Revised Preliminary Site Assessment Report

Parcel 75
US 17 North of NC 171 to Multi-lanes South of Williamston
9336 U.S. Highway 17 North
Beaufort County, North Carolina
WBS Number 35494.1.1
TIP Number R-2511
NCDOT Parcel No. 75
Beaufort County PIN 5770-08-2586

Prepared for

North Carolina Department of Transportation
Geotechnical Engineering Unit
GeoEnvironmental Section
Raleigh, North Carolina

Prepared by

Duncklee & Dunham, P.C.
Cary, North Carolina

June 14, 2019

DUNCKLEE
& DUNHAM

ENVIRONMENTAL GEOLOGISTS & ENGINEERS
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VIA EMAIL TO: dgli@ncdot.gov

June 14, 2019

Mr. Dennis Li, L.G., PhD
North Carolina Department of Transportation
Geotechnical Engineering Unit
GeoEnvironmental Section
1589 Mail Service Center
Raleigh, North Carolina 27699-1589

Reference: **Revised Preliminary Site Assessment Report**
Parcel 75
US 17 North of NC 171 to Multi-lanes South of Williamston
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Beaufort County, North Carolina
TIP Number R-2511
WBS Number 35494.1.1
NCDOT Parcel No. 75
Beaufort County PIN 5770-08-2586

Dear Mr. Li:

Duncklee & Dunham, P.C. (Duncklee & Dunham) is pleased to submit this *Revised Preliminary Site Assessment Report* for the referenced site. The objective of our services was to assist the North Carolina Department of Transportation (NCDOT) – Geotechnical Engineering Unit with identifying potential environmental concerns within the rights-of-way and/or easements of the above-referenced parcel. This work is consistent with the NCDOT's Request for Technical and Cost Proposal dated March 5, 2019 and our *Revised Technical and Cost Proposal for Preliminary Site Assessment* dated May 14, 2019. Based on the findings from this work, Duncklee & Dunham does not have technical evidence to support the need for further assessment at the site.

Please contact Rick Kolb at rkolb@dunckleedunham.com or (919) 858-9898, ext. 111 if you have any questions or require additional information.

Sincerely,

Duncklee & Dunham, P.C.

Alec N. Dziwanowski, G.I.T.
Staff Geologist II

DocuSigned by:
Richard A. Kolb
CC6C13E2086445F...

Richard A. Kolb, L.G. 6/20/2019
Senior Geologist
North Carolina License No. 1153

NORTH CAROLINA LICENSED SEAL 1153 GEOLOGIST RICHARD ALAN KOLB

Senior Peer Review

Andrew M. Rodak, P.E.
Senior Engineer/Director of Engineering
North Carolina No. 24576

Attachment: Revised Preliminary Site Assessment Report

p:\ncdot-geoenv\201939 - beaufort and martin counties phase ii\reports\report #2 - parcel 75\text\psa, parcel 75, r-2511 - 19267.docx

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June 14, 2019

1 Introduction

Duncklee & Dunham, P.C. (Duncklee & Dunham) conducted a Preliminary Site Assessment (PSA) of the referenced site located on the eastern side of U.S. Highway 17 (US 17) north of Washington in Beaufort County, North Carolina (Figures 1 and 2). The North Carolina Department of Transportation (NCDOT) plans to widen the two-lane portion of US 17 between Washington and Williamston, North Carolina. Our work is consistent with the NCDOT's *Request for Technical and Cost Proposal* dated March 5, 2019 and our *Revised Technical and Cost Proposal* dated May 14, 2019. The objective of this work was to assist the NCDOT – Geotechnical Engineering Unit with identifying potential environmental concerns within the rights-of-way and/or easements of the above-referenced site.

NCDOT*'s Request for Technical and Cost Proposal* shows the parcel is located at 8824 US 17 North; however, the Beaufort County GIS website shows the parcel is located at 9336 US 17 North. Our services included a geophysical survey to identify subsurface metallic features such as underground storage tank (UST) systems, and the advancement of six soil borings to test for the presence of contaminants in the areas where the new roadway will be constructed, along rights-of-way for NCDOT and at new utility easements.

2 History

The NCDOT prepared a Hazardous Materials Report dated November 14, 2011 that identified the site as a former grocery store and gasoline station, now converted to a small-engine repair shop. NCDOT reviewed the list of registered USTs compiled by the North Carolina Department of Environment and Natural Resources (NCDENR, now the North Carolina Department of Environmental Quality – NCDEQ) and discovered that three USTs were reportedly closed by removal on the northern side of the building in 1990.

3 Methods

Duncklee & Dunham called NC811 on March 26, 2019 and requested utilities to be marked in the areas of investigation. NC811 notified the Beaufort County Water Department, USIC Locating Services, CenturyLink, MCNC, Piedmont Natural Gas, Suddenlink Communications, and the City of Washington. The clearance was valid through April 16, 2019.

Duncklee & Dunham reviewed regulatory records on NCDEQ's Laserfiche website and did not find records for this parcel. Duncklee & Dunham interviewed Edward Hughes, owner of the property, and he stated that the USTs were formerly used to store gasoline. He was not aware of when the tanks were installed. During site reconnaissance, Duncklee & Dunham observed two vent pipes that extended up the northeastern corner of the building on the site.

3.1 Geophysics

ESP Associates (ESP), under contract to Duncklee & Dunham, conducted a geophysical survey at the site on April 1, 3, and 5, 2019. ESP used a Geonics EM61 MK2® metal detector with a DGPS instrument to locate buried metal objects, and then used a Sensors and Software Noggin® GPR instrument with a 250 MHz antenna to image selected anomalies. ESP traced underground lines using a Fisher Gemini-®3 conduction tool.

3.2 Soil Borings

Troxler Geologic Services, Inc. (Troxler), under contract to Duncklee & Dunham, used a Geoprobe® equipped with direct-push technology to advance six soil borings, nos. B-16 through B-21 (Photograph No. 1, Appendix A) on April 9, 2019. The locations of these borings are shown on Figure 2. Troxler advanced borings B-16, -17, -20, and -21 along an underground line on the northern side of the building that extends from the two vent pipes to the driveway (Photograph No. 2), B-19 along another underground line along the western side of the building (Photograph No. 3), and B-18 within the estimated former location of the UST pit identified by ESP (Photograph No. 4). Soil borings B-17 and B-21 were also advanced within the estimated former location of the UST pit. Troxler advanced B-16 and B-21 to a depth of 8 feet below land surface (bls) and the remaining borings to a depth of 4 feet bls. We encountered the water table at a depth of approximately 3 feet bls.

Duncklee & Dunham used a Trimble Geo 7x® handheld data collector to determine the location of each boring. Approximate Northings, Eastings, and elevations above sea level for these borings are in Table 1. Duncklee & Dunham contacted Tiffany Puett, Support Specialist with Duncan-Parnell, to inquire about the difference in elevation between B-16 and the other borings advanced on the site. Ms. Puett stated that this elevation difference is due to a reduction in vertical accuracy caused by tree cover that was present above B-16 and by the building that was adjacent to the south of the boring.

Troxler collected soil samples in new acetate sleeves, each 4 feet long. A majority of the soil samples were comprised of light to dark brown, silty, sandy clay and light brown and gray, silty clay with sand. Boring logs are provided in Appendix B. Duncklee & Dunham collected representative samples of native material at selected intervals in each soil boring and stored the samples in twin Ziploc® bags. After allowing one of the bags to sit untouched in the sun and the other in the shade for approximately 15 minutes, we used a photoionization detector (PID) to screen the headspace in each bag left in the sun for volatile organic compounds (VOCs). We recorded the soil-screening results in the field log. The soil samples collected were not stained and did not exhibit petroleum odors.

4 Results

4.1 Geophysics

ESP's *Geophysical Survey* report dated May 9, 2019 is in Appendix C. ESP identified one probable propane UST with a visible fill port on the southern side of the building. ESP used ground penetrating radar to confirm the location of this UST. ESP used a conduction tool to locate the underground line beneath the asphalt driveway west of the building that extended from the vent pipes attached to the northeastern corner of the building. ESP used electromagnetic conductive tracing to identify the former location of the UST pit near the northwestern corner of the building. ESP did not identify anomalies indicative of abandoned USTs or buried metal drums.

4.2 Soil Borings

Table 2 summarizes the screening results. The PID readings of the soil samples collected from the six soil borings ranged from 0.0 to 2.5 parts per million, indicative of background concentrations. Because the soil samples did not evoke an anomalous response on the PID, we did not submit a soil sample to a laboratory for testing, and we did not construct a temporary monitoring well on the site.

5 Conclusions

5.1 Geophysics

ESP identified the former location of the UST pit near the northwestern corner of the building, and the underground vent pipe along the northern side of the building. ESP did not identify anomalies indicative of abandoned USTs or buried metal drums.

5.2 Soil Sampling

The soil samples did not evoke an anomalous response on the PID and we did not observe petroleum odors or stains in the soil borings. Therefore, we do not expect the soil on the site contains petroleum constituent concentrations that exceed the action levels established by NCDEQ.

6 Recommendations

Duncklee & Dunham does not have technical evidence to support the need for further assessment at the site.

Tables

Table 1
Coordinates of Soil Borings
Parcel 75
Beaufort County, North Carolina
TIP No. R-2511; WBS No. 35494.1.1

Boring Identification	Northing (feet)	Easting (feet)	Elevation (feet asl)
B-16	708679.886	2570260.165	53.634
B-17	708689.311	2570241.213	40.818
B-18	708694.330	2570233.411	40.359
B-19	708679.372	2570232.885	41.235
B-20	708686.848	2570206.456	43.661
B-21	708686.296	2570236.368	41.052

Notes:

