



November 2, 2017

Mr. Mohammed A. Mulla, PE
Geotechnical Engineering Unit
State of N.C. Department of Transportation – Division of Highways
P.O. Box 25201
Raleigh, NC 27611-5201

**RE: PRELIMINARY SITE ASSESSMENT OF PARCEL 20
ESP Project No. CS34.358**

WBS: 38389.1.1
TIP: B-4491
County: Cumberland
Description: Replace Bridge 22 over I-95B/US 301 on NC 59
Parcel No.: 20
Address: 4933B S. Main St., Hope Mills, NC 28348

Dear Mr. Mulla:

ESP Associates, P.A. (ESP) is pleased to submit this report on our Preliminary Site Assessment of the subject parcel. This work was performed in accordance with your Request for Proposal dated August 24, 2017 and our Cost Proposal dated September 17, 2017. The Notice to Proceed (NTP) was received on September 18, 2017.

We appreciate the opportunity to assist you during this phase of the project. If you should have any questions concerning this report, or if we may be of further assistance, please contact us.

Sincerely,

ESP Associates, P.A.

A handwritten signature in blue ink, appearing to read "Edward D. Billington".

Edward D. Billington, PG
Senior Geologist/Geophysicist
EDB



not considered Final unless all signatures are completed
7402544DC82F4E0...

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1.0 INTRODUCTION

The North Carolina Department of Transportation (NCDOT) is planning to replace Bridge 22 over I-95B/US 301 on NC 59 (Figure 1). The NCDOT requested that ESP Associates, P.A. (ESP) perform a Preliminary Site Assessment (PSA) of Parcel 20 within the proposed Right of Way (ROW) and/or easement to locate possible underground storage tanks (USTs), sample soil, and delineate potential contaminated soil.

2.0 HISTORY

This parcel is currently occupied by a vacant used car lot. The facility is not listed in the UST Section Registry. There are no known groundwater or soil contamination incidents associated with this facility.

3.0 SITE OBSERVATIONS

During our October 2017 field work, the site was operating as a vacant used car lot (Figure 2). The ground in the study area was covered by gravel and grass.

4.0 METHODS

ESP performed a geophysical study of the area designated by the NCDOT on October 5, 2017. We performed direct-push drilling and sampling of subsurface soils within the proposed easement on October 19, 2017. A photoionization detector (PID) was used to screen subsurface soils in the field and select soil samples to send for laboratory analysis.

4.1 Geophysics

ESP performed a metal detector study over the accessible areas of the site using a Geonics EM61 MK2 with a line spacing of about three feet (Figures 3 and 4). Location control was provided in real-time using a sub-meter differential global positioning system (DGPS). We collected ground-penetrating radar (GPR) data over EM61 anomalies using our Sensors and Software Noggin 250 GPR system. The GPR data were collected using a line spacing of one to two feet.

4.2 Borings

ESP performed direct-push drilling activities within the easement of Parcel 20 using a subcontractor, SAEDACCO of Fort Mill, South Carolina. Initially, 3 borings were drilled, designated B20-1, B20-2, and B20-3. A fourth boring, B20-4, was added to explore possible contamination indicated by the field results of B20-2. The soil borings were advanced using a GeoProbe 7822DT drill rig. Continuous soil samples were obtained to a depth of approximately ten feet using a five-foot long Macro Core®. All soil cores had a recovery of less than five feet

due to loose sands present at the site. The sampling equipment was decontaminated prior to drilling and between borings by the driller using a Liquinox® detergent solution.

4.3 Soil Sample Protocol

Representative soil samples were taken from the Macro-Core tubes at approximate one-foot intervals to a depth of 10.0 feet by the ESP field geologist while wearing nitrile disposable gloves. Each sample was placed in a sealed plastic bag and then kept in a heated field vehicle for at least 5 minutes prior to measuring volatile organic compound (VOC) levels in the head space with the PID. All of the soil samples obtained had a PID reading of less than 10 parts per million (ppm) except for B20-2 S-1 (depth of 1.0-1.5 feet) that had a reading of 15.6 ppm (Table 1).

Soil samples selected for laboratory analysis were Sample S-7 (corresponding depth of 7.0-7.5 feet) from each of Borings B20-1, B20-3, and B20-4; Samples S-1, S-2, and S-7 (1.0-1.5 feet, 2.0-2.5 feet, and 7.0-7.5 feet) from Boring B20-2. For each selected sample, an approximate 10-gram soil sample was collected from the Macro-Core tube using a Terra Core Sampler and placed into a laboratory-supplied 40-milliliter volatile organic analysis (VOA) vial containing methanol. Once sealed, the vial was labeled with the sample identification number and then shaken vigorously for about one minute. The samples were packed on ice and sent via overnight delivery to RedLab, LLC (RedLab), located in Wilmington, North Carolina, following proper chain-of-custody procedures (Appendix C).

RedLab used a QED Hydrocarbon Analyzer to quantitatively analyze the soil samples using the ultraviolet fluorescence (UVF) method for benzene, toluene, ethylbenzene, and xylene (BTEX); gasoline range organics (GRO); diesel range organics (DRO); total petroleum hydrocarbons (TPH); total aromatics; polycyclic aromatic hydrocarbons (PAHs); and benzo(a)pyrene (BaP).

4.4 Groundwater

Groundwater was not encountered in the four borings drilled on the site.

5.0 RESULTS

5.1 Geophysics

The EM61 early time gate data show the response from both shallow and deeper metallic objects (Figure 3). The differential response reduces the effect of shallow anomalies and emphasizes anomalies from larger and more deeply buried metallic objects, such as USTs (Figure 4). The EM61 differential results indicated one anomaly (response above background) that could represent a buried UST(s).

GPR data were collected over the EM61 anomaly. The GPR data collected did not indicate the presence of unknown USTs within the study area.

The EM61 early time gate response and differential response are shown on the plan sheet on Figures 5 and 6, respectively.

5.2 Sample Data

The soil sample UVF hydrocarbon analysis results for BTEX, GRO, DRO, and PAHs are presented in Table 2. The RedLab laboratory report, which includes results for TPH, total aromatics, and BaP, is provided in Appendix B. Values are provided in (milligrams per kilogram, ppm).

5.3 Sample Observations

The results of the laboratory testing indicated that BTEX and GRO were below the detection limits for all samples. DRO was detected in 5 of the 6 soil samples tested but below the NCDEQ action level of 100 ppm. The highest DRO reading was 4.2 ppm in Sample S-1 (1.0-1.5 feet), Boring B20-2.

6.0 CONCLUSIONS

6.1 Interpretation of Results

The results of the PSA for Parcel 20 of NCDOT Project B-4491 do not indicate the presence of abandoned USTs or petroleum hydrocarbon soil contamination within the proposed construction easement on Parcel 20.

6.2 Geophysics

The geophysical data do not indicate the presence of abandoned USTs.

