



REPORT ON GEOENVIRONMENTAL PHASE II  
GEOPHYSICAL SERVICES

**PARCEL 155, CHARLES R. AND MATTIE W.  
NUCKLES, 2708 SANDY RIDGE RD., COLFAX, NC**

WBS 40251.1  
ESP Project No. IS14.335

**Prepared For:**

NCDOT Geotechnical Engineering Unit  
1020 Birch Ridge Drive  
Raleigh, NC 27610

**Prepared By:**

ESP Associates, Inc  
7011 Albert Pick Road  
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January 26, 2023



January 26, 2023

Mr. Gordon Box, PG  
ghbox@ncdot.gov  
Geotechnical Engineering Unit  
North Carolina Department of Transportation  
1020 Birch Ridge Drive  
Raleigh, NC 27610

Reference: **REPORT ON GEOENVIRONMENTAL PHASE II GEOPHYSICAL SERVICES**  
**PARCEL 155, CHARLES R. AND MATTIE W. NUCKLES, 2708 SANDY RIDGE RD.,**  
**COLFAX, NC**  
ESP Project No. IS14.335

TIP Number: U-4758  
WBS Number: 40251.1  
County: GUILFORD  
Description: Johnson St - Sandy Ridge Road from Skeet Club Road to I-40

Dear Mr. Box:

ESP Associates, Inc. (ESP) is pleased to submit this report on our GeoEnvironmental Phase II Geophysical Investigation of the subject parcel. This work was performed in accordance with your Request for Proposal dated December 6, 2022 and our Cost Proposal dated December 22, 2022.

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, Inc.

A handwritten signature in blue ink, appearing to read "Edward D. Billington", is written over a blue rectangular DocuSign verification box.

Edward D. Billington, PG  
Senior Managing Geophysicist



CRP/CWA/EDB

not considered Final unless all signatures are completed

Electronic submission via email



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## **1.0 INTRODUCTION**

### **1.1 Purpose of Work**

The NCDOT is planning to widen 4.4 miles of Johnson Street and Sandy Ridge Road from Skeet Club Road to Interstate 40 in High Point. The proposed work would help reduce congestion and traffic delays by widening the road from two to four lanes. The NCDOT requested that ESP provide geophysical services to locate underground storage tanks (USTs) at Parcel 155 and, after the parcel is acquired, remove the heating oil tank reported to be present by the current owner. Parcel 155 is located at 2708 Sandy Ridge Rd. in Colfax, NC (Figure 1).

### **1.2 Background Information**

We checked the following online sources with the results summarized below:

- NCDEQ Registered Tank Database:
  - Nothing found for this site.
- North Carolina Department of Environmental Quality (NCDEQ) Division of Waste Management Site Locator Tool and the UST Database:
  - Nothing found for this site.
- Guilford County GIS:
  - Property owner is listed as NCDOT (formerly Charles R. and Mattie W. Nuckles).

## **2.0 FIELD PROCEDURES**

### **2.1 Site Observations**

During our January 17, 2023 site visit, there was a single-family residence currently occupied by Mattie W. Nuckles (Figure 2). According to the resident, the former heating oil UST was located outside the kitchen window on the rear side of the house and may have been filled with sand when abandoned. Currently, there is a wooden deck located outside the kitchen window (Figure 2B). A cut metal pipe that penetrated through the brick foundation was seen near the northwest corner of the deck by the kitchen window; this pipe may have been the product line for the former heating oil UST. The site contained multiple concrete pavers, drain lines, drain grates, and cut-off metal fence posts. The site also contained an abandoned well, a chicken coop, a shed, a wooden deck, and a propane AST. The ground surface was covered by concrete pavement and grass.

### **2.2 Geophysical Data Collection**

On January 18, 19, and 20, 2023, ESP Staff Scientist Cody Allen, GIT collected metal detection data and ground-penetrating radar (GPR) images at the site. The metal detection data were collected over the accessible areas of the site using a Geonics EM61 MK2 instrument (EM61) at an approximate three-foot line spacing. The EM61 data were processed and reviewed by ESP personnel Edward (Ned) Billington, PG and Ryan Pastrana, PG (Figures 3 and 4). GPR data were collected over selected EM61 anomalies using a Sensors and Software Noggin 250 GPR system. Approximate locations of the EM61 data, relevant site

features, and GPR mark-outs were obtained using a Geode differential GPS (DGPS) instrument connected to a MESA field computer.