Coordinate system NAD83 NC State Plane - Survey Feet

GPS data collected using a Trimble Geo 7x handheld data collector

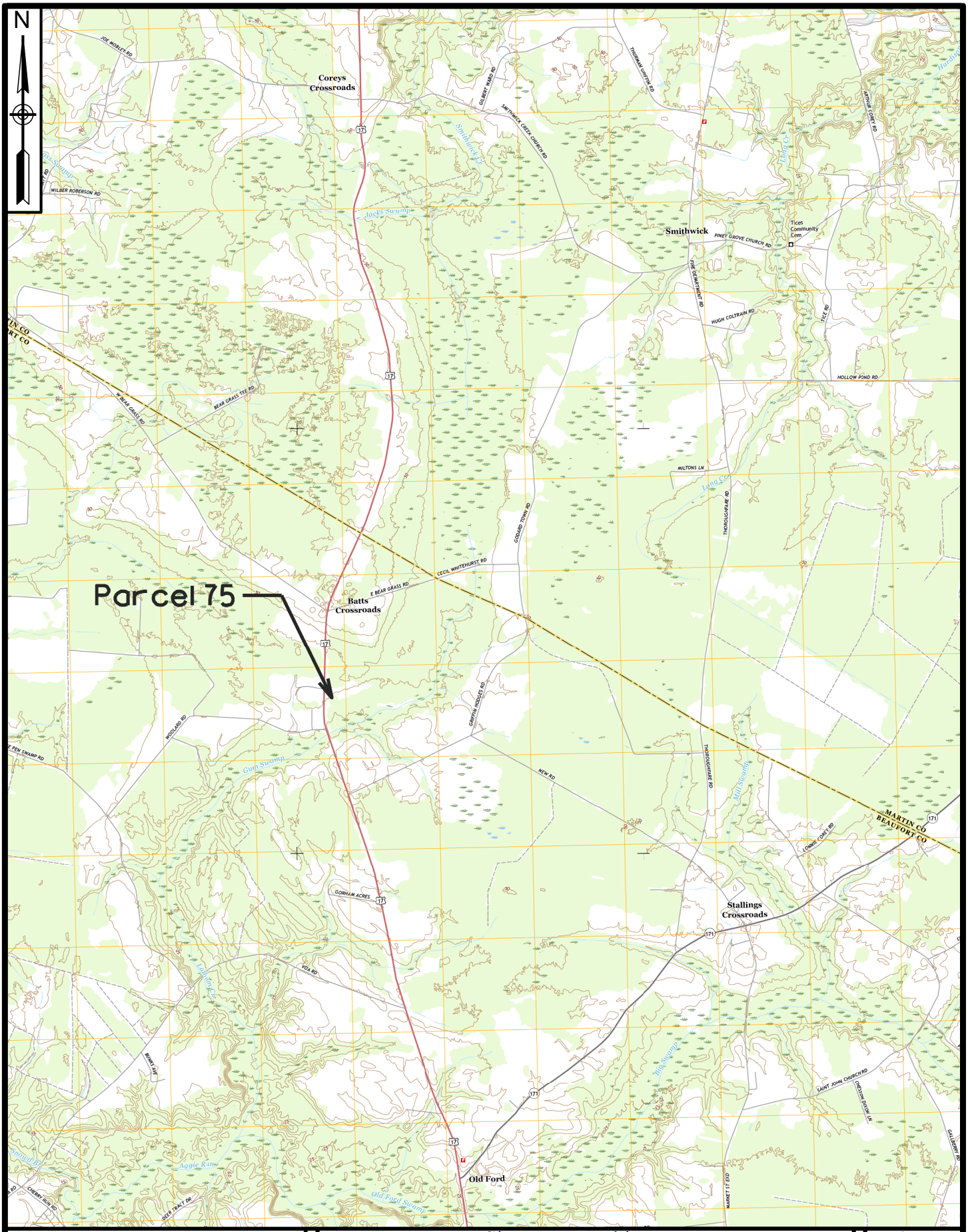
GPS data are approximate

Table 2
Summary of Soil Screening Results
Parcel 75
Beaufort County, North Carolina
TIP Number R-2511; WBS No. 35494.1.1

Soil Screening Results		
Boring Identification	**Depth (feet bls)**	**PID Reading (ppm)**
B-16	1	0.2
	2	0.1
B-17	1.5	0.2
	2	0
B-18	1	2.5
	2	0.1
B-19	1.25	0.0
	2	0.1
B-20	1	0.2
	2	0.1
B-21	1	0.1
	2	0.1

Notes:
PID data collected on April 9, 2019
bls - Feet below land surface
ppm - Parts per million
PID - Photoionization detector

Figures



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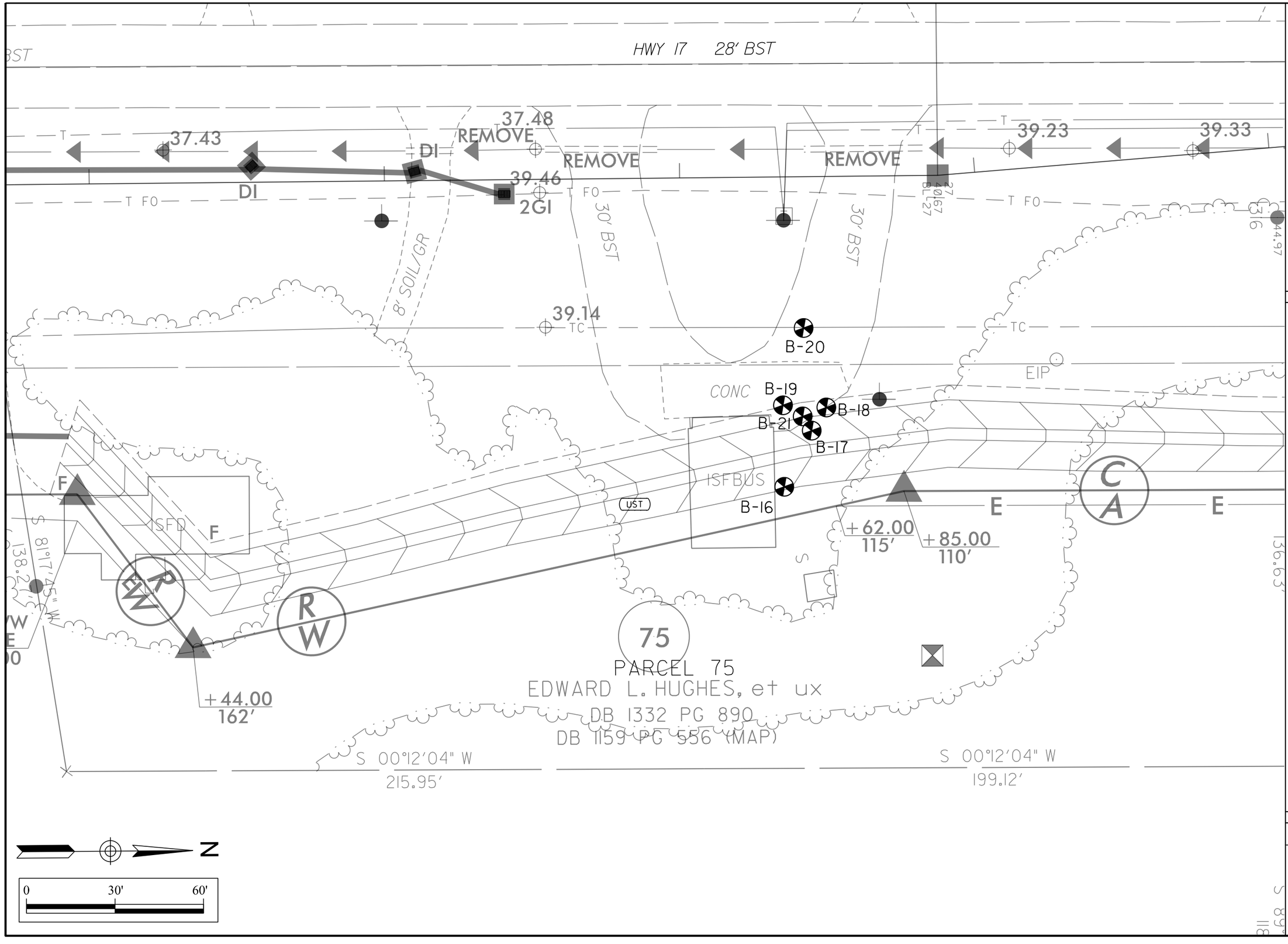
Site Topographic Map

NCDOT Parcel 75
Beaufort County, North Carolina

Figure 1

Drawn By:	Checked By:	Project Number:	Date:	References:
SBM	EDB	R-2511	4/30/2019	USGS US TOPO 7.5 Minute Old Fort Quadrangle

Scale: (Original)	Size:	Layers:	Filename:
1" = 24,000'	8.5" x 11"	N/A	R:\Projects (H)\HO40.300 (Duncklee and Dunham R-2511 NCDOT Geophysics)\CADD\CADD\R2511_Geo_TopoMap_75



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Site Map

NCDOT Parcel 75
9336 US 17 N Washington, Beaufort County, NC 27899

References:
R2511_NCDOT_FS.dgn
R2511_TbyI_DRN.dgn

Drawn By: SBM	Checked By: EDB	Project Number: R-2511	Date: 5/1/19
Scale: 1" = 30'	Size: 11" x 17"	Layers: N/A	Filename: R:\Projects\59 (H)\H040.300 (Duncklee and Dunham R-2511 NCDOT Geophysics)\CAD\JR2511_Geo_SiteMap_75

Figure

2

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 — EIP
Computed Property Corner
Property Monument — ECM
Parcel/Sequence Number — 123
Existing Fence Line
Proposed Woven Wire Fence
Proposed Chain Link Fence
Proposed Barbed Wire Fence
Existing Wetland Boundary — WLB
Proposed Wetland Boundary — WLB
Existing Endangered Animal Boundary — EAB
Existing Endangered Plant Boundary — EPB
Existing Historic Property Boundary — HPB
Known Contamination Area: Soil — S
Potential Contamination Area: Soil — S
Known Contamination Area: Water — W
Potential Contamination Area: Water — W
Contaminated Site: Known or Potential

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
Proposed Lateral, Tail, Head Ditch — FLOW
False Sump

RAILROADS:

Standard Gauge — CSX TRANSPORTATION
RR Signal Milepost — MILEPOST 35
Switch — SWITCH
RR Abandoned
RR Dismantled

RIGHT OF WAY & PROJECT CONTROL:

Secondary Horiz and Vert Control Point
Primary Horiz Control Point
Primary Horiz and Vert Control Point
Exist Permanent Easment Pin and Cap
New Permanent Easement Pin and Cap
Vertical Benchmark
Existing Right of Way Marker
Existing Right of Way Line
New Right of Way Line
New Right of Way Line with Pin and Cap
New Right of Way Line with Concrete or Granite R/W Marker
New Control of Access Line with Concrete C/A Marker
Existing Control of Access
New Control of Access
Existing Easement Line — E
New Temporary Construction Easement — E
New Temporary Drainage Easement — TDE
New Permanent Drainage Easement — PDE
New Permanent Drainage / Utility Easement — DUE
New Permanent Utility Easement — PUE
New Temporary Utility Easement — TUE
New Aerial Utility Easement — AUE

ROADS AND RELATED FEATURES:

Existing Edge of Pavement
Existing Curb
Proposed Slope Stakes Cut — C
Proposed Slope Stakes Fill — F
Proposed Curb Ramp — CR
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 — Vineyard

EXISTING STRUCTURES:

MAJOR:
Bridge, Tunnel or Box Culvert — CONC
Bridge Wing Wall, Head Wall and End Wall — CONC WW

MINOR:
Head and End Wall — CONC HW
Pipe Culvert
Footbridge
Drainage Box: Catch Basin, DI or JB — CB
Paved Ditch Gutter
Storm Sewer Manhole — S
Storm Sewer — S

UTILITIES:

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

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

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

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

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

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

MISCELLANEOUS:
Utility Pole
Utility Pole with Base
Utility Located Object
Utility Traffic Signal Box — S
Utility Unknown U/G Line LOS B (S.U.E.*) — PUTL
U/G Tank; Water, Gas, Oil
Underground Storage Tank, Approx. Loc. — UST
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.