6.3 Soil

The results of the PID field screening readings and off-site UVF hydrocarbon analyses do not indicate the presence of contaminated soil at or above the NCDEQ action levels within the proposed construction easement on Parcel 20 (Figure 7).

7.0 RECOMMENDATIONS

No limitations on construction activities or special handling of excavated soil are recommended for Parcel 20.

8.0 LIMITATIONS

ESP's professional services have been performed, findings obtained, and recommendations prepared in accordance with customary principles and practices in the fields of environmental science and engineering. ESP is not responsible for the independent conclusions, opinions, or recommendations made by others based on the data presented in this report.

The passage of time may result in a change in the environmental characteristics at this site and surrounding properties. ESP does not warrant against future operations or conditions, or against operations or conditions present of a type or at a location not investigated. ESP does not assume responsibility for other environmental issues that may be associated with the subject site.

TABLES

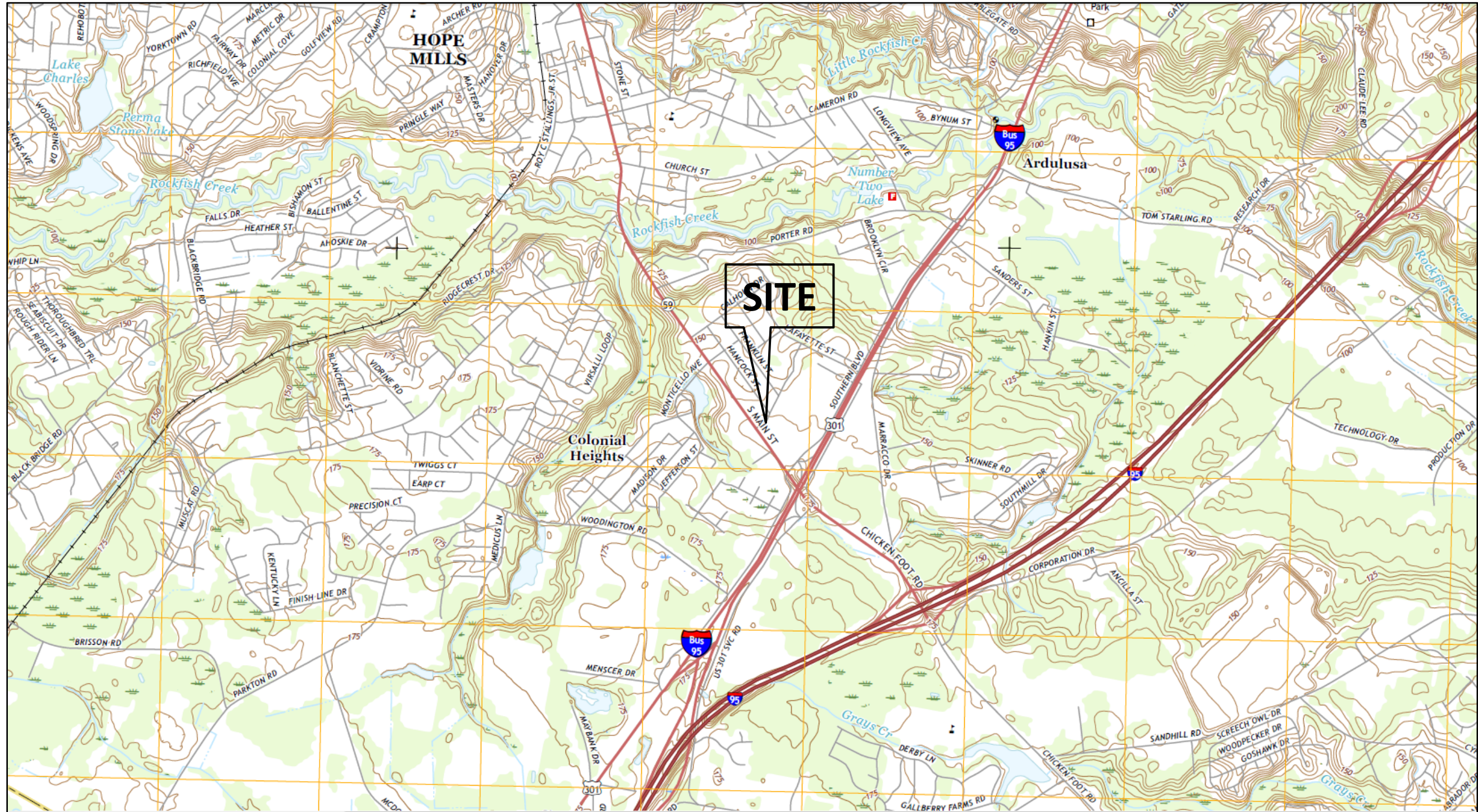
TABLE 1
SOIL SAMPLE PID READINGS

Boring	Sample Depth Range with PID > 10 ppm (feet bgs)	Maximum PID Reading (ppm) and Sample Depth (feet bgs)
B20-1	none	3.2 (5.0-5.5)
B20-2	1.0-1.5 (Sample S-1)	15.6 (1.0-1.5)
B20-3	none	2.7 (1.0-1.5)
B20-4	none	3.7 (7.0-7.5)

TABLE 2
SOIL SAMPLE UVF RESULTS SUMMARY

Boring	Sample ID (depth in feet bgs)	Date Collected	BTEX (C6-C9) (mg/kg)	GRO (C5-C10) (mg/kg)	DRO (C10-C35) (mg/kg)	PAHs (mg/kg)
B20-1	S-7 (7.0-7.5)	10/19/17	<0.68	<0.68	0.68	<0.22
B20-2	S-1 (1.0-1.5)	10/19/17	<0.65	<0.65	4.2	<0.21
	S-2 (2.0-2.5)	10/19/17	<0.63	<0.63	1.2	<0.20
	S-7 (7.0-7.5)	10/19/17	<0.7	<0.7	<0.7	<0.22
B20-3	S-7 (7.0-7.5)	10/19/17	<0.7	<0.7	0.7	<0.22
B20-4	S-7 (7.0-7.5)	10/19/17	<0.69	<0.69	0.69	<0.22

FIGURES



From: USGS US Topo 7.5 - minute map for HOPE MILLS, NC Date: 2016, Scale: 1:24,000

PROJECT NO.	CS34.358
SCALE	AS SHOWN
DATE	11/2/17
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**FIGURE 1 – PARCEL 20
SITE VICINITY MAP**

**B-4491, REPLACE BRIDGE 22 OVER I-95B/US 301 ON NC 59
CUMBERLAND COUNTY, NORTH CAROLINA**



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Suite E
Greensboro, NC 27409

