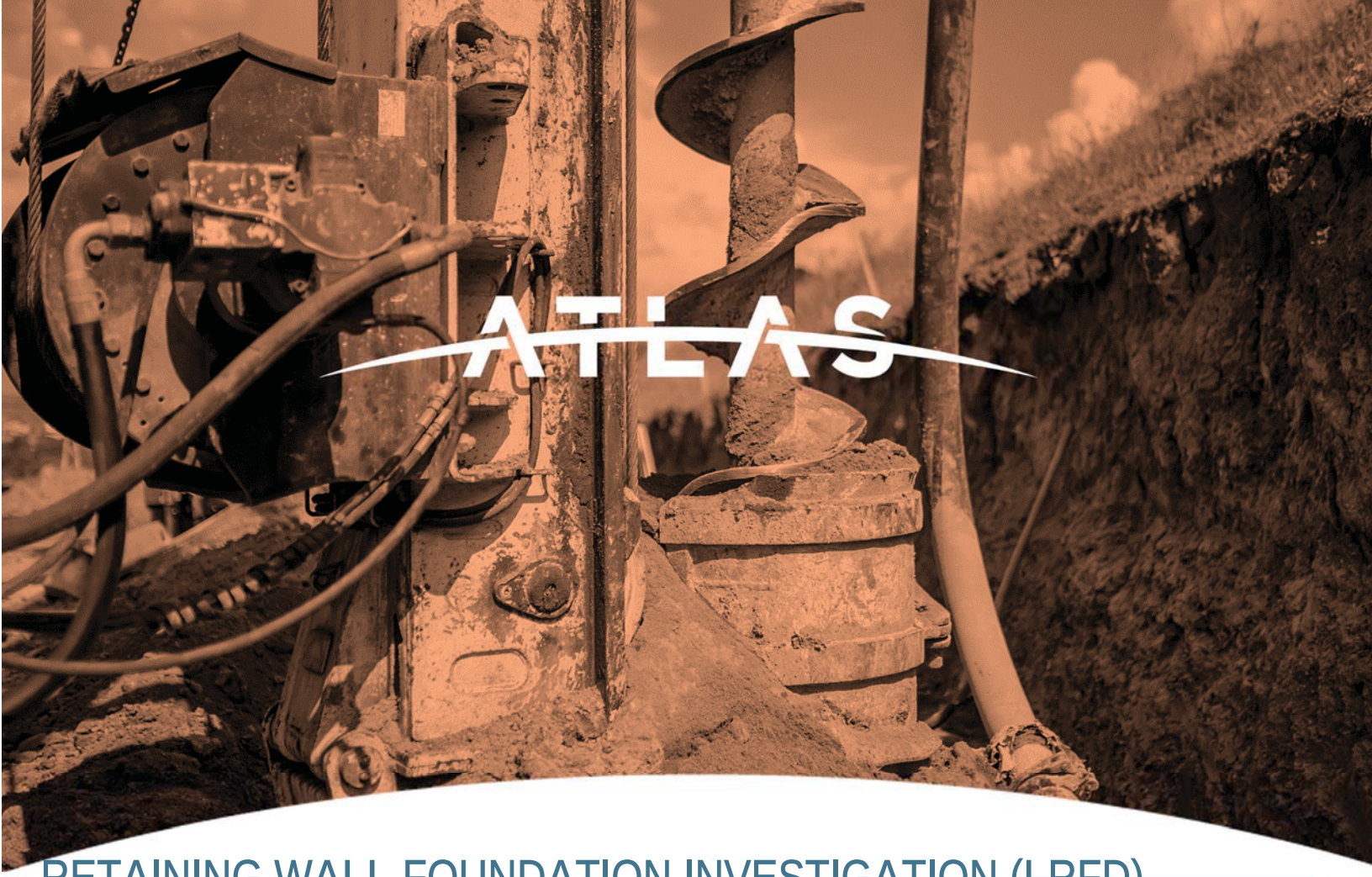


RETAINING WALL FOUNDATION INVESTIGATION (LRFD)

Courtesy Parkway Extension
Over Iris Drive, I-20 and Dogwood Drive
Walls No. 1 & No. 2
Rockdale County, Georgia
CSSTP-0006-00(934)
PI NO. 0006934

Initial Submittal, June 18, 2021
Revision #1, December 10, 2021

PREPARED BY:
Atlas Technical Consultants, LLC
2450 Commerce Avenue
Suite 100
Duluth, Georgia 30096

Atlas Project No. ROCK1701/GEO

Wall Foundation Investigation (LRFD)
Courtesy Pkwy Extension, Wall No. 1 and No. 2
CSSTP-0006-00(934), Rockdale County
PI No. 0006934
Revision #1, December 10, 2021

LOCATION (See Map) Courtesy Pkwy Extension, Wall No. 1 & No. 2

GENERAL INFORMATION

GEOLOGIC FORMATION This project will be geologically sited in the Biotitic Gneiss / Mica Schist/ Amphibolite Formation of the Georgia Piedmont Region.

SUBSURFACE FEATURES Subsurface soils consist of a layer of stiff sandy clay over medium dense to dense silty sand underlaid with very dense partially weathered rock (PWR) before the auger was refused. All borings were terminated at hard rock, which was encountered from elevations 755' to786'. Ground water was encountered from elevations 775' to 795'. For additional information see the boring layout and boring logs.

SITE CLASSIFICATION We recommend a site class of "D" per AASHTO LRFD 3.10.3.1.

WALL DESCRIPTION This project consists of two MSE walls. Wall 1 with a height range of 3.45 to 34 feet, begins at Courtesy Pkwy Ext. Station 133+25.00 to Courtesy Pkwy Ext. Station 137+70.23 (= Iris Drive Station 306+25.53) making 90º left turn and ends at Iris Drive Station 304+72.73; Wall 2 with a height range of 8.5 to 39 feet, begins at Courtesy Pkwy Ext. Station 146+00.00 to Courtesy Pkwy Ext. Station 140+72.23 (=Dogwood Drive Station 808+60.71) making 90º left turn to Dogwood Drive Station 809+59.98 (=Courtesy Pkwy Station 140+72.23) making 90º left turn again and ends at Courtesy Pkwy Station 146+50.00. The purpose of both Wall 1 and Wall 2 is to retain bridge approach embankment fill.

1.1 – RETAINED SOIL PARAMETERS

Wall # (Station Range)	Unit Weight (pcf)	Internal Friction Angle (degrees)	Cohesion (psf)
1 & 2 (Entire wall)	120	32	0

Note: Retained soil is for new fill beyond reinforced zone.

1.2 – FOUNDATION SOIL PARAMETERS

Wall # (Station Range)	Unit Weight (pcf)	Internal Friction Angle (degrees)	Cohesion (psf)
Wall 1 (Entire length)	120	33	0
Wall 2 (Courtesy Pkwy Ext. 146+00, Lt – 140+72.23, Lt)	115	31	0
Wall 2 (Dogwood Dr. 808+60.71, Lt – 809+59.98, Lt)	120	33	0
Wall 2 (Courtesy Pkwy Ext. 140+72.23, Rt – 144+50, Rt)	120	32	0
Wall 2 (Courtesy Pkwy Ext. 144+50, Lt – 146+50, Lt)	115	31	0

1.3 -- DESIGN DATA

Wall #	Wall Design Height (ft)	Wall Location Description	Strap Length, B (ft)	Strength Limit State		Service Limit State	
				Bearing Pressure (ksf)	Effective Strap Length, B'=L-2e (ft)	Bearing Pressure (ksf)	Effective Strap Length, B'=L-2e (ft)
1	15	133+25.00, Rt – 133+58.50, Rt 304+99.53, Rt – 304+72.73 Rt	11	3.57	7.59	2.89	8.65
1	20	133+58.50, Rt – 134+78.00, Rt 305+25.00, Rt – 304+92.00, Rt	14	4.66	9.42	3.80	10.88
1	25	134+78.00, Rt – 135+27.00, Rt 306+25.53, Rt – 305+25.00, Rt	18	5.46	12.58	4.56	14.32
1	30	135+27.00, Rt – 135+92.00, Rt 137+20.00, Rt – 137+70.23, Rt	21	6.53	14.43	5.45	16.56
1	34	135+92.00, Rt – 137+20.00, Rt	24	7.22	16.71	6.09	19.08
2	15	146+00.00, Lt – 145+63.00, Lt	11	3.57	7.59	2.89	8.65
2	20	145+63.00, Lt – 145+39.00, Lt 145+33.00, Rt – 146+13.00, Rt 146+29.00, Rt – 146+50.00, Rt	14	4.66	9.42	3.80	10.88
2	25	145+39.00, Lt – 145+23.00, Lt 144+54.25, Rt – 145+33.00 Rt 146+13.00, Rt – 146+29.00, Rt	18	5.46	12.58	4.56	14.32
2	30	145+23.00, Lt – 145+08.00, Lt 141+50.00, Rt – 144+54.25, Rt	21	6.53	14.43	5.45	16.56
2	35	145+08.00, Lt – 141+44.00, Lt	25	7.33	17.60	6.22	20.01
2	39	141+44.00, Lt – 140+72.23, Lt 808+60.71, Lt – 809+59.98, Lt 140+72.23, Rt – 141+50.00, Rt	28	8.04	19.87	6.86	22.52

Note 1: Design data was provided by the structural engineer, refer to Appendix F.

Note 2: The walls have multiple turns and use different sets of stations with following equivalency:
Wall 1: Courtesy Pkwy Ext. Station 137+70.23, 75' Rt = Iris Dr. Station 306+25.53, 39.85' Rt
Wall 2: Courtesy Pkwy Ext. Station 140+72.23, 39.29' Lt = Dogwood Dr. Station 808+60.71, 39.96' Lt
Wall 2: Courtesy Pkwy Ext. Station 140+72.23, 60.00' Rt = Dogwood Dr. Station 809+59.98, 40.01' Lt

2.0 -- FOUNDATION RECOMMENDATIONS

2.1 – BEARING RESISTANCE AND SETTLEMENT

Wall #	Wall Location	Wall Height (ft)	Strap Length B (ft)	Nominal Bearing Resistance (ksf)	Factored Bearing Resistance (ksf)	Reference Boring*	Total Settlement (inches)
1	133+25.00,Rt – 133+58.50,Rt	15	11	9.83	3.93	W-1	1.5
1	133+58.50,Rt – 134+18.25,Rt	20	14	12.68	5.07	W-1	2.5
1	134+78.00,Rt – 135+27.00,Rt	25	18	15.78	6.31	W-1	3.5
1	135+27.00,Rt – 135+92.00,Rt	30	21	16.43	6.57	W-1	4.0
1	135+92.00,Rt – 137+20.00,Rt	34	24	19.10	7.64	W-2	5.5
1	137+20.00,Rt – 137+70.23,Rt	30	21	17.20	6.88	W-2	4.5
1	306+25.53,Rt – 305+25.00,Rt	25	18	15.90	6.36	B-2	3.0
1	305+25.00,Rt – 304+92.00,Rt	20	14	13.05	5.22	B-2	2.0
1	304+92.00,Rt – 304+72.73,Rt	15	11	11.80	4.72	B-1	1.5
2	146+00.00,Lt – 145+63.00,Lt	15	11	9.38	3.75	W-3	1.5
2	145+63.00,Lt – 145+39.00,Lt	20	14	13.30	5.32	W-3	2.5
2	145+39.00,Lt – 145+23.00,Lt	25	18	16.25	6.50	W-3	2.5
2	145+23.00,Lt – 145+08.00,Lt	30	21	17.40	6.96	W-3	3.0
2	145+08.00,Lt – 141+44.00,Lt	35	25	19.40	7.76	W-4	6.0
2	141+44.00,Lt – 140+72.23,Lt	39	28	21.00	8.40	B-7	6.0
2	808+60.71,Lt – 809+59.98,Lt	39	28	21.00	8.44	B-8	6.5
2	140+72.23,Rt – 141+50.00,Rt	39	28	21.00	8.41	B-8	6.0
2	141+50.00,Rt – 144+54.25,Rt	30	21	17.30	6.92	W-5	4.0
2	144+54.25,Rt – 145+33.00,Rt	25	18	13.93	5.57	W-6	4.5
2	145+33.00,Rt – 146+13.00,Rt	20	14	13.33	5.33	W-6	3.5
2	146+13.00,Rt – 146+29.00,Rt	25	18	14.13	5.65	W-6	3.0
2	146+29.00,Rt – 146+50.00,Rt	20	14	13.33	5.33	W-6	3.5

* Indicate the boring used for bearing and settlement analysis.

3.0 -- GENERAL NOTES

Elevations All elevations are based on an Elevation of 845.24 of a 5/8” rebar set in ground at station 137+42.47, 200.59’ left.

Waiting Period None required.

Vibration Monitoring Several properties are located within 75 feet of the construction limits of this project. Vibration monitoring will be required due to vibrations from construction activities which may cause some concern with property owners. All work shall be performed in accordance with Special Provision 154: Vibration Monitoring.

As Built Foundation Information The as built foundation information should be forwarded to the Geotechnical Engineering Bureau upon completion of the foundation system.

3.1 – SHALLOW FOUNDATION NOTES

Bearing Resistance and Settlement Bearing Resistance and Settlement have been computed in accordance with AASHTO LRFD 2014 and GDOT Research Project 14-26 – Implementation of AASHTO LRFD Specifications: Bearing Capacity and Settlement Calculations for Shallow Foundations of Bridges and Walls. A LRFD Shallow Foundations Spreadsheet developed by Georgia Institute of Technology and GDOT's Geotechnical Bureau was used to evaluate these parameters. The factored bearing resistance vs. footing width vs. settlement curves generated using this spreadsheet are attached to this report.

Bearing Resistance Factor of Footings at the Strength Limit State Bearing resistance factors recommended by Paikowsky et al. (2010) were used in lieu of those recommended by AASHTO LRFD 2014. This was done to overcome the wide applicability of the AASHTO values since they do not properly represent all grades of soil types, the loading conditions or the strength characteristics. The following table shows the recommended resistance factors for shallow foundations on natural deposits of granular soil (after Paikowsky et al., 2010):

<table>
<tr><th rowspan="3">Soil Friction Angle, ϕ'</th><th colspan="4">Loading Conditions</th></tr>
<tr><th rowspan="2">Vertical – Centric or Eccentric</th><th rowspan="2">Inclined - Centric</th><th colspan="2">Inclined - Eccentric</th></tr>
<tr><th>Positive</th><th>Negative</th></tr>
<tr><td>30° - 34°</td><td>0.40</td><td rowspan="3">0.40</td><td rowspan="2">0.35</td><td>0.65</td></tr>
<tr><td>35° - 36°</td><td>0.45</td><td rowspan="2">0.70</td></tr>
<tr><td>37° - 39°</td><td>0.50</td><td rowspan="2">0.40</td></tr>
<tr><td>40° - 44°</td><td>0.55</td><td>0.45</td><td rowspan="2">0.75</td></tr>
<tr><td>> 45°</td><td>0.65</td><td>0.50</td><td>0.45</td></tr>
</table>

The resistance factor used is automatically selected from this table in the LRFD Shallow Foundations Spreadsheet based on the soil's effective friction angle and the Vertical – Centric or Eccentric loading condition. It is then used to compute the Factored Bearing Resistance. Resistance factor of 0.4 was used to calculate nominal bearing resistance for both wall 1 and wall 2 for this project.

Footing Excavation

The footing excavations should be protected from standing water and surface run-off.

MSE Wall Backfill Material

Lightweight backfill material should not be used for this MSE Wall so that the factors of safety against sliding and overturning are not affected negatively.

Differential Settlement Analyses

Differential settlement analyses have been performed in accordance with AASHTO LRFD 2014 requirements C11.10.4.1-1 for MSE Walls.

The wall system meets the AASHTO LRFD requirements. The results of these analyses are attached to this report.

Global Stability Analyses

Global stability analyses have been performed in accordance with AASHTO LRFD 2014, 11.6.2.3 requirements. The software used for the analyses is Slope/W by GeoStudio Software. Factor of safety was evaluated using the Bishop and Morgenstern-Price methods, and circular and non-circular failure analyses were performed.

The wall system with originally provided strap lengths fails to meet the AASHTO LRFD requirements. We recommend improving foundation soil with geogrid reinforced grade aggregate in accordance with the attached detail and special provisions SP 457 and SP 809. With the recommended ground improvement, the wall system achieves a minimum acceptable factor of safety of 1.54 (Resistance Factor = 0.65).

Location (Station)	Strap Length (ft)	Required Resistance Factor	Required Minimum FoS	Calculated FoS
136+50 Rt (Wall 1)	24	0.65	1.54	1.553
141+50 Lt (Wall 2)	28	0.65	1.54	1.569
141+50 Rt (Wall 2)	21	0.65	1.54	1.588
146+00 Rt (Wall 2)	18	0.65	1.54	1.546

Note: Calculated FoS is the least values from all methods.

Settlement Monitoring

Monitor settlement beneath the wall with settlement plates.

Short-term monitoring should be performed for these walls and may be terminated if a quarter inch or less movement is observed over a period of 2 weeks.

Details of the planned monitoring program should be submitted to GDOT Geotechnical Bureau prior to implementation. Settlement monitoring data should be provided to the Geotechnical Bureau on a bi-weekly basis during construction. Settlement monitoring points should be at every 100 linear feet of wall.

5.0 – QA / QC

Prepared By: Jay Shah, Staff Engineer 

Approved By: Yong C. Shao, Ph.D. PE
(Georgia Registration 026340) 

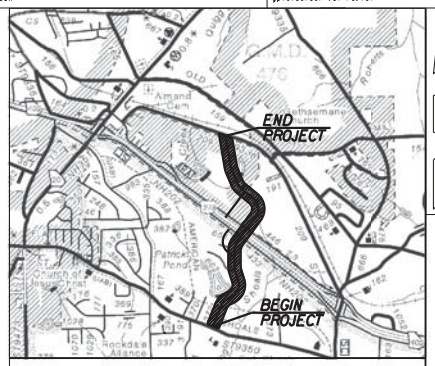
8/6/2019 bmorden | GPLOT-V8 gplotborder-V81-PO.tbl | 0006934_01-0001.dgn GAMCOV | GDOT | P. I. No. 0006934

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

PLAN AND PROFILE OF PROPOSED
COURTESY PKWY.EXT.FROM FLAT SHOALS RD TO OLD COVINGTON HWY.

FEDERAL AID PROJECT
CSSTP-0006-00(934)
ROCKDALE COUNTY

FEDERAL ROUTE • N/A
STATE ROUTE • N/A
P.I. NO. 0006934



LOCATION SKETCH

DESIGN DATA:	COURTESY PKWY.EXT.
TRAFFIC A.A.D.T.:	15,050 (2024)
TRAFFIC A.A.D.T.:	18,800 (2044)
TRAFFIC D.H.V.:	1,755
DIRECTIONAL DIST:	52%
% TRUCKS:	6.5%
24 HR.TRUCKS %:	3.0%
SPEED DESIGN:	35 MPH

LOCATION & DESIGN APPROVAL DATE:

FUNCTIONAL CLASS:
URBAN MINOR COLLECTOR

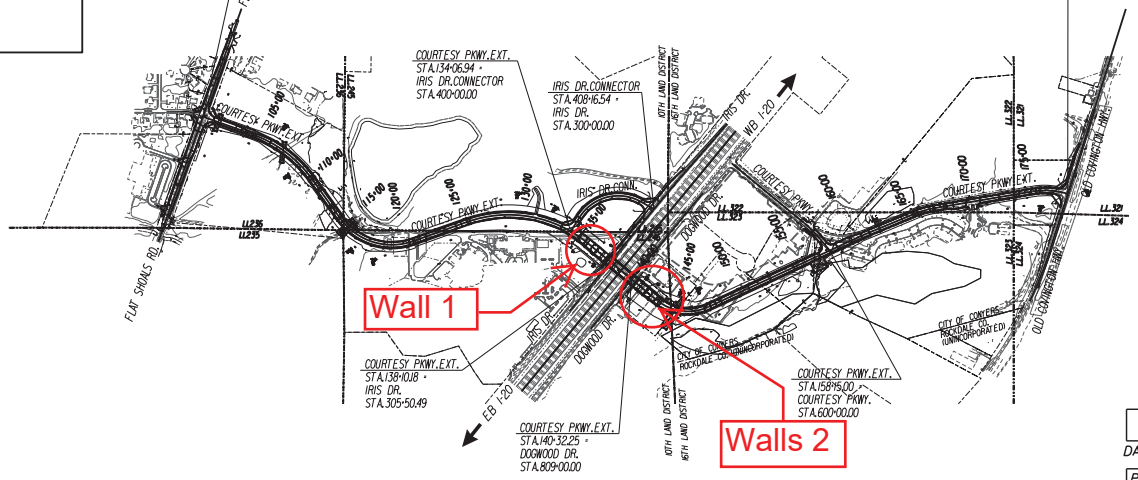
THIS PROJECT IS 100% IN ROCKDALE COUNTY AND IS 100% IN CONG.DIST.NO.4.

PROJECT DESIGNATION: EXEMPT

THIS PROJECT HAS BEEN PREPARED USING THE HORIZONTAL GEORGIA COORDINATE SYSTEM OF 1984 (NAD 1983)1994 WEST ZONE, AND THE NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988.

BEGIN PROJECT
0006934
COURTESY PKWY.EXT.
STA.100+00.00 •
FLAT SHOALS RD.
STA.209+24.35

END PROJECT
0006934
COURTESY PKWY.EXT.
STA.178+13.27 •
OLD COVINGTON HWY.
STA.700+00.00



PREPARED BY:

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RECOMMENDED FOR APPROVAL BY:

STATE PROGRAM DELIVERY ENGINEER

DATE CHIEF ENGINEER

NOTE :
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LENGTH OF PROJECT	COUNTY No. 247 Project No. 0006934 MILES
NET LENGTH OF ROADWAY	1.4356
NET LENGTH OF BRIDGES	0.0644
NET LENGTH OF PROJECT	1.5000
NET LENGTH OF EXCEPTIONS	0.0000
GROSS LENGTH OF PROJECT	1.5000

SCALE IN FEET
0 500 1000 2000

PLANS COMPLETED	- -
REVISIONS	

DRAWING No. 01-0001

APPENDICES

A. **Special provisions and details**
    a. **SP 154 – Vibration monitoring**
    b. **SP 457 – Geogrid reinforcement**
    c. **SP 809 – Geogrid materials**
    d. **Ground improvement detail**
B. **Boring locations and logs**
C. **Drilling calibration report**
D. **Soil laboratory tests**
E. **Seismic site class determination**
F. **Wall foundation design data**
G. **Bearing resistance calculations**
H. **Limiting differential settlement check**
I. **Global stability analysis graphical outputs**

Appendix A - Special Provisions

Revised 07/23/2014

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

SPECIAL PROVISION

PROJECT: Courtesy Pkwy Extension
From Flat Shoals Rd to Old Covington Hwy
PI No. 0006934, Rockdale County

Section 154 — Construction Vibration Monitoring

Add the following:

154.1 General Description

This Work consists of performing preconstruction crack surveys, seismograph and other monitoring of construction vibrations, and post construction crack surveys of the buildings located on Parcels 6 & 7 adjacent to the proposed project construction on Courtesy Pkwy Extension, Rockdale County by procuring the services of a prequalified subcontractor specializing in this work.

154.1.01 Definitions

General Provisions 101 through 150.

154.1.02 Related References

A. Standard Specifications

General Provisions 101 through 150.

B. Referenced Documents

General Provisions 101 through 150.

154.1.03 Submittals

A. Prequalification of Subcontractor

Submit the following documentation for the Engineer's review and approval a minimum of thirty days prior to beginning construction activities on the project:

Evidence of the subcontractor's successful completion of at least five projects similar in concept and scope to the proposed crack survey and vibration monitoring. Include names, addresses and telephone numbers of the owners' representatives for verification.

Résumés of employees performing this work. Provide evidence showing each employee possesses experience and knowledge similar in concept and scope of this work for performing crack surveys and installing and reading seismographs. Provide evidence that the reports will be reviewed and signed by a Georgia Licensed Professional Engineer or Georgia Licensed Professional Geologist. The Department will be sole judge of determining if employees are qualified to perform the work on this project.

A detailed survey plan, monitoring plan, and sequence of work that describes all materials, methods and equipment to be used to complete the crack survey and vibration monitoring.

B. Construction Monitoring

Submit the following documentation during construction monitoring:

Preconstruction Crack Survey Report documenting existing conditions of buildings prior to construction activities in accordance with subsection 154.3.03.B.

Monthly Seismograph Data and Data Summary Report and Activity Log of all construction activities within 500 feet (152 meters) of the seismograph in accordance with subsection 154.3.03.A.1.

Reports of building conditions regarding cracks or any other damage potentially caused by construction activities as complaints are received in accordance with subsection 154.3.03.C.

C. Post Construction

Submit a Post Construction Crack Survey Report in accordance with subsection 154.3.03.D documenting post construction condition of cracks or damage identified in the pre-construction survey and cracks or any other damage potentially caused by construction activities.

154.2 Materials

General Provision 101 through 150.

154.3 Construction Requirements

154.3.01 Personnel

Ensure all employees performing this work have been approved by the Engineer in accordance with subsection 154.1.03.A.

154.3.02 Equipment

Seismograph

Use a seismograph(s) that is weather proof and capable of continuously recording particle velocity in three perpendicular components with a flat response of 2-250 HZ over a range of at least 0.01 to 5.0 inches per second (0.254 to 127 mm per second). Provide a seismograph(s) that employs an internal dynamic calibration during each recording sequence and that has been shake table tested within the previous 24 months verifying an accuracy of +/- 5% over the frequency range of 4 to 125 Hertz. Provide a recorder/ software system that is capable of digitally storing and reproducing vibration levels in tabular or histogram (bar graph) form at no greater than six minute intervals.

154.3.03 Construction

Obtain Engineer's written approval of the Prequalification documents submitted in accordance with Subsection 154.1.03.A prior to beginning this work.

Perform the preconstruction crack survey prior to starting construction activities on the project.

Install and begin seismograph monitoring prior to starting construction activities on the project.

Maintain seismograph and crack monitoring until excavation, shoring and backfilling, compaction of subgrade, base and pavement construction activities on the project are complete.

A. Seismograph Installation and Monitoring

Monitor vibrations at building(s) using seismograph(s) when construction activities including, but not limited to, excavation, shoring installation, backfilling, and compaction of subgrade, base and pavement are within 75 feet (23 meters) of the building(s), or otherwise have the potential to result in vibrations that may cause damage or complaints. Relocate seismograph(s) as needed. Protect the seismograph from weather and vandalism. Replace missing or damaged equipment at no cost to the Department. Document the following information at the time that the seismograph is installed:

Date and time of installation

Coordinates of installed instrument or Station and offset

Method of transducer attachment

Name and affiliation of the person installing the instrument

Monthly Seismograph Data and Data Summary Report and Activity Log:

Compile a Monthly Seismograph Data and Data Summary Report containing the data from the seismograph and a summarization of the data showing time and magnitude of the maximum vibration that has occurred each day.

Maintain an activity log of all construction activities within 500 feet (152 meters) of the seismograph

Include the following data in each log:

Location of construction activity

Type of construction activity

Types and number of construction equipment being used, including model, manufacture and weight.

Date and times construction equipment was used.

Submit Monthly Seismograph Data Summary Report and Activity Log to the Engineer on a monthly basis.

B. Preconstruction Crack Survey

Complete a preconstruction crack survey on the outside and inside of all buildings located on Parcels 6 & 7. Document building conditions by taking photographs and detailed notes citing location, length and width of cracks. Compile documentation into a Preconstruction Crack Survey Report and submit to the Engineer.

C. Building Monitoring

Monitor buildings during construction for any new cracks and or elongation or widening of existing cracks. Provide a report of building conditions to the Engineer regarding cracks or any other damage potentially caused by construction activities as complaints are received.

D. Post Construction Crack Survey

Complete a post construction crack survey on the outside and inside of all buildings located on Parcels 6 & 7. Document building conditions by taking photographs and detailed notes citing condition of cracks or damage identified in the pre-construction survey; also, location, length and width of cracks or any other damage potentially caused by construction activities.

154.4 Measurement

The Work under this Contract Item is not measured separately for payment.

154.5 Payment

This Contract Item completed and accepted will be paid for at the Lump Sum Price bid. Payment will be full compensation for furnishing and installing the seismograph(s) for monitoring and reporting vibration data recorded on the seismograph(s) and completing crack survey and documenting building conditions and providing copies of all data to the Engineer in accordance with this specification. Seismographs and all other measuring equipment and devices will remain property of the Contractor.

Payment will be made under:

Item No. 154	Construction Vibration Monitoring	Per Lump Sum

July 13, 2005

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

SPECIAL PROVISION

Courtesy Pkwy Extension From Flat Shoals Rd to Old Covington Hwy
PI No. 0006934, Rockdale County

SECTION 457 – GEOGRID REINFORCEMENT

Delete Section 457 as written and substitute the following:

457.1 Description

This Work consists of placing geogrid reinforcement under new embankments at the locations and to the elevations or depths indicated on the Plans or as directed by the Engineer.

457.2 Materials

Use geogrid materials that meet the requirements of Special Provision Section 809– Geogrid Materials.

457.3 Construction

Place the geogrid reinforcement in accordance with the following requirements:

1. Preparation For Placement:

    a. Clearing and Grubbing: Clear and grub the areas of the proposed reinforcement in accordance with the applicable portions of Section 201.

    b. Benching: Bench into existing embankments in accordance with the applicable portions of Section 208 and the Plans.

    c. Embankments: Construct embankments in accordance with the applicable sections of Section 208.

    d. Attach weights to any geogrids that are to be placed in inundated areas to allow for placement to the required elevations or depths.

2. Placement of Geogrids: Place geogrids in a manner and at the locations shown on the Plans. Place the grids with the machine direction perpendicular to the roadway unless specified

otherwise on the Plans. Place the geogrids level or sloping away from the existing embankment at an inclination that is no greater than 5°. Spread the geogrids out free of wrinkles, bends or undulation and hold the geogrids taut by wooden stakes or other mechanical means while the embankment material is being placed.

3. Fill Placement Over Geogrid: Place fill over the geogrid in accordance with the Plans and applicable portions of Section 208. Maintain at least 4 inches (102 mm) of soil between the grid and any rubber-tired construction equipment. Maintain at least 8 inches (203 mm) of soil between the grid and any track construction equipment.

4. Degree of Compaction: Compact embankment fills to at least 95 percent of the maximum laboratory dry density for the full depth of the embankment, unless otherwise specified. The Engineer may adjust compaction requirements for initial lifts of fill over unstable soils until a stable mat is formed. Determine the maximum laboratory dry density and in place density of the compacted fill in accordance with Sub-Section 208.3.05.B.2.

5. Joints or Splices: Place grids in continuous strips in the direction of main reinforcement. Do not use joints or splices in the machine direction unless the joint or splice can be shown by laboratory tests to carry 100% of the required ultimate tensile strength of the grid.

6. Damaged Material: Remove any geogrid material damaged in shipping, storage or placement from the project and replace it at no additional expense to the Department.

457.4 Measurement

Geogrid reinforcement is measured for payment in square yards (meters) of accepted geogrid materials in place for Type C. Measurement is to the nearest square yard (meters).

457.5 Payment

Geogrid reinforcement is paid for at the Contract Price per square yard (meters), for geogrid Types A, B and C, complete and in place. Payment is full compensation for furnishing materials, placing materials, and for all labor, equipment, tools and incidentals necessary to perform the Work.

Payment for work under Section 457 will be made under:

Item No. 457-1015. Geogrid Reinforcement, Type C……. Per Square Yard (Meters)

Revised June 14, 2012

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

SPECIAL PROVISION

Courtesy Pkwy Extension From Flat Shoals Rd to Old Covington Hwy
PI No. 0006934, Rockdale County

Section 809— GEOGRID MATERIALS

Delete Subsection 809.2.A.1 and add the following:

1. Geogrid for Reinforced Slopes

   Use geogrid materials for reinforced slope construction that consist of the following:

   - Either a biaxial or uniaxial grid of polymer tensile elements manufactured into a regular network with apertures of sufficient size to allow for soil interlock.
   - A commercially prepared material of high tenacity polyester, high density polyethylene (HDPE) or polypropylene that is formed by stretching, heat welding, chemical welding, knitting, weaving or combinations of these methods.

   a. Determine the long-term design strengths listed in Sub-Section 809.03 that are required for the Project using reduction factors noted herein to reduce the ultimate strength of the geogrid to account for creep, site damage and durability. Calculate the long-term design strength using the following formula:

$$T_{al} = \frac{T_{ULT}}{RF_D * RF_{ID} * RF_{CR}}$$

where T_{al} = Long-Term strength

T_{ULT} = Geogrid ultimate tensile strength
RF_{CR} = Creep Reduction Factor
RF_{ID} = Installation Damage Reduction Factor
RF_D = Durability Reduction Factor

   b. Determine T_{ULT} using wide strip tensile testing as noted in Sub-Section 809.04.

   c. Determine the reduction factors by the methods described in paragraphs 1 - 4 as follows:

      1. Creep: Provide evidence from the manufacturer that the geogrid has been tested in laboratory creep tests conducted for a minimum duration of 10,000 hours for a range of load levels, including loads that the geogrid will be subject to on this Project. Conduct these tests as specified in Sub-Section 809.04. Extrapolate the results to a minimum design life of 75 years. Determine the tension level at which the total strain of the geogrid will not exceed 10% within the design life of 75 years (designated Tw), and calculate the creep reduction factor as follows:

$$RF_{CR} = \frac{T_{ULT}}{\text{Creep limit Strength}}$$

In the absence of such test data, use the following creep reduction factors for the geogrid type used on the Project:

Geogrid Type	Creep Reduction Factor
Polyester	2.5
Polypropylene	5.0
Polyethylene	5.0

2. Installation Damage: Provide evidence from the manufacturer that the geogrid has been subjected to full scale construction damage tests using fill materials and construction procedures that are representative of those on the Project. Provide evidence the grid has been excavated and tested according to Sub-Section 809.04.

   Use a minimum value of RF_{ID} of 1.1, and if no damage installation testing has been conducted use a value for RF_{ID} of 3.0.

3. Product Durability: Provide evidence from the manufacturer that the geogrid has been subjected to a series of durability tests to examine the effects of chemical and biological exposure on the grid, as described in the FHWA NHI-00-043 MSE and RSS Design and Construction guidelines.

   Include the effect on short-term and long-term mechanical properties as well as change to the reinforcement microstructure, dimensional changes, changes in mass, oxidation, environmental stress cracking, hydrolysis, temperature, plasticization, and changes in surface micrology together with any variation in the infrared spectrum analysis in the durability studies. Investigate the synergetic effects of different environments, particularly temperature, and subject the geogrid to a working stress during the environmental test.

   Perform the environmental testing protocol outlined in FHWA RD-97-144, which include but are not limited to the following:

   a) Thermo-Oxidation Resistance - ENV ISO 13438: 1999

   b) UV Oxidation Resistance – ASTM D-4355

   c) Hydrolysis – GSI Test Method – GG7

   Test the geogrids that have been subjected to these conditions according to Sub-Section 809.04.

   In the absence of such test data, use the following durability reduction factors for the geogrid type that meet the requirements of Table 3-12 of FHWA GEC 11, used on the Project:

Geogrid Type	Durability Reduction Factor
Polypropylene	1.1
Polyethylene	1.1
Polyester with:	
- Installation environment pH between 4.99 and 8	1.15
- Installation environment pH between 3 and 4.98 or 8.01 and 9	1.3

4. Pullout Resistance: Provide evidence from the manufacturer that the geogrid has been subjected to full scale pullout tests using backfill materials representative of those on the Project, as described in the FHWA NHI-00-043 MSE and RSS Design and Construction guidelines.

Calculate pullout resistance for design based on a maximum elongation of the embedded geogrid of ¾-inch (19 mm) as measured at the leading edge of the compressive zone within the soil mass and not the ultimate pullout capacity. For geogrids where insufficient data exists to evaluate pullout resistance as a function of soil type, perform pullout tests on a specific basis until such time that the engineering behavior of the soil-reinforcement system is clearly defined.

Perform the pullout tests using vertical stress variations (σ_v') and geogrid element configurations simulating actual project conditions.

Perform the pullout tests in accordance with Section 809.04 on samples with a minimum embedded length of 2 feet (610 mm). Perform the tests on samples with a minimum width of 1 foot (305 mm), or a width equal to a 4-longitudinal grid element, whichever is greater. Conduct these tests at 70°F ± 4ºF (21ºC ± 2°C) at constant strain rates of 0.5mm per minute.

Evaluate the pullout resistance by the following relation:

$$P_r = F^* \alpha \sigma_v' L_e C$$

where

P_r = pullout capacity of tensile reinforcement

$L_c C$ = the total surface area per unit width of the reinforcement in the resistive zone behind the failure surface

L_c = the embedment or adherence length in the resisting zone behind the failure surface

C = the reinforcement effective unit perimeter

F^* = the pullout resistance (or friction-bearing-interaction) factor

α = a scale effect correction factor to account for a non linear stress reduction over the embedded length of highly extensible reinforcements, based on laboratory data

σ_v' = the effective vertical stress at the soil- reinforcement interfaces

Ensure that the pullout resistance, P_r, meets the following minimum strength requirement:

P_r = FPO **x** T_{al} with a displacement less than or equal to ¾-inch (19 mm), where:

FPO = Factor of safety against pullout, equal to 1.5

T_{al} = Long-term design load

Delete Subsection 809.2.C and add the following:

C. Acceptance

Test geogrid according to the following:

Test Property	Test Method
Reinforced Slopes	
Tensile Strength—Wide Width	ASTM D 4595
Tensile Strength—Single Rib Strand	ASTM D 6637
Tensile Creep Testing	ASTM D 5262
Geogrid Pullout	ASTM D 6706
Installation Damage Testing	ASTM D-5818
Interface Friction Coefficient	ASTM D-5321

MSE Wall Backfill Stabilizing Geogrid	
Melt Index	ASTM D 1238
Density	ASTM D 1505
Tensile Strength	ASTM D 638
Ultimate Elongation	ASTM D 638
Vicat Softening Point	ASTM D 1525
Brittleness	ASTM D 746

Supply a certification from the manufacturer showing the physical properties of the material used and conformance with the Specifications as directed by Sub-Section 106.05 of the Specifications. In addition, provide evidence from the manufacturer that the geogrid has been used successfully in installations with similar environmental and project conditions. Submit certifications and test results to the Engineer for review and approval at least 45 days prior to intended use. Do not begin placement of geogrids until the test results have been reviewed and approved by the Engineer.

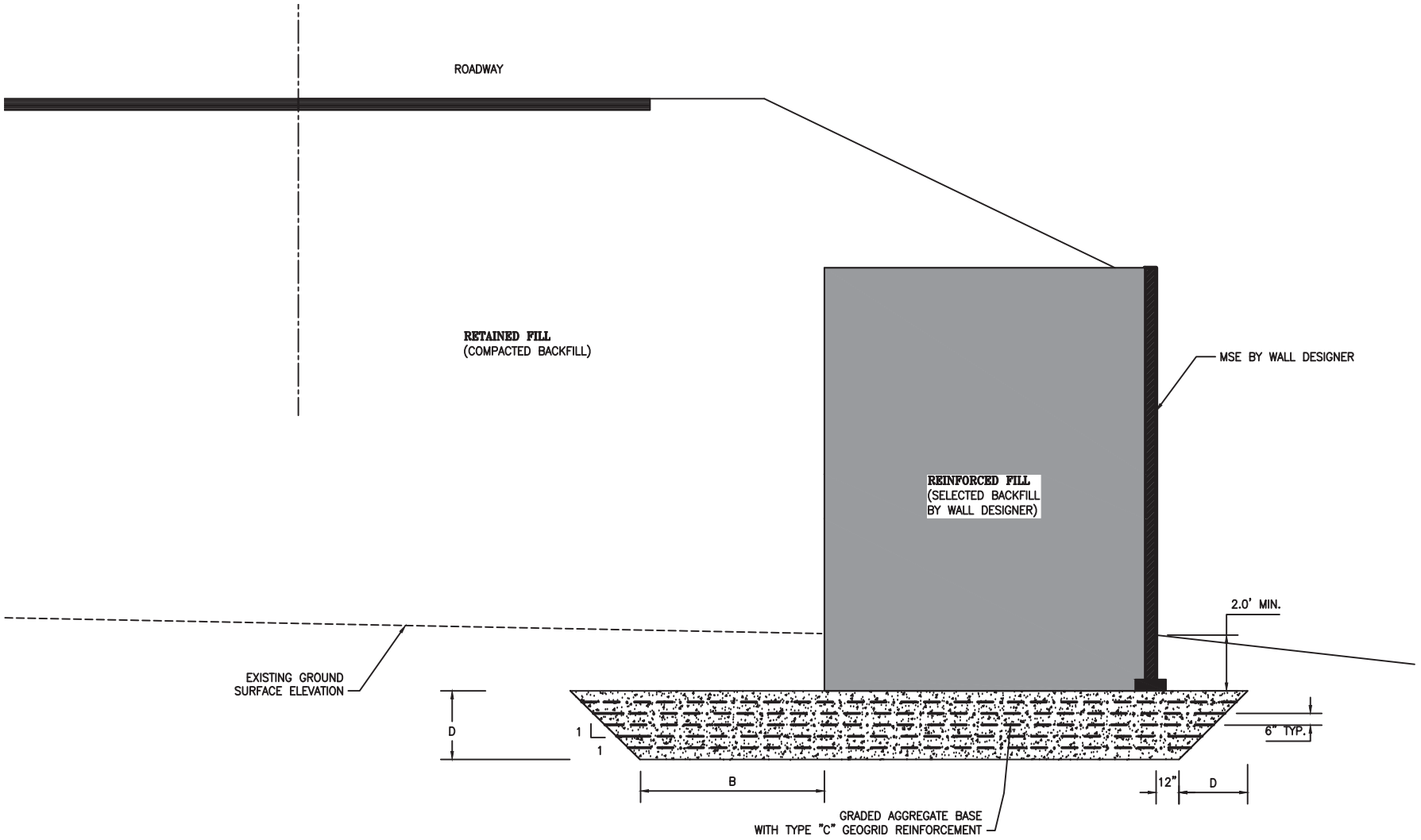
Add the following:

809.3 Design Properties

Ensure the geogrids meet the following minimum long-term design strengths (T_{al}) in the machine direction:

Geogrid Type	Minimum Long-Term Design Strength, T_{al}
Type C	3500 lb/ft

Provide the ultimate tensile strengths of the grids (T_{ULT}) to the Engineer in writing to verify the calculation in obtaining the long-term design loads (T_{al}).



NOTES:

UNDERCUT THE EXISTING FOUNDATION SOILS AS INDICATED, BACKFILL WITH GRADED AGGREGATE BASE AND PLACE LAYERS OF TYPE C GEOGRID 6" APART

THIS DETAIL APPLIES FOLLOWING STATIONS:

WALL NO.	STATION RANGE	LOCATION	D (FT)	B (FT)
WALL 1	133+25.00 – 137+70.23 (COURTESY PKWY EXT.)	RIGHT	5	10
WALL 1	306+25.53 – 304+72.73 (IRIS DRIVE)	RIGHT	5	10
WALL 2	140+72.23 – 145+00.00 (COURTESY PKWY EXT.)	RIGHT	3	3
WALL 2	145+00.00 – 146+50.00 (COURTESY PKWY EXT.)	RIGHT	4	7

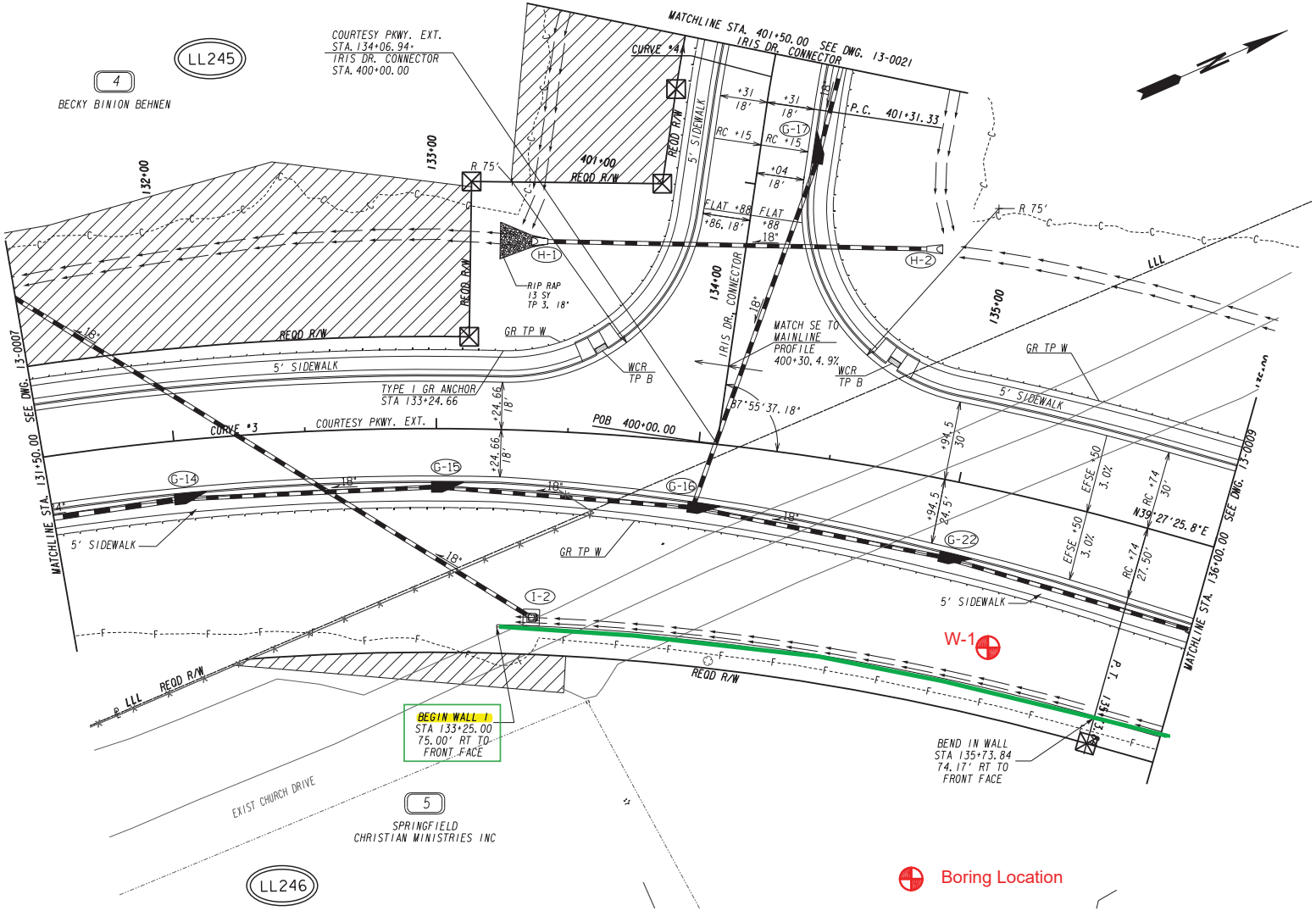
PROJECT: Courtesy Pkwy Extension – Walls # 1 & #2
Rockdale County, GA
P.I.No. 0006934

PROJECT NO: ROCK1701
DRAWN BY: YCS
DATE: 12/5/2021

TITLE: GROUND IMPROVEMENT DETAIL

ATLAS
TECHNICAL CONSULTANTS
2450 Commerce Avenue, STE 100, Duluth, GA 30096
(770)-2635945

Appendix B – Boring locations and logs



PROPERTY AND EXISTING R/W LINE
REQUIRED R/W LINE
CONSTRUCTION LIMITS
EASEMENT FOR CONSTR & MAINTENANCE OF SLOPES
EASEMENT FOR CONSTR OF SLOPES
EASEMENT FOR CONSTR OF DRIVES

BEGIN LIMIT OF ACCESS.....BLA
END LIMIT OF ACCESS.....ELA
LIMIT OF ACCESS
REQ'D R/W & LIMIT OF ACCESS
ORANGE BARRIER FENCE
ESA - ENV. SENSITIVE AREA (SEE ERIT TABLE)

ATLAS
2450 Commerce Avenue
Suite 100
Duluth, Georgia 30096
770.263.5945

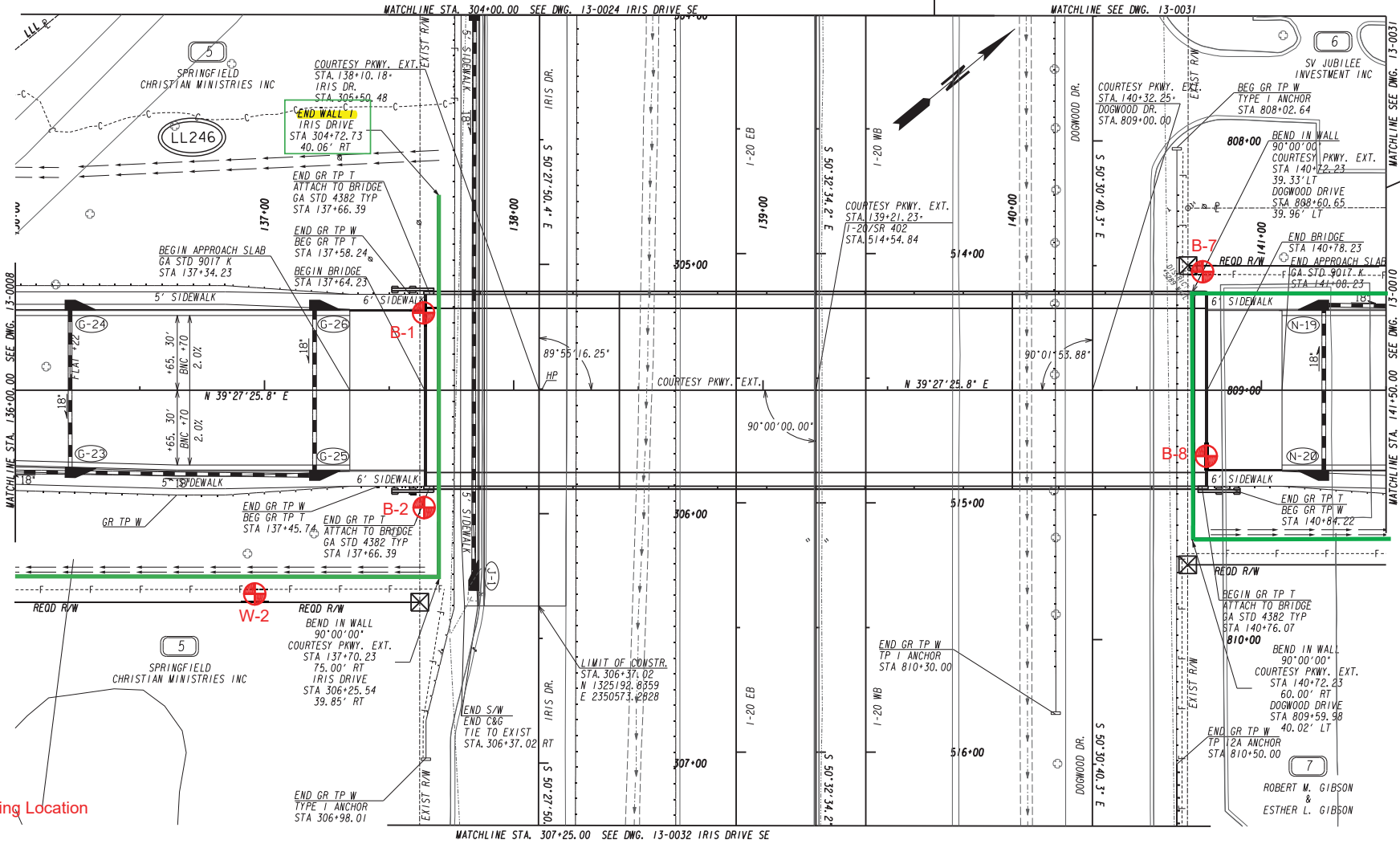
SCALE IN FEET
0 20 40 80

REVISION DATES

CONSTRUCTION PLAN
COURTESY PARKWAY EXTENSION
ROCKDALE COUNTY

CHECKED:	DATE:	DRAWING NO.
BACKCHECKED:	DATE:	13-0008
CORRECTED:	DATE:	
VERIFIED:	DATE:	

10/23/205 GPLN



PROPERTY AND EXISTING R/W LINE
REQUIRED R/W LINE
CONSTRUCTION LIMITS
EASEMENT FOR CONSTR & MAINTENANCE OF SLOPES
EASEMENT FOR CONSTR OF SLOPES
EASEMENT FOR CONSTR OF DRIVES

BEGIN LIMIT OF ACCESS.....BLA
END LIMIT OF ACCESS.....ELA
LIMIT OF ACCESS
REQ'D R/W & LIMIT OF ACCESS
ORANGE BARRIER FENCE
ESA - ENV. SENSITIVE AREA (SEE ERIT TABLE)

ATLAS
2450 Commerce Avenue
Suite 100
Duluth, Georgia 30096
770.263.5945

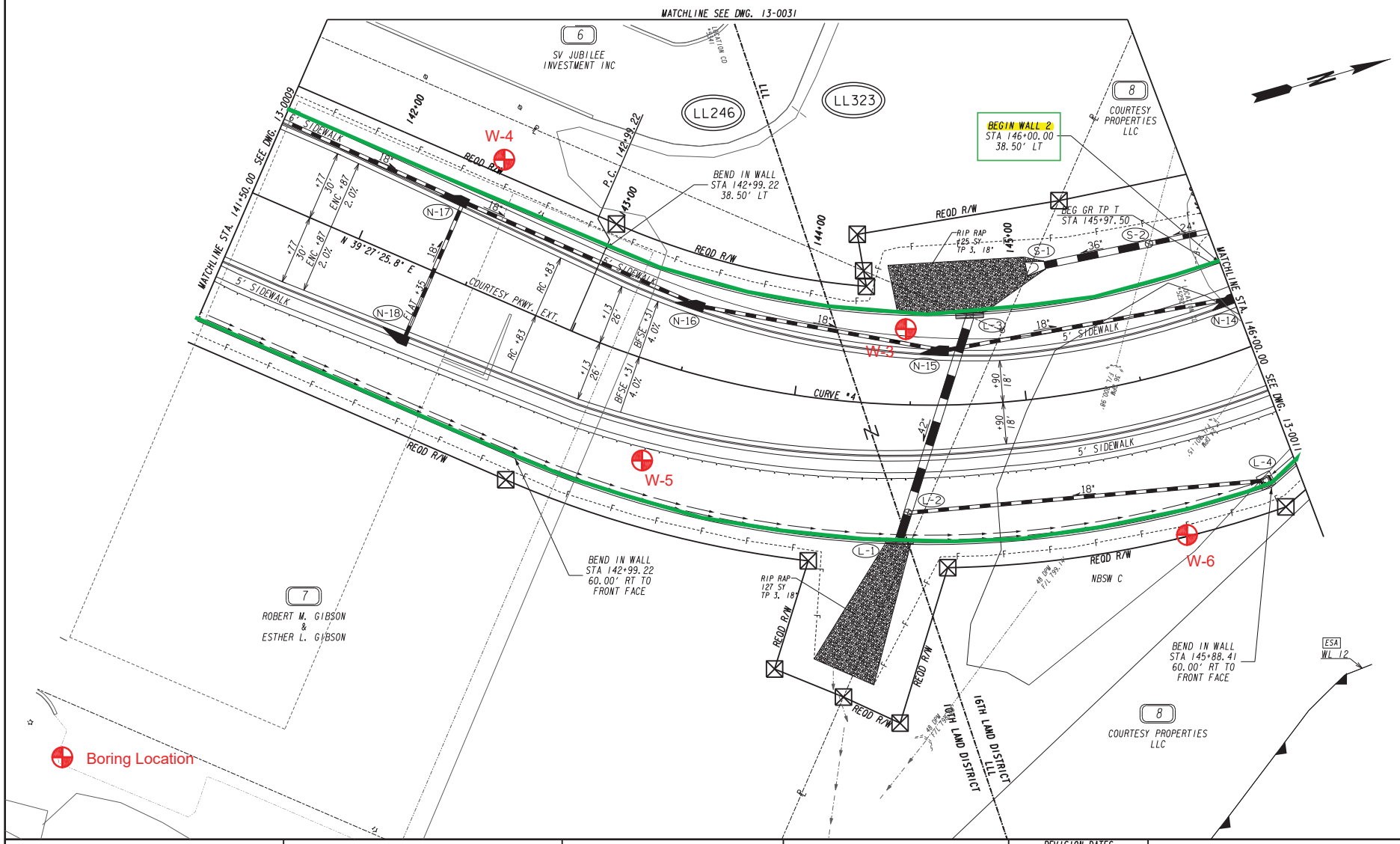
SCALE IN FEET
0 20 40 80

REVISION DATES

CONSTRUCTION PLAN
COURTESY PARKWAY EXTENSION
ROCKDALE COUNTY

CHECKED:		DATE:		DRAWING No.
BACKCHECKED:		DATE:		13-0009
CORRECTED:		DATE:		
VERIFIED:		DATE:		

10/23/205 GPLN



PROPERTY AND EXISTING R/W LINE
REQUIRED R/W LINE
CONSTRUCTION LIMITS
EASEMENT FOR CONSTR & MAINTENANCE OF SLOPES
EASEMENT FOR CONSTR OF SLOPES
EASEMENT FOR CONSTR OF DRIVES

BEGIN LIMIT OF ACCESS.....BLA
END LIMIT OF ACCESS.....ELA
LIMIT OF ACCESS
REQ'D R/W & LIMIT OF ACCESS
ORANGE BARRIER FENCE
ESA - ENV. SENSITIVE AREA (SEE ERIT TABLE)

ATLAS
2450 Commerce Avenue
Suite 100
Duluth, Georgia 30096
770.263.5945

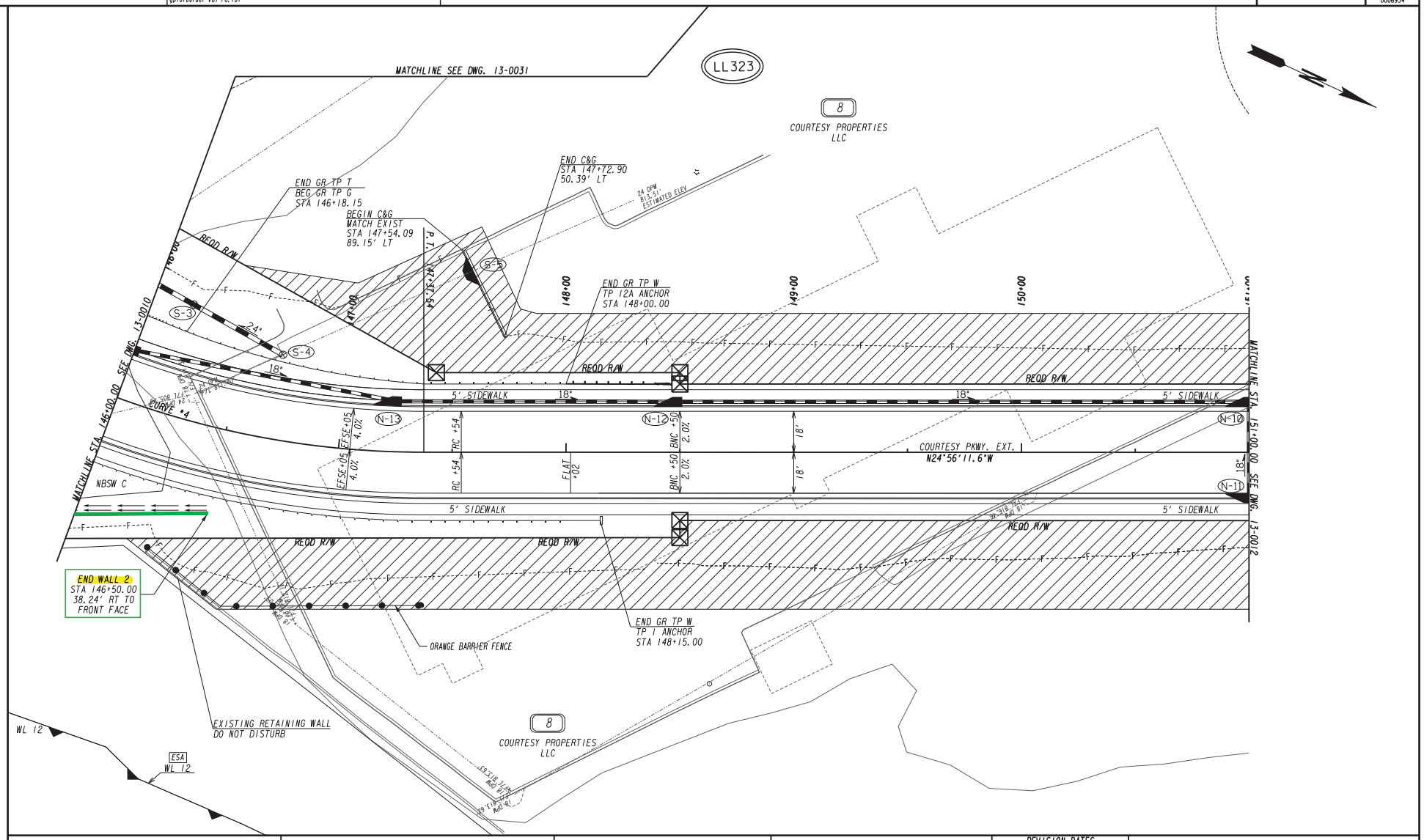
SCALE IN FEET
0 20 40 80

REVISION DATES

CONSTRUCTION PLAN
COURTESY PARKWAY EXTENSION
ROCKDALE COUNTY

CHECKED:		DATE:		DRAWING No.
BACKCHECKED:		DATE:		13-0010
CORRECTED:		DATE:		
VERIFIED:		DATE:		

10/23/205 GPLN



PROPERTY AND EXISTING R/W LINE
REQUIRED R/W LINE
CONSTRUCTION LIMITS
EASEMENT FOR CONSTR & MAINTENANCE OF SLOPES
EASEMENT FOR CONSTR OF SLOPES
EASEMENT FOR CONSTR OF DRIVES

BEGIN LIMIT OF ACCESS.....BLA
END LIMIT OF ACCESS.....ELA
LIMIT OF ACCESS
REQ'D R/W & LIMIT OF ACCESS
ORANGE BARRIER FENCE
ESA - ENV. SENSITIVE AREA (SEE ERIT TABLE)

ATLAS
2450 Commerce Avenue
Suite 100
Duluth, Georgia 30096
770.263.5945

SCALE IN FEET
0 20 40 80

REVISION DATES

CONSTRUCTION PLAN
COURTESY PARKWAY EXTENSION
ROCKDALE COUNTY

CHECKED:		DATE:		DRAWING No.
BACKCHECKED:		DATE:		13-0011
CORRECTED:		DATE:		
VERIFIED:		DATE:		

10/23/205 GPLN

ATLAS
TECHNICAL CONSULTANTS
2450 Commerce Avenue, STE 100, Duluth, GA 30096
(770)-2635945

W-1: Sta. 135+25, 65' Rt. (Wall No. 1)

Courtesy Parkway Extension
Over Iris Dr., I-20 and Dogwood Dr.
Rockdale County, Georgia

CSSTP-0006-00(934) / PI No. 0006934

Atlas Proj. No.: ROCK1701

DATE COMPLETED	: 7/11/2019	SURFACE ELE.	: 815'+/-
DRILL RIG	: CME 550 (SN 8971)	DEPTH OF BORING	: 48'
DRILLING METHOD	: HSA / Auto hammer	DEPTH TO WATER	: 30'
DRILLER	: Kilman Bros.	LOGGED BY	: JP
ENERGY EFFICIENCY: 84%		BOTTOM OF WALL	: 810'

Sample Condition: Remoulded; Undisturbed; Lost; Rock Core

Sampler Type: SS Split Spoon; ST Shelby Tube; PS Piston Sampler; DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 815	USCS	GRAPHIC	DESCRIPTION	Blow count	SPT-N60 Value	N60 Value Graph (0 50 100)	Sampler Type	Sample	Moist, %	Water Level
0	814	CL		Brown, SANDY LEAN CLAY, firm, slightly moist	2-2-2	6		SS			
2	812										
4	810				3-3-4	10		SS			
B.O.W.											
6	808	SM		Grey/brown, SILTY SAND, medium grained,medium dense, slightly moist	4-4-4	11		SS			
8	806				3-6-6	17		SS			
10	804										
12	802										
14	800				5-5-5	14		SS			
16	798										
18	796	SM		Grey, SILTY SAND,medium grained, medium dense, slightly moist	3-4-5	13		SS			
20	794										
22	792										
24	790				3-4-5	13		SS			
26	788										
28	786				4-4-4	11		SS			
30	784										
32	782										
34	780				6-7-8	21		SS			
36	778	SM		Grey/white, SILTY SAND,medium grained, dense							
38	776				8-10-16	36		SS			
40	774	SM		Grey/White,SILTY SAND, rock pieces, very dense,PWR							
42	772										
44	770				50/6"	50/6"		SS			
46	768										
48	766			Auger refused at depth of 48' BGS							
50	764										
52	762										
54	760										
56	758										
58	756										
60											

NOTE: SPT-N values have been corrected with 84% ER.

ATLAS
TECHNICAL CONSULTANTS
2450 Commerce Avenue, STE 100, Duluth, GA 30096
(770)-2635945

W-2: Sta. 137+00, 75' Rt (Wall No.1)

Courtesy Parkway Extension
Over Iris Dr., I-20 and Dogwood Dr.
Rockdale County, Georgia

CSSTP-0006-00(934) / PI No. 0006934

Atlas Proj. No.: ROCK1701

DATE COMPLETED	: 7/11/2019	SURFACE ELE.	: 815'+/-
DRILL RIG	: CME 550 (SN 8971)	DEPTH OF BORING	: 53.5'
DRILLING METHOD	: HSA / Auto hammer	DEPTH TO WATER	: 38.5'
DRILLER	: Kilman Bros.	LOGGED BY	: JP
ENERGY EFFICIENCY: 84%		BOTTOM OF WALL	: 812.5'

Sample Condition: Remoulded; Undisturbed; Lost; Rock Core

Sampler Type: SS Split Spoon; ST Shelby Tube; PS Piston Sampler; DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 815	USCS	GRAPHIC	DESCRIPTION	Blow count	SPT-N60 Value	N60 Value Graph (0 50 100)	Sampler Type	Sample	Moist, %	Water Level
0	814	CL		Brown, SANDY LEAN CLAY, firm ,slightly moist	2-2-3	7		SS			
B.O.W. 2	812										
4	810				3-4-5	13		SS			
6	808	SM		Grey/brown, SILTY SAND, medium dense, slightly moist	4-4-4	11		SS			
8	806				6-7-8	21		SS			
10	804										
12	802										
14	800				4-5-5	14		SS			
16	798										
18	796	SM		Grey/brown, SILTY SAND, medium dense, moist	3-3-3	8		SS			
20	794										
22	792										
24	790				3-3-4	10		SS			
26	788										
28	786				3-3-3	8		SS			
30	784										
32	782										
34	780				4-6-7	18		SS			
36	778										
38	776				4-6-7	18		SS			▼
40	774	SM		Grey/white, SILTY SAND, medium grained,medium dense							
42	772										
44	770				6-9-9	25		SS			
46	768	SM		Grey/White,SILTY SAND, rock pieces,very dense, PWR							
48	766				18-50/1"	50/1"		SS			
50	764										
52	762										
54	760										
56	758										
58	756										
60				Auger refused at depth of 53.5' BGS							

NOTE: SPT-N values have been corrected with 84% ER.

12-11-2021 Q:\Rockdale County\Rock1701 Courtesy Parkway\Borings\W-2.bor

ATLAS
TECHNICAL CONSULTANTS
2450 Commerce Avenue, STE 100, Duluth, GA 30096
(770)-2635945

W-3: Sta. 144+50, 30' Lt (Wall No. 2)

Courtesy Parkway Extension
Over Iris Dr., I-20 and Dogwood Dr.
Rockdale County, Georgia

CSSTP-0006-00(934) / PI No. 0006934

Atlas Proj. No.: ROCK1701

DATE COMPLETED	: 7/15/2019	SURFACE ELE.	: 803.57'
DRILL RIG	: CME 550 (SN 8971)	DEPTH OF BORING	: 43'
DRILLING METHOD	: HSA / Auto hammer	DEPTH TO WATER	: 29'
DRILLER	: Kilman Bros.	LOGGED BY	: JP
ENERGY EFFICIENCY: 84%		BOTTOM OF WALL	: 798'+/-

Sample Condition: Remoulded; Undisturbed; Lost; Rock Core

Sampler Type: SS Split Spoon; ST Shelby Tube; PS Piston Sampler; DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 803.57	USCS	GRAPHIC	DESCRIPTION	Blow count	SPT-N60 Value	N60 Value Graph (0, 50, 100)	Sampler Type	Sample	Moist, %	Water Level
0–2	802	CL		Brown, SANDY LEAN CLAY, firm, slightly moist	3-3-4	10		SS			
4	800				3-3-3	8		SS			
B.O.W. 6	798	ML		Grey SANDY SILT, firm to stiff, slightly moist	4-5-5	14		SS			
8	796				5-5-5	14		SS			
10	794	SM		Grey/brown, SILTY SAND, medium dense, slightly moist							
12–14	792–790				5-7-7	20		SS			
16	788	SM		Grey, SILTY SAND,medium grained, loose to medium dense, slightly moist	3-3-3	8		SS			
18–20	786–784										
22	782				4-4-4	11		SS			
24–26	780–778										
28	776				2-2-2	6		SS			▼
30	774	SM		Grey/white, SILTY SAND, medium grained,dense							
32–34	772–770				11-13-15	39		SS			
36	768	SM		Grey/White,SILTY SAND, rock pieces, Very dense,PWR							
38–40	766–764				50/3"	50/3"		SS			
42–60	762–744			Auger refused at depth of 43ft BGS							

NOTE: SPT-N values have been corrected with 84% ER.

12-11-2021 Q:\Rockdale County\Rock1701 Courtesy Parkway\Borings\W-3.bor

ATLAS
TECHNICAL CONSULTANTS
2450 Commerce Avenue, STE 100, Duluth, GA 30096
(770)-2635945

W-4: Sta. 142+50, 50' Lt (Wall No. 2)

Courtesy Parkway Extension
Over Iris Dr., I-20 and Dogwood Dr.
Rockdale County, Georgia

CSSTP-0006-00(934) / PI No. 0006934

Atlas Proj. No.: ROCK1701

DATE COMPLETED	: 7/15/2019	SURFACE ELE.	: 814'
DRILL RIG	: CME 550 (SN 8971)	DEPTH OF BORING	: 53'
DRILLING METHOD	: HSA / Auto hammer	DEPTH TO WATER	: 26'
DRILLER	: Kilman Bros.	LOGGED BY	: JP
ENERGY EFFICIENCY: 84%		BOTTOM OF WALL	: 812'+/-

Sample Condition: Remoulded; Undisturbed; Lost; Rock Core

Sampler Type: SS Split Spoon; ST Shelby Tube; PS Piston Sampler; DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 814	USCS	GRAPHIC	DESCRIPTION	Blow count	SPT-N60 Value	N60 Value Graph (0 50 100)	Sampler Type	Sample	Moist, %	Water Level
0	814										
B.O.W. 2	812	ML		Brown, SANDY SILT, very stiff, slightly moist	3-6-6	17		SS			
4	810				5-7-7	18		SS			
6	808	CL		Grey/brown, SILTY CLAY, stiff, slightly moist	3-4-4	11		SS			
8	806	SM		Grey, SILTY SAND, loose, slightly moist	3-3-3	8		SS			
10	804										
12	802				2-2-3	7		SS			
14	800										
16	798				3-3-3	8		SS			
18	796										
20	794				4-2-3	7		SS			
22	792										
24	790				3-3-4	10		SS			
26	788										
28	786				6-8-9	24		SS			
30	784	SM		Grey/brown, SILTY COARSE SAND,medium dense							
32	782				4-5-7	17		SS			
34	780										
36	778				3-5-5	14		SS			
38	776										
40	774				5-5-7	17		SS			
42	772										
44	770										
46	768										
48	766										
50	764										
52	762										
54	760			Auger refused at depth of 53ft BGS							
56	758										
58	756										
60											

NOTE: SPT-N values have been corrected with 84% ER.

ATLAS
TECHNICAL CONSULTANTS
2450 Commerce Avenue, STE 100, Duluth, GA 30096
(770)-2635945

W-5: Sta. 143+50, 55' Rt (Wall No. 2)

Courtesy Parkway Extension
Over Iris Dr., I-20 and Dogwood Dr.
Rockdale County, Georgia

CSSTP-0006-00(934) / PI No. 0006934

Atlas Proj. No.: ROCK1701

DATE COMPLETED	: 7/16/2019	SURFACE ELE.	: 803'+/-
DRILL RIG	: CME 550 (SN 8971)	DEPTH OF BORING	: 49'
DRILLING METHOD	: HSA / Auto hammer	DEPTH TO WATER	: 26'
DRILLER	: Kilman Bros.	LOGGED BY	: JP
ENERGY EFFICIENCY: 84%		BOTTOM OF WALL	: 800'+/-

Sample Condition: Remoulded; Undisturbed; Lost; Rock Core

Sampler Type: SS Split Spoon; ST Shelby Tube; PS Piston Sampler; DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 803	USCS	GRAPHIC	DESCRIPTION	Blow count	SPT-N60 Value	N60 Value Graph (0 50 100)	Sampler Type	Sample	Moist, %	Water Level
0	802	CL		Brown, SANDY LEAN CLAY, stiff, slightly moist	3-3-4	10		SS			
2 B.O.W.	800										
4	798				3-3-4	10		SS			
6	796				4-3-5	11		SS			
8	794	SM		Grey/brown, SILTY SAND, medium dense, slightly moist	3-4-5	13		SS			
10	792										
12	790										
14	788				3-5-3	11		SS			
16	786										
18	784				3-3-5	11		SS			
20	782	SM		Grey, SILTY SAND, medium grained,loose to medium dense, slightly moist							
22	780										
24	778				3-3-6	13		SS			
26	776										▼
28	774				4-3-3	8		SS			
30	772										
32	770										
34	768				12-10-9	27		SS			
36	766	SM		Grey/white, SILTY SAND, medium grained,very dense							
38	764										
40	762				12-23-22	63		SS			
42	760										
44	758	SM		Grey/white,SILTY SAND, very dense,PWR							
46	756				20-26-50/5"	50/5"		SS			
48	754										
50	752			Auger refused at depth of 49ft BGS							
52	750										
54	748										
56	746										
58	744										
60											

NOTE: SPT-N values have been corrected with 84% ER.

ATLAS
TECHNICAL CONSULTANTS
2450 Commerce Avenue, STE 100, Duluth, GA 30096
(770)-2635945

W-6: Sta. 145+50, 70' Rt (Wall No. 2)

Courtesy Parkway Extension
Over Iris Dr., I-20 and Dogwood Dr.
Rockdale County, Georgia

CSSTP-0006-00(934) / PI No. 0006934

Atlas Proj. No.: ROCK1701

DATE COMPLETED	: 7/16/2019	SURFACE ELE.	: 800'+/-
DRILL RIG	: CME 550 (SN 8971)	DEPTH OF BORING	: 48'
DRILLING METHOD	: HSA / Auto hammer	DEPTH TO WATER	: 14'
DRILLER	: Kilman Bros.	LOGGED BY	: JP
ENERGY EFFICIENCY: 84%		BOTTOM OF WALL	: 805'+/-

B.O.W. 805'

Sample Condition: Remoulded; Undisturbed; Lost; Rock Core

Sampler Type: SS Split Spoon; ST Shelby Tube; PS Piston Sampler; DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 800	USCS	GRAPHIC	DESCRIPTION	Blow count	SPT-N60 Value	N60 Value Graph (0, 50, 100)	Sampler Type	Sample	Moist, %	Water Level
0	800	CL		Brown, SANDY LEAN CLAY, firm, slightly moist	2-2-2	6		SS			
2	798										
4	796				3-1-2	4		SS			
6	794	ML		Grey/brown, SANDY SILT, soft to firm, moist	2-2-2	8		SS			
8	792										
10	790				1-3-2	7		SS			
12	788	SM		Grey, SILTY SAND, medium grained,loose to medium dense, moist							
14	786				1-1-1	3		SS			
16	784										
18	782										
20	780				2-1-2	4		SS			
22	778										
24	776				3-5-4	13		SS			
26	774										
28	772										
30	770				5-4-7	15		SS			
32	768										
34	766				8-10-8	25		SS			
36	764	SM		Grey/white, SILTY SAND, medium grained,dense							
38	762										
40	760				12-12-15	38		SS			
42	758	SM		Grey/white,SILTY SAND, very dense,PWR							
44	756				50/5"	50/5"		SS			
46	754										
48	752			Auger refused at depth of 48ft BGS							
50	750										
52	748										
54	746										
56	744										
58	742										
60											

NOTE: SPT-N values have been corrected with 84% ER.

12-11-2021 Q:\Rockdale County\Rock1701 Courtesy Parkway\Borings\W-6.bor

ATLAS
TECHNICAL CONSULTANTS
2450 Commerce Avenue, STE 100, Duluth, GA 30096
(770)-2635945

B-1: Sta. 137+65, 32' Lt (Bent 1 Left)

Courtesy Parkway Extension
Over Iris Dr., I-20 and Dogwood Dr.
Rockdale County. Georgia

CSSTP-0006-00(934) / PI 0006934

Atlas Proj. No.: ROCK1701

DATE COMPLETED	: 7/11/2019	SURFACE ELE.	: 833.3'
DRILL RIG	: CME 550 (SN 8971)	DEPTH OF BORING	: 47'
DRILLING METHOD	: HSA / Auto Hammer	DEPTH TO WATER	: 38.5'
DRILLER	: Kilman Bros.	LOGGED BY	: JP
ENERGY EFFICIENCY: 84%		BTM OF CAP ELE.	: 850'+/-

Sample Condition: Remoulded; Undisturbed; Lost; Rock Core

Sampler Type: SS Split Spoon; ST Shelby Tube; PS Piston Sampler; DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 833.3	USCS	GRAPHIC	DESCRIPTION	Blow count	SPT-N60 Value	N60 Value Graph (0 50 100)	Sampler Type	Sample	Moist, %	Water Level
0											
B.O.W. 2	832	CL		Brown, SANDY LEAN CLAY, stiff to very stiff, slightly moist,	4-5-5	14		SS			
4	830				3-5-6	15		SS			
6	828				5-5-7	17		SS			
8	826	SM		Grey/brown, SILTY SAND, medium dense, slightly moist,	4-5-7	17		SS			
10	824										
12	822										
14	820				3-7-8	21		SS			
16	818										
18	816										
20	814				5-7-8	21		SS			
22	812	SM		Grey/orange, SILTY SAND, medium dense, slightly moist,							
24	810				4-4-4	11		SS			
26	808										
28	806										
30	804				3-5-5	14		SS			
32	802										
34	800				3-5-6	15		SS			
36	798	SM		Dark grey, SILTY SAND, loose,very moist							
38	796										▼
40	794				3-3-3	8		SS			
42	792	SM		Grey/white, SILTY COARSE SAND, very dense.							
44	790				14-16-22	53		SS			
46	788										
48	786										
50	784										
52	782										
54	780										

Auger refused at depth of 47' BGS

NOTE: SPT-N values have been corrected with 84% ER

ATLAS
TECHNICAL CONSULTANTS
2450 Commerce Avenue, STE 100, Duluth, GA 30096
(770)-2635945

B-2: Sta. 137+65, 45' Rt (Bent 1 Right)

Courtesy Parkway Extension
Over Iris Dr., I-20 and Dogwood Dr.
Rockdale County. Georgia

CSSTP-0006-00(934) / PI 0006934

Atlas Proj. No.: ROCK1701

DATE COMPLETED	: 7/11/2019	SURFACE ELE.	: 827.3'
DRILL RIG	: CME 550 (SN 8971)	DEPTH OF BORING	: 48'
DRILLING METHOD	: HSA / Auto Hammer	DEPTH TO WATER	: 35'
DRILLER	: Kilman Bros.	LOGGED BY	: JP
ENERGY EFFICIENCY: 84%		BTM OF CAP ELE.	: 850'+/-

Sample Condition: Remoulded; Undisturbed; Lost; Rock Core

Sampler Type: SS Split Spoon; ST Shelby Tube; PS Piston Sampler; DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 827.3	USCS	GRAPHIC	DESCRIPTION	Blow count	SPT-N60 Value	N60 Value Graph (0 50 100)	Sampler Type	Sample	Moist, %	Water Level
0	826	CL		Brown, SANDY LEAN CLAY, stiff, slightly moist	2-3-5	11		SS			
B.O.W. 2	824										
4	822				3-4-5	13		SS			
6	820				4-5-6	15		SS			
8	818	SM		Grey/white, SILTY COARSE SAND, medium dense, slightly moist	6-6-9	21		SS			
10	816										
12	814				8-8-10	25		SS			
14	812	SM		Grey/orange, SILTY COARSE SAND, medium dense, moist							
16	810										
18	808				4-6-7	18		SS			
20	806										
22	804				7-8-10	25		SS			
24	802										
26	800				3-4-6	14		SS			
28	798										
30	796				2-3-4	10		SS			
32	794										
34	792				5-6-8	20		SS			
36	790										
38	788										
40	786	SM		Grey/brown, SILTY COARSE SAND, very dense, PWR	50/4"	50/4"		SS			
42	784										
44	782										
46	780										
48	778			Auger refused at depth of 48' BGS							
50	776										
52	774										
54											

NOTE: SPT-N values have been corrected with 84% ER.

ATLAS
TECHNICAL CONSULTANTS
2450 Commerce Avenue, STE 100, Duluth, GA 30096
(770)-2635945

B-7: Sta. 140+78, 45' Lt (Bent 4 Left)

Courtesy Parkway Extension
Over Iris Dr., I-20 and Dogwood Dr.
Rockdale County. Georgia

CSSTP-0006-00(934) / PI 0006934

Atlas Proj. No.: ROCK1701

DATE COMPLETED	: 7/16/2019	SURFACE ELE.	: 817.2'
DRILL RIG	: CME 550 (SN 8971)	DEPTH OF BORING	: 40'
DRILLING METHOD	: HSA / Auto hammer	DEPTH TO WATER	: 24'
DRILLER	: Kilman Bros.	LOGGED BY	: JP
ENERGY EFFICIENCY: 84%		BTM OF CAP ELE.	: 841'+/-

Sample Condition: Remoulded; Undisturbed; Lost; Rock Core

Sampler Type: SS Split Spoon; ST Shelby Tube; PS Piston Sampler; DC Diamond Core Bar.

Depth in Feet	Surf. Elev. 817.2	USCS	GRAPHIC	DESCRIPTION	Blow count	SPT-N60 Value	N60 Value Graph (0 50 100)	Sampler Type	Sample	Moist, %	Water Level
0	816	CL		Orange, SANDY LEAN CLAY, stiff, slightly moist	3-5-6	15		SS			
2	814	SM		Grey/brown, SILTY SAND, medium dense, slightly moist	4-4-4	11		SS			
4	812										
B.O.W. 6	810				5-5-5	14		SS			
8	808				3-5-5	14		SS			
10	806										
12	804				4-4-4	11		SS			
14	802										
16	800										
18	798				3-3-4	10		SS			
20	796	SM		Dark grey, SILTY COARSE SAND, medium dense, slightly moist							
22	794										
24	792				6-6-7	18		SS			▼
26	790	SM		Grey/brown/white, SILTY COARSE SAND, very dense, PWR							
28	788				50/1"	50/1"		SS			
30	786										
32	784										
34	782				50/2"	50/2"		SS			
36	780										
38	778										
40	776				50/2"	50/2"		SS			
42	774			Auger refused at depth of 40' BGS							
44	772										
46	770										
48	768										
50	766										
52	764										
54											

NOTE: SPT-N values have been corrected with 84% ER

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ATLAS
TECHNICAL CONSULTANTS
2450 Commerce Avenue, STE 100, Duluth, GA 30096
(770)-2635945

B-8: Sta. 140+78, 35' Rt (Bent 4 Right)

Courtesy Parkway Extension
Over Iris Dr., I-20 and Dogwood Dr.
Rockdale County. Georgia

CSSTP-0006-00(934) / PI 0006934

Atlas Proj. No.: ROCK1701

DATE COMPLETED	: 7/16/2019	SURFACE ELE.	: 814.4'
DRILL RIG	: CME 550 (SN 8971)	DEPTH OF BORING	: 33'
DRILLING METHOD	: HSA / Auto hammer	DEPTH TO WATER	: 24'
DRILLER	: Kilman Bros.	LOGGED BY	: JP
ENERGY EFFICIENCY: 84%		BTM OF CAP ELE.	: 841'+/-

Sample Condition: Remoulded; Undisturbed; Lost; Rock Core
Sampler Type: SS Split Spoon; ST Shelby Tube; PS Piston Sampler; DC Diamond Core Bar.

