

Prepared for:

North Carolina Department of Transportation

Geotechnical Engineering Unit

GeoEnvironmental Section

1589 Mail Service Center

Raleigh, North Carolina, 27699-1589

Preliminary Site Assessment Report

RLF II East, LLC Property (Parcel PIN #11711112 – ROW Only)

Parcel # 1

4001 Morris Field Drive

Charlotte, Mecklenburg County, North Carolina

Charlotte Wye Track Improvements

TIP Number: P-5705A

WBS Element: 44475.1.1



Apex Companies, LLC

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Charlotte, North Carolina 28269

Prepared by:

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A handwritten signature in black ink that reads 'Troy Holzschuh'.

2D73445FB9455...

Troy L. Holzschuh

Assistant Project Manager

Reviewed by:

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Eric W. Song, L.G.

Project Manager

NC Geologist License No. 2581

April 2, 2019

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1.0 INTRODUCTION

This report presents the results of a Preliminary Site Assessment (PSA) for the North Carolina Department of Transportation (NCDOT) RLF II East, LLC (RLF II East) Property performed by Apex Companies, LLC (Apex) (dba Apex Engineering, PC) on behalf of the NCDOT. The subject site of this PSA report will be affected by the Charlotte Wye Track improvements. The Site (Parcel PIN #11711112) is located at 4001 Morris Field Drive and is identified as Parcel 1, RLF II East Property, within the NCDOT P-5705A design project. The property is located at the southeastern quadrant of Morris Field Drive and the Norfolk Southern Rail-line intersection in Charlotte, Mecklenburg County, North Carolina, as shown in the attached Site Location Map (**Figure 1**). The site investigation was conducted in accordance with Apex's Technical and Cost proposal dated June 13, 2018.

NCDOT contracted Apex to perform the PSA within the existing right-of-way (ROW) of the Parcel 1, RLF II East property due to the potential presence of contamination at the site and because excavation and grading may occur within the area. The PSA was performed to evaluate if soils have been impacted by petroleum hydrocarbons as a result of past and present uses of the property within the proposed investigation area, especially around the storm drain structure lines, excavation areas, utility lines and slope stake cuts. Additionally, the PSA was performed to determine if groundwater is impacted.

The following report presents the results of an electromagnetic (EM) and ground penetrating radar (GPR) evaluation to identify potential underground storage tanks (USTs) in the investigation area and describes the subsurface field investigation at the site. The report includes the evaluation of field screening, as well as field and laboratory analyses with regards to the presence or absence of soil contamination within the area of investigation across the RLF II East property. **Appendix A** includes a Photograph log for the site.

1.1 Site History

Parcel 1 has been identified with the address of 4001 Morris Field Drive. Based on a search of the North Carolina Department of Environmental Quality (NCDEQ) UST database registry, no registered tanks were identified for the 4001 Morris Field Drive site. No visual evidence of USTs was noted during field activities. Currently the site operates as 48forty Solutions Pallet Facility in an office/warehouse building constructed in 1969. The building is located on the western portion of the property. Apex personnel also reviewed the NCDEQ Incident Management Database and no groundwater incidents are associated with this parcel.

1.2 Site Description

The site is located in a mixed commercial, light industrial, and residential area of Charlotte in Mecklenburg County. The property is developed with one structure on the western portion of the site, currently occupied by 48forty Solutions Pallet Facility. The eastern portion of the property is used as a gravel, dirt and/or grass parking area. The site is bordered to the south by Moore's Sanctuary A.M.E. Zion Church. Wurth Wood Group is located just beyond Morris Field Drive which borders the site to the west. Norfolk Southern Rail-line borders the site to the north, followed by Napa Auto Parts, Rain for Rent, and Southern Electrical Equipment Company. A vacant lot (3600 Primrose Avenue, Parcel 2) formerly a metal scrap yard is located to the east. Parcel 1 does not appear on the NCDEQ UST database registry and is not associated with known USTs. The geophysical surveyor, ESP Associates, Inc. (ESP) did not identify anomalies characteristic of a UST in the investigation area.

2.0 GEOLOGY

2.1 Regional Geology

Parcel 1, the RLF II East property, is located within the Charlotte Belt of the Piedmont Physiographic Province. According to the US Geological Survey Hydrogeological framework of the North Carolina Charlotte Belt, the geology consists of mostly 300 to 500 million year old igneous rocks such as granite, diorite, and gabbro. The igneous rocks are good sources for crushed and dimension stone for road aggregate and buildings (M.D. Winner Jr. and R.W. Coble, 1996, *Hydrogeologic Framework of the North Carolina Coastal Plain, Regional Aquifer-System Analysis – Northern Atlantic Coastal Plain*, USGS Professional Paper 1404-I).

2.2 Site Geology

Site geology was observed through the drilling and sampling of five direct push probe soil borings (SB) onsite. **Figure 2** presents the boring locations and site layout. Borings did not exceed a total depth of 13 feet below ground surface (bgs) since that depth was the maximum excavation depth for proposed drainage features. Soil consisting predominantly of tan silt to brown or orange clayey silts were observed across the parcel (see Boring Logs included in **Appendix B**). According to the topographical maps found on the Mecklenburg County Geographic Information System (GIS) site, the parcel is located in an area of little topographic relief. Although groundwater does not always follow topographic changes, based on the topography of surrounding parcels, groundwater flow is likely to be toward branches of Taggart Creek located east and southeast.

3.0 FIELD ACTIVITIES

3.1 Preliminary Activities

Prior to commencing field sampling activities at the site, several tasks were accomplished in preparation for the subsurface investigation. A Health and Safety Plan (HASP) was prepared to include the site-specific health and safety information necessary for the field activities. North Carolina-One Call was contacted on June 28, 2018 and again on March 12, 2019 to report the proposed drilling activities and notify affected utilities. Apex subcontracted ESP to locate subsurface utilities and other subsurface drilling hazards as well as to perform a geophysical survey. An additional private utility locate was conducted on March 18, 2019 by Priority Locating. Carolina Soil Investigations, LLC (CSI) of Olin, North Carolina was retained by Apex to perform the direct push sampling for soil borings. REDLAB, LLC (REDLAB) provided an ultraviolet fluorescence (UVF) Hydrocarbon Analyzer and Eastern Solutions provided a calibrated Flame Ionization/Photoionization Detector (FID/PID). Boring locations were strategically placed in a pattern within the area of investigation to maximize the opportunity to encounter potentially contaminated soil.

3.2 Site Reconnaissance

Apex personnel performed a site reconnaissance on March 18, 2019 to investigate the presence of USTs or areas/obstructions that could potentially affect the subsurface investigation. During the site reconnaissance, the area was visually examined for the presence of USTs or areas/obstructions that could potentially affect the subsurface investigation. The proposed boring locations were marked based on the site inspection and geophysical survey results. Apex personnel also used the site visit as an opportunity to contact the property manager/owner to inform them of upcoming field activities.

3.3 Geophysical Survey Results

The geophysical survey of the site was conducted from June 21 through June 28, 2018. ESP performed an electromagnetic (EM) induction metal survey followed by a GPR survey. A copy of the Geophysical Report is presented in **Appendix C**. The results of the geophysical survey did not record any evidence of unknown metallic USTs at the property. All of the EM features observed corresponded with the fence located on the north side, numerous parked trailers or miscellaneous metallic features located on the ground surface. Follow-up GPR scans adjacent to areas of EM interference did not record any evidence of subsurface structures such as USTs.

3.4 Well Survey

No water supply or groundwater monitoring wells were observed on Parcel 1.

3.5 Soil Sampling

Apex conducted drilling activities at the site on March 19, 2019. Apex drilling subcontractor, CSI, advanced five direct push soil borings within the proposed investigation area. These five boring locations were placed in a pattern to maximize the likelihood of intercepting potential soil contamination. **Figure 2** presents the Site Map with boring locations and identifications.

The purpose of soil sampling was to determine if a petroleum release has occurred within the investigation area, and if so, to estimate the volume of impacted soil that might require special handling during construction activities.

Soil sampling was performed utilizing hand auger and direct push methods accompanied by field screening with the FID/PID unit and onsite quantitative analyses with the UVF Hydrocarbon Analyzer. Two to three intervals of the soil boring, exhibiting the most elevated FID/PID readings, were selected for onsite quantitative analysis of total petroleum hydrocarbons (TPH) and polycyclic aromatic hydrocarbons (PAH) in soil using the REDLAB UVF Hydrocarbon Analyzer. The analysis was performed onsite by Troy Holzschuh, a certified REDLAB UVF technician with Apex. The UVF results were generated concurrent with soil boring activities so that rapid assessment could be utilized for strategic boring placement.

3.6 Groundwater Sampling

Groundwater was not encountered on site.

4.0 SAMPLING RESULTS

4.1 Soil Sampling Results

Based on FID/PID field screening and onsite UVF hydrocarbon analysis from the March 2019 soil sampling there is no evidence of petroleum hydrocarbon contamination above NCDEQ Action Levels onsite within the area of investigation.

Elevated FID/PID readings, above ten parts per million (ppm), were not observed in the borings conducted at the site. The PID readings ranged from non-detectable to 8.7 ppm and the FID readings were non-detectable. The FID/PID field screening results are provided on the boring logs in **Appendix B**.

Soil concentrations of TPH gasoline range organics (GRO) and diesel range organics (DRO) measured using the onsite UVF unit are presented in **Table 1**, with instrument generated tables and chromatographs in **Appendix D**. **Figure 3** presents the TPH-GRO and TPH-DRO results at each boring. Based on the UVF analyses, TPH-GRO and TPH-DRO was identified in soils on

Parcel 1. TPH-GRO concentrations ranged from below detectable levels to 2.8 milligram per kilogram (mg/kg) (P1-SB2). TPH-DRO concentrations ranged from below detectable levels to 67.2 mg/kg (P1-SB3). TPH-GRO concentrations did not exceed the regulatory action level of 50 mg/kg and the TPH-DRO concentrations did not exceed the regulatory action level of 100 mg/kg.

4.2 Groundwater Sampling Results

Groundwater was not encountered on site.

5.0 CONCLUSIONS

Based on site observations and onsite UVF analysis, no petroleum-impacted soil contamination was identified above the NCDEQ Action level of 50 mg/kg for TPH-GRO or above the NCDEQ Action level of 100 mg/kg for TPH-DRO.

The following bulleted summary is based upon Apex's evaluation of field observations and onsite quantitative analyses of samples collected from the Site on June 8, 2017.

- Results of the geophysical survey did not produce evidence of anomalies characteristic of USTs.
- Five soil borings were advanced onsite. Soil samples collected from each boring were analyzed in the field using a REDLAB UVF Hydrocarbon Analyzer.
- Soil samples analyzed using the UVF did not contain either TPH-DRO or TPH-GRO concentrations above their respective NCDEQ Action levels of 100 mg/kg and 50 mg/kg.

6.0 RECOMMENDATIONS

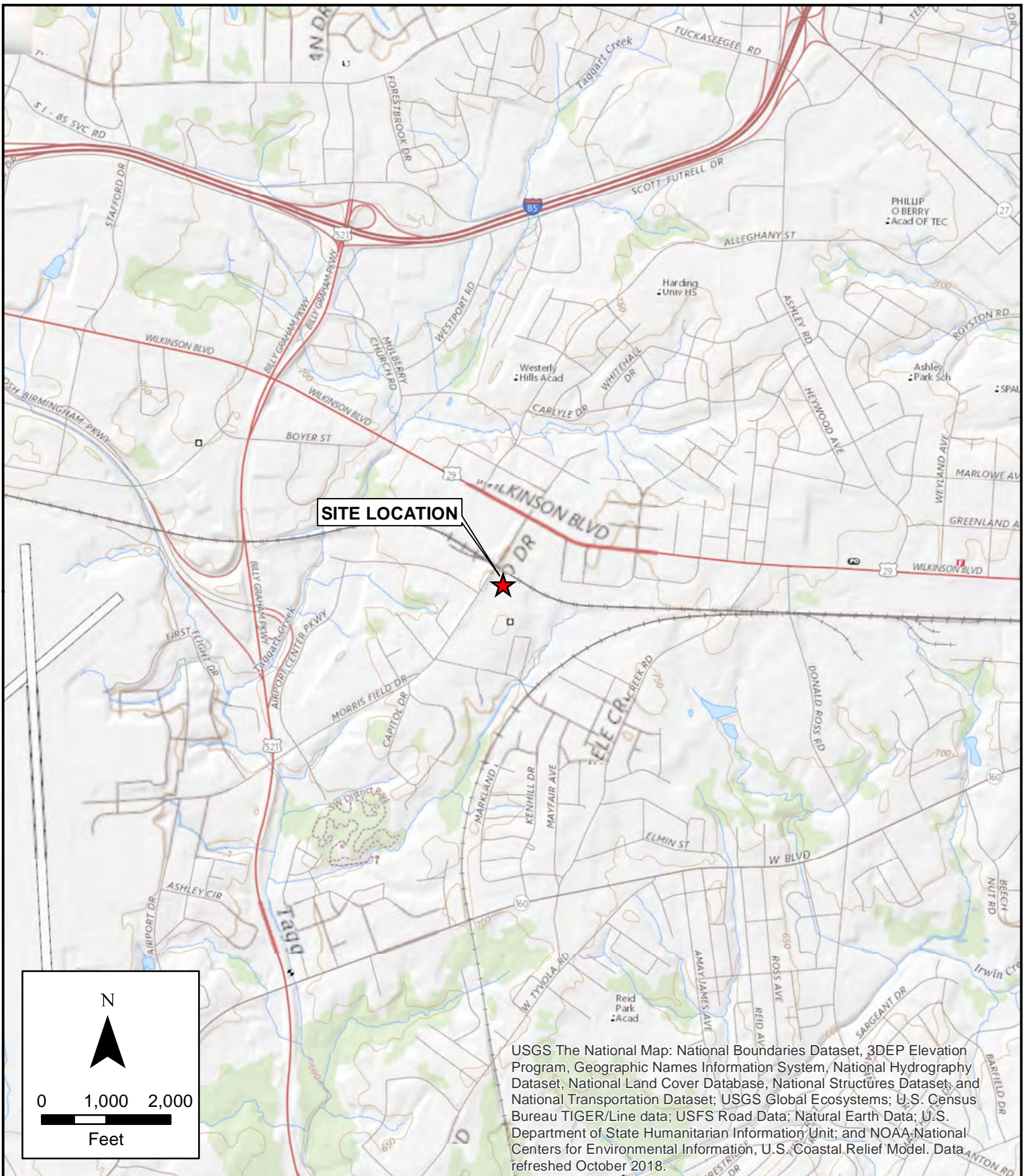
Based on these PSA results, Apex does not recommend further assessment or soil sampling in the area of investigation.

