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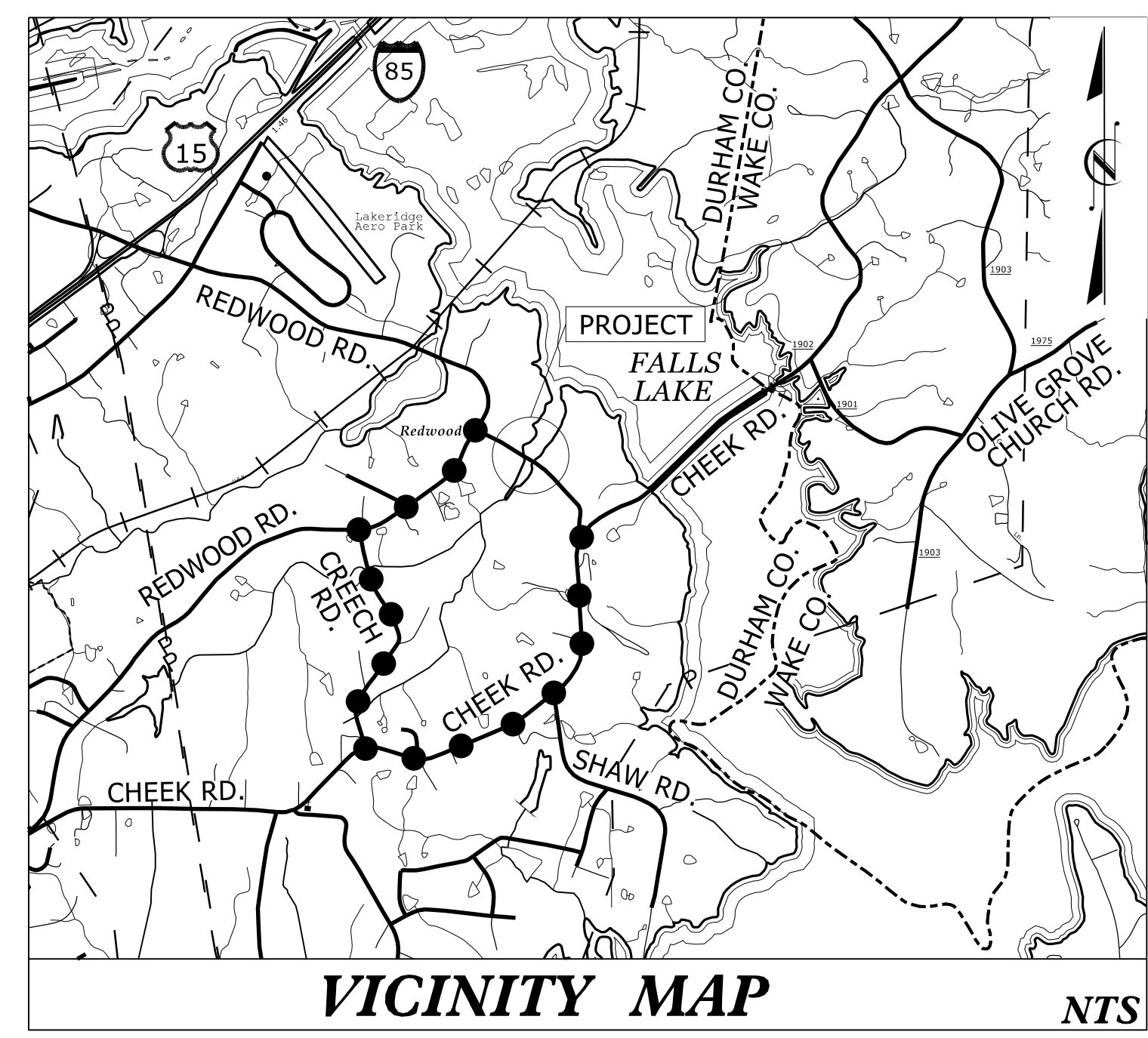
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09/08/19

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**TIP PROJECT: 51215.01Z**  
**CONTRACT: DE00354**

See Sheet 1A For Index of Sheets  
 See Sheet 1B For Conventional Symbols

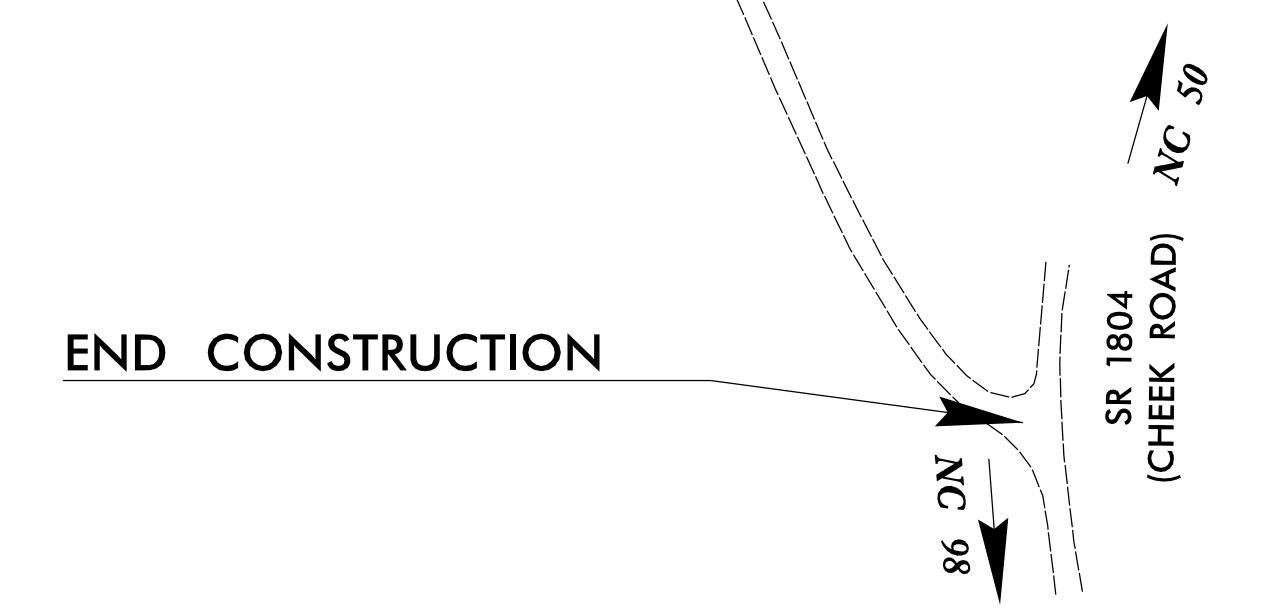
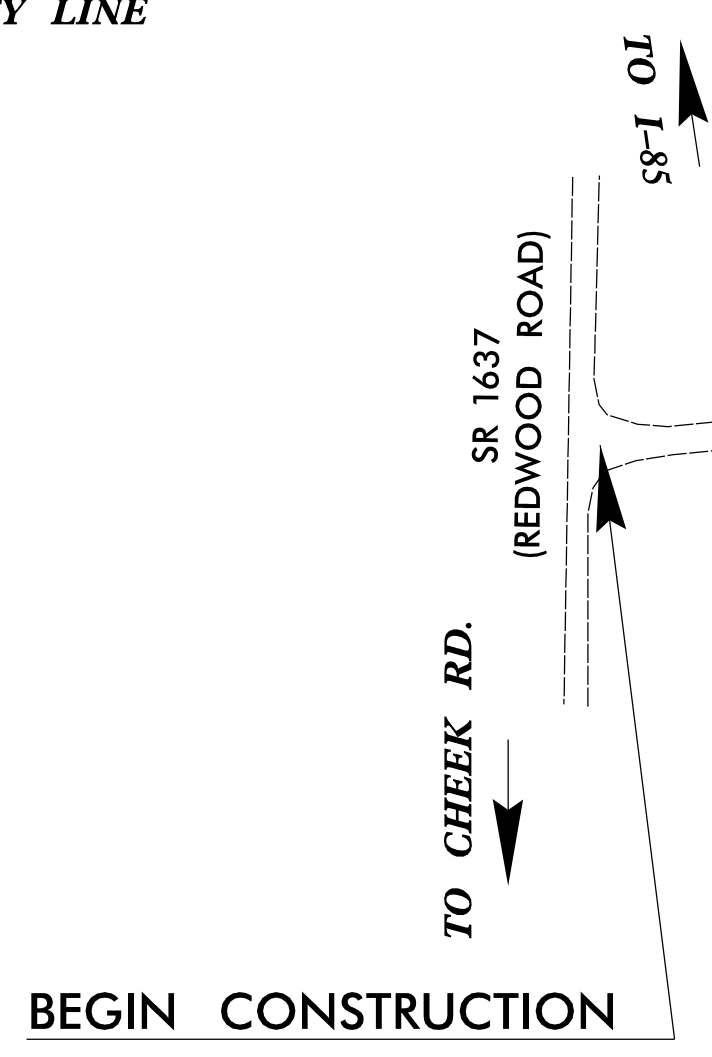
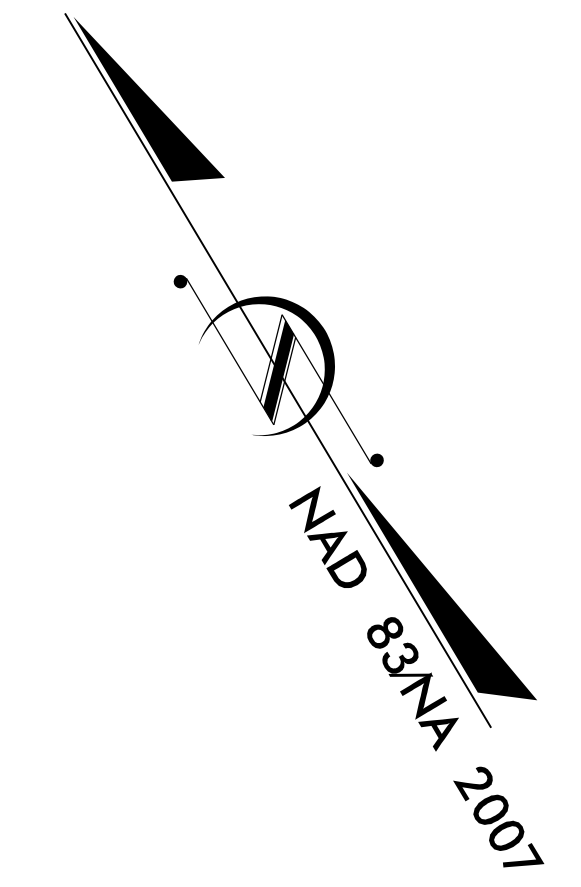
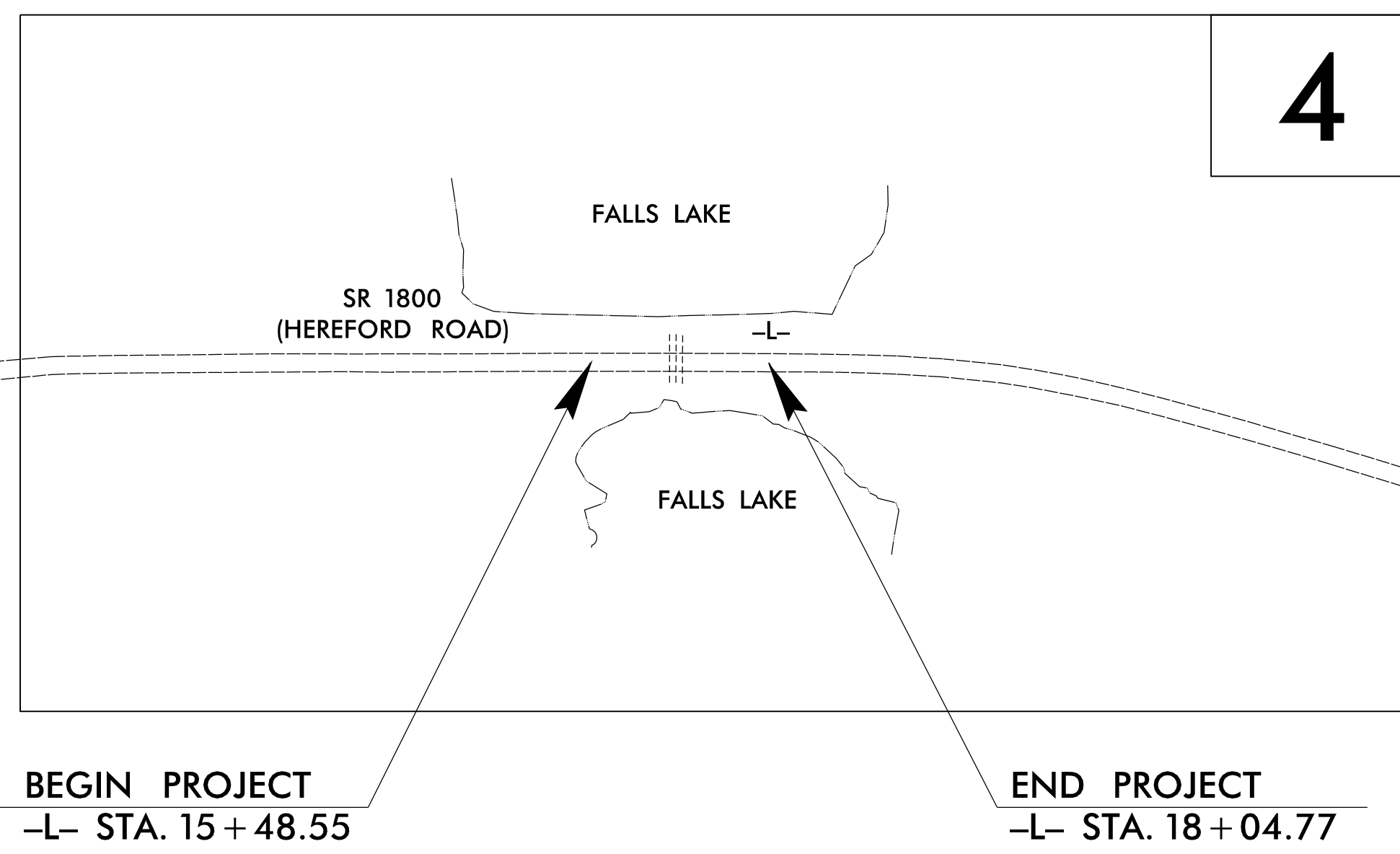
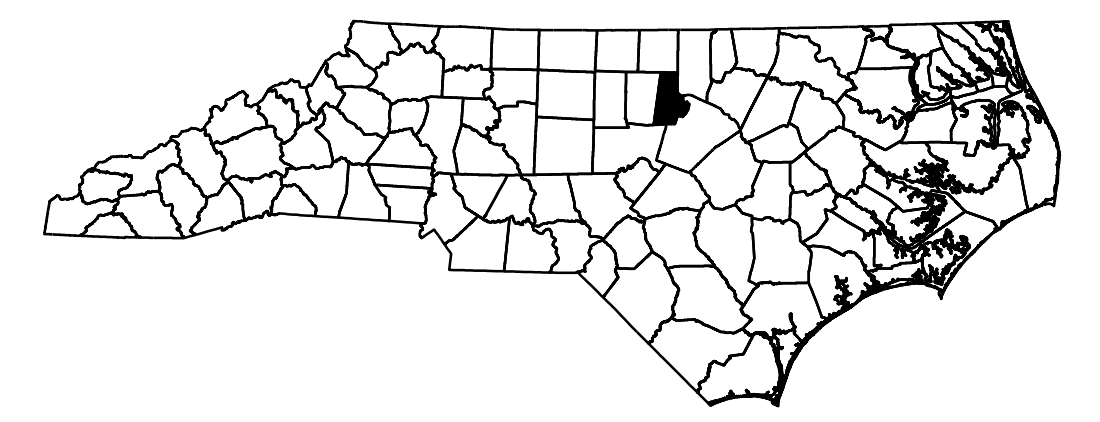


STATE OF NORTH CAROLINA  
 DIVISION OF HIGHWAYS  
**DURHAM COUNTY**

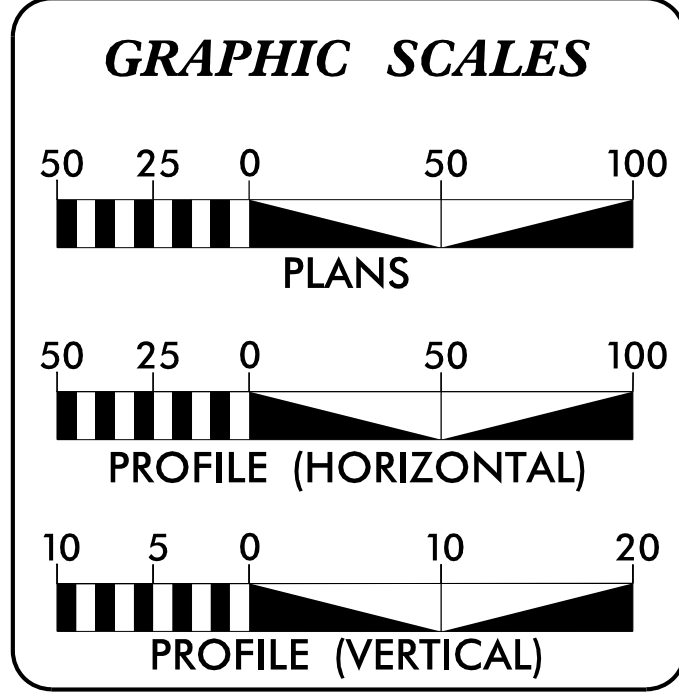
**LOCATION: SR 1800 (HEREFORD ROAD) AT FALLS LAKE**

**TYPE OF WORK: GRADING, PAVEMENT REMOVAL, DRAINAGE, AND SIGNING**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.		1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
51215.01Z		P.E.	
51215.01Z		CONSTR.	



