Soil Survey, Materials, and Slope Study Report

71-19-SP08
Old Highway 20 Bridges
Over Norfolk Southern Railroad and Beaverdam Creek
Huntsville, Limestone County, Alabama

August 11, 2020
Terracon Project E1185324

Prepared for:
Garver, LLC
Huntsville, Alabama

Prepared by:
Terracon Consultants, Inc.
Birmingham, Alabama

August 11, 2020

Garver, LLC
5125A Research Dr NW
Huntsville, AL 35805-5908

Attn: Mr. Scott Leach, P.E.
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Re: Soil Survey, Materials, and Slope Study Report
71-19-SP08
Old Highway 20 Bridges
Over Norfolk Southern Railroad and Beaverdam Creek
Huntsville, Limestone County, Alabama
Terracon Project No. E1185324

Dear Scott:

Terracon Consultants, Inc. (Terracon) is pleased to present to Garver, LLC this soil survey, materials, and slope study report for the planned Old Highway 20 realignment in Huntsville, Limestone County, Alabama. Our scope for this project was performed in general accordance with our proposal number PE1185324-Revision 4, dated September 10, 2019.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report, or if we may be of further service, please contact us.

Sincerely,
Terracon Consultants, Inc.

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SOIL SURVEY, MATERIALS, AND SLOPE STUDY REPORT
71-19-SP08
OLD HIGHWAY 20 BRIDGES
OVER NORFOLK SOUTHERN RAILROAD AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA

Terracon Project No. E1185324
August 11, 2020

1.0 INTRODUCTION

This geotechnical engineering evaluation has been completed for the planned realignment of Old Highway 20 in Huntsville, Limestone County, Alabama. Forty-one (41) soil borings were performed within the proposed new roadway, bridge abutment, and slope areas. The purpose of this geotechnical engineering evaluation is to report the subsurface conditions within the project limits and provide recommendations for roadway embankment, pavement, and slope construction.

2.0 SITE AND PROJECT DESCRIPTION

The overall project will consist of the realignment and improvements to Old Highway 20 near the existing at-grade railroad crossing and bridge over Beaverdam Creek in Huntsville, Limestone County, Alabama. This project will be associated with the new industrial development (MTMUS) being constructed north of the existing Old Highway 20. The overall realignment will be a little over 1 mile in length and will require two new bridges over Norfolk Southern Railroad and Beaverdam Creek, respectively. Terracon also prepared a bridge foundation report for the bridge replacement over Beaverdam Creek and submitted under a separate cover.

The majority of the realigned Old Highway 20 will extent through agricultural fields. New fill embankments with heights of up to about 37 feet are planned. The new slopes will mostly range in steepness from 3.0(H):1.0(V) to 2.0(H):1.0(V).

3.0 FIELD PROCEDURE

Drilling crews contracted by Terracon conducted soil boring and sampling operations at designated locations on the project site using an ATV track-mounted drill rig. The drill rig was fitted with a manual hammer. A total of forty-one (41) test borings were performed in the roadway and slope areas along the new alignment. Four of these borings (BD-1, BD-2, BD-7, and BD-8) were also used to evaluate foundation bearing conditions at the Beaverdam Creek

bridge abutments. Among the borings used in our engineering analysis, four borings (B-9 through B-12) were performed in 2015 as part of a previous Terracon project.

The borings were extended to a depths ranging from 10 feet to 58 feet below the existing grades. The soil boring locations are shown on Exhibits A-4 to A-9 in Appendix A.

Boring logs indicating the location and depth of the drilling and sampling operations were prepared by the driller in the field. Bagged soil samples from standard penetration testing were recovered. In addition to the bagged samples, several relatively-undisturbed Shelby tube samples were obtained from selected areas. The boring logs are included on the Test Boring Record Sheets in Appendix D. A Terracon engineer evaluated the recovered soil samples and logged the probable site stratigraphy. Selected soil samples were tested at the Terracon laboratories in Birmingham, Alabama and Chattanooga, Tennessee. Laboratory test results are included in this report in Appendix B, and on the individual boring logs on the Test Boring Record Sheets in Appendix D.

Copies of the Terracon engineer's boring logs are included in this report. The stratification lines indicated on the subsurface profiles represent approximate boundaries between major soil and rock types as interpreted by the Terracon engineer. The subsurface profiles were developed for roadway embankment and pavement design purposes only and are not intended to represent actual field conditions at all locations.

4.0 SUBSURFACE CONDITIONS

4.1 Geology

Maps published by the Geological Survey of Alabama indicate that the project is underlain by the Tuscumbia Limestone, and the Fort Payne Chert and Maury Formation undifferentiated. The Tuscumbia Limestone generally consists of light bluish-gray to very light gray, fine to coarse-grained, medium to thick-bedded bioclastic limestone, locally containing light gray to bluish-gray chert nodules and lenses.

The Fort Payne Chert contains interbedded olive-gray to tan bedded chert locally containing molds of large crinoid stems, light olive-gray very fine-grained variably cherty dolomitic limestone, very light-gray fine to coarse-grained bioclastic limestone, locally composed entirely of large crinoid columnals and thin lenses of chert at top of fining upward units; and light-greenish-gray to light-olive-gray variably cherty dolomite. The Maury Formation contains light greenish-gray and dark brownish-gray fissile shale and yellowish to greenish-gray fine-grained calcareous sandstone.

A Geologic Map of the site vicinity is included with this report (refer to Exhibit A-2 in Appendix A). The limestone that underlies the site is carbonate rock and therefore susceptible to sinkhole development. A sinkhole susceptibility map is included with this report as Exhibit A-3 in Appendix A. No evidence of sinkhole activity (i.e., surface depressions) was noted during our site reconnaissance.

4.2 Topsoil

The thickness of topsoil varied across the project from 1 to about 12 inches. The average thickness for all borings was around 6 to 8 inches. We have estimated a total of around **19,000 cubic yards** of available topsoil for this project. Two topsoil samples were retrieved. The samples were tested according to ALDOT requirements. The results of the topsoil tests are provided in the Topsoil Testing Table in Appendix B. One sample collected near Station 88+00, right of centerline, met the requirements of the ALDOT Standard Specifications. The other sample collected near Station 125+00, at centerline, **did not** meet the requirements of the ALDOT Standard Specifications due to the sample's gradation (fines content above 90%, sand content below 10%).

It will be the responsibility of the contractor to verify the topsoil testing results. The planned quantity of topsoil has not been determined, and therefore, additional topsoil from off site may be needed. Topsoil is to be stockpiled and used as directed by the engineer. The following pay items are recommended.

Pay Item No. 650A-000 – Topsoil – per cubic yard
Pay Item No. 650B-000 – Topsoil from stockpiles – per cubic yard

4.3 Subsurface Soil Conditions

The surface material at the boring locations consisted of topsoil having a thickness ranging from 1 to 12 inches. In most borings the topsoil had a thickness of about 10 inches, with an average thickness for the project of around 6 to 8 inches. No discernable topsoil was present at borings BD-1, BD-2, BD-7, BD-8, and S-32. The borings with no topsoil are near Beaverdam Creek and are subject to frequent flooding.

Below the surface material, the soils encountered at the borings typically consisted of native lean clays, fat clays, and elastic silts. Varying amounts of chert gravel were noted throughout the soil profile. The soils were typically AASHTO Classification A-6, A-7-5, or A-7-6 based on laboratory testing and visual classification. The clays and silts encountered in the upper intervals of the borings (i.e., in the upper 6 feet) were typically of soft to medium stiff consistency. The upper soft to medium stiff soils within the agricultural fields may be indicative of a cultivated zone.

The clays and silts typically exhibited stiff to very stiff and/or hard consistency below about 6 feet. A few borings encountered a deeper soft soil interval just prior to reaching auger refusal. Most borings were terminated within the native soils at their planned termination depths ranging from 10 to 30 feet below the existing grades. Auger refusal was noted in borings S-11 through S-19, BD-1, BD-2, BD-7, and BD-8 at depths ranging from 7 to 41 feet below the existing grades.

Borings BD-1, BD-2, BD-7, and BD-8 were extended into the bedrock by rock coring (these borings are also utilized in the Beaverdam Creek bridge foundation analysis at the abutments 1 and 4). The rock coring operations encountered limestone bedrock. The limestone was noted as mostly light gray, thin-bedded, and hard.

For a more detailed description of the subsurface conditions encountered, please refer to the test boring record sheets in Appendix D.

Selected soil samples were tested for properties such as natural moisture content (ASTM D-2216), grain-size distribution (ASTM D-422) and Atterberg Limits (ASTM D-4318). Our laboratory test results for the samples tested have Plasticity Indices (PI's) ranging from 13 to 32 percent and Liquid Limits (LL's) ranging from 30 to 58 percent. Laboratory test results are presented in the Soil Classification Summary in Appendix B.

4.4 Groundwater

The boreholes were observed during drilling and after completion for the presence and level of groundwater. The following table presents the groundwater levels observed in the borings at the time of drilling and for the short duration that the borings were allowed to remain open after drilling completion.

Table 4.3: Groundwater

Station	Offset	Boring No.	Depth Groundwater Observed During Drilling (feet)	Elevation Groundwater Observed During Drilling (feet)	Depth of Groundwater in Extended Reading (feet)	Elevation of Groundwater in Extended Reading (feet)
88+00	70' LT	S-5	13	577	---	---
88+00	70' RT	S-7	10	577.5	---	---
91+00	CL	S-9	23	564.5	---	---
91+00	90' RT	S-10	24	562.5	---	---
94+00	100' LT	S-11	23	564	---	---
94+00	CL	S-12	18	568.5	20	566.5
94+00	100' RT	S-13	27	560	---	---
102+00	100' LT	S-14	23.5	568	---	---
102+00	CL	S-15	23.5	567	25	565.5

Station	Offset	Boring No.	Depth Groundwater Observed During Drilling (feet)	Elevation Groundwater Observed During Drilling (feet)	Depth of Groundwater in Extended Reading (feet)	Elevation of Groundwater in Extended Reading (feet)
102+00	100' RT	S-16	23	566	---	---
106+00	80' LT	S-17	23	565	---	---
106+00	CL	S-18	19	568.5	---	---
106+00	80' RT	S-19	19.5	567	---	---
125+00	CL	S-32	6	559	---	---
125+00	50' RT	S-33	3	562	---	---
125+75	CL	B-9	7	561	---	---
128+50	CL	B-10	4	568.5	---	---

No groundwater was noted in any of the other borings performed for this project. A relatively long period of time may be necessary for a groundwater level to develop and stabilize in a borehole in these materials. Long term observations in piezometers or observation wells sealed from the influence of surface water are often required to define groundwater levels in materials of this type.

Groundwater level fluctuations occur due to seasonal variations in the amount of rainfall, runoff and other factors not evident at the time the borings were performed.

5.0 RECOMMENDATIONS FOR DESIGN AND CONSTRUCTION

5.1 Earthwork

The project will primarily require fills to reach the planned finish grades. The maximum fill heights (35 to 37 feet) will occur near the new abutments for the bridge over Norfolk Southern Railroad. At the new abutments for the bridge over Beaverdam Creek, fills will be on the order of 16 to 18 feet. Plans indicate that the new fill slopes will be graded at a maximum steepness of 2.0(H):1.0(V) near the Beaverdam Creek bridge. Fill slopes at the Norfolk Southern Railroad bridge will be graded at 3.0(H):1.0(V).

Cuts are only planned within the proposed new ditch line, mostly on the order of 2 to 5 feet in height and graded at a maximum steepness of 2.0(H):1.0(V).

5.1.1 Unclassified Excavation

The unclassified materials excavation for this project will consist of minor cuts to subgrade and soft soil undercut.

Based on the cross sections provided to us by Garver, LLC, and the data retrieved from our borings, we have estimated an unclassified materials excavation quantity of approximately **4,523 cubic yards** for cuts to finish subgrade. This quantity does not include topsoil or the additional soft soil undercut (presented below).

Pay Item 210A-000 – Unclassified Excavation – per cubic yard

Soft soil conditions were encountered within the project limits in several locations, as identified in the table below. In certain areas, undercutting of these soft soils is anticipated and estimates of the quantities have been provided.

In deeper fill areas, the soft soils may be bridged with underwater embankment in lieu of undercutting. Generally, we recommend any areas to be bridged with underwater embankment materials require a minimum of 5 feet of fill to reach the planned final grades. In these areas, the soft subgrade should be stabilized using underwater embankment materials. The underwater embankment should be placed in 18-inch thick lifts and each lift should be walked in with a dozer or excavator. Subsequent lifts of underwater embankment material should be placed until the subgrade is stabilized. The final lift of underwater embankment material should be choked at the top with an approximate 12-inch layer of underwater backfill. A separation geotextile should be placed above the choking material.

Table 5.1.1: Soft Soils

Station	Offset	Boring(s)	Required Average Undercut Depth (feet)	Required Average Undercut Width (feet)[1]	Required Average Undercut Volume (CY)
80+50 to 83+50	55' LT to 10' RT	S-2	3.5	65	2,525
83+50 to 86+50	60' LT to 10' RT	S-3, S-4	3.5	70	2,722
86+50 to 89+50	90' LT to 45' LT	S-5	None[2]	None[2]	None[2]
113+50 to 115+50	70' LT to 20' LT	S-26	6.0	50	2,222
115+50 to 117+00	70' LT to 85' RT	S-26, BD-1, BD-2	4.75	155	4,090
117+00 to 118+12.50	70' LT to 85' RT	BD-1, BD-2	None[2]	None[2]	None[2]
120+67.50 to 124+00	85' LT to 85' RT	BD-7, BD-8[3]	None[2]	None[2]	None[2]
124+00 to 124+50	40' LT to 85' RT	None[3]	None[2]	None[2]	None[2]

Station	Offset	Boring(s)	Required Average Undercut Depth (feet)	Required Average Undercut Width (feet)[1]	Required Average Undercut Volume (CY)
124+50 to 125+00	15' LT to 80' RT	None[3]	None[2]	None[2]	None[2]
125+00 to 126+50	0' to 40' RT[4]	S-32	None[2]	None[2]	None[2]
125+00 to 126+50	85' LT to 50' LT[4]	B-9	None[2]	None[2]	None[2]
126+50 to 128+00	85' LT to 20' LT[4]	B-9	None[2]	None[2]	None[2]
128+00 to 129+50	85' LT to 10' LT[4]	B-10	None[2]	None[2]	None[2]

1. Width of undercut extends a minimum 2 feet beyond proposed embankment toe on each side
2. Area anticipated to be bridged with underwater embankment and choking layer
3. Borings not performed in most of these areas due to flooded conditions. Estimates are based on visual observation during site reconnaissance.
4. Offsets extend laterally to toe of existing roadway embankment

The dimensions in the table above are intended as approximations based on the results of the soil borings. Since conditions between borings may vary, we recommend that the exposed subgrade be evaluate by a qualified engineer at the time of construction to evaluate the actual extent of undercutting and/or bridging needed. The following pay items are recommended:

Pay Item No. 201A-000 – Unclassified Excavation – per cubic yard
Pay Item No. 210F-001 – Borrow Excavation (Underwater Embankment) – per ton
Pay Item No. 210F-000 – Borrow Excavation (Underwater Backfill) – per ton
Pay Item No. 608A-000 – Separation Geotextile – per square yard

A typical detail is provided as Exhibit A-10 in Appendix A.

5.1.2 Shrink/Swell Values

We recommend that a typical shrink value of 20-25% be assumed for on-site soils. This typical value may also be applied to off-site borrow soils if laboratory testing is not available for these soils.

5.1.3 Embankment Settlement

Consolidation tests have been performed on relatively undisturbed Shelby tube samples retrieved from borings S-12, S-16, and BD-8. Based on the results of our analysis, total settlements of the fill embankments for this project are anticipated to range from 2.5 inches (estimated near Station 120+68) to 3 inches (estimated near Station 94+00). We estimate that

90 percent of the settlement will occur within 25 days (estimated near Station 120+60) to 50 days (estimated near Station 94+00) after fill placement.

5.1.4 Borrow

We anticipate that the fill material for the project will be comprised of off-site borrow soils. No off-site borrow sources have been identified at the time of this report.

Pay Item No. 210D-000 – Borrow Excavation – per cubic yard

5.2 Pavement Design

5.2.1 Traffic Data

Traffic data was provided by Garver and The City of Huntsville. The data provided indicates a 2020 Average Annual Daily Traffic (AADT) of 3,328 and a 2040 AADT of 15,200 (indicates growth rate of around 7.8%). No TADT was provided for this project, however, the provided TADT for the previous Old Highway 20 Materials Report completed by Terracon in 2015 was 2.8%. Based on the above AADT and the previously provided TADT of 2.8%, maximum project ESALs were calculated to be approximately 796,716 (7.97×10^5) – within ESAL range A/B.

Project ESALs

ESALs = [C+P]/2*(TADT)*(0.99)*(FDD)*(FLD)*(7,300)

= [3,328 + 15,200]/2*(0.028)*(0.99)*(0.50)*(0.85)*(7,300)

= **796,716** ESAL Range A/B

5.2.2 Subgrade

The soils that will comprise the new pavement subgrade will consist of mostly off-site borrow. The off-site borrow source is not known at this time. For our analysis, a subgrade Resilient Modulus of 7,400 psi was assumed based on our experience with testing results from other projects in the Huntsville, Alabama area. Confirmation of the design Resilient Modulus is recommended once the proposed borrow source is known.

Prior to the placement of any new base or pavement layer, the completed roadway subgrade is to be roadbed stabilized in accordance with Section 231 of the ALDOT Standard Specifications for Highway Construction. The roadbed should be stabilized by placing approximately 4 inches of ALDOT #410 Modified coarse aggregate on the finish subgrade soil. The coarse aggregate should then be mixed with the upper 3 inches of finished subgrade soil and re-compacted to form an approximate 6-inch mechanically stabilized layer.

Pay Item No. 231B-002 – Roadbed Stabilizing Material #410 (Modified) – per ton

5.2.3 New Pavement Buildup

The pavement buildup for this project has been requested to be the same as that from adjoining projects. The following buildup for the adjoining projects was provided by others.

As stated in Section 5.2.1, no anticipated percentage of trucks (2020 TADT) was provided in the traffic data for this project. Based on our analysis using the provided current and future AADT, calculated growth rate, and an assumed subgrade Resilient Modulus of 7,400 psi, the buildup provided will be adequate for a TADT of 3.4% or less.

Section	Item	Thickness (inches)	Total Thickness (inches)
Old Highway 20 Approximate Station 78+80 – 95+75.20 100+35.20 – 118+09.60 120+70.60 – 137+00	424A-340 140 lb/yd^2 Superpave Bituminous Concrete Wearing Surface Layer, ½ inch Maximum Aggregate Size Mix, ESAL Range A/B	1.25	14.25
	424B-636 330 lb/yd^2 Superpave Bituminous Concrete Upper Binder Layer, 1 inch Maximum Aggregate Size Mix, ESAL Range A/B	3.00	
	301A-008 Crushed Aggregate Base Course, Type B, Plant Mixed, 5” Compacted Thickness	5.00	
	301A-008 Crushed Aggregate Base Course, Type B, Plant Mixed, 5” Compacted Thickness	5.00	

The following buildup is recommended for the bridge end slabs.

Section	Item	Thickness (inches)	Total Thickness (inches)
Old Highway 20 Bridge End Slabs Approximate Station 118+09.60 – 118+29.60 120+50.60 – 120+70.60	424A-340 140 lb/yd^2 Superpave Bituminous Concrete Wearing Surface Layer, ½ inch Maximum Aggregate Size Mix, ESAL Range A/B	1.25	17.25
	424B-636 330 lb/yd^2 Superpave Bituminous Concrete Upper Binder Layer, 1 inch Maximum Aggregate Size Mix, ESAL Range A/B	3.00	
	450B-000 Reinforced Cement Concrete Bridge End Slab	9.0	
	301A-004 Crushed Aggregate Base Course, Type B, Plant Mixed, 4" Compacted Thickness	4.00	

5.3 Slope Stability Analyses

We have performed slope stability analysis using the computer program SLOPE/W, for several critical slope configurations throughout the project. Based on the results of the borings, laboratory testing, and experience with similar soils and conditions, we have utilized the following soil parameters in the slope stability evaluation.

Table 5.2A: Soil Parameters

Soil Type	Moist Unit Weight (pcf)	Angle of Internal Friction (degrees)	Cohesion (psf)
Medium stiff to stiff native soils (A-6, A-7)	125	24	100
Proposed borrow (A-6 or better)	125	28	80

The location, height, and steepness for the planned new cut and fill slopes are referenced below. The table also includes the calculated minimum factors of safety for each critical slope configuration within the range of locations listed. The factors of safety presented in the table below assume that all soft soils beneath new slopes will be undercut or stabilized with

underwater embankment and choking layer per the recommendations presented in Section 5.1.1.

Table 5.2B: Summary of Slope Configurations

Approximate Location	Left / Right of Travel Lanes	Cut or Fill	Maximum Planned Height (ft)	Maximum Planned Steepness	Calculated Minimum Factor of Safety
Station 78+50 to Station 80+50	Left	Cut	5	2.0(H):1.0(V)	2.4
Station 80+50 to Station 81+50	Left	Cut	5	3.0(H):1.0(V)	2.4
	Right	Cut	5	3.0(H):1.0(V)	2.4
Station 81+50 to Station 85+50	Left	Fill	7	3.0(H):1.0(V)	2.5
	Right	Fill	7	4.0(H):1.0(V)	3.0
Station 85+50 to Station 95+95.20	Left	Fill	37	3.0(H):1.0(V)	1.9
	Right	Fill	36	3.0(H):1.0(V)	1.9
Station 100+15.20 to Station 117+50	Left	Fill	35	3.0(H):1.0(V)	1.9
	Right	Fill	37	3.0(H):1.0(V)	1.9
Station 117+50 to Station 118+12.50	Left	Fill	12	2.0(H):1.0(V)	1.6
	Right	Fill	16	2.0(H):1.0(V)	1.6
Station 120+67.50 to Station 125+50	Left	Fill	16	2.0(H):1.0(V)	1.6
	Right	Fill	18	2.0(H):1.0(V)	1.6
Station 125+50 to Station 137+00	Left	Fill	12	3.0(H):1.0(V)	1.9
	Right	Fill	13	3.0(H):1.0(V)	1.9

The stability model output files included in Appendix C depict the critical slope configurations selected from the locations listed above.

5.4 General Slope Recommendations

New soil slopes should be covered for protection from rain. For erosion control, permanent vegetation should be established on all slopes as soon as possible. The use of a Rolled Erosion Control Product (RECP) may be considered as an alternative. Positive drainage should be maintained at the top and bottom of all slopes.

Pay Item No. 659C-002 – Erosion Control Product, Type S2-per square yard

During construction, all slopes should be regularly inspected for signs of movement or unsafe conditions. The Geotechnical Engineer should be contacted if movement is noted, if any slope should become saturated, if water should be observed seeping from the slope face, or if structures or other loads (such as a construction crane) are planned at the top of any slope.

5.5 Miscellaneous

A prime coat should be applied over the crushed aggregate base layer. A tack coat will be required for bituminous concrete overlays and other contact surfaces such as adjacent pavement edges. A joint sealant should be used during longitudinal and transverse joint construction.

Pay Item No. 401A-000 – Bituminous Treatment A – per square yard

Pay Item No. 405A-000 – Tack Coat – per gallon

Pay Item No. 407B-000 – Joint Sealant for Hot Mix Asphalt Pavement – per mile

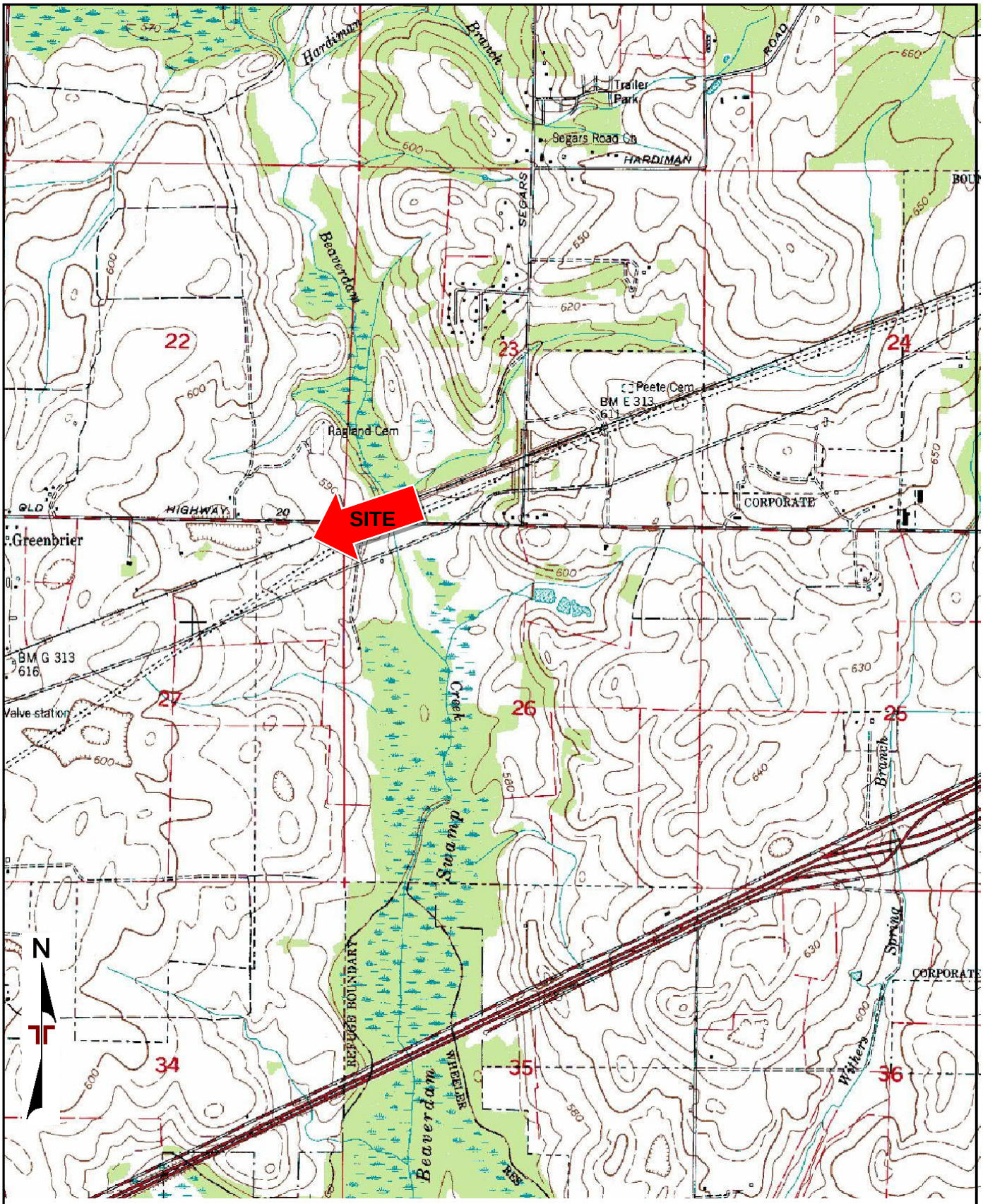
Leveling pay items may be required for correcting cross slope.

Pay Item No. 424B-644 – Superpave Bituminous Concrete Upper Binder Layer, Leveling, 1 inch Maximum Aggregate Size Mix, ESAL Range A/B – per ton

To minimize the potential for segregation, we recommend the use of a materials transfer device.

Pay Item No. 410H-000 – Material Remixing Device – per each

APPENDIX A:
FIGURES



TOPOGRAPHIC MAP IMAGE COURTESY OF THE U.S. GEOLOGICAL SURVEY
QUADRANGLES INCLUDE: GREENBRIER, AL (1/1/1992).

Project Manager: MSM	Project No. E1185324	Terracon	SITE LOCATION MAP	Exhibit
Drawn by: MSM	Scale: 1"=2,000'	2147 Riverchase Office Rd Hoover, AL 35244-1836	Old Highway 20 Bridges Over Norfolk Southern RR and Beaverdam Creek Huntsville, Limestone County, AL	A-1
Checked by: JAS	File Name:			
Approved by: JAS	Date: 7/31/2020			

Qal	**Alluvium in bottomlands.** Unconsolidated clay, silt, sand, and rounded gravel.
Qtl	**Terrace deposits.** Rounded to subrounded dark-reddish-brown iron-stained chert gravel, generally in dark-reddish-brown soil on the tops of low hills. Remnants of terraces are developed along major streams in the quadrangle. Most remnants are too thin to map.
Mt	**Tuscumbia Limestone.** Light-bluish-gray to very light-gray, fine- to coarse-grained, medium- to thick-bedded bioclastic limestone, locally containing light-gray to bluish-gray chert nodules and lenses. The upper part is locally characterized by dark fine-grained limestone containing colonial rugosan corals and chert nodules. The Tuscumbia is generally represented by weathered to cherty residuum in most of the quadrangle.
Mfpm	**Fort Payne Chert and Maury Formation undifferentiated.** Fort Payne Chert: interbedded olive-gray to tan bedded chert locally containing molds of large crinoid stems (greater than 0.75 inch in diameter); light-olive-gray very fine-grained variably cherty dolomitic limestone; very light-gray fine- to coarse-grained bioclastic limestone, locally composed entirely of large crinoid columnals and thin lenses of chert at top of fining upward units; light-greenish-gray to light-olive-gray variably cherty dolomite. Maury Formation (basal 3 - 10 feet): light-greenish-gray and dark-brownish-gray fissile shale and yellowish- to greenish-gray fine-grained calcareous sandstone (in cuttings).

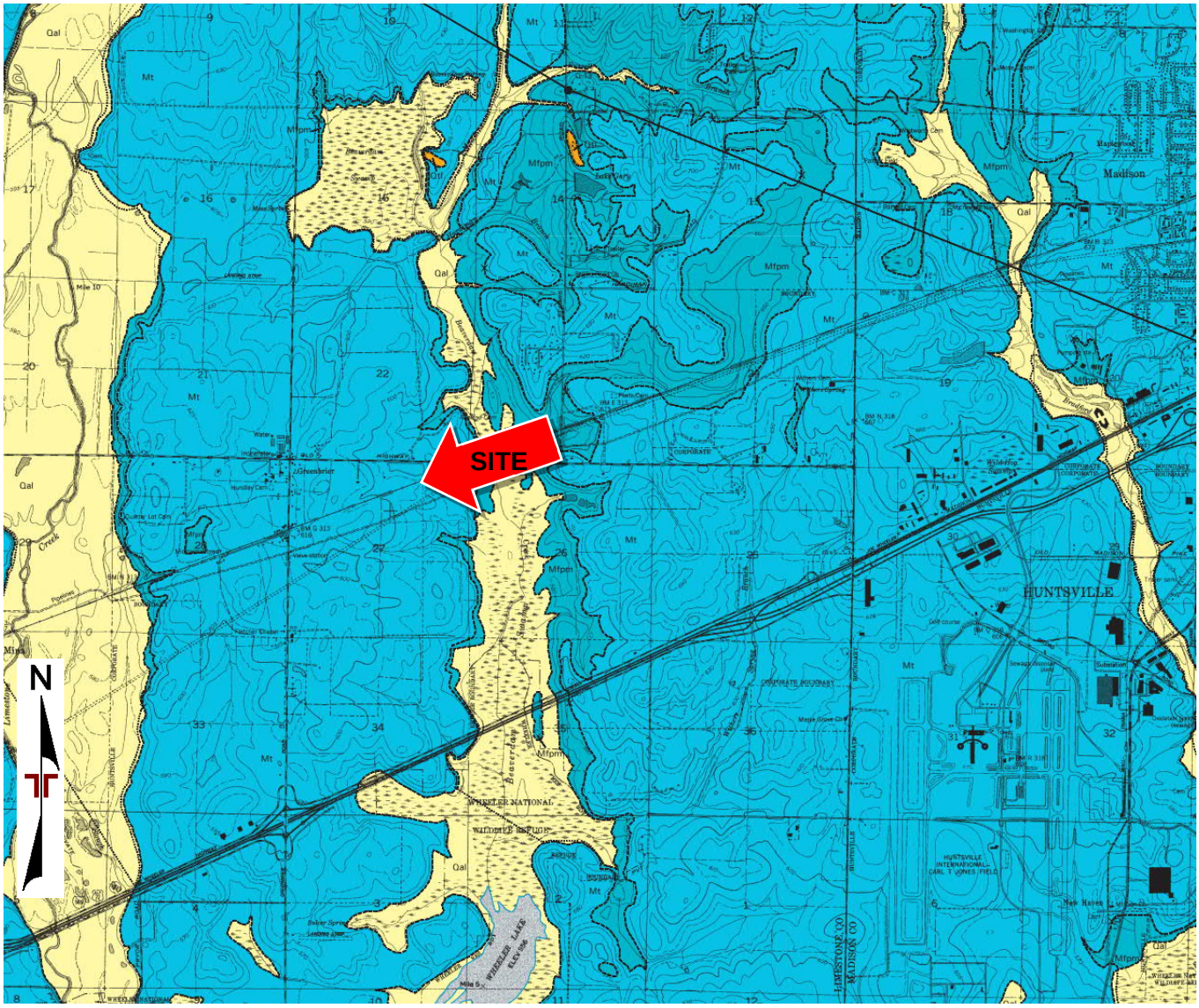
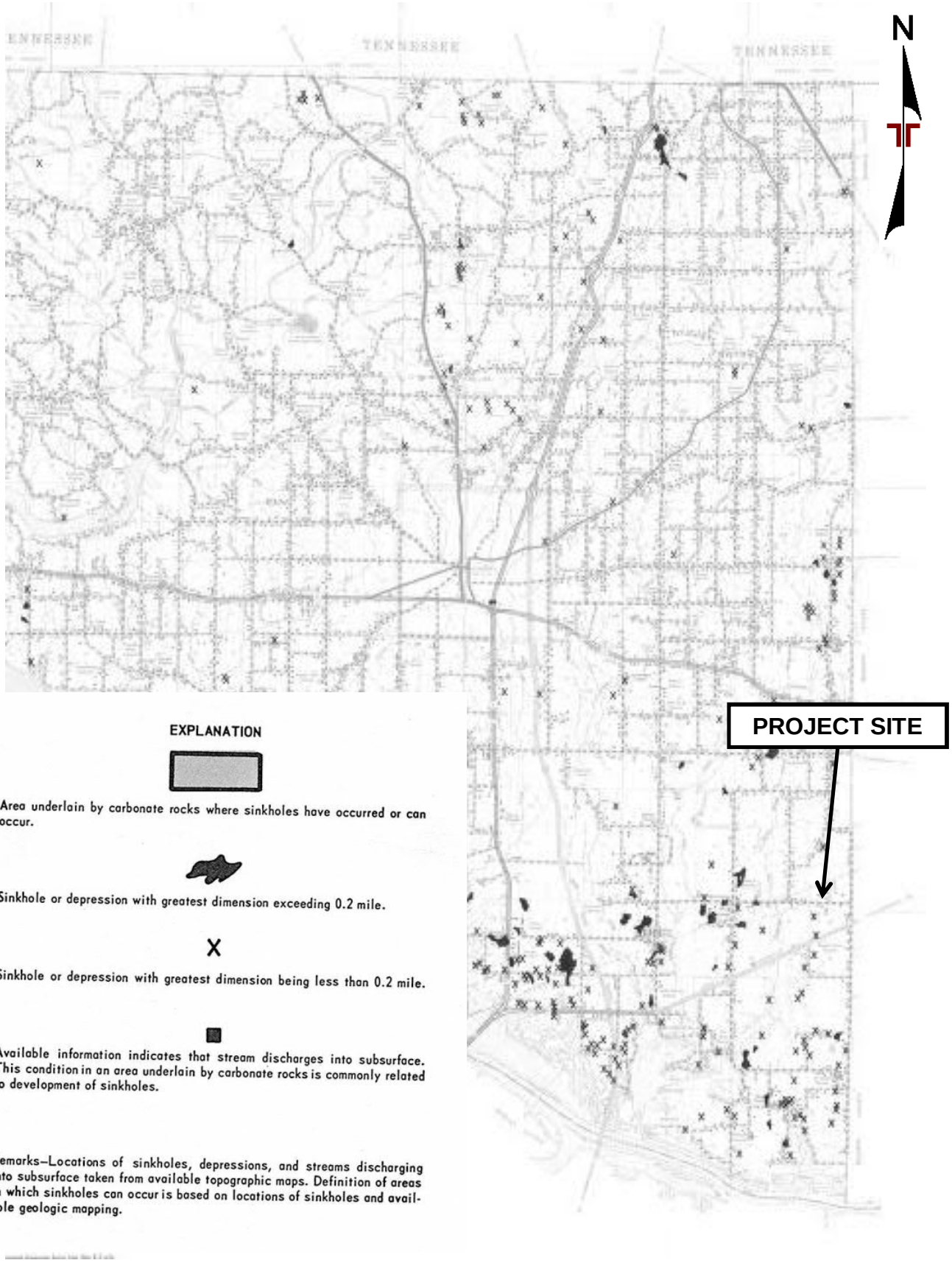


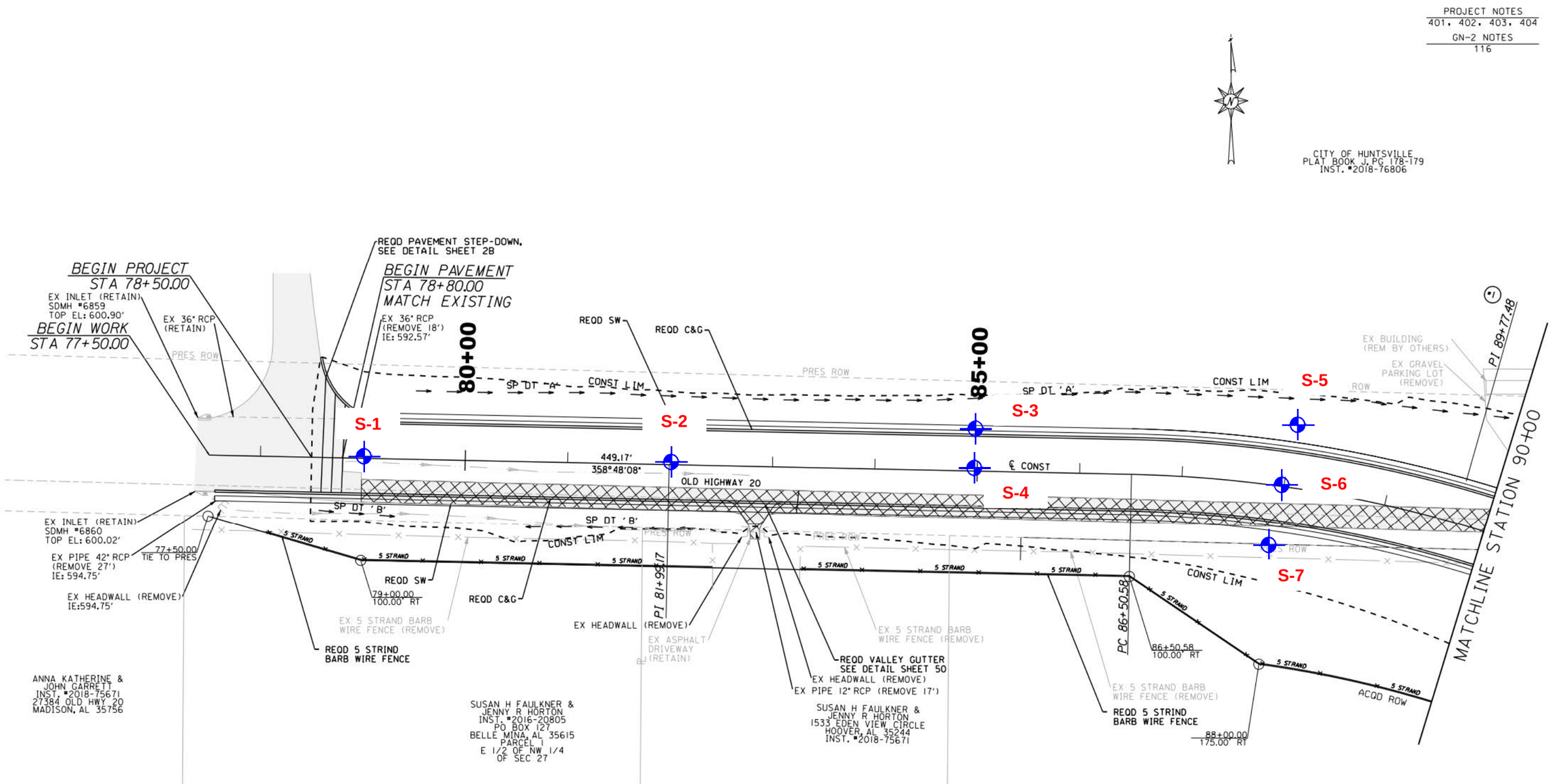
DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY GEOLOGICAL SURVEY OF ALABAMA

Project Manager: MSM	Project No. E1185324	Terracon	GEOLOGIC MAP	Exhibit
Drawn by: MSM	Scale: AS SHOWN	2147 Riverchase Office Rd	Old Highway 20 Bridges Over Norfolk Southern RR and Beaverdam Creek	A-2
Checked by: JAS	File Name:	Hoover, AL 35244-1836	Huntsville, Limestone County, AL	
Approved by: JAS	Date: 7/31/2020			



Project Manager: MSM	Project No. E1185324	Terracon Consulting Engineers & Scientists	SINKHOLE SUSCEPTIBILITY MAP	EXHIBIT
Drawn by: MSM	Scale: NTS'		Old Highway 20 Bridges Over Norfolk Southern Railroad and Beaverdam Creek Huntsville, Limestone County, AL	A-3
Checked by:	File Name:			
Approved by:	Date: 7/31/2020	2147 Riverchase Office Road Birmingham, Alabama 35244 PH. (205) 942-1289 FAX. (205) 443-5302		



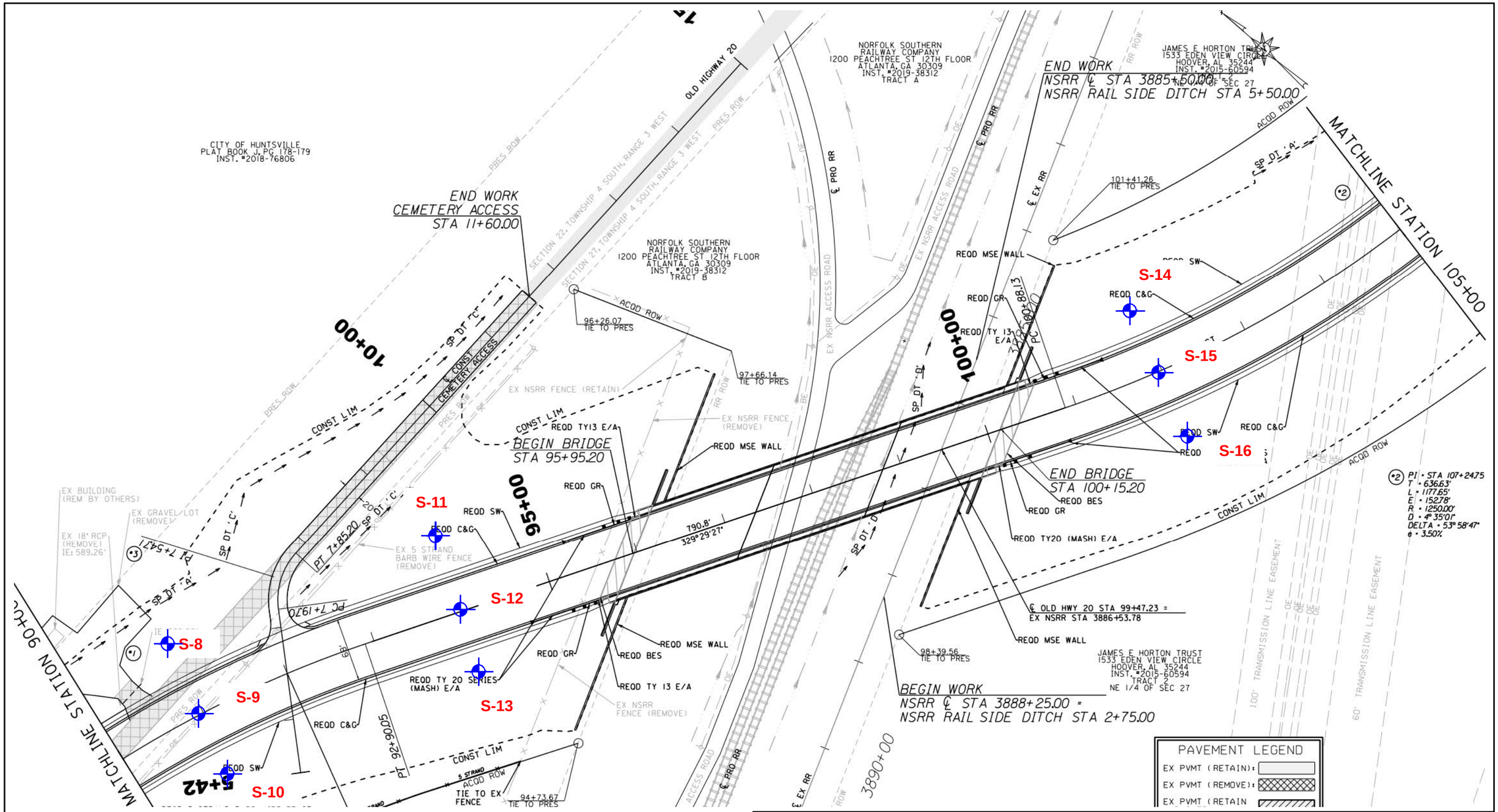
BORING LOCATION

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Manager: MSM	Project No. E1185324	Terracon Consulting Engineers & Scientists	BORING LOCATION PLAN
Drawn by: MSM	Scale: N.T.S.	2147 Riverchase Office Road Birmingham, Alabama 35244	Old Highway 20 Bridges
Checked by:	File Name:	PH. (205) 942-1289 FAX. (205) 443-5302	Over Norfolk Southern Railroad and Beaverdam Creek
Approved by:	Date: 7-31-2020		Huntsville, Limestone County, Alabama