TABLES

Table 1
UVF Onsite Hydrocarbon Analytical Soil Data from March 2019
P-5705A, Parcel 1, RLF II East LLC Property
Charlotte, North Carolina

Sample ID	Sample Date	Sample Depth (ft bgs)	GRO (mg/kg) (C5-C10)	DRO (mg/kg) (C10-C35)
NCDEQ Action Level in mg/kg			50	100
P1-SB1 (4-5)	3/19/2019	4-5	<0.54	2
P1-SB1 (9-10)	3/19/2019	9-10	<0.58	0.11
P1-SB2 (4-5)	3/19/2019	4-5	<0.66	9.4
P1-SB2 (6-7)	3/19/2019	6-7	<0.49	2
P1-SB2 (12-13)	3/19/2019	12-13	2.8	1.1
P1-SB3 (4-5)	3/19/2019	4-5	<0.77	67.2
P1-SB3 (6-7)	3/19/2019	6-7	<0.68	4.3
P1-SB3 (12-13)	3/19/2019	12-13	<0.64	13.1
P1-SB4 (4-5)	3/19/2019	4-5	<0.52	0.61
P1-SB4 (9-10)	3/19/2019	9-10	<0.75	1.3
P1-SB5 (4-5)	3/19/2019	4-5	<0.65	46.9
P1-SB5 (9-10)	3/19/2019	9-10	<0.79	7.6
NOTES: (mg/kg) = Milligrams per kilogram GRO = Gasoline Range Organics DRO = Diesel Range Organics ft bgs = feet below ground surface TPH - GRO values in exceedance of NCDEQ Action Level of 50 mg/kg are shown in Bold TPH - DRO values in exceedance of NCDEQ Action Level of 100 mg/kg are shown in Bold				

FIGURES



CHECK BY: TH
DRAWN BY: SP
DATE: 3/27/19
SCALE: AS SHOWN
CAD NO.: NCDOT-003
PRJ NO.: NCDOT-003

SITE LOCATION MAP
PARCEL 1
4001 MORRIS FIELD DRIVE
CHARLOTTE, NORTH CAROLINA



FIGURE
1

GENUINE PARTS CO.
DB 2385 PG 547
DB 2996 PG 260
DB 3298 PG 187

SEECO REALTY II, LLC.
DB 30523 PG 743
MB 3 PG 192

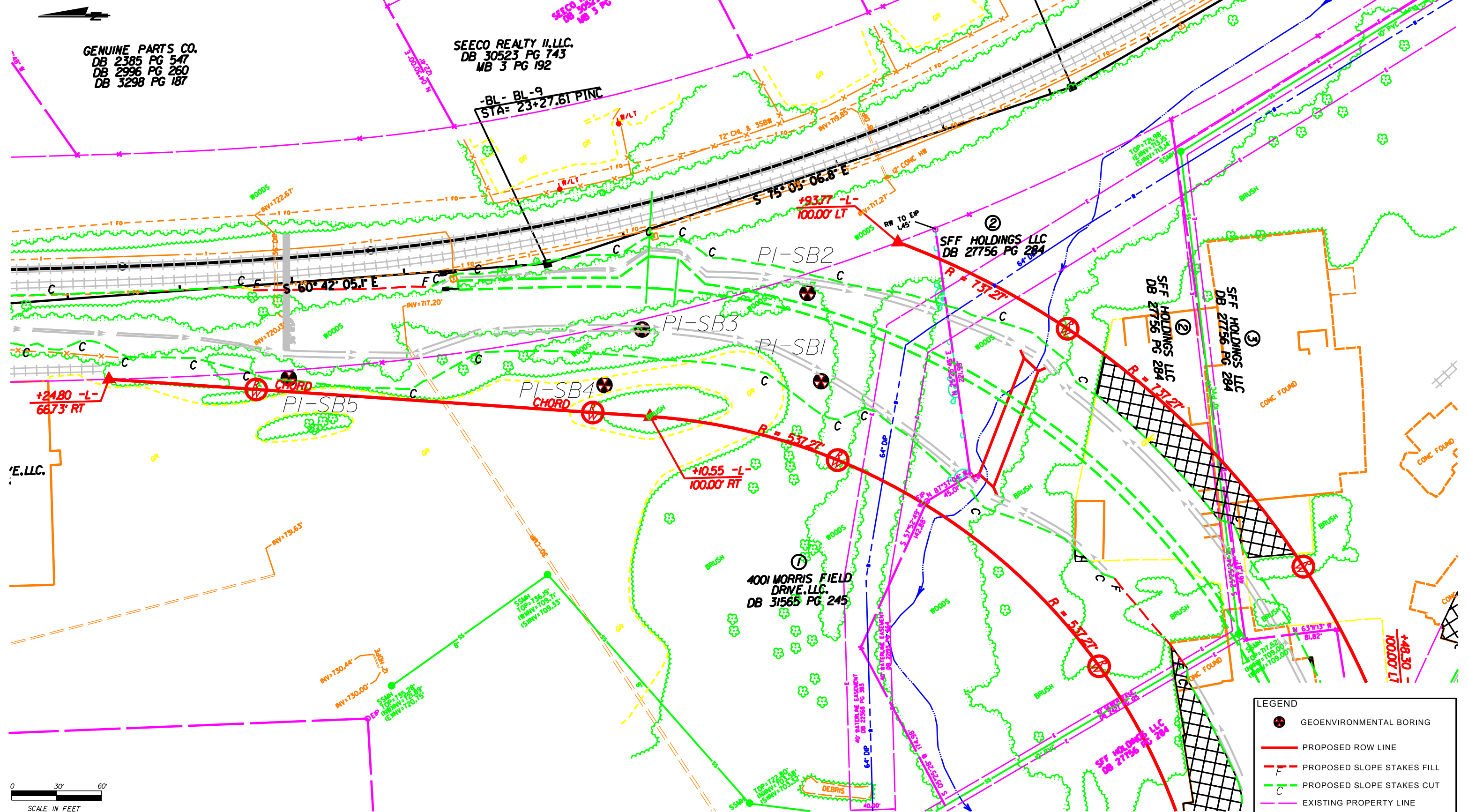
SFF HOLDINGS LLC
DB 27756 PG 284

SFF HOLDINGS LLC
DB 27756 PG 284

SFF HOLDINGS LLC
DB 27756 PG 284

400 MORRIS FIELD
DRIVE, LLC.
DB 31565 PG 245

SFF HOLDINGS LLC
DB 27756 PG 284



LEGEND	
	GEOENVIRONMENTAL BORING
	PROPOSED ROW LINE
	PROPOSED SLOPE STAKES FILL
	PROPOSED SLOPE STAKES CUT
	EXISTING PROPERTY LINE

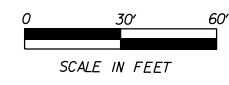
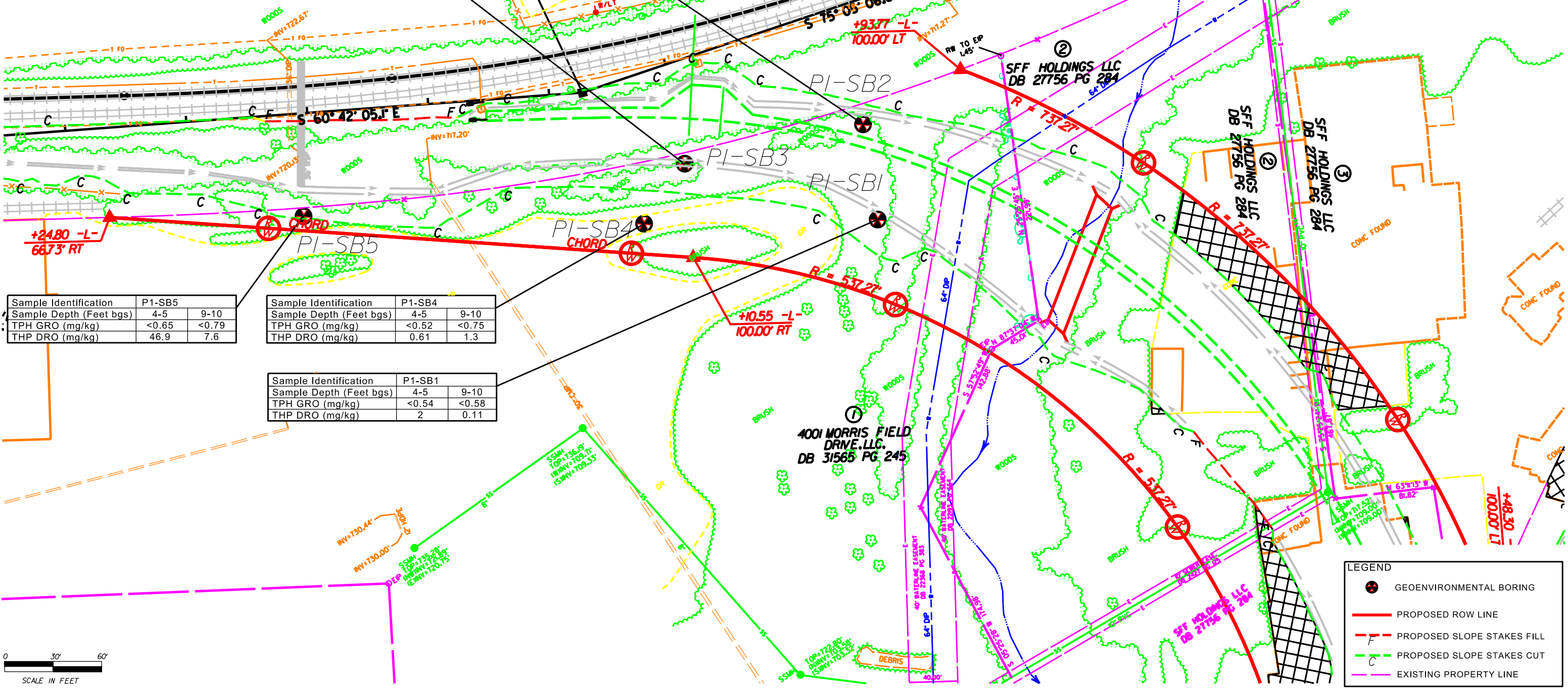


FIGURE 2
PARCEL 1
SITE MAP WITH SOIL BORING
LOCATIONS

Sample Identification	P1-SB2		
Sample Depth (Feet bgs)	4-5	6-7	12-13
TPH GRO (mg/kg)	<0.66	<0.49	2.8
THP DRO (mg/kg)	9.4	2	1.1

GENUINE PARTS CO.
DB 2385 PG 547
DB 2996 PG 260
DB 3298 PG 187

Sample Identification	P1-SB3		
Sample Depth (Feet bgs)	4-5	6-7	12-13
TPH GRO (mg/kg)	<0.77	<0.68	<0.64
THP DRO (mg/kg)	67.2	4.3	13.1



Sample Identification	P1-SB5	
Sample Depth (Feet bgs)	4-5	9-10
TPH GRO (mg/kg)	<0.65	<0.79
THP DRO (mg/kg)	46.9	7.6

Sample Identification	P1-SB4	
Sample Depth (Feet bgs)	4-5	9-10
TPH GRO (mg/kg)	<0.52	<0.75
THP DRO (mg/kg)	0.61	1.3

Sample Identification	P1-SB1	
Sample Depth (Feet bgs)	4-5	9-10
TPH GRO (mg/kg)	<0.54	<0.58
THP DRO (mg/kg)	2	0.11

LEGEND	
	GEOENVIRONMENTAL BORING
	PROPOSED ROW LINE
	PROPOSED SLOPE STAKES FILL
	PROPOSED SLOPE STAKES CUT
	EXISTING PROPERTY LINE

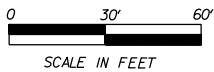


FIGURE 3
PARCEL 1
ONSITE UVF HYDROCARBON
ANALYSIS RESULTS

Date:	3/26/19	P5705a
Proj. #	NCDOT-003	
pc_1_fig 3.dgn		
CAD File:		Project Title:
1" = 80'	MJO	NC DOT
Approx. Scale:	Drawn by:	Client:

APPENDIX A
PHOTOGRAPH LOG



Photo 1

Overview of Parcel 1 prior to PSA activities.



Photo 2

View of investigation area prior to PSA activities.



Photo 3

Photo shows CSI hand clearing for utilities.



Photo 4

Photo shows CSI preparing to drill.