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**DESIGN DATA**

ADT 2023 =	N/A
ADT 2045 =	575
K =	N/A
D =	N/A
T =	N/A
V =	55 MPH

FUNC CLASS =  
 COLLECTOR  
 SUB-REGIONAL TIER

**PROJECT LENGTH**

LENGTH OF ROADWAY PROJECT = 0.03 MILES

NCDOT CONTACT:  
 LISA B. GILCHRIST  
 BRIDGE PROGRAM MANAGER  
 1636 GOLDSTAR DR.  
 RALEIGH, NC 27699  
 919-825-2639  
 LABULLARD-GILCHRIST@NCDOT.GOV

**Dewberry**  
 2610 WYCLIFF ROAD  
 SUITE 410  
 RALEIGH, NC 27607  
 PHONE: 919.881.9939  
 NC COA No. F-0929

FOR  
**DIVISION OF HIGHWAYS**

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:  
 N/A

LETTING DATE:  
 DECEMBER 14, 2022

BRYAN LAMBETH, P.E.  
 PROJECT ENGINEER

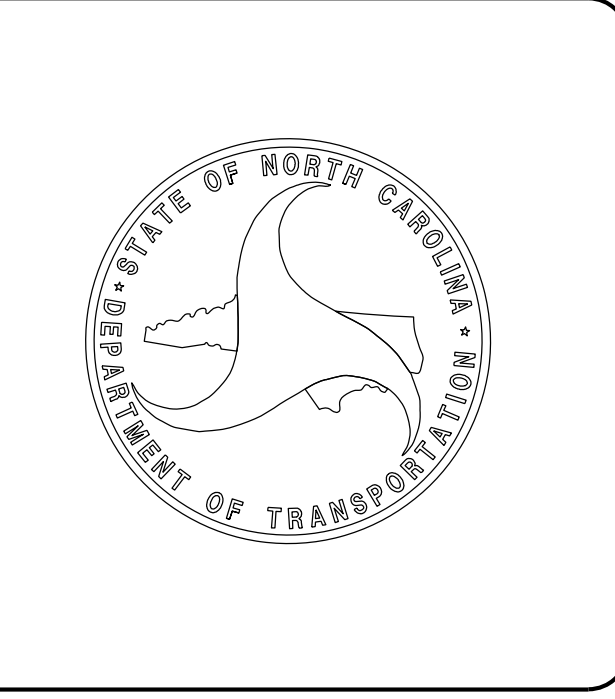
BEN STORMER, P.E.  
 PROJECT DESIGN ENGINEER

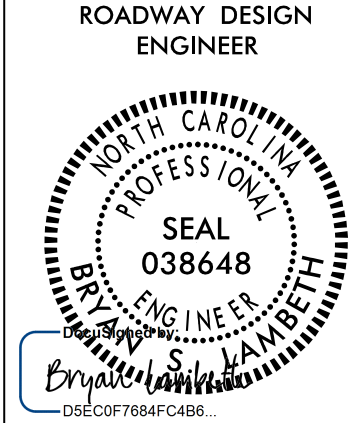
**HYDRAULICS ENGINEER**

DocuSigned by:  
 William G. Cail  
 06F097D904114D5...  
 SIGNATURE:

**ROADWAY DESIGN ENGINEER**

DocuSigned by:  
 Bryan Lambeth  
 D5E0F7884FC4B6...  
 SIGNATURE:





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TIP: 51215.01Z	INDEX OF SHEETS
SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
3B-1	SUMMARY OF ROADWAY QUANTITIES
4 THRU 5	PLAN AND PROFILE SHEETS
RW02C-1 THRU RW02C-2	RIGHT OF WAY PLANS
TMP-1 THRU TMP-3	TRANSPORTATION MANAGEMENT PLANS
EC-1 THRU EC-2	EROSION CONTROL PLANS
SIGN-1 THRU SIGN-6	SIGNING AND PAVEMENT MARKING PLANS
UO-1 THRU UO-2	UTILITIES BY OTHERS PLANS

2018 ROADWAY ENGLISH STANDARD DRAWINGS

EFF. 01-16-2018  
REV.

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated January, 2018 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
<b>DIVISION 2 - EARTHWORK</b>	
200.03	Method of Clearing - Method III
225.02	Guide for Grading Subgrade - Secondary and Local
<b>DIVISION 8 - INCIDENTALS</b>	
862.01	Guardrail Placement
862.02	Guardrail Installation
876.01	Rip Rap in Channels

GENERAL NOTES: 2018 SPECIFICATIONS

EFFECTIVE: 01-16-2018  
REVISED:

GRADING:  
THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED OR FUTURE SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. GRADE LINES MAY BE ADJUSTED AT THEIR BEGINNING AND ENDING AND AT STRUCTURES AS DIRECTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

CLEARING:  
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.

GUARDRAIL:  
THE GUARDRAIL LOCATIONS SHOWN ON THE PLANS MAY BE ADJUSTED DURING CONSTRUCTION AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHOULD CONSULT WITH THE ENGINEER PRIOR TO ORDERING GUARDRAIL MATERIAL.

UTILITIES:  
UTILITY OWNERS ON THIS PROJECT ARE  
WAKE EMC  
ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.



# STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS CONVENTIONAL PLAN SHEET SYMBOLS

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	(123)
Existing Fence Line	-x-x-x-
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	---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	-----
Buffer Zone 1	-----
Buffer Zone 2	-----
Flow Arrow	←
Disappearing Stream	-----
Spring	○
Wetland	-----
Proposed Lateral, Tail, Head Ditch	-----
False Sump	-----

### RAILROADS:

Standard Gauge	-----
RR Signal Milepost	-----
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)	◆
Proposed 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	-----
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:

\* 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	-----

### 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	-----

### SANITARY SEWER:

Sanitary Sewer Manhole	⊕
Sanitary Sewer Cleanout	⊕
U/G Sanitary Sewer Line	-----
Above Ground 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	-----
Underground Storage Tank, Approx. Loc.	-----
A/G Tank; Water, Gas, Oil	-----
Geoenvironmental Boring	⊕
Abandoned According to Utility Records	AATUR
End of Information	E.O.I.





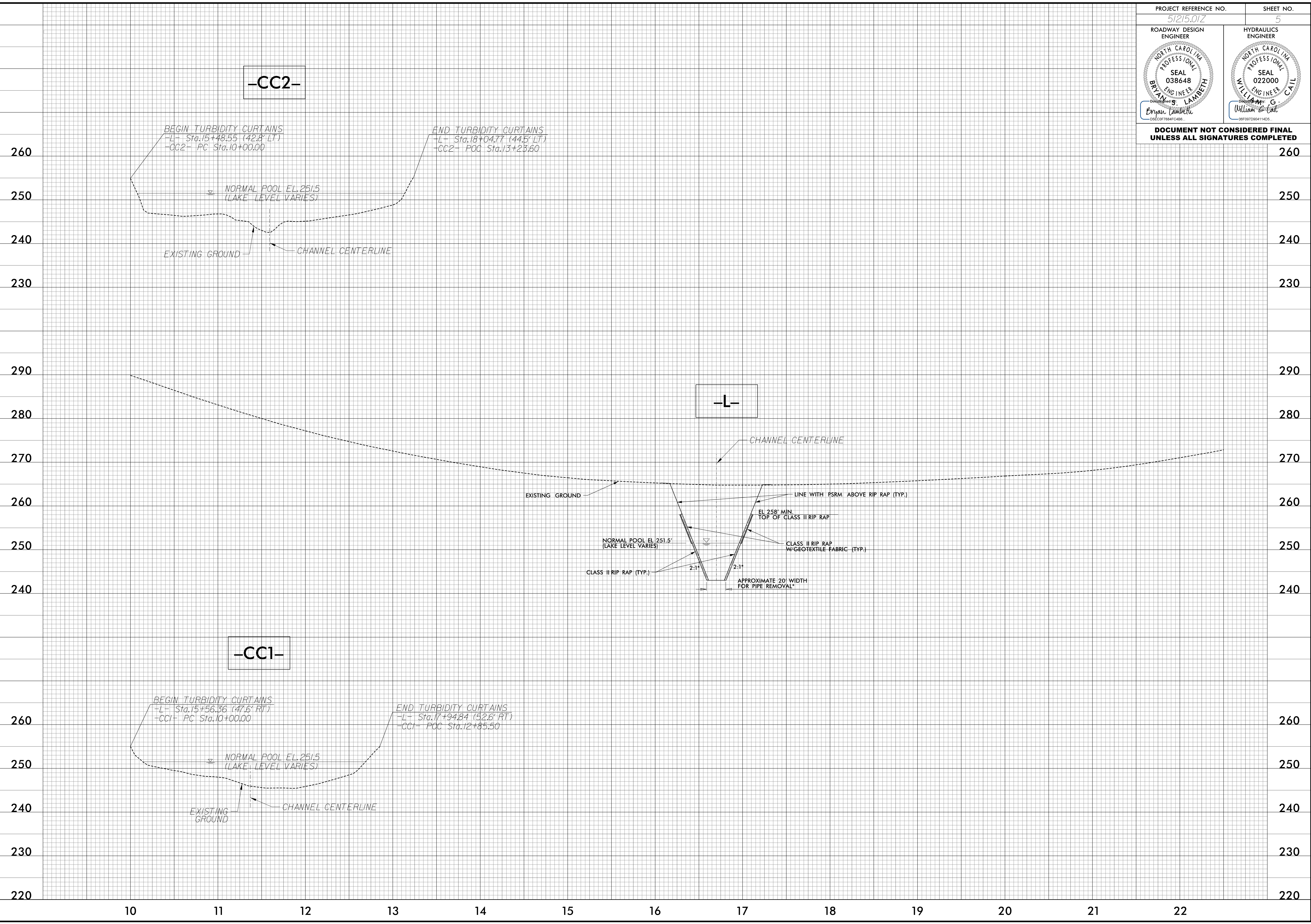




5/14/99

PROJECT REFERENCE NO. 51215.01Z	SHEET NO. 5
ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 038648 BRYAN LAMBERTI	HYDRAULICS ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 022000 WILLIAM G. CAIL

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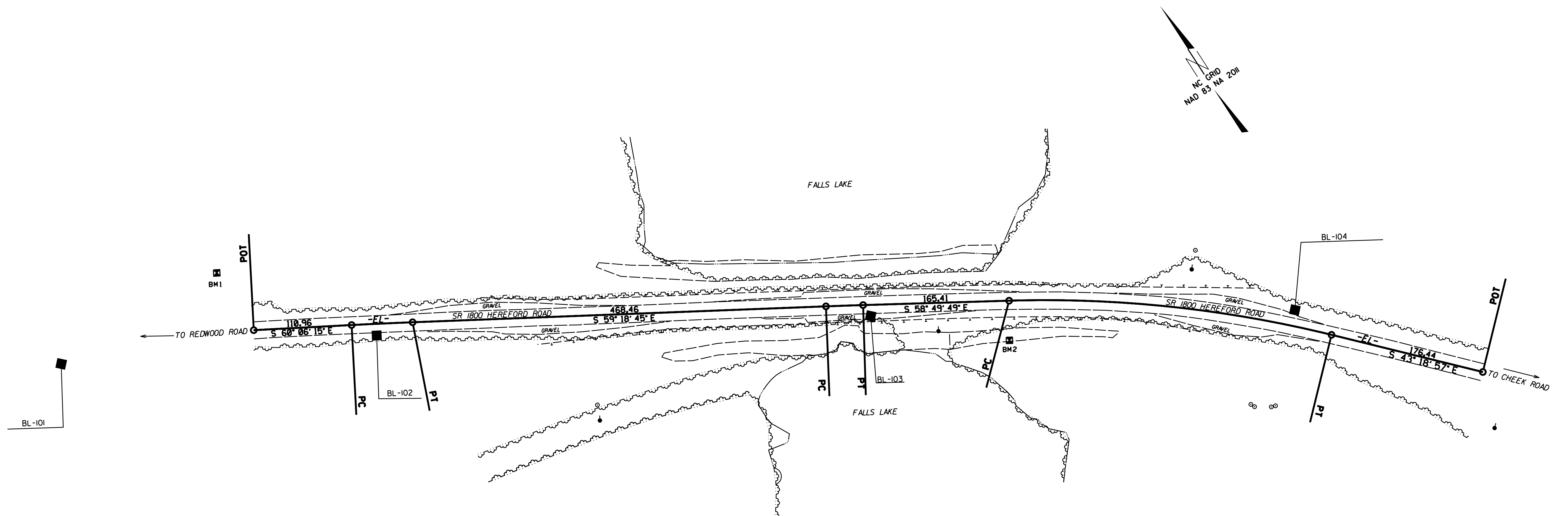
6/2/09

PROJECT REFERENCE NO.	SHEET NO.
SR-1800	RW02C-1
Location and Surveys	
DEWBERRY ENGINEERS INC.	

# SURVEY CONTROL SHEET

## W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

REVISIONS



OFFSITE PRIMARY CONTROL:

GPS SRI800-1  
GPS SRI800-2

SEE SHEET RW2C-2  
FOR FURTHER  
ALIGNMENT DETAILS

### NOTES:

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
2. THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

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# SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

PROJECT REFERENCE NO.	SHEET NO.
SR-1800	RW02C-2
Location and Surveys	
DEWBERRY ENGINEERS INC.	

## BASELINE DATA

BL	POINT	DESC.	NORTH	EAST	ELEVATION
101		BL101	835988.4396	2067831.7892	301.27
102		BL102	835821.4662	2068149.2260	279.81
103		BL103	835536.1327	2068630.9058	263.99
104		BL104	835280.9777	2069037.9826	270.04

PRIMARY CONTROL					
POINT	DESC.	NORTH	EAST	ELEVATION	
1	GPS-1	834818.9915	2066506.2480	315.74	
2	GPS-2	835220.7286	2067032.7203	307.35	

## BENCHMARK DATA

.....  
 BM1      ELEVATION = 298.40  
 N 835979      E 2068036  
 BL STATION 11+85.00 87 LEFT  
 22" OAK  
 .....