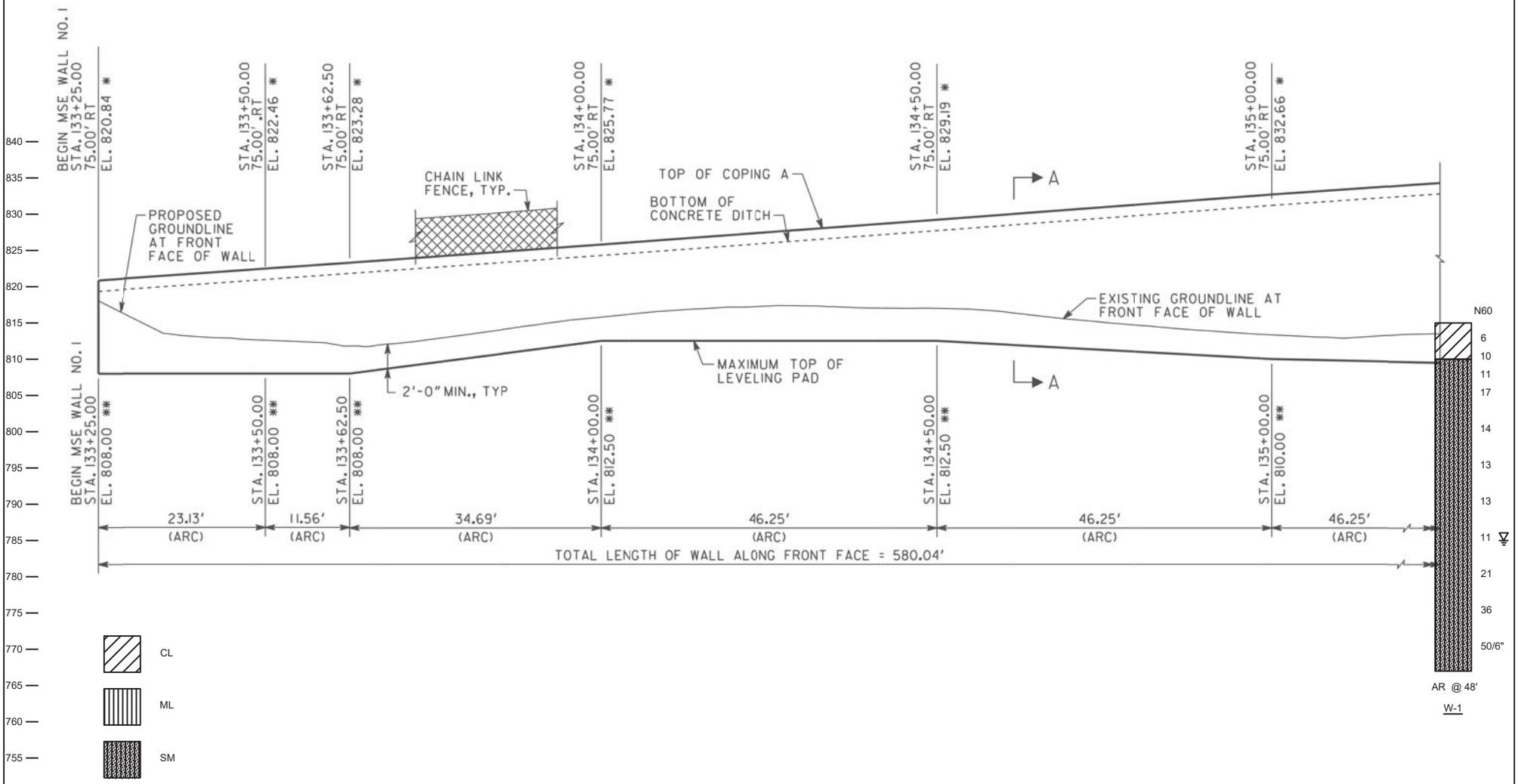
Depth in Feet	Surf. Elev. 814.4	USCS	DESCRIPTION	Blow count	SPT-N60 Value	Sampler Type	Sample
0	814	CL	Brown, SANDY LEAN CLAY, firm, slightly moist	3-3-3	8	SS	
2	812						
B.O.W. 4	810	SM	Grey, SILTY SAND, loose to medium dense, slightly moist	6-4-4	11	SS	
6	808			4-5-7	17	SS	
8	806			4-4-4	11	SS	
10	804						
12	802						
14	800			6-5-3	11	SS	
16	798						
18	796			2-3-3	8	SS	
20	794						
22	792						
24	790			5-6-6	17	SS	
26	788	SM	Grey/brown, SILTY COARSE SAND, very dense, moist, PWR.				
28	786			50/5"	50/5"	SS	
30	784						
32	782						
34	780		Auger refused at depth of 33' BGS				
36	778						
38	776						
40	774						
42	772						
44	770						
46	768						
48	766						
50	764						
52	762						
54							

N60 Value Graph: 0 50 100

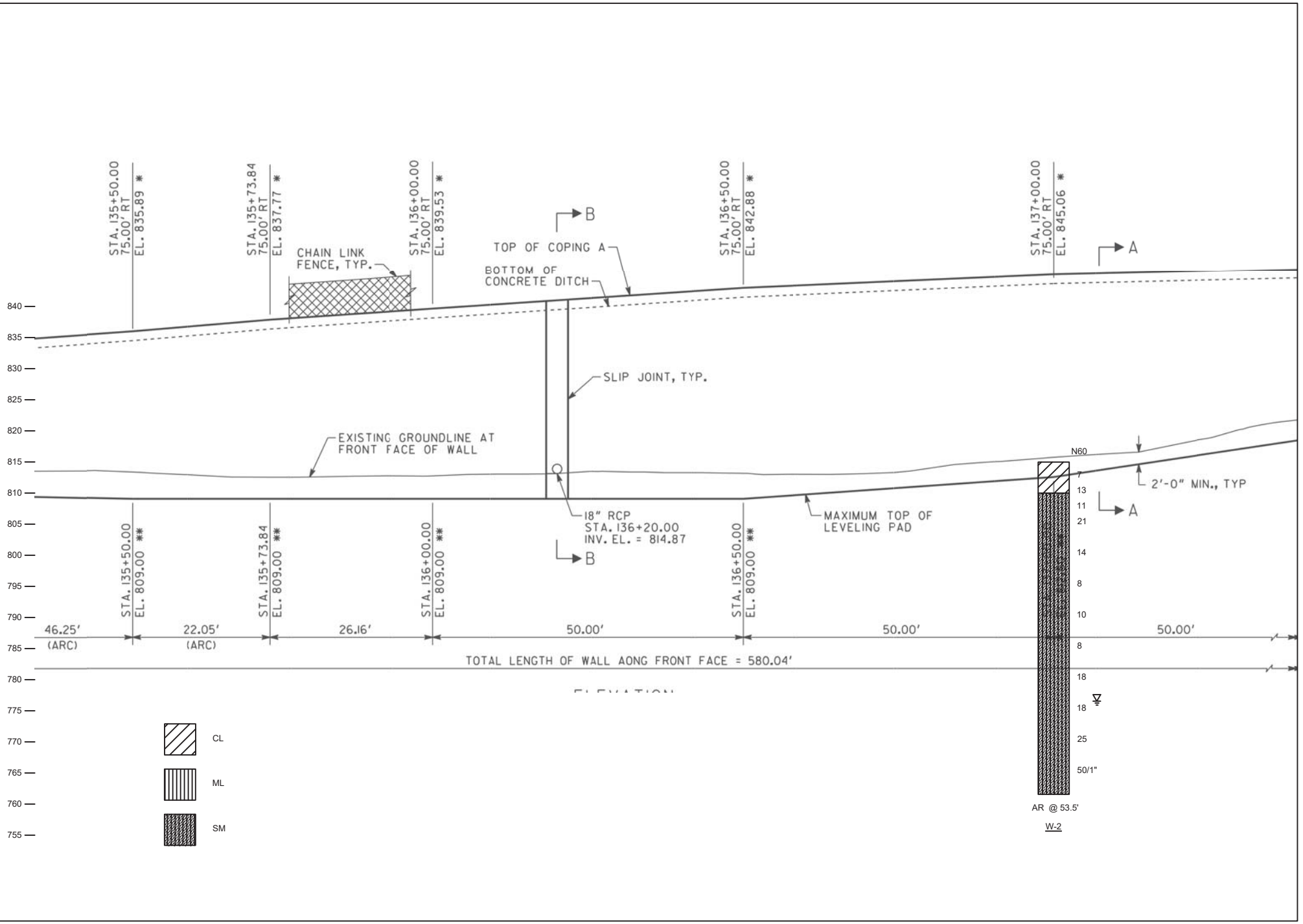
Moist, %

Water Level

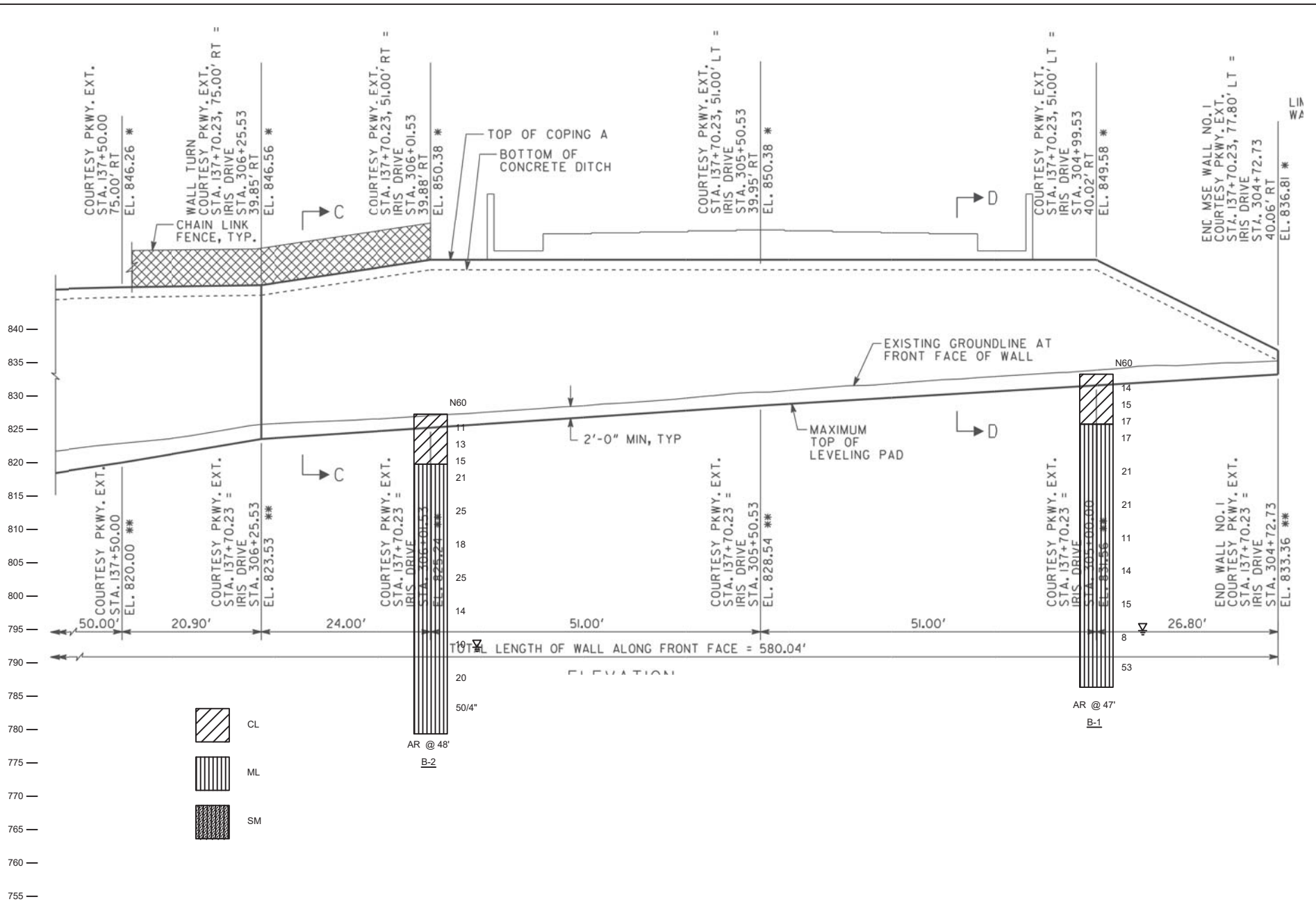
NOTE: SPT-N values have been corrected with 84% ER



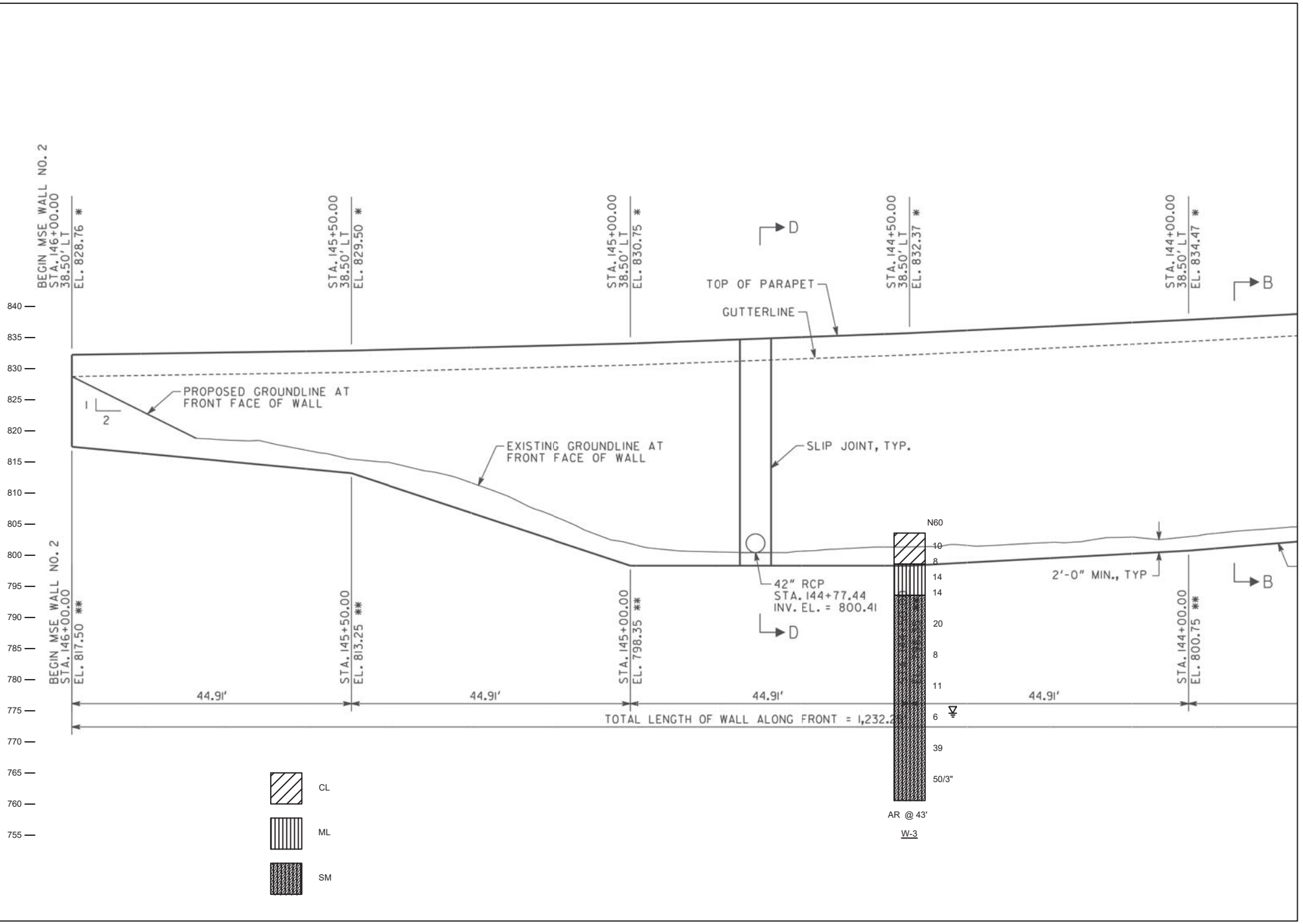
TITLE: BORING PROFILE – WALL NO. 1	PROJECT NO: ROCK1701	ATLAS	ATLAS TECHNICAL CONSULTANTS, LLC.
PROJECT: COURTESY PKWY EXTENSION, ROCKDALE COUNTY CSSTP-0006-00(934) / PI NO. 0006934	DRAWN BY: YCS		2450 COMMERCE AVE, SUITE 100 DULUTH, GEORGIA 30096 TEL: 770-2635945; FAX: 770-2635954
	DATE: 12/4/2021		



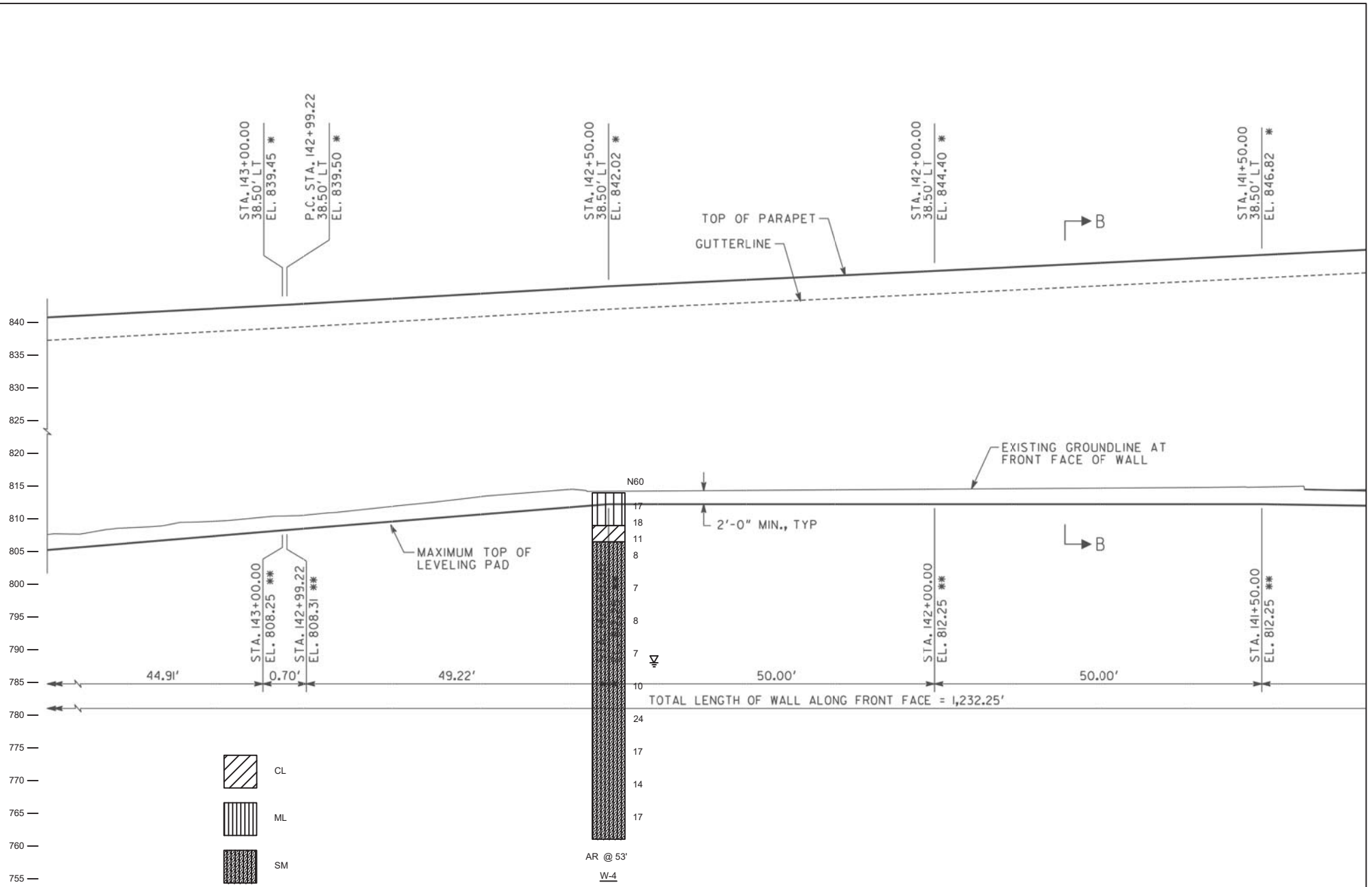
TITLE: BORING PROFILE – WALL NO. 1 CONT.	PROJECT NO: ROCK1701	ATLAS	ATLAS TECHNICAL CONSULTANTS, LLC.
PROJECT: COURTESY PKWY EXTENSION, ROCKDALE COUNTY CSSTP-0006-00(934) / PI NO. 0006934	DRAWN BY: YCS DATE: 12/4/2021		2450 COMMERCE AVE, SUITE 100 DULUTH, GEORGIA 30096 TEL: 770-2635945; FAX: 770-2635954



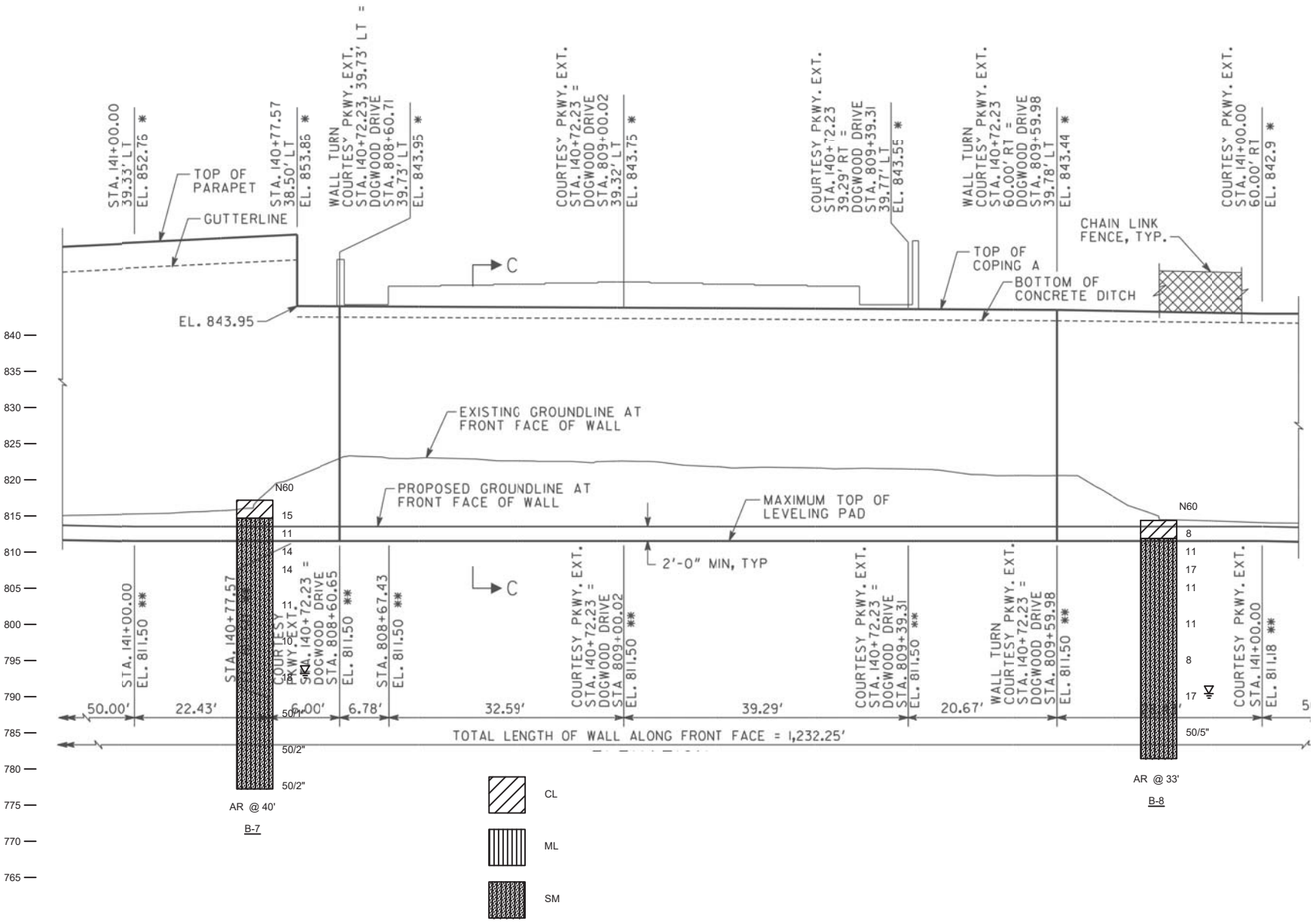
TITLE: BORING PROFILE – WALL NO. 1 CONT.	PROJECT NO: ROCK1701	ATLAS	ATLAS TECHNICAL CONSULTANTS, LLC.
PROJECT: COURTESY PKWY EXTENSION, ROCKDALE COUNTY CSSTP-0006-00(934) / PI NO. 0006934	DRAWN BY: YCS DATE: 12/4/2021		2450 COMMERCE AVE, SUITE 100 DULUTH, GEORGIA 30096 TEL: 770-2635945; FAX: 770-2635954



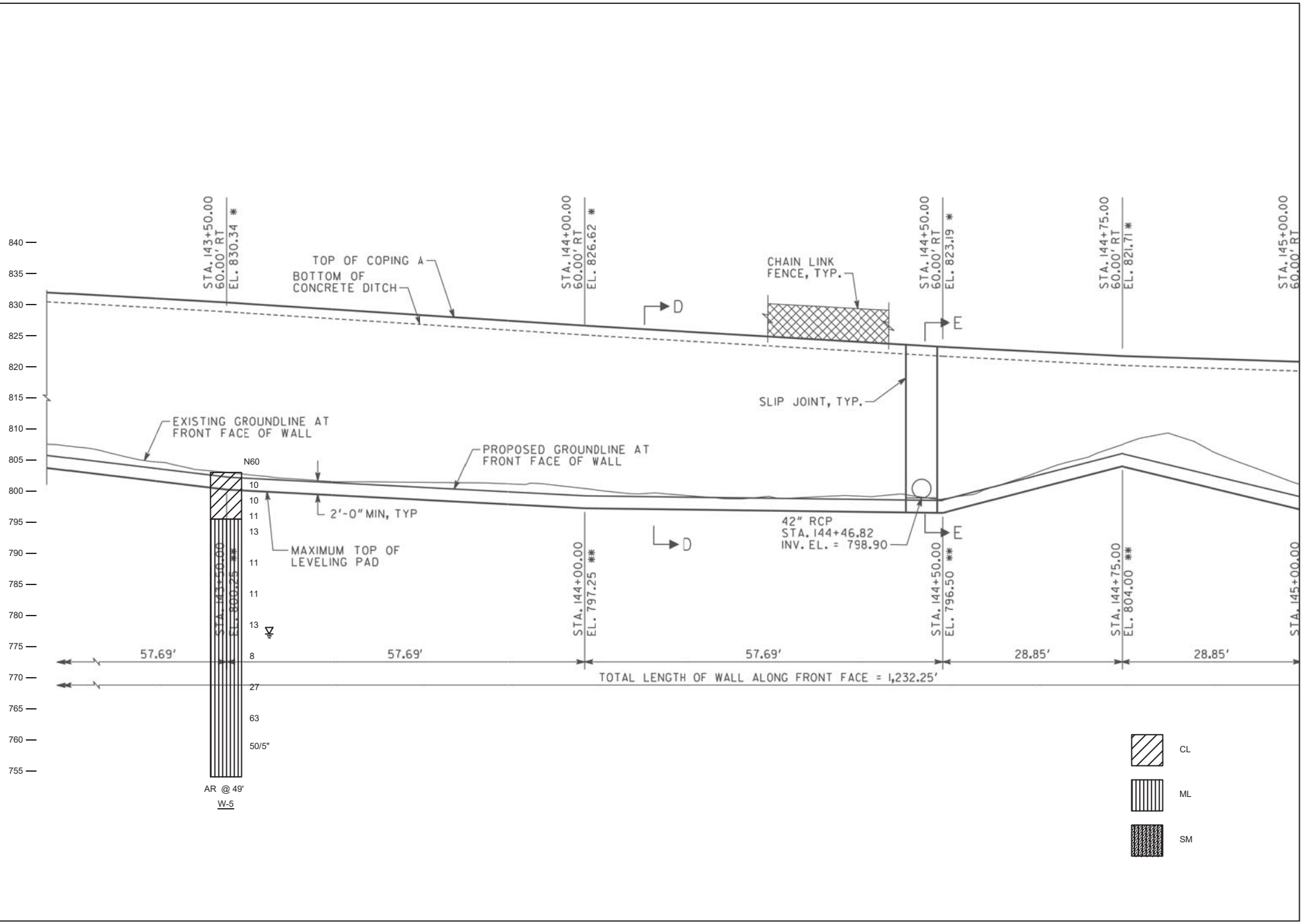
TITLE: BORING PROFILE – WALL NO. 2	PROJECT NO: ROCK1701	ATLAS	ATLAS TECHNICAL CONSULTANTS, LLC.
PROJECT: COURTESY PKWY EXTENSION, ROCKDALE COUNTY CSSTP-0006-00(934) / PI NO. 0015023	DRAWN BY: YCS DATE: 12/4/2021		2450 COMMERCE AVE, SUITE 100 DULUTH, GEORGIA 30096 TEL: 770-2635945; FAX: 770-2635954



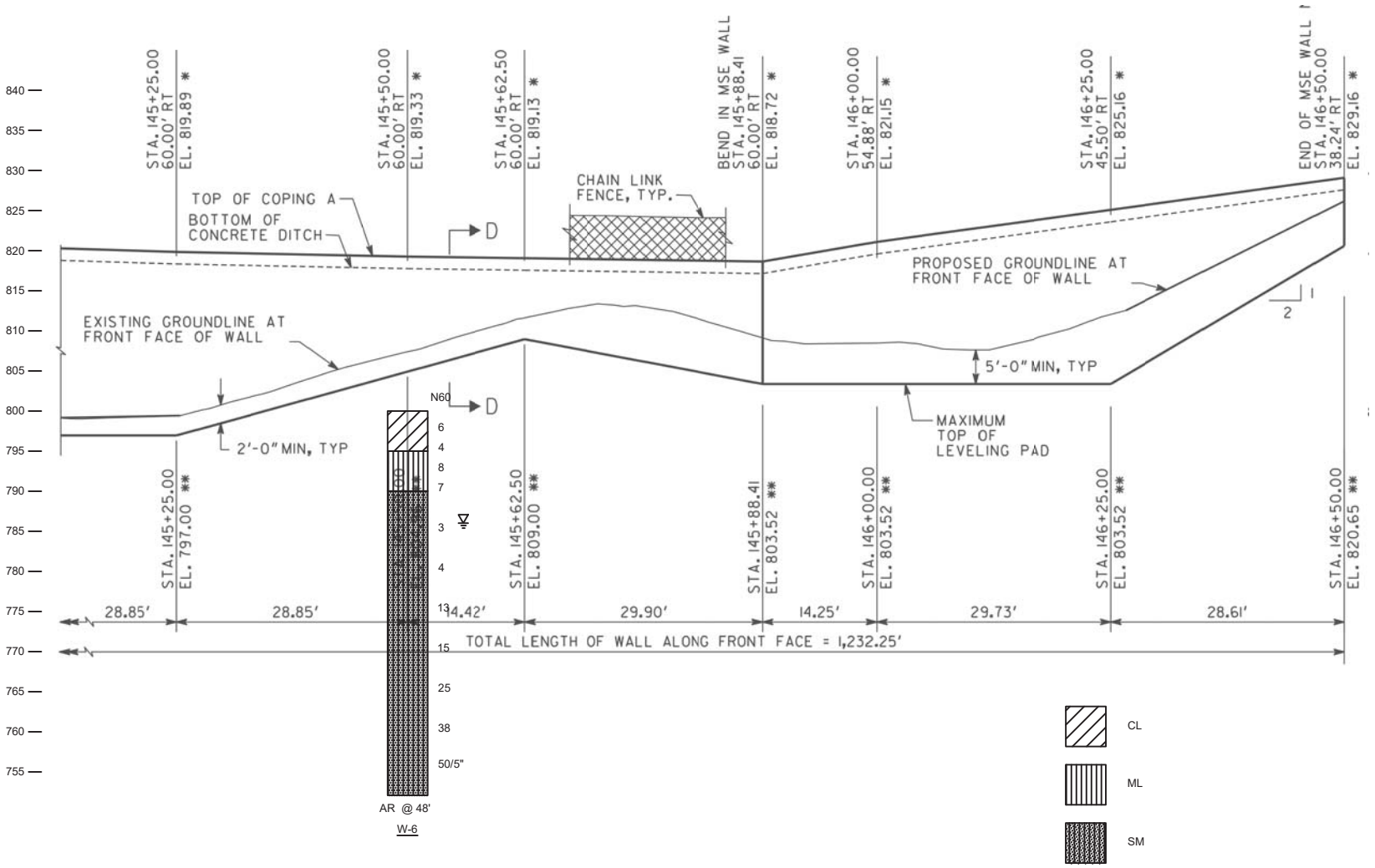
TITLE: BORING PROFILE – WALL NO. 2 CONT.	PROJECT NO: ROCK1701		ATLAS TECHNICAL CONSULTANTS, LLC.
PROJECT: COURTESY PKWY EXTENSION, ROCKDALE COUNTY CSSTP-0006-00(934) / PI NO. 0006934	DRAWN BY: YCS	ATLAS	2450 COMMERCE AVE, SUITE 100 DULUTH, GEORGIA 30096 TEL: 770-2635945; FAX: 770-2635954
	DATE: 12/4/2021		



TITLE: BORING PROFILE – WALL NO. 2 CONT.	PROJECT NO: ROCK1701		ATLAS TECHNICAL CONSULTANTS, LLC.
PROJECT: COURTESY PKWY EXTENSION, ROCKDALE COUNTY CSSTP-0006-00(934) / PI NO. 0006934	DRAWN BY: YCS	ATLAS	2450 COMMERCE AVE, SUITE 100 DULUTH, GEORGIA 30096 TEL: 770-2635945; FAX: 770-2635954
	DATE: 12/4/2021		

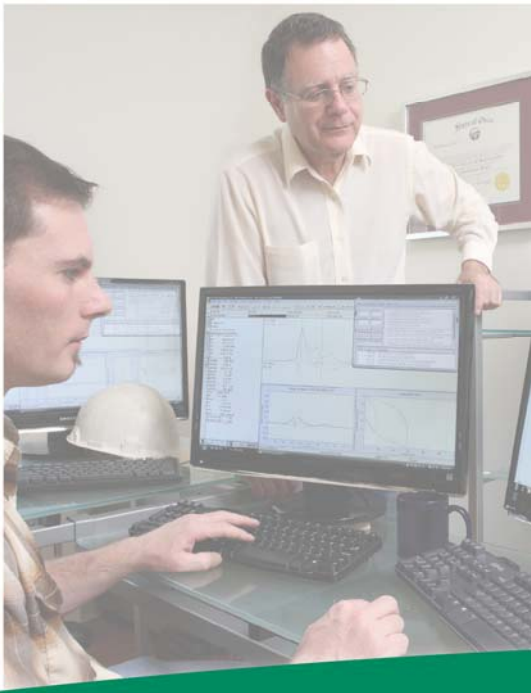


TITLE: BORING PROFILE – WALL NO. 2 CONT.	PROJECT NO: ROCK1701	ATLAS	ATLAS TECHNICAL CONSULTANTS, LLC.
PROJECT: COURTESY PKWY EXTENSION, ROCKDALE COUNTY CSSTP-0006-00(934) / PI NO. 0006934	DRAWN BY: YCS DATE: 12/4/2021		2450 COMMERCE AVE, SUITE 100 DULUTH, GEORGIA 30096 TEL: 770-2635945; FAX: 770-2635954



TITLE: BORING PROFILE – WALL NO. 2 CONT.	PROJECT NO: ROCK1701	ATLAS	ATLAS TECHNICAL CONSULTANTS, LLC.
PROJECT: COURTESY PKWY EXTENSION, ROCKDALE COUNTY CSSTP-0006-00(934) / PI NO. 0015023	DRAWN BY: YCS DATE: 12/4/2021		2450 COMMERCE AVE, SUITE 100 DULUTH, GEORGIA 30096 TEL: 770-2635945; FAX: 770-2635954

Appendix C – Drilling calibration report



GRL engineers, inc.

Dynamic Measurements and Analyses

Job No. 199001-1

Report on: Standard Penetration Test Energy Measurements
Jonesboro, GA

Prepared for Kilman Bros, INC.

By Thomas G. Hyatt, P.E. and Joel S. Webster, E.I.

June 20, 2019

www.GRLengineers.com info@GRLengineers.com

June 20, 2019

Mr. John Kilman
Kilman Bros. Inc.
110 Grayson Industrial Pkwy
Grayson, GA 30017

Re: Standard Penetration Test Energy Measurements
Jonesboro, GA GRL Job No. 199001-1

Dear Mr. Kilman,

This report presents results of energy measurements obtained on June 8, 2019 during Standard Penetration Tests (SPT) sampling. Two automatic hammers mounted on two separate Diedrich D-50 dill rigs that were tested generally following ASTM D4633-10 standards. All dynamic tests were performed on AWJ drill rods. GRL Engineers, Inc. obtained the dynamic measurements with an instrumented AW subsection that had AWJ adapters and a Model 8G Pile Driving Analyzer®. This report describes the testing procedures and summarizes the test results. Appendix A describes our measurement and analysis methods, Appendix B contains calibration information for the gages and equipment used, and Appendix C is a summary of the field data.

PURPOSE AND SCOPE OF WORK

At the request of Big Dog Geotech, GRL conducted SPT energy measurements in Jonesboro, GA according to ASTM D4633-10. Specifically, we recorded SPT energy measurements at five-foot sample intervals between 18.5 and 43.5 feet below the existing ground surface. SPT samples were taken every five feet from the ground surface until a boring depth of about 43.5 feet was reached. All SPT samples were driven for a total of 3 six-inch increments, or 1.5 feet.

EQUIPMENT

Drilling and SPT Hammer Equipment

CME 550 (Serial # 8971)

SPT energy measurements were made on an automatic hammer mounted on a CME 550 drill rig. The drilling method used to advance the boring was hollow stem auger. Energy measurements for this drill rig were collected at a borehole located in Jonesboro, GA. SPT energy measurements were performed at 5-foot sampling intervals between 18.5 and 40.0 feet. A total of five energy measurement events were performed for this drill rig.

CME 55 (Serial # 1504)

SPT energy measurements were made on an automatic hammer mounted on a CME 55 drill rig. The drilling method used to advance the boring was hollow stem auger. Energy measurements for this drill rig were collected at a borehole located in Jonesboro, GA. SPT energy measurements were performed at 5-foot sampling intervals between 18.5 and 43.5 feet. A total of six energy measurement events were performed for this drill rig. The SPT energy measurements performed from 33.5 to 40 feet did not meet the ASTM D4633-10 specifications for blow counts and were not considered in the calibration of this drill rig.

Instrumentation

A Model 8G Pile Driving Analyzer (PDA) data acquisition system (SN# 4613LE) was used to collect and process the dynamic measurements of force and velocity. The data was collected using a two foot long section of AW rod subsection (SN# 246AW) with a cross sectional area of 1.21 square inches and instrumented with two full bridge foil resistance strain gages and two piezoresistive accelerometers mounted in the midpoint location of the instrumented rod. Couplings were used to convert the threads from the AW rod subsection to the AWJ rod string.

Analog signals from the strain gages and accelerometers were conditioned, digitized, stored and processed with the PDA. The sampling frequency used during the SPT testing was 50 kHz. Selected output from the PDA for each recorded impact included the energy transfer ratio (ETR), maximum rod top velocity (VMX), maximum energy transfer (EFV), maximum rod top force (FMX), and the hammer operating rate (BPM).

MEASUREMENTS AND CALCULATIONS

FV Method (EFV)

Energy transfer to the PDA gage location, EFV, was computed by the PDA using force, F(t), and velocity, v(t), records as follows:

$$EFV = \int_a^b F(t) \cdot v(t) dt$$

The time "a" corresponds to the start of the record when the energy transfer begins, and "b" is the time at which energy transferred to the rod reaches a maximum value. The FV Method is currently recognized in ASTM D4633-10, and is the theoretically correct result; therefore, no other energy calculation methods are reported.

Corrected SPT number (N_{60})

While the primary purpose of SPT energy testing is to calculate the maximum transferred energy (ETR) of each hammer blow, the overall average EFV value can be used to calculate the corrected SPT number (N_{60}). To adjust the SPT N-values for hammer performance, the following correction as suggested by Seed for N-value adjustment to 60% transfer efficiency (e.g. 210 ft-pounds) was used:

Where:

N_{60} = Corrected N-value
E_m = overall average measured energy transfer (EFV)
N_m =number of blows for last 12 inches of sampler penetration

A general introduction to dynamic SPT testing methods is included in this report as Appendix A. References for more detailed descriptions of our testing and analysis methods are available upon request.

Any cross-sectional area difference between the GRL rod subsection and the drill rods, any loose connections or changes in area at section joints, or any cross-sectional area differences between the individual drill rod sections will result in stress wave reflections that can potentially influence the energy transfer. The EFV transferred energy calculation method, utilizing both force and velocity records, is theoretically correct and gives energy transfer results that are not adversely affected by cross-sectional area changes or loose connectors. The EFV results are included in Appendix C for all records collected and accepted after checking them for consistency.

RESULTS

Upon return to the office, the records collected by the PDA were checked for consistency and accuracy. For example, records from very weak startup or final impacts were not included in average results. Appendix C contains a representative plot of force and normalized velocity versus time, as well as tables of PDA results for all hammer blows at each dynamically monitored sampling depth. The results include the EFV (transferred energy by the FV method, as recommended by ASTM D4633-10), ETR (energy transfer efficiency for the EFV method), BPM (hammer operating rate), FMX (maximum rod top force) and VMX (maximum rod top velocity). The tables show statistical summaries for the final two 6 inch increments over which the SPT N value is calculated. At the end of each table is a statistical evaluation of these results which include the average and standard deviation.

$$N_{60} = \left(\frac{E_m}{210}\right) N_m$$

The table below and the summary tables in Appendix C summarize the average transferred energy values calculated by the EFV method. The records consist of averaged hammer blows from the last 12 inches (i.e. N value) at each dynamically monitored sampling depth. The “energy transfer ratio” (ETR) is defined as the ratio of maximum transferred energy EFV divided by the theoretical hammer potential energy of 350 ft-lbs (i.e., computed per the 140 lb SPT hammer and the standard 30 inch drop as specified by ASTM D1586-08). The average hammer operating rate is reported in blows per minute (BPM). A summary of the dynamic measurements of the energy transfer to the drill rods using the EFV equation is provided in the table below.

Drill Rig	Avg. EFV (ft-lbs)	Avg ETR (%)	Range of EFV (ft-lbs)	Range of ETR (%)
CME 550 SN 8971	330	84	309 – 367	78 – 97
CME 55 SN 1504	325	86	302 – 343	82 – 93

CONCLUSIONS

Based upon the dynamic test data obtained, the following conclusions are presented:

1. Loose connections in the drill string were sometimes observed in the force and velocity records. However, energy transfer values calculated using the EFV equation are not adversely affected by the connectors and therefore are considered a better indication of transferred energy.

2. Dynamic measurements of the transferred energy to the drill rods using the EFV equation ranged from 309 to 367 ft-lbs for the CME 550 SN 8971 drill rig. This corresponds to a transfer efficiency ranging from 78 to 97% of the SPT hammer energy of 350 ft-lbs.

3. Dynamic measurements of the transferred energy to the drill rods using the EFV equation ranged from 302 to 343 ft-lbs for the CME 55 SN 1504 drill rig. This corresponds to a transfer efficiency ranging from 82 to 93% of the SPT hammer energy of 350 ft-lbs.

4. The average transferred energy (EFV) and energy transfer ratio (ETR) for the CME drill rigs tested was as follows:

   CME 550 SN 8971: Average EFV = 330 ft-lbs; Average ETR = 84%

   CME 55 SN 1504: Average EFV = 325 ft-lbs; Average ETR = 86%

Please review both ASTM D4633-10 and ASTM D1586-08 prior to applying these test results. The energy calibrations reported herein are valid for the same hammer/drill rig, with the same drill operator, same anvil dimensions, and same drilling methods.

We appreciate the opportunity to be of assistance to you on this project. Please contact our office should you have any questions regarding this submittal, require additional information, or if we may be of further service.

Sincerely,

GRL Engineers, Inc.

Thomas G. Hyatt, P.E.

Joel S. Webster, E.I.

TGH:JSW:dms

Appendix D – Soil laboratory tests

2450 Commerce Avenue
Suite 100
Duluth, Georgia 30096
Tel: 770-2635945
Fax: 770-263-0166

Soil Classification

Project Name:	*Courtsey Pkwy*			Project Number:	*ROCK1701*
Sample Location:	*135+25,65' Right*	Broing No.	W-1	Sample Depth:	*3.5'-5'*
Date Sampled:	*7/11/2019*	Sampled By:	*Jay Shah*		
Date Tested:	*4/1/2021*	Tested By:	*Randy R*		
Sample Description:	*Brown sandy lean clay*				

Sieve Analysis

US Sieve Size	Sieve Opening		% Passing
	(inch)	(mm)	
3 Inch	3.0000	76.2	
1.5 Inch	1.5000	38.1	
1 Inch	1.0000	25.4	
No.4	1.8701	4.75	*100.0*
No.10	0.7874	2.00	*99.0*
No.20	0.3346	0.85	*89.8*
No.40	0.1673	0.425	*75.2*
No.60	0.0984	0.25	*69.2*
No.100	0.0591	0.15	*62.5*
No.200	0.0295	0.075	*52.1*
% Clay	0.0079	0.02	33.6

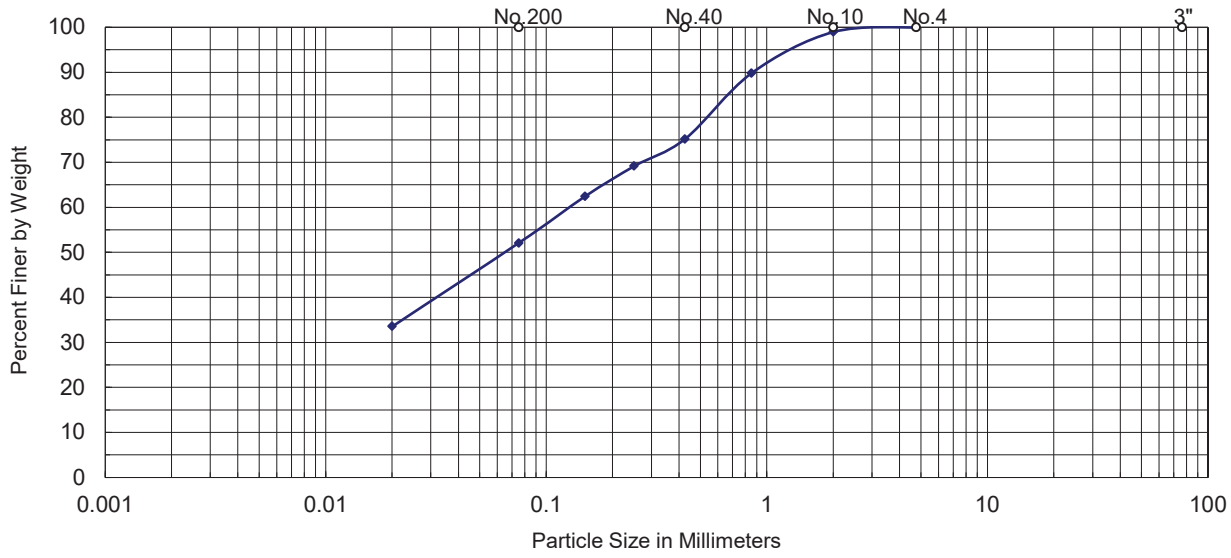
Atterberg Limits

Liquid limit (LL)	*35*
Plastic Limit (PL)	*23*
Plasticity Index (PI)	*12*

D_{10} (mm) =	
D_{30} (mm) =	
D_{75} (mm) =	0.418
Coefficient of Uniformity, C_u =	
Coefficient of ccurvature, C_c =	

Organic Content, %	
Maximum Dry Density,pcf	
Volume Change, %	

Grain size distribution



Soil Classification

AASHTO	
USCS	CL - Sandy lean clay
GDOT	

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Fax: 770-263-0166

Soil Classification

Project Name:	*Courtsey Pkwy*			Project Number:	*ROCK1701*
Sample Location:	*135+25,65' Right*	Broing No.	W-1	Sample Depth:	*13.5'-15'*
Date Sampled:	*7/11/2019*	Sampled By:	*Jay Shah*		
Date Tested:	*4/1/2021*	Tested By:	*Randy R*		
Sample Description:	*Brown grey mica silty sand*				

Sieve Analysis

US Sieve Size	Sieve Opening		% Passing
	(inch)	(mm)	
3 Inch	3.0000	76.2	
1.5 Inch	1.5000	38.1	
1 Inch	1.0000	25.4	
No.4	1.8701	4.75	*100.0*
No.10	0.7874	2.00	*96.6*
No.20	0.3346	0.85	*79.4*
No.40	0.1673	0.425	*60.8*
No.60	0.0984	0.25	*49.8*
No.100	0.0591	0.15	*34.8*
No.200	0.0295	0.075	*24.2*
% Clay	0.0079	0.02	22

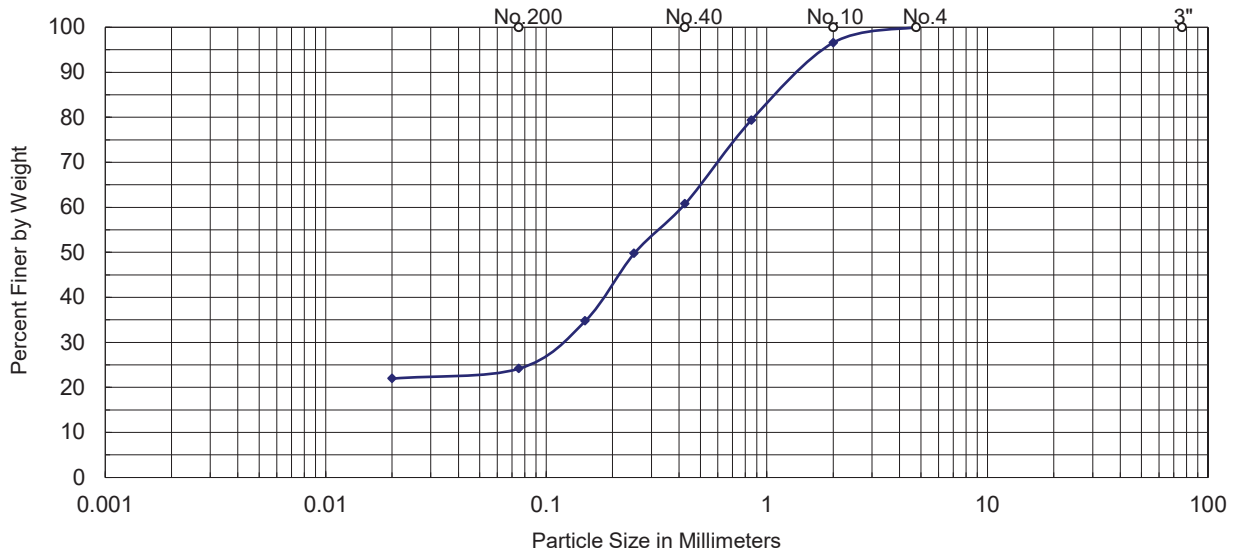
Atterberg Limits

Liquid limit (LL)	
Plastic Limit (PL)	
Plasticity Index (PI)	

D_{10} (mm) =	
D_{30} (mm) =	
D_{75} (mm) =	0.721
Coefficient of Uniformity, C_u =	
Coefficient of ccurvature, C_c =	

Organic Content, %	
Maximum Dry Density,pcf	
Volume Change, %	

Grain size distribution



Soil Classification

AASHTO	
USCS	SM - Silty sand
GDOT	

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Soil Classification

Project Name:	*Courtsey Pkwy*			Project Number:	*ROCK1701*
Sample Location:	*135+25,65' Right*	Broing No.	W-1	Sample Depth:	*33.5'-35'*
Date Sampled:	*7/11/2019*	Sampled By:	*Jay Shah*		
Date Tested:	*4/1/2021*	Tested By:	*Randy R*		
Sample Description:	*White/Grey mica silty sand*				

Sieve Analysis

US Sieve Size	Sieve Opening		% Passing
	(inch)	(mm)	
3 Inch	3.0000	76.2	
1.5 Inch	1.5000	38.1	
1 Inch	1.0000	25.4	
No.4	1.8701	4.75	*100.0*
No.10	0.7874	2.00	*94.2*
No.20	0.3346	0.85	*74.4*
No.40	0.1673	0.425	*54.8*
No.60	0.0984	0.25	*48.0*
No.100	0.0591	0.15	*33.8*
No.200	0.0295	0.075	*24.2*
% Clay	0.0079	0.02	23

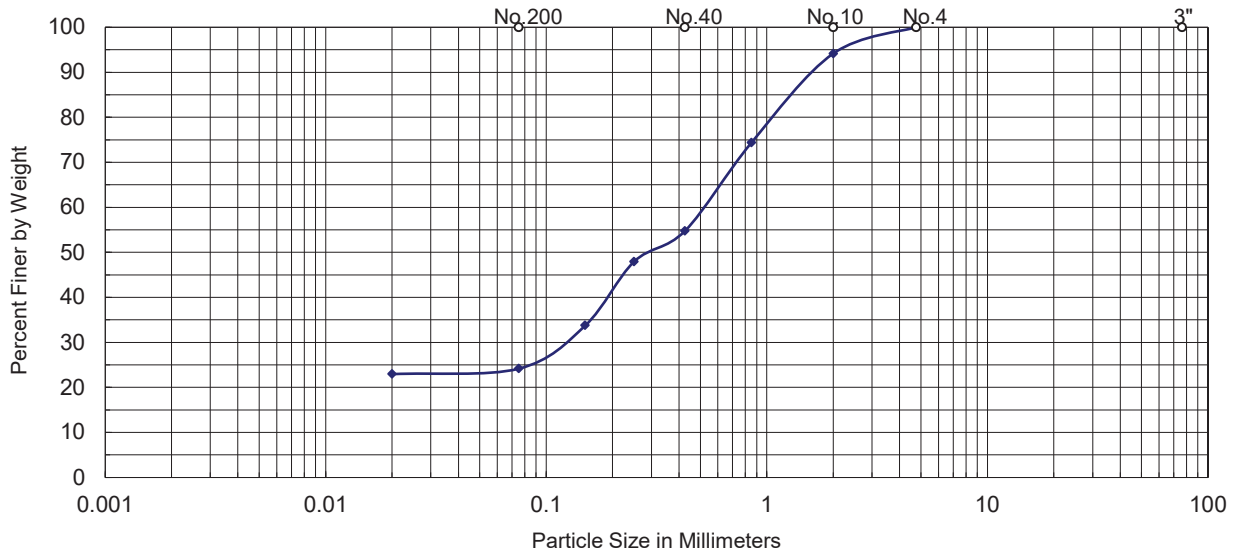
Atterberg Limits

Liquid limit (LL)	
Plastic Limit (PL)	
Plasticity Index (PI)	

D_{10} (mm) =	
D_{30} (mm) =	
D_{75} (mm) =	0.872
Coefficient of Uniformity, C_u =	
Coefficient of ccurvature, C_c =	

Organic Content, %	
Maximum Dry Density,pcf	
Volume Change, %	

Grain size distribution



Soil Classification

AASHTO	
USCS	SM - Silty sand
GDOT	

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Soil Classification

Project Name:	*Courtsey Pkwy*			Project Number:	*ROCK1701*
Sample Location:	*137+00,75' Right*	Broing No.	W-2	Sample Depth:	*3.5'-5'*
Date Sampled:	*7/11/2019*	Sampled By:	*Jay Shah*		
Date Tested:	*4/7/2021*	Tested By:	*Randy R*		
Sample Description:	*Light Brown mica sandy lean clay*				

Sieve Analysis

US Sieve Size	Sieve Opening		% Passing
	(inch)	(mm)	
3 Inch	3.0000	76.2	
1.5 Inch	1.5000	38.1	
1 Inch	1.0000	25.4	
No.4	1.8701	4.75	*100.0*
No.10	0.7874	2.00	*98.6*
No.20	0.3346	0.85	*87.4*
No.40	0.1673	0.425	*69.8*
No.60	0.0984	0.25	*60.8*
No.100	0.0591	0.15	*55.3*
No.200	0.0295	0.075	*50.6*
% Clay	0.0079	0.02	37.2

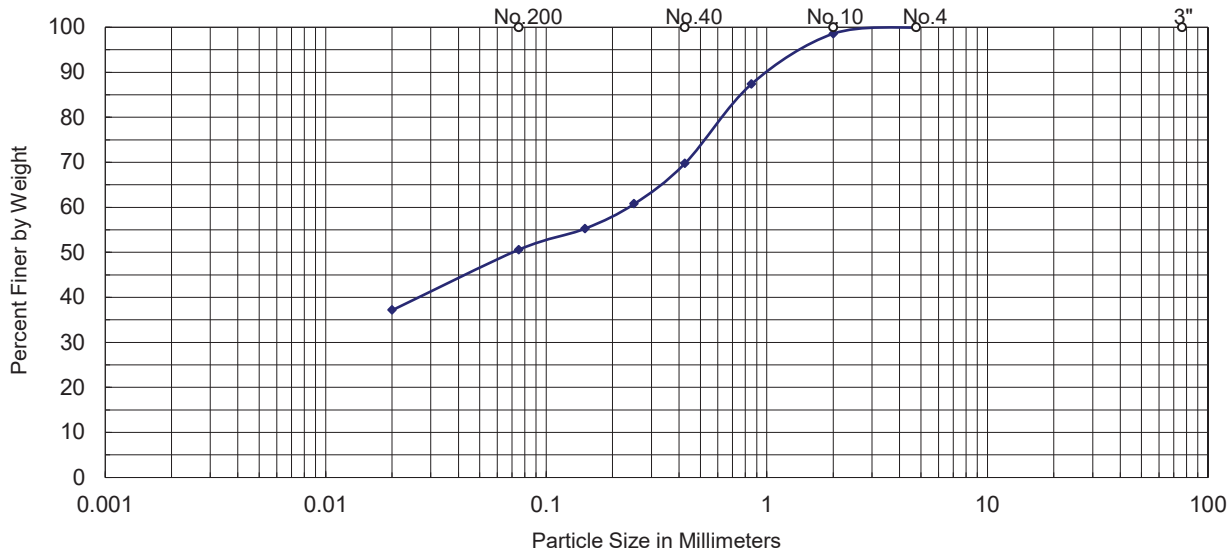
Atterberg Limits

Liquid limit (LL)	*44*
Plastic Limit (PL)	*26*
Plasticity Index (PI)	*18*

D_{10} (mm) =	
D_{30} (mm) =	
D_{75} (mm) =	0.522
Coefficient of Uniformity, C_u =	
Coefficient of ccurvature, C_c =	

Organic Content, %	
Maximum Dry Density,pcf	
Volume Change, %	

Grain size distribution



Soil Classification

AASHTO	
USCS	CL - Sandy lean clay
GDOT	

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Duluth, Georgia 30096
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Fax: 770-263-0166

Soil Classification

Project Name:	*Courtsey Pkwy*			Project Number:	*ROCK1701*
Sample Location:	*137+00,75' Right*	Broing No.	W-2	Sample Depth:	*6'-7.5'*
Date Sampled:	*7/11/2019*	Sampled By:	*Jay Shah*		
Date Tested:	*4/7/2021*	Tested By:	*Randy R*		
Sample Description:	*Brownish grey/white mica silty sand*				

Sieve Analysis

US Sieve Size	Sieve Opening		% Passing
	(inch)	(mm)	
3 Inch	3.0000	76.2	
1.5 Inch	1.5000	38.1	
1 Inch	1.0000	25.4	
No.4	1.8701	4.75	*100.0*
No.10	0.7874	2.00	*98.4*
No.20	0.3346	0.85	*91.8*
No.40	0.1673	0.425	*80.8*
No.60	0.0984	0.25	*67.4*
No.100	0.0591	0.15	*45.6*
No.200	0.0295	0.075	*31.2*
% Clay	0.0079	0.02	29.6

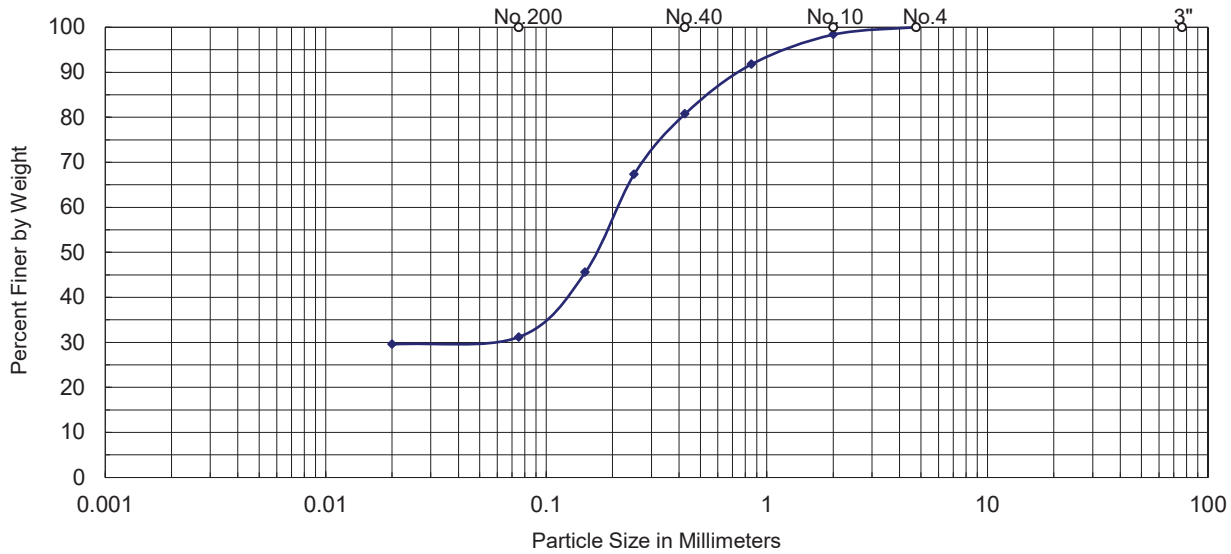
Atterberg Limits

Liquid limit (LL)	
Plastic Limit (PL)	
Plasticity Index (PI)	

D_{10} (mm) =	
D_{30} (mm) =	
D_{75} (mm) =	0.338
Coefficient of Uniformity, C_u =	
Coefficient of ccurvature, C_c =	

Organic Content, %	
Maximum Dry Density,pcf	
Volume Change, %	

Grain size distribution



Soil Classification

AASHTO	
USCS	SM - Silty sand
GDOT	

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Soil Classification

Project Name:	*Courtsey Pkwy*			Project Number:	*ROCK1701*
Sample Location:	*137+00,75' Right*	Broing No.	W-2	Sample Depth:	*18.5'-20'*
Date Sampled:	*7/11/2019*	Sampled By:	*Jay Shah*		
Date Tested:	*4/7/2021*	Tested By:	*Randy R*		
Sample Description:	*Grey/White mica silty sand*				

Sieve Analysis

US Sieve Size	Sieve Opening		% Passing
	(inch)	(mm)	
3 Inch	3.0000	76.2	
1.5 Inch	1.5000	38.1	
1 Inch	1.0000	25.4	
No.4	1.8701	4.75	*100.0*
No.10	0.7874	2.00	*98.0*
No.20	0.3346	0.85	*88.2*
No.40	0.1673	0.425	*70.2*
No.60	0.0984	0.25	*51.8*
No.100	0.0591	0.15	*32.2*
No.200	0.0295	0.075	*21.0*
% Clay	0.0079	0.02	20.2

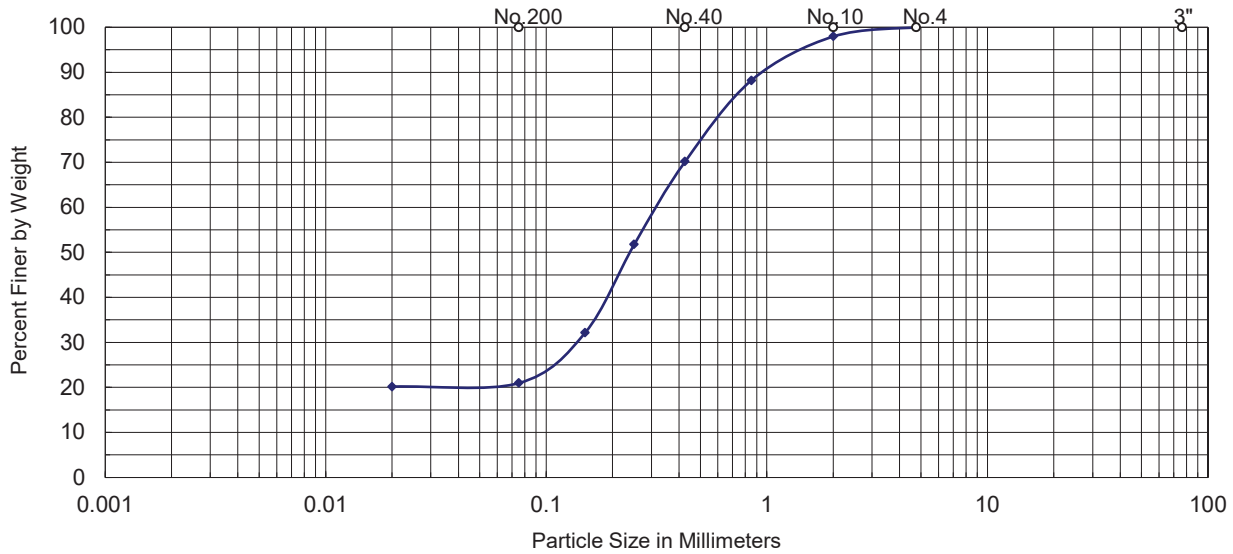
Atterberg Limits

Liquid limit (LL)	
Plastic Limit (PL)	
Plasticity Index (PI)	

D_{10} (mm) =	
D_{30} (mm) =	
D_{75} (mm) =	0.511
Coefficient of Uniformity, C_u =	
Coefficient of ccurvature, C_c =	

Organic Content, %	
Maximum Dry Density,pcf	
Volume Change, %	

Grain size distribution



Soil Classification

AASHTO	
USCS	SM - Silty sand
GDOT	

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Duluth, Georgia 30096
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Fax: 770-263-0166

Soil Classification

Project Name:	*Courtsey Pkwy*			Project Number:	*ROCK1701*
Sample Location:	*137+00,75' Right*	Broing No.	W-2	Sample Depth:	*33.5'-35'*
Date Sampled:	*7/11/2019*	Sampled By:	*Jay Shah*		
Date Tested:	*4/7/2021*	Tested By:	*Randy R*		
Sample Description:	*Light Grey/White mica silty sand*				

Sieve Analysis

US Sieve Size	Sieve Opening		% Passing
	(inch)	(mm)	
3 Inch	3.0000	76.2	
1.5 Inch	1.5000	38.1	
1 Inch	1.0000	25.4	
No.4	1.8701	4.75	*100.0*
No.10	0.7874	2.00	*97.8*
No.20	0.3346	0.85	*86.4*
No.40	0.1673	0.425	*68.8*
No.60	0.0984	0.25	*55.6*
No.100	0.0591	0.15	*38.0*
No.200	0.0295	0.075	*26.4*
% Clay	0.0079	0.02	25.2

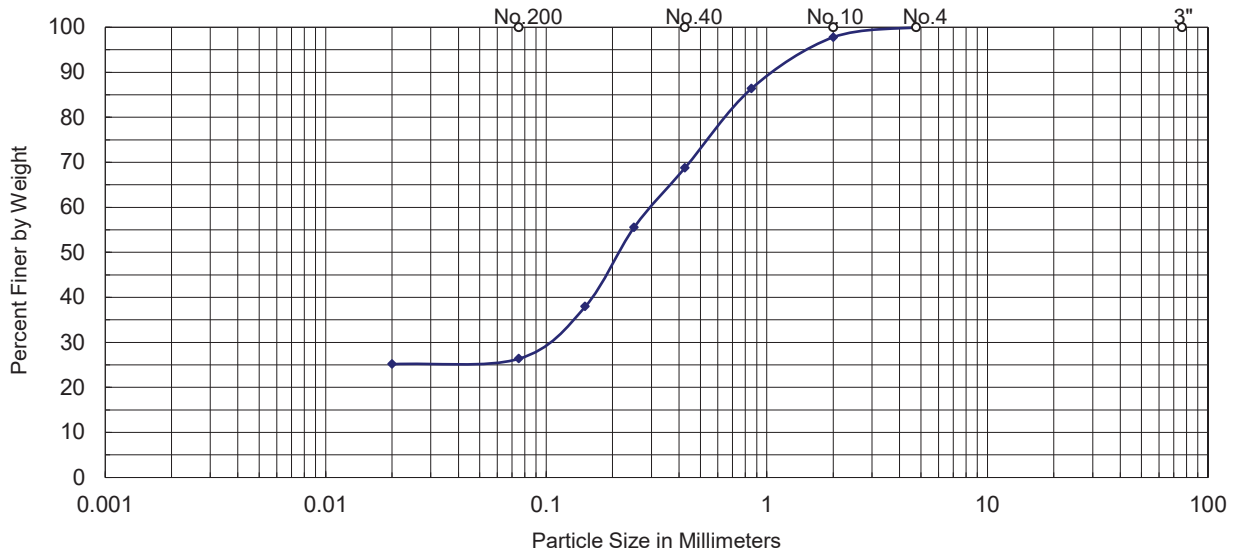
Atterberg Limits

Liquid limit (LL)	
Plastic Limit (PL)	
Plasticity Index (PI)	

D_{10} (mm) =	
D_{30} (mm) =	
D_{75} (mm) =	0.543
Coefficient of Uniformity, C_u =	
Coefficient of ccurvature, C_c =	

Organic Content, %	
Maximum Dry Density,pcf	
Volume Change, %	

Grain size distribution



Soil Classification

AASHTO	
USCS	SM - Silty sand
GDOT	

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Duluth, Georgia 30096
Tel: 770-2635945
Fax: 770-263-0166

Soil Classification

Project Name:	*Courtsey Pkwy*			Project Number:	*ROCK1701*
Sample Location:	*144+50,30' Left*	Broing No.	W-3	Sample Depth:	*1'-2.5'*
Date Sampled:	*7/15/2019*	Sampled By:	*Jay Shah*		
Date Tested:	*4/7/2021*	Tested By:	*Randy R*		
Sample Description:	*Brown mica sandy lean clay*				

Sieve Analysis

US Sieve Size	Sieve Opening		% Passing
	(inch)	(mm)	
3 Inch	3.0000	76.2	
1.5 Inch	1.5000	38.1	
1 Inch	1.0000	25.4	
No.4	1.8701	4.75	*100.0*
No.10	0.7874	2.00	*98.8*
No.20	0.3346	0.85	*90.8*
No.40	0.1673	0.425	*80.2*
No.60	0.0984	0.25	*76.8*
No.100	0.0591	0.15	*69.2*
No.200	0.0295	0.075	*63.6*
% Clay	0.0079	0.02	62.8

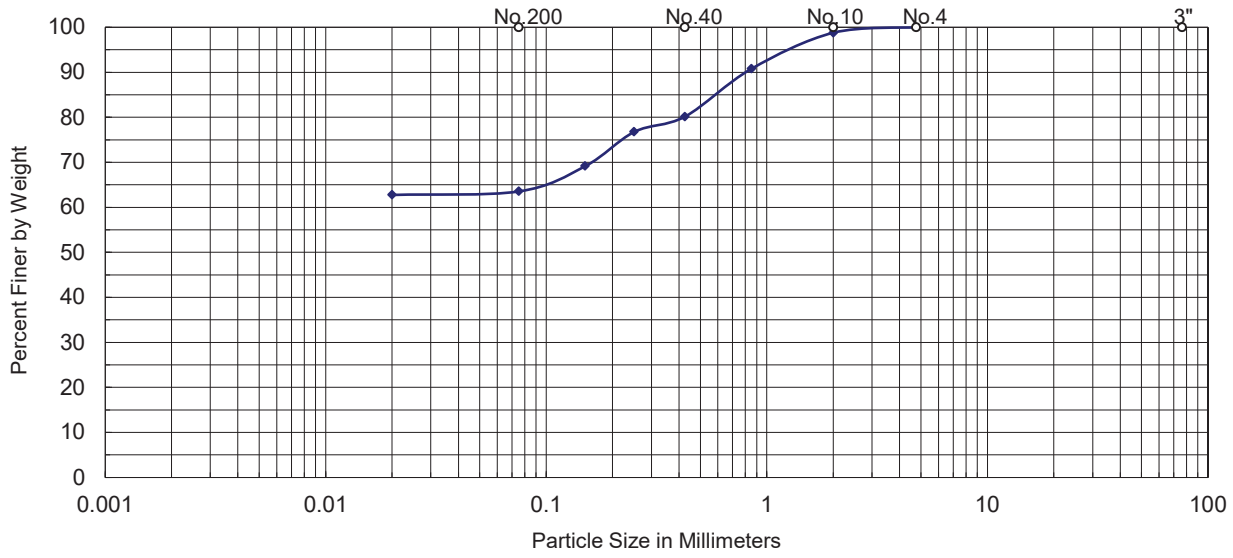
Atterberg Limits

Liquid limit (LL)	*49*
Plastic Limit (PL)	*25*
Plasticity Index (PI)	*24*

D_{10} (mm) =	
D_{30} (mm) =	
D_{75} (mm) =	
Coefficient of Uniformity, C_u =	
Coefficient of ccurvature, C_c =	

Organic Content, %	
Maximum Dry Density,pcf	
Volume Change, %	

Grain size distribution



Soil Classification

AASHTO	
USCS	CL - Sandy lean clay
GDOT	

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Duluth, Georgia 30096
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Fax: 770-263-0166

Soil Classification

Project Name:	*Courtsey Pkwy*			Project Number:	*ROCK1701*
Sample Location:	*144+50,30' Left*	Broing No.	W-3	Sample Depth:	*3.5'-5'*
Date Sampled:	*7/15/2019*	Sampled By:	*Jay Shah*		
Date Tested:	*4/7/2021*	Tested By:	*Randy R*		
Sample Description:	*Light Brown mica sandy silt*				

Sieve Analysis

US Sieve Size	Sieve Opening		% Passing
	(inch)	(mm)	
3 Inch	3.0000	76.2	
1.5 Inch	1.5000	38.1	
1 Inch	1.0000	25.4	
No.4	1.8701	4.75	*100.0*
No.10	0.7874	2.00	*99.0*
No.20	0.3346	0.85	*85.8*
No.40	0.1673	0.425	*69.6*
No.60	0.0984	0.25	*63.5*
No.100	0.0591	0.15	*55.2*
No.200	0.0295	0.075	*50.6*
% Clay	0.0079	0.02	28.8

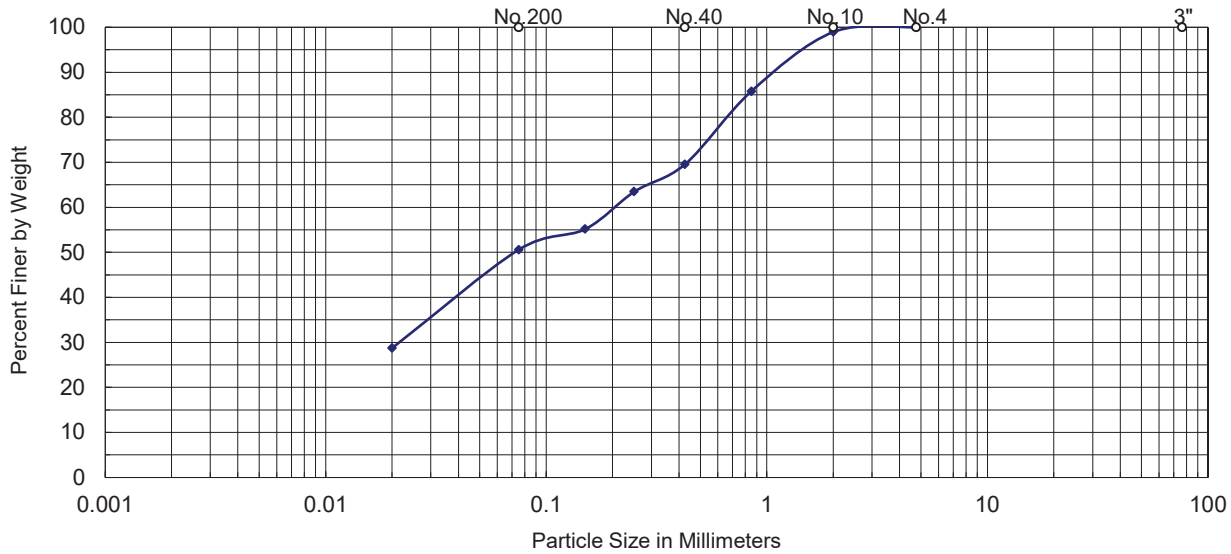
Atterberg Limits

Liquid limit (LL)	
Plastic Limit (PL)	
Plasticity Index (PI)	

D_{10} (mm) =	
D_{30} (mm) =	
D_{75} (mm) =	0.535
Coefficient of Uniformity, C_u =	
Coefficient of ccurvature, C_c =	

Organic Content, %	
Maximum Dry Density,pcf	
Volume Change, %	

Grain size distribution



Soil Classification

AASHTO	
USCS	ML - Sandy silt
GDOT	

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Duluth, Georgia 30096
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Fax: 770-263-0166

Soil Classification

Project Name:	*Courtsey Pkwy*			Project Number:	*ROCK1701*
Sample Location:	*144+50,30' Left*	Broing No.	W-3	Sample Depth:	*8.5'-10'*
Date Sampled:	*7/15/2019*	Sampled By:	*Jay Shah*		
Date Tested:	*4/7/2021*	Tested By:	*Randy R*		
Sample Description:	*Grey/White mica silty sand*				

Sieve Analysis

US Sieve Size	Sieve Opening		% Passing
	(inch)	(mm)	
3 Inch	3.0000	76.2	
1.5 Inch	1.5000	38.1	
1 Inch	1.0000	25.4	
No.4	1.8701	4.75	*100.0*
No.10	0.7874	2.00	*98.0*
No.20	0.3346	0.85	*81.6*
No.40	0.1673	0.425	*64.0*
No.60	0.0984	0.25	*52.2*
No.100	0.0591	0.15	*36.8*
No.200	0.0295	0.075	*24.8*
% Clay	0.0079	0.02	23.2

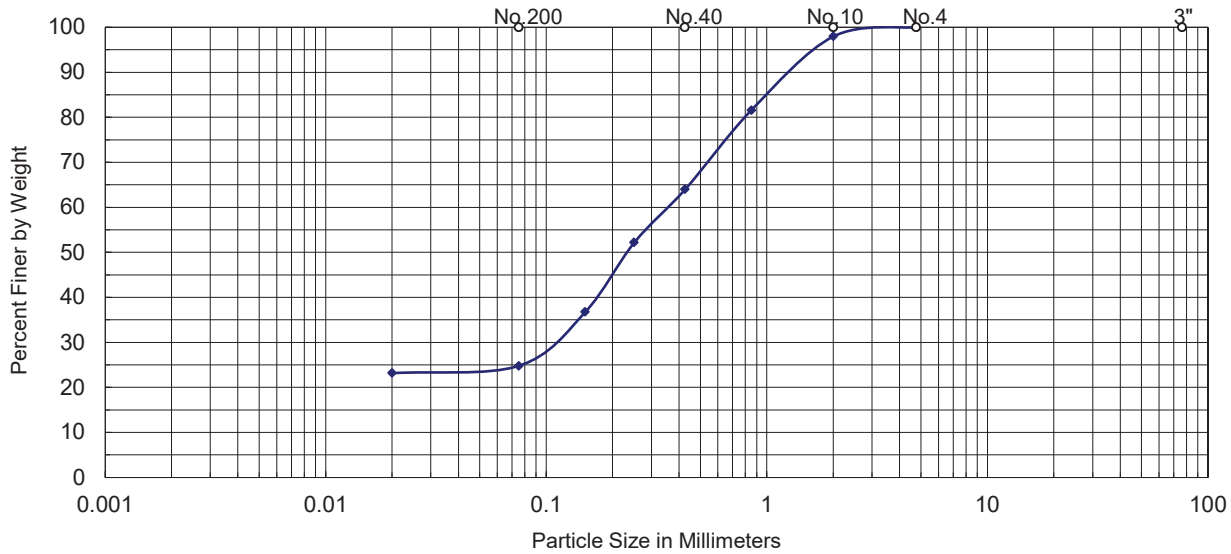
Atterberg Limits

Liquid limit (LL)	
Plastic Limit (PL)	
Plasticity Index (PI)	

D_{10} (mm) =	
D_{30} (mm) =	
D_{75} (mm) =	0.655
Coefficient of Uniformity, C_u =	
Coefficient of ccurvature, C_c =	

Organic Content, %	
Maximum Dry Density,pcf	
Volume Change, %	

Grain size distribution



Soil Classification

AASHTO	
USCS	SM - Silty sand
GDOT	

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Soil Classification

Project Name:	*Courtsey Pkwy*			Project Number:	*ROCK1701*
Sample Location:	*144+50,30' Left*	Broing No.	W-3	Sample Depth:	*28.5'-30'*
Date Sampled:	*7/15/2019*	Sampled By:	*Jay Shah*		
Date Tested:	*4/7/2021*	Tested By:	*Randy R*		
Sample Description:	*Grey mica silty sand*				

Sieve Analysis

US Sieve Size	Sieve Opening		% Passing
	(inch)	(mm)	
3 Inch	3.0000	76.2	
1.5 Inch	1.5000	38.1	
1 Inch	1.0000	25.4	
No.4	1.8701	4.75	*100.0*
No.10	0.7874	2.00	*99.0*
No.20	0.3346	0.85	*96.2*
No.40	0.1673	0.425	*85.6*
No.60	0.0984	0.25	*64.4*
No.100	0.0591	0.15	*39.2*
No.200	0.0295	0.075	*22.6*
% Clay	0.0079	0.02	20.2

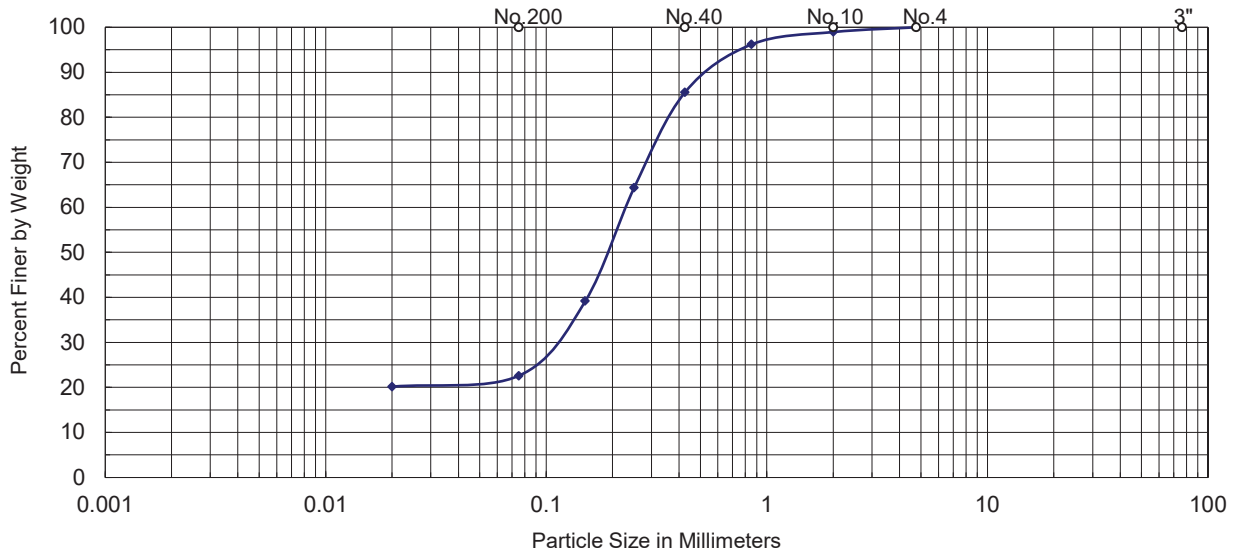
Atterberg Limits

Liquid limit (LL)	
Plastic Limit (PL)	
Plasticity Index (PI)	

D_{10} (mm) =	
D_{30} (mm) =	
D_{75} (mm) =	0.326
Coefficient of Uniformity, C_u =	
Coefficient of ccurvature, C_c =	

Organic Content, %	
Maximum Dry Density,pcf	
Volume Change, %	

Grain size distribution



Soil Classification

AASHTO	
USCS	SM - Silty sand
GDOT	

2450 Commerce Avenue
Suite 100
Duluth, Georgia 30096
Tel: 770-2635945
Fax: 770-263-0166

Soil Classification

Project Name:	*Courtsey Pkwy*			Project Number:	*ROCK1701*
Sample Location:	*142+50, 50' Left*	Broing No.	W-4	Sample Depth:	*3.5'-5'*
Date Sampled:	*7/15/2019*	Sampled By:	*Jay Shah*		
Date Tested:	*4/1/2021*	Tested By:	*Randy R*		
Sample Description:	*Brown mica sandy silt*				

Sieve Analysis

US Sieve Size	Sieve Opening		% Passing
	(inch)	(mm)	
3 Inch	3.0000	76.2	
1.5 Inch	1.5000	38.1	
1 Inch	1.0000	25.4	
No.4	1.8701	4.75	*100.0*
No.10	0.7874	2.00	*97.6*
No.20	0.3346	0.85	*84.0*
No.40	0.1673	0.425	*74.2*
No.60	0.0984	0.25	*66.2*
No.100	0.0591	0.15	*59.0*
No.200	0.0295	0.075	*54.3*
% Clay	0.0079	0.02	33.2

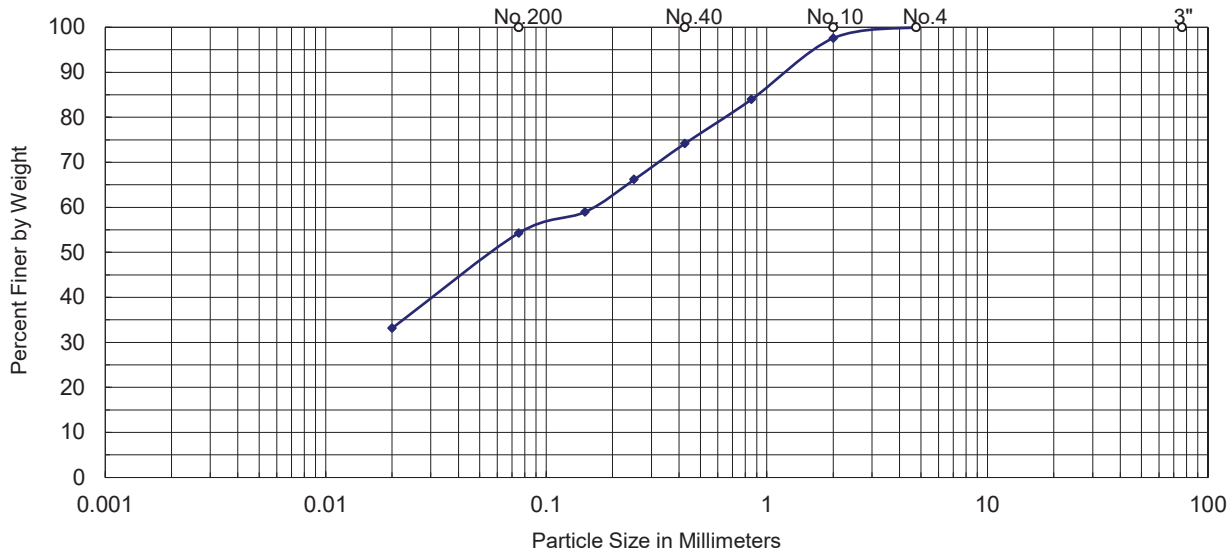
Atterberg Limits

Liquid limit (LL)	*36*
Plastic Limit (PL)	*28*
Plasticity Index (PI)	*8*

D_{10} (mm) =	
D_{30} (mm) =	
D_{75} (mm) =	
Coefficient of Uniformity, C_u =	
Coefficient of ccurvature, C_c =	

Organic Content, %	
Maximum Dry Density,pcf	
Volume Change, %	

Grain size distribution



Soil Classification

AASHTO	
USCS	ML - Sandy silt
GDOT	

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Soil Classification

Project Name:	*Courtsey Pkwy*			Project Number:	*ROCK1701*
Sample Location:	*142+50, 50' Left*	Broing No.	W-4	Sample Depth:	*8.5'-10'*
Date Sampled:	*7/15/2019*	Sampled By:	*Jay Shah*		
Date Tested:	*4/1/2021*	Tested By:	*Randy R*		
Sample Description:	*Brown/orange mica silty sand*				

Sieve Analysis

US Sieve Size	Sieve Opening		% Passing
	(inch)	(mm)	
3 Inch	3.0000	76.2	
1.5 Inch	1.5000	38.1	
1 Inch	1.0000	25.4	
No.4	1.8701	4.75	*100.0*
No.10	0.7874	2.00	*99.2*
No.20	0.3346	0.85	*88.2*
No.40	0.1673	0.425	*71.8*
No.60	0.0984	0.25	*58.8*
No.100	0.0591	0.15	*39.8*
No.200	0.0295	0.075	*25.6*
% Clay	0.0079	0.02	22.6

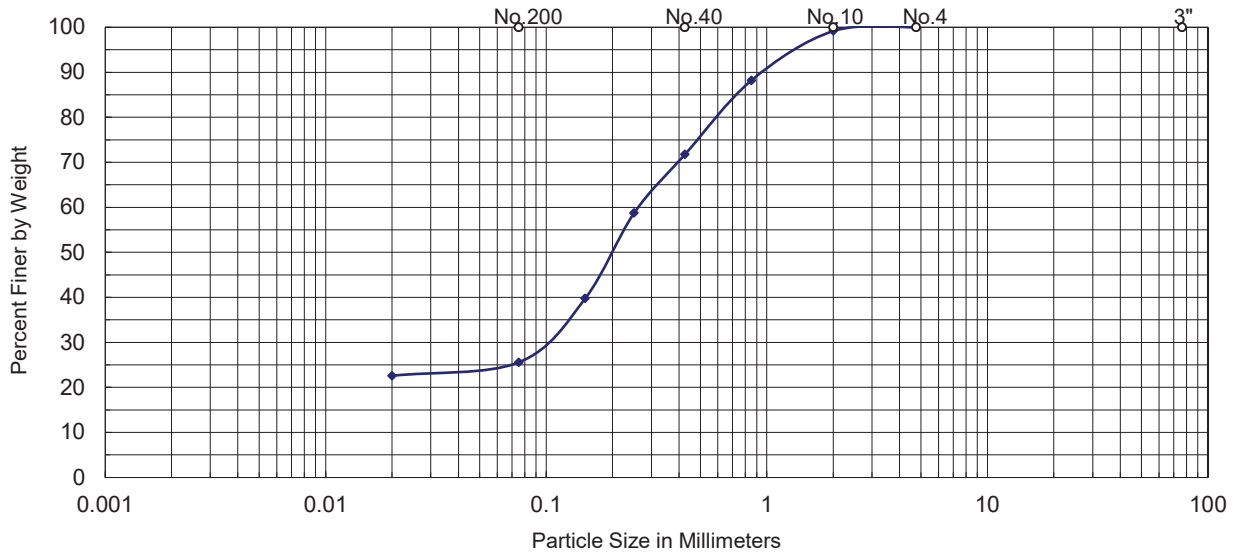
Atterberg Limits

Liquid limit (LL)	
Plastic Limit (PL)	
Plasticity Index (PI)	

