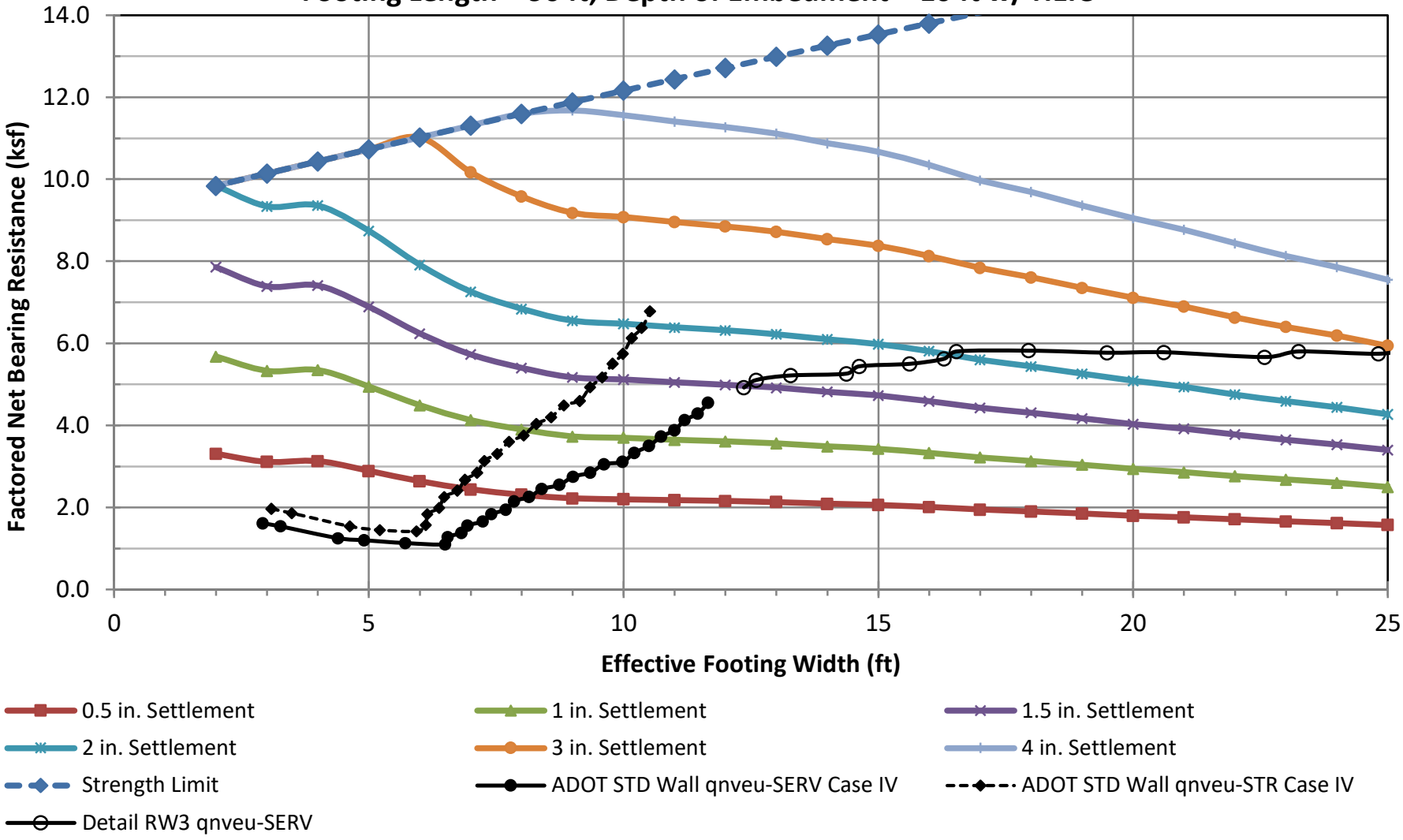


Figure F7 - Retaining Walls - Sloping Ground

RW-1084-RT, RW-1088-LT, RW-1089-RT, RW-1093-LT, RW-1094-RT

Footing Length = 90 ft, Depth of Embedment = 2.0 ft, Overex = 4 ft

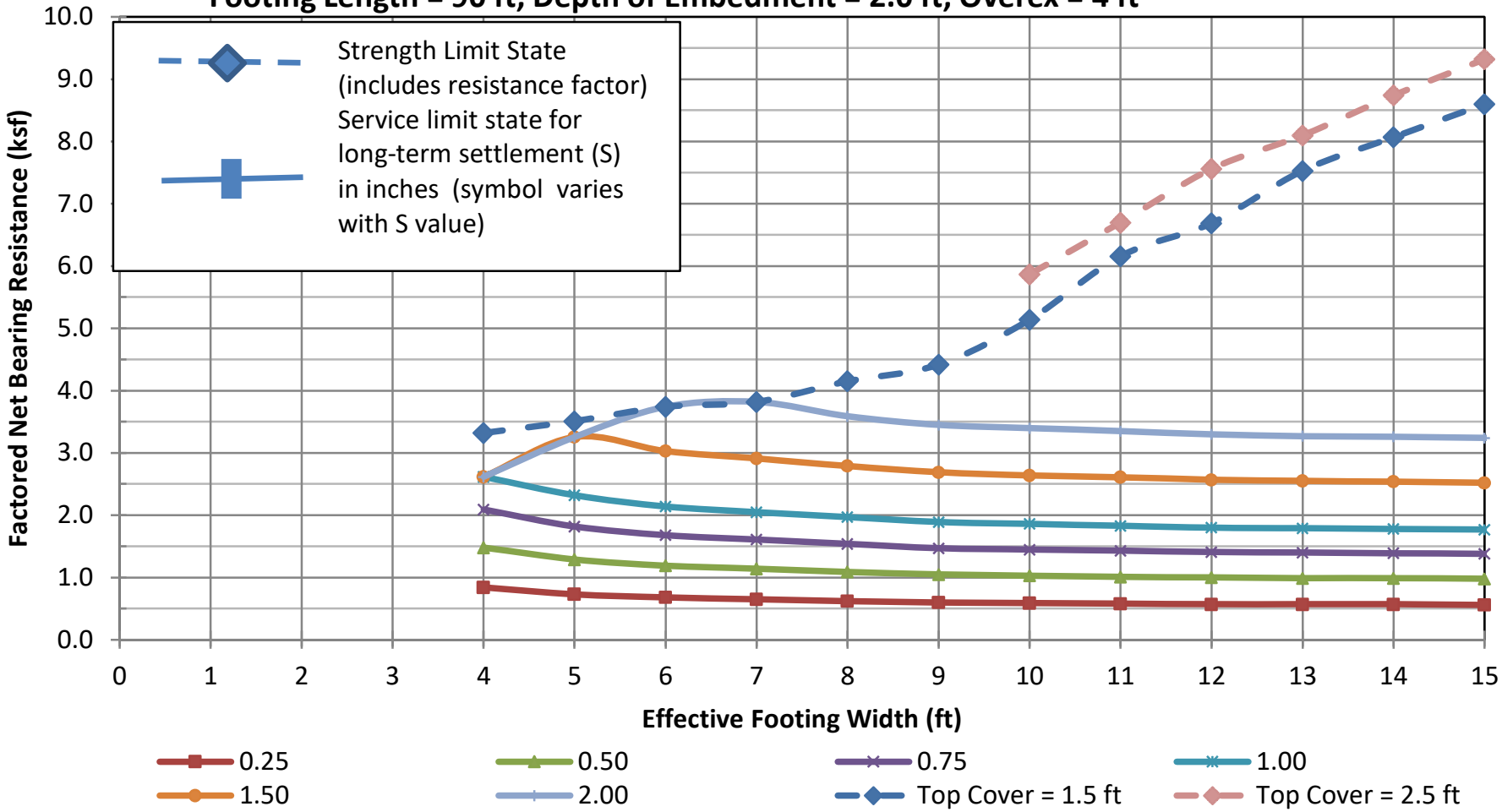
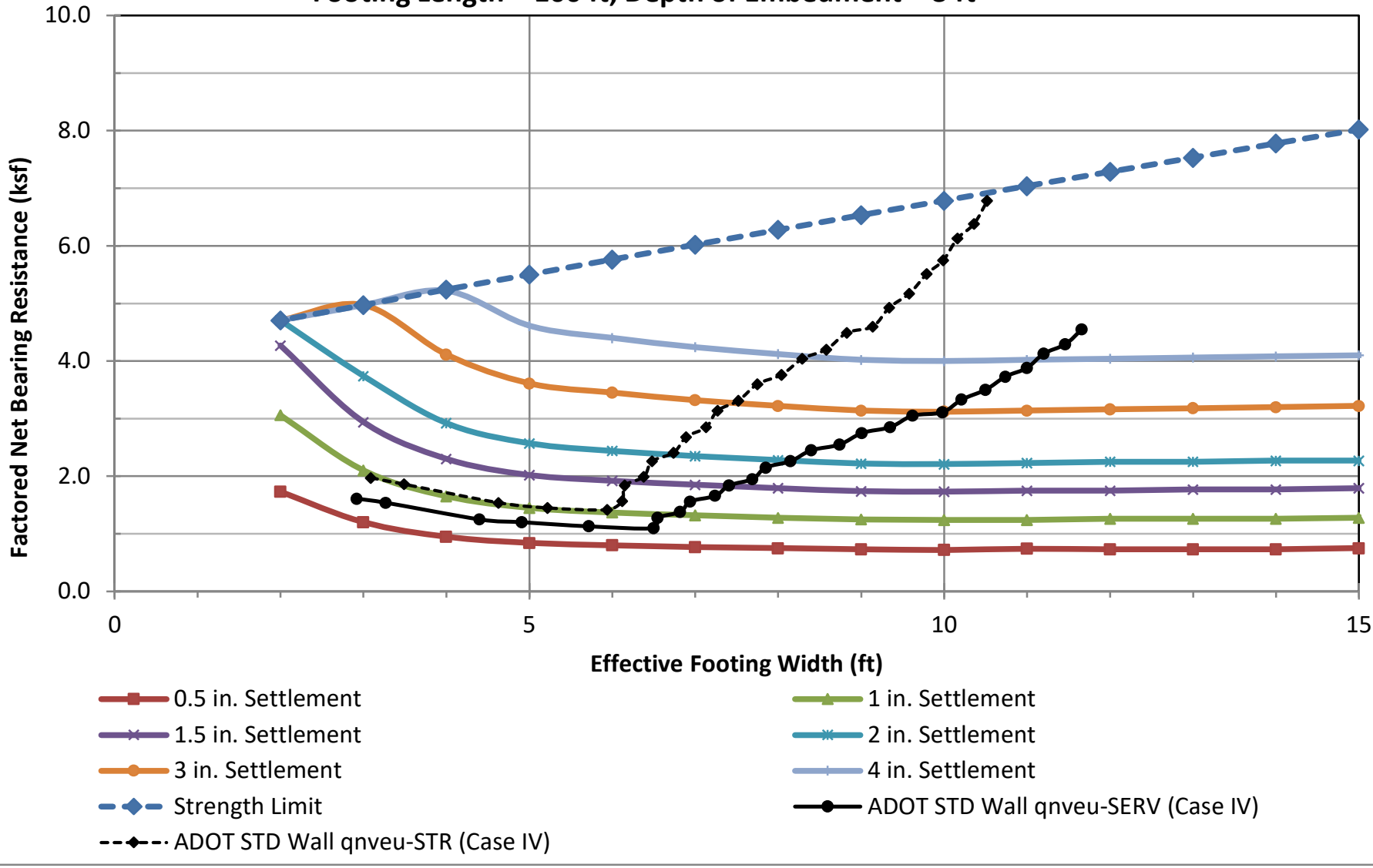


Figure F8 - Retaining Walls - Level Ground

Atlanta Avenue OP

Footing Length = 100 ft, Depth of Embedment = 3 ft



APPENDIX G

AZTEC Retaining Wall Memorandum

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December 12, 2024

Daniel Frechette, P.E.
Ethos Engineering, LLC
9180 S Kyrene Rd, Suite 104
Tempe, AZ 85284

Subject: **Engineering Analyses and Recommendations for Retaining Walls North of Yuma Rd. and between Elwood St. and Lower Buckeye Rd.**
State Route 303 Loop (Estrella) Phase I: MC 85 - Van Buren Street
TRACS No. H6870 01C
Federal Project No. 303-A(ASO)T
ADOT Contract No. 303L MA 099
Goodyear, Arizona

Dear Mr. Frechette,

This letter provides the Engineering Analyses and Recommendations for the cast-in-place (CIP) Retaining Walls listed in Table 1.

Table 1. List of Retaining Walls.

Retaining Wall ID	Location	Station	Approx. Wall Length[1] (ft)	Approx. Wall Height (ft)
RW-1142-LT[2]	SR 303 south of Elwood St., southbound	1140+40 to 1141+25	85	Min. 10 Max. 14
RW-1142-RT	SR 303 south of Elwood St., northbound	1141+47 to 1142+17	70	Min. 9 Max. 17
RW-1144-LT[2]	SR 303 north of Elwood St., southbound	1143+22 to 1143+92	70	Min. 7 Max. 15
RW-1144-RT	SR 303 north of Elwood St., southbound	1144+15 to 1145+10	95	Min. 11 Max. 18
RW-1157-LT[2]	SR 303 south of Southbound Frontage Rd., southbound	1152+84 to 1157+77	480	Min. 4 Max. 9
RW-1157-RT	SR 303 south of Southbound Frontage Rd., northbound	1156+12 to 1157+77	165	Min. 13 Max. 39
RW-1164-LT[2]	SR 303 north of Southbound Frontage Rd., southbound	1163+59 to 1166+98	330	Min. 7 Max. 35
RW-1164-RT	SR 303 north of Southbound Frontage Rd., southbound	1163+58 to 1163+73	15	Min. 8 Max. 8
RW-1228-LT[2]	SR 303 north of Yuma Rd, southbound	1226+51 to 1232+32	578	Min. 7 Max. 25
RW-1228-RT	SR 303 north of Yuma Rd, northbound	1226+51 to 1233+88	741	Min. 6 Max. 26
RW-1250-LT[2]	SR 303 south of Lilac St, southbound	1251+82 to 1239+39	1,238	Min. 5 Max. 30
RW-1250-RT	SR 303 south of Lilac St, northbound	1242+03 to 1251+85	982	Min. 5 Max. 31

RW-1254-LT [2]	SR 303 north of Lilac St, southbound	1261+50 to 1252+67	861	Min. 8 Max. 28
RW-1254-RT	SR 303 north of Lilac St, northbound	1252+65 to 1266+24	1,358	Min. 5 Max. 28
RW-1274-RT	SR 303 south of Van Buren St, northbound	1271+74 to 1275+60	390	Min. 6 Max. 15
RW-LBRB-28-LT	Lower Buckeye Ramp B south of Elwood St., west corner	27+48 to 28+18	70	Min. 6 Max. 13
RW-LBRB-28-RT	Lower Buckeye Ramp B south of Elwood St., east corner	27+76 to 28+41	65	Min. 8 Max. 13
RW-LBRB-30-LT	Lower Buckeye Ramp B north of Elwood St., west corner	30+21 to 30+86	65	Min. 8 Max. 13
RW-LBRB-30-RT	Lower Buckeye Ramp B north of Elwood St., west corner	30+43 to 31+28	85	Min. 6 Max. 13
RW-LBRB-41-LT	Lower Buckeye Ramp B south of Elwood Ramp D and Southbound Frontage Road, west corner	41+48 to 40+88	60	Min. 11 Max. 24
RW-LBRB-41-RT	Lower Buckeye Ramp B south of Elwood Ramp D and Southbound Frontage Road, east corner	40+50 to 41+24	75	Min. 9 Max. 26
RW-LBRB-46-LT	Lower Buckeye Ramp B north of Elwood Ramp D and Southbound Frontage Road, west corner	47+44 to 45+93	150	Min. 6 Max. 25
RW-LBRB-46-RT	Lower Buckeye Ramp B north of Elwood Ramp D and Southbound Frontage Road, east corner	45+61 to 50+54	495	Min. 6 Max. 29

Notes:
1. Wall height is measured from top of wall (TOW) to top of footing (TOF).
2. Include Sound Wall.

SITE SUBSURFACE CONDITIONS

A total of 58 test borings were drilled at or near the footprint of the retaining walls listed in Table 1. The test borings are spaced approximately 150 feet per ADOT standards. The boring depths are between 16 and 100 feet. Boring location maps and geotechnical site profiles are provided in Figures in the Geotechnical Exploration Report. Boring logs and laboratory test results are included in Appendix A and Appendix B, respectively, of the Geotechnical Exploration Report.

The subsurface materials encountered in the test borings consisted mainly of alluvial deposits containing varying proportions of Sand, Silt, and Clay. Table 2 describes in more detail the subsurface conditions expected at each retaining wall location.

Table 2. Subsurface Conditions at Retaining Wall locations.

Retaining Wall ID	Boring	Site Subsurface Conditions
RW-1142-LT	B-158	The top 60 feet consist of Clayey and Silty Sand with Gravel (SC-SM, SC, SM) and some interbedded layers of Sandy Clay (CL). Below 60 feet the soils are coarser and the % of fines decreased (SP, GP-GM, S-GC, GP) The coarse-grained soils are medium dense to very dense except for a layer of loose Silty, Clayey Sand between 6.5 and 13 feet below existing grade. The fine-grained soils are firm to very hard.
RW-1142-RT	B-159	The top 44 feet consist of Clayey and Silty Sand with Gravel (SC-SM, SC), followed by a 11-foot thick layer of Clay with Sand (CL) underlain by Sand with Clay, Silt and Gravel (SP-SM, SP-SC, SP). The apparent density of the coarse-grained soils are medium dense in the upper 15 feet and medium dense to very dense below 15 feet, except for a layer of very loose SP-SM & SP around 80-95 feet below existing grade.
RW-1144-LT	B-162	Predominantly coarse-grained soils consisting of Silty and Clayey Sand (SM, SC) and occasional Clayey Gravel with Sand (GC) and interbedded layers of Clay (CL, CH). The % of gravel increases below 80 below existing grade. The apparent density of the coarse-grained soils are medium dense in the upper 15 feet and medium dense to very dense below 15 feet.
RW-1144-RT	B-163	The upper 15 feet consisted of interbedded layers of Sandy and Silty Clay and Clayey and silty Sand (CL, SC-SM, CL-ML, SC, SM, SC-SM) moderately firm and medium dense, followed by dense to very dense coarse-grained soils (SC, GC) from 15 to 31 feet below existing grade, underlain by a 16-foot thick layer of firm plastic clay (CH). The soils below the clay layer and down to the bottom of the boring consist of medium dense to very dense coarse-grained soils (GC, SC, SM, SP, GP-GM, GP) and a thin layer of CL, CL-ML.
RW-1157-LT	B-175	Top 5-foot thick layer of soft Sandy Silty Clay (CL-ML) followed by 20 feet of coarse grained soils consisting of Silty and Clayey Sand and Gravel (SM, SP-SM, GC, SC, GP-GC) of loose to medium dense apparent density. Finer soils are encountered between 25 and 62 feet below existing grade consisting of alternating layers of firm to hard Clay and Clay with Sand (CL) and medium dense to dense Clayey Sand (SC). Below 62 feet, mostly coarse-grained soils (SC, SP, GC), loose to very dense, are encountered.
RW-1157-RT	B-171, B-176	B-176 located at the abutment shows a 10-foot thick layer of moderately to very firm Silty Clay with Sand (CL-ML) underlain by a 5-foot thick layer of loose to medium dense Sand (SP), underlain by medium dense to very dense Clayey Sand and Sand with Clay (SC, SP-SC) extending to 80 feet below existing grade, with a layer of very soft Clay (CH) between 45 and 55 feet below existing grade. Below 80 feet, the soil is coarser (GC, SP, GP) and medium dense to very dense. B-171 located 120 feet south of the future abutment encountered coarse-grained soils in the upper 25 feet consisting of Silty Sand and Clayey Sand with Gravel (SM, SC) loose to medium dense in the upper 5 feet and dense to very dense below 5 feet, followed by a 20 feet thick layer of firm, plastic Sandy Clay (CH).
RW-1164-LT	B-186, B-187, B-188	The soil profile consists of a top 3 to 7 feet thick layer of firm Sandy Clay and Sandy Silty Clay (CL, CL-ML), underlain by predominantly coarse-grained soils consisting of Clayey and Silty Sand and Gravel (SC, SM, SP, GC, SP-SM, SP-SC) medium dense to very dense.

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Retaining Wall ID	Boring	Site Subsurface Conditions
RW-1164-RT	B-186	The soil profile consists of a top 7 feet thick layer of firm Sandy Clay (CL), underlain by predominantly coarse-grained soils consisting of Clayey and Silty Sand and Gravel (SC, SM, SP, GC, SP-SM, SP-SC) medium dense to very dense.
RW-1228-LT	B-77, B-81 to B-83	Predominantly coarse-grained soils consisting of Poorly-graded Sand with Clay and Silt and Poorly-graded Sand (SP-SC, SP-SM, SP) in the southern ¾ of the wall alignment, and Silty Sandy Clay (CL) in the northern ¼ of the wall alignment. The coarse-grained soils are medium dense to dense in the first 25 feet below existing grade, and dense to very dense below 25 feet. The fine-grained soils are firm to hard.
RW-1228-RT	B-78, B-84, B-85, B-85A, B-85B	Predominantly fine-grained soils consisting of Silty Clay, Silty Clay with Sand, Clayey Silt (CL, CL-ML, ML) in the first 25 feet below existing grade, and coarse-grained soils consisting of Silty Sand, and Sand (SM, SP, SW) below 25 feet in the southern 2/3 of the wall alignment. The proportion of fine-grained soils decreases in the northern 1/3 of the alignment, where Silty and Clayey Sand (SC, SC-SM) are predominant. The fine-grained soils are firm to hard. The coarse-grained soils are medium dense to very dense.
RW-1250-LT	B-88 to B-96, B-102	Predominantly coarse-grained soils consisting of Clayey and Silty Sand and Sand (SC, SM, SC-SM, SP) with some interbedded layers of Sandy Clay (CL). The coarse-grained soils are generally medium dense in the first 10 feet below existing grade, with relative density increasing to dense to very dense below 10 feet. The fine-grained soils are firm to hard.
RW-1250-RT	B-97A, B-98A, B-99 to B-101, B-103	Predominantly coarse-grained soils consisting of Clayey and Silty Sand (SC, SM, SC-SM) with some interbedded layers of Silty and Sandy Clay (ML, CL). The coarse-grained soils are medium dense to very dense. The fine-grained soils are firm to hard except for the top 5 feet of B-100 where very loose to loose clays were encountered.
RW-1254-LT	B-104, B-109 to B-113	Predominantly coarse-grained soils consisting of Clayey and Silty Sand and Sand (SC, SM, SP) in the first 25 feet below existing grade of the southern half of the wall alignment; fines content increases below 25 feet and in the norther half of the wall alignment (CL). The coarse-grained soils are loose to medium dense in the first 10 feet below existing grade, with relative density increasing to medium dense to very dense below 10 feet. The fine-grained soils are firm to hard.
RW-1254-RT	B-105, B-115 to B-119, B-119A, B-119B	Predominantly coarse-grained soils consisting of Clayey Sand, Sand with Silt and Clay (SC, SP-SM, SP-SC). Gavels were encountered below depth of 50 feet on the southern end of the wall near Lilac St. Increasing proportion of Clay and Clay with Sand layers (CL) were encountered between depth of 20 to 40 feet. The coarse-grained soils are loose to dense in the first 15 feet below existing grade, with relative density increasing to very dense below 15 feet. The fine-grained soils are firm to hard.
RW-1274-RT	B-124A, B-124B	Predominantly coarse-grained soils consisting of Clayey Sand and Sand with Silt (SC, SP-SM) to a depth of 15 to 25 feet below existing grade, and Clay with Sand and Sandy Clay (CL) underneath. The SC soils correspond to the fill of existing embankment and are medium dense to dense. The fine-grained soils are moderately firm to hard.
RW-LBRB-28-LT RW-LBRB-28-RT	B-164	Predominantly coarse-grained soils, mainly gravelly and sandy (GC, SC-SM) are in the upper 23 feet and clayey and silty sand (GC, SM) are below 23 feet depth, with some interbedded layers of Sandy Silty Clay and Gravelly Clay (CL-ML, CL). The coarse-grained soils are medium dense to very dense in apparent density. The fine-grained soils are medium to low plasticity and are moderately firm to hard.

Retaining Wall ID	Boring	Site Subsurface Conditions
RW-LBRB-30-LT	B-166, B-167	Predominantly coarse-grained soils with some interbedded layers of Sandy Clay and Sandy Silt with Sand and Gravel (CL, CH, ML). The coarse-grained soils have a lower % of fines in the upper 20 feet and below 60 feet (SC-SM, SP-SM, GC, GP, SP-SC, GP-GM) than between 20 and 60 feet below ground surface (SC mainly). The coarse-grained soils are loose to medium dense in the upper 20 feet, medium dense to very dense between 20 and 70 feet below ground surface, and very loose to medium dense below 70 feet. The CL and ML layers are non-plastic to high plasticity, and firm to hard consistency.
RW-LBRB-30-RT		
RW-LBRB-41-LT	B-172	Predominantly fine-grained soils are in the upper 35 feet consisting of Sandy Silt and Sandy Clay (ML, CL) of low to medium plasticity and soft to hard consistency. Predominantly coarse-grained soils are below 35 feet consisting mainly of Clayey Sand with Gravel (GC).
RW-LBRB-41-RT		
RW-LBRB-46-LT	B-174	Predominantly coarse-grained soils consisting of Silty and Clayey Sand with Gravel (SM, SC, SP-SM, GP-GC, SP-SC) with medium dense apparent density are in the upper 15 feet and medium dense to very dense apparent density are below 15 feet.
RW-LBRB-46-RT	B-174, B-13, B-14, B-15	B-174 described above is located and the north abutment of the bridge. Towards the north, B-13, B-14, and B-15 encountered predominantly loose to medium dense coarse-grained soils (SC-SM, SP, SM, SC, SW) in the upper 20 to 35 feet, followed by a 5 to 20 feet thick layer of low to high plasticity, moderately firm to hard Silty and Sandy Clay (CL-ML, CH), underlain by mostly coarse grained soils (SC, SP, SM) with medium dense to very dense apparent density.

Groundwater was encountered in borings B15, B77, B78, B102, B103, B104, B105, B158, B159, B162, B163, B164, B166, B172, B174, B175, B176, B186, B187 and B188, at depths between 60 and 95 feet below existing grade (groundwater elevation from 861 to 887 feet).

GEOTECHNICAL RECOMMENDATIONS

The strength and service limit state analyses for CIP foundations were completed per the methods presented in Sections 10.6.3 of AASHTO (2012) and ADOT Geotechnical Design Policy SF-1 (2010), respectively.

The factored net bearing resistance, q_{Rn}, for the strength limit state was determined using the net nominal bearing resistance (ultimate bearing capacity), q_{nn}, calculated per Section 10.6.3.1.2a and bearing resistance factor, φ_b, from Section 10.5.5.2.2 of AASHTO (2012). Modified bearing resistance factors were used as presented in Article 10.6.3.1.2c of AASHTO (2012) for footings on or adjacent to a slope. Table 3 presents the design parameters used for the bearing resistance at strength limit state of CIP wall foundations.

Table 3. CIP Foundation Analysis Parameters - Strength Limit State for Bearing Resistance.

Parameter	Symbol	Value
Soil Angle of Internal Friction	ϕ_f	30 deg.
Soil Total Unit Weight	γ	CIP walls on new embankment fill: 130 pcf CIP walls on native soils: 115 pcf
Cohesion	c	0 psf
Maximum Foundation Length	L	90 ft
Top Cover	-	1.5 ft
Bearing Depth	D_f	Calculated as Top Cover + B dimension in SD 7.01 Case IV for the corresponding effective width.
Effective Width	B'	3 to 20 ft
Bearing Resistance Factor	φ_b	0.45

The modified Schmertmann method presented in Section 8.5 of the Federal Highway Administration Soils and Foundation Reference Manual (2006) was used to calculate wall settlements at the service limit state per the ADOT Geotechnical Design Policy SF-1 (2010). Table 4 presents the idealized soil profile and the elastic moduli used in the settlement analysis.

Figures D-A1 to D-A22 included in Attachment 1 provide the factored net bearing resistance vs effective foundation width, along with curves of 0.25, 0.5, 1.0, 1.5, and 2.0 inches of settlement. Figure D-A1 to D-A22 also provide the STR and SER bearing stress per SD 7.01 Case IV for the applicable range of B' of each wall for reference.

Table 4. Idealized Soil Profiles for settlement analyses.

Wall	Wall Height, H (ft) [1]	Thickness of layer (ft)		Moist unit weight (pcf)	Average Energy Corrected SPT N-Value, N_{60}	Elastic Modulus, E_s (ksf) [3]
RW-1142-LT	Min. 10 Max. 14	Layer 1	8 to 11 [2]	130	25	$8N_{60} = 200$
		Layer 2	15	115	25	$8N_{60} = 200$
		Layer 3	85	115	45	$8N_{60} = 360$
RW-1142-RT	Min. 9 Max. 17	Layer 1	15	115	25	$8N_{60} = 200$
		Layer 2	85	115	45	$8N_{60} = 360$
RW-1144-LT	Min. 7 Max. 15	Layer 1	15	115	25	$8N_{60} = 200$
		Layer 2	85	115	45	$8N_{60} = 360$
RW-1144-RT	Min. 11 Max. 18	Layer 1	6 to 10 [2]	130	25	$8N_{60} = 200$
		Layer 2	15	115	25	$8N_{60} = 200$
		Layer 3	85	115	45	$8N_{60} = 360$
RW-1157-LT	Min. 4 Max. 9	Layer 1	22 to 25 [2]	130	25	$8N_{60} = 200$
		Layer 2	25	115	10	$8N_{60} = 80$
		Layer 3	75	115	30	$8N_{60} = 240$
RW-1157-RT	Min. 13	Layer 1	0 to 15 [2]	130	25	$8N_{60} = 200$

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Wall	Wall Height, H (ft) [1]	Thickness of layer (ft)		Moist unit weight (pcf)	Average Energy Corrected SPT N-Value, N_{60}	Elastic Modulus, E_s (ksf) [3]
	Max. 39	Layer 2	10	115	135	$8N_{60} = 120$
		Layer 3	75	115	30	$8N_{60} = 320$
RW-1164-LT	Min. 7 Max. 35	Layer 1	5 to 25 [2]	130	25	$8N_{60} = 200$
		Layer 2	20	115	25	$8N_{60} = 200$
		Layer 3	80	115	70	$8N_{60} = 560$
RW-1164-RT	Min. 8 Max. 8	Layer 1	0 to 20 [2]	130	25	$8N_{60} = 200$
		Layer 2	10	115	30	$8N_{60} = 240$
		Layer 3	90	115	70	$8N_{60} = 560$
RW-1228-LT	Min. 7 Max. 25	Layer 1	2 to 6 [2]	130	25	$8N_{60} = 200$
		Layer 2	10	115	20	$8N_{60} = 160$
		Layer 3	90	115	60	$8N_{60} = 480$
RW-1228-RT	Min. 6 Max. 26	Layer 1	7 to 17 [2]	130	25	$8N_{60} = 200$
		Layer 2	100	115	60	$8N_{60} = 480$
RW-1250-LT	Min. 5 Max. 30	Layer 1	0 to 2 [2]	130	25	$8N_{60} = 200$
		Layer 2	8	115	11	$8N_{60} = 88$
		Layer 3	90	115	60	$8N_{60} = 480$
RW-1250-RT	Min. 5 Max. 31	Layer 1	0 to 13 [2]	130	25	$8N_{60} = 200$
		Layer 2	8	115	35	$8N_{60} = 280$
		Layer 3	90	115	65	$8N_{60} = 520$
RW-1254-LT	Min. 8 Max. 28	Layer 1	0 to 16 [2]	130	25	$8N_{60} = 200$
		Layer 2	10	115	20	$8N_{60} = 160$
		Layer 3	90	115	60	$8N_{60} = 480$
RW-1254-RT	Min. 5 Max. 28	Layer 1A [4]	8	115	35	$8N_{60} = 280$
		Layer 1B [4]	13	115	12	$8N_{60} = 96$
		Layer 2	90	115	75	$8N_{60} = 600$
RW-1274-RT	Min. 6 Max. 15	Layer 1	8 to 11 [5]	130	25	$8N_{60} = 200$
		Layer 2	90	115	70	$8N_{60} = 560$
RW-LBRB-28-LT	Min. 6 Max. 13	Layer 1	9 to 15 [2]	130	25	$8N_{60} = 200$
		Layer 2	100	115	40	$8N_{60} = 320$
RW-LBRB-28-RT	Min. 8	Layer 1	12 to 20 [2]	130	25	$8N_{60} = 200$

Wall	Wall Height, H (ft) [1]	Thickness of layer (ft)		Moist unit weight (pcf)	Average Energy Corrected SPT N-Value, N_{60}	Elastic Modulus, E_s (ksf) [3]
	Max. 13	Layer 2	100	115	40	$8N_{60} = 320$
RW-LBRB-30-LT	Min. 8 Max. 13	Layer 1	8 to 17 [2]	130	25	$8N_{60} = 200$
		Layer 2	100	115	30	$8N_{60} = 240$
RW-LBRB-30-RT	Min. 6 Max. 13	Layer 1	10 to 18 [2]	130	25	$8N_{60} = 200$
		Layer 2	100	115	30	$8N_{60} = 240$
RW-LBRB-41-LT	Min. 11 Max. 24	Layer 1	7 to 15 [2]	130	25	$8N_{60} = 200$
		Layer 2	15	115	15	$8N_{60} = 120$
		Layer 3	85	115	20	$8N_{60} = 160$
RW-LBRB-41-RT	Min. 9 Max. 26	Layer 1	5 to 14 [2]	130	25	$8N_{60} = 200$
		Layer 2	15	115	15	$8N_{60} = 120$
		Layer 3	85	115	20	$8N_{60} = 160$
RW-LBRB-46-LT	Min. 6 Max. 25	Layer 1	0 to 8 [2]	130	25	$8N_{60} = 200$
		Layer 2	15	115	25	$8N_{60} = 200$
		Layer 3	85	115	45	$8N_{60} = 360$
RW-LBRB-46-RT	Min. 6 Max. 29	Layer 1A [6]	15	115	25	$8N_{60} = 200$
		Layer 1B [6]	15	115	8	$8N_{60} = 64$
		Layer 2A [6]	85	115	30	$8N_{60} = 240$
		Layer 2B [6]	85	115	50	$8N_{60} = 400$

Notes:

1. H is measured from top of wall to TOF.
2. Corresponds to new embankment fill.
3. Correlation factors obtained from Table 5-16 of FHWA Soils and Foundations Reference Manual.
4. Layer 1A used between STA 1252+66 and STA 1257+50; Layer 1B used between STA 1257+50 and STA 1266+25.
5. Includes existing and new embankment fill.
6. Layer 1A&2A used between STA 45+61 and STA 46+51; Layer 1B&2B used between STA 46+51 and STA 50+54.

In addition to the wall settlement estimated with the Schmertmann method, the settlement due to the construction of the embankment adjacent to the north abutment of Yuma Rd. bridge and north and south abutments of Lilac Rd. bridge was estimated with the software Settle3 version 5.017 developed by Rocscience, and the results were used to calculate the induced negative skin friction and downdrag load on the drilled shafts of the bridge abutment. The downdrag load is provided in the main body of the Geotechnical Exploration Report. The Settle3 models consider the approximate geometry of the embankments and the idealized soil profiles presented above. The results of the models are presented in Attachment 2.

Overall stability of CIP walls was checked with Slide2 version 9.031 developed by Rocscience Inc. The results are included in Attachment 3 and summarized in Table 5. The models include a uniform surcharge of 250 psf to account

for traffic live load. Retaining walls with a sound wall on top include a surcharge load of 645 to 720 psf (depends on the wall height) distributed through a width of 7.3 feet (for SBW1 walls) or 5 feet (for SBW2 walls). In cases where the minimum factor of safety of 1.5 is not achieved with 1.5 feet of top cover, the wall embedment was increased until the minimum of 1.5 was achieved.

Table 5. Global Stability Analysis of CIP walls.

Retaining Wall ID	Analysis cross section	Toe Slope	CIP Wall dimensions (ft) [1]					Foundation Material	FOS
			Top Cover [2]	H	B	C	W		
RW-1142-LT	1141+20	Yes (3H:1V)	1.50	10.00	1.25	2.00	7.00	New Embankment Fill	1.53
RW-1142-RT	1142+15	Yes (4H:1V)	1.50	13.00	1.25	2.50	8.50	New Embankment Fill	1.55
RW-1144-LT	1143+25	Yes (3H:1V)	1.50	13.00	1.25	2.50	8.50	New Embankment Fill	1.42
			3.00	14.50	1.33	2.75	9.50	New Embankment Fill	1.53
RW-1144-RT	1144+20	Yes (3H:1V)	1.50	16.00	1.42	2.75	10.00	New Embankment Fill	1.38
			3.00	17.50	1.58	3.00	11.00	New Embankment Fill	1.48
			4.50	19.00	1.67	3.25	11.50	New Embankment Fill	1.55
RW-1157-LT	1157+75	Yes (3H:1V)	1.50	10.00	1.25	2.00	7.00	New Embankment Fill	1.46
			3.00	11.50	1.25	2.25	8.00	New Embankment Fill	1.60
RW-1157-RT	1157+75	No	1.50	40.00	6.75	8.25	25.50	Native Soils	1.56
	1157+30	Yes (3H:1V)	1.50	27.00	2.75	4.25	15.50	New Embankment Fill	1.22
			4.50	30.00	3.50	4.50	17.00	New Embankment Fill	1.35
			7.50	33.00	4.50	5.75	19.25	New Embankment Fill	1.48
			9.00	34.50	5.00	6.25	20.75	New Embankment Fill	1.57
RW-1164-LT	1163+60	No	1.50	30.00	3.50	4.50	17.00	Native Soils	1.34
			3.00	31.50	4.25	5.50	18.50	Native Soils	1.47
			4.50	33.00	4.50	5.75	19.25	Native Soils	1.58
	1165+00	Yes (3H:1V)	1.50	19.00	1.75	3.25	11.50	New Embankment Fill	1.28
			3.00	20.50	1.83	3.50	12.50	New Embankment Fill	1.38
			4.50	22.00	1.92	3.50	13.00	New Embankment Fill	1.47
			6.00	23.50	2.17	3.75	14.00	New Embankment Fill	1.58
RW-1164-RT	1163+60	No	1.50	39.00	6.50	7.75	24.25	Native Soils	1.60
	1164+20	Yes (3H:1V)	1.50	22.00	1.92	3.50	13.00	New Embankment Fill	1.28
			4.50	25.00	2.33	4.00	14.50	New Embankment Fill	1.42
			6.00	26.50	2.75	4.25	15.50	New Embankment Fill	1.49

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Retaining Wall ID	Analysis cross section	Toe Slope	CIP Wall dimensions (ft) [1]					Foundation Material	FOS
			Top Cover [2]	H	B	C	W		
			7.50	28.00	3.00	4.25	16.00	New Embankment Fill	1.57
RW-1228-LT	1227+00	Yes (3H:1V)	1.50	17.50	1.54	3.00	10.75	New embankment fill	1.26
			4.50	20.50	1.79	3.37	12.25	Native soils	1.53
RW-1228-RT	1227+00	Yes (3H:1V)	1.50	11.50	1.25	2.25	7.75	New embankment fill	1.55
RW-1250-LT	1251+00	No	1.50	25.50	2.42	4.00	14.75	New embankment fill	1.37
			3.00	27.00	2.75	4.25	15.50	Native soils	1.51
RW-1250-RT	1247+00	Yes (3H:1V)	1.50	21.50	1.87	3.50	12.75	New embankment fill	1.29
			4.00	24.00	2.17	3.75	14.00	New embankment fill	1.52
	1251+00	No	1.50	30.00	3.50	4.50	17.00	Native soils	1.52
RW-1254-LT	1253+00	No	1.50	25.50	2.42	4.00	14.75	New embankment fill	1.33
			3.50	27.50	2.87	4.25	15.75		1.51
	1258+00	Yes (3H:1V)	1.50	16.50	1.45	2.87	10.25	New embankment fill	1.41
			3.00	18.00	1.58	3.00	11.00	New embankment fill	1.53
RW-1254-RT	1253+00	Yes (3H:1V)	1.50	25.00	2.33	4.00	14.50	New embankment fill	1.40
			3.00	26.50	2.75	4.25	15.25	Native soils	1.53
RW-1274-RT	1275+50	Yes (3H:1V)	1.50	15.00	1.33	2.75	9.50	Existing and new embankment fill	1.39
			3.00	16.50	1.45	2.87	10.25	Existing and new embankment fill	1.50
RW-LBRB-28-LT	28+15	Yes (3H:1V)	1.50	12.00	1.25	2.25	8.00	New Embankment Fill	1.54
RW-LBRB-28-RT	28+40	Yes (3H:1V)	1.50	12.00	1.25	2.25	8.00	New Embankment Fill	1.53
RW-LBRB-30-LT	30+22	Yes (3H:1V)	1.50	13.00	1.25	2.50	8.50	New Embankment Fill	1.48
			3.00	14.50	1.33	2.75	9.50	New Embankment Fill	1.60
RW-LBRB-30-RT	30+45	Yes (3H:1V)	1.50	12.00	1.25	2.25	8.00	New Embankment Fill	1.53
RW-LBRB-41-LT	41+45	Yes (3H:1V)	1.50	22.00	1.92	3.50	13.00	New Embankment Fill	1.27
			3.00	23.50	2.17	3.75	14.00	New Embankment Fill	1.35
			4.50	25.00	2.33	4.00	14.50	New Embankment Fill	1.43
			6.00	26.50	2.75	4.25	15.50	New Embankment Fill	1.51
RW-LBRB-41-RT	41+22	Yes (4H:1V)	1.50	22.00	1.92	3.50	13.00	New Embankment Fill	1.34
			3.00	23.50	2.17	3.75	14.00	New Embankment Fill	1.45

Retaining Wall ID	Analysis cross section	Toe Slope	CIP Wall dimensions (ft) [1]					Foundation Material	FOS
			Top Cover [2]	H	B	C	W		
			4.50	25.00	2.33	4.00	14.50	New Embankment Fill	1.53
RW-LBRB-46-LT	45+80	No	1.50	28.00	3.00	4.25	16.00	Native Soils	1.36
			3.00	29.50	3.50	4.50	17.00	Native Soils	1.53
RW-LBRB-46-RT	45+65	No	1.50	29.00	3.25	4.50	16.50	Native Soils	1.36
			3.00	30.50	4.00	5.25	18.00	Native Soils	1.54

Notes:

1. Refer to SD 7.01 Case IV for F and X dimensions.
2. Top cover is measured from FG to TOF. Top cover in walls RW-1250-LT, RW-1254-LT (reach where the wall is on level ground) considers the backfill between the wall face and the concrete barrier in front of the wall face. Such backfill does not provide adequate embedment for bearing capacity purposes. Recommendations for these two walls are provided in Table 6.

Finally, Table 6 summarizes the recommendations for CIP walls:

Table 6. Recommendations for CIP walls.

Retaining Wall ID	Approx. Station	Toe Slope	Capacity Chart	Additional Recommendations
RW-1142-LT	1140+40 to 1141+25	Yes (3H:1V)	D-A10	None
RW-1142-RT	1141+47 to 1142+17	Yes (4H:1V)	D-A11	None
RW-1144-LT	1143+22 to 1143+92	Yes (3H:1V)	D-A11	Minimum top cover of 3.0 feet where H is more than 12 feet
RW-1144-RT	1144+15 to 1145+10	Yes (3H:1V)	D-A10	Minimum top cover of 4.5 feet where H is more than 12 feet
RW-1157-LT	1152+84 to 1157+77	Yes (3H:1V)	D-A12	Minimum top cover of 3.0 feet where H is more than 12 feet
RW-1157-RT	1156+12 to 1157+02	Yes (3H:1V)	D-A13	Minimum top cover of 9.0 feet where H is more than 12 feet
	1157+02 to 1157+77	No	D-A14	Over-excavate to elevation 918 feet and backfill with Structure Backfill between STA 1157+33 to STA 1157+78 under the footprint of the footing. Minimum lateral extension 8 feet from the front and rear edges of the footing.
RW-1164-LT	1163+59 to 1164+49	Yes (3H:1V)	D-A15B	Minimum top cover of 6.0 feet where H is more than 12 feet
	1164+49 to 1166+98	No	D-A15A	Minimum top cover of 4.5 feet
RW-1164-RT	1163+58 to 1163+73	No	D-A16A	No
	1163+58 to 1163+73	Yes (3H:1V)	D-A16B	Minimum top cover of 7.5 feet where H is more than 12 feet
RW-1228-LT	1232+55 to 1226+89	Yes (3H:1V)	D-A1	Minimum top cover of 4.5 feet where H is more than 12 feet
RW-1228-RT	1226+89 to 1234+16	Yes (3H:1V)	D-A2	None

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Retaining Wall ID	Approx. Station	Toe Slope	Capacity Chart	Additional Recommendations
RW-1250-LT	1251+87 to 1239+39	No	D-A3	A minimum top cover of 1.5 feet shall be provided, measured from top of footing elevation to finished grade elevation of the roadway in front of the retaining wall
RW-1250-RT	1241+60 to 1247+00	Yes (3H:1V)	D-A4	Minimum top cover of 4.0 feet where H is more than 12 feet
	1247+00 to 1251+87	No	D-A5	None
RW-1254-LT	1257+65 to 1252+71	No	D-A6	A minimum top cover of 1.5 feet shall be provided, measured from top of footing elevation to finished grade elevation of the roadway in front of the retaining wall
	1261+50 to 1257+65	Yes (3H:1V)	D-A7	Minimum top cover of 3.0 feet where H is more than 12 feet
RW-1254-RT	1252+66 to 1266+25	Yes (3H:1V)	D-A8	A minimum embedment of 1.75 feet shall be provided, measured from bottom of footing elevation to finished grade elevation of the roadway in front of the retaining wall
RW-1274-RT	1271+28 to 1275+60	Yes (3H:1V)	D-A9	Minimum top cover of 3.0 feet where H is more than 12 feet
RW-LBRB-28-LT	27+48 to 28+18	Yes (3H:1V)	A-17	None
RW-LBRB-28-RT	27+76 to 28+41	Yes (3H:1V)	A-17	None
RW-LBRB-30-LT	30+21 to 30+86	Yes (3H:1V)	A-18	Minimum top cover of 3.0 feet where H is more than 12 feet
RW-LBRB-30-RT	30+43 to 31+28	Yes (3H:1V)	A-18	None
RW-LBRB-41-LT	41+48 to 40+88	Yes (3H:1V)	A-19	Minimum top cover of 6.0 feet where H is more than 12 feet
RW-LBRB-41-RT	40+50 to 41+24	Yes (3H:1V)	A-19	Minimum top cover of 4.5 feet where H is more than 12 feet
RW-LBRB-46-LT	47+44 to 45+93	No	A-21	Minimum top cover of 3.0 feet
RW-LBRB-46-RT	45+61 to 50+54	No	A-22	Minimum top cover of 3.0 feet

Sincerely,

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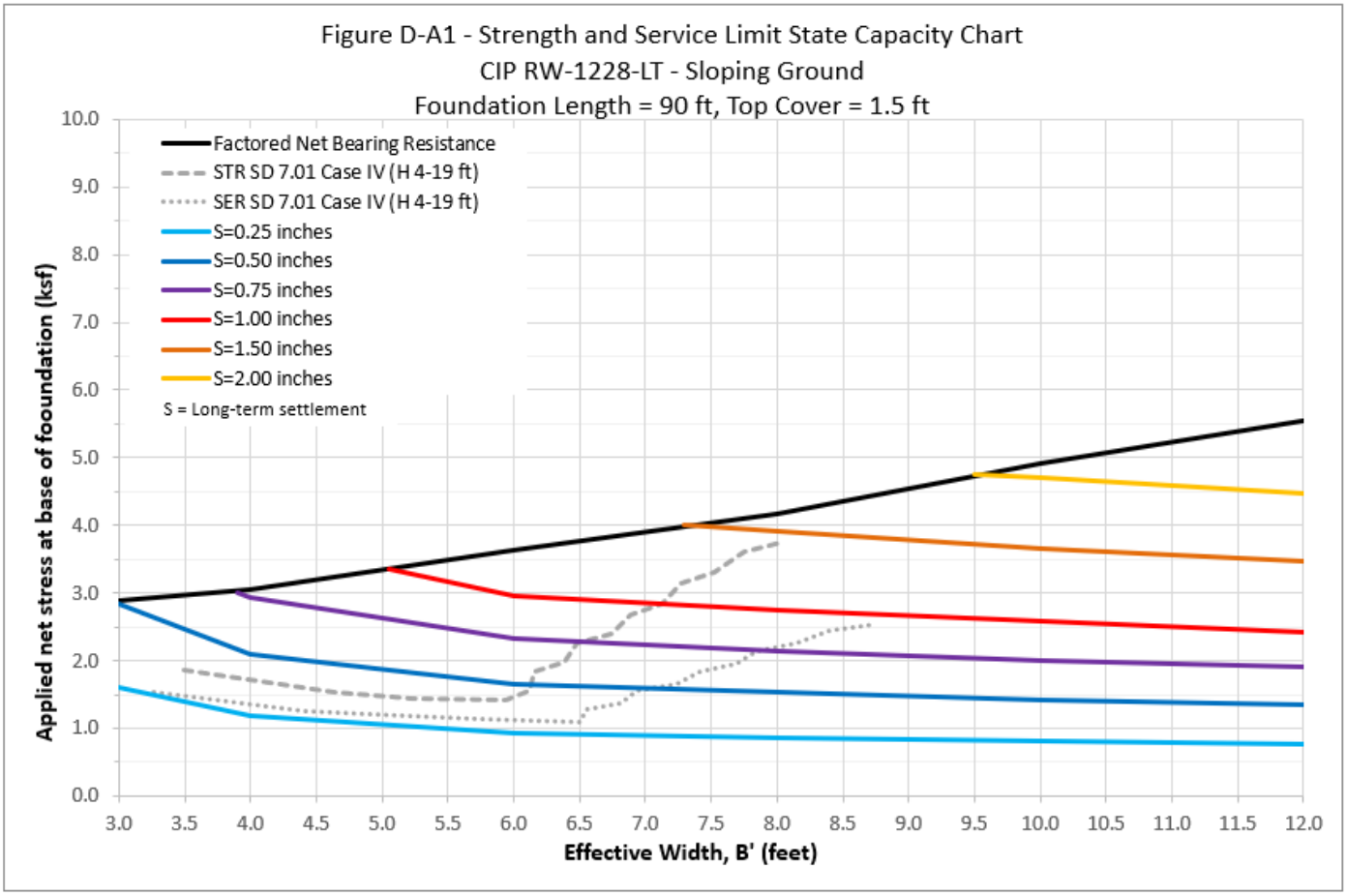
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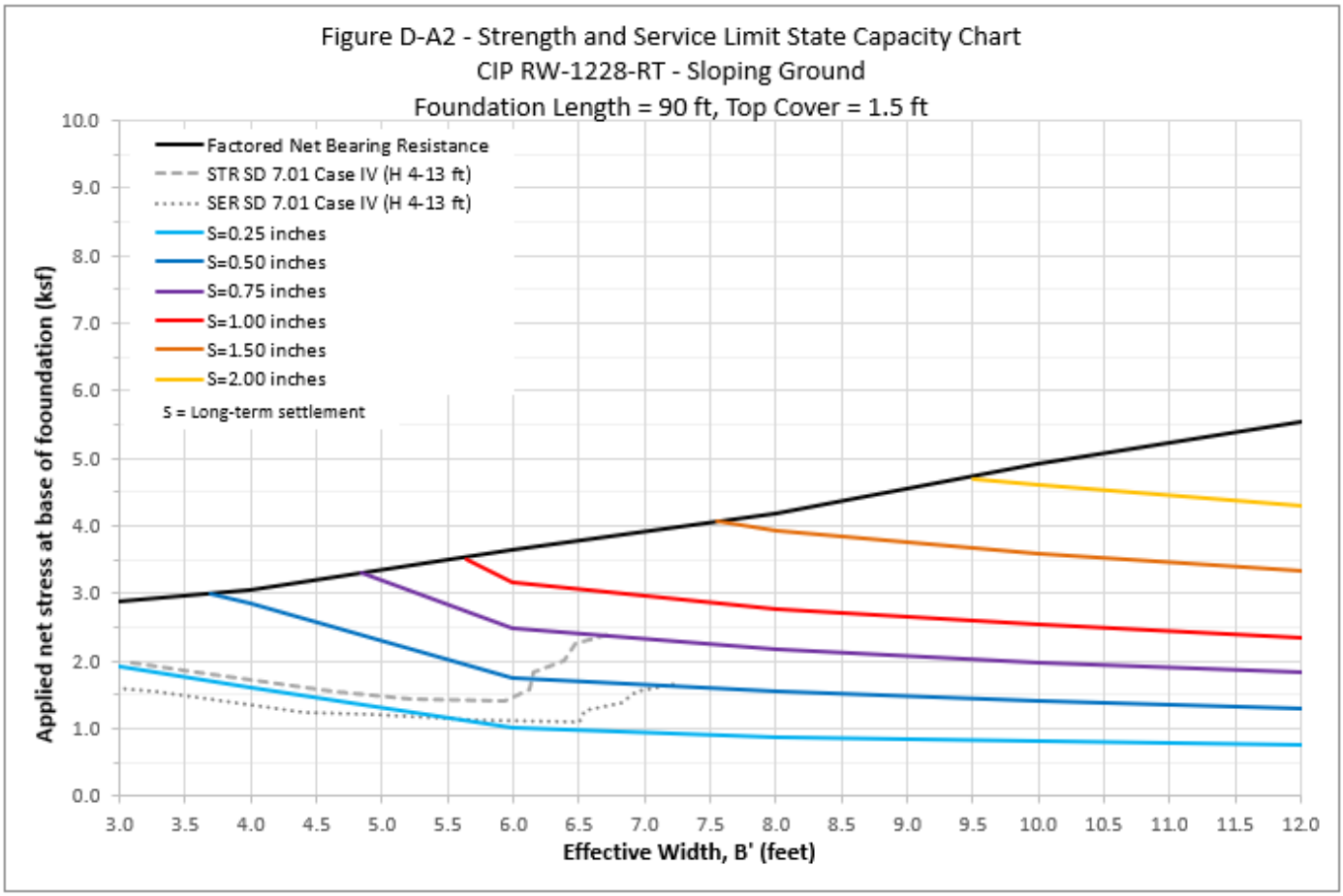
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ATTACHMENT 1 – FIGURES D-A1 TO D-A22

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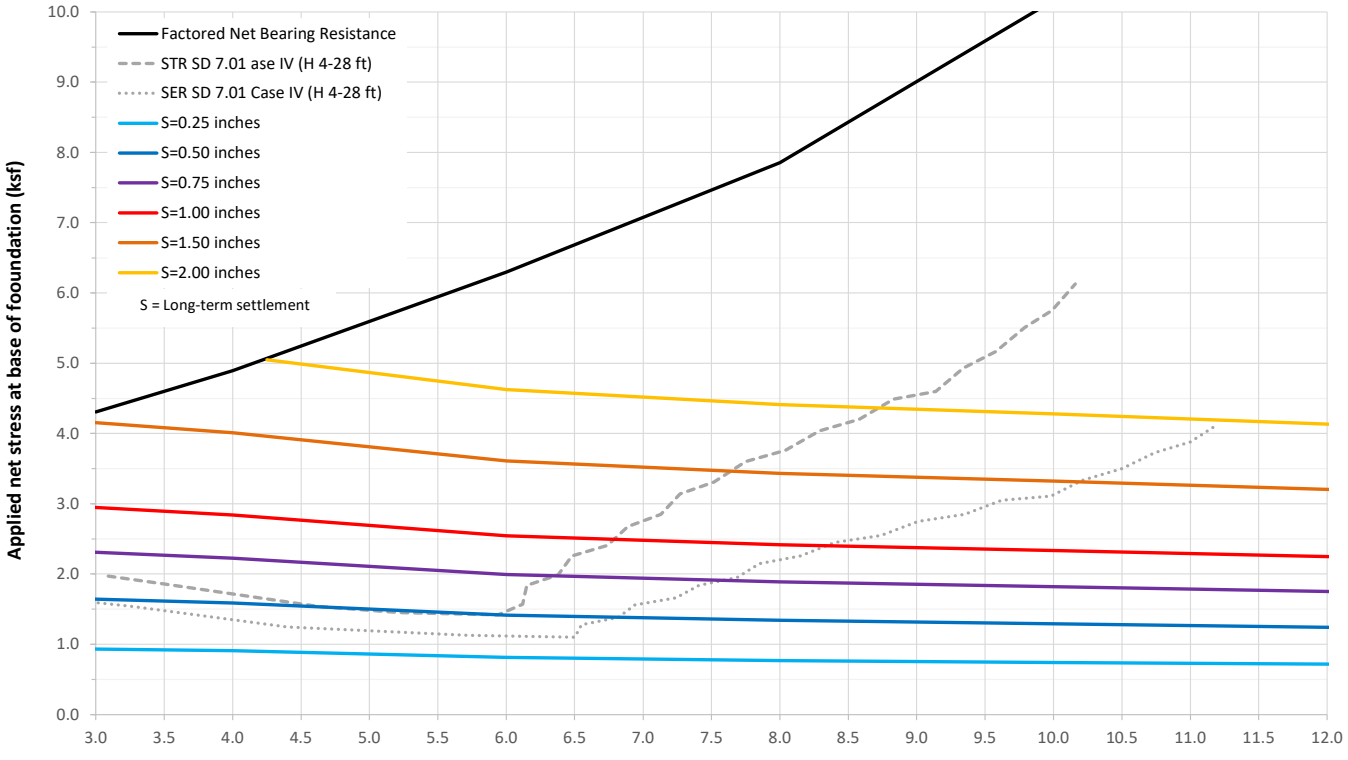


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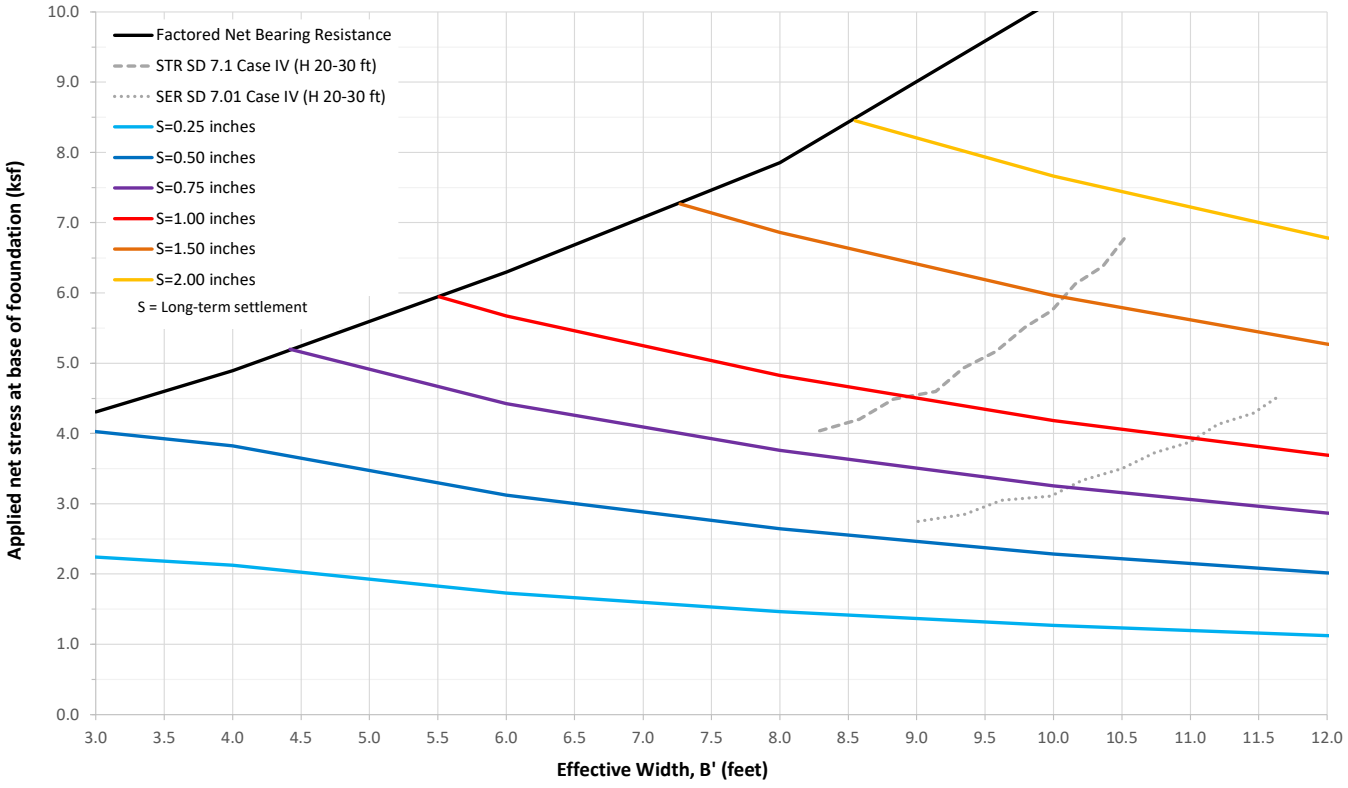
Figure D-A3 - Strength and Service Limit State Capacity Chart
CIP RW-1250-LT - Level Ground
Foundation Length = 90 ft, Top Cover = 1.5 ft *



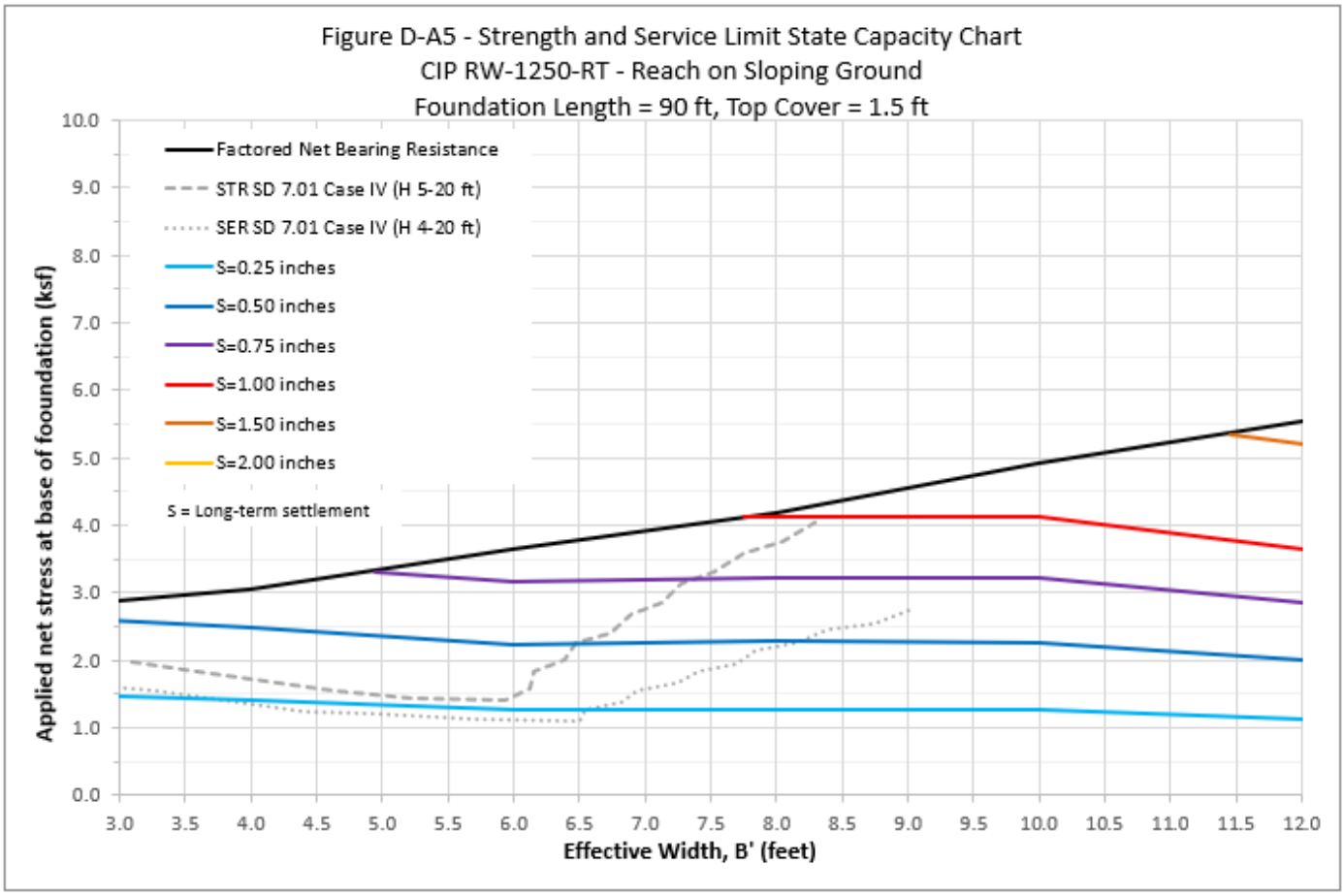
* Top cover measured from top of footing elevation to finished grade elevation of the roadway in front of the retaining wall.

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Figure D-A4 - Strength and Service Limit State Capacity Chart
CIP RW-1250-RT - Reach on Level Ground
Foundation Length = 90 ft, Top Cover = 1.5 ft

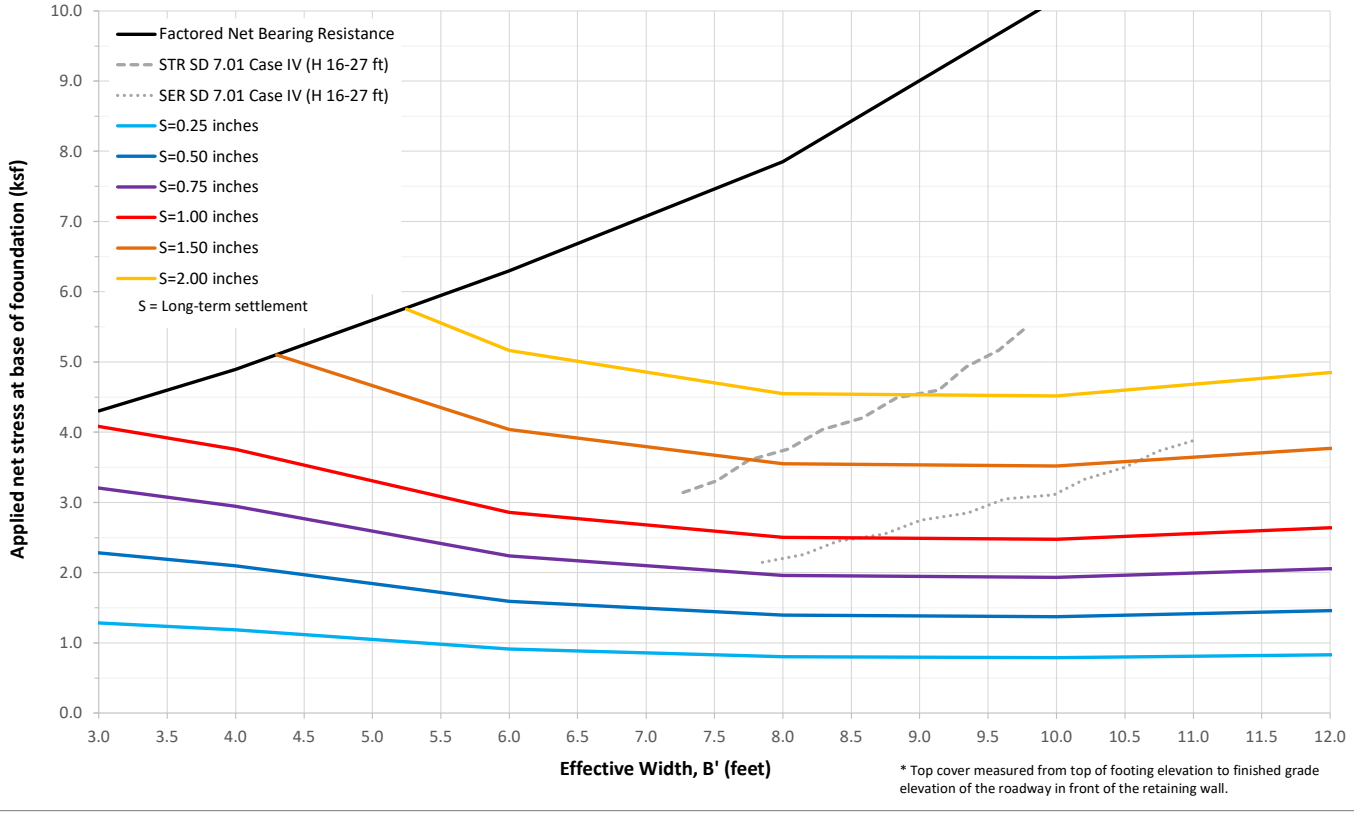


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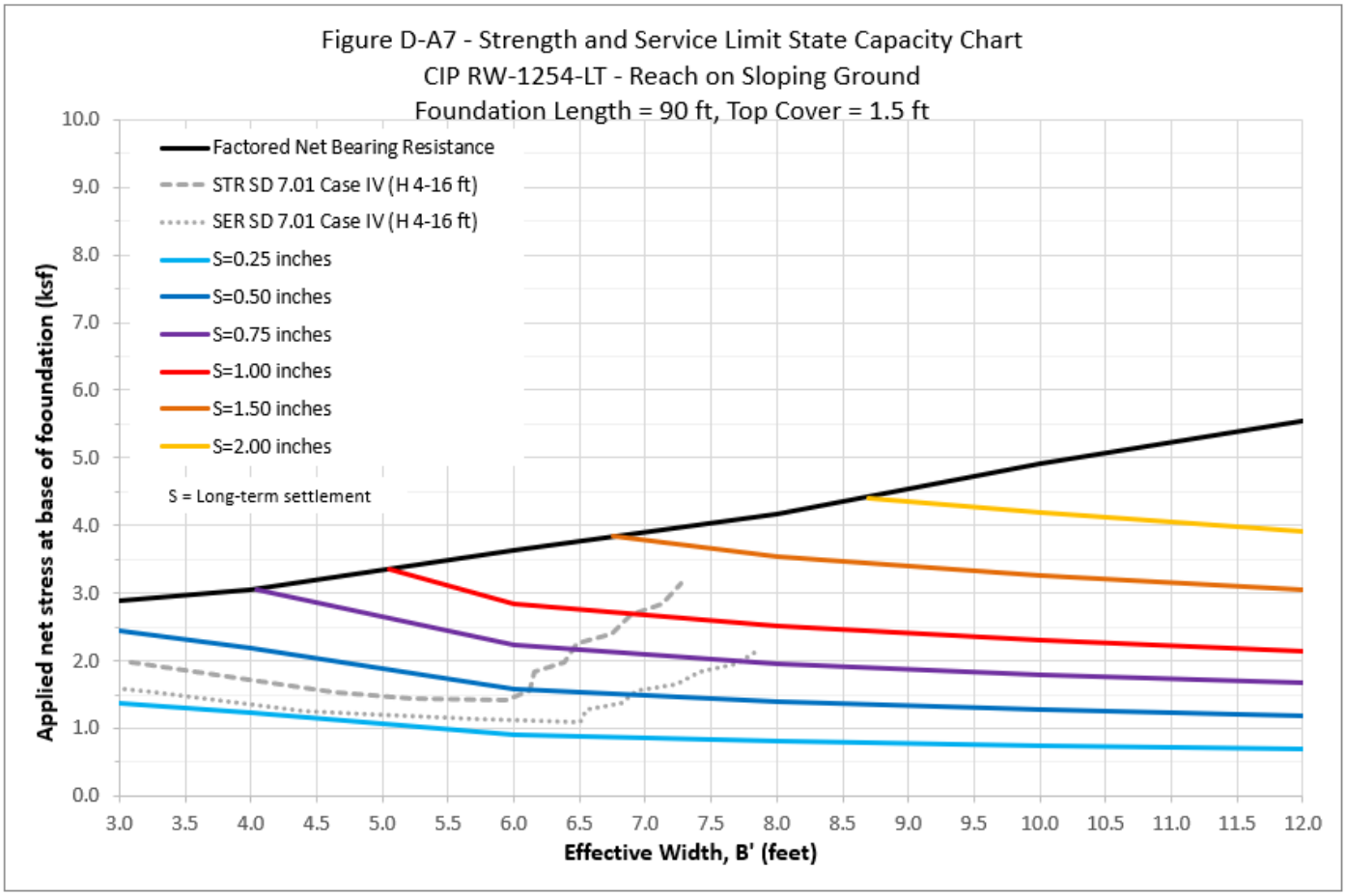
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Figure D-A6 - Strength and Service Limit State Capacity Chart
CIP RW-1254-LT - Reach on Level Ground
Foundation Length = 90 ft, Top Cover = 1.5 ft *

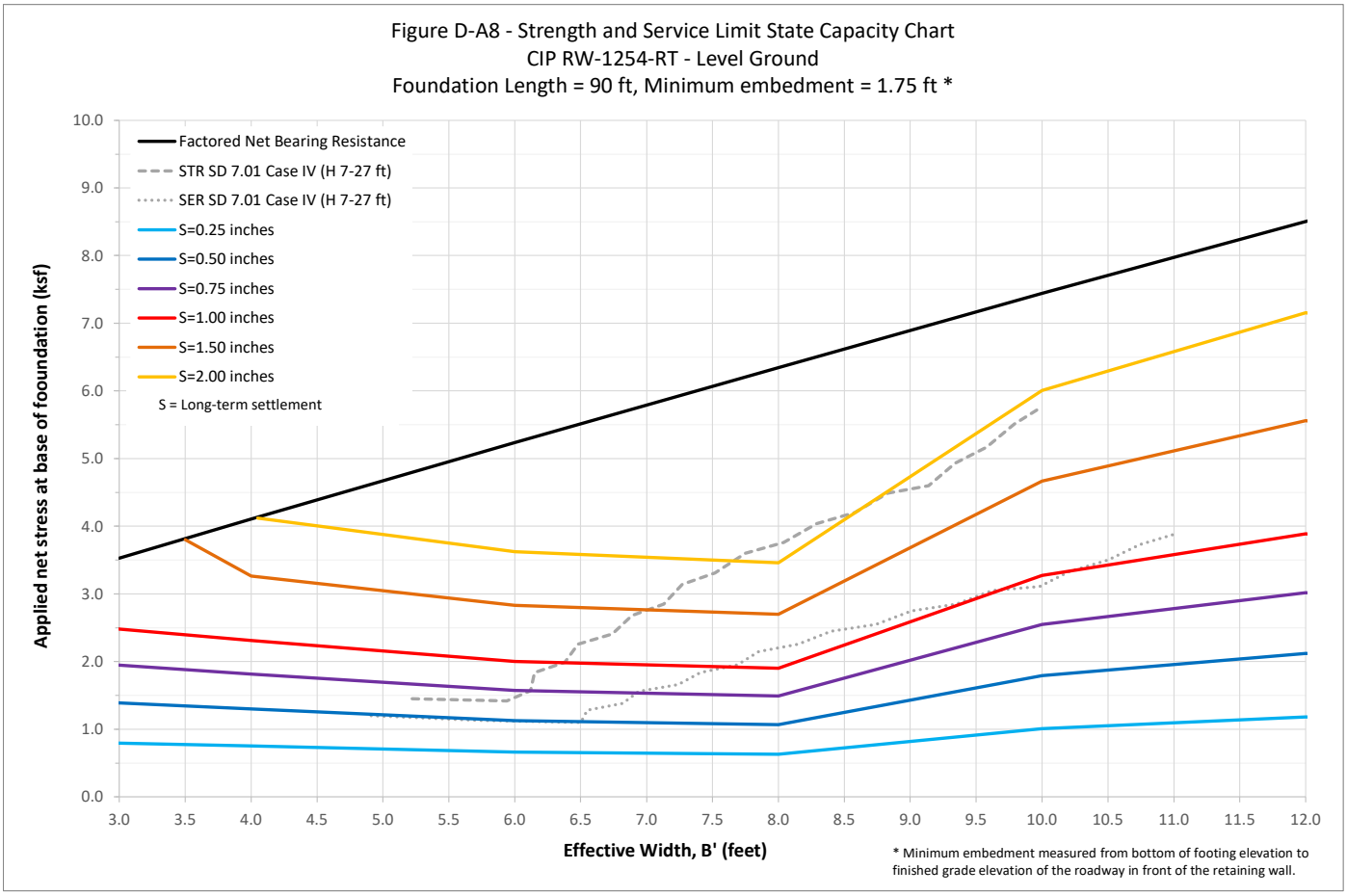


* Top cover measured from top of footing elevation to finished grade elevation of the roadway in front of the retaining wall.

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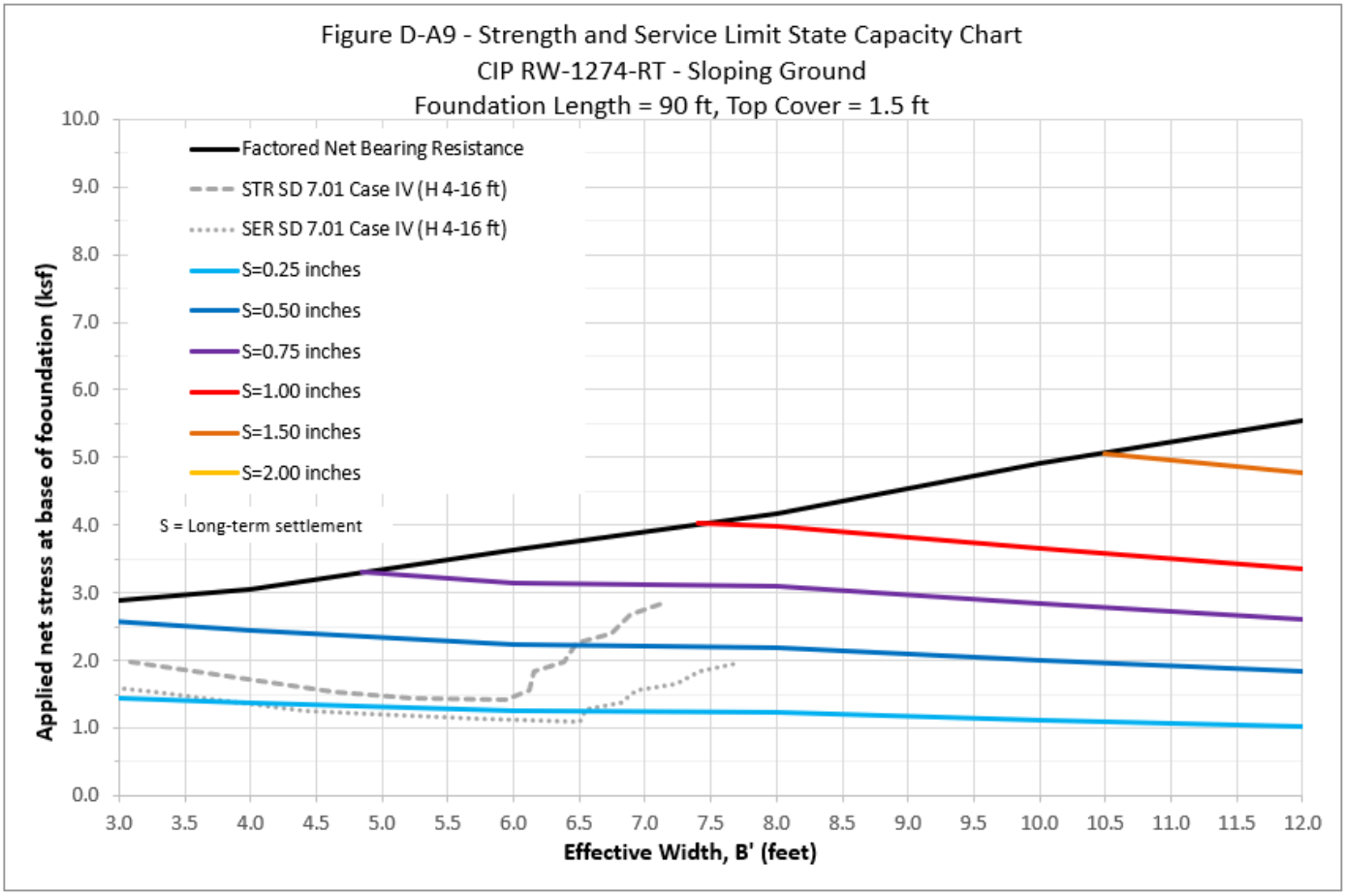


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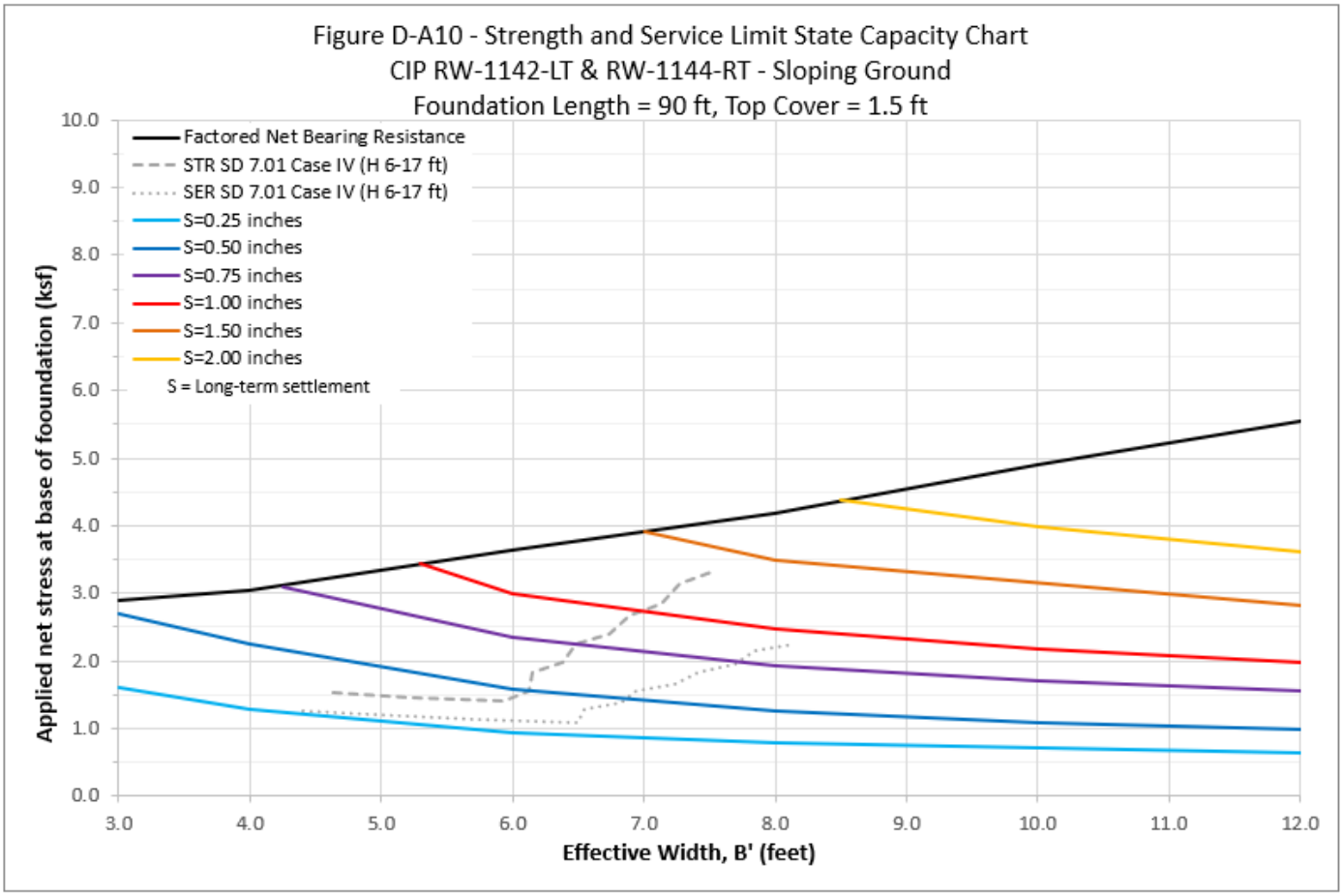


- *Please note that figure captures variability in the soil profile along the length of the wall as B' varies*

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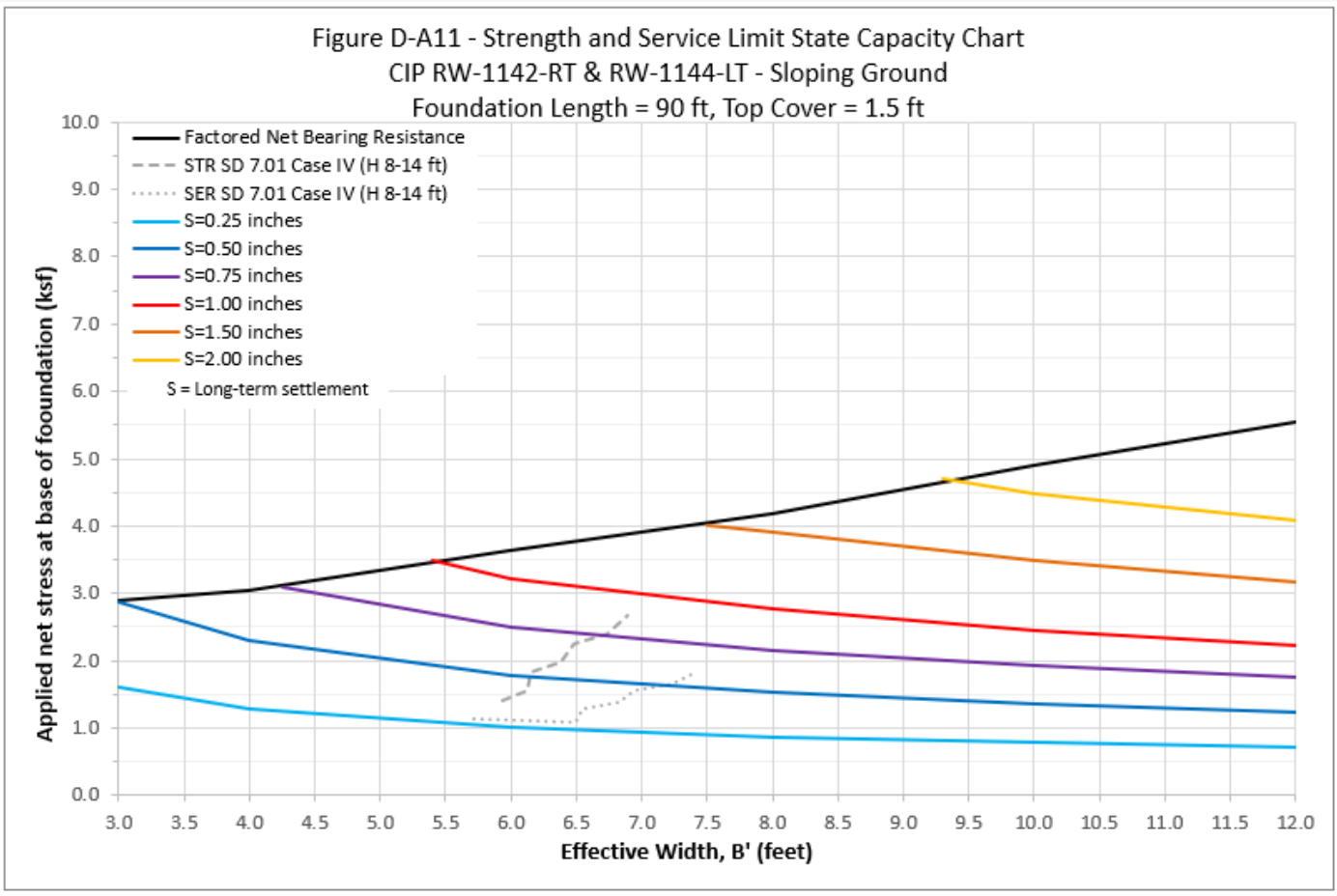


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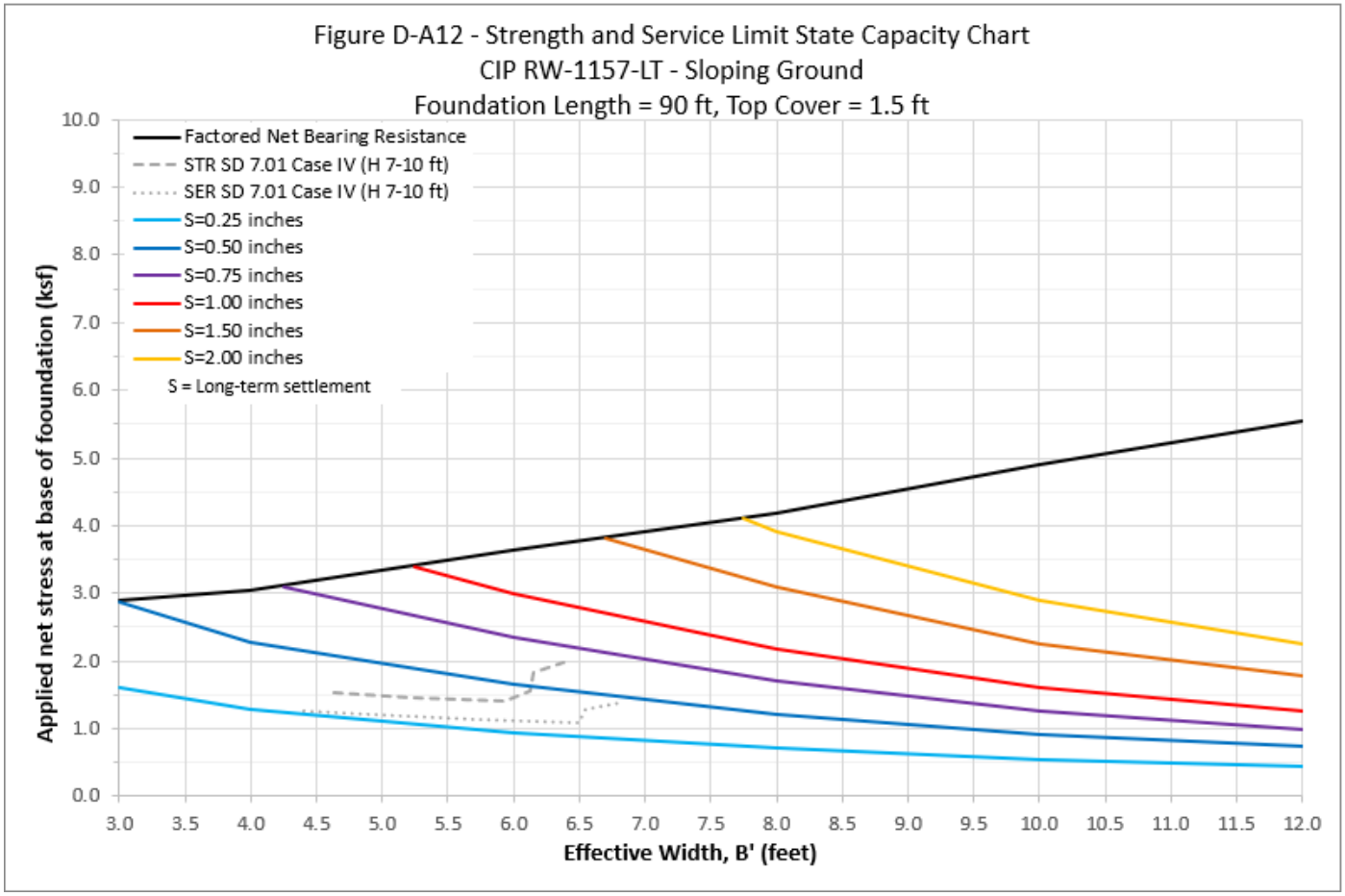


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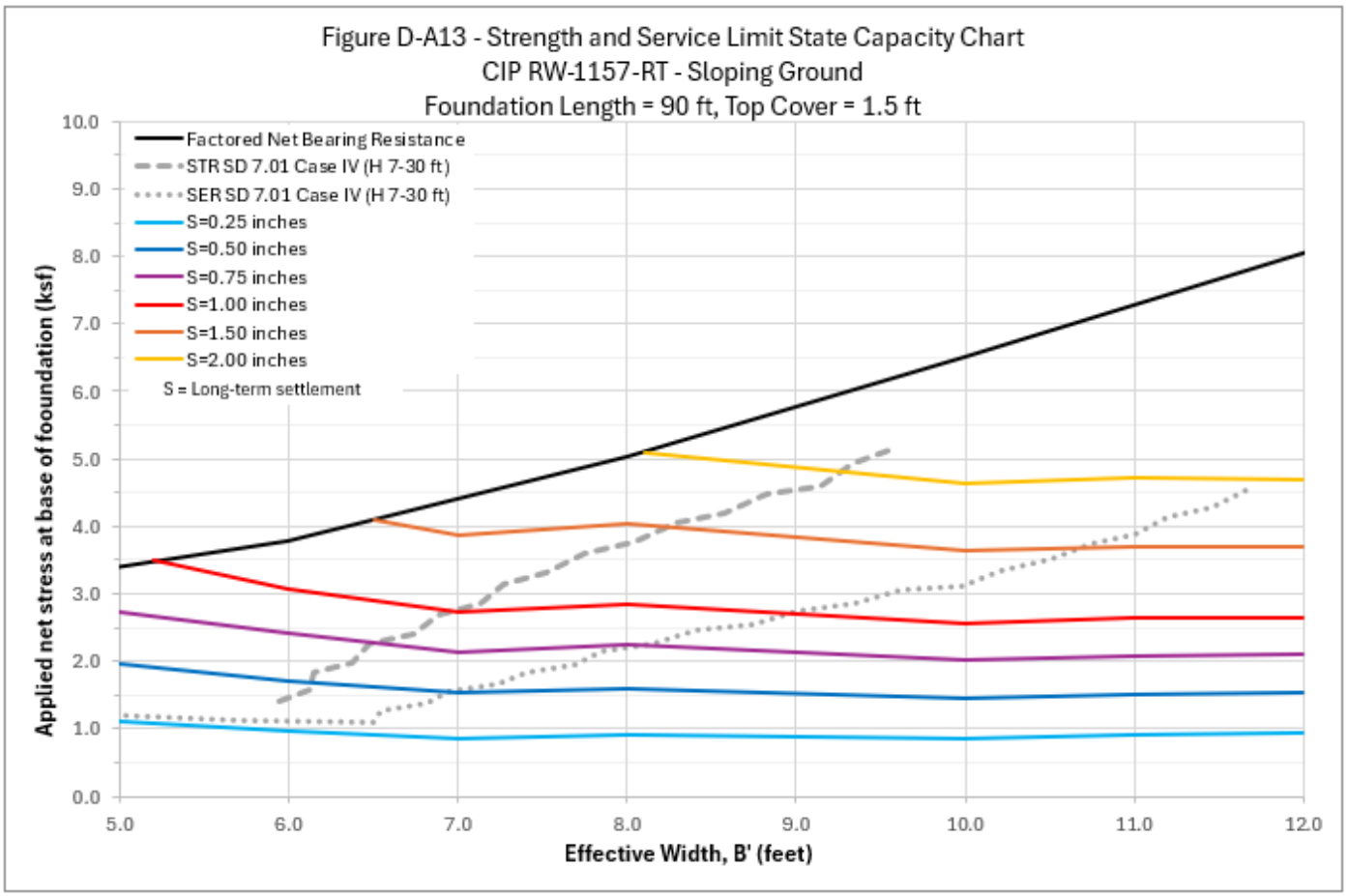
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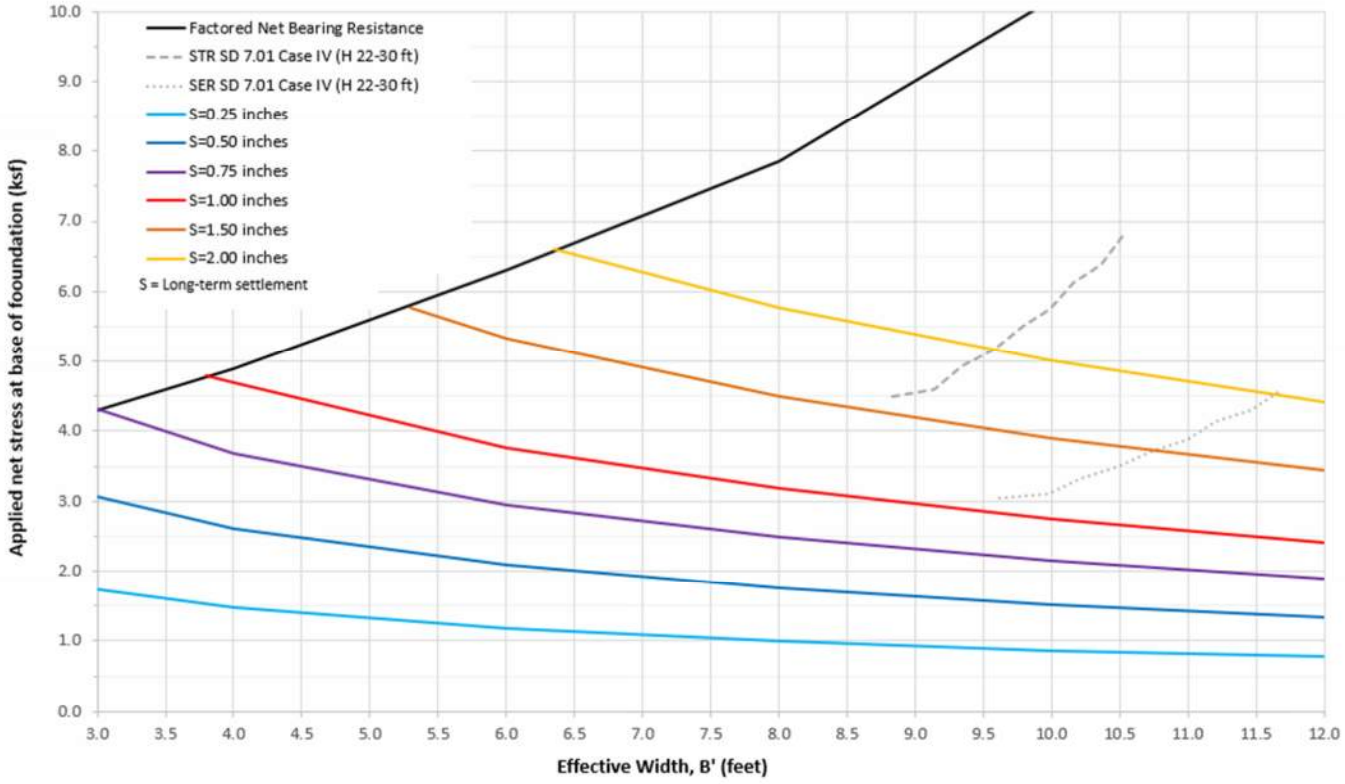
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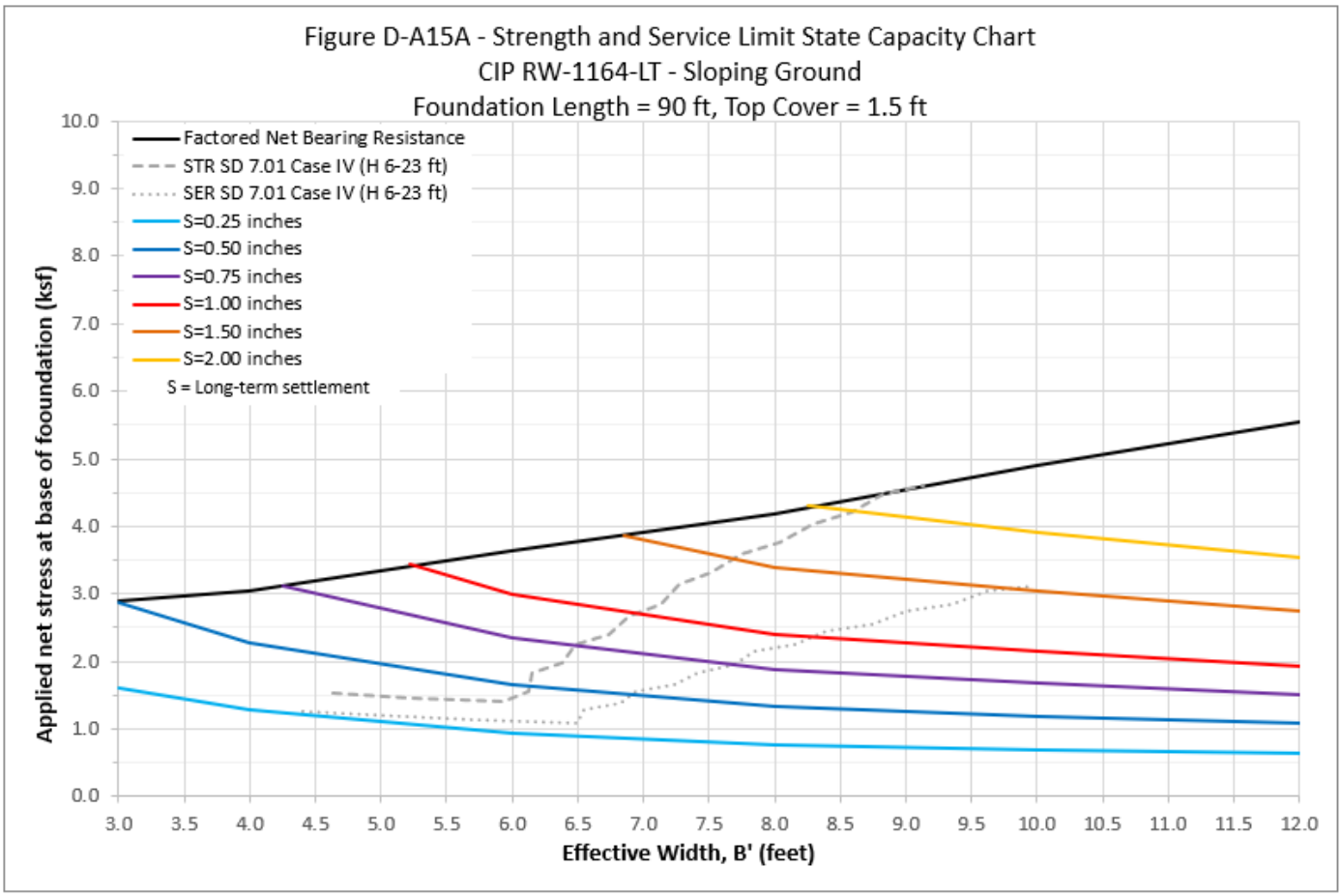
- *Please note that figure captures variability in the soil profile along the length of the wall as B' varies*

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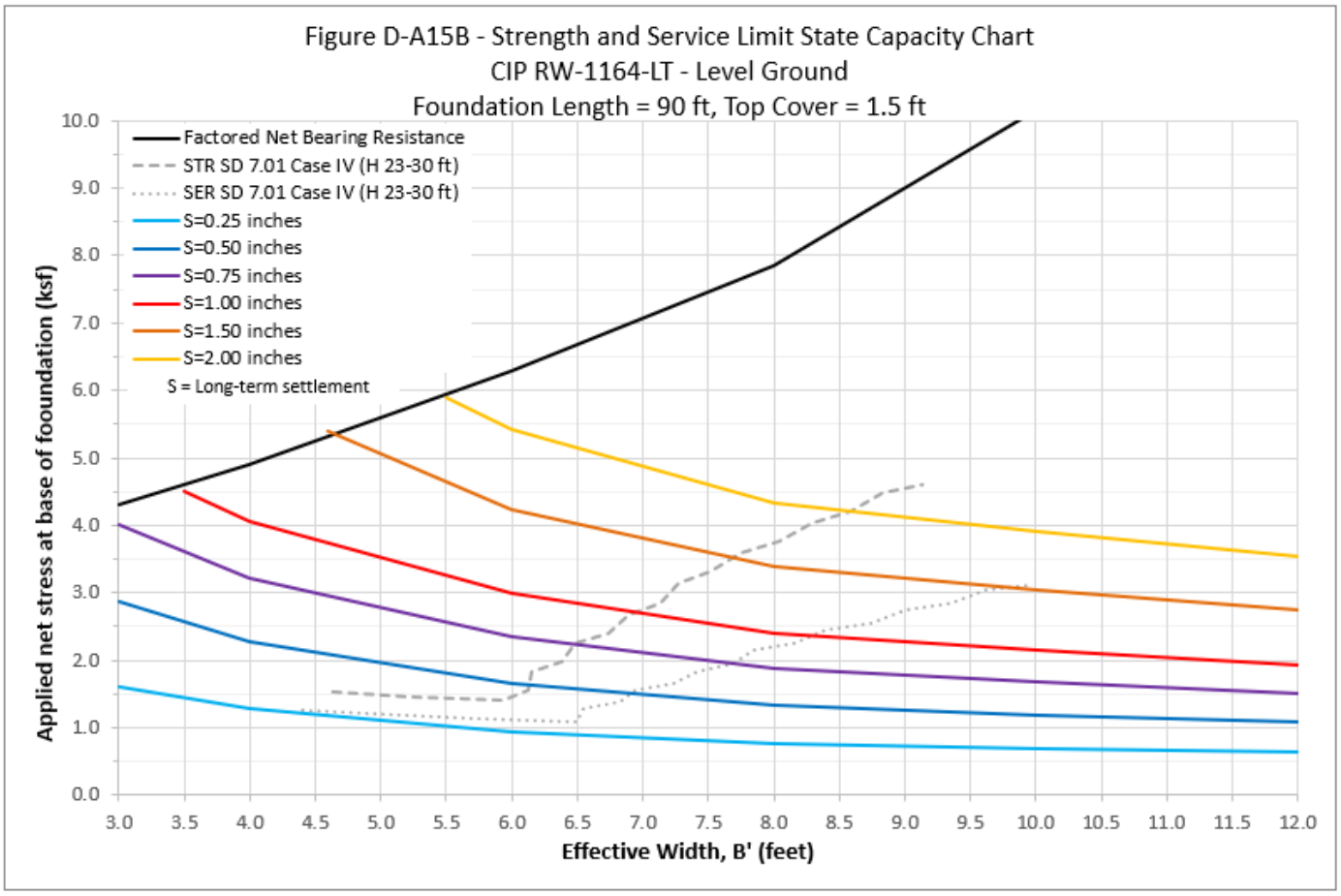
Figure D-A14 - Strength and Service Limit State Capacity Chart
CIP RW-1157-RT - Level Ground
Foundation Length = 90 ft, Top Cover = 1.5 ft