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NC Geo. License No. C-261

Legend for Plan Sheet Figures
NCDOT Parcel 75
Beaufort County, North Carolina

References: NCDOT PLAN SHEET SYMBOLOGY, Microstation Cell, 12/2/2016

Date: 5/3/2019
Filename: R:\Projects\59 (H)\H340.300 (Duncklee and Dunham R-2511 NCDOT Geophysics)\CADD\R2511_Geo_Legend_75
Project Number: R-2511
Layers: N/A
Checked By: EDB
Size: 11" x 17"
Drawn By: SBM
Scale: N/A

Figure

3

Appendix A

PHOTOGRAPHIC LOG

DUNCKLEE & DUNHAM
ENVIRONMENTAL GEOLOGISTS & ENGINEERS

Client Name:	Site Location:	Project No.
NCDOT-GeoEnvironmental	R-2511 Parcel 75; Beaufort County, North Carolina	201939

Photo No.	Date:
1	4/9/19

Direction of Photo:

South

Description:

Soil boring B-16, which was advanced using a Geoprobe®.

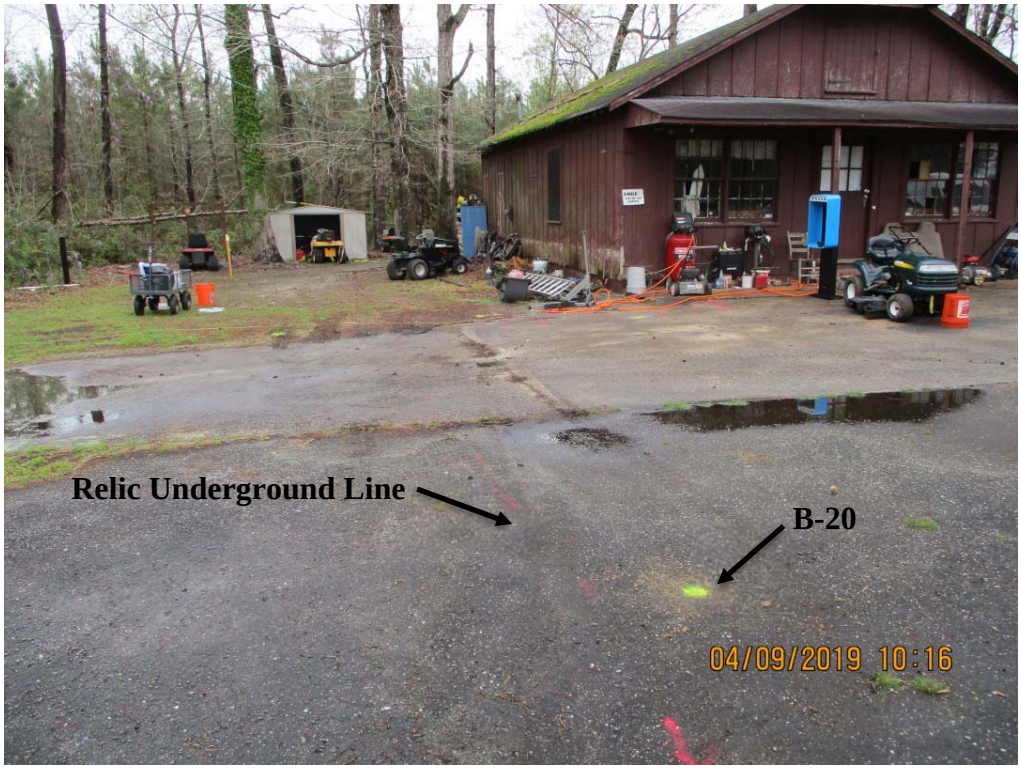
Photo No.	Date:
2	4/9/19

Direction of Photo:

East

Description:

Soil boring B-20 was advanced near the relic underground line along the northern side of the building.



PHOTOGRAPHIC LOG

DUNCKLEE & DUNHAM
ENVIRONMENTAL GEOLOGISTS & ENGINEERS

Client Name:	Site Location:	Project No.
NCDOT-GeoEnvironmental	R-2511 Parcel 75; Beaufort County, North Carolina	201939

Photo No.	Date:
3	4/9/19

Direction of Photo:

Northeast

Description:

Soil boring B-19 near the relic underground line along the western side of the building.

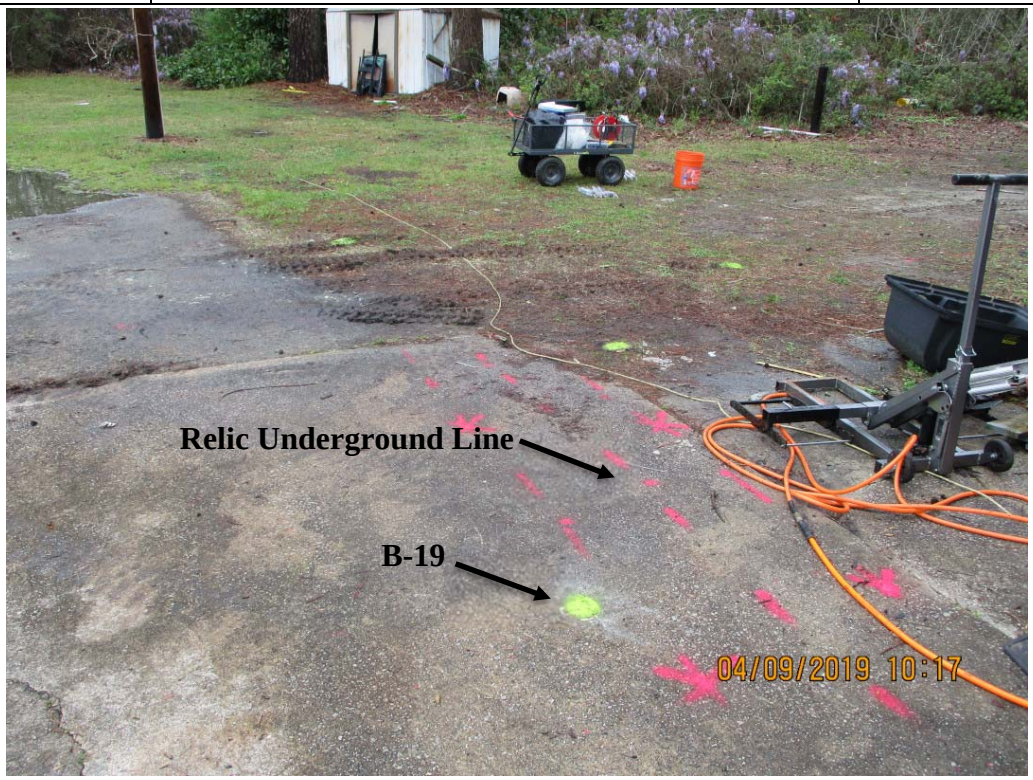


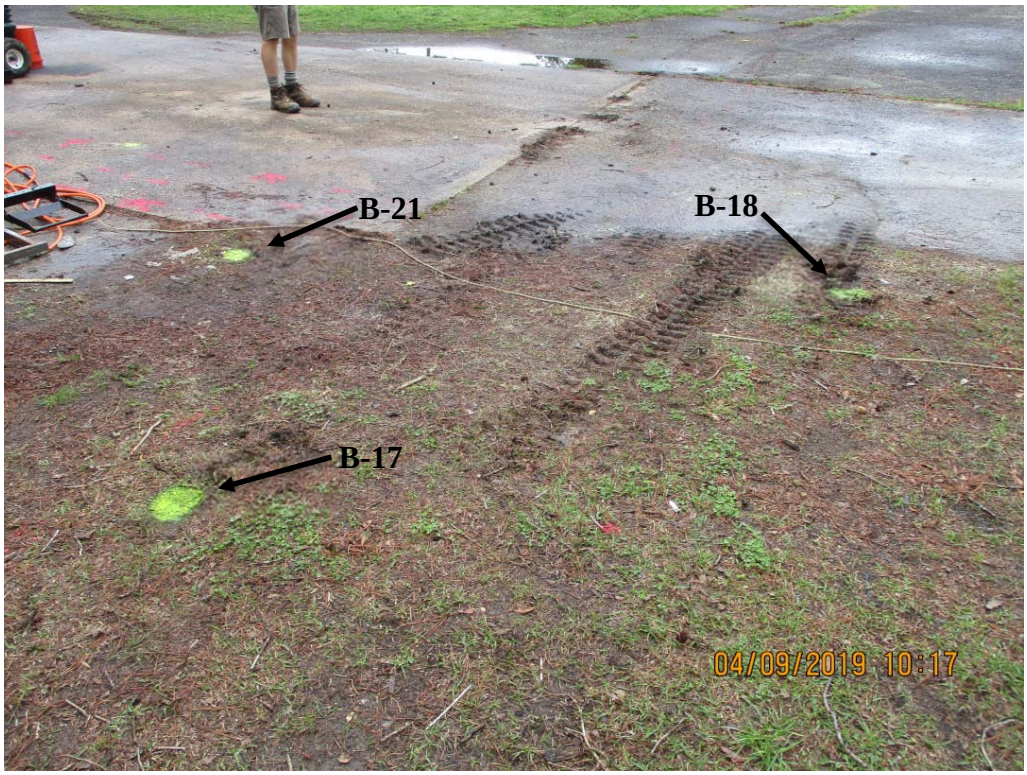
Photo No.	Date:
4	4/9/19

Direction of Photo:

West

Description:

Soil borings B-17, -18, and -21 were advanced along the estimated location of the former UST pit.



Appendix B

Boring/Well Construction Log

DUNCKLEE & DUNHAM

I. D. Number	B-16	**Purpose**	Soil boring
Project Name	Beaufort & Martin Co. - Site 7	**Contractor**	Troxler Geologic
Project No.	201939	**Registration No.**	2511
Geologist	Alec Dziwanowski	**Driller**	Ben Troxler
Start Date	4/9/19 **Complete Date** 4/9/19	**Equipment**	Geoprobe

Drilling Method direct-push

Comments WT at 3' bls
Petroleum odors/stains not observed

Well Construction Information	Depth From - To (ft.)	Lithology	FID / PID (ppm) @ Depth (ft.)	Petroleum odor?
Borehole Diameter	0-2	light to dark brown, silty, sandy CLAY	0.2 @ 1'	no
Riser Type	2-6	light brown w/ gray, silty CLAY w/ sand	0.1 @ 2'	no
Diameter	6-8	light gray, silty SAND	NA	no
Screen Type				
Diameter				
Riser Interval				
Screen Interval				
Slot Size				
Grout Type				
Interval				
Bentonite Type				
Interval				
Filter Pack				
Interval				
Total Depth				
R.P. Elevation				
Datum				

Water Level Information

Date	W.L. Below R.P.