APPENDIX B
BORING LOGS



Apex Companies, LLC

Boring Log

Boring/Well No.: P1-SB1	Site Name: Parcel 1
Date: 3/19/2019	Location: Charlotte, Mecklenburg County, NC
Job No.: NCDOT-003	Sample Method: Hand Auger and Direct Push
Apex Rep: Troy Holzschuh	Drilling Method: Hand Auger and Direct Push
Drilling Company: Carolina Soil Investigations	Driller Name/Cert #: Danny Summers/2856

Remarks:

Depth (ft BLS)	FID Reading (ppm)	PID Reading (ppm)	Lab Sample ID	Soil/Lithologic Description
1	<0.1	<0.1		0-2' Orange, Clayey Silt, Moist
2				
3	<0.1	1.2		2-4' Brown, Clayey Silt, Moist
4				
5	<0.1	2.3	P1-SB1 (4-5)	4-6' Grey, Clayey Silt, Moist
6				
7	<0.1	<0.1		6-10' Orange and White, Marbled Silt, Dry
8				
9				
10			P1-SB1 (9-10)	
				Boring Terminated at 10 feet BGS
11				
12				
13				
14				

WELL CONSTRUCTION DETAILS (If Applicable)

Well Type/Diameter:	Outer Casing Interval:
Total Depth:	Outer Casing Diameter:
Screen Interval:	Bentonite Interval:
Sand Interval:	Slot Size:
Grout Interval:	Static Water Level:



Apex Companies, LLC

Boring Log

Boring/Well No.: P1-SB2	Site Name: Parcel 1
Date: 3/19/2019	Location: Charlotte, Mecklenburg County, NC
Job No.: NCDOT-003	Sample Method: Hand Auger and Direct Push
Apex Rep: Troy Holzschuh	Drilling Method: Hand Auger and Direct Push
Drilling Company: Carolina Soil Investigations	Driller Name/Cert #: Danny Summers/2856

Remarks:

Depth (ft BLS)	FID Reading (ppm)	PID Reading (ppm)	Lab Sample ID	Soil/Lithologic Description
1	<0.1	<0.1		0-2' Tan, Clayey Silt, Moist
2				
3	<0.1	<0.1		2-6' Orange, Clayey Silt, Moist
4				
5	<0.1	2.7	P1-SB2 (4-5)	
6				
7	<0.1	<0.1	P1-SB2 (6-7)	6-7' Grey, Clayey Silt, Moist'
8				
9	<0.1	<0.1		7-13' Yellow, Silt, Dry
10				
11	<0.1	<0.1		
12				
13			P1-SB2 (12-13)	
				Boring Terminated at 13 feet BGS
14				

WELL CONSTRUCTION DETAILS (If Applicable)

Well Type/Diameter:	Outer Casing Interval:
Total Depth:	Outer Casing Diameter:
Screen Interval:	Bentonite Interval:
Sand Interval:	Slot Size:
Grout Interval:	Static Water Level:



Apex Companies, LLC

Boring Log

Boring/Well No.: P1-SB3	Site Name: Parcel 1
Date: 3/19/2019	Location: Charlotte, Mecklenburg County, NC
Job No.: NCDOT-003	Sample Method: Hand Auger and Direct Push
Apex Rep: Troy Holzschuh	Drilling Method: Hand Auger and Direct Push
Drilling Company: Carolina Soil Investigations	Driller Name/Cert #: Danny Summers/2856

Remarks:

Depth (ft BLS)	FID Reading (ppm)	PID Reading (ppm)	Lab Sample ID	Soil/Lithologic Description
1	<0.1	<0.1		0-3' Tan, Silt, Moist
2				
3				
4	<0.1	8.7	P1-SB3 (4-5)	3-6' Brown, Clayey Silt, Moist
5				
6				
7	<0.1	2.7	P1-SB3 (6-7)	6-7' Grey, Clayey Silt, Moist'
8	<0.1	<0.1		7-13' Orange and Yellow, Marbled Silt, Dry
9				
10	<0.1	<0.1		
11				
12				
13	<0.1	4.5	P1-SB3 (12-13)	
				Boring Terminated at 13 feet BGS
14				

WELL CONSTRUCTION DETAILS (If Applicable)

Well Type/Diameter:	Outer Casing Interval:
Total Depth:	Outer Casing Diameter:
Screen Interval:	Bentonite Interval:
Sand Interval:	Slot Size:
Grout Interval:	Static Water Level:



Apex Companies, LLC

Boring Log

Boring/Well No.: P1-SB4	Site Name: Parcel 1
Date: 3/19/2019	Location: Charlotte, Mecklenburg County, NC
Job No.: NCDOT-003	Sample Method: Hand Auger and Direct Push
Apex Rep: Troy Holzschuh	Drilling Method: Hand Auger and Direct Push
Drilling Company: Carolina Soil Investigations	Driller Name/Cert #: Danny Summers/2856

Remarks:

Depth (ft BLS)	FID Reading (ppm)	PID Reading (ppm)	Lab Sample ID	Soil/Lithologic Description
1	<0.1	<0.1		0-2' Tan, Silt, Moist
2				
3	<0.1	0.15		2-6' Brown, Clayey Silt, Moist
4				
5			P1-SB4 (4-5)	
6				
7	<0.1	0.25		6-10' Orange, Clayey Silt, Moist
8				
9				
10			P1-SB4 (9-10)	
11				
12				
13				
14				

WELL CONSTRUCTION DETAILS (If Applicable)

Well Type/Diameter:	Outer Casing Interval:
Total Depth:	Outer Casing Diameter:
Screen Interval:	Bentonite Interval:
Sand Interval:	Slot Size:
Grout Interval:	Static Water Level:



Apex Companies, LLC

Boring Log

Boring/Well No.: P1-SB5	Site Name: Parcel 1
Date: 3/19/2019	Location: Charlotte, Mecklenburg County, NC
Job No.: NCDOT-003	Sample Method: Hand Auger and Direct Push
Apex Rep: Troy Holzschuh	Drilling Method: Hand Auger and Direct Push
Drilling Company: Carolina Soil Investigations	Driller Name/Cert #: Danny Summers/2856

Remarks:

Depth (ft BLS)	FID Reading (ppm)	PID Reading (ppm)	Lab Sample ID	Soil/Lithologic Description
1	<0.1	<0.1		0-5' Brown, Clayey Silt, Moist
2				
3	<0.1	5.1		
4				
5			P1-SB5 (4-5)	
6	<0.1	<0.1		5-7' Orange, Clayey Silt, Moist
7				
8	<0.1	0.9		7-10' Tan, Silt, Dry
9				
10			P1-SB5 (9-10)	
				Boring Terminated at 10 feet BGS
11				
12				
13				
14				

WELL CONSTRUCTION DETAILS (If Applicable)

Well Type/Diameter:	Outer Casing Interval:
Total Depth:	Outer Casing Diameter:
Screen Interval:	Bentonite Interval:
Sand Interval:	Slot Size:
Grout Interval:	Static Water Level:

APPENDIX C
GEOPHYSICAL REPORT



December 21, 2018

Ms. Katie Lippard
Apex Companies, LLC
1071 Pemberton Hill Rd, Ste 203
Apex, NC 27502

Reference: REPORT ON GEOPHYSICAL SERVICES FOR PARCEL 1 – REVISION 1
4001 Morris Field Dr. LLC Property
4001 Morris Field Dr., Charlotte NC
ESP Project No. EO73.302

State Project: P-5705A
WBS Element: 44475.1.1
County: Mecklenburg
Description: Charlotte Wye Track Improvements

Dear Ms. Lippard:

ESP Associates, Inc. (ESP) is pleased to present this report to Apex Companies, LLC (Apex) on the geophysical services we provided for the referenced project. This work was performed under our subconsultant agreement dated March 29, 2015 and in accordance with our cost proposal to you dated May 24, 2018.

1.0 UTILITY DESIGNATION

ESP contacted NC811 to determine which utilities were listed as having facilities in the project location and then contacted the utility companies to request copies of their facility records. On June 25 and 28, 2018, ESP performed inductive sweeps and GPR scans in order to designate and attempt to identify unknown utility lines. The results did not indicate buried utility lines in the accessible areas of Parcel 1. A sketch of the results is provided in Appendix A, following by relative information from the utility companies.

2.0 GEOPHYSICAL DATA COLLECTION

On June 21, 2018, ESP performed geophysical studies within the accessible areas of the proposed easements of Parcel 1 located at 4001 Morris Field Dr. in Charlotte, North Carolina. Parcel 1 is currently occupied by a pallet company. The work consisted of metal detection using a Geonics EM61 MK2 instrument. Representative photographs of the geophysical study areas are provided on Figure 1.

The EM61 data were collected over the accessible areas of the site using a line spacing of approximately 3 feet. We were unable to collect geophysical data in the areas occupied by trailers and in the heavily wooded area north of the fence. 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.

3.0 GEOPHYSICAL DATA ANALYSIS AND PRESENTATION

The EM61 data were gridded and contoured to produce plan view contour maps of the early time gate response (Figure 2) and the differential response (Figure 3). 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. 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. Therefore, the above mentioned figures 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 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 4 and 5). The legend for the NCDOT line types and symbols is shown on Figure 6.

4.0 DISCUSSION OF GEOPHYSICAL RESULTS

The EM61 differential contour plot indicates high amplitude responses (anomalies) that correspond to the fence on the north side of the site, numerous parked trailers, and a few miscellaneous metallic features on the ground surface. The EM61 differential data did not show anomalies that would indicate unknown buried metallic objects. Since there were no significant EM61 differential anomalies, there was no need to perform ground-penetrating radar (GPR) imaging on this parcel.

5.0 SUMMARY AND CONCLUSIONS

Our review of the geophysical data collected for this project does not indicate the presence of possible USTs or buried metal drums in the geophysical study area. Please note that the presence of numerous parked trailers and heavy brush prevented us from collecting geophysical data in some areas.

6.0 LIMITATIONS

These services have been provided to Apex 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. Also, due to the nature of utility installation, site conditions, and limitations of equipment, the results of the utility designation may not indicate all utilities within the project area.

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

Sincerely,

ESP ASSOCIATES, Inc.



Edward D. Billington, PG

EDB/DMN/PLD

Attachments: Figures 1 – 6
Appendix A (Utility Designation Sketch and Relevant Information)



A. Photo from center of site, looking west.



B. Photo from east side of site, looking west.



C. Photo from west side of site, looking east.



D. Photo showing fence on north side of site.

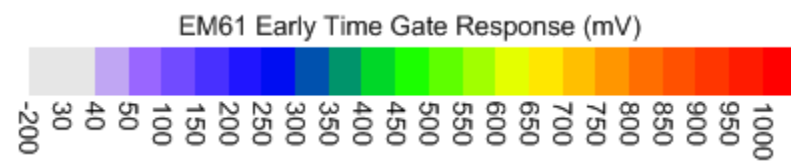
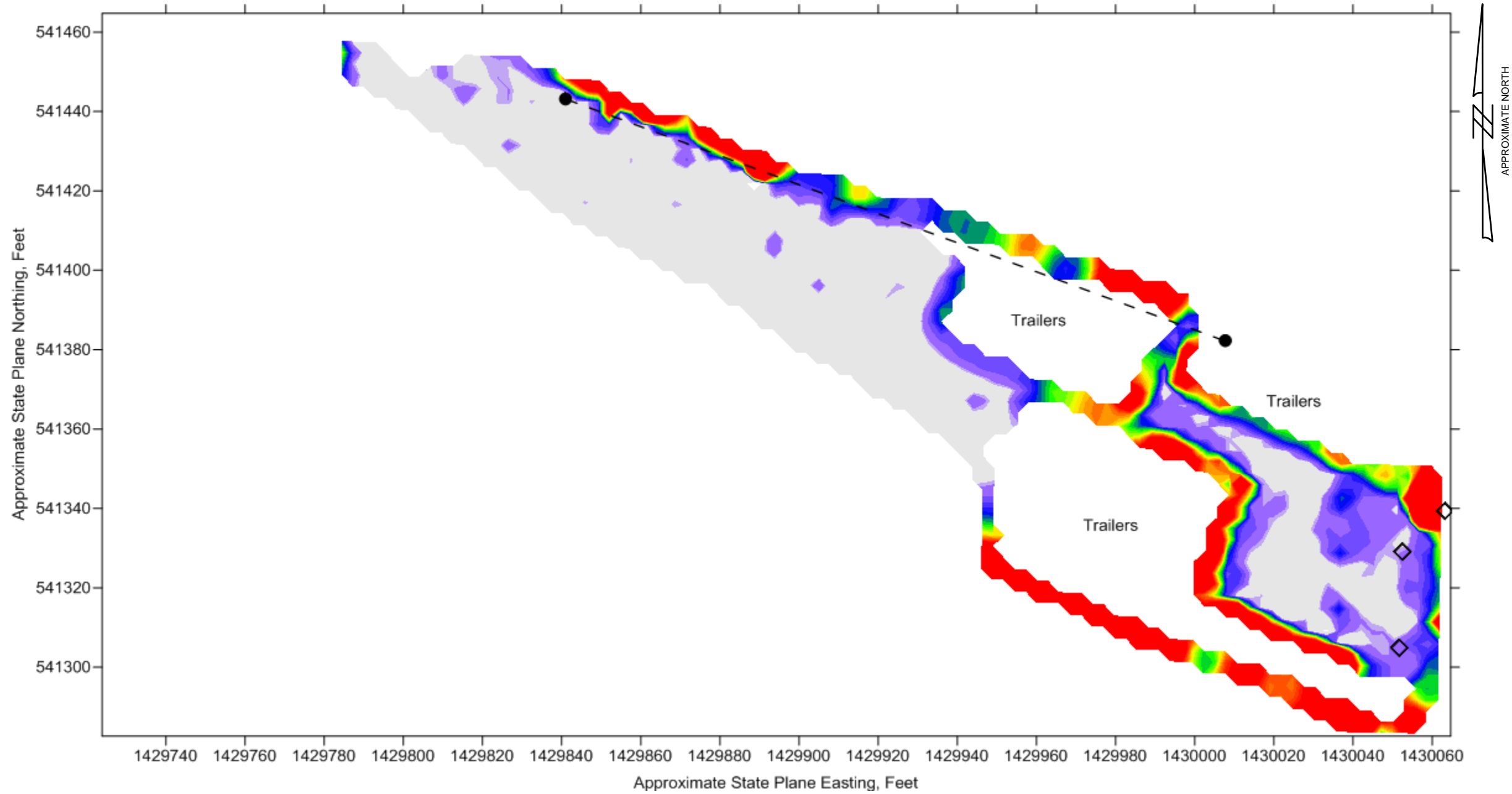
PROJECT NO.	EO73.302
SCALE	NTS
DATE	7/18/18
BY	DMN/EDB