EXHIBIT

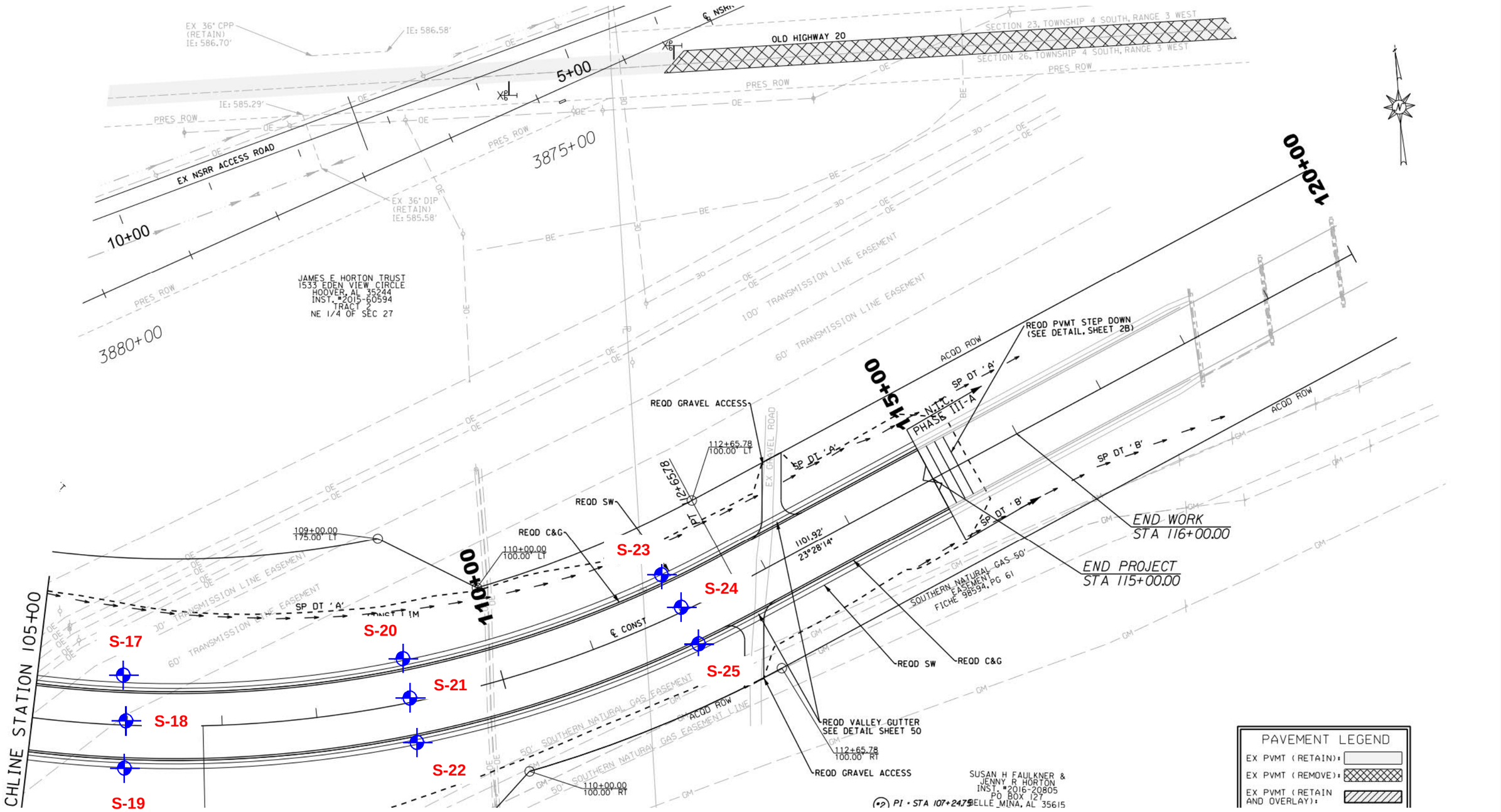
A-4



BORING LOCATION

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

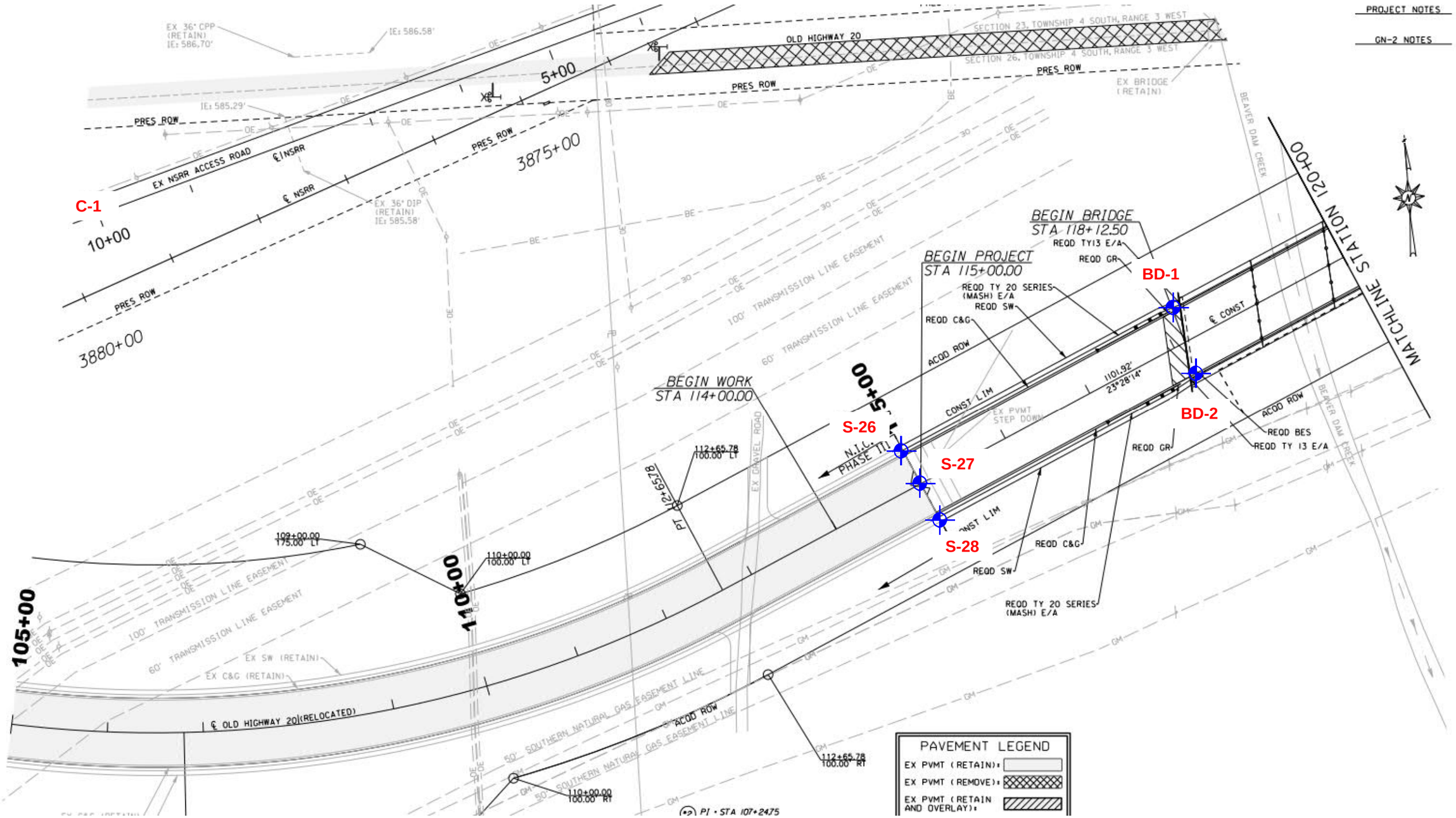
Project Manager: MSM	Project No. E1185324	Terracon Consulting Engineers & Scientists	BORING LOCATION PLAN
Drawn by: MSM	Scale: N.T.S.	2147 Riverchase Office Road Birmingham, Alabama 35244	Old Highway 20 Bridges Over Norfolk Southern Railroad and Beaverdam Creek Huntsville, Limestone County, Alabama
Checked by:	File Name:	PH. (205) 942-1289 FAX. (205) 443-5302	EXHIBIT
Approved by:	Date: 7-31-2020		A-5



BORING LOCATION

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

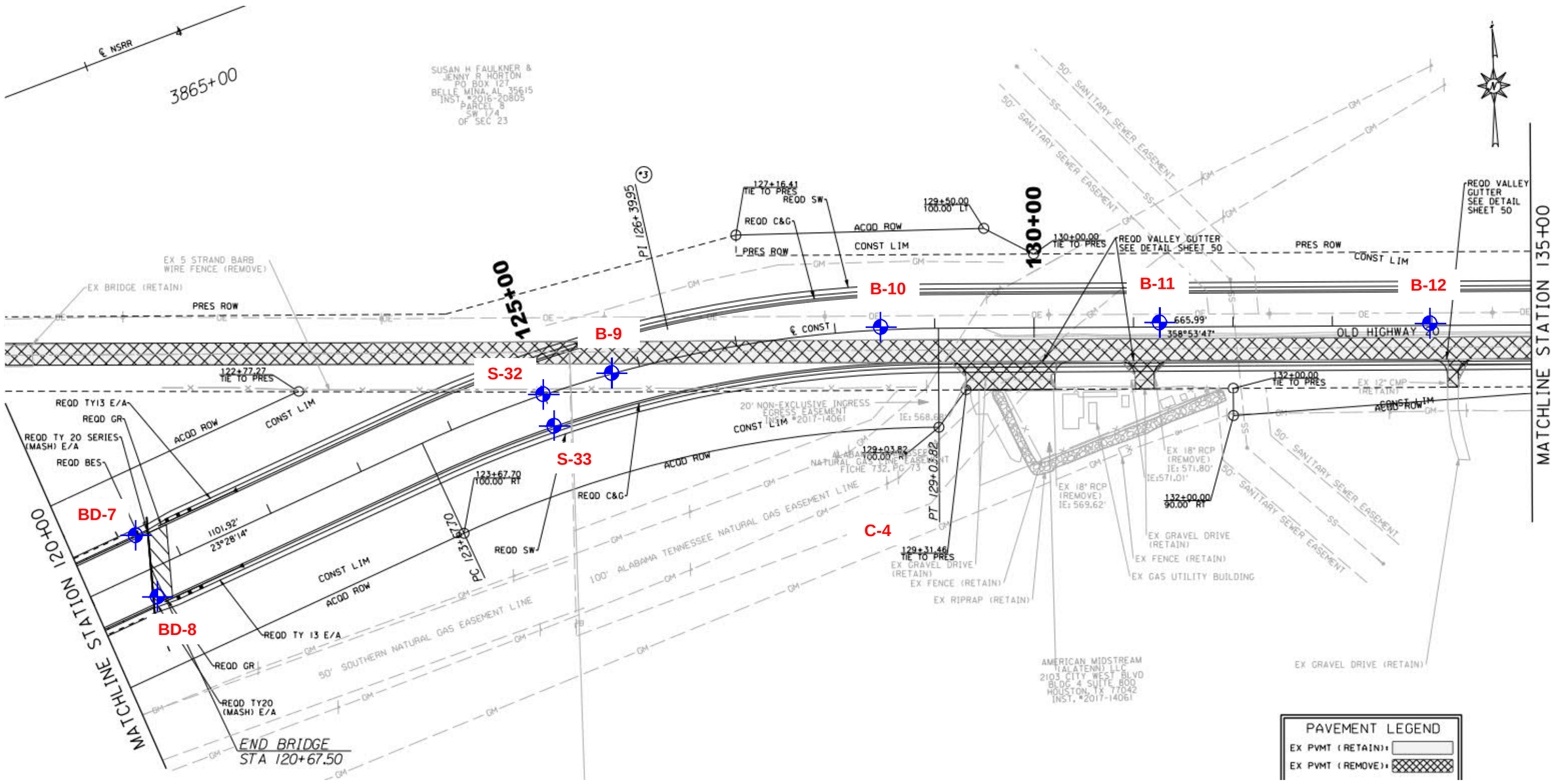
Project Manager: MSM	Project No. E1185324	Terracon Consulting Engineers & Scientists	BORING LOCATION PLAN
Drawn by: MSM	Scale: N.T.S.	2147 Riverchase Office Road Birmingham, Alabama 35244	Old Highway 20 Bridges Over Norfolk Southern Railroad and Beaverdam Creek Huntsville, Limestone County, Alabama
Checked by:	File Name:	PH. (205) 942-1289 FAX. (205) 443-5302	EXHIBIT A-6
Approved by:	Date: 7-31-2020		



BORING LOCATION

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Manager: MSM	Project No. E1185324	Terracon Consulting Engineers & Scientists	BORING LOCATION PLAN
Drawn by: MSM	Scale: N.T.S.	2147 Riverchase Office Road Birmingham, Alabama 35244	Old Highway 20 Bridges Over Norfolk Southern Railroad and Beaverdam Creek Huntsville, Limestone County, Alabama
Checked by:	File Name:	PH. (205) 942-1289 FAX. (205) 443-5302	EXHIBIT
Approved by:	Date: 7-31-2020		A-7



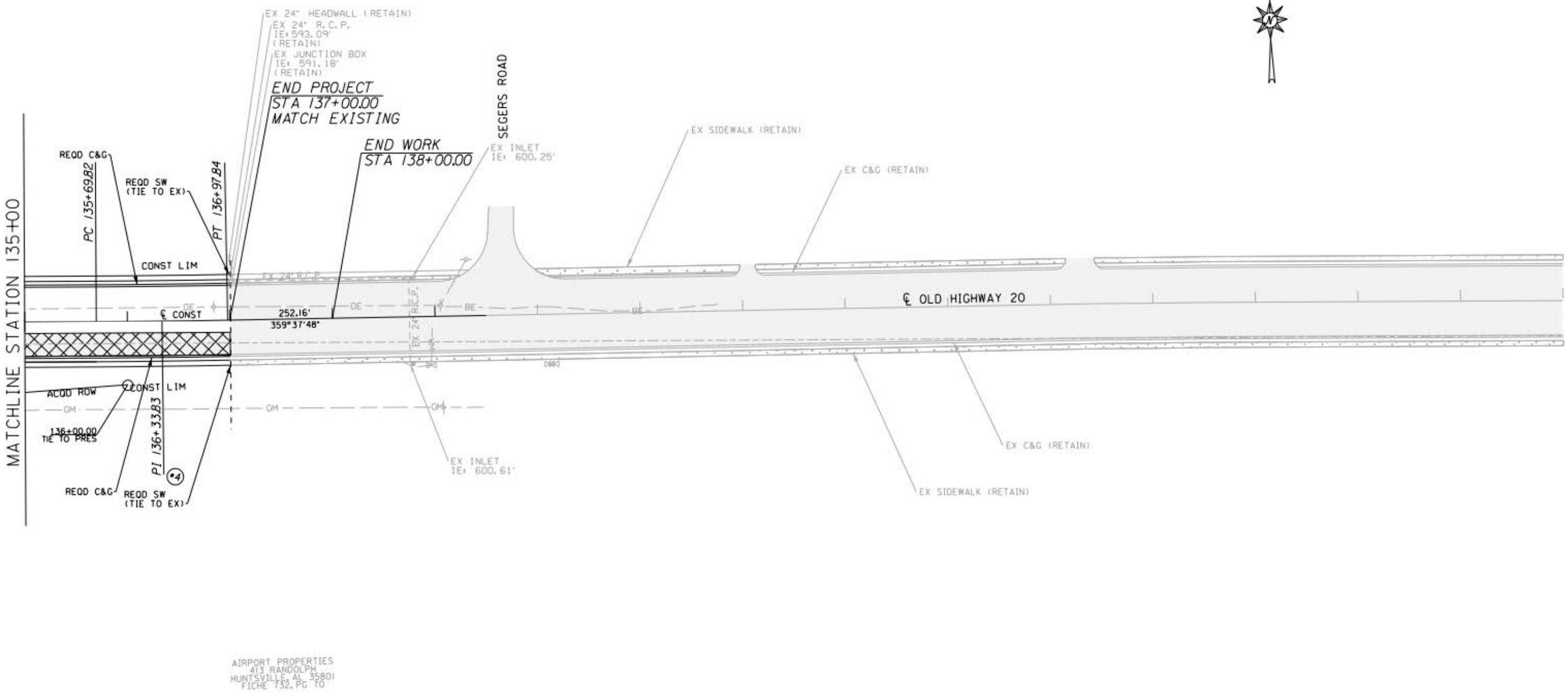
BORING LOCATION

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Manager: MSM	Project No. E1185324	Terracon Consulting Engineers & Scientists	BORING LOCATION PLAN
Drawn by: MSM	Scale: N.T.S.	2147 Riverchase Office Road Birmingham, Alabama 35244	Old Highway 20 Bridges Over Norfolk Southern Railroad and Beaverdam Creek Huntsville, Limestone County, Alabama
Checked by:	File Name:	PH. (205) 942-1289 FAX. (205) 443-5302	EXHIBIT
Approved by:	Date: 7-31-2020		A-8

PROJECT NOTES

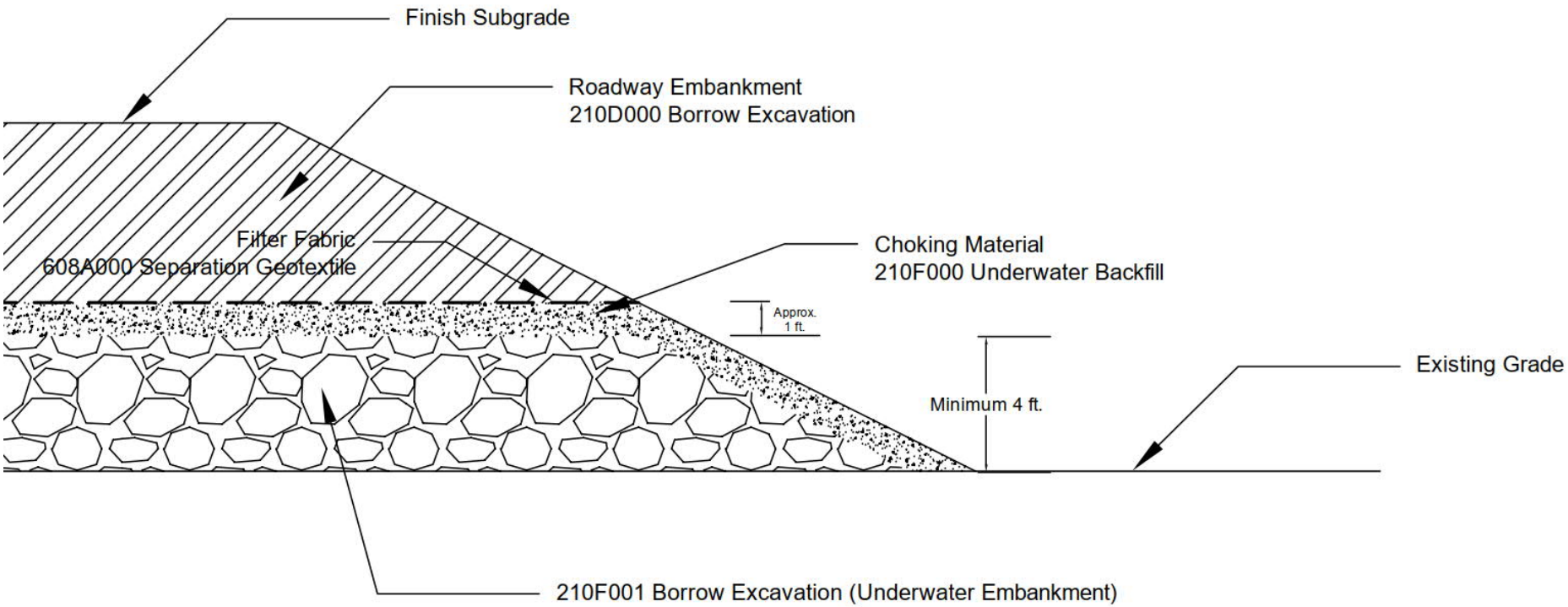
GN-2 NOTES



BORING LOCATION

DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Project Manager: MSM	Project No. E1185324	Terracon Consulting Engineers & Scientists	BORING LOCATION PLAN
Drawn by: MSM	Scale: N.T.S.	2147 Riverchase Office Road Birmingham, Alabama 35244	Old Highway 20 Bridges Over Norfolk Southern Railroad and Beaverdam Creek Huntsville, Limestone County, Alabama
Checked by:	File Name:	PH. (205) 942-1289 FAX. (205) 443-5302	EXHIBIT
Approved by:	Date: 7-31-2020		A-9



TYPICAL UNDERWATER EMBANKMENT DETAIL

SEE TABLE 5.1.1 FOR APPROXIMATE LIMITS OF USE

Project Manager: MSM	Project No. E1185324	Terracon	TYPICAL UNDERWATER EMBANKMENT DETAIL	Exhibit
Drawn by: MSM	Scale: NTS		Old Highway 20 Bridges Over Norfolk Southern Railroad and Beaverdam Creek Huntsville, Limestone County, Alabama	A-10
Checked by:	File Name:	2147 Riverchase Office Road Birmingham, Alabama 35244		
Approved by:	Date: 8-11-2020	PH. (205) 942-1289 FAX. (205) 443-5302		

APPENDIX B:
LABORATORY TESTING

Station & Offset	Boring No.	Sample ID	Depth (ft)	Water Content (%)	Liquid Limit	Plastic Limit	Plasticity Index	% Gravel	% Sand	% Pass 200	D50 (mm)	USCS	AASHTO Classification
85+00, 50’ LT of CL	S-3	S-3-1	1.0 – 2.5	19	33	17	16	0.0	12.2	87.8	---	CL	A-6 (13)
85+00, CL	S-4	S-4-1	1.0 – 2.5	25	32	19	13	0.0	10.1	89.9	---	CL	A-6 (11)
88+00, 70’ LT of CL	S-5	S-5-3	6.0 – 7.5	25	36	18	18	0.0	14.3	85.7	---	CL	A-6 (15)
91+00, 90’ LT of CL	S-8	S-8-3	6.0 – 7.5	32	50	36	14	0.1	9.0	90.9	---	MH	A-7-5 (17)
91+00, CL	S-9	S-9-2	3.5 – 5.0	28	41	23	18	1.0	12.9	86.1	---	CL	A-7-6 (16)
94+00, 100’ LT of CL	S-11	S-11-1	1.0 – 2.5	28	32	17	15	0.0	13.8	86.1	---	CL	A-6 (12)
94+00, 100’ RT of CL	S-13	S-13-4	8.5 – 10.0	33	52	34	18	0.0	9.9	90.1	---	MH	A-7-5 (20)
102+00, 100’ RT of CL	S-16	S-16-4	8.5 – 10.0	28	53	38	15	0.3	24.5	75.3	---	MH	A-7-5 (14)
106+00, 80’ LT of CL	S-17	S-17-1	1.0 – 2.5	26	41	21	20	0.6	13.2	86.2	---	CL	A-7-6 (18)
109+00, 70’ LT of CL	S-20	S-20-2	3.5 – 5.0	32	50	38	12	0.3	9.3	90.4	---	MH	A-7-5 (15)
109+00, CL	S-21	S-21-4	8.5 – 10.0	32	58	39	19	0.1	15.0	84.8	---	MH	A-7-5 (21)
112+00, 50’ LT of CL	S-23	S-23-1	1.0 – 2.5	23	37	18	19	0.0	10.3	89.7	---	CL	A-6 (15)
112+00, CL	S-24	S-24-3	6.0 – 7.5	31	46	23	23	0.0	10.8	89.2	---	CL	A-7-6 (22)
115+00, 50’ LT of CL	S-26	S-26-1	1.0 – 2.5	26	41	20	21	0.3	13.4	86.3	---	CL	A-7-6 (18)
118+12.50 / 40’ LT of CL	BD-1	BD-1-2	3.5 – 5.0	26	45	32	13	19.9	28.7	51.4	---	ML	A-7-5 (5)
118+12.50 / 40’ RT of CL	BD-2	BD-2-4	8.5 – 10.0	28	58	26	32	30.3	15.5	54.2	---	CH	A-7-6 (14)
120+67.50 / 40’ LT of CL	BD-7	BD-7-3	6.0 – 7.5	23	30	15	15	18.8	24.1	57.1	--	CL	A-6 (5)
128+50, CL	B-10	B-10-1	1.0 – 2.5	17	43	19	24	2.0	21.0	77.0	---	CL	A-7-6 (18)

SOIL CLASSIFICATION SUMMARY

City of Huntsville
71-19-SP08
Old Highway 20 Bridges
Over Norfolk Southern Railroad and Beaverdam Creek
Limestone County

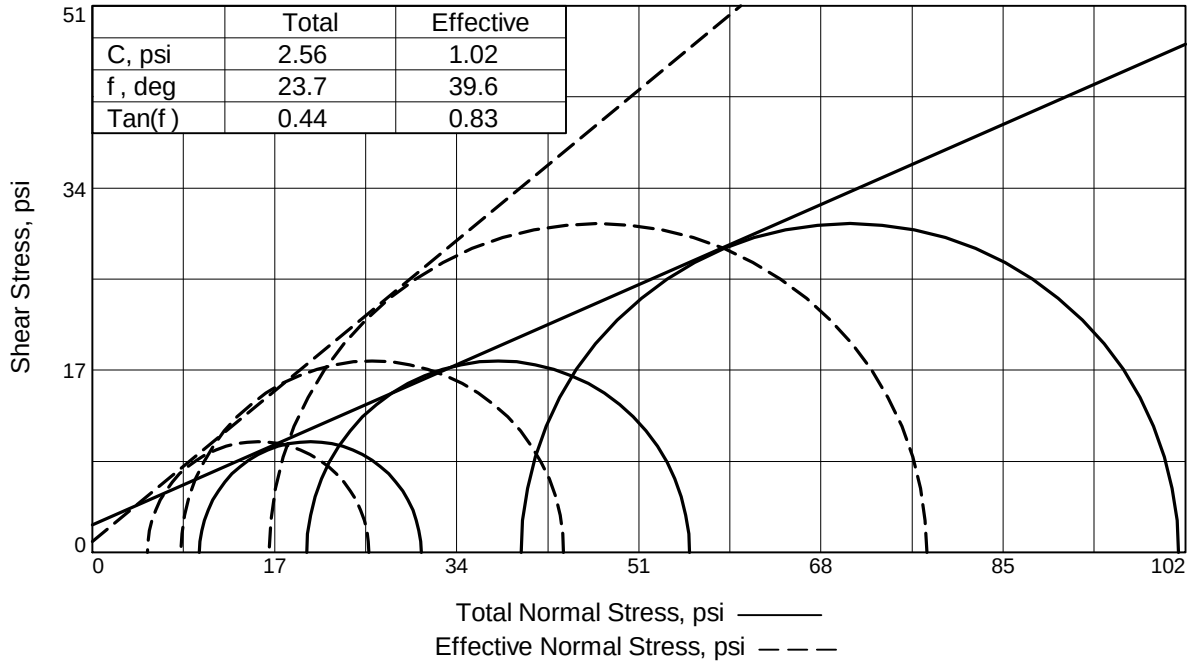
Sample No.	Sample Collected Date	Representative Beginning Station	Representative Ending Station	Average Topsoil Depth (ft)	Estimated Topsoil Volume (cy)	Deleterious Materials (7% max)	Sand Content (10-90%)	Silt and Clay Content (10-90%)	Organic Material (2-20%)	pH (5-7)	Meets ALDOT 2012 Specification Section 650.02(a)
T-1	5/22/20	78+50	115+00	0.69	14,000	0.4	10.4	89.2	10.97	5.4	Yes
T-2	5/22/20	115+00	137+00	0.51	5,000	0.1	7.4	92.5	6.12	5.7	No

TOPSOIL TEST RESULTS TABLE

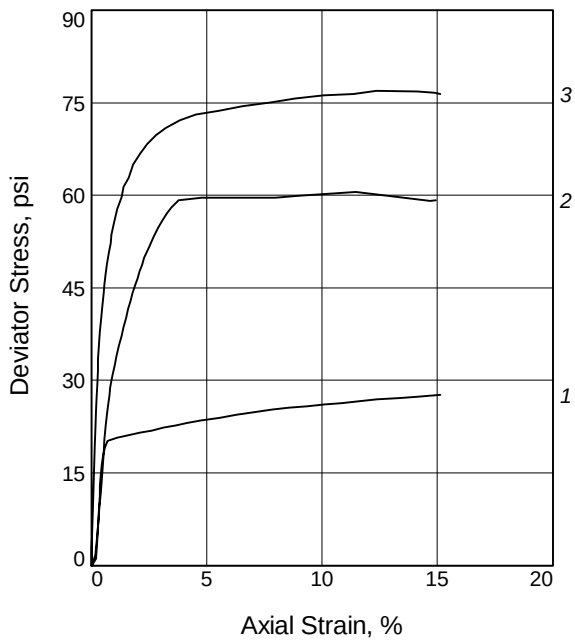
City of Huntsville
71-19-SP08
Old Highway 20 Bridges
Over Norfolk Southern Railroad and Beaverdam Creek
Huntsville, Limestone County

Notes:
Topsoil Requirements per ALDOT Section 650
Deleterious Materials per ASTM D 5268
Sand Content per ASTM D 5268

Silt and Clay per ASTM D 5268
Organic Material per ASTM D 2974 "C"
pH per EPA Method SW-846



	Total	Effective
C, psi	2.56	1.02
f , deg	23.7	39.6
Tan(f)	0.44	0.83



Sample No.		1	2	3
Initial	Water Content, %	27.0	25.2	27.8
	Dry Density, pcf	97.2	97.5	96.4
	Saturation, %	99.3	93.5	100.1
	Void Ratio	0.7333	0.7286	0.7485
	Diameter, in.	2.826	2.862	2.864
	Height, in.	5.691	5.676	5.684
At Test	Water Content, %	28.4	25.9	27.5
	Dry Density, pcf	95.4	99.2	96.7
	Saturation, %	100.0	100.0	100.0
	Void Ratio	0.7663	0.6990	0.7424
	Diameter, in.	2.863	2.849	2.869
	Height, in.	5.652	5.630	5.645
Strain rate, in./min.		0.001	0.001	0.001
Back Pressure, psi		50.0	50.0	50.0
Cell Pressure, psi		60.0	70.0	90.0
Fail. Stress, psi		20.7	35.7	61.4
Excess Pore Pr., psi		4.9	11.7	23.5
Ult. Stress, psi				
Excess Pore Pr., psi				
$\bar{s}_1$ Failure, psi		25.8	44.0	77.9
$\bar{s}_3$ Failure, psi		5.1	8.3	16.5

Type of Test:
CU with Pore Pressures
Sample Type: Tube
Description: Red Clay

LL= N/A **PI=** N/A
Assumed Specific Gravity= 2.7
Remarks:

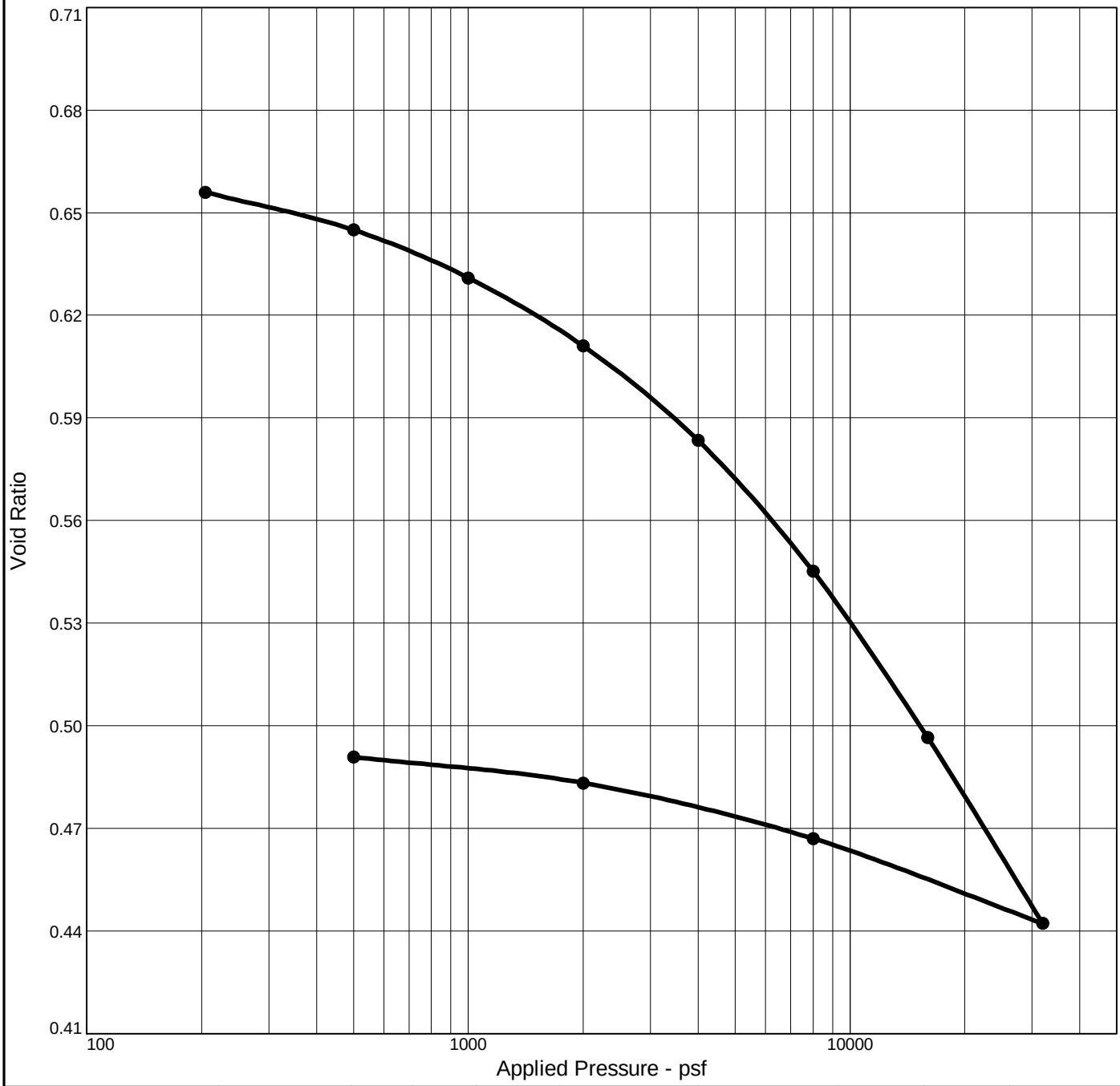
Client: Garver LLC

Project: Old Highway 20 Replacement

Source of Sample: S-15 **Depth:** 5.0-7.0 ft
Sample Number: N/A
Proj. No.: E1185324 **Date Sampled:**

TRIAXIAL SHEAR TEST REPORT
Terracon Consultants, Inc.
Chattanooga, TN

CONSOLIDATION TEST REPORT



Natural		Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (psf)	P_c (psf)	C_c	C_r	Initial Void Ratio
Saturation	Moisture									
93.3 %	22.7 %	101.8	N/A	N/A	2.7	356.3	5252	0.18	0.03	0.656

MATERIAL DESCRIPTION	USCS	AASHTO
Red Clay		

Project No. E1185324 **Client:** Garver LLC

Project: Old Highway 20 Replacement

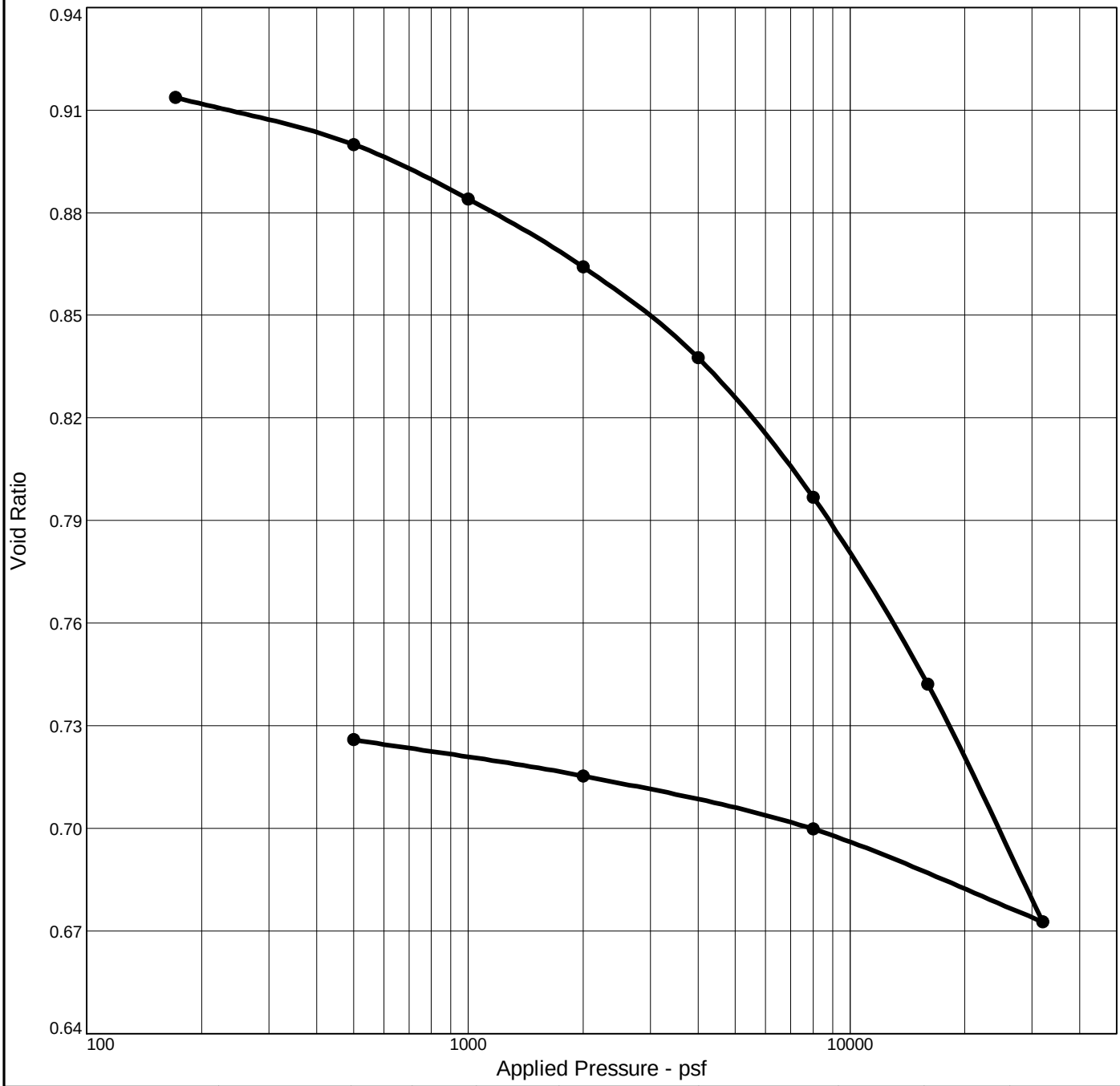
Source of Sample: S-12 **Depth:** 1.5-3.5 ft **Sample Number:** N/A

Remarks:
Swell Pressure of 204.01 psf.

Terracon Consultants, Inc.

Chattanooga, TN

CONSOLIDATION TEST REPORT



Natural		Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (psf)	P_c (psf)	C_c	C_r	Initial Void Ratio
Saturation	Moisture									
88.9 %	30.1 %	88.1	N/A	N/A	2.7	440.5	7266	0.23	0.03	0.914

MATERIAL DESCRIPTION	USCS	AASHTO
Red Clay		

Project No. E1185324 **Client:** Garver LLC

Project: Old Highway 20 Replacement

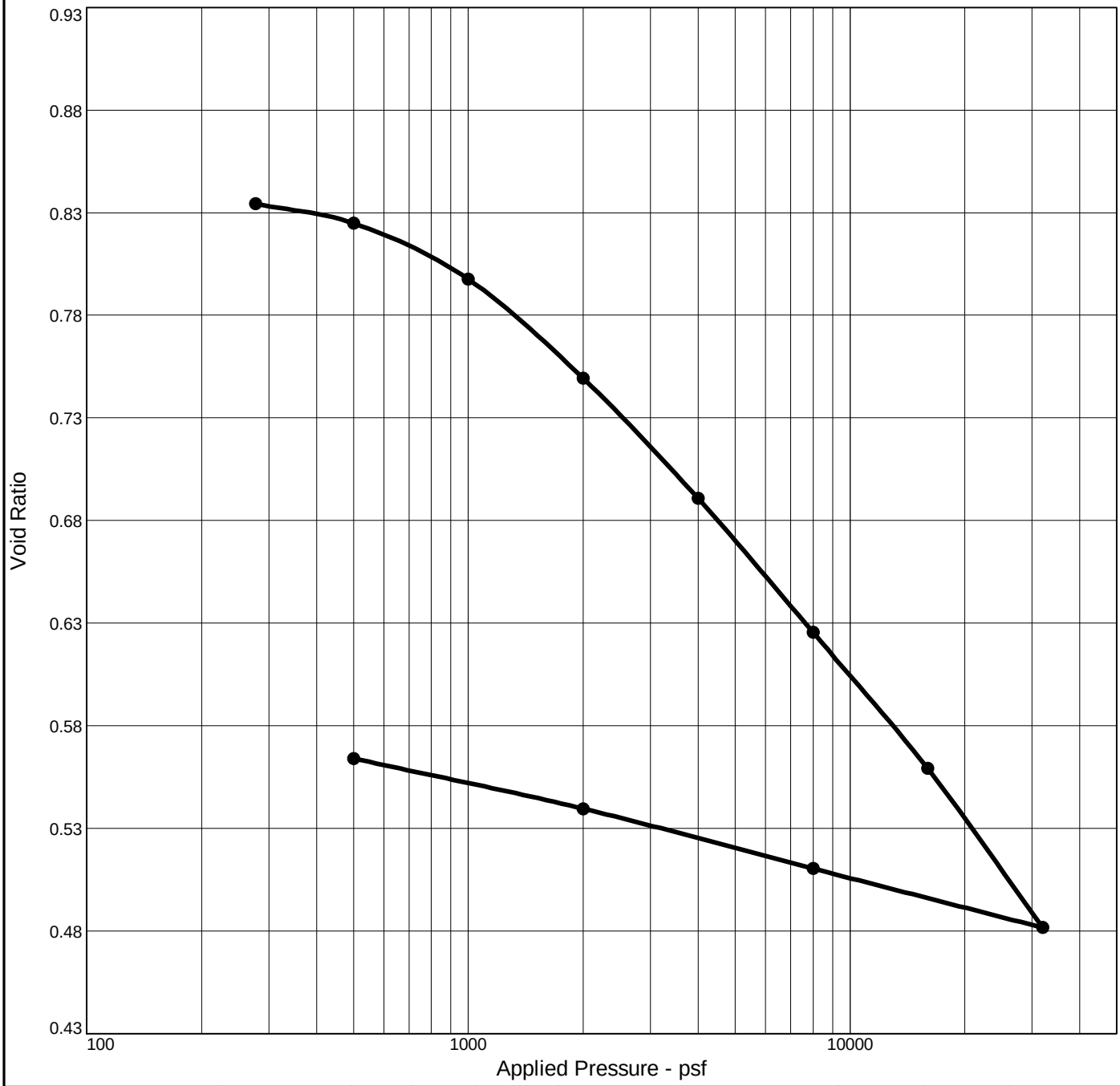
Source of Sample: S-16 **Depth:** 3.0-5.0 ft **Sample Number:** N/A

Remarks:
Swell Pressure of 170.83 psf.

Terracon Consultants, Inc.

Chattanooga, TN

CONSOLIDATION TEST REPORT



Natural		Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (psf)	P_c (psf)	C_c	C_r	Initial Void Ratio
Saturation	Moisture									
83.6 %	25.8 %	91.9	X	X	2.7	459.5	1465	0.22	0.05	0.835

MATERIAL DESCRIPTION	USCS	AASHTO
Gray Clay	X	X

Project No. E1185324 **Client:** Garver LLC

Project: Old Highway 20 Replacement

Source of Sample: BD-8 **Depth:** 3.0-5.0 ft **Sample Number:** N/A

Terracon Consultants, Inc.

Chattanooga, TN

Remarks:

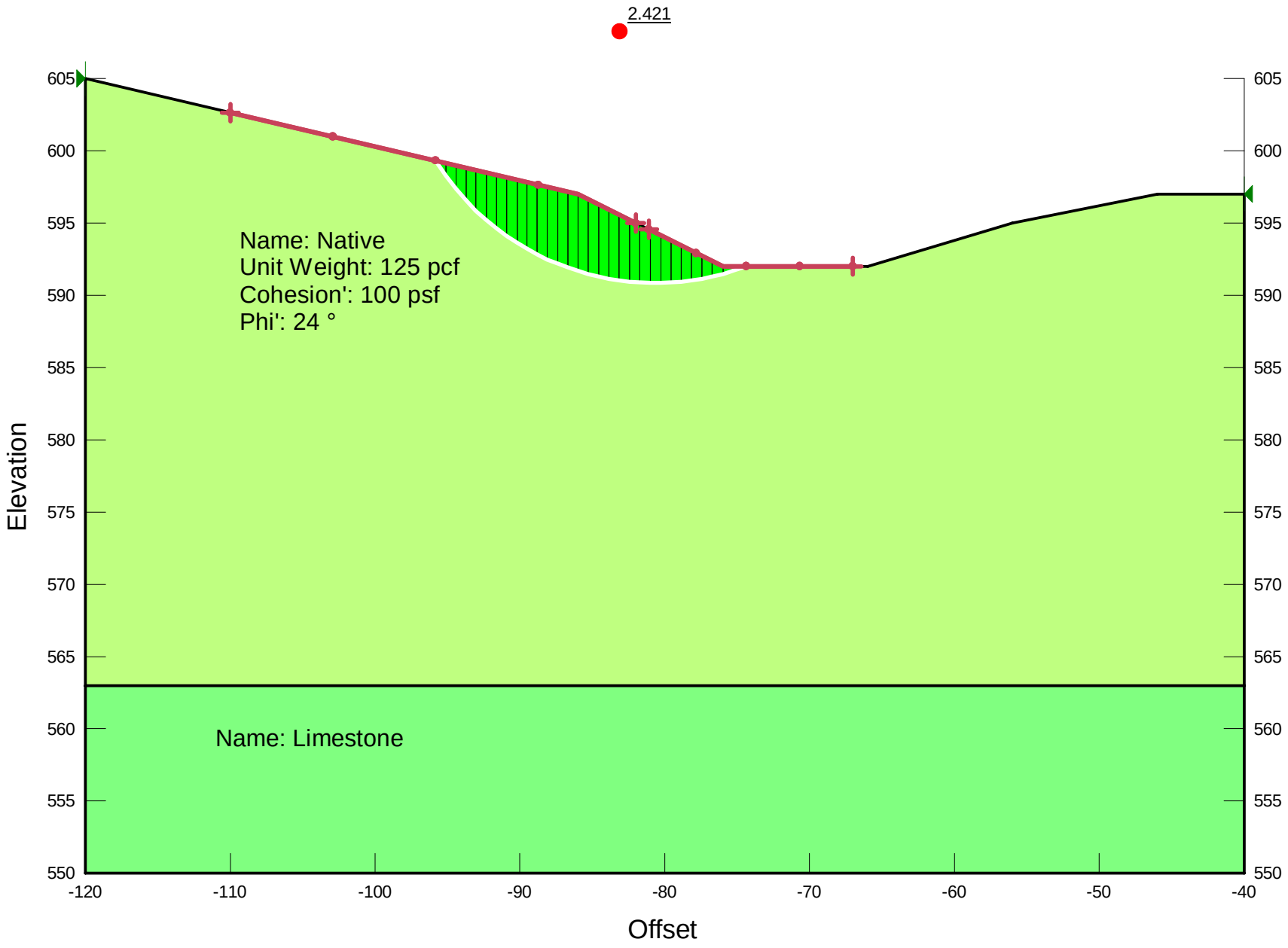
Swell pressure of 276.50 psf.

