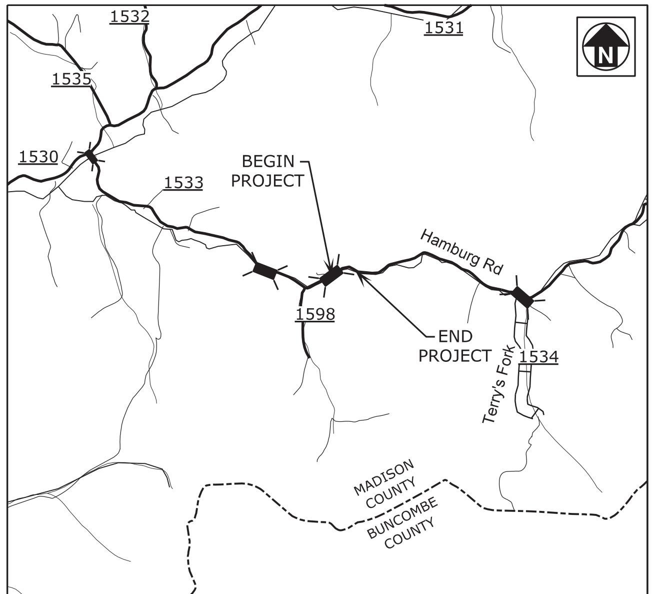
CONTRACT: DM00350 PROJECT: 17BP.13.R.161

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



VICINITY MAP
(NOT TO SCALE)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

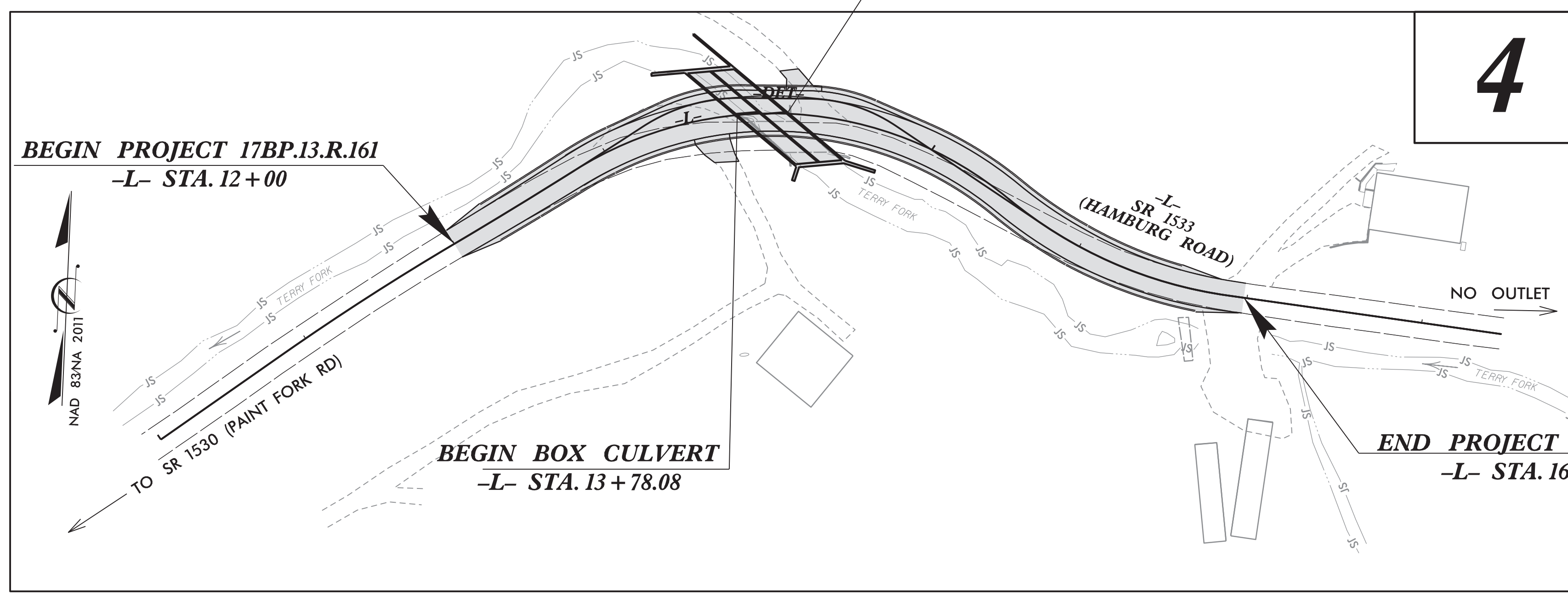
MADISON COUNTY

LOCATION: BRIDGE NO. 166 OVER TERRY FORK ON SR 1533 (HAMBURG ROAD)

TYPE OF WORK: GRADING, PAVING, DRAINAGE AND CULVERT

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.13.R.161	1	

STATE PROJECT NO.	F.A. PROJ. NO.	DESCRIPTION
17BP.13.PE.161	N/A	P.E.
17BP.13.ROW.161	N/A	RW & UTIL
17BP.13.R.161	N/A	CONST



PLANS PREPARED BY:

Mattern & Craig
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NC LIC. NO. C-1154

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GRAPHIC SCALES

30 15 0 30 60
PLANS

30 15 0 30 60
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2016 = 310

V = 35 MPH

FUNC CLASS = RURAL LOCAL SUBREGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY PROJECT 17BP.13.R.161 = 0.088 MILES

LENGTH STRUCTURE PROJECT 17BP.13.R.161 = 0.005 MILES

TOTAL LENGTH PROJECT 17BP.13.R.161 = 0.093 MILES

Prepared In the Office of:
MATTERN & CRAIG
12 BROAD ST.
ASHEVILLE, NC 28801
FOR NCDOT DIVISION OF HIGHWAYS

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JANUARY 15, 2019

LETTING DATE:
MAY 18, 2022

AARON CARVER, PE
PROJECT ENGINEER

MENG YANG, EI
PROJECT DESIGN ENGINEER

NCDOT CONTACT:
MIKE CALLOWAY
DIVISION 13 BRIDGE PROGRAM MANAGER

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 030453
DocuSigned by: Aaron Carver
8250B42A320F49C...
3/25/2022
P.E.
SIGNATURE:

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 030453
DocuSigned by: Aaron Carver
8250B42A320F49C...
3/25/2022
P.E.
SIGNATURE:

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PROJECT REFERENCE NO.	SHEET NO.
17BPJ3.RJ61	1A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL — DocuSigned by: Aaron Carver — AARON C. CARVER — 2022

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
2A-1	PAVEMENT SCHEDULE & TYPICAL SECTIONS
2B-1	ON-SITE DETOUR SHEET
2C-1	GUARDRAIL INSTALLATION IN LIEU OF STD 862.02 SHEET 6 OF 8
2C-2	GUARDRAIL INSTALLATION A.T.-1 SYSTEM
3B-1	SUMMARY OF DRAINAGE QUANTITIES, SUMMARY OF GUARDRAIL, SUMMARY OF PAVEMENT REMOVAL, AND SUMMARY OF EARTHWORK
4	PLAN SHEET & PROFILE SHEET
RW01 thru RW04	RIGHT OF WAY SHEETS
TMP-1 thru TMP-5	TRAFFIC MANAGEMENT PLANS
PM-1	PAVEMENT MARKING PLAN
EC-1 thru EC-6	EROSION CONTROL PLANS
RF-1	REFORESTATION PLAN
UO-1	UTILITIES BY OTHERS PLANS
X-0	CROSS-SECTION SUMMARY SHEET
X-1 thru X-6	CROSS SECTION SHEETS
C1 thru C12	CULVERT PLANS

GENERAL NOTES

GENERAL NOTES: 2018 SPECIFICATIONS
EFFECTIVE: 01-16-2018
REVISED:

GRADING AND SURFACING OR RESURFACING AND WIDENING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. WHERE NO GRADE LINES ARE SHOWN, THE PROFILES SHOWN DENOTE THE TOP ELEVATION OF THE EXISTING PAVEMENT ALONG THE CENTER LINE OF SURVEY ON WHICH THE PROPOSED RESURFACING WILL BE PLACED. GRADE LINES MAY BE ADJUSTED 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 II.

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

SHOULDER CONSTRUCTION:

ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.01

SIDE ROADS:

THE CONTRACTOR WILL BE REQUIRED TO DO ALL NECESSARY WORK TO PROVIDE SUITABLE CONNECTIONS WITH ALL ROADS, STREETS, AND DRIVES ENTERING THIS PROJECT. THIS WORK WILL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR THE PARTICULAR ITEMS INVOLVED.

BERM DITCHES:

BERM DITCHES SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 240.01 AT LOCATIONS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

SUBSURFACE DRAINS:

SUBSURFACE DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.02 AT LOCATIONS DIRECTED BY THE ENGINEER.

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.

TEMPORARY SHORING:

SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC NOT SHOWN ON THE PLANS WILL BE PAID FOR AT THE CONTRACT PRICE FOR "TEMPORARY SHORING".

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE:
POWER - FRENCH BROAD ELECTRIC MEMBERSHIP CORP.
PHONE - FRONTIER COMMUNICATIONS

RIGHT-OF-WAY MARKERS:

ALL RIGHT-OF-WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY OTHERS.

STANDARD DRAWINGS

EFF. 01-16-2018
REV.

2018 ROADWAY ENGLISH STANDARD DRAWINGS

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
DIVISION 2 - EARTHWORK	
200.02	Method of Clearing - Method II
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
240.01	Guide for Berm Ditch Construction
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
310.02	Parallel Pipe End Section - Precast Concrete Section for 18" to 30" Pipe
310.10	Driveway Pipe Construction
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 8 - INCIDENTALS	
815.02	Subsurface Drain
840.29	Frames and Narrow Slot Flat Grates
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.46	Traffic Bearing Precast Drainage Structure
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
848.03	Driveway Turnout - Drop Curb Type
850.10	Guide for Berm Drainage Outlet - 15" and 18" Pipe
862.01	Guardrail Placement
862.02	Guardrail Installation
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

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muang

12/2/2016

PROJECT REFERENCE NO.	SHEET NO.
17BPJ3.RJ61	1-B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

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

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin (EIP)
- Computed Property Corner
- Property Monument (ECM)
- Parcel/Sequence Number (123)
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary (WLB)
- Proposed Wetland Boundary (WLB)
- Existing Endangered Animal Boundary (EAB)
- Existing Endangered Plant Boundary (EPB)
- Existing Historic Property Boundary (HPB)
- Known Contamination Area: Soil (S)
- Potential Contamination Area: Soil (S)
- Known Contamination Area: Water (W)
- Potential Contamination Area: Water (W)
- Contaminated Site: Known or Potential

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or U/G Tank Cap
- Sign (S)
- Well (W)
- Small Mine
- Foundation
- Area Outline
- Cemetery
- Building
- School
- Church
- Dam

HYDROLOGY:

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

RAILROADS:

- Standard Gauge (CSX TRANSPORTATION)
- RR Signal Milepost (MILEPOST 35)
- Switch (SWITCH)
- RR Abandoned
- RR Dismantled

RIGHT OF WAY & PROJECT CONTROL:

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

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut (C)
- Proposed Slope Stakes Fill (F)
- Proposed Curb Ramp (CR)
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

VEGETATION:

- Single Tree
- Single Shrub
- Hedge
- Woods Line
- Orchard
- Vineyard (Vineyard)

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

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

PROJECT REFERENCE NO.	SHEET NO.
17BPJ3.RJ61	2A-1
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

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NC LIC. NO. C-1154

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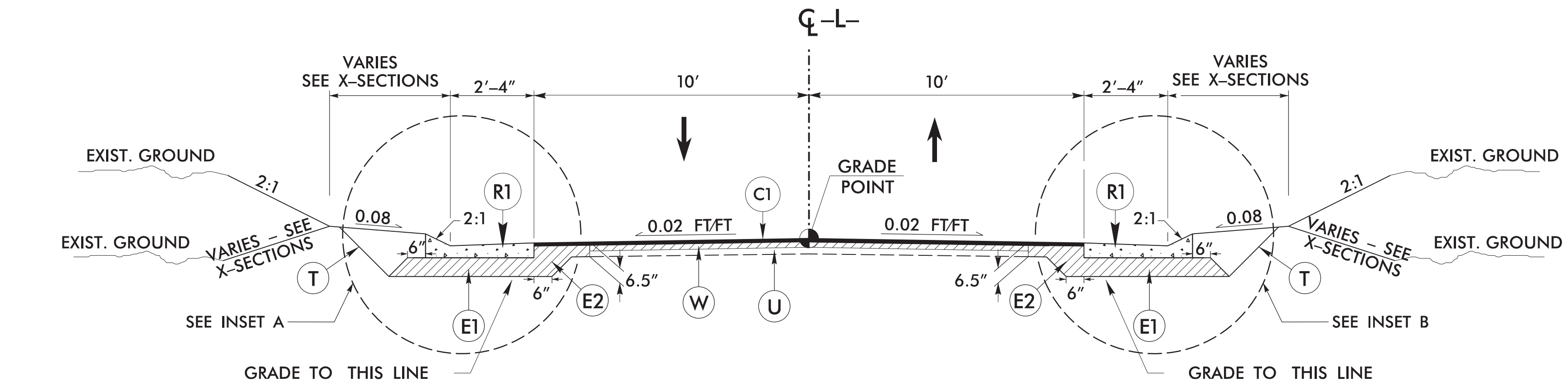
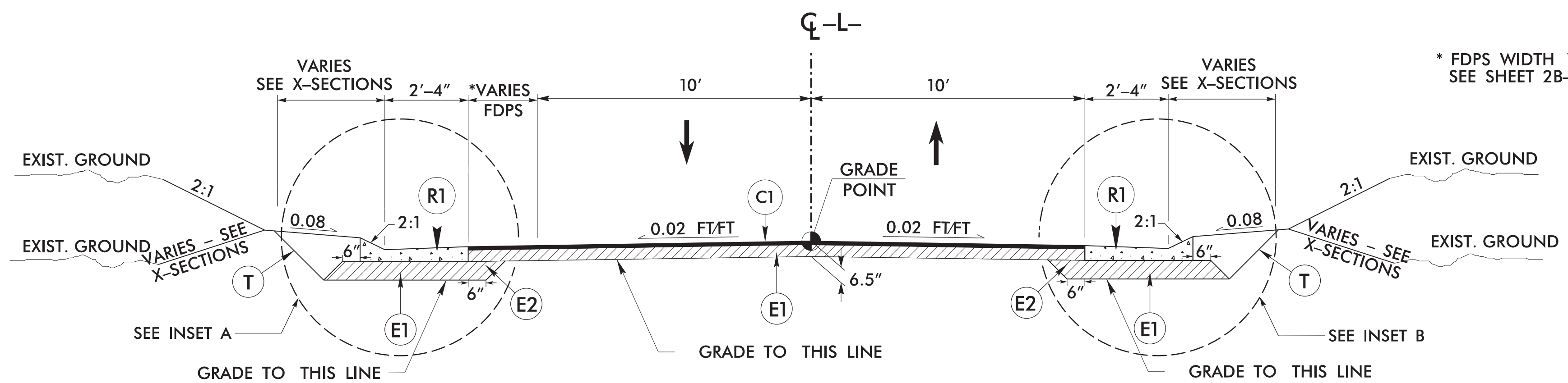


TYPICAL SECTION NO. 1



TYPICAL SECTION NO. 2

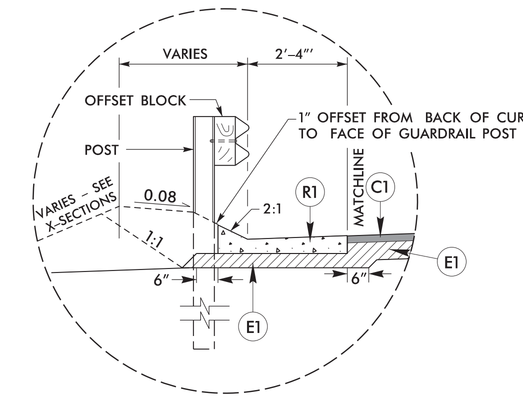
* FDPS WIDTH VARIES 0'-5',
SEE SHEET 2B-1.

USE TYPICAL SECTION NO. 1

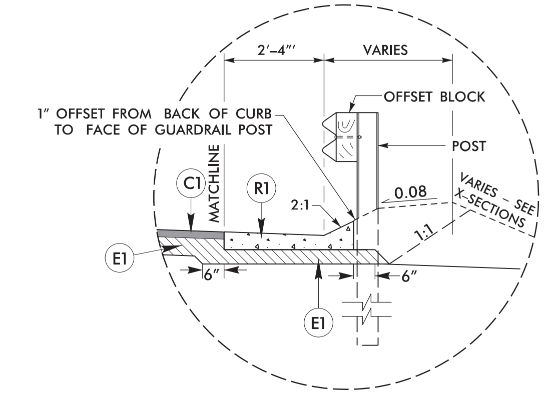
-L- STA. 12+00 TO -L- STA. 12+80
-L- STA. 16+05 TO -L- STA. 16+90

USE TYPICAL SECTION NO. 2

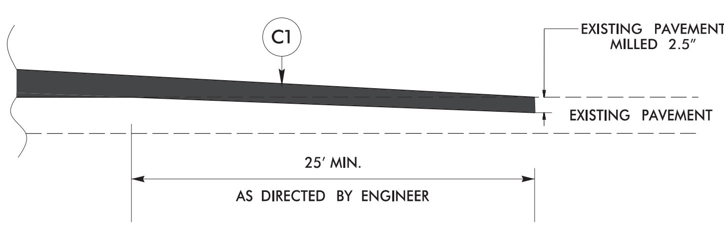
-L- STA. 12+80 TO -L- STA. 16+05



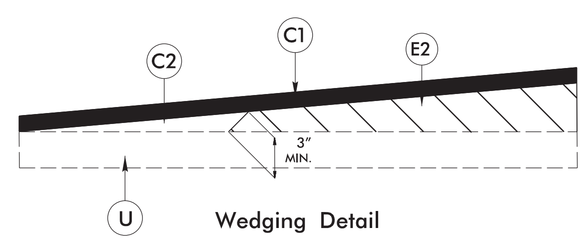
INSET A
-L- STA. 12+00.00 LT TO -L- STA. 13+98.92 LT



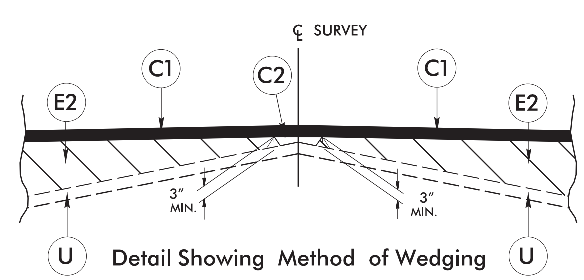
INSET B
-L- STA. 13+82.00 RT TO -L- STA. 16+66.59 RT



INCIDENTAL MILLING EXISTING PAVEMENT



Wedging Detail



Detail Showing Method of Wedging

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 2.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT TO EXCEED 1.5" IN DEPTH
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5.5" IN DEPTH.
R1	SHOULDER BERM GUTTER (NCDOT STANDARD DRAWING NO. 846.01)
U	EXISTING PAVEMENT
W	PROPOSED WEDGING (SEE APPROPRIATE DETAILS)

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE

PROJECT REFERENCE NO.	SHEET NO.
17BP.13.R.161	2B-1
R/W SHEET NO.	

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FAX (828) 254-4562
NC LIC. NO. C-1154

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DocuSigned by: Aaron Carver, 8250B42A220F49C... NORTH CAROLINA PROFESSIONAL ENGINEER AARON C. CARVER 2/22/2022	DocuSigned by: Aaron Carver, 8250B42A220F49C... NORTH CAROLINA PROFESSIONAL ENGINEER AARON C. CARVER 2/22/2022

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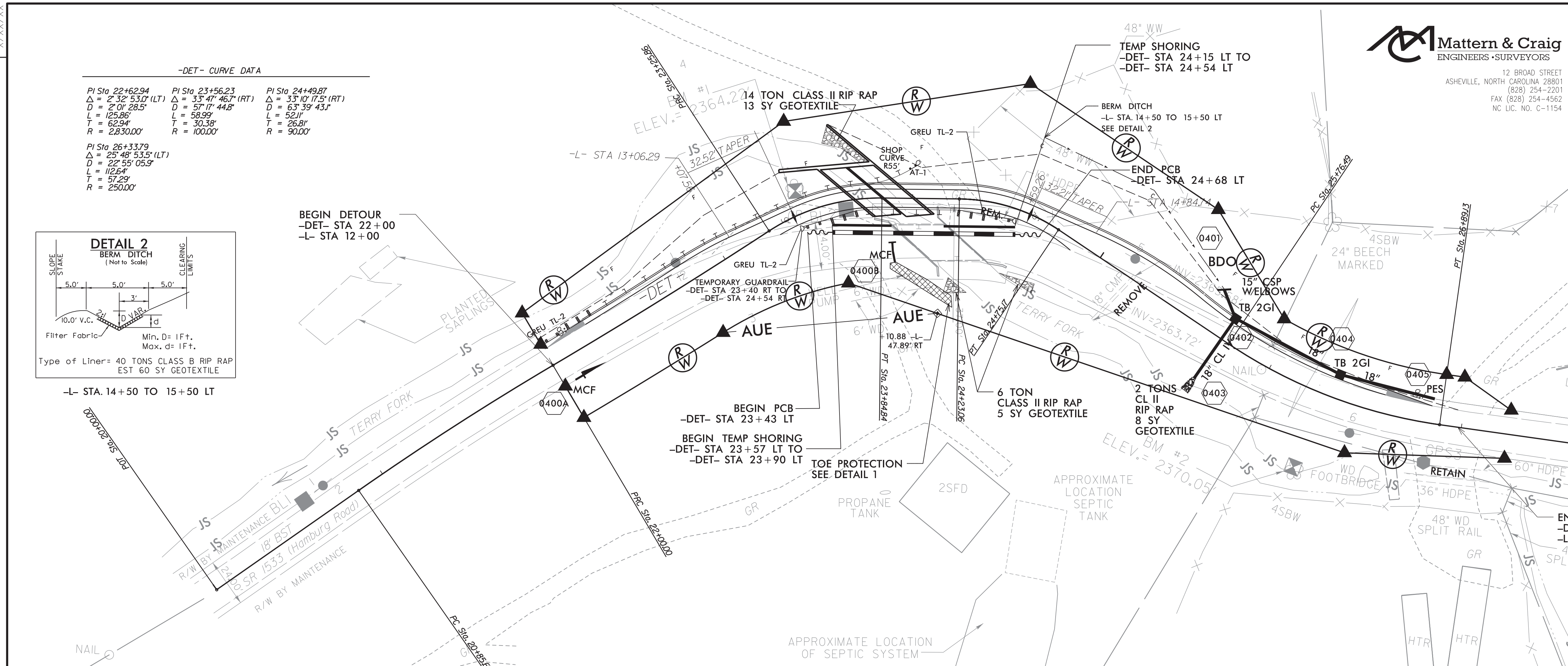
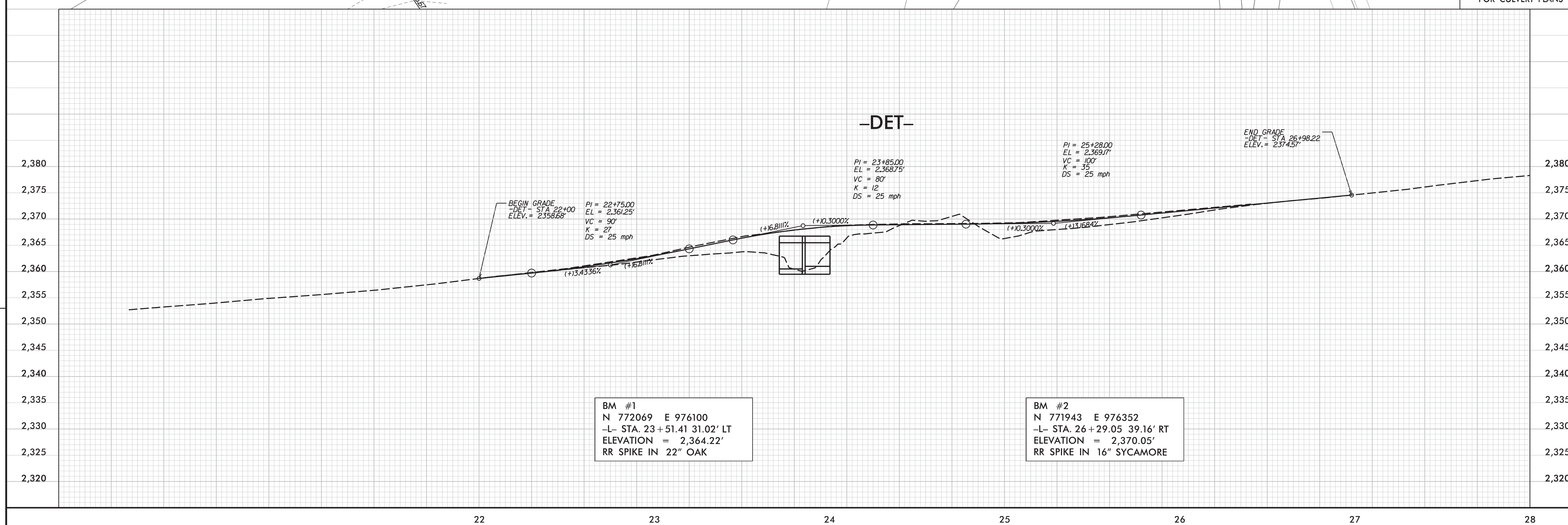
ON-SITE DETOUR





REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
17BP.13.R.161	2C-1

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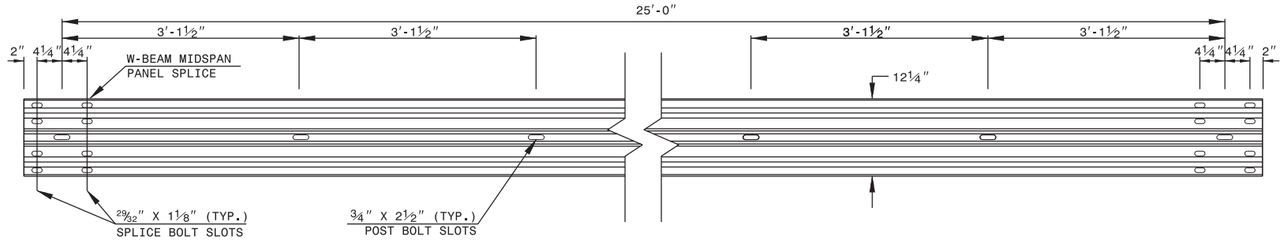
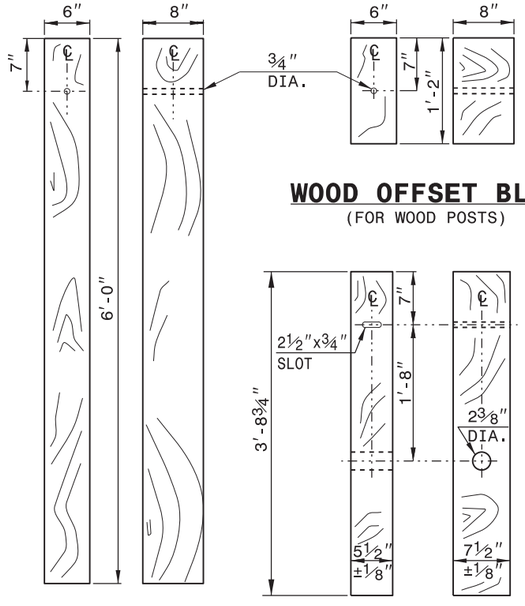
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02



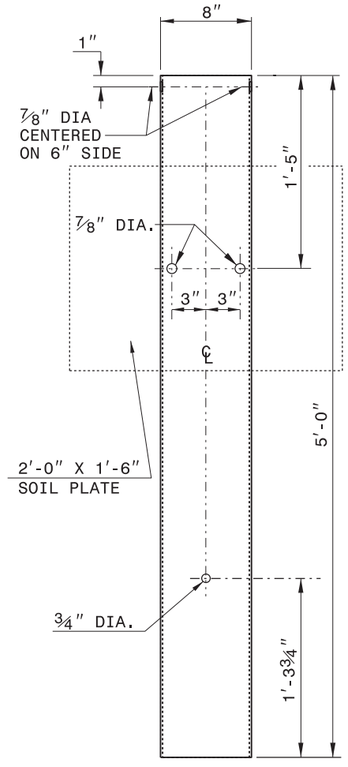
STANDARD W-BEAM GUARDRAIL



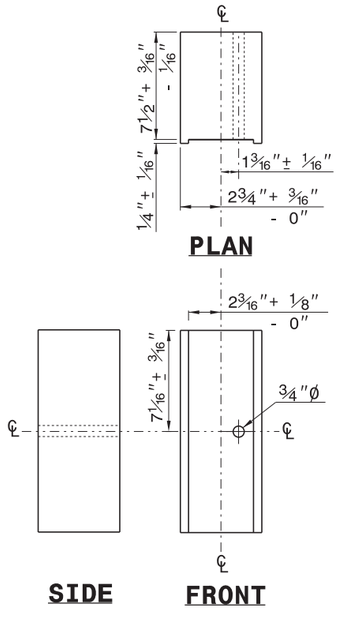
STANDARD LINE POST

SHORT WOOD BREAKAWAY POST

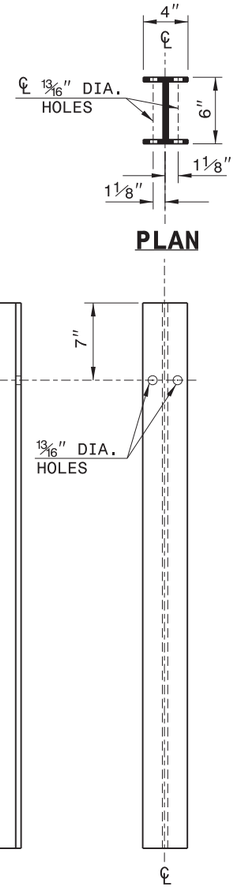
WOOD OFFSET BLOCK
(FOR WOOD POSTS)



STEEL TUBE
TS 6"x8"x0.1875"



ROUTED OFFSET BLOCK



"W6" STEEL POST

SYSTEM PARTS

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8
862D02

DocuSigned by: Ronald Davenport F81B0038A47A442... 022071 NORTH CAROLINA PROFESSIONAL ENGINEER RONALD DAVENPORT
2/28/2022

CONTRACTS STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

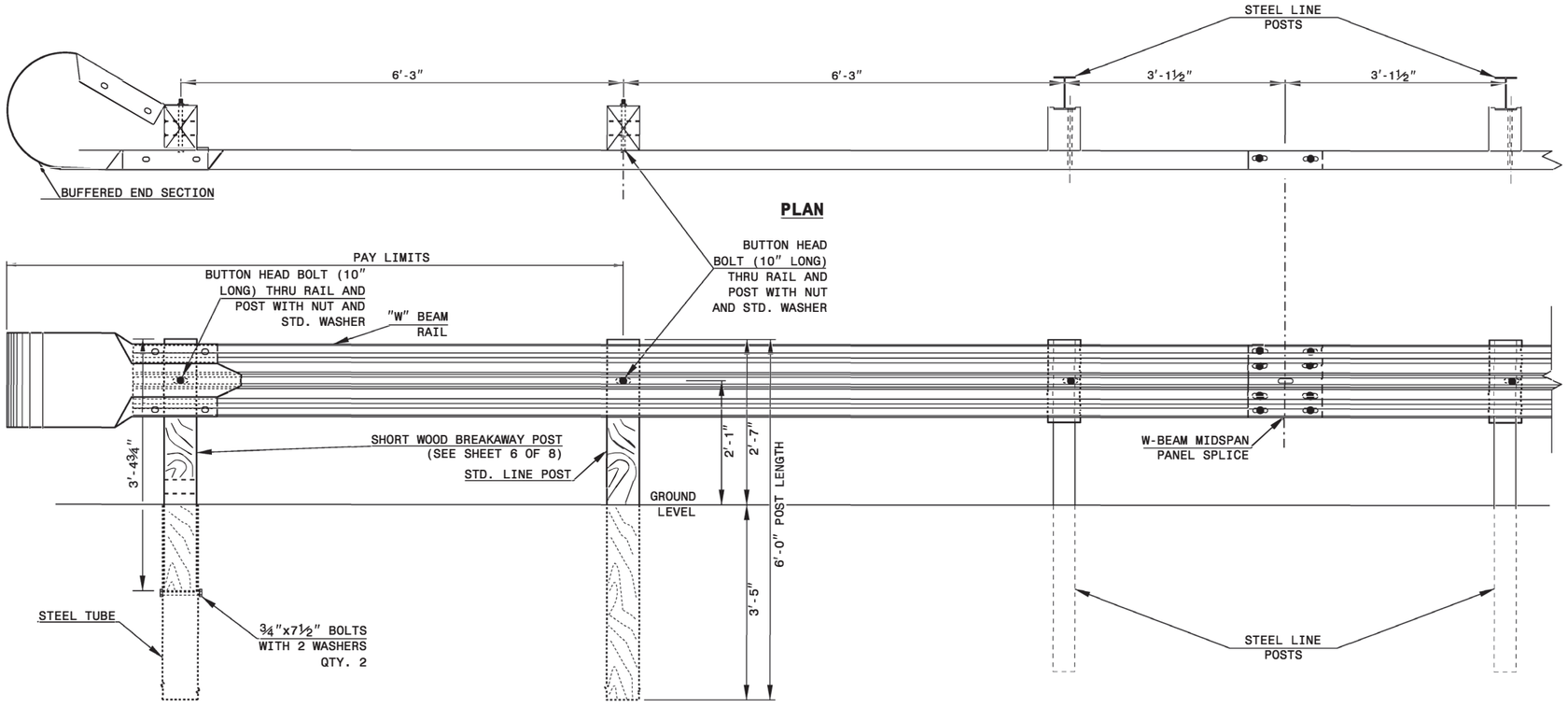
SEE TITLE BLOCK

ORIGINAL BY: J.HOWERTON DATE: 3-7-2018
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.:

PROJECT REFERENCE NO.	SHEET NO.
17BP.13.R.161	2C-2

STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION



TRAILING END UNIT ASSEMBLY

A.T.-1 SYSTEM

SHEET OF

STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET OF

DocuSigned by:
Ronald Davenport
F81B6035A47A442...
SEAL
022071
ENGINEER
RONALD ELTON DAVENPORT, JR.
2/28/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CONTRACTS STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

A.T.-1 SYSTEM

ORIGINAL BY: _____ DATE: _____
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: _____

6/21/00

COMPUTED BY: MY DATE: 12-6-18
CHECKED BY: ACC DATE: 12-6-18

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
17BPJ3.RJ61	3B-1

PAVEMENT REMOVAL SUMMARY

IN SQUARE YARDS					
LINE	LOCATION	ASPHALT REMOVAL	ASPHALT BREAK-UP	3"ASPHALT MILLING	
-L-	13+00 TO 13+78	138			
-L-	13+78.08 (BEGIN CULV.) TO 14+06.23 (END CULV.)	51			
-L-	14+07 TO 16+00	344			
	TOTAL	533			
	SAY	540			

SUMMARY OF EARTHWORK

IN CUBIC YARDS					
LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
SUMMARY NO.1					
-L- STA. 12+00 TO -L- STA. 16+90	353		828	475	
SUBTOTAL SUMMARY NO.1	353		828	475	
PROJECT SUBTOTAL	353		828	475	
GRAND TOTAL	353		828	475	
SAY	360			500	

CONTINGENCY ITEMS:
INCIDENTAL STONE = 50 TONS
UNDERCUT EXCAVATION = 450 CY
SELECT GRANULAR MATERIAL = 400 CY
SHALLOW UNDERCUT = 100 CY
CLASS IV SUBGRADE STABILIZATION = 200 TONS
GEOTEXTILE FOR SOIL STABILIZATION = 700 SY

NOTE: Invert Elevations are for Bid Purposes only and shall not be used for project construction stakeout. See "Standard Specifications For Roads and Structures, Section 300-5".

Approximate quantities only. Unclassified excavation, borrow excavation, fine grading, clearing and grubbing, and removal of existing pavement will be paid for at the contract lump sum price for "grading".

SUB-REGIONAL & REGIONAL LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48" & UNDER)

STATION	LOCATION (LT,RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC) SIZE	12"	15"	18"	24"	30"	36"	42"	48"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE
								THICKNESS OR GAUGE												
-L- 12+10.90	RT	400A																		
-L- 13+84.79	RT	400B																		
-L- 15+50	LT	401		2372.50	2371.24															
	LT	401	402		2371.24	2367.43														
-L- 15+02.12	LT																			
-L- 15+64	LT	402		2370.67	2367.18															
	LT	402	403		2367.18	2367.00														
-L- 16+26	LT			2372.24	2369.07															
	LT	404	402		2369.07	2367.43								56						
-L- 16+77	LT	405		2373.67	2373.67															
	LT	405	404		2373.67	2369.07								48						
TOTAL														104						

C.S. PIPE	12"	15"	18"	24"	36"	42"	48"
	.064	.064	.064	.064	.079	.109	.109
				16			
				16			

R.C. PIPE (CLASS III)	15"	18"	24"	30"	36"	42"	48"

R.C. PIPE (CLASS IV)	12"	15"	18"	24"	30"	36"	42"	48"
				36				

*** R. C. PIPE (CLASS V)	*** R. C. PIPE CULVERTS, CONTRACTOR DESIGN PIPE	*** R. C. PIPE CULVERTS, CONTRACTOR DESIGN PIPE	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YDS. R.C.P.	C.S.P.
					1	

QUANTITIES FOR DRAINAGE STRUCTURES * TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL. 'B') LIN. FT.	PER EACH (0' THRU 5.0')	A 5.0' THRU 10.0'	B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE E	F	G	CONCRETE TRANSITIONAL SECTION CATCH BASIN	DROP INLET	TBDI STD 840.35	TBDI FRAME WITH TWO GRATES 840.29	J.B. STD. 840.31 OR 840.32	M.H. FRAME & COVER STD. 840.54	MODIFIED CONCRETE FLUME		18" RC PIPE END SECTION	CONC. COLLARS CL. "B" C.Y. STD 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	PIPE REMOVAL LIN.FT.
														1				
														1				
																		32
	1									1	1							
	1									1	1							
																1		
	2									2	2			2		1		32

ABBREVIATIONS

C.B.	CATCH BASIN
N.D.I.	NARROW DROP INLET
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
G.D.I. (N.S.)	GRATED DROP INLET (NARROW SLOT)
J.B.	JUNCTION BOX
M.H.	MANHOLE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.G.I.	TRAFFIC BEARING GRATE INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX

REMARKS

"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL.
TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL.
W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL.
G = GATING IMPACT ATTENUATOR TYPE 350
NG = NON-GATING IMPACT ATTENUATOR TYPE 350

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH STRAIGHT	LENGTH SHOP CURVED	LENGTH DOUBLE FACED	WARRANT POINT APPROACH END	WARRANT POINT TRAILING END	"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH APPROACH END	FLARE LENGTH TRAILING END	W APPROACH END	W TRAILING END	ANCHORS XI MOD	XI	GREU 350 TL-2	GREU 350 TL-3	IA-350 TL-2	TYPE III	TYPE III SHOP CURVED	B-77	AT-1	IMPACT ATTENUATOR TYPE 350 EA	G	NG	SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
-L-	13+82	16+67	RT	256.25	25			12+53	4	7		25		0.5			1						1							
-L-	12+00	14+00	LT	206.25	25			15+68	4	7		25		0.5			1						1							
			SUBTOTAL	462.50	50																									
			LESS DEDUCTIONS FOR ANCHORS																											
			GREU 350 TL-2 2 @ 25'=	-50																										
			AT-1 2 @ 6.25'=	-12.50																										
			PROJECT TOTALS:	400	50												2						2							
TEMPORARY GUARDRAIL																														
-DET-	23+40	24+54	RT	100					1	7	25	25	0.5	0.5			2													
			LESS DEDUCTIONS FOR ANCHORS																											
			TEMPORARY GREU 350 TL-2 2 @ 25'=	-50																										
			PROJECT TOTALS:	50													2													
			ADDITIONAL GUARDRAIL POSTS=5 EA.																											

REVISIONS

-L- CURVE DATA

PI Sta 11+42.86	PI Sta 12+39.92	PI Sta 14+31.89	PI Sta 16+13.78
Δ = 4° 22' 01.5" (RT)	Δ = 1° 36' 58.4" (LT)	Δ = 71° 48' 58.4" (RT)	Δ = 31° 35' 42.3" (LT)
D = 3° 49' 11.0"	D = 2° 01' 28.5"	D = 27° 17' 01.3"	D = 22° 55' 05.9"
L = 114.33'	L = 79.83'	L = 26.32.2"	L = 137.86'
T = 57.19'	T = 39.92'	T = 152.06'	T = 70.73'
R = 1,500.00'	R = 2,830.00'	R = 210.00'	R = 250.00'
	SE = 04	SE = 04	SE = 04
	RO = 69'	RO = 69'	RO = 69'

BEGIN CULVERT
-L- STA 13+78.08

REMOVE 48" WW FENCE IN PROP. R/W LIMITS

14 TON CLASS II RIP RAP
13 SY GEOTEXTILE

END CULVERT
-L- STA 14+06.23
+40.00 -L-
71.00' LT

BERM DITCH
-L- STA. 14+50 TO 15+50 LT
SEE DETAIL 2

SEE SHEET 2B-1
FOR FDPS LIMITS

BEGIN PROJECT
17BP.13.R.161
-L- STA 12+00.00

+00.00 -L-
30.00' LT
12.00' LT (EX.R/W)

DEBORAH M. BROWN
DB 534 PG 198

+45.00 -L-
55.00' LT

SHOP CURVE R55'

SHOP CURVE R30'

+58.00 -L-
30.00' RT

AUE

DO NOT DISTURB

+10.88 -L-
47.89' RT

+79.83 -L-
30.00' RT

6 TON CLASS II RIP RAP
5 SY GEOTEXTILE

2 TONS CL II RIP RAP
8 SY GEOTEXTILE

TOE PROTECTION
SEE DETAIL 1

TO SR 1530
(PAINT FORK RD)

+00.00 -L-
30.00' RT
12.00' RT (EX.R/W)

100' TAPER LT & RT

BEGIN SBG
-L- STA 12+23.72 LT & RT

POT Sta 10+00.00

PRC Sta 12+79.83

PRC Sta 12+00.00

PC Sta 10+85.67

S 56°48'31" W
54.53'

N 52°32'08" E

18' BST

SR 1533 (Hamburg Road)

R/W BY MAINTENANCE

WOODS LINE

TERRY FORK

PROPANE TANK

2SFD

APPROXIMATE LOCATION SEPTIC TANK

APPROXIMATE LOCATION OF SEPTIC SYSTEM

RICHARD B. DOWNING, JR.
DB 554 PG 302
(DB 112 PG 47)

WARREN NEAL RAY
DB 241 PG 79
(DB 115 PG 172)

BRYAN LYMAN MARSHALL
DB 372 PG 552

JOSEPH B. RUPP
DB 592 PG 364

PRC Sta 15+43.05

PT Sta 16+80.91

BDO

15" CSP W/ELBOWS

TB 2GI

18" PES

END SBG
-L- STA 16+51.35 LT
+12.00 -L-
12.00' LT(EX.R/W)

NO OUTLET

S 84°29'37.8" E

POT Sta 18+37.43

RETAIN

+15.00 -L-
12.00' RT (EX.R/W)

END SBG
-L- STA 16+64.73 RT

+40.00 -L-
24' RT

RETAIN EXISTING FOOT BRIDGE

S 19°08'21" W
13.01'

S 81°46'13" E
224.84'

END PROJECT
17BP.13.R.161
-L- STA 16+90.00

FROM -L- STA. 13+85 TO STA. 14+15 RT

+26.00 -L-
50.00' LT

-L- STA. 14+50 TO 15+50 LT

+86.00 -L-
25.00' LT

+80.91 -L-
25.00' LT

+90.00 -L-
25.00' LT
12.00' LT(EX.R/W)

100' TAPER LT & RT

DETAIL 1
TOE PROTECTION
(Not to Scale)

Natural Ground

2:1 or Flatter Fill Slope

PSRM

d = 1 Ft.

Type of Liner = PSRM

DETAIL 2
BERM DITCH
(Not to Scale)

SLOPE STAKE

CLEARING LIMITS

5.0' 5.0' 5.0'

3'

10.0' V.C.

2d

VAR. d

Filter Fabric

Min. D= 1Ft.
Max. d= 1Ft.

Type of Liner= 40 TONS CLASS B RIP RAP
EST 60 SY GEOTEXTILE

PROJECT REFERENCE NO.	SHEET NO.
17BP.13.R.161	4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 049162 AARON C. CARVER

DocuSigned by: Aaron Carver 9250B43232DF49C

ENGINEER'S SIGNATURE AARON C. CARVER

7/22/2022

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 049162 AARON C. CARVER

DocuSigned by: Aaron Carver 9250B43232DF49C

ENGINEER'S SIGNATURE AARON C. CARVER

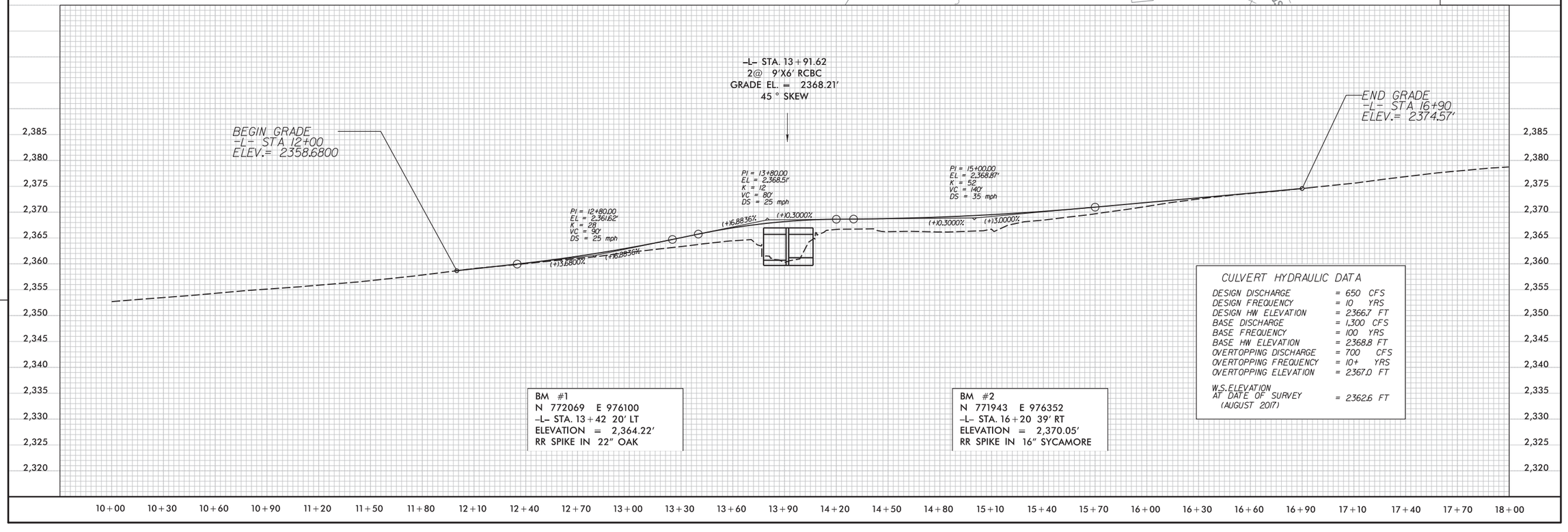
7/22/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Mattern & Craig
ENGINEERS • SURVEYORS
12 BROAD STREET
ASHEVILLE, NORTH CAROLINA 28801
(828) 254-2201
FAX (828) 254-4562
NC LIC. NO. C-1154

NC GRID NAD 83 NA 2011

SEE SHEETS C-1 THRU C-12 FOR CULVERT PLANS



BM #1
N 772069 E 976100
-L- STA. 13+42 20' LT
ELEVATION = 2,364.22'
RR SPIKE IN 22" OAK

BM #2
N 771943 E 976352
-L- STA. 16+20 39' RT
ELEVATION = 2,370.05'
RR SPIKE IN 16" SYCAMORE

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 650 CFS
DESIGN FREQUENCY	= 10 YRS
DESIGN HW ELEVATION	= 2366.7 FT
BASE DISCHARGE	= 1,300 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 2368.8 FT
OVERTOPPING DISCHARGE	= 700 CFS
OVERTOPPING FREQUENCY	= 10+ YRS
OVERTOPPING ELEVATION	= 2367.0 FT
W.S.ELEVATION AT DATE OF SURVEY (AUGUST 2017)	= 2362.6 FT

09/08/99

TIP PROJECT: 17BP.13.R.161

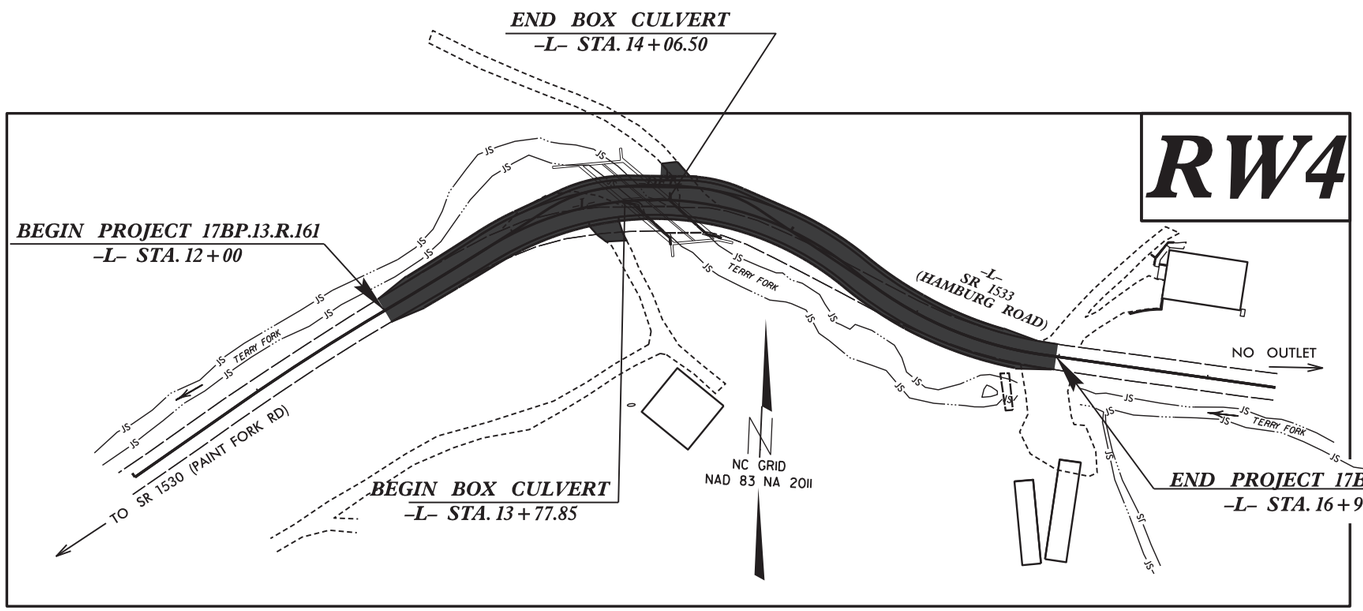
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.13.R.161	RW01	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SURVEY CONTROL, EXISTING CENTERLINES, RIGHT OF WAY, EASEMENTS AND PROPERTY TIES

MADISON COUNTY

LOCATION: BRIDGE NO. 166 OVER TERRY FORK ON SR 1533 (HAMBURG ROAD)



GRAPHIC SCALE

30 15 0 30 60
PLANS

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT
IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY
MATTERN AND CRAIG FOR MONUMENT "GPS3"
WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF
NORTHING: 771948.4820 (ft) EASTING: 976416.1483 (ft)
ELEVATION: 2373.74 (ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT
(GROUND TO GRID) IS: 0.999760522
THE N.C. LAMBERT GRID BEARING AND
LOCALIZED HORIZONTAL GROUND DISTANCE FROM
"GPS3" TO -L- STATION 10+00 IS
S 81°27'32.4" W 600.13 (ft)
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

Prepared in the Office of:

Mattern & Craig
ENGINEERS•SURVEYORS
12 BROAD STREET
ASHEVILLE, NORTH CAROLINA 28801
(828) 254-2201
FAX (828) 254-4562
NC LIC. NO. C-1154

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:	*LETTING DATE:*
JANUARY 15, 2019	JANUARY 15, 2020

PROFESSIONAL LAND SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-4473 LAND SURVEYOR JEFF B. HOPPES

DocuSigned by:
Jeff Hoppes
2C3FB0F0CD6D472...
SIGNATURE:

4/23/2019
Date:

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

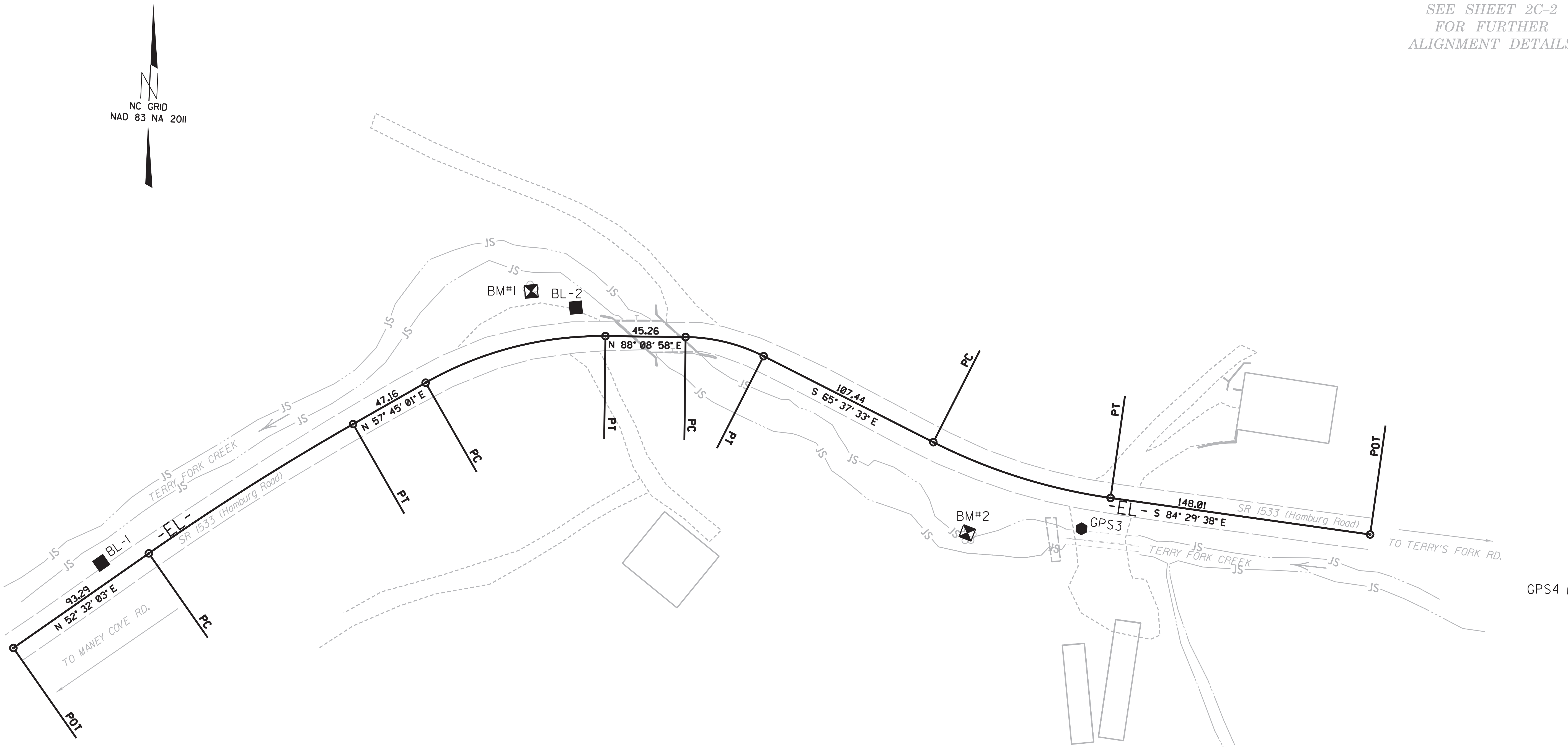
$$$$SYSTIME$$$$
$$$$DGN$$$$
$$$$USERNAME$$$$

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

PROJECT REFERENCE NO.	SHEET NO.
17BP.13.R.161	RW02C-1
Location and Surveys	
MATTERN AND CRAIG	

SEE SHEET 2C-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.

REVISIONS

6/2/99

11-APR-2019 15:05
I:\392[NCDOT Survey\3921H Div.13 R.W Stake\06 Working Folders\Survey\Deliverables\17BP13R161 RW E SERIES\17bp13-161_ls_rw02c-1.dgn
rlzietlow AT SURV-ASH-JBH01

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

PROJECT REFERENCE NO.	SHEET NO.
17BP.13.R.161	RW02C-2

Location and Surveys

MATTERN AND CRAIG

BASELINE

BL

POINT	DESC.	NORTH	EAST	ELEVATION
1	BL-1	771904.8830	975864.0150	2353.45
2	BL-2	772060.7400	976125.3890	2363.83
3	GPS-3	771948.4820	976416.1483	2373.74
4	GPS-4	771925.5135	976694.9789	2380.35

****

BM1 ELEVATION = 2364.22

N 772069 E 976010

BM1 IS RR SPIKE SET IN BASE OF 22" OAK

****

****

BM2 ELEVATION = 2370.05

N 771943 E 976352

BM2 IS RR SPIKE SET IN BASE OF 16" SYCAMORE

****

EXISTING ALIGNMENT

EL

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	771854.716	975816.623							
LINE			N 52°32'03" E	93.29					
PC	771911.464	975890.668							
CURVE			N 55°08'32" E	136.51	05°12'59"(RT)	03°49'11"	136.56	68.33	1500.00
PT	771989.487	976002.688							
LINE			N 57°45'01" E	47.16					
PC	772014.650	976042.570							
CURVE			N 72°57'00" E	104.87	30°23'57"(RT)	28°38'52"	106.11	54.34	200.00
PT	772045.400	976142.833							
LINE			N 88°08'58" E	45.26					
PC	772046.861	976188.075							
CURVE			S 78°44'18" E	45.37	26°13'28"(RT)	57°17'45"	45.77	23.29	100.00
PT	772038.001	976232.573							
LINE			S 65°37'33" E	107.44					
PC	771993.662	976330.433							
CURVE			S 75°03'36" E	104.90	18°52'04"(LT)	17°54'18"	105.38	53.17	320.00
PT	771966.618	976431.790							
LINE			S 84°29'38" E	148.01					
POT	771952.416	976579.116							

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.

REVISIONS

6/2/99

PROPOSED ALIGNMENT CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
17BP13R161	RW02D-1

Location and Surveys

MATTERN AND CRAIG
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12 BROAD STREET
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(828) 254-2201
FAX (828) 254-4562
NC LIC. NO. C-1154

PROJECT SURVEYOR

REVISIONS

6/2/99

L

TYPE	STATION	NORTH	EAST
POT	10+00.00	771859.3520	975822.6710
PC	10+85.67	771911.4639	975890.6685
PRC	12+00.00	771977.4857	975983.9755
PRC	12+79.83	772022.0171	976050.2281
PRC	15+43.05	772016.8880	976296.4993
PT	16+80.91	771967.4343	976423.3174
POT	18+37.43	771952.4157	976579.1159

NOTES:

1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

23-APR-2019 12:34
I:\3921 NCDOT Survey\3921H Div. 13 R_W Stake\06 Working Folders\Survey\Deliverables\17BP13R161 RW E SERIES\17bp13-161_ls_rw02d-1.dgn

RIGHT OF WAY CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
17BP.13.R.161	RW03E-1

Location and Surveys

MATTERN AND CRAIG
ENGINEERS & SURVEYORS
12 BROAD STREET
ASHEVILLE NORTH CAROLINA 28801
(828) 254-2201
FAX (828) 254-4562
NC LIC. NO. C-1154

PROJECT SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-4473 LAND SURVEYOR JEFF B. HOPPES

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

I, JEFF B. HOPPES, a Professional Land Surveyor in the state of North Carolina hereby certify to the best of my knowledge and belief that the following work item(s) (Base map Compilation, R/W Staking) performed under my responsible charge meet NCDOT Survey Standards as directed in the NCDOT Location & Surveys guidelines and procedures.

I further certify that the data compiled came from available surveys/mapping performed by others and provided to me by NCDOT and do not certify to the accuracy or quality of the individual data sources.

I further certify that the right of way and permanent easement points shown herein and outlined in the tables shown hereon (localized coordinates, station/offset) have been checked and are accurate representations of the right of way and permanent easement points depicted on the corresponding highway plans. I also certify that the right of way and permanent easement points shown herein have been field monumented under my supervision from existing survey control provided by others; that the depicted property data shown herein were surveyed by others; and these monuments denote the right of way and easement boundaries at the time of staking which may be subject to change due to right of way revisions (See deeds for final determination).

Witness my original signature, registration number and seal this 12th day of June, 2019.

DocuSigned by:
Jeff Hoppes
2C3FB0F0CD6D472...

Professional Land Surveyor — PLS # L-4473 — Seal

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST	
L	12+00.00	30.00	771952.3538	976000.3580	
L	12+00.00	-30.00	772002.6176	975967.5930	
L	12+00.00	12.00	771967.4329	975990.5285	PK NAIL SET IN ROCK
L	12+00.00	-12.00	771987.5385	975977.4225	PK NAIL SET IN ROCK
L	12+79.83	30.00	771997.3573	976067.3129	
L	13+45.00	-55.00	772102.9076	976092.6342	
L	13+58.00	30.00	772024.5070	976128.1458	
L	14+40.00	-71.00	772126.9499	976213.7085	
L	15+26.00	-50.00	772068.8037	976309.3255	
L	15+86.00	-25.00	772016.2662	976344.2562	
L	16+40.00	24.00	771951.4717	976376.9341	
L	16+80.91	-25.00	771992.3189	976425.7162	PK NAIL SET IN ROCK
L	16+90.00	-25.00	771991.4467	976434.7642	
L	17+15.00	12.00	771952.2186	976456.0986	
L	17+15.00	-12.00	771976.1079	976458.4014	

ROW MARKER PERMANENT AERIAL UTILITY EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	14+10.88	47.89	772011.4847	976172.7671

NOTES:

1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

REVISIONS

6/2/99

Location and Surveys

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NC LIC. NO. C-1154

PROJECT SURVEYOR

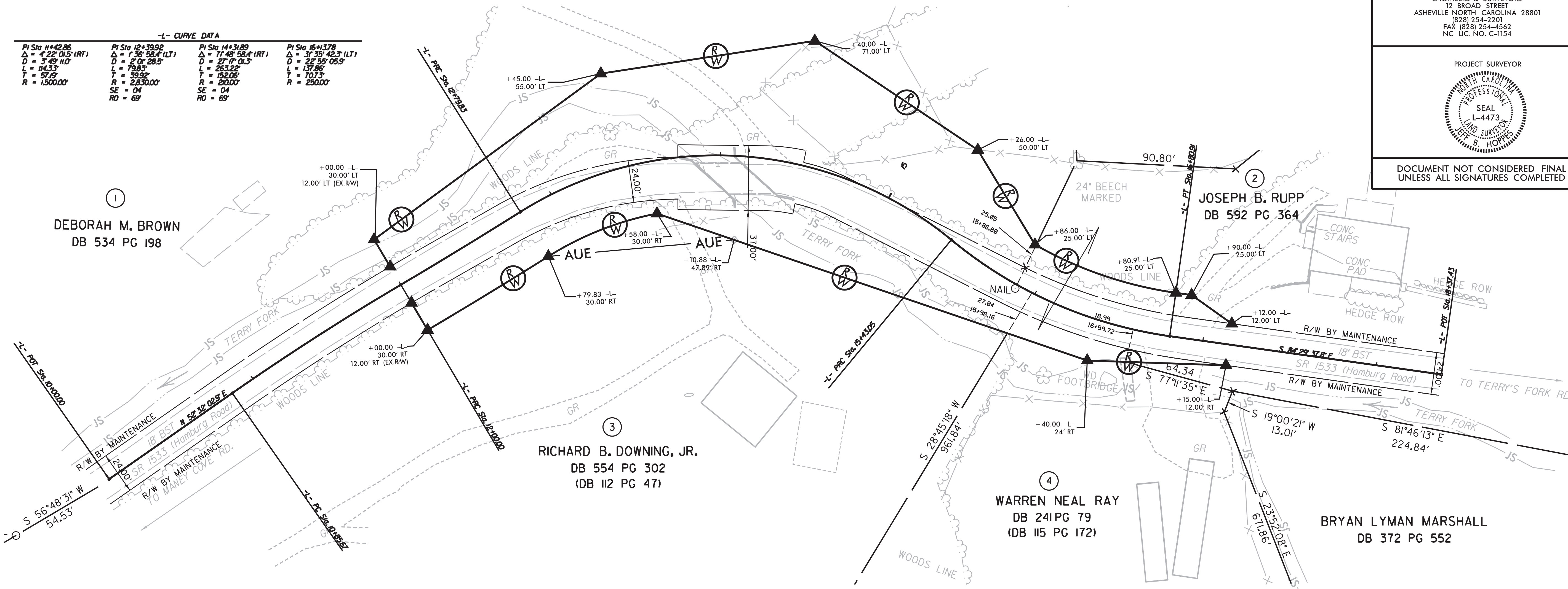
NORTH CAROLINA PROFESSIONAL LAND SURVEYOR SEAL L-4473 JEFF B. HOPPES

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

-L- CURVE DATA

PI Sta 11+42.86	PI Sta 12+39.92	PI Sta 14+31.89	PI Sta 16+13.78
Δ = 4° 22' 01.5" (RT)	Δ = 1° 36' 58.4" (LT)	Δ = 71° 48' 58.4" (RT)	Δ = 31° 35' 42.3" (LT)
D = 3° 49' 11.0"	D = 2° 01' 28.5"	D = 27° 17' 01.3"	D = 22° 55' 05.9"
L = 114.33'	L = 79.83'	L = 263.22'	L = 137.86'
T = 57.19'	T = 39.92'	T = 152.06'	T = 70.73'
R = 1,500.00'	R = 2,830.00'	R = 210.00'	R = 250.00'
	SE = 04	SE = 04	
	RO = 69'	RO = 69'	



I, JEFF B. HOPPES, a Professional Land Surveyor in the state of North Carolina hereby certify to the best of my knowledge and belief that the following work item(s) (R/W Staking) performed under my responsible charge meet NCDOT Survey Standards as directed in the NCDOT Location & Surveys guidelines and procedures.

I further certify that the right of way and permanent easement points shown herein and outlined in the tables shown hereon (localized coordinates, station/offset) have been checked and are accurate representations of the right of way and permanent easement points depicted on the corresponding highway plans. I also certify that the right of way and permanent easement points shown herein have been field monumented under my supervision from existing survey control provided by others; that the depicted property data shown herein were surveyed by others; and these monuments denote the right of way and easement boundaries at the time of staking which may be subject to change due to right of way revisions (See deeds for final determination).

Witness my original signature, registration number and seal this 12th day of June, 2019.

DocuSigned by:
Jeff Hoppes
2C3FB0F0CD6D472...

Professional Land Surveyor   L-4473 PLS #   Seal

NOTES:

1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

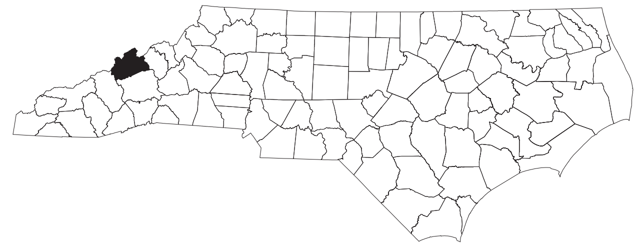
2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

6/2/99
17-JUL-2019 09:59
I:\3921\NCDOT_Survey\3921H_Div. 13 R_W Stake\06 Working Folders\Survey\Deliverables\17BP13R161 RW E SERIES\17bp13-161_ls_rw04.dgn

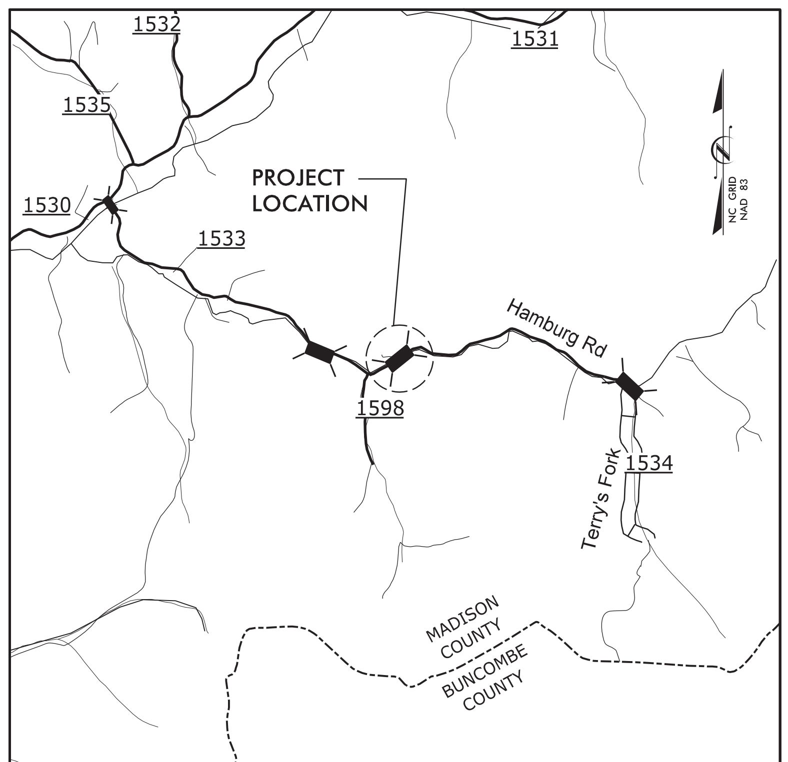
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

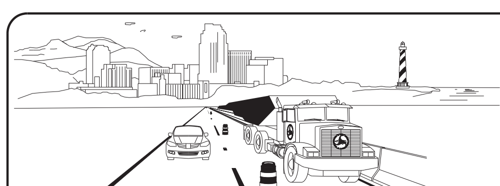
MADISON COUNTY



LOCATION: BRIDGE NO. 166 OVER GRASS CREEK ON SR 1533 (HAMBURG ROAD)



VICINITY MAP



WORK ZONE SAFETY & MOBILITY
"from the MOUNTAINS to the COAST"

PLANS PREPARED BY:

JAMES B. VOSO, PE

MENG YANG, EI

NCDOT CONTACTS:

MIKE CALLOWAY
PROJECT ENGINEER

PROJECT DESIGN ENGINEER

DIVISION OF HIGHWAYS — STATE OF NORTH CAROLINA — DEPARTMENT OF TRANSPORTATION — WORK ZONE TRAFFIC CONTROL

SHEET NO.
TMP-1

INDEX OF SHEETS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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NC LIC. NO. C-1154

APPROVED: DocuSigned by: James Voso

DATE: 2/23/2022

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 022599 ENGINEER JAMES B. VOSO

TIP PROJECT: 17BP.13.R.161

PROJ. REFERENCE NO.	SHEET NO.
17BP.13.R.161	TMP-1A

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS SHOWN 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
1101.01	WORK ZONE ADVANCE WARNING SIGNS
1101.02	TEMPORARY LANE CLOSURES
1101.04	TEMPORARY SHOULDER CLOSURES
1101.05	WORK ZONE VEHICLE ACCESSES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1130.01	DRUMS
1135.01	CONES
1145.01	BARRICADES
1150.01	FLAGGING DEVICES
1170.01	PORTABLE CONCRETE BARRIER
1180.01	SKINNY-DRUM
1205.01	PAVEMENT MARKINGS - LINE TYPES & OFFSETS
1205.12	PAVEMENT MARKINGS - BRIDGES
1251.01	RAISED PAVEMENT MARKERS
1253.01	RAISED PAVEMENT MARKERS - SNOWPLOWABLE
1261.01	GUARDRAIL & BARRIER DELINEATOR SPACING
1261.02	GUARDRAIL & BARRIER DELINEATOR TYPES
1262.01	GUARDRAIL END DELINEATION

LEGEND

GENERAL

- DIRECTION OF TRAFFIC FLOW
- DIRECTION OF PEDESTRIAN TRAFFIC FLOW
- EXIST. PVMT.
- NORTH ARROW
- PROPOSED PVMT.
- WORK AREA

TRAFFIC CONTROL DEVICES

- BARRICADE (TYPE III)
- CONE
- DRUM
- SKINNY DRUM
- TUBULAR MARKER
- TEMPORARY CRASH CUSHION
- FLASHING ARROW PANEL (TYPE C)
- FLAGGER
- LAW ENFORCEMENT
- TRUCK MOUNTED IMPACT ATTENUATOR (TMIA)
- CHANGEABLE MESSAGE SIGN

TEMPORARY SIGNING

- PORTABLE SIGN
- STATIONARY SIGN
- STATIONARY OR PORTABLE SIGN

SIGNALS

- TEMP TEMPORARY
- PORTABLE TRAFFIC SIGNAL

PAVEMENT MARKINGS

- EXISTING LINES
- TEMPORARY LINES

PAVEMENT MARKERS

- YELLOW/YELLOW
- TEMPORARY WHITE/WHITE

PAVEMENT MARKING SYMBOLS

- PAVEMENT MARKING SYMBOLS

TEMPORARY PAVEMENT MARKING

SYMBOL	DESCRIPTION	TOTAL QUANTITY
	PAINT	
P2	STOP BAR (24" WHITE)	18 FT
PA	WHITE EDGE LINE (4")	2,770 FT

TEMPORARY RAISED MARKERS

SYMBOL	DESCRIPTION	TOTAL QUANTITY
MF	CRYSTAL & CRYSTAL	72

APPROVED: DocuSigned by: James Voso DATE: 3/7/2022

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 022599 ENGINEER JAMES B. VOSO

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

ROADWAY STANDARD DRAWINGS & LEGEND

PROJ. REFERENCE NO.	SHEET NO.
17BP.13.R.161	TMP-1B

GENERAL NOTES / LOCAL NOTES

CHANGES MAY BE REQUIRED WHEN PHYSICAL DIMENSIONS IN THE DETAIL DRAWINGS, STANDARD DETAILS, AND ROADWAY DETAILS ARE NOT ATTAINABLE TO MEET FIELD CONDITIONS OR RESULT IN DUPLICATE OR UNDESIRED OVERLAPPING OF DEVICES. MODIFICATION MAY INCLUDE: MOVING, SUPPLEMENTING, COVERING, OR REMOVAL OF DEVICES AS DIRECTED BY THE ENGINEER.

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT EXCEPT WHEN OTHERWISE NOTED IN THE PLAN OR DIRECTED BY THE ENGINEER.

TIME RESTRICTIONS

A) DO NOT CLOSE ROADS AS FOLLOWS:

ROAD NAME	DAY AND TIME RESTRICTIONS
HAMBURG ROAD (SR 1533)	JUNE 15TH - AUGUST 14TH 6:00 AM TO 9:00 AM AND 4:00 PM TO 6:00 PM
HAMBURG ROAD (SR 1533)	AUGUST 15TH - JUNE 14TH 6:00 AM TO 9:00 AM AND 2:00 PM TO 6:00 PM

LANE AND SHOULDER CLOSURE REQUIREMENTS

B) REMOVE LANE CLOSURE DEVICES FROM THE LANE WHEN WORK IS NOT BEING PERFORMED BEHIND THE LANE CLOSURE OR WHEN A LANE CLOSURE IS NO LONGER NEEDED OR AS DIRECTED BY THE ENGINEER.

C) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN 15 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN SHOULDER USING ROADWAY STANDARD DRAWING NO. 1101.04 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL OR A LANE CLOSURE IS INSTALLED.

D) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON THE SHOULDER ADJACENT TO AN UNDIVIDED FACILITY AND WITHIN 5 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.

E) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN A LANE OF TRAVEL OF AN UNDIVIDED OR DIVIDED FACILITY, CLOSE THE LANE ACCORDING TO THE TRAFFIC CONTROL PLANS, ROADWAY STANDARD DRAWINGS, OR AS DIRECTED BY THE ENGINEER. CONDUCT THE WORK SO THAT ALL PERSONNEL AND/OR EQUIPMENT REMAIN WITHIN THE CLOSED TRAVEL LANE.

F) DO NOT WORK SIMULTANEOUSLY WITHIN 15 FT ON BOTH SIDES OF AN OPEN TRAVELWAY, RAMP, OR LOOP WITHIN THE SAME LOCATION UNLESS PROTECTED WITH GUARDRAIL OR BARRIER.

PAVEMENT EDGE DROP OFF REQUIREMENTS

G) BACKFILL AT A 6:1 SLOPE UP TO THE EDGE AND ELEVATION OF EXISTING PAVEMENT IN AREAS ADJACENT TO AN OPENED TRAVEL LANE THAT HAS AN EDGE OF PAVEMENT DROP-OFF AS FOLLOWS:

BACKFILL DROP-OFFS THAT EXCEED 2 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS OF 45 MPH OR GREATER.

BACKFILL DROP-OFFS THAT EXCEED 3 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS LESS THAN 45 MPH.

BACKFILL WITH SUITABLE COMPACTED MATERIAL, AS APPROVED BY THE ENGINEER, AT NO EXPENSE TO THE DEPARTMENT.

H) DO NOT EXCEED A DIFFERENCE OF 2 INCHES IN ELEVATION BETWEEN OPEN LANES OF TRAFFIC FOR NOMINAL LIFTS OF 1.5 INCHES. INSTALL ADVANCE WARNING "UNEVEN LANES" SIGNS (W8-11) IN ADVANCE AND A MINIMUM OF EVERY HALF MILE THROUGHOUT THE UNEVEN AREA.

TRAFFIC PATTERN ALTERATIONS

I) NOTIFY THE ENGINEER TWENTY ONE (21) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

SIGNING

J) INSTALL ADVANCE WORK ZONE WARNING SIGNS WHEN WORK IS WITHIN 40 FT FROM THE EDGE OF TRAVEL LANE AND NO MORE THAN THREE (3) DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.

K) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.

L) INSTALL BLACK ON ORANGE "DIP" SIGNS (W8-2) AND/OR "BUMP" SIGNS (W8-1) 100 ft IN ADVANCE OF THE UNEVEN AREA, OR AS DIRECTED BY THE ENGINEER.

TRAFFIC BARRIER

M) INSTALL TEMPORARY BARRIER ACCORDING TO THE TRANSPORTATION MANAGEMENT PLANS A MAXIMUM OF TWO (2) WEEKS PRIOR TO BEGINNING WORK IN ANY LOCATION. ONCE TEMPORARY BARRIER IS INSTALLED AT ANY LOCATION PROCEED IN A CONTINUOUS MANNER TO COMPLETE THE PROPOSED WORK IN THAT LOCATION UNLESS OTHERWISE STATED IN THE TRANSPORTATION MANAGEMENT PLANS OR AS DIRECTED BY THE ENGINEER.

DO NOT PLACE BARRIER DIRECTLY ON ANY SURFACE OTHER THAN ASPHALT OR CONCRETE.

ONCE TEMPORARY BARRIER IS INSTALLED AT ANY LOCATION AND NO WORK IS PERFORMED BEHIND THE TEMPORARY BARRIER FOR A PERIOD LONGER THAN TWO (2) MONTHS, REMOVE / RESET TEMPORARY BARRIER AT NO COST TO THE DEPARTMENT UNLESS OTHERWISE STATED IN THE TRANSPORTATION MANAGEMENT PLANS, TEMPORARY BARRIER IS PROTECTING A HAZARD, OR AS DIRECTED BY THE ENGINEER.

INSTALL TEMPORARY BARRIER WITH THE TRAFFIC FLOW BEGINNING WITH THE UPSTREAM SIDE OF TRAFFIC. REMOVE TEMPORARY BARRIER AGAINST THE TRAFFIC FLOW BEGINNING WITH THE DOWNSTREAM SIDE OF TRAFFIC.

INSTALL AND SPACE DRUMS NO GREATER THAN TWICE THE POSTED SPEED LIMIT (MPH) TO CLOSE OR KEEP THE SECTION OF THE ROADWAY CLOSED UNTIL THE TEMPORARY BARRIER CAN BE PLACED OR AFTER THE TEMPORARY BARRIER IS REMOVED.

N) PROTECT THE APPROACH END OF MOVABLE/PORTABLE CONCRETE BARRIER AT ALL TIMES DURING THE INSTALLATION AND REMOVAL OF THE BARRIER BY EITHER A TRUCK MOUNTED ATTENUATOR (MAXIMUM 72 HOURS) OR A TEMPORARY CRASH CUSHION.

PROTECT THE APPROACH END OF MOVABLE/PORTABLE CONCRETE BARRIER FROM ONCOMING TRAFFIC AT ALL TIMES BY A TEMPORARY CRASH CUSHION UNLESS THE APPROACH END OF MOVABLE/PORTABLE CONCRETE BARRIER IS OFFSET FROM ONCOMING TRAFFIC AS FOLLOWS OR AS SHOWN IN THE PLANS: (SEE ALSO 1101.05)

POSTED SPEED LIMIT	MINIMUM OFFSET
40 OR LESS	15 FT
45 - 50	20 FT
55	25 FT
60 MPH or HIGHER	30 FT

TRAFFIC CONTROL DEVICES

O) WHEN LANE CLOSURES ARE NOT IN EFFECT SPACE CHANNELIZING DEVICES IN WORK AREAS NO GREATER IN FEET THAN TWICE THE POSTED SPEED LIMIT (MPH) EXCEPT, 10 FT ON-CENTER IN RADII, AND 3 FT OFF THE EDGE OF AN OPEN TRAVELWAY. REFER TO STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES SECTIONS 1130 (DRUMS), 1135 (CONES) AND 1180 (SKINNY DRUMS) FOR ADDITIONAL REQUIREMENTS.

P) PLACE TYPE III BARRICADES, WITH "ROAD CLOSED" SIGN R11-2 ATTACHED, OF SUFFICIENT LENGTH TO CLOSE ENTIRE ROADWAY.

PAVEMENT MARKING

Q) INSTALL TEMPORARY PAVEMENT MARKINGS ON INTERIM LAYERS OF PAVEMENT AS FOLLOWS:

ROAD NAME	MARKING	MARKER
SR 1533 (HAMBURG ROAD)	PAINT	RAISED

R) PLACE ONE APPLICATION OF PAINT FOR TEMPORARY TRAFFIC PATTERNS. PLACE A SECOND APPLICATION OF PAINT SIX (6) MONTHS AFTER THE INITIAL APPLICATION AND EVERY SIX MONTHS AS DIRECTED BY THE ENGINEER.

S) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.

T) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS BY THE END OF EACH DAY'S OPERATION.

MISCELLANEOUS

U) IN THE EVENT A TIE-IN CANNOT BE MADE IN ONE DAY'S TIME, BRING THE TIE-IN AREA TO AN APPROPRIATE ROADWAY ELEVATION AS DETERMINED BY THE ENGINEER. PLACE BLACK ON ORANGE "LOOSE GRAVEL" SIGNS (W8-7) AND BLACK ON ORANGE "PAVEMENT ENDS" SIGNS (W8-3) 100 ft AND 200 ft RESPECTIVELY IN ADVANCE OF THE UNEVEN AREAS. USE DRUMS TO DELINEATE THE EDGE OF ROADWAY ALONG UNPAVED AREAS.

LOCAL NOTES:

1) EMERGENCY VEHICLE ACCESS MUST BE MAINTAINED AT ALL TIMES.

2) NOTIFY THE MADISON COUNTY SCHOOL BOARD 30 DAYS PRIOR TO ANY LANE CLOSURES.

3) MAINTAIN ACCESS TO DRIVEWAYS DURING CONSTRUCTION

MANAGEMENT STRATEGIES

PHASE I SHOWS TRAFFIC TO BE MAINTAINED ON THE EXISTING ROAD, BUT REDUCED TO ONE LANE USING TEMPORARY SIGNALS AND PAVEMENT MARKINGS AS NEW ALIGNMENT IS CONSTRUCTED.

PHASE 2 SHOWS TRAFFIC SHIFTED TO ONE LANE ON THE NEW ALIGNMENT USING TEMPORARY SIGNALS AND PAVEMENT MARKINGS WHILE THE REMAINDER IS CONSTRUCTED. A FLAGGING OPERATION WILL BE USED TO CONSTRUCT THE NEW TIE-INS.

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APPROVED: DocuSigned by: James Voso DATE: 2/23/2022

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022599 ENGINEER JAMES B. VOSO

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

TRANSPORTATION OPERATIONS PLAN
(MANAGEMENT STRATEGIES & GENERAL NOTES)

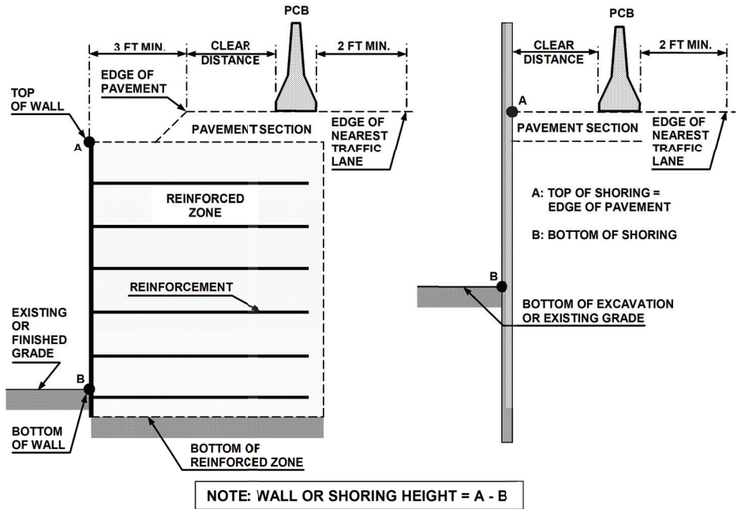

FIGURE A

NOTES

1- REFER TO THE TRAFFIC CONTROL PLANS FOR TEMPORARY SHORING LOCATIONS AND NOTES.

2- REFER TO THE "TEMPORARY SHORING" PROJECT SPECIAL PROVISION FOR INFORMATION ABOUT TEMPORARY SHORING AND PORTABLE CONCRETE BARRIER (PCB).

3- PCB IS REQUIRED IF TEMPORARY SHORING IS LOCATED WITHIN THE CLEAR ZONE IN ACCORDANCE WITH THE AASHTO ROADSIDE DESIGN GUIDE. DO NOT PLACE BARRIER DIRECTLY ON ANY SURFACE OTHER THAN ASPHALT OR CONCRETE. (CONTACT NCDOT PAVEMENT MANAGEMENT UNIT FOR APPLICABLE PAVEMENT DESIGN).

4- BASED ON THE CLEAR DISTANCE, OFFSET, DESIGN SPEED AND PAVEMENT TYPE, CHOOSE AN UNANCHORED OR ANCHORED PCB FROM THE TABLE SHOWN IN FIGURE B. CLEAR DISTANCE IS DEFINED AS SHOWN IN FIGURE A AND OFFSET IS DEFINED AS SHOWN IN FIGURE B.

5- AT THE CONTRACTOR'S OPTION OR IF THE MINIMUM REQUIRED CLEAR DISTANCE IS NOT AVAILABLE, SET PCB NEXT TO AND UP AGAINST THE TRAFFIC SIDE OF THE TEMPORARY SHORING EXCEPT FOR BARRIER ABOVE TEMPORARY WALLS. PCB WITH THE MINIMUM REQUIRED CLEAR DISTANCE IS REQUIRED ABOVE TEMPORARY WALLS.

6- USE NCDOT PORTABLE CONCRETE BARRIER (PCB) IN ACCORDANCE WITH ROADWAY STANDARD DRAWING NO. 1170.01 AND SECTION 1170 OF THE STANDARD SPECIFICATIONS.

7- PCB REQUIREMENTS FOR TEMPORARY WALLS APPLY TO TEMPORARY MECHANICALLY STABILIZED EARTH (MSE) WALLS AND TEMPORARY SOIL NAIL WALLS.

8- SET PCB WITH A MINIMUM HORIZONTAL DISTANCE OF 2 FT BETWEEN THE FRONT FACE OF THE BARRIER AND THE EDGE OF THE NEAREST TRAFFIC LANE AS SHOWN IN FIGURE A UNLESS OTHERWISE SHOWN IN THE PLANS AND OR AS APPROVED BY THE ENGINEER.

9- FOR PCB ABOVE AND BEHIND TEMPORARY WALLS, PROVIDE A MINIMUM DISTANCE OF 3 FT BETWEEN THE EDGE OF PAVEMENT AND THE WALL FACE AS SHOWN IN FIGURE A. IF THESE MINIMUM REQUIRED DISTANCES ARE NOT AVAILABLE, CONTACT THE ENGINEER.

10- TABLE SHOWN IN FIGURE B IS BASED ON NCDOT RESEARCH PROJECT NO. 2005-010 WITH VEHICLE TYPE USED FOR NCHRP 350 CRASH TESTS. BARRIER DEFLECTIONS AND RESULTING MINIMUM REQUIRED CLEAR DISTANCES MIGHT VARY SIGNIFICANTLY FOR LARGER HEAVIER VEHICLES, RUNS OF BARRIER LESS THAN 200 FT IN LENGTH AND WET OR DRY PAVEMENT.

PROJ. REFERENCE NO.	SHEET NO.
17BP.13.161	TMP-2

MINIMUM REQUIRED CLEAR DISTANCE, inches

Barrier Type	Pavement Type	Offset * ft	Design Speed, mph					
			<30	31-40	41-50	51-60	61-70	71-80
Unanchored PCB	Asphalt	<8	24	26	29	32	36	40
		8-14	26	28	31	35	38	42
		14-20	27	29	34	36	39	43
		20-26	28	31	35	38	40	44
		26-32	29	32	36	39	42	45
		32-38	30	34	38	41	43	46
		38-44	31	34	41	43	45	48
		44-50	31	35	41	43	46	49
		50-56	32	36	42	44	47	50
		>56	32	36	42	45	47	51
	Concrete	<8	17	18	21	22	25	26
		8-14	19	20	23	25	26	29
		14-20	22	22	24	26	28	31
		20-26	23	24	26	27	30	34
		26-32	24	25	27	28	32	35
		32-38	24	26	27	30	33	36
		38-44	25	26	28	30	34	37
		44-50	26	26	28	32	35	37
		50-56	26	26	28	32	35	38
		>56	26	27	29	32	36	38
Anchored PCB	Asphalt	All Offsets	24 for All Design Speeds					
Anchored PCB	Concrete (including bridge approach slabs)	All Offsets	12 for All Design Speeds					

* See Figure Below

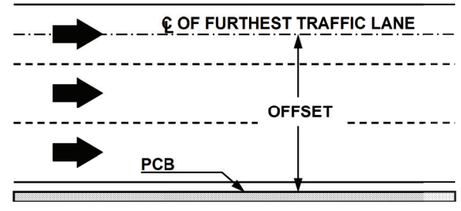

FIGURE B

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DIVISION OF HIGHWAYS • STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION • WORK ZONE TRAFFIC CONTROL

PORTABLE CONCRETE BARRIER AT TEMPORARY SHORING LOCATIONS

PROJ. REFERENCE NO.	SHEET NO.
17BP.13.R.161	TMP-3

PROJECT PHASING

PHASE I

STEP 1: - ERECT WORK ZONE ADVANCED WARNING SIGNS USING DETAIL DRAWINGS FOR WORK ZONE SIGNS. (SEE RDWY STD. 1101.01)

- INSTALL PORTABLE TRAFFIC SIGNALS AS REQUIRED IN APPROVED TRAFFIC SIGNAL TIMING PLANS (SEE RDWY STD. 1101.02 SHEET 14 OF 14)

NOTE: STEP 2 SHALL BE COMPLETED IN A CONTINUOUS OPERATION.