The EM61 early time gate response and differential response are shown on the plan sheet on Figures 5 and 6, respectively. The plan sheet data were provided by the NCDOT on January 20, 2023 and include the 75 percent Right of Way (ROW) design plans.

### **3.0 DISCUSSION OF RESULTS**

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). Our evaluation of the EM61 data indicated several anomalies that could not be attributed to known features; GPR data collected over these anomalies indicated that they were caused by metal drain grates, metal drain pipes, the metal shed door, and the metal carport.

The presence of the wooden deck prevented exploration of that area for the presence of the former heating oil UST. ESP personnel attempted to remove the deck planks in order to probe the soil beneath the deck but the screws were rusted and the planks could not be removed without causing damage to the deck.

### **4.0 CONCLUSIONS AND RECOMMENDATIONS**

Our review of the geophysical data collected for Parcel 155 does not indicate the presence of metallic USTs within the accessible areas of the geophysical study area. However, the former heating oil UST could be located beneath the wooden deck on the east (rear) side of the house near the kitchen window. Once the deck is removed for construction, this area should be investigated for the reported UST.

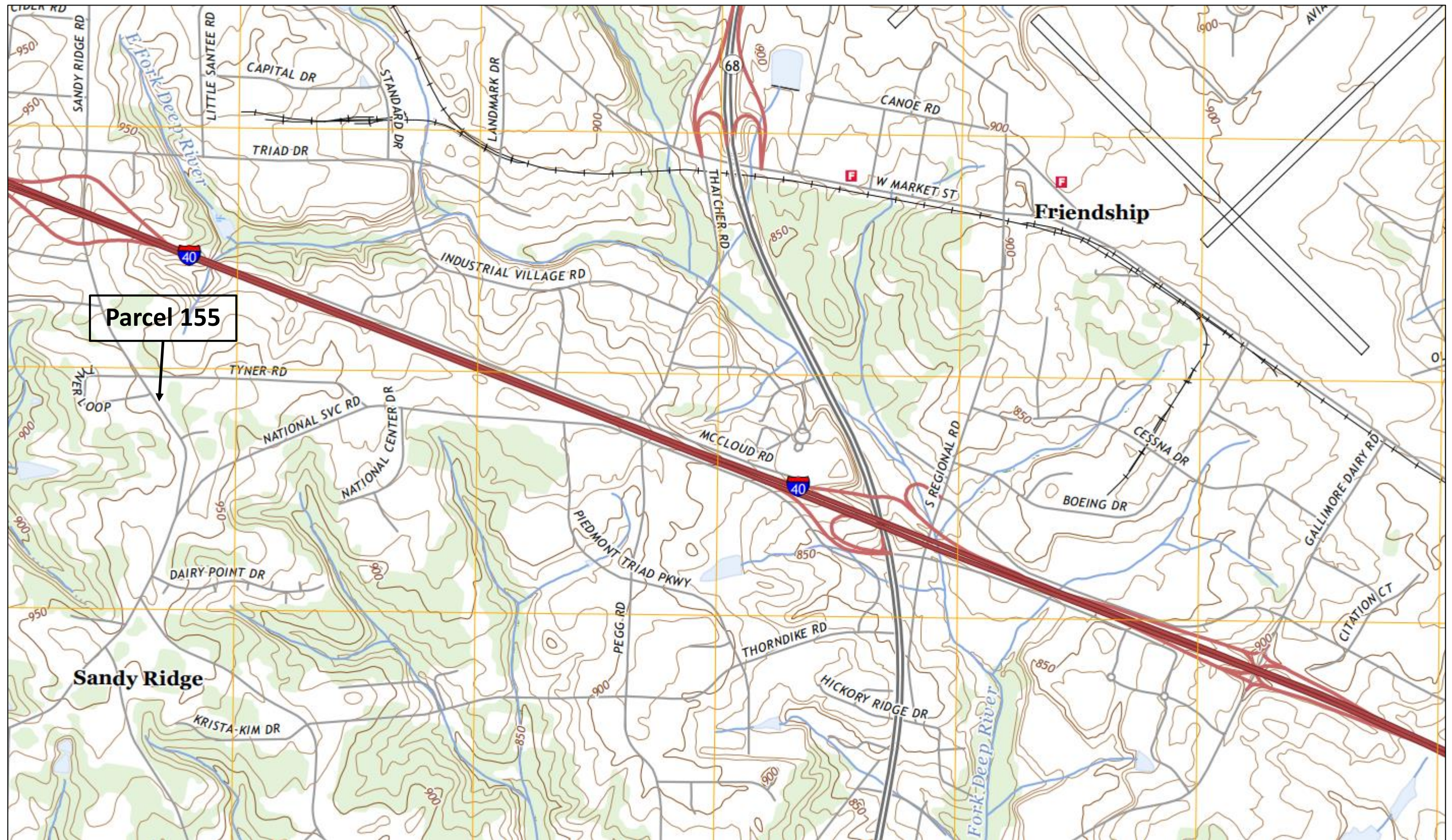