APPENDIX C:
SLOPE STABILITY

Old Highway 20 Realignment

Station 79+00 Left

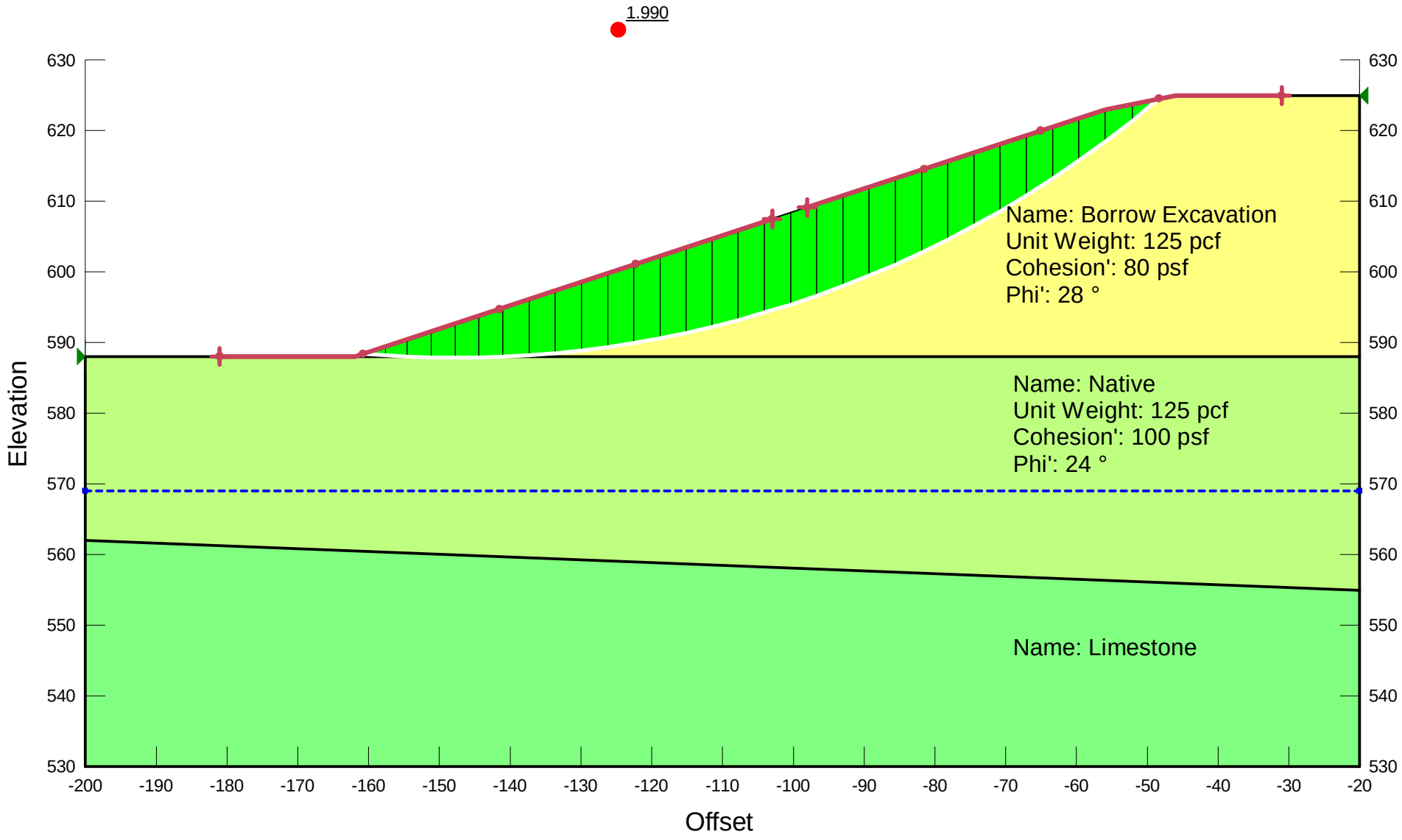
F of S: 2.421



Old Highway 20 Realignment

Station 95+50 Left

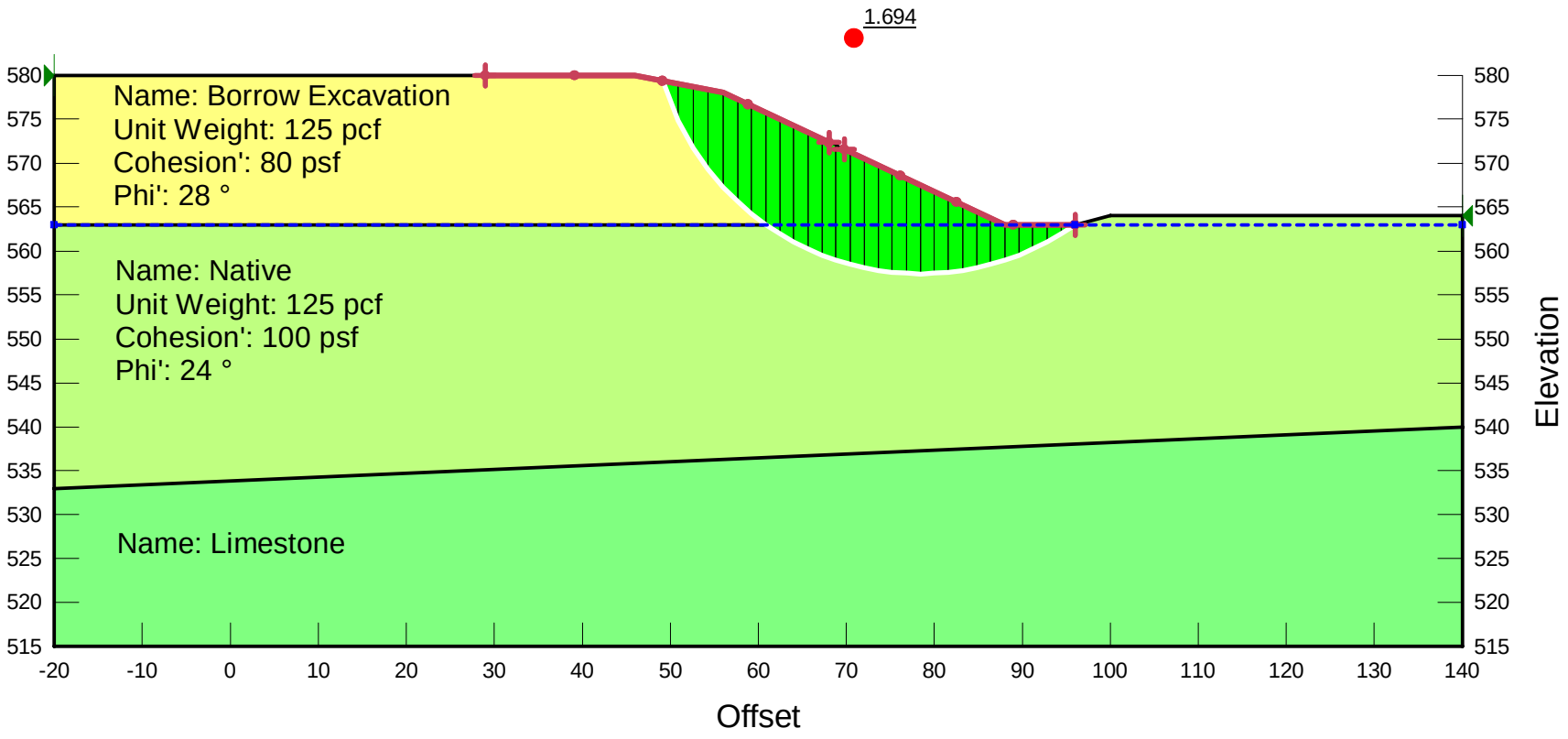
F of S: 1.990



Old Highway 20 Realignment

Station 121+00 RT

F of S: 1.694



APPENDIX D:
SOIL BORING DATA

PROJECT NO.	FISCAL YEAR	SHEET NO.
71-19-SP08		

BORING LOG NO. S-1; STA 79+00 / on CL

Page 1 of 1

PROJECT: Old Highway 20 Realignment
Huntsville, AL

CLIENT: Garver LLC
Huntsville, AL

Northing: 1518985.56 Easting: 354808.26 Surface Elev.: 596.19 (Ft.)

DEPTH	ELEVATION (Ft.)	Description
0.3	596	GRAVEL (3")
0.9	595.5	TOPSOIL (11")
3.5	592.5	SANDY LEAN CLAY, red to light brown, medium stiff, A-6
		SANDY LEAN CLAY, red, stiff to very stiff, A-6
10.0	586	Boring Terminated at 10 Feet

DEPTH (Ft.)	FIELD TEST RESULTS	WATER CONTENT (%)
	3-3-4 N=7	26
5	3-4-5 N=9	
	5-5-6 N=11	28
10	6-8-9 N=17	

WATER LEVEL OBSERVATIONS / SAMPLE TYPE / RECOVERY % / RQD % / ATTERBERG LIMITS (LL-PL-PI) / PERCENT FINES

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
Hollow stem auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

Notes:

WATER LEVEL OBSERVATIONS
Water not observed during drilling

Boring Started: 04-25-2020 Boring Completed: 04-25-2020
Drill Rig: Mobile B-47 Driller: Earth Core, LLC
Project No.: E1185324

BORING LOG NO. S-2; STA 82+00 / on CL

Page 1 of 1

PROJECT: Old Highway 20 Realignment
Huntsville, AL

CLIENT: Garver LLC
Huntsville, AL

Northing: 1518978.68 Easting: 355108.27 Surface Elev.: 593.52 (Ft.)

DEPTH	ELEVATION (Ft.)	Description
0.2	593.5	TOPSOIL (2")
		SANDY LEAN CLAY, trace roots, light brown, medium stiff, A-6
		no roots
6.0	587.5	SANDY LEAN CLAY, light brown to black, stiff to very stiff, A-6
10.0	583.5	Boring Terminated at 10 Feet

DEPTH (Ft.)	FIELD TEST RESULTS	WATER CONTENT (%)
	3-3-3 N=6	23
5	2-3-5 N=8	
	5-6-6 N=12	26
10	8-9-11 N=20	

WATER LEVEL OBSERVATIONS / SAMPLE TYPE / RECOVERY % / RQD % / ATTERBERG LIMITS (LL-PL-PI) / PERCENT FINES

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
Hollow stem auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

Notes:

WATER LEVEL OBSERVATIONS
Water not observed during drilling

Boring Started: 04-25-2020 Boring Completed: 04-25-2020
Drill Rig: Mobile B-47 Driller: Earth Core, LLC
Project No.: E1185324

BORING LOG NO. S-3; STA 85+00 / 50 FT LT of CL

Page 1 of 1

PROJECT: Old Highway 20 Realignment
Huntsville, AL

CLIENT: Garver LLC
Huntsville, AL

Northing: 1519022.94 Easting: 355409.36 Surface Elev.: 591.30 (Ft.)

DEPTH	ELEVATION (Ft.)	Description
0.1	591	TOPSOIL (1 1/2")
		SANDY LEAN CLAY, brown, medium stiff, A-6(13)
3.5	588	
		SANDY LEAN CLAY, red to light brown, stiff, A-6
		becomes tan to red, trace chert fragments
10.0	581.5	Boring Terminated at 10 Feet

DEPTH (Ft.)	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS (LL-PL-PI)	PERCENT FINES
	3-3-3 N=6	19	33-17-16	88
5	5-5-7 N=12			
	6-8-7 N=15			
10	5-7-8 N=15			

WATER LEVEL OBSERVATIONS / SAMPLE TYPE / RECOVERY % / RQD %

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
Hollow stem auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

Notes:

WATER LEVEL OBSERVATIONS
Water not observed during drilling

Boring Started: 04-25-2020 Boring Completed: 04-25-2020
Drill Rig: Mobile B-47 Driller: Earth Core, LLC
Project No.: E1185324

LEGEND

- TOPSOIL
- AASHTO A-6
- AASHTO A-7

CITY OF HUNTSVILLE

Terracon

APPROVED:
MATTHEW MCCULLOUGH, P.E.
GEOTECHNICAL ENGINEER
DATE: JULY 17, 2020

PROJECT NO. 71-19-SP08
OLD HIGHWAY 20 BRIDGE
OVER NORFOLK SOUTHERN RAILROAD
LIMESTONE COUNTY

PRELIMINARY PROJ. NO. 71-19-SP08

TEST BORING RECORD SHEET 1 of 9

PROJECT NO.	FISCAL YEAR	SHEET NO.
71-19-SP08		

BORING LOG NO. S-4; STA 85+00 / on CL

Page 1 of 1

PROJECT: Old Highway 20 Realignment
Huntsville, AL

CLIENT: Garver LLC
Huntsville, AL

Northing: 1518972.68 Easting: 355408.32
Surface Elev.: 591.34 (Ft.)

DEPTH	ELEVATION (Ft.)	DESCRIPTION	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	RECOVERY %	RQD %	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
0.1	591.5	TOPSOIL (1")									
		LEAN CLAY, trace roots, light brown to red, medium stiff, A-6(11)			X	2-3-3 N=6			25	32-19-13	90
3.5	588	SANDY LEAN CLAY, light brown to red, stiff to very stiff, A-6	5		X	5-6-8 N=14					
		becomes tan to red, trace chert fragments			X	6-8-8 N=16			35		
10.0	581.5		10		X	8-9-10 N=19					
		Boring Terminated at 10 Feet									

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
Hollow stem auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

Notes:

WATER LEVEL OBSERVATIONS
Water not observed during drilling

Boring Started: 04-25-2020 | Boring Completed: 04-25-2020
Drill Rig: Mobile B-47 | Driller: Earth Core, LLC
Project No.: E1185324

BORING LOG NO. S-5; STA 88+00 / 70 FT LT of CL

Page 1 of 1

PROJECT: Old Highway 20 Realignment
Huntsville, AL

CLIENT: Garver LLC
Huntsville, AL

Northing: 1519027.38 Easting: 355717.5
Surface Elev.: 589.89 (Ft.)

DEPTH	ELEVATION (Ft.)	DESCRIPTION	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	RECOVERY %	RQD %	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
0.2	589.5	TOPSOIL (2")									
		SANDY LEAN CLAY, trace roots, brown, soft, A-6			X	2-2-2 N=4			23		
		becomes red to light brown, no roots	5		X	2-1-2 N=3					
6.0	584	SANDY LEAN CLAY, red to tan, medium stiff to stiff, A-6(15)			X	3-4-5 N=9			25	36-18-18	86
			10		X	4-4-4 N=8					
				▽							
			15		X	4-5-6 N=11			25		
20.0	570		20		X	4-5-5 N=10					
		Boring Terminated at 20 Feet									

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
Hollow stem auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

Notes:

WATER LEVEL OBSERVATIONS
▽ *Water observed at 13' during drilling*

Boring Started: 04-24-2020 | Boring Completed: 04-24-2020
Drill Rig: Mobile B-47 | Driller: Earth Core, LLC
Project No.: E1185324

BORING LOG NO. S-6; STA 88+00 / on CL

Page 1 of 1

PROJECT: Old Highway 20 Realignment
Huntsville, AL

CLIENT: Garver LLC
Huntsville, AL

Northing: 1518957.75 Easting: 355707.75
Surface Elev.: 589.79 (Ft.)

DEPTH	ELEVATION (Ft.)	DESCRIPTION	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	RECOVERY %	RQD %	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
0.2	589.5	TOPSOIL (2")									
		SANDY LEAN CLAY, trace roots, brown, medium stiff, A-6			X	3-3-3 N=6			26		
3.5	586.5	SANDY LEAN CLAY, brown to red, stiff to very stiff, A-6	5		X	3-4-5 N=9					
					X	4-5-5 N=10			29		
			10		X	5-5-6 N=11					
			15		X	7-8-10 N=18					
20.0	570	trace chert fragments	20		X	10-8-10 N=18					
		Boring Terminated at 20 Feet									

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
Hollow stem auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

Notes:

WATER LEVEL OBSERVATIONS
Water not observed during drilling

Boring Started: 04-25-2020 | Boring Completed: 04-25-2020
Drill Rig: Mobile B-47 | Driller: Earth Core, LLC
Project No.: E1185324

LEGEND

- TOPSOIL
- AASHTO A-6
- AASHTO A-7

CITY OF HUNTSVILLE

Terracon

APPROVED:
MATTHEW MCCULLOUGH, P.E.
GEOTECHNICAL ENGINEER
DATE: JULY 17, 2020

PROJECT NO. 71-19-SP08
OLD HIGHWAY 20 BRIDGE
OVER NORFOLK SOUTHERN RAILROAD
LIMESTONE COUNTY

PRELIMINARY PROJ. NO. 71-19-SP08

TEST BORING RECORD SHEET 2 of 9

PROJECT NO.	FISCAL YEAR	SHEET NO.
71-19-SP08		

BORING LOG NO. S-7; STA 88+00 / 70 FT RT of CL

Page 1 of 1

PROJECT: Old Highway 20 Realignment, Huntsville, AL

CLIENT: Garver LLC, Huntsville, AL

Northing: 1518888.99 Easting: 355698.22 Surface Elev.: 587.61 (Ft.)

DEPTH	ELEVATION (Ft.)	Description
0.9	586.5	TOPSOIL (11")
3.5	584	SANDY LEAN CLAY, trace roots, brown, medium stiff, A-6
20.0	567.5	SANDY LEAN CLAY, red to light brown, stiff to very stiff, A-6

Boring Terminated at 20 Feet

Depth (Ft.)	Field Test Results	Water Content (%)
	2-3-3 N=6	28
5	3-5-6 N=11	
	6-8-13 N=21	24
10	6-8-8 N=16	
15	6-5-6 N=11	
20	3-4-5 N=9	

Water Level Observations: ▽ Water observed at 10' during drilling

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method: Hollow stem auger

Abandonment Method: Boring backfilled with auger cuttings upon completion.

Notes:

Boring Started: 04-24-2020 Boring Completed: 04-24-2020

Drill Rig: Mobile B-47 Driller: Earth Core, LLC

Project No.: E1185324

BORING LOG NO. S-8; STA 91+00 / 90 FT RT of CL

Page 1 of 1

PROJECT: Old Highway 20 Realignment, Huntsville, AL

CLIENT: Garver LLC, Huntsville, AL

Northing: 1518964.23 Easting: 356030.4 Surface Elev.: 590.65 (Ft.)

DEPTH	ELEVATION (Ft.)	Description
0.2	590.5	TOPSOIL (2")
		SANDY LEAN CLAY, brown, medium stiff, A-6
		becomes red to light brown
6.0	584.5	ELASTIC SILT, red to light brown, stiff to very stiff, A-7-5(17)
		becomes tan to red, with chert fragments
30.0	560.5	

Boring Terminated at 30 Feet

Depth (Ft.)	Field Test Results	Water Content (%)	Atterberg Limits LL-PL-PI	Percent Fines
	3-3-4 N=7	25		
	4-4-4 N=8			
5	5-6-9 N=15	32	50-36-14	91
10	5-5-7 N=12			
15	9-11-13 N=24	30		
20	12-15-14 N=29			
25	8-13-15 N=28	39		
30	9-13-12 N=25			

Water Level Observations: Water not observed during drilling

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method: Hollow stem auger

Abandonment Method: Boring backfilled with auger cuttings upon completion.

Notes:

Boring Started: 04-25-2020 Boring Completed: 04-25-2020

Drill Rig: Mobile B-47 Driller: Earth Core, LLC

Project No.: E1185324

BORING LOG NO. S-9; STA 91+00 / on CL

Page 1 of 1

PROJECT: Old Highway 20 Realignment, Huntsville, AL

CLIENT: Garver LLC, Huntsville, AL

Northing: 1518880.61 Easting: 355996.84 Surface Elev.: 587.66 (Ft.)

DEPTH	ELEVATION (Ft.)	Description
1.0	586.5	TOPSOIL (12")
		LEAN CLAY, brown to red, medium stiff to stiff, A-7-6(16)
		trace chert fragments
18.5	569	SANDY LEAN CLAY, red, very stiff, some chert fragments, A-6
30.0	557.5	

Boring Terminated at 30 Feet

Depth (Ft.)	Field Test Results	Water Content (%)	Atterberg Limits LL-PL-PI	Percent Fines
	3-3-2 N=5			
	3-5-4 N=9	28	41-23-18	86
5	2-3-5 N=8			
	4-5-5 N=10			
10	3-6-6 N=12			
15	6-8-11 N=19			
20	8-11-13 N=24			
25	8-9-16 N=25			
30				

Water Level Observations: ▽ Water observed at 23' during drilling

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method: Hollow stem auger

Abandonment Method: Boring backfilled with auger cuttings upon completion.

Notes:

Boring Started: 04-24-2020 Boring Completed: 04-24-2020

Drill Rig: Mobile B-47 Driller: Earth Core, LLC

Project No.: E1185324

LEGEND

- TOPSOIL
- AASHTO A-6
- AASHTO A-7

CITY OF HUNTSVILLE

Terracon

APPROVED:

MATTHEW MCCULLOUGH, P.E.

GEOTECHNICAL ENGINEER

DATE: JULY 17, 2020

PROJECT NO. 71-19-SP08
OLD HIGHWAY 20 BRIDGE
OVER NORFOLK SOUTHERN RAILROAD
LIMESTONE COUNTY

PRELIMINARY PROJ. NO. 71-19-SP08

TEST BORING RECORD SHEET 3 of 9

PROJECT NO.	FISCAL YEAR	SHEET NO.
71-19-SP08		

BORING LOG NO. S-10; STA 91+00 / 90 FT RT of CL

Page 1 of 1

PROJECT: Old Highway 20 Realignment
Huntsville, AL

CLIENT: Garver LLC
Huntsville, AL

Northing: 1518797.16 Easting: 355963.56 Surface Elev.: 586.62 (Ft.)

DEPTH	ELEVATION (Ft.)	FIELD TEST RESULTS	WATER CONTENT (%)
0.9	585.5	TOPSOIL (11")	
		SANDY LEAN CLAY, brown, medium stiff, A-6	
		4-3-3 N=6	32
3.5	583	SANDY LEAN CLAY, brown, stiff, A-6	
		3-5-6 N=11	
		3-4-6 N=10	25
		4-6-4 N=10	
13.5	573	SANDY LEAN CLAY, tan to red, very stiff, trace chert fragments, A-6	
		6-8-8 N=16	
		some rock and chert fragments	
		8-12-9 N=21	
		6-8-13 N=21	
30.0	556.5	10-12-11 N=23	
		Boring Terminated at 30 Feet	

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method: Hollow stem auger

Abandonment Method: Boring backfilled with auger cuttings upon completion.

Notes:

WATER LEVEL OBSERVATIONS
Water observed at 24' during drilling

Boring Started: 04-24-2020 Boring Completed: 04-24-2020
Drill Rig: Mobile B-47 Driller: Earth Core, LLC
Project No.: E1185324

BORING LOG NO. S-11; STA 94+00 / 100 FT LT of CL

Page 1 of 1

PROJECT: Old Highway 20 Realignment
Huntsville, AL

CLIENT: Garver LLC
Huntsville, AL

Northing: 1518827.81 Easting: 356312.91 Surface Elev.: 586.99 (Ft.)

DEPTH	ELEVATION (Ft.)	FIELD TEST RESULTS	WATER CONTENT (%)	LL-PL-PI	PERCENT FINES
0.1	587	TOPSOIL (1")			
		SANDY LEAN CLAY, brown, medium stiff, A-6(12)			
		3-3-3 N=6	28	32-17-15	86
		3-3-2 N=5			
6.0	581	SANDY LEAN CLAY, red, stiff, A-6			
		5-6-6 N=12	25		
		trace chert fragments			
		4-6-8 N=14			
13.5	573.5	SANDY LEAN CLAY, red to tan, very stiff to hard, A-6			
		8-9-10 N=19	31		
		6-8-9 N=17			
24.0	563	Auger Refusal at 24 Feet			
		21-50/2" N=50+			

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method: Hollow stem auger

Abandonment Method: Boring backfilled with auger cuttings upon completion.

Notes:

WATER LEVEL OBSERVATIONS
Water observed at 23' during drilling

Boring Started: 04-24-2020 Boring Completed: 04-24-2020
Drill Rig: Mobile B-47 Driller: Earth Core, LLC
Project No.: E1185324

BORING LOG NO. S-12; STA 94+00 / on CL

Page 1 of 1

PROJECT: Old Highway 20 Realignment
Huntsville, AL

CLIENT: Garver LLC
Huntsville, AL

Northing: 1518741.13 Easting: 356282.06 Surface Elev.: 586.54 (Ft.)

DEPTH	ELEVATION (Ft.)	FIELD TEST RESULTS
0.8	585.5	TOPSOIL (10")
		SANDY LEAN CLAY, brown, medium stiff, A-6
3.5	583	SANDY LEAN CLAY, brown, stiff to very stiff, A-6
		3-4-7 N=11
		6-6-7 N=13
		8-8-8 N=16
		trace chert fragments
		6-8-8 N=16
		chert content increases
		18-12-10 N=22
		8-12-12 N=24
28.5	558	NO RECOVERY, SANDY LEAN CLAY, brown, soft, A-6
		2-2-2 N=4
32.0	554.5	Auger Refusal at 32 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method: Hollow stem auger

Abandonment Method: Boring backfilled with auger cuttings upon completion.

Notes:

WATER LEVEL OBSERVATIONS
Water observed at 18' during drilling
Water observed at 20' on 5/20/2020

Boring Started: 04-24-2020 Boring Completed: 04-24-2020
Drill Rig: Mobile B-47 Driller: Earth Core, LLC
Project No.: E1185324

LEGEND

- TOPSOIL
- AASHTO A-6
- AASHTO A-7

CITY OF HUNTSVILLE

Terracon

APPROVED:
MATTHEW MCCULLOUGH, P.E.
GEOTECHNICAL ENGINEER
DATE: JULY 17, 2020

PROJECT NO. 71-19-SP08
OLD HIGHWAY 20 BRIDGE
OVER NORFOLK SOUTHERN RAILROAD
LIMESTONE COUNTY

PRELIMINARY PROJ. NO. 71-19-SP08

TEST BORING RECORD SHEET 4 of 9

PROJECT NO.	FISCAL YEAR	SHEET NO.
71-19-SP08		

BORING LOG NO. S-13; STA 94+00 / 100 FT RT of CL

Page 1 of 1

PROJECT: Old Highway 20 Realignment
Huntsville, AL

CLIENT: Garver LLC
Huntsville, AL

Northing: 1518655.08 Easting: 356211.29 Surface Elev.: 587.07 (Ft.)

DEPTH	ELEVATION (Ft.)	Description
0.9	586	TOPSOIL (11")
		SANDY LEAN CLAY, some roots, trace chert fragments, brown, medium stiff, A-6
		becomes red, no roots
6.0	581	ELASTIC SILT, red, stiff to very stiff, A-7-5(20)
		trace chert fragments
		chert content increases
		becomes brown
41.0	546	Auger Refusal at 41 Feet

DEPTH (Ft.)	FIELD TEST RESULTS	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
	2-3-3 N=6	27		
5	3-3-4 N=7			
	6-8-9 N=17	31		
10	6-9-10 N=19	33	52-34-18	90
15	7-6-8 N=14	32		
20	8-8-8 N=16			
25	6-8-9 N=17	33		
30	8-11-13 N=24			
35	6-12-6 N=18			
40	3-12-4 N=16			

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
Hollow stem auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

Notes:

WATER LEVEL OBSERVATIONS
Water observed at 27' during drilling

Boring Started: 04-24-2020 Boring Completed: 04-24-2020
Drill Rig: Mobile B-47 Driller: Earth Core, LLC
Project No.: E1185324

BORING LOG NO. S-14; STA 102+00 / 100 FT LT of CL

Page 1 of 1

PROJECT: Old Highway 20 Realignment
Huntsville, AL

CLIENT: Garver LLC
Huntsville, AL

Northing: 1518429.28 Easting: 356997.14 Surface Elev.: 591.58 (Ft.)

DEPTH	ELEVATION (Ft.)	Description
0.8	591	TOPSOIL (10")
		SANDY LEAN CLAY, red, stiff to very stiff, A-6
		trace chert fragments
		chert content increases
28.5	563	SANDY LEAN CLAY, tan to light purple, medium stiff, A-6
32.0	559.5	Auger Refusal at 32 Feet

DEPTH (Ft.)	FIELD TEST RESULTS
	6-5-5 N=10
5	
	6-8-9 N=17
10	7-8-11 N=19
15	6-6-7 N=13
20	6-8-9 N=17
25	5-6-6 N=12
30	4-6-2 N=8

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
Hollow stem auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

Notes:

WATER LEVEL OBSERVATIONS
Water observed at 23.5' during drilling

Boring Started: 04-22-2020 Boring Completed: 04-22-2020
Drill Rig: Mobile B-47 Driller: Earth Core, LLC
Project No.: E1185324

BORING LOG NO. S-15; STA 102+00 / on CL

Page 1 of 1

PROJECT: Old Highway 20 Realignment
Huntsville, AL

CLIENT: Garver LLC
Huntsville, AL

Northing: 1518339.59 Easting: 356953.68 Surface Elev.: 590.38 (Ft.)

DEPTH	ELEVATION (Ft.)	Description
0.8	589.5	TOPSOIL (10")
		SANDY LEAN CLAY, red, medium stiff, A-6
3.5	587	SANDY LEAN CLAY, red, stiff, A-6
		some chert fragments
18.5	572	ELASTIC SILT, with chert fragments, red, very stiff, A-7
		more light brown
33.0	557.5	Auger Refusal at 33 Feet

DEPTH (Ft.)	FIELD TEST RESULTS	WATER CONTENT (%)
	3-3-3 N=6	28.4
5	4-6-7 N=13	
10	4-5-8 N=13	30.1
15	4-7-8 N=15	
20	6-8-8 N=16	34.8
25	6-6-18 N=24	
30	6-8-9 N=17	

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
Hollow stem auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

Notes:

WATER LEVEL OBSERVATIONS
Water observed at 23.5' during drilling
Water observed at 25' on 5/20/2020

Boring Started: 04-22-2020 Boring Completed: 04-22-2020
Drill Rig: Mobile B-47 Driller: Earth Core, LLC
Project No.: E1185324

LEGEND

- TOPSOIL
- AASHTO A-6
- AASHTO A-7

CITY OF HUNTSVILLE

Terracon

APPROVED:
MATTHEW MCCULLOUGH, P.E.

GEOTECHNICAL ENGINEER

DATE: JULY 17, 2020

PROJECT NO. 71-19-SP08
OLD HIGHWAY 20 BRIDGE
OVER NORFOLK SOUTHERN RAILROAD
LIMESTONE COUNTY

PRELIMINARY PROJ. NO. 71-19-SP08

TEST BORING RECORD SHEET 5 of 9

PROJECT NO.	FISCAL YEAR	SHEET NO.
71-19-SP08		

BORING LOG NO. S-16; STA 102+00 / 100 FT RT of CL

Page 1 of 1

PROJECT: Old Highway 20 Realignment
Huntsville, AL

CLIENT: Garver LLC
Huntsville, AL

Northing: 1518249.06 Easting: 356910.58 Surface Elev.: 588.80 (Ft.)

DEPTH	ELEVATION (Ft.)	Description
0.8	588	TOPSOIL (10")
		SANDY LEAN CLAY, trace chert fragments, red, medium stiff, A-6
6.0	583	ELASTIC SILT WITH SAND, red, very stiff, A-7-5(20)
		some chert fragments
18.5	570.5	SANDY LEAN CLAY, red, medium stiff, A-6
23.5	565.5	SANDY LEAN CLAY, red, hard, A-6
25.0	564	Auger Refusal at 25 Feet

DEPTH (Ft.)	FIELD TEST RESULTS	WATER CONTENT (%)	LL-PL-PI	PERCENT FINES
	3-3-3 N=6	28		
5				
	6-10-12 N=22			
	8-11-15 N=26	28	53-38-15	75
10				
15	10-8-10 N=18			
20	3-2-3 N=5			
25	50/2" N=50+			

WATER LEVEL OBSERVATIONS: ▽ Water observed at 23' during drilling

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method: Hollow stem auger

Abandonment Method: Boring backfilled with auger cuttings upon completion.

Notes:

Boring Started: 04-22-2020 Boring Completed: 04-22-2020
Drill Rig: Mobile B-47 Driller: Earth Core, LLC
Project No.: E1185324

BORING LOG NO. S-17; STA 106+00 / 80 FT LT of CL

Page 1 of 1

PROJECT: Old Highway 20 Realignment
Huntsville, AL

CLIENT: Garver LLC
Huntsville, AL

Northing: 1518307.16 Easting: 357346.07 Surface Elev.: 587.99 (Ft.)

DEPTH	ELEVATION (Ft.)	Description
0.8	587	TOPSOIL (10")
		SANDY LEAN CLAY, trace chert fragments, red to light brown, medium stiff, A-7-6(18)
3.5	584.5	SANDY LEAN CLAY, red, stiff to very stiff, A-6
		some chert fragments
		chert content increases
28.5	559.5	SANDY LEAN CLAY, red, soft, A-6
32.0	556	SANDY LEAN CLAY, red, hard, A-6
33.5	554.5	Auger Refusal at 33.5 Feet

DEPTH (Ft.)	FIELD TEST RESULTS	WATER CONTENT (%)	LL-PL-PI	PERCENT FINES
	3-2-3 N=5	26	41-21-20	86
5	6-6-10 N=16			
	10-12-9 N=21	31		
10	8-12-10 N=22			
15	4-6-6 N=12	33		
20	6-6-8 N=14			
25	4-5-5 N=10			
30	WOH			
	50/1" N=50+			

WATER LEVEL OBSERVATIONS: ▽ Water observed at 23' during drilling

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method: Hollow stem auger

Abandonment Method: Boring backfilled with auger cuttings upon completion.

Notes:

Boring Started: 04-21-2020 Boring Completed: 04-21-2020
Drill Rig: Mobile B-47 Driller: Earth Core, LLC
Project No.: E1185324

BORING LOG NO. S-18; STA 106+00 / on CL

Page 1 of 1

PROJECT: Old Highway 20 Realignment
Huntsville, AL

CLIENT: Garver LLC
Huntsville, AL

Northing: 1518228.85 Easting: 357336.18 Surface Elev.: 587.28 (Ft.)

DEPTH	ELEVATION (Ft.)	Description
0.8	586.5	TOPSOIL (10")
		SANDY LEAN CLAY, trace chert fragments, red to light brown, stiff to very stiff, A-6
		more tan, chert content increases
18.5	569	SANDY LEAN CLAY, tan to red, hard, A-6
21.0	566.5	Auger Refusal at 21 Feet

DEPTH (Ft.)	FIELD TEST RESULTS	WATER CONTENT (%)	LL-PL-PI	PERCENT FINES
	5-5-4 N=9			
5	7-6-6 N=12			
	8-12-11 N=23	31		
10	7-6-11 N=17	31		
15	6-7-8 N=15			
20	3-50/2" N=50+			

WATER LEVEL OBSERVATIONS: ▽ Water observed at 19' during drilling

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method: Hollow stem auger

Abandonment Method: Boring backfilled with auger cuttings upon completion.

Notes:

Boring Started: 04-22-2020 Boring Completed: 04-22-2020
Drill Rig: Mobile B-47 Driller: Earth Core, LLC
Project No.: E1185324

LEGEND

- TOPSOIL
- AASHTO A-6
- AASHTO A-7

CITY OF HUNTSVILLE

Terracon

APPROVED:
MATTHEW MCCULLOUGH, P.E.

GEOTECHNICAL ENGINEER

DATE: JULY 17, 2020

PROJECT NO. 71-19-SP08
OLD HIGHWAY 20 BRIDGE
OVER NORFOLK SOUTHERN RAILROAD
LIMESTONE COUNTY

PRELIMINARY PROJ. NO. 71-19-SP08

TEST BORING RECORD SHEET 6 of 9

PROJECT NO.	FISCAL YEAR	SHEET NO.
71-19-SP08		

BORING LOG NO. S-19; STA 106+00 / 80 FT RT of CL

Page 1 of 1

PROJECT: Old Highway 20 Realignment
Huntsville, AL

CLIENT: Garver LLC
Huntsville, AL

Northing: 1518149.29 Easting: 357326.29 Surface Elev.: 586.61 (Ft.)

DEPTH	ELEVATION (Ft.)	FIELD TEST RESULTS	WATER CONTENT (%)
0.8	586	TOPSOIL (10")	
		SANDY LEAN CLAY, red, medium stiff to stiff, A-6	
		2-4-4 N=8	28
		6-7-8 N=15	
		7-7-7 N=14	32
8.5	578		
		SANDY LEAN CLAY, some chert fragments, red, stiff to very stiff, A-6	
		8-6-11 N=17	
		5-6-5 N=11	
18.5	568		
		SANDY LEAN CLAY, some chert fragments, red, soft, A-6	
		2-2-2 N=4	
23.0	563.5		

Auger Refusal at 23 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
Hollow stem auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

Notes:

WATER LEVEL OBSERVATIONS
Water observed at 19.5' during drilling

Boring Started: 04-22-2020 Boring Completed: 04-22-2020
Drill Rig: Mobile B-47 Driller: Earth Core, LLC
Project No.: E1185324

BORING LOG NO. S-20; STA 109+00 / 70 FT LT of CL

Page 1 of 1

PROJECT: Old Highway 20 Realignment
Huntsville, AL

CLIENT: Garver LLC
Huntsville, AL

Northing: 1518297 Easting: 357627.33 Surface Elev.: 587.86 (Ft.)

DEPTH	ELEVATION (Ft.)	FIELD TEST RESULTS	WATER CONTENT (%)	LL-PL-PI	PERCENT FINES
0.8	587	TOPSOIL (10")			
		SANDY LEAN CLAY, red, stiff, A-6			
		5-5-6 N=11	28		
3.5	584.5				
		ELASTIC SILT, red, very stiff, A-7-5(15)			
		4-6-10 N=16	32	50-38-12	90
		10-11-12 N=23			
		6-11-12 N=23	34		
		stiff to very stiff			
		6-6-9 N=15			
		trace rock fragments, red to tan			
		5-7-9 N=16			
20.0	568				

Boring Terminated at 20 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
Hollow stem auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

Notes:

WATER LEVEL OBSERVATIONS
Water not observed during drilling

Boring Started: 04-21-2020 Boring Completed: 04-21-2020
Drill Rig: Mobile B-47 Driller: Earth Core, LLC
Project No.: E1185324

BORING LOG NO. S-21; STA 109+00 / on CL

Page 1 of 1

PROJECT: Old Highway 20 Realignment
Huntsville, AL

CLIENT: Garver LLC
Huntsville, AL

Northing: 1518227.94 Easting: 357635.65 Surface Elev.: 587.54 (Ft.)

DEPTH	ELEVATION (Ft.)	FIELD TEST RESULTS	WATER CONTENT (%)	LL-PL-PI	PERCENT FINES
0.8	586.5	TOPSOIL (10")			
		SANDY LEAN CLAY, trace chert fragments, red to light brown, stiff to very stiff, A-6			
		4-4-5 N=9	27		
		trace roots			
		4-6-8 N=14			
		9-11-14 N=25			
8.5	579				
		ELASTIC SILT WITH SAND, red, stiff to very stiff, A-7-5(21)			
		9-12-15 N=27	32	58-39-19	85
		trace chert fragments			
		5-5-7 N=12			
		chert content increases			
		5-11-12 N=23			
20.0	567.5				

Boring Terminated at 20 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
Hollow stem auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

Notes:

WATER LEVEL OBSERVATIONS
Water not observed during drilling

Boring Started: 04-21-2020 Boring Completed: 04-21-2020
Drill Rig: Mobile B-47 Driller: Earth Core, LLC
Project No.: E1185324

LEGEND

- TOPSOIL
- AASHTO A-6
- AASHTO A-7

CITY OF HUNTSVILLE

Terracon

APPROVED:
MATTHEW MCCULLOUGH, P.E.
GEOTECHNICAL ENGINEER
DATE: JULY 17, 2020

PROJECT NO. 71-19-SP08
OLD HIGHWAY 20 BRIDGE
OVER NORFOLK SOUTHERN RAILROAD
LIMESTONE COUNTY

PRELIMINARY PROJ. NO. 71-19-SP08

TEST BORING RECORD SHEET 7 of 9

PROJECT NO.	FISCAL YEAR	SHEET NO.
71-19-SP08		

BORING LOG NO. S-22; STA 109+00 / 70 FT RT of CL

Page 1 of 1

PROJECT: Old Highway 20 Realignment
Huntsville, AL

CLIENT: Garver LLC
Huntsville, AL

Northing: 1518158.53 Easting: 357643.89 Surface Elev.: 587.05 (Ft.)

DEPTH	ELEVATION (Ft.)	Description	Depth (Ft.)	Field Test Results	Water Content (%)	LL-PL-PI	Percent Fines
0.8	586	TOPSOIL (10")					
3.5	583.5	SANDY LEAN CLAY, trace chert fragments, red to light brown, medium stiff, A-6		3-3-4 N=7	27		
		SANDY LEAN CLAY, red to light brown, stiff to very stiff, A-6	5	3-5-8 N=13			
				3-10-12 N=22	31		
		trace chert fragments	10	6-8-7 N=15			
13.5	573.5	ELASTIC SILT, red, very stiff, A-7	15	8-12-11 N=23	32		
20.0	567	tan to gray, stiff	20	4-6-5 N=11			

Boring Terminated at 20 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method: Hollow stem auger

Abandonment Method: Boring backfilled with auger cuttings upon completion.

Notes:

WATER LEVEL OBSERVATIONS
Water not observed during drilling

Boring Started: 04-21-2020 Boring Completed: 04-21-2020
Drill Rig: Mobile B-47 Driller: Earth Core, LLC
Project No.: E1185324

BORING LOG NO. S-23; STA 112+00 / 50 FT LT of CL

Page 1 of 1

PROJECT: Old Highway 20 Realignment
Huntsville, AL

CLIENT: Garver LLC
Huntsville, AL

Northing: 1518344.63 Easting: 357908.62 Surface Elev.: 584.51 (Ft.)

DEPTH	ELEVATION (Ft.)	Description	Depth (Ft.)	Field Test Results	Water Content (%)	LL-PL-PI	Percent Fines
0.8	583.5	TOPSOIL (10")					
		SANDY LEAN CLAY, red to light brown, stiff to very stiff, A-6(17)		3-4-5 N=9	23	37-18-19	90
			5	5-6-6 N=12			
				6-7-10 N=17			
			10	6-8-8 N=16			
15.0	569.5		15	7-8-8 N=16			

Boring Terminated at 15 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method: Hollow stem auger

Abandonment Method: Boring backfilled with auger cuttings upon completion.

Notes:

WATER LEVEL OBSERVATIONS
Water not observed during drilling

Boring Started: 04-21-2020 Boring Completed: 04-21-2020
Drill Rig: Mobile B-47 Driller: Earth Core, LLC
Project No.: E1185324

BORING LOG NO. S-24; STA 112+00 / on CL

Page 1 of 1

PROJECT: Old Highway 20 Realignment
Huntsville, AL

CLIENT: Garver LLC
Huntsville, AL

Northing: 1518298.19 Easting: 357926.02 Surface Elev.: 584.06 (Ft.)

DEPTH	ELEVATION (Ft.)	Description	Depth (Ft.)	Field Test Results	Water Content (%)	LL-PL-PI	Percent Fines
0.8	583	TOPSOIL (10")					
		SANDY LEAN CLAY, trace chert fragments, red to light brown, stiff to very stiff, A-7-6(22)		3-4-6 N=10	23		
			5	4-6-7 N=13			
		chert content decreases		7-8-9 N=17	31	46-23-23	89
			10	7-8-7 N=15			
15.0	569		15	5-5-7 N=12	31		

Boring Terminated at 15 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method: Hollow stem auger

Abandonment Method: Boring backfilled with auger cuttings upon completion.

Notes:

WATER LEVEL OBSERVATIONS
Water not observed during drilling

Boring Started: 04-21-2020 Boring Completed: 04-21-2020
Drill Rig: Mobile B-47 Driller: Earth Core, LLC
Project No.: E1185324

LEGEND

- TOPSOIL
- AASHTO A-6
- AASHTO A-7

CITY OF HUNTSVILLE

Terracon

APPROVED:
MATTHEW MCCULLOUGH, P.E.
GEOTECHNICAL ENGINEER
DATE: JULY 17, 2020

PROJECT NO. 71-19-SP08
OLD HIGHWAY 20 BRIDGE
OVER NORFOLK SOUTHERN RAILROAD
LIMESTONE COUNTY

PRELIMINARY PROJ. NO. 71-19-SP08

TEST BORING RECORD SHEET 8 of 9

PROJECT NO.	FISCAL YEAR	SHEET NO.
71-19-SP08		

BORING LOG NO. S-25; STA 112+00 / 50 FT RT of CL

PROJECT: Old Highway 20 Realignment
Huntsville, AL

CLIENT: Garver LLC
Huntsville, AL

Northing: 1518250.71 Easting: 357943.75
Surface Elev.: 584.23 (Ft.)

GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	RECOVERY %	RQD %	WATER CONTENT (%)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
	0.8	583.5									
TOPSOIL (10")											
SANDY LEAN CLAY, red to light brown, medium stiff, A-6					X	3-3-4 N=7					
	3.5	580.5									
SANDY LEAN CLAY, red, stiff to very stiff, A-6					X	4-4-7 N=11			33		
			5								
trace chert fragments					X	6-9-9 N=18					
					X	6-6-9 N=15			30		
			10								
some rock fragments					X	6-5-7 N=12					
	15.0	569	15								
Boring Terminated at 15 Feet											

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
Hollow stem auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

Notes:

WATER LEVEL OBSERVATIONS
Water not observed during drilling

Boring Started: 04-21-2020 Boring Completed: 04-21-2020
Drill Rig: Mobile B-47 Driller: Earth Core, LLC
Project No.: E1185324

LEGEND

TOPSOIL
AASHTO A-6
AASHTO A-7

CITY OF HUNTSVILLE

Terracon

APPROVED:
MATTHEW MCCULLOUGH, P.E.

GEOTECHNICAL ENGINEER

DATE: JULY 17, 2020

PROJECT NO. 71-19-SP08
OLD HIGHWAY 20 BRIDGE
OVER NORFOLK SOUTHERN RAILROAD
LIMESTONE COUNTY

PRELIMINARY PROJ. NO. 71-19-SP08

TEST BORING RECORD SHEET 9 of 9

PROJECT NO.	FISCAL YEAR	SHEET NO.
71-19-SP08		

BORING LOG NO. S-26; STA 115+00 / 50 LT of CL

Page 1 of 1

PROJECT: Old Highway 20 Realignment
Huntsville, AL

CLIENT: Garver LLC
Huntsville, AL

Northing: 1518460.65 Easting: 358181.49
Surface Elev.: 579.30 (Ft.)

DEPTH	ELEVATION (Ft.)	Description	Field Test Results	Water Content (%)	Atterberg Limits LL-PL-PI	Percent Fines
0.8	578.5	TOPSOIL (10")				
		SANDY LEAN CLAY, red, soft, A-7-6(18)	2-2-1 N=3	26	41-20-21	86
6.0	573.5					
		SANDY LEAN CLAY, some rock fragments, red, very stiff, A-6	6-12-14 N=26			
			21-16-14 N=30	24		
10.0	569.5	Boring Terminated at 10 Feet				

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
Hollow stem auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

Notes:

WATER LEVEL OBSERVATIONS
Water not observed during drilling

Boring Started: 04-21-2020 Boring Completed: 04-21-2020
Drill Rig: Mobile B-47 Driller: Earth Core, LLC
Project No.: E1185324

BORING LOG NO. S-27; STA 115+00 / on CL

Page 1 of 1

PROJECT: Old Highway 20 Realignment
Huntsville, AL

CLIENT: Garver LLC
Huntsville, AL

Northing: 1518415.67 Easting: 358202.34
Surface Elev.: 579.18 (Ft.)

DEPTH	ELEVATION (Ft.)	Description	Field Test Results	Water Content (%)	Atterberg Limits LL-PL-PI	Percent Fines
0.8	578.5	TOPSOIL (10")				
		SANDY LEAN CLAY, red, medium stiff, A-6	3-3-4 N=7	26		
6.0	573					
		SANDY LEAN CLAY, red, stiff, A-6	6-7-8 N=15			
		trace rock and chert fragments	5-7-7 N=14	26		
10.0	569	Boring Terminated at 10 Feet				

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
Hollow stem auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

Notes:

WATER LEVEL OBSERVATIONS
Water not observed during drilling

Boring Started: 04-21-2020 Boring Completed: 04-21-2020
Drill Rig: Mobile B-47 Driller: Earth Core, LLC
Project No.: E1185324

BORING LOG NO. S-28; STA 115+00 / 50 FT RT of CL

Page 1 of 1

PROJECT: Old Highway 20 Realignment
Huntsville, AL

CLIENT: Garver LLC
Huntsville, AL

Northing: 1518369.98 Easting: 358222.11
Surface Elev.: 579.34 (Ft.)

DEPTH	ELEVATION (Ft.)	Description	Field Test Results	Water Content (%)	Atterberg Limits LL-PL-PI	Percent Fines
0.8	578.5	TOPSOIL (10")				
		SANDY LEAN CLAY, red to light brown, medium stiff, A-6	3-4-3 N=7	25		
6.0	573.5					
		SANDY LEAN CLAY, trace rock and chert fragments, red to light brown, stiff, A-6	5-5-6 N=11	26		
			5-7-8 N=15			
10.0	569.5	Boring Terminated at 10 Feet				

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
Hollow stem auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

Notes:

WATER LEVEL OBSERVATIONS
Water not observed during drilling

Boring Started: 04-21-2020 Boring Completed: 04-21-2020
Drill Rig: Mobile B-47 Driller: Earth Core, LLC
Project No.: E1185324

LEGEND

- TOPSOIL
- AASHTO A-3
- AASHTO A-6
- AASHTO A-7

CITY OF HUNTSVILLE

Terracon

APPROVED:
MATTHEW MCCULLOUGH, P.E.
GEOTECHNICAL ENGINEER
DATE: JULY 17, 2020

PROJECT NO. 71-19-SP08
OLD HIGHWAY 20 BRIDGE
OVER BEAVERDAM CREEK
PHASE III-A
LIMESTONE COUNTY

PRELIMINARY PROJ. NO. 71-19-SP08

TEST BORING RECORD SHEET 1 of 6

PROJECT NO.	FISCAL YEAR	SHEET NO.
71-19-SP08		

BORING LOG NO. BD-1; STA 118+12.50 / 40 FT LT of CL

Page 1 of 1

PROJECT: Old Highway 20 Realignment
Huntsville, AL

CLIENT: Garver LLC
Huntsville, AL

Northing: 1518577.1 Easting: 358472.76 Surface Elev.: 570.68 (Ft.)