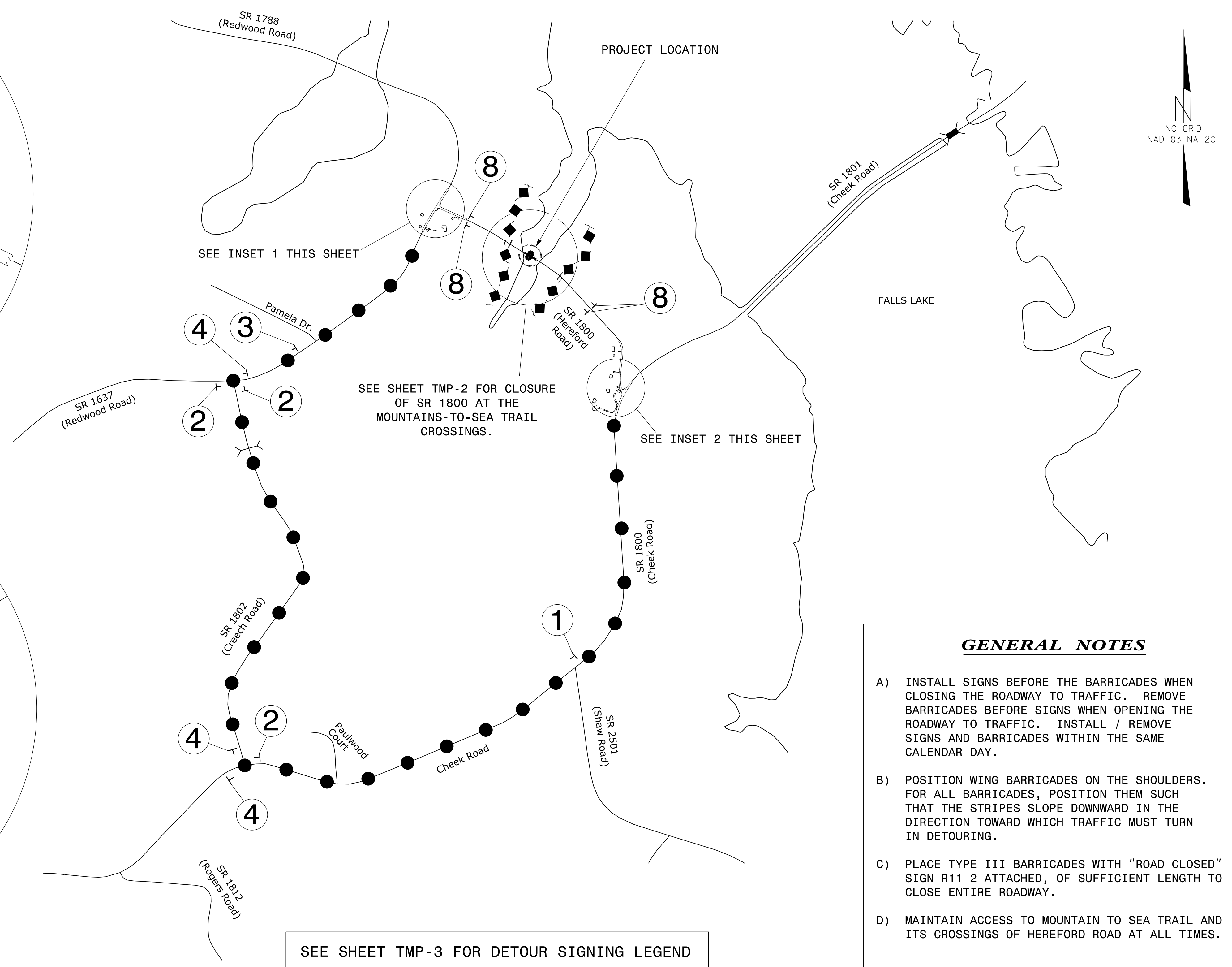
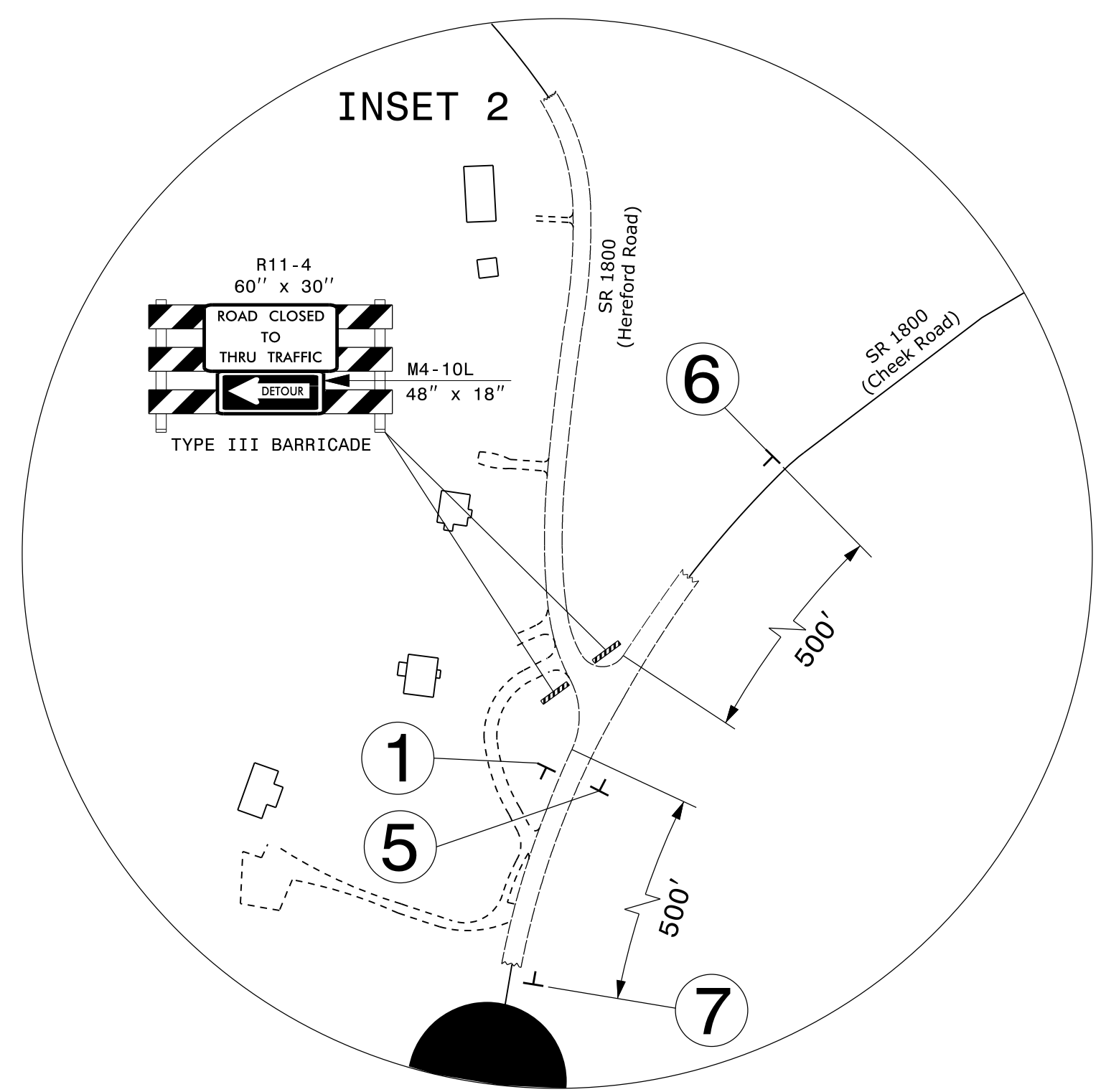
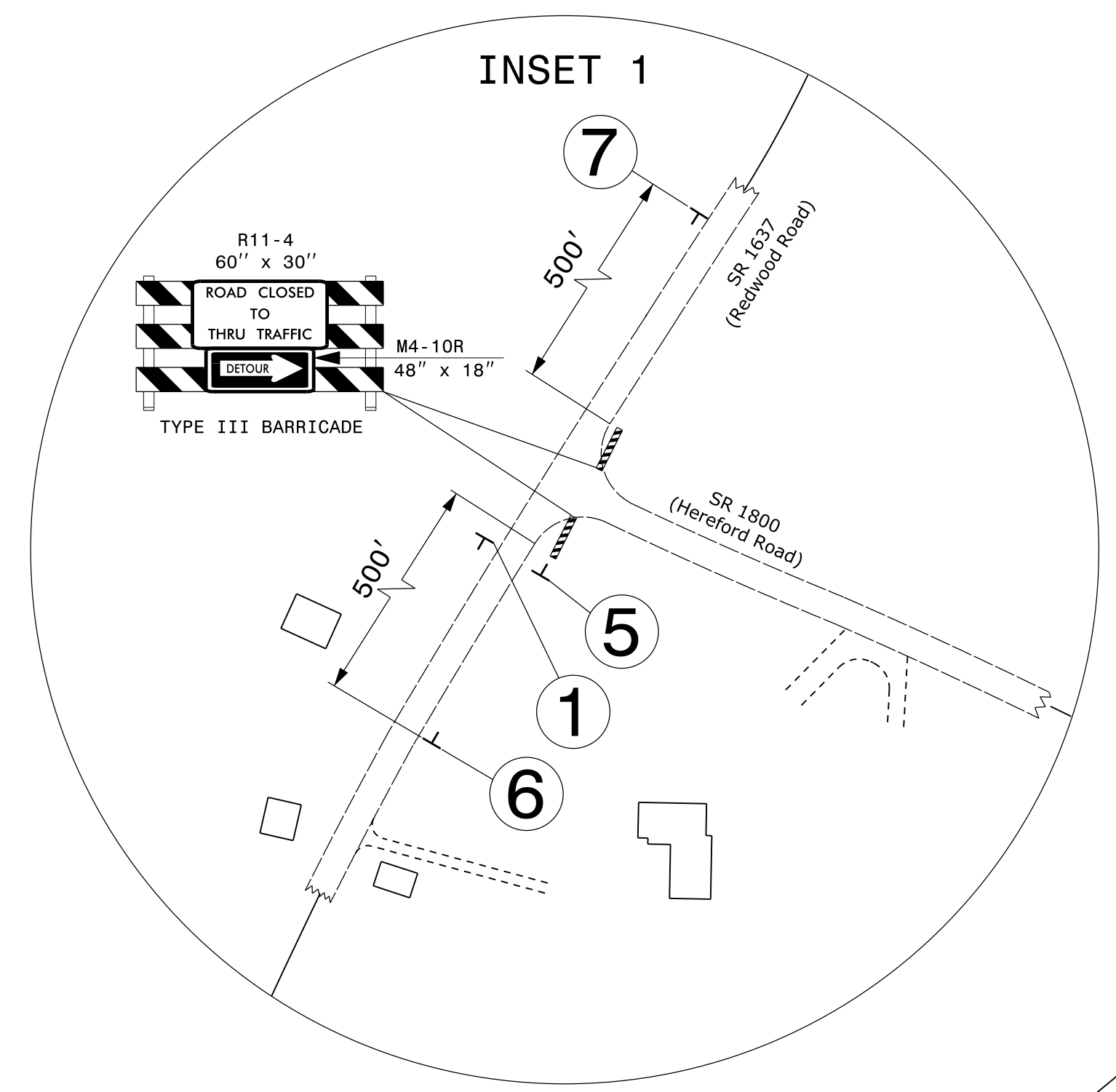
.....  
 BM2      ELEVATION = 255.62  
 N 835428      E 2068748  
 BL STATION 20+75.00 30 RIGHT  
 15" PINE  
 .....

## ALIGNMENT DATA

EL POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	835902.110	2068035.643							
LINE			S 60°06'15.4" E	110.96					
PC	835846.804	2068131.839							
CURVE			S 59°42'30.0" E	69.11	00°47'30.8"(RT)	01°08'45.3'	69.11	34.55	5000.00
PT	835811.947	2068191.509							
LINE			S 59°18'44.6" E	468.46					
PC	835572.863	2068594.371							
CURVE			S 59°04'16.6" E	42.08	00°28'56.0"(RT)	01°08'45.3'	42.08	21.04	5000.00
PT	835551.235	2068630.469							
LINE			S 58°49'48.6" E	165.41					
PC	835465.622	2068772.000							
CURVE			S 51°04'22.7" E	367.13	15°30'51.8"(RT)	04°12'46.5'	368.26	185.26	1360.00
PT	835234.941	2069057.610							
LINE			S 43°18'56.8" E	176.44					
POT	835106.566	2069178.652							

**NOTES:**

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
2. THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.



SEE SHEET TMP-3 FOR DETOUR SIGNING LEGEND

- GENERAL NOTES**
- A) INSTALL SIGNS BEFORE THE BARRICADES WHEN CLOSING THE ROADWAY TO TRAFFIC. REMOVE BARRICADES BEFORE SIGNS WHEN OPENING THE ROADWAY TO TRAFFIC. INSTALL / REMOVE SIGNS AND BARRICADES WITHIN THE SAME CALENDAR DAY.
  - B) POSITION WING BARRICADES ON THE SHOULDERS. FOR ALL BARRICADES, POSITION THEM SUCH THAT THE STRIPES SLOPE DOWNWARD IN THE DIRECTION TOWARD WHICH TRAFFIC MUST TURN IN DETOURING.
  - C) PLACE TYPE III BARRICADES WITH "ROAD CLOSED" SIGN R11-2 ATTACHED, OF SUFFICIENT LENGTH TO CLOSE ENTIRE ROADWAY.
  - D) MAINTAIN ACCESS TO MOUNTAIN TO SEA TRAIL AND ITS CROSSINGS OF HEREFORD ROAD AT ALL TIMES.

**LEGEND**

<b>TRAFFIC CONTROL DEVICES</b>		<b>OTHER</b>	
	BARRICADE (TYPE III)		DETOUR ROUTE TO BE USED DURING CLOSURE OF SR 1800 (HEREFORD RD.)
	WATER FILLED-BARRIER		MOUNTAINS-TO-SEA TRAIL
<b>TEMPORARY SIGNING</b>			
	STATIONARY SIGN		

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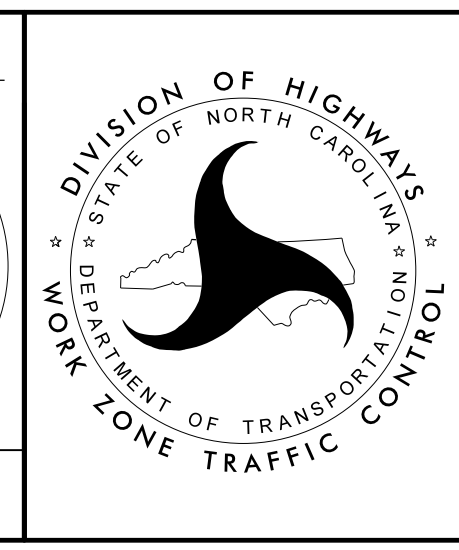
2610 WYCLIFF ROAD  
 SUITE 410  
 RALEIGH, NC 27607  
 PHONE: 919.881.9939  
 NC COA No. F-0929

APPROVED:

DATE: 10/31/2022

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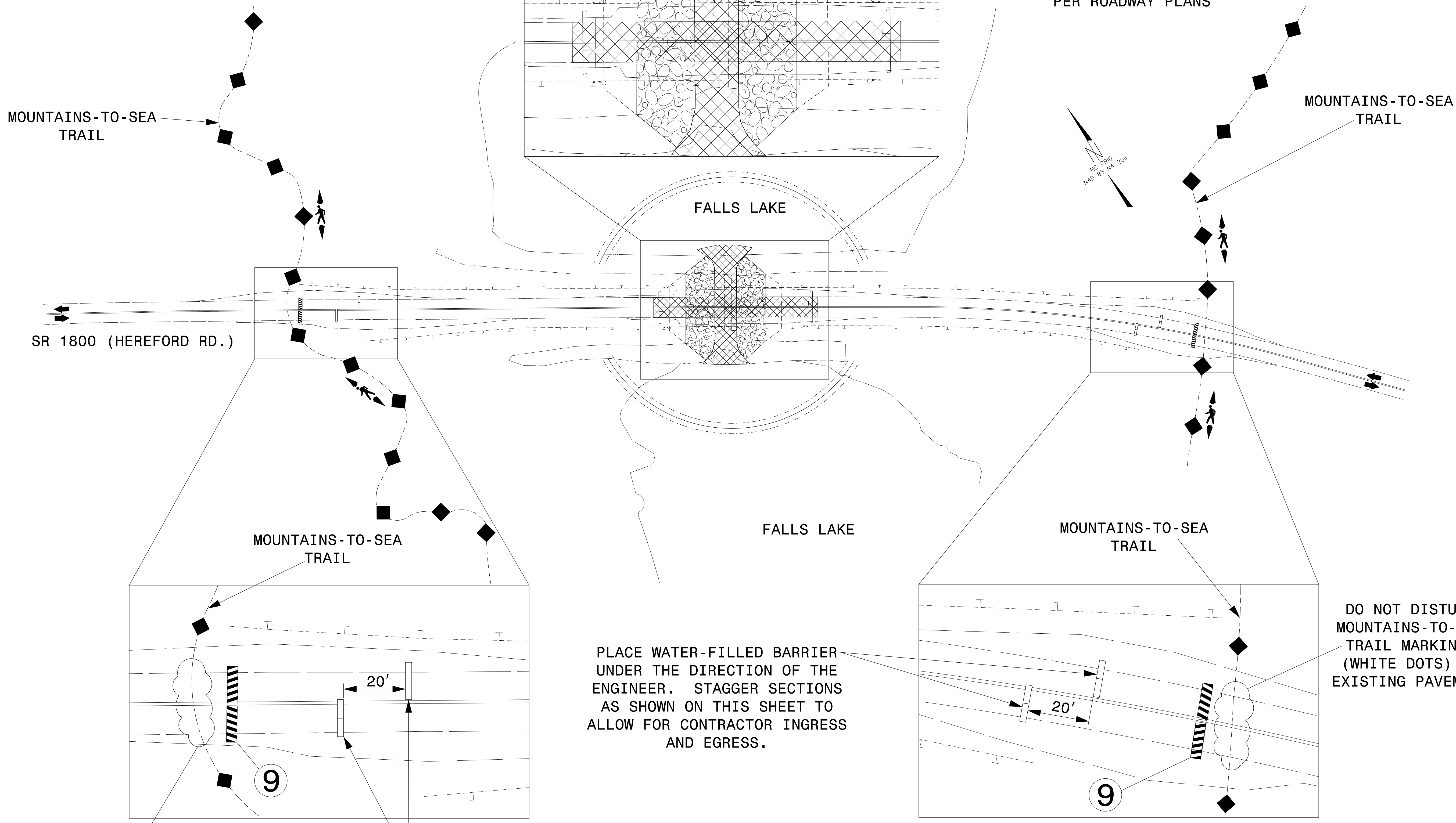


**SR 1800  
 (HEREFORD ROAD)  
 ROAD CLOSURE  
 & DETOUR DETAIL**



SEE SHEET TMP-1 FOR TRAFFIC CONTROL  
DEVICE AND SYMBOLS LEGEND

SEE SHEET TMP-3 FOR DETOUR SIGNING LEGEND



DO NOT DISTURB  
MOUNTAINS-TO-SEA  
TRAIL MARKINGS  
(WHITE DOTS) ON  
EXISTING PAVEMENT

PLACE WATER-FILLED BARRIER UNDER THE  
DIRECTION OF THE ENGINEER. STAGGER SECTIONS  
AS SHOWN ON THIS SHEET TO ALLOW FOR CONTRACTOR  
INGRESS AND EGRESS.