R.P. = Reference Point *W.L. = Water Level* *TBM = Temporary Benchmark* *MSL = Mean Sea Level*

Boring/Well Construction Log

DUNCKLEE & DUNHAM

I. D. Number	B-17	**Purpose**	Soil boring
Project Name	Beaufort & Martin Co. - Site 7	**Contractor**	Troxler Geologic
Project No.	201939	**Registration No.**	2511
Geologist	Alec Dziwanowski	**Driller**	Ben Troxler
Start Date	4/9/19 **Complete Date** 4/9/19	**Equipment**	Geoprobe

Drilling Method direct-push

Comments WT at 2.75' bls
Petroleum odors/stains not observed

Well Construction Information	Depth From - To (ft.)	Lithology	FID / PID (ppm) @ Depth (ft.)	Petroleum odor?
Borehole Diameter	0-0.5	light brown sand w/ silt NA	0.2 @ 1.5'	no
Riser Type	0.5-2	light to dark brown, silty, sandy, CLAY	↓	no
Diameter	2-4	light brown with gray, silty CLAY w/ sand	0.0 @ 2'	no
Screen Type				
Diameter				
Riser Interval				
Screen Interval				
Slot Size				
Grout Type				
Interval				
Bentonite Type				
Interval				
Filter Pack				
Interval				
Total Depth				
R.P. Elevation				
Datum				

Water Level Information

Date	W.L. Below R.P.

R.P. = Reference Point *W.L. = Water Level* *TBM = Temporary Benchmark* *MSL = Mean Sea Level*

Boring/Well Construction Log

DUNCKLEE & DUNHAM

I. D. Number	B-18	**Purpose**	Soil boring
Project Name	Beaufort & Martin Co. - Site 7	**Contractor**	Troxler Geologic
Project No.	201939	**Registration No.**	2511
Geologist	Alec Dziwanowski	**Driller**	Ben Troxler
Start Date	4/9/19 **Complete Date** 4/9/19	**Equipment**	Geoprobe

Drilling Method direct-push

Comments WT at 2.75' bls
Petroleum odors/stains not observed
Sample collected at 1048 @ 1'

Well Construction Information	Depth From - To (ft.)	Lithology	FID / PID (ppm) @ Depth (ft.)	Petroleum odor?
Borehole Diameter	0-2	~~Light tt~~ dark brown silty, sandy, CLAY	2.5 @ 1'	no
Riser Type	2-4	light brown w/ gray, silty CLAY w/ sand	0.1 @ 2'	no
Diameter				
Screen Type				
Diameter				
Riser Interval				
Screen Interval				
Slot Size				
Grout Type				
Interval				
Bentonite Type				
Interval				
Filter Pack				
Interval				
Total Depth				
R.P. Elevation				
Datum				

Water Level Information

Date	W.L. Below R.P.

R.P. = Reference Point *W.L. = Water Level* *TBM = Temporary Benchmark* *MSL = Mean Sea Level*

Boring/Well Construction Log

DUNCKLEE & DUNHAM

I. D. Number	B-19	**Purpose**	Soil Boring
Project Name	Beaufort & Martin Co. - Site 7	**Contractor**	Troxler Geologic
Project No.	20939	**Registration No.**	2511
Geologist	Alec Dziwanowski	**Driller**	Ben Troxler
Start Date	4/9/19 **Complete Date** 4/9/19	**Equipment**	Geoprobe

Drilling Method direct-push

Comments WT at 2.75' bls
petroleum odors/stains not observed

Well Construction Information	Depth From - To (ft.)	Lithology	FID / PID (ppm) @ Depth (ft.)	Petroleum ~~odor?~~
Borehole Diameter	0-0.5	concrete and debris	NA	no
Riser Type	0.5 - 2	dark brown, silty, sandy CLAY	0.0 @ 1.25'	no
Diameter	2 - 4	light brown w/ gray, silty CLAY w/ sand	0.1 @ 2'	no
Screen Type				
Diameter				
Riser Interval				
Screen Interval				
Slot Size				
Grout Type				
Interval				
Bentonite Type				
Interval				
Filter Pack				
Interval				
Total Depth				
R.P. Elevation				
Datum				

Water Level Information

Date	W.L. Below R.P.

R.P. = Reference Point *W.L. = Water Level* *TBM = Temporary Benchmark* *MSL = Mean Sea Level*

Boring/Well Construction Log

DUNCKLEE & DUNHAM

I. D. Number	B-20	**Purpose**	Soil Boring
Project Name	Beaufort & Martin Co. - Site 7	**Contractor**	Troxler Geologic
Project No.	201939	**Registration No.**	2511
Geologist	Alec Dziwanowski	**Driller**	Ben Troxler
Start Date	4/9/19 **Complete Date** 4/9/19	**Equipment**	Geoprobe

Drilling Method direct-push

Comments WT at 3' bls
petroleum odor/stains not observed

Well Construction Information	Depth From - To (ft.)	Lithology	FID / PID (ppm) @ Depth (ft.)	Petroleum odor?
Borehole Diameter	0 - 0.5	asphalt debris	NA	no
Riser Type	0.5 - 2	dark brown, silty, sandy CLAY	0.2 @ 1'	no
Diameter	2 - 4	light brown/gray, silty CLAY w/ sand	0.1 @ 2'	no
Screen Type				
Diameter				
Riser Interval				
Screen Interval				
Slot Size				
Grout Type				
Interval				
Bentonite Type				
Interval				
Filter Pack				
Interval				
Total Depth				
R.P. Elevation				
Datum				

Water Level Information

Date	W.L. Below R.P.

R.P. = Reference Point *W.L. = Water Level* *TBM = Temporary Benchmark* *MSL = Mean Sea Level*

Boring/Well Construction Log

DUNCKLEE & DUNHAM

I. D. Number	B-21	**Purpose**	Soil boring
Project Name	Beaufort & Martin Co. - Site 7	**Contractor**	Troxler Geologic
Project No.	201939	**Registration No.**	2511
Geologist	Alec Dziwanowski	**Driller**	Ben Troxler
Start Date	4/9/19 **Complete Date** 4/9/19	**Equipment**	Geoprobe

Drilling Method direct-push

Comments WT at 2.75' bls
petroleum odor/stains not observed

Well Construction Information	Depth From - To (ft.)	Lithology	FID / PID (ppm) @ Depth (ft.)	Petroleum odor?
Borehole Diameter	0 - 0.5	concrete debris	NA	no
Riser Type	0.5 - 2	dark brown, silty, sandy CLAY	0.1 @ 1'	no
Diameter	2 - 6	light brown/gray, silty CLAY w/ sand	0.1 @ 2'	no
Screen Type	6 - 8	light gray, silty SAND	NA	no
Diameter				
Riser Interval				
Screen Interval				
Slot Size				
Grout Type				
Interval				
Bentonite Type				
Interval				
Filter Pack				
Interval				
Total Depth				
R.P. Elevation				
Datum				

Water Level Information

Date	W.L. Below R.P.

R.P. = Reference Point *W.L. = Water Level* *TBM = Temporary Benchmark* *MSL = Mean Sea Level*

Appendix C

May 9, 2019

Richard A. Kolb, L.G.
Duncklee & Dunham, P.C.
511 Keisler Drive, Suite 102
Cary, North Carolina 27518

Reference: **REPORT ON GEOPHYSICAL SERVICES FOR PARCEL 75, Durwood K Wynne Sr.**
8824 US 17 North, Washington, North Carolina
ESP Project No. HO40.300

TIP Number: R-2511
WBS Number: 35494.1.1
County: Beaufort and Martin
Description: US 17 North of NC 171 to Multi-lanes South of Williamston in Beaufort and Martin Counties

Dear Mr. Kolb:

ESP Associates, Inc. (ESP) is pleased to present this report to Duncklee & Dunham, P.C. (Duncklee & Dunham) on the geophysical services we provided for the referenced project. This work was performed under our subcontractor agreement dated January 28, 2019, as authorized by the Work Authorization dated March 26, 2019, and in accordance with our cost proposal to you dated March 13, 2019. The purpose of the work was to help identify possible underground storage tanks (USTs).

1.0 GEOPHYSICAL DATA COLLECTION

On April 1, 3 and 5, 2019, ESP performed geophysical studies at Parcel 75, located on the east side of US 17, north of Washington, North Carolina. Geophysical data were collected separately around the shop and around the residence. The work consisted of metal detection using a Geonics EM61 MK2 instrument, obtaining the approximate locations of relevant site features using a DGPS instrument, collecting ground-penetrating radar (GPR) data over selected EM61 anomalies, and tracing a buried product line with a Fisher Gemini-3 conduction tool.

The limits of the study areas were based on NCDOT field staking and on the NCDOT MicroStation file provided by Duncklee & Dunham, and extended from the edge of the current roadway to the proposed right-of-way (ROW)/easement. Representative photographs of the geophysical study areas are provided on Figure 1.

The EM61 data were collected over the accessible areas of the study areas using a line spacing of approximately 3 feet. We used a Hemisphere XF101 differential GPS instrument (DGPS) connected to an Archer field computer to provide approximate locations of the EM61 data in real time. The DGPS instrument was also used to obtain the approximate location of site features that could affect the EM61 readings.

We compared the location of the EM61 responses to the location of site features and noted several anomalies that did not correspond to known features. We collected GPR data in four areas using a Sensors and Software Noggin GPR system with a 250 MHz antenna.

2.0 DATA ANALYSIS AND PRESENTATION

The EM61 data were gridded and contoured in Surfer to produce plan view contour maps of the early time gate response (Figure 2, Figure 4) and the differential response (Figure 3, Figure 5). The differential response is calculated by subtracting the response of the bottom coil from the response of the top coil of the EM61. Typically, the differential response diminishes the response from smaller, near-surface metallic objects, thus emphasizing the response from deeper and larger metallic objects, such as USTs. The DGPS locations of observed site features were superimposed on the EM61 contour maps so that anomalies caused by site features such as metal objects on the ground surface could be recognized. The Figures 2 through 5 show the EM61 data and the site features that we observed and mapped in the field with DGPS; these figures do not necessarily show all existing site features.

The GPR data collected over the EM61 anomalies were reviewed in the field. The GPR data collected at the shop indicated a probable propane UST on the south side of the shop that appears to be approximately 3 feet diameter by 7 feet long and buried one foot deep (Figure 6). The GPR data did not indicate the presence of abandoned USTs in the others areas around the shop.

The EM61 anomalies in the data collected around the residence appeared to be caused by the presence of various vehicles and other metallic features. No GPR data was collected around the residence.

The EM61 early time gate response and differential response were exported from Surfer as geo-referenced images and attached to the NCDOT plan sheet in MicroStation (Figures 7 through 10). The legend for the NCDOT line types and symbols is shown on Figure 11.

4.0 SUMMARY AND CONCLUSIONS

Our review of the geophysical data collected for this project indicates the presence of one probable propane UST on the south side of the shop with a visible metal fill port and cover. This UST is approximately 350 gallons in size. Based on the location of the vent pipe at the northeast corner of the shop building and the results of our EM conductive tracing, the UST(s) at the shop appear to have been located near the northwest corner of the building.

5.0 LIMITATIONS

These services have been provided to Duncklee & Dunham in accordance with generally accepted guidelines for performing geophysical surveys. It is recognized that the results of geophysical surveys are non-unique and subject to interpretation. Further, the locations of data and features included in this report are approximate and were collected using a DGPS instrument. ESP makes no guarantee as to the accuracy of these locations.

Thank you for the opportunity to be of service on this project. Please contact us if you have any questions or need further information.