**FIGURE 1 – PARCEL 1
PHOTOS OF SITE**

**P-5705A, CHARLOTTE WYE TRACK IMPROVEMENTS
MECKLENBURG COUNTY, NORTH CAROLINA**



ESP Associates, Inc.
7011 Albert Pick Rd.,
Suite E
Greensboro, NC 27409
336.334.7724
www.espassociates.com



EXPLANATION	
	Fence and fencepost
	Miscellaneous metal objects on ground surface
	EM61 data collection areas

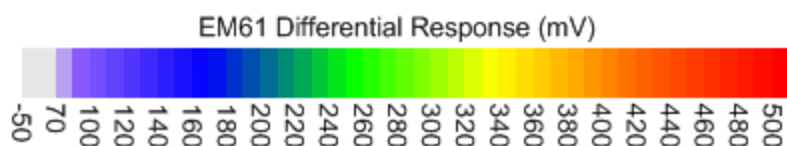
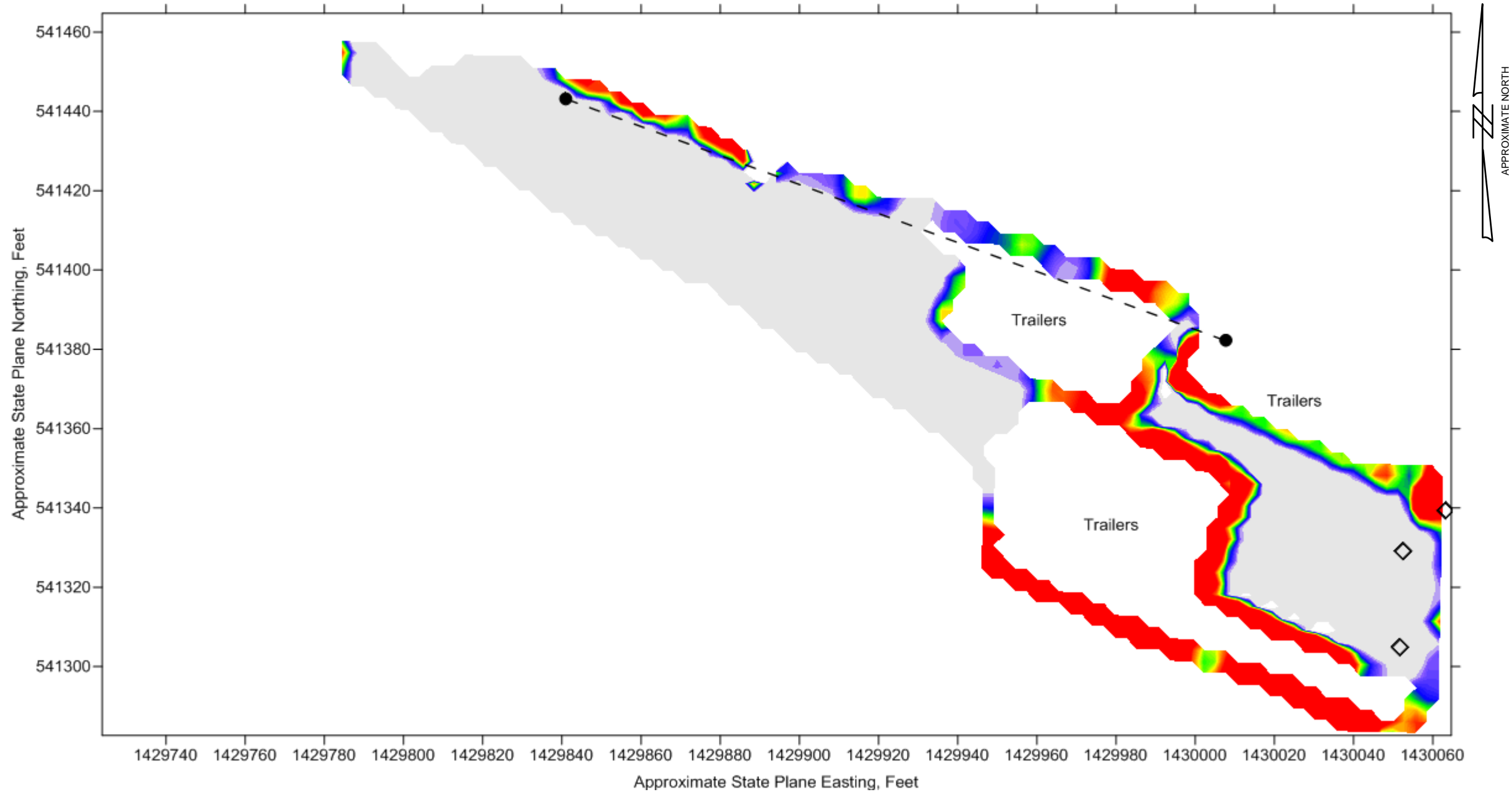
Note: Locations of data and features are approximate and were collected using a DGPS instrument. ESP make no guarantees as to the accuracy of these locations. Coordinates on the axes of the maps are approximate and provided for general reference only.

PROJECT NO.	EO73.302
SCALE	AS SHOWN
DATE	7/18/18
BY	DMN/EDB

FIGURE 2 – PARCEL 1 EM61 EARLY TIME GATE RESPONSE
P-5705A, CHARLOTTE WYE TRACK IMPROVEMENTS MECKLENBURG COUNTY, NORTH CAROLINA



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EXPLANATION	
	Fence and fencepost
	Miscellaneous metal objects on ground surface
	EM61 data collection areas

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.

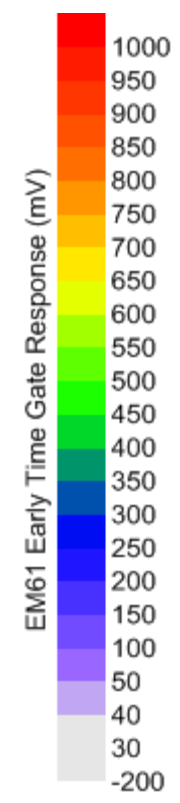
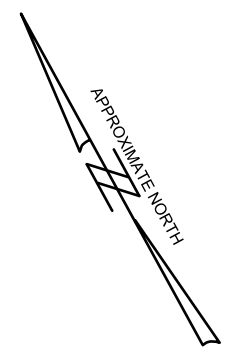
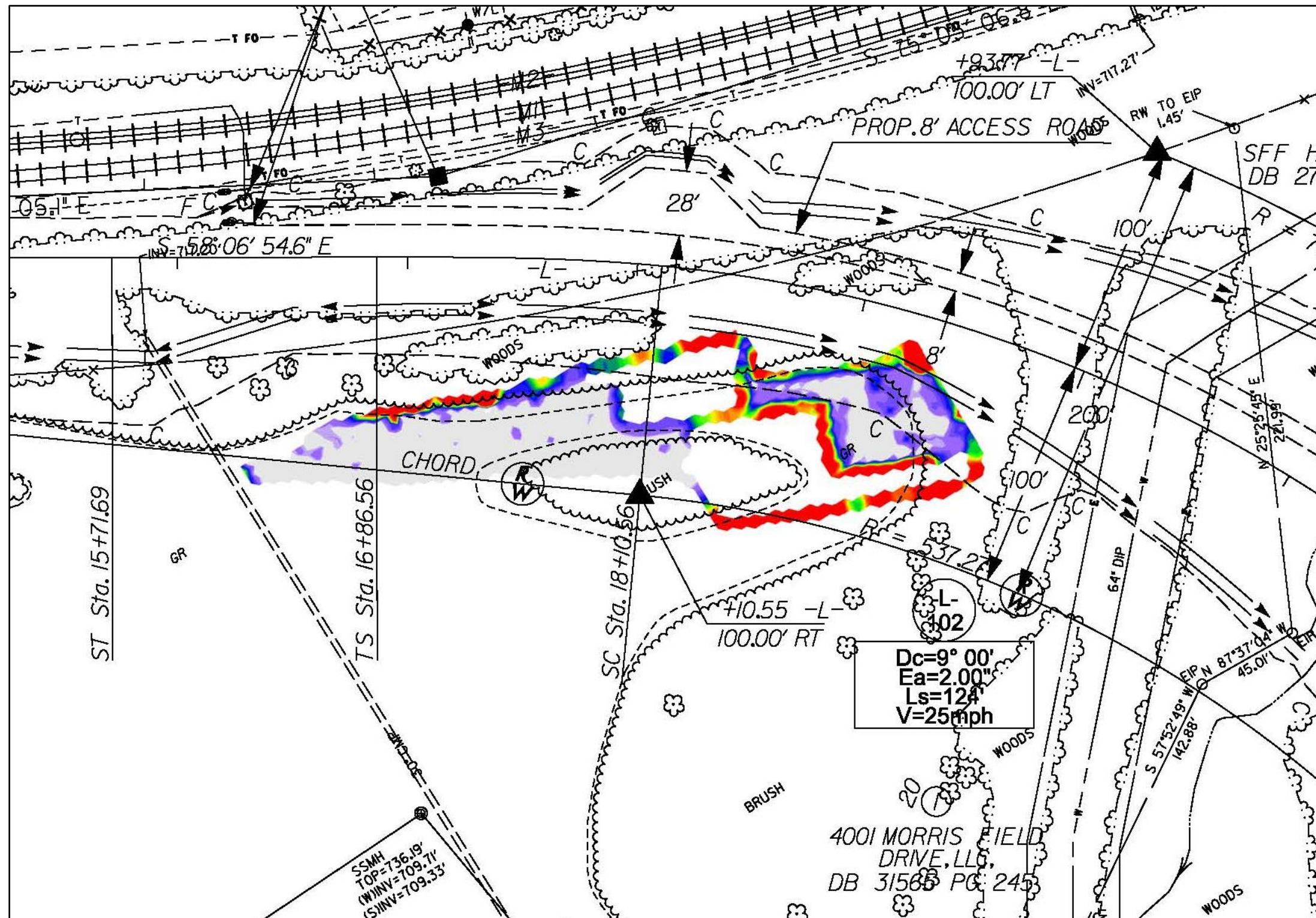
PROJECT NO.	EO73.302
SCALE	AS SHOWN
DATE	7/18/18
BY	DMN/EDB

FIGURE 3 – PARCEL 1
EM61 DIFFERENTIAL RESPONSE

P-5705A, CHARLOTTE WYE TRACK IMPROVEMENTS
MECKLENBURG COUNTY, NORTH CAROLINA



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Greensboro, NC 27409
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List of NCDOT reference files

- p5705a_r_dsn.dgn
- p5705a_ncdot_fs.dgn
- p5705a_r_ss.dgn
- p5705a_r_row.dgn
- p5705a_r_aln.dgn

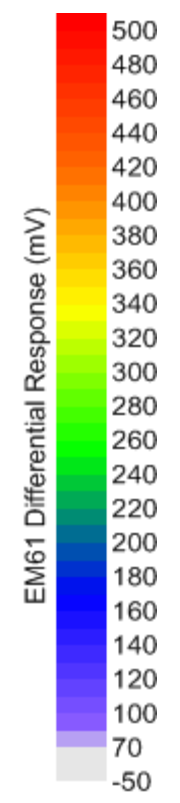
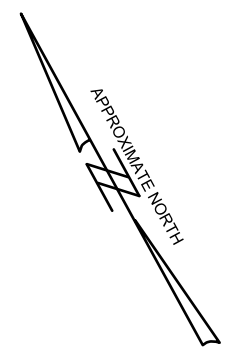
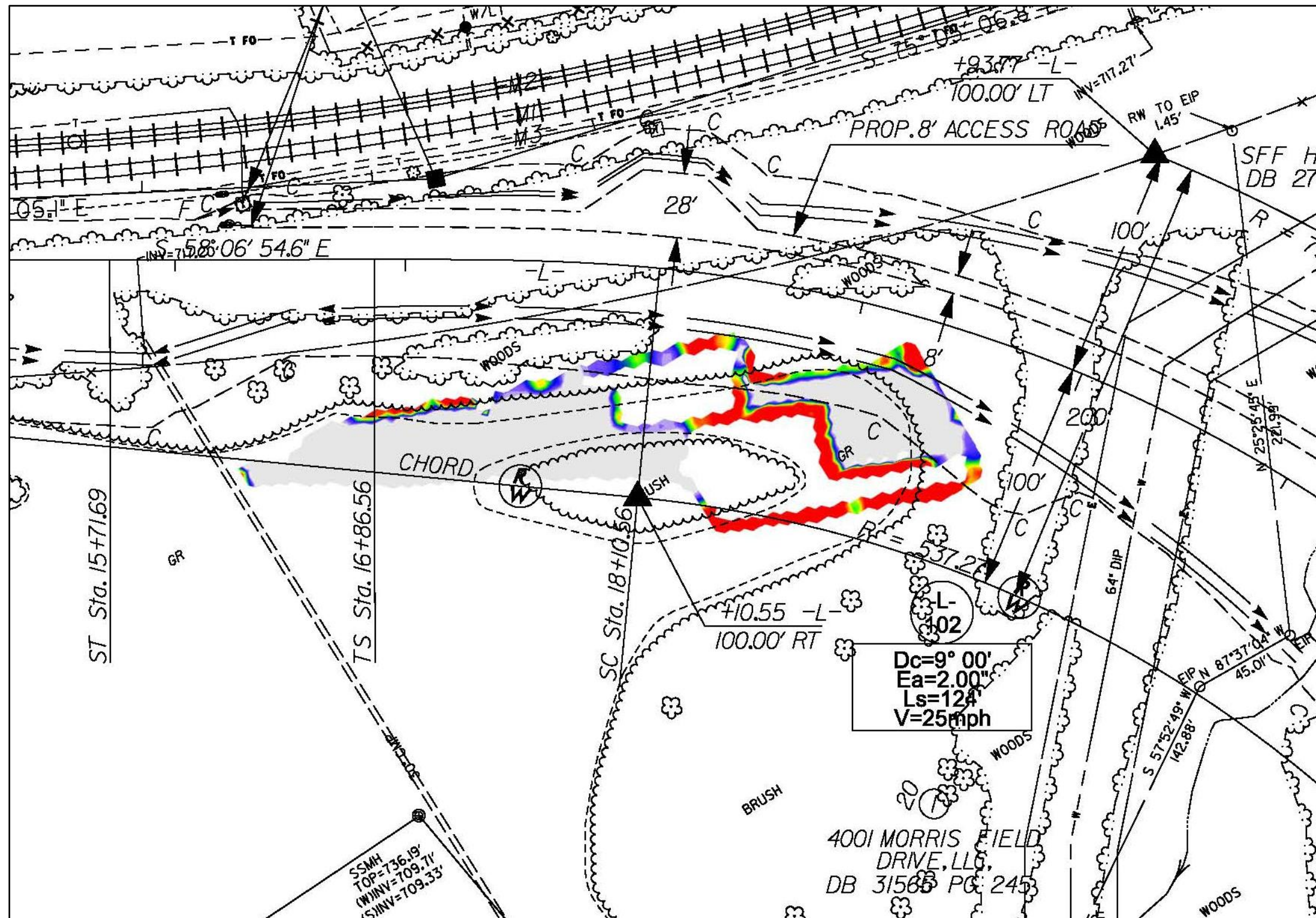
See Figure 6 for explanation of symbols and line types