STEP 2: USING RDWY STD 1101.02 SHEET 1 OF 14 AND FLAGGERS, PERFORM THE FOLLOWING ON SR 1533:

- REMOVE AS NECESSARY EXISTING PAVEMENT MARKINGS, AND PLACE TEMPORARY PAVEMENT MARKINGS (PAINT), AND MARKERS FROM -L- STA. 10+50 +/- TO -L- STA. 18+40 +/-. (SEE TMP-4)
- ACTIVATE PORTABLE TRAFFIC SIGNALS AND DIRECT SR 1533 (HAMBURG ROAD) TRAFFIC INTO A ONE LANE, TWO WAY PATTERN IN THE EXISTING WESTBOUND LANE OF SR 1533 (HAMBURG ROAD). SEE (TMP-4)
- INSTALL TEMPORARY CONCRETE BARRIER FROM -L- STA. 13+43 +/- TO -L- STA. 14+60 +/-.(SEE TMP-3).

STEP 3: - INSTALL TEMPORARY SHORING AS FOLLOWS:

- INSTALL TEMPORARY SHORING BEHIND TEMPORARY CONCRETE BARRIER FROM -L- STA. 13+55 +/- TO -L- STA. 13+85 +/- AND FROM -L- STA. 14+11 +/- TO -L- STA. 14+47 +/-. (SEE TMP-4)

STEP 4: - REMOVE EXISTING BRIDGE RAIL (LEFT SIDE) ON BRIDGE 166, SAWCUT AND REMOVE LEFT SIDE OF EXISTING BRIDGE TO LIMIT SHOWN (SEE SECCTION B-B, TMP-4)

- CONSTRUCT STRUCTURES PER THE STRUCTURE PLANS STAGE 1.
- CONSTRUCT -L- (SR 1533 HAMBURG ROAD) FROM -L- STA 12+00 TO -L- STA 16+90 WESTBOUND LANE (LEFT SIDE) EXCLUDING FINAL PAVEMENT LAYER.

NOTE: STEP 5 SHALL BE COMPLETED IN A CONTINUOUS OPERATION.

STEP 5: - INSTALL GUARDRAIL FROM -L- STA. 12+00 +/- LT TO -L- STA. 13+96 +/- LT (SEE RDY PLAN 2B-1 AND TMP-4) AND REMOVE TEMPORARY CONCRETE BARRIER IN STEP 2, PHASE I.

- INSTALL TEMPORARY GUARDRAIL FROM -L- STA. 13+40 +/- TO -L- STA. 14+46 +/- (SEE RDY PLAN 2B-1 AND TMP-4).
- PLACE TEMPORARY PAVEMENT MARKINGS (PAINT) AND MARKERS FROM -L- STA. 11+00 +/- TO -L- STA. 17+90 +/-. (SEE TMP-4) REMOVE AS NECESSARY, PAVEMENT MARKINGS AND MARKERS PLACED IN STEP 2.

PHASE II

STEP 1: USING RDWY STD 1101.02 SHEET 1 OF 14 AND FLAGGERS, PERFORM THE FOLLOWING ON SR 1533:

- RETAIN TEMPORARY SHORING CONSTRUCTED IN PHASE 1.
- ACTIVATE PORTABLE TRAFFIC SIGNALS AND DIRECT SR 1533 (HAMBURG ROAD) TRAFFIC INTO A ONE LANE, TWO-WAY PATTERN IN THE WESTBOUND LANE OF SR 1533 (HAMBURG ROAD). (SEE TMP-5)

STEP 2: - REMOVE EASTBOUND SIDE (RIGHT SIDE) OF EXISTING STRUCTURE (SEE STRUCTURE PLANS).

STEP 3: - CONSTRUCT STRUCTURE PER THE STRUCTURE PLANS STAGE 2.

- CONSTRUCT -L- SR 1533 (HAMBURG RD) FROM STA 12+00 TO STA 16+90 EASTBOUND LANE (RIGHT SIDE) EXCLUDING FINAL PAVEMENT LAYER.
- USING RDWY STD 1101.02 SHEET 1 OF 14 AND FLAGGERS, CONSTRUCT GUARDRAIL, REMOVE TEMPORARY GUARDRAIL PLACED IN STEP 1, PHASE II, AND REMOVE TEMPORARY SHORING.

STEP 4: - PLACE THE FINAL LAYER OF SURFACE COURSE, FINAL PAVEMENT MARKINGS (PAINT), AND PAVEMENT MARKERS ON THE ENTIRE PROJECT. (SEE PM-1)

STEP 5: - REMOVE ALL TEMPORARY TRAFFIC CONTROL DEVICES AND SIGNALS.

- OPEN SR 1533 (HAMBURG ROAD) TO 2-LANE, 2-WAY TRAFFIC.

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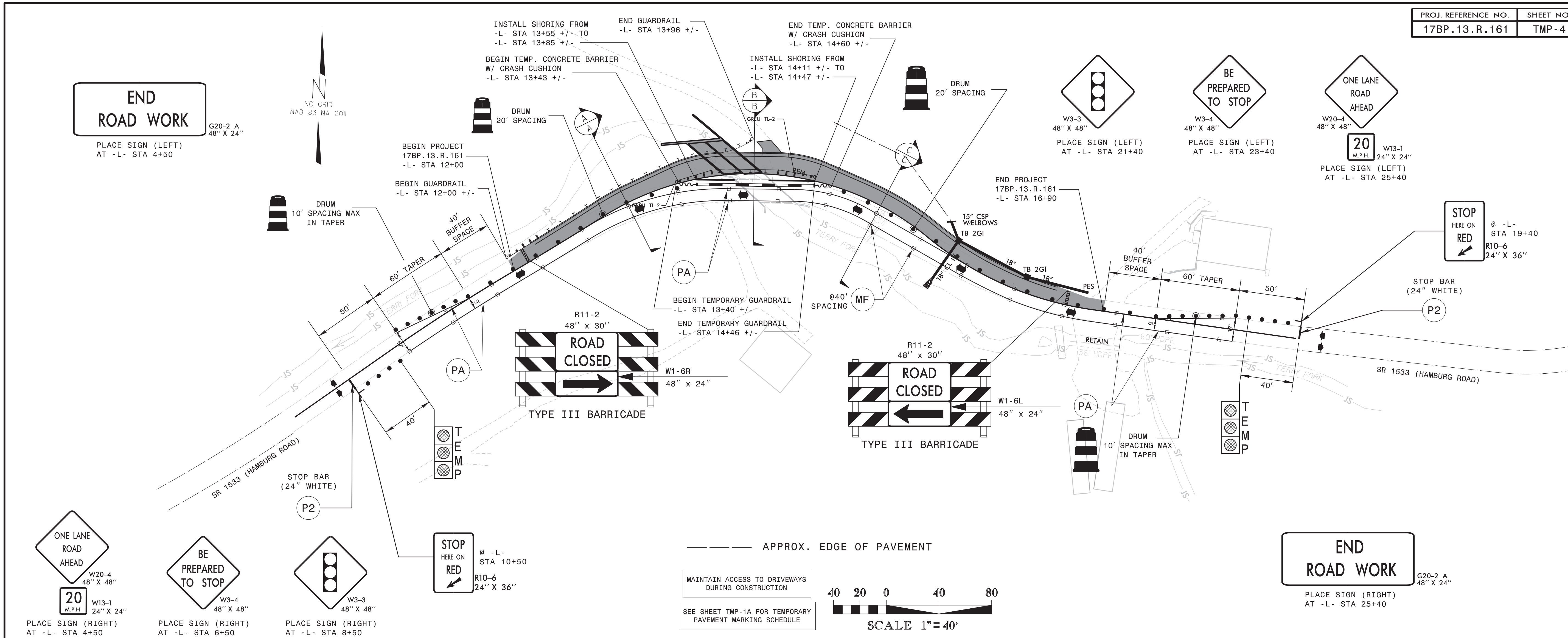
APPROVED: James Voso
DATE: 2/23/2022
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022599 ENGINEER JAMES B. VOSO

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

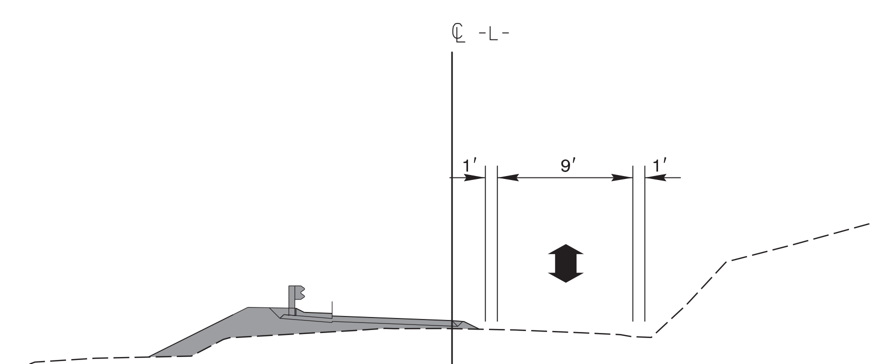
DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

PHASING

PROJ. REFERENCE NO.	SHEET NO.
17BP.13.R.161	TMP-4

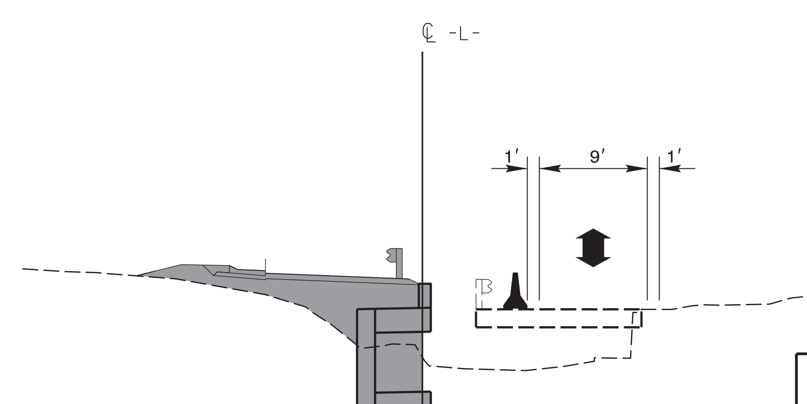


SECTION A-A
-L- STA 13+00
NOT TO SCALE



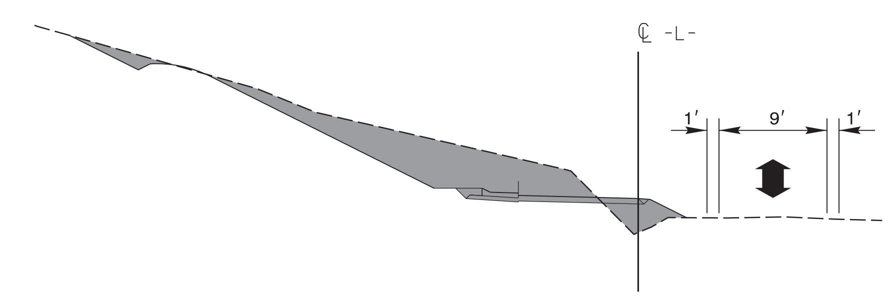
N.T.S.

SECTION B-B
-L- STA 14+00
NOT TO SCALE



N.T.S.

SECTION C-C
-L- STA 15+00
NOT TO SCALE



N.T.S.

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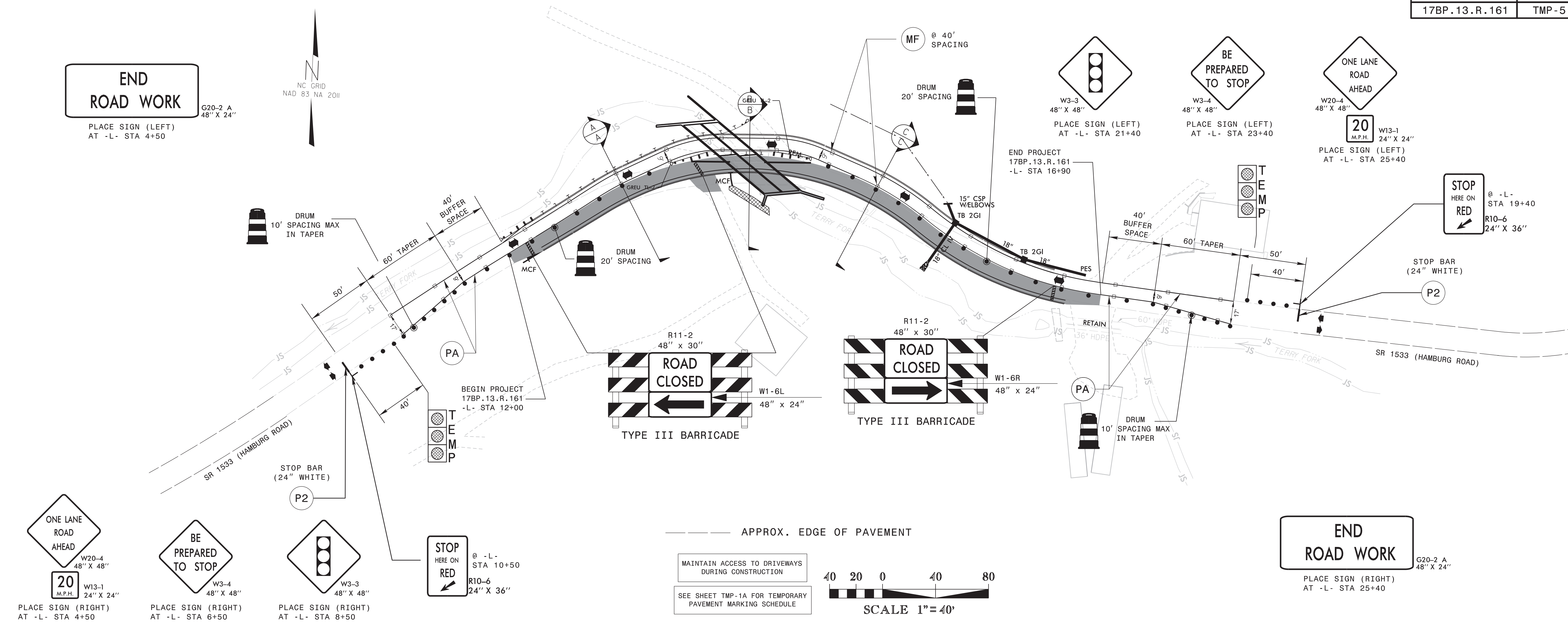
PHASE I DETAILS

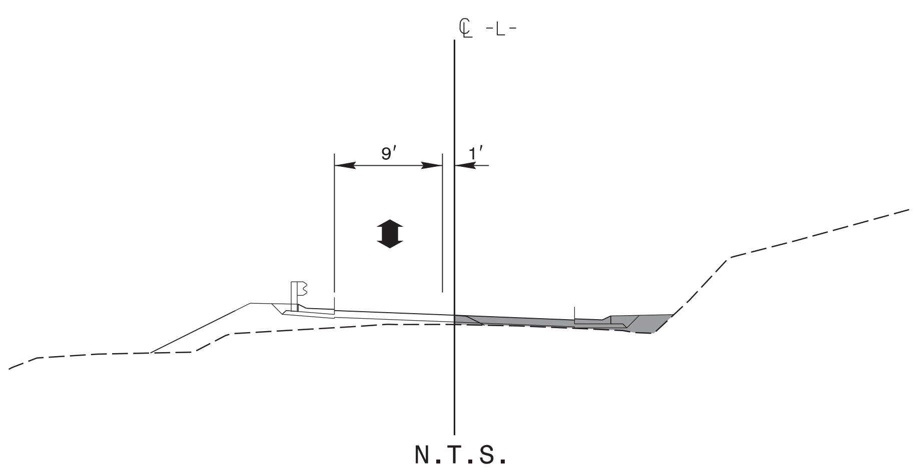
PROJ. REFERENCE NO.	SHEET NO.
17BP.13.R.161	TMP-5



SECTION A-A

-L- STA 13+00

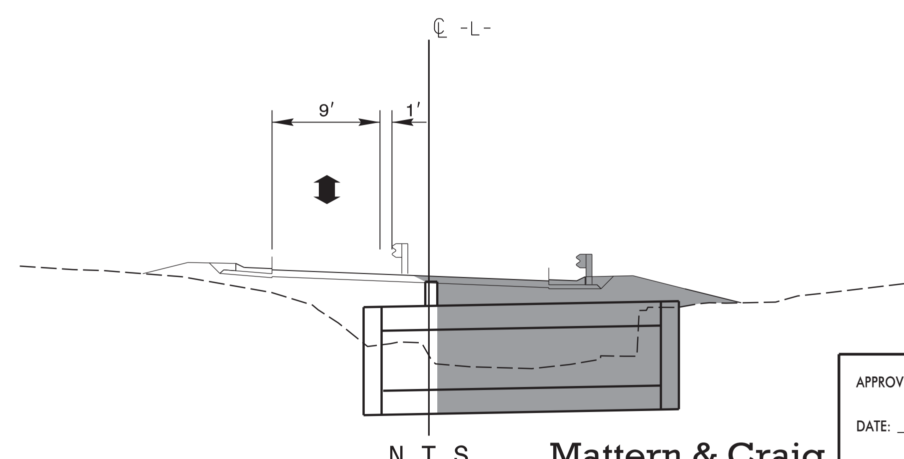
NOT TO SCALE



SECTION B-B

-L- STA 14+00

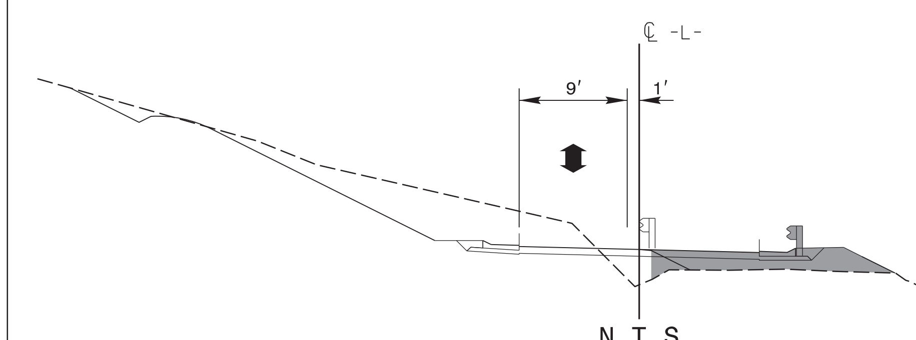
NOT TO SCALE



SECTION C-C

-L- STA 15+00

NOT TO SCALE



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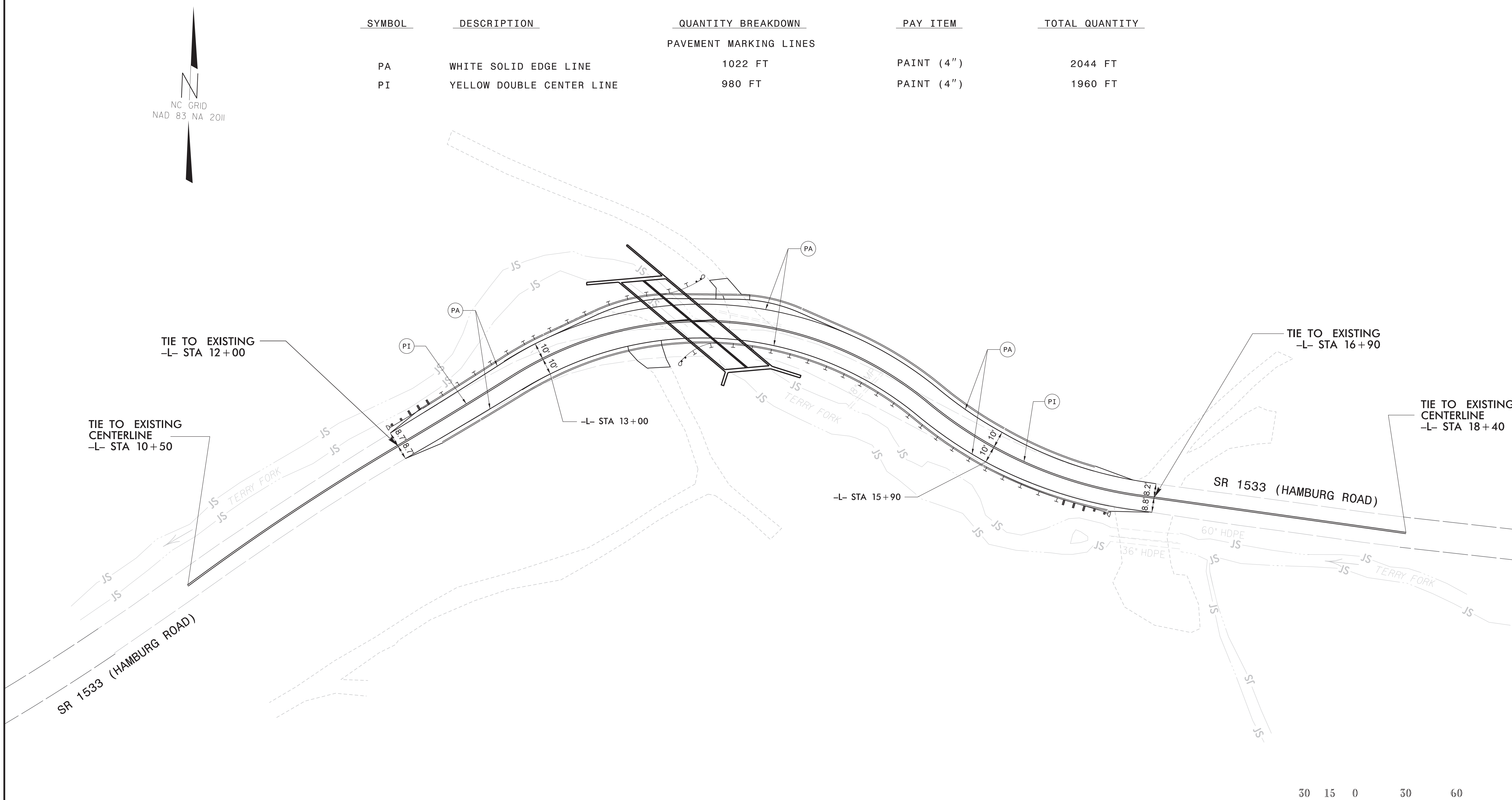
DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

PHASE II DETAILS

PROJ. REFERENCE NO.	SHEET NO.
17BP.13.R.161	PM-1

FINAL PAVEMENT MARKING SCHEDULE

SYMBOL	DESCRIPTION	QUANTITY BREAKDOWN	PAY ITEM	TOTAL QUANTITY
		PAVEMENT MARKING LINES		
PA	WHITE SOLID EDGE LINE	1022 FT	PAINT (4")	2044 FT
PI	YELLOW DOUBLE CENTER LINE	980 FT	PAINT (4")	1960 FT



NOTE: FINAL PAVEMENT MARKINGS = 2 COATS OF PAINT

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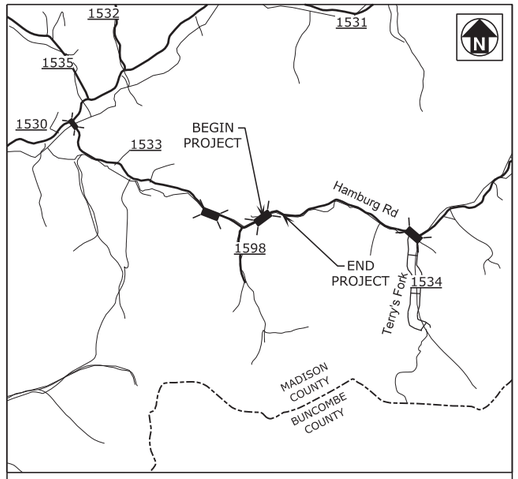
PERMANENT PAVEMENT MARKING PLAN

TIP PROJECT: 17BP.13.R.161



VICINITY MAP
(NOT TO SCALE)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

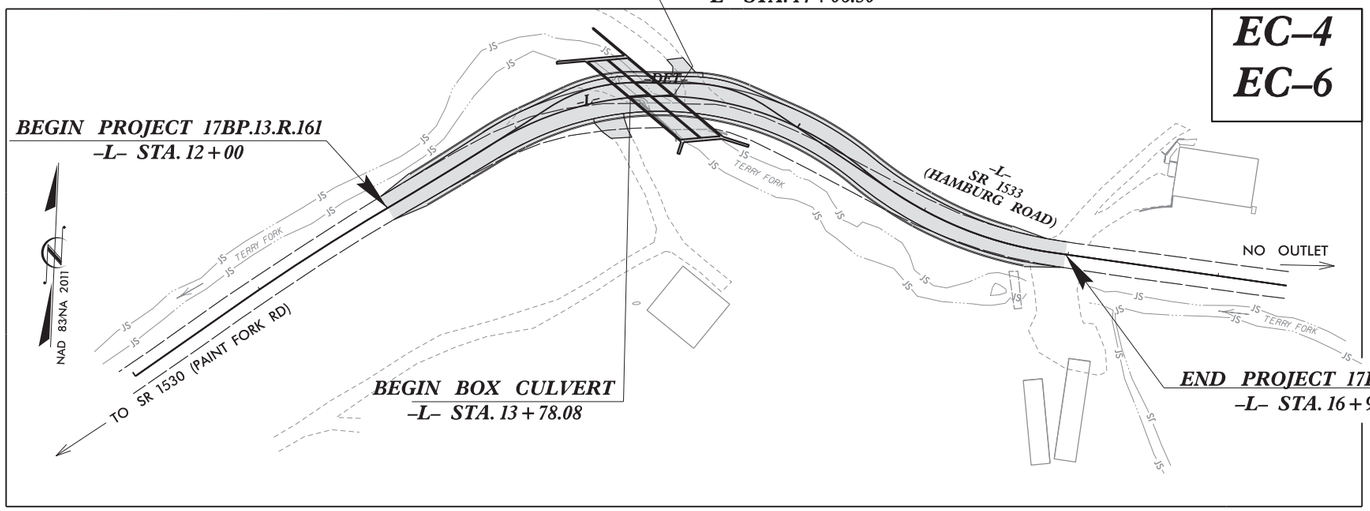
PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

MADISON COUNTY

LOCATION: BRIDGE NO. 166 OVER TERRY FORK ON SR 1533 (HAMBURG ROAD)

TYPE OF WORK: GRADING, PAVING, DRAINAGE AND CULVERT

END BOX CULVERT
–L– STA. 14+06.50



STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.13.R.161	EC-1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
17BP.13.PE.161	N/A	P.E.
17BP.13.ROW.161	N/A	R/W & UTIL
17BP.13.R.161	N/A	CONST

EROSION AND SEDIMENT CONTROL MEASURES

Std. #	Description	Symbol
1630.03	Temporary Silt Ditch	TSD
1630.05	Temporary Diversion	TD
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	
1622.01	Temporary Berms and Slope Drains	
1630.02	Silt Basin Type B	
1633.01	Temporary Rock Silt Check Type-A	
	Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM)	
1633.02	Temporary Rock Silt Check Type-B	
	Wattle / Coir Fiber Wattle	SW CFW
	Wattle / Coir Fiber Wattle with Polyacrylamide (PAM)	
1634.01	Temporary Rock Sediment Dam Type-A	
1634.02	Temporary Rock Sediment Dam Type-B	
1635.01	Rock Pipe Inlet Sediment Trap Type-A	
1635.02	Rock Pipe Inlet Sediment Trap Type-B	
1630.04	Stilling Basin	
1630.06	Special Stilling Basin	
	Rock Inlet Sediment Trap:	
1632.01	Type A	A
1632.02	Type B	B
1632.03	Type C	C
	Skimmer Basin	
	Tiered Skimmer Basin	
	Infiltration Basin	

ENVIRONMENTALLY SENSITIVE AREA(S) EXIST ON THIS PROJECT

Refer To E. C. Special Provisions for Special Considerations.

THIS PROJECT HAS BEEN DESIGNED TO SENSITIVE WATERSHED STANDARDS.

THIS PROJECT CONTAINS EROSION CONTROL PLANS FOR CLEARING AND GRUBBING PHASE OF CONSTRUCTION.

HIGH QUALITY WATER(S) EXIST ON THIS PROJECT

High Quality Water Zone(s) Exist
From Sta. 12+00
to Sta. 16+90
Refer To E. C. Special Provisions for Special Considerations.

PLANS PREPARED BY:

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GRAPHIC SCALE

30 15 0 30 60

THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE REGULATIONS SET FORTH BY THE NCG-010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE APRIL 1, 2019 AND ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES DIVISION OF WATER RESOURCES.

PROJECT LENGTH

LENGTH OF ROADWAY PROJECT 17BP.13.R.161 = 0.088 MILES

LENGTH OF STRUCTURE PROJECT 17BP.13.R.161 = 0.005 MILES

TOTAL LENGTH OF PROJECT 17BP.13.R.161 = 0.093 MILES

Prepared in the Office of:
MATTERN & CRAIG
12 BROAD ST.
ASHEVILLE, NC 28801
FOR NCDOT DIVISION OF HIGHWAYS

2018 STANDARD SPECIFICATIONS	*Designed by:*
RIGHT OF WAY DATE: JANUARY 15, 2019	NICK WOODS *NAME*
LETTING DATE:	4289 *LEVEL III CERTIFICATION NO.*
	MIKE CALLOWAY *NCDOT DIVISION 13 CONTACT*

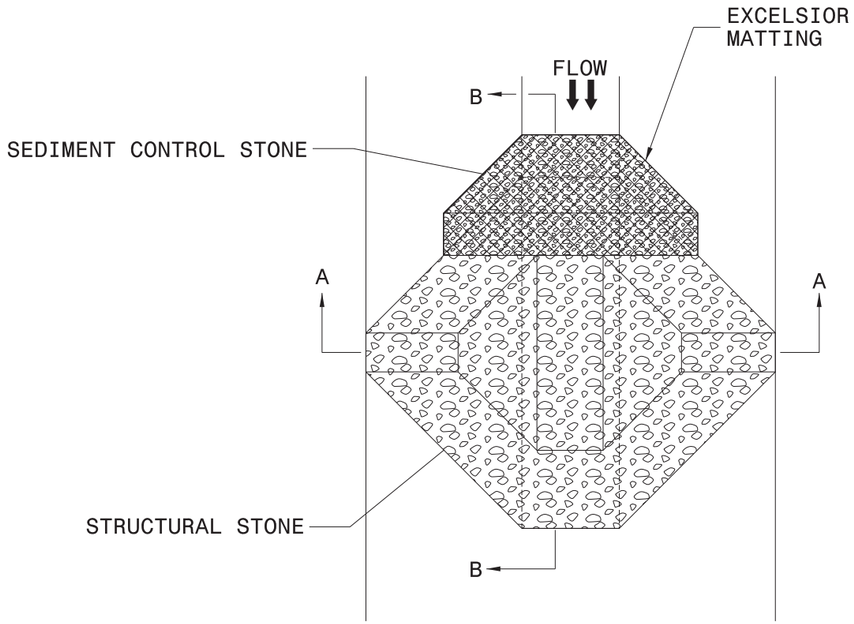
Roadway Standard Drawings

The following roadway english standards as appear in "Roadway Standard Drawings"– Roadway Design Unit – N. C. Department of Transportation – Raleigh, N. C., dated January 2018 and the latest revison thereto are applicable to this project and by reference hereby are considered a part of these plans.

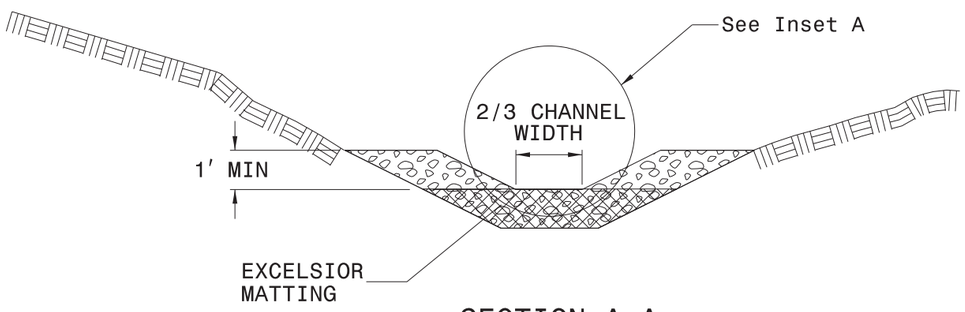
1604.01	Railroad Erosion Control Detail	1632.01	Rock Inlet Sediment Trap Type A
1605.01	Temporary Silt Fence	1632.02	Rock Inlet Sediment Trap Type B
1606.01	Special Sediment Control Fence	1632.03	Rock Inlet Sediment Trap Type C
1607.01	Gravel Construction Entrance	1633.01	Temporary Rock Silt Check Type A
1622.01	Temporary Berms and Slope Drains	1633.02	Temporary Rock Silt Check Type B
1630.01	Riser Basin	1634.01	Temporary Rock Sediment Dam Type A
1630.02	Silt Basin Type B	1634.02	Temporary Rock Sediment Dam Type B
1630.03	Temporary Silt Ditch	1635.01	Rock Pipe Inlet Sediment Trap Type A
1630.04	Stilling Basin	1635.02	Rock Pipe Inlet Sediment Trap Type B
1630.05	Temporary Diversion	1640.01	Coir Fiber Baffle
1630.06	Special Stilling Basin	1645.01	Temporary Stream Crossing
1631.01	Matting Installation		

PROJECT REFERENCE NO.	SHEET NO.
17BPJ3.R161	EC-2

TEMPORARY ROCK SILT CHECK TYPE 'A' WITH EXCELSIOR MATTING AND POLYACRYLAMIDE (PAM)



PLAN



SECTION A-A

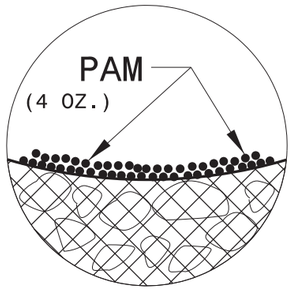
NOTES:

INSTALL TEMPORARY ROCK SILT CHECK TYPE A IN ACCORDANCE WITH ROADWAY STANDARD DRAWING NO. 1633.01.

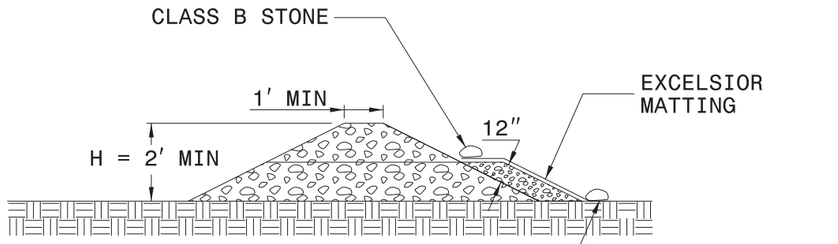
USE EXCELSIOR FOR MATTING MATERIAL AND ANCHOR MATTING SECTION AT TOP AND BOTTOM WITH CLASS B STONE.

PRIOR TO POLYACRYLAMIDE (PAM) APPLICATION, OBTAIN A SOIL SAMPLE FROM PROJECT LOCATION, AND FROM OFFSITE MATERIAL, AND ANALYZE FOR APPROPRIATE PAM FLOCCULANT TO BE APPLIED TO EACH ROCK SILT CHECK.

INITIALLY APPLY 4 OUNCES OF POLYACRYLAMIDE (PAM) TO TOP OF MATTING SECTION AND AFTER EVERY RAINFALL EVENT THAT EQUALS OR EXCEEDS 0.50 INCHES.



INSET A

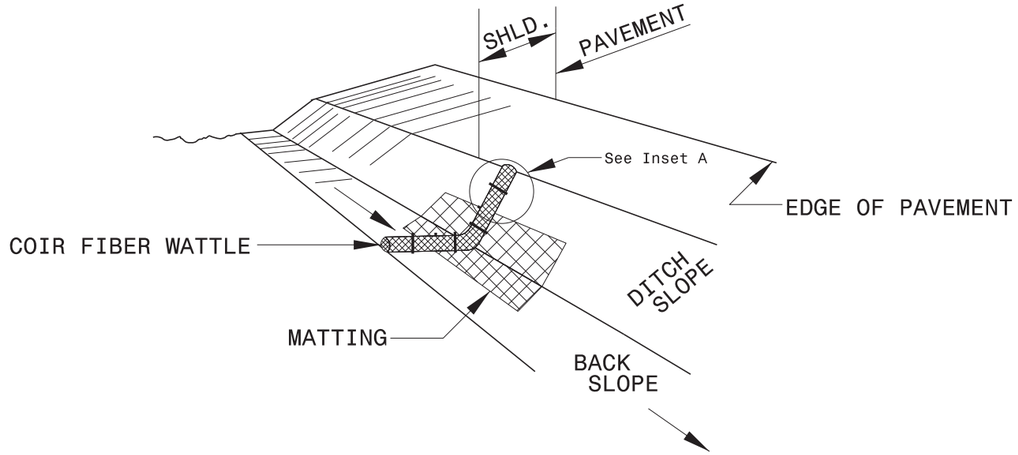


SECTION B-B

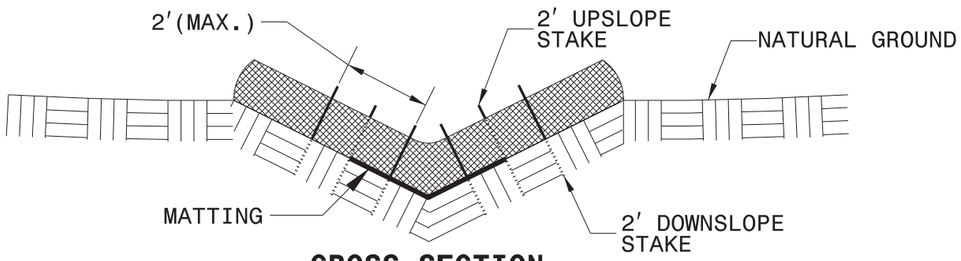
NOT TO SCALE

PROJECT REFERENCE NO.	SHEET NO.
17BPJ3.RJ61	EC-2A

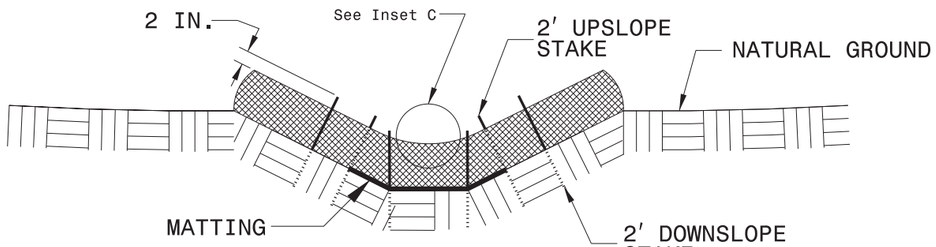
COIR FIBER WATTLE WITH POLYACRYLAMIDE (PAM) DETAIL



ISOMETRIC VIEW



CROSS SECTION VEE DITCH



CROSS SECTION TRAPEZOIDAL DITCH

NOTES:

USE MINIMUM 12 IN. DIAMETER COIR FIBER (COCONUT FIBER) WATTLE.

USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.

INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.

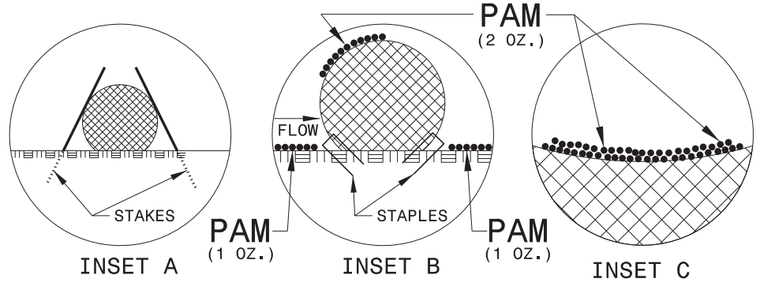
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12″ IN LENGTH.

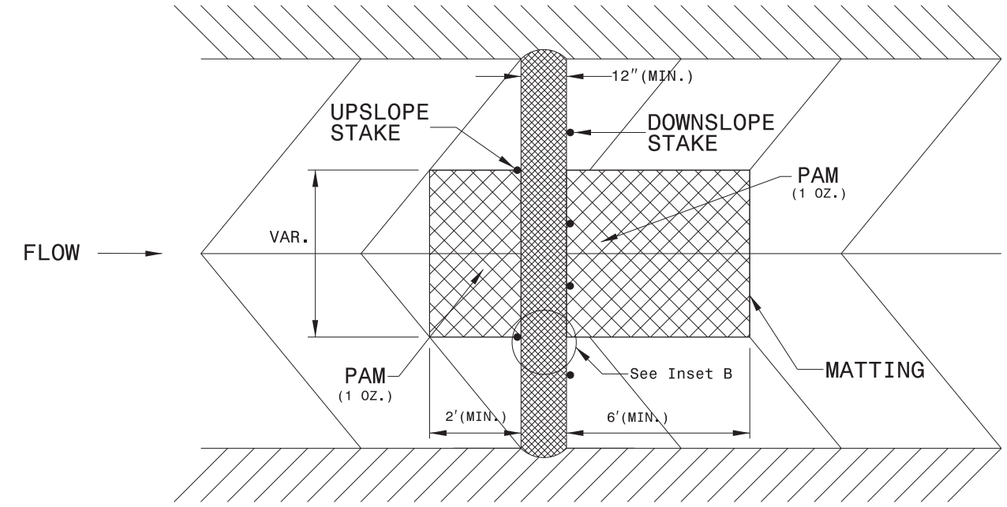
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

INSTALL MATTING IN ACCORDANCE WITH SECTION 1631 OF THE STANDARD SPECIFICATIONS.

PRIOR TO POLYACRYLAMIDE (PAM) APPLICATION, OBTAIN A SOIL SAMPLE FROM PROJECT LOCATION, AND FROM OFFSITE MATERIAL, AND ANALYZE FOR APPROPRIATE PAM FLOCCULANT TO BE APPLIED TO EACH WATTLE.

INITIALLY APPLY 2 OUNCES OF ANIONIC OR NEUTRALLY CHARGED PAM OVER WATTLE WHERE WATER WILL FLOW AND 1 OUNCE OF PAM ON MATTING ON EACH SIDE OF WATTLE. REAPPLY PAM AFTER EVERY RAINFALL EVENT THAT IS EQUAL TO OR EXCEEDS 0.50 IN.





TOP VIEW

PROJECT REFERENCE NO.	SHEET NO.
17BPJ3.R.161	EC-3

REVISIONS

SOIL STABILIZATION TIMEFRAMES

SITE DESCRIPTION	STABILIZATION TIME	TIMEFRAME EXCEPTIONS
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HQW) ZONES	7 DAYS	NONE
SLOPES STEEPER THAN 3:1	7 DAYS	IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1, 14 DAYS ARE ALLOWED.
SLOPES 3:1 OR FLATTER	14 DAYS	7 DAYS FOR SLOPES GREATER THAN 50' IN LENGTH.
ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1	14 DAYS	NONE, EXCEPT FOR PERIMETERS AND HQW ZONES.

SOIL STABILIZATION SUMMARY SHEET

MATTING FOR EROSION CONTROL

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
			SUBTOTAL		
MISCELLANEOUS MATTING TO BE INSTALLED AS DIRECTED BY THE ENGINEER					1000
				TOTAL	1000
				SAY	1000

PERMANENT SOIL REINFORCEMENT MAT

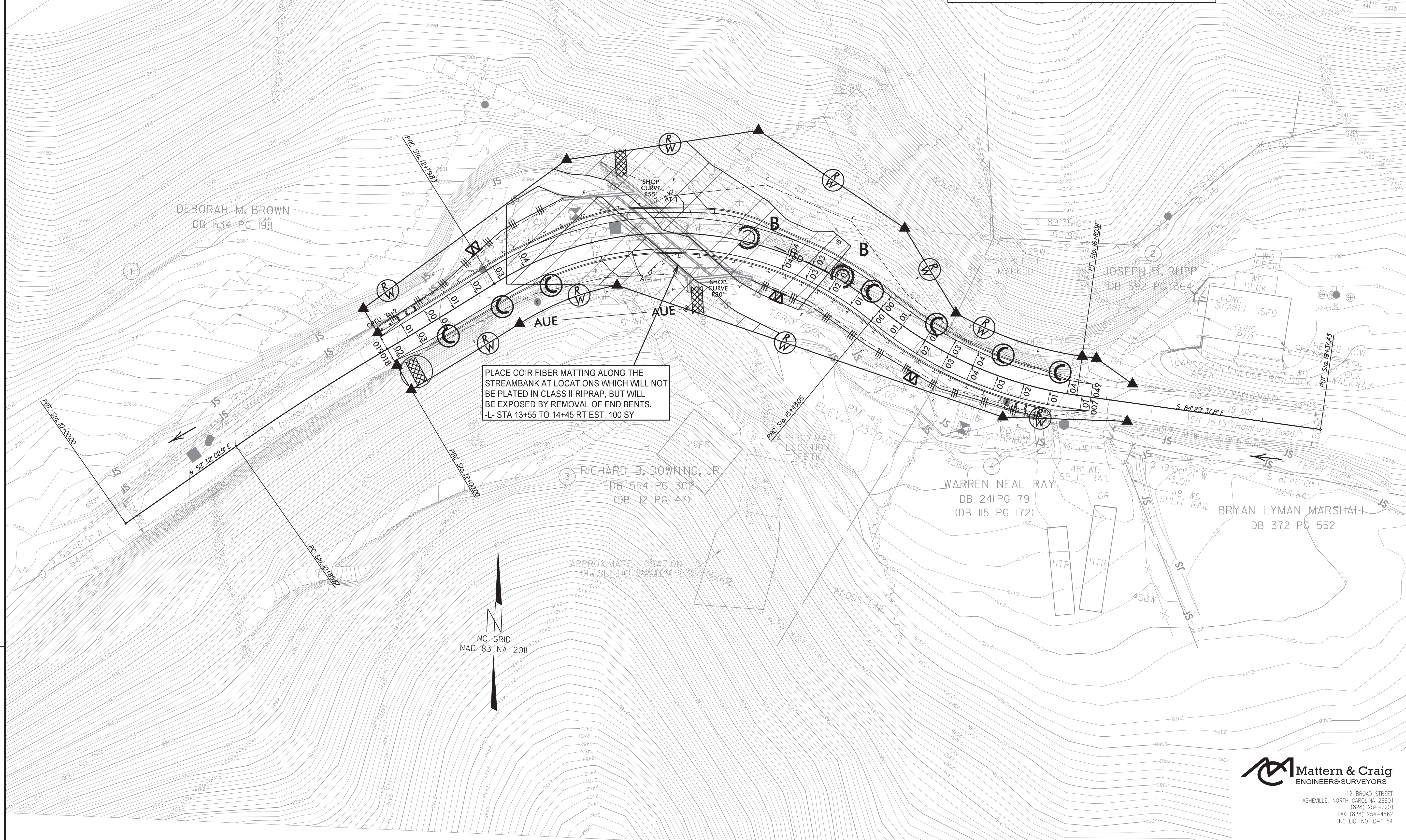
CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
4	-L-	13+85	14+15	RT	120
			SUBTOTAL		120
		ADDITIONAL PSRM TO BE INSTALLED			
				TOTAL	120
				SAY	120

PROJECT REFERENCE NO.	SHEET NO.
17.BPJ3J61	EC-4/CONST.4

REVISIONS

8/17/99

ENVIRONMENTALLY SENSITIVE AREA
SEE PROJECT SPECIAL PROVISIONS



DEBORAH M. BROWN
DB 534 PG 198
JOSEPH B. RUPP
DB 592 PG 364
RICHARD B. DOWNING, JR.
DB 554 PG 302
(DB 112 PG 47)
WARREN NEAL RAY
DB 241 PG 79
(DB 115 PG 172)
BRYAN LYMAN MARSHALL
DB 372 PG 552
SHOP CURVE R55'
SHOP CURVE R30'
AUE
TERRY FORK
SR 1533 (Hamburg Road)
WOODS LINE
APPROXIMATE LOCATION OF SEPTIC SYSTEM
APPROXIMATE LOCATION SEPTIC TANK
PLACE COIR FIBER MATTING ALONG THE STREAMBANK AT LOCATIONS WHICH WILL NOT BE PLATED IN CLASS II RIPRAP, BUT WILL BE EXPOSED BY REMOVAL OF END BENTS.
-L- STA 13+55 TO 14+45 RT EST. 100 SY
NC GRID
NAD 83 NA 2011

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PROJECT REFERENCE NO.	SHEET NO.
17BP.13.R.161	EC-5/CONST.4

CULVERT CONSTRUCTION SEQUENCE STA. 13 + 91.62 –L–

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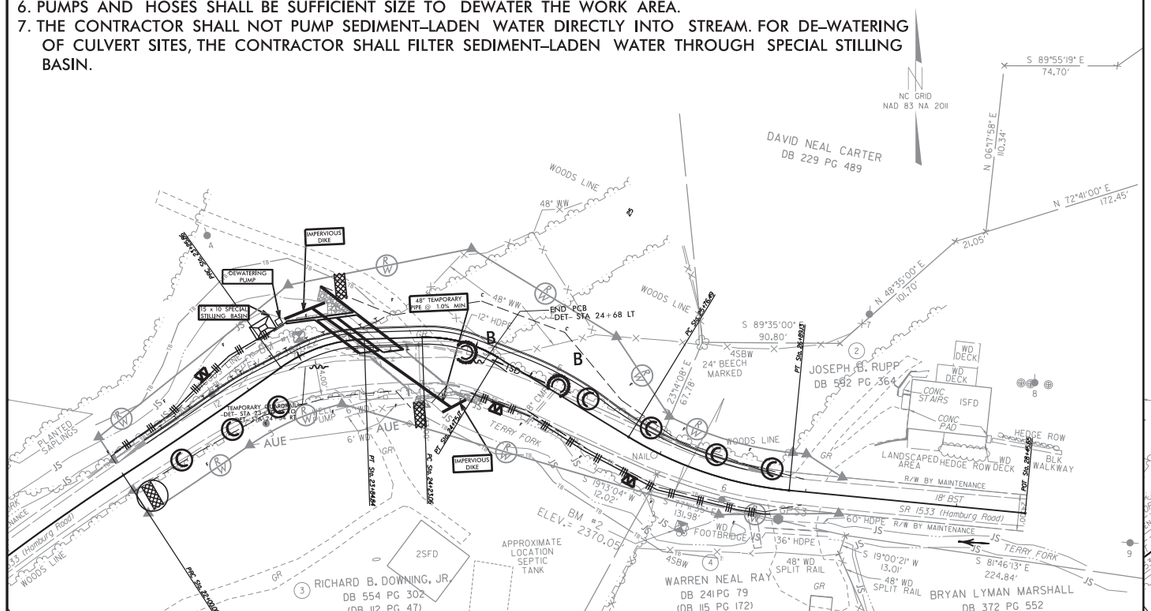
PHASE I

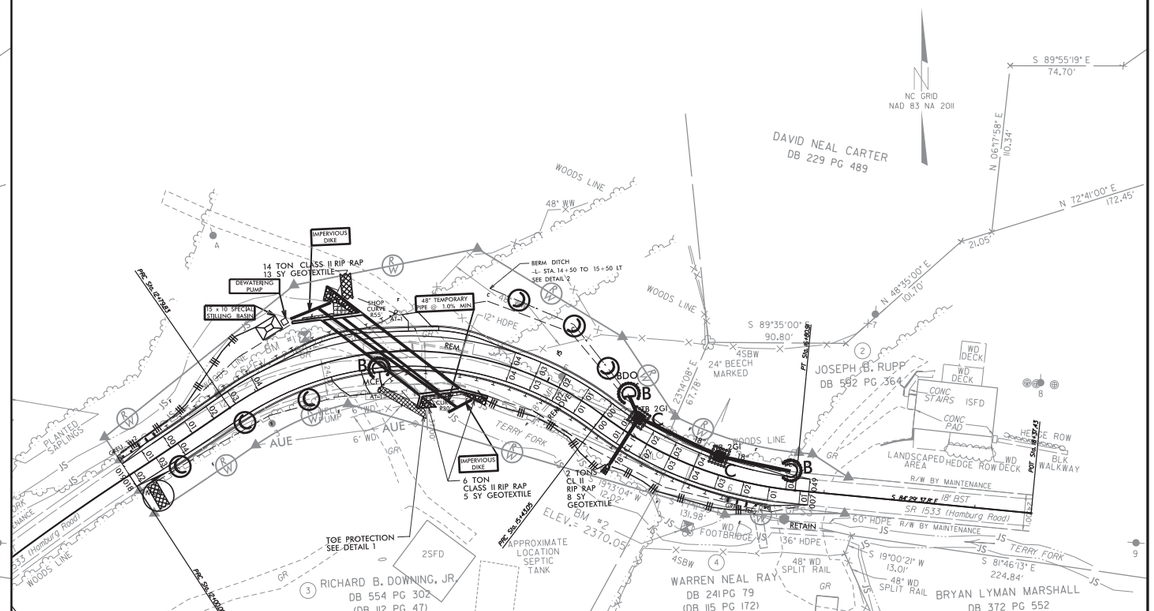
1. INSTALL PERIMETER EROSION CONTROL DEVICES PRIOR TO CONSTRUCTION AS SHOWN IN THE CLEAR AND GRUBBING PHASE
2. INSTALL IMPERVIOUS DIKES AND TEMPORARY 48" PIPE. TOP OF DIKE SHOULD BE 1' ABOVE SOFFIT.
3. INSTALL DEWATERING PUMP AND SPECIAL STILLING BASIN AS DIRECTED BY THE ENGINEER.
4. CONSTRUCT DOWNSTREAM SECTION (STAGED CONSTRUCTION) OF PROPOSED R.C.B.C.
5. CONSTRUCT A PORTION OF THE PROPOSED ROADWAY SUFFIECIENT TO ALLOW TRAFFIC THROUGH THE SITE AS DESCRIBED IN TRAFFIC MANAGEMENT PLANS.

PHASE II

1. INSTALL FINAL GRADE EROSION CONTROL DEVICES AS REMOVAL OF THE EXISTING ROADWAY AND BRIDGE MAKE THEM NECESSARY.
2. SHIFT TRAFFIC, AS DESCRIBED IN THE TRAFFIC MANAGEMENT PLANS, TO ONE LANE, TWO WAY PATTERN ON THE DOWNSTREAM SIDE OF THE NEW STRUCTURE STAGED CULVERT AND CONSTRUCT UPSTREAM SIDE OF R.C.B.C.
3. REMOVE EMBANKMENT AND ROADWAY BEHIND THE WINGWALLS OF THE EXISTING BRIDGE PRIOR TO REMOVAL OF THE BRIDGE ITSELF. THIS WILL PREVENT SEDIMENT FROM BEING DEPOSITED IN THE STREAM BED.
4. CONSTRUCT THE REMAINDER OF THE PROPOSED ROADWAY.
5. ENSURE DISTURBED LAND IS STABILIZED.
6. REMOVE TEMPORARY EROSION CONTROL DEVICES

NOTES:
1. CULVERT CONSTRUCTION SHALL BE PERFORMED IN ONLY DRY OR ISOLATED SECTIONS OF CHANNEL.
2. IMPERVIOUS DIKES ARE TO BE USED TO ISOLATE WORK FROM STREAM FLOW AS NECESSARY.
3. IMPERVIOUS DIKE SHALL BE INSTALLED PRIOR TO BRIDGE REMOVAL UPSTREAM AND DOWNSTREAM OF CONSTRUCTION TO CONTAIN THE WORK SITE AND SHALL BE DE–WATERED WITH TEMPORARY 48" PIPE. PLACEMENT SHALL BE APPROVED BY THE ENGINEER.
4. ALL GRADED AREAS SHALL BE STABILIZED WITHIN 24 HOURS.
5. MAINTENANCE OF STREAM FLOW OPERATIONS SHALL BE INCIDENTAL TO THE WORK. THIS INCLUDES POLETHYLENE SHEETING, DIVERSION PIPES, PUMPS AND HOSES.
6. PUMPS AND HOSES SHALL BE SUFFICIENT SIZE TO DEWATER THE WORK AREA.
7. THE CONTRACTOR SHALL NOT PUMP SEDIMENT–LADEN WATER DIRECTLY INTO STREAM. FOR DE–WATERING OF CULVERT SITES, THE CONTRACTOR SHALL FILTER SEDIMENT–LADEN WATER THROUGH SPECIAL STILLING BASIN.





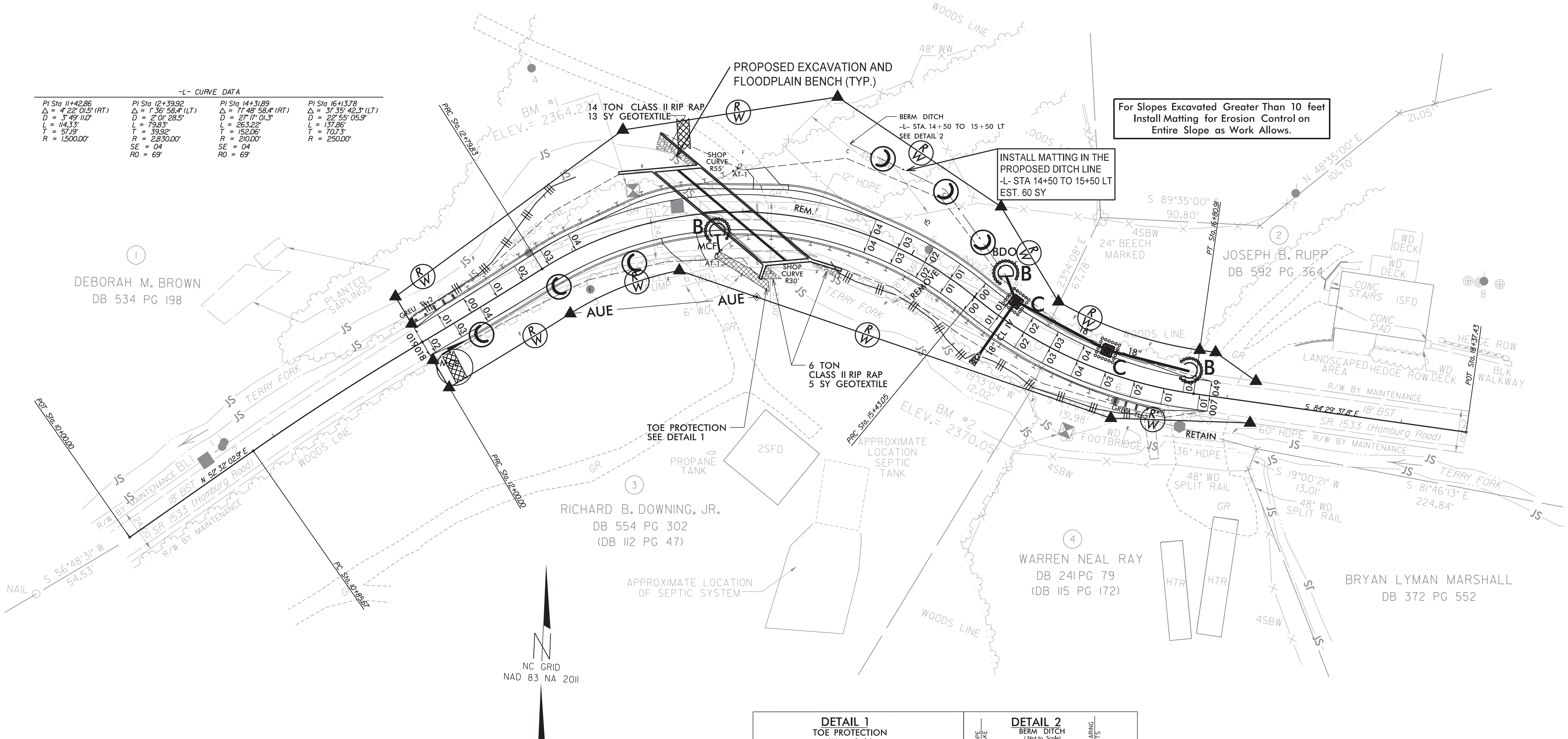
PROJECT REFERENCE NO.	SHEET NO.
17.BPJ3J61	EC-6/CONST.4

8/17/99

REVISIONS

-L- CURVE DATA

PI Sta 11+42.86	PI Sta 12+39.92	PI Sta 14+31.89	PI Sta 16+13.78
Δ = 4° 22′ 01.5″ (RT)	Δ = 1° 36′ 58.4″ (LT)	Δ = 71° 48′ 58.4″ (RT)	Δ = 31° 35′ 42.3″ (LT)
D = 3° 49′ 11.0″	D = 2° 01′ 28.5″	D = 27° 17′ 01.3″	D = 22° 55′ 05.9″
L = 114.33′	L = 79.83′	L = 263.22′	L = 137.86′
T = 57.19′	T = 39.92′	T = 152.06′	T = 70.73′
R = 1,500.00′	R = 2,830.00′	R = 210.00′	R = 250.00′
	SE = 04	SE = 04	
	RO = 69′	RO = 69′	

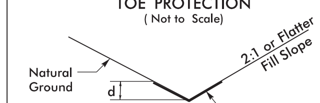


PROPOSED EXCAVATION AND
FLOODPLAIN BENCH (TYP.)
14 TON CLASS II RIP RAP
13 SY GEOTEXTILE
SHOP CURVE R55′
SHOP CURVE R30′
BERM DITCH
-L- STA. 14+50 TO 15+50 LT
SEE DETAIL 2
INSTALL MATTING IN THE
PROPOSED DITCH LINE
-L- STA 14+50 TO 15+50 LT
EST. 60 SY
For Slopes Excavated Greater Than 10 feet
Install Matting for Erosion Control on
Entire Slope as Work Allows.
6 TON
CLASS II RIP RAP
5 SY GEOTEXTILE
TOE PROTECTION
SEE DETAIL 1
AUE
RETAIN
REMOVE
DEBORAH M. BROWN
DB 534 PG 198
RICHARD B. DOWNING, JR.
DB 554 PG 302
(DB 112 PG 47)
JOSEPH B. RUPP
DB 592 PG 364
WARREN NEAL RAY
DB 241 PG 79
(DB 115 PG 172)
BRYAN LYMAN MARSHALL
DB 372 PG 552
BM #1
ELEV.= 2364.22
BM #2
ELEV.= 2370.05
SR 1533 (Hamburg Road)
TERRY FORK
WOODS LINE
PLANTED SAPLINGS
APPROXIMATE LOCATION OF SEPTIC SYSTEM
APPROXIMATE LOCATION SEPTIC TANK
PROPANE TANK
2SFD
24″ BEECH MARKED
LANDSCAPED AREA
HEDGE ROW
WD DECK
CONC STAIRS
CONC PAD
BLK WALKWAY
WD FOOTBRIDGE
48″ WD SPLIT RAIL
POT Sta. 10+00.00
PC Sta. 10+85.67
PRC Sta. 12+00.00
PRC Sta. 12+79.83
PRC Sta. 15+43.05
PT Sta. 16+80.91
POT Sta. 18+37.43
N 52° 32′ 02.9″ E
S 84° 29′ 37.8″ E
S 56°48′31″ W 54.53′
S 89°35′00″ E 90.80′
N 48°35′00″ E 101.70′
S 19°00′21″ W 13.01′
S 81°46′13″ E 224.84′
NC GRID
NAD 83 NA 2011

DETAIL 1

TOE PROTECTION

(Not to Scale)



d= 1 Ft.

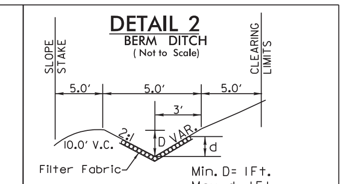
Type of Liner= PSRM

FROM -L- STA. 13+85 TO STA. 14+15 RT

DETAIL 2

BERM DITCH

(Not to Scale)



Min. D= 1Ft.
Max. d= 1Ft.

Type of Liner= 40 TONS CLASS B RIP RAP
EST 60 SY GEOTEXTILE

-L- STA. 14+50 TO 15+50 LT

Mattern & Craig
ENGINEERS-SURVEYORS
12 BROAD STREET
ASHEVILLE, NORTH CAROLINA 28801
(828) 254-2201
FAX (828) 254-4562
NC LIC. NO. C-1154

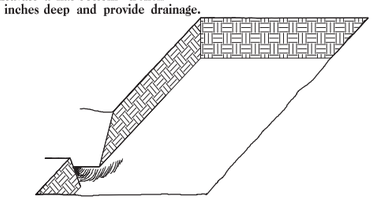
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	173P.13.R.161	RF-1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	

PLANTING DETAILS

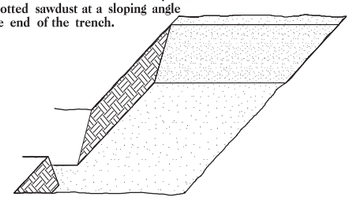
SEEDLING / LINER 3AREROOT PLANTING DETAIL

HEALING IN

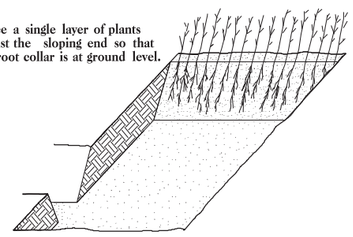
1. Locate a healing-in site in a shady, well protected area.
2. Excavate a flat bottom trench 12 inches deep and provide drainage.



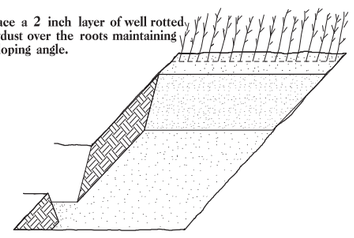
3. 3ackfill the trench with 2 inches well rotted sawdust. Place a 2 inch layer of well rotted sawdust at a sloping angle at one end of the trench.



4. Place a single layer of plants against the sloping end so that the root collar is at ground level.

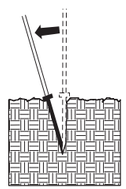


5. Place a 2 inch layer of well rotted sawdust over the roots maintaining a sloping angle.

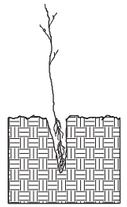


6. Repeat layers of plants and sawdust as neeessary and water thoroughly.

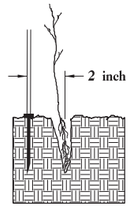
DI33LE PLANTING METHOD
USING THE K3C PLANTING 3AR



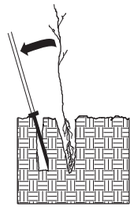
1. Insert planting bar as shown and pull handle toward planter.



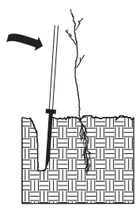
2. Remove planting bar and place seedling at correct depth.



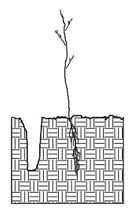
3. Insert planting bar 2 inches toward planter from seedling.



4. Pull handle of bar toward planter, firming soil at bottom.



5. Push handle forward firming soil at top.



6. Leave compaction hole open. Water thoroughly.

PLANTING NOTES:

PLANTING 3AG
During planting, seedlings shall be kept in a moist canvas bag or similar container to prevent the root systems from drying.

K3C PLANTING 3AR
Planting bar shall have a blade with a triangular cross section, and shall be 12 inches long, 4 inches wide and 1 inch thick at center.

ROOT PRUNING
All seedlings shall be root pruned, if necessary, so that no roots extend more than 10 inches below the root collar.

REFORESTATION

☐ TREE REFORESTATION SHALL 3E PLANTED 6 FT. TO 10 FT. ON CENTER, RANDOM SPACING, AVERAGING 8 FT. ON CENTER, APPROXIMATELY 680 PLANTS PER ACRE.

REFORESTATION

MIXTURE, TYPE, SIZE, AND FURNISH SHALL CONFORM TO THE FOLLOWING:

25% LIRIODENDRON TULIPIFERA	TULIP POPLAR	12 in - 18 in 3R
25% PLATANUS OCCIDENTALIS	AMERICAN SYCAMORE	12 in - 18 in 3R
25% FRAXINUS PENNSYLVANICA	GREEN ASH	12 in - 18 in 3R
25% 3ETULA NIGRA	RIVER 3IRCH	12 in - 18 in 3R

REFORESTATION DETAIL SHEET

N.C.D.O.T. - ROADSIDE ENVIRONMENTAL UNIT

PROJECT REFERENCE NO.	SHEET NO.
17BP.13.RJ.61	U0-1

UTILITIES BY OTHERS

NOTE:
ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS

8/17/99

REVISIONS

NEW O/H GUY AND DN GUY

SHIFT EXISTING O/H TEL ACROSS ROAD TO EXISTING POWER POLE

NEW POLE AND DN GUY

REMOVE POLE AND ANCHOR/GUY

SHIFT EXISTING O/H TEL ACROSS ROAD TO EXISTING POWER POLE

NEW ANCHOR AND DN GUY

PLACE CABLE AS HIGH AS POSSIBLE PER NESC CLEARANCE

SHIFT EXISTING O/H UTILITIES TO NEW POLES

NEW POLE AND DN GUY

REMOVE POLE

REMOVE POLE AND ANCHOR/GUY

NC GRID
NAD 83 NA 20

DAVID NEAL CARTER
DB 229 PG 489

DEBORAH M. BROWN
DB 534 PG 198

JOSEPH B. RUPP
DB 592 PG 364

RICHARD B. DOWNING, JR.
DB 554 PG 302
(DB 112 PG 47)

WARREN NEAL RAY
DB 241 PG 79
(DB 115 PG 172)

BRYAN LYMAN MARSHALL
DB 372 PG 552

APPROXIMATE LOCATION OF SEPTIC SYSTEM

PROPANE TANK

APPROXIMATE LOCATION SEPTIC TANK

WOODS LINE

TERRY FORK

R/W BY MAINTENANCE

SR 1533 (Hamburg Road)

EXISTING O/H UTILITIES LOCATION APPROX.

PROP O/H TEL LINES

UTILITY OWNERS

FRENCH BROAD ELECTRIC
MEMBERSHIP CORP.
3043 NC-213
MARSHALL, NC 28753

TELEPHONE
FRONTIER COMMUNICATIONS
84 ALLEN STREET
SYLVA, N.C. 28779

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Mattern & Craig
ENGINEERS • SURVEYORS
FIRM LICENSE No. C-1154
12 BROAD STREET
ASHEVILLE, NORTH CAROLINA 28801
(828) 254-2201
FAX (828) 254-4562

COMPUTED BY: MY DATE: 11/2018
CHECKED BY: ACC DATE: 11/2018

PROJECT REFERENCE NO.	SHEET NO.
17BPJ3.RJ61	X-0

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

CROSS SECTION SUMMARY

IN CUBIC YARDS

-L- LOCATION	UNCLASSIFIED EXCAVATION	EMBT
12+00	0	0
12+50	18	7
13+00	9	37
13+50	0	157
14+00	0	201
14+50	68	116
15+00	145	67
15+50	82	66
16+00	6	52
16+50	10	15
16+90	15	2

Approximate quantities only. Unclassified excavation, borrow excavation, fine grading, clearing and grubbing, and removal of existing pavement will be paid for at the contract lump sum price for "grading".

NOTE: EMBANKMENT COLUMN DOES NOT INCLUDE BACKFILL FOR UNDERCUT.

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	17BP.13.R.161	X-1

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

2385
2380
2375
2370
2365
2360
2355
2350

BEGIN PROJECT
–L– STA 12+00.00

0.019 0.018
2358.68

12+00.00

2385
2380
2375
2370
2365
2360
2355
2350

2356.76

11+50.00

–L–

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

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mujang

6/23/16

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	17BP.13.R.161	X-2

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2390
2385
2380
2375
2370
2365
2360
2355

2363.59
2363.11
2362.62
0.039
0.040
2:1
S.S. 2363.06
2362.23
S.S. 2359.86

13+00.00

2385
2380
2375
2370
2365
2360
2355

USE EXTRA
DEPTH POSTS
2360.68
2360.56
2360.09
2:1
0.010
0.040
2360.39

12+50.00

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6/23/2016
mjang

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6/23/16

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	17BP.13.R.161	X-3

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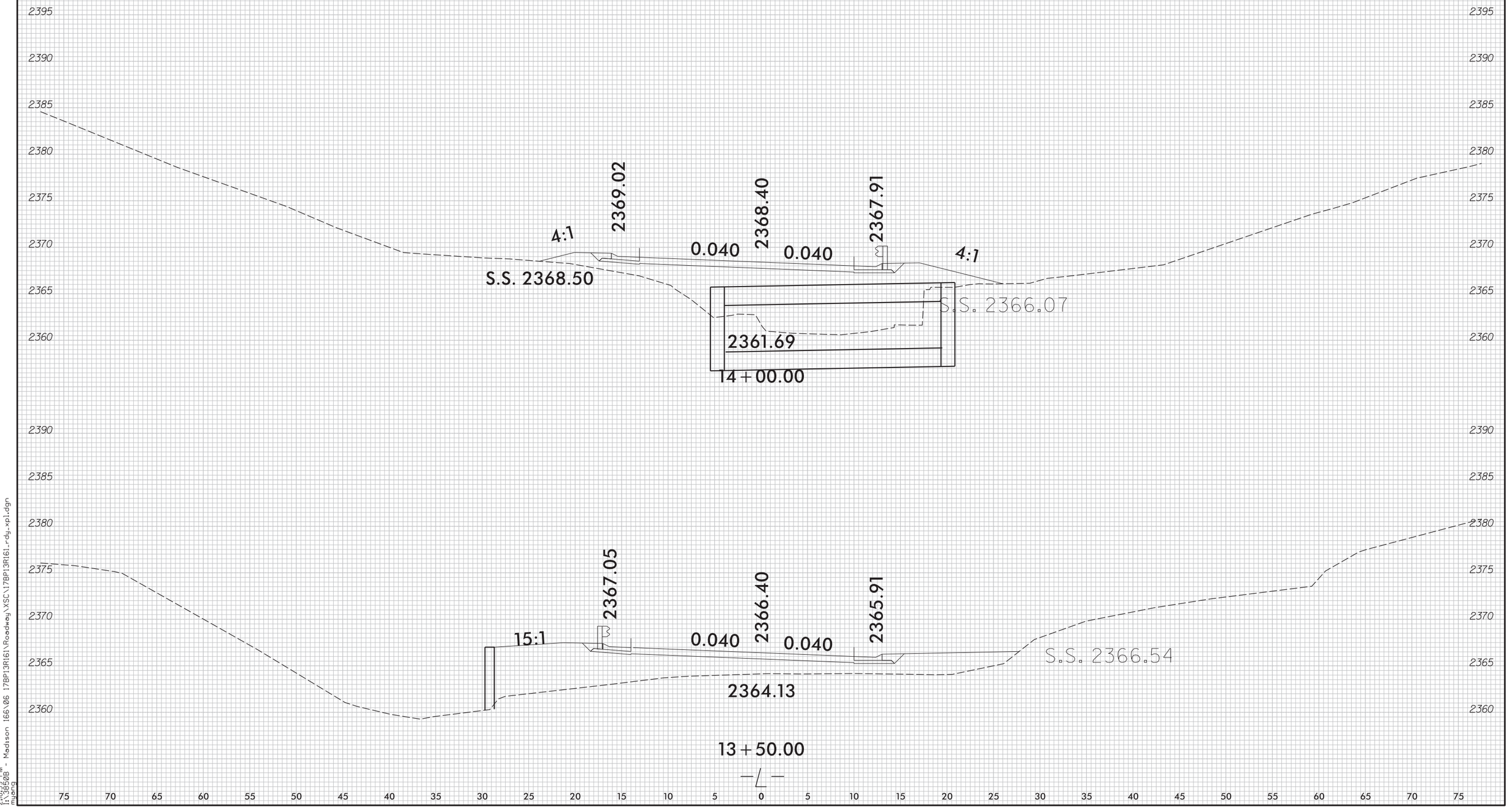
2395 2390 2385 2380 2375 2370 2365 2360



2390 2385 2380 2375 2370 2365 2360

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mjang

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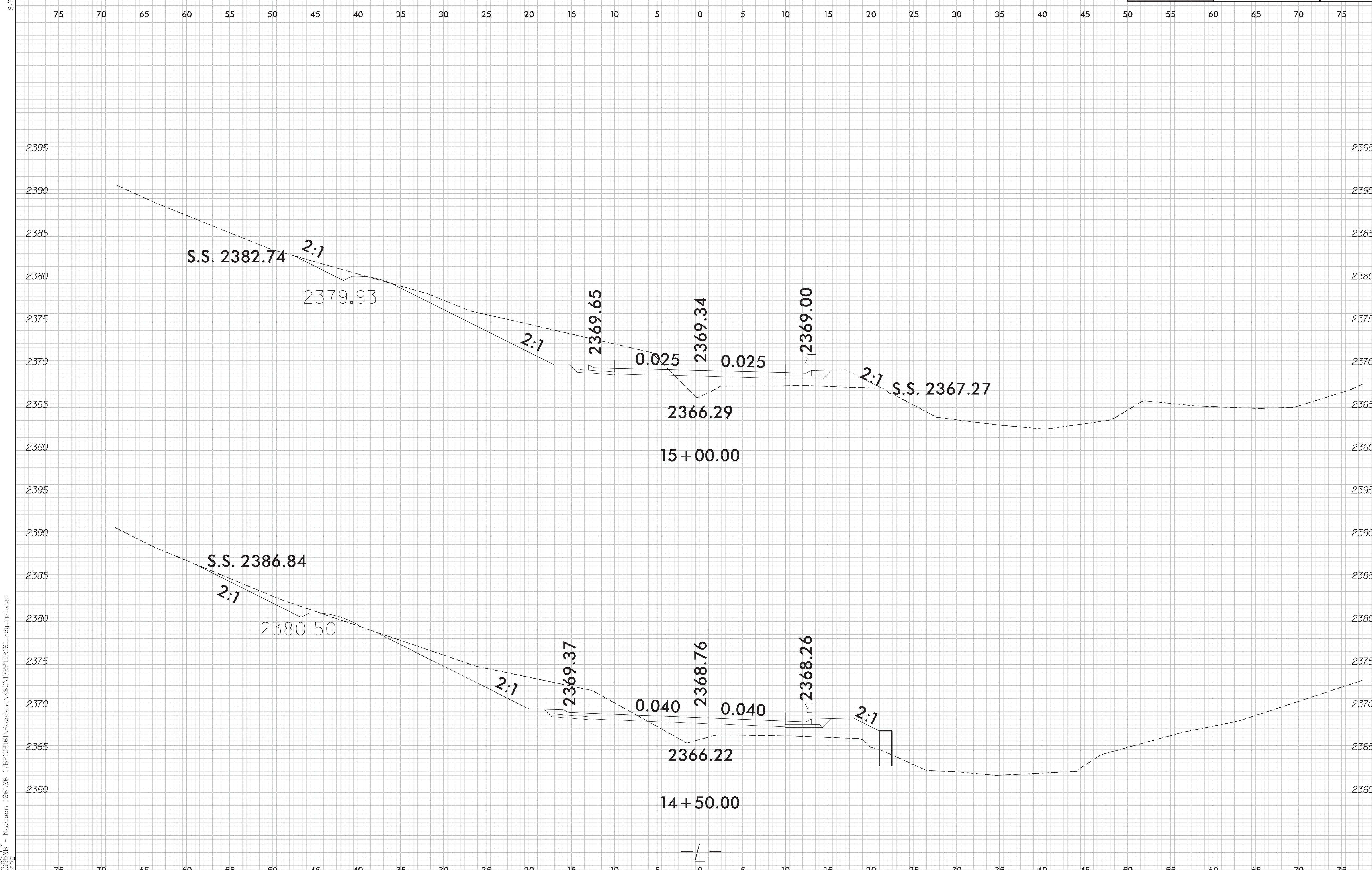

6/23/16

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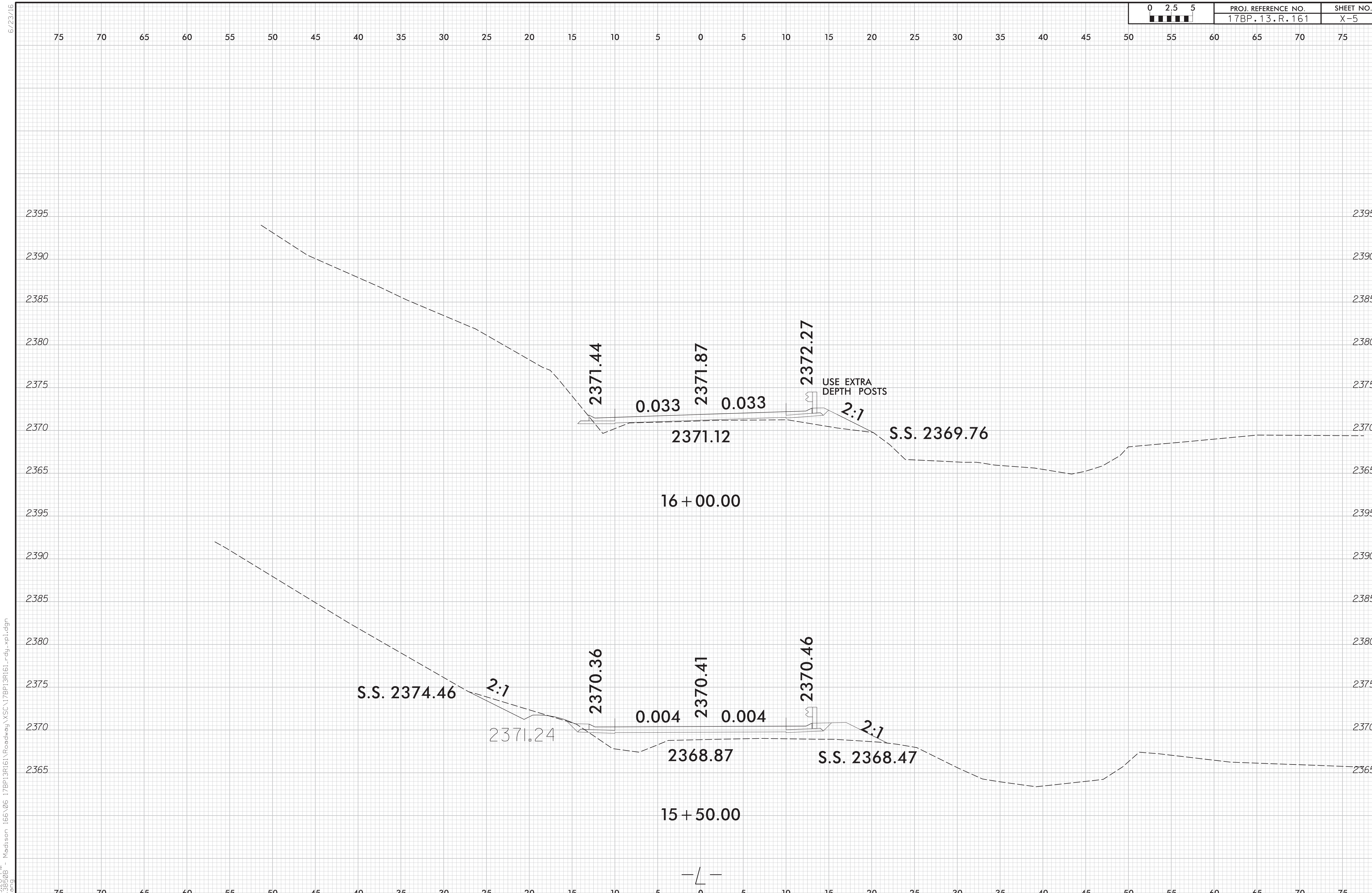

6/23/16

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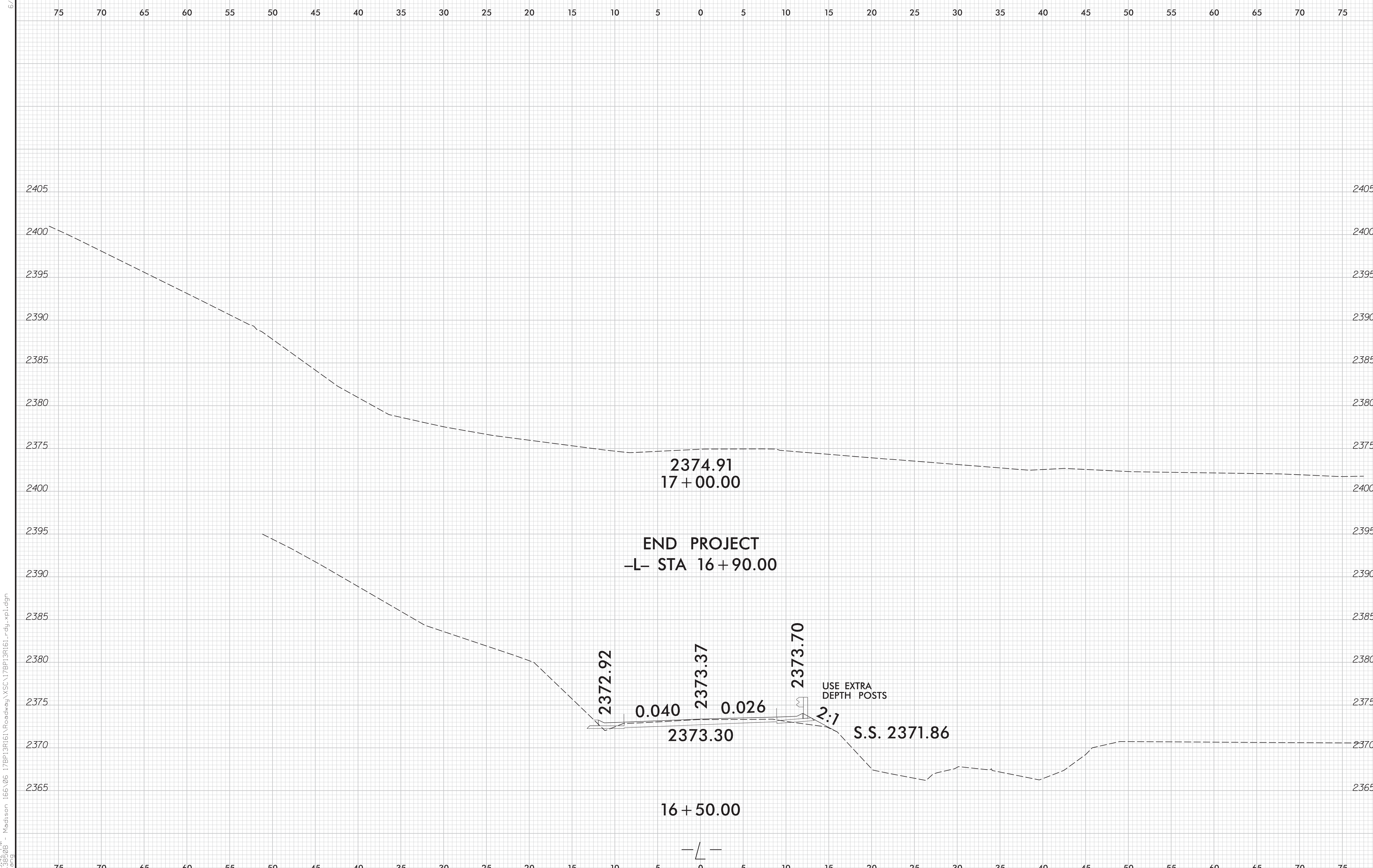

6/23/16

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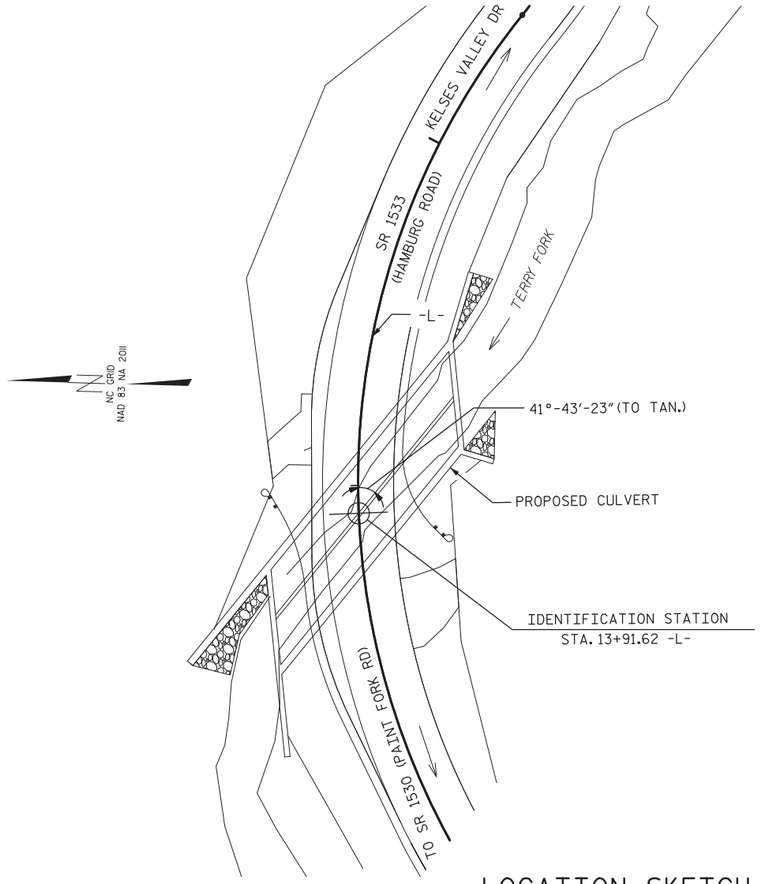
myang

B.M. #1: RR SPIKE IN 22" OAK -L- STA. 13+42.00 20.00' LT., EL. 2364.22'

GRADE POINT ELEV. @ STA. 13+91.62 -L- = 2368.21
BED ELEV. @ STA. 13+91.62 -L- = 2359.70
ROADWAY SLOPES = VARIES



LOCATION SKETCH

NO KNOWN UTILITY CONFLICTS

HYDRAULIC DATA

DESIGN DISCHARGE	650 CFS
FREQUENCY OF DESIGN FLOOD	10 YR.
DESIGN HIGH WATER ELEVATION	2366.7 FT
DRAINAGE AREA	3.1 SQ. MI.
BASE DISCHARGE (Q 100)	1300 CFS
BASE HIGH WATER ELEVATION	2368.8 FT

OVERTOPPING DATA

OVERTOPPING DISCHARGE	700 CFS
FREQUENCY OF OVERTOPPING FLOOD	10+ YR.
OVERTOPPING FLOOD ELEVATION	2367.0 FT

NOTES

ASSUMED LIVE LOAD ----------HL-93 OR ALTERNATE LOADING.