PLACE WATER-FILLED BARRIER  
UNDER THE DIRECTION OF THE  
ENGINEER. STAGGER SECTIONS  
AS SHOWN ON THIS SHEET TO  
ALLOW FOR CONTRACTOR INGRESS  
AND EGRESS.

DO NOT DISTURB  
MOUNTAINS-TO-SEA  
TRAIL MARKINGS  
(WHITE DOTS) ON  
EXISTING PAVEMENT

PERFORM CONSTRUCTION ACTIVITES  
PER ROADWAY PLANS

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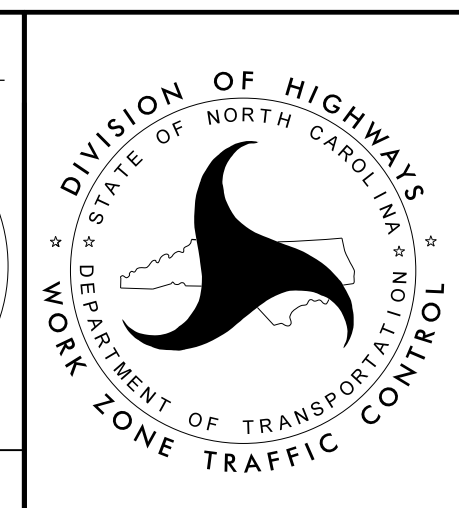
2610 WYCLIFF ROAD  
SUITE 410  
RALEIGH, NC 27607  
PHONE: 919.881.9939  
NC COA No. F-0929

APPROVED: *[Signature]*  
DATE: 10/31/2022

SEAL

**NORTH CAROLINA PROFESSIONAL ENGINEER**  
SEAL 17586  
TODD BROOKS

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**SR 1800  
(HEREFORD ROAD)  
CLOSURE DETAIL**

**DETOUR SIGNING LEGEND**

1

M4-8  
24" X 12"

HEREFORD ROAD (T101)

M6-3  
21" X 15"

6

ROAD CLOSED AHEAD (W20-3)  
48" X 48"

NEXT RIGHT (SP-4R)  
42" X 12"

2

M4-8  
24" X 12"

HEREFORD ROAD (T101)

M6-1 R  
21" X 15"

7

ROAD CLOSED AHEAD (W20-3)  
48" X 48"

NEXT LEFT (SP-4L)  
42" X 12"

3

M4-8  
24" X 12"

HEREFORD ROAD (T101)

M5-1 L  
21" X 15"

8

ROAD CLOSED 500 FT (W20-3)  
48" X 48"

INSTALL W20-3 SIGNS  
500' IN ADVANCE OF THE  
MOUNTAINS-TO-SEA TRAIL  
CROSSINGS

4

M4-8  
24" X 12"

HEREFORD ROAD (T101)

M6-1 L  
21" X 15"

9

R11-2  
48" x 30"

ROAD CLOSED

TYPE III BARRICADE(S)

CLOSE ROAD WITH TYPE III BARRICADES.  
PLACE JUST BEHIND THE MOUNTAINS-TO-SEA  
TRAIL CROSSINGS.

5

END  
DETOUR (M4-8 A)  
24" X 18"

**DETOUR SIGN DESIGN**

SIGN NUMBER: T101	BACKG COLOR: Fluorescent Orange	DESIGN BY: AB	CHECKED BY: JTB	Aug 18, 2022
TYPE: D	COPY COLOR: Black	PROJECT ID: 51215.01Z	LOCATION: DURHAM COUNTY	DIV: 5
QUANTITY: 10				
SIGN WIDTH: 3'-0"				
HEIGHT: 2'-0"				
TOTAL AREA: 6.0 Sq.Ft.				
BORDER TYPE: RECESSED				
RECESS: 0.47"				
WIDTH: 0.63"				
RADII: 1.5"				
NO. Z BARS:	MAT'L: 0.080" (2.0 mm) ALUMINUM			
LENGTH:				

USE NOTES:

- Legend and border shall be non-reflective opaque black ink.
- Background shall be Grade C reflective sheeting.

BORDER R=1.5" TH=0.63" IN=0.47"

Panel Style: construction\_guide.ssi  
M.U.T.C.D.: 2009 Edition

Spacing Factor is 1 unless specified otherwise

LETTER POSITIONS

Letter spacings are to start of next letter

	H	E	R	E	F	O	R	D		Series/Size	
	4.1	3.9	3.4	3.6	3.4	3.1	3.9	3.6	2.8	4.1	C 2000
											27.9
											C 2000
											13.8

FILENAME: Sign Designs

NORTH CAROLINA D.O.T. SIGN DETAIL

SIGN T101 MEASURED AND PAID FOR AS WORK ZONE SIGNS, STATIONARY

31-OCT-2022 09:23  
 P:\50176\51501761\CAD\Civil\TrafficControl\TCP\Plans\SR1800\_TMP\_3.dgn  
 jwiles AT R90K8AV4

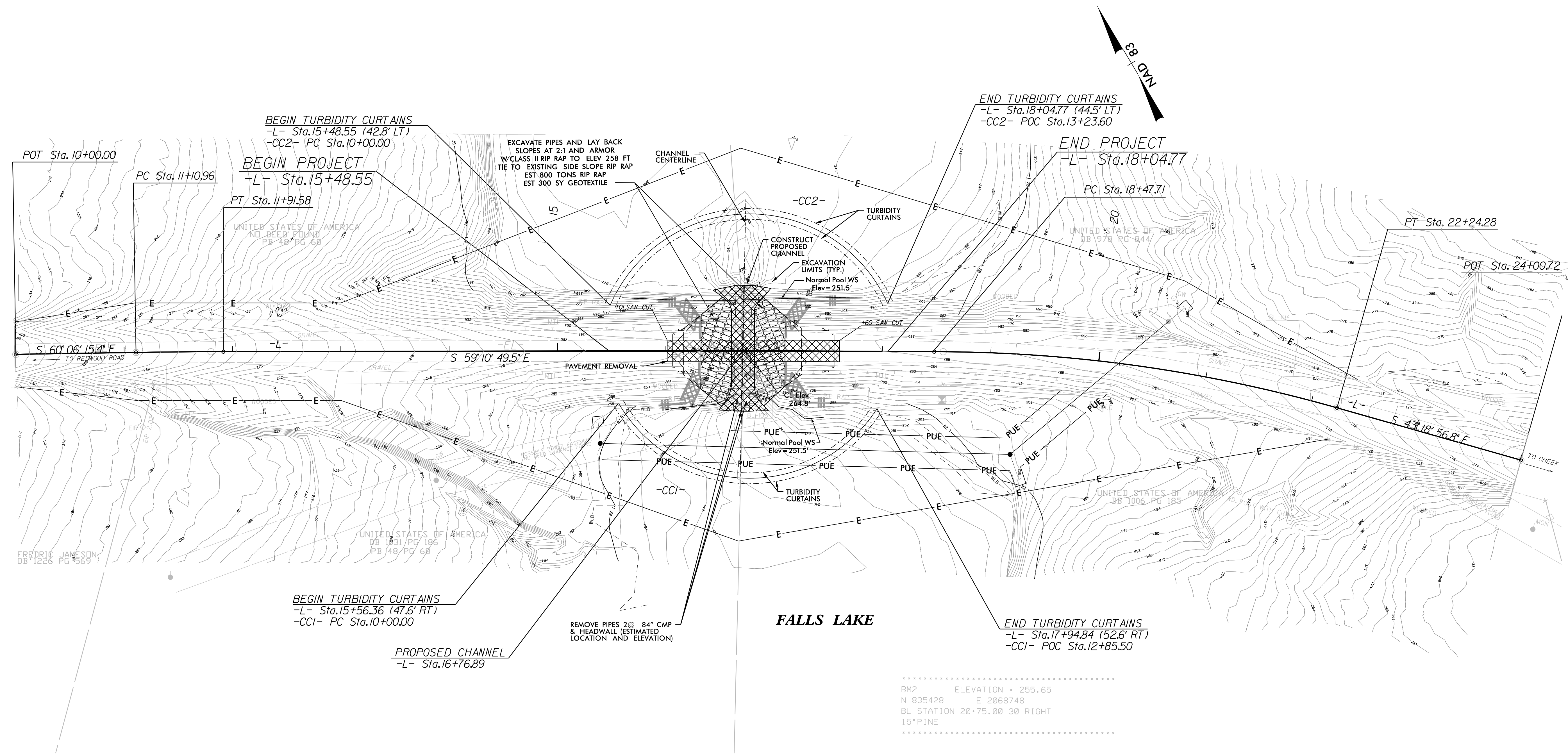
2610 WYCLIFF ROAD  
SUITE 410  
RALEIGH, NC 27607  
PHONE: 919.881.9039  
NC COA No. F-0929

APPROVED: DATE: 10/31/2022 SEAL NORTH CAROLINA PROFESSIONAL ENGINEER J. TODD BROOKS SEAL 17586	<p>DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL</p>	<p><b>DETOUR SIGNING LEGEND AND DETOUR SIGN DESIGN</b></p>
<p>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</p>		





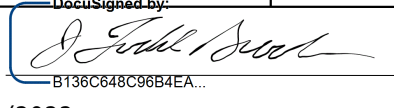
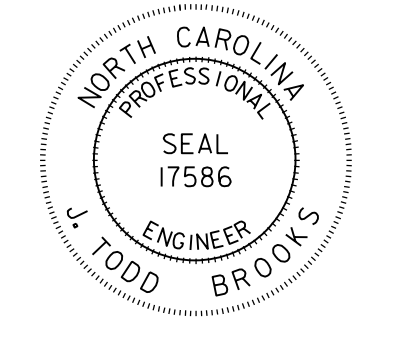




The Contractor shall install turbidity curtains prior to any excavation.

The Contractor will extend silt fence as need to cover the limits of any staging, stockpiling or other construction area needed during this project.

All disturbed areas left unstabilized shall be covered with plastic and/or geotextile fabric at the end of the day's operation to avoid erodible area adjacent to Falls Lake. This will be incidental to the lump sum grading item.

PROJECT	SHEET NO.
51215.01Z	SIGN-1
APPROVED: 	
DATE: 11/1/2022	
SEAL	
	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

**STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION**

**SIGNING PLAN  
DURHAM COUNTY**

**LOCATION: CLOSURE OF SR 1800 (HEREFORD ROAD) AT FALLS LAKE**

**CONTRACT: DE00354 PROJECT: 51215.01Z**

**ROADWAY STANDARD DRAWING**

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2018 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
904.10	ORIENTATION OF GROUND MOUNTED SIGNS
904.50	MOUNTING OF TYPE 'D', 'E' AND 'F' SIGNS ON 'U' CHANNEL POSTS
1264.01	OBJECT MARKERS - TYPES
1264.02	OBJECT MARKERS - INSTALLATION

**GENERAL NOTES**

- . SIGNS FURNISHED BY STATE
- . OBJECT MARKERS FURNISHED BY CONTRACTOR
- . CONTACT CECIL BOWES AT 919-536-4000 OR cbbowes@ncdot.gov AT LEAST TWO WEEKS IN ADVANCE OF PICKING UP THE STATE-FURNISHED SIGNS. THE PICKUP LOCATION IS 1041 PRISON CAMP ROAD, DURHAM, NC 27705.
- . IF REMOVAL OR RELOCATION OF SIGNS ON PRIVATE STREET (NON-STATE MAINTAINED) IS REQUIRED DUE TO CONSTRUCTION, THE CONTRACTOR SHALL INFORM THE ENGINEER. THE WORK WILL BE COMPLETED BY OTHERS.
- . WHEN NOT STATIONED OR DIMENSIONED ON PLANS, ALL 'E' AND 'F' SIGNS SHALL BE FIELD LOCATED BY THE ENGINEER
- . ALL EXISTING SIGNS ON "U" CHANNEL POST WITHIN THE PROJECT LIMITS SHALL BE REMOVED AND DISPOSED OF UNLESS OTHERWISE NOTED ON PLANS.
- . THE BACKGROUND FOR TYPE E & F SIGNS SHALL BE TYPE C REFLECTIVE SHEETING.
- . SEE ROADWAY PLANS FOR GUARD/GUIDE RAIL DETAILS.

**SUMMARY OF QUANTITIES**

ITEM NO.	ITEM DESCRIPTION		QUANTITY	UNIT
DESC. NO.	SECT. NO.			
4072000000	903	SUPPORTS, 3 LB STEEL U-CHANNEL	51	L.F.
4102000000	904	SIGN ERECTION, TYPE E	10	EA.
4155000000	907	DISPOSAL OF SIGN SYSTEM, U-CHANNEL	2	EA.
4850000000-E	1205	REMOVAL OF PAVEMENT MARKING LINES, 4"	1,400	L.F.
4915000000-E	1264	7' U-CHANNEL POSTS	6	EA.
4955000000-N	1264	OBJECT MARKERS (END OF ROAD)	6	EA.

**PAY ITEM NOTES**

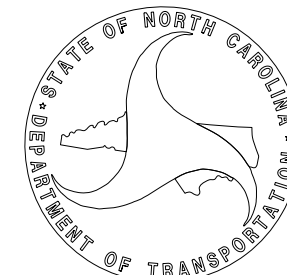
1. DISPOSAL OF SIGN SYSTEM, U-CHANNEL

**INDEX**

SHEET NO.	DESCRIPTION
SIGN-1	TITLE SHEET
SIGN-2	E SHEET
SIGN-3-5	SIGN DETAIL SHEETS
SIGN-6	SIGN DESIGNS

**PLAN SUBMITTED TO: N.C.D.O.T. SIGNING AND DELINEATION UNIT**

**AYMAN I. ALQUDWAH, PE** SIGNING & DELINEATION REGIONAL ENGINEER  
**ANDREW M. SCOTT** SIGNING & DELINEATION DESIGN ENGINEER



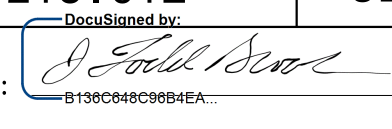
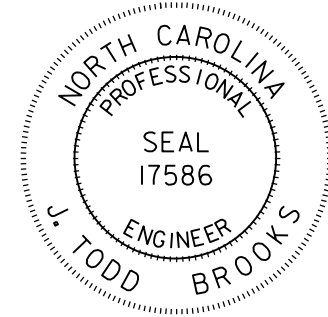
**PLAN PREPARED BY: DEWBERRY ENGINEERS INC.**

**J. TODD BROOKS, PE** PROJECT ENGINEER  
**ABRAHAM WILES** PROJECT DESIGN ENGINEER

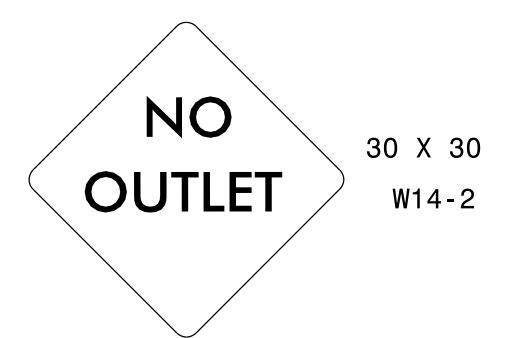


2610 WYCLIFF ROAD  
 SUITE 410  
 RALEIGH, NC 27607  
 PHONE: 919-881-9939  
 NC COA No. F-0929

D:\NOV-2022\0817\CAD\Civil\Traffic\Signing\CADD\Signing Layout Plans\Plans\SR1800\_Sign\_01.dgn  
 J. Todd Brooks

PROJECT	SHEET NO.
51215.01Z	SIGN-2
APPROVED: 	
DATE: 10/31/2022	
SEAL	
	
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	

401 QUANTITY REQ'D 2



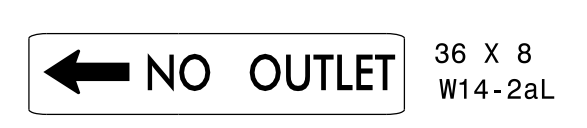
ONE "U" POST PER SIGN

402 QUANTITY REQ'D 2



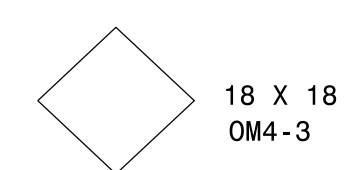
MOUNT BELOW EXISTING STREET NAME SIGN  
IN 2 INSTALLATIONS

403 QUANTITY REQ'D 2



MOUNT BELOW EXISTING STREET NAME SIGN  
IN 2 INSTALLATIONS

404 QUANTITY REQ'D 6



ONE 7' "U" POST PER SIGN  
SEE RSD NOS. 1264.01 &  
1264.02, TYPE 4 OBJECT  
MARKERS (END OF ROAD)

405 QUANTITY REQ'D 2



ONE "U" POST PER SIGN

406 QUANTITY REQ'D 2



MOUNT BELOW SIGN 405  
IN 2 INSTALLATIONS

31-OCT-2022 09:20  
P:\50176\501767\CAD\Civil\Traffic\Signing\CADD\Signing Layout Plans\SR1800\_Sign\_02.dgn  
J.Wiles