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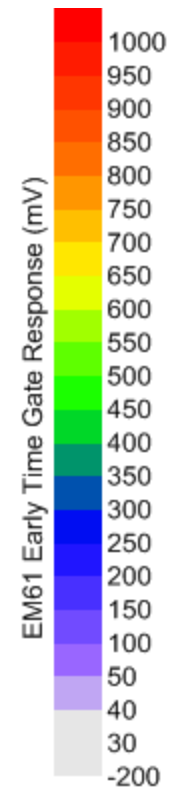
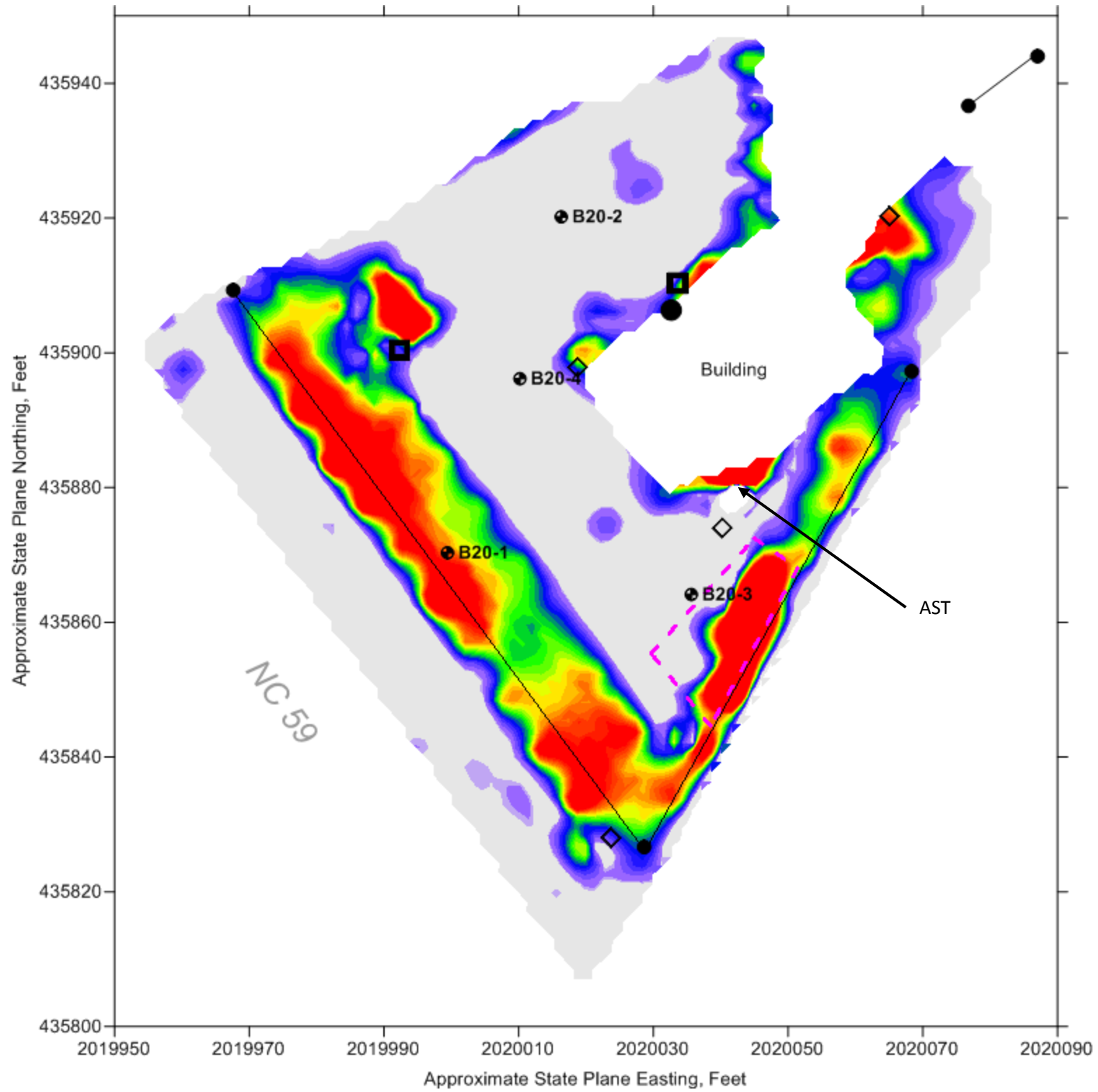


a. Photo from southeast side of site looking northwest.



b. Photo from west side of site looking east.

PROJECT NO. CS34.358	FIGURE 2 – PARCEL 20 SITE PHOTOGRAPHS	 7011 Albert Pick Rd., Suite E Greensboro, NC 27409 336.334.7724 www.espassociates.com
SCALE AS SHOWN		
DATE 11/2/17	B-4491, REPLACE BRIDGE 22 OVER I-95B/US 301 ON NC 59 CUMBERLAND COUNTY, NORTH CAROLINA	
BY DMN		



EXPLANATION	
	Utility feature (water meter, hydrant, etc.)
	Fence and fencepost
	Miscellaneous metal objects on ground surface
	Sign pole, other pole
	Approximate location of buried utility lines marked by others
	Soil boring location
	EM61 data collection areas
	GPR data collection area