DESIGN FILLS (ABOVE TOP OF TOP SLAB):

MAXIMUM DESIGN FILL---------- 2'-10"

MINIMUM DESIGN FILL---------- 1'-0"

DESIGN FILLS ARE MEASURED FROM THE FINISHED GRADE TO BOTTOM OF TOP SLAB.

FOR OTHER DESIGN DATA AND NOTES SEE STANDARD NOTE SHEET.

3"Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.

CONCRETE IN CULVERTS TO BE POURED IN THE FOLLOWING ORDER:

1. WING FOOTINGS AND FLOOR SLAB INCLUDING 4" OF ALL VERTICAL WALLS.
2. THE REMAINING PORTIONS OF THE WALLS AND WINGS FULL HEIGHT FOLLOWED BY ROOF SLAB AND HEADWALLS.

THE RESIDENT ENGINEER SHALL CHECK THE LENGTH OF CULVERT BEFORE STAKING IT OUT TO MAKE CERTAIN THAT IT WILL PROPERLY TAKE CARE OF THE FILL.

THIS BARREL STANDARD TO BE USED ONLY ON DOUBLE BARREL CULVERTS LESS THAN 8 FT. VERTICAL CLEARENCE ON 45° SKEW AND TO BE USED WITH STANDARD WING SHEET FOR THE SAME SKEW AND VERTICAL CLEARANCE.

DIMENSIONS FOR WING LAYOUT AS WELL AS ADDITIONAL REINFORCING STEEL EMBEDDED IN BARREL ARE SHOWN ON WING SHEET.

TRANSVERSE CONSTRUCTION JOINTS SHALL BE USED IN THE BARREL, SPACED TO LIMIT THE POURS TO A MAXIMUM OF 70 FT. LOCATION OF JOINTS SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER.

STEEL IN THE BOTTOM SLAB MAY BE SPLICED AT THE PERMITTED CONSTRUCTION JOINT AT THE CONTRACTOR'S OPTION. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.

AT THE CONTRACTOR'S OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF EXTERIOR WALL AND BOTH FACES OF INTERIOR WALLS ABOVE LOWER WALL CONSTRUCTION JOINT. THE SPLICE LENGTH SHALL BE AS PROVIDED IN THE SPLICE LENGTH CHART SHOWN ON THE PLANS. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.

AT THE CONTRACTOR'S OPTION HE MAY SUBMIT, TO THE ENGINEER FOR APPROVAL, DESIGN AND DETAIL DRAWINGS FOR A PRECAST REINFORCED CONCRETE BOX CULVERT IN LIEU OF THE CAST-IN-PLACE CULVERT SHOWN ON THE PLANS. THE DESIGN SHALL PROVIDE THE SAME SIZE AND NUMBER OF BARRELS AS USED ON THE CAST-IN-PLACE DESIGN. FOR OPTIONAL PRECAST REINFORCED CONCRETE BOX CULVERT, SEE SPECIAL PROVISIONS.

THE EXISTING STRUCTURE CONSISTING OF A ONE 27'-10" SPAN COMPRISED OF A TIMBER DECK ON STEEL I BEAMS WITH A 17.3' CLEAR ROADWAY WIDTH SUPPORTED BY VERTICAL TIMBER ABUTMENTS SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED BELOW THE LEGAL LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE FURTHER DETERIORATE, THIS LOAD LIMITATION MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

A 3 FOOT STRIP OF FILTER FABRIC SHALL BE ATTACHED TO THE FILL FACE OF THE WING COVERING THE ENTIRE LENGTH OF THE EXPANSION JOINT.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

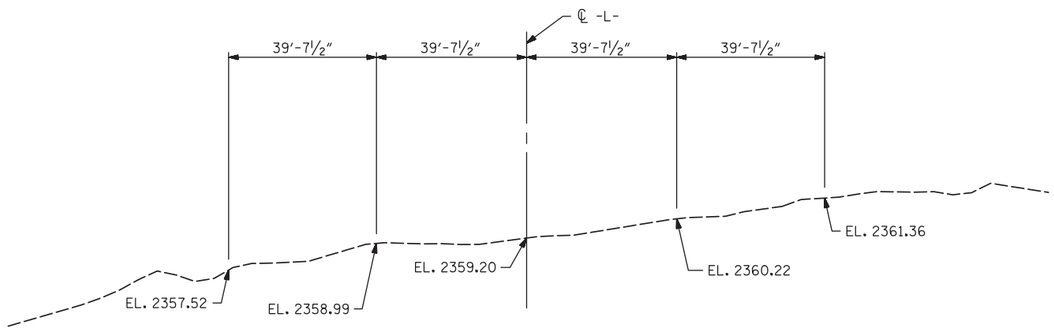
FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.

REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED IN A MANNER THAT PREVENTS DEBRIS FROM FALLING INTO THE WATER. THE CONTRACTOR SHALL SUBMIT DEMOLITION PLANS FOR REVIEW AND REMOVE THE BRIDGE IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE @ STA. 14+08.75 -L-".



PROFILE ALONG ℄ CULVERT

TOTAL STRUCTURE QUANTITIES

	STAGE I	STAGE II
CLASS II RIP RAP	14 TONS	6 TONS
GEOTEXTILE FABRIC	13 SQ. YD.	5 SQ. YD.
CLASS A CONCRETE		
BARREL	82.3 C.Y.	93.4 C.Y.
WINGS ETC.	8.1 C.Y.	12.9 C.Y.
REINFORCING STEEL		
BARREL	15813 LBS.	16784 LBS.
WINGS ETC.	393 LBS.	696 LBS.

SOIL NAIL RETAINING WALL	232 S.F.
SOIL NAIL VERIFICATION TESTS	2 EA.
SOIL NAIL PROOF TESTS	3 EA.
FOUNDATION CONDITIONING MATERIAL, BOX CULVERT	145 TONS
ASBESTOS ASSESSMENT	LUMP SUM
REMOVAL OF EXISTING STRUCTURE @ STA. 14+08.75 -L-	LUMP SUM
UNCLASSIFIED STRUCTURE EXCAVATION	LUMP SUM

PROJECT NO. 17BP.13.R.161

MADISON COUNTY

STATION: 13+91.62 -L-

SHEET 1 OF 12 REPLACES BRIDGE NO. 560166

DRAWN BY : CTB DATE : 03-22
CHECKED BY : TJT DATE : 03-22

DESIGN ENGINEER OF RECORD: T. TOWNSEND DATE : 03-22

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BRC1881FA3E1402...
SEAL 34955 ENGINEER TIMOTHY J. TOWNSEND
3/1/2022

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NC LIC. NO. C-1154

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 9'-0" X 6'-0" CONCRETE BOX CULVERT ON SR 1533 AT TERRY FORK 45°-00'-00" SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-1
1			3			TOTAL SHEETS
2			4			12

DATE: 3/1/2022 TIME: 12:21:56 PM
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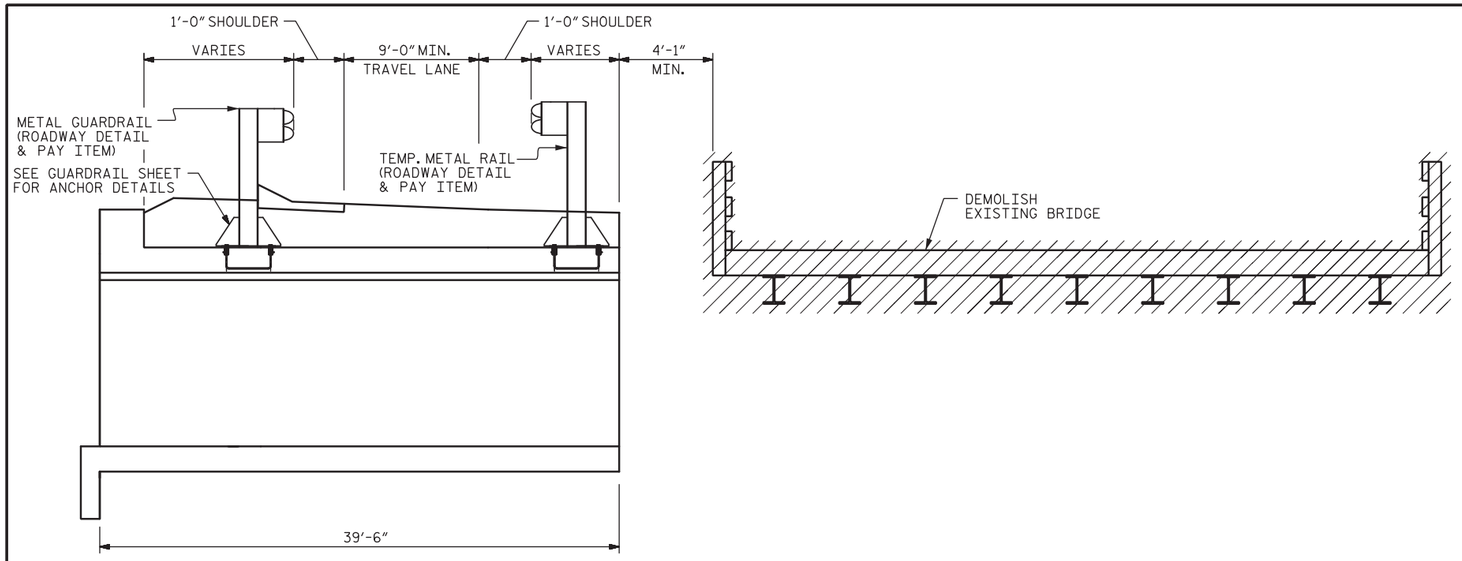
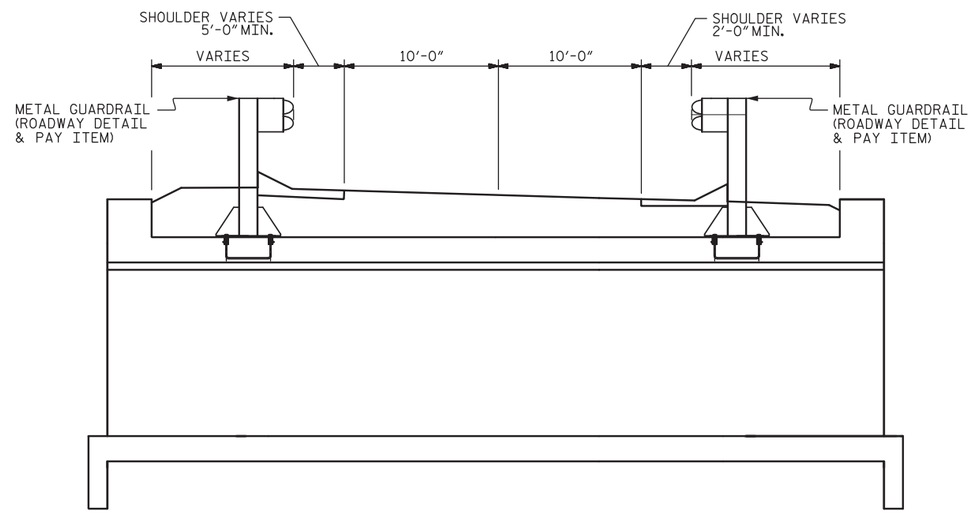


PHASE 1 CONSTRUCTION

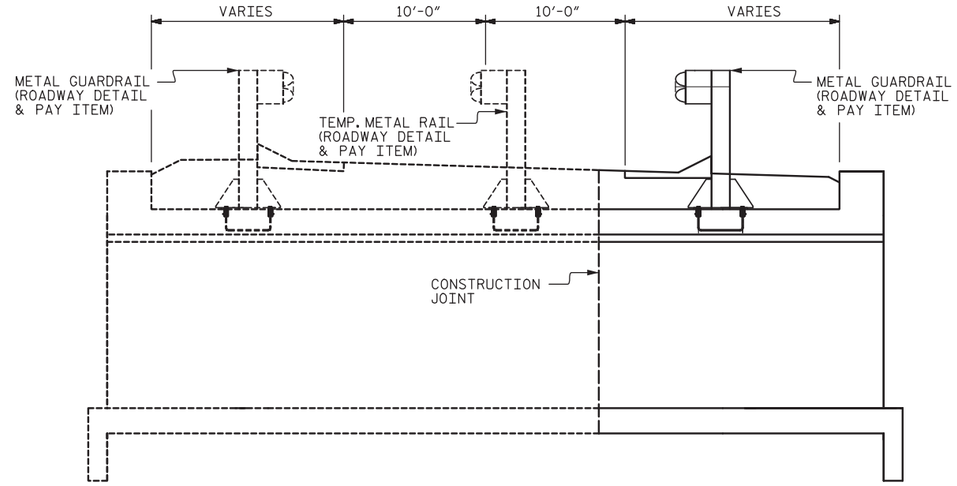
PHASE 1 CONSTRUCTION NOTES:

1. MAINTAIN THE EXISTING STRUCTURE, ALIGNMENT, AND GUARDRAIL. TRAFFIC SHALL BE MAINTAINED ON EXISTING STRUCTURE DURING PHASE 1 CONSTRUCTION.
2. THE LEFT HALF OF THE PROPOSED STRUCTURE AND TEMPORARY ALIGNMENT SHALL BE CONSTRUCTED.
3. APPROXIMATELY 39'-6" OF THE PROPOSED STRUCTURE SHALL BE CONSTRUCTED, MEASURED ALONG THE LONGITUDINAL CENTERLINE OF THE CULVERT. THE DOWNSTREAM WINGWALL AND SOIL NAIL WALL SHALL ALSO BE CONSTRUCTED.
4. PERMANENT GUARDRAIL SHALL BE INSTALLED ON THE LEFT SIDE OF THE PROPOSED STRUCTURE.
5. TEMPORARY GUARDRAIL SHALL BE INSTALLED ON THE RIGHT SIDE OF THE PROPOSED STRUCTURE ALONG THE TEMPORARY ALIGNMENT STARTING AT STA. 23+40 AND ENDING AT STA. 24+54.
6. TEMPORARY SHORING SHALL BE INSTALLED BETWEEN THE EXISTING AND PROPOSED STRUCTURES STARTING AT STA. 23+57 AND ENDING AT STA. 23+90.
7. SHIFT TRAFFIC OVER TO CONSTRUCTION COMPLETED DURING PHASE 1.



FINAL LAYOUT

NOTE: ALL LAYOUTS ON THIS SHEET ARE DEPICTED LOOKING UPSTATION.



PHASE 2 CONSTRUCTION

PHASE 2 CONSTRUCTION NOTES:

1. DEMOLISH THE EXISTING STRUCTURE.
2. CONSTRUCT REMAINDER OF THE PROPOSED STRUCTURE AND THE TWO UPSTREAM WINGWALLS.
3. AFTER COMPLETION OF PHASE 2 CONSTRUCTION, REMOVE TEMPORARY METAL RAIL AND SHIFT TRAFFIC TO FINAL TRAFFIC PATTERN.

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SEAL 34955 ENGINEER TIMOTHY J. TOWNSEND
3/1/2022

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NC LIC. NO. C-1154

REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CULVERT PHASING PLAN

SHEET NO. C-2
TOTAL SHEETS 12

PROJECT NO. 17BP.13.R.161
MADISON COUNTY
STATION: 13+91.62 -L-
SHEET 2 OF 12

DATE: 3/1/2022 TIME: 12:21:59 PM
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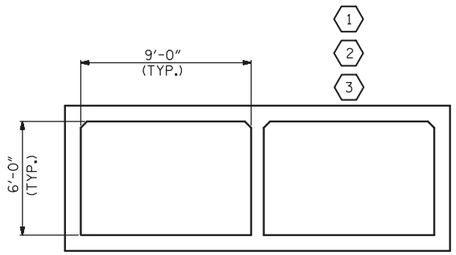
LOAD AND RESISTANCE FACTOR RATING (LRFD) SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE									COMMENT NUMBER
							LIVELOAD FACTORS	MOMENT				SHEAR				
								RATING FACTOR	BOX NO.	ELEMENT TYPE	* DISTANCE FROM LEFT END OF ELEMENT (ft)	RATING FACTOR	BOX NO.	ELEMENT TYPE	* DISTANCE FROM LEFT END OF ELEMENT (ft)	
DESIGN LOAD RATING		HL-93(Inv)	N/A	1	1.692	--	1.75	1.790	2	ROOF SLAB	4.5	1.692	2	ROOF SLAB	1.07	
		HL-93(Opr)	N/A	--	2.193	--	1.35	2.320	2	ROOF SLAB	4.5	2.193	2	ROOF SLAB	1.07	
		HS-20(Inv)	36.000	2	1.789	64.42	1.75	1.789	1	ROOF SLAB	4.5	2.250	1	ROOF SLAB	7.2	
		HS-20(Opr)	36.000	--	2.320	83.51	1.35	2.320	1	ROOF SLAB	4.5	2.920	1	ROOF SLAB	7.2	
LEGAL LOAD RATING	SV	SNSH	13.500	--	3.905	52.72	1.4	3.905	2	ROOF SLAB	4.5	4.910	1	ROOF SLAB	7.2	
		SNGARBS2	20.000	--	3.656	73.11	1.4	3.656	2	ROOF SLAB	4.5	4.600	1	ROOF SLAB	7.2	
		SNAGRIS2	22.000	--	3.905	85.91	1.4	3.905	2	ROOF SLAB	4.5	4.910	1	ROOF SLAB	7.2	
		SNCOTTS3	27.250	3	2.527	68.85	1.4	2.830	2	ROOF SLAB	4.5	2.527	2	ROOF SLAB	1.07	
		SNAGGRS4	34.925	--	3.072	107.30	1.4	3.072	1	FLOOR SLAB	9.0	3.960	1	ROOF SLAB	7.2	
		SNS5A	35.550	--	2.953	104.96	1.4	3.260	1	ROOF SLAB	4.5	2.953	2	ROOF SLAB	1.07	
		SNS6A	39.950	--	2.890	115.45	1.4	3.280	1	ROOF SLAB	4.5	2.890	2	ROOF SLAB	1.07	
		SNS7B	42.000	--	2.890	121.37	1.4	3.280	1	ROOF SLAB	4.5	2.890	2	ROOF SLAB	1.07	
	TTST	TNAGRIT3	33.000	--	3.647	120.35	1.4	3.647	2	FLOOR SLAB	0.0	4.530	1	ROOF SLAB	7.2	
		TNT4A	33.075	--	2.947	97.46	1.4	3.340	2	ROOF SLAB	4.5	2.947	2	ROOF SLAB	1.07	
		TNT6A	41.600	--	2.949	122.70	1.4	3.260	2	ROOF SLAB	4.5	2.949	2	ROOF SLAB	1.07	
		TNT7A	42.000	--	2.834	119.05	1.4	2.834	1	FLOOR SLAB	9.0	3.480	1	ROOF SLAB	7.2	
		TNT7B	42.000	--	2.897	121.66	1.4	3.290	1	ROOF SLAB	4.5	2.897	2	ROOF SLAB	1.07	
		TNAGRIT4	43.000	--	2.888	124.18	1.4	3.340	2	ROOF SLAB	4.5	2.888	2	ROOF SLAB	1.07	
		TNAGT5A	45.000	--	2.888	129.96	1.4	3.340	2	ROOF SLAB	4.5	2.888	2	ROOF SLAB	1.07	
		TNAGT5B	45.000	--	2.573	115.77	1.4	2.573	2	FLOOR SLAB	0.0	3.490	1	ROOF SLAB	7.2	

* MEASURED FROM EDGE OF ELEMENT



LRFR SUMMARY

(LOOKING UPSTREAM)

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γ_{DC}	γ_{DW}
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

NOTES:

MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATES.

COMMENTS:

1.
2.
3.
4.

(#) CONTROLLING LOAD RATING

(1) DESIGN LOAD RATING (HL-93)

(2) DESIGN LOAD RATING (HS-20)

(3) LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

PROJECT NO. 17BP.13.R.161

MADISON COUNTY

STATION: 13+91.62 -L-

SHEET 3 OF 12

DRAWN BY : CTB DATE : 03-22

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DESIGN ENGINEER OF RECORD: T. TOWNSEND DATE : 03-22

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3/1/2022

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NC LIC. NO. C-1154

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

LRFR SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS (NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-3
1			3			TOTAL SHEETS
2			4			12

DATE: 3/1/2022 TIME: 12:12:03 PM
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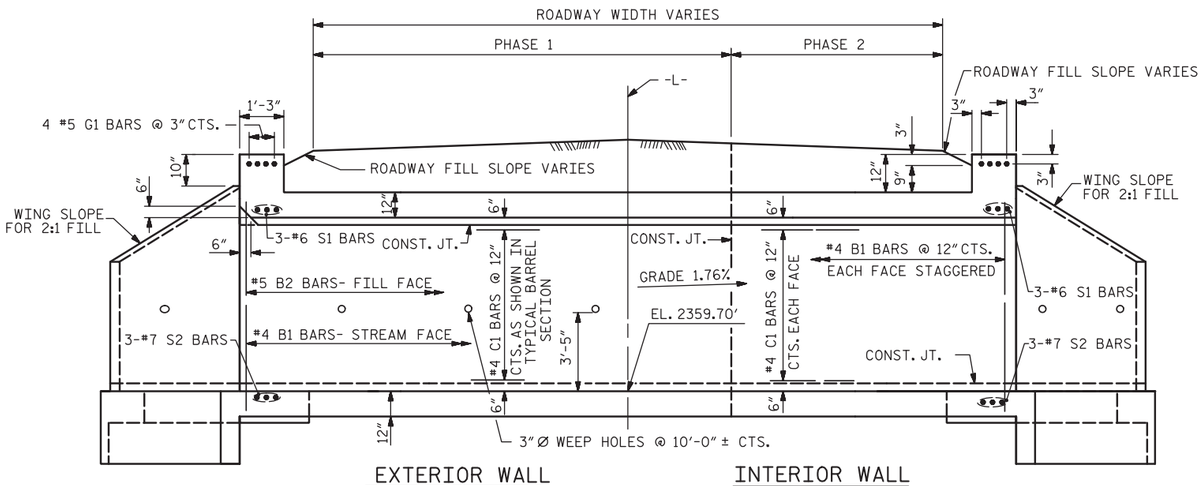
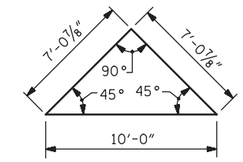
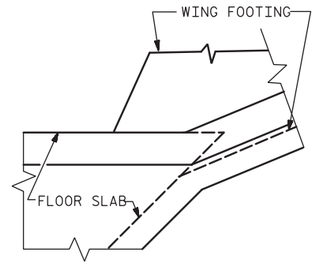
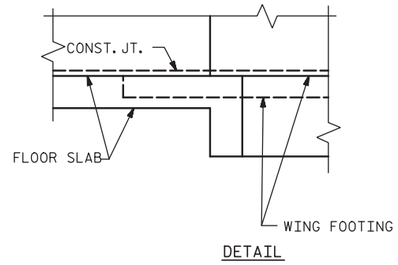


CULVERT SECTION NORMAL TO ROADWAY



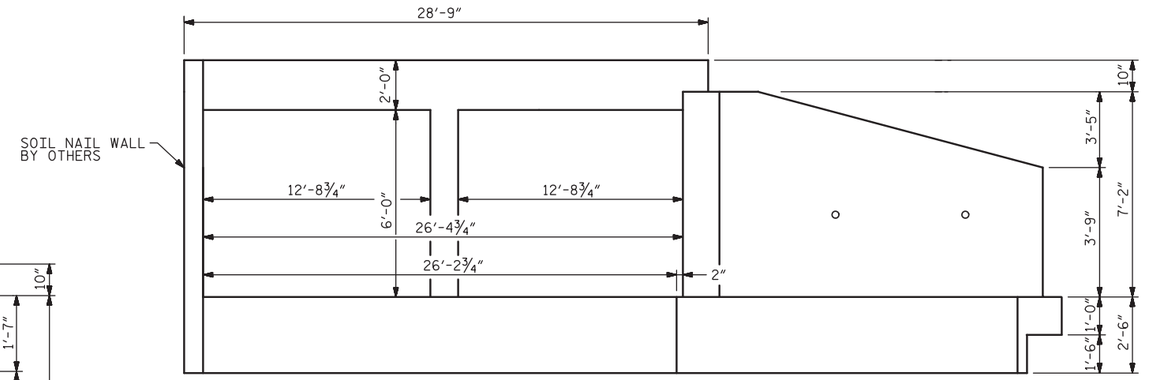
SKEW TRIANGLE



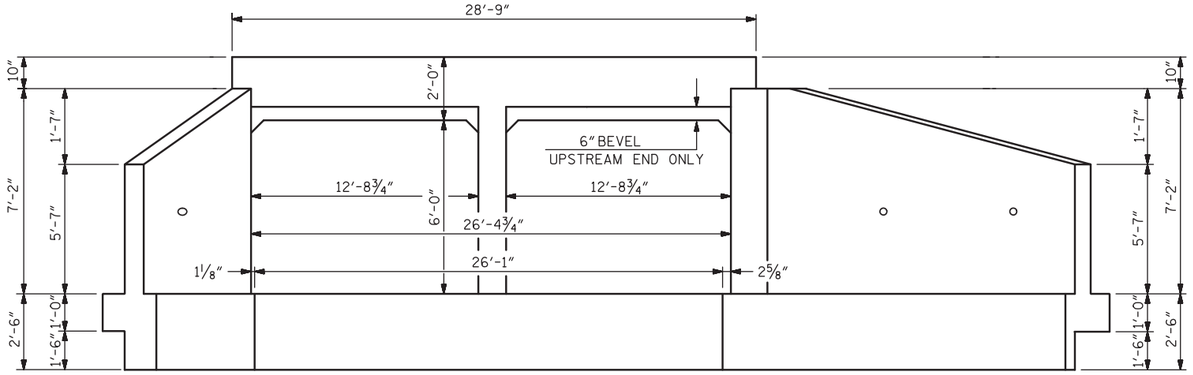


DETAIL

CONNECTION OF WING FOOTING AND FLOOR SLAB WHEN SLAB IS THICKER THAN FOOTING



END ELEVATION NORMAL TO SKEW
(DOWNSTREAM END)



END ELEVATION NORMAL TO SKEW
(UPSTREAM END)

PROJECT NO. 17BP.13.R.161

MADISON COUNTY

STATION: 13+91.62 -L-

SHEET 4 OF 12

DRAWN BY : CTB DATE : 03-22
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DESIGN ENGINEER OF RECORD: T. TOWNSEND DATE : 03-22

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08C1881FA1E1462...
SEAL 34955 ENGINEER TIMOTHY J. TOWNSEND
3/1/2022

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(828) 254-2201
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NC LIC. NO. C-1154

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 9'-0" X 6'-0" CONCRETE BOX CULVERT ON SR 1533 AT TERRY FORK 45°-00'-00" SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-4
1			3			TOTAL SHEETS
2			4			12

DATE: 3/1/2022 TIME: 12:22:07 PM
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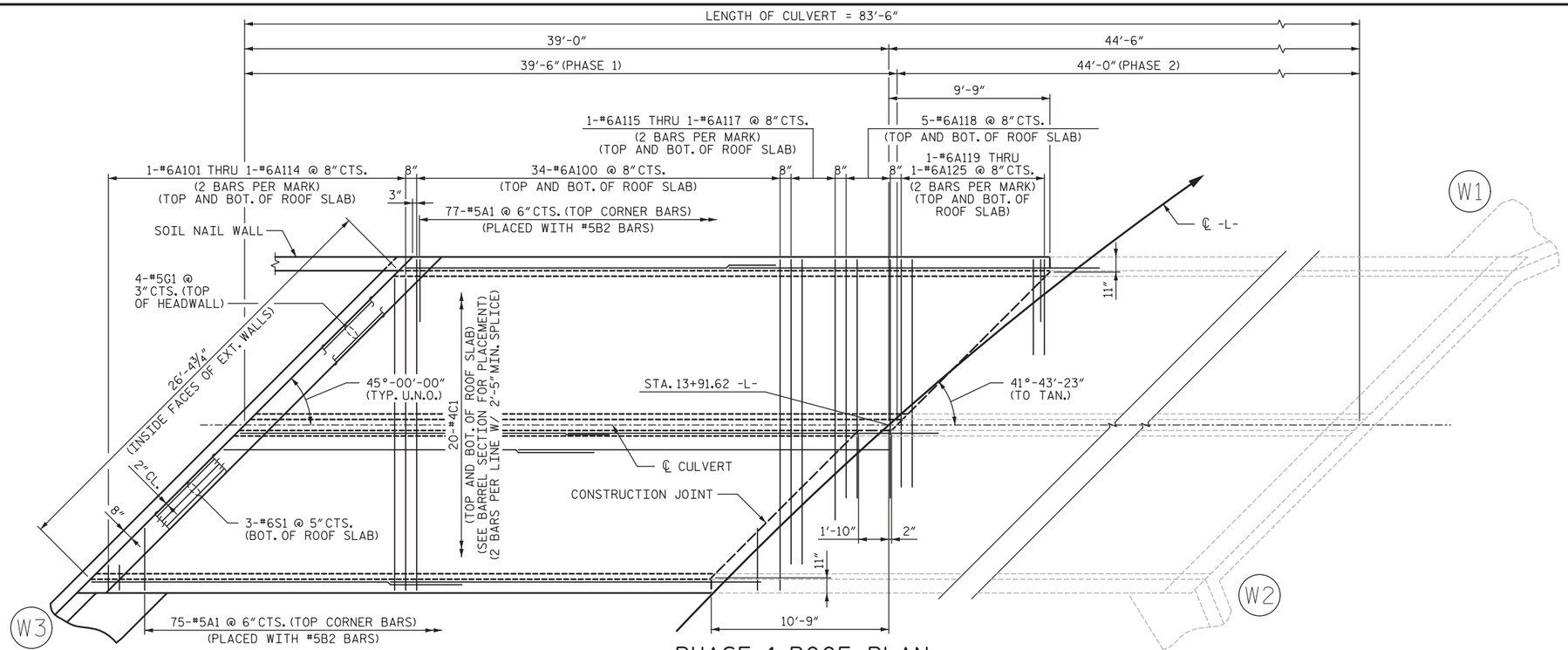
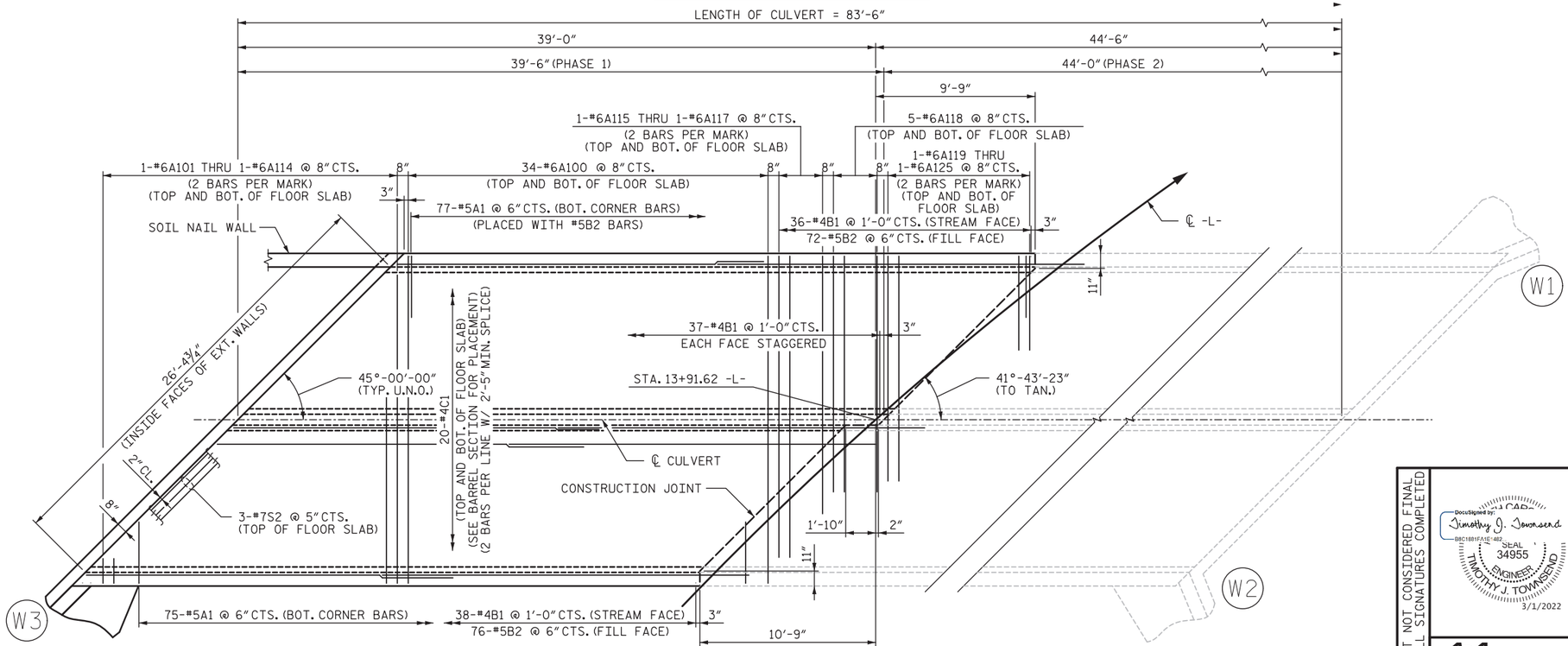


PHASE 1 ROOF PLAN



PHASE 1 FLOOR PLAN

GENERAL TIPS AND TECHNIQUES

1. MECHANICAL SPLICES MAY BE USED IF THE REBAR CONFLICTS WITH ANY EXISTING STRUCTURES. NO ADDITIONAL PAYMENT WILL BE MADE FOR MECHANICAL SPLICES. ALL MATERIAL AND LABOR COSTS FOR PROVIDIUNG AND INSTALLING MECHANICAL SPLICES SHALL BE INCLUDED IN THE UNIT PRICE FOR "REINFORCING STEEL".
2. THE MIN. SPLICE LENGTH FOR "A" BARS SHALL BE 3'-7".
3. THE MIN. SPLICE LENGTH FOR "C" BARS SHALL BE 2'-5".
4. "A" BARS EXTENDING THROUGH THE CONSTRUCTION JOINT SHALL PROJECT A MIN. OF 4'-0"
5. "C" BARS EXTENDING THROUGH THE CONSTRUCTION JOINT SHALL PROJECT A MIN. OF 3'-0".
6. SILLS NOT SHOWN FOR CLARITY.
7. GUARDRAIL ANCHORAGES NOT SHOWN FOR CLARITY.

PROJECT NO. 17BP.13.R.161

MADISON COUNTY

STATION: 13+91.62 -L-

SHEET 5 OF 12

DRAWN BY : CTB DATE : 03-22

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DESIGN ENGINEER OF RECORD: T. TOWNSEND DATE : 03-22

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SEAL 34955 ENGINEER TIMOTHY J. TOWNSEND
3/1/2022

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 9'-0" X 6'-0" CONCRETE BOX CULVERT ON SR 1533 AT TERRY FORK 45°-00'-00" SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-5
1			3			TOTAL SHEETS
2			4			12

DATE: 3/1/2022 TIME: 12:22:10 PM
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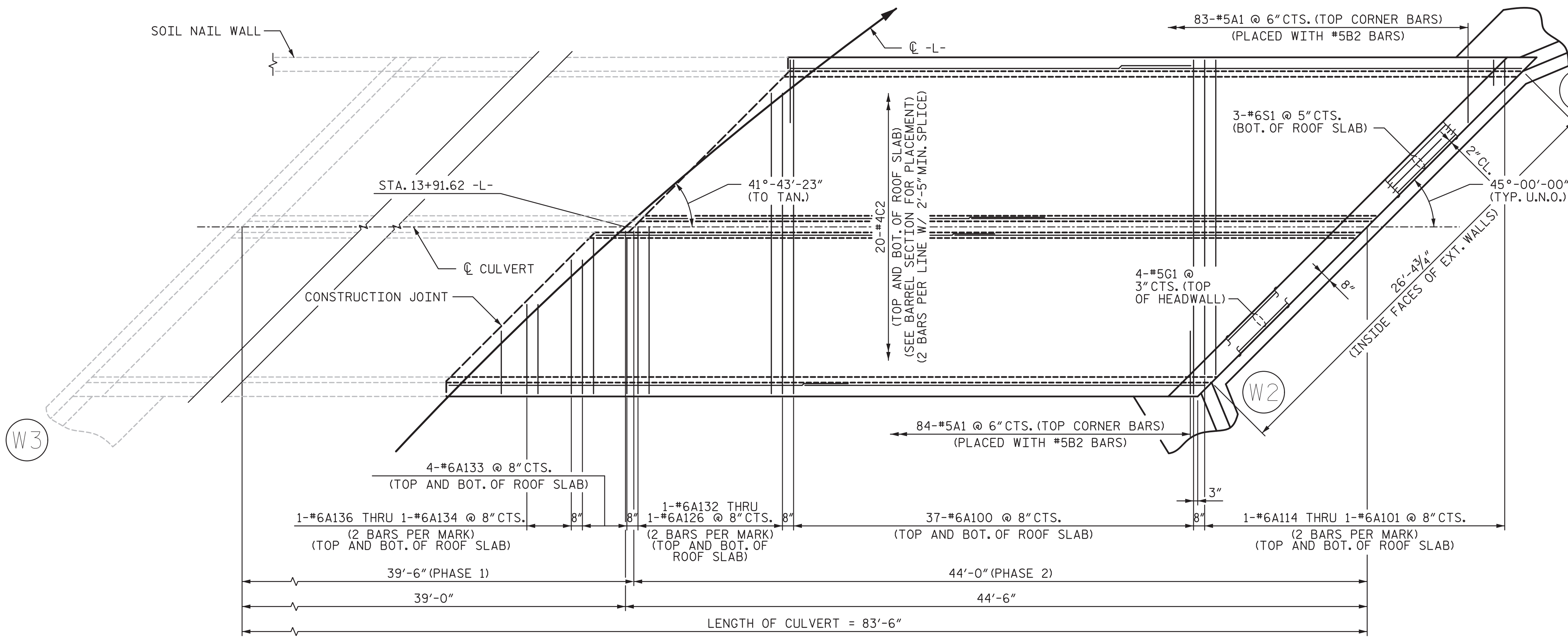
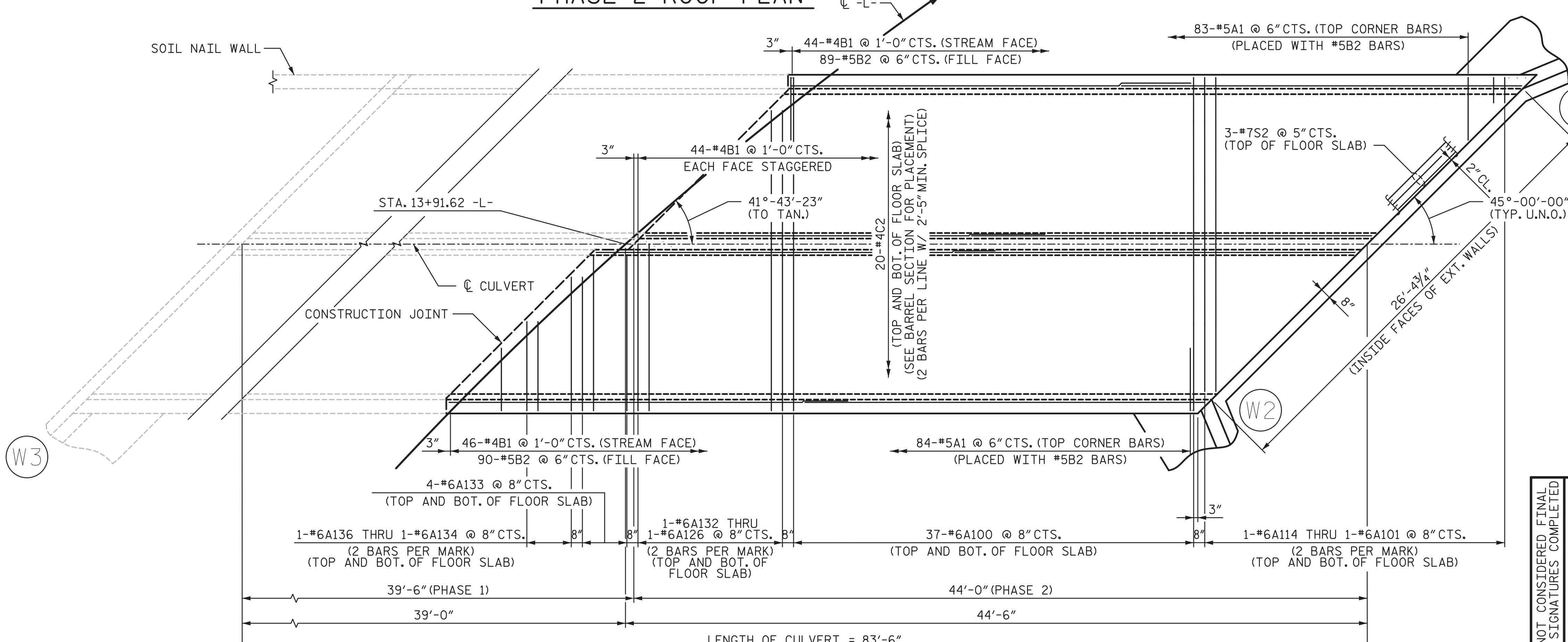


PHASE 2 ROOF PLAN



PHASE 2 FLOOR PLAN

GENERAL TIPS AND TECHNIQUES

1. MECHANICAL SPLICES MAY BE USED IF THE REBAR CONFLICTS WITH ANY EXISTING STRUCTURES. NO ADDITIONAL PAYMENT WILL BE MADE FOR MECHANICAL SPLICES. ALL MATERIAL AND LABOR COSTS FOR PROVIDIUNG AND INSTALLING MECHANICAL SPLICES SHALL BE INCLUDED IN THE UNIT PRICE FOR "REINFORCING STEEL".
2. THE MIN. SPLICE LENGTH FOR "A" BARS SHALL BE 3'-7".
3. THE MIN. SPLICE LENGTH FOR "C" BARS SHALL BE 2'-5".
4. "A" BARS EXTENDING THROUGH THE CONSTRUCTION JOINT SHALL PROJECT A MIN. OF 4'-0"
5. "C" BARS EXTENDING THROUGH THE CONSTRUCTION JOINT SHALL PROJECT A MIN. OF 3'-0".
6. SILLS NOT SHOWN FOR CLARITY.
7. GUARDRAIL ANCHORAGES NOT SHOWN FOR CLARITY.

PROJECT NO. 17BP.13.R.161
MADISON COUNTY
STATION: 13+91.62 -L-

SHEET 6 OF 12

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 9'-0" X 6'-0"
CONCRETE BOX CULVERT
ON SR 1533 AT TERRY FORK
45°-00'-00" SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-6
1			3			TOTAL SHEETS
2			4			12

DRAWN BY : CTB	DATE : 03-22	DESIGN ENGINEER OF RECORD: T. TOWNSEND	DATE : 03-22
CHECKED BY : TJT	DATE : 03-22		

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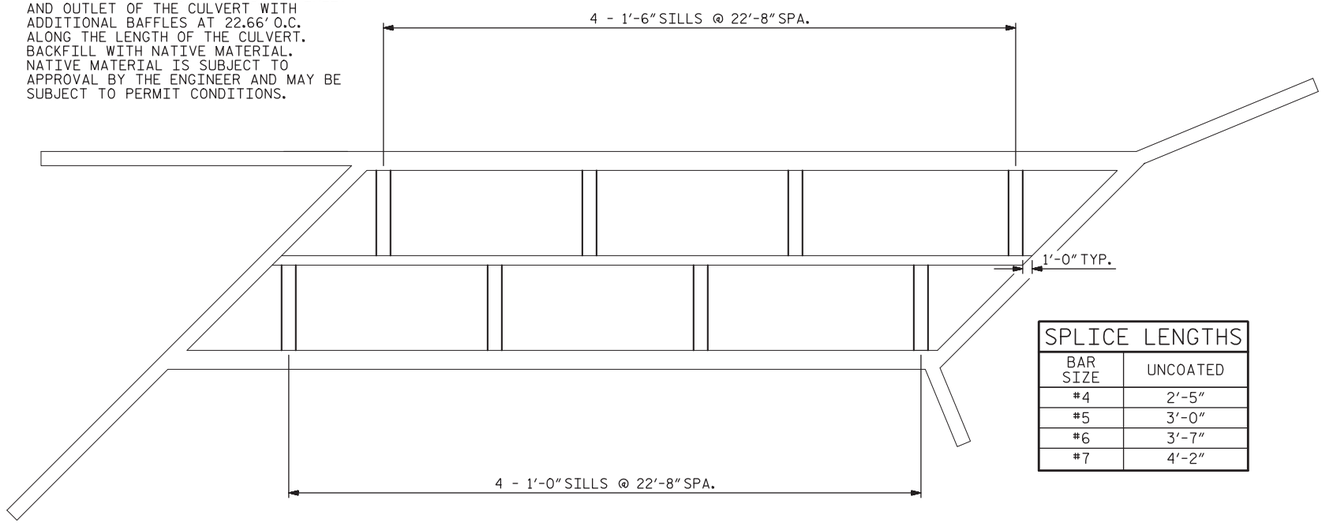
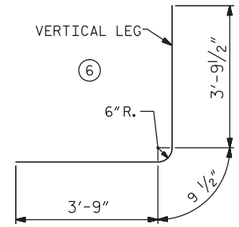
NOTE:
PLACE SILLS ONE FOOT INSIDE OF INLET AND OUTLET OF THE CULVERT WITH ADDITIONAL BAFFLES AT 22.66' O.C. ALONG THE LENGTH OF THE CULVERT. BACKFILL WITH NATIVE MATERIAL. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.



SPLICE LENGTHS

BAR SIZE	UNCOATED
#4	2'-5"
#5	3'-0"
#6	3'-7"
#7	4'-2"

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL (PHASE 1)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	304	#5	6	8'-4"	2642	A123	8	#6	STR	8'-5"	101
A100	136	#6	STR	20'-0"	4085	A124	8	#6	STR	7'-1"	85
A101	8	#6	STR	1'-6"	18	A125	8	#6	STR	5'-9"	69
A102	8	#6	STR	2'-10"	34						
A103	8	#6	STR	4'-2"	50	B1	148	#4	STR	7'-9"	766
A104	8	#6	STR	5'-6"	66	B2	148	#5	STR	5'-4"	823
A105	8	#6	STR	6'-10"	82						
A106	8	#6	STR	8'-2"	98	C1	232	#4	STR	22'-5"	3474
A107	8	#6	STR	9'-6"	114						
A108	8	#6	STR	10'-10"	130	D1	6	#6	STR	2'-1"	19
A109	8	#6	STR	12'-2"	146	D2	6	#6	STR	1'-7"	14
A110	8	#6	STR	13'-6"	162						
A111	8	#6	STR	14'-10"	178	G1	4	#5	STR	28'-0"	117
A112	8	#6	STR	16'-2"	194						
A113	8	#6	STR	17'-6"	210	S1	3	#6	STR	28'-0"	126
A114	8	#6	STR	18'-10"	226	S2	3	#7	STR	28'-0"	172
A115	8	#6	STR	18'-5"	221						
A116	8	#6	STR	17'-1"	205						
A117	8	#6	STR	15'-9"	189						
A118	20	#6	STR	14'-5"	433						
A119	8	#6	STR	13-9"	165						
A120	8	#6	STR	12'-5"	149						
A121	8	#6	STR	11'-1"	133						
A122	8	#6	STR	9'-9"	117						

REINFORCING STEEL 15813 LBS
FOR PHASE 1 OF CULVERT

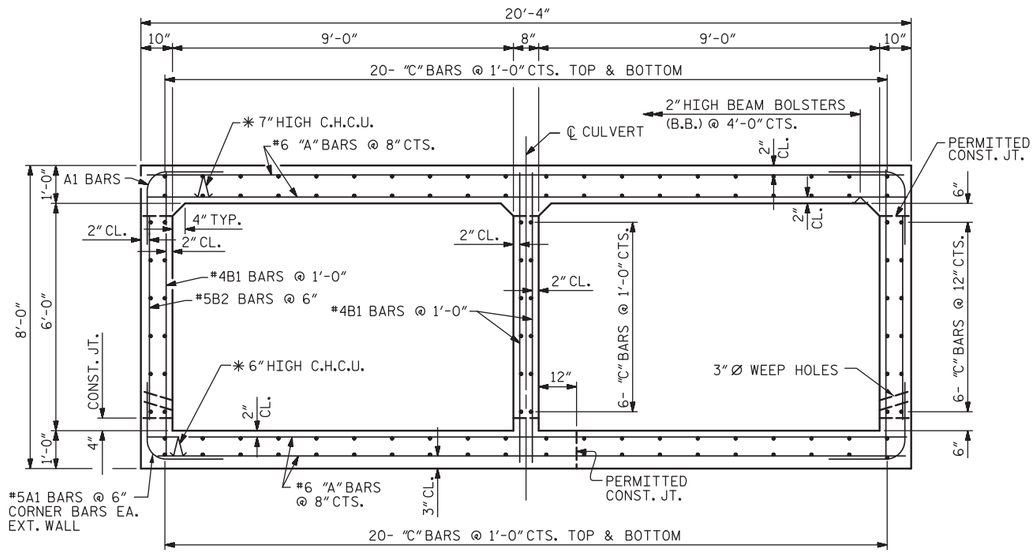
CLASS A CONCRETE
CULVERT 80.6 CY
SILLS 1.6 CY
TOTAL 82.3 CY

BILL OF MATERIAL (PHASE 2)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	334	#5	6	8'-4"	2903	A134	8	#6	STR	8'-0"	96
A100	148	#6	STR	20'-0"	4446	A135	8	#6	STR	6'-8"	80
A101	8	#6	STR	1'-6"	18	A136	8	#6	STR	5'-4"	64
A102	8	#6	STR	2'-10"	34						
A103	8	#6	STR	4'-2"	50	B1	178	#4	STR	7'-9"	922
A104	8	#6	STR	5'-6"	66	B2	179	#5	STR	5'-4"	996
A105	8	#6	STR	6'-10"	82						
A106	8	#6	STR	8'-2"	98	C2	232	#4	STR	24'-0"	3719
A107	8	#6	STR	9'-6"	114						
A108	8	#6	STR	10'-10"	130	D1	6	#6	STR	2'-1"	19
A109	8	#6	STR	12'-2"	146	D2	6	#6	STR	1'-7"	14
A110	8	#6	STR	13'-6"	162						
A111	8	#6	STR	14'-10"	178	G1	4	#5	STR	28'-0"	117
A112	8	#6	STR	16'-2"	194						
A113	8	#6	STR	17'-6"	210	S1	3	#6	STR	28'-0"	126
A114	8	#6	STR	18'-10"	226	S2	3	#7	STR	28'-0"	172
A126	8	#6	STR	18'-0"	216						
A127	8	#6	STR	16'-8"	200						
A128	8	#6	STR	15'-4"	184						
A129	8	#6	STR	14'-0"	168						
A130	8	#6	STR	12'-8"	152						
A131	8	#6	STR	11'-4"	136						
A132	8	#6	STR	10'-0"	120						
A133	16	#6	STR	9'-5"	226						

REINFORCING STEEL 16784 LBS
FOR PHASE 2 OF CULVERT

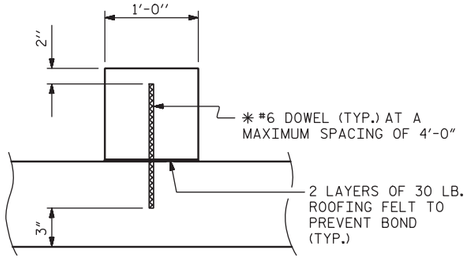
CLASS A CONCRETE
CULVERT 91.8 CY
SILLS 1.6 CY
TOTAL 93.4 CY



* ALL CONTINUOUS HIGH CHAIR UPPER (C.H.C.U.) @ 3'-0" CTS.

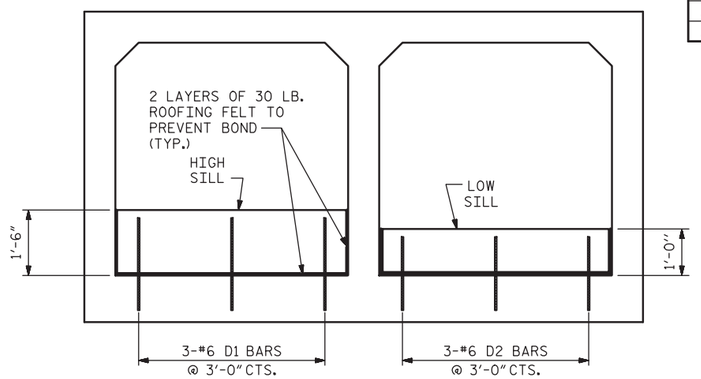
RIGHT ANGLE SECTION OF BARREL

(REINFORCING IS SYMMETRIC ABOUT ℄ CULVERT)
("C" BARS EXTENDING THOROUGH CONSTRUCTION JOINT SHALL PROJECT A MINIMUM OF 3'-0")
THERE ARE 116 "C" BARS IN SECTION OF BARREL



SECTION THROUGH SILL

* DOWELS MAY BE PUSHED INTO GREEN CONCRETE AFTER SLAB HAS BEEN FLOAT FINISHED.



ELEVATION

(LOOKING UPSTREAM)

CULVERT SILL DETAILS

PROJECT NO. 17BP.13.R.161
MADISON COUNTY
STATION: 13+91.62 -L-
SHEET 7 OF 12

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DOUBLE 9'-0" X 6'-0" CONCRETE BOX CULVERT ON SR 1533 AT TERRY FORK 45°-00'-00" SKEW

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2			4			12

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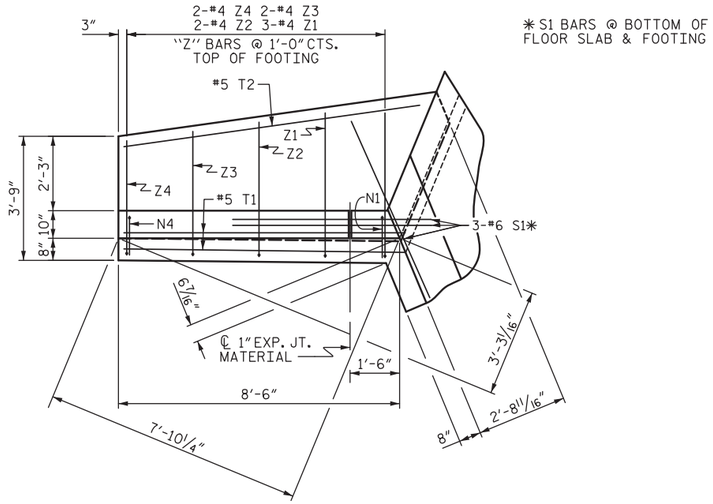
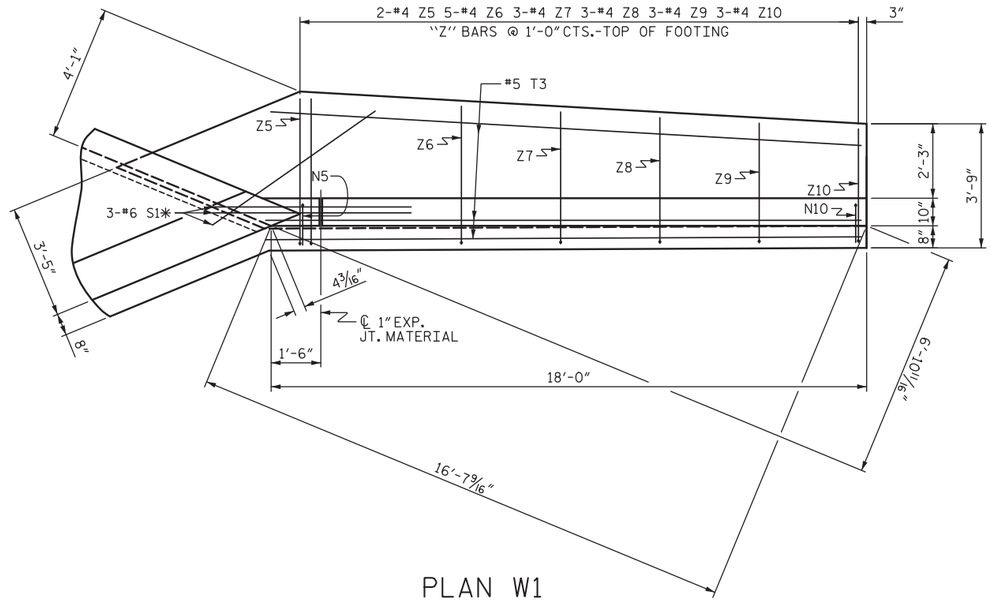
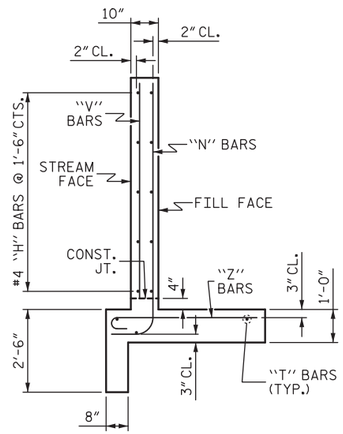


* S1 BARS @ BOTTOM OF FLOOR SLAB & FOOTING

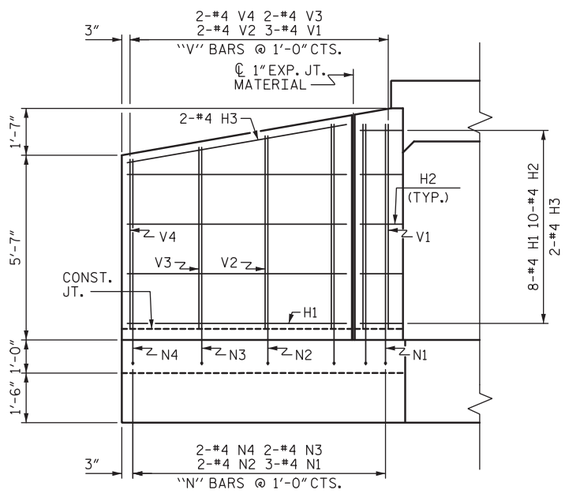
PLAN W2



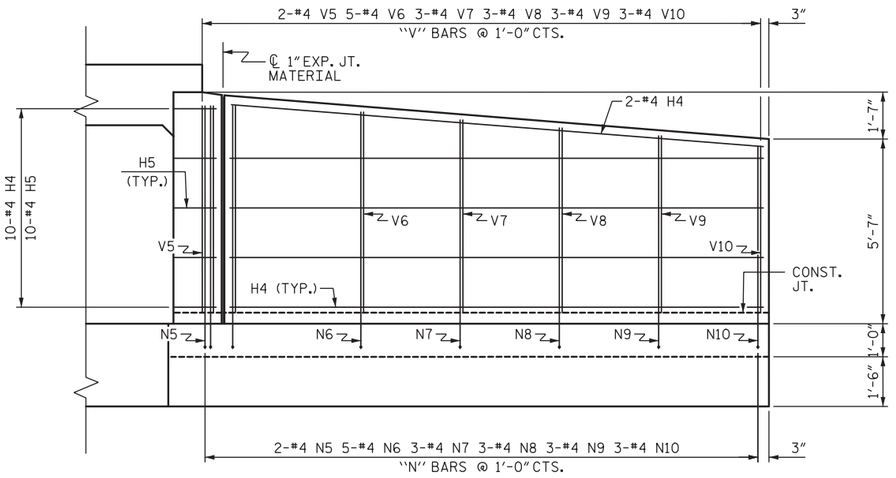
PLAN W1



TYPICAL WING SECTION



ELEVATION W2



ELEVATION W1

PROJECT NO. 17BP.13.R.161

MADISON COUNTY

STATION: 13+91.62 -L-

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STATE OF NORTH CAROLINA
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WINGS FOR CONCRETE BOX CULVERT H = 6'-0" SLOPE VARIES 45°-00'-00" SKEW

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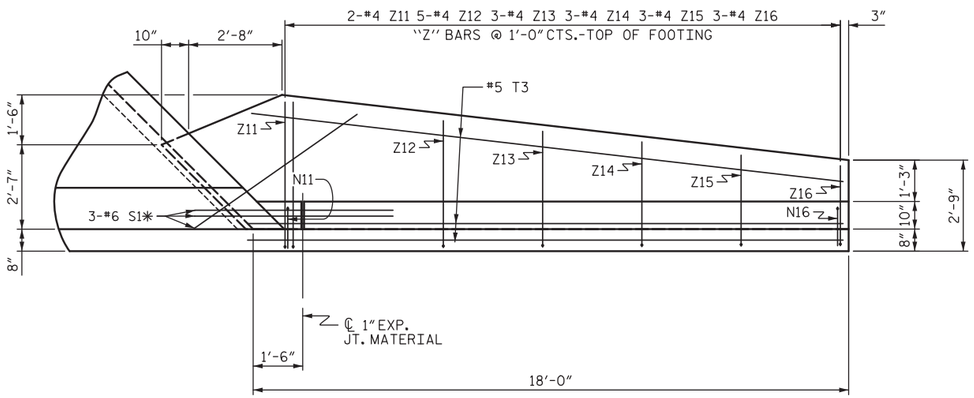
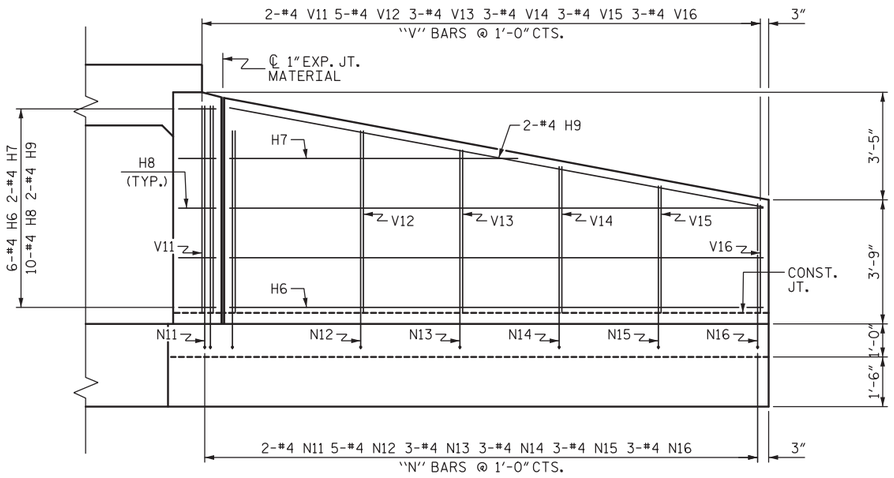
✳S1 BARS @ BOTTOM OF FLOOR SLAB & FOOTING



PLAN W3



ELEVATION W3

PHASE 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H6	6	#4	STR	16'-1"	64
H7	2	#4	STR	8'-8"	12
H8	10	#4	2	1'-4"	9
H9	2	#4	STR	16'-4"	22
N11	2	#4	3	8'-4"	11
N12	5	#4	3	7'-6"	25
N13	3	#4	3	7'-0"	14
N14	3	#4	3	6'-5"	13
N15	3	#4	3	5'-10"	12
N16	3	#4	3	5'-4"	11
S1	3	#6	STR	6'-0"	27
T3	3	#5	STR	18'-0"	56
V11	2	#4	STR	6'-3"	8
V12	5	#4	STR	5'-6"	18
V13	3	#4	STR	4'-11"	10
V14	3	#4	STR	4'-5"	9
V15	3	#4	STR	8'-0"	16
V16	3	#4	STR	3'-3"	7
Z11	2	#4	4	4'-11"	7
Z12	5	#4	4	4'-4"	14
Z13	3	#4	4	4'-0"	8
Z14	3	#4	4	3'-8"	7
Z15	3	#4	4	3'-3"	7
Z16	3	#4	4	2'-11"	6

PHASE 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	8	#4	STR	6'-7"	35	V1	3	#4	STR	6'-2"	12
H2	10	#4	1	3'-3"	22	V2	2	#4	STR	5'-9"	8
H3	2	#4	STR	6'-9"	9	V3	2	#4	STR	5'-5"	7
H4	10	#4	STR	16'-1"	107	V4	2	#4	STR	5'-0"	7
H5	10	#4	2	3'-3"	22	V5	2	#4	STR	6'-2"	8
						V6	5	#4	STR	6'-0"	20
N1	3	#4	3	8'-2"	16	V7	3	#4	STR	5'-9"	12
N2	2	#4	3	7'-9"	10	V8	3	#4	STR	5'-6"	11
N3	2	#4	3	7'-5"	10	V9	3	#4	STR	5'-3"	11
N4	2	#4	3	7'-0"	9	V10	3	#4	STR	5'-0"	10
N5	2	#4	3	8'-2"	11						
N6	5	#4	3	8'-0"	27	Z1	3	#4	4	12'-5"	25
N7	3	#4	3	7'-9"	16	Z2	2	#4	4	11'-1"	15
N8	3	#4	3	7'-6"	15	Z3	2	#4	4	9'-9"	13
N9	3	#4	3	7'-3"	15	Z4	2	#4	4	5'-9"	8
N10	3	#4	3	7'-0"	14	Z5	2	#4	4	4'-9"	6
						Z6	5	#4	4	4'-7"	15
S1	6	#6	STR	6'-0"	54	Z7	3	#4	4	4'-5"	9
						Z8	3	#4	4	4'-3"	9
T1	2	#5	STR	8'-4"	17	Z9	3	#4	4	4'-1"	8
T2	1	#5	STR	9'-1"	9	Z10	3	#4	4	3'-11"	8
T3	3	#5	STR	18'-0"	56						

BILL OF MATERIAL

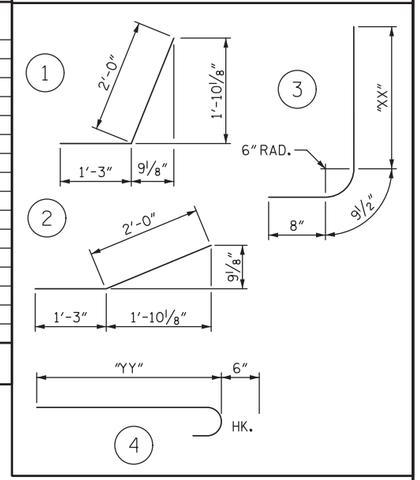
REINFORCING STEEL	
PHASE 1	393 LBS
PHASE 2	696 LBS
CLASS A CONCRETE	
PHASE 1	
1 WING	5.63 CY
1 HEADWALL	1.35 CY
1 END CURTAIN WALL	1.11 CY
TOTAL	8.09 CY
PHASE 2	
2 WINGS	9.92 CY
1 HEADWALL	1.35 CY
2 END CURTAIN WALLS	1.64 CY
TOTAL	12.91 CY

BAR DIMENSIONS

BAR	"XX"	BAR	"YY"
N1	6'-8½"	Z1	4'-3"
N2	6'-3½"	Z2	4'-0"
N3	5'-11½"	Z3	3'-9"
N4	5'-6½"	Z4	3'-5"
N5	6'-8½"	Z5	4'-3"
N6	6'-6½"	Z6	4'-1"
N7	6'-3½"	Z7	3'-11"
N8	6'-0½"	Z8	3'-9"
N9	5'-9½"	Z9	3'-7"
N10	5'-6½"	Z10	3'-5"
N11	6'-10½"	Z11	4'-5"
N12	6'-0½"	Z12	3'-10"
N13	5'-6½"	Z13	3'-6"
N14	4'-11½"	Z14	3'-2"
N15	4'-4½"	Z15	2'-9"
N16	3'-10½"	Z16	2'-5"

ALL BAR DIMENSIONS ARE OUT TO OUT.

BAR TYPES



PROJECT NO. 17BP.13.R.161

MADISON COUNTY

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SHEET 9 OF 12

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

WINGS FOR CONCRETE BOX CULVERT H = 6'-0" SLOPE VARIES 45°-00'-00" SKEW

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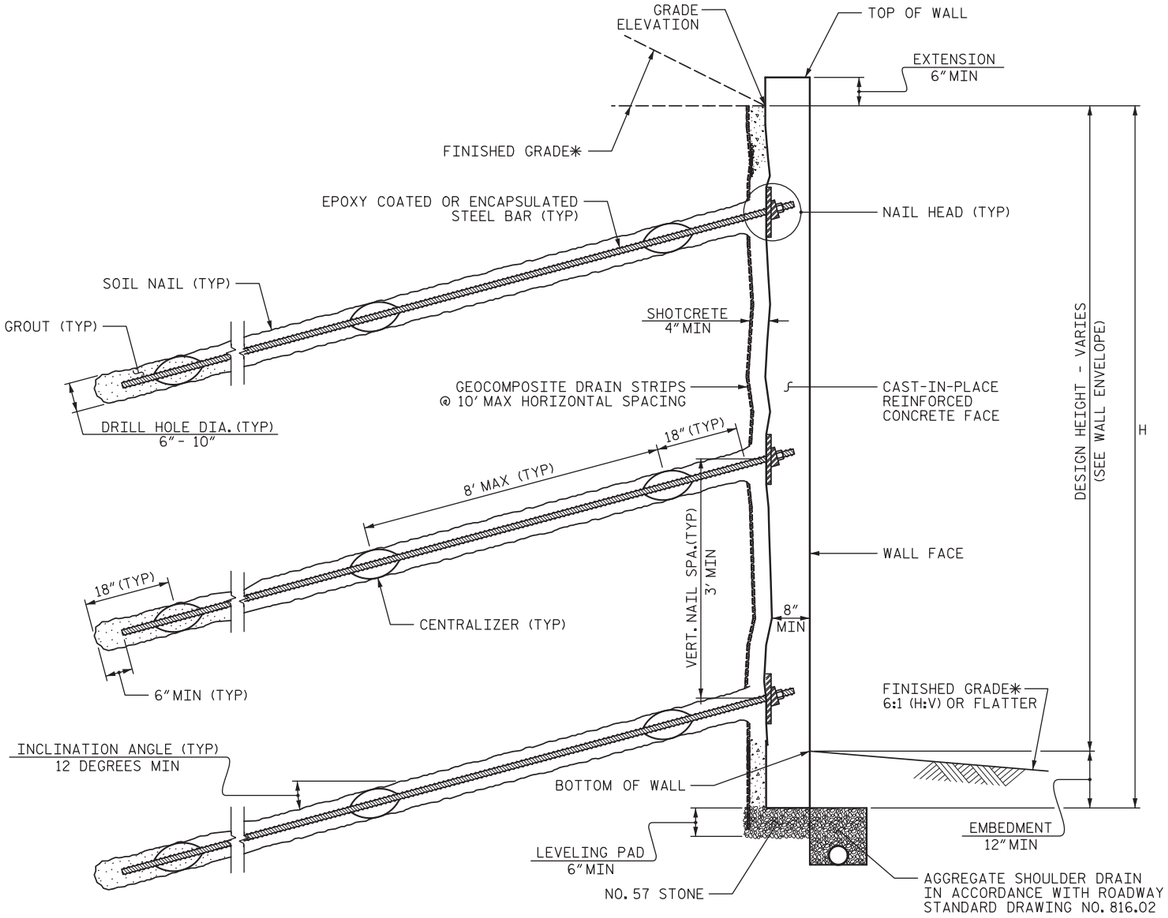
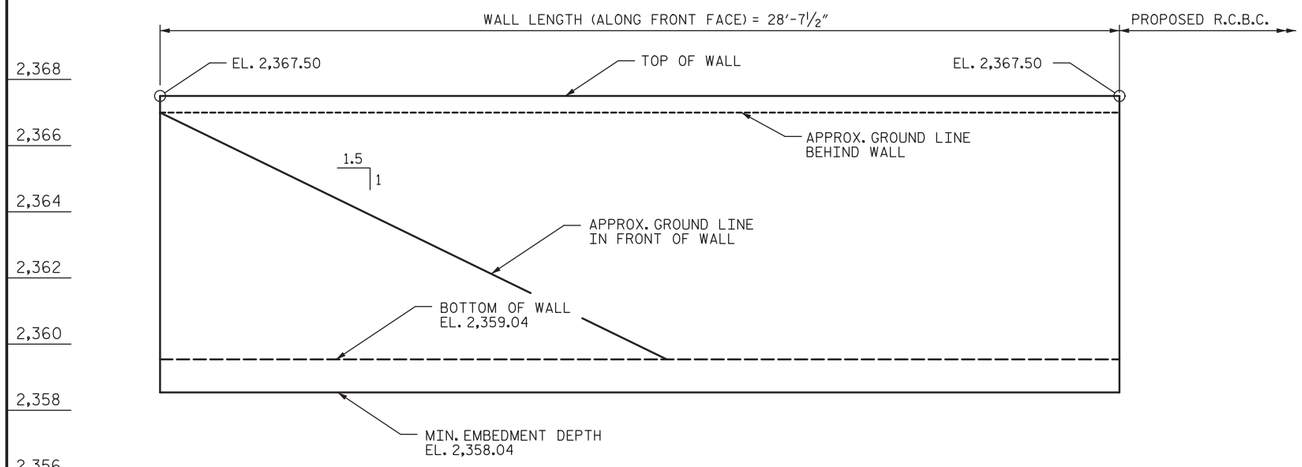


SOIL NAIL WALL - TYPICAL SECTION

*SEE ROADWAY PLANS FOR FINISHED GRADE AND DITCH DETAILS



WALL PROFILE

NOTES:

FOR SOIL NAIL RETAINING WALLS, SEE SOIL NAIL RETAINING WALLS PROVISION.

BEFORE BEGINNING SOIL NAIL WALL DESIGN FOR RETAINING WALL, SURVEY WALL LOCATION AND SUBMIT A REVISED WALL PROFILE VIEW (WALL ENVELOPE) FOR REVIEW. DO NOT START WALL DESIGN OR CONSTRUCTION UNTIL THE REVISED WALL ENVELOPE IS ACCEPTED.

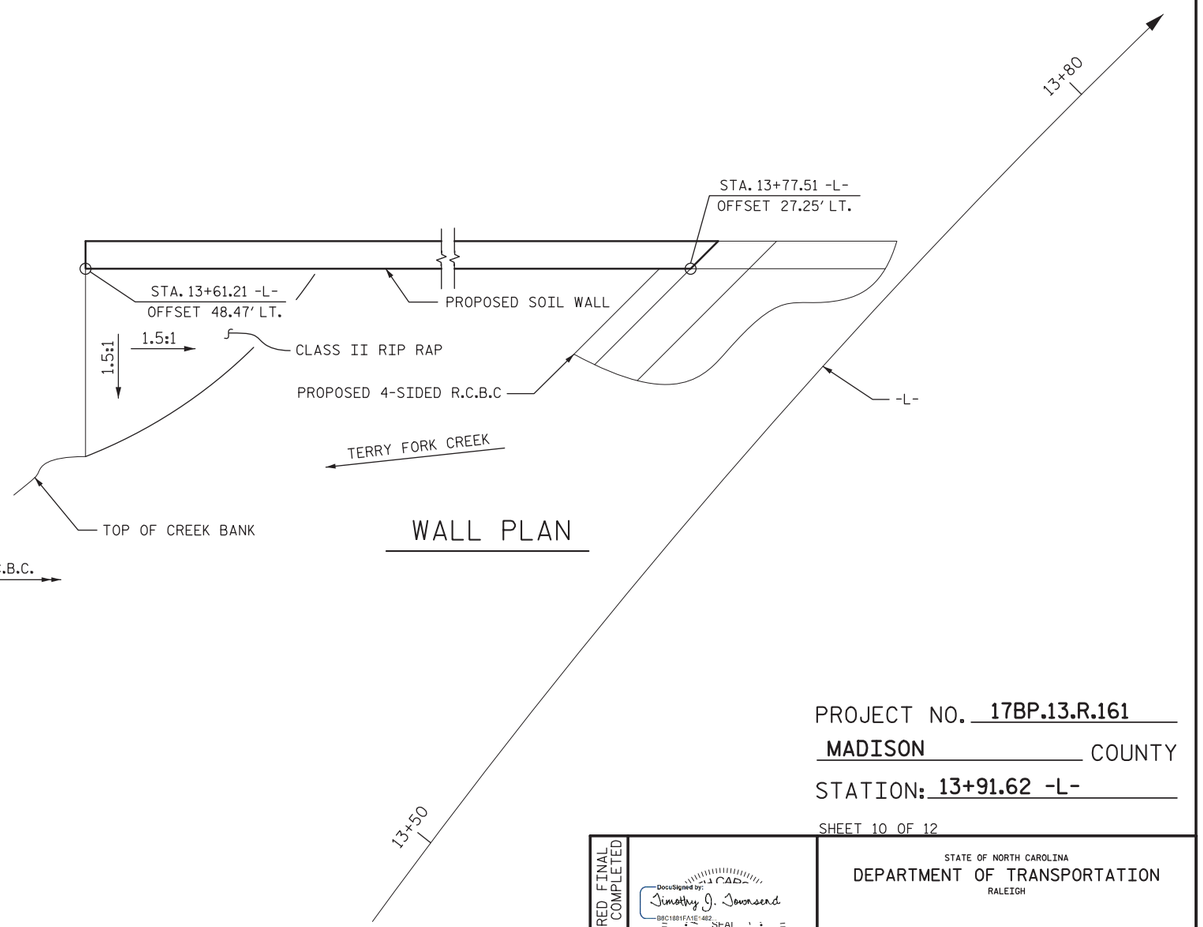
DESIGN RETAINING WALL FOR THE FOLLOWING:
1) H = DESIGN HEIGHT + EMBEDMENT
2) DESIGN LIFE = 75 YEARS
3) MINIMUM EMBEDMENT ELEVATION = 2358.04 FT
4) IN-SITU ASSUMED MATERIAL PARAMETERS ABOVE ELEVATION 2359.04 FT:
UNIT WEIGHT, γ = 120 LB/CF
FRICTION ANGLE, ϕ = 30 DEGREES
COHESION, c = 0 LB/SF

THE MINIMUM EMBEDMENT ELEVATION FOR RETAINING WALL INCLUDES EMBEDMENT FOR SCOUR.

DESIGN RETAINING WALL FOR A LIVE LOAD (TRAFFIC) SURCHARGE.

EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, GUARDRAIL, FENCE OR HANDRAIL POSTS, PAVEMENTS, PIPES, INLETS OR UTILITIES MAY INTERFERE WITH SOIL NAILS FOR RETAINING WALL.

"TEMPORARY SHORING" MAY BE REQUIRED FOR RETAINING WALL IN ACCORDANCE WITH THE TEMPORARY SHORING PROVISION. SEE ROADWAY PLANS.



WALL PLAN

PROJECT NO. 17BP.13.R.161

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SOIL NAIL WALL FOR CONCRETE BOX CULVERT

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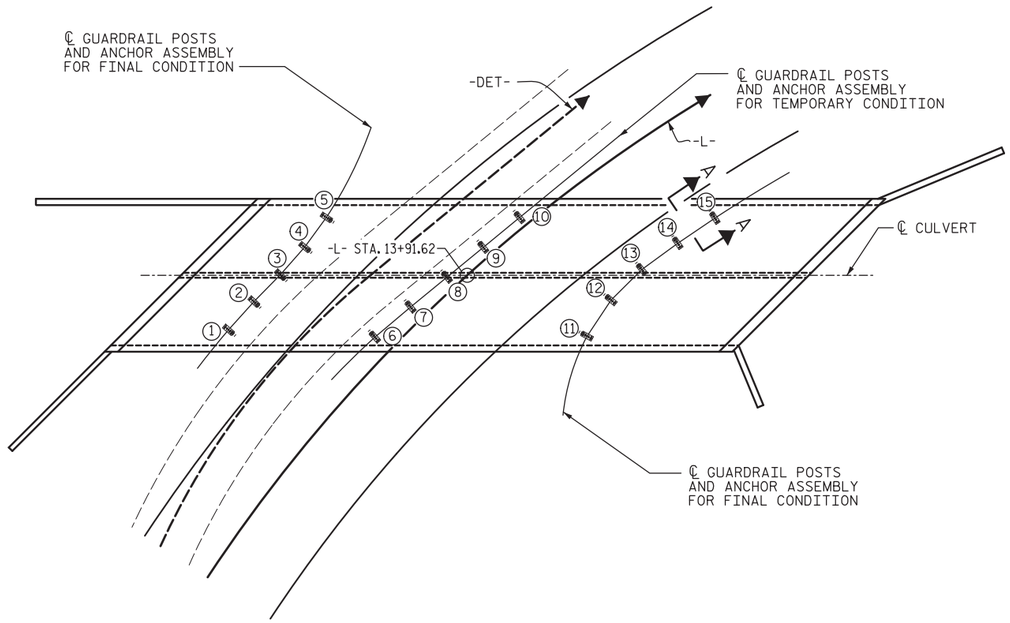
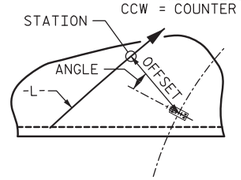


PLAN OF CULVERT GUARDRAIL ANCHOR ASSEMBLY SPACING

GUARDRAIL ANCHORAGE LOCATION			
POINT	STATION	OFFSET	ANGLE
1	13+64.65	18.21′ LT.	00°-13′-35″ CCW
2	13+69.31	18.17′ LT.	00°-11′-11″ CW
3	13+73.92	18.03′ LT.	00°-33′-47″ CW
4	13+78.41	18.26′ LT.	05°-52′-24″ CCW
5	13+82.86	19.03′ LT.	12°-17′-35″ CCW
6	13+76.51	3.20′ LT.	03°-54′-16″ CW
7	13+82.60	2.68′ LT.	04°-49′-19″ CW
8	13+88.77	2.25′ LT.	03°-08′-25″ CW
9	13+94.95	2.00′ LT.	01°-27′-13″ CW
10	14+01.15	1.93′ LT.	00°-14′-09″ CCW
11	13+97.91	15.94′ RT.	22°-01′-51″ CCW
12	14+03.86	14.24′ RT.	12°-11′-25″ CCW
13	14+09.97	13.51′ RT.	02°-24′-01″ CCW
14	14+16.29	13.48′ RT.	00°-00′-00″
15	14+22.67	13.48′ RT.	00°-00′-00″

CW = CLOCKWISE
CCW = COUNTER CLOCKWISE



LEGEND

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS SHALL CONSIST OF THE FOLLOWING COMPONENTS :

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2½″.

B. 4 - 1″Ø X 2¼″ BOLTS WITH WASHERS, BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 1″Ø X 2 ¼″ GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

C. WIRE STRUTS SHOWN IN THE GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS DETAIL ARE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 P.S.I. AS AN OPTION, A 7/16″Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

GUARDRAIL ANCHOR ASSEMBLY WITH BOLTS SHALL BE ASSEMBLED IN THE SHOP. BOLT THREADS MAY BE RECUT AS NECESSARY TO INSURE FIT.

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CLASS "A" CONCRETE.

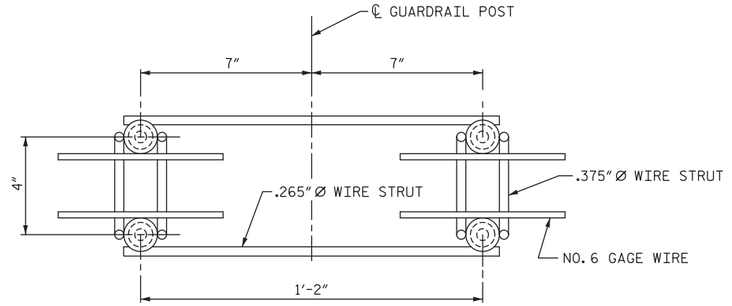
FERRULES TO BE PLUGGED DURING POURING OF SLAB AS RECOMMENDED BY THE MANUFACTURER.

AT THE CONTRACTOR'S OPTION, FERRULES WITH OPEN OR CLOSED ENDS MAY BE USED.

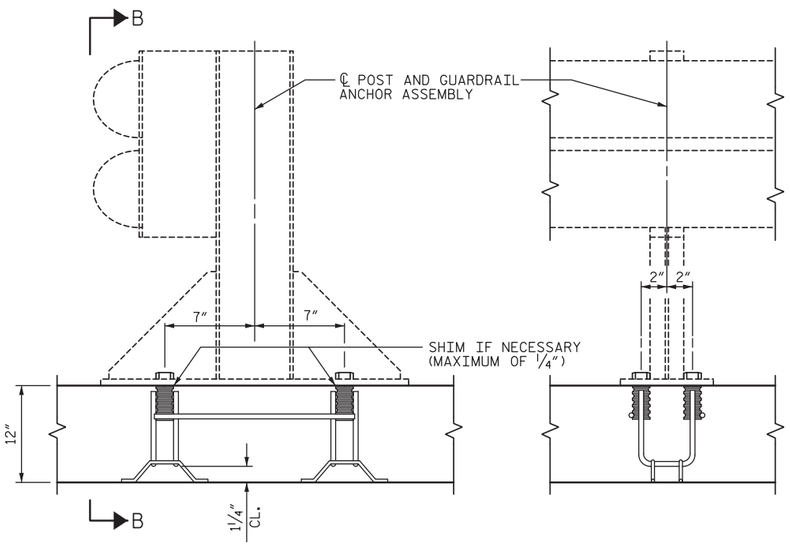
PAYMENT FOR GUARDRAIL, POSTS, AND POST BASE PLATES IS INCLUDED IN ROADWAY PAY ITEMS.

SLAB REINFORCING STEEL MAY BE SHIFTED AS NECESSARY TO CLEAR GUARDRAIL ANCHOR ASSEMBLY. CARE SHOULD BE TAKEN TO KEEP THE SHIFTING OF REINFORCING STEEL TO A MINIMUM.

THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF GUARDRAIL ANCHOR ASSEMBLY. LEVEL TWO FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 1″Ø BOLT IS 21.8 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS.

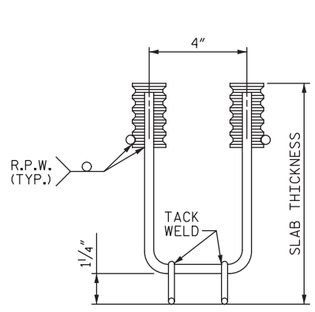


PLAN

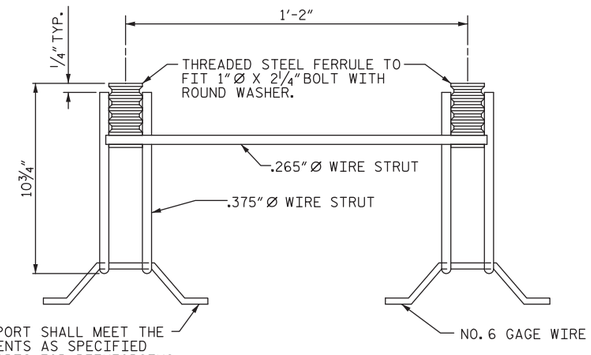


SECTION A-A

SECTION B-B



ELEVATION



THIS SUPPORT SHALL MEET THE REQUIREMENTS AS SPECIFIED FOR SUPPORTS FOR REINFORCING STEEL. SEE SPECIFICATIONS.

SIDE VIEW

GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS

PROJECT NO. 17BP.13.R.161

MADISON COUNTY

STATION: 13+91.62 -L-

SHEET 11 OF 12

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DocuSigned by: Timothy J. Townsend
SEAL 34955 ENGINEER TIMOTHY J. TOWNSEND
3/1/2022

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

ANCHORAGE DETAILS FOR GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS

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FAX (828) 254-4562
NC LIC. NO. C-1154

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-11
1			3			TOTAL SHEETS
2			4			12

DRAWN BY : CTB	DATE : 03-22	DESIGN ENGINEER OF RECORD: T. TOWNSEND	DATE : 03-22
CHECKED BY : TJT	DATE : 03-22		

DATE: 3/1/2022 TIME: 12:22:31 PM
FILE: I:\3850B - Div 13 Bridge 166 (Madison Co)\Dwgs\401_021_17BP.13.R.161_SMU_CU_011_560166.dgn

STANDARD NOTES

DESIGN DATA:

SPECIFICATIONS	A.A.S.H.T.O. (CURRENT)
LIVE LOAD	SEE PLANS
IMPACT ALLOWANCE	SEE A.A.S.H.T.O.
STRESS IN EXTREME FIBER OF STRUCTURAL STEEL - AASHTO M270 GRADE 36	20,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50W	27,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50	27,000 LBS. PER SQ. IN.
REINFORCING STEEL IN TENSION - GRADE 60	24,000 LBS. PER SQ. IN.
CONCRETE IN COMPRESSION	1,200 LBS. PER SQ. IN.
CONCRETE IN SHEAR	SEE A.A.S.H.T.O.
STRUCTURAL TIMBER - TREATED OR UNTREATED EXTREME FIBER STRESS	1,800 LBS. PER SQ. IN.
COMPRESSION PERPENDICULAR TO GRAIN OF TIMBER	375 LBS. PER SQ. IN.
EQUIVALENT FLUID PRESSURE OF EARTH	30 LBS. PER CU. FT. (MINIMUM)

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2018 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

STEEL SHEET PILING FOR PERMANENT OR TEMPORARY APPLICATIONS SHALL BE HOT ROLLED.

CONCRETE:

UNLESS OTHERWISE REQUIRED ON PLANS, CLASS A CONCRETE SHALL BE USED FOR ALL PORTIONS OF ALL STRUCTURES WITH THE EXCEPTION THAT: CLASS AA CONCRETE SHALL BE USED IN BRIDGE SUPERSTRUCTURES, ABUTMENT BACKWALLS, AND APPROACH SLABS; AND CLASS B CONCRETE SHALL BE USED FOR SLOPE PROTECTION AND RIP RAP.

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED ¾" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1½" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A ¼" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A ¼" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

DOWELS WHEN INDICATED ON PLANS AS FOR CULVERT EXTENSIONS, SHALL BE EMBEDDED AT LEAST 12" INTO THE OLD CONCRETE AND GROUTED INTO PLACE WITH 1:2 CEMENT MORTAR.

ALLOWANCE FOR DEAD LOAD DEFLECTION, SETTLEMENT, ETC. IN CASTING SUPERSTRUCTURES:

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.

ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER.

IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER.

DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.

WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE ⅞" Ø SHEAR STUDS FOR THE ¾" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - ⅞" Ø STUDS FOR 4 - ¾" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF ⅞" Ø STUDS ALONG THE BEAM AS SHOWN FOR ¾" Ø STUDS BASED ON THE RATIO OF 3 - ⅞" Ø STUDS FOR 4 - ¾" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16 INCH OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.

METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

GENERALLY, IN CASE OF DISCREPANCY, THIS STANDARD SHEET OF NOTES SHALL GOVERN OVER THE SPECIFICATIONS, BUT THE REMAINDER OF THE PLANS SHALL GOVERN OVER NOTES HEREON, AND SPECIAL PROVISIONS SHALL GOVERN OVER ALL. SEE SPECIFICATIONS ARTICLE 105-4.