D_{10} (mm) =	
D_{30} (mm) =	
D_{75} (mm) =	0.487
Coefficient of Uniformity, C_u =	
Coefficient of ccurvature, C_c =	

Organic Content, %	
Maximum Dry Density,pcf	
Volume Change, %	

Grain size distribution



Soil Classification

AASHTO	
USCS	SM - Silty sand
GDOT	

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Fax: 770-263-0166

Soil Classification

Project Name:	*Courtsey Pkwy*			Project Number:	*ROCK1701*
Sample Location:	*142+50, 50' Left*	Broing No.	W-4	Sample Depth:	*18.5'-20'*
Date Sampled:	*7/15/2019*	Sampled By:	*Jay Shah*		
Date Tested:	*4/1/2021*	Tested By:	*Randy R*		
Sample Description:	*Grey silty sand*				

Sieve Analysis

US Sieve Size	Sieve Opening		% Passing
	(inch)	(mm)	
3 Inch	3.0000	76.2	
1.5 Inch	1.5000	38.1	
1 Inch	1.0000	25.4	
No.4	1.8701	4.75	*100.0*
No.10	0.7874	2.00	*98.4*
No.20	0.3346	0.85	*85.8*
No.40	0.1673	0.425	*68.2*
No.60	0.0984	0.25	*53.4*
No.100	0.0591	0.15	*34.8*
No.200	0.0295	0.075	*21.4*
% Clay	0.0079	0.02	19.4

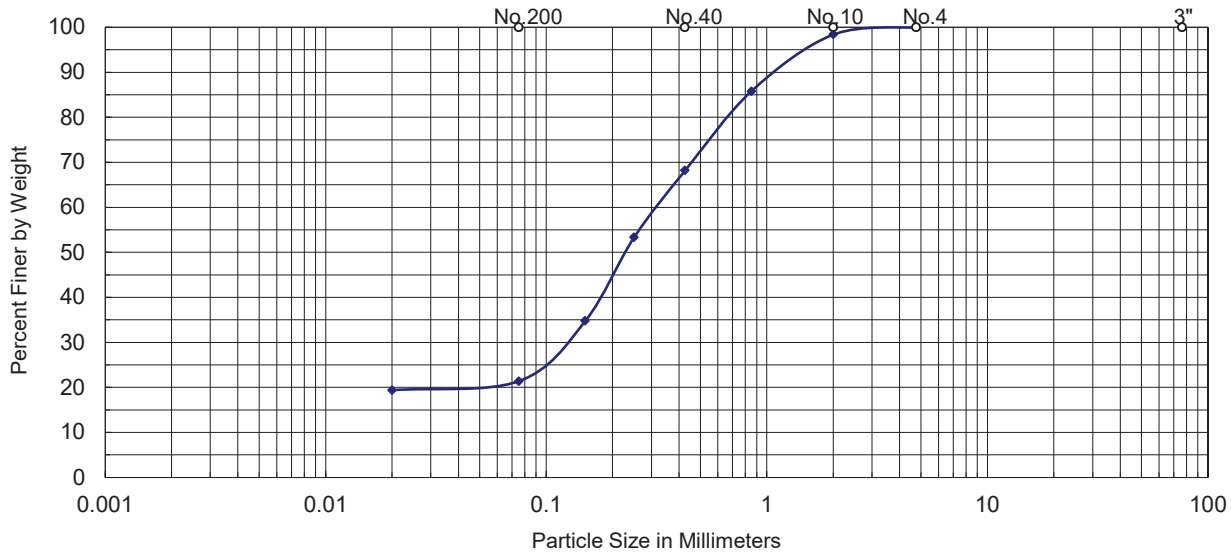
Atterberg Limits

Liquid limit (LL)	
Plastic Limit (PL)	
Plasticity Index (PI)	

D_{10} (mm) =	
D_{30} (mm) =	
D_{75} (mm) =	0.556
Coefficient of Uniformity, C_u =	
Coefficient of ccurvature, C_c =	

Organic Content, %	
Maximum Dry Density,pcf	
Volume Change, %	

Grain size distribution



Soil Classification

AASHTO	
USCS	SM - Silty sand
GDOT	

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Soil Classification

Project Name:	*Courtsey Pkwy*			Project Number:	*ROCK1701*
Sample Location:	*142+50, 50' Left*	Broing No.	W-4	Sample Depth:	*33.5'-35'*
Date Sampled:	*7/15/2019*	Sampled By:	*Jay Shah*		
Date Tested:	*4/1/2021*	Tested By:	*Randy R*		
Sample Description:	*Brown/grey mica silty sand*				

Sieve Analysis

US Sieve Size	Sieve Opening		% Passing
	(inch)	(mm)	
3 Inch	3.0000	76.2	
1.5 Inch	1.5000	38.1	
1 Inch	1.0000	25.4	
No.4	1.8701	4.75	*100.0*
No.10	0.7874	2.00	*97.4*
No.20	0.3346	0.85	*80.4*
No.40	0.1673	0.425	*61.0*
No.60	0.0984	0.25	*47.6*
No.100	0.0591	0.15	*30.2*
No.200	0.0295	0.075	*18.4*
% Clay	0.0079	0.02	16.4

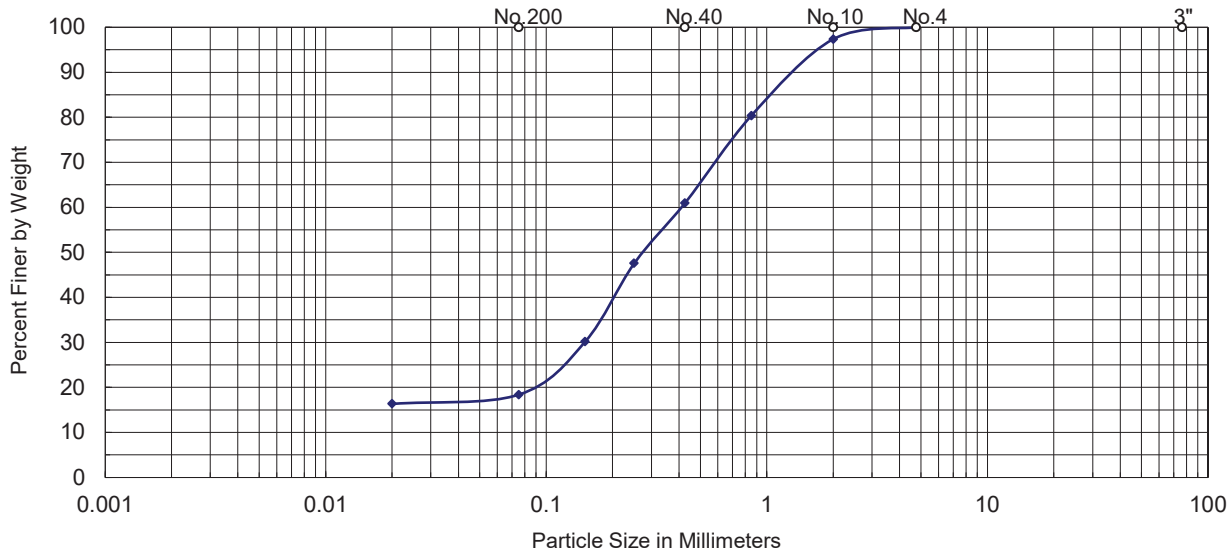
Atterberg Limits

Liquid limit (LL)	
Plastic Limit (PL)	
Plasticity Index (PI)	

D_{10} (mm) =	
D_{30} (mm) =	
D_{75} (mm) =	0.701
Coefficient of Uniformity, C_u =	
Coefficient of ccurvature, C_c =	

Organic Content, %	
Maximum Dry Density,pcf	
Volume Change, %	

Grain size distribution



Soil Classification

AASHTO	
USCS	SM - Silty sand
GDOT	

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Fax: 770-263-0166

Soil Classification

Project Name:	*Courtsey Pkwy*			Project Number:	*ROCK1701*
Sample Location:	*143+50,55' Right*	Boring	W-5	Sample Depth:	*1'-2.5'*
Date Sampled:	*7/15/2019*	Sampled By:	*Jay Shah*		
Date Tested:	*4/7/2021*	Tested By:	*Randy R*		
Sample Description:	*Brown mica sandy lean clay*				

Sieve Analysis

US Sieve Size	Sieve Opening		% Passing
	(inch)	(mm)	
3 Inch	3.0000	76.2	
1.5 Inch	1.5000	38.1	
1 Inch	1.0000	25.4	
No.4	1.8701	4.75	*100.0*
No.10	0.7874	2.00	*97.7*
No.20	0.3346	0.85	*91.2*
No.40	0.1673	0.425	*81.6*
No.60	0.0984	0.25	*75.6*
No.100	0.0591	0.15	*65.3*
No.200	0.0295	0.075	*53.6*
% Clay	0.0079	0.02	45.6

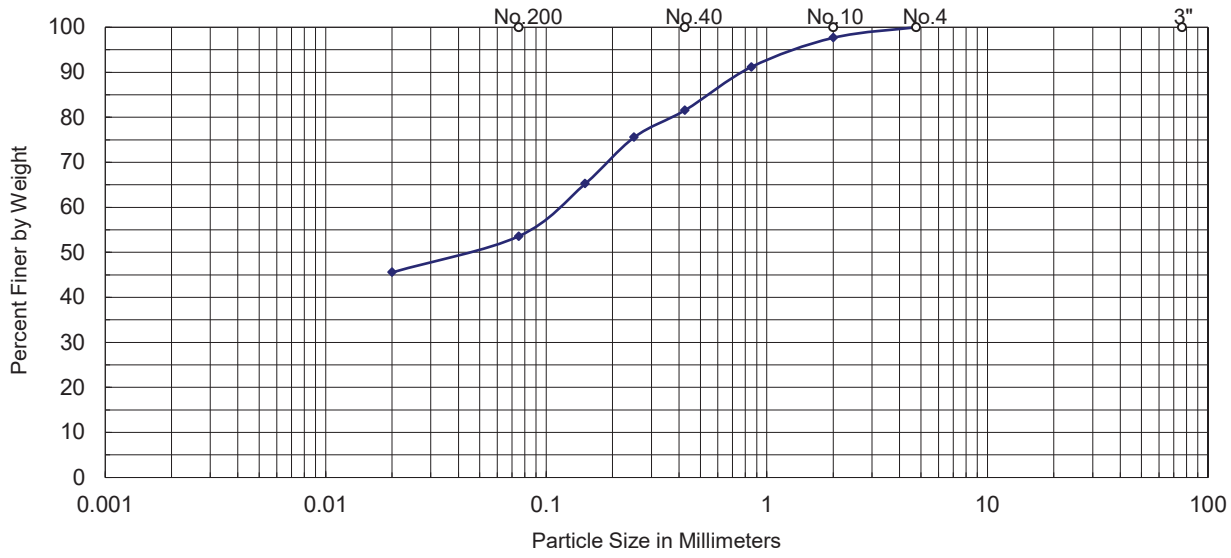
Atterberg Limits

Liquid limit (LL)	*48*
Plastic Limit (PL)	*22*
Plasticity Index (PI)	*26*

D_{10} (mm) =	
D_{30} (mm) =	
D_{75} (mm) =	0.243
Coefficient of Uniformity, C_u =	
Coefficient of ccurvature, C_c =	

Organic Content, %	
Maximum Dry Density,pcf	
Volume Change, %	

Grain size distribution



Soil Classification

AASHTO	
USCS	CL - Sandy lean clay
GDOT	

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Fax: 770-263-0166

Soil Classification

Project Name:	*Courtsey Pkwy*			Project Number:	*ROCK1701*
Sample Location:	*143+50, 55' Right*	Boring	W-5	Sample Depth:	*18.5'-20'*
Date Sampled:	*7/15/2019*	Sampled By:	*Jay Shah*		
Date Tested:	*4/1/2021*	Tested By:	*Randy R*		
Sample Description:	*Grey silty sand*				

Sieve Analysis

US Sieve Size	Sieve Opening		% Passing
	(inch)	(mm)	
3 Inch	3.0000	76.2	
1.5 Inch	1.5000	38.1	
1 Inch	1.0000	25.4	
No.4	1.8701	4.75	*100.0*
No.10	0.7874	2.00	*95.3*
No.20	0.3346	0.85	*83.6*
No.40	0.1673	0.425	*69.4*
No.60	0.0984	0.25	*55.1*
No.100	0.0591	0.15	*36.9*
No.200	0.0295	0.075	*22.6*
% Clay	0.0079	0.02	21

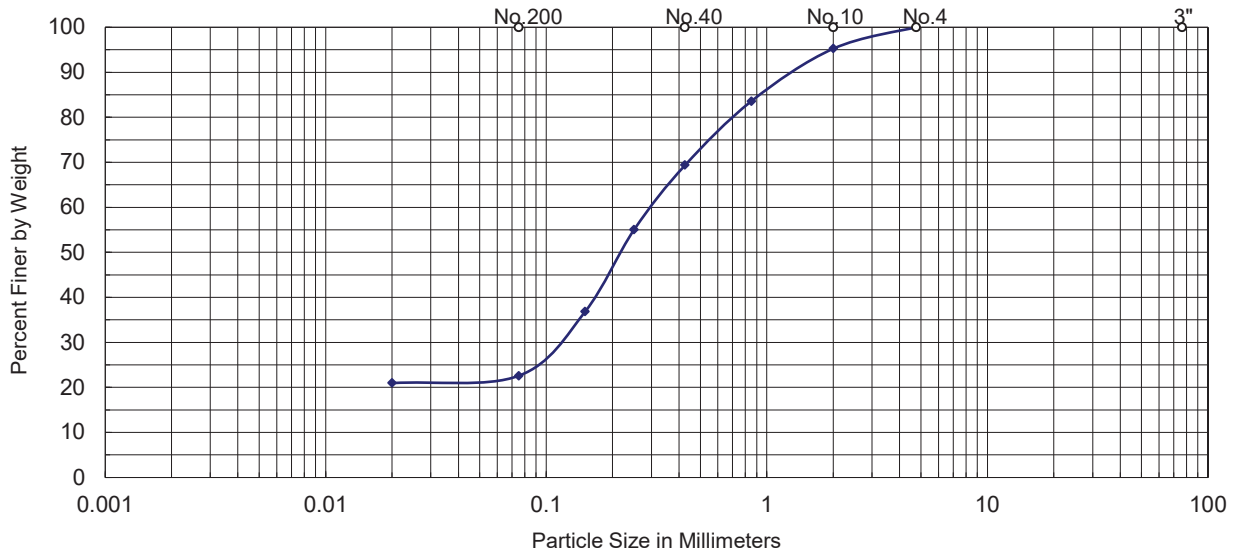
Atterberg Limits

Liquid limit (LL)	
Plastic Limit (PL)	
Plasticity Index (PI)	

D_{10} (mm) =	
D_{30} (mm) =	
D_{75} (mm) =	0.559
Coefficient of Uniformity, C_u =	
Coefficient of ccurvature, C_c =	

Organic Content, %	
Maximum Dry Density,pcf	
Volume Change, %	

Grain size distribution



Soil Classification

AASHTO	
USCS	SM - Silty sand
GDOT	

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Duluth, Georgia 30096
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Fax: 770-263-0166

Soil Classification

Project Name:	*Courtsey Pkwy*			Project Number:	*ROCK1701*
Sample Location:	*143+50, 55' right*	Boring	W-5	Sample Depth:	*33.5'-35'*
Date Sampled:	*7/15/2019*	Sampled By:	*Jay Shah*		
Date Tested:	*4/1/2021*	Tested By:	*Randy R*		
Sample Description:	*Brown/grey mica silty sand*				

Sieve Analysis

US Sieve Size	Sieve Opening		% Passing
	(inch)	(mm)	
3 Inch	3.0000	76.2	
1.5 Inch	1.5000	38.1	
1 Inch	1.0000	25.4	
No.4	1.8701	4.75	*100.0*
No.10	0.7874	2.00	*99.3*
No.20	0.3346	0.85	*82.0*
No.40	0.1673	0.425	*62.2*
No.60	0.0984	0.25	*48.6*
No.100	0.0591	0.15	*30.8*
No.200	0.0295	0.075	*18.8*
% Clay	0.0079	0.02	14.6

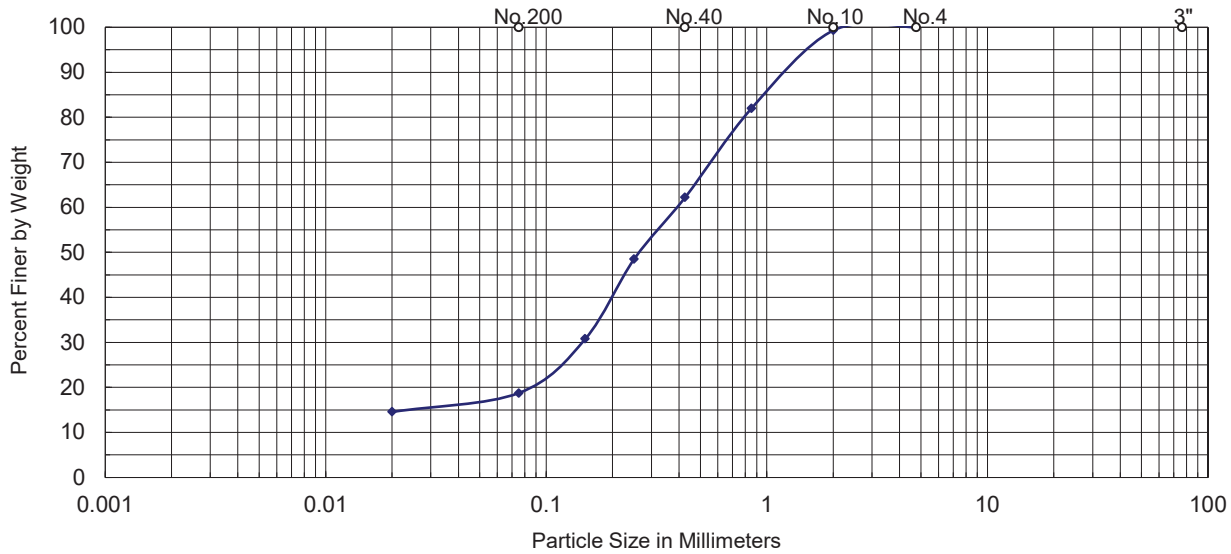
Atterberg Limits

Liquid limit (LL)	
Plastic Limit (PL)	
Plasticity Index (PI)	

D_{10} (mm) =	
D_{30} (mm) =	
D_{75} (mm) =	0.665
Coefficient of Uniformity, C_u =	
Coefficient of ccurvature, C_c =	

Organic Content, %	
Maximum Dry Density,pcf	
Volume Change, %	

Grain size distribution



Soil Classification

AASHTO	
USCS	SM - Silty sand
GDOT	

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Duluth, Georgia 30096
Tel: 770-2635945
Fax: 770-263-0166

Soil Classification

Project Name:	*Courtsey Pkwy*			Project Number:	*ROCK1701*
Sample Location:	*145+50,70' Right*	Boring	W-6	Sample Depth:	*3.5'-5'*
Date Sampled:	*7/15/2019*	Sampled By:	*Jay Shah*		
Date Tested:	*4/7/2021*	Tested By:	*Randy R*		
Sample Description:	*Brown mica sandy lean clay*				

Sieve Analysis

US Sieve Size	Sieve Opening		% Passing
	(inch)	(mm)	
3 Inch	3.0000	76.2	
1.5 Inch	1.5000	38.1	
1 Inch	1.0000	25.4	
No.4	1.8701	4.75	*100.0*
No.10	0.7874	2.00	*97.7*
No.20	0.3346	0.85	*91.2*
No.40	0.1673	0.425	*81.6*
No.60	0.0984	0.25	*75.6*
No.100	0.0591	0.15	*65.3*
No.200	0.0295	0.075	*53.6*
% Clay	0.0079	0.02	45.6

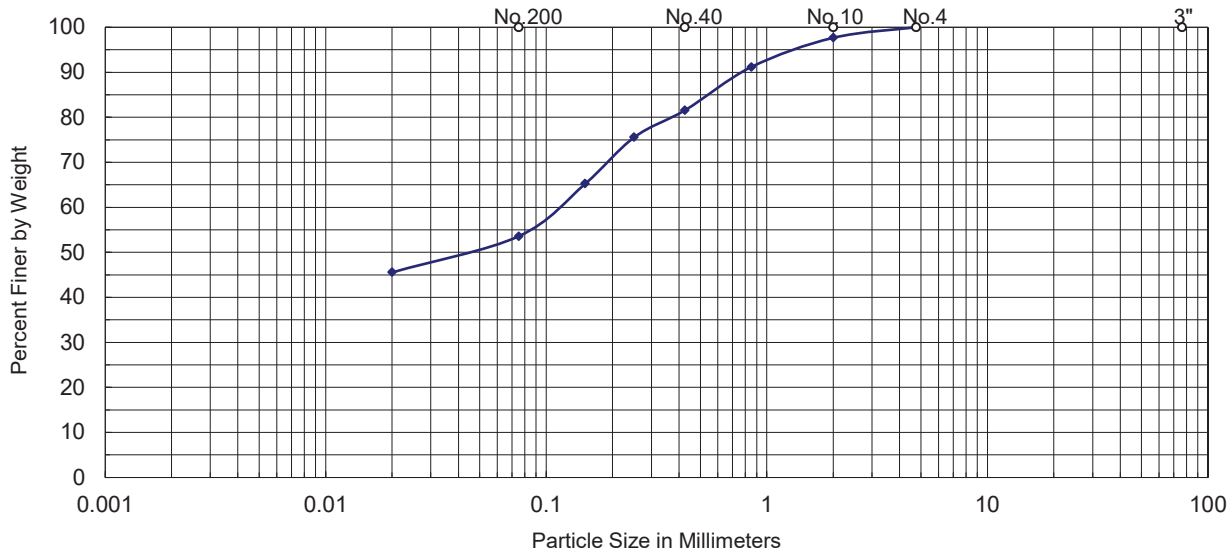
Atterberg Limits

Liquid limit (LL)	*44*
Plastic Limit (PL)	*22*
Plasticity Index (PI)	*22*

D_{10} (mm) =	
D_{30} (mm) =	
D_{75} (mm) =	0.243
Coefficient of Uniformity, C_u =	
Coefficient of ccurvature, C_c =	

Organic Content, %	
Maximum Dry Density,pcf	
Volume Change, %	

Grain size distribution



Soil Classification

AASHTO	
USCS	CL - Sandy lean clay
GDOT	

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Fax: 770-263-0166

Soil Classification

Project Name:	*Courtsey Pkwy*			Project Number:	*ROCK1701*
Sample Location:	*145+50, 70' Right*	Boring	W-6	Sample Depth:	*23.5-25'*
Date Sampled:	*7/15/2019*	Sampled By:	*Jay Shah*		
Date Tested:	*4/1/2021*	Tested By:	*Randy R*		
Sample Description:	*Grey silty sand*				

Sieve Analysis

US Sieve Size	Sieve Opening		% Passing
	(inch)	(mm)	
3 Inch	3.0000	76.2	
1.5 Inch	1.5000	38.1	
1 Inch	1.0000	25.4	
No.4	1.8701	4.75	*100.0*
No.10	0.7874	2.00	*95.7*
No.20	0.3346	0.85	*83.6*
No.40	0.1673	0.425	*69.4*
No.60	0.0984	0.25	*55.5*
No.100	0.0591	0.15	*34.1*
No.200	0.0295	0.075	*25.1*
% Clay	0.0079	0.02	18.7

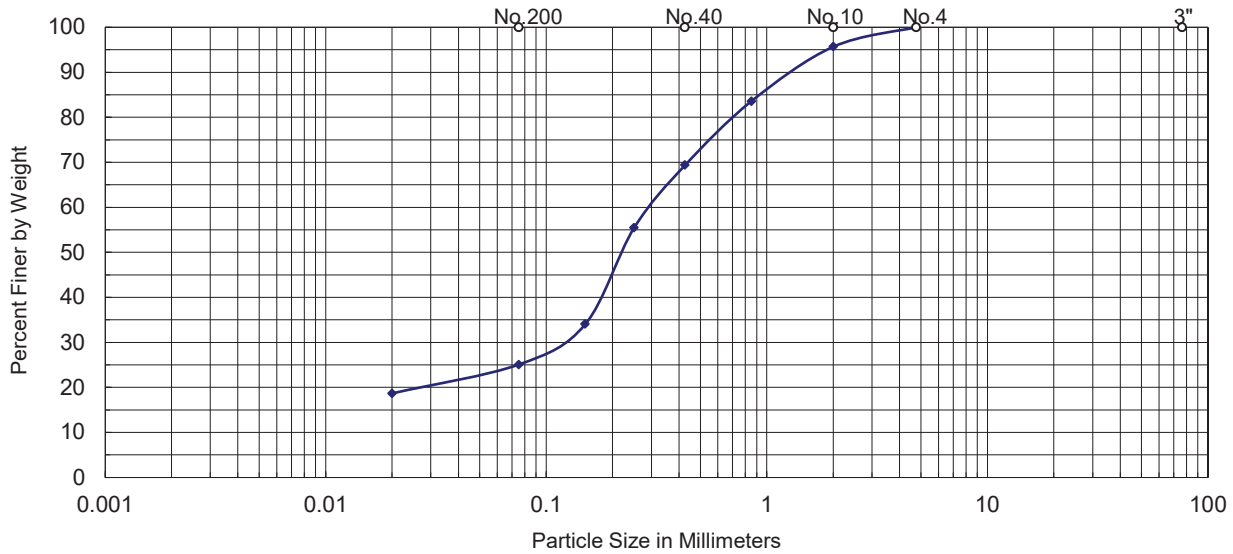
Atterberg Limits

Liquid limit (LL)	
Plastic Limit (PL)	
Plasticity Index (PI)	

D_{10} (mm) =	
D_{30} (mm) =	
D_{75} (mm) =	0.559
Coefficient of Uniformity, C_u =	
Coefficient of ccurvature, C_c =	

Organic Content, %	
Maximum Dry Density,pcf	
Volume Change, %	

Grain size distribution



Soil Classification

AASHTO	
USCS	SM - Silty sand
GDOT	

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Soil Classification

Project Name:	*Courtsey Pkwy*			Project Number:	*ROCK1701*
Sample Location:	*137+65, 32' Left*	Broing No.	B-1	Sample Depth:	*3.5'-5'*
Date Sampled:	*7/11/2019*	Sampled By:	*Jay Shah*		
Date Tested:	*3/30/2021*	Tested By:	*Randy R*		
Sample Description:	*Brown mica sandy lean clay*				

Sieve Analysis

US Sieve Size	Sieve Opening		% Passing
	(inch)	(mm)	
3 Inch	3.0000	76.2	
1.5 Inch	1.5000	38.1	
1 Inch	1.0000	25.4	
No.4	1.8701	4.75	*100.0*
No.10	0.7874	2.00	*99.6*
No.20	0.3346	0.85	*92.4*
No.40	0.1673	0.425	*77.8*
No.60	0.0984	0.25	*69.2*
No.100	0.0591	0.15	*56.6*
No.200	0.0295	0.075	*53.1*
% Clay	0.0079	0.02	47.6

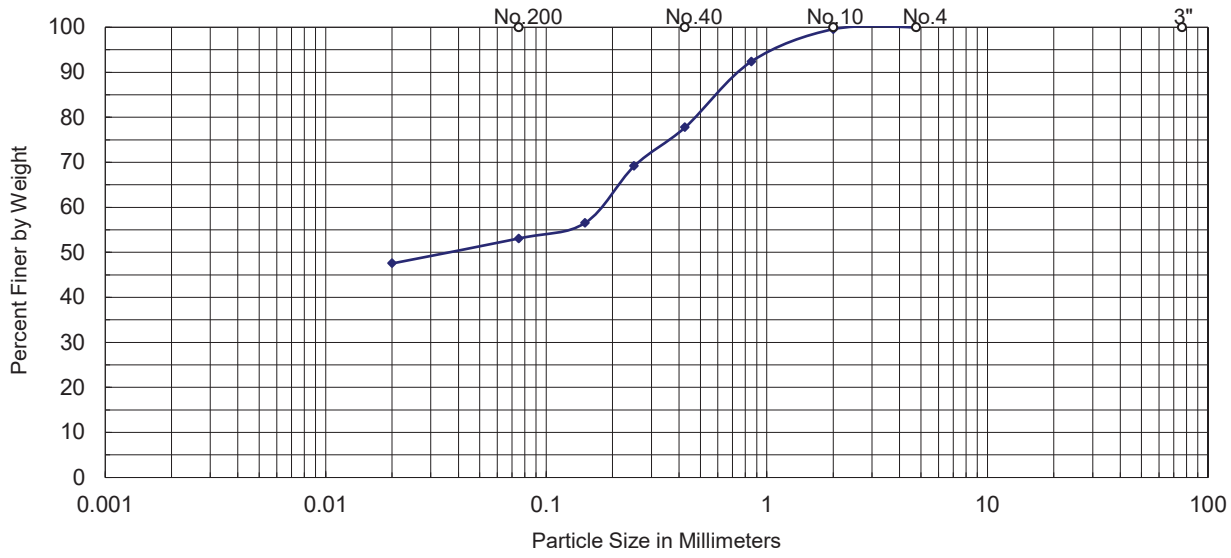
Atterberg Limits

Liquid limit (LL)	*39*
Plastic Limit (PL)	*25*
Plasticity Index (PI)	*14*

D_{10} (mm) =	
D_{30} (mm) =	
D_{75} (mm) =	
Coefficient of Uniformity, C_u =	
Coefficient of ccurvature, C_c =	

Organic Content, %	
Maximum Dry Density,pcf	
Volume Change, %	

Grain size distribution



Soil Classification

AASHTO	
USCS	CL - Sandy lean clay
GDOT	

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Soil Classification

Project Name:	*Courtsey Pkwy*			Project Number:	*ROCK1701*
Sample Location:	*137+65, 32' Left*	Broing No.	B-1	Sample Depth:	*18.5'-20'*
Date Sampled:	*7/11/2019*	Sampled By:	*Jay Shah*		
Date Tested:	*3/30/2021*	Tested By:	*Randy R*		
Sample Description:	*Grey/brown mica silty sand*				

Sieve Analysis

US Sieve Size	Sieve Opening		% Passing
	(inch)	(mm)	
3 Inch	3.0000	76.2	
1.5 Inch	1.5000	38.1	
1 Inch	1.0000	25.4	
No.4	1.8701	4.75	*100.0*
No.10	0.7874	2.00	*98.8*
No.20	0.3346	0.85	*85.8*
No.40	0.1673	0.425	*65.8*
No.60	0.0984	0.25	*53.0*
No.100	0.0591	0.15	*36.4*
No.200	0.0295	0.075	*24.4*
% Clay	0.0079	0.02	22.6

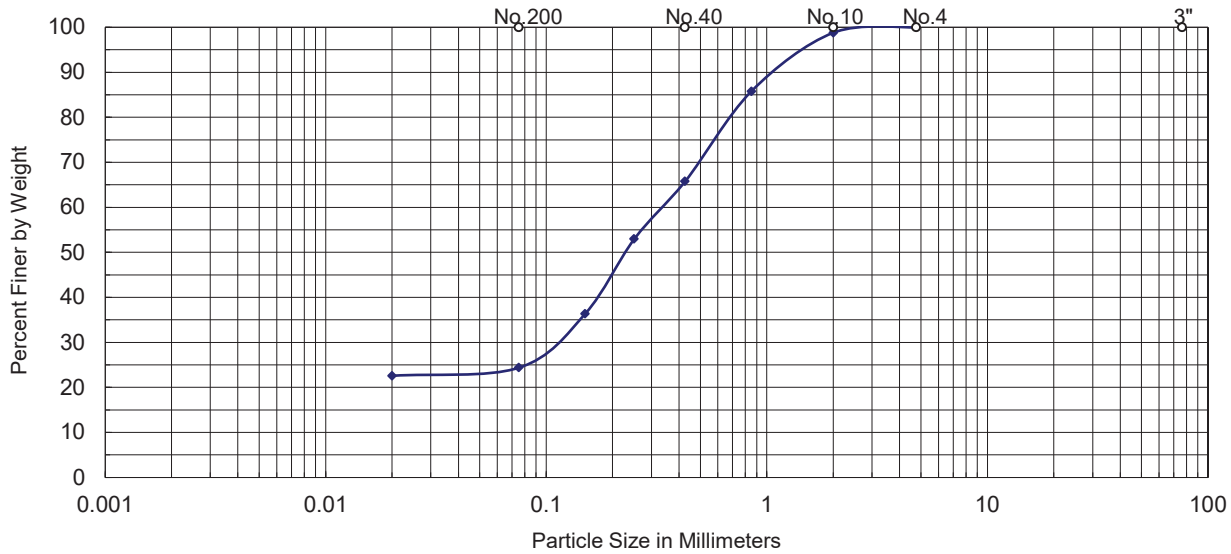
Atterberg Limits

Liquid limit (LL)	
Plastic Limit (PL)	
Plasticity Index (PI)	

D_{10} (mm) =	
D_{30} (mm) =	
D_{75} (mm) =	0.585
Coefficient of Uniformity, C_u =	
Coefficient of ccurvature, C_c =	

Organic Content, %	
Maximum Dry Density,pcf	
Volume Change, %	

Grain size distribution



Soil Classification

AASHTO	
USCS	SM - Silty sand
GDOT	

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Soil Classification

Project Name:	*Courtsey Pkwy*			Project Number:	*ROCK1701*
Sample Location:	*137+65, 45' Right*	Broing No.	B-2	Sample Depth:	*3.5'-5'*
Date Sampled:	*7/11/2019*	Sampled By:	*Jay Shah*		
Date Tested:	*3/30/2021*	Tested By:	*Randy R*		
Sample Description:	*Light brown/Grey mica sandy lean clay*				

Sieve Analysis

US Sieve Size	Sieve Opening		% Passing
	(inch)	(mm)	
3 Inch	3.0000	76.2	
1.5 Inch	1.5000	38.1	
1 Inch	1.0000	25.4	
No.4	1.8701	4.75	*100.0*
No.10	0.7874	2.00	*99.0*
No.20	0.3346	0.85	*85.8*
No.40	0.1673	0.425	*68.6*
No.60	0.0984	0.25	*62.3*
No.100	0.0591	0.15	*55.4*
No.200	0.0295	0.075	*52.6*
% Clay	0.0079	0.02	39.8

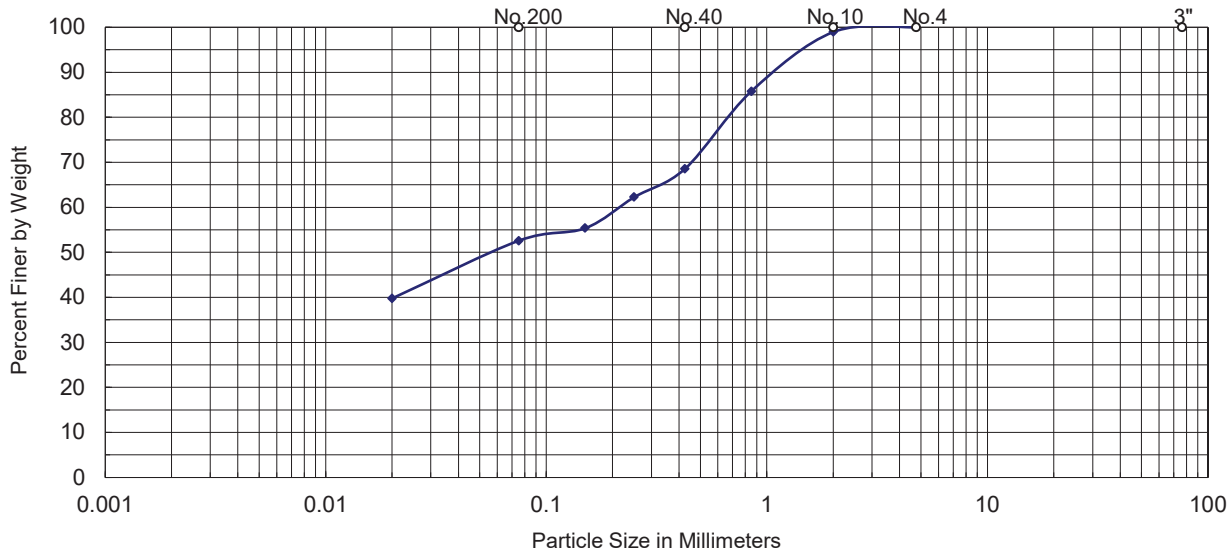
Atterberg Limits

Liquid limit (LL)	*42*
Plastic Limit (PL)	*24*
Plasticity Index (PI)	*18*

D_{10} (mm) =	
D_{30} (mm) =	
D_{75} (mm) =	0.2926
Coefficient of Uniformity, C_u =	
Coefficient of ccurvature, C_c =	

Organic Content, %	
Maximum Dry Density,pcf	
Volume Change, %	

Grain size distribution



Soil Classification

AASHTO	
USCS	CL - Sandy lean clay
GDOT	

2450 Commerce Avenue
Suite 100
Duluth, Georgia 30096
Tel: 770-2635945
Fax: 770-263-0166

Soil Classification

Project Name:	*Courtsey Pkwy*			Project Number:	*ROCK1701*
Sample Location:	*137+65, 45' Right*	Broing No.	B-2	Sample Depth:	*6'-7.5'*
Date Sampled:	*7/11/2019*	Sampled By:	*Jay Shah*		
Date Tested:	*3/30/2021*	Tested By:	*Randy R*		
Sample Description:	*White/ Light Grey mica sandy silt*				

Sieve Analysis

US Sieve Size	Sieve Opening		% Passing
	(inch)	(mm)	
3 Inch	3.0000	76.2	
1.5 Inch	1.5000	38.1	
1 Inch	1.0000	25.4	
No.4	1.8701	4.75	*100.0*
No.10	0.7874	2.00	*99.2*
No.20	0.3346	0.85	*88.0*
No.40	0.1673	0.425	*70.4*
No.60	0.0984	0.25	*65.0*
No.100	0.0591	0.15	*58.0*
No.200	0.0295	0.075	*51.0*
% Clay	0.0079	0.02	29.4

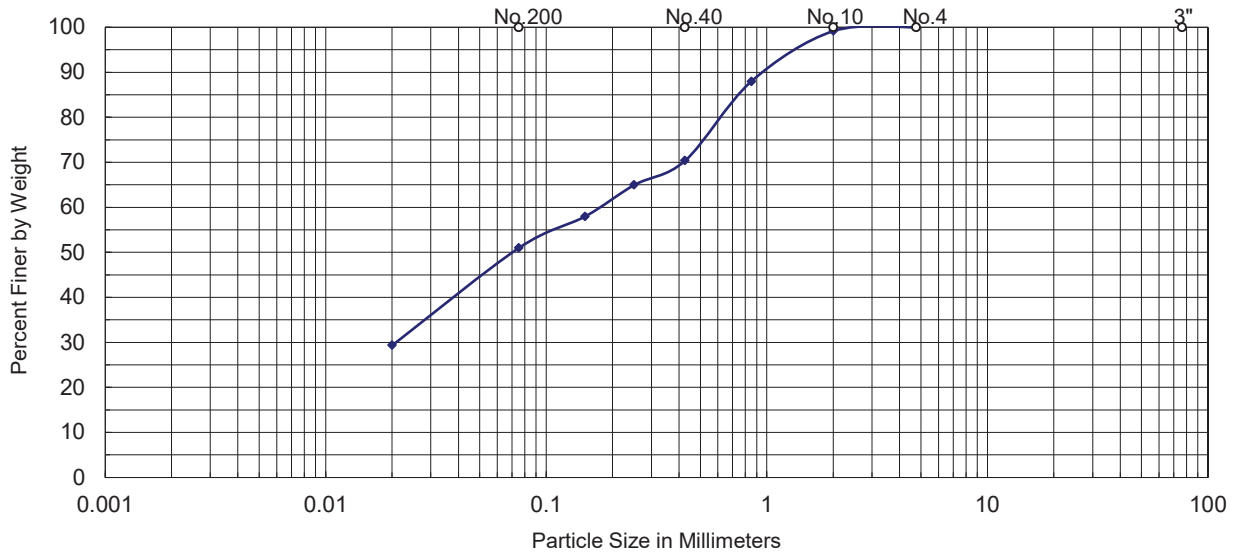
Atterberg Limits

Liquid limit (LL)	
Plastic Limit (PL)	
Plasticity Index (PI)	

D_{10} (mm) =	
D_{30} (mm) =	
D_{75} (mm) =	0.509
Coefficient of Uniformity, C_u =	
Coefficient of ccurvature, C_c =	

Organic Content, %	
Maximum Dry Density,pcf	
Volume Change, %	

Grain size distribution



Soil Classification

AASHTO	
USCS	ML - Sandy silt
GDOT	

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Duluth, Georgia 30096
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Fax: 770-263-0166

Soil Classification

Project Name:	*Courtsey Pkwy*			Project Number:	*ROCK1701*
Sample Location:	*137+65 , 45' Right*	Broing No.	B-2	Sample Depth:	*18.5'-20'*
Date Sampled:	*7/11/2019*	Sampled By:	*Jay Shah*		
Date Tested:	*3/30/2021*	Tested By:	*Randy R*		
Sample Description:	*Grey mica silty sand*				

Sieve Analysis

US Sieve Size	Sieve Opening		% Passing
	(inch)	(mm)	
3 Inch	3.0000	76.2	
1.5 Inch	1.5000	38.1	
1 Inch	1.0000	25.4	
No.4	1.8701	4.75	*100.0*
No.10	0.7874	2.00	*98.0*
No.20	0.3346	0.85	*84.6*
No.40	0.1673	0.425	*66.6*
No.60	0.0984	0.25	*55.6*
No.100	0.0591	0.15	*40.0*
No.200	0.0295	0.075	*28.8*
% Clay	0.0079	0.02	27

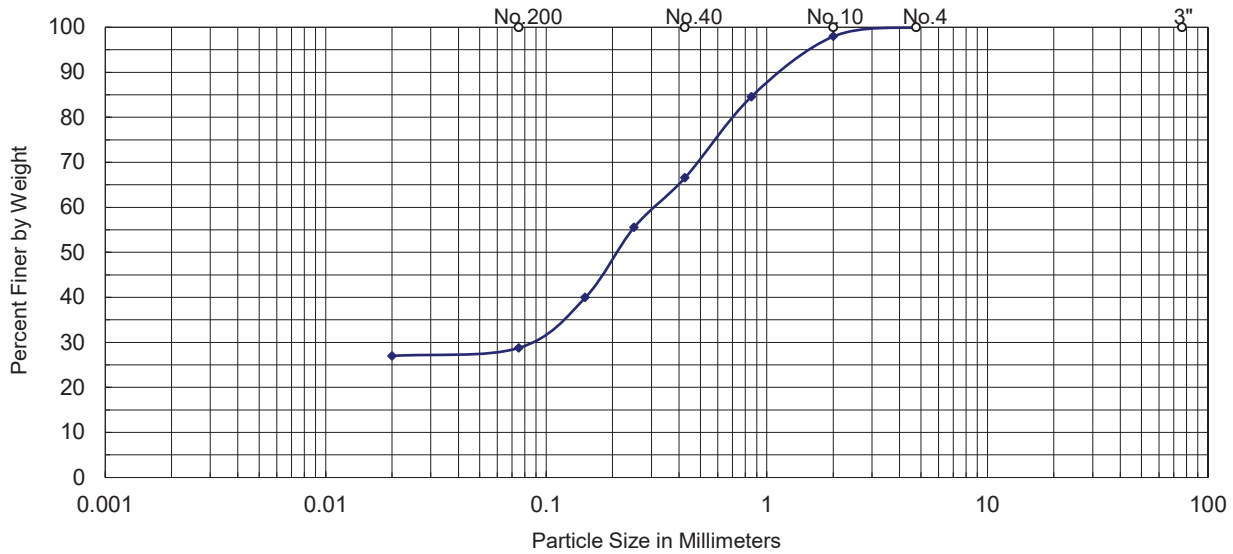
Atterberg Limits

Liquid limit (LL)	
Plastic Limit (PL)	
Plasticity Index (PI)	

D_{10} (mm) =	
D_{30} (mm) =	
D_{75} (mm) =	0.587
Coefficient of Uniformity, C_u =	
Coefficient of ccurvature, C_c =	

Organic Content, %	
Maximum Dry Density,pcf	
Volume Change, %	

Grain size distribution



Soil Classification

AASHTO	
USCS	SM - Silty sand
GDOT	

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Duluth, Georgia 30096
Tel: 770-2635945
Fax: 770-263-0166

Soil Classification

Project Name:	*Courtsey Pkwy*			Project Number:	*ROCK1701*
Sample Location:	*140+78, 45' Left*	Broing No.	B-7	Sample Depth:	*0'-1.5'*
Date Sampled:	*7/16/2019*	Sampled By:	*Jay Shah*		
Date Tested:	*4/1/2021*	Tested By:	*Randy R*		
Sample Description:	*Pink/Brown mica sandy lean clay*				

Sieve Analysis

US Sieve Size	Sieve Opening		% Passing
	(inch)	(mm)	
3 Inch	3.0000	76.2	
1.5 Inch	1.5000	38.1	
1 Inch	1.0000	25.4	
No.4	1.8701	4.75	*100.0*
No.10	0.7874	2.00	*98.6*
No.20	0.3346	0.85	*87.4*
No.40	0.1673	0.425	*75.4*
No.60	0.0984	0.25	*66.4*
No.100	0.0591	0.15	*59.6*
No.200	0.0295	0.075	*51.2*
% Clay	0.0079	0.02	34.2

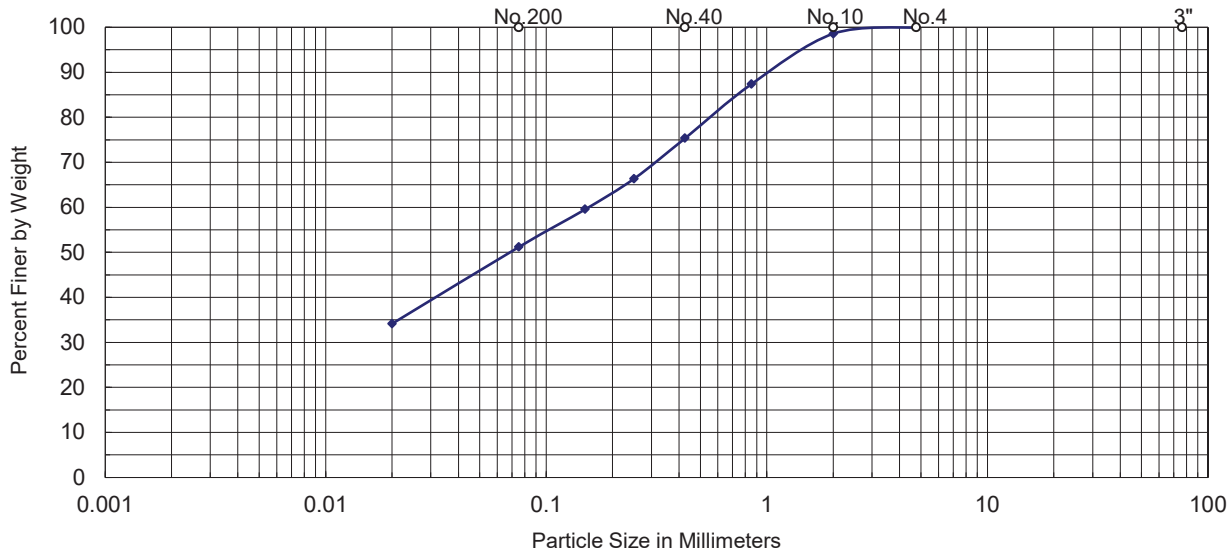
Atterberg Limits

Liquid limit (LL)	*35*
Plastic Limit (PL)	*13*
Plasticity Index (PI)	*22*

D_{10} (mm) =	
D_{30} (mm) =	
D_{75} (mm) =	0.4151
Coefficient of Uniformity, C_u =	
Coefficient of ccurvature, C_c =	

Organic Content, %	
Maximum Dry Density,pcf	
Volume Change, %	

Grain size distribution



Soil Classification

AASHTO	
USCS	CL - Sandy lean clay
GDOT	

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Duluth, Georgia 30096
Tel: 770-2635945
Fax: 770-263-0166

Soil Classification

Project Name:	*Courtsey Pkwy*			Project Number:	*ROCK1701*
Sample Location:	*140+78, 45' Left*	Broing No.	B-7	Sample Depth:	*13.5'-15'*
Date Sampled:	*7/12/2019*	Sampled By:	*Jay Shah*		
Date Tested:	*4/1/2021*	Tested By:	*Randy R*		
Sample Description:	*Grey/White silty sand with rock*				

Sieve Analysis

US Sieve Size	Sieve Opening		% Passing
	(inch)	(mm)	
3 Inch	3.0000	76.2	
1.5 Inch	1.5000	38.1	
1 Inch	1.0000	25.4	
No.4	1.8701	4.75	*100.0*
No.10	0.7874	2.00	*95.2*
No.20	0.3346	0.85	*73.6*
No.40	0.1673	0.425	*54.0*
No.60	0.0984	0.25	*44.4*
No.100	0.0591	0.15	*31.2*
No.200	0.0295	0.075	*23.4*
% Clay	0.0079	0.02	22.2

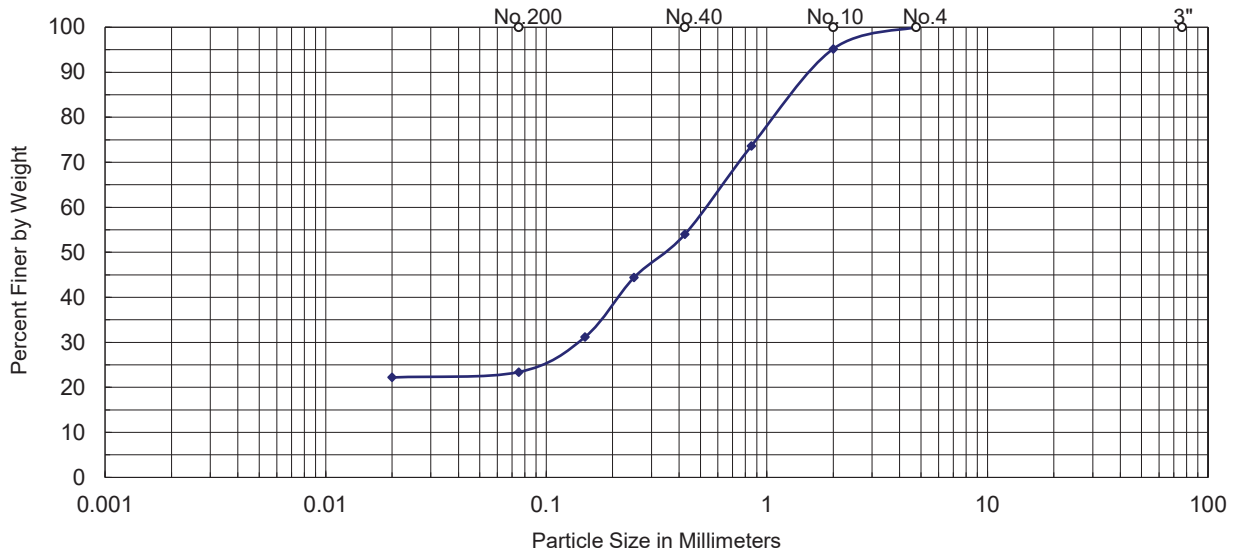
Atterberg Limits

Liquid limit (LL)	
Plastic Limit (PL)	
Plasticity Index (PI)	

D_{10} (mm) =	
D_{30} (mm) =	
D_{75} (mm) =	0.8985
Coefficient of Uniformity, C_u =	
Coefficient of ccurvature, C_c =	

Organic Content, %	
Maximum Dry Density,pcf	
Volume Change, %	

Grain size distribution



Soil Classification

AASHTO	
USCS	SM - Silty sand
GDOT	

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Suite 100
Duluth, Georgia 30096
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Fax: 770-263-0166

Soil Classification

Project Name:	*Courtsey Pkwy*			Project Number:	*ROCK1701*
Sample Location:	*140+78, 45' Left*	Broing No.	B-7	Sample Depth:	*23.5'-25'*
Date Sampled:	*7/12/2019*	Sampled By:	*Jay Shah*		
Date Tested:	*4/1/2021*	Tested By:	*Randy R*		
Sample Description:	*Brown/white mica silty sand*				

Sieve Analysis

US Sieve Size	Sieve Opening		% Passing
	(inch)	(mm)	
3 Inch	3.0000	76.2	
1.5 Inch	1.5000	38.1	
1 Inch	1.0000	25.4	
No.4	1.8701	4.75	*100.0*
No.10	0.7874	2.00	*98.6*
No.20	0.3346	0.85	*89.4*
No.40	0.1673	0.425	*72.0*
No.60	0.0984	0.25	*53.2*
No.100	0.0591	0.15	*34.0*
No.200	0.0295	0.075	*21.4*
% Clay	0.0079	0.02	18.8

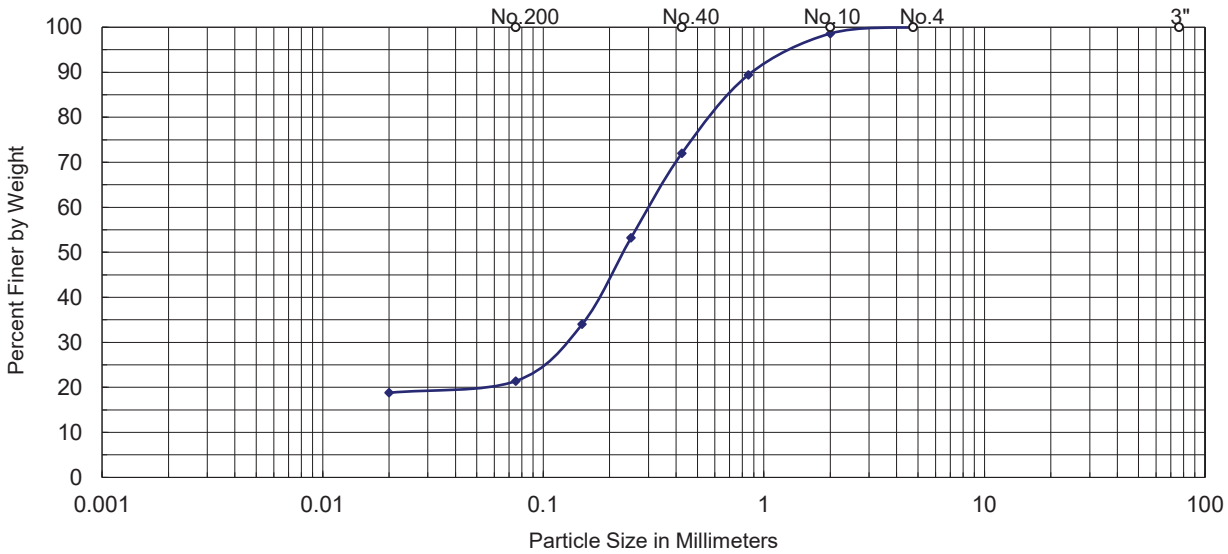
Atterberg Limits

Liquid limit (LL)	
Plastic Limit (PL)	
Plasticity Index (PI)	

D_{10} (mm) =	
D_{30} (mm) =	
D_{75} (mm) =	0.4790
Coefficient of Uniformity, C_u =	
Coefficient of ccurvature, C_c =	

Organic Content, %	
Maximum Dry Density,pcf	
Volume Change, %	

Grain size distribution



Soil Classification

AASHTO	
USCS	SM - Silty sand
GDOT	

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Duluth, Georgia 30096
Tel: 770-2635945
Fax: 770-263-0166

Soil Classification

Project Name:	*Courtsey Pkwy*			Project Number:	*ROCK1701*
Sample Location:	*140+78, 35' Right*	Broing No.	B-8	Sample Depth:	*0'-1.5'*
Date Sampled:	*7/16/2019*	Sampled By:	*Jay Shah*		
Date Tested:	*4/7/2021*	Tested By:	*Randy R*		
Sample Description:	*Red/Brown mica sandy lean clay*				

Sieve Analysis

US Sieve Size	Sieve Opening		% Passing
	(inch)	(mm)	
3 Inch	3.0000	76.2	
1.5 Inch	1.5000	38.1	
1 Inch	1.0000	25.4	
No.4	1.8701	4.75	*100.0*
No.10	0.7874	2.00	*99.2*
No.20	0.3346	0.85	*88.2*
No.40	0.1673	0.425	*70.2*
No.60	0.0984	0.25	*64.4*
No.100	0.0591	0.15	*57.3*
No.200	0.0295	0.075	*51.4*
% Clay	0.0079	0.02	36.2

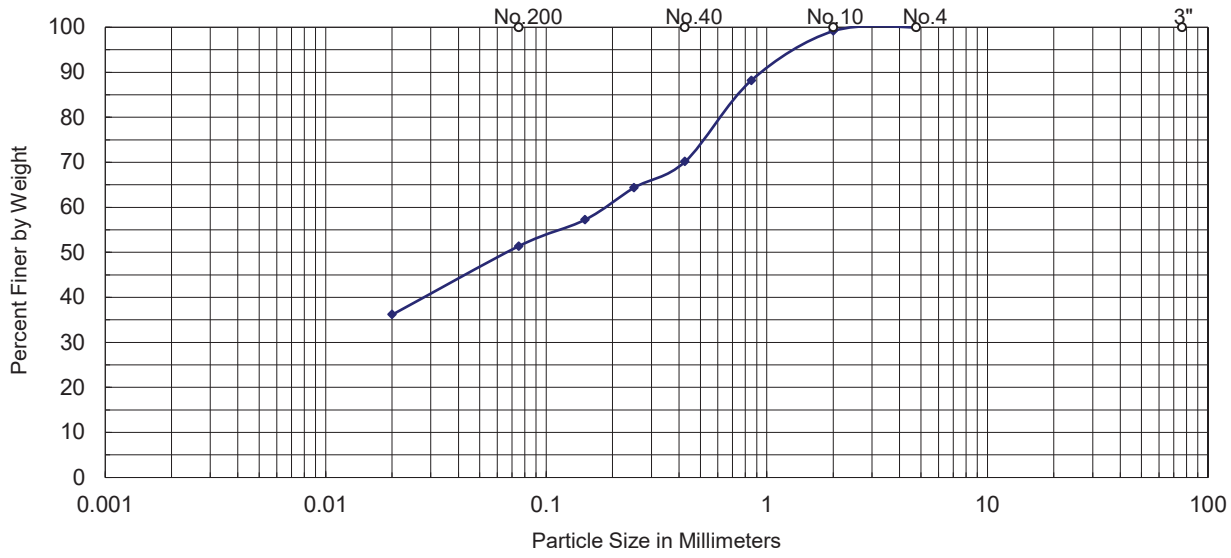
Atterberg Limits

Liquid limit (LL)	*49*
Plastic Limit (PL)	*23*
Plasticity Index (PI)	*26*

D_{10} (mm) =	
D_{30} (mm) =	
D_{75} (mm) =	0.5113
Coefficient of Uniformity, C_u =	
Coefficient of ccurvature, C_c =	

Organic Content, %	
Maximum Dry Density,pcf	
Volume Change, %	

Grain size distribution



Soil Classification

AASHTO	
USCS	CL - Sandy lean clay
GDOT	

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Duluth, Georgia 30096
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Fax: 770-263-0166

Soil Classification

Project Name:	*Courtsey Pkwy*			Project Number:	*ROCK1701*
Sample Location:	*140+78, 35' Right*	Broing No.	B-8	Sample Depth:	*8.5'-10'*
Date Sampled:	*7/16/2019*	Sampled By:	*Jay Shah*		
Date Tested:	*4/7/2021*	Tested By:	*Randy R*		
Sample Description:	*Dark grey/White mica silty sand*				

Sieve Analysis

US Sieve Size	Sieve Opening		% Passing
	(inch)	(mm)	
3 Inch	3.0000	76.2	
1.5 Inch	1.5000	38.1	
1 Inch	1.0000	25.4	
No.4	1.8701	4.75	*100.0*
No.10	0.7874	2.00	*98.2*
No.20	0.3346	0.85	*86.2*
No.40	0.1673	0.425	*65.4*
No.60	0.0984	0.25	*49.6*
No.100	0.0591	0.15	*31.8*
No.200	0.0295	0.075	*20.4*
% Clay	0.0079	0.02	19

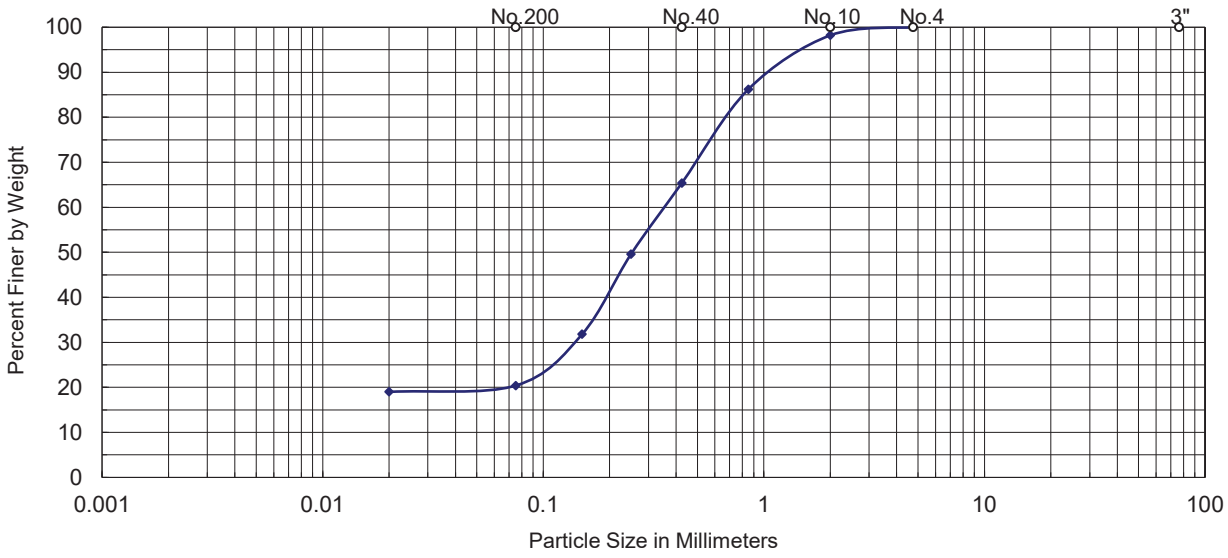
Atterberg Limits

Liquid limit (LL)	
Plastic Limit (PL)	
Plasticity Index (PI)	

D_{10} (mm) =	
D_{30} (mm) =	
D_{75} (mm) =	0.5852
Coefficient of Uniformity, C_u =	
Coefficient of ccurvature, C_c =	

Organic Content, %	
Maximum Dry Density,pcf	
Volume Change, %	

Grain size distribution



Soil Classification

AASHTO	
USCS	SM - Silty sand
GDOT	

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Duluth, Georgia 30096
Tel: 770-2635945
Fax: 770-263-0166

Soil Classification

Project Name:	*Courtsey Pkwy*			Project Number:	*ROCK1701*
Sample Location:	*140+78, 35' Right*	Broing No.	B-8	Sample Depth:	*18.5'-20'*
Date Sampled:	*7/16/2019*	Sampled By:	*Jay Shah*		
Date Tested:	*4/7/2021*	Tested By:	*Randy R*		
Sample Description:	*Dark Grey/White mica silty sand*				

Sieve Analysis

US Sieve Size	Sieve Opening		% Passing
	(inch)	(mm)	
3 Inch	3.0000	76.2	
1.5 Inch	1.5000	38.1	
1 Inch	1.0000	25.4	
No.4	1.8701	4.75	*100.0*
No.10	0.7874	2.00	*95.4*
No.20	0.3346	0.85	*78.8*
No.40	0.1673	0.425	*59.8*
No.60	0.0984	0.25	*44.6*
No.100	0.0591	0.15	*28.2*
No.200	0.0295	0.075	*18.2*
% Clay	0.0079	0.02	16.6

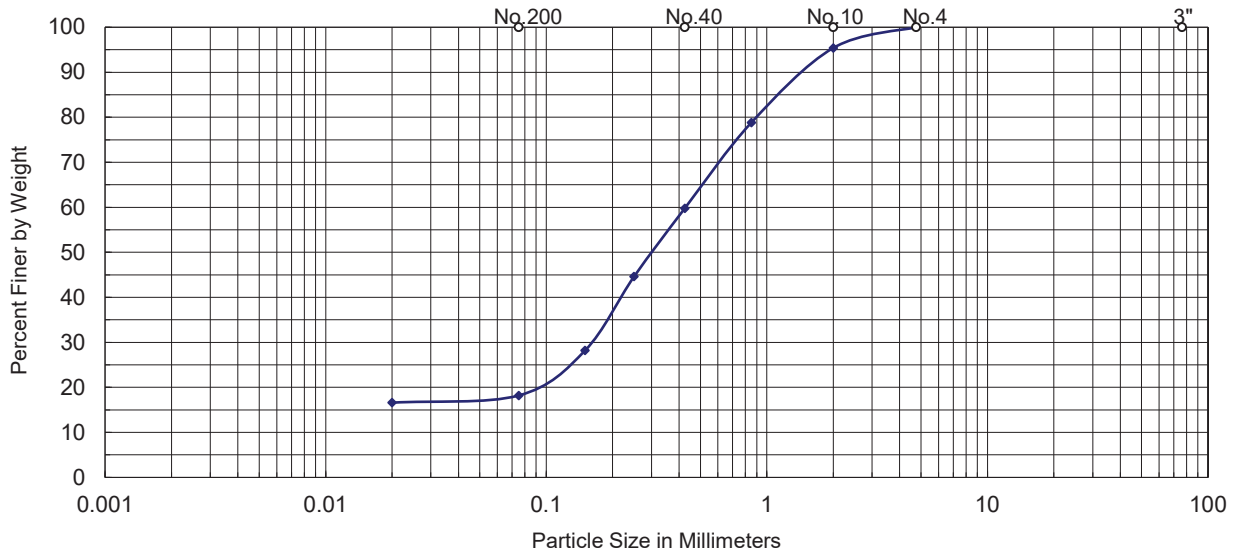
Atterberg Limits

Liquid limit (LL)	
Plastic Limit (PL)	
Plasticity Index (PI)	

D_{10} (mm) =	
D_{30} (mm) =	
D_{75} (mm) =	0.7400
Coefficient of Uniformity, C_u =	
Coefficient of ccurvature, C_c =	

Organic Content, %	
Maximum Dry Density,pcf	
Volume Change, %	

Grain size distribution



Soil Classification

AASHTO	
USCS	SM - Silty sand
GDOT	

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Suite 100
Duluth, Georgia 30096
Tel: 770-2635945
Fax: 770-263-0166

Soil Classification

Project Name:	*Courtsey Pkwy*			Project Number:	*ROCK1701*
Sample Location:	*140+78, 35' Right*	Broing No.	B-8	Sample Depth:	*23.5'-25'*
Date Sampled:	*7/16/2019*	Sampled By:	*Jay Shah*		
Date Tested:	*4/7/2021*	Tested By:	*Randy R*		
Sample Description:	*Light grey/White silty sand*				

Sieve Analysis

US Sieve Size	Sieve Opening		% Passing
	(inch)	(mm)	
3 Inch	3.0000	76.2	
1.5 Inch	1.5000	38.1	
1 Inch	1.0000	25.4	
No.4	1.8701	4.75	*100.0*
No.10	0.7874	2.00	*92.0*
No.20	0.3346	0.85	*69.8*
No.40	0.1673	0.425	*52.4*
No.60	0.0984	0.25	*43.0*
No.100	0.0591	0.15	*29.4*
No.200	0.0295	0.075	*20.0*
% Clay	0.0079	0.02	19.2

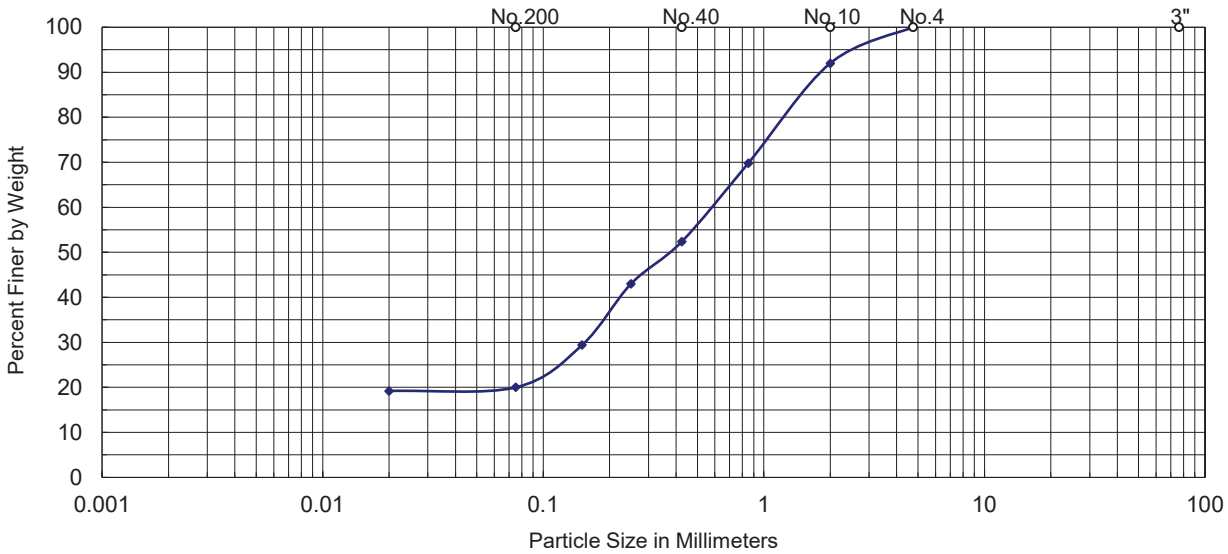
Atterberg Limits

Liquid limit (LL)	
Plastic Limit (PL)	
Plasticity Index (PI)	

D_{10} (mm) =	
D_{30} (mm) =	
D_{75} (mm) =	1.0386
Coefficient of Uniformity, C_u =	
Coefficient of ccurvature, C_c =	

Organic Content, %	
Maximum Dry Density,pcf	
Volume Change, %	

Grain size distribution



Soil Classification

AASHTO	
USCS	SM - Silty sand
GDOT	

Appendix E – Seismic site class determination

Courtsey Pkwy Ext. over Iris Dr., I-20 and Dogwood Dr., PI 0006934

Table 3.10.3.1-1—Site Class Definitions

Site Class	Soil Type and Profile
A	Hard rock with measured shear wave velocity, $\bar{v}_s > 5{,}000$ ft/s
B	Rock with 2,500 ft/sec $< \bar{v}_s < 5{,}000$ ft/s
C	Very dense soil and soil rock with 1,200 ft/sec $< \bar{v}_s < 2{,}500$ ft/s, or with either $\bar{N} > 50$ blows/ft, or $\bar{s}_u > 2.0$ ksf
D	Stiff soil with 600 ft/s $< \bar{v}_s < 1{,}200$ ft/s, or with either $15 < \bar{N} < 50$ blows/ft, or $1.0 < \bar{s}_u < 2.0$ ksf
E	Soil profile with $\bar{v}_s < 600$ ft/s or with either $\bar{N} < 15$ blows/ft or $\bar{s}_u < 1.0$ ksf, or any profile with more than 10.0 ft of soft clay defined as soil with $PI > 20$, $w > 40$ percent and $\bar{s}_u < 0.5$ ksf
F	Soils requiring site-specific evaluations, such as: • Peats or highly organic clays ($H > 10.0$ ft of peat or highly organic clay where H = thickness of soil) • Very high plasticity clays ($H > 25.0$ ft with $PI > 75$) • Very thick soft/medium stiff clays ($H > 120$ ft)

Boring W-1

Sample	di	N60	di/N60
1	2.5	6	0.4167
2	2.5	10	0.2500
3	2.5	11	0.2273
4	2.5	17	0.1471
5	5	14	0.3571
6	5	13	0.3846
7	5	13	0.3846
8	5	11	0.4545
9	5	21	0.2381
10	5	36	0.1389
11	5	100	0.0500
12	5	100	0.0500
13	5	100	0.0500
14	5	100	0.0500
15	5	100	0.0500
16	5	100	0.0500
17	5	100	0.0500
18	5	100	0.0500
19	5	100	0.0500
20	5	100	0.0500
21	5	100	0.0500
22	5	100	0.0500
∑di=	100	∑di/N60=	3.5989

Average N= 27.8

Site Class = D

Boring W-2

Sample	di	N60	di/N60
1	2.5	7	0.3571
2	2.5	13	0.1923
3	2.5	11	0.2273
4	2.5	21	0.1190
5	5	14	0.3571
6	5	8	0.6250
7	5	10	0.5000
8	5	8	0.6250
9	5	18	0.2778
10	5	18	0.2778
11	5	25	0.2000
12	5	100	0.0500
13	5	100	0.0500
14	5	100	0.0500
15	5	100	0.0500
16	5	100	0.0500
17	5	100	0.0500
18	5	100	0.0500
19	5	100	0.0500
20	5	100	0.0500
21	5	100	0.0500
22	5	100	0.0500
∑di=	100	∑di/N/60=	4.3085

Average N= 23.2

Site Class = D

Courtsey Pkwy Ext. over Iris Dr., I-20 and Dogwood Dr., PI 0006934

Table 3.10.3.1-1—Site Class Definitions

Site Class	Soil Type and Profile
A	Hard rock with measured shear wave velocity, $\bar{v}_s > 5{,}000$ ft/s
B	Rock with 2,500 ft/sec $< \bar{v}_s < 5{,}000$ ft/s
C	Very dense soil and soil rock with 1,200 ft/sec $< \bar{v}_s < 2{,}500$ ft/s, or with either $\bar{N} > 50$ blows/ft, or $\bar{s}_u > 2.0$ ksf
D	Stiff soil with 600 ft/s $< \bar{v}_s < 1{,}200$ ft/s, or with either $15 < \bar{N} < 50$ blows/ft, or $1.0 < \bar{s}_u < 2.0$ ksf
E	Soil profile with $\bar{v}_s < 600$ ft/s or with either $\bar{N} < 15$ blows/ft or $\bar{s}_u < 1.0$ ksf, or any profile with more than 10.0 ft of soft clay defined as soil with $PI > 20$, $w > 40$ percent and $\bar{s}_u < 0.5$ ksf
F	Soils requiring site-specific evaluations, such as: • Peats or highly organic clays ($H > 10.0$ ft of peat or highly organic clay where H = thickness of soil) • Very high plasticity clays ($H > 25.0$ ft with $PI > 75$) • Very thick soft/medium stiff clays ($H > 120$ ft)

Boring W-3

Sample	di	N60	di/N60
1	2.5	10	0.2500
2	2.5	8	0.3125
3	2.5	14	0.1786
4	2.5	14	0.1786
5	5	20	0.2500
6	5	8	0.6250
7	5	11	0.4545
8	5	6	0.8333
9	5	39	0.1282
10	5	100	0.0500
11	5	100	0.0500
12	5	100	0.0500
13	5	100	0.0500
14	5	100	0.0500
15	5	100	0.0500
16	5	100	0.0500
17	5	100	0.0500
18	5	100	0.0500
19	5	100	0.0500
20	5	100	0.0500
21	5	100	0.0500
22	5	100	0.0500
∑di=	100	∑di/N60=	3.8607

Average N= 25.9

Site Class = D

Boring W-4

Sample	di	N60	di/N60
1	2.5	17	0.1471
2	2.5	18	0.1389
3	2.5	11	0.2273
4	2.5	8	0.3125
5	5	7	0.7143
6	5	8	0.6250
7	5	7	0.7143
8	5	10	0.5000
9	5	24	0.2083
10	5	17	0.2941
11	5	14	0.3571
12	5	17	0.2941
13	5	100	0.0500
14	5	100	0.0500
15	5	100	0.0500
16	5	100	0.0500
17	5	100	0.0500
18	5	100	0.0500
19	5	100	0.0500
20	5	100	0.0500
21	5	100	0.0500
22	5	100	0.0500
∑di=	100	∑di/N/60=	5.0330

Average N= 19.9

Site Class = D

Courtsey Pkwy Ext. over Iris Dr., I-20 and Dogwood Dr., PI 0006934

Table 3.10.3.1-1—Site Class Definitions

Site Class	Soil Type and Profile
A	Hard rock with measured shear wave velocity, $\bar{v}_s > 5{,}000$ ft/s
B	Rock with 2,500 ft/sec $< \bar{v}_s < 5{,}000$ ft/s
C	Very dense soil and soil rock with 1,200 ft/sec $< \bar{v}_s < 2{,}500$ ft/s, or with either $\bar{N} > 50$ blows/ft, or $\bar{s}_u > 2.0$ ksf
D	Stiff soil with 600 ft/s $< \bar{v}_s < 1{,}200$ ft/s, or with either $15 < \bar{N} < 50$ blows/ft, or $1.0 < \bar{s}_u < 2.0$ ksf
E	Soil profile with $\bar{v}_s < 600$ ft/s or with either $\bar{N} < 15$ blows/ft or $\bar{s}_u < 1.0$ ksf, or any profile with more than 10.0 ft of soft clay defined as soil with $PI > 20$, $w > 40$ percent and $\bar{s}_u < 0.5$ ksf
F	Soils requiring site-specific evaluations, such as: • Peats or highly organic clays ($H > 10.0$ ft of peat or highly organic clay where H = thickness of soil) • Very high plasticity clays ($H > 25.0$ ft with $PI > 75$) • Very thick soft/medium stiff clays ($H > 120$ ft)

Boring W-5

Sample	di	N60	di/N60
1	2.5	10	0.2500
2	2.5	10	0.2500
3	2.5	11	0.2273
4	2.5	13	0.1923
5	5	11	0.4545
6	5	11	0.4545
7	5	13	0.3846
8	5	8	0.6250
9	5	27	0.1852
10	5	63	0.0794
11	5	100	0.0500
12	5	100	0.0500
13	5	100	0.0500
14	5	100	0.0500
15	5	100	0.0500
16	5	100	0.0500
17	5	100	0.0500
18	5	100	0.0500
19	5	100	0.0500
20	5	100	0.0500
21	5	100	0.0500
22	5	100	0.0500
∑di=	100	∑di/N60=	3.7028

Average N= 27.0
Site Class = D

Boring W-6

Sample	di	N60	di/N60
1	2.5	6	0.4167
2	2.5	4	0.6250
3	2.5	8	0.3125
4	2.5	7	0.3571
5	5	3	1.6667
6	5	4	1.2500
7	5	13	0.3846
8	5	15	0.3333
9	5	25	0.2000
10	5	38	0.1316
11	5	100	0.0500
12	5	100	0.0500
13	5	100	0.0500
14	5	100	0.0500
15	5	100	0.0500
16	5	100	0.0500
17	5	100	0.0500
18	5	100	0.0500
19	5	100	0.0500
20	5	100	0.0500
21	5	100	0.0500
22	5	100	0.0500
∑di=	100	∑di/N/60=	6.2775

Average N= 15.9
Site Class = D

Courtsey Pkwy Ext. over Iris Dr., I-20 and Dogwood Dr., PI 0006934

Table 3.10.3.1-1—Site Class Definitions

Site Class	Soil Type and Profile
A	Hard rock with measured shear wave velocity, $\bar{v}_s > 5{,}000$ ft/s
B	Rock with 2,500 ft/sec $< \bar{v}_s < 5{,}000$ ft/s
C	Very dense soil and soil rock with 1,200 ft/sec $< \bar{v}_s < 2{,}500$ ft/s, or with either $\bar{N} > 50$ blows/ft, or $\bar{s}_u > 2.0$ ksf
D	Stiff soil with 600 ft/s $< \bar{v}_s < 1{,}200$ ft/s, or with either $15 < \bar{N} < 50$ blows/ft, or $1.0 < \bar{s}_u < 2.0$ ksf
E	Soil profile with $\bar{v}_s < 600$ ft/s or with either $\bar{N} < 15$ blows/ft or $\bar{s}_u < 1.0$ ksf, or any profile with more than 10.0 ft of soft clay defined as soil with $PI > 20$, $w > 40$ percent and $\bar{s}_u < 0.5$ ksf
F	Soils requiring site-specific evaluations, such as: • Peats or highly organic clays ($H > 10.0$ ft of peat or highly organic clay where H = thickness of soil) • Very high plasticity clays ($H > 25.0$ ft with $PI > 75$) • Very thick soft/medium stiff clays ($H > 120$ ft)

Boring B-1

Sample	di	N60	di/N60
1	2.5	14	0.1786
2	2.5	15	0.1667
3	2.5	17	0.1471
4	2.5	17	0.1471
5	5	21	0.2381
6	5	21	0.2381
7	5	11	0.4545
8	5	14	0.3571
9	5	15	0.3333
10	5	8	0.6250
11	5	53	0.0943
12	5	100	0.0500
13	5	100	0.0500
14	5	100	0.0500
15	5	100	0.0500
16	5	100	0.0500
17	5	100	0.0500
18	5	100	0.0500
19	5	100	0.0500
20	5	100	0.0500
21	5	100	0.0500
22	5	100	0.0500
∑di=	100	∑di/N60=	3.5299

Average N= 28.3
Site Class = D

Boring B-2

Sample	di	N60	di/N60
1	2.5	11	0.2273
2	2.5	13	0.1923
3	2.5	15	0.1667
4	2.5	21	0.1190
5	5	25	0.2000
6	5	18	0.2778
7	5	25	0.2000
8	5	14	0.3571
9	5	10	0.5000
10	5	20	0.2500
11	5	100	0.0500
12	5	100	0.0500
13	5	100	0.0500
14	5	100	0.0500
15	5	100	0.0500
16	5	100	0.0500
17	5	100	0.0500
18	5	100	0.0500
19	5	100	0.0500
20	5	100	0.0500
21	5	100	0.0500
22	5	100	0.0500
∑di=	100	∑di/N/60=	3.0902

Average N= 32.4
Site Class = D

Courtsey Pkwy Ext. over Iris Dr., I-20 and Dogwood Dr., PI 0006934

Table 3.10.3.1-1—Site Class Definitions

Site Class	Soil Type and Profile
A	Hard rock with measured shear wave velocity, $\bar{v}_s > 5{,}000$ ft/s
B	Rock with 2,500 ft/sec $< \bar{v}_s < 5{,}000$ ft/s
C	Very dense soil and soil rock with 1,200 ft/sec $< \bar{v}_s < 2{,}500$ ft/s, or with either $\bar{N} > 50$ blows/ft, or $\bar{s}_u > 2.0$ ksf
D	Stiff soil with 600 ft/s $< \bar{v}_s < 1{,}200$ ft/s, or with either $15 < \bar{N} < 50$ blows/ft, or $1.0 < \bar{s}_u < 2.0$ ksf
E	Soil profile with $\bar{v}_s < 600$ ft/s or with either $\bar{N} < 15$ blows/ft or $\bar{s}_u < 1.0$ ksf, or any profile with more than 10.0 ft of soft clay defined as soil with $PI > 20$, $w > 40$ percent and $\bar{s}_u < 0.5$ ksf
F	Soils requiring site-specific evaluations, such as: • Peats or highly organic clays ($H > 10.0$ ft of peat or highly organic clay where H = thickness of soil) • Very high plasticity clays ($H > 25.0$ ft with $PI > 75$) • Very thick soft/medium stiff clays ($H > 120$ ft)

Boring B-7

Sample	di	N60	di/N60
1	2.5	15	0.1667
2	2.5	11	0.2273
3	2.5	14	0.1786
4	2.5	14	0.1786
5	5	11	0.4545
6	5	10	0.5000
7	5	18	0.2778
8	5	100	0.0500
9	5	100	0.0500
10	5	100	0.0500
11	5	100	0.0500
12	5	100	0.0500
13	5	100	0.0500
14	5	100	0.0500
15	5	100	0.0500
16	5	100	0.0500
17	5	100	0.0500
18	5	100	0.0500
19	5	100	0.0500
20	5	100	0.0500
21	5	100	0.0500
22	5	100	0.0500
∑di=	100	∑di/N60=	2.7334

Average N= 36.6
Site Class = D

Boring B-8

Sample	di	N60	di/N60
1	2.5	8	0.3125
2	2.5	11	0.2273
3	2.5	17	0.1471
4	2.5	11	0.2273
5	5	11	0.4545
6	5	8	0.6250
7	5	17	0.2941
8	5	100	0.0500
9	5	100	0.0500
10	5	100	0.0500
11	5	100	0.0500
12	5	100	0.0500
13	5	100	0.0500
14	5	100	0.0500
15	5	100	0.0500
16	5	100	0.0500
17	5	100	0.0500
18	5	100	0.0500
19	5	100	0.0500
20	5	100	0.0500
21	5	100	0.0500
22	5	100	0.0500
∑di=	100	∑di/N/60=	3.0378

Average N= 32.9
Site Class = D

Appendix F – Wall foundation design data

DESIGNER: ATLAS
DATE: April 19, 2021
PI NUMBER: CSSTP-0006-00(934)
PROJECT: Courtesy Parkway Extension Over Iris Drive, Interstate 20, And Dogwood Drive
FROM: Jaime Mandujano, EIT, Bridge Engineer, Atlas Technical Consultants, LLC
TO: Yong Shao, Ph.D. PE Atlas Technical Consultants, LLC

SUBJECT: **WALL FOUNDATION DESIGN DATA (LRFD)**

The following design information has been calculated for the below listed structures. Please use the provided values to complete the Wall Foundation Investigation report for this project.

Structural Data For Foundation Design								
Wall #	Design Height (ft)	Location	Description	Strap Length (ft)	Strength		Service	
					Bearing Pressure (ksf)	B'=L-2e (ft)	Bearing Pressure (ksf)	B'=L-2e (ft)
1	15	133+25.00 Rt to 133+58.50 Rt 304+92.00 Rt to 304+72.73 Rt	Along Roadway	11	3.57	7.59	2.89	8.65
1	20	133+58.50 Rt to 134+78.00 Rt 305+25.00 Rt to 304+92.00 Rt	Along Roadway	14	4.66	9.42	3.80	10.88
1	25	134+78.00 Rt to 135+27.00 Rt 306+25.53 Rt to 305+25.00 Rt	Along Roadway	18	5.46	12.58	4.56	14.32
1	30	135+27.00 Rt to 135+92.00 Rt 137+20.00 Rt to 137+70.23 Rt	Along Roadway	21	6.53	14.43	5.45	16.56
1	34	135+92.00 Rt to 137+20.00 Rt	Along Roadway	24	7.22	16.71	6.09	19.08
2	15	146+00.00 Lt to 145+63.00 Lt	Along Roadway	11	3.57	7.59	2.89	8.65
2	20	145+63.00 Lt to 145+39.00 Lt 145+33.00 Rt to 146+13.00 Rt 146+29.00 Rt to 146+50.00 Rt	Along Roadway	14	4.66	9.42	3.80	10.88

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2	25	145+39.00 Lt to 145+23.00 Lt 144+54.25 Rt to 145+33.00 Rt 146+13.00 Rt to 146+29.00 Rt	Along Roadway	18	5.46	12.58	4.56	14.32
2	30	145+23.00 Lt to 145+08.00 Lt 141+50.00 Rt to 144+54.25 Rt	Along Roadway	21	6.53	14.43	5.45	16.56
2	35	145+08.00 Lt to 141+44.00 Lt	Along Roadway	25	7.33	17.60	6.22	20.01
2	39	141+44.00 Lt to 140+72.23 Lt 880+60.71 Lt to 809+59.98 Lt 140+72.23 Rt to 141+50.00 Rt	Along Roadway	28	8.04	19.87	6.86	22.52
LL Surcharge = 0.25 ksf								

If you have any questions please contact Jaime Mandujano of Atlas Technical Consultants at 770-263-5945 or Jaime.Mandujano@oneatlas.com

Appendix G – Bearing resistance calculations

Standard Penetration Test Data		
GDOT Project ID:	0006934	← data entry
Project Name:	Courtesy Pkwy	← data entry
Location:	Wall 1	← data entry
Boring Number:	W-1	← data entry
Date:	15-Nov	← data entry

SPT procedures per ASTM D 1586

Additional Notes:

Section 1 - Design Height = 15ft
133+25.00,Rt – 133+58.50,Rt.