### **5.0 LIMITATIONS**

ESP's professional services have been provided in accordance with generally accepted guidelines for performing geophysical surveys. It is recognized that the results of geophysical surveys are non-unique, subject to interpretation, and limited by the specific equipment, methodology, and site conditions. It is possible that not all subsurface features of interest have been identified by this work. The passage of time may result in a change in the conditions at this site. ESP does not warrant against future operations or conditions, or against operations or conditions present of a type or at a location not included as part of this work.



## FIGURES





From: USGS Topo 7.5 - minute map for GUILFORD QUADRANGLE, NC, Date: 2022, Original Scale: 1:24,000

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<b>FIGURE 1 – PARCEL 155, C.R. &amp; M.W. NUCKLES SITE VICINITY MAP</b>
<b>NCDOT PROJECT U-4758 JOHNSON ST - SANDY RIDGE RD FROM SKEET CLUB RD TO I-40 GUILFORD COUNTY, NORTH CAROLINA</b>



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A. Photograph of west side of site and front of house, facing east.




B. Photograph of east side of site and rear of house, facing west. The former heating oil UST is reportedly located outside the kitchen widow beneath the deck.



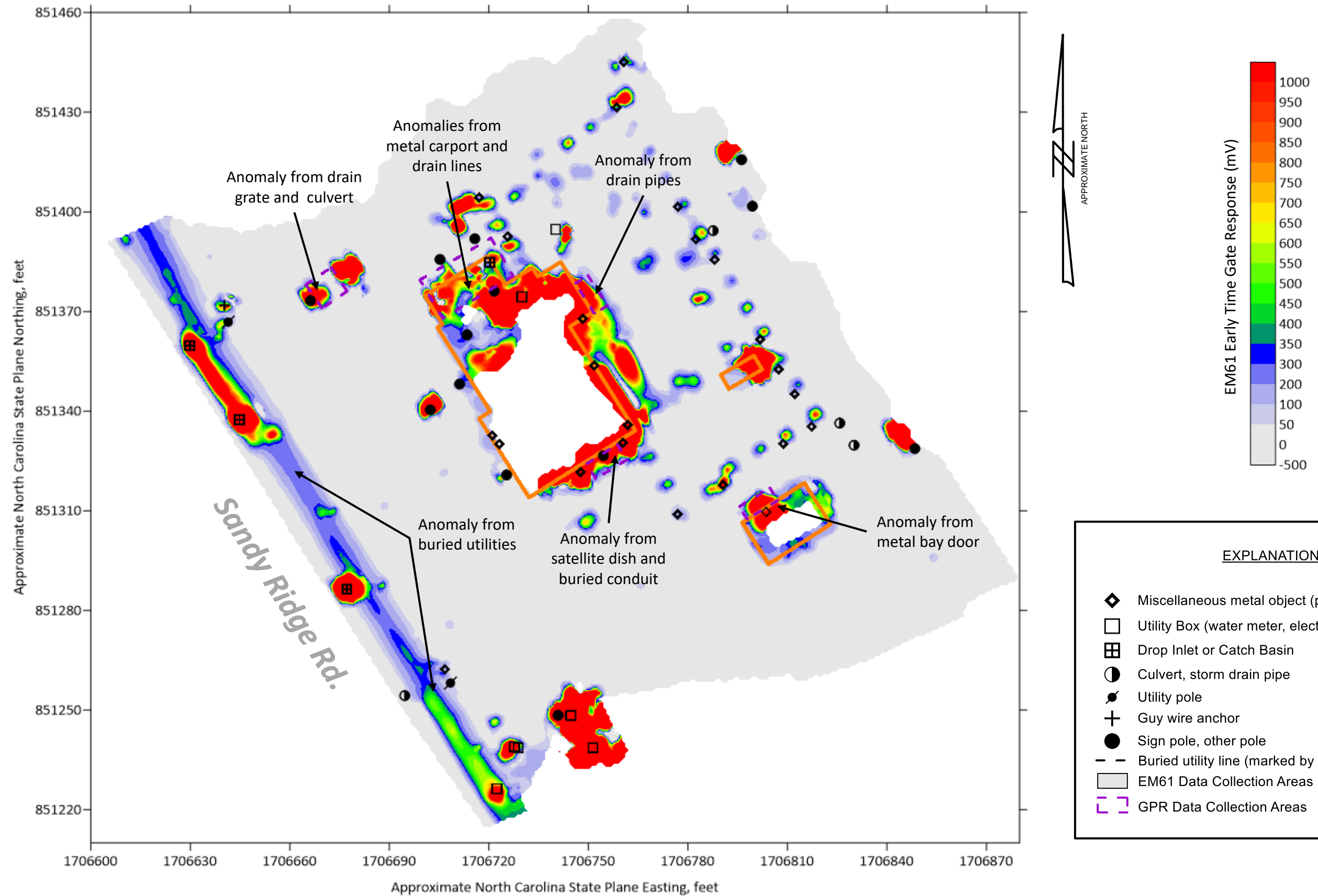
C. Photograph of south side of house showing AC unit, satellite dish, and propane AST, facing north.