PROJECT NO. 17BP.13.R.161

MADISON COUNTY

STATION: 13+91.62 -L-

SHEET 12 OF 12

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD NOTES

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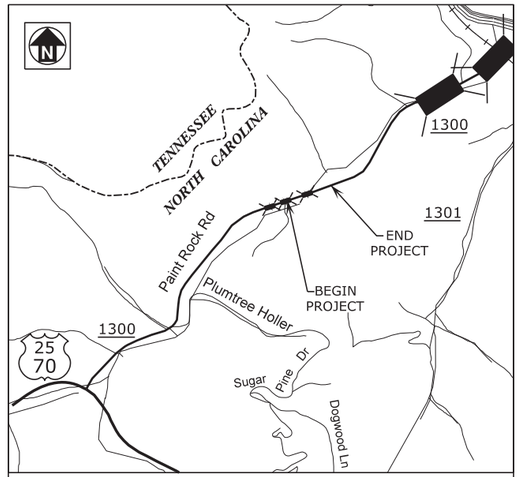
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-12
1			3			TOTAL SHEETS
2			4			12

CONTRACT: DM00350 PROJECT: 17BP.13.R.164

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



VICINITY MAP
(NOT TO SCALE)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

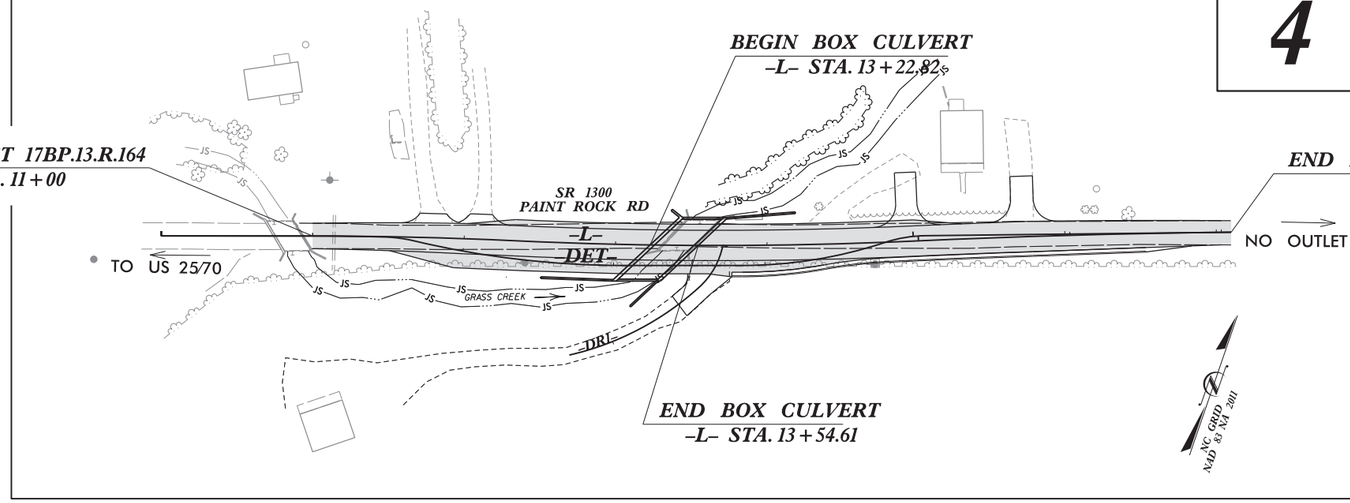
MADISON COUNTY

LOCATION: BRIDGE NO. 134 OVER GRASS CREEK ON SR 1300 (PAINT ROCK ROAD)

TYPE OF WORK: GRADING, PAVING, DRAINAGE AND CULVERT

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.13.R.164	1	

STATE PROJECT NO.	F.A. PROJ. NO.	DESCRIPTION
17BP.13.PE.164	N/A	P.E.
17BP.13.ROW.164	N/A	R/W & UTIL
17BP.13.R.164	N/A	CONST



4

PLANS PREPARED BY:

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GRAPHIC SCALES

PLANS: 30 15 0 30 60
PROFILE (HORIZONTAL): 30 15 0 30 60
PROFILE (VERTICAL): 10 5 0 10 20

DESIGN DATA

ADT 2015 = 170

V = 55 MPH

FUNC CLASS = RURAL LOCAL
SUBREGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY PROJECT 17BP.13.R.164 = 0.108 MILES

LENGTH STRUCTURE PROJECT 17BP.13.R.164 = 0.006 MILES

TOTAL LENGTH PROJECT 17BP.13.R.164 = 0.114 MILES

Prepared in the Office of:
MATTERN & CRAIG
12 BROAD ST.
ASHEVILLE, NC 28801
FOR NCDOT DIVISION OF HIGHWAYS

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
MARCH 18, 2021

LETTING DATE:
MAY 18, 2022

AARON CARVER, PE
PROJECT ENGINEER

MENG YANG, EI
PROJECT DESIGN ENGINEER

NCDOT CONTACT:
MIKE CALLOWAY
DIVISION 13 BRIDGE PROGRAM MANAGER

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 030453 ENGINEER AARON C. CARVER

DocuSigned by: Aaron Carver 8250B42A320F49C...

SIGNATURE: *P.E.* 3/25/2022

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 030453 ENGINEER AARON C. CARVER

DocuSigned by: Aaron Carver 8250B42A320F49C...

SIGNATURE: *P.E.* 3/25/2022

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

PROJECT REFERENCE NO.	SHEET NO.
17BP13.R164	1A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL
Aaron Carver
12/16/2021

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1B	CONVENTIONAL PLAN SHEET SYMBOLS
2A-1	PAVEMENT SCHEDULE & TYPICAL SECTIONS
2B-1	ON-SITE DETOUR SHEET
2C-1	GUARDRAIL INSTALLATION IN LIEU OF STD 862.02 SHEET 6 OF 8
2C-2	GUARDRAIL INSTALLATION: A.T.-1 SYSTEM
3B-1	SUMMARY OF DRAINAGE QUANTITIES, SUMMARY OF GUARDRAIL, SUMMARY OF PAVEMENT REMOVAL, AND SUMMARY OF EARTHWORK
4	PLAN SHEET & PROFILE SHEET
RW01 thru RW04	RIGHT OF WAY SHEETS
TMP-1 thru TMP-5	TRAFFIC MANAGEMENT PLANS
PM-1	PAVEMENT MARKING PLAN
EC-1 thru EC-6	EROSION CONTROL PLANS
UO-1	UTILITIES BY OTHERS PLANS
X-0	CROSS-SECTION SUMMARY SHEET
X-1 thru X-12	CROSS-SECTION SHEETS
C1 thru C8	CULVERT PLANS

GENERAL NOTES

GENERAL NOTES: 2018 SPECIFICATIONS
EFFECTIVE: 01-16-2018
REVISED:

GRADING AND SURFACING OR RESURFACING AND WIDENING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. WHERE NO GRADE LINES ARE SHOWN, THE PROFILES SHOWN DENOTE THE TOP ELEVATION OF THE EXISTING PAVEMENT ALONG THE CENTER LINE OF SURVEY ON WHICH THE PROPOSED RESURFACING WILL BE PLACED. GRADE LINES MAY BE ADJUSTED 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 II.

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

SHOULDER CONSTRUCTION:

ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.01

SIDE ROADS:

THE CONTRACTOR WILL BE REQUIRED TO DO ALL NECESSARY WORK TO PROVIDE SUITABLE CONNECTIONS WITH ALL ROADS, STREETS, AND DRIVES ENTERING THIS PROJECT. THIS WORK WILL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR THE PARTICULAR ITEMS INVOLVED.

SUBSURFACE DRAINS:

SUBSURFACE DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.02 AT LOCATIONS DIRECTED BY THE ENGINEER.

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.

TEMPORARY SHORING:

SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC NOT SHOWN ON THE PLANS WILL BE PAID FOR AT THE CONTRACT PRICE FOR "TEMPORARY SHORING".

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE:
POWER - FRENCH BROAD ELECTRIC MEMBERSHIP CORP.
PHONE - FRONTIER COMMUNICATIONS
ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS.

RIGHT-OF-WAY MARKERS:

ALL RIGHT-OF-WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY OTHERS.

ROCK:

ROCK IS ANTICIPATED BETWEEN -DR1 STA 10+10 AND 10+50. BLASTING MAY BE REQUIRED FOR EXCAVATION ON THE PROJECT. SEE SECTION 220 OF THE STANDARD SPECIFICATIONS AND IF APPLICABLE, ROCK BLASTING PROVISION.

STANDARD DRAWINGS

EFF. 01-16-2018
REV.

2018 ROADWAY ENGLISH STANDARD DRAWINGS

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
DIVISION 2 - EARTHWORK	
200.02	Method of Clearing - Method II
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 8 - INCIDENTALS	
815.02	Subsurface Drain840.29 Frames and Narrow Slot Flat Grates
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.46	Traffic Bearing Precast Drainage Structure
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

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12/2/2016

PROJECT REFERENCE NO.	SHEET NO.
17BPJ3.RJ64	1-B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

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

BOUNDARIES AND PROPERTY:

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

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or U/G Tank Cap
- Sign — S
- Well — W
- Small Mine
- Foundation
- Area Outline
- Cemetery
- Building
- School
- Church
- Dam

HYDROLOGY:

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

RAILROADS:

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

RIGHT OF WAY & PROJECT CONTROL:

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

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut — C
- Proposed Slope Stakes Fill — F
- Proposed Curb Ramp — CR
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

VEGETATION:

- Single Tree
- Single Shrub
- Hedge
- Woods Line
- Orchard
- Vineyard — Vineyard

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

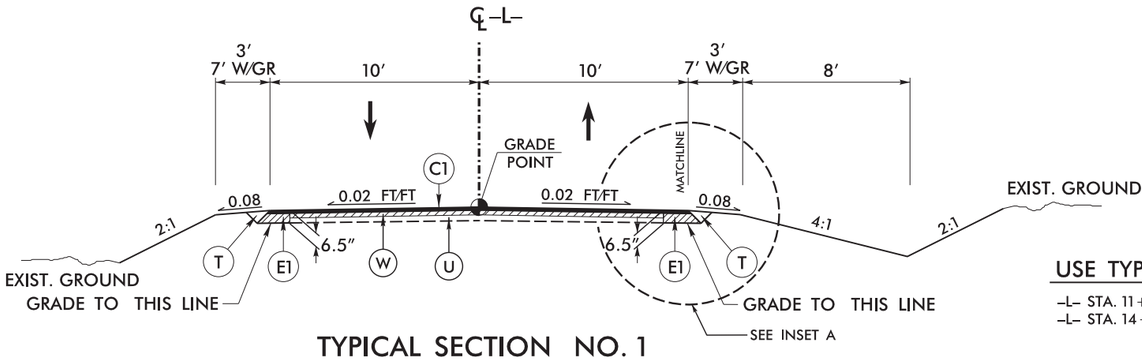
- Gas Valve
- Gas Meter
- U/G Gas Line LOS B (S.U.E.*) — G
- U/G Gas Line LOS C (S.U.E.*) — G
- U/G Gas Line LOS D (S.U.E.*) — G
- Above Ground Gas Line — A/G Gas

SANITARY SEWER:

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

MISCELLANEOUS:

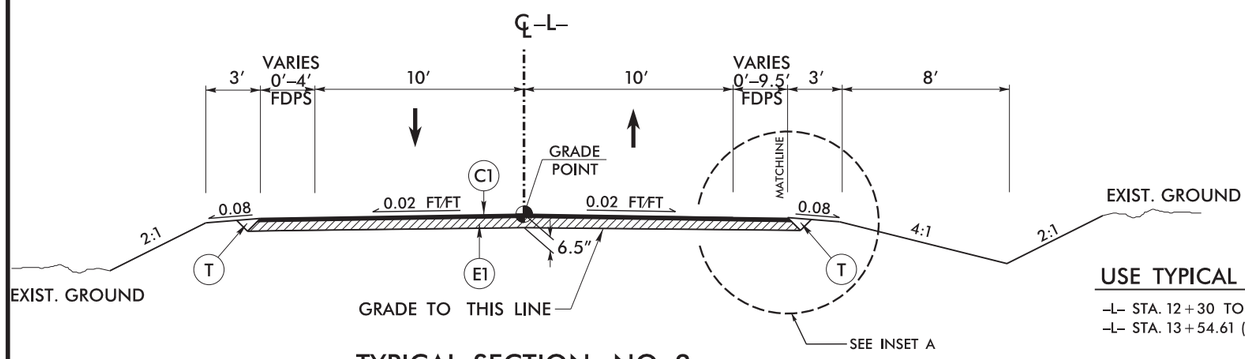
- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — S
- Utility Unknown U/G Line LOS B (S.U.E.*) — ?UTL
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc. — UST
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- U/G Test Hole LOS A (S.U.E.*)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



TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1

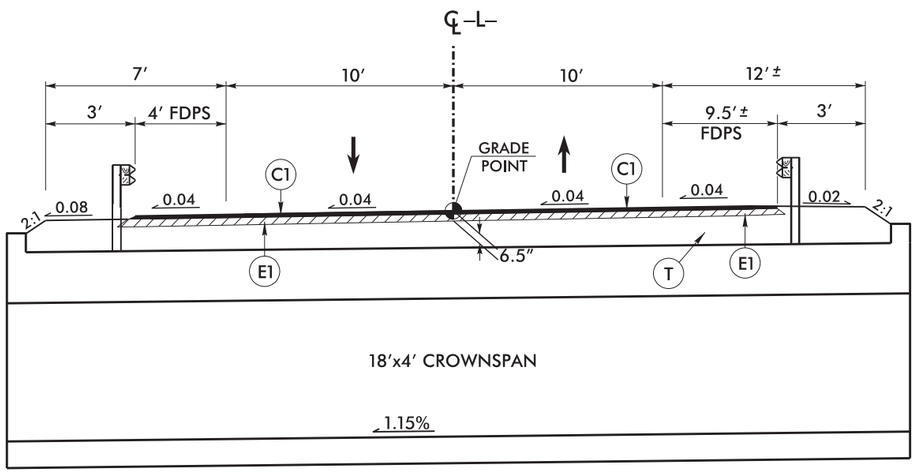
–L– STA. 11+00 TO –L– STA. 12+30
–L– STA. 14+30 TO –L– STA. 17+00



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2

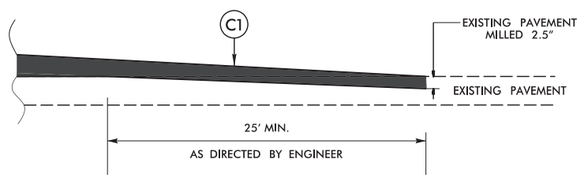
–L– STA. 12+30 TO –L– STA. 13+22.82 (BEGIN CULVERT)
–L– STA. 13+54.61 (END CULVERT) TO –L– STA. 14+30



TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3

–L– STA. 13+22.82 (BEGIN CULVERT) TO –L– STA. 13+54.61 (END CULVERT)



INCIDENTAL MILLING EXISTING PAVEMENT

Mattern & Craig
ENGINEERS • SURVEYORS

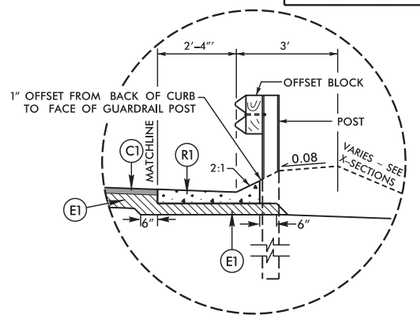
12 BROAD STREET
ASHEVILLE, NORTH CAROLINA 28801
(828) 254-2201
FAX (828) 254-4562
NC LIC. NO. C-1154

PROJECT REFERENCE NO.	SHEET NO.
17BPJ3.RJ64	2A-1

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL CERTIFICATION C. CARVER
DocuSigned by: Karen Carver
12/17/2021

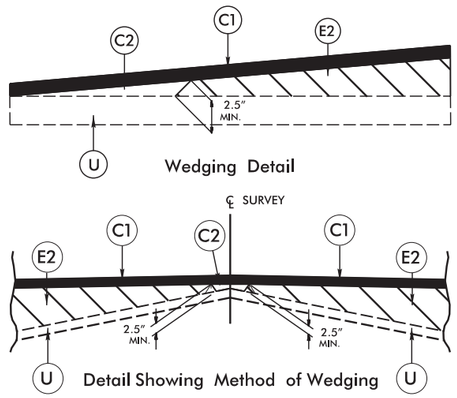
PAVEMENT DESIGN ENGINEER
12/17/2021
NORTH CAROLINA PROFESSIONAL SEAL 022896 ENGINEER CLARK S. MORRISON
DocuSigned by: Clark S. Morrison
12/17/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



INSET A

SBG –L– STA. 13+77 RT TO –L– STA. 16+50 RT



	PAVEMENT SCHEDULE
C1	PROP. APPROX. 2.5″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 138 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1″ DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1.5″ IN DEPTH.
E1	PROP. APPROX. 4″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1″ DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3″ IN DEPTH OR GREATER THAN 5.5″ IN DEPTH.
R1	SHOULDER BERM GUTTER (NCDOT STANDARD DRAWING NO. 846.01)
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	PROPOSED WEDGING (SEE APPROPRIATE DETAILS)

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE

PROJECT REFERENCE NO.	SHEET NO.
17BPJ3,RJ64	2B-1
RW SHEET NO.	

ROADWAY DESIGN ENGINEER — CF AI — DocuSigned by: Karen Carver — 12/16/2021

HYDRAULICS ENGINEER — TON C. CAM — DocuSigned by: Karen Carver — 12/16/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ON–SITE DETOUR

Mattern & Craig
ENGINEERS•SURVEYORS
12 BROAD STREET
ASHEVILLE, NORTH CAROLINA 28801
(828) 254–2201
FAX (828) 254–4562
NC LIC. NO. C–1154

REVISIONS

CLINT SPIEGEL
DB 646 PG 734
TRACT TWO

CHARLENE HOLT
DB 676 PG 41
DB 72 PG 317
(DB 13 PG 549)
PB 8 PG 975
GREEN TRACT

DONALD HOLT & SHIRLEY HOLT
DB 676 PG 41
DB 683 PG 138
PB 8 PG 975
YELLOW TRACT

BILLY M. WARD
DB 341PG 271

HAROLD ANTHONY HOLT
BRIDGET HOLT PATTERSON
DB 676 PG 41
DB 72 PG 317
PB 8 PG 975
ORANGE TRACT

CHARLES KENNETH RICKER
DB 152 PG 517
TRACT 1

BILL HOLT & BRENDA HOLT
DB 676 PG 41
PB 8 PG 975
PINK TRACT

BEGIN TEMP GUARDRAIL
–DET– STA 22+17.41 LT

BEGIN PCB
–DET– STA 22+21.85 LT

TEMP SHORING
–DET– STA 22+34.71 LT

TEMP SHORING
–DET– STA 24+28.34 LT

END TEMP GUARDRAIL
–DET– STA 24+39.32 LT

END PCB
–DET– STA 24+50.96 LT

BEGIN DETOUR
17BP.13.R.164
–DET– STA 21+94.23
–L– STA 11+93.68

END DETOUR
17BP.13.R.164
–DET– STA 24+67.56
–L– STA 14+65.00

BEGIN SBG
–L– STA 13+77
–DET– STA 23+78.14

END SBG
–L– STA 16+50
–DET– STA 26+53.45

125' TAPER
LT & RT

1 TONS CLASS II RIP RAP
1 SY GEOTEXTILE
(STRUCTURES PAY ITEM)

2 TONS CLASS II RIP RAP
2 SY GEOTEXTILE
(STRUCTURES PAY ITEM)

EST. 2 TONS CLASS B RIP-RAP
7 S.Y. GEOTEXTILE

INSTALL TEMPORARY OBJECT MARKER SIGN

O/H WIRE HGT. 1333.08'

BM #1
ELEV.= 1319.08'

BM #2
ELEV.= 1316.08'

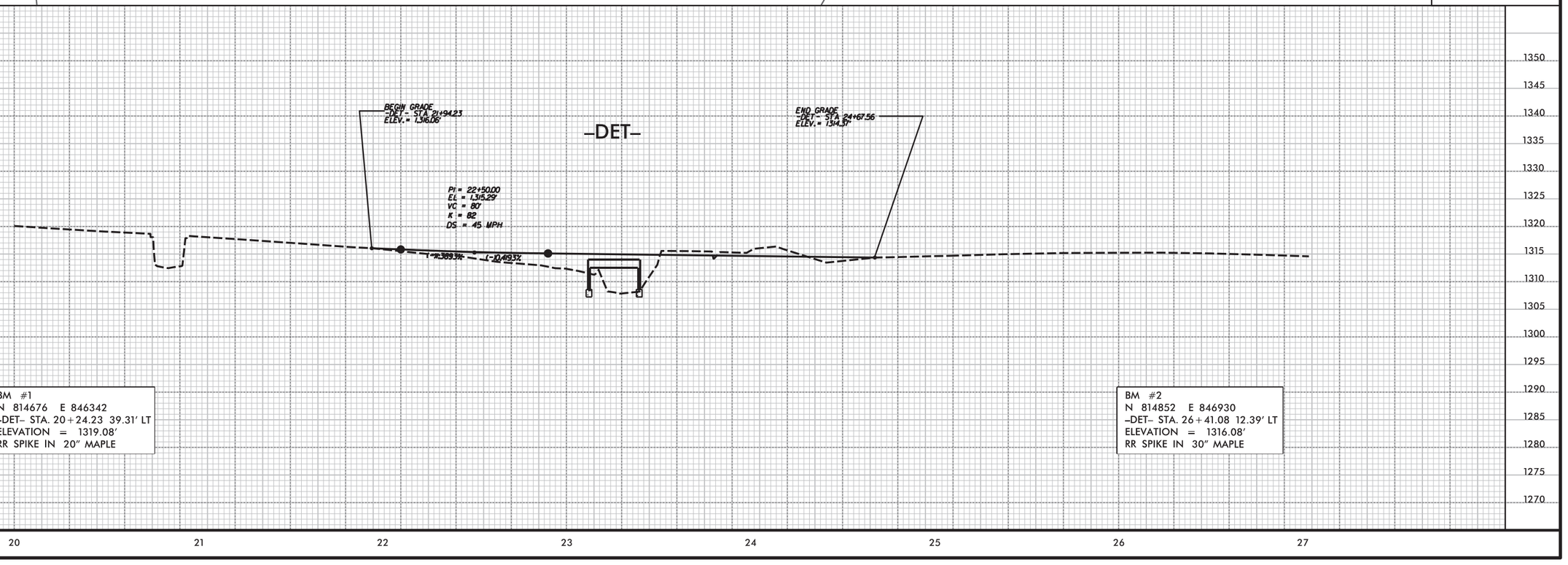
GRASS CREEK

NC GRID
NAD 83 NA 2011

-DET- CURVE DATA

PI Sta 21+24.24	PI Sta 21+57.64	PI Sta 22+37.13	PI Sta 24+33.21	PI Sta 24+94.56
Δ = 1°44'08.8" (RT)	Δ = 11°38'03.6" (RT)	Δ = 13°22'54.7" (LT)	Δ = 18°15'47.2" (LT)	Δ = 11°37'24.1" (RT)
D = 3°34'51.6"	D = 63°39'43.1"	D = 9°32'57.5"	D = 19°05'54.9"	D = 63°39'43.1"
L = 48.47'	L = 18.28'	L = 140.13'	L = 95.63'	L = 27.68'
T = 24.24'	T = 9.17'	T = 70.39'	T = 48.22'	T = 13.95'
R = 1600.00'	R = 90.00'	R = 600.00'	R = 300.00'	R = 90.00'

SEE SHEETS C–1 THRU C–7 FOR STRUCTURE PLANS



BM #1
N 814676 E 846342
–DET– STA. 20+24.23 39.31' LT
ELEVATION = 1319.08'
RR SPIKE IN 20" MAPLE

BM #2
N 814852 E 846930
–DET– STA. 26+41.08 12.39' LT
ELEVATION = 1316.08'
RR SPIKE IN 30" MAPLE

PROJECT REFERENCE NO.	SHEET NO.
17BP.13.R.164	2C-1

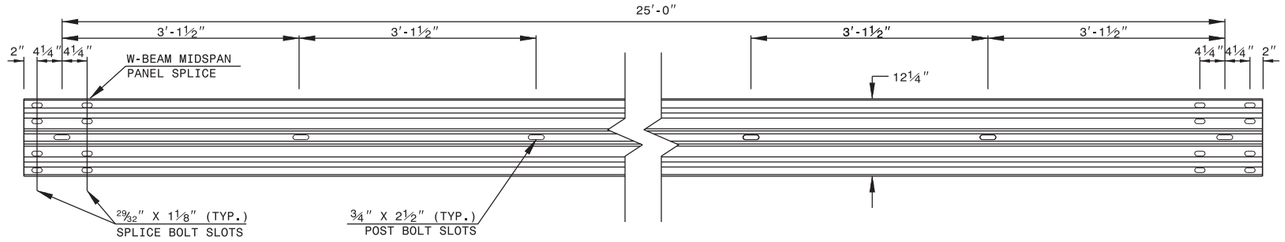
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

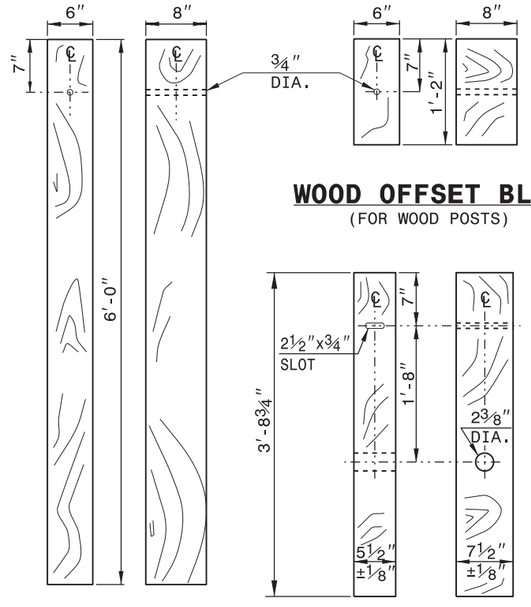
ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8

862D02



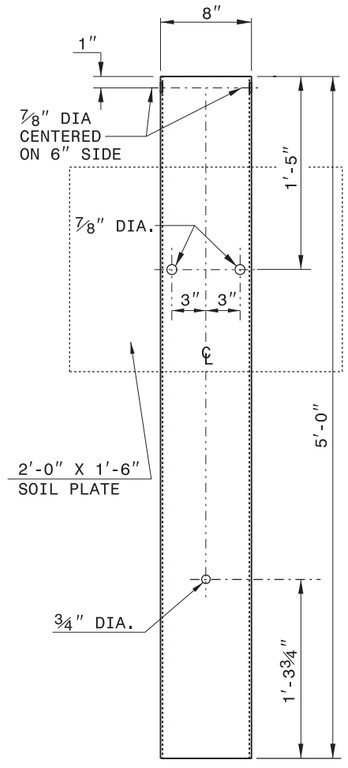
STANDARD W-BEAM GUARDRAIL



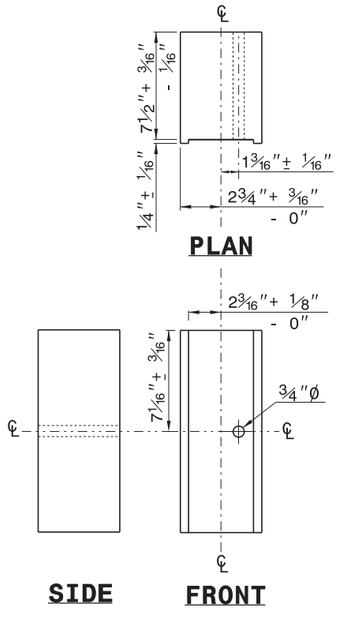
STANDARD LINE POST

WOOD OFFSET BLOCK
(FOR WOOD POSTS)

SHORT WOOD BREAKAWAY POST



STEEL TUBE
TS 6"x8"x0.1875"

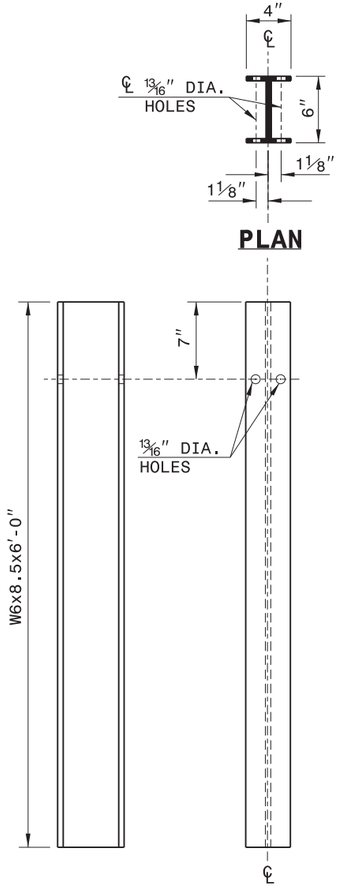


PLAN

SIDE

FRONT

ROUTED OFFSET BLOCK



PLAN

SIDE

FRONT

"W6" STEEL POST

SYSTEM PARTS

STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET 6 OF 8

862D02

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON

DocuSigned by: Joel S Howerton 873F3D17DCDC45F...

CONTRACTS STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

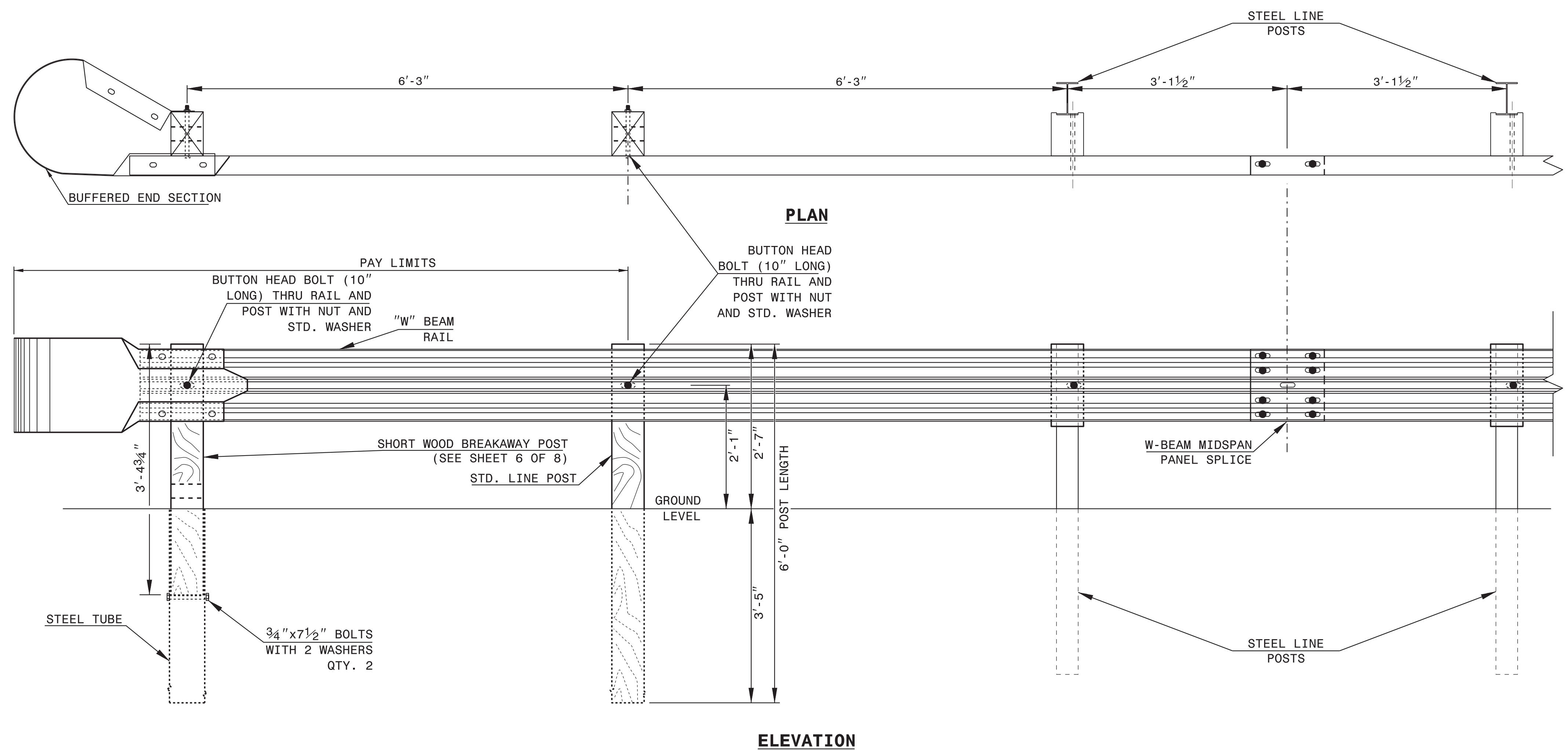
SEE TITLE BLOCK

ORIGINAL BY: J.HOWERTON DATE: 3-7-2018
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.:

PROJECT REFERENCE NO.	SHEET NO.
17BP.13.R.164	2C-2

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION



TRAILING END UNIT ASSEMBLY

A.T.-1 SYSTEM

SHEET OF

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET OF

NORTH CAROLINA PROFESSIONAL SEAL 022966 ENGINEER JOEL S. HOWERTON
DocuSigned by:
973F3D17DC0C45F...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CONTRACTS STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

A.T.-1 SYSTEM

ORIGINAL BY: DATE:
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.:

6/21/00

COMPUTED BY: MY DATE: 11-20-18
CHECKED BY: ACC DATE: 11-20-18

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
17BPJ3.RJ64	3B-1

PAVEMENT REMOVAL SUMMARY

IN SQUARE YARDS					
LINE	LOCATION	ASPHALT REMOVAL	ASPHALT BREAK-UP	3"ASPHALT MILLING	
-L-	12+35 TO 13+31	171			
-L-	13+55 TO 14+35	51			
-L-	13+55 TO 14+35	142			
	TOTAL	364			
	SAY	370			

SUMMARY OF EARTHWORK

IN CUBIC YARDS					
LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT+%	BORROW	WASTE
SUMMARY NO.1					
-L- STA. 11+00 TO -L- STA. 17+00	829		503		326
-DR1- STA 10+19.18 TO -DR1- STA 10+50	152				152
SUBTOTAL SUMMARY NO.1	981		503		478
PROJECT SUBTOTAL	981		503		478
LOSS DUE TO CLEARING & GRUBBING	-15				-15
GRAND TOTAL	966		503		463
SAY	1000				

CONTINGENCY ITEMS:
INCIDENTAL STONE = 50 TONS
UNDERCUT EXCAVATION = 450 CY
SELECT GRANULAR MATERIAL = 400 CY
CLASS IV SUBGRADE STABILIZATION = 200 TONS
GEOTEXTILE FOR SOIL STABILIZATION = 700 SY

NOTE: Invert Elevations are for Bid Purposes only and shall not be used for project construction stakeout. See "Standard Specifications For Roads and Structures, Section 300-5".

Approximate quantities only. Unclassified excavation, borrow excavation, fine grading, clearing and grubbing, and removal of existing pavement will be paid for at the contract lump sum price for "grading".

SUB-REGIONAL & REGIONAL
LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48" & UNDER)

STATION	LOCATION (LT,RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC) SIZE	12"	15"	18"	24"	30"	36"	42"	48"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE
								THICKNESS OR GAUGE												
-L- 13+73	RT	401		1314.33	1313.08															
	RT	401	402		1313.08	1311.26														
-L- 14+26	RT	402		1315.07	1311.26															
	RT	402	403		1311.26	1311.09														
-L- 15+17	RT	404		1314.82	1311.71															
	RT	404	402		1311.71	1311.26														
-L- 15+52	RT	405		1314.89	1311.89															
	RT	405	404		1311.89	1311.71														
-L- 16+62.72	RT																			
TOTAL																				

C.S. PIPE	12"	15"	18"	24"	36"	42"	48"
	.064	.064	.064	.064	.079	.109	.109

R.C. PIPE (CLASS III)	15"	18"	24"	30"	36"	42"	48"
	56						

R.C. PIPE (CLASS IV)	12"	15"	18"	24"	30"	36"	42"	48"
	36							

	*** R. C. PIPE (CLASS V)	*** R. C. PIPE CULVERTS, CONTRACTOR DESIGN PIPE	*** R. C. PIPE CULVERTS, CONTRACTOR DESIGN PIPE	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE	ENDWALLS: STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YDS. R.C.P.	ENDWALLS: CU. YDS. C.S.P.	QUANTITIES FOR DRAINAGE STRUCTURES * TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL. 'B') LIN. *FT. PER EACH (0' THRU 5.0')	LIN. *FT. A 5.0' THRU 10.0'	LIN. *FT. B 10.0' AND ABOVE	C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE E	TYPE OF GRATE F	TYPE OF GRATE G	CONCRETE TRANSITIONAL SECTION CATCH BASIN	CONCRETE TRANSITIONAL SECTION DROP INLET	TBDI STD 840.35 OR STD 840.46	TBDI FRAME WITH TWO GRATES 840.29	J.B. STD. 840.31 OR 840.32	M.H. FRAME & COVER STD. 840.54	MODIFIED CONCRETE FLUME		CORR. STEEL ELBOWS NO. & SIZE	CONC. COLLARS CL "B" C.Y. STD 840.72	CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71	PIPE REMOVAL LIN.FT.	REMARKS
-L- 13+73																													
-L- 14+26									1								1	1											
-L- 15+17									1								1	1											
-L- 15+52									1								1	1											
-L- 16+62.72																										1			
TOTAL									3								3	3								1			

ABBREVIATIONS

C.B.	CATCH BASIN
N.D.I.	NARROW DROP INLET
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
G.D.I. (N.S.)	GRATED DROP INLET (NARROW SLOT)
J.B.	JUNCTION BOX
M.H.	MANHOLE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.G.I.	TRAFFIC BEARING GRATE INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX

"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL.
TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL.
W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL.
G = GATING IMPACT ATTENUATOR TYPE 350
NG = NON-GATING IMPACT ATTENUATOR TYPE 350

GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH STRAIGHT	LENGTH SHOP CURVED	LENGTH DOUBLE FACED	WARRANT POINT APPROACH END	WARRANT POINT TRAILING END	"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH APPROACH END	FLARE LENGTH TRAILING END	W APPROACH END	W TRAILING END	ANCHORS XI MOD	XI	GREU 350 TL-2	GREU 350 TL-3	IA-350 TL-2	TYPE III	TYPE III SHOP CURVED	B-77	AT-1	IMPACT ATTENUATOR TYPE 350 EA	G	NG	SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
-L-	11+90	13+44	RT	156.25			N/A	N/A	4	7	50		1					1					1							
-L-	12+34	14+72	LT	237.5			14+20	13+40	4	7	50	50	1	1				2													
-DET-	22+17	23+89	LT	212.5			23+30	23+50	4	7	25	25	1	1			2													TEMPORARY GUARDRAIL
				606.25																										
		LESS DEDUCTIONS FOR ANCHORS																												
		GREU 350 TL-3 3 @ 50'=		-150																										
		TEMPORARY GREU 350 TL-2 2 @ 25'=		-50																										
		AT-1 1 @ 6.25'=		-6.25																										
		PROJECT TOTALS:		400													2	3					1							
		ADDITIONAL GUARDRAIL POSTS=5 EA.																												

PROJECT REFERENCE NO.	SHEET NO.
17BPJ3,RJ64	4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL — CC A1 — DocuSigned by: Aaron Carver — 12/16/2021

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL — SF A1 — DocuSigned by: Aaron Carver — 12/16/2021

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

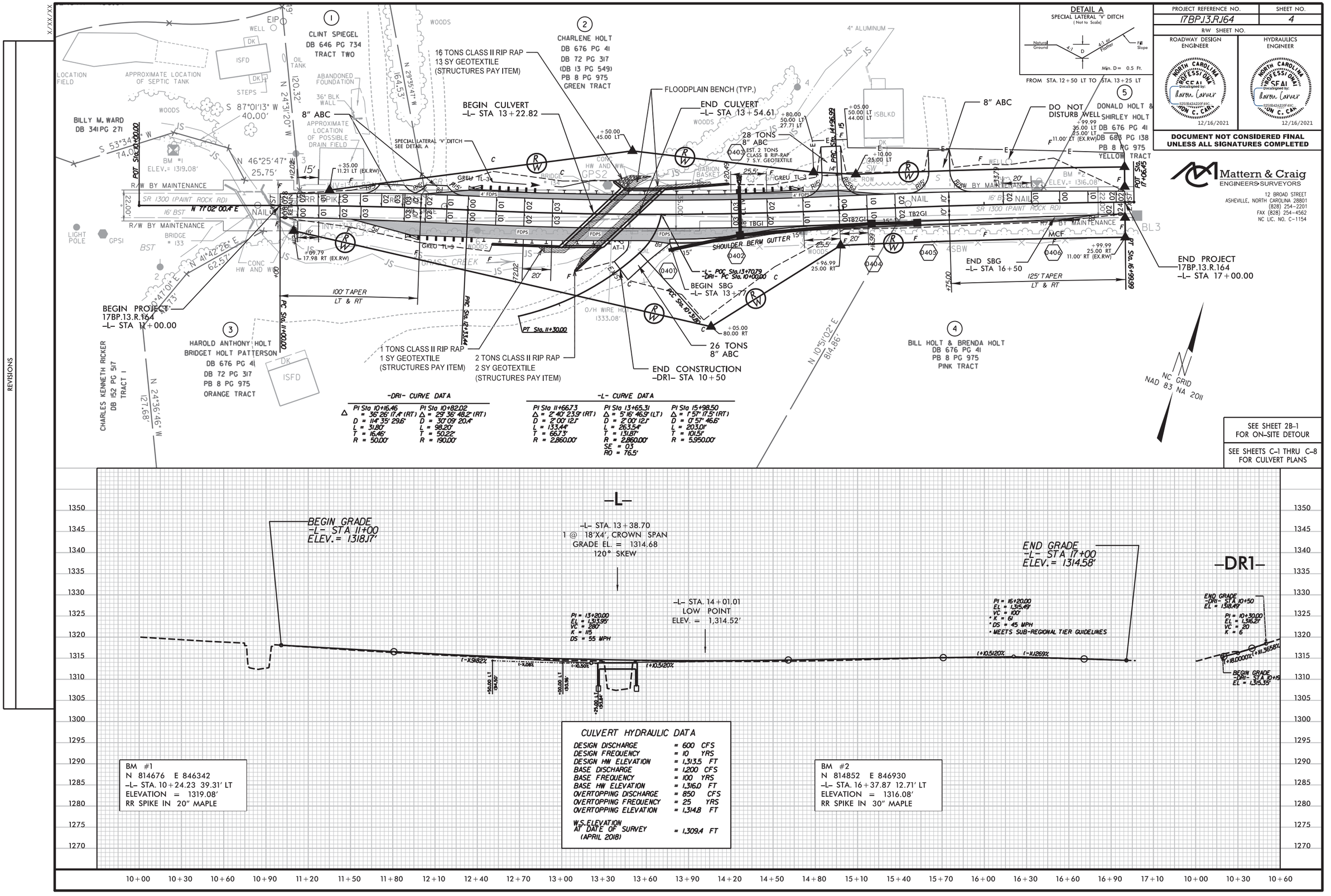
Mattern & Craig
ENGINEERS•SURVEYORS
12 BROAD STREET
ASHEVILLE, NORTH CAROLINA 28801
(828) 254-2201
FAX (828) 254-4562
NC LIC. NO. C-1154

DETAIL A
SPECIAL LATERAL "V" DITCH
(Not to Scale)

FROM STA. 12+50 LT TO STA. 13+25 LT

REVISIONS

X/XX/XX



CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 600 CFS
DESIGN FREQUENCY	= 10 YRS
DESIGN HW ELEVATION	= 1,313.5 FT
BASE DISCHARGE	= 1,200 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 1,316.0 FT
OVERTOPPING DISCHARGE	= 850 CFS
OVERTOPPING FREQUENCY	= 25 YRS
OVERTOPPING ELEVATION	= 1,314.8 FT
W.S. ELEVATION AT DATE OF SURVEY (APRIL 2018)	= 1,309.4 FT

BM #1
N 814676 E 846342
-L- STA. 10+24.23 39.31' LT
ELEVATION = 1319.08'
RR SPIKE IN 20" MAPLE

BM #2
N 814852 E 846930
-L- STA. 16+37.87 12.71' LT
ELEVATION = 1316.08'
RR SPIKE IN 30" MAPLE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.13.R.164	RW01	

TIP PROJECT: 17BP.13.R.164

09/08/99

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SURVEY CONTROL, EXISTING CENTERLINES, RIGHT OF WAY, EASEMENTS AND PROPERTY TIES

MADISON COUNTY

LOCATION: BRIDGE NO. 134 OVER GRASS CREEK ON SR 1300 (PAINT ROCK ROAD)

I, R.L. Zietlow, a Professional Land Surveyor in the state of North Carolina hereby certify to the best of my knowledge and belief that the following work item(s) (R/W Staking) performed under my responsible charge meet NCDOT Survey Standards as directed in the NCDOT Location & Surveys guidelines and procedures.

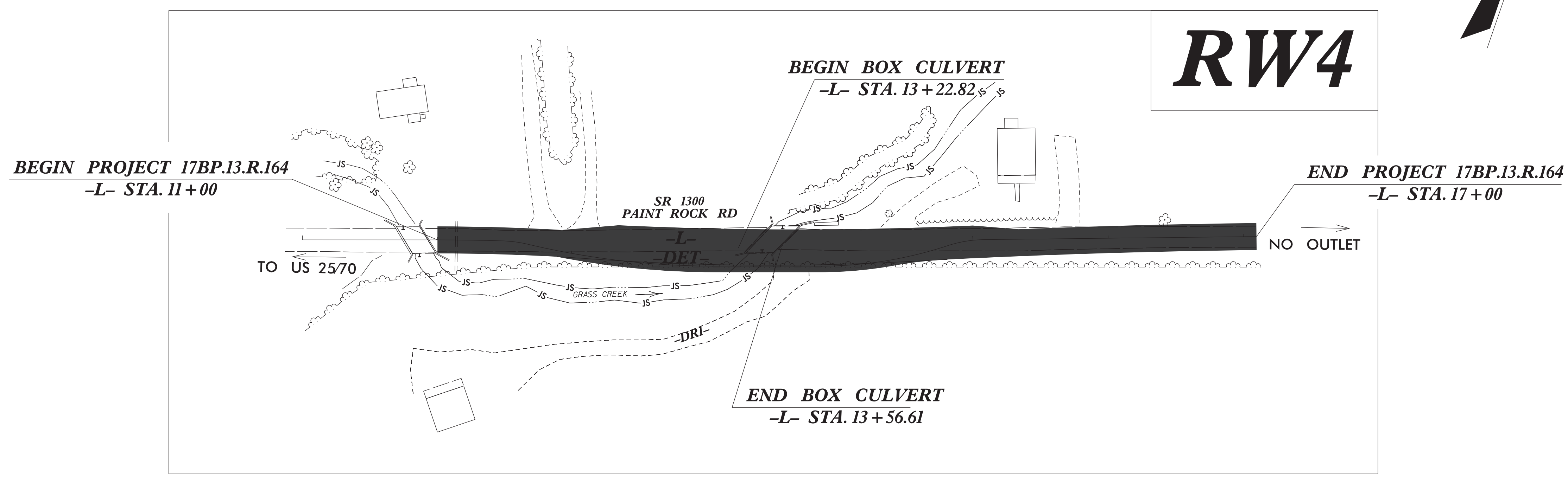
I further certify that the right of way and permanent easement points shown herein and outlined in the tables shown hereon (localized coordinates, station/offset) have been checked and are accurate representations of the right of way and permanent easement points depicted on the corresponding highway plans. I also certify that the right of way and permanent easement points shown herein have been field monumented under my supervision from existing survey control provided by others; that the depicted property data shown herein were surveyed by others; and these monuments denote the right of way and easement boundaries at the time of staking which may be subject to change due to right of way revisions (See deeds for final determination).

Witness my original signature, registration number and seal this 16th day of February, 2021.

DocuSigned by:
Ron Zietlow
84E55C984005472...

Professional Land Surveyor — L-5235 PLS # — Seal

NORTH CAROLINA PROFESSIONAL SEAL L-5235 LAND SURVEYOR RON L. ZIETLOW



GRAPHIC SCALE

30 15 0 30 60

PLANS

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY MATTERN AND CRAIG FOR MONUMENT "GPS2" WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF NORTHING: 814753.0620 (ft) EASTING: 846641.3627 (ft)
ELEVATION: 1314.01 (ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999862523
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "GPS2" TO -L- STATION 10+00 IS S 68°31'03.4" W 332.90 (ft)
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

Prepared In the Office of:

Mattern & Craig
ENGINEERS·SURVEYORS
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ASHEVILLE, NORTH CAROLINA 28801
(828) 254-2201
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NC LIC. NO. C-1154

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
TO BE DETERMINED

LETTING DATE:
SEPTEMBER 15, 2021

PROFESSIONAL LAND SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-5235 LAND SURVEYOR RON L. ZIETLOW

DocuSigned by:
Ron Zietlow
84E55C984005472...
2/18/2021
SIGNATURE: Date:

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

$$$$SYSTIME$$$$
$$$$DGN$$$$
$$$$USERNAME$$$$

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

SEE SHEET 2C-2 FOR FURTHER ALIGNMENT DETAILS

PROJECT REFERENCE NO.	SHEET NO.
17BP13R164	RW02C-1

Location and Surveys

MATTERN & CRAIG
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12 BROAD STREET
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PROJECT SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-5235 LAND SURVEYOR RON L. ZIETLOW

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

I, R.L.ZIETLOW, PLS, certify that the Project Control was performed under my supervision from an actual GPS survey made under my supervision and the following information was used to perform the survey:

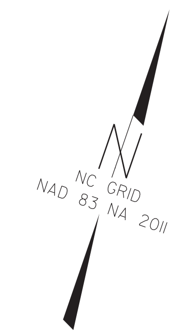
Class of survey: ***AA***
Type of GPS field procedure: RTN
Dates of survey: 1/4/18
Datum/Epoch:NAD83/NA 2011 NAVD 88
Published/Fixed-control use: N/A
Localized around: GPS 2
Northing:814753.0620
Easting:846641.3627
Combined grid factor:0.999862523
Geoid model:12USB
Units:US SURVEY FEET

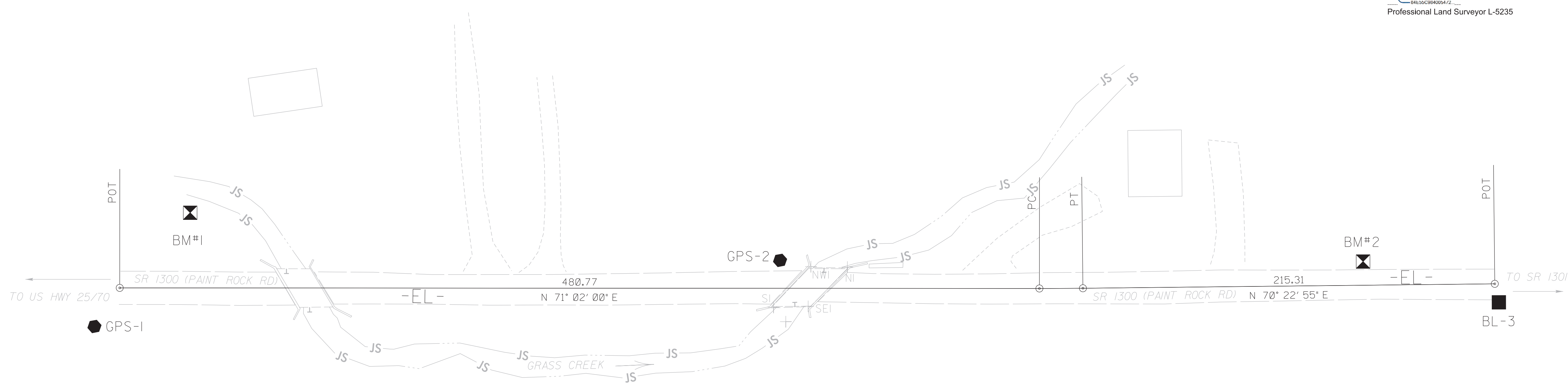
I also certify that the Baseline Control for this project was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:20,000 (Class AA) and Vertical accuracy to Class A. Field work was performed from 1/16/18 to 3/16/18 , and all coordinates are based on NAD 83/2011 and all elevations are based on NAVD 88; that this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 16th day of February, 2021.

DocuSigned by:
Ron Zietlow

Professional Land Surveyor L-5235





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.

REVISIONS

6/2/99

18-FEB-2021 15:06
I:\3921 NCDOT Survey\3921H Div 13 R_W Stake\06 Working Folders\Survey\Deliverables\17BP13R164 RW E SERIES\210217 SIGNED RLZ\17bp13-164_ls_rw02c_1.dgn
rzietlow AT MC-ACARVER01-NB

6/2/99

REVISIONS

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rlzietlow AT MC-ACARVER01-NB

PROJECT REFERENCE NO.	SHEET NO.
17BP13R164	RW02C-2

Location and Surveys

MATTERN & CRAIG
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12 BROAD STREET
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(828) 254-2201
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PROJECT SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-5235 LAND SURVEYOR RON L. ZIETLOW

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

EL

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	814627.056	846319.680							
LINE			N 71°02'00" E	480.77					
PC	814783.313	846774.344							
CURVE			N 70°42'28" E	22.74	00°39'06"(LT)	02°51'53"	22.74	11.37	2000.00
PT	814790.826	846795.809							
LINE			N 70°22'55" E	215.31					
POT	814863.117	846998.623							

I, R.L.ZIETLOW, PLS, certify that the Project Control was performed under my supervision from an actual GPS survey made under my supervision and the following information was used to perform the survey:

Class of survey: ***AA***
Type of GPS field procedure: RTN
Dates of survey: 1/4/18
Datum/Epoch:NAD83/NA 2011 NAVD 88
Published/Fixed-control use: N/A
Localized around: GPS 2
Northing:814753.0620
Easting:846641.3627
Combined grid factor:0.999862523
Geoid model:12USB
Units:US SURVEY FEET

I also certify that the Baseline Control for this project was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:20,000 (Class AA) and Vertical accuracy to Class A. Field work was performed from 1/16/18 to 3/16/18 , and all coordinates are based on NAD 83/2011 and all elevations are based on NAVD 88; that this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 16th day of February, 2021.

DocuSigned by:
Ron Zietlow
84E55C9840054 72...

Professional Land Surveyor L-5235

BASELINE

BL

POINT	DESC.	NORTH	EAST	ELEVATION
1	GPS1	814603.6734	846313.7569	1322.43
2	GPS2	814753.0620	846641.3627	1314.01
3	BL3	814854.6720	847003.7580	1313.69

BM1 ELEVATION = 1319.08
N 814676 E 846342
BM1 IS RR SPIKE SET IN BASE OF 20" WALNUT

BM2 ELEVATION = 1316.08
N 814852 E 846930
BM2 IS RR SPIKE SET IN BASE OF 30" WALNUT

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.

6/2/99

REVISIONS

PROPOSED ALIGNMENT CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
17BP13R164	RW02D-1

Location and Surveys

MATTERN AND CRAIG
ENGINEERS & SURVEYORS
12 BROAD STREET
ASHEVILLE NORTH CAROLINA 28801
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PROJECT SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-5235 LAND SURVEYOR RON L. ZIETLOW

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

I, R.L. Zietlow, PLS, certify that the data compiled came from available surveys/mapping performed by others and provided to me by NCDOT and do not certify to the accuracy or quality of the individual data sources.

This 18th day of February, 2021.

DocuSigned by:
Ron Zietlow

Professional Land Surveyor L-5235

L

TYPE	STATION	NORTH	EAST
POT	10+00.00	814631.1485	846331.5881
PC	11+00.00	814663.6502	846426.1589
PRC	12+33.44	814704.0618	846553.3221
PRC	14+96.99	814789.5420	846802.5195
PT	16+99.99	814860.9502	846992.5431
POT	17+06.45	814863.1172	846998.6226

NOTES:

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

2. THE PROPOSED ALIGNMENT CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATINO REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

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rlzietlow AT ML-ACARVER01-NB

RIGHT OF WAY CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
17BP13R164	RW03E-1

Location and Surveys

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NC LIC. NO. C-1154

PROJECT SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-5235 LAND SURVEYOR RON L. ZIETLOW

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

I , R.L. Zietlow , certify that the right of way and permanent easement monumentation for this project shown herein was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:10,000 (Class A). Field work was performed from 3/22/19 to 3/27/21, and all coordinates are based on NAD83/2011; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 30th day of March, 2021.

____
Professional Land Surveyor L-5235

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	11+09.79	17.98	814649.7905	846441.2130
L	11+35.00	-11.21	814685.4729	846455.8125
L	13+50.00	-45.00	814781.6754	846650.1273
L	14+05.00	80.00	814681.7980	846743.4553
L	14+80.00	-27.71	814809.1714	846776.6700
L	14+96.99	25.00	814766.2932	846811.7116
L	15+10.00	-25.00	814817.5827	846805.4859
L	16+99.99	25.00	814837.4014	847000.9368
L	16+99.99	-25.00	814884.4990	846984.1493
L	16+99.99	-11.00	814871.3117	846988.8498
L	16+99.99	11.00	814850.5854	846996.2375

NOTES:

1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
3. RIGHT OF WAY MONUMENTATION ESTABLISHED 3/22/19 TO 3/27/19 .

REVISIONS

6/2/99

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rlzietlow AT MC-ACARVER01-NB

PROJECT REFERENCE NO.	SHEET NO.
17BP.13.R.164	RW04

Location and Surveys

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NC LIC. NO. C-1154

PROJECT SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-5235 LAND SURVEYOR RON L. ZIETLOW

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

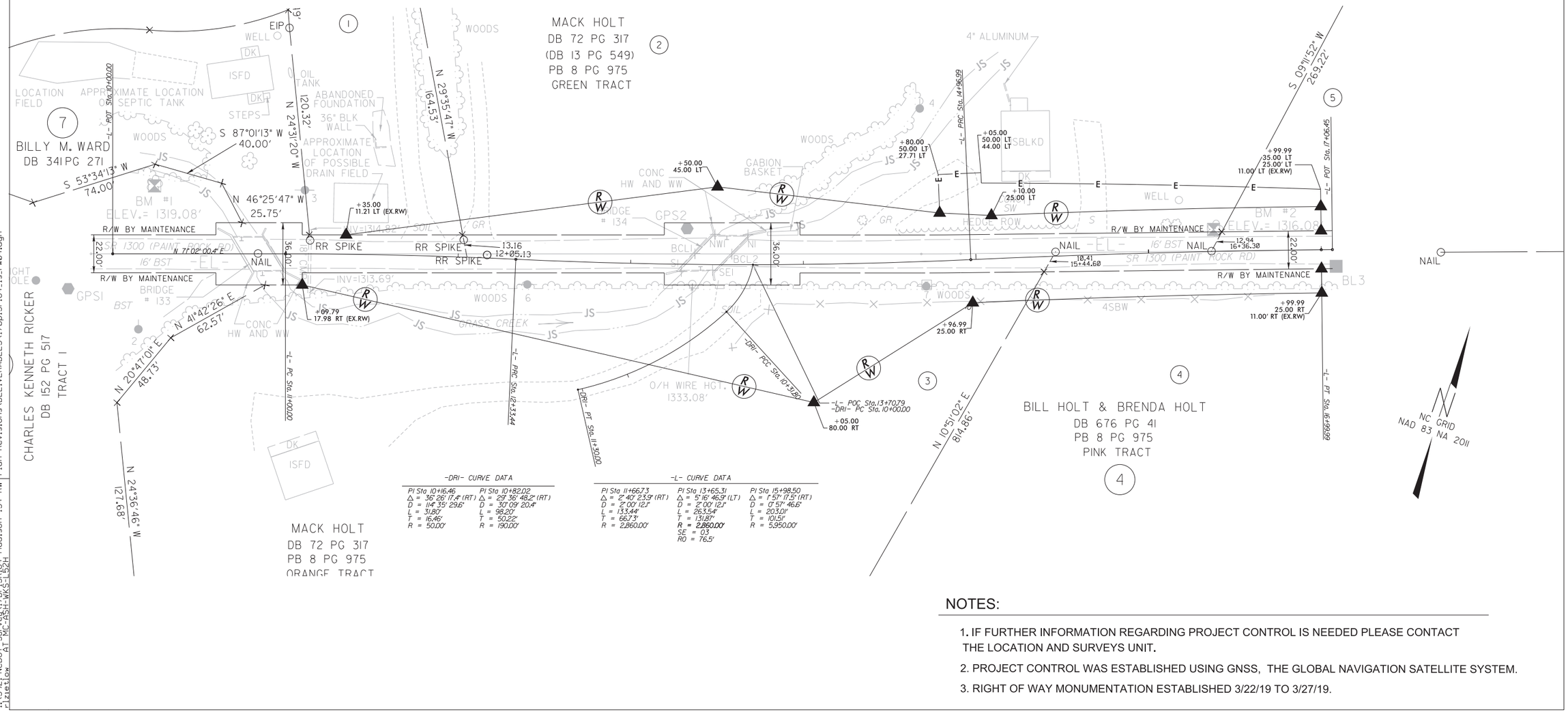
I, R.L. Zietlow, certify that the right of way and permanent easement monumentation for this project shown herein was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:10,000 (Class A). Field work was performed from 3/22/2019 to 3/27/19, and all coordinates are based on NAD83/2011; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 18th day of February, 2021.

Professional Land Surveyor L-5235

REVISIONS

6/27/19



NOTES:

1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
3. RIGHT OF WAY MONUMENTATION ESTABLISHED 3/22/19 TO 3/27/19.

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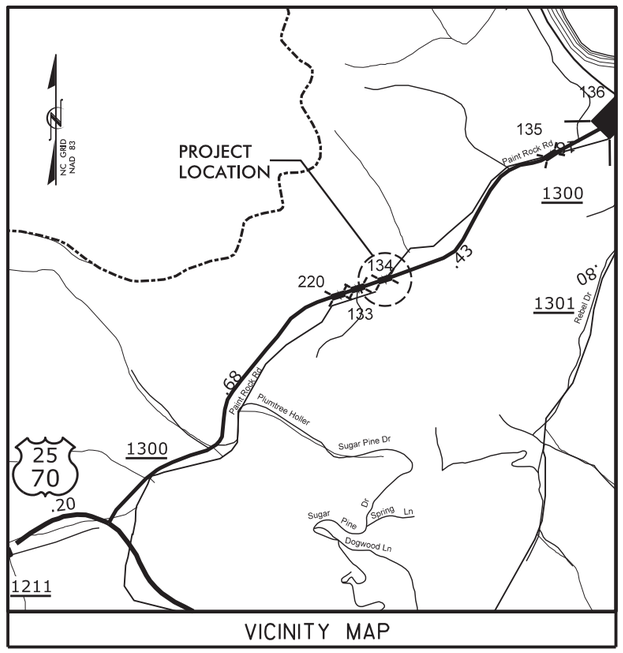
rzietlow AT MC-ASH-WKS-152H

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

MADISON COUNTY

LOCATION: BRIDGE NO. 134 OVER GRASS CREEK ON SR 1300 (PAINT ROCK ROAD)



VICINITY MAP

INDEX OF SHEETS

SHEET NO.	TITLE
TMP-1	TITLE SHEET, VICINITY MAP AND INDEX OF SHEETS
TMP-1A	LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS AND LEGEND
TMP-1B	TRANSPORTATION OPERATIONS PLAN: (MANAGEMENT STRATEGIES, GENERAL NOTES, AND LOCAL NOTES)
TMP-2	PORTABLE CONCRETE BARRIER AT TEMPORARY SHORING LOCATIONS - STANDARD DETAIL
TMP-3	PROJECT PHASING NOTES
TMP-4	TEMPORARY TRAFFIC CONTROL, PHASE I DETAILS
TMP-5	TEMPORARY TRAFFIC CONTROL, PHASE II DETAILS
PM-1	PAVEMENT MARKING PLAN

SHEET NO.
TMP-1

17BP.13.R.164

TIP PROJECT:

WORK ZONE SAFETY & MOBILITY
"from the MOUNTAINS to the COAST"

PLANS PREPARED BY:

JAMES B. VOSO, PE

MENG YANG, EI

NCDOT CONTACTS:

MIKE CALLOWAY
PROJECT ENGINEER

PROJECT DESIGN ENGINEER

DIVISION OF HIGHWAYS * STATE OF NORTH CAROLINA * DEPARTMENT OF TRANSPORTATION * WORK ZONE TRAFFIC CONTROL

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY:

Mattern & Craig
ENGINEERS SURVEYORS

12 BROAD STREET
ASHEVILLE, NORTH CAROLINA 28801
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FAX (828) 254-4562
NC LIC. NO. C-1154

APPROVED: DocuSigned by: James B. Voso, PE 140FD603706E041F...

DATE: 12/16/2021

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 022599 ENGINEER JAMES B. VOSO

PROJ. REFERENCE NO.	SHEET NO.
17BP.13.R.164	TMP-1A

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS SHOWN 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
1101.01	WORK ZONE ADVANCE WARNING SIGNS
1101.02	TEMPORARY LANE CLOSURES
1101.04	TEMPORARY SHOULDER CLOSURES
1101.05	WORK ZONE VEHICLE ACCESSES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1130.01	DRUMS
1135.01	CONES
1145.01	BARRICADES
1150.01	FLAGGING DEVICES
1170.01	PORTABLE CONCRETE BARRIER
1180.01	SKINNY-DRUM
1205.01	PAVEMENT MARKINGS - LINE TYPES & OFFSETS
1205.12	PAVEMENT MARKINGS - BRIDGES
1251.01	RAISED PAVEMENT MARKERS
1253.01	RAISED PAVEMENT MARKERS - SNOWPLOWABLE
1261.01	GUARDRAIL & BARRIER DELINEATOR SPACING
1261.02	GUARDRAIL & BARRIER DELINEATOR TYPES
1262.01	GUARDRAIL END DELINEATION

LEGEND

GENERAL

- DIRECTION OF TRAFFIC FLOW
- DIRECTION OF PEDESTRIAN TRAFFIC FLOW
- EXIST. PVMT.
- NORTH ARROW
- PROPOSED PVMT.
- WORK AREA

TRAFFIC CONTROL DEVICES

- BARRICADE (TYPE III)
- CONE
- DRUM SKINNY DRUM TUBULAR MARKER
- TEMPORARY CRASH CUSHION
- FLASHING ARROW PANEL (TYPE C)
- FLAGGER
- LAW ENFORCEMENT
- TRUCK MOUNTED IMPACT ATTENUATOR (TMIA)
- CHANGEABLE MESSAGE SIGN

TEMPORARY SIGNING

- PORTABLE SIGN
- STATIONARY SIGN
- STATIONARY OR PORTABLE SIGN

SIGNALS

- TEMP — TEMPORARY
- PORTABLE TRAFFIC SIGNAL

PAVEMENT MARKINGS

- EXISTING LINES
- TEMPORARY LINES

PAVEMENT MARKERS

- YELLOW/YELLOW
- TEMPORARY WHITE/WHITE

PAVEMENT MARKING SYMBOLS

- PAVEMENT MARKING SYMBOLS

TEMPORARY PAVEMENT MARKING

SYMBOL	DESCRIPTION
	PAINT
PA	WHITE EDGE LINE (4")
PI	YELLOW DOUBLE CENTER (4")
P2	STOP BAR (24" WHITE)

TEMPORARY RAISED MARKERS

MF	CRYSTAL & CRYSTAL

APPROVED: DocuSigned by: James B. Vosa, PE 140FD6037E041F... DATE 12/16/2021

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 022599 ENGINEER JAMES B. VOSA

DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

ROADWAY STANDARD DRAWINGS & LEGEND

PROJ. REFERENCE NO.	SHEET NO.
17BP.13.R.164	TMP-1B

GENERAL NOTES / LOCAL NOTES

CHANGES MAY BE REQUIRED WHEN PHYSICAL DIMENSIONS IN THE DETAIL DRAWINGS, STANDARD DETAILS, AND ROADWAY DETAILS ARE NOT ATTAINABLE TO MEET FIELD CONDITIONS OR RESULT IN DUPLICATE OR UNDESIRED OVERLAPPING OF DEVICES. MODIFICATION MAY INCLUDE: MOVING, SUPPLEMENTING, COVERING, OR REMOVAL OF DEVICES AS DIRECTED BY THE ENGINEER.

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT EXCEPT WHEN OTHERWISE NOTED IN THE PLAN OR DIRECTED BY THE ENGINEER.

TIME RESTRICTIONS

A) DO NOT CLOSE ROADS AS FOLLOWS:

ROAD NAME	DAY AND TIME RESTRICTIONS
PAINT ROCK ROAD (SR 1300)	JUNE 15TH - AUGUST 14TH 6:00 AM TO 9:00 AM AND 4:00 PM TO 6:00 PM
PAINT ROCK ROAD (SR 1300)	AUGUST 15TH - JUNE 14TH 6:00 AM TO 9:00 AM AND 2:00 PM TO 6:00 PM

LANE AND SHOULDER CLOSURE REQUIREMENTS

B) REMOVE LANE CLOSURE DEVICES FROM THE LANE WHEN WORK IS NOT BEING PERFORMED BEHIND THE LANE CLOSURE OR WHEN A LANE CLOSURE IS NO LONGER NEEDED OR AS DIRECTED BY THE ENGINEER.

C) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN 15 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN SHOULDER USING ROADWAY STANDARD DRAWING NO. 1101.04 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL OR A LANE CLOSURE IS INSTALLED.

D) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON THE SHOULDER ADJACENT TO AN UNDIVIDED FACILITY AND WITHIN 5 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.

E) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN A LANE OF TRAVEL OF AN UNDIVIDED OR DIVIDED FACILITY, CLOSE THE LANE ACCORDING TO THE TRAFFIC CONTROL PLANS, ROADWAY STANDARD DRAWINGS, OR AS DIRECTED BY THE ENGINEER. CONDUCT THE WORK SO THAT ALL PERSONNEL AND/OR EQUIPMENT REMAIN WITHIN THE CLOSED TRAVEL LANE.

F) DO NOT WORK SIMULTANEOUSLY WITHIN 15 FT ON BOTH SIDES OF AN OPEN TRAVELWAY, RAMP, OR LOOP WITHIN THE SAME LOCATION UNLESS PROTECTED WITH GUARDRAIL OR BARRIER.

PAVEMENT EDGE DROP OFF REQUIREMENTS

G) BACKFILL AT A 6:1 SLOPE UP TO THE EDGE AND ELEVATION OF EXISTING PAVEMENT IN AREAS ADJACENT TO AN OPENED TRAVEL LANE THAT HAS AN EDGE OF PAVEMENT DROP-OFF AS FOLLOWS:

BACKFILL DROP-OFFS THAT EXCEED 2 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS OF 45 MPH OR GREATER.

BACKFILL DROP-OFFS THAT EXCEED 3 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS LESS THAN 45 MPH.

BACKFILL WITH SUITABLE COMPACTED MATERIAL, AS APPROVED BY THE ENGINEER, AT NO EXPENSE TO THE DEPARTMENT.

H) DO NOT EXCEED A DIFFERENCE OF 2 INCHES IN ELEVATION BETWEEN OPEN LANES OF TRAFFIC FOR NOMINAL LIFTS OF 1.5 INCHES. INSTALL ADVANCE WARNING "UNEVEN LANES" SIGNS (W8-11) IN ADVANCE AND A MINIMUM OF EVERY HALF MILE THROUGHOUT THE UNEVEN AREA.

TRAFFIC PATTERN ALTERATIONS

I) NOTIFY THE ENGINEER TWENTY ONE (21) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

SIGNING

J) INSTALL ADVANCE WORK ZONE WARNING SIGNS WHEN WORK IS WITHIN 40 FT FROM THE EDGE OF TRAVEL LANE AND NO MORE THAN THREE (3) DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.

K) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.

L) INSTALL BLACK ON ORANGE "DIP" SIGNS (W8-2) AND/OR "BUMP" SIGNS (W8-1) 100 ft IN ADVANCE OF THE UNEVEN AREA, OR AS DIRECTED BY THE ENGINEER.

TRAFFIC BARRIER

M) INSTALL TEMPORARY BARRIER ACCORDING TO THE TRANSPORTATION MANAGEMENT PLANS A MAXIMUM OF TWO (2) WEEKS PRIOR TO BEGINNING WORK IN ANY LOCATION. ONCE TEMPORARY BARRIER IS INSTALLED AT ANY LOCATION PROCEED IN A CONTINUOUS MANNER TO COMPLETE THE PROPOSED WORK IN THAT LOCATION UNLESS OTHERWISE STATED IN THE TRANSPORTATION MANAGEMENT PLANS OR AS DIRECTED BY THE ENGINEER.

DO NOT PLACE BARRIER DIRECTLY ON ANY SURFACE OTHER THAN ASPHALT OR CONCRETE.

ONCE TEMPORARY BARRIER IS INSTALLED AT ANY LOCATION AND NO WORK IS PERFORMED BEHIND THE TEMPORARY BARRIER FOR A PERIOD LONGER THAN TWO (2) MONTHS, REMOVE / RESET TEMPORARY BARRIER AT NO COST TO THE DEPARTMENT UNLESS OTHERWISE STATED IN THE TRANSPORTATION MANAGEMENT PLANS, TEMPORARY BARRIER IS PROTECTING A HAZARD, OR AS DIRECTED BY THE ENGINEER.

INSTALL TEMPORARY BARRIER WITH THE TRAFFIC FLOW BEGINNING WITH THE UPSTREAM SIDE OF TRAFFIC. REMOVE TEMPORARY BARRIER AGAINST THE TRAFFIC FLOW BEGINNING WITH THE DOWNSTREAM SIDE OF TRAFFIC.

INSTALL AND SPACE DRUMS NO GREATER THAN TWICE THE POSTED SPEED LIMIT (MPH) TO CLOSE OR KEEP THE SECTION OF THE ROADWAY CLOSED UNTIL THE TEMPORARY BARRIER CAN BE PLACED OR AFTER THE TEMPORARY BARRIER IS REMOVED.

N) PROTECT THE APPROACH END OF MOVABLE/PORTABLE CONCRETE BARRIER AT ALL TIMES DURING THE INSTALLATION AND REMOVAL OF THE BARRIER BY EITHER A TRUCK MOUNTED ATTENUATOR (MAXIMUM 72 HOURS) OR A TEMPORARY CRASH CUSHION.

PROTECT THE APPROACH END OF MOVABLE/PORTABLE CONCRETE BARRIER FROM ONCOMING TRAFFIC AT ALL TIMES BY A TEMPORARY CRASH CUSHION UNLESS THE APPROACH END OF MOVABLE/PORTABLE CONCRETE BARRIER IS OFFSET FROM ONCOMING TRAFFIC AS FOLLOWS OR AS SHOWN IN THE PLANS: (SEE ALSO 1101.05)

POSTED SPEED LIMIT	MINIMUM OFFSET
40 OR LESS	15 FT
45 - 50	20 FT
55	25 FT
60 MPH or HIGHER	30 FT

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TRAFFIC CONTROL DEVICES

O) WHEN LANE CLOSURES ARE NOT IN EFFECT SPACE CHANNELIZING DEVICES IN WORK AREAS NO GREATER IN FEET THAN TWICE THE POSTED SPEED LIMIT (MPH) EXCEPT, 10 FT ON-CENTER IN RADII, AND 3 FT OFF THE EDGE OF AN OPEN TRAVELWAY. REFER TO STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES SECTIONS 1130 (DRUMS), 1135 (CONES) AND 1180 (SKINNY DRUMS) FOR ADDITIONAL REQUIREMENTS.

P) PLACE TYPE III BARRICADES, WITH "ROAD CLOSED" SIGN R11-2 ATTACHED, OF SUFFICIENT LENGTH TO CLOSE ENTIRE ROADWAY.

PAVEMENT MARKING & MARKERS

Q) INSTALL TEMPORARY PAVEMENT MARKINGS ON INTERIM LAYERS OF PAVEMENT AS FOLLOWS:

ROAD NAME	MARKING	MARKER
SR 1300 (PAINT ROCK ROAD)	PAINT	RAISED

R) PLACE ONE APPLICATION OF PAINT FOR TEMPORARY TRAFFIC PATTERNS. PLACE A SECOND APPLICATION OF PAINT SIX (6) MONTHS AFTER THE INITIAL APPLICATION AND EVERY SIX MONTHS AS DIRECTED BY THE ENGINEER.

S) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.

T) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS BY THE END OF EACH DAY'S OPERATION.

MISCELLANEOUS

U) IN THE EVENT A TIE-IN CANNOT BE MADE IN ONE DAY'S TIME, BRING THE TIE-IN AREA TO AN APPROPRIATE ROADWAY ELEVATION AS DETERMINED BY THE ENGINEER. PLACE BLACK ON ORANGE "LOOSE GRAVEL" SIGNS (W8-7) AND BLACK ON ORANGE "PAVEMENT ENDS" SIGNS (W8-3) 100 ft AND 200 ft RESPECTIVELY IN ADVANCE OF THE UNEVEN AREAS. USE DRUMS TO DELINEATE THE EDGE OF ROADWAY ALONG UNPAVED AREAS.

LOCAL NOTES:

1) EMERGENCY VEHICLE ACCESS MUST BE MAINTAINED AT ALL TIMES.

2) NOTIFY THE MADISON COUNTY SCHOOL BOARD 30 DAYS PRIOR TO ANY LANE CLOSURES.

3) MAINTAIN ACCESS TO DRIVEWAYS DURING CONSTRUCTION

MANAGEMENT STRATEGIES

PHASE I SHOWS TRAFFIC TO BE MAINTAINED ON THE EXISTING ROAD, BUT REDUCED TO ONE LANE USING TEMPORARY SIGNALS AND PAVEMENT MARKINGS AS NEW ALIGNMENT IS CONSTRUCTED.

PHASE 2 SHOWS TRAFFIC SHIFTED TO ONE LANE ON THE NEW ALIGNMENT USING TEMPORARY SIGNALS AND PAVEMENT MARKINGS WHILE THE REMAINDER IS CONSTRUCTED. A FLAGGING OPERATION WILL BE USED TO CONSTRUCT THE NEW TIE-INS.

APPROVED: DocuSigned by: James B. Vosso, PE 140FD6037DE041F... DATE: 12/16/2021

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 022599 ENGINEER JAMES B. VOSSO

DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

TRANSPORTATION OPERATIONS PLAN
(MANAGEMENT STRATEGIES & GENERAL NOTES/ LOCAL NOTES)

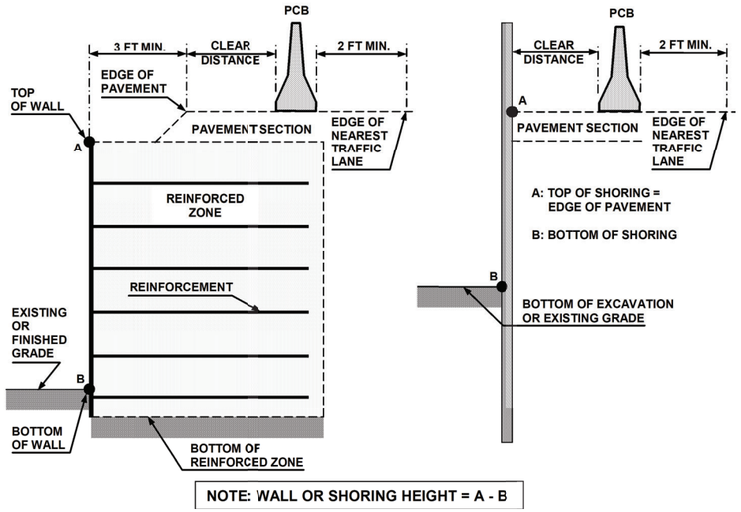

FIGURE A

NOTES

1- REFER TO THE TRAFFIC CONTROL PLANS FOR TEMPORARY SHORING LOCATIONS AND NOTES.

2- REFER TO THE "TEMPORARY SHORING" PROJECT SPECIAL PROVISION FOR INFORMATION ABOUT TEMPORARY SHORING AND PORTABLE CONCRETE BARRIER (PCB).

3- PCB IS REQUIRED IF TEMPORARY SHORING IS LOCATED WITHIN THE CLEAR ZONE IN ACCORDANCE WITH THE AASHTO ROADSIDE DESIGN GUIDE. DO NOT PLACE BARRIER DIRECTLY ON ANY SURFACE OTHER THAN ASPHALT OR CONCRETE. (CONTACT NCDOT PAVEMENT MANAGEMENT UNIT FOR APPLICABLE PAVEMENT DESIGN).

4- BASED ON THE CLEAR DISTANCE, OFFSET, DESIGN SPEED AND PAVEMENT TYPE, CHOOSE AN UNANCHORED OR ANCHORED PCB FROM THE TABLE SHOWN IN FIGURE B. CLEAR DISTANCE IS DEFINED AS SHOWN IN FIGURE A AND OFFSET IS DEFINED AS SHOWN IN FIGURE B.

5- AT THE CONTRACTOR'S OPTION OR IF THE MINIMUM REQUIRED CLEAR DISTANCE IS NOT AVAILABLE, SET PCB NEXT TO AND UP AGAINST THE TRAFFIC SIDE OF THE TEMPORARY SHORING EXCEPT FOR BARRIER ABOVE TEMPORARY WALLS. PCB WITH THE MINIMUM REQUIRED CLEAR DISTANCE IS REQUIRED ABOVE TEMPORARY WALLS.

6- USE NCDOT PORTABLE CONCRETE BARRIER (PCB) IN ACCORDANCE WITH ROADWAY STANDARD DRAWING NO. 1170.01 AND SECTION 1170 OF THE STANDARD SPECIFICATIONS.

7- PCB REQUIREMENTS FOR TEMPORARY WALLS APPLY TO TEMPORARY MECHANICALLY STABILIZED EARTH (MSE) WALLS AND TEMPORARY SOIL NAIL WALLS.

8- SET PCB WITH A MINIMUM HORIZONTAL DISTANCE OF 2 FT BETWEEN THE FRONT FACE OF THE BARRIER AND THE EDGE OF THE NEAREST TRAFFIC LANE AS SHOWN IN FIGURE A UNLESS OTHERWISE SHOWN IN THE PLANS AND OR AS APPROVED BY THE ENGINEER.

9- FOR PCB ABOVE AND BEHIND TEMPORARY WALLS, PROVIDE A MINIMUM DISTANCE OF 3 FT BETWEEN THE EDGE OF PAVEMENT AND THE WALL FACE AS SHOWN IN FIGURE A. IF THESE MINIMUM REQUIRED DISTANCES ARE NOT AVAILABLE, CONTACT THE ENGINEER.

10- TABLE SHOWN IN FIGURE B IS BASED ON NCDOT RESEARCH PROJECT NO. 2005-010 WITH VEHICLE TYPE USED FOR NCHRP 350 CRASH TESTS. BARRIER DEFLECTIONS AND RESULTING MINIMUM REQUIRED CLEAR DISTANCES MIGHT VARY SIGNIFICANTLY FOR LARGER HEAVIER VEHICLES, RUNS OF BARRIER LESS THAN 200 FT IN LENGTH AND WET OR DRY PAVEMENT.

PROJ. REFERENCE NO.	SHEET NO.
17BP.13.R.164	TMP-2

MINIMUM REQUIRED CLEAR DISTANCE, inches

Barrier Type	Pavement Type	Offset * ft	Design Speed, mph					
			<30	31-40	41-50	51-60	61-70	71-80
Unanchored PCB	Asphalt	<8	24	26	29	32	36	40
		8-14	26	28	31	35	38	42
		14-20	27	29	34	36	39	43
		20-26	28	31	35	38	40	44
		26-32	29	32	36	39	42	45
		32-38	30	34	38	41	43	46
		38-44	31	34	41	43	45	48
		44-50	31	35	41	43	46	49
		50-56	32	36	42	44	47	50
		>56	32	36	42	45	47	51
	Concrete	<8	17	18	21	22	25	26
		8-14	19	20	23	25	26	29
		14-20	22	22	24	26	28	31
		20-26	23	24	26	27	30	34
		26-32	24	25	27	28	32	35
		32-38	24	26	27	30	33	36
		38-44	25	26	28	30	34	37
		44-50	26	26	28	32	35	37
		50-56	26	26	28	32	35	38
		>56	26	27	29	32	36	38
Anchored PCB	Asphalt	All Offsets	24 for All Design Speeds					
Anchored PCB	Concrete (including bridge approach slabs)	All Offsets	12 for All Design Speeds					

* See Figure Below

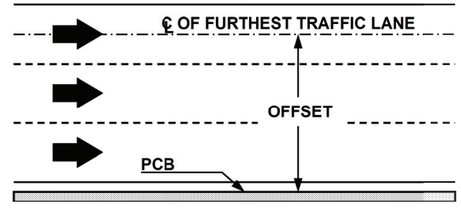

FIGURE B

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DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

PORTABLE CONCRETE BARRIER AT TEMPORARY SHORING LOCATIONS

PROJ. REFERENCE NO.	SHEET NO.
17BP.13.R.164	TMP-3

PROJECT PHASING

PHASE I

STEP 1: - ERECT WORK ZONE ADVANCED WARNING SIGNS USING DETAIL DRAWINGS FOR WORK ZONE SIGNS. (SEE RDWY STD. 1101.01)

- INSTALL PORTABLE TRAFFIC SIGNALS AS REQUIRED IN APPROVED TRAFFIC SIGNAL TIMING PLANS (SEE RDWY STD. 1101.02 SHEET 14 OF 14)

NOTE: STEP 2 SHALL BE COMPLETED IN A CONTINUOUS OPERATION.

STEP 2: USING RDWY STD 1101.02 SHEET 1 OF 14 AND FLAGGERS, PERFORM THE FOLLOWING ON SR 1300:

- REMOVE AS NECESSARY EXISTING PAVEMENT MARKINGS, AND PLACE TEMPORARY PAVEMENT MARKINGS (PAINT), AND MARKERS FROM -L- STA. 9+50 +/- TO -L- STA. 18+50 +/-. (SEE TMP-4)

- ACTIVATE PORTABLE TRAFFIC SIGNALS AND DIRECT SR 1300 (PAINT ROCK ROAD) TRAFFIC INTO A ONE LANE, TWO WAY PATTERN IN THE EXISTING WESTBOUND LANE OF SR 1300 (PAINT ROCK ROAD). SEE (TMP-4)

- INSTALL TEMPORARY CONCRETE BARRIER FROM -L- STA. 12+22 +/- TO -L- STA. 14+47 +/-. (SEE TMP-4) REMOVE EXISTING BRIDGE RAIL (RIGHT SIDE) ON BRIDGE 134, SAWCUT AND REMOVE RIGHT SIDE OF EXISTING BRIDGE TO LIMIT SHOWN. (SEE SECTION B-B, TMP-4)

STEP 3: - INSTALL TEMPORARY SHORING BEHIND TEMPORARY CONCRETE BARRIER FROM -L- STA. 12+35 +/- TO -L- STA. 13+31 +/- AND FROM -L- STA. 13+51+/- TO -L- STA. 14+25 +/-. (SEE TMP-4)

STEP 4: - REMOVE EXISTING BRIDGE RAIL (RIGHT SIDE) ON BRIDGE 134, SAWCUT AND REMOVE RIGHT SIDE OF EXISTING BRIDGE TO LIMIT SHOWN. (SEE SECTION B-B, TMP-4)

- CONSTRUCT STRUCTURES PER THE STRUCTURE PLANS STAGE 1.

- CONSTRUCT PROPOSED STORM DRAINAGE.

- CONSTRUCT -L- (SR 1300 PAINT ROCK ROAD) FROM -L- STA 11+00 TO -L- STA 17+00 EASTBOUND LANE (RIGHT SIDE) EXCLUDING FINAL PAVEMENT LAYER.

- INSTALL GUARDRAIL FROM -L- STA. 11+89 +/- TO -L- STA. 13+44 +/- RT (SEE RDY PLANS 2B-1 AND TMP-5.

- INSTALL TEMPORARY GUARDRAIL FROM -L- STA. 12+17 +/- TO -L- STA. 14+36 +/- (SEE RDY PLANS 2B-1 AND TMP-5).

PHASE II

NOTE: STEP 1 SHALL BE COMPLETED IN A CONTINUOUS OPERATION.

STEP 1: USING RDWY STD 1101.02 SHEET 1 OF 14 AND FLAGGERS, PERFORM THE FOLLOWING ON SR 1300:

- PLACE TEMPORARY PAVEMENT (PAINT) AND MARKERS FROM -L- STA. 10+00 +/- TO -L- STA. 18+00 +/-. (SEE TMP-5) REMOVE AS NECESSARY, PAVEMENT MARKINGS AND MARKERS PLACED IN STEP 2, PHASE I.

- ACTIVATE PORTABLE TRAFFIC SIGNALS AND DIRECT SR 1300 (PAINT ROCK ROAD) TRAFFIC INTO A ONE LANE, TWO-WAY PATTERN IN THE EASTBOUND LANE OF SR 1300 (PAINT ROCK ROAD). (SEE TMP-5)

STEP 2: - RETAIN TEMPORARY SHORING CONSTRUCTED IN PHASE 1. REMOVE PORTIONS, AS NECESSARY TO CONSTRUCT PHASE 2 OF THE PROPOSED CULVERT.

- REMOVE TEMPORARY CONCRETE BARRIER FROM PHASE I, STEP 2.

- REMOVE WESTBOUND SIDE (LEFT SIDE) OF EXISTING STRUCTURE (SEE STRUCTURE PLANS).

STEP 3: - CONSTRUCT STRUCTURE PER THE STRUCTURE PLANS STAGE 2.

- CONSTRUCT -L- SR 1300 (PAINT ROCK RD) FROM STA 11+00 TO STA 17+00 WESTBOUND LANE (LEFT SIDE) EXCLUDING FINAL PAVEMENT LAYER.

- USING RDWY STD 1101.02 SHEET 1 OF 14 AND FLAGGERS, CONSTRUCT GUARDRAIL, REMOVE TEMPORARY GUARDRAIL PLACED IN PHASE 1, STEP 4, AND REMOVE TEMPORARY SHORING.

STEP 4: - USING RDWY STD 1101.02 SHEET 1 OF 14 AND FLAGGERS, PLACE THE FINAL LAYER OF SURFACE COURSE AND FINAL PAVEMENT MARKINGS (PAINT). (SEE PM-1)

STEP 5: - REMOVE ALL TEMPORARY TRAFFIC CONTROL DEVICES AND SIGNALS.

- OPEN SR 1300 (PAINT ROCK RD) TO 2-LANE, 2-WAY TRAFFIC.