DEPTH	ELEVATION (Ft.)	Description	Field Test Results	Recovery %	RQD %	Water Content (%)	Atterberg Limits LL-PL-PI	Percent Fines
		SANDY SILT WITH GRAVEL, brown to tan, medium stiff to stiff, A-7-5(5)	1-2-3 N=5			24.6		
			4-5-8 N=13			25.9	45-32-13	51
6.0	564.5							
7.0	563.5	SANDY LEAN CLAY, some limestone and chert fragments, brown to tan, hard, A-6	50/1" N=50+					
		Auger refusal at 7' - begin rock coring						
10.0	560.5	LIMESTONE, light gray, hard, thin-bedded, highly-fractured		7	0			
		LIMESTONE, light gray, hard, thin-bedded		89	89			
				100	100			
				98	98			
				100	100			
33.0	537.5			91	91			

Boring Terminated at 33 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method: Hollow stem auger

Abandonment Method: Boring backfilled with auger cuttings upon completion.

Notes:

WATER LEVEL OBSERVATIONS
Water not observed during drilling

Boring Started: 05-20-2020 Boring Completed: 05-20-2020
Drill Rig: Mobile B-47 Driller: Earth Core, LLC
Project No.: E1185324

BORING LOG NO. BD-2; STA 118+12.50 / 40 FT RT of CL

Page 1 of 1

PROJECT: Old Highway 20 Realignment
Huntsville, AL

CLIENT: Garver LLC
Huntsville, AL

Northing: 1518503.47 Easting: 358504.22 Surface Elev.: 567.55 (Ft.)

DEPTH	ELEVATION (Ft.)	Description	Field Test Results	Recovery %	RQD %	Water Content (%)	Atterberg Limits LL-PL-PI	Percent Fines
		SANDY LEAN CLAY, trace limestone fragments, brown to tan, soft, A-6	1-1-1 N=2					
		medium stiff	3-4-4 N=8					
6.0	561.5							
		FAT CLAY WITH SAND, some chert fragments, brown to tan, stiff, A-7-6(14)	5-4-5 N=9					
			5-2-2 N=4			27.5	58-26-32	54
11.0	556.5	soft						
		Auger refusal at 11' - begin rock coring						
		LIMESTONE, light gray, hard, thin-bedded		96	96			
				100	98			
				90	76			
29.0	538.5			100	94			

Boring Terminated at 29 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method: Hollow stem auger

Abandonment Method: Boring backfilled with auger cuttings upon completion.

Notes:

WATER LEVEL OBSERVATIONS
Water not observed during drilling

Boring Started: 05-19-2020 Boring Completed: 05-19-2020
Drill Rig: Mobile B-47 Driller: Earth Core, LLC
Project No.: E1185324

LEGEND

- TOPSOIL
- AASHTO A-3
- AASHTO A-6
- AASHTO A-7
- MUD-FILLED VOID
- LIMESTONE

CITY OF HUNTSVILLE

Terracon

APPROVED:
MATTHEW MCCULLOUGH, P.E.
GEOTECHNICAL ENGINEER
DATE: JULY 17, 2020

PROJECT NO. 71-19-SP08
OLD HIGHWAY 20 BRIDGE
OVER BEAVERDAM CREEK
PHASE III-A
LIMESTONE COUNTY

PRELIMINARY PROJ. NO. 71-19-SP08

TEST BORING RECORD SHEET 2 of 6

PROJECT NO.	FISCAL YEAR	SHEET NO.
71-19-SP08		

BORING LOG NO. BD-7; STA 120+67.50 / 40 FT LT of CL

Page 1 of 2

PROJECT: Old Highway 20 Realignment
Huntsville, AL

CLIENT: Garver LLC
Huntsville, AL

Northing: 1518678.84 Easting: 358706.6
Surface Elev.: 565.33 (Ft.)

DEPTH	ELEVATION (Ft.)	Description	Field Test Results	Recovery %	RQD %	Water Content (%)	Atterberg Limits LL-PL-PI	Percent Fines
		LEAN CLAY, trace roots, brown, soft, A-6	1-2-2 N=4					
			2-1-3 N=4					
6.0	559.5	SANDY LEAN CLAY, brown, very stiff, A-6(5)	7-4-21 N=25			23.5	30-15-15	57
		with limestone fragments	8-7-17 N=24					
13.0	552.5	CLAYEY SAND, some limestone fragments, tan, loose, A-6	2-2-3 N=5					
18.0	547.5	SANDY LEAN CLAY, with limestone fragments, tan, stiff, A-6	3-4-7 N=11					
			6-7-5 N=12					
28.0	537.5	SANDY LEAN CLAY, with limestone fragments, brown, soft, A-6	3-1-1 N=2					
32.0	533.5	Auger refusal at 32' – begin rock coring						
		LIMESTONE, light gray, hard, thin-bedded		93	93			
				100	95			
				95	85			

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
Hollow stem auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

Notes:

WATER LEVEL OBSERVATIONS
Water not observed during drilling

Boring Started: 05-15-2020 Boring Completed: 05-15-2020
Drill Rig: Mobile B-47 Driller: Earth Core, LLC
Project No.: E1185324

BORING LOG NO. BD-7; STA 120+67.50 / 40 FT LT of CL

Page 2 of 2

PROJECT: Old Highway 20 Realignment
Huntsville, AL

CLIENT: Garver LLC
Huntsville, AL

Northing: 1518678.84 Easting: 358706.6
Surface Elev.: 565.33 (Ft.)

DEPTH	ELEVATION (Ft.)	Description	Recovery %	RQD %
		LIMESTONE, light gray, hard, thin-bedded (continued)	97	95
52.0	513.5	Boring Terminated at 52 Feet		

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
Hollow stem auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

Notes:

WATER LEVEL OBSERVATIONS
Water not observed during drilling

Boring Started: 05-15-2020 Boring Completed: 05-15-2020
Drill Rig: Mobile B-47 Driller: Earth Core, LLC
Project No.: E1185324

LEGEND

- TOPSOIL
- AASHTO A-3
- AASHTO A-6
- AASHTO A-7
- MUD-FILLED VOID
- LIMESTONE

CITY OF HUNTSVILLE

Terracon

APPROVED:
MATTHEW MCCULLOUGH, P.E.
GEOTECHNICAL ENGINEER
DATE: JULY 17, 2020

PROJECT NO. 71-19-SP08
OLD HIGHWAY 20 BRIDGE
OVER BEAVERDAM CREEK
PHASE III-A
LIMESTONE COUNTY

PRELIMINARY PROJ. NO. 71-19-SP08

TEST BORING RECORD SHEET 3 of 6

PROJECT NO.	FISCAL YEAR	SHEET NO.
71-19-SP08		

BORING LOG NO. BD-8; STA 120+67.50 / 40 FT RT of CL

Page 1 of 2

PROJECT: Old Highway 20 Realignment
Huntsville, AL

CLIENT: Garver LLC
Huntsville, AL

Northing: 1518604.78 Easting: 358738.69
Surface Elev.: 565.20 (Ft.)

DEPTH	ELEVATION (Ft.)	Description	Field Test Results	Recovery %	RQD %
		ELASTIC SILT, trace roots/organics, brown, very soft to medium stiff, A-7	1-1-1 N=2; 3-4-4 N=8; 2-8-19 N=27; 8-9-2 N=11; 2-2-2 N=4; 2-2-3 N=5		
6.0	559				
		ELASTIC SILT, trace limestone fragments, brown, stiff to very stiff, A-7			
13.0	552				
		ELASTIC SILT, some limestone fragments, brown, soft to medium stiff, A-7			
25.0	540	Auger refusal at 25' - begin rock coring	50/0" N=50+		
26.0	539	LIMESTONE, light gray, hard, thin-bedded		11	0
		MUD FILLED VOID		0	0
33.0	532				
		LIMESTONE, light gray, hard, thin-bedded		35	35
				99	99

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
Hollow stem auger / NQ coring

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

Notes:

WATER LEVEL OBSERVATIONS
Water not observed during drilling

Boring Started: 05-15-2020 | Boring Completed: 05-15-2020
Drill Rig: Mobile B-47 | Driller: Earth Core, LLC
Project No.: E1185324

BORING LOG NO. BD-8; STA 120+67.50 / 40 FT RT of CL

Page 2 of 2

PROJECT: Old Highway 20 Realignment
Huntsville, AL

CLIENT: Garver LLC
Huntsville, AL

Northing: 1518604.78 Easting: 358738.69
Surface Elev.: 565.20 (Ft.)

DEPTH	ELEVATION (Ft.)	Description	Recovery %	RQD %
		LIMESTONE, light gray, hard, thin-bedded (continued)	100	98
			87	74
			100	100
58.0	507			
		Boring Terminated at 58 Feet		

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
Hollow stem auger / NQ coring

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

Notes:

WATER LEVEL OBSERVATIONS
Water not observed during drilling

Boring Started: 05-15-2020 | Boring Completed: 05-15-2020
Drill Rig: Mobile B-47 | Driller: Earth Core, LLC
Project No.: E1185324

LEGEND

- TOPSOIL
- AASHTO A-3
- AASHTO A-6
- AASHTO A-7
- MUD-FILLED VOID
- LIMESTONE

CITY OF HUNTSVILLE

Terracon

APPROVED:
MATTHEW MCCULLOUGH, P.E.
GEOTECHNICAL ENGINEER
DATE: JULY 17, 2020

PROJECT NO. 71-19-SP08
OLD HIGHWAY 20 BRIDGE
OVER BEAVERDAM CREEK
PHASE III-A
LIMESTONE COUNTY

PRELIMINARY PROJ. NO. 71-19-SP08

TEST BORING RECORD SHEET 4 of 6

PROJECT NO.	FISCAL YEAR	SHEET NO.
71-19-SP08		

BORING LOG NO. S-32; STA 125+00 / on CL

Page 1 of 1

PROJECT: Old Highway 20 Realignment
Huntsville, AL

CLIENT: Garver LLC
Huntsville, AL

Northing: 1518808.09 Easting: 359121.41 Surface Elev.: 565.10 (Ft.)

DEPTH	ELEVATION (Ft.)	FIELD TEST RESULTS
ELASTIC SILT, trace rock fragments, brown to tan, soft, A-7		
3.0	562	1-1-1 N=2
ELASTIC SILT, with rock fragments, gray to tan, very stiff, A-7		12-11-9 N=20
		8-9-11 N=20
8.0	557	
ELASTIC SILT, tan, medium stiff, A-7		6-4-3 N=7
		2-1-1 N=2
18.0	547	
ELASTIC SILT, tan, hard, A-7		2-50/3" N=50+
20.0	545	

Boring Terminated at 20 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
Hollow stem auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

Notes:

WATER LEVEL OBSERVATIONS
Water observed at 6' during drilling

Boring Started: 05-14-2020 Boring Completed: 05-14-2020
Drill Rig: Mobile B-47 Driller: Earth Core, LLC
Project No.: E1185324

BORING LOG NO. S-33; STA 125+00 / 50 FT RT of CL

Page 1 of 1

PROJECT: Old Highway 20 Realignment
Huntsville, AL

CLIENT: Garver LLC
Huntsville, AL

Northing: 1518759.45 Easting: 359137.16 Surface Elev.: 564.93 (Ft.)

DEPTH	ELEVATION (Ft.)	FIELD TEST RESULTS
0.8 TOPSOIL (9")	564	
ELASTIC SILT, some rock fragments, brown to tan, stiff, A-7 becomes gray to tan, with rock fragments		2-6-8 N=14
		5-6-6 N=12
5.0	559	
CLAYEY SAND, trace rock fragments, gray to tan, medium dense		5-6-7 N=13
8.0	557	
POORLY GRADED SAND, trace rock fragments, gray to black, loose, A-3		6-4-2 N=6
13.0	552	
ELASTIC SILT, some rock fragments, gray to tan, medium stiff, A-7		3-3-5 N=8
15.0	550	

Boring Terminated at 15 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
Hollow stem auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

Notes:

WATER LEVEL OBSERVATIONS
Water observed at 3' during drilling

Boring Started: 05-14-2020 Boring Completed: 05-14-2020
Drill Rig: Mobile B-47 Driller: Earth Core, LLC
Project No.: E1185324

BORING LOG NO. B-9: STA 125+75 / CL

Page 1 of 1

PROJECT: Old Highway 20 Realignment
Huntsville, AL

CLIENT: Garver LLC
Huntsville, AL

Surface Elev.: 567.97 (Ft.)

DEPTH	ELEVATION (Ft.)	FIELD TEST RESULTS	WATER CONTENT (%)
0.3 TOPSOIL (4 inches)	567.5		
SANDY LEAN CLAY WITH CHERT, light brown, medium stiff, A-6		4-2-3 N=5	23.0
3.0	565		
SANDY LEAN CLAY WITH CHERT AND GRAVEL, brown with gray and yellow mottling, hard, A-7		17-50/0" N=50+	17.0
6.0	562		
SANDY LEAN CLAY WITH CHERT, brown with gray and yellow mottling, very stiff, A-7		9-10-9 N=19	
8.5	559.5		
SANDY LEAN CLAY WITH GRAVEL, brown and gray, very stiff, A-7		7-8-8 N=16	20.0
10.0	558		

Boring Terminated at 10 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
Hollow stem auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

Notes:

WATER LEVEL OBSERVATIONS
Water encountered at 7 feet during drilling

Boring Started: 04-09-2015 Boring Completed: 04-09-2015
Drill Rig: Mobile B-47 Driller: Earth Core, LLC
Project No.: E1185324

LEGEND

- TOPSOIL
- AASHTO A-3
- AASHTO A-6
- AASHTO A-7

CITY OF HUNTSVILLE	
Terracon	PROJECT NO. 71-19-SP08 OLD HIGHWAY 20 BRIDGE OVER BEAVERDAM CREEK PHASE III-A LIMESTONE COUNTY
APPROVED: MATTHEW MCCULLOUGH, P.E.	
GEOTECHNICAL ENGINEER	PRELIMINARY PROJ. NO. 71-19-SP08
DATE: JULY 17, 2020	TEST BORING RECORD SHEET 5 of 6

PROJECT NO.	FISCAL YEAR	SHEET NO.
71-19-SP08		

BORING LOG NO. B-10: STA 128+50 / CL

Page 1 of 1

PROJECT: Old Highway 20 Realignment
Huntsville, AL

CLIENT: Garver LLC
Huntsville, AL

Surface Elev.: 572.47 (Ft.)

DEPTH (Ft.)	ELEVATION (Ft.)	Description	Sample	Field Test Results	Water Content (%)	Atterberg Limits LL-PL-PI	Percent Fines
0.5	572	TOPSOIL (3 inches)					
		SANDY LEAN CLAY WITH CHERT, brownish-red, stiff, A-7-6(18)	X	4-4-5 N=9	17.0	43-19-24	77
3.5	569	LEAN CLAY WITH CHERT, brown with gray mottling, soft, A-7	X	1-1-2 N=3	29.0		
5			X	2-2-4 N=6	30.0		
7.0	565.5	FAT CLAY, tan and gray, medium stiff, A-7	X	7-14-23 N=37			
9.0	563.5						
10.0	562.5	LEAN CLAY WITH CHERT, yellowish-brown, hard, A-7					
10		Boring Terminated at 10 Feet					

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
Hollow stem auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

Notes:

WATER LEVEL OBSERVATIONS
Water encountered at 4 feet during drilling

Boring Started: 04-09-2015 | Boring Completed: 04-09-2015
Drill Rig: Mobile B-47 | Driller: Earth Core, LLC
Project No.: E1185324

BORING LOG NO. B-11: STA 131+25 / CL

Page 1 of 1

PROJECT: Old Highway 20 Realignment
Huntsville, AL

CLIENT: Garver LLC
Huntsville, AL

Surface Elev.: 581.87 (Ft.)

DEPTH (Ft.)	ELEVATION (Ft.)	Description	Sample	Field Test Results	Water Content (%)	Atterberg Limits LL-PL-PI	Percent Fines
0.5	581.5	TOPSOIL (6 inches)					
		LEAN CLAY, brown, stiff, A-6	X	7-5-5 N=10	20.0		
3.0	579	LEAN CLAY, red with tan mottling, stiff, A-7	X	3-5-5 N=10	24.0		
5			X	9-13-15 N=28			
7.0	575	LEAN CLAY, red with tan mottling, very stiff, A-7	X	8-11-12 N=23			
9.0	573						
10.0	572	SANDY LEAN CLAY WITH CHERT, brown with gray and yellow mottling, very stiff, A-7					
10		Boring Terminated at 10 Feet					

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
Hollow stem auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

Notes:

WATER LEVEL OBSERVATIONS
Water not observed during drilling

Boring Started: 04-09-2015 | Boring Completed: 04-09-2015
Drill Rig: Mobile B-47 | Driller: Earth Core, LLC
Project No.: E1185324

BORING LOG NO. B-12: STA 134+00 / CL

Page 1 of 1

PROJECT: Old Highway 20 Realignment
Huntsville, AL

CLIENT: Garver LLC
Huntsville, AL

Surface Elev.: 594.14 (Ft.)

DEPTH (Ft.)	ELEVATION (Ft.)	Description	Sample	Field Test Results	Water Content (%)	Atterberg Limits LL-PL-PI	Percent Fines
0.3	594	TOPSOIL (3 inches)					
		LEAN CLAY, brownish-red, stiff, A-6	X	4-4-6 N=10	25.0		
3.0	591	SANDY LEAN CLAY WITH CHERT, red, stiff, A-6	X	3-2-6 N=8	24.0		
5			X	8-14-13 N=27			
7.0	587	SANDY LEAN CLAY WITH CHERT, red and tan, very stiff, A-7	X	5-7-7 N=14			
8.5	585.5	CHERTY LEAN CLAY, reddish-brown, stiff, A-7					
10.0	584						
10		Boring Terminated at 10 Feet					

Stratification lines are approximate. In-situ, the transition may be gradual.

Advancement Method:
Hollow stem auger

Abandonment Method:
Boring backfilled with auger cuttings upon completion.

Notes:

WATER LEVEL OBSERVATIONS
Water not observed during drilling

Boring Started: 04-09-2015 | Boring Completed: 04-09-2015
Drill Rig: Mobile B-47 | Driller: Earth Core, LLC
Project No.: E1185324

LEGEND

- TOPSOIL
- AASHTO A-3
- AASHTO A-6
- AASHTO A-7

CITY OF HUNTSVILLE

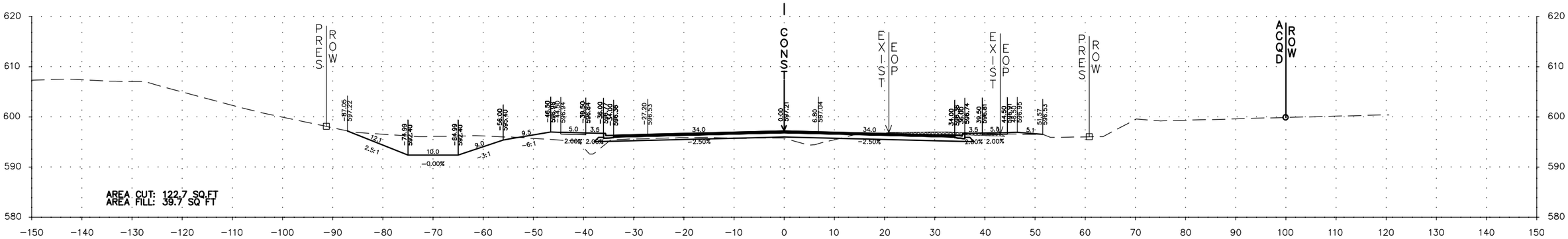
Terracon

APPROVED:
MATTHEW MCCULLOUGH, P.E.
GEOTECHNICAL ENGINEER
DATE: JULY 17, 2020

PROJECT NO. 71-19-SP08
OLD HIGHWAY 20 BRIDGE
OVER BEAVERDAM CREEK
PHASE III-A
LIMESTONE COUNTY

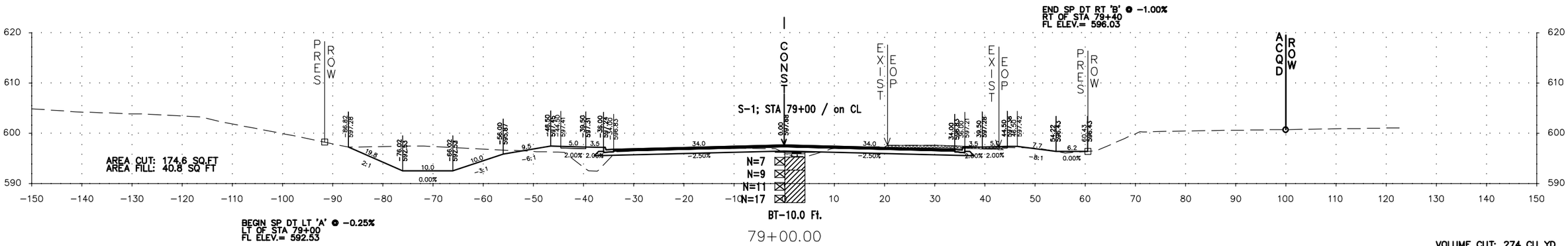
PRELIMINARY PROJ. NO. 71-19-SP08

TEST BORING RECORD SHEET 6 of 6



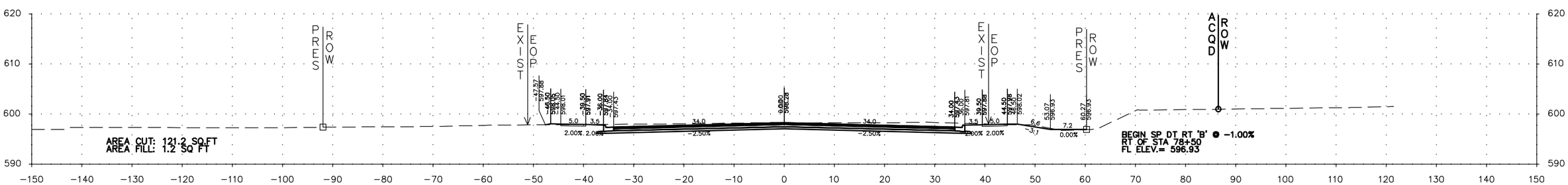
79+50.00

VOLUME CUT: 275 CU YD
VOLUME FILL: 74 CU YD



79+00.00

VOLUME CUT: 274 CU YD
VOLUME FILL: 39 CU YD



78+50.00

VOLUME CUT: 0 CU YD
VOLUME FILL: 0 CU YD

Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling

Borehole Lithology

AR – Auger Refusal
BT – Boring Termination

Water Level Reading at time of drilling.

Topsoil

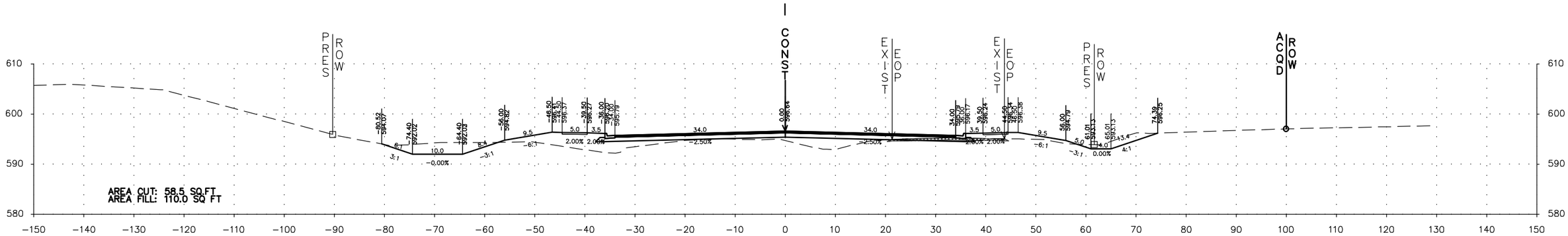
AASHTO A-6

AASHTO A-7

Drawn by: MSM	Project No.: E1185324	Terracon
Date: 7/27/2020	Scale: 1"=20'	2147 Riverchase Office Rd Hoover, AL
		PH. 205-942-1289 FAX. 205-443-5302

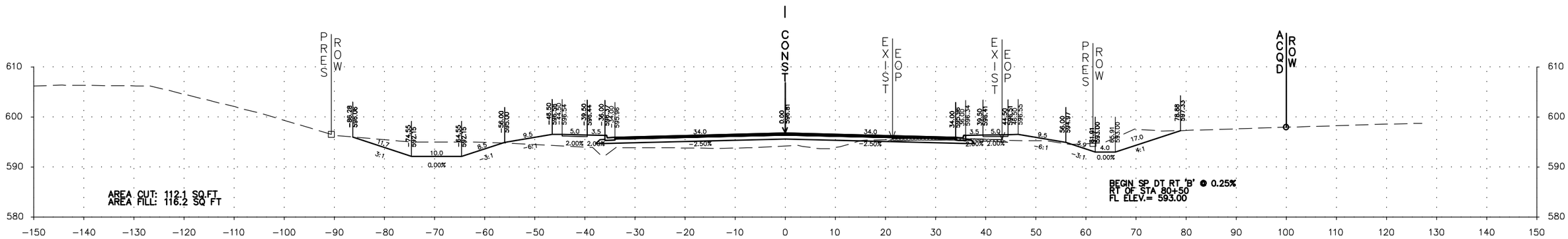
BORING LOG CROSS SECTIONS

OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA



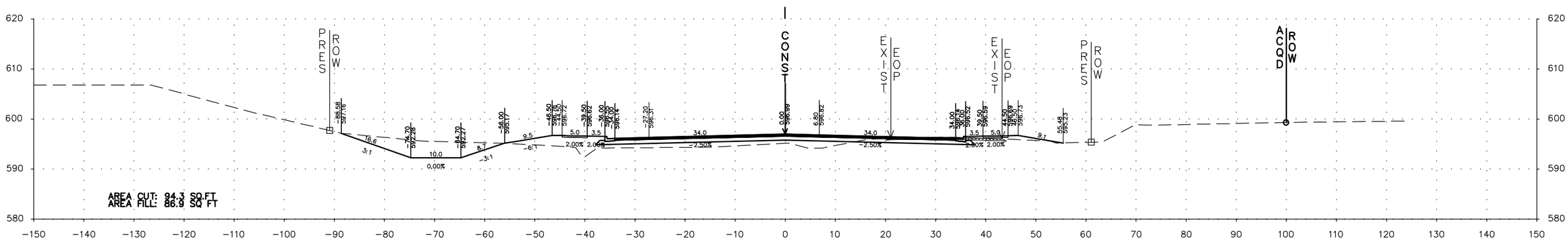
81+00.00

VOLUME CUT: 158 CU YD
VOLUME FILL: 209 CU YD



80+50.00

VOLUME CUT: 191 CU YD
VOLUME FILL: 188 CU YD



80+00.00

VOLUME CUT: 201 CU YD
VOLUME FILL: 117 CU YD

Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling

Borehole Lithology

AR – Auger Refusal
BT – Boring Termination

Water Level Reading at time of drilling.

Topsoil

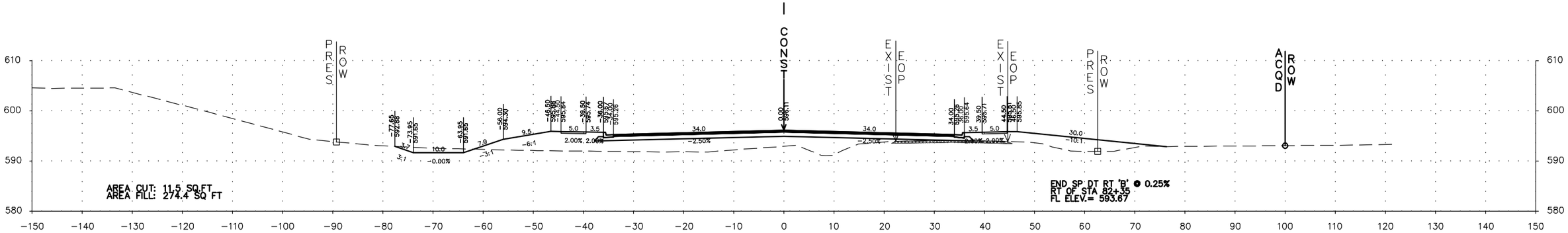
AASHTO A-6

AASHTO A-7

Drawn by: MSM	Project No.: E1185324	Terracon
Date: 7/27/2020	Scale: 1"=20'	2147 Riverchase Office Rd Hoover, AL
		PH. 205-942-1289 FAX. 205-443-5302

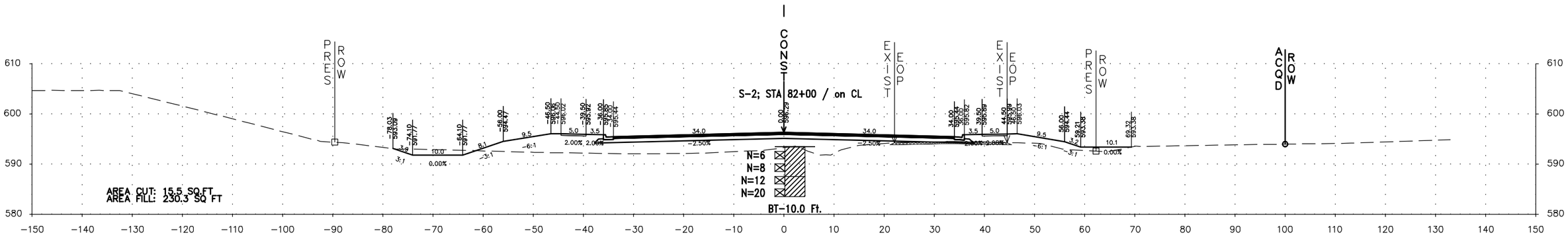
BORING LOG CROSS SECTIONS

OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA



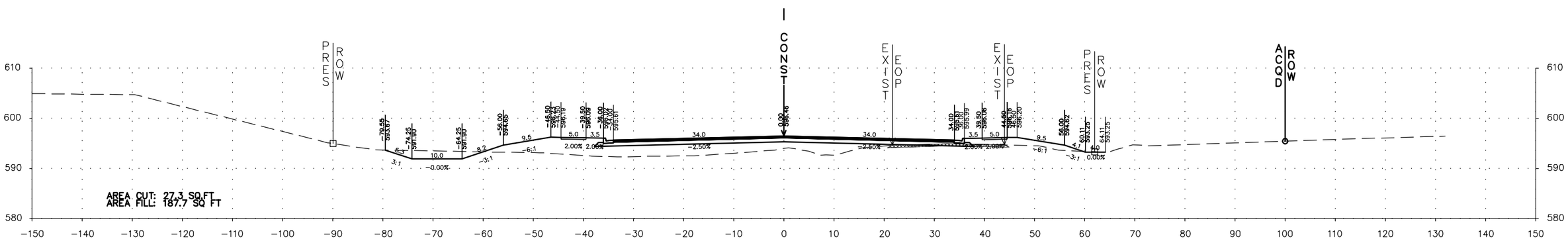
82+50.00

VOLUME CUT: 25 CU YD
VOLUME FILL: 467 CU YD



82+00.00

VOLUME CUT: 40 CU YD
VOLUME FILL: 387 CU YD



81+50.00

VOLUME CUT: 79 CU YD
VOLUME FILL: 276 CU YD

Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling

Borehole Lithology

AR – Auger Refusal
BT – Boring Termination

Water Level Reading at time of drilling.

Topsoil

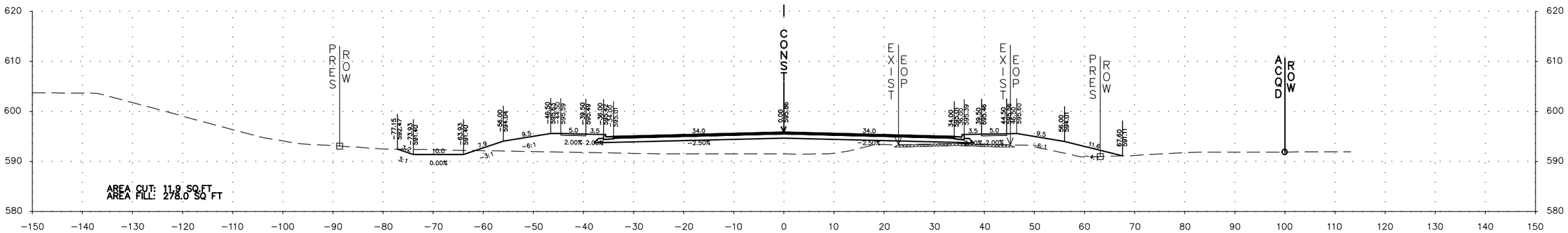
AASHTO A-6

AASHTO A-7

Drawn by: MSM	Project No.: E1185324	Terracon
Date: 7/27/2020	Scale: 1"=20'	2147 Riverchase Office Rd Hoover, AL
		PH. 205-942-1289 FAX. 205-443-5302

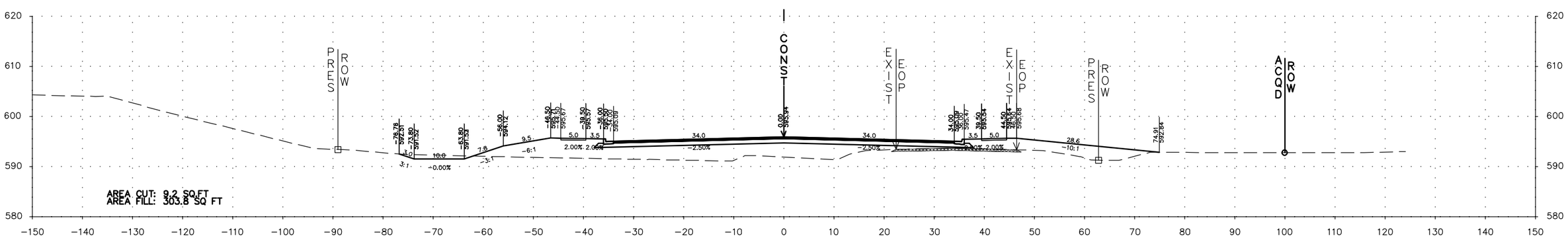
BORING LOG CROSS SECTIONS

OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA



83+50.00

VOLUME CUT: 20 CU YD
VOLUME FILL: 539 CU YD



83+00.00

VOLUME CUT: 19 CU YD
VOLUME FILL: 535 CU YD

Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling — Borehole Lithology

AR – Auger Refusal
BT – Boring Termination

Water Level Reading at time of drilling.

Topsoil

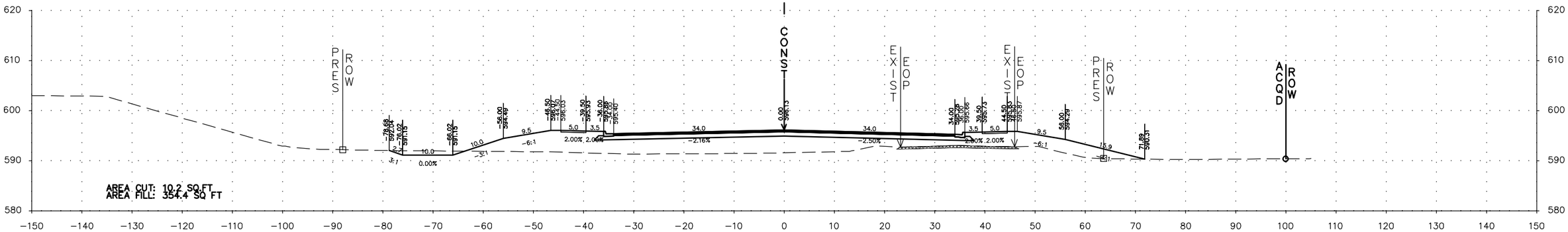
AASHTO A-6

AASHTO A-7

Drawn by: MSM	Project No.: E1185324	Terracon 2147 Riverchase Office Rd Hoover, AL PH. 205-942-1289 FAX. 205-443-5302
Date: 7/27/2020	Scale: 1"=20'	

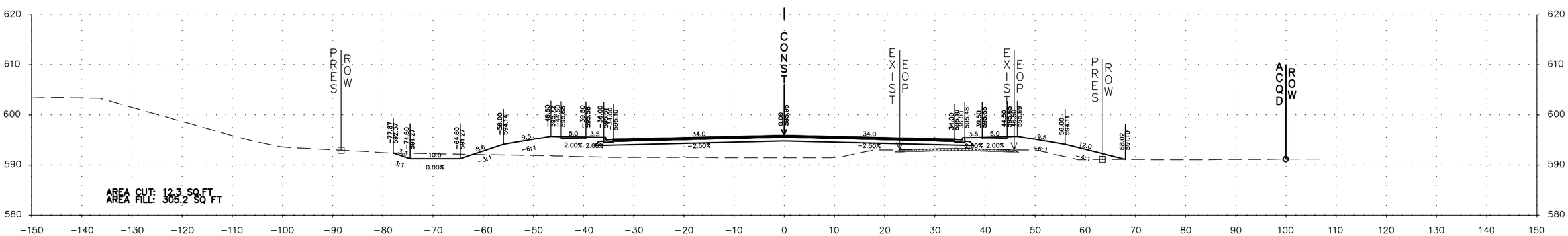
BORING LOG CROSS SECTIONS

OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA



84+50.00

VOLUME CUT: 21 CU YD
VOLUME FILL: 611 CU YD



84+00.00

VOLUME CUT: 22 CU YD
VOLUME FILL: 540 CU YD

Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling

Borehole Lithology

AR – Auger Refusal
BT – Boring Termination

Water Level Reading at time of drilling.

Topsoil

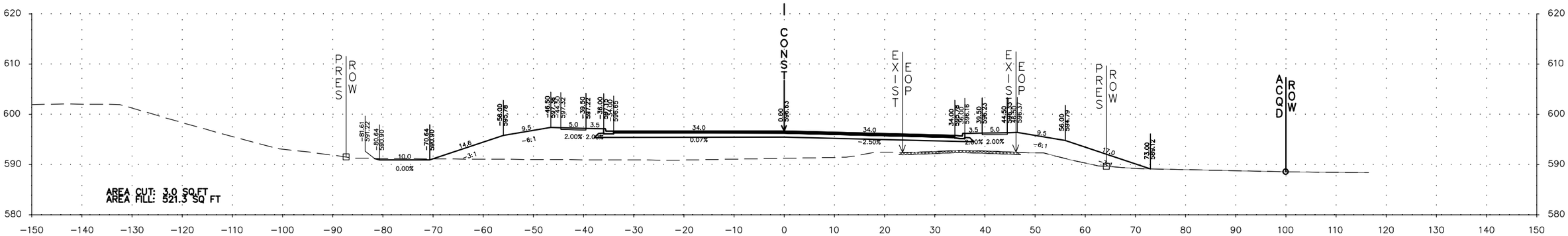
AASHTO A-6

AASHTO A-7

Drawn by: MSM	Project No.: E1185324	Terracon
Date: 7/27/2020	Scale: 1"=20'	2147 Riverchase Office Rd Hoover, AL
		PH. 205-942-1289 FAX. 205-443-5302

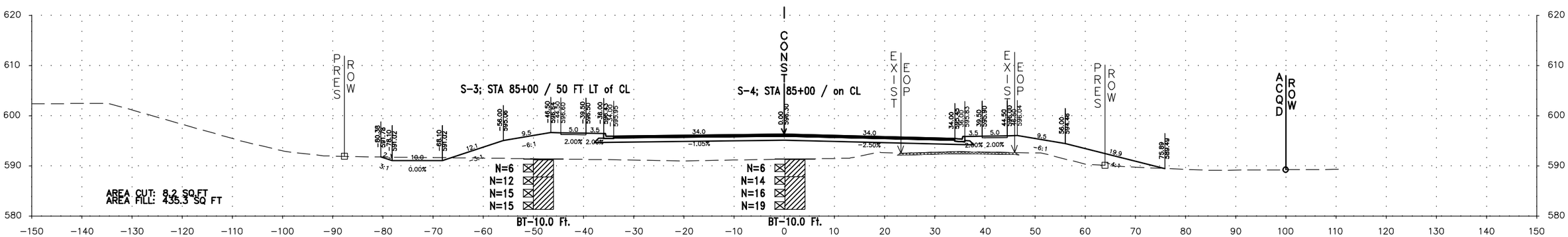
BORING LOG CROSS SECTIONS

OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA



85+50.00

VOLUME CUT: 10 CU YD
VOLUME FILL: 886 CU YD



85+00.00

VOLUME CUT: 17 CU YD
VOLUME FILL: 731 CU YD

Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling

Borehole Lithology

AR – Auger Refusal
BT – Boring Termination

Water Level Reading at time of drilling.

Topsoil

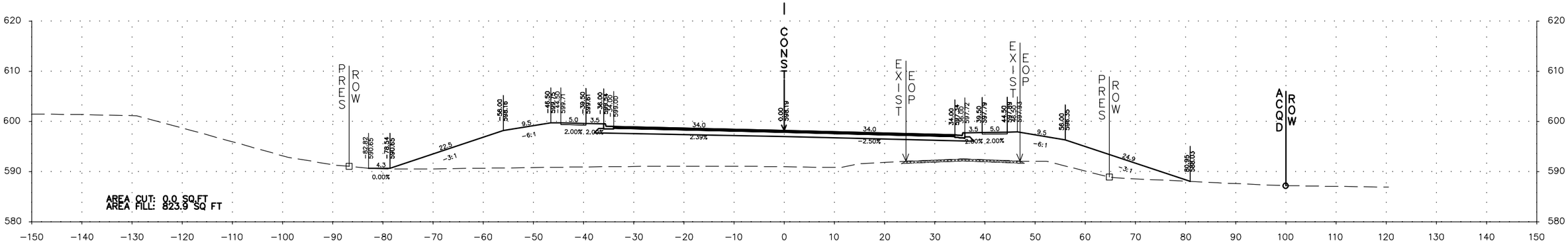
AASHTO A-6

AASHTO A-7

Drawn by: MSM	Project No.: E1185324	Terracon 2147 Riverchase Office Rd Hoover, AL PH. 205-942-1289 FAX. 205-443-5302
Date: 7/27/2020	Scale: 1"=20'	

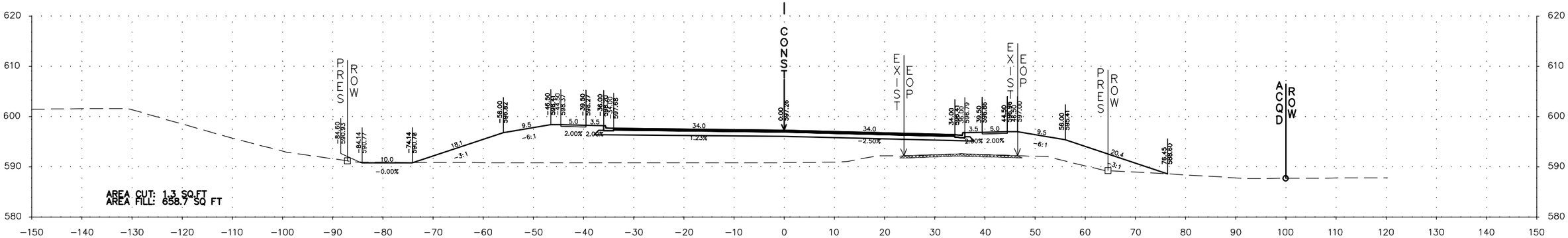
BORING LOG CROSS SECTIONS

OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA



86+50.00

VOLUME CUT: 1 CU YD
VOLUME FILL: 1373 CU YD



86+00.00

VOLUME CUT: 4 CU YD
VOLUME FILL: 1093 CU YD

Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling

Borehole Lithology

AR – Auger Refusal
BT – Boring Termination

Water Level Reading at time of drilling.

Topsoil

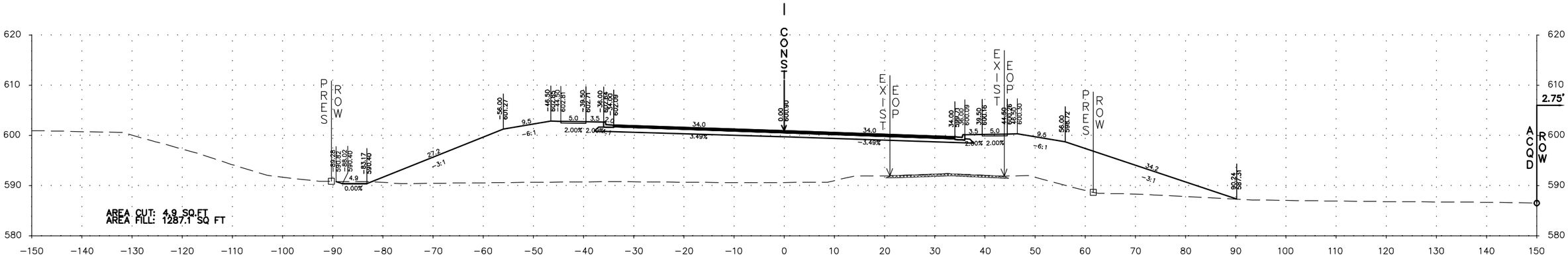
AASHTO A-6

AASHTO A-7

Drawn by: MSM	Project No.: E1185324	Terracon 2147 Riverchase Office Rd Hoover, AL PH. 205-942-1289 FAX. 205-443-5302
Date: 7/27/2020	Scale: 1"=20'	

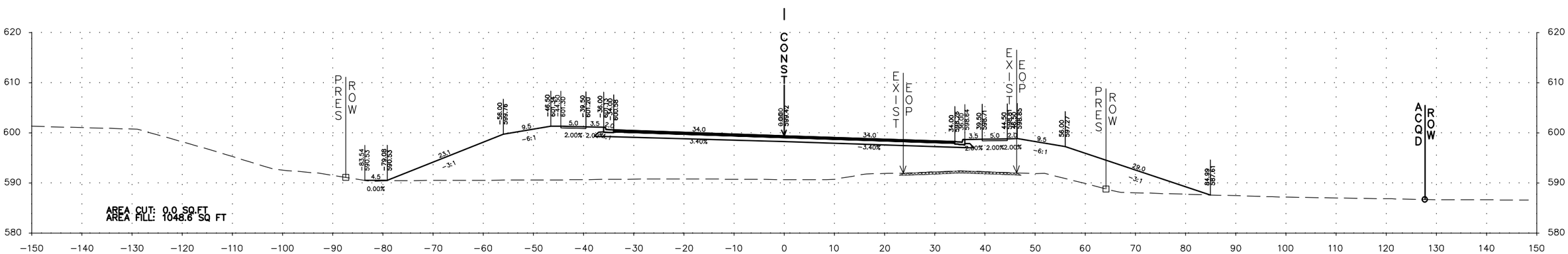
BORING LOG CROSS SECTIONS

OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA



87+50.00

VOLUME CUT: 5 CU YD
VOLUME FILL: 2163 CU YD



87+00.00

VOLUME CUT: 0 CU YD
VOLUME FILL: 1734 CU YD

Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling — Borehole Lithology

AR – Auger Refusal
BT – Boring Termination

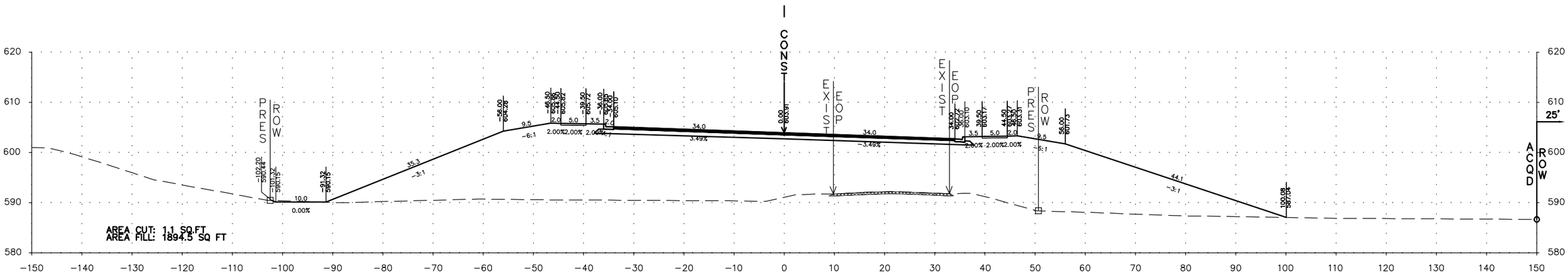
Water Level Reading at time of drilling.