Sincerely,

ESP Associates, Inc.

Edward D. Billington, PG
Senior Geophysicist

SBM/EDB

Attachments: Figures 1 – 11

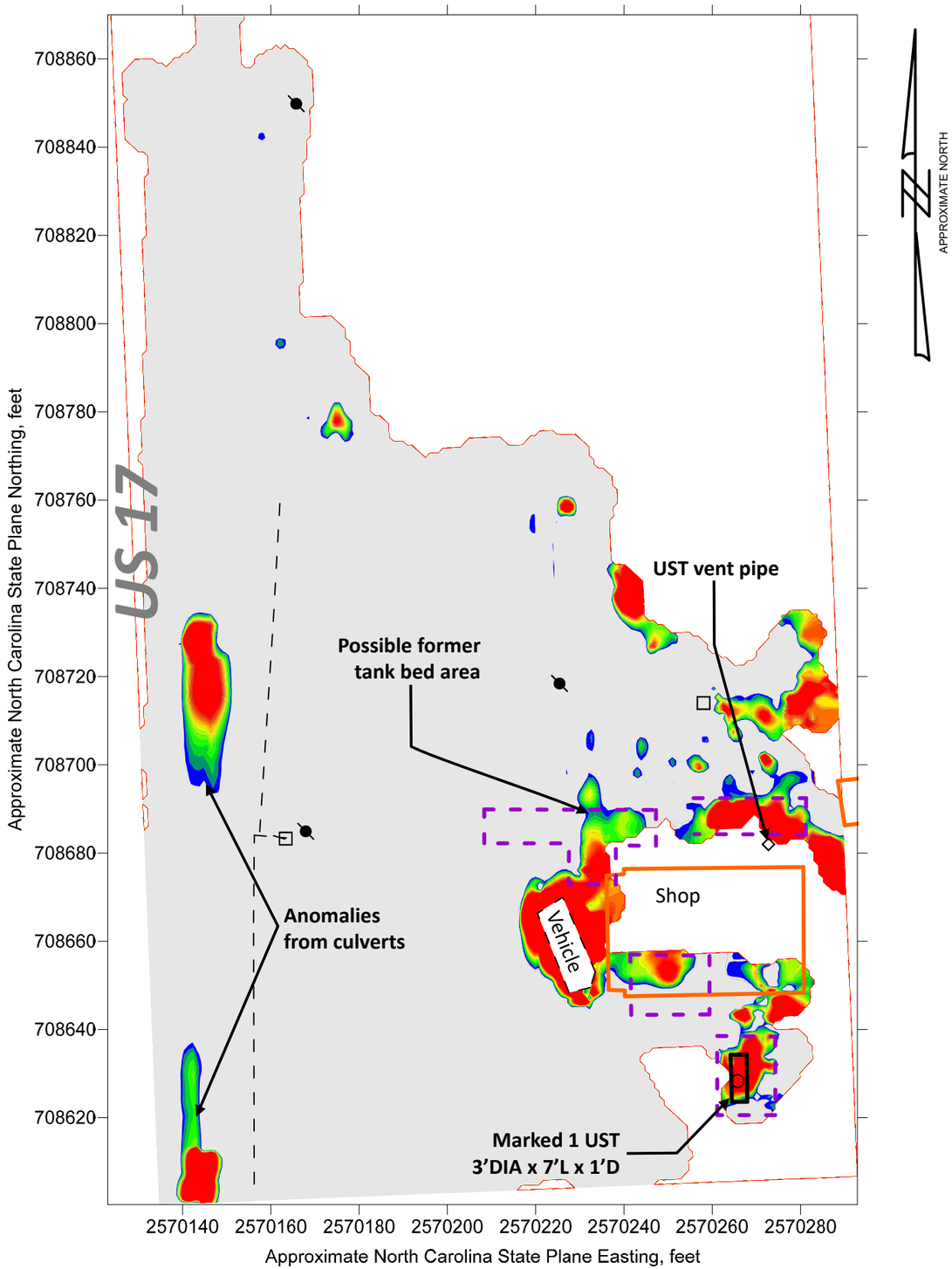
A. Probable propane UST marked on south side of shop building.

B. Approximate location of line leading from shop building to propane UST on south side of building.

C. Possible area of former tank bed with line (arrow) traced from vent pipe on northeast corner of shop building.

D. Photograph showing a portion of Parcel 75 surrounding the hone , looking northeast.

PROJECT NO. HO40.300	***FIGURE 1 - PARCEL 75, EDWARDS L. HUGHES ET. UX SITE PHOTOGRAPHS, SHOP & HOME***	ESP Associates, Inc. 7011 Albert Pick Rd., Suite E Greensboro, NC 27409 336.334.7724 www.espassociates.com
SCALE N/A		
DATE 4/11/19	***NCDOT PROJECT R-2511, US 17 NORTH OF NC 171 TO MULTI-LANES SOUTH OF WILLIAMSTON BEAUFORT AND MARTIN COUNTIES, NORTH CAROLINA***	
BY SBM/EDB		



APPROXIMATE NORTH

EM61 Early Time Gate Response (mV)

1000
950
900
850
800
750
700
650
600
550
500
450
400
350
300
275
0
-500

EXPLANATION

- Miscellaneous metal object (pipe, debris, etc.)
- Utility Box (water meter, electrical outlet, etc.)
- Storm drain
- Utility pole
- Guy wire anchor
- Sign pole, other pole
- UST Valve Cover or Fill Port
- Buried utility line (marked by others)
- Existing Building (per NCDOT file)
- EM61 Data Collection Areas
- GPR Data Collection Areas
- Underground Storage Tank

Note: Locations of data and features are approximate and were collected using a DGPS instrument. ESP make 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.	HO40.300
SCALE	AS SHOWN
DATE	4/11/19
BY	SBM/EDB

FIGURE 2 - PARCEL 75, EDWARDS L. HUGHES ET. UX EM61 EARLY TIME GATE DATA, SHOP

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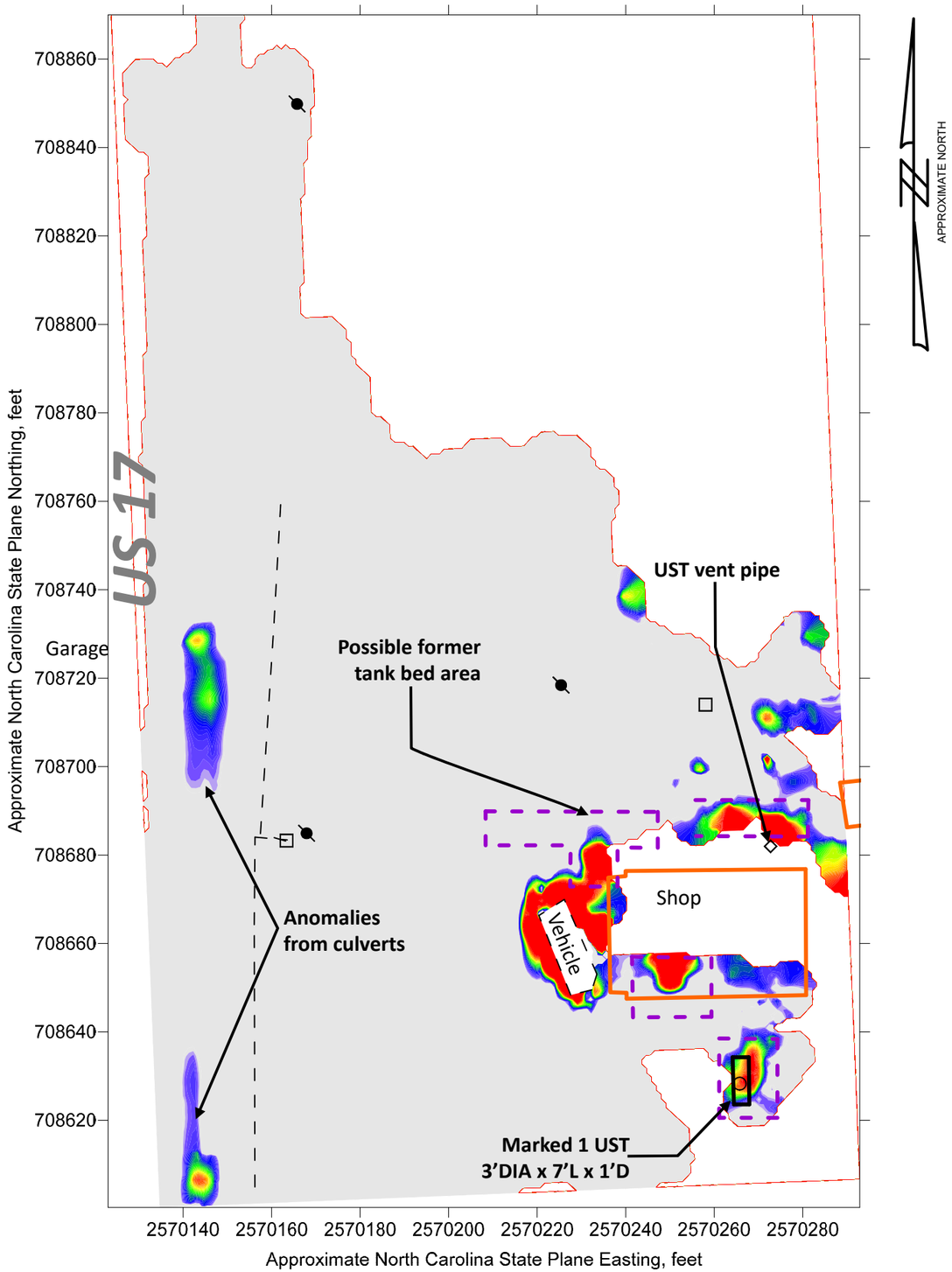

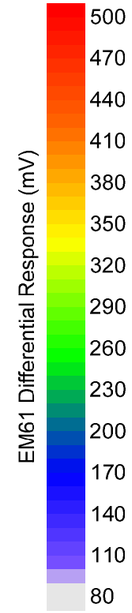

EXPLANATION

- Miscellaneous metal object (pipe, debris, etc.)
- Utility Box (water meter, electrical outlet, etc.)
- Storm drain
- Utility pole
- Guy wire anchor
- Sign pole, other pole
- UST Valve Cover or Fill Port
- Buried utility line (marked by others)
- Existing Building (per NCDOT file)
- EM61 Data Collection Areas
- GPR Data Collection Areas
- Underground Storage Tank

Note: Locations of data and features are approximate and were collected using a DGPS instrument. ESP make 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.	HO40.300
SCALE	AS SHOWN
DATE	4/11/19
BY	SBM/EDB