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DATE: 12/16/2021

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 022599 ENGINEER JAMES B. VOSO

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PHASING

PROJ. REFERENCE NO.	SHEET NO.
17BP.13.R.164	TMP-4

END ROAD WORK
G20-2 A 48" X 24"
PLACE SIGN (LEFT) AT -L- STA 0+00

R11-2 48" x 30"
ROAD CLOSED
W1-6L 48" x 24"
TYPE III BARRICADE

R11-2 48" x 30"
ROAD CLOSED
W1-6R 48" x 24"
TYPE III BARRICADE

W3-3 48" X 48"
PLACE SIGN (LEFT) AT -L- STA 22+00

BE PREPARED TO STOP
W3-4 48" X 48"
PLACE SIGN (LEFT) AT -L- STA 25+50

ONE LANE ROAD AHEAD
W20-4 48" X 48"
20 M.P.H. W13-1 24" X 24"
PLACE SIGN (LEFT) AT -L- STA 28+00

NC GRID NAD 83 NA 2011

DRUM 20' SPACING

BEGIN PROJECT 17BP.13.R.164 -L- STA 11+00

DRUM 10' SPACING MAX IN TAPER

BEGIN TEMP. CONC. BARRIER W/CRASH CUSHION -L- STA 12+22 +/-

CRYSTAL/CRYSTAL @ 40' SPACING

END TEMP. CONC. BARRIER W/Crash cushion -L- STA 14+47 +/-

40' BUFFER SPACE

60' TAPER

50'

40'

TEMP

STOP HERE ON RED @ -L- STA 18+50 R10-6 24" X 36"

SR 1300 (PAINT ROCK RD)

P2

PA

MF

A A

B B

C C

GREU TL-2

GREU TL-3

TB2GI

AT-1

GRASS CREEK

MCF

STOP HERE ON RED @ -L- STA 9+50 R10-6 24" X 36"

50'

60' TAPER

40' BUFFER SPACE

TEMP

40'

BEGIN TEMP. GUARDRAIL -L- STA 12+17 +/-

INSTALL TEMP.SHORING FROM -L- STA 12+35 +/- TO -L- STA 13+31 +/-

INSTALL TEMPORARY OBJECT MARKER SIGN

INSTALL TEMP.SHORING FROM -L- STA 13+51+/- TO -L- STA 14+25 +/-

END TEMP. GUARDRAIL -L- STA 14+36 +/-

DRUM 20' SPACING

END PROJECT 17BP.13.R.164 -L- STA 17+00

DRUM 10' SPACING MAX IN TAPER

TEMP.SHORING FROM -L- STA 13+92 +/- TO -L- STA 14+25 +/- NEEDED IN PHASE 2

ONE LANE ROAD AHEAD
W20-4 48" X 48"
20 M.P.H. W13-1 24" X 24"
PLACE SIGN (RIGHT) AT -L- STA 0+00

BE PREPARED TO STOP
W3-4 48" X 48"
PLACE SIGN (RIGHT) AT -L- STA 2+50

W3-3 48" X 48"
PLACE SIGN (RIGHT) AT -L- STA 6+00

END ROAD WORK
G20-2 A 48" X 24"
PLACE SIGN (RIGHT) AT -L- STA 28+00

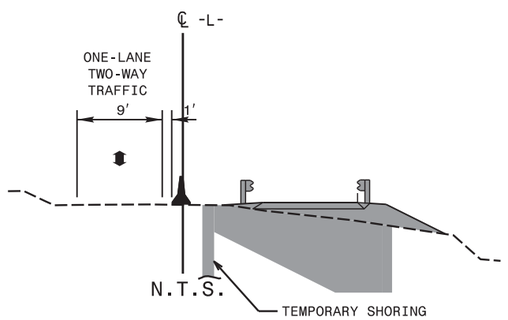
MAINTAIN ACCESS TO DRIVEWAYS DURING CONSTRUCTION

SEE SHEET PM-1 FOR TEMPORARY PAVEMENT MARKING SCHEDULE

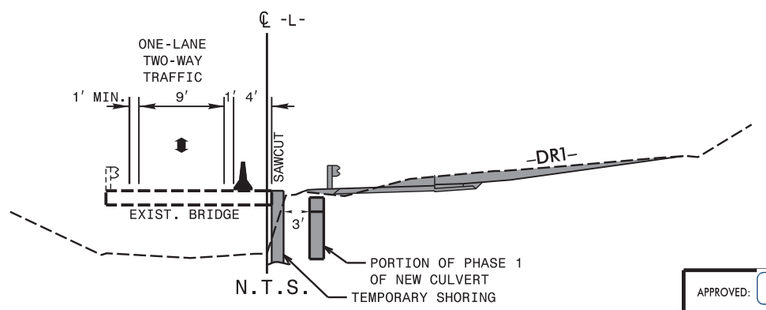
40 20 0 40 80
SCALE 1"= 40'

SEE SHEET 2B-1 FOR DETOUR ALIGNMENT

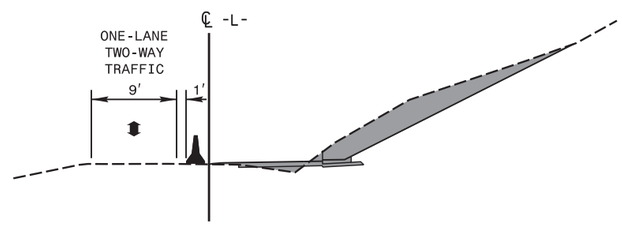
SECTION A-A
-L- STA 12+50
NOT TO SCALE



SECTION B-B
-L- STA 13+50
NOT TO SCALE



SECTION C-C
-L- STA 14+50
NOT TO SCALE



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NORTH CAROLINA PROFESSIONAL SEAL 022599 ENGINEER JAMES B. VOSCO

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DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

PHASE I DETAILS

PROJ. REFERENCE NO.	SHEET NO.
17BP.13.R.164	TMP-5

END ROAD WORK
G20-2 A 48" X 24"
PLACE SIGN (LEFT) AT -L- STA 0+00

R11-2 48" x 30"
ROAD CLOSED
W1-6R 48" x 24"
TYPE III BARRICADE

R11-2 48" x 30"
ROAD CLOSED
W1-6L 48" x 24"
TYPE III BARRICADE

W24-1L 48" X 48"
20 M.P.H. W13-1 24" X 24"
PLACE SIGN (LEFT) AT -L- STA 17+10

W3-3 48" X 48"
PLACE SIGN (LEFT) AT -L- STA 22+00

BE PREPARED TO STOP
W3-4 48" X 48"
PLACE SIGN (LEFT) AT -L- STA 25+50

ONE LANE ROAD AHEAD
W20-4 48" X 48"
20 M.P.H. W13-1 24" X 24"
PLACE SIGN (LEFT) AT -L- STA 28+00

NC GRID NAD 83 NA 2011

DRUM 10' SPACING MAX IN TAPER

PORTION OF TEMP.SHORING TO BE REMOVED TO ALLOW FOR PHASE 2 CULVERT CONSTRUCTION

TEMPORARY SHORING FROM -L- STA 12+35 TO -L- STA 12+95 NOT NEEDED IN PHASE 2

TEMPORARY SHORING NO. 1 -L- STA 12+35 TO -L- STA 13+31

TEMPORARY SHORING NO. 2 -L- STA 13+51 TO -L- STA 14+25

END PROJECT 17BP.13.R.164 -L- STA 17+00

P2 PA

50' 60' TAPER 40' BUFFER SPACE 40'

SR 1300 (PAINT ROCK RD)

GRASS CREEK

@ -L- STA 9+50
STOP HERE ON RED R10-6 24" X 36"

TEMP

BEGIN PROJECT 17BP.13.R.164 -L- STA 11+00

TEMPORARY OBJECT MARKER SIGN
CRYSTAL/CRYSTAL @ 40' SPACING MF

DRUM 20' SPACING

40' BUFFER SPACE 60' TAPER 50' 40'

TEMP

@ -L- STA 18+50
STOP HERE ON RED R10-6 24" X 36"

DRUM 10' SPACING MAX IN TAPER

MCF TBGI TBZGI

ONE LANE ROAD AHEAD
W20-4 48" X 48"
20 M.P.H. W13-1 24" X 24"
PLACE SIGN (RIGHT) AT -L- STA 0+00

BE PREPARED TO STOP
W3-4 48" X 48"
PLACE SIGN (RIGHT) AT -L- STA 2+50

W3-3 48" X 48"
PLACE SIGN (RIGHT) AT -L- STA 6+00

W24-1R 48" X 48"
20 M.P.H. W13-1 24" X 24"
PLACE SIGN (RIGHT) AT -L- STA 8+50

END ROAD WORK
G20-2 A 48" X 24"
PLACE SIGN (RIGHT) AT -L- STA 28+00

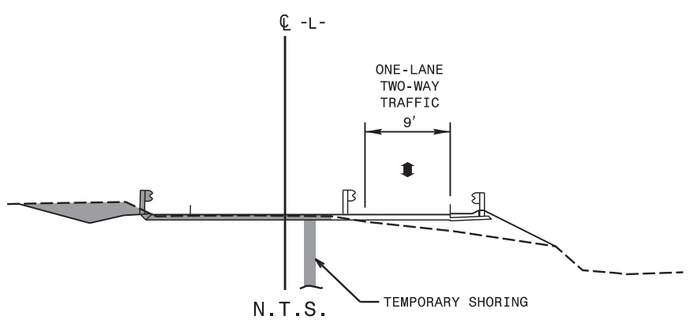
MAINTAIN ACCESS TO DRIVEWAYS DURING CONSTRUCTION

SEE SHEET PM-1 FOR TEMPORARY PAVEMENT MARKING SCHEDULE

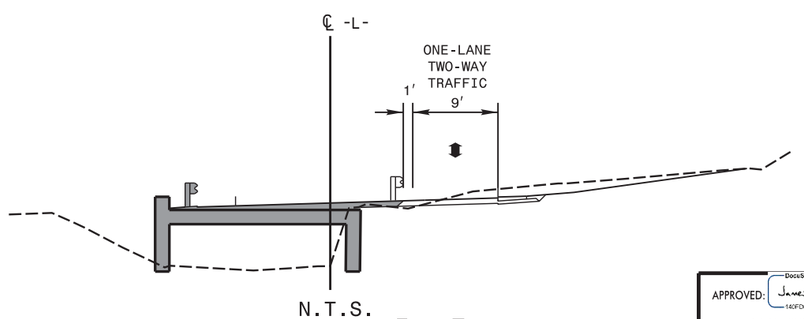
40 20 0 40 80
SCALE 1"=40'

SEE SHEET 2B-1 FOR DETOUR ALIGNMENT

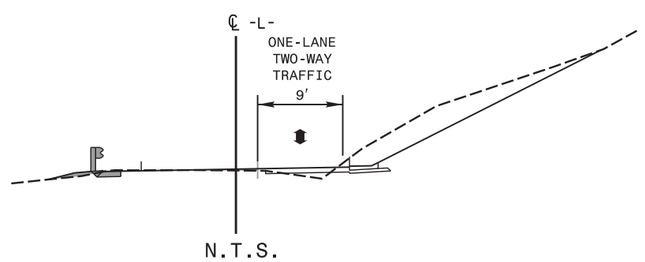
SECTION A-A
-L- STA 12+50
NOT TO SCALE



SECTION B-B
-L- STA 13+50
NOT TO SCALE



SECTION C-C
-L- STA 14+50
NOT TO SCALE



Mattern & Craig
ENGINEERS SURVEYORS
12 BROAD STREET
ASHEVILLE, NORTH CAROLINA 28801
(828) 254-2201
FAX (828) 254-4562
NC LIC. NO. C-1154

APPROVED: DocuSigned by: James B. Vosc, PE 145FD6037B6D41F...
DATE: 12/16/2021
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022599 ENGINEER JAMES B. VOSCO

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

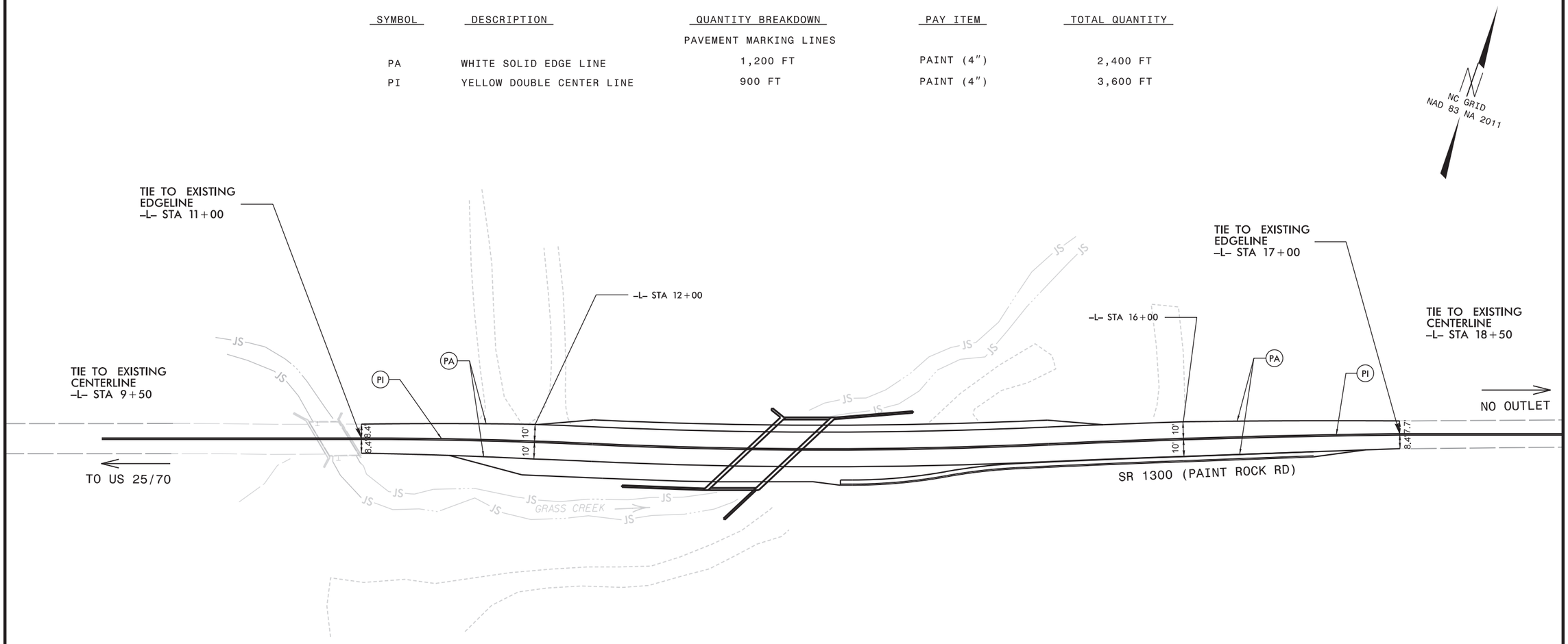
DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

PHASE II DETAILS

PROJ. REFERENCE NO.	SHEET NO.
17BP.13.R.164	PM-1

FINAL PAVEMENT MARKING SCHEDULE

SYMBOL	DESCRIPTION	QUANTITY BREAKDOWN	PAY ITEM	TOTAL QUANTITY
		PAVEMENT MARKING LINES		
PA	WHITE SOLID EDGE LINE	1,200 FT	PAINT (4")	2,400 FT
PI	YELLOW DOUBLE CENTER LINE	900 FT	PAINT (4")	3,600 FT



30 15 0 30 60

SCALE 1"=30'

NOTE: FINAL PAVEMENT MARKINGS = 2 COATS OF PAINT

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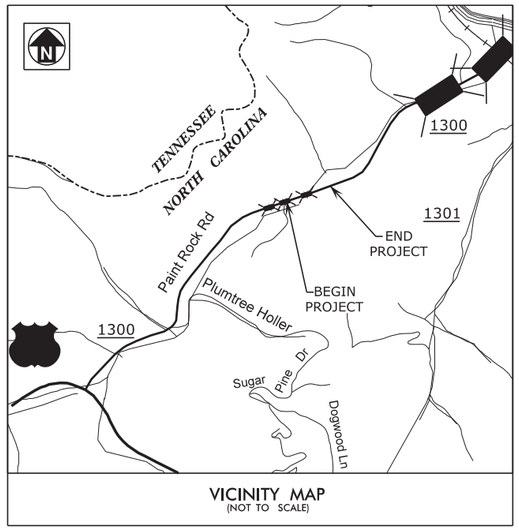
PERMANENT PAVEMENT MARKING PLAN

TIP PROJECT: 17BP.13.R.164



VICINITY MAP
(NOT TO SCALE)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

MADISON COUNTY

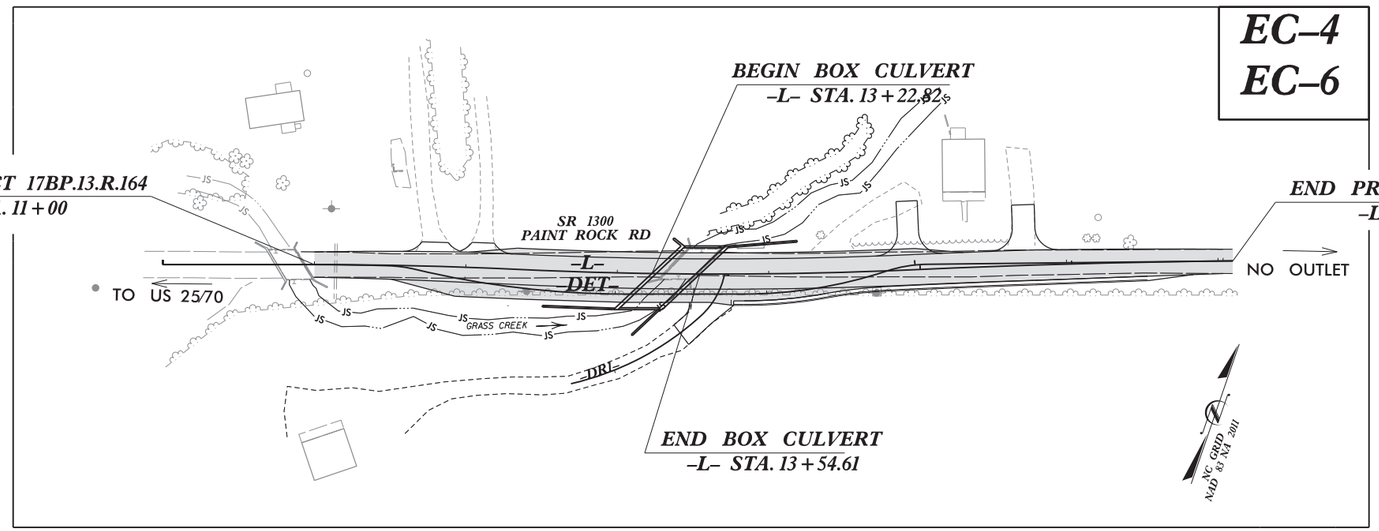
LOCATION: BRIDGE NO. 134 OVER GRASS CREEK ON SR 1300 (PAINT ROCK ROAD)

TYPE OF WORK: GRADING, PAVING, DRAINAGE AND CULVERT

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.13.R.164	EC-1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
17BP.13.PE.164	N/A	P.E.
17BP.13.ROW.164	N/A	R/W & UTIL
17BP.13.R.164	N/A	CONST

EC–4
EC–6



EROSION AND SEDIMENT CONTROL MEASURES

Std. #	Description	Symbol
1630.03	Temporary Silt Ditch	TSD
1630.05	Temporary Diversion	TD
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	
1622.01	Temporary Berms and Slope Drains	
1630.02	Silt Basin Type B	
1633.01	Temporary Rock Silt Check Type-A	
	Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM)	
1633.02	Temporary Rock Silt Check Type-B	
	Wattle / Coir Fiber Wattle	EW CFW
	Wattle / Coir Fiber Wattle with Polyacrylamide (PAM)	
1634.01	Temporary Rock Sediment Dam Type-A	
1634.02	Temporary Rock Sediment Dam Type-B	
1635.01	Rock Pipe Inlet Sediment Trap Type-A	
1635.02	Rock Pipe Inlet Sediment Trap Type-B	
1630.04	Stilling Basin	
1630.06	Special Stilling Basin	
	Rock Inlet Sediment Trap:	
1632.01	Type A	A
1632.02	Type B	B
1632.03	Type C	C
	Skimmer Basin	
	Tiered Skimmer Basin	
	Infiltration Basin	

THIS PROJECT CONTAINS EROSION CONTROL PLANS FOR CLEARING AND GRUBBING PHASE OF CONSTRUCTION.

PLANS PREPARED BY:

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12 BROAD STREET
ASHEVILLE, NORTH CAROLINA 28801
(828) 254-2201
FAX (828) 254-4562
NC LIC. NO. C-1154

GRAPHIC SCALE

30 15 0 30 60

THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE REGULATIONS SET FORTH BY THE NCG-010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE APRIL 1, 2019 AND ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES DIVISION OF WATER RESOURCES.

PROJECT LENGTH

LENGTH OF ROADWAY PROJECT 17BP.13.R.164 = 0.108 MILES

LENGTH OF STRUCTURE PROJECT 17BP.13.R.164 = 0.006 MILES

TOTAL LENGTH OF PROJECT 17BP.13.R.164 = 0.114 MILES

Prepared in the Office of:
MATTERN & CRAIG
12 BROAD ST.
ASHEVILLE, NC 28801
FOR NCDOT DIVISION OF HIGHWAYS

2018 STANDARD SPECIFICATIONS	*Designed by:*
RIGHT OF WAY DATE: MARCH 18, 2021	NICK WOODS *NAME*
LETTING DATE: MAY 18, 2022	4289 *LEVEL III CERTIFICATION NO.*
	MIKE CALLOWAY *NCDOT DIVISION 13 CONTACT*

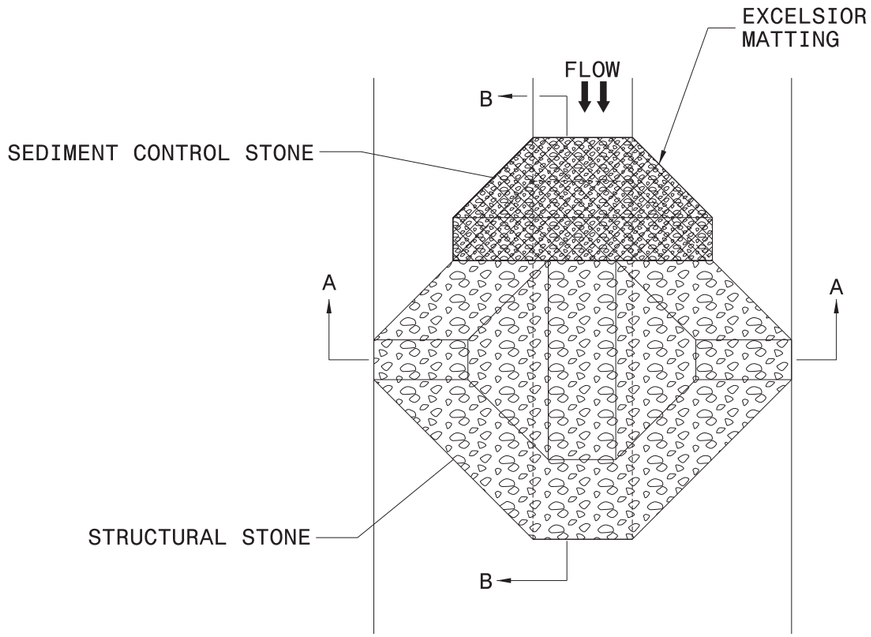
Roadway Standard Drawings

The following roadway english standards as appear in "Roadway Standard Drawings"– Roadway Design Unit – N. C. Department of Transportation – Raleigh, N. C., dated January 2018 and the latest revison thereto are applicable to this project and by reference hereby are considered a part of these plans.

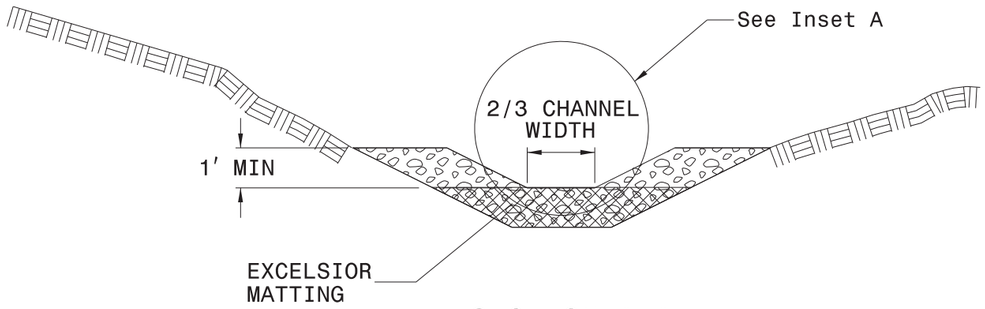
1604.01	Railroad Erosion Control Detail	1632.01	Rock Inlet Sediment Trap Type A
1605.01	Temporary Silt Fence	1632.02	Rock Inlet Sediment Trap Type B
1606.01	Special Sediment Control Fence	1632.03	Rock Inlet Sediment Trap Type C
1607.01	Gravel Construction Entrance	1633.01	Temporary Rock Silt Check Type A
1622.01	Temporary Berms and Slope Drains	1633.02	Temporary Rock Silt Check Type B
1630.01	Riser Basin	1634.01	Temporary Rock Sediment Dam Type A
1630.02	Silt Basin Type B	1634.02	Temporary Rock Sediment Dam Type B
1630.03	Temporary Silt Ditch	1635.01	Rock Pipe Inlet Sediment Trap Type A
1630.04	Stilling Basin	1635.02	Rock Pipe Inlet Sediment Trap Type B
1630.05	Temporary Diversion	1640.01	Coir Fiber Baffle
1630.06	Special Stilling Basin	1645.01	Temporary Stream Crossing
1631.01	Matting Installation		

PROJECT REFERENCE NO.	SHEET NO.
17BPJ3.RJ64	EC-2
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

TEMPORARY ROCK SILT CHECK TYPE 'A' WITH EXCELSIOR MATTING AND POLYACRYLAMIDE (PAM)



PLAN



SECTION A-A

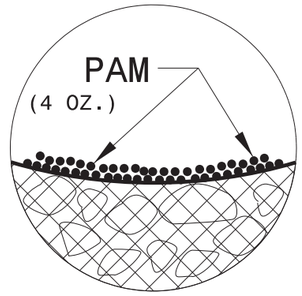
NOTES:

INSTALL TEMPORARY ROCK SILT CHECK TYPE A IN ACCORDANCE WITH ROADWAY STANDARD DRAWING NO. 1633.01.

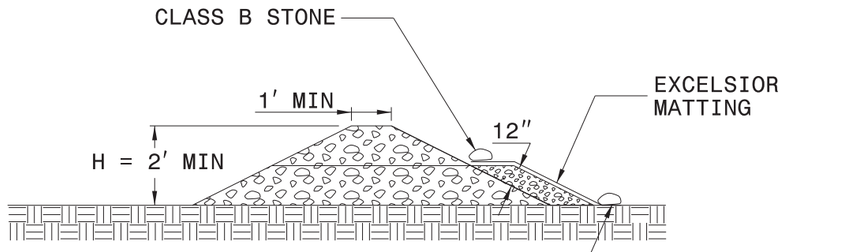
USE EXCELSIOR FOR MATTING MATERIAL AND ANCHOR MATTING SECTION AT TOP AND BOTTOM WITH CLASS B STONE.

PRIOR TO POLYACRYLAMIDE (PAM) APPLICATION, OBTAIN A SOIL SAMPLE FROM PROJECT LOCATION, AND FROM OFFSITE MATERIAL, AND ANALYZE FOR APPROPRIATE PAM FLOCCULANT TO BE APPLIED TO EACH ROCK SILT CHECK.

INITIALLY APPLY 4 OUNCES OF POLYACRYLAMIDE (PAM) TO TOP OF MATTING SECTION AND AFTER EVERY RAINFALL EVENT THAT EQUALS OR EXCEEDS 0.50 INCHES.



INSET A

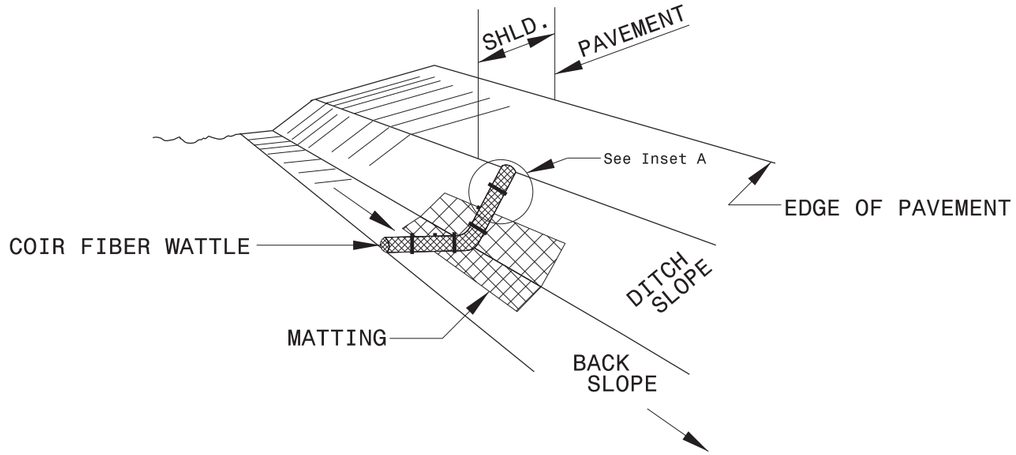


SECTION B-B

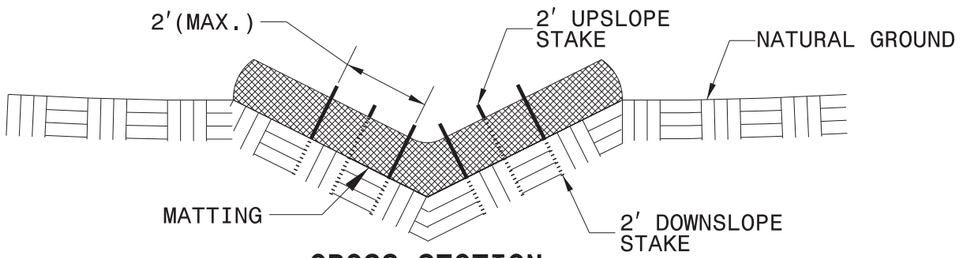
NOT TO SCALE

PROJECT REFERENCE NO.	SHEET NO.
17BPJ3.R.164	EC-2A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

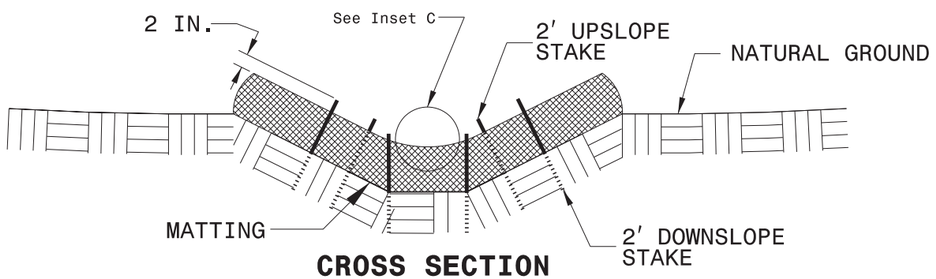
COIR FIBER WATTLE WITH POLYACRYLAMIDE (PAM) DETAIL



ISOMETRIC VIEW



CROSS SECTION VEE DITCH



CROSS SECTION TRAPEZOIDAL DITCH

NOTES:

USE MINIMUM 12 IN. DIAMETER COIR FIBER (COCONUT FIBER) WATTLE.

USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.

INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.

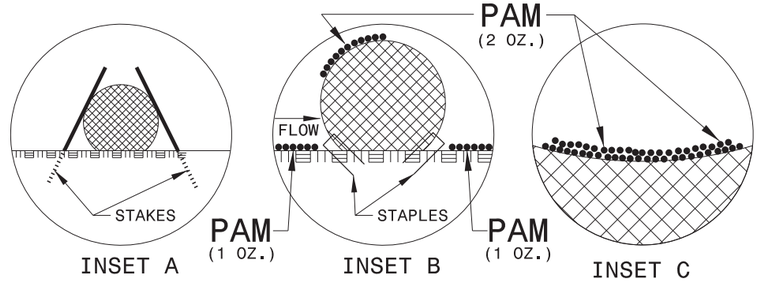
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12″ IN LENGTH.

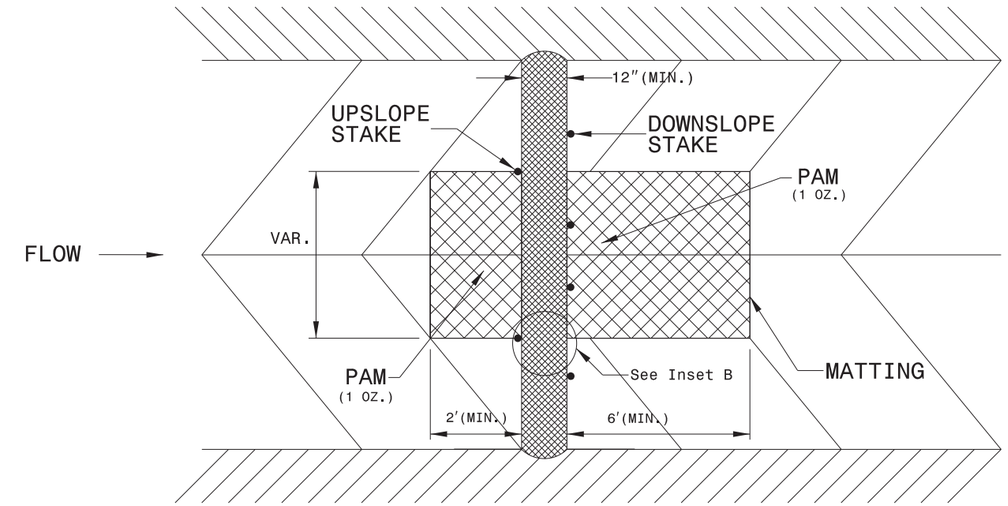
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

INSTALL MATTING IN ACCORDANCE WITH SECTION 1631 OF THE STANDARD SPECIFICATIONS.

PRIOR TO POLYACRYLAMIDE (PAM) APPLICATION, OBTAIN A SOIL SAMPLE FROM PROJECT LOCATION, AND FROM OFFSITE MATERIAL, AND ANALYZE FOR APPROPRIATE PAM FLOCCULANT TO BE APPLIED TO EACH WATTLE.

INITIALLY APPLY 2 OUNCES OF ANIONIC OR NEUTRALLY CHARGED PAM OVER WATTLE WHERE WATER WILL FLOW AND 1 OUNCE OF PAM ON MATTING ON EACH SIDE OF WATTLE. REAPPLY PAM AFTER EVERY RAINFALL EVENT THAT IS EQUAL TO OR EXCEEDS 0.50 IN.

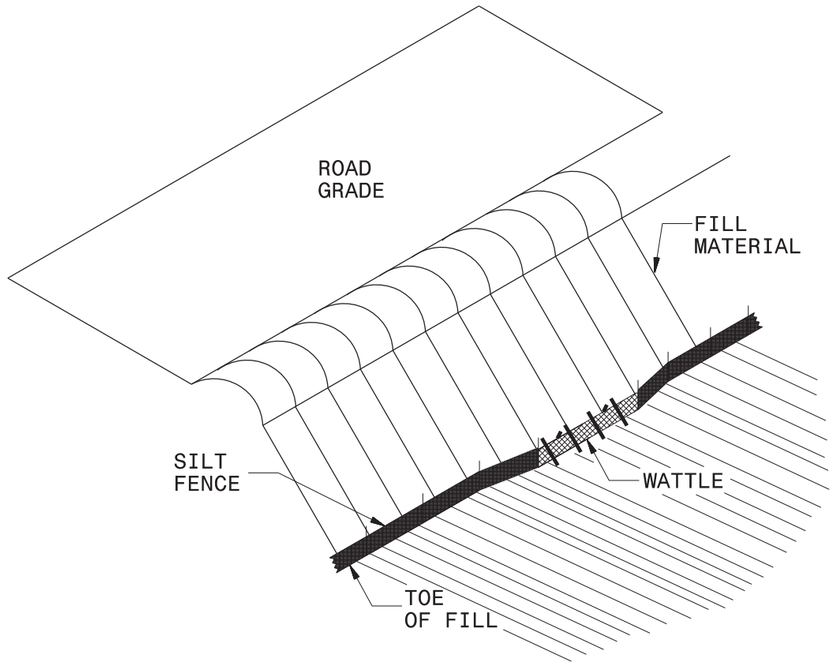




TOP VIEW

PROJECT REFERENCE NO.	SHEET NO.
17BPJ3.RJ64	EC-2B
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

SILT FENCE COIR FIBER WATTLE BREAK DETAIL



ISOMETRIC VIEW

NOTES:

USE MINIMUM 12 IN. DIAMETER COIR FIBER (COCONUT FIBER) WATTLE AND LENGTH OF 10 FT.

EXCAVATE A 1 TO 2 INCH TRENCH FOR WATTLE TO BE PLACED.

DO NOT PLACE WATTLE ON TOE OF SLOPE.

USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO GROUND.

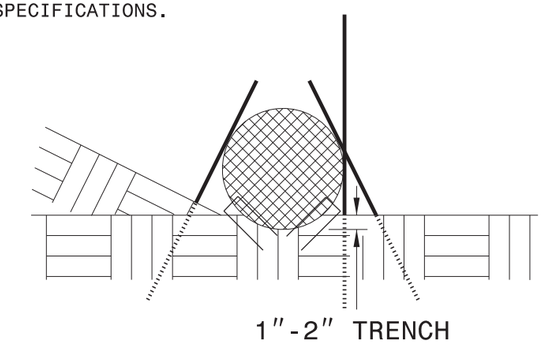
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12″ IN LENGTH.

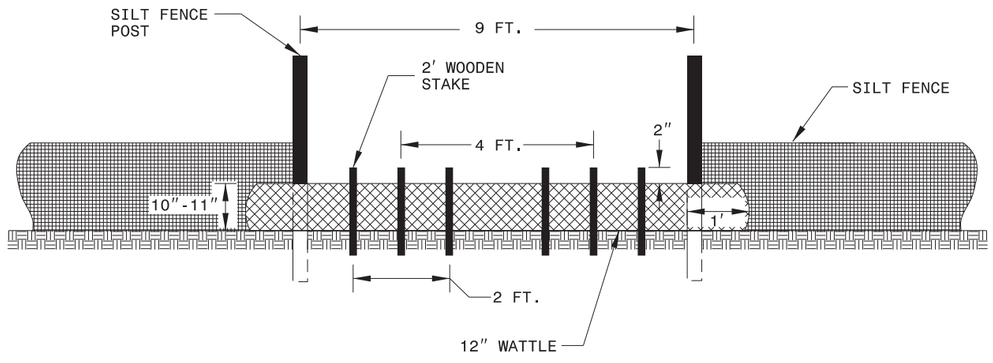
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

WATTLE INSTALLATION CAN BE ON OUTSIDE OF THE SILT FENCE AS DIRECTED.

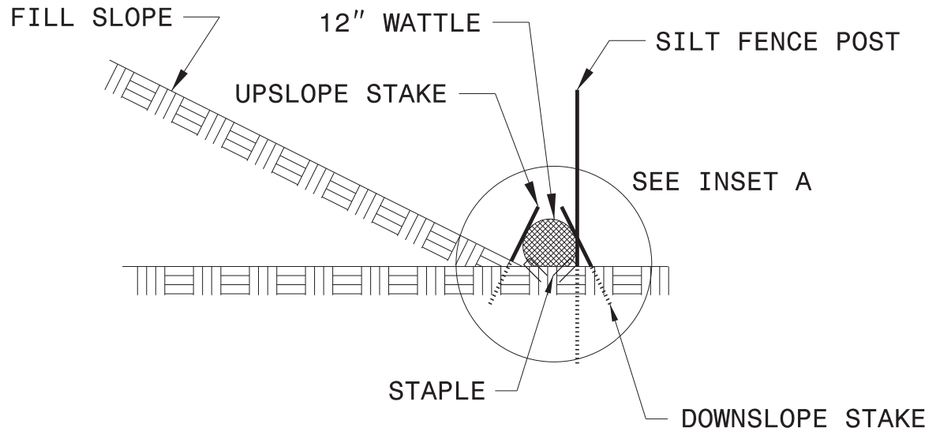
INSTALL TEMPORARY SILT FENCE IN ACCORDANCE WITH SECTION 1605 OF THE STANDARD SPECIFICATIONS.

INSET A





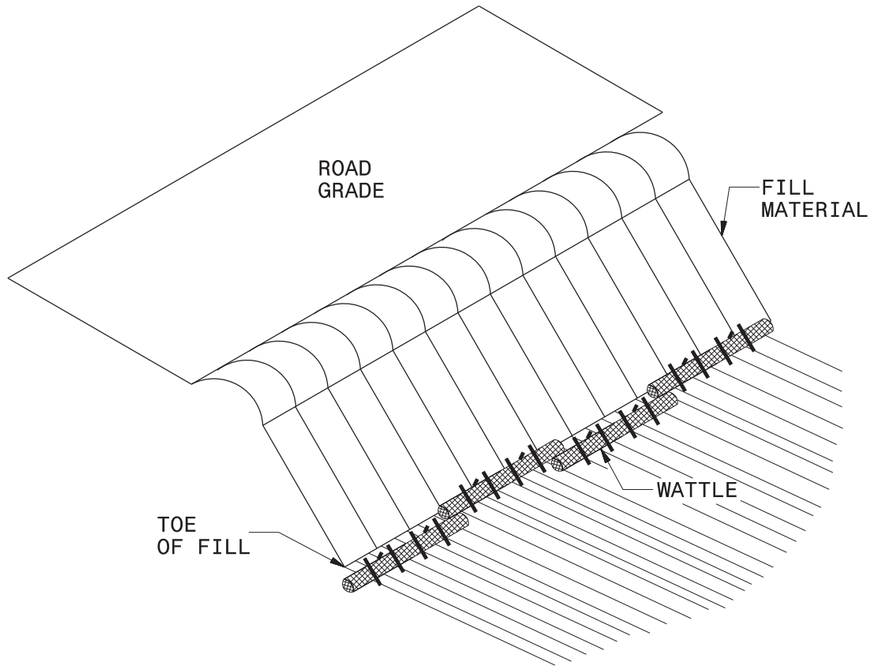
VIEW FROM SLOPE



SIDE VIEW

PROJECT REFERENCE NO.	SHEET NO.
17BPJ3.RJ64	EC-2C
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

COIR FIBER WATTLE BARRIER DETAIL



ISOMETRIC VIEW

NOTES:

USE MINIMUM 18 IN. NOMINAL DIAMETER COIR FIBER (COCONUT) WATTLE AND LENGTH OF 10 FT.

EXCAVATE A 2 TO 3 INCH TRENCH FOR WATTLE TO BE PLACED.

DO NOT PLACE WATTLES ON TOE OF SLOPE.

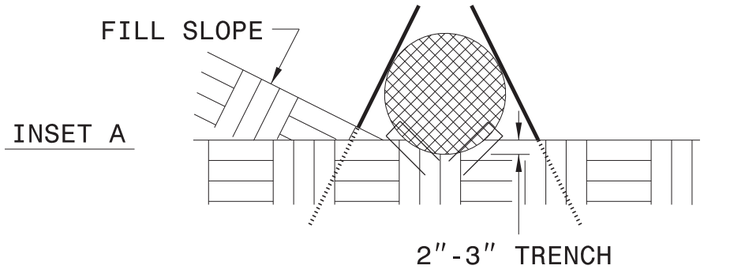
USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

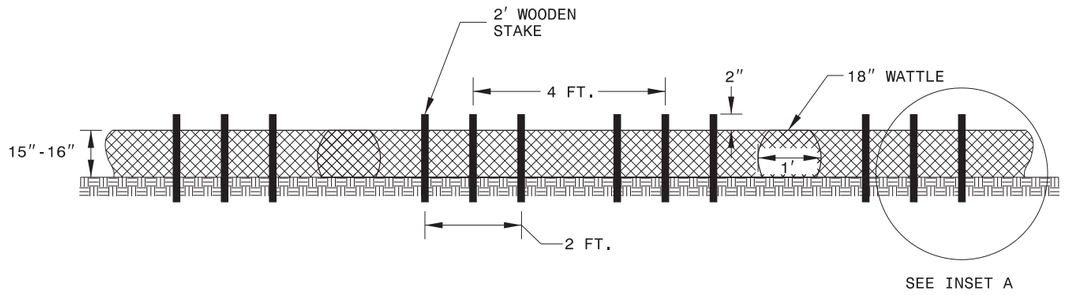
INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO GROUND.

PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12″ IN LENGTH.

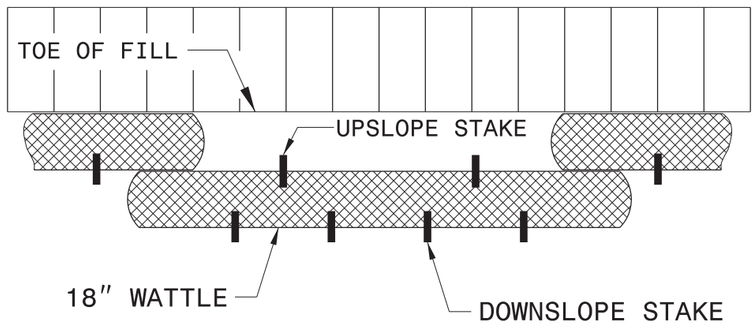
INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

FOR BREAKS ALONG LARGE SLOPES, USE MAXIMUM SPACING OF 25 FT.





FRONT VIEW



TOP VIEW

PROJECT REFERENCE NO.	SHEET NO.
17BP.13.R.164	EC-3
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

REVISIONS

SOIL STABILIZATION TIMEFRAMES

SITE DESCRIPTION	STABILIZATION TIME	TIMEFRAME EXCEPTIONS
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HQW) ZONES	7 DAYS	NONE
SLOPES STEEPER THAN 3:1	7 DAYS	IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1, 14 DAYS ARE ALLOWED.
SLOPES 3:1 OR FLATTER	14 DAYS	7 DAYS FOR SLOPES GREATER THAN 50' IN LENGTH.
ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1	14 DAYS	NONE, EXCEPT FOR PERIMETERS AND HQW ZONES.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION SUMMARY SHEET

MATTING FOR EROSION CONTROL

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
4	-L-	12+50	13+40	LT	45
				SUBTOTAL	45
MISCELLANEOUS MATTING TO BE INSTALLED AS DIRECTED BY THE ENGINEER					2255
				TOTAL	2300
				SAY	2300

PERMANENT SOIL REINFORCEMENT MAT

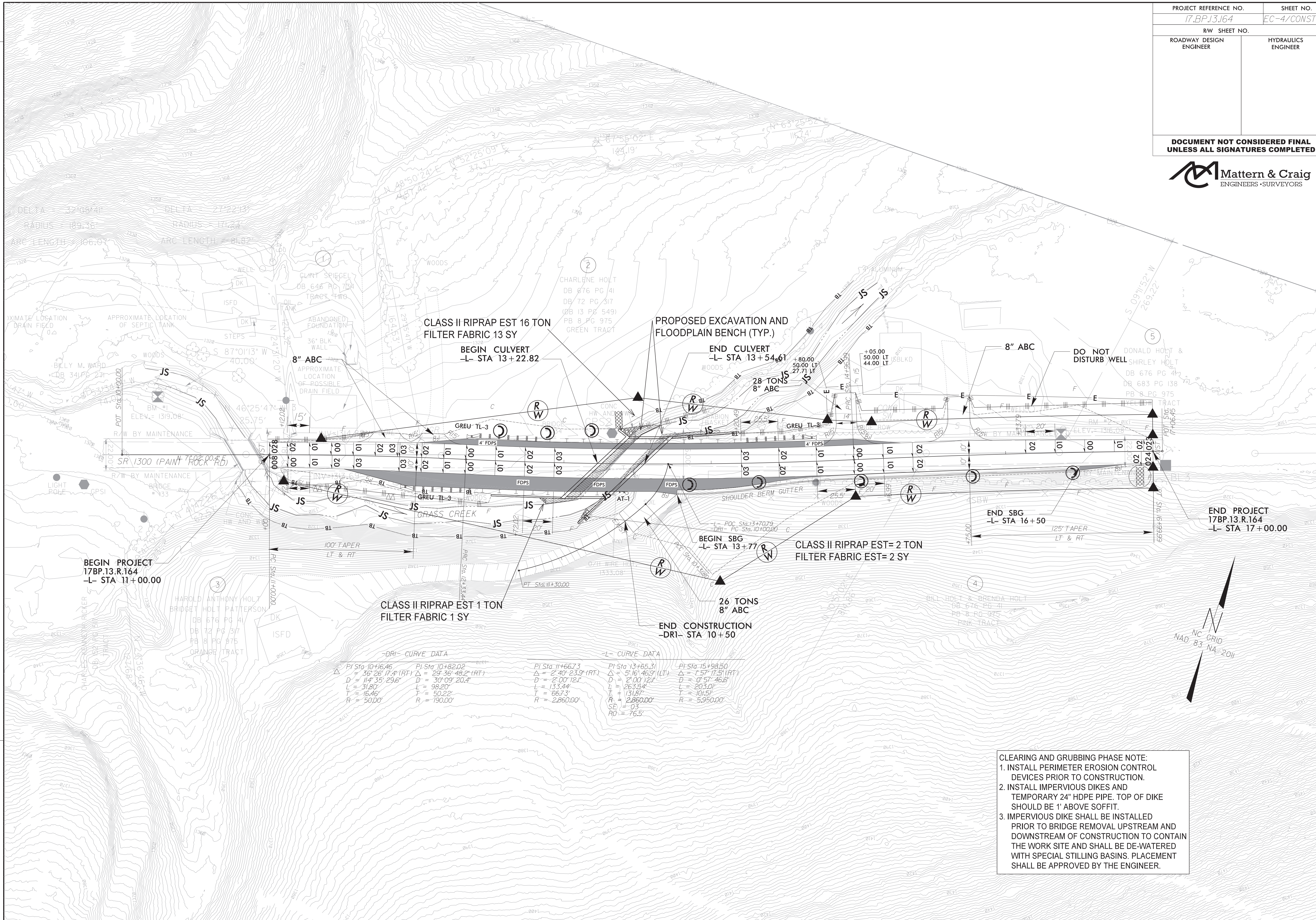
CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
			SUBTOTAL		
		ADDITIONAL PSRM TO BE INSTALLED			
			TOTAL		
			SAY		

PROJECT REFERENCE NO.	SHEET NO.
17.BP13.164	EC-4/CONST.4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Mattern & Craig
ENGINEERS • SURVEYORS

REVISIONS



CLASS II RIPRAP EST 16 TON
FILTER FABRIC 13 SY
PROPOSED EXCAVATION AND
FLOODPLAIN BENCH (TYP.)
BEGIN CULVERT
-L- STA 13+22.82
END CULVERT
-L- STA 13+54.61
8" ABC
28 TONS
8" ABC
DO NOT
DISTURB WELL
SR 1300 (PAINT ROCK RD)
GRASS CREEK
BEGIN PROJECT
17BP.13.R.164
-L- STA 11+00.00
END PROJECT
17BP.13.R.164
-L- STA 17+00.00
END SBG
-L- STA 16+50
BEGIN SBG
-L- STA 13+77
CLASS II RIPRAP EST= 2 TON
FILTER FABRIC EST= 2 SY
CLASS II RIPRAP EST 1 TON
FILTER FABRIC 1 SY
26 TONS
8" ABC
END CONSTRUCTION
-DR1- STA 10+50
100' TAPER
LT & RT
125' TAPER
LT & RT
SHOULDER BERM GUTTER
CLINT SPIEGEL
CHARLENE HOLT
DONALD HOLT &
SHIRLEY HOLT
HAROLD ANTHONY HOLT
BRIDGET HOLT PATTERSON
BILL HOLT & BRENDA HOLT
BILLY M. WARD
NC GRID
NAD 83 NA 2011
-DR1- CURVE DATA
PI Sta 10+16.46
Δ = 36°26'17.4" (RT)
D = 114°35'29.6"
L = 31.80'
T = 16.46'
R = 50.00'
PI Sta 10+82.02
Δ = 29°36'48.2" (RT)
D = 30°09'20.4"
L = 98.20'
T = 50.22'
R = 190.00'
-L- CURVE DATA
PI Sta 11+66.73
Δ = 2°40'23.9" (RT)
D = 2°00'12.1"
L = 133.44'
T = 66.73'
R = 2,860.00'
PI Sta 13+65.31
Δ = 5°16'46.9" (LT)
D = 2°00'12.1"
L = 263.54'
T = 131.87'
R = 2,860.00'
SE = .03
RO = 76.5'
PI Sta 15+98.50
Δ = 1°57'17.5" (RT)
D = 0°57'46.8"
L = 203.01'
T = 101.51'
R = 5,950.00'

CLEARING AND GRUBBING PHASE NOTE:

1. INSTALL PERIMETER EROSION CONTROL DEVICES PRIOR TO CONSTRUCTION.
2. INSTALL IMPERVIOUS DIKES AND TEMPORARY 24" HDPE PIPE. TOP OF DIKE SHOULD BE 1' ABOVE SOFFIT.
3. IMPERVIOUS DIKE SHALL BE INSTALLED PRIOR TO BRIDGE REMOVAL UPSTREAM AND DOWNSTREAM OF CONSTRUCTION TO CONTAIN THE WORK SITE AND SHALL BE DE-WATERED WITH SPECIAL STILLING BASINS. PLACEMENT SHALL BE APPROVED BY THE ENGINEER.

CULVERT CONSTRUCTION SEQUENCE STA. 13+38.70 –L–

PROJECT REFERENCE NO.	SHEET NO.
17BP.13.R.164	EC-5/CONST.4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

Mattern & Craig
ENGINEERS • SURVEYORS

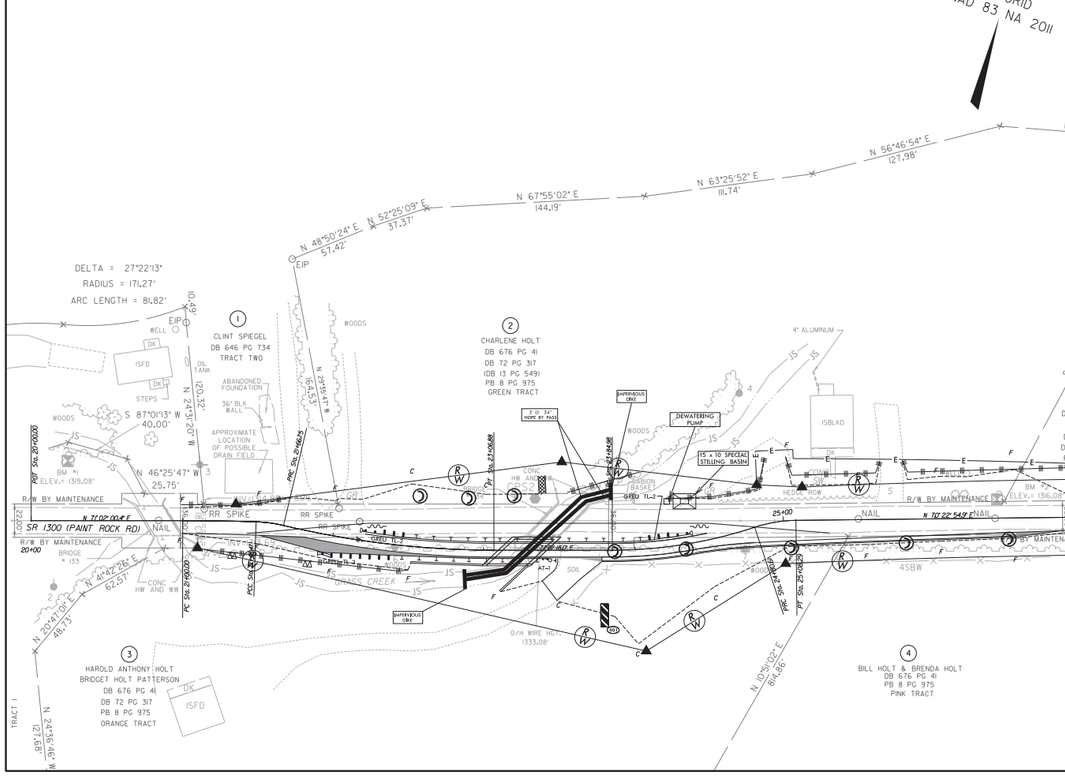
PHASE I

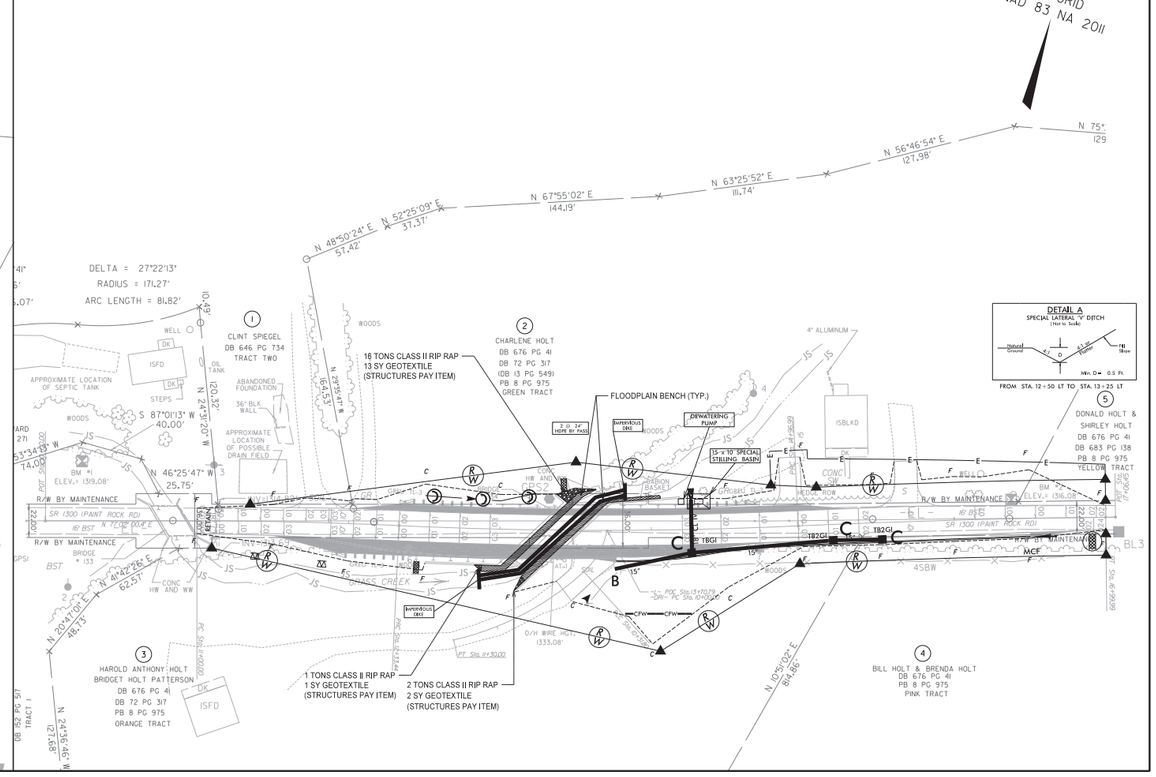
1. INSTALL PERIMETER EROSION CONTROL DEVICES PRIOR TO CONSTRUCTION AS SHOWN IN THE CLEARING AND GRUBBING PHASE
2. INSTALL IMPERVIOUS DIKES AND TEMPORARY 24" HDPE PIPE. TOP OF DIKE SHOULD BE 1' ABOVE SOFFITT.
3. INSTALL DEWATERING PUMP AND SILT BAG AS DIRECTED BY THE ENGINEER.
4. CONSTRUCT UPSTREAM SECTION (STAGED CONSTRUCTION) OF PROPOSED 3–SIDED CULVERT.
5. CONSTRUCT A PORTION OF THE PROPOSED ROADWAY SUFFIECIENT TO ALLOW TRAFFIC THROUGH THE SITE AS DESCRIBED IN TRAFFIC MANAGEMENT PLANS.

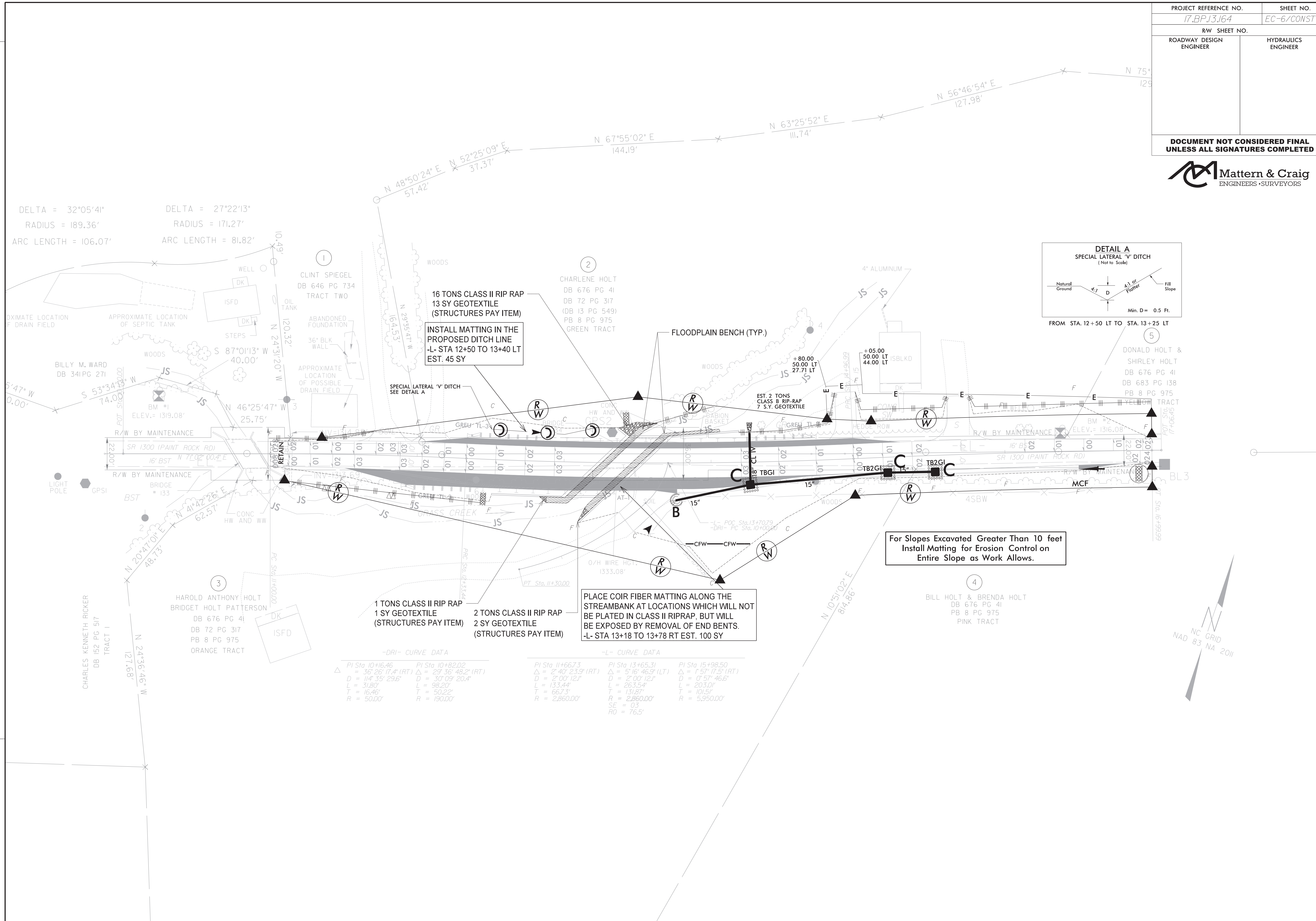
PHASE II

1. INSTALL FINAL GRADE EROSION CONTROL DEVICES AS REMOVAL OF THE EXISTING ROADWAY AND BRIDGE MAKE THEM NECESSARY.
2. SHIFT TRAFFIC, AS DESCRIBED IN THE TRAFFIC MANAGEMENT PLANS, TO ONE LANE, TWO WAY PATTERN ON THE UPSTREAM SIDE OF THE NEW STRUCTURE STAGED CULVERT AND CONSTRUCT DOWNSTREAM SIDE OF 3–SIDED CULVERT.
3. REMOVE EMBANKMENT AND ROADWAY BEHIND THE WINGWALLS OF THE EXISTING BRIDGE PRIOR TO REMOVAL OF THE BRIDGE ITSELF. THIS WILL PREVENT SEDIMENT FROM BEING DEPOSITED IN THE STREAM BED.
4. CONSTRUCT THE REMAINDER OF THE PROPOSED ROADWAY.
5. ENSURE DISTURBED LAND IS STABILIZED.
6. REMOVE TEMPORARY EROSION CONTROL DEVICES

NOTES:
1. CULVERT CONSTRUCTION SHALL BE PERFORMED IN ONLY DRY OR ISOLATED SECTIONS OF CHANNEL.
2. IMPERVIOUS DIKES ARE TO BE USED TO ISOLATE WORK FROM STREAM FLOW AS NECESSARY.
3. ALL GRADED AREAS SHALL BE STABILIZED WITHIN 24 HOURS.
4. MAINTENANCE OF STREAM FLOW OPERATIONS SHALL BE INCIDENTAL TO THE WORK. THIS INCLUDES POLETHYLENE SHEETING, DIVERSION PIPES, PUMPS AND HOSES.
5. PUMPS AND HOSES SHALL BE SUFFICIENT SIZE TO DEWATER THE WORK AREA.
6. THE CONTRACTOR SHALL NOT PUMP SEDIMENT–LADEN WATER DIRECTLY INTO STREAM. FOR DE–WATERING OF CULVERT SITES, THE CONTRACTOR SHALL FILTER SEDIMENT–LADEN WATER THROUGH SPECIAL STILLING BASIN.







PROJECT REFERENCE NO.
17BPJ3.J64
SHEET NO.
EC-6/CONST.-4
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
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REVISIONS
DETAIL A
SPECIAL LATERAL 'V' DITCH
(Not to Scale)
Natural Ground
Fill Slope
4:1 or Flatter
Min. D= 0.5 Ft.
FROM STA. 12+50 LT TO STA. 13+25 LT
16 TONS CLASS II RIP RAP
13 SY GEOTEXTILE
(STRUCTURES PAY ITEM)
INSTALL MATTING IN THE PROPOSED DITCH LINE
-L- STA 12+50 TO 13+40 LT
EST. 45 SY
SPECIAL LATERAL 'V' DITCH
SEE DETAIL A
FLOODPLAIN BENCH (TYP.)
EST. 2 TONS CLASS B RIP-RAP
7 S.Y. GEOTEXTILE
For Slopes Excavated Greater Than 10 feet Install Matting for Erosion Control on Entire Slope as Work Allows.
1 TONS CLASS II RIP RAP
1 SY GEOTEXTILE
(STRUCTURES PAY ITEM)
2 TONS CLASS II RIP RAP
2 SY GEOTEXTILE
(STRUCTURES PAY ITEM)
PLACE COIR FIBER MATTING ALONG THE STREAMBANK AT LOCATIONS WHICH WILL NOT BE PLATED IN CLASS II RIPRAP, BUT WILL BE EXPOSED BY REMOVAL OF END BENTS.
-L- STA 13+18 TO 13+78 RT EST. 100 SY
CLINT SPIEGEL
DB 646 PG 734
TRACT TWO
CHARLENE HOLT
DB 676 PG 41
DB 72 PG 317
(DB 13 PG 549)
PB 8 PG 975
GREEN TRACT
DONALD HOLT &
SHIRLEY HOLT
DB 676 PG 41
DB 683 PG 138
PB 8 PG 975
YELLOW TRACT
BILLY M. WARD
DB 341 PG 271
HAROLD ANTHONY HOLT
BRIDGET HOLT PATTERSON
DB 676 PG 41
DB 72 PG 317
PB 8 PG 975
ORANGE TRACT
BILL HOLT & BRENDA HOLT
DB 676 PG 41
PB 8 PG 975
PINK TRACT
CHARLES KENNETH RICKER
DB 152 PG 517
TRACT 1
SR 1300 (PAINT ROCK RD)
R/W BY MAINTENANCE
GRASS CREEK
DELTA = 32°05'41"
RADIUS = 189.36'
ARC LENGTH = 106.07'
DELTA = 27°22'13"
RADIUS = 171.27'
ARC LENGTH = 81.82'
-DRI- CURVE DATA
-L- CURVE DATA
NC GRID
NAD 83 NA 2011
TBGI
TB2GI
MCF
CFW

PROJECT REFERENCE NO.	SHEET NO.
17BP.13.RJ.64	U0-1

UTILITIES BY OTHERS

NOTE:
ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS

8/17/99

REVISIONS

MOVE O/H CATV LINES

REROUTE AERIAL CATV (FO) TO NEW POLE

NEW POLE

REMOVE POLE

REMOVE U/G CATV LINES

NEW T PED

REMOVE T PED

REMOVE POLE

NEW POLE

USE TALLER POLE DUE TO PLACEMENT IN CUT

NEW POLE

TREE TRIMMING NEEDED DUE TO RELOCATED POLES AND O/H LINES

16 TONS CLASS II RIP RAP
13 SY GEOTEXTILE
(STRUCTURES PAY ITEM)

11 TONS CLASS II RIP RAP
1 SY GEOTEXTILE
(STRUCTURES PAY ITEM)

2 TONS CLASS II RIP RAP
2 SY GEOTEXTILE
(STRUCTURES PAY ITEM)

EST. 2 TONS CLASS B RIP-RAP
7 S.Y. GEOTEXTILE

FLOODPLAIN BENCH (TYP.)

GABION BASKET

SPECIAL LATERAL "V" DITCH SEE DETAIL A

CLINT SPIEGEL
DB 646 PG 734
TRACT TWO

CHARLENE HOLT
DB 676 PG 41
DB 72 PG 317
(DB 13 PG 549)
PB 8 PG 975
GREEN TRACT

BILLY M. WARD
DB 341 PG 271

HAROLD ANTHONY HOLT
BRIDGET HOLT PATTERSON
DB 676 PG 41
DB 72 PG 317
PB 8 PG 975
ORANGE TRACT

CHARLES KENNETH RICKER
DB 152 PG 517
TRACT 1

DONALD HOLT & SHIRLEY HOLT
DB 676 PG 41
DB 683 PG 138
PB 8 PG 975
YELLOW TRACT

BILL HOLT & BRENDA HOLT
DB 676 PG 41
PB 8 PG 975
PINK TRACT

-DRI- CURVE DATA

PI Sta 10+16.46	PI Sta 10+82.02
Δ = 36° 26' 17.4" (RT)	Δ = 29° 36' 48.2" (RT)
D = 114° 35' 29.6"	D = 30° 09' 20.4"
L = 31.80'	L = 98.20'
T = 16.46'	T = 50.22'
R = 50.00'	R = 190.00'

-L- CURVE DATA

PI Sta 11+66.73	PI Sta 13+65.31	PI Sta 15+98.50
Δ = 2° 40' 23.9" (RT)	Δ = 5° 16' 46.9" (LT)	Δ = 1° 57' 17.5" (RT)
D = 2° 00' 12.1"	D = 2° 00' 12.1"	D = 0° 57' 46.6"
L = 133.44'	L = 263.54'	L = 203.01'
T = 66.73'	T = 131.87'	T = 101.51'
R = 2,860.00'	R = 2,860.00'	R = 5,950.00'
	SE = 03	
	RO = 76.5'	

UTILITY OWNERS

TELEPHONE
FRONTIER COMMUNICATIONS
84 ALLEN STREET
SYLVA, N.C. 28779

FRENCH BROAD ELECTRIC
MEMBERSHIP CORP.
3043 NC-213
MARSHALL, NC 28753

NC GRID
NAD 83 NA 2011

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ENGINEERS • SURVEYORS
FIRM LICENSE No. C-1154
12 BROAD STREET
ASHEVILLE, NORTH CAROLINA 28801
(828) 254-2201
FAX (828) 254-4562

COMPUTED BY: MY DATE: 11/2018
CHECKED BY: ACC DATE: 11/2018

PROJECT REFERENCE NO.	SHEET NO.
17BPJ3,RJ64	X-0

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

CROSS SECTION SUMMARY

IN CUBIC YARDS

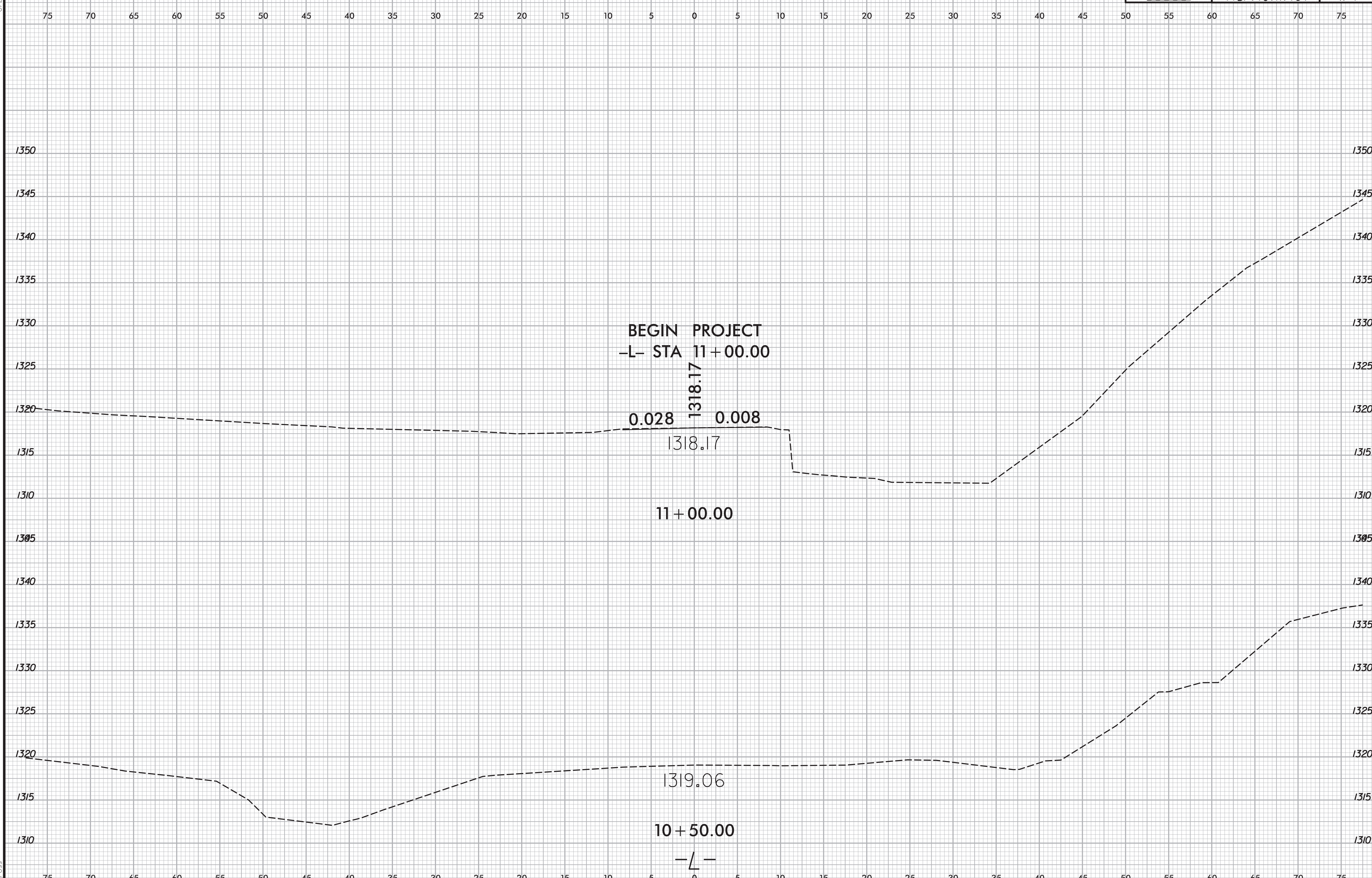
–L– LOCATION	UNCLASSIFIED EXCAVATION	EMBT
11+00	0	0
11+50	3	13
12+00	3	21
12+50	26	38
13+00	38	62
13+22.82 (BEGIN CULVERT)	12	36
13+54.61 (END CULVERT)	0	0
14+00	305	121
14+50	358	16
15+00	51	29
15+50	6	28
16+00	8	29
16+50	10	44
17+00	9	48

–DR1– LOCATION	UNCLASSIFIED EXCAVATION	EMBT
10+19.18	0	0
10+25	29	0
10+50	123	0

Approximate quantities only. Unclassified excavation, borrow excavation, fine grading, clearing and grubbing, and removal of existing pavement will be paid for at the contract lump sum price for "grading".

NOTE: EMBANKMENT COLUMN DOES NOT INCLUDE BACKFILL FOR UNDERCUT.

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	17BP.13.R.164	X-1



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bgross

8/23/99

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1345
1340
1335
1330
1325
1320
1315
1310
1300

A:1 50:1 0.025 1316.27 0.025 2:1

1316.11

S.S. 1314.00

12+00.00

1345
1340
1335
1330
1325
1320
1315
1310
1300

0.005 1317.21 0.025 3:1

1317.04

S.S. 1315.88

11+50.00

—℄—

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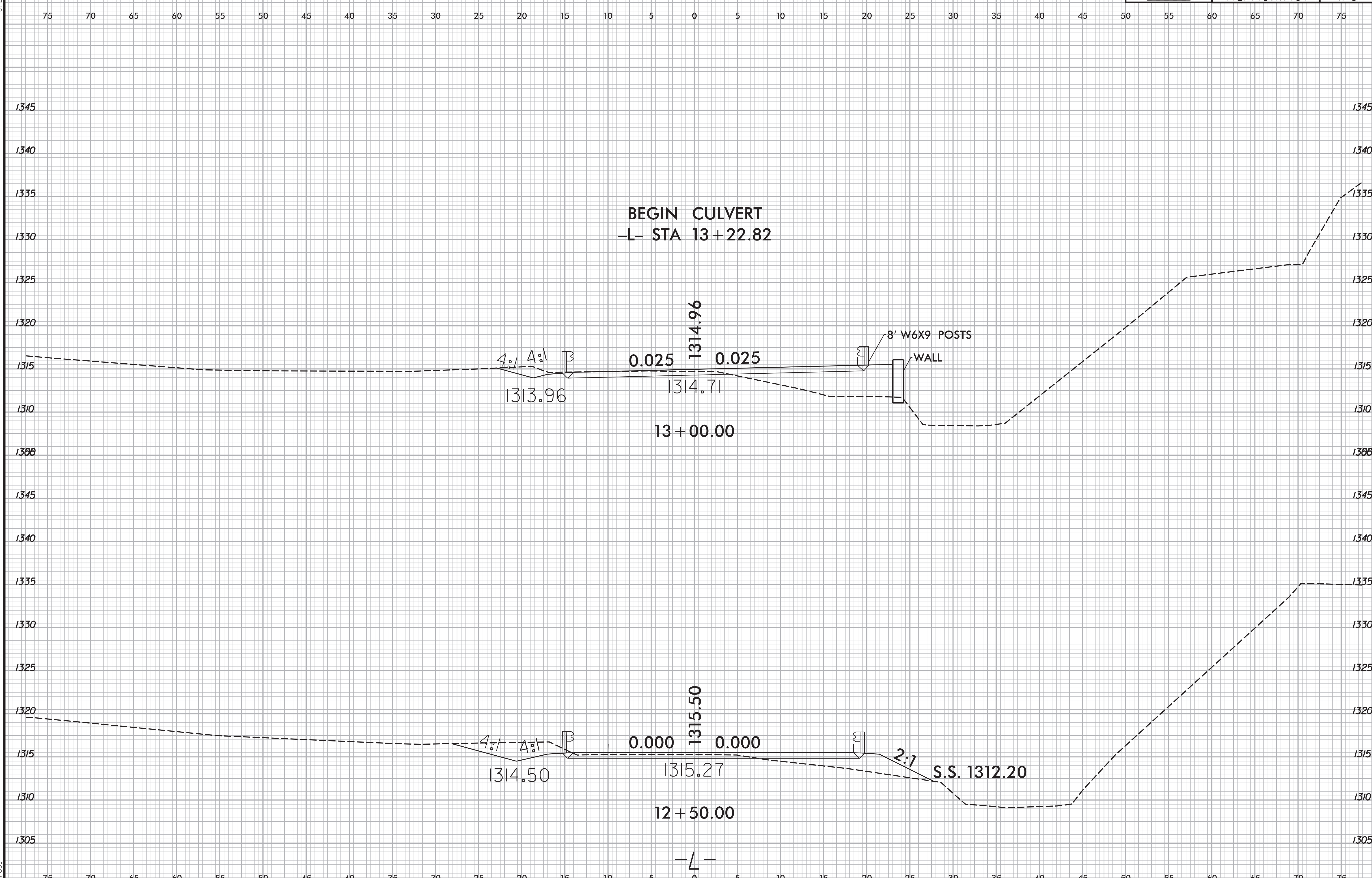

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	17BP.13.R.164	X-4

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1345 1340 1335 1330 1325 1320 1315 1310 1305

S.S. 1342

2:1

1314.98

1314.39

0.030 0.030

WALL

1314.36

14+00.00

END CULVERT
–L– STA 13+56.61

1315.23

1314.63

DR1

S.S. 1318.17

0.030 0.030

1307.91

13+50.00

–L–

1345 1340 1335 1330 1325 1320 1315 1310 1305 1300

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

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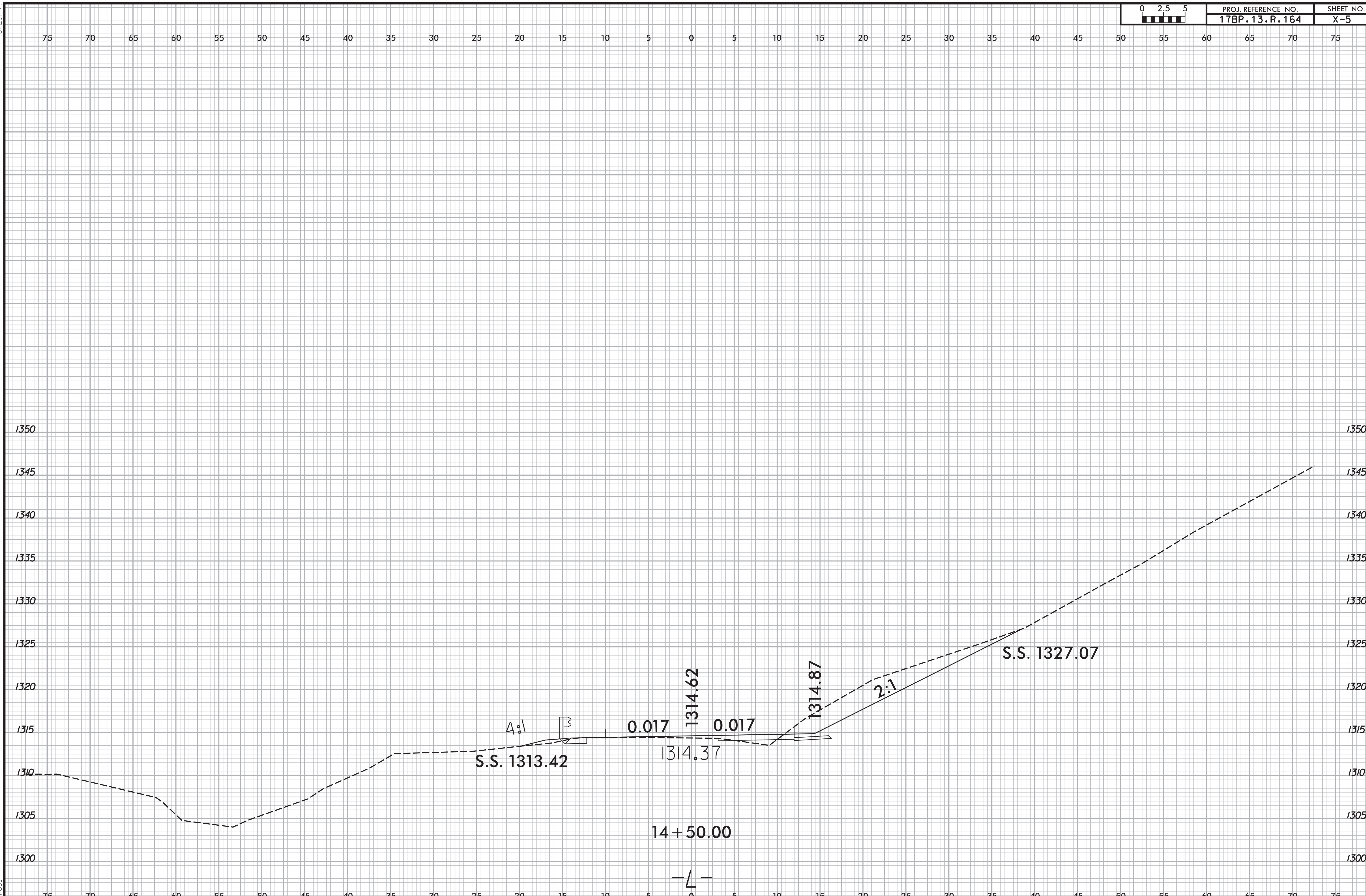

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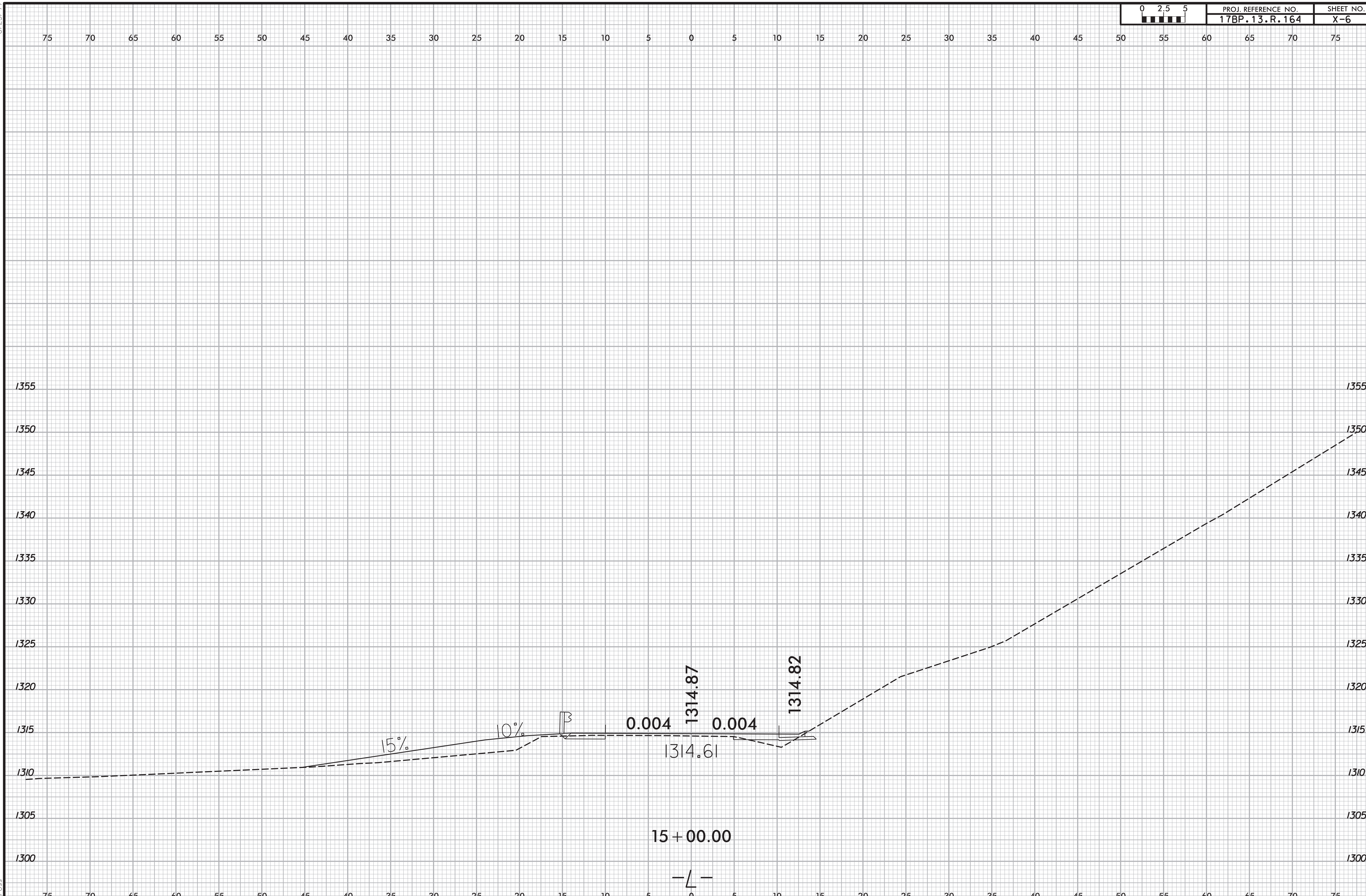

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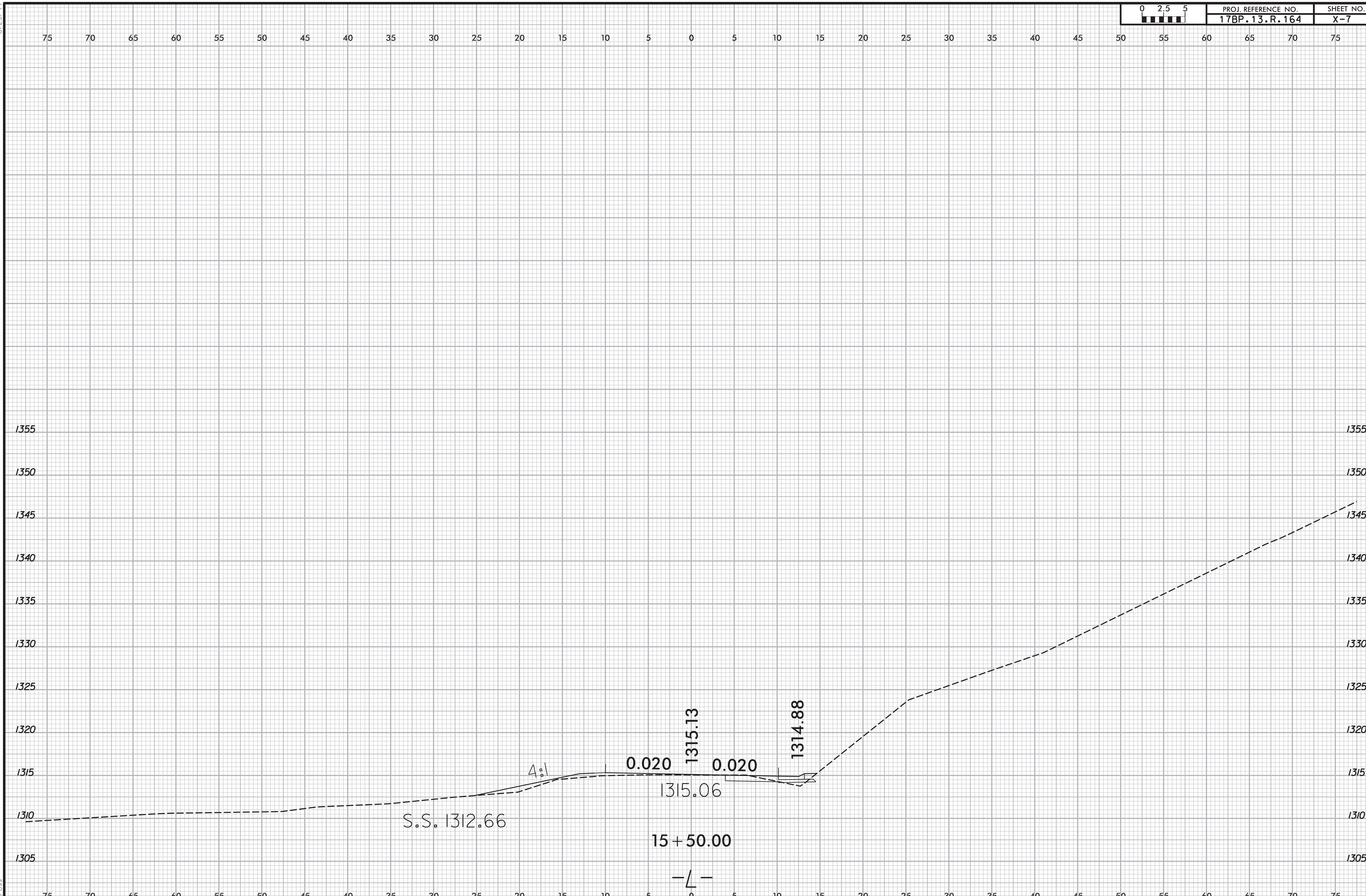