PROJECT NO.	EO73.302
SCALE	1" = 50'
DATE	7/18/18
BY	DMN/EDB

FIGURE 4 – PARCEL 1
EM61 EARLY TIME GATE RESPONSE ON PLAN SHEET
P-5705A, CHARLOTTE WYE TRACK IMPROVEMENTS
MECKLENBURG COUNTY, NORTH CAROLINA



ESP Associates, Inc.
 7011 Albert Pick Rd.,
 Suite E
 Greensboro, NC 27409
 336.334.7724
 www.espassociates.com



List of NCDOT reference files

- p5705a_r_dsn.dgn
- p5705a_ncdot_fs.dgn
- p5705a_r_ss.dgn
- p5705a_r_row.dgn
- p5705a_r_aln.dgn

See Figure 6 for explanation of symbols and line types

PROJECT NO.	EO73.302
SCALE	1" = 50'
DATE	7/18/18
BY	DMN/EDB

FIGURE 5 – PARCEL 1
EM61 DIFFERENTIAL RESPONSE ON PLAN SHEET
P-5705A, CHARLOTTE WYE TRACK IMPROVEMENTS
MECKLENBURG COUNTY, NORTH CAROLINA



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 7011 Albert Pick Rd., Suite E
 Greensboro, NC 27409
 336.334.7724
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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—x—
Proposed Woven Wire Fence	—•—•—•—
Proposed Chain Link Fence	—□—□—□—
Proposed Barbed Wire Fence	—◇—◇—◇—
Existing Wetland Boundary	—w—w—w—
Proposed Wetland Boundary	—w—w—w—
Existing Endangered Animal Boundary	—a—
Existing Endangered Plant Boundary	—p—
Existing Historic Property Boundary	—h—
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	—s—

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—
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 C/A 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.	EO73.302
SCALE	N/A
DATE	7/18/18
BY	DMN/EDB

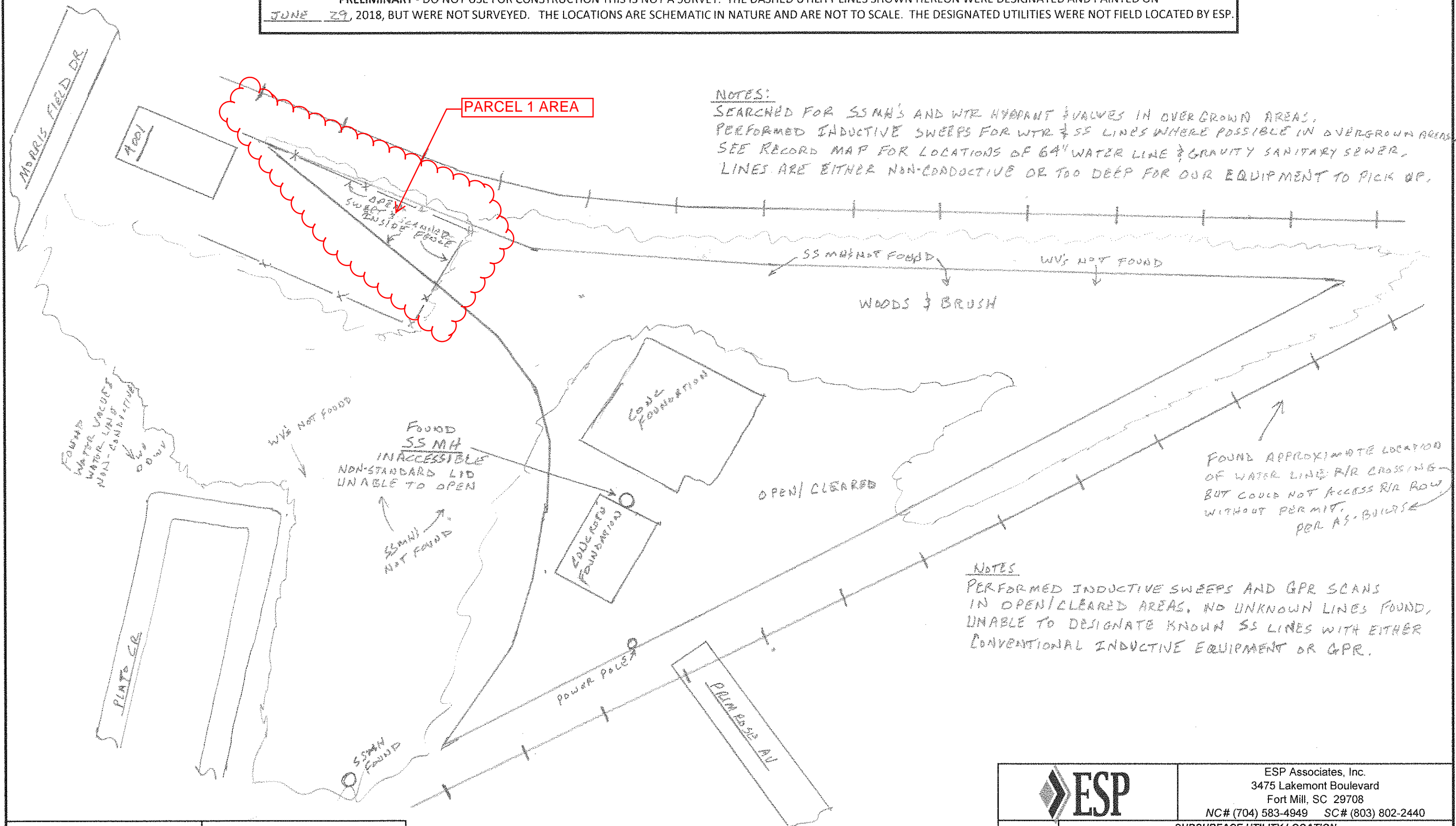
FIGURE 6
LEGEND FOR PLAN SHEET FIGURES
P-5705A, CHARLOTTE WYE TRACK IMPROVEMENTS
MECKLENBURG COUNTY, NORTH CAROLINA



ESP Associates, Inc.
7011 Albert Pick Rd.,
Suite E
Greensboro, NC 27409
336.334.7724
www.espassociates.com

**APPENDIX A
UTILITY DESIGNATION**

PRELIMINARY - DO NOT USE FOR CONSTRUCTION THIS IS NOT A SURVEY. THE DASHED UTILITY LINES SHOWN HEREON WERE DESIGNATED AND PAINTED ON JUNE 29, 2018, BUT WERE NOT SURVEYED. THE LOCATIONS ARE SCHEMATIC IN NATURE AND ARE NOT TO SCALE. THE DESIGNATED UTILITIES WERE NOT FIELD LOCATED BY ESP.



NOTES:
 SEARCHED FOR SS MH'S AND WTR HYDRANT & VALVES IN OVERGROWN AREAS.
 PERFORMED INDUCTIVE SWEEPS FOR WTR & SS LINES WHERE POSSIBLE IN OVERGROWN AREAS.
 SEE RECORD MAP FOR LOCATIONS OF 64" WATER LINE & GRAVITY SANITARY SEWER.
 LINES ARE EITHER NON-CONDUCTIVE OR TOO DEEP FOR OUR EQUIPMENT TO PICK UP.

NOTES
 PERFORMED INDUCTIVE SWEEPS AND GPR SCANS IN OPEN/CLEARED AREAS. NO UNKNOWN LINES FOUND, UNABLE TO DESIGNATE KNOWN SS LINES WITH EITHER CONVENTIONAL INDUCTIVE EQUIPMENT OR GPR.

QUALITY CONTROL CHECK	SURVEYING AND MAPPING
PERFORMED BY: <u>TW/DP</u>	PERFORMED BY: <u>N/A</u>
DATE CHECKED: <u>6-29-18</u>	DATE CHECKED: <u>N/A</u>

	ESP Associates, Inc. 3475 Lakemont Boulevard Fort Mill, SC 29708 NC# (704) 583-4949 SC# (803) 802-2440
	SUBSURFACE UTILITY LOCATION SKETCH
2018	PROJECT NAME: <u>APEX ROAD 7-5705A</u> PROJECT Number: <u>ED73.302</u> Sheet <u>1</u> of <u>1</u>

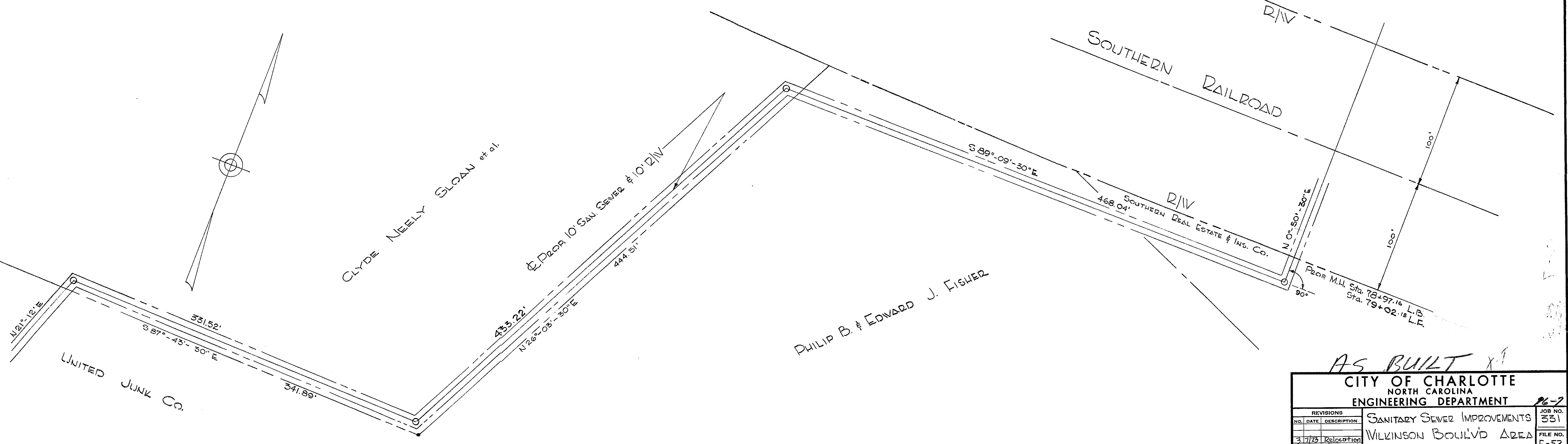
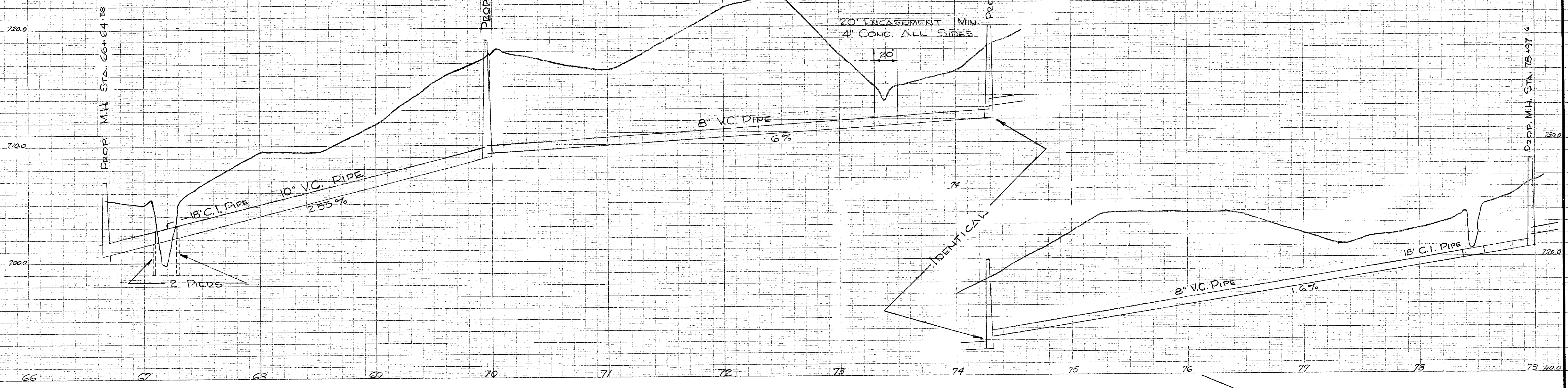


