AUBURN
ALABAMA

East University Drive and Summertrees Drive Culvert Replacement
City of Auburn, Alabama

Addendum B
May 12, 2026

The following, as clarifications, corrections or changes to the Contract Documents, will be included into any agreement for the construction of the East University Drive and Summertrees Drive Culvert Replacement and must be taken into account in preparing and submitting a Bid for the work. No other provisions or conditions are waived or changed hereby.

Addendum B is being sent by email. Acknowledgment of receipt should be emailed back to the City of Auburn at webengineering@auburnal.gov upon receipt.

Geotechnical Report

1. Geotechnical report has been included for this project.

Revised Plans

1. Revision of plans to address RFI's:
    - Note 303 on sheet 2B states that we can use a precast culvert in lieu of CIP. Please clarify which pay item should be used for precast.
    - Can the temporary retaining wall be left in place if sheet piles or etc. is used?
    - Sheet 21, confirm what device letters H & J are.

Attachments:

Geotechnical Report and Revised Plans

- -

I acknowledge receipt of Addendum B to the East University Drive and Summertrees Drive Culvert Replacement.

____
(Name)

____
(Date)

REPORT OF SUBSURFACE EXPLORATION AND GEOTECHNICAL EVALUATION
EAST UNIVERSITY CULVERT REPLACEMENT
AUBURN, ALABAMA
BUILDING & EARTH PROJECT NO.: AU240126

PREPARED FOR:
City of Auburn

AUGUST 19, 2024

BUILDING & EARTH
Geotechnical, Environmental, and Materials Engineers

BUILDING & EARTH
Geotechnical, Environmental, and Materials Engineers

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August 19, 2024

City of Auburn
144 Tichenor Ave
Auburn, AL 36830

Attention: Ms. Alvena Willams

Subject: Report of Subsurface Exploration and Geotechnical Evaluation
East University Culvert Replacement
Auburn, Alabama
Building & Earth Project No: AU240126

Dear Ms. Williams:

Building & Earth Sciences, Inc. has completed the authorized subsurface exploration and geotechnical engineering evaluation for the East University Culvert Replacement located on East university Drive directly east of the intersection with Summertree Drive in Auburn, AL

The purpose of this exploration and evaluation was to determine general subsurface conditions at the site and to address applicable geotechnical aspects of the proposed construction and site development. The recommendations in this report are based on a physical reconnaissance of the site and observation and classification of samples obtained from five soil test borings conducted at the site. Confirmation of the anticipated subsurface conditions during construction is an essential part of geotechnical services.

We appreciate the opportunity to provide consultation services for the proposed project. If you have any questions regarding the information in this report or need any additional information, please call us.

Respectfully Submitted,
BUILDING & EARTH SCIENCES, INC.

Aaron Roy
Aaron Roy, P.E.
Branch Manager

Jeffrey C. Pepper
Jeff Pepper, P.E.
Chief Engineer

ALABAMA LICENSED PROFESSIONAL ENGINEER
No. 30081
JEFFREY C. PEPPER

Table of Contents

1.0 PROJECT & SITE DESCRIPTION

Project information was provided by Ms. Alvena Williams with the City of Auburn. Ms. Williams provided a *Preliminary E.U.D Culvert Plan (Sheet No. 04) dated 08/2024*. We understand that the existing triple barrel culvert between stations 1+00S and 1+00N on East University Drive directly east of the intersection with Summertree Drive in Auburn, AL will be replaced.

Based on the provided plans, the existing culvert will be replaced with a 10 ft. tall by 40 ft. wide, 129 ft. long box culvert. The rights-of-ways mostly consisted of lawn grass with a gentle slope falling away from the crown of East University Drive. Overhead utilities were located along the south side right-of-way. Photographs depicting the current site conditions are presented below and on the following page.

Figure 1: Google Earth Aerial of the Existing Culvert Location

Figure 2: North Side of Existing Culvert Facing South

Figure 3: South Side of Existing Culvert Facing North

2.0 SCOPE OF SERVICES

The authorized subsurface exploration was performed on July 29, 2024, in conformance with our proposal AU26064 – Revision III dated June 19, 2024. Occasionally some modification of the scope outlined in our proposal is required to provide for proper evaluation of the encountered subsurface conditions. Boring B-03 was terminated at 6 feet due to possible aggregate fill material atop of the existing culvert causing the augers to lock up beneath the surface. Additionally, due to collapsing boring conditions from the soft underlying soils and groundwater depths, undisturbed Shelby tube samples were unable to be collected.

The purpose of the geotechnical exploration was to determine general subsurface conditions at specific boring locations and to gather data on which to base a geotechnical evaluation with respect to the proposed construction. The subsurface exploration for this project consisted of five soil test borings. The site was drilled using a Diedrich D-50 ATV drill rig equipped with an automatic hammer for performing Standard Penetration Tests (SPT) to help evaluate the relative soil strength. Refer to the Appendix for a description of the drilling and sampling procedures.

The soil boring locations were determined in the field by a representative of our staff by estimating right angles and measuring distances from existing site features. As such, the boring locations shown on the Boring Location Plan attached to this report should be considered approximate.

The soil samples recovered during our site investigation were visually classified and specific samples were selected by the project engineer for laboratory analysis. The laboratory analysis consisted of:

Test	ASTM	No. of Tests
Natural Moisture Content	D2216	20
Atterberg Limits	D4318	4
Particle Size Distribution of Soils (Gradation)	D6913	6

Table 1: Scope of Laboratory Tests

The results of the laboratory analysis are presented on the enclosed Boring Logs and in tabular form in the Appendix of this report. Descriptions of the laboratory tests that were performed are also included in the Appendix.

The information gathered from the exploration was evaluated to determine a suitable foundation type for the proposed structure. The information was also evaluated to help determine if any special subgrade preparation procedures will be required during the earthwork phase of the project.

The results of the work presented within this report address:

- Site geology and its impact on site development.
- Summary of existing surface conditions.
- A description of the subsurface and groundwater conditions encountered at the soil test boring locations. Long-term water level monitoring was not included in our scope of work.
- Presentation of laboratory test results.
- Recommendations to be used for culvert foundation design, including appropriate bearing pressures, estimated settlement, and treatment of unfavorable bearing conditions, if encountered.

3.0 GEOTECHNICAL SITE CHARACTERIZATION

The following discussion is intended to create a general understanding of the site from a geotechnical engineering perspective. It is not intended to be a discussion of every potential geotechnical issue that may arise, nor to provide every possible interpretation of the conditions identified. The following conditions and subsequent recommendations assume that significant changes in subsurface conditions do not occur between boreholes. However, anomalous conditions can occur due to the geologic conditions at the site, and it will be necessary to evaluate the assumed conditions during site grading and foundation installation.

3.1 GEOLOGY

Published data from the USGS indicate that the site is underlain by Mylonitic and Cataclastic Cocks in the Brevard, Towaliga, and Goat Rock fault zones. Mylonite, primary rock type in this formation, is a metamorphic chert-like rock with a streaky and banded structure. Gneiss, secondary rock type, is a metamorphic rock that is foliated with alternating bands of granular and flaky minerals. Other rock types found in this formation consist of schist and quartzite. Generally, the underlying rock formation is produced by the extreme granulation and shearing of rock that have been pulverized and rolled during over thrusting or intense dynamic metamorphism.

3.2 EXISTING SURFACE CONDITIONS

At the time of our subsurface exploration, the right-of-way was covered with light grass landscaping. Approximatley 6 to 13 inches of water flow was occurring at the stream flowing from north to south. Mature trees and dense undergrowth were present along the stream shoreline. The bottom of the stream consists of alluvial sands.

3.3 SUBSURFACE CONDITIONS

A generalized stratification summary has been prepared using data from the soil test borings and is presented in the table below. The stratification depicts the general soil conditions and strata types encountered during our field investigation.

Stratum No.	Description	Consistency
1	Topsoil	N/A
1A	Asphalt Pavement/Aggregate Base	N/A
2	Fill Material: Silty Sand (SM) and Sandy Silt (ML)	Very soft/very loose to stiff/medium dense
3	Residual Silty Sand (SM) and Sandy Silt (ML)	Loose/medium stiff to medium dense/hard

Table 2: Stratification Summary

Subsurface soil profiles which show the thickness of the stratum referenced above have also been prepared based on the data obtained at the specific boring locations. The subsurface soil profiles are presented in the Appendix. For specific details on the information obtained from individual soil borings, please refer to the Boring Logs included in the Appendix. The elevations of the borings indicated in this report were estimated based on the provided *Preliminary E.U.D Culvert Plan (Sheet No. 04) dated 08/2024* and should be considered approximate.

3.3.1 TOPSOIL AND ASPHALT/AGGREGATE BASE

Borings B-03 through B-05 penetrated approximately 6 inches of asphalt with 4 to 6 inches of aggregate base beneath, while B-01 and B-02 encountered approximately 3 and 5 inches of topsoil, respectively. Topsoil depths reported on the boring logs should only be construed as an estimate and topsoil thickness may vary in unexplored areas. For this report, topsoil is defined as the soil horizon which contains the root mat of the noted vegetation.

3.3.2 FILL MATERIAL

Beneath the topsoil and asphalt, all borings encountered silty sands (SM), and sandy silts (ML) classified as fill materials that extended to approximately 6 to 8.5 feet below existing surface elevations. SPT values of the fill ranged from 2 blows per foot (bpf) to 12 bpf exhibiting very loose/very soft to stiff/medium dense soil conditions. Moisture contents of the fill material ranged between approximately 5 to 26 percent. The fill material will be excavated in order to install the culvert.

3.3.3 RESIDUAL SOILS

Below the fill, the northern borings B-01 and B-02 encountered residual sandy silt (ML) through the auger refusal depths, while the southernmost borings B-04 and B-05 encountered a stratum of silty sands (SM) in the upper elevations. The sands in B-04 continued through the auger refusal depth, whereas the SM soils in B-05 transitioned into ML soils at 13.5 feet and continued through the termination depth.

The SM soils exhibited loose to medium dense relative densities with SPT values between 5 and 18 bpf. SPT values of the ML soils ranged between 4 and 67 bpf with an average value of 8 bpf exhibiting medium stiff to hard soil consistencies. After a review of the plans anticipate the culvert foundations will bear on low consistency (N≤6) and low relative density (N≤8) soils at the bearing elevation of about 570.

Laboratory analysis of select samples of the residual soils indicated approximately 40 to 69 percent finer than the No. 200 sieve with soil moisture contents ranging between 18 and 37 percent. Atterberg limits conducted on samples of the residual soils exhibited non-plastic characteristics.

3.3.4 AUGER REFUSAL

Auger refusal is the drilling depth at which the borehole can no longer be advanced using soil drilling procedures. Auger refusal can occur on hard soil, boulders, buried debris or bedrock. Coring is required to sample the material below auger refusal. Auger refusal was encountered in all borings at the depths below.

Boring No.	Depth (ft)
B-01	23.5
B-02	17.0
B-03	N/A
B-04	18.0
B-05	26.0

Table 3: Approximate Auger Refusal Depths

3.3.5 GROUNDWATER

At the time of drilling, groundwater was encountered between 8 and 10.5 feet below the surface. Water levels reported are accurate only for the time and date that the borings were drilled. Long term monitoring of the boreholes was not included as part of our subsurface exploration. The borings were backfilled and patched the same day that they were drilled. Groundwater data is included in the following table.

Boring No.	Depth (ft)
B-01	9.3
B-02	8.5
B-03	N/A
B-04	10.5
B-05	8.1

Table 4: Approximate Groundwater Depth

4.0 FOUNDATION RECOMMENDATIONS

Specific structural loading conditions were not known at the time of this report. Loading conditions have been assumed based on previous experience with similar projects. According to the provided *Preliminary E.U.D Culvert Plan (Sheet No. 04) dated 08/2024*, the existing culvert will be replaced with a 10 ft. tall by 40 ft. wide, 129 ft. long box culvert.

Due to the depth of the low consistency/density soils encountered, some ground modification may be required following the removal of the existing culvert. If soft soils are encountered at the foundation bearing elevation, we recommend the proposed culvert bearing surface be over excavated and backfilled with underwater embankment material, such as ALDOT No. 2 stone. For budgeting purposes, we recommend an average of 1 foot of No. 2 stone will be required. A minimum 4-inch-thick bedding layer such as ALDOT No. 57 stone should be placed beneath the bottom slab. The overexcavation and bedding material should extend at least 1 foot beyond each side of the culvert.

A settlement analysis was performed using Settle 3D®. An assumed bearing pressure of 2,000 psf was used in the analysis. Based on an assumed bearing pressure of 2,000 psf, total settlement of the culvert should be 1 inch or less.

5.0 DEWATERING CONSIDERATIONS

At the time of our exploration, shallow flowing water was observed at the stream. For the purposes of this report, we have assumed that the existing culvert will be removed and temporary diversion and/or damming of the creek will be accomplished by temporary grading. Care should be taken to make sure dewatering measures are available until the new box culvert has been set to grade, and at least initial backfill is complete. It is the contractor's responsibility to plan and budget for groundwater control. The means and methods of lowering the groundwater are at the contractor's discretion.