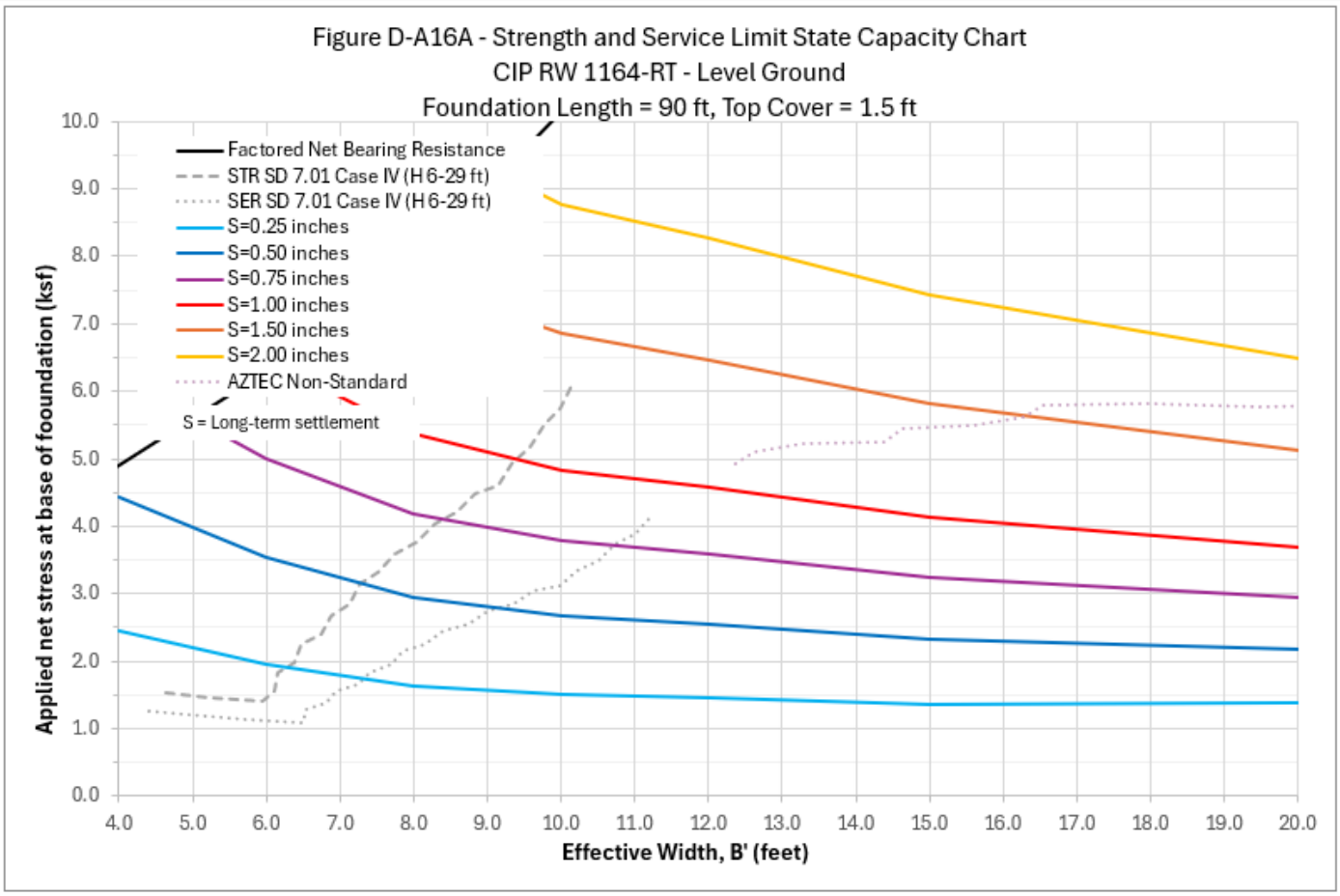
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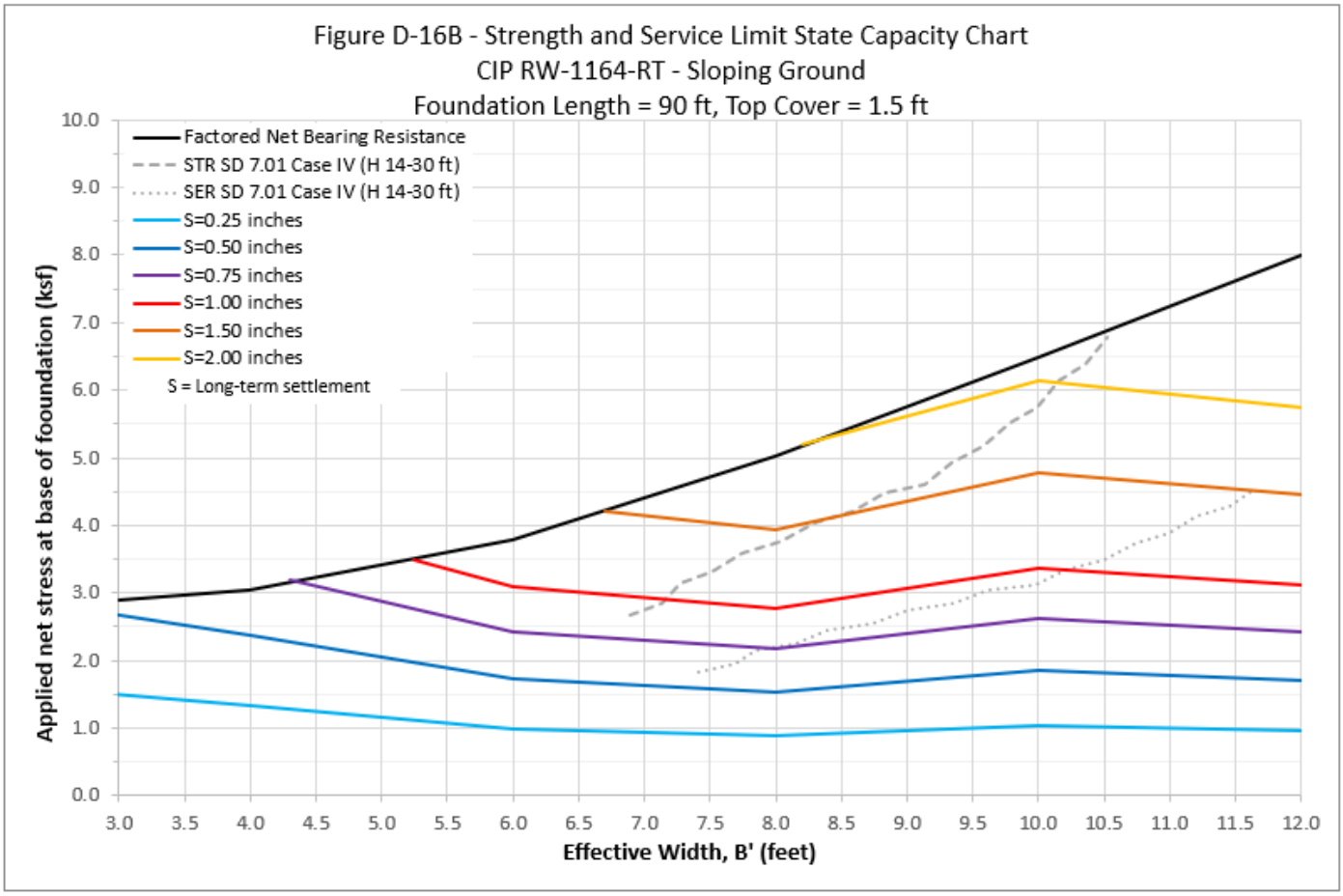
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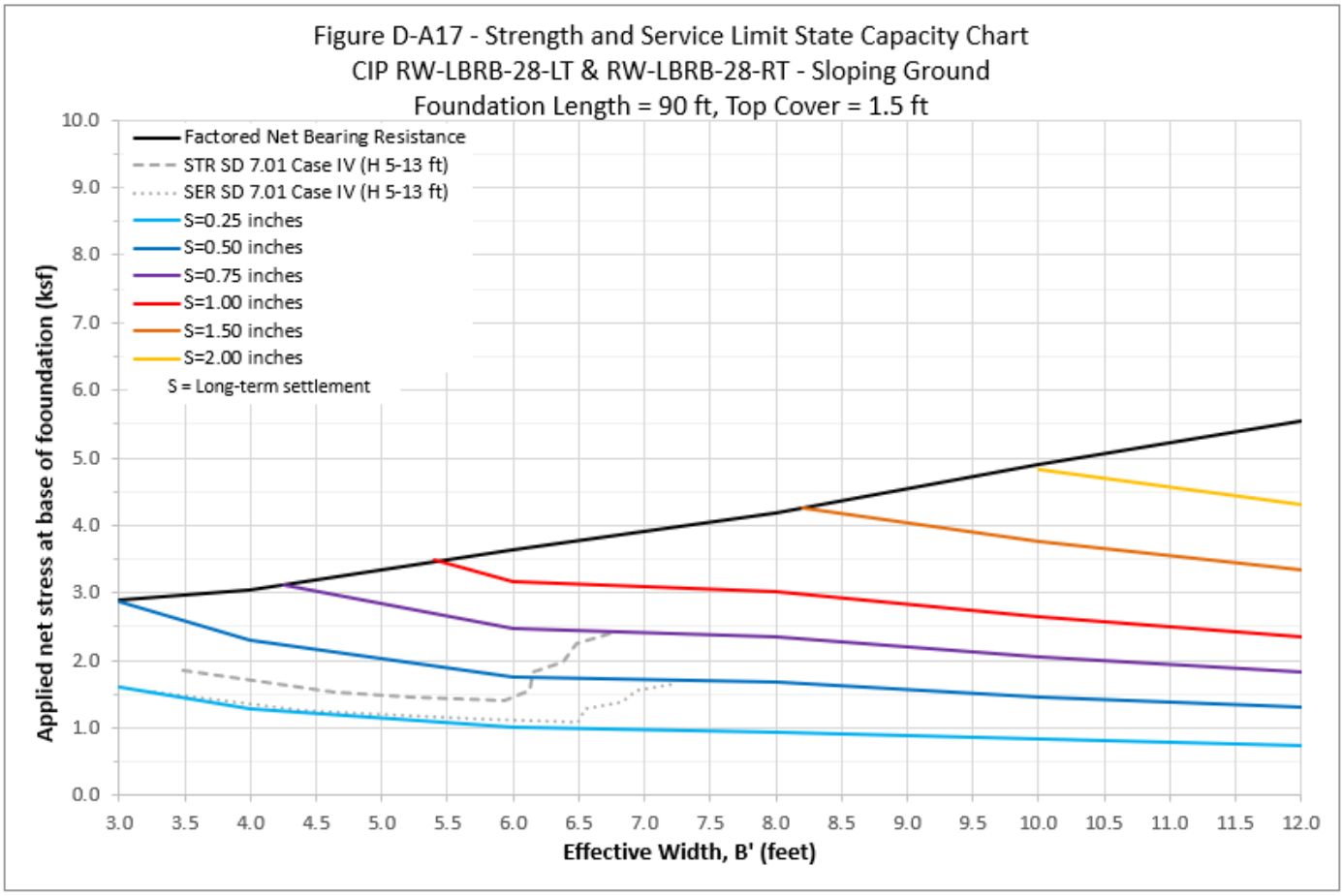


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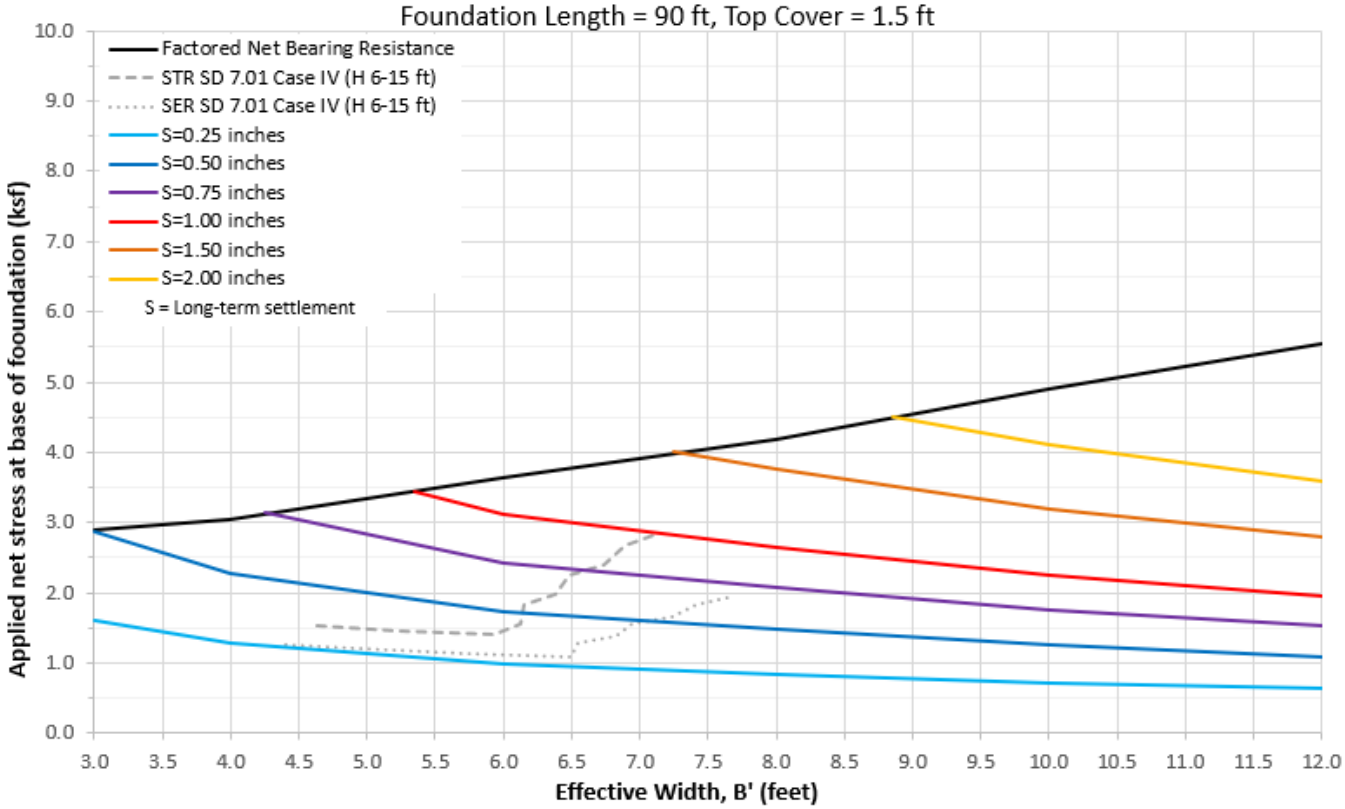
- *Please note that figure captures variability in the soil profile along the length of the wall as B' varies*

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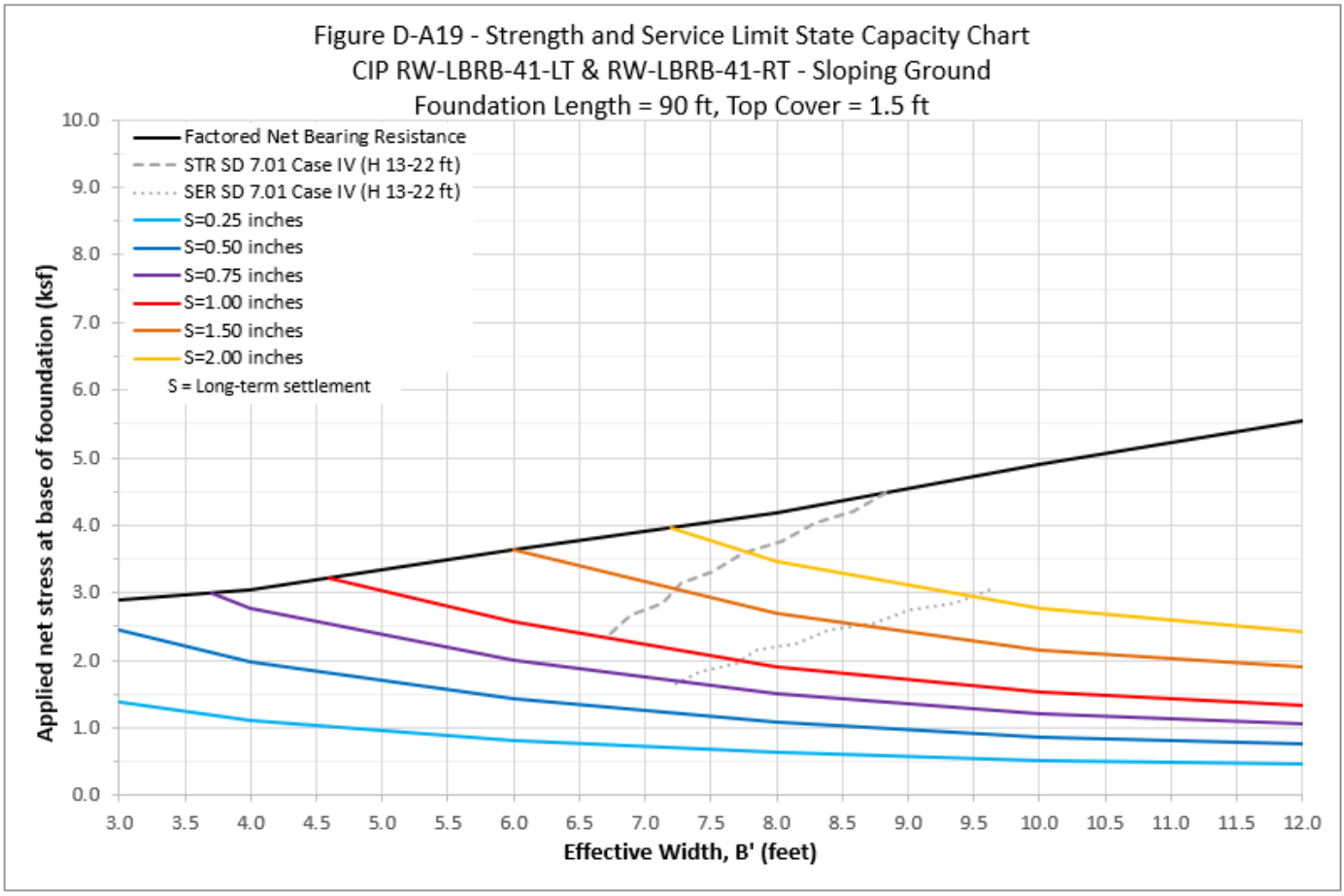


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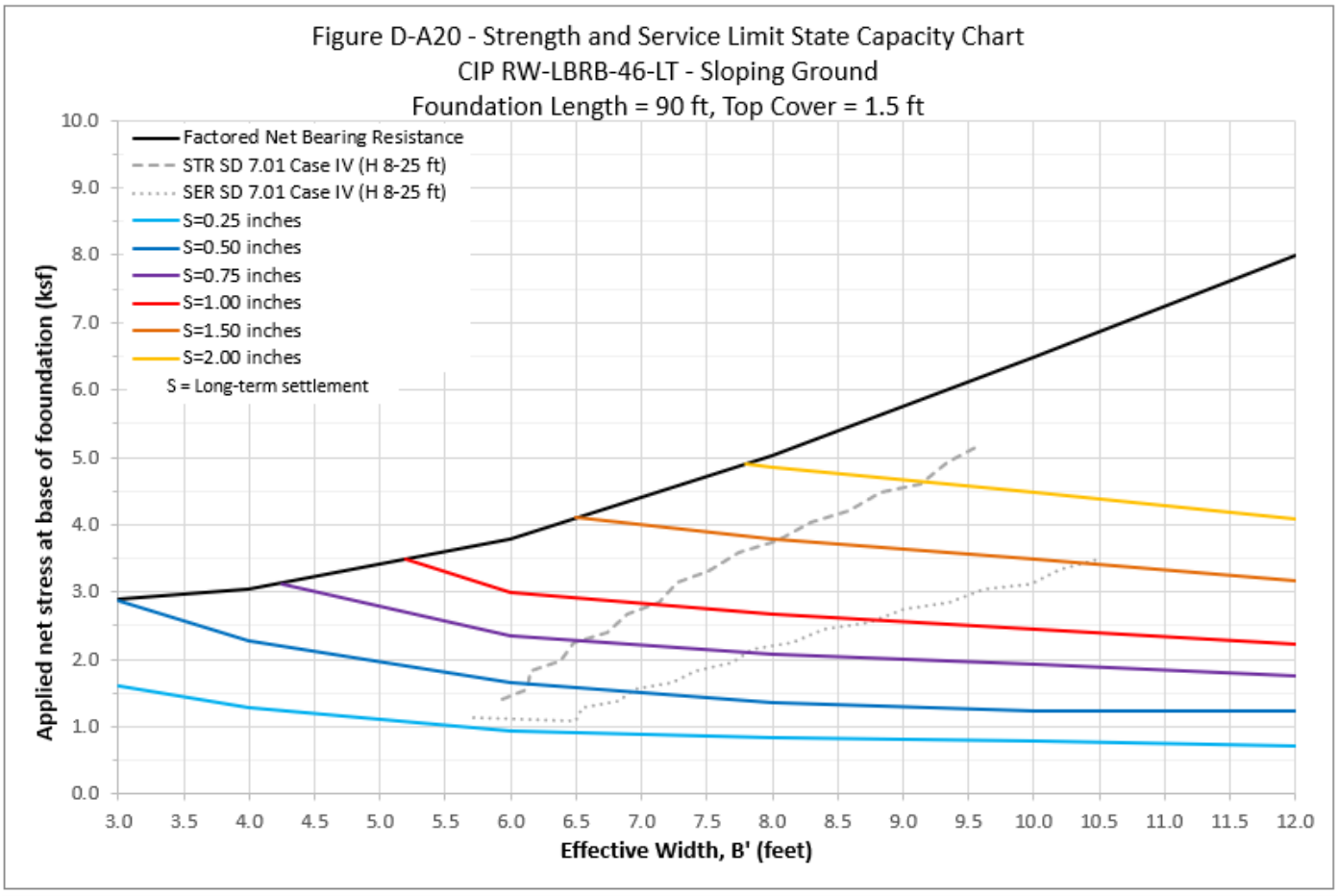
Figure D-A18 - Strength and Service Limit State Capacity Chart
CIP RW-LBRB-30-LT & RW-LBRB-30-RT - Sloping Ground
Foundation Length = 90 ft, Top Cover = 1.5 ft



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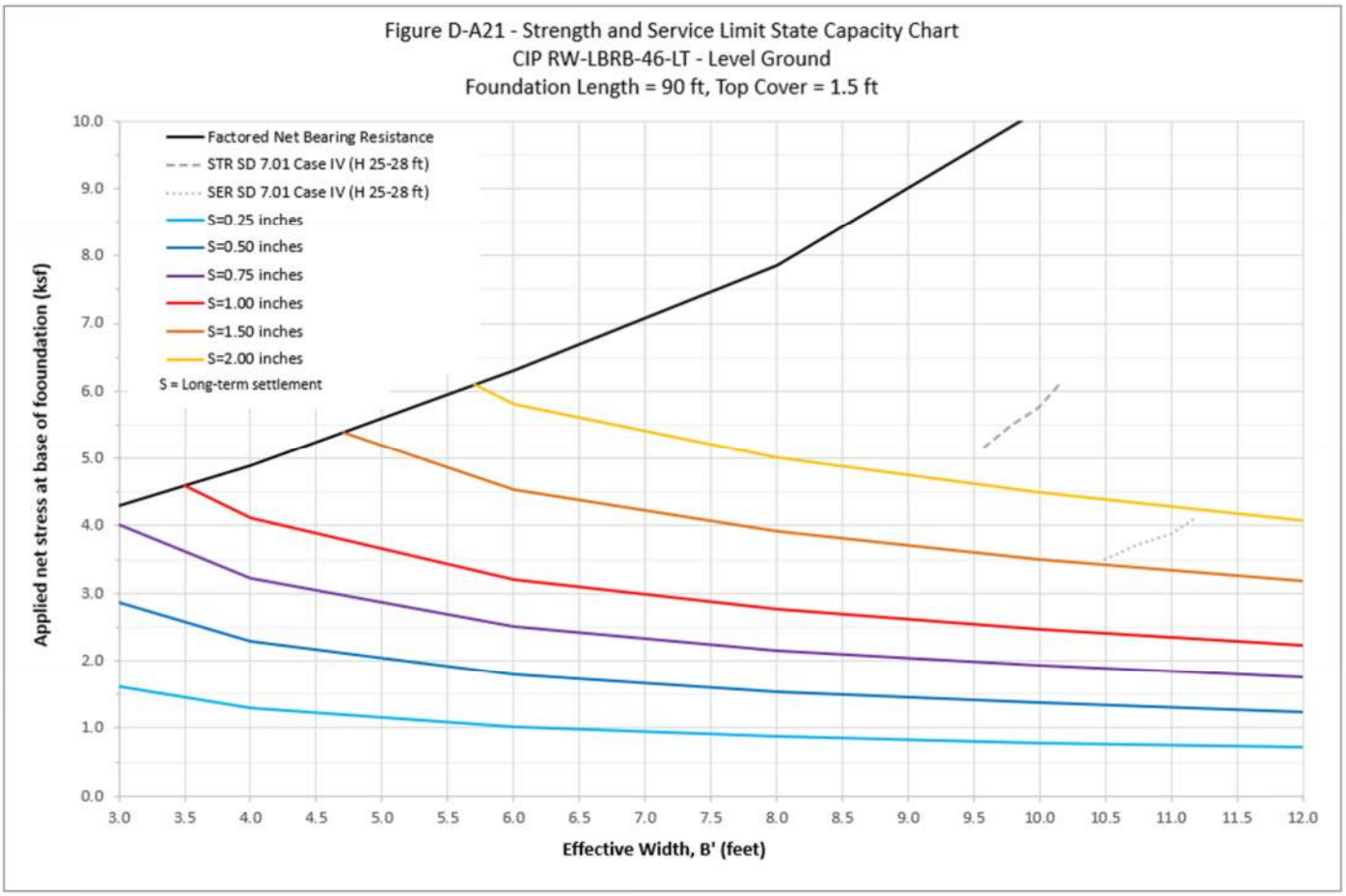


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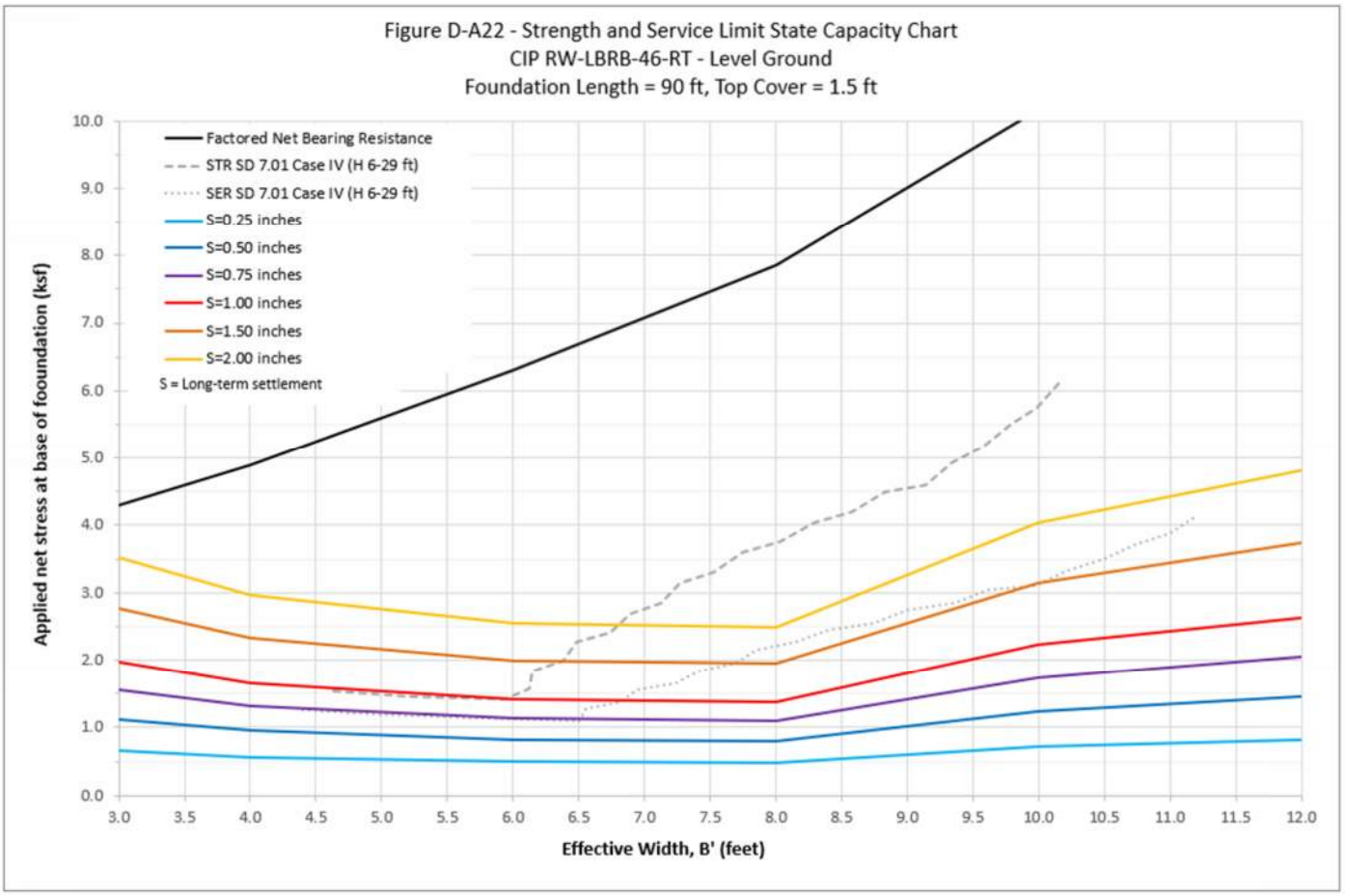


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Figure D-A21 - Strength and Service Limit State Capacity Chart
CIP RW-LBRB-46-LT - Level Ground
Foundation Length = 90 ft, Top Cover = 1.5 ft



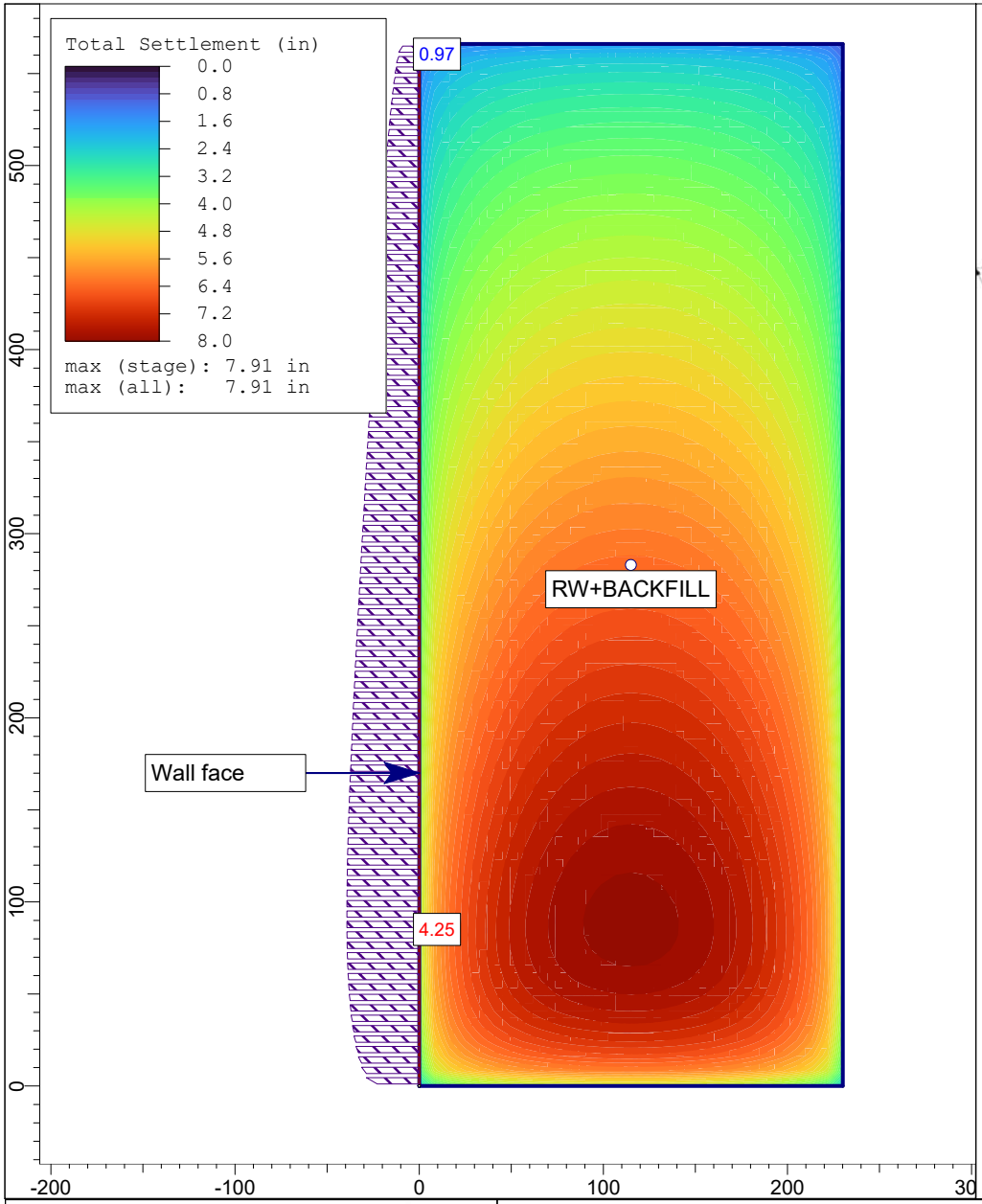
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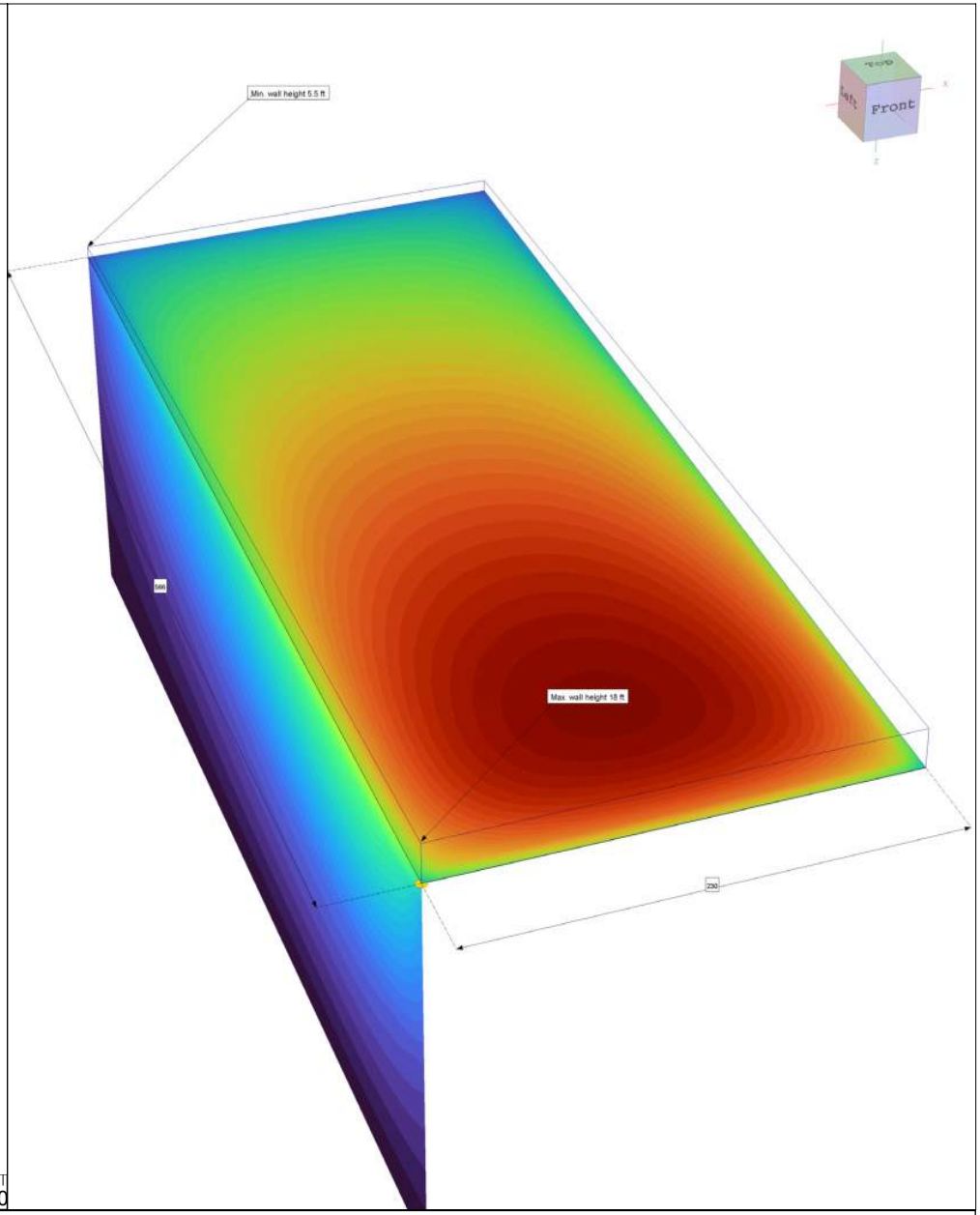


- *Please note that figure captures variability in the soil profile along the length of the wall as B' varies*

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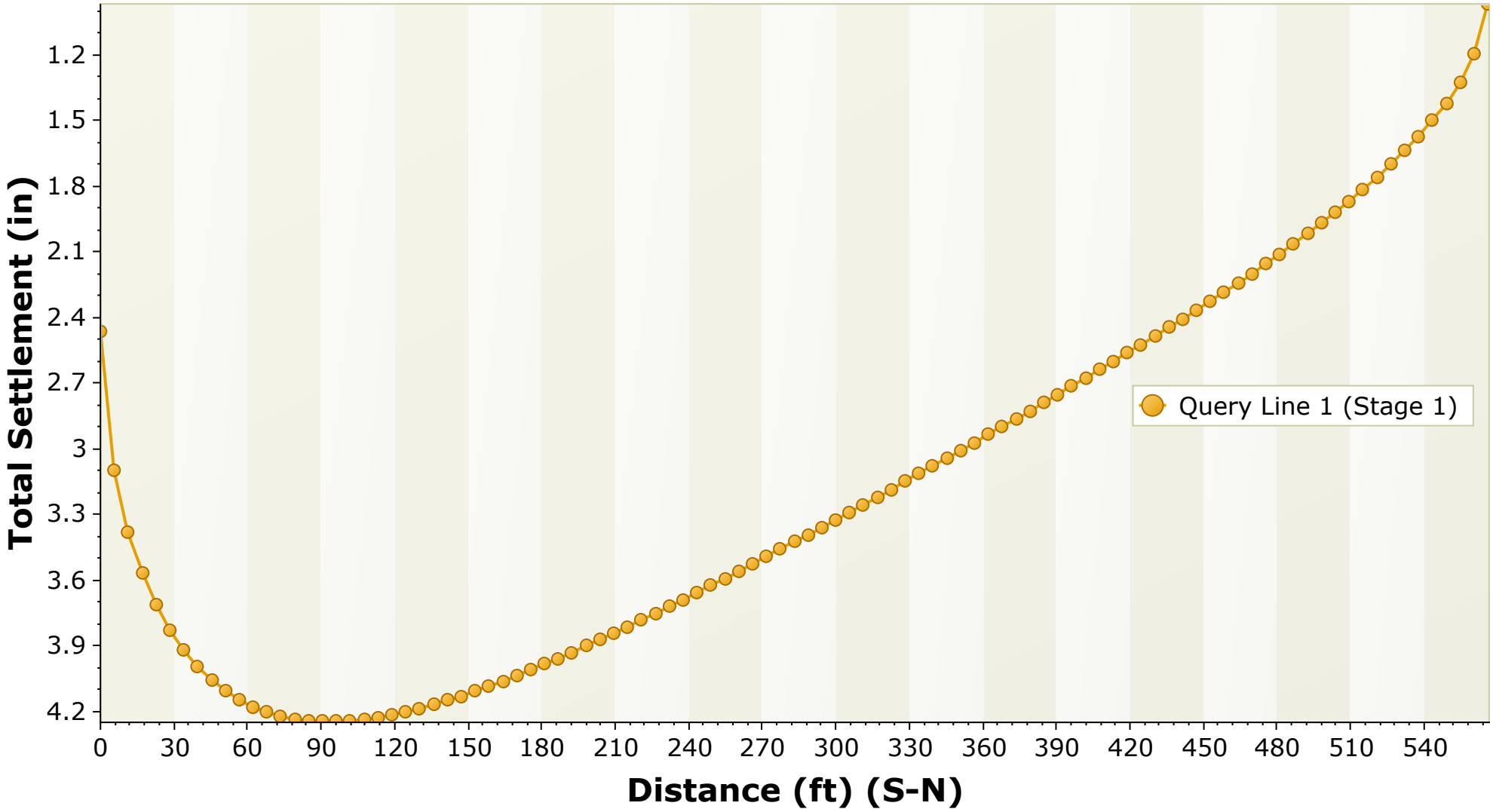
ATTACHMENT 2 – OUTPUTS FROM SETTLE3





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	Analysis: Settlement of RW-1228-LT	
	Author: APL	Company: AZTEC
SETTLE3 5.017	Date: 10/4/2022	FIle Name: AZFWY1802-SR303L-Yuma_North_RWs-RW-1228-LT-Rev0a.s3z

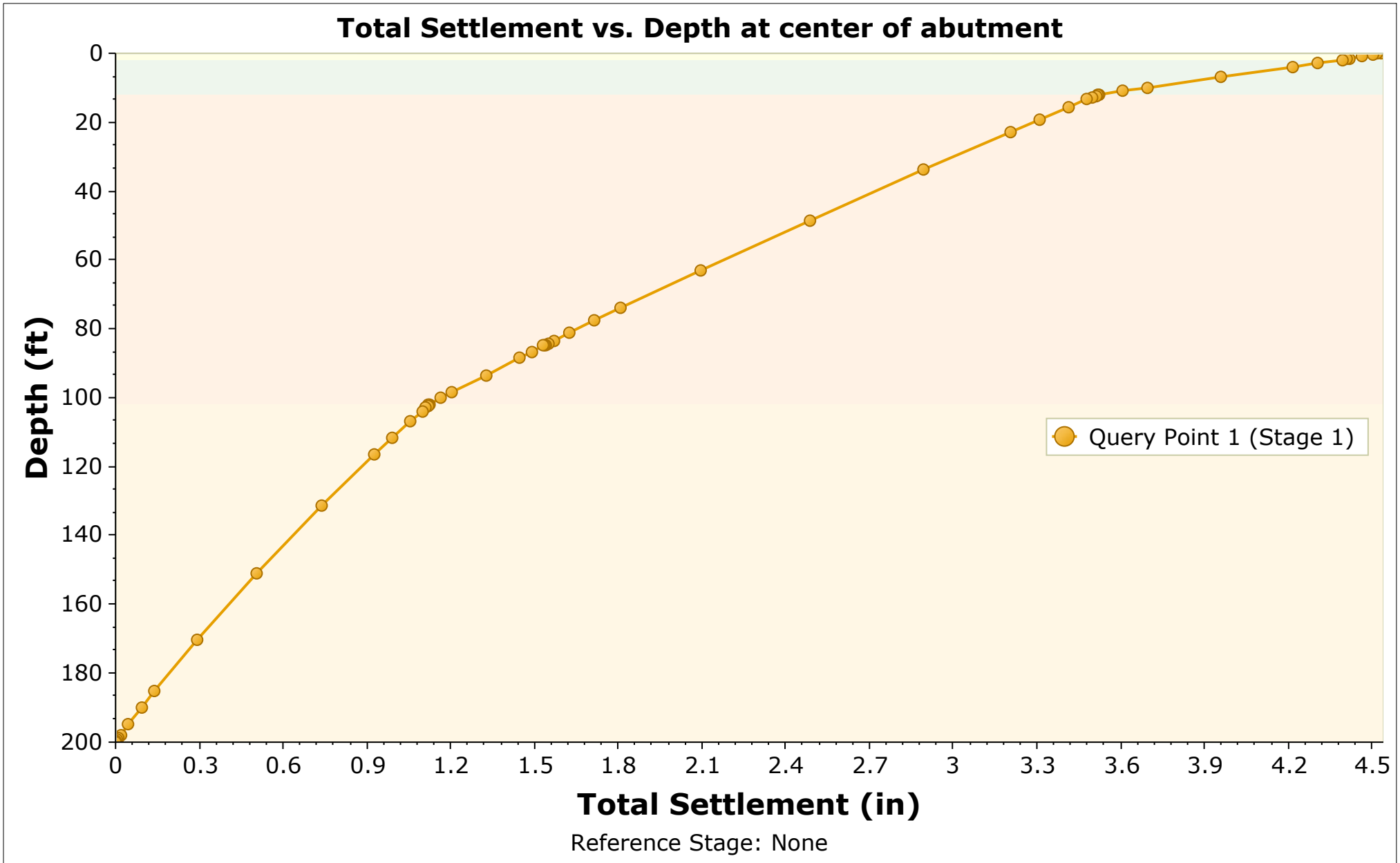
Distance vs. Total Settlement at wall face



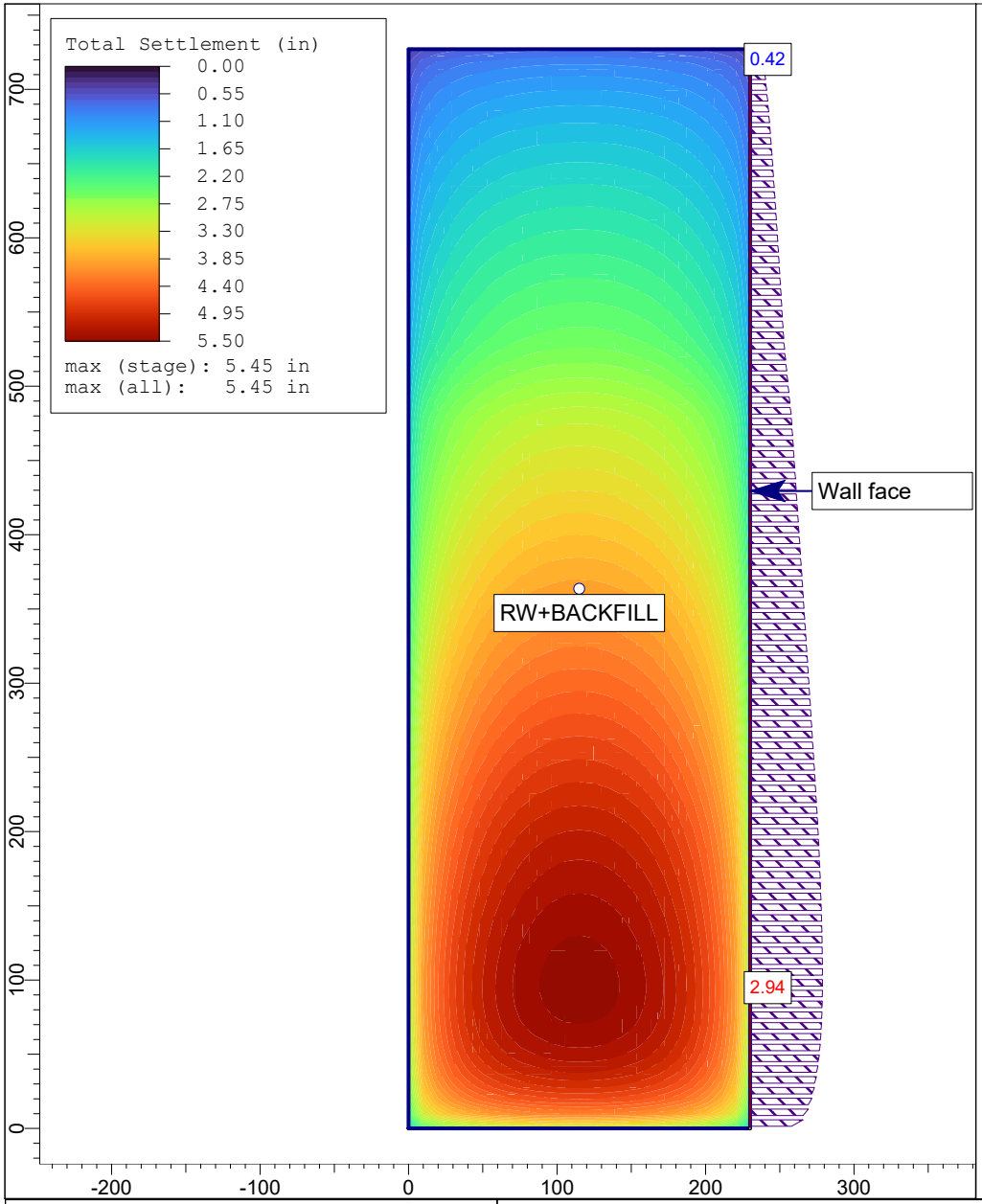
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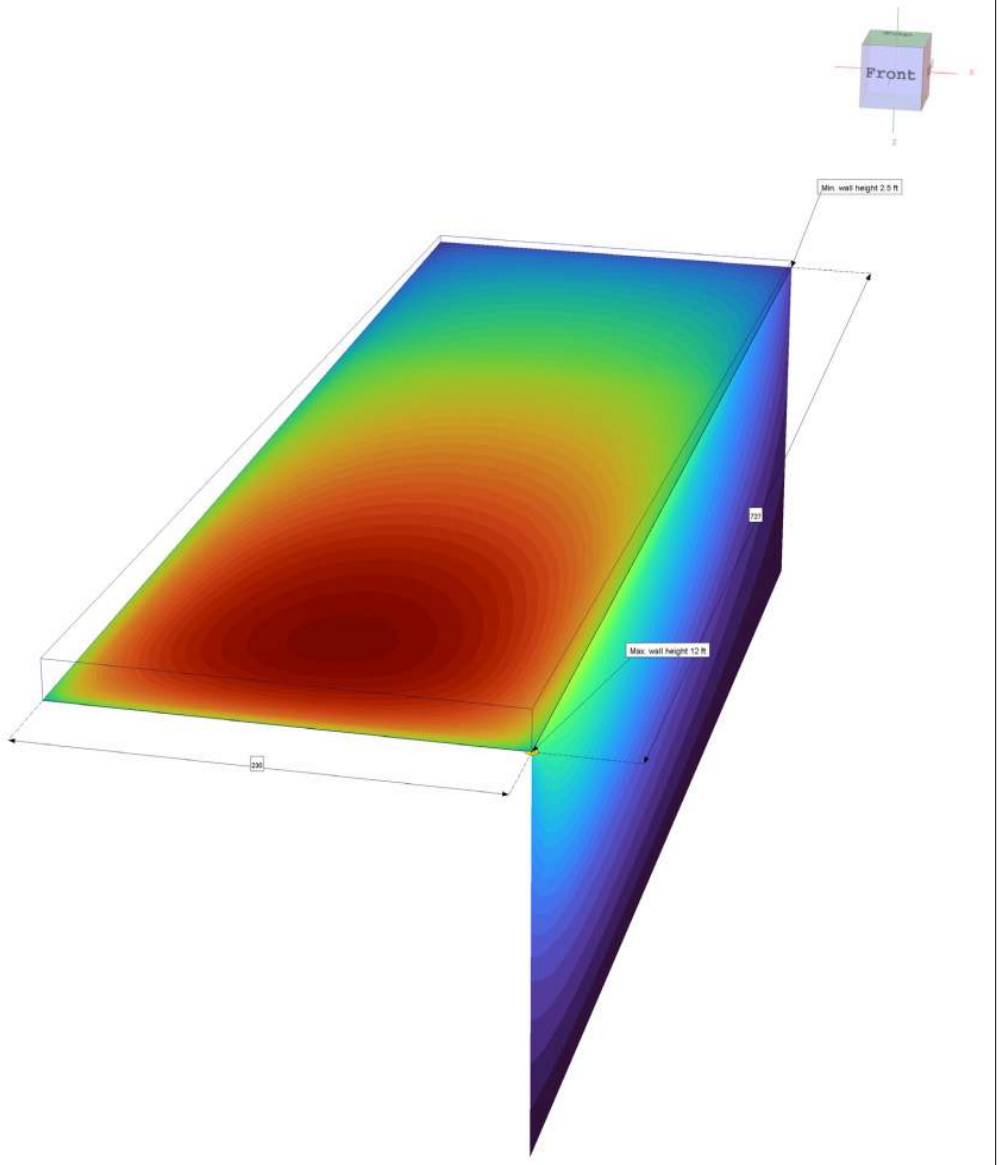
Total Settlement at Depth = 0 ft

AZTEC TYPSA	Project: SR303L - Phase I - MC85-Van Buren St	
	Analysis: Settlement of RW-1228-LT	
	Author: APL	Company: AZTEC
SETTLE3 5.017	Date: 10/4/2022	FIle Name: AZFWY1802-SR303L-Yuma_North_RWs-RW-1228-LT-Rev0a.s3z



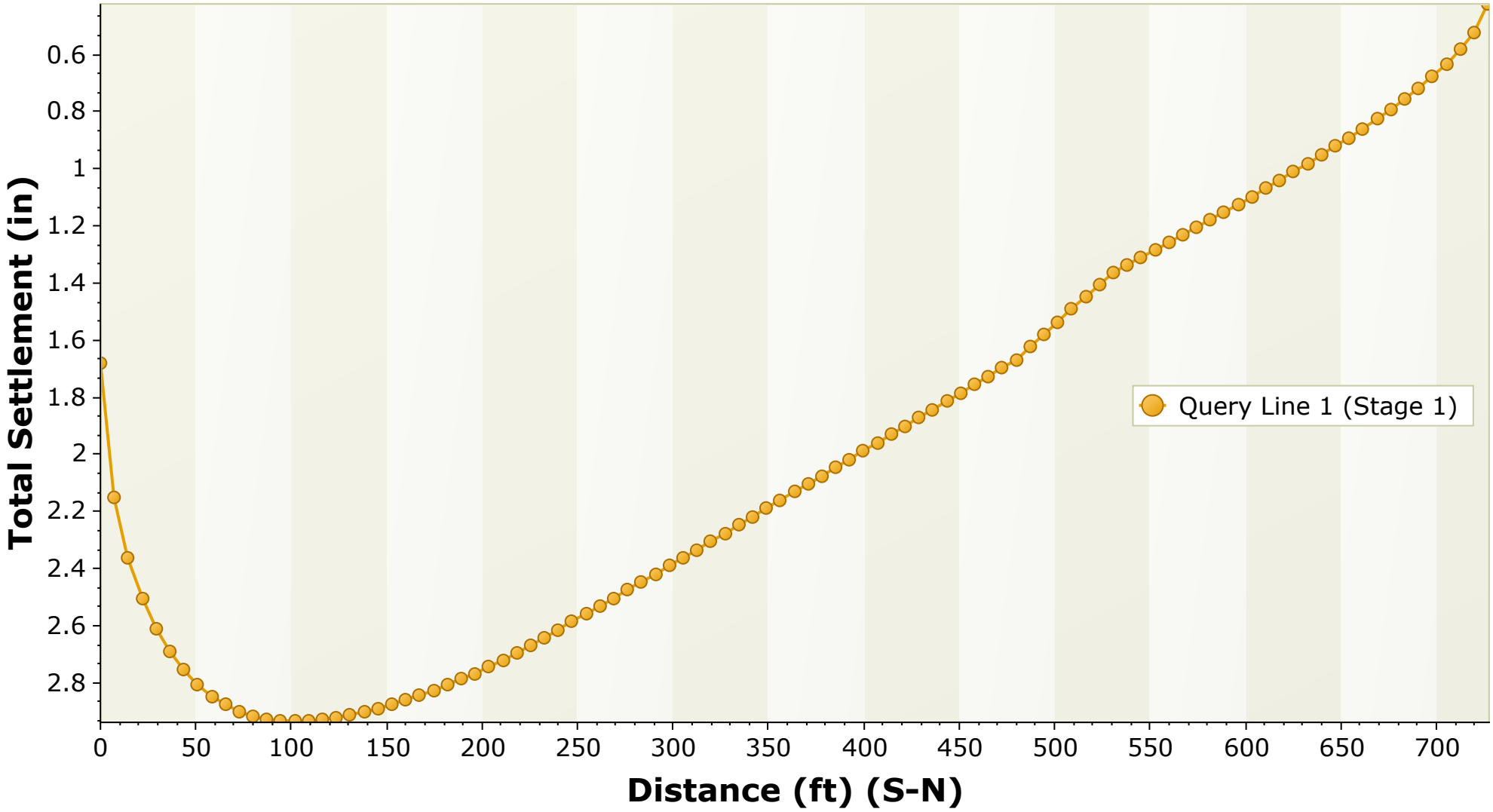
AZTEC TYPSA	Project: SR303L - Phase I - MC85-Van Buren St	
	Analysis: Settlement of RW-1228-LT	
	Author: APL	Company: AZTEC
SETTLE3 5.017	Date: 10/4/2022	FIle Name: AZFWY1802-SR303L-Yuma_North_RWs-RW-1228-LT-Rev0a.s3z





AZTEC TYPSA	Project: SR303L - Phase I - MC85-Van Buren St	
	Analysis: Settlement of RW-1228-RT	
	Author: APL	Company: AZTEC
SETTLE3 5.017	Date: 10/4/2022	FIle Name: AZFWY1802-SR303L-Yuma_North_RWs-RW-1228-RT-Rev0a.s3z

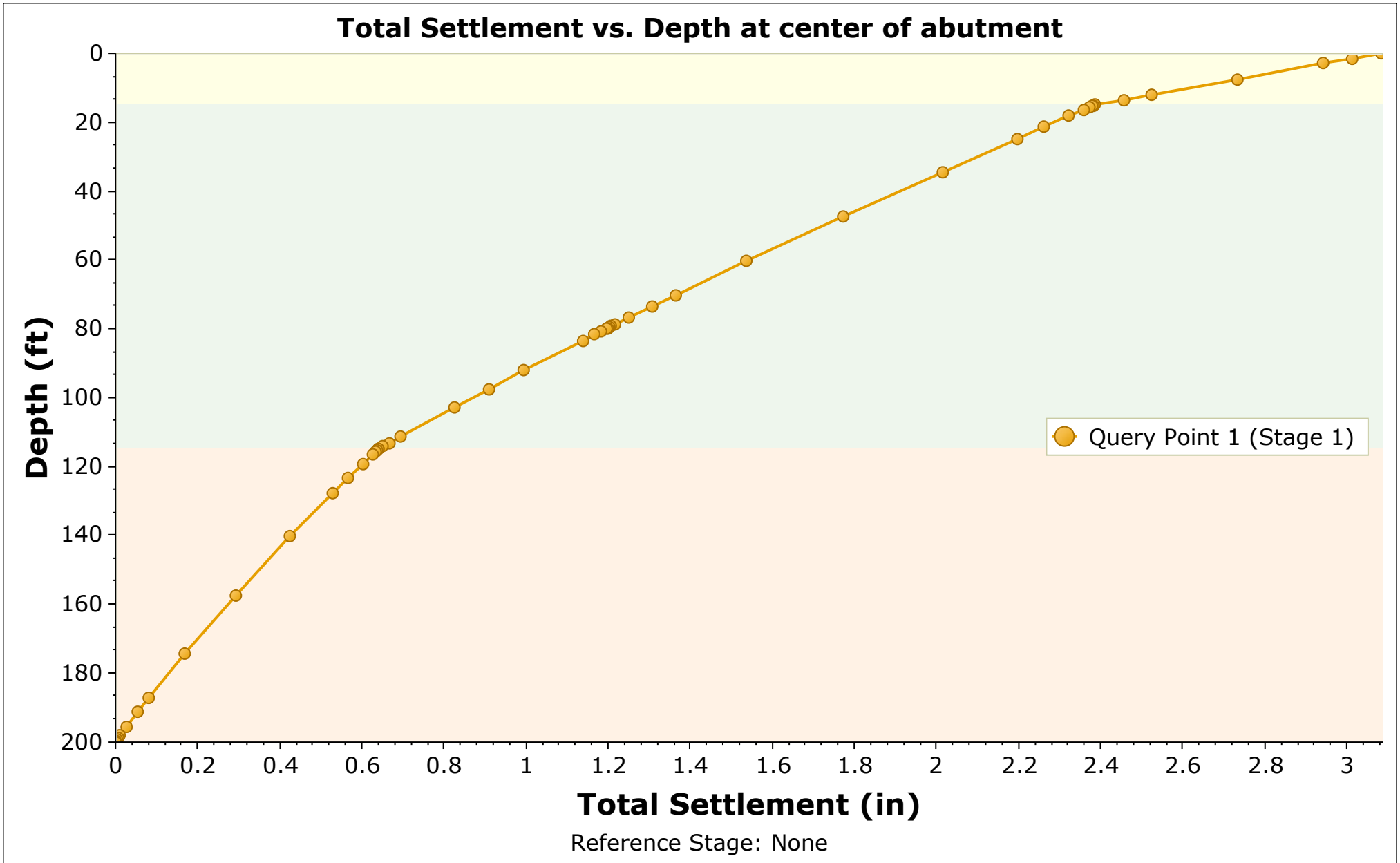
Distance vs. Total Settlement along wall face



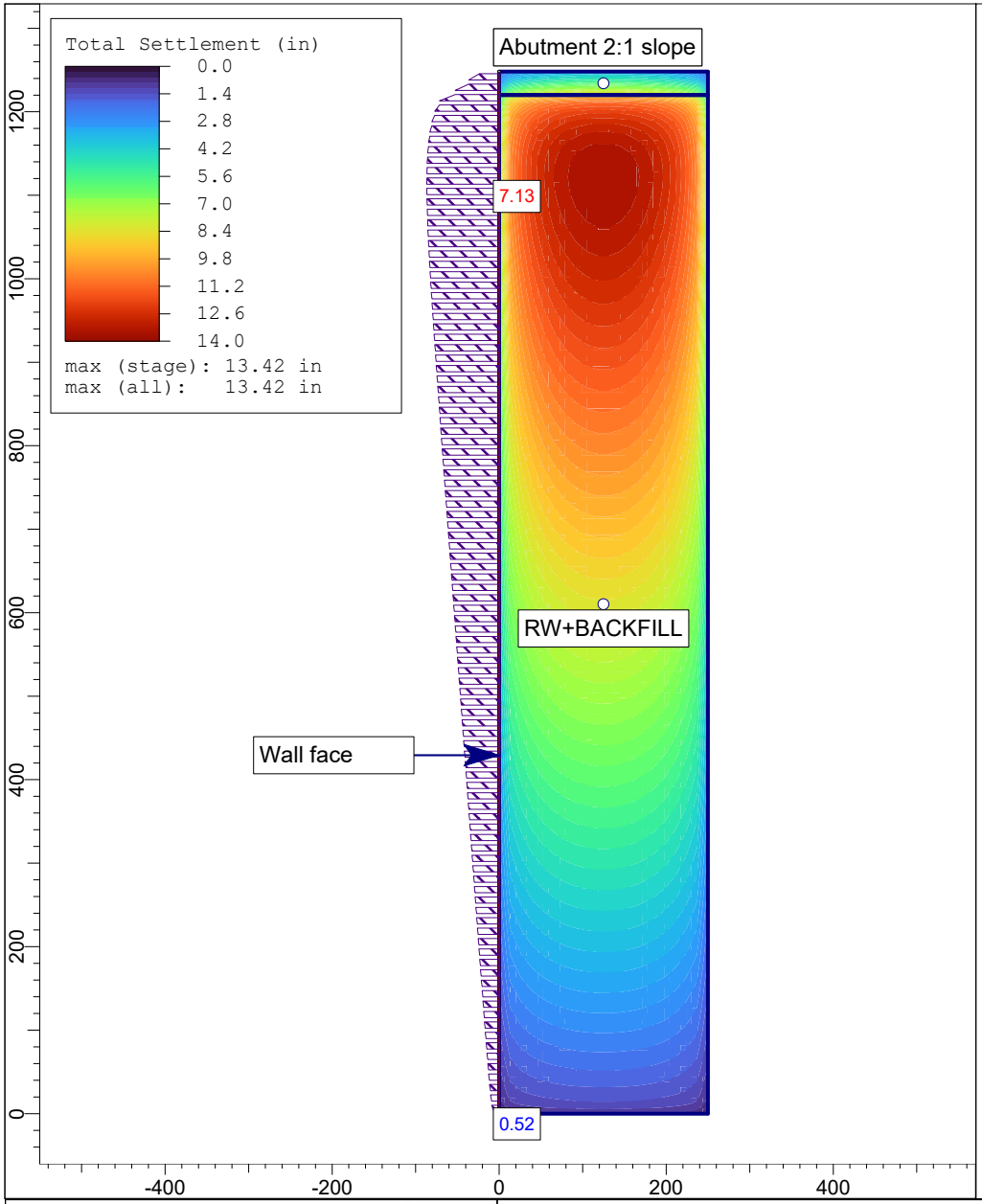
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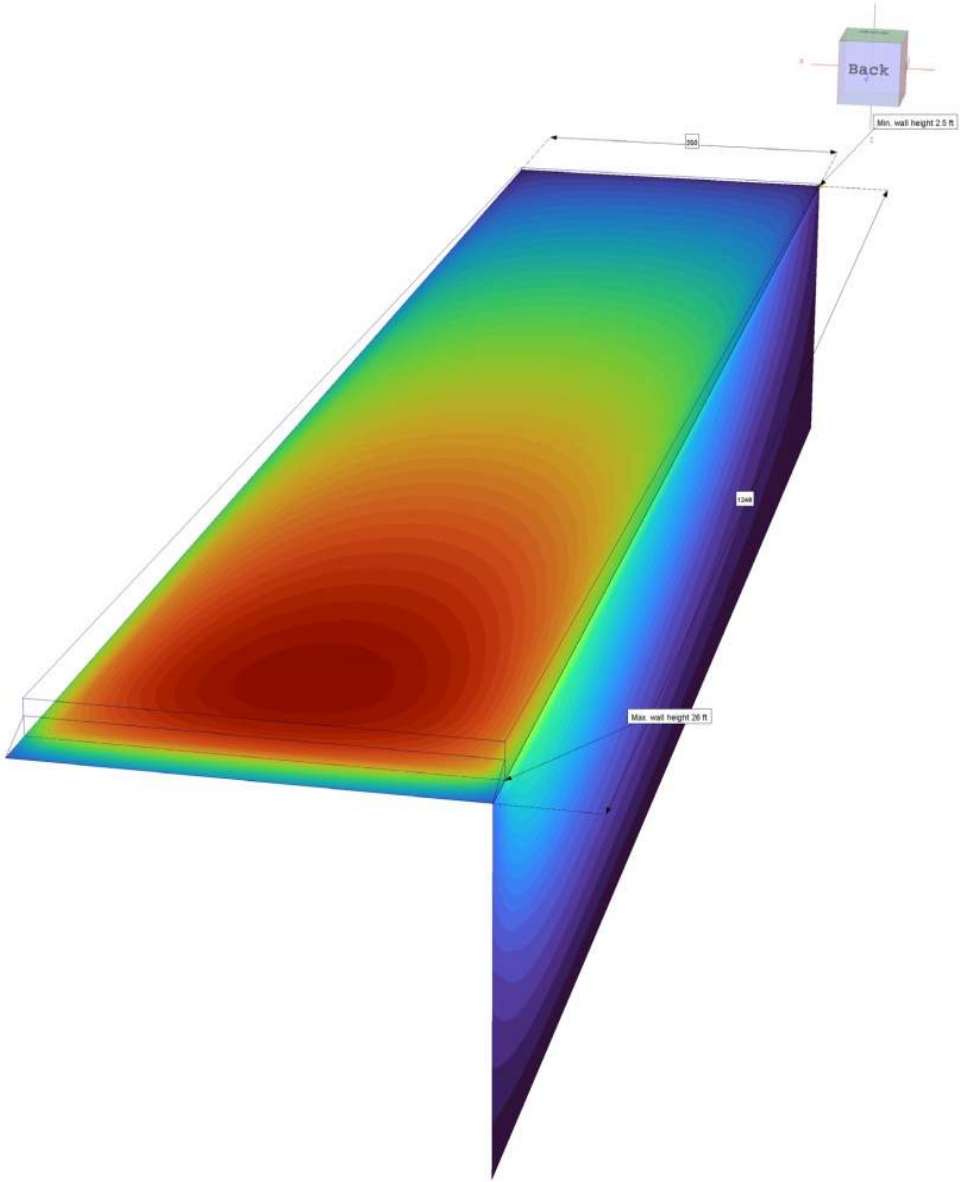
Total Settlement at Depth = 0 ft

AZTEC TYPSA	Project: SR303L - Phase I - MC85-Van Buren St	
	Analysis: Settlement of RW-1228-RT	
	Author: APL	Company: AZTEC
SETTLE3 5.017	Date: 10/4/2022	FIle Name: AZFWY1802-SR303L-Yuma_North_RWs-RW-1228-RT-Rev0a.s3z



AZTEC TYPSA	Project: SR303L - Phase I - MC85-Van Buren St	
	Analysis: Settlement of RW-1228-RT	
	Author: APL	Company: AZTEC
SETTLE3 5.017	Date: 10/4/2022	FIle Name: AZFWY1802-SR303L-Yuma_North_RWs-RW-1228-RT-Rev0a.s3z



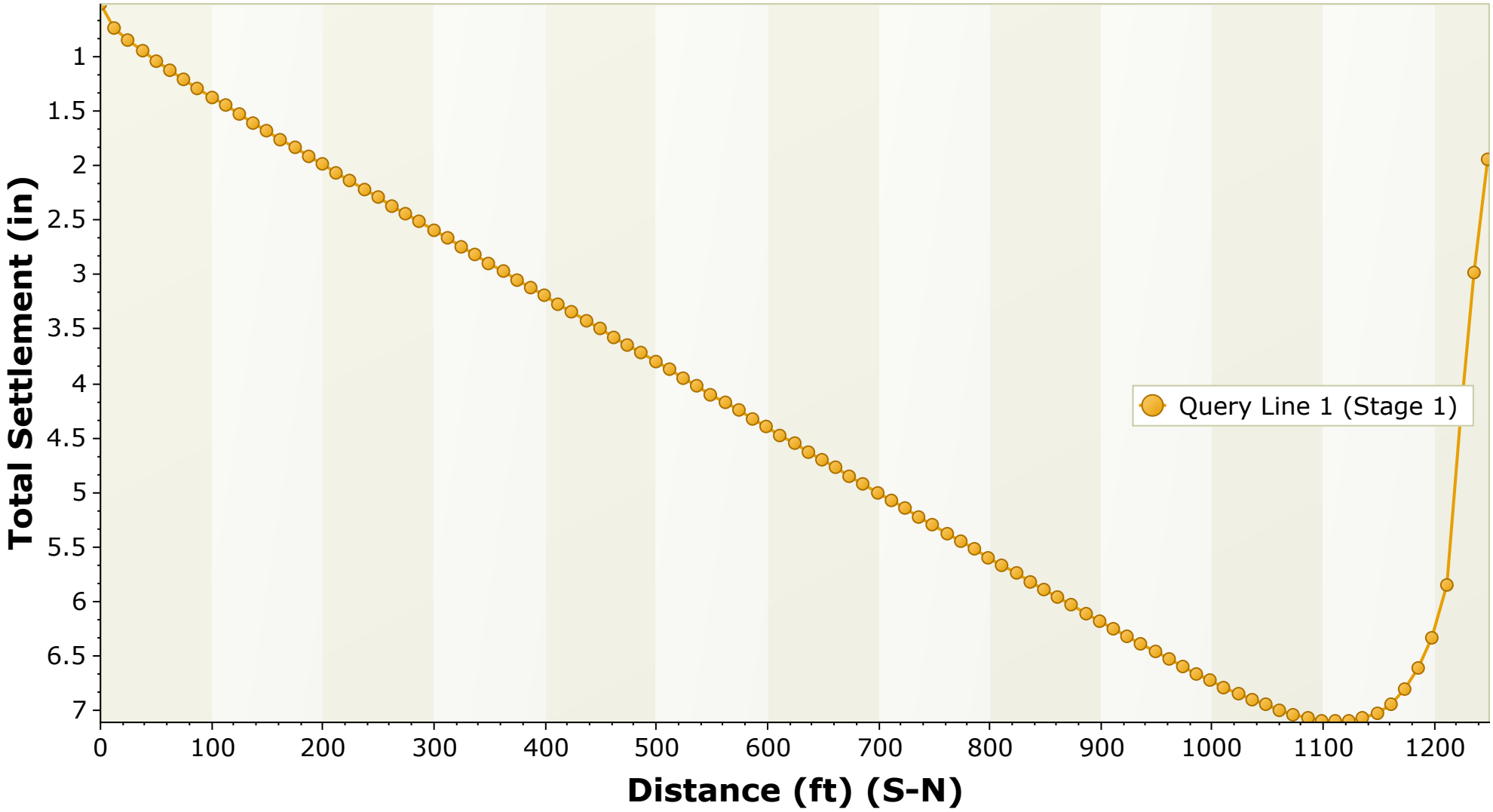


AZTEC TYPSA

SETTLE3 5.017

Project: SR303L - Phase I - MC85-Van Buren St	
Analysis: Settlement of RW-1250-LT	
Author: APL	Company: AZTEC
Date: 10/4/2022	FIle Name: AZFWY1802-SR303L-Yuma_North_RWs-RW-1250-LT-Rev0a.s3z

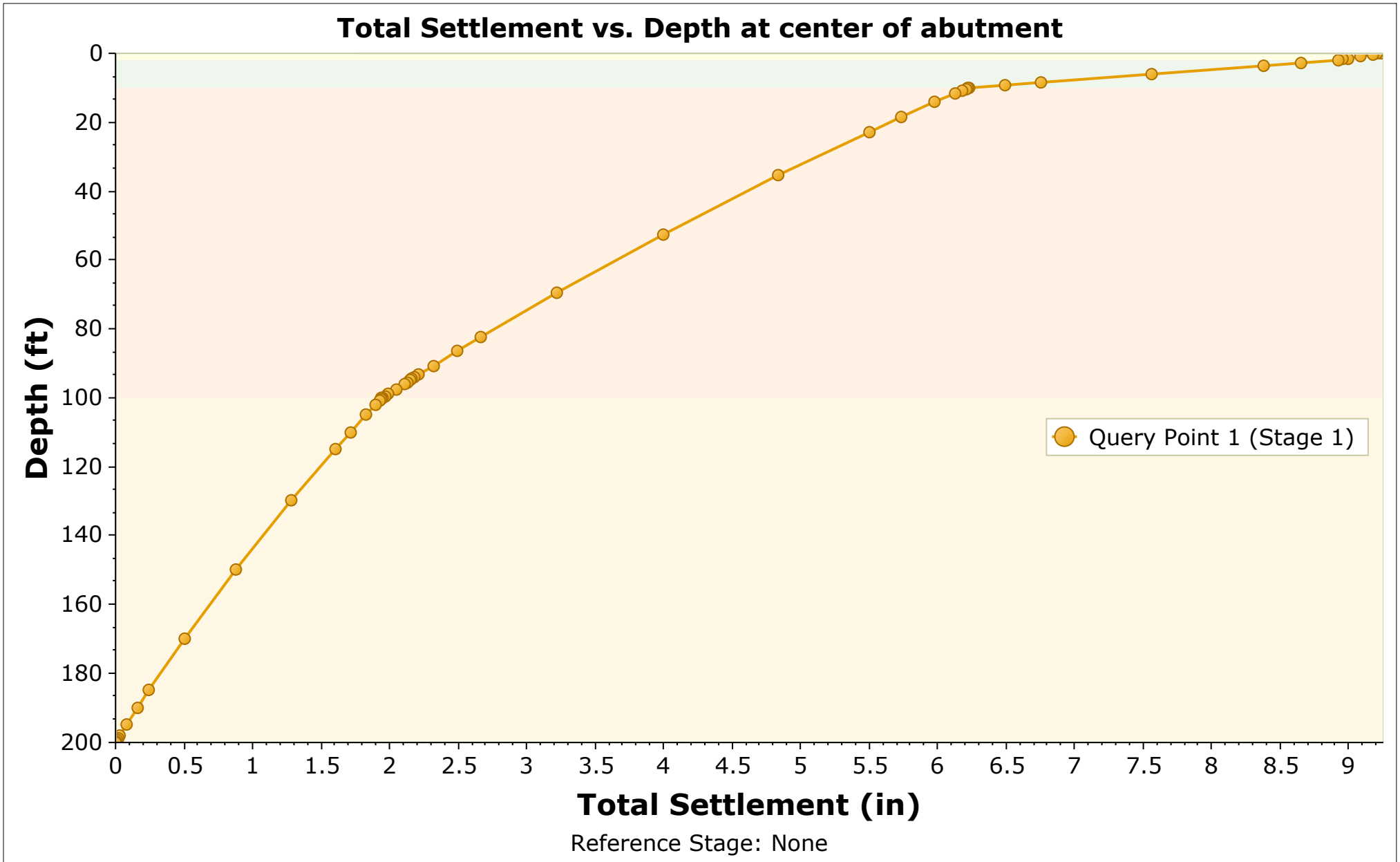
Distance vs. Total Settlement along wall face



Reference Stage: None

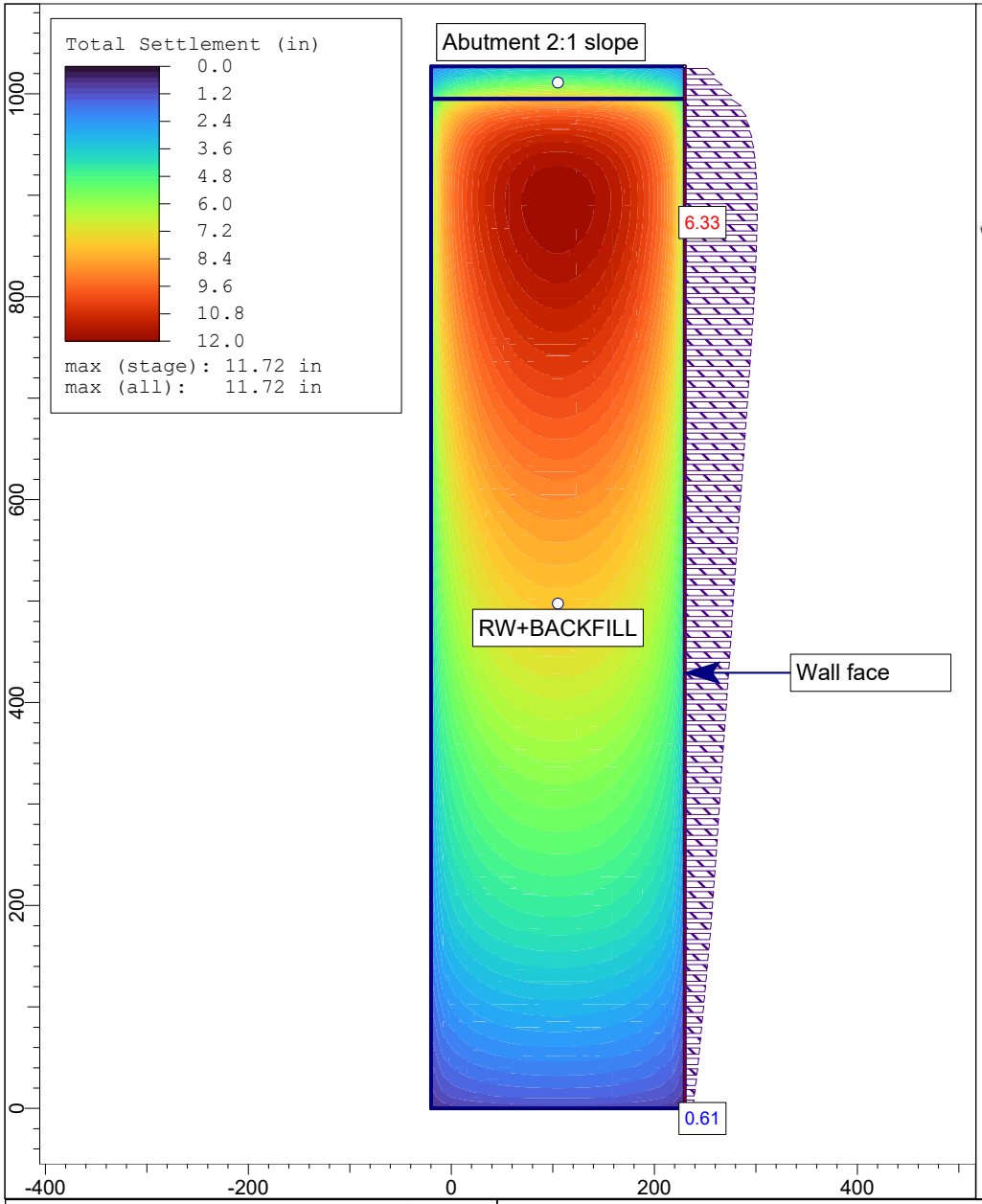
Total Settlement at Depth = 0 ft

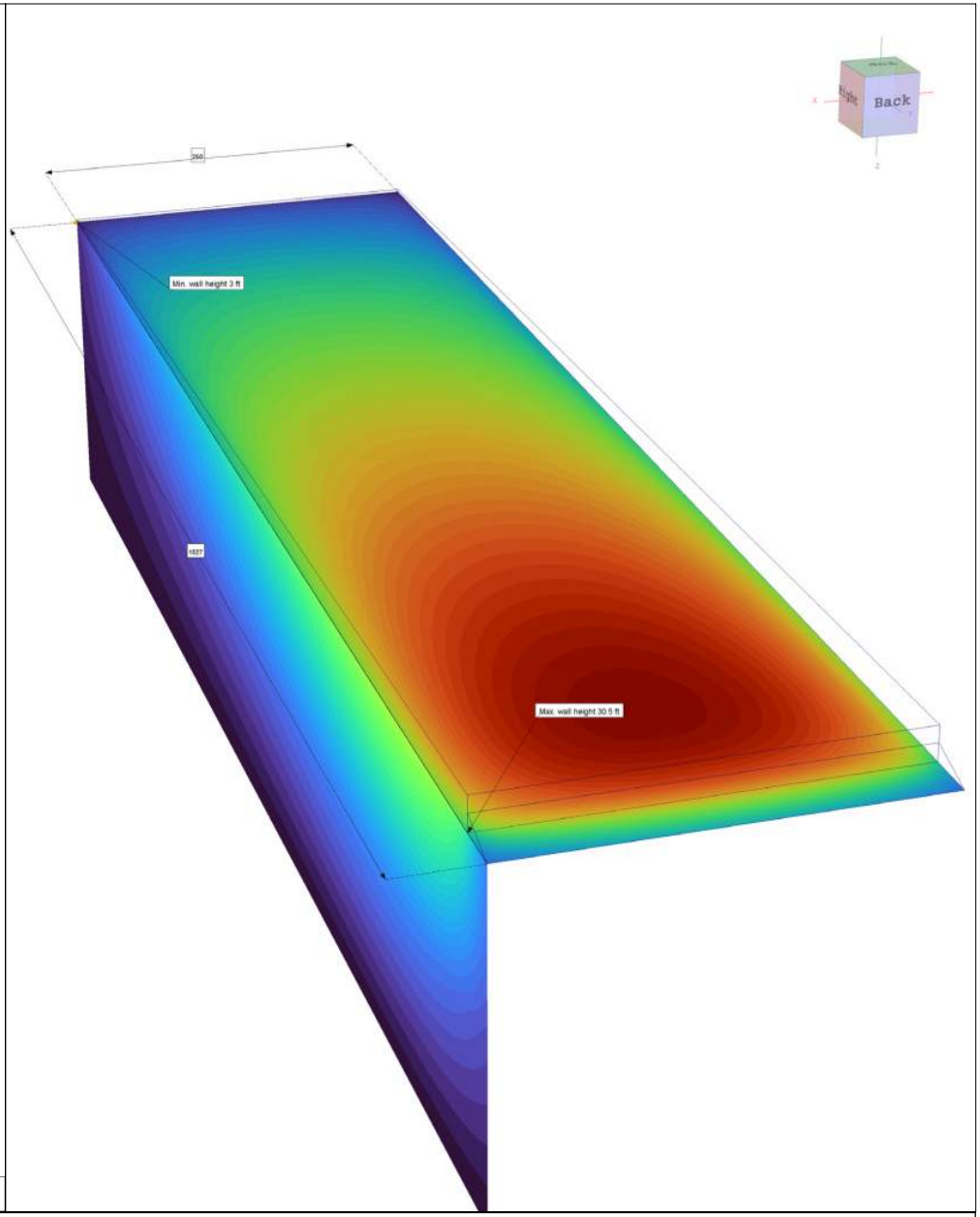
AZTEC TYPSA	Project: SR303L - Phase I - MC85-Van Buren St	
	Analysis: Settlement of RW-1250-LT	
	Author: APL	Company: AZTEC
SETTLE3 5.017	Date: 10/4/2022	FIle Name: AZFWY1802-SR303L-Yuma_North_RWs-RW-1250-LT-Rev0a.s3z



AZTEC TYPSA	Project: SR303L - Phase I - MC85-Van Buren St	
	Analysis: Settlement of RW-1250-LT	
	Author: APL	Company: AZTEC
	Date: 10/4/2022	FIle Name: AZFWY1802-SR303L-Yuma_North_RWs-RW-1250-LT-Rev0a.s3z

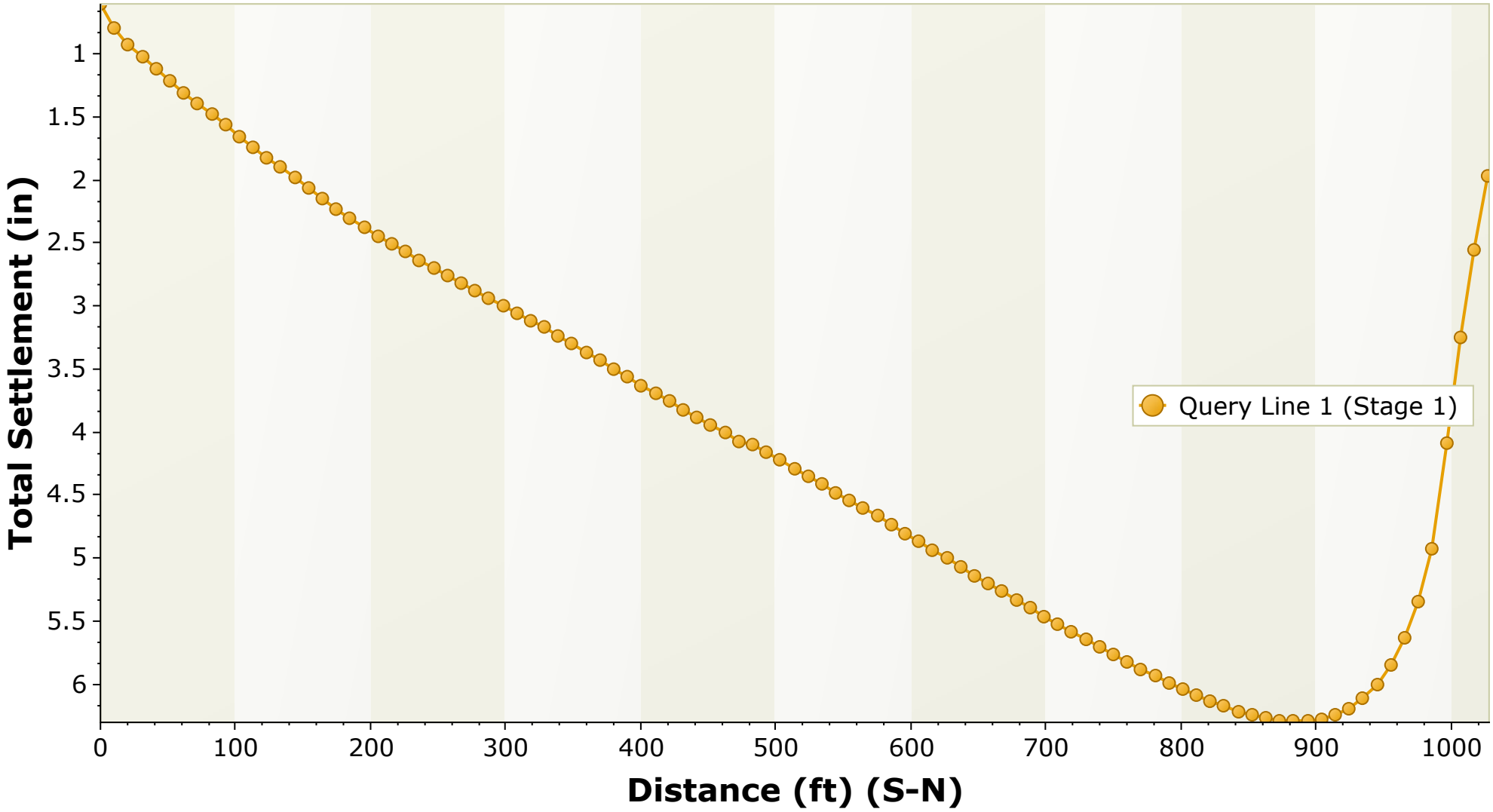
SETTLE3 5.017





AZTEC TYPSA	Project: SR303L - Phase I - MC85-Van Buren St	
	Analysis: Settlement of RW-1250-RT	
	Author: APL	Company: AZTEC
SETTLE3 5.017	Date: 10/4/2022	FIle Name: AZFWY1802-SR303L-Yuma_North_RWs-RW-1250-RT-Rev0a.s3z

Distance vs. Total Settlement along wall face



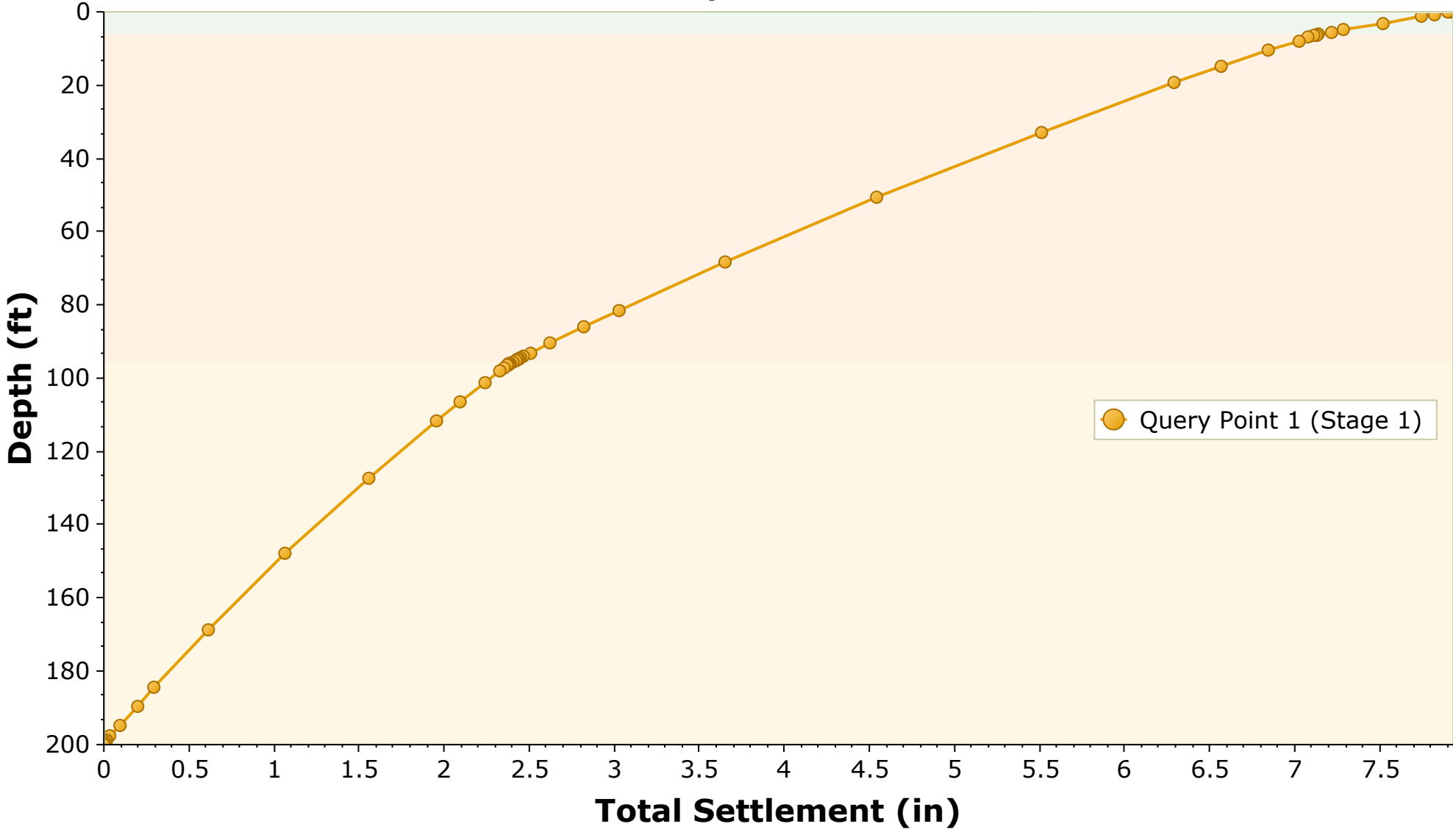
Reference Stage: None

Total Settlement at Depth = 0 ft

AZTEC TYPSA	Project: SR303L - Phase I - MC85-Van Buren St	
	Analysis: Settlement of RW-1250-RT	
	Author: APL	Company: AZTEC
	Date: 10/4/2022	FIle Name: AZFWY1802-SR303L-Yuma_North_RWs-RW-1250-RT-Rev0a.s3z

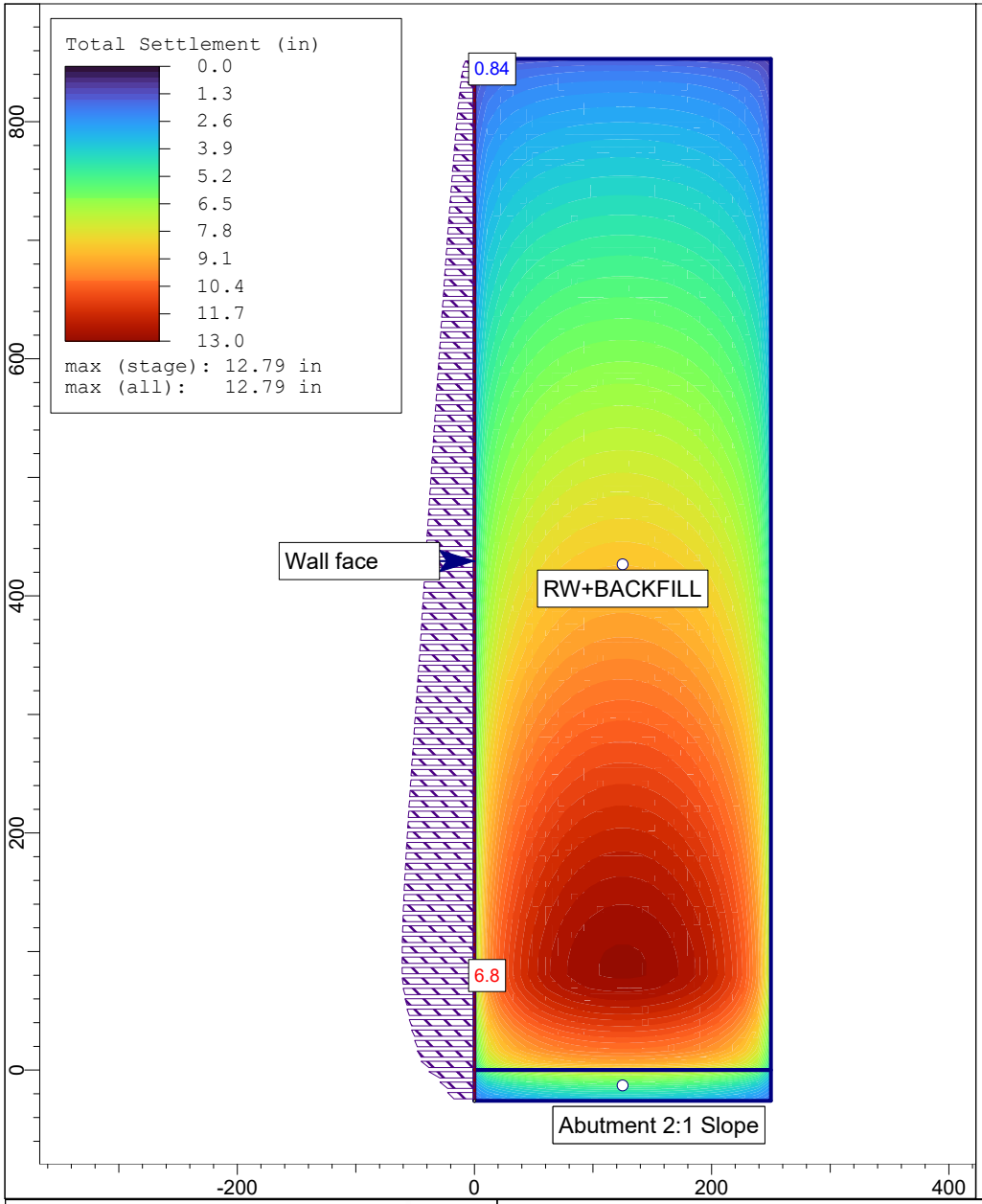
SETTLE3 5.017

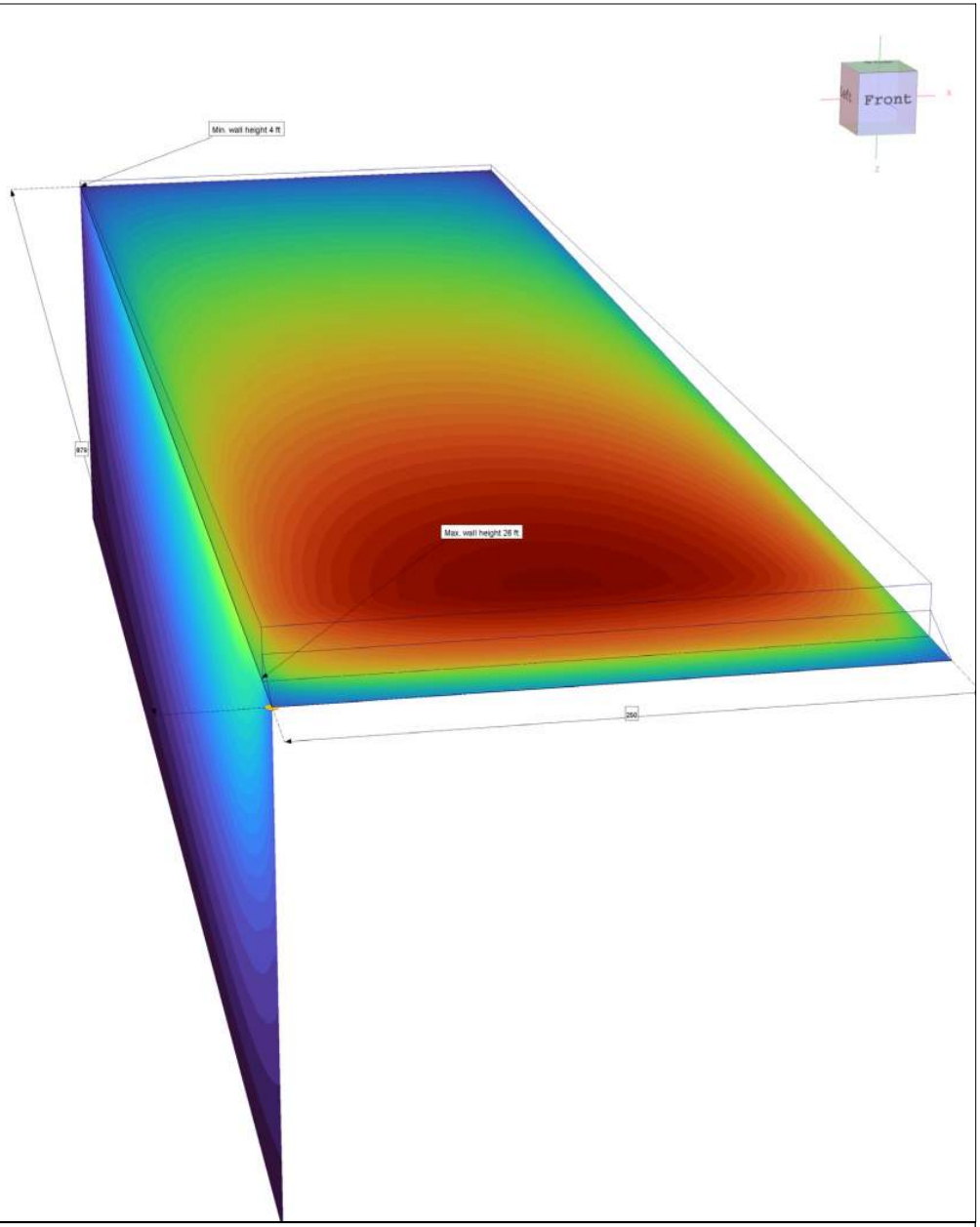
Total Settlement vs. Depth at center of abutment



Reference Stage: None

AZTEC TYPSA	Project: SR303L - Phase I - MC85-Van Buren St	
	Analysis: Settlement of RW-1250-RT	
	Author: APL	Company: AZTEC
SETTLE3 5.017	Date: 10/4/2022	FIle Name: AZFWY1802-SR303L-Yuma_North_RWs-RW-1250-RT-Rev0a.s3z

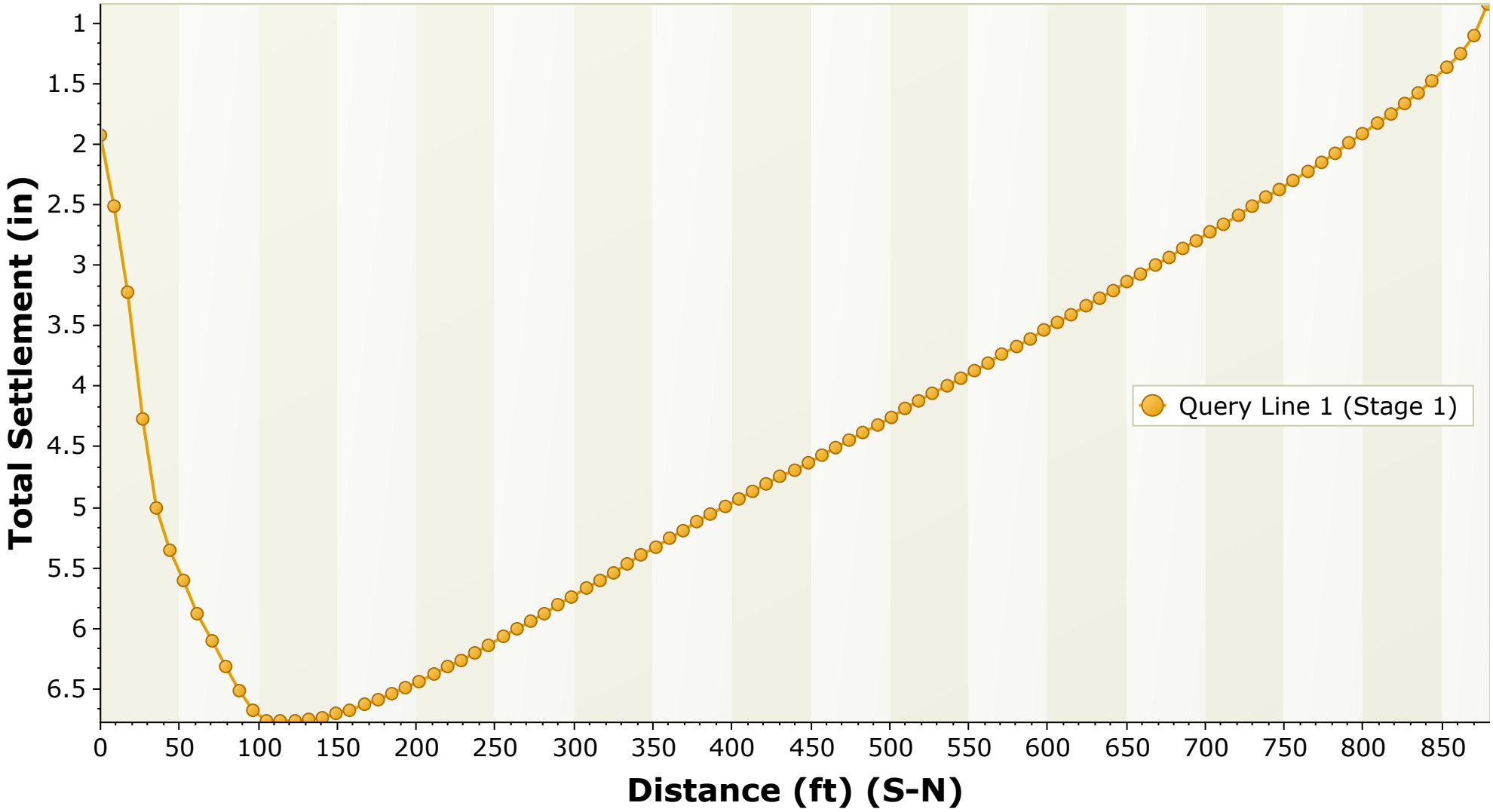




Project: SR303L - Phase I - MC85-Van Buren St	
Analysis: Settlement of RW-1254-LT	
Author: APL	Company: AZTEC
Date: 10/4/2022	FIle Name: AZFWY1802-SR303L-Yuma_North_RWs-RW-1254-LT-Rev0a.s3z