Topsoil | AASHTO A-6 | AASHTO A-7

Drawn by: MSM	Project No.: E1185324	Terracon 2147 Riverchase Office Rd Hoover, AL PH. 205-942-1289 FAX. 205-443-5302
Date: 7/27/2020	Scale: 1"=20'	

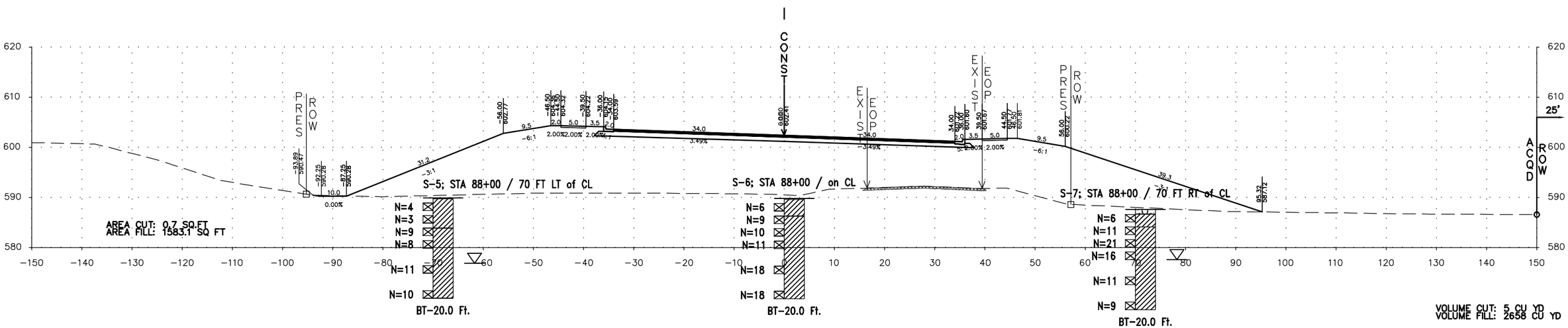
BORING LOG CROSS SECTIONS

OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA



88+50.00

VOLUME CUT: 2 CU YD
VOLUME FILL: 3220 CU YD



88+00.00

VOLUME CUT: 5 CU YD
VOLUME FILL: 2658 CU YD

Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling

Borehole Lithology

AR – Auger Refusal
BT – Boring Termination

Water Level Reading at time of drilling.

Topsoil

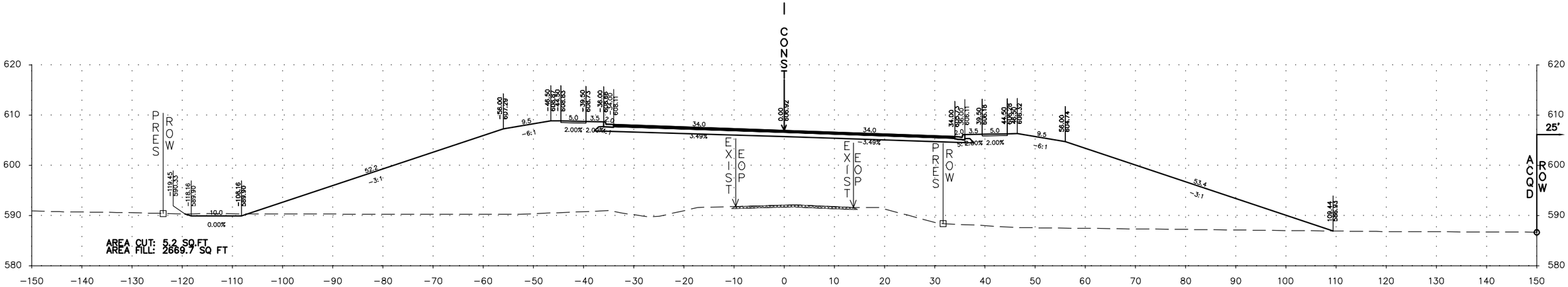
AASHTO A-6

AASHTO A-7

Drawn by: MSM	Project No.: E1185324	Terracon 2147 Riverchase Office Rd Hoover, AL PH. 205-942-1289 FAX. 205-443-5302
Date: 7/27/2020	Scale: 1"=20'	

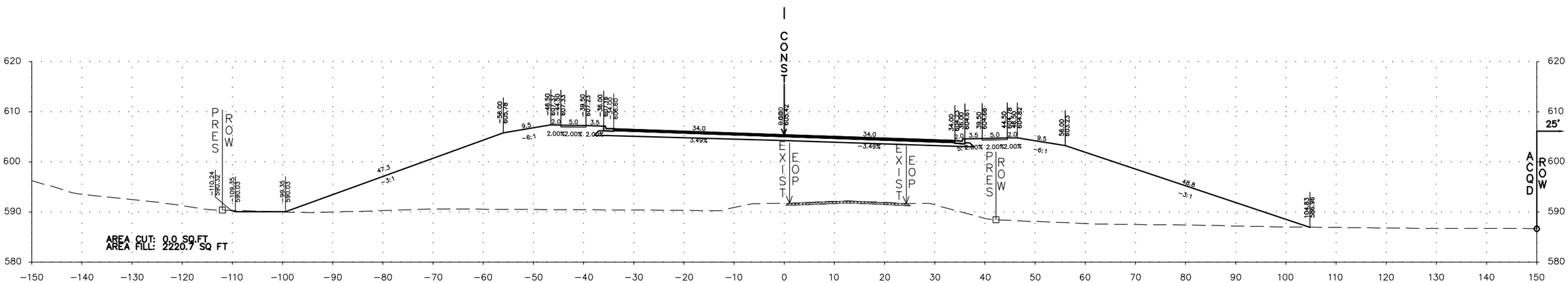
BORING LOG CROSS SECTIONS

OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA



89+50.00

VOLUME CUT: 5 CU YD
VOLUME FILL: 4528 CU YD



89+00.00

VOLUME CUT: 1 CU YD
VOLUME FILL: 3810 CU YD

Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling

Borehole Lithology

AR - Auger Refusal
BT - Boring Termination

Water Level Reading at time of drilling.

Topsoil

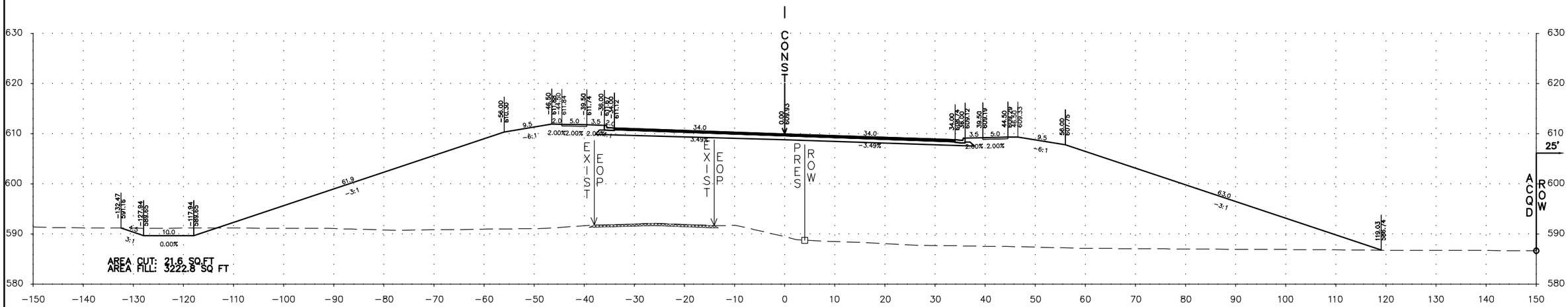
AASHTO A-6

AASHTO A-7

Drawn by: MSM	Project No.: E1185324	Terracon
Date: 7/27/2020	Scale: 1"=20'	2147 Riverchase Office Rd Hoover, AL
		PH. 205-942-1289 FAX. 205-443-5302

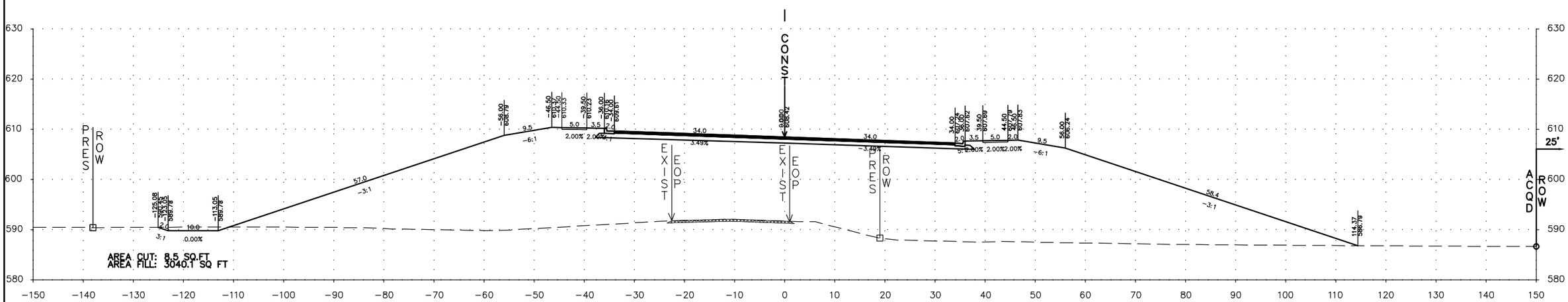
BORING LOG CROSS SECTIONS

OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA



90+50.00

VOLUME CUT: 28 CU YD
VOLUME FILL: 5799 CU YD



90+00.00

VOLUME CUT: 13 CU YD
VOLUME FILL: 5287 CU YD

Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling — Borehole Lithology

AR – Auger Refusal
BT – Boring Termination

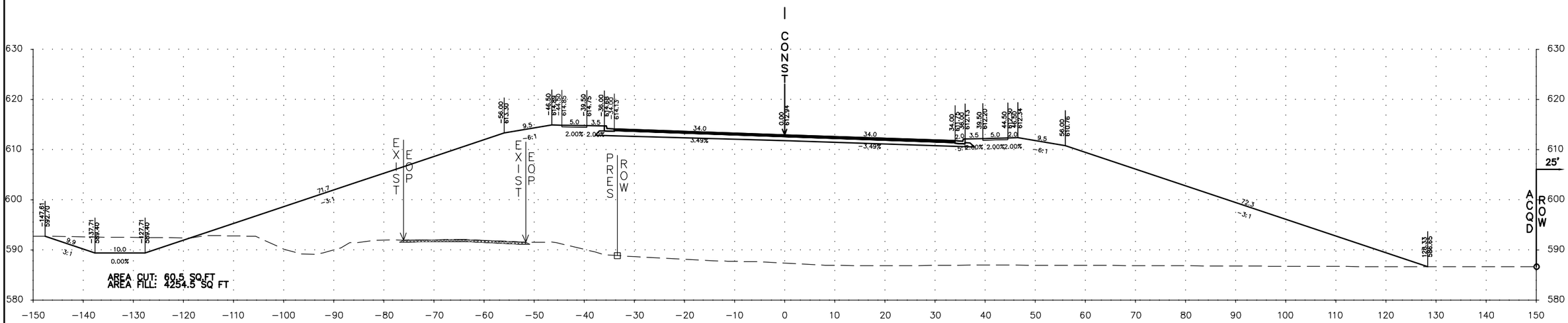
Water Level Reading at time of drilling.

Topsoil | AASHTO A-6 | AASHTO A-7

Drawn by: MSM	Project No.: E1185324	Terracon 2147 Riverchase Office Rd Hoover, AL PH. 205-942-1289 FAX. 205-443-5302
Date: 7/27/2020	Scale: 1"=20'	

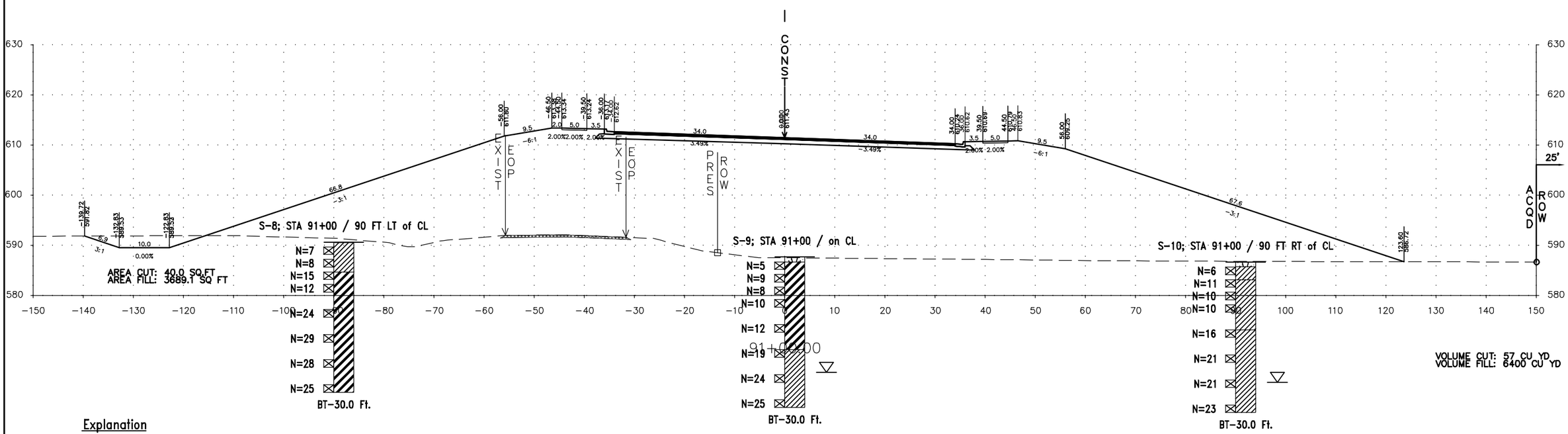
BORING LOG CROSS SECTIONS

OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA



91+50.00

VOLUME CUT: 93 CU YD
VOLUME FILL: 7355 CU YD



VOLUME CUT: 57 CU YD
VOLUME FILL: 6400 CU YD

Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling

Borehole Lithology

AR – Auger Refusal
BT – Boring Termination

Water Level Reading at time of drilling.

Topsoil

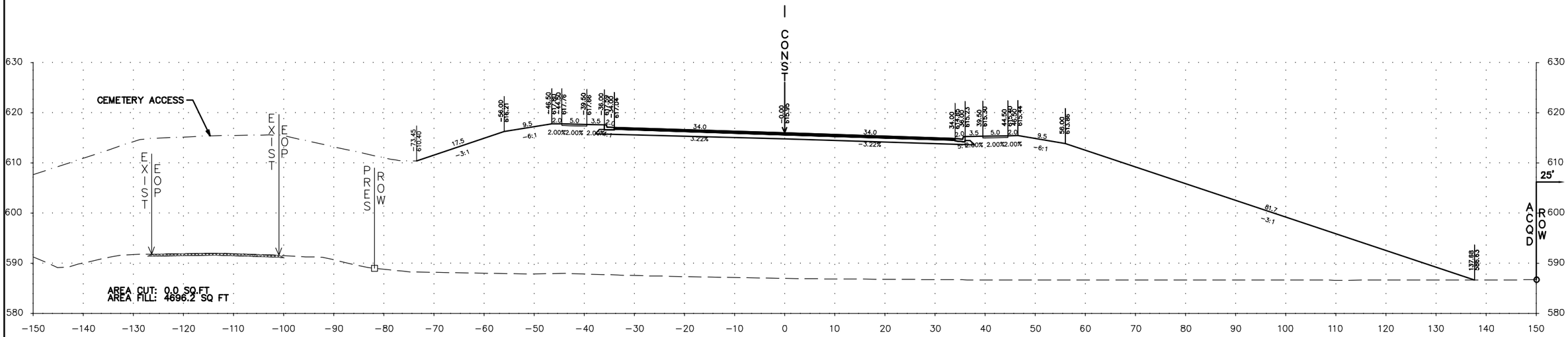
AASHTO A-6

AASHTO A-7

Drawn by: MSM	Project No.: E1185324	Terracon, 2147 Riverchase Office Rd, Hoover, AL, PH. 205-942-1289, FAX. 205-443-5302
Date: 7/27/2020	Scale: 1"=20'	

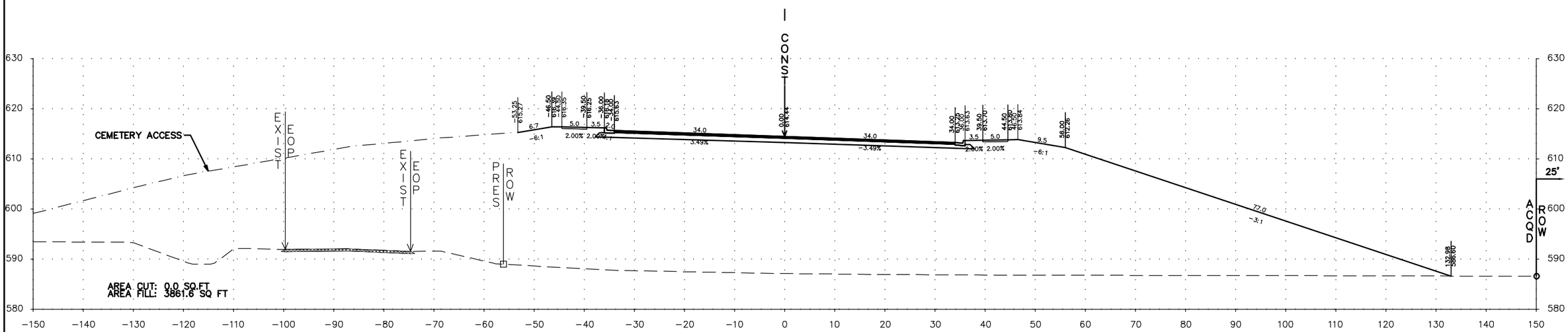
BORING LOG CROSS SECTIONS

OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA



92+50.00

VOLUME CUT: 0 CU YD
VOLUME FILL: 7924 CU YD



92+00.00

VOLUME CUT: 56 CU YD
VOLUME FILL: 7515 CU YD

Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling — Borehole Lithology

AR - Auger Refusal
BT - Boring Termination

Water Level Reading at time of drilling.

Topsoil

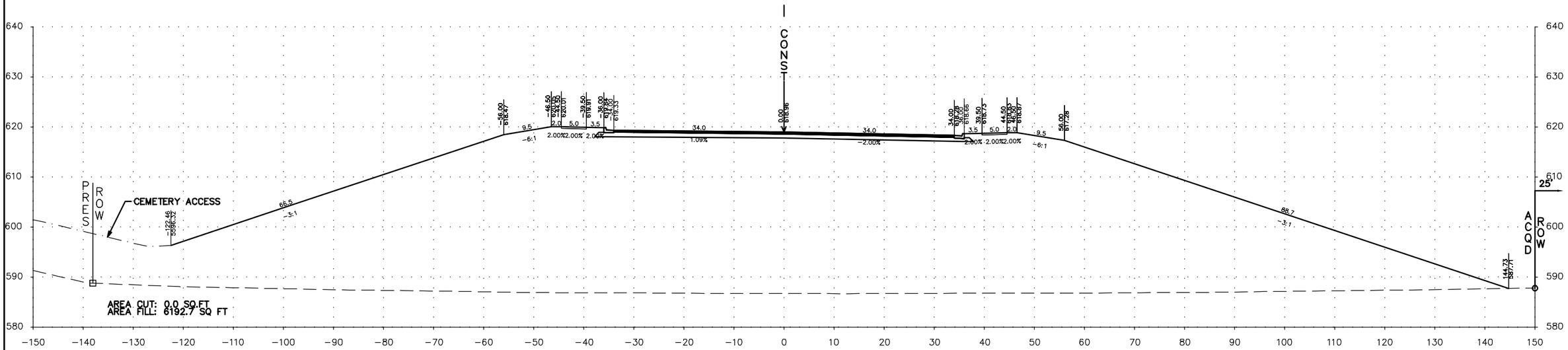
AASHTO A-6

AASHTO A-7

Drawn by: MSM	Project No.: E1185324	Terracon 2147 Riverchase Office Rd Hoover, AL PH. 205-942-1289 FAX. 205-443-5302
Date: 7/27/2020	Scale: 1"=20'	

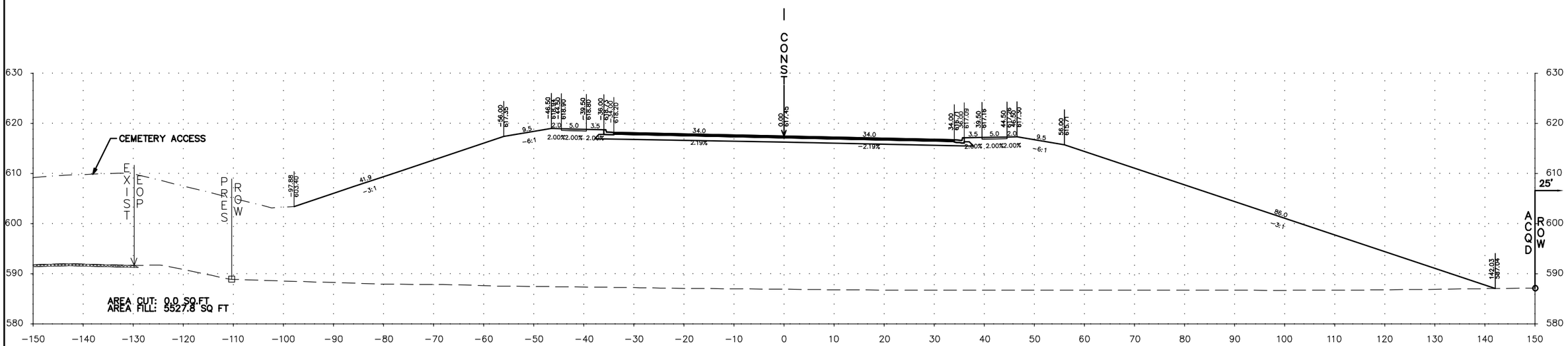
BORING LOG CROSS SECTIONS

OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA



93+50.00

VOLUME CUT: 0 CU YD
VOLUME FILL: 10852 CU YD



93+00.00

VOLUME CUT: 0 CU YD
VOLUME FILL: 9467 CU YD

Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling

Borehole Lithology

AR – Auger Refusal
BT – Boring Termination

Water Level Reading at time of drilling.

Topsoil

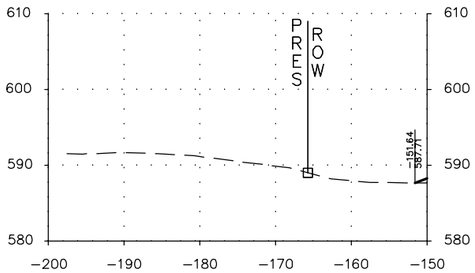
AASHTO A-6

AASHTO A-7

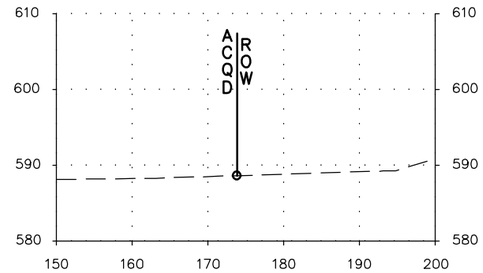
Drawn by: MSM	Project No.: E1185324	Terracon, 2147 Riverchase Office Rd, Hoover, AL, PH. 205-942-1289, FAX. 205-443-5302
Date: 7/27/2020	Scale: 1"=20'	

BORING LOG CROSS SECTIONS

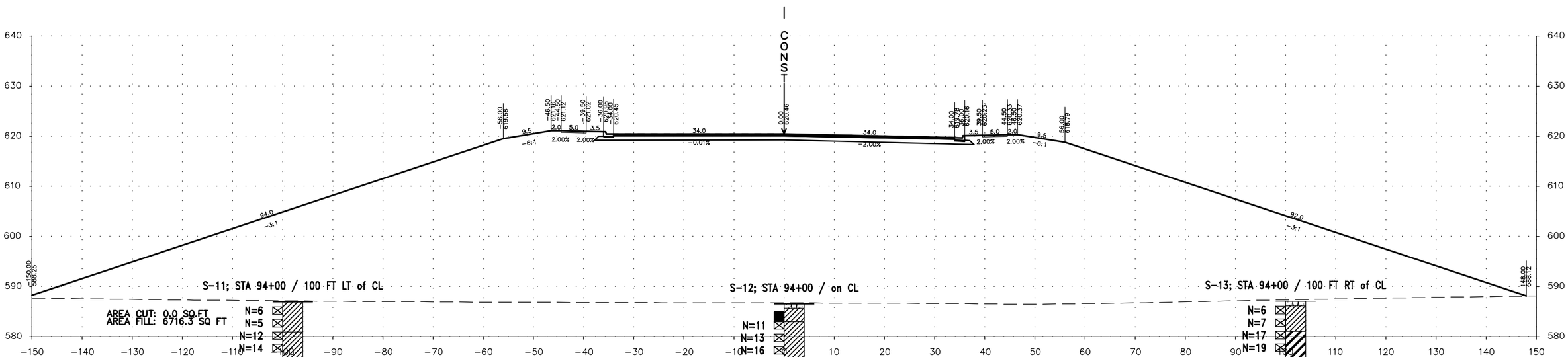
OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA



94+00.00 (LT)



94+00.00 (RT)



Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling

Borehole Lithology

AR – Auger Refusal
BT – Boring Termination

Water Level Reading at time of drilling.

Topsoil

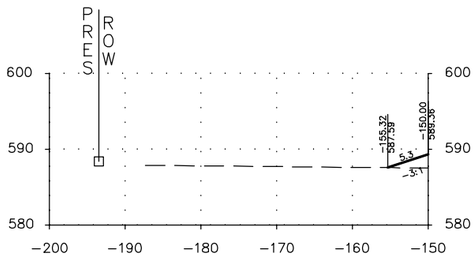
AASHTO A-6

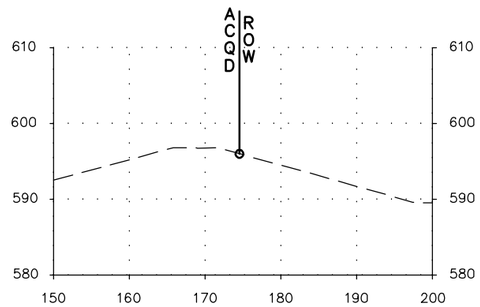
AASHTO A-7

Drawn by: MSM	Project No.: E1185324	Terracon 2147 Riverchase Office Rd Hoover, AL PH. 205-942-1289 FAX. 205-443-5302
Date: 7/27/2020	Scale: 1"=20'	

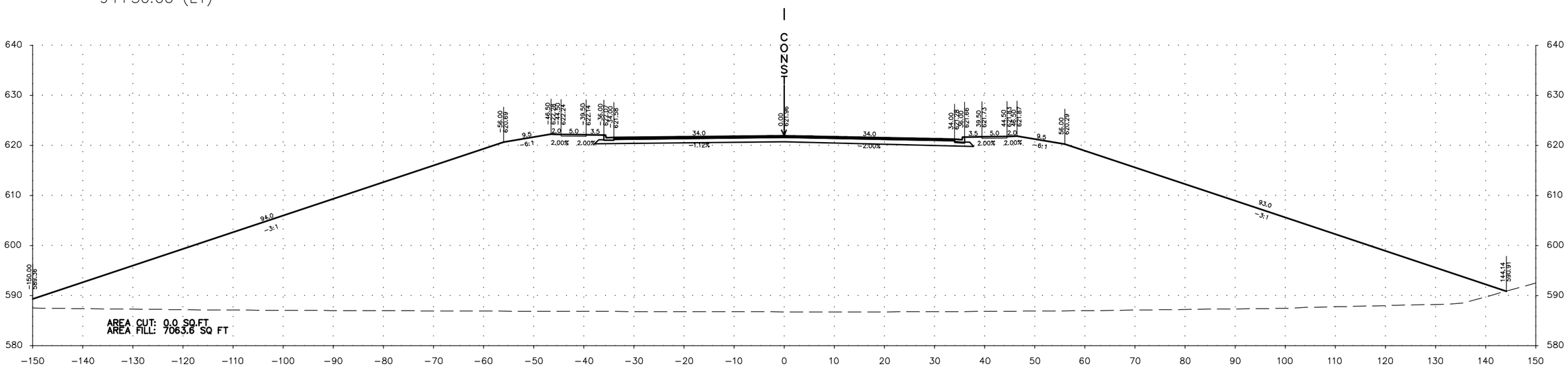
BORING LOG CROSS SECTIONS

OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA





94+50.00 (LT)



94+50.00

VOLUME CUT: 0 CU YD
VOLUME FILL: 12759 CU YD

Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling — Borehole Lithology

AR – Auger Refusal
BT – Boring Termination

Water Level Reading at time of drilling.

Topsoil

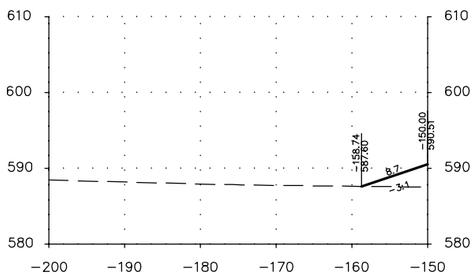
AASHTO A-6

AASHTO A-7

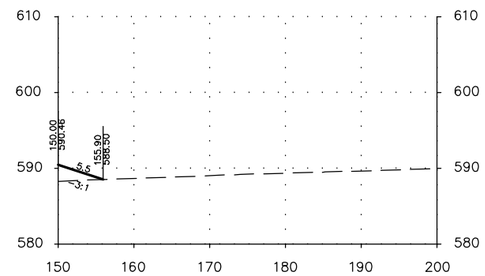
Drawn by: MSM	Project No.: E1185324	Terracon 2147 Riverchase Office Rd Hoover, AL PH. 205-942-1289 FAX. 205-443-5302
Date: 7/27/2020	Scale: 1"=20'	

BORING LOG CROSS SECTIONS

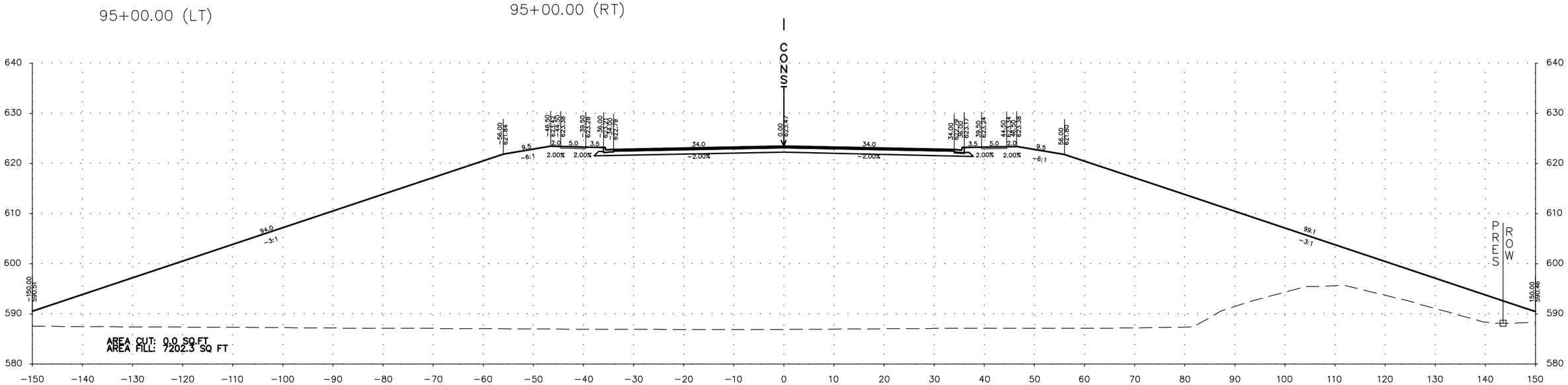
OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA



95+00.00 (LT)



95+00.00 (RT)



95+00.00

VOLUME CUT: 0 CU YD
VOLUME FILL: 13209 CU YD

Explanation

S−1; STA 79+00 / on CL — Borehole Number

SPT N−Value — N=8

Sampling

Borehole Lithology

AR − Auger Refusal
BT − Boring Termination

Water Level Reading at time of drilling.

Topsoil

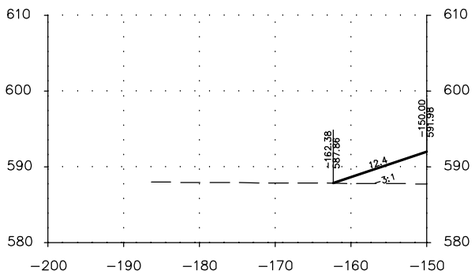
AASHTO A−6

AASHTO A−7

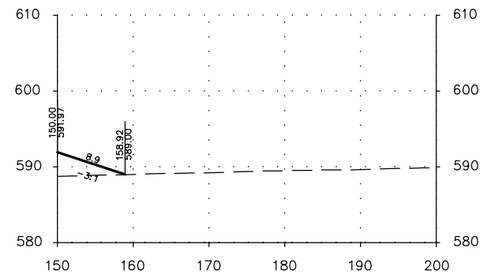
Drawn by: MSM	Project No.: E1185324	Terracon 2147 Riverchase Office Rd Hoover, AL PH. 205-942-1289 FAX. 205-443-5302
Date: 7/27/2020	Scale: 1"=20'	

BORING LOG CROSS SECTIONS

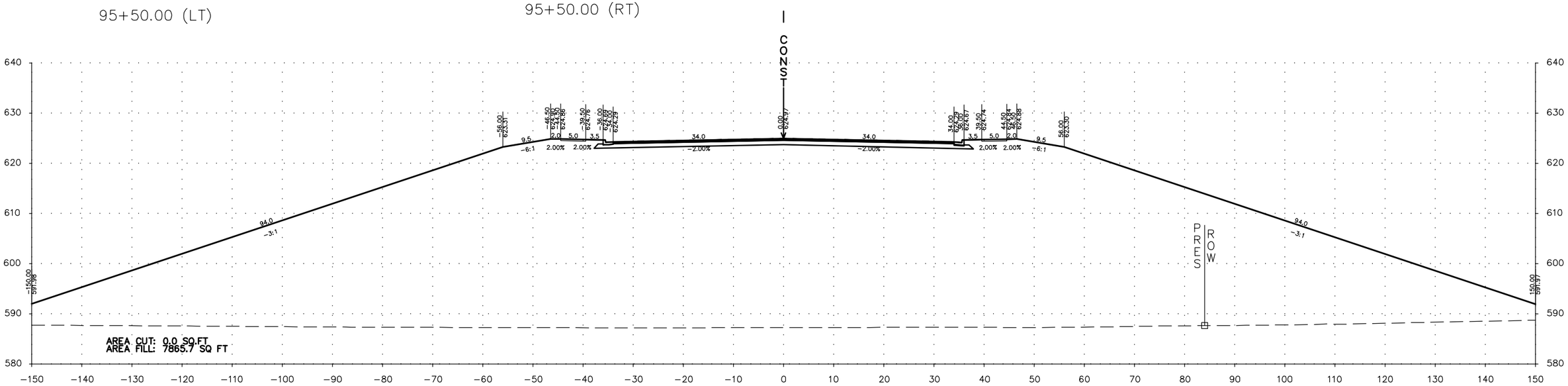
OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA



95+50.00 (LT)



95+50.00 (RT)



95+50.00

VOLUME CUT: 0 CU YD
VOLUME FILL: 13952 CU YD

Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling

Borehole Lithology

AR - Auger Refusal
BT - Boring Termination

Water Level Reading at time of drilling.

Topsoil

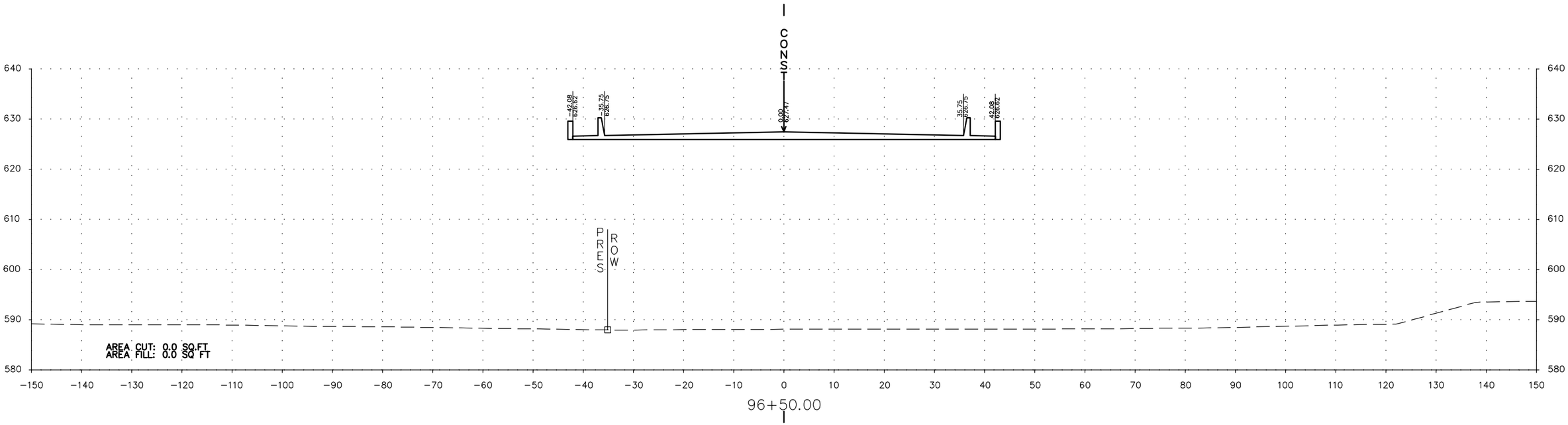
AASHTO A-6

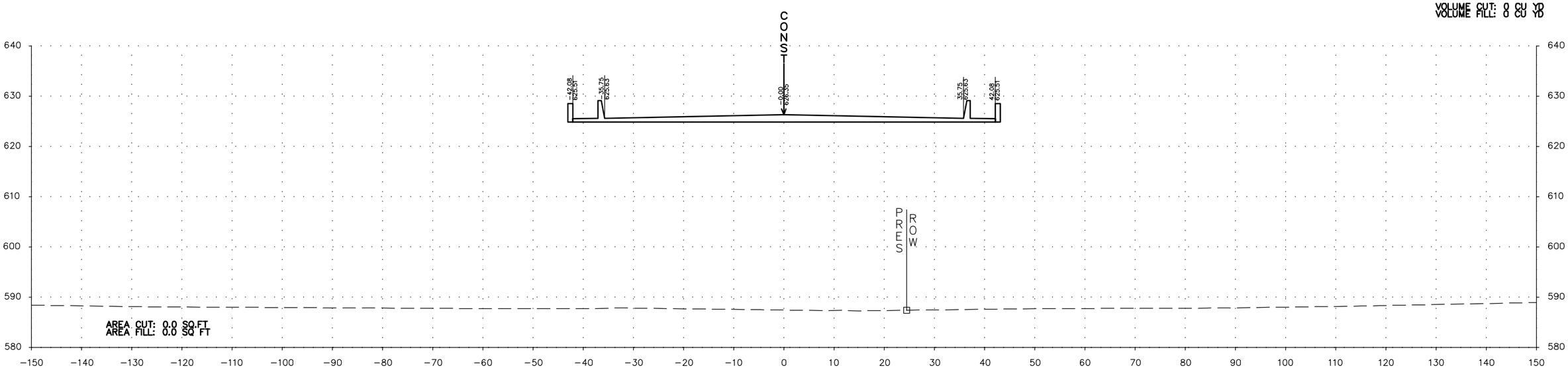
AASHTO A-7

Drawn by: MSM	Project No.: E1185324	Terracon 2147 Riverchase Office Rd Hoover, AL PH. 205-942-1289 FAX. 205-443-5302
Date: 7/27/2020	Scale: 1"=20'	

BORING LOG CROSS SECTIONS

OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA





Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling — Borehole Lithology

AR – Auger Refusal
BT – Boring Termination

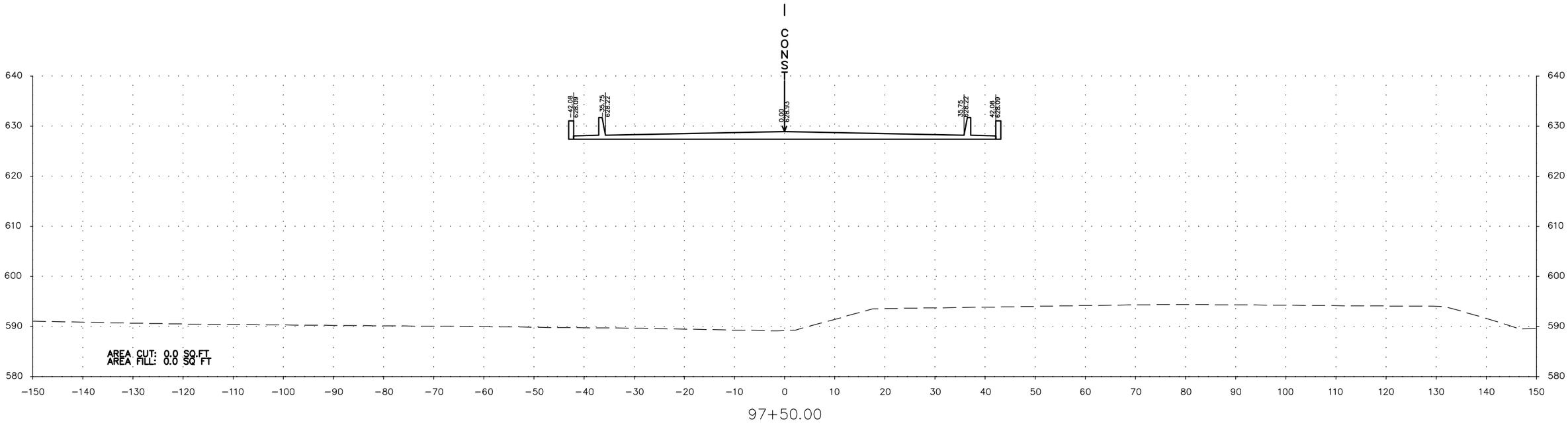
Water Level Reading at time of drilling.

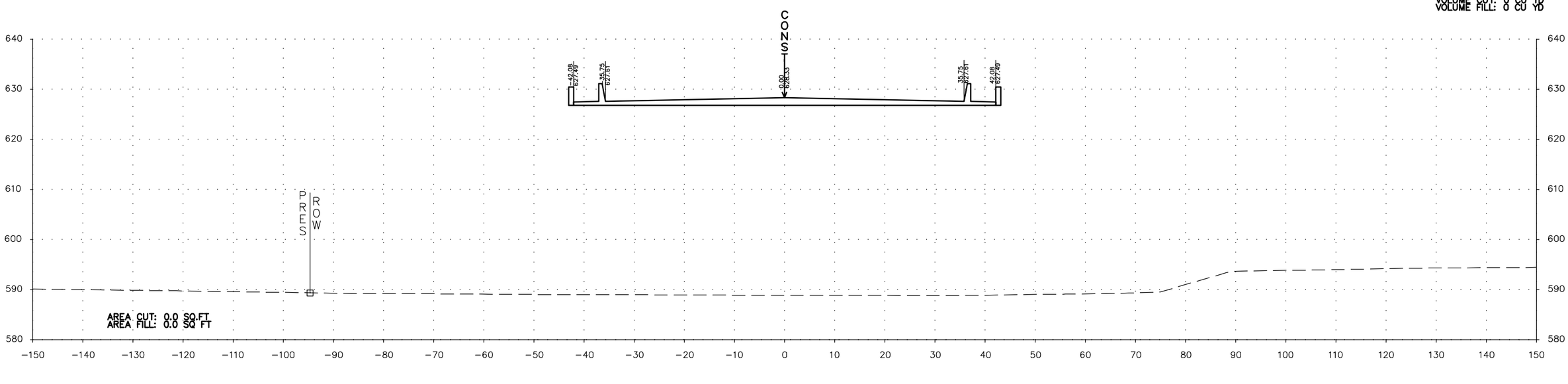
Topsoil | AASHTO A-6 | AASHTO A-7

Drawn by: MSM	Project No.: E1185324	Terracon, 2147 Riverchase Office Rd, Hoover, AL, PH. 205-942-1289, FAX. 205-443-5302
Date: 7/27/2020	Scale: 1"=20'	

BORING LOG CROSS SECTIONS

OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA





Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling

Borehole Lithology

AR - Auger Refusal
BT - Boring Termination

Water Level Reading at time of drilling.

Topsoil

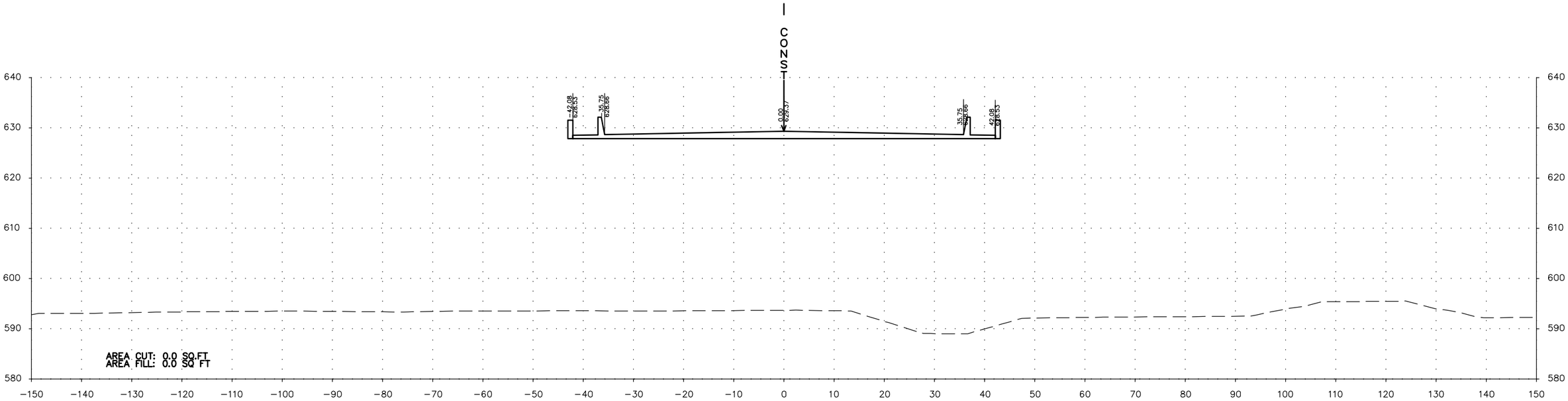
AASHTO A-6

AASHTO A-7

Drawn by: MSM	Project No.: E1185324	Terracon 2147 Riverchase Office Rd Hoover, AL PH. 205-942-1289 FAX. 205-443-5302
Date: 7/27/2020	Scale: 1"=20'	

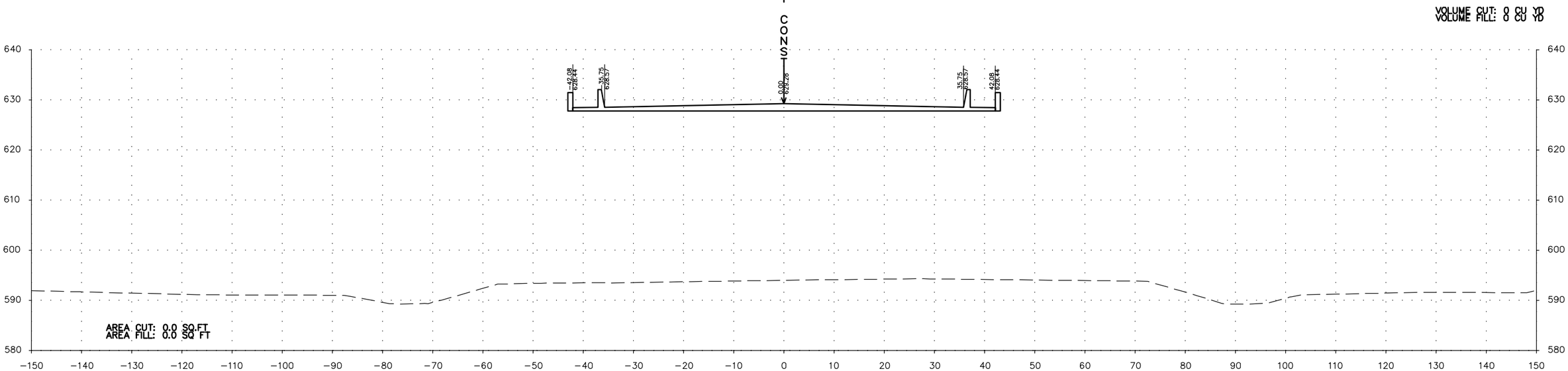
BORING LOG CROSS SECTIONS

OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA



98+50.00

VOLUME CUT: 0 CU YD
VOLUME FILL: 0 CU YD



98+00.00

VOLUME CUT: 0 CU YD
VOLUME FILL: 0 CU YD

Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling — Borehole Lithology

AR – Auger Refusal
BT – Boring Termination

Water Level Reading at time of drilling.