6.0 CONSTRUCTION MONITORING

Field verification of site conditions is an essential part of the services provided by the geotechnical consultant. In order to confirm our recommendations, it will be necessary for Building & Earth personnel to make periodic visits to the site during site grading. Typical construction monitoring services are listed below.

- Periodic observation and consultations by a member of our engineering staff during site development.
- Observations and verification of the exposed bearing surface.
- Molding and testing of concrete cylinders.

7.0 CLOSING AND LIMITATIONS

This report was prepared for the City of Auburn, for specific application to the East University Culvert Replacement located in Auburn, Alabama. The information in this report is not transferable. This report should not be used for a different development on the same property without first being evaluated by the engineer.

The recommendations in this report were based on the information obtained from our field exploration and laboratory analysis. The data collected is representative of the locations tested. Variations are likely to occur at other locations throughout the site. Engineering judgment was applied in regards to conditions between borings. It will be necessary to confirm the anticipated subsurface conditions during construction.

This report has been prepared in accordance with generally accepted standards of geotechnical engineering practice. No other warranty is expressed or implied. In the event that changes are made, or anticipated to be made, to the nature, design, or location of the project as outlined in this report, Building & Earth must be informed of the changes and given the opportunity to either verify or modify the conclusions of this report in writing, or the recommendations of this report will no longer be valid.

The scope of services for this project did not include any environmental assessment of the site or identification of pollutants or hazardous materials or conditions. If the owner is concerned about environmental issues Building & Earth would be happy to provide an additional scope of services to address those concerns.

This report is intended for use during design and preparation of specifications and may not address all conditions at the site during construction. Contractors reviewing this information should acknowledge that this document is for design information only.

An article published by the Geoprofessional Business Association (GBA), titled *Important Information About Your Geotechnical Report*, has been included in the Appendix. We encourage all individuals to become familiar with the article to help manage risk.

Appendix Table of Contents

GEOTECHNICAL INVESTIGATION METHODOLOGIES

The subsurface exploration, which is the basis of the recommendations of this report, has been performed in accordance with industry standards. Detailed methodologies employed in the investigation are presented in the following sections.

DRILLING PROCEDURES – STANDARD PENETRATION TEST (ASTM D1586)

At each boring location, soil samples were obtained at standard sampling intervals with a split-spoon sampler. The borehole was first advanced to the sample depth by augering and the sampling tools were placed in the open hole. The sampler was then driven 18 inches into the ground with a 140-pound automatic hammer free-falling 30 inches. The number of blows required to drive the sampler each 6-inch increment was recorded. The initial increment is considered the "seating" blows, where the sampler penetrates loose or disturbed soil in the bottom of the borehole.

The blows required to penetrate the final two (2) increments are added together and are referred to as the Standard Penetration Test (SPT) N-value. The N-value, when properly evaluated, gives an indication of the soil's strength and ability to support structural loads. Many factors can affect the SPT N-value, so this result cannot be used exclusively to evaluate soil conditions.

The SPT testing was performed using a drill rig equipped with an automatic hammer. Automatic hammers mechanically control the height of the hammer drop, and doing so, deliver higher energy efficiency (90 to 99 % efficiency) than manual hammers (60 % efficiency) which are dropped using a manually operated rope and cathead system. Because historic data correlations were developed based on use of a manual hammer, it is necessary to adjust the N-values obtained using an automatic hammer to make these correlations valid. Therefore, an energy correction factor of 1.3 was applied to the recorded field N-values from the automatic hammer for the purpose of our evaluation. The N-values discussed or mentioned in this report and shown on the boring logs are recorded field values.

Samples retrieved from the boring locations were labeled and stored in plastic bags at the jobsite before being transported to our laboratory for analysis. The project engineer prepared Boring Logs summarizing the subsurface conditions at the boring locations.

BORING LOG DESCRIPTION

Building & Earth Sciences, Inc. used the gINT software program to prepare the attached boring logs. The gINT program provides the flexibility to custom design the boring logs to include the pertinent information from the subsurface exploration and results of our laboratory analysis. The soil and laboratory information included on our logs is summarized below:

DEPTH AND ELEVATION

The depth below the ground surface and the corresponding elevation are shown in the first two columns.

SAMPLE TYPE

The method used to collect the sample is shown. The typical sampling methods include Split Spoon Sampling, Shelby Tube Sampling, Grab Samples, and Rock Core. A key is provided at the bottom of the log showing the graphic symbol for each sample type.

SAMPLE NUMBER

Each sample collected is numbered sequentially.

BLOWS PER INCREMENT, REC%, RQD%

When Standard Split Spoon sampling is used, the blows required to drive the sampler each 6-inch increment are recorded and shown in column 5. When rock core is obtained the recovery ration (REC%) and Rock Quality Designation (RQD%) is recorded.

SOIL DATA

Column 6 is a graphic representation of four different soil parameters. Each of the parameters use the same graph, however, the values of the graph subdivisions vary with each parameter. Each parameter presented on column 6 is summarized below:

- N-value- The Standard Penetration Test N-value, obtained by adding the number of blows required to drive the sampler the final 12 inches, is recorded . The graph labels range from 0 to 50.
- Qu – Unconfined Compressive Strength estimate from the Pocket Penetrometer test in tons per square foot (tsf). The graph labels range from 0 to 5 tsf.
- Atterberg Limits – The Atterberg Limits are plotted with the plastic limit to the left, and liquid limit to the right, connected by a horizontal line. The difference in the plastic and liquid limits is referred to as the Plasticity Index. The Atterberg Limits test results are also included in the Remarks column on the far right of the boring log. The Atterberg Limits graph labels range from 0 to 100%.
- Moisture – The Natural Moisture Content of the soil sample as determined in our laboratory.

SOIL DESCRIPTION

The soil description prepared in accordance with ASTM D2488, Visual Description of Soil Samples. The Munsel Color chart is used to determine the soil color. Strata changes are indicated by a solid line, with the depth of the change indicated on the left side of the line and the elevation of the change indicated on the right side of the line. If subtle changes within a soil type occur, a broken line is used. The Boring Termination or Auger Refusal depth is shown as a solid line at the bottom of the boring.

GRAPHIC

The graphic representation of the soil type is shown. The graphic used for each soil type is related to the Unified Soil Classification chart. A chart showing the graphic associated with each soil classification is included.

REMARKS

Remarks regarding borehole observations, and additional information regarding the laboratory results and groundwater observations.

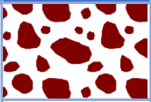
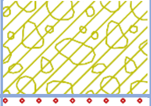
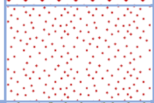
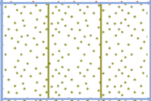
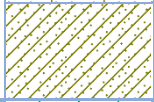
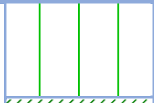
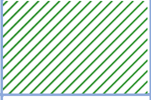
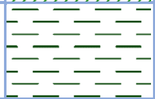
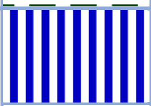
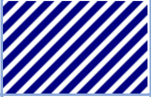
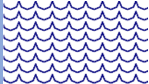
Major Divisions			***Symbols***		***Group Name & Typical Description***
			Lithology	***Group***	
Coarse Grained Soils *More than 50% of material is larger than No. 200 sieve size*	***Gravel and Gravelly Soils*** *More than 50% of coarse fraction is larger than No. 4 sieve*	***Clean Gravels*** *(Less than 5% fines)*		***GW***	*Well-graded gravels, gravel – sand mixtures, little or no fines*
				***GP***	*Poorly-graded gravels, gravel – sand mixtures, little or no fines*
		Gravels with Fines *(More than 12% fines)*		***GM***	*Silty gravels, gravel – sand – silt mixtures*
				***GC***	*Clayey gravels, gravel – sand – clay mixtures*
	Sand and Sandy Soils *More than 50% of coarse fraction is smaller than No. 4 sieve*	***Clean Sands*** *(Less than 5% fines)*		***SW***	*Well-graded sands, gravelly sands, little or no fines*
				***SP***	*Poorly-graded sands, gravelly sands, little or no fines*
		Sands with Fines *(More than 12% fines)*		***SM***	*Silty sands, sand – silt mixtures*
				***SC***	*Clayey sands, sand – clay mixtures*
Fine Grained Soils *More than 50% of material is smaller than No. 200 sieve size*	***Silts and Clays*** *Liquid Limit less than 50*	***Inorganic***		***ML***	*Inorganic silts and very find sands, rock flour, silty or clayey fine sands or clayey silt with slight plasticity*
				***CL***	*Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays*
		Organic		***OL***	*Organic silts and organic silty clays of low plasticity*
	Silts and Clays *Liquid Limit greater than 50*	***Inorganic***		***MH***	*Inorganic silts, micaceous or diatomaceous fine sand, or silty soils*
				***CH***	*Inorganic clays of high plasticity*
		Organic		***OH***	*Organic clays of medium to high plasticity, organic silts*
Highly Organic Soils				***PT***	*Peat, humus, swamp soils with high organic contents*

Table 1: Soil Classification Chart (based on ASTM D2487)

SOIL CLASSIFICATION METHODOLOGY

Building & Earth Sciences classifies soil in general accordance with the Unified Soil Classification System (USCS) presented in ASTM D2487. Table 1 and Figure 1 exemplify the general guidance of the USCS. Soil consistencies and relative densities are presented in general accordance with Terzaghi, Peck, & Mesri's (1996) method, as shown on Table 2, when quantitative field and/or laboratory data is available. Table 2 includes Consistency and Relative Density correlations with N-values obtained using either a manual hammer (60 percent efficiency) or automatic hammer (90 percent efficiency). The *Blows Per Increment* and *SPT N-values* displayed on the boring logs are the unaltered values measured in the field. When field and/or laboratory data is not available, we may classify soil in general accordance with the Visual Manual Procedure presented in ASTM D2488.

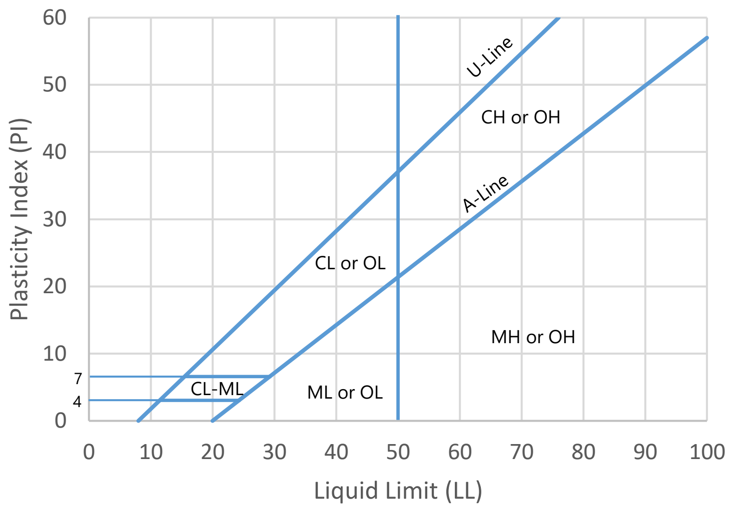


Figure 1: Plasticity Chart (based on ASTM D2487)

Non-cohesive: Coarse-Grained Soil			Cohesive: Fine-Grained Soil			
SPT Penetration (blows/foot)		**Relative Density**	**SPT Penetration (blows/foot)**		**Consistency**	**Estimated Range of Unconfined Compressive Strength (tsf)**
			Automatic Hammer*	Manual Hammer		
Automatic Hammer*	Manual Hammer		< 2	< 2	Very Soft	< 0.25
0 - 3	0 - 4	Very Loose	2 - 3	2 - 4	Soft	0.25 – 0.50
3 - 8	4 - 10	Loose	3 - 6	4 - 8	Medium Stiff	0.50 – 1.00
8 - 23	10 - 30	Medium Dense	6 - 12	8 - 15	Stiff	1.00 – 2.00
23 - 38	30 - 50	Dense	12 - 23	15 - 30	Very Stiff	2.00 – 4.00
> 38	> 50	Very Dense	> 23	> 30	Hard	> 4.00

Table 2: Soil Consistency and Relative Density (based on Terzaghi, Peck & Mesri, 1996)

* - Modified based on 80% hammer efficiency

KEY TO LOGS

☒	Standard Penetration Test ASTM D1586 or AASHTO T-206	⬇	Dynamic Cone Penetrometer (Sower DCP) ASTM STP-399
■	Shelby Tube Sampler ASTM D1587	○	No Sample Recovery
▥	Rock Core Sample ASTM D2113	▽	Groundwater at Time of Drilling
▮	Auger Cuttings	▼	Groundwater as Indicated

Table 1: Symbol Legend

Soil	Particle Size	U.S. Standard
Boulders	Larger than 300 mm	N.A.
Cobbles	300 mm to 75 mm	N.A.
Gravel	75 mm to 4.75 mm	3-inch to #4 sieve
Coarse	75 mm to 19 mm	3-inch to ¾-inch sieve
Fine	19 mm to 4.75 mm	¾-inch to #4 sieve
Sand	4.75 mm to 0.075 mm	#4 to #200 Sieve
Coarse	4.75 mm to 2 mm	#4 to #10 Sieve
Medium	2 mm to 0.425 mm	#10 to #40 Sieve
Fine	0.425 mm to 0.075 mm	#40 to #200 Sieve
Fines	Less than 0.075 mm	Passing #200 Sieve
Silt	0.075 mm to 2 µm	N.A.
Clay	Less than 2 µm	N.A.