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8/23/99

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1355 1355

1350 1350

1345 1345

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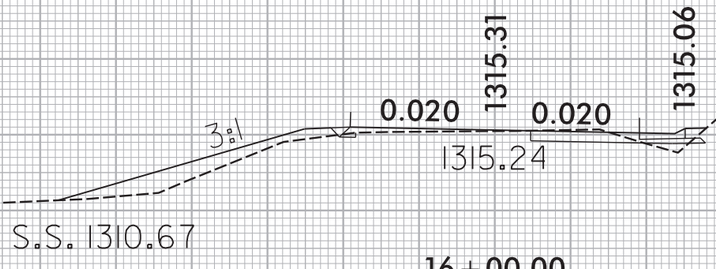
1325 1325

1320 1320

1315 1315

1310 1310

1305 1305



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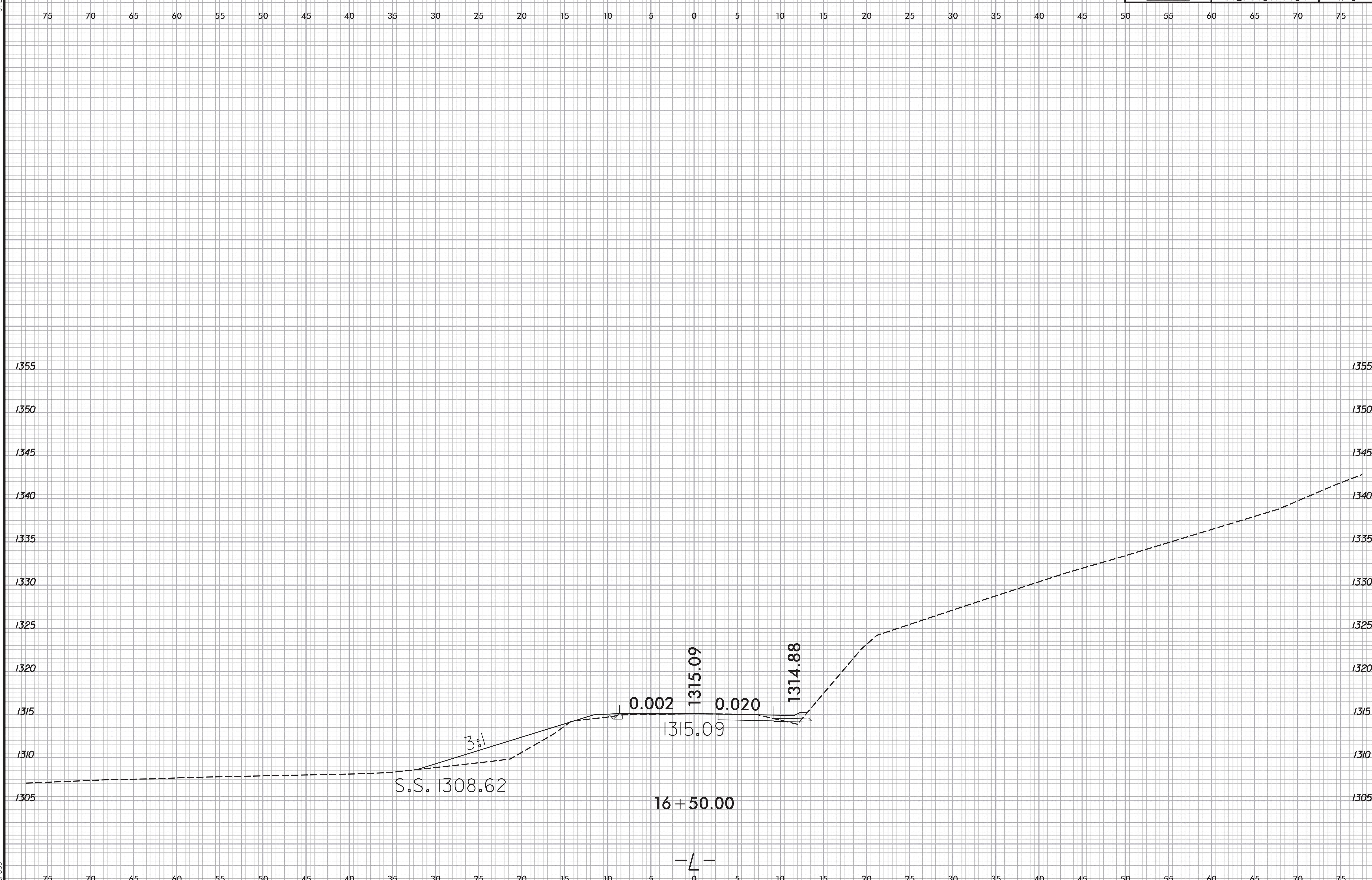

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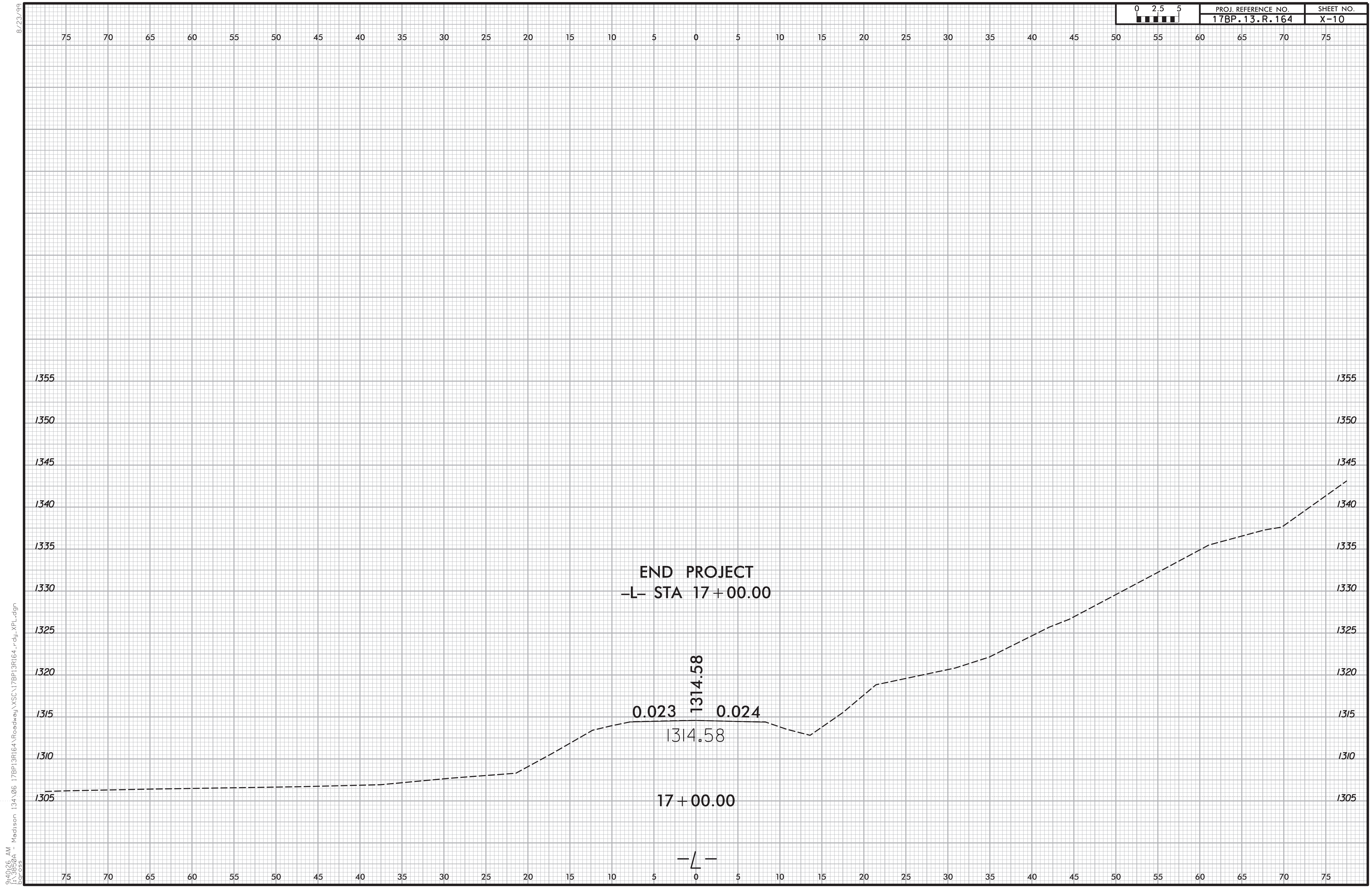

0 2.5 5
PROJ. REFERENCE NO.
17BP.13.R.164
SHEET NO.
X-10
END PROJECT
-L- STA 17+00.00
1314.58
0.023
0.024
1314.58
17+00.00
-L-

PROJ. REFERENCE NO.	SHEET NO.
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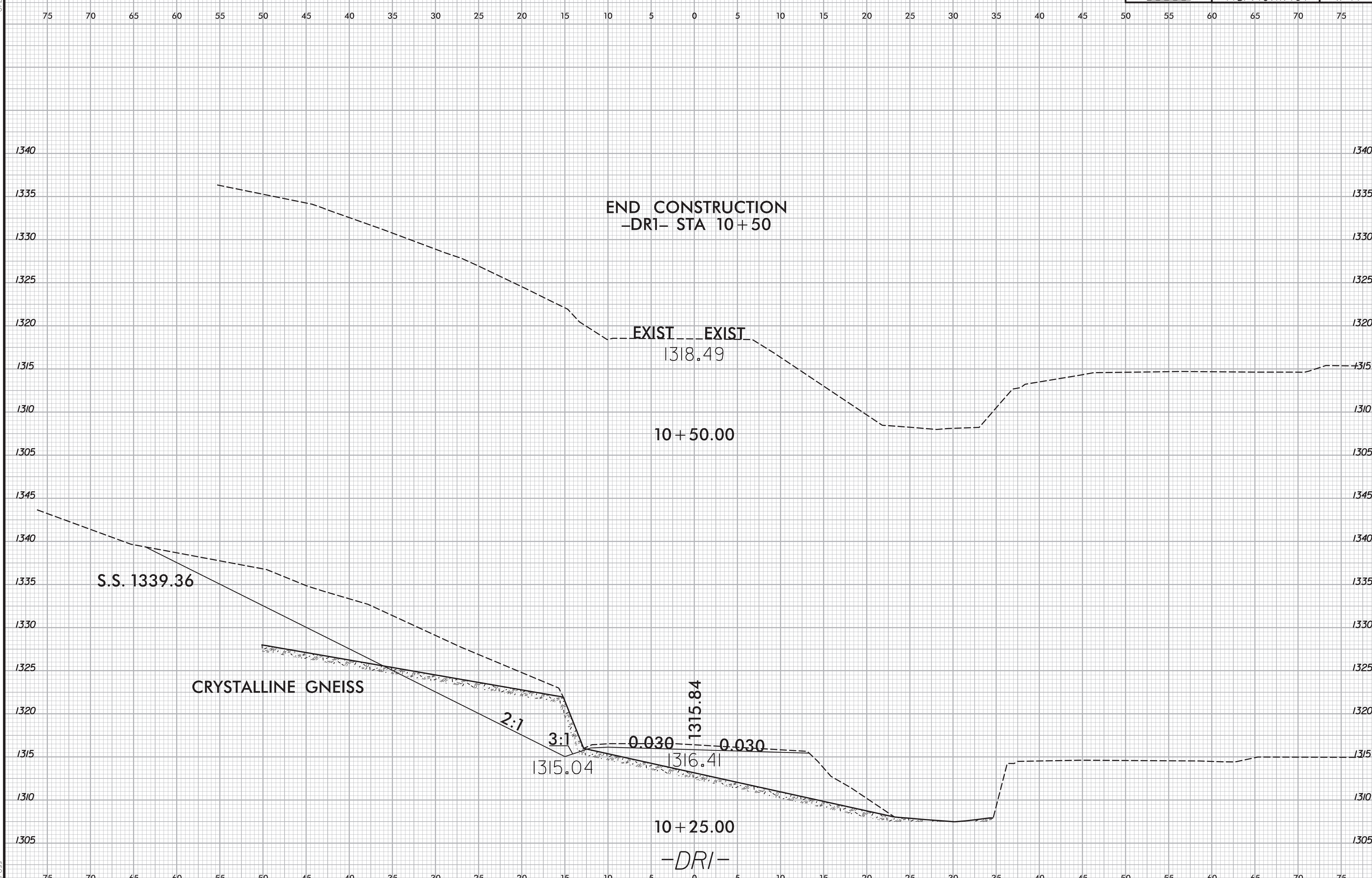

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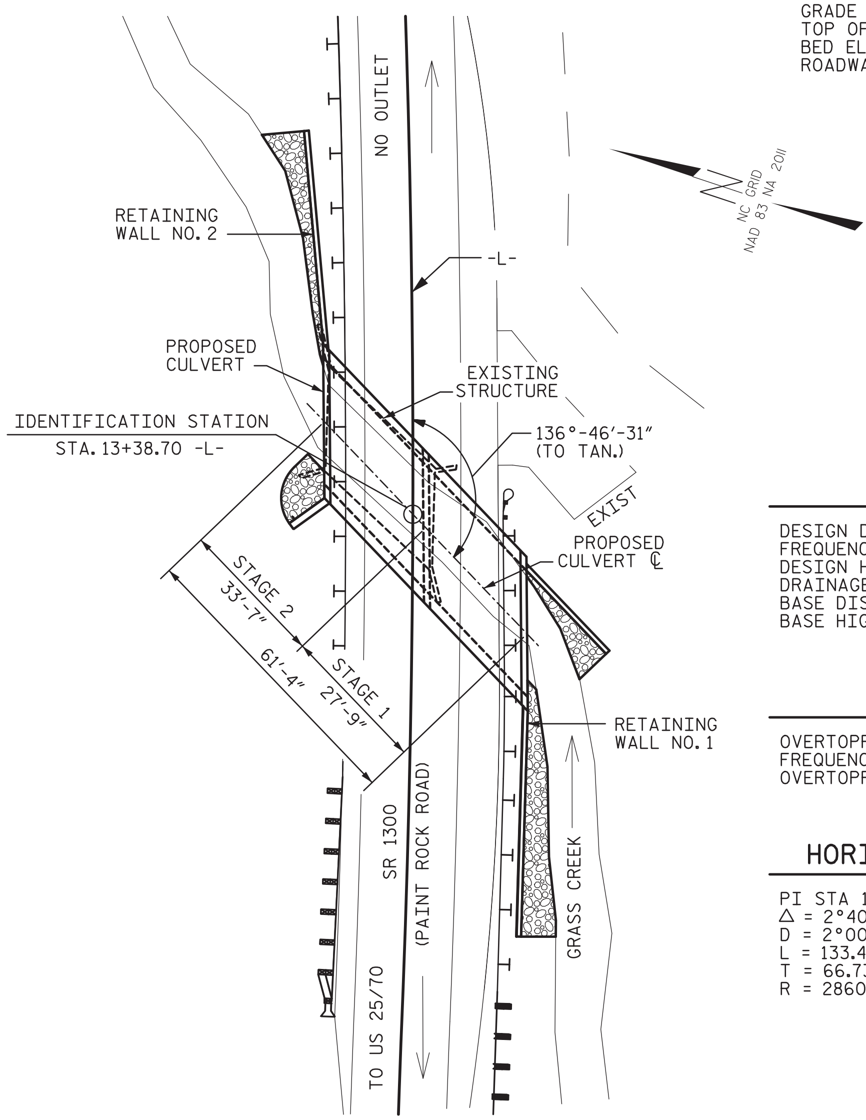
B.M. #1: RR SPIKE SET IN BASE OF 20" WALNUT -L- STA. 10+24.23 39.31' LT., EL. 1319.08' NAVD 88

GRADE POINT ELEV. @ STA. 13+38.70 -L- = 1314.68
TOP OF FOOTING ELEV. @ STA 13+38.70 -L- = 1308.57
BED ELEV. @ STA. 13+38.70 -L- = 1306.83
ROADWAY SLOPES = 2:1



HYDRAULIC DATA

DESIGN DISCHARGE	600 CFS
FREQUENCY OF DESIGN FLOOD	10 YR.
DESIGN HIGH WATER ELEVATION	1313.5 FT
DRAINAGE AREA	2.8 SQ. MI.
BASE DISCHARGE (Q 100)	1200 CFS
BASE HIGH WATER ELEVATION	1316.0 FT

OVERTOPPING DATA

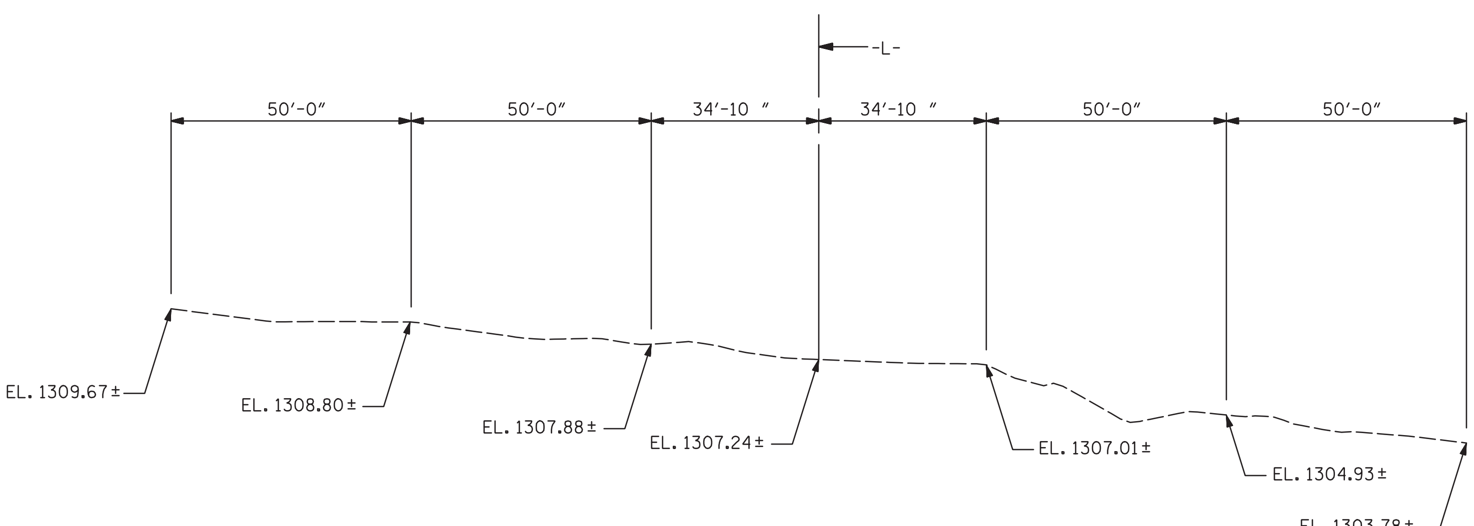
OVERTOPPING DISCHARGE	850 CFS
FREQUENCY OF OVERTOPPING FLOOD	25 YR.
OVERTOPPING FLOOD ELEVATION	1314.8 FT

HORIZONTAL CURVE DATA -L-

PI STA 11+66.73	PI STA 13+65.31
Δ = 2°40' 23.9" (RT)	Δ = 5°16' 46.9" (LT)
D = 2°00' 12.1"	D = 2°00' 12.1"
L = 133.44'	L = 263.54'
T = 66.73'	T = 131.87'
R = 2860.00'	R = 2860.00'
	SE = 0.3
	RO = 76.5'

LOCATION SKETCH

NO KNOWN UTILITY CONFLICTS



PROFILE ALONG ℄ CULVERT

NOTES:

ASSUMED LIVE LOAD = HL-93

MAXIMUM DESIGN FILL---------------- 3'-0"

MINIMUM DESIGN FILL---------------- 1'-9"

TOP OF FOOTING ELEVATIONS:
UPSTREAM = 1,308.92'
DOWNSTREAM = 1,308.22'

AFTER SERVING AS A TEMPORARY STRUCTURE, THE EXISTING STRUCTURE, CONSISTING OF (1) 22'-0" TIMBER DECK ON I-BEAMS SPAN WITH A 17'-0" CLEAR ROADWAY WIDTH ON CONCRETE BENT CAPS AND LOCATED AT THE PROPOSED STRUCTURE, SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRUTY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, THE LOAD LIMIT MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

REMOVAL OF THE EXISTING STRUCTURE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

FOR OTHER DESIGN DATA AND NOTES, SEE SHEET SN.

FOR PRECAST REINFORCED CONCRETE THREE-SIDED CULVERT, SEE SPECIAL PROVISIONS.

A 3 FOOT STRIP OF FILTER FABRIC SHALL BE ATTACHED TO THE FILL FACE OF THE WING COVERING THE ENTIRE LENGTH OF THE EXPANSION JOINT.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CULVERT DIVERSION DETAILS AND PAY ITEM, SEE EROSION CONTROL PLANS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

THE PRECAST CULVERT SECTIONS SHALL BE DESIGNED TO HANDLE FULL DEPTH HYDROSTATIC PRESSURE IF WEEP HOLES ARE NOT UTILIZED. IF PROVIDED, WEEP HOLES SHALL BE LOCATED A MINIMUM HEIGHT OF 6 INCHES ABOVE THE NORMAL FLOW LINE AND HAVE A MAXIMUM SPACING OF 10 FEET.

THE CONTRACTOR SHALL SUBMIT, TO THE ENGINEER FOR APPROVAL, DESIGN AND DETAIL DRAWINGS FOR CAST-IN-PLACE OR PRECAST HEADWALLS AND WINGWALLS, AND CAST-IN-PLACE FOOTINGS. PLANS AND DESIGN CALCULATIONS SHALL BE CHECKED AND SEALED BY A NORTH CAROLINA REGISTERED PROFESSIONAL ENGINEER.

FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 13+38.70 -L-".

TRAFFIC ON SR 1300 SHALL BE MAINTAINED. IN ORDER TO MAINTAIN TRAFFIC THE CULVERT SHALL BE CONSTRUCTED IN SECTIONS AS SHOWN IN THE STAGING PLANS.

THE RESIDENT ENGINEER SHALL CHECK THE LENGTH OF THE CULVERT BEFORE STAKING IT OUT TO MAKE CERTAIN THAT IT WILL PROPERLY TAKE CARE OF THE FILL.

THE BOTTOM OF FOOTINGS MAY BE LOWERED IF NECESSARY TO ACHIEVE REQUIRED BEARING CAPACITY.

BACKFILL FLOODPLAIN BENCH WITH NATIVE MATERIAL. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED AT THE PROJECT SITE DURING CULVERT CONSTRUCTION. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

THE ENTIRE COST OF WORK REQUIRED TO CONSTRUCT AND BACKFILL THE FLOODPLAIN BENCH AS SHOWN ON THE PLANS SHALL BE INCLUDED IN THE CONTRACT LUMP SUM PRICE BID FOR PRECAST REINFORCED CONCRETE THREE-SIDED CULVERT @ STA. 13+38.70 -L-

THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH HEC 18 "EVALUATING SCOUR AT BRIDGES"

FOR LIMITS OF TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE TRAFFIC CONTROL PLANS. FOR PAY ITEM FOR TEMPORARY SHORING FOR MAINTENANCE OF TRAFFIC, SEE ROADWAY PLANS.

FOR CONSTRUCTION SEQUENCE, SEE EROSION CONTROL PLANS.

FOUNDATION NOTES

FOOTINGS SHALL BE KEYED A MINIMUM OF 12 INCHES INTO WEATHERED OR CRYSTALLINE ROCK WITH A MINIMUM THICKNESS AS SHOWN ON THE PLANS.

SCOUR PROTECTION SHALL BE REQUIRED. RIP RAP IS NOT TO BE PLACED ABOVE THE STREAMBED.

THE SCOUR CRITICAL ELEVATION IS THE AS BUILT BOTTOM OF FOOTING ELEVATION. THE SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

THE CONTRACTOR IS RESPONSIBLE FOR GEOTECHNICAL INVESTIGATION IN ORDER TO DESIGN THE SPREAD FOOTING FOR THE THREE-SIDED CULVERT AND VERIFY THE NOMINAL BEARING CAPACITY FOR THE RETAINING WALLS.

TO PROVIDE PROTECTION FROM POSSIBLE SCOUR, DO NOT CONSTRUCT SPREAD FOOTINGS FOR THE CULVERT AT AN ELEVATION HIGHER THAN SHOWN ON THE PLANS.

FOR BLASTING ADJACENT TO HIGHWAY STRUCTURES, SEE ARTICLE 410-9 OF THE STANDARD SPECIFICATIONS.

TOTAL STRUCTURE QUANTITIES

REMOVAL OF EXISTING STRUCTURE @ STA. 13+38.70 -L-	LUMP SUM
UNCLASSIFIED STRUCTURE EXCAVATION	LUMP SUM
FOUNDATION EXCAVATION	7.5 C.Y.
PRECAST REINFORCED CONCRETE THREE-SIDED CULVERT @ STA. 13+38.70 -L-	LUMP SUM
CLASS A CONCRETE	46.0 C.Y.
ASBESTOS ASSESSMENT	LUMP SUM
CLASS A CONCRETE (RETAINING WALL)	55.3 C.Y.
REINFORCING STEEL (RETAINING WALL)	6,000 LBS
RIP RAP, CLASS II	19 TON
GEOTEXTILE FOR DRAINAGE	113.8 S.Y.

PROJECT NO. 17.BP.13.R.164
MADISON COUNTY
STATION: 13+38.70 -L-

SHEET 1 OF 8
REPLACES BRIDGE NO. 134

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PRECAST REINFORCED CONCRETE THREE-SIDED CULVERT
136°-46'-31"

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. C-1
TOTAL SHEETS 8

DRAWN BY : CTB DATE : 12-21
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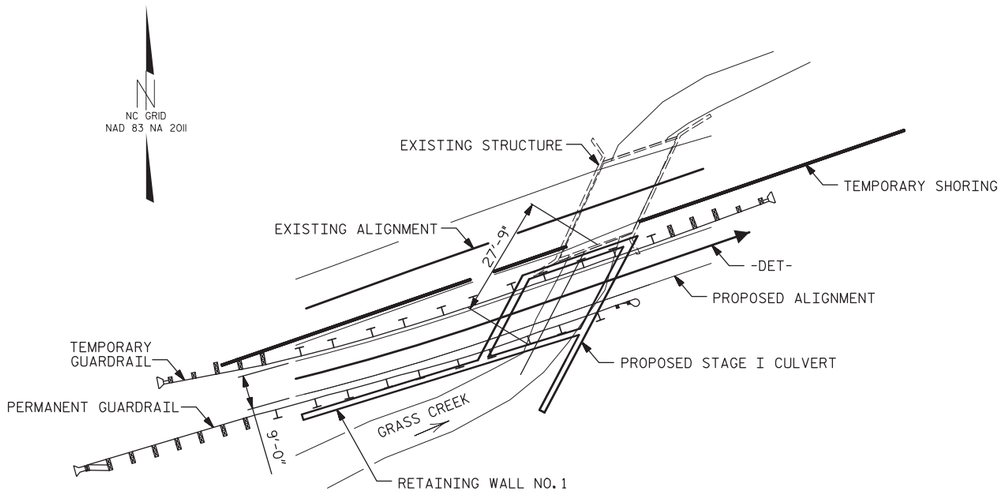
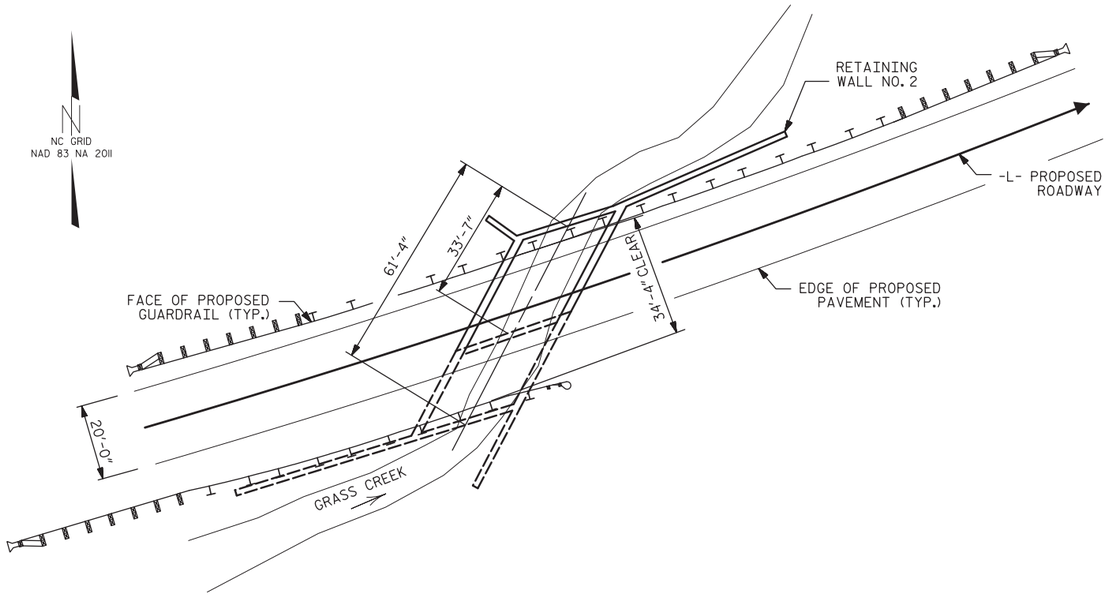


STAGE 1 CONSTRUCTION

1. MAINTAIN THE EXISTING STRUCTURE, ALIGNMENT, AND GUARDRAIL. TRAFFIC SHALL FLOW ON EXISTING STRUCTURE.
2. APPROXIMATELY 27'-9" OF THE PROPOSED STRUCTURE SHALL BE CONSTRUCTED TO THE UPSTREAM SIDE OF THE EXISTING BRIDGE, MEASURED ALONG THE LONGITUDINAL CENTERLINE OF THE CULVERT. THE UPSTREAM WINGWALL AND RETAINING WALL NO. 1, SHALL ALSO BE CONSTRUCTED.
3. SECTIONS OF PRECAST CULVERT SHALL BE CONNECTED PER MANUFACTURER SPECIFICATIONS/RECOMMENDATIONS TO ACT AS ONE UNIT
4. PERMANENT GUARDRAIL SHALL BE INSTALLED ON THE RIGHT SIDE OF THE PROPOSED STRUCTURE.
5. TEMPORARY GUARDRAIL SHALL BE INSTALLED ON THE LEFT SIDE OF THE PROPOSED STRUCTURE STARTING AT -DET- STA. 22+17.41 AND ENDING AT -DET- STA. 23+88.49.
6. TEMPORARY SHORING SHALL BE INSTALLED BETWEEN THE EXISTING AND PROPOSED STRUCTURES STARTING AT -DET- STA. 22+34.71 AND ENDING AT -DET- STA. 24+28.34.
7. TRAFFIC SHALL FLOW SHIFT TO THE PROPOSED STRUCTURE.



STAGE 2 CONSTRUCTION

1. DEMOLISH THE EXISTING STRUCTURE.
2. APPROXIMATELY 33'-7" OF THE PROPOSED STRUCTURE SHALL BE CONSTRUCTED, MEASURED ALONG THE LONGITUDINAL CENTERLINE OF THE CULVERT. THE DOWNSTREAM WINGWALL AND RETAINING WALL NO. 2, SHALL ALSO BE CONSTRUCTED.
3. SECTIONS OF PRECAST CONCRETE CULVERT SHALL BE CONNECTED PER MANUFACTURER SPECIFICATIONS/RECOMMENDATIONS TO ACT AS ONE UNIT.
4. TRAFFIC SHALL FLOW ON THE RIGHT HALF OF THE STRUCTURE UNTIL THE LEFT HALF IS COMPLETED.

NOTE: DIRECTIONS NOTED ON THIS SHEET ARE ORIENTED FACING UPSTATION.

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PROJECT NO. 17.BP.13.R.164

MADISON COUNTY

STATION: 13+38.70 -L-

SHEET 2 OF 8

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PRECAST REINFORCED CONCRETE THREE-SIDED CULVERT STAGING

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-2
1			3			TOTAL SHEETS
2			4			8

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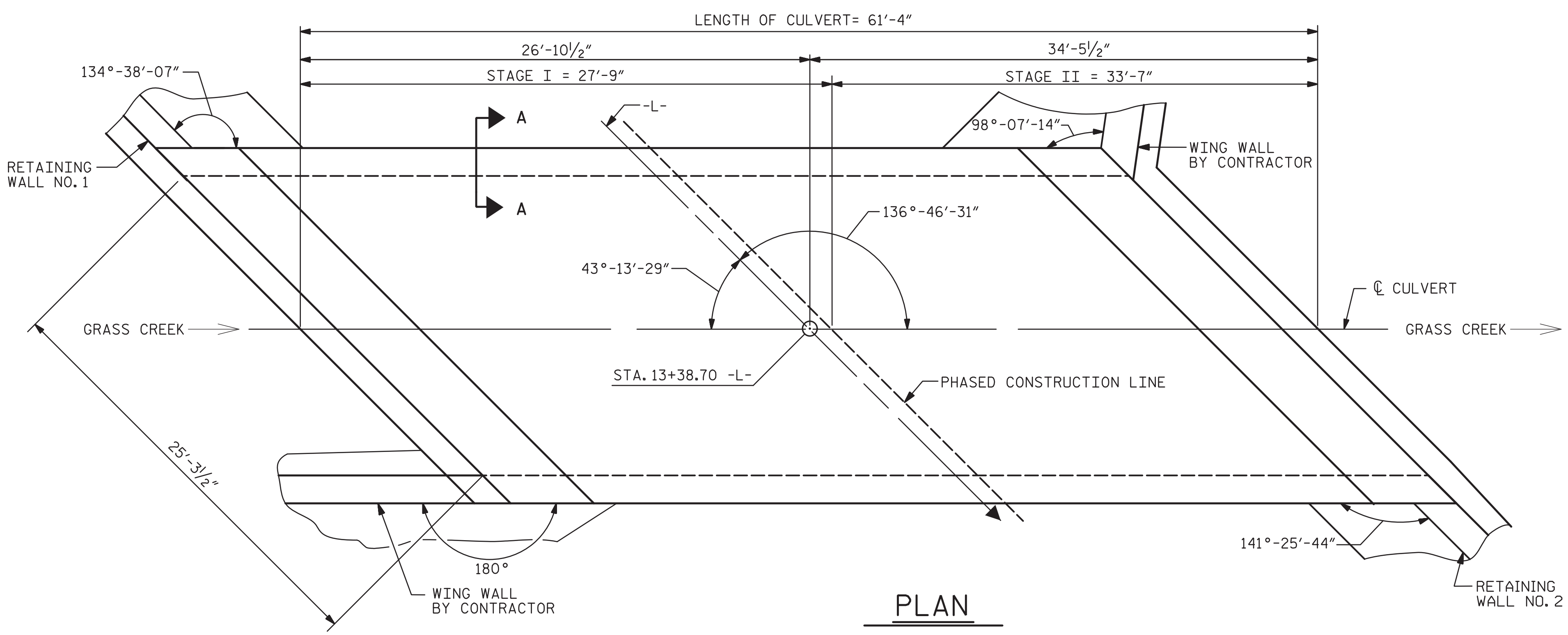
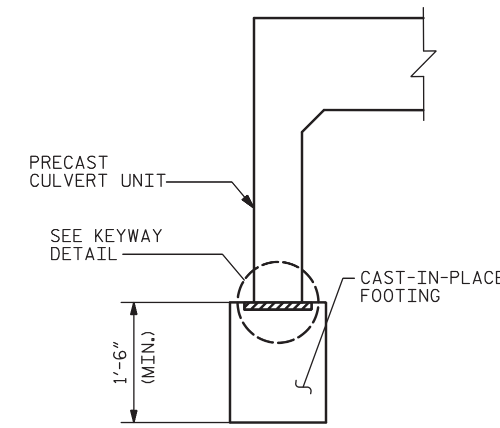
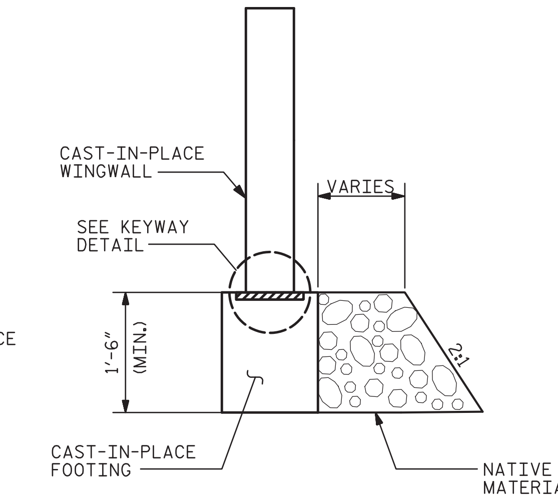


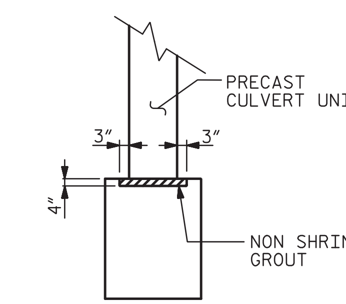
PLAN



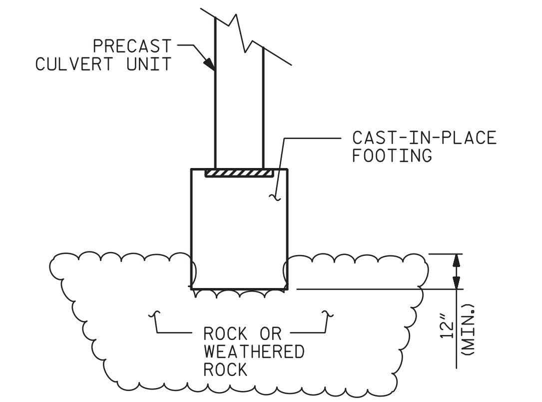
SECTION A-A



SECTION THRU WINGWALL

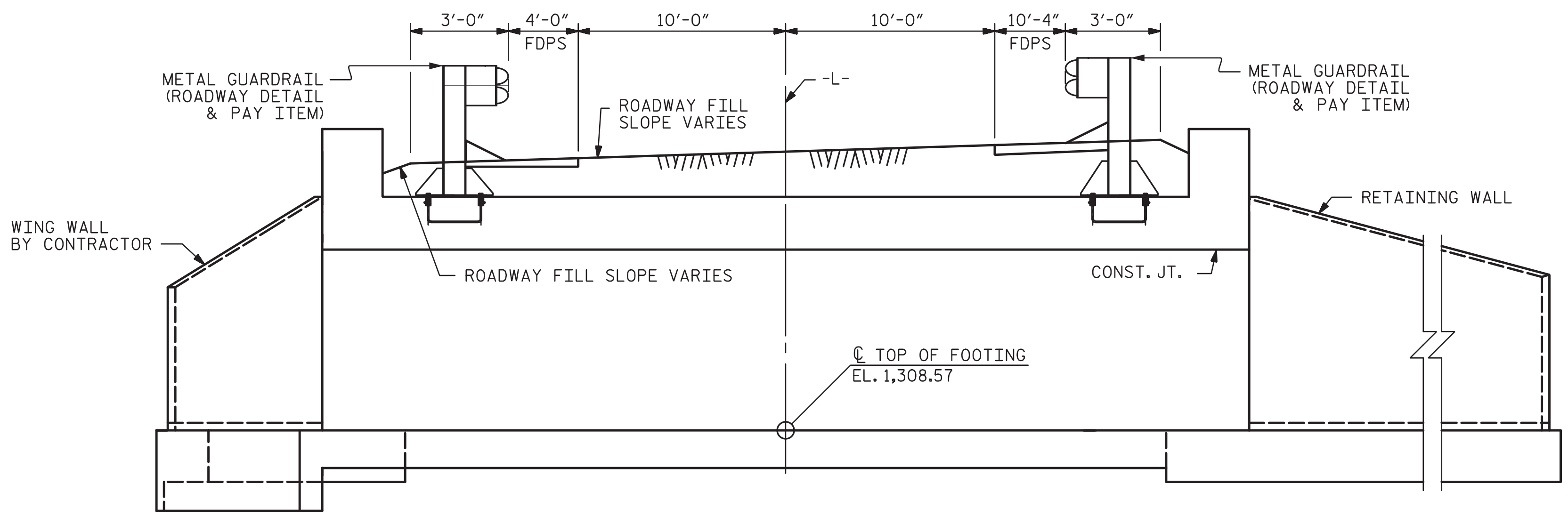


KEYWAY DETAIL

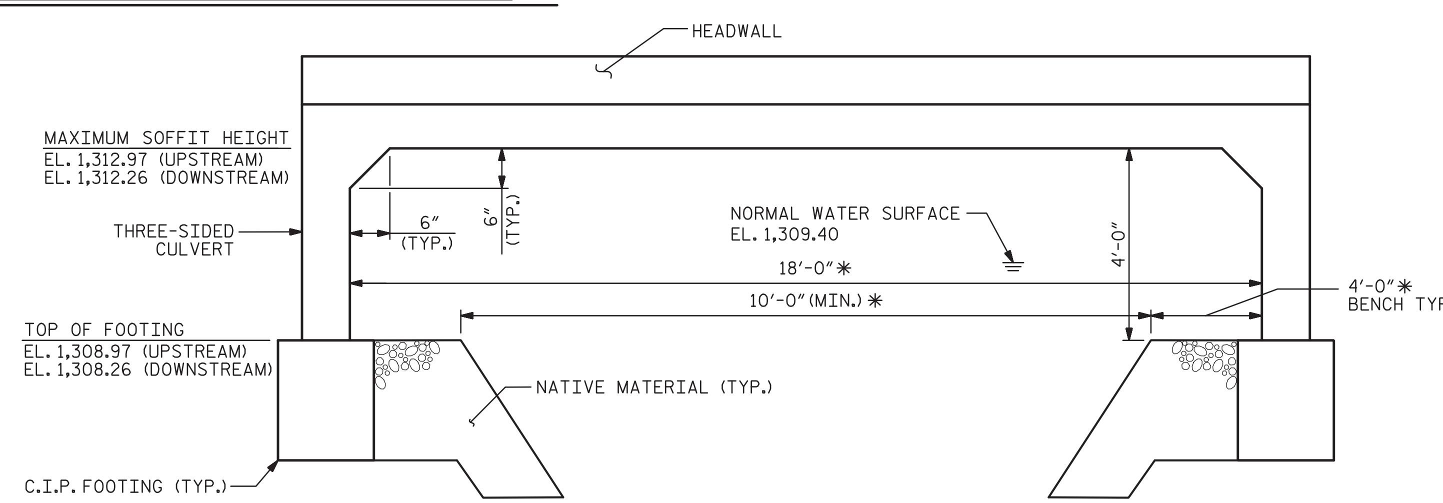


KEYED FOOTING DETAIL

SIDES OF FOOTING SHALL BE IN CONTACT WITH UNDISTURBED MATERIAL FOR MINIMUM DIMENSION SHOWN.



CULVERT SECTION NORMAL TO ROADWAY



TYPICAL SECTION

MINIMUM HYDRAULIC OPENING = 76.5 SQ. FT.

✱ NORMAL TO CULVERT

PROJECT NO. 17.BP.13.R.164

MADISON COUNTY

STATION: 13+38.70 -L-

SHEET 3 OF 8

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DEPARTMENT OF TRANSPORTATION
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PRECAST REINFORCED CONCRETE THREE-SIDED CULVERT DETAILS

REVISIONS								SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:			C-3
1			3					TOTAL SHEETS
2			4					8

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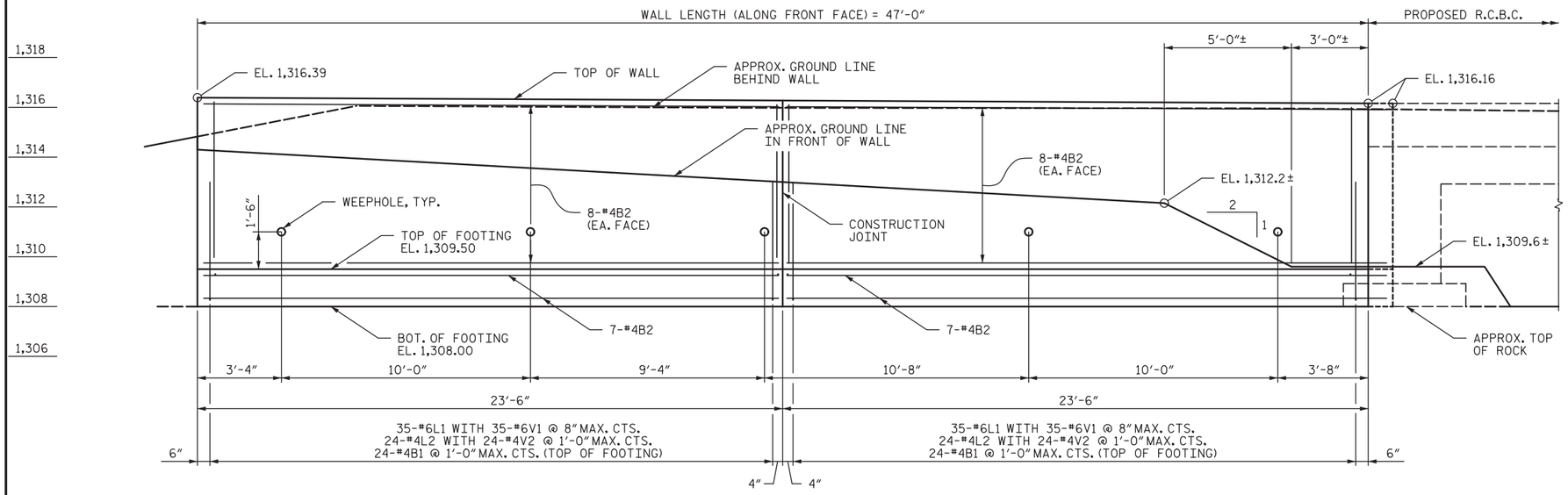
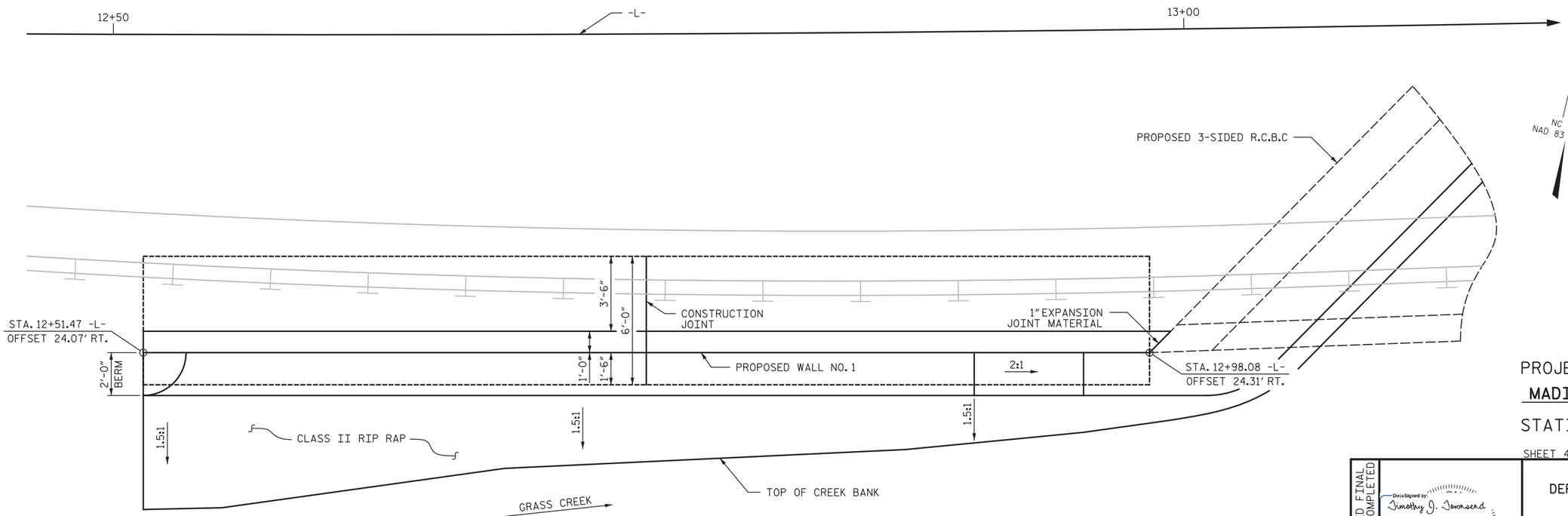
NOTES:
1. SEE SHEET 6 OF 8 FOR NOTES.



WALL PROFILE



WALL PLAN

PROJECT NO. 17.BP.13.R.164
MADISON COUNTY
STATION: 13+38.70 -L-
SHEET 4 OF 8

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RALEIGH

CAST-IN-PLACE RETAINING WALL NO. 1

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			8

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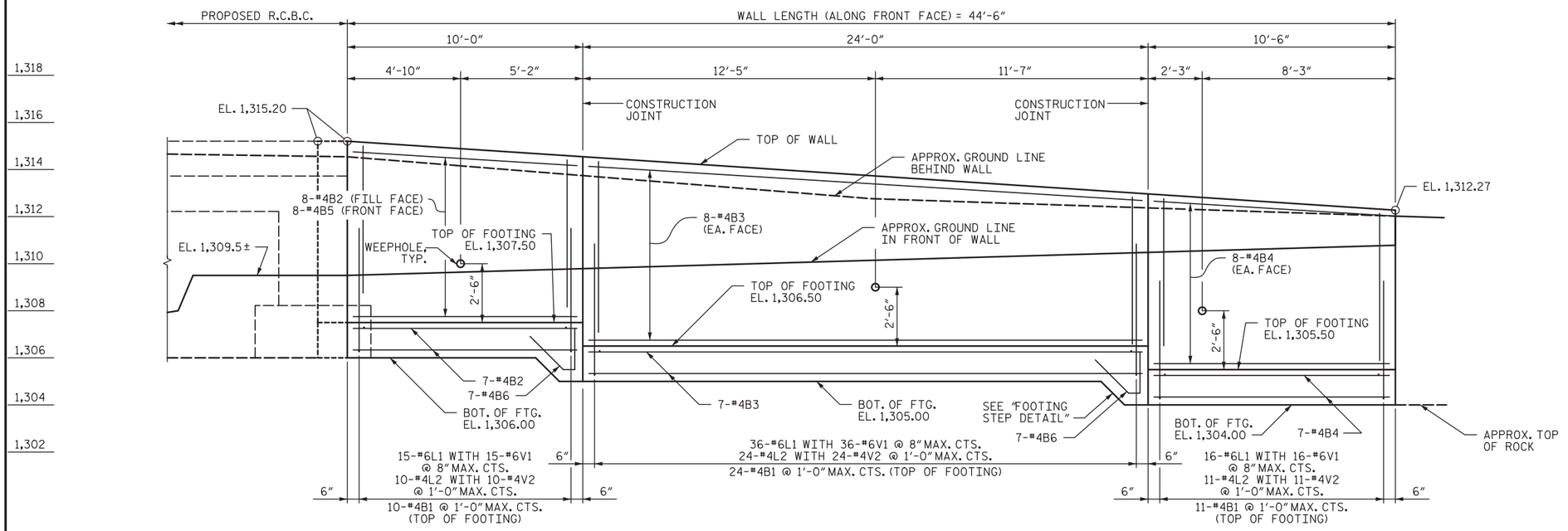
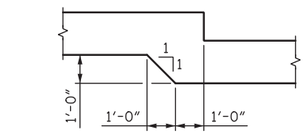
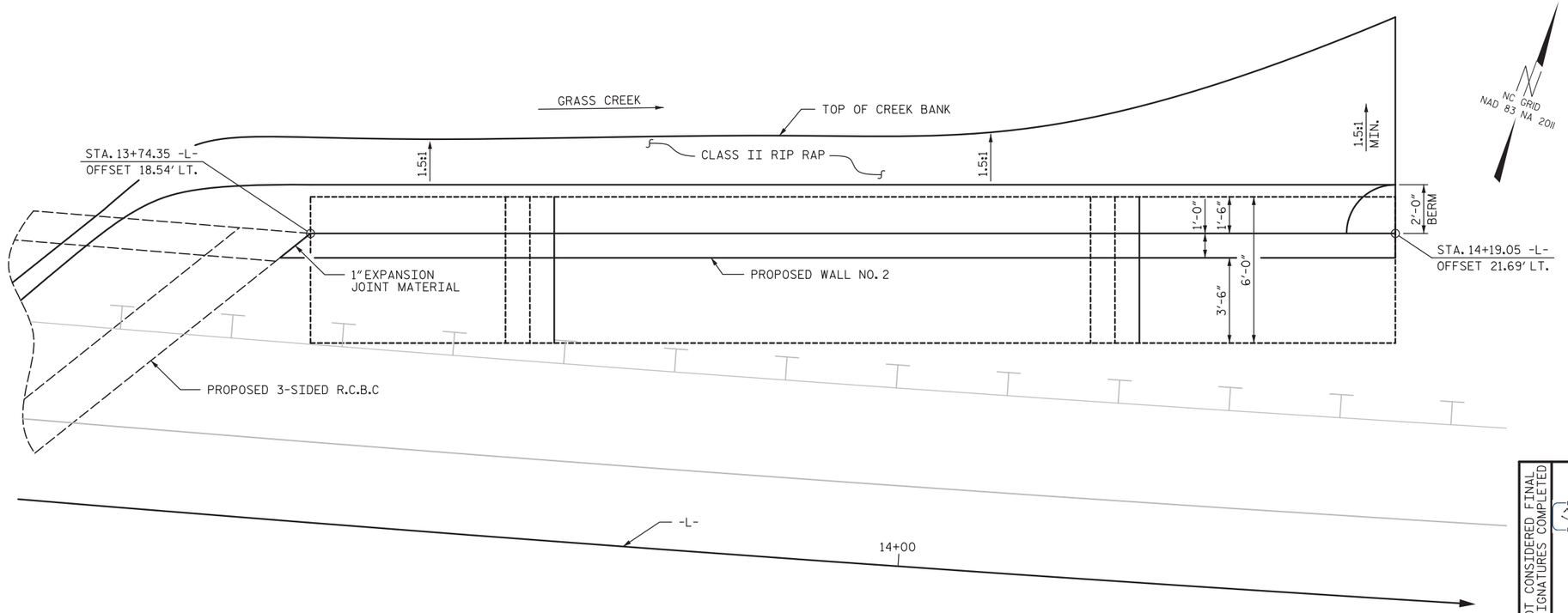
NOTES:
1. SEE SHEET 6 OF 8 FOR NOTES.



WALL PROFILE



FOOTING STEP DETAIL



WALL PLAN

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CAST-IN-PLACE
RETAINING WALL NO. 2

PROJECT NO. 17.BP.13.R.164
MADISON COUNTY
STATION: 13+38.70 -L-
SHEET 5 OF 8

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-5
1			3			TOTAL SHEETS
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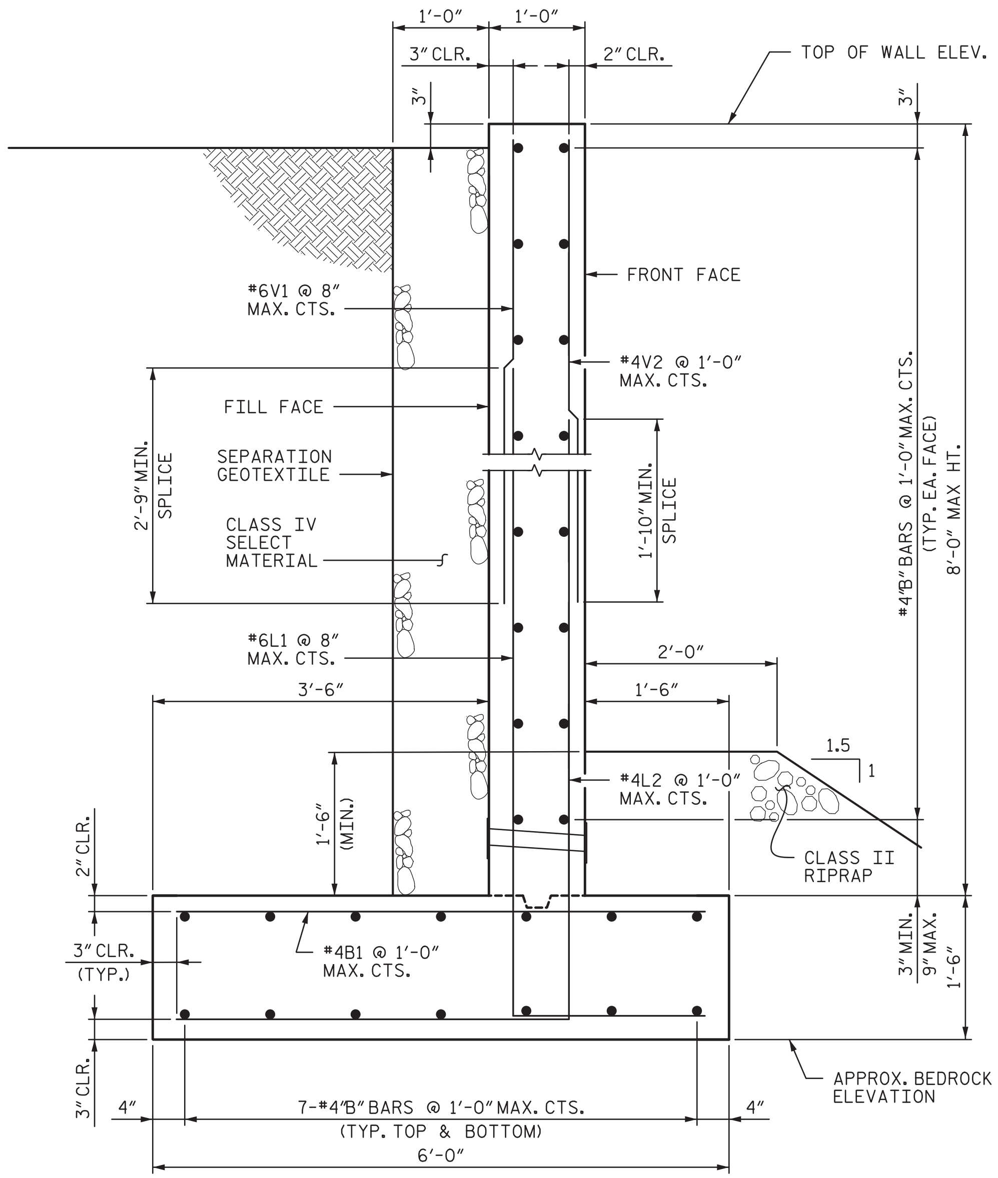
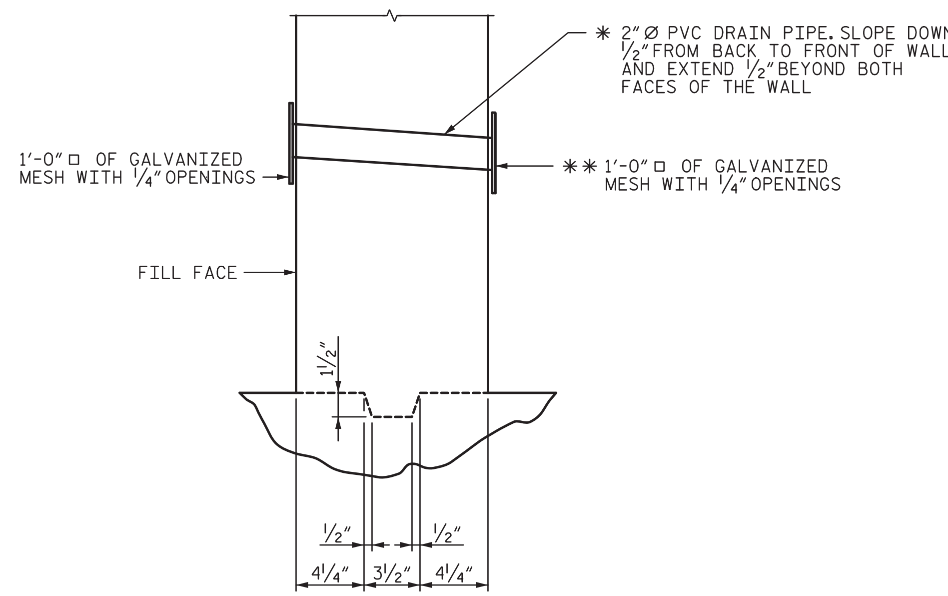


TYPICAL SECTION



WEEP HOLE DETAIL

* DRAIN PIPE TO BE LOCATED 6" ABOVE NORMAL WATER ELEVATION

** USE IF UNDER GROUND ELEVATION

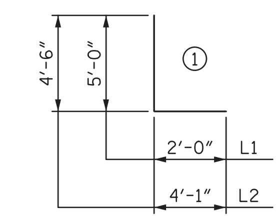
NOTES:

1. DIMENSIONS AND ELEVATIONS ARE BASED ON BEST INFORMATION AVAILABLE. THE CONTRACTOR SHALL VERIFY THESE DIMENSIONS IN THE FIELD PRIOR TO CONSTRUCTING THE RETAINING WALLS.
2. THE RETAINING WALLS HAVE BEEN DESIGNED ASSUMING BEDROCK ELEVATIONS AT THE BOTTOM OF FOOTING ELEVATIONS. BEDROCK SHALL HAVE A NOMINAL BEARING CAPACITY OF 5,000 PSF. THE CONTRACTOR SHALL VERIFY THESE PARAMETERS PRIOR TO BEGINNING WALL CONSTRUCTION AND CONTACT THE ENGINEER IMEDIATELY IF OF ANY DISCREPENCIES.
3. CHAMFER ALL EXPOSED CORNERS OF THE RETAINING WALL 3/4".
4. THE CONTRACTOR SHALL PLACE 1" EXPANSION JOINT MATERIAL BETWEEN THE 3 SIDED R.C.B.C. AND THE RETAINING WALLS.
5. WEEP HOLE DRAINAGE PIPES SHALL BE 2" Ø SCHEDULE 40 PVC CONFORMING TO ASTM D1785 AND SHALL HAVE A MAXIMUM SPACING OF 5'-0".

BILL OF MATERIAL
RETAINING WALL NO. 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	48	#4	STR	5'-6"	176
B2	60	#4	STR	24'-8"	922
L1	70	#6	1	7'-0"	736
L2	48	#4	1	8'-7"	275
V1	70	#6	STR	6'-3"	657
V2	48	#4	STR	6'-3"	200
REINFORCING STEEL				LBS.	2,966
CLASS A CONCRETE				C. Y.	27.6

BAR TYPES

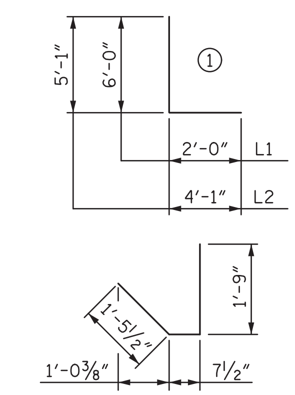


ALL BAR DIMENSIONS ARE OUT-TO-OUT

BILL OF MATERIAL
RETAINING WALL NO. 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	45	#4	STR	5'-6"	165
B2	22	#4	STR	9'-6"	140
B3	30	#4	STR	23'-6"	471
B4	30	#4	STR	10'-0"	200
B5	8	#4	STR	10'-6"	56
B6	14	#4	2	3'-10"	36
L1	67	#6	1	8'-0"	805
L2	45	#4	1	9'-2"	276
V1	67	#6	STR	6'-3"	629
V2	45	#4	STR	6'-3"	188
REINFORCING STEEL				LBS.	2,966
CLASS A CONCRETE				C. Y.	27.7

BAR TYPES



ALL BAR DIMENSIONS ARE OUT-TO-OUT

PROJECT NO. 17.BP.13.R.164

MADISON COUNTY

STATION: 13+38.70 -L-

SHEET 6 OF 8

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CAST-IN-PLACE
RETAINING WALL DETAILS

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
2			4			8

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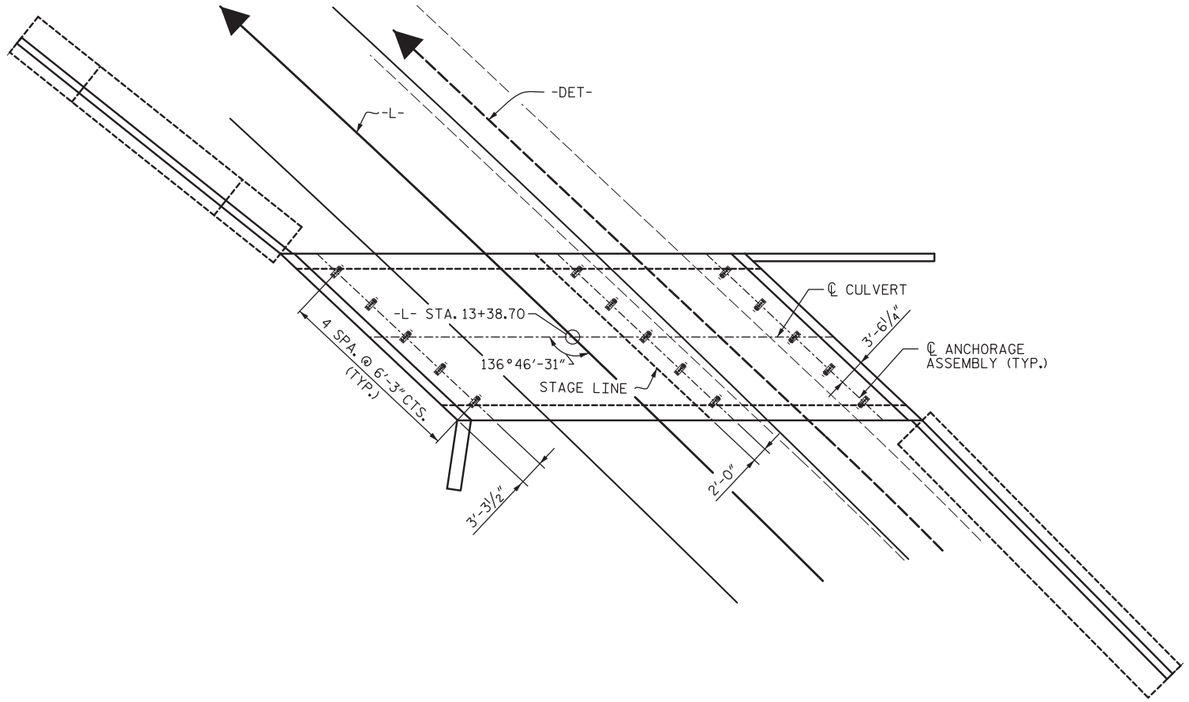


PLAN OF CULVERT GUARDRAIL ANCHOR ASSEMBLY SPACING

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS SHALL CONSIST OF THE FOLLOWING COMPONENTS :

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2½".

B. 4 - 1"Ø X 2¼" BOLTS WITH WASHERS, BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 1"Ø X 2 ¼" GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

C. WIRE STRUTS SHOWN IN THE GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS DETAIL ARE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 P.S.I. AS AN OPTION, A 7/16"Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

GUARDRAIL ANCHOR ASSEMBLY WITH BOLTS SHALL BE ASSEMBLED IN THE SHOP. BOLT THREADS MAY BE RECUT AS NECESSARY TO INSURE FIT.

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR PRECAST REINFORCED CONCRETE THREE-SIDED CULVERT @ STA. 13+38.70 -L-.

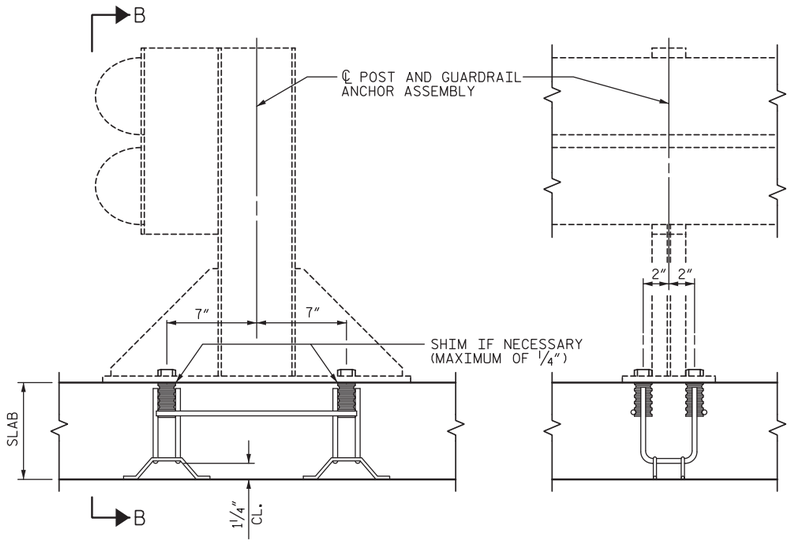
FERRULES TO BE PLUGGED DURING POURING OF SLAB AS RECOMMENDED BY THE MANUFACTURER.

AT THE CONTRACTOR'S OPTION, FERRULES WITH OPEN OR CLOSED ENDS MAY BE USED.

PAYMENT FOR GUARDRAIL, POSTS, AND POST BASE PLATES IS INCLUDED IN ROADWAY PAY ITEMS.

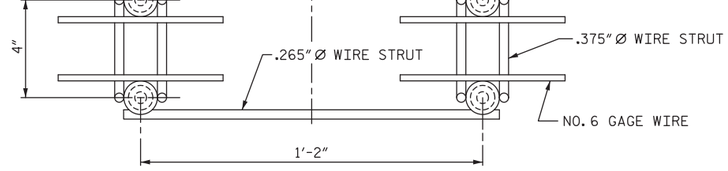
SLAB REINFORCING STEEL MAY BE SHIFTED AS NECESSARY TO CLEAR GUARDRAIL ANCHOR ASSEMBLY. CARE SHOULD BE TAKEN TO KEEP THE SHIFTING OF REINFORCING STEEL TO A MINIMUM.

THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF GUARDRAIL ANCHOR ASSEMBLY. LEVEL TWO FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 1"Ø BOLT IS 21.8 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS.

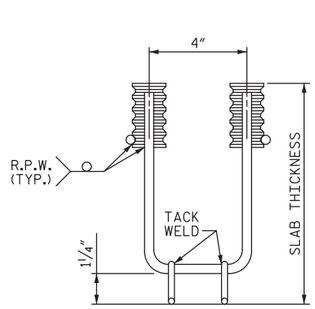


SECTION A-A

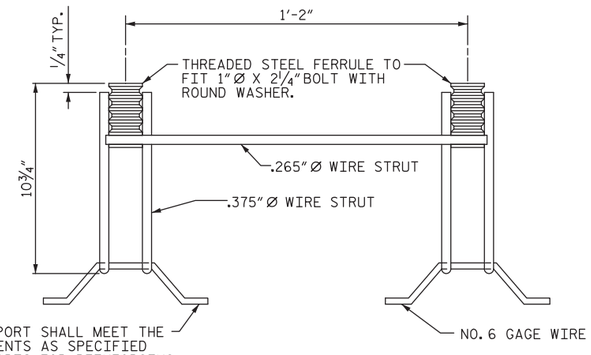
SECTION B-B



PLAN



ELEVATION



THIS SUPPORT SHALL MEET THE REQUIREMENTS AS SPECIFIED FOR SUPPORTS FOR REINFORCING STEEL. SEE SPECIFICATIONS.

SIDE VIEW

GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS

PROJECT NO. 17.BP.13.R.164

MADISON COUNTY

STATION: 13+38.70 -L-

SHEET 7 OF 8

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DocuSigned by: Timothy J. Townsend
D8C1881FA1E1402...
SEAL 34955 ENGINEER TIMOTHY J. TOWNSEND
12/16/2021

Mattern & Craig
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(828) 254-2201
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NC LIC. NO. C-1154

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

ANCHORAGE DETAILS FOR GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-7
1			3			TOTAL SHEETS
2			4			8

DRAWN BY : CTB	DATE : 12-21	DESIGN ENGINEER OF RECORD: T. TOWNSEND	DATE : 12-21
CHECKED BY : TJT	DATE : 12-21		

DATE: 12/16/2021 TIME: 9:22:26 AM
FILE: I:\3850A - Div 13 Bridge 134 (Madison Co)\DWG\401_013_17BP.13.R.161_SMU_CU_007_560134.dgn

STANDARD NOTES

DESIGN DATA:

SPECIFICATIONS	A.A.S.H.T.O. (CURRENT)
LIVE LOAD	SEE PLANS
IMPACT ALLOWANCE	SEE A.A.S.H.T.O.
STRESS IN EXTREME FIBER OF STRUCTURAL STEEL - AASHTO M270 GRADE 36	20,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50W	27,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50	27,000 LBS. PER SQ. IN.
REINFORCING STEEL IN TENSION - GRADE 60	24,000 LBS. PER SQ. IN.
CONCRETE IN COMPRESSION	1,200 LBS. PER SQ. IN.
CONCRETE IN SHEAR	SEE A.A.S.H.T.O.
STRUCTURAL TIMBER - TREATED OR UNTREATED EXTREME FIBER STRESS	1,800 LBS. PER SQ. IN.
COMPRESSION PERPENDICULAR TO GRAIN OF TIMBER	375 LBS. PER SQ. IN.
EQUIVALENT FLUID PRESSURE OF EARTH	30 LBS. PER CU. FT. (MINIMUM)

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2018 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

STEEL SHEET PILING FOR PERMANENT OR TEMPORARY APPLICATIONS SHALL BE HOT ROLLED.

CONCRETE:

UNLESS OTHERWISE REQUIRED ON PLANS, CLASS A CONCRETE SHALL BE USED FOR ALL PORTIONS OF ALL STRUCTURES WITH THE EXCEPTION THAT: CLASS AA CONCRETE SHALL BE USED IN BRIDGE SUPERSTRUCTURES, ABUTMENT BACKWALLS, AND APPROACH SLABS; AND CLASS B CONCRETE SHALL BE USED FOR SLOPE PROTECTION AND RIP RAP.

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED ¾" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1½" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A ¼" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A ¼" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

DOWELS WHEN INDICATED ON PLANS AS FOR CULVERT EXTENSIONS, SHALL BE EMBEDDED AT LEAST 12" INTO THE OLD CONCRETE AND GROUTED INTO PLACE WITH 1:2 CEMENT MORTAR.

ALLOWANCE FOR DEAD LOAD DEFLECTION, SETTLEMENT, ETC. IN CASTING SUPERSTRUCTURES:

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.

ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER.

IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER.

DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.

WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE ⅞" Ø SHEAR STUDS FOR THE ¾" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - ⅞" Ø STUDS FOR 4 - ¾" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF ⅞" Ø STUDS ALONG THE BEAM AS SHOWN FOR ¾" Ø STUDS BASED ON THE RATIO OF 3 - ⅞" Ø STUDS FOR 4 - ¾" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16 INCH OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.

METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

GENERALLY, IN CASE OF DISCREPANCY, THIS STANDARD SHEET OF NOTES SHALL GOVERN OVER THE SPECIFICATIONS, BUT THE REMAINDER OF THE PLANS SHALL GOVERN OVER NOTES HEREON, AND SPECIAL PROVISIONS SHALL GOVERN OVER ALL. SEE SPECIFICATIONS ARTICLE 105-4.

PROJECT NO. 17.BP.13.R.164

MADISON COUNTY

STATION: 13+38.70 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD NOTES

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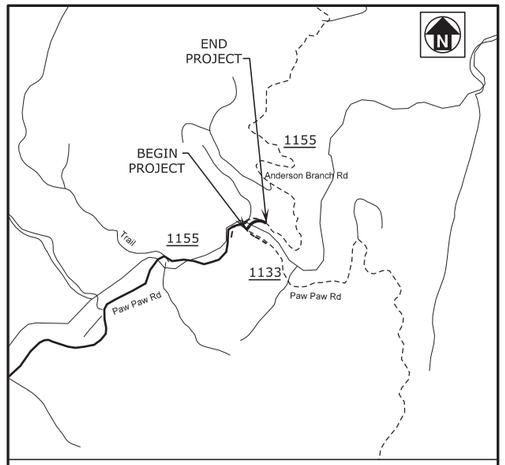
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-8
1			3			TOTAL SHEETS
2			4			8

DATE: 12/16/2021 TIME: 9:19:19 AM
FILE: I:\3850A - Div 13 Bridge 134 (Madison Co)\DWG\401_015_17BP.13.R.161_SMU_CU_008_560134.dgn

PROJECT: 17BP.13.R.166

CONTRACT: DM00350

See Sheet 1-A For Index of Sheets
See Sheet 1-B for Conventionol Symbols



VICINITY MAP
(NOT TO SCALE)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

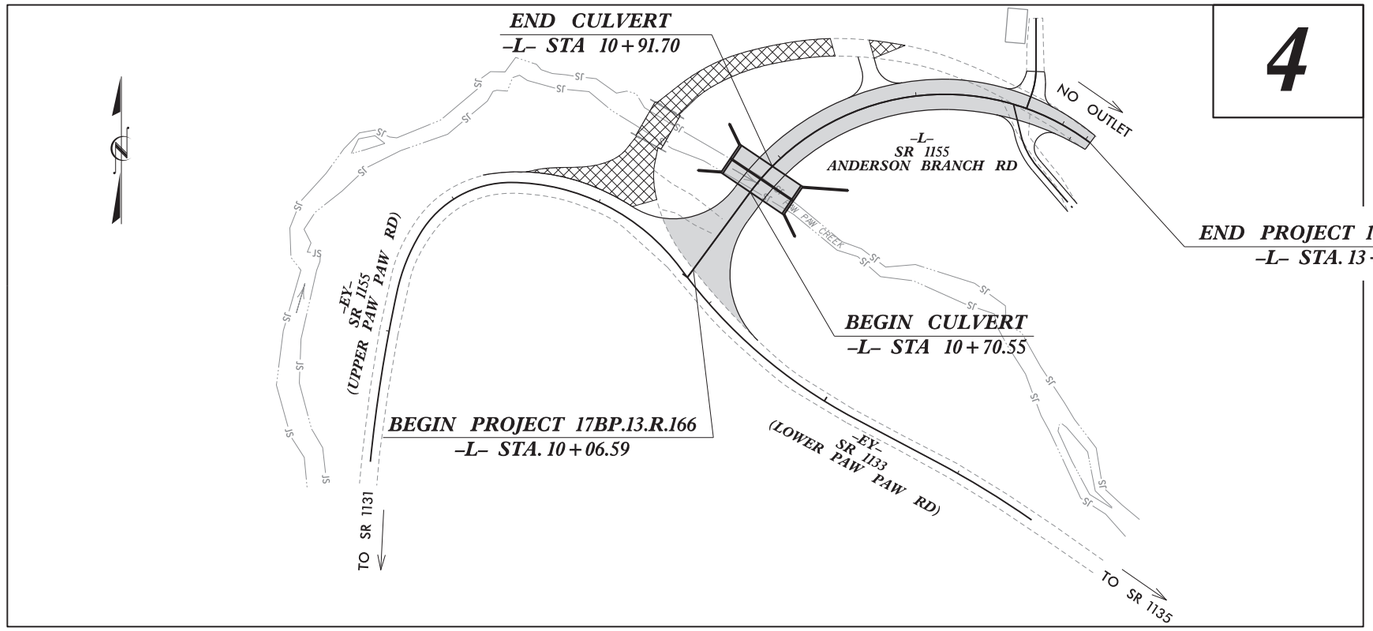
MADISON COUNTY

LOCATION: BRIDGE NO. 353 ON SR 1155 (ANDERSON BRANCH ROAD) OVER PAW PAW CREEK

TYPE OF WORK: GRADING, PAVING, DRAINAGE AND CULVERT

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.13.R.166	1	

STATE PROJECT NO.	F. A. PROJ. NO.	DESCRIPTION
17BP.13.PE.166	N/A	P.E.
17BP.13.ROW.166	N/A	R/W & UTIL
17BP.13.R.166	N/A	CONST



PLANS PREPARED BY:

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GRAPHIC SCALES

30 15 0 30 60
PLANS

30 15 0 30 60
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT (2011) =420

V = 25 MPH

FUNC CLASS =
RURAL LOCAL
SUBREGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY PROJECT 17BP.13.R.166 = 0.056 MILES

LENGTH STRUCTURE PROJECT 17BP.13.R.166 = 0.004 MILES

TOTAL LENGTH PROJECT 17BP.13.R.166 = 0.060 MILES

Prepared in the Office of:
MATTERN & CRAIG
12 BROAD ST.
ASHEVILLE, NC 28801
FOR NCDOT DIVISION OF HIGHWAYS

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
FEBRUARY 19, 2019

LETTING DATE:
MAY 18, 2022

AARON CARVER, PE
PROJECT ENGINEER

MENG YANG, EI
PROJECT DESIGN ENGINEER

NCDOT CONTACT:
MIKE CALLOWAY
DIVISION 13 BRIDGE PROGRAM MANAGER

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 030453 DocuSigned by: Aaron Carver 9250B42A220F49C... P.E.

3/25/2022

SIGNATURE:

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 030453 DocuSigned by: Aaron Carver 9250B42A220F49C... P.E.

3/25/2022

SIGNATURE:

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION

PROJECT REFERENCE NO.	SHEET NO.
17BPJ3.R166	1A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL — DocuSigned by: Aaron Carver — 3/7/2022

INDEX OF SHEETS

GENERAL NOTES

GENERAL NOTES: 2018 SPECIFICATIONS
EFFECTIVE: 01-16-2018
REVISED:

GRADING AND SURFACING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED 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 II.

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

SHOULDER CONSTRUCTION:

ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.01

SIDE ROADS:

THE CONTRACTOR WILL BE REQUIRED TO DO ALL NECESSARY WORK TO PROVIDE SUITABLE CONNECTIONS WITH ALL ROADS, STREETS, AND DRIVES ENTERING THIS PROJECT. THIS WORK WILL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR THE PARTICULAR ITEMS INVOLVED.

SUBSURFACE DRAINS:

SUBSURFACE DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.02 AT LOCATIONS DIRECTED BY THE ENGINEER.

TEMPORARY SHORING:

SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC WILL BE PAID FOR AS "EXTRA WORK" IN ACCORDANCE WITH SECTION 104-7.

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE FRENCH BROAD ELECTRIC MEMBERSHIP CORP. AND TELEPHONE FRONTIER COMMUNICATIONS.

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

RIGHT-OF-WAY MARKERS:

ALL RIGHT-OF-WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY OTHERS.

STANDARD DRAWINGS

EFF. 01-16-2018
REV.

2018 ROADWAY ENGLISH STANDARD DRAWINGS

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
DIVISION 2 - EARTHWORK	
200.02	Method of Clearing - Method II
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
225.06	Method of Grading Sight Distance at Intersections
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
310.10	Driveway Pipe Construction
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
DIVISION 8 - INCIDENTALS	
815.02	Subsurface Drain
876.02	Guide for Rip Rap at Pipe Outlets

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12/2/2016

PROJECT REFERENCE NO.	SHEET NO.
17BPJ3,RJ66	1-B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

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

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin (EIP)
- Computed Property Corner
- Property Monument (ECM)
- Parcel/Sequence Number (123)
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary (WLB)
- Proposed Wetland Boundary (WLB)
- Existing Endangered Animal Boundary (EAB)
- Existing Endangered Plant Boundary (EPB)
- Existing Historic Property Boundary (HPB)
- Known Contamination Area: Soil (S)
- Potential Contamination Area: Soil (S)
- Known Contamination Area: Water (W)
- Potential Contamination Area: Water (W)
- Contaminated Site: Known or Potential

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or U/G Tank Cap
- Sign (S)
- Well (W)
- Small Mine
- Foundation
- Area Outline
- Cemetery
- Building
- School
- Church
- Dam

HYDROLOGY:

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

RAILROADS:

- Standard Gauge (CSX TRANSPORTATION)
- RR Signal Milepost (MILEPOST 35)
- Switch (SWITCH)
- RR Abandoned
- RR Dismantled

RIGHT OF WAY & PROJECT CONTROL:

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

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut (C)
- Proposed Slope Stakes Fill (F)
- Proposed Curb Ramp (CR)
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

VEGETATION:

- Single Tree
- Single Shrub
- Hedge
- Woods Line
- Orchard
- Vineyard (Vineyard)

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

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

PROJECT REFERENCE NO.	SHEET NO.
17BPJ3.RJ66	2A-1
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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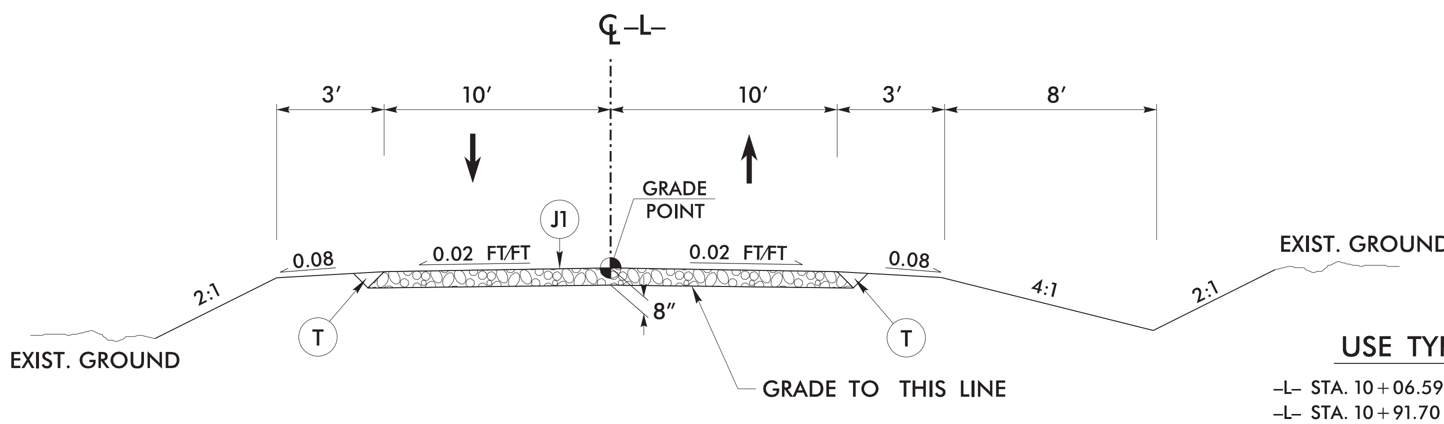
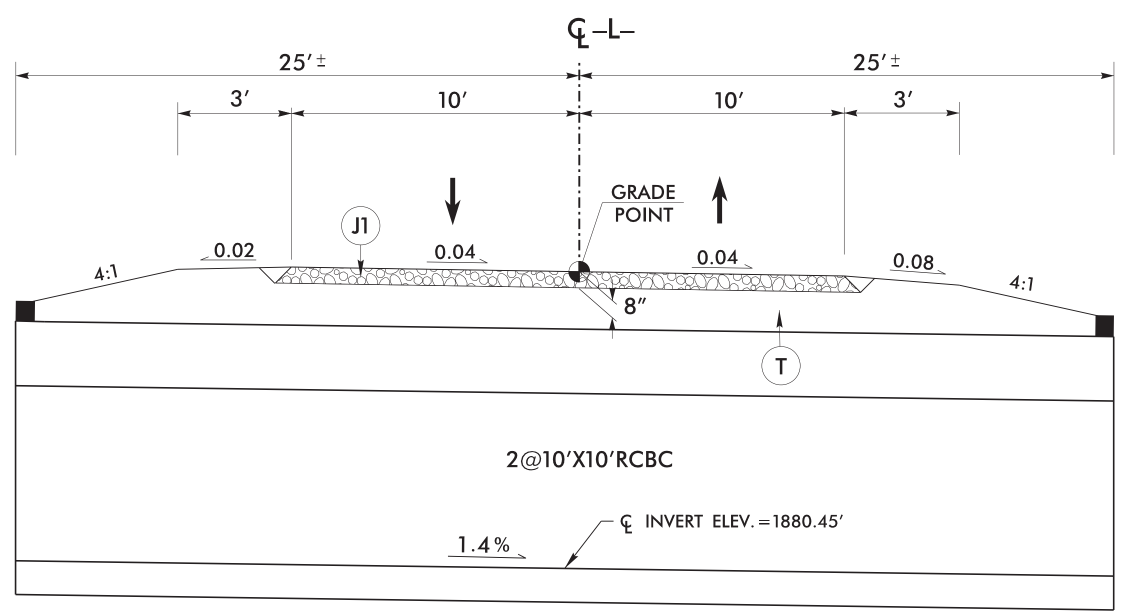


TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1

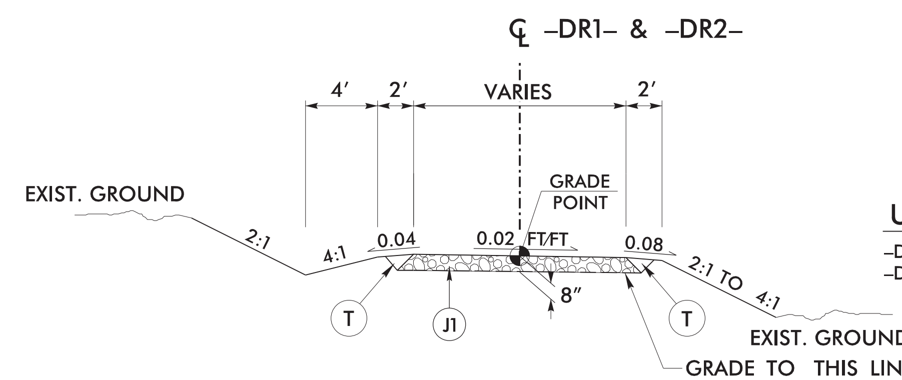
-L- STA. 10+06.59 TO -L- STA. 10+70.55 (BEGIN CULVERT)
-L- STA. 10+91.70 (END CULVERT) TO -L- STA. 13+21.87



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2

-L- STA. 10+70.55 (BEGIN CULVERT) TO -L- STA. 10+91.70 (END CULVERT)



TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3

-DR1- STA. 10+10.61 TO -DR1- 10+80.35
-DR2- STA. 10+08.20 TO -DR2- 10+25.35

PAVEMENT SCHEDULE	
J1	8" AGGREGATE BASE COURSE
T	EARTH MATERIAL

NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE

6/21/00

COMPUTED BY: MY DATE: 12-6-18
CHECKED BY: ACC DATE: 12-6-18

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
17BPJ3.RJ66	3B-1

SUMMARY OF EARTHWORK

IN CUBIC YARDS					
LOCATION	UNCLASSIFIED EXCAVATION	UNDERCUT	EMBT + %	BORROW	WASTE
SUMMARY NO.1					
–L– STA. 10+06 TO –L– STA. 13+21	250		2203	1953	
–DR1– 10+10.61 TO –DR1– 10+80.35			20	20	
SUBTOTAL SUMMARY NO.1	250		2223	1973	
PROJECT SUBTOTAL	250		2223	1973	
EST. 5% FOR REPLACING TOP SOIL ON BORROW PITS				99	
GRAND TOTAL	250		2223	2072	
SAY	250			2100	

EST. DDE = 140 CY

CONTINGENCY ITEMS:
INCIDENTAL STONE = 50 TONS
UNDERCUT EXCAVATION = 50 CY
SELECT GRANULAR MATERIAL = 50 CY
CLASS IV SUBGRADE STABILIZATION = 50 TONS
GEOTEXTILE FOR SOIL STABILIZATION = 50 SY

Approximate quantities only. Unclassified excavation, fine grading, and clearing and grubbing will be paid for at the contract lump sum price for "grading".