Topsoil

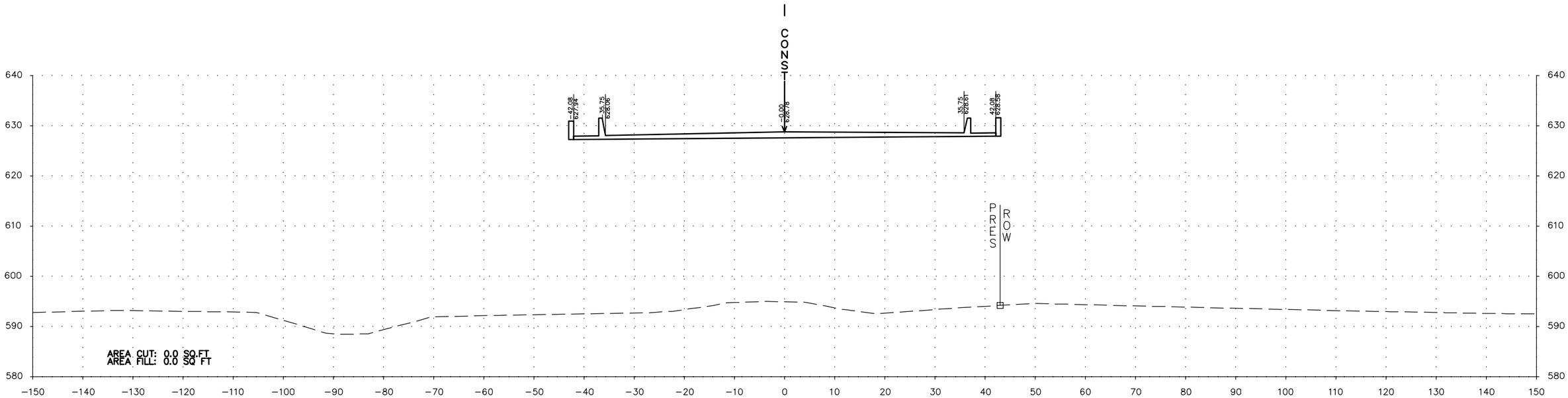
AASHTO A-6

AASHTO A-7

Drawn by: MSM	Project No.: E1185324	Terracon
Date: 7/27/2020	Scale: 1"=20'	2147 Riverchase Office Rd Hoover, AL
		PH. 205-942-1289 FAX. 205-443-5302

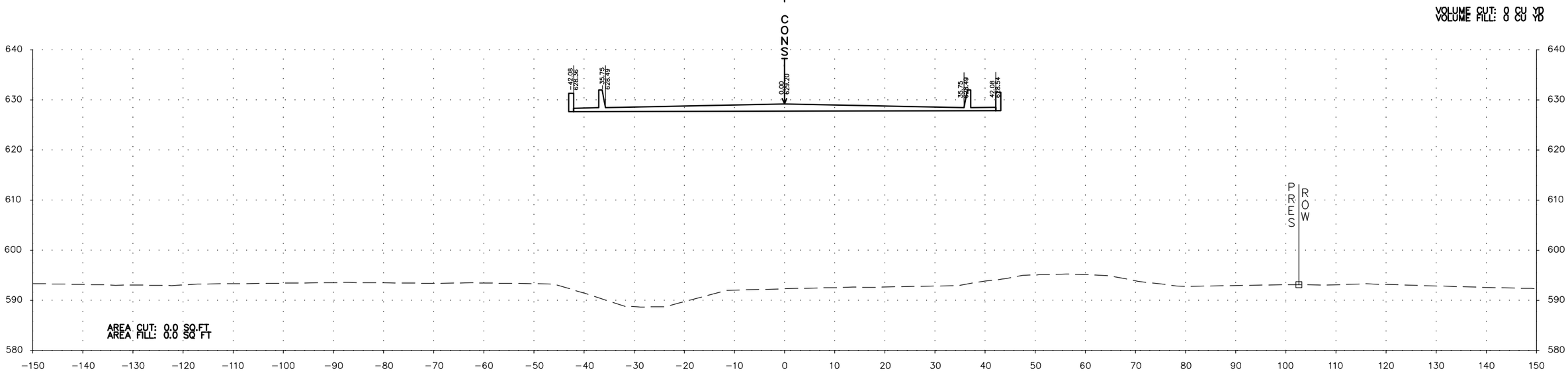
BORING LOG CROSS SECTIONS

OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA



99+50.00

VOLUME CUT: 0 CU YD
VOLUME FILL: 0 CU YD



99+00.00

VOLUME CUT: 0 CU YD
VOLUME FILL: 0 CU YD

Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling — Borehole Lithology

AR – Auger Refusal
BT – Boring Termination

Water Level Reading at time of drilling.

Topsoil

AASHTO A-6

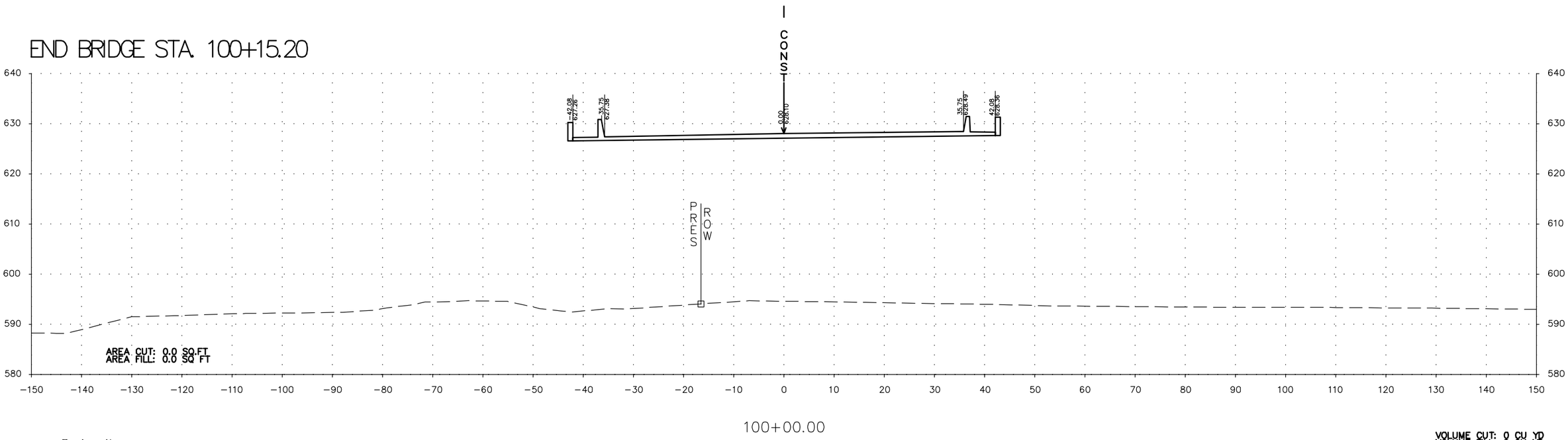
AASHTO A-7

Drawn by: MSM	Project No.: E1185324	Terracon 2147 Riverchase Office Rd Hoover, AL PH. 205-942-1289 FAX. 205-443-5302
Date: 7/27/2020	Scale: 1"=20'	

BORING LOG CROSS SECTIONS

OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA

END BRIDGE STA. 100+15.20



VOLUME CUT: 0 CU YD
VOLUME FILL: 0 CU YD

Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling

Borehole Lithology

AR – Auger Refusal
BT – Boring Termination

Water Level Reading at time of drilling.

Topsoil

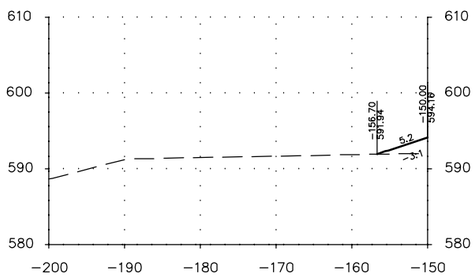
AASHTO A-6

AASHTO A-7

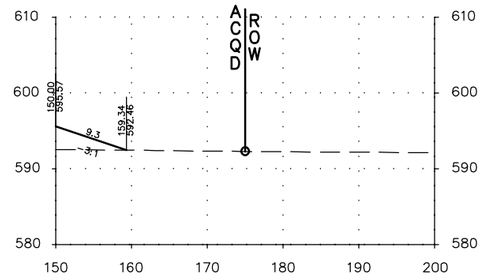
Drawn by: MSM	Project No.: E1185324	Terracon 2147 Riverchase Office Rd Hoover, AL PH. 205-942-1289 FAX. 205-443-5302
Date: 7/27/2020	Scale: 1"=20'	

BORING LOG CROSS SECTIONS

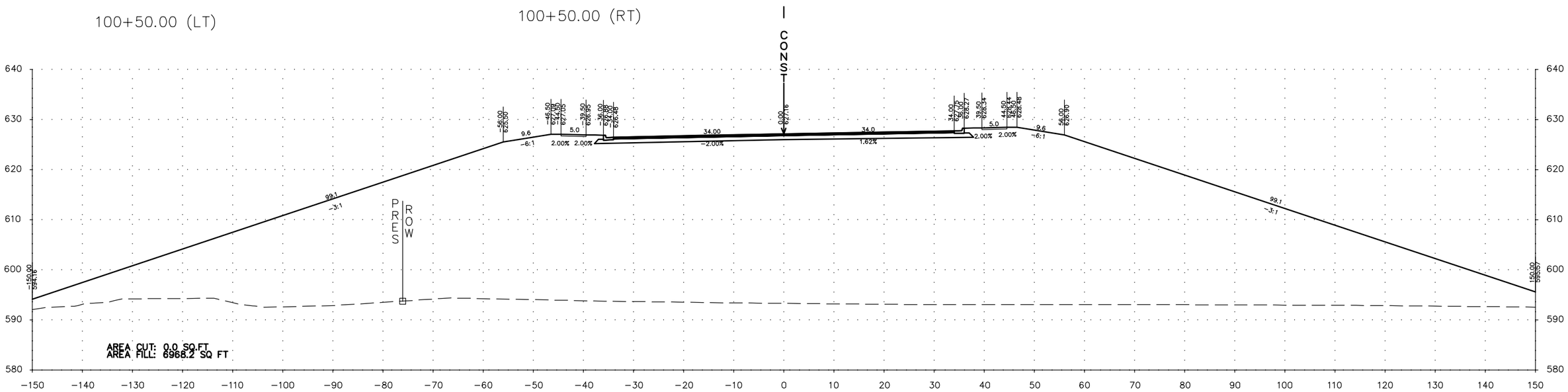
OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA



100+50.00 (LT)



100+50.00 (RT)



100+50.00

VOLUME CUT: 0 CU YD
VOLUME FILL: 6452 CU YD

Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling

Borehole Lithology

AR – Auger Refusal
BT – Boring Termination

Water Level Reading at time of drilling.

Topsoil

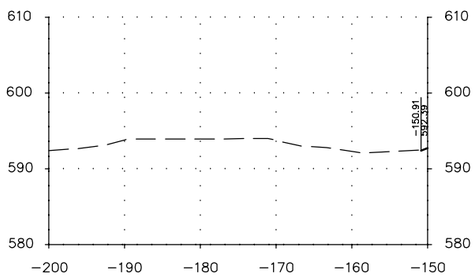
AASHTO A-6

AASHTO A-7

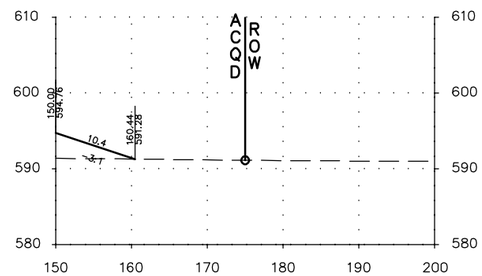
Drawn by: MSM	Project No.: E1185324	Terracon 2147 Riverchase Office Rd Hoover, AL PH. 205-942-1289 FAX. 205-443-5302
Date: 7/27/2020	Scale: 1"=20'	

BORING LOG CROSS SECTIONS

OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA



101+00.00 (LT)



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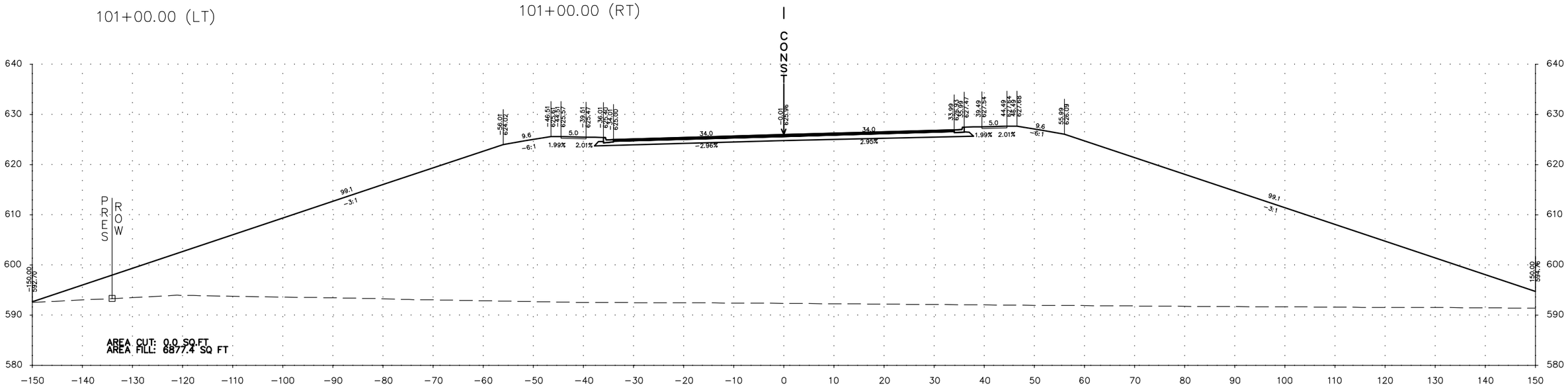


101+00.00

VOLUME CUT: 0 CU YD
VOLUME FILL: 12820 CU YD

Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling

Borehole Lithology

AR – Auger Refusal
BT – Boring Termination

Water Level Reading at time of drilling.

Topsoil

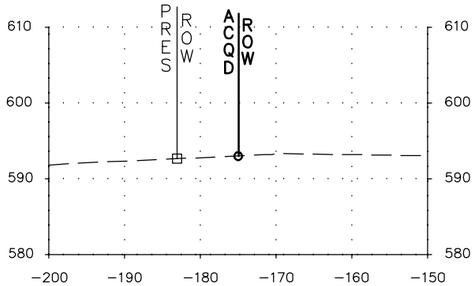
AASHTO A-6

AASHTO A-7

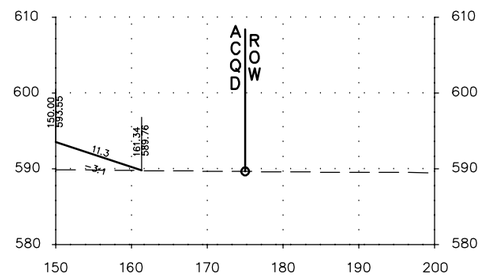
Drawn by: MSM	Project No.: E1185324	Terracon 2147 Riverchase Office Rd Hoover, AL PH. 205-942-1289 FAX. 205-443-5302
Date: 7/27/2020	Scale: 1"=20'	

BORING LOG CROSS SECTIONS

OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA



101+50.00 (LT)



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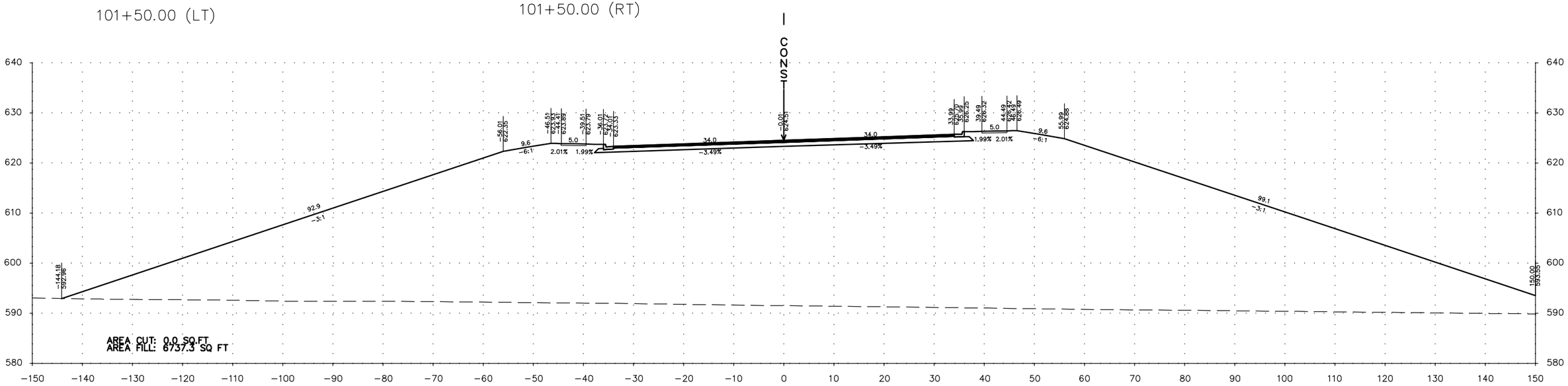


101+50.00

VOLUME CUT: 0 CU YD
VOLUME FILL: 12606 CU YD

Explanation

S−1; STA 79+00 / on CL — Borehole Number

SPT N−Value — N=8

Sampling

Borehole Lithology

AR − Auger Refusal
BT − Boring Termination

Water Level Reading at time of drilling.

Topsoil

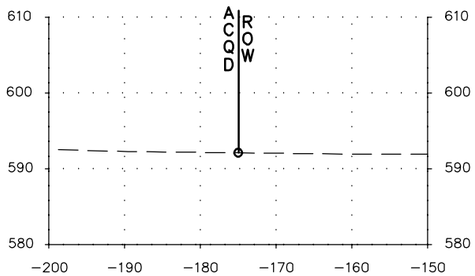
AASHTO A−6

AASHTO A−7

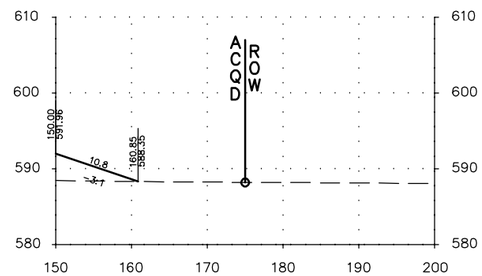
Drawn by: MSM	Project No.: E1185324	Terracon 2147 Riverchase Office Rd Hoover, AL PH. 205-942-1289 FAX. 205-443-5302
Date: 7/27/2020	Scale: 1"=20'	

BORING LOG CROSS SECTIONS

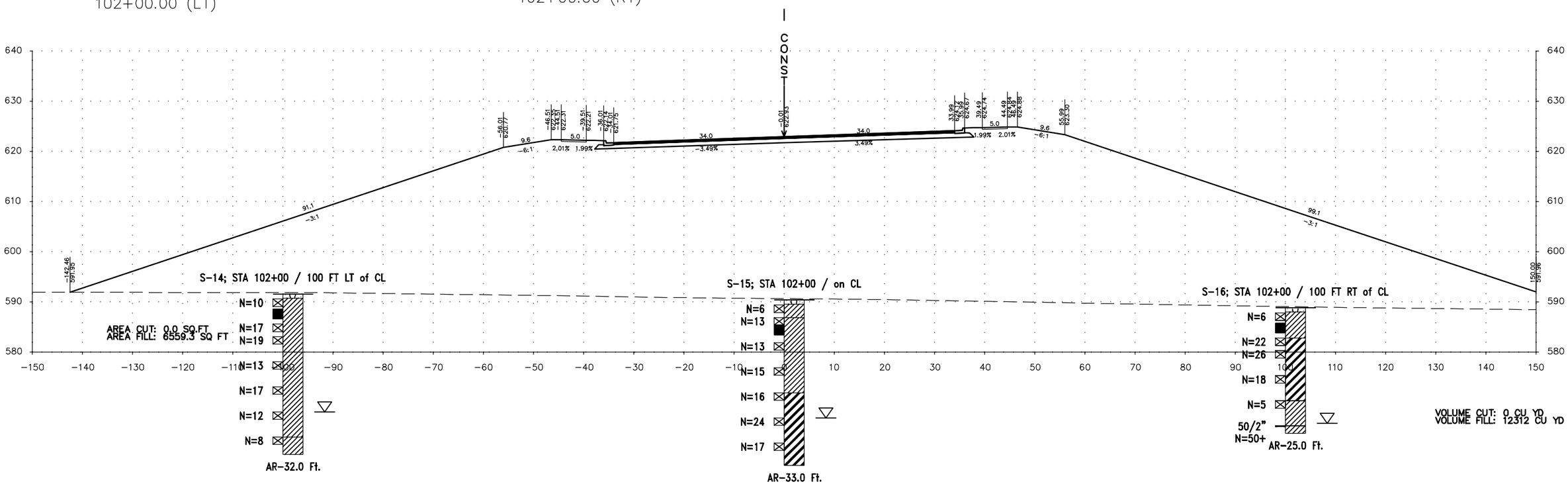
OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA



102+00.00 (LT)



102+00.00 (RT)



102+00.00

Explanation

S−1; STA 79+00 / on CL — Borehole Number

SPT N−Value — N=8

Sampling

Borehole Lithology

AR − Auger Refusal
BT − Boring Termination

Water Level Reading at time of drilling.

Topsoil

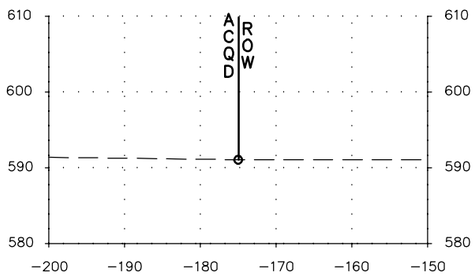
AASHTO A−6

AASHTO A−7

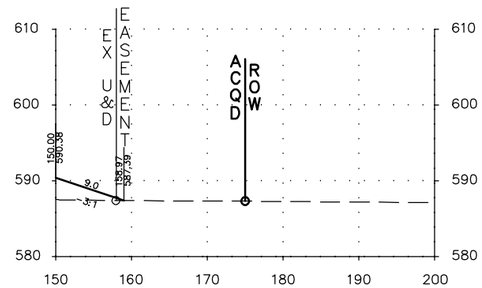
Drawn by: MSM	Project No.: E1185324	Terracon 2147 Riverchase Office Rd Hoover, AL PH. 205-942-1289 FAX. 205-443-5302
Date: 7/27/2020	Scale: 1"=20'	

BORING LOG CROSS SECTIONS

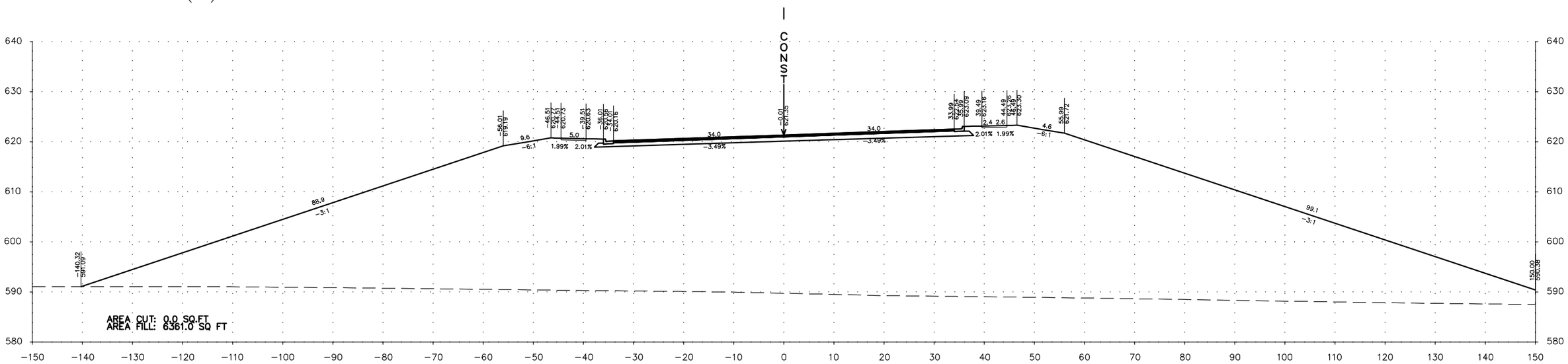
OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA



102+50.00 (LT)



102+50.00 (RT)



102+50.00

VOLUME CUT: 0 CU YD
VOLUME FILL: 11963 CU YD

Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling

Borehole Lithology

AR – Auger Refusal
BT – Boring Termination

Water Level Reading at time of drilling.

Topsoil

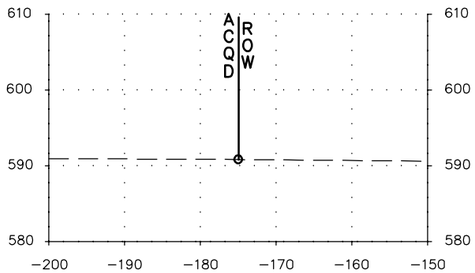
AASHTO A-6

AASHTO A-7

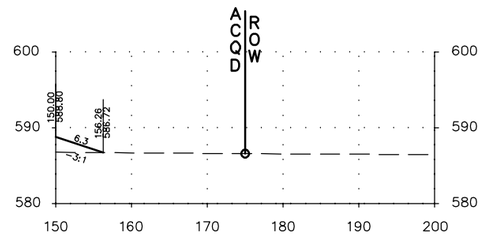
Drawn by: MSM	Project No.: E1185324	Terracon 2147 Riverchase Office Rd Hoover, AL PH. 205-942-1289 FAX. 205-443-5302
Date: 7/27/2020	Scale: 1"=20'	

BORING LOG CROSS SECTIONS

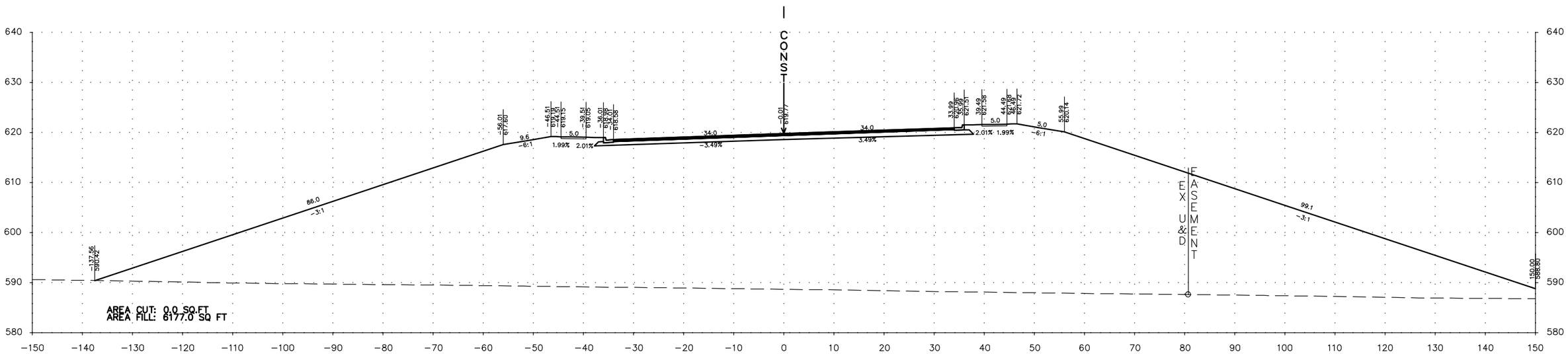
OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA



103+00.00 (LT)



103+00.00 (RT)



103+00.00

VOLUME CUT: 0 CU YD
VOLUME FILL: 11609 CU YD

Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling

Borehole Lithology

AR – Auger Refusal
BT – Boring Termination

Water Level Reading at time of drilling.

Topsoil

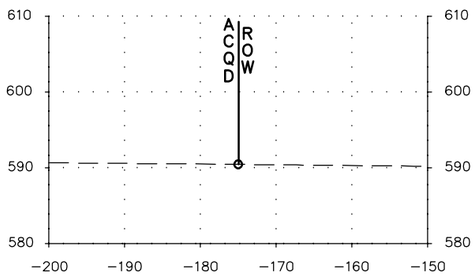
AASHTO A-6

AASHTO A-7

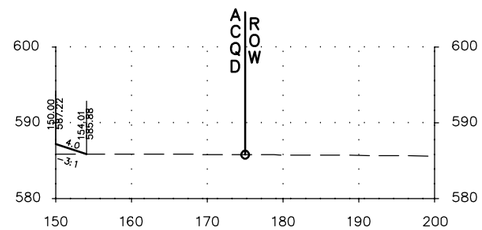
Drawn by: MSM	Project No.: E1185324	Terracon 2147 Riverchase Office Rd Hoover, AL PH. 205-942-1289 FAX. 205-443-5302
Date: 7/27/2020	Scale: 1"=20'	

BORING LOG CROSS SECTIONS

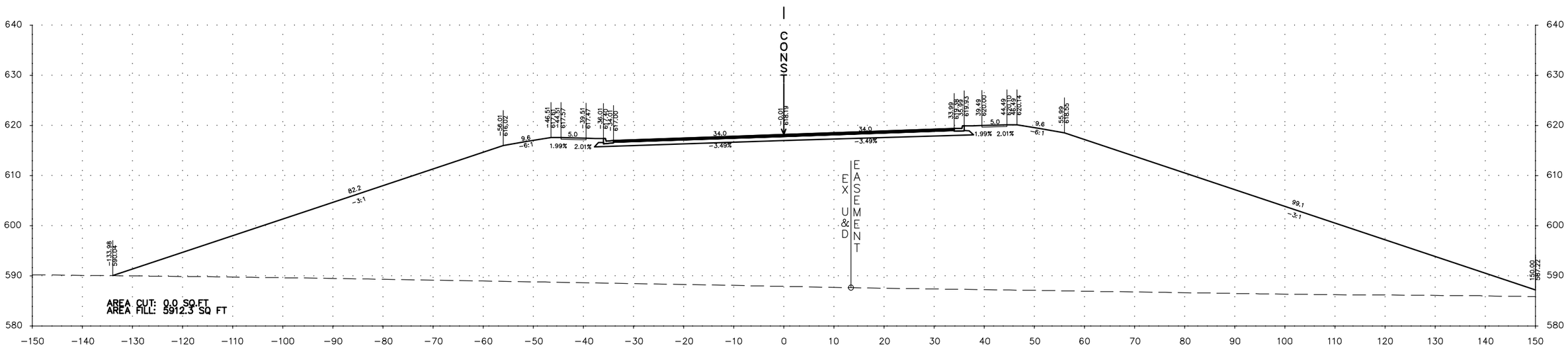
OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA



103+50.00 (LT)



103+50.00 (RT)



103+50.00

VOLUME CUT: 0 CU YD
VOLUME FILL: 11194 CU YD

Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling

Borehole Lithology

AR – Auger Refusal
BT – Boring Termination

Water Level Reading at time of drilling.

Topsoil

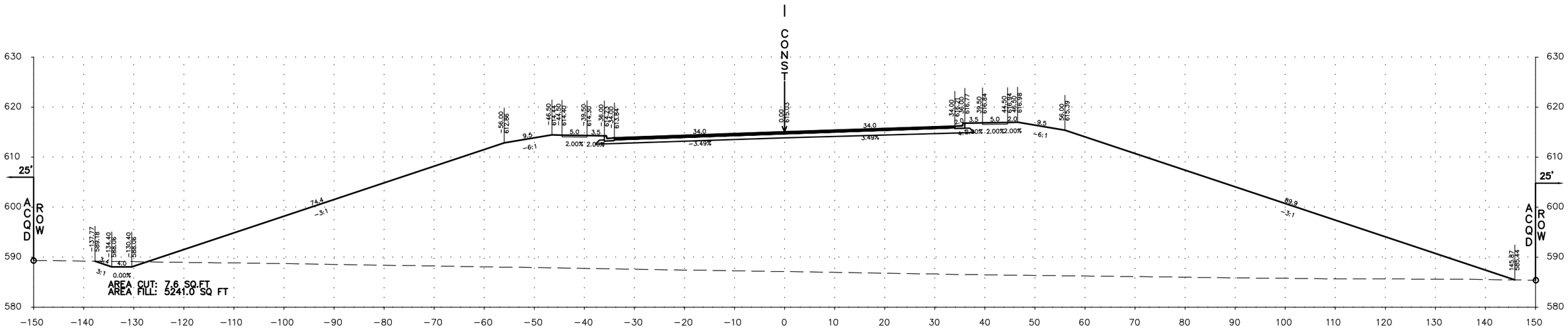
AASHTO A-6

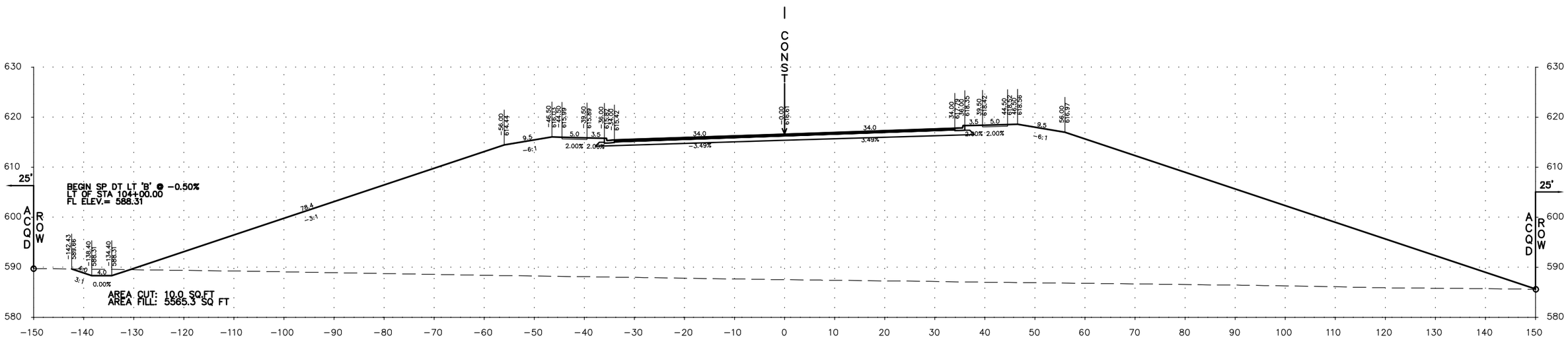
AASHTO A-7

Drawn by: MSM	Project No.: E1185324	Terracon 2147 Riverchase Office Rd Hoover, AL PH. 205-942-1289 FAX. 205-443-5302
Date: 7/27/2020	Scale: 1"=20'	

BORING LOG CROSS SECTIONS

OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA





Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

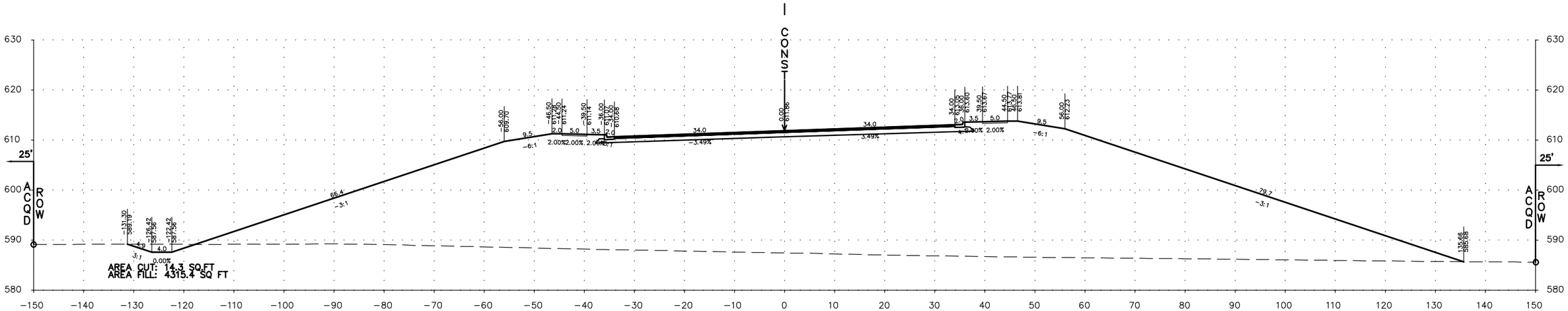
Sampling — Borehole Lithology

AR – Auger Refusal
BT – Boring Termination

Water Level Reading at time of drilling.

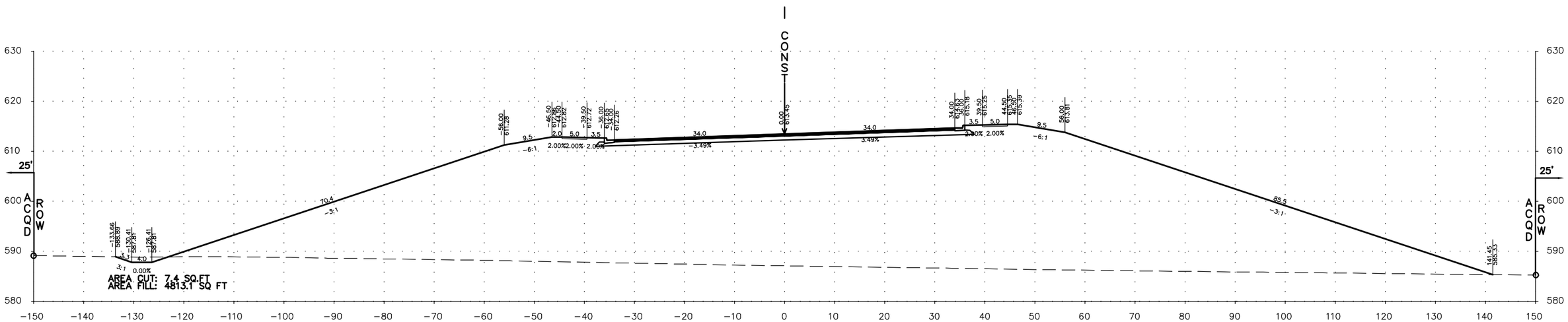
Topsoil | AASHTO A-6 | AASHTO A-7

Drawn by: MSM	Project No.: E1185324	Terracon, 2147 Riverchase Office Rd, Hoover, AL, PH. 205-942-1289, FAX. 205-443-5302
Date: 7/27/2020	Scale: 1"=20'	BORING LOG CROSS SECTIONS
		OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD AND BEAVERDAM CREEK HUNTSVILLE, LIMESTONE COUNTY, ALABAMA



105+50.00

VOLUME CUT: 20 CU YD
VOLUME FILL: 8452 CU YD



105+00.00

VOLUME CUT: 14 CU YD
VOLUME FILL: 9309 CU YD

Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling — Borehole Lithology

AR – Auger Refusal
BT – Boring Termination

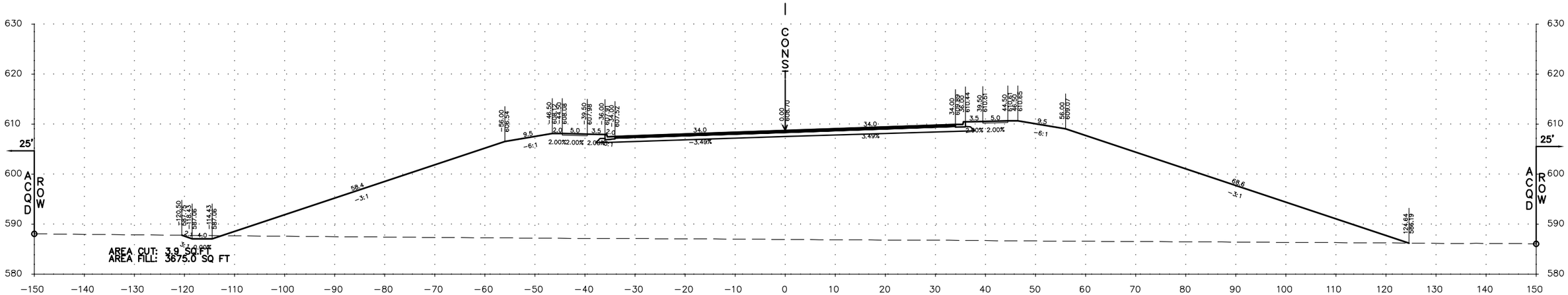
Water Level Reading at time of drilling.

Topsoil | AASHTO A-6 | AASHTO A-7

Drawn by: MSM	Project No.: E1185324	Terracon, 2147 Riverchase Office Rd, Hoover, AL, PH. 205-942-1289, FAX. 205-443-5302
Date: 7/27/2020	Scale: 1"=20'	

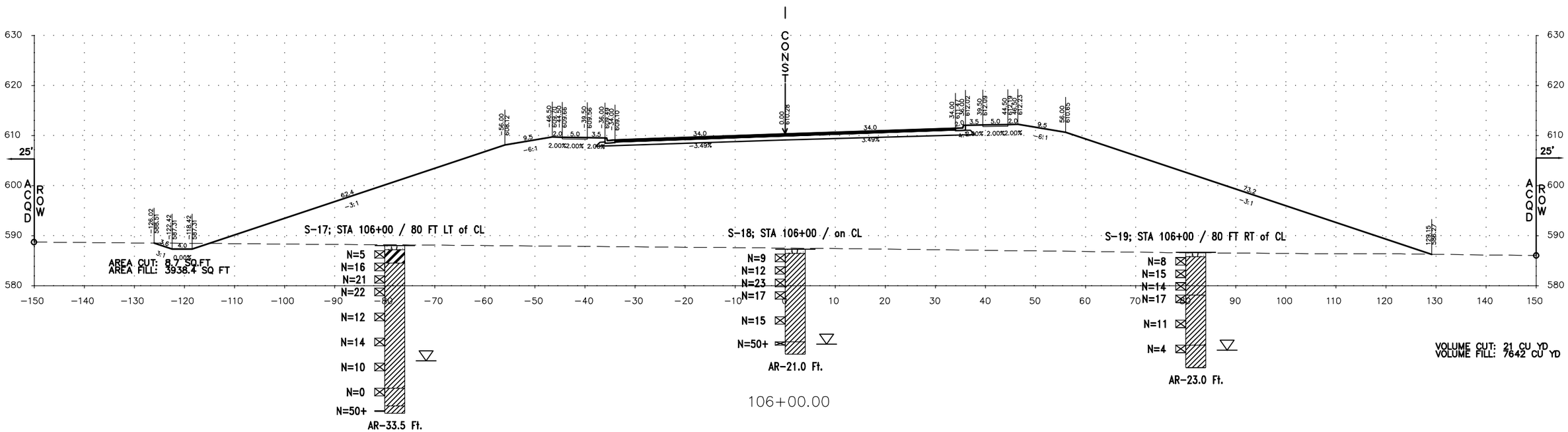
BORING LOG CROSS SECTIONS

OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA



106+50.00

VOLUME CUT: 12 CU YD
VOLUME FILL: 7049 CU YD



106+00.00

VOLUME CUT: 21 CU YD
VOLUME FILL: 7642 CU YD

Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling

Borehole Lithology

AR – Auger Refusal
BT – Boring Termination

Water Level Reading at time of drilling.

Topsoil

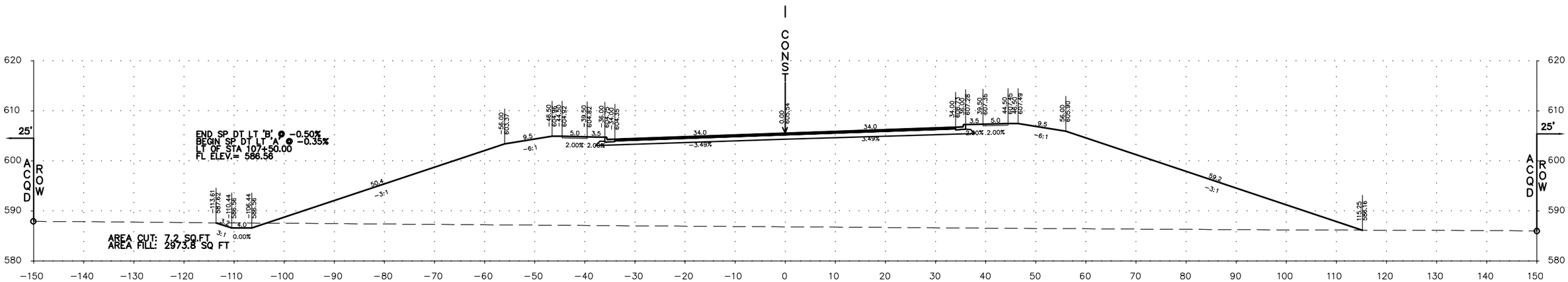
AASHTO A-6

AASHTO A-7

Drawn by: MSM	Project No.: E1185324	Terracon 2147 Riverchase Office Rd Hoover, AL PH. 205-942-1289 FAX. 205-443-5302
Date: 7/27/2020	Scale: 1"=20'	

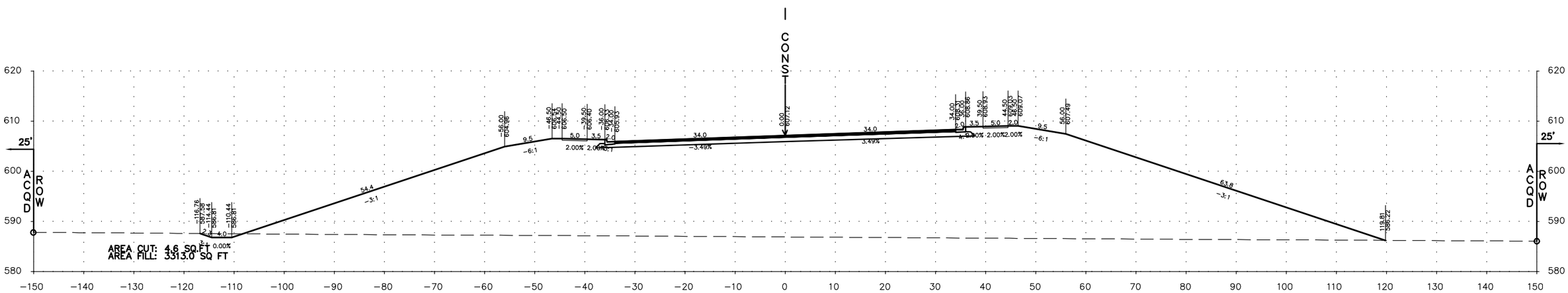
BORING LOG CROSS SECTIONS

OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA



107+50.00

VOLUME CUT: 11 CU YD
VOLUME FILL: 5821 CU YD



107+00.00

VOLUME CUT: 8 CU YD
VOLUME FILL: 6470 CU YD

Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling

Borehole Lithology

AR - Auger Refusal
BT - Boring Termination

Water Level Reading at time of drilling.