FOUNDATION SHAPES and GEOMETRY

Footing Length L (ft) =	34	← data entry if known
Footing Width B (ft) =	7.59	← data entry if known
Current Case - L/B =	4	
Square - L/B =	1	
Rectangular - L/B =	5	
Strip - L/B =	10	

SPECIFIC SETTLEMENT VALUE (

1	← data entry
1.5	← data entry
2	← data entry
2.5	← data entry
3	← data entry
3.5	← data entry
4	← data entry

Total Number of Readings	10
Number of Clay Readings	2
% Clay Readings	20

Note: "CLAY" means any of the following: CL, CH, ML, MH, CL-ML, (

CONTACT GEOTECH ENGINEER - CONSIDER CLAY %

Ground Water Table	30	feet	← data entry
Energy Rating	84	%	← data entry

SPT DATA INPUT: PLEASE ENTER EITHER
(a) Raw Field Blows in Columns B, C, & D or put (b) Measured N-value (bpf) in column I

Advisory Note: If the bottom of wall footing/leveling pad/spread footing elevation is more than5 feet below the ground elevation in your boring log, begin inputting boring log data from the elevation that corresponds to5 feet above the bottom of wall footing/leveling pad/spread footing elevation.

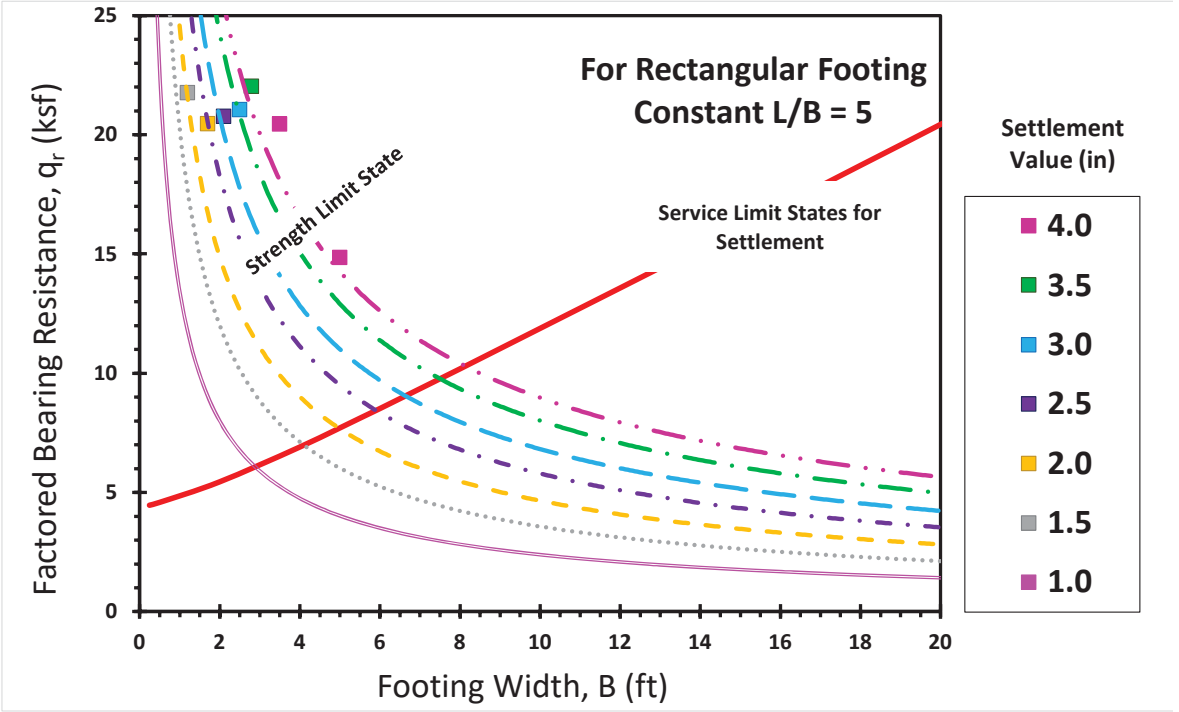
	Raw SPT Blows Per 6 inches			
	#1	#2	#3	N-value (bpf)
data entry →	2	2	2	4
data entry →	3	3	4	7
data entry →	4	4	4	8
data entry →	3	6	6	12
data entry →	5	5	5	10
data entry →	3	4	5	9
data entry →	3	4	5	9
data entry →	4	4	4	8
data entry →	6	7	8	15
data entry →	8	10	16	26

	Depth	SPT Reading	USCS
	(feet)	N-value (bpf)	Soil Type
	0.00		
data entry →	2.50		CL
data entry →	5.00		CL
data entry →	7.50		SM
data entry →	10.00		SM
data entry →	15.00		SM
data entry →	20.00		SM
data entry →	25.00		SM
data entry →	30.00		SM
data entry →	35.00		SM
data entry →	40.00		SM

Rectangular Footing Solution for L/B = 5

Effective Cohesion Intercept , c' (ksf) =	0
Effective Friction Angle, ϕ' (deg) =	33.80
Rectangular Distortion Ratio (L/B) =	5.00
Embedment Depth, D_f (ft) =	2.00
Ground Water Table, D_w (ft) =	30.00
Average Bulk UW, γ_{bulk} (kcf) =	0.12
Layer Thickness, h (ft) =	48.00
Modulus of Foundation, E_{FDTN} (ksf) =	4000
Poisson's Ratio of Soil=	0.20
Poisson's Ratio of Foundation=	0.20
Soil Modulus of Elasticity, E' (ksf) =	387.54
Footing Thickness, t (ft) =	0.00

Friction Angle, ϕ_f	Cohesion BC Term, N_c	Unit Weight BC Term, N_γ	Surcharge BC Term, N_q	Resistance Factor, ϕ_b
33.80	41.426	39.808	28.732	0.4



1.0

Settlement, s (in)	Settlement, s (ft)	Footing Width, B (ft)	Footing Length, L (ft)	Equivalent Diameter, d_e (ft)	Layer Thickness, h (ft)	Shape Disp. factor, I_H	Efdtn (ksf)	Esoil (ksf)	Foundation Thickness, t (ft)	Fdtn Flexibility factor, K_F	Fdtn Flexibility Factor, I_F	z_E (ft)	Embedment factor, I_E	q (ksf)
1	0.08	1.20	6.00	3.03	48	2.158	4000	387.54	0.00	0.00000	1.003	2	0.8928	14.51
1	0.08	2.00	10.00	5.05	48	2.095	4000	387.54	0.00	0.00000	1.003	2	0.9190	8.71
1	0.08	3.50	17.50	8.83	48	1.985	4000	387.54	0.00	0.00000	1.003	2	0.9445	5.11
1	0.08	6.00	30.00	15.14	48	1.827	4000	387.54	0.00	0.00000	1.003	2	0.9636	3.18
1	0.08	8.00	40.00	20.19	48	1.717	4000	387.54	0.00	0.00000	1.003	2	0.9714	2.51
1	0.08	12.00	60.00	30.28	48	1.533	4000	387.54	0.00	0.00000	1.003	2	0.9800	1.86
1	0.08	14.00	70.00	35.32	48	1.455	4000	387.54	0.00	0.00000	1.003	2	0.9827	1.68
1	0.08	16.00	80.00	40.37	48	1.384	4000	387.54	0.00	0.00000	1.003	2	0.9847	1.54
1	0.08	18.00	90.00	45.42	48	1.320	4000	387.54	0.00	0.00000	1.003	2	0.9863	1.43
1	0.08	20.00	100.00	50.46	48	1.262	4000	387.54	0.00	0.00000	1.003	2	0.9876	1.35
1	0.08	22.00	110.00	55.51	48	1.208	4000	387.54	0.00	0.00000	1.003	2	0.9886	1.28
1	0.08	24.00	120.00	60.56	48	1.159	4000	387.54	0.00	0.00000	1.003	2	0.9895	1.22
1	0.08	26.00	130.00	65.60	48	1.114	4000	387.54	0.00	0.00000	1.003	2	0.9903	1.17
1	0.08	28.00	140.00	70.65	48	1.072	4000	387.54	0.00	0.00000	1.003	2	0.9910	1.13
1	0.08	30.00	150.00	75.69	48	1.034	4000	387.54	0.00	0.00000	1.003	2	0.9915	1.09
1	0.08	32.00	160.00	80.74	48	0.998	4000	387.54	0.00	0.00000	1.003	2	0.9920	1.06
1	0.08	34.00	170.00	85.79	48	0.964	4000	387.54	0.00	0.00000	1.003	2	0.9925	1.03
1	0.08	38.00	190.00	95.88	48	0.903	4000	387.54	0.00	0.00000	1.003	2	0.9933	0.98
1	0.08	42.00	210.00	105.97	48	0.849	4000	387.54	0.00	0.00000	1.003	2	0.9939	0.95
1	0.08	7.59	37.95	19.15	48	1.738	4000	387.54	0.00	0.00000	1.003	2	0.9701	2.62

1.5

Settlement, s (in)	Settlement, s (ft)	Footing Width, B (ft)	Footing Length, L (ft)	Equivalent Diameter, d_e (ft)	Layer Thickness, h (ft)	Shape Disp. factor, I_H	Efdtn (ksf)	Esoil (ksf)	Foundation Thickness, t (ft)	Fdtn Flexibility factor, K_F	Fdtn Flexibility Factor, I_F	z_E (ft)	Embedment factor, I_E	q (ksf)
1.5	0.12	1.20	6.00	3.03	48	2.158	4000	387.54	0.00	0.00000	1.003	2	0.8928	21.77
1.5	0.12	2.00	10.00	5.05	48	2.095	4000	387.54	0.00	0.00000	1.003	2	0.9190	13.07
1.5	0.12	3.50	17.50	8.83	48	1.985	4000	387.54	0.00	0.00000	1.003	2	0.9445	7.67
1.5	0.12	6.00	30.00	15.14	48	1.827	4000	387.54	0.00	0.00000	1.003	2	0.9636	4.76
1.5	0.12	8.00	40.00	20.19	48	1.717	4000	387.54	0.00	0.00000	1.003	2	0.9714	3.77
1.5	0.12	12.00	60.00	30.28	48	1.533	4000	387.54	0.00	0.00000	1.003	2	0.9800	2.79
1.5	0.12	14.00	70.00	35.32	48	1.455	4000	387.54	0.00	0.00000	1.003	2	0.9827	2.51
1.5	0.12	16.00	80.00	40.37	48	1.384	4000	387.54	0.00	0.00000	1.003	2	0.9847	2.31
1.5	0.12	18.00	90.00	45.42	48	1.320	4000	387.54	0.00	0.00000	1.003	2	0.9863	2.15
1.5	0.12	20.00	100.00	50.46	48	1.262	4000	387.54	0.00	0.00000	1.003	2	0.9876	2.02
1.5	0.12	22.00	110.00	55.51	48	1.208	4000	387.54	0.00	0.00000	1.003	2	0.9886	1.91
1.5	0.12	24.00	120.00	60.56	48	1.159	4000	387.54	0.00	0.00000	1.003	2	0.9895	1.83
1.5	0.12	26.00	130.00	65.60	48	1.114	4000	387.54	0.00	0.00000	1.003	2	0.9903	1.75
1.5	0.12	28.00	140.00	70.65	48	1.072	4000	387.54	0.00	0.00000	1.003	2	0.9910	1.69
1.5	0.12	30.00	150.00	75.69	48	1.034	4000	387.54	0.00	0.00000	1.003	2	0.9915	1.64
1.5	0.12	32.00	160.00	80.74	48	0.998	4000	387.54	0.00	0.00000	1.003	2	0.9920	1.59
1.5	0.12	34.00	170.00	85.79	48	0.964	4000	387.54	0.00	0.00000	1.003	2	0.9925	1.55
1.5	0.12	38.00	190.00	95.88	48	0.903	4000	387.54	0.00	0.00000	1.003	2	0.9933	1.48
1.5	0.12	42.00	210.00	105.97	48	0.849	4000	387.54	0.00	0.00000	1.003	2	0.9939	1.42

1.5	0.12	7.59	37.95	19.15	48	1.738	4000	387.54	0.00	0.00000	1.003	2	0.9701	3.93

Standard Penetration Test Data		
GDOT Project ID:	0006934	← data entry
Project Name:	Courtesy Pkwy	← data entry
Location:	Wall 1	← data entry
Boring Number:	W-1	← data entry
Date:	15-Nov	← data entry

SPT procedures per ASTM D 1586

Additional Notes:

Section 2 - Design Height = 20ft
133+58.00,Rt – 134+78.00,Rt.

FOUNDATION SHAPES and GEOMETRY

Footing Length L (ft) =	120	← data entry if known
Footing Width B (ft) =	9.42	← data entry if known
Current Case - L/B =	13	
Square - L/B =	1	
Rectangular - L/B =	5	
Strip - L/B =	10	

SPECIFIC SETTLEMENT VALUE (

1	← data entry
1.5	← data entry
2	← data entry
2.5	← data entry
3	← data entry
3.5	← data entry
4	← data entry

Total Number of Readings	10
Number of Clay Readings	2
% Clay Readings	20

Note: "CLAY" means any of the following: CL, CH, ML, MH, CL-ML, (

CONTACT GEOTECH ENGINEER - CONSIDER CLAY %

Ground Water Table	30	feet	← data entry
Energy Rating	84	%	← data entry

SPT DATA INPUT: PLEASE ENTER EITHER
(a) Raw Field Blows in Columns B, C, & D or put (b) Measured N-value (bpf) in column I

Advisory Note: If the bottom of wall footing/leveling pad/spread footing elevation is more than5 feet below the ground elevation in your boring log, begin inputting boring log data from the elevation that corresponds to5 feet above the bottom of wall footing/leveling pad/spread footing elevation.

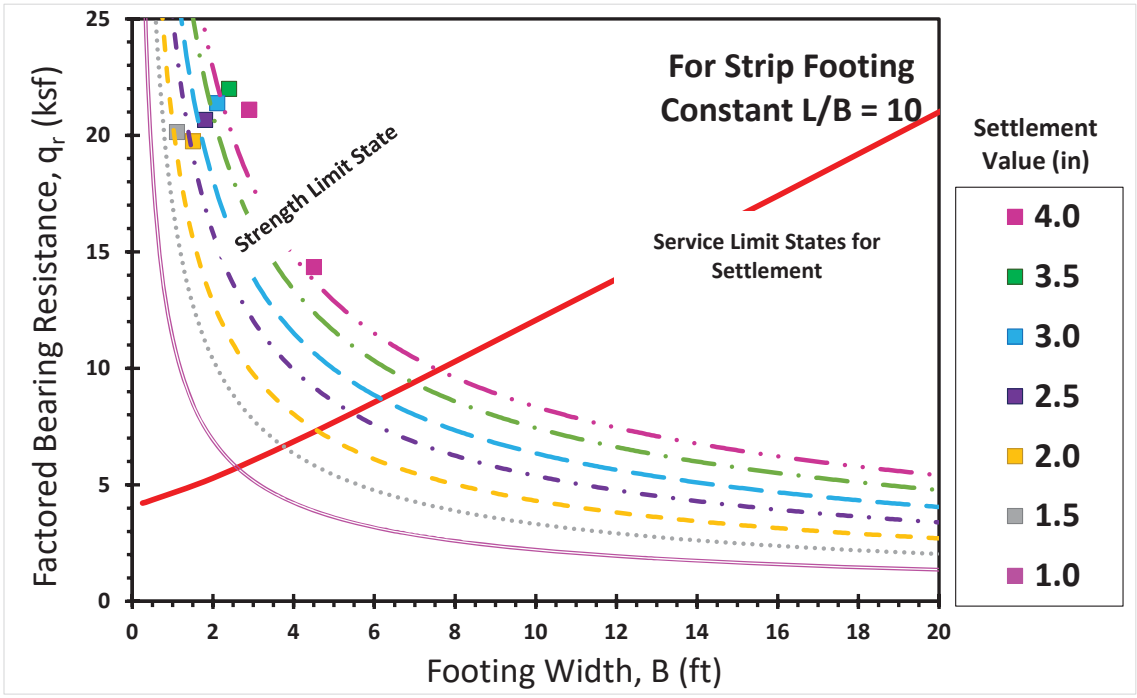
	Raw SPT Blows Per 6 inches			
	#1	#2	#3	N-value (bpf)
data entry →	2	2	2	4
data entry →	3	3	4	7
data entry →	4	4	4	8
data entry →	3	6	6	12
data entry →	5	5	5	10
data entry →	3	4	5	9
data entry →	3	4	5	9
data entry →	4	4	4	8
data entry →	6	7	8	15
data entry →	8	10	16	26

	Depth	SPT Reading	USCS
	(feet)	N-value (bpf)	Soil Type
	0.00		
data entry →	2.50		CL
data entry →	5.00		CL
data entry →	7.50		SM
data entry →	10.00		SM
data entry →	15.00		SM
data entry →	20.00		SM
data entry →	25.00		SM
data entry →	30.00		SM
data entry →	35.00		SM
data entry →	40.00		SM

Strip Footing Solution for L/B = 10

Effective Cohesion Intercept , c' (ksf) =	0
Effective Friction Angle, ϕ' (deg) =	33.80
Rectangular Distortion Ratio (L/B) =	10.00
Embedment Depth, D_f (ft) =	2.00
Ground Water Table, D_w (ft) =	30.00
Average Bulk UW, γ_{bulk} (kcf) =	0.12
Layer Thickness, h (ft) =	48.00
Modulus of Foundation, E_{FDTN} (ksf) =	4000
Poisson's Ratio of Soil=	0.20
Poisson's Ratio of Foundation=	0.20
Soil Modulus of Elasticity, E' (ksf) =	387.54
Footing Thickness, t (ft) =	0.00

Friction Angle, ϕ_f	Cohesion BC Term, N_c	Unit Weight BC Term, N_γ	Surcharge BC Term, N_q	Resistance Factor, ϕ_b
33.80	41.426	39.808	28.732	0.4



2.0

Settlement, s (in)	Settlement, s (ft)	Footing Width, B (ft)	Footing Length, L (ft)	Equivalent Diameter, d_e (ft)	Layer Thickness, h (ft)	Shape Disp. factor, I_H	Efdtn (ksf)	Esoil (ksf)	Foundation Thickness, t (ft)	Fdtn Flexibility factor, K_F	Fdtn Flexibility Factor, I_F	z_E (ft)	Embedment factor, I_E	q (ksf)
2	0.17	1.50	15.00	5.35	48	2.458	4000	387.54	0.00	0.00000	1.003	2	0.9219	19.74
2	0.17	3.00	30.00	10.70	48	2.295	4000	387.54	0.00	0.00000	1.003	2	0.9520	10.24
2	0.17	5.00	50.00	17.84	48	2.110	4000	387.54	0.00	0.00000	1.003	2	0.9683	6.57
2	0.17	7.00	70.00	24.98	48	1.952	4000	387.54	0.00	0.00000	1.003	2	0.9763	5.03
2	0.17	9.00	90.00	32.11	48	1.816	4000	387.54	0.00	0.00000	1.003	2	0.9811	4.19
2	0.17	12.00	120.00	42.82	48	1.644	4000	387.54	0.00	0.00000	1.003	2	0.9855	3.45
2	0.17	14.00	140.00	49.96	48	1.546	4000	387.54	0.00	0.00000	1.003	2	0.9874	3.14
2	0.17	16.00	160.00	57.09	48	1.460	4000	387.54	0.00	0.00000	1.003	2	0.9889	2.90
2	0.17	18.00	180.00	64.23	48	1.382	4000	387.54	0.00	0.00000	1.003	2	0.9901	2.72
2	0.17	20.00	200.00	71.36	48	1.313	4000	387.54	0.00	0.00000	1.003	2	0.9910	2.58
2	0.17	22.00	220.00	78.50	48	1.250	4000	387.54	0.00	0.00000	1.003	2	0.9918	2.46
2	0.17	24.00	240.00	85.64	48	1.193	4000	387.54	0.00	0.00000	1.003	2	0.9925	2.36
2	0.17	26.00	260.00	92.77	48	1.141	4000	387.54	0.00	0.00000	1.003	2	0.9930	2.28
2	0.17	28.00	280.00	99.91	48	1.093	4000	387.54	0.00	0.00000	1.003	2	0.9935	2.21
2	0.17	30.00	300.00	107.05	48	1.049	4000	387.54	0.00	0.00000	1.003	2	0.9939	2.15
2	0.17	32.00	320.00	114.18	48	1.008	4000	387.54	0.00	0.00000	1.003	2	0.9943	2.09
2	0.17	34.00	340.00	121.32	48	0.971	4000	387.54	0.00	0.00000	1.003	2	0.9946	2.04
2	0.17	38.00	380.00	135.59	48	0.904	4000	387.54	0.00	0.00000	1.003	2	0.9952	1.96
2	0.17	42.00	420.00	149.87	48	0.845	4000	387.54	0.00	0.00000	1.003	2	0.9956	1.90
2	0.17	9.42	94.20	33.61	48	1.789	4000	387.54	0.00	0.00000	1.003	2	0.9819	4.05

2.5

Settlement, s (in)	Settlement, s (ft)	Footing Width, B (ft)	Footing Length, L (ft)	Equivalent Diameter, d_e (ft)	Layer Thickness, h (ft)	Shape Disp. factor, I_H	Efdtn (ksf)	Esoil (ksf)	Foundation Thickness, t (ft)	Fdtn Flexibility factor, K_F	Fdtn Flexibility Factor, I_F	z_E (ft)	Embedment factor, I_E	q (ksf)
2.5	0.21	1.80	18.00	6.42	48	2.423	4000	387.54	0.00	0.00000	1.003	2	0.9306	20.66
2.5	0.21	3.00	30.00	10.70	48	2.295	4000	387.54	0.00	0.00000	1.003	2	0.9520	12.79
2.5	0.21	5.50	55.00	19.63	48	2.068	4000	387.54	0.00	0.00000	1.003	2	0.9707	7.60
2.5	0.21	7.50	75.00	26.76	48	1.916	4000	387.54	0.00	0.00000	1.003	2	0.9777	5.97
2.5	0.21	12.00	120.00	42.82	48	1.644	4000	387.54	0.00	0.00000	1.003	2	0.9855	4.31
2.5	0.21	14.00	140.00	49.96	48	1.546	4000	387.54	0.00	0.00000	1.003	2	0.9874	3.92
2.5	0.21	16.00	160.00	57.09	48	1.460	4000	387.54	0.00	0.00000	1.003	2	0.9889	3.63
2.5	0.21	18.00	180.00	64.23	48	1.382	4000	387.54	0.00	0.00000	1.003	2	0.9901	3.40
2.5	0.21	20.00	200.00	71.36	48	1.313	4000	387.54	0.00	0.00000	1.003	2	0.9910	3.22
2.5	0.21	22.00	220.00	78.50	48	1.250	4000	387.54	0.00	0.00000	1.003	2	0.9918	3.08
2.5	0.21	24.00	240.00	85.64	48	1.193	4000	387.54	0.00	0.00000	1.003	2	0.9925	2.95
2.5	0.21	26.00	260.00	92.77	48	1.141	4000	387.54	0.00	0.00000	1.003	2	0.9930	2.85
2.5	0.21	28.00	280.00	99.91	48	1.093	4000	387.54	0.00	0.00000	1.003	2	0.9935	2.76
2.5	0.21	30.00	300.00	107.05	48	1.049	4000	387.54	0.00	0.00000	1.003	2	0.9939	2.68
2.5	0.21	32.00	320.00	114.18	48	1.008	4000	387.54	0.00	0.00000	1.003	2	0.9943	2.61
2.5	0.21	34.00	340.00	121.32	48	0.971	4000	387.54	0.00	0.00000	1.003	2	0.9946	2.55
2.5	0.21	38.00	380.00	135.59	48	0.904	4000	387.54	0.00	0.00000	1.003	2	0.9952	2.45
2.5	0.21	42.00	420.00	149.87	48	0.845	4000	387.54	0.00	0.00000	1.003	2	0.9956	2.37
2.5	0.21	9.42	94.20	33.61	48	1.789	4000	387.54	0.00	0.00000	1.003	2	0.9819	5.07

Standard Penetration Test Data		
GDOT Project ID:	0006934	← data entry
Project Name:	Courtesy Pkwy	← data entry
Location:	Wall 1	← data entry
Boring Number:	W-1	← data entry
Date:	15-Nov	← data entry

SPT procedures per ASTM D 1586

Additional Notes:

Section 3 - Design Height = 25ft
134+78.00,Rt – 135+27.00,Rt.

FOUNDATION SHAPES and GEOMETRY

Footing Length L (ft) =	49	← data entry if known
Footing Width B (ft) =	12.58	← data entry if known
Current Case - L/B =	4	
Square - L/B =	1	
Rectangular - L/B =	5	
Strip - L/B =	10	

SPECIFIC SETTLEMENT VALUE (

1	← data entry
1.5	← data entry
2	← data entry
2.5	← data entry
3	← data entry
3.5	← data entry
4	← data entry

Total Number of Readings	10
Number of Clay Readings	2
% Clay Readings	20

Note: "CLAY" means any of the following: CL, CH, ML, MH, CL-ML, (

CONTACT GEOTECH ENGINEER - CONSIDER CLAY %

Ground Water Table	30	feet	← data entry
Energy Rating	84	%	← data entry

SPT DATA INPUT: PLEASE ENTER EITHER
(a) Raw Field Blows in Columns B, C, & D or put (b) Measured N-value (bpf) in column I

Advisory Note: If the bottom of wall footing/leveling pad/spread footing elevation is more than5 feet below the ground elevation in your boring log, begin inputting boring log data from the elevation that corresponds to5 feet above the bottom of wall footing/leveling pad/spread footing elevation.

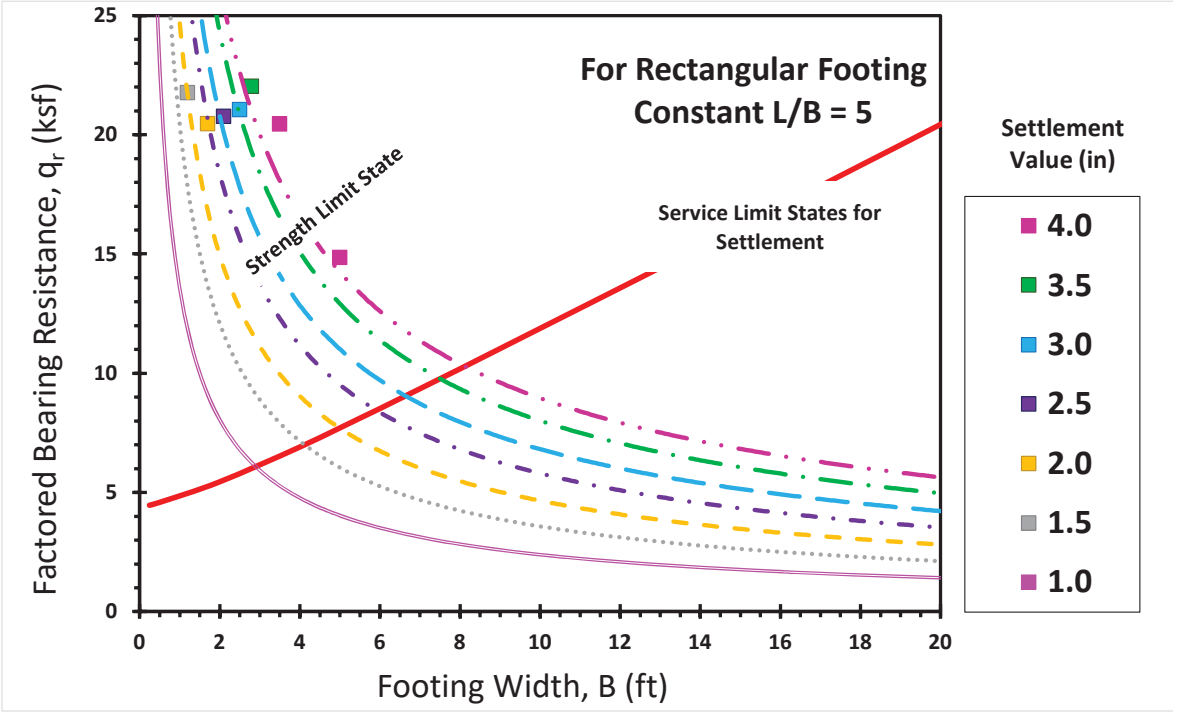
	Raw SPT Blows Per 6 inches			
	#1	#2	#3	N-value (bpf)
data entry →	2	2	2	4
data entry →	3	3	4	7
data entry →	4	4	4	8
data entry →	3	6	6	12
data entry →	5	5	5	10
data entry →	3	4	5	9
data entry →	3	4	5	9
data entry →	4	4	4	8
data entry →	6	7	8	15
data entry →	8	10	16	26

	Depth	SPT Reading	USCS
	(feet)	N-value (bpf)	Soil Type
	0.00		
data entry →	2.50		CL
data entry →	5.00		CL
data entry →	7.50		SM
data entry →	10.00		SM
data entry →	15.00		SM
data entry →	20.00		SM
data entry →	25.00		SM
data entry →	30.00		SM
data entry →	35.00		SM
data entry →	40.00		SM

Rectangular Footing Solution for L/B = 5

Effective Cohesion Intercept , c' (ksf) =	0
Effective Friction Angle, ϕ' (deg) =	33.80
Rectangular Distortion Ratio (L/B) =	5.00
Embedment Depth, D_f (ft) =	2.00
Ground Water Table, D_w (ft) =	30.00
Average Bulk UW, γ_{bulk} (kcf) =	0.12
Layer Thickness, h (ft) =	48.00
Modulus of Foundation, E_{FDTN} (ksf) =	4000
Poisson's Ratio of Soil=	0.20
Poisson's Ratio of Foundation=	0.20
Soil Modulus of Elasticity, E' (ksf) =	387.54
Footing Thickness, t (ft) =	0.00

Friction Angle, ϕ_f	Cohesion BC Term, N_c	Unit Weight BC Term, N_γ	Surcharge BC Term, N_q	Resistance Factor, ϕ_b
33.80	41.426	39.808	28.732	0.4



3.0

Settlement, s (in)	Settlement, s (ft)	Footing Width, B (ft)	Footing Length, L (ft)	Equivalent Diameter, d_e (ft)	Layer Thickness, h (ft)	Shape Disp. factor, I_H	Efdtn (ksf)	Esoil (ksf)	Foundation Thickness, t (ft)	Fdtn Flexibility factor, K_F	Fdtn Flexibility Factor, I_F	z_E (ft)	Embedment factor, I_E	q (ksf)
3	0.25	2.50	12.50	6.31	48	2.057	4000	387.54	0.00	0.00000	1.003	2	0.9298	21.05
3	0.25	4.00	20.00	10.09	48	1.951	4000	387.54	0.00	0.00000	1.003	2	0.9498	13.58
3	0.25	6.00	30.00	15.14	48	1.827	4000	387.54	0.00	0.00000	1.003	2	0.9636	9.53
3	0.25	7.50	37.50	18.92	48	1.743	4000	387.54	0.00	0.00000	1.003	2	0.9698	7.94
3	0.25	9.00	45.00	22.71	48	1.667	4000	387.54	0.00	0.00000	1.003	2	0.9742	6.89
3	0.25	12.00	60.00	30.28	48	1.533	4000	387.54	0.00	0.00000	1.003	2	0.9800	5.58
3	0.25	14.00	70.00	35.32	48	1.455	4000	387.54	0.00	0.00000	1.003	2	0.9827	5.03
3	0.25	16.00	80.00	40.37	48	1.384	4000	387.54	0.00	0.00000	1.003	2	0.9847	4.62
3	0.25	18.00	90.00	45.42	48	1.320	4000	387.54	0.00	0.00000	1.003	2	0.9863	4.29
3	0.25	20.00	100.00	50.46	48	1.262	4000	387.54	0.00	0.00000	1.003	2	0.9876	4.04
3	0.25	22.00	110.00	55.51	48	1.208	4000	387.54	0.00	0.00000	1.003	2	0.9886	3.83
3	0.25	24.00	120.00	60.56	48	1.159	4000	387.54	0.00	0.00000	1.003	2	0.9895	3.66
3	0.25	26.00	130.00	65.60	48	1.114	4000	387.54	0.00	0.00000	1.003	2	0.9903	3.51
3	0.25	28.00	140.00	70.65	48	1.072	4000	387.54	0.00	0.00000	1.003	2	0.9910	3.38
3	0.25	30.00	150.00	75.69	48	1.034	4000	387.54	0.00	0.00000	1.003	2	0.9915	3.27
3	0.25	32.00	160.00	80.74	48	0.998	4000	387.54	0.00	0.00000	1.003	2	0.9920	3.18
3	0.25	34.00	170.00	85.79	48	0.964	4000	387.54	0.00	0.00000	1.003	2	0.9925	3.09
3	0.25	38.00	190.00	95.88	48	0.903	4000	387.54	0.00	0.00000	1.003	2	0.9933	2.95
3	0.25	42.00	210.00	105.97	48	0.849	4000	387.54	0.00	0.00000	1.003	2	0.9939	2.84
3	0.25	12.58	62.90	31.74	48	1.509	4000	387.54	0.00	0.00000	1.003	2	0.9809	5.40

3.5

Settlement, s (in)	Settlement, s (ft)	Footing Width, B (ft)	Footing Length, L (ft)	Equivalent Diameter, d_e (ft)	Layer Thickness, h (ft)	Shape Disp. factor, I_H	Efdtn (ksf)	Esoil (ksf)	Foundation Thickness, t (ft)	Fdtn Flexibility factor, K_F	Fdtn Flexibility Factor, I_F	z_E (ft)	Embedment factor, I_E	q (ksf)
3.5	0.29	2.80	14.00	7.06	48	2.035	4000	387.54	0.00	0.00000	1.003	2	0.9349	22.04
3.5	0.29	4.00	20.00	10.09	48	1.951	4000	387.54	0.00	0.00000	1.003	2	0.9498	15.84
3.5	0.29	6.00	30.00	15.14	48	1.827	4000	387.54	0.00	0.00000	1.003	2	0.9636	11.12
3.5	0.29	9.00	45.00	22.71	48	1.667	4000	387.54	0.00	0.00000	1.003	2	0.9742	8.03
3.5	0.29	12.00	60.00	30.28	48	1.533	4000	387.54	0.00	0.00000	1.003	2	0.9800	6.51
3.5	0.29	16.00	80.00	40.37	48	1.384	4000	387.54	0.00	0.00000	1.003	2	0.9847	5.38
3.5	0.29	20.00	100.00	50.46	48	1.262	4000	387.54	0.00	0.00000	1.003	2	0.9876	4.71
3.5	0.29	22.00	110.00	55.51	48	1.208	4000	387.54	0.00	0.00000	1.003	2	0.9886	4.47
3.5	0.29	24.00	120.00	60.56	48	1.159	4000	387.54	0.00	0.00000	1.003	2	0.9895	4.26
3.5	0.29	26.00	130.00	65.60	48	1.114	4000	387.54	0.00	0.00000	1.003	2	0.9903	4.09
3.5	0.29	28.00	140.00	70.65	48	1.072	4000	387.54	0.00	0.00000	1.003	2	0.9910	3.95
3.5	0.29	30.00	150.00	75.69	48	1.034	4000	387.54	0.00	0.00000	1.003	2	0.9915	3.82
3.5	0.29	32.00	160.00	80.74	48	0.998	4000	387.54	0.00	0.00000	1.003	2	0.9920	3.71
3.5	0.29	34.00	170.00	85.79	48	0.964	4000	387.54	0.00	0.00000	1.003	2	0.9925	3.61
3.5	0.29	38.00	190.00	95.88	48	0.903	4000	387.54	0.00	0.00000	1.003	2	0.9933	3.44
3.5	0.29	42.00	210.00	105.97	48	0.849	4000	387.54	0.00	0.00000	1.003	2	0.9939	3.31
3.5	0.29	12.58	62.90	31.74	48	1.509	4000	387.54	0.00	0.00000	1.003	2	0.9809	6.31

Standard Penetration Test Data		
GDOT Project ID:	0006934	← data entry
Project Name:	Courtesy Pkwy	← data entry
Location:	Wall 1	← data entry
Boring Number:	W-1	← data entry
Date:	15-Nov	← data entry

SPT procedures per ASTM D 1586

Additional Notes:

Section 4 - Design Height = 30ft
135+27.00,Rt – 135+92.00,Rt.

FOUNDATION SHAPES and GEOMETRY

Footing Length L (ft) =	65	← data entry if known
Footing Width B (ft) =	14.43	← data entry if known
Current Case - L/B =	5	
Square - L/B =	1	
Rectangular - L/B =	5	
Strip - L/B =	10	

SPECIFIC SETTLEMENT VALUE (

2	← data entry
2.5	← data entry
3	← data entry
3.5	← data entry
4	← data entry
4.5	← data entry
5	← data entry

Total Number of Readings	10
Number of Clay Readings	2
% Clay Readings	20

Note: "CLAY" means any of the following: CL, CH, ML, MH, CL-ML, (

CONTACT GEOTECH ENGINEER - CONSIDER CLAY %

Ground Water Table	30	feet	← data entry
Energy Rating	84	%	← data entry

SPT DATA INPUT: PLEASE ENTER EITHER
(a) Raw Field Blows in Columns B, C, & D or put (b) Measured N-value (bpf) in column I

Advisory Note: If the bottom of wall footing/leveling pad/spread footing elevation is more than5 feet below the ground elevation in your boring log, begin inputting boring log data from the elevation that corresponds to5 feet above the bottom of wall footing/leveling pad/spread footing elevation.

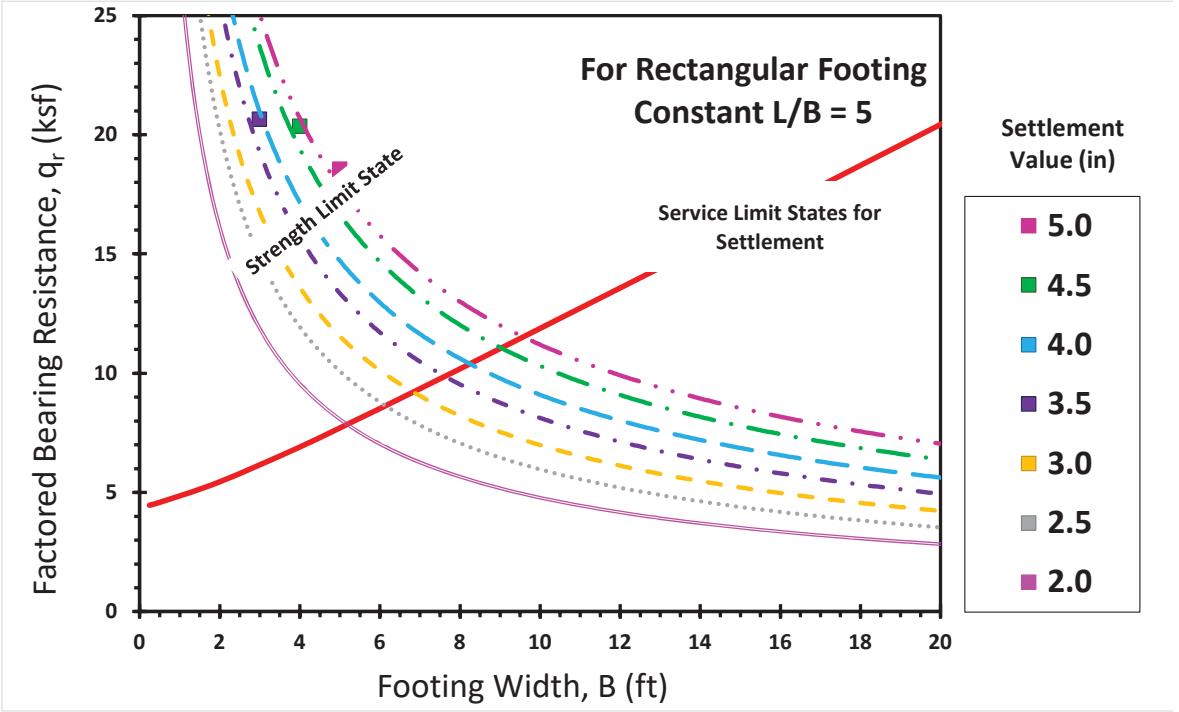
	Raw SPT Blows Per 6 inches			
	#1	#2	#3	N-value (bpf)
data entry →	2	2	2	4
data entry →	3	3	4	7
data entry →	4	4	4	8
data entry →	3	6	6	12
data entry →	5	5	5	10
data entry →	3	4	5	9
data entry →	3	4	5	9
data entry →	4	4	4	8
data entry →	6	7	8	15
data entry →	8	10	16	26

	Depth	SPT Reading	USCS
	(feet)	N-value (bpf)	Soil Type
	0.00		
data entry →	2.50		CL
data entry →	5.00		CL
data entry →	7.50		SM
data entry →	10.00		SM
data entry →	15.00		SM
data entry →	20.00		SM
data entry →	25.00		SM
data entry →	30.00		SM
data entry →	35.00		SM
data entry →	40.00		SM

Rectangular Footing Solution for L/B = 5

Effective Cohesion Intercept , c' (ksf) =	0
Effective Friction Angle, ϕ' (deg) =	33.80
Rectangular Distortion Ratio (L/B) =	5.00
Embedment Depth, D_f (ft) =	2.00
Ground Water Table, D_w (ft) =	30.00
Average Bulk UW, γ_{bulk} (kcf) =	0.12
Layer Thickness, h (ft) =	48.00
Modulus of Foundation, E_{FDTN} (ksf) =	4000
Poisson's Ratio of Soil=	0.20
Poisson's Ratio of Foundation=	0.20
Soil Modulus of Elasticity, E' (ksf) =	387.54
Footing Thickness, t (ft) =	0.00

Friction Angle, ϕ_f	Cohesion BC Term, N_c	Unit Weight BC Term, N_γ	Surcharge BC Term, N_q	Resistance Factor, ϕ_b
33.80	41.426	39.808	28.732	0.4



3.5

Settlement, s (in)	Settlement, s (ft)	Footing Width, B (ft)	Footing Length, L (ft)	Equivalent Diameter, d_e (ft)	Layer Thickness, h (ft)	Shape Disp. factor, I_H	Efdtn (ksf)	Esoil (ksf)	Foundation Thickness, t (ft)	Fdtn Flexibility factor, K_F	Fdtn Flexibility Factor, I_F	z_E (ft)	Embedment factor, I_E	q (ksf)
3.5	0.29	2.10	10.50	5.30	48	2.087	4000	387.54	0.00	0.00000	1.003	2	0.9214	29.08
3.5	0.29	3.00	15.00	7.57	48	2.021	4000	387.54	0.00	0.00000	1.003	2	0.9380	20.65
3.5	0.29	5.50	27.50	13.88	48	1.856	4000	387.54	0.00	0.00000	1.003	2	0.9609	11.97
3.5	0.29	8.00	40.00	20.19	48	1.717	4000	387.54	0.00	0.00000	1.003	2	0.9714	8.80
3.5	0.29	12.00	60.00	30.28	48	1.533	4000	387.54	0.00	0.00000	1.003	2	0.9800	6.51
3.5	0.29	14.00	70.00	35.32	48	1.455	4000	387.54	0.00	0.00000	1.003	2	0.9827	5.87
3.5	0.29	16.00	80.00	40.37	48	1.384	4000	387.54	0.00	0.00000	1.003	2	0.9847	5.38
3.5	0.29	18.00	90.00	45.42	48	1.320	4000	387.54	0.00	0.00000	1.003	2	0.9863	5.01
3.5	0.29	20.00	100.00	50.46	48	1.262	4000	387.54	0.00	0.00000	1.003	2	0.9876	4.71
3.5	0.29	22.00	110.00	55.51	48	1.208	4000	387.54	0.00	0.00000	1.003	2	0.9886	4.47
3.5	0.29	24.00	120.00	60.56	48	1.159	4000	387.54	0.00	0.00000	1.003	2	0.9895	4.26
3.5	0.29	26.00	130.00	65.60	48	1.114	4000	387.54	0.00	0.00000	1.003	2	0.9903	4.09
3.5	0.29	28.00	140.00	70.65	48	1.072	4000	387.54	0.00	0.00000	1.003	2	0.9910	3.95
3.5	0.29	30.00	150.00	75.69	48	1.034	4000	387.54	0.00	0.00000	1.003	2	0.9915	3.82
3.5	0.29	32.00	160.00	80.74	48	0.998	4000	387.54	0.00	0.00000	1.003	2	0.9920	3.71
3.5	0.29	34.00	170.00	85.79	48	0.964	4000	387.54	0.00	0.00000	1.003	2	0.9925	3.61
3.5	0.29	38.00	190.00	95.88	48	0.903	4000	387.54	0.00	0.00000	1.003	2	0.9933	3.44
3.5	0.29	42.00	210.00	105.97	48	0.849	4000	387.54	0.00	0.00000	1.003	2	0.9939	3.31
3.5	0.29	14.43	72.15	36.41	48	1.439	4000	387.54	0.00	0.00000	1.003	2	0.9831	5.75

4.0

Settlement, s (in)	Settlement, s (ft)	Footing Width, B (ft)	Footing Length, L (ft)	Equivalent Diameter, d_e (ft)	Layer Thickness, h (ft)	Shape Disp. factor, I_H	Efdtn (ksf)	Esoil (ksf)	Foundation Thickness, t (ft)	Fdtn Flexibility factor, K_F	Fdtn Flexibility Factor, I_F	z_E (ft)	Embedment factor, I_E	q (ksf)
4	0.33	2.50	12.50	6.31	48	2.057	4000	387.54	0.00	0.00000	1.003	2	0.9298	28.07
4	0.33	4.00	20.00	10.09	48	1.951	4000	387.54	0.00	0.00000	1.003	2	0.9498	18.10
4	0.33	6.00	30.00	15.14	48	1.827	4000	387.54	0.00	0.00000	1.003	2	0.9636	12.71
4	0.33	7.50	37.50	18.92	48	1.743	4000	387.54	0.00	0.00000	1.003	2	0.9698	10.58
4	0.33	9.00	45.00	22.71	48	1.667	4000	387.54	0.00	0.00000	1.003	2	0.9742	9.18
4	0.33	12.00	60.00	30.28	48	1.533	4000	387.54	0.00	0.00000	1.003	2	0.9800	7.45
4	0.33	14.00	70.00	35.32	48	1.455	4000	387.54	0.00	0.00000	1.003	2	0.9827	6.71
4	0.33	16.00	80.00	40.37	48	1.384	4000	387.54	0.00	0.00000	1.003	2	0.9847	6.15
4	0.33	18.00	90.00	45.42	48	1.320	4000	387.54	0.00	0.00000	1.003	2	0.9863	5.73
4	0.33	20.00	100.00	50.46	48	1.262	4000	387.54	0.00	0.00000	1.003	2	0.9876	5.38
4	0.33	22.00	110.00	55.51	48	1.208	4000	387.54	0.00	0.00000	1.003	2	0.9886	5.11
4	0.33	24.00	120.00	60.56	48	1.159	4000	387.54	0.00	0.00000	1.003	2	0.9895	4.87
4	0.33	26.00	130.00	65.60	48	1.114	4000	387.54	0.00	0.00000	1.003	2	0.9903	4.68
4	0.33	28.00	140.00	70.65	48	1.072	4000	387.54	0.00	0.00000	1.003	2	0.9910	4.51
4	0.33	30.00	150.00	75.69	48	1.034	4000	387.54	0.00	0.00000	1.003	2	0.9915	4.36
4	0.33	32.00	160.00	80.74	48	0.998	4000	387.54	0.00	0.00000	1.003	2	0.9920	4.24
4	0.33	34.00	170.00	85.79	48	0.964	4000	387.54	0.00	0.00000	1.003	2	0.9925	4.13
4	0.33	38.00	190.00	95.88	48	0.903	4000	387.54	0.00	0.00000	1.003	2	0.9933	3.94
4	0.33	42.00	210.00	105.97	48	0.849	4000	387.54	0.00	0.00000	1.003	2	0.9939	3.78
4	0.33	14.43	72.15	36.41	48	1.439	4000	387.54	0.00	0.00000	1.003	2	0.9831	6.57

Standard Penetration Test Data		
GDOT Project ID:	0006934	← data entry
Project Name:	Courtesy Pkwy	← data entry
Location:	Wall 1	← data entry
Boring Number:	W-2	← data entry
Date:	15-Nov	← data entry

SPT procedures per ASTM D 1586

Additional Notes:

Section 5 - Design Height = 34ft
Station 135+92.00, Rt to 137+20.00, Rt

FOUNDATION SHAPES and GEOMETRY

Footing Length L (ft) =	128	← data entry if known
Footing Width B (ft) =	16.71	← data entry if known
Current Case - L/B =	8	
Square - L/B =	1	
Rectangular - L/B =	5	
Strip - L/B =	10	

SPECIFIC SETTLEMENT VALUE (

1	← data entry
4	← data entry
5	← data entry
5.5	← data entry
6	← data entry
6.5	← data entry
7	← data entry

Total Number of Readings	11
Number of Clay Readings	2
% Clay Readings	18

Note: "CLAY" means any of the following: CL, CH, ML, MH, CL-ML, (

CONTACT GEOTECH ENGINEER - CONSIDER CLAY %

Ground Water Table	38.5	feet	← data entry
Energy Rating	84	%	← data entry

SPT DATA INPUT: PLEASE ENTER EITHER
(a) Raw Field Blows in Columns B, C, & D or put (b) Measured N-value (bpf) in column I

Advisory Note: If the bottom of wall footing/leveling pad/spread footing elevation is more than5 feet below the ground elevation in your boring log, begin inputting boring log data from the elevation that corresponds to5 feet above the bottom of wall footing/leveling pad/spread footing elevation.

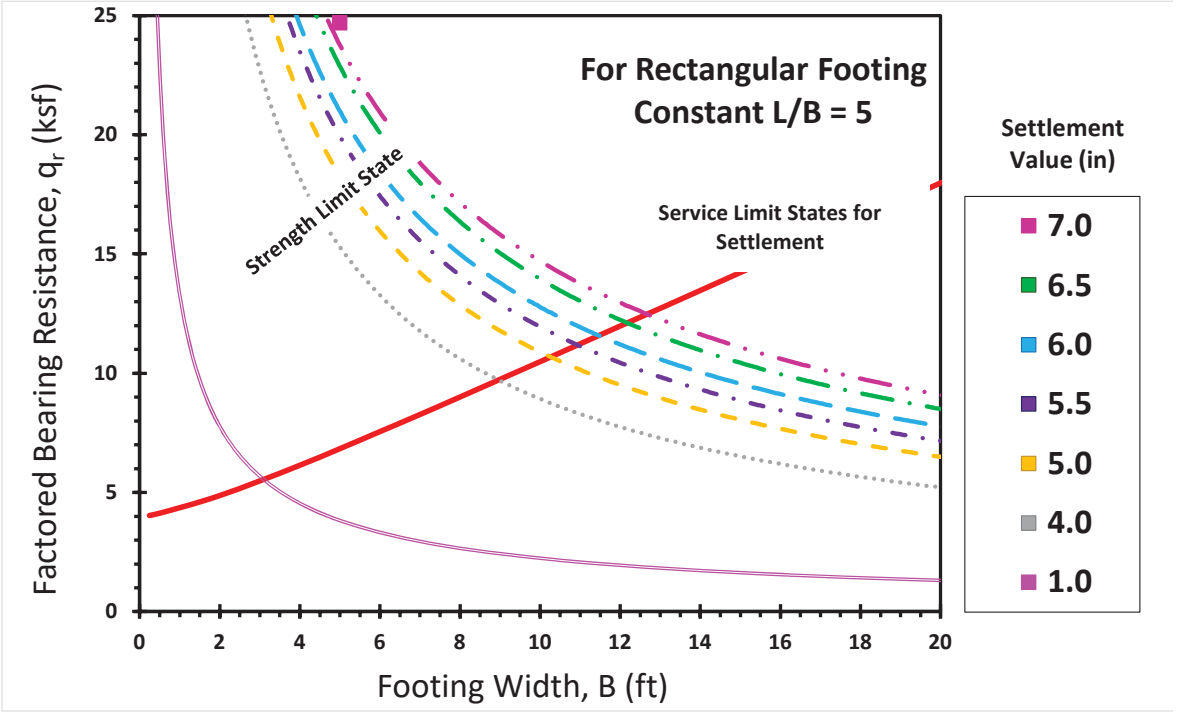
	Raw SPT Blows Per 6 inches			
	#1	#2	#3	N-value (bpf)
data entry →	2	2	3	5
data entry →	3	4	5	9
data entry →	4	4	4	8
data entry →	6	7	8	15
data entry →	4	5	5	10
data entry →	3	3	3	6
data entry →	3	3	4	7
data entry →	3	3	3	6
data entry →	4	6	7	13
data entry →	4	6	7	13
data entry →	6	9	9	18

	Depth	SPT Reading	USCS
	(feet)	N-value (bpf)	Soil Type
	0.00		
data entry →	2.50		CL
data entry →	5.00		CL
data entry →	7.50		SM
data entry →	10.00		SM
data entry →	15.00		SM
data entry →	20.00		SM
data entry →	25.00		SM
data entry →	30.00		SM
data entry →	35.00		SM
data entry →	40.00		SM
data entry →	45.00		SM

Rectangular Footing Solution for L/B = 5

Effective Cohesion Intercept , c' (ksf) =	0
Effective Friction Angle, ϕ' (deg) =	32.99
Rectangular Distortion Ratio (L/B) =	5.00
Embedment Depth, D_f (ft) =	2.00
Ground Water Table, D_w (ft) =	38.50
Average Bulk UW, γ_{bulk} (kcf) =	0.12
Layer Thickness, h (ft) =	53.50
Modulus of Foundation, E_{FDTN} (ksf) =	4000
Poisson's Ratio of Soil=	0.20
Poisson's Ratio of Foundation=	0.20
Soil Modulus of Elasticity, E' (ksf) =	374.57
Footing Thickness, t (ft) =	0.00

Friction Angle, ϕ_f	Cohesion BC Term, N_c	Unit Weight BC Term, N_γ	Surcharge BC Term, N_q	Resistance Factor, ϕ_b
32.99	38.616	35.151	26.071	0.4



5.0

Settlement, s (in)	Settlement, s (ft)	Footing Width, B (ft)	Footing Length, L (ft)	Equivalent Diameter, d_e (ft)	Layer Thickness, h (ft)	Shape Disp. factor, I_H	Efdtn (ksf)	Esoil (ksf)	Foundation Thickness, t (ft)	Fdtn Flexibility factor, K_F	Fdtn Flexibility Factor, I_F	z_E (ft)	Embedment factor, I_E	q (ksf)
5	0.42	1.70	8.50	4.29	53.5	2.132	4000	374.57	0.00	0.00000	1.003	2	0.9108	49.12
5	0.42	3.00	15.00	7.57	53.5	2.043	4000	374.57	0.00	0.00000	1.003	2	0.9380	28.20
5	0.42	5.00	25.00	12.62	53.5	1.920	4000	374.57	0.00	0.00000	1.003	2	0.9578	17.64
5	0.42	7.00	35.00	17.66	53.5	1.810	4000	374.57	0.00	0.00000	1.003	2	0.9680	13.22
5	0.42	9.00	45.00	22.71	53.5	1.713	4000	374.57	0.00	0.00000	1.003	2	0.9742	10.79
5	0.42	12.00	60.00	30.28	53.5	1.585	4000	374.57	0.00	0.00000	1.003	2	0.9800	8.70
5	0.42	14.00	70.00	35.32	53.5	1.510	4000	374.57	0.00	0.00000	1.003	2	0.9827	7.81
5	0.42	16.00	80.00	40.37	53.5	1.441	4000	374.57	0.00	0.00000	1.003	2	0.9847	7.14
5	0.42	18.00	90.00	45.42	53.5	1.379	4000	374.57	0.00	0.00000	1.003	2	0.9863	6.62
5	0.42	20.00	100.00	50.46	53.5	1.322	4000	374.57	0.00	0.00000	1.003	2	0.9876	6.21
5	0.42	22.00	110.00	55.51	53.5	1.269	4000	374.57	0.00	0.00000	1.003	2	0.9886	5.87
5	0.42	24.00	120.00	60.56	53.5	1.220	4000	374.57	0.00	0.00000	1.003	2	0.9895	5.59
5	0.42	26.00	130.00	65.60	53.5	1.175	4000	374.57	0.00	0.00000	1.003	2	0.9903	5.36
5	0.42	28.00	140.00	70.65	53.5	1.134	4000	374.57	0.00	0.00000	1.003	2	0.9910	5.15
5	0.42	30.00	150.00	75.69	53.5	1.095	4000	374.57	0.00	0.00000	1.003	2	0.9915	4.98
5	0.42	32.00	160.00	80.74	53.5	1.058	4000	374.57	0.00	0.00000	1.003	2	0.9920	4.83
5	0.42	34.00	170.00	85.79	53.5	1.024	4000	374.57	0.00	0.00000	1.003	2	0.9925	4.69
5	0.42	38.00	190.00	95.88	53.5	0.962	4000	374.57	0.00	0.00000	1.003	2	0.9933	4.46
5	0.42	42.00	210.00	105.97	53.5	0.908	4000	374.57	0.00	0.00000	1.003	2	0.9939	4.28
5	0.42	16.71	83.55	42.16	53.5	1.419	4000	374.57	0.00	0.00000	1.003	2	0.9853	6.94

5.5

Settlement, s (in)	Settlement, s (ft)	Footing Width, B (ft)	Footing Length, L (ft)	Equivalent Diameter, d_e (ft)	Layer Thickness, h (ft)	Shape Disp. factor, I_H	Efdtn (ksf)	Esoil (ksf)	Foundation Thickness, t (ft)	Fdtn Flexibility factor, K_F	Fdtn Flexibility Factor, I_F	z_E (ft)	Embedment factor, I_E	q (ksf)
5.5	0.46	2.10	10.50	5.30	53.5	2.104	4000	374.57	0.00	0.00000	1.003	2	0.9214	43.81
5.5	0.46	3.00	15.00	7.57	53.5	2.043	4000	374.57	0.00	0.00000	1.003	2	0.9380	31.02
5.5	0.46	5.50	27.50	13.88	53.5	1.891	4000	374.57	0.00	0.00000	1.003	2	0.9609	17.84
5.5	0.46	8.00	40.00	20.19	53.5	1.760	4000	374.57	0.00	0.00000	1.003	2	0.9714	13.04
5.5	0.46	12.00	60.00	30.28	53.5	1.585	4000	374.57	0.00	0.00000	1.003	2	0.9800	9.57
5.5	0.46	14.00	70.00	35.32	53.5	1.510	4000	374.57	0.00	0.00000	1.003	2	0.9827	8.59
5.5	0.46	16.00	80.00	40.37	53.5	1.441	4000	374.57	0.00	0.00000	1.003	2	0.9847	7.85
5.5	0.46	18.00	90.00	45.42	53.5	1.379	4000	374.57	0.00	0.00000	1.003	2	0.9863	7.28
5.5	0.46	20.00	100.00	50.46	53.5	1.322	4000	374.57	0.00	0.00000	1.003	2	0.9876	6.83
5.5	0.46	22.00	110.00	55.51	53.5	1.269	4000	374.57	0.00	0.00000	1.003	2	0.9886	6.46
5.5	0.46	24.00	120.00	60.56	53.5	1.220	4000	374.57	0.00	0.00000	1.003	2	0.9895	6.15
5.5	0.46	26.00	130.00	65.60	53.5	1.175	4000	374.57	0.00	0.00000	1.003	2	0.9903	5.89
5.5	0.46	28.00	140.00	70.65	53.5	1.134	4000	374.57	0.00	0.00000	1.003	2	0.9910	5.67
5.5	0.46	30.00	150.00	75.69	53.5	1.095	4000	374.57	0.00	0.00000	1.003	2	0.9915	5.48
5.5	0.46	32.00	160.00	80.74	53.5	1.058	4000	374.57	0.00	0.00000	1.003	2	0.9920	5.31
5.5	0.46	34.00	170.00	85.79	53.5	1.024	4000	374.57	0.00	0.00000	1.003	2	0.9925	5.16
5.5	0.46	38.00	190.00	95.88	53.5	0.962	4000	374.57	0.00	0.00000	1.003	2	0.9933	4.91
5.5	0.46	42.00	210.00	105.97	53.5	0.908	4000	374.57	0.00	0.00000	1.003	2	0.9939	4.71
5.5	0.46	16.71	83.55	42.16	53.5	1.419	4000	374.57	0.00	0.00000	1.003	2	0.9853	7.64

Standard Penetration Test Data		
GDOT Project ID:	0006934	← data entry
Project Name:	Courtesy Pkwy	← data entry
Location:	Wall 1	← data entry
Boring Number:	W-2	← data entry
Date:	15-Nov	← data entry

SPT procedures per ASTM D 1586

Additional Notes:

Section 6 - Design Height = 30ft
Station 137+20.00, Rt to 137+70.23, Rt

FOUNDATION SHAPES and GEOMETRY

Footing Length L (ft) =	50	← data entry if known
Footing Width B (ft) =	14.43	← data entry if known
Current Case - L/B =	3	
Square - L/B =	1	
Rectangular - L/B =	5	
Strip - L/B =	10	

SPECIFIC SETTLEMENT VALUE (

1	← data entry
2	← data entry
4	← data entry
4.5	← data entry
5	← data entry
5.5	← data entry
6	← data entry

Total Number of Readings	11
Number of Clay Readings	2
% Clay Readings	18

Note: "CLAY" means any of the following: CL, CH, ML, MH, CL-ML, (

CONTACT GEOTECH ENGINEER - CONSIDER CLAY %

Ground Water Table	38.5	feet	← data entry
Energy Rating	84	%	← data entry

SPT DATA INPUT: PLEASE ENTER EITHER
(a) Raw Field Blows in Columns B, C, & D or put (b) Measured N-value (bpf) in column I

Advisory Note: If the bottom of wall footing/leveling pad/spread footing elevation is more than5 feet below the ground elevation in your boring log, begin inputting boring log data from the elevation that corresponds to5 feet above the bottom of wall footing/leveling pad/spread footing elevation.

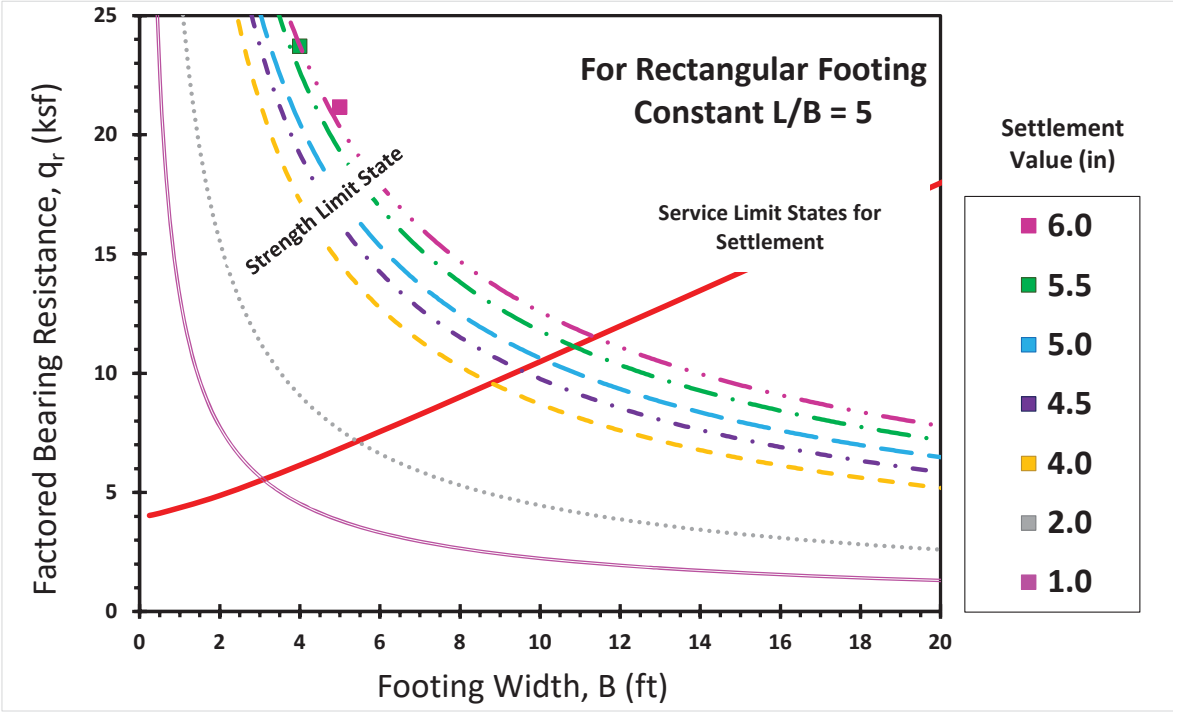
	Raw SPT Blows Per 6 inches			
	#1	#2	#3	N-value (bpf)
data entry →	2	2	3	5
data entry →	3	4	5	9
data entry →	4	4	4	8
data entry →	6	7	8	15
data entry →	4	5	5	10
data entry →	3	3	3	6
data entry →	3	3	4	7
data entry →	3	3	3	6
data entry →	4	6	7	13
data entry →	4	6	7	13
data entry →	6	9	9	18

	Depth	SPT Reading	USCS
	(feet)	N-value (bpf)	Soil Type
	0.00		
data entry →	2.50		CL
data entry →	5.00		CL
data entry →	7.50		SM
data entry →	10.00		SM
data entry →	15.00		SM
data entry →	20.00		SM
data entry →	25.00		SM
data entry →	30.00		SM
data entry →	35.00		SM
data entry →	40.00		SM
data entry →	45.00		SM

Rectangular Footing Solution for L/B = 5

Effective Cohesion Intercept , c' (ksf) =	0
Effective Friction Angle, ϕ' (deg) =	32.99
Rectangular Distortion Ratio (L/B) =	5.00
Embedment Depth, D_f (ft) =	2.00
Ground Water Table, D_w (ft) =	38.50
Average Bulk UW, γ_{bulk} (kcf) =	0.12
Layer Thickness, h (ft) =	53.50
Modulus of Foundation, E_{FDTN} (ksf) =	4000
Poisson's Ratio of Soil=	0.20
Poisson's Ratio of Foundation=	0.20
Soil Modulus of Elasticity, E' (ksf) =	374.57
Footing Thickness, t (ft) =	0.00

Friction Angle, ϕ_f	Cohesion BC Term, N_c	Unit Weight BC Term, N_γ	Surcharge BC Term, N_q	Resistance Factor, ϕ_b
32.99	38.616	35.151	26.071	0.4



4.0

Settlement, s (in)	Settlement, s (ft)	Footing Width, B (ft)	Footing Length, L (ft)	Equivalent Diameter, d_e (ft)	Layer Thickness, h (ft)	Shape Disp. factor, I_H	Efdtn (ksf)	Esoil (ksf)	Foundation Thickness, t (ft)	Fdtn Flexibility factor, K_F	Fdtn Flexibility Factor, I_F	z_E (ft)	Embedment factor, I_E	q (ksf)
4	0.33	1.70	8.50	4.29	53.5	2.132	4000	374.57	0.00	0.00000	1.003	2	0.9108	39.29
4	0.33	3.00	15.00	7.57	53.5	2.043	4000	374.57	0.00	0.00000	1.003	2	0.9380	22.56
4	0.33	5.00	25.00	12.62	53.5	1.920	4000	374.57	0.00	0.00000	1.003	2	0.9578	14.11
4	0.33	7.00	35.00	17.66	53.5	1.810	4000	374.57	0.00	0.00000	1.003	2	0.9680	10.57
4	0.33	9.00	45.00	22.71	53.5	1.713	4000	374.57	0.00	0.00000	1.003	2	0.9742	8.64
4	0.33	12.00	60.00	30.28	53.5	1.585	4000	374.57	0.00	0.00000	1.003	2	0.9800	6.96
4	0.33	14.00	70.00	35.32	53.5	1.510	4000	374.57	0.00	0.00000	1.003	2	0.9827	6.24
4	0.33	16.00	80.00	40.37	53.5	1.441	4000	374.57	0.00	0.00000	1.003	2	0.9847	5.71
4	0.33	18.00	90.00	45.42	53.5	1.379	4000	374.57	0.00	0.00000	1.003	2	0.9863	5.30
4	0.33	20.00	100.00	50.46	53.5	1.322	4000	374.57	0.00	0.00000	1.003	2	0.9876	4.97
4	0.33	22.00	110.00	55.51	53.5	1.269	4000	374.57	0.00	0.00000	1.003	2	0.9886	4.70
4	0.33	24.00	120.00	60.56	53.5	1.220	4000	374.57	0.00	0.00000	1.003	2	0.9895	4.47
4	0.33	26.00	130.00	65.60	53.5	1.175	4000	374.57	0.00	0.00000	1.003	2	0.9903	4.29
4	0.33	28.00	140.00	70.65	53.5	1.134	4000	374.57	0.00	0.00000	1.003	2	0.9910	4.12
4	0.33	30.00	150.00	75.69	53.5	1.095	4000	374.57	0.00	0.00000	1.003	2	0.9915	3.98
4	0.33	32.00	160.00	80.74	53.5	1.058	4000	374.57	0.00	0.00000	1.003	2	0.9920	3.86
4	0.33	34.00	170.00	85.79	53.5	1.024	4000	374.57	0.00	0.00000	1.003	2	0.9925	3.75
4	0.33	38.00	190.00	95.88	53.5	0.962	4000	374.57	0.00	0.00000	1.003	2	0.9933	3.57
4	0.33	42.00	210.00	105.97	53.5	0.908	4000	374.57	0.00	0.00000	1.003	2	0.9939	3.42
4	0.33	14.43	72.15	36.41	53.5	1.495	4000	374.57	0.00	0.00000	1.003	2	0.9831	6.12

4.5

Settlement, s (in)	Settlement, s (ft)	Footing Width, B (ft)	Footing Length, L (ft)	Equivalent Diameter, d_e (ft)	Layer Thickness, h (ft)	Shape Disp. factor, I_H	Efdtn (ksf)	Esoil (ksf)	Foundation Thickness, t (ft)	Fdtn Flexibility factor, K_F	Fdtn Flexibility Factor, I_F	z_E (ft)	Embedment factor, I_E	q (ksf)
4.5	0.37	2.10	10.50	5.30	53.5	2.104	4000	374.57	0.00	0.00000	1.003	2	0.9214	35.85
4.5	0.37	3.00	15.00	7.57	53.5	2.043	4000	374.57	0.00	0.00000	1.003	2	0.9380	25.38
4.5	0.37	5.50	27.50	13.88	53.5	1.891	4000	374.57	0.00	0.00000	1.003	2	0.9609	14.60
4.5	0.37	8.00	40.00	20.19	53.5	1.760	4000	374.57	0.00	0.00000	1.003	2	0.9714	10.67
4.5	0.37	12.00	60.00	30.28	53.5	1.585	4000	374.57	0.00	0.00000	1.003	2	0.9800	7.83
4.5	0.37	14.00	70.00	35.32	53.5	1.510	4000	374.57	0.00	0.00000	1.003	2	0.9827	7.02
4.5	0.37	16.00	80.00	40.37	53.5	1.441	4000	374.57	0.00	0.00000	1.003	2	0.9847	6.42
4.5	0.37	18.00	90.00	45.42	53.5	1.379	4000	374.57	0.00	0.00000	1.003	2	0.9863	5.96
4.5	0.37	20.00	100.00	50.46	53.5	1.322	4000	374.57	0.00	0.00000	1.003	2	0.9876	5.59
4.5	0.37	22.00	110.00	55.51	53.5	1.269	4000	374.57	0.00	0.00000	1.003	2	0.9886	5.29
4.5	0.37	24.00	120.00	60.56	53.5	1.220	4000	374.57	0.00	0.00000	1.003	2	0.9895	5.03
4.5	0.37	26.00	130.00	65.60	53.5	1.175	4000	374.57	0.00	0.00000	1.003	2	0.9903	4.82
4.5	0.37	28.00	140.00	70.65	53.5	1.134	4000	374.57	0.00	0.00000	1.003	2	0.9910	4.64
4.5	0.37	30.00	150.00	75.69	53.5	1.095	4000	374.57	0.00	0.00000	1.003	2	0.9915	4.48
4.5	0.37	32.00	160.00	80.74	53.5	1.058	4000	374.57	0.00	0.00000	1.003	2	0.9920	4.34
4.5	0.37	34.00	170.00	85.79	53.5	1.024	4000	374.57	0.00	0.00000	1.003	2	0.9925	4.22
4.5	0.37	38.00	190.00	95.88	53.5	0.962	4000	374.57	0.00	0.00000	1.003	2	0.9933	4.02
4.5	0.37	42.00	210.00	105.97	53.5	0.908	4000	374.57	0.00	0.00000	1.003	2	0.9939	3.85
4.5	0.37	14.43	72.15	36.41	53.5	1.495	4000	374.57	0.00	0.00000	1.003	2	0.9831	6.88

Standard Penetration Test Data		
GDOT Project ID:	0006934	← data entry
Project Name:	Courtesy Pkwy	← data entry
Location:	Wall 1	← data entry
Boring Number:	B-2	← data entry
Date:	15-Nov	← data entry

SPT procedures per ASTM D 1586

Additional Notes:

Section 7 - Design Height = 25ft
Station 306+25.53, Rt to 305+25.00, Rt

FOUNDATION SHAPES and GEOMETRY

Footing Length L (ft) =	101	← data entry if known
Footing Width B (ft) =	12.58	← data entry if known
Current Case - L/B =	8	
Square - L/B =	1	
Rectangular - L/B =	5	
Strip - L/B =	10	

SPECIFIC SETTLEMENT VALUE (

1	← data entry
1.5	← data entry
2	← data entry
2.5	← data entry
3	← data entry
3.5	← data entry
4	← data entry

Total Number of Readings	10	
Number of Clay Readings	3	Note: "CLAY" means any of the following: CL, CH, ML, MH, CL-ML, (
% Clay Readings	30	CONTACT GEOTECH ENGINEER - CONSIDER CLAY %

Ground Water Table	35	feet	← data entry
Energy Rating	84	%	← data entry

SPT DATA INPUT: PLEASE ENTER EITHER
(a) Raw Field Blows in Columns B, C, & D or put (b) Measured N-value (bpf) in column I

Advisory Note: If the bottom of wall footing/leveling pad/spread footing elevation is more than5 feet below the ground elevation in your boring log, begin inputting boring log data from the elevation that corresponds to5 feet above the bottom of wall footing/leveling pad/spread footing elevation.

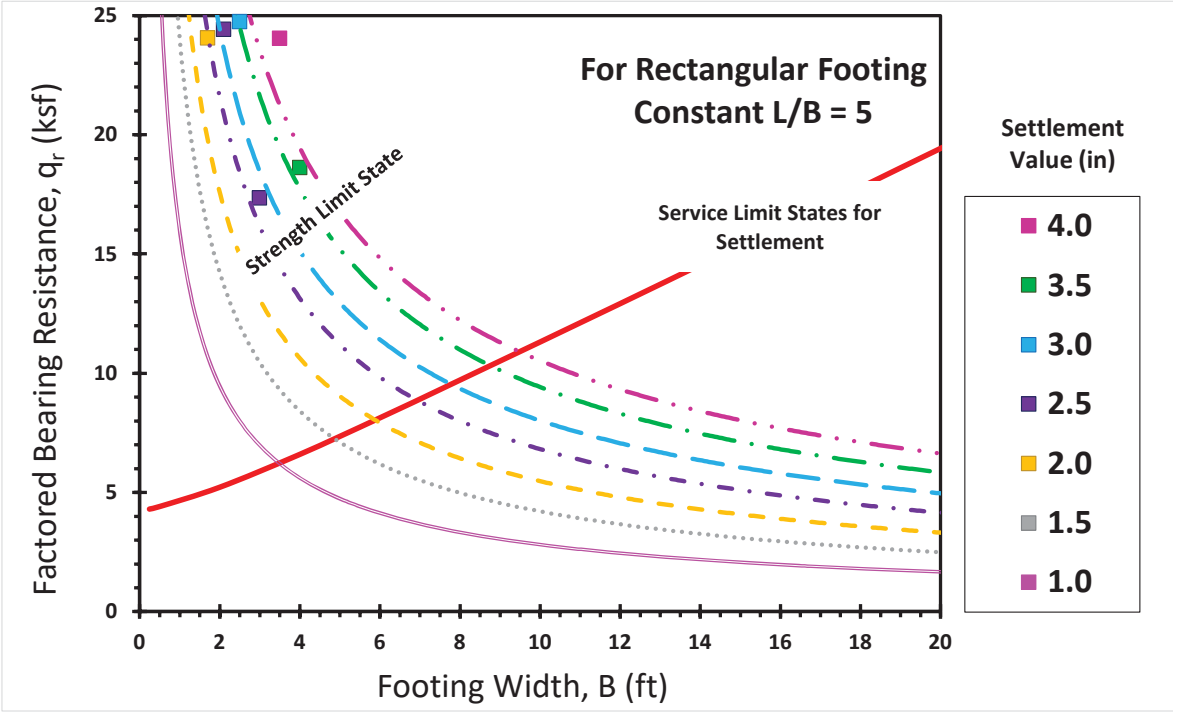
	Raw SPT Blows Per 6 inches			
	#1	#2	#3	N-value (bpf)
data entry →	2	3	5	8
data entry →	3	4	5	9
data entry →	4	5	6	11
data entry →	6	6	9	15
data entry →	8	8	10	18
data entry →	4	6	7	13
data entry →	7	8	10	18
data entry →	3	4	6	10
data entry →	2	3	4	7
data entry →	5	6	8	14

	Depth	SPT Reading	USCS
	(feet)	N-value (bpf)	Soil Type
	0.00		
data entry →	2.50		CL
data entry →	5.00		ML
data entry →	7.50		ML
data entry →	10.00		SM
data entry →	15.00		SM
data entry →	20.00		SM
data entry →	25.00		SM
data entry →	30.00		SM
data entry →	35.00		SM
data entry →	40.00		SM

Rectangular Footing Solution for L/B = 5

Effective Cohesion Intercept , c' (ksf) =	0
Effective Friction Angle, ϕ' (deg) =	33.38
Rectangular Distortion Ratio (L/B) =	5.00
Embedment Depth, D_f (ft) =	2.00
Ground Water Table, D_w (ft) =	35.00
Average Bulk UW, γ_{bulk} (kcf) =	0.12
Layer Thickness, h (ft) =	48.00
Modulus of Foundation, E_{FDTN} (ksf) =	4000
Poisson's Ratio of Soil=	0.20
Poisson's Ratio of Foundation=	0.20
Soil Modulus of Elasticity, E' (ksf) =	455.74
Footing Thickness, t (ft) =	0.00

Friction Angle, ϕ_f	Cohesion BC Term, N_c	Unit Weight BC Term, N_γ	Surcharge BC Term, N_q	Resistance Factor, ϕ_b
33.38	39.947	37.332	27.325	0.4



2.5

Settlement, s (in)	Settlement, s (ft)	Footing Width, B (ft)	Footing Length, L (ft)	Equivalent Diameter, d_e (ft)	Layer Thickness, h (ft)	Shape Disp. factor, I_H	Efdtn (ksf)	Esoil (ksf)	Foundation Thickness, t (ft)	Fdtn Flexibility factor, K_F	Fdtn Flexibility Factor, I_F	z_E (ft)	Embedment factor, I_E	q (ksf)
2.5	0.21	2.10	10.50	5.30	48	2.087	4000	455.74	0.00	0.00000	1.003	2	0.9214	24.42
2.5	0.21	3.00	15.00	7.57	48	2.021	4000	455.74	0.00	0.00000	1.003	2	0.9380	17.35
2.5	0.21	5.50	27.50	13.88	48	1.856	4000	455.74	0.00	0.00000	1.003	2	0.9609	10.05
2.5	0.21	8.00	40.00	20.19	48	1.717	4000	455.74	0.00	0.00000	1.003	2	0.9714	7.39
2.5	0.21	12.00	60.00	30.28	48	1.533	4000	455.74	0.00	0.00000	1.003	2	0.9800	5.47
2.5	0.21	14.00	70.00	35.32	48	1.455	4000	455.74	0.00	0.00000	1.003	2	0.9827	4.93
2.5	0.21	16.00	80.00	40.37	48	1.384	4000	455.74	0.00	0.00000	1.003	2	0.9847	4.52
2.5	0.21	18.00	90.00	45.42	48	1.320	4000	455.74	0.00	0.00000	1.003	2	0.9863	4.21
2.5	0.21	20.00	100.00	50.46	48	1.262	4000	455.74	0.00	0.00000	1.003	2	0.9876	3.96
2.5	0.21	22.00	110.00	55.51	48	1.208	4000	455.74	0.00	0.00000	1.003	2	0.9886	3.75
2.5	0.21	24.00	120.00	60.56	48	1.159	4000	455.74	0.00	0.00000	1.003	2	0.9895	3.58
2.5	0.21	26.00	130.00	65.60	48	1.114	4000	455.74	0.00	0.00000	1.003	2	0.9903	3.44
2.5	0.21	28.00	140.00	70.65	48	1.072	4000	455.74	0.00	0.00000	1.003	2	0.9910	3.31
2.5	0.21	30.00	150.00	75.69	48	1.034	4000	455.74	0.00	0.00000	1.003	2	0.9915	3.21
2.5	0.21	32.00	160.00	80.74	48	0.998	4000	455.74	0.00	0.00000	1.003	2	0.9920	3.11
2.5	0.21	34.00	170.00	85.79	48	0.964	4000	455.74	0.00	0.00000	1.003	2	0.9925	3.03
2.5	0.21	38.00	190.00	95.88	48	0.903	4000	455.74	0.00	0.00000	1.003	2	0.9933	2.89
2.5	0.21	42.00	210.00	105.97	48	0.849	4000	455.74	0.00	0.00000	1.003	2	0.9939	2.78
2.5	0.21	12.58	62.90	31.74	48	1.509	4000	455.74	0.00	0.00000	1.003	2	0.9809	5.30

3.0

Settlement, s (in)	Settlement, s (ft)	Footing Width, B (ft)	Footing Length, L (ft)	Equivalent Diameter, d_e (ft)	Layer Thickness, h (ft)	Shape Disp. factor, I_H	Efdtn (ksf)	Esoil (ksf)	Foundation Thickness, t (ft)	Fdtn Flexibility factor, K_F	Fdtn Flexibility Factor, I_F	z_E (ft)	Embedment factor, I_E	q (ksf)
3	0.25	2.50	12.50	6.31	48	2.057	4000	455.74	0.00	0.00000	1.003	2	0.9298	24.75
3	0.25	4.00	20.00	10.09	48	1.951	4000	455.74	0.00	0.00000	1.003	2	0.9498	15.96
3	0.25	6.00	30.00	15.14	48	1.827	4000	455.74	0.00	0.00000	1.003	2	0.9636	11.21
3	0.25	7.50	37.50	18.92	48	1.743	4000	455.74	0.00	0.00000	1.003	2	0.9698	9.34
3	0.25	9.00	45.00	22.71	48	1.667	4000	455.74	0.00	0.00000	1.003	2	0.9742	8.10
3	0.25	12.00	60.00	30.28	48	1.533	4000	455.74	0.00	0.00000	1.003	2	0.9800	6.57
3	0.25	14.00	70.00	35.32	48	1.455	4000	455.74	0.00	0.00000	1.003	2	0.9827	5.91
3	0.25	16.00	80.00	40.37	48	1.384	4000	455.74	0.00	0.00000	1.003	2	0.9847	5.43
3	0.25	18.00	90.00	45.42	48	1.320	4000	455.74	0.00	0.00000	1.003	2	0.9863	5.05
3	0.25	20.00	100.00	50.46	48	1.262	4000	455.74	0.00	0.00000	1.003	2	0.9876	4.75
3	0.25	22.00	110.00	55.51	48	1.208	4000	455.74	0.00	0.00000	1.003	2	0.9886	4.50
3	0.25	24.00	120.00	60.56	48	1.159	4000	455.74	0.00	0.00000	1.003	2	0.9895	4.30
3	0.25	26.00	130.00	65.60	48	1.114	4000	455.74	0.00	0.00000	1.003	2	0.9903	4.13
3	0.25	28.00	140.00	70.65	48	1.072	4000	455.74	0.00	0.00000	1.003	2	0.9910	3.98
3	0.25	30.00	150.00	75.69	48	1.034	4000	455.74	0.00	0.00000	1.003	2	0.9915	3.85
3	0.25	32.00	160.00	80.74	48	0.998	4000	455.74	0.00	0.00000	1.003	2	0.9920	3.74
3	0.25	34.00	170.00	85.79	48	0.964	4000	455.74	0.00	0.00000	1.003	2	0.9925	3.64
3	0.25	38.00	190.00	95.88	48	0.903	4000	455.74	0.00	0.00000	1.003	2	0.9933	3.47
3	0.25	42.00	210.00	105.97	48	0.849	4000	455.74	0.00	0.00000	1.003	2	0.9939	3.34
3	0.25	12.58	62.90	31.74	48	1.509	4000	455.74	0.00	0.00000	1.003	2	0.9809	6.36

Standard Penetration Test Data		
GDOT Project ID:	0006934	← data entry
Project Name:	Courtesy Pkwy	← data entry
Location:	Wall 1	← data entry
Boring Number:	B-2	← data entry
Date:	15-Nov	← data entry

SPT procedures per ASTM D 1586

Additional Notes:

Section 8 - Design Height = 20ft
Station 305+25.00, Rt to 304+92.00, Rt

FOUNDATION SHAPES and GEOMETRY

Footing Length L (ft) =	33	← data entry if known
Footing Width B (ft) =	9.42	← data entry if known
Current Case - L/B =	4	
Square - L/B =	1	
Rectangular - L/B =	5	
Strip - L/B =	10	

SPECIFIC SETTLEMENT VALUE (

1	← data entry
1.5	← data entry
2	← data entry
2.5	← data entry
3	← data entry
3.5	← data entry
4	← data entry

Total Number of Readings	10
Number of Clay Readings	3
% Clay Readings	30

Note: "CLAY" means any of the following: CL, CH, ML, MH, CL-ML, (

CONTACT GEOTECH ENGINEER - CONSIDER CLAY %

Ground Water Table	35	feet	← data entry
Energy Rating	84	%	← data entry

SPT DATA INPUT: PLEASE ENTER EITHER
(a) Raw Field Blows in Columns B, C, & D or put (b) Measured N-value (bpf) in column I

Advisory Note: If the bottom of wall footing/leveling pad/spread footing elevation is more than5 feet below the ground elevation in your boring log, begin inputting boring log data from the elevation that corresponds to5 feet above the bottom of wall footing/leveling pad/spread footing elevation.