SETTLE3 5.017

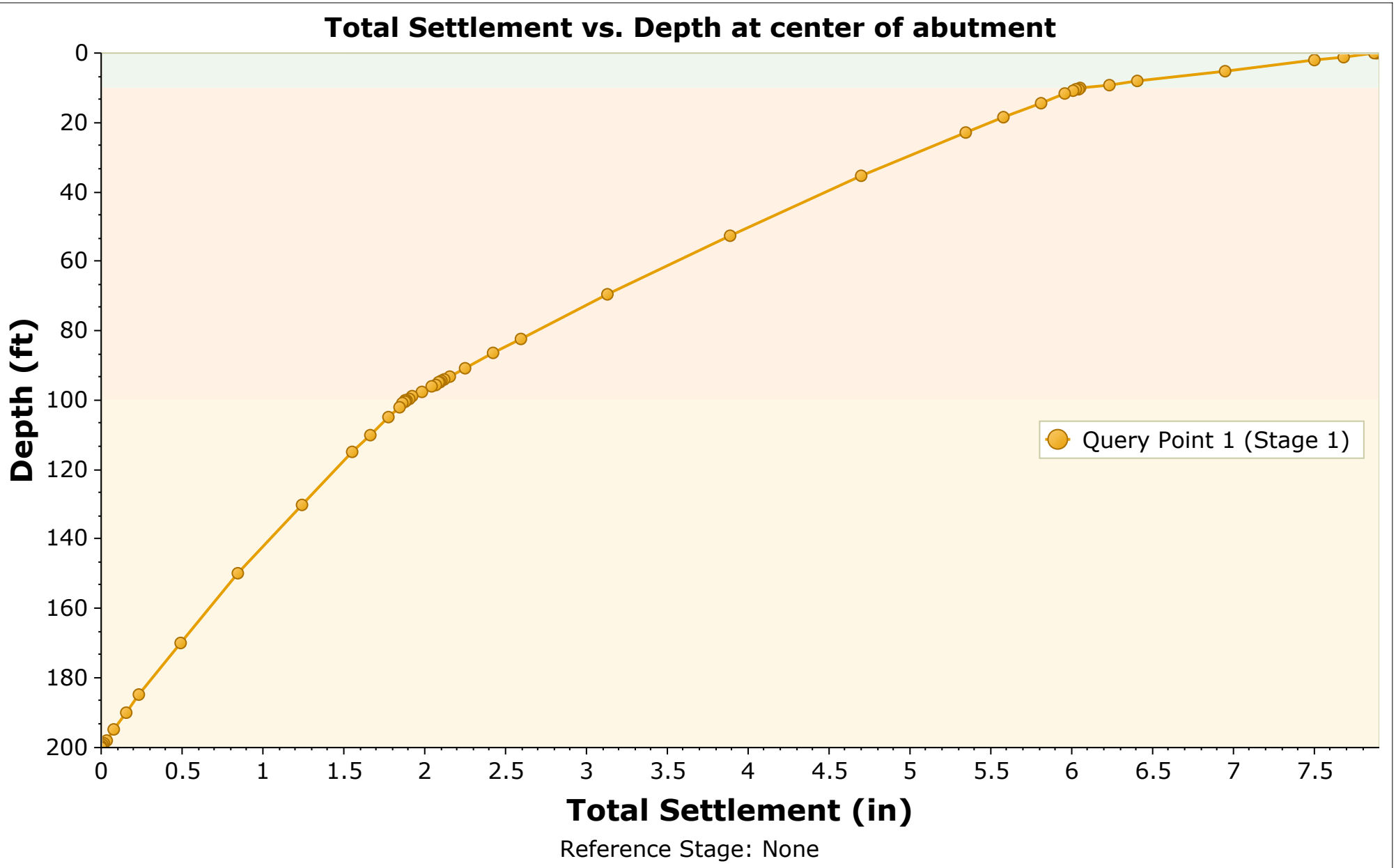
Distance vs. Total Settlement along wall face



Reference Stage: None

Total Settlement at Depth = 0 ft

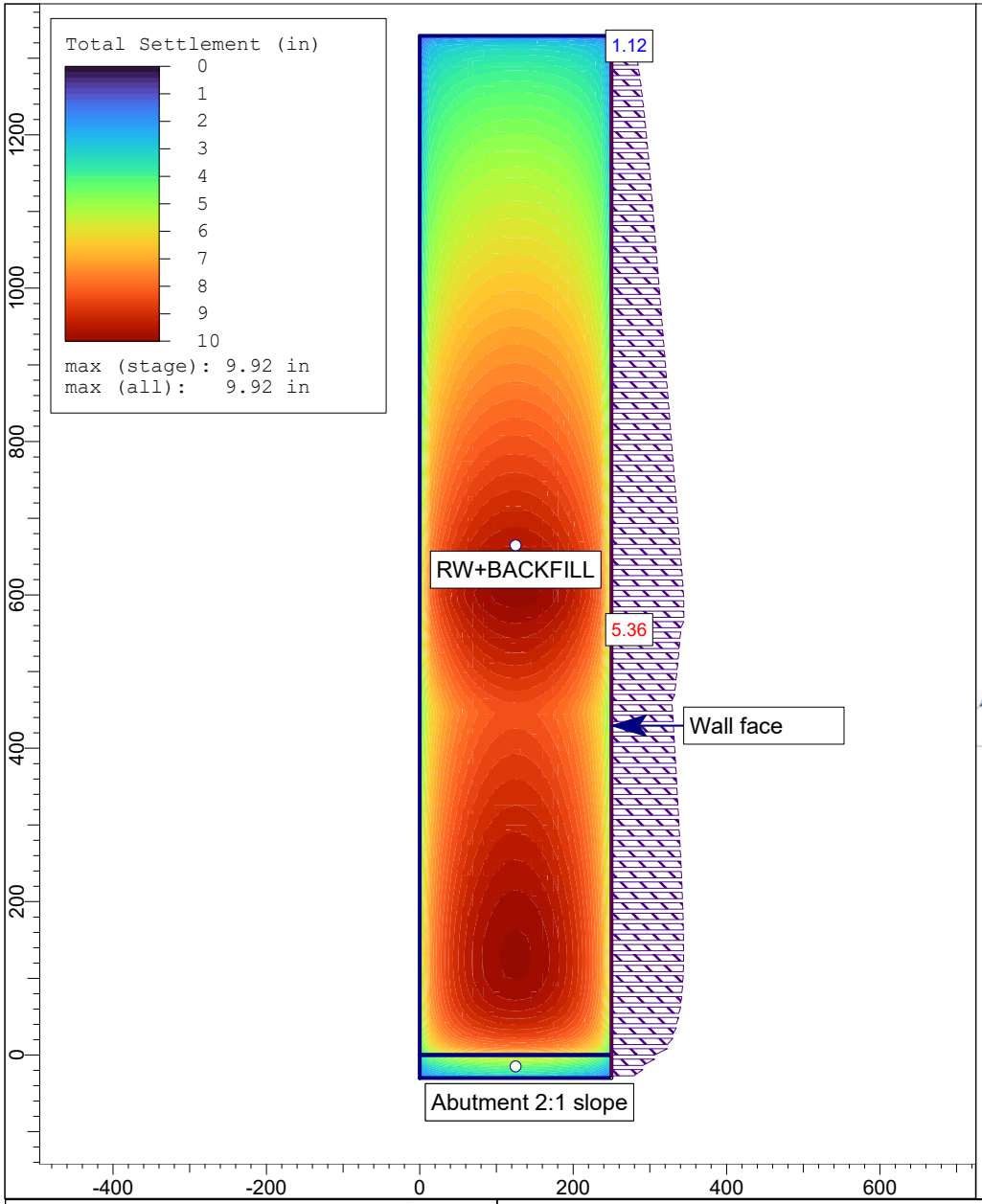
AZTEC TYPSA	Project: SR303L - Phase I - MC85-Van Buren St	
	Analysis: Settlement of RW-1254-LT	
	Author: APL	Company: AZTEC
SETTLE3 5.017	Date: 10/4/2022	FIle Name: AZFWY1802-SR303L-Yuma_North_RWs-RW-1254-LT-Rev0a.s3z

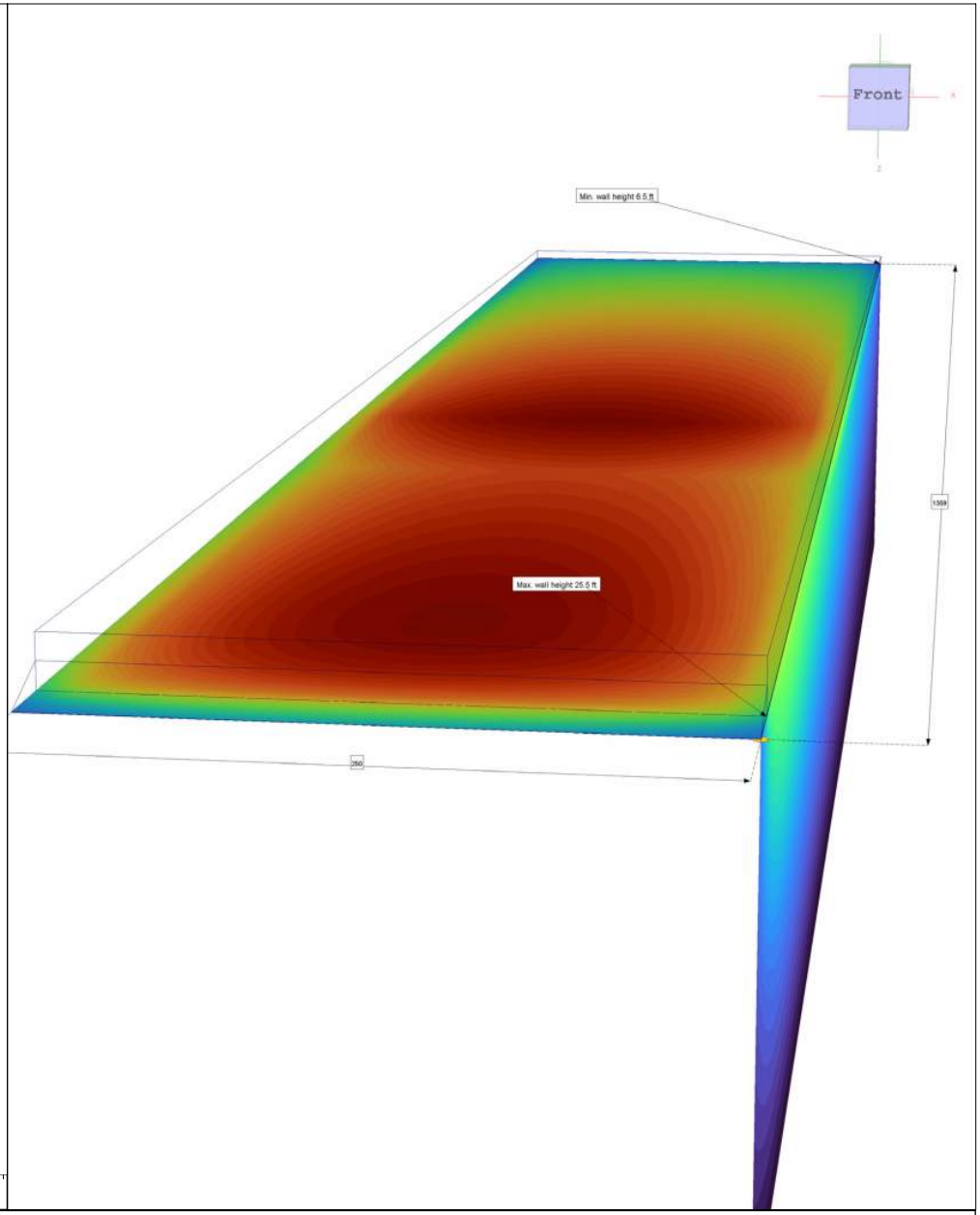


Reference Stage: None

AZTEC TYPSA	Project: SR303L - Phase I - MC85-Van Buren St	
	Analysis: Settlement of RW-1254-LT	
	Author: APL	Company: AZTEC
	Date: 10/4/2022	FIle Name: AZFWY1802-SR303L-Yuma_North_RWs-RW-1254-LT-Rev0a.s3z

SETTLE3 5.017



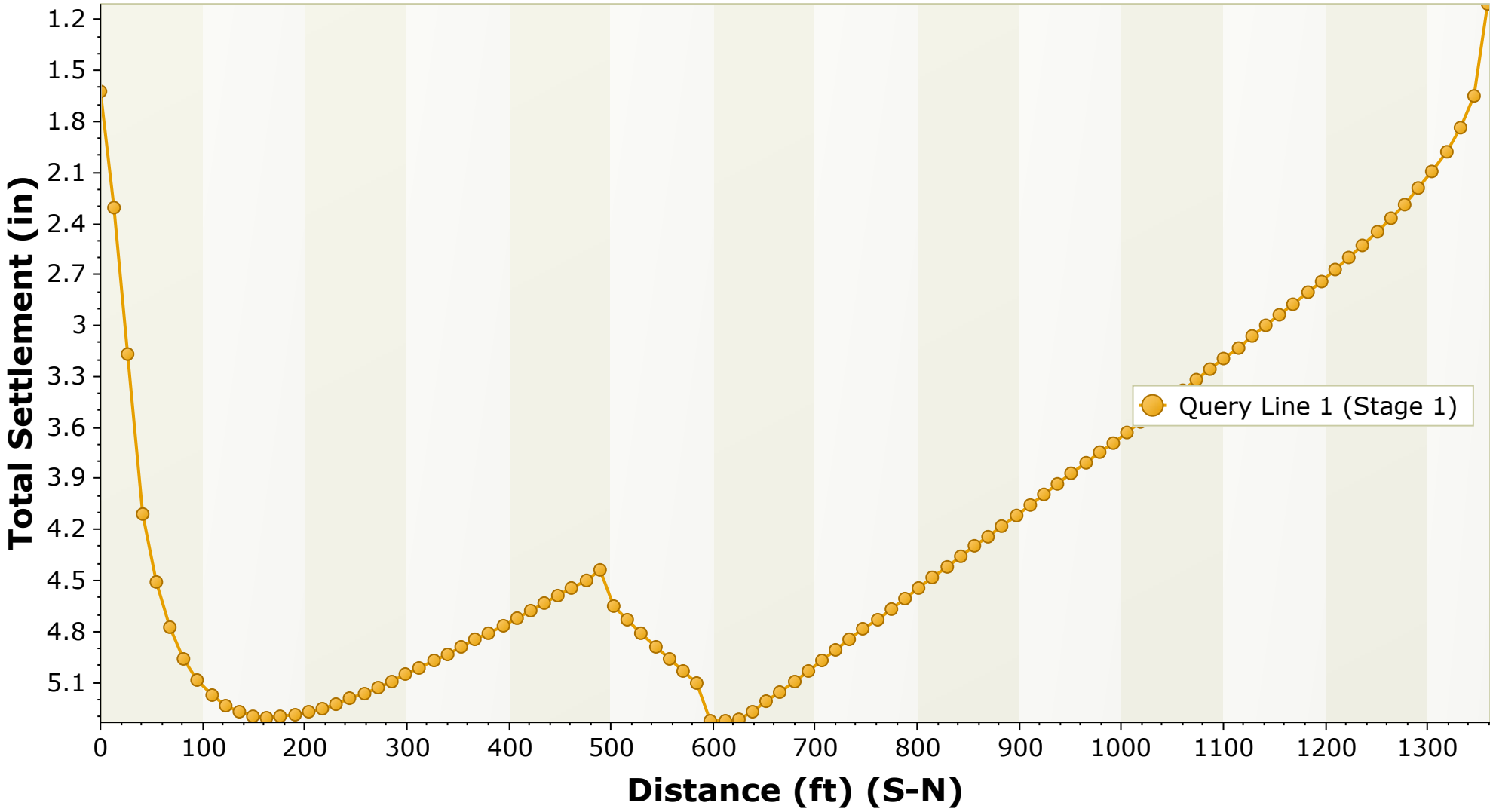


AZTEC TYPSA

SETTLE3 5.017

Project: SR303L - Phase I - MC85-Van Buren St	
Analysis: Settlement of RW-1254-RT	
Author: APL	Company: AZTEC
Date: 10/4/2022	FIle Name: AZFWY1802-SR303L-Yuma_North_RWs-RW-1254-RT-Rev0a.s3z

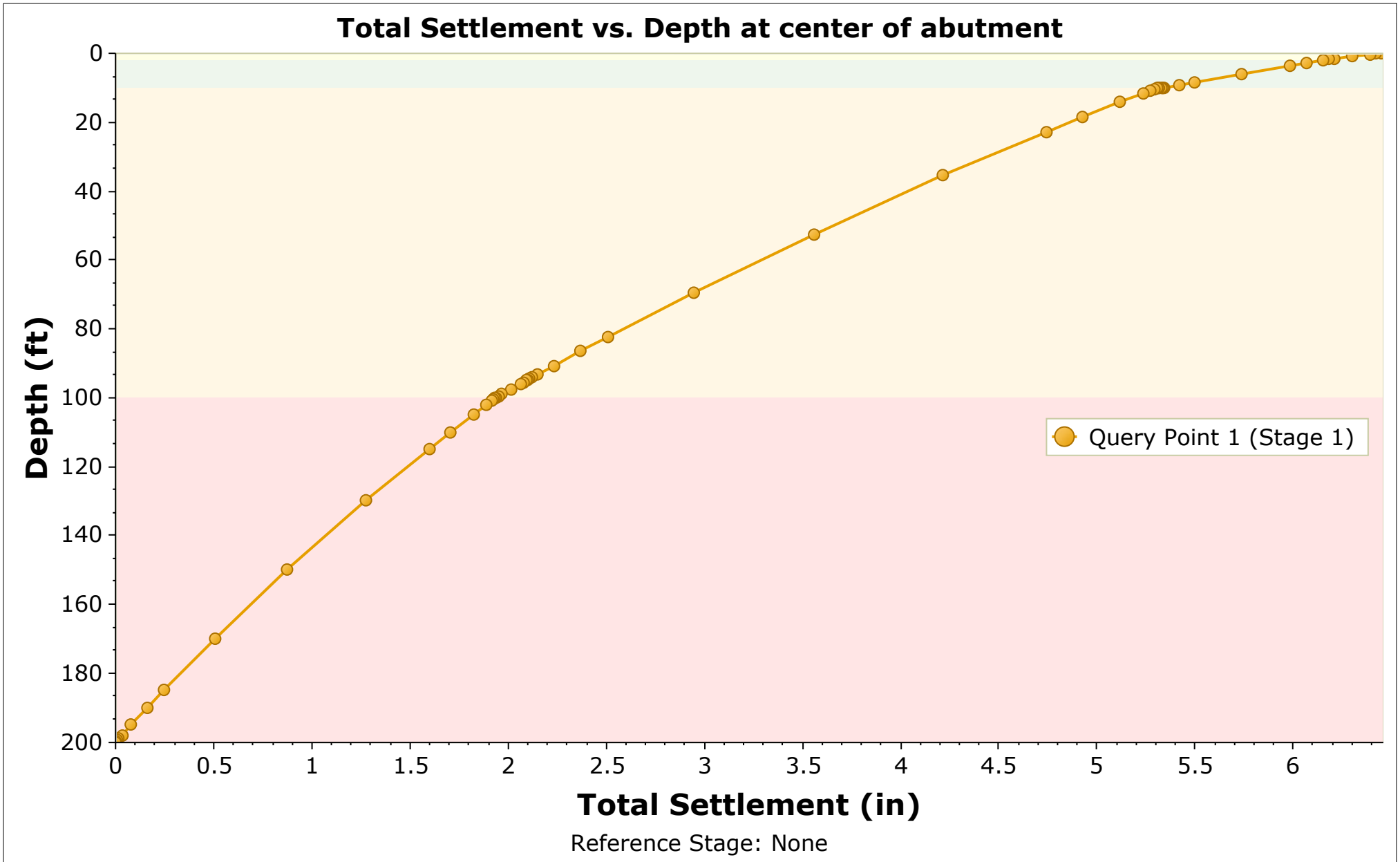
Distance vs. Total Settlement along wall face



Reference Stage: None

Total Settlement at Depth = 0 ft

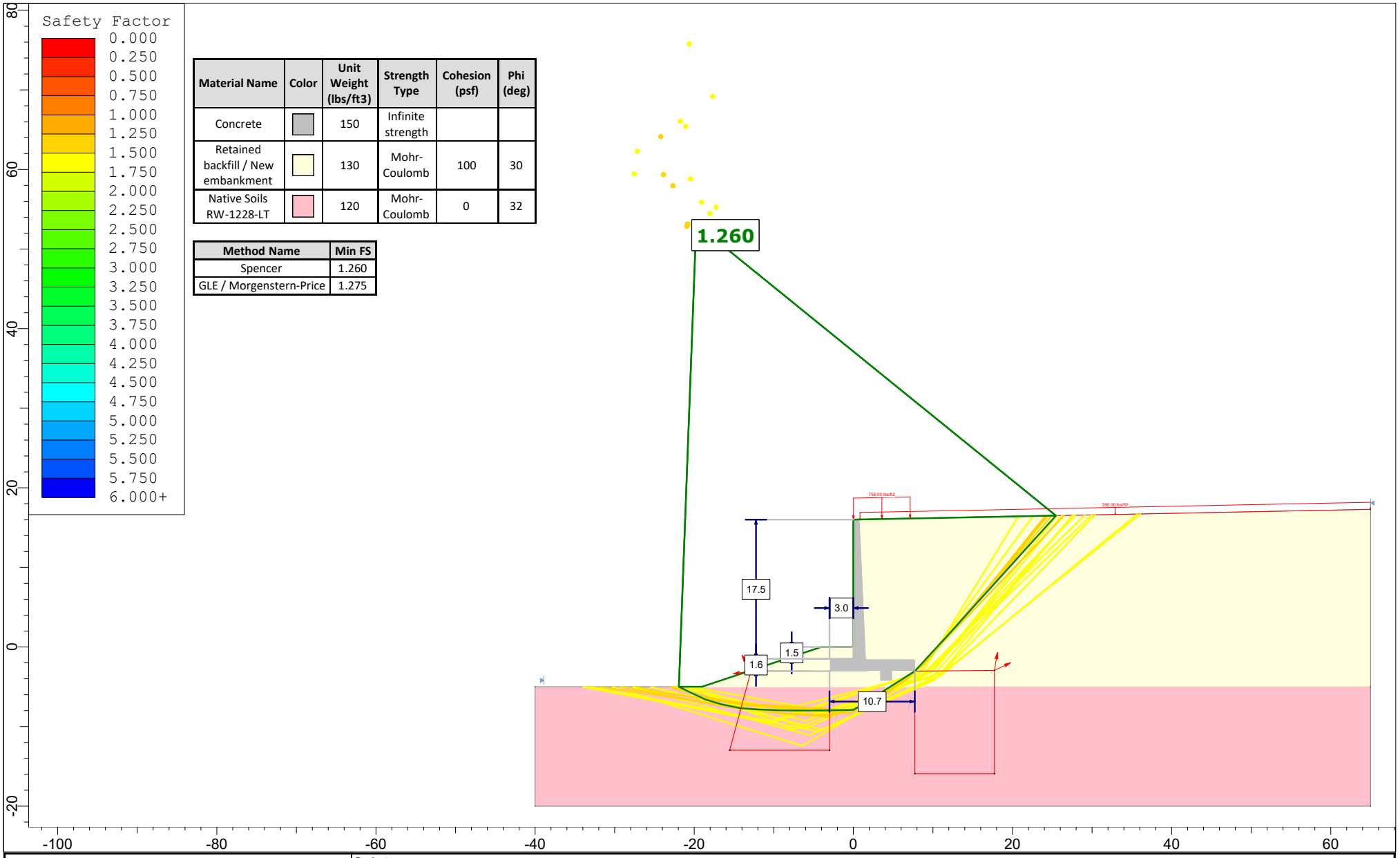
AZTEC TYPSA	Project: SR303L - Phase I - MC85-Van Buren St	
	Analysis: Settlement of RW-1254-RT	
	Author: APL	Company: AZTEC
SETTLE3 5.017	Date: 10/4/2022	FIle Name: AZFWY1802-SR303L-Yuma_North_RWs-RW-1254-RT-Rev0a.s3z



AZTEC TYPSA	Project: SR303L - Phase I - MC85-Van Buren St	
	Analysis: Settlement of RW-1254-RT	
	Author: APL	Company: AZTEC
SETTLE3 5.017	Date: 10/4/2022	FIle Name: AZFWY1802-SR303L-Yuma_North_RWs-RW-1254-RT-Rev0a.s3z

AZTEC Engineering Group, Inc.
501 N 44th Street. Suite 300
Phoenix, AZ 85008
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ATTACHMENT 3 – OUTPUTS FROM SLIDE



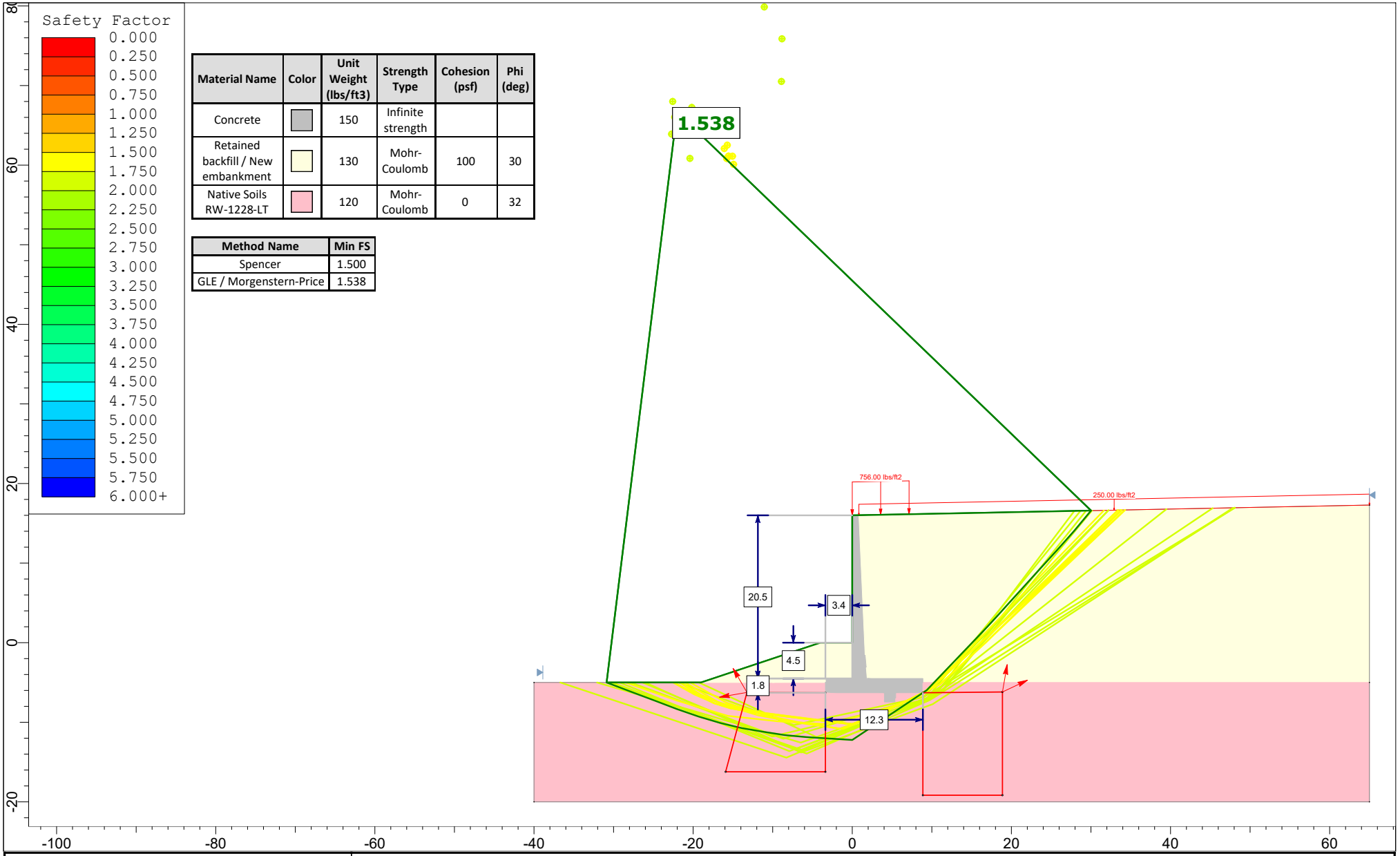
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Concrete		150	Infinite strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW-1228-LT		120	Mohr-Coulomb	0	32

Method Name	Min FS
Spencer	1.260
GLE / Morgenstern-Price	1.275

AZTEC TYPSA

SLIDEINTERPRET 9.024

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-1228-LT STA 1227+00 - CIP	*Scenario*	Scenario 1 - Top cover 1.5 feet
Prepared By	APL	*Company*	AZTEC
Date	10/21/2022	*File Name*	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev0c_CIP.slmd



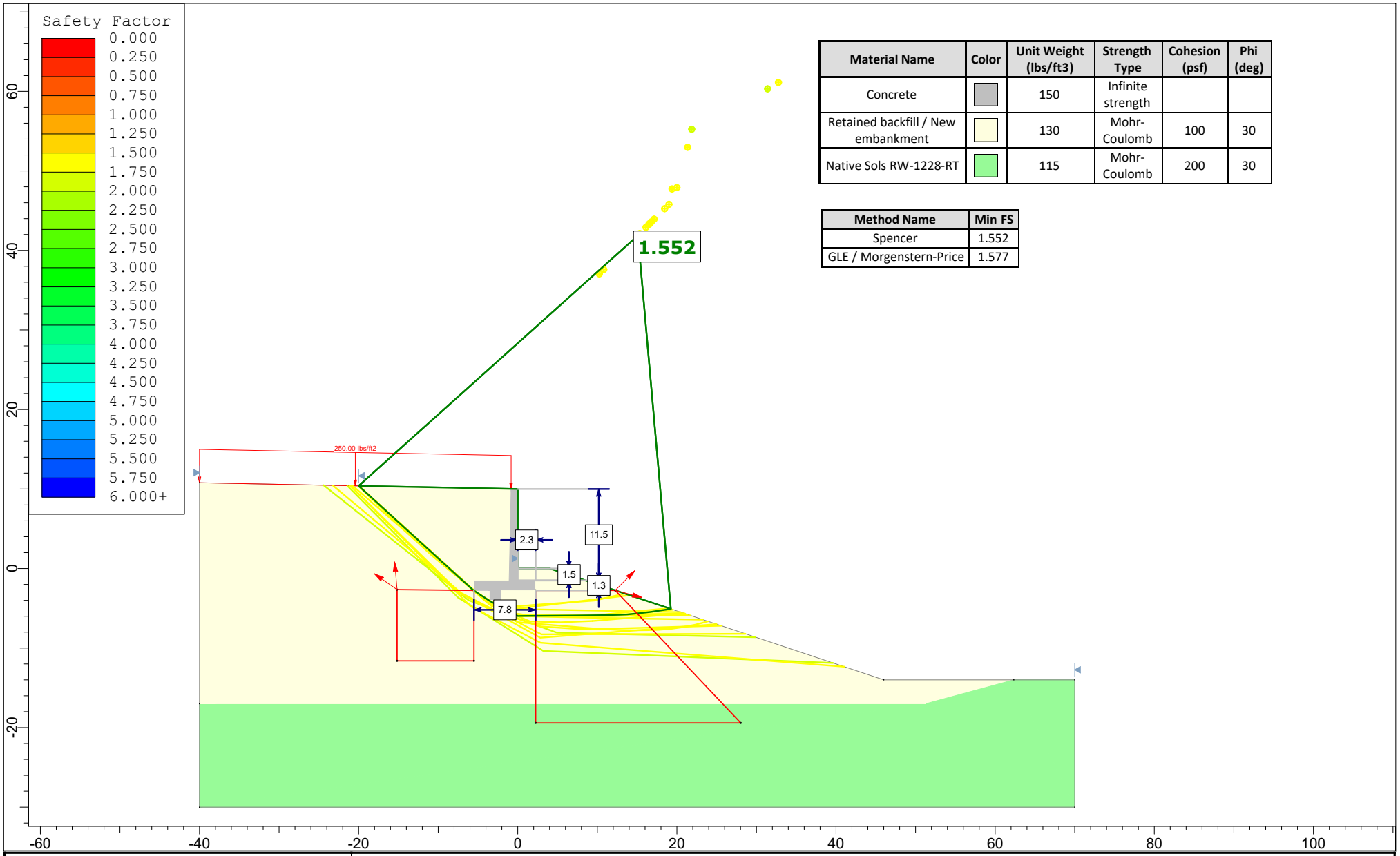
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Concrete		150	Infinite strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW-1228-LT		120	Mohr-Coulomb	0	32

Method Name	Min FS
Spencer	1.500
GLE / Morgenstern-Price	1.538

AZTEC TYPSA

SLIDEINTERPRET 9.024

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-1228-LT STA 1227+00 - CIP	*Scenario*	Scenario 3 - Top cover 4.5 feet
Prepared By	APL	*Company*	AZTEC
Date	10/21/2022	*File Name*	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev0c_CIP.slmd



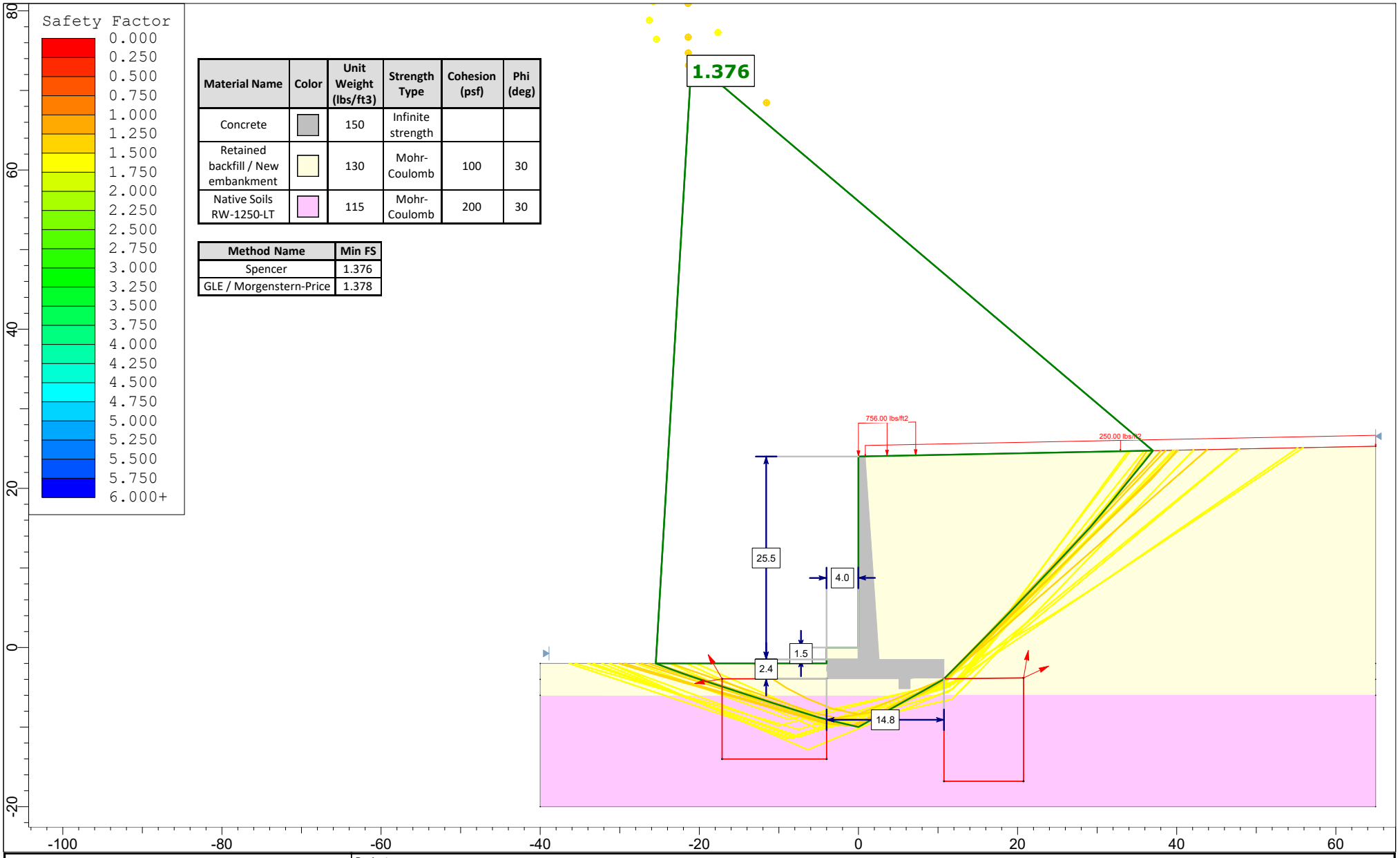
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Concrete		150	Infinite strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Sols RW-1228-RT		115	Mohr-Coulomb	200	30

Method Name	Min FS
Spencer	1.552
GLE / Morgenstern-Price	1.577

AZTEC TYPSA

SLIDEINTERPRET 9.024

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-1228-RT STA 1227+00 - CIP	*Scenario*	Scenario 1 - Top cover 1.5 feet
Prepared By	APL	*Company*	AZTEC
Date	10/21/2022	*File Name*	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev0c_CIP.slmd



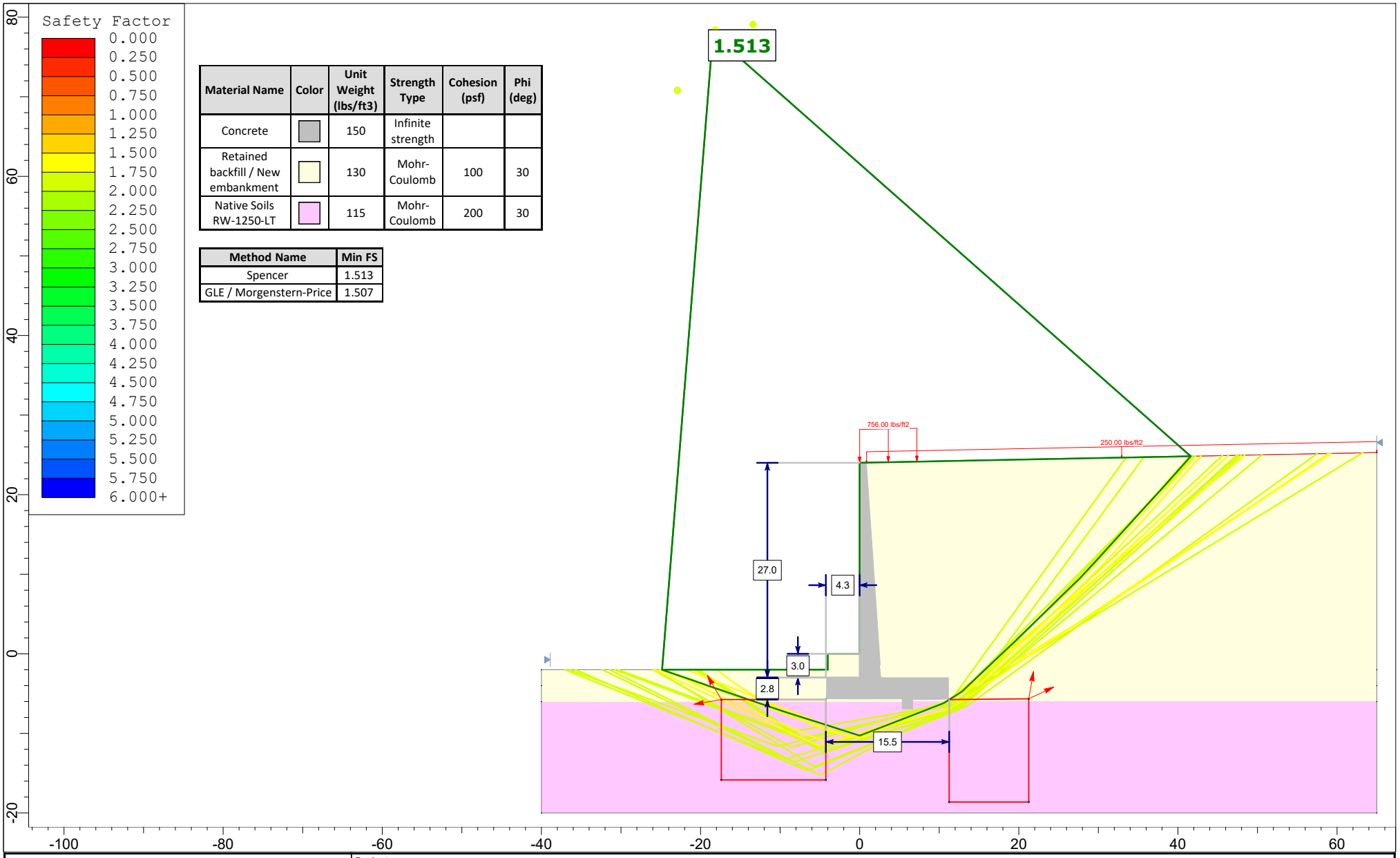
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Concrete		150	Infinite strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW-1250-LT		115	Mohr-Coulomb	200	30

Method Name	Min FS
Spencer	1.376
GLE / Morgenstern-Price	1.378

AZTEC TYPSA

SLIDEINTERPRET 9.024

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-1250-LT STA 1251+00 - CIP	*Scenario*	Scenario 1 - Top cover 1.5 feet
Prepared By	APL	*Company*	AZTEC
Date	10/21/2022	*File Name*	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev0c_CIP.slmd



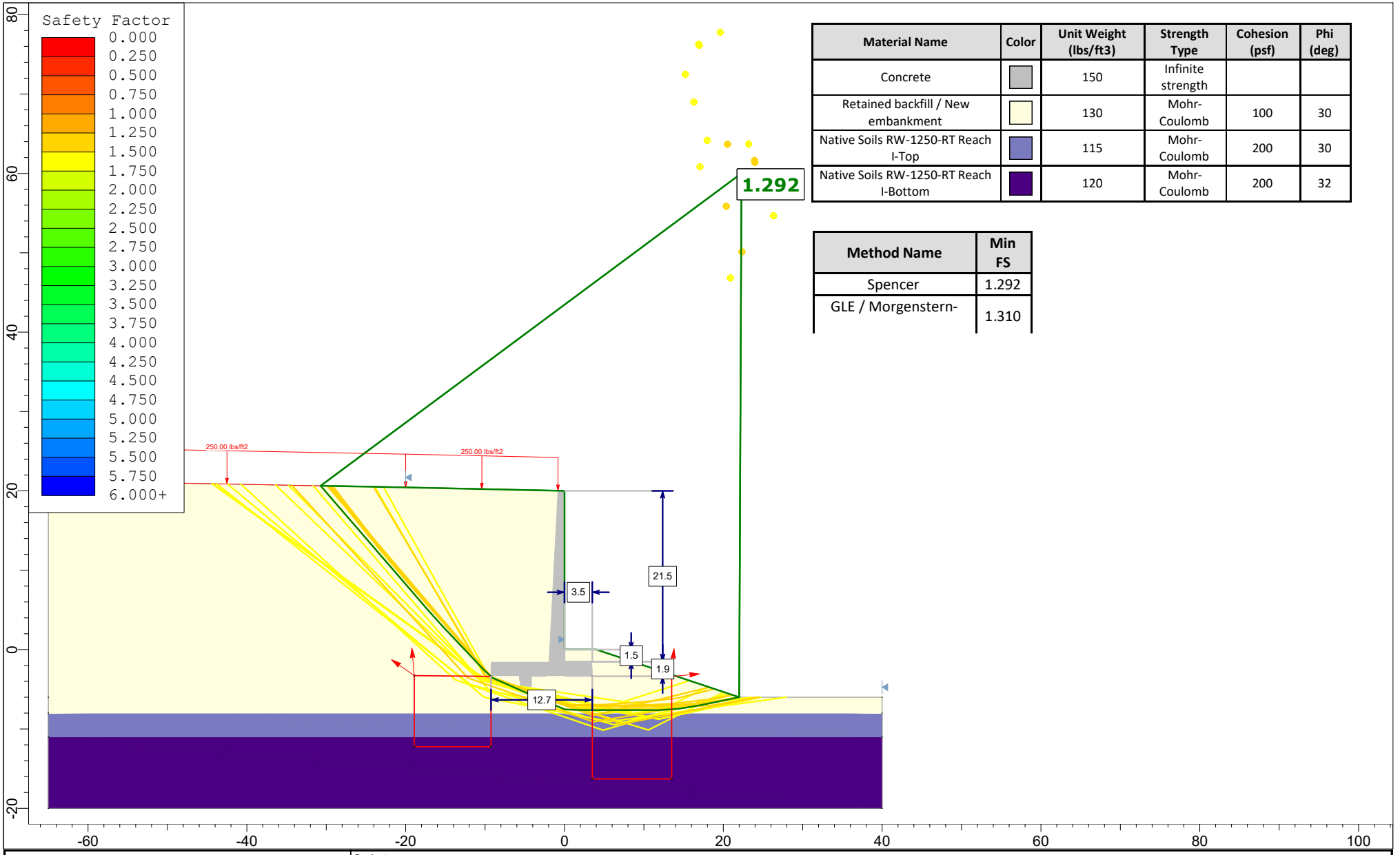
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Concrete		150	Infinite strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW-1250-LT		115	Mohr-Coulomb	200	30

Method Name	Min FS
Spencer	1.513
GLE / Morgenstern-Price	1.507

AZTEC TYPSA

SLIDEINTERPRET 9.024

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-1250-LT STA 1251+00 - CIP	*Scenario*	Scenario 2 - Top cover 3.0 feet
Prepared By	APL	*Company*	AZTEC
Date	10/21/2022	*File Name*	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev0c_CIP.slmd



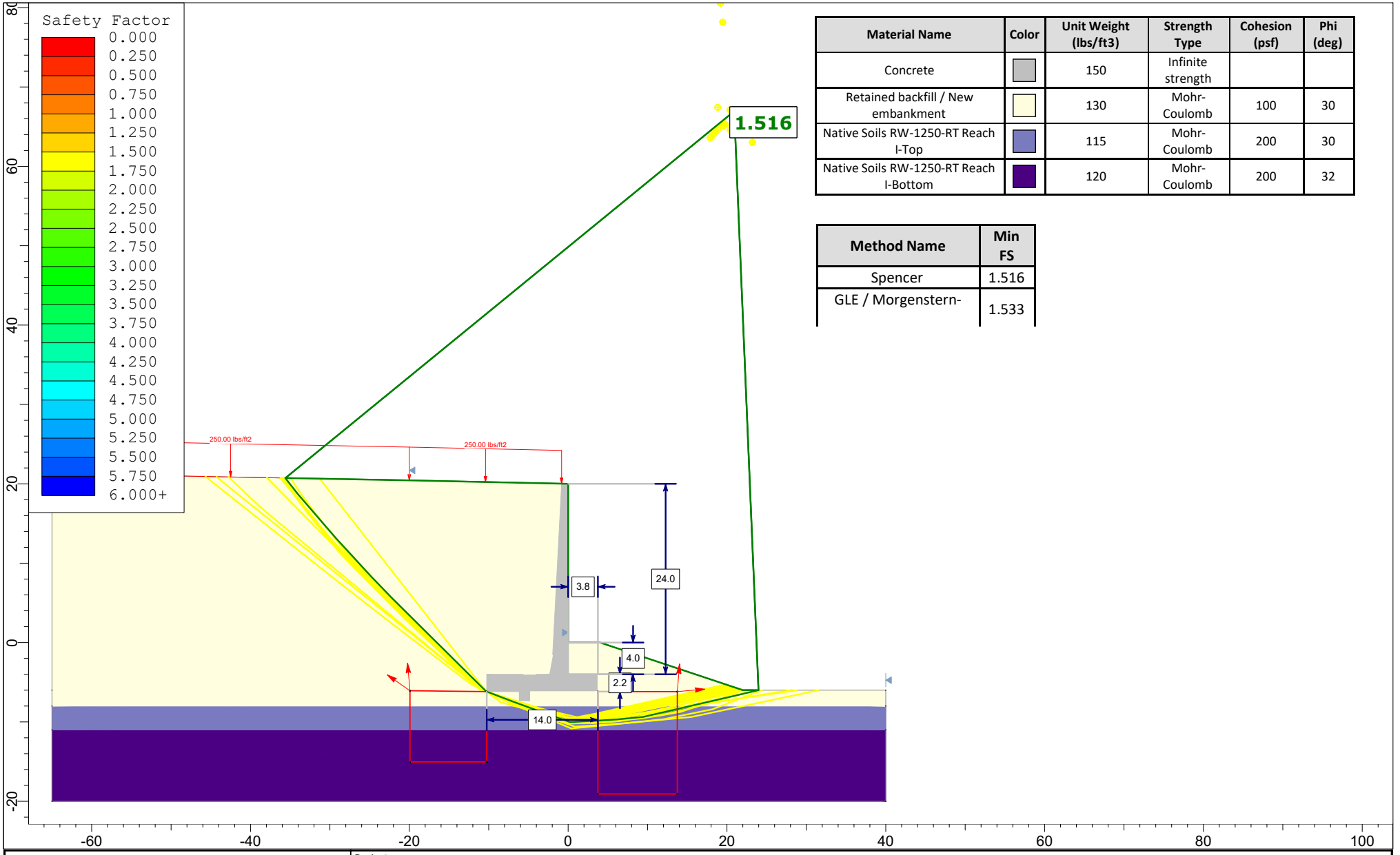
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Concrete		150	Infinite strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW-1250-RT Reach I-Top		115	Mohr-Coulomb	200	30
Native Soils RW-1250-RT Reach I-Bottom		120	Mohr-Coulomb	200	32

Method Name	Min FS
Spencer	1.292
GLE / Morgenstern-	1.310

AZTEC TYPSA

SLIDEINTERPRET 9.024

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-1250-RT STA 1247+00 - CIP	*Scenario*	Scenario 1 - Top cover 1.5 feet
Prepared By	APL	*Company*	AZTEC
Date	10/21/2022	*File Name*	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev0c_CIP.slmd



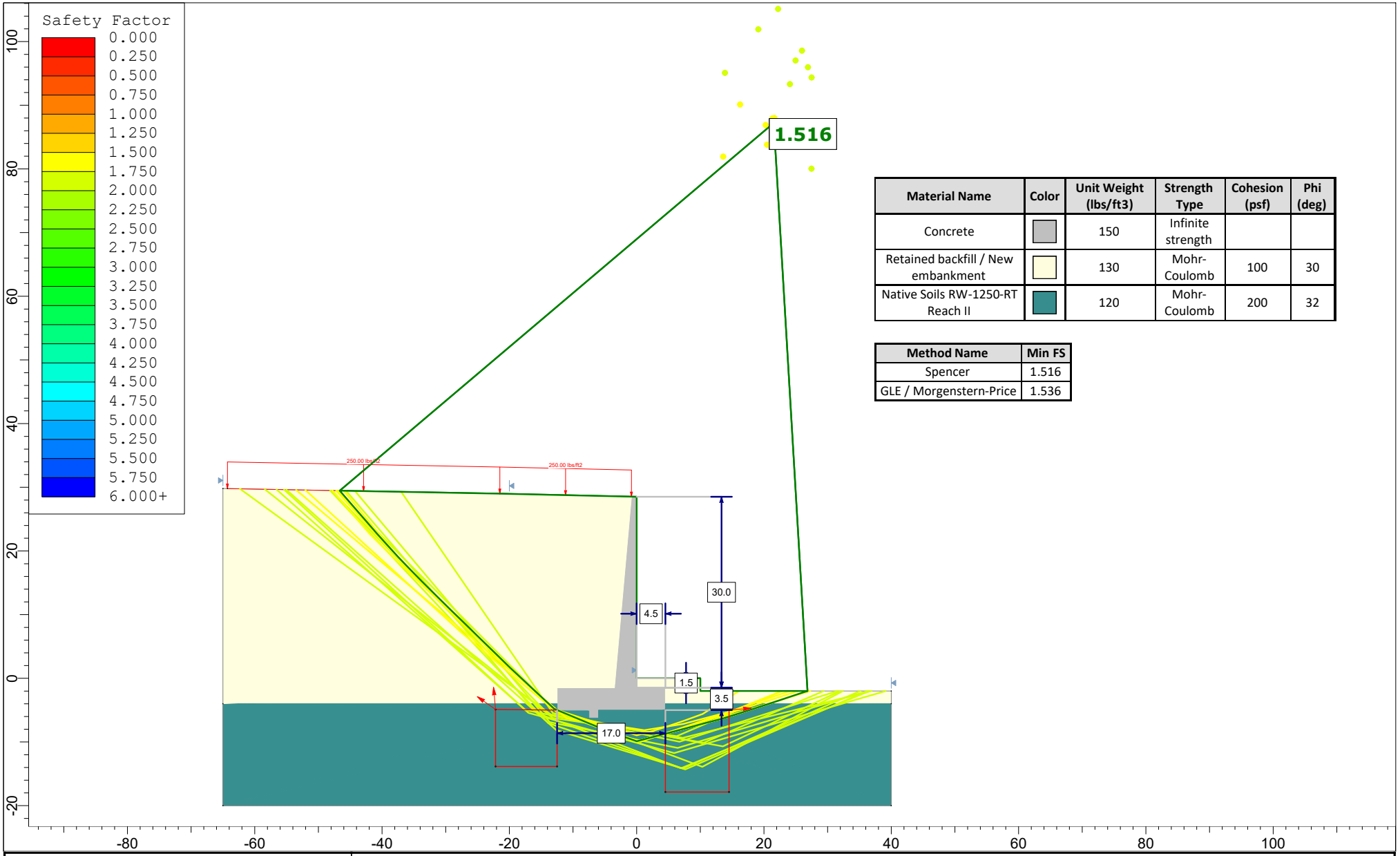
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Concrete		150	Infinite strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW-1250-RT Reach I-Top		115	Mohr-Coulomb	200	30
Native Soils RW-1250-RT Reach I-Bottom		120	Mohr-Coulomb	200	32

Method Name	Min FS
Spencer	1.516
GLE / Morgenstern-	1.533

AZTEC TYPSA

SLIDEINTERPRET 9.024

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-1250-RT STA 1247+00 - CIP	*Scenario*	Scenario 3 - Top cover 4.0 feet
Prepared By	APL	*Company*	AZTEC
Date	10/21/2022	*File Name*	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev0c_CIP.slmd



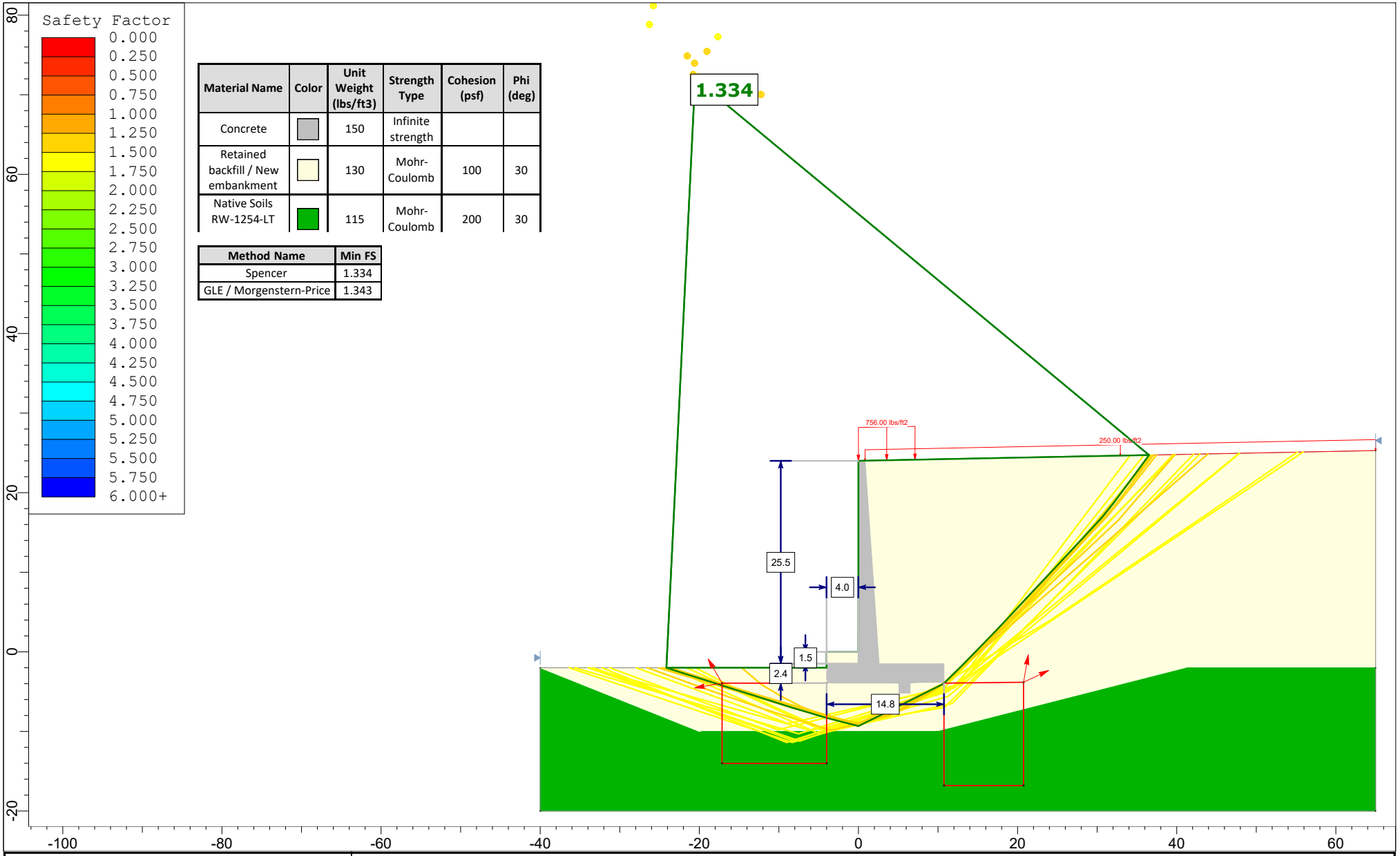
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Concrete		150	Infinite strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW-1250-RT Reach II		120	Mohr-Coulomb	200	32

Method Name	Min FS
Spencer	1.516
GLE / Morgenstern-Price	1.536

AZTEC TYPSA

SLIDEINTERPRET 9.024

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-1250-RT STA 1251+00 - CIP	*Scenario*	Scenario 1 - Top cover 1.5 feet
Prepared By	APL	*Company*	AZTEC
Date	10/21/2022	*File Name*	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev0c_CIP.slmd



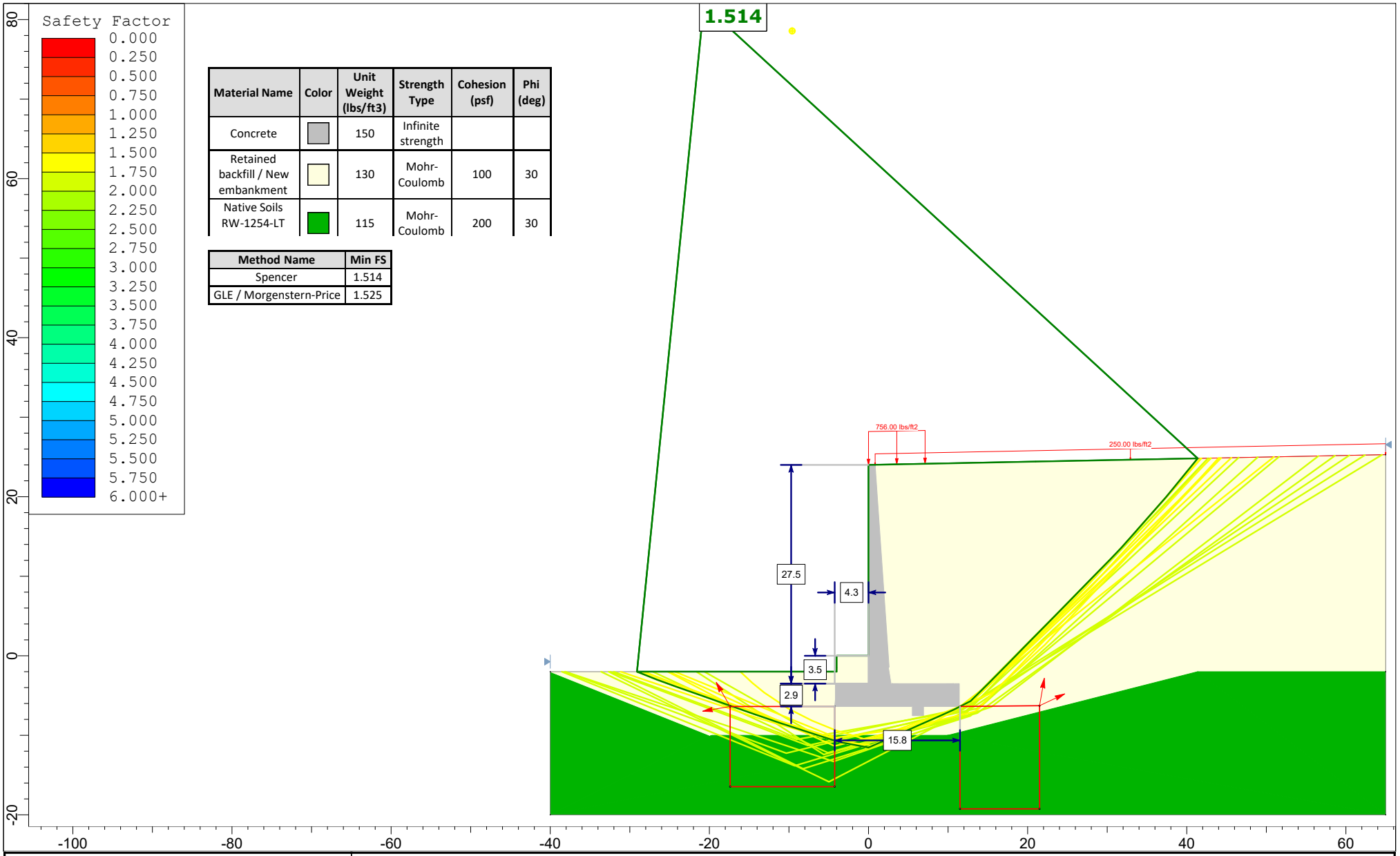
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Concrete		150	Infinite strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW-1254-LT		115	Mohr-Coulomb	200	30

Method Name	Min FS
Spencer	1.334
GLE / Morgenstern-Price	1.343

AZTEC TYPSA

SLIDEINTERPRET 9.024

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-1254-LT STA 1253+00 - CIP	*Scenario*	Scenario 1 - Top cover 1.5 feet
Prepared By	APL	*Company*	AZTEC
Date	10/21/2022	*File Name*	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev0c_CIP.slmd



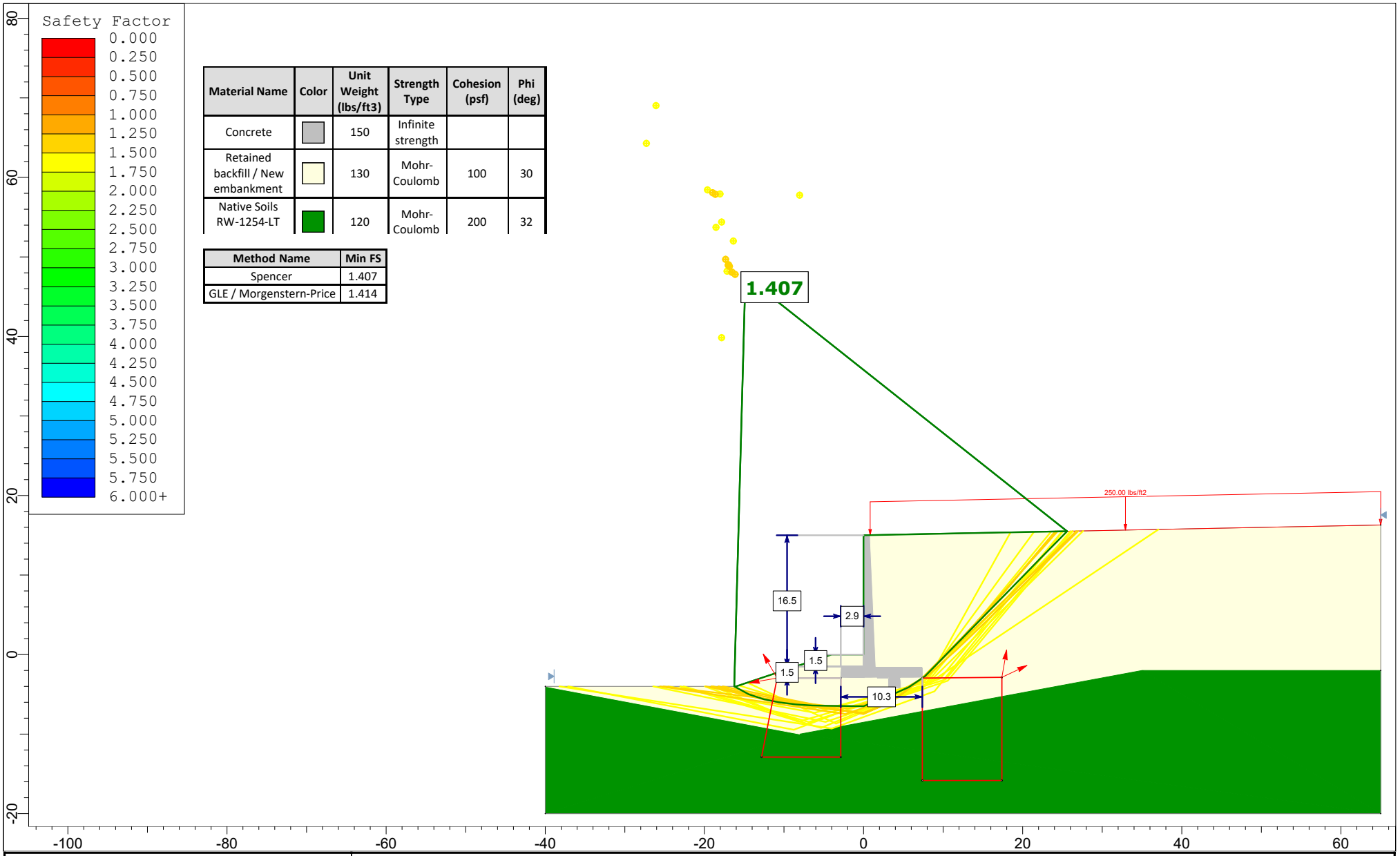
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Concrete		150	Infinite strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW-1254-LT		115	Mohr-Coulomb	200	30

Method Name	Min FS
Spencer	1.514
GLE / Morgenstern-Price	1.525

AZTEC TYPSA

SLIDEINTERPRET 9.024

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-1254-LT STA 1253+00 - CIP	*Scenario*	Scenario 2 - Top cover 3.5 feet
Prepared By	APL	*Company*	AZTEC
Date	10/21/2022	*File Name*	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev0c_CIP.slmd



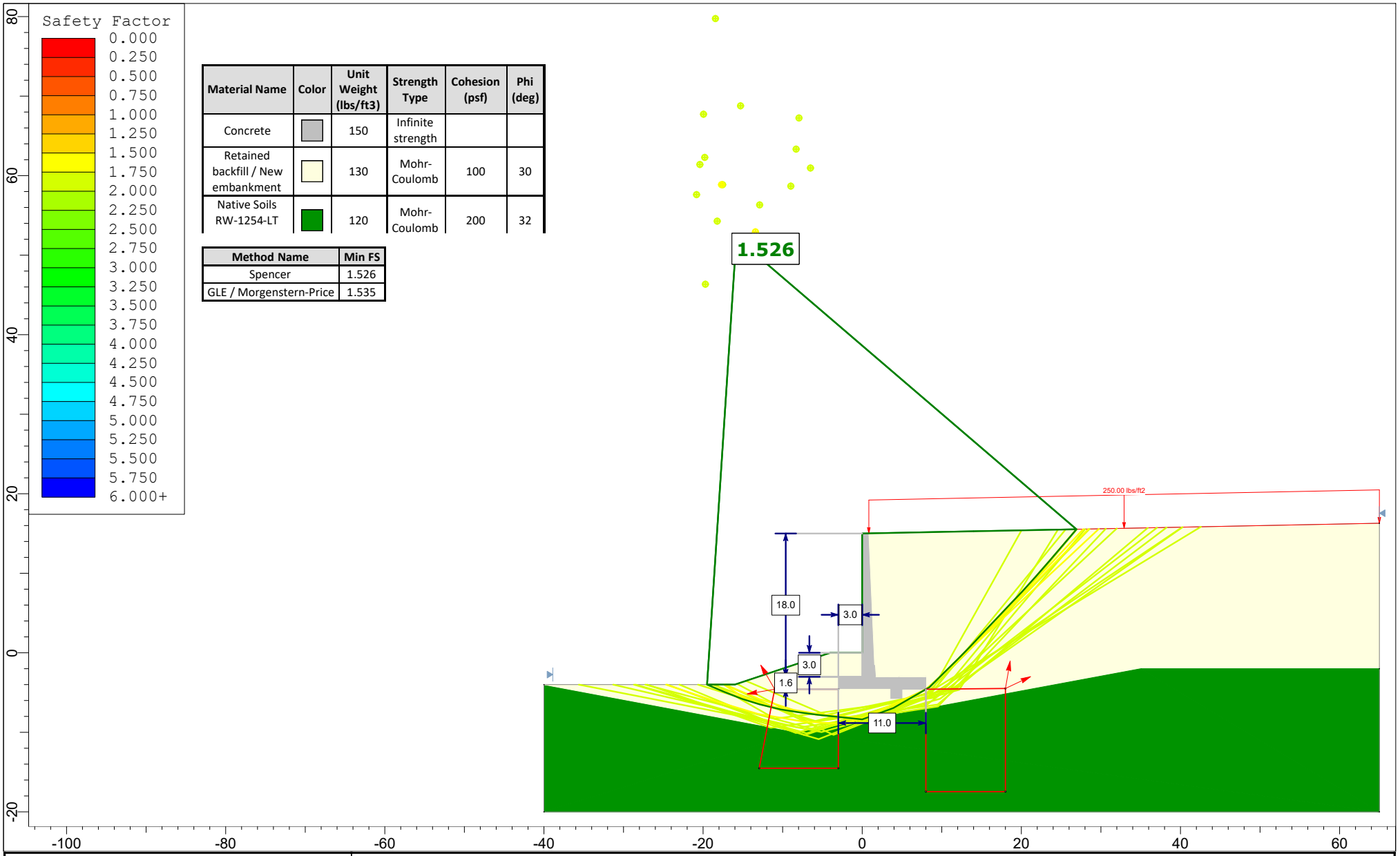
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Concrete		150	Infinite strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW-1254-LT		120	Mohr-Coulomb	200	32

Method Name	Min FS
Spencer	1.407
GLE / Morgenstern-Price	1.414

AZTEC TYPSA

SLIDEINTERPRET 9.024

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-1254-LT STA 1258+00 - CIP	*Scenario*	Scenario 1 - Top cover 1.5 feet
Prepared By	APL	*Company*	AZTEC
Date	10/21/2022	*File Name*	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev0c_CIP.slmd



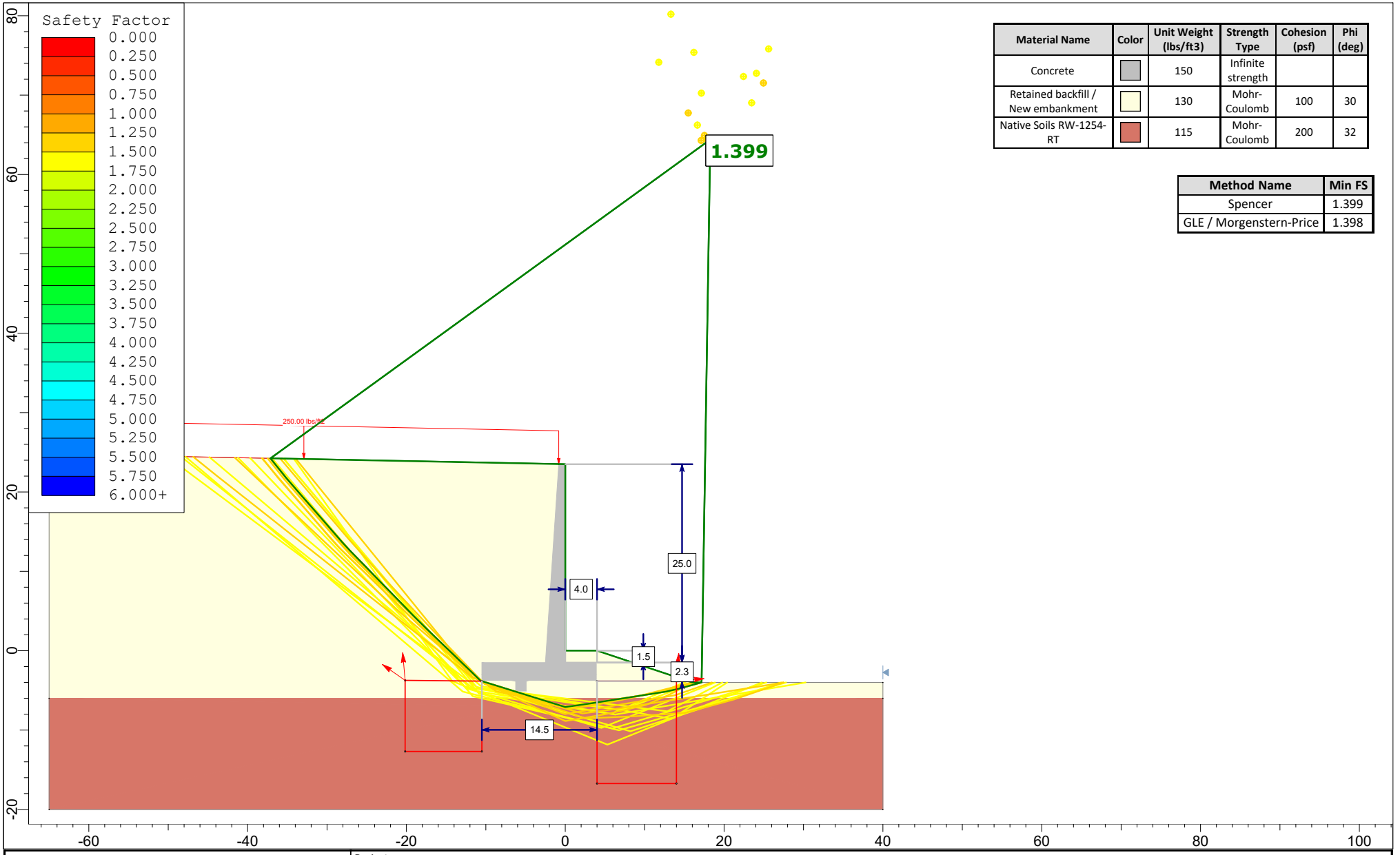
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Concrete		150	Infinite strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW-1254-LT		120	Mohr-Coulomb	200	32

Method Name	Min FS
Spencer	1.526
GLE / Morgenstern-Price	1.535

AZTEC TYPSA

SLIDEINTERPRET 9.024

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-1254-LT STA 1258+00 - CIP	*Scenario*	Scenario 3 - Top cover 3.0 feet
Prepared By	APL	*Company*	AZTEC
Date	10/21/2022	*File Name*	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev0c_CIP.slmd



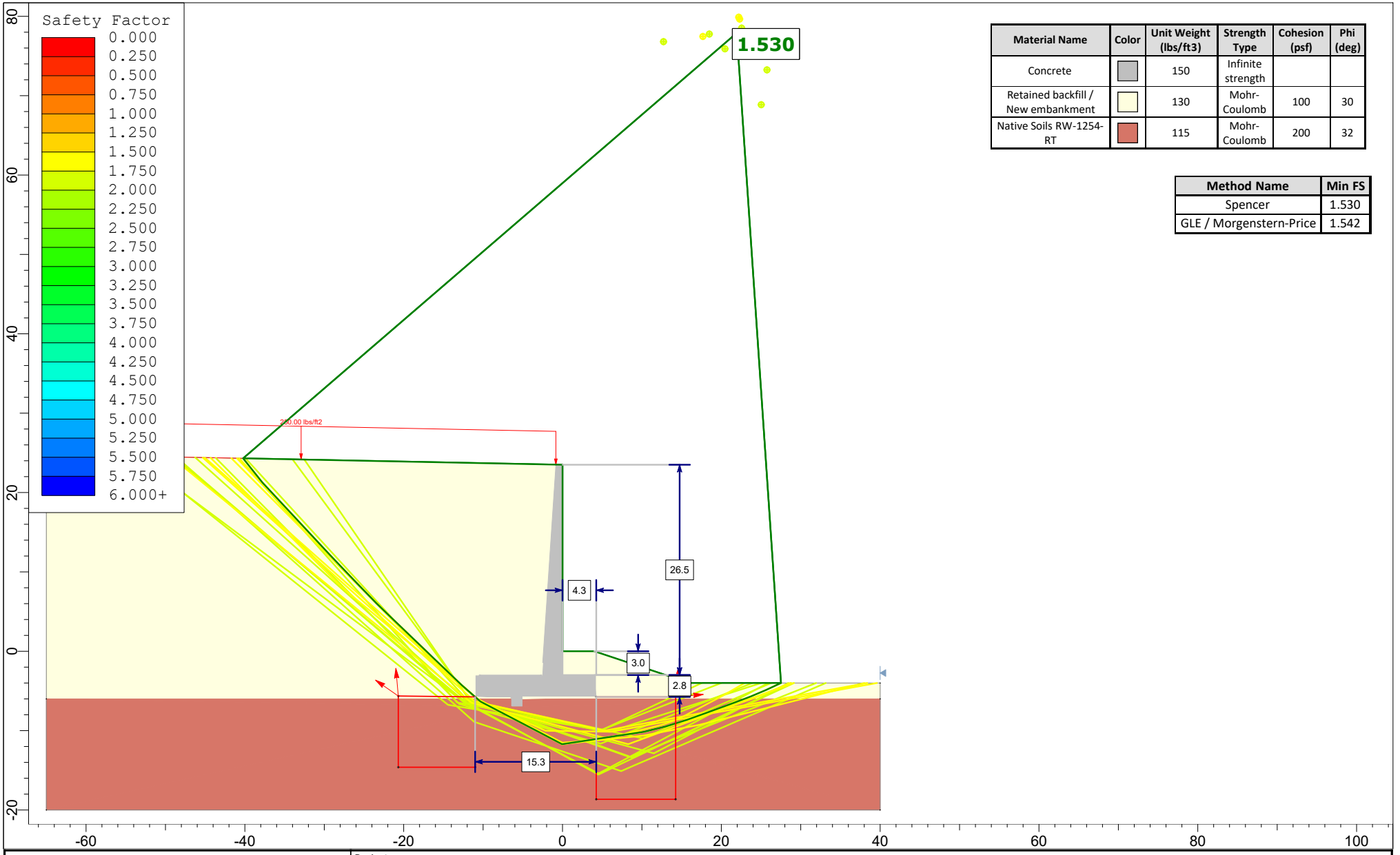
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Concrete		150	Infinite strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW-1254-RT		115	Mohr-Coulomb	200	32

Method Name	Min FS
Spencer	1.399
GLE / Morgenstern-Price	1.398

AZTEC TYPSA

SLIDEINTERPRET 9.024

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-1254-RT STA 1253+00 - CIP	*Scenario*	Scenario 1 - Top cover 1.5 feet
Prepared By	APL	*Company*	AZTEC
Date	10/21/2022	*File Name*	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev0c_CIP.slmd



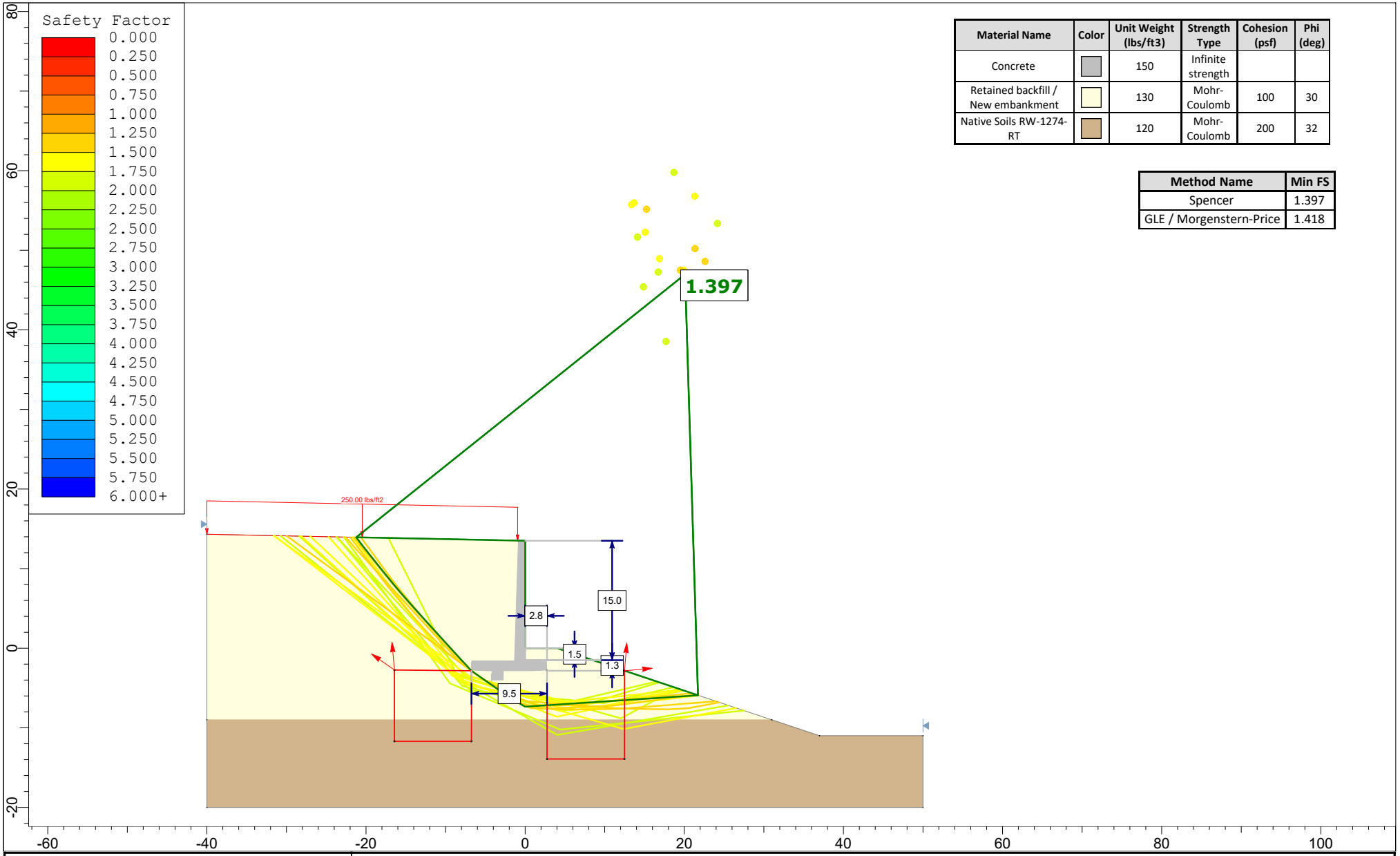
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Concrete		150	Infinite strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW-1254-RT		115	Mohr-Coulomb	200	32

Method Name	Min FS
Spencer	1.530
GLE / Morgenstern-Price	1.542

AZTEC TYPSA

SLIDEINTERPRET 9.024

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-1254-RT STA 1253+00 - CIP	*Scenario*	Scenario 2 - Top cover 3.0 feet
Prepared By	APL	*Company*	AZTEC
Date	10/21/2022	*File Name*	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev0c_CIP.slmd



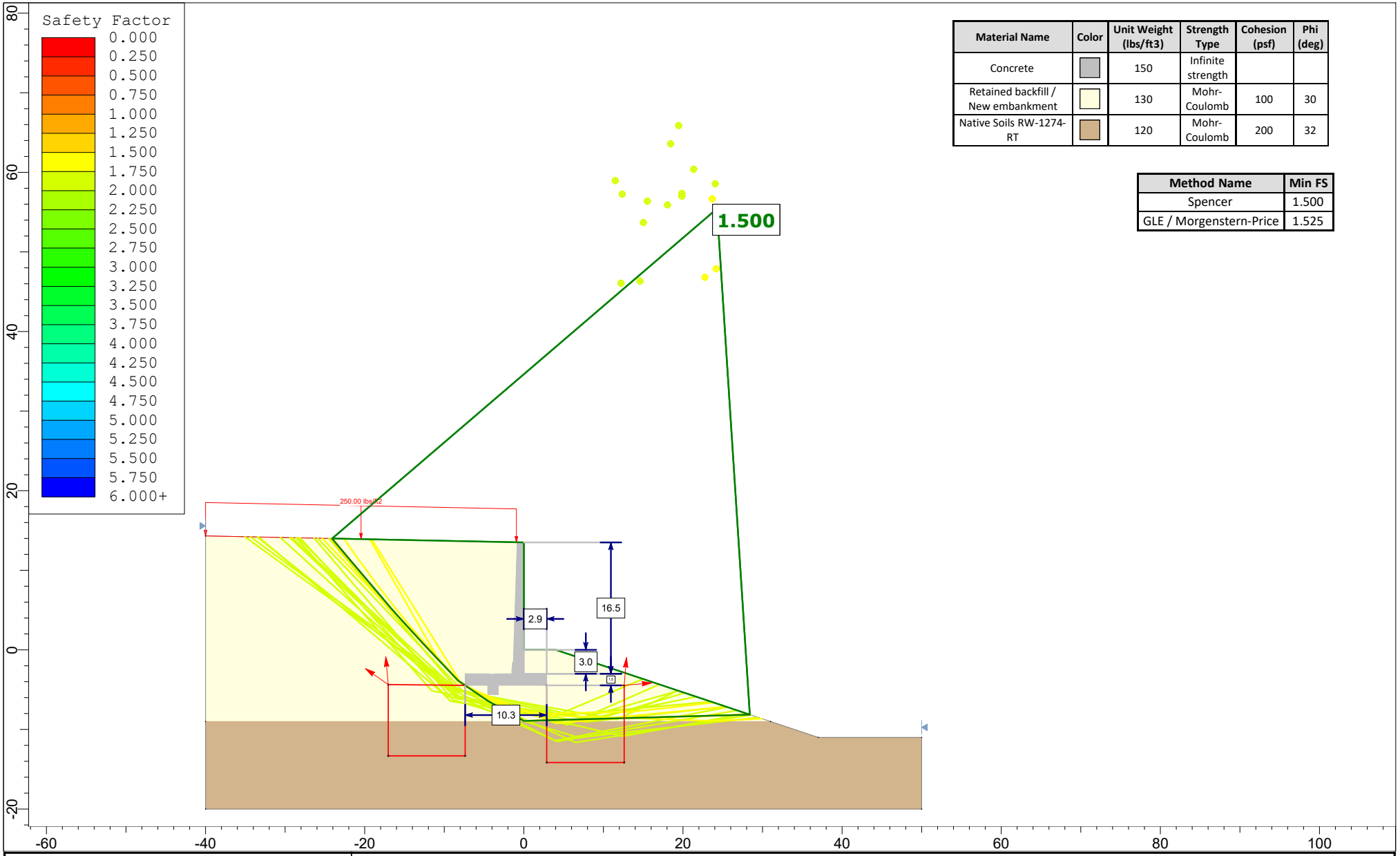
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Concrete		150	Infinite strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW-1274-RT		120	Mohr-Coulomb	200	32

Method Name	Min FS
Spencer	1.397
GLE / Morgenstern-Price	1.418

AZTEC TYPSA

SLIDEINTERPRET 9.024

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-1274-RT 1275+50	*Scenario*	Scenario 1 - Top cover 1.5 feet
Prepared By	APL	*Company*	AZTEC
Date	10/21/2022	*File Name*	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev0c_CIP.slmd



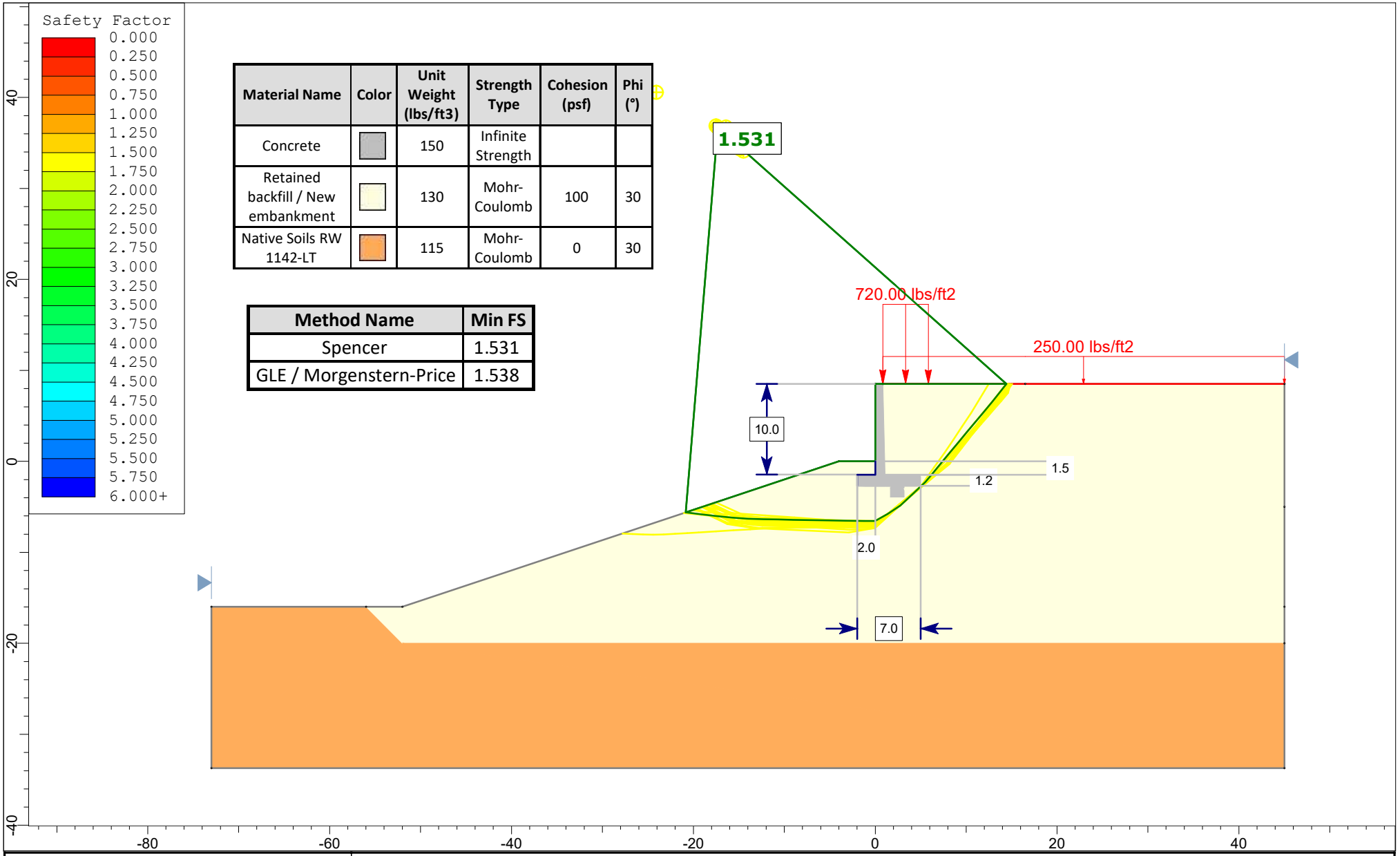
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Concrete		150	Infinite strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW-1274-RT		120	Mohr-Coulomb	200	32

Method Name	Min FS
Spencer	1.500
GLE / Morgenstern-Price	1.525

AZTEC TYPSA

SLIDEINTERPRET 9.024

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-1274-RT 1275+50	*Scenario*	Scenario 3 - Top cover 3.0 feet
Prepared By	APL	*Company*	AZTEC
Date	10/21/2022	*File Name*	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev0c_CIP.slmd



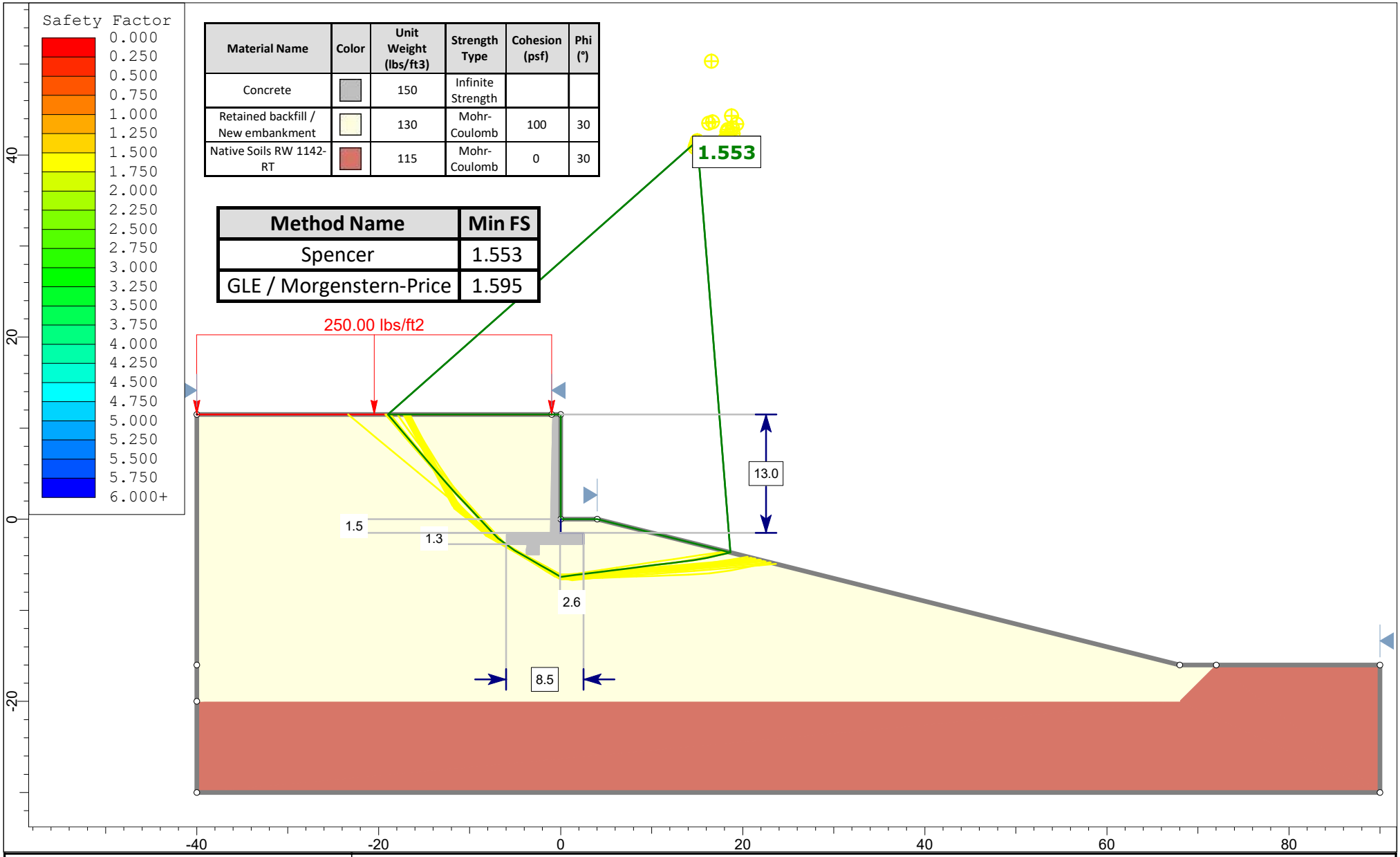
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (°)
Concrete		150	Infinite Strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW 1142-LT		115	Mohr-Coulomb	0	30

Method Name	Min FS
Spencer	1.531
GLE / Morgenstern-Price	1.538

AZTEC TYPSA

SLIDEINTERPRET 9.034

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-1142 LT STA 1141+20 CIP	Scenario	Scenario 1 - Top cover 1.5 feet
Drawn By	BDG	Company	AZTEC
Date	10/11/2024	File Name	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev1a.slmd



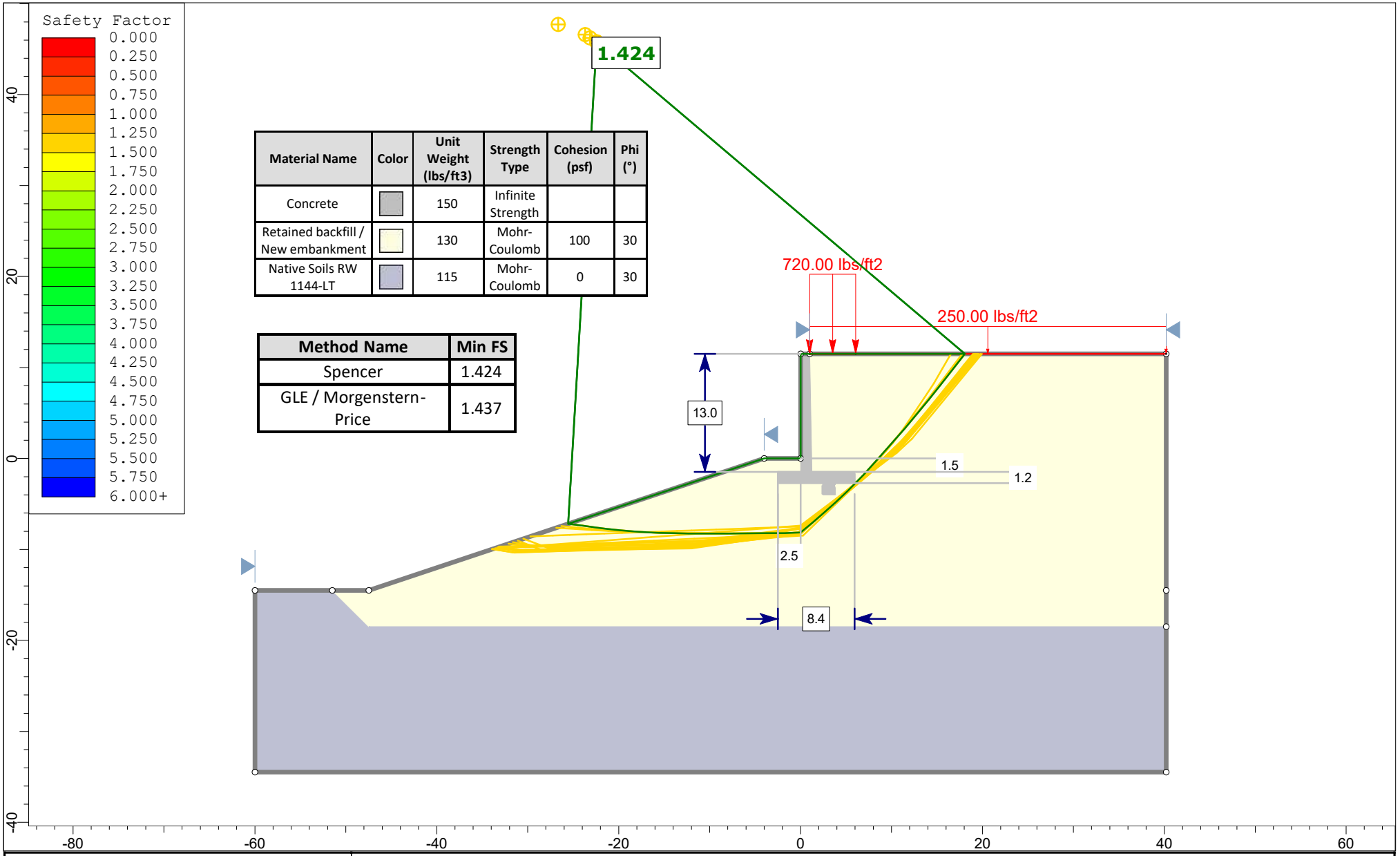
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (°)
Concrete		150	Infinite Strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW 1142-RT		115	Mohr-Coulomb	0	30

Method Name	Min FS
Spencer	1.553
GLE / Morgenstern-Price	1.595

AZTEC TYPSA

SLIDEINTERPRET 9.034

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-1142 RT STA 1142+15 CIP	*Scenario*	Scenario 1 - Top cover 1.5 feet
Drawn By	BDG	*Company*	AZTEC
Date	10/11/2024	*File Name*	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev1a.slmd



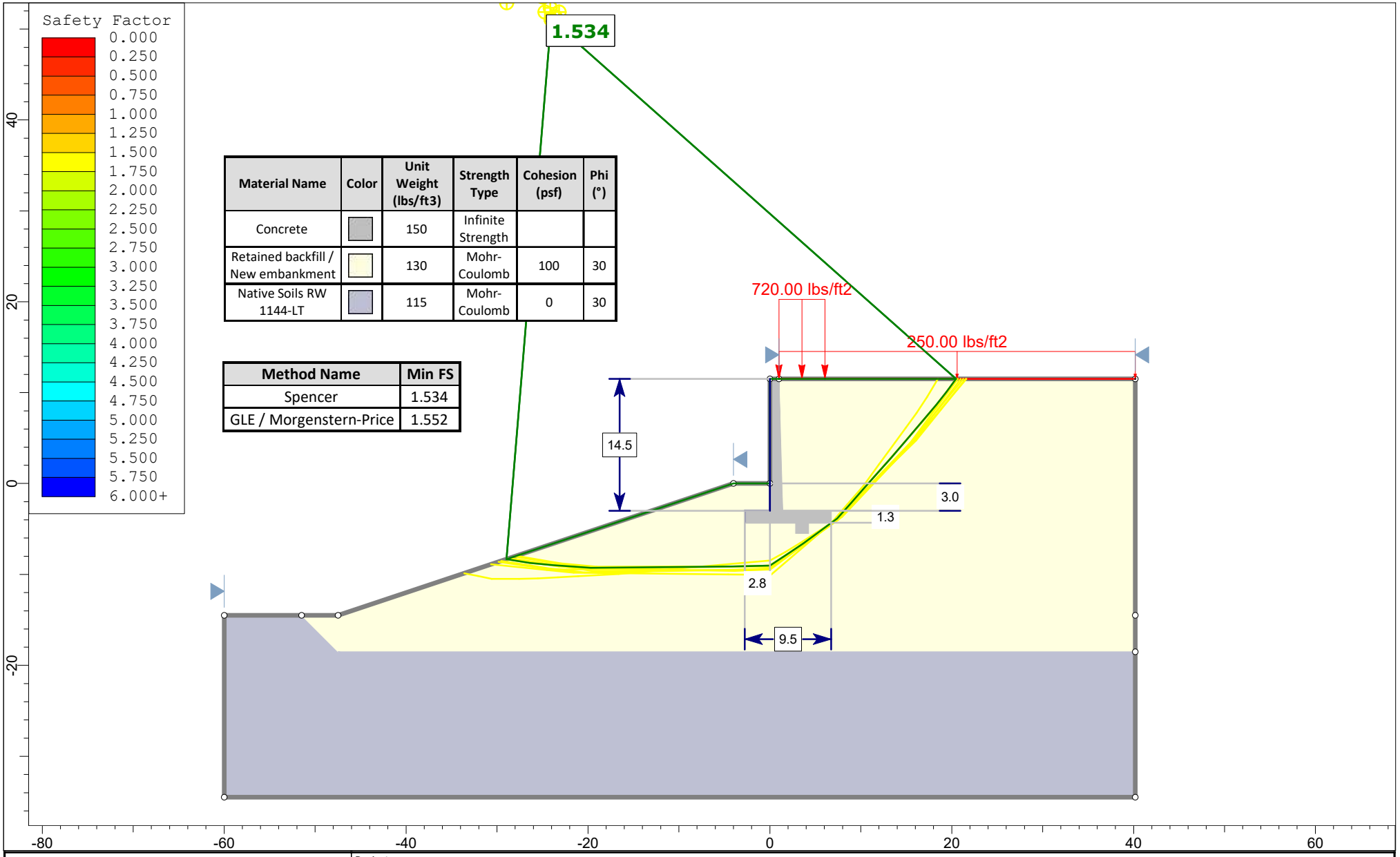
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (°)
Concrete		150	Infinite Strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW 1144-LT		115	Mohr-Coulomb	0	30

Method Name	Min FS
Spencer	1.424
GLE / Morgenstern-Price	1.437

AZTEC TYPSA

SLIDEINTERPRET 9.034

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-1144 LT STA 1143+25 CIP	Scenario	Scenario 1 - Top cover 1.5 feet
Drawn By	BDG	Company	AZTEC
Date	10/11/2024	File Name	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev1a.slmd



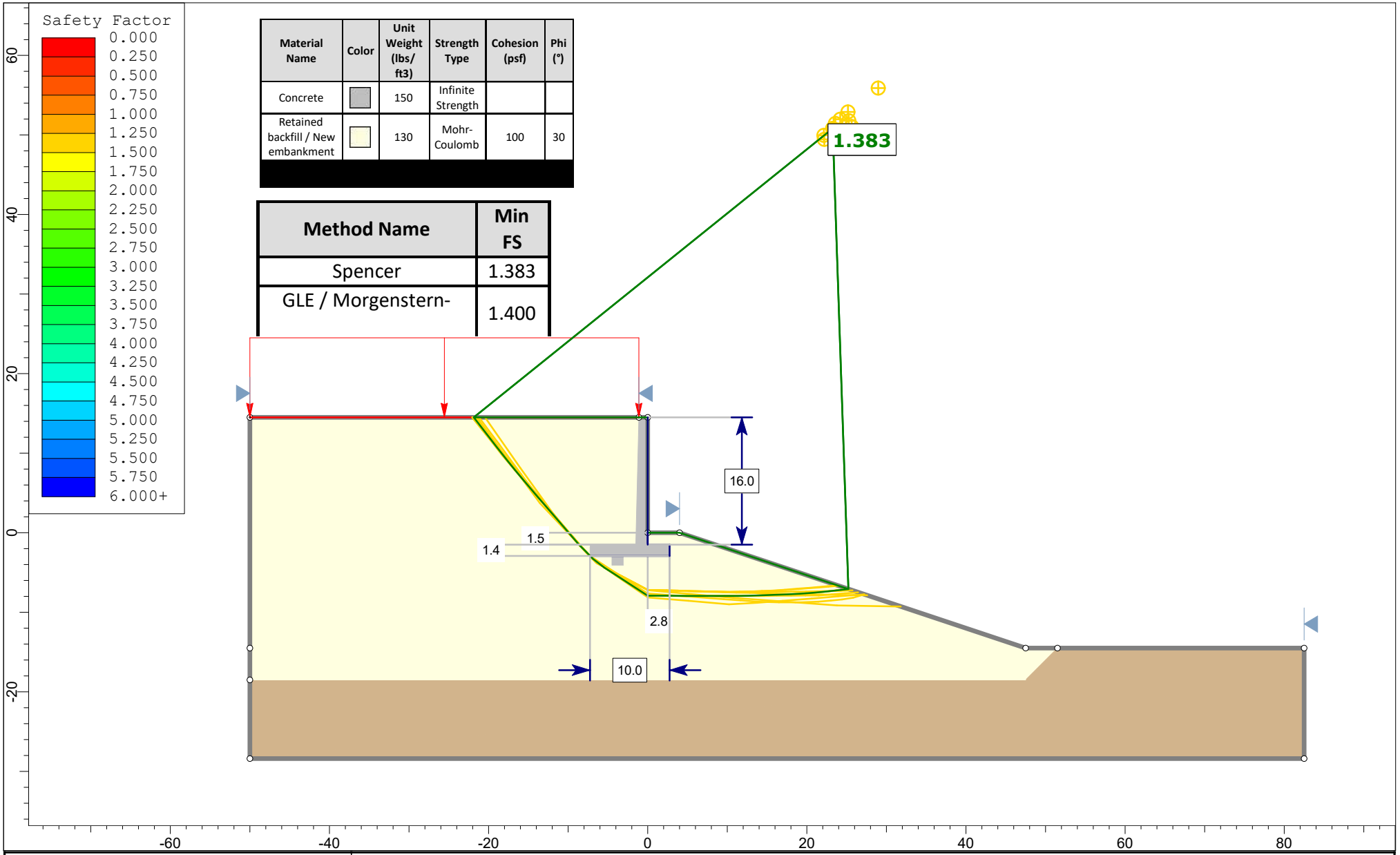
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (°)
Concrete		150	Infinite Strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW 1144-LT		115	Mohr-Coulomb	0	30

