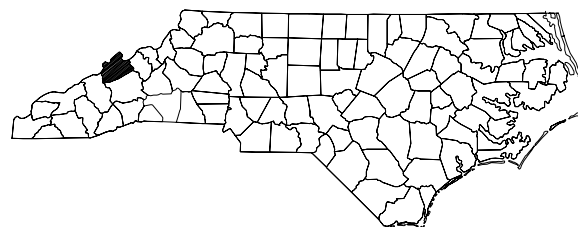
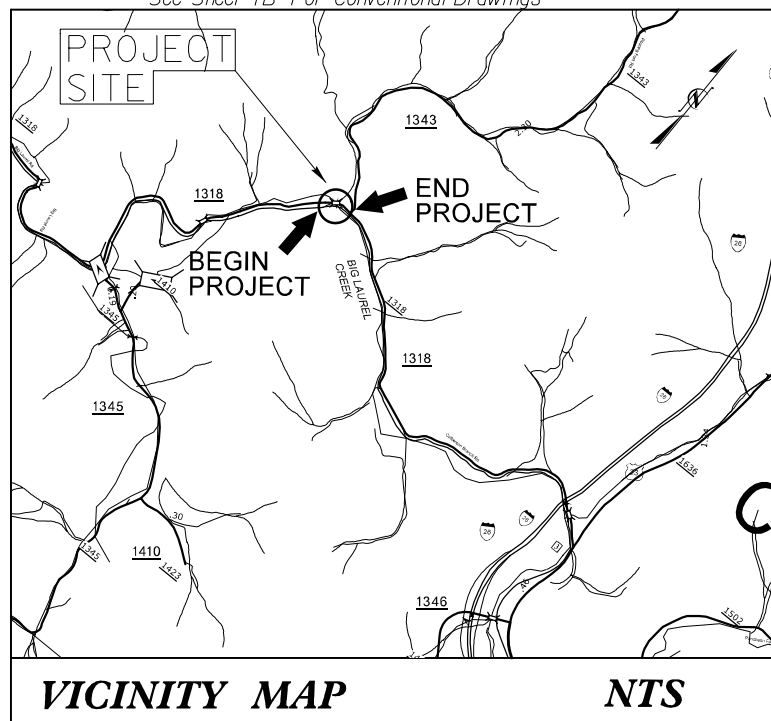


2B-5640
09/08/99

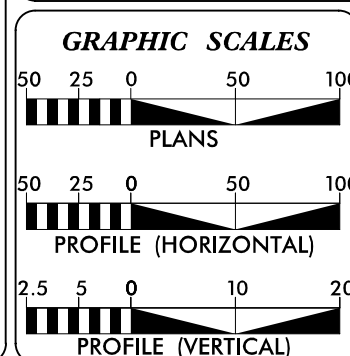
CONTRACT: DM00401

TIP PROJECT: BP13-R014

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



DESIGN EXCEPTION REQUESTED FOR DESIGN SPEED OF 30 MPH



DESIGN DATA

ADT	=	650
V	=	30 MPH
FUNC CLASS	=	
RURAL LOCAL		
SUBREGIONAL TIER		

PROJECT LENGTH

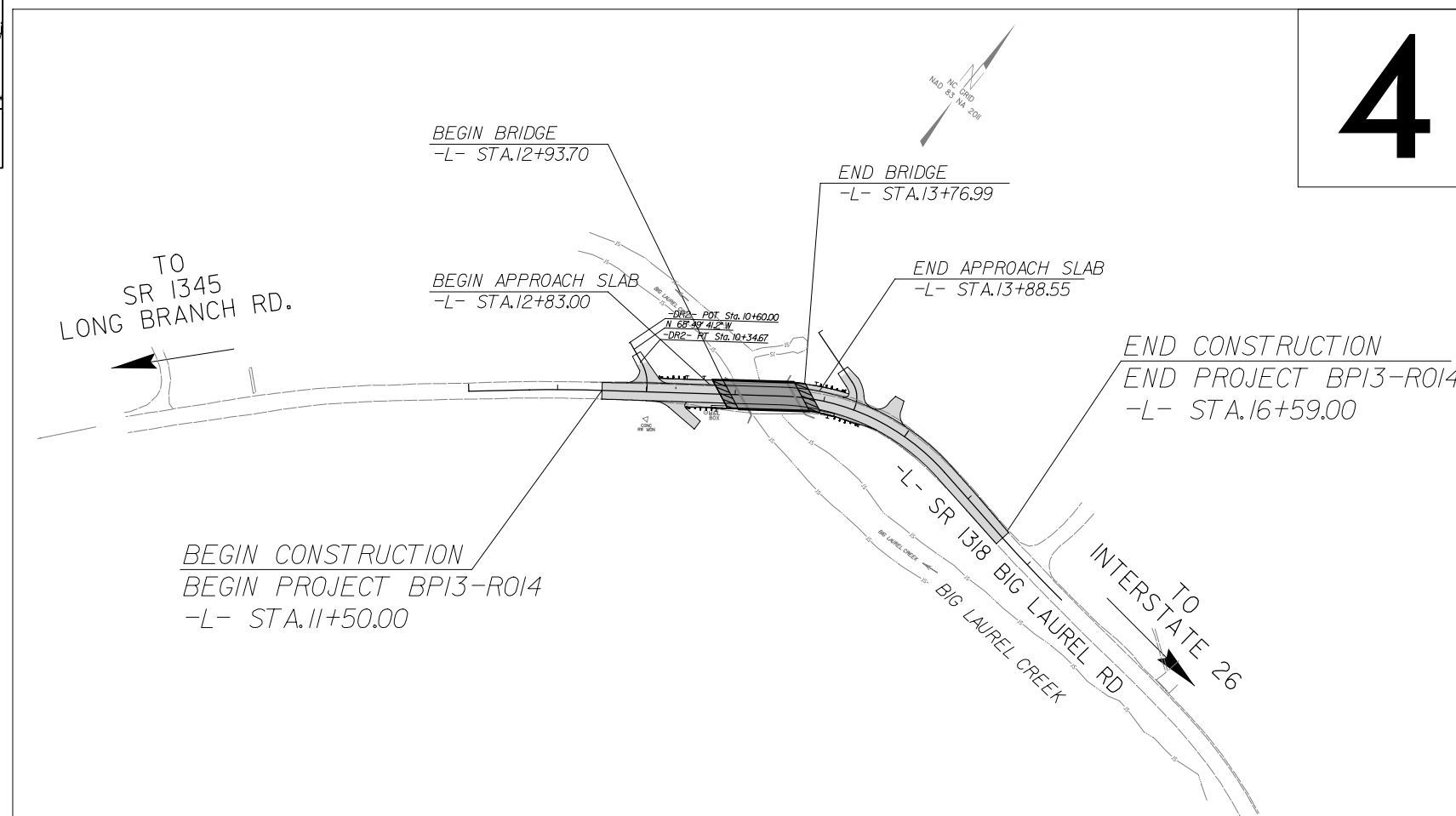
LENGTH ROADWAY PROJECT	=	0.080 MILES
LENGTH STRUCTURES PROJECT	=	0.016 MILES
TOTAL LENGTH PROJECT	=	0.096 MILES

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

MADISON COUNTY

**LOCATION: BRIDGE NO. 560090 ON SR 1318 (BIG LAUREL ROAD)
OVER BIG LAUREL CREEK**

TYPE OF WORK: GRADING, PAVING, DRAINAGE, & STRUCTURE



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

HYDRAULICS ENGINEER

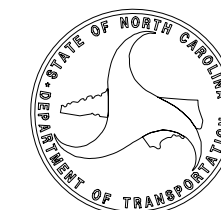


Signed by:
James O. Brit
DAC07C127582415
SIGNATURE:

**ROADWAY DESIGN
ENGINEER**



DocuSigned by:
Hunter Reid
99D56CEA55853C4
SIGNATURE



8/17/99

INDEX OF SHEETS:

SHEET NUMBER	SHEET DESCRIPTION
1	TITLE SHEET
1A	INDEX OF SHEETS
1B	CONVENTIONAL SYMBOLS
2A-1 THRU 2A-2	PAVEMENT SCHEDULE, TYPICAL SECTIONS, AND WEDGING DETAILS
2B	ROADWAY DETAILS
2C-1	METHOD OF PIPE INSTALLATION – FLEXIBLE PIPE
2C-2	METHOD OF PIPE INSTALLATION – RIGID PIPE
2C-3 THRU 2C-5	GUARDRAIL PLACEMENT
2G-1 THRU 2G-4	GEOTECHNICAL DETAILS – STANDARD DETAIL NO. 1801.01 & 1801.02
3B-1	EARTHWORK AND GUARDRAIL SUMMARY
3D-1	DRAINAGE SUMMARY
3G-1	GEOTECHNICAL SUMMARY
4	PLAN SHEETS
5	PROFILE SHEET
RW01 THRU RW04	SURVEY CONTROL, EXISTING CENTERLINES, RIGHT OF WAY, EASEMENTS, AND PROPERTY TIES
TMP-01 THRU TMP-06	TRANSPORTATION MANAGEMENT PLANS
PMP-01 THRU PMP-02	PAVEMENT MARKING PLANS
EC-1 THRU EC-5	EROSION CONTROL PLANS
RF-1	RESTORATION PLANS
SIGN-01 THRU SIGN-02	SIGNING PLANS
UO-01 THRU UO-02	UTILITY BY OTHERS PLANS
X-0	CROSS-SECTIONS INDEX
X-1A	CROSS-SECTIONS SUMMARY
X-1 THRU X-9	CROSS-SECTIONS
S-0	STRUCTURE TITLE SHEET
S-1 THRU S-21	STRUCTURE PLANS
SN	STRUCTURE NOTES

GENERAL NOTES: 2024 SPECIFICATIONS

EFFECTIVE: 01-16-2024

REVISED:

GRADE LINE:

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.