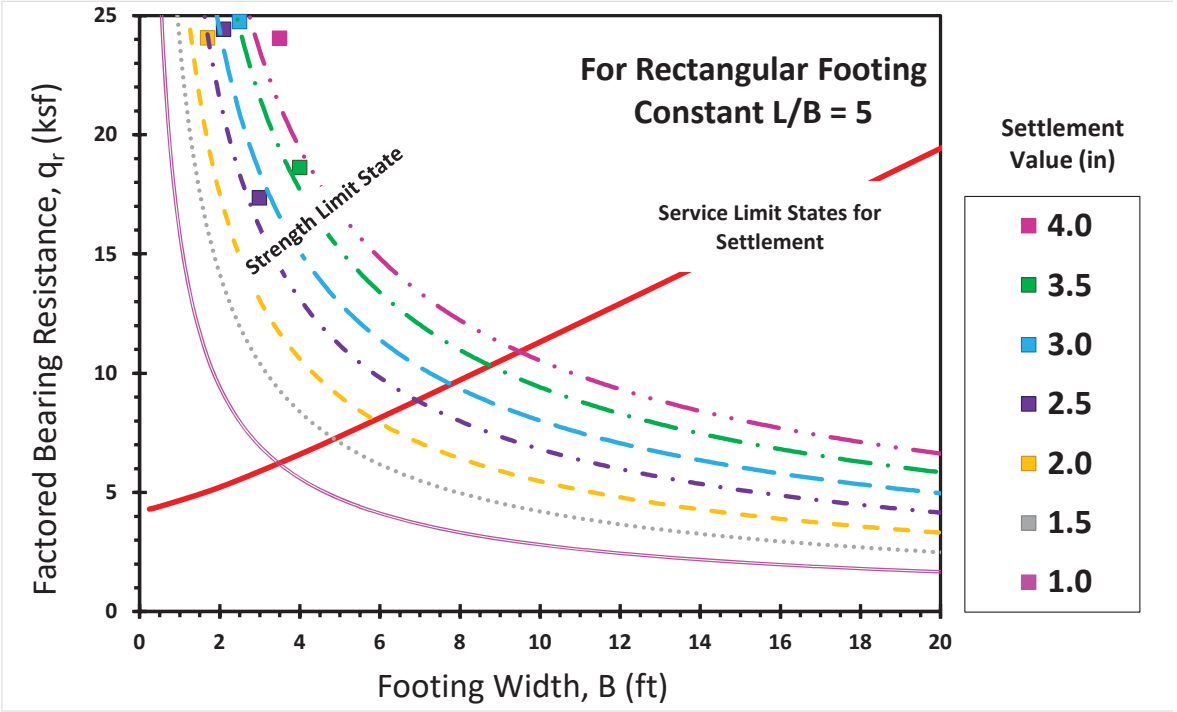
	Raw SPT Blows Per 6 inches			
	#1	#2	#3	N-value (bpf)
data entry →	2	3	5	8
data entry →	3	4	5	9
data entry →	4	5	6	11
data entry →	6	6	9	15
data entry →	8	8	10	18
data entry →	4	6	7	13
data entry →	7	8	10	18
data entry →	3	4	6	10
data entry →	2	3	4	7
data entry →	5	6	8	14

	Depth	SPT Reading	USCS
	(feet)	N-value (bpf)	Soil Type
	0.00		
data entry →	2.50		CL
data entry →	5.00		ML
data entry →	7.50		ML
data entry →	10.00		SM
data entry →	15.00		SM
data entry →	20.00		SM
data entry →	25.00		SM
data entry →	30.00		SM
data entry →	35.00		SM
data entry →	40.00		SM

Rectangular Footing Solution for L/B = 5

Effective Cohesion Intercept , c' (ksf) =	0
Effective Friction Angle, ϕ' (deg) =	33.38
Rectangular Distortion Ratio (L/B) =	5.00
Embedment Depth, D_f (ft) =	2.00
Ground Water Table, D_w (ft) =	35.00
Average Bulk UW, γ_{bulk} (kcf) =	0.12
Layer Thickness, h (ft) =	48.00
Modulus of Foundation, E_{FDTN} (ksf) =	4000
Poisson's Ratio of Soil=	0.20
Poisson's Ratio of Foundation=	0.20
Soil Modulus of Elasticity, E' (ksf) =	455.74
Footing Thickness, t (ft) =	0.00

Friction Angle, ϕ_f	Cohesion BC Term, N_c	Unit Weight BC Term, N_γ	Surcharge BC Term, N_q	Resistance Factor, ϕ_b
33.38	39.947	37.332	27.325	0.4



1.5

Settlement, s (in)	Settlement, s (ft)	Footing Width, B (ft)	Footing Length, L (ft)	Equivalent Diameter, d_e (ft)	Layer Thickness, h (ft)	Shape Disp. factor, I_H	Efdtn (ksf)	Esoil (ksf)	Foundation Thickness, t (ft)	Fdtn Flexibility factor, K_F	Fdtn Flexibility Factor, I_F	z_E (ft)	Embedment factor, I_E	q (ksf)
1.5	0.12	1.20	6.00	3.03	48	2.158	4000	455.74	0.00	0.00000	1.003	2	0.8928	25.60
1.5	0.12	2.00	10.00	5.05	48	2.095	4000	455.74	0.00	0.00000	1.003	2	0.9190	15.37
1.5	0.12	3.50	17.50	8.83	48	1.985	4000	455.74	0.00	0.00000	1.003	2	0.9445	9.02
1.5	0.12	6.00	30.00	15.14	48	1.827	4000	455.74	0.00	0.00000	1.003	2	0.9636	5.60
1.5	0.12	8.00	40.00	20.19	48	1.717	4000	455.74	0.00	0.00000	1.003	2	0.9714	4.44
1.5	0.12	12.00	60.00	30.28	48	1.533	4000	455.74	0.00	0.00000	1.003	2	0.9800	3.28
1.5	0.12	14.00	70.00	35.32	48	1.455	4000	455.74	0.00	0.00000	1.003	2	0.9827	2.96
1.5	0.12	16.00	80.00	40.37	48	1.384	4000	455.74	0.00	0.00000	1.003	2	0.9847	2.71
1.5	0.12	18.00	90.00	45.42	48	1.320	4000	455.74	0.00	0.00000	1.003	2	0.9863	2.53
1.5	0.12	20.00	100.00	50.46	48	1.262	4000	455.74	0.00	0.00000	1.003	2	0.9876	2.37
1.5	0.12	22.00	110.00	55.51	48	1.208	4000	455.74	0.00	0.00000	1.003	2	0.9886	2.25
1.5	0.12	24.00	120.00	60.56	48	1.159	4000	455.74	0.00	0.00000	1.003	2	0.9895	2.15
1.5	0.12	26.00	130.00	65.60	48	1.114	4000	455.74	0.00	0.00000	1.003	2	0.9903	2.06
1.5	0.12	28.00	140.00	70.65	48	1.072	4000	455.74	0.00	0.00000	1.003	2	0.9910	1.99
1.5	0.12	30.00	150.00	75.69	48	1.034	4000	455.74	0.00	0.00000	1.003	2	0.9915	1.92
1.5	0.12	32.00	160.00	80.74	48	0.998	4000	455.74	0.00	0.00000	1.003	2	0.9920	1.87
1.5	0.12	34.00	170.00	85.79	48	0.964	4000	455.74	0.00	0.00000	1.003	2	0.9925	1.82
1.5	0.12	38.00	190.00	95.88	48	0.903	4000	455.74	0.00	0.00000	1.003	2	0.9933	1.74
1.5	0.12	42.00	210.00	105.97	48	0.849	4000	455.74	0.00	0.00000	1.003	2	0.9939	1.67
1.5	0.12	9.42	47.10	23.77	48	1.647	4000	455.74	0.00	0.00000	1.003	2	0.9752	3.91

2.0

Settlement, s (in)	Settlement, s (ft)	Footing Width, B (ft)	Footing Length, L (ft)	Equivalent Diameter, d_e (ft)	Layer Thickness, h (ft)	Shape Disp. factor, I_H	Efdtn (ksf)	Esoil (ksf)	Foundation Thickness, t (ft)	Fdtn Flexibility factor, K_F	Fdtn Flexibility Factor, I_F	z_E (ft)	Embedment factor, I_E	q (ksf)
2	0.17	1.70	8.50	4.29	48	2.118	4000	455.74	0.00	0.00000	1.003	2	0.9108	24.06
2	0.17	3.00	15.00	7.57	48	2.021	4000	455.74	0.00	0.00000	1.003	2	0.9380	13.88
2	0.17	5.00	25.00	12.62	48	1.887	4000	455.74	0.00	0.00000	1.003	2	0.9578	8.73
2	0.17	7.00	35.00	17.66	48	1.770	4000	455.74	0.00	0.00000	1.003	2	0.9680	6.58
2	0.17	9.00	45.00	22.71	48	1.667	4000	455.74	0.00	0.00000	1.003	2	0.9742	5.40
2	0.17	12.00	60.00	30.28	48	1.533	4000	455.74	0.00	0.00000	1.003	2	0.9800	4.38
2	0.17	14.00	70.00	35.32	48	1.455	4000	455.74	0.00	0.00000	1.003	2	0.9827	3.94
2	0.17	16.00	80.00	40.37	48	1.384	4000	455.74	0.00	0.00000	1.003	2	0.9847	3.62
2	0.17	18.00	90.00	45.42	48	1.320	4000	455.74	0.00	0.00000	1.003	2	0.9863	3.37
2	0.17	20.00	100.00	50.46	48	1.262	4000	455.74	0.00	0.00000	1.003	2	0.9876	3.17
2	0.17	22.00	110.00	55.51	48	1.208	4000	455.74	0.00	0.00000	1.003	2	0.9886	3.00
2	0.17	24.00	120.00	60.56	48	1.159	4000	455.74	0.00	0.00000	1.003	2	0.9895	2.87
2	0.17	26.00	130.00	65.60	48	1.114	4000	455.74	0.00	0.00000	1.003	2	0.9903	2.75
2	0.17	28.00	140.00	70.65	48	1.072	4000	455.74	0.00	0.00000	1.003	2	0.9910	2.65
2	0.17	30.00	150.00	75.69	48	1.034	4000	455.74	0.00	0.00000	1.003	2	0.9915	2.57
2	0.17	32.00	160.00	80.74	48	0.998	4000	455.74	0.00	0.00000	1.003	2	0.9920	2.49
2	0.17	34.00	170.00	85.79	48	0.964	4000	455.74	0.00	0.00000	1.003	2	0.9925	2.43
2	0.17	38.00	190.00	95.88	48	0.903	4000	455.74	0.00	0.00000	1.003	2	0.9933	2.31
2	0.17	42.00	210.00	105.97	48	0.849	4000	455.74	0.00	0.00000	1.003	2	0.9939	2.23
2	0.17	9.42	47.10	23.77	48	1.647	4000	455.74	0.00	0.00000	1.003	2	0.9752	5.22

Standard Penetration Test Data		
GDOT Project ID:	0006934	← data entry
Project Name:	Courtesy Pkwy	← data entry
Location:	Wall 1	← data entry
Boring Number:	B-1	← data entry
Date:	15-Nov	← data entry

SPT procedures per ASTM D 1586

Additional Notes:

Section 9 - Design Height = 15ft
Station 304+92.00, Rt to 304+72.73, Rt

FOUNDATION SHAPES and GEOMETRY

Footing Length L (ft) =	19	← data entry if known
Footing Width B (ft) =	7.59	← data entry if known
Current Case - L/B =	3	
Square - L/B =	1	
Rectangular - L/B =	5	
Strip - L/B =	10	

SPECIFIC SETTLEMENT VALUE (

1	← data entry
1.5	← data entry
2	← data entry
2.5	← data entry
3	← data entry
3.5	← data entry
4	← data entry

Total Number of Readings	11
Number of Clay Readings	3
% Clay Readings	27

Note: "CLAY" means any of the following: CL, CH, ML, MH, CL-ML, (

CONTACT GEOTECH ENGINEER - CONSIDER CLAY %

Ground Water Table	38.5	feet	← data entry
Energy Rating	84	%	← data entry

SPT DATA INPUT: PLEASE ENTER EITHER
(a) Raw Field Blows in Columns B, C, & D or put (b) Measured N-value (bpf) in column I

Advisory Note: If the bottom of wall footing/leveling pad/spread footing elevation is more than5 feet below the ground elevation in your boring log, begin inputting boring log data from the elevation that corresponds to5 feet above the bottom of wall footing/leveling pad/spread footing elevation.

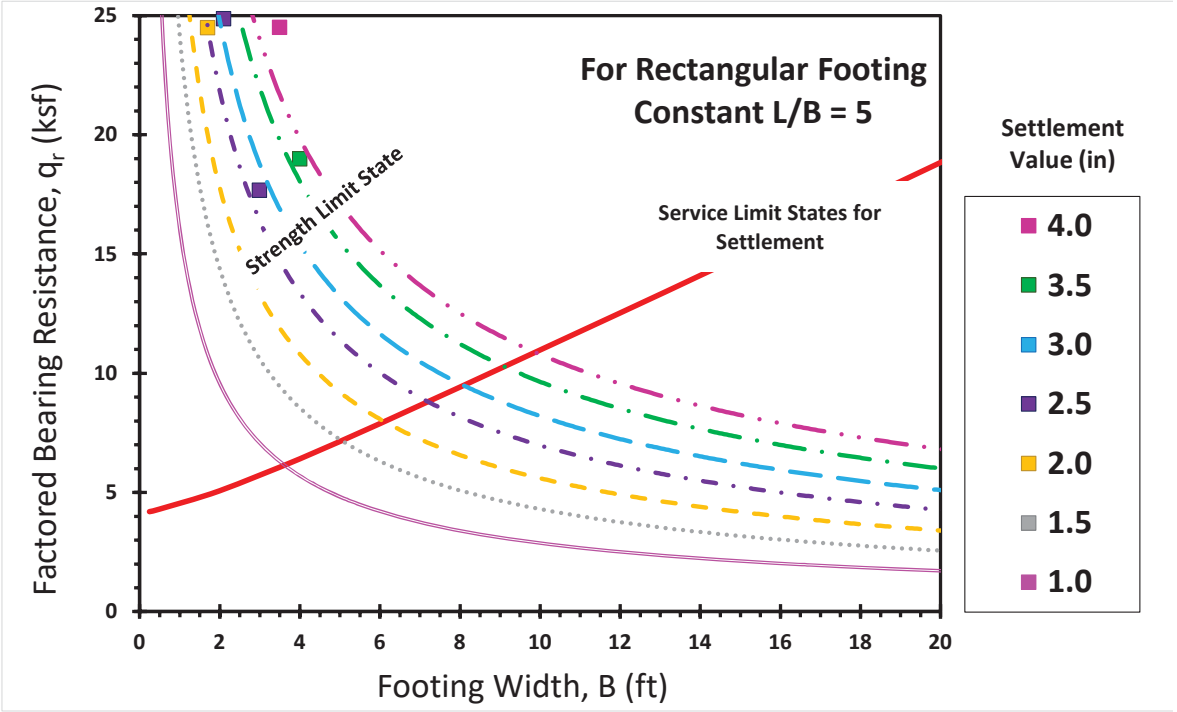
	Raw SPT Blows Per 6 inches			
	#1	#2	#3	N-value (bpf)
data entry →	4	5	5	10
data entry →	3	5	6	11
data entry →	5	5	7	12
data entry →	4	5	7	12
data entry →	3	7	8	15
data entry →	5	7	8	15
data entry →	4	4	4	8
data entry →	3	5	5	10
data entry →	3	5	6	11
data entry →	3	3	3	6
data entry →	114	16	22	38

	Depth	SPT Reading	USCS
	(feet)	N-value (bpf)	Soil Type
	0.00		
data entry →	2.50		CL
data entry →	5.00		ML
data entry →	7.50		ML
data entry →	10.00		SM
data entry →	15.00		SM
data entry →	20.00		SM
data entry →	25.00		SM
data entry →	30.00		SM
data entry →	35.00		SM
data entry →	40.00		SM
data entry →	45.00		SM

Rectangular Footing Solution for L/B = 5

Effective Cohesion Intercept , c' (ksf) =	0
Effective Friction Angle, ϕ' (deg) =	33.20
Rectangular Distortion Ratio (L/B) =	5.00
Embedment Depth, D_f (ft) =	2.00
Ground Water Table, D_w (ft) =	38.50
Average Bulk UW, γ_{bulk} (kcf) =	0.12
Layer Thickness, h (ft) =	47.00
Modulus of Foundation, E_{FDTN} (ksf) =	4000
Poisson's Ratio of Soil=	0.20
Poisson's Ratio of Foundation=	0.20
Soil Modulus of Elasticity, E' (ksf) =	463.21
Footing Thickness, t (ft) =	0.00

Friction Angle, ϕ_f	Cohesion BC Term, N_c	Unit Weight BC Term, N_γ	Surcharge BC Term, N_q	Resistance Factor, ϕ_b
33.20	39.304	36.273	26.718	0.4



1.0

Settlement, s (in)	Settlement, s (ft)	Footing Width, B (ft)	Footing Length, L (ft)	Equivalent Diameter, d_e (ft)	Layer Thickness, h (ft)	Shape Disp. factor, I_H	Efdtn (ksf)	Esoil (ksf)	Foundation Thickness, t (ft)	Fdtn Flexibility factor, K_F	Fdtn Flexibility Factor, I_F	z_E (ft)	Embedment factor, I_E	q (ksf)
1	0.08	1.20	6.00	3.03	47	2.156	4000	463.21	0.00	0.00000	1.003	2	0.8928	17.36
1	0.08	2.00	10.00	5.05	47	2.091	4000	463.21	0.00	0.00000	1.003	2	0.9190	10.43
1	0.08	3.50	17.50	8.83	47	1.980	4000	463.21	0.00	0.00000	1.003	2	0.9445	6.13
1	0.08	6.00	30.00	15.14	47	1.819	4000	463.21	0.00	0.00000	1.003	2	0.9636	3.81
1	0.08	8.00	40.00	20.19	47	1.708	4000	463.21	0.00	0.00000	1.003	2	0.9714	3.02
1	0.08	12.00	60.00	30.28	47	1.522	4000	463.21	0.00	0.00000	1.003	2	0.9800	2.24
1	0.08	14.00	70.00	35.32	47	1.444	4000	463.21	0.00	0.00000	1.003	2	0.9827	2.02
1	0.08	16.00	80.00	40.37	47	1.373	4000	463.21	0.00	0.00000	1.003	2	0.9847	1.85
1	0.08	18.00	90.00	45.42	47	1.309	4000	463.21	0.00	0.00000	1.003	2	0.9863	1.73
1	0.08	20.00	100.00	50.46	47	1.250	4000	463.21	0.00	0.00000	1.003	2	0.9876	1.62
1	0.08	22.00	110.00	55.51	47	1.197	4000	463.21	0.00	0.00000	1.003	2	0.9886	1.54
1	0.08	24.00	120.00	60.56	47	1.148	4000	463.21	0.00	0.00000	1.003	2	0.9895	1.47
1	0.08	26.00	130.00	65.60	47	1.102	4000	463.21	0.00	0.00000	1.003	2	0.9903	1.41
1	0.08	28.00	140.00	70.65	47	1.061	4000	463.21	0.00	0.00000	1.003	2	0.9910	1.36
1	0.08	30.00	150.00	75.69	47	1.022	4000	463.21	0.00	0.00000	1.003	2	0.9915	1.32
1	0.08	32.00	160.00	80.74	47	0.986	4000	463.21	0.00	0.00000	1.003	2	0.9920	1.28
1	0.08	34.00	170.00	85.79	47	0.952	4000	463.21	0.00	0.00000	1.003	2	0.9925	1.25
1	0.08	38.00	190.00	95.88	47	0.892	4000	463.21	0.00	0.00000	1.003	2	0.9933	1.19
1	0.08	42.00	210.00	105.97	47	0.838	4000	463.21	0.00	0.00000	1.003	2	0.9939	1.15
1	0.08	7.59	37.95	19.15	47	1.730	4000	463.21	0.00	0.00000	1.003	2	0.9701	3.15

1.5

Settlement, s (in)	Settlement, s (ft)	Footing Width, B (ft)	Footing Length, L (ft)	Equivalent Diameter, d_e (ft)	Layer Thickness, h (ft)	Shape Disp. factor, I_H	Efdtn (ksf)	Esoil (ksf)	Foundation Thickness, t (ft)	Fdtn Flexibility factor, K_F	Fdtn Flexibility Factor, I_F	z_E (ft)	Embedment factor, I_E	q (ksf)
1.5	0.12	1.20	6.00	3.03	47	2.156	4000	463.21	0.00	0.00000	1.003	2	0.8928	26.04
1.5	0.12	2.00	10.00	5.05	47	2.091	4000	463.21	0.00	0.00000	1.003	2	0.9190	15.65
1.5	0.12	3.50	17.50	8.83	47	1.980	4000	463.21	0.00	0.00000	1.003	2	0.9445	9.19
1.5	0.12	6.00	30.00	15.14	47	1.819	4000	463.21	0.00	0.00000	1.003	2	0.9636	5.72
1.5	0.12	8.00	40.00	20.19	47	1.708	4000	463.21	0.00	0.00000	1.003	2	0.9714	4.53
1.5	0.12	12.00	60.00	30.28	47	1.522	4000	463.21	0.00	0.00000	1.003	2	0.9800	3.36
1.5	0.12	14.00	70.00	35.32	47	1.444	4000	463.21	0.00	0.00000	1.003	2	0.9827	3.03
1.5	0.12	16.00	80.00	40.37	47	1.373	4000	463.21	0.00	0.00000	1.003	2	0.9847	2.78
1.5	0.12	18.00	90.00	45.42	47	1.309	4000	463.21	0.00	0.00000	1.003	2	0.9863	2.59
1.5	0.12	20.00	100.00	50.46	47	1.250	4000	463.21	0.00	0.00000	1.003	2	0.9876	2.44
1.5	0.12	22.00	110.00	55.51	47	1.197	4000	463.21	0.00	0.00000	1.003	2	0.9886	2.31
1.5	0.12	24.00	120.00	60.56	47	1.148	4000	463.21	0.00	0.00000	1.003	2	0.9895	2.21
1.5	0.12	26.00	130.00	65.60	47	1.102	4000	463.21	0.00	0.00000	1.003	2	0.9903	2.12
1.5	0.12	28.00	140.00	70.65	47	1.061	4000	463.21	0.00	0.00000	1.003	2	0.9910	2.04
1.5	0.12	30.00	150.00	75.69	47	1.022	4000	463.21	0.00	0.00000	1.003	2	0.9915	1.98
1.5	0.12	32.00	160.00	80.74	47	0.986	4000	463.21	0.00	0.00000	1.003	2	0.9920	1.92
1.5	0.12	34.00	170.00	85.79	47	0.952	4000	463.21	0.00	0.00000	1.003	2	0.9925	1.87
1.5	0.12	38.00	190.00	95.88	47	0.892	4000	463.21	0.00	0.00000	1.003	2	0.9933	1.79
1.5	0.12	42.00	210.00	105.97	47	0.838	4000	463.21	0.00	0.00000	1.003	2	0.9939	1.72
1.5	0.12	7.59	37.95	19.15	47	1.730	4000	463.21	0.00	0.00000	1.003	2	0.9701	4.72

Standard Penetration Test Data		
GDOT Project ID:	0006934	← data entry
Project Name:	Courtesy Pkwy	← data entry
Location:	Wall 2	← data entry
Boring Number:	W-3	← data entry
Date:	15-Nov	← data entry

SPT procedures per ASTM D 1586

Additional Notes:

Section 1 - Design Height = 15ft
Station 146+00.00, Lt to 145+63.00, Lt

FOUNDATION SHAPES and GEOMETRY

Footing Length L (ft) =	37	← data entry if known
Footing Width B (ft) =	7.59	← data entry if known
Current Case - L/B =	5	
Square - L/B =	1	
Rectangular - L/B =	5	
Strip - L/B =	10	

SPECIFIC SETTLEMENT VALUE (

1	← data entry
1.5	← data entry
2	← data entry
2.5	← data entry
3	← data entry
3.5	← data entry
4	← data entry

Total Number of Readings	9
Number of Clay Readings	4
% Clay Readings	44

Note: "CLAY" means any of the following: CL, CH, ML, MH, CL-ML, (

CONTACT GEOTECH ENGINEER - CONSIDER CLAY %

Ground Water Table	29	feet	← data entry
Energy Rating	84	%	← data entry

SPT DATA INPUT: PLEASE ENTER EITHER
(a) Raw Field Blows in Columns B, C, & D or put (b) Measured N-value (bpf) in column I

Advisory Note: If the bottom of wall footing/leveling pad/spread footing elevation is more than5 feet below the ground elevation in your boring log, begin inputting boring log data from the elevation that corresponds to5 feet above the bottom of wall footing/leveling pad/spread footing elevation.

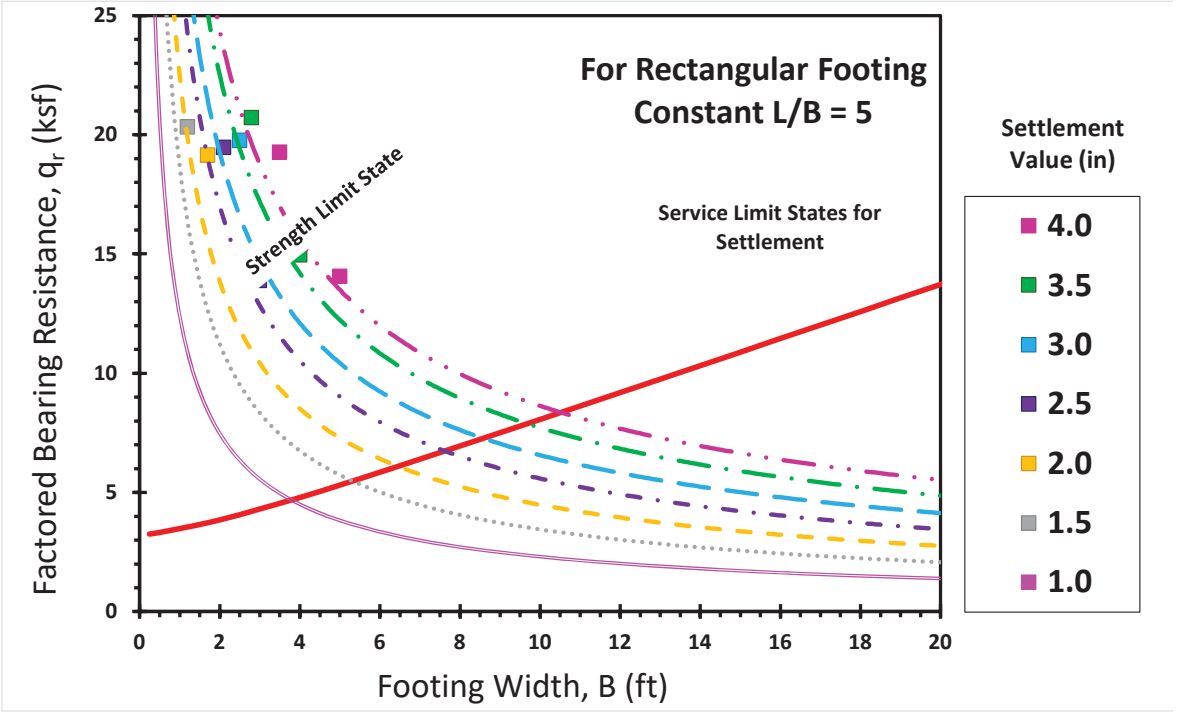
	Raw SPT Blows Per 6 inches			
	#1	#2	#3	N-value (bpf)
data entry →	3	3	4	7
data entry →	3	3	3	6
data entry →	4	5	5	10
data entry →	5	5	5	10
data entry →	5	7	7	14
data entry →	3	3	3	6
data entry →	4	4	4	8
data entry →	2	2	2	4
data entry →	11	13	15	28

	Depth	SPT Reading	USCS
	(feet)	N-value (bpf)	Soil Type
	0.00		
data entry →	2.50		CL
data entry →	5.00		CL
data entry →	7.50		ML
data entry →	10.00		ML
data entry →	15.00		SM
data entry →	20.00		SM
data entry →	25.00		SM
data entry →	30.00		SM
data entry →	35.00		SM

Rectangular Footing Solution for L/B = 5

Effective Cohesion Intercept , c' (ksf) =	0
Effective Friction Angle, ϕ' (deg) =	31.11
Rectangular Distortion Ratio (L/B) =	5.00
Embedment Depth, D_f (ft) =	2.00
Ground Water Table, D_w (ft) =	29.00
Average Bulk UW, γ_{bulk} (kcf) =	0.12
Layer Thickness, h (ft) =	43.00
Modulus of Foundation, E_{FDTN} (ksf) =	4000
Poisson's Ratio of Soil=	0.20
Poisson's Ratio of Foundation=	0.20
Soil Modulus of Elasticity, E' (ksf) =	360.18
Footing Thickness, t (ft) =	0.00

Friction Angle, ϕ_f	Cohesion BC Term, N_c	Unit Weight BC Term, N_γ	Surcharge BC Term, N_q	Resistance Factor, ϕ_b
31.11	32.976	26.439	20.903	0.4



1.0

Settlement, s (in)	Settlement, s (ft)	Footing Width, B (ft)	Footing Length, L (ft)	Equivalent Diameter, d_e (ft)	Layer Thickness, h (ft)	Shape Disp. factor, I_H	Efdtn (ksf)	Esoil (ksf)	Foundation Thickness, t (ft)	Fdtn Flexibility factor, K_F	Fdtn Flexibility Factor, I_F	z_E (ft)	Embedment factor, I_E	q (ksf)
1	0.08	1.20	6.00	3.03	43	2.147	4000	360.18	0.00	0.00000	1.003	2	0.8928	13.56
1	0.08	2.00	10.00	5.05	43	2.077	4000	360.18	0.00	0.00000	1.003	2	0.9190	8.17
1	0.08	3.50	17.50	8.83	43	1.958	4000	360.18	0.00	0.00000	1.003	2	0.9445	4.82
1	0.08	6.00	30.00	15.14	43	1.787	4000	360.18	0.00	0.00000	1.003	2	0.9636	3.02
1	0.08	8.00	40.00	20.19	43	1.670	4000	360.18	0.00	0.00000	1.003	2	0.9714	2.40
1	0.08	12.00	60.00	30.28	43	1.477	4000	360.18	0.00	0.00000	1.003	2	0.9800	1.79
1	0.08	14.00	70.00	35.32	43	1.397	4000	360.18	0.00	0.00000	1.003	2	0.9827	1.62
1	0.08	16.00	80.00	40.37	43	1.324	4000	360.18	0.00	0.00000	1.003	2	0.9847	1.49
1	0.08	18.00	90.00	45.42	43	1.259	4000	360.18	0.00	0.00000	1.003	2	0.9863	1.39
1	0.08	20.00	100.00	50.46	43	1.200	4000	360.18	0.00	0.00000	1.003	2	0.9876	1.32
1	0.08	22.00	110.00	55.51	43	1.146	4000	360.18	0.00	0.00000	1.003	2	0.9886	1.25
1	0.08	24.00	120.00	60.56	43	1.097	4000	360.18	0.00	0.00000	1.003	2	0.9895	1.20
1	0.08	26.00	130.00	65.60	43	1.052	4000	360.18	0.00	0.00000	1.003	2	0.9903	1.15
1	0.08	28.00	140.00	70.65	43	1.011	4000	360.18	0.00	0.00000	1.003	2	0.9910	1.11
1	0.08	30.00	150.00	75.69	43	0.972	4000	360.18	0.00	0.00000	1.003	2	0.9915	1.08
1	0.08	32.00	160.00	80.74	43	0.937	4000	360.18	0.00	0.00000	1.003	2	0.9920	1.05
1	0.08	34.00	170.00	85.79	43	0.904	4000	360.18	0.00	0.00000	1.003	2	0.9925	1.02
1	0.08	38.00	190.00	95.88	43	0.844	4000	360.18	0.00	0.00000	1.003	2	0.9933	0.98
1	0.08	42.00	210.00	105.97	43	0.792	4000	360.18	0.00	0.00000	1.003	2	0.9939	0.94
1	0.08	7.59	37.95	19.15	43	1.693	4000	360.18	0.00	0.00000	1.003	2	0.9701	2.50

1.5

Settlement, s (in)	Settlement, s (ft)	Footing Width, B (ft)	Footing Length, L (ft)	Equivalent Diameter, d_e (ft)	Layer Thickness, h (ft)	Shape Disp. factor, I_H	Efdtn (ksf)	Esoil (ksf)	Foundation Thickness, t (ft)	Fdtn Flexibility factor, K_F	Fdtn Flexibility Factor, I_F	z_E (ft)	Embedment factor, I_E	q (ksf)
1.5	0.12	1.20	6.00	3.03	43	2.147	4000	360.18	0.00	0.00000	1.003	2	0.8928	20.34
1.5	0.12	2.00	10.00	5.05	43	2.077	4000	360.18	0.00	0.00000	1.003	2	0.9190	12.25
1.5	0.12	3.50	17.50	8.83	43	1.958	4000	360.18	0.00	0.00000	1.003	2	0.9445	7.23
1.5	0.12	6.00	30.00	15.14	43	1.787	4000	360.18	0.00	0.00000	1.003	2	0.9636	4.53
1.5	0.12	8.00	40.00	20.19	43	1.670	4000	360.18	0.00	0.00000	1.003	2	0.9714	3.60
1.5	0.12	12.00	60.00	30.28	43	1.477	4000	360.18	0.00	0.00000	1.003	2	0.9800	2.69
1.5	0.12	14.00	70.00	35.32	43	1.397	4000	360.18	0.00	0.00000	1.003	2	0.9827	2.43
1.5	0.12	16.00	80.00	40.37	43	1.324	4000	360.18	0.00	0.00000	1.003	2	0.9847	2.24
1.5	0.12	18.00	90.00	45.42	43	1.259	4000	360.18	0.00	0.00000	1.003	2	0.9863	2.09
1.5	0.12	20.00	100.00	50.46	43	1.200	4000	360.18	0.00	0.00000	1.003	2	0.9876	1.97
1.5	0.12	22.00	110.00	55.51	43	1.146	4000	360.18	0.00	0.00000	1.003	2	0.9886	1.88
1.5	0.12	24.00	120.00	60.56	43	1.097	4000	360.18	0.00	0.00000	1.003	2	0.9895	1.79
1.5	0.12	26.00	130.00	65.60	43	1.052	4000	360.18	0.00	0.00000	1.003	2	0.9903	1.73
1.5	0.12	28.00	140.00	70.65	43	1.011	4000	360.18	0.00	0.00000	1.003	2	0.9910	1.67
1.5	0.12	30.00	150.00	75.69	43	0.972	4000	360.18	0.00	0.00000	1.003	2	0.9915	1.62
1.5	0.12	32.00	160.00	80.74	43	0.937	4000	360.18	0.00	0.00000	1.003	2	0.9920	1.57
1.5	0.12	34.00	170.00	85.79	43	0.904	4000	360.18	0.00	0.00000	1.003	2	0.9925	1.53
1.5	0.12	38.00	190.00	95.88	43	0.844	4000	360.18	0.00	0.00000	1.003	2	0.9933	1.47
1.5	0.12	42.00	210.00	105.97	43	0.792	4000	360.18	0.00	0.00000	1.003	2	0.9939	1.41
1.5	0.12	7.59	37.95	19.15	43	1.693	4000	360.18	0.00	0.00000	1.003	2	0.9701	3.75

Standard Penetration Test Data		
GDOT Project ID:	0006934	← data entry
Project Name:	Courtesy Pkwy	← data entry
Location:	Wall 2	← data entry
Boring Number:	W-3	← data entry
Date:	15-Nov	← data entry

SPT procedures per ASTM D 1586

Additional Notes:

Section 2 - Design Height = 20ft
Station 145+63.00, Lt to 145+39.00, Lt

FOUNDATION SHAPES and GEOMETRY

Footing Length L (ft) =	24	← data entry if known
Footing Width B (ft) =	9.42	← data entry if known
Current Case - L/B =	3	
Square - L/B =	1	
Rectangular - L/B =	5	
Strip - L/B =	10	

SPECIFIC SETTLEMENT VALUE (

1	← data entry
1.5	← data entry
2	← data entry
2.5	← data entry
3	← data entry
3.5	← data entry
4	← data entry

Total Number of Readings	9
Number of Clay Readings	4
% Clay Readings	44

Note: "CLAY" means any of the following: CL, CH, ML, MH, CL-ML, (

CONTACT GEOTECH ENGINEER - CONSIDER CLAY %

Ground Water Table	29	feet	← data entry
Energy Rating	84	%	← data entry

SPT DATA INPUT: PLEASE ENTER EITHER
(a) Raw Field Blows in Columns B, C, & D or put (b) Measured N-value (bpf) in column I

Advisory Note: If the bottom of wall footing/leveling pad/spread footing elevation is more than5 feet below the ground elevation in your boring log, begin inputting boring log data from the elevation that corresponds to5 feet above the bottom of wall footing/leveling pad/spread footing elevation.

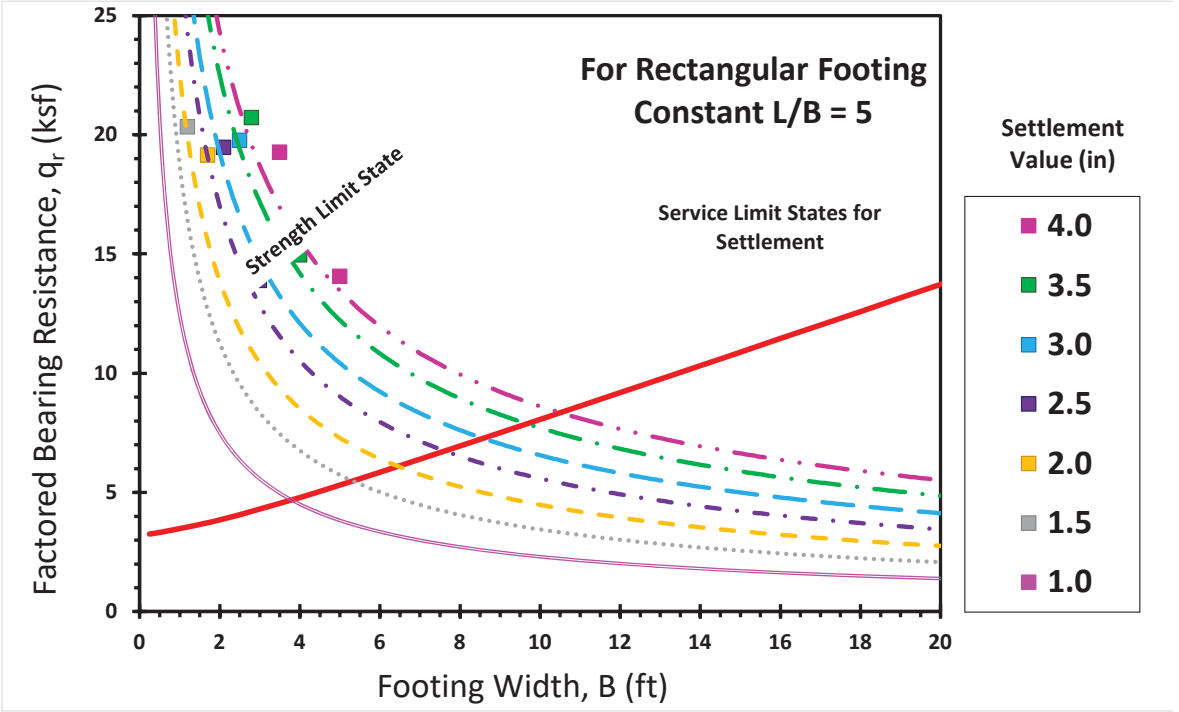
	Raw SPT Blows Per 6 inches			
	#1	#2	#3	N-value (bpf)
data entry →	3	3	4	7
data entry →	3	3	3	6
data entry →	4	5	5	10
data entry →	5	5	5	10
data entry →	5	7	7	14
data entry →	3	3	3	6
data entry →	4	4	4	8
data entry →	2	2	2	4
data entry →	11	13	15	28

	Depth	SPT Reading	USCS
	(feet)	N-value (bpf)	Soil Type
	0.00		
data entry →	2.50		CL
data entry →	5.00		CL
data entry →	7.50		ML
data entry →	10.00		ML
data entry →	15.00		SM
data entry →	20.00		SM
data entry →	25.00		SM
data entry →	30.00		SM
data entry →	35.00		SM

Rectangular Footing Solution for L/B = 5

Effective Cohesion Intercept , c' (ksf) =	0
Effective Friction Angle, ϕ' (deg) =	31.11
Rectangular Distortion Ratio (L/B) =	5.00
Embedment Depth, D_f (ft) =	2.00
Ground Water Table, D_w (ft) =	29.00
Average Bulk UW, γ_{bulk} (kcf) =	0.12
Layer Thickness, h (ft) =	43.00
Modulus of Foundation, E_{FDTN} (ksf) =	4000
Poisson's Ratio of Soil=	0.20
Poisson's Ratio of Foundation=	0.20
Soil Modulus of Elasticity, E' (ksf) =	360.18
Footing Thickness, t (ft) =	0.00

Friction Angle, ϕ_f	Cohesion BC Term, N_c	Unit Weight BC Term, N_γ	Surcharge BC Term, N_q	Resistance Factor, ϕ_b
31.11	32.976	26.439	20.903	0.4



2.0

Settlement, s (in)	Settlement, s (ft)	Footing Width, B (ft)	Footing Length, L (ft)	Equivalent Diameter, d_e (ft)	Layer Thickness, h (ft)	Shape Disp. factor, I_H	Efdtn (ksf)	Esoil (ksf)	Foundation Thickness, t (ft)	Fdtn Flexibility factor, K_F	Fdtn Flexibility Factor, I_F	z_E (ft)	Embedment factor, I_E	q (ksf)
2	0.17	1.70	8.50	4.29	43	2.103	4000	360.18	0.00	0.00000	1.003	2	0.9108	19.15
2	0.17	3.00	15.00	7.57	43	1.996	4000	360.18	0.00	0.00000	1.003	2	0.9380	11.10
2	0.17	5.00	25.00	12.62	43	1.851	4000	360.18	0.00	0.00000	1.003	2	0.9578	7.03
2	0.17	7.00	35.00	17.66	43	1.726	4000	360.18	0.00	0.00000	1.003	2	0.9680	5.33
2	0.17	9.00	45.00	22.71	43	1.617	4000	360.18	0.00	0.00000	1.003	2	0.9742	4.40
2	0.17	12.00	60.00	30.28	43	1.477	4000	360.18	0.00	0.00000	1.003	2	0.9800	3.59
2	0.17	14.00	70.00	35.32	43	1.397	4000	360.18	0.00	0.00000	1.003	2	0.9827	3.25
2	0.17	16.00	80.00	40.37	43	1.324	4000	360.18	0.00	0.00000	1.003	2	0.9847	2.99
2	0.17	18.00	90.00	45.42	43	1.259	4000	360.18	0.00	0.00000	1.003	2	0.9863	2.79
2	0.17	20.00	100.00	50.46	43	1.200	4000	360.18	0.00	0.00000	1.003	2	0.9876	2.63
2	0.17	22.00	110.00	55.51	43	1.146	4000	360.18	0.00	0.00000	1.003	2	0.9886	2.50
2	0.17	24.00	120.00	60.56	43	1.097	4000	360.18	0.00	0.00000	1.003	2	0.9895	2.39
2	0.17	26.00	130.00	65.60	43	1.052	4000	360.18	0.00	0.00000	1.003	2	0.9903	2.30
2	0.17	28.00	140.00	70.65	43	1.011	4000	360.18	0.00	0.00000	1.003	2	0.9910	2.22
2	0.17	30.00	150.00	75.69	43	0.972	4000	360.18	0.00	0.00000	1.003	2	0.9915	2.16
2	0.17	32.00	160.00	80.74	43	0.937	4000	360.18	0.00	0.00000	1.003	2	0.9920	2.10
2	0.17	34.00	170.00	85.79	43	0.904	4000	360.18	0.00	0.00000	1.003	2	0.9925	2.04
2	0.17	38.00	190.00	95.88	43	0.844	4000	360.18	0.00	0.00000	1.003	2	0.9933	1.96
2	0.17	42.00	210.00	105.97	43	0.792	4000	360.18	0.00	0.00000	1.003	2	0.9939	1.89
2	0.17	9.42	47.10	23.77	43	1.596	4000	360.18	0.00	0.00000	1.003	2	0.9752	4.25

2.5

Settlement, s (in)	Settlement, s (ft)	Footing Width, B (ft)	Footing Length, L (ft)	Equivalent Diameter, d_e (ft)	Layer Thickness, h (ft)	Shape Disp. factor, I_H	Efdtn (ksf)	Esoil (ksf)	Foundation Thickness, t (ft)	Fdtn Flexibility factor, K_F	Fdtn Flexibility Factor, I_F	z_E (ft)	Embedment factor, I_E	q (ksf)
2.5	0.21	2.10	10.50	5.30	43	2.069	4000	360.18	0.00	0.00000	1.003	2	0.9214	19.47
2.5	0.21	3.00	15.00	7.57	43	1.996	4000	360.18	0.00	0.00000	1.003	2	0.9380	13.88
2.5	0.21	5.50	27.50	13.88	43	1.819	4000	360.18	0.00	0.00000	1.003	2	0.9609	8.11
2.5	0.21	8.00	40.00	20.19	43	1.670	4000	360.18	0.00	0.00000	1.003	2	0.9714	6.01
2.5	0.21	12.00	60.00	30.28	43	1.477	4000	360.18	0.00	0.00000	1.003	2	0.9800	4.49
2.5	0.21	14.00	70.00	35.32	43	1.397	4000	360.18	0.00	0.00000	1.003	2	0.9827	4.06
2.5	0.21	16.00	80.00	40.37	43	1.324	4000	360.18	0.00	0.00000	1.003	2	0.9847	3.74
2.5	0.21	18.00	90.00	45.42	43	1.259	4000	360.18	0.00	0.00000	1.003	2	0.9863	3.49
2.5	0.21	20.00	100.00	50.46	43	1.200	4000	360.18	0.00	0.00000	1.003	2	0.9876	3.29
2.5	0.21	22.00	110.00	55.51	43	1.146	4000	360.18	0.00	0.00000	1.003	2	0.9886	3.13
2.5	0.21	24.00	120.00	60.56	43	1.097	4000	360.18	0.00	0.00000	1.003	2	0.9895	2.99
2.5	0.21	26.00	130.00	65.60	43	1.052	4000	360.18	0.00	0.00000	1.003	2	0.9903	2.88
2.5	0.21	28.00	140.00	70.65	43	1.011	4000	360.18	0.00	0.00000	1.003	2	0.9910	2.78
2.5	0.21	30.00	150.00	75.69	43	0.972	4000	360.18	0.00	0.00000	1.003	2	0.9915	2.70
2.5	0.21	32.00	160.00	80.74	43	0.937	4000	360.18	0.00	0.00000	1.003	2	0.9920	2.62
2.5	0.21	34.00	170.00	85.79	43	0.904	4000	360.18	0.00	0.00000	1.003	2	0.9925	2.56
2.5	0.21	38.00	190.00	95.88	43	0.844	4000	360.18	0.00	0.00000	1.003	2	0.9933	2.45
2.5	0.21	42.00	210.00	105.97	43	0.792	4000	360.18	0.00	0.00000	1.003	2	0.9939	2.36
2.5	0.21	9.42	47.10	23.77	43	1.596	4000	360.18	0.00	0.00000	1.003	2	0.9752	5.32

Standard Penetration Test Data		
GDOT Project ID:	0006934	← data entry
Project Name:	Courtesy Pkwy	← data entry
Location:	Wall 2	← data entry
Boring Number:	W-3	← data entry
Date:	15-Nov	← data entry

SPT procedures per ASTM D 1586

Additional Notes:

Section 3 - Design Height = 25ft
Station 145+39.00, Lt to 145+23.00, Lt

FOUNDATION SHAPES and GEOMETRY

Footing Length L (ft) =	16	← data entry if known
Footing Width B (ft) =	12.58	← data entry if known
Current Case - L/B =	1	
Square - L/B =	1	
Rectangular - L/B =	5	
Strip - L/B =	10	

SPECIFIC SETTLEMENT VALUE (

1	← data entry
1.5	← data entry
2	← data entry
2.5	← data entry
3	← data entry
3.5	← data entry
4	← data entry

Total Number of Readings	9	
Number of Clay Readings	4	Note: "CLAY" means any of the following: CL, CH, ML, MH, CL-ML, (
% Clay Readings	44	CONTACT GEOTECH ENGINEER - CONSIDER CLAY %

Ground Water Table	29	feet	← data entry
Energy Rating	84	%	← data entry

SPT DATA INPUT: PLEASE ENTER EITHER
(a) Raw Field Blows in Columns B, C, & D or put (b) Measured N-value (bpf) in column I

Advisory Note: If the bottom of wall footing/leveling pad/spread footing elevation is more than5 feet below the ground elevation in your boring log, begin inputting boring log data from the elevation that corresponds to5 feet above the bottom of wall footing/leveling pad/spread footing elevation.

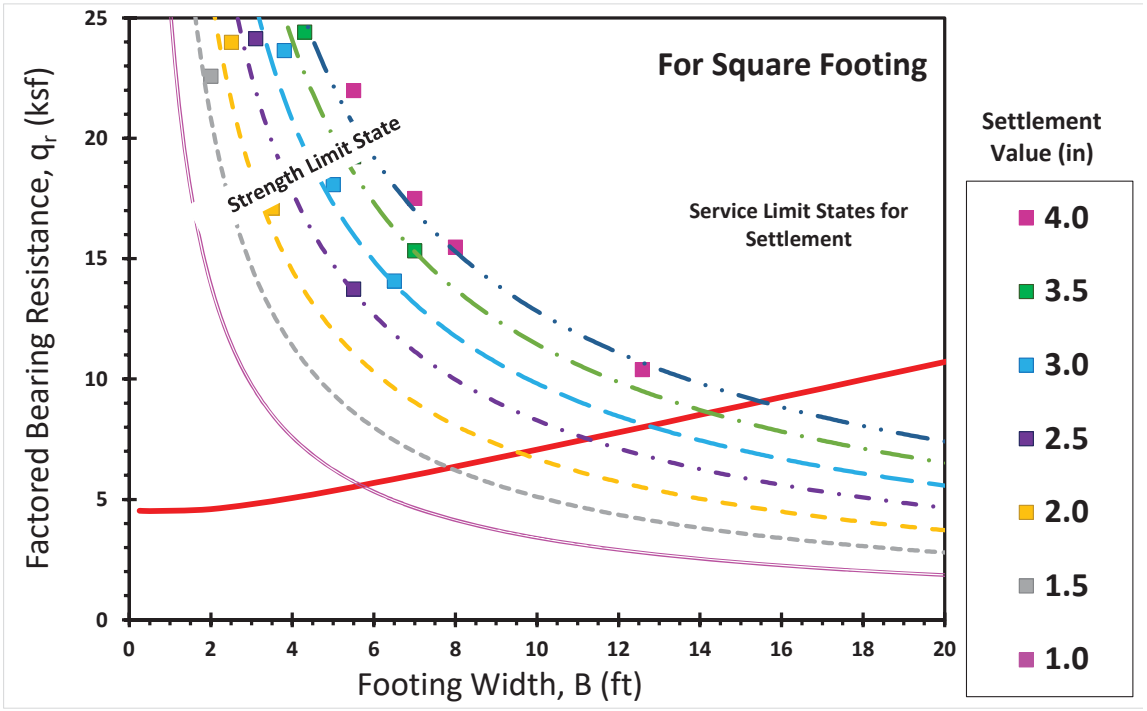
	Raw SPT Blows Per 6 inches			
	#1	#2	#3	N-value (bpf)
data entry →	3	3	4	7
data entry →	3	3	3	6
data entry →	4	5	5	10
data entry →	5	5	5	10
data entry →	5	7	7	14
data entry →	3	3	3	6
data entry →	4	4	4	8
data entry →	2	2	2	4
data entry →	11	13	15	28

	Depth	SPT Reading	USCS
	(feet)	N-value (bpf)	Soil Type
	0.00		
data entry →	2.50		CL
data entry →	5.00		CL
data entry →	7.50		ML
data entry →	10.00		ML
data entry →	15.00		SM
data entry →	20.00		SM
data entry →	25.00		SM
data entry →	30.00		SM
data entry →	35.00		SM

Square Footing Solution for L/B = 1

Effective Cohesion Intercept , c' (ksf) =	0
Effective Friction Angle, ϕ' (deg) =	31.11
Rectangular Distortion Ratio (L/B) =	1.00
Embedment Depth, D_f (ft) =	2.00
Ground Water Table, D_w (ft) =	29.00
Average Bulk UW, γ_{bulk} (kcf) =	0.12
Layer Thickness, h (ft) =	43.00
Modulus of Foundation, E_{FDTN} (ksf) =	4000
Poisson's Ratio of Soil=	0.20
Poisson's Ratio of Foundation=	0.20
Soil Modulus of Elasticity, E' (ksf) =	360.18
Footing Thickness, t (ft) =	0.00

Friction Angle, ϕ_f	Cohesion BC Term, N_c	Unit Weight BC Term, N_γ	Surcharge BC Term, N_q	Resistance Factor, ϕ_b
31.11	32.976	26.439	20.903	0.4



2.0

Settlement, s (in)	Settlement, s (ft)	Footing Width, B (ft)	Footing Length, L (ft)	Equivalent Diameter, d_e (ft)	Layer Thickness, h (ft)	Shape Disp. factor, I_H	Efdtn (ksf)	Esoil (ksf)	Foundation Thickness, t (ft)	Fdtn Flexibility factor, K_F	Fdtn Flexibility Factor, I_F	z_E (ft)	Embedment factor, I_E	q (ksf)
2	0.17	2.50	2.50	2.82	43	1.169	4000	360.18	0.00	0.000	1.003	2	0.8891	24.00
2	0.17	3.50	3.50	3.95	43	1.149	4000	360.18	0.00	0.000	1.003	2	0.9066	17.11
2	0.17	5.00	5.00	5.64	43	1.119	4000	360.18	0.00	0.000	1.003	2	0.9245	12.05
2	0.17	7.00	7.00	7.90	43	1.083	4000	360.18	0.00	0.000	1.003	2	0.9398	8.76
2	0.17	9.00	9.00	10.16	43	1.048	4000	360.18	0.00	0.000	1.003	2	0.9500	6.96
2	0.17	12.00	12.00	13.54	43	1.000	4000	360.18	0.00	0.000	1.003	2	0.9601	5.41
2	0.17	14.00	14.00	15.80	43	0.971	4000	360.18	0.00	0.000	1.003	2	0.9648	4.76
2	0.17	16.00	16.00	18.05	43	0.943	4000	360.18	0.00	0.000	1.003	2	0.9686	4.27
2	0.17	18.00	18.00	20.31	43	0.917	4000	360.18	0.00	0.000	1.003	2	0.9716	3.89
2	0.17	20.00	20.00	22.57	43	0.892	4000	360.18	0.00	0.000	1.003	2	0.9741	3.59
2	0.17	22.00	22.00	24.82	43	0.868	4000	360.18	0.00	0.000	1.003	2	0.9762	3.34
2	0.17	24.00	24.00	27.08	43	0.846	4000	360.18	0.00	0.000	1.003	2	0.9779	3.14
2	0.17	26.00	26.00	29.34	43	0.825	4000	360.18	0.00	0.000	1.003	2	0.9795	2.97
2	0.17	26.00	26.00	29.34	43	0.825	4000	360.18	0.00	0.000	1.003	2	0.9795	2.97
2	0.17	28.00	28.00	31.59	43	0.805	4000	360.18	0.00	0.000	1.003	2	0.9808	2.82
2	0.17	30.00	30.00	33.85	43	0.785	4000	360.18	0.00	0.000	1.003	2	0.9820	2.70
2	0.17	32.00	32.00	36.11	43	0.767	4000	360.18	0.00	0.000	1.003	2	0.9830	2.58
2	0.17	34.00	34.00	38.36	43	0.750	4000	360.18	0.00	0.000	1.003	2	0.9839	2.49
2	0.17	36.00	36.00	40.62	43	0.733	4000	360.18	0.00	0.000	1.003	2	0.9848	2.40
2	0.17	42.00	42.00	47.39	43	0.687	4000	360.18	0.00	0.000	1.003	2	0.9868	2.19
2	0.17	12.58	12.58	14.20	43	0.992	4000	360.18	0.00	0.000	1.003	2	0.9616	5.20

2.5

Settlement, s (in)	Settlement, s (ft)	Footing Width, B (ft)	Footing Length, L (ft)	Equivalent Diameter, d_e (ft)	Layer Thickness, h (ft)	Shape Disp. factor, I_H	Efdtn (ksf)	Esoil (ksf)	Foundation Thickness, t (ft)	Fdtn Flexibility factor, K_F	Fdtn Flexibility Factor, I_F	z_E (ft)	Embedment factor, I_E	q (ksf)
2.5	0.21	3.10	3.10	3.50	43	1.157	4000	360.18	0.00	0.000	1.003	2	0.9003	24.14
2.5	0.21	4.00	4.00	4.51	43	1.139	4000	360.18	0.00	0.000	1.003	2	0.9134	18.73
2.5	0.21	5.50	5.50	6.21	43	1.110	4000	360.18	0.00	0.000	1.003	2	0.9290	13.74
2.5	0.21	7.00	7.00	7.90	43	1.083	4000	360.18	0.00	0.000	1.003	2	0.9398	10.94
2.5	0.21	9.00	9.00	10.16	43	1.048	4000	360.18	0.00	0.000	1.003	2	0.9500	8.70
2.5	0.21	12.00	12.00	13.54	43	1.000	4000	360.18	0.00	0.000	1.003	2	0.9601	6.76
2.5	0.21	14.00	14.00	15.80	43	0.971	4000	360.18	0.00	0.000	1.003	2	0.9648	5.94
2.5	0.21	16.00	16.00	18.05	43	0.943	4000	360.18	0.00	0.000	1.003	2	0.9686	5.33
2.5	0.21	18.00	18.00	20.31	43	0.917	4000	360.18	0.00	0.000	1.003	2	0.9716	4.86
2.5	0.21	20.00	20.00	22.57	43	0.892	4000	360.18	0.00	0.000	1.003	2	0.9741	4.49
2.5	0.21	22.00	22.00	24.82	43	0.868	4000	360.18	0.00	0.000	1.003	2	0.9762	4.18
2.5	0.21	24.00	24.00	27.08	43	0.846	4000	360.18	0.00	0.000	1.003	2	0.9779	3.93
2.5	0.21	26.00	26.00	29.34	43	0.825	4000	360.18	0.00	0.000	1.003	2	0.9795	3.71
2.5	0.21	28.00	28.00	31.59	43	0.805	4000	360.18	0.00	0.000	1.003	2	0.9808	3.53
2.5	0.21	30.00	30.00	33.85	43	0.785	4000	360.18	0.00	0.000	1.003	2	0.9820	3.37
2.5	0.21	32.00	32.00	36.11	43	0.767	4000	360.18	0.00	0.000	1.003	2	0.9830	3.23
2.5	0.21	34.00	34.00	38.36	43	0.750	4000	360.18	0.00	0.000	1.003	2	0.9839	3.11
2.5	0.21	38.00	38.00	42.88	43	0.717	4000	360.18	0.00	0.000	1.003	2	0.9855	2.90
2.5	0.21	42.00	42.00	47.39	43	0.687	4000	360.18	0.00	0.000	1.003	2	0.9868	2.74
2.5	0.21	12.58	12.58	14.20	43	0.992	4000	360.18	0.00	0.000	1.003	2	0.9616	6.50

Standard Penetration Test Data		
GDOT Project ID:	0006934	← data entry
Project Name:	Courtesy Pkwy	← data entry
Location:	Wall 2	← data entry
Boring Number:	W-3	← data entry
Date:	15-Nov	← data entry

SPT procedures per ASTM D 1586

Additional Notes:

Section 4 - Design Height = 30ft
Station 145+23.00, Lt to 145+08.00, Lt

FOUNDATION SHAPES and GEOMETRY

Footing Length L (ft) =	15	← data entry if known
Footing Width B (ft) =	14.43	← data entry if known
Current Case - L/B =	1	
Square - L/B =	1	
Rectangular - L/B =	5	
Strip - L/B =	10	

SPECIFIC SETTLEMENT VALUE (

1	← data entry
1.5	← data entry
2	← data entry
2.5	← data entry
3	← data entry
3.5	← data entry
4	← data entry

Total Number of Readings	9	
Number of Clay Readings	4	Note: "CLAY" means any of the following: CL, CH, ML, MH, CL-ML, (
% Clay Readings	44	CONTACT GEOTECH ENGINEER - CONSIDER CLAY %

Ground Water Table	29	feet	← data entry
Energy Rating	84	%	← data entry

SPT DATA INPUT: PLEASE ENTER EITHER
(a) Raw Field Blows in Columns B, C, & D or put (b) Measured N-value (bpf) in column I

Advisory Note: If the bottom of wall footing/leveling pad/spread footing elevation is more than5 feet below the ground elevation in your boring log, begin inputting boring log data from the elevation that corresponds to5 feet above the bottom of wall footing/leveling pad/spread footing elevation.

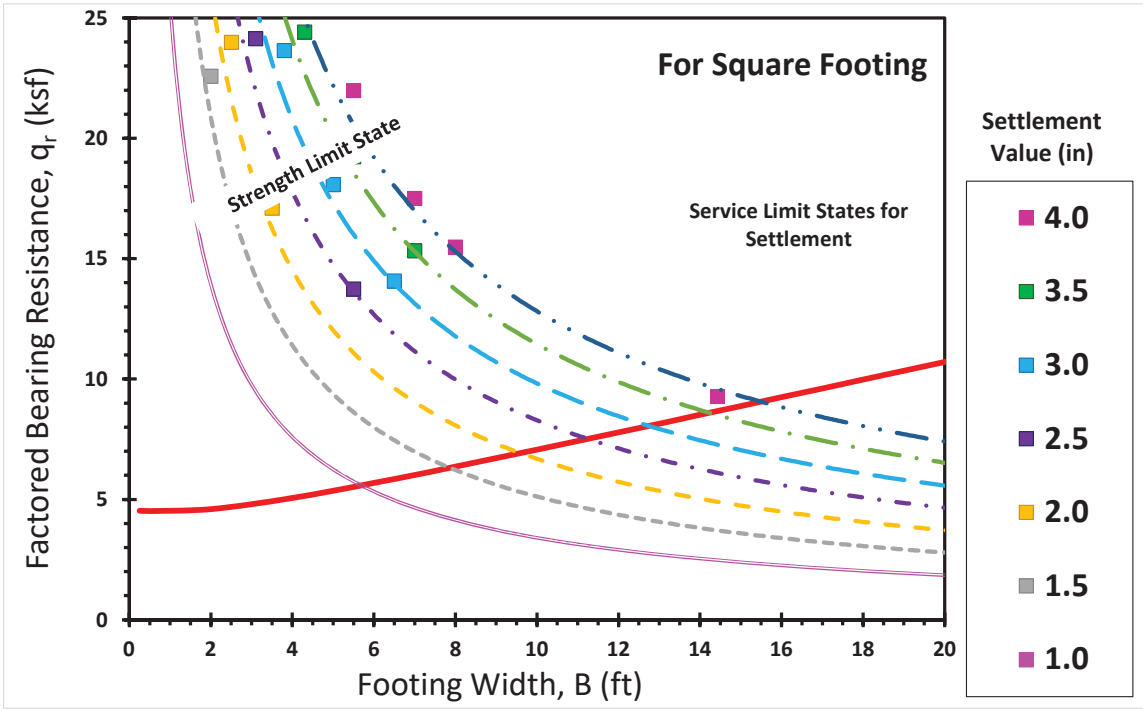
	Raw SPT Blows Per 6 inches			
	#1	#2	#3	N-value (bpf)
data entry →	3	3	4	7
data entry →	3	3	3	6
data entry →	4	5	5	10
data entry →	5	5	5	10
data entry →	5	7	7	14
data entry →	3	3	3	6
data entry →	4	4	4	8
data entry →	2	2	2	4
data entry →	11	13	15	28

	Depth	SPT Reading	USCS
	(feet)	N-value (bpf)	Soil Type
	0.00		
data entry →	2.50		CL
data entry →	5.00		CL
data entry →	7.50		ML
data entry →	10.00		ML
data entry →	15.00		SM
data entry →	20.00		SM
data entry →	25.00		SM
data entry →	30.00		SM
data entry →	35.00		SM

Square Footing Solution for L/B = 1

Effective Cohesion Intercept , c' (ksf) =	0
Effective Friction Angle, ϕ' (deg) =	31.11
Rectangular Distortion Ratio (L/B) =	1.00
Embedment Depth, D_f (ft) =	2.00
Ground Water Table, D_w (ft) =	29.00
Average Bulk UW, γ_{bulk} (kcf) =	0.12
Layer Thickness, h (ft) =	43.00
Modulus of Foundation, E_{FDTN} (ksf) =	4000
Poisson's Ratio of Soil=	0.20
Poisson's Ratio of Foundation=	0.20
Soil Modulus of Elasticity, E' (ksf) =	360.18
Footing Thickness, t (ft) =	0.00

Friction Angle, ϕ_f	Cohesion BC Term, N_c	Unit Weight BC Term, N_γ	Surcharge BC Term, N_q	Resistance Factor, ϕ_b
31.11	32.976	26.439	20.903	0.4



2.5

Settlement, s (in)	Settlement, s (ft)	Footing Width, B (ft)	Footing Length, L (ft)	Equivalent Diameter, d_e (ft)	Layer Thickness, h (ft)	Shape Disp. factor, I_H	Efdtn (ksf)	Esoil (ksf)	Foundation Thickness, t (ft)	Fdtn Flexibility factor, K_F	Fdtn Flexibility Factor, I_F	z_E (ft)	Embedment factor, I_E	q (ksf)
2.5	0.21	3.10	3.10	3.50	43	1.157	4000	360.18	0.00	0.000	1.003	2	0.9003	24.14
2.5	0.21	4.00	4.00	4.51	43	1.139	4000	360.18	0.00	0.000	1.003	2	0.9134	18.73
2.5	0.21	5.50	5.50	6.21	43	1.110	4000	360.18	0.00	0.000	1.003	2	0.9290	13.74
2.5	0.21	7.00	7.00	7.90	43	1.083	4000	360.18	0.00	0.000	1.003	2	0.9398	10.94
2.5	0.21	9.00	9.00	10.16	43	1.048	4000	360.18	0.00	0.000	1.003	2	0.9500	8.70
2.5	0.21	12.00	12.00	13.54	43	1.000	4000	360.18	0.00	0.000	1.003	2	0.9601	6.76
2.5	0.21	14.00	14.00	15.80	43	0.971	4000	360.18	0.00	0.000	1.003	2	0.9648	5.94
2.5	0.21	16.00	16.00	18.05	43	0.943	4000	360.18	0.00	0.000	1.003	2	0.9686	5.33
2.5	0.21	18.00	18.00	20.31	43	0.917	4000	360.18	0.00	0.000	1.003	2	0.9716	4.86
2.5	0.21	20.00	20.00	22.57	43	0.892	4000	360.18	0.00	0.000	1.003	2	0.9741	4.49
2.5	0.21	22.00	22.00	24.82	43	0.868	4000	360.18	0.00	0.000	1.003	2	0.9762	4.18
2.5	0.21	24.00	24.00	27.08	43	0.846	4000	360.18	0.00	0.000	1.003	2	0.9779	3.93
2.5	0.21	26.00	26.00	29.34	43	0.825	4000	360.18	0.00	0.000	1.003	2	0.9795	3.71
2.5	0.21	28.00	28.00	31.59	43	0.805	4000	360.18	0.00	0.000	1.003	2	0.9808	3.53
2.5	0.21	30.00	30.00	33.85	43	0.785	4000	360.18	0.00	0.000	1.003	2	0.9820	3.37
2.5	0.21	32.00	32.00	36.11	43	0.767	4000	360.18	0.00	0.000	1.003	2	0.9830	3.23
2.5	0.21	34.00	34.00	38.36	43	0.750	4000	360.18	0.00	0.000	1.003	2	0.9839	3.11
2.5	0.21	38.00	38.00	42.88	43	0.717	4000	360.18	0.00	0.000	1.003	2	0.9855	2.90
2.5	0.21	42.00	42.00	47.39	43	0.687	4000	360.18	0.00	0.000	1.003	2	0.9868	2.74
2.5	0.21	14.43	14.43	16.28	43	0.965	4000	360.18	0.00	0.000	1.003	2	0.9657	5.80

3.0

Settlement, s (in)	Settlement, s (ft)	Footing Width, B (ft)	Footing Length, L (ft)	Equivalent Diameter, d_e (ft)	Layer Thickness, h (ft)	Shape Disp. factor, I_H	Efdtn (ksf)	Esoil (ksf)	Foundation Thickness, t (ft)	Fdtn Flexibility factor, K_F	Fdtn Flexibility Factor, I_F	z_E (ft)	Embedment factor, I_E	q (ksf)
3	0.25	3.80	3.80	4.29	43	1.143	4000	360.18	0.00	0.000	1.003	2	0.9108	23.65
3	0.25	5.00	5.00	5.64	43	1.119	4000	360.18	0.00	0.000	1.003	2	0.9245	18.08
3	0.25	6.50	6.50	7.33	43	1.092	4000	360.18	0.00	0.000	1.003	2	0.9366	14.08
3	0.25	8.00	8.00	9.03	43	1.065	4000	360.18	0.00	0.000	1.003	2	0.9454	11.61
3	0.25	9.00	9.00	10.16	43	1.048	4000	360.18	0.00	0.000	1.003	2	0.9500	10.44
3	0.25	12.00	12.00	13.54	43	1.000	4000	360.18	0.00	0.000	1.003	2	0.9601	8.12
3	0.25	14.00	14.00	15.80	43	0.971	4000	360.18	0.00	0.000	1.003	2	0.9648	7.13
3	0.25	16.00	16.00	18.05	43	0.943	4000	360.18	0.00	0.000	1.003	2	0.9686	6.40
3	0.25	18.00	18.00	20.31	43	0.917	4000	360.18	0.00	0.000	1.003	2	0.9716	5.83
3	0.25	20.00	20.00	22.57	43	0.892	4000	360.18	0.00	0.000	1.003	2	0.9741	5.38
3	0.25	22.00	22.00	24.82	43	0.868	4000	360.18	0.00	0.000	1.003	2	0.9762	5.02
3	0.25	24.00	24.00	27.08	43	0.846	4000	360.18	0.00	0.000	1.003	2	0.9779	4.71
3	0.25	26.00	26.00	29.34	43	0.825	4000	360.18	0.00	0.000	1.003	2	0.9795	4.45
3	0.25	28.00	28.00	31.59	43	0.805	4000	360.18	0.00	0.000	1.003	2	0.9808	4.23
3	0.25	30.00	30.00	33.85	43	0.785	4000	360.18	0.00	0.000	1.003	2	0.9820	4.04
3	0.25	32.00	32.00	36.11	43	0.767	4000	360.18	0.00	0.000	1.003	2	0.9830	3.88
3	0.25	34.00	34.00	38.36	43	0.750	4000	360.18	0.00	0.000	1.003	2	0.9839	3.73
3	0.25	38.00	38.00	42.88	43	0.717	4000	360.18	0.00	0.000	1.003	2	0.9855	3.48
3	0.25	42.00	42.00	47.39	43	0.687	4000	360.18	0.00	0.000	1.003	2	0.9868	3.28
3	0.25	14.43	14.43	16.28	43	0.965	4000	360.18	0.00	0.000	1.003	2	0.9657	6.96

Standard Penetration Test Data		
GDOT Project ID:	0006934	← data entry
Project Name:	Courtesy Pkwy	← data entry
Location:	Wall 2	← data entry
Boring Number:	W-3	← data entry
Date:	15-Nov	← data entry

SPT procedures per ASTM D 1586

Additional Notes:

Section 5 - Design Height = 35ft
Station 145+08.00, Lt to 144+44.00, Lt

FOUNDATION SHAPES and GEOMETRY

Footing Length L (ft) =	64	← data entry if known
Footing Width B (ft) =	17.6	← data entry if known
Current Case - L/B =	4	
Square - L/B =	1	
Rectangular - L/B =	5	
Strip - L/B =	10	

SPECIFIC SETTLEMENT VALUE (

1	← data entry
3	← data entry
4.5	← data entry
5	← data entry
5.5	← data entry
6	← data entry
6.5	← data entry

Total Number of Readings	9
Number of Clay Readings	4
% Clay Readings	44

Note: "CLAY" means any of the following: CL, CH, ML, MH, CL-ML, (

CONTACT GEOTECH ENGINEER - CONSIDER CLAY %

Ground Water Table	29	feet	← data entry
Energy Rating	84	%	← data entry

SPT DATA INPUT: PLEASE ENTER EITHER
(a) Raw Field Blows in Columns B, C, & D or put (b) Measured N-value (bpf) in column I

Advisory Note: If the bottom of wall footing/leveling pad/spread footing elevation is more than5 feet below the ground elevation in your boring log, begin inputting boring log data from the elevation that corresponds to5 feet above the bottom of wall footing/leveling pad/spread footing elevation.

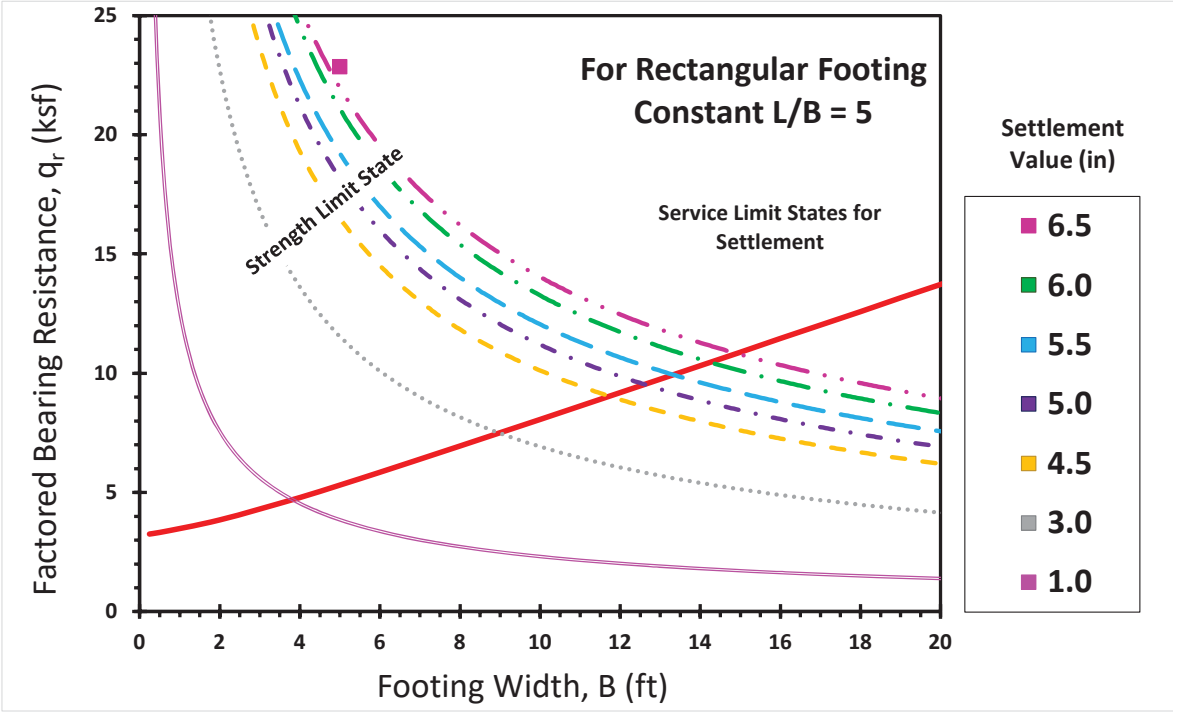
	Raw SPT Blows Per 6 inches			
	#1	#2	#3	N-value (bpf)
data entry →	3	3	4	7
data entry →	3	3	3	6
data entry →	4	5	5	10
data entry →	5	5	5	10
data entry →	5	7	7	14
data entry →	3	3	3	6
data entry →	4	4	4	8
data entry →	2	2	2	4
data entry →	11	13	15	28

	Depth	SPT Reading	USCS
	(feet)	N-value (bpf)	Soil Type
	0.00		
data entry →	2.50		CL
data entry →	5.00		CL
data entry →	7.50		ML
data entry →	10.00		ML
data entry →	15.00		SM
data entry →	20.00		SM
data entry →	25.00		SM
data entry →	30.00		SM
data entry →	35.00		SM

Rectangular Footing Solution for L/B = 5

Effective Cohesion Intercept , c' (ksf) =	0
Effective Friction Angle, ϕ' (deg) =	31.11
Rectangular Distortion Ratio (L/B) =	5.00
Embedment Depth, D_f (ft) =	2.00
Ground Water Table, D_w (ft) =	29.00
Average Bulk UW, γ_{bulk} (kcf) =	0.12
Layer Thickness, h (ft) =	43.00
Modulus of Foundation, E_{FDTN} (ksf) =	4000
Poisson's Ratio of Soil=	0.20
Poisson's Ratio of Foundation=	0.20
Soil Modulus of Elasticity, E' (ksf) =	360.18
Footing Thickness, t (ft) =	0.00

Friction Angle, ϕ_f	Cohesion BC Term, N_c	Unit Weight BC Term, N_γ	Surcharge BC Term, N_q	Resistance Factor, ϕ_b
31.11	32.976	26.439	20.903	0.4



5.0

Settlement, s (in)	Settlement, s (ft)	Footing Width, B (ft)	Footing Length, L (ft)	Equivalent Diameter, d_e (ft)	Layer Thickness, h (ft)	Shape Disp. factor, I_H	Efdtn (ksf)	Esoil (ksf)	Foundation Thickness, t (ft)	Fdtn Flexibility factor, K_F	Fdtn Flexibility Factor, I_F	z_E (ft)	Embedment factor, I_E	q (ksf)
5	0.42	2.10	10.50	5.30	43	2.069	4000	360.18	0.00	0.00000	1.003	2	0.9214	38.95
5	0.42	3.00	15.00	7.57	43	1.996	4000	360.18	0.00	0.00000	1.003	2	0.9380	27.76
5	0.42	5.50	27.50	13.88	43	1.819	4000	360.18	0.00	0.00000	1.003	2	0.9609	16.22
5	0.42	8.00	40.00	20.19	43	1.670	4000	360.18	0.00	0.00000	1.003	2	0.9714	12.01
5	0.42	12.00	60.00	30.28	43	1.477	4000	360.18	0.00	0.00000	1.003	2	0.9800	8.97
5	0.42	14.00	70.00	35.32	43	1.397	4000	360.18	0.00	0.00000	1.003	2	0.9827	8.11
5	0.42	16.00	80.00	40.37	43	1.324	4000	360.18	0.00	0.00000	1.003	2	0.9847	7.47
5	0.42	18.00	90.00	45.42	43	1.259	4000	360.18	0.00	0.00000	1.003	2	0.9863	6.97
5	0.42	20.00	100.00	50.46	43	1.200	4000	360.18	0.00	0.00000	1.003	2	0.9876	6.58
5	0.42	22.00	110.00	55.51	43	1.146	4000	360.18	0.00	0.00000	1.003	2	0.9886	6.25
5	0.42	24.00	120.00	60.56	43	1.097	4000	360.18	0.00	0.00000	1.003	2	0.9895	5.98
5	0.42	26.00	130.00	65.60	43	1.052	4000	360.18	0.00	0.00000	1.003	2	0.9903	5.75
5	0.42	28.00	140.00	70.65	43	1.011	4000	360.18	0.00	0.00000	1.003	2	0.9910	5.56
5	0.42	30.00	150.00	75.69	43	0.972	4000	360.18	0.00	0.00000	1.003	2	0.9915	5.39
5	0.42	32.00	160.00	80.74	43	0.937	4000	360.18	0.00	0.00000	1.003	2	0.9920	5.24
5	0.42	34.00	170.00	85.79	43	0.904	4000	360.18	0.00	0.00000	1.003	2	0.9925	5.11
5	0.42	38.00	190.00	95.88	43	0.844	4000	360.18	0.00	0.00000	1.003	2	0.9933	4.89
5	0.42	42.00	210.00	105.97	43	0.792	4000	360.18	0.00	0.00000	1.003	2	0.9939	4.72
5	0.42	17.60	88.00	44.41	43	1.272	4000	360.18	0.00	0.00000	1.003	2	0.9860	7.06

5.5

Settlement, s (in)	Settlement, s (ft)	Footing Width, B (ft)	Footing Length, L (ft)	Equivalent Diameter, d_e (ft)	Layer Thickness, h (ft)	Shape Disp. factor, I_H	Efdtn (ksf)	Esoil (ksf)	Foundation Thickness, t (ft)	Fdtn Flexibility factor, K_F	Fdtn Flexibility Factor, I_F	z_E (ft)	Embedment factor, I_E	q (ksf)
5.5	0.46	2.50	12.50	6.31	43	2.036	4000	360.18	0.00	0.00000	1.003	2	0.9298	36.24
5.5	0.46	4.00	20.00	10.09	43	1.921	4000	360.18	0.00	0.00000	1.003	2	0.9498	23.50
5.5	0.46	6.00	30.00	15.14	43	1.787	4000	360.18	0.00	0.00000	1.003	2	0.9636	16.60
5.5	0.46	7.50	37.50	18.92	43	1.698	4000	360.18	0.00	0.00000	1.003	2	0.9698	13.89
5.5	0.46	9.00	45.00	22.71	43	1.617	4000	360.18	0.00	0.00000	1.003	2	0.9742	12.09
5.5	0.46	12.00	60.00	30.28	43	1.477	4000	360.18	0.00	0.00000	1.003	2	0.9800	9.87
5.5	0.46	14.00	70.00	35.32	43	1.397	4000	360.18	0.00	0.00000	1.003	2	0.9827	8.92
5.5	0.46	16.00	80.00	40.37	43	1.324	4000	360.18	0.00	0.00000	1.003	2	0.9847	8.22
5.5	0.46	18.00	90.00	45.42	43	1.259	4000	360.18	0.00	0.00000	1.003	2	0.9863	7.67
5.5	0.46	20.00	100.00	50.46	43	1.200	4000	360.18	0.00	0.00000	1.003	2	0.9876	7.23
5.5	0.46	22.00	110.00	55.51	43	1.146	4000	360.18	0.00	0.00000	1.003	2	0.9886	6.88
5.5	0.46	24.00	120.00	60.56	43	1.097	4000	360.18	0.00	0.00000	1.003	2	0.9895	6.58
5.5	0.46	26.00	130.00	65.60	43	1.052	4000	360.18	0.00	0.00000	1.003	2	0.9903	6.33
5.5	0.46	28.00	140.00	70.65	43	1.011	4000	360.18	0.00	0.00000	1.003	2	0.9910	6.12
5.5	0.46	30.00	150.00	75.69	43	0.972	4000	360.18	0.00	0.00000	1.003	2	0.9915	5.93
5.5	0.46	32.00	160.00	80.74	43	0.937	4000	360.18	0.00	0.00000	1.003	2	0.9920	5.77
5.5	0.46	34.00	170.00	85.79	43	0.904	4000	360.18	0.00	0.00000	1.003	2	0.9925	5.62
5.5	0.46	38.00	190.00	95.88	43	0.844	4000	360.18	0.00	0.00000	1.003	2	0.9933	5.38
5.5	0.46	42.00	210.00	105.97	43	0.792	4000	360.18	0.00	0.00000	1.003	2	0.9939	5.19
5.5	0.46	17.60	88.00	44.41	43	1.272	4000	360.18	0.00	0.00000	1.003	2	0.9860	7.77

Standard Penetration Test Data		
GDOT Project ID:	0006934	← data entry
Project Name:	Courtesy Pkwy	← data entry
Location:	Wall 2	← data entry
Boring Number:	W-3	← data entry
Date:	15-Nov	← data entry

SPT procedures per ASTM D 1586

Additional Notes:

Section 6 - Design Height = 35ft
Station 144+44.00, Lt to 143+44.00, Lt

FOUNDATION SHAPES and GEOMETRY

Footing Length L (ft) =	100	← data entry if known
Footing Width B (ft) =	17.6	← data entry if known
Current Case - L/B =	6	
Square - L/B =	1	
Rectangular - L/B =	5	
Strip - L/B =	10	

SPECIFIC SETTLEMENT VALUE (

1	← data entry
3	← data entry
4.5	← data entry
5	← data entry
5.5	← data entry
6	← data entry
6.5	← data entry

Total Number of Readings	9
Number of Clay Readings	4
% Clay Readings	44

Note: "CLAY" means any of the following: CL, CH, ML, MH, CL-ML, (

CONTACT GEOTECH ENGINEER - CONSIDER CLAY %

Ground Water Table	29	feet	← data entry
Energy Rating	84	%	← data entry

SPT DATA INPUT: PLEASE ENTER EITHER
(a) Raw Field Blows in Columns B, C, & D or put (b) Measured N-value (bpf) in column I

Advisory Note: If the bottom of wall footing/leveling pad/spread footing elevation is more than5 feet below the ground elevation in your boring log, begin inputting boring log data from the elevation that corresponds to5 feet above the bottom of wall footing/leveling pad/spread footing elevation.