Method Name	Min FS
Spencer	1.534
GLE / Morgenstern-Price	1.552

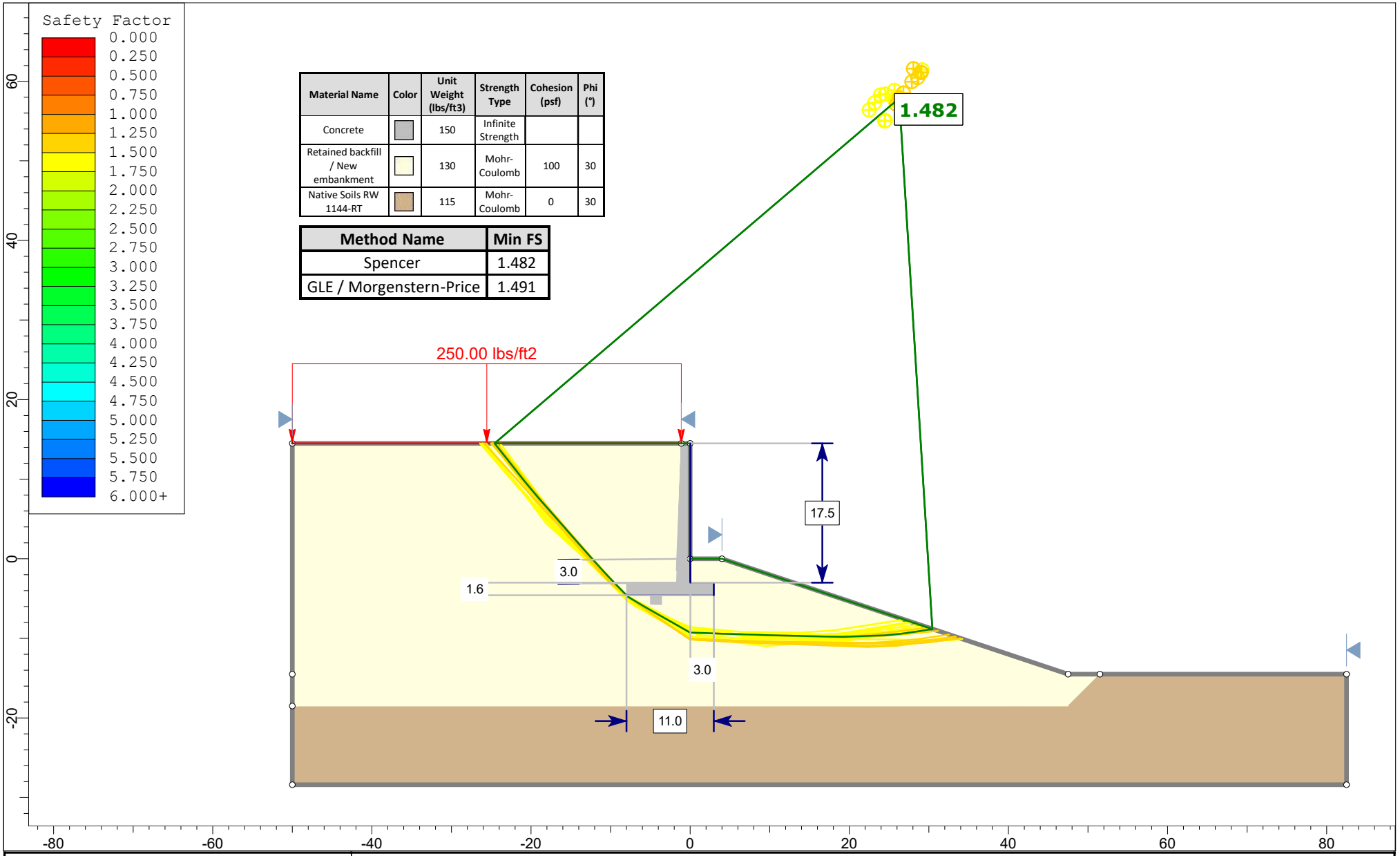
AZTEC TYPSA

SLIDEINTERPRET 9.034

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-1144 LT STA 1143+25 CIP	*Scenario*	Scenario 2 - Top cover 3.0 feet
Drawn By	BDG	*Company*	AZTEC
Date	10/11/2024	*File Name*	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev1a.slmd



AZTEC TYPSA	Project	SR303L - Phase I - MC85-Van Buren St	
	Group	RW-1144 RT STA 1144+20 - CIP	Scenario: Scenario 1 - Top cover 1.5 feet
	Drawn By	BDG	Company: AZTEC
SLIDEINTERPRET 9.034	Date	10/11/2024	File Name: AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev1a.slmd



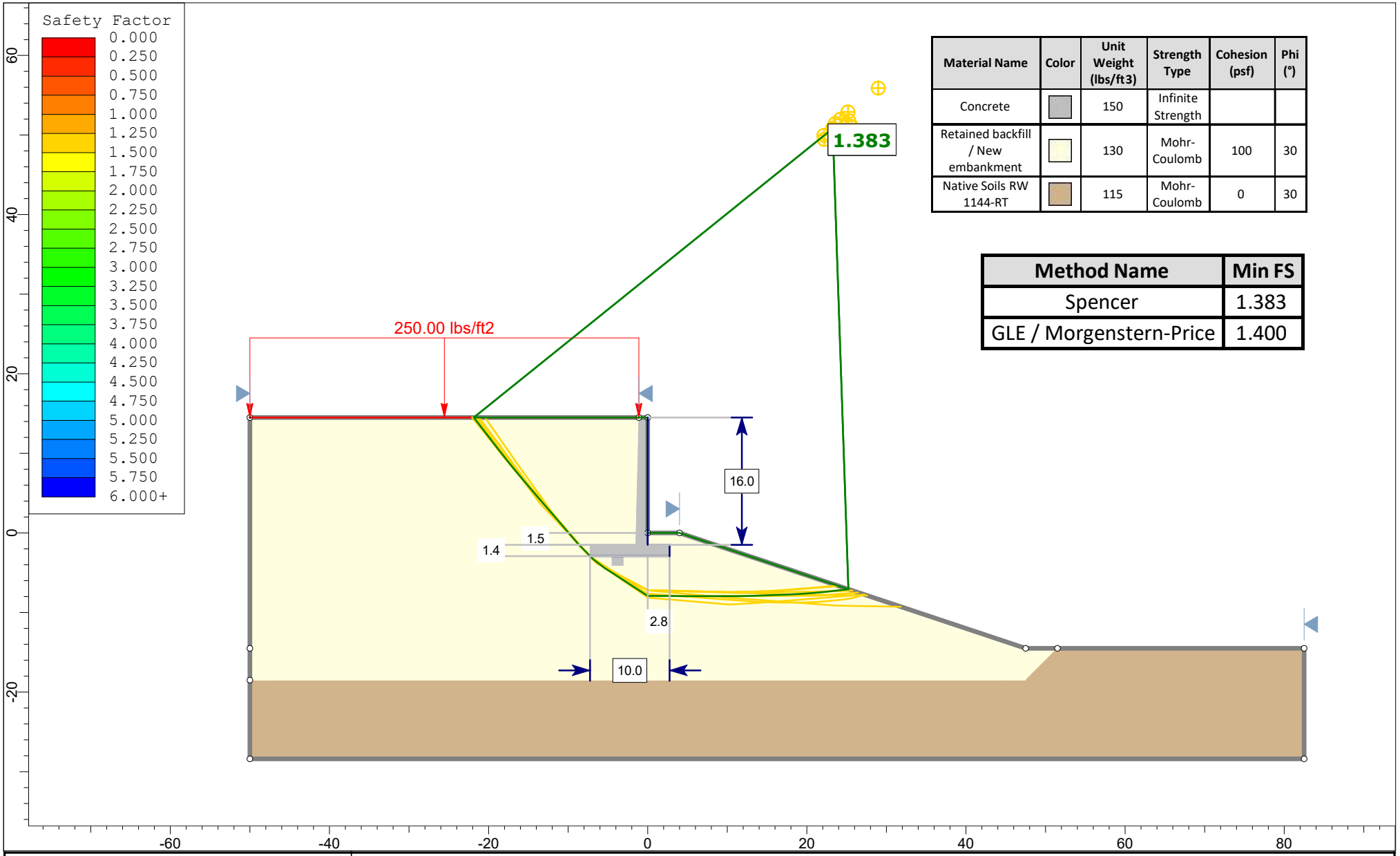
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (°)
Concrete		150	Infinite Strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW 1144-RT		115	Mohr-Coulomb	0	30

Method Name	Min FS
Spencer	1.482
GLE / Morgenstern-Price	1.491

AZTEC TYPSA

SLIDEINTERPRET 9.034

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-1144 RT STA 1144+20 - CIP	Scenario	Scenario 2 - Top cover 3 feet
Drawn By	BDG	Company	AZTEC
Date	10/11/2024	File Name	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev1a.slmd



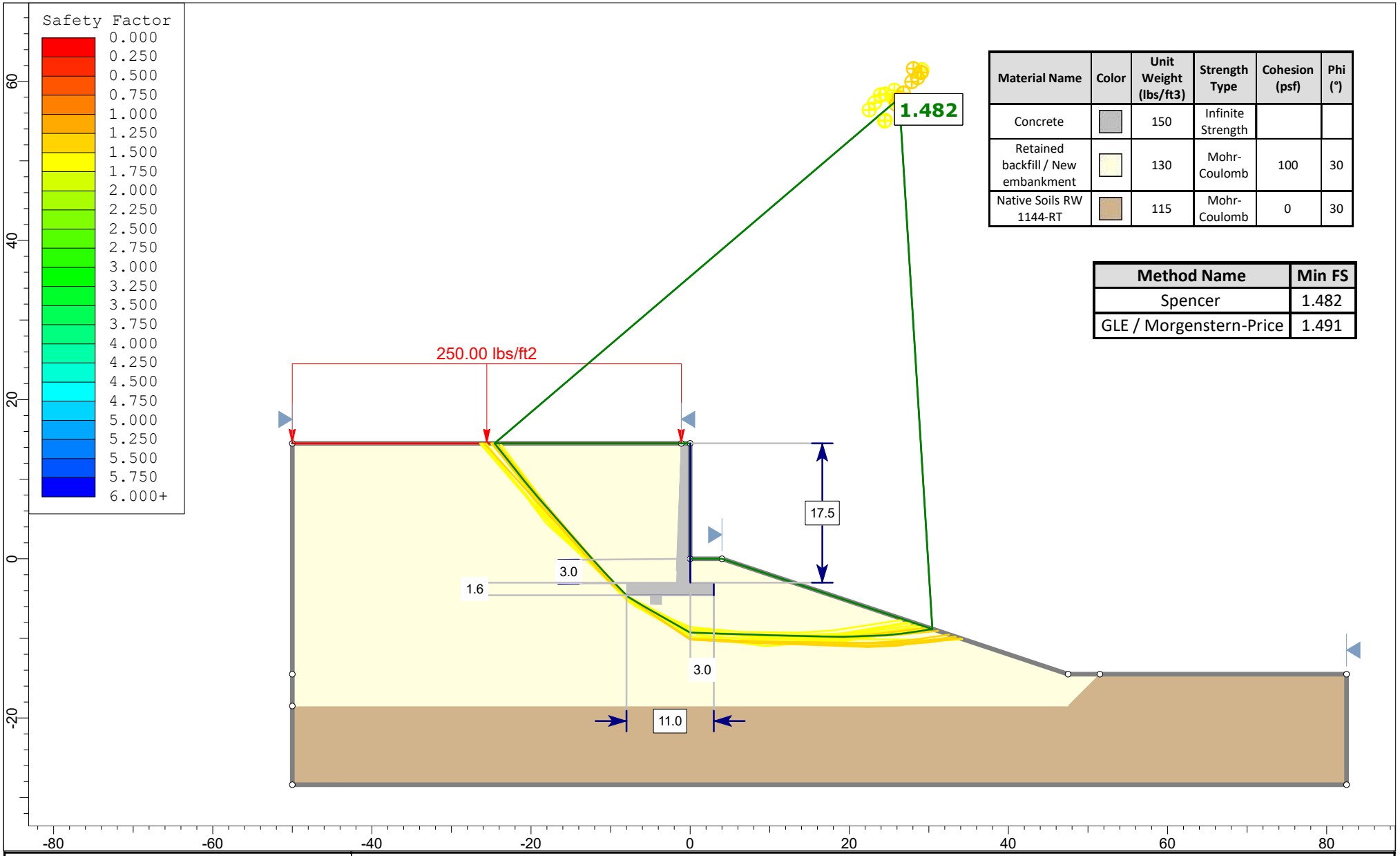
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (°)
Concrete		150	Infinite Strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW 1144-RT		115	Mohr-Coulomb	0	30

Method Name	Min FS
Spencer	1.383
GLE / Morgenstern-Price	1.400

AZTEC TYPSA

SLIDEINTERPRET 9.034

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-1144 RT STA 1144+20 - CIP	Scenario	Scenario 1 - Top cover 1.5 feet
Drawn By	BDG	Company	AZTEC
Date	10/11/2024	File Name	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev1a.slmd



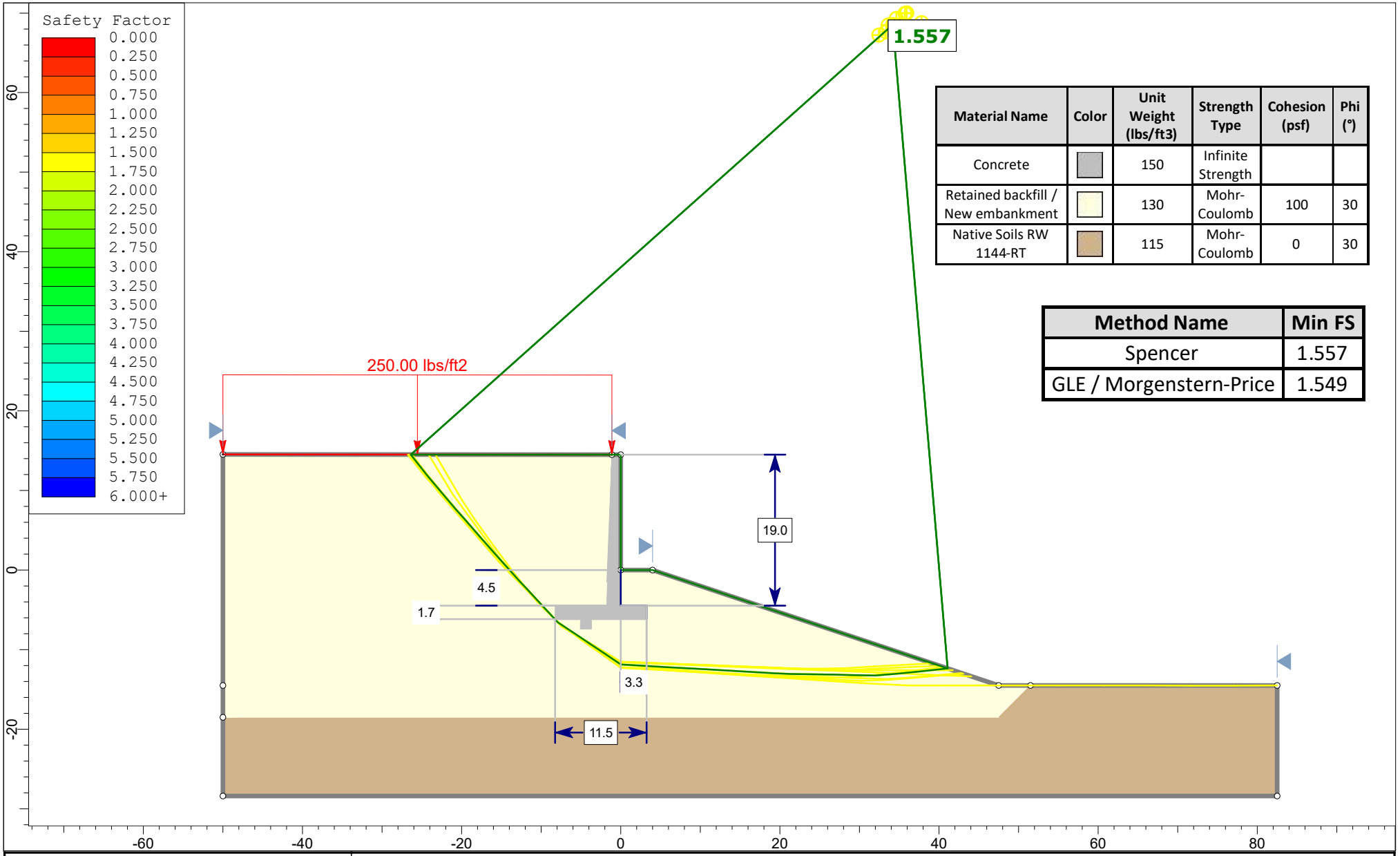
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (°)
Concrete		150	Infinite Strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW 1144-RT		115	Mohr-Coulomb	0	30

Method Name	Min FS
Spencer	1.482
GLE / Morgenstern-Price	1.491

AZTEC TYPSA

SLIDEINTERPRET 9.034

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-1144 RT STA 1144+20 - CIP	Scenario	Scenario 2 - Top cover 3 feet
Drawn By	BDG	Company	AZTEC
Date	10/11/2024	File Name	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev1a.slmd



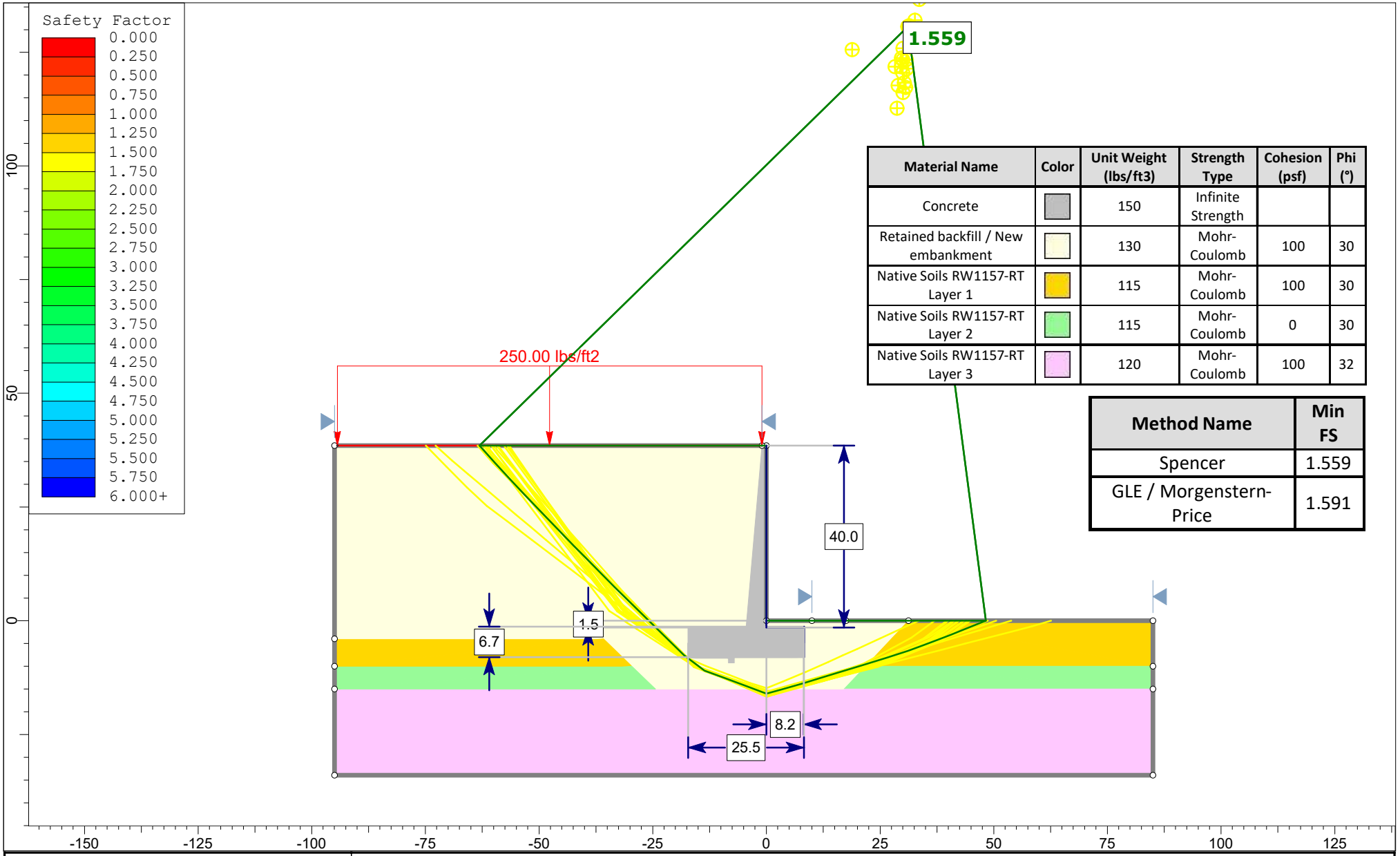
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (°)
Concrete		150	Infinite Strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW 1144-RT		115	Mohr-Coulomb	0	30

Method Name	Min FS
Spencer	1.557
GLE / Morgenstern-Price	1.549

AZTEC TYPSA

SLIDEINTERPRET 9.034

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-1144 RT STA 1144+20 - CIP	Scenario	Scenario 3 - Top cover 4.5 feet
Drawn By	BDG	Company	AZTEC
Date	10/11/2024	File Name	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev1a.slmd



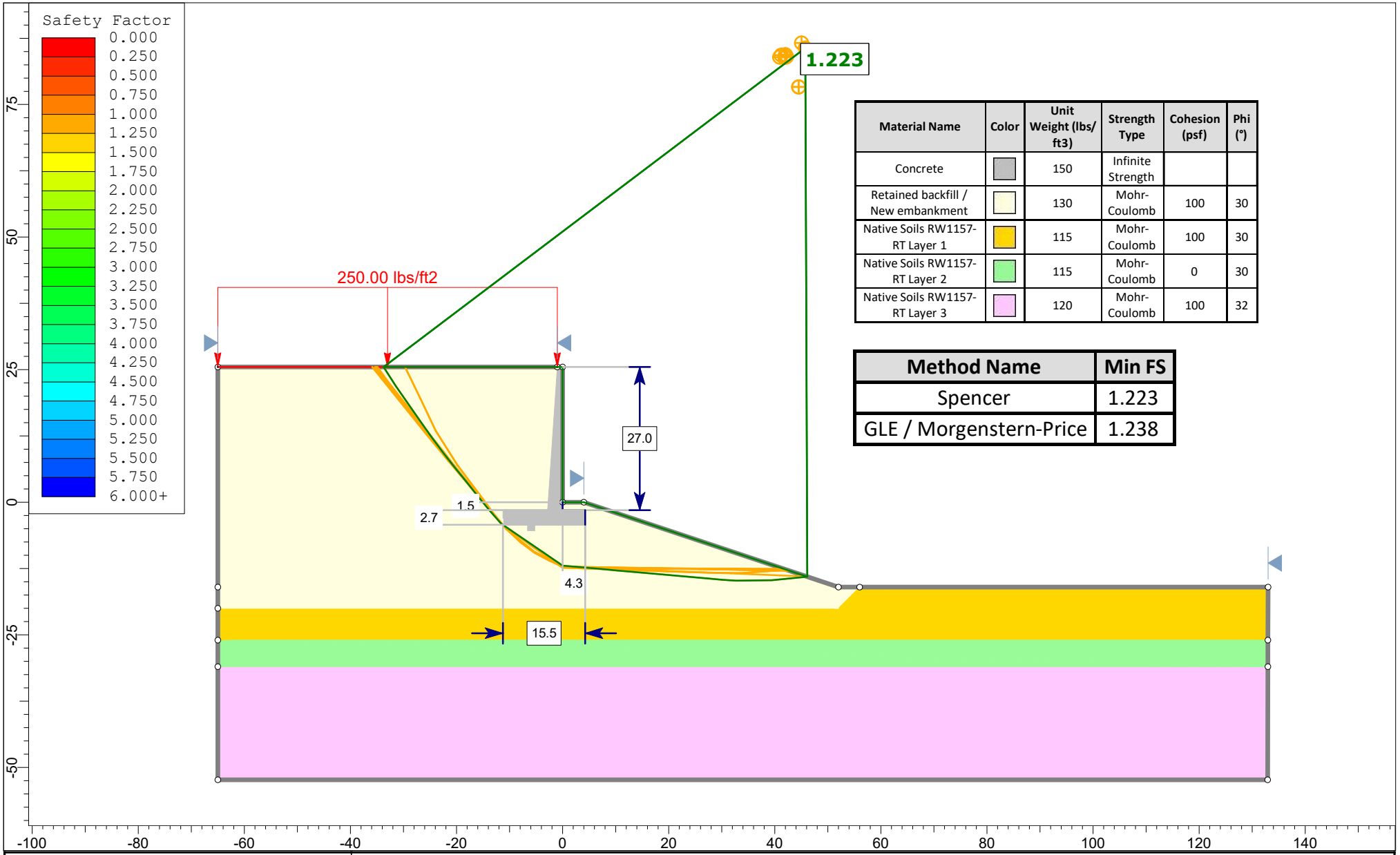
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (°)
Concrete		150	Infinite Strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW1157-RT Layer 1		115	Mohr-Coulomb	100	30
Native Soils RW1157-RT Layer 2		115	Mohr-Coulomb	0	30
Native Soils RW1157-RT Layer 3		120	Mohr-Coulomb	100	32

Method Name	Min FS
Spencer	1.559
GLE / Morgenstern-Price	1.591

AZTEC TYPSA

SLIDEINTERPRET 9.034

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-1157-RT STA 1157+75- CIP	Scenario	Scenario 1 - Top cover 1.5 feet
Drawn By	BDG	Company	AZTEC
Date	10/11/2024	File Name	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev1a.slmd



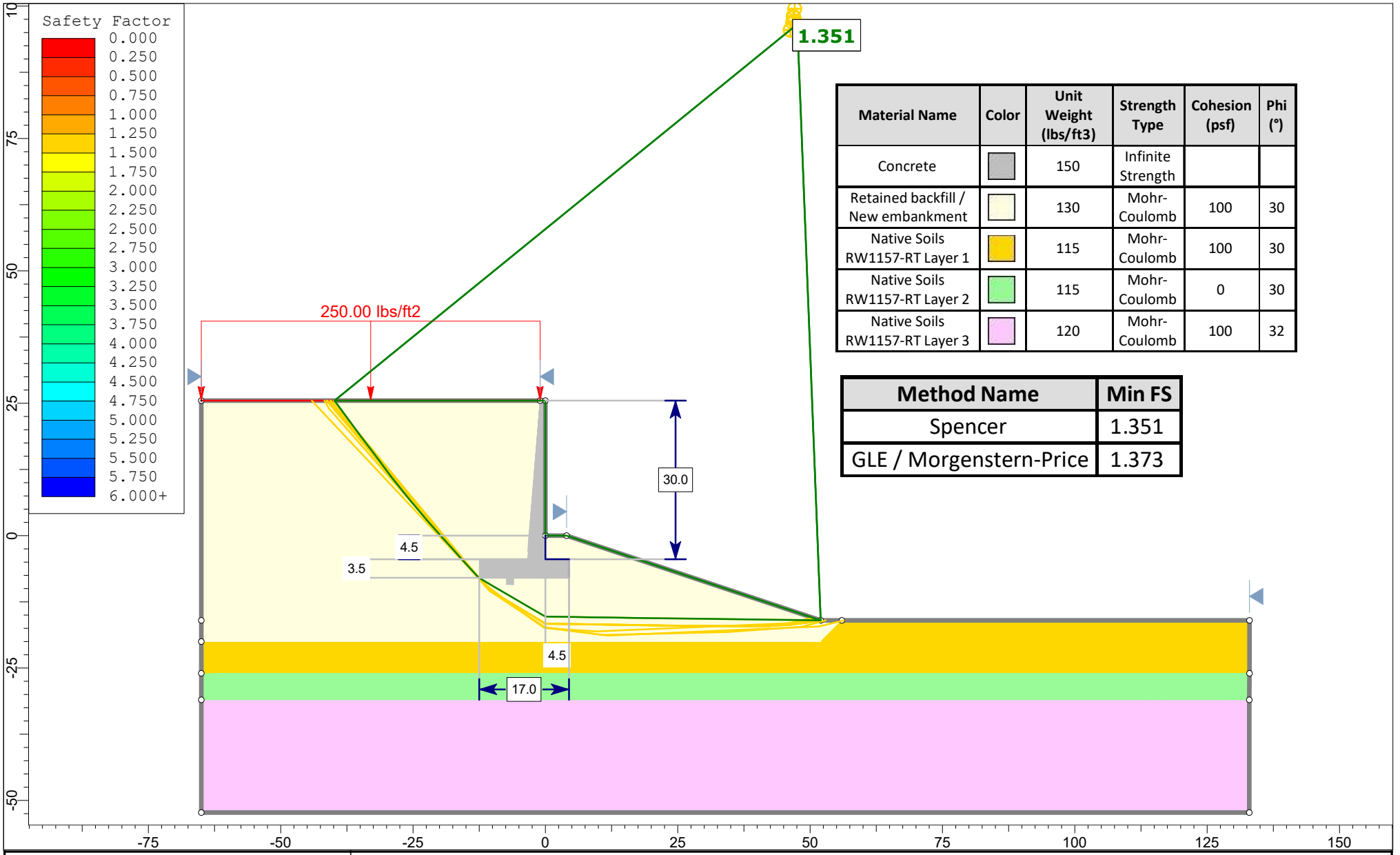
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (°)
Concrete		150	Infinite Strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW1157-RT Layer 1		115	Mohr-Coulomb	100	30
Native Soils RW1157-RT Layer 2		115	Mohr-Coulomb	0	30
Native Soils RW1157-RT Layer 3		120	Mohr-Coulomb	100	32

Method Name	Min FS
Spencer	1.223
GLE / Morgenstern-Price	1.238

AZTEC TYPSA

SLIDEINTERPRET 9.034

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-1157-RT#2 : STA 1157+30 - CIP	*Scenario*	Scenario 1 - Top cover 1.5 feet
Drawn By	BDG	*Company*	AZTEC
Date	10/11/2024	*File Name*	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev1a.slmd



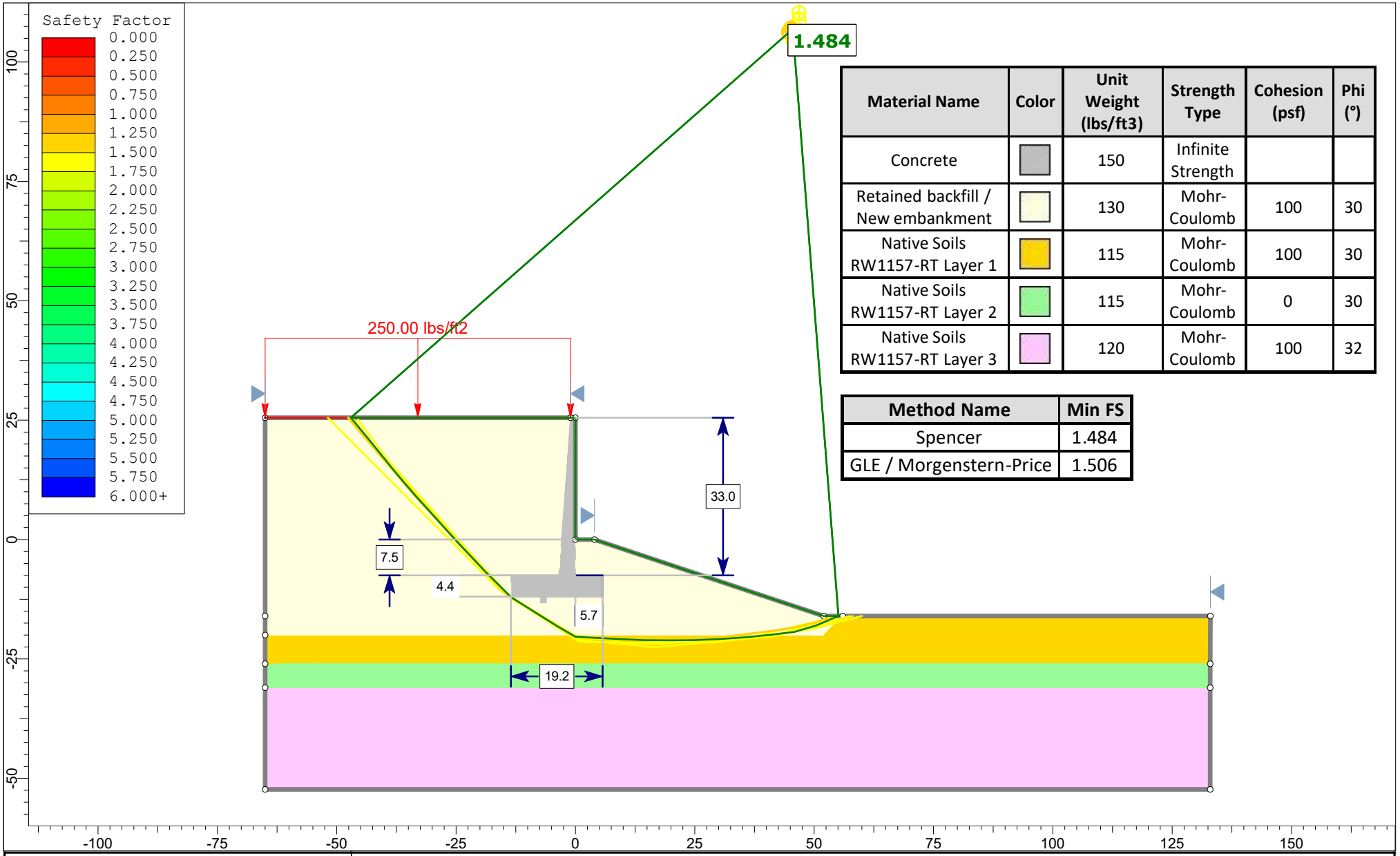
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (°)
Concrete		150	Infinite Strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW1157-RT Layer 1		115	Mohr-Coulomb	100	30
Native Soils RW1157-RT Layer 2		115	Mohr-Coulomb	0	30
Native Soils RW1157-RT Layer 3		120	Mohr-Coulomb	100	32

Method Name	Min FS
Spencer	1.351
GLE / Morgenstern-Price	1.373

AZTEC TYPSA

SLIDEINTERPRET 9.034

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-1157-RT#2 : STA 1157+30 - CIP	Scenario	Scenario 3 - Top cover 4.5 feet
Drawn By	BDG	Company	AZTEC
Date	10/11/2024	File Name	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev1a.slmd



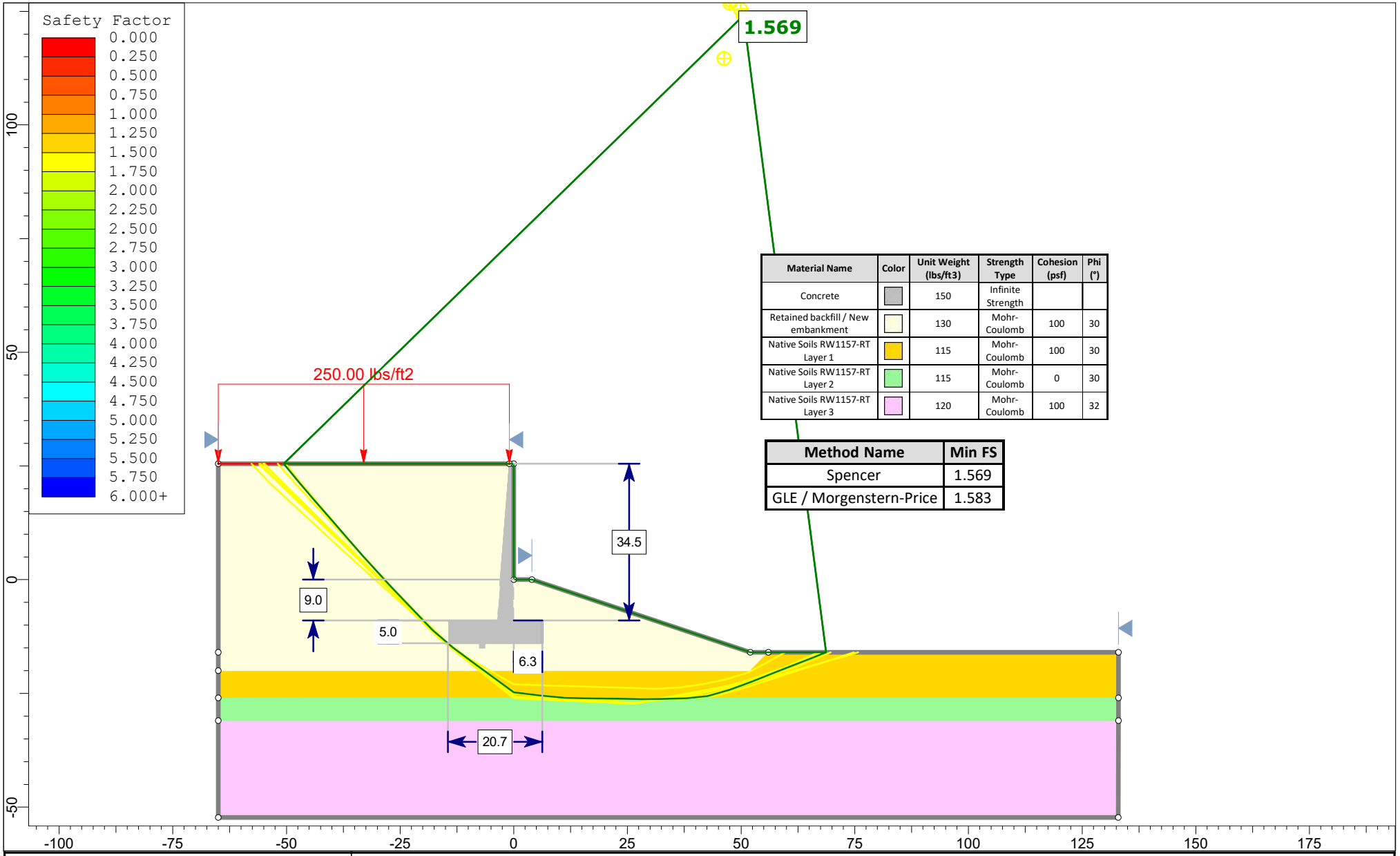
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (°)
Concrete		150	Infinite Strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW1157-RT Layer 1		115	Mohr-Coulomb	100	30
Native Soils RW1157-RT Layer 2		115	Mohr-Coulomb	0	30
Native Soils RW1157-RT Layer 3		120	Mohr-Coulomb	100	32

Method Name	Min FS
Spencer	1.484
GLE / Morgenstern-Price	1.506

AZTEC TYPSA

SLIDEINTERPRET 9.034

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-1157-RT#2 : STA 1157+30 - CIP	Scenario	Scenario 5 - Top cover 7.5 feet
Drawn By	BDG	Company	AZTEC
Date	10/11/2024	File Name	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev1a.slmd



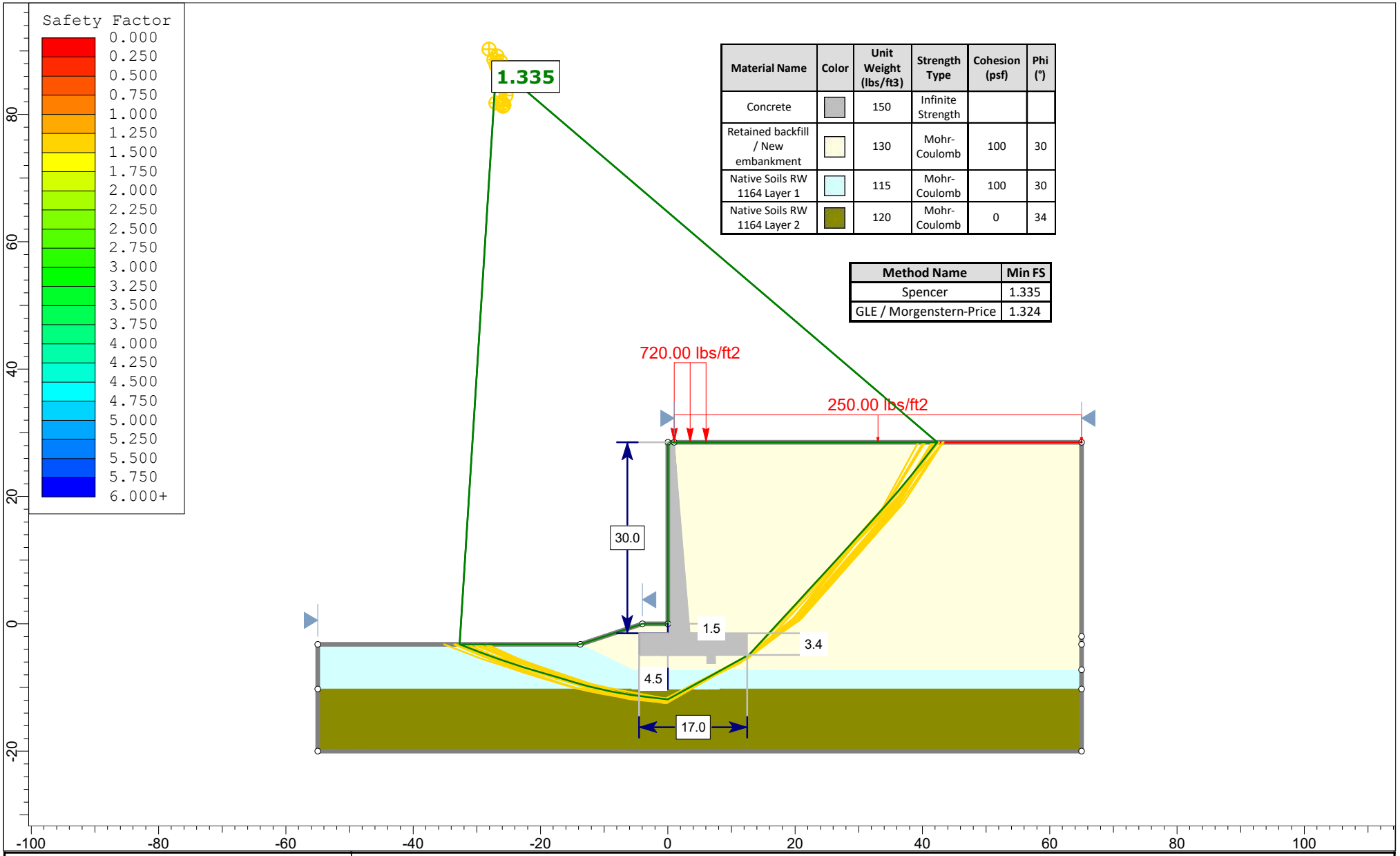
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (°)
Concrete		150	Infinite Strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW1157-RT Layer 1		115	Mohr-Coulomb	100	30
Native Soils RW1157-RT Layer 2		115	Mohr-Coulomb	0	30
Native Soils RW1157-RT Layer 3		120	Mohr-Coulomb	100	32

Method Name	Min FS
Spencer	1.569
GLE / Morgenstern-Price	1.583

AZTEC TYPSA

SLIDEINTERPRET 9.034

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-1157-RT#2 : STA 1157+30 - CIP	Scenario	Scenario 6 - Top cover 9 feet
Drawn By	BDG	Company	AZTEC
Date	10/11/2024	File Name	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev1a.slmd



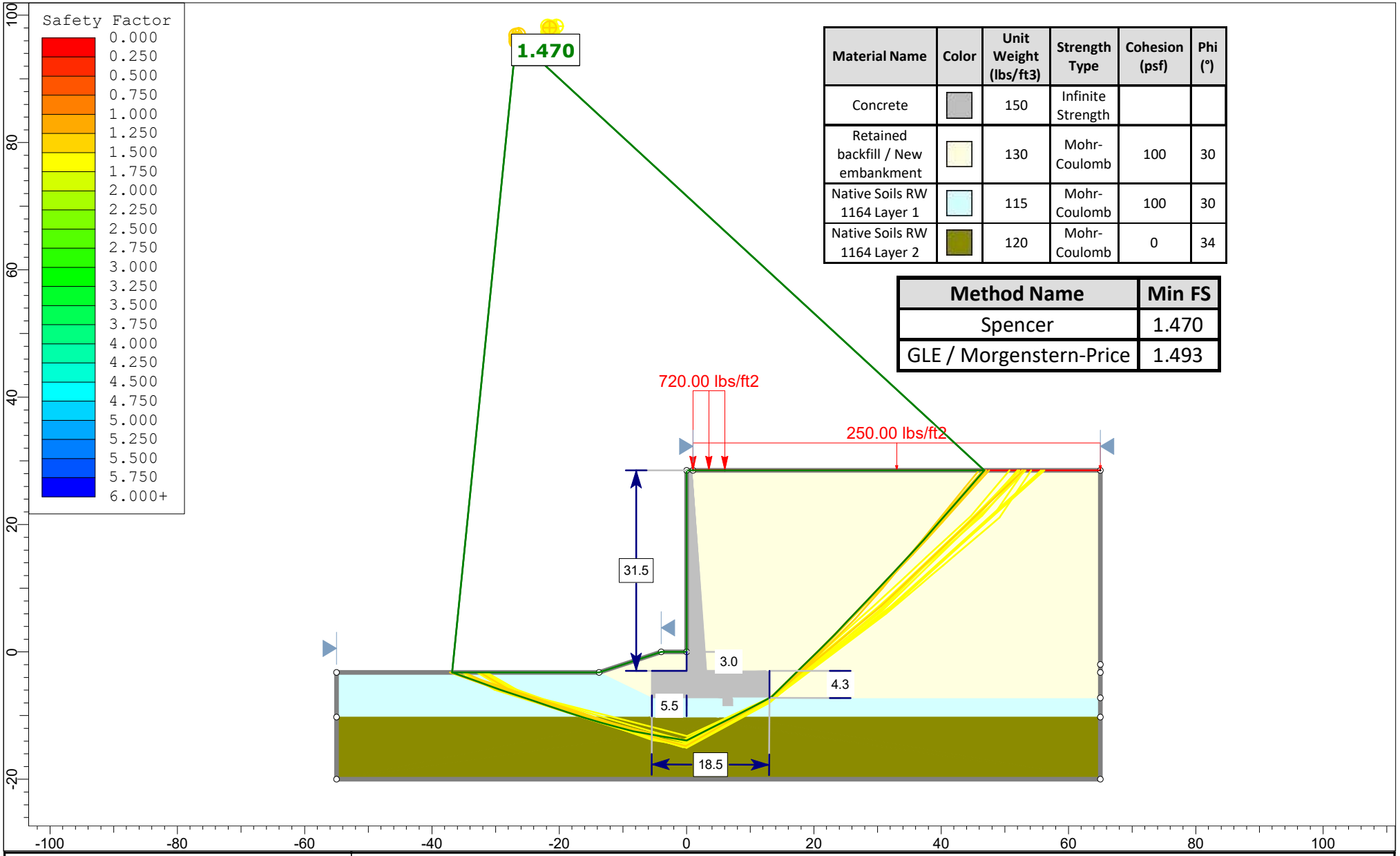
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (°)
Concrete		150	Infinite Strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW 1164 Layer 1		115	Mohr-Coulomb	100	30
Native Soils RW 1164 Layer 2		120	Mohr-Coulomb	0	34

Method Name	Min FS
Spencer	1.335
GLE / Morgenstern-Price	1.324

AZTEC TYPSA

SLIDEINTERPRET 9.034

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-1164 LT STA 1163+60 - CIP	*Scenario*	Scenario 1 - Top cover 1.5 feet
Drawn By	BDG	*Company*	AZTEC
Date	10/11/2024	*File Name*	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev1a.slmd



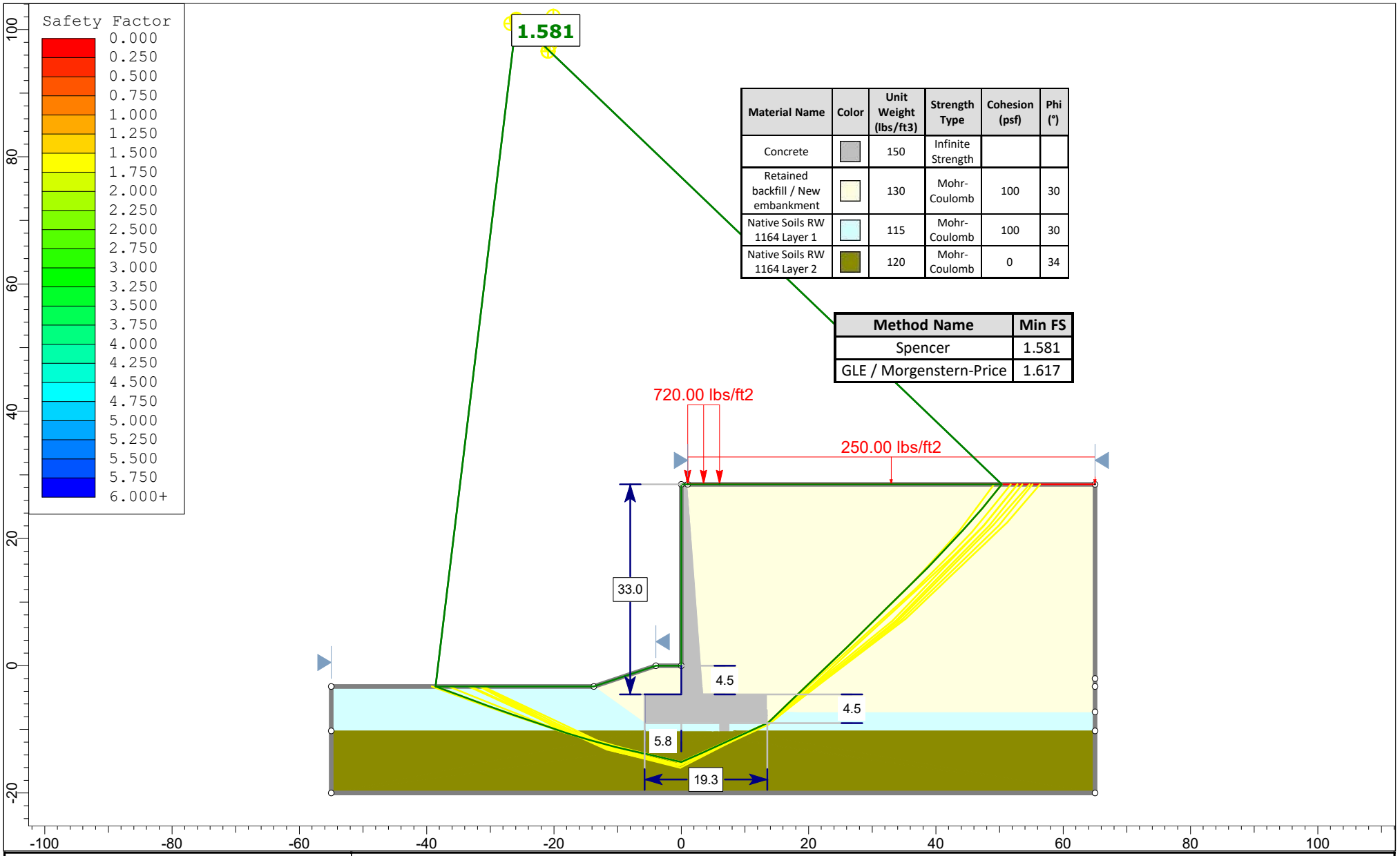
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (°)
Concrete		150	Infinite Strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW 1164 Layer 1		115	Mohr-Coulomb	100	30
Native Soils RW 1164 Layer 2		120	Mohr-Coulomb	0	34

Method Name	Min FS
Spencer	1.470
GLE / Morgenstern-Price	1.493

AZTEC TYPSA

SLIDEINTERPRET 9.034

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-1164 LT STA 1163+60 - CIP	Scenario	Scenario 2 - Top cover 3.0 feet
Drawn By	BDG	Company	AZTEC
Date	10/11/2024	File Name	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev1a.slmd



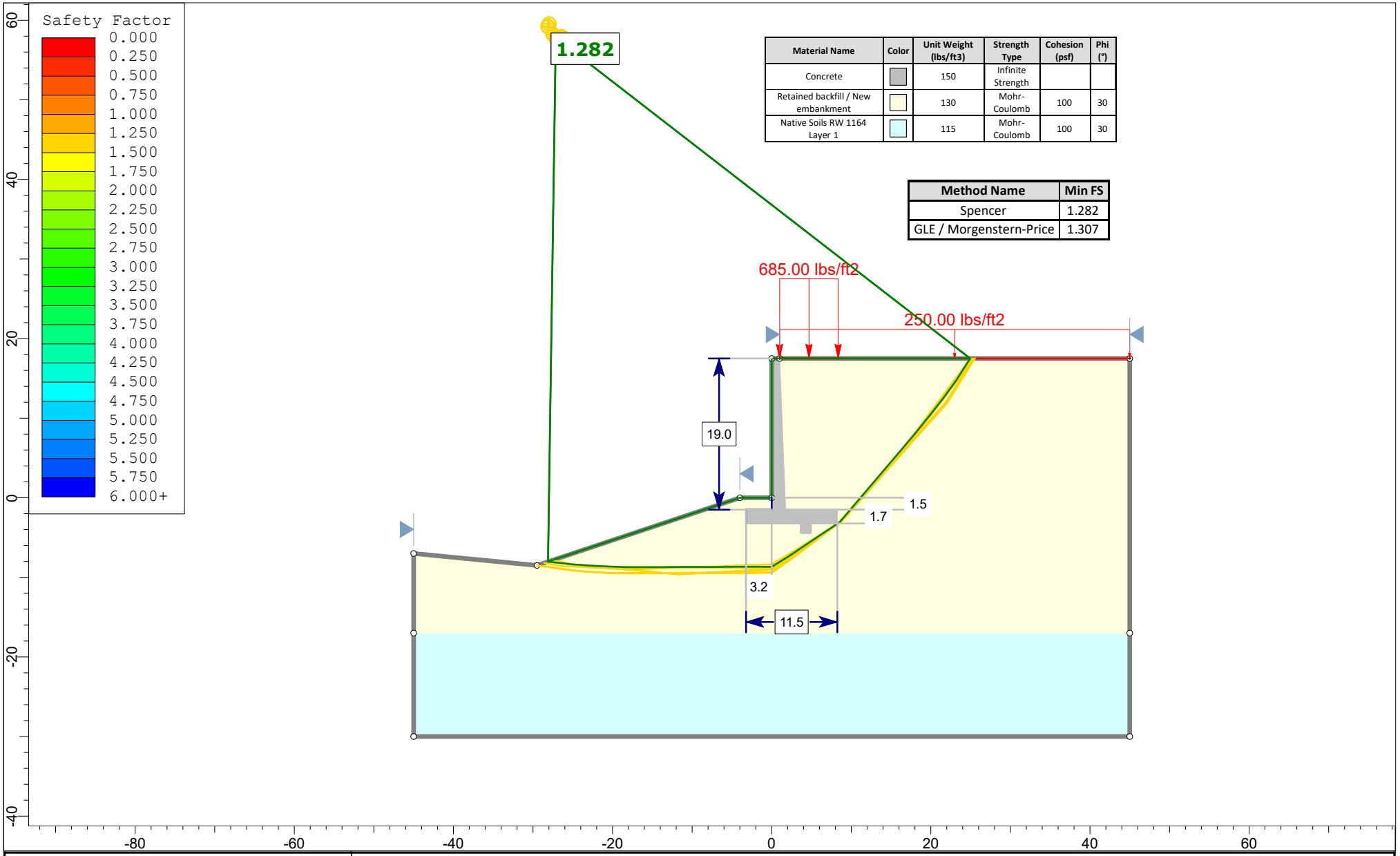
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Concrete		150	Infinite Strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW 1164 Layer 1		115	Mohr-Coulomb	100	30
Native Soils RW 1164 Layer 2		120	Mohr-Coulomb	0	34

Method Name	Min FS
Spencer	1.581
GLE / Morgenstern-Price	1.617

AZTEC TYPSA

SLIDEINTERPRET 9.034

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-1164 LT STA 1163+60 - CIP	*Scenario*	Scenario 3 - Top cover 4.5 feet
Drawn By	BDG	*Company*	AZTEC
Date	10/11/2024	*File Name*	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev1a.slmd



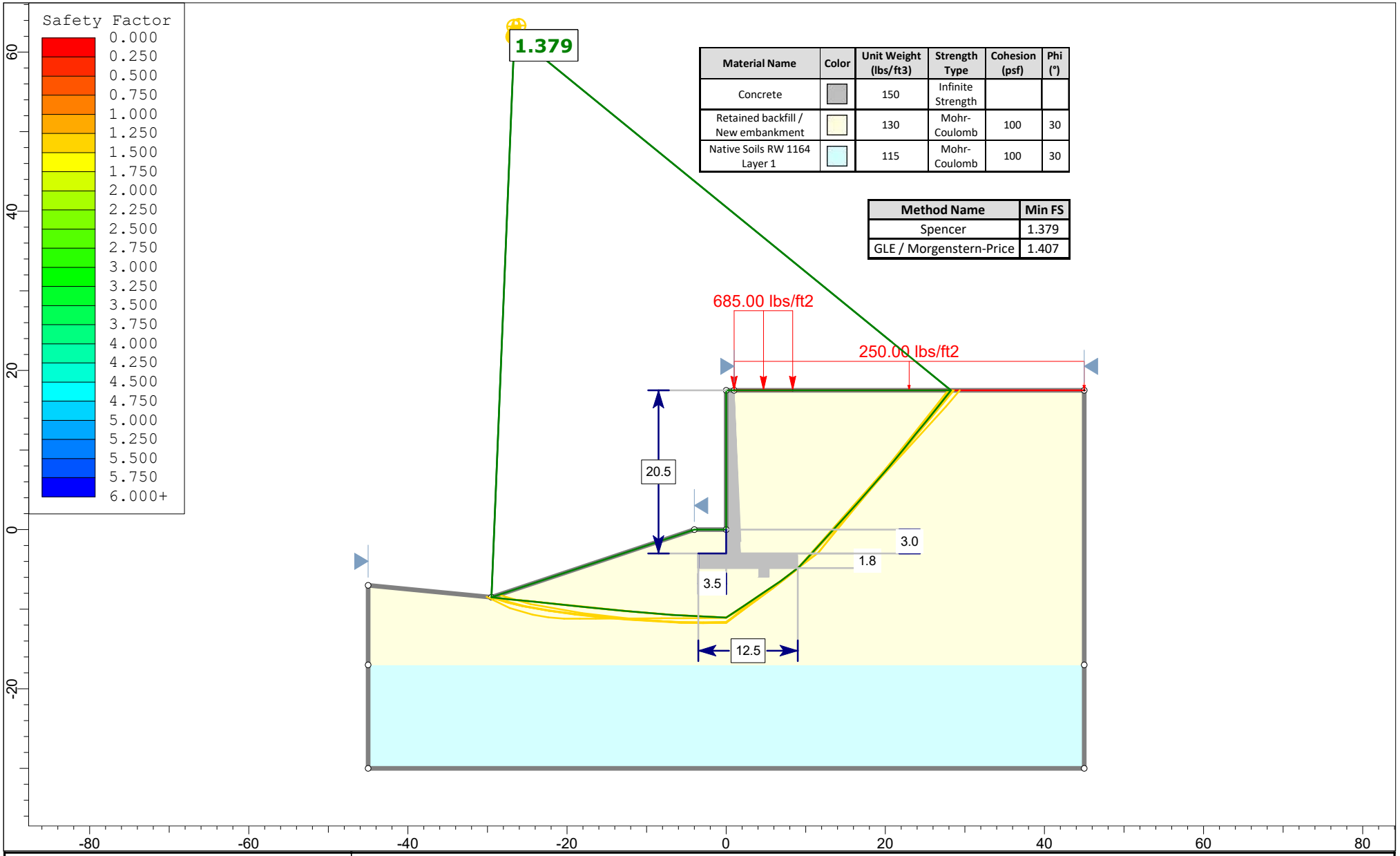
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (°)
Concrete		150	Infinite Strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW 1164 Layer 1		115	Mohr-Coulomb	100	30

Method Name	Min FS
Spencer	1.282
GLE / Morgenstern-Price	1.307

AZTEC TYPSA

SLIDEINTERPRET 9.034

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-1164 LT #2: STA 1165+00 - CIP	*Scenario*	Scenario 1 - Top cover 1.5 feet
Drawn By	BDG	*Company*	AZTEC
Date	10/11/2024	*File Name*	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev1a.slmd



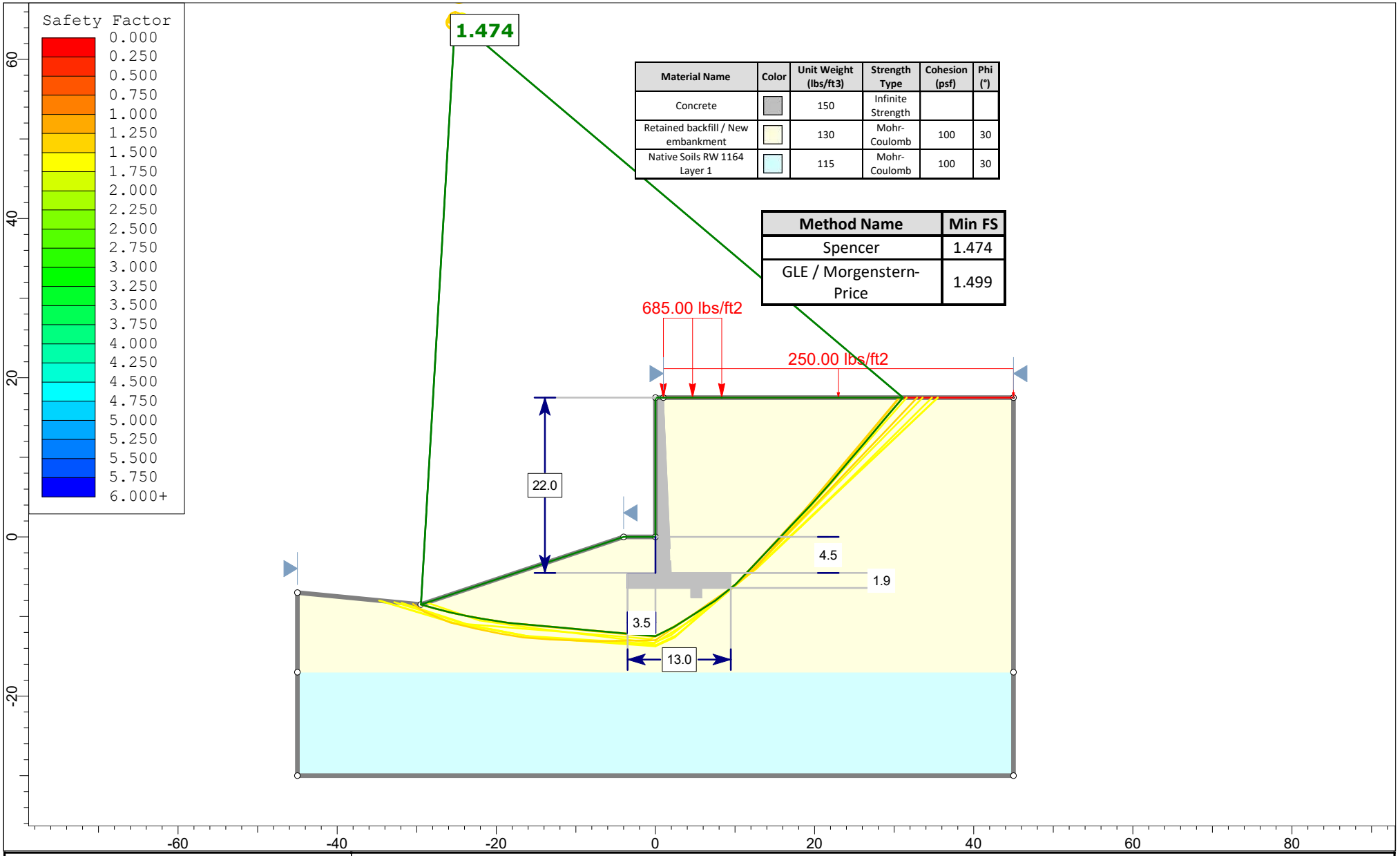
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (°)
Concrete		150	Infinite Strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW 1164 Layer 1		115	Mohr-Coulomb	100	30

Method Name	Min FS
Spencer	1.379
GLE / Morgenstern-Price	1.407

AZTEC TYPSA

SLIDEINTERPRET 9.034

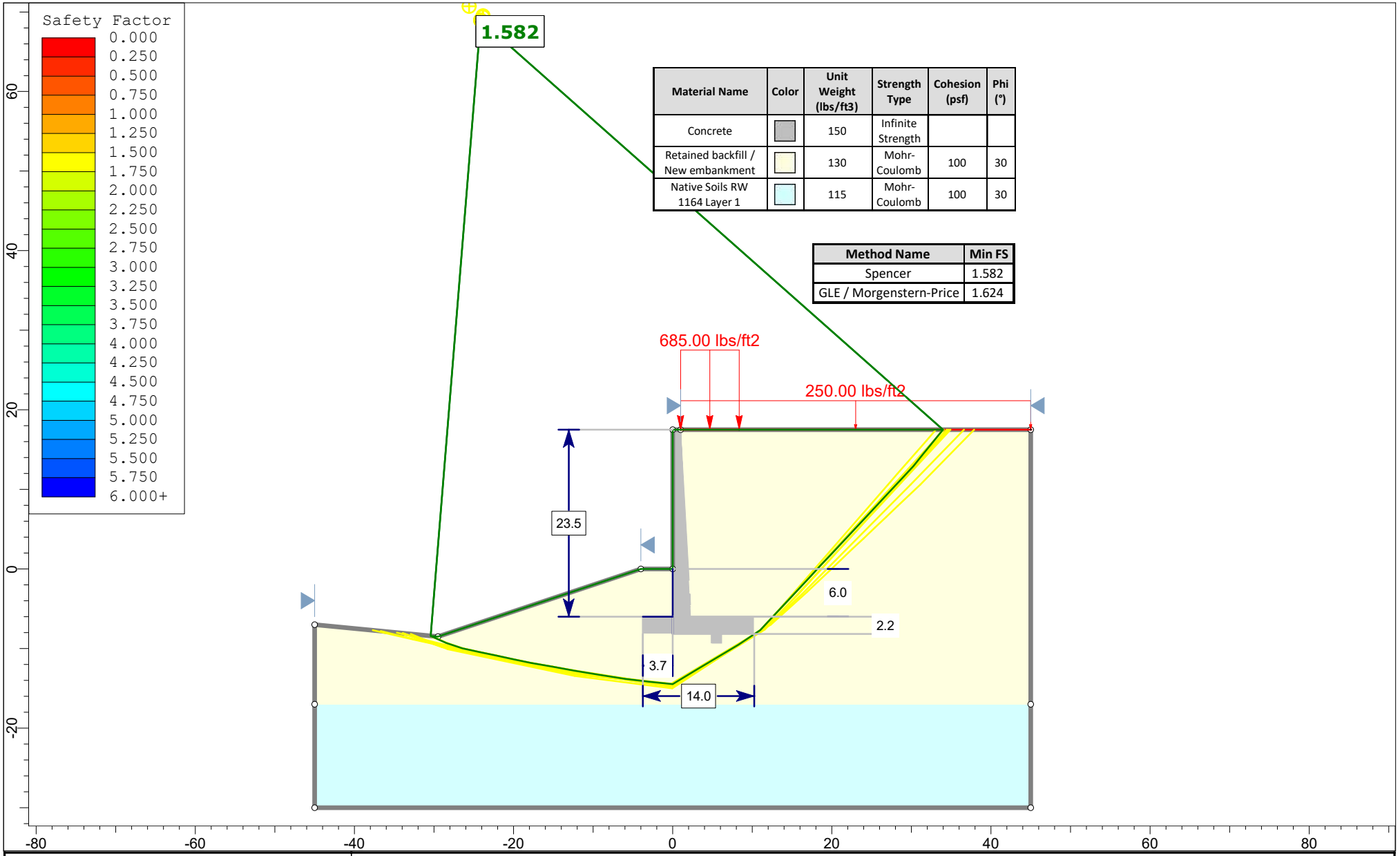
Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-1164 LT #2: STA 1165+00 - CIP	*Scenario*	Scenario 2 - Top cover 3.0 feet
Drawn By	BDG	*Company*	AZTEC
Date	10/11/2024	*File Name*	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev1a.slmd



AZTEC TYPSA

SLIDEINTERPRET 9.034

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-1164 LT #2: STA 1165+00 - CIP	*Scenario*	Scenario 3 - Top cover 4.5 feet
Drawn By	BDG	*Company*	AZTEC
Date	10/11/2024	*File Name*	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev1a.slmd



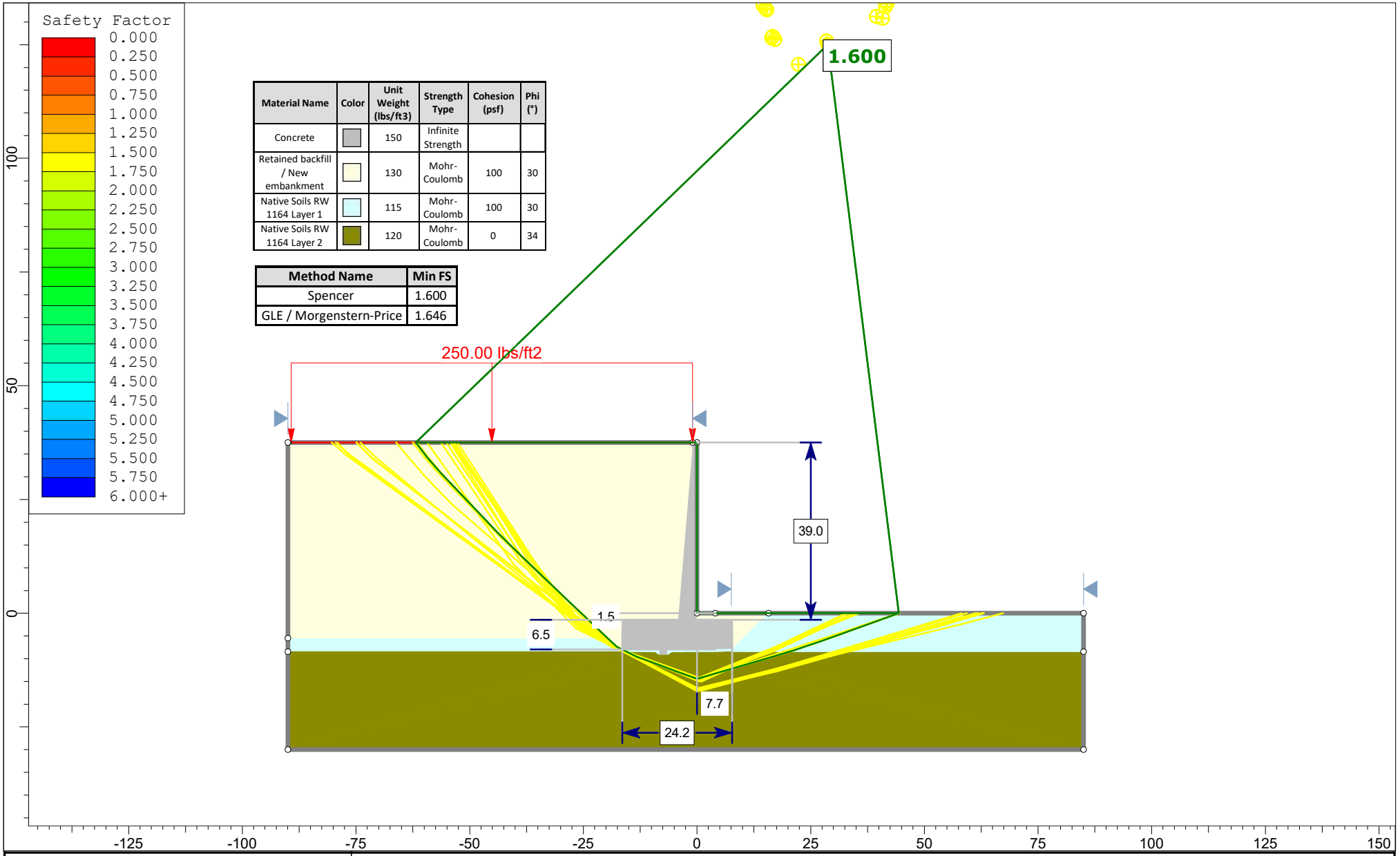
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (°)
Concrete		150	Infinite Strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW 1164 Layer 1		115	Mohr-Coulomb	100	30

Method Name	Min FS
Spencer	1.582
GLE / Morgenstern-Price	1.624

AZTEC TYPSA

SLIDEINTERPRET 9.034

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-1164 LT #2: STA 1165+00 - CIP	*Scenario*	Scenario 4 - Top cover 6.0 feet
Drawn By	BDG	*Company*	AZTEC
Date	10/11/2024	*File Name*	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev1a.slmd



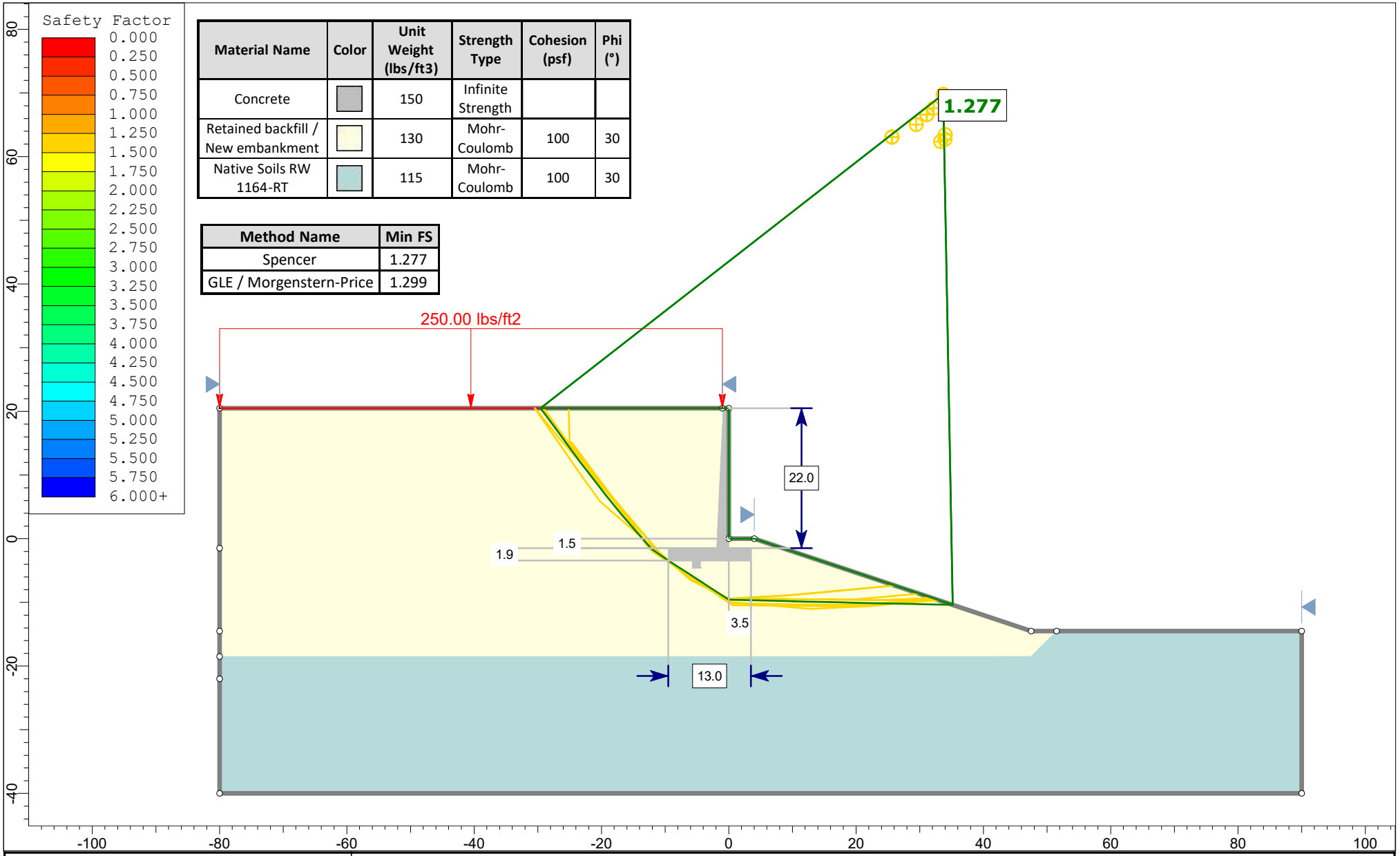
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (°)
Concrete		150	Infinite Strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW 1164 Layer 1		115	Mohr-Coulomb	100	30
Native Soils RW 1164 Layer 2		120	Mohr-Coulomb	0	34

Method Name	Min FS
Spencer	1.600
GLE / Morgenstern-Price	1.646

AZTEC TYPSA

SLIDEINTERPRET 9.034

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-1164 RT STA 1163+60 - CIP	*Scenario*	Scenario 1 - Top cover 1.5 feet
Drawn By	BDG	*Company*	AZTEC
Date	10/11/2024	*File Name*	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev1a.slmd



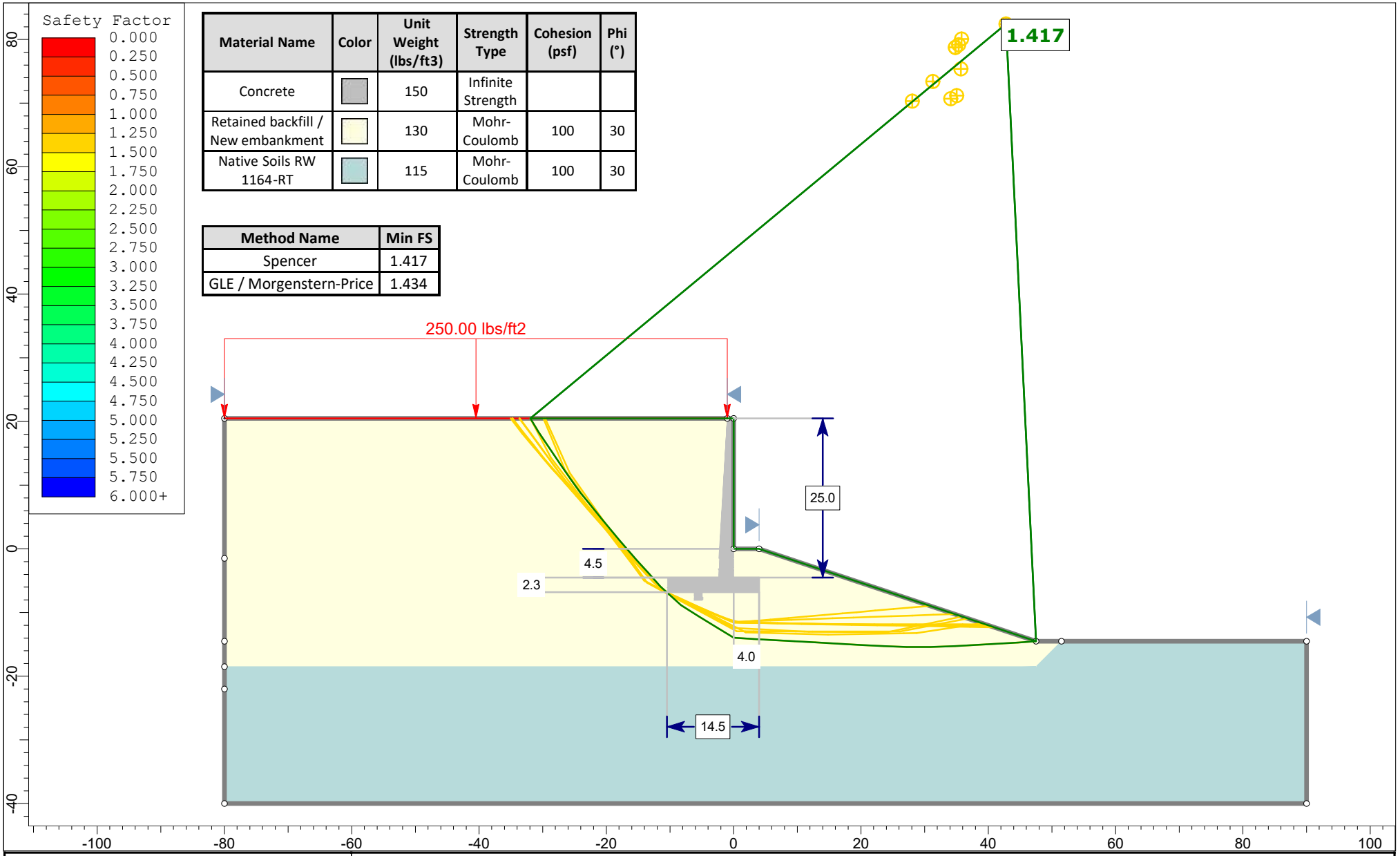
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (°)
Concrete		150	Infinite Strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW 1164-RT		115	Mohr-Coulomb	100	30

Method Name	Min FS
Spencer	1.277
GLE / Morgenstern-Price	1.299

AZTEC TYPSA

SLIDEINTERPRET 9.034

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-1164 RT#2: STA 1164+20 - CIP	Scenario	Scenario 1 - Top cover 1.5 feet
Drawn By	BDG	Company	AZTEC
Date	10/11/2024	File Name	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev1a.slmd



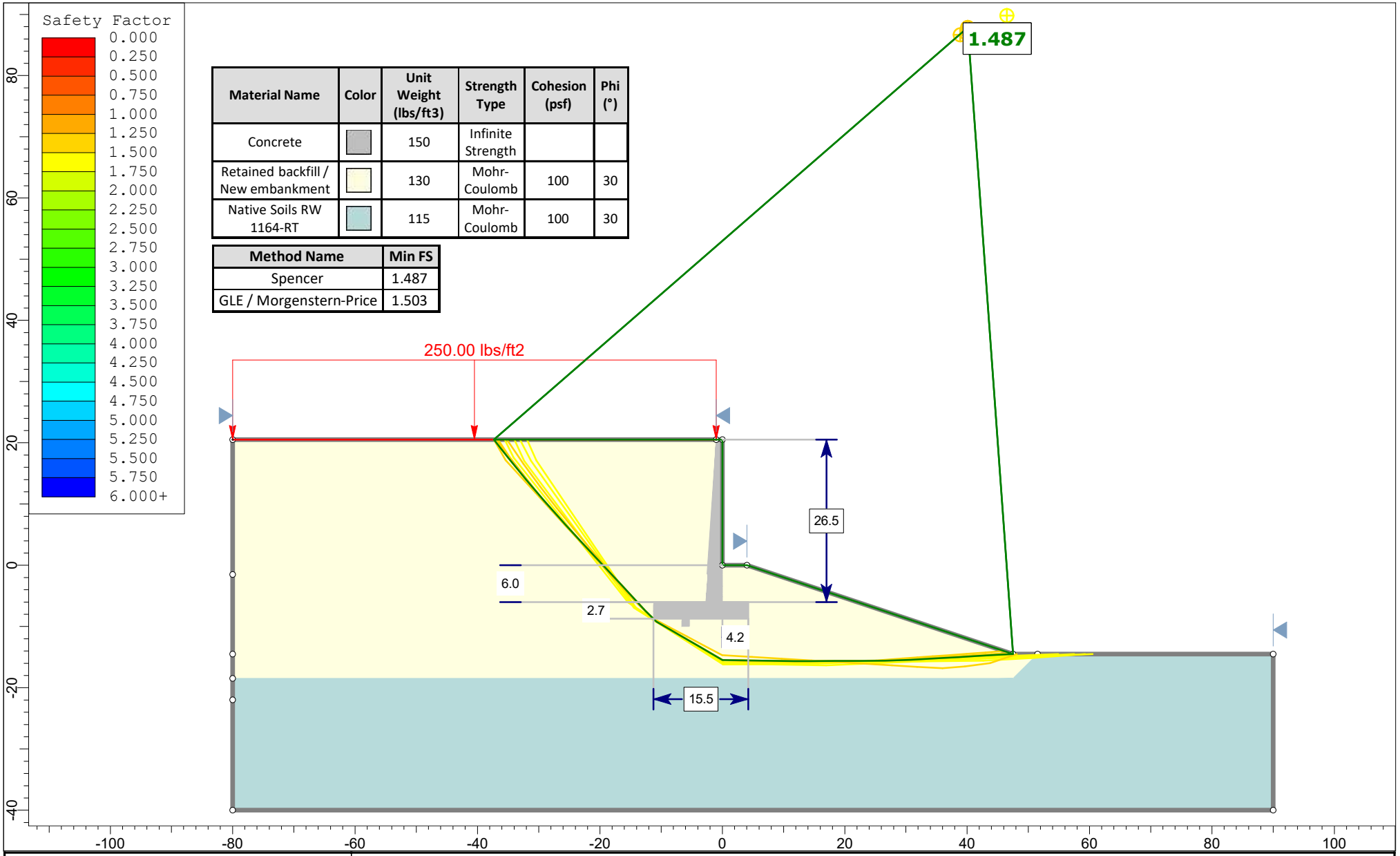
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (°)
Concrete		150	Infinite Strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW 1164-RT		115	Mohr-Coulomb	100	30

Method Name	Min FS
Spencer	1.417
GLE / Morgenstern-Price	1.434

AZTEC TYPSA

SLIDEINTERPRET 9.034

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-1164 RT#2: STA 1164+20 - CIP	Scenario	Scenario 3 - Top cover 4.5 feet
Drawn By	BDG	Company	AZTEC
Date	10/11/2024	File Name	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev1a.slmd



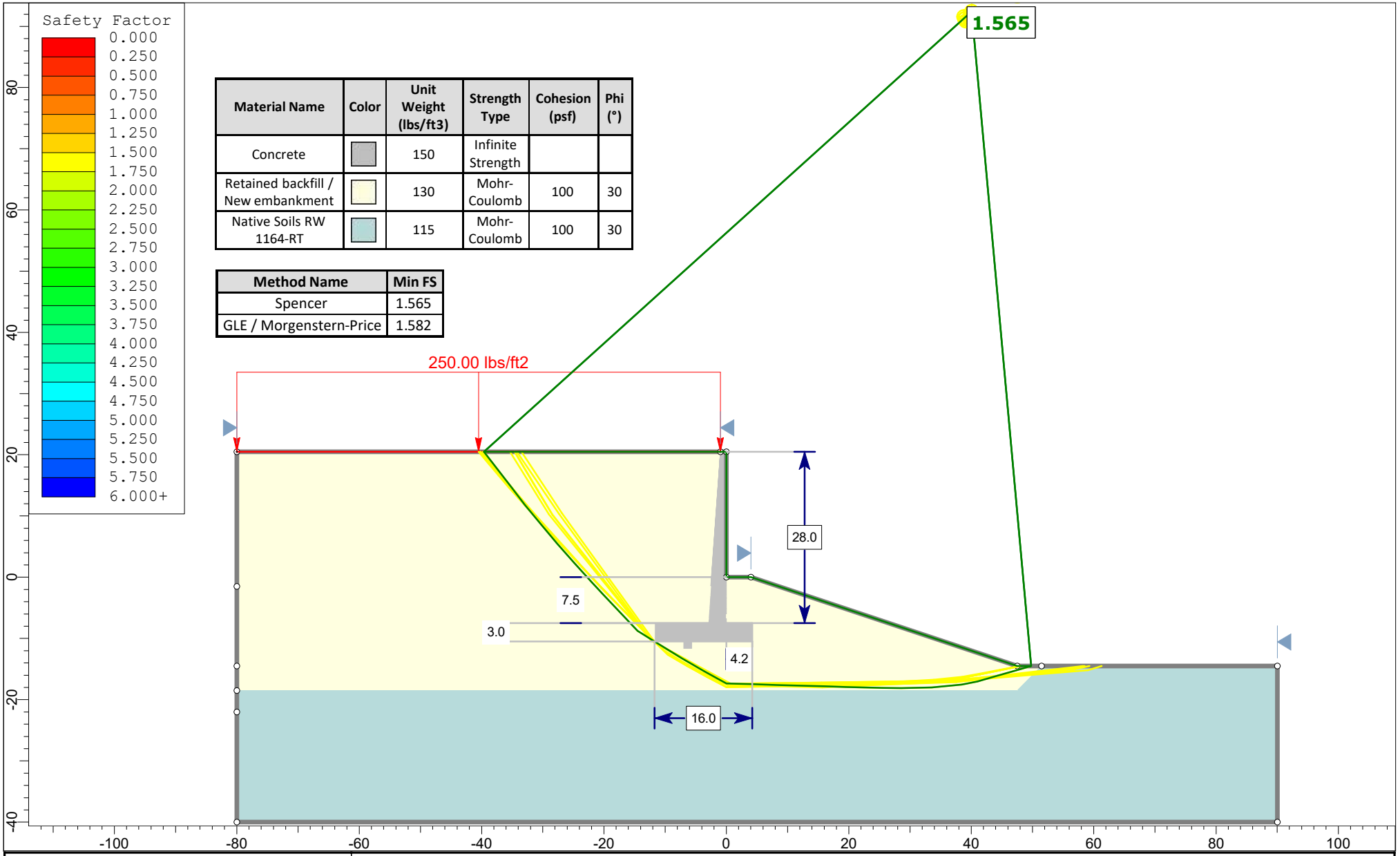
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (°)
Concrete		150	Infinite Strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW 1164-RT		115	Mohr-Coulomb	100	30

Method Name	Min FS
Spencer	1.487
GLE / Morgenstern-Price	1.503

AZTEC TYPSA

SLIDEINTERPRET 9.034

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-1164 RT#2: STA 1164+20 - CIP	Scenario	Scenario 4 - Top cover 6.0 feet
Drawn By	BDG	Company	AZTEC
Date	10/11/2024	File Name	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev1a.slmd



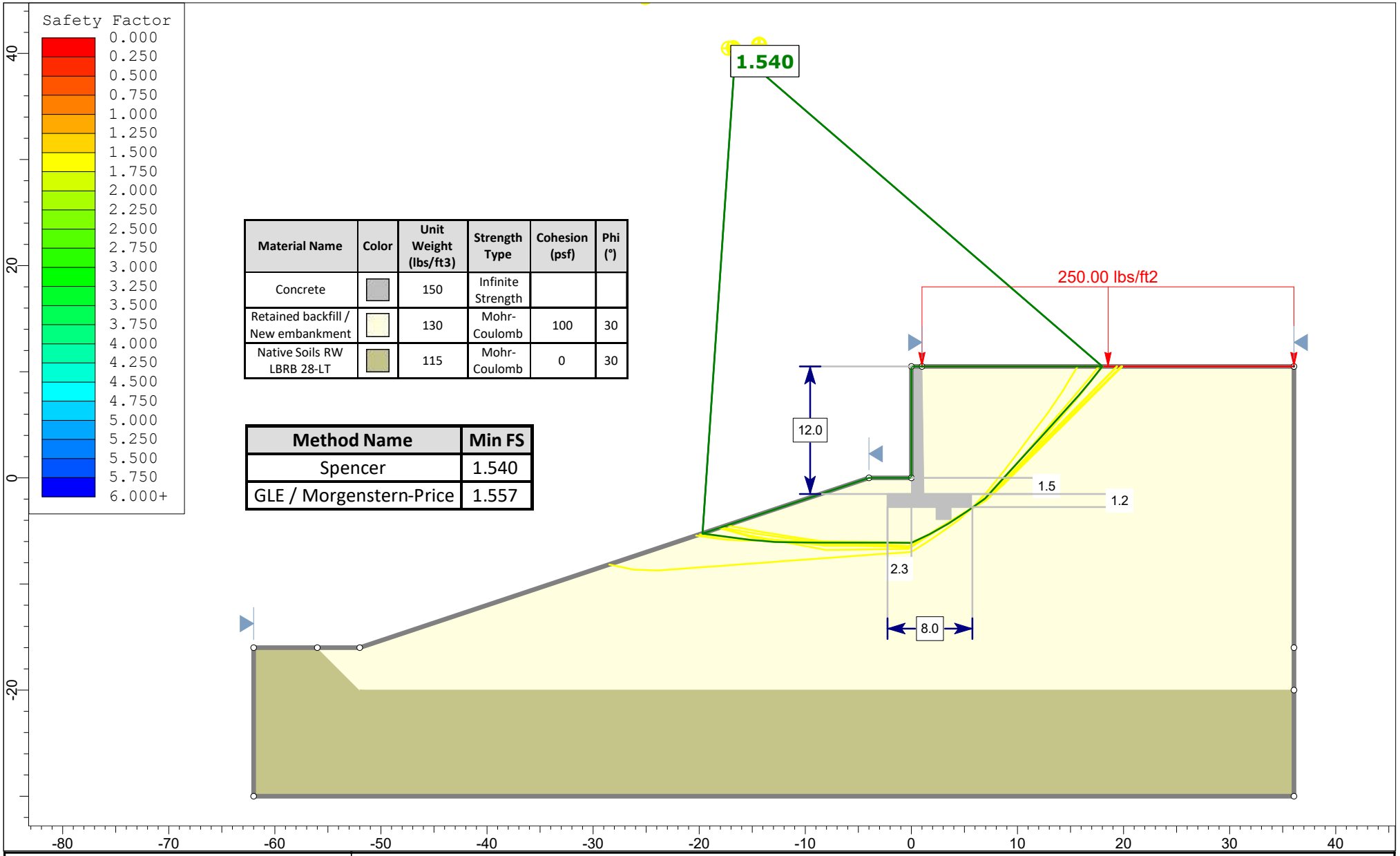
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (°)
Concrete		150	Infinite Strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW 1164-RT		115	Mohr-Coulomb	100	30

Method Name	Min FS
Spencer	1.565
GLE / Morgenstern-Price	1.582

AZTEC TYPSA

SLIDEINTERPRET 9.034

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-1164 RT#2: STA 1164+20 - CIP	Scenario	Scenario 5 - Top Cover 7.5 feet
Drawn By	BDG	Company	AZTEC
Date	10/11/2024	File Name	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev1a.slmd



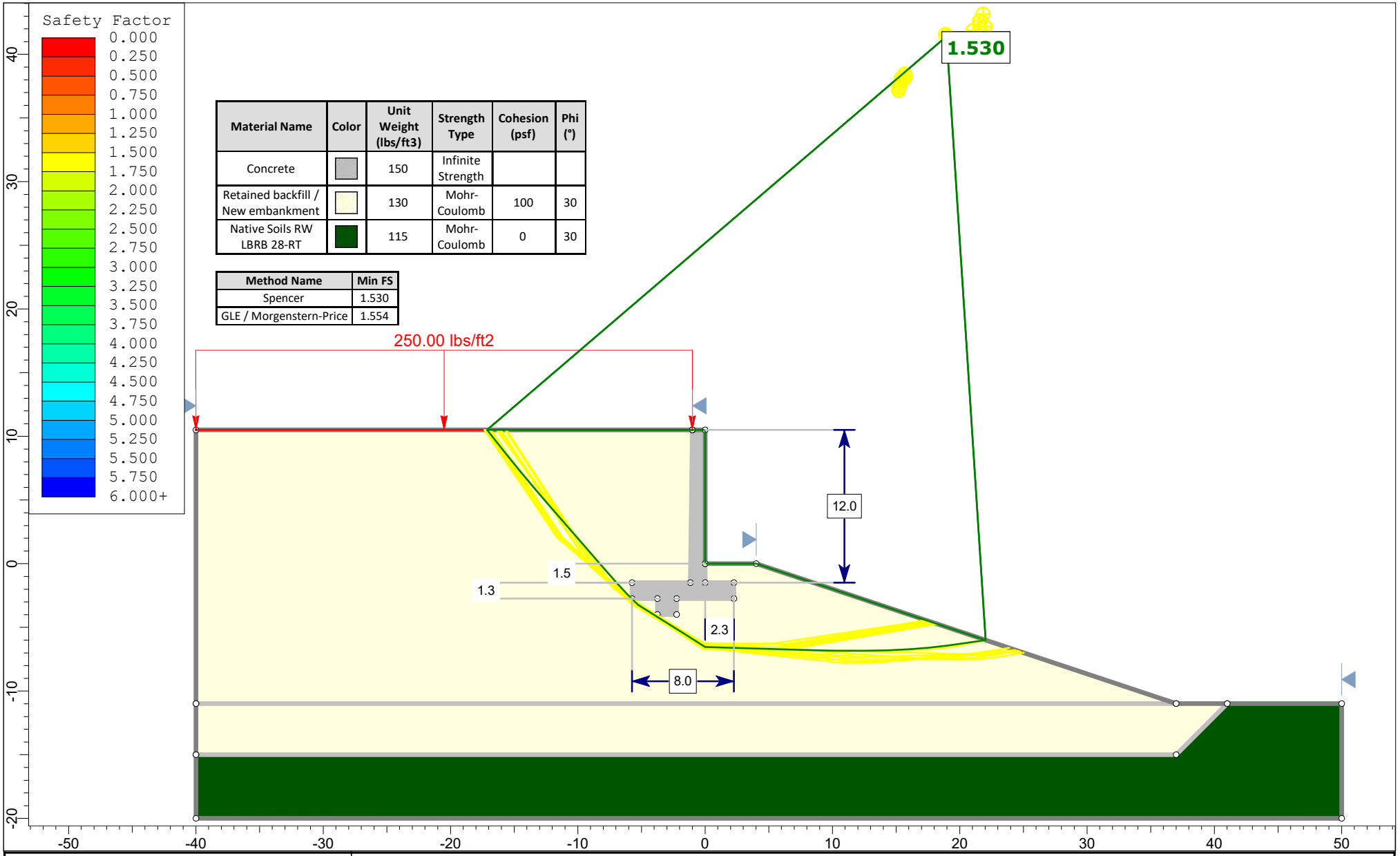
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (°)
Concrete		150	Infinite Strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW LBRB 28-LT		115	Mohr-Coulomb	0	30

Method Name	Min FS
Spencer	1.540
GLE / Morgenstern-Price	1.557

AZTEC TYPSA

SLIDEINTERPRET 9.034

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-LBRB 28 LT STA 28+15 - CIP	*Scenario*	Scenario 1 - Top cover 1.5 feet
Drawn By	BDG	*Company*	AZTEC
Date	10/11/2024	*File Name*	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev1a.slmd



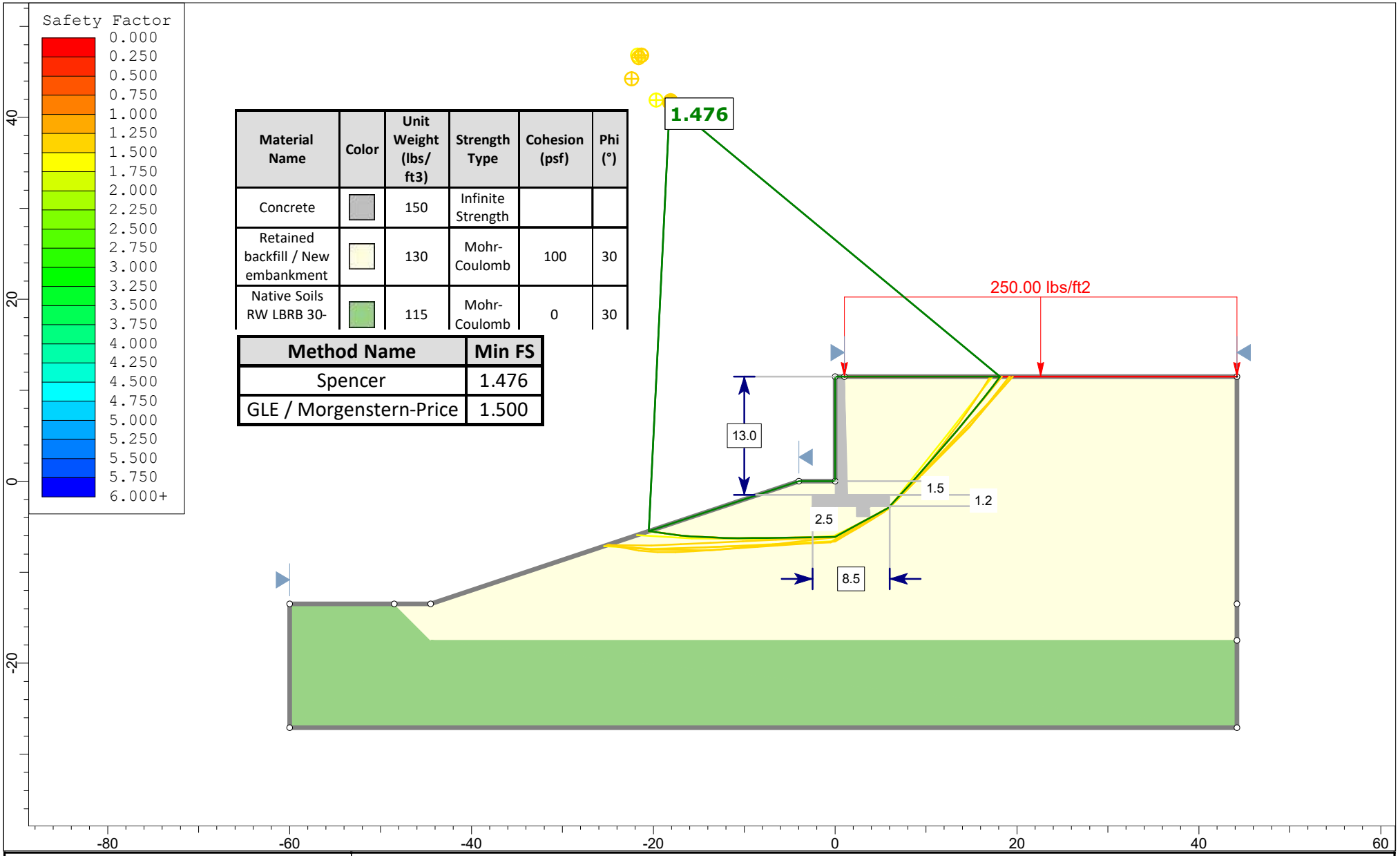
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (°)
Concrete		150	Infinite Strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW LBRB 28-RT		115	Mohr-Coulomb	0	30

Method Name	Min FS
Spencer	1.530
GLE / Morgenstern-Price	1.554

AZTEC TYPSA

SLIDEINTERPRET 9.034

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-LBRB 28 RT STA 28+40 - CIP	Scenario	Scenario 1 - Top cover 1.5 feet
Drawn By	BDG	Company	AZTEC
Date	10/11/2024	File Name	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev1a.slmd



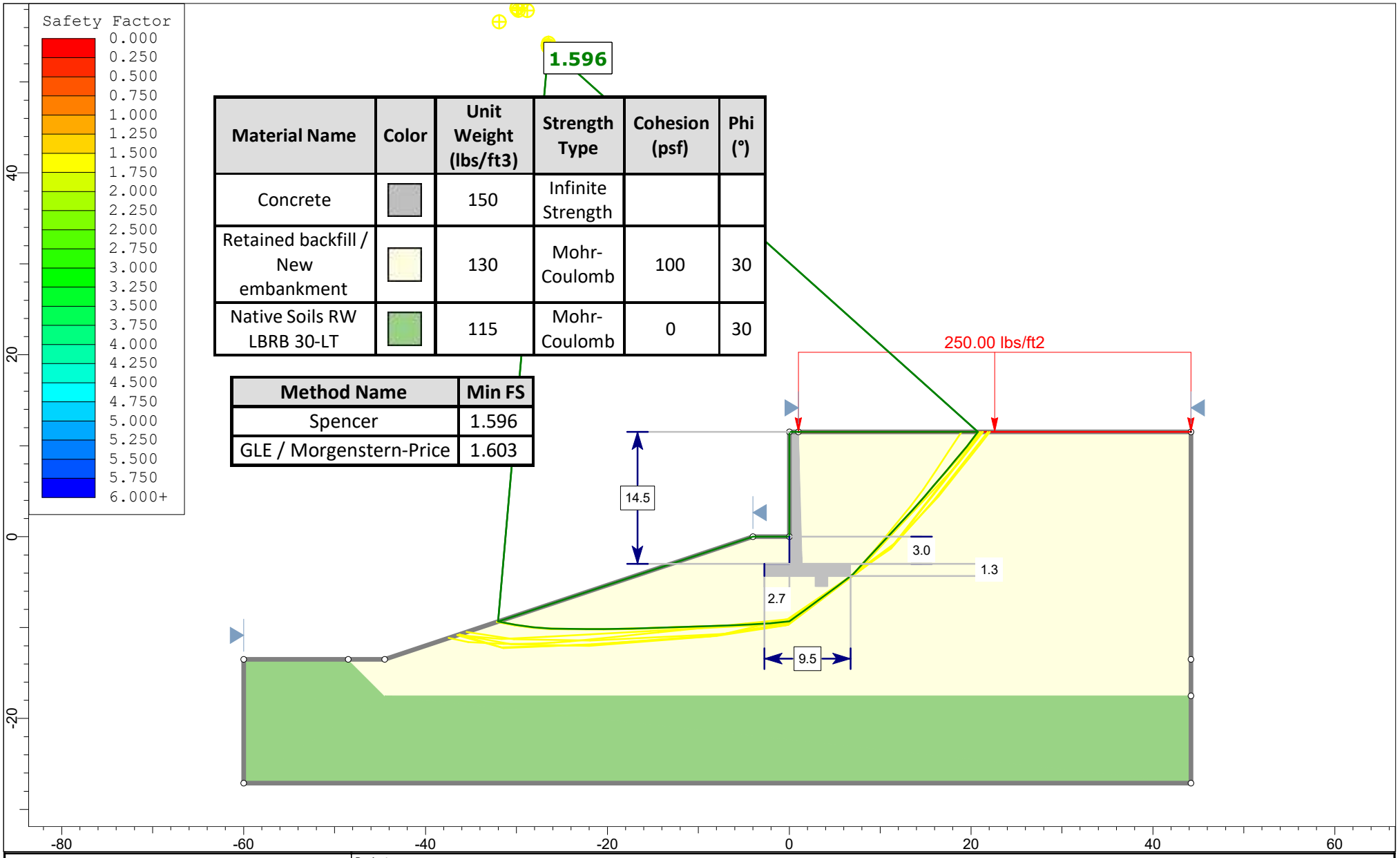
Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (°)
Concrete		150	Infinite Strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW LBRB 30-		115	Mohr-Coulomb	0	30