FIGURE 3 - PARCEL 75, EDWARDS L. HUGHES ET UX EM61 DIFFERENTIAL DATA, SHOP

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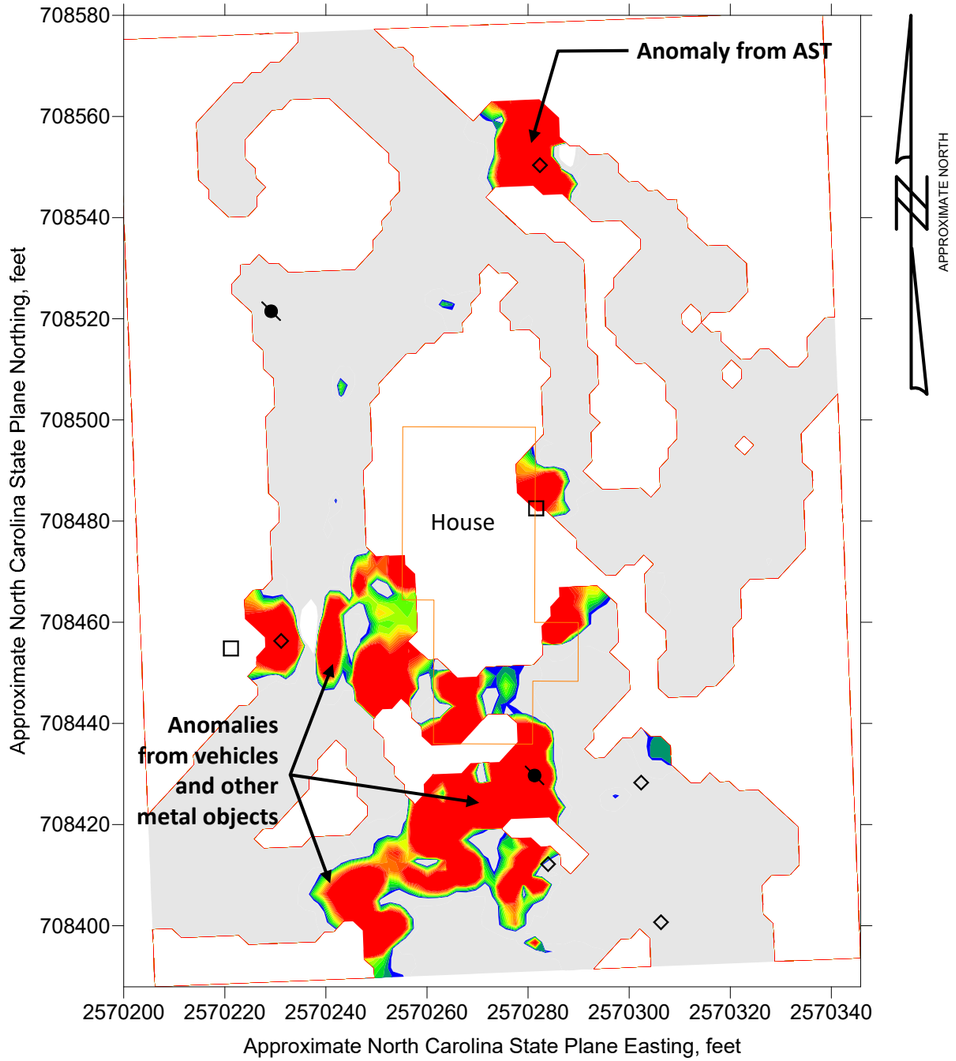

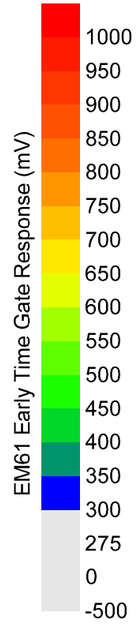

EXPLANATION

- Miscellaneous metal object (pipe, debris, etc.)
- Utility Box (water meter, electrical outlet, etc.)
- Storm drain
- Utility pole
- Guy wire anchor
- Sign pole, other pole
- UST Valve Cover or Fill Port
- Buried utility line (marked by others)
- Existing Building (per NCDOT file)
- EM61 Data Collection Areas
- GPR Data Collection Areas
- Underground Storage Tank

Note: Locations of data and features are approximate and were collected using a DGPS instrument. ESP make 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.	HO40.300
SCALE	AS SHOWN
DATE	4/11/19
BY	SBM/EDB

FIGURE 4 - PARCEL 75, EDWARDS L. HUGHES ET. UX
EM61 EARLY TIME GATE DATA, HOUSE

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BEAUFORT AND MARTIN COUNTIES, NORTH CAROLINA

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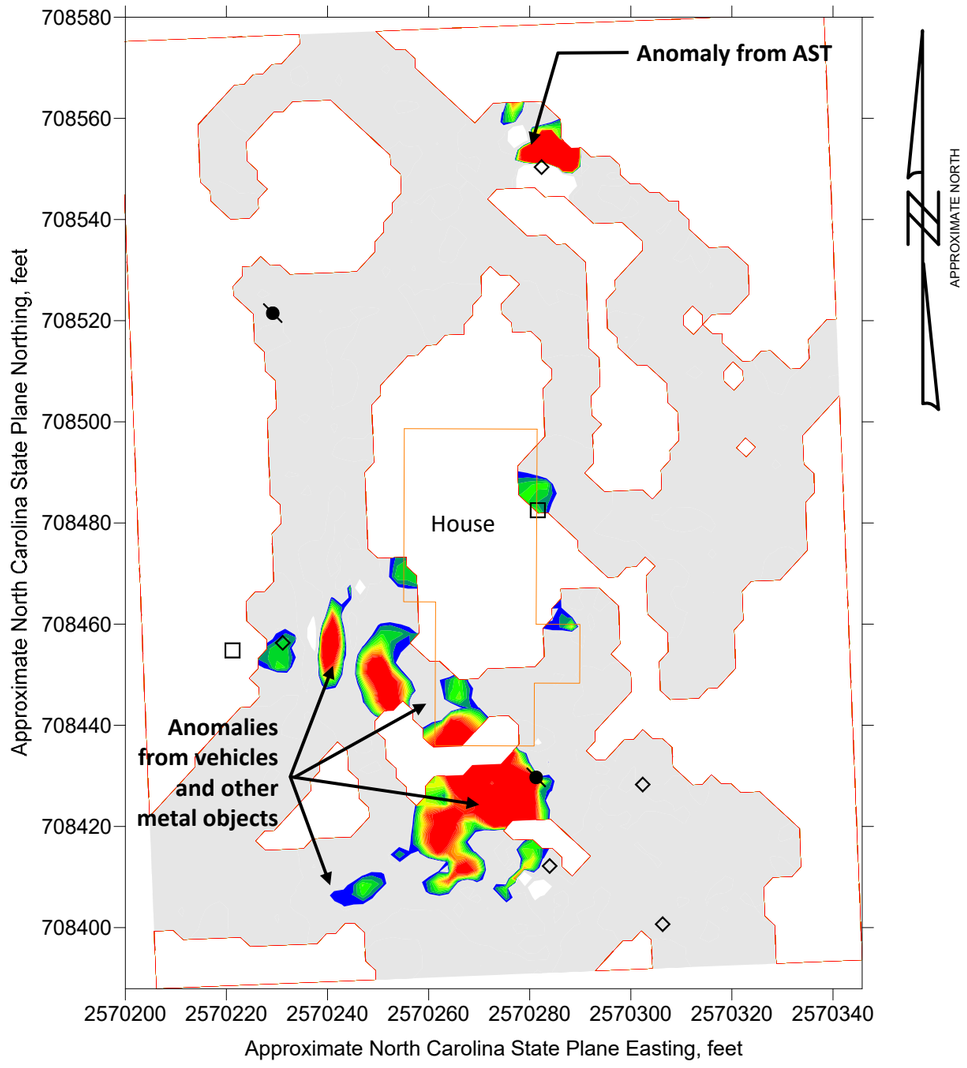

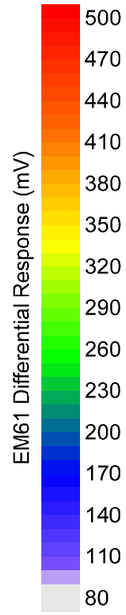

EXPLANATION

- Miscellaneous metal object (pipe, debris, etc.)
- Utility Box (water meter, electrical outlet, etc.)
- Storm drain
- Utility pole
- Guy wire anchor
- Sign pole, other pole
- UST Valve Cover or Fill Port
- Buried utility line (marked by others)
- Existing Building (per NCDOT file)
- EM61 Data Collection Areas
- GPR Data Collection Areas
- Underground Storage Tank

Note: Locations of data and features are approximate and were collected using a DGPS instrument. ESP make 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.	HO40.300
SCALE	AS SHOWN
DATE	4/11/19
BY	SBM/EDB