C. Photograph of north side of house, showing metal carport, building, facing southeast.

PROJECT NO. IS14.335	<b>FIGURE 2 – PARCEL 155, C.R. &amp; M.W. NUCKLES SITE PHOTOGRAPHS</b>	 <div>ESP Associates, Inc.  7011 Albert Pick Rd., Suite E Greensboro, NC 27409  336.334.7724  www.espassociates.com</div>
SCALE N/A		
DATE 1/25/2023	<b>NCDOT PROJECT U-4758 JOHNSON ST - SANDY RIDGE RD FROM SKEET CLUB RD TO I-40 GUILFORD COUNTY, NORTH CAROLINA</b>	
BY CWA/CRP		




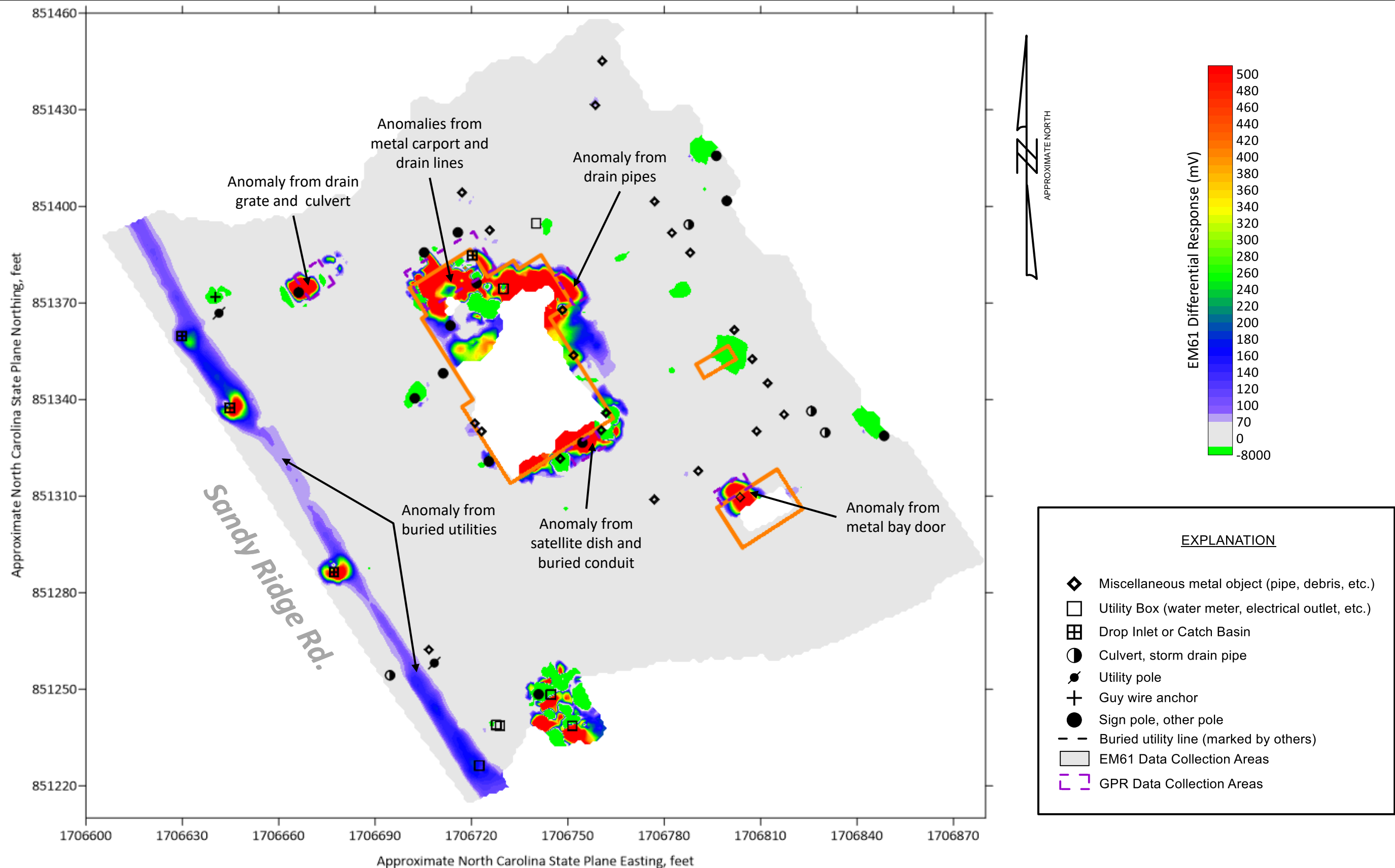


EXPLANATION


- ◆ Miscellaneous metal object (pipe, debris, etc.)
- Utility Box (water meter, electrical outlet, etc.)
- ⊞ Drop Inlet or Catch Basin
- Culvert, storm drain pipe
- ⦿ Utility pole