NOTE: Invert Elevations are for Bid Purposes only and shall not be used for project construction stakeout. See "Standard Specifications For Roads and Structures, Section 300–5".

SUB–REGIONAL & REGIONAL
LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48" & UNDER)

STATION	LOCATION (LT,RT, OR CL)	STRUCTURE NO. FROM	STRUCTURE NO. TO	TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	SLOPE CRITICAL	DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC) SIZE	12"	15"	18"	24"	30"	36"	42"	48"	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE
								THICKNESS OR GAUGE												
–L– 11+51	CL	0401			1893.3	1888.5														
–L– 11+75	LT	0401A																		
–L– 12+38	CL	0402			1897.8	1890.1														
–L– 12+74	LT	0403																		
TOTAL																				

C.S. PIPE	12"	15"	18"	24"	36"	42"	48"
	.064	.064	.064	.064	.079	.109	.109
–L– 11+51					64		
–L– 11+75							
–L– 12+38			72				
–L– 12+74							
TOTAL			72		64		

R.C. PIPE (CLASS III)	15"	18"	24"	30"	36"	42"	48"
–L– 11+51							
–L– 11+75							
–L– 12+38							
–L– 12+74							
TOTAL							

R.C. PIPE (CLASS IV)	12"	15"	18"	24"	30"	36"	42"	48"
–L– 11+51					64			
–L– 11+75								
–L– 12+38								
–L– 12+74								
TOTAL					64			

	*** R. C. PIPE (CLASS V)	*** R. C. PIPE CULVERTS, CONTRACTOR DESIGN PIPE	*** R. C. PIPE CULVERTS, CONTRACTOR DESIGN PIPE	15" SIDE DRAIN PIPE	18" SIDE DRAIN PIPE
–L– 11+51					
–L– 11+75					20
–L– 12+38					
–L– 12+74				24	
TOTAL				24	20

ENDWALLS	STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YDS. R.C.P.	C.S.P.
–L– 11+51		
–L– 11+75		
–L– 12+38		
–L– 12+74		
TOTAL		

QUANTITIES FOR DRAINAGE STRUCTURES * TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL. 'B') LIN. FT.	PER EACH (0' THRU 5.0')	A 5.0' THRU 10.0'	B 10.0' AND ABOVE
–L– 11+51			
–L– 11+75			
–L– 12+38			
–L– 12+74			
TOTAL			

C.B. STD. 840.01 OR STD. 840.02
–L– 11+51
–L– 11+75
–L– 12+38
–L– 12+74
TOTAL

FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE	E	F	G
–L– 11+51			
–L– 11+75			
–L– 12+38			
–L– 12+74			
TOTAL			

CONCRETE TRANSITIONAL SECTION	CATCH BASIN	DROP INLET
–L– 11+51		
–L– 11+75		
–L– 12+38		
–L– 12+74		
TOTAL		

TBDI STD 840.35
–L– 11+51
–L– 11+75
–L– 12+38
–L– 12+74
TOTAL

TBDI FRAME WITH TWO GRATES 840.37
–L– 11+51
–L– 11+75
–L– 12+38
–L– 12+74
TOTAL

J.B. STD. 840.31 OR 840.32
–L– 11+51
–L– 11+75
–L– 12+38
–L– 12+74
TOTAL

M.H. FRAME & COVER STD. 840.54
–L– 11+51
–L– 11+75
–L– 12+38
–L– 12+74
TOTAL

MODIFIED CONCRETE FLUME
–L– 11+51
–L– 11+75
–L– 12+38
–L– 12+74
TOTAL

CORR. STEEL ELBOWS NO. & SIZE
–L– 11+51
–L– 11+75
–L– 12+38
–L– 12+74
TOTAL

CONC. COLLARS CL. "B" C.Y. STD. 840.72
–L– 11+51
–L– 11+75
–L– 12+38
–L– 12+74
TOTAL

CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71
–L– 11+51
–L– 11+75
–L– 12+38
–L– 12+74
TOTAL

PIPE REMOVAL LIN.FT.	REMARKS
–L– 11+51	
–L– 11+75	
–L– 12+38	32
–L– 12+74	24
TOTAL	56

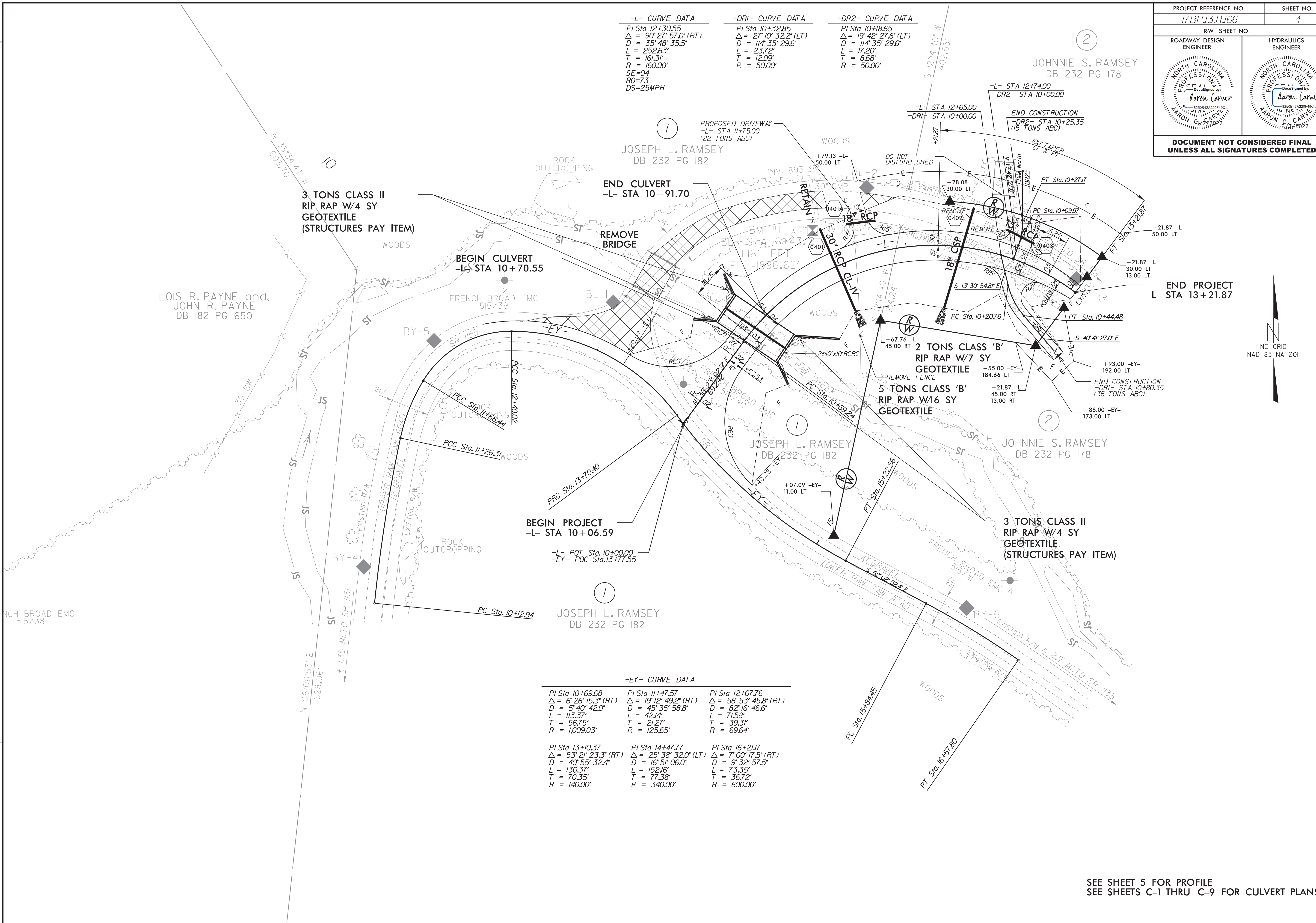
ABBREVIATIONS

C.B.	CATCH BASIN
N.D.I.	NARROW DROP INLET
D.I.	DROP INLET
G.D.I.	GRATED DROP INLET
G.D.I. (N.S.)	GRATED DROP INLET (NARROW SLOT)
J.B.	JUNCTION BOX
M.H.	MANHOLE
T.B.D.I.	TRAFFIC BEARING DROP INLET
T.B.G.I.	TRAFFIC BEARING GRATE INLET
T.B.J.B.	TRAFFIC BEARING JUNCTION BOX

PROJECT REFERENCE NO.	SHEET NO.
17BPJ3.R166	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS



LOIS R. PAYNE and JOHN R. PAYNE
DB 182 PG 650
JOSEPH L. RAMSEY
DB 232 PG 182
JOHNNIE S. RAMSEY
DB 232 PG 178
FRENCH BROAD EMC
3 TONS CLASS II RIP RAP W/4 SY GEOTEXTILE (STRUCTURES PAY ITEM)
REMOVE BRIDGE
BEGIN CULVERT -L- STA 10+70.55
END CULVERT -L- STA 10+91.70
PROPOSED DRIVEWAY -L- STA 11+75.00 (22 TONS ABC)
DO NOT DISTURB SHED
-L- STA 12+65.00
-DR1- STA 10+00.00
-L- STA 12+74.00
-DR2- STA 10+00.00
END CONSTRUCTION -DR2- STA 10+25.35 (15 TONS ABC)
END PROJECT -L- STA 13+21.87
2 TONS CLASS 'B' RIP RAP W/7 SY GEOTEXTILE
5 TONS CLASS 'B' RIP RAP W/16 SY GEOTEXTILE
END CONSTRUCTION -DR1- STA 10+80.35 (36 TONS ABC)
BEGIN PROJECT -L- STA 10+06.59
-L- POT Sta. 10+00.00
-EY- POC Sta. 13+77.55
3 TONS CLASS II RIP RAP W/4 SY GEOTEXTILE (STRUCTURES PAY ITEM)
18" RCP
30" RCP CL-IV
18" CSP
15" RCP
2@10'x10' RCBC
RETAIN
REMOVE FENCE
ROCK OUTCROPPING
WOODS
UPPER PAW PAW ROAD
LOWER PAW PAW ROAD
± 1.35 MI. TO SR 1131
± 2.17 MI. TO SR 1135
NC GRID NAD 83 NA 2011

-L- CURVE DATA

PI Sta 12+30.55
Δ = 90° 27' 57.0" (RT)
D = 35° 48' 35.5"
L = 252.63'
T = 161.31'
R = 160.00'
SE=04
RO=73
DS=25MPH

-DR1- CURVE DATA

PI Sta 10+32.85
Δ = 27° 10' 32.2" (LT)
D = 114° 35' 29.6"
L = 23.72'
T = 12.09'
R = 50.00'

-DR2- CURVE DATA

PI Sta 10+18.65
Δ = 19° 42' 27.6" (LT)
D = 114° 35' 29.6"
L = 17.20'
T = 8.68'
R = 50.00'

-EY- CURVE DATA

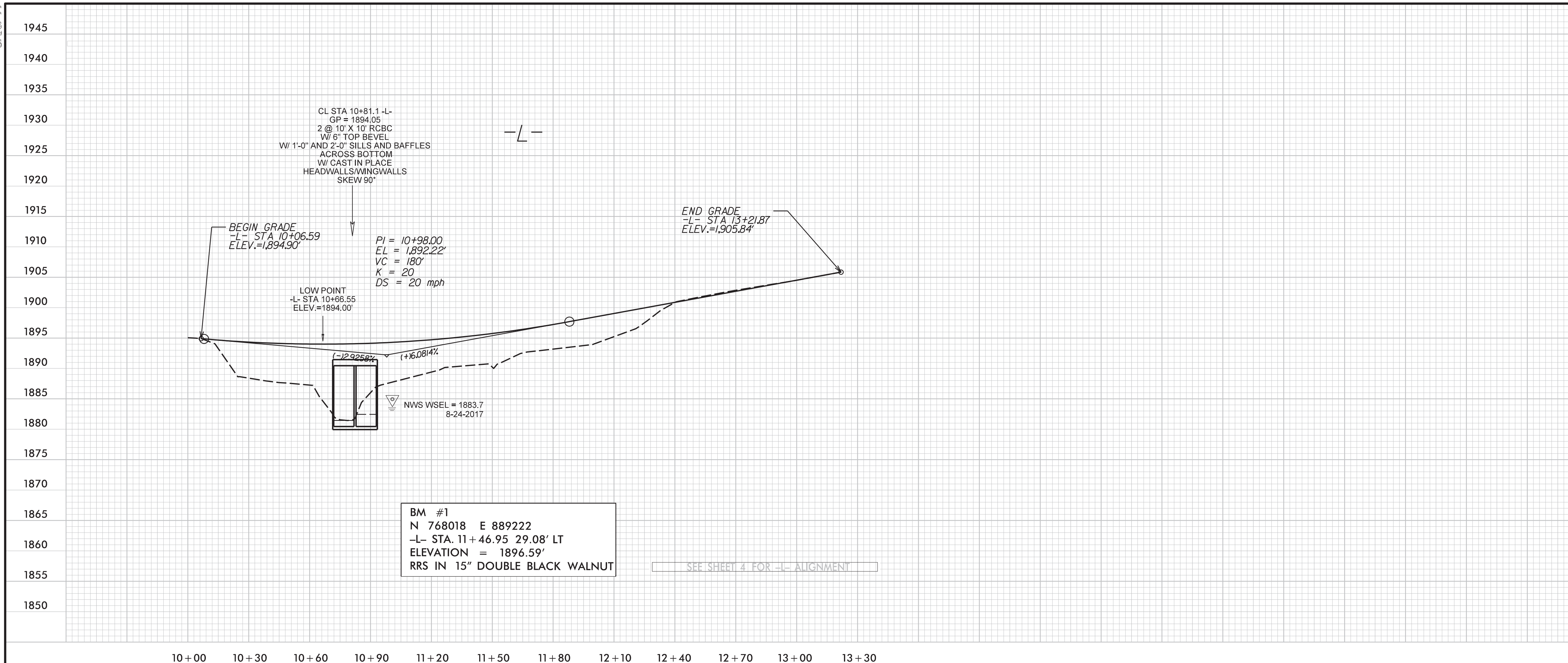
PI Sta 10+69.68	PI Sta 11+47.57	PI Sta 12+07.76
Δ = 6° 26' 15.3" (RT)	Δ = 19° 12' 49.2" (RT)	Δ = 58° 53' 45.8" (RT)
D = 5° 40' 42.0"	D = 45° 35' 58.8"	D = 82° 16' 46.6"
L = 113.37'	L = 42.14'	L = 71.58'
T = 56.75'	T = 21.27'	T = 39.31'
R = 1,009.03'	R = 125.65'	R = 69.64'
PI Sta 13+10.37	PI Sta 14+47.77	PI Sta 16+21.17
Δ = 53° 21' 23.3" (RT)	Δ = 25° 38' 32.0" (LT)	Δ = 7° 00' 17.5" (RT)
D = 40° 55' 32.4"	D = 16° 51' 06.0"	D = 9° 32' 57.5"
L = 130.37'	L = 152.16'	L = 73.35'
T = 70.35'	T = 77.38'	T = 36.72'
R = 140.00'	R = 340.00'	R = 600.00'

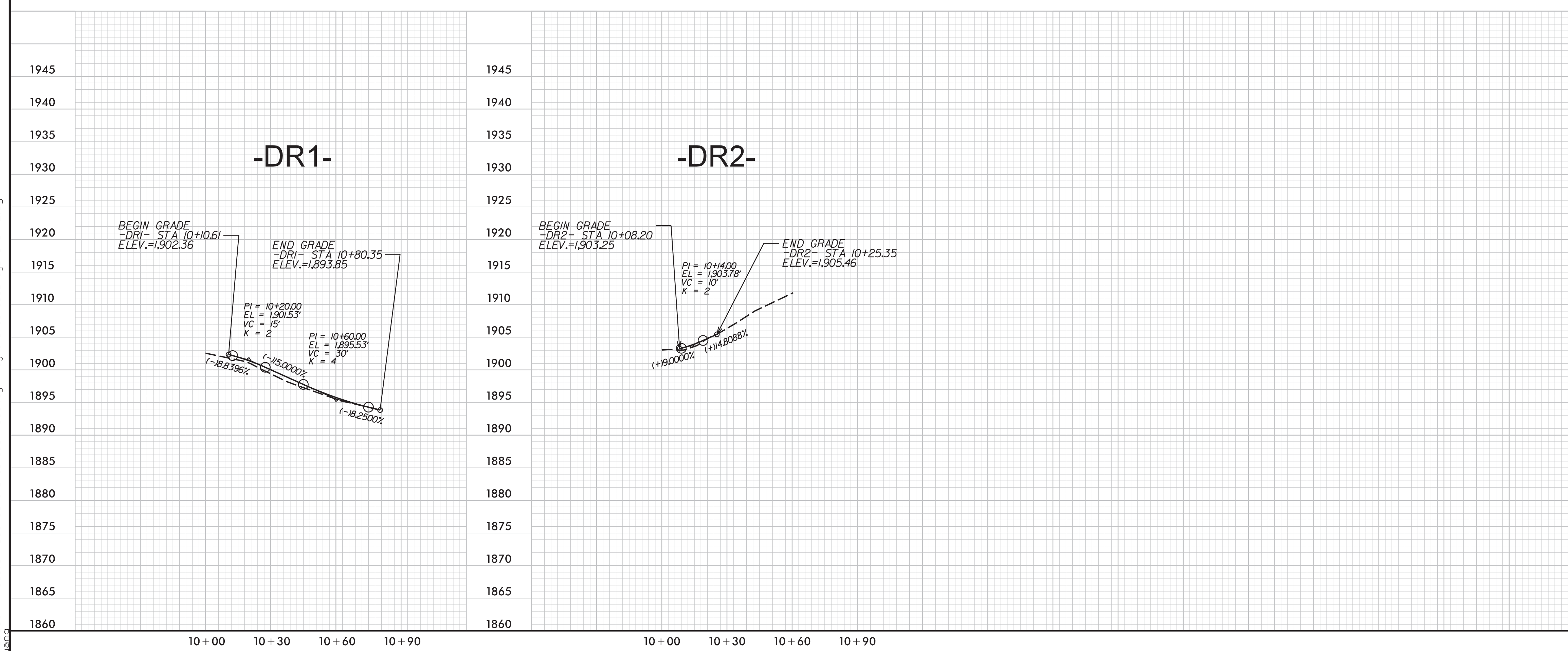
SEE SHEET 5 FOR PROFILE
SEE SHEETS C-1 THRU C-9 FOR CULVERT PLANS

PROJECT REFERENCE NO.	SHEET NO.
17BPJ3.R166	5

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL — DocuSigned by: Aaron Carver — AARON C. CARY	NORTH CAROLINA PROFESSIONAL SEAL — DocuSigned by: Aaron Carver — AARON C. CARY

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 1,000 CFS
DESIGN FREQUENCY	= 25 YRS
DESIGN HW ELEVATION	= 1888.6 FT
BASE DISCHARGE	= 1,400 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 1889.5 FT
OVERTOPPING DISCHARGE	= 2,300 CFS
OVERTOPPING FREQUENCY	= 500+ YRS
OVERTOPPING ELEVATION	= 1893.4 FT
W.S. ELEVATION AT DATE OF SURVEY (NOVEMBER 2018)	= 1883.7 FT

09/08/99

TIP PROJECT: 17BP.13.R.166

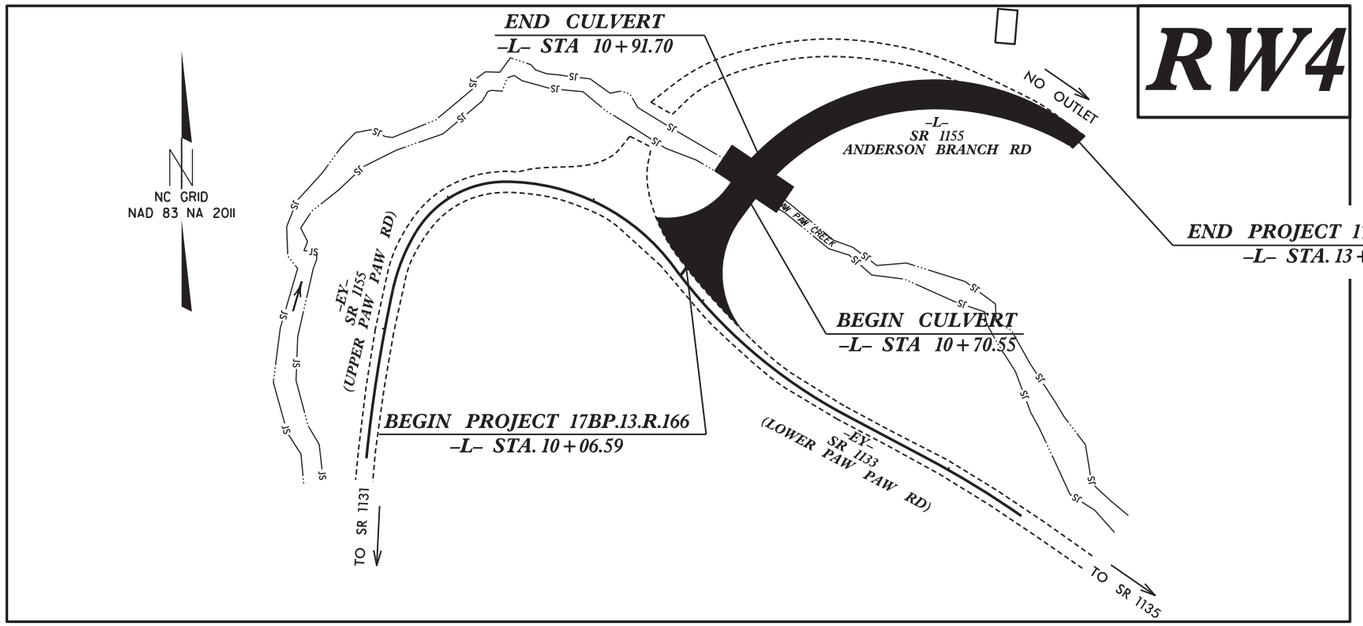
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.13.R.166	RW01	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SURVEY CONTROL, EXISTING CENTERLINES, RIGHT OF WAY, EASEMENTS AND PROPERTY TIES

MADISON COUNTY

LOCATION: BRIDGE NO. 353 ON SR 1155 (ANDERSON BRANCH ROAD) OVER PAW PAW CREEK



GRAPHIC SCALE

30 15 0 30 60
PLANS

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "GPS100" WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF NORTHING: 766396.949 (ft) EASTING: 886420.464 (ft) ELEVATION: 2000.71 (ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999760522
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "GPS100" TO -L- STATION 10+00 IS N 61°13'44.5" E 3096.45 (ft)
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

Prepared in the Office of:
Mattern & Craig
ENGINEERS·SURVEYORS
12 BROAD STREET
ASHEVILLE, NORTH CAROLINA 28801
(828) 254-2201
FAX (828) 254-4562
NC LIC. NO. C-1154

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:	*LETTING DATE:*
FEBRUARY 19, 2019	FEBRUARY 19, 2020

PROFESSIONAL LAND SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-4473 LAND SURVEYOR JEFF B. HOPPES

DocuSigned by: Jeff Hoppes 2C3FB0F0CD6D472...
4/23/2019
SIGNATURE: *Date:*

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION ·

$$$$SYSTIME$$$$
$$$$DGN$$$$
$$$$USERNAME$$$$

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

PROJECT REFERENCE NO.	SHEET NO.
17BP.13.R.166	RW02C-1

Location and Surveys

MATTERN AND CRAIG
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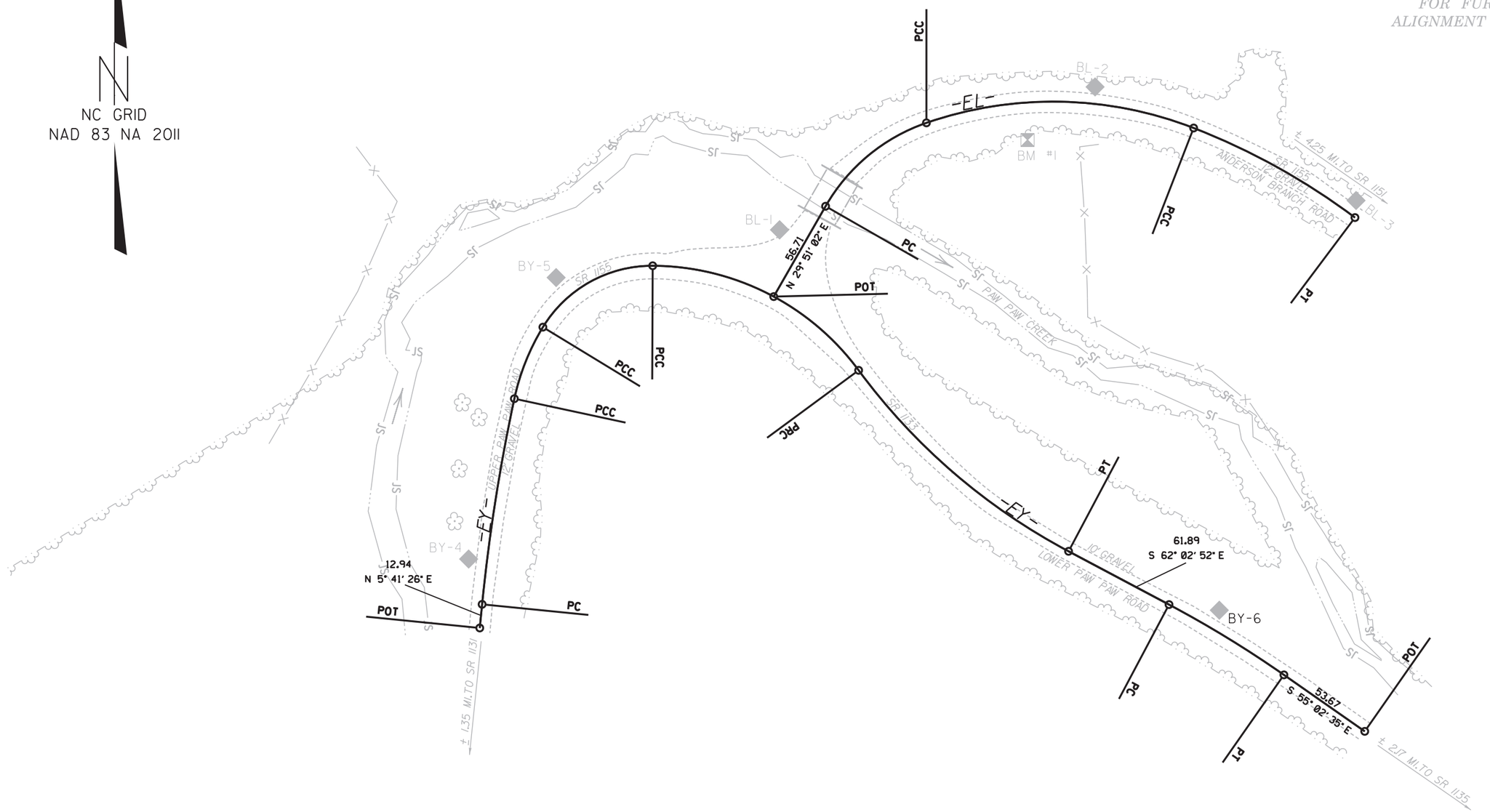
FAX (828) 254-4562
NC LIC. NO. C-1154

SEE SHEET 2C-2
FOR FURTHER
ALIGNMENT DETAILS

NC GRID
NAD 83 NA 2011



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.

PROJECT REFERENCE NO.	SHEET NO.
17BP.13.R.166	RW02C–2

Location and Surveys

MATTERN AND CRAIG
ENGINEERS & SURVEYORS
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ASHEVILLE NORTH CAROLINA 28801
(828) 254–2201
FAX (828) 254–4562
NC LIC. NO. C–1154

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

EL

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	767933.147	889084.130							
LINE			N 29°51′01.7" E	56.71					
PC	767982.334	889112.358							
CURVE			N 50°24′34.7" E	71.23	41°07′06.1"(RT)	56°29′50.9"	72.78	38.04	101.41
PCC	768027.727	889167.247							
CURVE			S 88°53′48.7" E	145.47	40°16′07.2"(RT)	27°06′56.2"	148.51	77.47	211.30
PCC	768024.926	889312.690							
CURVE			S 60°57′22.6" E	100.44	15°36′45.0"(RT)	15°29′46.5"	100.75	50.69	369.74
PT	767976.165	889400.498							

EY

POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	767752.737	888924.130							
LINE			N 05°41′25.9" E	12.94					
PC	767765.609	888925.413							
CURVE			N 08°54′33.6" E	113.31	06°26′15.3"(RT)	05°40′42.0"	113.37	56.75	1009.03
PCC	767877.553	888942.961							
CURVE			N 21°44′05.9" E	41.94	19°12′49.2"(RT)	45°35′58.8"	42.14	21.27	125.65
PCC	767916.510	888958.492							
CURVE			N 60°47′23.4" E	68.47	58°53′45.8"(RT)	82°16′46.6"	71.58	39.31	69.64
PCC	767949.925	889018.255							
CURVE			S 63°05′02.1" E	125.71	53°21′23.3"(RT)	40°55′32.4"	130.37	70.35	140.00
PCC	767893.016	889130.350							
CURVE			S 49°13′36.4" E	150.90	25°38′32.0"(LT)	16°51′06.0"	152.16	77.38	340.00
PT	767794.469	889244.625							
LINE			S 62°02′52.4" E	61.89					
PC	767765.460	889299.294							
CURVE			S 58°32′43.7" E	73.31	07°00′17.5"(RT)	09°32′57.5"	73.35	36.72	600.00
PT	767727.206	889361.830							
LINE			S 55°02′34.9" E	53.67					
POT	767696.454	889405.819							

BL

POINT	DESC.	NORTH	EAST	ELEVATION
1	BL-1	767969.4810	889087.2960	1895.42
2	BL-2	768047.2750	889259.0140	1898.73
3	BL-3	767985.4410	889401.0630	1905.49

BY

POINT	DESC.	NORTH	EAST	ELEVATION
4	BY-4	767790.2520	888918.0550	1918.17
5	BY-5	767943.4930	888965.6720	1905.14
1	BL-1	767969.4810	889087.2960	1895.42
6	BY-6	767762.3910	889326.6300	1889.03

****

BM1 ELEVATION = 1896.59
N 768018 E 889222
RR SPIKE IN 15" DOUBLE BLACK WALNUT

****

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.

6/2/99

REVISIONS

Working Folders\Survey\Deliverables\17BP13R166 RW E SERIES\17bp13r166_ls_rw02c-2.dgn

PROPOSED ALIGNMENT CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
17BP13R166	RW02D-1

Location and Surveys

MATTERN AND CRAIG
ENGINEERS & SURVEYORS
12 BROAD STREET
ASHEVILLE NORTH CAROLINA 28801
(828) 254-2201
FAX (828) 254-4562
NC LIC. NO. C-1154

L

TYPE	STATION	NORTH	EAST
POT	10+00.00	767887.2995	889134.6592
PC	10+69.24	767943.0434	889175.7333
PT	13+21.87	767976.1655	889400.4981

EY

TYPE	STATION	NORTH	EAST
PC	10+12.94	767765.6086	888925.4126
PCC	11+26.31	767877.5532	888942.9614
PCC	11+68.44	767916.5100	888958.4917
PCC	12+40.02	767949.9245	889018.2550
PRC	13+70.40	767893.0157	889130.3504
PT	15+22.56	767794.4694	889244.6253
PC	15+84.45	767765.4603	889299.2936
PT	16+57.80	767727.2061	889361.8302

NOTES:

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2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

REVISIONS

6/2/99

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23-APR-2018 11:57
Survey\3921H Div.13 R_W Stake\06
NCDOT
AT SURV ASH (BH01)

RIGHT OF WAY CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
17BP13R166	RW03E-1

Location and Surveys

MATTERN AND CRAIG
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12 BROAD STREET
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(828) 254-2201
FAX (828) 254-4562
NC LIC. NO. C-1154

I, JEFF B. HOPPES, a Professional Land Surveyor in the state of North Carolina hereby certify to the best of my knowledge and belief that the following work item(s) (Base map Compilation, R/W Staking) performed under my responsible charge meet NCDOT Survey Standards as directed in the NCDOT Location & Surveys guidelines and procedures.

I further certify that the data compiled came from available surveys/mapping performed by others and provided to me by NCDOT and do not certify to the accuracy or quality of the individual data sources.

I further certify that the right of way and permanent easement points shown herein and outlined in the tables shown hereon (localized coordinates, station/offset) have been checked and are accurate representations of the right of way and permanent easement points depicted on the corresponding highway plans. I also certify that the right of way and permanent easement points shown herein have been field monumented under my supervision from existing survey control provided by others; that the depicted property data shown herein were surveyed by others; and these monuments denote the right of way and easement boundaries at the time of staking which may be subject to change due to right of way revisions (See deeds for final determination).

Witness my original signature, registration number and seal this 1st day of April, 2019.

DocuSigned by:
Jeff Hoppes
2C3FB0F0CD6D472...

Professional Land Surveyor — L-4473 PLS # — Seal

PROJECT SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-4473 LAND SURVEYOR JEFF B. HOPPES

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	10+41.58	-84.93	767971.1562	889090.9545
L	10+53.27	-87.27	767981.9536	889095.9979
L	10+53.38	-86.27	767981.4559	889096.8652
L	10+61.69	NOT SET -88.24	767989.3023	889100.2151
L	10+77.02	-88.10	768004.8371	889112.2011
L	10+77.03	-89.10	768005.4749	889111.4310
L	11+17.28	-78.44	768040.0162	889163.0079
L	11+67.76	45.00	767957.2934	889268.3651
L	12+28.08	-30.00	768037.8239	889315.3608
L	13+21.87	40.00	767944.1571	889376.5092
L	13+21.87	13.00	767965.7627	889392.7017
L	13+21.87	-13.00	767986.5682	889408.2945
L	13+21.87	-30.00	768000.1717	889418.4897

ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
EY	12+57.97	-13.00	767961.5883	889037.8595
EY	15+07.09	-11.00	767811.4997	889236.7249

NOTES:

1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

REVISIONS

6/2/99

23-APR-2019 10:26
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rlzietlow AT SURV ASH JBH01

PROJECT REFERENCE NO.	SHEET NO.
17BP.13.R.166	RW04

Location and Surveys

MATTERN AND CRAIG
ENGINEERS & SURVEYORS
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ASHEVILLE NORTH CAROLINA 28801
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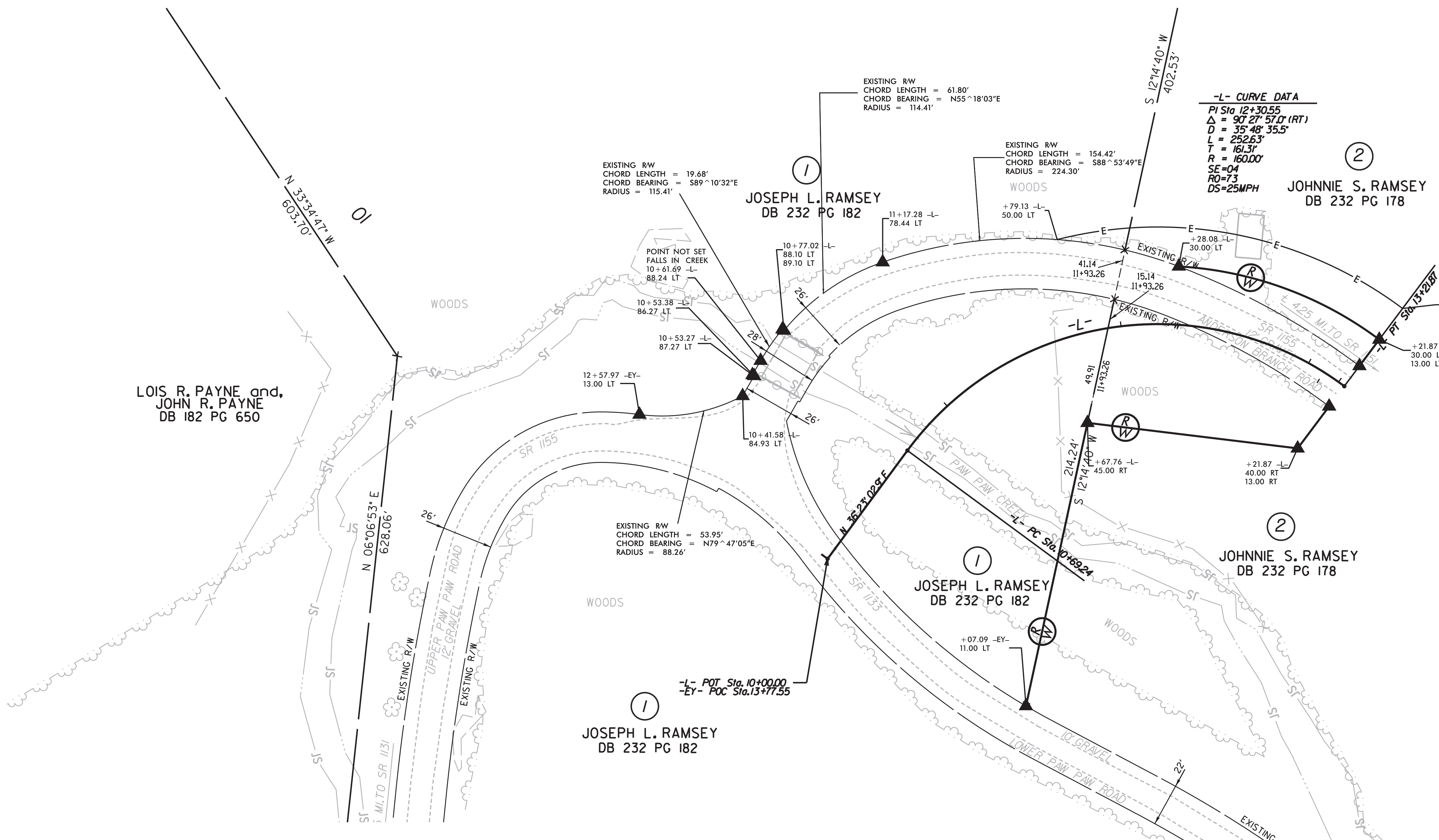
FAX (828) 254-4562
NC LIC. NO. C-1154

PROJECT SURVEYOR

NORTH CAROLINA PROFESSIONAL SEAL L-4473 LAND SURVEYOR JEFF B. HOPPES

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS



I, JEFF B. HOPPES, a Professional Land Surveyor in the state of North Carolina hereby certify to the best of my knowledge and belief that the following work item(s) (R/W Staking) performed under my responsible charge meet NCDOT Survey Standards as directed in the NCDOT Location & Surveys guidelines and procedures.

I further certify that the right of way and permanent easement points shown herein and outlined in the tables shown hereon (localized coordinates, station/offset) have been checked and are accurate representations of the right of way and permanent easement points depicted on the corresponding highway plans. I also certify that the right of way and permanent easement points shown herein have been field monumented under my supervision from existing survey control provided by others; that the depicted property data shown herein were surveyed by others; and these monuments denote the right of way and easement boundaries at the time of staking which may be subject to change due to right of way revisions (See deeds for final determination).

Witness my original signature, registration number and seal this 1st day of April, 2019.

DocuSigned by:
Jeff Hoppes
2C3FB0F0CD6D472...

Professional Land Surveyor — L-4473 PLS # — Seal

NOTES:

1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

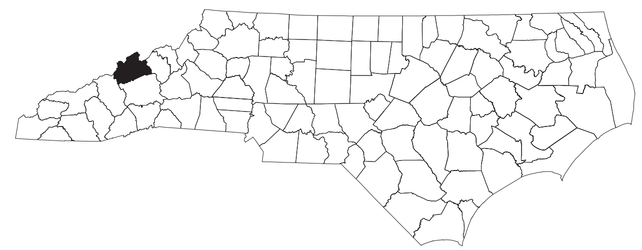
2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

6/2/99
17-JUL-2019 09:50
I:\3921 NCDOT Survey\3921H Div. 13 R_W Stake\06 Working Folders\Survey\Deliverables\17BP13R166 RW E SERIES\17bp13r166_ls_rw04.dgn

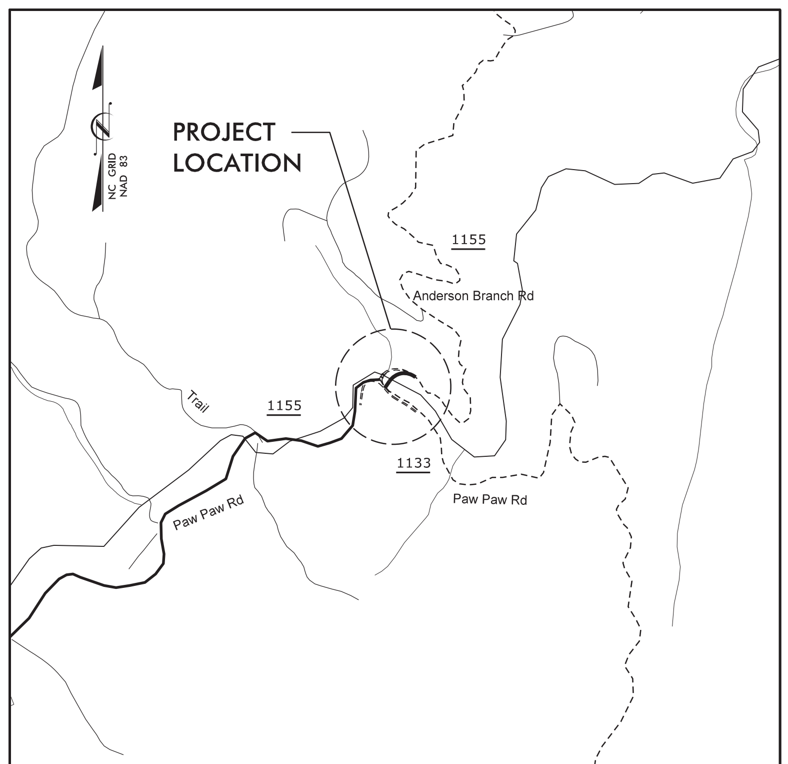
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

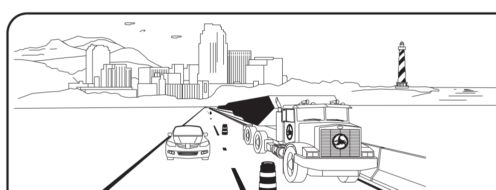
MADISON COUNTY



LOCATION: BRIDGE NO. 353 OVER PAW PAW CREEK ON SR 1155 (ANDERSON BRANCH ROAD)



VICINITY MAP



WORK ZONE SAFETY & MOBILITY
"from the MOUNTAINS to the COAST"

PLANS PREPARED BY:

JAMES B. VOSO, PE

MENG YANG, EI

NCDOT CONTACTS:

MIKE CALLOWAY
PROJECT ENGINEER

PROJECT DESIGN ENGINEER

DIVISION OF HIGHWAYS – STATE OF NORTH CAROLINA – DEPARTMENT OF TRANSPORTATION – WORK ZONE TRAFFIC CONTROL

INDEX OF SHEETS

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY:

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APPROVED: James Voso

DATE: 2/23/2022

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022599 JAMES B. VOSO

SHEET NO.
TMP-1

TIP PROJECT: 17BP.13.R.166

PROJ. REFERENCE NO.	SHEET NO.
17BP.13.R.166	TMP-1A

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS SHOWN 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
1101.01	WORK ZONE ADVANCE WARNING SIGNS
1101.02	TEMPORARY LANE CLOSURES
1101.04	TEMPORARY SHOULDER CLOSURES
1101.05	WORK ZONE VEHICLE ACCESSES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1130.01	DRUMS
1135.01	CONES
1145.01	BARRICADES
1150.01	FLAGGING DEVICES
1180.01	SKINNY-DRUM

LEGEND

GENERAL

- DIRECTION OF TRAFFIC FLOW
- DIRECTION OF PEDESTRIAN TRAFFIC FLOW
- EXIST. PVMT.
- NORTH ARROW
- PROPOSED PVMT.
- WORK AREA
- PAVEMENT REMOVAL

TRAFFIC CONTROL DEVICES

- BARRICADE (TYPE III)
- CONE
- DRUM   SKINNY DRUM   TUBULAR MARKER
- TEMPORARY CRASH CUSHION
- FLASHING ARROW PANEL (TYPE C)
- FLAGGER
- LAW ENFORCEMENT
- TRUCK MOUNTED IMPACT ATTENUATOR (TMIA)
- CHANGEABLE MESSAGE SIGN

TEMPORARY SIGNING

- PORTABLE SIGN
- STATIONARY SIGN
- STATIONARY OR PORTABLE SIGN

TEMPORARY SIGNING

- PORTABLE SIGN
- STATIONARY SIGN
- STATIONARY OR PORTABLE SIGN

SIGNALS

- EXISTING   PROPOSED   TEMPORARY (T E M P)
- PORTABLE TRAFFIC SIGNAL

PAVEMENT MARKINGS

- EXISTING LINES
- TEMPORARY LINES

PAVEMENT MARKING SYMBOLS

- PAVEMENT MARKING SYMBOLS

APPROVED: James Vose   DATE: 2/23/2022

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022599 JAMES B. VOSE

ROADWAY STANDARD DRAWINGS & LEGEND

PROJ. REFERENCE NO.	SHEET NO.
17BP.13.R.166	TMP-1B

GENERAL NOTES / LOCAL NOTES

CHANGES MAY BE REQUIRED WHEN PHYSICAL DIMENSIONS IN THE DETAIL DRAWINGS, STANDARD DETAILS, AND ROADWAY DETAILS ARE NOT ATTAINABLE TO MEET FIELD CONDITIONS OR RESULT IN DUPLICATE OR UNDESIRED OVERLAPPING OF DEVICES. MODIFICATION MAY INCLUDE: MOVING, SUPPLEMENTING, COVERING, OR REMOVAL OF DEVICES AS DIRECTED BY THE ENGINEER.

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT EXCEPT WHEN OTHERWISE NOTED IN THE PLAN OR DIRECTED BY THE ENGINEER.

TIME RESTRICTIONS

A) DO NOT CLOSE OR NARROW TRAVEL LANES AS FOLLOWS:

ROAD NAME	DAY AND TIME RESTRICTIONS
ANDERSON BRANCH RD (SR 1155)	JUNE 15TH - AUGUST 14TH 6:00 AM TO 9:00 AM AND 4:00 PM TO 6:00 PM
ANDERSON BRANCH RD (SR 1155)	AUGUST 15TH - JUNE 14TH 6:00 AM TO 9:00 AM AND 2:00 PM TO 6:00 PM

LANE AND SHOULDER CLOSURE REQUIREMENTS

B) REMOVE LANE CLOSURE DEVICES FROM THE LANE WHEN WORK IS NOT BEING PERFORMED BEHIND THE LANE CLOSURE OR WHEN A LANE CLOSURE IS NO LONGER NEEDED OR AS DIRECTED BY THE ENGINEER.

C) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN 15 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN SHOULDER USING ROADWAY STANDARD DRAWING NO. 1101.04 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL OR A LANE CLOSURE IS INSTALLED.

D) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON THE SHOULDER ADJACENT TO AN UNDIVIDED FACILITY AND WITHIN 5 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.

E) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN A LANE OF TRAVEL OF AN UNDIVIDED OR DIVIDED FACILITY, CLOSE THE LANE ACCORDING TO THE TRAFFIC CONTROL PLANS, ROADWAY STANDARD DRAWINGS, OR AS DIRECTED BY THE ENGINEER. CONDUCT THE WORK SO THAT ALL PERSONNEL AND/OR EQUIPMENT REMAIN WITHIN THE CLOSED TRAVEL LANE.

F) DO NOT WORK SIMULTANEOUSLY WITHIN 15 FT ON BOTH SIDES OF AN OPEN TRAVELWAY, RAMP, OR LOOP WITHIN THE SAME LOCATION UNLESS PROTECTED WITH GUARDRAIL OR BARRIER.

PAVEMENT EDGE DROP OFF REQUIREMENTS

G) BACKFILL AT A 6:1 SLOPE UP TO THE EDGE AND ELEVATION OF EXISTING PAVEMENT IN AREAS ADJACENT TO AN OPENED TRAVEL LANE THAT HAS AN EDGE OF PAVEMENT DROP-OFF AS FOLLOWS:

BACKFILL DROP-OFFS THAT EXCEED 2 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS OF 45 MPH OR GREATER.

BACKFILL DROP-OFFS THAT EXCEED 3 INCHES ON ROADWAYS WITH POSTED SPEED LIMITS LESS THAN 45 MPH.

BACKFILL WITH SUITABLE COMPACTED MATERIAL, AS APPROVED BY THE ENGINEER, AT NO EXPENSE TO THE DEPARTMENT.

H) DO NOT EXCEED A DIFFERENCE OF 2 INCHES IN ELEVATION BETWEEN OPEN LANES OF TRAFFIC FOR NOMINAL LIFTS OF 1.5 INCHES. INSTALL ADVANCE WARNING "UNEVEN LANES" SIGNS (W8-11) IN ADVANCE AND A MINIMUM OF EVERY HALF MILE THROUGHOUT THE UNEVEN AREA.

TRAFFIC PATTERN ALTERATIONS

I) NOTIFY THE ENGINEER TWENTY ONE (21) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

SIGNING

J) INSTALL ADVANCE WORK ZONE WARNING SIGNS WHEN WORK IS WITHIN 40 FT FROM THE EDGE OF TRAVEL LANE AND NO MORE THAN THREE (3) DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.

K) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.

L) INSTALL BLACK ON ORANGE "DIP" SIGNS (W8-2) AND/OR "BUMP" SIGNS (W8-1) 100 ft IN ADVANCE OF THE UNEVEN AREA, OR AS DIRECTED BY THE ENGINEER.

TRAFFIC CONTROL DEVICES

M) WHEN LANE CLOSURES ARE NOT IN EFFECT SPACE CHANNELIZING DEVICES IN WORK AREAS NO GREATER IN FEET THAN TWICE THE POSTED SPEED LIMIT (MPH) EXCEPT, 10 FT ON-CENTER IN RADII, AND 3 FT OFF THE EDGE OF AN OPEN TRAVELWAY. REFER TO STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES SECTIONS 1130 (DRUMS), 1135 (CONES) AND 1180 (SKINNY DRUMS) FOR ADDITIONAL REQUIREMENTS.

N) PLACE TYPE III BARRICADES, WITH "ROAD CLOSED" SIGN R11-2 ATTACHED, OF SUFFICIENT LENGTH TO CLOSE ENTIRE ROADWAY.

MISCELLANEOUS

O) IN THE EVENT A TIE-IN CANNOT BE MADE IN ONE DAY'S TIME, BRING THE TIE-IN AREA TO AN APPROPRIATE ROADWAY ELEVATION AS DETERMINED BY THE ENGINEER. PLACE BLACK ON ORANGE "LOOSE GRAVEL" SIGNS (W8-7) AND BLACK ON ORANGE "PAVEMENT ENDS" SIGNS (W8-3) 100 ft AND 200 ft RESPECTIVELY IN ADVANCE OF THE UNEVEN AREAS. USE DRUMS TO DELINEATE THE EDGE OF ROADWAY ALONG UNPAVED AREAS.

LOCAL NOTES:

1) EMERGENCY VEHICLE ACCESS MUST BE MAINTAINED AT ALL TIMES.

2) NOTIFY THE MADISON COUNTY SCHOOL BOARD 30 DAYS PRIOR TO ANY LANE CLOSURES.

3) MAINTAIN ACCESS TO DRIVEWAYS DURING CONSTRUCTION

MANAGEMENT STRATEGIES

PHASE I DEPICTS SR 1155 (ANDERSON BRANCH ROAD) TRAFFIC TO BE MAINTAINED ON THE EXISTING ROAD AS THE EXISTING CHANNEL IS ROUTED THROUGH A TEMPORARY PIPE AND CHANNEL WHILE THE PROPOSED CULVERT AND PORTIONS OF ITS WINGWALLS ARE CONSTRUCTED.

PHASE II DEPICTS SR 1155 (ANDERSON BRANCH ROAD) TRAFFIC TO BE MAINTAINED ON THE EXISTING ROAD AS THE TEMPORARY CHANNEL IS REMOVED AND FLOW IS ROUTED BACK ONTO THE EXISTING CHANNEL AND THROUGH THE PROPOSED CULVERT WHILE THE LAST REMAINING WINGWALL AND THE PROPOSED ROADWAY ARE BEING CONSTRUCTED.

PHASE III DEPICTS TRAFFIC DIVERTED ONTO THE NEWLY CONSTRUCTED SR 1155 (ANDERSON BRANCH ROAD) AS PORTIONS OF THE OLD SR 1155 IS REMOVED AS INDICATED ON THE PLANS.

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APPROVED: DocuSigned by: James Voso DATE: 3/23/2022

SEAL — NORTH CAROLINA PROFESSIONAL SEAL 022599 ENGINEER JAMES B. VOSO

DIVISION OF HIGHWAYS — STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION — WORK ZONE TRAFFIC CONTROL

TRANSPORTATION OPERATIONS PLAN
(MANAGEMENT STRATEGIES & GENERAL NOTES)

PROJ. REFERENCE NO.	SHEET NO.
17BP.13.R.166	TMP-2

PROJECT PHASING

PHASE I

STEP 1: INSTALL WORK ZONE ADVANCED WARNING SIGNS ON -L- SR 1155 (ANDERSON BRANCH ROAD) AND -EY- SR 1133 (LOWER PAW PAW ROAD). (SEE RDWY STD. 1101.01)

STEP 2: MAINTAIN TRAFFIC IN EXISTING TRAFFIC PATTERN (ANDERSON BRANCH ROAD) AND -EY- SR 1133 (LOWER PAW PAW ROAD). (SEE RDWY STD. 1101.01)

STEP 3: AWAY FROM TRAFFIC, INSTALL TEMPORARY PIPE AND CONSTRUCT TEMPORARY DIVERSION CHANNEL AS SHOWN IN THE EROSION CONTROL PLANS AND DIVERT THE FLOW FROM PAW PAW CREEK. (SEE EC-5/CONST.4 AND TMP-3)

STEP 4: CONSTRUCT THE PROPOSED CULVERT AND WINGWALLS EXCEPT THE WINGWALL ON THE SOUTHWEST CORNER OF THE CULVERT. (SEE EC-5/CONST 4. AND TMP-3)

PHASE II

STEP 1: REMOVE THE IMPERVIOUS DIKE AND DIVERT THE FLOW FROM TEMPORARY PIPE AND TEMPORARY DIVERSION CHANNEL THROUGH NEWLY CONSTRUCTED CULVERT.

STEP 2: REMOVE THE TEMPORARY PIPE AND CONSTRUCT THE WINGWALL ON THE SOUTHWEST CORNER OF THE CULVERT.

STEP 3: AWAY FROM TRAFFIC, CONSTRUCT SR 1155 (ANDERSON BRANCH RD) UP TO THE FINAL SURFACE GRADE FROM -L- STA 10+06.59 TO -L- STA 12+65.04. (SEE SHEET TMP-4)

STEP 4: USING ROADWAY STD 1101.02 (SHEET 1 OF 14) AND FLAGGERS CONSTRUCT SR 1155 UP THE FINAL SURFACE GRADE FROM -L- STA 12+65.04 TO -L- STA 13+21.87. (SEE SHEET TMP-4)

STEP 5: SHIFT TRAFFIC ON TO THE PROPOSED SR 1155 (ANDERSON BRANCH ROAD) AND CLOSE THE EXISTING SR 1155 (ANDERSON BRANCH ROAD).

PHASE III

STEP 1: AWAY FROM TRAFFIC, REMOVE THE EXISTING ROAD AND BRIDGE ON SR 1155 (ANDERSON BRANCH RD) AS SHOWN ON TMP-5.

STEP 2: REMOVE ALL WORK ZONE ADVANCED WARNING SIGNS AND TRAFFIC CONTROL DEVICES.

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APPROVED James Voso DATE 2/23/2022

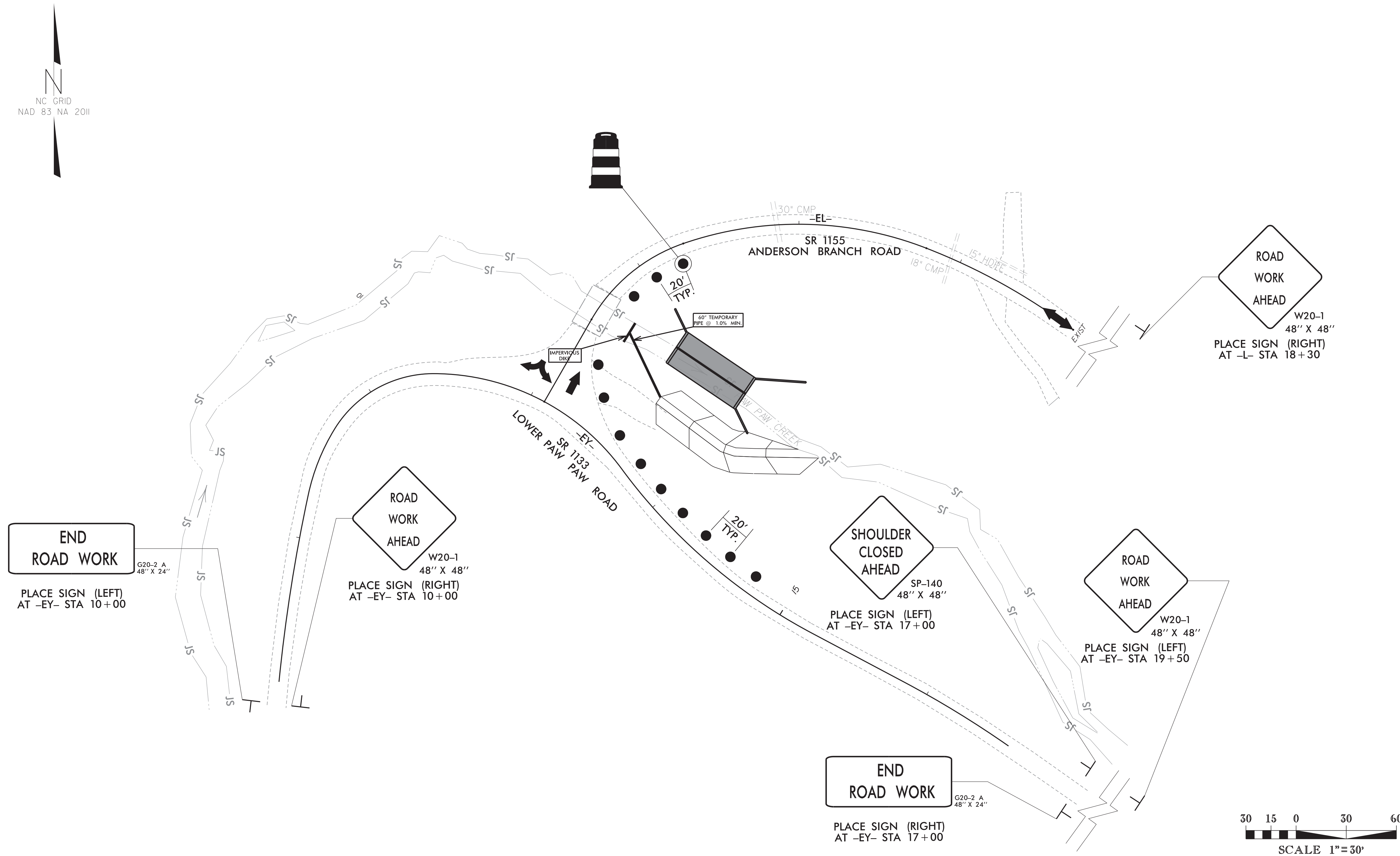
SEAL

NORTH CAROLINA PROFESSIONAL SEAL 022599 ENGINEER JAMES B. VOSO

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WORK ZONE TRAFFIC CONTROL

PHASING

PROJ. REFERENCE NO.	SHEET NO.
17BP.13.R.166	TMP-3



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APPROVED: James Voso
DATE: 2/23/2022
SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022599 JAMES B. VOSO

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DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WORK ZONE TRAFFIC CONTROL

PHASE I

PROJ. REFERENCE NO.	SHEET NO.
17BP.13.R.166	TMP-4

NC GRID
NAD 83 NA 2011

R11-2
48" x 30"
ROAD CLOSED
TYPE III BARRICADE(S)

R11-2
48" x 30"
ROAD CLOSED
TYPE III BARRICADE(S)

REMOVE BRIDGE

–EL– RETAIN

30" CMP

15" HDPE

SR 1155
ANDERSON BRANCH ROAD

–L–

10'

10'

20'
TYP.

EXIST

END PROJECT
–L– STA 13+21.87

ROAD
WORK
AHEAD
W20-1
48" X 48"
PLACE SIGN (RIGHT)
AT –L– STA 18+30

–EY–
SR 1133
LOWER PAW PAW ROAD

16'

16'

20'
TYP.

PAW PAW CREEK

ROAD
WORK
AHEAD
W20-1
48" X 48"
PLACE SIGN (RIGHT)
AT –EY– STA 10+00

END
ROAD WORK
G20-2 A
48" X 24"
PLACE SIGN (LEFT)
AT –EY– STA 10+00

BEGIN PROJECT
–L– STA 10+06.59

SHOULDER
CLOSED
AHEAD
SP-140
48" X 48"
PLACE SIGN (LEFT)
AT –EY– STA 17+00

ROAD
WORK
AHEAD
W20-1
48" X 48"
PLACE SIGN (LEFT)
AT –EY– STA 19+50

END
ROAD WORK
G20-2 A
48" X 24"
PLACE SIGN (RIGHT)
AT –EY– STA 17+00

30 15 0 30 60
SCALE 1"=30'

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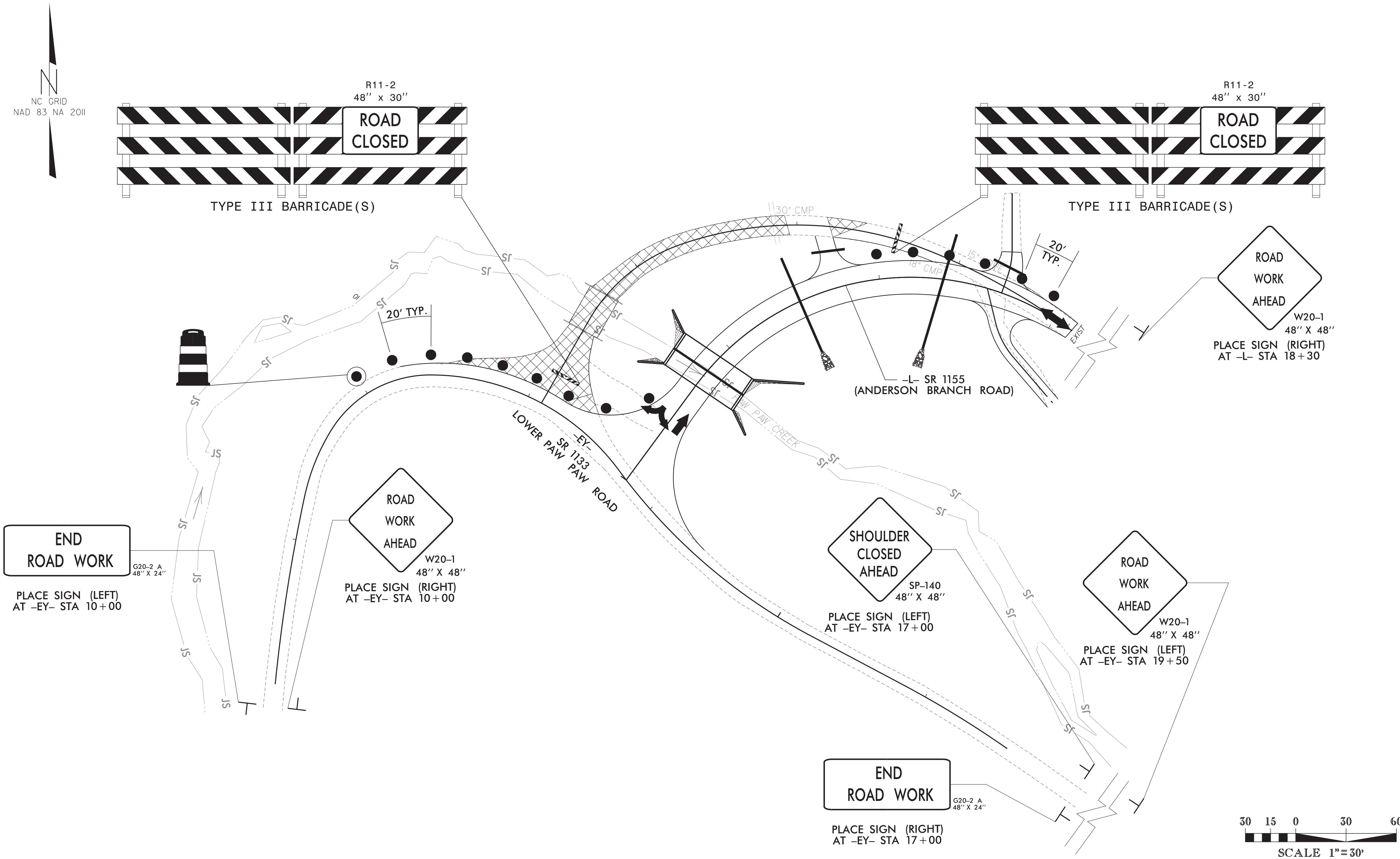
DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WORK ZONE TRAFFIC CONTROL

PHASE II

PROJ. REFERENCE NO.	SHEET NO.
17BP.13.R.166	TMP-5


N
NC GRID
NAD 83 NA 2011
R11-2
48" x 30"
ROAD CLOSED
TYPE III BARRICADE(S)
R11-2
48" x 30"
ROAD CLOSED
TYPE III BARRICADE(S)
30" CMP
20' TYP.
20' TYP.
ROAD WORK AHEAD
W20-1
48" X 48"
PLACE SIGN (RIGHT)
AT -L- STA 18+30
-L- SR 1155
(ANDERSON BRANCH ROAD)
-EY-
SR 1133
LOWER PAW PAW ROAD
END ROAD WORK
G20-2 A
48" X 24"
PLACE SIGN (LEFT)
AT -EY- STA 10+00
ROAD WORK AHEAD
W20-1
48" X 48"
PLACE SIGN (RIGHT)
AT -EY- STA 10+00
SHOULDER CLOSED AHEAD
SP-140
48" X 48"
PLACE SIGN (LEFT)
AT -EY- STA 17+00
ROAD WORK AHEAD
W20-1
48" X 48"
PLACE SIGN (LEFT)
AT -EY- STA 19+50
END ROAD WORK
G20-2 A
48" X 24"
PLACE SIGN (RIGHT)
AT -EY- STA 17+00
30 15 0 30 60
SCALE 1"=30'

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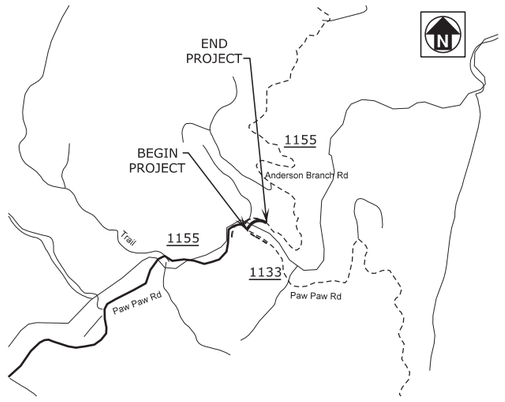
DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

PHASE III

TIP PROJECT: 17BP.13.R.166



VICINITY MAP
NOT TO SCALE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

MADISON COUNTY

LOCATION: BRIDGE NO. 353 ON SR 1155 (ANDERSON BRANCH ROAD) OVER PAW PAW CREEK

TYPE OF WORK: GRADING, PAVING, DRAINAGE AND CULVERT

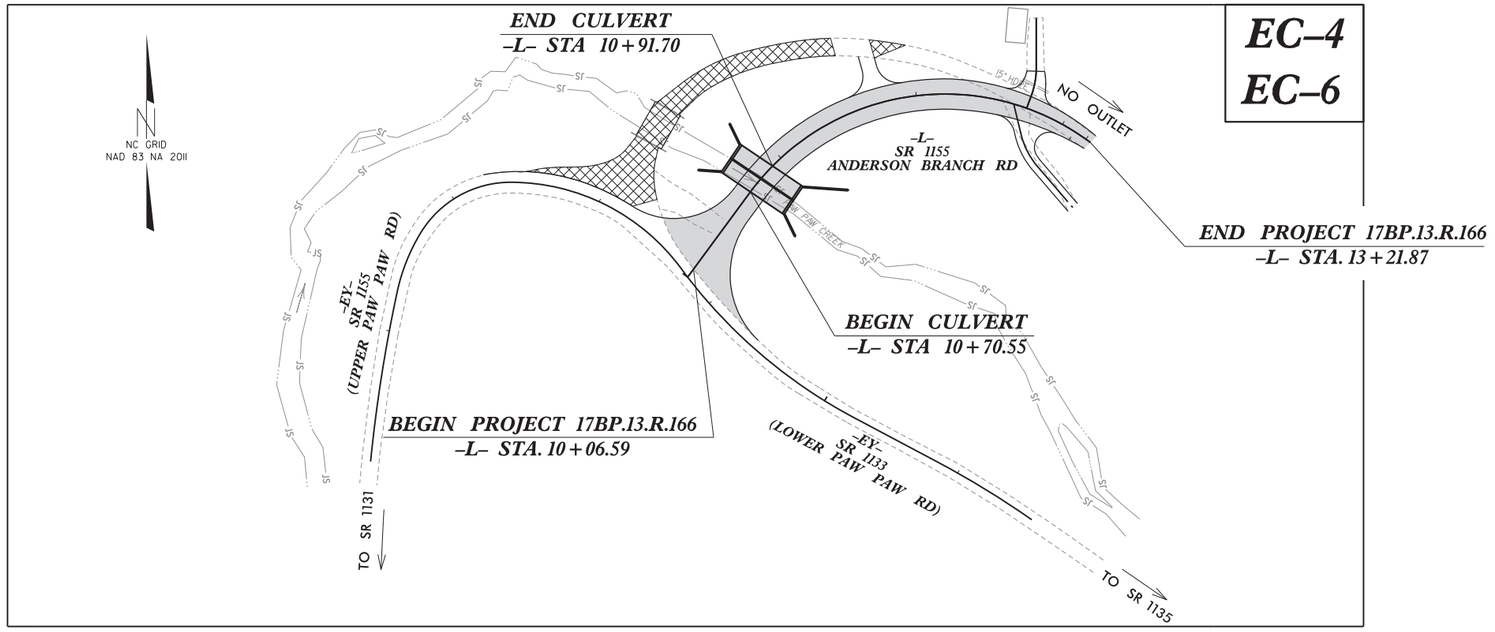
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.13.R.166	EC-1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
17BP.13.R.166	N/A	P.E.
17BP.13.R.166	N/A	R/W & UTIL
17BP.13.R.166	N/A	CONST

EROSION AND SEDIMENT CONTROL MEASURES

Std. #	Description	Symbol
1630.03	Temporary Silt Ditch	TSD
1630.05	Temporary Diversion	TD
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	
1622.01	Temporary Berms and Slope Drains	
1630.02	Silt Basin Type B	
1633.01	Temporary Rock Silt Check Type-A	
	Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM)	
1633.02	Temporary Rock Silt Check Type-B	
	Wattle / Coir Fiber Wattle	EW CFW
	Wattle / Coir Fiber Wattle with Polyacrylamide (PAM)	
1634.01	Temporary Rock Sediment Dam Type-A	
1634.02	Temporary Rock Sediment Dam Type-B	
1635.01	Rock Pipe Inlet Sediment Trap Type-A	
1635.02	Rock Pipe Inlet Sediment Trap Type-B	
1630.04	Stilling Basin	
1630.06	Special Stilling Basin	
	Rock Inlet Sediment Trap:	
1632.01	Type A	A
1632.02	Type B	B
1632.03	Type C	C
	Skimmer Basin	SK
	Tiered Skimmer Basin	SK
	Infiltration Basin	SK

THIS PROJECT CONTAINS EROSION CONTROL PLANS FOR CLEARING AND GRUBBING PHASE OF CONSTRUCTION.



GRAPHIC SCALE

30 15 0 30 60

PLANS

THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE APPLICABLE REGULATIONS SET FORTH BY THE NCG–010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE APRIL 1, 2019 AND ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY DIVISION OF WATER RESOURCES.

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Prepared in the Office of:

MATTERN & CRAIG

12 BROAD ST.

ASHEVILLE, NC 28801

FOR NCDOT DIVISION OF HIGHWAYS

Designed by:

MENG YANG, EI — *4149*

NAME — *LEVEL III CERTIFICATION NO.*

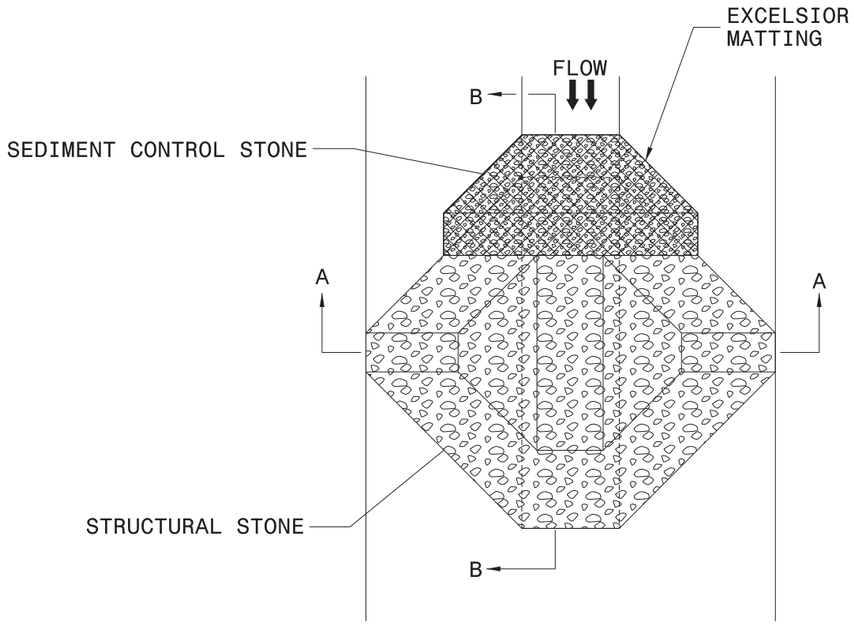
Roadway Standard Drawings

The following roadway english standards as appear in "Roadway Standard Drawings"– Roadway Design Unit – N. C. Department of Transportation – Raleigh, N. C., dated January 2018 and the latest revison thereto are applicable to this project and by reference hereby are considered a part of these plans.

1604.01	Railroad Erosion Control Detail	1632.01	Rock Inlet Sediment Trap Type A
1605.01	Temporary Silt Fence	1632.02	Rock Inlet Sediment Trap Type B
1606.01	Special Sediment Control Fence	1632.03	Rock Inlet Sediment Trap Type C
1607.01	Gravel Construction Entrance	1633.01	Temporary Rock Silt Check Type A
1622.01	Temporary Berms and Slope Drains	1633.02	Temporary Rock Silt Check Type B
1630.01	Riser Basin	1634.01	Temporary Rock Sediment Dam Type A
1630.02	Silt Basin Type B	1634.02	Temporary Rock Sediment Dam Type B
1630.03	Temporary Silt Ditch	1635.01	Rock Pipe Inlet Sediment Trap Type A
1630.04	Stilling Basin	1635.02	Rock Pipe Inlet Sediment Trap Type B
1630.05	Temporary Diversion	1640.01	Coir Fiber Baffle
1630.06	Special Stilling Basin	1645.01	Temporary Stream Crossing
1631.01	Matting Installation		

PROJECT REFERENCE NO.	SHEET NO.
17BPJ3.RJ66	EC-2

TEMPORARY ROCK SILT CHECK TYPE 'A' WITH EXCELSIOR MATTING AND POLYACRYLAMIDE (PAM)



PLAN

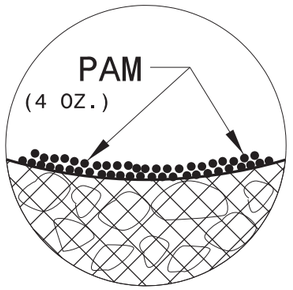
NOTES:

INSTALL TEMPORARY ROCK SILT CHECK TYPE A IN ACCORDANCE WITH ROADWAY STANDARD DRAWING NO. 1633.01.

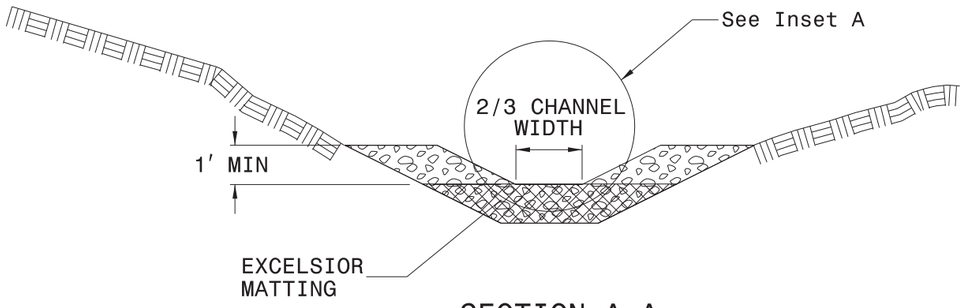
USE EXCELSIOR FOR MATTING MATERIAL AND ANCHOR MATTING SECTION AT TOP AND BOTTOM WITH CLASS B STONE.

PRIOR TO POLYACRYLAMIDE (PAM) APPLICATION, OBTAIN A SOIL SAMPLE FROM PROJECT LOCATION, AND FROM OFFSITE MATERIAL, AND ANALYZE FOR APPROPRIATE PAM FLOCCULANT TO BE APPLIED TO EACH ROCK SILT CHECK.

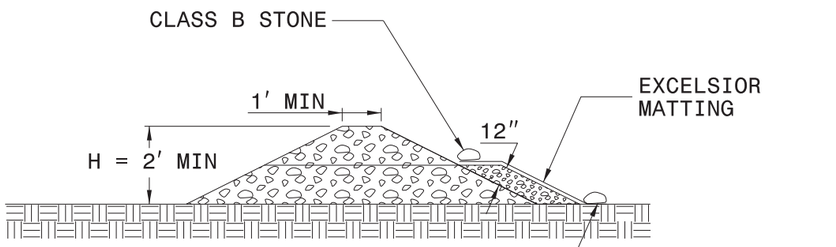
INITIALLY APPLY 4 OUNCES OF POLYACRYLAMIDE (PAM) TO TOP OF MATTING SECTION AND AFTER EVERY RAINFALL EVENT THAT EQUALS OR EXCEEDS 0.50 INCHES.



INSET A



SECTION A-A

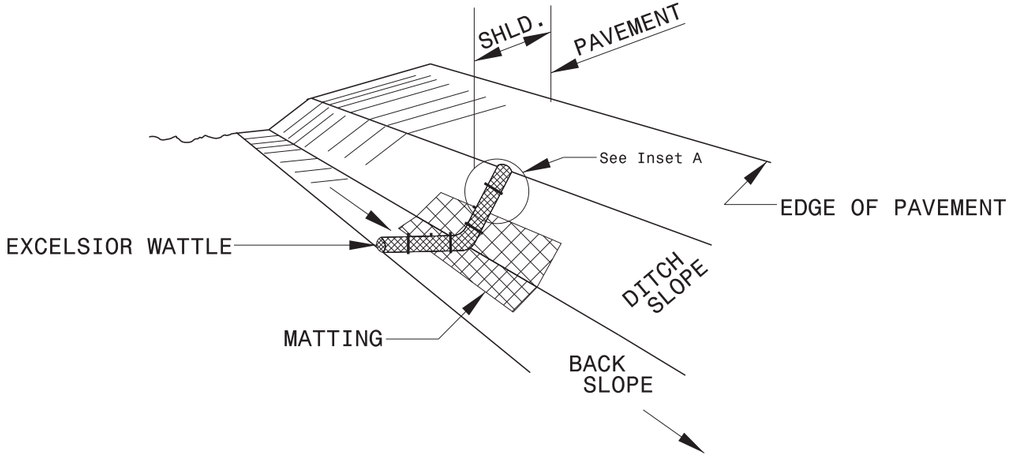


SECTION B-B

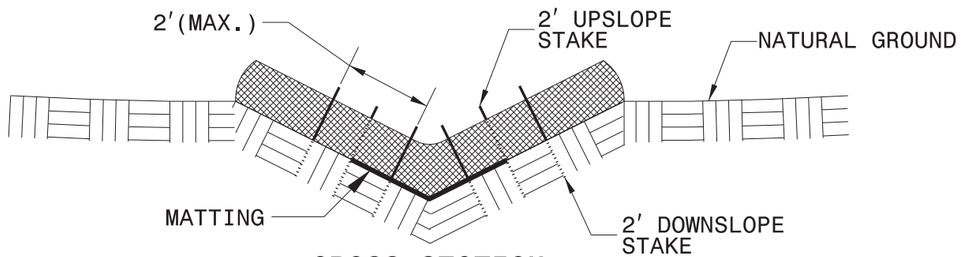
NOT TO SCALE

PROJECT REFERENCE NO.	SHEET NO.
17BPJ3.RJ66	EC-2A

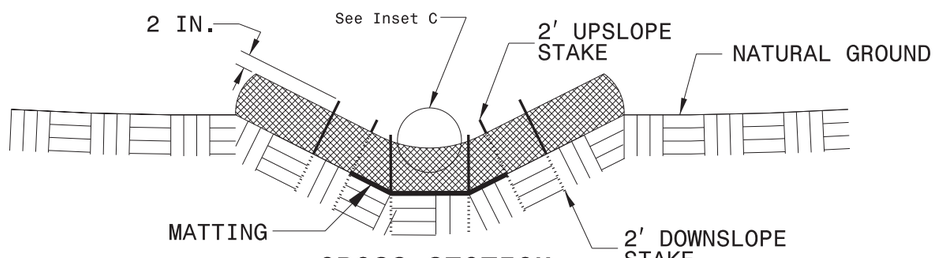
WATTLE WITH POLYACRYLAMIDE DETAIL



ISOMETRIC VIEW



CROSS SECTION VEE DITCH



CROSS SECTION TRAPEZOIDAL DITCH

NOTES:

USE MINIMUM 12 IN. DIAMETER EXCELSIOR WATTLE.

USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. CROSS SECTION.

ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.

INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.

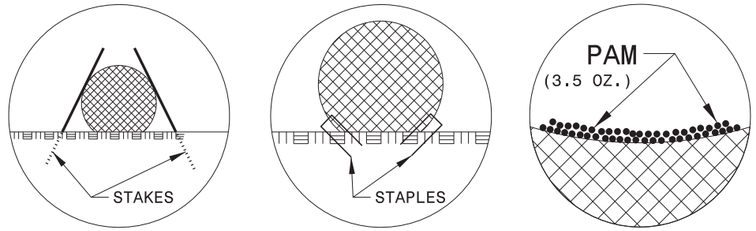
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12″ IN LENGTH.

INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

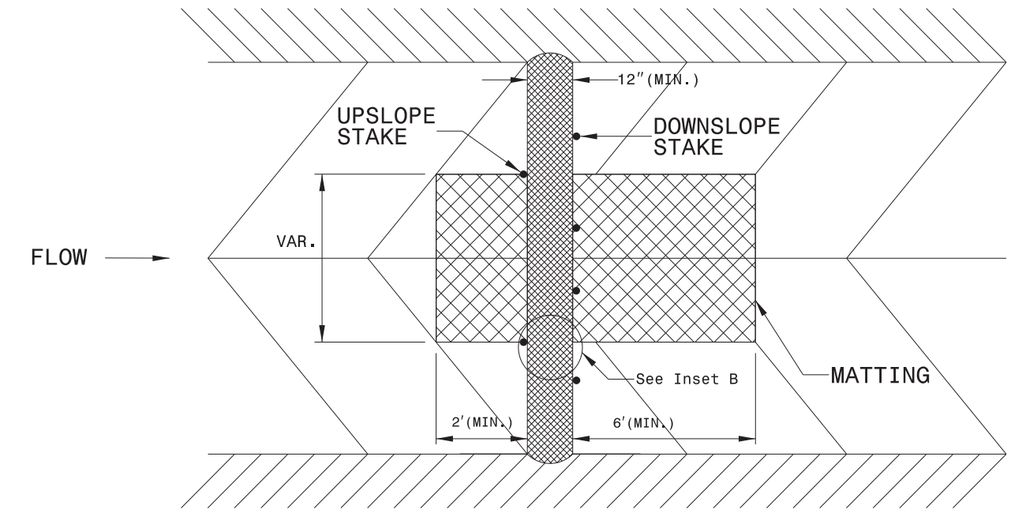
INSTALL MATTING IN ACCORDANCE WITH SECTION 1631 OF THE STANDARD SPECIFICATIONS.

PRIOR TO POLYACRYLAMIDE (PAM) APPLICATION, OBTAIN A SOIL SAMPLE FROM PROJECT LOCATION, AND FROM OFFSITE MATERIAL, AND ANALYZE FOR APPROPRIATE PAM FLOCCULANT TO BE APPLIED TO EACH WATTLE.

INITIALLY APPLY 3.5 OUNCES OF ANIONIC OR NEUTRALLY CHARGED POLYACRYLAMIDE (PAM) OVER WATTLE WHERE WATER WILL FLOW AND AFTER EVERY RAINFALL EVENT THAT IS EQUAL TO OR EXCEEDS 0.50 IN.



INSET A INSET B INSET C



TOP VIEW

NOT TO SCALE

PROJECT REFERENCE NO.	SHEET NO.
17BP.13.R.166	EC-3

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION TIMEFRAMES

SITE DESCRIPTION	STABILIZATION TIME	TIMEFRAME EXCEPTIONS
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HQW) ZONES	7 DAYS	NONE
SLOPES STEEPER THAN 3:1	7 DAYS	IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1, 14 DAYS ARE ALLOWED.
SLOPES 3:1 OR FLATTER	14 DAYS	7 DAYS FOR SLOPES GREATER THAN 50' IN LENGTH.
ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1	14 DAYS	NONE, EXCEPT FOR PERIMETERS AND HQW ZONES.

SOIL STABILIZATION SUMMARY SHEET

MATTING FOR EROSION CONTROL

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
			SUBTOTAL		
MISCELLANEOUS MATTING TO BE INSTALLED AS DIRECTED BY THE ENGINEER					1,800
				TOTAL	
				SAY	

PERMANENT SOIL REINFORCEMENT MAT

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
			SUBTOTAL		
		ADDITIONAL PSRM TO BE INSTALLED			
				TOTAL	
				SAY	

PROJECT REFERENCE NO.	SHEET NO.
17.BP.13.R.166	EC-4/CONST.4

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 4

NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE – B AND TEMPORARY ROCK SILT CHECKS TYPE – A AT DRAINAGE OUTLETS.

PROJECT REFERENCE NO.	SHEET NO.
17BP.13.R.166	EC-5/CONST.4

CULVERT CONSTRUCTION SEQUENCE STA. 10+81.10 –L–

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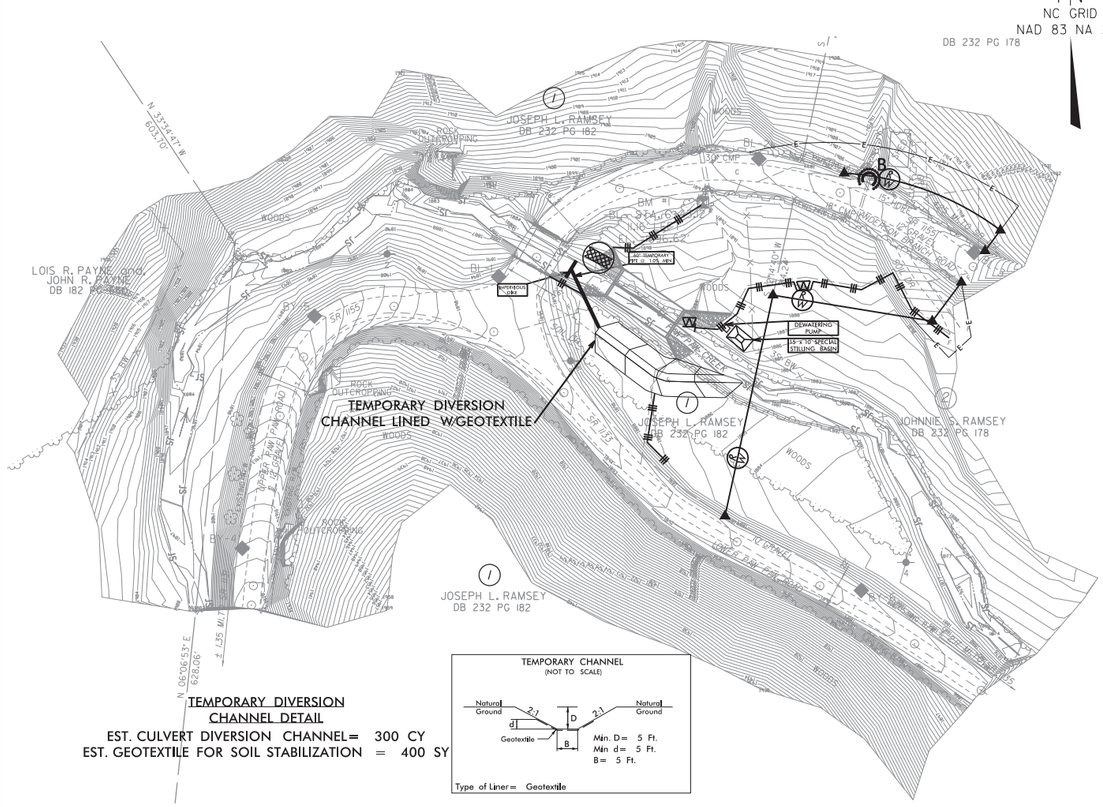
ENGINEERS • SURVEYORS

PHASE I

1. INSTALL PERIMETER EROSION CONTROL DEVICES PRIOR TO CONSTRUCTION AS SHOWN IN THE CLEAR AND GRUBBING PHASE
2. INSTALL IMPERVIOUS DIKES AND TEMPORARY 60" PIPE AND CONSTRUCT TEMPORARY DIVERISON CHANNEL AS SHOWN.
3. DIVERT CHANNEL FLOW THROUGH TEMPORARY PIPE AND TEMPORARY DIVERSION CHANNEL.
4. INSTALL DEWATERING PUMP AND SILT BAG AS DIRECTED BY THE ENGINEER.
5. CONSTRUCT PROPOSED BOX CULVERTS EXCEPT SOUTHWEST WINGWALL AND CHANNEL IMPROVEMENTS.
6. REMOVE IMPERVIOUS DIKES, TEMPORARY 60" PIPE, AND ALLOW FLOW THROUGH THE NEWLY CONSTRUCTED RCBC.
7. REMOVE AND FILL TEMPORARY DIVERSION CHANNEL.
8. CONSTRUCT SOUTHWEST WINGWALL.
9. CONSTRUCT THE PROPOSED ROADWAY SUFFICIENTLY TO ALLOW TRAFFIC THROUGH THE SITE AS DESCRIBED IN TRAFFIC MANAGEMENT PLANS.