Method Name	Min FS
Spencer	1.476
GLE / Morgenstern-Price	1.500

AZTEC TYPSA

SLIDEINTERPRET 9.034

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-LBRB 30 LT STA 30+22 - CIP	Scenario	Scenario 1 - Top cover 1.5 feet
Drawn By	BDG	Company	AZTEC
Date	10/11/2024	File Name	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev1a.slmd



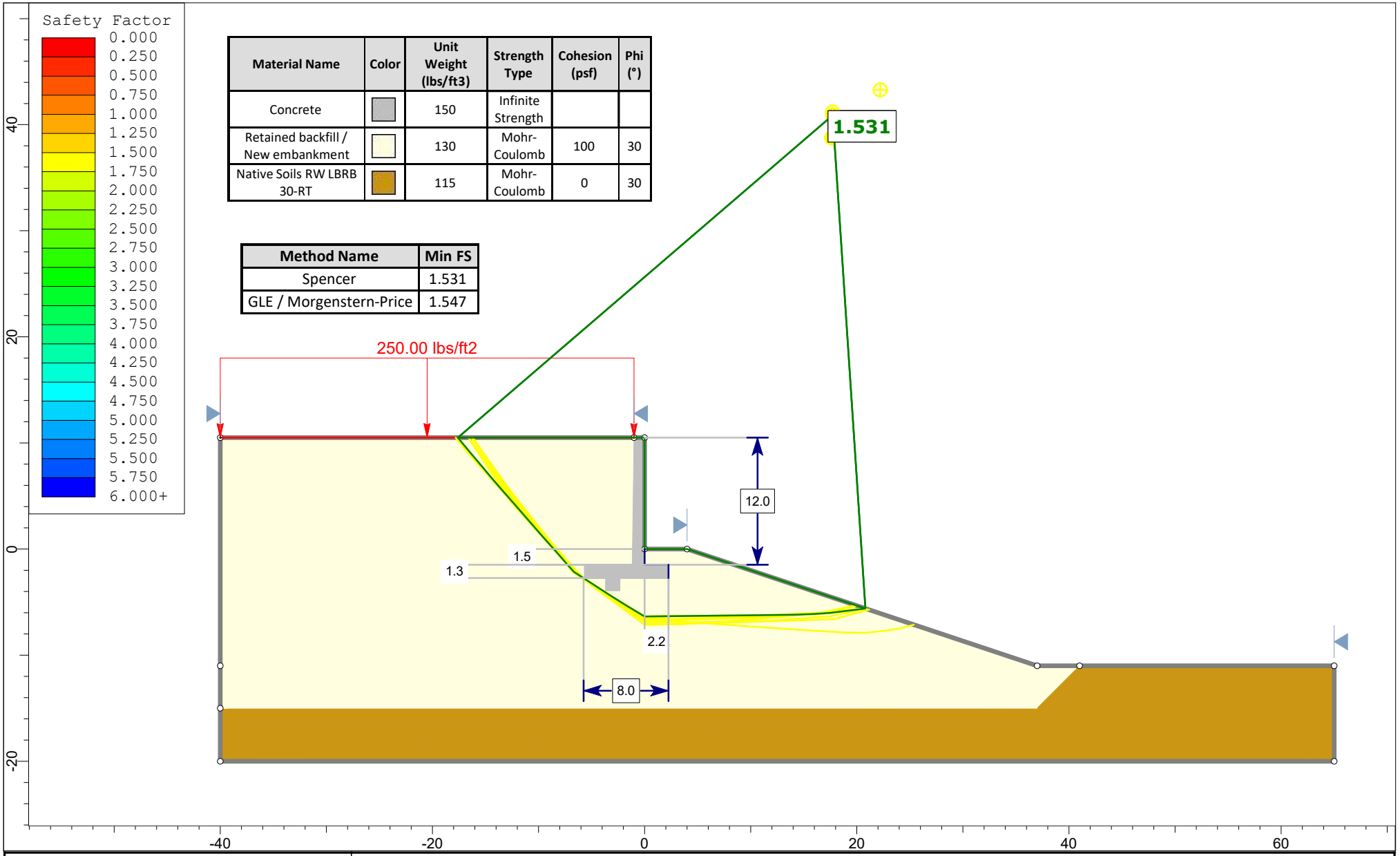
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (°)
Concrete		150	Infinite Strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW LBRB 30-LT		115	Mohr-Coulomb	0	30

Method Name	Min FS
Spencer	1.596
GLE / Morgenstern-Price	1.603

AZTEC TYPSA

SLIDEINTERPRET 9.034

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-LBRB 30 LT STA 30+22 - CIP	Scenario	Scenario 2 - Top cover 3.0 feet
Drawn By	BDG	Company	AZTEC
Date	10/11/2024	File Name	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev1a.slmd



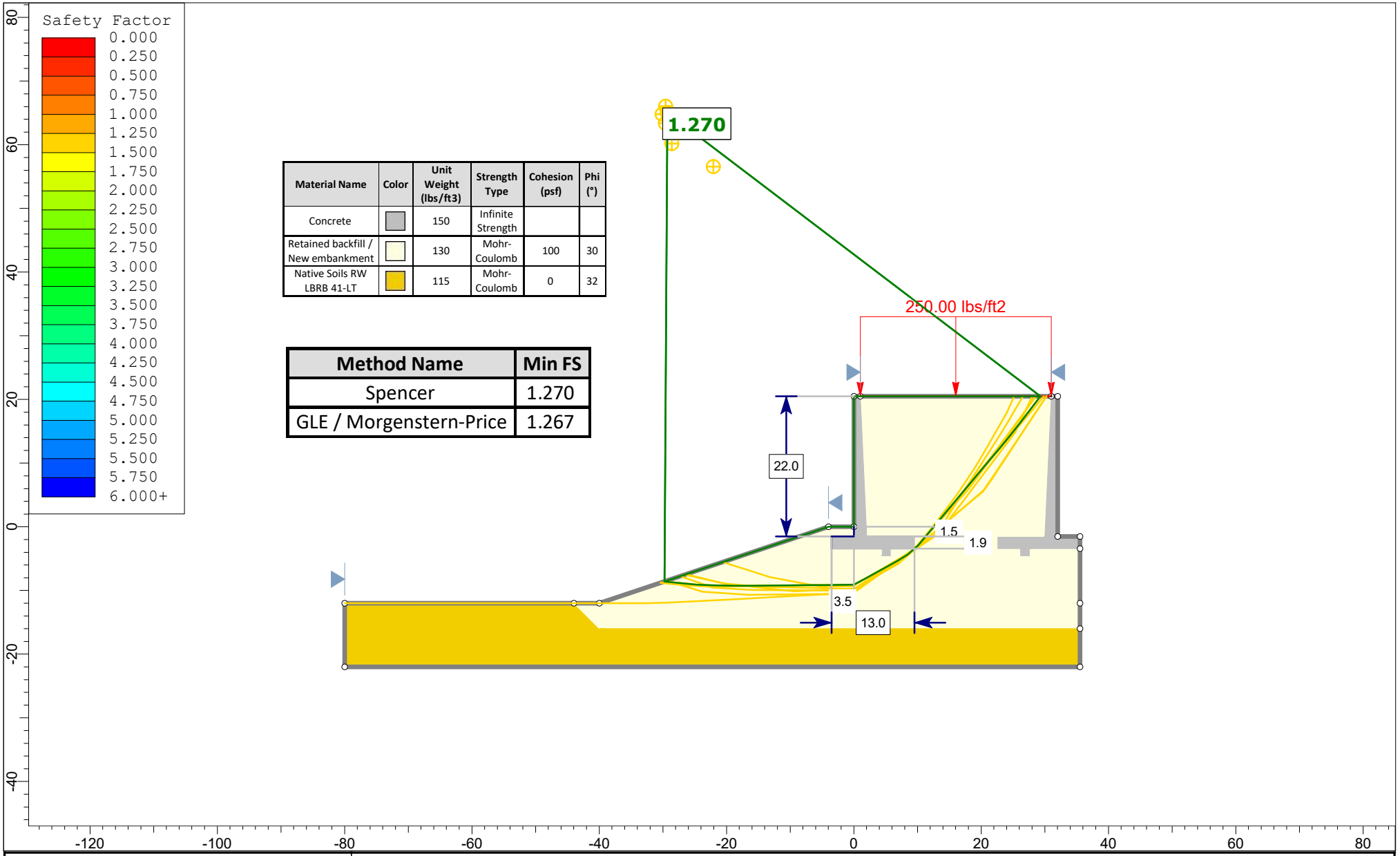
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (°)
Concrete		150	Infinite Strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW LBRB 30-RT		115	Mohr-Coulomb	0	30

Method Name	Min FS
Spencer	1.531
GLE / Morgenstern-Price	1.547

AZTEC TYPSA

SLIDEINTERPRET 9.034

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-LBRB 30 RT STA 30+45 - CIP	*Scenario*	Scenario 1 - Top cover 1.5 feet
Drawn By	BDG	*Company*	AZTEC
Date	10/11/2024	*File Name*	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev1a.slmd



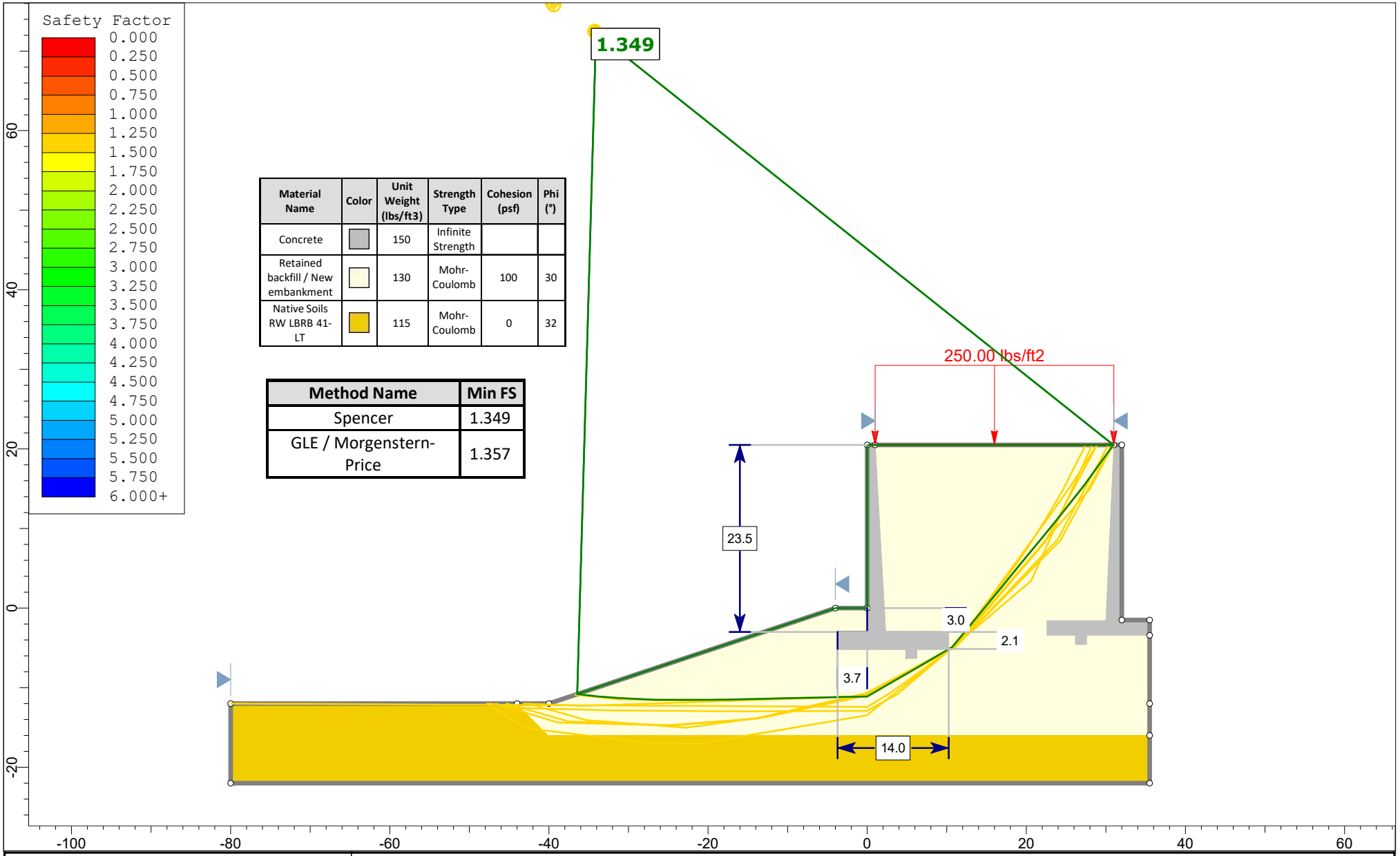
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (°)
Concrete		150	Infinite Strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW LBRB 41-LT		115	Mohr-Coulomb	0	32

Method Name	Min FS
Spencer	1.270
GLE / Morgenstern-Price	1.267

AZTEC TYPSA

SLIDEINTERPRET 9.034

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-LBRB 41 LT STA 41+45 - CIP	*Scenario*	Scenario 1 - Top cover 1.5 feet
Drawn By	BDG	*Company*	AZTEC
Date	10/11/2024	*File Name*	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev1a.slmd



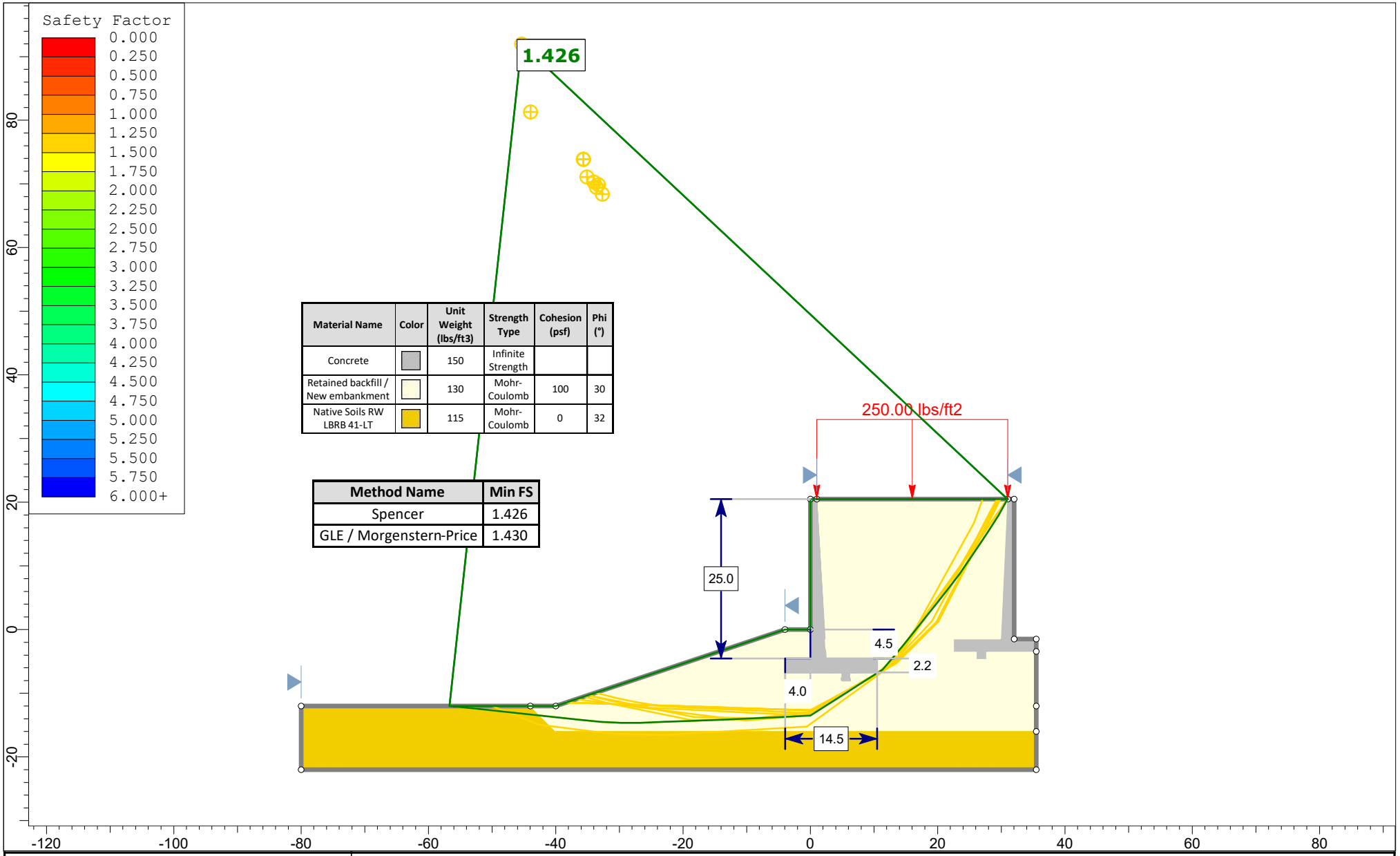
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (°)
Concrete		150	Infinite Strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW LBRB 41-LT		115	Mohr-Coulomb	0	32

Method Name	Min FS
Spencer	1.349
GLE / Morgenstern-Price	1.357

AZTEC TYPSA

SLIDEINTERPRET 9.034

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-LBRB 41 LT STA 41+45 - CIP	Scenario	Scenario 2 - Top cover 3.0 feet
Drawn By	BDG	Company	AZTEC
Date	10/11/2024	File Name	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev1a.slmd



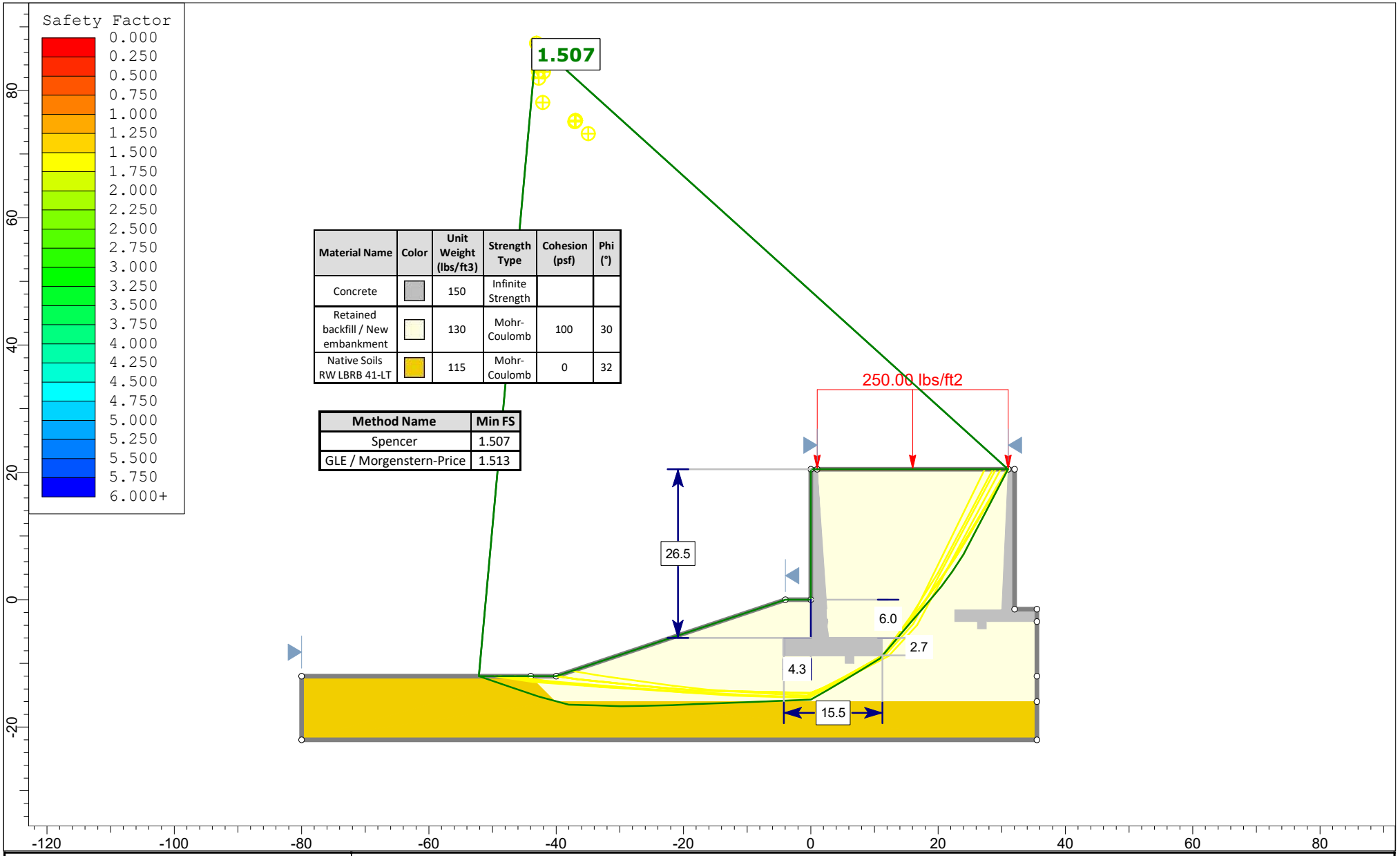
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (°)
Concrete		150	Infinite Strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW LBRB 41-LT		115	Mohr-Coulomb	0	32

Method Name	Min FS
Spencer	1.426
GLE / Morgenstern-Price	1.430

AZTEC TYPSA

SLIDEINTERPRET 9.034

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-LBRB 41 LT STA 41+45 - CIP	*Scenario*	Scenario 3 - Top cover 4.5 feet
Drawn By	BDG	*Company*	AZTEC
Date	10/11/2024	*File Name*	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev1a.slmd



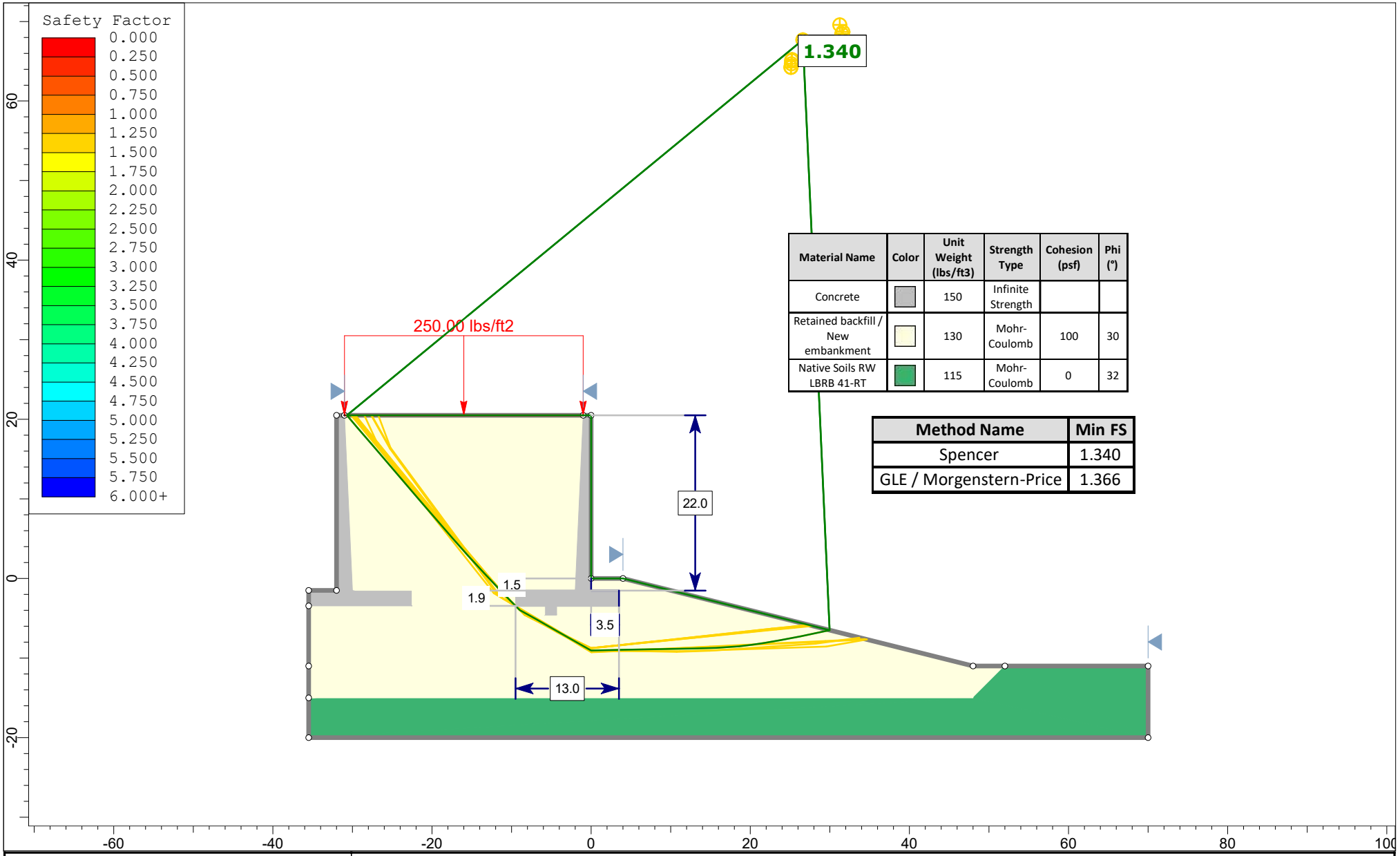
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (°)
Concrete		150	Infinite Strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW LBRB 41-LT		115	Mohr-Coulomb	0	32

Method Name	Min FS
Spencer	1.507
GLE / Morgenstern-Price	1.513

AZTEC TYPSA

SLIDEINTERPRET 9.034

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-LBRB 41 LT STA 41+45 - CIP	Scenario	Scenario 4 - Top cover 6.0 feet
Drawn By	BDG	Company	AZTEC
Date	10/11/2024	File Name	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev1a.slmd



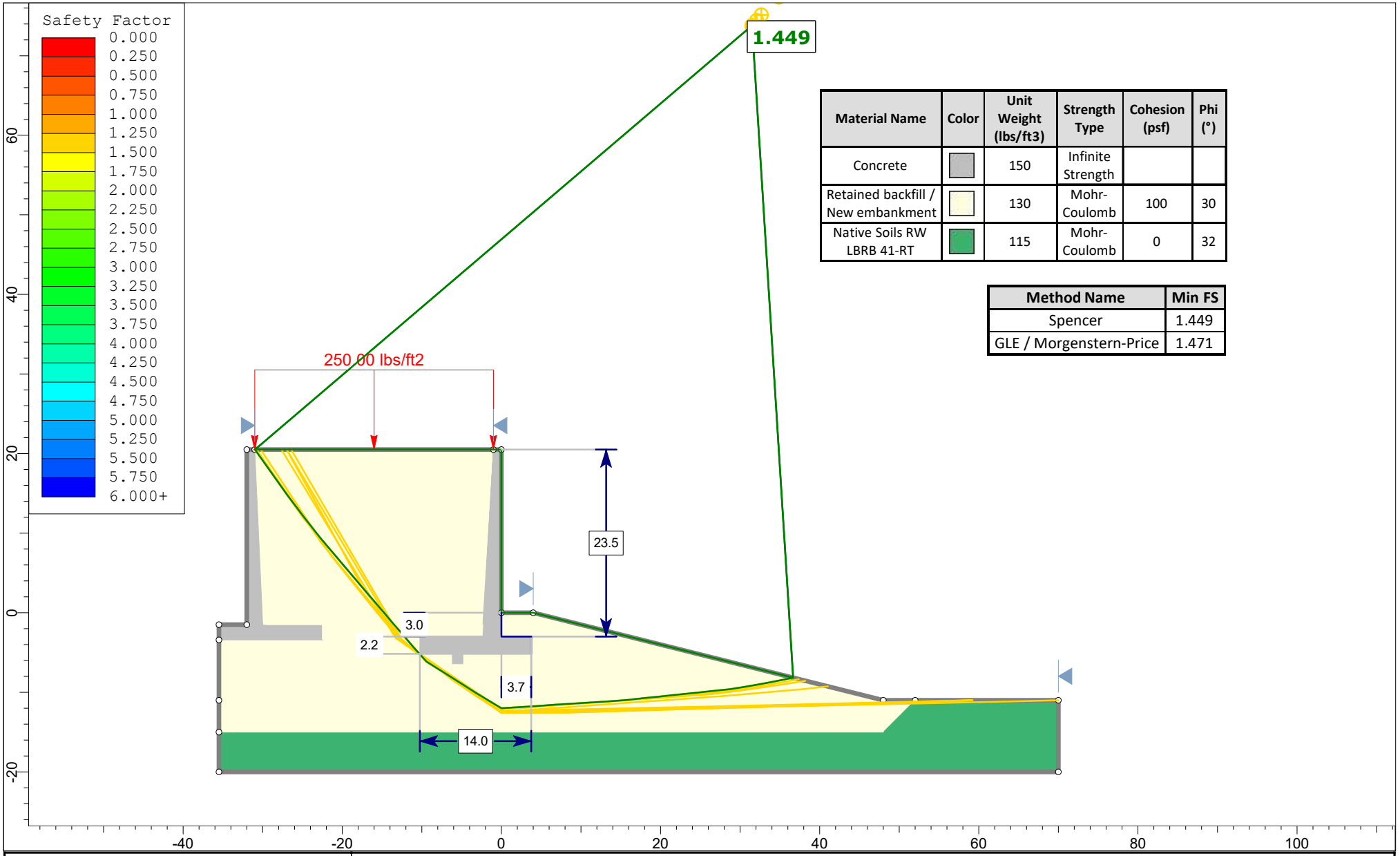
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (°)
Concrete		150	Infinite Strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW LBRB 41-RT		115	Mohr-Coulomb	0	32

Method Name	Min FS
Spencer	1.340
GLE / Morgenstern-Price	1.366

AZTEC TYPSA

SLIDEINTERPRET 9.034

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-LBRB 41 RT STA 41+22 - CIP	Scenario	Scenario 1 - Top cover 1.5 feet
Drawn By	BDG	Company	AZTEC
Date	10/11/2024	File Name	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev1a.slmd



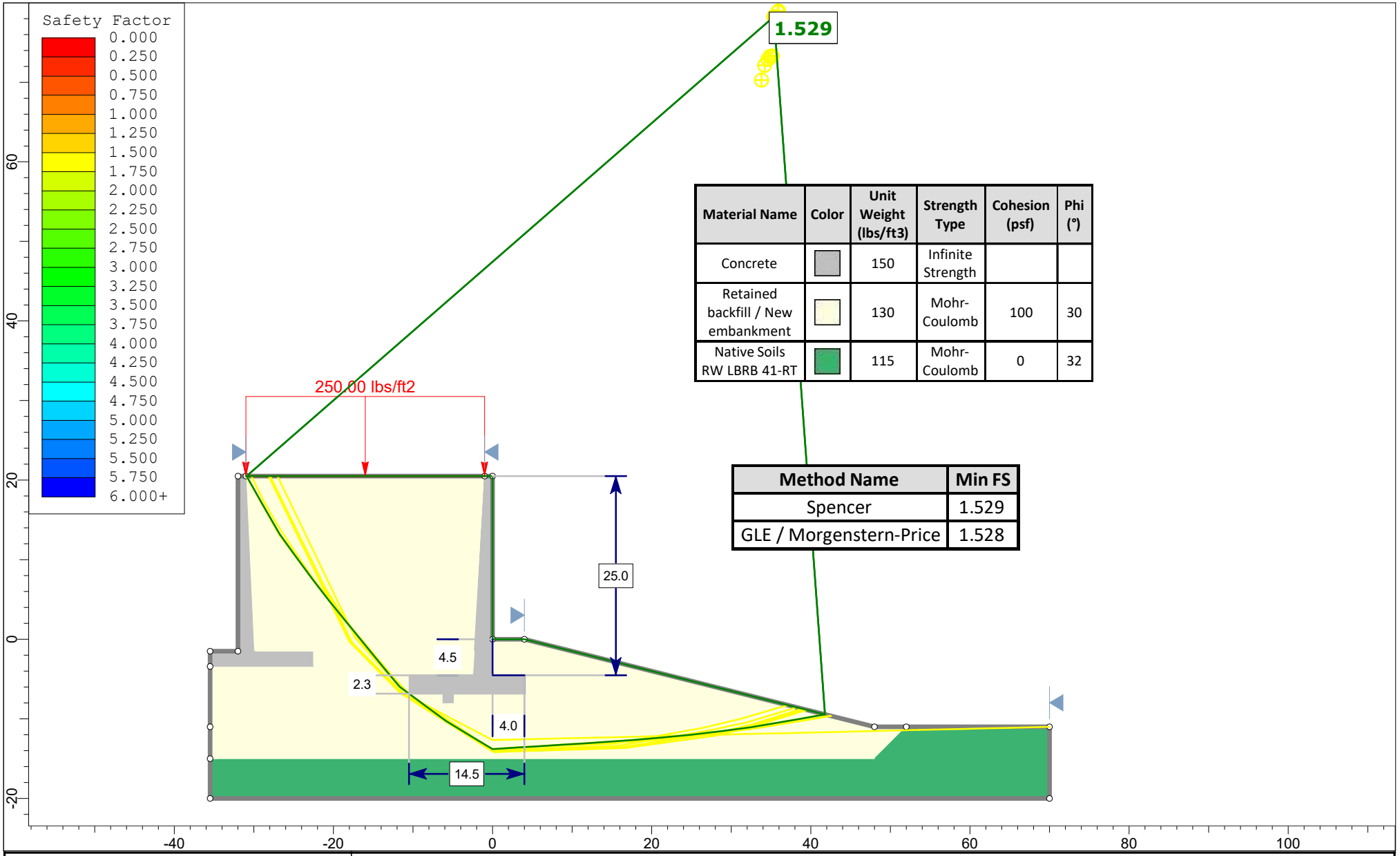
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (°)
Concrete		150	Infinite Strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW LBRB 41-RT		115	Mohr-Coulomb	0	32

Method Name	Min FS
Spencer	1.449
GLE / Morgenstern-Price	1.471

AZTEC TYPSA

SLIDEINTERPRET 9.034

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-LBRB 41 RT STA 41+22 - CIP	Scenario	Scenario 2 - Top cover 3.0 feet
Drawn By	BDG	Company	AZTEC
Date	10/11/2024	File Name	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev1a.slmd



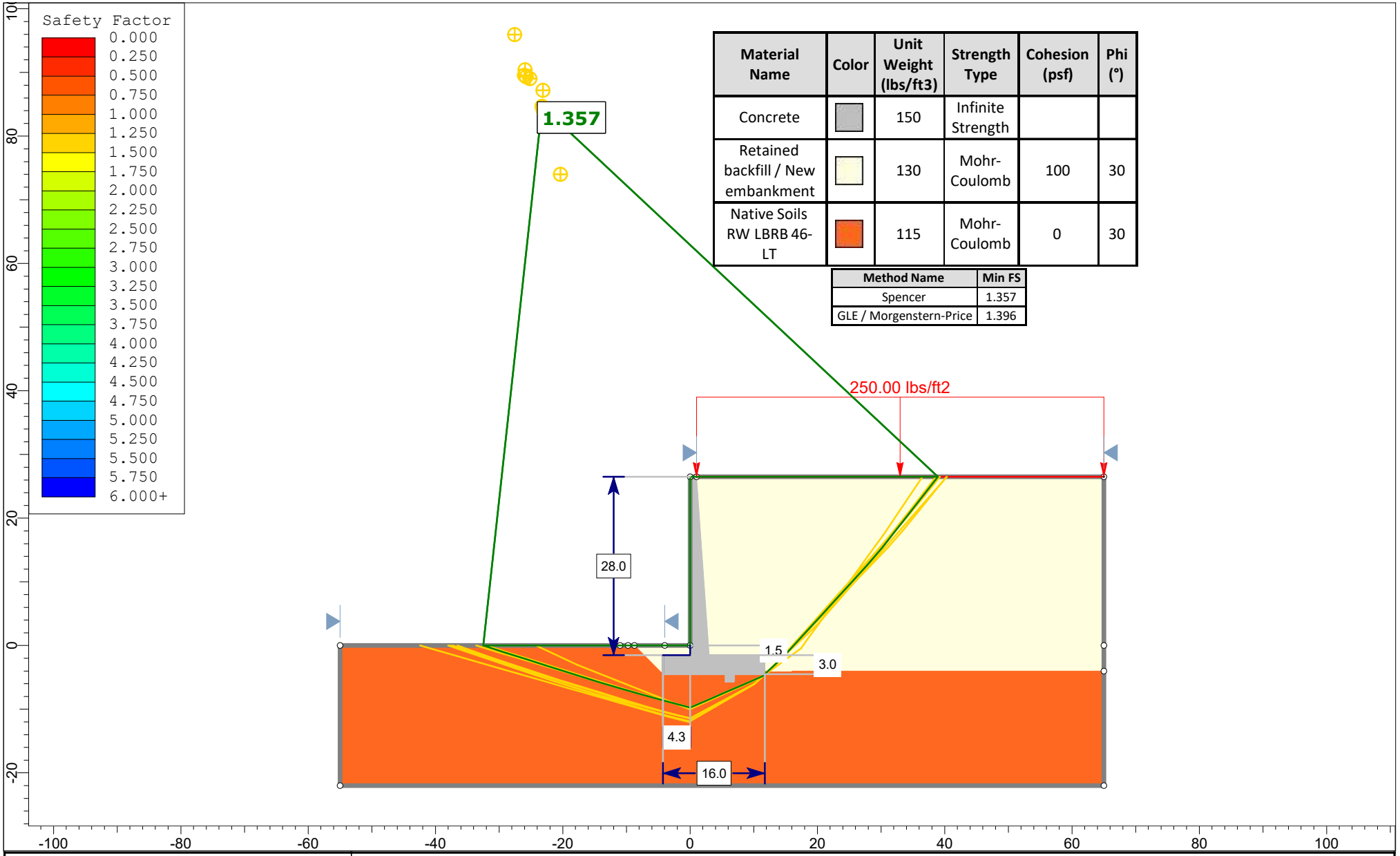
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (°)
Concrete		150	Infinite Strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW LBRB 41-RT		115	Mohr-Coulomb	0	32

Method Name	Min FS
Spencer	1.529
GLE / Morgenstern-Price	1.528

AZTEC TYPSA

SLIDEINTERPRET 9.034

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-LBRB 41 RT STA 41+22 - CIP	Scenario	Scenario 3 - Top cover 4.5 feet
Drawn By	BDG	Company	AZTEC
Date	10/11/2024	File Name	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev1a.slmd



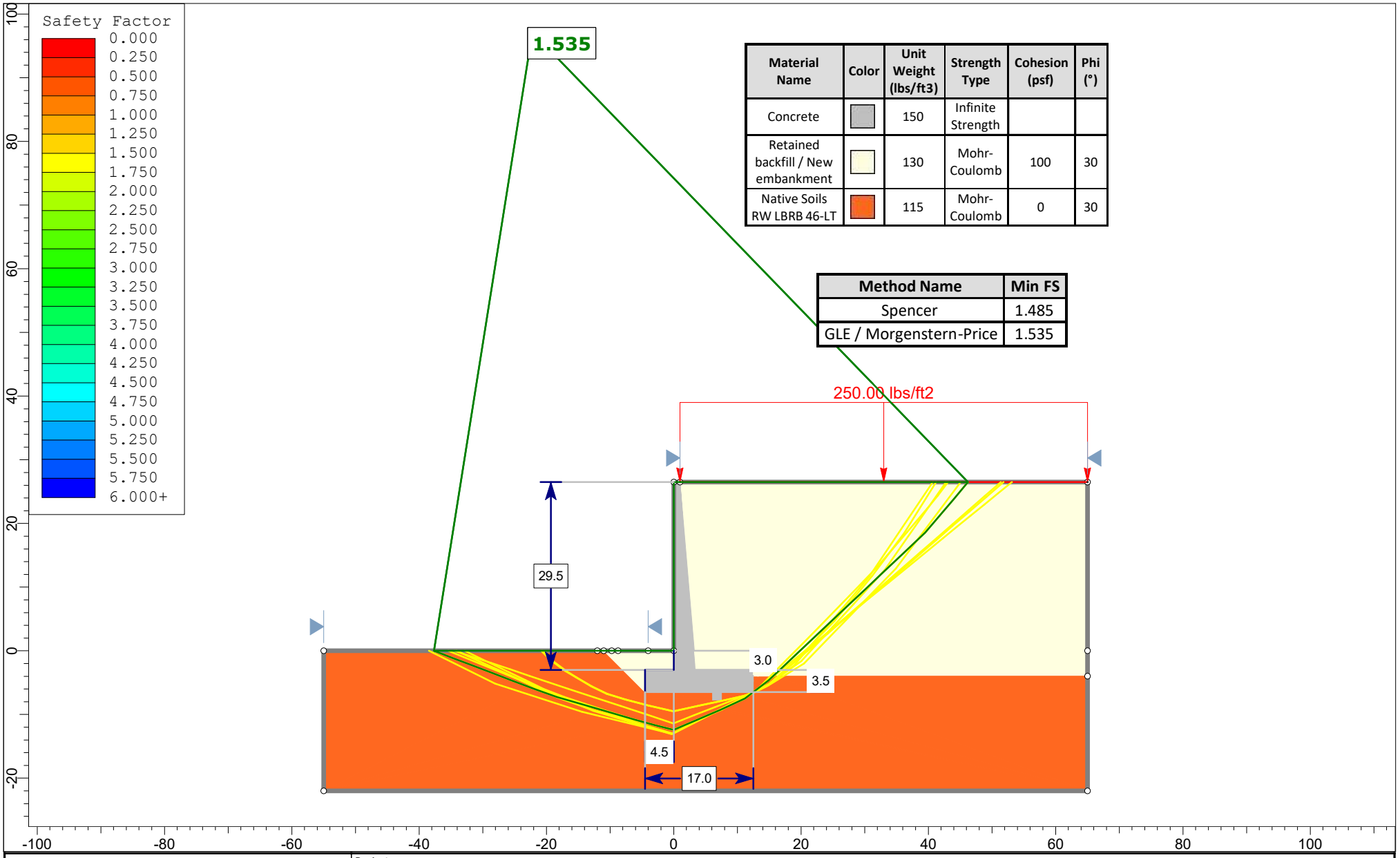
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (°)
Concrete		150	Infinite Strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW LBRB 46-LT		115	Mohr-Coulomb	0	30

Method Name	Min FS
Spencer	1.357
GLE / Morgenstern-Price	1.396

AZTEC TYPSA

SLIDEINTERPRET 9.034

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-LBRB 46 LT STA 45+80 - CIP	Scenario	Scenario 1 - Top cover 1.5 feet
Drawn By	BDG	Company	AZTEC
Date	10/11/2024	File Name	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev1a.slmd



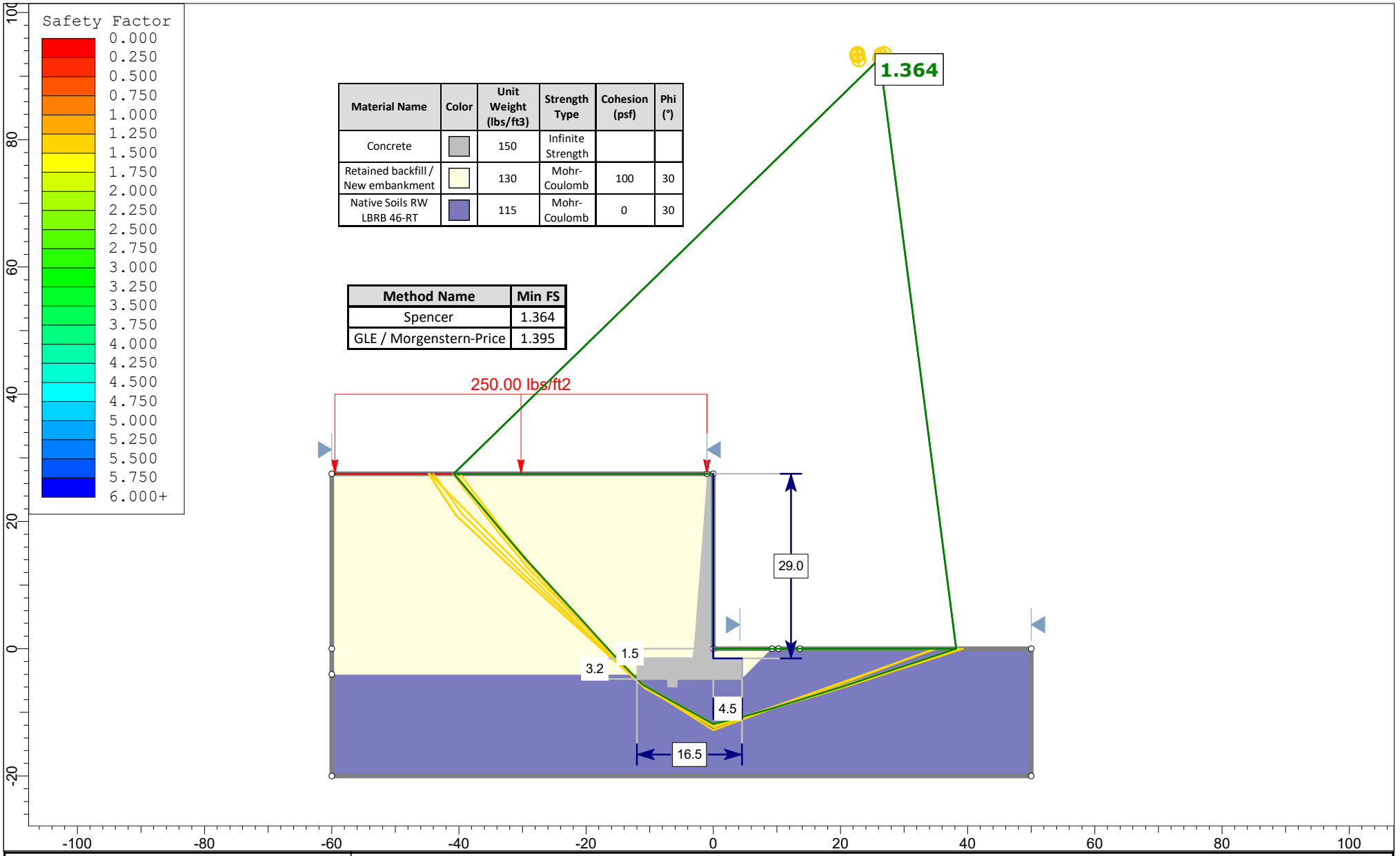
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (°)
Concrete		150	Infinite Strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW LBRB 46-LT		115	Mohr-Coulomb	0	30

Method Name	Min FS
Spencer	1.485
GLE / Morgenstern-Price	1.535

AZTEC TYPSA

SLIDEINTERPRET 9.034

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-LBRB 46 LT STA 45+80 - CIP	Scenario	Scenario 2 - Top cover 3.0 feet
Drawn By	BDG	Company	AZTEC
Date	10/11/2024	File Name	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev1a.slmd



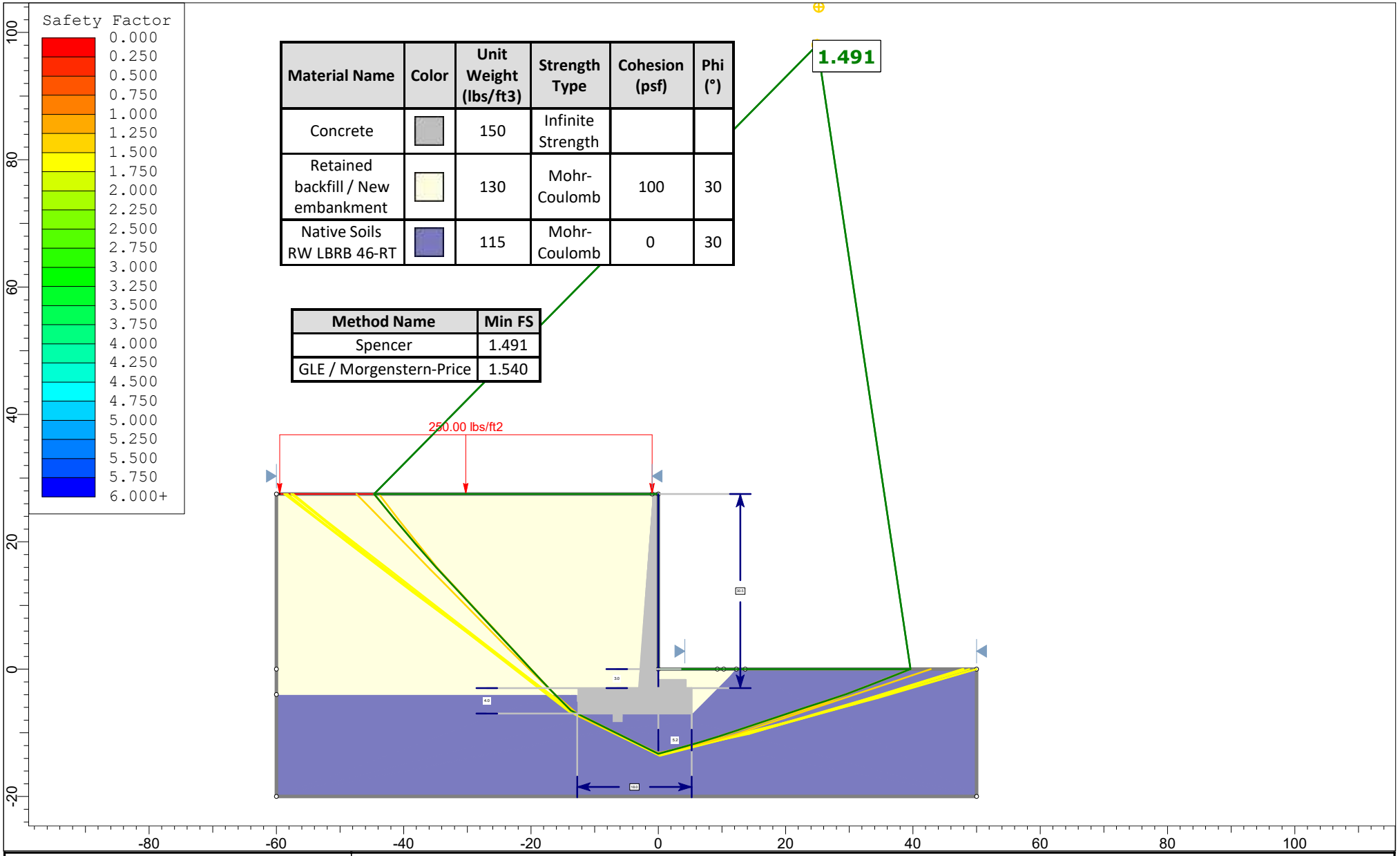
Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (°)
Concrete		150	Infinite Strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW LBRB 46-RT		115	Mohr-Coulomb	0	30

Method Name	Min FS
Spencer	1.364
GLE / Morgenstern-Price	1.395

AZTEC TYPSA

SLIDEINTERPRET 9.034

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-LBRB 46 RT STA 45+65 - CIP	*Scenario*	Scenario 1 - Top cover 1.5 feet
Drawn By	BDG	*Company*	AZTEC
Date	10/11/2024	*File Name*	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev1a.slmd



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (°)
Concrete		150	Infinite Strength		
Retained backfill / New embankment		130	Mohr-Coulomb	100	30
Native Soils RW LBRB 46-RT		115	Mohr-Coulomb	0	30

Method Name	Min FS
Spencer	1.491
GLE / Morgenstern-Price	1.540

AZTEC TYPSA

SLIDEINTERPRET 9.034

Project	SR303L - Phase I - MC85-Van Buren St		
Group	RW-LBRB 46 RT STA 45+65 - CIP	Scenario	Scenario 2 - Top cover 3.0 feet
Drawn By	BDG	Company	AZTEC
Date	10/11/2024	File Name	AZFWY1802-SR303L-Yuma_North_RWs-SLIDE-Rev1a.slmd

APPENDIX H

Cast-in-Place Walls – Slope Stability Results

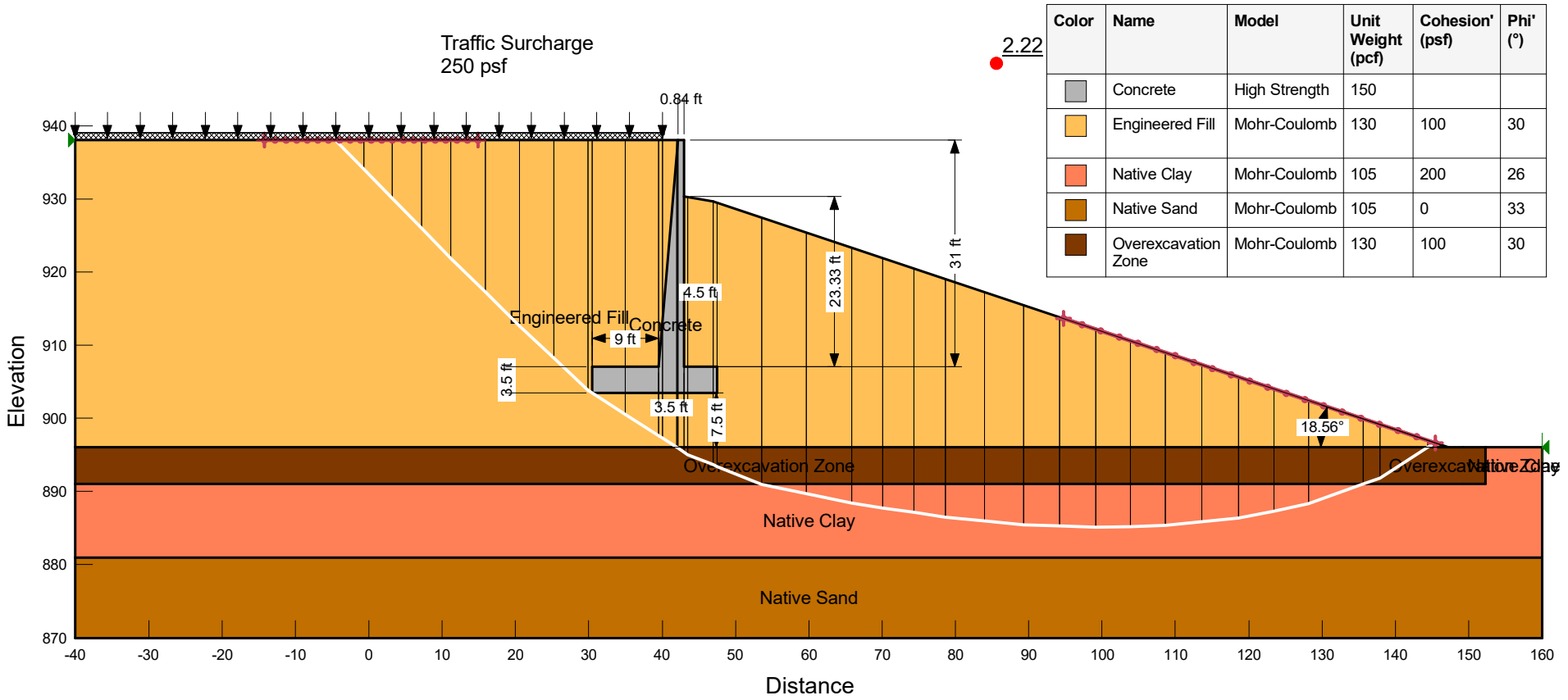
UPRR OP
RW-1084-RT
Slope Stability Results

Figure H-1

Name: CIP Wall 1084-RT
Method: Spencer
Factor of Safety: 2.22

Retaining Wall 1084-RT
STA 0+00 to 0+30

Wall Height=31'
Fill Beneath Footing=7.5'

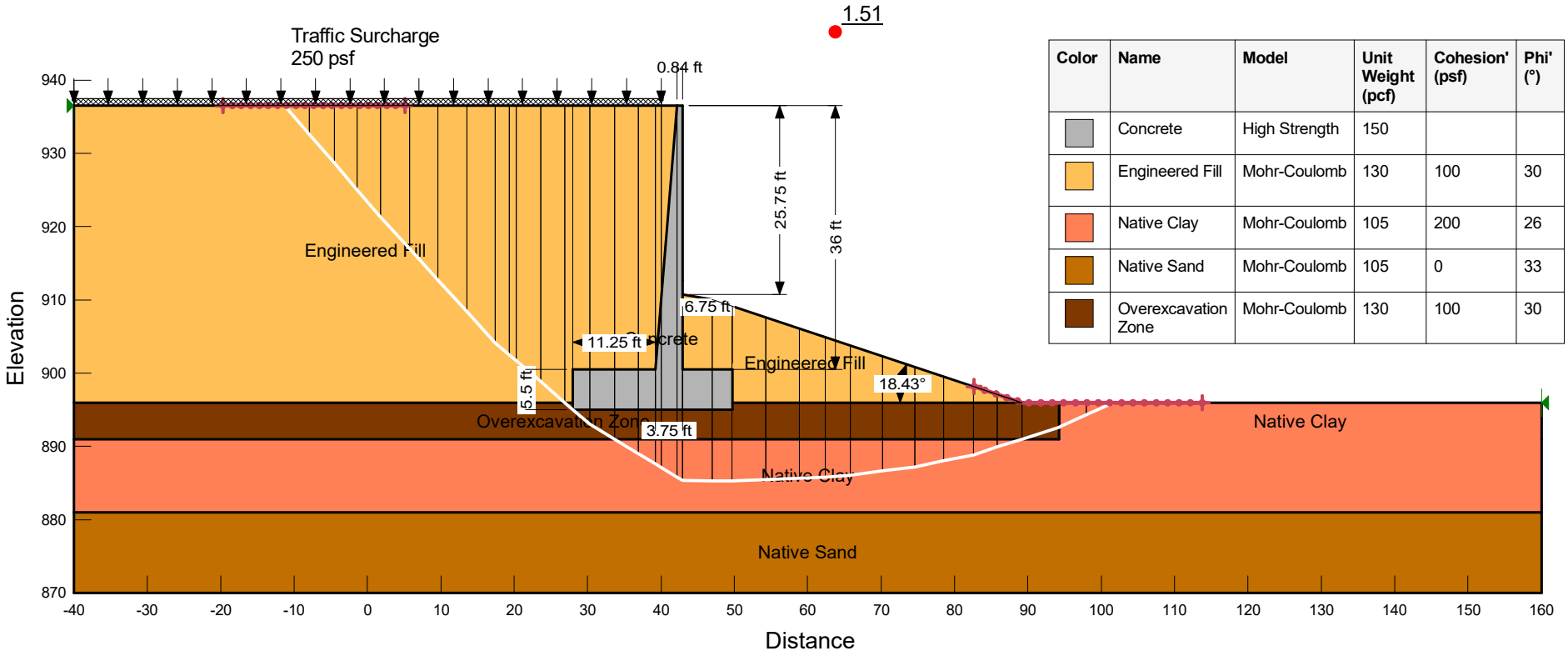


Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Concrete	High Strength	150		
	Engineered Fill	Mohr-Coulomb	130	100	30
	Native Clay	Mohr-Coulomb	105	200	26
	Native Sand	Mohr-Coulomb	105	0	33
	Overexcavation Zone	Mohr-Coulomb	130	100	30

Figure H-2

Name: CIP Wall 1084-RT 36 ft
Method: Spencer
Factor of Safety: 1.51

Retaining Wall 1084-RT
STA 0+30 to STA 0+60
Wall Height=36'
Fill Beneath Footing=0'



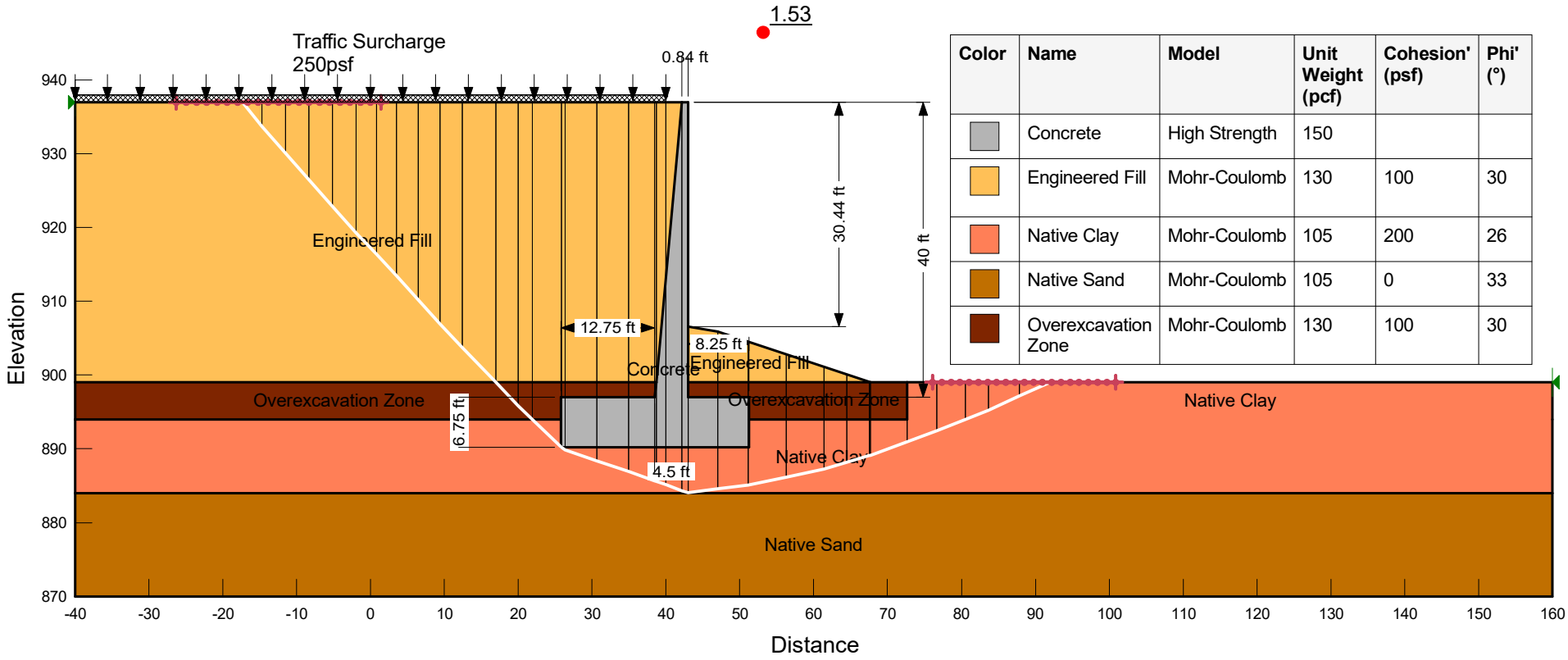
Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Concrete	High Strength	150		
	Engineered Fill	Mohr-Coulomb	130	100	30
	Native Clay	Mohr-Coulomb	105	200	26
	Native Sand	Mohr-Coulomb	105	0	33
	Overexcavation Zone	Mohr-Coulomb	130	100	30

Figure H-3

Name: CIP Wall 1084-LT 40 ft
Method: Spencer
Factor of Safety: 1.53

Retaining Wall 1084-LT
STA 0+60 to 1+20

Wall Height=40'
Fill Beneath Footing=0'



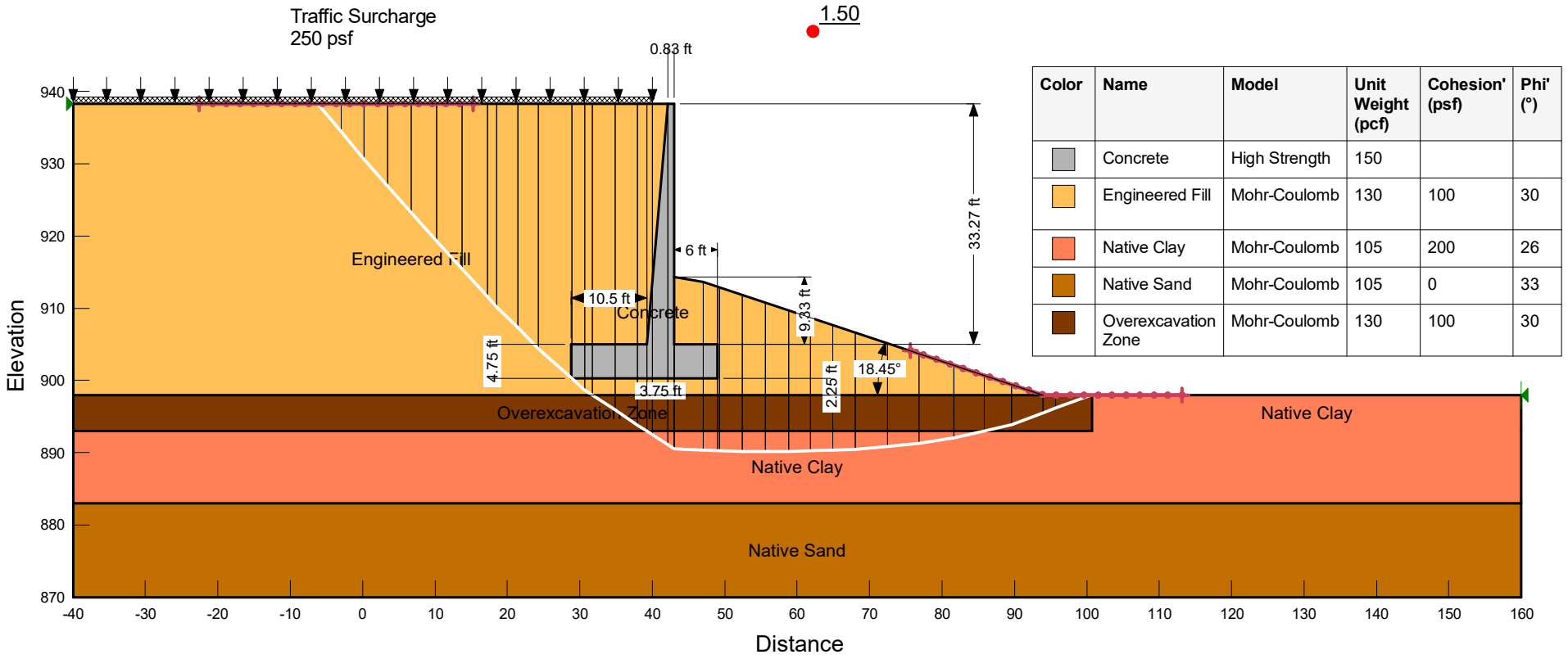
Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Concrete	High Strength	150		
	Engineered Fill	Mohr-Coulomb	130	100	30
	Native Clay	Mohr-Coulomb	105	200	26
	Native Sand	Mohr-Coulomb	105	0	33
	Overexcavation Zone	Mohr-Coulomb	130	100	30

Figure H-4

Name: CIP Wall 1084-RT 34
Method: Spencer
Factor of Safety: 1.50

Retaining Wall 1084-RT

STA 1+87 to 2+10
Wall Height=34'
Fill Beneath Footing=2.25'

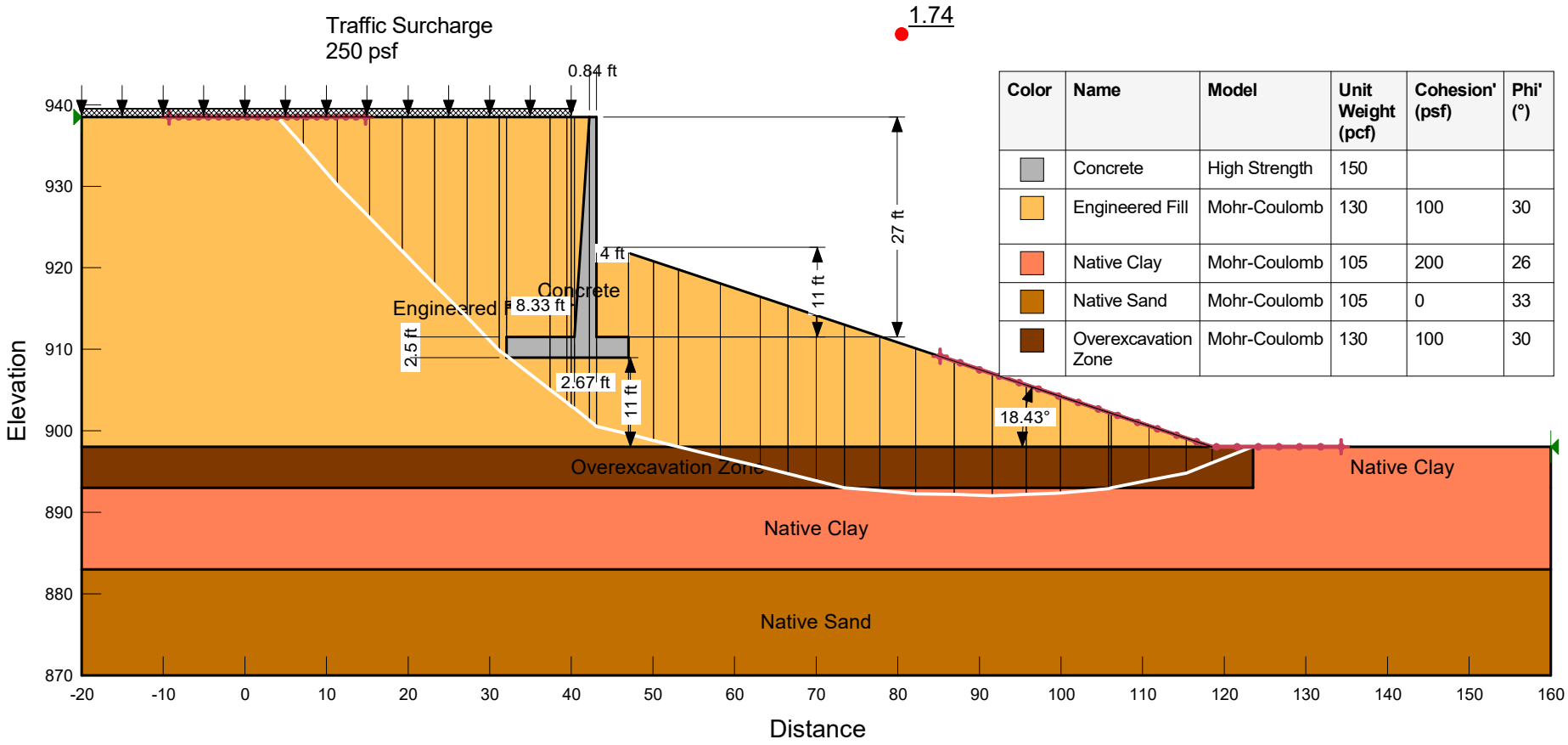


Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Concrete	High Strength	150		
	Engineered Fill	Mohr-Coulomb	130	100	30
	Native Clay	Mohr-Coulomb	105	200	26
	Native Sand	Mohr-Coulomb	105	0	33
	Overexcavation Zone	Mohr-Coulomb	130	100	30

Figure H-5

Name: CIP Wall 1084-RT 27 ft
Method: Spencer
Factor of Safety: 1.74

Retaining Wall 1084-RT
STA 2+10 to 2+40
Wall Height=27'
Fill Beneath Footing=11'

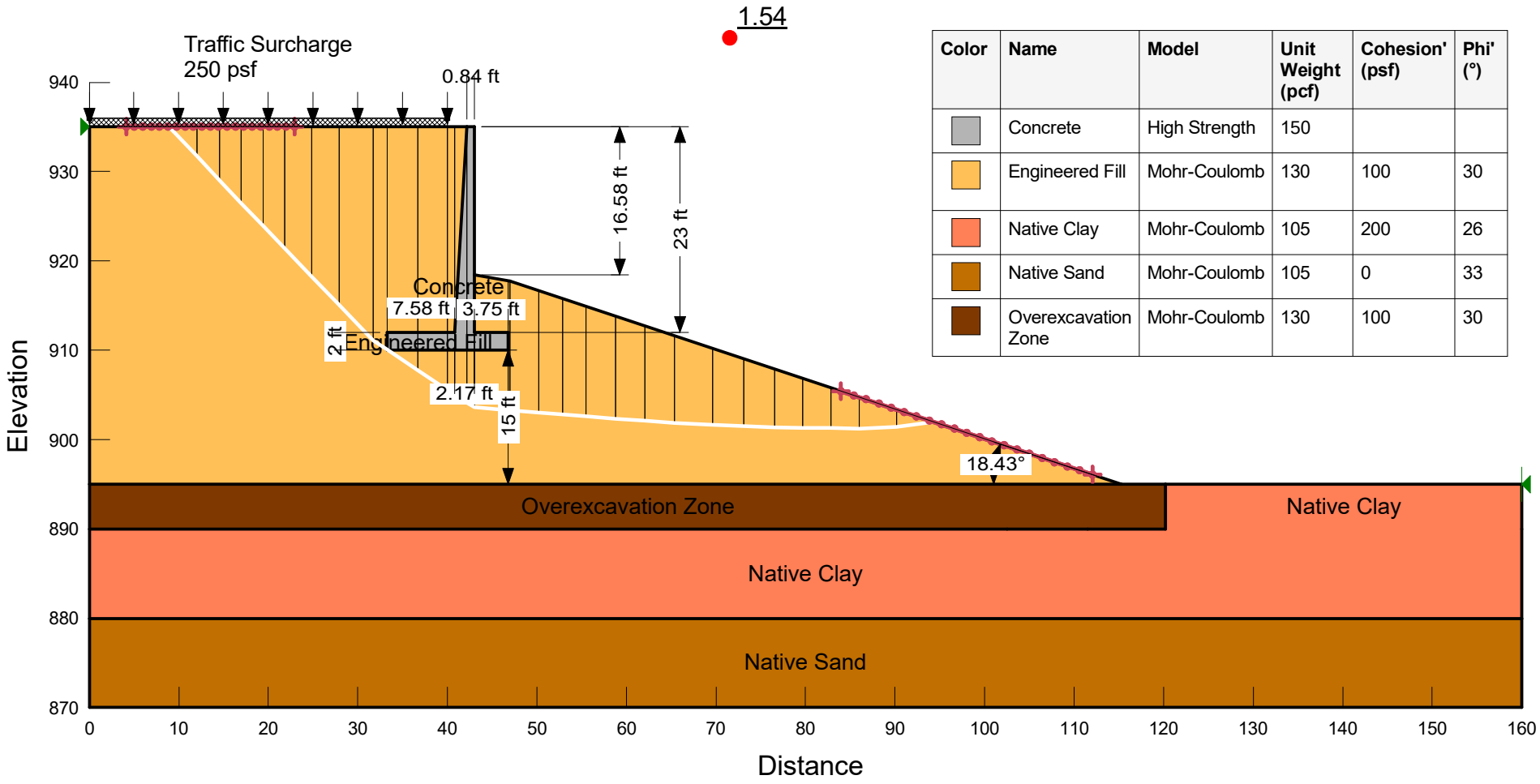


Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Concrete	High Strength	150		
	Engineered Fill	Mohr-Coulomb	130	100	30
	Native Clay	Mohr-Coulomb	105	200	26
	Native Sand	Mohr-Coulomb	105	0	33
	Overexcavation Zone	Mohr-Coulomb	130	100	30

Figure H-6

Name: CIP Wall 1084-RT 23 ft
Method: Spencer
Factor of Safety: 1.54

Retaining Wall 1084-RT
STA 2+40 to 2+70
Wall Height=23'
Fill Beneath Footing=15'



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Concrete	High Strength	150		
	Engineered Fill	Mohr-Coulomb	130	100	30
	Native Clay	Mohr-Coulomb	105	200	26
	Native Sand	Mohr-Coulomb	105	0	33
	Overexcavation Zone	Mohr-Coulomb	130	100	30

Figure H-7

UPRR OP
RW-1089-RT
Slope Stability Results

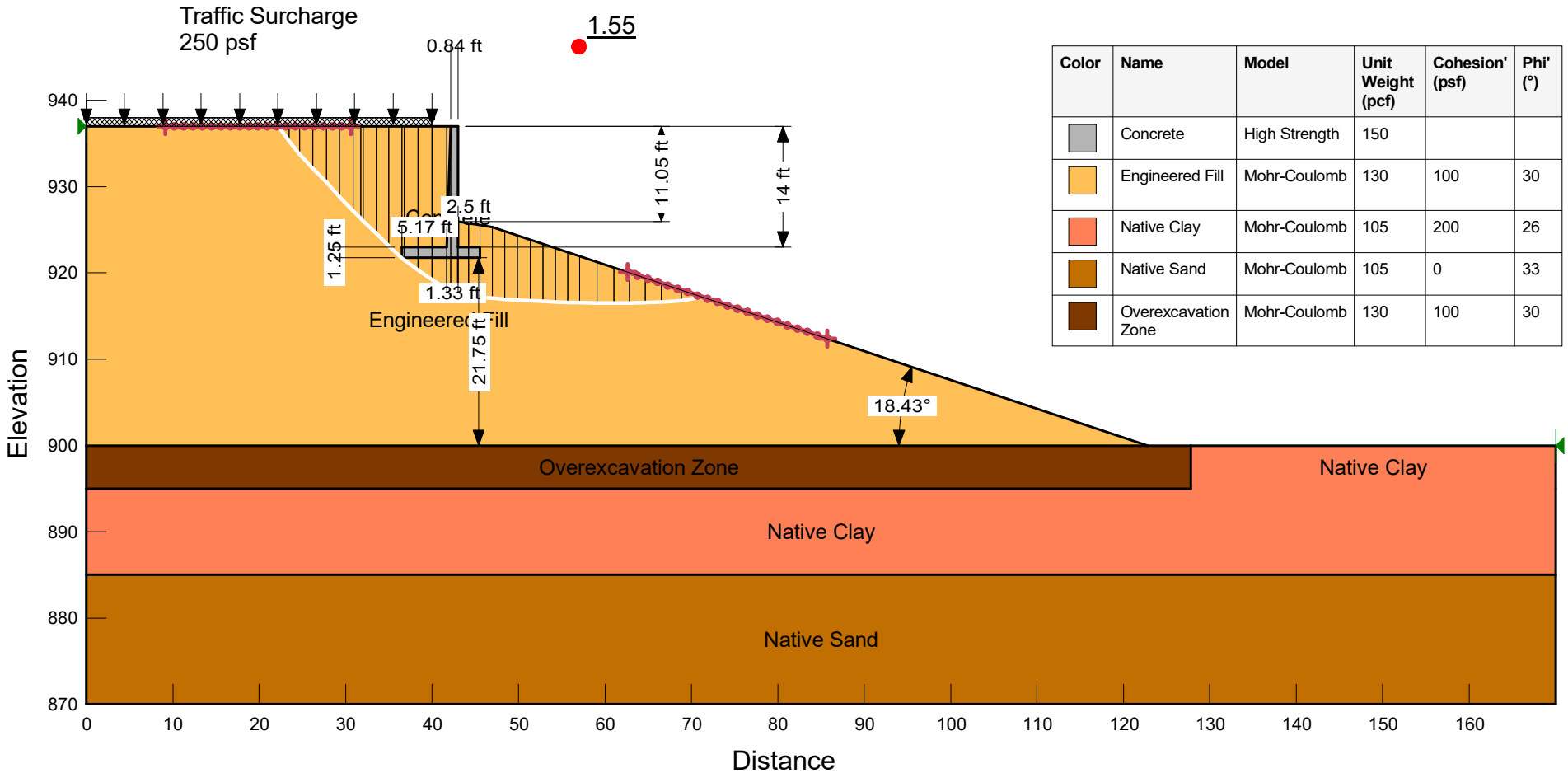
Figure H-8

Name: CIP Wall 1094-LT 14 ft
Method: Spencer
Factor of Safety: 1.55

Retaining Wall 1089-RT
STA 0+00 to STA 0+30

Wall Height=14'
Fill Beneath Footing=21.75'

*All RW 1089-RT wall segments are shorter and have deeper embedment than this analysis



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Concrete	High Strength	150		
	Engineered Fill	Mohr-Coulomb	130	100	30
	Native Clay	Mohr-Coulomb	105	200	26
	Native Sand	Mohr-Coulomb	105	0	33
	Overexcavation Zone	Mohr-Coulomb	130	100	30

Figure H-9

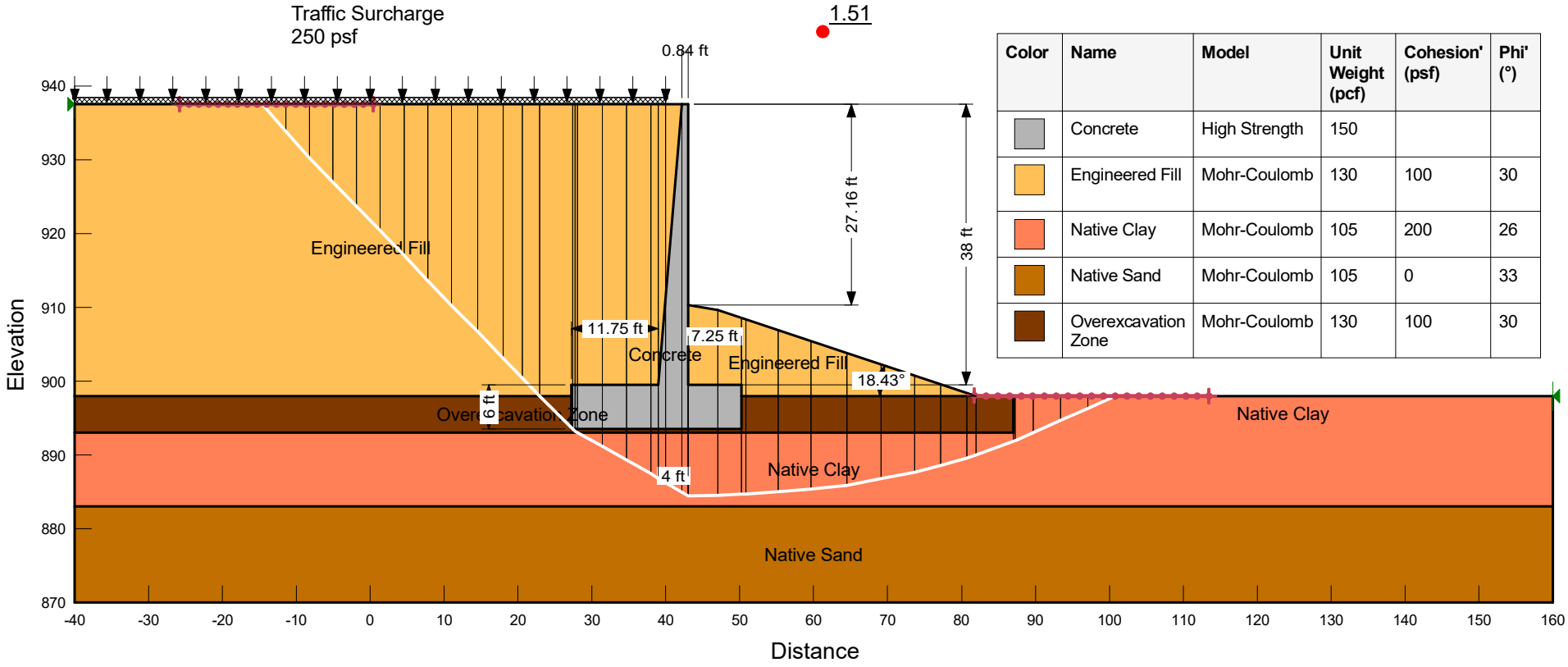
UPRR OP
RW-1088-LT
Slope Stability Results

Figure H-10

Name: CIP Wall 1088-LT 38 ft
Method: Spencer
Factor of Safety: 1.51

Retaining Wall 1088-LT
STA 0+00 to 1+75

Wall Height=38'
Fill Beneath Footing=0'



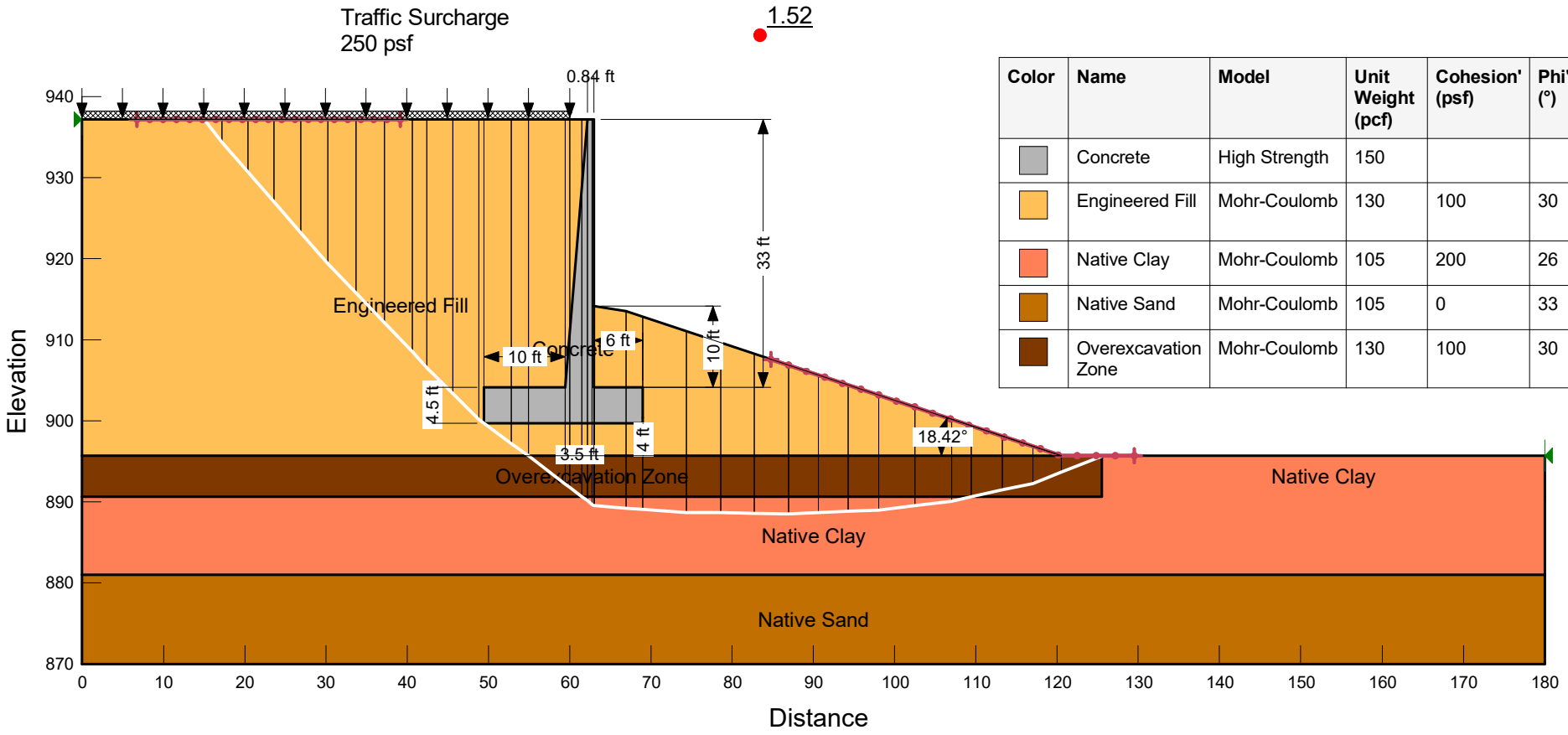
Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Concrete	High Strength	150		
	Engineered Fill	Mohr-Coulomb	130	100	30
	Native Clay	Mohr-Coulomb	105	200	26
	Native Sand	Mohr-Coulomb	105	0	33
	Overexcavation Zone	Mohr-Coulomb	130	100	30

Figure H-11

Name: CIP Wall 1088-LT 33 ft
Method: Spencer
Factor of Safety: 1.52

Retaining Wall 1088-LT
STA 2+42 to 2+83

Wall Height=33'
Fill Beneath Footing=4'



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Concrete	High Strength	150		
	Engineered Fill	Mohr-Coulomb	130	100	30
	Native Clay	Mohr-Coulomb	105	200	26
	Native Sand	Mohr-Coulomb	105	0	33
	Overexcavation Zone	Mohr-Coulomb	130	100	30

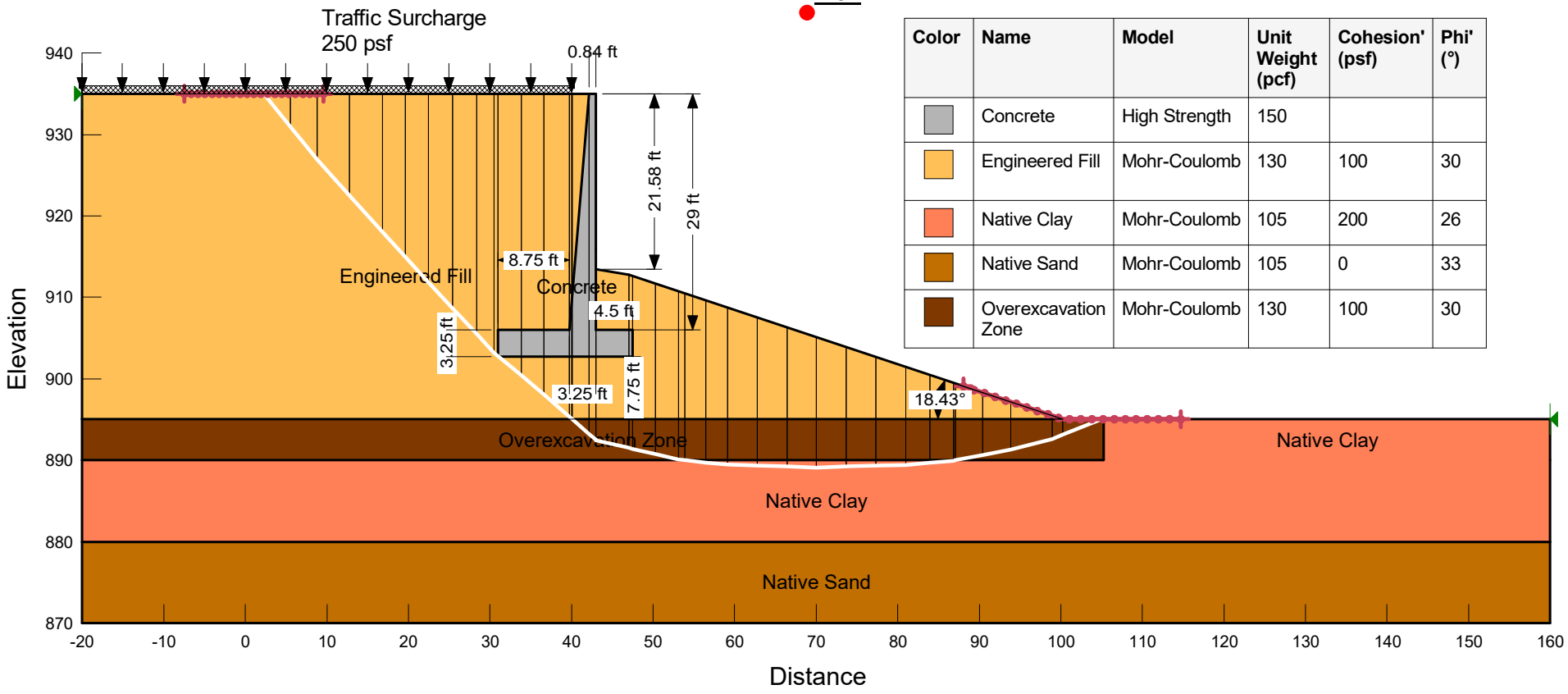
Figure H-12

Name: CIP Wall 1084-LT 27 ft
Method: Spencer
Factor of Safety: 1.51

Retaining Wall 1088-LT
STA 2+83 to 3+13

Wall Height=29'
Fill Beneath Footing=7.75'
*The stationing specified above has same wall height and deeper embedment than this analysis

1.51



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Concrete	High Strength	150		
	Engineered Fill	Mohr-Coulomb	130	100	30
	Native Clay	Mohr-Coulomb	105	200	26
	Native Sand	Mohr-Coulomb	105	0	33
	Overexcavation Zone	Mohr-Coulomb	130	100	30

Figure H-13

UPRR OP
RW-1093-LT
Slope Stability Results

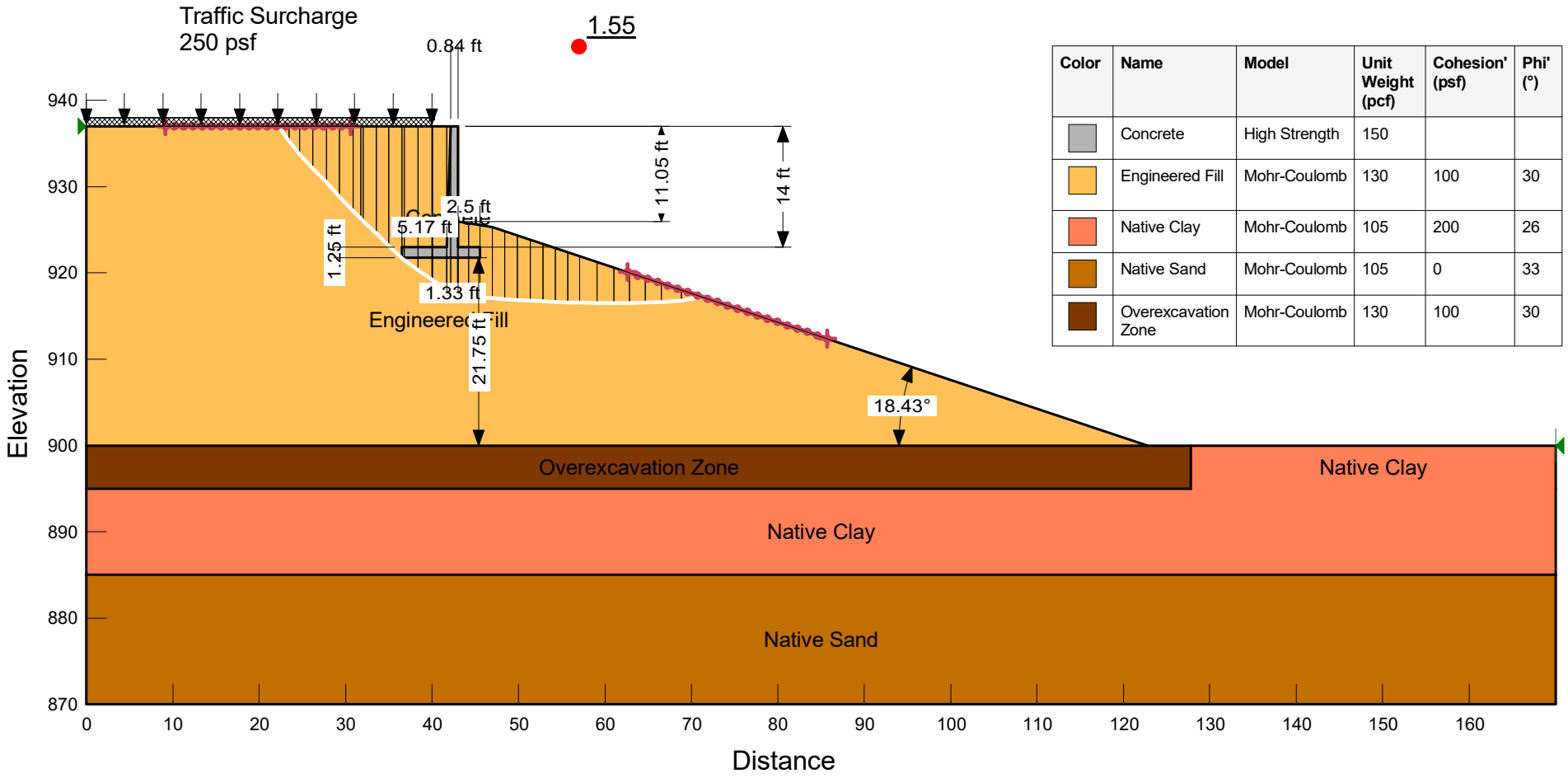
Figure H-14

Name: CIP Wall 1094-LT 14 ft
Method: Spencer
Factor of Safety: 1.55

Retaining Wall 1093-LT
STA 0+00 to STA 0+30

Wall Height=14'
Fill Beneath Footing=21.75'

*All RW 1093-LT wall segments are 14 feet or shorter and have deeper embedment than this analysis



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Concrete	High Strength	150		
	Engineered Fill	Mohr-Coulomb	130	100	30
	Native Clay	Mohr-Coulomb	105	200	26
	Native Sand	Mohr-Coulomb	105	0	33
	Overexcavation Zone	Mohr-Coulomb	130	100	30

Figure H-15

UPRR OP
RW-1093-LT
Slope Stability Results

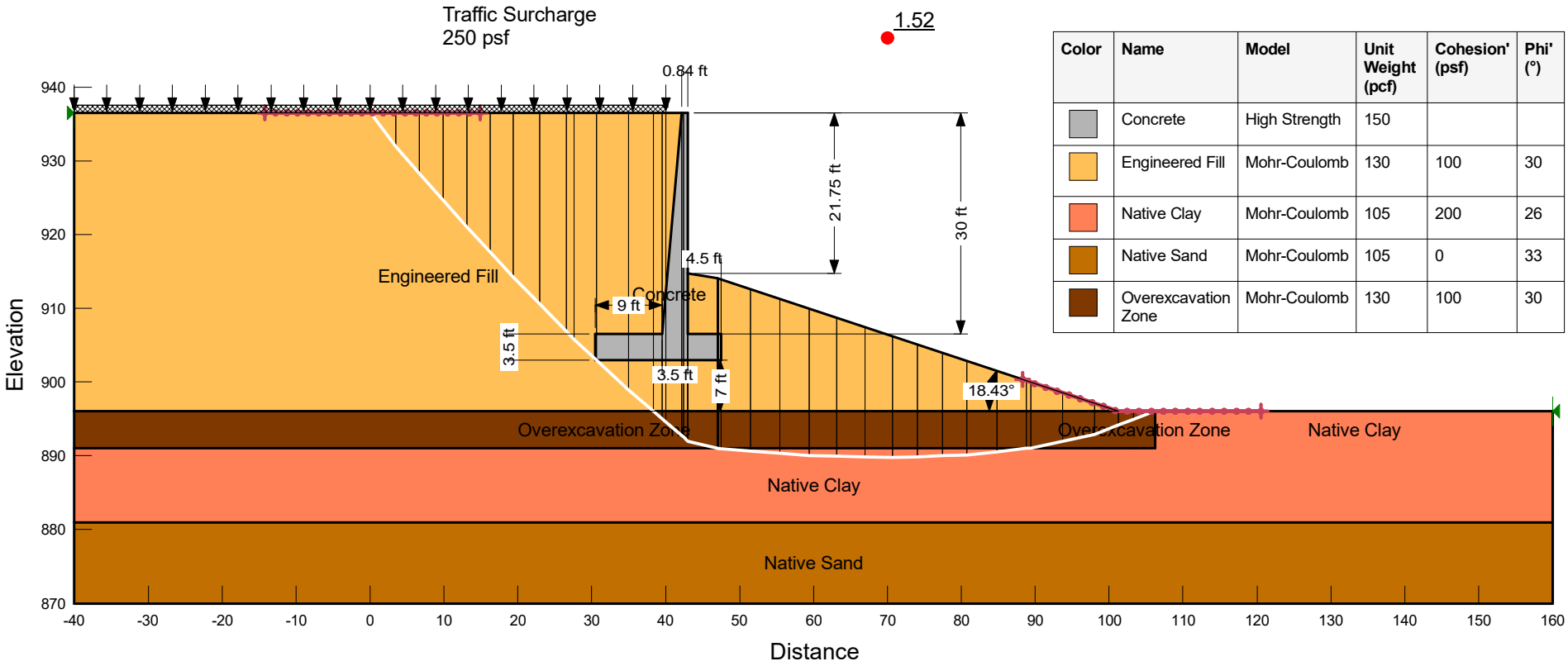
Figure H-16

Name: CIP Wall 1089-LT 24 ft
Method: Spencer
Factor of Safety: 1.52

Retaining Wall 1094-RT
STA 0+00 to STA 0+30

Wall Height=30'
Fill Beneath Footing=7'

*The stationing specified above has the same wall height, deeper embedment, and less fill beneath footing than this analysis



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Concrete	High Strength	150		
	Engineered Fill	Mohr-Coulomb	130	100	30
	Native Clay	Mohr-Coulomb	105	200	26
	Native Sand	Mohr-Coulomb	105	0	33
	Overexcavation Zone	Mohr-Coulomb	130	100	30

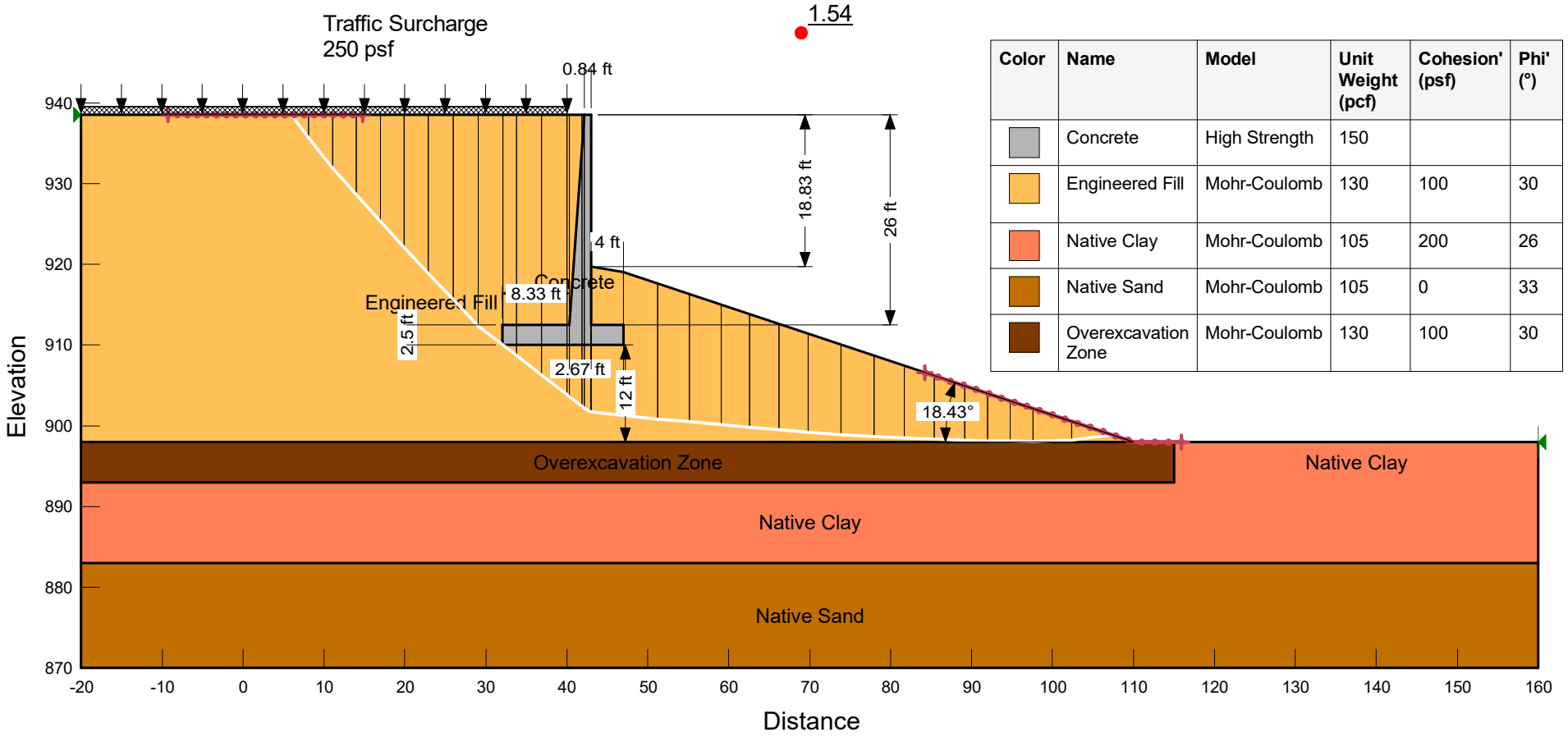
Figure H-17

Name: CIP Wall 1084-LT 24 ft
Method: Spencer
Factor of Safety: 1.54

Retaining Wall 1094-RT
STA 0+30 to 0+45

Wall Height=26'
Fill Beneath Footing=12'

*The stationing specified above has same wall height and deeper embedment than this analysis



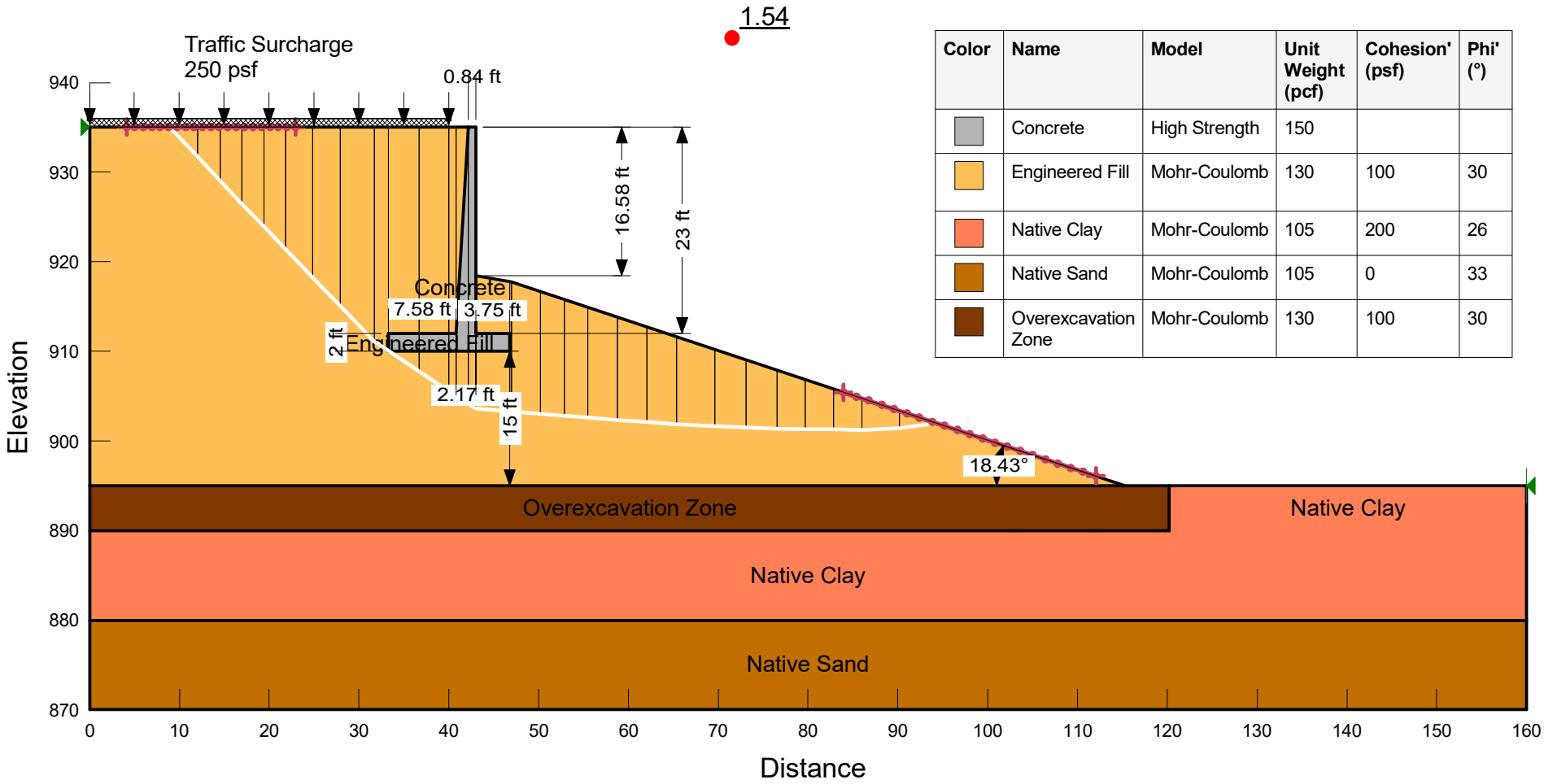
Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Concrete	High Strength	150		
	Engineered Fill	Mohr-Coulomb	130	100	30
	Native Clay	Mohr-Coulomb	105	200	26
	Native Sand	Mohr-Coulomb	105	0	33
	Overexcavation Zone	Mohr-Coulomb	130	100	30