DRIVEWAYS:

DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. 848.02 USING 3 FOOT RADII OR RADII AS SHOWN ON THE PLANS. LOCATIONS OF DRIVE WILL BE AS SHOWN ON THE PLANS OR AS 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 WILL BE PAID FOR AT THE CONTRACT PRICE FOR "TEMPORARY SHORING"

END BENTS:

THE ENGINEER SHALL CHECK THE STRUCTURE END BENT PLANS, DETAILS, AND CROSS-SECTION PRIOR TO SETTING OF THE SLOPE STAKES FOR THE EMBANKMENT OR EXCAVATION APPROACHING A BRIDGE.

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE
FRENCH BROAD ELECTRIC MEMBERSHIP CORP.
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.

PROJECT REFERENCE NO.		SHEET NO.	
BPI3-R014		1A	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER 			
DocuSigned by: <i>Hunter Reid</i>		9/11/2026	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

EFF. 01-16-2024
REV.

2024 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Contracts Standards and Development Unit – N. C. Department of Transportation – Raleigh, N. C., Dated January 16, 2024 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
310.10	Driveway Pipe Construction
DIVISION 4 – MAJOR STRUCTURES	
423.01	Bridge Approach Fills – Type 1 Approach Fill for Bridge Abutment
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
840.00	Concrete Base Pad for Drainage Structures
840.25	Anchorage for Frames – Brick, Concrete or Precast
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
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
848.02	Driveway Turnout – Radius Type
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
876.02	Guide for Rip Rap at Pipe Outlets

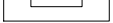
STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS
CONVENTIONAL PLAN SHEET SYMBOLS

PROJECT REFERENCE NO.	SHEET NO.
BPI3-RO14	1B

BOUNDARIES AND PROPERTY:

State Line	
County Line	
Township Line	
City Line	
Reservation Line	
Property Line	
Existing Iron Pin	
Computed Property Corner	
Property Monument	
Parcel/Sequence Number	
Existing Fence Line	
Proposed Woven Wire Fence	
Proposed Chain Link Fence	
Proposed Barbed Wire Fence	
Existing Wetland Boundary	
Proposed Wetland Boundary	
Existing Endangered Animal Boundary	
Existing Endangered Plant Boundary	
Existing Historic Property Boundary	
Known Contamination Area: Soil	
Potential Contamination Area: Soil	
Known Contamination Area: Water	
Potential Contamination Area: Water	
Contaminated Site: Known or Potential	

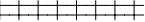
BUILDINGS AND OTHER CULTURE:

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

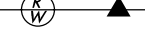
HYDROLOGY:

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

RAILROADS:

Standard Gauge	
RR Signal Milepost	
Switch	
RR Abandoned	
RR Dismantled	

RIGHT OF WAY & PROJECT CONTROL:

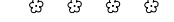
Secondary Horiz and Vert Control Point	
Primary Horiz Control Point	
Primary Horiz and Vert Control Point	
Exist Permanent Easment Pin and Cap	
New Permanent Easement Pin and Cap	
Vertical Benchmark	
Existing Right of Way Marker	
Existing Right of Way Line	
New Right of Way Line	
New Right of Way Line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

ROADS AND RELATED FEATURES:

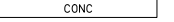
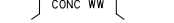
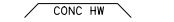
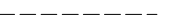
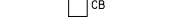
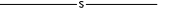
Existing Edge of Pavement	
Existing Curb	
Proposed Slope Stakes Cut	
Proposed Slope Stakes Fill	
Proposed Curb Ramp	
Existing Metal Guardrail	
Proposed Guardrail	
Existing Cable Guiderail	
Proposed Cable Guiderail	
Equality Symbol	
Pavement Removal	

VEGETATION:

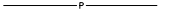
Single Tree	
Single Shrub	

Hedge	
Woods Line	
Orchard	
Vineyard	

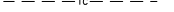
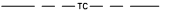
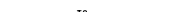
EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	
Bridge Wing Wall, Head Wall and End Wall	
MINOR:	
Head and End Wall	
Pipe Culvert	
Footbridge	
Drainage Box: Catch Basin, DI or JB	
Paved Ditch Gutter	
Storm Sewer Manhole	
Storm Sewer	

UTILITIES:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

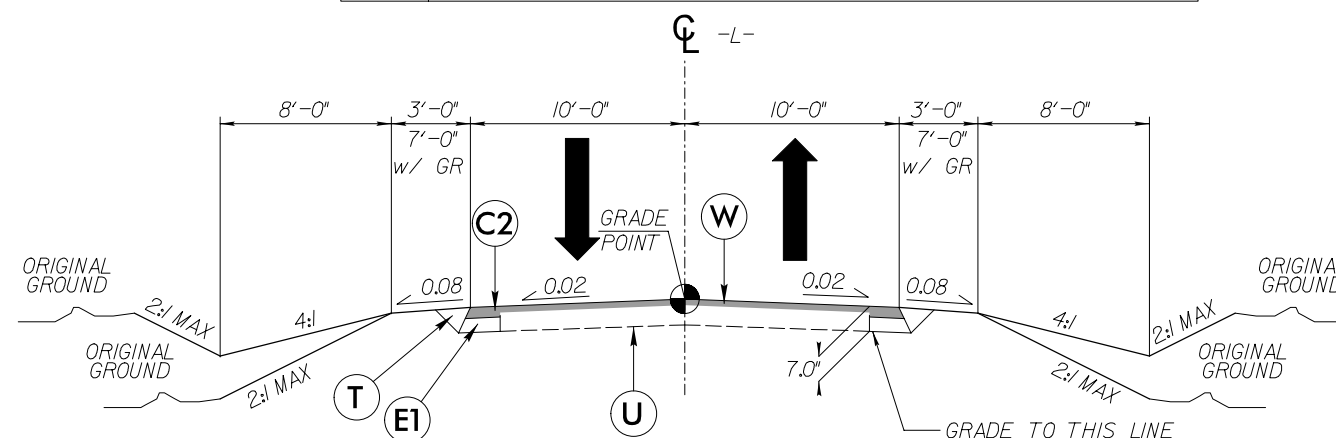
MISCELLANEOUS:

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

P A V E M E N T S C H E D U L E			
C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.	J1	6" AGGREGATE BASE COURSE
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.	T	EARTH MATERIAL.
C3	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 2" IN DEPTH.	U	EXISTING PAVEMENT.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	W	VARIABLE DEPTH ASPHALT PAVEMENT. (See Wedging Detail)
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 5½" IN DEPTH.	NOTE: USE 2" S9.5B, 6" ABC AND PRIMECOAT FOR DRIVEWAYS LOCATED AT STA. 12	

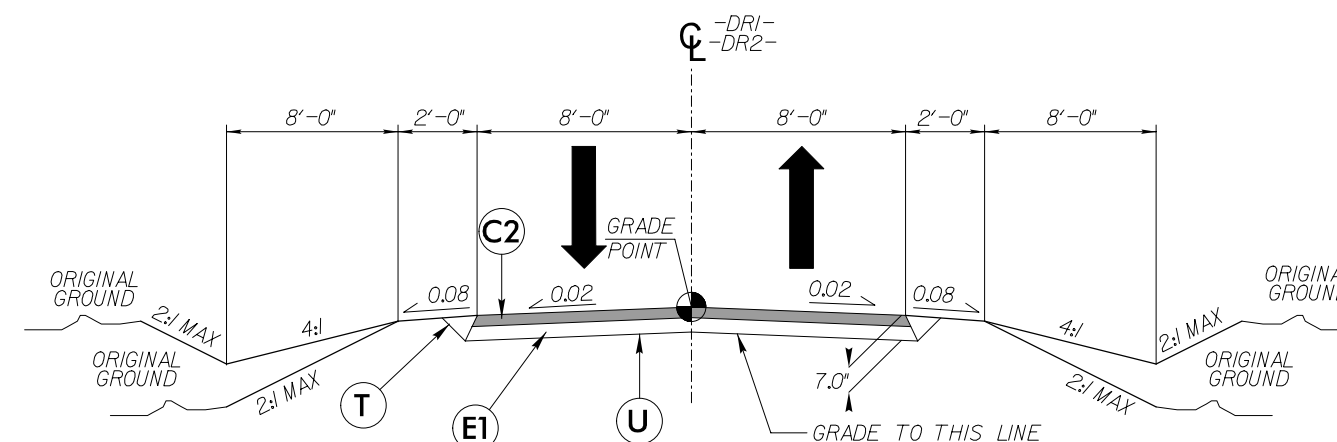
N.T.S.