Topsoil

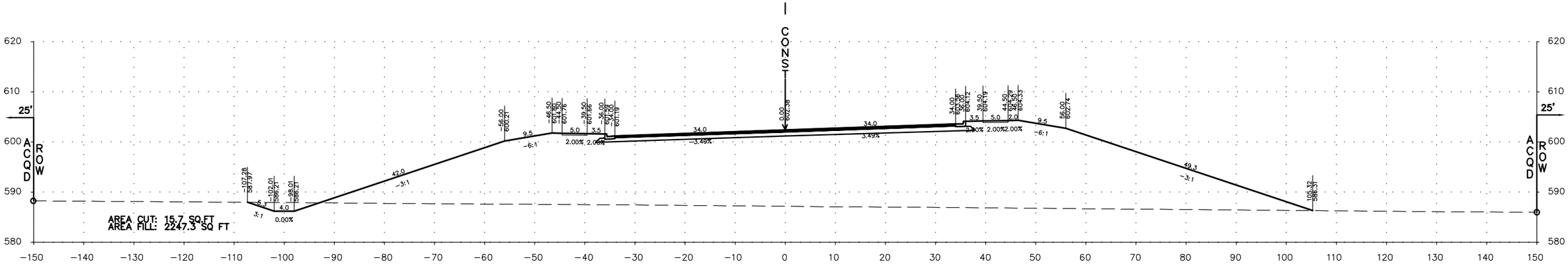
AASHTO A-6

AASHTO A-7

Drawn by: MSM	Project No.: E1185324	Terracon
Date: 7/27/2020	Scale: 1"=20'	2147 Riverchase Office Rd Hoover, AL
		PH. 205-942-1289 FAX. 205-443-5302

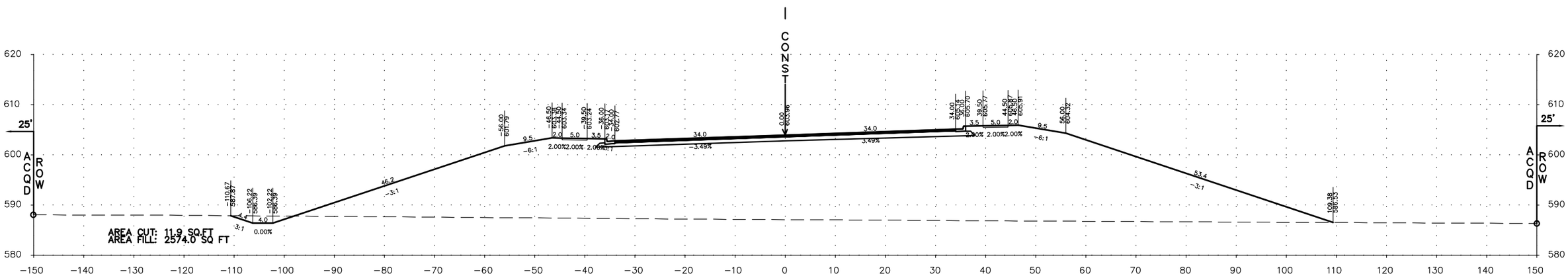
BORING LOG CROSS SECTIONS

OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA



108+50.00

VOLUME CUT: 26 CU YD
VOLUME FILL: 4464 CU YD



108+00.00

VOLUME CUT: 18 CU YD
VOLUME FILL: 5137 CU YD

Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling

Borehole Lithology

AR – Auger Refusal
BT – Boring Termination

Water Level Reading at time of drilling.

Topsoil

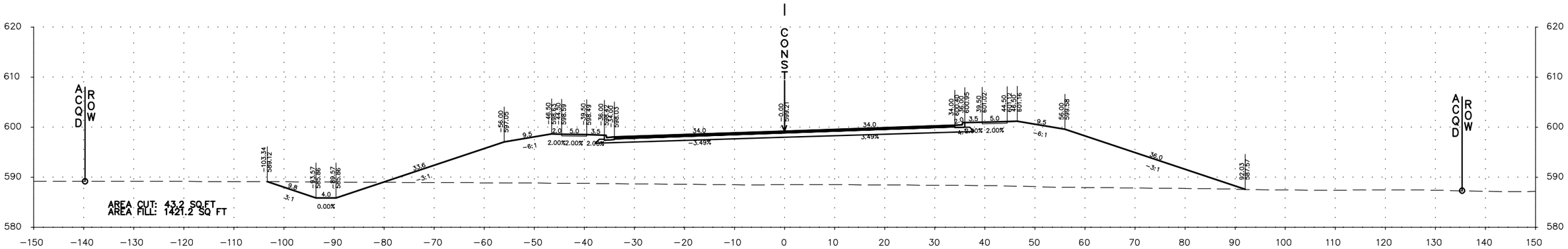
AASHTO A-6

AASHTO A-7

Drawn by: MSM	Project No.: E1185324	Terracon 2147 Riverchase Office Rd Hoover, AL PH. 205-942-1289 FAX. 205-443-5302
Date: 7/27/2020	Scale: 1"=20'	

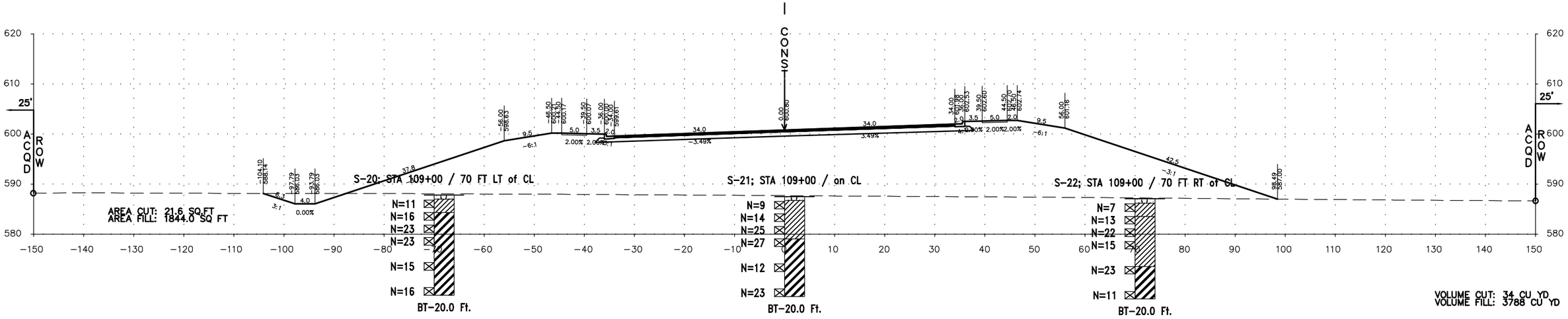
BORING LOG CROSS SECTIONS

OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA



109+50.00

VOLUME CUT: 60 CU YD
VOLUME FILL: 3023 CU YD



109+00.00

VOLUME CUT: 34 CU YD
VOLUME FILL: 3788 CU YD

Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling

Borehole Lithology

AR – Auger Refusal
BT – Boring Termination

Water Level Reading at time of drilling.

Topsoil

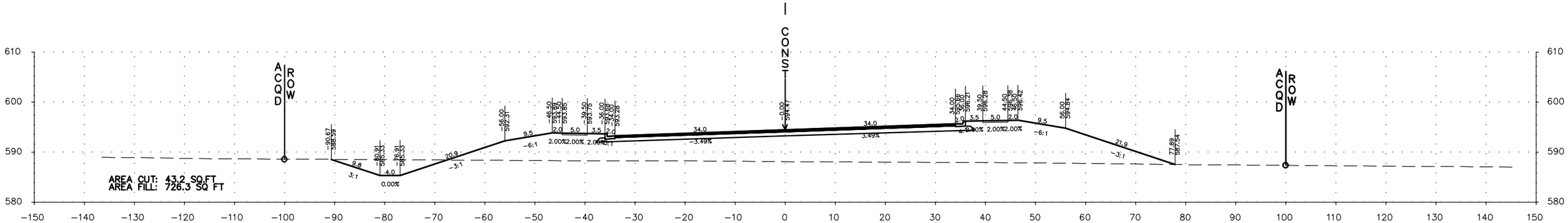
AASHTO A-6

AASHTO A-7

Drawn by: MSM	Project No.: E1185324	Terracon 2147 Riverchase Office Rd Hoover, AL PH. 205-942-1289 FAX. 205-443-5302
Date: 7/27/2020	Scale: 1"=20'	

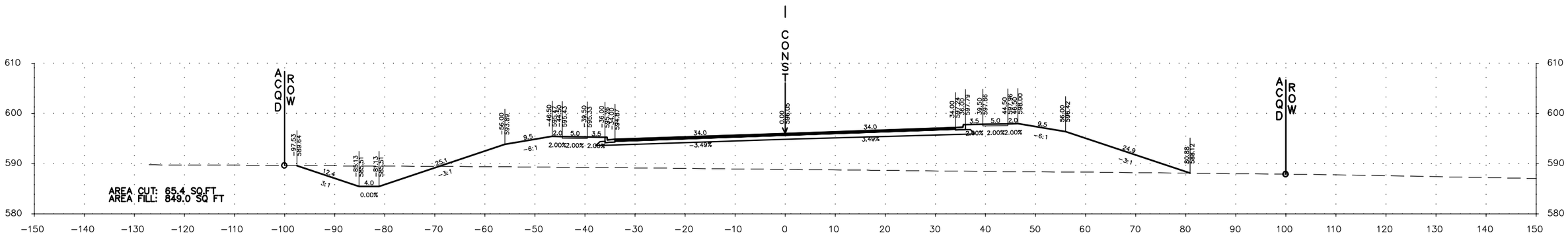
BORING LOG CROSS SECTIONS

OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA



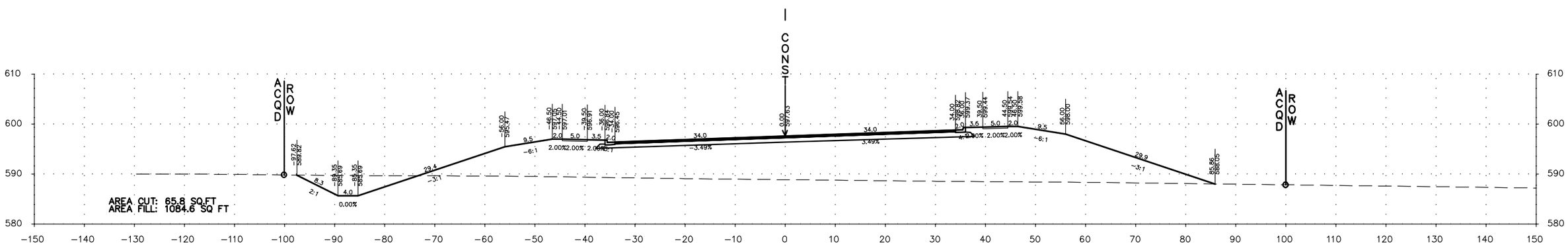
111+00.00

VOLUME CUT: 101 CU YD
VOLUME FILL: 1459 CU YD



110+50.00

VOLUME CUT: 121 CU YD
VOLUME FILL: 1790 CU YD



110+00.00

VOLUME CUT: 101 CU YD
VOLUME FILL: 2320 CU YD

Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling

Borehole Lithology

AR – Auger Refusal
BT – Boring Termination

Water Level Reading at time of drilling.

Topsoil

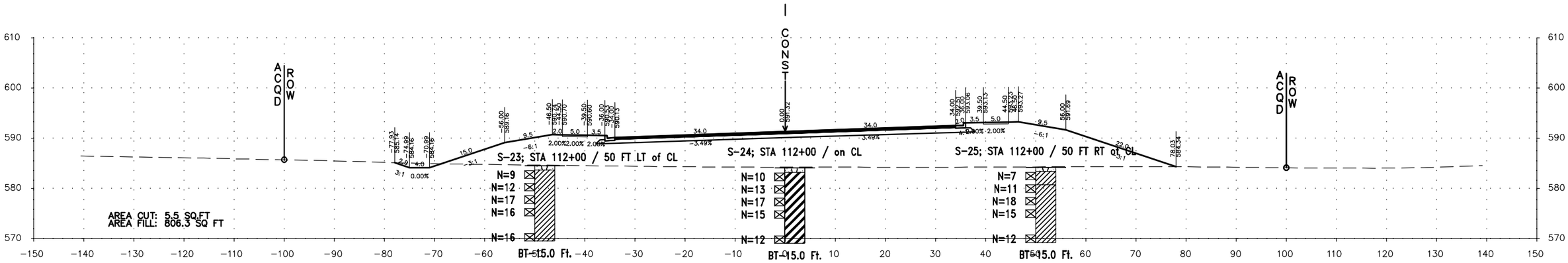
AASHTO A-6

AASHTO A-7

Drawn by: MSM	Project No.: E1185324	Terracon 2147 Riverchase Office Rd Hoover, AL PH. 205-942-1289 FAX. 205-443-5302
Date: 7/27/2020	Scale: 1"=20'	

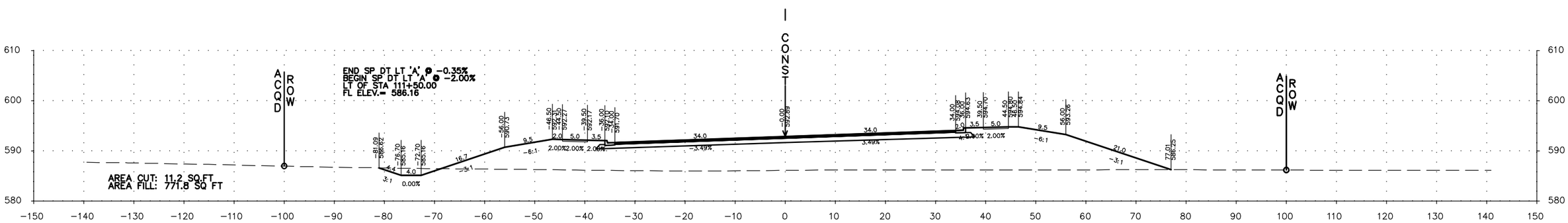
BORING LOG CROSS SECTIONS

OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA



112+00.00

VOLUME CUT: 15 CU YD
VOLUME FILL: 1461 CU YD



111+50.00

VOLUME CUT: 50 CU YD
VOLUME FILL: 1387 CU YD

Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling

Borehole Lithology

AR - Auger Refusal
BT - Boring Termination

Water Level Reading at time of drilling.

Topsoil

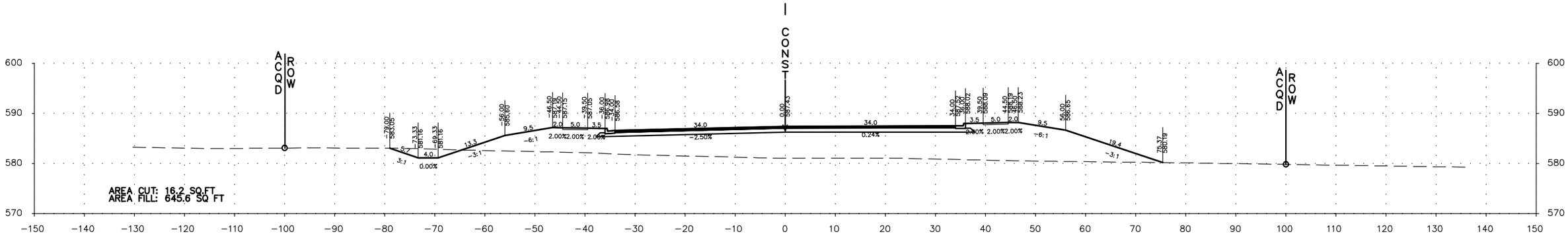
AASHTO A-6

AASHTO A-7

Drawn by: MSM	Project No.: E1185324	Terracon
Date: 7/27/2020	Scale: 1"=20'	2147 Riverchase Office Rd Hoover, AL
		PH. 205-942-1289 FAX. 205-443-5302

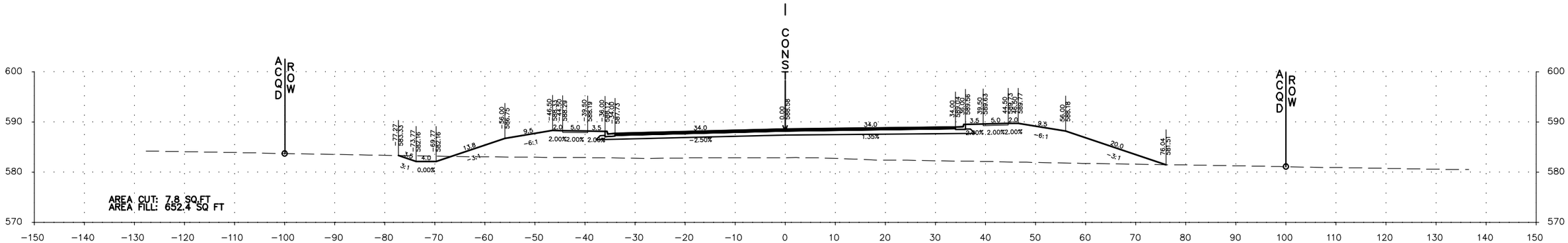
BORING LOG CROSS SECTIONS

OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA



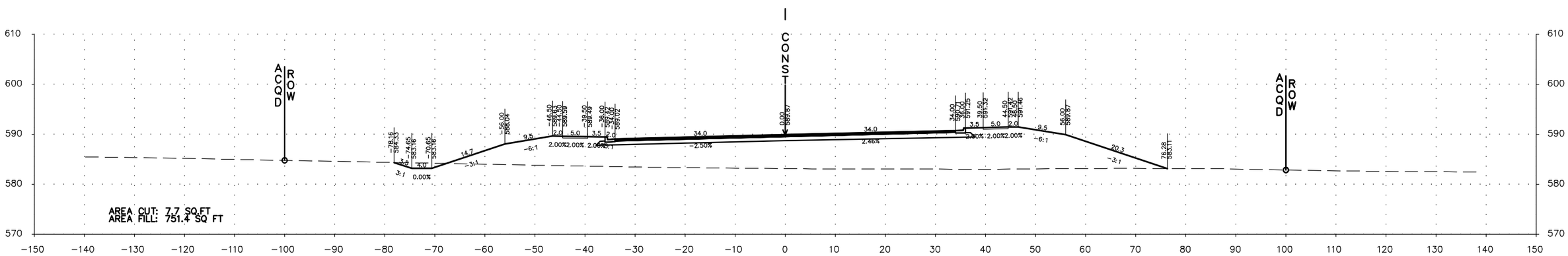
113+50.00

VOLUME CUT: 22 CU YD
VOLUME FILL: 1202 CU YD



113+00.00

VOLUME CUT: 14 CU YD
VOLUME FILL: 1300 CU YD



112+50.00

VOLUME CUT: 12 CU YD
VOLUME FILL: 1442 CU YD

Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling — Borehole Lithology

AR – Auger Refusal
BT – Boring Termination

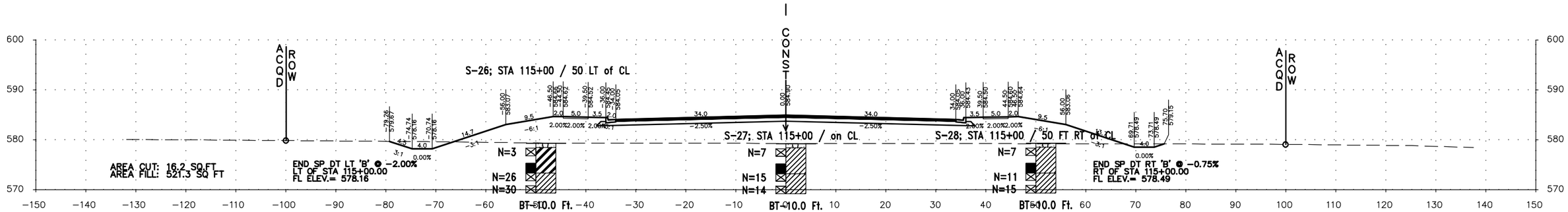
Water Level Reading at time of drilling.

Topsoil | AASHTO A-6 | AASHTO A-7

Drawn by: MSM	Project No.: E1185324	Terracon, 2147 Riverchase Office Rd, Hoover, AL, PH. 205-942-1289, FAX. 205-443-5302
Date: 7/27/2020	Scale: 1"=20'	

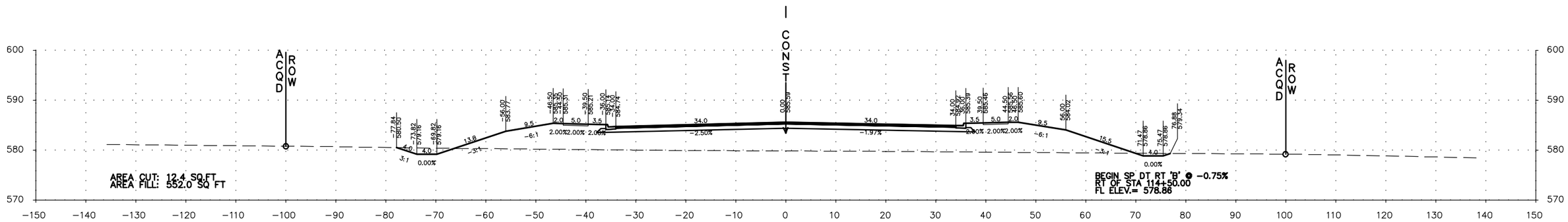
BORING LOG CROSS SECTIONS

OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA



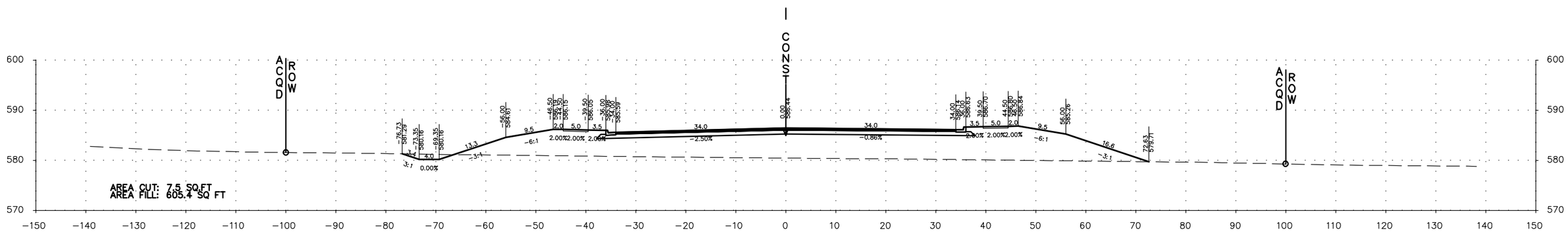
115+00.00

VOLUME CUT: 27 CU YD
VOLUME FILL: 994 CU YD



114+50.00

VOLUME CUT: 18 CU YD
VOLUME FILL: 1072 CU YD



114+00.00

VOLUME CUT: 22 CU YD
VOLUME FILL: 1158 CU YD

Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling

Borehole Lithology

AR - Auger Refusal
BT - Boring Termination

Water Level Reading at time of drilling.

Topsoil

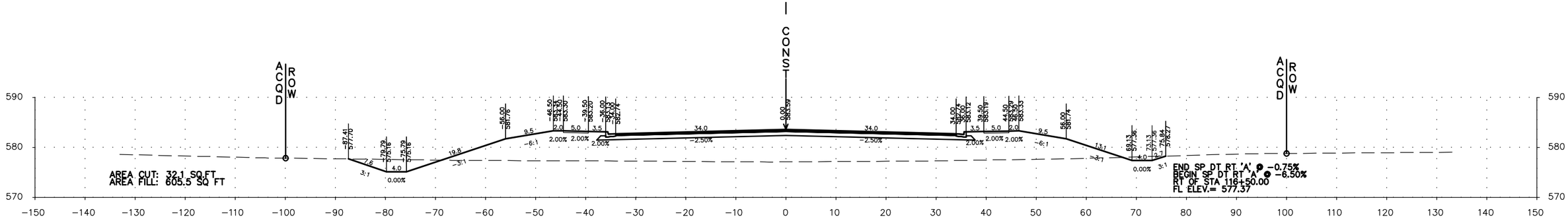
AASHTO A-6

AASHTO A-7

Drawn by: MSM	Project No.: E1185324	Terracon
Date: 7/27/2020	Scale: 1"=20'	2147 Riverchase Office Rd Hoover, AL
		PH. 205-942-1289 FAX. 205-443-5302

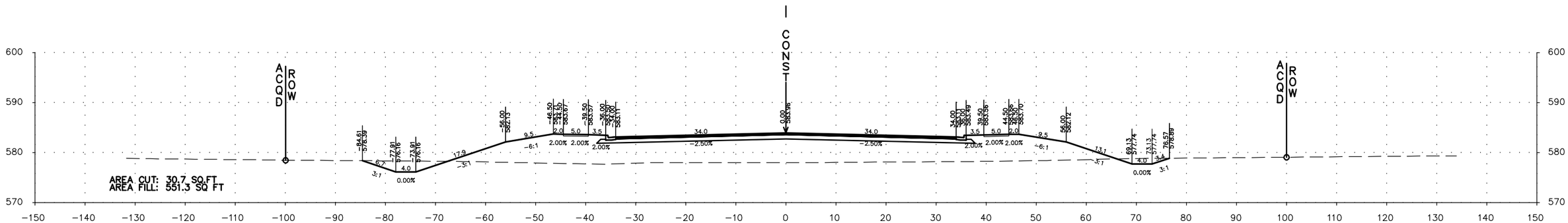
BORING LOG CROSS SECTIONS

OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA



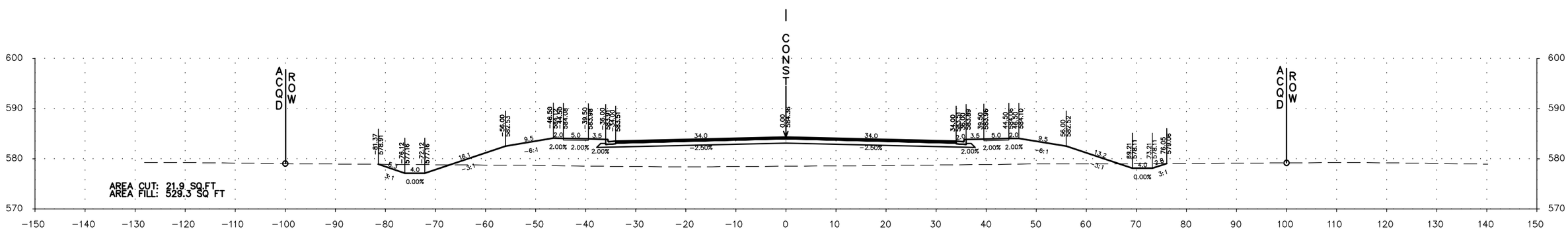
116+50.00

VOLUME CUT: 58 CU YD
VOLUME FILL: 1071 CU YD



116+00.00

VOLUME CUT: 49 CU YD
VOLUME FILL: 1001 CU YD



115+50.00

VOLUME CUT: 0 CU YD
VOLUME FILL: 0 CU YD

Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling

Borehole Lithology

AR - Auger Refusal
BT - Boring Termination

Water Level Reading at time of drilling.

Topsoil

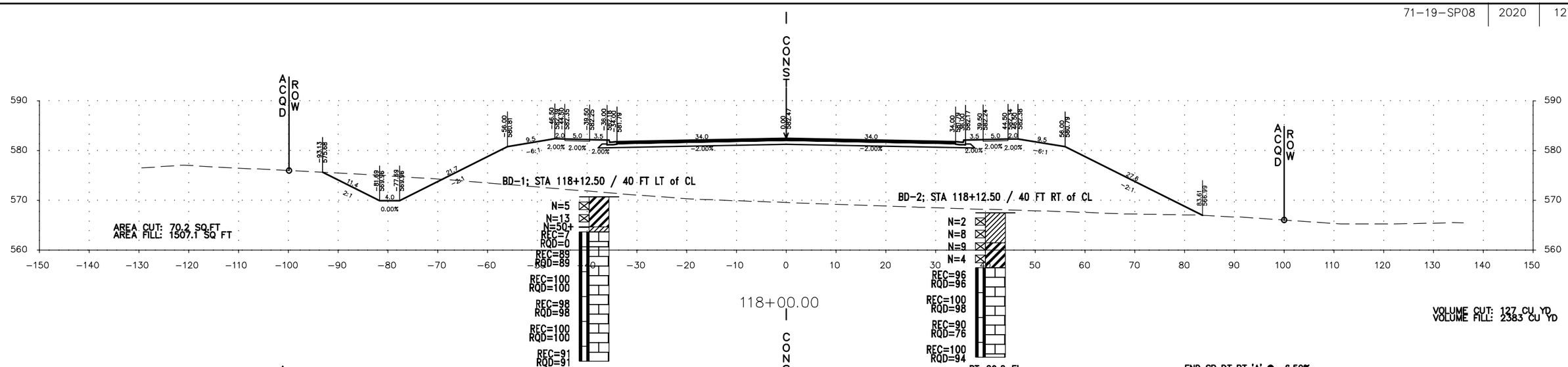
AASHTO A-6

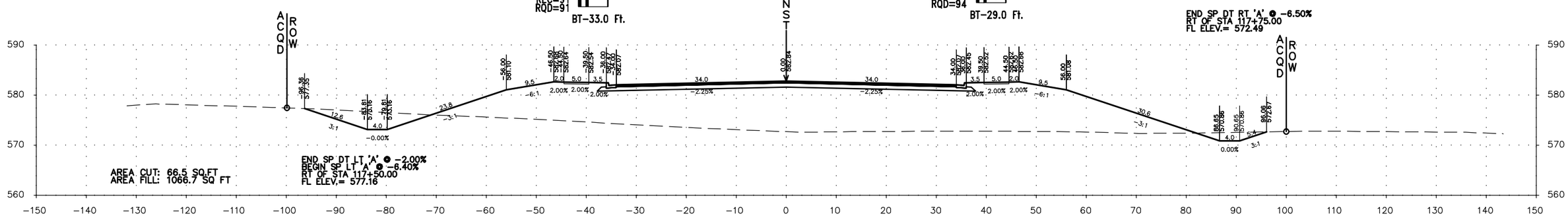
AASHTO A-7

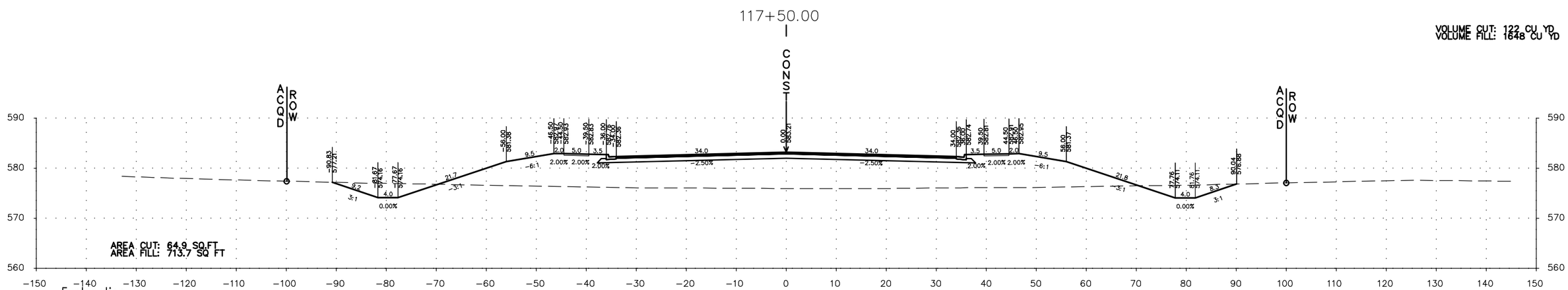
Drawn by: MSM	Project No.: E1185324	Terracon
Date: 7/27/2020	Scale: 1"=20'	2147 Riverchase Office Rd Hoover, AL
		PH. 205-942-1289 FAX. 205-443-5302

BORING LOG CROSS SECTIONS

OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA







Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling

Borehole Lithology

AR - Auger Refusal

BT - Boring Termination

Water Level Reading at time of drilling.

Topsoil

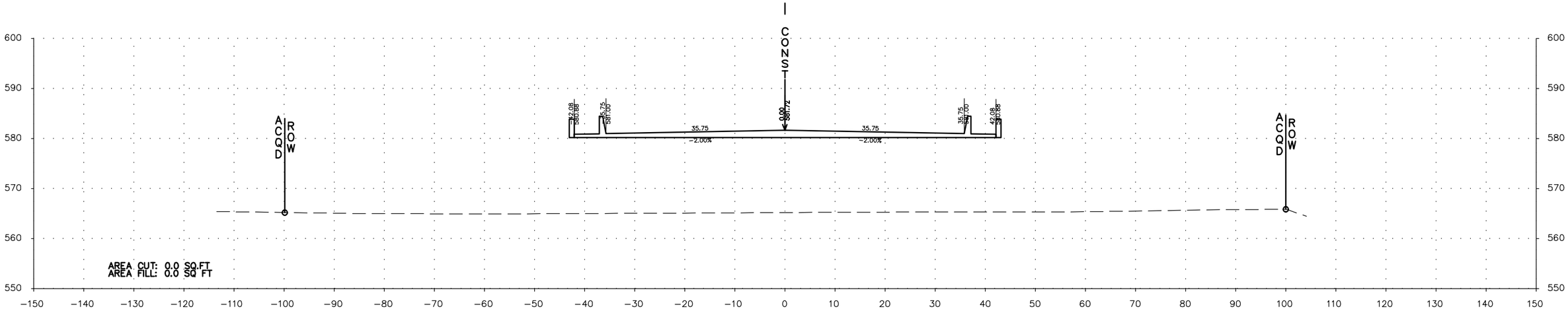
AASHTO A-6

AASHTO A-7

Drawn by: MSM	Project No.: E1185324	Terracon, 2147 Riverchase Office Rd, Hoover, AL, PH. 205-942-1289, FAX. 205-443-5302
Date: 7/27/2020	Scale: 1"=20'	

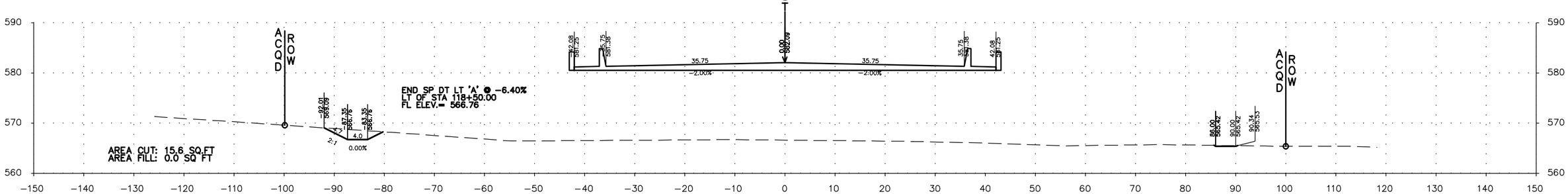
BORING LOG CROSS SECTIONS

OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA



119+00.00

VOLUME CUT: 14 CU YD
VOLUME FILL: 0 CU YD



118+50.00

VOLUME CUT: 79 CU YD
VOLUME FILL: 1395 CU YD

BEGIN BRIDGE STA. 118+12.50

Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling

Borehole Lithology

AR - Auger Refusal
BT - Boring Termination

Water Level Reading at time of drilling.

Topsoil

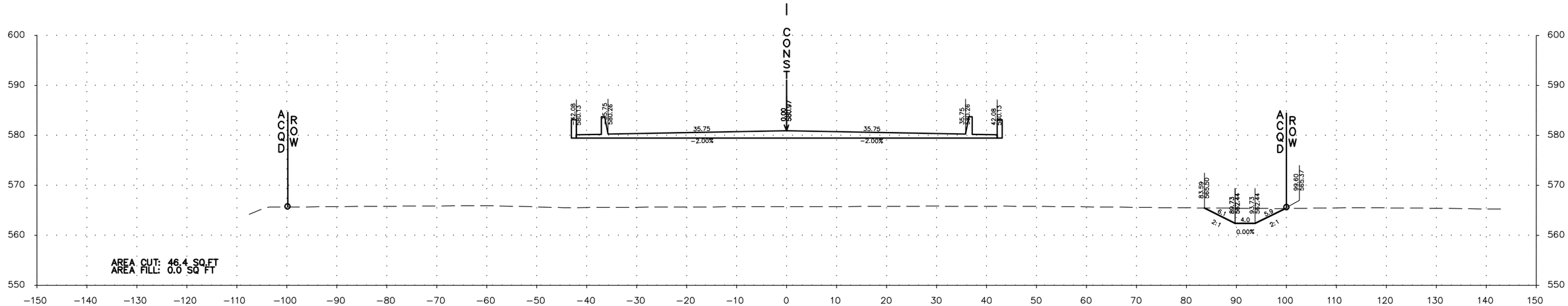
AASHTO A-6

AASHTO A-7

Drawn by: MSM	Project No.: E1185324	Terracon
Date: 7/27/2020	Scale: 1"=20'	2147 Riverchase Office Rd Hoover, AL
		PH. 205-942-1289 FAX. 205-443-5302

BORING LOG CROSS SECTIONS

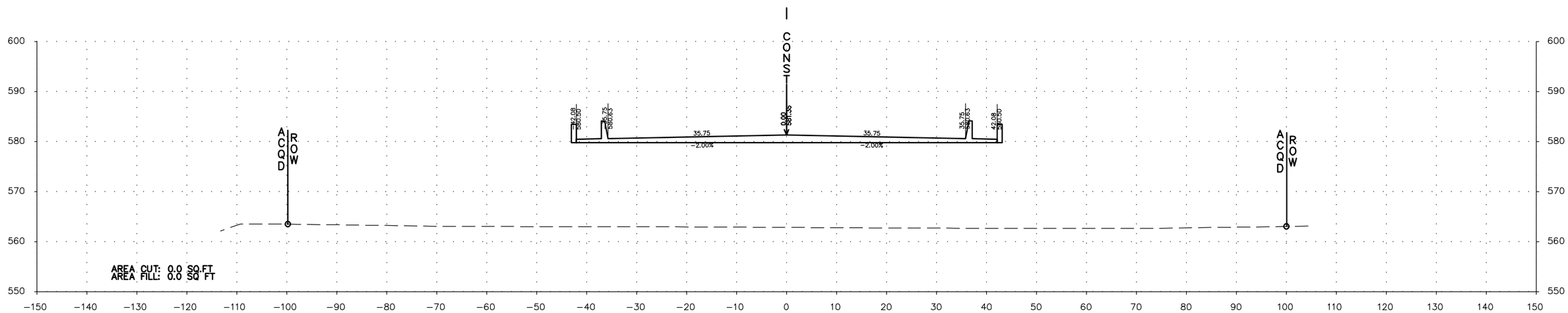
OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA



120+00.00

BEGIN SP DT RT 'B' @ 0.25%
RT OF STA 119+90.00
FL ELEV.= 562.41

VOLUME CUT: 43 CU YD
VOLUME FILL: 0 CU YD



119+50.00

VOLUME CUT: 0 CU YD
VOLUME FILL: 0 CU YD

Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling — Borehole Lithology

AR - Auger Refusal
BT - Boring Termination

Water Level Reading at time of drilling.

Topsoil

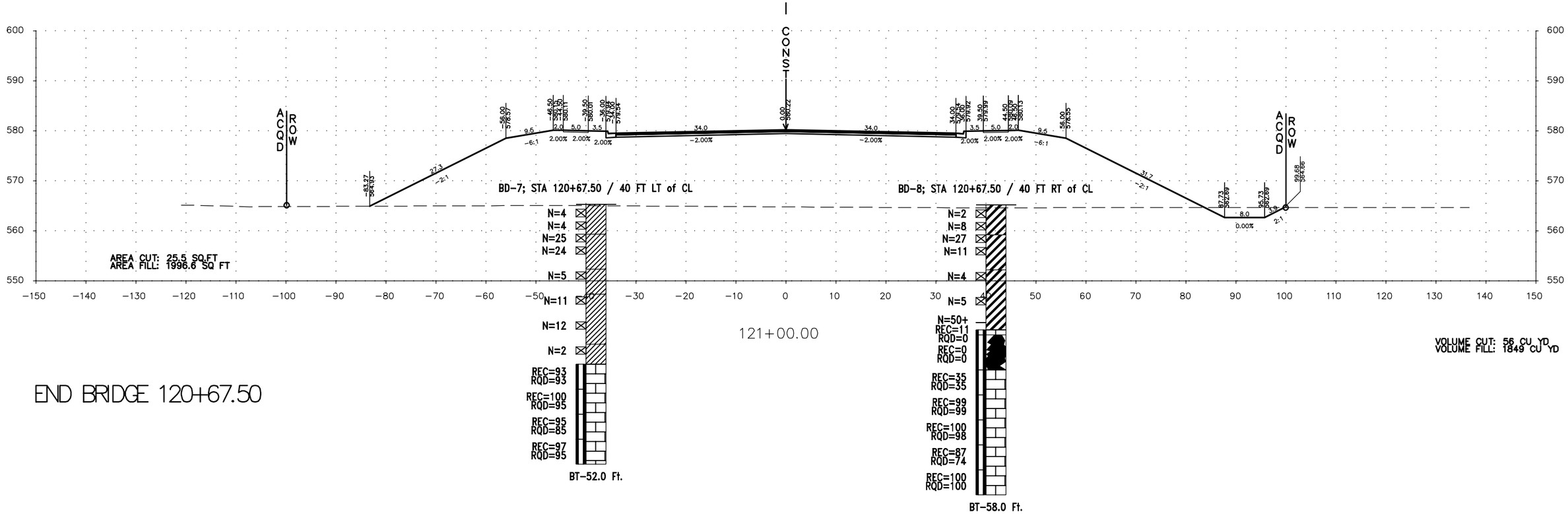
AASHTO A-6

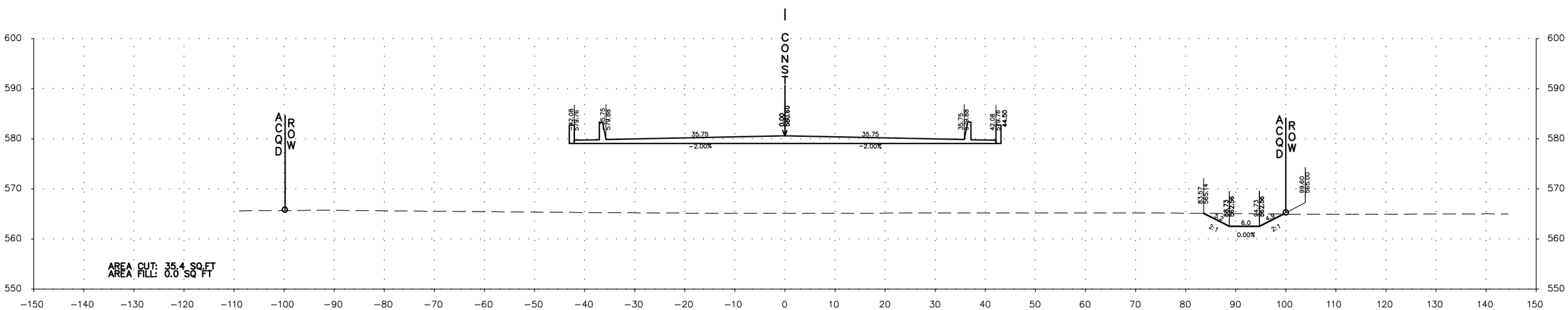
AASHTO A-7

Drawn by: MSM	Project No.: E1185324	Terracon 2147 Riverchase Office Rd Hoover, AL PH. 205-942-1289 FAX. 205-443-5302
Date: 7/27/2020	Scale: 1"=20'	

BORING LOG CROSS SECTIONS

OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA





Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling

Borehole Lithology

AR - Auger Refusal
BT - Boring Termination

Water Level Reading at time of drilling.

Topsoil

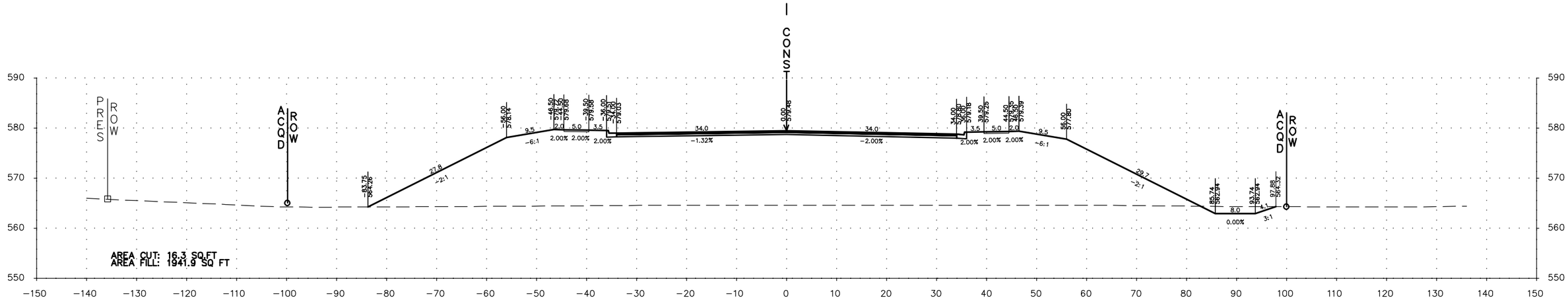
AASHTO A-6

AASHTO A-7

Drawn by: MSM	Project No.: E1185324	Terracon
Date: 7/27/2020	Scale: 1"=20'	2147 Riverchase Office Rd Hoover, AL
		PH. 205-942-1289 FAX. 205-443-5302

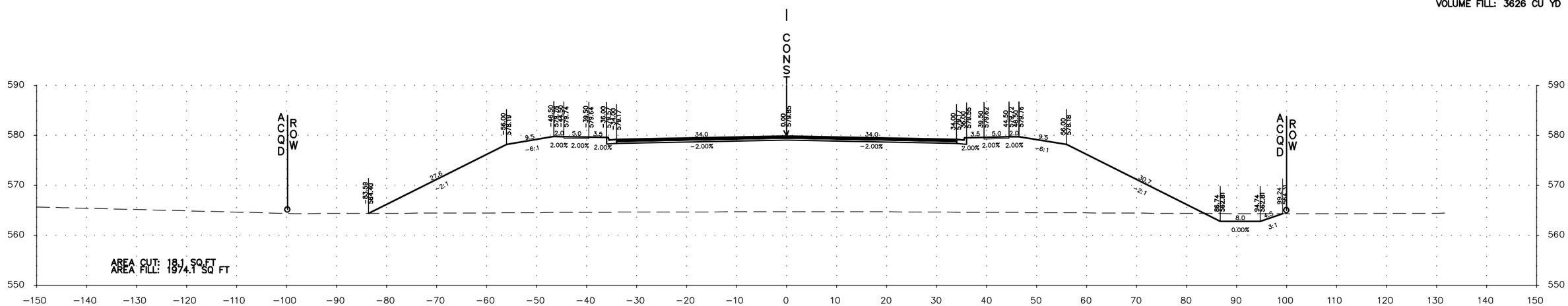
BORING LOG CROSS SECTIONS

OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA



122+00.00

VOLUME CUT: 32 CU YD
VOLUME FILL: 3626 CU YD



121+50.00

VOLUME CUT: 40 CU YD
VOLUME FILL: 3677 CU YD

Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling — Borehole Lithology

AR - Auger Refusal
BT - Boring Termination

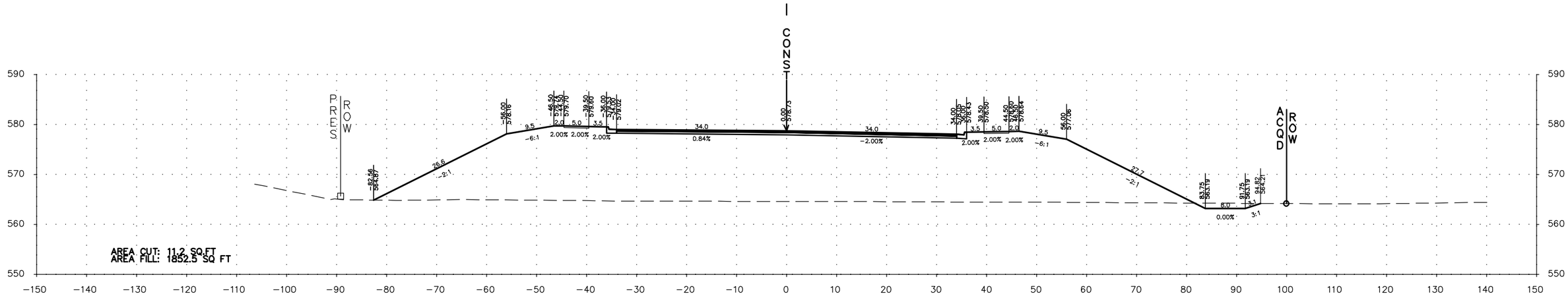
Water Level Reading at time of drilling.