Figure H-18

Name: CIP Wall 1084-LT 23 ft
Method: Spencer
Factor of Safety: 1.54

Retaining Wall 1094-RT
STA 0+45 to 0+75
Wall Height=23'
Fill Beneath Footing=15'

*The stationing specified above has shorter wall height and deeper embedment than this analysis



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Concrete	High Strength	150		
	Engineered Fill	Mohr-Coulomb	130	100	30
	Native Clay	Mohr-Coulomb	105	200	26
	Native Sand	Mohr-Coulomb	105	0	33
	Overexcavation Zone	Mohr-Coulomb	130	100	30

Figure H-19

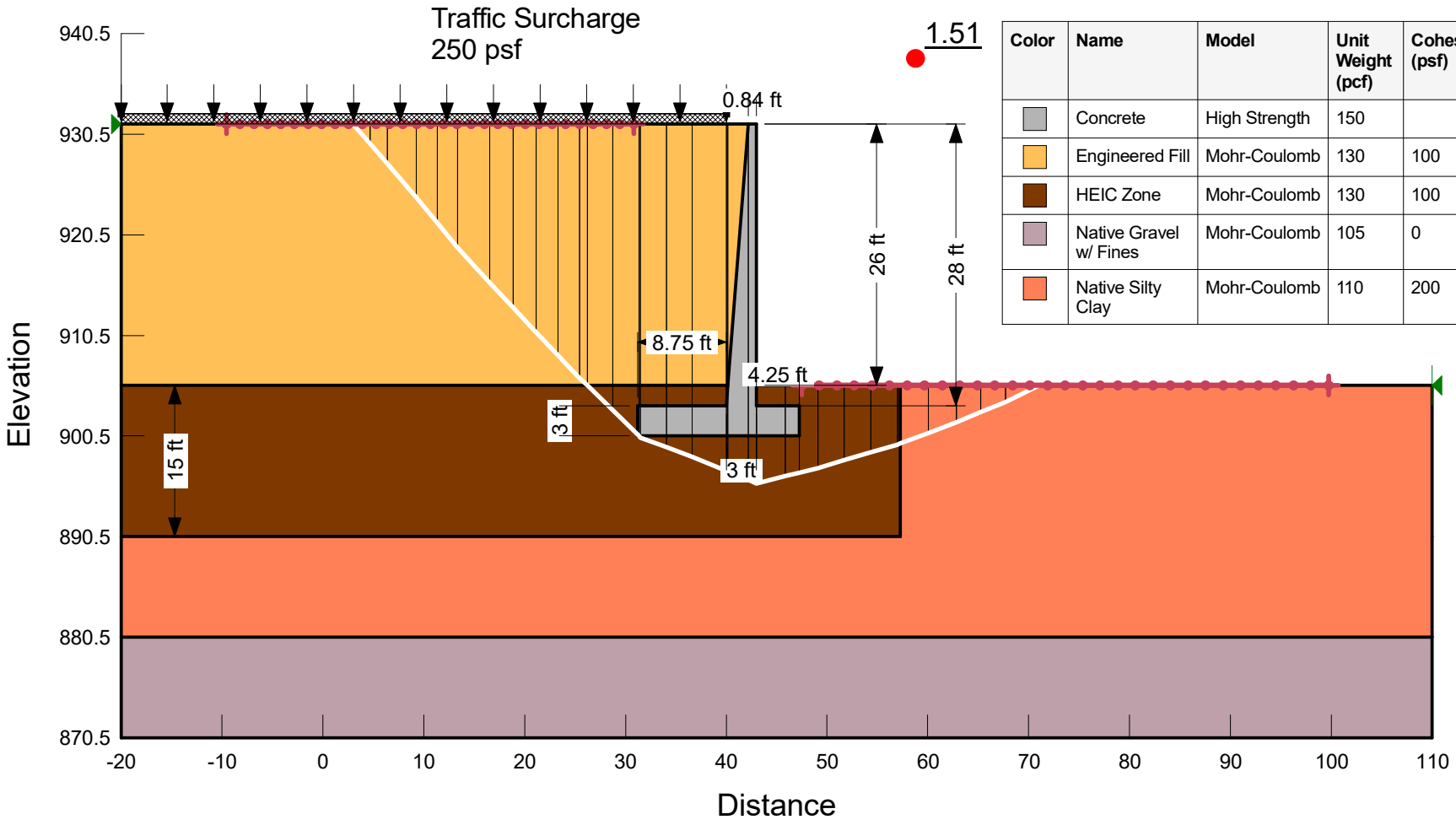
Broadway Road OP
RW-1107 & RW-1108
Slope Stability Results

Figure H-20

Name: CIP Wall 1107
Method: Spencer
Factor of Safety: 1.51

Retaining Walls 1107 & 1108

Wall Height=28'
Fill Beneath Footing=0'
HEIC Improvement=15'



Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Concrete	High Strength	150		
	Engineered Fill	Mohr-Coulomb	130	100	30
	HEIC Zone	Mohr-Coulomb	130	100	30
	Native Gravel w/ Fines	Mohr-Coulomb	105	0	33
	Native Silty Clay	Mohr-Coulomb	110	200	26

Figure H-21

Lower Buckeye
RW-1171-RT
Slope Stability Results

Figure H-22

Name: CIP Wall 1171-RT SLOPE/W Analysis
Method: Spencer
Factor of Safety: 1.86

Retaining Wall 1171-RT

Wall Height=6' on fill
Sta. 0+00 to 0+30

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Concrete	140		
	Engineered Fill	130	100	30
	Native Clayey Sand	115	200	30

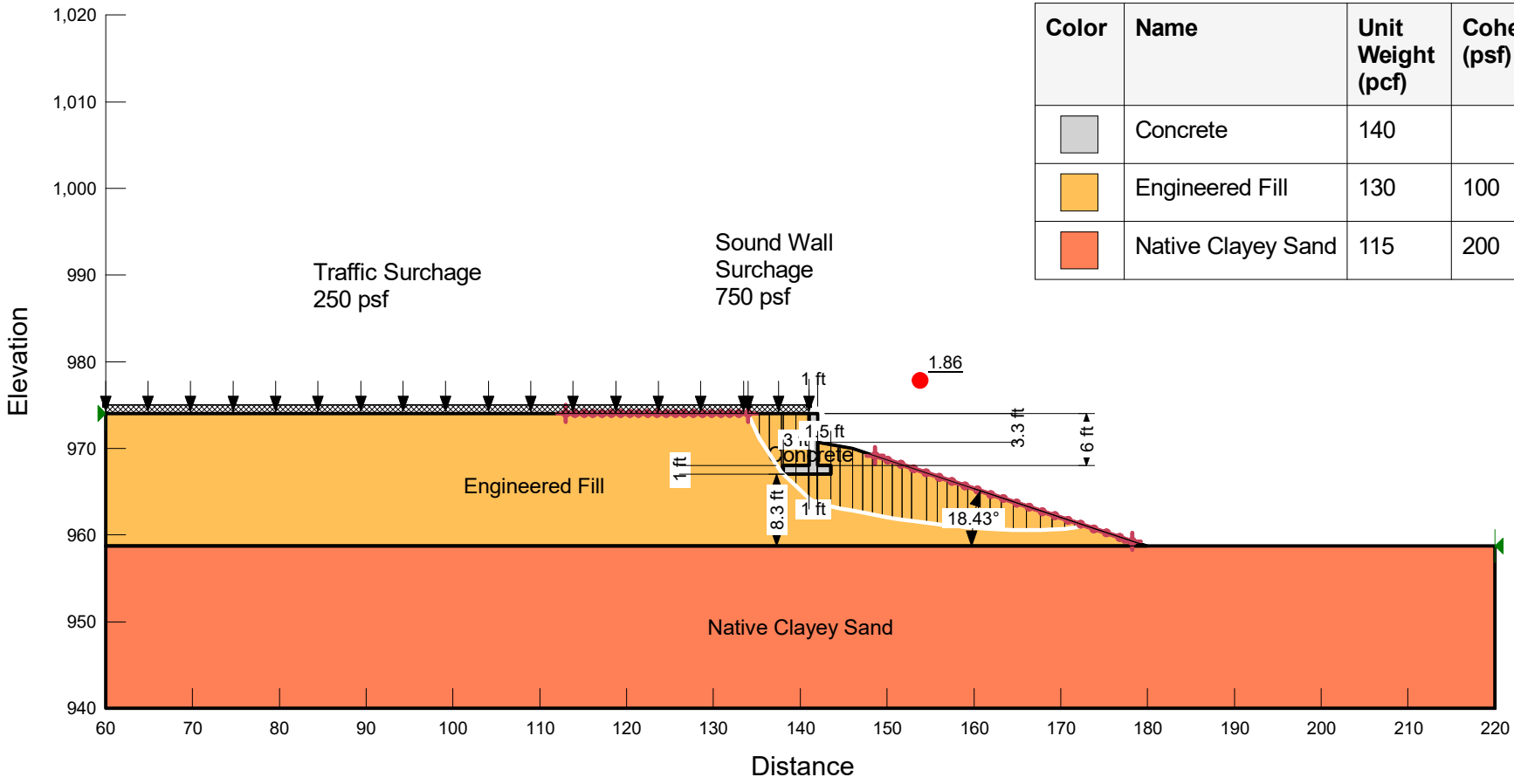
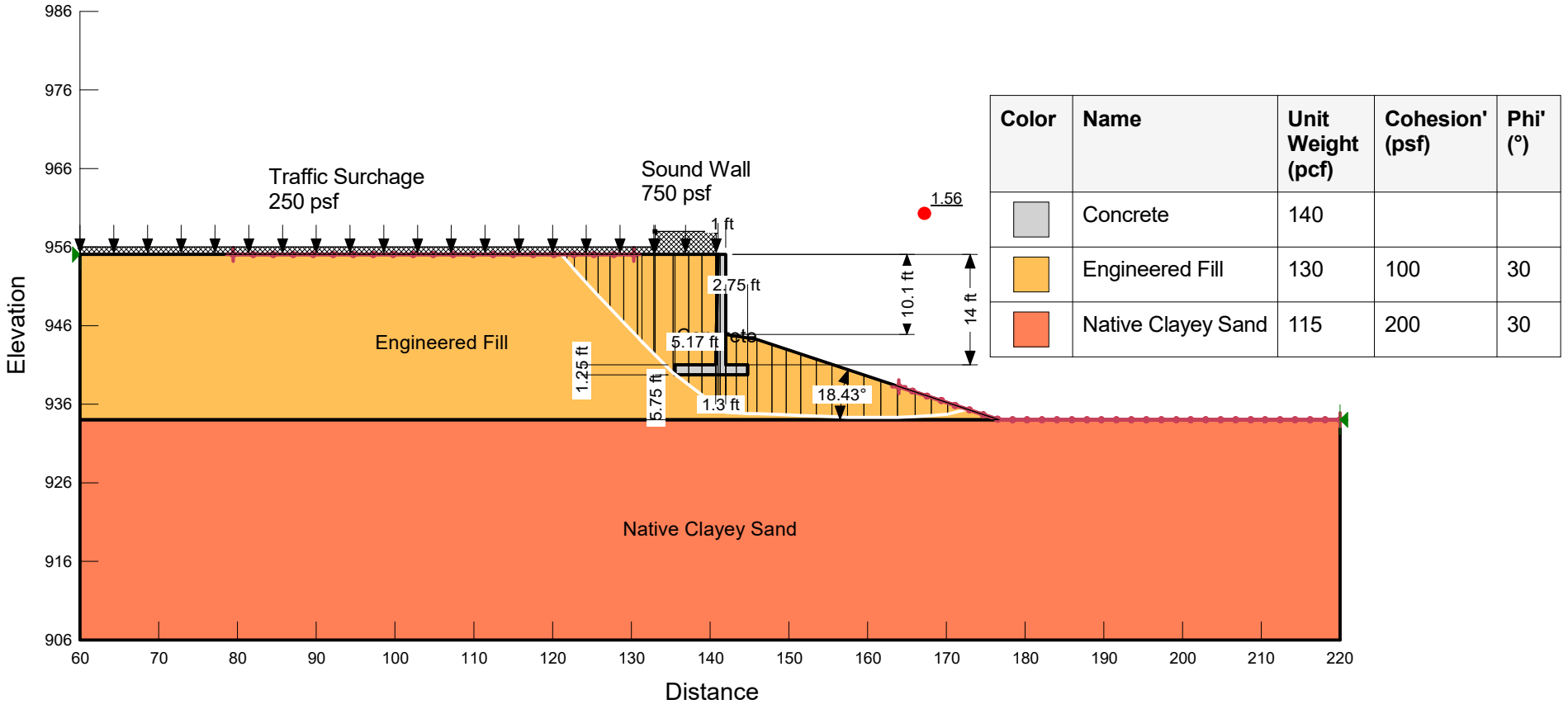


Figure H-23

Name: CIP Wall 1171-RT 14 ft
Method: Spencer
Factor of Safety: 1.56

Retaining Wall 1171-RT

Wall Height=14'
Sta. 0+30 1+20



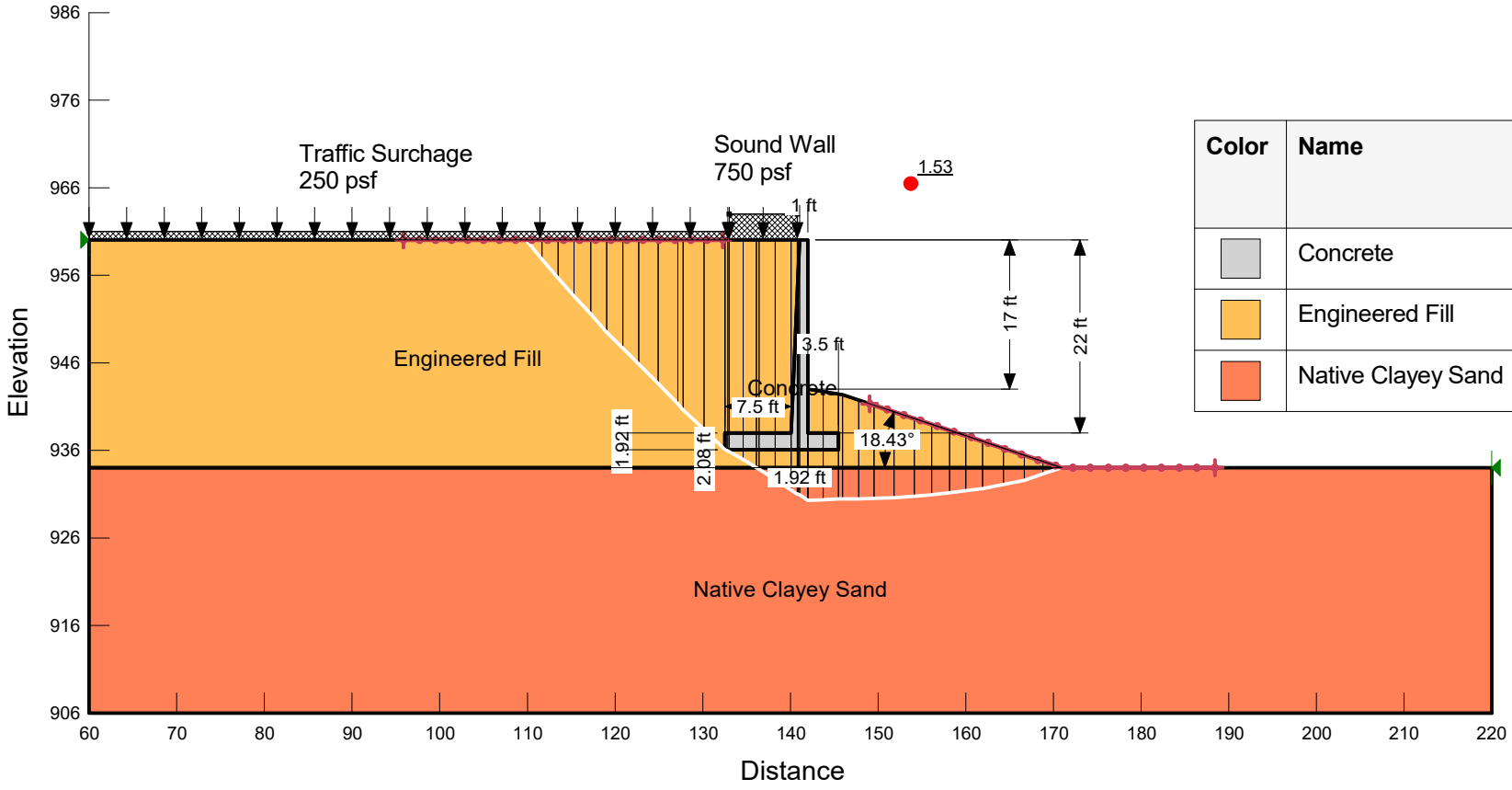
Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Concrete	140		
	Engineered Fill	130	100	30
	Native Clayey Sand	115	200	30

Figure H-24

Name: CIP Wall 1171-RT 22 ft
Method: Spencer
Factor of Safety: 1.53

Retaining Wall 1171-RT

Wall Height=21'
Sta. 1+20 to 2+40



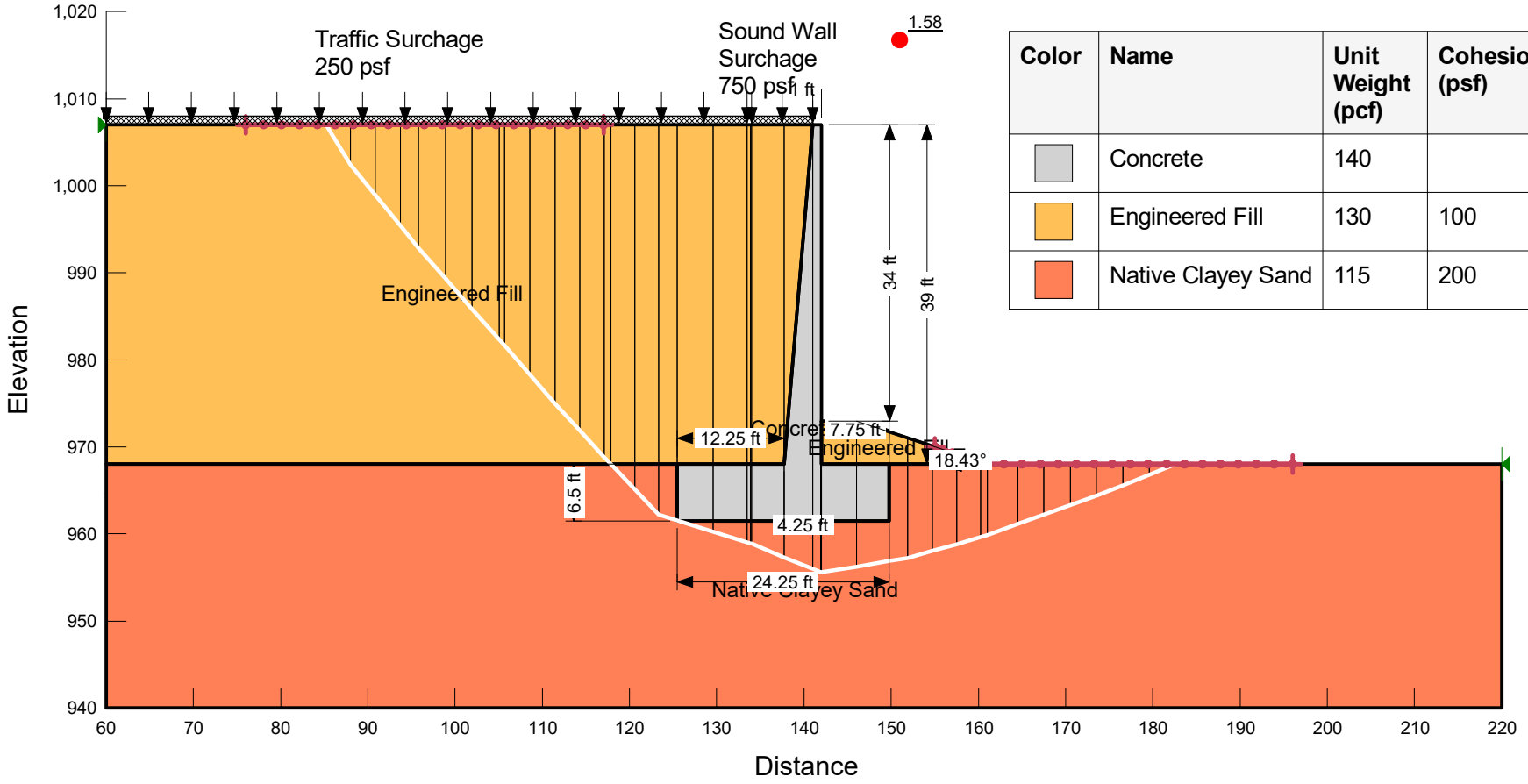
Color	Name	Unit Weight (pcf)	Cohesion' (psf)
	Concrete	140	
	Engineered Fill	130	100
	Native Clayey Sand	115	200

Figure H-25

Name: CIP Wall 1171-RT SLOPE/W Analysis 39H
Method: Spencer
Factor of Safety: 1.58

Retaining Wall 1171-RT

Wall Height=39'
Sta. 9+29



Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Concrete	140		
	Engineered Fill	130	100	30
	Native Clayey Sand	115	200	30

Figure H-26

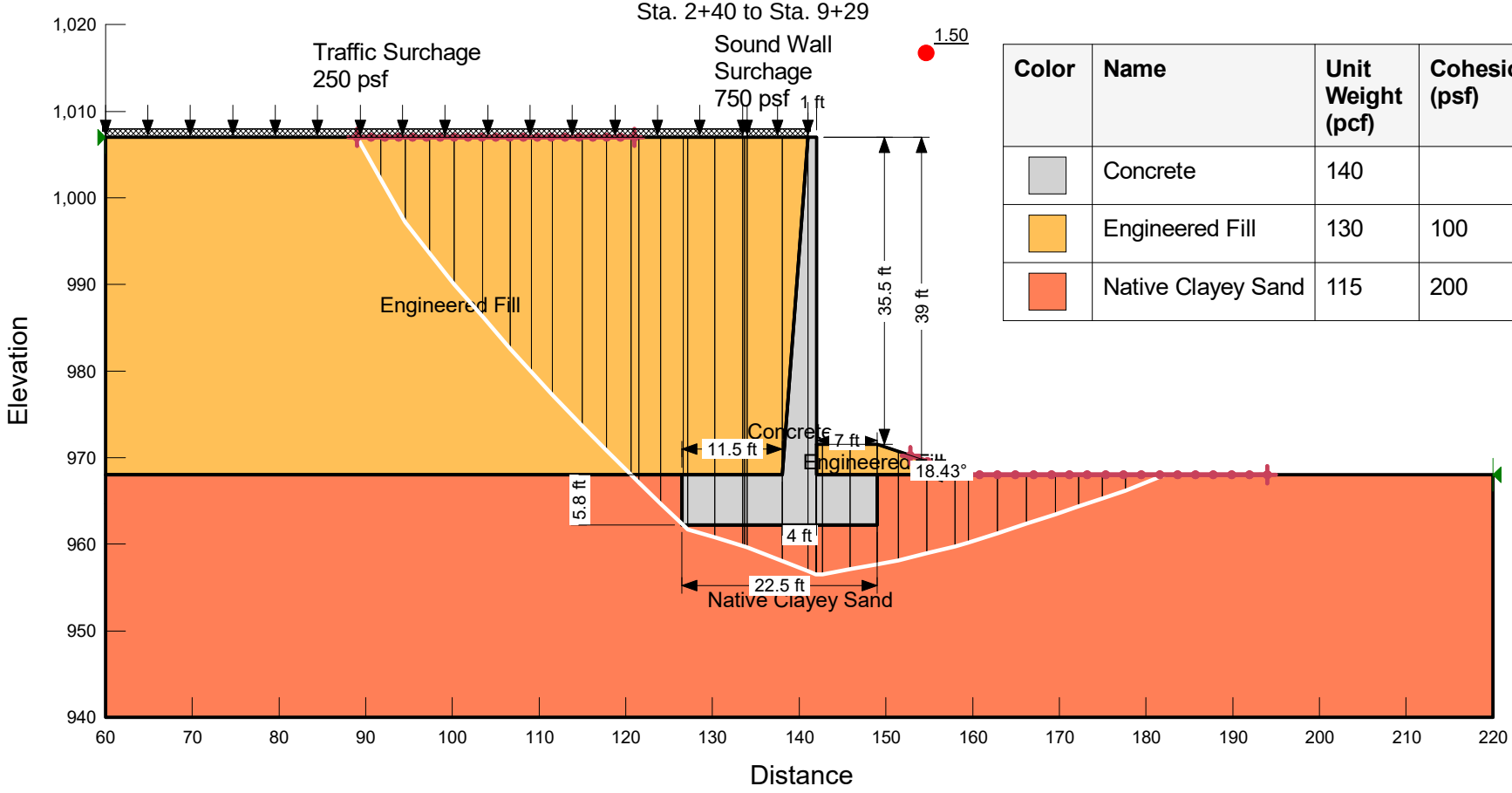
Name: CIP Wall 1171-RT SLOPE/W Analysis
Method: Spencer
Factor of Safety: 1.50

Retaining Wall 1171-RT

Wall Height=39'

Reduced footing size to 37' wall dimensions and reduced soil cover at face of wall to 3.5' for application at other wall locations

Sta. 2+40 to Sta. 9+29



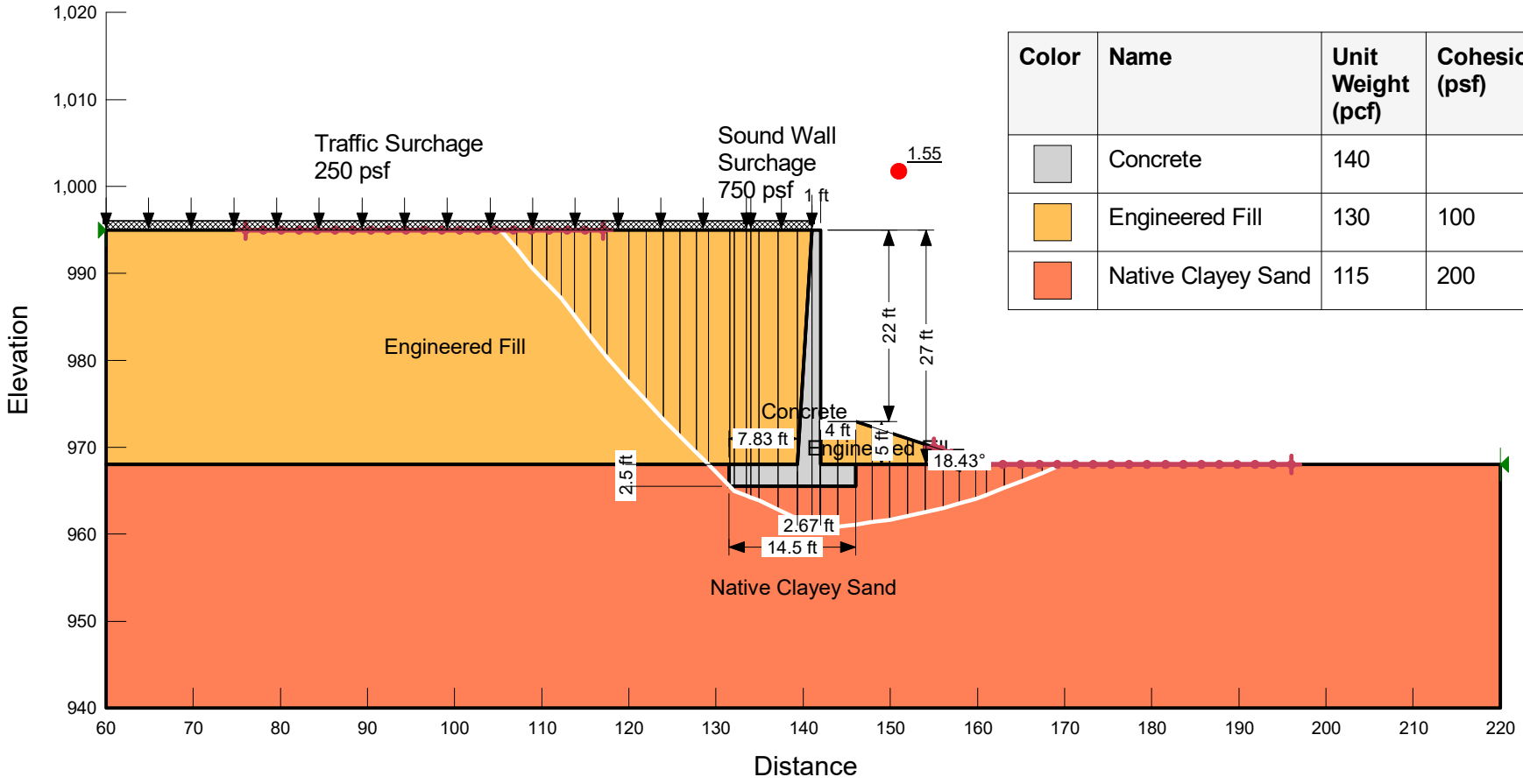
Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Concrete	140		
	Engineered Fill	130	100	30
	Native Clayey Sand	115	200	30

Figure H-27

Name: CIP Wall 1171-RT27H Case I
Method: Spencer
Factor of Safety: 1.55

Retaining Wall 1171-RT

Wall Height=27
Sta. 9+29 to 9+83
Case I



Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Concrete	140		
	Engineered Fill	130	100	30
	Native Clayey Sand	115	200	30

Figure H-28

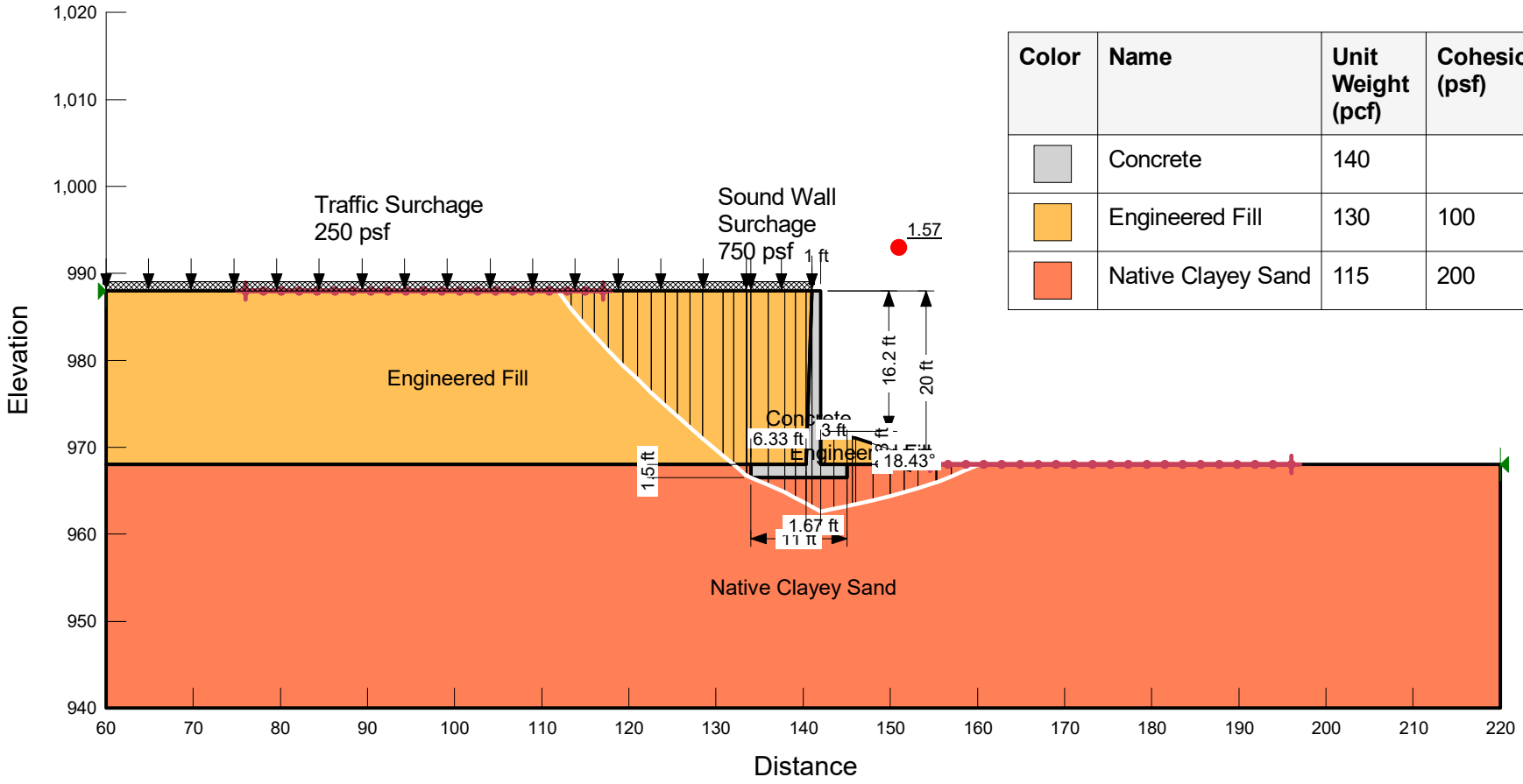
Lower Buckeye
RW-1171-LT
Slope Stability Results

Figure H-29

Name: CIP Wall 1171-LT 20H Case I
Method: Spencer
Factor of Safety: 1.57

Retaining Wall 1171-LT

Wall Height=20
Sta. 0+00 to 0+45
Case I



Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Concrete	140		
	Engineered Fill	130	100	30
	Native Clayey Sand	115	200	30

Figure H-30

Name: CIP Wall 1171-LT 28 ft STA 1+75
Method: Spencer
Factor of Safety: 1.52

Retaining Wall 1171-LT

Wall Height=28'
Sta. 0+45 to 0+56 & Sta 1+15 to 6+09

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Concrete	140		
	Engineered Fill	130	100	30
	Native Clayey Sand	115	200	30

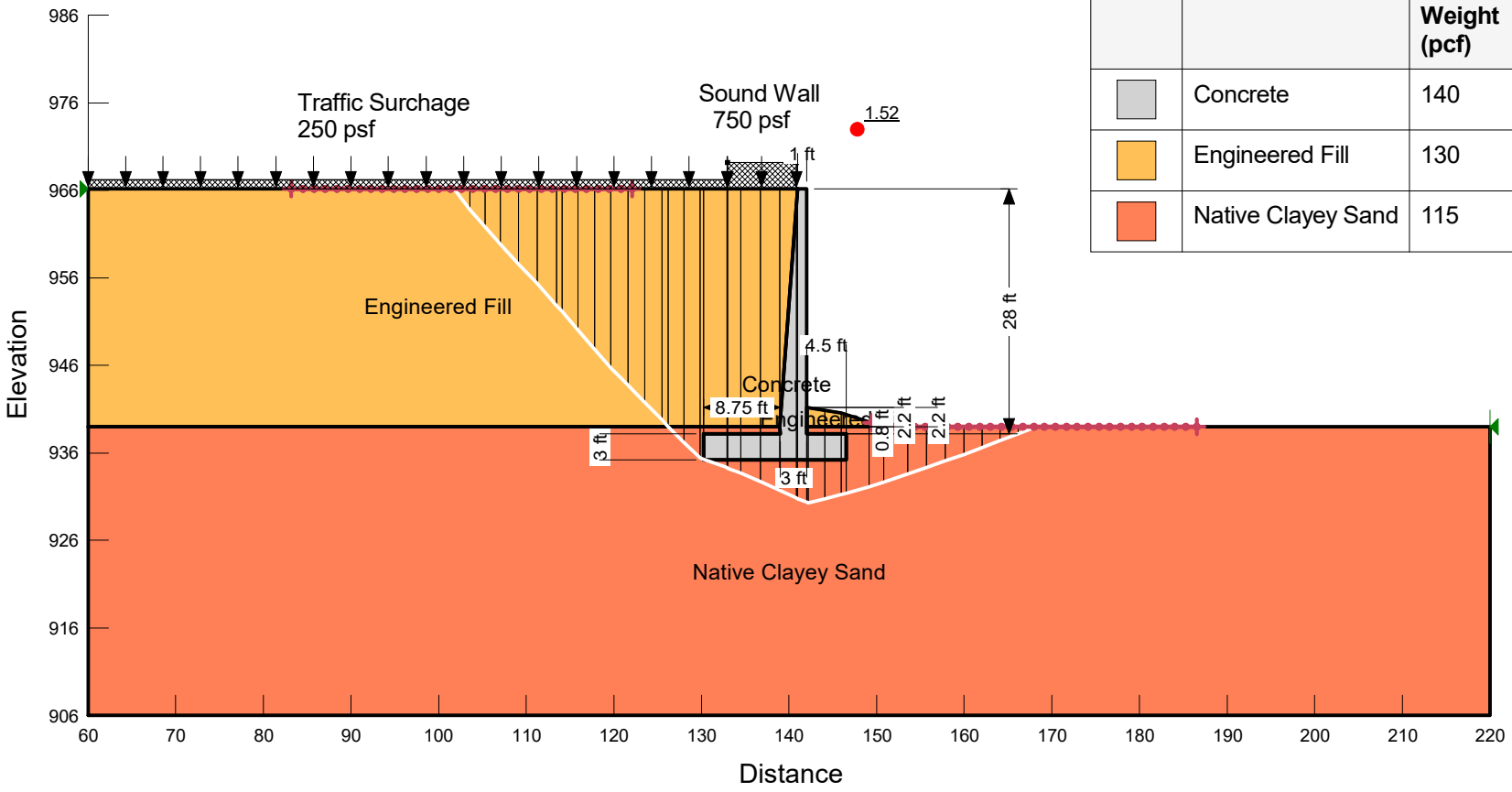
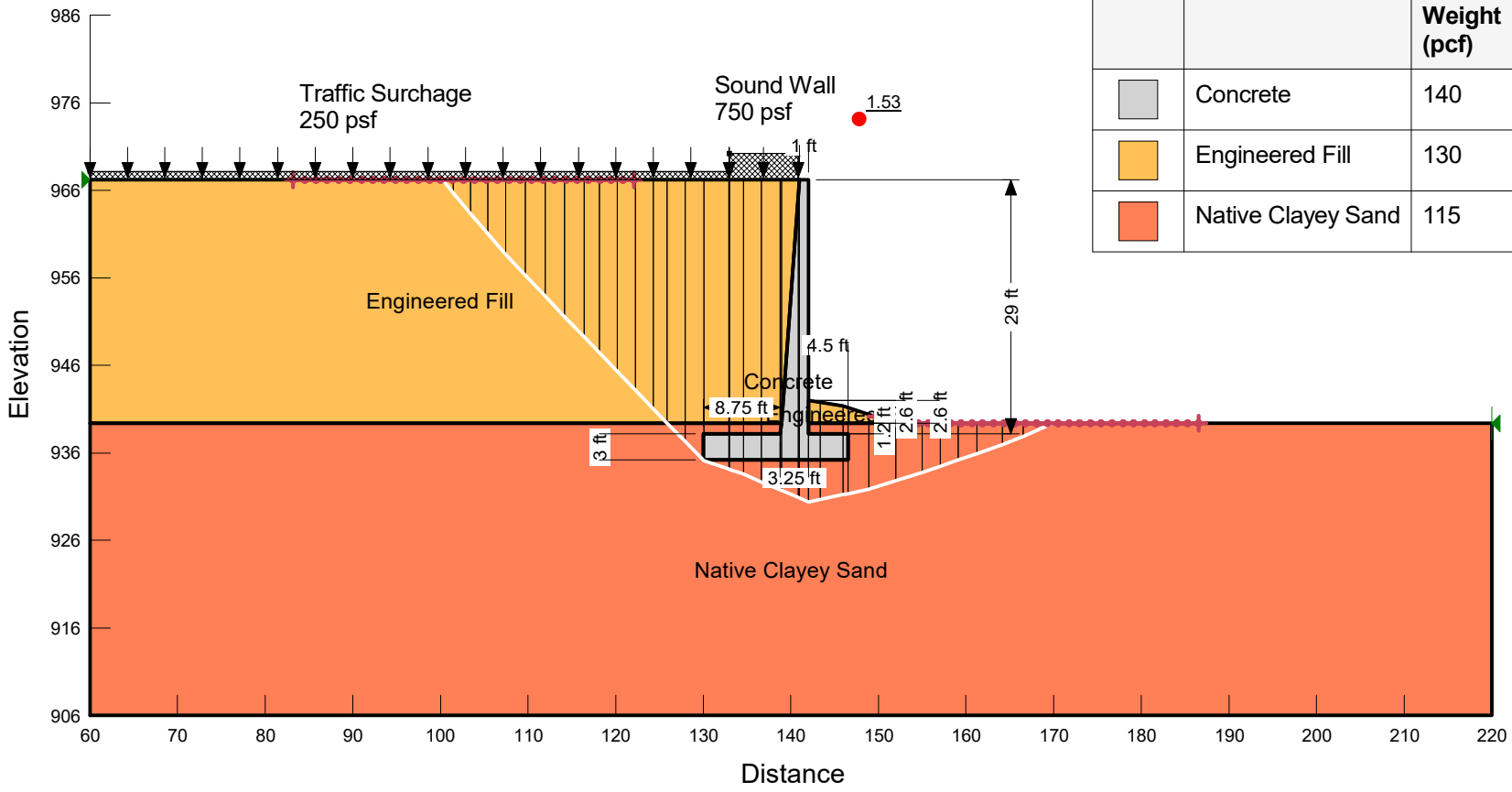


Figure H-31

Name: CIP Wall 1171-LT 29 ft Sta 1+15
Method: Spencer
Factor of Safety: 1.53

Retaining Wall 1171-LT

Wall Height=29'
Sta. 0+56 to 1+15



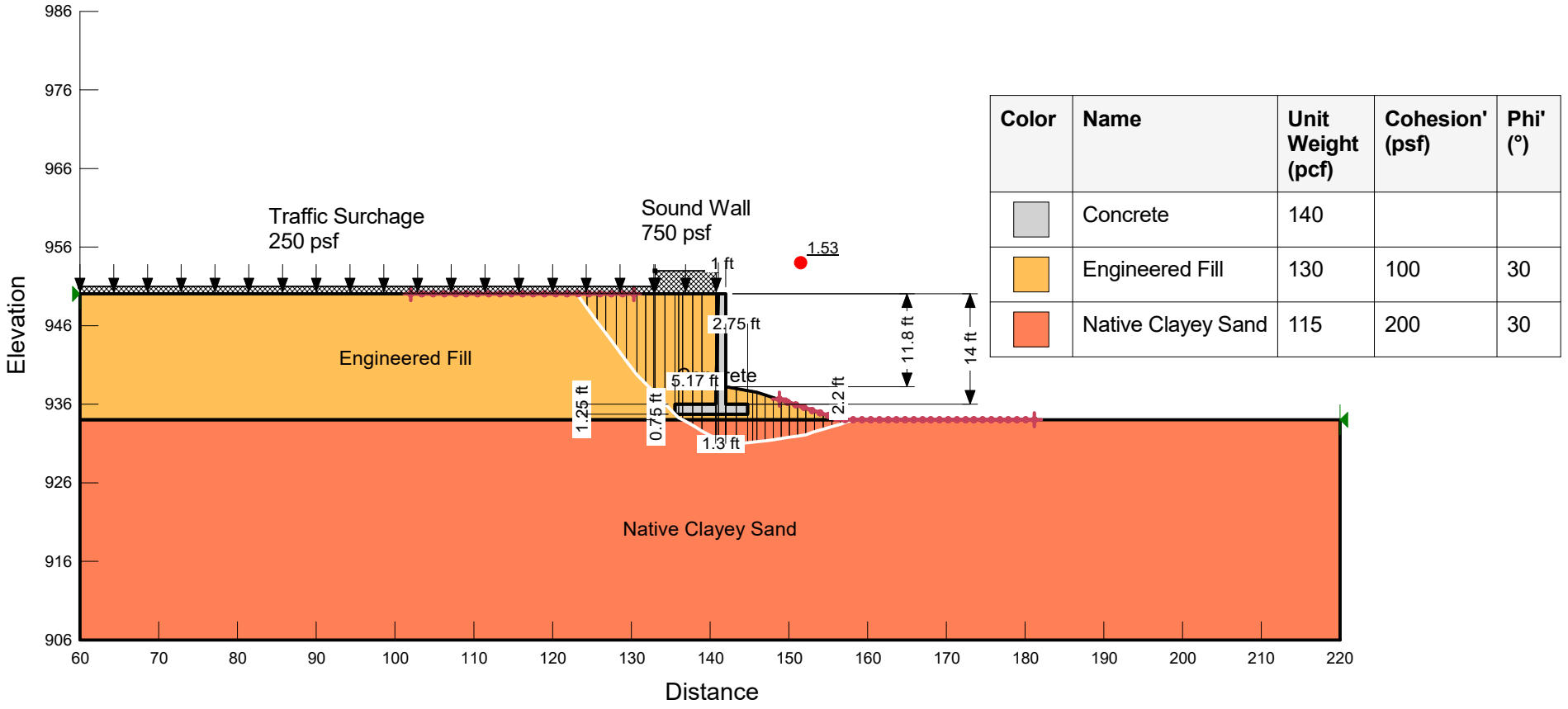
Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Concrete	140		
	Engineered Fill	130	100	30
	Native Clayey Sand	115	200	30

Figure H-32

Name: CIP Wall 1171-LT 14 ft
Method: Spencer
Factor of Safety: 1.53

Retaining Wall 1171-LT

Wall Height=14'
Sta. 6+09 6+99



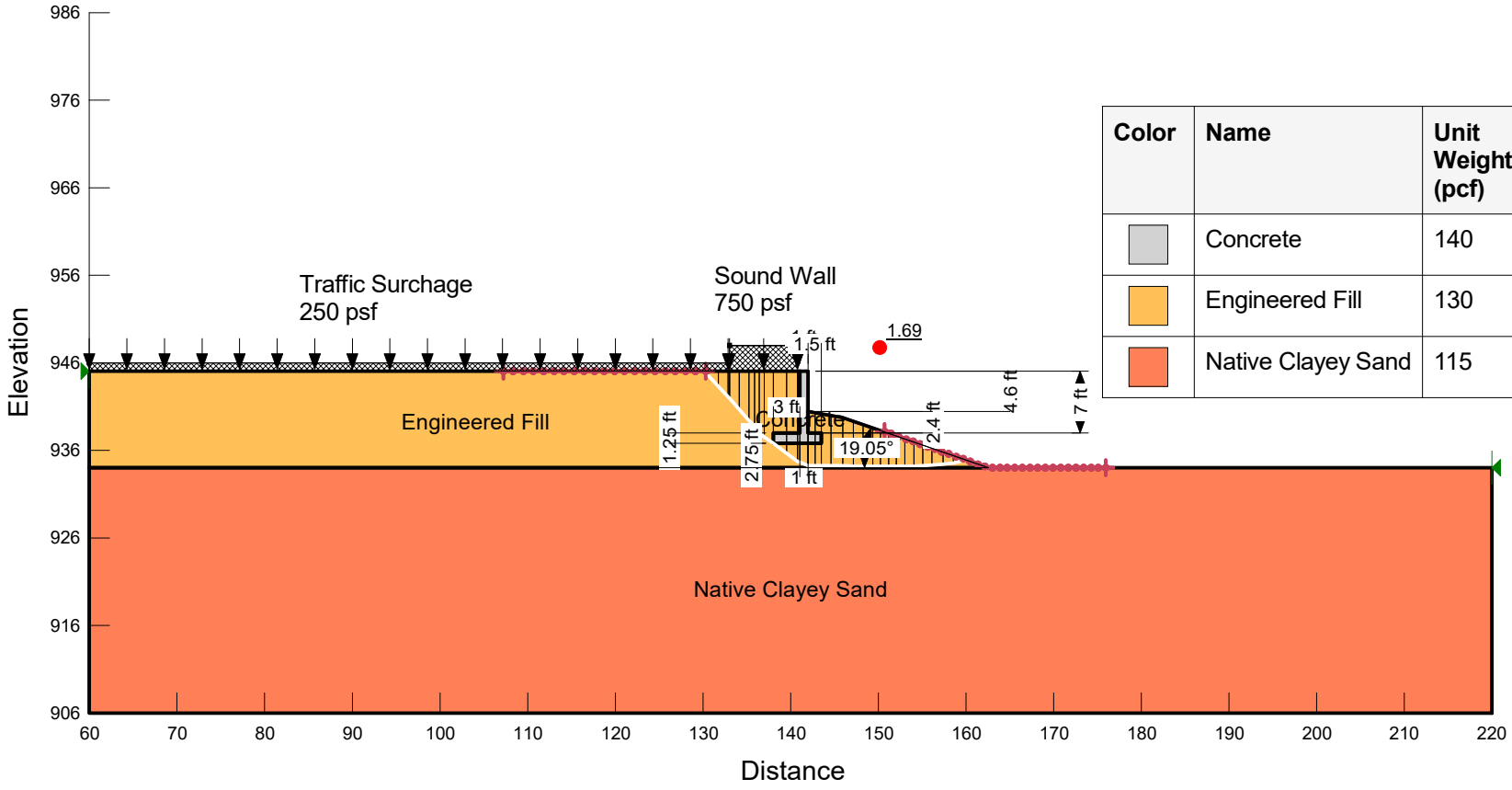
Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Concrete	140		
	Engineered Fill	130	100	30
	Native Clayey Sand	115	200	30

Figure H-33

Name: CIP Wall 1171-LT 14 ft
Method: Spencer
Factor of Safety: 1.69

Retaining Wall 1171-LT

Wall Height=7'
Sta. 6+99 to 7+52



Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Concrete	140		
	Engineered Fill	130	100	30
	Native Clayey Sand	115	200	30

Figure H-34

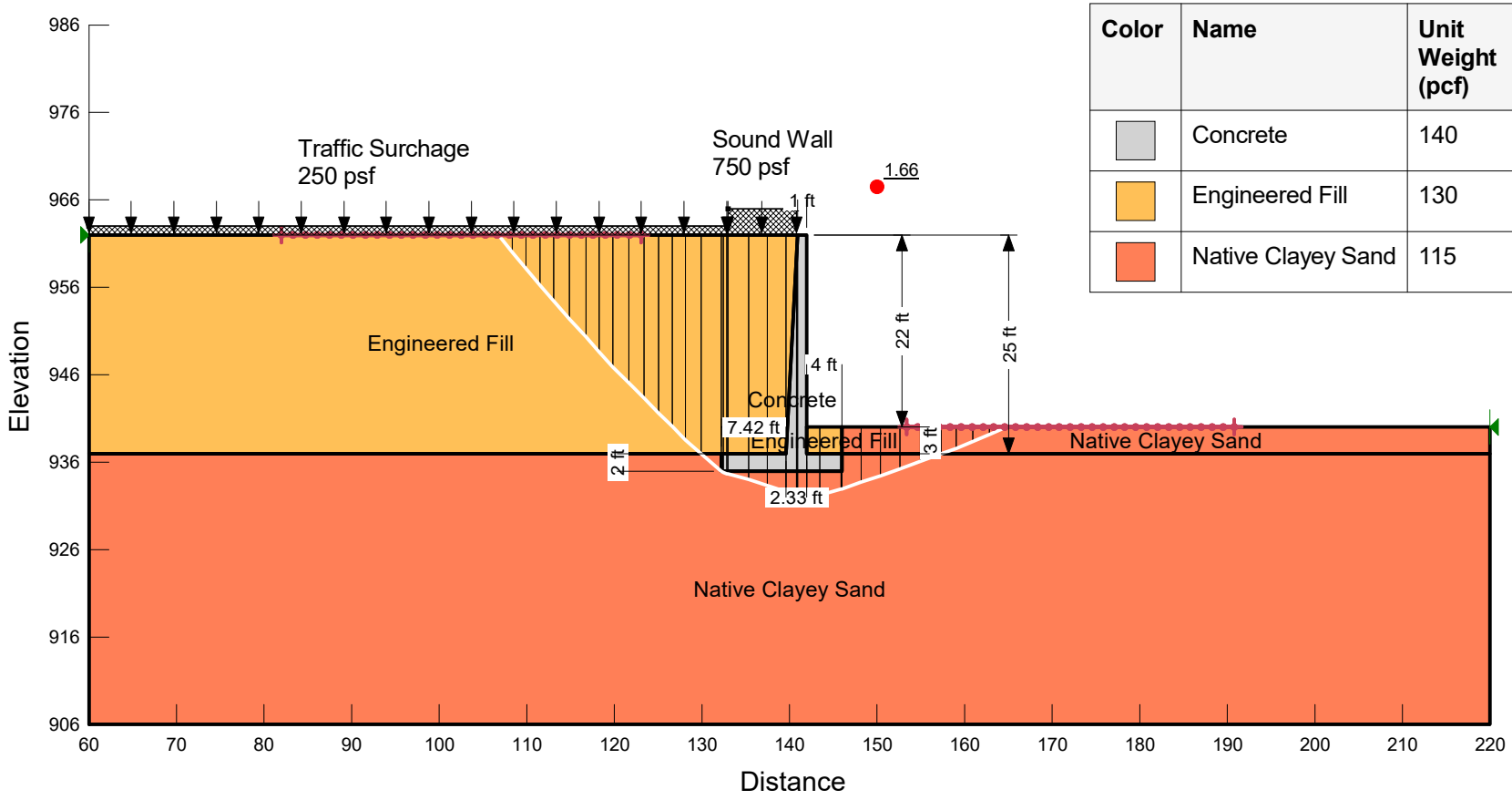
Lower Buckeye
RW-1175-RT
Slope Stability Results

Figure H-35

Name: CIP Wall 1175-RT 25 ft
Method: Spencer
Factor of Safety: 1.66

Retaining Wall 1175-RT

Wall Height=25'
Sta. 0+00 to 0+44
Case I



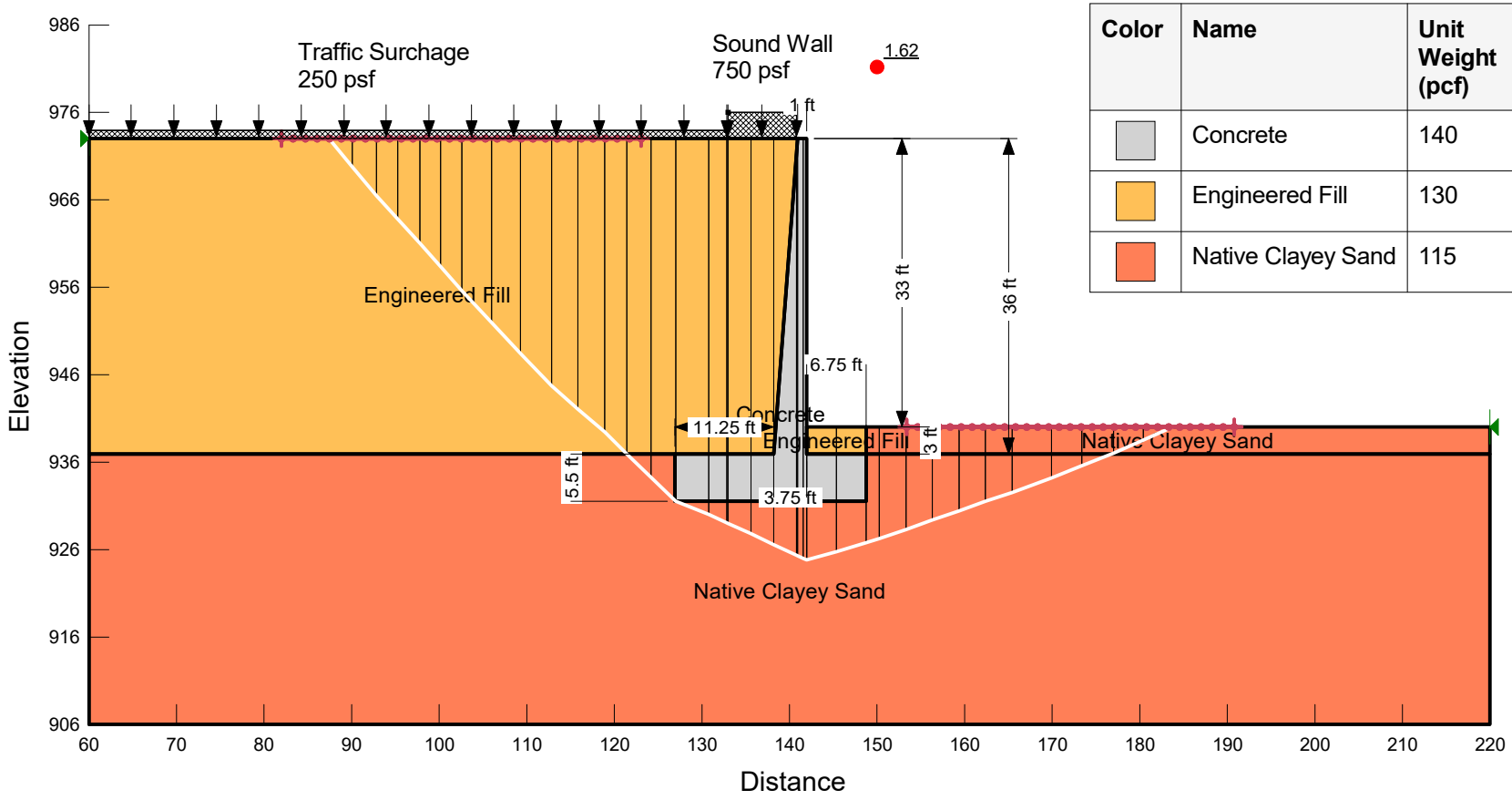
Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Concrete	140		
	Engineered Fill	130	100	30
	Native Clayey Sand	115	200	30

Figure H-36

Name: CIP Wall 1175-RT 36 ft
Method: Spencer
Factor of Safety: 1.62

Retaining Wall 1175-RT

Wall Height=36'
Sta. 0+44 to 2+80



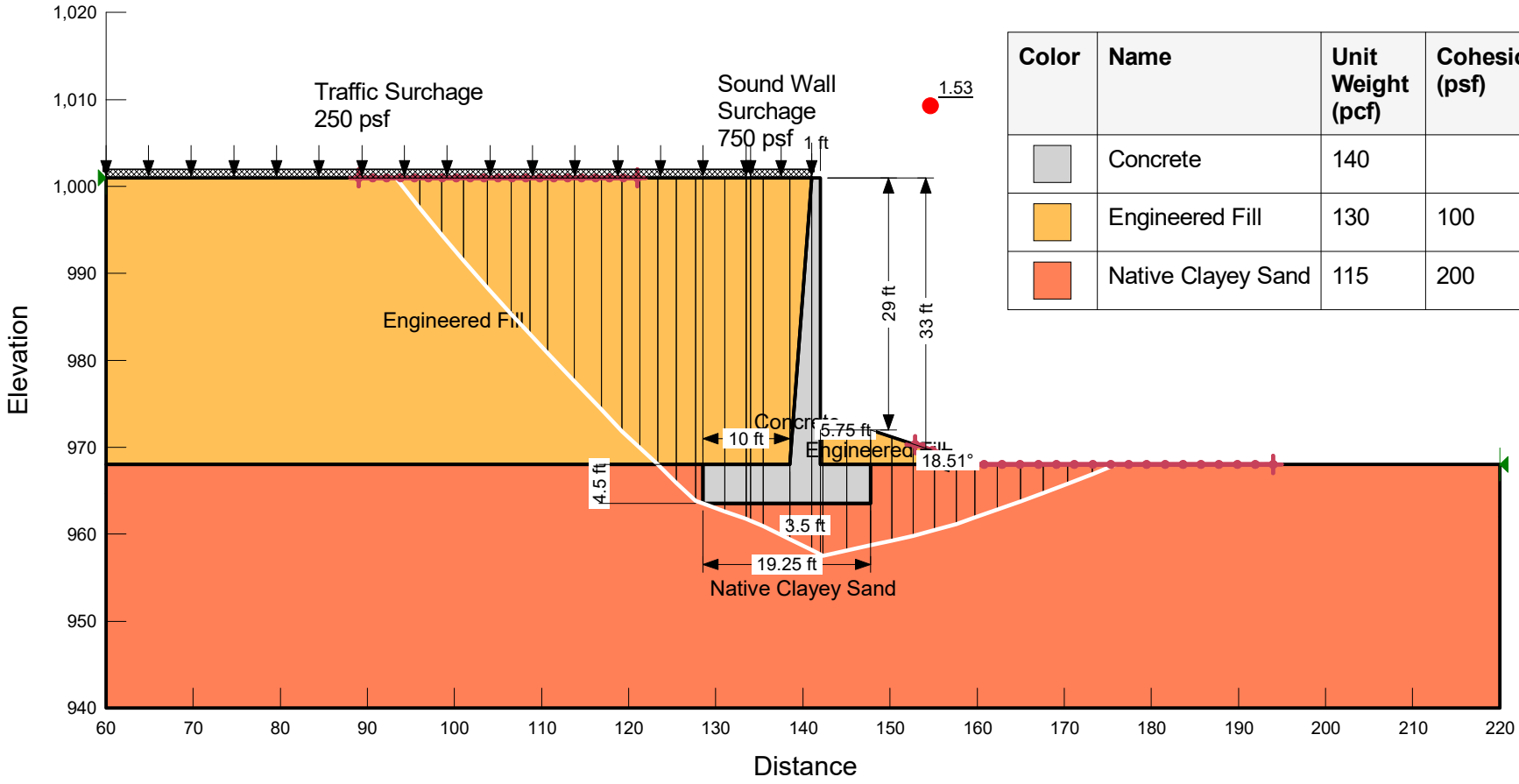
Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Concrete	140		
	Engineered Fill	130	100	30
	Native Clayey Sand	115	200	30

Figure H-37

Name: CIP Wall 1175-RT33H
Method: Spencer
Factor of Safety: 1.53

Retaining Wall 1175-RT

Wall Height=33'
Sta 2+80 to Sta 3+70



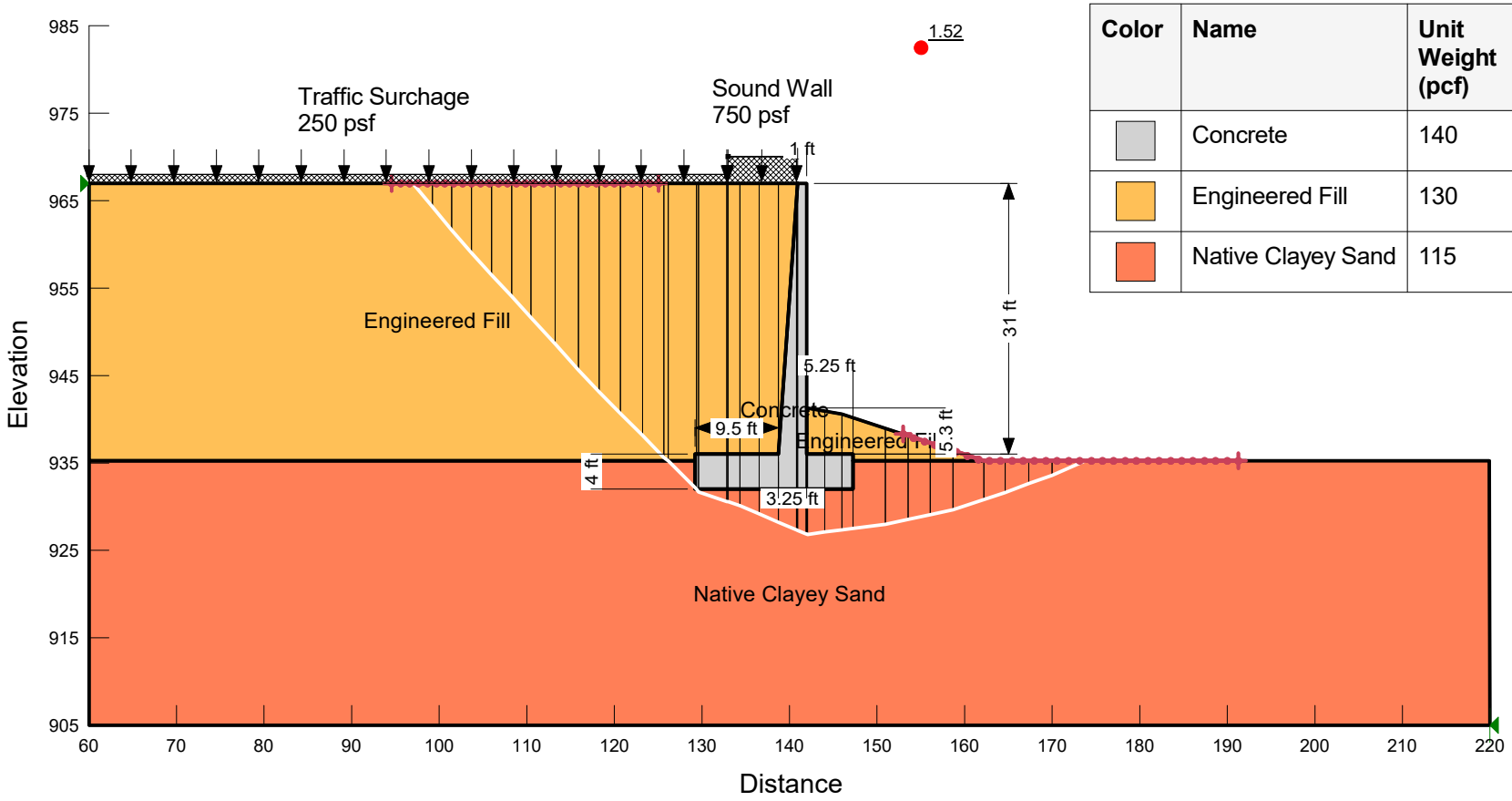
Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Concrete	140		
	Engineered Fill	130	100	30
	Native Clayey Sand	115	200	30

Figure H-38

Name: CIP Wall 1175-RT 36 ft
Method: Spencer
Factor of Safety: 1.52

Retaining Wall 1175-RT

Wall Height=31'
Sta. 3+70 to 4+40



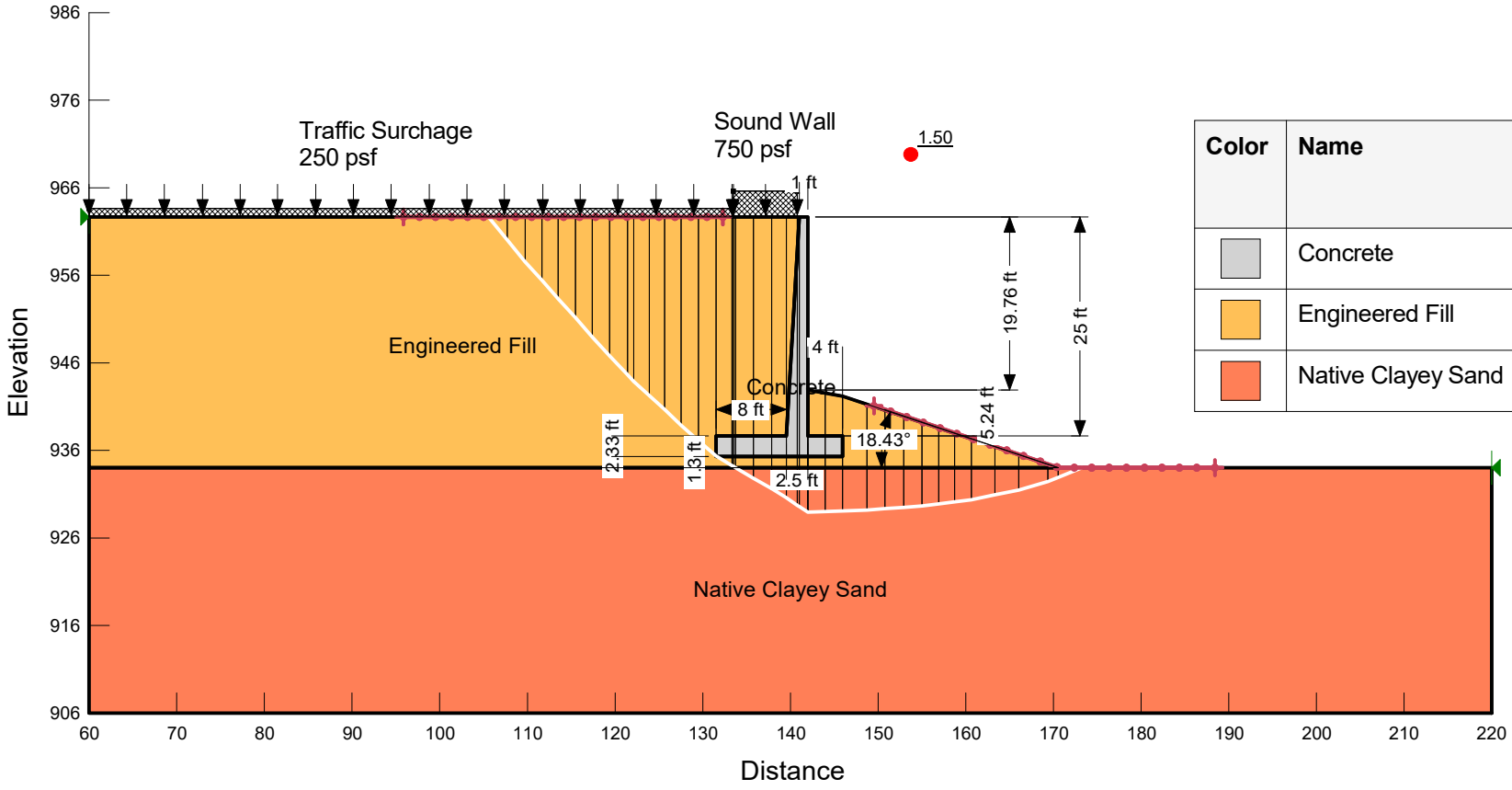
Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Concrete	140		
	Engineered Fill	130	100	30
	Native Clayey Sand	115	200	30

Figure H-39

Name: CIP Wall 1175-RT 25 ft
Method: Spencer
Factor of Safety: 1.50

Retaining Wall 1175-RT

Wall Height=25'
Sta. 4+40 to 10+30



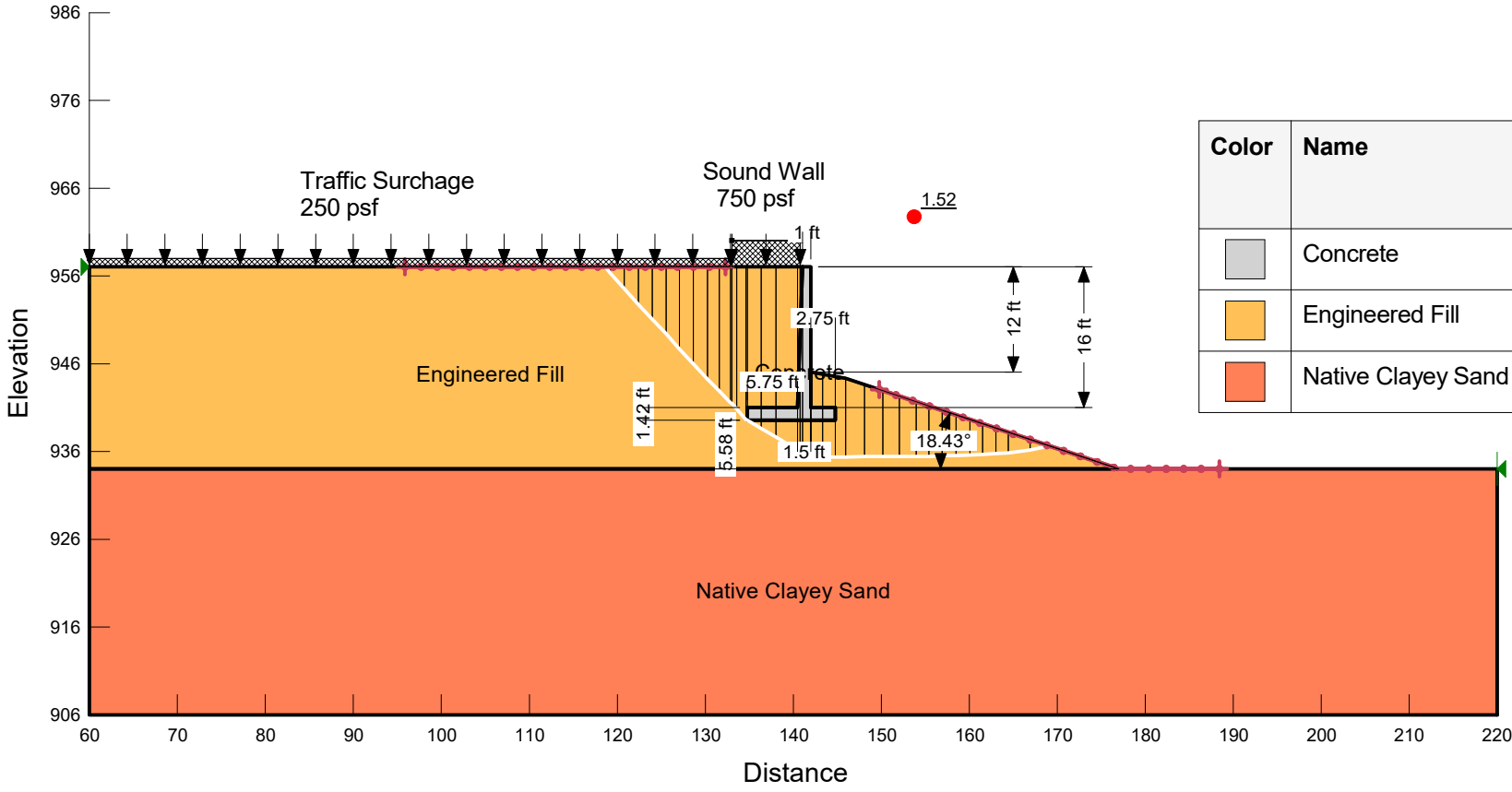
Color	Name	Unit Weight (pcf)	Cohesion' (psf)
	Concrete	140	
	Engineered Fill	130	100
	Native Clayey Sand	115	200

Figure H-40

Name: CIP Wall 1175-RT 16 ft
Method: Spencer
Factor of Safety: 1.52

Retaining Wall 1175-RT

Wall Height=16'
Sta. 10+30 to 14+30



Color	Name	Unit Weight (pcf)	Cohesion' (psf)
	Concrete	140	
	Engineered Fill	130	100
	Native Clayey Sand	115	200

Figure H-41

Lower Buckeye
RW-1175-LT
Slope Stability Results

Figure H-42

Name: CIP Wall 1175-LT 28 ft
Method: Spencer
Factor of Safety: 1.60

Retaining Wall 1175-LT

Wall Height=20'
Sta. 0+00 to 7+40

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Concrete	140		
	Engineered Fill	130	100	30
	Native Clayey Sand	115	200	30

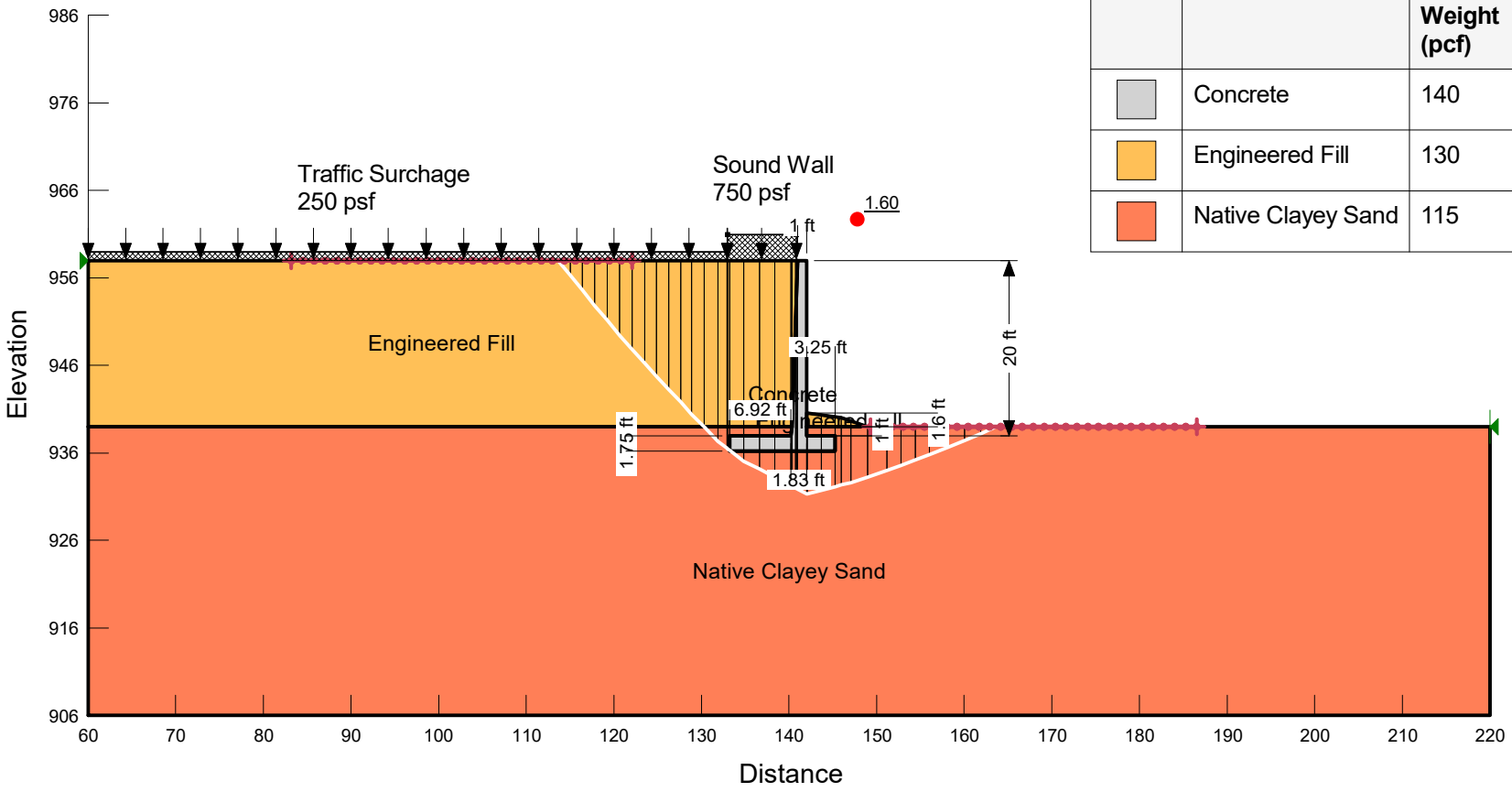


Figure H-43

Name: CIP Wall 1175-LT 28 ft
Method: Spencer
Factor of Safety: 1.50

Retaining Wall 1175-LT

Wall Height=28'
Sta. 7+40 to 13+95

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Concrete	140		
	Engineered Fill	130	100	30
	Native Clayey Sand	115	200	30

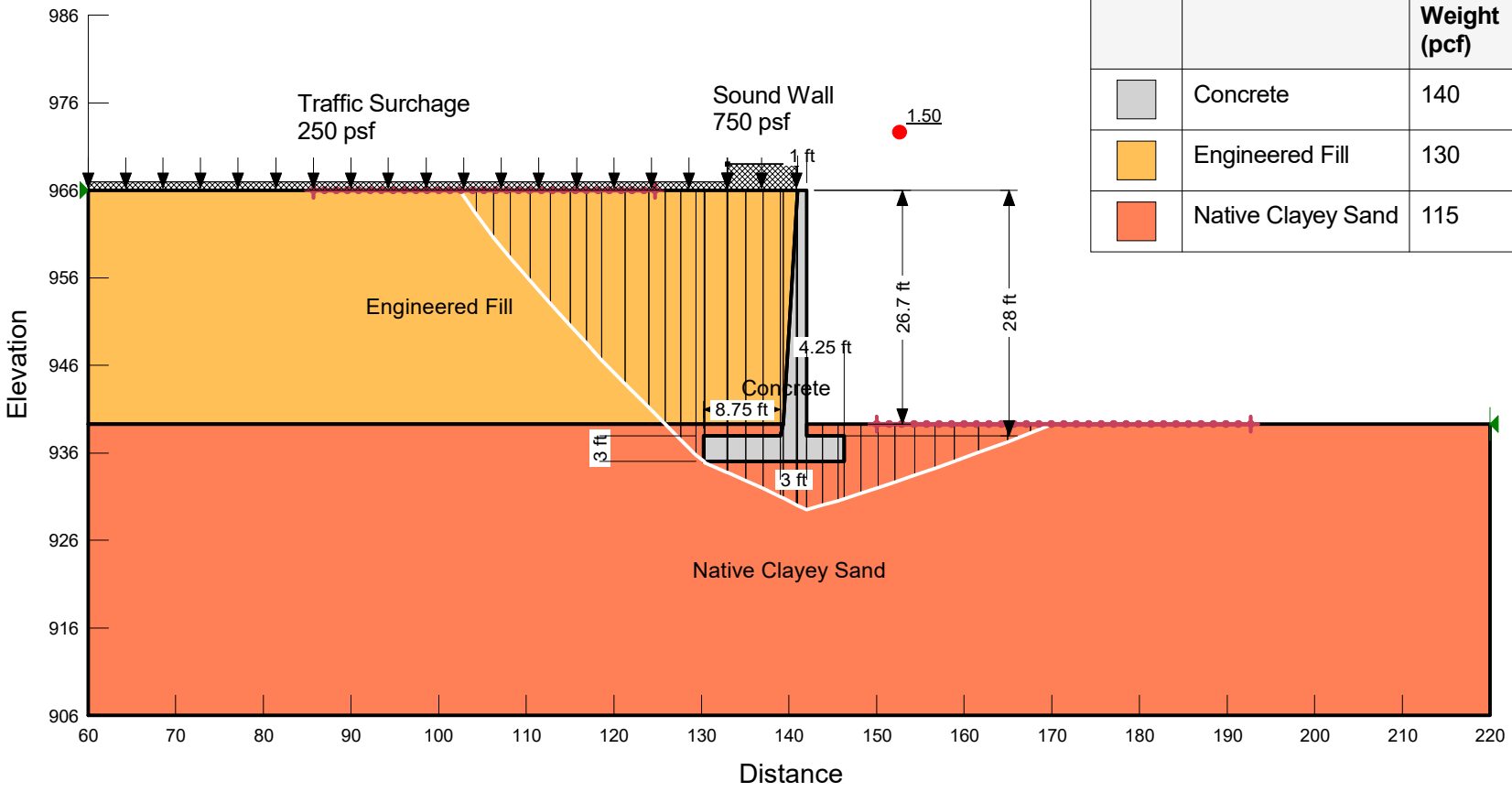


Figure H-44

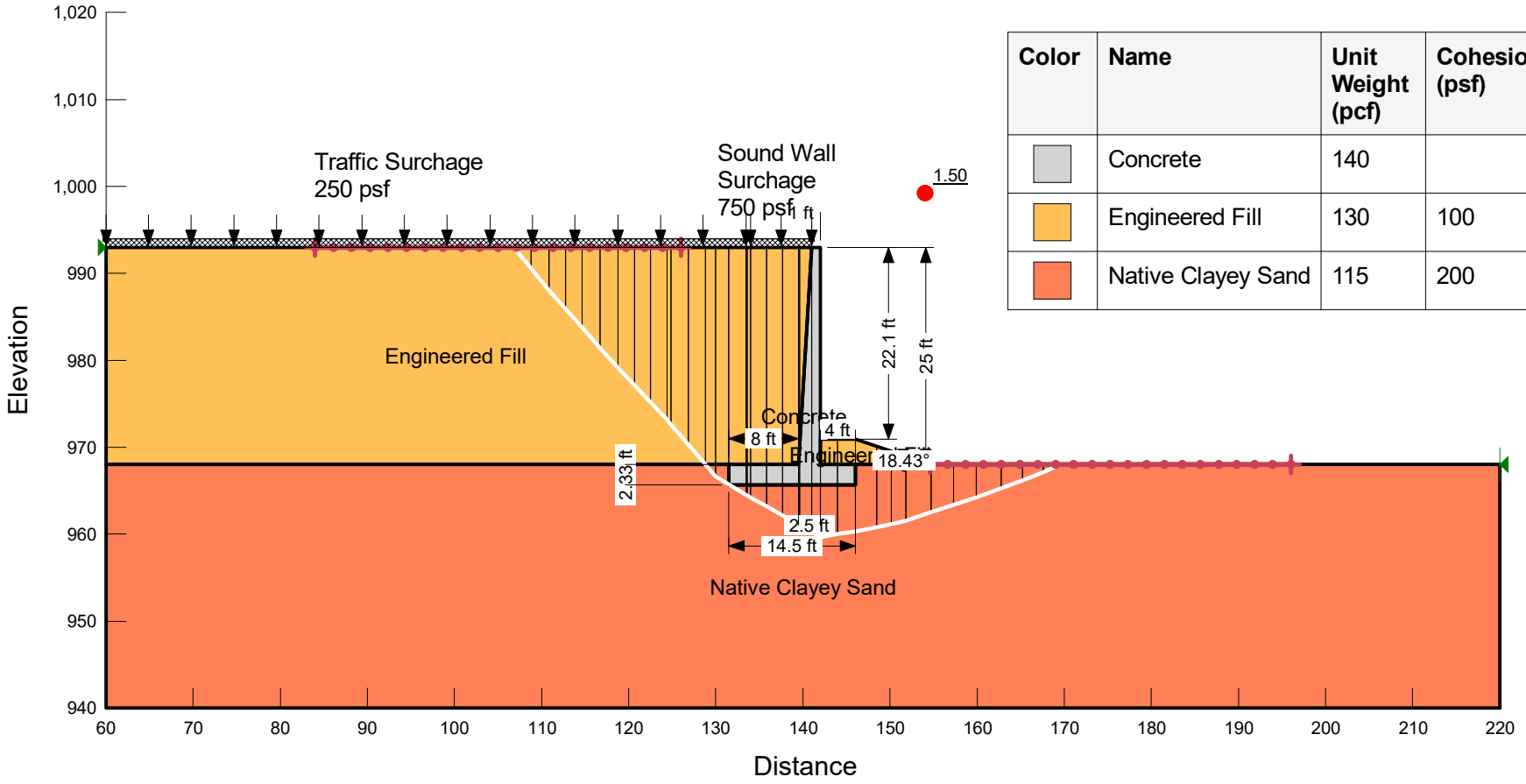
Yuma Road OP
RW-1224-RT
Slope Stability Results

Figure H-45

Name: CIP Wall 1224-RT 25H
Method: Spencer
Factor of Safety: 1.50

Retaining Wall 1224-RT

Wall Height=25'
Sta. 5+10 to 5+78



Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Concrete	140		
	Engineered Fill	130	100	30
	Native Clayey Sand	115	200	30

Figure H-46

Yuma Road OP
RW-1224-LT
Slope Stability Results

Figure H-47

Name: CIP Wall 1224-LT 16H Case 1
Method: Spencer
Factor of Safety: 1.68

Retaining Wall 1224-LT

Wall Height=16'
Sta.0+00 to 0+26
Case I

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Concrete	140		
	Engineered Fill	130	100	30
	Native Clayey Sand	115	200	30

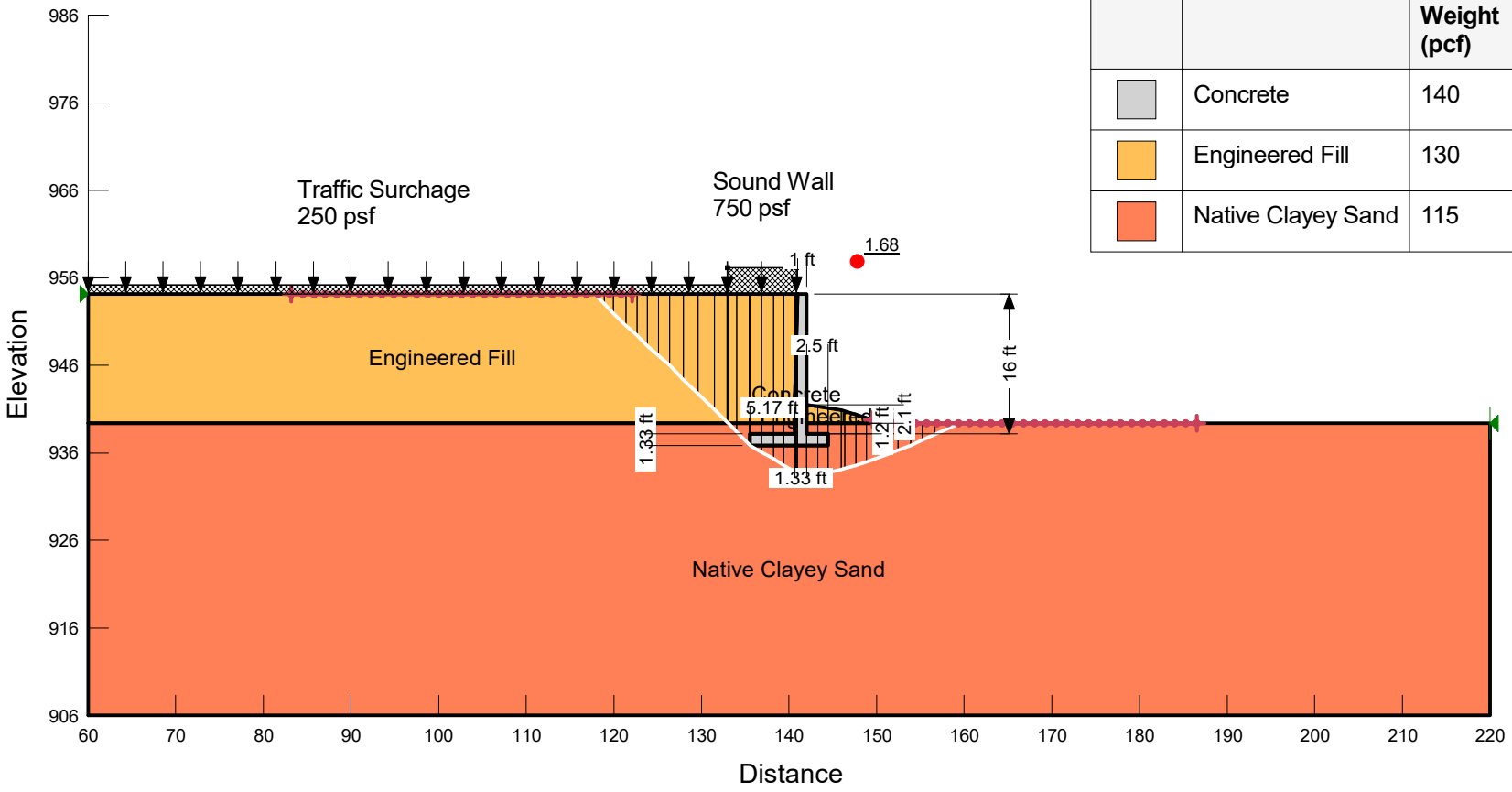


Figure H-48

Name: CIP Wall 1224-LT 24H
Method: Spencer
Factor of Safety: 1.56

Retaining Wall 1224-LT

Wall Height=24'
Sta. 0+26 to 2+48

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Concrete	140		
	Engineered Fill	130	100	30
	Native Clayey Sand	115	200	30

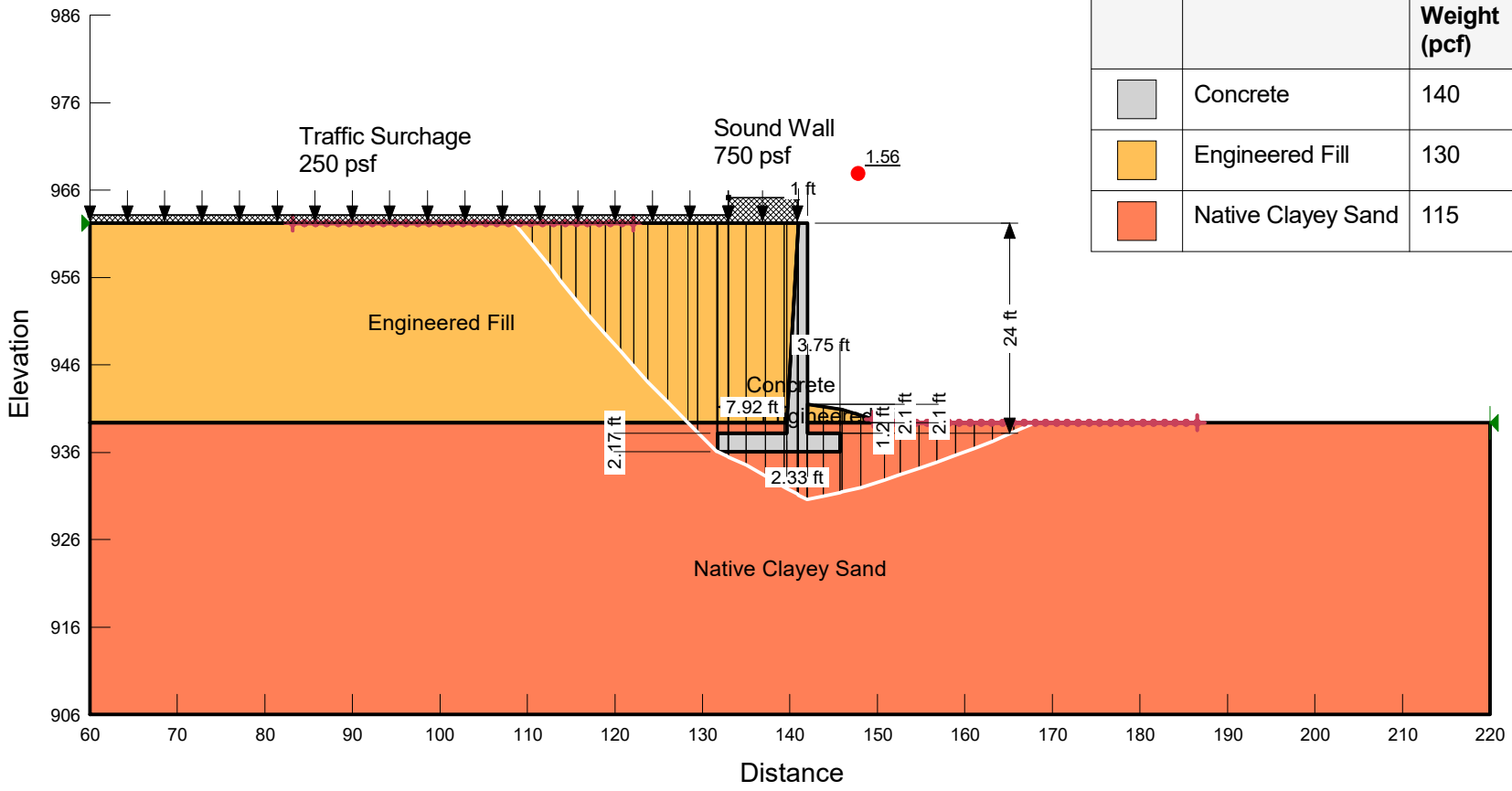


Figure H-49

Name: CIP Wall 1224-LT 17 ft
Method: Spencer
Factor of Safety: 1.63

Retaining Wall 1224-LT

Wall Height=17'
Sta. 2+48 to 3+68

Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Concrete	140		
	Engineered Fill	130	100	30
	Native Clayey Sand	115	200	30

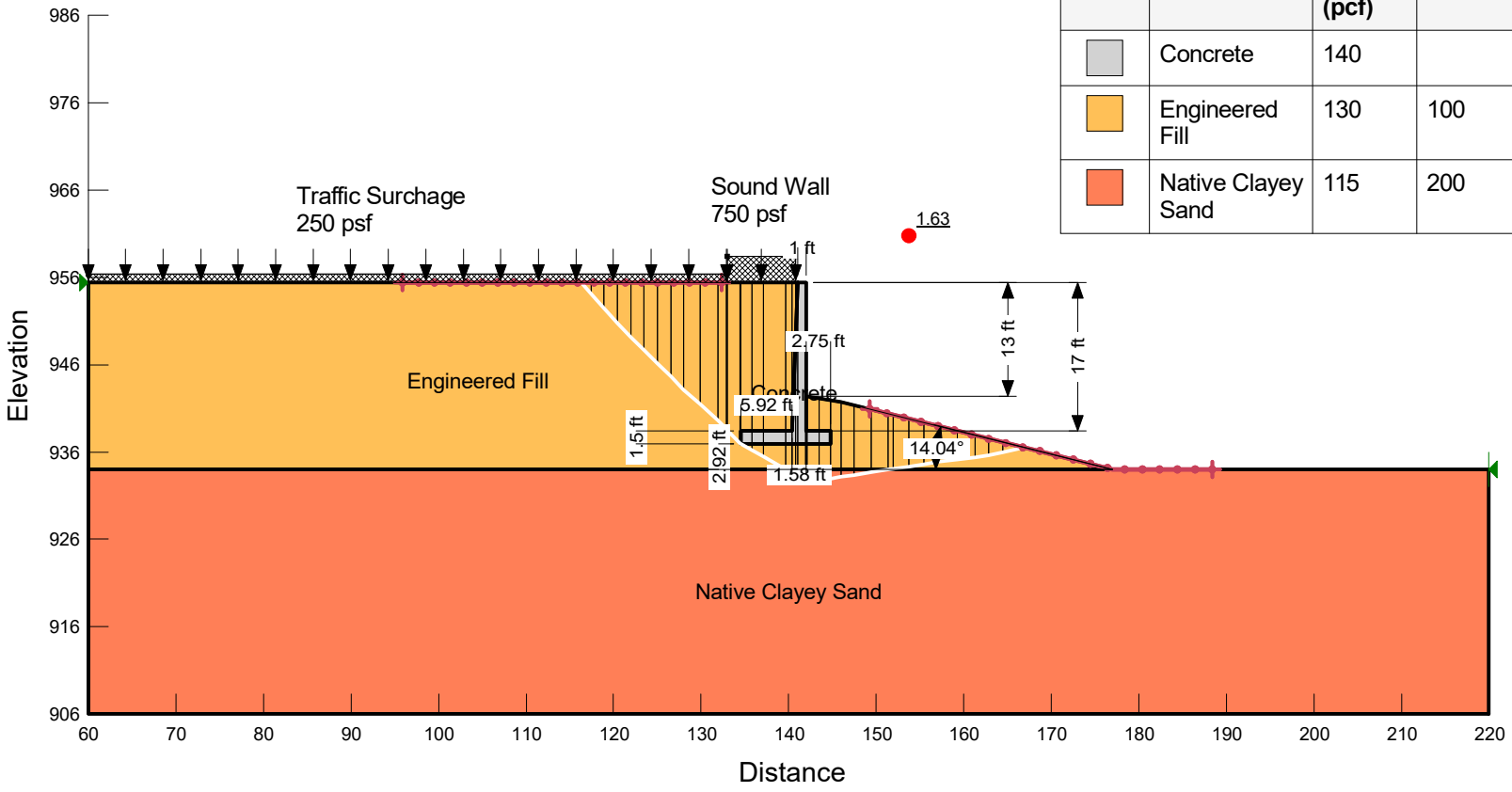


Figure H-50

Frontage Road
RW-NBFR-26-RT
Slope Stability Results

Figure H-51

Name: CIP Wall NBFR-26-RT
Method: Spencer
Factor of Safety: 1.82

Retaining Wall NBFR-26-RT

Wall Height=7'

Footing Dimensions for 4' Wall Height

Fill Beneath Footing=0'

Sta 0+00 to 6+67

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Concrete	High Strength	140		
	Engineered Fill	Mohr-Coulomb	130	100	30
	Native Silty Clay	Mohr-Coulomb	110	200	26
	Native Silty Sand	Mohr-Coulomb	110	0	30

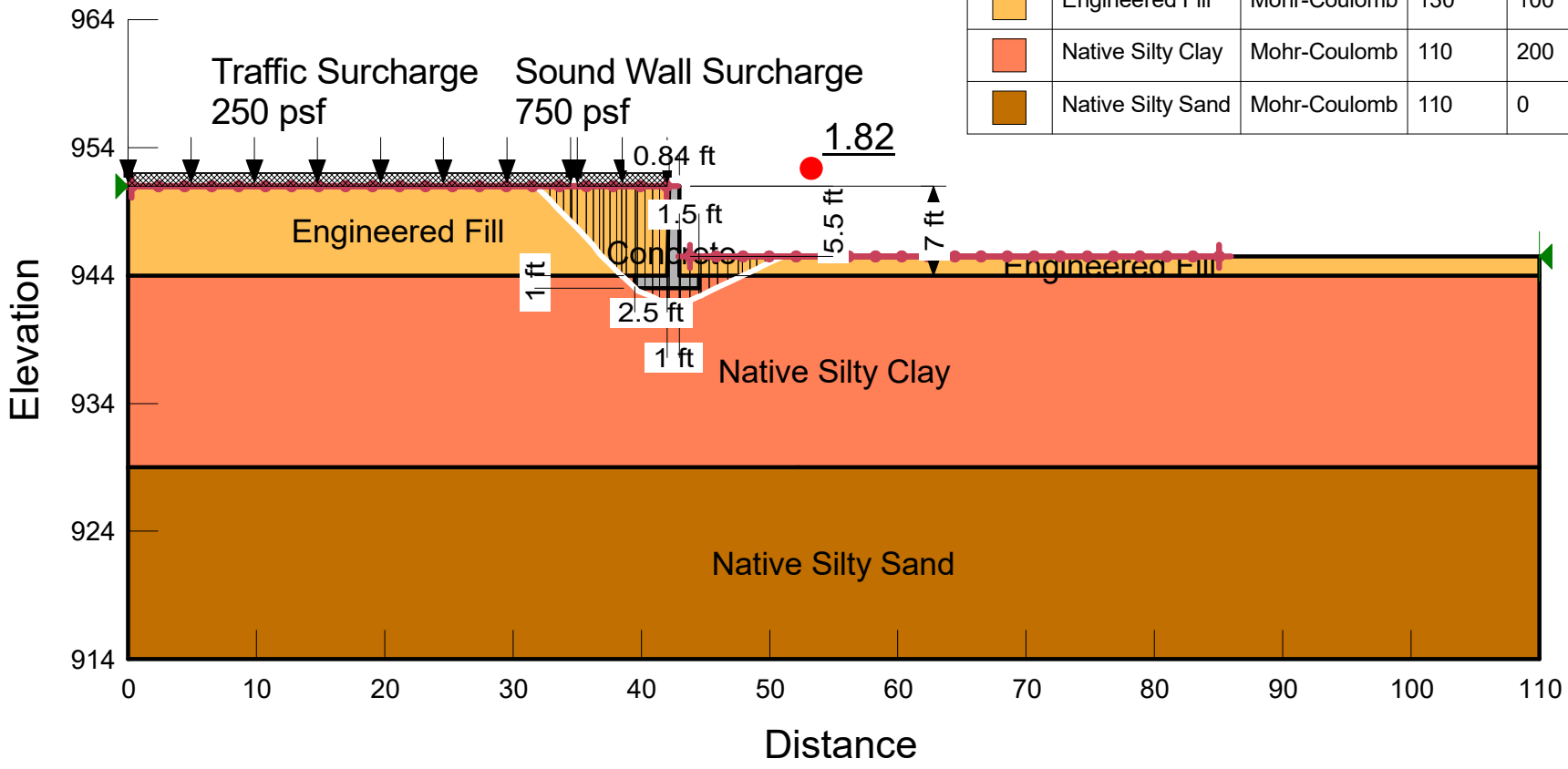


Figure H-52

Frontage Road
RW-NBFR-47-RT
Slope Stability Results

Figure H-53

Name: CIP Wall NBFR-47-RT STA 0+00
Method: Spencer
Factor of Safety: 1.78

Retaining Wall NBRF-47-RT
STA 0+00 to 0+30 & 8+10 to 9+70
Wall Height=4'
Fill Beneath Footing=0'

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Concrete	High Strength	140		
	Engineered Fill	Mohr-Coulomb	130	100	30
	Native Clayey Sand	Mohr-Coulomb	110	100	30
	Native Silty,Clayey Sand	Mohr-Coulomb	110	0	30