PROJECT REFERENCE NO.	SHEET NO.
BPI3-R014	2A-1
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER <i>Hunter Reid</i> REDUCED COPY  9/16/2026	PAVEMENT DESIGN ENGINEER <i>Andrew Ward</i> 202009000000  9/16/2026
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



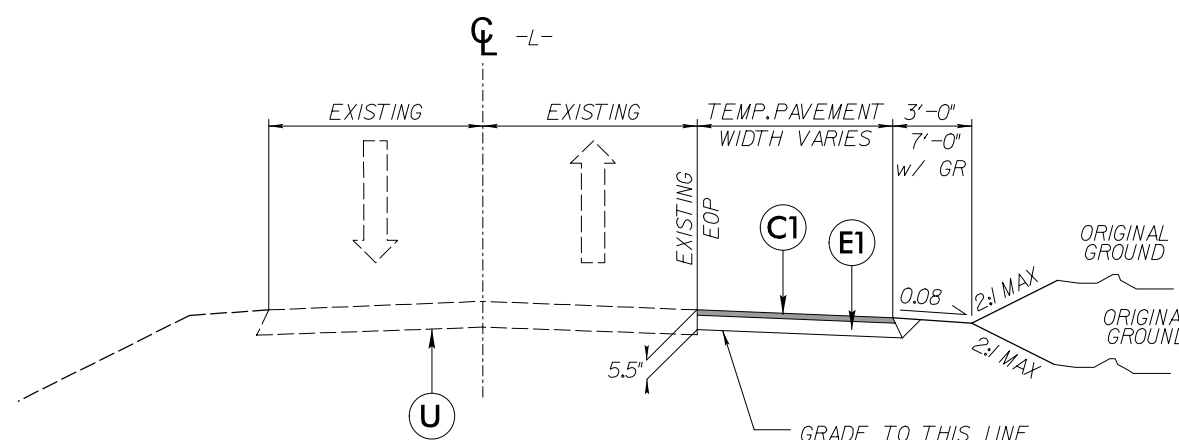
TYPICAL SECTION NO. 1

-L- STA 11+50.00 TO -L- STA 12+93.70
 -L- STA 13+76.99 TO -L- STA 16+59.00



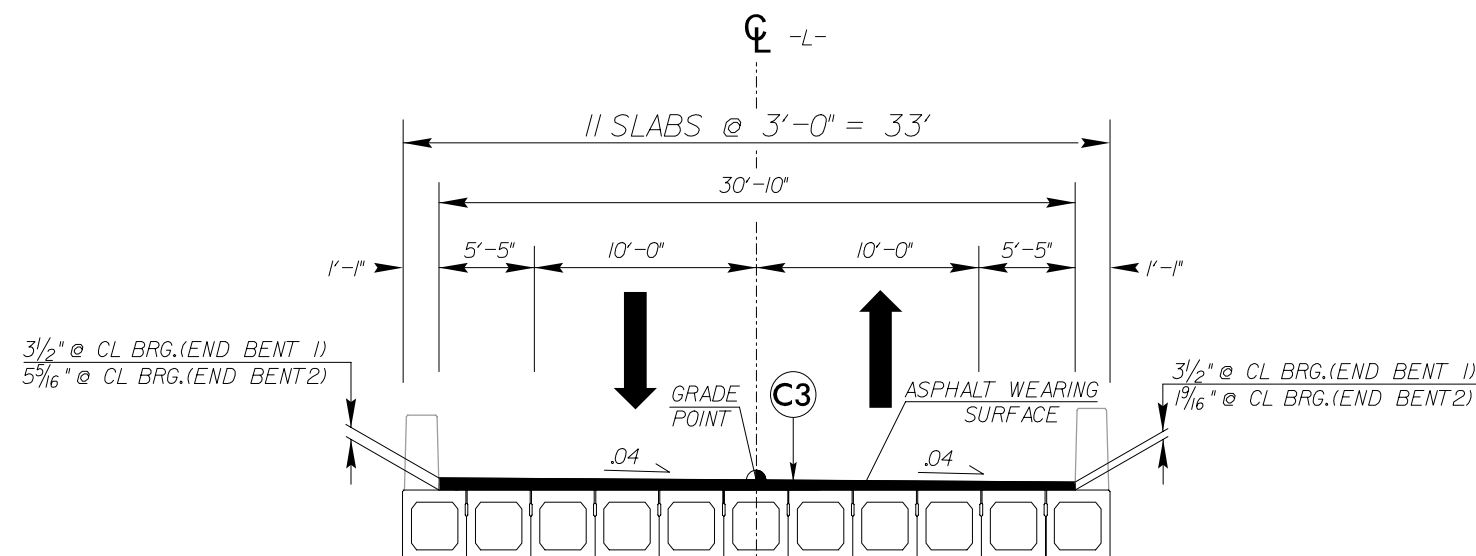
TYPICAL SECTION NO. 2

-DR1- STA. 10+10.00 TO 10+50.00
 -DR2- STA. 10+10.00 TO 10+45.00



TEMP. PAVEMENT DETAIL

-L- STA 11+30 +/- TO -L- STA 13+19 +/-

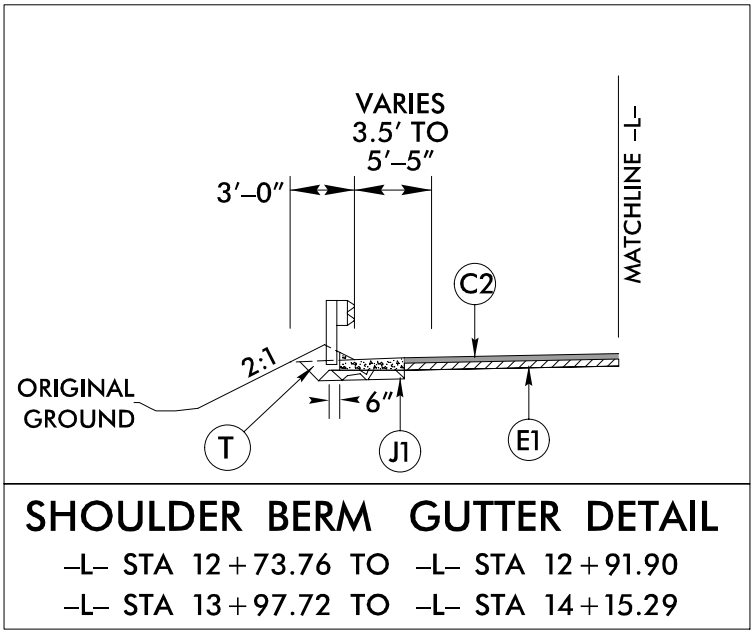
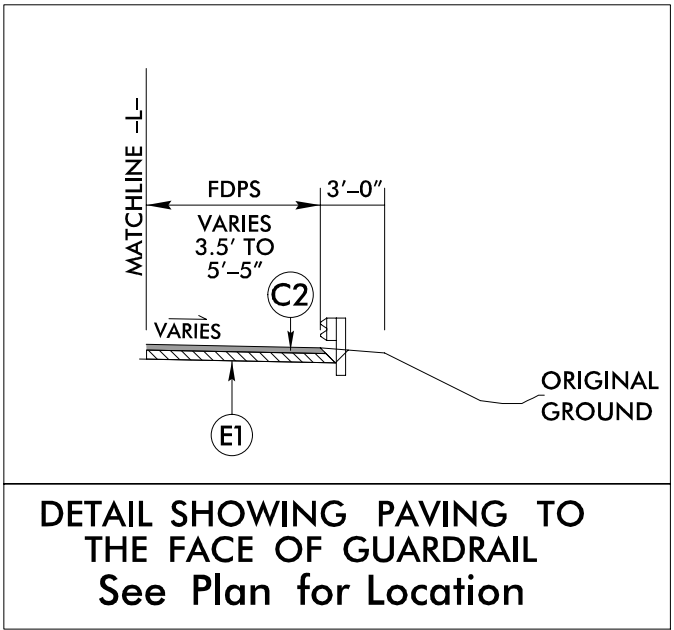
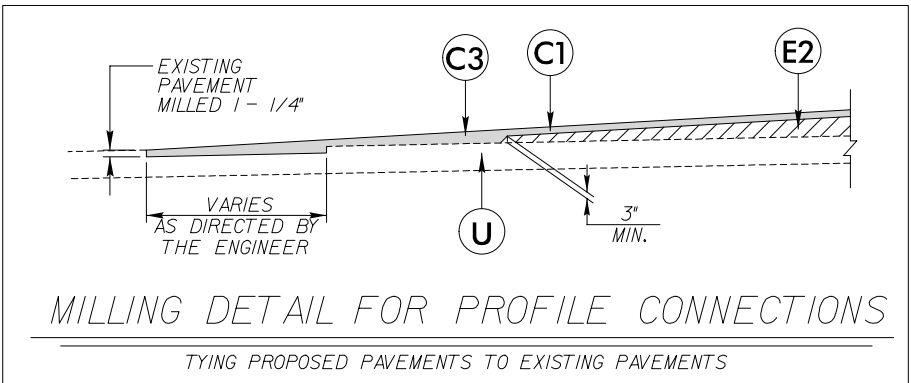
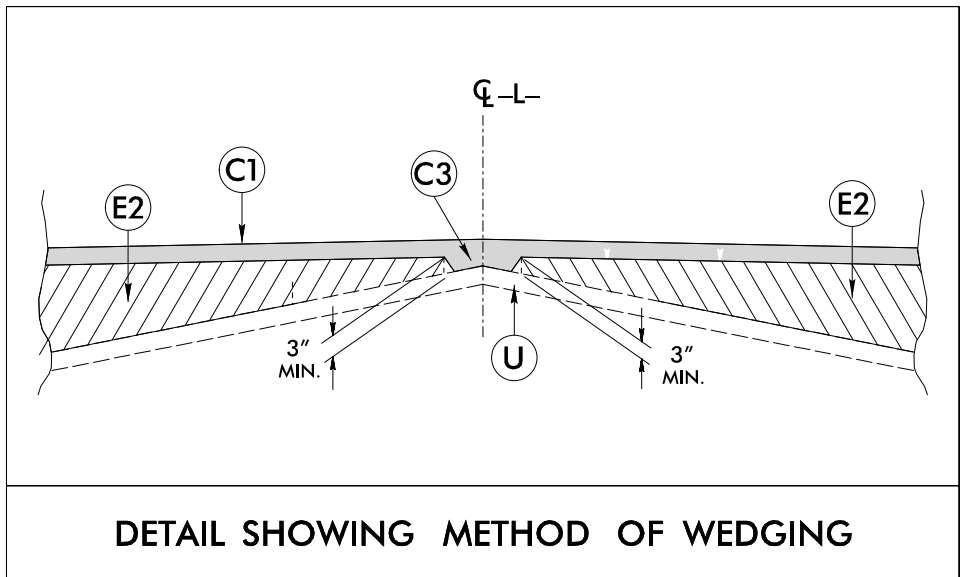


TYPICAL SECTION NO. 3

BOX BEAM BRIDGE

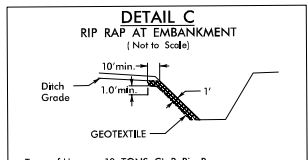
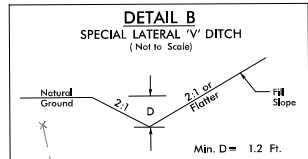
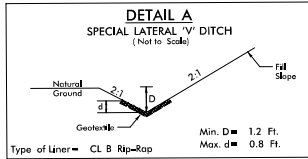
- L- STA 12 + 93.70 TO - L- STA 13 + 76.99

CONSTRUCTION NOTE: WHERE EXISTING PAVEMENT IS DAMAGED
DURING CONSTRUCTION REPLACE WITH FULL DEPTH PAVEMENT.