Project: <PROJECT NAME>

 Map Number: 1

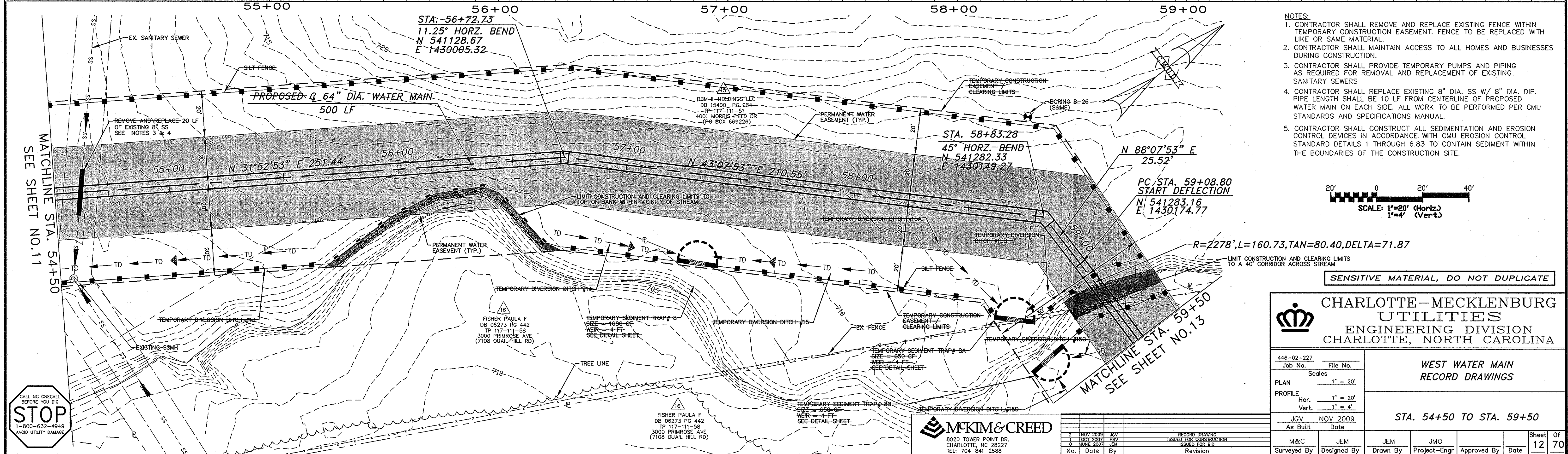
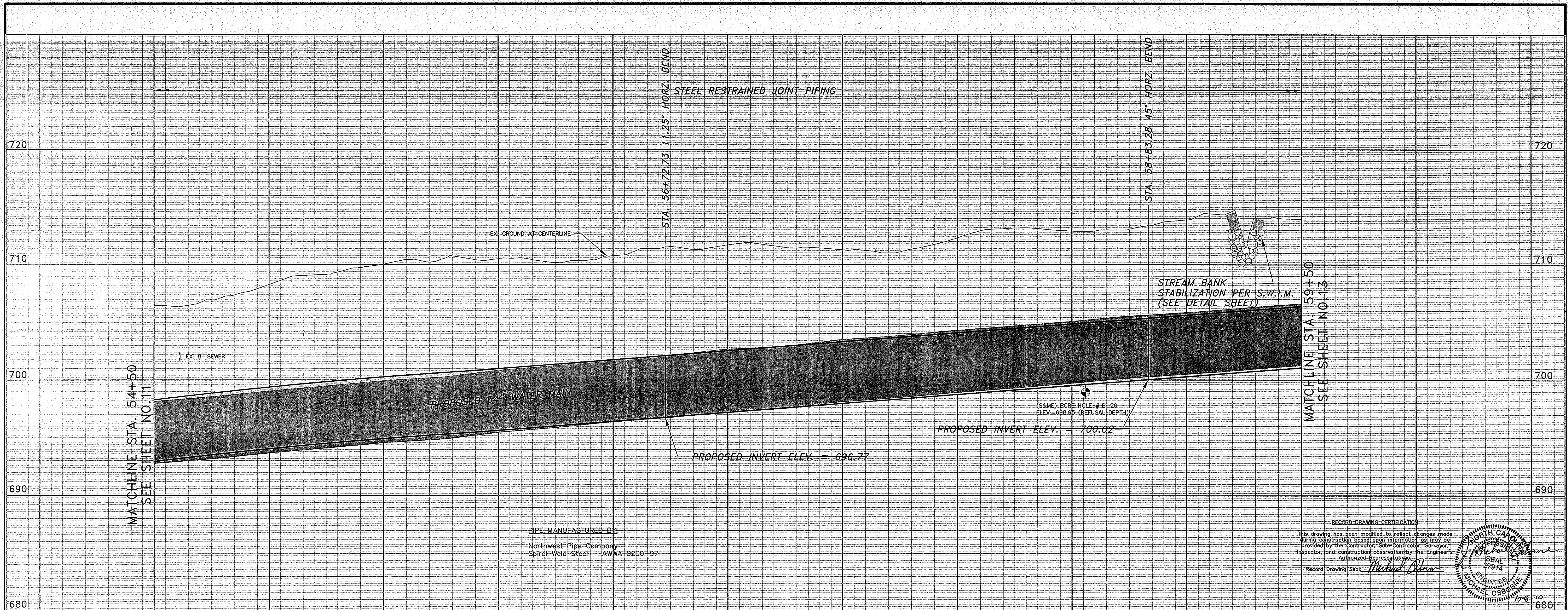
Created By: Abe Collins
 Technology Services - GIS Group
 6/15/2018

Charlotte Water geographic data and other records are provided for general information purposes only. While Charlotte Water makes every effort to confirm the accuracy of information, it does not warrant nor guarantee information provided is accurate, current or complete. Charlotte Water assumes no responsibility for the consequences of inappropriate uses or misinterpretations of released data.

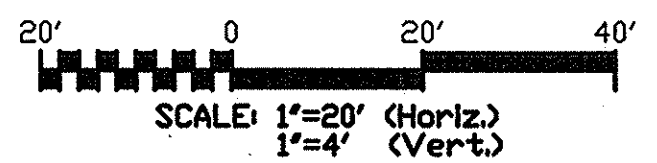


AS BUILT

CITY OF CHARLOTTE		JOB NO. 331
NORTH CAROLINA ENGINEERING DEPARTMENT		
REVISIONS	SANITARY SEWER IMPROVEMENTS	FILE NO. E-52
NO. DATE DESCRIPTION	WILKINSON BOULV'D AREA	SHEET 14
DRAWN BY SHAW	FROM STA. 66+64.38 TO STA. 79+02.15	OF 17
CHECKED BY CDR	WILKINSON BOULV'D TRUNK	DATE JULY 22, 1965
CITY ENGINEER	SCALE 1"=40'	



- NOTES:**
- CONTRACTOR SHALL REMOVE AND REPLACE EXISTING FENCE WITHIN TEMPORARY CONSTRUCTION EASEMENT. FENCE TO BE REPLACED WITH LIKE OR SAME MATERIAL.
 - CONTRACTOR SHALL MAINTAIN ACCESS TO ALL HOMES AND BUSINESSES DURING CONSTRUCTION.
 - CONTRACTOR SHALL PROVIDE TEMPORARY PUMPS AND PIPING AS REQUIRED FOR REMOVAL AND REPLACEMENT OF EXISTING SANITARY SEWERS.
 - CONTRACTOR SHALL REPLACE EXISTING 8" DIA. SS W/ 8" DIA. DIP. PIPE LENGTH SHALL BE 10 LF FROM CENTERLINE OF PROPOSED WATER MAIN ON EACH SIDE. ALL WORK TO BE PERFORMED PER CMU STANDARDS AND SPECIFICATIONS MANUAL.
 - CONTRACTOR SHALL CONSTRUCT ALL SEDIMENTATION AND EROSION CONTROL DEVICES IN ACCORDANCE WITH CMU EROSION CONTROL STANDARD DETAILS 1 THROUGH 6.83 TO CONTAIN SEDIMENT WITHIN THE BOUNDARIES OF THE CONSTRUCTION SITE.



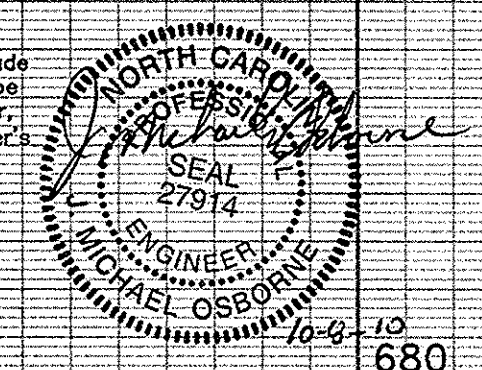
SENSITIVE MATERIAL, DO NOT DUPLICATE

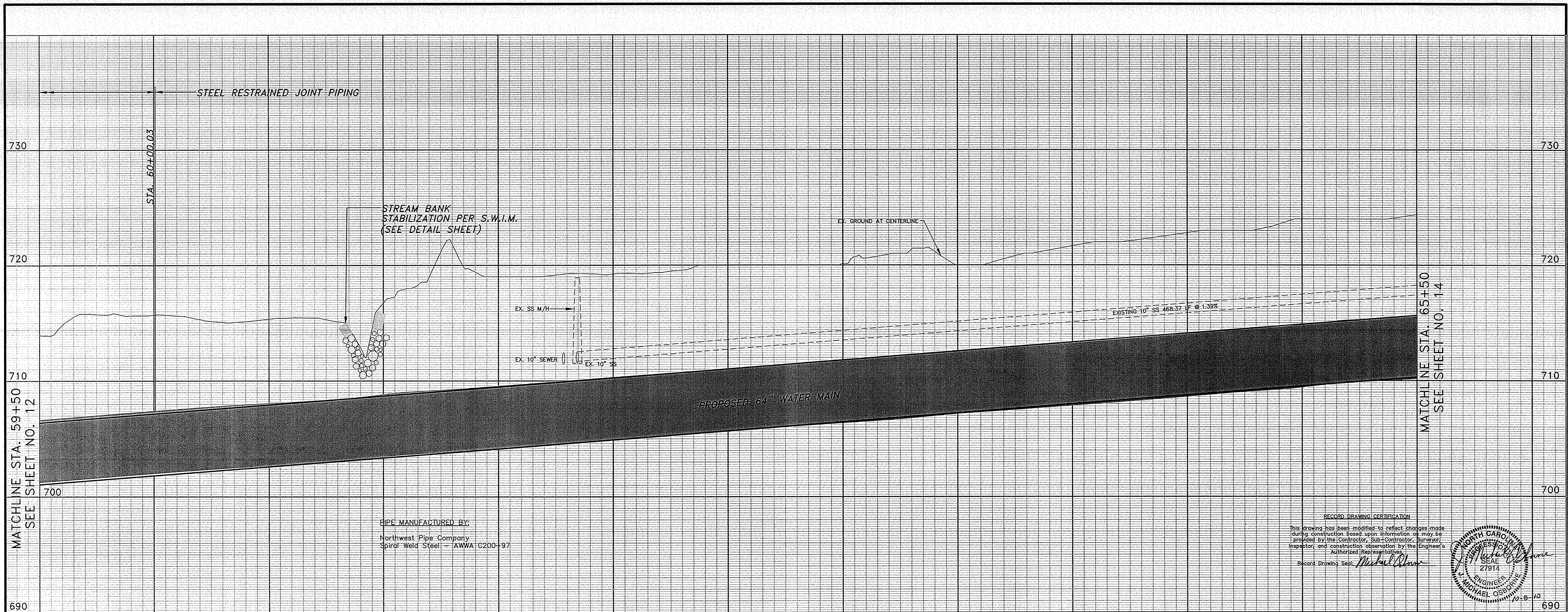
CHARLOTTE-MECKLENBURG UTILITIES
 ENGINEERING DIVISION
 CHARLOTTE, NORTH CAROLINA

446-02-227 Job No.	File No.	WEST WATER MAIN RECORD DRAWINGS	
PLAN	Scale: 1" = 20'		
PROFILE	Hor. 1" = 20' Vert. 1" = 4'		
JGV As Built	NOV 2009 Date	STA. 54+50 TO STA. 59+50	
M&C Surveyed By	JEM Designed By	JEM Drawn By	JMO Project-Engr
		Approved By	
		Date	
		Sheet 12 Of 70	