- + Guy wire anchor
- Sign pole, other pole
- - Buried utility line (marked by others)
- EM61 Data Collection Areas
- GPR Data Collection Areas

Note: Locations of data and features are approximate and were collected using a 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.

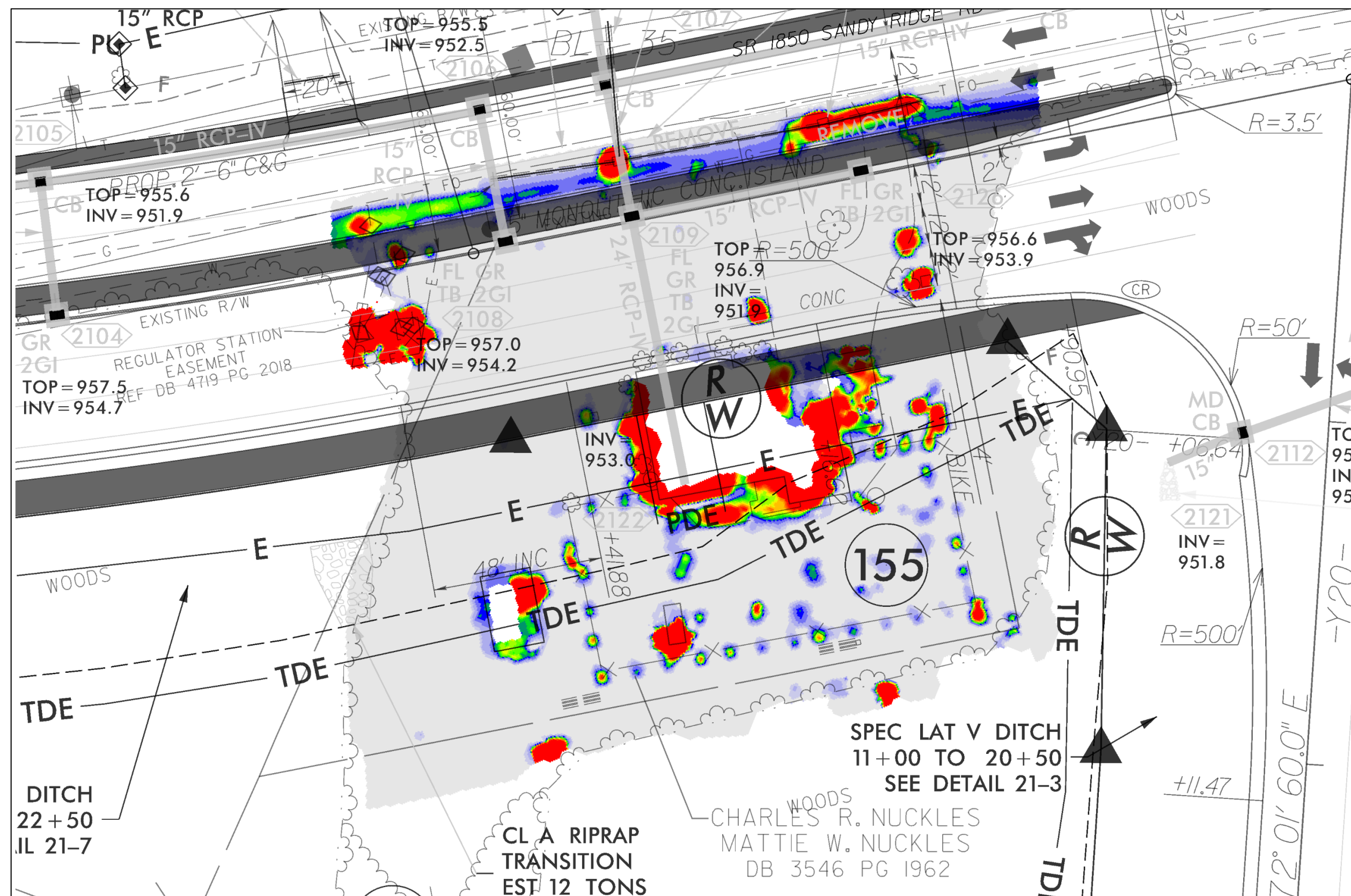
PROJECT NO. IS14.335	<b>FIGURE 3 – PARCEL 155, C.R. &amp; M.W. NUCKLES EM61 EARLY TIME GATE DATA</b>	 <div>ESP Associates, Inc. 7011 Albert Pick Rd., Suite E Greensboro, NC 27409 336.334.7724 www.espassociates.com</div>
SCALE AS SHOWN		
DATE 1/25/2023	<b>NCDOT PROJECT U-4758 JOHNSON ST - SANDY RIDGE RD FROM SKEET CLUB RD TO I-40 GUILFORD COUNTY, NORTH CAROLINA</b>	
BY CWA/CRP		