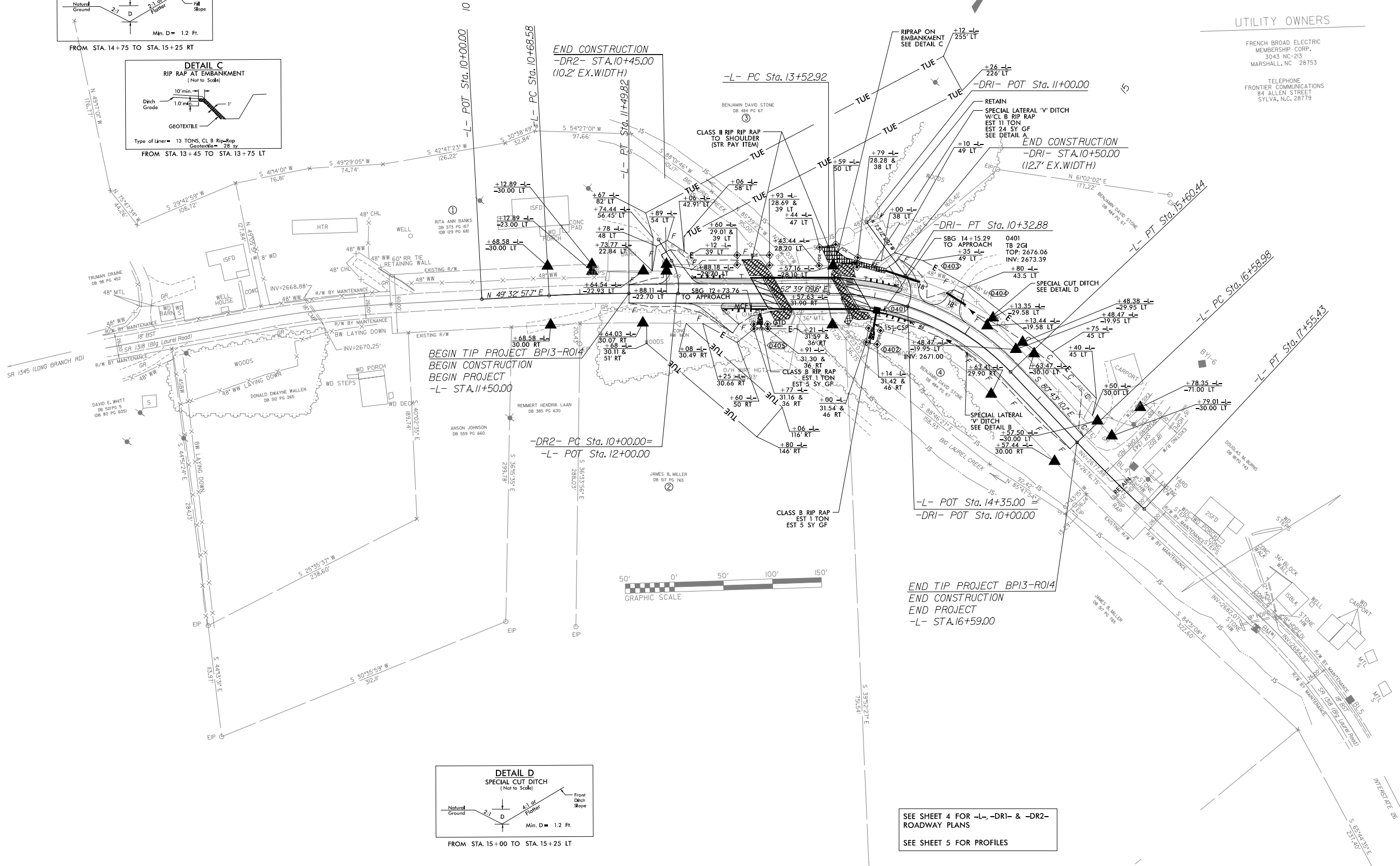


PROJECT REFERENCE NO.		SHEET NO.	
BPI3-R014		2A-2	
RW SHEET NO.			
ROADWAY DESIGN DocuSign ENGINEER <i>Hunter Reid</i> REDUCED		PAVEMENT DESIGN DocuSign ENGINEER <i>Andrew Wargo</i> REDUCED	
9/16/2026		9/16/2026	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

PAVEMENT SCHEDULE	
C1	1½" S9.5B
C2	3" S9.5B
C3	VAR. S9.5B
E1	4" B25.0C
E2	VAR B25.0C
J1	6" ABC
T	EARTH
U	EXIST PAVEMENT



-L-	-DRI-	-DR2-
$PI\ Sta\ 11+09.21$ $\Delta = 3^{\circ}06'11.8" (RT)$ $D = 3^{\circ}49'11.0"$ $L = 81.24'$ $T = 40.63'$ $R = 1,500.00'$ $SE = EXISTING$	$PI\ Sta\ 14+62.81$ $\Delta = 46^{\circ}37'40.3" (RT)$ $D = 22^{\circ}28'40.2"$ $L = 207.52'$ $T = 109.89'$ $R = 255.00'$ $RO = 96'$ $SE = 0.06$	$PI\ Sta\ 17+07.22$ $\Delta = 3^{\circ}41'02.1" (LT)$ $D = 3^{\circ}49'11.0"$ $L = 96.44'$ $T = 48.24'$ $R = 1,500.00'$ $SE = EXISTING$
$PI\ Sta\ 10+18.31$ $\Delta = 62^{\circ}47'45.2" (LT)$ $D = 190^{\circ}59'09.4"$ $L = 32.88'$ $T = 18.31'$ $R = 30.00'$	$PI\ Sta\ 10+18.07$ $\Delta = 39^{\circ}43'47.8" (LT)$ $D = 114^{\circ}35'29.6"$ $L = 34.67'$ $T = 18.07'$ $R = 50.00'$	



UTILITY OWNERS

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

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

PROJECT REFERENCE NO.

BPI3-R014

SHEET NO.

2B

RW SHEET NO.

ROADWAY DESIGN
ENGINEER
11/19/2024



Designed by:
Hunter Reid

HYDRAULICS
ENGINEER
11/19/2024



Signed by:
James O. Britt

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SEE SHEET 4 FOR -L-, -DRI- & -DR2-
ROADWAY PLANS

SEE SHEET 5 FOR PROFILES

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

ROADWAY DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION
FLEXIBLE PIPE

SHEET 1 OF 2
300.01

TOP OF FILL

NORMAL EARTH FOUNDATION

TOP OF FILL

**ROCK FOUNDATION
PIPE IN TRENCH**

TOP OF FILL

UNSUITABLE MATERIAL FOUNDATION

TOP OF FILL

NORMAL EARTH FOUNDATION

TOP OF FILL

**ROCK FOUNDATION
PIPE ABOVE GROUND**

TOP OF FILL

UNSUITABLE MATERIAL FOUNDATION

GENERAL NOTES:

I.D. = THE MAXIMUM HORIZONTAL INSIDE DIAMETER DIMENSION.

O.D. = THE MAXIMUM HORIZONTAL OUTSIDE DIAMETER DIMENSION.

H = THE FILL HEIGHT MEASURED VERTICALLY AT ANY POINT ALONG THE PIPE FROM THE TOP OF THE PIPE TO THE TOP OF THE EMBANKMENT AT THAT POINT.

APPROVED SUITABLE LOCAL MATERIAL.

TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.

LOOSELY PLACED SELECT MATERIAL CLASS III OR CLASS II, TYPE 1 FOR PIPE BEDDING. LEAVE SECTION DIRECTLY BENEATH PIPE UNCOMPACTED AS PIPE SEATING AND BACKFILL WILL ACCOMPLISH COMPACTION.

DO NOT OPERATE HEAVY EQUIPMENT OVER ANY PIPE CULVERT UNTIL THE PIPE CULVERT HAS BEEN PROPERLY BACKFILLED AND COVERED WITH AT LEAST 3 FEET OF APPROVED MATERIAL.

REFER TO NCDOT PIPE MATERIAL SELECTION GUIDE AND STANDARD SPECIFICATIONS FOR ALLOWABLE PIPE FILL HEIGHTS AND PIPE SPECIFICATIONS.

SPRINGLINE OF PIPE

SELECT BACKFILL MATERIAL CLASS III OR CLASS II, TYPE 1 ABOVE AND BELOW SPRINGLINE.

UNDISTURBED EARTH MATERIAL

SELECT MATERIAL CLASS V OR VI FOR FOUNDATION CONDITIONING. ENCAPSULATE WITH TYPE IV GEOTEXTILE AS DIRECTED BY THE ENGINEER.