Table 2: Standard Sieve Sizes

N-Value ☐	Standard Penetration Test Resistance calculated using ASTM D1586 or AASHTO T-206. Calculated as sum of original, field recorded values.	Atterberg Limits ├──┤ PL LL	A measure of a soil's plasticity characteristics in general accordance with ASTM D4318. The soil Plasticity Index (PI) is representative of this characteristic and is bracketed by the Liquid Limit (LL) and the Plastic Limit (PL).
Qu ▲	Unconfined compressive strength, typically estimated from a pocket penetrometer. Results are presented in tons per square foot (tsf).	% Moisture ●	Percent natural moisture content in general accordance with ASTM D2216.

Table 3: Soil Data

Hollow Stem Auger	Flights on the outside of the shaft advance soil cuttings to the surface. The hollow stem allows sampling through the middle of the auger flights.
Mud Rotary / Wash Bore	A cutting head advances the boring and discharges a drilling fluid to support the borehole and circulate cuttings to the surface.
Solid Flight Auger	Flights on the outside bring soil cuttings to the surface. Solid stem requires removal from borehole during sampling.
Hand Auger	Cylindrical bucket (typically 3-inch diameter and 8 inches long) attached to a metal rod and turned by human force.

Table 4: Soil Drilling Methods

Descriptor	Meaning
Trace	Likely less than 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

Table 5: Descriptors

Manual Hammer	The operator tightens and loosens the rope around a rotating drum assembly to lift and drop a sliding, 140-pound hammer falling 30 inches.
Automatic Trip Hammer	An automatic mechanism is used to lift and drop a sliding, 140-pound hammer falling 30 inches.
Dynamic Cone Penetrometer (Sower DCP) ASTM STP-399	Uses a 15-pound steel mass falling 20 inches to strike an anvil and cause penetration of a 1.5-inch diameter cone seated in the bottom of a hand augered borehole. The blows required to drive the embedded cone a depth of 1-3/4 inches have been correlated by others to N-values derived from the Standard Penetration Test (SPT).

Table 6: Sampling Methods

Non-plastic	A 1/8-inch thread cannot be rolled at any water content.
Low	The thread can barely be rolled and the lump cannot be formed when drier than the plastic limit.
Medium	The thread is easy to roll and not much time is required to reach the plastic limit. The thread cannot be re-rolled after reaching the plastic limit. The lump crumbles when drier than the plastic limit.
High	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be re-rolled several times after reaching the plastic limit. The lump can be formed without crumbling when drier than the plastic limit.

Table 7: Plasticity

Dry	Absence of moisture, dusty, dry to the touch.
Moist	Damp but no visible water.
Wet	Visible free water, usually soil is below water table.

Table 8: Moisture Condition

Stratified	Alternating layers of varying material or color with layers at least ½ inch thick.
Laminated	Alternating layers of varying material or color with layers less than ¼ inch thick.
Fissured	Breaks along definite planes of fracture with little resistance to fracturing.
Slickensides	Fracture planes appear polished or glossy, sometimes striated.
Blocky	Cohesive soil that can be broken down into small angular lumps which resist further breakdown.
Lensed	Inclusion of small pockets of different soils, such as small lenses of sand scattered through a mass of clay.
Homogeneous	Same color and appearance throughout.

Table 9: Structure

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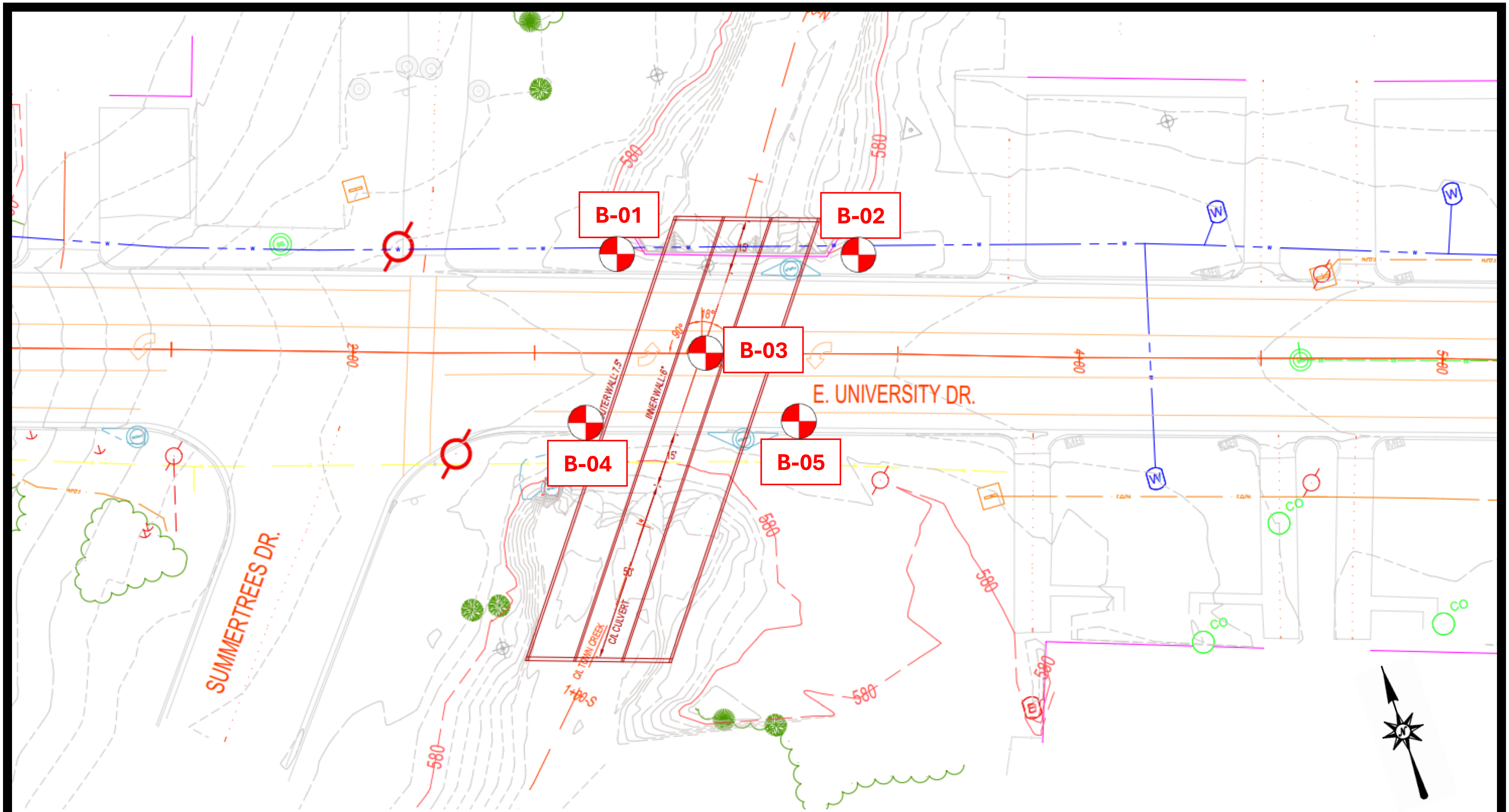
KEY TO HATCHES

Hatch	*Description*	*Hatch*	*Description*	*Hatch*	*Description*
▨	***GW*** *- Well-graded gravels, gravel – sand mixtures, little or no fines*	▨	*Asphalt*	▨	*Clay with Gravel*
▨	***GP*** *- Poorly-graded gravels, gravel – sand mixtures, little or no fines*	▨	*Aggregate Base*	▨	*Sand with Gravel*
▨	***GM*** *- Silty gravels, gravel – sand – silt mixtures*	▨	*Topsoil*	▨	*Silt with Gravel*
▨	***GC*** *- Clayey gravels, gravel – sand – clay mixtures*	▨	*Concrete*	▨	*Gravel with Sand*
▨	***SW*** *- Well-graded sands, gravelly sands, little or no fines*	▨	*Coal*	▨	*Gravel with Clay*
▨	***SP*** *- Poorly-graded sands, gravelly sands, little or no fines*	▨	***CL-ML*** *- Silty Clay*	▨	*Gravel with Silt*
▨	***SM*** *- Silty sands, sand – silt mixtures*	▨	*Sandy Clay*	▨	*Limestone*
▨	***SC*** *- Clayey sands, sand – clay mixtures*	▨	*Clayey Chert*	▨	*Chalk*
▨	***ML*** *- Inorganic silts and very find sands, rock flour, silty or clayey fine sands or clayey silt with slight plasticity*	▨	*Low and High Plasticity Clay*	▨	*Siltstone*
▨	***CL*** *- Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays*	▨	*Low Plasticity Silt and Clay*	▨	*Till*
▨	***OL*** *- Organic silts and organic silty clays of low plasticity*	▨	*High Plasticity Silt and Clay*	▨	*Sandy Clay with Cobbles and Boulders*
▨	***MH*** *- Inorganic silts, micaceous or diatomaceous fine sand, or silty soils*	▨	*Fill*	▨	*Sandstone with Shale*
▨	***CH*** *- Inorganic clays of high plasticity*	▨	*Weathered Rock*	▨	*Coral*
▨	***OH*** *- Organic clays of medium to high plasticity, organic silts*	▨	*Sandstone*	▨	*Boulders and Cobbles*
▨	***PT*** *- Peat, humus, swamp soils with high organic contents*	▨	*Shale*	▨	*Soil and Weathered Rock*

Table 1: Key to Hatches Used for Boring Logs and Soil Profiles

BORING LOCATION PLAN



Reference used to produce this drawing:

Preliminary E.U.D Culvert Plan (Sheet No. 04) dated 08/2024

BORING LOCATION PLAN

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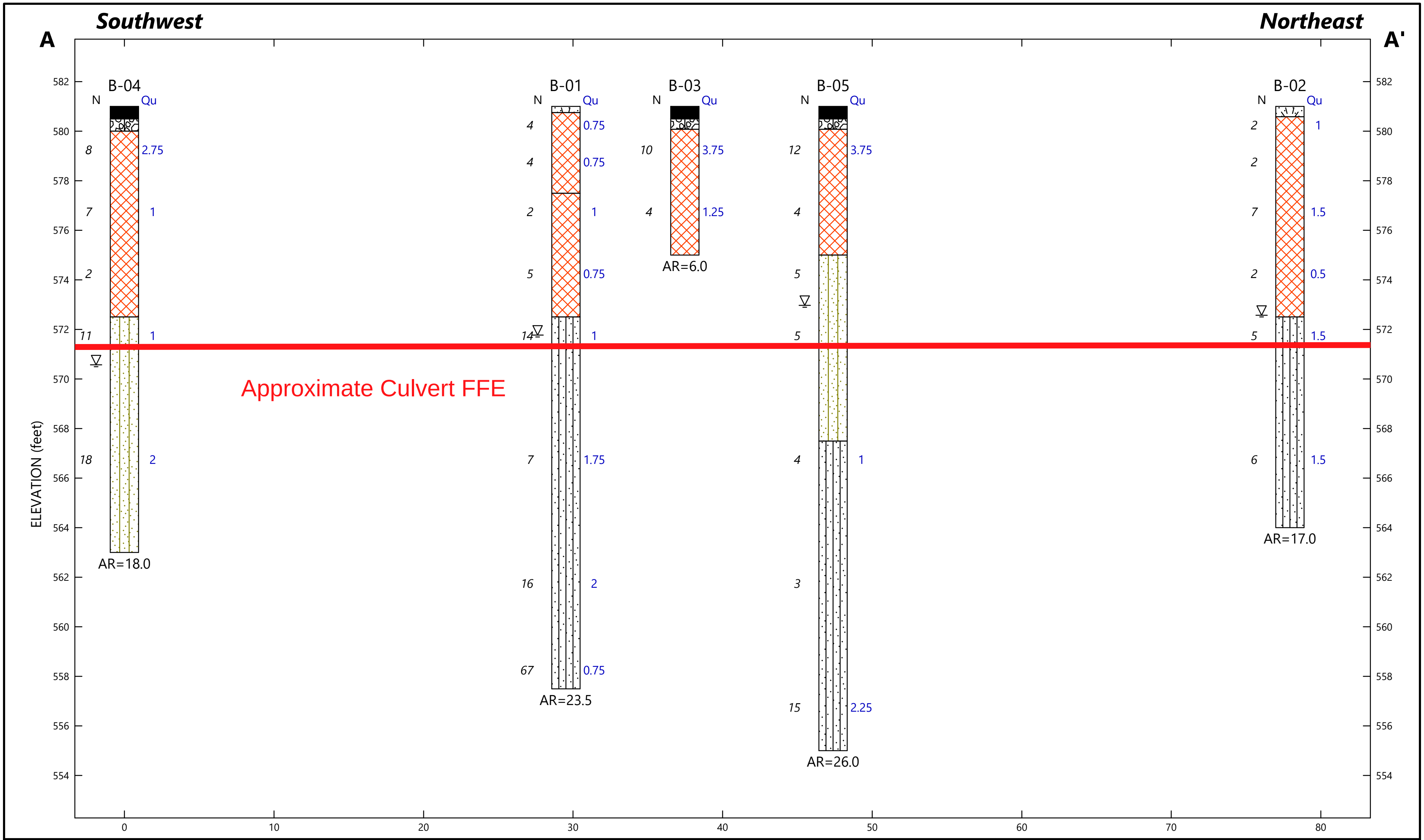
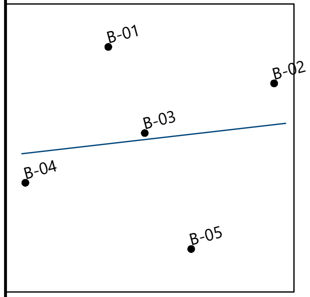
Geotechnical, Environmental, and Materials Engineers

PROJECT NO.:	**PROJECT NAME / LOCATION:**	**SCALE:**	**DATE:**
AU240126	East University Culvert Replacement Auburn, AL	NTS	08/08/2024

SUBSURFACE SOIL PROFILES





Site Map Scale 1 inch equals 60 feet

Key to Hatches

▨	Topsoil
■	Asphalt
▨	Fill
▨	Aggregate Base Material
▨	USCS Sandy Silt
▨	USCS Silty Sand

Legend

BT=Boring Termination, TPT=Test Pit Terminated
AR=Auger Refusal, ER=Excavation Refusal
N=Standard Penetration Test N-Value
Qu=Unconfined compressive strength estimate from pocket penetrometer test (tsf)
▽ Water Level Reading at time of drilling.
▼ Water Level Reading after drilling.