Note: Locations of data and features are approximate and were collected using a 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. IS14.335	<b>FIGURE 4 – PARCEL 155, C.R. &amp; M.W. NUCKLES EM61 DIFFERENTIAL DATA</b>	 <div>ESP Associates, Inc. 7011 Albert Pick Rd., Suite E Greensboro, NC 27409 336.334.7724 www.espassociates.com</div>
SCALE AS SHOWN		
DATE 1/25/2023	<b>NCDOT PROJECT U-4758</b>	
BY CWA/CRP	<b>JOHNSON ST - SANDY RIDGE RD FROM SKEET CLUB RD TO I-40 GUILFORD COUNTY, NORTH CAROLINA</b>	





List of Microstation References

- U4758\_Geo\_Env.dgn
- U4758\_rdy\_ss.dgn
- U-4758\_rdy\_WEX.dgn
- U4758\_HYD\_DRN.dgn
- U4758\_ncdot\_fs.dgn
- U4758\_rdy\_dsn.dgn
- U4758\_rdy\_row.dgn

See Figure 7 for explanation of symbols and line types.

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**FIGURE 5 – PARCEL 155, C.R. & M.W. NUCKLES  
EM61 EARLY TIME GATE DATA ON PLAN SHEET**

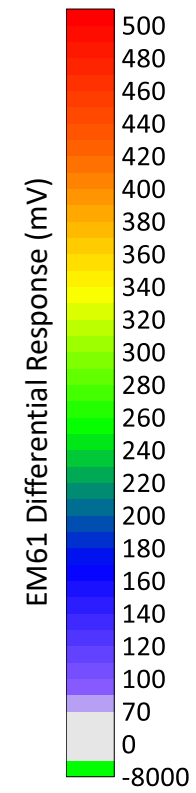
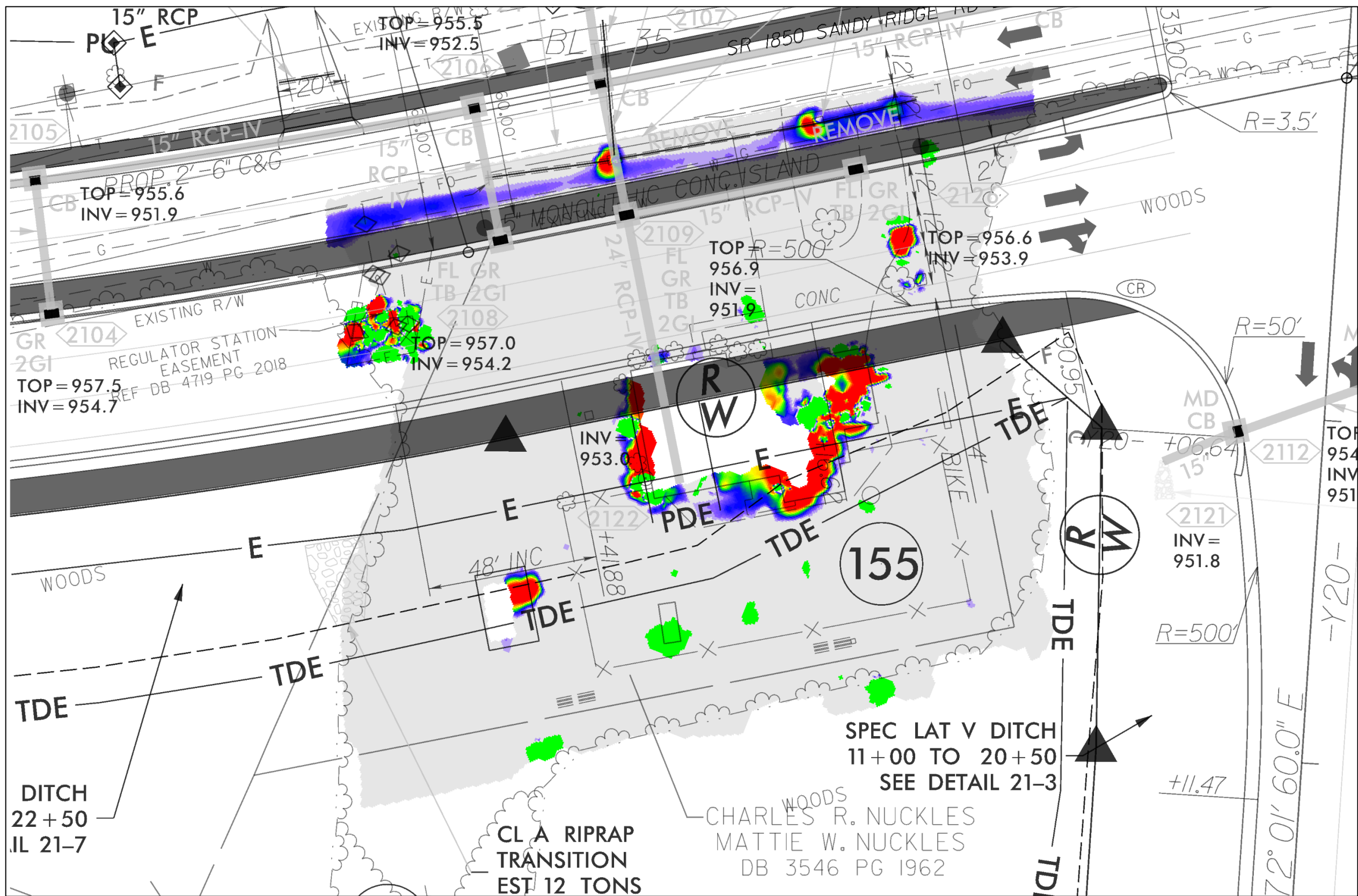
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Note: Locations of geophysical data and USTs are approximate and were collected using a DGPS instrument. ESP makes no guarantees as to the accuracy of these locations.





List of Microstation References