Topsoil | AASHTO A-6 | AASHTO A-7

Drawn by: MSM	Project No.: E1185324	Terracon, 2147 Riverchase Office Rd, Hoover, AL, PH. 205-942-1289, FAX. 205-443-5302
Date: 7/27/2020	Scale: 1"=20'	

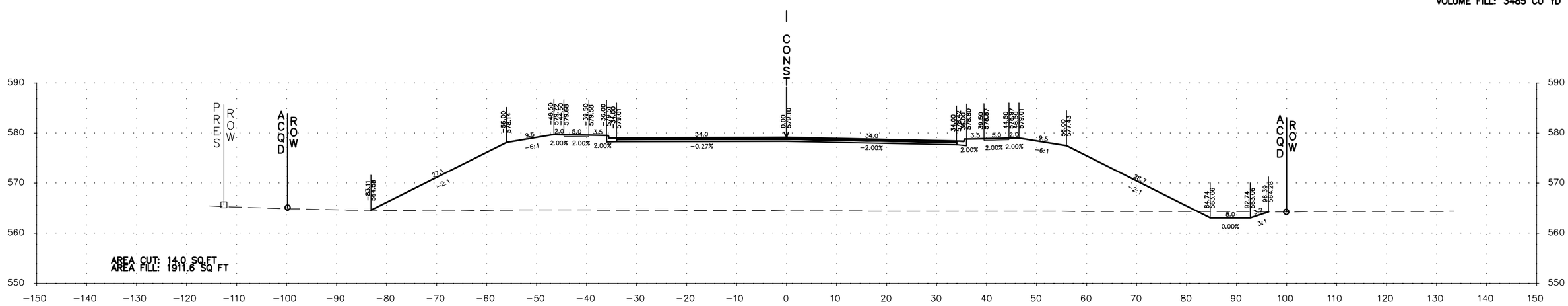
BORING LOG CROSS SECTIONS

OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA



123+00.00

VOLUME CUT: 23 CU YD
VOLUME FILL: 3485 CU YD



122+50.00

VOLUME CUT: 28 CU YD
VOLUME FILL: 3568 CU YD

Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling

Borehole Lithology

AR - Auger Refusal
BT - Boring Termination

Water Level Reading at time of drilling.

Topsoil

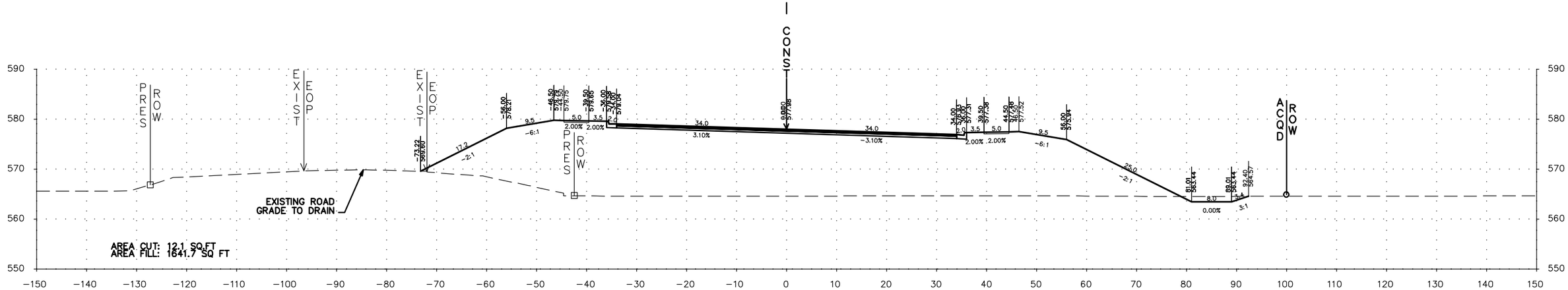
AASHTO A-6

AASHTO A-7

Drawn by: MSM	Project No.: E1185324	Terracon 2147 Riverchase Office Rd Hoover, AL PH. 205-942-1289 FAX. 205-443-5302
Date: 7/27/2020	Scale: 1"=20'	

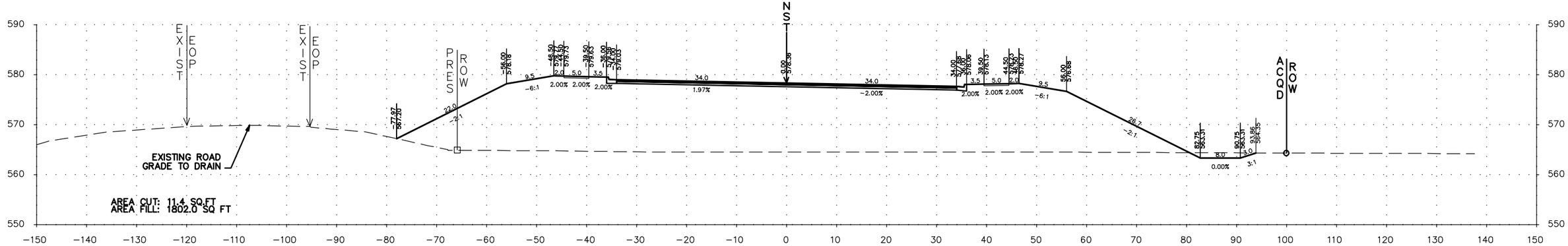
BORING LOG CROSS SECTIONS

OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA



124+00.00

VOLUME CUT: 22 CU YD
VOLUME FILL: 3189 CU YD



123+50.00

VOLUME CUT: 21 CU YD
VOLUME FILL: 3384 CU YD

Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling

Borehole Lithology

AR - Auger Refusal
BT - Boring Termination

Water Level Reading at time of drilling.

Topsoil

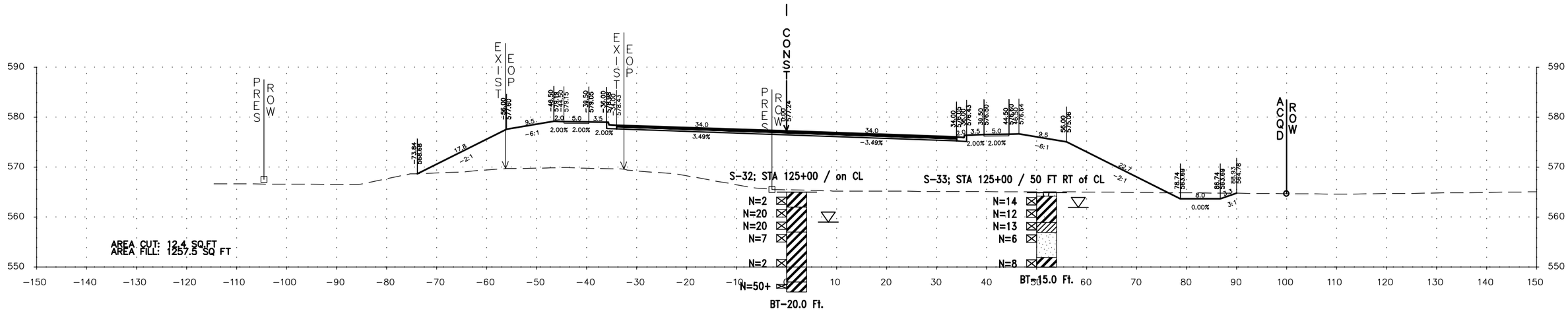
AASHTO A-6

AASHTO A-7

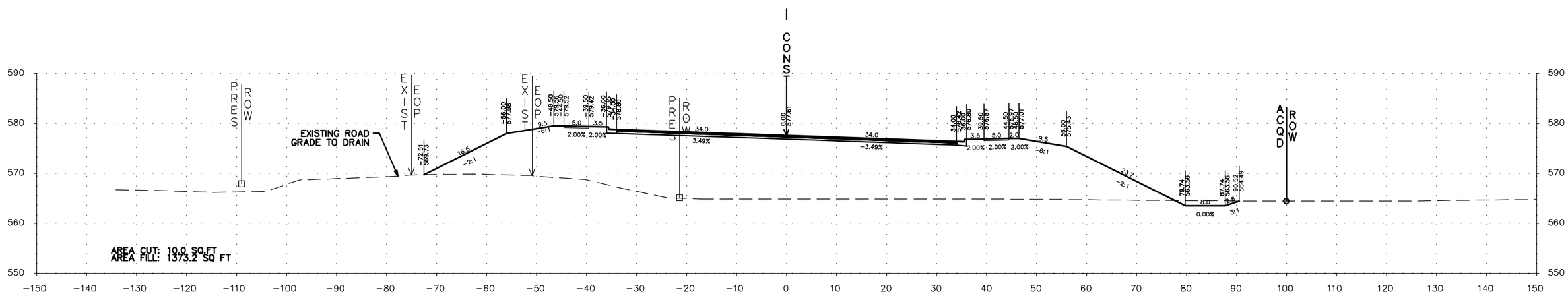
Drawn by: MSM	Project No.: E1185324	Terracon, 2147 Riverchase Office Rd, Hoover, AL, PH. 205-942-1289, FAX. 205-443-5302
Date: 7/27/2020	Scale: 1"=20'	

BORING LOG CROSS SECTIONS

OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA



125+00.00



124+50.00

Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling — Borehole Lithology

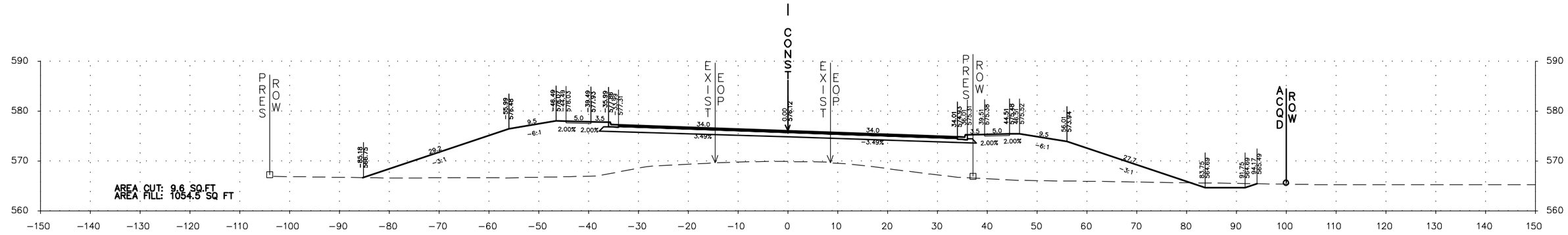
AR - Auger Refusal
BT - Boring Termination

Water Level Reading at time of drilling.

Topsoil | AASHTO A-6 | AASHTO A-7

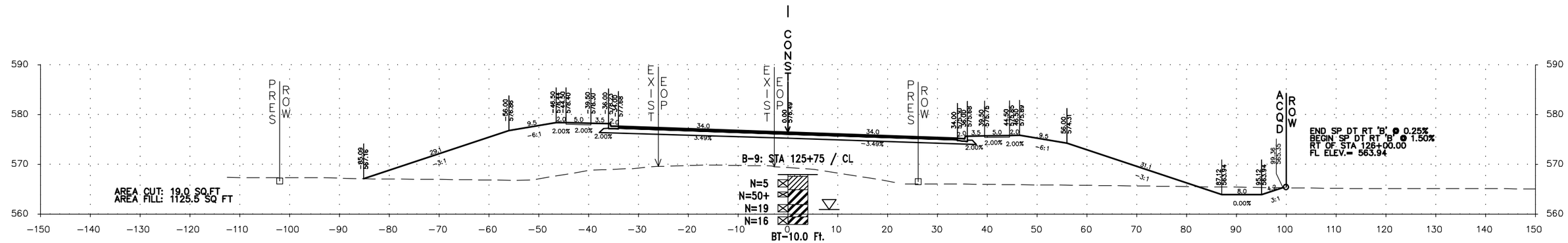
Drawn by: MSM	Project No.: E1185324	Terracon, 2147 Riverchase Office Rd, Hoover, AL, PH. 205-942-1289, FAX. 205-443-5302
Date: 7/27/2020	Scale: 1"=20'	BORING LOG CROSS SECTIONS

OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA



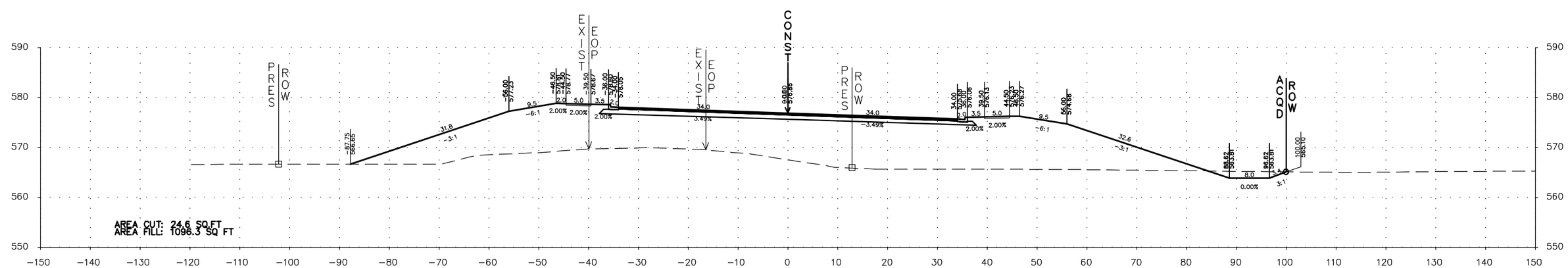
126+50.00

VOLUME CUT: 27 CU YD
VOLUME FILL: 2019 CU YD



126+00.00

VOLUME CUT: 40 CU YD
VOLUME FILL: 2057 CU YD



125+50.00

VOLUME CUT: 34 CU YD
VOLUME FILL: 2179 CU YD

Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling

Borehole Lithology

AR - Auger Refusal
BT - Boring Termination

Water Level Reading at time of drilling.

Topsoil

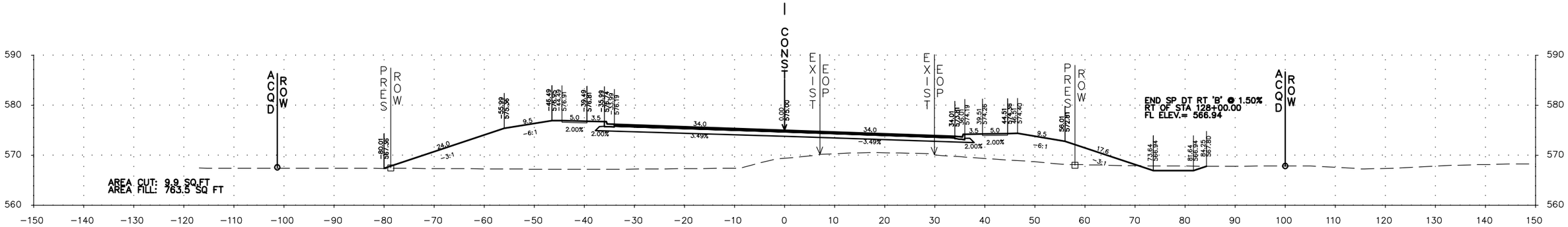
AASHTO A-6

AASHTO A-7

Drawn by: MSM	Project No.: E1185324	Terracon
Date: 7/27/2020	Scale: 1"=20'	2147 Riverchase Office Rd Hoover, AL
		PH. 205-942-1289 FAX. 205-443-5302

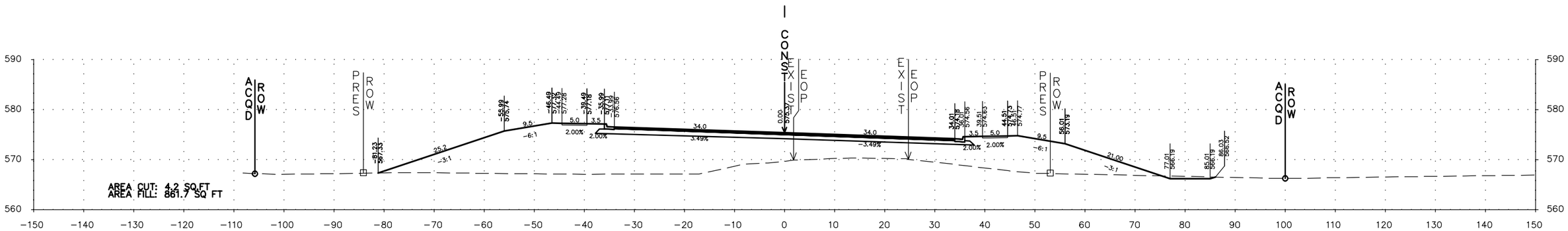
BORING LOG CROSS SECTIONS

OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA



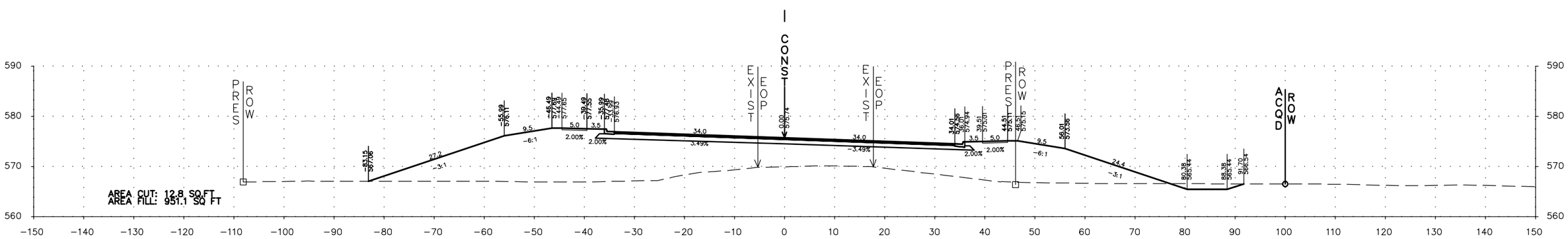
128+00.00

VOLUME CUT: 13 CU YD
VOLUME FILL: 1505 CU YD



127+50.00

VOLUME CUT: 16 CU YD
VOLUME FILL: 1679 CU YD



127+00.00

VOLUME CUT: 21 CU YD
VOLUME FILL: 1857 CU YD

Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling — Borehole Lithology

AR - Auger Refusal
BT - Boring Termination

Water Level Reading at time of drilling.

Topsoil

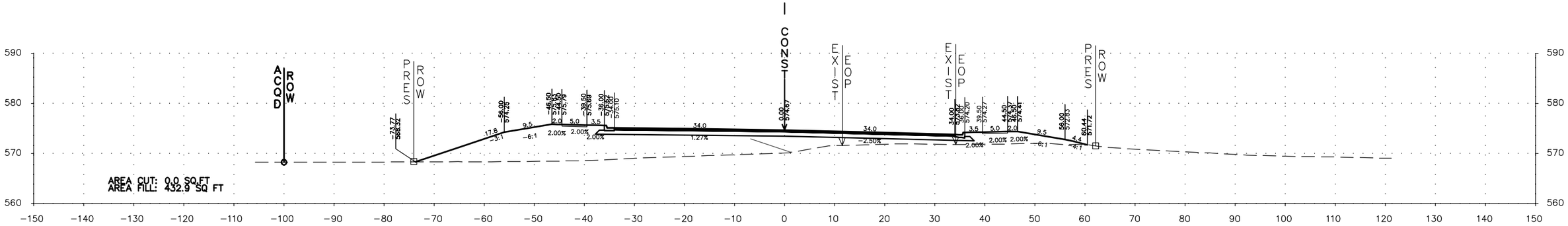
AASHTO A-6

AASHTO A-7

Drawn by: MSM	Project No.: E1185324	Terracon
Date: 7/27/2020	Scale: 1"=20'	2147 Riverchase Office Rd Hoover, AL
		PH. 205-942-1289 FAX. 205-443-5302

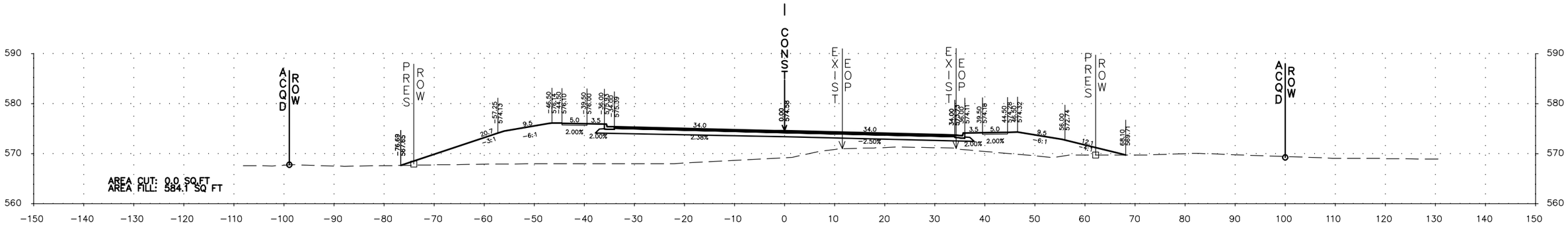
BORING LOG CROSS SECTIONS

OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA



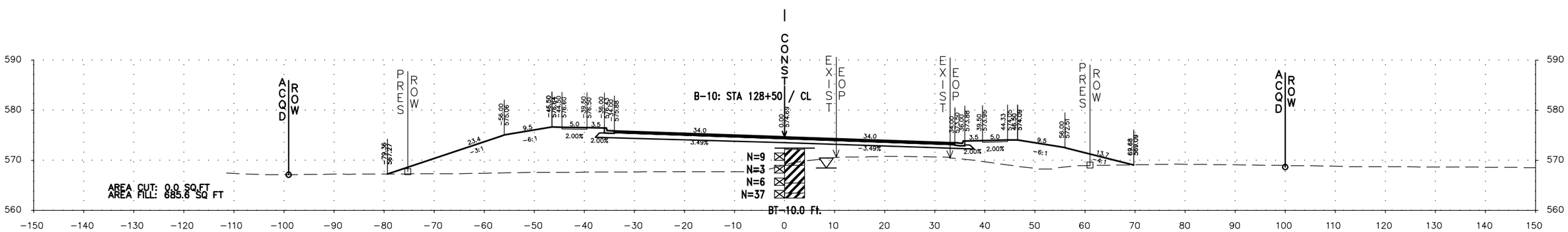
129+50.00

VOLUME CUT: 0 CU YD
VOLUME FILL: 942 CU YD



129+00.00

VOLUME CUT: 0 CU YD
VOLUME FILL: 1176 CU YD



128+50.00

VOLUME CUT: 9 CU YD
VOLUME FILL: 1342 CU YD

Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling

Borehole Lithology

AR - Auger Refusal
BT - Boring Termination

Water Level Reading at time of drilling.

Topsoil

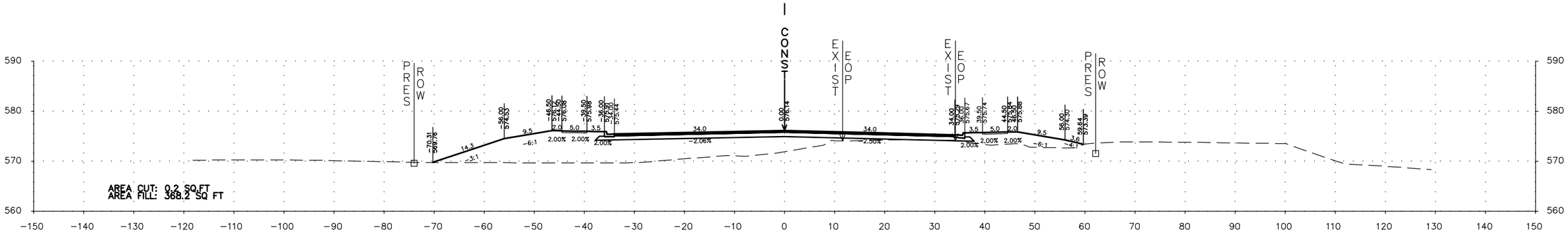
AASHTO A-6

AASHTO A-7

Drawn by: MSM	Project No.: E1185324	Terracon
Date: 7/27/2020	Scale: 1"=20'	2147 Riverchase Office Rd Hoover, AL
		PH. 205-942-1289 FAX. 205-443-5302

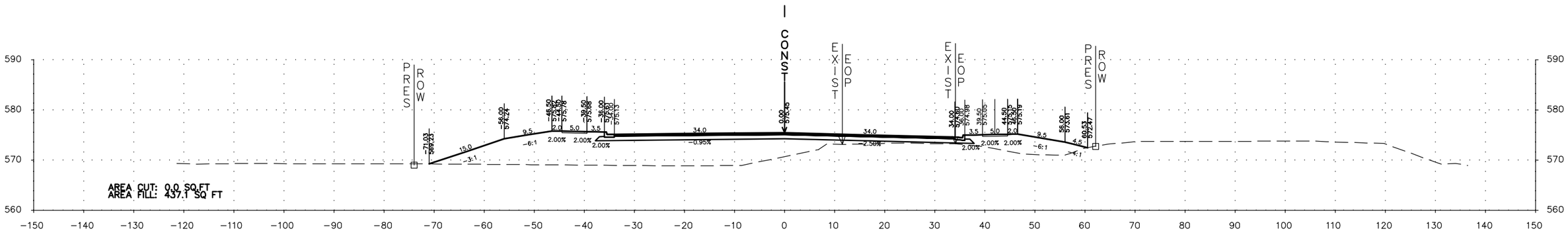
BORING LOG CROSS SECTIONS

OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA



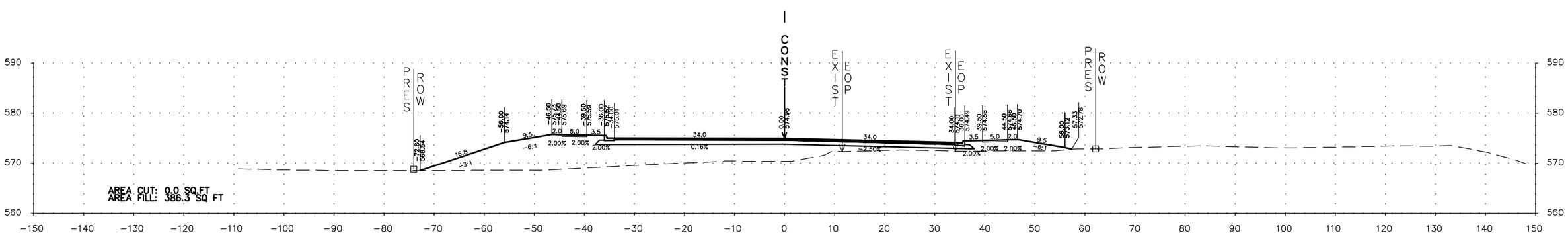
131+00.00

VOLUME CUT: 0 CU YD
VOLUME FILL: 746 CU YD



130+50.00

VOLUME CUT: 0 CU YD
VOLUME FILL: 762 CU YD



130+00.00

VOLUME CUT: 0 CU YD
VOLUME FILL: 759 CU YD

Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling

Borehole Lithology

AR - Auger Refusal
BT - Boring Termination

Water Level Reading at time of drilling.

Topsoil

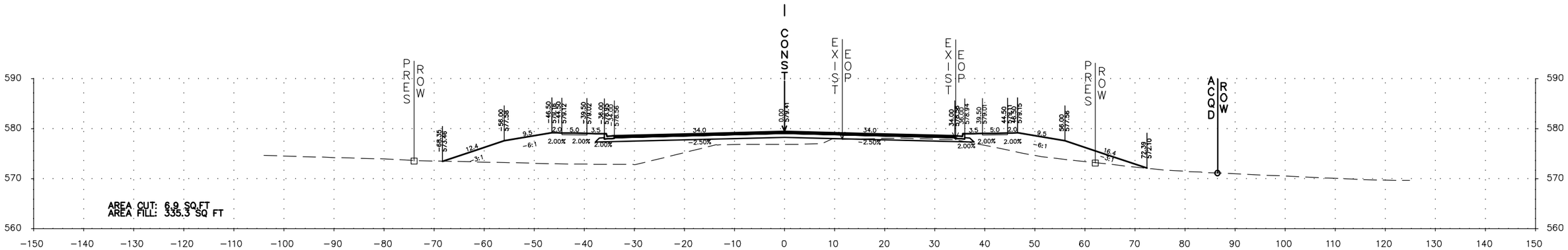
AASHTO A-6

AASHTO A-7

Drawn by: MSM	Project No.: E1185324	Terracon
Date: 7/27/2020	Scale: 1"=20'	2147 Riverchase Office Rd Hoover, AL
		PH. 205-942-1289 FAX. 205-443-5302

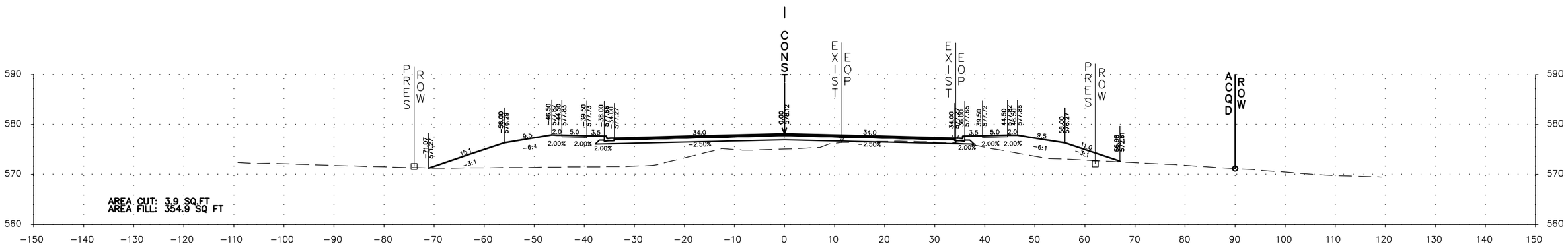
BORING LOG CROSS SECTIONS

OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA



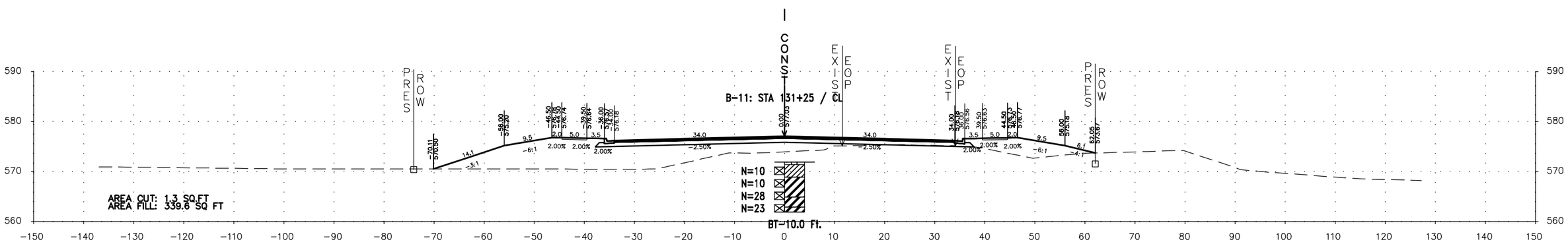
132+50.00

VOLUME CUT: 10 CU YD
VOLUME FILL: 639 CU YD



132+00.00

VOLUME CUT: 5 CU YD
VOLUME FILL: 643 CU YD



131+50.00

VOLUME CUT: 1 CU YD
VOLUME FILL: 655 CU YD

Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling

Borehole Lithology

AR - Auger Refusal
BT - Boring Termination

Water Level Reading at time of drilling.

Topsoil

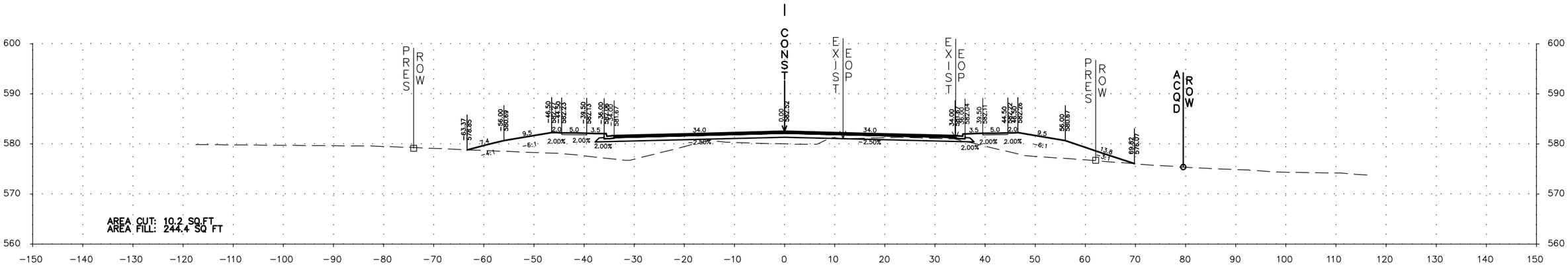
AASHTO A-6

AASHTO A-7

Drawn by: MSM	Project No.: E1185324	Terracon
Date: 7/27/2020	Scale: 1"=20'	2147 Riverchase Office Rd Hoover, AL
		PH. 205-942-1289 FAX. 205-443-5302

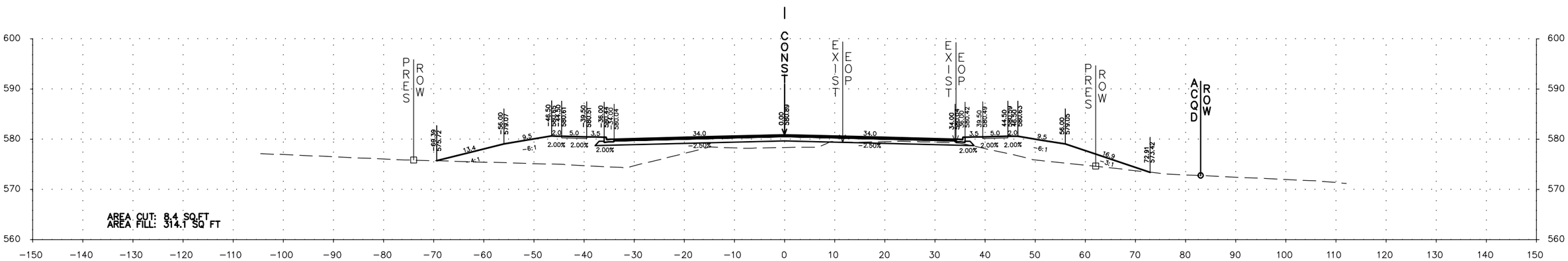
BORING LOG CROSS SECTIONS

OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA



133+50.00

VOLUME CUT: 17 CU YD
VOLUME FILL: 517 CU YD



133+00.00

VOLUME CUT: 14 CU YD
VOLUME FILL: 601 CU YD

Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling

Borehole Lithology

AR - Auger Refusal
BT - Boring Termination

Water Level Reading at time of drilling.

Topsoil

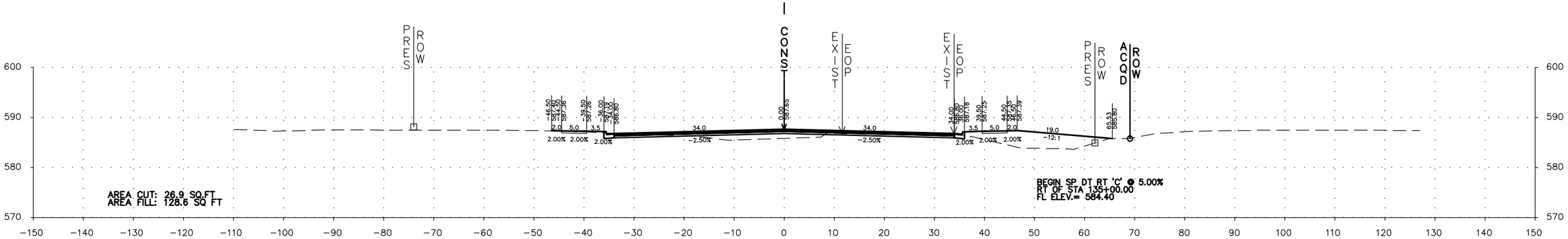
AASHTO A-6

AASHTO A-7

Drawn by: MSM	Project No.: E1185324	Terracon 2147 Riverchase Office Rd Hoover, AL PH. 205-942-1289 FAX. 205-443-5302
Date: 7/27/2020	Scale: 1"=20'	

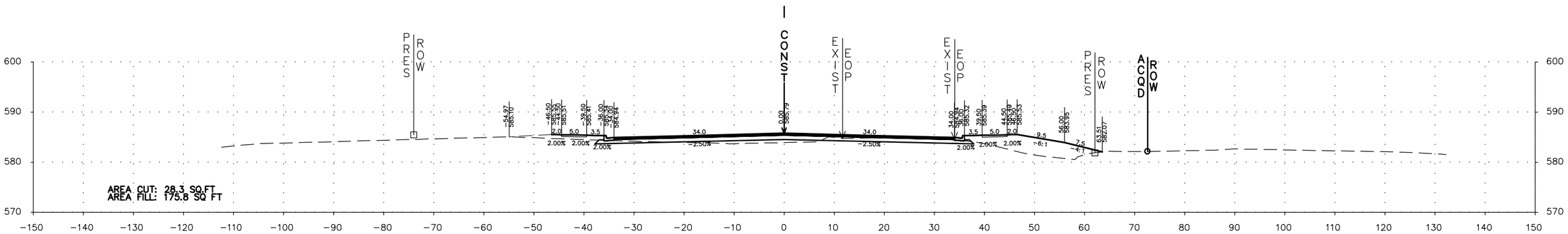
BORING LOG CROSS SECTIONS

OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA



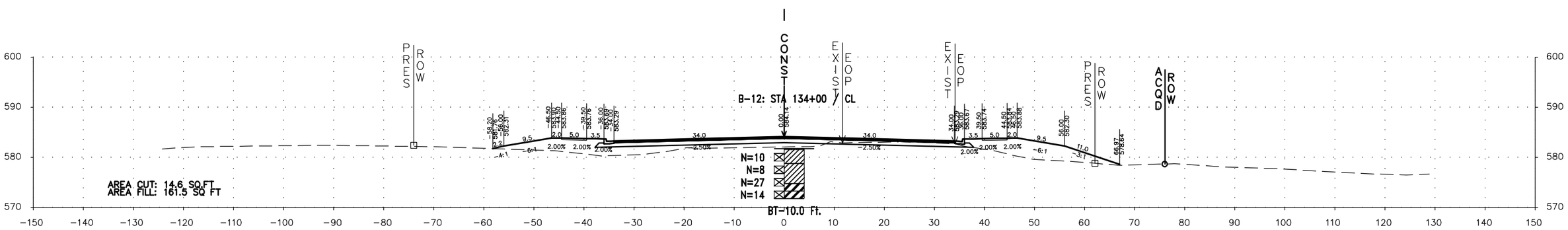
135+00.00

VOLUME CUT: 51 CU YD
VOLUME FILL: 282 CU YD



134+50.00

VOLUME CUT: 40 CU YD
VOLUME FILL: 312 CU YD



134+00.00

VOLUME CUT: 23 CU YD
VOLUME FILL: 376 CU YD

Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling

Borehole Lithology

AR - Auger Refusal
BT - Boring Termination

Water Level Reading at time of drilling.

Topsoil

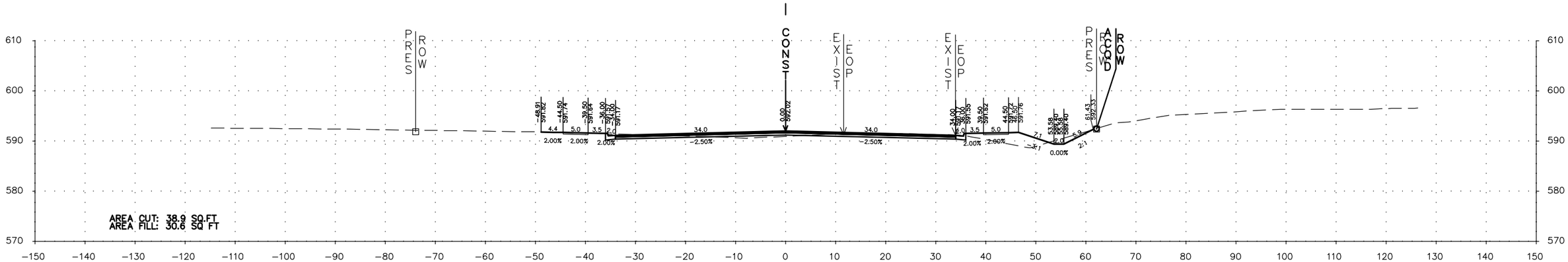
AASHTO A-6

AASHTO A-7

Drawn by: MSM	Project No.: E1185324	Terracon 2147 Riverchase Office Rd Hoover, AL PH. 205-942-1289 FAX. 205-443-5302
Date: 7/27/2020	Scale: 1"=20'	

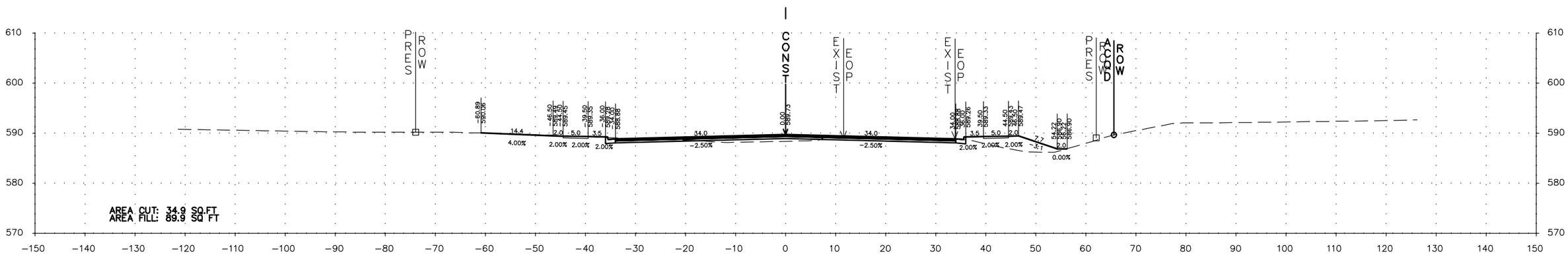
BORING LOG CROSS SECTIONS

OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA



136+00.00

VOLUME CUT: 68 CU YD
VOLUME FILL: 112 CU YD



135+50.00

VOLUME CUT: 57 CU YD
VOLUME FILL: 202 CU YD

Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling

Borehole Lithology

AR - Auger Refusal
BT - Boring Termination

Water Level Reading at time of drilling.

Topsoil

AASHTO A-6

AASHTO A-7

Drawn by: MSM	Project No.: E1185324	Terracon
Date: 7/27/2020	Scale: 1"=20'	2147 Riverchase Office Rd Hoover, AL
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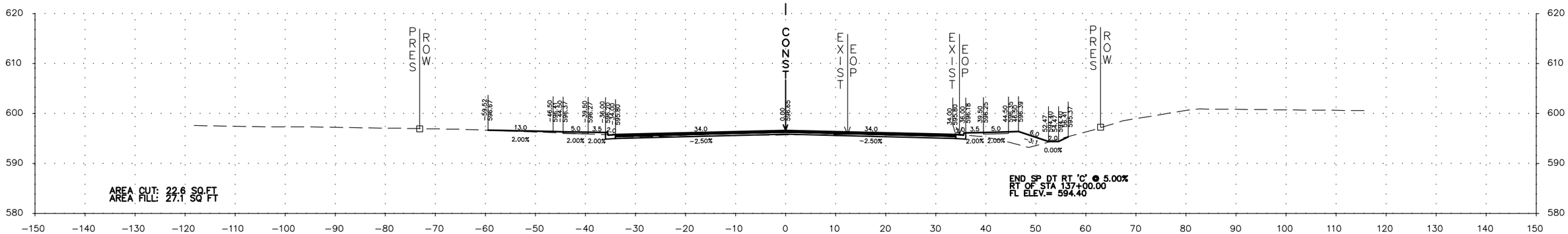
BORING LOG CROSS SECTIONS

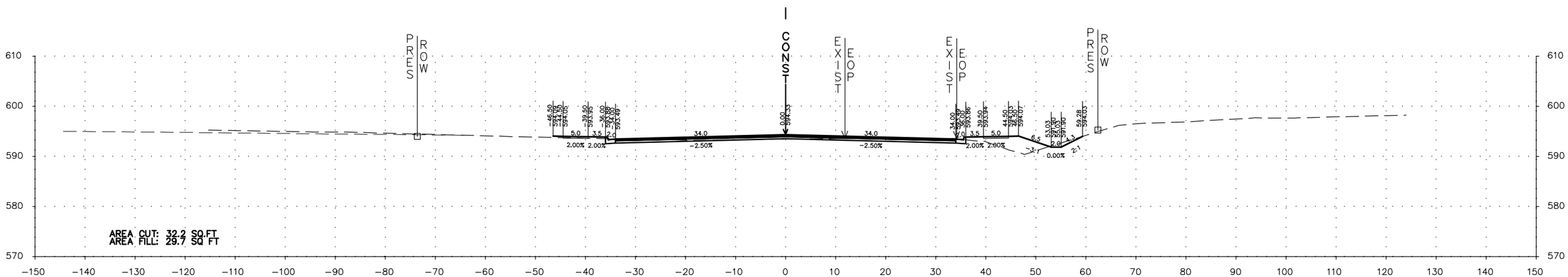
OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA

END PROJECT STA. 137+00.00



137+00.00

VOLUME CUT: 51 CU YD
VOLUME FILL: 53 CU YD



136+50.00

VOLUME CUT: 66 CU YD
VOLUME FILL: 56 CU YD

Explanation

S-1; STA 79+00 / on CL — Borehole Number

SPT N-Value — N=8

Sampling

Borehole Lithology

AR - Auger Refusal
BT - Boring Termination

Water Level Reading at time of drilling.

Topsoil

AASHTO A-6

AASHTO A-7

Drawn by: MSM	Project No.: E1185324	Terracon
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BORING LOG CROSS SECTIONS

OLD HIGHWAY 20 BRIDGES OVER NORFOLK SOUTHERN RAILROAD
AND BEAVERDAM CREEK
HUNTSVILLE, LIMESTONE COUNTY, ALABAMA

APPENDIX E:
PAY ITEM SUMMARY

Pay Item Summary

Hot Mix Asphalt

424A-340 – Superpave Bituminous Concrete Wearing Surface Layer, ½ inch Maximum Aggregate Size Mix, ESAL Range A/B – per ton

424B-636 – Superpave Bituminous Concrete Upper Binder Layer, 1 inch Maximum Aggregate Size Mix, ESAL Range A/B – per ton

424B-644 – Superpave Bituminous Concrete Upper Binder Layer, Leveling, 1 inch Maximum Aggregate Size Mix, ESAL Range A/B

401A-000 – Bituminous Treatment A – per square yard
405A-000 – Tack Coat – per gallon
407B-000 – Joint Sealant for Hot Mix Asphalt Pavement – per mile

Earthwork

210A-000 – Unclassified Excavation – per cubic yard
210D-000 – Borrow Excavation – per cubic yard
210F-000 – Borrow Excavation (Underwater Backfill) – per ton
210F-001 – Borrow Excavation (Underwater Embankment) – per ton
231B-002 – Roadbed Stabilizing Material #410 (Modified) – per ton

Graded Aggregate Base

301A-004 – Crushed Aggregate Base Course, Type B, Plant Mixed, 4” Compacted Thickness – per square yard

301A-008 – Crushed Aggregate Base Course, Type B, Plant Mixed, 5” Compacted Thickness – per square yard

Miscellaneous

410H-000 – Material Remixing Device – per each
450B-000 – Reinforced Cement Concrete Bridge End Slab
608A-000 – Separation Geotextile – per square yard
650A-000 – Topsoil – per cubic yard
650B-000 – Topsoil From Stockpiles – per cubic yard
659C-002 – Erosion Control Product, Type S2 – per square yard