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Nicole M. Hackler
588432/0334/16403

9/11/2026

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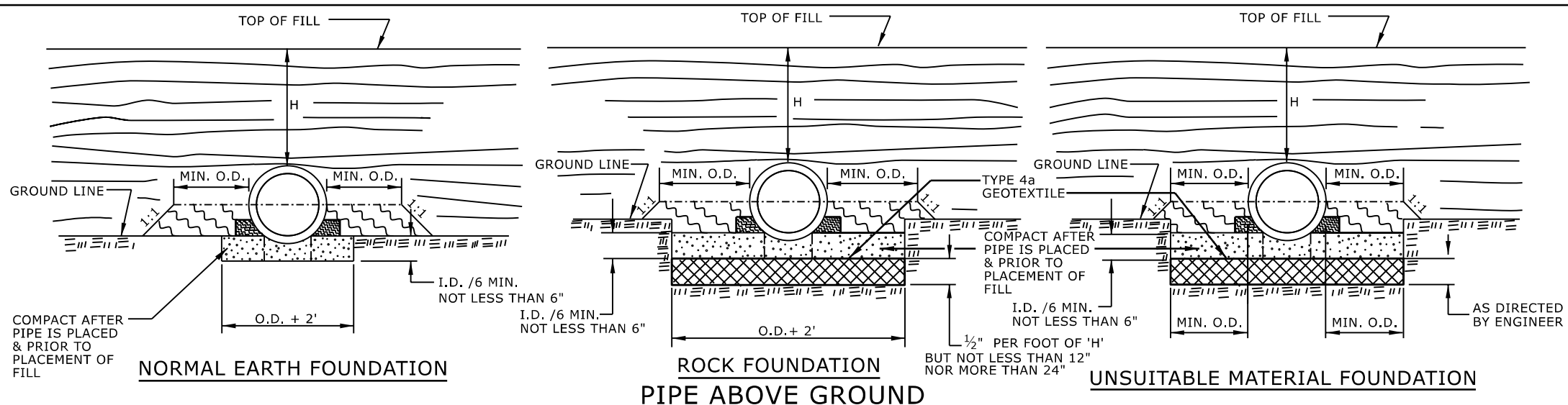
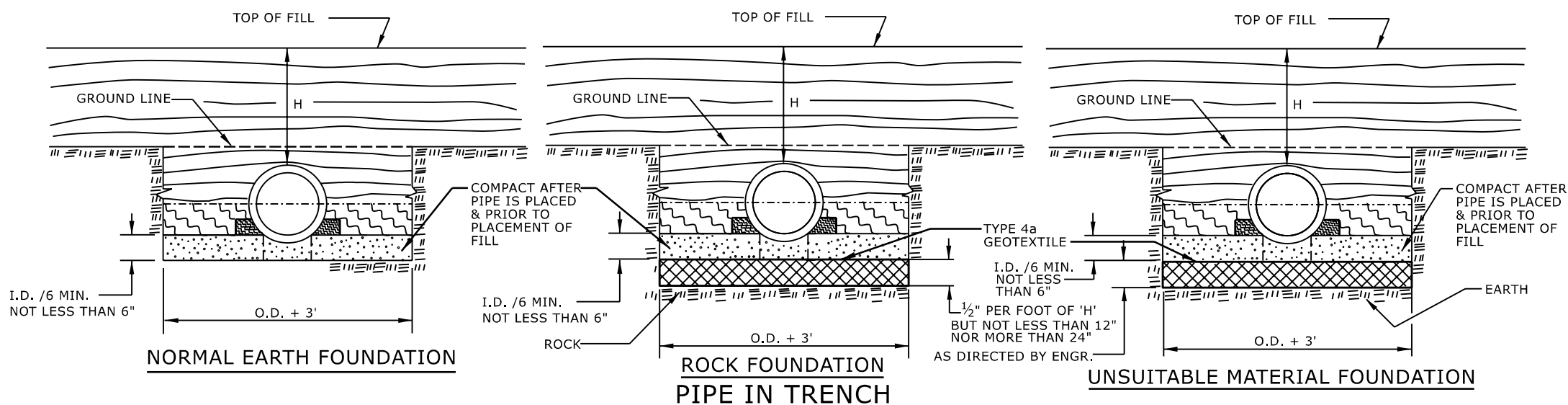
CONTRACTS STANDARDS
AND DEVELOPMENT UNIT

Office 919-707-6950

FAX 919-250-4119

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GENERAL NOTES:

I.D. = THE MAXIMUM HORIZONTAL INSIDE DIAMETER DIMENSION.

O.D. = THE MAXIMUM HORIZONTAL OUTSIDE DIAMETER DIMENSION.

H = THE FILL HEIGHT MEASURED VERTICALLY AT ANY POINT ALONG THE PIPE FROM THE TOP OF THE PIPE TO THE TOP OF THE EMBANKMENT AT THAT POINT.

 APPROVED SUITABLE LOCAL MATERIAL.

 TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.

 LOOSELY PLACED SELECT MATERIAL CLASS III OR CLASS II, TYPE 1 FOR PIPE BEDDING. LEAVE SECTION DIRECTLY BENEATH PIPE UNCOMPACTED AS PIPE SEATING AND BACKFILL WILL ACCOMPLISH COMPACTION.

DO NOT OPERATE HEAVY EQUIPMENT OVER ANY PIPE CULVERT UNTIL THE PIPE CULVERT HAS BEEN PROPERLY BACKFILLED AND COVERED WITH AT LEAST 3 FEET OF APPROVED MATERIAL.

REFER TO NCDOT PIPE MATERIAL SELECTION GUIDE AND STANDARD SPECIFICATIONS
FOR ALLOWABLE PIPE FILL HEIGHTS AND PIPE SPECIFICATIONS.

	SPRINGLINE OF PIPE
	SELECT BACKFILL MATERIAL CLASS III OR CLASS II, BELOW SPRINGLINE.
	UNDISTURBED EARTH MATERIAL
	SELECT MATERIAL CLASS V OR VI FOR FOUNDATION CONDITIONING. ENCAPSULATE WITH TYPE IV GEOTEXTILE AS DIRECTED BY THE ENGINEER.

STATE OF
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ROADWAY DETAIL DRAWING FOR METHOD OF PIPE INSTALLATION RIGID PIPE

SHEET 2 OF 2
300.01



Signed by: Nicole M. Hackler 9/11/2026
68842503416406

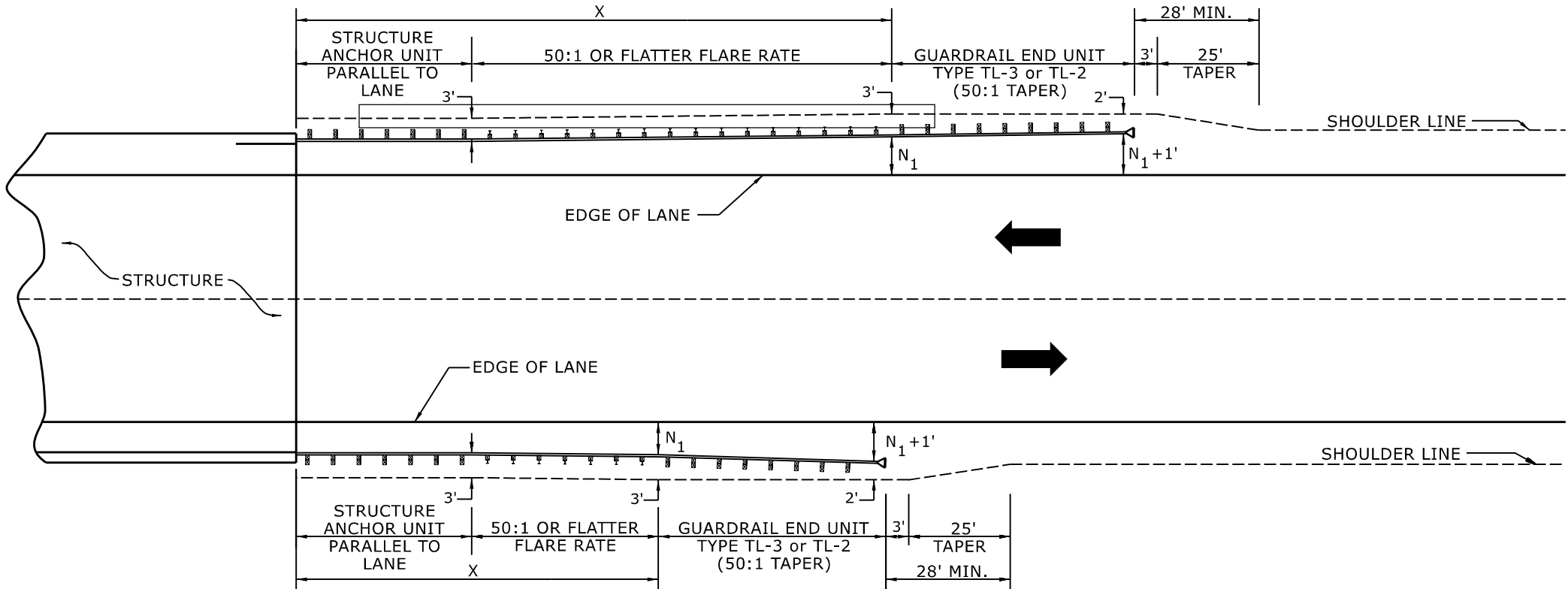
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PROJECT REFERENCE NO.	SHEET NO.
BP13-R014	2C-3



USE FLARE RATE AS THE CONTROL IF THE " N_1 " DISTANCE IS NOT OBTAINED.
(" N_1 " IS BASED ON SHOULDER WIDTHS IN THE ROADWAY DESIGN MANUAL)

SEE STD. 862.03 FOR STRUCTURE ANCHOR UNITS

FOR POSTED SPEEDS $\geq$ 45MPH USE GREU TYPE TL-3
FOR POSTED SPEEDS $<$ 45MPH USE GREU TYPE TL-2

GUARDRAIL LENGTH OF NEED (X) IS CALCULATED BASED ON THE AASHTO ROADSIDE DESIGN GUIDE.