- U4758\_Geo\_Env.dgn
- U4758\_rdy\_ss.dgn
- U-4758\_rdy\_WEX.dgn
- U4758\_HYD\_DRN.dgn
- U4758\_ncdot\_fs.dgn
- U4758\_rdy\_dsn.dgn
- U4758\_rdy\_row.dgn

Note: Locations of geophysical data and USTs are approximate and were collected using a DGPS instrument. ESP makes no guarantees as to the accuracy of these locations.



See Figure 7 for explanation of symbols and line types.

PROJECT NO.	IS14.335	FIGURE 6 – PARCEL 155, C.R. & M.W. NUCKLES EM61 DIFFERENTIAL DATA ON PLAN SHEET
SCALE	1" = 30'	
DATE	1/25/2023	NCDOT PROJECT U-4758 JOHNSON ST - SANDY RIDGE RD FROM SKEET CLUB RD TO I-40 GUILFORD COUNTY, NORTH CAROLINA
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Note: Not to Scale

BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin (EIP)	○
Computed Property Corner	×
Existing Concrete Monument (ECM)	□
Parcel/Sequence Number	②
Existing Fence Line	-x-x-x-
Proposed Woven Wire Fence	-o-o-o-
Proposed Chain Link Fence	-s-s-s-
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	-s-s-s-
Potential Contamination Area: Soil	-s-s-s-
Known Contamination Area: Water	-w-w-w-
Potential Contamination Area: Water	-w-w-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	-----
False Sump	▽

RAILROADS:

Standard Gauge	-----
RR Signal Milepost	○
Switch	SWITCH
RR Abandoned	-----
RR Dismantled	-----

RIGHT OF WAY & PROJECT CONTROL:

Primary Horiz Control Point	○
Primary Horiz and Vert Control Point	●
Secondary Horiz and Vert Control Point	◆
Vertical Benchmark	⊕
Existing Right of Way Monument	△
Proposed Right of Way Monument (Rebar and Cap)	▲
Proposed Right of Way Monument (Concrete)	⊙
Existing Permanent Easement Monument	◇
Proposed Permanent Easement Monument (Rebar and Cap)	◆
Existing C/A Monument	△
Proposed C/A Monument (Rebar and Cap)	▲
Proposed C/A Monument (Concrete)	⊙
Existing Right of Way Line	-----
Proposed Right of Way Line	-----
Existing Control of Access Line	-----
Proposed Control of Access Line	-----
Proposed ROW and CA Line	-----
Existing Easement Line	-----
Proposed Temporary Construction Easement	-----
Proposed Temporary Drainage Easement	-----
Proposed Permanent Drainage Easement	-----
Proposed Permanent Drainage/Utility Easement	-----
Proposed Permanent Utility Easement	-----
Proposed Temporary Utility Easement	-----
Proposed Aerial Utility Easement	-----

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	XXXX

VEGETATION:

Single Tree	○
Single Shrub	○
Hedge	-----

Woods Line	-----
Orchard	-----
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	⊕
Storm Sewer	-----

UTILITIES:

\* SUE - Subsurface Utility Engineering  
LOS - Level of Service - A,B,C or D (Accuracy)

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 Test Hole (SUE - LOS A)*	⊕
U/G Power Line (SUE - LOS B)*	-----
U/G Power Line (SUE - LOS C)*	-----
U/G Power Line (SUE - LOS D)*	-----

TELEPHONE:

Existing Telephone Pole	●
Proposed Telephone Pole	○
Telephone Manhole	⊕
Telephone Pedestal	⊕
Telephone Cell Tower	⊕
U/G Telephone Cable Hand Hole	⊕
U/G Telephone Test Hole (SUE - LOS A)*	⊕
U/G Telephone Cable (SUE - LOS B)*	-----
U/G Telephone Cable (SUE - LOS C)*	-----
U/G Telephone Cable (SUE - LOS D)*	-----
U/G Telephone Conduit (SUE - LOS B)*	-----
U/G Telephone Conduit (SUE - LOS C)*	-----
U/G Telephone Conduit (SUE - LOS D)*	-----
U/G Fiber Optics Cable (SUE - LOS B)*	-----
U/G Fiber Optics Cable (SUE - LOS C)*	-----
U/G Fiber Optics Cable (SUE - LOS D)*	-----

WATER:

Water Manhole	⊕
Water Meter	○
Water Valve	⊕
Water Hydrant	⊕
U/G Water Line Test Hole (SUE - LOS A)*	⊕
U/G Water Line (SUE - LOS B)*	-----
U/G Water Line (SUE - LOS C)*	-----
U/G Water Line (SUE - LOS D)*	-----
Above Ground Water Line	A/G Water

TV:

TV Pedestal	⊕
TV Tower	⊕
U/G TV Cable Hand Hole	⊕
U/G TV Test Hole (SUE - LOS A)*	⊕
U/G TV Cable (SUE - LOS B)*	-----
U/G TV Cable (SUE - LOS C)*	-----
U/G TV Cable (SUE - LOS D)*	-----
U/G Fiber Optic Cable (SUE - LOS B)*	-----
U/G Fiber Optic Cable (SUE - LOS C)*	-----
U/G Fiber Optic Cable (SUE - LOS D)*	-----

GAS:

Gas Valve	⊕
Gas Meter	⊕
U/G Gas Line Test Hole (SUE - LOS A)*	⊕
U/G Gas Line (SUE - LOS B)*	-----
U/G Gas Line (SUE - LOS C)*	-----
U/G Gas Line (SUE - LOS D)*	-----
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 Force Main Line Test Hole (SUE - LOS A)*	⊕
SS Force Main Line (SUE - LOS B)*	-----
SS Force Main Line (SUE - LOS C)*	-----
SS Force Main Line (SUE - LOS D)*	-----

MISCELLANEOUS:

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

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SCALE	N/A
DATE	1/25/2023
BY	CWA/CRP

FIGURE 7
LEGEND FOR PLAN SHEET FIGURES
NCDOT PROJECT U-4758
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