0 9

Horizontal Scale (feet)
Vertical Exaggeration: 1.5x

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East University Culvert Replacement
Auburn, Alabama

Culvert Replacement A-A': Subsurface Profile

PROJECT NO: AU240126 | PLATE NO: A-1 | DATE: 8/8/24

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BORING LOGS

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LOG OF BORING

Designation: B-01

Sheet 1 of 1

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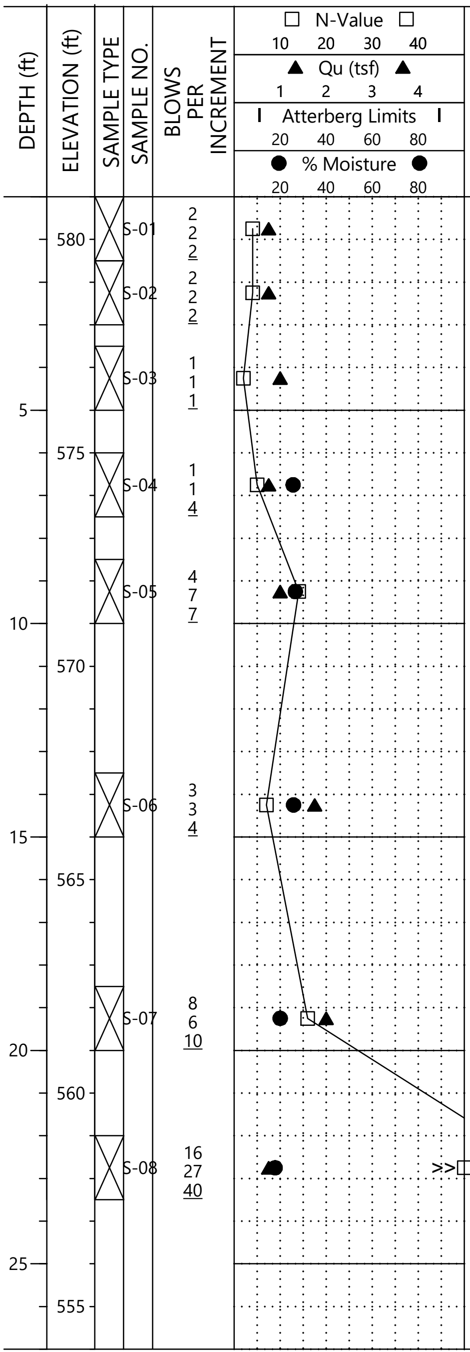
PROJECT NAME: East University Culvert Replacement
PROJECT NUMBER: AU240126
DRILLING METHOD: Hollow Stem Auger
EQUIPMENT USED: Geoprobe 7822DT
HAMMER TYPE: Automatic
BORING LOCATION: NW Corner: 32°34'47.20"N, 85°28'42.00"W

LOCATION: Auburn, Alabama
DATE DRILLED: 7/29/24
WEATHER: Partly Cloudy, 80°
ELEVATION: 581
DRILL CREW: Building & Earth
LOGGED BY: W. Martine



DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE	SAMPLE NO.	BLOWS PER INCREMENT	LAB DATA	SOIL DESCRIPTION	GRAPHIC	REMARKS
0.3	580.8					TOPSOIL: 3 inches		
		⊠	S-01	2 2 2		SILTY SAND (SM): loose, light reddish brown, fine to coarse grained, moist, (FILL)	▨	
		⊠	S-02	2 2 2			▨	
3.5	577.5	⊠	S-03	1 1 1		SANDY SILT (ML): very soft, light brown, low plasticity, moist, (FILL)	▨	
		⊠	S-04	1 1 4	Sample S-04 M: 25.6%	medium stiff, gray, brown	▨	
8.5	572.5	⊠	S-05	4 7 7	Sample S-05 M: 26.6% F: 57.7%	SANDY SILT (ML): very stiff, gray, brown, low plasticity, moist, trace of mica, (RESIDUAL) ∇		Groundwater encountered at 9.3 feet (EL 571.7) at time of drilling.
		⊠	S-06	3 3 4	Sample S-06 M: 25.8%	stiff, light brown, wet		
		⊠	S-07	8 6 10	Sample S-07 M: 20.0%	very stiff, brown		
		⊠	S-08	16 27 40	Sample S-08 M: 17.8%	hard		
23.5	557.5					Auger Refusal at 23.5 feet.		Borehole backfilled on date drilled unless otherwise noted. Consistency/Relative Density based on correction factor for Automatic hammer.

SAMPLE TYPE ⊠ Standard Penetration Test

N-VALUE	STANDARD PENETRATION RESISTANCE (AASHTO T-206)	**REC**	RECOVERY	**LL:** LIQUID LIMIT	**M:** NATURAL MOISTURE CONTENT
% MOISTURE	PERCENT NATURAL MOISTURE CONTENT	**RQD**	ROCK QUALITY DESIGNATION	**PL:** PLASTIC LIMIT	**F:** PERCENT PASSING NO. 200 SIEVE
∇	GROUNDWATER LEVEL IN THE BOREHOLE AT TIME OF DRILLING	**UD**	UNDISTURBED	**PI:** PLASTICITY INDEX	
▼	STABILIZED GROUNDWATER LEVEL	**Qu**	POCKET PENETROMETER UNCONFINED COMPRESSIVE STRENGTH		

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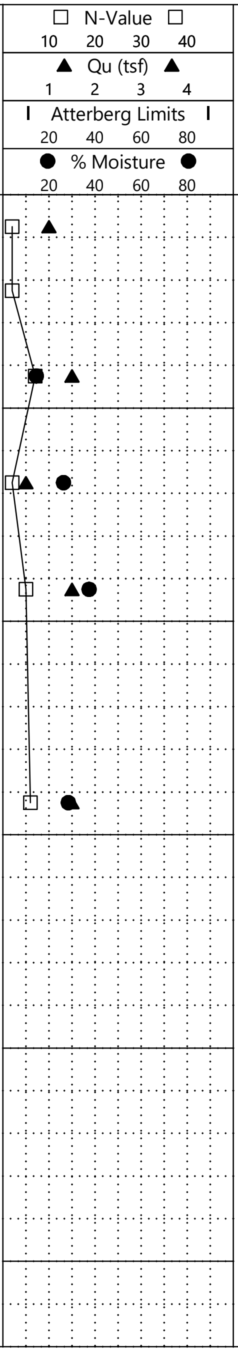
LOG OF BORING
Designation: B-02
Sheet 1 of 1

PROJECT NAME: East University Culvert Replacement
PROJECT NUMBER: AU240126
DRILLING METHOD: Hollow Stem Auger
EQUIPMENT USED: Geoprobe 7822DT
HAMMER TYPE: Automatic
BORING LOCATION: NE Corner: 32°34'47.08"N, 85°28'41.44"W

LOCATION: Auburn, Alabama
DATE DRILLED: 7/29/24
WEATHER: Partly Cloudy, 80°
ELEVATION: 581
DRILL CREW: Building & Earth
LOGGED BY: W. Martine



DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE	SAMPLE NO.	BLOWS PER INCREMENT	LAB DATA	SOIL DESCRIPTION	GRAPHIC	REMARKS
0.4	580.6					TOPSOIL: 5 inches		
	580	☒	S-01	1 1 1		SILTY SAND (SM): very loose, light reddish brown, fine to medium grained, moist, (FILL)		
		☒	S-02	1 1 1				
5		☒	S-03	6 4 3	Sample S-03 M: 14.5%	loose, grayish brown		
	575	☒	S-04	1 1 1	Sample S-04 M: 26.3%	very loose, wet, trace of mica		
8.5	▽572.5							
10		☒	S-05	2 2 3	Sample S-05 M: 37.4% F: 54.9%	SANDY SILT (ML): medium stiff, grayish brown, fine to medium grained, low plasticity, wet, (RESIDUAL)		Groundwater encountered at 8.5 feet (EL 572.5) at time of drilling.
	570							
15		☒	S-06	2 2 4	Sample S-06 M: 28.4%			
	565							
17.0	564.0					Auger Refusal at 17 feet.		
20	560							
25	555							Borehole backfilled on date drilled unless otherwise noted. Consistency/Relative Density based on correction factor for Automatic hammer.

SAMPLE TYPE ☒ Standard Penetration Test

N-VALUE STANDARD PENETRATION RESISTANCE (AASHTO T-206)
% MOISTURE PERCENT NATURAL MOISTURE CONTENT
▽ GROUNDWATER LEVEL IN THE BOREHOLE AT TIME OF DRILLING
▼ STABILIZED GROUNDWATER LEVEL
REC RECOVERY
RQD ROCK QUALITY DESIGNATION
UD UNDISTURBED
Qu POCKET PENETROMETER UNCONFINED COMPRESSIVE STRENGTH
LL: LIQUID LIMIT
PL: PLASTIC LIMIT
PI: PLASTICITY INDEX
M: NATURAL MOISTURE CONTENT
F: PERCENT PASSING NO. 200 SIEVE

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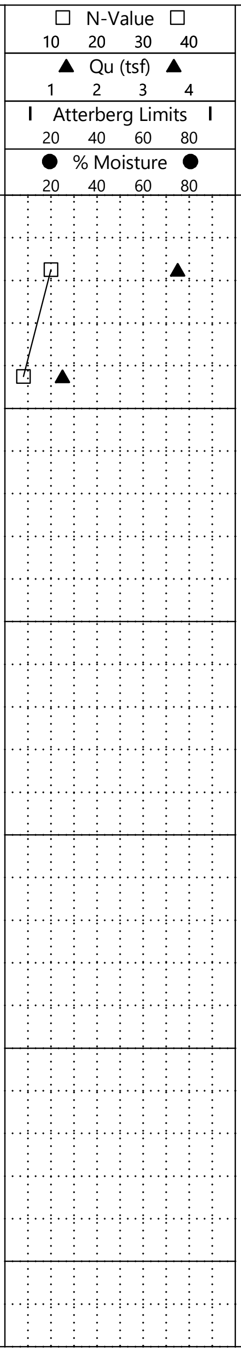
LOG OF BORING

Designation: B-03

Sheet 1 of 1

PROJECT NAME: East University Culvert Replacement
PROJECT NUMBER: AU240126
DRILLING METHOD: Hollow Stem Auger
EQUIPMENT USED: Detrich D-50
HAMMER TYPE: Automatic
BORING LOCATION: Center: 32°34'46.92"N, 85°28'41.89"W

LOCATION: Auburn, Alabama
DATE DRILLED: 7/29/24
WEATHER: Partly Cloudy, 80°
ELEVATION: 581
DRILL CREW: Building & Earth
LOGGED BY: W. Martine



DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE	SAMPLE NO.	BLOWS PER INCREMENT	LAB DATA	SOIL DESCRIPTION	GRAPHIC	REMARKS
0.5	580.5					ASPHALT: 6 inches	■	
0.9	580.1					AGGREGATE BASE: 5 inches		
	580	☒	S-01	3 4 6		SANDY SILT (ML): stiff, light reddish brown, low plasticity, moist, (FILL)		
		☒	S-02	2 2 2		medium stiff		
5								
6.0	575.0					Auger Refusal at 6 feet.		Refusal likey caused by aggregate fill material
10	570							
15	565							
20	560							
25	555							Groundwater not encountered at time of drilling. Borehole backfilled on date drilled unless otherwise noted. Consistency/Relative Density based on correction factor for Automatic hammer.