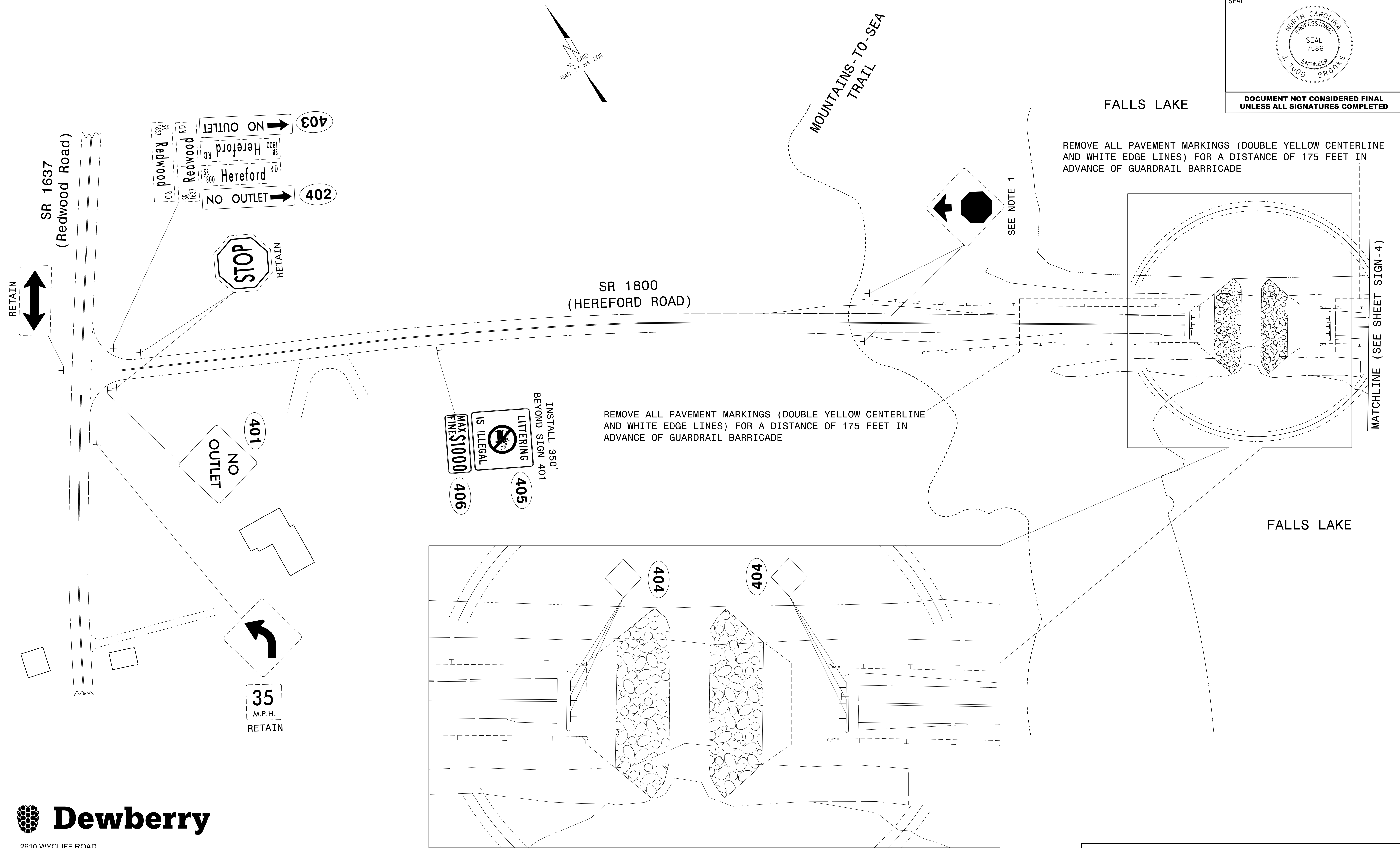


2610 WYCLIFF ROAD  
SUITE 410  
RALEIGH, NC 27607  
PHONE: 919-881-9939  
NC COA No. F-0929

**TYPE "E" SIGNS**



PROJECT	SHEET NO.
51215.01Z	SIGN-3
APPROVED: <i>J. Todd Brooks</i>	
DATE: 10/31/2022	
SEAL	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

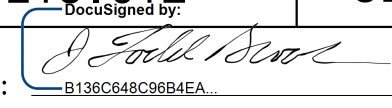
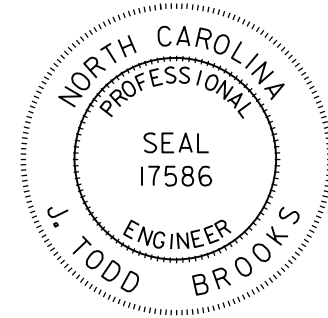


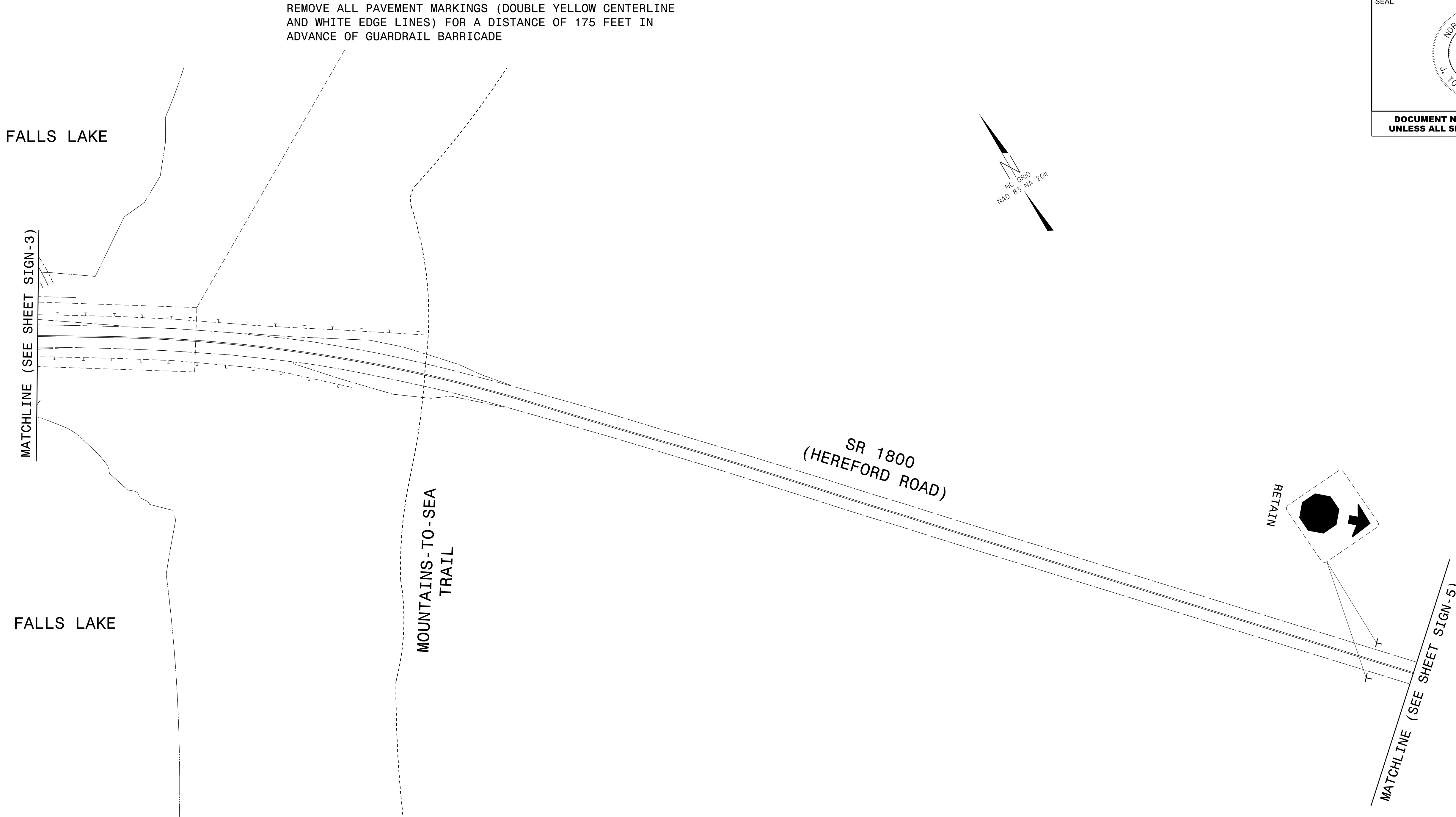
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 AT: R90K8AV4



2610 WYCLIFF ROAD  
 SUITE 410  
 RALEIGH, NC 27607  
 PHONE: 919-881-9939  
 NC COA No. F-0929

**EXISTING AND PROPOSED  
SIGNING DETAIL**

PROJECT	SHEET NO.
51215.01Z	SIGN-4
APPROVED: 	
DATE: 10/31/2022	
SEAL	
	
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	

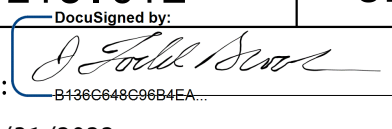
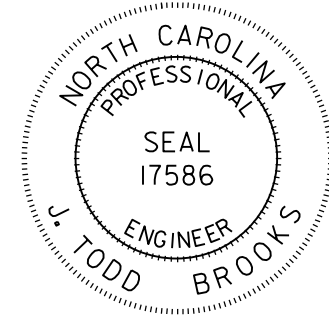


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 AT: R90K8AV4  
 J.Wiles



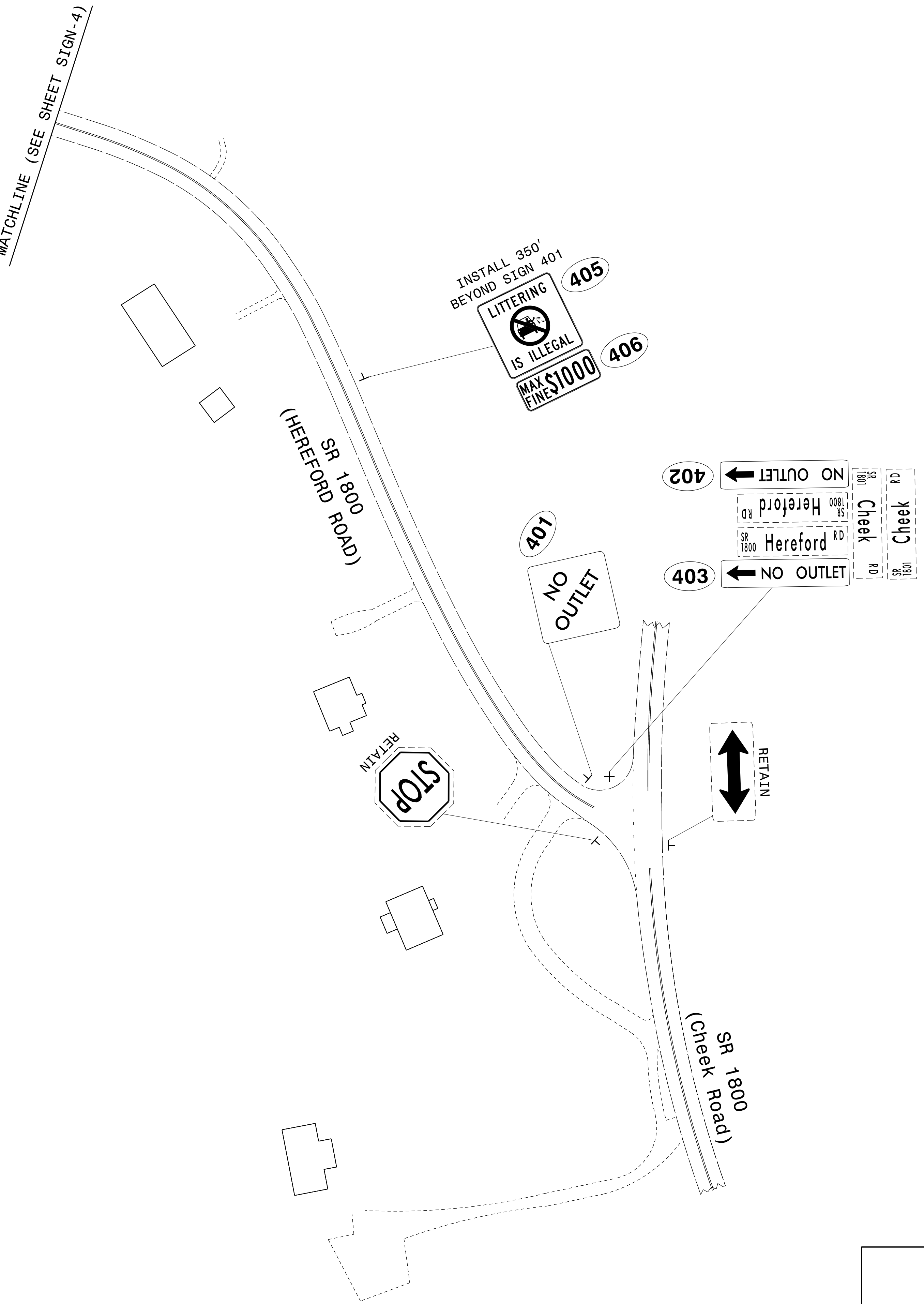
2610 WYCLIFF ROAD  
 SUITE 410  
 RALEIGH, NC 27607  
 PHONE: 919-881-9939  
 NC COA No. F-0929

**EXISTING AND PROPOSED  
SIGNING DETAIL**

PROJECT	SHEET NO.
51215.01Z	SIGN-5
APPROVED: 	
DATE: 10/31/2022	
SEAL	
	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



MATCHLINE (SEE SHEET SIGN-4)



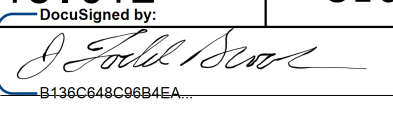
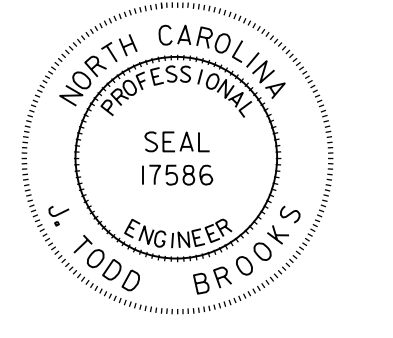
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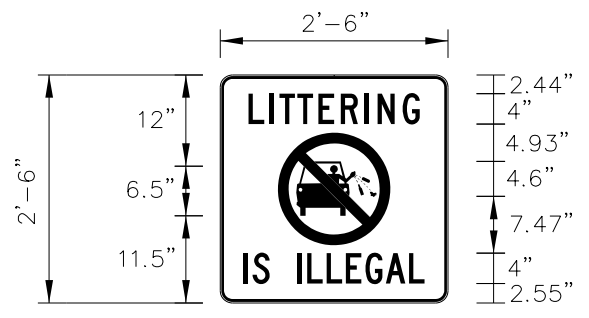
2610 WYCLIFF ROAD  
 SUITE 410  
 RALEIGH, NC 27607  
 PHONE: 919-881-9939  
 NC COA No. F-0929

**EXISTING AND PROPOSED  
SIGNING DETAIL**



PROJECT	SHEET NO.
51215.01Z	SIGN-6
APPROVED:  <small>DocuSigned by: J. Todd Brooks</small>	
DATE: 10/31/2022	
SEAL	
	
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	

SIGN NUMBER: 405 TYPE: E QUANTITY: 2 SIGN WIDTH: 2'-6" HEIGHT: 2'-6" TOTAL AREA: 6.3 Sq.Ft. BORDER TYPE: RECESSED RECESS: 0.14" WIDTH: 0.38" RADII: 1.5" NO. Z BARS: LENGTH:	BACKG COLOR: White COPY COLOR: Black/Red <table border="1"> <thead> <tr> <th>SYMBOL</th> <th>X</th> <th>Y</th> <th>WID</th> <th>HT</th> </tr> </thead> <tbody> <tr> <td></td> <td>12.4</td> <td>14</td> <td>5.4</td> <td>4.6</td> </tr> <tr> <td></td> <td></td> <td>10</td> <td>11.5</td> <td>6.5</td> </tr> <tr> <td></td> <td></td> <td>7.6</td> <td>7.6</td> <td>14.8</td> </tr> </tbody> </table> MAT'L: 0.063" (1.6 mm) ALUMINUM	SYMBOL	X	Y	WID	HT		12.4	14	5.4	4.6			10	11.5	6.5			7.6	7.6	14.8	DESIGN BY: AB PROJECT ID: 51215.01Z CHECKED BY: TB LOCATION: DURHAM COUNTY Sep 30, 2022 DIV: 5
SYMBOL	X	Y	WID	HT																		
	12.4	14	5.4	4.6																		
		10	11.5	6.5																		
		7.6	7.6	14.8																		