FIGURE 5 - PARCEL 75, EDWARDS L. HUGHES ET. UX
EM61 DIFFERENTIAL DATA, HOUSE

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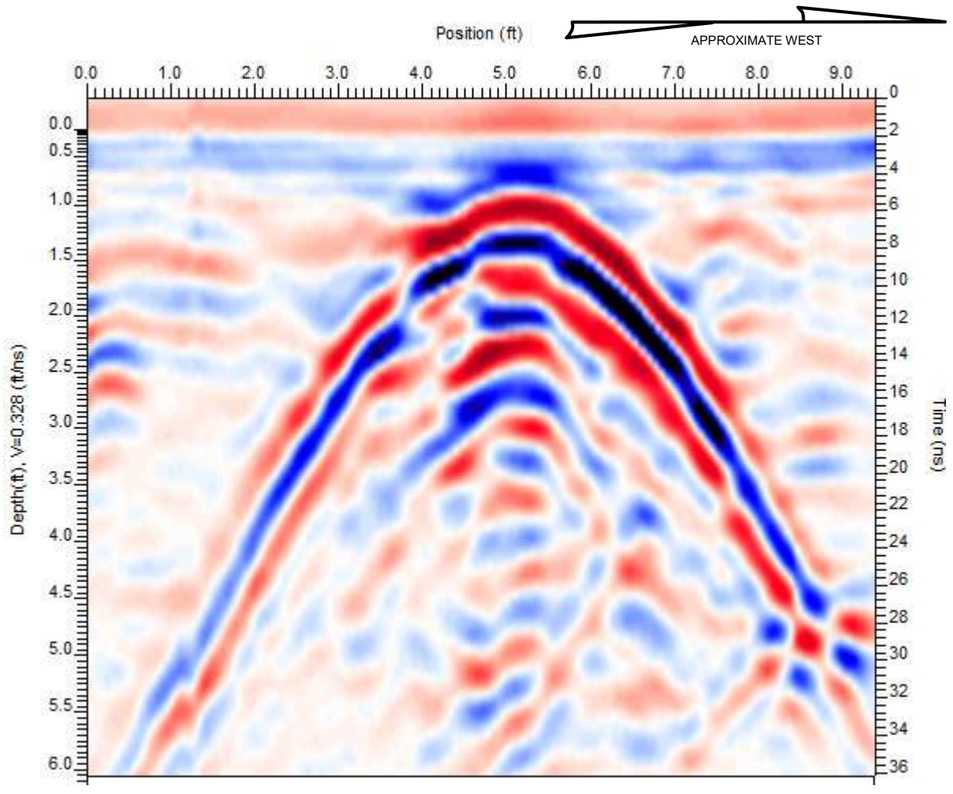
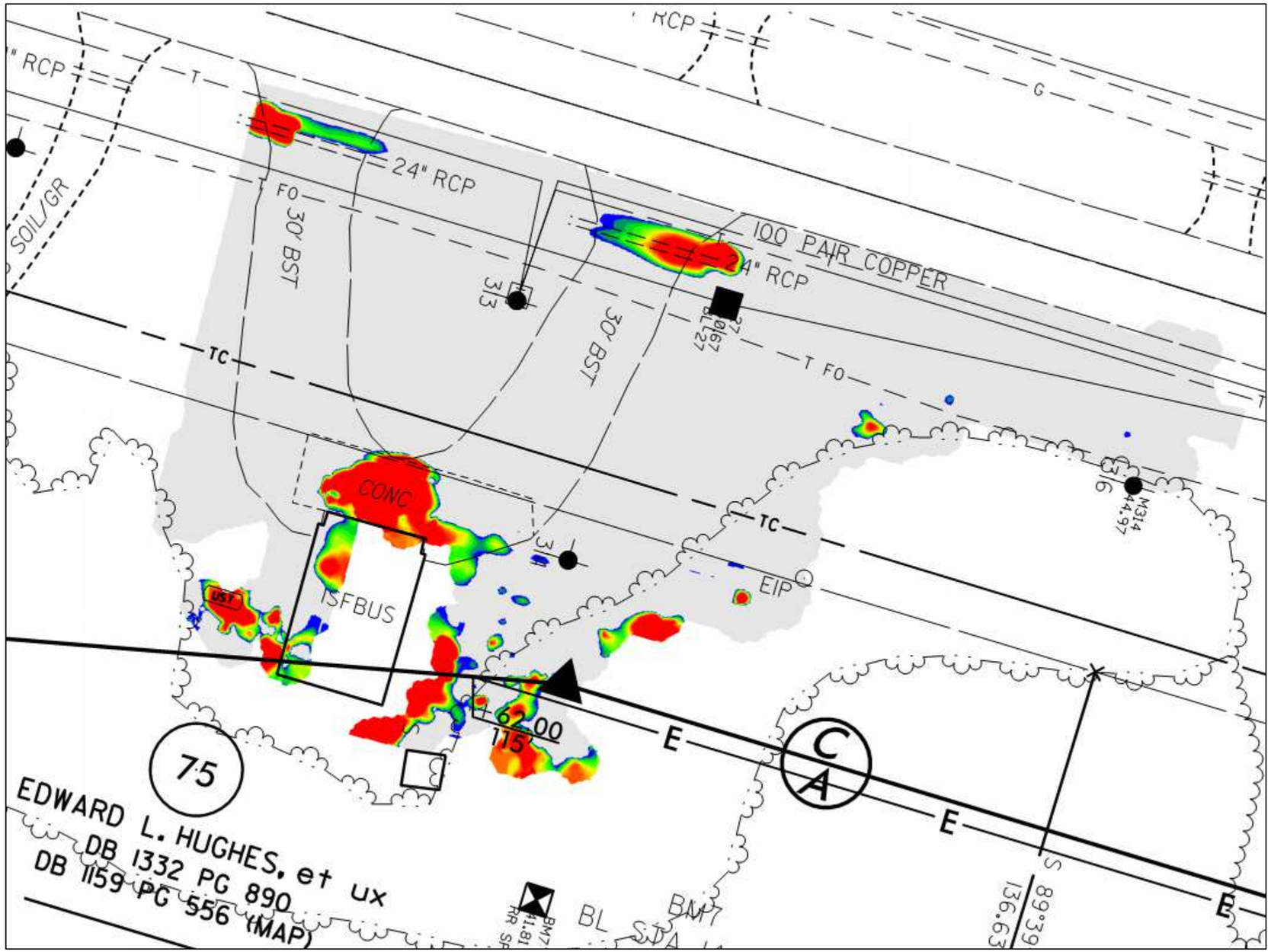


A. GPR image collected across short axes of one probable UST marked on south side of the shop building.

PROJECT NO. HO40.300	***FIGURE 6 - PARCEL 75, EDWARDS L. HUGHES ET. UX GPR IMAGE OF PROBABLE UST, SHOP***	ESP Associates, Inc. 7011 Albert Pick Rd., Suite E Greensboro, NC 27409 336.334.7724 www.espassociates.com
SCALE AS SHOWN		
DATE 4/11/19	***NCDOT PROJECT R-2511, US 17 NORTH OF NC 171 TO MULTI-LANES SOUTH OF WILLIAMSTON BEAUFORT AND MARTIN COUNTIES, NORTH CAROLINA***	
BY SBM/EDB		



See Figure 11 for explanation of symbols and line types

List of NCDOT reference files

- R2511_Geo_Env.dgn
  - R2511_NCDOT_FS.dgn
  - R2511_Rdy_row.dgn

30' 0' 30'

GRAPHIC SCALE

PROJECT NO. HO40.300	***FIGURE 7 – PARCEL 75, EDWARDS L. HUGHES ET. UX EM61 EARLY TIME GATE DATA ON PLAN SHEET, SHOP***
SCALE 1" = 30'	
DATE 4/11/19	***NCDOT PROJECT R-2511, US 17 NORTH OF NC 171 TO MULTI-LANES SOUTH OF WILLIAMSTON BEAUFORT AND MARTIN COUNTIES, NORTH CAROLINA***
BY SBM/EDB	

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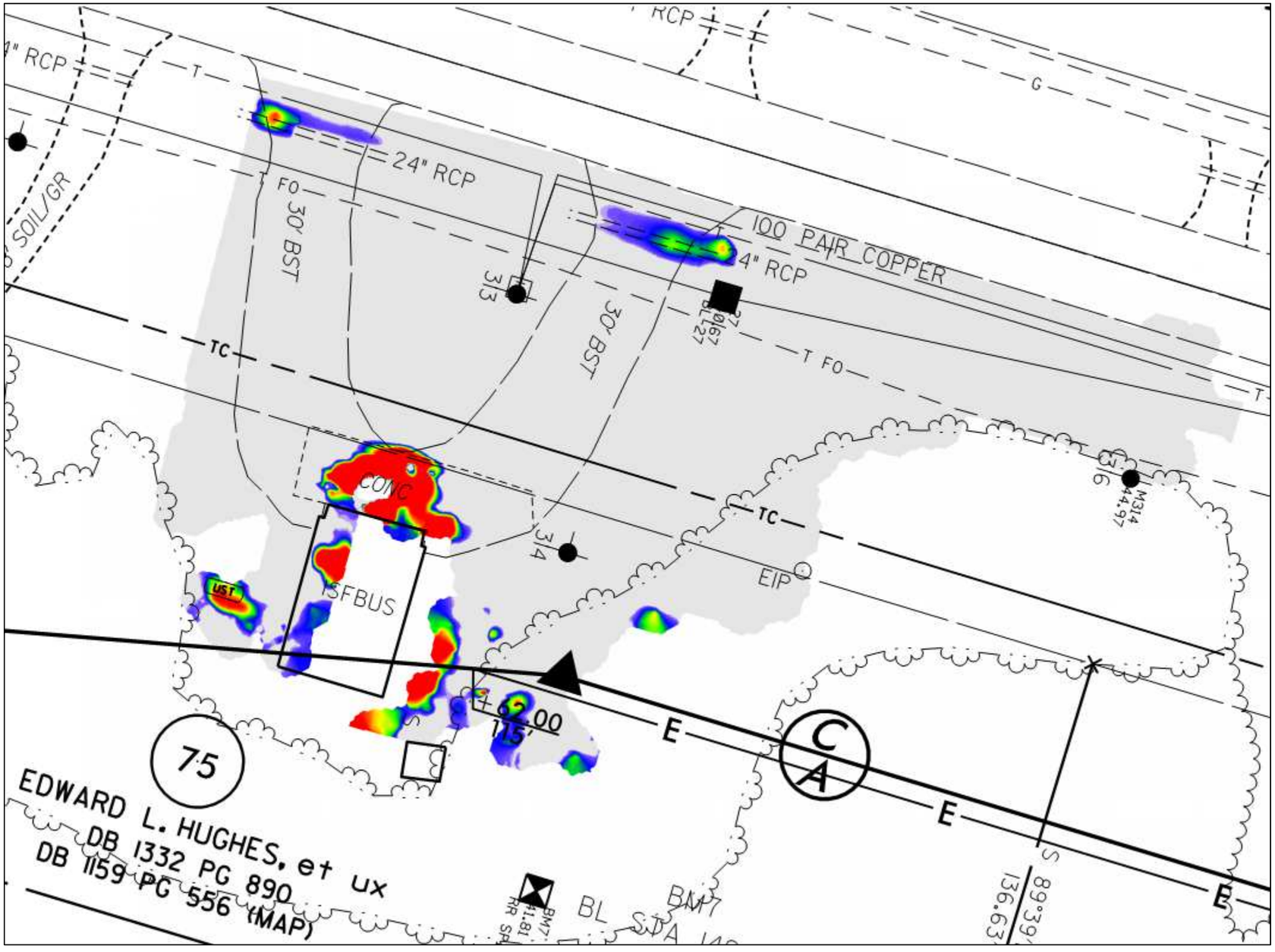

See Figure 11 for explanation of symbols and line types

List of NCDOT reference files

- R2511_Geo_Env.dgn
  - R2511_NCDOT_FS.dgn
  - R2511_Rdy_row.dgn

30′ 0′ 30′
GRAPHIC SCALE

PROJECT NO. HO40.300	***FIGURE 8 – PARCEL 75, EDWARDS L. HUGHES ET. UX EM61 DIFFERENTIAL DATA ON PLAN SHEET, SHOP***
SCALE 1" = 30'	
DATE 4/11/19	***NCDOT PROJECT R-2511, US 17 NORTH OF NC 171 TO MULTI-LANES SOUTH OF WILLIAMSTON BEAUFORT AND MARTIN COUNTIES, NORTH CAROLINA***
BY SBM/EDB	