NOTES:
1. CULVERT CONSTRUCTION SHALL BE PERFORMED IN ONLY DRY OR ISOLATED SECTIONS OF CHANNEL.
2. IMPERVIOUS DIKES ARE TO BE USED TO ISOLATE WORK FROM STREAM FLOW AS NECESSARY.
3. ALL GRADED AREAS SHALL BE STABILIZED WITHIN 24 HOURS.
4. MAINTENANCE OF STREAM FLOW OPERATIONS SHALL BE INCIDENTAL TO THE WORK. THIS INCLUDES POLETHYLENE SHEETING, DIVERSION PIPES, PUMPS AND HOSES.
5. PUMPS AND HOSES SHALL BE SUFFICIENT SIZE TO DEWATER THE WORK AREA.
6. THE CONTRACTOR SHALL NOT PUMP SEDIMENT–LADEN WATER DIRECTLY INTO STREAM. FOR DEWATERING OF CULVERT SITES, THE CONTRACTOR SHALL FILTER SEDIMENT–LADEN WATER THROUGH SPECIAL STILLING BASIN.



TEMPORARY CHANNEL
(NOT TO SCALE)

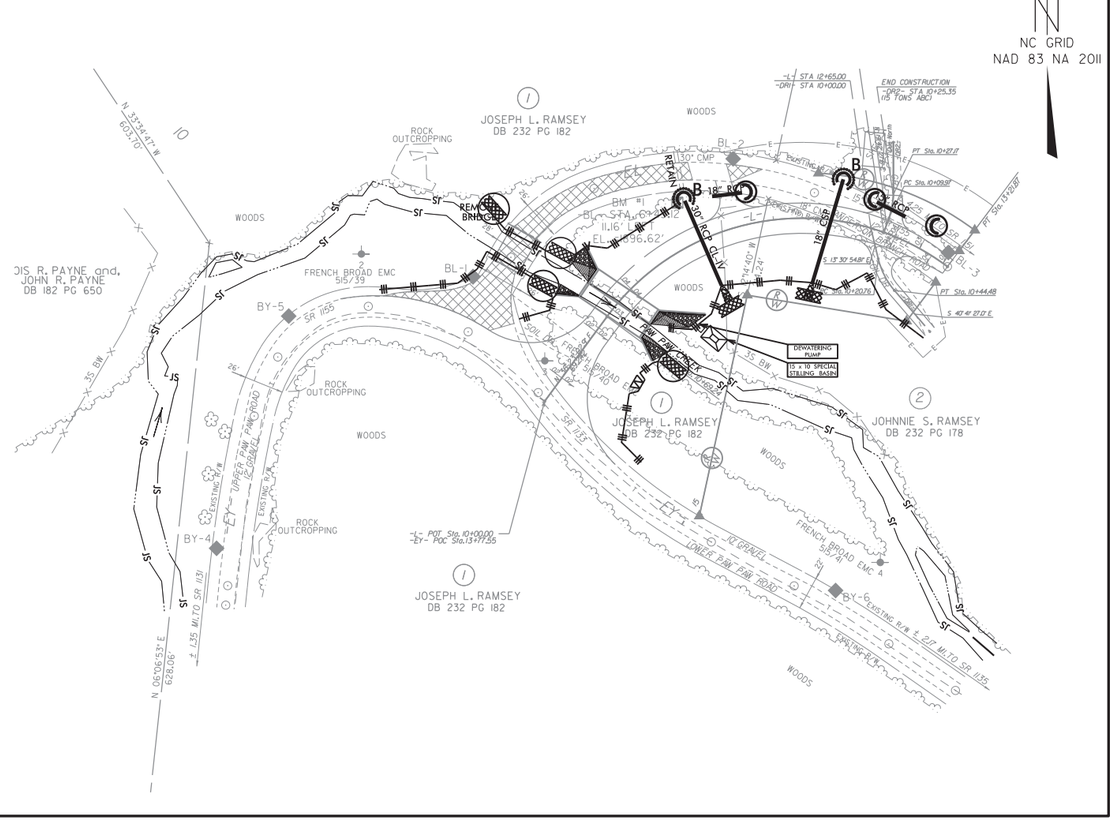
Type of Liner = Geotextile

TEMPORARY DIVERSION CHANNEL DETAIL

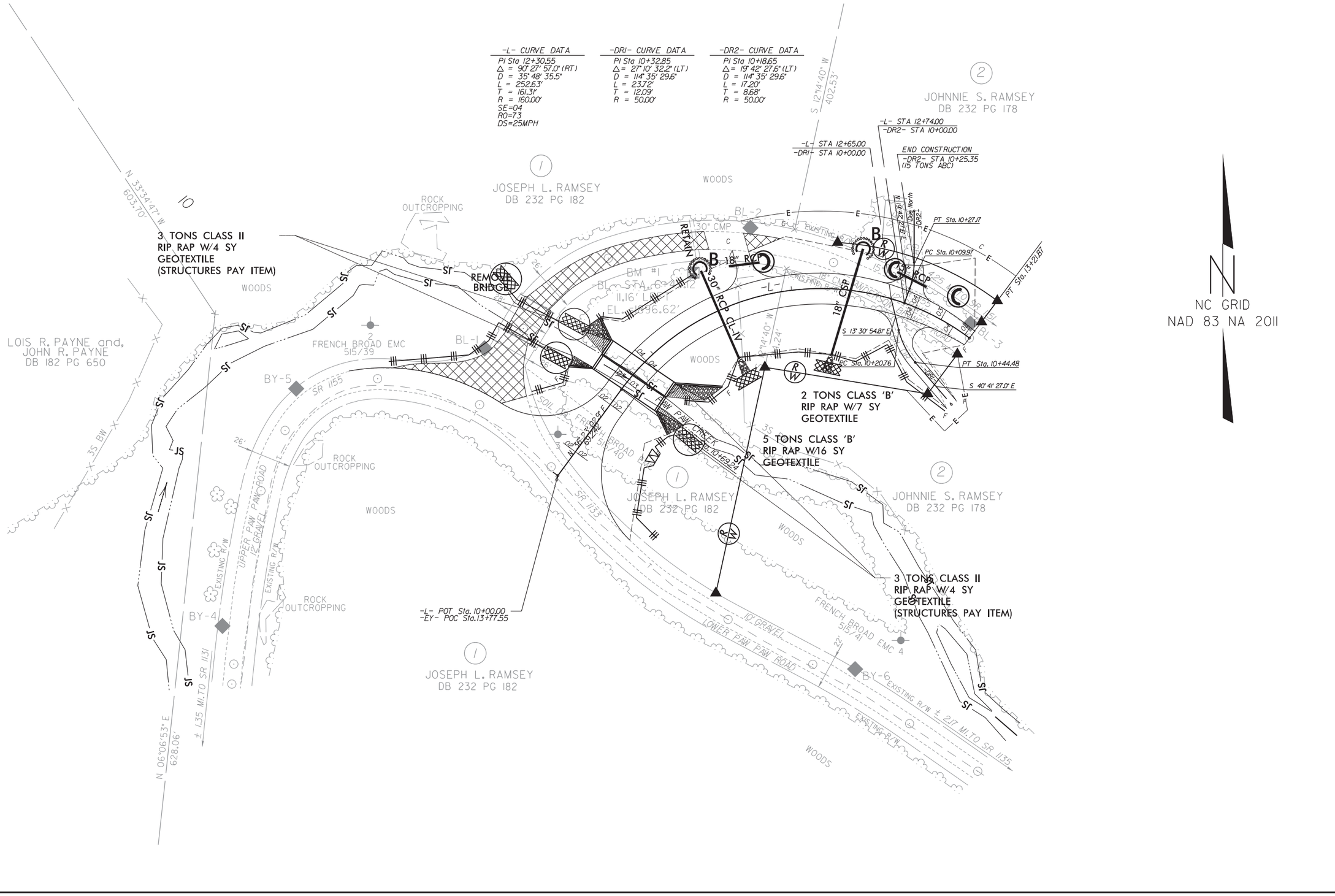
EST. CULVERT DIVERSION CHANNEL = 300 CY
EST. GEOTEXTILE FOR SOIL STABILIZATION = 400 SY

PHASE II

1. INSTALL FINAL GRADE EROSION CONTROL DEVICES AS REMOVAL OF THE EXISTING ROADWAY AND BRIDGE MAKE THEM NECESSARY.
2. SHIFT TRAFFIC AS DESCRIBED IN THE TRAFFIC MANAGEMENT PLANS TO PROPOSED ROADWAY.
3. REMOVE EMBANKMENT AND ROADWAY BEHIND THE WINGWALLS OF THE EXISTING BRIDGE PRIOR TO REMOVAL OF THE BRIDGE ITSELF. THIS WILL PREVENT SEDIMENT FROM BEING DEPOSITED IN THE STREAM BED.
4. ENSURE DISTURBED LAND IS STABILIZED.
5. REMOVE TEMPORARY EROSION CONTROL DEVICES



PROJECT REFERENCE NO.	SHEET NO.
17.BP.13.R.166	EC-6/CONST.5



PROJECT REFERENCE NO. 17BPJ3.RJ66 | SHEET NO. U0-1

UTILITIES BY OTHERS

NOTE:
ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS

8/17/99

REVISIONS

-L- CURVE DATA

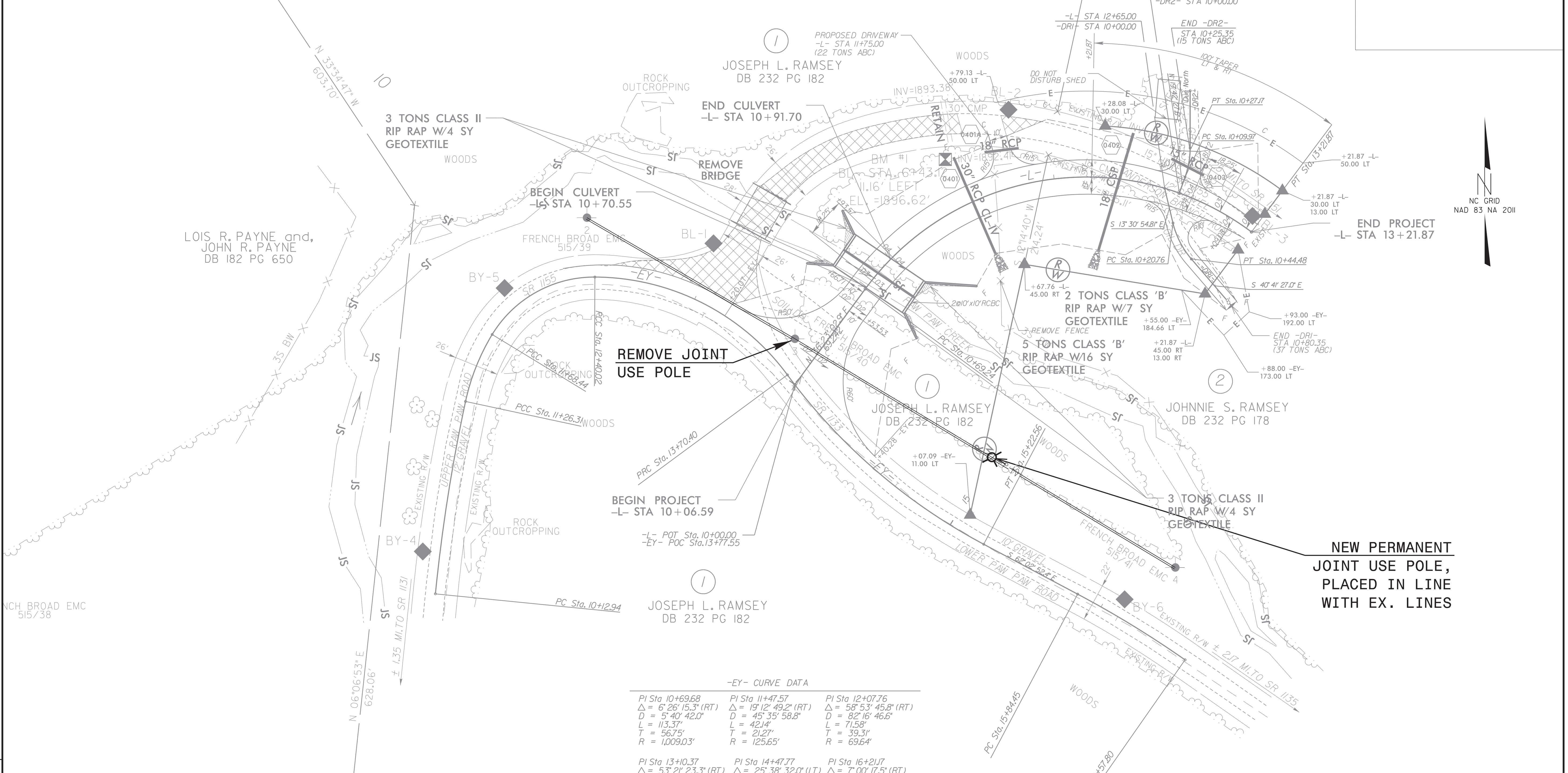
PI Sta 12+30.55
Δ = 90° 27' 57.0" (RT)
D = 35° 48' 35.5"
L = 252.63'
T = 161.31'
R = 160.00'
SE=04
RO=73
DS=25MPH

-DR1- CURVE DATA

PI Sta 10+32.85
Δ = 27° 10' 32.2" (LT)
D = 114° 35' 29.6"
L = 23.72'
T = 12.09'
R = 50.00'

-DR2- CURVE DATA

PI Sta 10+18.65
Δ = 19° 42' 27.6" (LT)
D = 114° 35' 29.6"
L = 17.20'
T = 8.68'
R = 50.00'



-EY- CURVE DATA

PI Sta 10+69.68	PI Sta 11+47.57	PI Sta 12+07.76
Δ = 6° 26' 15.3" (RT)	Δ = 19° 12' 49.2" (RT)	Δ = 58° 53' 45.8" (RT)
D = 5° 40' 42.0"	D = 45° 35' 58.8"	D = 82° 16' 46.6"
L = 113.37'	L = 42.14'	L = 71.58'
T = 56.75'	T = 21.27'	T = 39.31'
R = 1,009.03'	R = 125.65'	R = 69.64'
PI Sta 13+10.37	PI Sta 14+47.77	PI Sta 16+21.17
Δ = 53° 21' 23.3" (RT)	Δ = 25° 38' 32.0" (LT)	Δ = 7° 00' 17.5" (RT)
D = 40° 55' 32.4"	D = 16° 51' 06.0"	D = 9° 32' 57.5"
L = 130.37'	L = 152.16'	L = 73.35'
T = 70.35'	T = 77.38'	T = 36.72'
R = 140.00'	R = 340.00'	R = 600.00'

UTILITY OWNERS

FRENCH BROAD EMC
3043 HIGHWAY 213
MARSHALL, NC 28753

FRONTIER COMMUNICATIONS
196 REEMS CREEK ROAD
WEAVERVILLE, NC 28787

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Mattern & Craig
ENGINEERS • SURVEYORS
FIRM LICENSE No. C-1154
12 BROAD STREET
ASHEVILLE, NORTH CAROLINA 28801
(828) 254-2201
FAX (828) 254-4562

COMPUTED BY: MY DATE: 11/2018
CHECKED BY: ACC DATE: 11/2018

PROJECT REFERENCE NO.	SHEET NO.
17BP.13.R.166	X-0

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

CROSS SECTION SUMMARY

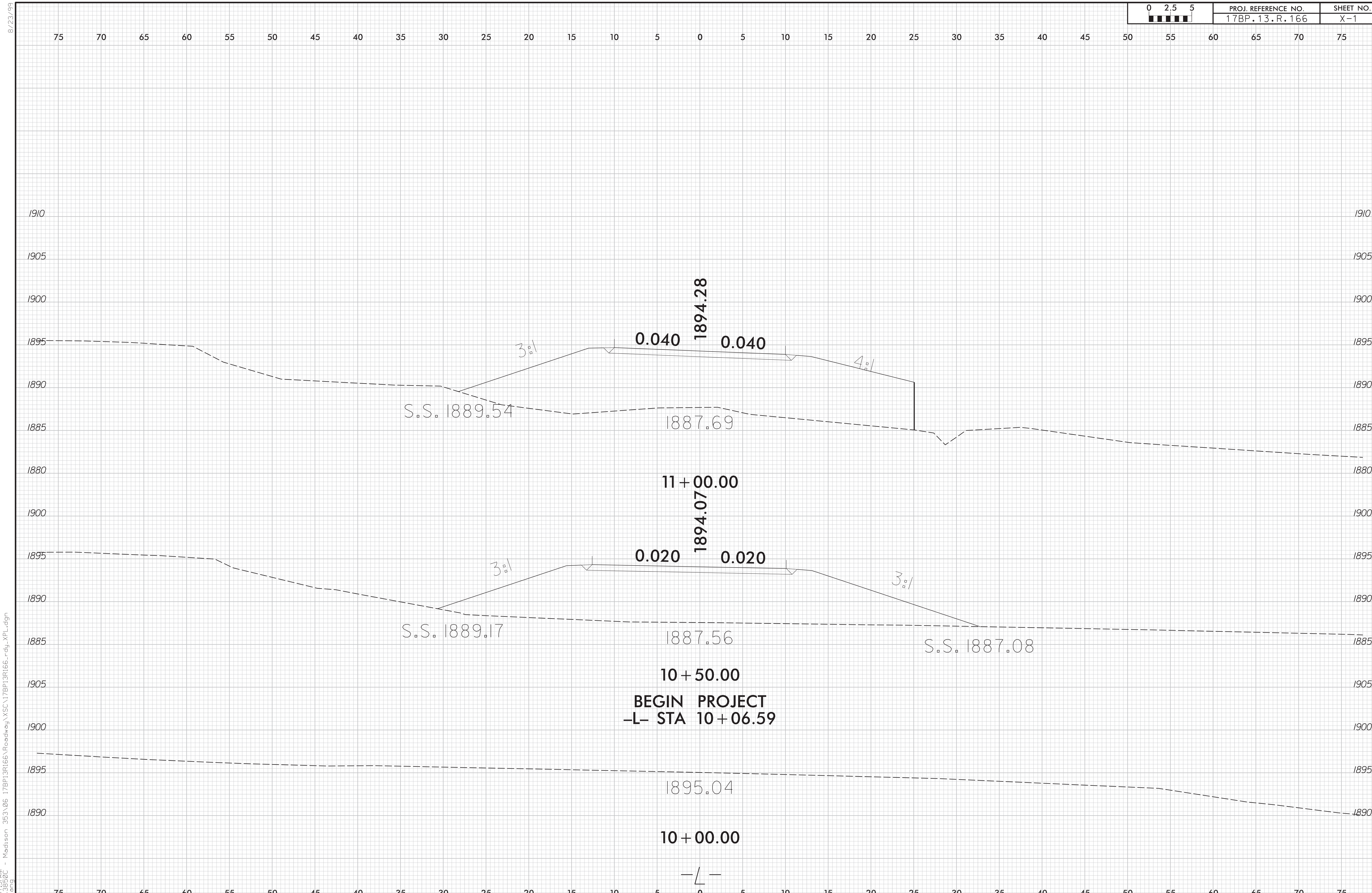
IN CUBIC YARDS

-L- LOCATION	UNCLASSIFIED EXCAVATION	EMBT
10+06.59	0	0
10+50	0	458
11+00	0	234
11+50	0	488
12+00	28	359
12+50	49	243
13+00	128	118
13+21.87	45	15

Approximate quantities only. Unclassified excavation, fine grading, and clearing and grubbing will be paid for at the contract lump sum price for "grading".

NOTE: EMBANKMENT COLUMN DOES NOT INCLUDE BACKFILL FOR UNDERCUT.

PROJ. REFERENCE NO.	SHEET NO.
17BP.13.R.166	X-1



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myang

8/23/99

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	17BP.13.R.166	X-2

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

1910 1905 1900 1895 1890 1885 1880

S.S. 1899.55

5:1

4:1

0.040 1898.42 0.040

1896.76

1894.01

3:1

S.S. 1889.42

12+00.00

1910 1905 1900 1895 1890 1885 1880

1895.75

5:1

0.040 0.040

3:1

S.S. 1893.33

1890.23

S.S. 1888.49

11+50.00

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mjong

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8/23/99

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	17BP.13.R.166	X-3

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

1910 1905 1900 1895 1890 1885 1880

S.S. 1914.95

2%

4%

0.030

0.040

1904.51

1902.72

END PROJECT
–L– STA 13+21.87

2%

–DR1–
0.030

S.S. 1898.00

2%

13+00.00

1901.47

4%

0.040

0.040

1901.60

1899.81

3%

S.S. 1890.80

12+50.00

–L–

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

1910 1905 1900 1895 1890 1885 1880

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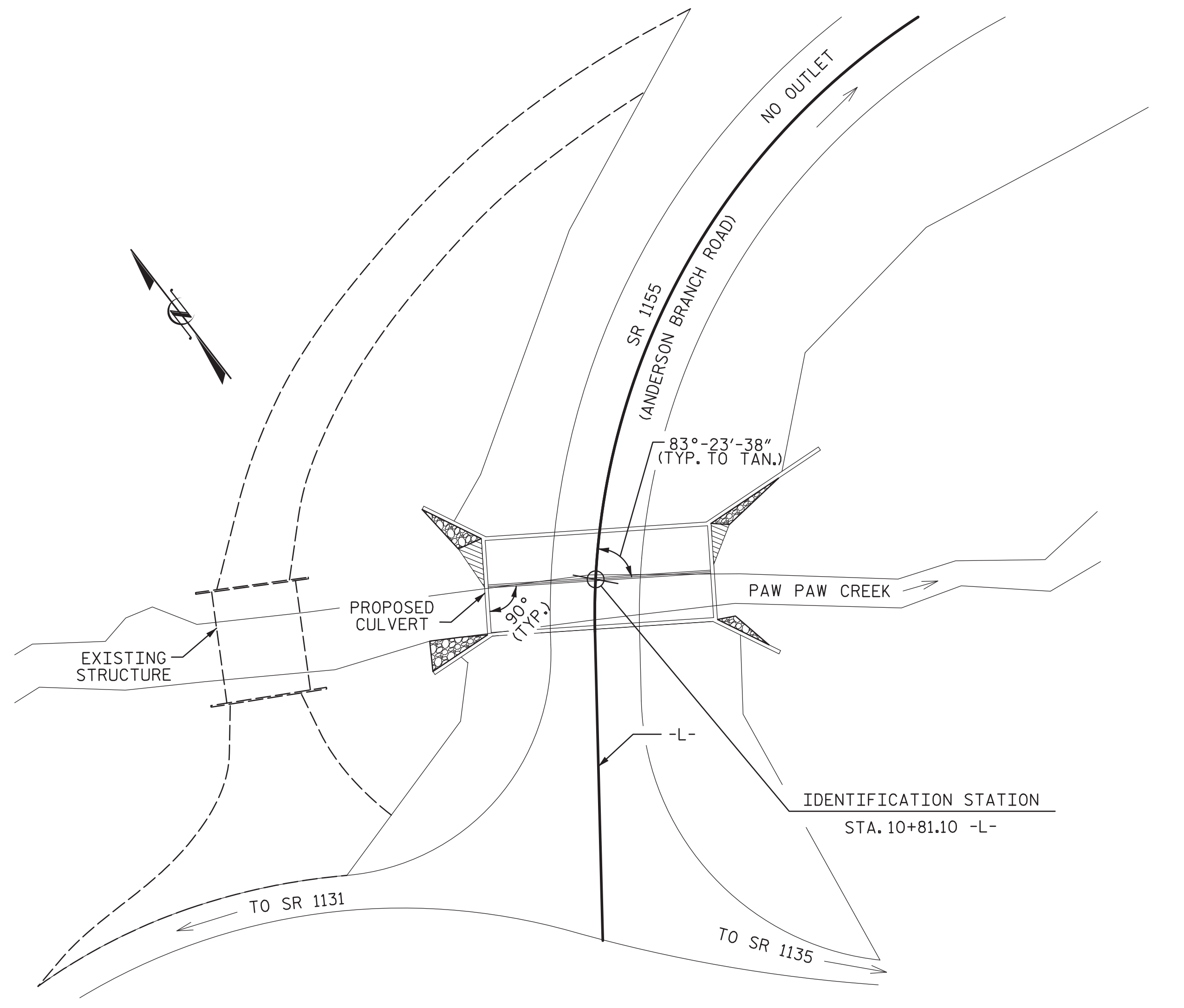
mjong

B.M. #1: RR SPIKE IN 15" BLACK WALNUT -L- STA. 11+46.95 29.08' LT., EL. 1896.62' NAVD 88

GRADE POINT ELEV. @ STA. 10+81.1 -L- = 1894.05
BED ELEV. @ STA. 10+81.1 -L- = 1879.62
ROADWAY SLOPES = VARIES



LOCATION SKETCH

HYDRAULIC DATA

DESIGN DISCHARGE	1000 CFS
FREQUENCY OF DESIGN FLOOD	25 YR.
DESIGN HIGH WATER ELEVATION	1888.6 FT
DRAINAGE AREA	3.6 SQ. MI.
BASE DISCHARGE (Q 100)	1400 CFS
BASE HIGH WATER ELEVATION	1889.5 FT

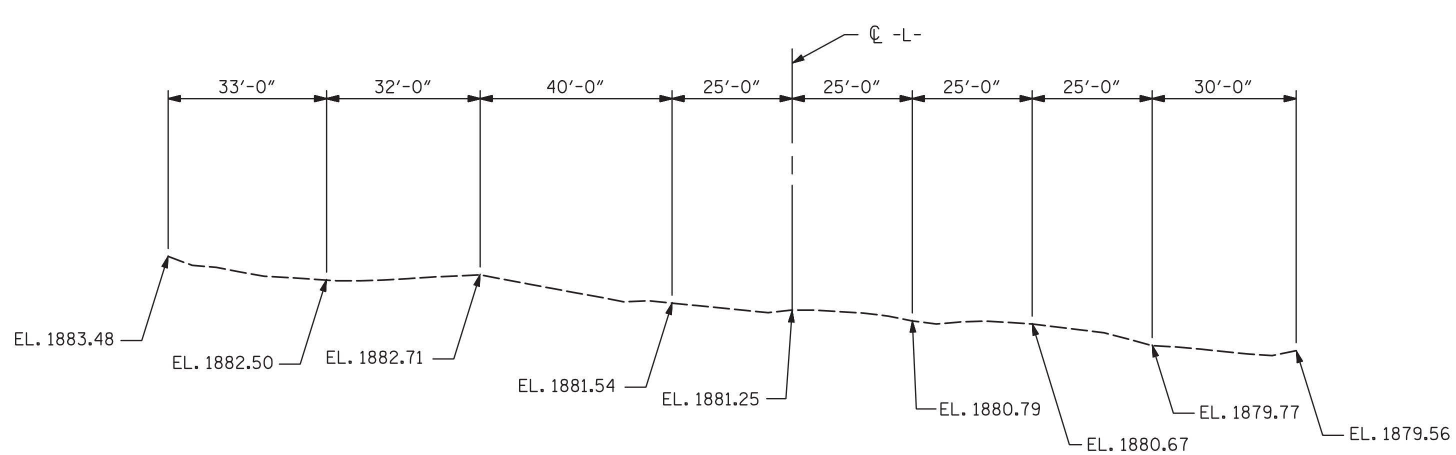
OVERTOPPING DATA

OVERTOPPING DISCHARGE	2300 CFS
FREQUENCY OF OVERTOPPING FLOOD	500+ YR.
OVERTOPPING FLOOD ELEVATION AT STA 10+66.80 -L-	1893.4 FT

HORIZONTAL CURVE DATA -L-

PI Sta 12+30.55
Δ = 90° 27' 57.0" (RT)
D = 35° 48' 35.5"
L = 252.63'
T = 161.31'
R = 160.00'

NO KNOWN UTILITY CONFLICTS



PROFILE ALONG ℄ CULVERT

TOTAL STRUCTURE QUANTITIES

CLASS A CONCRETE		
BARREL @ 2.42 CY/FT	120.9	C.Y.
WING ETC.	43.8	C.Y.
TOTAL	164.7	C.Y.
REINFORCING STEEL		
BARREL	27412	LBS.
WINGS ETC.	3766	LBS.
TOTAL	31178	LBS.
FOUNDATION CONDITIONING MATERIAL, BOX CULVERT	93 TONS	
CLASS II RIP RAP	6 TONS	
GEOTEXTILE FABRIC	8 S.Y.	
ASBESTOS ASSESSMENT	LUMP SUM	
REMOVAL OF EXIST. STRUCTURE @ STA. 10+69.27 -L-	LUMP SUM	
UNCLASSIFIED STRUCTURE EXCAVATION	LUMP SUM	

DRAWN BY : CTB DATE : 02-22
CHECKED BY : CMT DATE : 02-22
DESIGN ENGINEER OF RECORD: T. TOWNSEND DATE : 02-22

NOTES

ASSUMED LIVE LOAD ---------- HL-93.

DESIGN FILLS (ABOVE TOP OF TOP SLAB):

MAXIMUM DESIGN FILL----------------- 4'-0"

MINIMUM DESIGN FILL----------------- 2'-2"

FOR OTHER DESIGN DATA AND NOTES SEE STANDARD NOTE SHEET.

3" Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.

CONCRETE IN CULVERTS TO BE POURED IN THE FOLLOWING ORDER:

1. WING FOOTINGS AND FLOOR SLAB INCLUDING 4" OF ALL VERTICAL WALLS.
2. THE REMAINING PORTIONS OF THE WALLS AND WINGS FULL HEIGHT FOLLOWED BY ROOF SLAB AND HEADWALLS.

THE RESIDENT ENGINEER SHALL CHECK THE LENGTH OF CULVERT BEFORE STAKING IT OUT TO MAKE CERTAIN THAT IT WILL PROPERLY TAKE CARE OF THE FILL.

THIS BARREL STANDARD TO BE USED ONLY ON CULVERT ON 90° SKEW AND TO BE USED WITH STANDARD WING SHEET WITH THE SAME SKEW AND VERTICAL CLEARANCE.

DIMENSIONS FOR WING LAYOUT AS WELL AS ADDITIONAL REINFORCING STEEL EMBEDDED IN BARREL ARE SHOWN ON WING SHEET.

A 3 FOOT STRIP OF FILTER FABRIC SHALL BE ATTACHED TO THE FILL FACE OF THE WING COVERING THE ENTIRE LENGTH OF THE EXPANSION JOINT.

TRANSVERSE CONSTRUCTION JOINTS SHALL BE USED IN THE BARREL, SPACED TO LIMIT THE POURS TO A MAXIMUM OF 70 FT. LOCATION OF JOINTS SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER.

STEEL IN THE BOTTOM SLAB MAY BE SPLICED AT THE PERMITTED CONSTRUCTION JOINT AT THE CONTRACTOR'S OPTION. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.

AT THE CONTRACTOR'S OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF EXTERIOR WALL AND BOTH FACES OF INTERIOR WALLS ABOVE LOWER WALL CONSTRUCTION JOINT. THE SPLICE LENGTH SHALL BE AS PROVIDED IN THE SPLICE LENGTH CHART SHOWN ON THE PLANS. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.

AT THE CONTRACTOR'S OPTION HE MAY SUBMIT, TO THE ENGINEER FOR APPROVAL, DESIGN AND DETAIL DRAWINGS FOR A PRECAST REINFORCED CONCRETE BOX CULVERT IN LIEU OF THE CAST-IN-PLACE CULVERT SHOWN ON THE PLANS. THE DESIGN SHALL PROVIDE THE SAME SIZE AND NUMBER OF BARRELS AS USED ON THE CAST-IN-PLACE DESIGN. FOR OPTIONAL PRECAST REINFORCED CONCRETE BOX CULVERT, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.

REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED IN A MANNER THAT PREVENTS DEBRIS FROM FALLING INTO THE WATER. THE CONTRACTOR SHALL SUBMIT DEMOLITION PLANS FOR REVIEW AND REMOVE THE BRIDGE IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE @ STA. 14+08.75 -L-".

THE EXISTING STRUCTURE CONSISTING OF A SINGLE SPAN, 25'-6" I-BEAM STRUCTURE; 19'-2" CLEAR ROADWAY ON A TIMBER DECK SUPPORTED BY TIMBER CAPS AND POSTS AND LOCATED APPROXIMATELY 75' UPSTREAM FROM PROPOSED STRUCTURE SHALL BE REMOVED AFTER SERVING AS A TEMPORARY STRUCTURE. THE EXISTING BRIDGE IS PRESENTLY POSTED BELOW THE LEGAL LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE FURTHER DETERIORATE, THIS LOAD LIMITATION MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

PROJECT NO. 17BP.13.R.166
MADISON COUNTY
STATION: 10+81.10 -L-

SHEET 1 OF 9 REPLACES BRIDGE NO. 353

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DocuSigned by: Timothy J. Townsend
SEAL 34955 ENGINEER TIMOTHY J. TOWNSEND
2/24/2022

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(828) 254-2201
FAX (828) 254-4562
NC LIC. NO. C-1154

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
LOCATION SKETCH
GENERAL NOTES
90° SKEW

REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

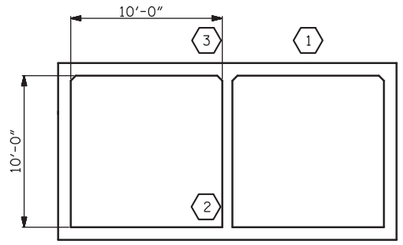
SHEET NO. C-1
TOTAL SHEETS 9

DATE: 2/10/2022 TIME: 1:58:19 PM
FILE: I:\3850C - Div 13 Bridge 353 (Madison Co)\Dwgs\401.001.17BP.13.R.166_SMU_CU.001_560353.dgn

LOAD AND RESISTANCE FACTOR RATING (LRFD) SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING	MINIMUM RATING FACTORS (RF)	TONS = W X RF	STRENGTH I LIMIT STATE									COMMENT NUMBER
							LIVELOAD FACTORS	MOMENT				SHEAR				
								RATING FACTOR	BOX NO.	ELEMENT TYPE	* DISTANCE FROM LEFT END OF ELEMENT (ft)	RATING FACTOR	BOX NO.	ELEMENT TYPE	* DISTANCE FROM LEFT END OF ELEMENT (ft)	
DESIGN LOAD RATING		HL-93(Inv)	N/A	3	2.651	--	1.75	2.651	2	FLOOR SLAB	0.33	2.651	2	FLOOR SLAB	0.33	
		HL-93(Opr)	N/A	--	3.436	--	1.35	3.436	2	FLOOR SLAB	0.33	3.436	2	FLOOR SLAB	0.33	
		HS-20(Inv)	36.000	--	2.769	99.68	1.75	2.769	2	ROOF SLAB	0.93	2.769	2	ROOF SLAB	0.93	
		HS-20(Opr)	36.000	--	3.590	129.24	1.35	3.590	2	ROOF SLAB	0.93	3.590	2	ROOF SLAB	0.93	
LEGAL LOAD RATING	SV	SNSH	13.500	--	4.232	57.13	1.4	4.232	2	ROOF SLAB	0.93	4.232	2	ROOF SLAB	0.93	
		SNGARBS2	20.000	--	3.905	78.10	1.4	3.905	2	ROOF SLAB	0.93	3.905	2	ROOF SLAB	0.93	
		SNAGRIS2	22.000	--	4.050	89.10	1.4	4.050	2	FLOOR SLAB	0.33	4.050	2	FLOOR SLAB	0.33	
		SNCOTTS3	27.250	2	2.584	70.41	1.4	2.584	1	ROOF SLAB	5.0	18.090	1	ROOF SLAB	5.0	
		SNAGGRS4	34.925	--	2.746	95.90	1.4	2.746	2	FLOOR SLAB	0.33	2.746	2	FLOOR SLAB	0.33	
		SNS5A	35.550	--	3.069	108.95	1.4	3.069	2	FLOOR SLAB	0.33	3.069	2	FLOOR SLAB	0.33	
		SNS6A	39.950	--	2.808	112.18	1.4	2.808	2	FLOOR SLAB	0.33	2.808	2	FLOOR SLAB	0.33	
		SNS7B	42.000	--	2.951	123.94	1.4	2.951	2	FLOOR SLAB	0.33	2.951	2	FLOOR SLAB	0.33	
	TTST	TNAGRIT3	33.000	--	3.265	107.75	1.4	3.265	2	FLOOR SLAB	0.33	3.265	2	FLOOR SLAB	0.33	
		TNT4A	33.075	--	3.078	101.80	1.4	3.078	2	ROOF SLAB	5.0	3.078	2	ROOF SLAB	5.0	
		TNT6A	41.600	--	3.055	127.09	1.4	3.055	1	FLOOR SLAB	0.33	3.055	2	FLOOR SLAB	0.33	
		TNT7A	42.000	--	2.822	118.52	1.4	2.822	2	FLOOR SLAB	0.33	2.822	2	FLOOR SLAB	0.33	
		TNT7B	42.000	--	3.074	129.11	1.4	3.074	2	FLOOR SLAB	0.33	3.074	2	FLOOR SLAB	0.33	
		TNAGRIT4	43.000	--	2.785	119.76	1.4	2.785	2	FLOOR SLAB	0.33	2.785	2	FLOOR SLAB	0.33	
		TNAGT5A	45.000	--	2.777	124.97	1.4	2.777	2	FLOOR SLAB	0.33	2.777	2	FLOOR SLAB	0.33	
		TNAGT5B	45.000	1	2.353	105.89	1.4	2.353	2	FLOOR SLAB	0.33	2.353	2	FLOOR SLAB	0.33	

* MEASURED FROM EDGE OF ELEMENT



LRFR SUMMARY
(LOOKING UPSTREAM)

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γ_{DC}	γ_{DW}
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

NOTES:

MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATES.

COMMENTS:

1.
2.
3.
4.

(#) CONTROLLING LOAD RATING
(1) DESIGN LOAD RATING (HL-93)
(2) DESIGN LOAD RATING (HS-20)
(3) LEGAL LOAD RATING **
** SEE CHART FOR VEHICLE TYPE

PROJECT NO. 17BP.13.R.166
MADISON COUNTY
STATION: 10+81.10 -L-
SHEET 2 OF 9 REPLACES BRIDGE NO. 353

DRAWN BY : CTB DATE : 02-22
CHECKED BY : CMT DATE : 02-22
DESIGN ENGINEER OF RECORD: T. TOWNSEND DATE : 02-22

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NORTH CARO
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ENGINEER
TIMOTHY J. TOWNSEND
2/24/2022

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NC LIC. NO. C-1154

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

LRFR SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS
(NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-2
1			3			TOTAL SHEETS
2			4			9

DATE: 2/10/2022 TIME: 1:58:23 PM
FILE: I:\3850C - Div 13 Bridge 353 (Madison Co)\Dwgs\401_003_17BP.13.R.166_SMU_CU_002_560353.dgn

2/10/2022
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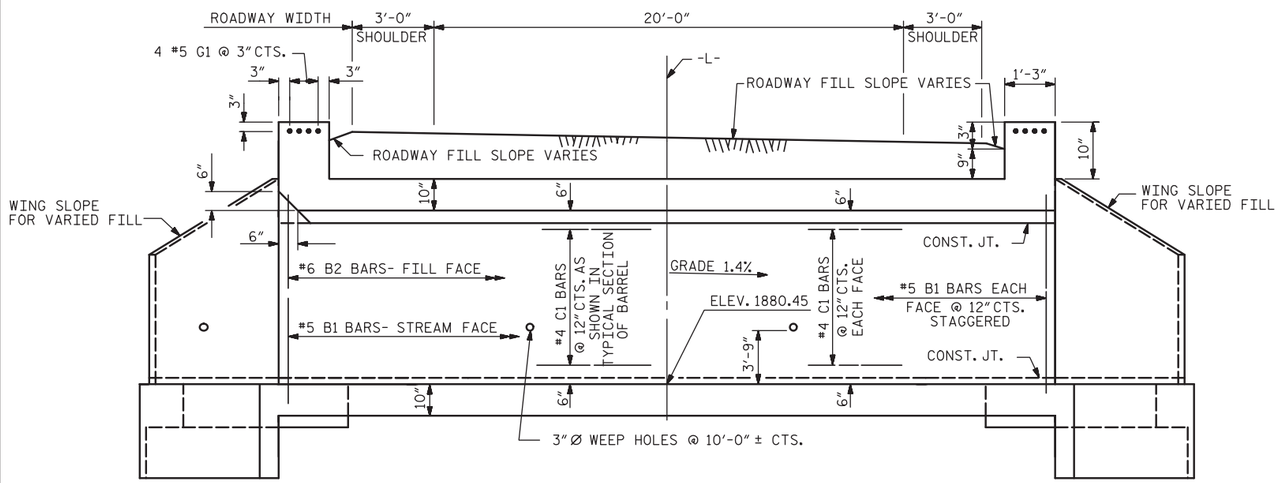
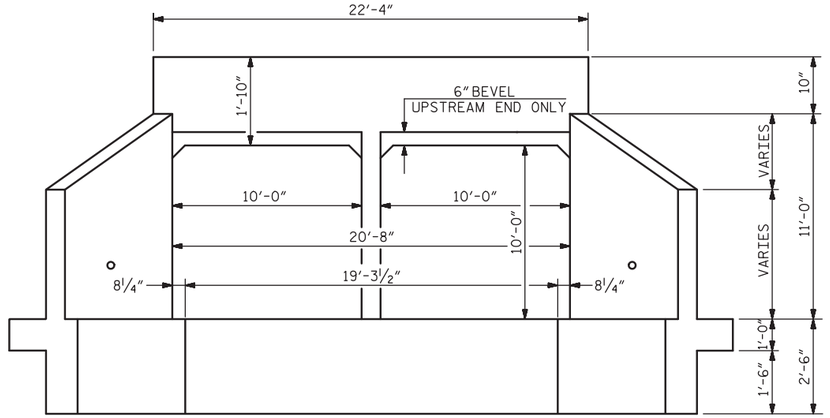
ctb



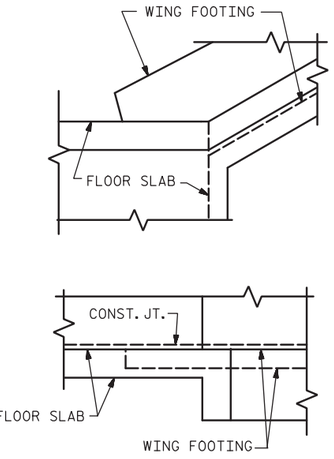
CULVERT SECTION NORMAL TO ROADWAY



END ELEVATION

PART PLAN-ROOF SLAB

PART PLAN-FLOOR SLAB



DETAIL

CONNECTION OF WING FOOTING AND FLOOR SLAB WHEN SLAB IS THICKER THAN FOOTING

PROJECT NO. 17BP.13.R.166

MADISON COUNTY

STATION: 10+81.10 -L-

SHEET 3 OF 9 REPLACES BRIDGE NO. 353

DRAWN BY : CTB DATE : 02-22

CHECKED BY : CMT DATE : 02-22

DESIGN ENGINEER OF RECORD: T. TOWNSEND DATE : 02-22

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA
DocuSigned by: Timothy J. Townsend
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SEAL 34955
ENGINEER TIMOTHY J. TOWNSEND
2/24/2022

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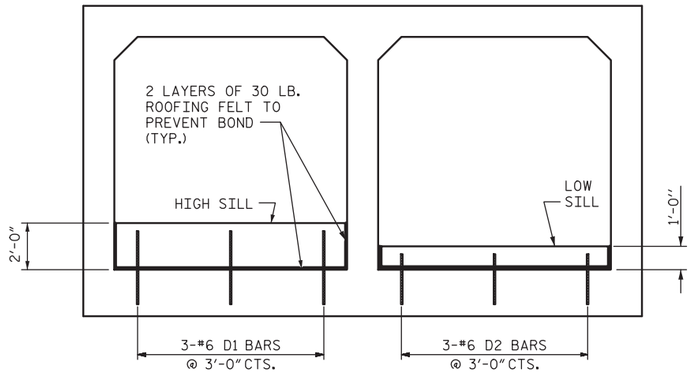
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BARREL STANDARD DOUBLE 10 FT. X 10 FT. CONCRETE BOX CULVERT 90° SKEW

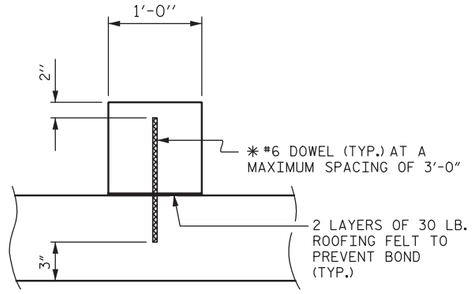
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-3
1			3			TOTAL SHEETS
2			4			9

DATE: 2/10/2022 TIME: 15:8:27 PM
FILE: I:\3850C - Div 13 Bridge 353 (Madison Co)\Dwgs\401.005.17BP.13.R.166_SMU.CU.003.560353.dgn



ELEVATION

(LOOKING UPSTREAM)

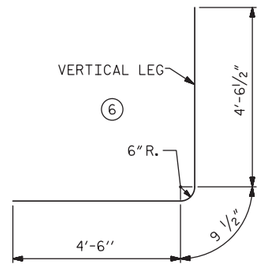


SECTION THROUGH SILL

✳ DOWELS MAY BE PUSHED INTO GREEN CONCRETE AFTER SLAB HAS BEEN FLOAT FINISHED.

SPLICE LENGTHS	
BAR SIZE	UNCOATED
#4	2'-5"
#5	3'-0"
#6	3'-7"
#7	4'-2"

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

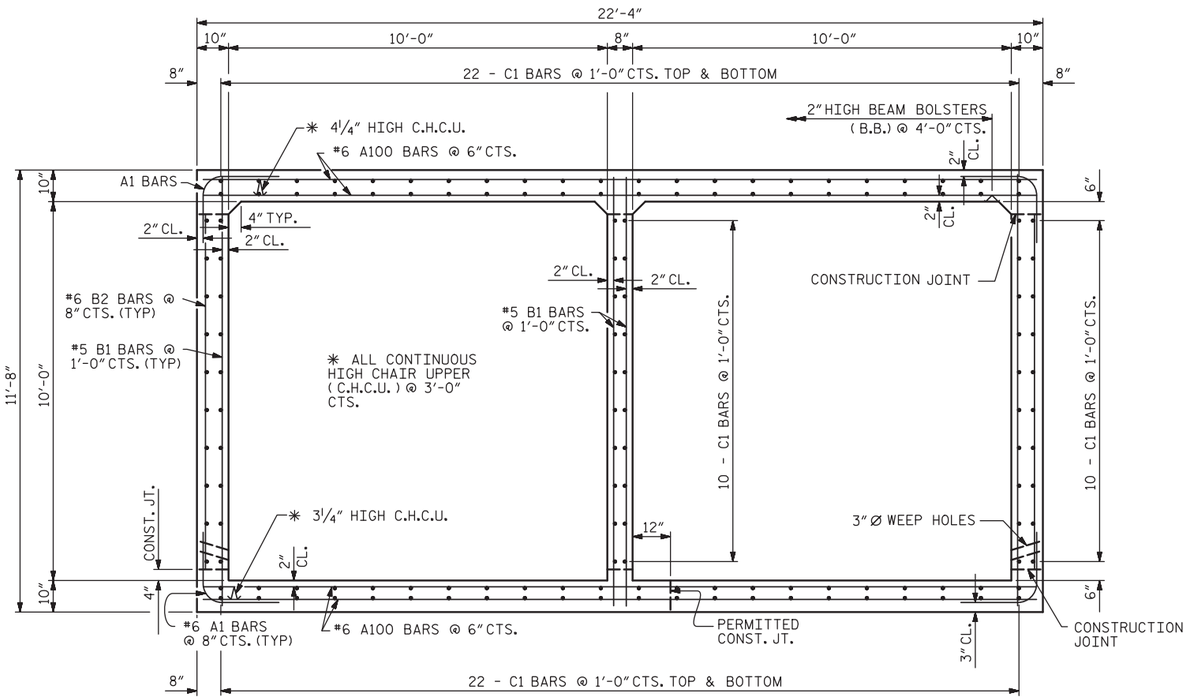
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
A1	300	#6	6	9'-10"	4431
A100	400	#6	STR	21'-10"	13117
B1	202	#5	STR	11'-3"	2370
B2	150	#6	STR	9'-4"	2103
C1	296	#4	STR	26'-1"	5157
D1	9	#6	STR	2'-5"	33
D2	9	#6	STR	1'-5"	19
G1	8	#5	STR	21'-10"	182

REINFORCING STEEL FOR CULVERT 27412

CLASS A CONCRETE

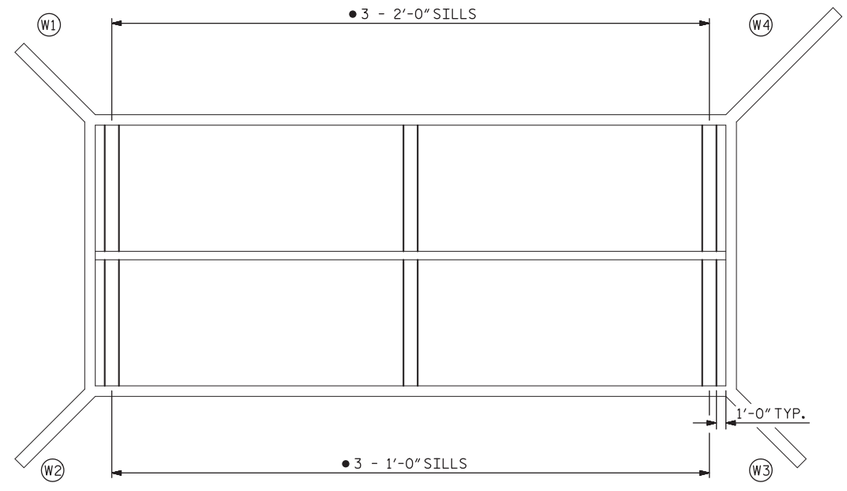
CULVERT	112.6	CY
SILLS	3.4	CY
HEADWALLS	2.1	CY
END CURTAIN WALLS	2.8	CY
TOTAL	120.9	CY

CULVERT SILL DETAILS



RIGHT ANGLE SECTION OF BARREL

THERE ARE 148 "C" BARS IN SECTION OF BARREL



● NOTE:
PLACE SILLS ONE FOOT INSIDE OF INLET AND OUTLET OF THE CULVERT WITH AN ADDITIONAL BAFFLE AT 23'-6" O.C. ALONG THE LENGTH OF THE CULVERT. BACKFILL WITH NATIVE MATERIAL. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

PROJECT NO. 17BP.13.R.166

MADISON COUNTY

STATION: 10+81.10 -L-

SHEET 4 OF 9 REPLACES BRIDGE NO. 353

DRAWN BY : CTB DATE : 02-22
CHECKED BY : CMT DATE : 02-22

DESIGN ENGINEER OF RECORD: T. TOWNSEND DATE : 02-22

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NORTH CAROLINA
DocuSigned by: Timothy J. Townsend
88C1681FA1E1402...
SEAL 34955
ENGINEER TIMOTHY J. TOWNSEND
2/24/2022

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NC LIC. NO. C-1154

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BARREL STANDARD DOUBLE 10 FT. X 10 FT. CONCRETE BOX CULVERT 90° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-4
1			3			TOTAL SHEETS
2			4			9

STD. NO. CB12

DATE: 2/10/2022 TIME: 1:58:30 PM
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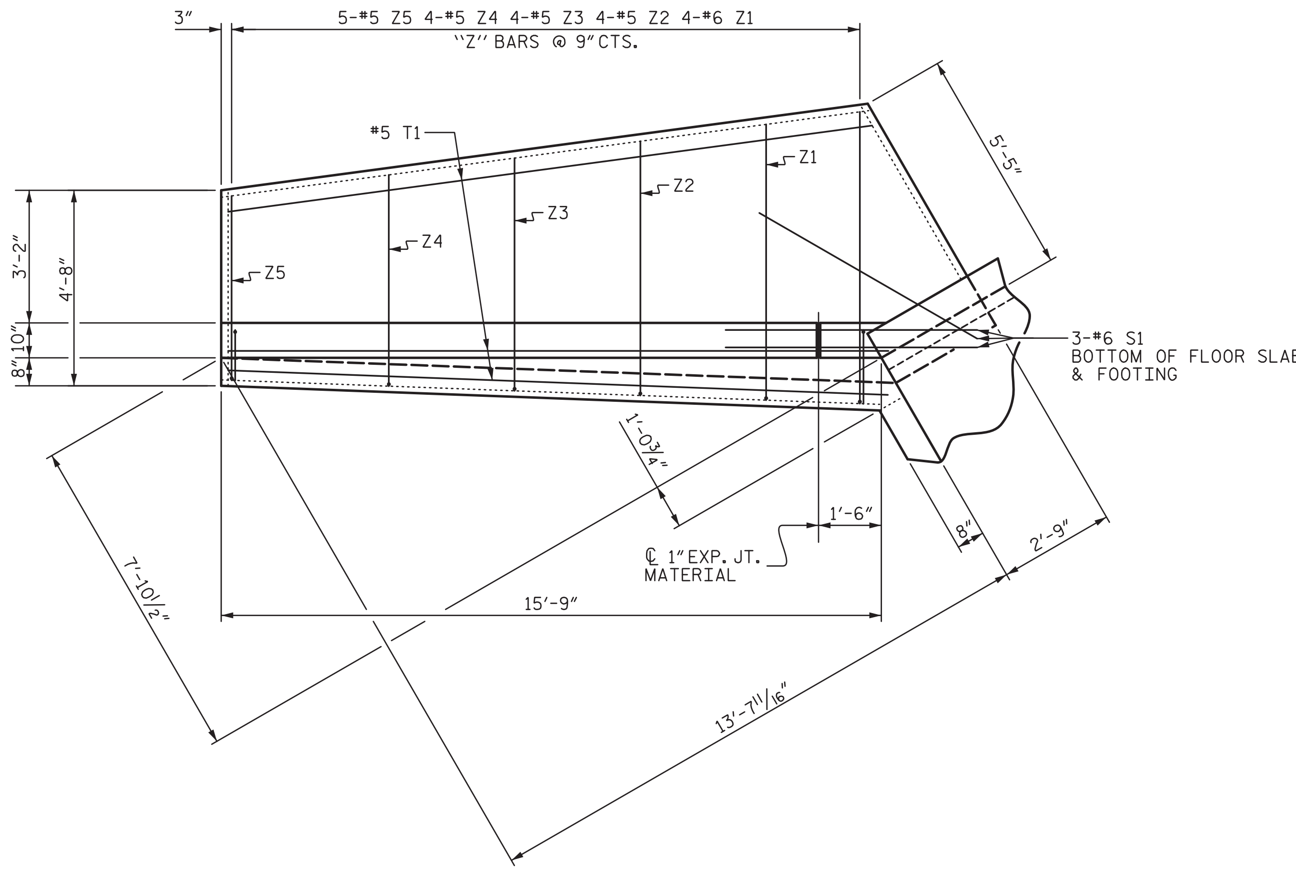
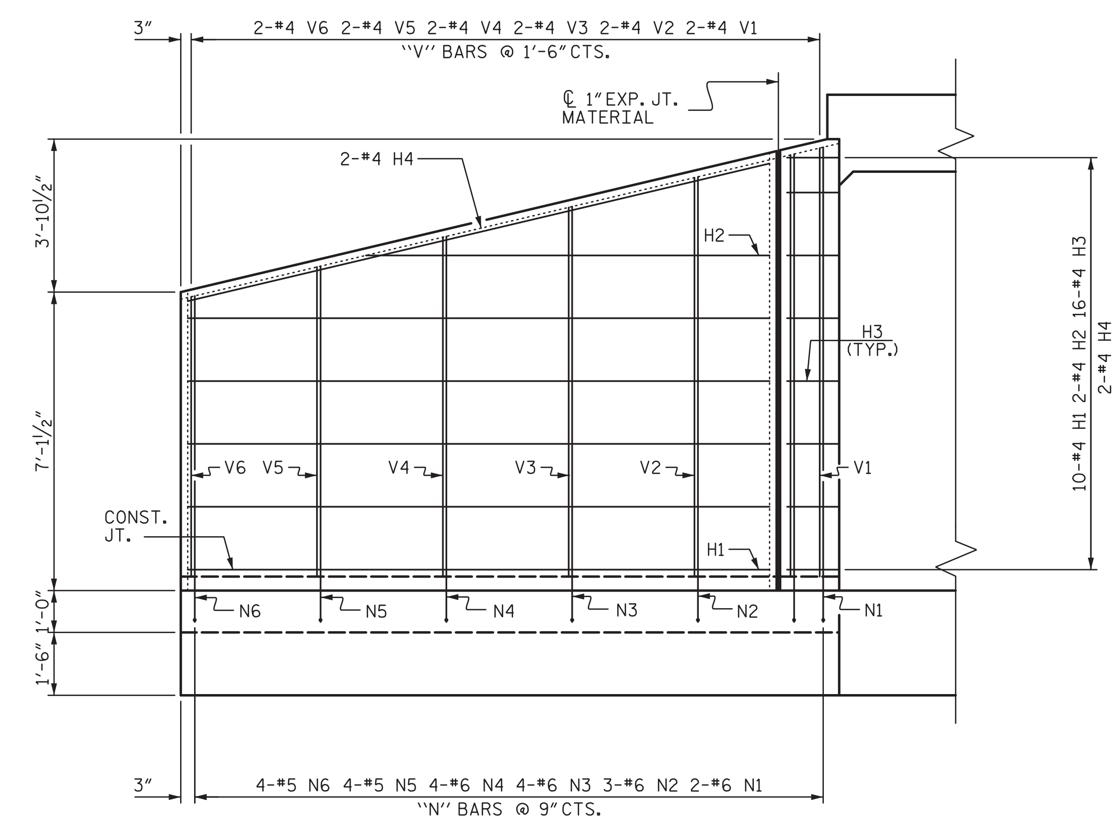
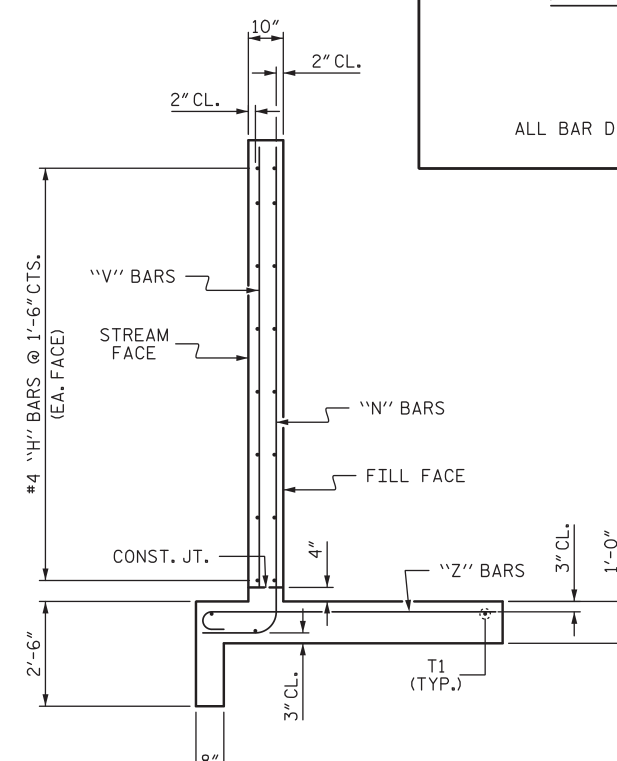


PLAN

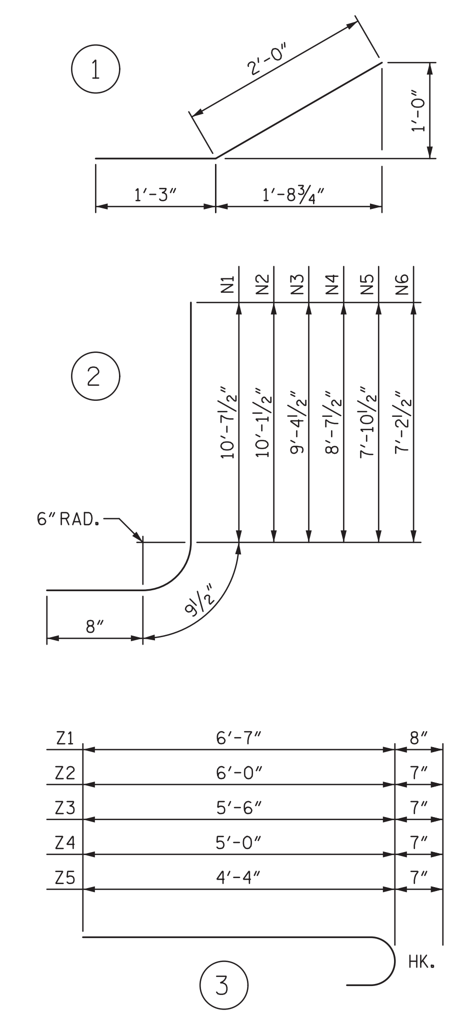


ELEVATION



TYPICAL WING SECTION

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	10	#4	STR	13'-10"	93
H2	2	#4	STR	10'-0"	14
H3	16	#4	1	3'-3"	35
H4	2	#4	STR	14'-3"	20
N1	2	#6	2	12'-1"	37
N2	3	#6	2	11'-7"	53
N3	4	#6	2	10'-10"	66
N4	4	#6	2	10'-1"	61
N5	4	#5	2	9'-4"	39
N6	4	#5	2	8'-8"	37
S1	3	#6	STR	6'-0"	28
T1	3	#5	STR	15'-9"	50
V1	2	#4	STR	10'-1"	14
V2	2	#4	STR	9'-6"	13
V3	2	#4	STR	8'-10"	12
V4	2	#4	STR	8'-1"	11
V5	2	#4	STR	7'-4"	10
V6	2	#4	STR	6'-8"	9
Z1	4	#6	3	7'-3"	44
Z2	4	#5	3	6'-7"	28
Z3	4	#5	3	6'-1"	26
Z4	4	#5	3	5'-7"	24
Z5	5	#5	3	4'-11"	26

REINFORCING STEEL FOR WING 1 — 750 LBS

CLASS A CONCRETE FOR WING 1 — 8.7 CY

PROJECT NO. 17BP.13.R.166

MADISON COUNTY

STATION: 10+81.10 -L-

SHEET 5 OF 9 — REPLACES BRIDGE NO. 353

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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2/24/2022

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

WING 1 FOR CONCRETE BOX CULVERT

H = 10'-0" SLOPE = 3:1
90° SKEW

REVISIONS							
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.	C-5
1			3			TOTAL SHEETS	9
2			4				

DRAWN BY : CTB	DATE : 02-22	DESIGN ENGINEER OF RECORD: T. TOWNSEND	DATE : 02-22
CHECKED BY : CMT	DATE : 02-22		

DATE: 2/10/2022 TIME: 1:58:34 PM
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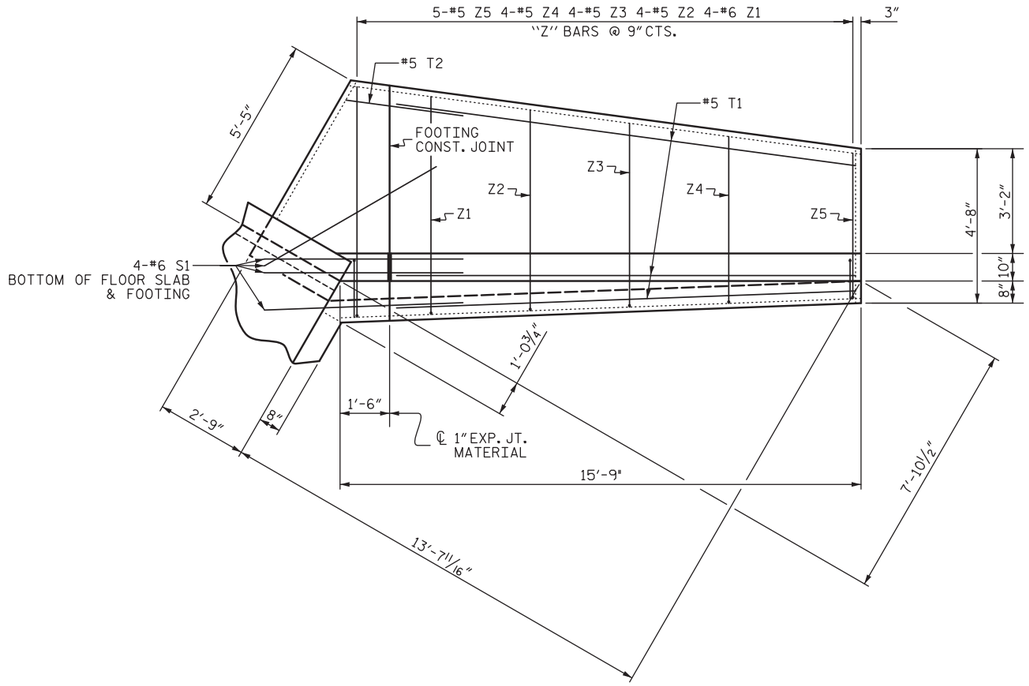
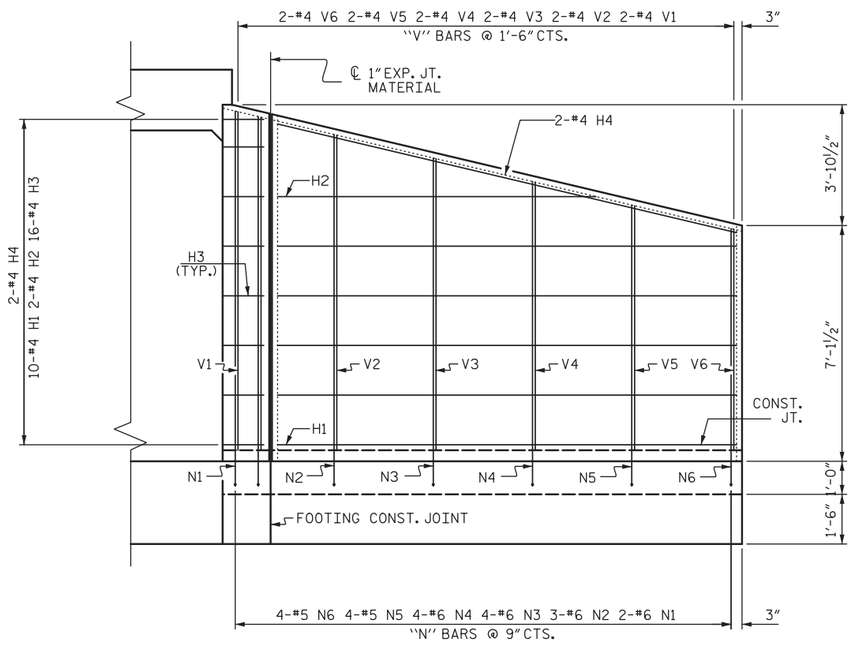
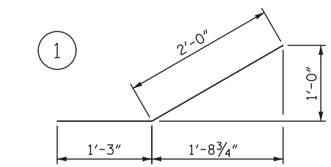


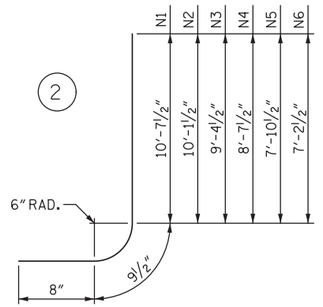
PLAN

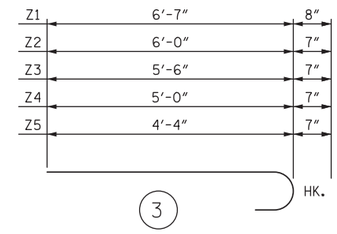


ELEVATION

BAR TYPES







ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H1	10	#4	STR	13'-10"	93
H2	2	#4	STR	10'-0"	14
H3	16	#4	1	3'-3"	35
H4	2	#4	STR	14'-3"	20
N1	2	#6	2	12'-1"	37
N2	3	#6	2	11'-7"	53
N3	4	#6	2	10'-10"	66
N4	4	#6	2	10'-1"	61
N5	4	#5	2	9'-4"	39
N6	4	#5	2	8'-8"	37
S1	4	#6	STR	6'-0"	37
T1	3	#5	STR	14'-0"	44
T2	1	#5	STR	5'-0"	6
V1	2	#4	STR	10'-1"	14
V2	2	#4	STR	9'-6"	13
V3	2	#4	STR	8'-10"	12
V4	2	#4	STR	8'-1"	11
V5	2	#4	STR	7'-4"	10
V6	2	#4	STR	6'-8"	9
Z1	4	#6	3	7'-3*	44
Z2	4	#5	3	6'-7*	28
Z3	4	#5	3	6'-1"	26
Z4	4	#5	3	5'-7"	24
Z5	5	#5	3	4'-11"	26

REINFORCING STEEL FOR WING 2 — 759 LBS

CLASS A CONCRETE FOR WING 2 — 8.7 CY

DRAWN BY : CTB DATE : 02-22
CHECKED BY : CMT DATE : 02-22

DESIGN ENGINEER OF RECORD: T. TOWNSEND DATE : 02-22

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DocuSigned by: Timothy J. Townsend BBC1881FA1E1482...
NORTH CARO 34955 ENGINEER TIMOTHY J. TOWNSEND
2/24/2022

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NC LIC. NO. C-1154

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

WING 2 FOR CONCRETE BOX CULVERT

H = 10'-0" SLOPE = 3:1
90° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	C-6
1			3			TOTAL SHEETS
2			4			9

PROJECT NO. 17BP.13.R.166
MADISON COUNTY
STATION: 10+81.10 -L-
SHEET 6 OF 9 REPLACES BRIDGE NO. 353

DATE: 2/10/2022 TIME: 1:58:37 PM
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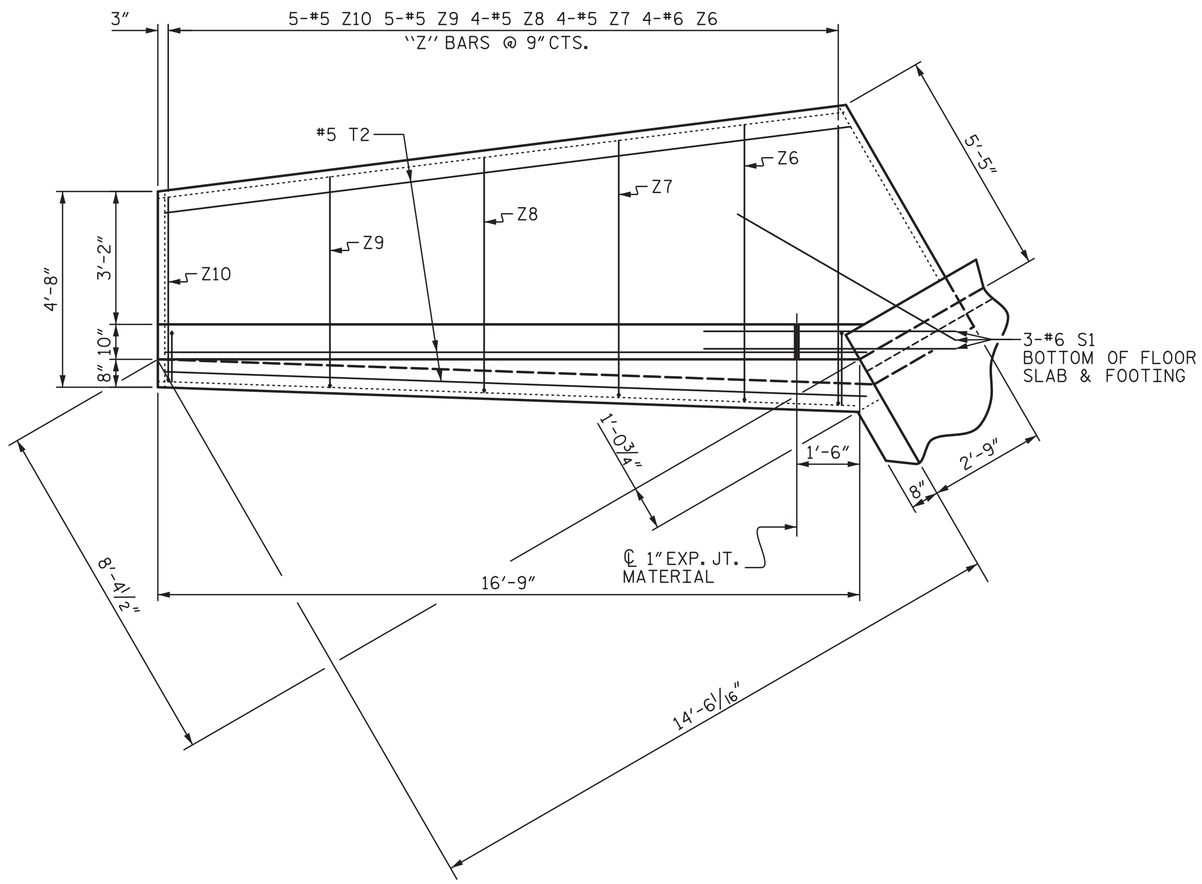
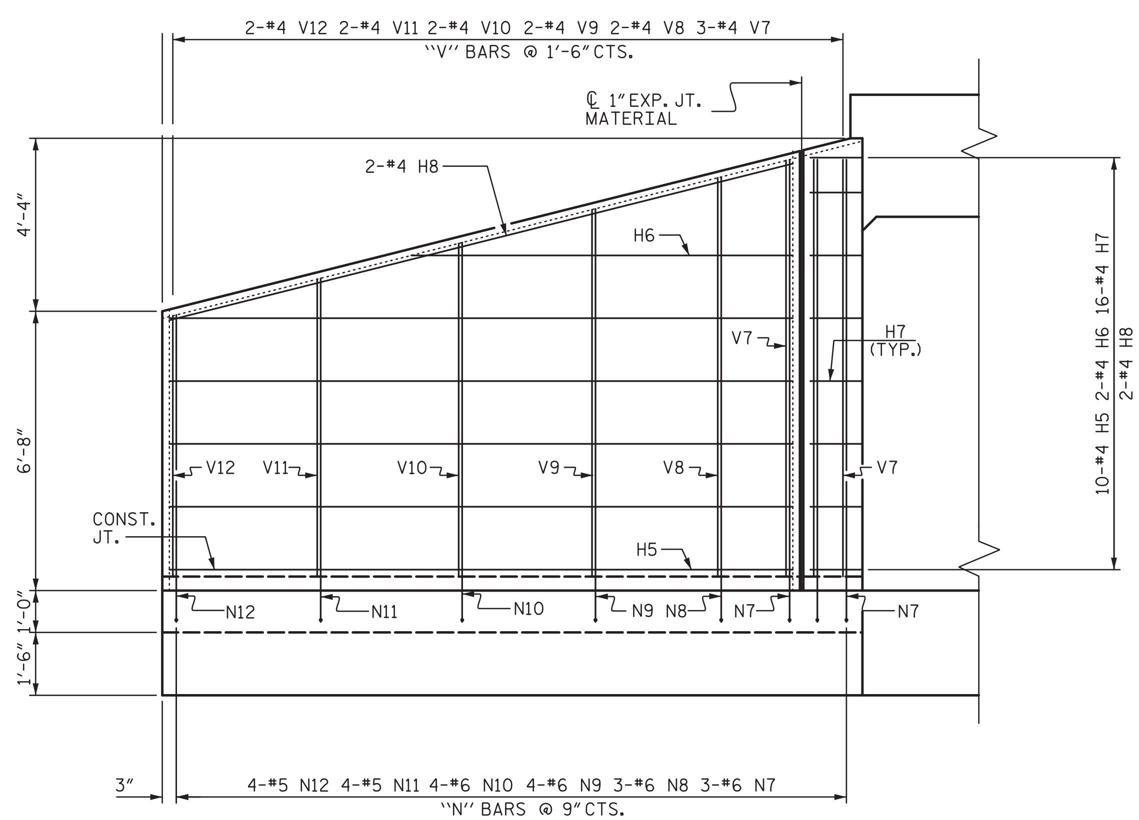
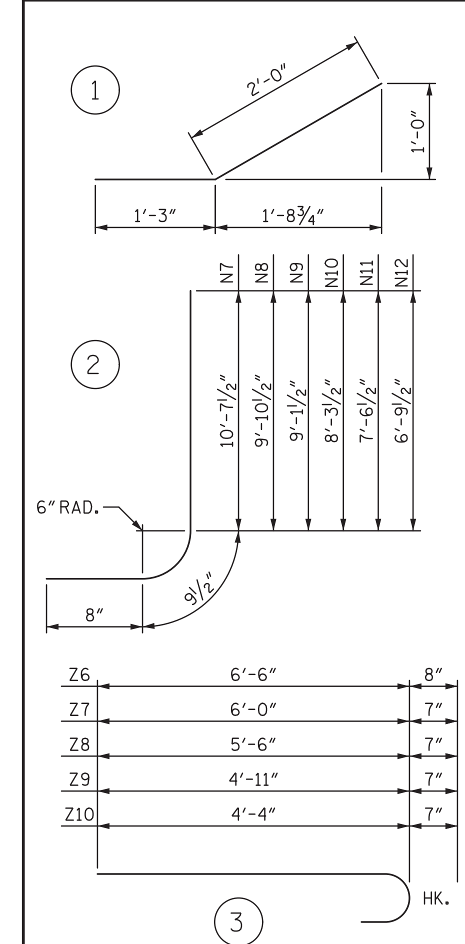


PLAN



ELEVATION

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H5	10	#4	STR	14'-10"	99
H6	2	#4	STR	9'-6"	13
H7	16	#4	1	3'-3"	35
H8	2	#4	STR	15'-4"	20
N7	3	#6	2	12'-1"	54
N8	3	#6	2	11'-4"	51
N9	4	#6	2	10'-7"	64
N10	4	#6	2	9'-9"	59
N11	4	#5	2	9'-0"	38
N12	4	#5	2	8'-3"	34
S1	3	#6	STR	6'-0"	27
T2	3	#5	STR	16'-9"	52
V7	3	#4	STR	10'-0"	20
V8	2	#4	STR	9'-4"	12
V9	2	#4	STR	8'-6"	11
V10	2	#4	STR	7'-9"	10
V11	2	#4	STR	7'-0"	9
V12	2	#4	STR	6'-2"	8
Z6	4	#6	3	7'-2"	43
Z7	4	#5	3	6'-7"	27
Z8	4	#5	3	6'-1"	25
Z9	5	#5	3	5'-6"	29
Z10	5	#5	3	4'-11"	26

REINFORCING STEEL FOR WING 3 — 766 LBS

CLASS A CONCRETE FOR WING 3 — 9.1 CY

NOTE:
1. FOR SECTION, SEE SHEET 5 OF 8.

PROJECT NO. 17BP.13.R.166
MADISON COUNTY
STATION: 10+81.10 -L-

SHEET 7 OF 9 REPLACES BRIDGE NO. 353

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2/24/2022

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

WING 3 FOR CONCRETE BOX CULVERT

H = 10'-0" SLOPE = 4:1
90° SKEW

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NO.	BY:	DATE:	NO.	BY:	DATE:		C-7
1			3				TOTAL SHEETS
2			4				9

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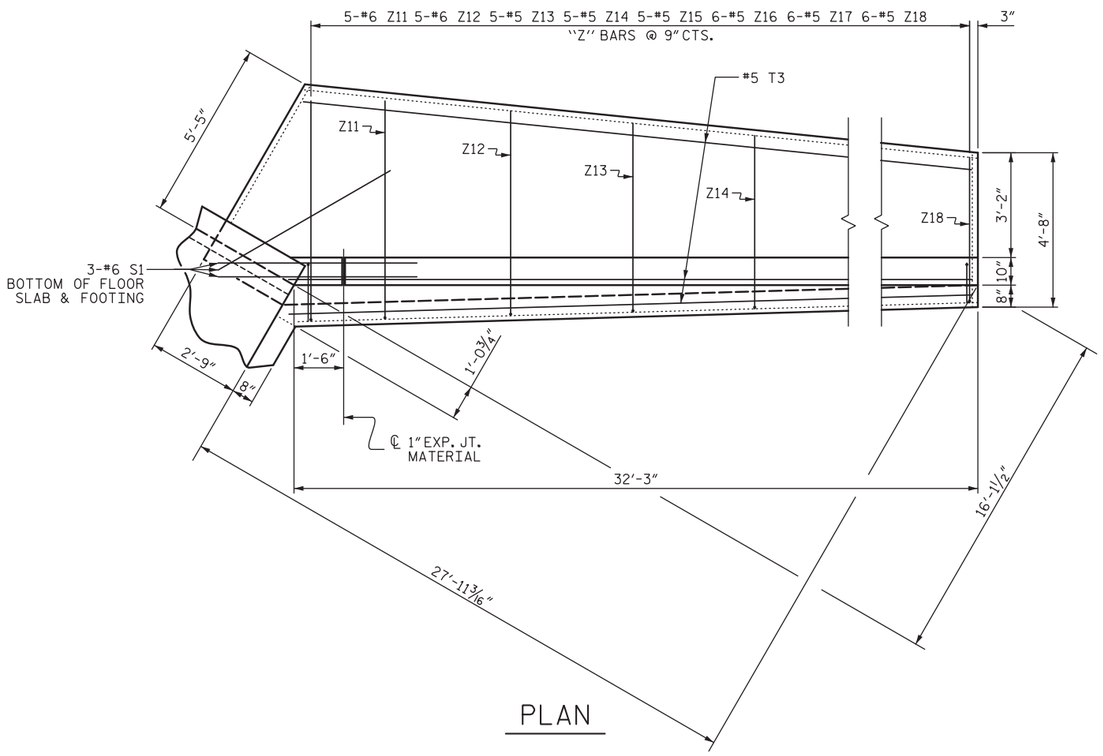
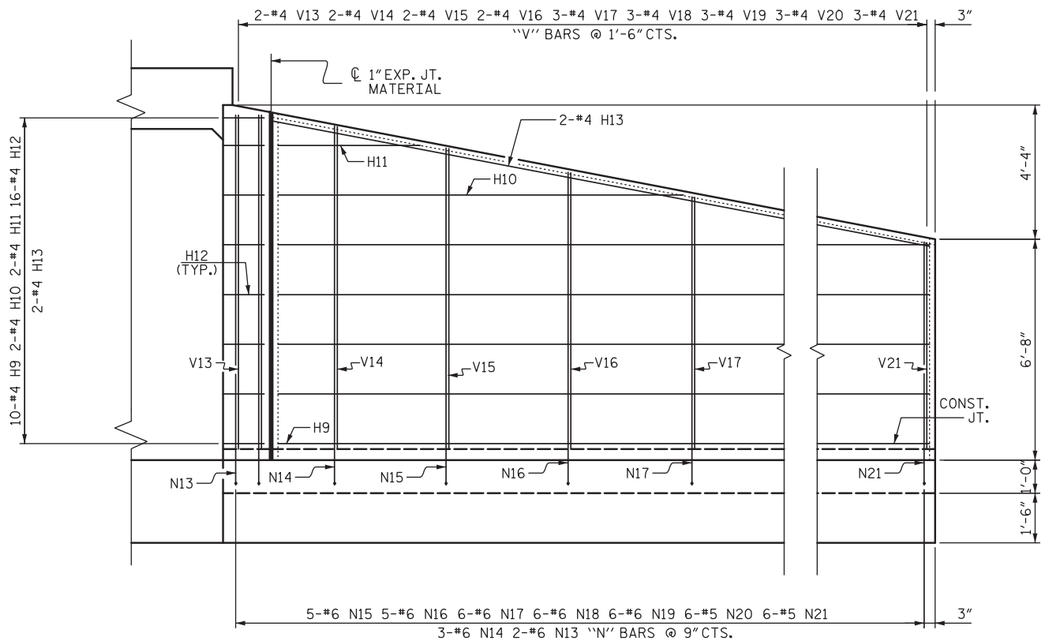
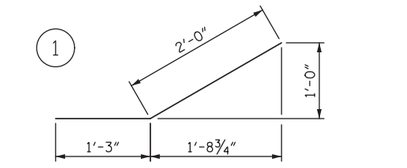


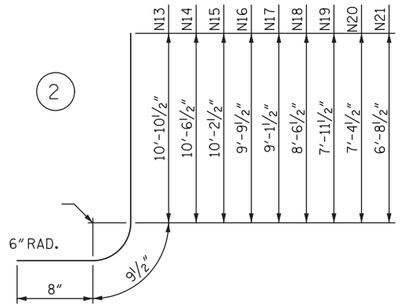
PLAN

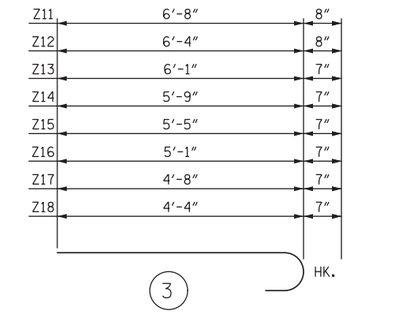


ELEVATION

BAR TYPES







ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
H9	10	#4	STR	30'-4"	203
H10	2	#4	STR	19'-11"	27
H11	2	#4	STR	8'-10"	12
H12	16	#4	1	3'-3"	35
H13	2	#4	STR	30'-7"	41
N13	2	#6	2	12'-4"	37
N14	3	#6	2	12'-0"	54
N15	5	#6	2	11'-8"	88
N16	5	#6	2	11'-3"	84
N17	6	#6	2	10'-7"	95
N18	6	#6	2	10'-0"	90
N19	6	#5	2	9'-5"	59
N20	6	#5	2	8'-10"	55
N21	6	#5	2	8'-2"	51
S1	3	#6	STR	6'-0"	27
T3	3	#5	STR	32'-3"	101
V13	2	#4	STR	10'-3"	14
V14	2	#4	STR	10'-0"	13
V15	2	#4	STR	9'-7"	13
V16	2	#4	STR	9'-2"	12
V17	3	#4	STR	8'-7"	17
V18	3	#4	STR	8'-0"	16
V19	3	#4	STR	7'-4"	15
V20	3	#4	STR	6'-9"	14
V21	3	#4	STR	6'-2"	12
Z11	5	#6	3	7'-4"	55
Z12	5	#6	3	7'-0"	53
Z13	5	#5	3	6'-8"	35
Z14	5	#5	3	6'-4"	33
Z15	5	#5	3	6'-0"	31
Z16	6	#5	3	5'-8"	35
Z17	6	#5	3	5'-3"	33
Z18	6	#5	3	4'-11"	31

REINFORCING STEEL FOR WING 4 — 1491 LBS

CLASS A CONCRETE WING 4 — 17.3 CY

PROJECT NO. 17BP.13.R.166

MADISON COUNTY

STATION: 10+81.10 -L-

SHEET 8 OF 9 REPLACES BRIDGE NO. 353

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T H CARY
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34955
ENGINEER
TIMOTHY J. TOWNSEND
2/24/2022

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

WING 4 FOR CONCRETE BOX CULVERT

H = 10'-0" SLOPE = Varies
90° SKEW

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2			4			9

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STANDARD NOTES

DESIGN DATA:

SPECIFICATIONS	A.A.S.H.T.O. (CURRENT)
LIVE LOAD	SEE PLANS
IMPACT ALLOWANCE	SEE A.A.S.H.T.O.
STRESS IN EXTREME FIBER OF STRUCTURAL STEEL - AASHTO M270 GRADE 36	20,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50W	27,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50	27,000 LBS. PER SQ. IN.
REINFORCING STEEL IN TENSION - GRADE 60	24,000 LBS. PER SQ. IN.
CONCRETE IN COMPRESSION	1,200 LBS. PER SQ. IN.
CONCRETE IN SHEAR	SEE A.A.S.H.T.O.
STRUCTURAL TIMBER - TREATED OR UNTREATED EXTREME FIBER STRESS	1,800 LBS. PER SQ. IN.
COMPRESSION PERPENDICULAR TO GRAIN OF TIMBER	375 LBS. PER SQ. IN.
EQUIVALENT FLUID PRESSURE OF EARTH	30 LBS. PER CU. FT. (MINIMUM)

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2018 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

STEEL SHEET PILING FOR PERMANENT OR TEMPORARY APPLICATIONS SHALL BE HOT ROLLED.

CONCRETE:

UNLESS OTHERWISE REQUIRED ON PLANS, CLASS A CONCRETE SHALL BE USED FOR ALL PORTIONS OF ALL STRUCTURES WITH THE EXCEPTION THAT: CLASS AA CONCRETE SHALL BE USED IN BRIDGE SUPERSTRUCTURES, ABUTMENT BACKWALLS, AND APPROACH SLABS; AND CLASS B CONCRETE SHALL BE USED FOR SLOPE PROTECTION AND RIP RAP.

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED ¾" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1½" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A ¼" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A ¼" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

DOWELS WHEN INDICATED ON PLANS AS FOR CULVERT EXTENSIONS, SHALL BE EMBEDDED AT LEAST 12" INTO THE OLD CONCRETE AND GROUTED INTO PLACE WITH 1:2 CEMENT MORTAR.

ALLOWANCE FOR DEAD LOAD DEFLECTION, SETTLEMENT, ETC. IN CASTING SUPERSTRUCTURES:

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.

ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER.

IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER.

DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.

WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE ⅞" Ø SHEAR STUDS FOR THE ¾" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - ⅞" Ø STUDS FOR 4 - ¾" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF ⅞" Ø STUDS ALONG THE BEAM AS SHOWN FOR ¾" Ø STUDS BASED ON THE RATIO OF 3 - ⅞" Ø STUDS FOR 4 - ¾" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16 INCH OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.

METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

GENERALLY, IN CASE OF DISCREPANCY, THIS STANDARD SHEET OF NOTES SHALL GOVERN OVER THE SPECIFICATIONS, BUT THE REMAINDER OF THE PLANS SHALL GOVERN OVER NOTES HEREON, AND SPECIAL PROVISIONS SHALL GOVERN OVER ALL. SEE SPECIFICATIONS ARTICLE 105-4.

PROJECT NO. 17BP.13.R.166

MADISON COUNTY

STATION: 10+81.10 -L-

SHEET 9 OF 9 REPLACES BRIDGE NO. 353

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD NOTES

DRAWN BY : CTB	DATE : 02-22
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REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
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