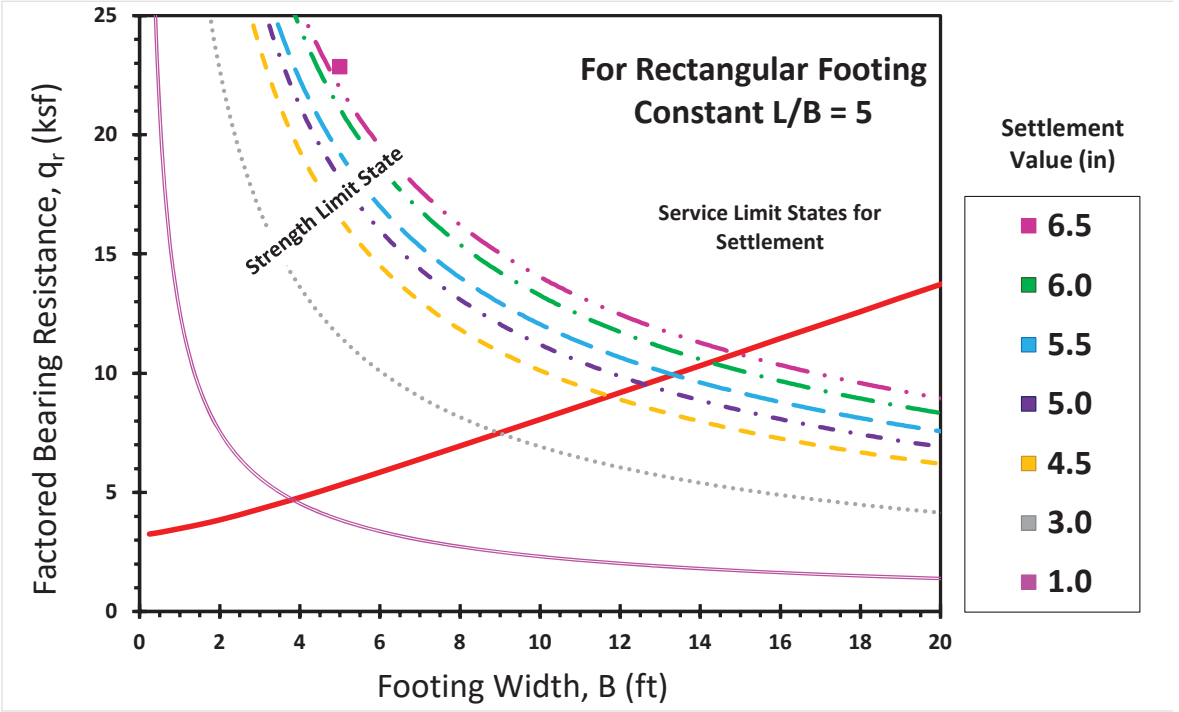
	Raw SPT Blows Per 6 inches			
	#1	#2	#3	N-value (bpf)
data entry →	3	3	4	7
data entry →	3	3	3	6
data entry →	4	5	5	10
data entry →	5	5	5	10
data entry →	5	7	7	14
data entry →	3	3	3	6
data entry →	4	4	4	8
data entry →	2	2	2	4
data entry →	11	13	15	28

	Depth	SPT Reading	USCS
	(feet)	N-value (bpf)	Soil Type
	0.00		
data entry →	2.50		CL
data entry →	5.00		CL
data entry →	7.50		ML
data entry →	10.00		ML
data entry →	15.00		SM
data entry →	20.00		SM
data entry →	25.00		SM
data entry →	30.00		SM
data entry →	35.00		SM

Rectangular Footing Solution for L/B = 5

Effective Cohesion Intercept , c' (ksf) =	0
Effective Friction Angle, ϕ' (deg) =	31.11
Rectangular Distortion Ratio (L/B) =	5.00
Embedment Depth, D_f (ft) =	2.00
Ground Water Table, D_w (ft) =	29.00
Average Bulk UW, γ_{bulk} (kcf) =	0.12
Layer Thickness, h (ft) =	43.00
Modulus of Foundation, E_{FDTN} (ksf) =	4000
Poisson's Ratio of Soil=	0.20
Poisson's Ratio of Foundation=	0.20
Soil Modulus of Elasticity, E' (ksf) =	360.18
Footing Thickness, t (ft) =	0.00

Friction Angle, ϕ_f	Cohesion BC Term, N_c	Unit Weight BC Term, N_γ	Surcharge BC Term, N_q	Resistance Factor, ϕ_b
31.11	32.976	26.439	20.903	0.4



5.0

Settlement, s (in)	Settlement, s (ft)	Footing Width, B (ft)	Footing Length, L (ft)	Equivalent Diameter, d_e (ft)	Layer Thickness, h (ft)	Shape Disp. factor, I_H	Efdtn (ksf)	Esoil (ksf)	Foundation Thickness, t (ft)	Fdtn Flexibility factor, K_F	Fdtn Flexibility Factor, I_F	z_E (ft)	Embedment factor, I_E	q (ksf)
5	0.42	2.10	10.50	5.30	43	2.069	4000	360.18	0.00	0.00000	1.003	2	0.9214	38.95
5	0.42	3.00	15.00	7.57	43	1.996	4000	360.18	0.00	0.00000	1.003	2	0.9380	27.76
5	0.42	5.50	27.50	13.88	43	1.819	4000	360.18	0.00	0.00000	1.003	2	0.9609	16.22
5	0.42	8.00	40.00	20.19	43	1.670	4000	360.18	0.00	0.00000	1.003	2	0.9714	12.01
5	0.42	12.00	60.00	30.28	43	1.477	4000	360.18	0.00	0.00000	1.003	2	0.9800	8.97
5	0.42	14.00	70.00	35.32	43	1.397	4000	360.18	0.00	0.00000	1.003	2	0.9827	8.11
5	0.42	16.00	80.00	40.37	43	1.324	4000	360.18	0.00	0.00000	1.003	2	0.9847	7.47
5	0.42	18.00	90.00	45.42	43	1.259	4000	360.18	0.00	0.00000	1.003	2	0.9863	6.97
5	0.42	20.00	100.00	50.46	43	1.200	4000	360.18	0.00	0.00000	1.003	2	0.9876	6.58
5	0.42	22.00	110.00	55.51	43	1.146	4000	360.18	0.00	0.00000	1.003	2	0.9886	6.25
5	0.42	24.00	120.00	60.56	43	1.097	4000	360.18	0.00	0.00000	1.003	2	0.9895	5.98
5	0.42	26.00	130.00	65.60	43	1.052	4000	360.18	0.00	0.00000	1.003	2	0.9903	5.75
5	0.42	28.00	140.00	70.65	43	1.011	4000	360.18	0.00	0.00000	1.003	2	0.9910	5.56
5	0.42	30.00	150.00	75.69	43	0.972	4000	360.18	0.00	0.00000	1.003	2	0.9915	5.39
5	0.42	32.00	160.00	80.74	43	0.937	4000	360.18	0.00	0.00000	1.003	2	0.9920	5.24
5	0.42	34.00	170.00	85.79	43	0.904	4000	360.18	0.00	0.00000	1.003	2	0.9925	5.11
5	0.42	38.00	190.00	95.88	43	0.844	4000	360.18	0.00	0.00000	1.003	2	0.9933	4.89
5	0.42	42.00	210.00	105.97	43	0.792	4000	360.18	0.00	0.00000	1.003	2	0.9939	4.72
5	0.42	17.60	88.00	44.41	43	1.272	4000	360.18	0.00	0.00000	1.003	2	0.9860	7.06

5.5

Settlement, s (in)	Settlement, s (ft)	Footing Width, B (ft)	Footing Length, L (ft)	Equivalent Diameter, d_e (ft)	Layer Thickness, h (ft)	Shape Disp. factor, I_H	Efdtn (ksf)	Esoil (ksf)	Foundation Thickness, t (ft)	Fdtn Flexibility factor, K_F	Fdtn Flexibility Factor, I_F	z_E (ft)	Embedment factor, I_E	q (ksf)
5.5	0.46	2.50	12.50	6.31	43	2.036	4000	360.18	0.00	0.00000	1.003	2	0.9298	36.24
5.5	0.46	4.00	20.00	10.09	43	1.921	4000	360.18	0.00	0.00000	1.003	2	0.9498	23.50
5.5	0.46	6.00	30.00	15.14	43	1.787	4000	360.18	0.00	0.00000	1.003	2	0.9636	16.60
5.5	0.46	7.50	37.50	18.92	43	1.698	4000	360.18	0.00	0.00000	1.003	2	0.9698	13.89
5.5	0.46	9.00	45.00	22.71	43	1.617	4000	360.18	0.00	0.00000	1.003	2	0.9742	12.09
5.5	0.46	12.00	60.00	30.28	43	1.477	4000	360.18	0.00	0.00000	1.003	2	0.9800	9.87
5.5	0.46	14.00	70.00	35.32	43	1.397	4000	360.18	0.00	0.00000	1.003	2	0.9827	8.92
5.5	0.46	16.00	80.00	40.37	43	1.324	4000	360.18	0.00	0.00000	1.003	2	0.9847	8.22
5.5	0.46	18.00	90.00	45.42	43	1.259	4000	360.18	0.00	0.00000	1.003	2	0.9863	7.67
5.5	0.46	20.00	100.00	50.46	43	1.200	4000	360.18	0.00	0.00000	1.003	2	0.9876	7.23
5.5	0.46	22.00	110.00	55.51	43	1.146	4000	360.18	0.00	0.00000	1.003	2	0.9886	6.88
5.5	0.46	24.00	120.00	60.56	43	1.097	4000	360.18	0.00	0.00000	1.003	2	0.9895	6.58
5.5	0.46	26.00	130.00	65.60	43	1.052	4000	360.18	0.00	0.00000	1.003	2	0.9903	6.33
5.5	0.46	28.00	140.00	70.65	43	1.011	4000	360.18	0.00	0.00000	1.003	2	0.9910	6.12
5.5	0.46	30.00	150.00	75.69	43	0.972	4000	360.18	0.00	0.00000	1.003	2	0.9915	5.93
5.5	0.46	32.00	160.00	80.74	43	0.937	4000	360.18	0.00	0.00000	1.003	2	0.9920	5.77
5.5	0.46	34.00	170.00	85.79	43	0.904	4000	360.18	0.00	0.00000	1.003	2	0.9925	5.62
5.5	0.46	38.00	190.00	95.88	43	0.844	4000	360.18	0.00	0.00000	1.003	2	0.9933	5.38
5.5	0.46	42.00	210.00	105.97	43	0.792	4000	360.18	0.00	0.00000	1.003	2	0.9939	5.19
5.5	0.46	17.60	88.00	44.41	43	1.272	4000	360.18	0.00	0.00000	1.003	2	0.9860	7.77

Standard Penetration Test Data		
GDOT Project ID:	0006934	← data entry
Project Name:	Courtesy Pkwy	← data entry
Location:	Wall 2	← data entry
Boring Number:	W-4	← data entry
Date:	15-Nov	← data entry

SPT procedures per ASTM D 1586

Additional Notes:

Section 7 - Design Height = 35ft
Station 143+44.00, Lt to 142+44.00, Lt

FOUNDATION SHAPES and GEOMETRY

Footing Length L (ft) =	100	← data entry if known
Footing Width B (ft) =	17.6	← data entry if known
Current Case - L/B =	6	
Square - L/B =	1	
Rectangular - L/B =	5	
Strip - L/B =	10	

SPECIFIC SETTLEMENT VALUE (

1	← data entry
3	← data entry
5	← data entry
5.5	← data entry
6	← data entry
6.5	← data entry
7	← data entry

Total Number of Readings	12
Number of Clay Readings	3
% Clay Readings	25

Note: "CLAY" means any of the following: CL, CH, ML, MH, CL-ML, (

CONTACT GEOTECH ENGINEER - CONSIDER CLAY %

Ground Water Table	26	feet	← data entry
Energy Rating	84	%	← data entry

SPT DATA INPUT: PLEASE ENTER EITHER
(a) Raw Field Blows in Columns B, C, & D or put (b) Measured N-value (bpf) in column I

Advisory Note: If the bottom of wall footing/leveling pad/spread footing elevation is more than5 feet below the ground elevation in your boring log, begin inputting boring log data from the elevation that corresponds to5 feet above the bottom of wall footing/leveling pad/spread footing elevation.

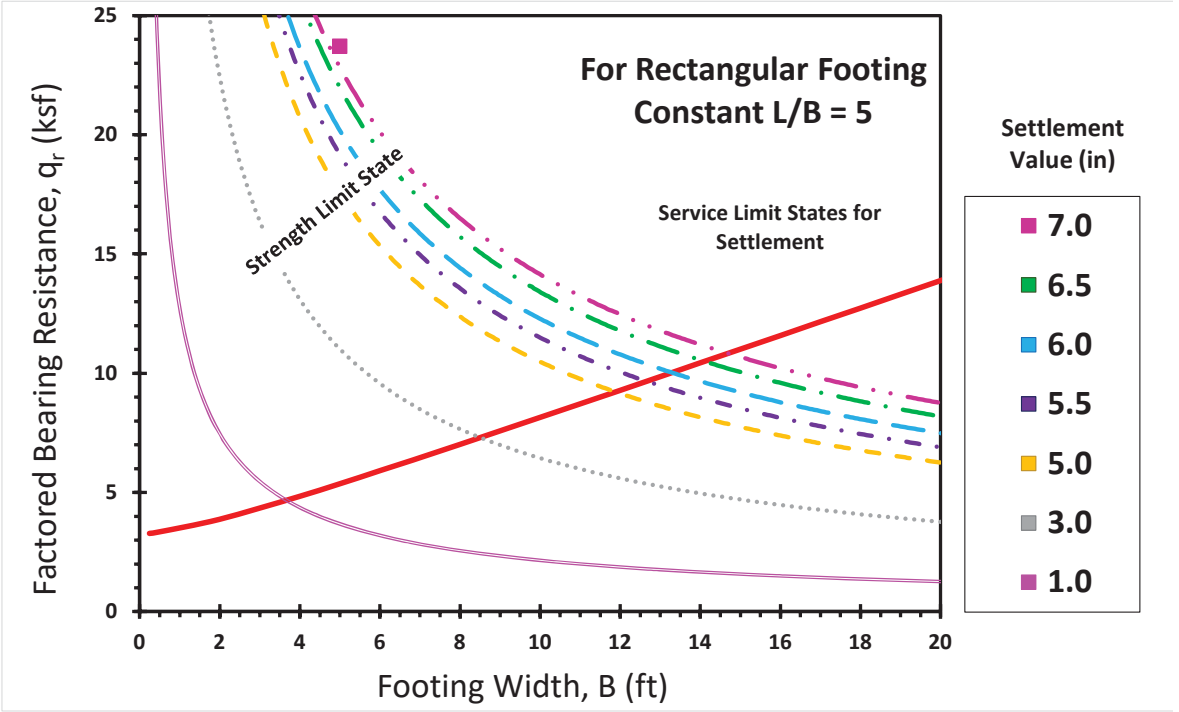
	Raw SPT Blows Per 6 inches			
	#1	#2	#3	N-value (bpf)
data entry →	3	6	6	12
data entry →	5	7	7	14
data entry →	3	4	4	8
data entry →	3	3	3	6
data entry →	2	2	3	5
data entry →	3	3	3	6
data entry →	4	2	3	5
data entry →	3	3	4	7
data entry →	6	8	9	17
data entry →	4	5	7	12
data entry →	3	5	5	10
data entry →	5	5	7	12

	Depth	SPT Reading	USCS
	(feet)	N-value (bpf)	Soil Type
	0.00		
data entry →	2.50		ML
data entry →	5.00		ML
data entry →	7.50		CL
data entry →	10.00		SM
data entry →	15.00		SM
data entry →	20.00		SM
data entry →	25.00		SM
data entry →	30.00		SM
data entry →	35.00		SM
data entry →	40.00		SM
data entry →	45.00		SM
data entry →	50.00		SM

Rectangular Footing Solution for L/B = 5

Effective Cohesion Intercept , c' (ksf) =	0
Effective Friction Angle, ϕ' (deg) =	31.28
Rectangular Distortion Ratio (L/B) =	5.00
Embedment Depth, D_f (ft) =	2.00
Ground Water Table, D_w (ft) =	26.00
Average Bulk UW, γ_{bulk} (kcf) =	0.12
Layer Thickness, h (ft) =	53.00
Modulus of Foundation, E_{FDTN} (ksf) =	4000
Poisson's Ratio of Soil=	0.20
Poisson's Ratio of Foundation=	0.20
Soil Modulus of Elasticity, E' (ksf) =	359.24
Footing Thickness, t (ft) =	0.00

Friction Angle, ϕ_f	Cohesion BC Term, N_c	Unit Weight BC Term, N_γ	Surcharge BC Term, N_q	Resistance Factor, ϕ_b
31.28	33.435	27.115	21.314	0.4



5.5

Settlement, s (in)	Settlement, s (ft)	Footing Width, B (ft)	Footing Length, L (ft)	Equivalent Diameter, d_e (ft)	Layer Thickness, h (ft)	Shape Disp. factor, I_H	Efdtn (ksf)	Esoil (ksf)	Foundation Thickness, t (ft)	Fdtn Flexibility factor, K_F	Fdtn Flexibility Factor, I_F	z_E (ft)	Embedment factor, I_E	q (ksf)
5.5	0.46	2.10	10.50	5.30	53	2.102	4000	359.24	0.00	0.00000	1.003	2	0.9214	42.05
5.5	0.46	3.00	15.00	7.57	53	2.041	4000	359.24	0.00	0.00000	1.003	2	0.9380	29.78
5.5	0.46	5.50	27.50	13.88	53	1.888	4000	359.24	0.00	0.00000	1.003	2	0.9609	17.14
5.5	0.46	8.00	40.00	20.19	53	1.757	4000	359.24	0.00	0.00000	1.003	2	0.9714	12.53
5.5	0.46	12.00	60.00	30.28	53	1.581	4000	359.24	0.00	0.00000	1.003	2	0.9800	9.20
5.5	0.46	14.00	70.00	35.32	53	1.505	4000	359.24	0.00	0.00000	1.003	2	0.9827	8.26
5.5	0.46	16.00	80.00	40.37	53	1.437	4000	359.24	0.00	0.00000	1.003	2	0.9847	7.56
5.5	0.46	18.00	90.00	45.42	53	1.374	4000	359.24	0.00	0.00000	1.003	2	0.9863	7.01
5.5	0.46	20.00	100.00	50.46	53	1.317	4000	359.24	0.00	0.00000	1.003	2	0.9876	6.58
5.5	0.46	22.00	110.00	55.51	53	1.264	4000	359.24	0.00	0.00000	1.003	2	0.9886	6.22
5.5	0.46	24.00	120.00	60.56	53	1.215	4000	359.24	0.00	0.00000	1.003	2	0.9895	5.93
5.5	0.46	26.00	130.00	65.60	53	1.170	4000	359.24	0.00	0.00000	1.003	2	0.9903	5.68
5.5	0.46	28.00	140.00	70.65	53	1.128	4000	359.24	0.00	0.00000	1.003	2	0.9910	5.46
5.5	0.46	30.00	150.00	75.69	53	1.089	4000	359.24	0.00	0.00000	1.003	2	0.9915	5.28
5.5	0.46	32.00	160.00	80.74	53	1.053	4000	359.24	0.00	0.00000	1.003	2	0.9920	5.12
5.5	0.46	34.00	170.00	85.79	53	1.019	4000	359.24	0.00	0.00000	1.003	2	0.9925	4.97
5.5	0.46	38.00	190.00	95.88	53	0.957	4000	359.24	0.00	0.00000	1.003	2	0.9933	4.73
5.5	0.46	42.00	210.00	105.97	53	0.902	4000	359.24	0.00	0.00000	1.003	2	0.9939	4.54
5.5	0.46	17.60	88.00	44.41	53	1.386	4000	359.24	0.00	0.00000	1.003	2	0.9860	7.11

6.0

Settlement, s (in)	Settlement, s (ft)	Footing Width, B (ft)	Footing Length, L (ft)	Equivalent Diameter, d_e (ft)	Layer Thickness, h (ft)	Shape Disp. factor, I_H	Efdtn (ksf)	Esoil (ksf)	Foundation Thickness, t (ft)	Fdtn Flexibility factor, K_F	Fdtn Flexibility Factor, I_F	z_E (ft)	Embedment factor, I_E	q (ksf)
6	0.50	2.50	12.50	6.31	53	2.075	4000	359.24	0.00	0.00000	1.003	2	0.9298	38.69
6	0.50	4.00	20.00	10.09	53	1.977	4000	359.24	0.00	0.00000	1.003	2	0.9498	24.84
6	0.50	6.00	30.00	15.14	53	1.860	4000	359.24	0.00	0.00000	1.003	2	0.9636	17.35
6	0.50	7.50	37.50	18.92	53	1.781	4000	359.24	0.00	0.00000	1.003	2	0.9698	14.40
6	0.50	9.00	45.00	22.71	53	1.709	4000	359.24	0.00	0.00000	1.003	2	0.9742	12.45
6	0.50	12.00	60.00	30.28	53	1.581	4000	359.24	0.00	0.00000	1.003	2	0.9800	10.04
6	0.50	14.00	70.00	35.32	53	1.505	4000	359.24	0.00	0.00000	1.003	2	0.9827	9.01
6	0.50	16.00	80.00	40.37	53	1.437	4000	359.24	0.00	0.00000	1.003	2	0.9847	8.24
6	0.50	18.00	90.00	45.42	53	1.374	4000	359.24	0.00	0.00000	1.003	2	0.9863	7.65
6	0.50	20.00	100.00	50.46	53	1.317	4000	359.24	0.00	0.00000	1.003	2	0.9876	7.17
6	0.50	22.00	110.00	55.51	53	1.264	4000	359.24	0.00	0.00000	1.003	2	0.9886	6.79
6	0.50	24.00	120.00	60.56	53	1.215	4000	359.24	0.00	0.00000	1.003	2	0.9895	6.47
6	0.50	26.00	130.00	65.60	53	1.170	4000	359.24	0.00	0.00000	1.003	2	0.9903	6.19
6	0.50	28.00	140.00	70.65	53	1.128	4000	359.24	0.00	0.00000	1.003	2	0.9910	5.96
6	0.50	30.00	150.00	75.69	53	1.089	4000	359.24	0.00	0.00000	1.003	2	0.9915	5.76
6	0.50	32.00	160.00	80.74	53	1.053	4000	359.24	0.00	0.00000	1.003	2	0.9920	5.58
6	0.50	34.00	170.00	85.79	53	1.019	4000	359.24	0.00	0.00000	1.003	2	0.9925	5.43
6	0.50	38.00	190.00	95.88	53	0.957	4000	359.24	0.00	0.00000	1.003	2	0.9933	5.16
6	0.50	42.00	210.00	105.97	53	0.902	4000	359.24	0.00	0.00000	1.003	2	0.9939	4.95
6	0.50	17.60	88.00	44.41	53	1.386	4000	359.24	0.00	0.00000	1.003	2	0.9860	7.76

Standard Penetration Test Data		
GDOT Project ID:	0006934	← data entry
Project Name:	Courtesy Pkwy	← data entry
Location:	Wall 2	← data entry
Boring Number:	W-4	← data entry
Date:	15-Nov	← data entry

SPT procedures per ASTM D 1586

Additional Notes:

Section 8 - Design Height = 35ft
Station 142+44.00, Lt to 141+44.00, Lt

FOUNDATION SHAPES and GEOMETRY

Footing Length L (ft) =	100	← data entry if known
Footing Width B (ft) =	17.6	← data entry if known
Current Case - L/B =	6	
Square - L/B =	1	
Rectangular - L/B =	5	
Strip - L/B =	10	

SPECIFIC SETTLEMENT VALUE (

1	← data entry
3	← data entry
5	← data entry
5.5	← data entry
6	← data entry
6.5	← data entry
7	← data entry

Total Number of Readings	12
Number of Clay Readings	3
% Clay Readings	25

Note: "CLAY" means any of the following: CL, CH, ML, MH, CL-ML, (

CONTACT GEOTECH ENGINEER - CONSIDER CLAY %

Ground Water Table	26	feet	← data entry
Energy Rating	84	%	← data entry

SPT DATA INPUT: PLEASE ENTER EITHER
(a) Raw Field Blows in Columns B, C, & D or put (b) Measured N-value (bpf) in column I

Advisory Note: If the bottom of wall footing/leveling pad/spread footing elevation is more than5 feet below the ground elevation in your boring log, begin inputting boring log data from the elevation that corresponds to5 feet above the bottom of wall footing/leveling pad/spread footing elevation.

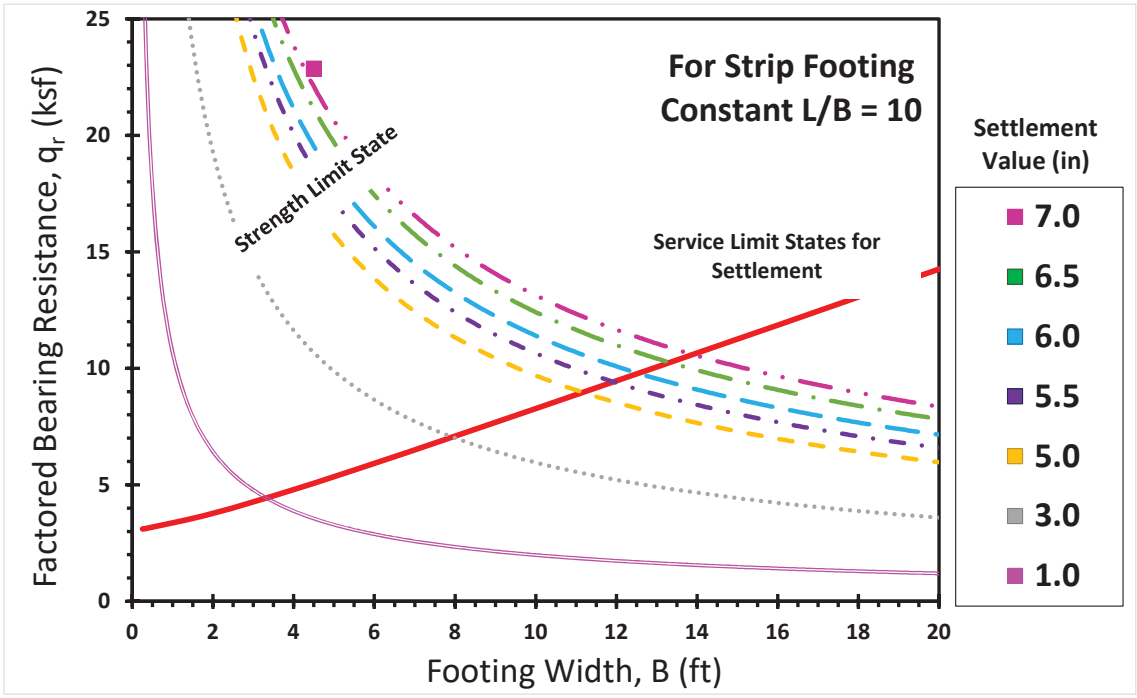
	Raw SPT Blows Per 6 inches			
	#1	#2	#3	N-value (bpf)
data entry →	3	6	6	12
data entry →	5	7	7	14
data entry →	3	4	4	8
data entry →	3	3	3	6
data entry →	2	2	3	5
data entry →	3	3	3	6
data entry →	4	2	3	5
data entry →	3	3	4	7
data entry →	6	8	9	17
data entry →	4	5	7	12
data entry →	3	5	5	10
data entry →	5	5	7	12

	Depth	SPT Reading	USCS
	(feet)	N-value (bpf)	Soil Type
	0.00		
data entry →	2.50		ML
data entry →	5.00		ML
data entry →	7.50		CL
data entry →	10.00		SM
data entry →	15.00		SM
data entry →	20.00		SM
data entry →	25.00		SM
data entry →	30.00		SM
data entry →	35.00		SM
data entry →	40.00		SM
data entry →	45.00		SM
data entry →	50.00		SM

Strip Footing Solution for L/B = 10

Effective Cohesion Intercept , c' (ksf) =	0
Effective Friction Angle, ϕ' (deg) =	31.28
Rectangular Distortion Ratio (L/B) =	10.00
Embedment Depth, D_f (ft) =	2.00
Ground Water Table, D_w (ft) =	26.00
Average Bulk UW, γ_{bulk} (kcf) =	0.12
Layer Thickness, h (ft) =	53.00
Modulus of Foundation, E_{FDTN} (ksf) =	4000
Poisson's Ratio of Soil=	0.20
Poisson's Ratio of Foundation=	0.20
Soil Modulus of Elasticity, E' (ksf) =	359.24
Footing Thickness, t (ft) =	0.00

Friction Angle, ϕ_f	Cohesion BC Term, N_c	Unit Weight BC Term, N_γ	Surcharge BC Term, N_q	Resistance Factor, ϕ_b
31.28	33.435	27.115	21.314	0.4



6.0														
Settlement, s (in)	Settlement, s (ft)	Footing Width, B (ft)	Footing Length, L (ft)	Equivalent Diameter, d_e (ft)	Layer Thickness, h (ft)	Shape Disp. factor, I_H	Efdtn (ksf)	Esoil (ksf)	Foundation Thickness, t (ft)	Fdtn Flexibility factor, K_F	Fdtn Flexibility Factor, I_F	z_E (ft)	Embedment factor, I_E	q (ksf)
6	0.50	2.10	21.00	7.49	53	2.412	4000	359.24	0.00	0.00000	1.003	2	0.9375	39.29
6	0.50	3.50	35.00	12.49	53	2.278	4000	359.24	0.00	0.00000	1.003	2	0.9574	24.44
6	0.50	6.00	60.00	21.41	53	2.073	4000	359.24	0.00	0.00000	1.003	2	0.9729	15.42
6	0.50	7.50	75.00	26.76	53	1.967	4000	359.24	0.00	0.00000	1.003	2	0.9777	12.94
6	0.50	9.50	95.00	33.90	53	1.841	4000	359.24	0.00	0.00000	1.003	2	0.9820	10.86
6	0.50	12.00	120.00	42.82	53	1.705	4000	359.24	0.00	0.00000	1.003	2	0.9855	9.26
6	0.50	14.00	140.00	49.96	53	1.609	4000	359.24	0.00	0.00000	1.003	2	0.9874	8.39
6	0.50	16.00	160.00	57.09	53	1.524	4000	359.24	0.00	0.00000	1.003	2	0.9889	7.74
6	0.50	18.00	180.00	64.23	53	1.448	4000	359.24	0.00	0.00000	1.003	2	0.9901	7.23
6	0.50	20.00	200.00	71.36	53	1.378	4000	359.24	0.00	0.00000	1.003	2	0.9910	6.83
6	0.50	22.00	220.00	78.50	53	1.315	4000	359.24	0.00	0.00000	1.003	2	0.9918	6.50
6	0.50	24.00	240.00	85.64	53	1.258	4000	359.24	0.00	0.00000	1.003	2	0.9925	6.23
6	0.50	26.00	260.00	92.77	53	1.205	4000	359.24	0.00	0.00000	1.003	2	0.9930	6.00
6	0.50	28.00	280.00	99.91	53	1.157	4000	359.24	0.00	0.00000	1.003	2	0.9935	5.80
6	0.50	30.00	300.00	107.05	53	1.112	4000	359.24	0.00	0.00000	1.003	2	0.9939	5.63
6	0.50	32.00	320.00	114.18	53	1.071	4000	359.24	0.00	0.00000	1.003	2	0.9943	5.48
6	0.50	34.00	340.00	121.32	53	1.032	4000	359.24	0.00	0.00000	1.003	2	0.9946	5.34
6	0.50	38.00	380.00	135.59	53	0.963	4000	359.24	0.00	0.00000	1.003	2	0.9952	5.12
6	0.50	42.00	420.00	149.87	53	0.903	4000	359.24	0.00	0.00000	1.003	2	0.9956	4.94
6	0.50	17.60	176.00	62.80	53	1.462	4000	359.24	0.00	0.00000	1.003	2	0.9899	7.32

Standard Penetration Test Data		
GDOT Project ID:	0006934	← data entry
Project Name:	Courtesy Pkwy	← data entry
Location:	Wall 2	← data entry
Boring Number:	B-7	← data entry
Date:	15-Nov	← data entry

SPT procedures per ASTM D 1586

Additional Notes:

Section 9 - Design Height = 39ft
Station 141+44.00, Lt to 140+72.23, Lt

FOUNDATION SHAPES and GEOMETRY

Footing Length L (ft) =	72	← data entry if known
Footing Width B (ft) =	19.87	← data entry if known
Current Case - L/B =	4	
Square - L/B =	1	
Rectangular - L/B =	5	
Strip - L/B =	10	

SPECIFIC SETTLEMENT VALUE (

1	← data entry
5	← data entry
6	← data entry
6.5	← data entry
7	← data entry
7.5	← data entry
8	← data entry

Total Number of Readings	7
Number of Clay Readings	2
% Clay Readings	29

Note: "CLAY" means any of the following: CL, CH, ML, MH, CL-ML, (

CONTACT GEOTECH ENGINEER - CONSIDER CLAY %

Ground Water Table	24	feet	← data entry
Energy Rating	84	%	← data entry

SPT DATA INPUT: PLEASE ENTER EITHER
(a) Raw Field Blows in Columns B, C, & D or put (b) Measured N-value (bpf) in column I

Advisory Note: If the bottom of wall footing/leveling pad/spread footing elevation is more than5 feet below the ground elevation in your boring log, begin inputting boring log data from the elevation that corresponds to5 feet above the bottom of wall footing/leveling pad/spread footing elevation.

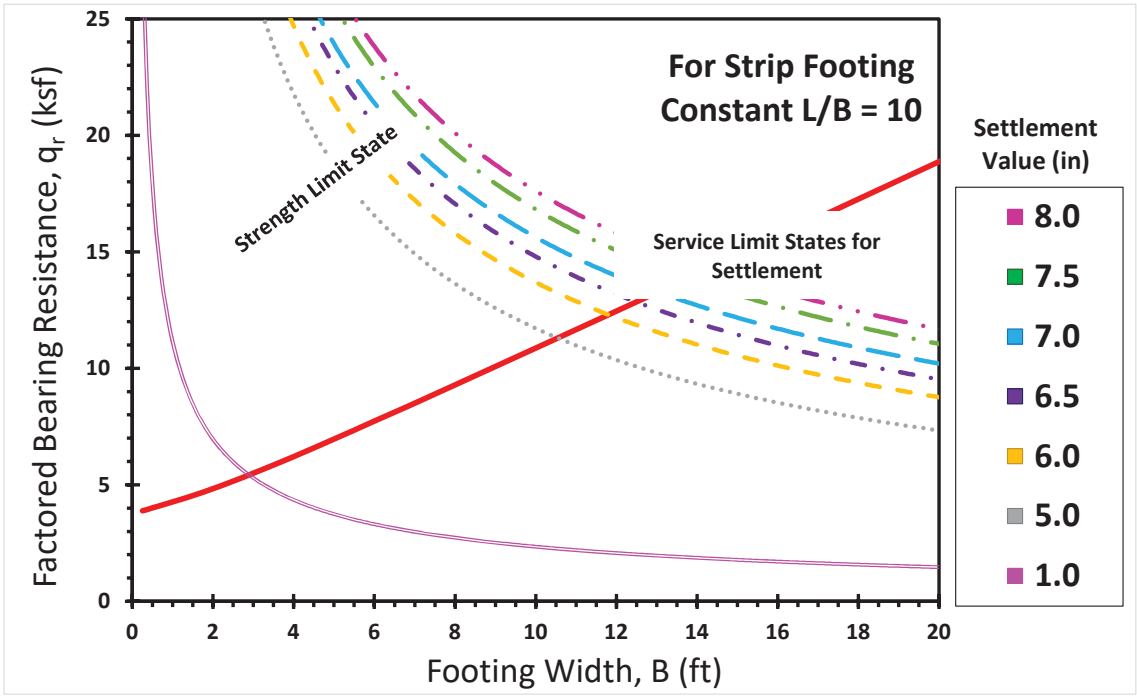
	Raw SPT Blows Per 6 inches			
	#1	#2	#3	N-value (bpf)
data entry →	3	5	6	11
data entry →	4	4	4	8
data entry →	5	5	5	10
data entry →	3	5	5	10
data entry →	4	4	4	8
data entry →	3	3	4	7
data entry →	6	6	7	13

	Depth	SPT Reading	USCS
	(feet)	N-value (bpf)	Soil Type
	0.00		
data entry →	2.50		CL
data entry →	5.00		CL
data entry →	7.50		SM
data entry →	10.00		SM
data entry →	15.00		SM
data entry →	20.00		SM
data entry →	25.00		SM

Strip Footing Solution for L/B = 10

Effective Cohesion Intercept , c' (ksf) =	0
Effective Friction Angle, ϕ' (deg) =	33.00
Rectangular Distortion Ratio (L/B) =	10.00
Embedment Depth, D_f (ft) =	2.00
Ground Water Table, D_w (ft) =	24.00
Average Bulk UW, γ_{bulk} (kcf) =	0.12
Layer Thickness, h (ft) =	40.00
Modulus of Foundation, E_{FDTN} (ksf) =	4000
Poisson's Ratio of Soil=	0.20
Poisson's Ratio of Foundation=	0.20
Soil Modulus of Elasticity, E' (ksf) =	379.70
Footing Thickness, t (ft) =	0.00

Friction Angle, ϕ_f	Cohesion BC Term, N_c	Unit Weight BC Term, N_γ	Surcharge BC Term, N_q	Resistance Factor, ϕ_b
33.00	38.625	35.165	26.079	0.4



6.0														
Settlement, s (in)	Settlement, s (ft)	Footing Width, B (ft)	Footing Length, L (ft)	Equivalent Diameter, d_e (ft)	Layer Thickness, h (ft)	Shape Disp. factor, I_H	Efdtn (ksf)	Esoil (ksf)	Foundation Thickness, t (ft)	Fdtn Flexibility factor, K_F	Fdtn Flexibility Factor, I_F	z_E (ft)	Embedment factor, I_E	q (ksf)
6	0.50	1.50	15.00	5.35	40	2.423	4000	379.70	0.00	0.00000	1.003	2	0.9219	58.85
6	0.50	3.00	30.00	10.70	40	2.236	4000	379.70	0.00	0.00000	1.003	2	0.9520	30.88
6	0.50	5.00	50.00	17.84	40	2.027	4000	379.70	0.00	0.00000	1.003	2	0.9683	20.09
6	0.50	7.00	70.00	24.98	40	1.854	4000	379.70	0.00	0.00000	1.003	2	0.9763	15.56
6	0.50	9.00	90.00	32.11	40	1.709	4000	379.70	0.00	0.00000	1.003	2	0.9811	13.07
6	0.50	12.00	120.00	42.82	40	1.528	4000	379.70	0.00	0.00000	1.003	2	0.9855	10.91
6	0.50	14.00	140.00	49.96	40	1.428	4000	379.70	0.00	0.00000	1.003	2	0.9874	9.99
6	0.50	16.00	160.00	57.09	40	1.340	4000	379.70	0.00	0.00000	1.003	2	0.9889	9.30
6	0.50	18.00	180.00	64.23	40	1.262	4000	379.70	0.00	0.00000	1.003	2	0.9901	8.77
6	0.50	20.00	200.00	71.36	40	1.193	4000	379.70	0.00	0.00000	1.003	2	0.9910	8.34
6	0.50	22.00	220.00	78.50	40	1.131	4000	379.70	0.00	0.00000	1.003	2	0.9918	7.99
6	0.50	24.00	240.00	85.64	40	1.075	4000	379.70	0.00	0.00000	1.003	2	0.9925	7.70
6	0.50	26.00	260.00	92.77	40	1.024	4000	379.70	0.00	0.00000	1.003	2	0.9930	7.46
6	0.50	28.00	280.00	99.91	40	0.978	4000	379.70	0.00	0.00000	1.003	2	0.9935	7.25
6	0.50	30.00	300.00	107.05	40	0.936	4000	379.70	0.00	0.00000	1.003	2	0.9939	7.07
6	0.50	32.00	320.00	114.18	40	0.897	4000	379.70	0.00	0.00000	1.003	2	0.9943	6.91
6	0.50	34.00	340.00	121.32	40	0.862	4000	379.70	0.00	0.00000	1.003	2	0.9946	6.77
6	0.50	38.00	380.00	135.59	40	0.799	4000	379.70	0.00	0.00000	1.003	2	0.9952	6.53
6	0.50	42.00	420.00	149.87	40	0.744	4000	379.70	0.00	0.00000	1.003	2	0.9956	6.34
6	0.50	19.87	198.70	70.90	40	1.197	4000	379.70	0.00	0.00000	1.003	2	0.9910	8.37

Standard Penetration Test Data		
GDOT Project ID:	0006934	← data entry
Project Name:	Courtesy Pkwy	← data entry
Location:	Wall 2	← data entry
Boring Number:	B-8	← data entry
Date:	15-Nov	← data entry

SPT procedures per ASTM D 1586

Additional Notes:

Section 10 - Design Height = 39ft
Station 808+60.71 Lt to 809+59.98 Lt.

FOUNDATION SHAPES and GEOMETRY

Footing Length L (ft) =	99	← data entry if known
Footing Width B (ft) =	19.87	← data entry if known
Current Case - L/B =	5	
Square - L/B =	1	
Rectangular - L/B =	5	
Strip - L/B =	10	

SPECIFIC SETTLEMENT VALUE (

1	← data entry
3	← data entry
5	← data entry
5.5	← data entry
6	← data entry
6.5	← data entry
7	← data entry

Total Number of Readings	7	
Number of Clay Readings	1	Note: "CLAY" means any of the following: CL, CH, ML, MH, CL-ML, (
% Clay Readings	14	CONTACT GEOTECH ENGINEER - CONSIDER CLAY %

Ground Water Table	24	feet	← data entry
Energy Rating	84	%	← data entry

SPT DATA INPUT: PLEASE ENTER EITHER
(a) Raw Field Blows in Columns B, C, & D or put (b) Measured N-value (bpf) in column I

Advisory Note: If the bottom of wall footing/leveling pad/spread footing elevation is more than5 feet below the ground elevation in your boring log, begin inputting boring log data from the elevation that corresponds to5 feet above the bottom of wall footing/leveling pad/spread footing elevation.

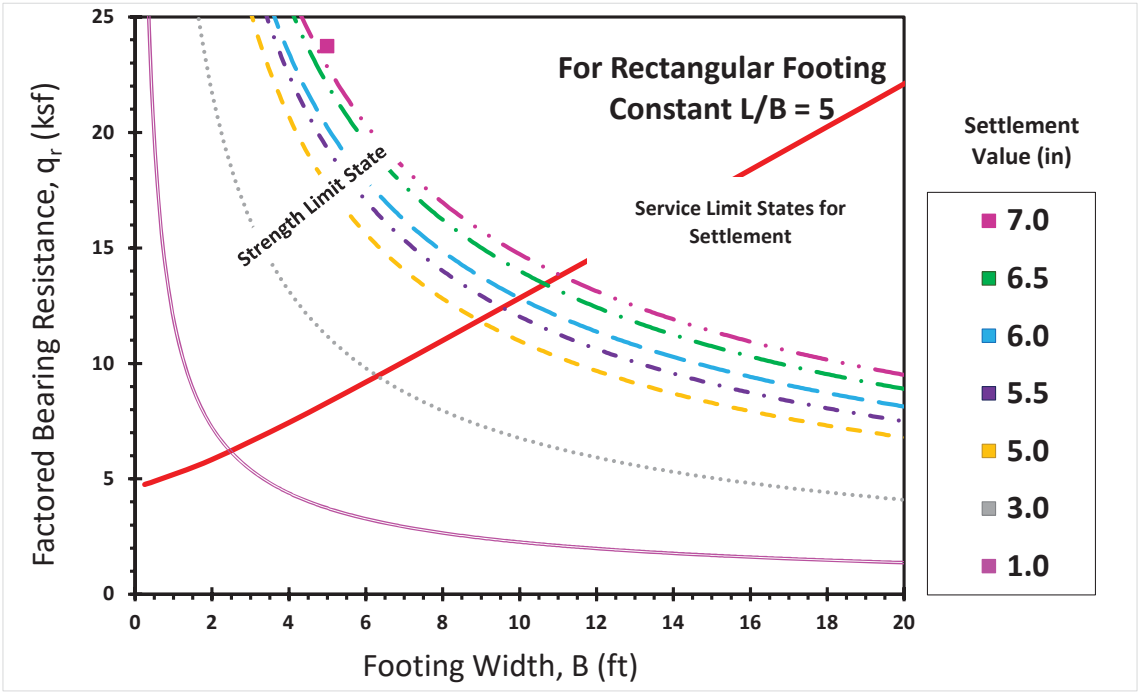
	Raw SPT Blows Per 6 inches			
	#1	#2	#3	N-value (bpf)
data entry →	3	3	3	6
data entry →	6	4	4	8
data entry →	4	5	7	12
data entry →	4	4	4	8
data entry →	6	5	3	8
data entry →	2	3	3	6
data entry →	5	6	6	12

	Depth	SPT Reading	USCS
	(feet)	N-value (bpf)	Soil Type
	0.00		
data entry →	2.50		CL
data entry →	5.00		SM
data entry →	7.50		SM
data entry →	10.00		SM
data entry →	15.00		SM
data entry →	20.00		SM
data entry →	25.00		SM

Rectangular Footing Solution for L/B = 5

Effective Cohesion Intercept , c' (ksf) =	0
Effective Friction Angle, ϕ' (deg) =	34.28
Rectangular Distortion Ratio (L/B) =	5.00
Embedment Depth, D_f (ft) =	2.00
Ground Water Table, D_w (ft) =	24.00
Average Bulk UW, γ_{bulk} (kcf) =	0.12
Layer Thickness, h (ft) =	40.00
Modulus of Foundation, E_{FDTN} (ksf) =	4000
Poisson's Ratio of Soil=	0.20
Poisson's Ratio of Foundation=	0.20
Soil Modulus of Elasticity, E' (ksf) =	342.46
Footing Thickness, t (ft) =	0.00

Friction Angle, ϕ_f	Cohesion BC Term, N_c	Unit Weight BC Term, N_γ	Surcharge BC Term, N_q	Resistance Factor, ϕ_b
34.28	43.228	42.898	30.466	0.4



6.0

Settlement, s (in)	Settlement, s (ft)	Footing Width, B (ft)	Footing Length, L (ft)	Equivalent Diameter, d_e (ft)	Layer Thickness, h (ft)	Shape Disp. factor, I_H	Efdtn (ksf)	Esoil (ksf)	Foundation Thickness, t (ft)	Fdtn Flexibility factor, K_F	Fdtn Flexibility Factor, I_F	z_E (ft)	Embedment factor, I_E	q (ksf)
6	0.50	2.50	12.50	6.31	40	2.021	4000	342.46	0.00	0.00000	1.003	2	0.9298	37.87
6	0.50	4.00	20.00	10.09	40	1.900	4000	342.46	0.00	0.00000	1.003	2	0.9498	24.65
6	0.50	6.00	30.00	15.14	40	1.759	4000	342.46	0.00	0.00000	1.003	2	0.9636	17.49
6	0.50	7.50	37.50	18.92	40	1.667	4000	342.46	0.00	0.00000	1.003	2	0.9698	14.67
6	0.50	9.00	45.00	22.71	40	1.584	4000	342.46	0.00	0.00000	1.003	2	0.9742	12.81
6	0.50	12.00	60.00	30.28	40	1.440	4000	342.46	0.00	0.00000	1.003	2	0.9800	10.50
6	0.50	14.00	70.00	35.32	40	1.358	4000	342.46	0.00	0.00000	1.003	2	0.9827	9.52
6	0.50	16.00	80.00	40.37	40	1.284	4000	342.46	0.00	0.00000	1.003	2	0.9847	8.79
6	0.50	18.00	90.00	45.42	40	1.219	4000	342.46	0.00	0.00000	1.003	2	0.9863	8.22
6	0.50	20.00	100.00	50.46	40	1.159	4000	342.46	0.00	0.00000	1.003	2	0.9876	7.77
6	0.50	22.00	110.00	55.51	40	1.106	4000	342.46	0.00	0.00000	1.003	2	0.9886	7.40
6	0.50	24.00	120.00	60.56	40	1.057	4000	342.46	0.00	0.00000	1.003	2	0.9895	7.09
6	0.50	26.00	130.00	65.60	40	1.012	4000	342.46	0.00	0.00000	1.003	2	0.9903	6.83
6	0.50	28.00	140.00	70.65	40	0.970	4000	342.46	0.00	0.00000	1.003	2	0.9910	6.61
6	0.50	30.00	150.00	75.69	40	0.932	4000	342.46	0.00	0.00000	1.003	2	0.9915	6.41
6	0.50	32.00	160.00	80.74	40	0.897	4000	342.46	0.00	0.00000	1.003	2	0.9920	6.24
6	0.50	34.00	170.00	85.79	40	0.865	4000	342.46	0.00	0.00000	1.003	2	0.9925	6.10
6	0.50	38.00	190.00	95.88	40	0.806	4000	342.46	0.00	0.00000	1.003	2	0.9933	5.84
6	0.50	42.00	210.00	105.97	40	0.755	4000	342.46	0.00	0.00000	1.003	2	0.9939	5.64
6	0.50	19.87	99.35	50.13	40	1.163	4000	342.46	0.00	0.00000	1.003	2	0.9875	7.79

6.5

Settlement, s (in)	Settlement, s (ft)	Footing Width, B (ft)	Footing Length, L (ft)	Equivalent Diameter, d_e (ft)	Layer Thickness, h (ft)	Shape Disp. factor, I_H	Efdtn (ksf)	Esoil (ksf)	Foundation Thickness, t (ft)	Fdtn Flexibility factor, K_F	Fdtn Flexibility Factor, I_F	z_E (ft)	Embedment factor, I_E	q (ksf)
6.5	0.54	2.80	14.00	7.06	40	1.995	4000	342.46	0.00	0.00000	1.003	2	0.9349	36.89
6.5	0.54	4.00	20.00	10.09	40	1.900	4000	342.46	0.00	0.00000	1.003	2	0.9498	26.70
6.5	0.54	6.00	30.00	15.14	40	1.759	4000	342.46	0.00	0.00000	1.003	2	0.9636	18.95
6.5	0.54	9.00	45.00	22.71	40	1.584	4000	342.46	0.00	0.00000	1.003	2	0.9742	13.88
6.5	0.54	12.00	60.00	30.28	40	1.440	4000	342.46	0.00	0.00000	1.003	2	0.9800	11.38
6.5	0.54	16.00	80.00	40.37	40	1.284	4000	342.46	0.00	0.00000	1.003	2	0.9847	9.52
6.5	0.54	20.00	100.00	50.46	40	1.159	4000	342.46	0.00	0.00000	1.003	2	0.9876	8.41
6.5	0.54	22.00	110.00	55.51	40	1.106	4000	342.46	0.00	0.00000	1.003	2	0.9886	8.01
6.5	0.54	24.00	120.00	60.56	40	1.057	4000	342.46	0.00	0.00000	1.003	2	0.9895	7.68
6.5	0.54	26.00	130.00	65.60	40	1.012	4000	342.46	0.00	0.00000	1.003	2	0.9903	7.40
6.5	0.54	28.00	140.00	70.65	40	0.970	4000	342.46	0.00	0.00000	1.003	2	0.9910	7.16
6.5	0.54	30.00	150.00	75.69	40	0.932	4000	342.46	0.00	0.00000	1.003	2	0.9915	6.95
6.5	0.54	32.00	160.00	80.74	40	0.897	4000	342.46	0.00	0.00000	1.003	2	0.9920	6.76
6.5	0.54	34.00	170.00	85.79	40	0.865	4000	342.46	0.00	0.00000	1.003	2	0.9925	6.60
6.5	0.54	38.00	190.00	95.88	40	0.806	4000	342.46	0.00	0.00000	1.003	2	0.9933	6.33
6.5	0.54	42.00	210.00	105.97	40	0.755	4000	342.46	0.00	0.00000	1.003	2	0.9939	6.11
6.5	0.54	19.87	99.35	50.13	40	1.163	4000	342.46	0.00	0.00000	1.003	2	0.9875	8.44

Standard Penetration Test Data		
GDOT Project ID:	0006934	← data entry
Project Name:	Courtesy Pkwy	← data entry
Location:	Wall 2	← data entry
Boring Number:	B-8	← data entry
Date:	15-Nov	← data entry

SPT procedures per ASTM D 1586

Additional Notes:

Section 11 - Design Height = 39ft
Station 140+72.23, Rt to 141+50.00, Rt

FOUNDATION SHAPES and GEOMETRY

Footing Length L (ft) =	78	← data entry if known
Footing Width B (ft) =	19.87	← data entry if known
Current Case - L/B =	4	
Square - L/B =	1	
Rectangular - L/B =	5	
Strip - L/B =	10	

SPECIFIC SETTLEMENT VALUE (

1	← data entry
3	← data entry
4	← data entry
4.5	← data entry
5	← data entry
5.5	← data entry
6	← data entry

Total Number of Readings	7	
Number of Clay Readings	1	Note: "CLAY" means any of the following: CL, CH, ML, MH, CL-ML, (
% Clay Readings	14	CONTACT GEOTECH ENGINEER - CONSIDER CLAY %

Ground Water Table	24	feet	← data entry
Energy Rating	84	%	← data entry

SPT DATA INPUT: PLEASE ENTER EITHER
(a) Raw Field Blows in Columns B, C, & D or put (b) Measured N-value (bpf) in column I

Advisory Note: If the bottom of wall footing/leveling pad/spread footing elevation is more than5 feet below the ground elevation in your boring log, begin inputting boring log data from the elevation that corresponds to5 feet above the bottom of wall footing/leveling pad/spread footing elevation.

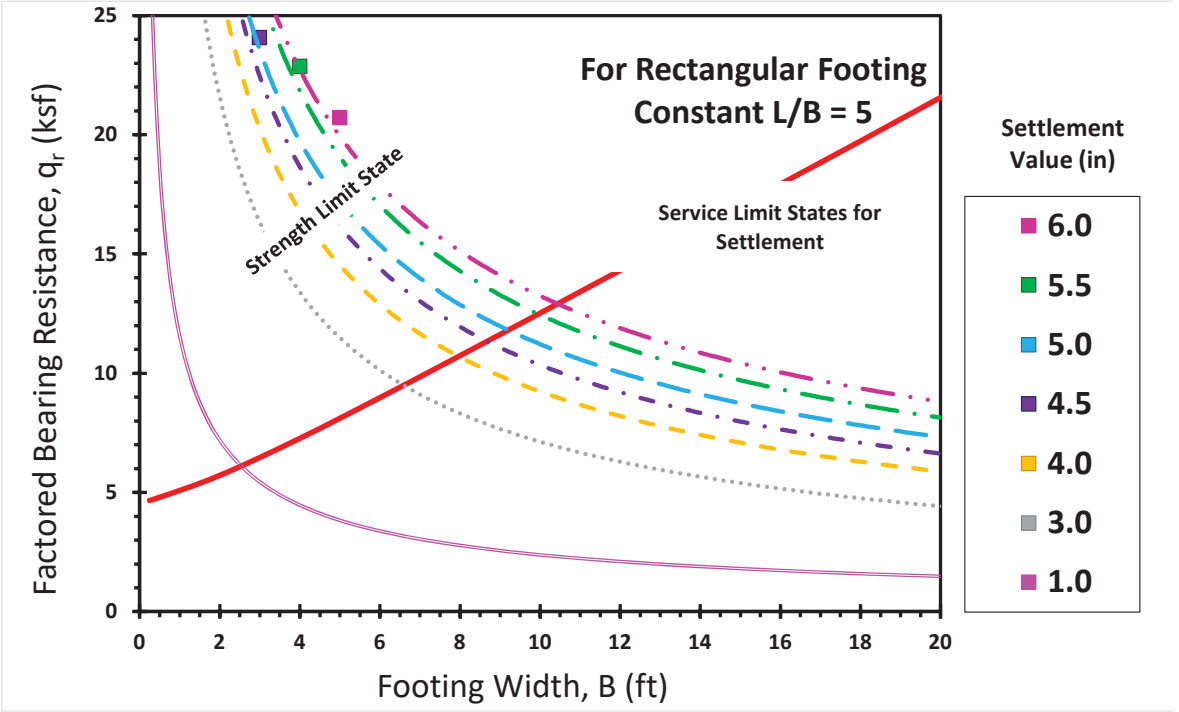
	Raw SPT Blows Per 6 inches			
	#1	#2	#3	N-value (bpf)
data entry →	3	3	3	6
data entry →	6	4	4	8
data entry →	4	5	7	12
data entry →	4	4	4	8
data entry →	6	5	3	8
data entry →	2	2	3	5
data entry →	5	6	6	12

	Depth	SPT Reading	USCS
	(feet)	N-value (bpf)	Soil Type
	0.00		
data entry →	2.50		CL
data entry →	5.00		SM
data entry →	7.50		SM
data entry →	10.00		SM
data entry →	15.00		SM
data entry →	20.00		SM
data entry →	25.00		SM

Rectangular Footing Solution for L/B = 5

Effective Cohesion Intercept , c' (ksf) =	0
Effective Friction Angle, ϕ' (deg) =	34.13
Rectangular Distortion Ratio (L/B) =	5.00
Embedment Depth, D_f (ft) =	2.00
Ground Water Table, D_w (ft) =	24.00
Average Bulk UW, γ_{bulk} (kcf) =	0.12
Layer Thickness, h (ft) =	33.00
Modulus of Foundation, E_{FDTN} (ksf) =	4000
Poisson's Ratio of Soil=	0.20
Poisson's Ratio of Foundation=	0.20
Soil Modulus of Elasticity, E' (ksf) =	335.22
Footing Thickness, t (ft) =	0.00

Friction Angle, ϕ_f	Cohesion BC Term, N_c	Unit Weight BC Term, N_γ	Surcharge BC Term, N_q	Resistance Factor, ϕ_b
34.13	42.646	41.893	29.905	0.4



5.5

Settlement, s (in)	Settlement, s (ft)	Footing Width, B (ft)	Footing Length, L (ft)	Equivalent Diameter, d_e (ft)	Layer Thickness, h (ft)	Shape Disp. factor, I_H	Efdtn (ksf)	Esoil (ksf)	Foundation Thickness, t (ft)	Fdtn Flexibility factor, K_F	Fdtn Flexibility Factor, I_F	z_E (ft)	Embedment factor, I_E	q (ksf)
5.5	0.46	2.80	14.00	7.06	33	1.947	4000	335.22	0.00	0.00000	1.003	2	0.9349	31.32
5.5	0.46	4.00	20.00	10.09	33	1.837	4000	335.22	0.00	0.00000	1.003	2	0.9498	22.87
5.5	0.46	6.00	30.00	15.14	33	1.680	4000	335.22	0.00	0.00000	1.003	2	0.9636	16.43
5.5	0.46	9.00	45.00	22.71	33	1.489	4000	335.22	0.00	0.00000	1.003	2	0.9742	12.22
5.5	0.46	12.00	60.00	30.28	33	1.337	4000	335.22	0.00	0.00000	1.003	2	0.9800	10.15
5.5	0.46	16.00	80.00	40.37	33	1.177	4000	335.22	0.00	0.00000	1.003	2	0.9847	8.61
5.5	0.46	20.00	100.00	50.46	33	1.051	4000	335.22	0.00	0.00000	1.003	2	0.9876	7.69
5.5	0.46	22.00	110.00	55.51	33	0.998	4000	335.22	0.00	0.00000	1.003	2	0.9886	7.36
5.5	0.46	24.00	120.00	60.56	33	0.949	4000	335.22	0.00	0.00000	1.003	2	0.9895	7.08
5.5	0.46	26.00	130.00	65.60	33	0.906	4000	335.22	0.00	0.00000	1.003	2	0.9903	6.84
5.5	0.46	28.00	140.00	70.65	33	0.866	4000	335.22	0.00	0.00000	1.003	2	0.9910	6.64
5.5	0.46	30.00	150.00	75.69	33	0.829	4000	335.22	0.00	0.00000	1.003	2	0.9915	6.47
5.5	0.46	32.00	160.00	80.74	33	0.796	4000	335.22	0.00	0.00000	1.003	2	0.9920	6.32
5.5	0.46	34.00	170.00	85.79	33	0.765	4000	335.22	0.00	0.00000	1.003	2	0.9925	6.18
5.5	0.46	38.00	190.00	95.88	33	0.710	4000	335.22	0.00	0.00000	1.003	2	0.9933	5.96
5.5	0.46	42.00	210.00	105.97	33	0.662	4000	335.22	0.00	0.00000	1.003	2	0.9939	5.78
5.5	0.46	19.87	99.35	50.13	33	1.055	4000	335.22	0.00	0.00000	1.003	2	0.9875	7.71

6.0

Settlement, s (in)	Settlement, s (ft)	Footing Width, B (ft)	Footing Length, L (ft)	Equivalent Diameter, d_e (ft)	Layer Thickness, h (ft)	Shape Disp. factor, I_H	Efdtn (ksf)	Esoil (ksf)	Foundation Thickness, t (ft)	Fdtn Flexibility factor, K_F	Fdtn Flexibility Factor, I_F	z_E (ft)	Embedment factor, I_E	q (ksf)
6	0.50	3.50	17.50	8.83	33	1.881	4000	335.22	0.00	0.00000	1.003	2	0.9445	28.00
6	0.50	5.00	25.00	12.62	33	1.755	4000	335.22	0.00	0.00000	1.003	2	0.9578	20.71
6	0.50	7.00	35.00	17.66	33	1.611	4000	335.22	0.00	0.00000	1.003	2	0.9680	15.95
6	0.50	9.00	45.00	22.71	33	1.489	4000	335.22	0.00	0.00000	1.003	2	0.9742	13.34
6	0.50	14.00	70.00	35.32	33	1.252	4000	335.22	0.00	0.00000	1.003	2	0.9827	10.11
6	0.50	16.00	80.00	40.37	33	1.177	4000	335.22	0.00	0.00000	1.003	2	0.9847	9.39
6	0.50	18.00	90.00	45.42	33	1.110	4000	335.22	0.00	0.00000	1.003	2	0.9863	8.83
6	0.50	20.00	100.00	50.46	33	1.051	4000	335.22	0.00	0.00000	1.003	2	0.9876	8.39
6	0.50	22.00	110.00	55.51	33	0.998	4000	335.22	0.00	0.00000	1.003	2	0.9886	8.02
6	0.50	24.00	120.00	60.56	33	0.949	4000	335.22	0.00	0.00000	1.003	2	0.9895	7.72
6	0.50	26.00	130.00	65.60	33	0.906	4000	335.22	0.00	0.00000	1.003	2	0.9903	7.47
6	0.50	28.00	140.00	70.65	33	0.866	4000	335.22	0.00	0.00000	1.003	2	0.9910	7.25
6	0.50	30.00	150.00	75.69	33	0.829	4000	335.22	0.00	0.00000	1.003	2	0.9915	7.06
6	0.50	32.00	160.00	80.74	33	0.796	4000	335.22	0.00	0.00000	1.003	2	0.9920	6.89
6	0.50	34.00	170.00	85.79	33	0.765	4000	335.22	0.00	0.00000	1.003	2	0.9925	6.75
6	0.50	38.00	190.00	95.88	33	0.710	4000	335.22	0.00	0.00000	1.003	2	0.9933	6.50
6	0.50	42.00	210.00	105.97	33	0.662	4000	335.22	0.00	0.00000	1.003	2	0.9939	6.30
6	0.50	19.87	99.35	50.13	33	1.055	4000	335.22	0.00	0.00000	1.003	2	0.9875	8.41

Standard Penetration Test Data		
GDOT Project ID:	0006934	← data entry
Project Name:	Courtesy Pkwy	← data entry
Location:	Wall 2	← data entry
Boring Number:	W-5	← data entry
Date:	15-Nov	← data entry

SPT procedures per ASTM D 1586

Additional Notes:

Section 12 - Design Height = 30ft
Station 141+50.00 Rt to 142+54.25 Rt

FOUNDATION SHAPES and GEOMETRY

Footing Length L (ft) =	104	← data entry if known
Footing Width B (ft) =	14.43	← data entry if known
Current Case - L/B =	7	
Square - L/B =	1	
Rectangular - L/B =	5	
Strip - L/B =	10	

SPECIFIC SETTLEMENT VALUE (

1	← data entry
2	← data entry
3	← data entry
3.5	← data entry
4	← data entry
4.5	← data entry
5	← data entry

Total Number of Readings	10
Number of Clay Readings	3
% Clay Readings	30

Note: "CLAY" means any of the following: CL, CH, ML, MH, CL-ML, (

CONTACT GEOTECH ENGINEER - CONSIDER CLAY %

Ground Water Table	26	feet	← data entry
Energy Rating	84	%	← data entry

SPT DATA INPUT: PLEASE ENTER EITHER
(a) Raw Field Blows in Columns B, C, & D or put (b) Measured N-value (bpf) in column I

Advisory Note: If the bottom of wall footing/leveling pad/spread footing elevation is more than5 feet below the ground elevation in your boring log, begin inputting boring log data from the elevation that corresponds to5 feet above the bottom of wall footing/leveling pad/spread footing elevation.

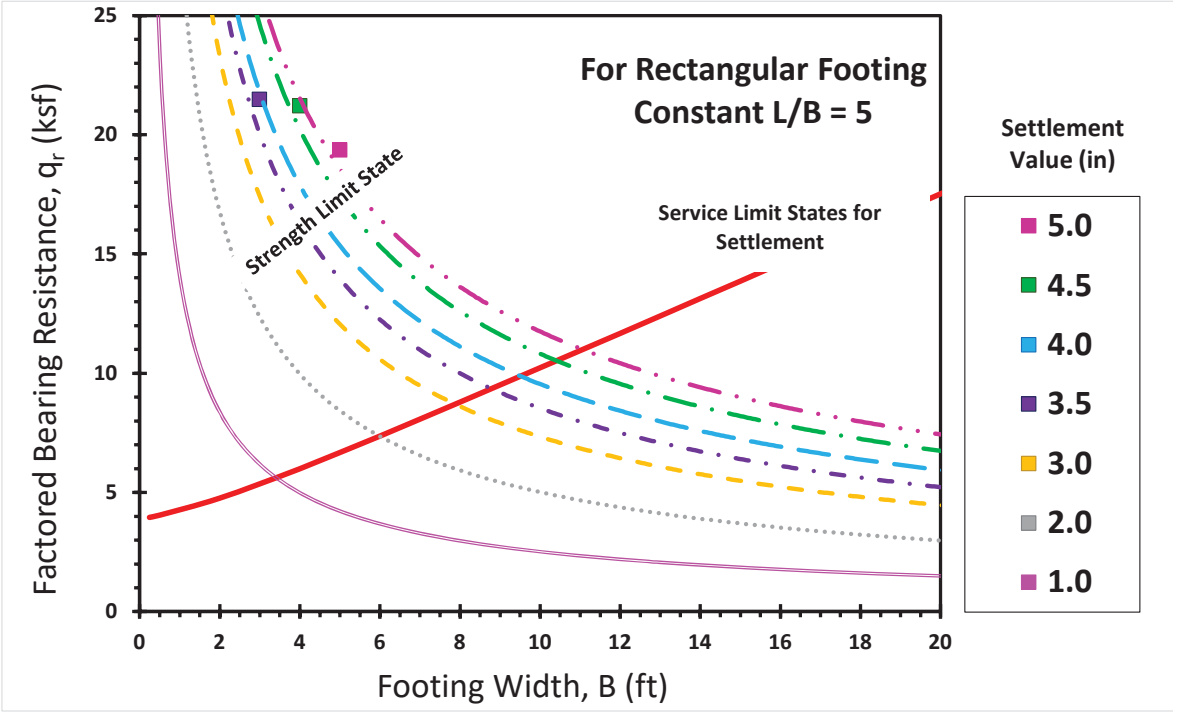
	Raw SPT Blows Per 6 inches			
	#1	#2	#3	N-value (bpf)
data entry →	3	3	4	7
data entry →	3	3	4	7
data entry →	4	3	5	8
data entry →	3	4	5	9
data entry →	3	5	3	8
data entry →	3	3	5	8
data entry →	3	3	6	9
data entry →	4	3	3	6
data entry →	12	10	9	19
data entry →	12	23	22	45

	Depth	SPT Reading	USCS
	(feet)	N-value (bpf)	Soil Type
	0.00		
data entry →	2.50		CL
data entry →	5.00		CL
data entry →	7.50		CL
data entry →	10.00		SM
data entry →	15.00		SM
data entry →	20.00		SM
data entry →	25.00		SM
data entry →	30.00		SM
data entry →	35.00		SM
data entry →	40.00		SM

Rectangular Footing Solution for L/B = 5

Effective Cohesion Intercept , c' (ksf) =	0
Effective Friction Angle, ϕ' (deg) =	32.76
Rectangular Distortion Ratio (L/B) =	5.00
Embedment Depth, D_f (ft) =	2.00
Ground Water Table, D_w (ft) =	26.00
Average Bulk UW, γ_{bulk} (kcf) =	0.12
Layer Thickness, h (ft) =	46.00
Modulus of Foundation, E_{FDTN} (ksf) =	4000
Poisson's Ratio of Soil=	0.20
Poisson's Ratio of Foundation=	0.20
Soil Modulus of Elasticity, E' (ksf) =	401.40
Footing Thickness, t (ft) =	0.00

Friction Angle, ϕ_f	Cohesion BC Term, N_c	Unit Weight BC Term, N_γ	Surcharge BC Term, N_q	Resistance Factor, ϕ_b
32.76	37.837	33.896	25.343	0.4



3.5

Settlement, s (in)	Settlement, s (ft)	Footing Width, B (ft)	Footing Length, L (ft)	Equivalent Diameter, d_e (ft)	Layer Thickness, h (ft)	Shape Disp. factor, I_H	Efdtn (ksf)	Esoil (ksf)	Foundation Thickness, t (ft)	Fdtn Flexibility factor, K_F	Fdtn Flexibility Factor, I_F	z_E (ft)	Embedment factor, I_E	q (ksf)
3.5	0.29	2.10	10.50	5.30	46	2.080	4000	401.40	0.00	0.00000	1.003	2	0.9214	30.22
3.5	0.29	3.00	15.00	7.57	46	2.011	4000	401.40	0.00	0.00000	1.003	2	0.9380	21.49
3.5	0.29	5.50	27.50	13.88	46	1.842	4000	401.40	0.00	0.00000	1.003	2	0.9609	12.49
3.5	0.29	8.00	40.00	20.19	46	1.699	4000	401.40	0.00	0.00000	1.003	2	0.9714	9.21
3.5	0.29	12.00	60.00	30.28	46	1.511	4000	401.40	0.00	0.00000	1.003	2	0.9800	6.84
3.5	0.29	14.00	70.00	35.32	46	1.432	4000	401.40	0.00	0.00000	1.003	2	0.9827	6.17
3.5	0.29	16.00	80.00	40.37	46	1.361	4000	401.40	0.00	0.00000	1.003	2	0.9847	5.67
3.5	0.29	18.00	90.00	45.42	46	1.297	4000	401.40	0.00	0.00000	1.003	2	0.9863	5.28
3.5	0.29	20.00	100.00	50.46	46	1.238	4000	401.40	0.00	0.00000	1.003	2	0.9876	4.97
3.5	0.29	22.00	110.00	55.51	46	1.184	4000	401.40	0.00	0.00000	1.003	2	0.9886	4.72
3.5	0.29	24.00	120.00	60.56	46	1.135	4000	401.40	0.00	0.00000	1.003	2	0.9895	4.51
3.5	0.29	26.00	130.00	65.60	46	1.090	4000	401.40	0.00	0.00000	1.003	2	0.9903	4.33
3.5	0.29	28.00	140.00	70.65	46	1.048	4000	401.40	0.00	0.00000	1.003	2	0.9910	4.18
3.5	0.29	30.00	150.00	75.69	46	1.010	4000	401.40	0.00	0.00000	1.003	2	0.9915	4.05
3.5	0.29	32.00	160.00	80.74	46	0.974	4000	401.40	0.00	0.00000	1.003	2	0.9920	3.93
3.5	0.29	34.00	170.00	85.79	46	0.940	4000	401.40	0.00	0.00000	1.003	2	0.9925	3.83
3.5	0.29	38.00	190.00	95.88	46	0.880	4000	401.40	0.00	0.00000	1.003	2	0.9933	3.66
3.5	0.29	42.00	210.00	105.97	46	0.827	4000	401.40	0.00	0.00000	1.003	2	0.9939	3.52
3.5	0.29	14.43	72.15	36.41	46	1.416	4000	401.40	0.00	0.00000	1.003	2	0.9831	6.05

4.0

Settlement, s (in)	Settlement, s (ft)	Footing Width, B (ft)	Footing Length, L (ft)	Equivalent Diameter, d_e (ft)	Layer Thickness, h (ft)	Shape Disp. factor, I_H	Efdtn (ksf)	Esoil (ksf)	Foundation Thickness, t (ft)	Fdtn Flexibility factor, K_F	Fdtn Flexibility Factor, I_F	z_E (ft)	Embedment factor, I_E	q (ksf)
4	0.33	2.50	12.50	6.31	46	2.049	4000	401.40	0.00	0.00000	1.003	2	0.9298	29.18
4	0.33	4.00	20.00	10.09	46	1.940	4000	401.40	0.00	0.00000	1.003	2	0.9498	18.86
4	0.33	6.00	30.00	15.14	46	1.812	4000	401.40	0.00	0.00000	1.003	2	0.9636	13.27
4	0.33	7.50	37.50	18.92	46	1.726	4000	401.40	0.00	0.00000	1.003	2	0.9698	11.07
4	0.33	9.00	45.00	22.71	46	1.648	4000	401.40	0.00	0.00000	1.003	2	0.9742	9.62
4	0.33	12.00	60.00	30.28	46	1.511	4000	401.40	0.00	0.00000	1.003	2	0.9800	7.82
4	0.33	14.00	70.00	35.32	46	1.432	4000	401.40	0.00	0.00000	1.003	2	0.9827	7.05
4	0.33	16.00	80.00	40.37	46	1.361	4000	401.40	0.00	0.00000	1.003	2	0.9847	6.48
4	0.33	18.00	90.00	45.42	46	1.297	4000	401.40	0.00	0.00000	1.003	2	0.9863	6.04
4	0.33	20.00	100.00	50.46	46	1.238	4000	401.40	0.00	0.00000	1.003	2	0.9876	5.68
4	0.33	22.00	110.00	55.51	46	1.184	4000	401.40	0.00	0.00000	1.003	2	0.9886	5.40
4	0.33	24.00	120.00	60.56	46	1.135	4000	401.40	0.00	0.00000	1.003	2	0.9895	5.15
4	0.33	26.00	130.00	65.60	46	1.090	4000	401.40	0.00	0.00000	1.003	2	0.9903	4.95
4	0.33	28.00	140.00	70.65	46	1.048	4000	401.40	0.00	0.00000	1.003	2	0.9910	4.78
4	0.33	30.00	150.00	75.69	46	1.010	4000	401.40	0.00	0.00000	1.003	2	0.9915	4.63
4	0.33	32.00	160.00	80.74	46	0.974	4000	401.40	0.00	0.00000	1.003	2	0.9920	4.50
4	0.33	34.00	170.00	85.79	46	0.940	4000	401.40	0.00	0.00000	1.003	2	0.9925	4.38
4	0.33	38.00	190.00	95.88	46	0.880	4000	401.40	0.00	0.00000	1.003	2	0.9933	4.18
4	0.33	42.00	210.00	105.97	46	0.827	4000	401.40	0.00	0.00000	1.003	2	0.9939	4.03
4	0.33	14.43	72.15	36.41	46	1.416	4000	401.40	0.00	0.00000	1.003	2	0.9831	6.92

Standard Penetration Test Data		
GDOT Project ID:	0006934	← data entry
Project Name:	Courtesy Pkwy	← data entry
Location:	Wall 2	← data entry
Boring Number:	W-5	← data entry
Date:	15-Nov	← data entry

SPT procedures per ASTM D 1586

Additional Notes:

Section 13 - Design Height = 30ft
Station 142+54.25 Rt to 143+54.25 Rt

FOUNDATION SHAPES and GEOMETRY

Footing Length L (ft) =	100	← data entry if known
Footing Width B (ft) =	14.43	← data entry if known
Current Case - L/B =	7	
Square - L/B =	1	
Rectangular - L/B =	5	
Strip - L/B =	10	

SPECIFIC SETTLEMENT VALUE (

1	← data entry
2	← data entry
3	← data entry
3.5	← data entry
4	← data entry
4.5	← data entry
5	← data entry

Total Number of Readings	10
Number of Clay Readings	3
% Clay Readings	30

Note: "CLAY" means any of the following: CL, CH, ML, MH, CL-ML, (

CONTACT GEOTECH ENGINEER - CONSIDER CLAY %

Ground Water Table	26	feet	← data entry
Energy Rating	84	%	← data entry

SPT DATA INPUT: PLEASE ENTER EITHER
(a) Raw Field Blows in Columns B, C, & D or put (b) Measured N-value (bpf) in column I

Advisory Note: If the bottom of wall footing/leveling pad/spread footing elevation is more than5 feet below the ground elevation in your boring log, begin inputting boring log data from the elevation that corresponds to5 feet above the bottom of wall footing/leveling pad/spread footing elevation.

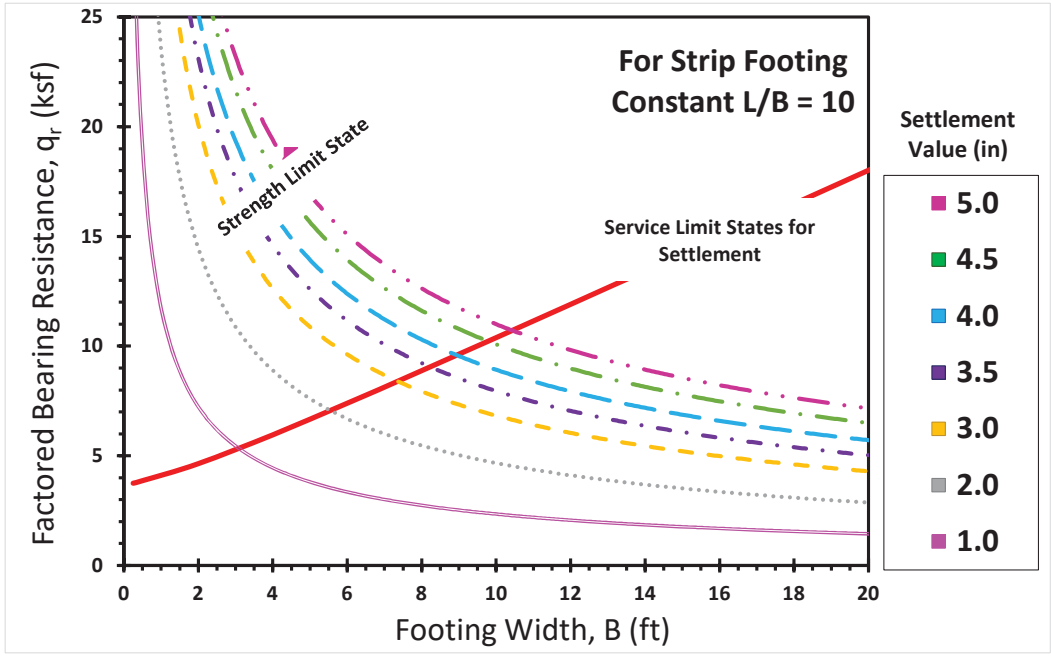
	Raw SPT Blows Per 6 inches			
	#1	#2	#3	N-value (bpf)
data entry →	3	3	4	7
data entry →	3	3	4	7
data entry →	4	3	5	8
data entry →	3	4	5	9
data entry →	3	5	3	8
data entry →	3	3	5	8
data entry →	3	3	6	9
data entry →	4	3	3	6
data entry →	12	10	9	19
data entry →	12	23	22	45

	Depth	SPT Reading	USCS
	(feet)	N-value (bpf)	Soil Type
	0.00		
data entry →	2.50		CL
data entry →	5.00		CL
data entry →	7.50		CL
data entry →	10.00		SM
data entry →	15.00		SM
data entry →	20.00		SM
data entry →	25.00		SM
data entry →	30.00		SM
data entry →	35.00		SM
data entry →	40.00		SM

Strip Footing Solution for L/B = 10

Effective Cohesion Intercept , c' (ksf) =	0
Effective Friction Angle, ϕ' (deg) =	32.76
Rectangular Distortion Ratio (L/B) =	10.00
Embedment Depth, D_f (ft) =	2.00
Ground Water Table, D_w (ft) =	26.00
Average Bulk UW, γ_{bulk} (kcf) =	0.12
Layer Thickness, h (ft) =	46.00
Modulus of Foundation, E_{FDTN} (ksf) =	4000
Poisson's Ratio of Soil=	0.20
Poisson's Ratio of Foundation=	0.20
Soil Modulus of Elasticity, E' (ksf) =	401.40
Footing Thickness, t (ft) =	0.00

Friction Angle, ϕ_f	Cohesion BC Term, N_c	Unit Weight BC Term, N_γ	Surcharge BC Term, N_q	Resistance Factor, ϕ_b
32.76	37.837	33.896	25.343	0.4



4.0														
Settlement, s (in)	Settlement, s (ft)	Footing Width, B (ft)	Footing Length, L (ft)	Equivalent Diameter, d_e (ft)	Layer Thickness, h (ft)	Shape Disp. factor, I_H	Efdtn (ksf)	Esoil (ksf)	Foundation Thickness, t (ft)	Fdtn Flexibility factor, K_F	Fdtn Flexibility Factor, I_F	z_E (ft)	Embedment factor, I_E	q (ksf)
4	0.33	2.10	21.00	7.49	46	2.380	4000	401.40	0.00	0.00000	1.003	2	0.9375	29.66
4	0.33	3.50	35.00	12.49	46	2.231	4000	401.40	0.00	0.00000	1.003	2	0.9574	18.59
4	0.33	6.00	60.00	21.41	46	2.007	4000	401.40	0.00	0.00000	1.003	2	0.9729	11.86
4	0.33	7.50	75.00	26.76	46	1.893	4000	401.40	0.00	0.00000	1.003	2	0.9777	10.01
4	0.33	9.50	95.00	33.90	46	1.760	4000	401.40	0.00	0.00000	1.003	2	0.9820	8.47
4	0.33	12.00	120.00	42.82	46	1.617	4000	401.40	0.00	0.00000	1.003	2	0.9855	7.27
4	0.33	14.00	140.00	49.96	46	1.519	4000	401.40	0.00	0.00000	1.003	2	0.9874	6.62
4	0.33	16.00	160.00	57.09	46	1.432	4000	401.40	0.00	0.00000	1.003	2	0.9889	6.13
4	0.33	18.00	180.00	64.23	46	1.354	4000	401.40	0.00	0.00000	1.003	2	0.9901	5.76
4	0.33	20.00	200.00	71.36	46	1.285	4000	401.40	0.00	0.00000	1.003	2	0.9910	5.46
4	0.33	22.00	220.00	78.50	46	1.222	4000	401.40	0.00	0.00000	1.003	2	0.9918	5.21
4	0.33	24.00	240.00	85.64	46	1.165	4000	401.40	0.00	0.00000	1.003	2	0.9925	5.01
4	0.33	26.00	260.00	92.77	46	1.113	4000	401.40	0.00	0.00000	1.003	2	0.9930	4.84
4	0.33	28.00	280.00	99.91	46	1.066	4000	401.40	0.00	0.00000	1.003	2	0.9935	4.69
4	0.33	30.00	300.00	107.05	46	1.022	4000	401.40	0.00	0.00000	1.003	2	0.9939	4.56
4	0.33	32.00	320.00	114.18	46	0.982	4000	401.40	0.00	0.00000	1.003	2	0.9943	4.45
4	0.33	34.00	340.00	121.32	46	0.945	4000	401.40	0.00	0.00000	1.003	2	0.9946	4.35
4	0.33	38.00	380.00	135.59	46	0.878	4000	401.40	0.00	0.00000	1.003	2	0.9952	4.18
4	0.33	42.00	420.00	149.87	46	0.821	4000	401.40	0.00	0.00000	1.003	2	0.9956	4.05
4	0.33	14.43	144.30	51.49	46	1.499	4000	401.40	0.00	0.00000	1.003	2	0.9878	6.50

Standard Penetration Test Data		
GDOT Project ID:	0006934	← data entry
Project Name:	Courtesy Pkwy	← data entry
Location:	Wall 2	← data entry
Boring Number:	W-5	← data entry
Date:	15-Nov	← data entry

SPT procedures per ASTM D 1586

Additional Notes:

Section 14 - Design Height = 30ft
Station 143+54.25 Rt to 144+54.25 Rt

FOUNDATION SHAPES and GEOMETRY

Footing Length L (ft) =	100	← data entry if known
Footing Width B (ft) =	14.43	← data entry if known
Current Case - L/B =	7	
Square - L/B =	1	
Rectangular - L/B =	5	
Strip - L/B =	10	

SPECIFIC SETTLEMENT VALUE (

1	← data entry
2	← data entry
3	← data entry
3.5	← data entry
4	← data entry
4.5	← data entry
5	← data entry

Total Number of Readings	10
Number of Clay Readings	3
% Clay Readings	30

Note: "CLAY" means any of the following: CL, CH, ML, MH, CL-ML, (

CONTACT GEOTECH ENGINEER - CONSIDER CLAY %

Ground Water Table	26	feet	← data entry
Energy Rating	84	%	← data entry

SPT DATA INPUT: PLEASE ENTER EITHER
(a) Raw Field Blows in Columns B, C, & D or put (b) Measured N-value (bpf) in column I

Advisory Note: If the bottom of wall footing/leveling pad/spread footing elevation is more than5 feet below the ground elevation in your boring log, begin inputting boring log data from the elevation that corresponds to5 feet above the bottom of wall footing/leveling pad/spread footing elevation.

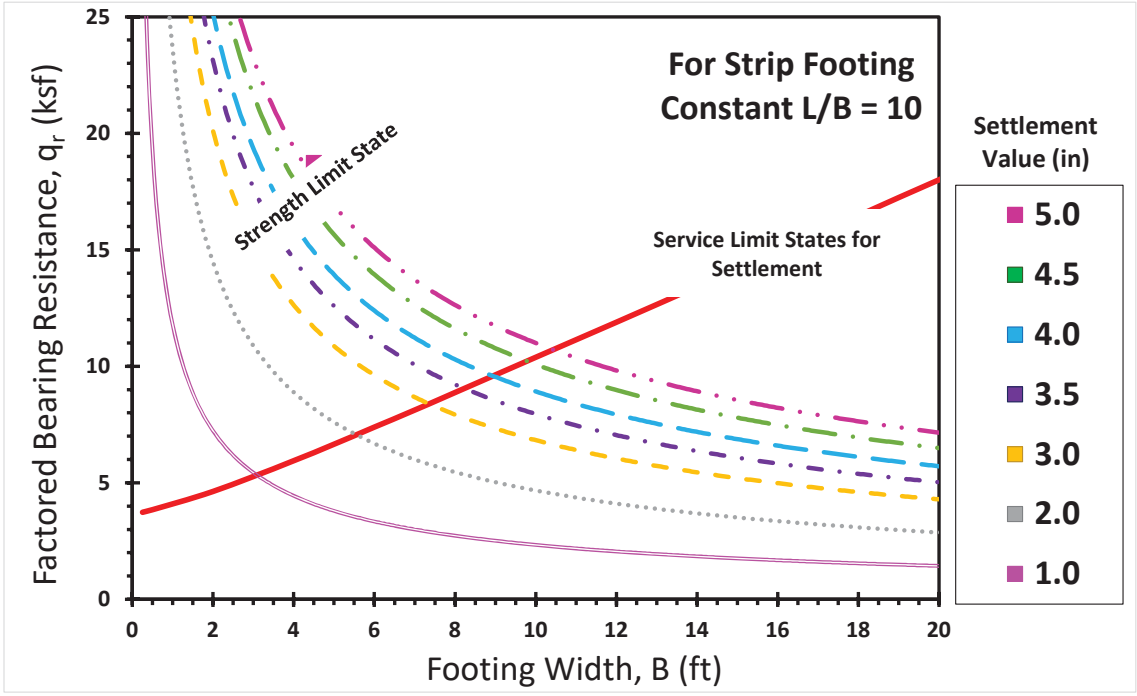
	Raw SPT Blows Per 6 inches			
	#1	#2	#3	N-value (bpf)
data entry →	3	3	4	7
data entry →	3	3	4	7
data entry →	4	3	5	8
data entry →	3	4	5	9
data entry →	3	5	3	8
data entry →	3	3	5	8
data entry →	3	3	6	9
data entry →	4	3	3	6
data entry →	12	10	9	19
data entry →	12	23	22	45

	Depth	SPT Reading	USCS
	(feet)	N-value (bpf)	Soil Type
	0.00		
data entry →	2.50		CL
data entry →	5.00		CL
data entry →	7.50		CL
data entry →	10.00		SM
data entry →	15.00		SM
data entry →	20.00		SM
data entry →	25.00		SM
data entry →	30.00		SM
data entry →	35.00		SM
data entry →	40.00		SM

Strip Footing Solution for L/B = 10

Effective Cohesion Intercept , c' (ksf) =	0
Effective Friction Angle, ϕ' (deg) =	32.76
Rectangular Distortion Ratio (L/B) =	10.00
Embedment Depth, D_f (ft) =	2.00
Ground Water Table, D_w (ft) =	26.00
Average Bulk UW, γ_{bulk} (kcf) =	0.12
Layer Thickness, h (ft) =	46.00
Modulus of Foundation, E_{FDTN} (ksf) =	4000
Poisson's Ratio of Soil=	0.20
Poisson's Ratio of Foundation=	0.20
Soil Modulus of Elasticity, E' (ksf) =	401.40
Footing Thickness, t (ft) =	0.00

Friction Angle, ϕ_f	Cohesion BC Term, N_c	Unit Weight BC Term, N_γ	Surcharge BC Term, N_q	Resistance Factor, ϕ_b
32.76	37.837	33.896	25.343	0.4



4.0														
Settlement, s (in)	Settlement, s (ft)	Footing Width, B (ft)	Footing Length, L (ft)	Equivalent Diameter, d_e (ft)	Layer Thickness, h (ft)	Shape Disp. factor, I_H	Efdtn (ksf)	Esoil (ksf)	Foundation Thickness, t (ft)	Fdtn Flexibility factor, K_F	Fdtn Flexibility Factor, I_F	z_E (ft)	Embedment factor, I_E	q (ksf)
4	0.33	2.10	21.00	7.49	46	2.380	4000	401.40	0.00	0.00000	1.003	2	0.9375	29.66
4	0.33	3.50	35.00	12.49	46	2.231	4000	401.40	0.00	0.00000	1.003	2	0.9574	18.59
4	0.33	6.00	60.00	21.41	46	2.007	4000	401.40	0.00	0.00000	1.003	2	0.9729	11.86
4	0.33	7.50	75.00	26.76	46	1.893	4000	401.40	0.00	0.00000	1.003	2	0.9777	10.01
4	0.33	9.50	95.00	33.90	46	1.760	4000	401.40	0.00	0.00000	1.003	2	0.9820	8.47
4	0.33	12.00	120.00	42.82	46	1.617	4000	401.40	0.00	0.00000	1.003	2	0.9855	7.27
4	0.33	14.00	140.00	49.96	46	1.519	4000	401.40	0.00	0.00000	1.003	2	0.9874	6.62
4	0.33	16.00	160.00	57.09	46	1.432	4000	401.40	0.00	0.00000	1.003	2	0.9889	6.13
4	0.33	18.00	180.00	64.23	46	1.354	4000	401.40	0.00	0.00000	1.003	2	0.9901	5.76
4	0.33	20.00	200.00	71.36	46	1.285	4000	401.40	0.00	0.00000	1.003	2	0.9910	5.46
4	0.33	22.00	220.00	78.50	46	1.222	4000	401.40	0.00	0.00000	1.003	2	0.9918	5.21
4	0.33	24.00	240.00	85.64	46	1.165	4000	401.40	0.00	0.00000	1.003	2	0.9925	5.01
4	0.33	26.00	260.00	92.77	46	1.113	4000	401.40	0.00	0.00000	1.003	2	0.9930	4.84
4	0.33	28.00	280.00	99.91	46	1.066	4000	401.40	0.00	0.00000	1.003	2	0.9935	4.69
4	0.33	30.00	300.00	107.05	46	1.022	4000	401.40	0.00	0.00000	1.003	2	0.9939	4.56
4	0.33	32.00	320.00	114.18	46	0.982	4000	401.40	0.00	0.00000	1.003	2	0.9943	4.45
4	0.33	34.00	340.00	121.32	46	0.945	4000	401.40	0.00	0.00000	1.003	2	0.9946	4.35
4	0.33	38.00	380.00	135.59	46	0.878	4000	401.40	0.00	0.00000	1.003	2	0.9952	4.18
4	0.33	42.00	420.00	149.87	46	0.821	4000	401.40	0.00	0.00000	1.003	2	0.9956	4.05
4	0.33	14.43	144.30	51.49	46	1.499	4000	401.40	0.00	0.00000	1.003	2	0.9878	6.50

Standard Penetration Test Data		
GDOT Project ID:	0006934	← data entry
Project Name:	Courtesy Pkwy	← data entry
Location:	Wall 2	← data entry
Boring Number:	W-6	← data entry
Date:	15-Nov	← data entry

SPT procedures per ASTM D 1586

Additional Notes:

Section 15 - Design Height=25ft
Station 144+54.25, Rt to 145+33.00, Rt

FOUNDATION SHAPES and GEOMETRY

Footing Length L (ft) =	79	← data entry if known
Footing Width B (ft) =	12.58	← data entry if known
Current Case - L/B =	6	
Square - L/B =	1	
Rectangular - L/B =	5	
Strip - L/B =	10	

Total Number of Readings	10
Number of Clay Readings	4
% Clay Readings	40

Note: "CLAY" means any of the following: CL, CH, ML, MH, CL-ML, (

CONTACT GEOTECH ENGINEER - CONSIDER CLAY %

SPECIFIC SETTLEMENT VALUE (

1	← data entry
2	← data entry
4	← data entry
4.5	← data entry
5	← data entry
5.5	← data entry
6	← data entry

Ground Water Table	14	feet ← data entry
Energy Rating	84	% ← data entry

SPT DATA INPUT: PLEASE ENTER EITHER
(a) Raw Field Blows in Columns B, C, & D or put (b) Measured N-value (bpf) in column I

Advisory Note: If the bottom of wall footing/leveling pad/spread footing elevation is more than5 feet below the ground elevation in your boring log, begin inputting boring log data from the elevation that corresponds to5 feet above the bottom of wall footing/leveling pad/spread footing elevation.