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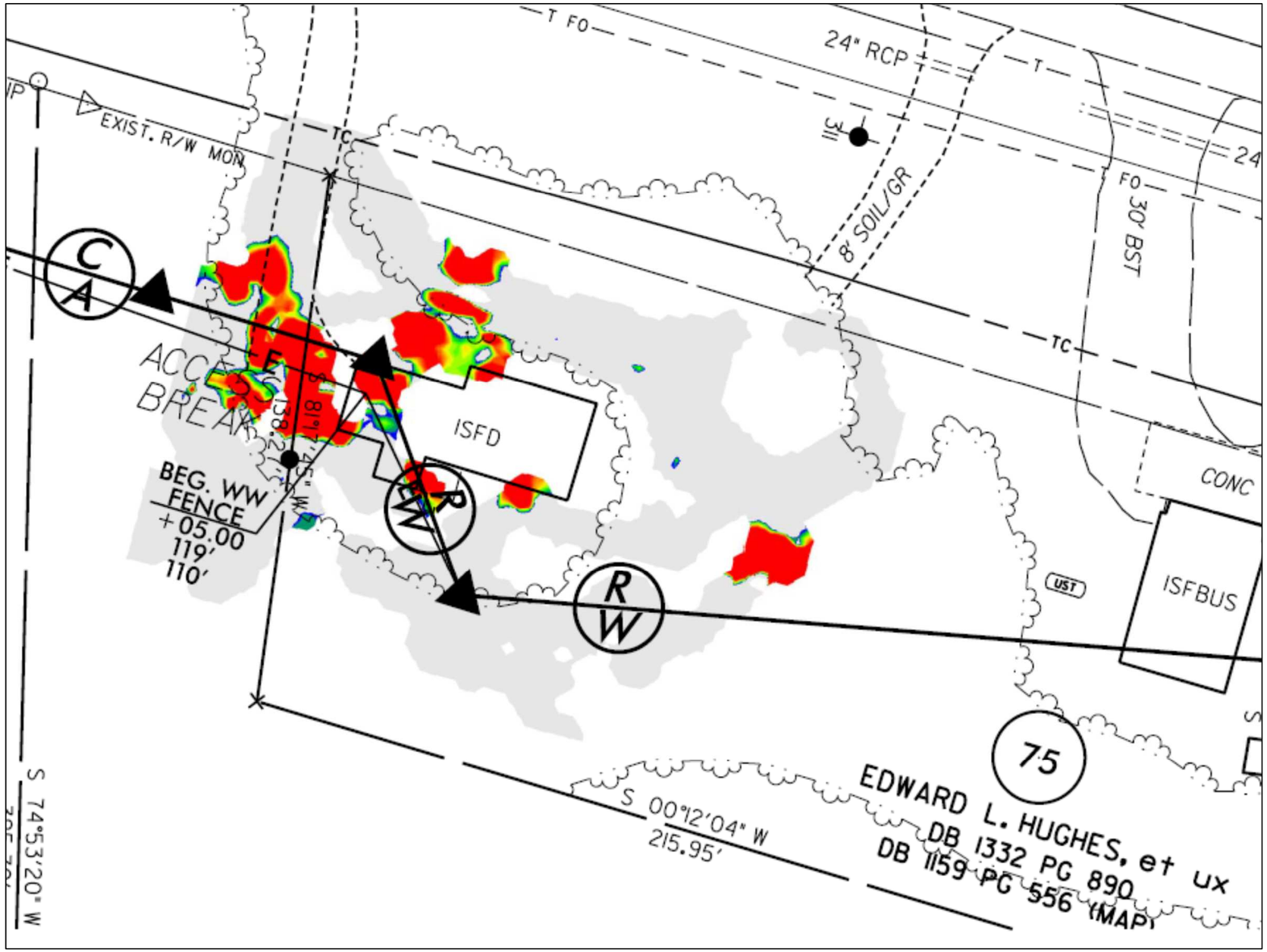

See Figure 11 for explanation of symbols and line types

List of NCDOT reference files

- R2511_Geo_Env.dgn
  - R2511_NCDOT_FS.dgn
  - R2511_Rdy_row.dgn

30′ 0′ 30′
GRAPHIC SCALE

PROJECT NO. HO40.300	***FIGURE 9 – PARCEL 75, EDWARDS L. HUGHES ET. UX EM61 EARLY TIME GATE DATA ON PLAN SHEET, HOUSE***
SCALE 1" = 30'	
DATE 4/11/19	***NCDOT PROJECT R-2511, US 17 NORTH OF NC 171 TO MULTI-LANES SOUTH OF WILLIAMSTON BEAUFORT AND MARTIN COUNTIES, NORTH CAROLINA***
BY SBM/EDB	

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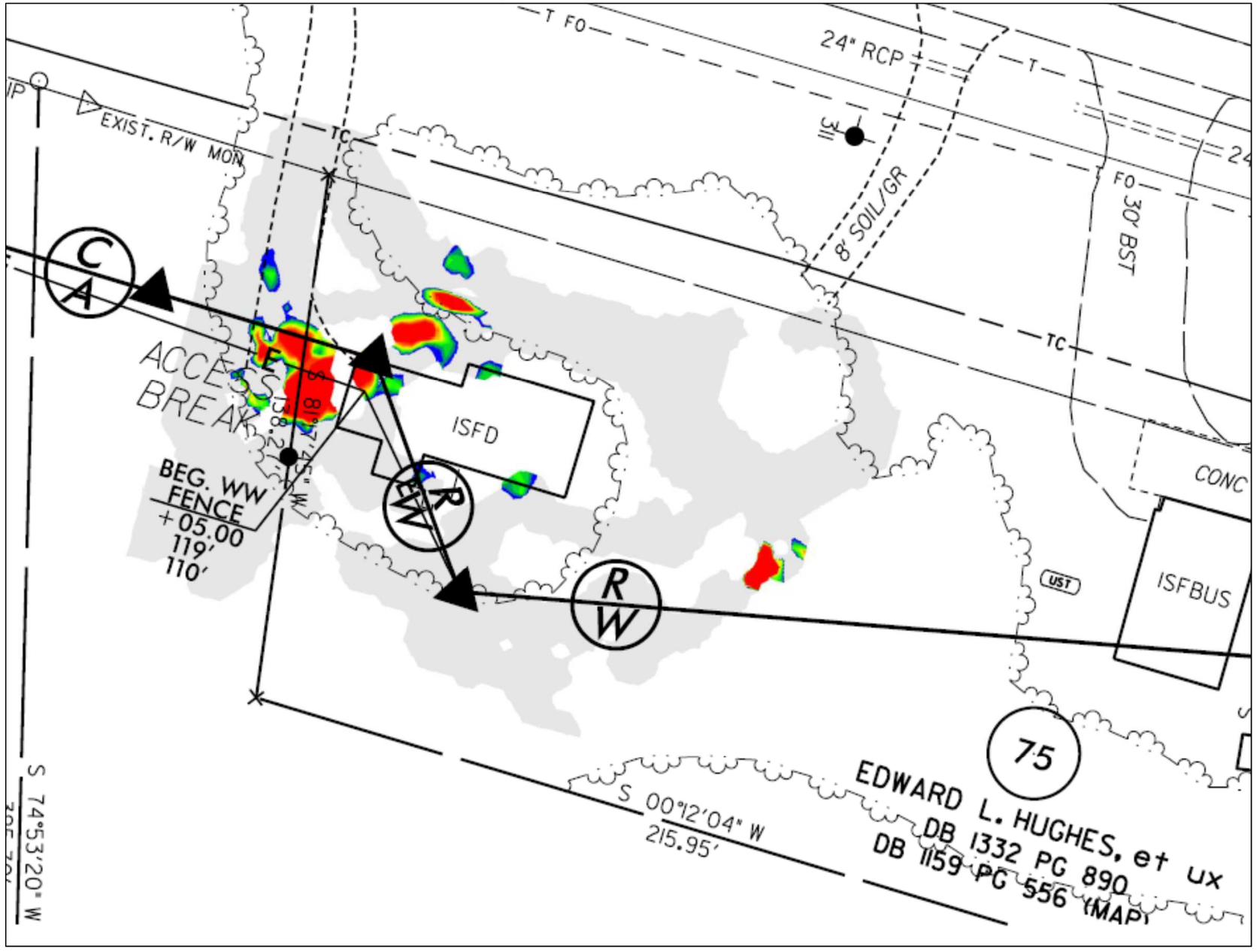

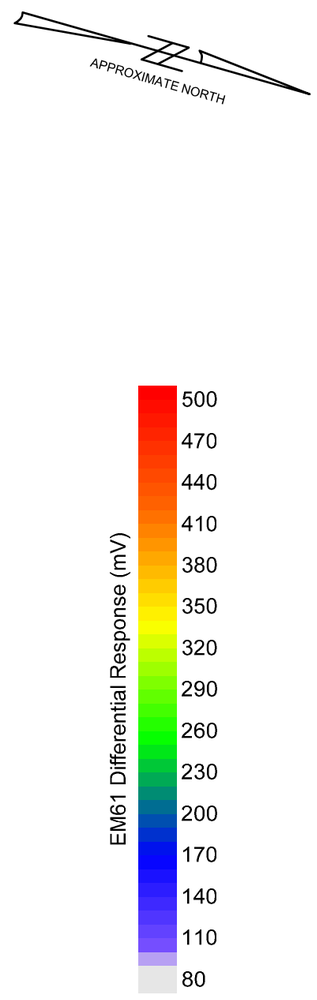

See Figure 11 for explanation of symbols and line types

List of NCDOT reference files

- R2511_Geo_Env.dgn
  - R2511_NCDOT_FS.dgn
  - R2511_Rdy_row.dgn

30' 0' 30'
GRAPHIC SCALE

PROJECT NO.	HO40.300
SCALE	1" = 30'
DATE	4/11/19
BY	SBM/EDB

FIGURE 10 – PARCEL 75, EDWARDS L. HUGHES ET. UX EM61 DIFFERENTIAL DATA ON PLAN SHEET, HOUSE

NCDOT PROJECT R-2511, US 17 NORTH OF NC 171 TO MULTI-LANES SOUTH OF WILLIAMSTON BEAUFORT AND MARTIN COUNTIES, NORTH CAROLINA

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04/26/15

PROJECT REFERENCE NO. | SHEET NO.

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
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary
- Proposed Wetland Boundary
- Existing Endangered Animal Boundary
- Existing Endangered Plant Boundary
- Existing Historic Property Boundary
- Known Contamination Area: Soil
- Potential Contamination Area: Soil
- Known Contamination Area: Water
- Potential Contamination Area: Water
- Contaminated Site: Known or Potential

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
- Proposed Lateral, Tail, Head Ditch (LAT)
- False Sump

RAILROADS:

- Standard Gauge (CSX TRANSPORTATION)
- RR Signal Milepost (MILEPOST 35)
- Switch (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 (RW)
- Proposed Right of Way Line with Iron Pin and Cap Marker (RW)
- Proposed Right of Way Line with Concrete or Granite R/W Marker (RW)
- Proposed Control of Access Line with Concrete C/A Marker (CA)
- Existing Control of Access (CA)
- Proposed Control of Access (CA)
- 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 (CR)
- 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 (Vineyard)

EXISTING STRUCTURES:

MAJOR:

- Bridge, Tunnel or Box Culvert (CONC)
- Bridge Wing Wall, Head Wall and End Wall (CONC WW)

MINOR:

- Head and End Wall (CONC HW)
- Pipe Culvert
- Footbridge
- Drainage Box: Catch Basin, DI or JB (CB)
- Paved Ditch Gutter
- Storm Sewer Manhole (S)
- Storm Sewer

UTILITIES:

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box
- Utility Unknown U/G Line LOS B (S.U.E.*) (UNK)
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc. (UST)
- 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.	HO40.300
SCALE	N/A
DATE	4/11/19
BY	SBM/EDB

FIGURE 11
LEGEND FOR PLAN SHEET FIGURES

NCDOT PROJECT R-2511, US 17 NORTH OF NC 171 TO MULTI-LANES SOUTH OF WILLIAMSTON
BEAUFORT AND MARTIN COUNTIES, NORTH CAROLINA

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