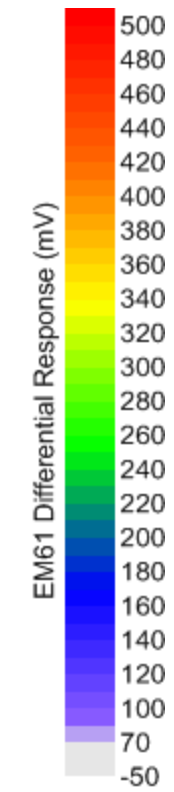
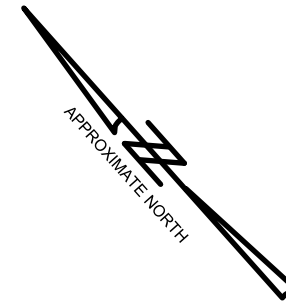
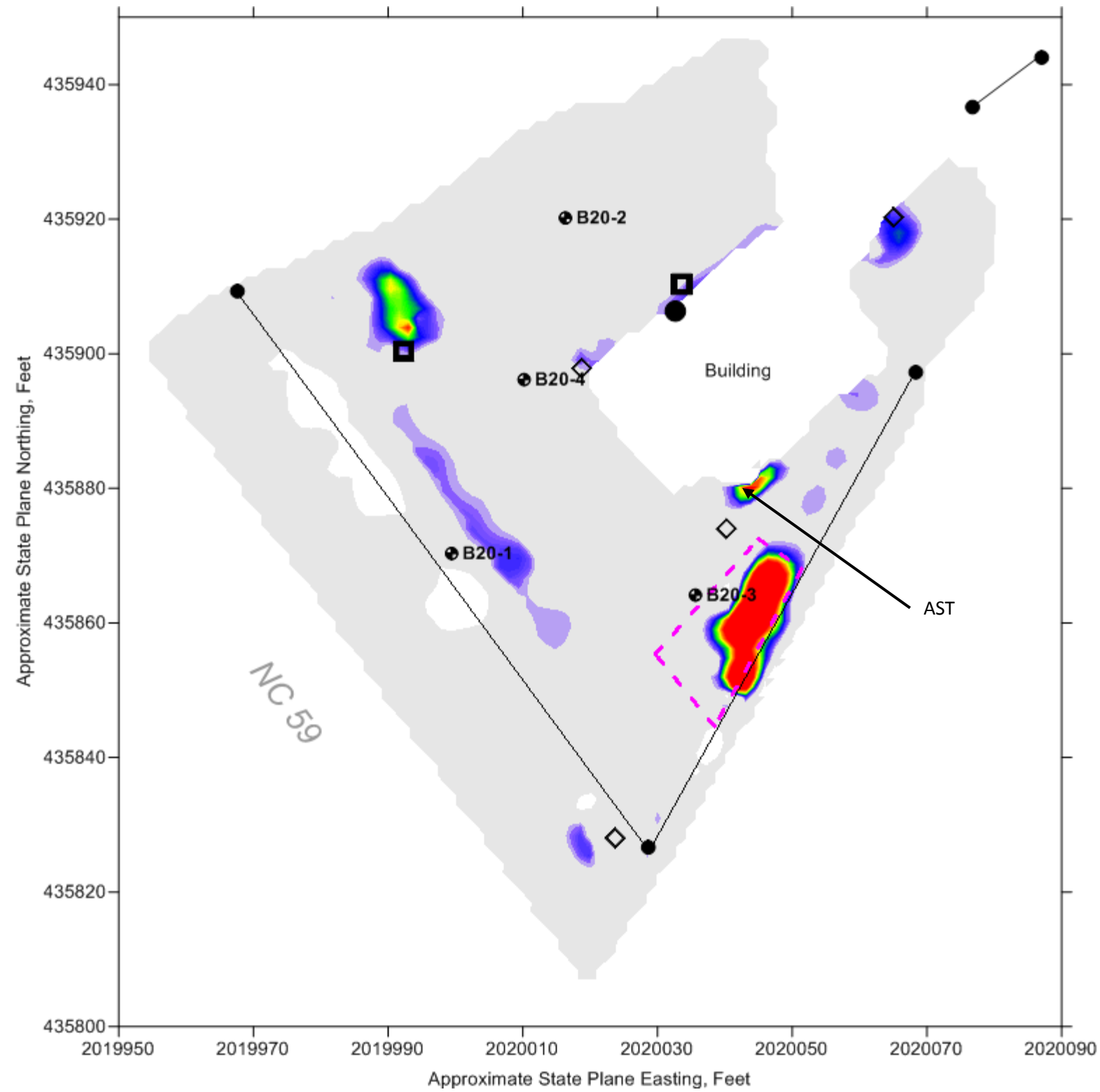
Note: Locations of data and features are approximate and were collected using a sub-meter DGPS instrument. ESP makes no guarantees as to the accuracy of these locations. Coordinates on the axes of the maps are approximate and provided for general reference only.

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FIGURE 3 – PARCEL 20
EM61 EARLY TIME GATE RESPONSE
B-4491, REPLACE BRIDGE 22 OVER I-95B/US 301 ON NC 59
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EXPLANATION	
	Utility feature (water meter, hydrant, etc.)
	Fence and fencepost
	Miscellaneous metal objects on ground surface
	Sign pole, other pole
	Approximate location of buried utility lines marked by others
	Soil boring location
	EM61 data collection areas
	GPR data collection area

Note: Locations of data and features are approximate and were collected using a sub-meter DGPS instrument. ESP makes no guarantees as to the accuracy of these locations. Coordinates on the axes of the maps are approximate and provided for general reference only.

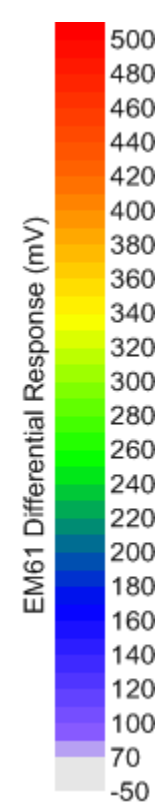
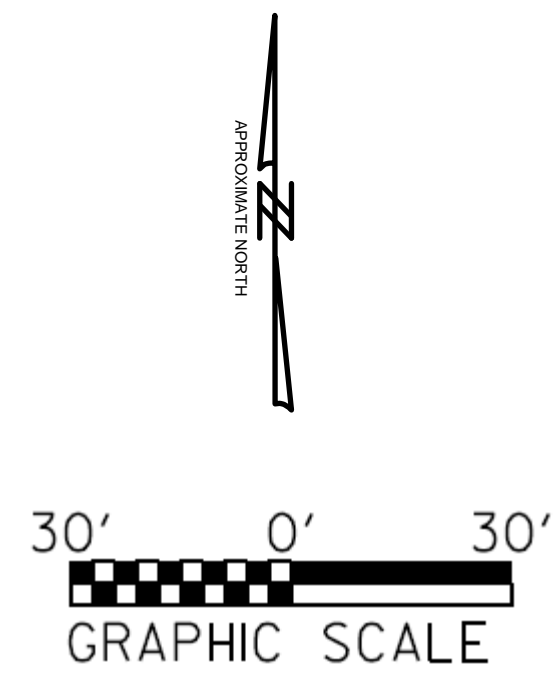
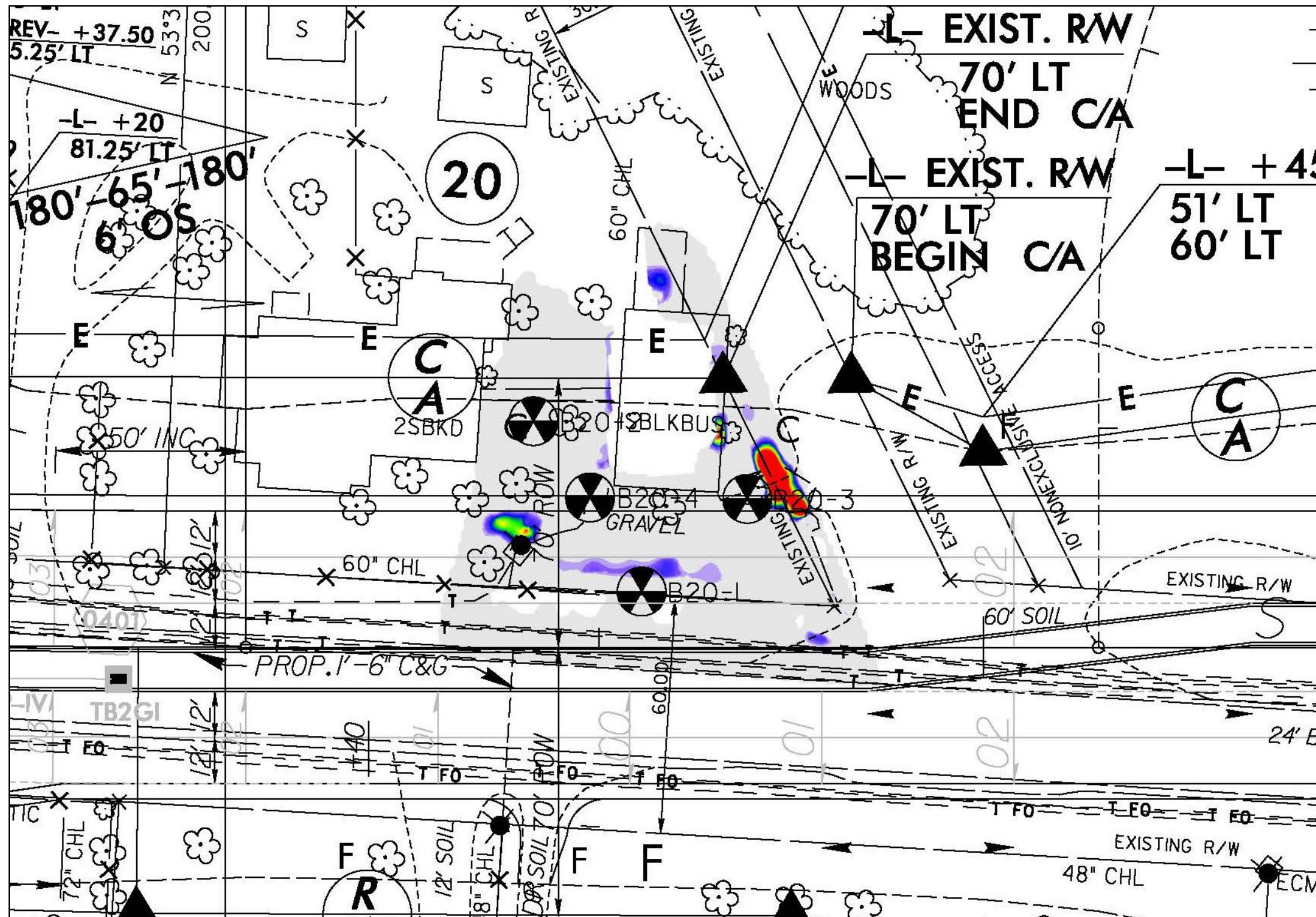
PROJECT NO.	CS34.358
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FIGURE 4- PARCEL 20 EM61 DIFFERENTIAL RESPONSE
B-4491, REPLACE BRIDGE 22 OVER I-95B/US 301 ON NC 59 CUMBERLAND COUNTY, NORTH CAROLINA