MCKIM & CREED
 8020 TOWER POINT DR.
 CHARLOTTE, NC 28227
 TEL: 704-841-2589

NOV 2009	JGV	RECORD DRAWING
OCT 2007	JGV	ISSUED FOR CONSTRUCTION
JUN 2007	JGV	ISSUED FOR BID
No.	Date	By
		Revision





MATCHLINE STA. 59+50
SEE SHEET NO. 12

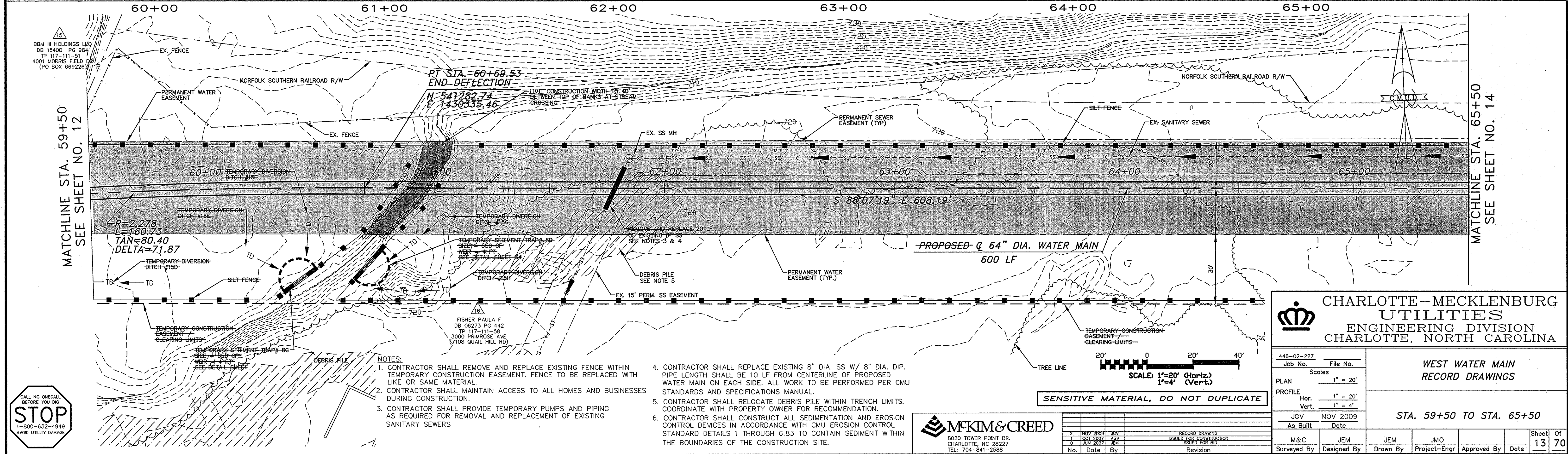
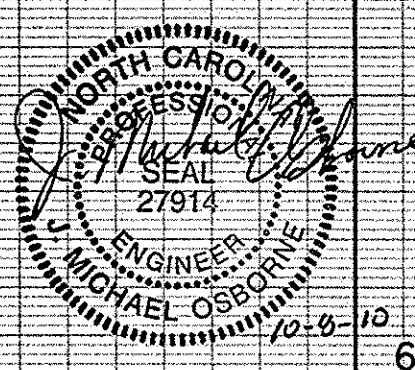
MATCHLINE STA. 65+50
SEE SHEET NO. 14

STREAM BANK
STABILIZATION PER S.W.I.M.
(SEE DETAIL SHEET)

PROPOSED 64" WATER MAIN

PIPE MANUFACTURED BY:
Northwest Pipe Company
Spiral Weld Steel - AWWA C200-97

RECORD DRAWING CERTIFICATION
This drawing has been modified to reflect changes made during construction based upon information provided by the Contractor, Sub-Contractor, Surveyor, Inspector and construction observation by the Engineer's Authorized Representative.
Record Drawing Seal: *Michael Obbrien*



MATCHLINE STA. 59+50
SEE SHEET NO. 12

MATCHLINE STA. 65+50
SEE SHEET NO. 14

PT STA. 60+69.53
END DEFLECTION
N 54°28'27.4"
E 145°03'39.46"

PROPOSED 64" DIA. WATER MAIN
600 LF

- NOTES:
- CONTRACTOR SHALL REMOVE AND REPLACE EXISTING FENCE WITHIN TEMPORARY CONSTRUCTION EASEMENT. FENCE TO BE REPLACED WITH LIKE OR SAME MATERIAL.
 - CONTRACTOR SHALL MAINTAIN ACCESS TO ALL HOMES AND BUSINESSES DURING CONSTRUCTION.
 - CONTRACTOR SHALL PROVIDE TEMPORARY PUMPS AND PIPING AS REQUIRED FOR REMOVAL AND REPLACEMENT OF EXISTING SANITARY SEWERS
 - CONTRACTOR SHALL REPLACE EXISTING 8" DIA. SS W/ 8" DIA. DIP. PIPE LENGTH SHALL BE 10 LF FROM CENTERLINE OF PROPOSED WATER MAIN ON EACH SIDE. ALL WORK TO BE PERFORMED PER CMU STANDARDS AND SPECIFICATIONS MANUAL.
 - CONTRACTOR SHALL RELOCATE DEBRIS PILE WITHIN TRENCH LIMITS. COORDINATE WITH PROPERTY OWNER FOR RECOMMENDATION.
 - CONTRACTOR SHALL CONSTRUCT ALL SEDIMENTATION AND EROSION CONTROL DEVICES IN ACCORDANCE WITH CMU EROSION CONTROL STANDARD DETAILS 1 THROUGH 6.83 TO CONTAIN SEDIMENT WITHIN THE BOUNDARIES OF THE CONSTRUCTION SITE.

SCALE: 1"=20' (Horiz.)
1"=4' (Vert.)

SENSITIVE MATERIAL, DO NOT DUPLICATE

MCKIM & CREED
8020 TOWER POINT DR.
CHARLOTTE, NC 28227
TEL: 704-841-2689

No.	Date	By	Revision
2	NOV 2009	JGV	RECORD DRAWING
1	OCT 2009	ASV	ISSUED FOR CONSTRUCTION
0	JUN 2009	SEN	ISSUED FOR BID

CHARLOTTE-MECKLENBURG UTILITIES
ENGINEERING DIVISION
CHARLOTTE, NORTH CAROLINA

446-02-227 File No.
Job No. Scales 1" = 20'

PLAN

PROFILE Hor. 1" = 20' Vert. 1" = 4'

JGV NOV 2009 Date
As Built

M&C JEM JEM JMO
Surveyed By Designed By Drawn By Project-Engr

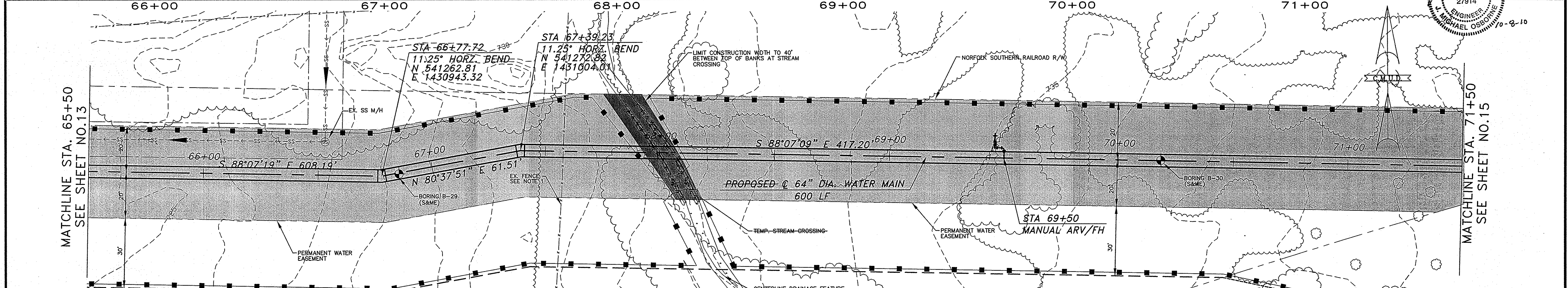
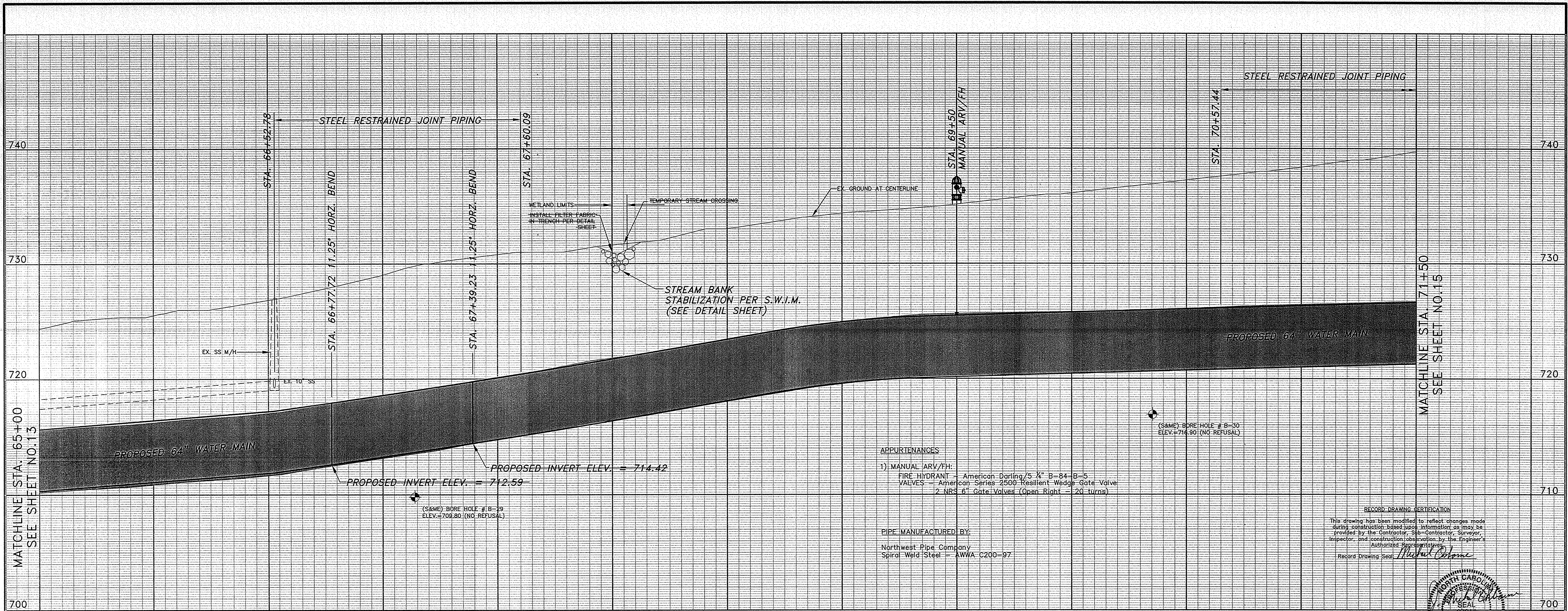
Approved By Date

WEST WATER MAIN
RECORD DRAWINGS

STA. 59+50 TO STA. 65+50

Sheet 13 of 70





NOTES:

- CONTRACTOR SHALL REMOVE AND REPLACE EXISTING FENCE WITHIN TEMPORARY CONSTRUCTION EASEMENT. FENCE TO BE REPLACED WITH LIKE OR SAME MATERIAL.
- CONTRACTOR SHALL MAINTAIN ACCESS TO ALL HOMES AND BUSINESSES DURING CONSTRUCTION.
- CONTRACTOR SHALL LIMIT AREA OF DISTURBANCE TO 40' WIDE ON EITHER SIDE OF WETLANDS AND STREAM CROSSINGS.
- CONTRACTOR SHALL MAINTAIN SS LINE SERVICE AT ALL TIMES.
- CONTRACTOR SHALL CONSTRUCT ALL SEDIMENTATION AND EROSION CONTROL DEVICES IN ACCORDANCE WITH CMU EROSION CONTROL STANDARD DETAILS 1 THROUGH 6.83 TO CONTAIN SEDIMENT WITHIN THE BOUNDARIES OF THE CONSTRUCTION SITE.

SENSITIVE MATERIAL, DO NOT DUPLICATE

SCALE: 1"=20' (Horiz.)
1"=4' (Vert.)

CHARLOTTE-MECKLENBURG UTILITIES
ENGINEERING DIVISION
CHARLOTTE, NORTH CAROLINA

445-02-227 Job No. File No.
Scales: 1" = 20'
1" = 4'

PROFILE: Hor. 1" = 20'
Vert. 1" = 4'