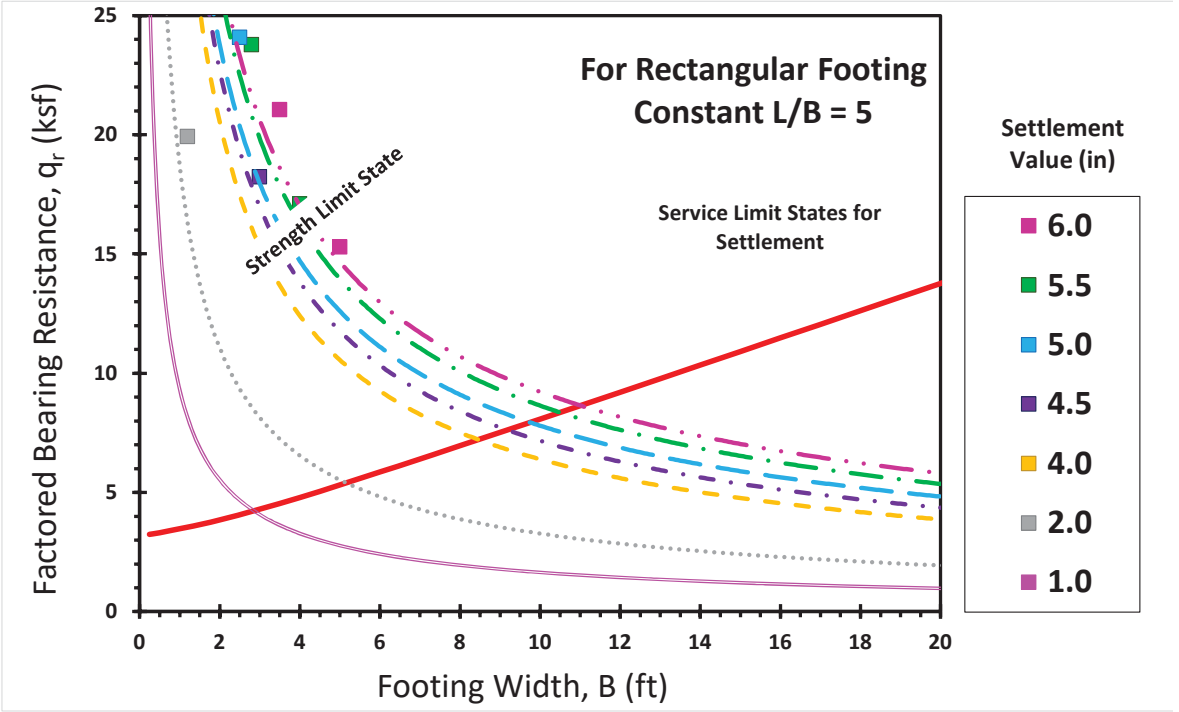
	Raw SPT Blows Per 6 inches			
	#1	#2	#3	N-value (bpf)
data entry →	2	2	2	4
data entry →	3	1	2	3
data entry →	2	2	2	4
data entry →	1	3	2	5
data entry →	1	1	1	2
data entry →	2	1	2	3
data entry →	3	5	4	9
data entry →	5	4	7	11
data entry →	8	10	8	18
data entry →	12	12	15	27

	Depth	SPT Reading	USCS
	(feet)	N-value (bpf)	Soil Type
	0.00		
data entry →	2.50		CL
data entry →	5.00		CL
data entry →	7.50		ML
data entry →	10.00		ML
data entry →	15.00		SM
data entry →	20.00		SM
data entry →	25.00		SM
data entry →	30.00		SM
data entry →	35.00		SM
data entry →	40.00		SM

Rectangular Footing Solution for L/B = 5

Effective Cohesion Intercept , c' (ksf) =	0
Effective Friction Angle, ϕ' (deg) =	31.32
Rectangular Distortion Ratio (L/B) =	5.00
Embedment Depth, D_f (ft) =	2.00
Ground Water Table, D_w (ft) =	14.00
Average Bulk UW, γ_{bulk} (kcf) =	0.11
Layer Thickness, h (ft) =	48.00
Modulus of Foundation, E_{FDTN} (ksf) =	4000
Poisson's Ratio of Soil=	0.20
Poisson's Ratio of Foundation=	0.20
Soil Modulus of Elasticity, E' (ksf) =	266.09
Footing Thickness, t (ft) =	0.00

Friction Angle, ϕ_f	Cohesion BC Term, N_c	Unit Weight BC Term, N_γ	Surcharge BC Term, N_q	Resistance Factor, ϕ_b
31.32	33.548	27.282	21.416	0.4



4.0

Settlement, s (in)	Settlement, s (ft)	Footing Width, B (ft)	Footing Length, L (ft)	Equivalent Diameter, d_e (ft)	Layer Thickness, h (ft)	Shape Disp. factor, I_H	Efdtn (ksf)	Esoil (ksf)	Foundation Thickness, t (ft)	Fdtn Flexibility factor, K_F	Fdtn Flexibility Factor, I_F	z_E (ft)	Embedment factor, I_E	q (ksf)
4	0.33	1.70	8.50	4.29	48	2.118	4000	266.09	0.00	0.00000	1.003	2	0.9108	28.09
4	0.33	3.00	15.00	7.57	48	2.021	4000	266.09	0.00	0.00000	1.003	2	0.9380	16.20
4	0.33	5.00	25.00	12.62	48	1.887	4000	266.09	0.00	0.00000	1.003	2	0.9578	10.20
4	0.33	7.00	35.00	17.66	48	1.770	4000	266.09	0.00	0.00000	1.003	2	0.9680	7.68
4	0.33	9.00	45.00	22.71	48	1.667	4000	266.09	0.00	0.00000	1.003	2	0.9742	6.30
4	0.33	12.00	60.00	30.28	48	1.533	4000	266.09	0.00	0.00000	1.003	2	0.9800	5.11
4	0.33	14.00	70.00	35.32	48	1.455	4000	266.09	0.00	0.00000	1.003	2	0.9827	4.60
4	0.33	16.00	80.00	40.37	48	1.384	4000	266.09	0.00	0.00000	1.003	2	0.9847	4.23
4	0.33	18.00	90.00	45.42	48	1.320	4000	266.09	0.00	0.00000	1.003	2	0.9863	3.93
4	0.33	20.00	100.00	50.46	48	1.262	4000	266.09	0.00	0.00000	1.003	2	0.9876	3.70
4	0.33	22.00	110.00	55.51	48	1.208	4000	266.09	0.00	0.00000	1.003	2	0.9886	3.51
4	0.33	24.00	120.00	60.56	48	1.159	4000	266.09	0.00	0.00000	1.003	2	0.9895	3.35
4	0.33	26.00	130.00	65.60	48	1.114	4000	266.09	0.00	0.00000	1.003	2	0.9903	3.21
4	0.33	28.00	140.00	70.65	48	1.072	4000	266.09	0.00	0.00000	1.003	2	0.9910	3.10
4	0.33	30.00	150.00	75.69	48	1.034	4000	266.09	0.00	0.00000	1.003	2	0.9915	3.00
4	0.33	32.00	160.00	80.74	48	0.998	4000	266.09	0.00	0.00000	1.003	2	0.9920	2.91
4	0.33	34.00	170.00	85.79	48	0.964	4000	266.09	0.00	0.00000	1.003	2	0.9925	2.83
4	0.33	38.00	190.00	95.88	48	0.903	4000	266.09	0.00	0.00000	1.003	2	0.9933	2.70
4	0.33	42.00	210.00	105.97	48	0.849	4000	266.09	0.00	0.00000	1.003	2	0.9939	2.60
4	0.33	12.58	62.90	31.74	48	1.509	4000	266.09	0.00	0.00000	1.003	2	0.9809	4.95

4.5

Settlement, s (in)	Settlement, s (ft)	Footing Width, B (ft)	Footing Length, L (ft)	Equivalent Diameter, d_e (ft)	Layer Thickness, h (ft)	Shape Disp. factor, I_H	Efdtn (ksf)	Esoil (ksf)	Foundation Thickness, t (ft)	Fdtn Flexibility factor, K_F	Fdtn Flexibility Factor, I_F	z_E (ft)	Embedment factor, I_E	q (ksf)
4.5	0.37	2.10	10.50	5.30	48	2.087	4000	266.09	0.00	0.00000	1.003	2	0.9214	25.67
4.5	0.37	3.00	15.00	7.57	48	2.021	4000	266.09	0.00	0.00000	1.003	2	0.9380	18.23
4.5	0.37	5.50	27.50	13.88	48	1.856	4000	266.09	0.00	0.00000	1.003	2	0.9609	10.57
4.5	0.37	8.00	40.00	20.19	48	1.717	4000	266.09	0.00	0.00000	1.003	2	0.9714	7.77
4.5	0.37	12.00	60.00	30.28	48	1.533	4000	266.09	0.00	0.00000	1.003	2	0.9800	5.75
4.5	0.37	14.00	70.00	35.32	48	1.455	4000	266.09	0.00	0.00000	1.003	2	0.9827	5.18
4.5	0.37	16.00	80.00	40.37	48	1.384	4000	266.09	0.00	0.00000	1.003	2	0.9847	4.75
4.5	0.37	18.00	90.00	45.42	48	1.320	4000	266.09	0.00	0.00000	1.003	2	0.9863	4.42
4.5	0.37	20.00	100.00	50.46	48	1.262	4000	266.09	0.00	0.00000	1.003	2	0.9876	4.16
4.5	0.37	22.00	110.00	55.51	48	1.208	4000	266.09	0.00	0.00000	1.003	2	0.9886	3.94
4.5	0.37	24.00	120.00	60.56	48	1.159	4000	266.09	0.00	0.00000	1.003	2	0.9895	3.76
4.5	0.37	26.00	130.00	65.60	48	1.114	4000	266.09	0.00	0.00000	1.003	2	0.9903	3.61
4.5	0.37	28.00	140.00	70.65	48	1.072	4000	266.09	0.00	0.00000	1.003	2	0.9910	3.48
4.5	0.37	30.00	150.00	75.69	48	1.034	4000	266.09	0.00	0.00000	1.003	2	0.9915	3.37
4.5	0.37	32.00	160.00	80.74	48	0.998	4000	266.09	0.00	0.00000	1.003	2	0.9920	3.27
4.5	0.37	34.00	170.00	85.79	48	0.964	4000	266.09	0.00	0.00000	1.003	2	0.9925	3.19
4.5	0.37	38.00	190.00	95.88	48	0.903	4000	266.09	0.00	0.00000	1.003	2	0.9933	3.04
4.5	0.37	42.00	210.00	105.97	48	0.849	4000	266.09	0.00	0.00000	1.003	2	0.9939	2.92
4.5	0.37	12.58	62.90	31.74	48	1.509	4000	266.09	0.00	0.00000	1.003	2	0.9809	5.57

Standard Penetration Test Data		
GDOT Project ID:	0006934	← data entry
Project Name:	Courtesy Pkwy	← data entry
Location:	Wall 2	← data entry
Boring Number:	W-6	← data entry
Date:	15-Nov	← data entry

SPT procedures per ASTM D 1586

Additional Notes:

Section 16 - Design Height=20ft
Station 145+33.00, Rt to 146+13.00, Rt

FOUNDATION SHAPES and GEOMETRY

Footing Length L (ft) =	80	← data entry if known
Footing Width B (ft) =	9.42	← data entry if known
Current Case - L/B =	8	
Square - L/B =	1	
Rectangular - L/B =	5	
Strip - L/B =	10	

SPECIFIC SETTLEMENT VALUE (

1	← data entry
1.5	← data entry
2	← data entry
2.5	← data entry
3	← data entry
3.5	← data entry
4	← data entry

Total Number of Readings	10	
Number of Clay Readings	4	Note: "CLAY" means any of the following: CL, CH, ML, MH, CL-ML, (
% Clay Readings	40	CONTACT GEOTECH ENGINEER - CONSIDER CLAY %

Ground Water Table	14	feet	← data entry
Energy Rating	84	%	← data entry

SPT DATA INPUT: PLEASE ENTER EITHER
(a) Raw Field Blows in Columns B, C, & D or put (b) Measured N-value (bpf) in column I

Advisory Note: If the bottom of wall footing/leveling pad/spread footing elevation is more than5 feet below the ground elevation in your boring log, begin inputting boring log data from the elevation that corresponds to5 feet above the bottom of wall footing/leveling pad/spread footing elevation.

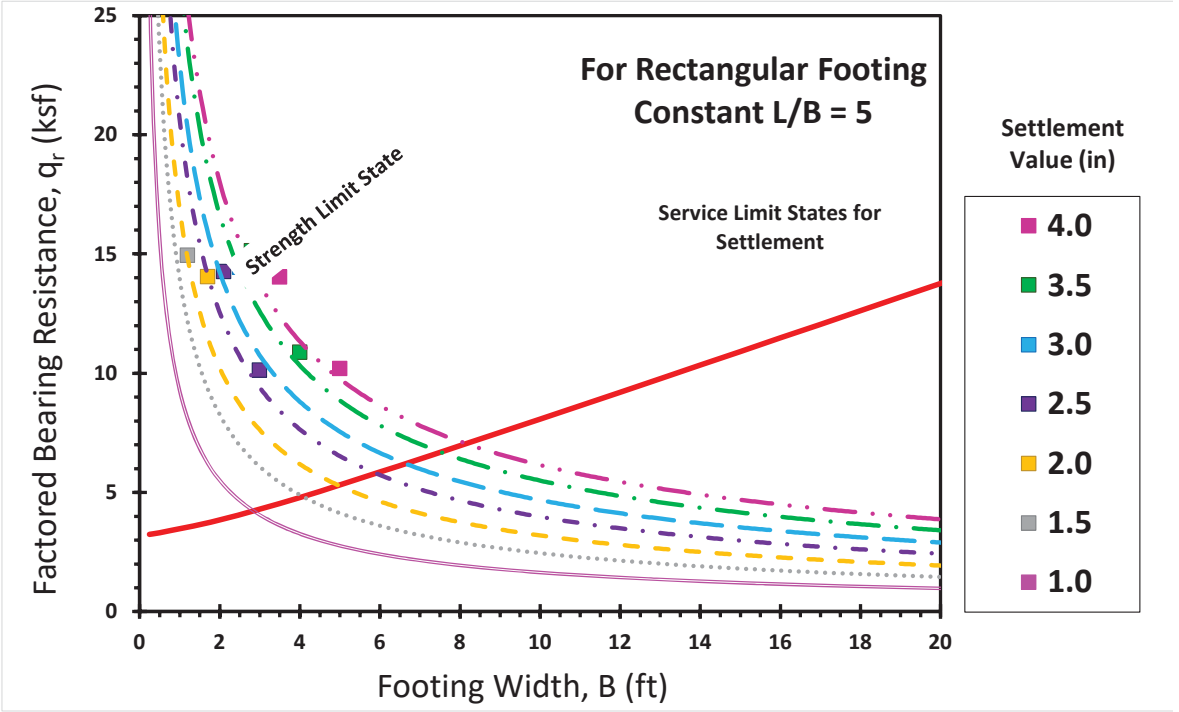
	Raw SPT Blows Per 6 inches			
	#1	#2	#3	N-value (bpf)
data entry →	2	2	2	4
data entry →	3	1	2	3
data entry →	2	2	2	4
data entry →	1	3	2	5
data entry →	1	1	1	2
data entry →	2	1	2	3
data entry →	3	5	4	9
data entry →	5	4	7	11
data entry →	8	10	8	18
data entry →	12	12	15	27

	Depth	SPT Reading	USCS
	(feet)	N-value (bpf)	Soil Type
	0.00		
data entry →	2.50		CL
data entry →	5.00		CL
data entry →	7.50		ML
data entry →	10.00		ML
data entry →	15.00		SM
data entry →	20.00		SM
data entry →	25.00		SM
data entry →	30.00		SM
data entry →	35.00		SM
data entry →	40.00		SM

Rectangular Footing Solution for L/B = 5

Effective Cohesion Intercept , c' (ksf) =	0
Effective Friction Angle, ϕ' (deg) =	31.32
Rectangular Distortion Ratio (L/B) =	5.00
Embedment Depth, D_f (ft) =	2.00
Ground Water Table, D_w (ft) =	14.00
Average Bulk UW, γ_{bulk} (kcf) =	0.11
Layer Thickness, h (ft) =	48.00
Modulus of Foundation, E_{FDTN} (ksf) =	4000
Poisson's Ratio of Soil=	0.20
Poisson's Ratio of Foundation=	0.20
Soil Modulus of Elasticity, E' (ksf) =	266.09
Footing Thickness, t (ft) =	0.00

Friction Angle, ϕ_f	Cohesion BC Term, N_c	Unit Weight BC Term, N_γ	Surcharge BC Term, N_q	Resistance Factor, ϕ_b
31.32	33.548	27.282	21.416	0.4



3.0

Settlement, s (in)	Settlement, s (ft)	Footing Width, B (ft)	Footing Length, L (ft)	Equivalent Diameter, d_e (ft)	Layer Thickness, h (ft)	Shape Disp. factor, I_H	Efdtn (ksf)	Esoil (ksf)	Foundation Thickness, t (ft)	Fdtn Flexibility factor, K_F	Fdtn Flexibility Factor, I_F	z_E (ft)	Embedment factor, I_E	q (ksf)
3	0.25	2.50	12.50	6.31	48	2.057	4000	266.09	0.00	0.00000	1.003	2	0.9298	14.45
3	0.25	4.00	20.00	10.09	48	1.951	4000	266.09	0.00	0.00000	1.003	2	0.9498	9.32
3	0.25	6.00	30.00	15.14	48	1.827	4000	266.09	0.00	0.00000	1.003	2	0.9636	6.54
3	0.25	7.50	37.50	18.92	48	1.743	4000	266.09	0.00	0.00000	1.003	2	0.9698	5.45
3	0.25	9.00	45.00	22.71	48	1.667	4000	266.09	0.00	0.00000	1.003	2	0.9742	4.73
3	0.25	12.00	60.00	30.28	48	1.533	4000	266.09	0.00	0.00000	1.003	2	0.9800	3.83
3	0.25	14.00	70.00	35.32	48	1.455	4000	266.09	0.00	0.00000	1.003	2	0.9827	3.45
3	0.25	16.00	80.00	40.37	48	1.384	4000	266.09	0.00	0.00000	1.003	2	0.9847	3.17
3	0.25	18.00	90.00	45.42	48	1.320	4000	266.09	0.00	0.00000	1.003	2	0.9863	2.95
3	0.25	20.00	100.00	50.46	48	1.262	4000	266.09	0.00	0.00000	1.003	2	0.9876	2.77
3	0.25	22.00	110.00	55.51	48	1.208	4000	266.09	0.00	0.00000	1.003	2	0.9886	2.63
3	0.25	24.00	120.00	60.56	48	1.159	4000	266.09	0.00	0.00000	1.003	2	0.9895	2.51
3	0.25	26.00	130.00	65.60	48	1.114	4000	266.09	0.00	0.00000	1.003	2	0.9903	2.41
3	0.25	28.00	140.00	70.65	48	1.072	4000	266.09	0.00	0.00000	1.003	2	0.9910	2.32
3	0.25	30.00	150.00	75.69	48	1.034	4000	266.09	0.00	0.00000	1.003	2	0.9915	2.25
3	0.25	32.00	160.00	80.74	48	0.998	4000	266.09	0.00	0.00000	1.003	2	0.9920	2.18
3	0.25	34.00	170.00	85.79	48	0.964	4000	266.09	0.00	0.00000	1.003	2	0.9925	2.12
3	0.25	38.00	190.00	95.88	48	0.903	4000	266.09	0.00	0.00000	1.003	2	0.9933	2.03
3	0.25	42.00	210.00	105.97	48	0.849	4000	266.09	0.00	0.00000	1.003	2	0.9939	1.95
3	0.25	9.42	47.10	23.77	48	1.647	4000	266.09	0.00	0.00000	1.003	2	0.9752	4.57

3.5

Settlement, s (in)	Settlement, s (ft)	Footing Width, B (ft)	Footing Length, L (ft)	Equivalent Diameter, d_e (ft)	Layer Thickness, h (ft)	Shape Disp. factor, I_H	Efdtn (ksf)	Esoil (ksf)	Foundation Thickness, t (ft)	Fdtn Flexibility factor, K_F	Fdtn Flexibility Factor, I_F	z_E (ft)	Embedment factor, I_E	q (ksf)
3.5	0.29	2.80	14.00	7.06	48	2.035	4000	266.09	0.00	0.00000	1.003	2	0.9349	15.13
3.5	0.29	4.00	20.00	10.09	48	1.951	4000	266.09	0.00	0.00000	1.003	2	0.9498	10.87
3.5	0.29	6.00	30.00	15.14	48	1.827	4000	266.09	0.00	0.00000	1.003	2	0.9636	7.63
3.5	0.29	9.00	45.00	22.71	48	1.667	4000	266.09	0.00	0.00000	1.003	2	0.9742	5.52
3.5	0.29	12.00	60.00	30.28	48	1.533	4000	266.09	0.00	0.00000	1.003	2	0.9800	4.47
3.5	0.29	16.00	80.00	40.37	48	1.384	4000	266.09	0.00	0.00000	1.003	2	0.9847	3.70
3.5	0.29	20.00	100.00	50.46	48	1.262	4000	266.09	0.00	0.00000	1.003	2	0.9876	3.23
3.5	0.29	22.00	110.00	55.51	48	1.208	4000	266.09	0.00	0.00000	1.003	2	0.9886	3.07
3.5	0.29	24.00	120.00	60.56	48	1.159	4000	266.09	0.00	0.00000	1.003	2	0.9895	2.93
3.5	0.29	26.00	130.00	65.60	48	1.114	4000	266.09	0.00	0.00000	1.003	2	0.9903	2.81
3.5	0.29	28.00	140.00	70.65	48	1.072	4000	266.09	0.00	0.00000	1.003	2	0.9910	2.71
3.5	0.29	30.00	150.00	75.69	48	1.034	4000	266.09	0.00	0.00000	1.003	2	0.9915	2.62
3.5	0.29	32.00	160.00	80.74	48	0.998	4000	266.09	0.00	0.00000	1.003	2	0.9920	2.55
3.5	0.29	34.00	170.00	85.79	48	0.964	4000	266.09	0.00	0.00000	1.003	2	0.9925	2.48
3.5	0.29	38.00	190.00	95.88	48	0.903	4000	266.09	0.00	0.00000	1.003	2	0.9933	2.37
3.5	0.29	42.00	210.00	105.97	48	0.849	4000	266.09	0.00	0.00000	1.003	2	0.9939	2.27
3.5	0.29	9.42	47.10	23.77	48	1.647	4000	266.09	0.00	0.00000	1.003	2	0.9752	5.33

Standard Penetration Test Data		
GDOT Project ID:	0006934	← data entry
Project Name:	Courtesy Pkwy	← data entry
Location:	Wall 2	← data entry
Boring Number:	W-6	← data entry
Date:	15-Nov	← data entry

SPT procedures per ASTM D 1586

Additional Notes:

Section 17 - Design Height=25ft
Station 146+13.00, Rt to 146+29.00, Rt

FOUNDATION SHAPES and GEOMETRY

Footing Length L (ft) =	16	← data entry if known
Footing Width B (ft) =	12.58	← data entry if known
Current Case - L/B =	1	
Square - L/B =	1	
Rectangular - L/B =	5	
Strip - L/B =	10	

SPECIFIC SETTLEMENT VALUE (

1	← data entry
1.5	← data entry
2	← data entry
2.5	← data entry
3	← data entry
3.5	← data entry
4	← data entry

Total Number of Readings	10	
Number of Clay Readings	4	Note: "CLAY" means any of the following: CL, CH, ML, MH, CL-ML, (
% Clay Readings	40	CONTACT GEOTECH ENGINEER - CONSIDER CLAY %

Ground Water Table	14	feet	← data entry
Energy Rating	84	%	← data entry

SPT DATA INPUT: PLEASE ENTER EITHER
(a) Raw Field Blows in Columns B, C, & D or put (b) Measured N-value (bpf) in column I

Advisory Note: If the bottom of wall footing/leveling pad/spread footing elevation is more than5 feet below the ground elevation in your boring log, begin inputting boring log data from the elevation that corresponds to5 feet above the bottom of wall footing/leveling pad/spread footing elevation.

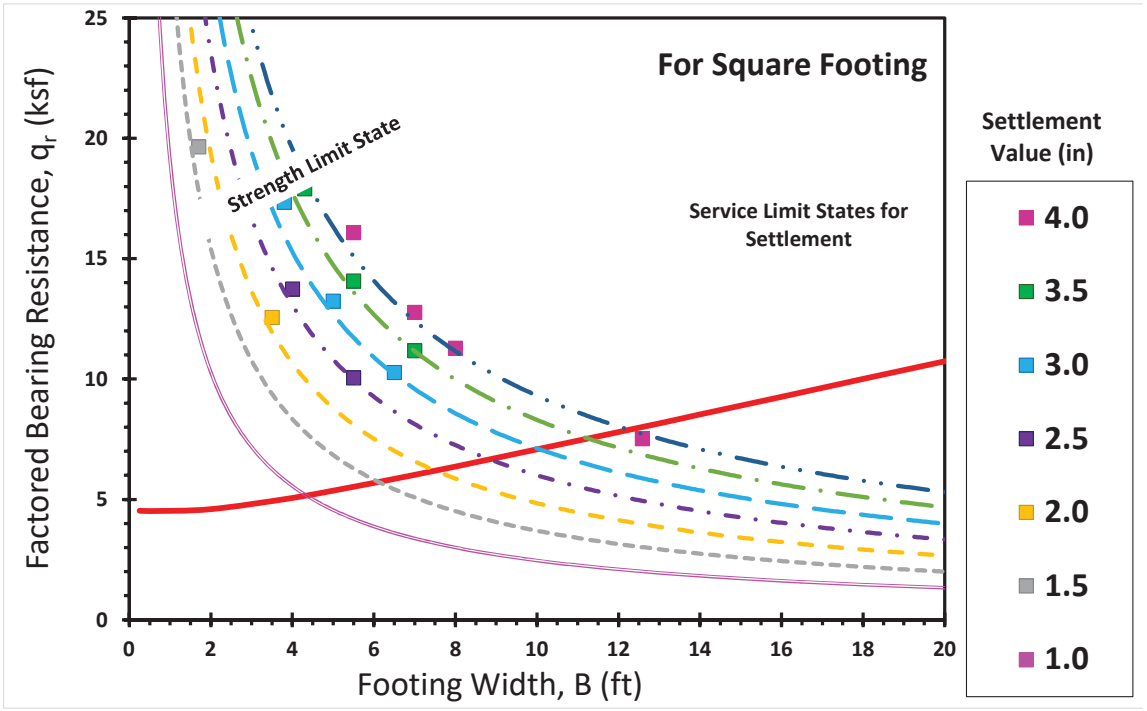
	Raw SPT Blows Per 6 inches			
	#1	#2	#3	N-value (bpf)
data entry →	2	2	2	4
data entry →	3	1	2	3
data entry →	2	2	2	4
data entry →	1	3	2	5
data entry →	1	1	1	2
data entry →	2	1	2	3
data entry →	3	5	4	9
data entry →	5	4	7	11
data entry →	8	10	8	18
data entry →	12	12	15	27

	Depth	SPT Reading	USCS
	(feet)	N-value (bpf)	Soil Type
	0.00		
data entry →	2.50		CL
data entry →	5.00		CL
data entry →	7.50		ML
data entry →	10.00		ML
data entry →	15.00		SM
data entry →	20.00		SM
data entry →	25.00		SM
data entry →	30.00		SM
data entry →	35.00		SM
data entry →	40.00		SM

Square Footing Solution for L/B = 1

Effective Cohesion Intercept , c' (ksf) =	0
Effective Friction Angle, ϕ' (deg) =	31.32
Rectangular Distortion Ratio (L/B) =	1.00
Embedment Depth, D_f (ft) =	2.00
Ground Water Table, D_w (ft) =	14.00
Average Bulk UW, γ_{bulk} (kcf) =	0.11
Layer Thickness, h (ft) =	48.00
Modulus of Foundation, E_{FDTN} (ksf) =	4000
Poisson's Ratio of Soil=	0.20
Poisson's Ratio of Foundation=	0.20
Soil Modulus of Elasticity, E' (ksf) =	266.09
Footing Thickness, t (ft) =	0.00

Friction Angle, ϕ_f	Cohesion BC Term, N_c	Unit Weight BC Term, N_γ	Surcharge BC Term, N_q	Resistance Factor, ϕ_b
31.32	33.548	27.282	21.416	0.4



2.5

Settlement, s (in)	Settlement, s (ft)	Footing Width, B (ft)	Footing Length, L (ft)	Equivalent Diameter, d_e (ft)	Layer Thickness, h (ft)	Shape Disp. factor, I_H	Efdtn (ksf)	Esoil (ksf)	Foundation Thickness, t (ft)	Fdtn Flexibility factor, K_F	Fdtn Flexibility Factor, I_F	z_E (ft)	Embedment factor, I_E	q (ksf)
2.5	0.21	3.10	3.10	3.50	48	1.163	4000	266.09	0.00	0.000	1.003	2	0.9003	17.73
2.5	0.21	4.00	4.00	4.51	48	1.147	4000	266.09	0.00	0.000	1.003	2	0.9134	13.74
2.5	0.21	5.50	5.50	6.21	48	1.121	4000	266.09	0.00	0.000	1.003	2	0.9290	10.06
2.5	0.21	7.00	7.00	7.90	48	1.096	4000	266.09	0.00	0.000	1.003	2	0.9398	7.99
2.5	0.21	9.00	9.00	10.16	48	1.064	4000	266.09	0.00	0.000	1.003	2	0.9500	6.33
2.5	0.21	12.00	12.00	13.54	48	1.020	4000	266.09	0.00	0.000	1.003	2	0.9601	4.90
2.5	0.21	14.00	14.00	15.80	48	0.992	4000	266.09	0.00	0.000	1.003	2	0.9648	4.30
2.5	0.21	16.00	16.00	18.05	48	0.966	4000	266.09	0.00	0.000	1.003	2	0.9686	3.85
2.5	0.21	18.00	18.00	20.31	48	0.941	4000	266.09	0.00	0.000	1.003	2	0.9716	3.50
2.5	0.21	20.00	20.00	22.57	48	0.918	4000	266.09	0.00	0.000	1.003	2	0.9741	3.22
2.5	0.21	22.00	22.00	24.82	48	0.895	4000	266.09	0.00	0.000	1.003	2	0.9762	2.99
2.5	0.21	24.00	24.00	27.08	48	0.874	4000	266.09	0.00	0.000	1.003	2	0.9779	2.81
2.5	0.21	26.00	26.00	29.34	48	0.854	4000	266.09	0.00	0.000	1.003	2	0.9795	2.65
2.5	0.21	28.00	28.00	31.59	48	0.834	4000	266.09	0.00	0.000	1.003	2	0.9808	2.51
2.5	0.21	30.00	30.00	33.85	48	0.816	4000	266.09	0.00	0.000	1.003	2	0.9820	2.40
2.5	0.21	32.00	32.00	36.11	48	0.798	4000	266.09	0.00	0.000	1.003	2	0.9830	2.29
2.5	0.21	34.00	34.00	38.36	48	0.781	4000	266.09	0.00	0.000	1.003	2	0.9839	2.20
2.5	0.21	38.00	38.00	42.88	48	0.749	4000	266.09	0.00	0.000	1.003	2	0.9855	2.05
2.5	0.21	42.00	42.00	47.39	48	0.720	4000	266.09	0.00	0.000	1.003	2	0.9868	1.93
2.5	0.21	12.58	12.58	14.20	48	1.011	4000	266.09	0.00	0.000	1.003	2	0.9616	4.71

3.0

Settlement, s (in)	Settlement, s (ft)	Footing Width, B (ft)	Footing Length, L (ft)	Equivalent Diameter, d_e (ft)	Layer Thickness, h (ft)	Shape Disp. factor, I_H	Efdtn (ksf)	Esoil (ksf)	Foundation Thickness, t (ft)	Fdtn Flexibility factor, K_F	Fdtn Flexibility Factor, I_F	z_E (ft)	Embedment factor, I_E	q (ksf)
3	0.25	3.80	3.80	4.29	48	1.151	4000	266.09	0.00	0.000	1.003	2	0.9108	17.35
3	0.25	5.00	5.00	5.64	48	1.129	4000	266.09	0.00	0.000	1.003	2	0.9245	13.24
3	0.25	6.50	6.50	7.33	48	1.104	4000	266.09	0.00	0.000	1.003	2	0.9366	10.28
3	0.25	8.00	8.00	9.03	48	1.080	4000	266.09	0.00	0.000	1.003	2	0.9454	8.46
3	0.25	9.00	9.00	10.16	48	1.064	4000	266.09	0.00	0.000	1.003	2	0.9500	7.60
3	0.25	12.00	12.00	13.54	48	1.020	4000	266.09	0.00	0.000	1.003	2	0.9601	5.88
3	0.25	14.00	14.00	15.80	48	0.992	4000	266.09	0.00	0.000	1.003	2	0.9648	5.16
3	0.25	16.00	16.00	18.05	48	0.966	4000	266.09	0.00	0.000	1.003	2	0.9686	4.62
3	0.25	18.00	18.00	20.31	48	0.941	4000	266.09	0.00	0.000	1.003	2	0.9716	4.20
3	0.25	20.00	20.00	22.57	48	0.918	4000	266.09	0.00	0.000	1.003	2	0.9741	3.87
3	0.25	22.00	22.00	24.82	48	0.895	4000	266.09	0.00	0.000	1.003	2	0.9762	3.59
3	0.25	24.00	24.00	27.08	48	0.874	4000	266.09	0.00	0.000	1.003	2	0.9779	3.37
3	0.25	26.00	26.00	29.34	48	0.854	4000	266.09	0.00	0.000	1.003	2	0.9795	3.18
3	0.25	28.00	28.00	31.59	48	0.834	4000	266.09	0.00	0.000	1.003	2	0.9808	3.02
3	0.25	30.00	30.00	33.85	48	0.816	4000	266.09	0.00	0.000	1.003	2	0.9820	2.88
3	0.25	32.00	32.00	36.11	48	0.798	4000	266.09	0.00	0.000	1.003	2	0.9830	2.75
3	0.25	34.00	34.00	38.36	48	0.781	4000	266.09	0.00	0.000	1.003	2	0.9839	2.64
3	0.25	38.00	38.00	42.88	48	0.749	4000	266.09	0.00	0.000	1.003	2	0.9855	2.46
3	0.25	42.00	42.00	47.39	48	0.720	4000	266.09	0.00	0.000	1.003	2	0.9868	2.32
3	0.25	12.58	12.58	14.20	48	1.011	4000	266.09	0.00	0.000	1.003	2	0.9616	5.65

Standard Penetration Test Data		
GDOT Project ID:	0006934	← data entry
Project Name:	Courtesy Pkwy	← data entry
Location:	Wall 2	← data entry
Boring Number:	W-6	← data entry
Date:	15-Nov	← data entry

SPT procedures per ASTM D 1586

Additional Notes:

Section 18 - Design Height=20ft
Station 146+29.00, Rt to 146+50.00, Rt

FOUNDATION SHAPES and GEOMETRY

Footing Length L (ft) =	21	← data entry if known
Footing Width B (ft) =	9.42	← data entry if known
Current Case - L/B =	2	
Square - L/B =	1	
Rectangular - L/B =	5	
Strip - L/B =	10	

SPECIFIC SETTLEMENT VALUE (

1	← data entry
2	← data entry
3	← data entry
3.5	← data entry
4	← data entry
4.5	← data entry
5	← data entry

Total Number of Readings	10
Number of Clay Readings	4
% Clay Readings	40

Note: "CLAY" means any of the following: CL, CH, ML, MH, CL-ML, (

CONTACT GEOTECH ENGINEER - CONSIDER CLAY %

Ground Water Table	14	feet	← data entry
Energy Rating	84	%	← data entry

SPT DATA INPUT: PLEASE ENTER EITHER
(a) Raw Field Blows in Columns B, C, & D or put (b) Measured N-value (bpf) in column I

Advisory Note: If the bottom of wall footing/leveling pad/spread footing elevation is more than5 feet below the ground elevation in your boring log, begin inputting boring log data from the elevation that corresponds to5 feet above the bottom of wall footing/leveling pad/spread footing elevation.

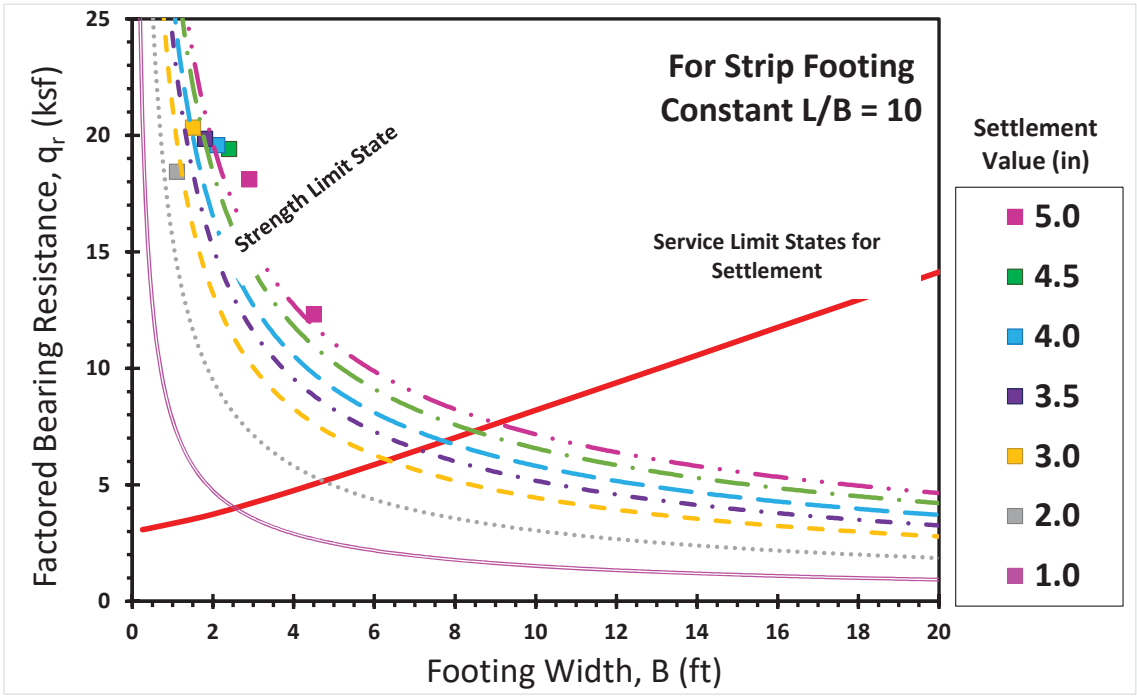
	Raw SPT Blows Per 6 inches			
	#1	#2	#3	N-value (bpf)
data entry →	2	2	2	4
data entry →	3	1	2	3
data entry →	2	2	2	4
data entry →	1	3	2	5
data entry →	1	1	1	2
data entry →	2	1	2	3
data entry →	3	5	4	9
data entry →	5	4	7	11
data entry →	8	10	8	18
data entry →	12	12	15	27

	Depth	SPT Reading	USCS
	(feet)	N-value (bpf)	Soil Type
	0.00		
data entry →	2.50		CL
data entry →	5.00		CL
data entry →	7.50		ML
data entry →	10.00		ML
data entry →	15.00		SM
data entry →	20.00		SM
data entry →	25.00		SM
data entry →	30.00		SM
data entry →	35.00		SM
data entry →	40.00		SM

Strip Footing Solution for L/B = 10

Effective Cohesion Intercept , c' (ksf) =	0
Effective Friction Angle, ϕ' (deg) =	31.32
Rectangular Distortion Ratio (L/B) =	10.00
Embedment Depth, D_f (ft) =	2.00
Ground Water Table, D_w (ft) =	14.00
Average Bulk UW, γ_{bulk} (kcf) =	0.11
Layer Thickness, h (ft) =	48.00
Modulus of Foundation, E_{FDTN} (ksf) =	4000
Poisson's Ratio of Soil=	0.20
Poisson's Ratio of Foundation=	0.20
Soil Modulus of Elasticity, E' (ksf) =	266.09
Footing Thickness, t (ft) =	0.00

Friction Angle, ϕ_f	Cohesion BC Term, N_c	Unit Weight BC Term, N_γ	Surcharge BC Term, N_q	Resistance Factor, ϕ_b
31.32	33.548	27.282	21.416	0.4



3.5														
Settlement, s (in)	Settlement, s (ft)	Footing Width, B (ft)	Footing Length, L (ft)	Equivalent Diameter, d_e (ft)	Layer Thickness, h (ft)	Shape Disp. factor, I_H	Efdtn (ksf)	Esoil (ksf)	Foundation Thickness, t (ft)	Fdtn Flexibility factor, K_F	Fdtn Flexibility Factor, I_F	z_E (ft)	Embedment factor, I_E	q (ksf)
3.5	0.29	1.80	18.00	6.42	48	2.423	4000	266.09	0.00	0.00000	1.003	2	0.9306	19.86
3.5	0.29	3.00	30.00	10.70	48	2.295	4000	266.09	0.00	0.00000	1.003	2	0.9520	12.30
3.5	0.29	5.50	55.00	19.63	48	2.068	4000	266.09	0.00	0.00000	1.003	2	0.9707	7.30
3.5	0.29	7.50	75.00	26.76	48	1.916	4000	266.09	0.00	0.00000	1.003	2	0.9777	5.74
3.5	0.29	12.00	120.00	42.82	48	1.644	4000	266.09	0.00	0.00000	1.003	2	0.9855	4.15
3.5	0.29	14.00	140.00	49.96	48	1.546	4000	266.09	0.00	0.00000	1.003	2	0.9874	3.77
3.5	0.29	16.00	160.00	57.09	48	1.460	4000	266.09	0.00	0.00000	1.003	2	0.9889	3.49
3.5	0.29	18.00	180.00	64.23	48	1.382	4000	266.09	0.00	0.00000	1.003	2	0.9901	3.27
3.5	0.29	20.00	200.00	71.36	48	1.313	4000	266.09	0.00	0.00000	1.003	2	0.9910	3.10
3.5	0.29	22.00	220.00	78.50	48	1.250	4000	266.09	0.00	0.00000	1.003	2	0.9918	2.96
3.5	0.29	24.00	240.00	85.64	48	1.193	4000	266.09	0.00	0.00000	1.003	2	0.9925	2.84
3.5	0.29	26.00	260.00	92.77	48	1.141	4000	266.09	0.00	0.00000	1.003	2	0.9930	2.74
3.5	0.29	28.00	280.00	99.91	48	1.093	4000	266.09	0.00	0.00000	1.003	2	0.9935	2.65
3.5	0.29	30.00	300.00	107.05	48	1.049	4000	266.09	0.00	0.00000	1.003	2	0.9939	2.58
3.5	0.29	32.00	320.00	114.18	48	1.008	4000	266.09	0.00	0.00000	1.003	2	0.9943	2.51
3.5	0.29	34.00	340.00	121.32	48	0.971	4000	266.09	0.00	0.00000	1.003	2	0.9946	2.46
3.5	0.29	38.00	380.00	135.59	48	0.904	4000	266.09	0.00	0.00000	1.003	2	0.9952	2.36
3.5	0.29	42.00	420.00	149.87	48	0.845	4000	266.09	0.00	0.00000	1.003	2	0.9956	2.28
3.5	0.29	9.42	94.20	33.61	48	1.789	4000	266.09	0.00	0.00000	1.003	2	0.9819	4.87

Appendix H – Limiting differential settlement check

Differential Settlement Check

Courtesy Pkwy Extension, Wall No. 1
CSSTP-0006-00(934), Rockdale County
PI No. 0006934

AASHTO Table C11.10.4.1-1 Guide for Limiting Distortion for Precast Concrete Facings of MSE Walls

Joint Width (in)		Limiting Differential Settlement	
		Area ≤ 30 ft^2	30 ft^2 ≤ Area ≤ 75 ft^2
0.75		1/100	1/200
0.50		1/200	1/300
0.25		1/300	1/600

AASHTO Table C11.6.2.2 Rigid Retaining Walls

Limiting Differential Settlement
1/1000

Section Height (ft)	Wall Section			Centroid	Settlement (in)	Rise (ft)	Run (ft)	Slope
15	133+25.00	to	133+58.50	133+41.75	1.36			
20	133+58.50	to	134+78.00	134+18.25	2.30	0.0780	77	0.00102007
25	134+78.00	to	135+27.00	135+02.50	3.03	0.0612	84	0.00072596
30	135+27.00	to	135+92.00	135+59.50	3.98	0.0786	57	0.00137813
34	135+92.00	to	137+20.00	136+56.00	5.20	0.1020	97	0.00105733
30	137+20.00	to	137+70.23	137+45.12	4.27	-0.0775	89	-0.00086991
25	306+25.53	to	305+25.00	305+75.27	2.58	-0.1412	37	-0.00381591
20	305+25.00	to	304+92.00	305+08.50	1.79	-0.0658	67	-0.00098506
15	304+92.00	to	304+72.73	304+82.37	1.13	-0.0544	26	-0.00208055

Note: Courtesy Pkwy Ext. Station 137+70.23, 75’ Rt = Iris Dr. Station 306+25.53, 39.85’ Rt

Differential Settlement Check

Courtesy Pkwy Extension, Wall No. 2
CSSTP-0006-00(934), Rockdale County
PI No. 0006934

AASHTO Table C11.10.4.1-1 Guide for Limiting Distortion for Precast Concrete Facings of MSE Walls

Joint Width (in)		Limiting Differential Settlement	
		Area ≤ 30 ft^2	30 ft^2 ≤ Area ≤ 75 ft^2
0.75		1/100	1/200
0.50		1/200	1/300
0.25		1/300	1/600

AASHTO Table C11.6.2.2 Rigid Retaining Walls

Limiting Differential Settlement
1/1000

Section

Height (ft)	Wall Section			Centroid	Settlement (in)	Rise (ft)	Run (ft)	Slope
15	146+00.00	to	145+63.00	145+81.50	1.5			
20	145+63.00	to	145+39.00	145+51.00	2.5	0.0833	31	0.00273224
25	145+39.00	to	145+23.00	145+31.00	2.5	0.0000	20	0.00000000
30	145+23.00	to	145+08.00	145+15.50	3.0	0.0417	16	0.00268817
35	145+08.00	to	144+44.00	144+76.00	6.0	0.2500	40	0.00632911
35	144+44.00	to	143+44.00	143+94.00	6.0	0.0000	82	0.00000000
35	143+44.00	to	142+44.00	142+94.00	6.0	0.0000	100	0.00000000
35	142+44.00	to	141+44.00	141+94.00	6.0	0.0000	100	0.00000000
39	141+44.00	to	140+72.23	141+08.12	6.0	0.0000	86	0.00000000
39	808+60.71	to	809+59.98	809+10.35	6.5	0.0417	85	0.00049020
39	140+72.23	to	141+50.00	141+11.12	6.0	0.0000	89	0.00000000
30	141+50.00	to	142+54.25	142+02.13	4.0	-0.1667	91	-0.00183130
30	142+54.25	to	143+54.25	143+04.25	4.5	-0.1250	102	-0.00122399
30	143+54.25	to	144+54.25	144+04.25	4.5	-0.1667	100	-0.00166667
25	144+54.25	to	145+33.00	144+93.63	4.5	-0.1250	89	-0.00139860
20	145+33.00	to	146+13.00	145+73.00	3.5	-0.0417	79	-0.00052493
25	146+13.00	to	146+29.00	146+21.00	3.0	-0.1250	48	-0.00260417
20	146+29.00	to	146+50.00	146+39.50	3.5	-0.0833	19	-0.00450450

Note: Courtesy Pkwy Ext. Station 140+72.23, 39.29’ Lt = Dogwood Dr. Station 808+60.71, 39.96’ Lt
Courtesy Pkwy Ext. Station 140+72.23, 60.00’ Rt = Dogwood Dr. Station 809+59.98, 40.01’ Lt

Appendix I – Global stability analysis graphical outputs

Global Stability Analysis for Station 136+50, Right (Wall 1)

Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	foundation soils	120	0	33
	reinforced fill	120	0	34
	retained soils	120	0	32
	wall	135	50,000	70

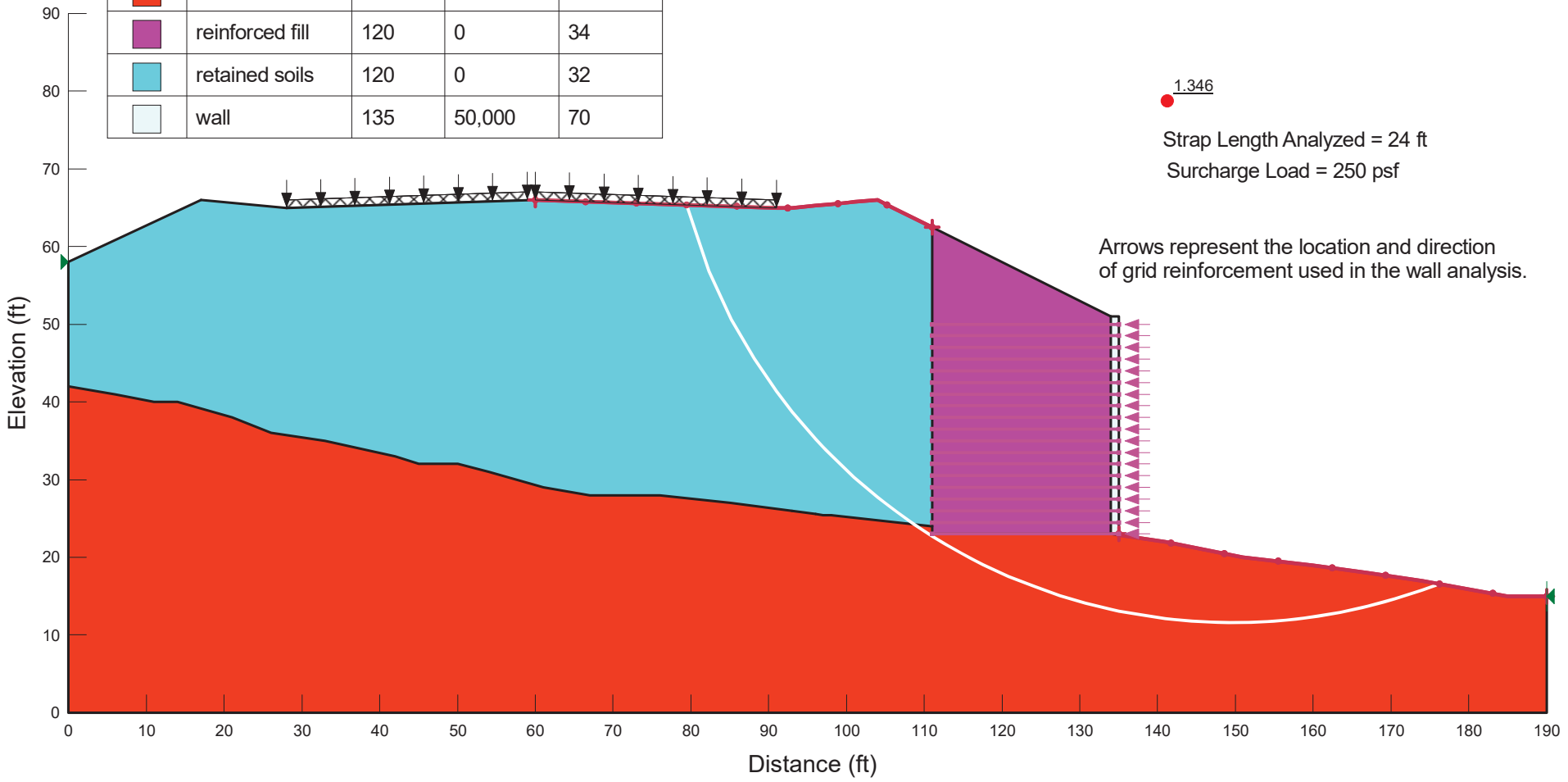
Atlas Technical Consultants, LLC
ROCK1701
Courtesy Parkway
STA 136+50 Rt
Bishop Analysis

1.346

Strap Length Analyzed = 24 ft

Surcharge Load = 250 psf

Arrows represent the location and direction of grid reinforcement used in the wall analysis.



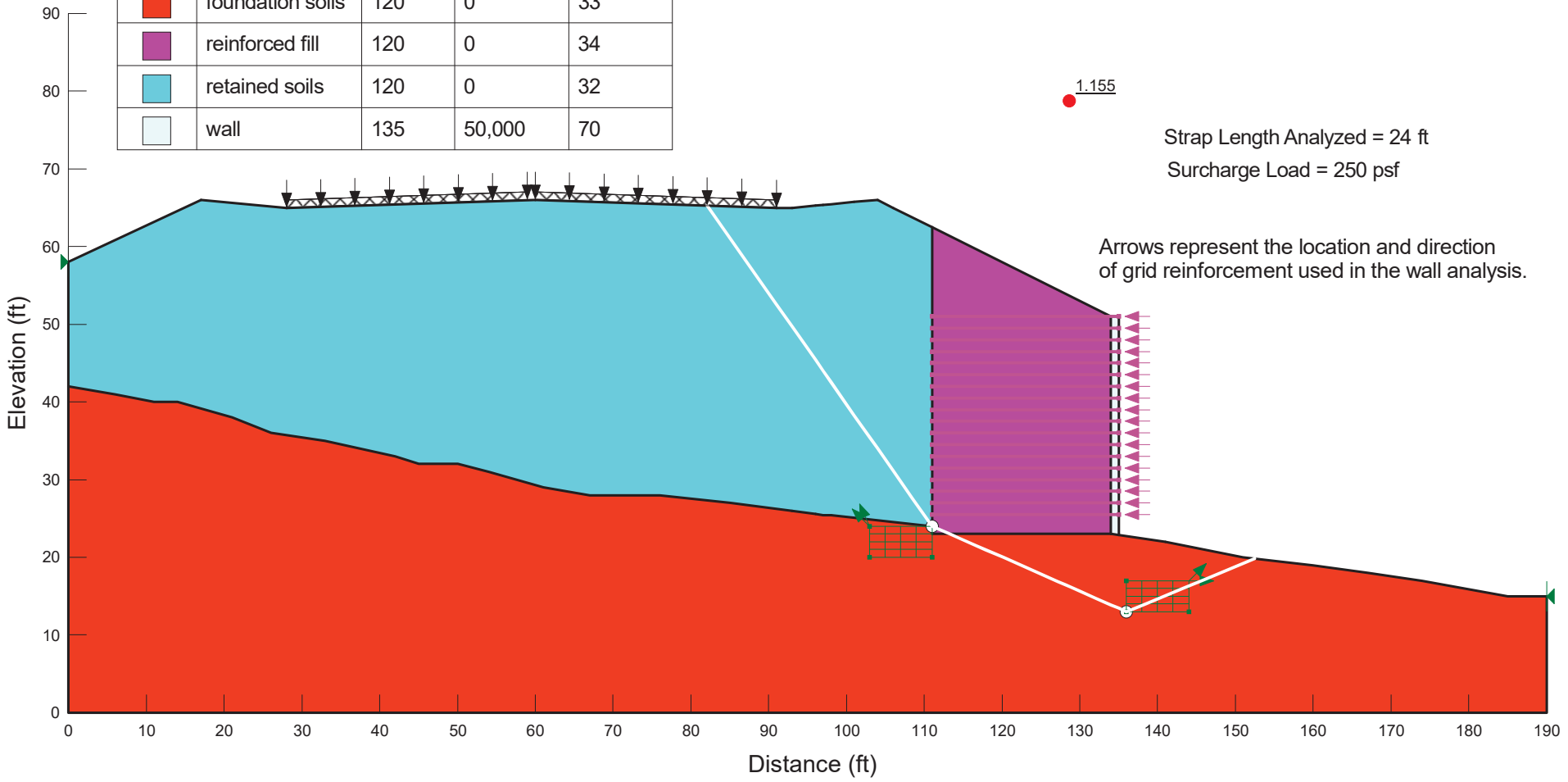
Bishop Non Rigorous Analysis - Circular

Courtesy Parkway - ROCK1701 - STA 136+50 Rt.gsz

12/06/2021 1:243

Atlas Technical Consultants, LLC
ROCK1701
Courtesy Parkway
STA 136+50 Rt
Bishop Analysis

Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	foundation soils	120	0	33
	reinforced fill	120	0	34
	retained soils	120	0	32
	wall	135	50,000	70



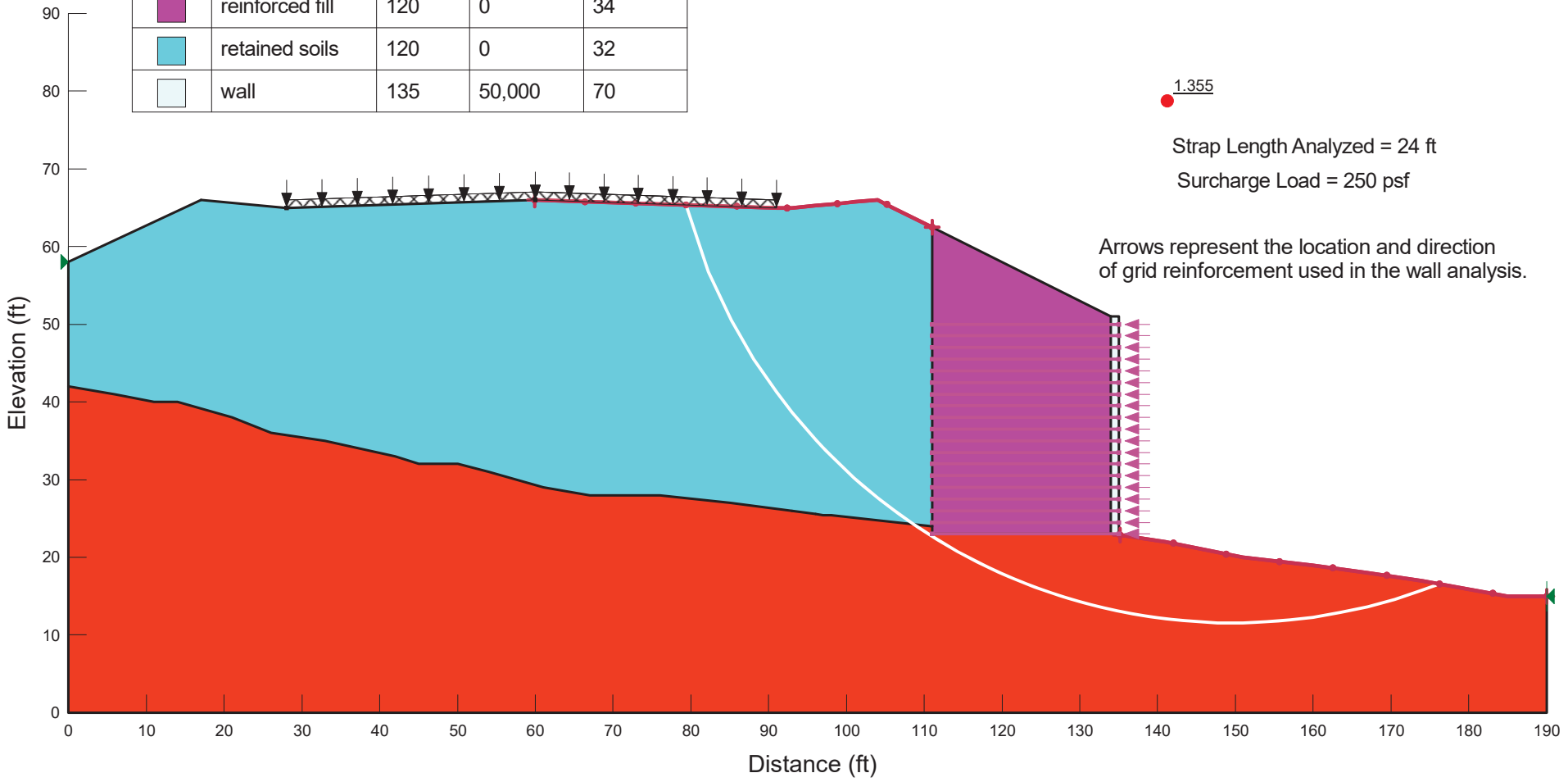
Bishop Non Rigorous Analysis - Non Circular

Courtesy Parkway - ROCK1701 - STA 136+50 Rt.gsz

12/06/2021 1:243

Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	foundation soils	120	0	33
	reinforced fill	120	0	34
	retained soils	120	0	32
	wall	135	50,000	70

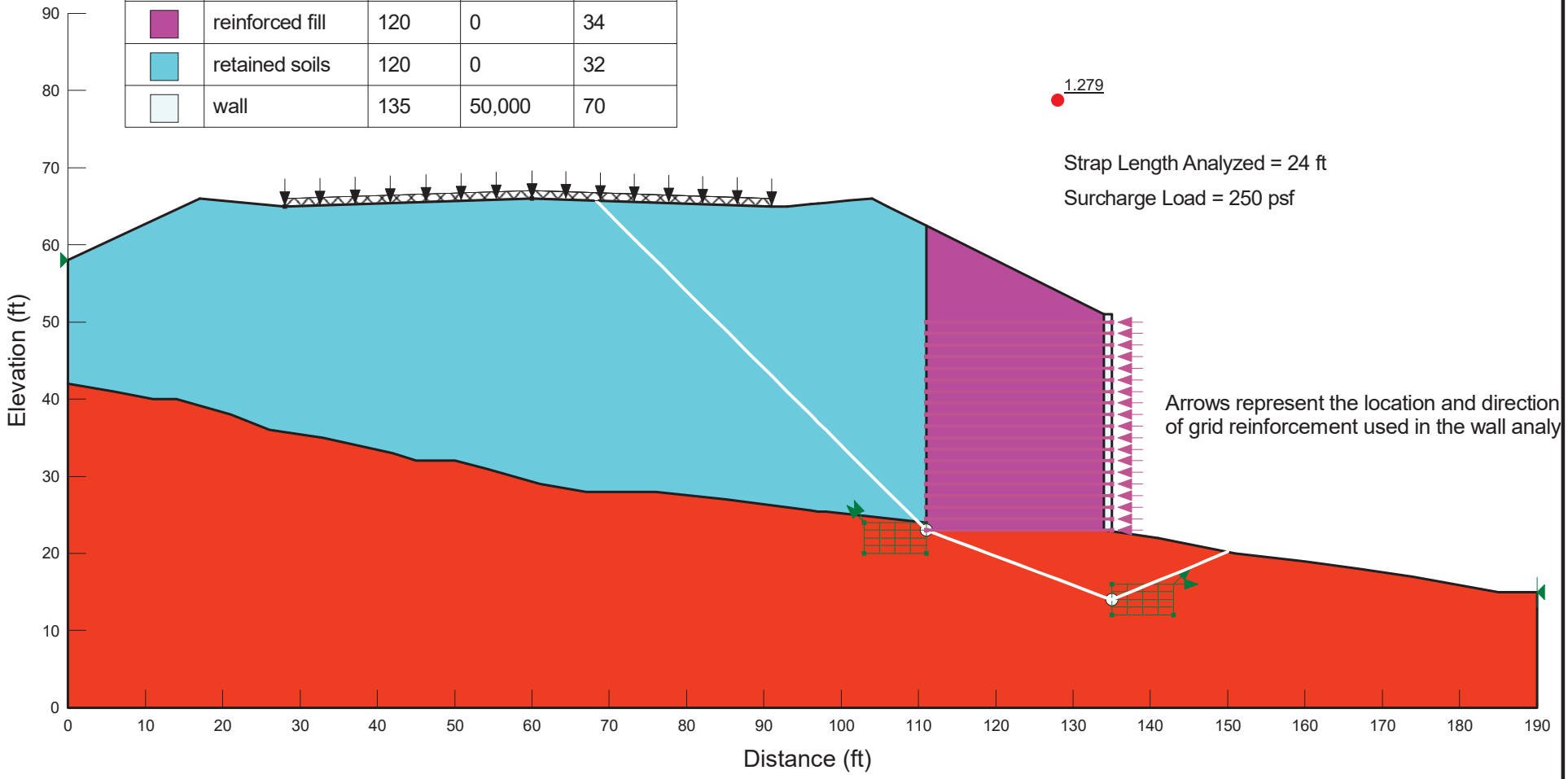
Atlas Technical Consultants, LLC
ROCK1701
Courtesy Parkway
STA 136+50 Rt
Morgenstern Price Analysis



Morgenstern Price Rigorous Analysis - Circular
Courtesy Parkway - ROCK1701 - STA 136+50 Rt.gsz
12/06/2021 1:243

Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	foundation soils	120	0	33
	reinforced fill	120	0	34
	retained soils	120	0	32
	wall	135	50,000	70

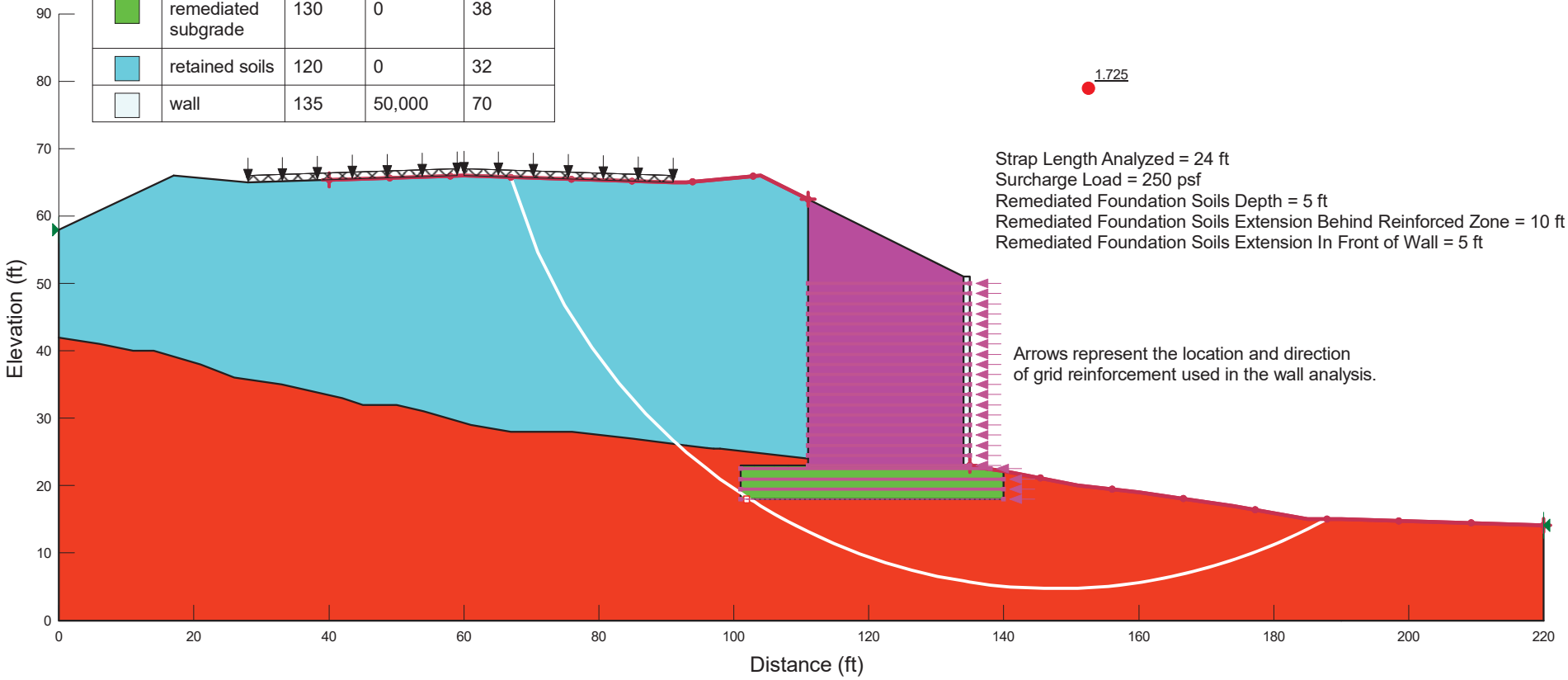
Atlas Technical Consultants, LLC
ROCK1701
Courtesy Parkway
STA 136+50 Rt
Morgenstern Price Analysis



Morgenstern Price Rigorous Analysis - Non Circular	
Courtesy Parkway - ROCK1701 - STA 136+50 Rt.gsz	
12/06/2021	1:243

Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	foundation soils	120	0	33
	reinforced fill	120	0	34
	remediated subgrade	130	0	38
	retained soils	120	0	32
	wall	135	50,000	70

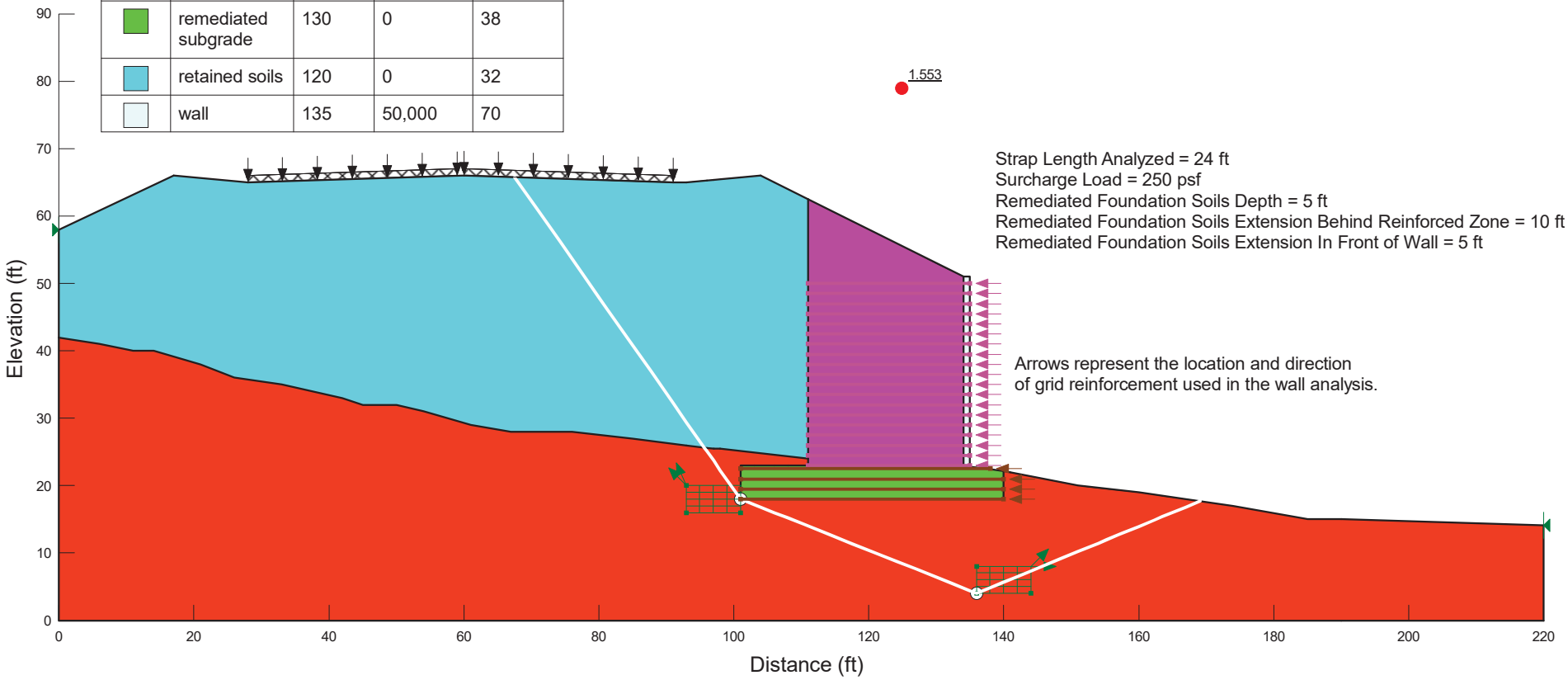
Atlas Technical Consultants, LLC
ROCK1701
Courtesy Parkway
STA 136+50 Rt
Remediated Foundation Soils



Bishop Non Rigorous Analysis - Circular	
Courtesy Parkway - ROCK 1701 - STA 136+50 Rt.gsz	
12/06/2021	1:282

Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	foundation soils	120	0	33
	reinforced fill	120	0	34
	remediated subgrade	130	0	38
	retained soils	120	0	32
	wall	135	50,000	70

Atlas Technical Consultants, LLC
ROCK1701
Courtesy Parkway
STA 136+50 Rt
Remediated Foundation Soils



Strap Length Analyzed = 24 ft
Surcharge Load = 250 psf
Remediated Foundation Soils Depth = 5 ft
Remediated Foundation Soils Extension Behind Reinforced Zone = 10 ft
Remediated Foundation Soils Extension In Front of Wall = 5 ft

Arrows represent the location and direction of grid reinforcement used in the wall analysis.

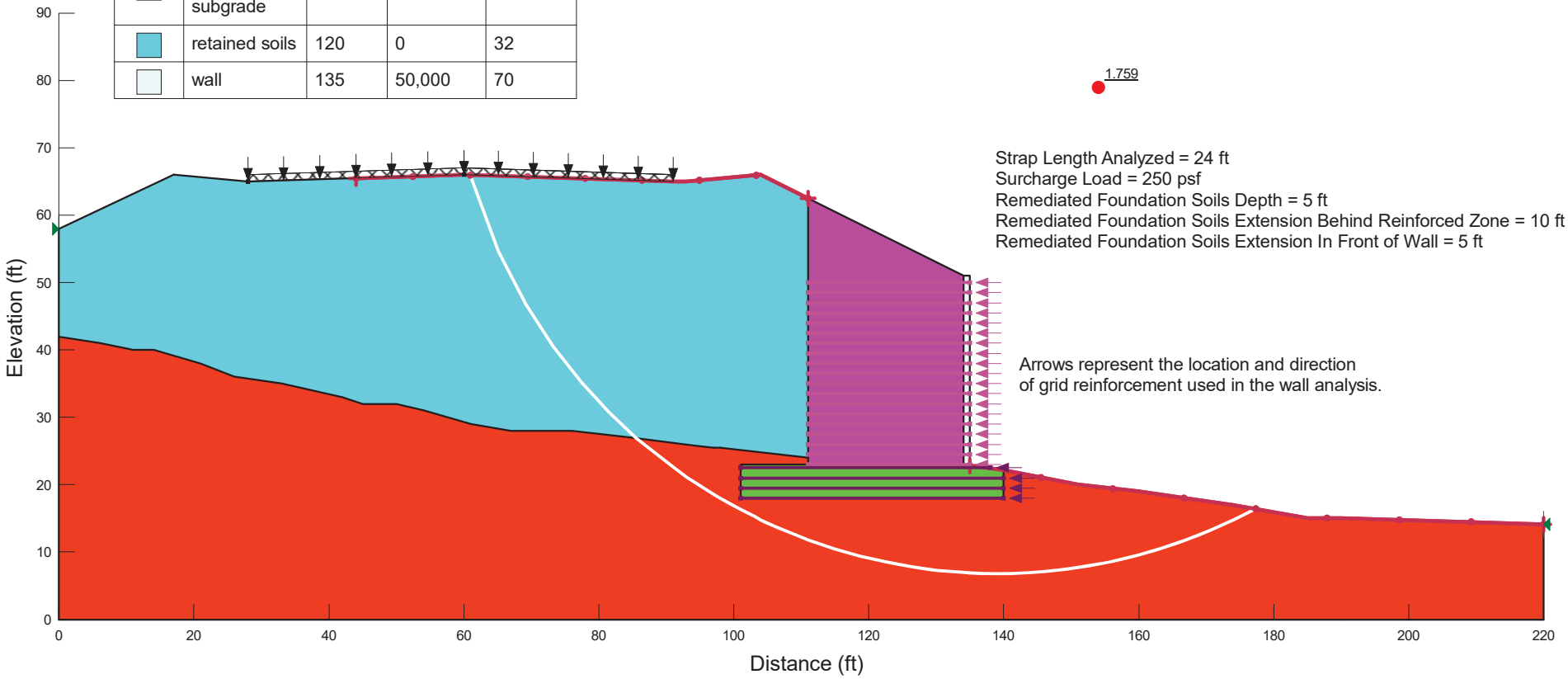
Bishop Non Rigorous Analysis - Non Circular

Courtesy Parkway - ROCK 1701 - STA 136+50 Rt.gsz

12/06/2021 1:282

Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	foundation soils	120	0	33
	reinforced fill	120	0	34
	remediated subgrade	130	0	38
	retained soils	120	0	32
	wall	135	50,000	70

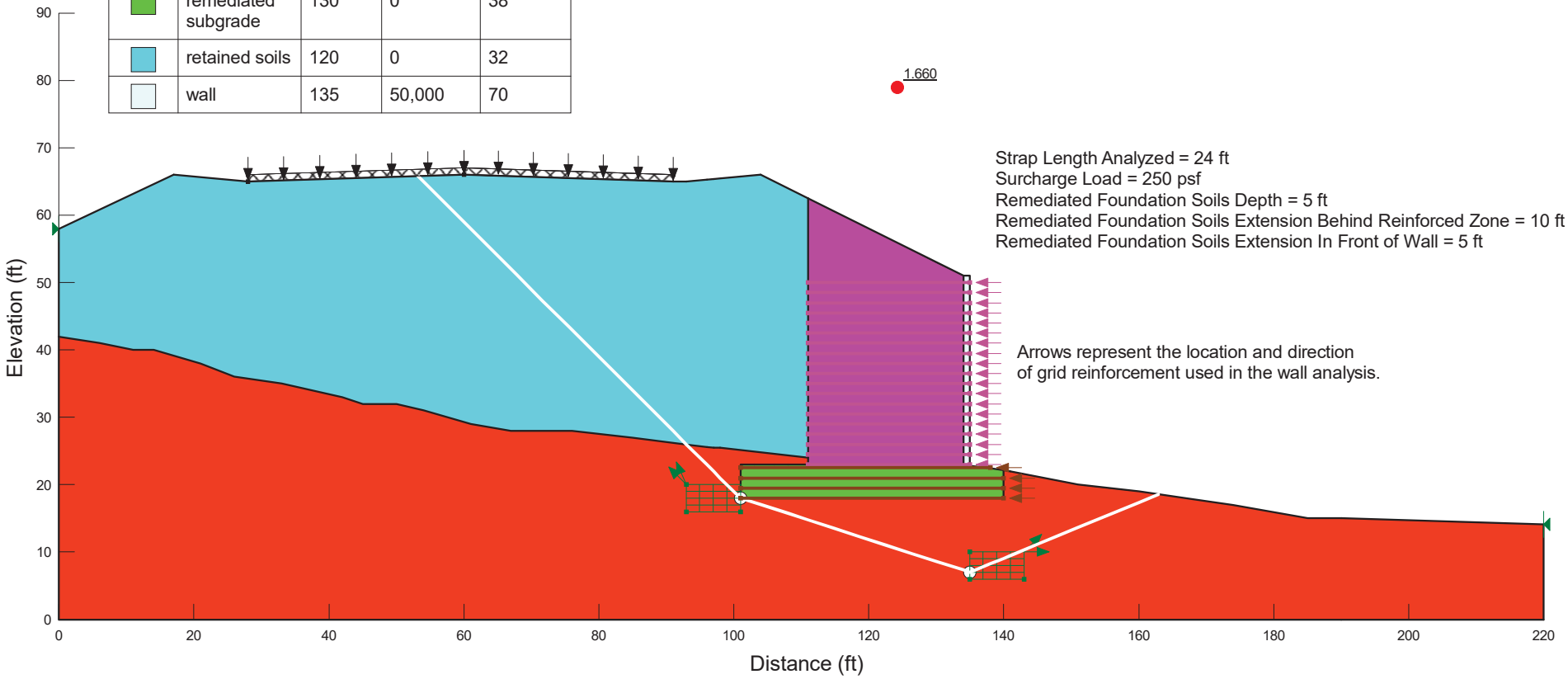
Atlas Technical Consultants, LLC
ROCK1701
Courtesy Parkway
STA 136+50 Rt
Remediated Foundation Soils



Morgenstern Price Rigorous Analysis - Circular	
Courtesy Parkway - ROCK 1701 - STA 136+50 Rt.gsz	
12/06/2021	1:282

Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	foundation soils	120	0	33
	reinforced fill	120	0	34
	remediated subgrade	130	0	38
	retained soils	120	0	32
	wall	135	50,000	70

Atlas Technical Consultants, LLC
ROCK1701
Courtesy Parkway
STA 136+50 Rt
Remediated Foundation Soils



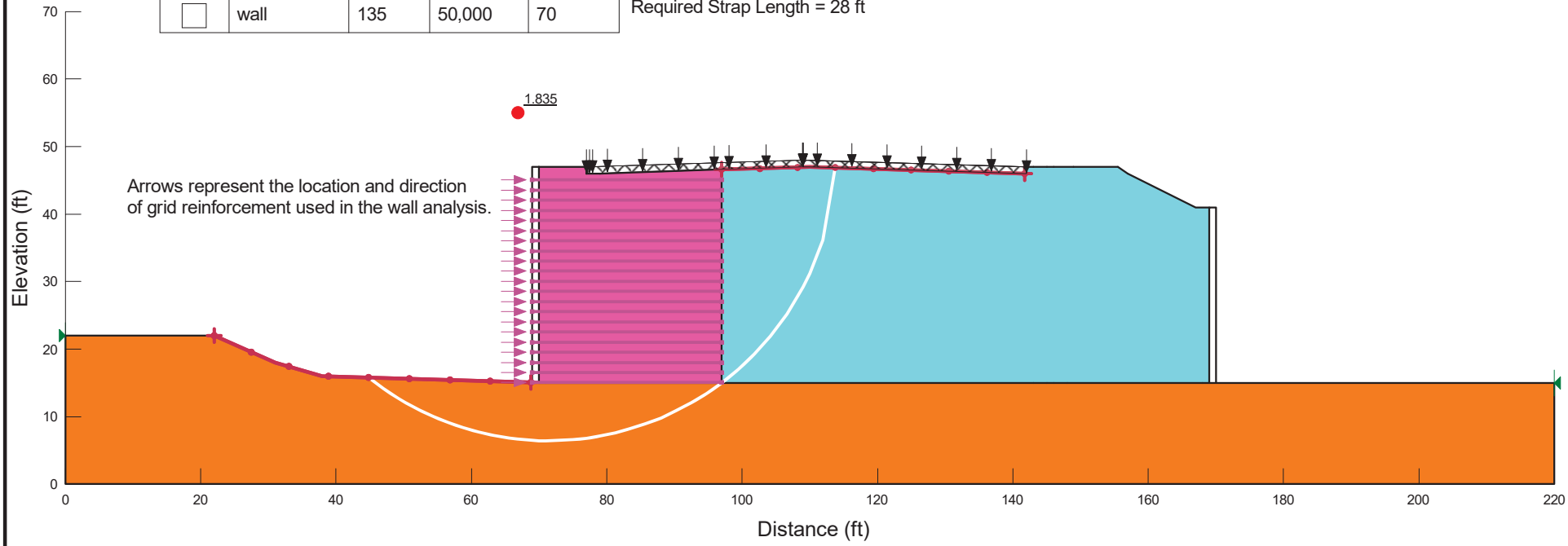
Morgenstern Price Rigorous Analysis - Non Circular	
Courtesy Parkway - ROCK 1701 - STA 136+50 Rt.gsz	
12/06/2021	1:282

Global Stability Analysis for Station 141+50, Left (Wall 2)

Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	foundation soils left	115	0	31
	reinforced fill	120	0	34
	retained soils	120	0	32
	wall	135	50,000	70

Atlas Technical Consultants, LLC
ROCK1701
Courtesy Parkway
STA 141+50 Lt
Bishop Analysis

Surcharge Load = 250 psf
Required Strap Length = 28 ft

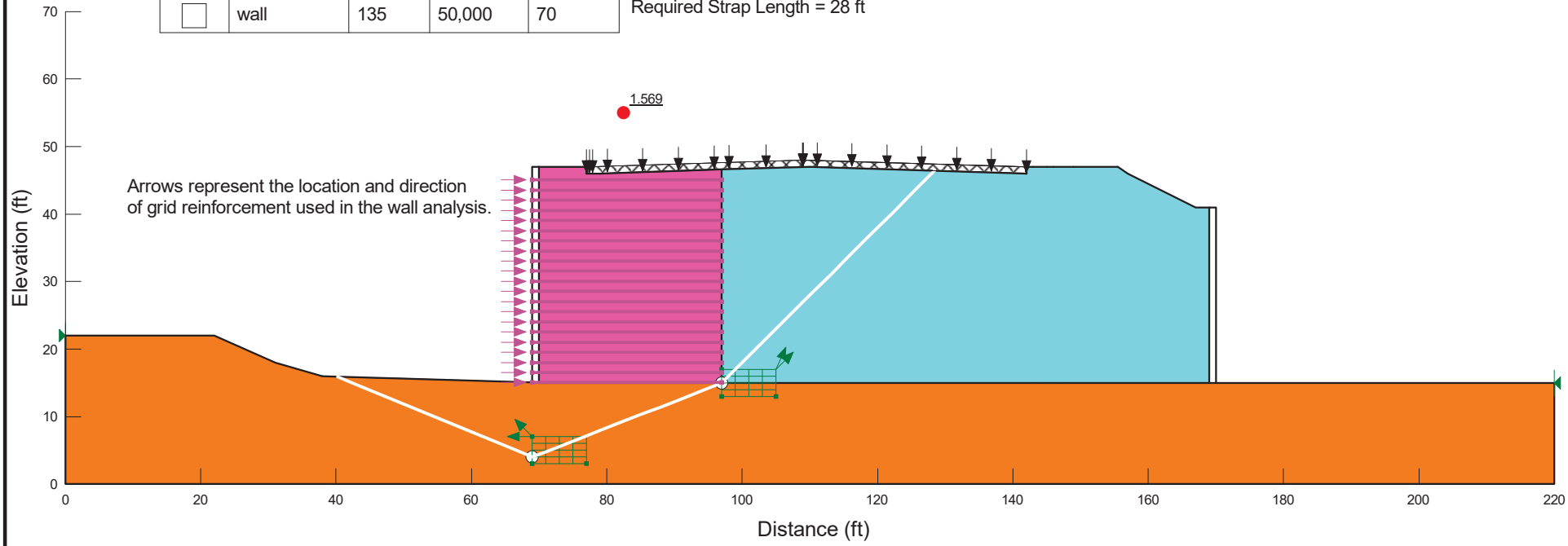


Bishop Non Rigorous Analysis - Circular	
Courtesy Parkway - ROCK1701 - STA 141+50 Lt.gsz	
12/06/2021	1:278

Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	foundation soils left	115	0	31
	reinforced fill	120	0	34
	retained soils	120	0	32
	wall	135	50,000	70

Atlas Technical Consultants, LLC
ROCK1701
Courtesy Parkway
STA 141+50 Lt
Bishop Analysis

Surcharge Load = 250 psf
Required Strap Length = 28 ft



Bishop Non Rigorous Analysis - Non Circular

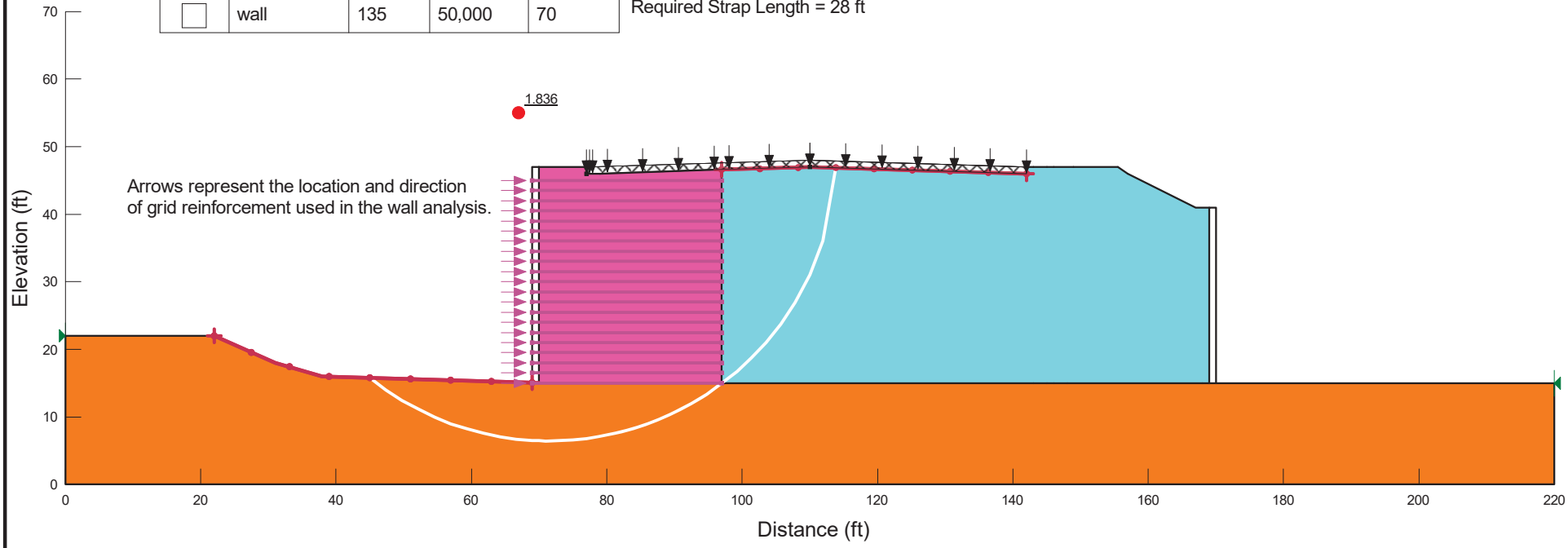
Courtesy Parkway - ROCK1701 - STA 141+50 Lt.gsz

12/06/2021 1:278

Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	foundation soils left	115	0	31
	reinforced fill	120	0	34
	retained soils	120	0	32
	wall	135	50,000	70

Atlas Technical Consultants, LLC
ROCK1701
Courtesy Parkway
STA 141+50 Lt
Morgenstern Price Analysis

Surcharge Load = 250 psf
Required Strap Length = 28 ft

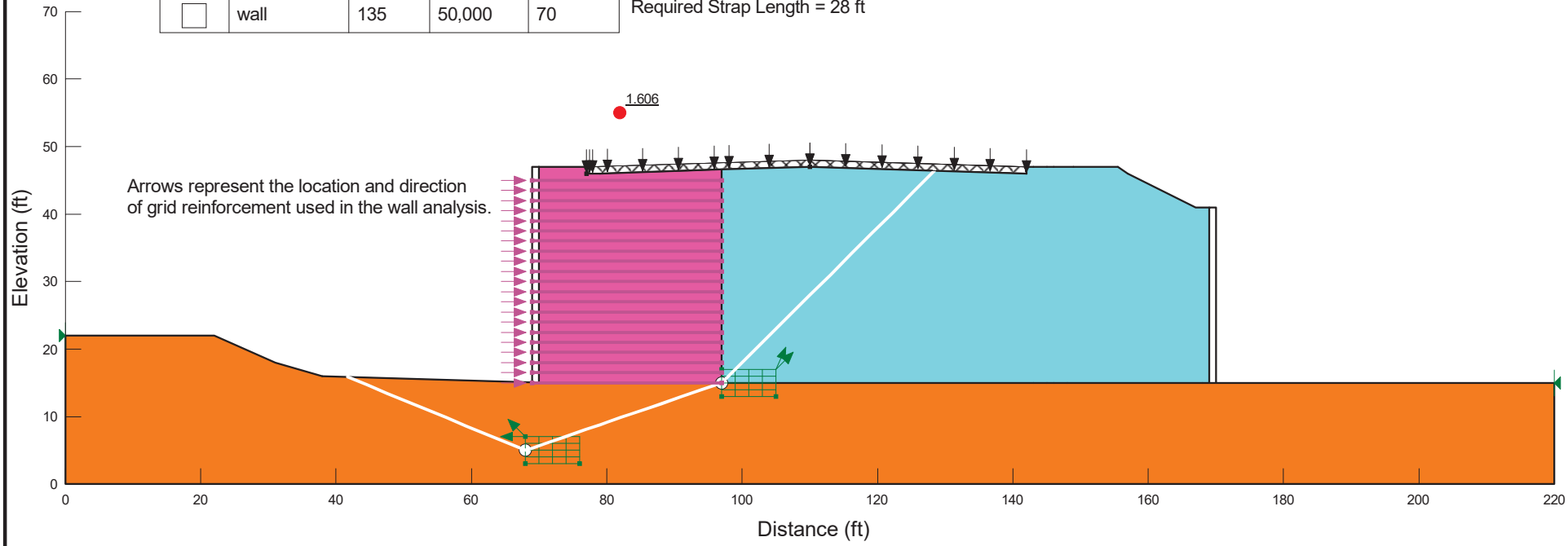


Morgenstern Price Rigorous Analysis - Circular
Courtesy Parkway - ROCK1701 - STA 141+50 Lt.gsz
12/06/2021 1:278

Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	foundation soils left	115	0	31
	reinforced fill	120	0	34
	retained soils	120	0	32
	wall	135	50,000	70

Atlas Technical Consultants, LLC
ROCK1701
Courtesy Parkway
STA 141+50 Lt
Morgenstern Price Analysis

Surcharge Load = 250 psf
Required Strap Length = 28 ft



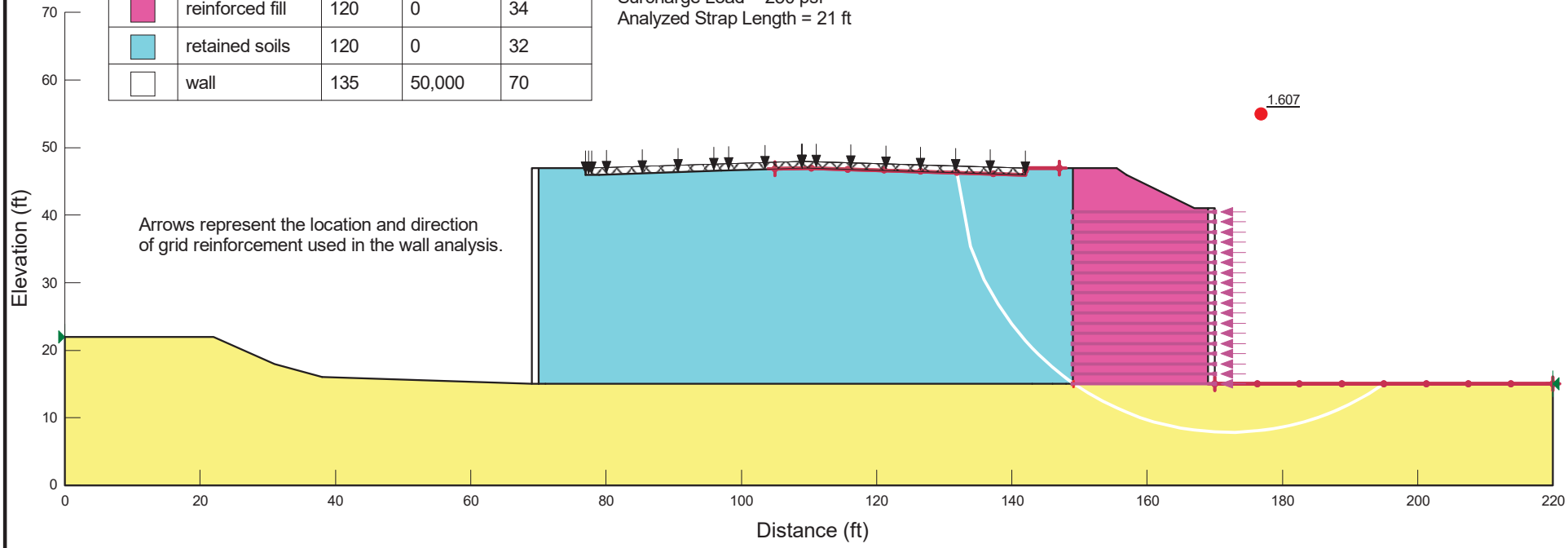
Morgenstern Price Rigorous Analysis - Non Circular	
Courtesy Parkway - ROCK1701 - STA 141+50 Lt.gsz	
12/06/2021	1:278

Global Stability Analysis for Station 141+50, Right (Wall 2)

Atlas Technical Consultants, LLC
ROCK1701
Courtesy Parkway
STA 141+50 Rt
Bishop Analysis

Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	foundation soils	120	0	32
	reinforced fill	120	0	34
	retained soils	120	0	32
	wall	135	50,000	70

Surcharge Load = 250 psf
Analyzed Strap Length = 21 ft



Bishop Non Rigorous Analysis - Circular

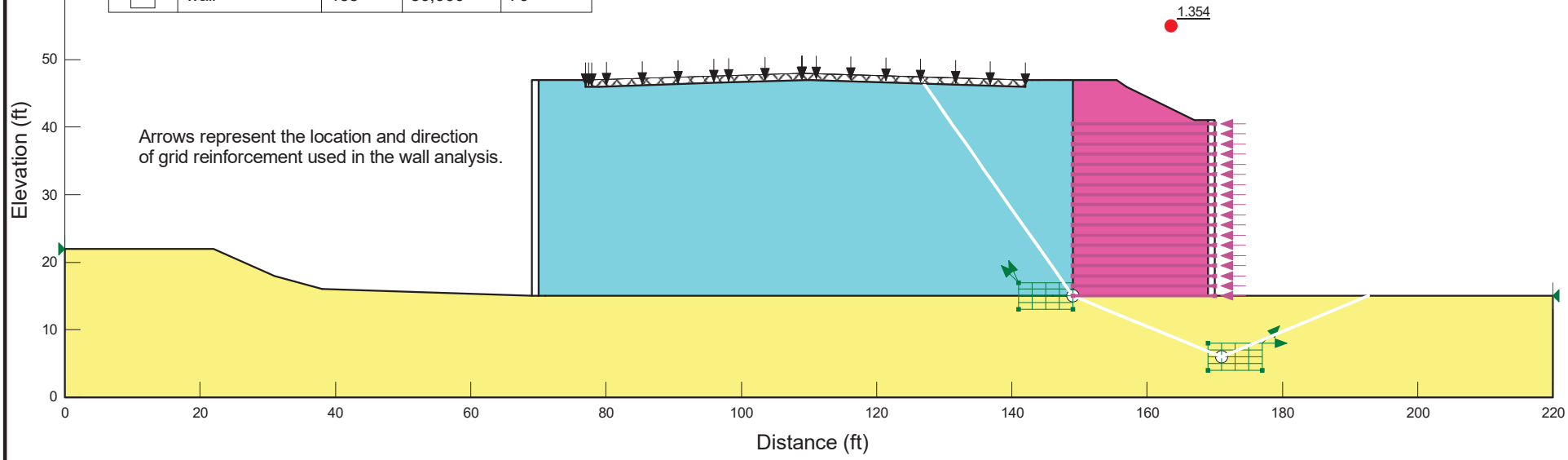
Courtesy Parkway - ROCK 1701 - STA 141+50 Rt.gsz

12/06/2021 1:278

Atlas Technical Consultants, LLC
ROCK1701
Courtesy Parkway
STA 141+50 Rt
Bishop Analysis

Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	foundation soils	120	0	32
	reinforced fill	120	0	34
	retained soils	120	0	32
	wall	135	50,000	70

Surcharge Load = 250 psf
Analyzed Strap Length = 21 ft



Bishop Non Rigorous Analysis - Non Circular

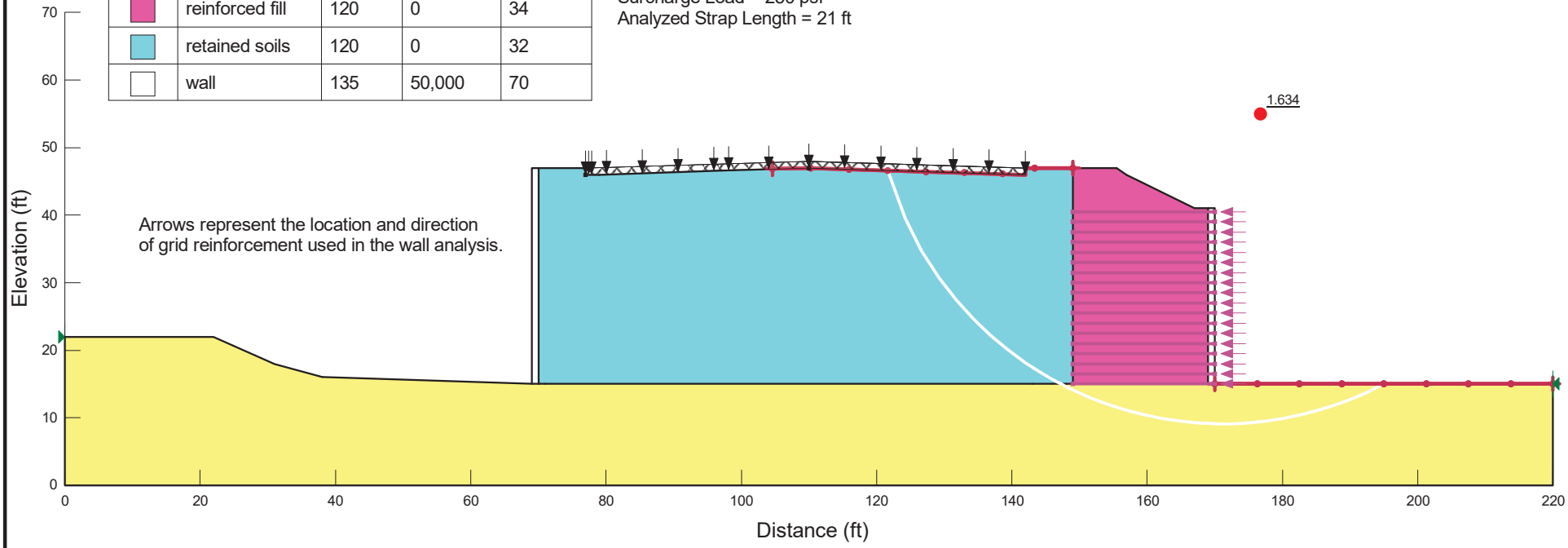
Courtesy Parkway - ROCK 1701 - STA 141+50 Rt.gsz

12/06/2021 1:278

Atlas Technical Consultants, LLC
ROCK1701
Courtesy Parkway
STA 141+50 Rt
Morgenstern Price Analysis

Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	foundation soils	120	0	32
	reinforced fill	120	0	34
	retained soils	120	0	32
	wall	135	50,000	70

Surcharge Load = 250 psf
Analyzed Strap Length = 21 ft



Morgenstern Price Rigorous Analysis - Circular

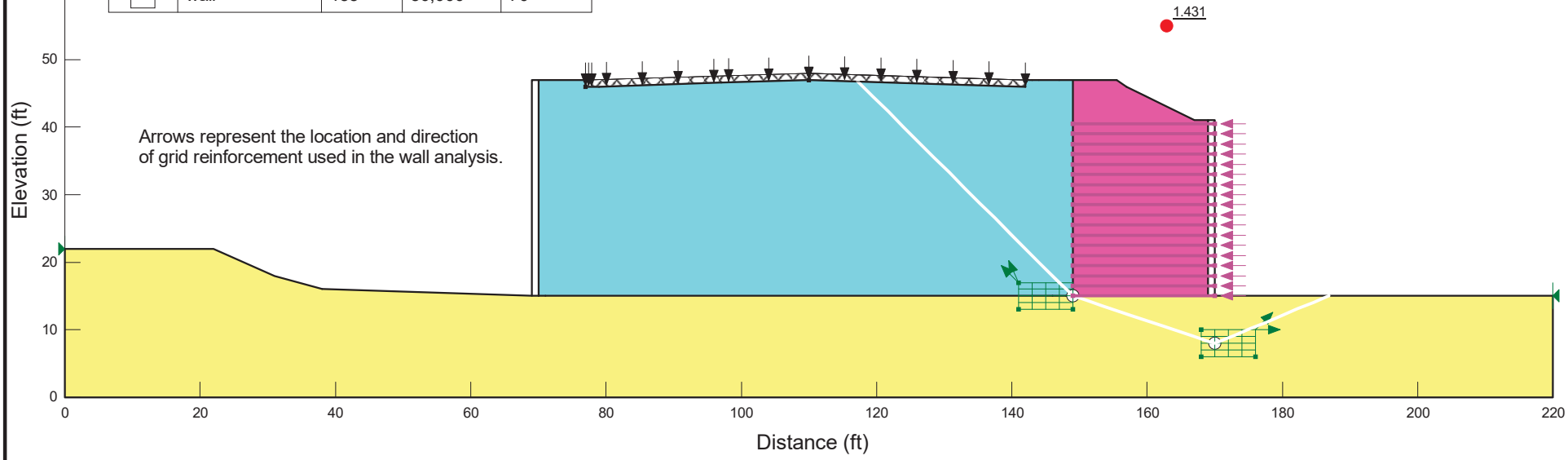
Courtesy Parkway - ROCK 1701 - STA 141+50 Rt.gsz

12/06/2021 1:278

Atlas Technical Consultants, LLC
ROCK1701
Courtesy Parkway
STA 141+50 Rt
Morgenstern Price Analysis

Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	foundation soils	120	0	32
	reinforced fill	120	0	34
	retained soils	120	0	32
	wall	135	50,000	70

Surcharge Load = 250 psf
Analyzed Strap Length = 21 ft



Morgenstern Price Rigorous Analysis - Non Circular

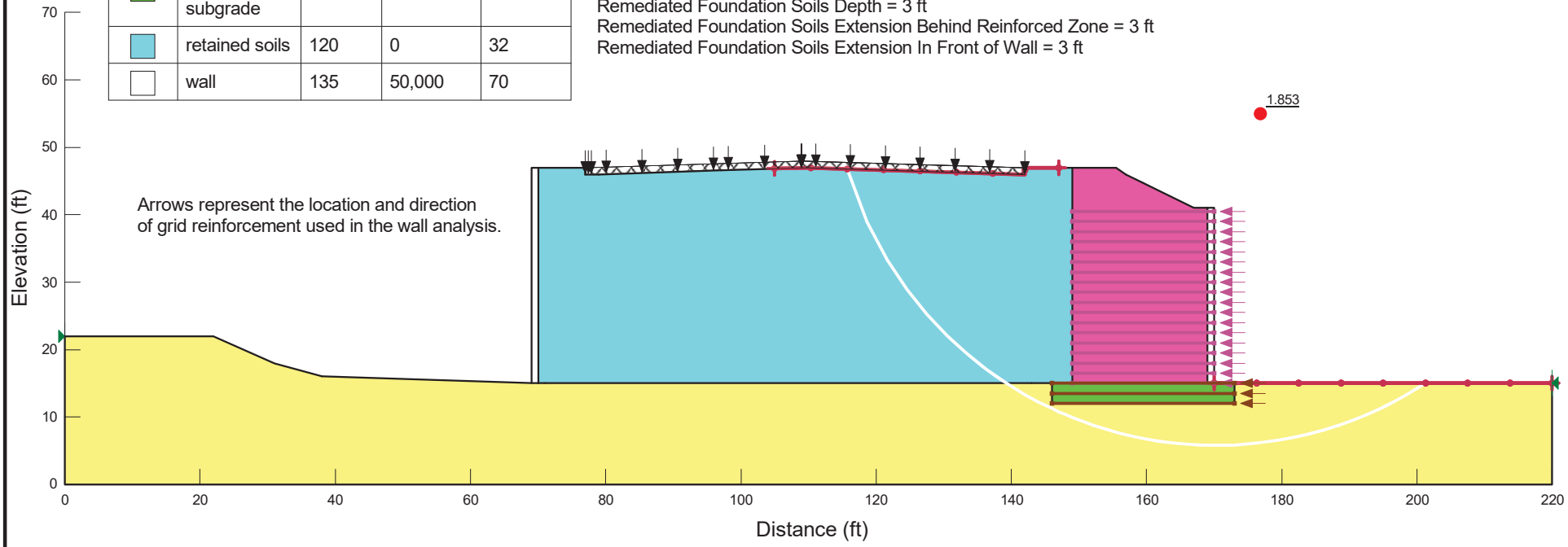
Courtesy Parkway - ROCK 1701 - STA 141+50 Rt.gsz

12/06/2021 1:278

Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	foundation soils	120	0	32
	reinforced fill	120	0	34
	remediated subgrade	130	0	38
	retained soils	120	0	32
	wall	135	50,000	70

Atlas Technical Consultants, LLC
ROCK1701
Courtesy Parkway
STA 141+50 Rt
Bishop Analysis

Surcharge Load = 250 psf
Analyzed Strap Length = 21 ft
Remediated Foundation Soils Depth = 3 ft
Remediated Foundation Soils Extension Behind Reinforced Zone = 3 ft
Remediated Foundation Soils Extension In Front of Wall = 3 ft

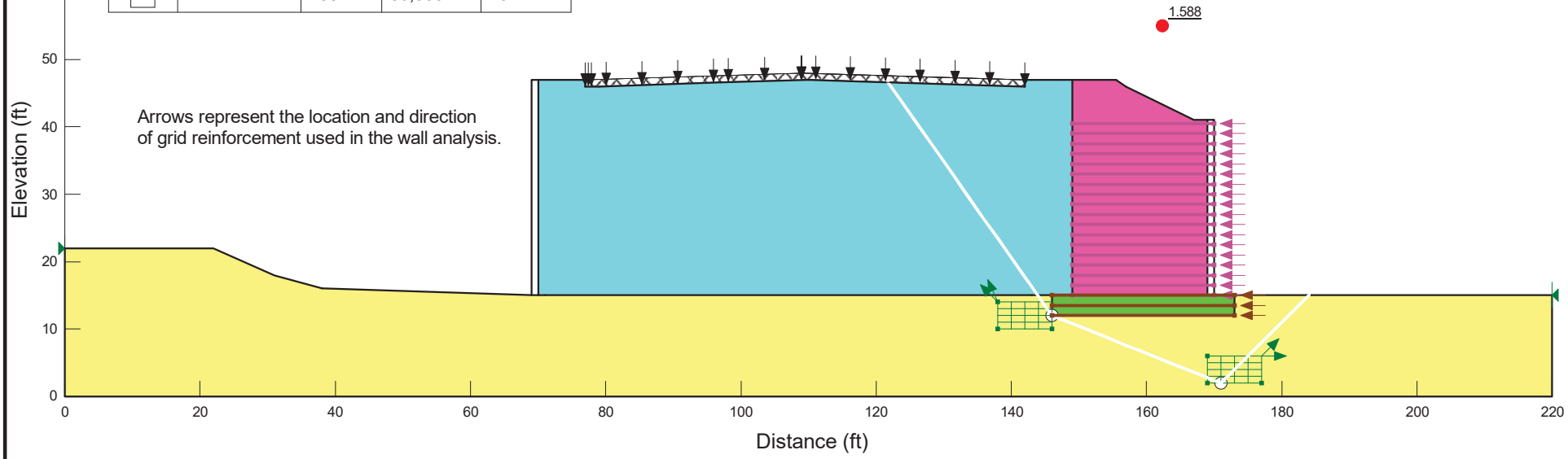


Bishop Non Rigorous Analysis - Circular	
Courtesy Parkway - ROCK1701 - STA 141+50 Rt.gsz	
12/06/2021	1:278

Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	foundation soils	120	0	32
	reinforced fill	120	0	34
	remediated subgrade	130	0	38
	retained soils	120	0	32
	wall	135	50,000	70

Atlas Technical Consultants, LLC
ROCK1701
Courtesy Parkway
STA 141+50 Rt
Bishop Analysis

Surcharge Load = 250 psf
Analyzed Strap Length = 21 ft
Remediated Foundation Soils Depth = 3 ft
Remediated Foundation Soils Extension Behind Reinforced Zone = 3 ft
Remediated Foundation Soils Extension In Front of Wall = 3 ft

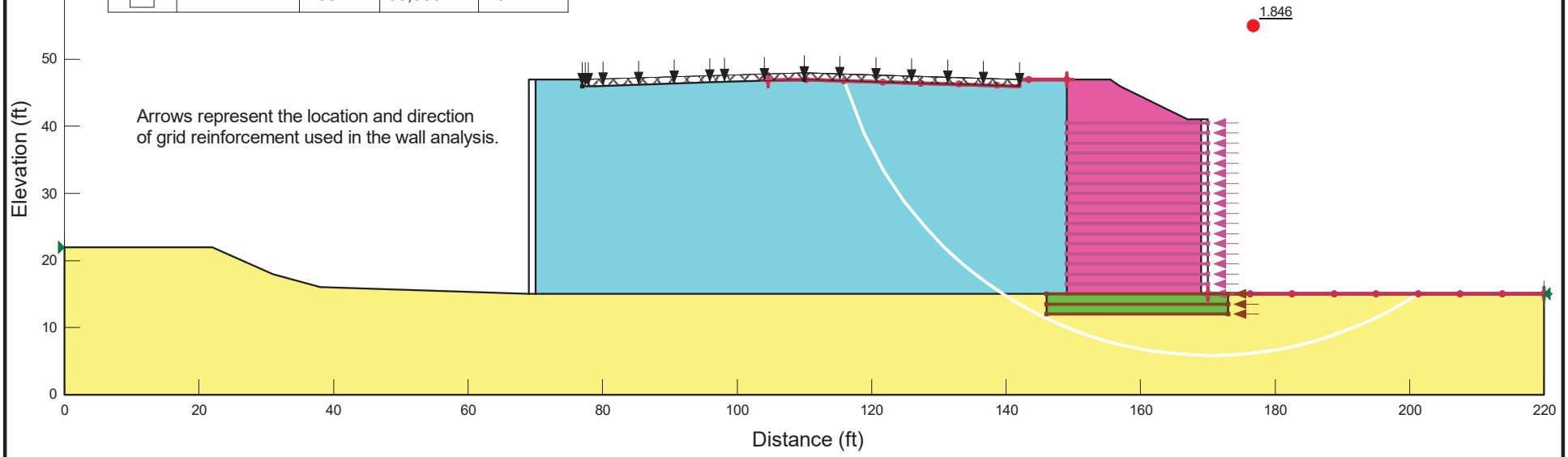


Bishop Non Rigorous Analysis - Non Circular	
Courtesy Parkway - ROCK1701 - STA 141+50 Rt.gsz	
12/06/2021	1:278

Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	foundation soils	120	0	32
	reinforced fill	120	0	34
	remediated subgrade	130	0	38
	retained soils	120	0	32
	wall	135	50,000	70

Atlas Technical Consultants, LLC
ROCK1701
Courtesy Parkway
STA 141+50 Rt
Morgenstern Price Analysis

Surcharge Load = 250 psf
Analyzed Strap Length = 21 ft
Remediated Foundation Soils Depth = 3 ft
Remediated Foundation Soils Extension Behind Reinforced Zone = 3 ft
Remediated Foundation Soils Extension In Front of Wall = 3 ft

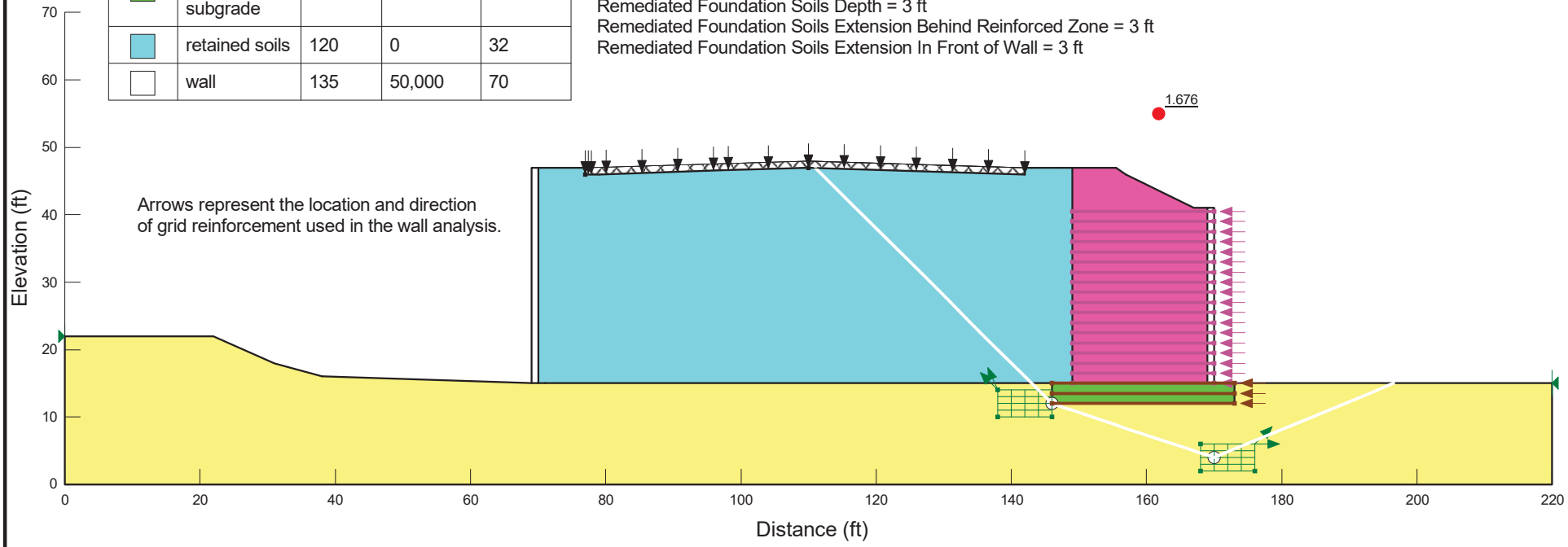


Morgenstern Price Rigorous Analysis - Circular	
Courtesy Parkway - ROCK1701 - STA 141+50 Rt.gsz	
12/06/2021	1:278

Atlas Technical Consultants, LLC
ROCK1701
Courtesy Parkway
STA 141+50 Rt
Morgenstern Price Analysis

Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	foundation soils	120	0	32
	reinforced fill	120	0	34
	remediated subgrade	130	0	38
	retained soils	120	0	32
	wall	135	50,000	70

Surcharge Load = 250 psf
Analyzed Strap Length = 21 ft
Remediated Foundation Soils Depth = 3 ft
Remediated Foundation Soils Extension Behind Reinforced Zone = 3 ft
Remediated Foundation Soils Extension In Front of Wall = 3 ft



Morgenstern Price Rigorous Analysis - Non Circular
Courtesy Parkway - ROCK1701 - STA 141+50 Rt.gsz
12/06/2021 1:278

Global Stability Analysis for Station 146+00, Right (Wall 2)

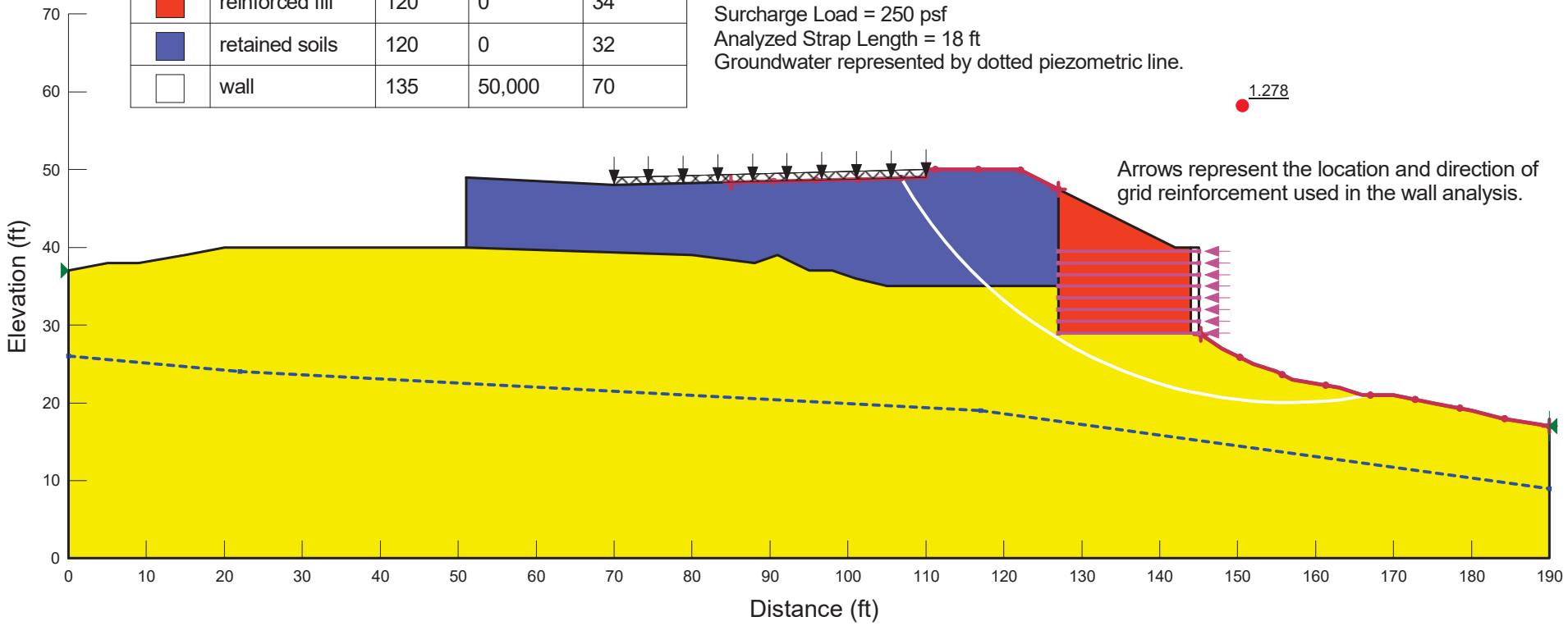
Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	foundation soils	115	0	31
	reinforced fill	120	0	34
	retained soils	120	0	32
	wall	135	50,000	70

Atlas Technical Consultants, LLC
ROCK 1701
Courtesy Parkway
STA 146+00 Rt
Bishop Analysis

Surcharge Load = 250 psf
Analyzed Strap Length = 18 ft
Groundwater represented by dotted piezometric line.

1.278

Arrows represent the location and direction of grid reinforcement used in the wall analysis.

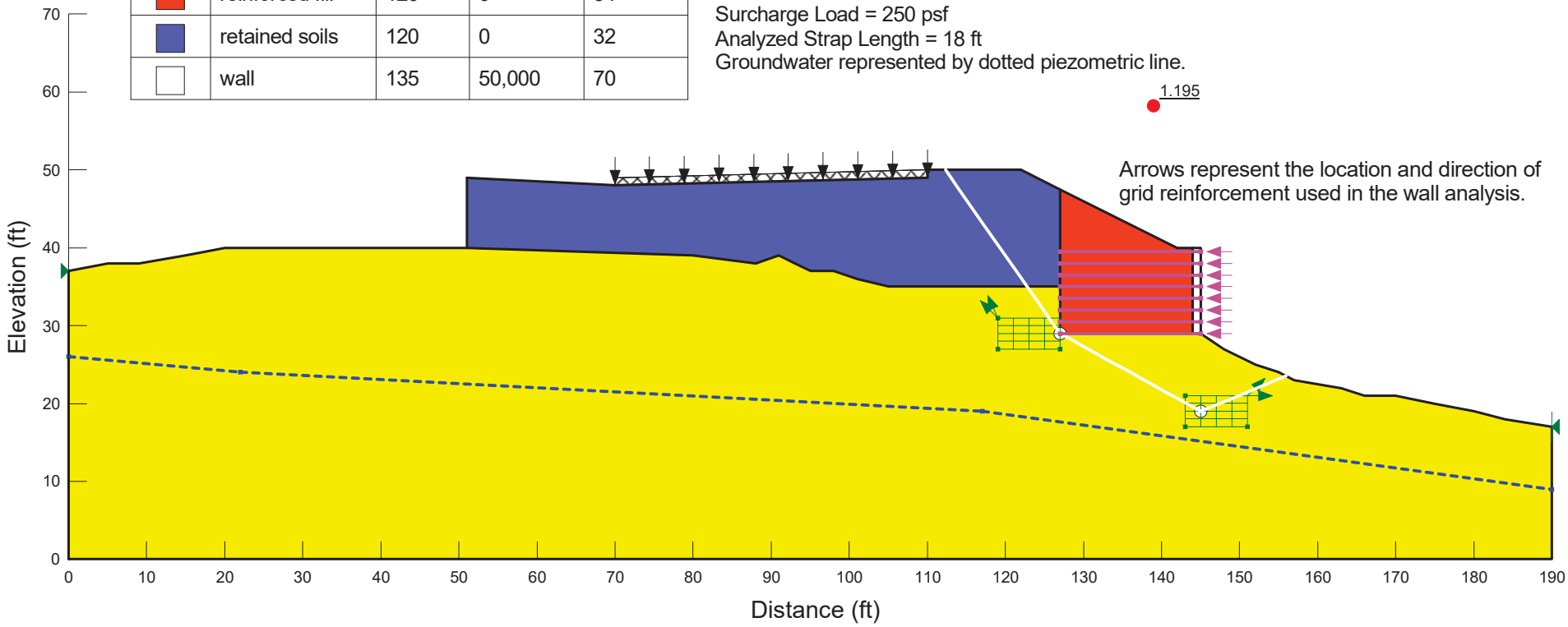


Bishop Non Rigorous Analysis - Circular	
Courtesy Parkway - ROCK 1701 - STA 146+00 Rt.gsz	
12/07/2021	1:243

Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	foundation soils	115	0	31
	reinforced fill	120	0	34
	retained soils	120	0	32
	wall	135	50,000	70

Atlas Technical Consultants, LLC
ROCK 1701
Courtesy Parkway
STA 146+00 Rt
Bishop Analysis

Surcharge Load = 250 psf
Analyzed Strap Length = 18 ft
Groundwater represented by dotted piezometric line.



Bishop Non Rigorous Analysis - Non Circular	
Courtesy Parkway - ROCK 1701 - STA 146+00 Rt.gsz	
12/07/2021	1:243

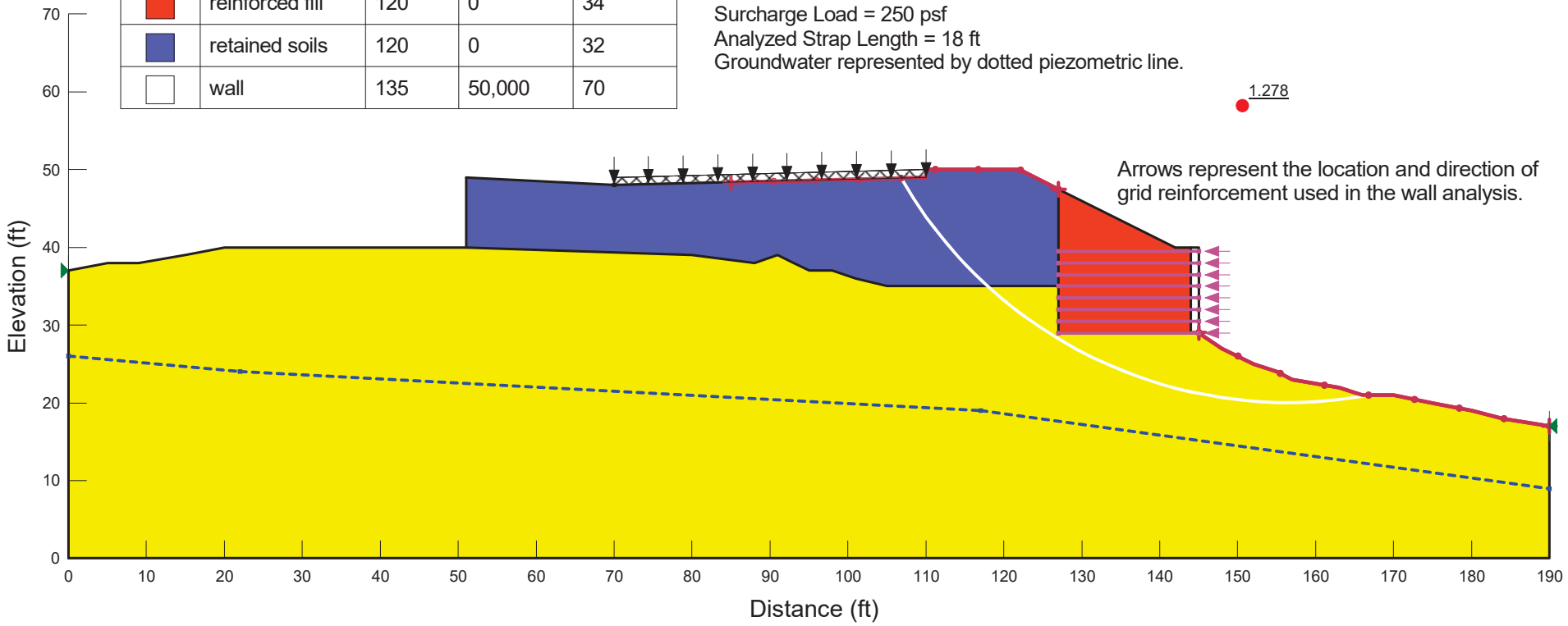
Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	foundation soils	115	0	31
	reinforced fill	120	0	34
	retained soils	120	0	32
	wall	135	50,000	70

Atlas Technical Consultants, LLC
ROCK 1701
Courtesy Parkway
STA 146+00 Rt
Morgenstern Price Analysis

Surcharge Load = 250 psf
Analyzed Strap Length = 18 ft
Groundwater represented by dotted piezometric line.

1.278

Arrows represent the location and direction of grid reinforcement used in the wall analysis.



Morgenstern Price Rigorous Analysis - Circular
Courtesy Parkway - ROCK 1701 - STA 146+00 Rt.gsz
12/07/2021 1:243

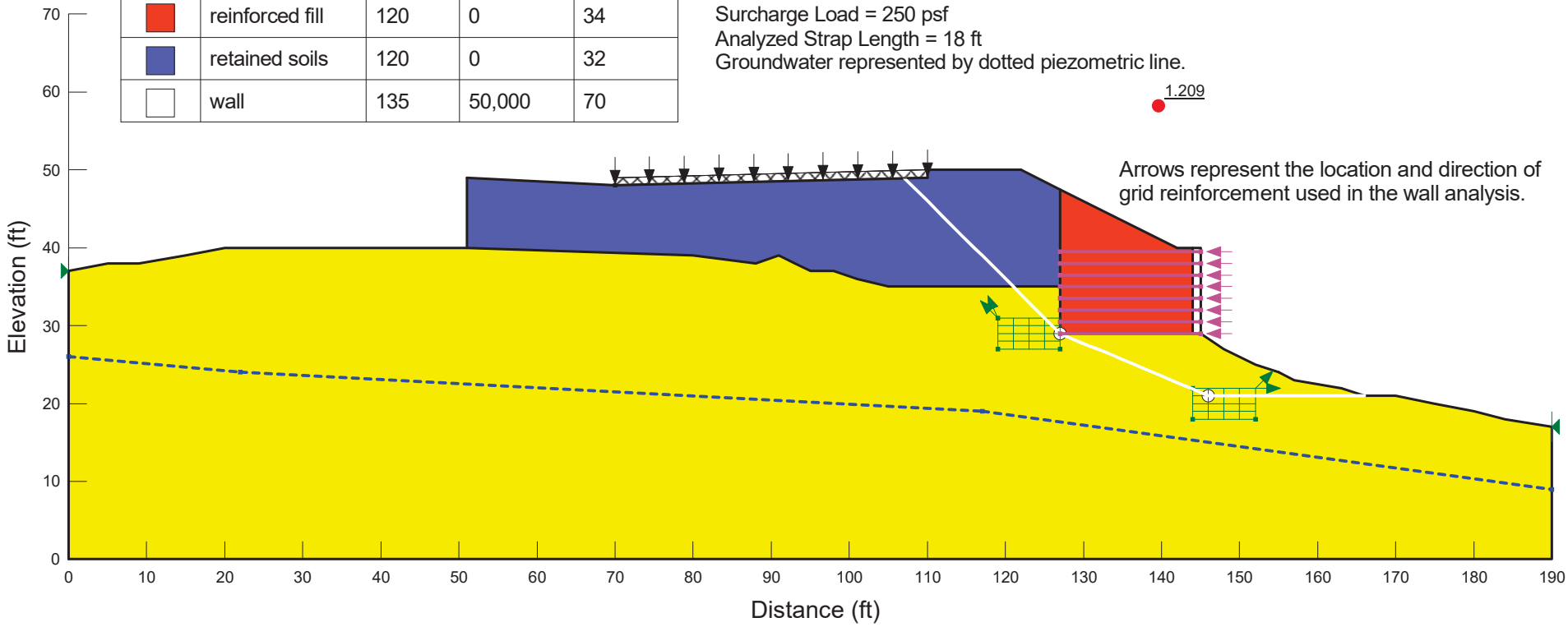
Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	foundation soils	115	0	31
	reinforced fill	120	0	34
	retained soils	120	0	32
	wall	135	50,000	70

Atlas Technical Consultants, LLC
ROCK 1701
Courtesy Parkway
STA 146+00 Rt
Morgenstern Price Analysis

Surcharge Load = 250 psf
Analyzed Strap Length = 18 ft
Groundwater represented by dotted piezometric line.

1.209

Arrows represent the location and direction of grid reinforcement used in the wall analysis.

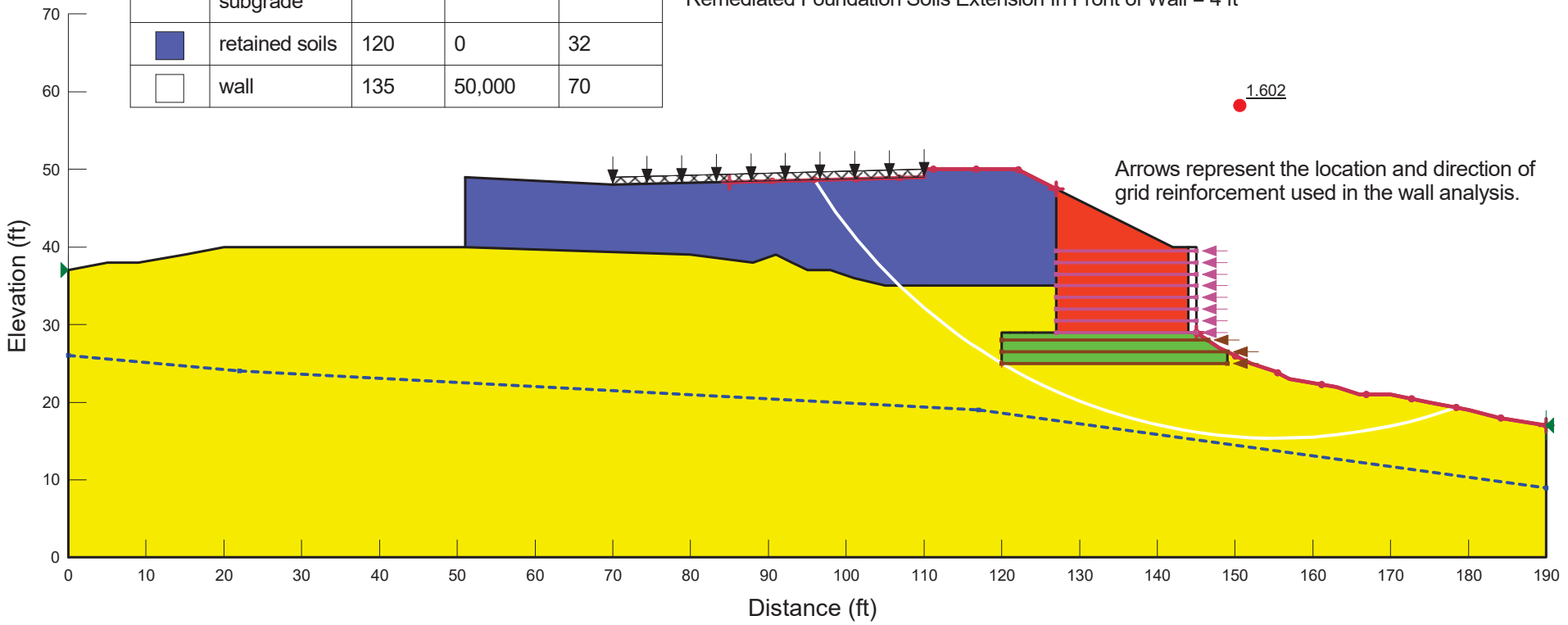


Morgenstern Price Rigorous Analysis - Non Circular	
Courtesy Parkway - ROCK 1701 - STA 146+00 Rt.gsz	
12/07/2021	1:243

Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	foundation soils	115	0	31
	reinforced fill	120	0	34
	remediated subgrade	130	0	38
	retained soils	120	0	32
	wall	135	50,000	70

Atlas Technical Consultants, LLC
ROCK 1701
Courtesy Parkway
STA 146+00 Rt
Bishop Analysis

Surcharge Load = 250 psf
Analyzed Strap Length = 18 ft
Groundwater represented by dotted piezometric line.
Remediated Foundation Soils Depth = 4 ft
Remediated Foundation Soils Extension Behind Renforced Zone = 7 ft
Remediated Foundation Soils Extension In Front of Wall = 4 ft

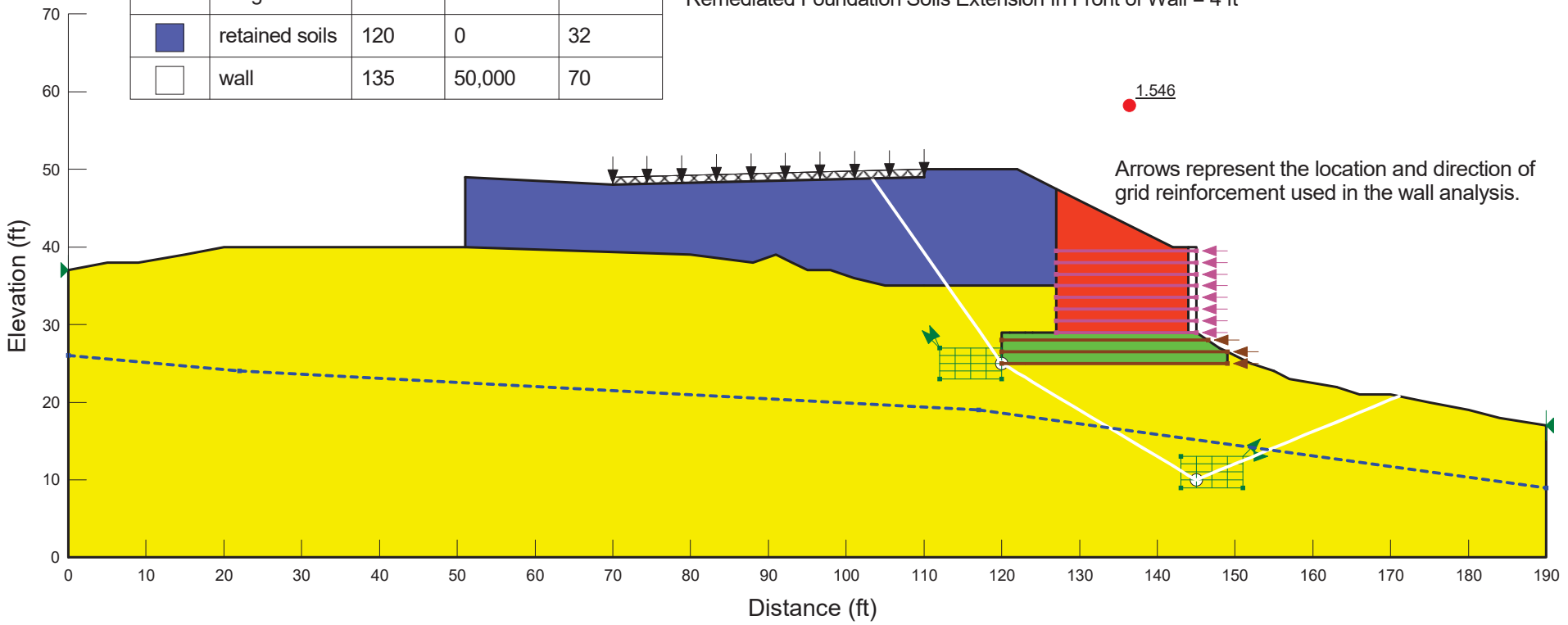


Bishop Non Rigorous Analysis - Circular
Courtesy Parkway - ROCK1701 - STA 146+00 Rt.gsz
12/07/2021 1:243

Atlas Technical Consultants, LLC
ROCK 1701
Courtesy Parkway
STA 146+00 Rt
Bishop Analysis

Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	foundation soils	115	0	31
	reinforced fill	120	0	34
	remediated subgrade	130	0	38
	retained soils	120	0	32
	wall	135	50,000	70

Surcharge Load = 250 psf
Analyzed Strap Length = 18 ft
Groundwater represented by dotted piezometric line.
Remediated Foundation Soils Depth = 4 ft
Remediated Foundation Soils Extension Behind Renforced Zone = 7 ft
Remediated Foundation Soils Extension In Front of Wall = 4 ft

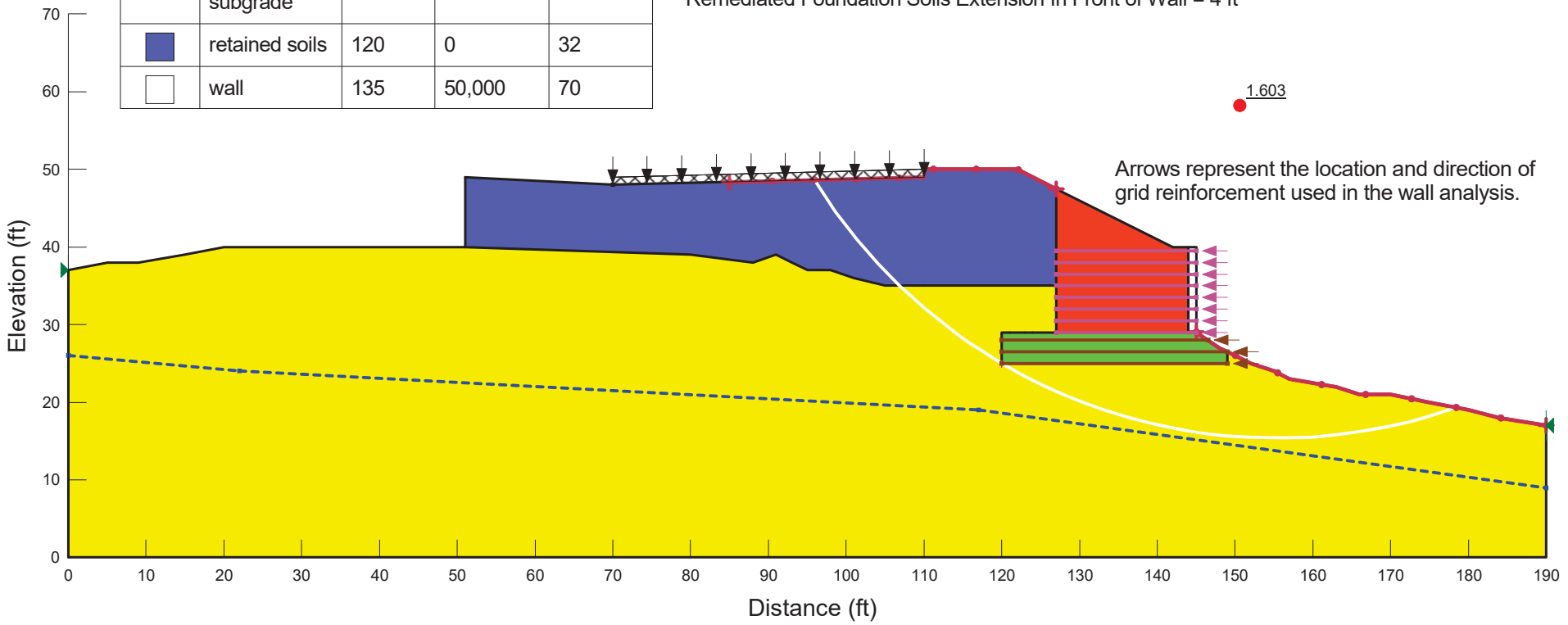


Bishop Non Rigorous Analysis - Non Circular
Courtesy Parkway - ROCK1701 - STA 146+00 Rt.gsz
12/07/2021 1:243

Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	foundation soils	115	0	31
	reinforced fill	120	0	34
	remediated subgrade	130	0	38
	retained soils	120	0	32
	wall	135	50,000	70

Atlas Technical Consultants, LLC
ROCK 1701
Courtesy Parkway
STA 146+00 Rt
Morgenstern Price Analysis

Surcharge Load = 250 psf
Analyzed Strap Length = 18 ft
Groundwater represented by dotted piezometric line.
Remediated Foundation Soils Depth = 4 ft
Remediated Foundation Soils Extension Behind Renforced Zone = 7 ft
Remediated Foundation Soils Extension In Front of Wall = 4 ft

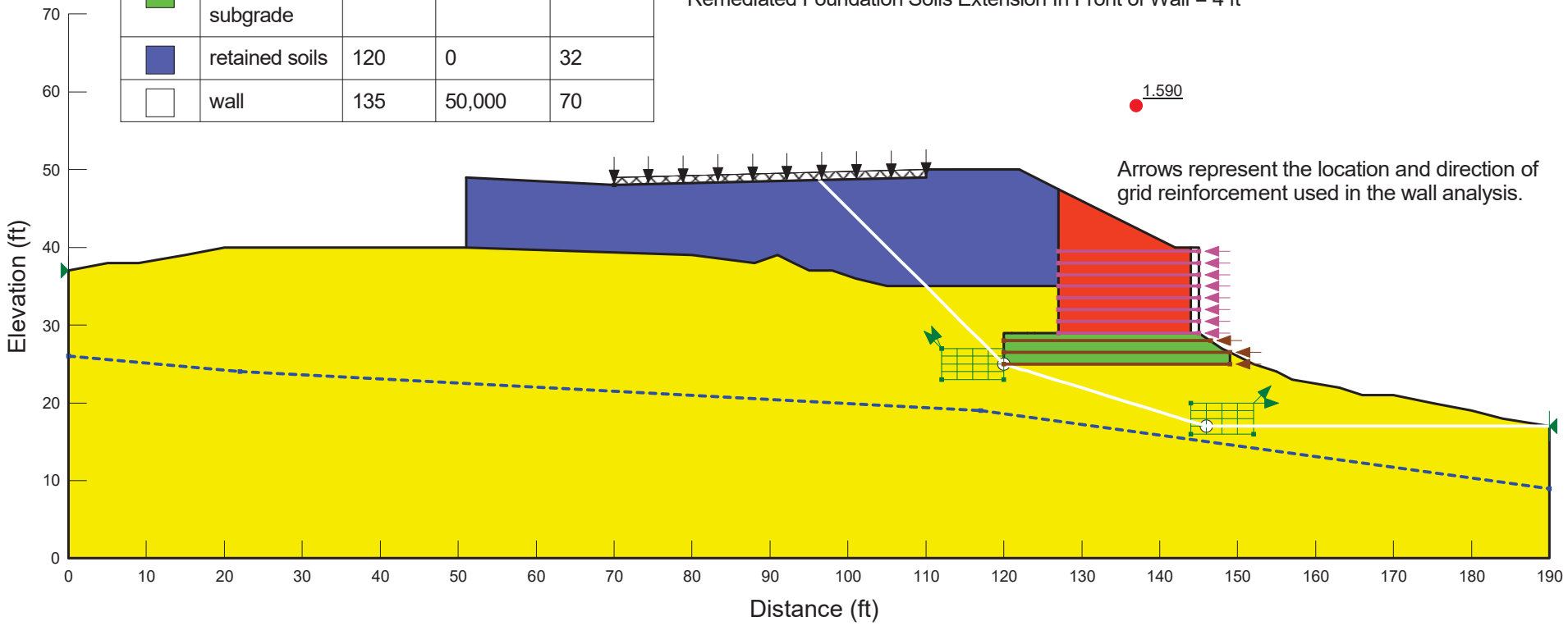


Morgenstern Price Rigorous Analysis - Circular
Courtesy Parkway - ROCK1701 - STA 146+00 Rt.gsz
12/07/2021 1:243

Color	Name	Unit Weight (pcf)	Effective Cohesion (psf)	Effective Friction Angle (°)
	foundation soils	115	0	31
	reinforced fill	120	0	34
	remediated subgrade	130	0	38
	retained soils	120	0	32
	wall	135	50,000	70

Atlas Technical Consultants, LLC
ROCK 1701
Courtesy Parkway
STA 146+00 Rt
Morgenstern Price Analysis

Surcharge Load = 250 psf
Analyzed Strap Length = 18 ft
Groundwater represented by dotted piezometric line.
Remediated Foundation Soils Depth = 4 ft
Remediated Foundation Soils Extension Behind Renforced Zone = 7 ft
Remediated Foundation Soils Extension In Front of Wall = 4 ft



Morgenstern Price Rigorous Analysis - Non Circular	
Courtesy Parkway - ROCK1701 - STA 146+00 Rt.gsz	
12/07/2021	1:243

GDOT Earthwork Volumes Report

Report Created: 7/27/2022
Time: 9:01am

Cross Section Set Name: Flat Shoals Road_Earthwork

Alignment Name: DE2

Input Grid Factor: 1.000000 **Note:** All units in this report are in feet, square feet and cubic yards unless specified otherwise.

- - - - - - - - - - - - - - - - Station Quantities - - - - - - - - - - - - - - - -

Baseline Station	Cut				Fill				Mass Ordinate
	Factor	Area	Volume	Adjusted	Factor	Area	Volume	Adjusted	
200+00.00	1.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000
200+50.00	1.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000
201+00.00	1.000	1.084	1.004	1.004	1.000	2.059	1.907	1.907	-0.903
201+50.00	1.000	1.929	2.790	2.790	1.000	7.402	8.760	8.760	-6.873
202+00.00	1.000	4.920	6.341	6.341	1.000	51.408	54.454	54.454	-54.985
202+50.00	1.000	5.372	9.530	9.530	1.000	33.988	79.071	79.071	-124.527
203+00.00	1.000	8.083	12.458	12.458	1.000	34.315	63.244	63.244	-175.312
203+50.00	1.000	10.124	16.858	16.858	1.000	31.970	61.375	61.375	-219.829
204+00.00	1.000	13.148	21.549	21.549	1.000	34.886	61.904	61.904	-260.184
204+50.00	1.000	16.264	27.234	27.234	1.000	34.246	64.011	64.011	-296.962
205+00.00	1.000	29.122	42.025	42.025	1.000	29.111	58.664	58.664	-313.601
205+50.00	1.000	24.809	49.936	49.936	1.000	29.962	54.697	54.697	-318.362
206+00.00	1.000	27.924	48.827	48.827	1.000	27.420	53.131	53.131	-322.667
206+50.00	1.000	44.419	66.984	66.984	1.000	27.200	50.574	50.574	-306.256
207+00.00	1.000	29.277	68.237	68.237	1.000	28.720	51.778	51.778	-289.797
207+50.00	1.000	32.263	56.981	56.981	1.000	35.989	59.916	59.916	-292.732
208+00.00	1.000	25.645	53.618	53.618	1.000	52.491	81.926	81.926	-321.040
208+50.00	1.000	13.424	36.174	36.174	1.000	38.135	83.913	83.913	-368.778
209+00.00	1.000	13.631	25.051	25.051	1.000	6.831	41.635	41.635	-385.362
209+50.00	1.000	30.151	40.539	40.539	1.000	10.097	15.674	15.674	-360.497
210+00.00	1.000	25.890	51.890	51.890	1.000	38.663	45.147	45.147	-353.755
210+50.00	1.000	28.498	50.359	50.359	1.000	69.528	100.177	100.177	-403.573
211+00.00	1.000	27.234	51.604	51.604	1.000	86.029	144.034	144.034	-496.003
211+50.00	1.000	32.808	55.595	55.595	1.000	86.040	159.323	159.323	-599.731
212+00.00	1.000	26.696	55.097	55.097	1.000	90.445	163.412	163.412	-708.047
212+50.00	1.000	49.185	70.260	70.260	1.000	126.260	200.653	200.653	-838.440
213+00.00	1.000	31.131	74.367	74.367	1.000	71.461	183.074	183.074	-947.147
213+50.00	1.000	29.564	56.199	56.199	1.000	75.924	136.467	136.467	-1027.415
214+00.00	1.000	32.139	57.132	57.132	1.000	129.894	190.572	190.572	-1160.854
214+50.00	1.000	38.003	64.947	64.947	1.000	134.463	244.775	244.775	-1340.682
215+00.00	1.000	34.059	66.724	66.724	1.000	123.171	238.550	238.550	-1512.509
215+50.00	1.000	28.109	57.563	57.563	1.000	108.097	214.137	214.137	-1669.083
216+00.00	1.000	24.115	48.356	48.356	1.000	113.956	205.605	205.605	-1826.331
216+50.00	1.000	25.769	46.190	46.190	1.000	119.782	216.424	216.424	-1996.565
217+00.00	1.000	21.726	43.978	43.978	1.000	59.023	165.560	165.560	-2118.147
217+50.00	1.000	19.572	38.239	38.239	1.000	67.571	117.217	117.217	-2197.126
218+00.00	1.000	16.701	33.586	33.586	1.000	81.874	138.376	138.376	-2301.916
218+50.00	1.000	14.667	29.045	29.045	1.000	9.407	84.520	84.520	-2357.391

- - - - - - - - - - - - - - - - - Station Quantities - - - - - - - - - - - - - - - - -

Baseline Station	Cut				Fill				Mass Ordinate
	Factor	Area	Volume	Adjusted	Factor	Area	Volume	Adjusted	
219+00.00	1.000	7.374	20.409	20.409	1.000	1.463	10.065	10.065	-2347.047
219+50.00	1.000	0.000	6.828	6.828	1.000	0.000	1.355	1.355	-2341.574
219+95.97	1.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	-2341.574
Grand Total:			1564.502	1564.502			3906.076	3906.076	

GDOT Earthwork Volumes Report

Report Created: 7/27/2022
Time: 3:34pm

Cross Section Set Name: Flat Shoals_Earthwork_STG 1

Alignment Name: DE2

Input Grid Factor: 1.000000 **Note:** All units in this report are in feet, square feet and cubic yards unless specified otherwise.

- - - - - - - - - - - - - - - - Station Quantities - - - - - - - - - - - - - - - -

Baseline Station	Cut				Fill				Mass Ordinate
	Factor	Area	Volume	Adjusted	Factor	Area	Volume	Adjusted	
200+00.00	1.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000
200+50.00	1.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000
201+00.00	1.000	0.752	0.696	0.696	1.000	0.337	0.312	0.312	0.384
201+07.86									0.000
201+50.00	1.000	1.248	1.852	1.852	1.000	4.300	4.293	4.293	-2.058
202+00.00	1.000	2.865	3.809	3.809	1.000	23.164	25.430	25.430	-23.679
202+50.00	1.000	2.172	4.664	4.664	1.000	27.509	46.919	46.919	-65.934
203+00.00	1.000	3.175	4.951	4.951	1.000	26.874	50.354	50.354	-111.338
203+50.00	1.000	4.364	6.981	6.981	1.000	18.776	42.269	42.269	-146.626
204+00.00	1.000	5.903	9.507	9.507	1.000	20.788	36.633	36.633	-173.752
204+50.00	1.000	5.737	10.778	10.778	1.000	21.689	39.331	39.331	-202.304
205+00.00	1.000	6.768	11.578	11.578	1.000	20.746	39.292	39.292	-230.018
205+50.00	1.000	7.804	13.492	13.492	1.000	16.894	34.852	34.852	-251.377
206+00.00	1.000	19.176	24.981	24.981	1.000	6.063	21.257	21.257	-247.653
206+50.00	1.000	30.817	46.290	46.290	1.000	6.225	11.379	11.379	-212.742
207+00.00	1.000	8.744	36.630	36.630	1.000	13.003	17.804	17.804	-193.915
207+50.00	1.000	4.357	12.130	12.130	1.000	20.817	31.315	31.315	-213.100
208+00.00	1.000	6.598	10.143	10.143	1.000	30.730	47.729	47.729	-250.687
208+50.00	1.000	7.641	13.183	13.183	1.000	38.135	63.764	63.764	-301.267
209+00.00	1.000	8.327	14.785	14.785	1.000	4.294	39.286	39.286	-325.768
209+50.00	1.000	25.511	31.332	31.332	1.000	5.502	9.071	9.071	-303.508
210+00.00	1.000	31.952	53.206	53.206	1.000	28.957	31.907	31.907	-282.209
210+50.00	1.000	24.049	51.852	51.852	1.000	8.026	34.244	34.244	-264.600
211+00.00	1.000	21.639	42.304	42.304	1.000	5.881	12.877	12.877	-235.173
211+50.00	1.000	27.060	45.092	45.092	1.000	4.941	10.020	10.020	-200.102
212+00.00	1.000	20.819	44.332	44.332	1.000	8.245	12.209	12.209	-167.979
212+50.00	1.000	41.295	57.513	57.513	1.000	55.049	58.606	58.606	-169.071
213+00.00	1.000	23.904	60.369	60.369	1.000	8.433	58.780	58.780	-167.482
213+50.00	1.000	23.799	44.169	44.169	1.000	18.639	25.067	25.067	-148.380
214+00.00	1.000	26.598	46.664	46.664	1.000	66.847	79.154	79.154	-180.870
214+50.00	1.000	32.336	54.569	54.569	1.000	69.902	126.619	126.619	-252.920
215+00.00	1.000	28.809	56.617	56.617	1.000	59.785	120.081	120.081	-316.384
215+50.00	1.000	23.208	48.164	48.164	1.000	52.728	104.178	104.178	-372.398
216+00.00	1.000	19.600	39.637	39.637	1.000	62.777	106.949	106.949	-439.709
216+50.00	1.000	22.649	39.119	39.119	1.000	67.252	120.396	120.396	-520.987
217+00.00	1.000	19.473	39.001	39.001	1.000	8.432	70.077	70.077	-552.063

- - - - - - - - - - - - - - - - Station Quantities - - - - - - - - - - - - - - - -

Baseline Station	Cut				Fill				Mass Ordinate
	Factor	Area	Volume	Adjusted	Factor	Area	Volume	Adjusted	
217+50.00	1.000	17.886	34.592	34.592	1.000	5.893	13.263	13.263	-530.735
218+00.00	1.000	14.326	29.826	29.826	1.000	61.250	62.169	62.169	-563.077
218+50.00	1.000	13.382	25.655	25.655	1.000	6.705	62.921	62.921	-600.343
219+00.00	1.000	6.614	18.514	18.514	1.000	0.006	6.214	6.214	-588.043
219+50.00	1.000	0.000	6.124	6.124	1.000	0.000	0.006	0.006	-581.924
219+95.97	1.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	-581.924
Grand Total:			1095.102	1095.102			1677.026	1677.026	

GDOT Earthwork Volumes Report

Report Created: 7/27/2022
Time: 3:44pm

Cross Section Set Name: Flat Shoals_Earthwork_STG 2

Alignment Name: DE2

Input Grid Factor: 1.000000 **Note:** All units in this report are in feet, square feet and cubic yards unless specified otherwise.

- - - - - - - - - - - - - - - - Station Quantities - - - - - - - - - - - - - - - -

Baseline Station	Cut				Fill				Mass Ordinate
	Factor	Area	Volume	Adjusted	Factor	Area	Volume	Adjusted	
200+00.00	1.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000
200+50.00	1.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000
201+00.00	1.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000
201+50.00	1.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000
202+00.00	1.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000
202+50.00	1.000	1.349	1.249	1.249	1.000	4.565	4.226	4.226	-2.978
203+00.00	1.000	1.412	2.556	2.556	1.000	4.718	8.595	8.595	-9.016
203+50.00	1.000	5.766	6.646	6.646	1.000	13.194	16.585	16.585	-18.956
204+00.00	1.000	7.189	11.995	11.995	1.000	14.098	25.270	25.270	-32.231
204+50.00	1.000	10.525	16.402	16.402	1.000	12.557	24.680	24.680	-40.509
205+00.00	1.000	21.871	29.996	29.996	1.000	8.376	19.382	19.382	-29.896
205+50.00	1.000	16.982	35.974	35.974	1.000	13.060	19.848	19.848	-13.769
206+00.00	1.000	6.351	21.605	21.605	1.000	21.879	32.351	32.351	-24.516
206+50.00	1.000	13.047	17.962	17.962	1.000	20.974	39.679	39.679	-46.233
207+00.00	1.000	20.528	31.088	31.088	1.000	15.718	33.974	33.974	-49.119
207+50.00	1.000	27.928	44.867	44.867	1.000	15.172	28.601	28.601	-32.853
208+00.00	1.000	19.000	43.452	43.452	1.000	21.761	34.197	34.197	-23.598
208+50.00	1.000	4.496	21.756	21.756	1.000	23.179	41.611	41.611	-43.453
209+00.00	1.000	5.255	9.029	9.029	1.000	24.524	44.169	44.169	-78.593
209+50.00	1.000	4.648	9.170	9.170	1.000	26.234	46.998	46.998	-116.422
210+00.00	1.000	18.677	21.597	21.597	1.000	30.909	52.911	52.911	-147.736
210+50.00	1.000	4.364	21.334	21.334	1.000	61.502	85.566	85.566	-211.968
211+00.00	1.000	4.940	8.614	8.614	1.000	80.148	131.158	131.158	-334.511
211+50.00	1.000	5.754	9.902	9.902	1.000	81.099	149.303	149.303	-473.913
212+00.00	1.000	5.938	10.826	10.826	1.000	82.202	151.205	151.205	-614.291
212+50.00	1.000	6.862	11.852	11.852	1.000	71.211	142.048	142.048	-744.488
213+00.00	1.000	7.339	13.150	13.150	1.000	63.027	124.294	124.294	-855.633
213+50.00	1.000	5.824	12.188	12.188	1.000	57.284	111.400	111.400	-954.845
214+00.00	1.000	5.485	10.471	10.471	1.000	63.047	111.418	111.418	-1055.792
214+50.00	1.000	5.716	10.372	10.372	1.000	64.561	118.156	118.156	-1163.576
215+00.00	1.000	5.276	10.178	10.178	1.000	63.386	118.470	118.470	-1271.868
215+50.00	1.000	4.664	9.203	9.203	1.000	55.382	109.970	109.970	-1372.635
216+00.00	1.000	3.258	7.335	7.335	1.000	52.797	100.165	100.165	-1465.465
216+50.00	1.000	3.230	6.007	6.007	1.000	52.530	97.525	97.525	-1556.982
217+00.00	1.000	2.222	5.048	5.048	1.000	50.685	95.570	95.570	-1647.504
217+50.00	1.000	1.635	3.572	3.572	1.000	61.744	104.101	104.101	-1748.033
218+00.00	1.000	1.232	2.655	2.655	1.000	19.876	75.574	75.574	-1820.952
218+50.00	1.000	1.183	2.236	2.236	1.000	57.339	71.495	71.495	-1890.212

- - - - - - - - - - - - - - - - - Station Quantities - - - - - - - - - - - - - - - - -

Baseline Station	Cut				Fill				Mass Ordinate
	Factor	Area	Volume	Adjusted	Factor	Area	Volume	Adjusted	
219+00.00	1.000	0.000	1.095	1.095	1.000	0.000	53.091	53.091	-1942.208
219+50.00	1.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	-1942.208
219+95.97	1.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	-1942.208
Grand Total:			481.379	481.379			2423.588	2423.588	

GDOT Earthwork Volumes Report

Report Created: 7/27/2022
Time: 9:08am

Cross Section Set Name: Iris Drive Connector_Earthwork

Alignment Name: DE4

Input Grid Factor: 1.000000 **Note:** All units in this report are in feet, square feet and cubic yards unless specified otherwise.

- - - - - - - - - - - - - - - - - Station Quantities - - - - - - - - - - - - - - - - -

Baseline Station	Cut				Fill				Mass Ordinate
	Factor	Area	Volume	Adjusted	Factor	Area	Volume	Adjusted	
400+00.00	1.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000
400+50.00	1.000	0.000	0.000	0.000	1.000	2325.554	2153.288	2153.288	-2153.288
401+00.00	1.000	25.351	23.473	23.473	1.000	1978.716	3985.434	3985.434	-6115.249
401+50.00	1.000	25.066	46.683	46.683	1.000	1985.874	3670.916	3670.916	-9739.483
402+00.00	1.000	27.577	48.744	48.744	1.000	2057.518	3743.882	3743.882	-13434.621
402+50.00	1.000	24.266	48.003	48.003	1.000	1811.576	3582.494	3582.494	-16969.112
403+00.00	1.000	24.960	45.580	45.580	1.000	1430.291	3001.728	3001.728	-19925.261
403+50.00	1.000	31.626	52.394	52.394	1.000	1106.271	2348.669	2348.669	-22221.535
404+00.00	1.000	81.497	104.743	104.743	1.000	895.246	1853.256	1853.256	-23970.049
404+50.00	1.000	68.369	138.765	138.765	1.000	960.624	1718.398	1718.398	-25549.682
405+00.00	1.000	23.432	85.001	85.001	1.000	1000.926	1816.250	1816.250	-27280.931
405+50.00	1.000	15.642	36.179	36.179	1.000	922.240	1780.709	1780.709	-29025.460
406+00.00	1.000	14.188	27.620	27.620	1.000	726.546	1526.653	1526.653	-30524.493
406+50.00	1.000	10.751	23.092	23.092	1.000	380.538	1025.077	1025.077	-31526.478
407+00.00	1.000	7.692	17.077	17.077	1.000	65.470	412.970	412.970	-31922.371
407+50.00	1.000	131.558	128.935	128.935	1.000	1.226	61.755	61.755	-31855.191
408+00.00	1.000	0.000	121.813	121.813	1.000	0.000	1.135	1.135	-31734.513
408+16.54	1.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	-31734.513
Grand Total:			948.103	948.103			32682.616	32682.616	

GDOT Earthwork Volumes Report

Report Created: 7/27/2022
Time: 9:04am

Cross Section Set Name: Iris Drive SE_Earthwork

Alignment Name: DE3

Input Grid Factor: 1.000000 **Note:** All units in this report are in feet, square feet and cubic yards unless specified otherwise.

- - - - - - - - - - - - - - - - Station Quantities - - - - - - - - - - - - - - - -

Baseline Station	Cut				Fill				Mass Ordinate
	Factor	Area	Volume	Adjusted	Factor	Area	Volume	Adjusted	
290+94.62	1.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000
291+00.00	1.000	0.855	0.085	0.085	1.000	0.634	0.063	0.063	0.022
291+00.05									0.000
291+50.00	1.000	2.336	2.954	2.954	1.000	27.047	25.630	25.630	-22.654
292+00.00	1.000	4.433	6.268	6.268	1.000	23.634	46.926	46.926	-63.312
292+50.00	1.000	5.651	9.337	9.337	1.000	27.685	47.517	47.517	-101.493
293+00.00	1.000	6.411	11.168	11.168	1.000	29.256	52.723	52.723	-143.047
293+50.00	1.000	6.607	12.054	12.054	1.000	28.349	53.338	53.338	-184.331
294+00.00	1.000	8.431	13.924	13.924	1.000	23.016	47.560	47.560	-217.967
294+50.00	1.000	10.079	17.139	17.139	1.000	30.250	49.321	49.321	-250.149
295+00.00	1.000	10.151	18.732	18.732	1.000	34.714	60.152	60.152	-291.569
295+50.00	1.000	10.393	19.023	19.023	1.000	28.449	58.484	58.484	-331.030
296+00.00	1.000	11.665	20.424	20.424	1.000	24.400	48.934	48.934	-359.540
296+50.00	1.000	12.453	22.332	22.332	1.000	27.069	47.656	47.656	-384.864
297+00.00	1.000	10.935	21.656	21.656	1.000	15.936	39.819	39.819	-403.027
297+50.00	1.000	12.056	21.288	21.288	1.000	17.446	30.909	30.909	-412.648
298+00.00	1.000	26.295	35.510	35.510	1.000	20.895	35.501	35.501	-412.639
298+50.00	1.000	21.314	44.082	44.082	1.000	5.646	24.575	24.575	-393.132
299+00.00	1.000	17.176	35.639	35.639	1.000	8.797	13.373	13.373	-370.866
299+50.00	1.000	12.960	27.903	27.903	1.000	4.118	11.958	11.958	-354.921
300+00.00	1.000	10.617	21.830	21.830	1.000	6.098	9.460	9.460	-342.551
300+50.00	1.000	7.900	17.145	17.145	1.000	6.663	11.816	11.816	-337.222
301+00.00	1.000	4.310	11.305	11.305	1.000	17.196	22.092	22.092	-348.009
301+50.00	1.000	0.953	4.872	4.872	1.000	10.711	25.840	25.840	-368.976
302+00.00	1.000	0.973	1.783	1.783	1.000	10.469	19.611	19.611	-386.803
302+50.00	1.000	0.957	1.788	1.788	1.000	11.313	20.169	20.169	-405.184
303+00.00	1.000	1.128	1.931	1.931	1.000	8.519	18.363	18.363	-421.616
303+50.00	1.000	2.827	3.662	3.662	1.000	4.722	12.260	12.260	-430.214
304+00.00	1.000	4.395	6.688	6.688	1.000	5.797	9.741	9.741	-433.267
304+50.00	1.000	3.862	7.646	7.646	1.000	6.246	11.151	11.151	-436.772
305+00.00	1.000	4.763	7.987	7.987	1.000	5.632	10.998	10.998	-439.784
305+50.00	1.000	4.470	8.549	8.549	1.000	6.584	11.312	11.312	-442.546
306+00.00	1.000	3.496	7.375	7.375	1.000	11.435	16.684	16.684	-451.855
306+50.00	1.000	0.000	3.237	3.237	1.000	0.000	10.588	10.588	-459.206
307+00.00	1.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	-459.206
307+50.00	1.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	-459.206

- - - - - - - - - - - - - - - - - Station Quantities - - - - - - - - - - - - - - - - -

Baseline Station	Cut				Fill				Mass Ordinate
	Factor	Area	Volume	Adjusted	Factor	Area	Volume	Adjusted	
308+00.00	1.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	-459.206
308+50.00	1.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	-459.206
309+00.00	1.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	-459.206
309+50.00	1.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	-459.206
310+00.00	1.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	-459.206
310+50.00	1.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	-459.206
310+68.90	1.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	-459.206
Grand Total:			445.317	445.317			904.523	904.523	

GDOT Earthwork Volumes Report

Report Created: 7/27/2022
Time: 9:19am

Cross Section Set Name: Mission Ridge Drive_Earthwork

Alignment Name: DE9

Input Grid Factor: 1.000000 **Note:** All units in this report are in feet, square feet and cubic yards unless specified otherwise.

- - - - - - - - - - - - - - - - - Station Quantities - - - - - - - - - - - - - - - - -

Baseline Station	Cut				Fill				Mass Ordinate
	Factor	Area	Volume	Adjusted	Factor	Area	Volume	Adjusted	
95+86.87	1.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000
96+00.00	1.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000
96+50.00	1.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000
97+00.00	1.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000
97+50.00	1.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000
98+00.00	1.000	0.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000
98+50.00	1.000	45.245	41.894	41.894	1.000	0.000	0.000	0.000	41.894
99+00.00	1.000	76.752	112.960	112.960	1.000	0.000	0.000	0.000	154.854
99+50.00	1.000	142.607	203.110	203.110	1.000	0.000	0.000	0.000	357.965
100+00.00	1.000	0.000	132.044	132.044	1.000	0.000	0.000	0.000	490.008
Grand Total:			490.008	490.008			0.000	0.000	

Georgia Department of Transportation

Interoffice Memo

FILE: Rockdale County
PI No. 0006934
Courtesy Parkway Extension Over Iris Drive, I-20 and Dogwood Drive

DATE: December 15, 2021

FROM: Patrick Allen, P.E., State Materials Engineer

TO: Kimberly Nesbitt, State Program Delivery Administrator
Attn: Eka Okonmkpaeto, Project Manager

SUBJECT: **Acceptance of Consultant's Bridge Foundation Investigation Report**

As requested, we have reviewed the Bridge Foundation Investigation Report that was written on May 23, 2021, and revised on October 10, 2021, by Atlas Technical Consultants of Duluth, Georgia. This Report is acceptable for use. Copies of this Report should be forwarded to the appropriate Office(s) by the Project Manager.

The Project Manager should provide a link to the accepted Report in ProjectWise to Geotechnical_Reports@dot.ga.gov.

If additional information is needed, please contact Shacoya Fisher of the Geotechnical Bureau at 404-608-4716 (Direct) or 404-608-4720 (Main).

PA: GEF: STF

cc: Donn Digamon, P.E., State Bridge and Structural Engineer
Attn: Lyn Clements, P.E., Assistant State Bridge and Structural Engineer
Rabindra Koirala, P.E., State Bridge Maintenance Engineer
Paul DeNard, P.E., District Engineer, Chamblee
Borden Polk, Area Manager, Chamblee
Jay Shah, (jay.shah@oneatlas.com)
Yong Shao, Ph.D., P.E., (yong.shao@oneatlas.com)

Georgia Department of Transportation

Interoffice Memo

FILE: CSSTP-006-00(934), Rockdale County
PI No. 0006934
Courtesy Parkway Extension over Iris Drive, I-20 and Dogwood Drive – Walls 1 and 2

DATE: January 12, 2022

FROM: Patrick Allen, P.E., State Materials Engineer

TO: Kimberly Nesbitt, State Program Delivery Administrator
Attn: Eka Okonmkpaeto, Project Manager

SUBJECT: **Acceptance of Consultant's Wall Foundation Investigation (LRFD) Report**

As requested, we have reviewed the Wall Foundation Investigation Report (LRFD) that was written on June 18, 2021, and revised on December 10, 2021, by Atlas Technical Consultants. LLC of Duluth, Georgia. This Report is acceptable for use. Copies of this Report should be forwarded to the appropriate Offices by the Project Manager.

The Project Manager should provide a link to the accepted Report in ProjectWise to Geotechnical_Reports@dot.ga.gov.

If additional information is needed, please contact Christian Bowman of the Geotechnical Bureau at 404-608-4781 (Direct) or 404-608-4720 (Main).

PA: GEF: CAB

cc: Donn Digamon, P.E., State Bridge and Structural Engineer
Attn: Lyn Clements, P.E., Assistant State Bridge and Structural Engineer
Andy Casey, P.E., State Roadway Design Engineer
Paul DeNard, District Engineer, Chamblee
Borden S. Polk, Area Engineer, Chamblee
Jay Shah (jay.shah@oneatlas.com)
Yong C. Shao, PH.D., P.E. (yong.shao@oneatlas.com)