STATE OF
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RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT



Signed by:
Nicole M. Hackler
58643230334164625

9/11/2026

LENGTHS AND OFFSETS FOR PROPOSED GUARDRAIL AT TWO LANE - TWO WAY LOCATIONS

SHEET 4 OF 15

862D01

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**CONTRACTS STANDARDS
AND DEVELOPMENT UNIT**

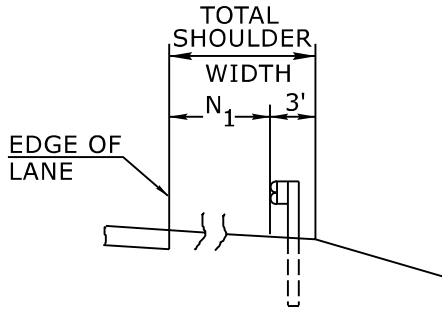
Office 919-707-6950

FAX 919-250-4119

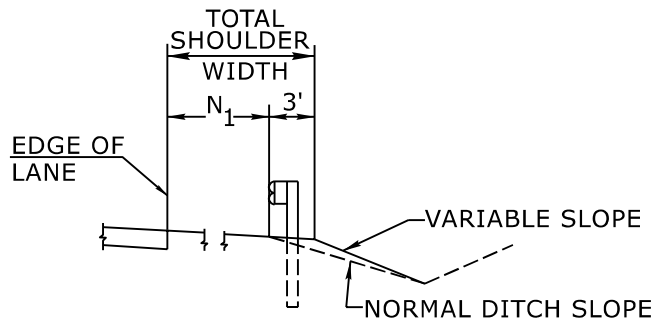
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BP13-R014	2C-4

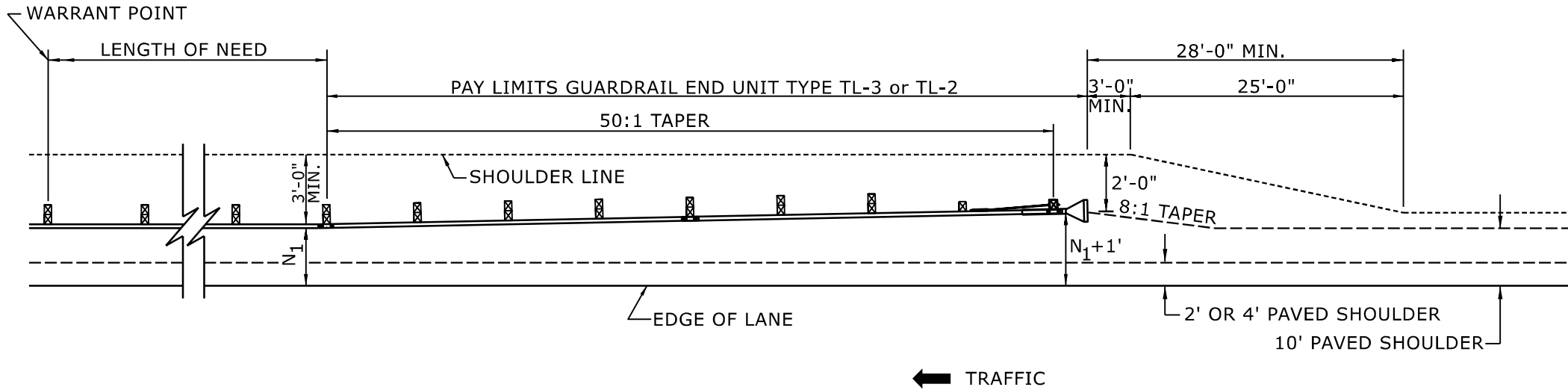


FILL SECTION



CUT SECTION

"N₁" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL WHERE GUARDRAIL IS PARALLEL TO LANE.



FOR POSTED SPEEDS ≥ 45mph USE GREU TYPE TL-3
FOR POSTED SPEEDS < 45mph USE GREU TYPE TL-2

DETAIL OF BEGINNING OF GUARDRAIL IN CUT OR FILL SECTION

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 6 OF 15
862D01

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RALEIGH, N.C.



Signed by:
Nicole M. Hackler
086432303416405

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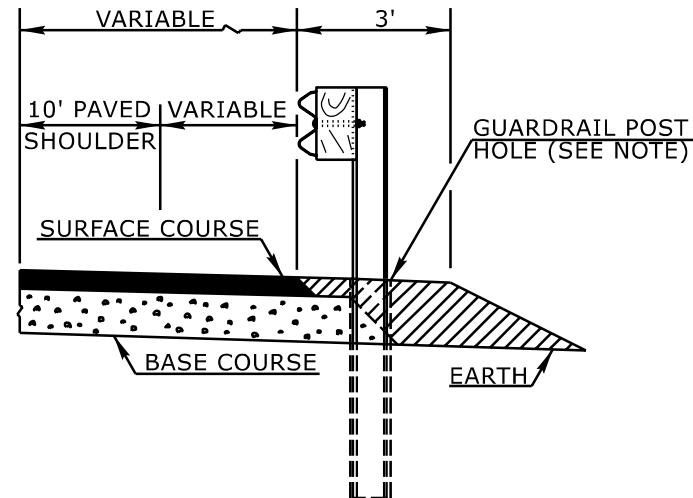
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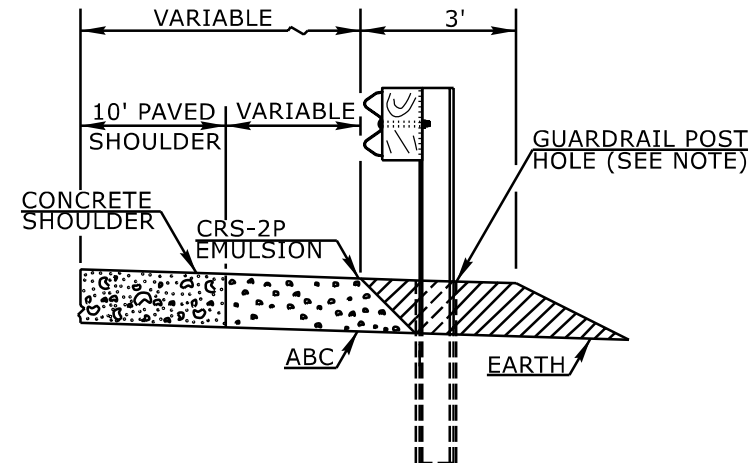
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FILE SPEC.: DATE:

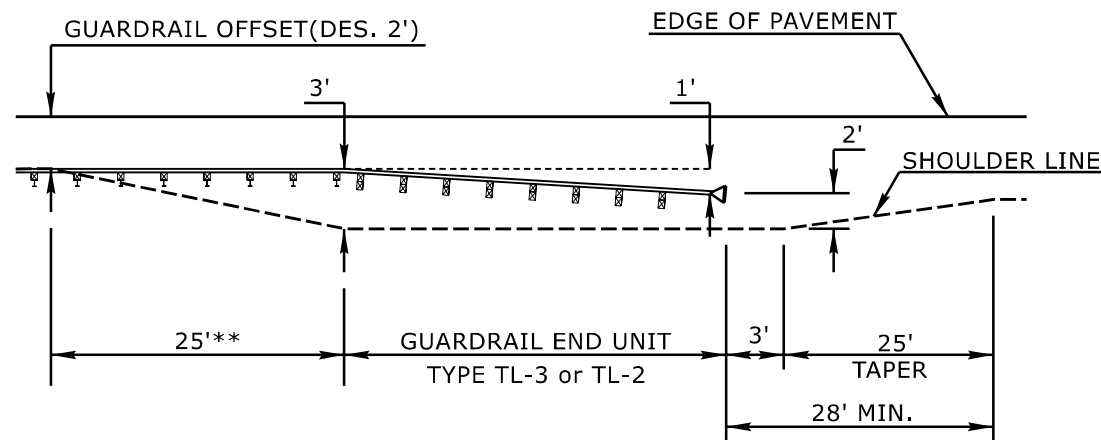
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BP13-R014	2C-5



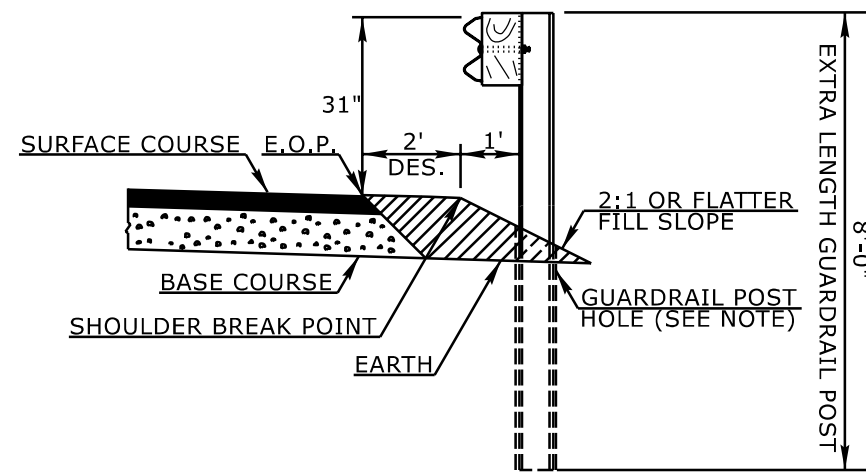
FLEXIBLE PAVED SHOULDER



CONCRETE PAVED SHOULDER



8' GUARDRAIL POST ON 2:1 SLOPE-END UNIT TRANSITION*
PLAN VIEW



8' GUARDRAIL POST ON 2:1 SLOPE*

- * THE 8' GUARDRAIL POST ON 2:1 SLOPE DETAIL IS INTENDED FOR USE ONLY IN SEVERELY CONSTRAINED AREAS WITH A POSTED SPEED $\leq$ 60 MPH. GUARDRAIL END UNITS MAY NOT BE PLACED ON THE 2:1 SLOPE AND MUST TRANSITION TO THE SHOULDER.
- ** 8' GUARDRAIL POST SHOULD BE USED IN THIS RANGE

NOTE:
WHEN WOODEN GUARDRAIL POSTS ARE USED, DRILL HOLES THROUGH EARTH MATERIAL AND BASE COURSE. THE POST MAY THEN BE DRIVEN TO THE PROPER DEPTH. DRILL THE HOLE OF SUFFICIENT SIZE TO ACCOMMODATE THE PARTICULAR POST BEING USED. BACKFILL AND TAMP HOLES USING THE EXCAVATED MATERIAL.