JGV NOV 2009 Date
As Built

M&C JEM JEM WSR
Surveyed By Designed By Drawn By Project-Engr Approved By Date

STOP
CALL NC ONECALL BEFORE YOU DIG
1-800-632-4949
AVOID UTILITY DAMAGE

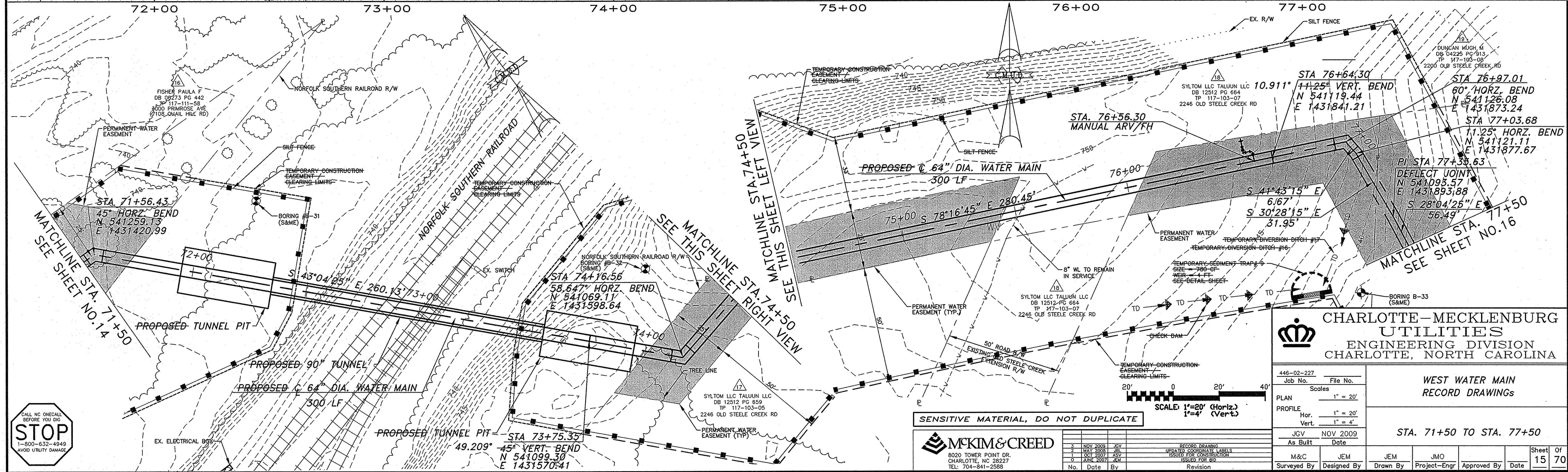
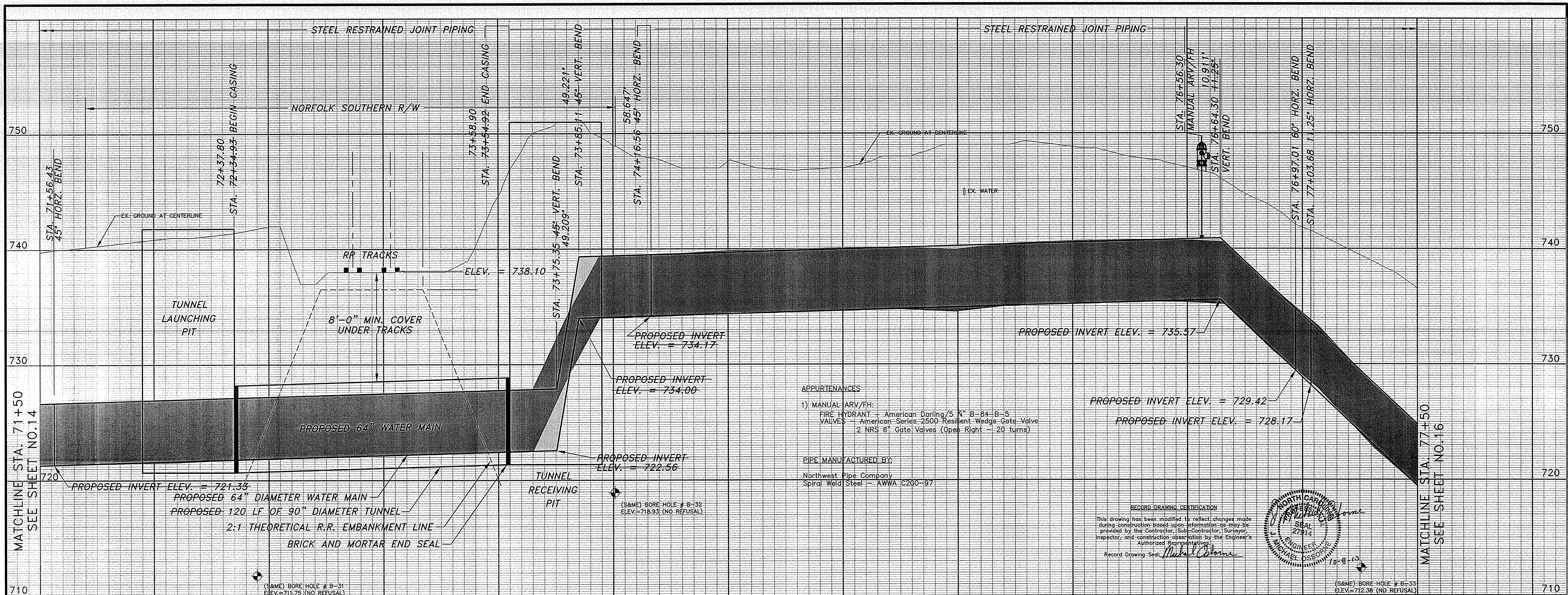
MCKIM & CREED
8020 TOWER POINT DR.
CHARLOTTE, NC 28227
TEL: 704-541-2588

No.	Date	By	Revision
2	NOV 2009	JGV	RECORD DRAWING
1	OCT 2007	JGV	ISSUED FOR CONSTRUCTION
0	APR 2007	JGV	ISSUED FOR BID

WEST WATER MAIN
RECORD DRAWINGS

STA. 65+50 TO STA. 71+50

Sheet 14 Of 70



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MCKIM & CREED
 8020 TOWER POINT DR.
 CHARLOTTE, NC 28227
 TEL: 704-541-2589

No.	Date	By	Revision
1	NOV 2009	JGV	RECORD DRAWING
2	NOV 2009	JGV	UPDATE COORDINATE LABELS
3	OCT 2007	ASV	ISSUED FOR CONSTRUCTION
4	JUNE 2002	JGL	ISSUED FOR BID

446-02-227	File No.
Job No.	Scales
PLAN	1" = 20'
PROFILE	Hor. 1" = 20'
	Vert. 1" = 4'
JGV	NOV 2009
As Built	Date
M&C	JEM
Surveyed By	Designed By
JEM	JMO
Drawn By	Project-Engr
Approved By	Date

WEST WATER MAIN RECORD DRAWINGS	
STA. 71+50 TO STA. 77+50	
Sheet	Of
15	70

APPENDIX D
UVF HYDROCARBON ANALYSIS RESULTS



Hydrocarbon Analysis Results

Client: NCDOT
Address: 4001 Morris Field Dr., Charlotte, NC

Samples taken Tuesday, March 19, 2019
Samples extracted Tuesday, March 19, 2019
Samples analysed Tuesday, March 19, 2019

Contact: Gordon Box

Operator Troy Holzschuh

Project:

H09382

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	
Soil	P1-SB1 (4-5)	21.5	<0.54	<0.54	2	2	0.71	0.05	0.001	0	96.3	3.7	Deg.PHC 61.1%,(FCM),(P)
Soil	P1-SB1 (9-10)	23.2	<0.58	<0.58	0.11	0.11	0.1	0.004	<0.007	0	43.7	56.3	Residual HC,(P)
Soil	P1-SB2 (4-5)	26.5	<0.66	<0.66	9.4	9.4	4.2	0.23	0.004	0	90.8	9.2	V.Deg.PHC 72.4%,(FCM),(P)
Soil	P1-SB2 (6-7)	19.6	<0.49	<0.49	2	2	1	0.04	0.002	0	92.3	7.7	Deg.PHC 65.5%,(FCM),(P)
Soil	P1-SB2 (12-13)	25.0	<0.63	2.8	1.1	3.9	0.78	0.05	<0.008	81	18.2	0.8	Deg.Light.Fuel 45.2%,(FCM)
Soil	P1-SB3 (4-5)	31.0	<0.77	<0.77	67.2	67.2	29.8	1.6	0.016	0	93.5	6.5	V.Deg.PHC 73.2%,(FCM)
Soil	P1-SB3 (6-7)	27.3	<0.68	<0.68	4.3	4.3	2.1	0.29	0.03	0	93.5	6.5	Pyrogenic HC 69%,(FCM),(P)
Soil	P1-SB3 (12-13)	25.7	<0.64	<0.64	13.1	13.1	2.4	0.22	0.028	0	94.8	5.2	No Match found
Soil	P1-SB4 (4-5)	20.6	<0.52	<0.52	0.61	0.61	0.58	0.08	0.012	0	91.8	8.2	No HC Match. Estimated values,(FCM)
Soil	P1-SB4 (9-10)	29.9	<0.75	<0.75	1.3	1.3	1.3	0.16	0.02	0	86.6	13.4	No HC Match. Estimated values,(FCM),(P)

Initial Calibrator QC check **OK**

Final FCM QC Check **OK**

102.9%

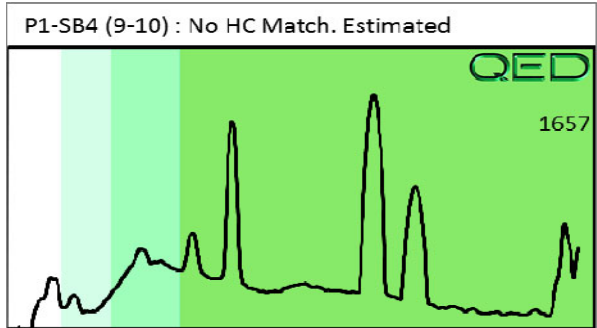
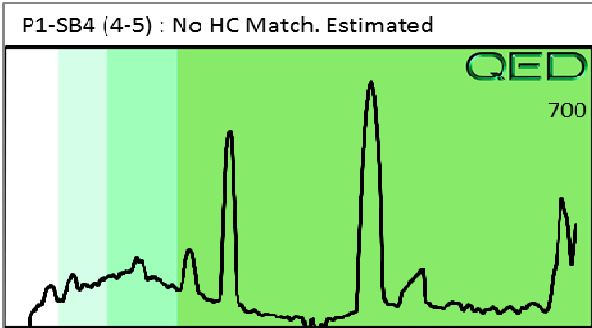
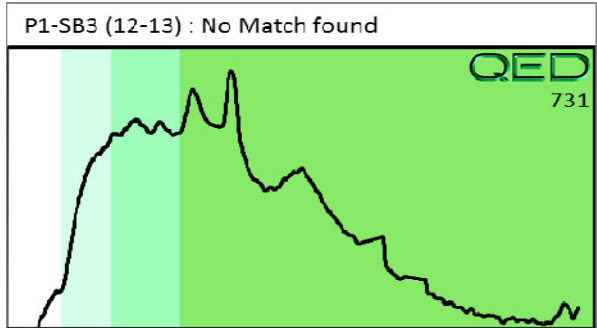
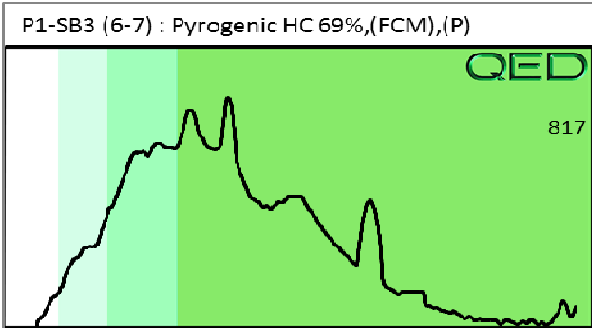
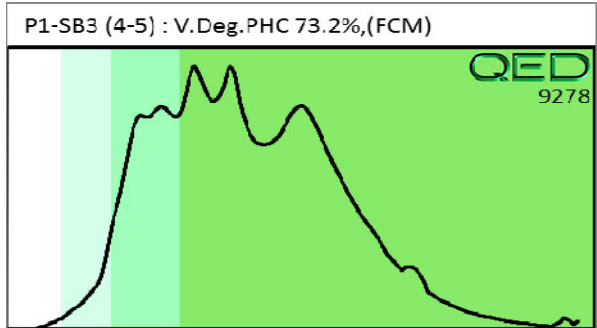
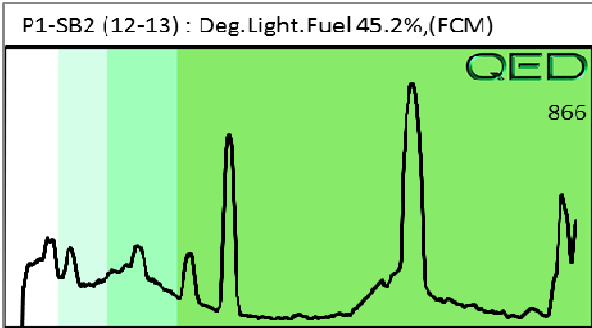
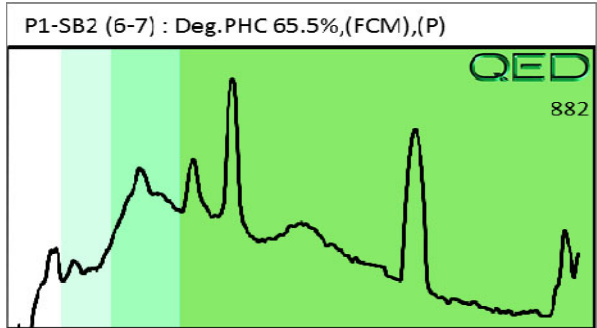
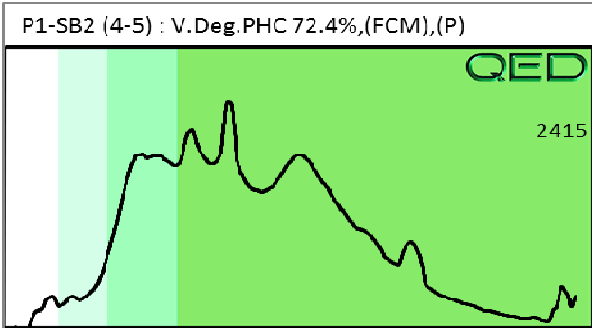
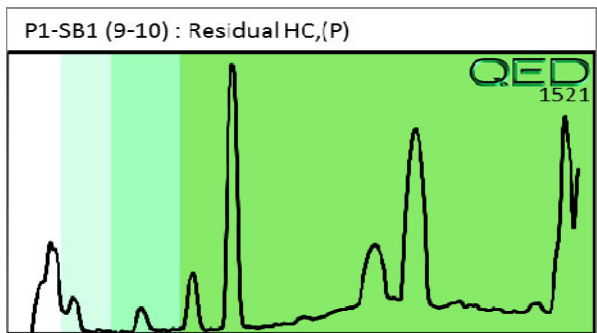
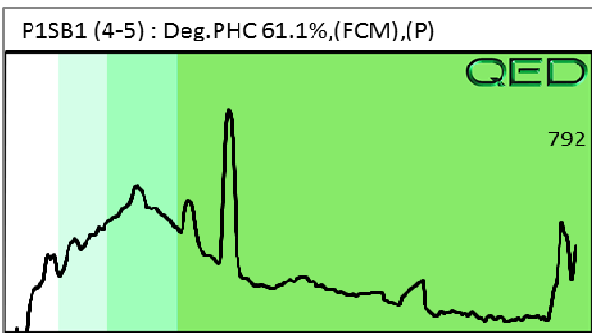
Concentration values in mg/kg for soil samples and mg/L for water samples. Soil values uncorrected for moisture or stone content. Fingerprints provide a tentative hydrocarbon identification.

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





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										C5 - C10	C10 - C18	C18	
Soil	P1-SB5 (4-5)	26.1	<0.65	<0.65	46.9	46.9	23.2	1.2	0.016	0	91.1	8.9	V.Deg.PHC 54.6%
Soil	P1-SB5 (9-10)	31.5	<0.79	<0.79	7.6	7.6	7.2	1.1	0.022	0	93.6	6.4	Coal Tar 53.2%,(FCM),(P)
Initial Calibrator QC check										OK			99.0%
Final FCM QC Check										OK			99.0%

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.

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