SAMPLE TYPE ☒ Standard Penetration Test

N-VALUE	STANDARD PENETRATION RESISTANCE (AASHTO T-206)	**REC**	RECOVERY	**LL:**	LIQUID LIMIT **M:** NATURAL MOISTURE CONTENT
% MOISTURE	PERCENT NATURAL MOISTURE CONTENT	**RQD**	ROCK QUALITY DESIGNATION	**PL:**	PLASTIC LIMIT **F:** PERCENT PASSING NO. 200 SIEVE
▽	GROUNDWATER LEVEL IN THE BOREHOLE AT TIME OF DRILLING	**UD**	UNDISTURBED	**PI:**	PLASTICITY INDEX
▼	STABILIZED GROUNDWATER LEVEL	**Qu**	POCKET PENETROMETER UNCONFINED COMPRESSIVE STRENGTH		

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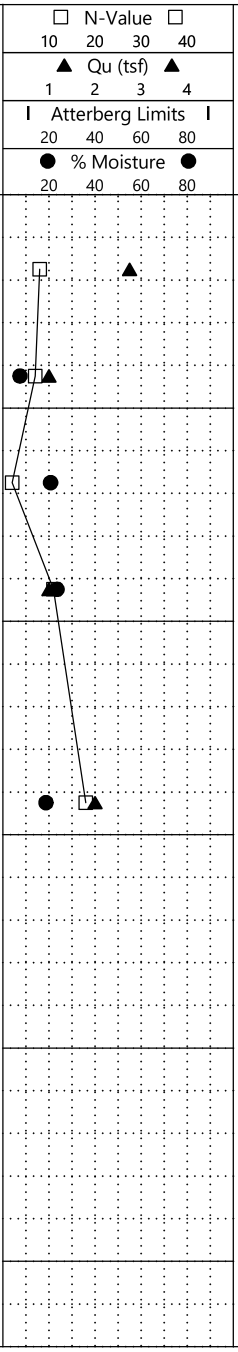
LOG OF BORING

Designation: B-04

Sheet 1 of 1

PROJECT NAME: East University Culvert Replacement
PROJECT NUMBER: AU240126
DRILLING METHOD: Hollow Stem Auger
EQUIPMENT USED: Geoprobe 7822DT
HAMMER TYPE: Automatic
BORING LOCATION: SW Corner: 32°34'46.79", 85°28'42.31"W

LOCATION: Auburn, Alabama
DATE DRILLED: 7/29/24
WEATHER: Partly Cloudy, 80°
ELEVATION: 581
DRILL CREW: Building & Earth
LOGGED BY: W. Martine



SAMPLE TYPE	SAMPLE NO.	BLOWS PER INCREMENT	LAB DATA
☒	S-01	3 4 4	
☒	S-02	4 4 3	Sample S-02 M: 7.4%
☒	S-03	1 1 1	Sample S-03 M: 20.7%
☒	S-04	4 5 6	Sample S-04 M: 23.5% F: 29.1%
☒	S-05	5 7 11	Sample S-05 M: 18.7% F: 40.2%

DEPTH (ft)	SOIL DESCRIPTION	ELEVATION (ft)
0.5	ASPHALT: 6 inches	580.5
1.0	AGGREGATE BASE: 6 inches	580.0
	SILTY SAND (SM): loose, light reddish brown, fine to medium grained, moist, (FILL)	
	very loose, gray	
8.5	SILTY SAND (SM): medium dense, light yellowish brown, gray, fine to medium grained, moist, (RESIDUAL) ▽	572.5
	brown, gray, wet	
18.0	Auger Refusal at 18 feet.	563.0

REMARKS

Groundwater encountered at 10.5 feet (EL 570.5) at time of drilling.

Borehole backfilled on date drilled unless otherwise noted.
Consistency/Relative Density based on correction factor for Automatic hammer.

SAMPLE TYPE ☒ Standard Penetration Test

N-VALUE STANDARD PENETRATION RESISTANCE (AASHTO T-206)
% MOISTURE PERCENT NATURAL MOISTURE CONTENT
▽ GROUNDWATER LEVEL IN THE BOREHOLE AT TIME OF DRILLING
▼ STABILIZED GROUNDWATER LEVEL

REC RECOVERY
RQD ROCK QUALITY DESIGNATION
UD UNDISTURBED
Qu POCKET PENETROMETER UNCONFINED COMPRESSIVE STRENGTH

LL: LIQUID LIMIT
PL: PLASTIC LIMIT
PI: PLASTICITY INDEX

M: NATURAL MOISTURE CONTENT
F: PERCENT PASSING NO. 200 SIEVE

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LOG OF BORING

Designation: B-05

Sheet 1 of 1

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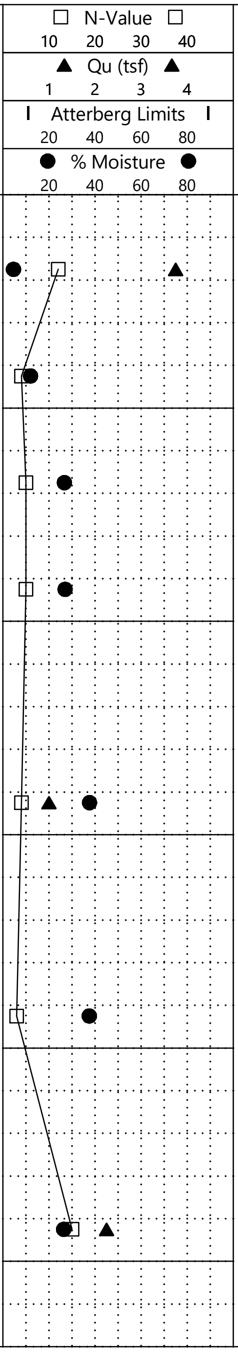
PROJECT NAME: East University Culvert Replacement
PROJECT NUMBER: AU240126
DRILLING METHOD: Hollow Stem Auger
EQUIPMENT USED: Geoprobe 7822DT
HAMMER TYPE: Automatic
BORING LOCATION: SE Corner: 32°34'46.60"N,85°28'41.72"W
LOCATION: Auburn, Alabama
DATE DRILLED: 7/29/24
WEATHER: Partly Cloudy, 80°
ELEVATION: 581
DRILL CREW: Building & Earth
LOGGED BY: W. Martine

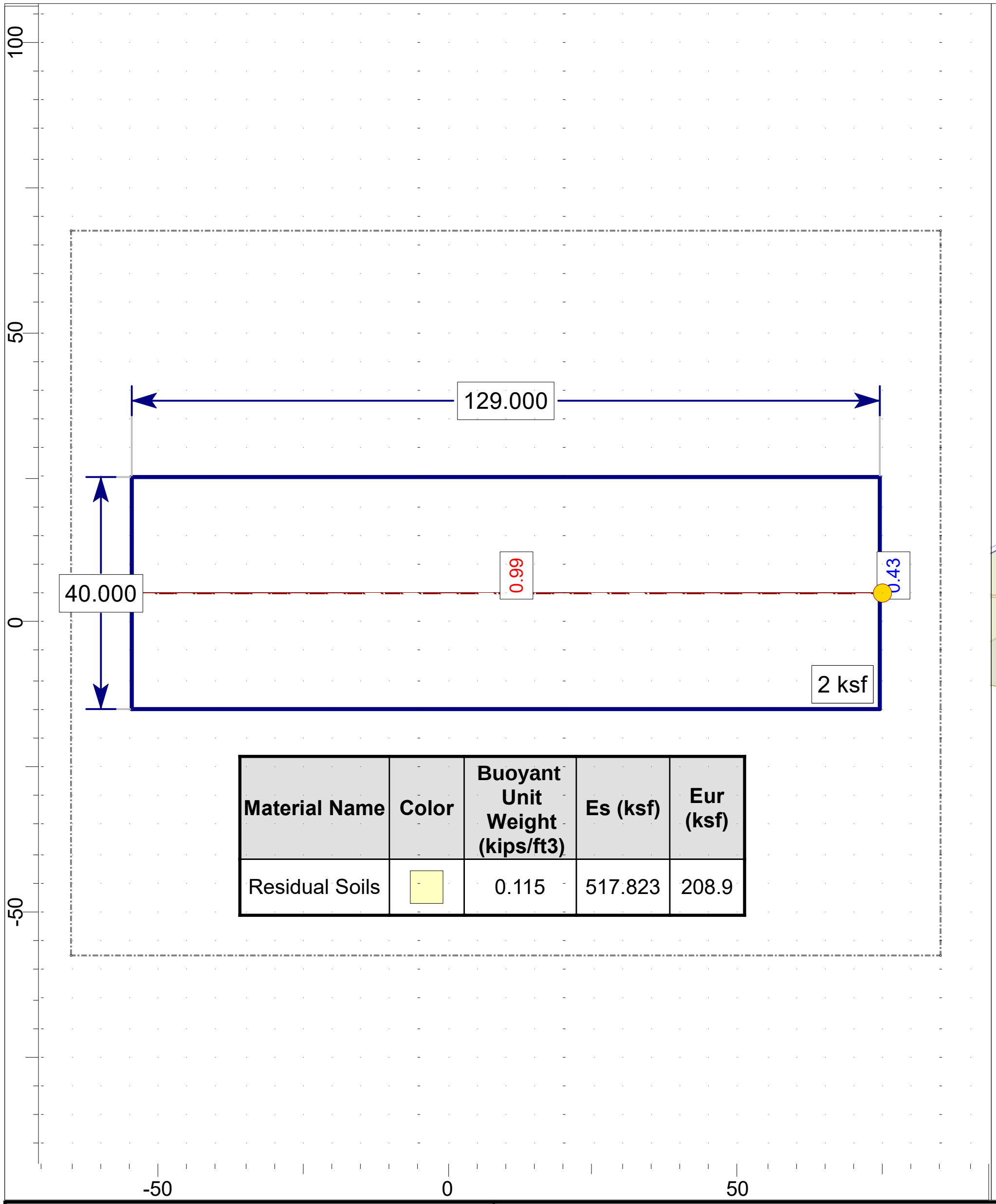


DEPTH (ft)	ELEVATION (ft)	SAMPLE TYPE	SAMPLE NO.	BLOWS PER INCREMENT	LAB DATA	SOIL DESCRIPTION	REMARKS
0.5	580.5					ASPHALT: 6 inches	
0.9	580.1					AGGREGATE BASE: 4 inches	
		☒	S-01	4 6 6	Sample S-01 M: 4.6%	SILTY SAND (SM): medium dense, light yellowish brown, gray, fine to medium grained, moist, (FILL)	
		☒	S-02	3 2 2	Sample S-02 M: 12.0%	loose, gray	
6.0	575.0					SILTY SAND (SM): loose, gray, brown, fine to coarse grained, wet, (RESIDUAL)	
		☒	S-03	1 2 3	Sample S-03 M: 26.7%		
						▽	Groundwater encountered at 8.1 feet (EL 572.9) at time of drilling.
		☒	S-04	1 3 2	Sample S-04 M: 27.0% F: 45.2%		
13.5	567.5					SANDY SILT (ML): medium stiff, brown, low plasticity, wet, (RESIDUAL)	
		☒	S-05	1 2 2	Sample S-05 M: 37.6% F: 69%		
		☒	S-06	1 1 2	Sample S-06 M: 37.5%	soft	
		☒	S-07	6 7 8	Sample S-07 M: 26.4%	very stiff	Borehole backfilled on date drilled unless otherwise noted. Consistency/Relative Density based on correction factor for Automatic hammer.
26.0	555.0					Auger Refusal at 26 feet.	