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RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 11 OF 15
862D01



Signed by:
Nicole M. Hecker
038432303416405

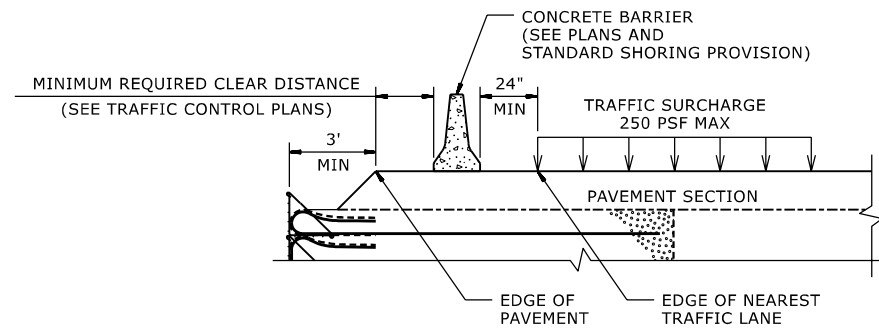
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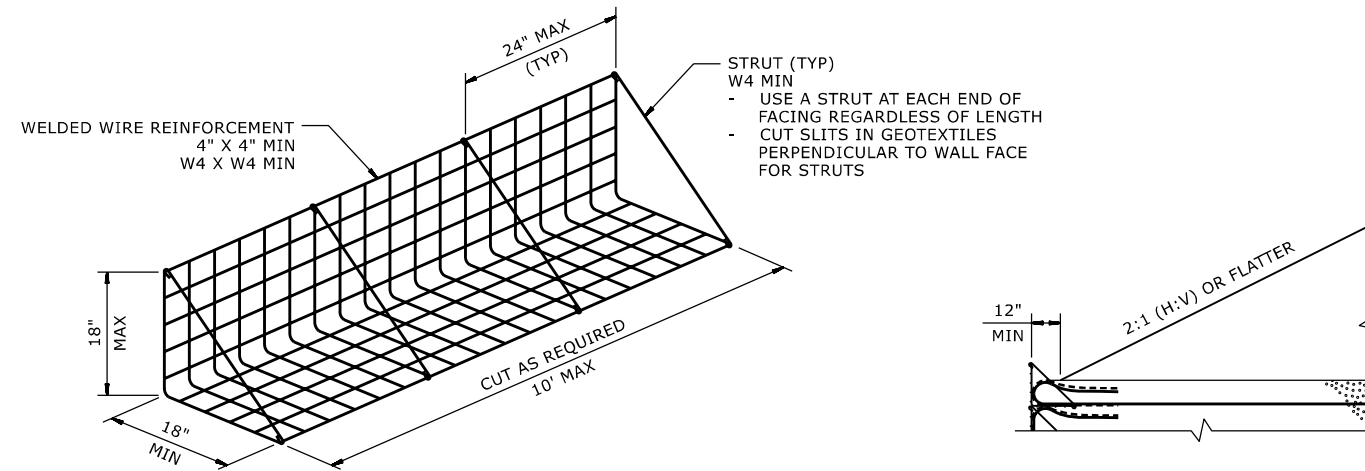
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SEE TITLE BLOCK

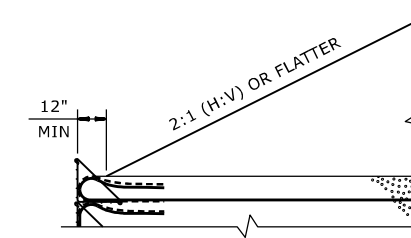
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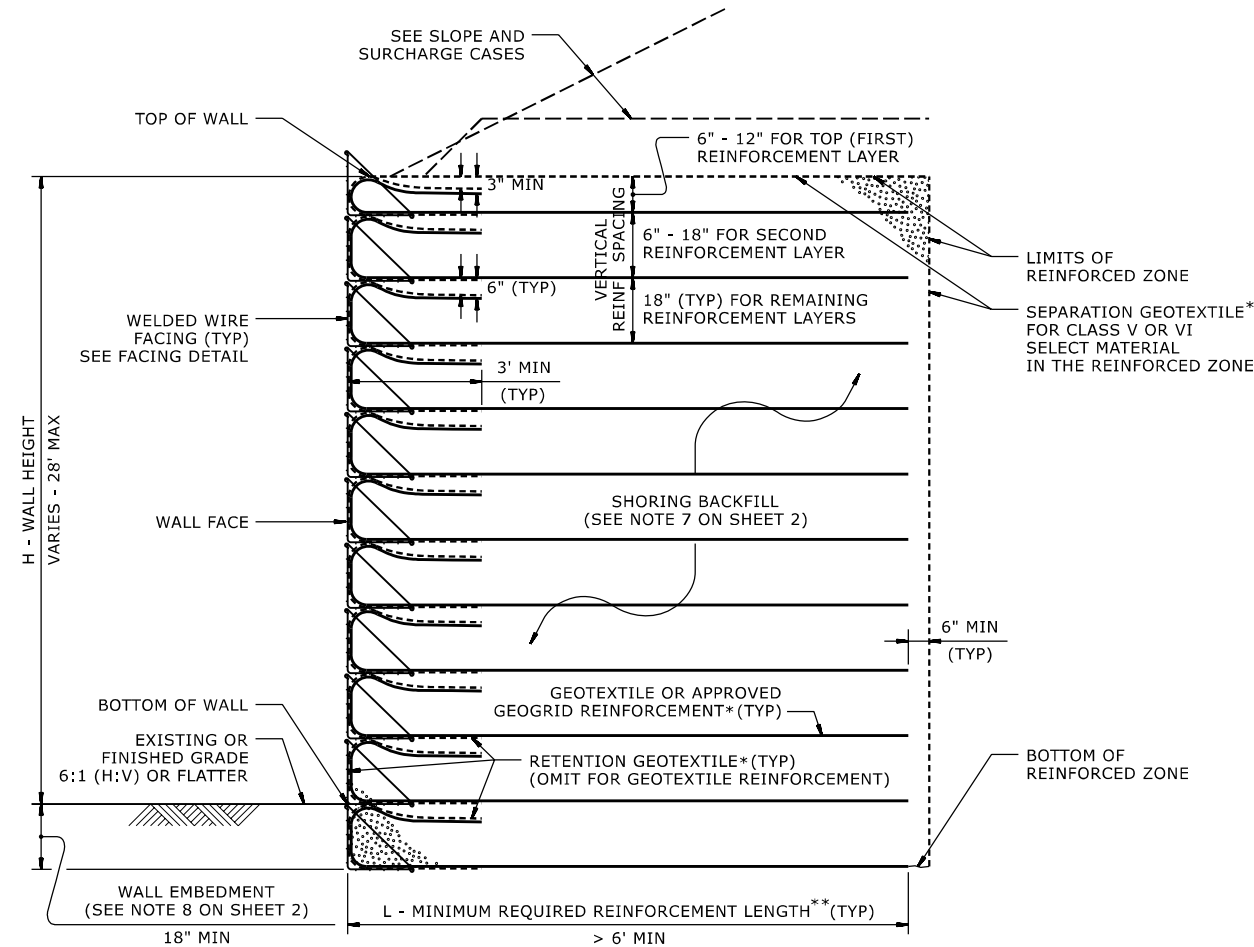
SURCHARGE CASE