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List of NCDOT reference files

- ☑ b4491_ESP_Geo_Erv.dgn
- ☑ b4491_rdy_aln.dgn
- ☑ FS_D_...FinalSurvey\b4491_ncdot_fs.dgn
- ☑ b4491_rdy_dsn.dgn
- ☑ B-4491_Geo_env.dgn
- ☑ b4491_rdy_psh04.dgn
- ☑ b4491_rdy_row.dgn
- ☑ b4491_rdy_ss.dgn
- ☑ B-4491_Hyd_DRN.dgn

See Figure 8 for explanation of symbols and line types

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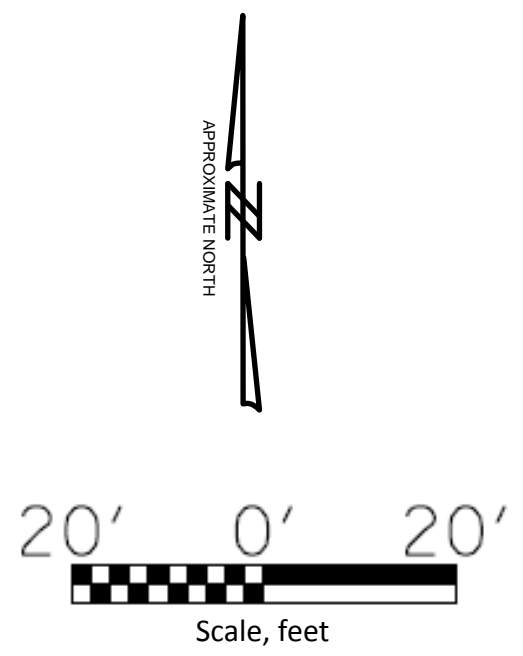
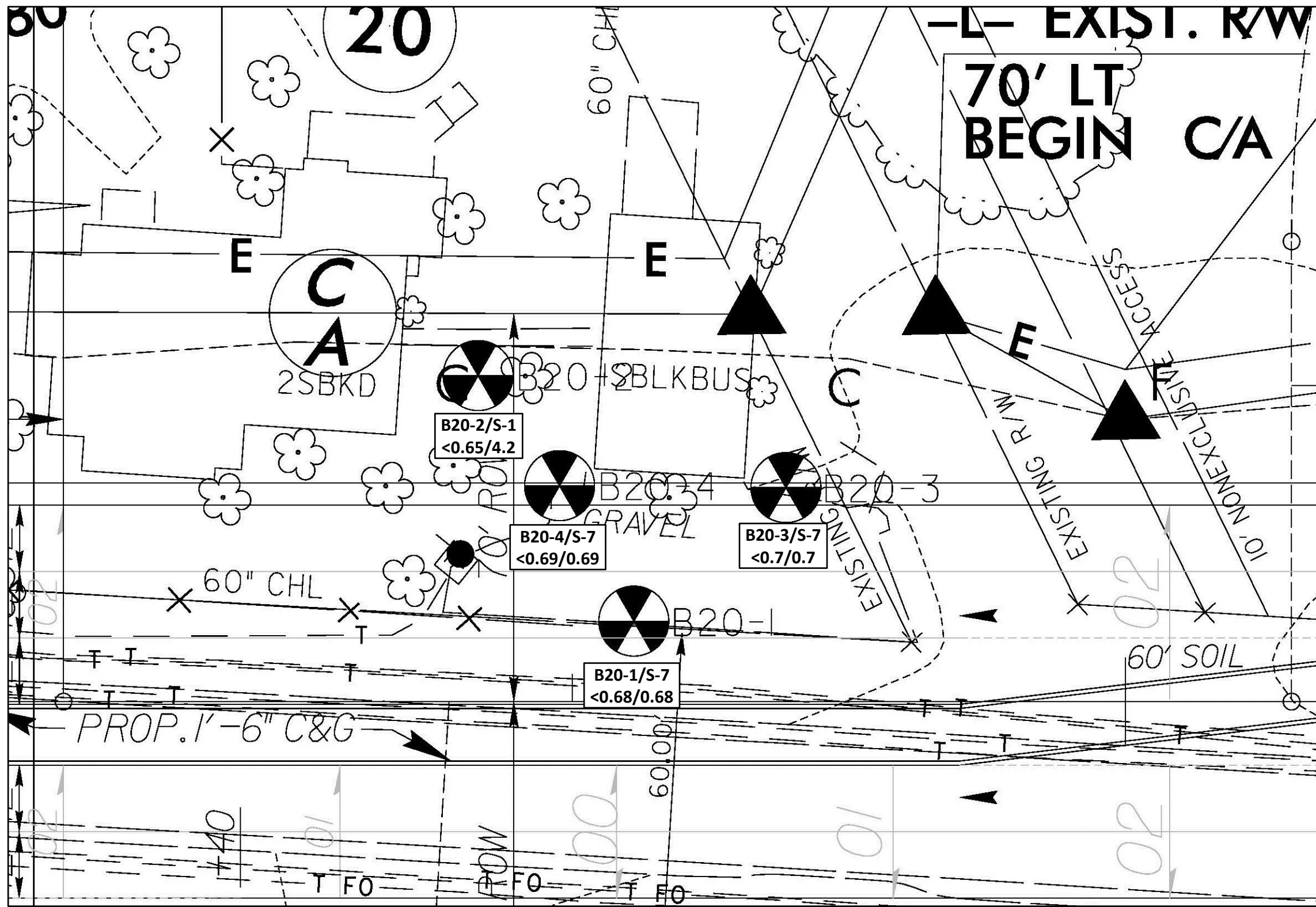
FIGURE 6- PARCEL 20
EM61 DIFFERENTIAL RESPONSE ON PLAN SHEET
B-4491, REPLACE BRIDGE 22 OVER I-95B/US 301 ON NC 59
CUMBERLAND COUNTY, NORTH CAROLINA