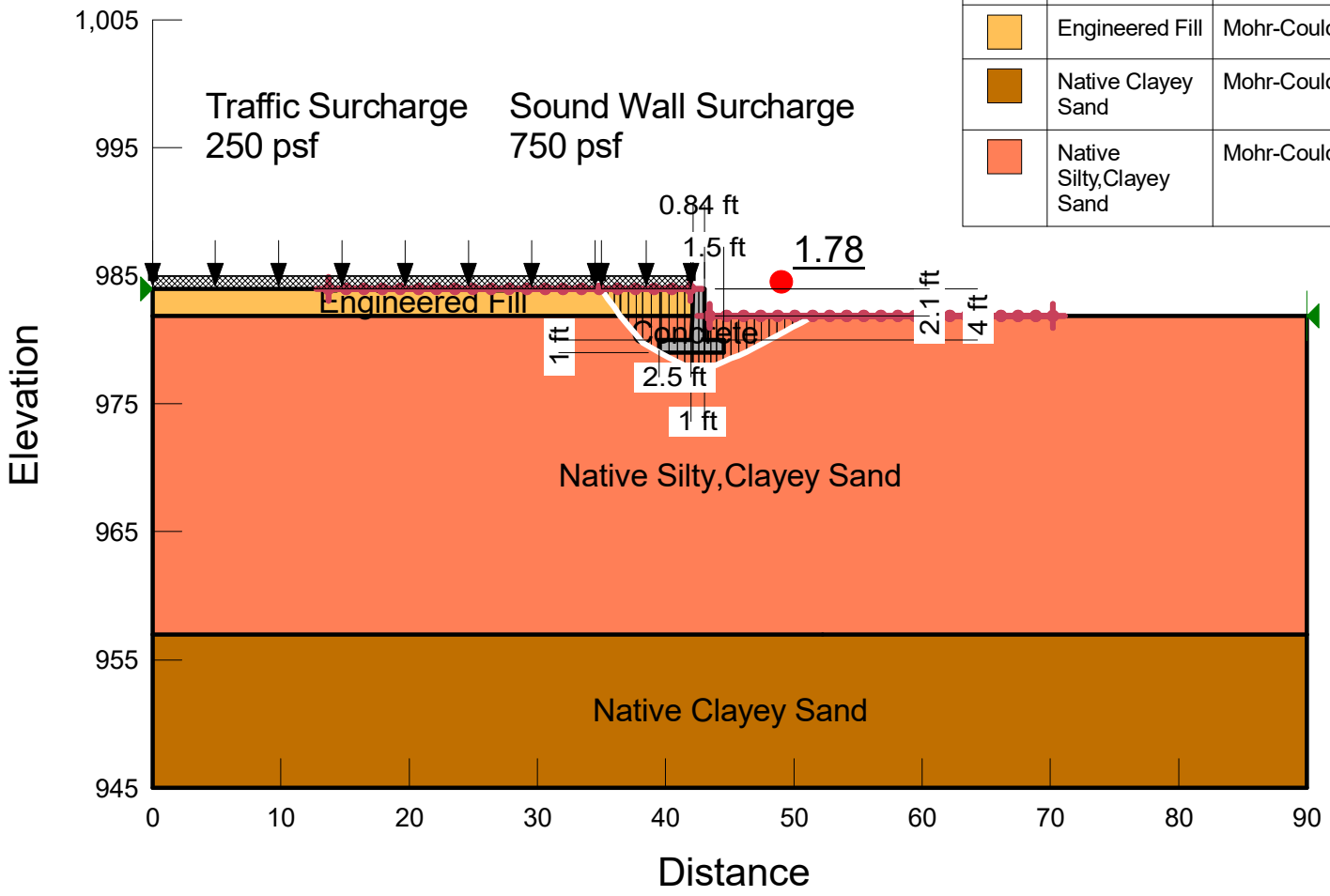


Figure H-54

Name: CIP Wall NBFR-47-RT STA 0+30.00
Method: Spencer
Factor of Safety: 1.65

Retaining Wall NBRF-47-RT
STA 0+30 to 0+90
Wall Height=5'
Fill Beneath Footing=0'

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Concrete	High Strength	140		
	Engineered Fill	Mohr-Coulomb	130	100	30
	Native Clayey Sand	Mohr-Coulomb	110	100	30
	Native Silty,Clayey Sand	Mohr-Coulomb	110	0	30

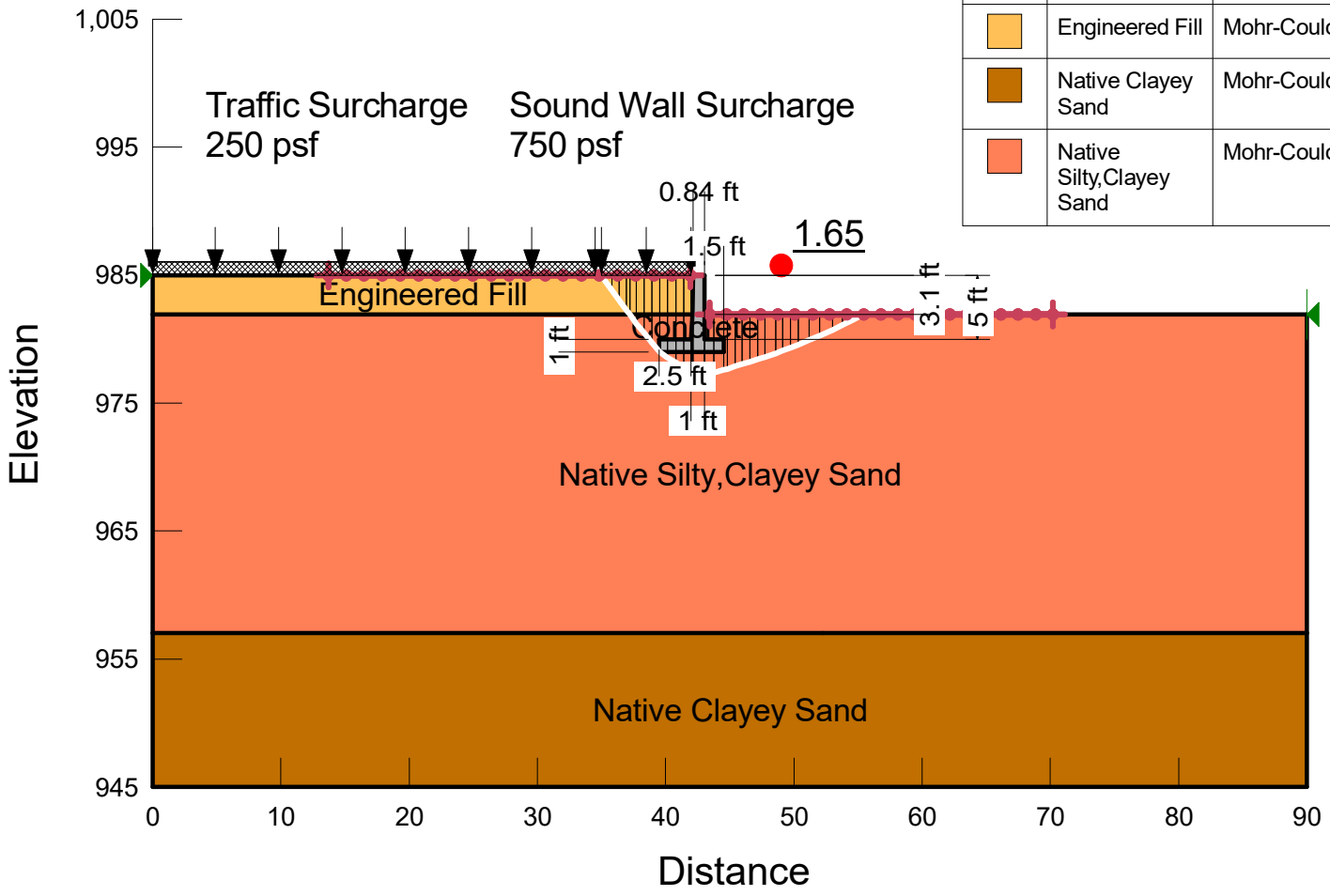


Figure H-55

Name: CIP Wall NBFR-47-RT STA 7+20
Method: Spencer
Factor of Safety: 1.68

Retaining Wall NBRF-47-RT
STA 0+90 to 1+20 & 7+20 to 8+10
Wall Height=6'
Fill Beneath Footing=0'

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Concrete	High Strength	140		
	Engineered Fill	Mohr-Coulomb	130	100	30
	Native Clayey Sand	Mohr-Coulomb	110	100	30
	Native Silty,Clayey Sand	Mohr-Coulomb	110	0	30

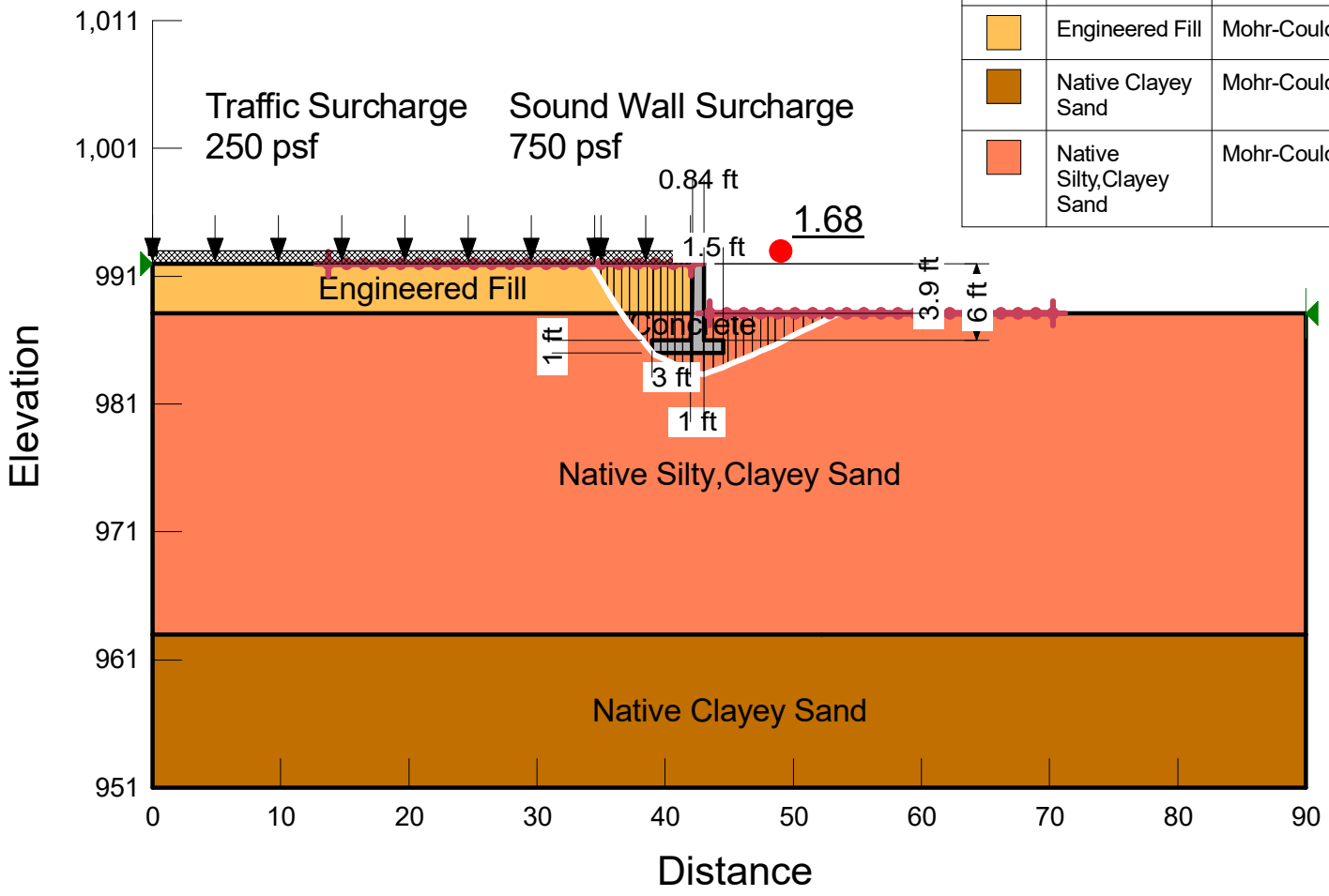


Figure H-56

Name: CIP Wall NBFR-47-RT STA 1+80
Method: Spencer
Factor of Safety: 1.56

Retaining Wall NBRF-47-RT
STA 1+20 to 2+10 & 6+90 to 7+20
Wall Height=7'
Fill Beneath Footing=0'

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Concrete	High Strength	140		
	Engineered Fill	Mohr-Coulomb	130	100	30
	Native Clayey Sand	Mohr-Coulomb	110	100	30
	Native Silty,Clayey Sand	Mohr-Coulomb	110	0	30

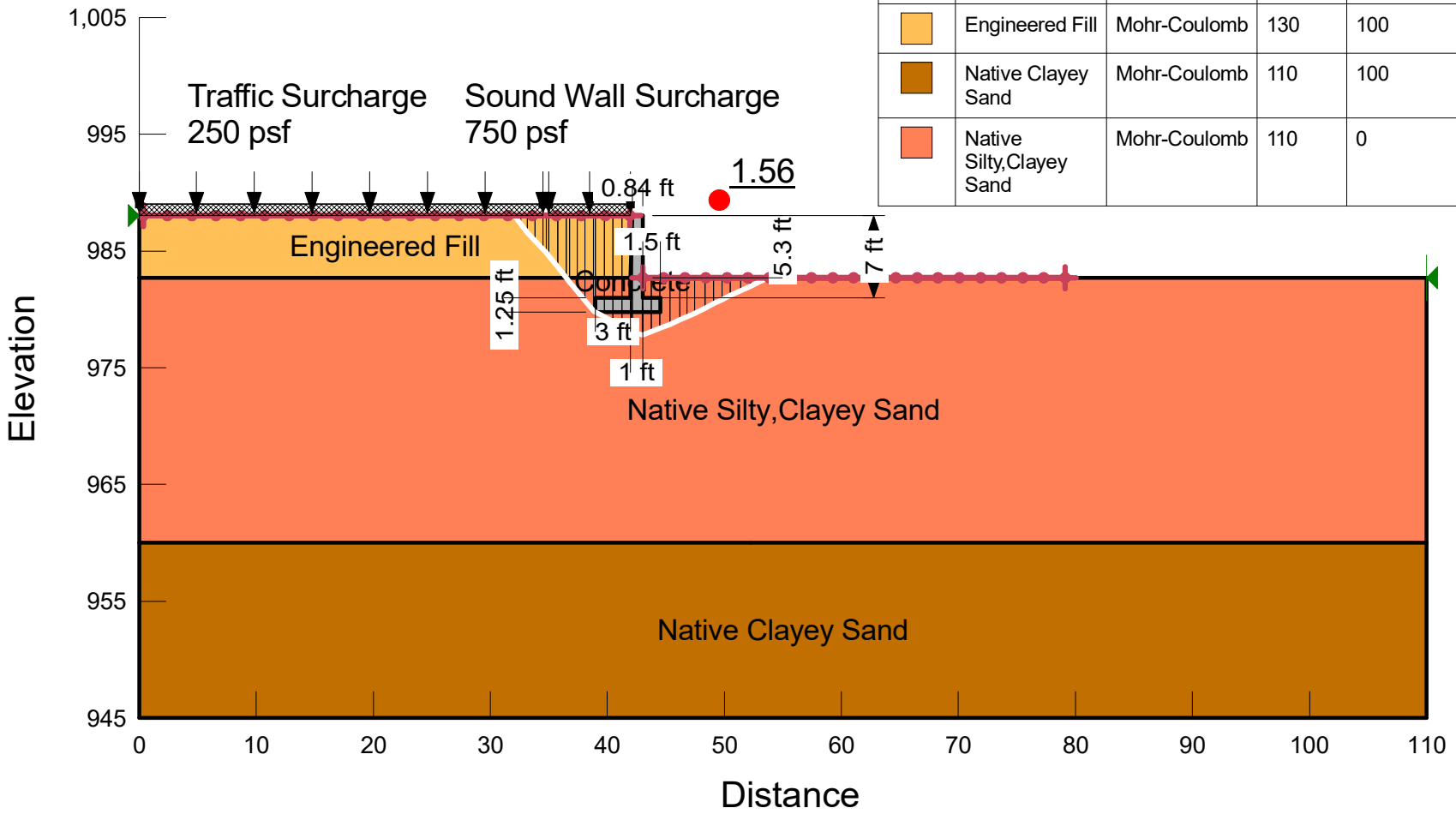


Figure H-57

Name: CIP Wall NBFR-47-RT STA 2+10
Method: Spencer
Factor of Safety: 1.60

Retaining Wall NBRF-47-RT
STA 2+10 to 2+40 & 6+60 to 6+90
Wall Height=8'
Fill Beneath Footing=0'

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Concrete	High Strength	140		
	Engineered Fill	Mohr-Coulomb	130	100	30
	Native Clayey Sand	Mohr-Coulomb	110	100	30
	Native Silty,Clayey Sand	Mohr-Coulomb	110	0	30

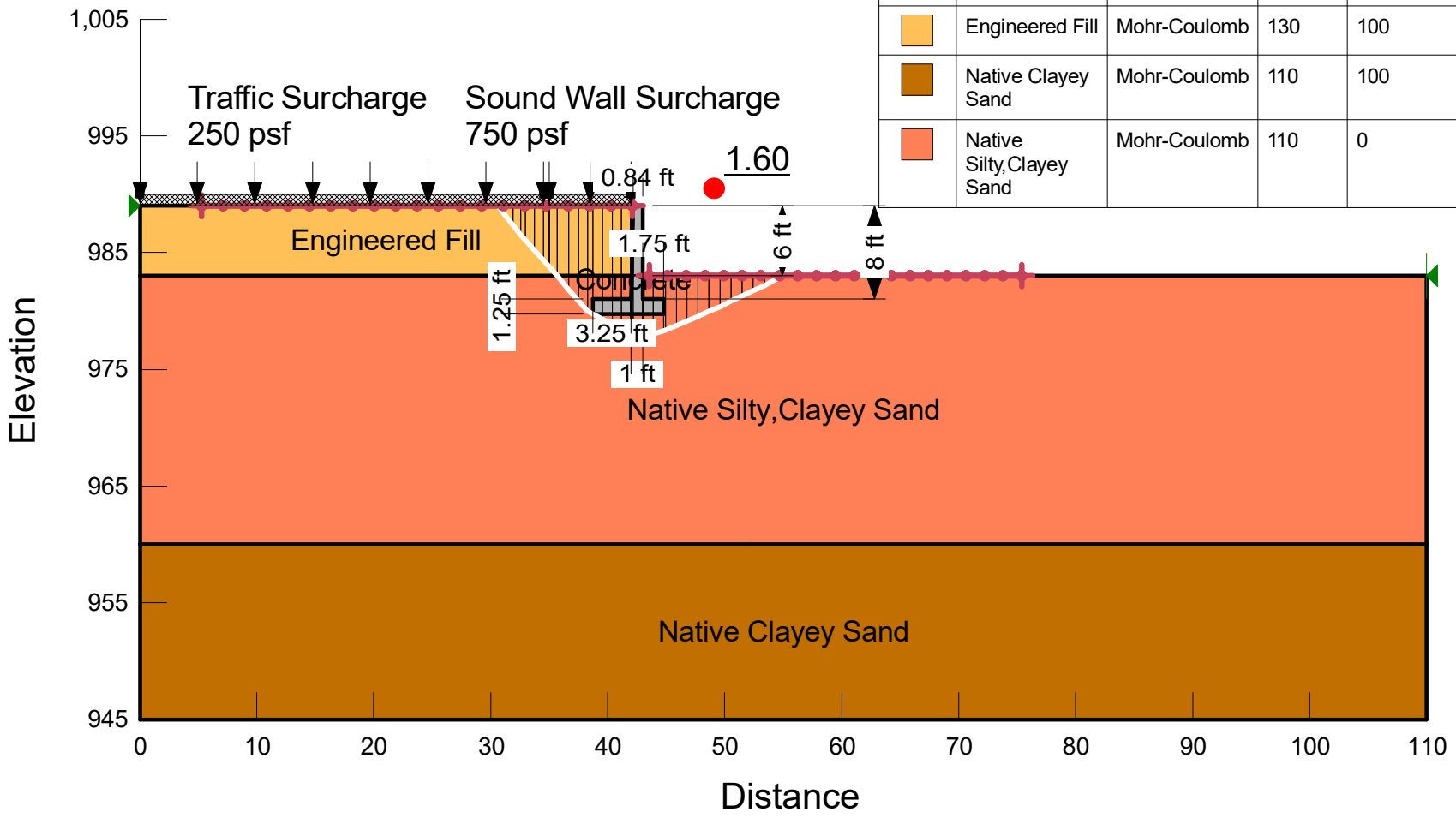


Figure H-58

Name: CIP Wall NBFR-47-RT STA 5+70
Method: Spencer
Factor of Safety: 1.56

Retaining Wall NBRF-47-RT
STA 2+40 to 3+60; 4+20 to 4+50; & 5+70 to 6+60
Wall Height=9'
Fill Beneath Footing=0'

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Concrete	High Strength	140		
	Engineered Fill	Mohr-Coulomb	130	100	30
	Native Clayey Sand	Mohr-Coulomb	110	100	30
	Native Silty,Clayey Sand	Mohr-Coulomb	110	0	30

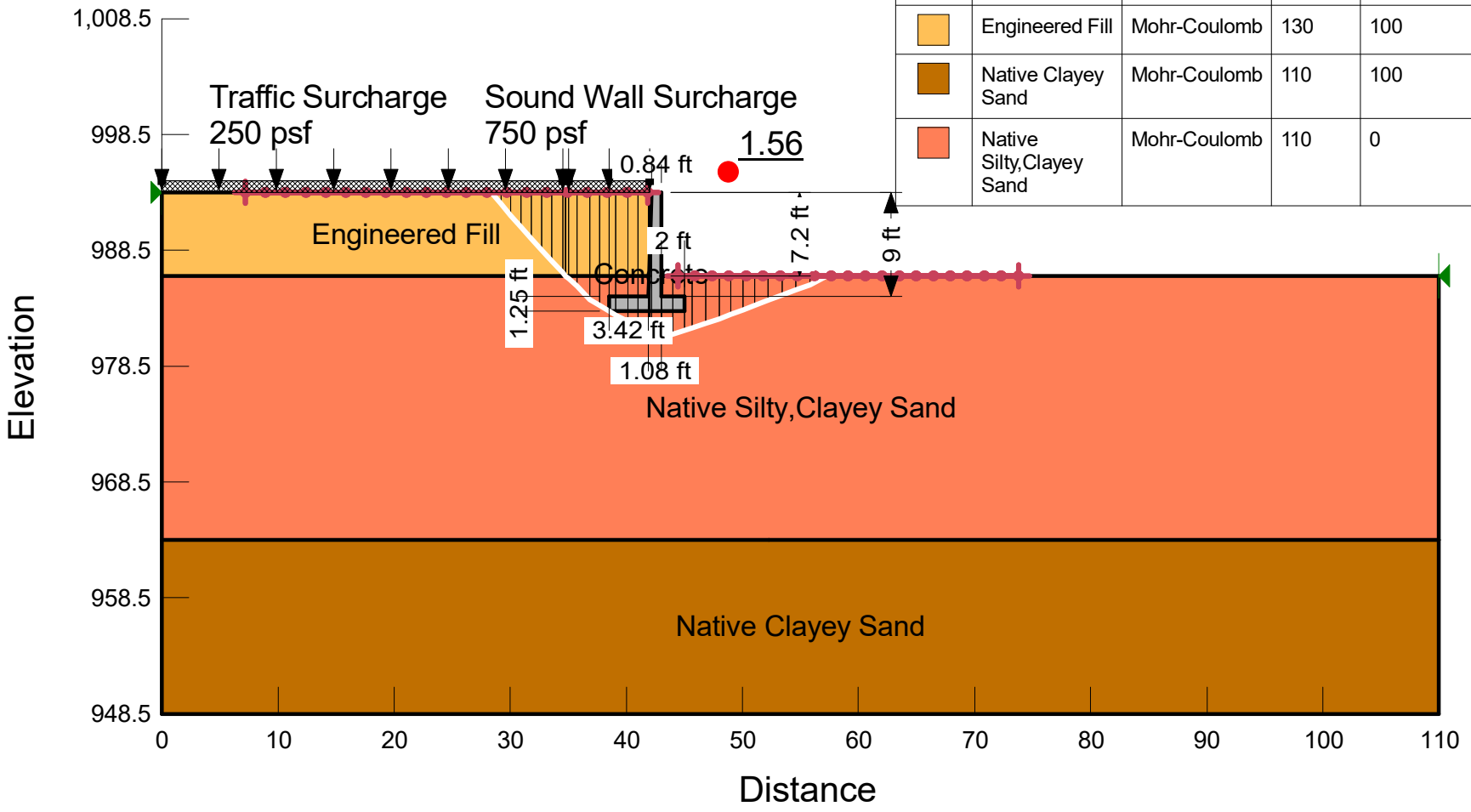


Figure H-59

Name: CIP Wall NBFR-47-RT STA 4+50
Method: Spencer
Factor of Safety: 1.52

Retaining Wall NBRF-47-RT
STA 3+60 to 4+20 & 4+50 to 5+70
Wall Height=10'
Embedment Depth=2'

Color	Name	Model	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Concrete	High Strength	140		
	Engineered Fill	Mohr-Coulomb	130	100	30
	Native Clayey Sand	Mohr-Coulomb	110	100	30
	Native Silty,Clayey Sand	Mohr-Coulomb	110	0	30

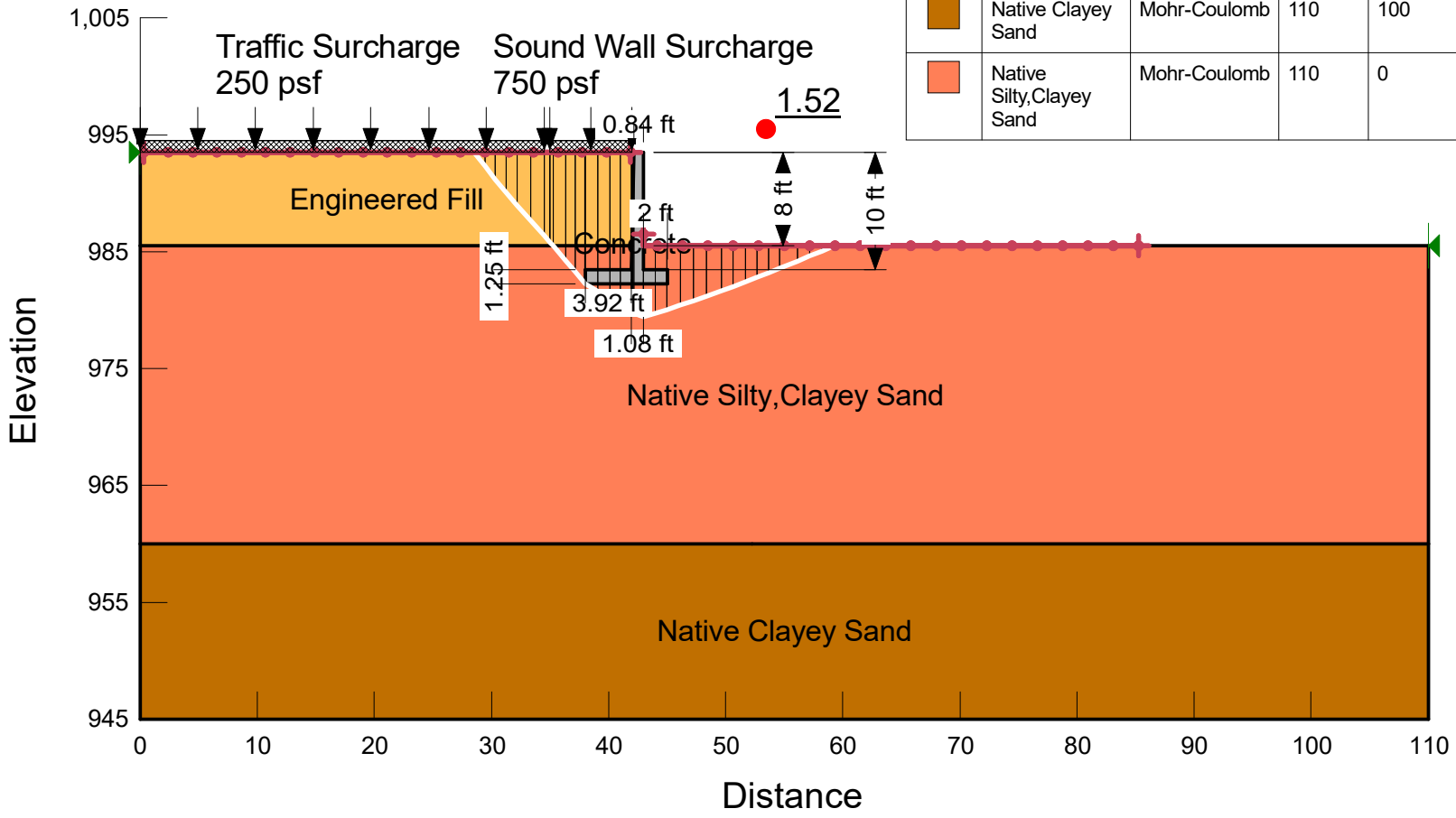
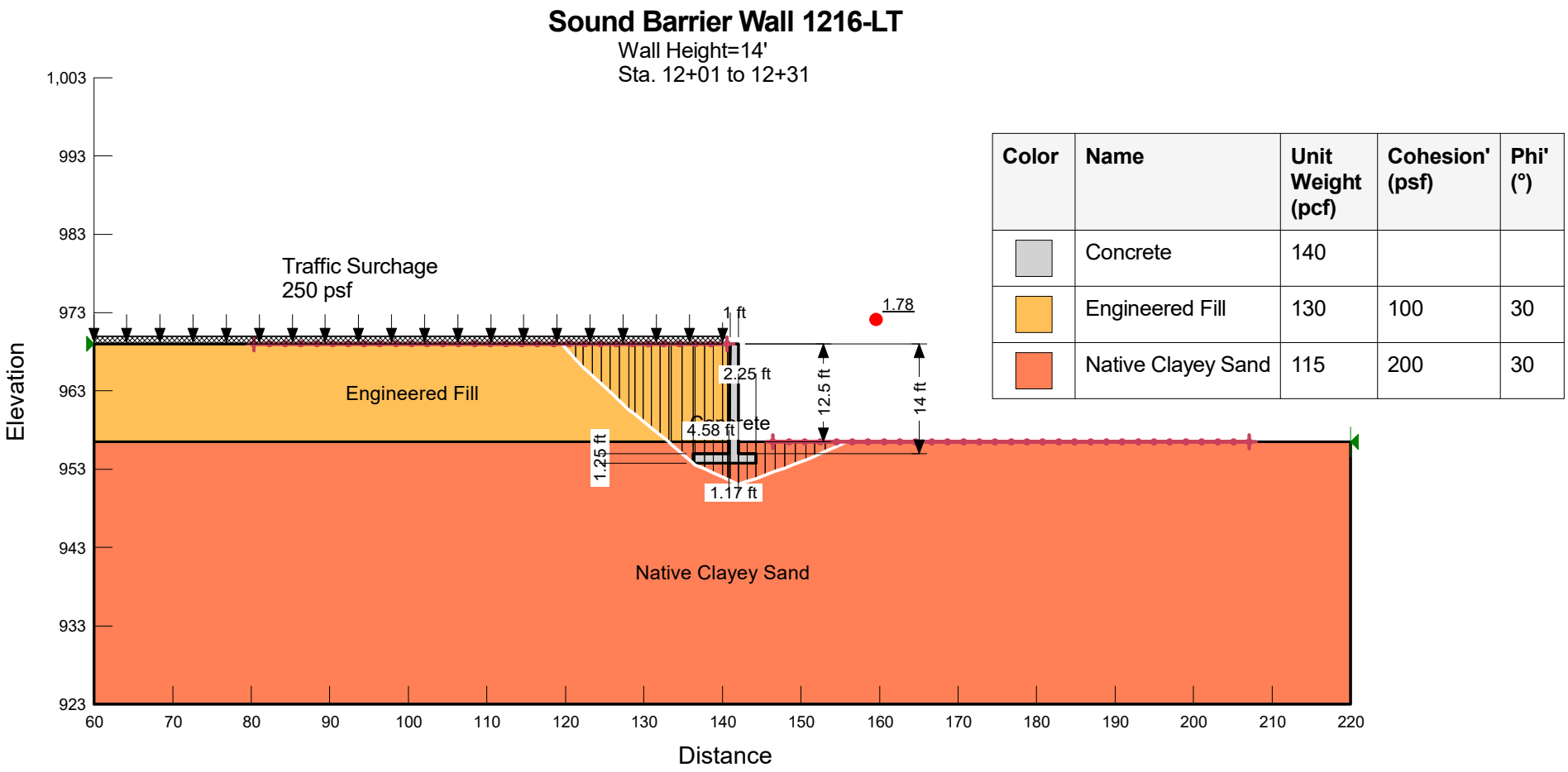


Figure H-60

Sound Barrier Walls
Slope Stability Results

Figure H-61

Name: CIP Wall SBW-1216-LT 14 ft
Method: Spencer
Factor of Safety: 1.78



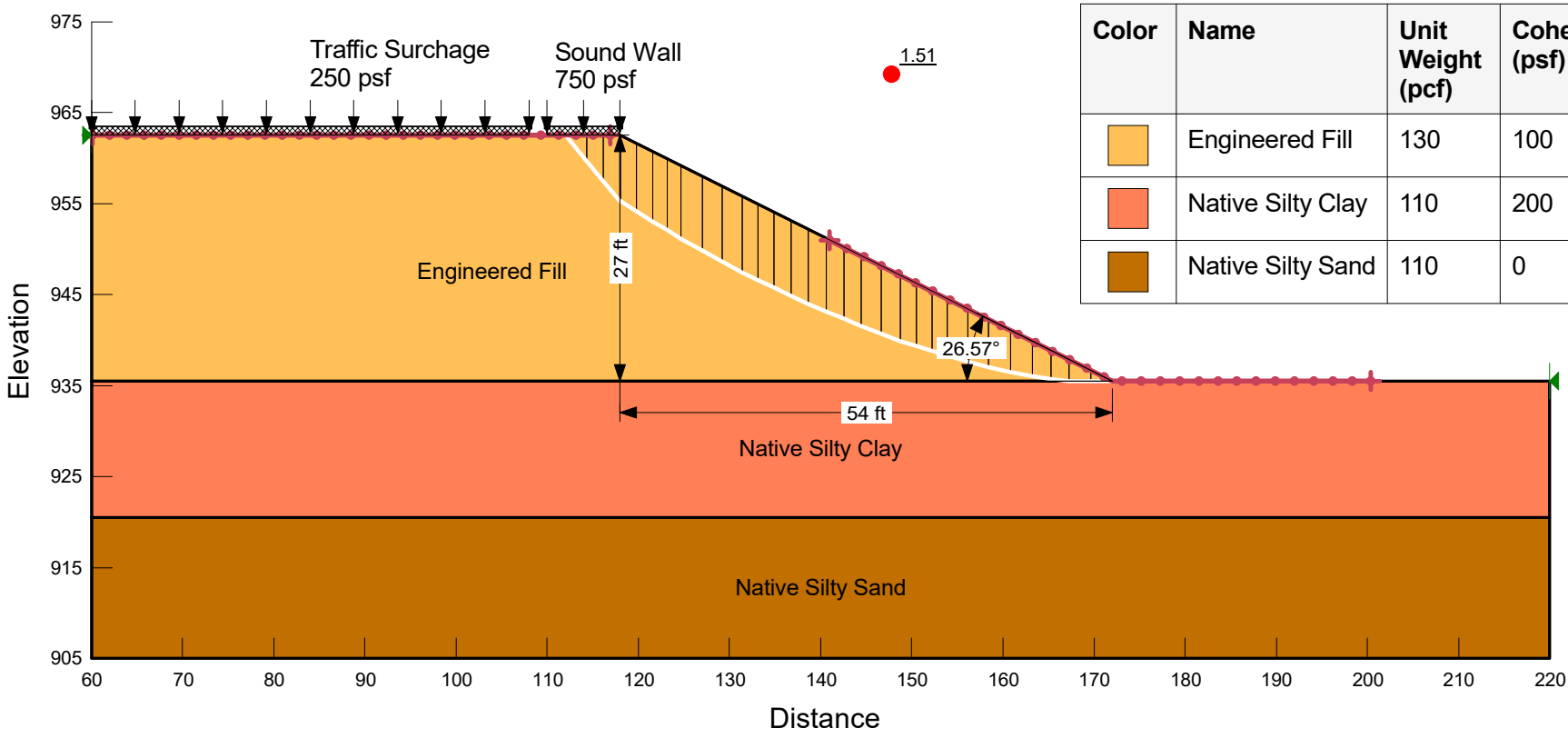
Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Concrete	140		
	Engineered Fill	130	100	30
	Native Clayey Sand	115	200	30

Figure H-62

Name: NBFR-26 Sound Wall SLOPE/W Analysis
Method: Spencer
Factor of Safety: 1.51

Sound Wall on Fill

2:1 Fill Slope

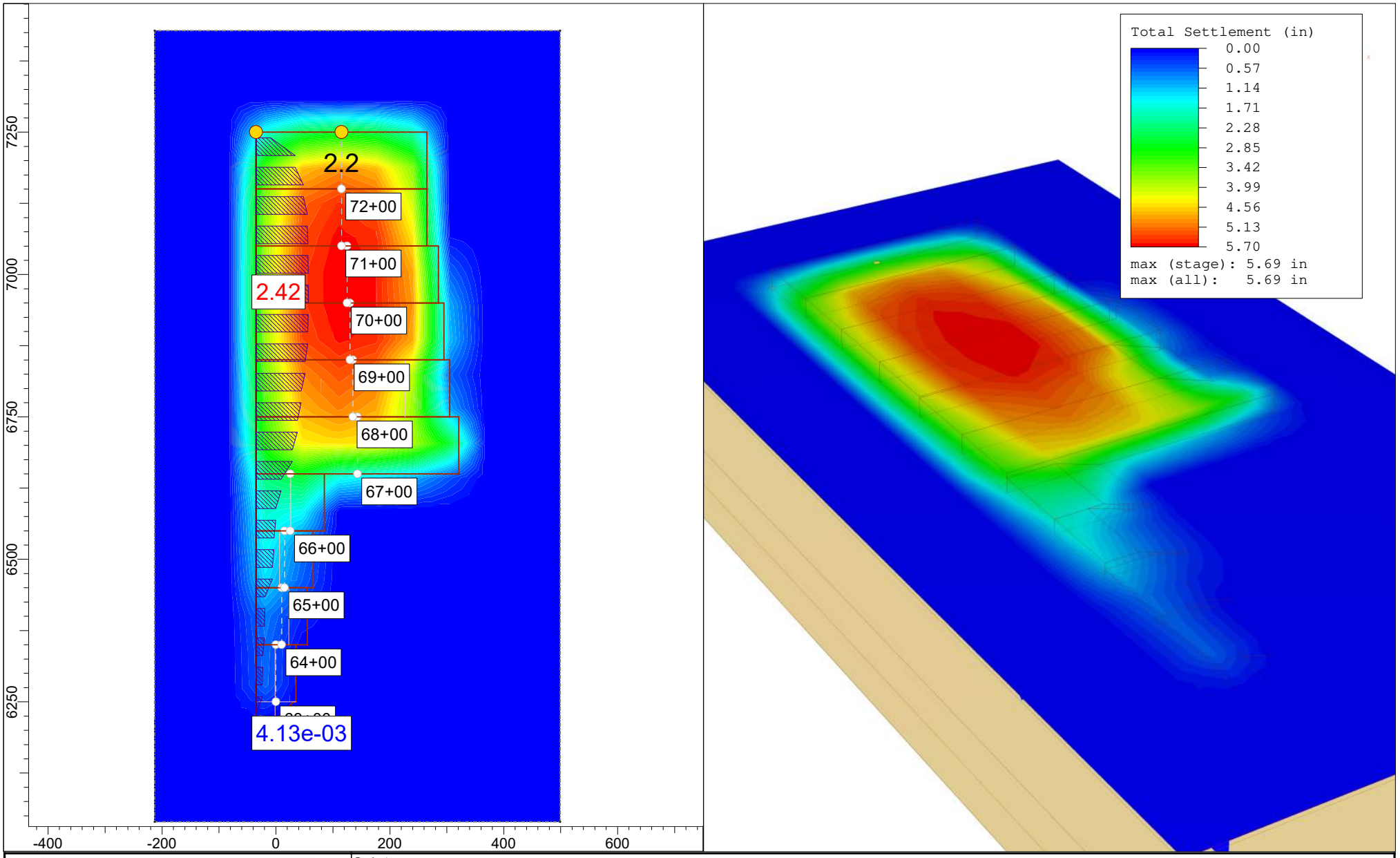


Color	Name	Unit Weight (pcf)	Cohesion' (psf)	Phi' (°)
	Engineered Fill	130	100	30
	Native Silty Clay	110	200	26
	Native Silty Sand	110	0	30

Figure H-63

APPENDIX I

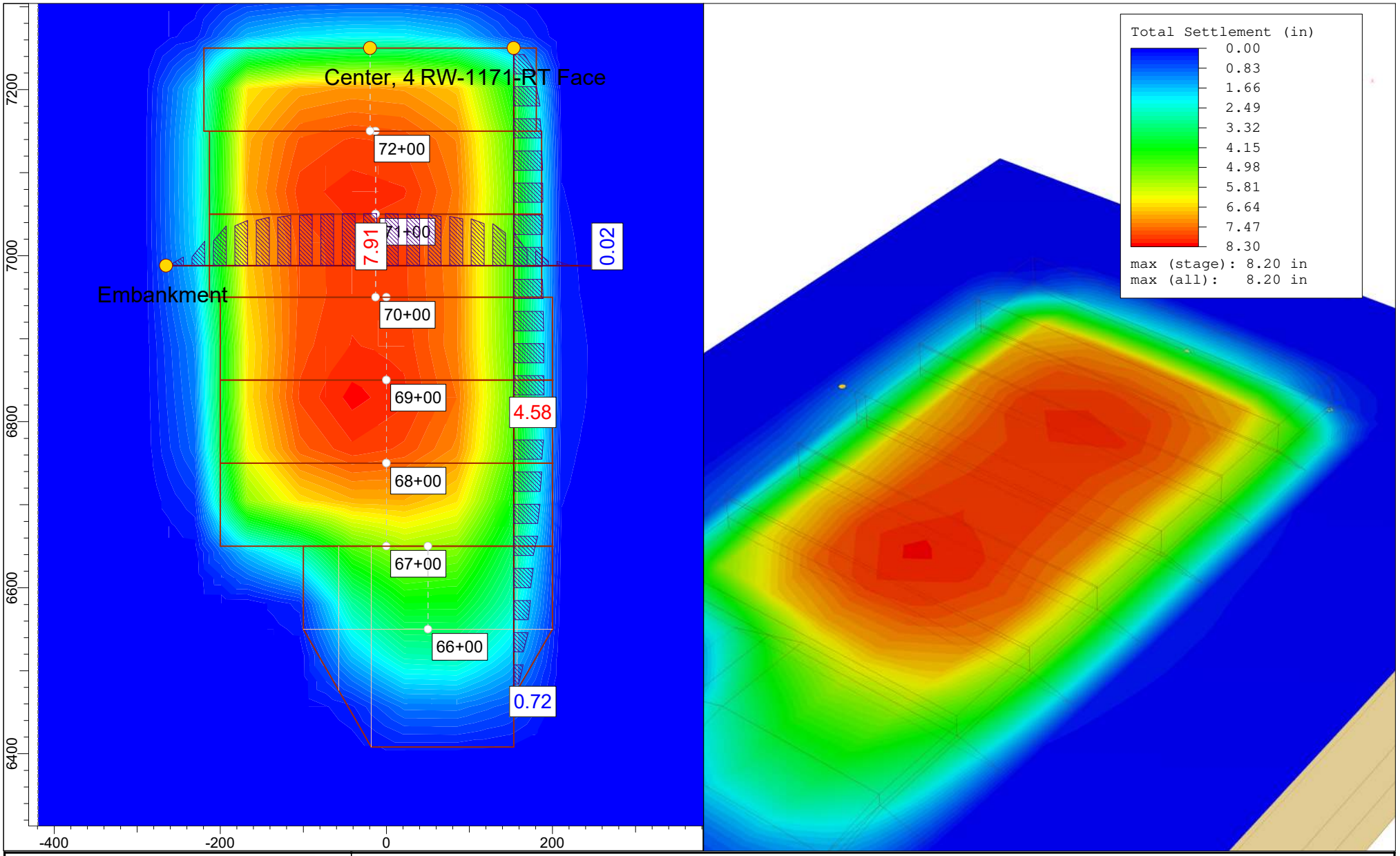
Graphical Settlement Results



ethos ENGINEERING, LLC.	*Project*	Lower Buckeye Road TIOP - Wall RW-1171-LT	
	Analysis Description	MSE Face Differential	
	Drawn By	JRH	*Company* Ethos Engineering, LLC
	Date	6/16/2022, 4:16:22 PM	*File Name* RW-1171-LT, 9-24-24.s3z

SETTLE3 5.012

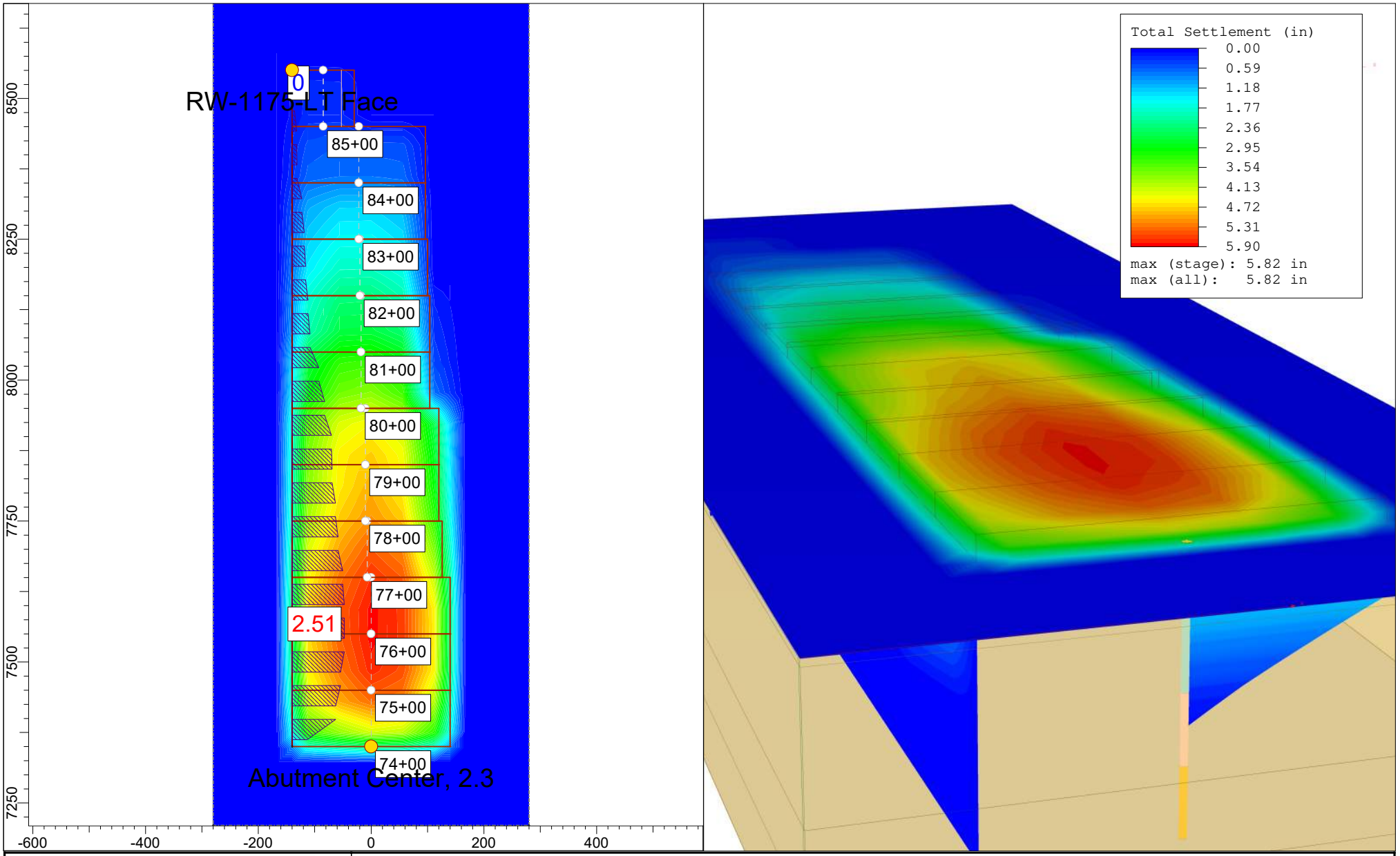
Figure I-1



ethos ENGINEERING, LLC.	*Project*	Lower Buckeye Road TIOP - Wall RW-1171-RT	
	Analysis Description	MSE Wall Face Differential	
	Drawn By	JRH	*Company* Ethos Engineering, LLC
	Date	6/16/2022, 4:16:22 PM	*File Name* RW-1171-RT, 9-24-24.s3z

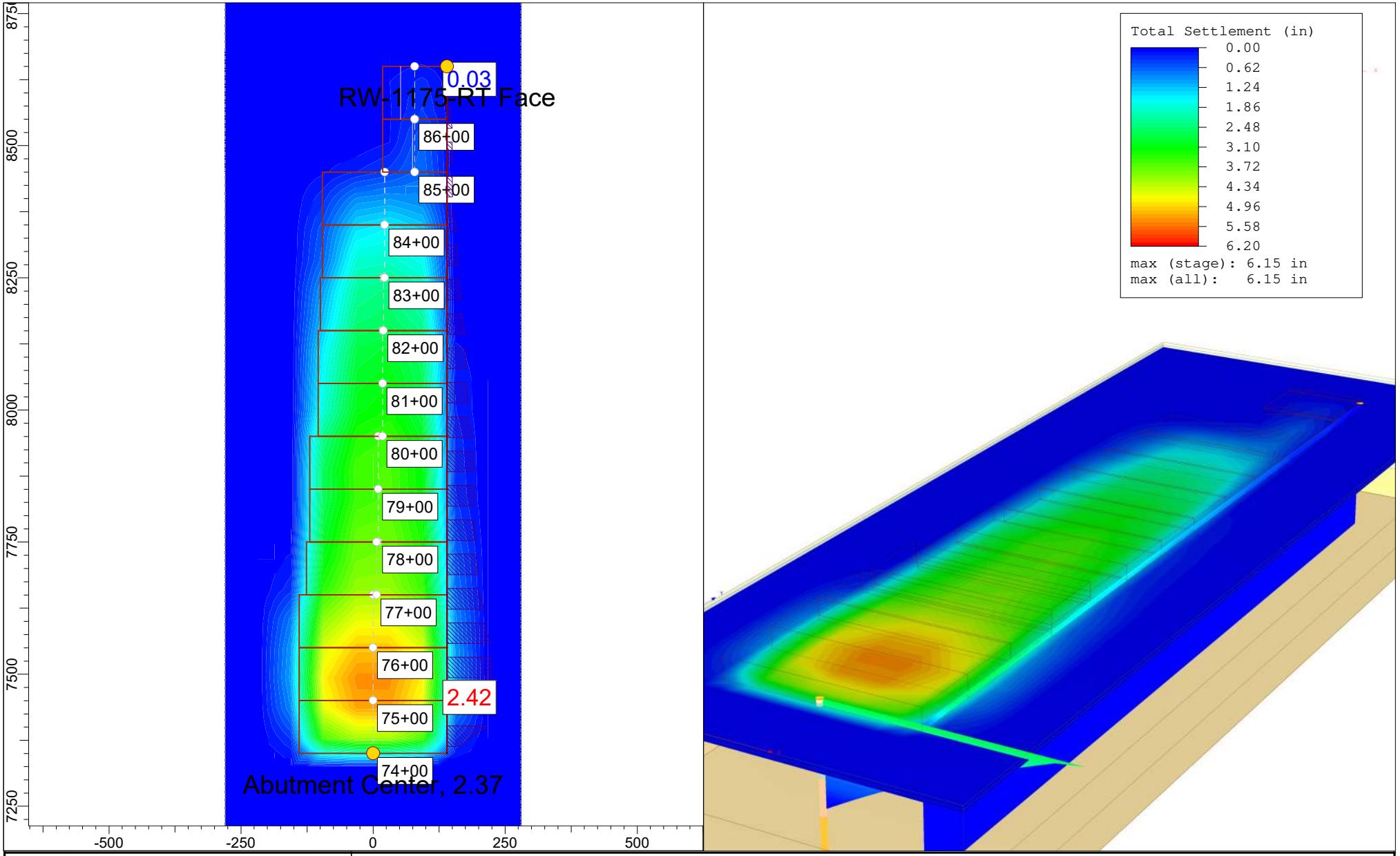
SETTLE3 5.012

Figure I-2



ethos ENGINEERING, LLC.	*Project*	Lower Buckeye Road TIOP - Wall RW-1175-LT	
	Analysis Description	MSE Face Differential	
	Drawn By	JRH	*Company* Ethos Engineering, LLC
SETTLE3 5.012	*Date*	6/16/2022, 4:16:22 PM	*File Name* RW-1175-LT, 9-24-24.s3z

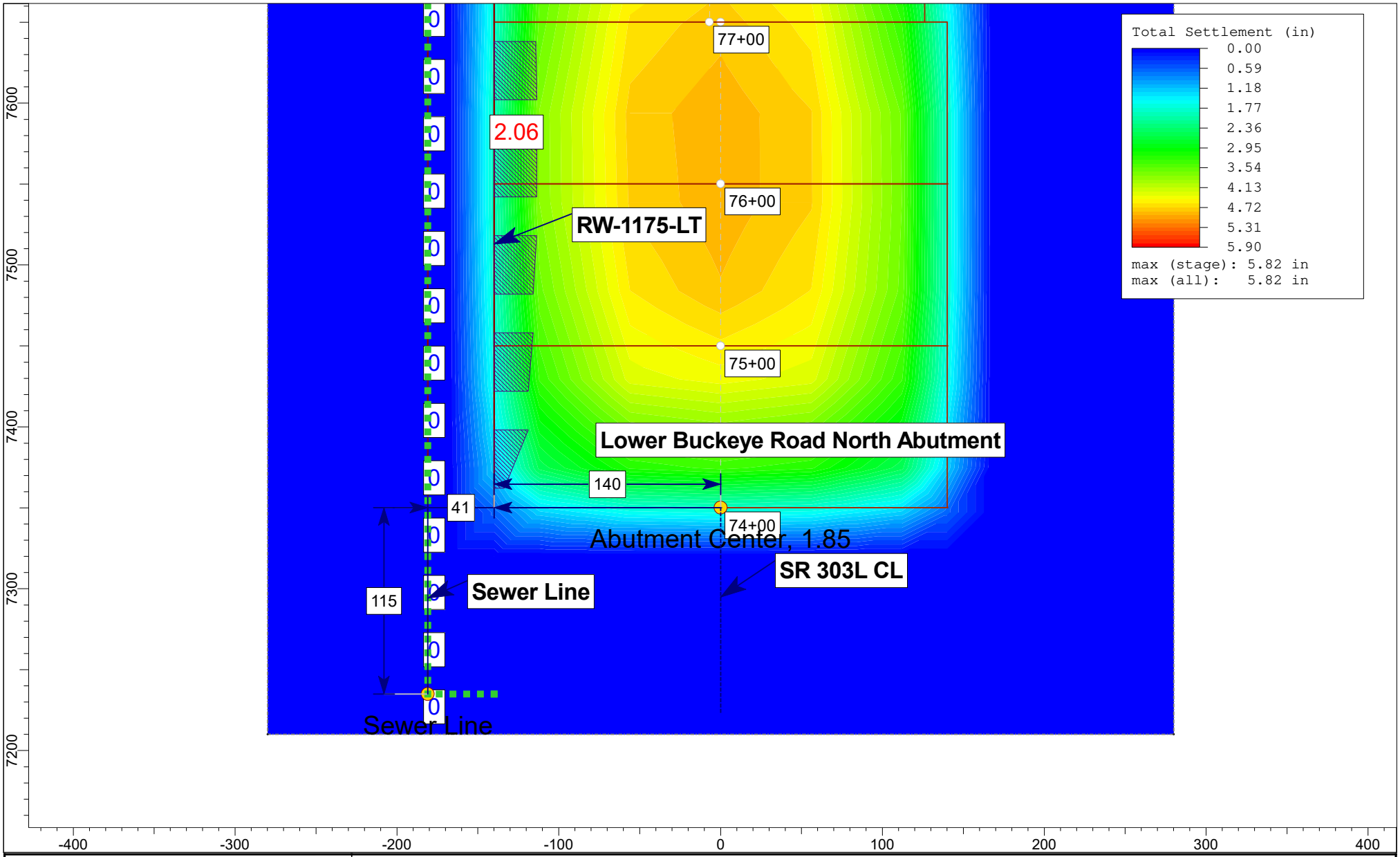
Figure I-3



ethos ENGINEERING, LLC.	*Project*	Lower Buckeye Road TIOP - Wall RW-1175-RT	
	Analysis Description	MSE Face Differential	
	Drawn By	JRH	*Company* Ethos Engineering, LLC
	Date	6/16/2022, 4:16:22 PM	*File Name* RW-1175-RT, 9-24-24.s3z

SETTLE3 5.012

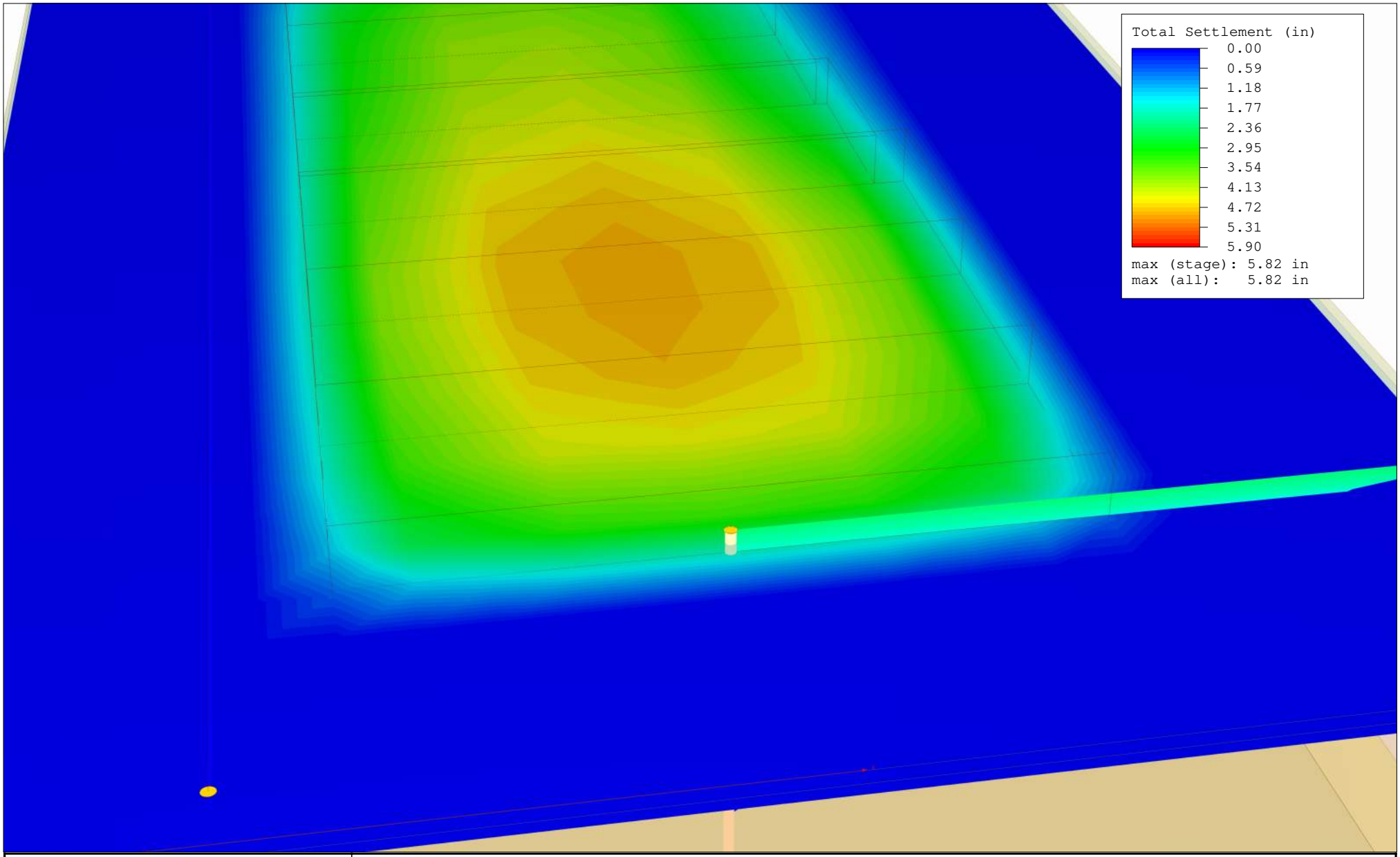
Figure I-4



ethos ENGINEERING, LLC.	*Project*	Lower Buckeye Road TIOP - Wall RW-1175-LT	
	Analysis Description	Sewer Line at Lower Buckeye and Cotton Lane	
	Drawn By	JRH	*Company* Ethos Engineering, LLC
	Date	6/16/2022, 4:16:22 PM	*File Name* RW-1175-LT, 9-24-24.s3z

SETTLE3 5.012

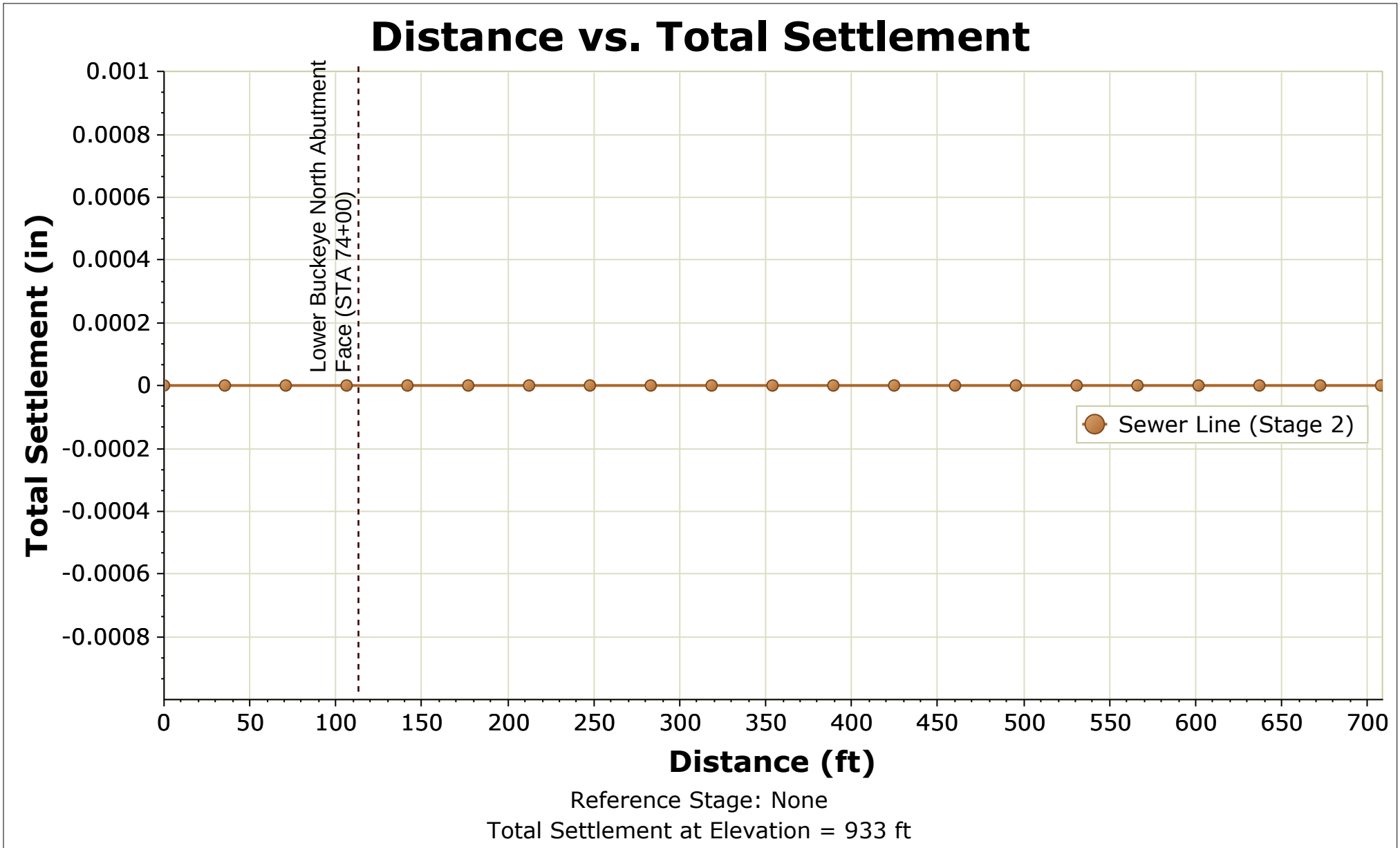
Figure I-5



ethos ENGINEERING, LLC.	*Project*	Lower Buckeye Road TIOP - Wall RW-1175-LT	
	Analysis Description	Sewer Line at Lower Buckeye and Cotton Lane	
	Drawn By	JRH	*Company* Ethos Engineering, LLC
	Date	6/16/2022, 4:16:22 PM	*File Name* RW-1175-LT, 9-24-24.s3z

SETTLE3 5.012

Figure I-6



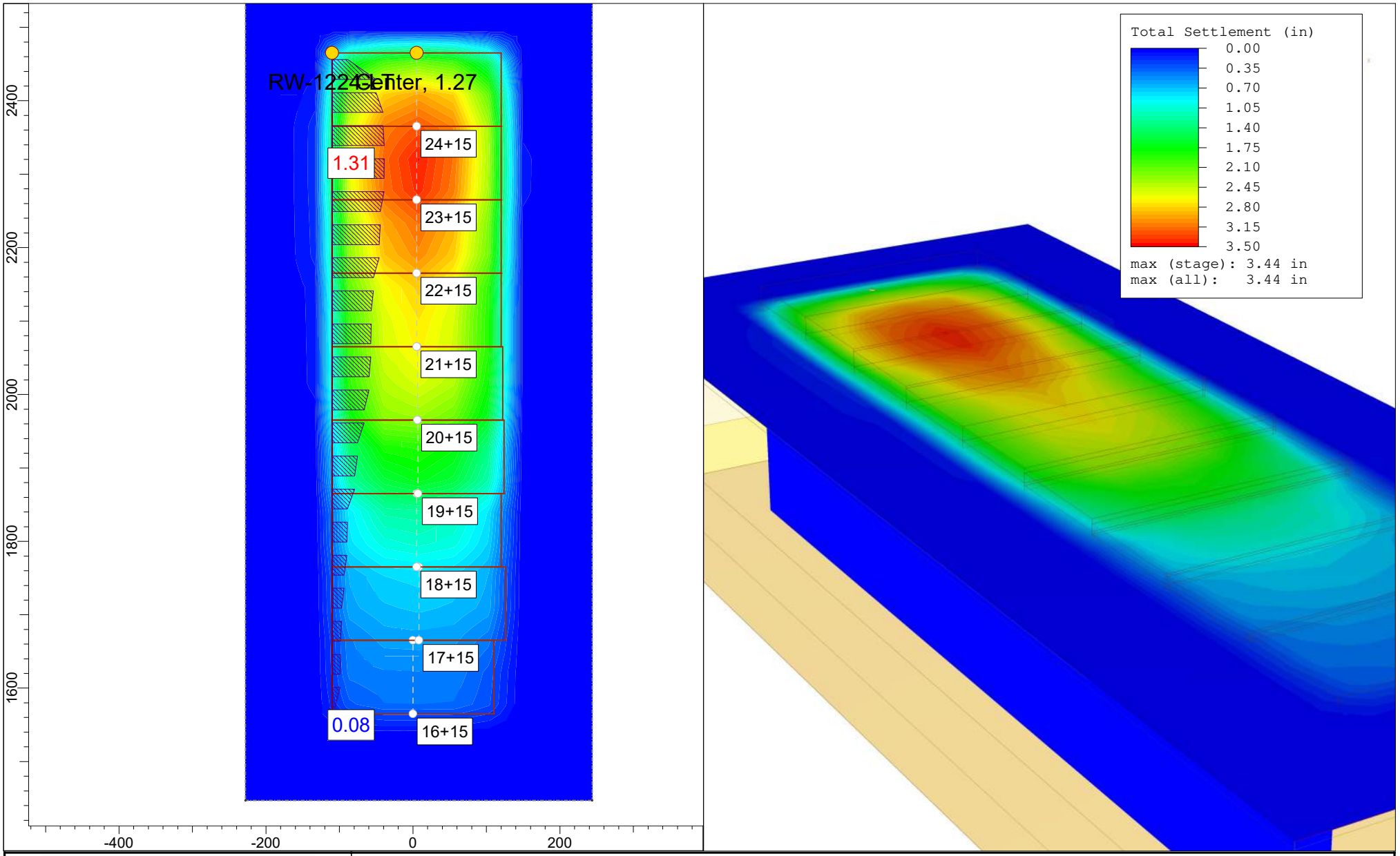
Reference Stage: None

Total Settlement at Elevation = 933 ft

ethos ENGINEERING, LLC.	Project	Lower Buckeye Road TIOP -Wall RW-1175-LT	
	Analysis Description	Sewer Line at Lower Buckeye and Cotton Lane	
	Drawn By	JRH	Company: Ethos Engineering, LLC
	Date	6/16/2022, 4:16:22 PM	File Name: RW-1175-LT, 9-24-24.s3z

SETTLE3 5.012

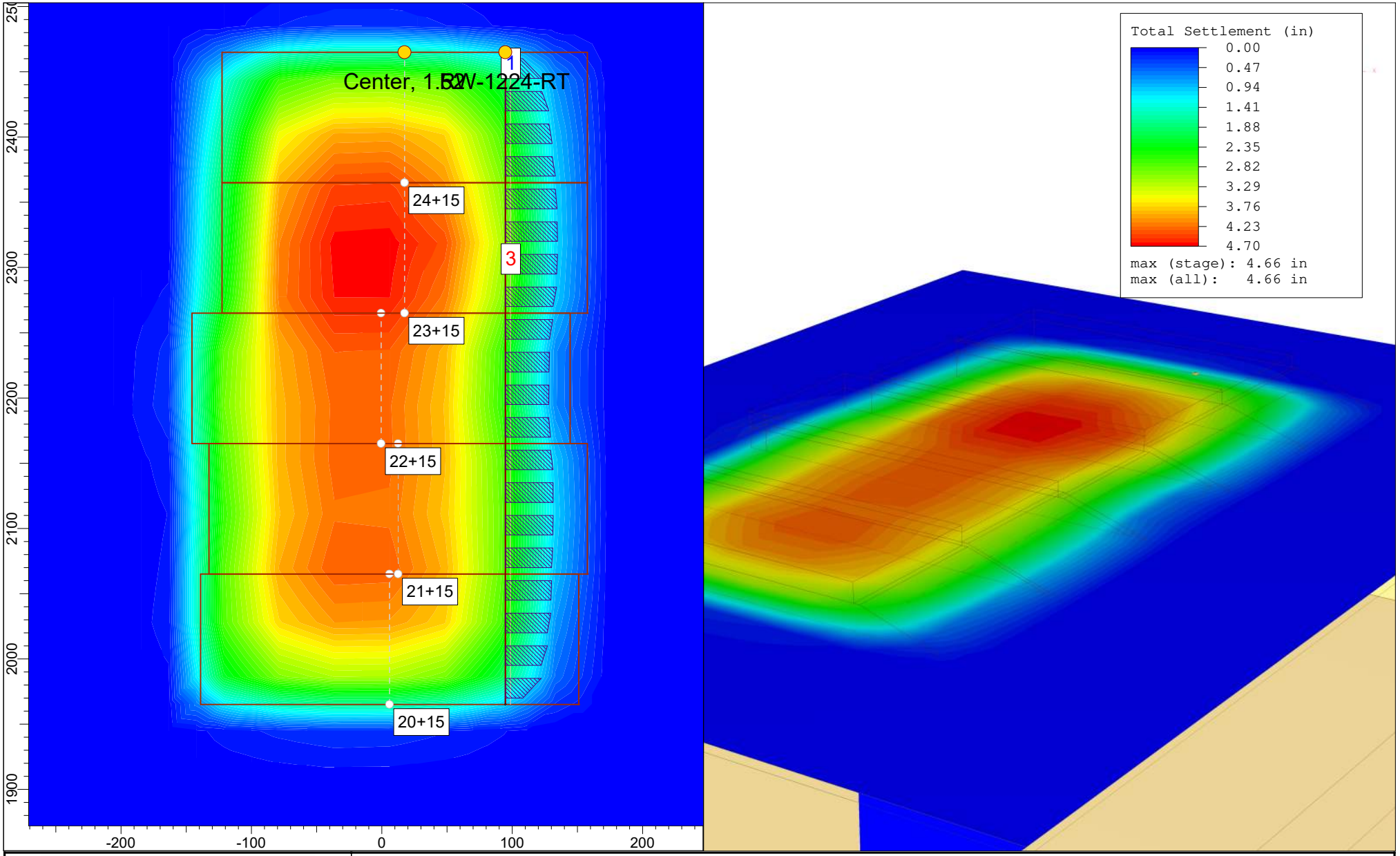
Figure I-7



ethos ENGINEERING, LLC.	*Project*	Yuma Road TIOP - Wall RW-1224-LT	
	Analysis Description		
	Drawn By	JRH	*Company* Ethos Engineering, LLC
	Date	6/16/2022, 4:16:22 PM	*File Name* RW-1224-LT, 9-24-24.s3z

SETTLE3 5.012

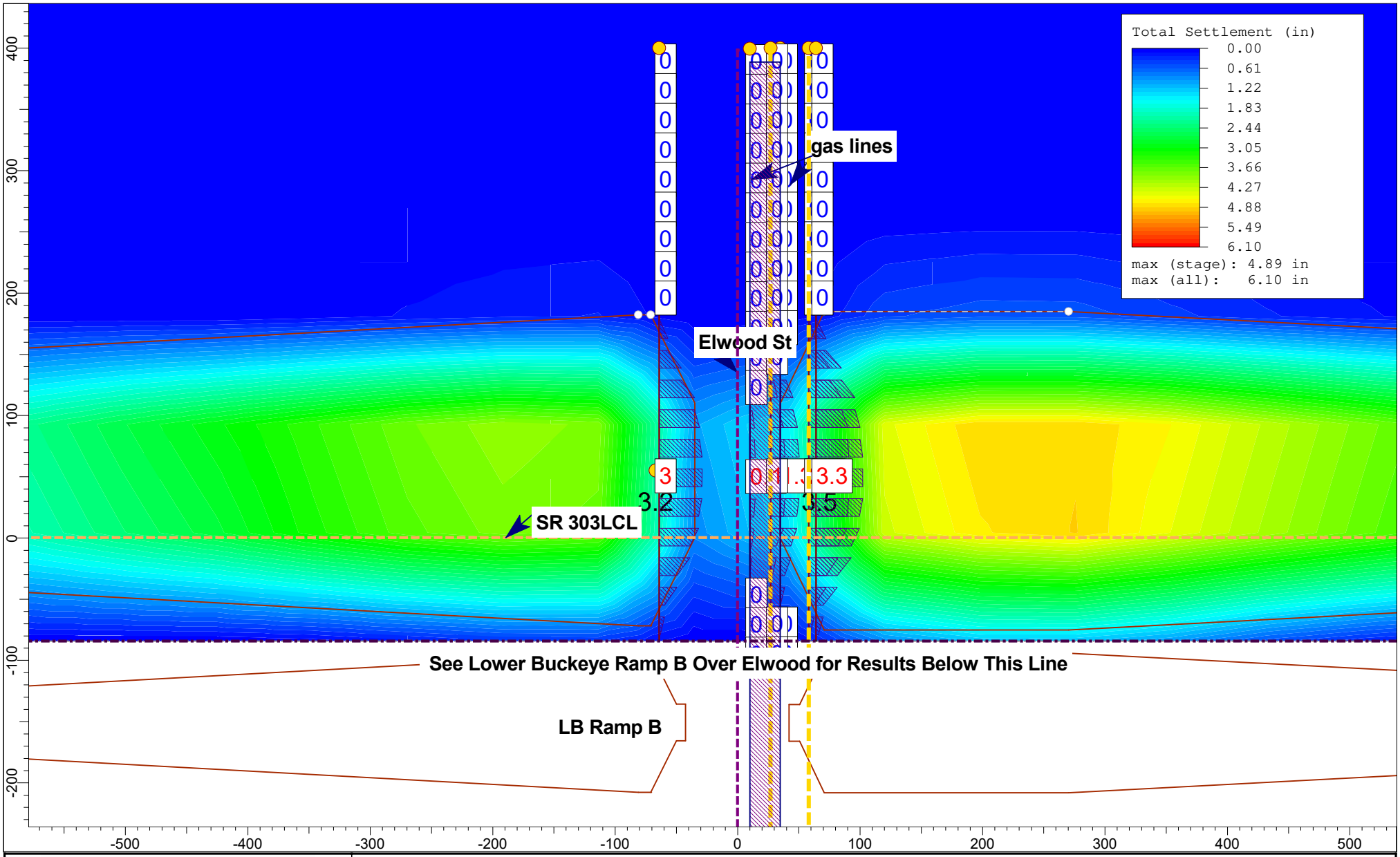
Figure I-8



ethos ENGINEERING, LLC.	*Project*	Yuma Road TIOP - Wall RW-1224-RT	
	Analysis Description		
	Drawn By	JRH	*Company* Ethos Engineering, LLC
	Date	6/16/2022, 4:16:22 PM	*File Name* RW-1224-RT, 9-24-24.s3z

SETTLE3 5.012

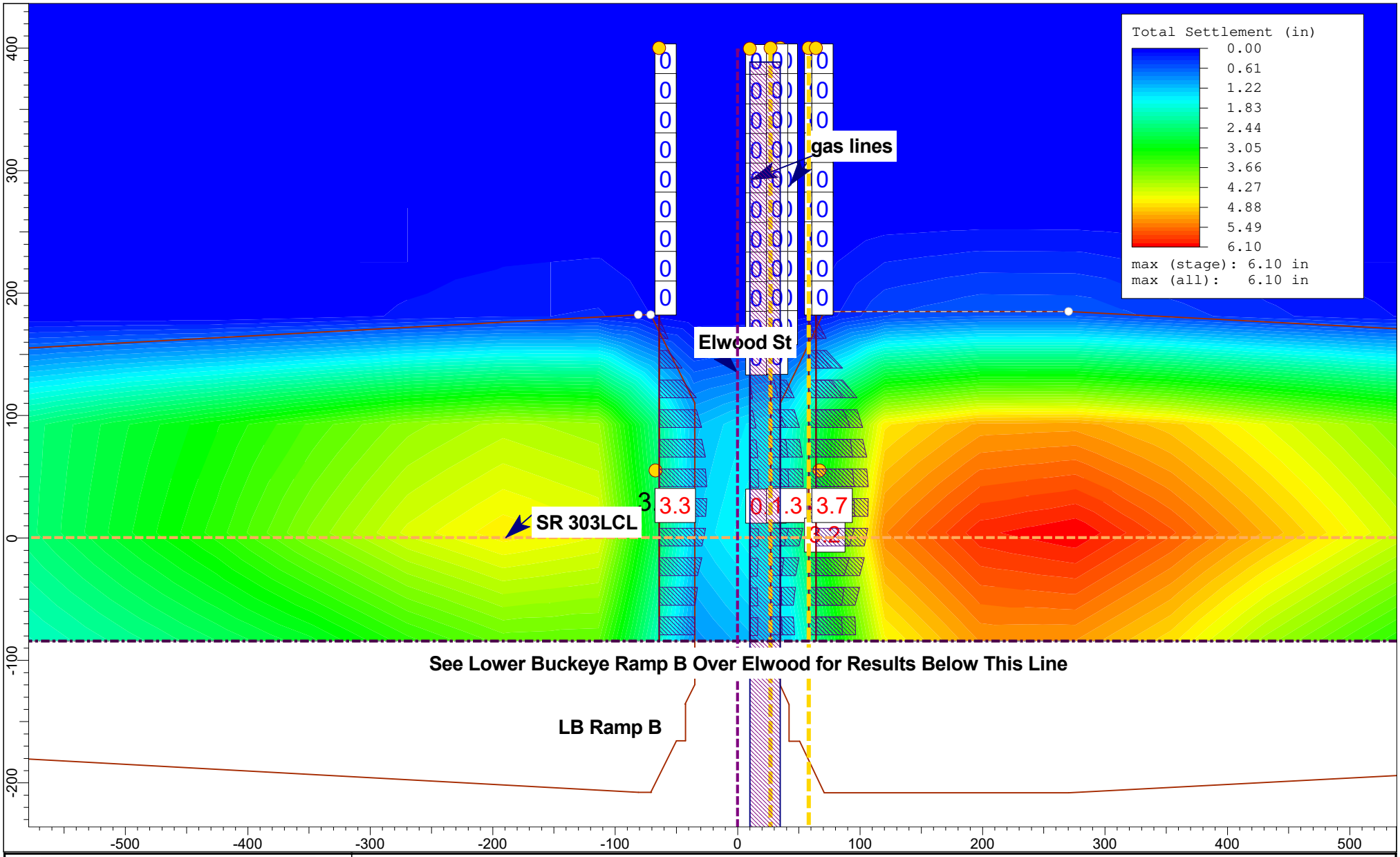
Figure I-9



ethos ENGINEERING, LLC.	*Project*	SR 303L – MC 85 to Van Buren	
	Analysis Description	SR 303L Mainline over Elwood - Stage 1	
	Drawn By	Katie Mackay	*Company* Ethos
	Date	6/27/2024, 4:31:18 PM	*File Name* Mainline over Elwood 9-24-24.s3z

SETTLE3 5.012

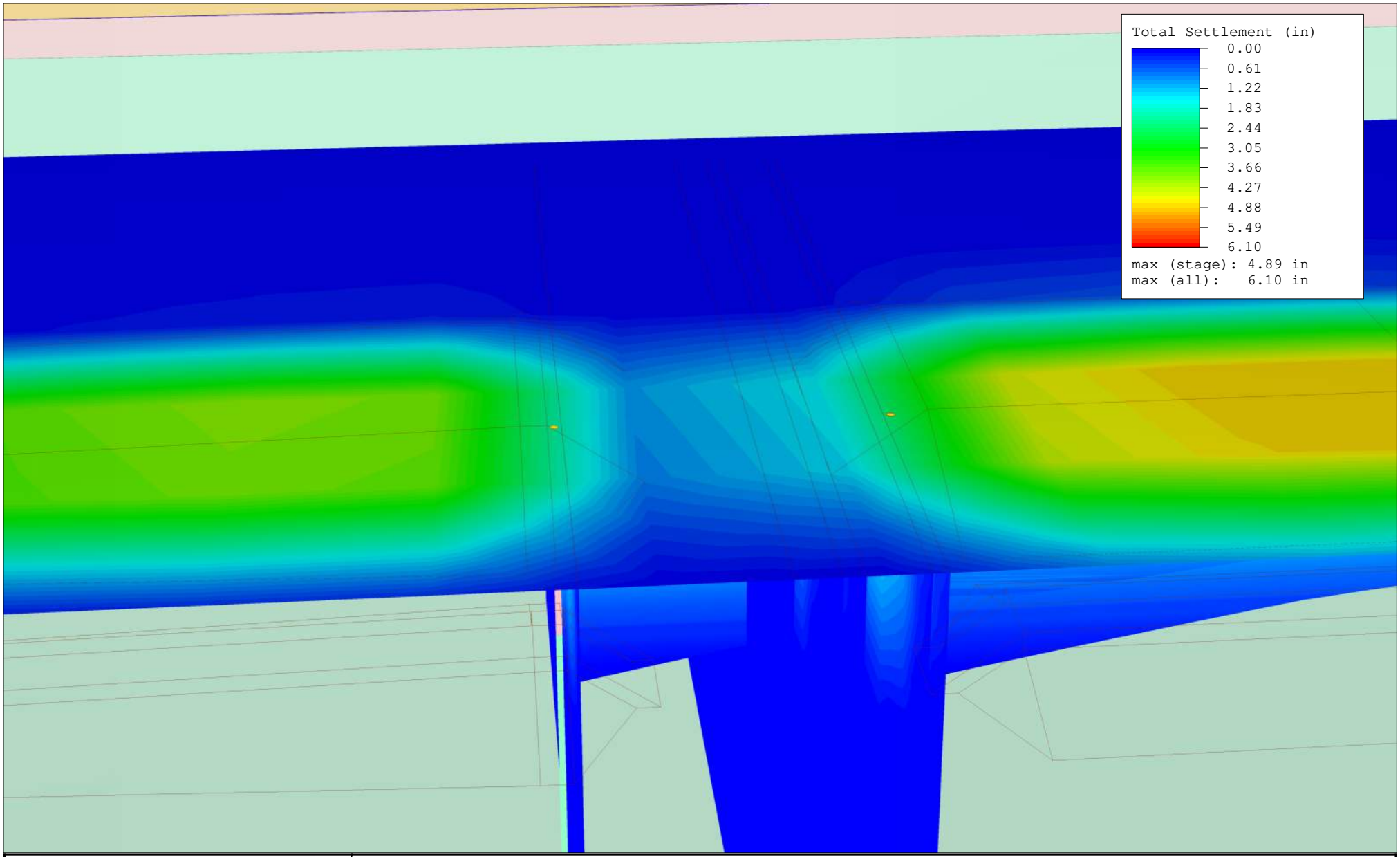
Figure I-10



ethos ENGINEERING, LLC.	*Project*	SR 303L – MC 85 to Van Buren	
	Analysis Description	SR 303L Mainline over Elwood - Stage 2	
	Drawn By	Katie Mackay	*Company* Ethos
	Date	6/27/2024, 4:31:18 PM	*File Name* Mainline over Elwood 9-24-24.s3z

SETTLE3 5.012

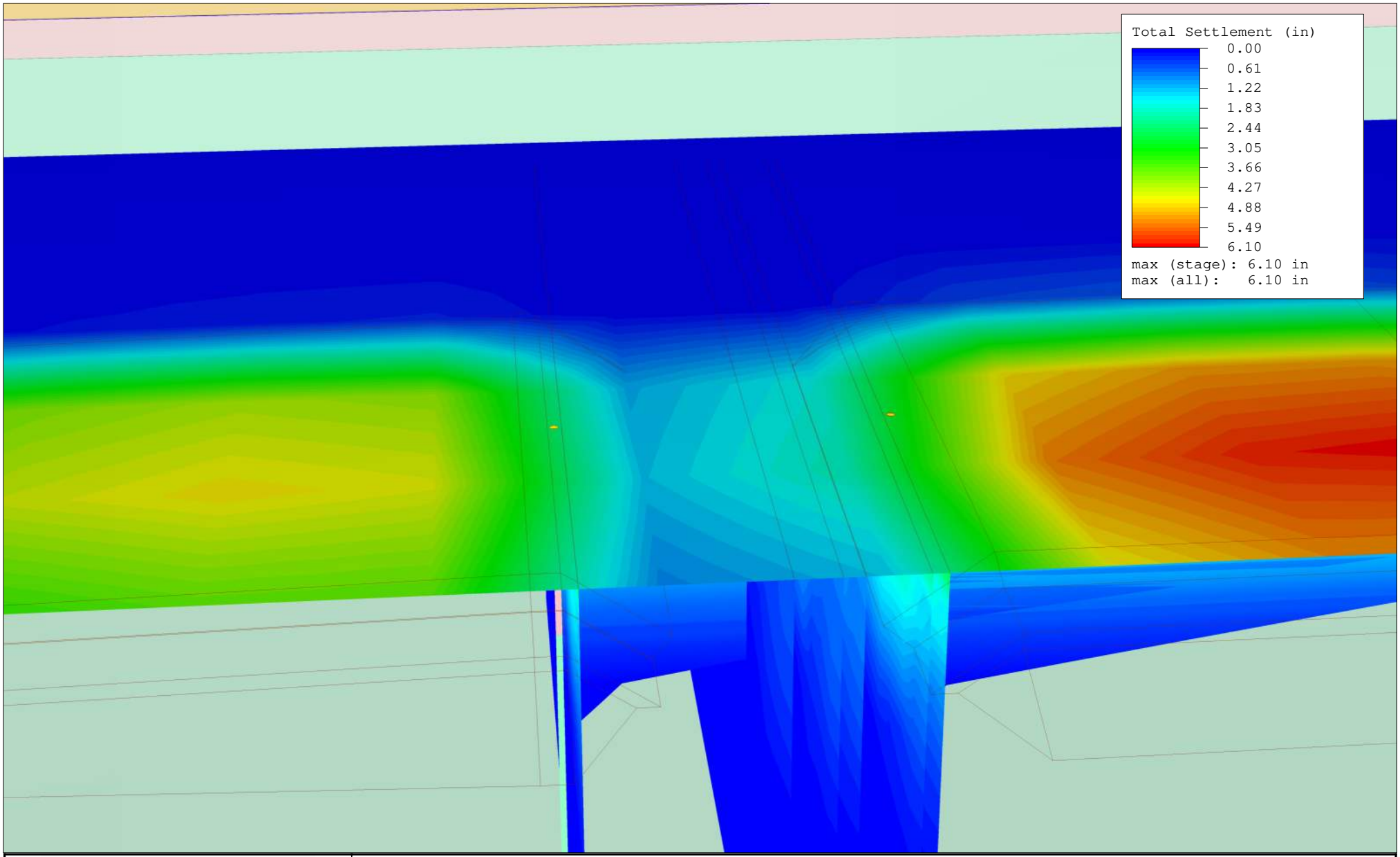
Figure I-11



ethos ENGINEERING, LLC.	*Project*	SR 303L – MC 85 to Van Buren	
	Analysis Description	SR 303L Mainline over Elwood - Stage 1	
	Drawn By	Katie Mackay	*Company* Ethos
	Date	6/27/2024, 4:31:18 PM	*File Name* Mainline over Elwood 9-24-24.s3z

SETTLE3 5.012

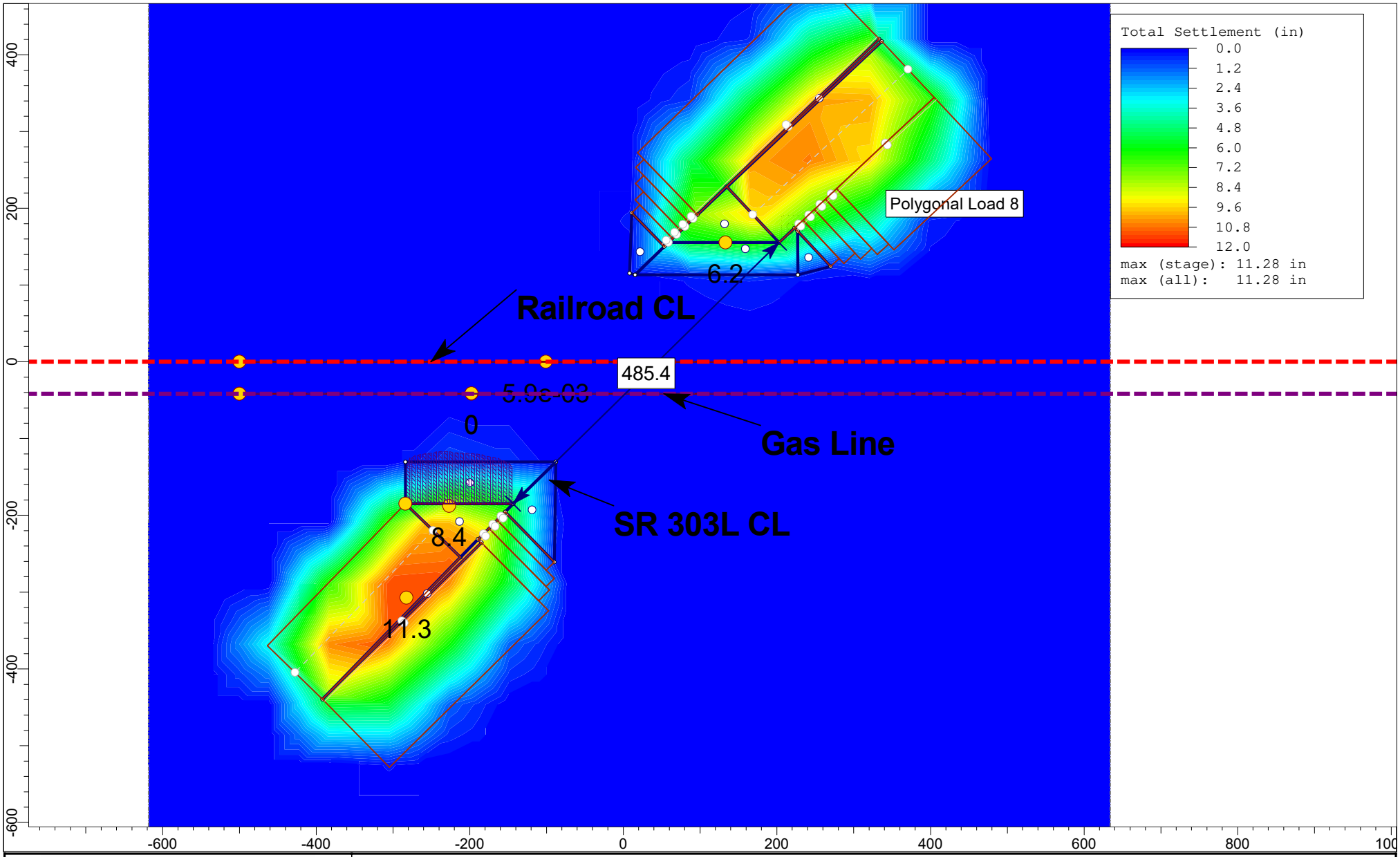
Figure I-12



ethos ENGINEERING, LLC.	*Project*	SR 303L – MC 85 to Van Buren	
	Analysis Description	SR 303L Mainline over Elwood - Stage 2	
	Drawn By	Katie Mackay	*Company* Ethos
	Date	6/27/2024, 4:31:18 PM	*File Name* Mainline over Elwood 9-24-24.s3z

SETTLE3 5.012

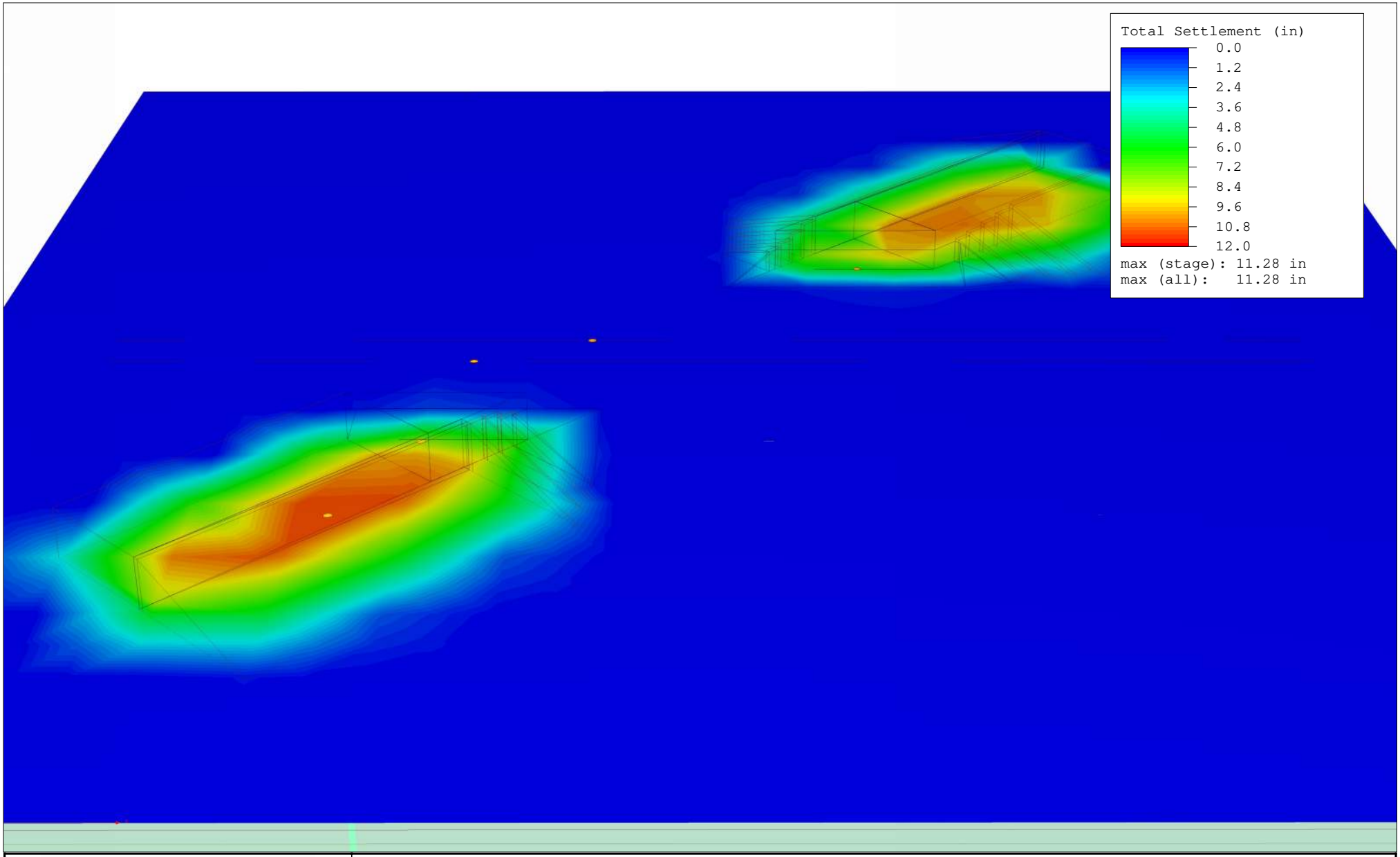
Figure I-13



ethos ENGINEERING, LLC.	*Project*	UPRR OP - Stage 1	
	Analysis Description		
	Drawn By	Katie Mackay	*Company* Ethos
	Date	6/18/2024, 2:32:39 PM	*File Name* UPRR OP_Final.s3z

SETTLE3 5.012

Figure I-14

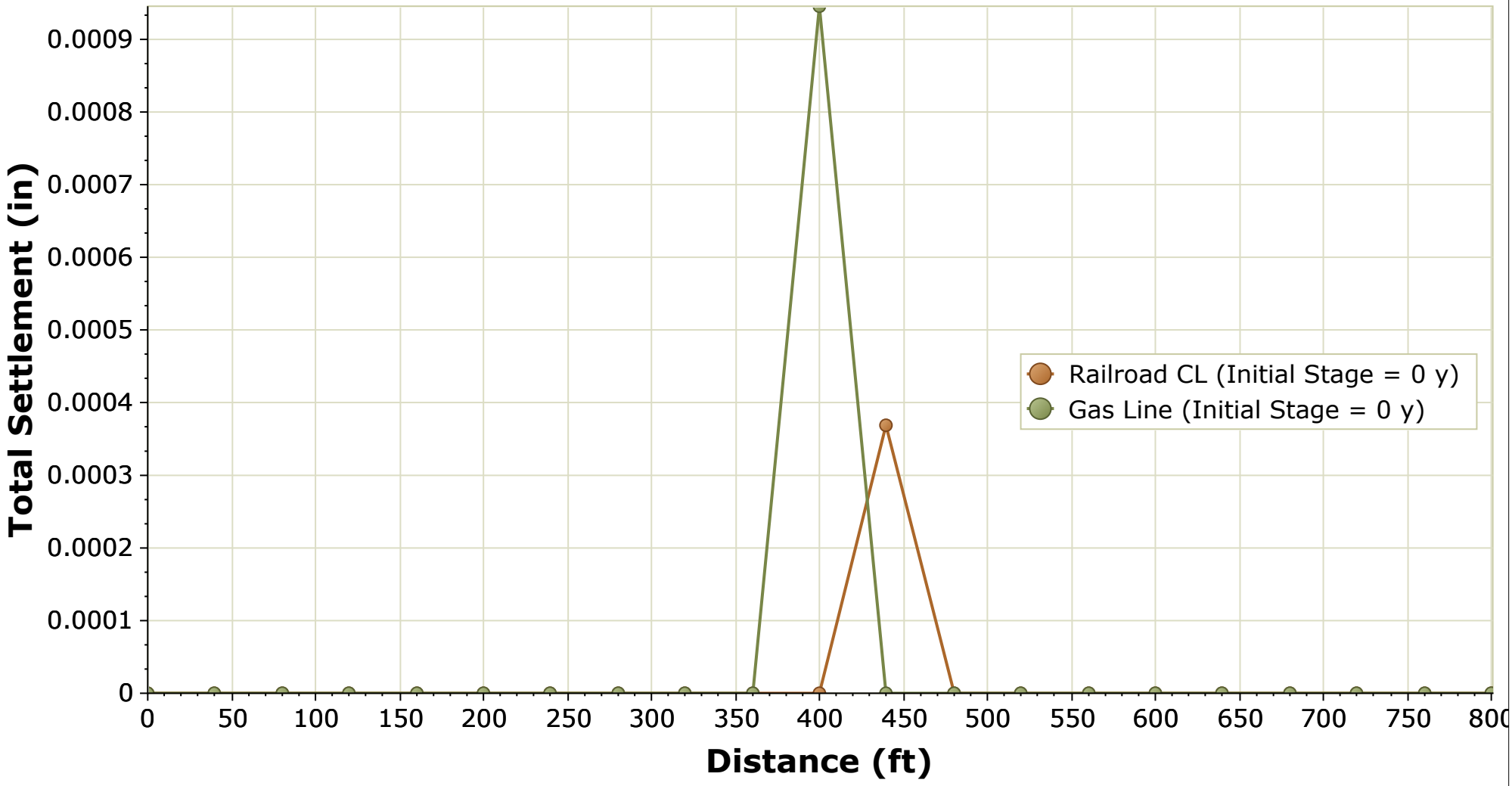


ethos ENGINEERING, LLC.	*Project*	UPRR OP - Stage 1	
	Analysis Description		
	Drawn By	Katie Mackay	*Company* Ethos
	Date	6/18/2024, 2:32:39 PM	*File Name* UPRR OP_Final.s3z

SETTLE3 5.012

Figure I-15

Distance vs. Total Settlement



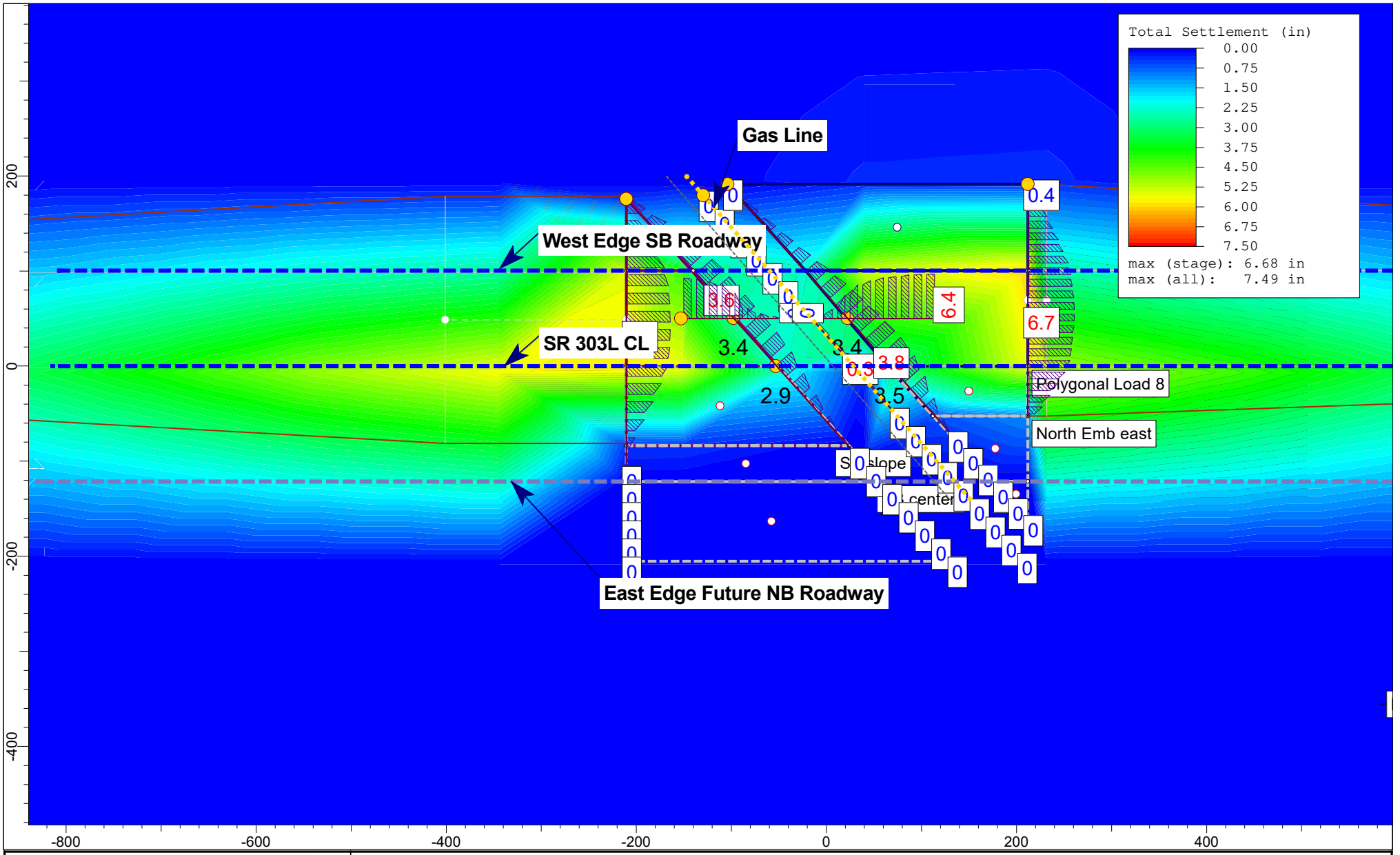
Reference Stage: None

Total Settlement at Elevation = 0 ft

ethos ENGINEERING, LLC.	Project	UPRR OP	
	Analysis Description		
	Drawn By	Katie Mackay	Company: Ethos
	Date	6/18/2024, 2:32:39 PM	File Name: UPRR OP_Final.s3z