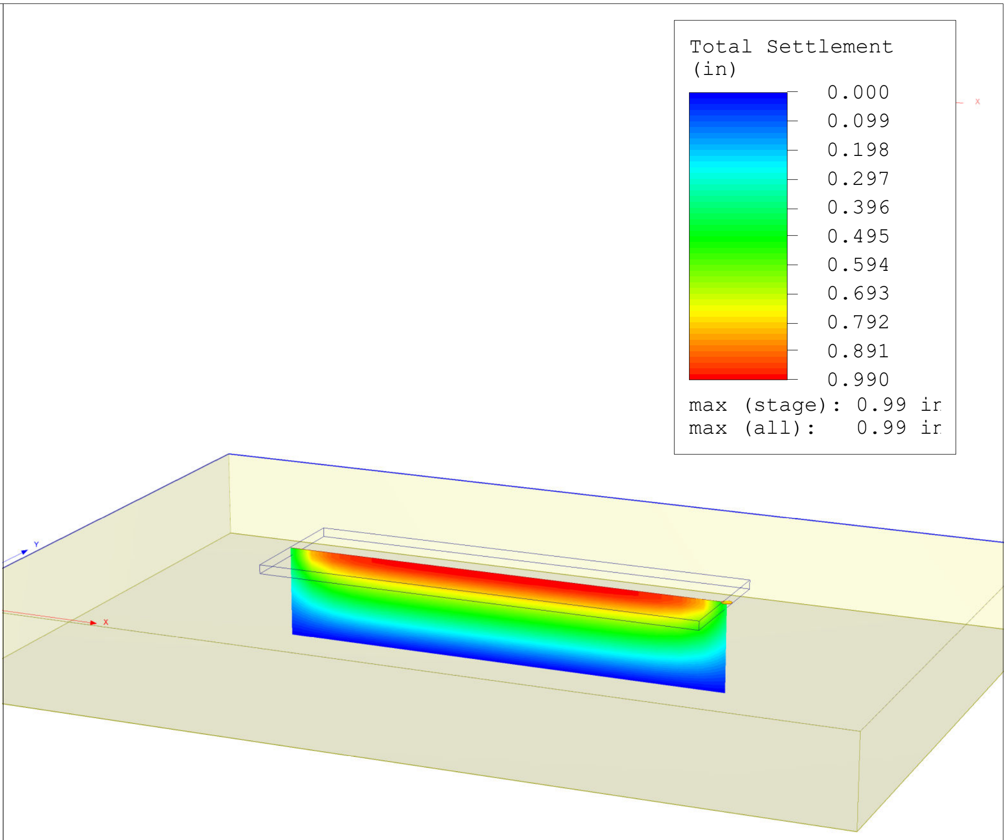
SAMPLE TYPE ☒ Standard Penetration Test

N-VALUE STANDARD PENETRATION RESISTANCE (AASHTO T-206)
% MOISTURE PERCENT NATURAL MOISTURE CONTENT
▽ GROUNDWATER LEVEL IN THE BOREHOLE AT TIME OF DRILLING
▼ STABILIZED GROUNDWATER LEVEL
REC RECOVERY
RQD ROCK QUALITY DESIGNATION
UD UNDISTURBED
Qu POCKET PENETROMETER UNCONFINED COMPRESSIVE STRENGTH
LL: LIQUID LIMIT
PL: PLASTIC LIMIT
PI: PLASTICITY INDEX
M: NATURAL MOISTURE CONTENT
F: PERCENT PASSING NO. 200 SIEVE

SETTLEMENT ANALYSIS



Material Name	Color	Buoyant Unit Weight (kips/ft3)	Es (ksf)	Eur (ksf)
Residual Soils	🟨	0.115	517.823	208.9



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SETTLE3D 4.023

Project	East University Culvert Replacement
Analysis Description	Settlement Analysis - Existing Conditions

Drawn By	Aaron Roy, P.E.	*Company*	Building & Earth
Date	8/8/2024, 1:20:16 PM	*File Name*	Culvert Settlement Analysis.s3z

LABORATORY TEST PROCEDURES

A brief description of the laboratory tests performed is provided in the following sections.

DESCRIPTION OF SOILS (VISUAL-MANUAL PROCEDURE) (ASTM D2488)

The soil samples were visually examined by our engineer and soil descriptions were provided. Representative samples were then selected and tested in accordance with the aforementioned laboratory-testing program to determine soil classifications and engineering properties. This data was used to correlate our visual descriptions with the Unified Soil Classification System (USCS).

POCKET PENETROMETER

Pocket Penetrometer tests were performed on cohesive soil samples. The pocket penetrometer provides a consistency classification, and an indication of the soils unconfined compressive strength (Qu).

NATURAL MOISTURE CONTENT (ASTM D2216)

Natural moisture contents (M%) were determined on selected samples. The natural moisture content is the ratio, expressed as a percentage, of the weight of water in a given amount of soil to the weight of solid particles.

ATTERBERG LIMITS (ASTM D4318)

The Atterberg Limits test was performed to evaluate the soil's plasticity characteristics. The soil Plasticity Index (PI) is representative of this characteristic and is bracketed by the Liquid Limit (LL) and the Plastic Limit (PL). The Liquid Limit is the moisture content at which the soil will flow as a heavy viscous fluid. The Plastic Limit is the moisture content at which the soil is between "plastic" and the semi-solid stage. The Plasticity Index (PI = LL - PL) is a frequently used indicator for a soil's potential for volume change. Typically, a soil's potential for volume change increases with higher plasticity indices.

MATERIAL FINER THAN NO. 200 SIEVE BY WASHING (ASTM D1140)

Grain-size tests were performed to determine the partial soil particle size distribution. The amount of material finer than the openings on the No. 200 sieve (0.075 mm) was determined by washing soil over the No. 200 sieve. The results of wash #200 tests are presented on the boring logs included in this report and in the table of laboratory test results.

LABORATORY TEST RESULTS

The results of the laboratory testing are presented in the following tables.

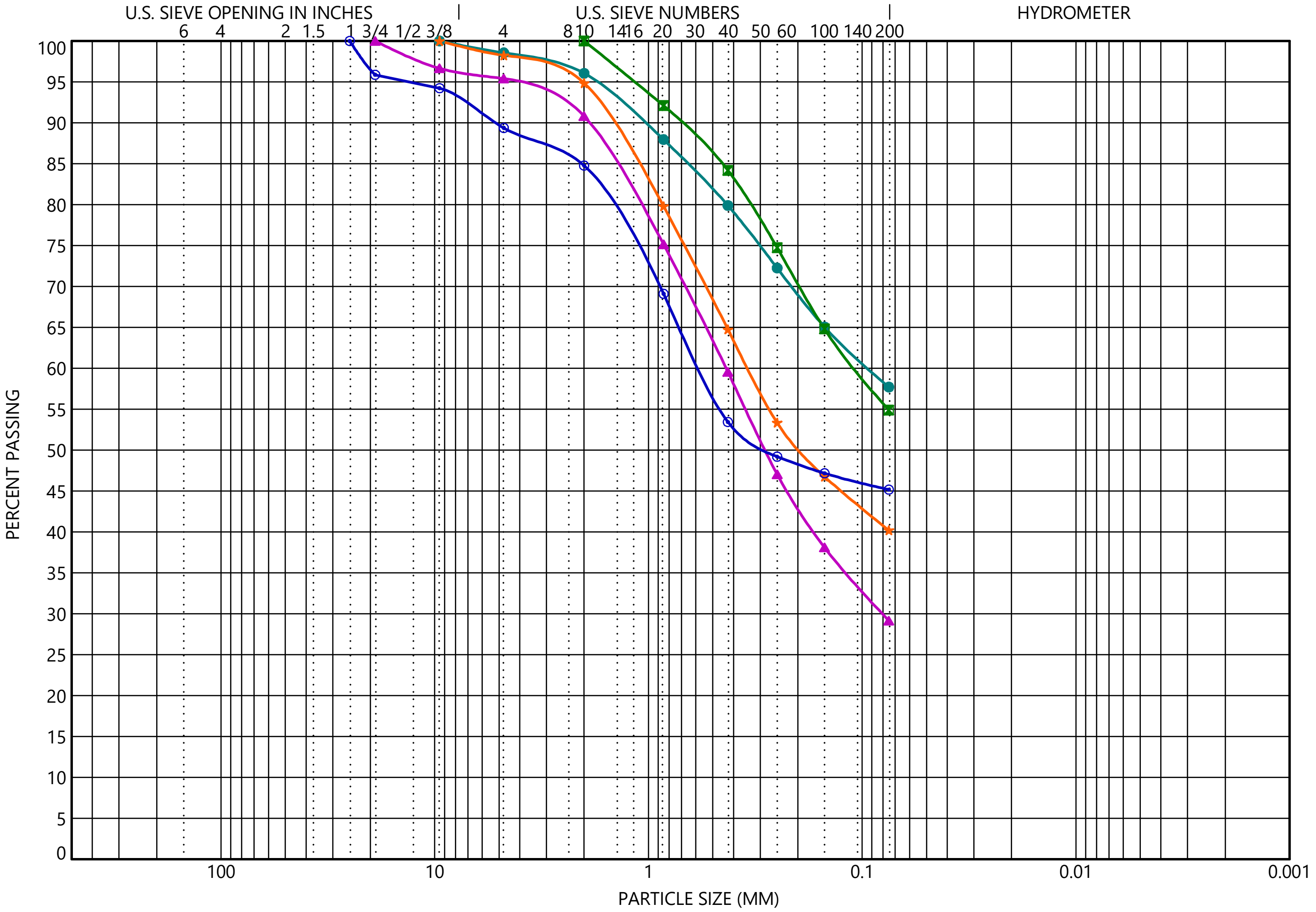
Boring Location	Sample Depth (ft)	LL	PL	PI	% Passing #200 Sieve	Moisture Content (%)
B-01	6.5 - 7.5	-	-	-	-	25.6
	8.5 - 10	30	NP	NP	57.7	26.6
	13.5 - 15	-	-	-	-	25.8
	18.5 - 20	-	-	-	-	20.0
	22 - 23.5	-	-	-	-	17.8
B-02	3.5 - 5	-	-	-	-	14.5
	6 - 7.5	-	-	-	-	26.3
	8.5 - 10	28	NP	NP	54.9	37.4
	13.5 - 15	-	-	-	-	28.4
B-04	3.5 - 5	-	-	-	-	7.4
	6 - 7.5	-	-	-	-	20.7
	8.5 - 10	-	-	-	29.2	23.5
	13.5 - 15	31	NP	NP	40.2	18.7
B-05	1 -2.5	-	-	-	-	4.6
	3.5 - 5	-	-	-	-	12.0
	6 - 7.5	-	-	-	-	26.7
	8.5 - 10	-	-	-	45.2	27.0
	13.5 - 15	37	NP	NP	69.0	37.6
	18.5 - 20	-	-	-	-	37.5
	23.5 - 25	-	-	-	-	26.4

Table A-1: General Soil Classification Test Results

GRAIN SIZE DISTRIBUTION

GRAIN SIZE DISTRIBUTION

PROJECT NAME East University Culvert Replacement
PROJECT NUMBER AU240126
CLIENT City of Auburn
PROJECT LOCATION Auburn, Alabama



(USCS MATERIAL DESIGNATIONS)

COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

	SOURCE	DEPTH	DESCRIPTION	LL	PL	PI	Cc	Cu
●	B-01	8.5	Sandy Silt (ML)					
☒	B-02	8.5	Sandy Silt (ML)					
▲	B-04	8.5	Silty Sand (SM)					
★	B-04	13.5	Silty Sand (SM)					
⊙	B-05	8.5	Silty Sand (SM)					

	SOURCE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	B-01	8.5	9.5	0.093			1.4	40.9	57.7	
☒	B-02	8.5	2	0.107			0.0	45.1	54.9	
▲	B-04	8.5	19	0.434	0.08		4.6	66.3	29.1	
★	B-04	13.5	9.5	0.341			1.8	58.0	40.2	
⊙	B-05	8.5	25	0.568			10.6	44.2	45.2	

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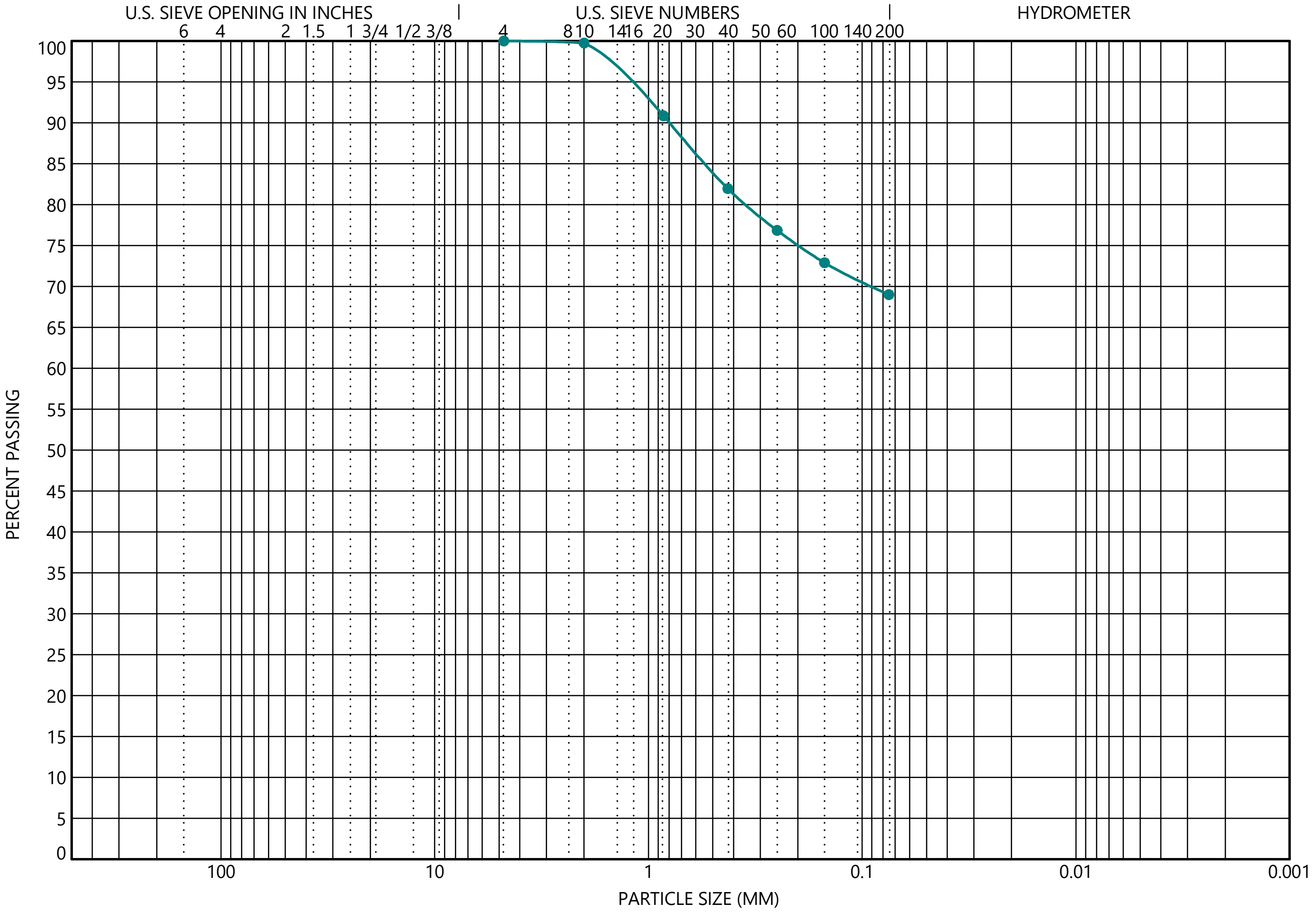
GRAIN SIZE DISTRIBUTION