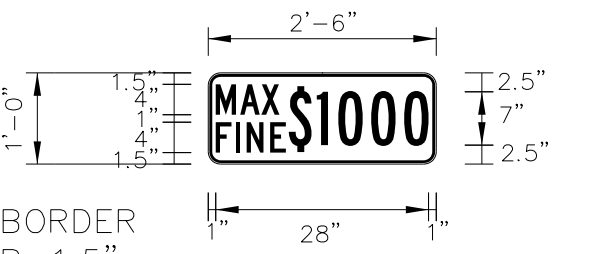
BORDER R=1.5"  
 TH=0.38"  
 IN=0.14"  
 Panel Style: Hereford.ssi  
 M.U.T.C.D.: 2009 Edition

Spacing Factor is 1 unless specified otherwise

LETTER POSITIONS													Series/Size
Letter spacings are to start of next letter													Text Length
	L	I	T	T	E	R	I	N	G				C 2000
	3.7	2.8	1.3	2.4	2.8	2.9	3.1	1.7	3.3	2.2	3.7		22.5
	I	S		I	L	L	E	G	A	L			C 2000
	3.1	1.2	2.2	3.6	1.4	2.5	2.5	2.6	2.7	3.1	2	3.1	23.8

FILENAME: Sign Designs NORTH CAROLINA D.O.T. SIGN DETAIL

SIGN NUMBER: 406 TYPE: E QUANTITY: 2 SIGN WIDTH: 2'-6" HEIGHT: 1'-0" TOTAL AREA: 2.5 Sq.Ft. BORDER TYPE: FLUSH RECESS: 0.14" WIDTH: 0.38" RADII: 1.5" NO. Z BARS: LENGTH:	BACKG COLOR: White COPY COLOR: Black <table border="1"> <thead> <tr> <th>SYMBOL</th> <th>X</th> <th>Y</th> <th>WID</th> <th>HT</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> MAT'L: 0.063" (1.6 mm) ALUMINUM	SYMBOL	X	Y	WID	HT						DESIGN BY: AB PROJECT ID: 51215.01Z CHECKED BY: TB LOCATION: DURHAM COUNTY Sep 30, 2022 DIV: 5
SYMBOL	X	Y	WID	HT								



BORDER R=1.5"  
 TH=0.38"  
 IN=0.14"  
 Panel Style: Hereford.ssi  
 M.U.T.C.D.: 2009 Edition

Spacing Factor is 1 unless specified otherwise

LETTER POSITIONS													Series/Size
Letter spacings are to start of next letter													Text Length
	M	A	X										C 2000
1	3.2	2.8	2.4	20.6									8.4
	F	I	N	E									C 2000
1	2.6	1.4	3.1	2	19.8								9.2
	\$	1	0	0	0								B 2000
10.6	3.7	2.8	4.3	4.3	3.2	1							18.4

FILENAME: Sign Designs NORTH CAROLINA D.O.T. SIGN DETAIL

31-OCT-2022 09:20  
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 AT: R90K8AV4



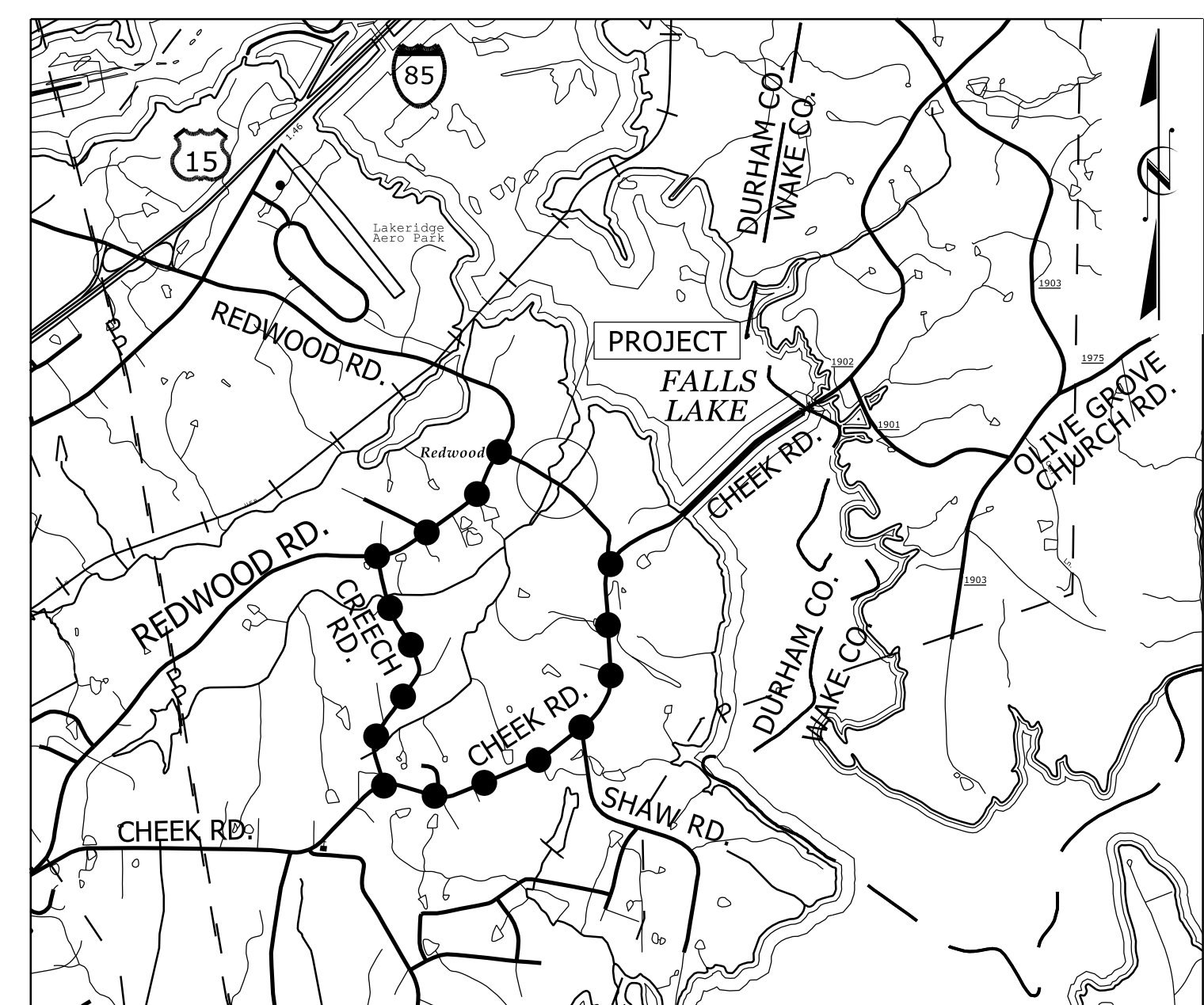
2610 WYCLIFF ROAD  
 SUITE 410  
 RALEIGH, NC 27607  
 PHONE: 919-881-9939  
 NC COA No. F-0929

SIGN DESIGNS

09/08/99  
 31-OCT-2022 10:28  
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 \$\$\$USERNAME\$\$\$

**TIP PROJECT: 51215.01Z**  
**CONTRACT: DE00354**

See Sheet 1A For Index of Sheets  
See Sheet 1B For Conventional Symbols



**VICINITY MAP** NTS

— DURHAM COUNTY LINE  
 ● OFFSITE DETOUR

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# DURHAM COUNTY

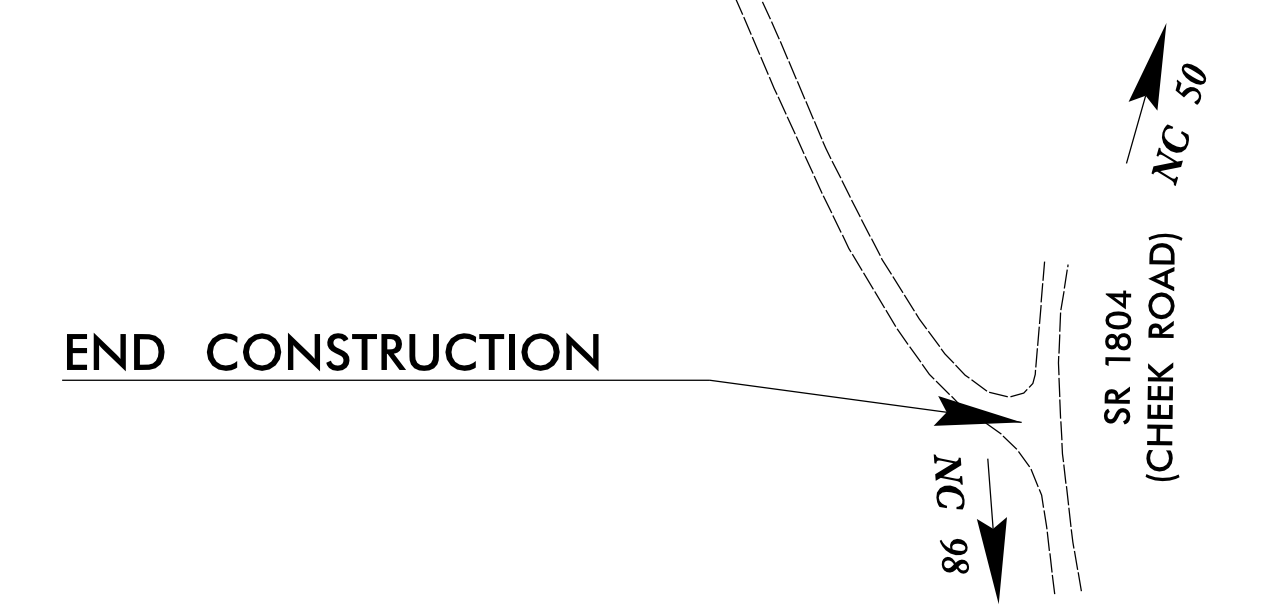
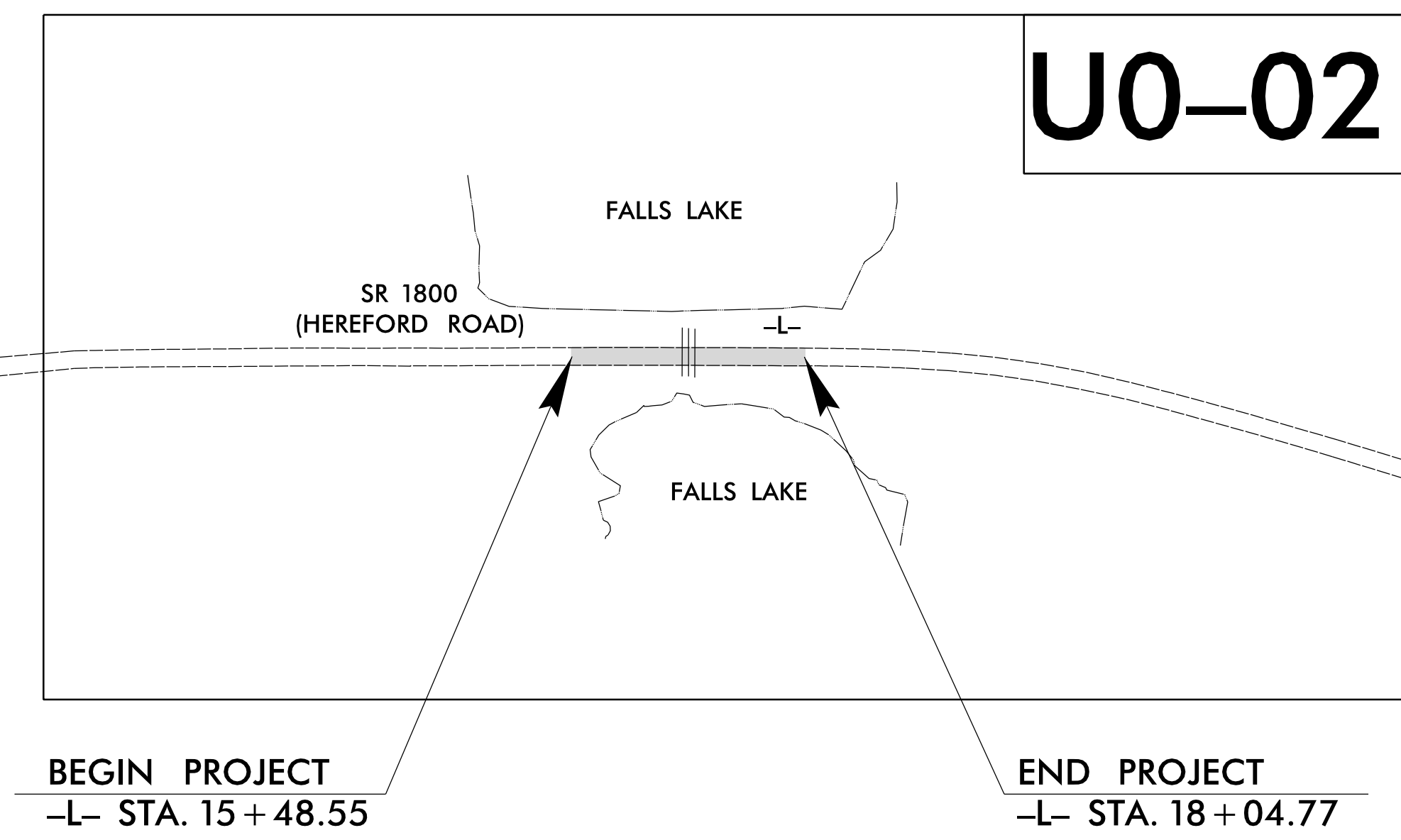
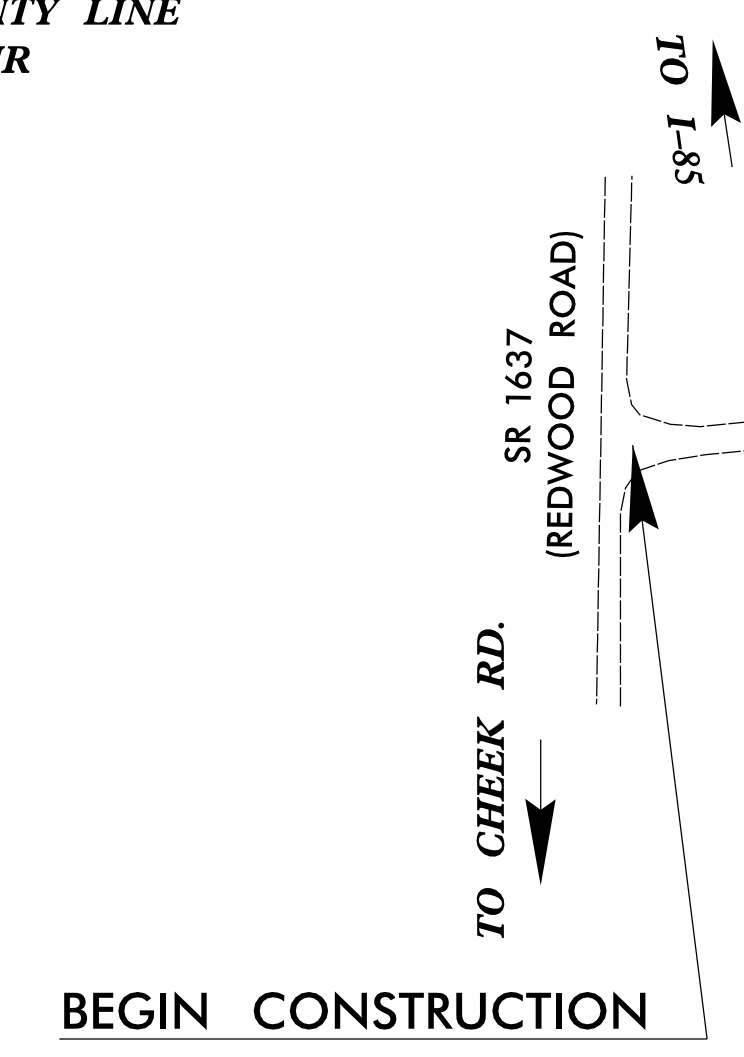
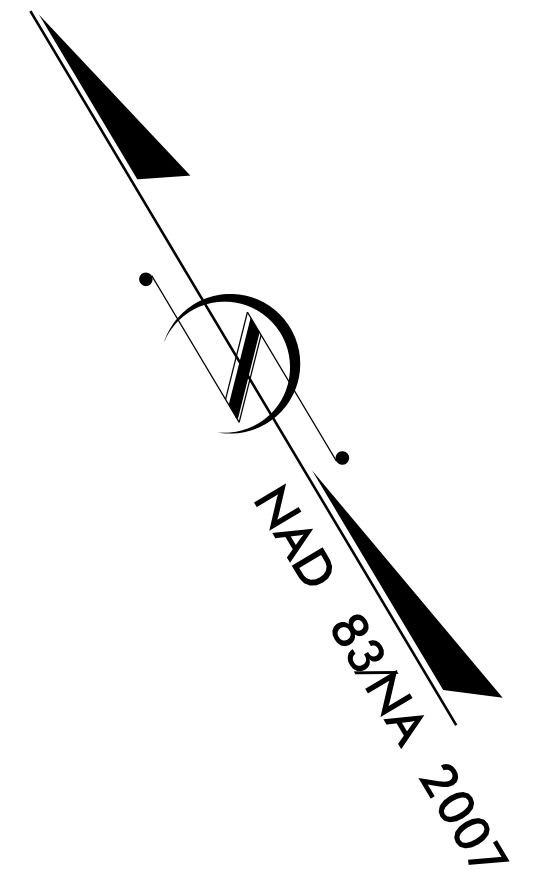
**LOCATION: CONSTRUCT CHANNEL ON SR 1800 (HEREFORD ROAD)  
AT FALLS LAKE**

**TYPE OF WORK: UTILITY RELOCATION**

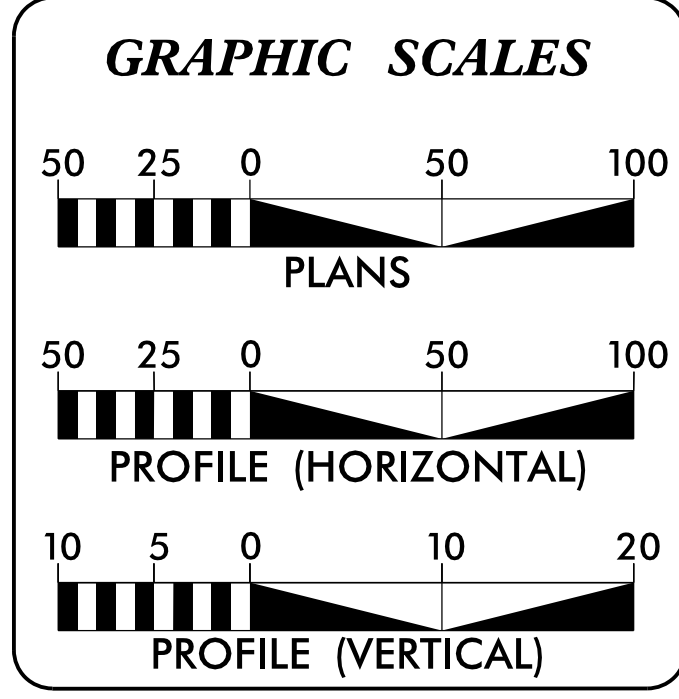
T.I.P. NO.	SHEET NO.
51215.01Z	UO-1

**UTILITES BY OTHERS**

NOTE:  
ALL UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR UTILITY WORK SHOWN ON THIS SHEET.



DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED



**INDEX OF SHEETS**

SHEET NO.:	DESCRIPTION:
UO-01	TITLE SHEET
UO-02	UBO PLAN SHEET

**UTILITY OWNERS WITH CONFLICTS**

WAKE EMC - POWER

PREPARED IN THE OFFICE OF:

**Dewberry**

2610 WYCLIFF ROAD  
SUITE 410  
RALEIGH, NC 27607  
PHONE: 919.881.9939  
NC COA No. F-0929

**TIMOTHY RITACCO, PE** PROJECT UTILITY COORDINATOR

**DIVISION OF HIGHWAYS  
UTILITIES UNIT**

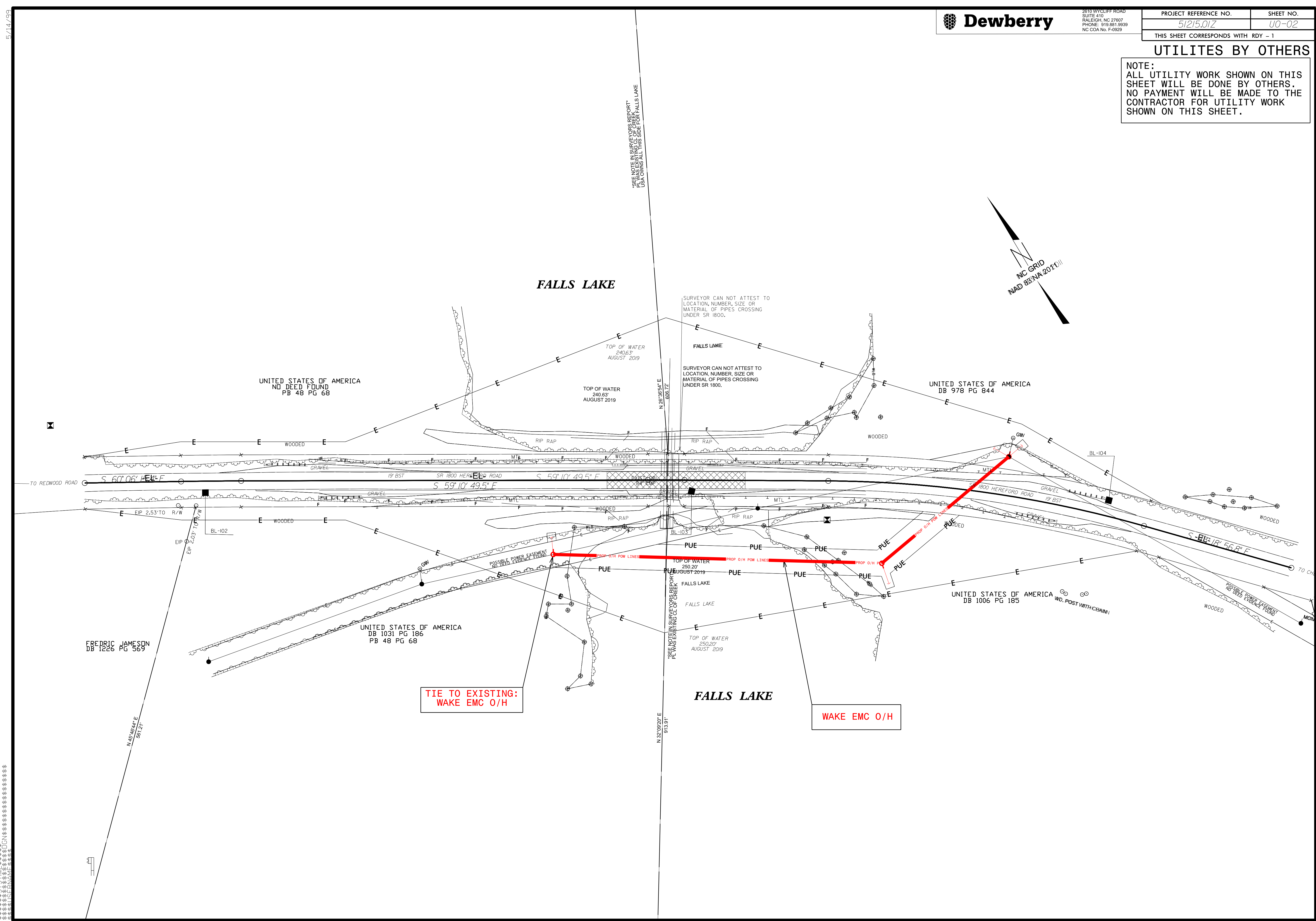
1555 MAIL SERVICES CENTER  
RALEIGH NC 27699-1555  
PHONE (919) 707-6690  
FAX (919) 250-4151

**BRANDON H. JONES** DIVISION ENGINEER  
**MONROE BROWN** DIVISION UTILITY COORDINATOR



**UTILITES BY OTHERS**

NOTE:  
ALL UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR UTILITY WORK SHOWN ON THIS SHEET.





PROJECT: 17BP.5.R.142 REFERENCE: N/A

**CONTENTS**

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND (SOIL & ROCK)
3	SITE PLAN
4-9	BORE LOG(S)

**STATE OF NORTH CAROLINA**  
**DEPARTMENT OF TRANSPORTATION**  
**DIVISION OF HIGHWAYS**  
**GEOTECHNICAL ENGINEERING UNIT**

**STRUCTURE**  
**SUBSURFACE INVESTIGATION**

COUNTY DURHAM  
 PROJECT DESCRIPTION REPLACE CULVERT ON  
HEREFORD RD (SR 1800) OVER FINGER  
OF FALLS LAKE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.5.R.142	1	9

**CAUTION NOTICE**

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT 1919 TOT-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

NOTES:

1. THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS ACCURATE NOR IS IT CONSIDERED PART OF THE PLANS, SPECIFICATIONS OR CONTRACT FOR THE PROJECT.
2. BY HAVING REQUESTED THIS INFORMATION, THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

PERSONNEL

A. N. KINTNER

D. G. PINTER

J. E. DEAN

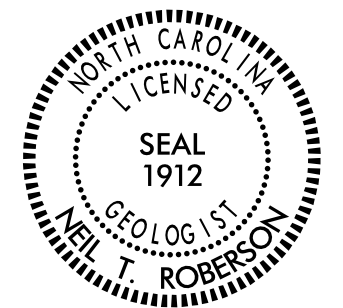
INVESTIGATED BY A. N. KINTNER

DRAWN BY A. N. KINTNER

CHECKED BY N. T. ROBERSON

SUBMITTED BY N. T. ROBERSON

DATE AUGUST 2019



DocuSigned by:

*Neil Roberson*

8/14/2019

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SIGNATURE

DATE

**DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED**

**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION**  
**DIVISION OF HIGHWAYS**  
**GEOTECHNICAL ENGINEERING UNIT**  
**SUBSURFACE INVESTIGATION**  
**SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS**

SOIL DESCRIPTION	GRADATION	ROCK DESCRIPTION	TERMS AND DEFINITIONS																																																																																																																																										
SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 208, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE, <i>VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i>	<b>WELL GRADED</b> - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. <b>UNIFORMLY GRADED</b> - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. <b>GAP-GRADED</b> - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.	<b>HARD ROCK</b> IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED, AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:	<b>ALLUVIUM (ALLUV.)</b> - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. <b>AQUIFER</b> - A WATER BEARING FORMATION OR STRATA. <b>ARENACEOUS</b> - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. <b>ARGILLACEOUS</b> - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC. <b>ARTESIAN</b> - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. <b>CALCAREOUS (CALC.)</b> - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. <b>COLLUVIUM</b> - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. <b>CORE RECOVERY (REC.)</b> - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. <b>DIKE</b> - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. <b>DIP</b> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. <b>DIP DIRECTION (DIP AZIMUTH)</b> - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. <b>FAULT</b> - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. <b>FISSILE</b> - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. <b>FLOAT</b> - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOGGED FROM PARENT MATERIAL. <b>FLOOD PLAIN (FP)</b> - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. <b>FORMATION (FM)</b> - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. <b>JOINT</b> - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. <b>LEDGE</b> - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. <b>LENS</b> - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. <b>MOTTLED (MOT.)</b> - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. <b>PERCHED WATER</b> - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. <b>RESIDUAL (RES.) SOIL</b> - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. <b>ROCK QUALITY DESIGNATION (RQD)</b> - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. <b>SAPROLITE (SAP.)</b> - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. <b>SILL</b> - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. <b>SLICKENSIDE</b> - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. <b>STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT)</b> - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. <b>STRATA CORE RECOVERY (SREC.)</b> - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. <b>STRATA ROCK QUALITY DESIGNATION (SROD)</b> - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. <b>TOPSOIL (TS.)</b> - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.																																																																																																																																										
<b>SOIL LEGEND AND AASHTO CLASSIFICATION</b> <table border="1"> <tr> <th rowspan="2">GENERAL CLASS.</th> <th colspan="7">GRANULAR MATERIALS (≤ 35% PASSING #200)</th> <th colspan="3">SILT-CLAY MATERIALS (&gt; 35% PASSING #200)</th> <th colspan="3">ORGANIC MATERIALS</th> </tr> <tr> <th>A-1</th> <th>A-3</th> <th>A-2</th> <th>A-4</th> <th>A-5</th> <th>A-6</th> <th>A-7</th> <th>A-1, A-2</th> <th>A-4, A-5</th> <th>A-6, A-7</th> <th>A-1, A-2</th> <th>A-4, A-5</th> <th>A-6, A-7</th> </tr> <tr> <th>GROUP CLASS.</th> <td>A-1-a</td> <td>A-1-b</td> <td>A-2-4</td> <td>A-2-5</td> <td>A-2-6</td> <td>A-2-7</td> <td>A-7-5</td> <td>A-7-6</td> <td>A-3</td> <td>A-3</td> <td>A-3</td> <td>A-3</td> <td>A-3</td> </tr> <tr> <th>SYMBOL</th> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <th>% PASSING</th> <td>50 MX</td> <td>30 MX</td> <td>10 MX</td> <td>5 MN</td> <td>35 MX</td> <td>35 MX</td> <td>35 MX</td> <td>35 MX</td> <td>36 MN</td> <td>36 MN</td> <td>36 MN</td> <td>36 MN</td> <td>36 MN</td> </tr> <tr> <th>MATERIAL PASSING #40</th> <td>6 MX</td> <td>NP</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td>41 MN</td> </tr> <tr> <th>GROUP INDEX</th> <td>0</td> <td>0</td> <td>0</td> <td>4 MX</td> <td>8 MX</td> <td>12 MX</td> <td>16 MX</td> <td>NO MX</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <th>USUAL TYPES OF MAJOR MATERIALS</th> <td>STONE FRAGS. GRAVEL, AND SAND</td> <td>FINE SAND</td> <td>SILTY OR CLAYEY GRAVEL AND SAND</td> <td>SILTY SOILS</td> <td>CLAYEY SOILS</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <th>GEN. RATING AS SUBGRADE</th> <td colspan="3">EXCELLENT TO GOOD</td> <td colspan="3">FAIR TO POOR</td> <td>FAIR TO POOR</td> <td>POOR</td> <td>UNSUITABLE</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td colspan="13">PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS &gt; LL - 30</td> </tr> </table>	GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)							SILT-CLAY MATERIALS (> 35% PASSING #200)			ORGANIC MATERIALS			A-1	A-3	A-2	A-4	A-5	A-6	A-7	A-1, A-2	A-4, A-5	A-6, A-7	A-1, A-2	A-4, A-5	A-6, A-7	GROUP CLASS.	A-1-a	A-1-b	A-2-4	A-2-5	A-2-6	A-2-7	A-7-5	A-7-6	A-3	A-3	A-3	A-3	A-3	SYMBOL														% PASSING	50 MX	30 MX	10 MX	5 MN	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN	36 MN	MATERIAL PASSING #40	6 MX	NP	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	41 MN	GROUP INDEX	0	0	0	4 MX	8 MX	12 MX	16 MX	NO MX						USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL, AND SAND	FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND	SILTY SOILS	CLAYEY SOILS									GEN. RATING AS SUBGRADE	EXCELLENT TO GOOD			FAIR TO POOR			FAIR TO POOR	POOR	UNSUITABLE					PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30													<b>ANGULARITY OF GRAINS</b> THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.	<b>WEATHERED ROCK (WR)</b> 	<b>NON-COASTAL PLAIN MATERIAL</b> THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.
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<b>MINERALOGICAL COMPOSITION</b> MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.	<b>CRYSTALLINE ROCK (CR)</b> 	<b>FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK</b> THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.	<b>CRISTALLINE ROCK (CR)</b> 																																																																																																																																										
<b>COMPRESSION</b> SLIGHTLY COMPRESSIBLE LL < 31 MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50	<b>NON-CRYSTALLINE ROCK (NCR)</b> 	<b>FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK</b> THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.	<b>NON-CRYSTALLINE ROCK (NCR)</b> 																																																																																																																																										
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<b>GROUND WATER</b> WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING STATIC WATER LEVEL AFTER 24 HOURS PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA SPRING OR SEEP	<b>MISCELLANEOUS SYMBOLS</b> ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION SOIL SYMBOL ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT INFERRED SOIL BOUNDARY INFERRED ROCK LINE ALLUVIAL SOIL BOUNDARY DIP & DIP DIRECTION OF ROCK STRUCTURES TEST BORING AUGER BORING CORE BORING MONITORING WELL PIEZOMETER INSTALLATION SLOPE INDICATOR INSTALLATION CONE PENETROMETER TEST SOUNDING ROD TEST BORING WITH CORE SPT N-VALUE	<b>ROCK HARDNESS</b> <b>VERY HARD</b> - CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK. <b>HARD</b> - CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN. <b>MODERATELY HARD</b> - CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS. <b>MEDIUM HARD</b> - CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK. <b>SOFT</b> - CAN BE GROOVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE. <b>VERY SOFT</b> - CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGER NAIL.																																																																																																																																											
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<b>COLOR</b> DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.	<b>INDURATION</b> <b>FRILABLE</b> - RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE. <b>MODERATELY INDURATED</b> - GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER. <b>INDURATED</b> - GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER. <b>EXTREMELY INDURATED</b> - SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.	<b>NOTES:</b> BOREHOLE NORTHING AND EASTINGS COLLECTED IN FIELD BY GEU PERSONNEL.																																																																																																																																											



PROJECT REFERENCE NO.	SHEET NO.
17BP.5.R.142	3
<b>SITE PLAN</b>	



FALLS LAKE

7+00\*

8+00\*

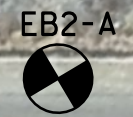
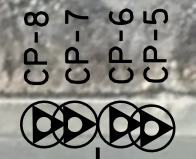
9+00\*

10+00\*

11+00\*

12+00\*

13+00\*



-EL-

← REDWOOD RD

HEREFORD RD (SR 1800)