SETTLE3 5.012

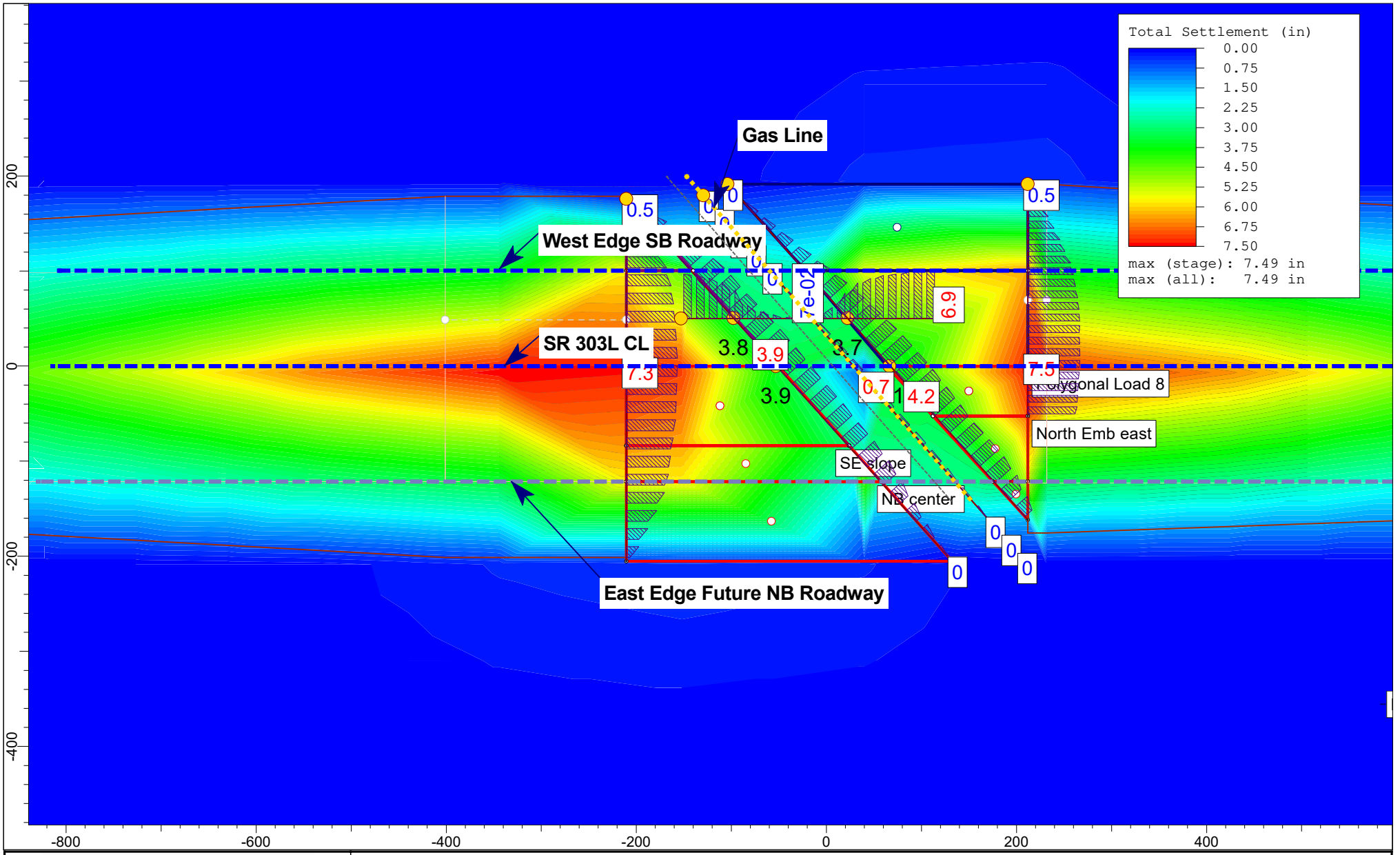
Figure I-16



ethos ENGINEERING, LLC.	*Project*	SR 303L – MC 85 to Van Buren	
	Analysis Description	Braodway Road OP - Stage 1	
	Drawn By	Katie Mackay	*Company* Ethos
	Date	6/18/2024, 2:32:39 PM	*File Name* Broadway Road OP_10-2-24.s3z

SETTLE3 5.012

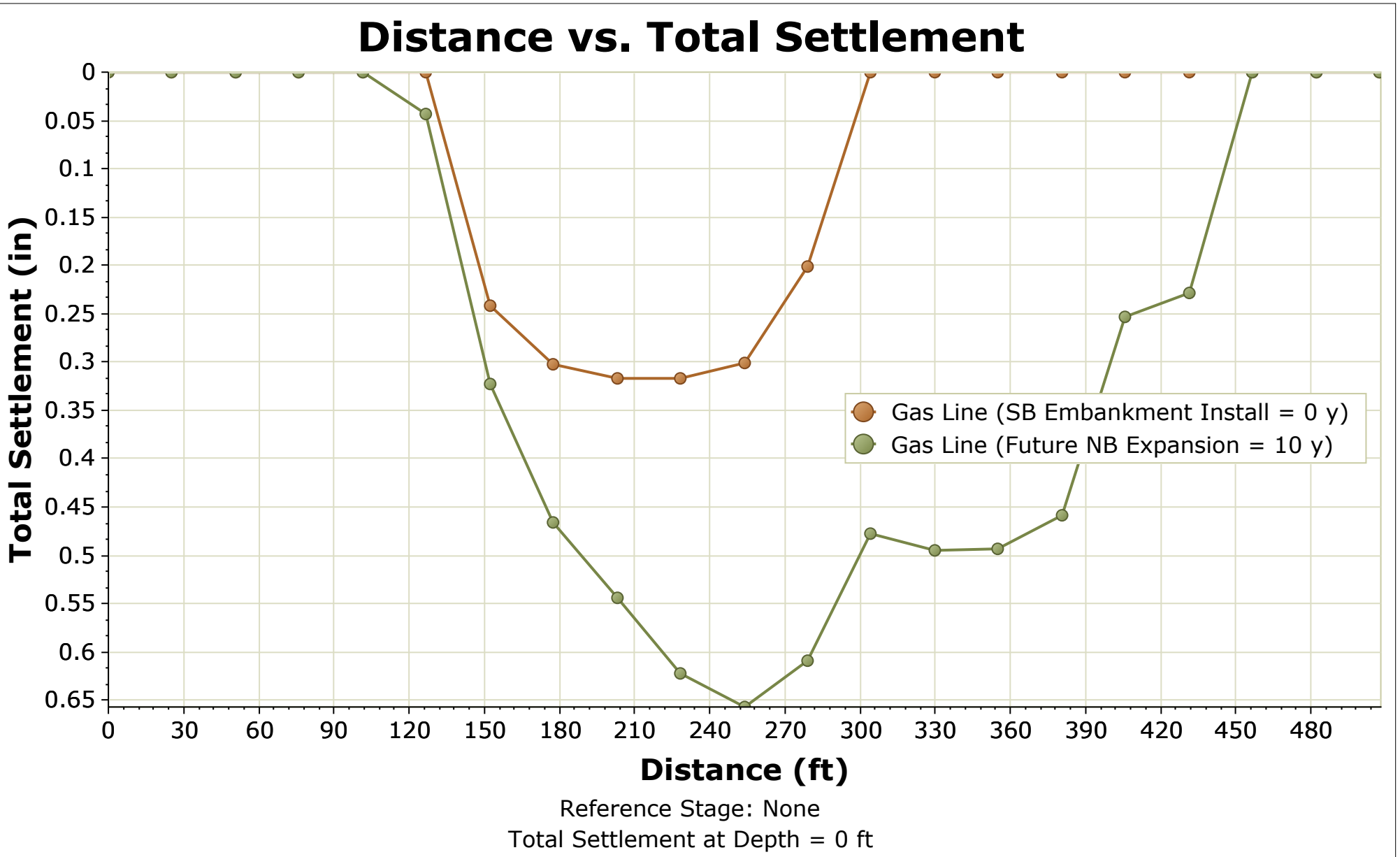
Figure I-17



ethos ENGINEERING, LLC.	*Project*	SR 303L – MC 85 to Van Buren	
	Analysis Description	Braodway Road OP - Stage 2	
	Drawn By	Katie Mackay	*Company* Ethos
	Date	6/18/2024, 2:32:39 PM	*File Name* Broadway Road OP_10-2-24.s3z

SETTLE3 5.012

Figure I-18

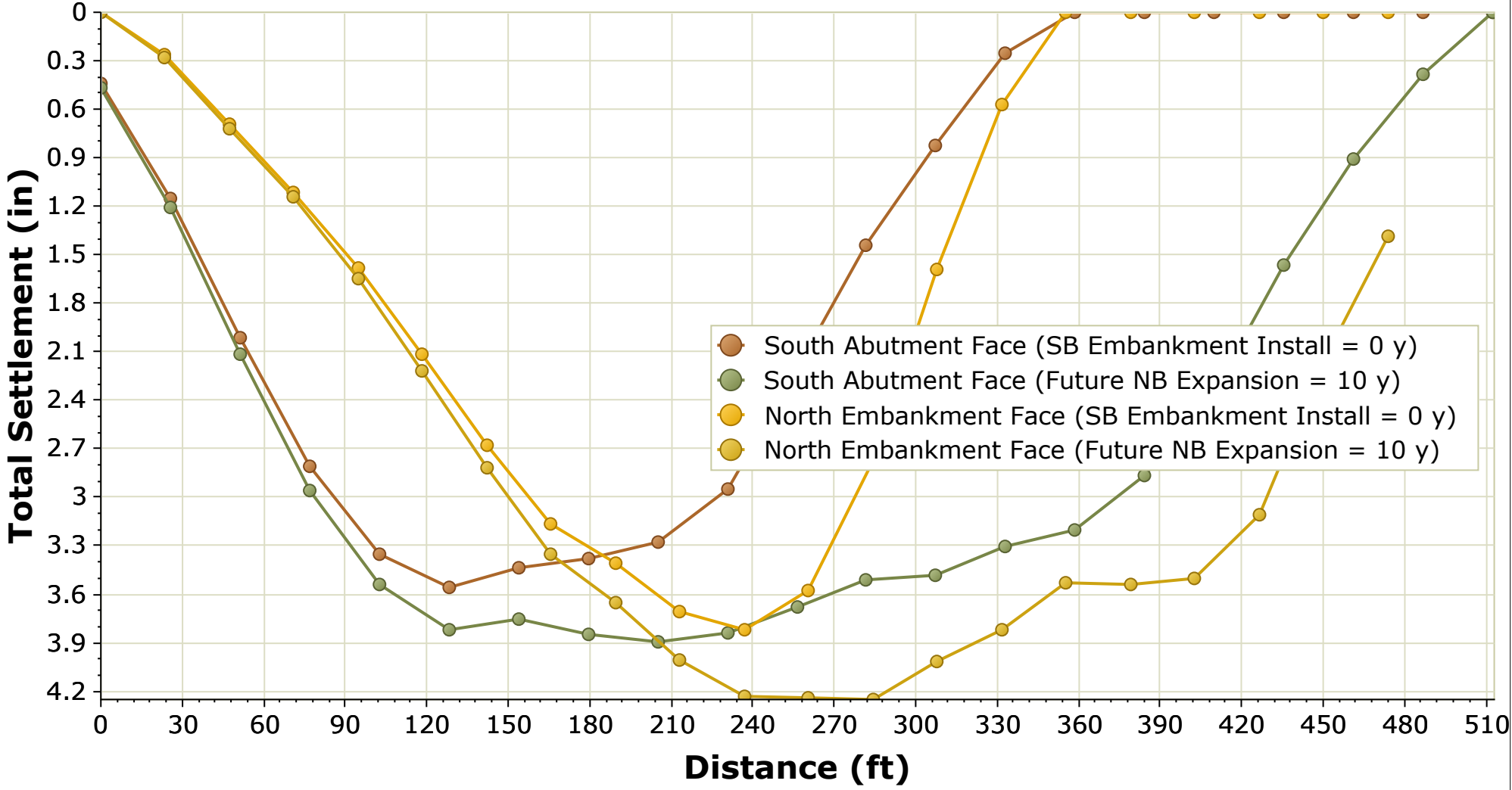


ethos ENGINEERING, LLC.	Project	SR 303L – MC 85 to Van Buren	
	Analysis Description	Braodway Road OP	
	Drawn By	Katie Mackay	Company: Ethos
	Date	6/18/2024, 2:32:39 PM	File Name: Broadway Road OP_10-2-24.s3z

SETTLE3 5.012

Figure I-19

Distance vs. Total Settlement



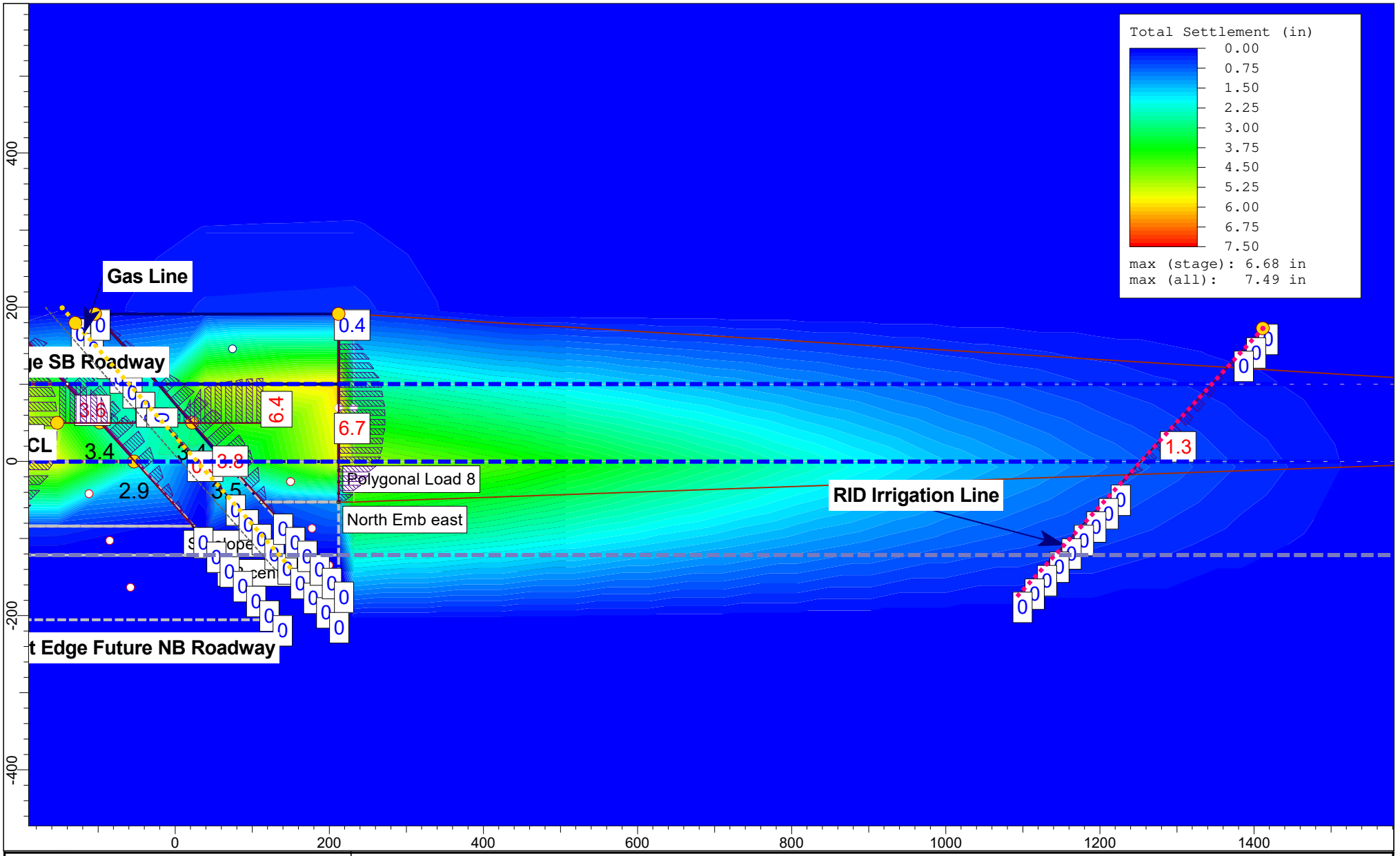
Reference Stage: None

Total Settlement at Depth = 0 ft

ethos ENGINEERING, LLC.	*Project*	SR 303L – MC 85 to Van Buren	
	Analysis Description	Braodway Road OP	
	Drawn By	Katie Mackay	*Company* Ethos
	Date	6/18/2024, 2:32:39 PM	*File Name* Broadway Road OP_10-2-24.s3z

SETTLE3 5.012

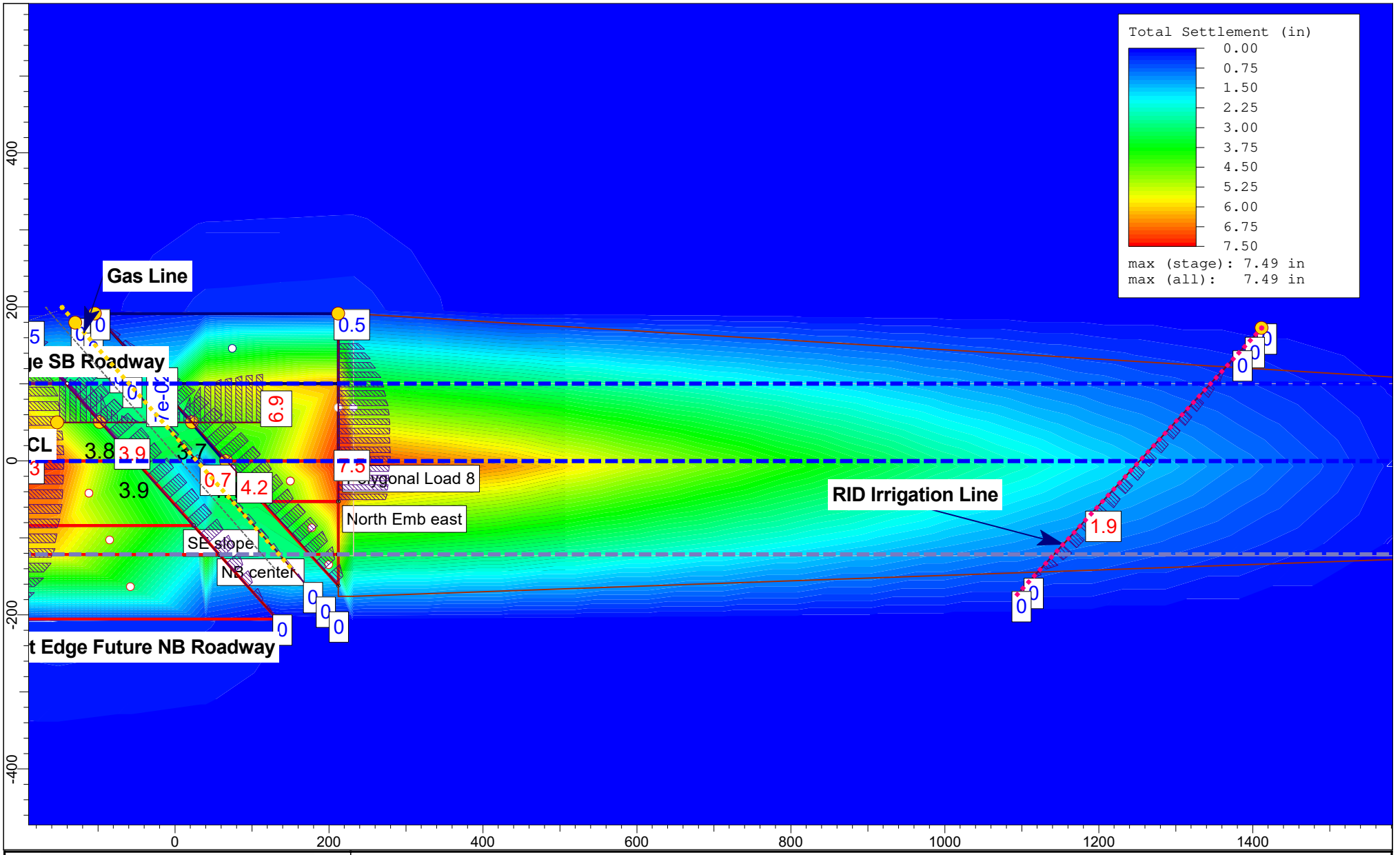
Figure I-20



ethos ENGINEERING, LLC.	*Project*	SR 303L – MC 85 to Van Buren	
	Analysis Description	RID Irrigation Line- Stage 1	
	Drawn By	Katie Mackay	*Company* Ethos
	Date	6/18/2024, 2:32:39 PM	*File Name* Broadway Road OP_10-2-24.s3z

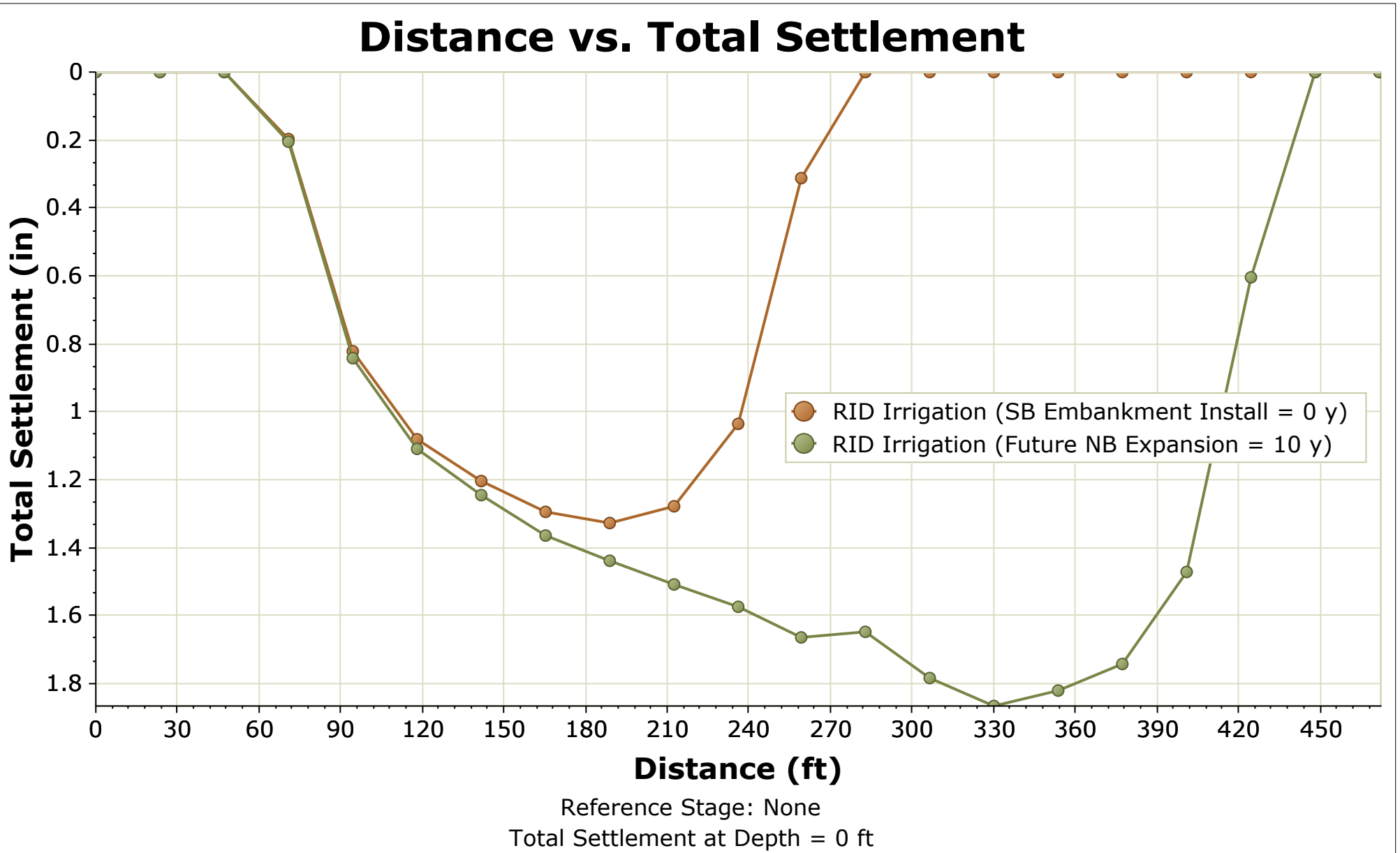
SETTLE3 5.012

Figure I-21



ethos ENGINEERING, LLC.	*Project*	SR 303L – MC 85 to Van Buren	
SETTLE3 5.012	*Analysis Description*	RID Irrigation Line - Stage 2	
	Drawn By	Katie Mackay	*Company* Ethos
	Date	6/18/2024, 2:32:39 PM	*File Name* Broadway Road OP_10-2-24.s3z

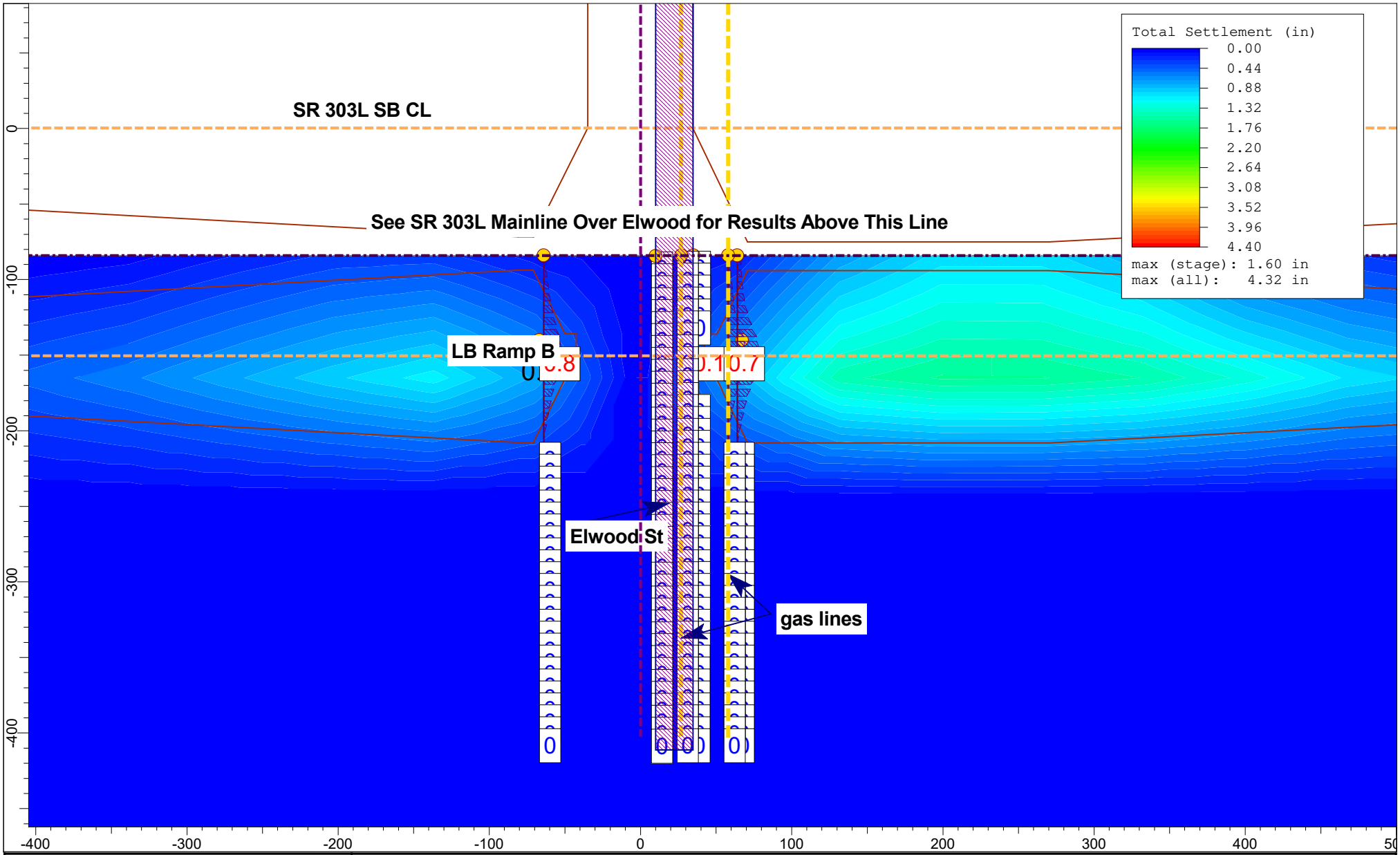
Figure I-22



ethos ENGINEERING, LLC.	*Project*	SR 303L – MC 85 to Van Buren	
	Analysis Description	RID Irrigation Line	
	Drawn By	Katie Mackay	*Company* Ethos
	Date	6/18/2024, 2:32:39 PM	*File Name* Broadway Road OP_10-2-24.s3z

SETTLE3 5.012

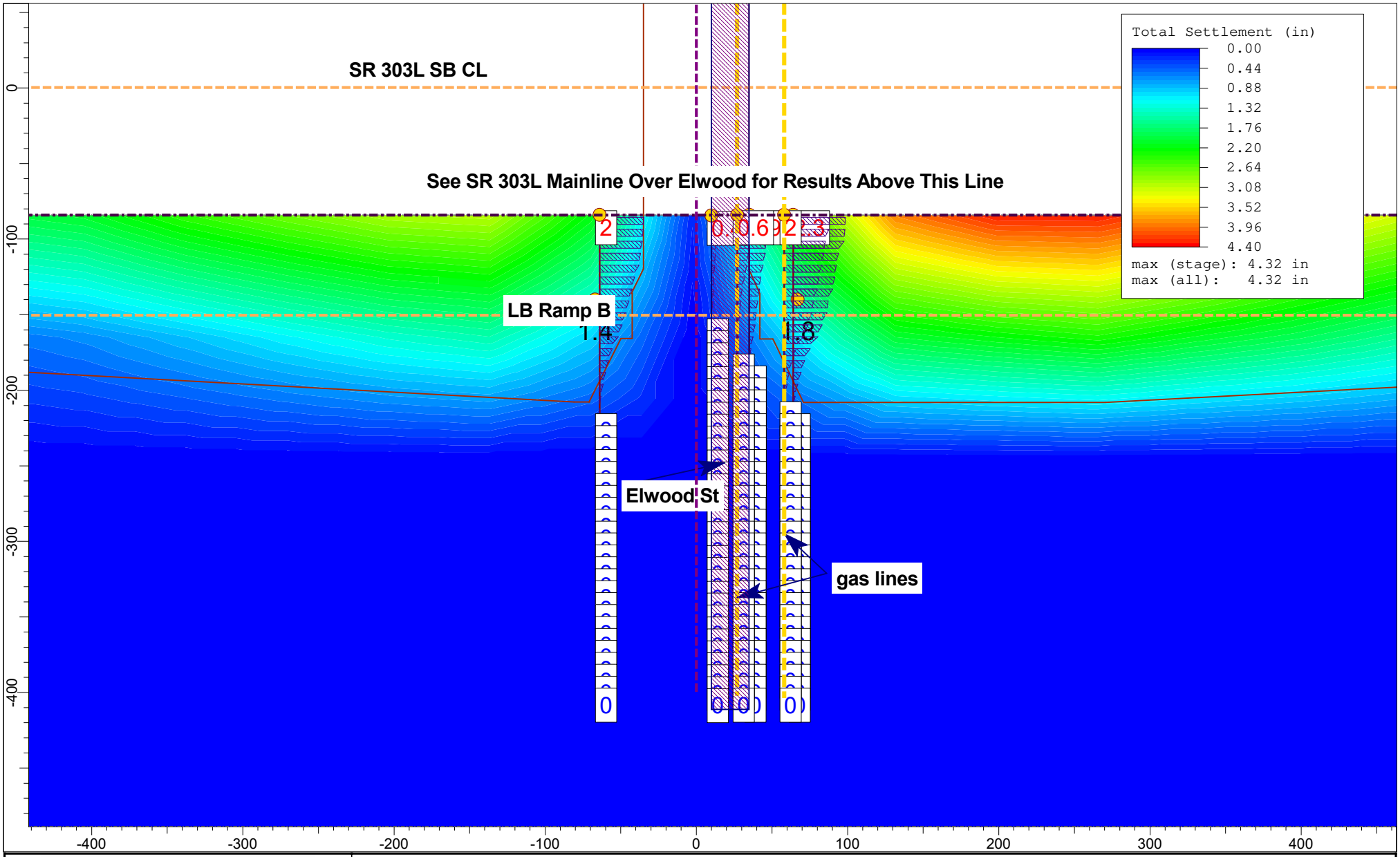
Figure I-23



ethos ENGINEERING, LLC.	*Project*	SR 303L – MC 85 to Van Buren	
	Analysis Description	LB Ramp B over Elwood - Stage 1	
	Drawn By	Katie Mackay	*Company* Ethos
	Date	6/27/2024, 4:31:18 PM	*File Name* LB Ramp B over Elwood 11-12-24.s3z

SETTLE3 5.012

Figure I-24

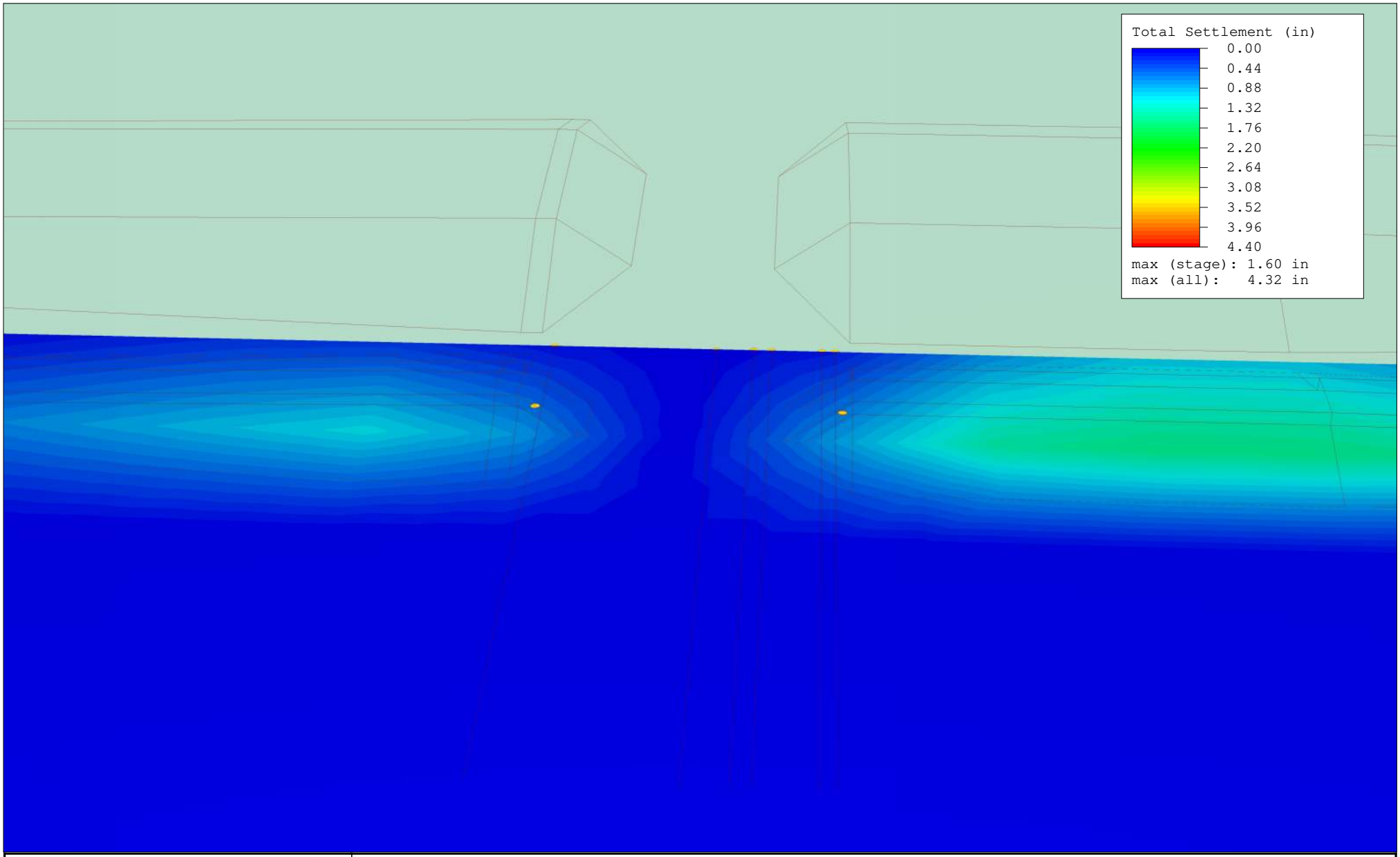


Project	SR 303L – MC 85 to Van Buren		
Analysis Description	LB Ramp B over Elwood - Stage 2		
Drawn By	Katie Mackay	Company	Ethos
Date	6/27/2024, 4:31:18 PM	File Name	LB Ramp B over Elwood 11-12-24.s3z

ethos ENGINEERING, LLC.

SETTLE3 5.012

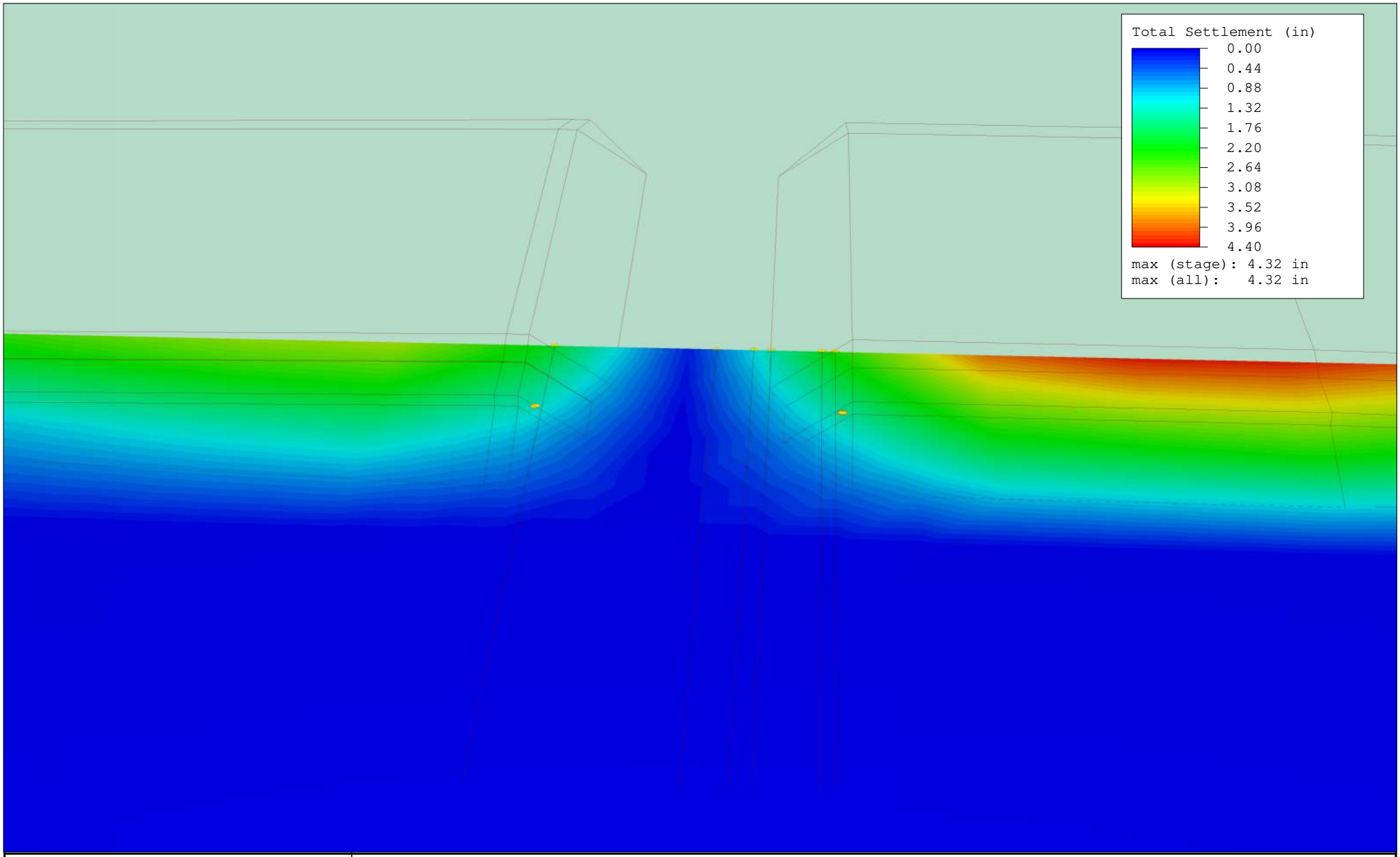
Figure I-25



ethos ENGINEERING, LLC.	*Project*	SR 303L – MC 85 to Van Buren	
	Analysis Description	LB Ramp B over Elwood - Stage 1	
	Drawn By	Katie Mackay	*Company* Ethos
	Date	6/27/2024, 4:31:18 PM	*File Name* LB Ramp B over Elwood 11-12-24.s3z

SETTLE3 5.012

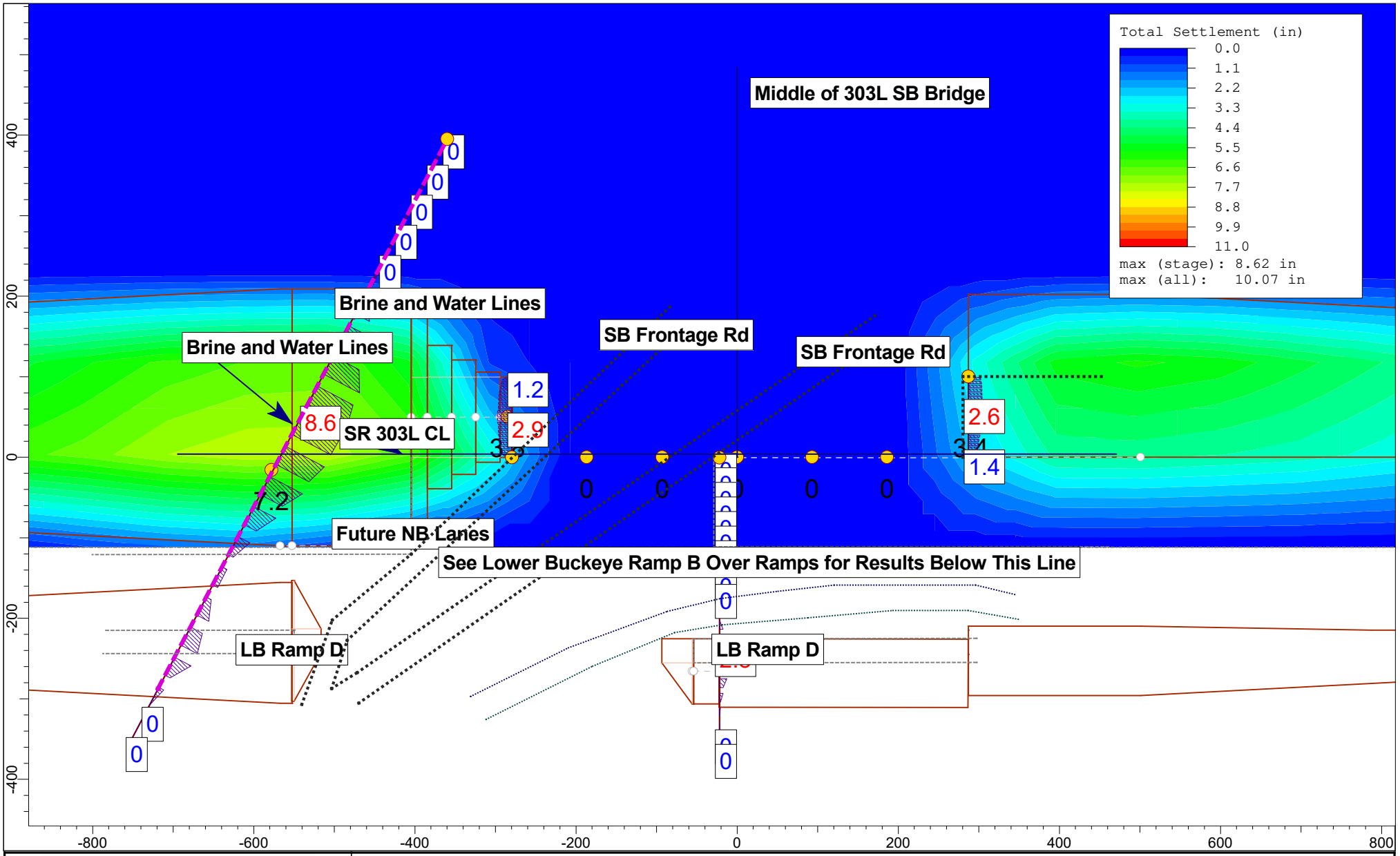
Figure I-26



ethos ENGINEERING, LLC.	*Project*	SR 303L – MC 85 to Van Buren	
	Analysis Description	LB Ramp B over Elwood - Stage 2	
	Drawn By	Katie Mackay	*Company* Ethos
	Date	6/27/2024, 4:31:18 PM	*File Name* LB Ramp B over Elwood 11-12-24.s3z

SETTLE3 5.012

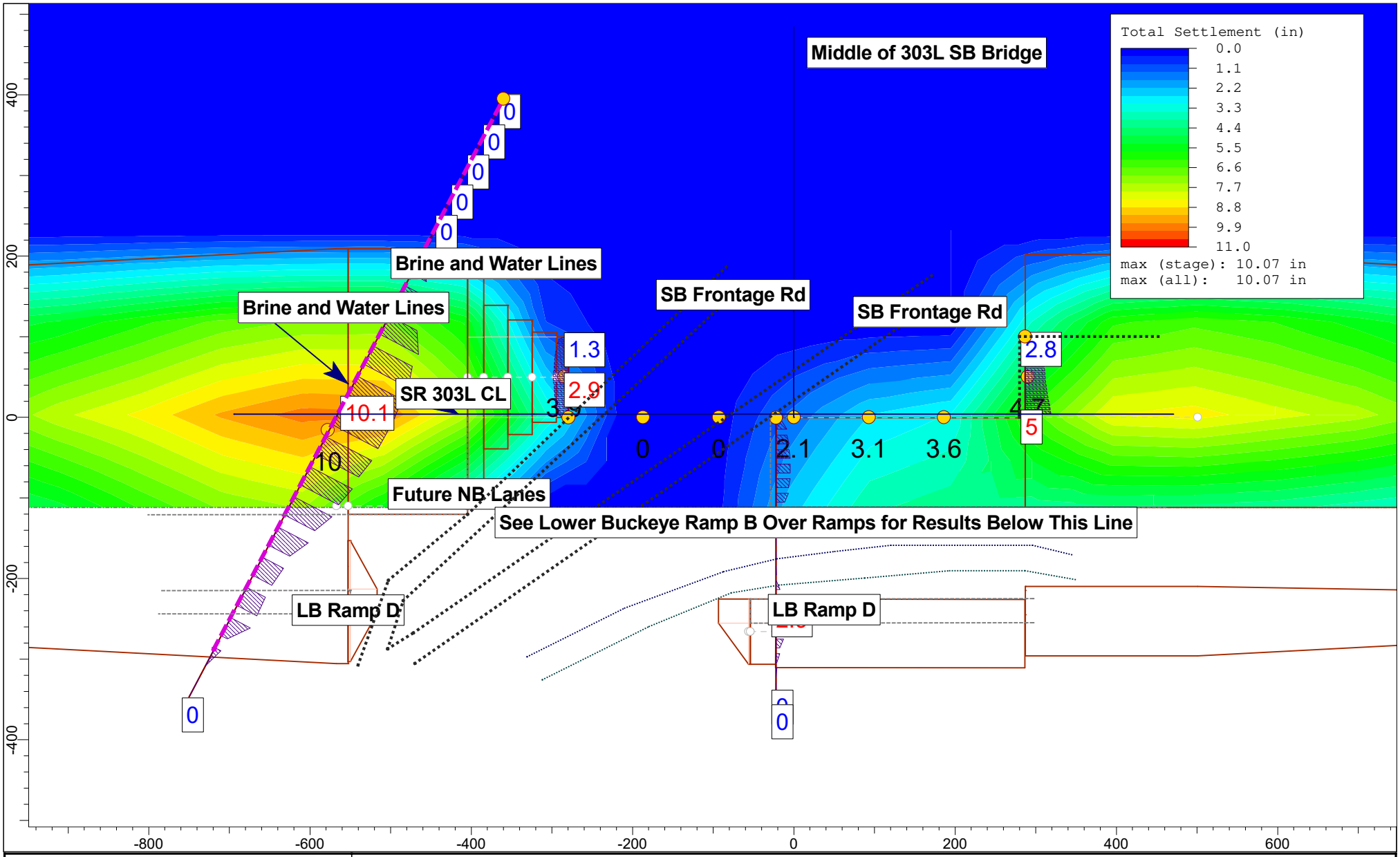
Figure I-27



ethos ENGINEERING, LLC.	*Project*	SR 303L - MC 85 to Van Buren	
	Analysis Description	SR 303L over SB Frontage Road and SB Elwood Off Ramp - Stage 1	
	Drawn By	Katie Mackay	*Company* Ethos
	Date	7/24/2024, 4:17:10 PM	*File Name* Mainline over ramps_9-24-24.s3z

SETTLE3 5.012

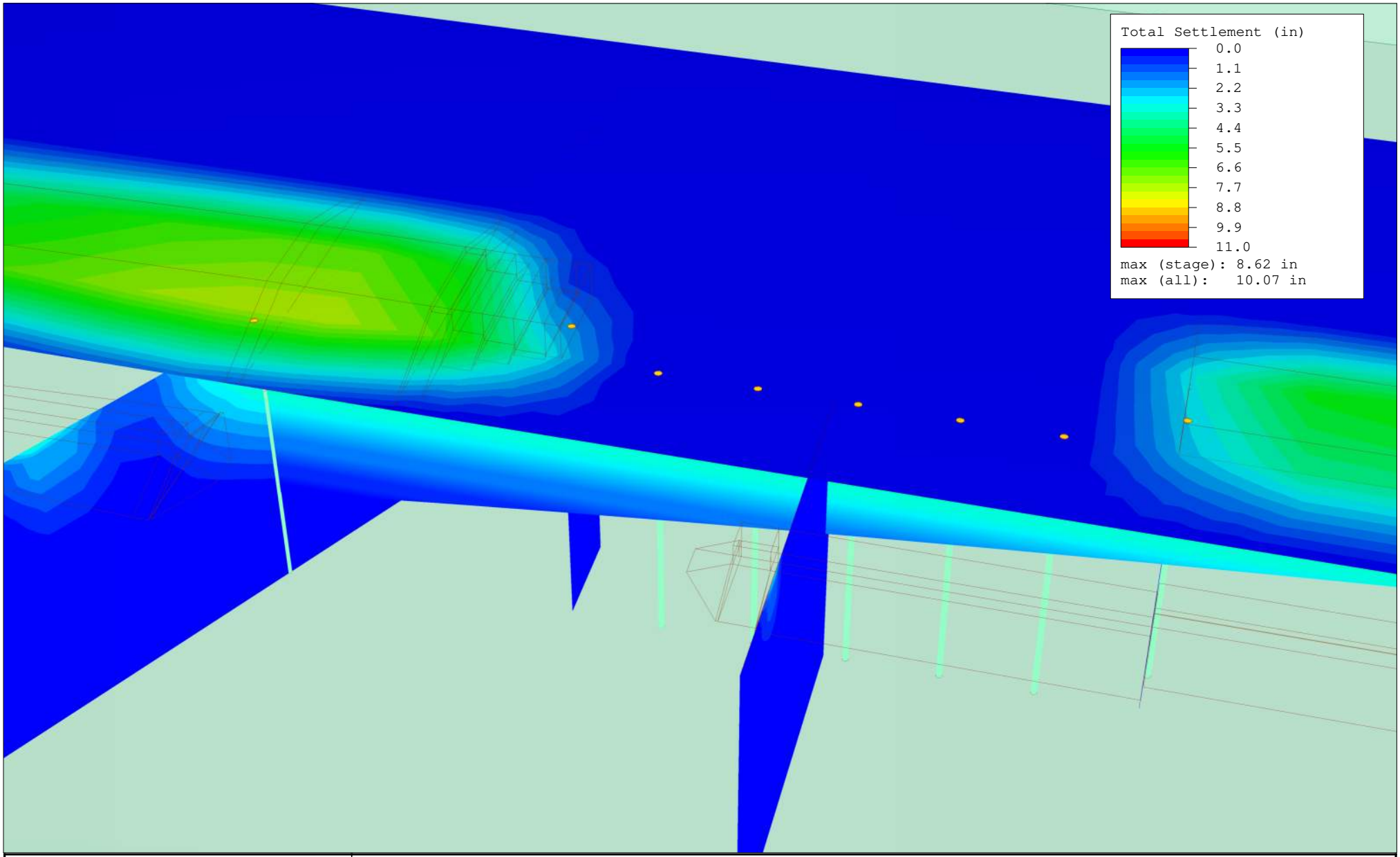
Figure I-28



ethos ENGINEERING, LLC.	*Project*	SR 303L - MC 85 to Van Buren	
	Analysis Description	SR 303L over SB Frontage Road and SB Elwood Off Ramp - Stage 2	
	Drawn By	Katie Mackay	*Company* Ethos
	Date	7/24/2024, 4:17:10 PM	*File Name* Mainline over ramps_9-24-24.s3z

SETTLE3 5.012

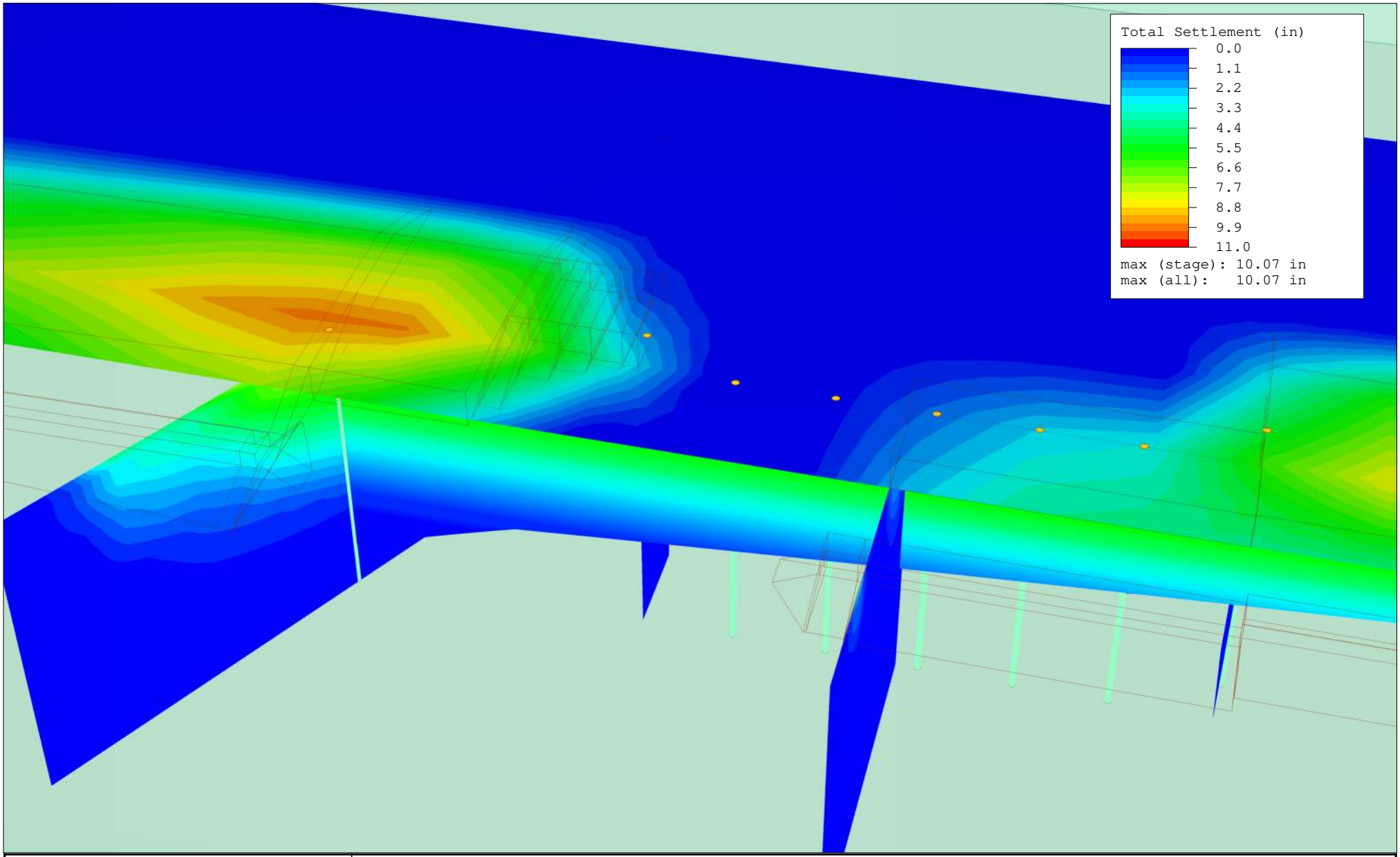
Figure I-29



ethos ENGINEERING, LLC.	*Project*	SR 303L - MC 85 to Van Buren	
	Analysis Description	SR 303L over SB Frontage Road and SB Elwood Off Ramp - Stage 1	
	Drawn By	Katie Mackay	*Company* Ethos
	Date	7/24/2024, 4:17:10 PM	*File Name* Mainline over ramps_9-24-24.s3z

SETTLE3 5.012

Figure I-30

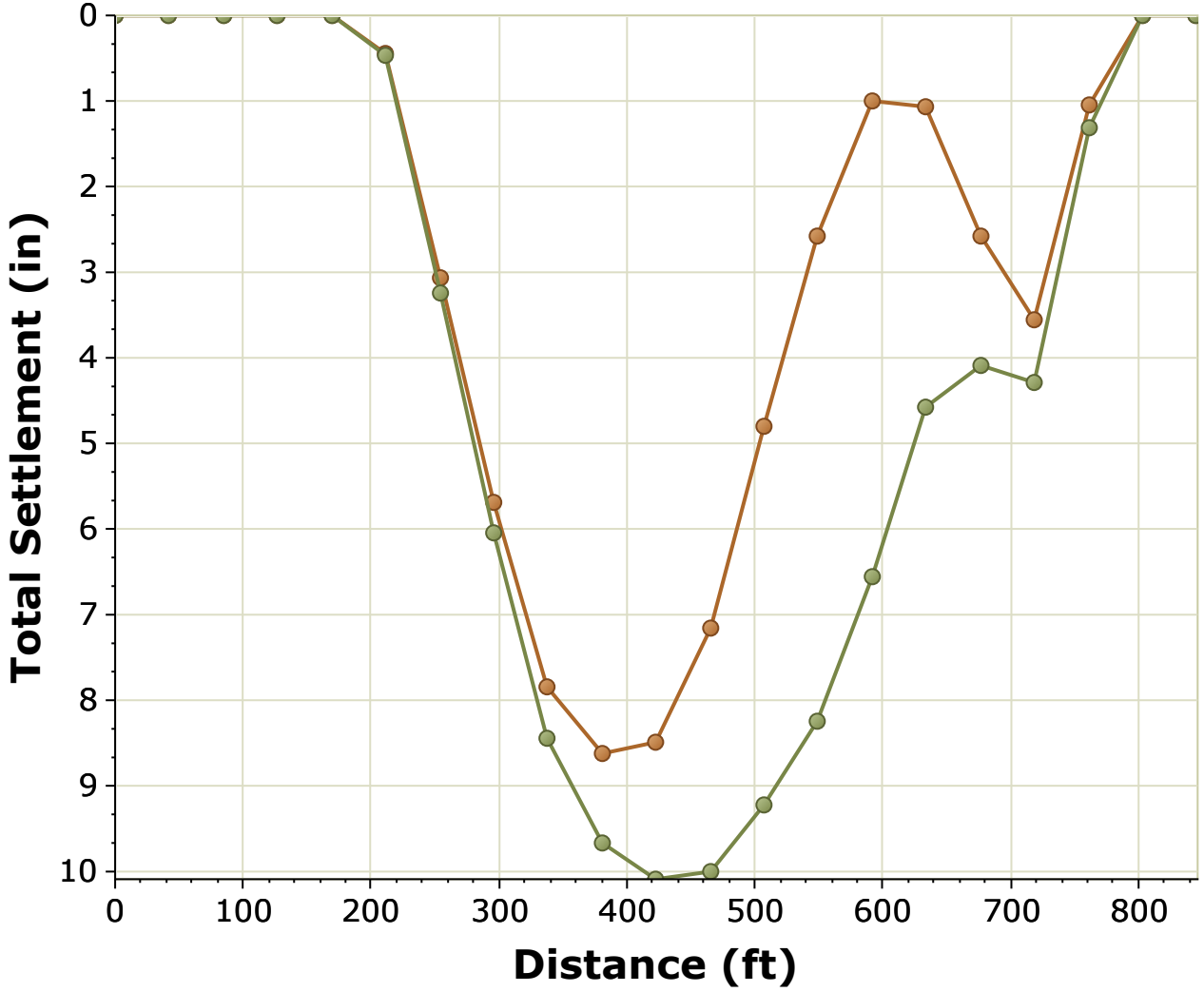


ethos ENGINEERING, LLC.	*Project*	SR 303L - MC 85 to Van Buren	
	Analysis Description	SR 303L over SB Frontage Road and SB Elwood Off Ramp - Stage 2	
	Drawn By	Katie Mackay	*Company* Ethos
	Date	7/24/2024, 4:17:10 PM	*File Name* Mainline over ramps_9-24-24.s3z

SETTLE3 5.012

Figure I-31

Distance vs. Total Settlement



Brine Line (Initial Construction = 0 y)
Brine Line (10 years = 10 y)

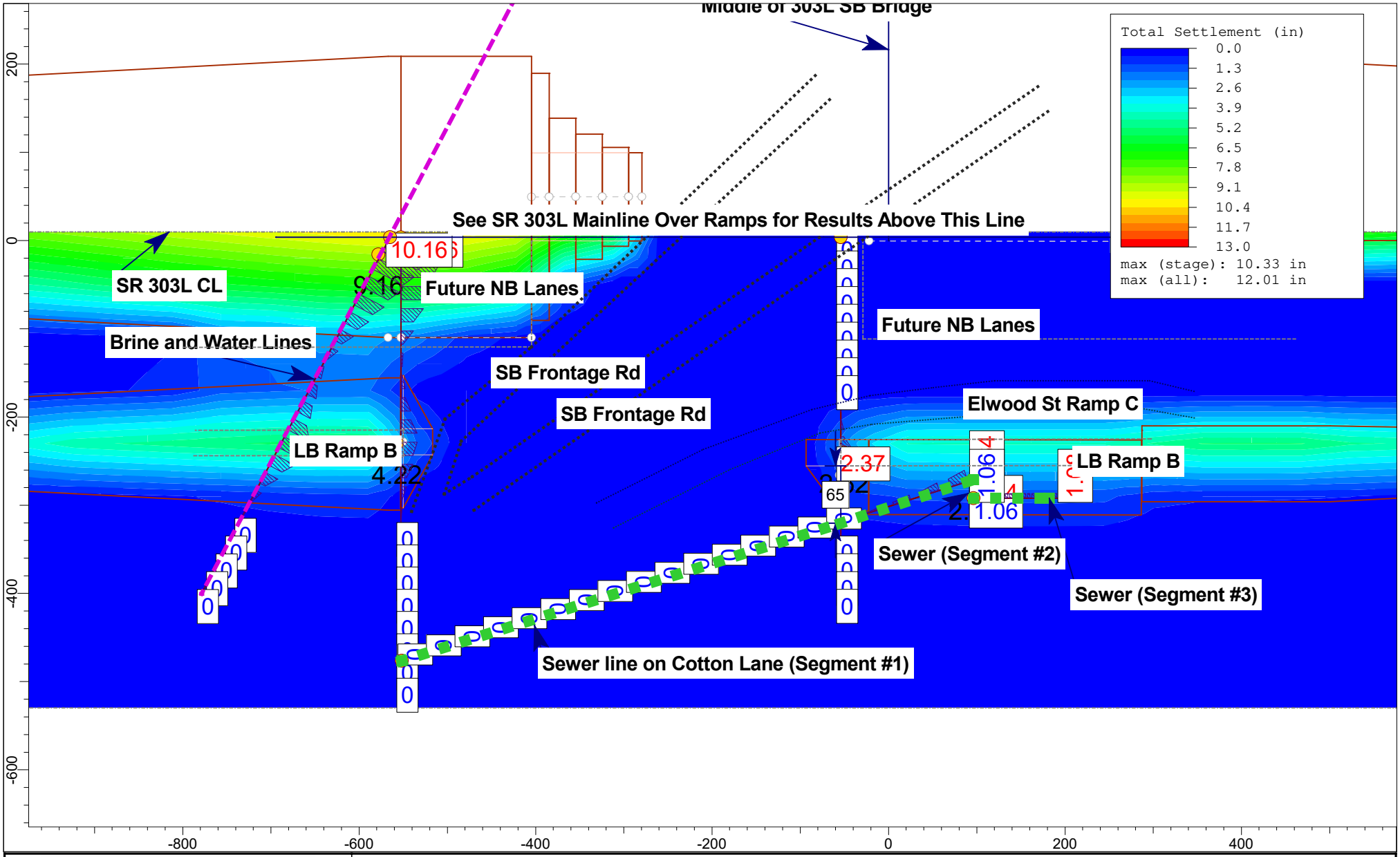
Note: Brine Line and Water Line are considered to have the same settlement profile given their close proximity.

Reference Stage: None
Total Settlement at Depth = 0 ft

ethos ENGINEERING, LLC.	*Project*	SR 303L - MC 85 to Van Buren	
	Analysis Description	SR 303L over SB Frontage Road and SB Elwood Off Ramp	
	Drawn By	Katie Mackay	*Company* Ethos
	Date	7/24/2024, 4:17:10 PM	*File Name* Mainline over ramps_9-24-24.s3z

SETTLE3 5.012

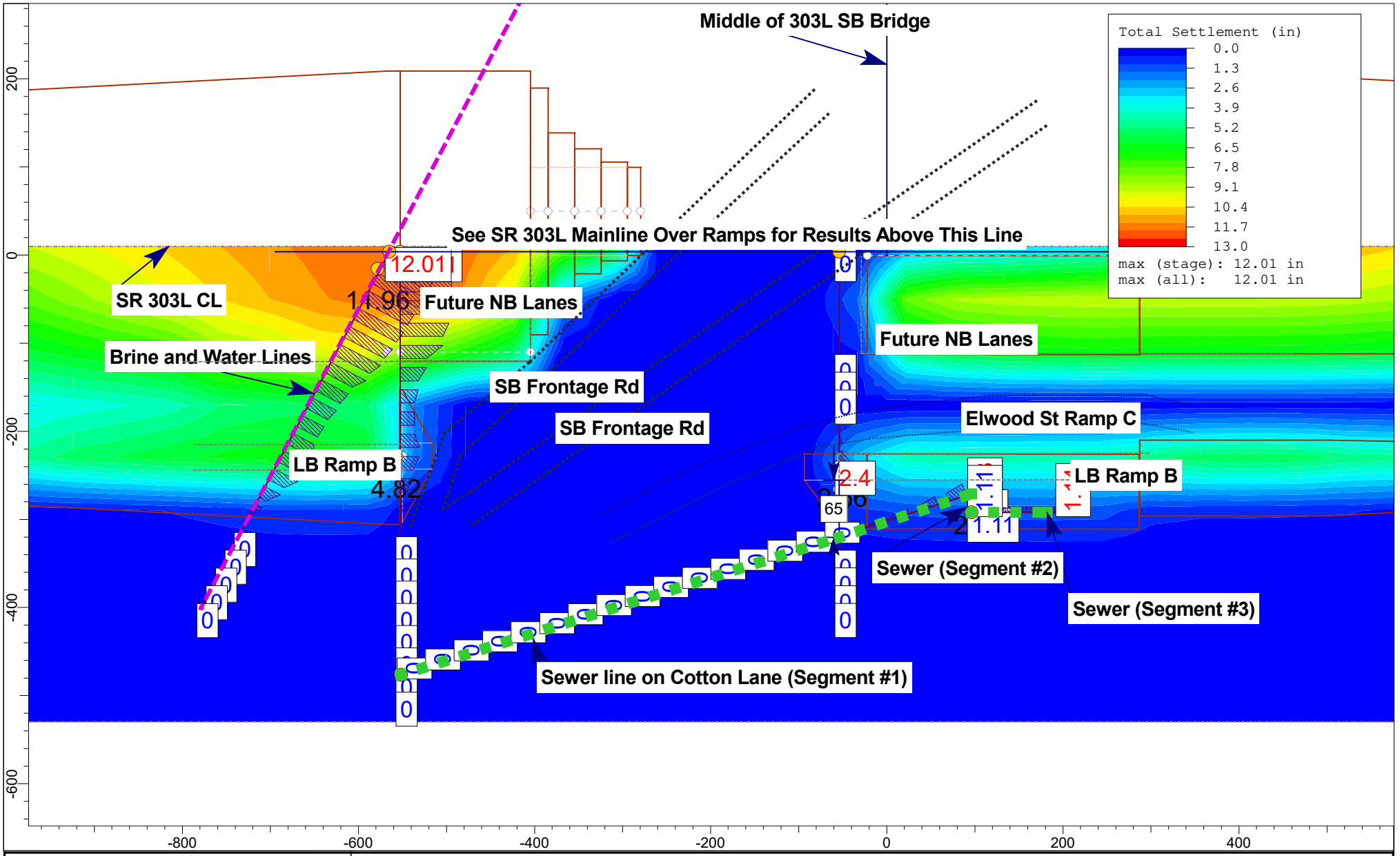
Figure I-32



ethos ENGINEERING, LLC.	*Project*	SR 303L - MC 85 to Van Buren	
	Analysis Description	LB Ramp B over SB Frontage Road and SB Elwood Off Ramp - Stage 1	
	Drawn By	Katie Mackay	*Company* Ethos
	Date	7/24/2024, 4:17:10 PM	*File Name* LB Ramp B over ramps_9-24-24.s3z

SETTLE3 5.012

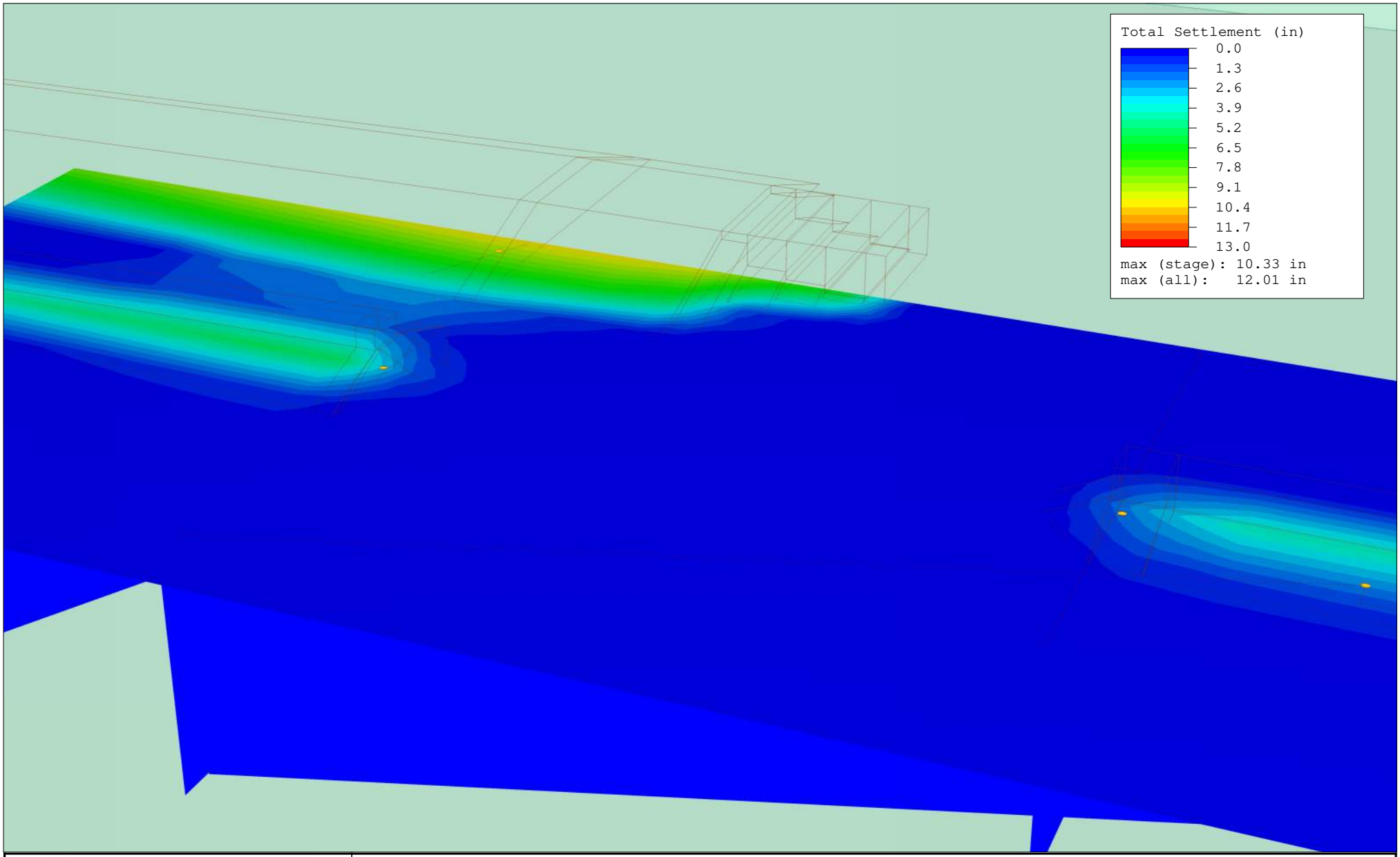
Figure I-33



ethos ENGINEERING, LLC.	*Project*	SR 303L - MC 85 to Van Buren	
	Analysis Description	LB Ramp B over SB Frontage Road and SB Elwood Off Ramp - Stage 2	
	Drawn By	Katie Mackay	*Company* Ethos
	Date	7/24/2024, 4:17:10 PM	*File Name* LB Ramp B over ramps_9-24-24.s3z

SETTLE3 5.012

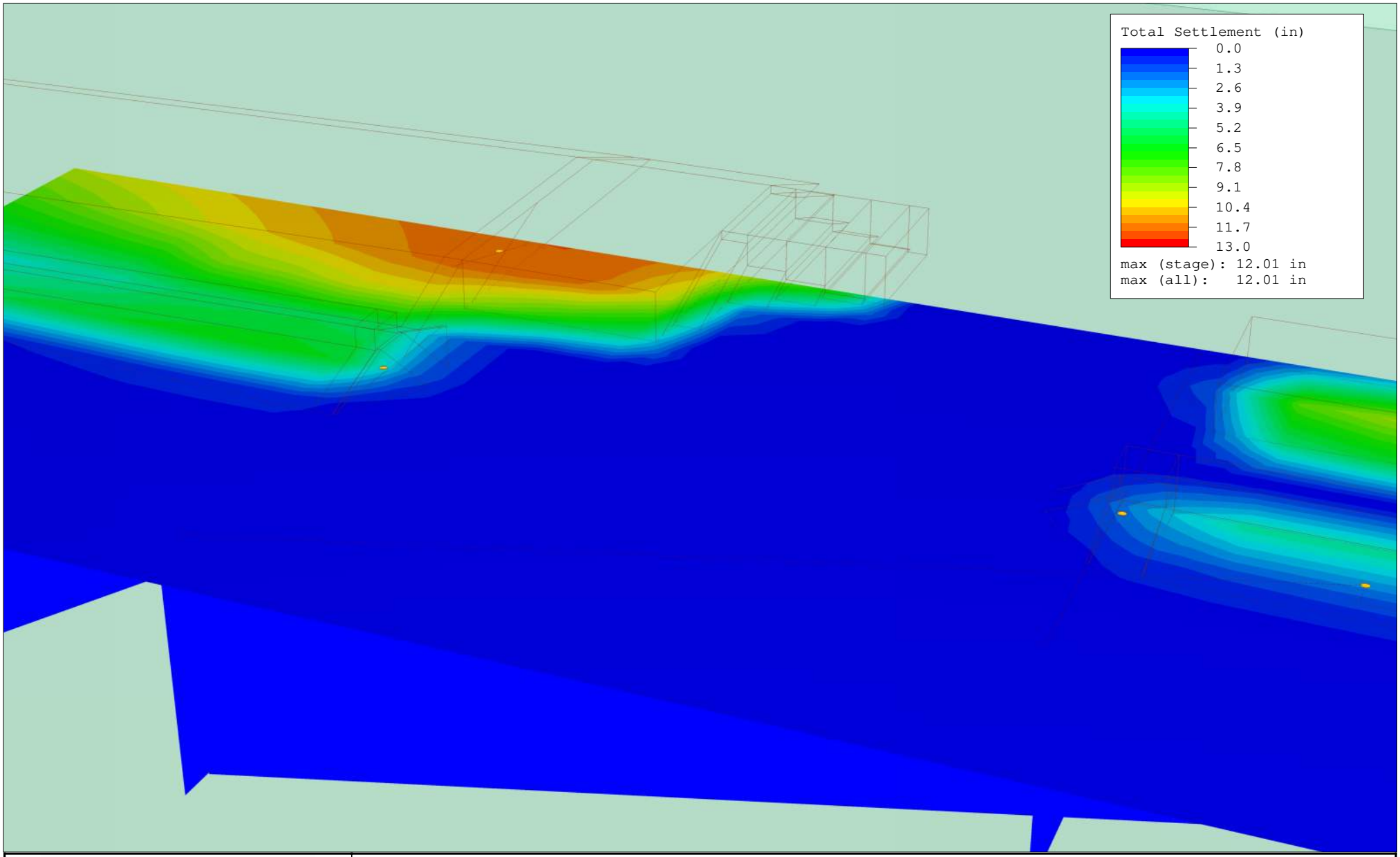
Figure I-34



ethos ENGINEERING, LLC.	*Project*	SR 303L - MC 85 to Van Buren	
	Analysis Description	LB Ramp B over SB Frontage Road and SB Elwood Off Ramp - Stage 1	
	Drawn By	Katie Mackay	*Company* Ethos
	Date	7/24/2024, 4:17:10 PM	*File Name* LB Ramp B over ramps_9-24-24.s3z

SETTLE3 5.012

Figure I-35

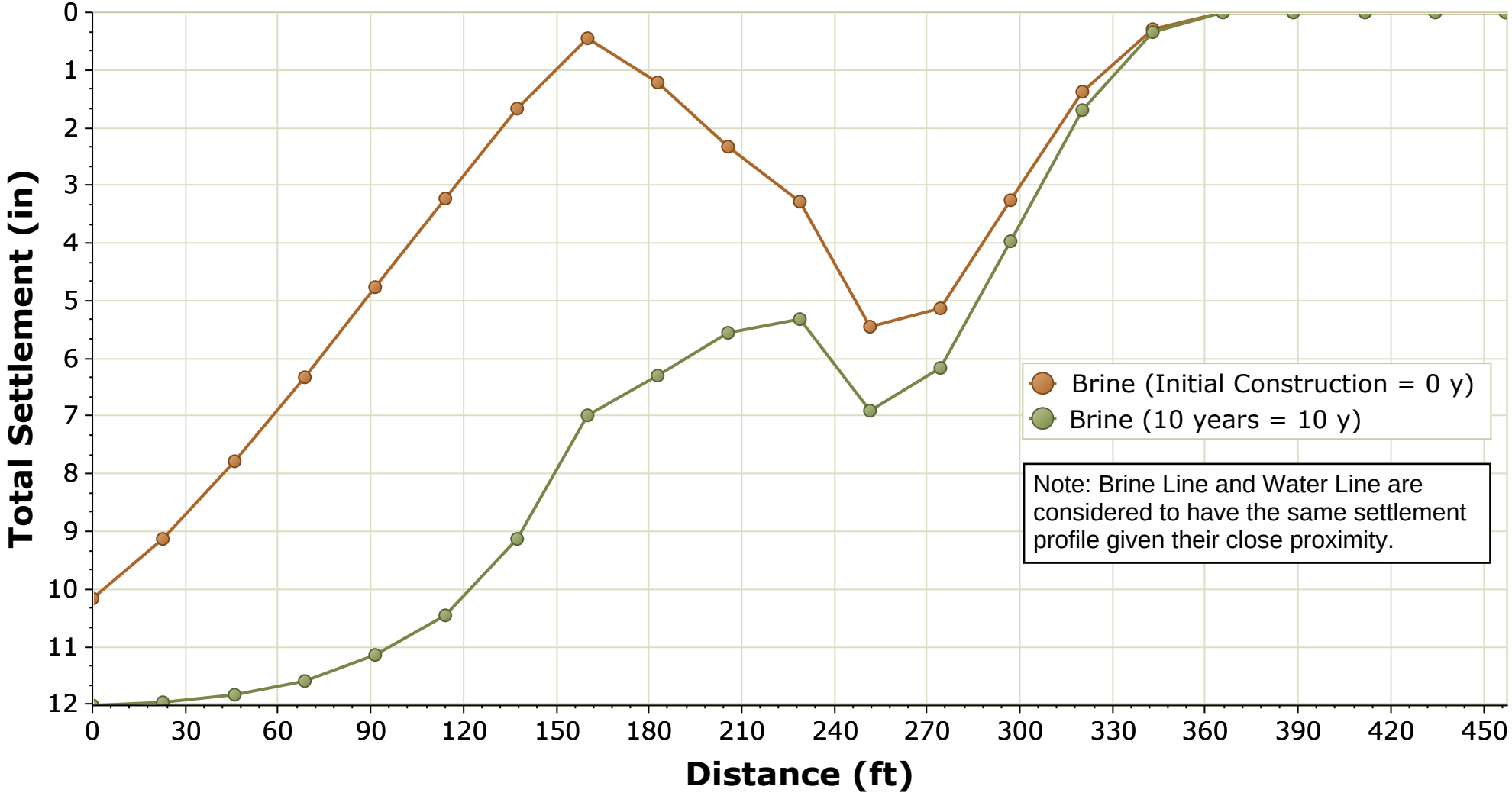


ethos ENGINEERING, LLC.	*Project*	SR 303L - MC 85 to Van Buren	
	Analysis Description	LB Ramp B over SB Frontage Road and SB Elwood Off Ramp - Stage 2	
	Drawn By	Katie Mackay	*Company* Ethos
	Date	7/24/2024, 4:17:10 PM	*File Name* LB Ramp B over ramps_9-24-24.s3z

SETTLE3 5.012

Figure I-36

Distance vs. Total Settlement



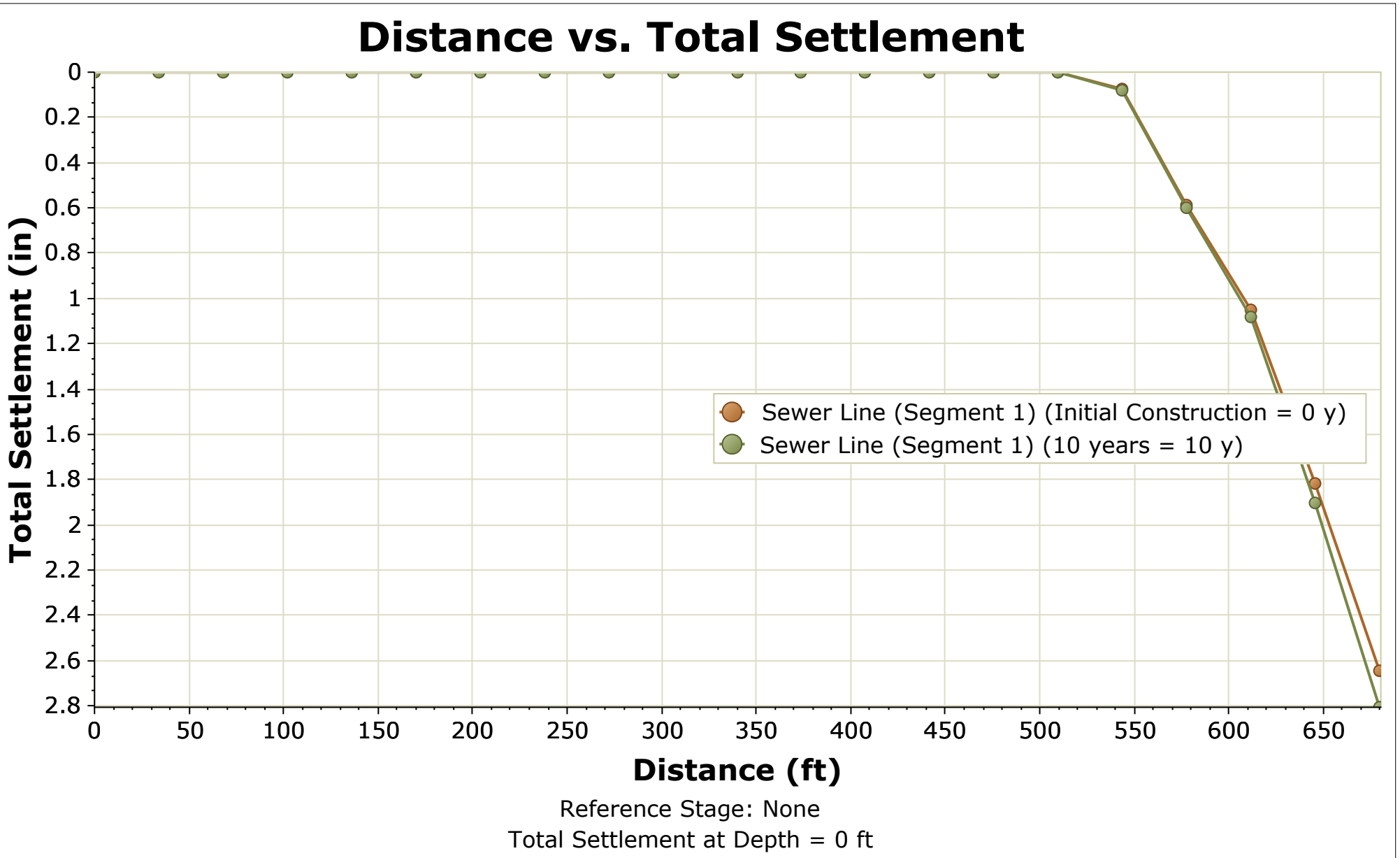
Reference Stage: None

Total Settlement at Depth = 0 ft

ethos ENGINEERING, LLC.	*Project*	SR 303L - MC 85 to Van Buren	
	Analysis Description	LB Ramp B over SB Frontage Road and SB Elwood Off Ramp	
	Drawn By	Katie Mackay	*Company* Ethos
	Date	7/24/2024, 4:17:10 PM	*File Name* LB Ramp B over ramps_9-24-24.s3z

SETTLE3 5.012

Figure I-37

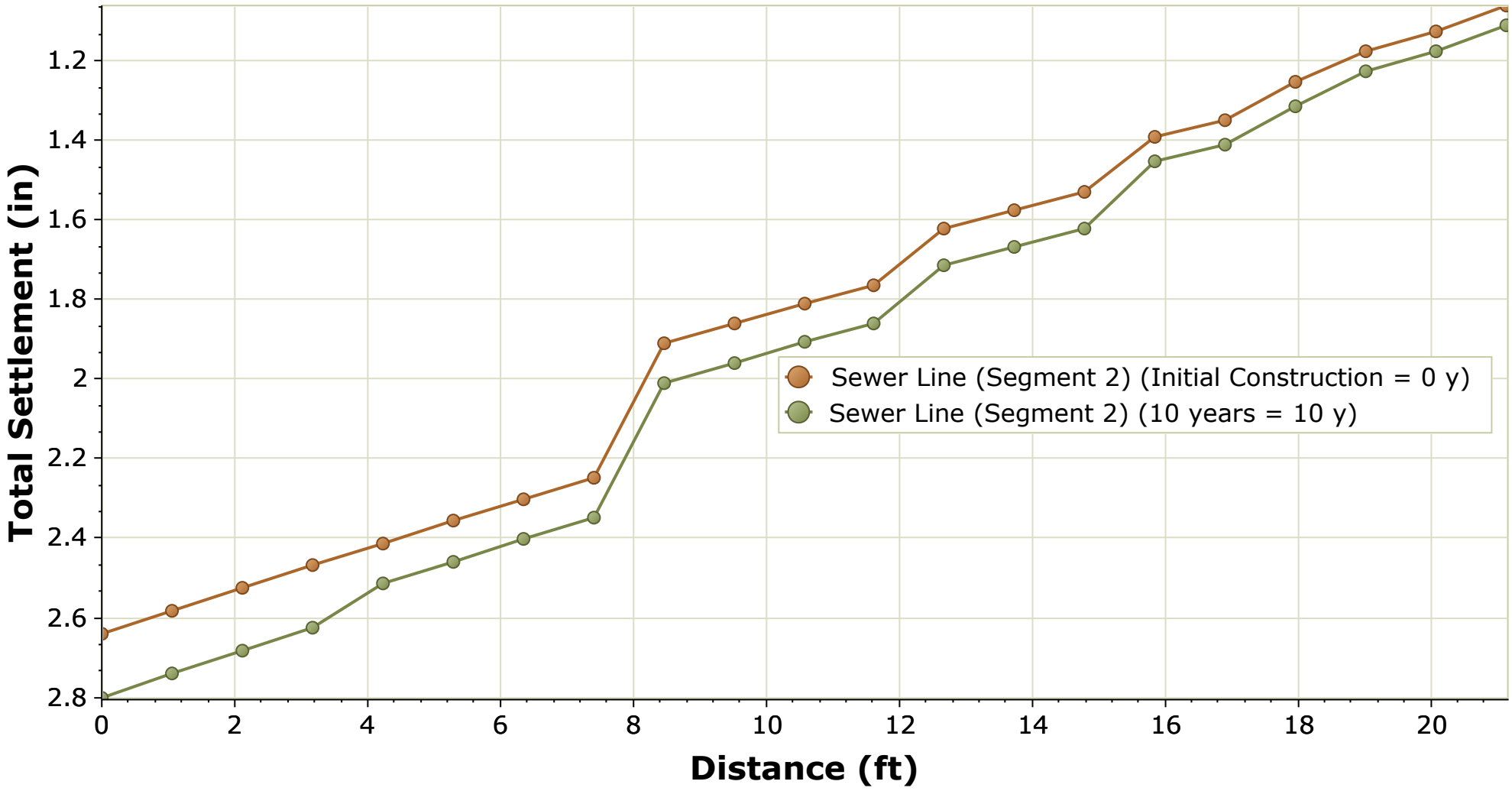


ethos ENGINEERING, LLC.	Project	SR 303L - MC 85 to Van Buren	
	Analysis Description	LB Ramp B over SB Frontage Road and SB Elwood Off Ramp	
	Drawn By	Katie Mackay	Company: Ethos
	Date	7/24/2024, 4:17:10 PM	File Name: LB Ramp B over ramps_9-24-24.s3z

SETTLE3 5.012

Figure I-38

Distance vs. Total Settlement



Reference Stage: None

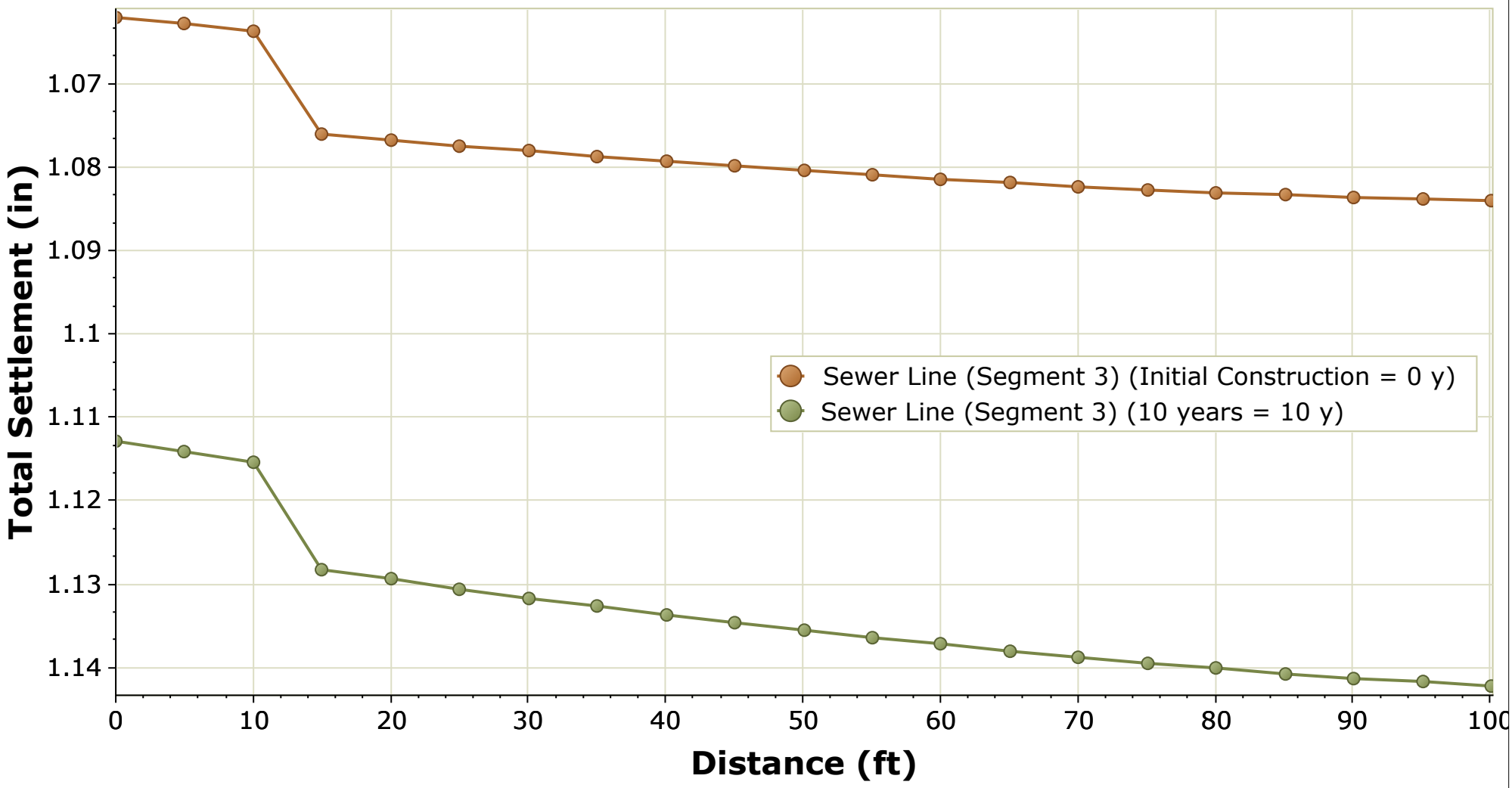
Total Settlement at Depth = 0 ft

ethos ENGINEERING, LLC.	Project	SR 303L - MC 85 to Van Buren	
	Analysis Description	LB Ramp B over SB Frontage Road and SB Elwood Off Ramp	
	Drawn By	Katie Mackay	Company: Ethos
	Date	7/24/2024, 4:17:10 PM	File Name: LB Ramp B over ramps_9-24-24.s3z

SETTLE3 5.012

Figure I-39

Distance vs. Total Settlement



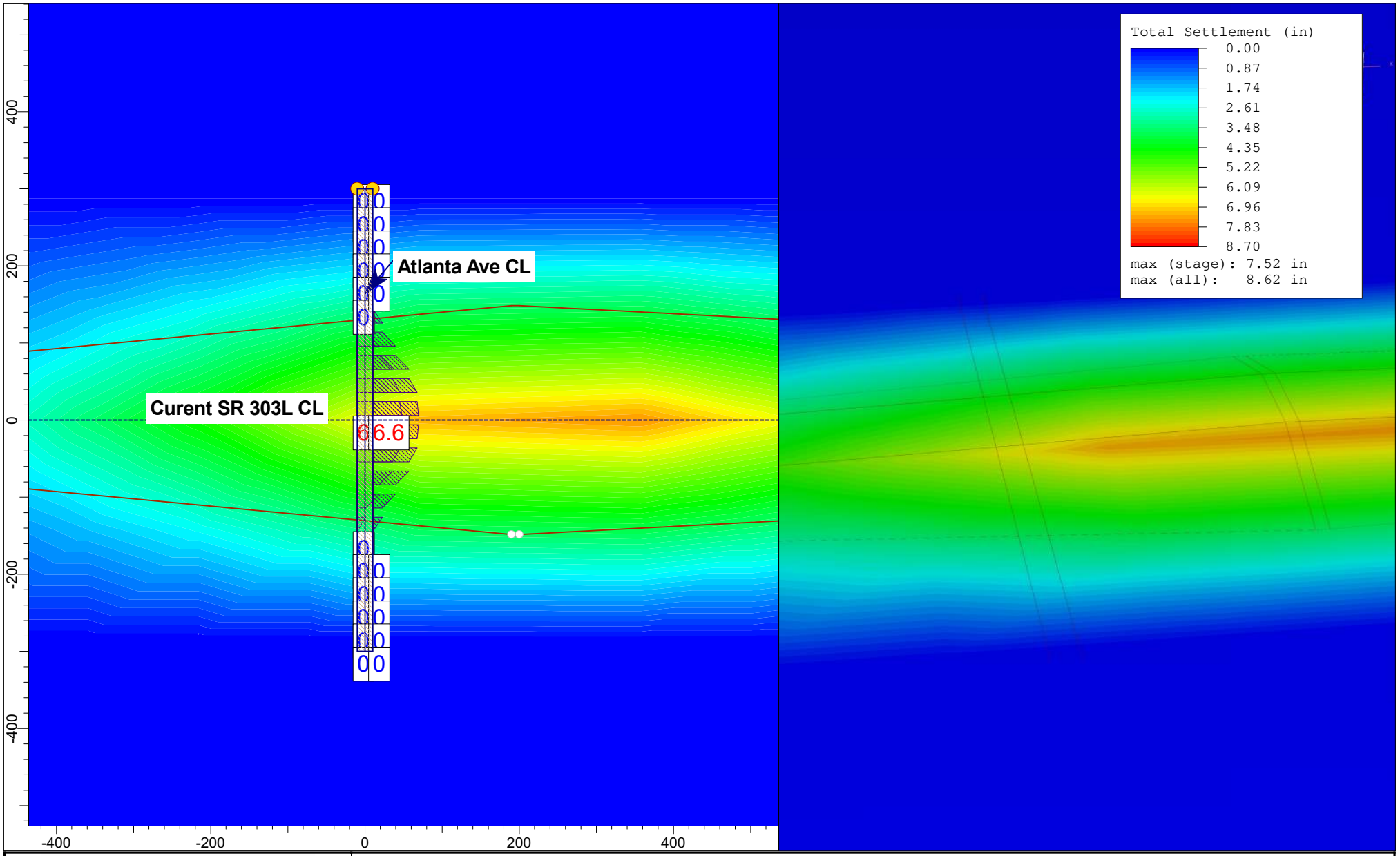
Reference Stage: None

Total Settlement at Depth = 0 ft

ethos ENGINEERING, LLC.	Project	SR 303L - MC 85 to Van Buren	
	Analysis Description	LB Ramp B over SB Frontage Road and SB Elwood Off Ramp	
	Drawn By	Katie Mackay	Company: Ethos
	Date	7/24/2024, 4:17:10 PM	File Name: LB Ramp B over ramps_9-24-24.s3z

SETTLE3 5.012

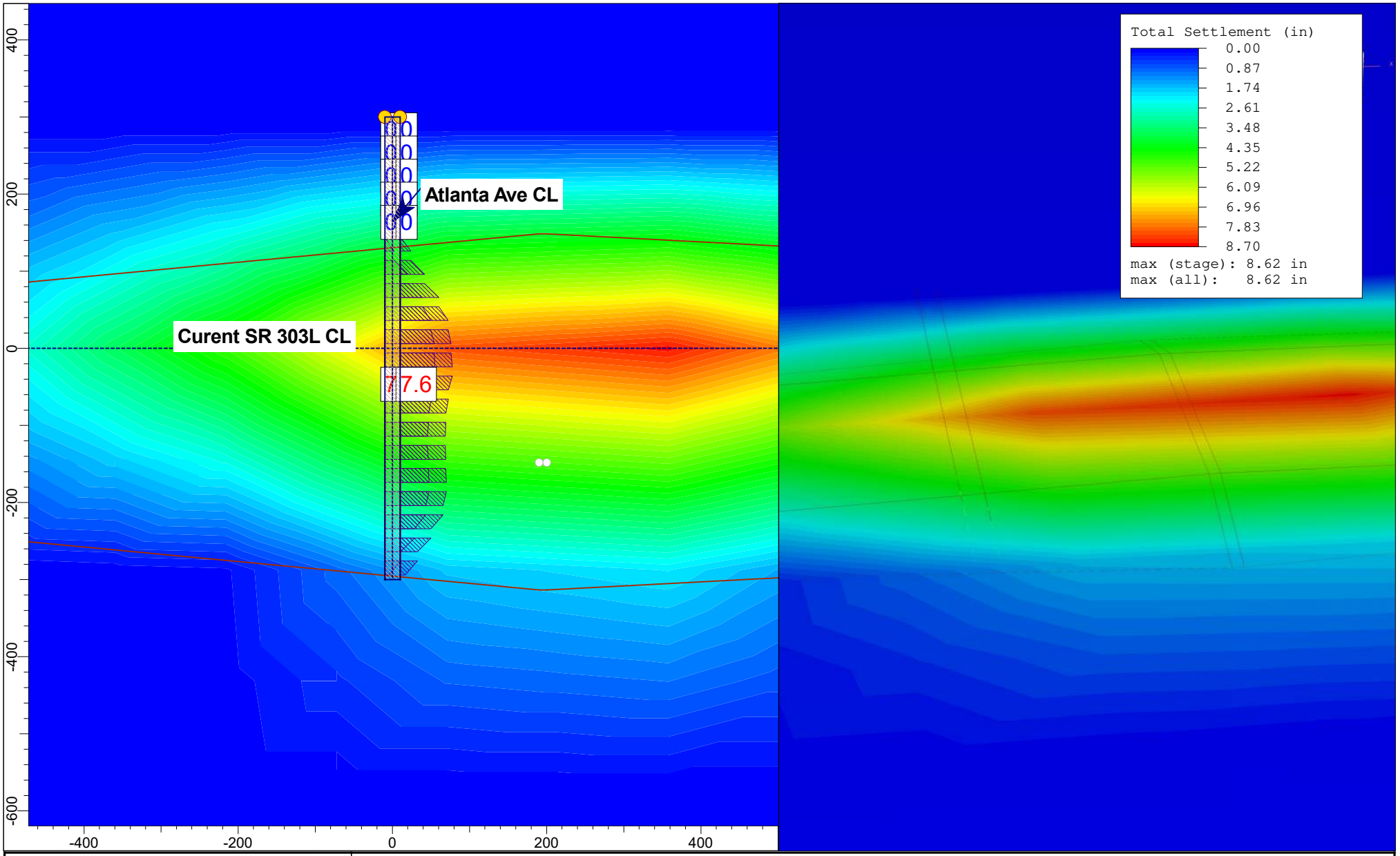
Figure I-40



ethos ENGINEERING, LLC.	*Project*	SR 303L – MC 85 to Van Buren	
	Analysis Description	Atlanta Ave - Stage 1	
	Drawn By	Katie Mackay	*Company* Ethos
	Date	7/31/2024, 3:30:26 PM	*File Name* Atlanta ave_9-25-24.s3z

SETTLE3 5.012

Figure I-41

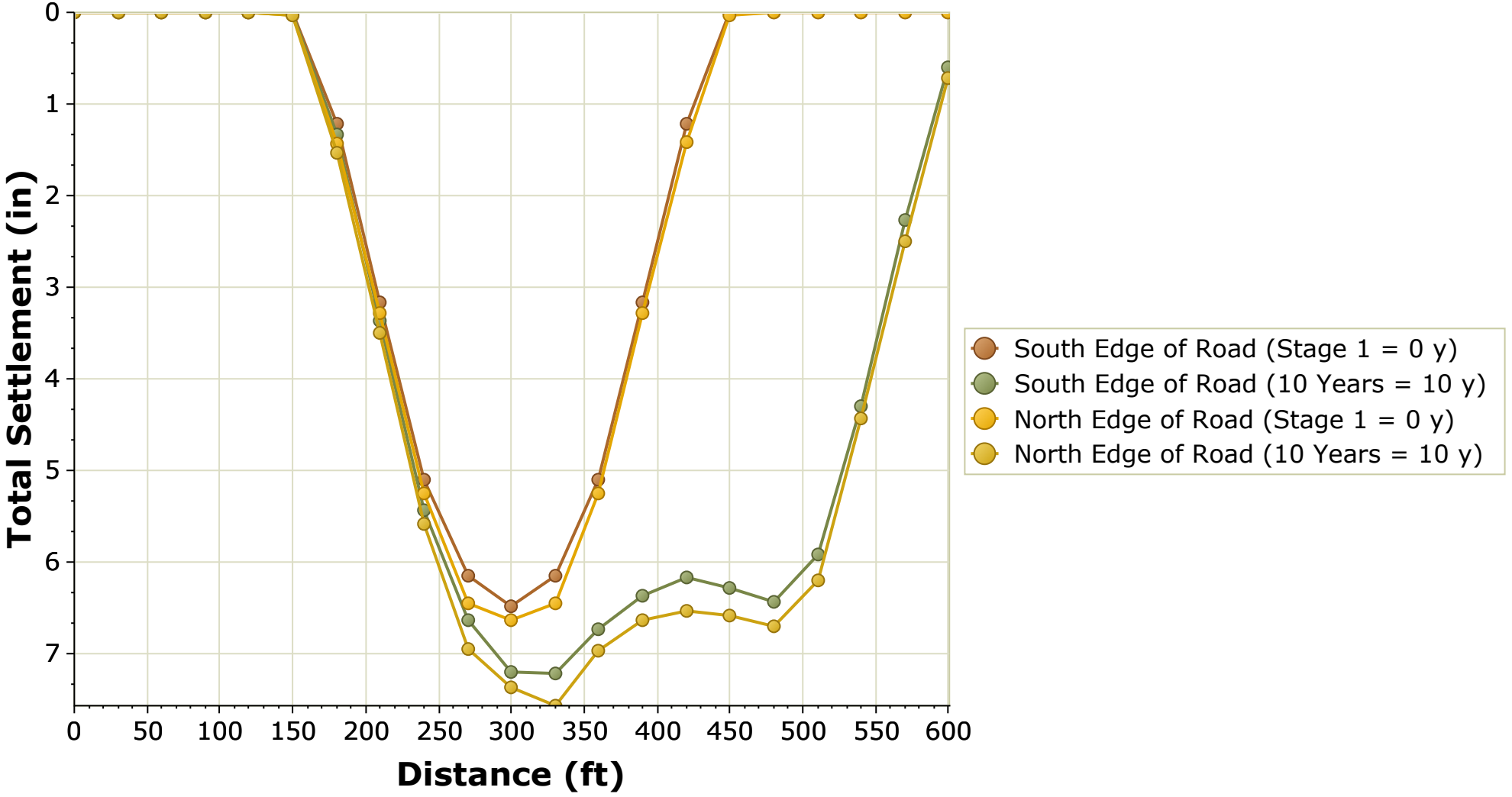


ethos ENGINEERING, LLC.	*Project*	SR 303L – MC 85 to Van Buren	
	Analysis Description	Atlanta Ave - Stage 2	
	Drawn By	Katie Mackay	*Company* Ethos
	Date	7/31/2024, 3:30:26 PM	*File Name* Atlanta ave_9-25-24.s3z

SETTLE3 5.012

Figure I-42

Distance vs. Total Settlement



Reference Stage: None

Total Settlement at Depth = 0 ft

ethos ENGINEERING, LLC.	*Project*	SR 303L – MC 85 to Van Buren	
	Analysis Description	Atlanta Ave	
	Drawn By	Katie Mackay	*Company* Ethos
	Date	7/31/2024, 3:30:26 PM	*File Name* Atlanta ave_9-25-24.s3z

SETTLE3 5.012

Figure I-43