PROJECT NAME East University Culvert Replacement
PROJECT NUMBER AU240126
CLIENT City of Auburn
PROJECT LOCATION Auburn, Alabama



(USCS MATERIAL DESIGNATIONS)

COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

	SOURCE	DEPTH	DESCRIPTION	LL	PL	PI	Cc	Cu
●	B-05	13.5	Sandy Silt (ML)					

	SOURCE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	B-05	13.5	4.75				0.0	31.0	69.0	

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a civil engineer may not fulfill the needs of a constructor — a construction contractor — or even another civil engineer. Because each geotechnical- engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. No one except you should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you* — should apply this report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical-engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

Geotechnical Engineers Base Each Report on a Unique Set of Project-Specific Factors

Geotechnical engineers consider many unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk-management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical-engineering report that was:

- not prepared for you;
- not prepared for your project;
- not prepared for the specific site explored; or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical-engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical-engineering report is based on conditions that existed at the time the geotechnical engineer performed the study. *Do not rely on a geotechnical-engineering report whose adequacy may have been affected by*: the passage of time; man-made events, such as construction on or adjacent to the site; or natural events, such as floods, droughts, earthquakes, or groundwater fluctuations. *Contact the geotechnical engineer before applying this report to determine if it is still reliable.* A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ — sometimes significantly — from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide geotechnical-construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are Not Final

Do not overrely on the confirmation-dependent recommendations included in your report. *Confirmation-dependent recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations *only* by observing actual subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's confirmation-dependent recommendations if that engineer does not perform the geotechnical-construction observation required to confirm the recommendations' applicability.*

A Geotechnical-Engineering Report Is Subject to Misinterpretation

Other design-team members' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Constructors can also misinterpret a geotechnical-engineering report. Confront that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing geotechnical construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical-engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make constructors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give constructors the complete geotechnical-engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise constructors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure constructors have sufficient time* to perform additional study. Only then might you be in a position to give constructors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and constructors fail to recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Environmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform an *environmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold-prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, many mold- prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical- engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; *none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.*

Rely, on Your GBC-Member Geotechnical Engineer for Additional Assistance

Membership in the Geotechnical Business Council of the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project. Confer with you GBC-Member geotechnical engineer for more information.

GEOTECHNICAL
BUSINESS COUNCIL
of the Geoprofessional Business Association

8811 Colesville Road/Suite G106, Silver Spring, MD 20910
Telephone: 301/565-2733 Facsimile: 301/589-2017
e-mail: info@geoprofessional.org www.geoprofessional.org

CONSTRUCTION PLANS FOR
EAST UNIVERSITY DRIVE AND SUMMERTREES DRIVE
CULVERT REPLACEMENT
FOR THE
CITY OF AUBURN
AUBURN, ALABAMA

CITY CONTACTS

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JUSTIN FOSTER
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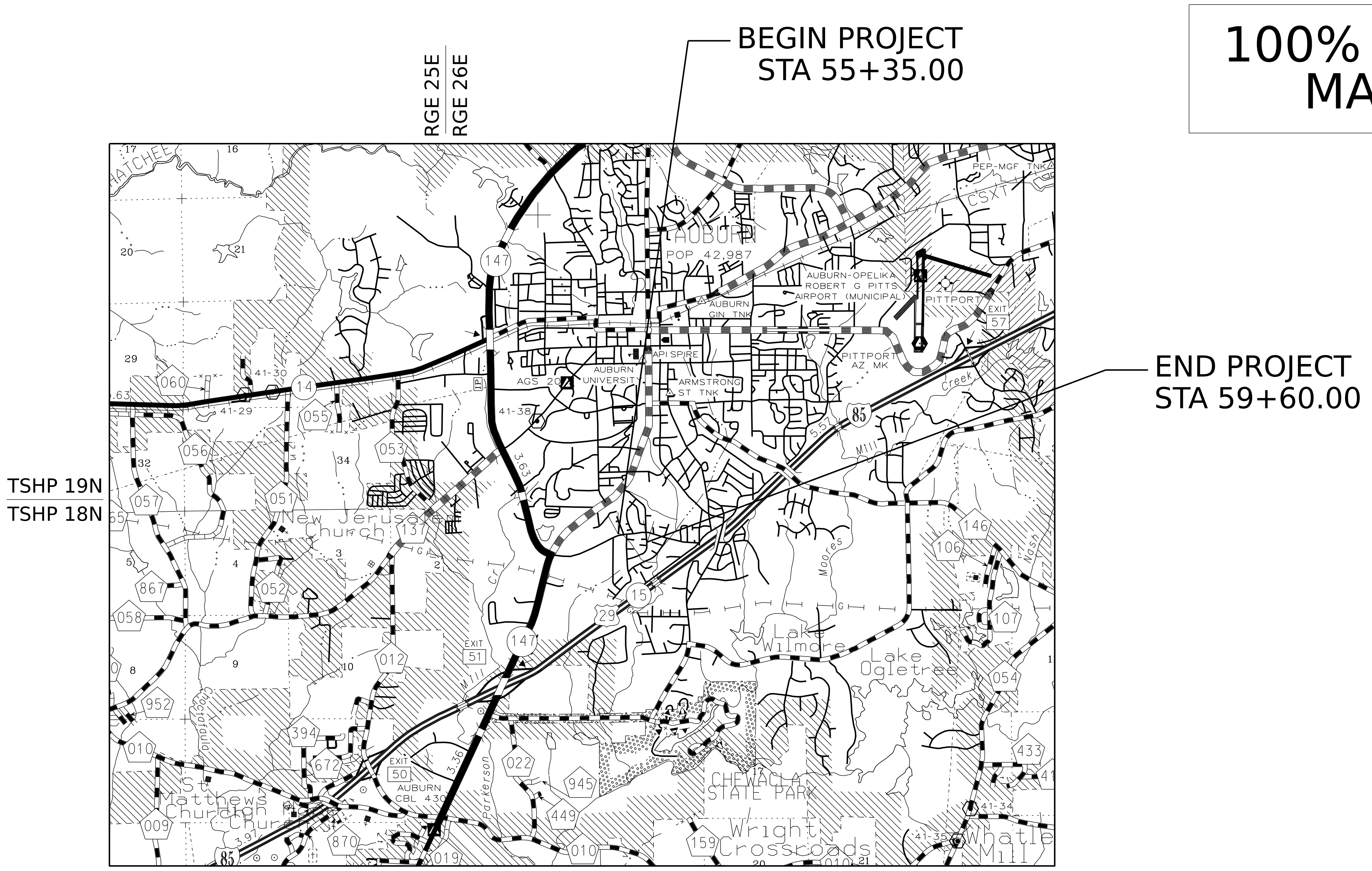
(334) 501-3017
jfoster@auburnalabama.org

KRIS BERRY, P.E.
UTILITY ENGINEER
(334) 501-3064
kberry@auburnalabama.org

UTILITY	CONTACT	EMAIL	PHONE
AUBURN WATER & SEWER	TIMOTHY JOHNSON	tjohnson@auburnalabama.org	N/A
SPIRE (GAS)	ALAINA KIZZIAH	alaina.kizziah@spireenergy.com	N/A
AT&T (TELECOM)	PATRICK ENGLISH	pe314x@att.com	N/A
ALABAMA POWER (POWER)	T.J. PEARSON	tepearso@southernco.com	(334) 352-2495

AUBURN

100% PLAN SUBMITTAL
MARCH 20, 2026



VICINITY MAP
N.T.S.

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TITLE SHEET

EAST UNIVERSITY DRIVE AND SUMMERTREES DRIVE
CULVERT REPLACEMENT
AUBURN, ALABAMA

REVISION INFORMATION

REV.	DR.	CHK.	DATE	DESCRIPTION
			05-11-2026	REVISION #1

1

FILE NO. 33162-29

PROJECT NOTES SHEET

NOTE NO.	NOTES
200	ROADBED PROCESSING IS WAIVED. THE SUBGRADE SHALL BE COMPACTED TO 100% DENSITY OF AASHTO T-99 OR TO THE SATISFACTION OF THE ENGINEER. THE COST OF THIS WORK WILL BE A SUBSIDIARY OBLIGATION OF THE OVERLYING LAYER.
201	DRIVEWAYS SHALL MEET CITY STANDARDS

NOTE NO.		NOTES
300		ITEMS TO BE REMOVED THAT ARE NOT SPECIFICALLY MENTIONED BY NOTE TO BE INCLUDED IN OTHER ITEMS OF WORK SHALL BE REMOVED IN ACCORDANCE WITH THE REQUIREMENTS FOR EXTRA WORK IN ARTICLE 104.03 OF THE STANDARD SPECIFICATIONS.
301		CONTRACTOR SHALL REMOVE THE EXISTING RECTANGULAR RAPID FLASHING BEACONS (RRFB) PRIOR TO CONSTRUCTION, STORE THE RRFB, AND RE-INSTALL IT ONCE CONSTRUCTION IS COMPLETE. THE COST FOR THIS WORK, INCLUDING ANY NECESSARY MATERIALS WILL BE A SUBSIDIARY OBLIGATION OF PAY ITEM 730Y-080 (RELOCATION OF PEDESTAL POLE AND FOUNDATION WITH FLASHING BEACON).
302		ALL PAVEMENT AND/OR TEMPORARY STRIPING PLACED ON A FINAL WEARING SURFACE THAT DOES NOT MEET THE TOLERANCES SPECIFIED SHALL BE REMOVED BY HYDRAULIC MEANS ONLY AND REPLACED WITHOUT COMPENSATION.
303	1	THE CONTRACTOR MAY, AT THEIR OPTION, PROVIDE A PRECAST CONCRETE CULVERT IN LIEU OF CAST-IN-PLACE CONSTRUCTION. ALL MATERIALS, FABRICATION, AND INSTALLATION SHALL BE IN ACCORDANCE WITH ALDOT SPECIFICATION 524 AND SHALL BE PAID FOR UNDER ITEM 19, CULVERT CONCRETE.
304	1	THE TEMPORARY RETAINING WALLS MAY BE LEFT IN PLACE AFTER CONSTRUCTION, HOWEVER THE TOP PORTION OF THE WALLS SHALL BE REMOVED TO THE BOTTOM OF SUBGRADE PRIOR TO THE PLACEMENT OF ASPHALT AS SHOWN IN PHASE 3 OF THE TCP PLANS. ALL COST ASSOCIATED WITH THIS WORK SHALL BE SUBSIDIARY TO ITEM 65, COFFERDAMS OR SHEETING AND SHORING.
400		OMIT
401		THE CONTRACTOR SHALL ENSURE NO EXISTING MAILBOXES ARE DAMAGED DURING CONSTRUCTION.
402		THE CONTRACTOR SHALL NOTIFY THE CITY 48 HOURS PRIOR TO CONSTRUCTION. COORDINATE WITH THE CITY PROJECT MANAGER.
403		IN THE EVENT A WATER MAIN OR SEWER MAIN IS DAMAGED THE CITY OF AUBURN WATER RESOURCE MANAGEMENT OFFICE SHOULD BE CONTACTED IMMEDIATELY AT (334) 501-3060.
404		48 HOURS ADVANCED NOTICED SHALL BE PROVIDED IN THE EVENT OF ANY POTENTIAL WATER OUTAGE DURING CONSTRUCTION. THE CITY OF AUBURN WATER RESOURCE MANAGEMENT OFFICE SHOULD BE CONTACTED AT (334) 501-3060.
405		DRIVEWAY ACCESS SHALL BE MAINTAINED DURING CONSTRUCTION.
406		THE CONTRACTOR IS RESPONSIBLE FOR CLEANING OUT ANY MATERIALS INTRODUCED TO INLETS DURING CONSTRUCTION.
407		ALL PAVEMENT AND/OR TEMPORARY STRIPING PLACED ON A FINAL WEARING SURFACE THAT DOES NOT MEET THE TOLERANCES SPECIFIED SHALL BE REMOVED BY HYDRAULIC MEANS ONLY AND REPLACED WITHOUT COMPENSATION.
408		THE CONTRACTOR SHALL MAINTAIN CONTINUOUS PEDESTRIAN ACCESS TO THE EXISTING TOWN CREEK WALKING TRAIL LOCATED AT THE INTERSECTION OF SUMMERTREES DRIVE AND E. UNIVERSITY DRIVE AT ALL TIMES DURING CONSTRUCTION. THIS INCLUDES MAINTAINING SAFE AND ACCESSIBLE CONNECTIVITY FROM THE EXISTING SIDEWALK ALONG E. UNIVERSITY DRIVE ACROSS THE INTERSECTION AT SUMMERTREES DR. TO THE TRAIL. IF TEMPORARY IMPACTS TO PEDESTRIAN ROUTING ARE NECESSARY, THE CONTRACTOR SHALL PROVIDE APPROPRIATE TRAFFIC CONTROL MEASURES IN ACCORDANCE WITH THE MUTCD AND AS DIRECTED BY THE ENGINEER. ANY PROPOSED CLOSURE OF THE WALKING TRAIL, WHETHER FULL OR PARTIAL, SHALL REQUIRE PRIOR APPROVAL FROM THE ENGINEER. THE CONTRACTOR SHALL SUBMIT A WRITTEN REQUEST FOR SUCH CLOSURE A MINIMUM OF SEVENTY-TWO (72) HOURS IN ADVANCE, INCLUDING THE DURATION, JUSTIFICATION, AND PROPOSED PEDESTRIAN DETOUR PLAN. NO TRAIL CLOSURE SHALL OCCUR WITHOUT EXPLICIT APPROVAL.