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Explanation	
<div style="border: 1px solid black; padding: 2px; display: inline-block;"> B20-1/S-7 <0.68/0.68 </div>	Maximum Analytical Results per Boring Boring No./Sample No. GRO/DRO (mg/kg, ppm)

List of NCDOT reference files

- b4491_ESP_Geo_Erv.dgn
- b4491_rdy_aln.dgn
- FS_D_...FinalSurvey\b4491_ncdot_fs.dgn
- b4491_rdy_dsn.dgn
- B-4491_Geo_env.dgn
- b4491_rdy_psh04.dgn
- b4491_rdy_row.dgn
- b4491_rdy_ss.dgn
- B-4491_Hyd_DRN.dgn

See Figure 8 for explanation of symbols and line types

PROJECT NO.	CS34.358
SCALE	1" = 20'
DATE	11/2/17
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FIGURE 7 – PARCEL 20
SOIL ANALYTICAL RESULTS ON PLAN SHEET

B-4491, REPLACE BRIDGE 22 OVER I-95B/US 301 ON NC 59
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STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS CONVENTIONAL PLAN SHEET SYMBOLS

*Note: Not to Scale *S.U.E. = Subsurface Utility Engineering*

BOUNDARIES AND PROPERTY:

State Line	—————
County Line	—————
Township Line	—————
City Line	—————
Reservation Line	—————
Property Line	—————
Existing Iron Pin	○
Property Corner	⊠
Property Monument	⊠
Parcel/Sequence Number	⊕
Existing Fence Line	—x—x—
Proposed Woven Wire Fence	—•—•—
Proposed Chain Link Fence	—□—□—
Proposed Barbed Wire Fence	—◇—◇—
Existing Wetland Boundary	—w—w—
Proposed Wetland Boundary	—w—w—
Existing Endangered Animal Boundary	—a—
Existing Endangered Plant Boundary	—p—
Existing Historic Property Boundary	—h—
Known Contamination Area: Soil	—X—X—
Potential Contamination Area: Soil	—X—X—
Known Contamination Area: Water	—W—W—
Potential Contamination Area: Water	—W—W—
Contaminated Site: Known or Potential	—X—X—

BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or U/G Tank Cap	○
Sign	⊕
Well	⊕
Small Mine	⊕
Foundation	⊠
Area Outline	⊠
Cemetery	⊠
Building	⊠
School	⊠
Church	⊠
Dam	⊠

HYDROLOGY:

Stream or Body of Water	—————
Hydro, Pool or Reservoir	—————
Jurisdictional Stream	—JS—
Buffer Zone 1	—BZ 1—
Buffer Zone 2	—BZ 2—
Flow Arrow	—————
Disappearing Stream	—————
Spring	⊕
Wetland	—w—w—
Proposed Lateral, Tail, Head Ditch	—————
False Sump	⊕

RAILROADS:

Standard Gauge	—————
RR Signal Milepost	⊕
Switch	⊕
RR Abandoned	—————
RR Dismantled	—————

RIGHT OF WAY:

Baseline Control Point	⊕
Existing Right of Way Marker	⊕
Existing Right of Way Line	—————
Proposed Right of Way Line	—————
Proposed Right of Way Line with Iron Pin and Cap Marker	⊕
Proposed Right of Way Line with Concrete or Granite RW Marker	⊕
Proposed Control of Access Line with Concrete CA Marker	⊕
Existing Control of Access	⊕
Proposed Control of Access	⊕
Existing Easement Line	—E—
Proposed Temporary Construction Easement	—E—
Proposed Temporary Drainage Easement	—TDE—
Proposed Permanent Drainage Easement	—PDE—
Proposed Permanent Drainage / Utility Easement	—DUE—
Proposed Permanent Utility Easement	—PUE—
Proposed Temporary Utility Easement	—TUE—
Proposed Aerial Utility Easement	—AUE—
Proposed Permanent Easement with Iron Pin and Cap Marker	⊕

ROADS AND RELATED FEATURES:

Existing Edge of Pavement	—————
Existing Curb	—————
Proposed Slope Stakes Cut	—————
Proposed Slope Stakes Fill	—————
Proposed Curb Ramp	⊕
Existing Metal Guardrail	—————
Proposed Guardrail	—————
Existing Cable Guiderail	—————
Proposed Cable Guiderail	—————
Equality Symbol	⊕
Pavement Removal	—————

VEGETATION:

Single Tree	⊕
Single Shrub	⊕
Hedge	—————
Woods Line	—————

Orchard	⊕
Vineyard	⊕

EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	—————
Bridge Wing Wall, Head Wall and End Wall	—————
MINOR:	
Head and End Wall	—————
Pipe Culvert	—————
Footbridge	—————
Drainage Box: Catch Basin, DI or JB	⊕
Paved Ditch Gutter	—————
Storm Sewer Manhole	⊕
Storm Sewer	—————

UTILITIES:

POWER:	
Existing Power Pole	⊕
Proposed Power Pole	⊕
Existing Joint Use Pole	⊕
Proposed Joint Use Pole	⊕
Power Manhole	⊕
Power Line Tower	⊕
Power Transformer	⊕
U/G Power Cable Hand Hole	⊕
H-Frame Pole	⊕
U/G Power Line LOS B (S.U.E.*)	—————
U/G Power Line LOS C (S.U.E.*)	—————
U/G Power Line LOS D (S.U.E.*)	—————

TELEPHONE:

Existing Telephone Pole	⊕
Proposed Telephone Pole	⊕
Telephone Manhole	⊕
Telephone Pedestal	⊕
Telephone Cell Tower	⊕
U/G Telephone Cable Hand Hole	⊕
U/G Telephone Cable LOS B (S.U.E.*)	—————
U/G Telephone Cable LOS C (S.U.E.*)	—————
U/G Telephone Cable LOS D (S.U.E.*)	—————
U/G Telephone Conduit LOS B (S.U.E.*)	—————
U/G Telephone Conduit LOS C (S.U.E.*)	—————
U/G Telephone Conduit LOS D (S.U.E.*)	—————
U/G Fiber Optics Cable LOS B (S.U.E.*)	—————
U/G Fiber Optics Cable LOS C (S.U.E.*)	—————
U/G Fiber Optics Cable LOS D (S.U.E.*)	—————

WATER:

Water Manhole	⊕
Water Meter	⊕
Water Valve	⊕
Water Hydrant	⊕
U/G Water Line LOS B (S.U.E.*)	—————
U/G Water Line LOS C (S.U.E.*)	—————
U/G Water Line LOS D (S.U.E.*)	—————
Above Ground Water Line	—————

TV:

TV Pedestal	⊕
TV Tower	⊕
U/G TV Cable Hand Hole	⊕
U/G TV Cable LOS B (S.U.E.*)	—————
U/G TV Cable LOS C (S.U.E.*)	—————
U/G TV Cable LOS D (S.U.E.*)	—————
U/G Fiber Optic Cable LOS B (S.U.E.*)	—————
U/G Fiber Optic Cable LOS C (S.U.E.*)	—————
U/G Fiber Optic Cable LOS D (S.U.E.*)	—————

GAS:

Gas Valve	⊕
Gas Meter	⊕
U/G Gas Line LOS B (S.U.E.*)	—————
U/G Gas Line LOS C (S.U.E.*)	—————
U/G Gas Line LOS D (S.U.E.*)	—————
Above Ground Gas Line	—————

SANITARY SEWER:

Sanitary Sewer Manhole	⊕
Sanitary Sewer Cleanout	⊕
U/G Sanitary Sewer Line	—————
Above Ground Sanitary Sewer	—————
SS Forced Main Line LOS B (S.U.E.*)	—————
SS Forced Main Line LOS C (S.U.E.*)	—————
SS Forced Main Line LOS D (S.U.E.*)	—————

MISCELLANEOUS:

Utility Pole	⊕
Utility Pole with Base	⊕
Utility Located Object	⊕
Utility Traffic Signal Box	⊕
Utility Unknown U/G Line LOS B (S.U.E.*)	—————
U/G Tank; Water, Gas, Oil	⊕
Underground Storage Tank, Approx. Loc.	⊕
A/G Tank; Water, Gas, Oil	⊕
Geoenvironmental Boring	⊕
U/G Test Hole LOS A (S.U.E.*)	⊕
Abandoned According to Utility Records	AATUR
End of Information	E.O.I.

PROJECT NO.	CS34.358
SCALE	N/A
DATE	11/2/17
BY	DMN

FIGURE 8
LEGEND FOR PLAN SHEET FIGURES
B-4491, REPLACE BRIDGE 22 OVER I-95B/US 301 ON NC 59
CUMBERLAND COUNTY, NORTH CAROLINA



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APPENDIX A
SOIL BORING LOGS



FIELD BORING LOG

BORING NO.

B20-1

PROJECT NAME: NCDOT B-4491 PSA PROJ. NO.: CS34.358

LOCATION: Front of building near fence

TYPE OF BORING: Direct Push DATE STARTED: 10/19/17 SHEET: 1 of 1

DRILLING FIRM: SAEDACCO DATE FINISHED: 10/19/17 TOTAL DEPTH: 10.0 ft

DRILLER: Michael Wilson SAMPLE METHOD: 5' Macro Core DEPTH TO GW: N/A ft

DRILL RIG: Geoprobe 7822 DT LOGGED BY: D. Nance COMMENT: _____

DEPTH (ft)	SAMPLE NO.	SAMPLE DEPTH (ft)	PID READING (ppm)	FIELD CLASSIFICATION AND PHYSICAL DESCRIPTION	REMARKS
				0.0-0.3 Topsoil	Core 1 Rec 2.5'/5.0'
1	S-1	1.0-1.5	0.7	0.3-7.5 Tan to white silty sand	
2	S-2	2.0-2.5	0.5		
3	S-3	N/A	N/A	No Recovery	
4	S-4	N/A	N/A	No Recovery	Core 2 Rec 2.5'/5.0'
5	S-5	5.0-5.5	3.2		
6	S-6	6.0-6.5	1.8		
7	S-7	7.0-7.5	1.5		
8	S-8	N/A	N/A	No Recovery	
9	S-9	N/A	N/A	No Recovery	
10					
11					
12					
13					
14					
15					



FIELD BORING LOG

BORING NO.

PROJECT NAME: NCDOT B-4491 PSA PROJ. NO.: CS34.358
 LOCATION: Between buildings
 TYPE OF BORING: Direct Push DATE STARTED: 10/19/17
 DRILLING FIRM: SAEDACCO DATE FINISHED: 10/19/17
 DRILLER: Michael Wilson SAMPLE METHOD: 5' Macro Core
 DRILL RIG: Geoprobe 7822 DT LOGGED BY: D. Nance

B20-2SHEET: 1 of 1TOTAL DEPTH: 10.0 ftDEPTH TO GW: N/A ft

COMMENT: _____

DEPTH (ft)	SAMPLE NO.	SAMPLE DEPTH (ft)	PID READING (ppm)	FIELD CLASSIFICATION AND PHYSICAL DESCRIPTION	REMARKS
				0.0-0.5 Asphalt	Core 1 Rec 2.5'/5.0'
1	S-1	1.0-1.5	15.6	0.5-8.0 Tan to white silty sand	
2	S-2	2.0-2.5	2.4		
3	S-3	N/A	N/A	No Recovery	
4	S-4	N/A	N/A	No Recovery	Core 2 Rec 3.0'/5.0'
5	S-5	5.0-5.5	3.2		
6	S-6	6.0-6.5	2.7		
7	S-7	7.0-7.5	1.6		
8	S-8	N/A	N/A	No Recovery	
9	S-9	N/A	N/A	No Recovery	
10					
11					
12					
13					
14					
15					



FIELD BORING LOG

BORING NO.

B20-3

PROJECT NAME: NCDOT B-4491 PSA PROJ. NO.: CS34.358

LOCATION: SE side of building near fence

TYPE OF BORING: Direct Push DATE STARTED: 10/19/17 SHEET: 1 of 1

DRILLING FIRM: SAEDACCO DATE FINISHED: 10/19/17 TOTAL DEPTH: 10.0 ft

DRILLER: Michael Wilson SAMPLE METHOD: 5' Macro Core DEPTH TO GW: N/A ft

DRILL RIG: Geoprobe 7822 DT LOGGED BY: D. Nance COMMENT: _____

DEPTH (ft)	SAMPLE NO.	SAMPLE DEPTH (ft)	PID READING (ppm)	FIELD CLASSIFICATION AND PHYSICAL DESCRIPTION	REMARKS
				0.0-0.5 Topsoil	Core 1 Rec 2.0'/5.0'
1	S-1	1.0-1.5	2.7	0.5-8.0 Tan to white silty sand	
2	S-2	N/A	N/A		
3	S-3	N/A	N/A	No Recovery	
4	S-4	N/A	N/A	No Recovery	Core 2 Rec 3.0'/5.0'
5	S-5	5.0-5.5	2.0		
6	S-6	6.0-6.5	1.6		
7	S-7	7.0-7.5	1.7		
8	S-8	N/A	N/A	No Recovery	
9	S-9	N/A	N/A	No Recovery	
10					
11					
12					
13					
14					
15					



FIELD BORING LOG

BORING NO.