CHEEK RD →

FALLS LAKE

\* ASSUMED STATIONS



# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS 17BP.5.R.142		TIP N/A		COUNTY DURHAM		GEOLOGIST Kintner, A. N.											
SITE DESCRIPTION REPLACE CULVERTS ON HEREFORD RD (SR 1800)							GROUND WTR (ft)										
BORING NO. EB1-A		STATION 9+48		OFFSET 14 ft LT		ALIGNMENT EL											
COLLAR ELEV. 98.2 ft		TOTAL DEPTH 28.4 ft		NORTHING 835,606		EASTING 2,068,578											
DRILL RIG/HAMMER EFF./DATE RFC0074 CME-55 80% 03/08/2019				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER Pinter, D. G.		START DATE 07/10/19		COMP. DATE 07/10/19		SURFACE WATER DEPTH N/A											
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG G	SOIL AND ROCK DESCRIPTION	ELEV. (ft)	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100							
100															98.2	0.0	GROUND SURFACE
95	94.9	3.3	5	6	7								M				ROADWAY EMBANKMENT GRAY AND BROWN, SANDY SILT
90	89.9	8.3	4	4	5								M				
85	84.9	13.3	3	3	4								M				
80	79.9	18.3	1	1	3								M				ALLUVIAL GRAY-TAN, SILTY SAND WITH TRACE ROOT FRAGMENTS
75	74.9	23.3	3	2	4								Sat.				
70	69.9	28.3	60/0.1												72.4	25.8	WEATHERED ROCK (TRIASSIC SANDSTONE)
															70.0	28.2	NON-CRYSTALLINE ROCK (TRIASSIC SANDSTONE)
															69.9	28.3	Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 69.8 ft IN NON-CRYSTALLINE ROCK (TRIASSIC SANDSTONE)

WBS 17BP.5.R.142		TIP N/A		COUNTY DURHAM		GEOLOGIST Kintner, A. N.											
SITE DESCRIPTION REPLACE CULVERTS ON HEREFORD RD (SR 1800)							GROUND WTR (ft)										
BORING NO. EB1-B		STATION 9+42		OFFSET 14 ft RT		ALIGNMENT EL											
COLLAR ELEV. 97.9 ft		TOTAL DEPTH 33.2 ft		NORTHING 835,583		EASTING 2,068,561											
DRILL RIG/HAMMER EFF./DATE RFC0074 CME-55 80% 03/08/2019				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER Pinter, D. G.		START DATE 07/10/19		COMP. DATE 07/10/19		SURFACE WATER DEPTH N/A											
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100															97.9	0.0	GROUND SURFACE
95	94.6	3.3	5	9	10								M				ROADWAY EMBANKMENT GRAY AND BROWN, SANDY SILT
90	89.6	8.3	2	4	5								M				
85	84.6	13.3	3	3	4								M				
80	79.6	18.3	2	3	2								M				ALLUVIAL DARK GRAY, SANDY SILT
75	74.6	23.3	2	3	16								Sat.				
70	69.6	28.3	100/0.3												73.6	24.3	TRIASSIC RESIDUAL TAN-PINK, SILTY SAND
															69.9	28.0	WEATHERED ROCK (TRIASSIC MUDSTONE)
65	64.7	33.2	60/0.0												64.9	33.0	NON-CRYSTALLINE ROCK (TRIASSIC MUDSTONE)
															64.7	33.2	Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 64.7 ft IN NON-CRYSTALLINE ROCK (TRIASSIC MUDSTONE)

NCDOT BORE DOUBLE 31\_GEO\_HEREFORD\_PIPE\_BH.GPJ NC\_DOT.GDT 8/13/19

# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS 17BP.5.R.142		TIP N/A		COUNTY DURHAM		GEOLOGIST Kintner, A. N.										
SITE DESCRIPTION REPLACE CULVERTS ON HEREFORD RD (SR 1800)							GROUND WTR (ft)									
BORING NO. EB2-A		STATION 10+53		OFFSET 14 ft LT		ALIGNMENT EL										
COLLAR ELEV. 98.3 ft		TOTAL DEPTH 28.3 ft		NORTHING 835,550		EASTING 2,068,662										
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 80% 03/08/2019				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Pinter, D. G.		START DATE 07/10/19		COMP. DATE 07/10/19		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	ELEV. (ft)	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
100															98.3	0.0
															ROADWAY EMBANKMENT TAN-GRAY, SILTY SAND	
95	95.0	3.3	4	5	6								M		94.6	3.7
															GRAY AND BROWN, SANDY SILT	
90	90.0	8.3	4	5	6								M			
85	85.0	13.3	3	2	4								M		83.6	14.7
															ALLUVIAL DARK GRAY, SANDY SILT WITH TRACE ROOT FRAGMENTS	
80	80.0	18.3	1	9	6								Sat.		76.3	22.0
															GRAY-TAN, SILTY SAND	
75	75.0	23.3	WOH	1	3								Sat.		71.4	26.9
															NON-CRYSTALLINE ROCK (TRIASSIC SANDSTONE)	28.3
															Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 70.0 ft IN NON-CRYSTALLINE ROCK (TRIASSIC SANDSTONE)	
70	70.0	28.3													70.0	28.3
																60/0.0

WBS 17BP.5.R.142		TIP N/A		COUNTY DURHAM		GEOLOGIST Kintner, A. N.										
SITE DESCRIPTION REPLACE CULVERTS ON HEREFORD RD (SR 1800)							GROUND WTR (ft)									
BORING NO. EB2-B		STATION 10+53		OFFSET 14 ft RT		ALIGNMENT EL										
COLLAR ELEV. 97.9 ft		TOTAL DEPTH 28.4 ft		NORTHING 835,527		EASTING 2,068,651										
DRILL RIG/HAMMER EFF./DATE RFO0074 CME-55 80% 03/08/2019				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Pinter, D. G.		START DATE 07/10/19		COMP. DATE 07/10/19		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	ELEV. (ft)	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
100															97.9	0.0
															ROADWAY EMBANKMENT GRAY AND BROWN, SANDY SILT	
95	94.6	3.3	4	5	4								M			
90	89.6	8.3	3	6	6								M			
85	84.6	13.3	2	2	2								M		83.2	14.7
															ALLUVIAL GRAY-TAN, SILTY SAND	
80	79.6	18.3	1	2	1								Sat.			
75	74.6	23.3	2	6	6								Sat.		70.0	27.9
															NON-CRYSTALLINE ROCK (TRIASSIC MUDSTONE)	28.4
															Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 69.5 ft IN NON-CRYSTALLINE ROCK (TRIASSIC MUDSTONE)	
70	69.6	28.3													70.0	28.4
																60/0.1

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# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS 17BP.5.R.142		TIP N/A		COUNTY DURHAM		GEOLOGIST Kintner, A. N.										
SITE DESCRIPTION REPLACE CULVERTS ON HEREFORD RD (SR 1800)							GROUND WTR (ft)									
BORING NO. CP-1		STATION 9+85		OFFSET 11 ft RT		ALIGNMENT EL										
COLLAR ELEV. 98.0 ft		TOTAL DEPTH 19.0 ft		NORTHING 835,564		EASTING 2,068,597										
DRILL RIG/HAMMER EFF./DATE RFC0067 CME-550X 89% 03/08/2019				DRILL METHOD CPT / DPT		HAMMER TYPE Automatic										
DRILLER Pinter, D. G.		START DATE 07/08/19		COMP. DATE 07/08/19		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
100														98.0	GROUND SURFACE	0.0
			5	6											ROADWAY EMBANKMENT	
			3	4											GRAY AND BROWN, SANDY SILT	
			4	4												
95			3	3												
			5	5												
			4	5												
			5	5												
90			7	6												
			9	10												
			9	9												
			8	9												
			9	9												
85			8	8												
			10	10												
			11	11												
			11	12												
			13	13												
			16	16												
80			16	16												
														79.0	Boring Terminated at Elevation 79.0 ft IN ROADWAY EMBANKMENT (SANDY SILT)	19.0

WBS 17BP.5.R.142		TIP N/A		COUNTY DURHAM		GEOLOGIST Kintner, A. N.										
SITE DESCRIPTION REPLACE CULVERTS ON HEREFORD RD (SR 1800)							GROUND WTR (ft)									
BORING NO. CP-2		STATION 9+93		OFFSET 12 ft RT		ALIGNMENT EL										
COLLAR ELEV. 98.0 ft		TOTAL DEPTH 16.8 ft		NORTHING 835,559		EASTING 2,068,602										
DRILL RIG/HAMMER EFF./DATE RFC0067 CME-550X 89% 03/08/2019				DRILL METHOD CPT / DPT		HAMMER TYPE Automatic										
DRILLER Pinter, D. G.		START DATE 07/08/19		COMP. DATE 07/08/19		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
100														98.0	GROUND SURFACE	0.0
			6	6											ROADWAY EMBANKMENT	
			7	8											GRAY AND BROWN, SANDY SILT	
			3	4												
95			4	5												
			4	5												
			4	4												
			5	5												
90			7	7												
			5	6												
			6	6												
			6	6												
			6	7												
85			7	7												
			8	9												
			8	8												
			8	9												
			9	9												
														81.2	Boring Terminated at Elevation 81.2 ft IN ROADWAY EMBANKMENT (SANDY SILT)	16.8

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# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS 17BP.5.R.142		TIP N/A		COUNTY DURHAM		GEOLOGIST Kintner, A. N.										
SITE DESCRIPTION REPLACE CULVERTS ON HEREFORD RD (SR 1800)							GROUND WTR (ft)									
BORING NO. CP-3		STATION 10+06		OFFSET 12 ft RT		ALIGNMENT EL										
COLLAR ELEV. 97.8 ft		TOTAL DEPTH 18.3 ft		NORTHING 835,552		EASTING 2,068,610										
DRILL RIG/HAMMER EFF./DATE RFC0067 CME-550X 89% 03/08/2019				DRILL METHOD CPT / DPT		HAMMER TYPE Automatic										
DRILLER Pinter, D. G.		START DATE 07/08/19		COMP. DATE 07/08/19		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
100														97.8	0.0	GROUND SURFACE
			6	6												ROADWAY EMBANKMENT GRAY AND BROWN, SANDY SILT
			5	5												
			4	5												
95			2	3												
			4	4												
			4	4												
			3	4												
90			5	5												
			6	6												
			5	6												
			5	5												
			11	12												
85			5	6												
			6	6												
			6	6												
			8	8												
			9	10												
80			11	12												
			12	0												
														79.5	18.3	Boring Terminated at Elevation 79.5 ft IN ROADWAY EMBANKMENT (SANDY SILT)

WBS 17BP.5.R.142		TIP N/A		COUNTY DURHAM		GEOLOGIST Kintner, A. N.										
SITE DESCRIPTION REPLACE CULVERTS ON HEREFORD RD (SR 1800)							GROUND WTR (ft)									
BORING NO. CP-4		STATION 10+15		OFFSET 12 ft RT		ALIGNMENT EL										
COLLAR ELEV. 97.8 ft		TOTAL DEPTH 19.0 ft		NORTHING 835,547		EASTING 2,068,619										
DRILL RIG/HAMMER EFF./DATE RFC0067 CME-550X 89% 03/08/2019				DRILL METHOD CPT / DPT		HAMMER TYPE Automatic										
DRILLER Pinter, D. G.		START DATE 07/08/19		COMP. DATE 07/08/19		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
100														97.8	0.0	GROUND SURFACE
			6	7												
			3	4												
95			3	4												
			3	4												
			3	4												
			4	4												
			5	5												
90			7	7												
			7	8												
			7	8												
			10	10												
			8	9												
85			6	7												
			6	6												
			8	8												
			10	10												
			13	13												
80			14	14												
			15	16												
														78.8	19.0	Boring Terminated at Elevation 78.8 ft IN ROADWAY EMBANKMENT (SANDY SILT)

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# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS 17BP.5.R.142		TIP N/A		COUNTY DURHAM		GEOLOGIST Kintner, A. N.										
SITE DESCRIPTION REPLACE CULVERTS ON HEREFORD RD (SR 1800)							GROUND WTR (ft)									
BORING NO. CP-5		STATION 10+14		OFFSET 12 ft LT		ALIGNMENT EL										
COLLAR ELEV. 98.0 ft		TOTAL DEPTH 19.0 ft		NORTHING 835,568		EASTING 2,068,633										
DRILL RIG/HAMMER EFF./DATE RFC0067 CME-550X 89% 03/08/2019				DRILL METHOD CPT / DPT		HAMMER TYPE Automatic										
DRILLER Pinter, D. G.		START DATE 07/08/19		COMP. DATE 07/08/19		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
100														98.0	GROUND SURFACE	0.0
			8	9											ROADWAY EMBANKMENT	
			11	11											GRAY AND BROWN, SANDY SILT	
			6	6												
95			7	7												
			6	6												
			6	7												
			4	4												
90			4	5												
			5	5												
			4	5												
			5	5												
			7	7												
			4	5												
85			4	4												
			5	6												
			7	8												
			10	10												
			11	12												
80			13	14												
														79.0	Boring Terminated at Elevation 79.0 ft IN ROADWAY EMBANKMENT (SANDY SILT)	19.0

WBS 17BP.5.R.142		TIP N/A		COUNTY DURHAM		GEOLOGIST Kintner, A. N.										
SITE DESCRIPTION REPLACE CULVERTS ON HEREFORD RD (SR 1800)							GROUND WTR (ft)									
BORING NO. CP-6		STATION 10+06		OFFSET 13 ft LT		ALIGNMENT EL										
COLLAR ELEV. 98.1 ft		TOTAL DEPTH 20.0 ft		NORTHING 835,573		EASTING 2,068,623										
DRILL RIG/HAMMER EFF./DATE RFC0067 CME-550X 89% 03/08/2019				DRILL METHOD CPT / DPT		HAMMER TYPE Automatic										
DRILLER Pinter, D. G.		START DATE 07/08/19		COMP. DATE 07/08/19		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
100														98.1	GROUND SURFACE	0.0
			8	8											ROADWAY EMBANKMENT	
			9	9											GRAY AND BROWN, SANDY SILT	
			5	6												
95			6	6												
			7	7												
			5	6												
			5	5												
			4	4												
90			4	4												
			3	4												
			3	4												
			4	4												
			3	3												
			5	5												
85			4	4												
			4	4												
			4	5												
			6	6												
			8	9												
			11	11												
			11	12												
80			11	11												
														78.1	Boring Terminated at Elevation 78.1 ft IN ROADWAY EMBANKMENT (SANDY SILT)	20.0

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# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS 17BP.5.R.142		TIP N/A		COUNTY DURHAM		GEOLOGIST Kintner, A. N.	
SITE DESCRIPTION REPLACE CULVERTS ON HEREFORD RD (SR 1800)							GROUND WTR (ft)
BORING NO. CP-7		STATION 9+94		OFFSET 13 ft LT		ALIGNMENT EL	
COLLAR ELEV. 98.1 ft		TOTAL DEPTH 19.0 ft		NORTHING 835,579		EASTING 2,068,615	
DRILL RIG/HAMMER EFF./DATE RFC0067 CME-550X 89% 03/08/2019			DRILL METHOD CPT / DPT		HAMMER TYPE Automatic		
DRILLER Pinter, D. G.		START DATE 07/08/19		COMP. DATE 07/08/19		SURFACE WATER DEPTH N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
100																
															98.1	GROUND SURFACE
																ROADWAY EMBANKMENT GRAY AND BROWN, SANDY SILT
			3	4												
			7	7												
95			4	4												
			4	5												
			4	5												
			3	4												
			4	4												
90			4	4												
			5	5												
			6	6												
			8	9												
			6	7												
85			6	7												
			6	7												
			5	5												
			6	6												
			7	8												
80			9	9												
			9	10												
															79.1	Boring Terminated at Elevation 79.1 ft IN ROADWAY EMBANKMENT (SANDY SILT)

WBS 17BP.5.R.142		TIP N/A		COUNTY DURHAM		GEOLOGIST Kintner, A. N.	
SITE DESCRIPTION REPLACE CULVERTS ON HEREFORD RD (SR 1800)							GROUND WTR (ft)
BORING NO. CP-8		STATION 9+86		OFFSET 13 ft LT		ALIGNMENT EL	
COLLAR ELEV. 98.3 ft		TOTAL DEPTH 19.0 ft		NORTHING 835,585		EASTING 2,068,605	
DRILL RIG/HAMMER EFF./DATE RFC0067 CME-550X 89% 03/08/2019			DRILL METHOD CPT / DPT		HAMMER TYPE Automatic		
DRILLER Pinter, D. G.		START DATE 07/08/19		COMP. DATE 07/08/19		SURFACE WATER DEPTH N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
100																
															98.3	GROUND SURFACE
																ROADWAY EMBANKMENT GRAY AND BROWN, SANDY SILT
						7	7									
						6	6									
95						4	4									
						4	4									
						4	4									
						4	5									
						4	4									
						4	5									
90						5	5									
						7	7									
						6	7									
						7	7									
						6	7									
85						6	6									
						6	6									
						6	6									
						6	6									
						8	9									
80						10	10									
						11	11									
															79.3	Boring Terminated at Elevation 79.3 ft IN ROADWAY EMBANKMENT (SANDY SILT)

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