NOTE NO.	NOTES
800	IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO CONTACT THE VARIOUS UTILITY OWNERS AND DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES ON THIS PROJECT WHETHER SHOWN ON THE PLANS OR NOT. THE LOCATION OF ANY REQUIRED GUARDRAIL, SIGNS, FOOTINGS OF ANY NATURE AND/OR ELECTRICAL/COMMUNICATIONS CONDUITS MAY BE ADJUSTED AS DIRECTED BY THE ENGINEER TO PREVENT ANY CONFLICTS WITH THESE UTILITIES. UTILITY LINE LOCATE REQUESTS WILL BE LIMITED TO INCREMENTS NOT TO EXCEED 2000 LINEAR FEET PER WORKING DAY OPERATION. MULTIPLE LOCATE REQUESTS WILL BE REQUIRED FOR PROJECTS GREATER THAN 2000 LINEAR FEET IN LENGTH.
900	A NOTICE OF INTENT FOR NPDES PERMIT IS NOT REQUIRED FOR THIS PROJECT.
901	OMIT
902	OMIT
903	OMIT
904	OMIT
905	OMIT
906	THERE SHALL BE NO FUEL TANKS STORED ON THE RIGHT OF WAY. IN ADDITION, FUEL TRUCKS OR VEHICLES TRANSPORTING CHEMICALS, FERTILIZERS, ETC. SHALL NOT BE LEFT UNATTENDED ON THE RIGHT OF WAY.

1 UPDATED NOTE 303.
ADDED NOTE 304.

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PROJECT NOTES SHEET
EAST UNIVERSITY DRIVE AND SUMMERTREES DRIVE
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AUBURN, ALABAMA

REVISION INFORMATION

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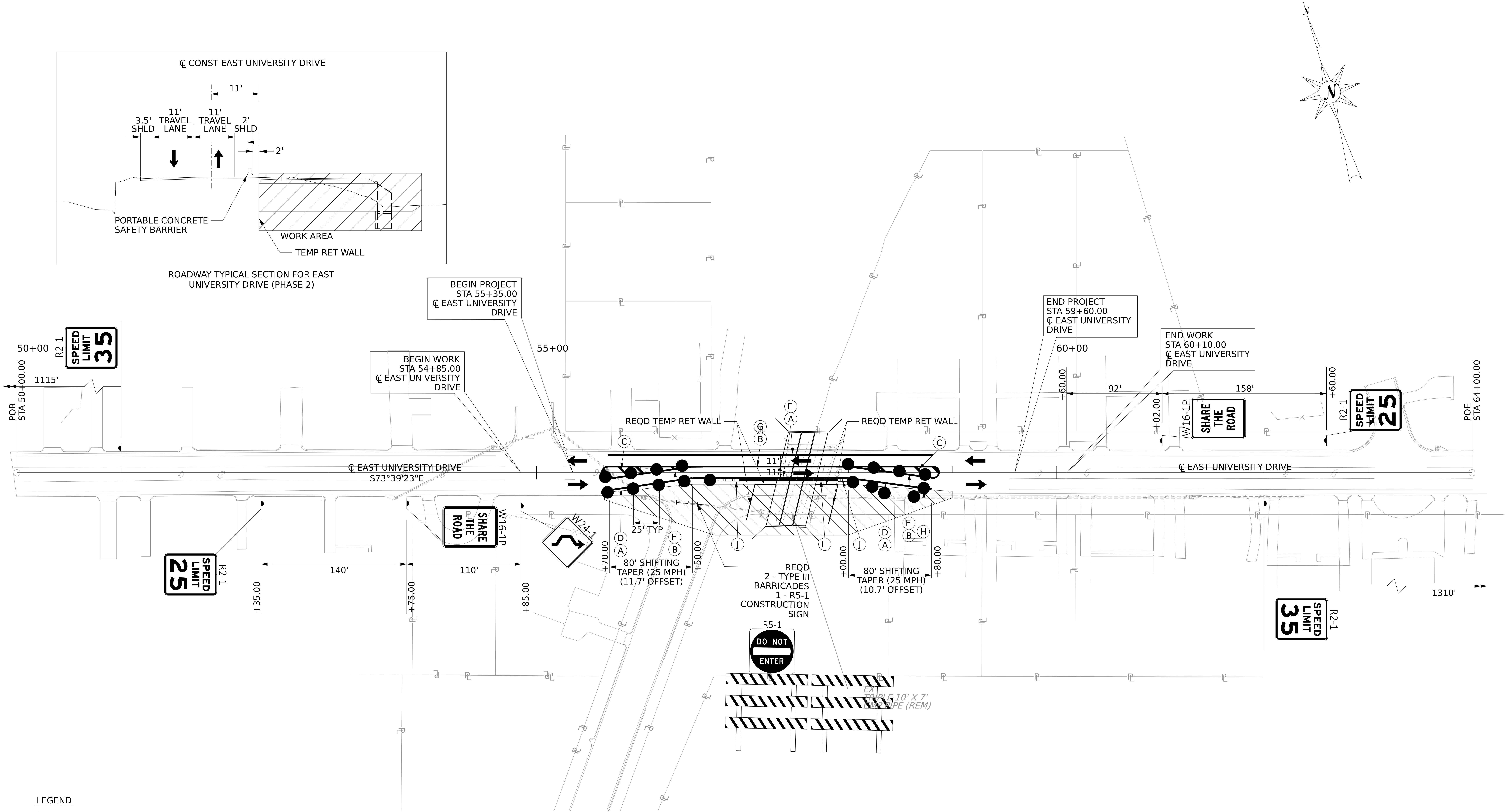
2B

FILE NO. 33162-29

TEMPORARY TRAFFIC CONTROL PLAN - PHASE 2



LEGEND

- Ⓐ SOLID WHITE TEMPORARY TRAFFIC STRIPE
- Ⓑ SOLID YELLOW TEMPORARY TRAFFIC STRIPE
- 1 Ⓒ YELLOW TEMPORARY TRAFFIC MARKINGS (24" WIDE)
- Ⓓ REQD CLASS C, TYPE 1-A PAVEMENT MARKERS @ 3' O.C.
- Ⓔ REQD CLASS C, TYPE 1-A PAVEMENT MARKERS @ 10' O.C.
- Ⓕ REQD CLASS C, TYPE 1-B PAVEMENT MARKERS @ 3' O.C.
- 1 Ⓖ REQD CLASS C, TYPE 1-B PAVEMENT MARKERS @ 10' O.C.
- 1 Ⓗ CHANNELIZING DRUMS
- 1 Ⓘ TYPE 6 CONCRETE BARRIER
- 1 Ⓙ PORTABLE IMPACT ATTENUATOR W/ TYPE 6A CONCRETE BARRIER

1

UPDATED LEGENDS C, G, H,AND I.
ADDED LEGEND J.

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0 50 100
HORZ
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TEMPORARY TRAFFIC CONTROL PLAN-PHASE 2

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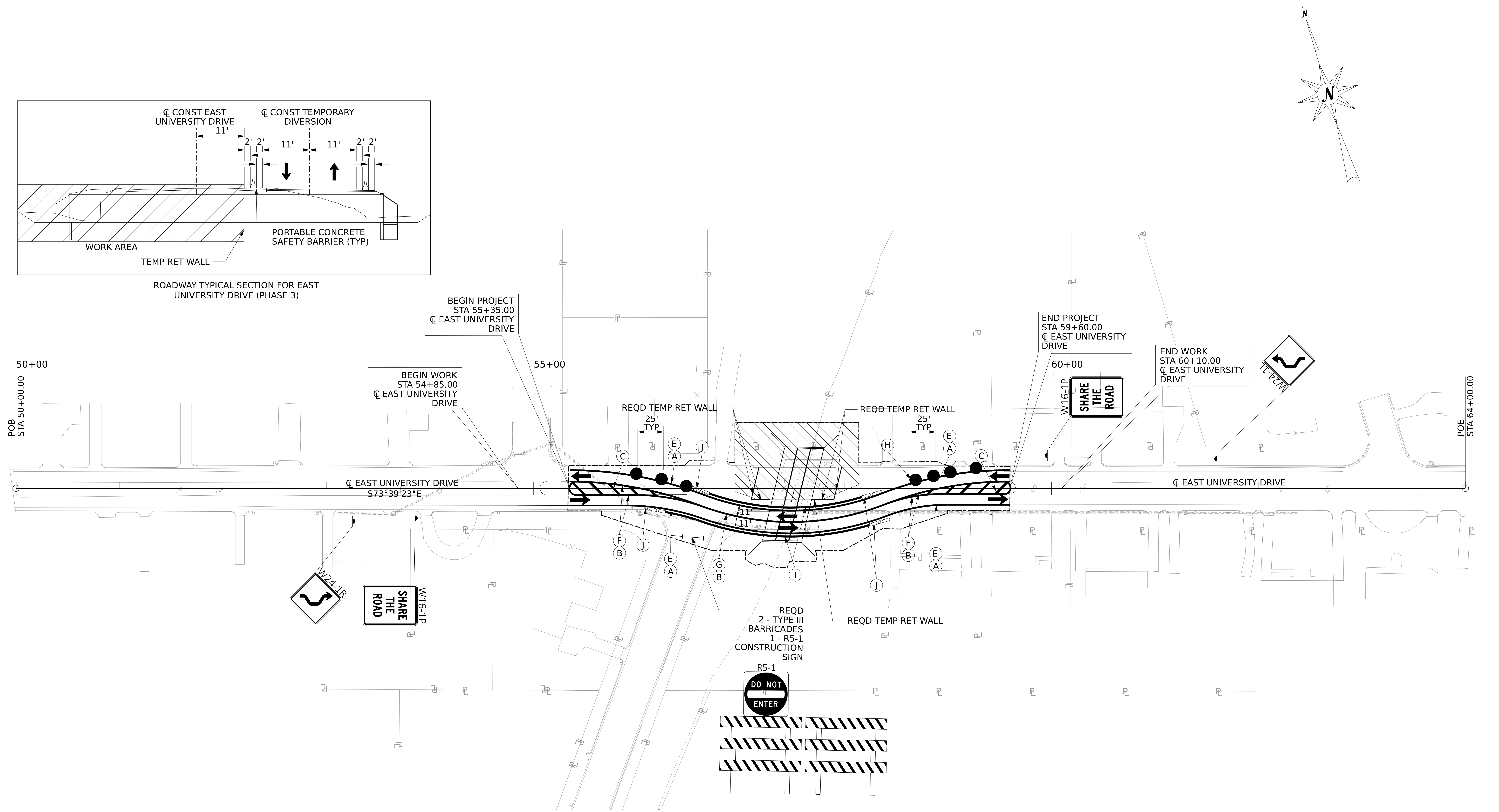
TEMPORARY TRAFFIC CONTROL PLAN - PHASE 3



LEGEND

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1 Ⓙ PORTABLE IMPACT ATTENUATOR W/ TYPE 6A CONCRETE BARRIER

1 UPDATED LEGENDS C, G, H, AND I.
ADDED LEGEND J.

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ALABAMA LICENSED No. 40325-E PROFESSIONAL ENGINEER ATTRICE DAVON ELDER
05/11/2026

TEMPORARY TRAFFIC CONTROL PLAN-PHASE 3

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AUBURN, ALABAMA

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