PROJECT NAME: NCDOT B-4491 PSA PROJ. NO.: CS34.358
 LOCATION: West corner of building
 TYPE OF BORING: Direct Push DATE STARTED: 10/19/17
 DRILLING FIRM: SAEDACCO DATE FINISHED: 10/19/17
 DRILLER: Michael Wilson SAMPLE METHOD: 5' Macro Core
 DRILL RIG: Geoprobe 7822 DT LOGGED BY: D. Nance

B20-4SHEET: 1 of 1

TOTAL DEPTH: 10.0 ft
 DEPTH TO GW: N/A ft
 COMMENT: _____

DEPTH (ft)	SAMPLE NO.	SAMPLE DEPTH (ft)	PID READING (ppm)	FIELD CLASSIFICATION AND PHYSICAL DESCRIPTION	REMARKS
				0.0-0.6 Topsoil	Core 1 Rec 3.5/5.0'
1	S-1	1.0-1.5	2.7	0.6-8.0 Tan to white silty sand	
2	S-2	2.0-2.5	1.7		
3	S-3	3.0-3.5	2.6		
4	S-4	N/A	N/A	No Recovery	Core 2 Rec 3.0/5.0'
5	S-5	5.0-5.5	3.0		
6	S-6	6.0-6.5	2.1		
7	S-7	7.0-7.5	3.7		
8	S-8	N/A	N/A	No Recovery	
9	S-9	N/A	N/A	No Recovery	
10					
11					
12					
13					
14					
15					

APPENDIX B

REDLAB LABORATORY TESTING REPORT



Hydrocarbon Analysis Results

Client: ESP ASSOCIATES PA
Address: 7011 ALBERT PICK ROAD SUITE E
 GREENSBORO NC

Samples taken Thursday, October 19, 2017
Samples extracted Thursday, October 19, 2017
Samples analysed Tuesday, October 24, 2017

Contact: NED BILLINGTON
 COLLECTED BY D. NANCE

Operator NICK HENDRIX

Project: B-4491

U00902

Matrix	Sample ID	Dilution used	BTEX (C6 - C9)	GRO (C5 - C10)	DRO (C10 - C35)	TPH (C5 - C35)	Total Aromatics (C10-C35)	16 EPA PAHs	BaP	% Ratios			HC Fingerprint Match
										C5 - C10	C10 - C18	C18	
s	B20-1 S-7	27.4	<0.68	<0.68	0.68	0.68	0.52	<0.22	<0.027	0	28.7	71.3	Residual HC,(BO),(P)
s	B20-2 S-1	26.0	<0.65	<0.65	4.2	4.2	3.5	<0.21	<0.026	0	68.3	31.7	V.Deg.PHC 71.9%,(FCM),(BO),(P)
s	B20-2 S-2	25.0	<0.63	<0.63	1.2	1.2	0.84	<0.2	<0.025	0	56.7	43.3	V.Deg.PHC 75.1%,(FCM)
s	B20-2 S-7	28.0	<0.7	<0.7	<0.7	<0.7	<0.14	<0.22	<0.028	0	0	0	Residual HC,(BO),(P)
s	B20-3 S-7	28.0	<0.7	<0.7	0.7	0.7	0.5	<0.22	<0.028	0	63.3	36.7	Residual HC,(BO),(P)
s	B20-4 S-7	27.7	<0.69	<0.69	0.69	0.69	0.48	<0.22	<0.028	0	0	100	Residual HC,(BO),(P)
s	B27-1 S-8	26.5	<0.66	<0.66	0.66	0.66	0.44	<0.21	<0.027	0	74.6	25.4	Residual HC,(BO),(P)
s	B27-2 S-8	26.0	<0.65	<0.65	<0.65	<0.65	<0.13	<0.21	<0.026	0	0	0	PHC not detected
s	B27-3 S-7	26.8	<0.67	<0.67	0.67	0.67	0.34	<0.21	<0.027	0	72.6	27.4	Residual HC,(BO),(P)

Initial Calibrator QC check **OK**

Final FCM QC Check **OK**

99.2 %

Concentration values in mg/kg for soil samples and mg/L for water samples. Soil values uncorrected for moisture or stone content. Fingerprints provide a tentative hydrocarbon identification.

Abbreviations :- FCM = Results calculated using Fundamental Calibration Mode : % = confidence of hydrocarbon identification : (PFM) = Poor Fingerprint Match : (T) = Turbid : (P) = Particulate detected

B = Blank Drift : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : (OCR) = Outside cal range : (M) = Modified Result.

% Ratios estimated aromatic carbon number proportions : HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only. **Data generated by HC-1 Analyser**

APPENDIX C
CHAIN-OF-CUSTODY FORM

Barb 60

Client Name: **ESP Associates PA**
 Address: **7011 Albert Park Rd. Ste E Greensboro, NC 27409**
 Contact: **Ned Billington**
 Project Ref.: **B-4491**
 Email: **Abillington@espassociates.com**
 Phone #: **336-420-5452**
 Collected by: **D. Nance**



RED Lab, LLC
 5598 Marvin K Moss Lane
 MARBIONC Bldg, Suite 2003
 Wilmington, NC 28409

Each sample will be analyzed for
 BTEX, GRO, DRO, TPH, PAH total
 aromatics and Bap

Sample Collection Date/Time	TAT Requested		Initials	Sample ID	Total Wt.	Tare Wt.	Sample Wt.
	24 Hour	48 Hour					
10/19/17		✓	DMN	B20-1 5-7	53.9	44.4	9.5
			DMN	B20-2 5-1	54.1	44.1	10.0
			DMN	B20-2 5-2	55.0	44.6	10.4
			DMN	B20-2 5-7	53.6	44.3	9.3
			DMN	B20-3 5-7	54.1	44.8	9.3
			DMN	B20-4 5-7	53.8	44.4	9.4
			DMN	B22-1 5-8	54.3	44.5	9.8
			DMN	B22-2 5-8	54.5	44.5	10.0
10/19/17		✓	DMN	B27-3 5-7	54.0	44.3	9.7

RED Lab USE ONLY



Comments:

Relinquished by **Dillon Nance** Date/Time **10/23/17**

Relinquished by _____ Date/Time _____

Accepted by **AN** Date/Time **10/24/17 12:30**

Accepted by _____ Date/Time _____