FACING DETAIL

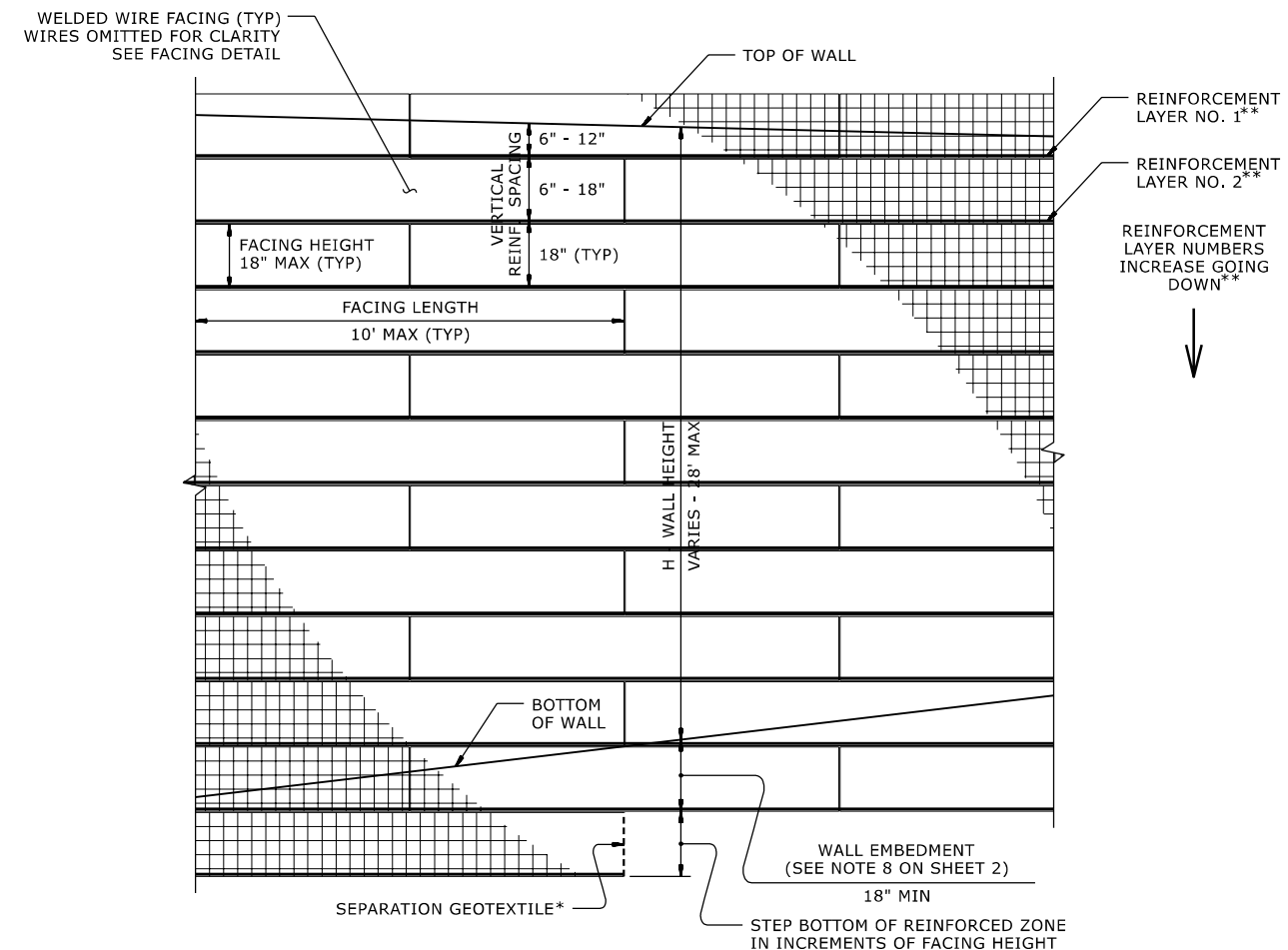


SLOPE CASE



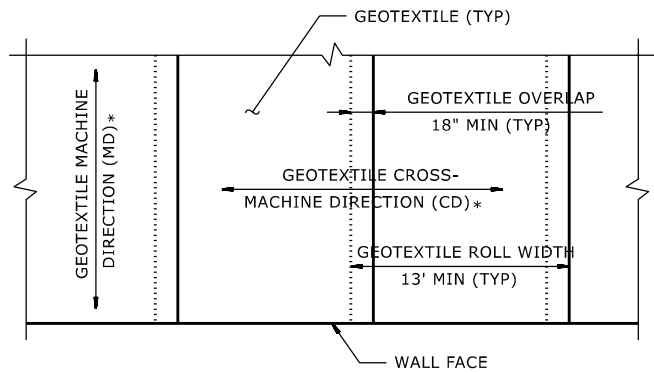
STANDARD TEMPORARY WALL

(FOR STANDARD TEMPORARY WALLS ON STRUCTURES,
SEE TEMPORARY WALL ON STRUCTURE DETAIL ON SHEET 2.)
*SEE GEOSYNTHETIC PLACEMENT DETAILS ON SHEET 2.
**SEE REINFORCEMENT TABLES ON SHEET 3.



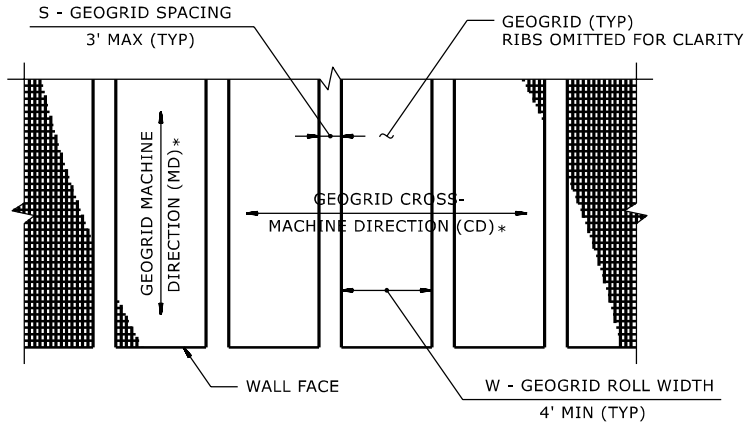
STANDARD TEMPORARY WALL - PARTIAL ELEVATION

*SEE GEOSYNTHETIC PLACEMENT DETAILS ON SHEET 2.
**SEE REINFORCEMENT TABLES ON SHEET 3.



GEOTEXTILE PLACEMENT

(100% COVERAGE MIN FOR
GEOTEXTILE REINFORCEMENT)

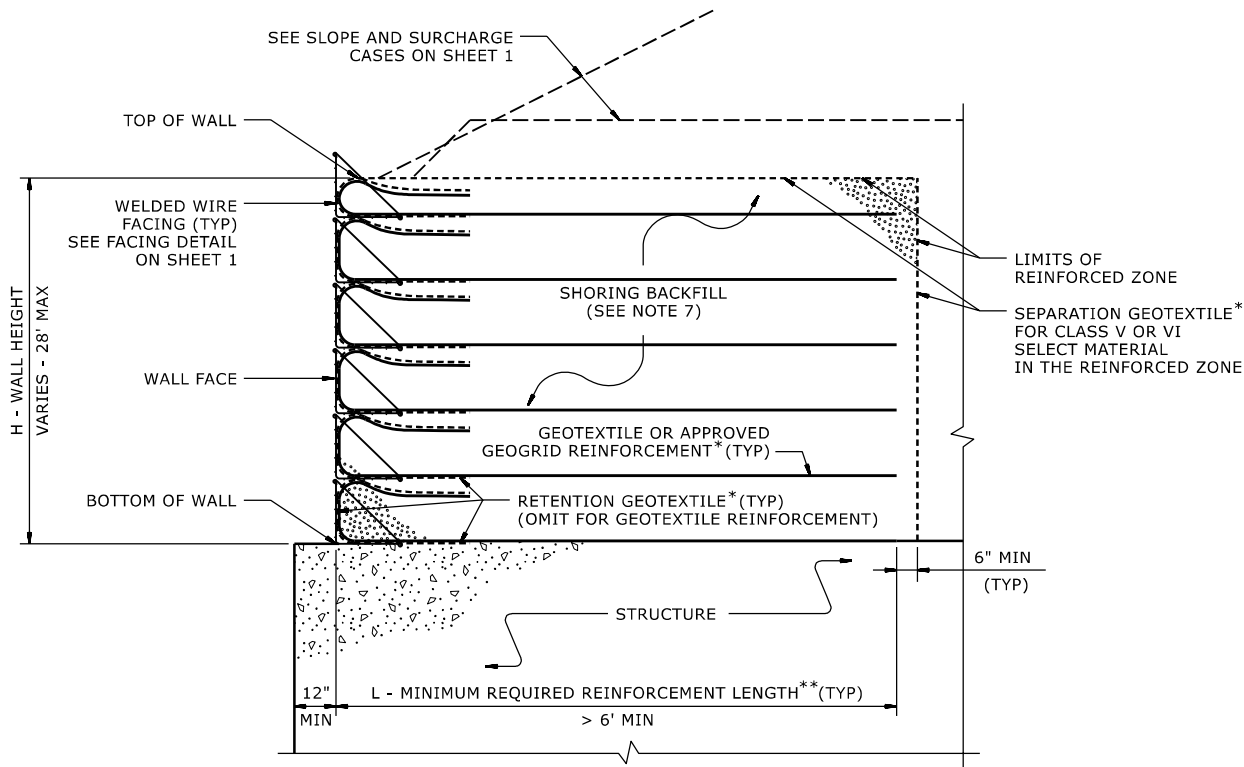


GEOGRID PLACEMENT

(80% COVERAGE MIN FOR
GEOGRID REINFORCEMENT -
 $\frac{W}{W+S} \times 100 \geq 80\%$,
SEE NOTE 11)

GEOSYNTHETIC PLACEMENT DETAILS

(PLAN VIEW)
*SEE NOTE 12.



TEMPORARY WALL ON STRUCTURE DETAIL

*SEE GEOSYNTHETIC PLACEMENT DETAILS.
**SEE REINFORCEMENT TABLES ON SHEET 3.

NOTES:

- AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY WALLS AS NOTED IN THE PLANS.
- FOR STANDARD TEMPORARY WALLS, SEE STANDARD SHORING PROVISION.
- STANDARD TEMPORARY WALLS ARE BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:
UNIT WEIGHT, $\gamma = 120$ PCF
FRICTION ANGLE, $\phi = 30$ DEGREES
COHESION, $c = 0$ PSF
- DO NOT USE STANDARD TEMPORARY WALLS IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE.
- DO NOT USE STANDARD TEMPORARY WALLS WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS BELOW TEMPORARY WALLS.
- USE GROUNDWATER ELEVATION NOTED IN THE PLANS. IF NO GROUNDWATER ELEVATION IS SHOWN IN THE PLANS, ASSUME GROUNDWATER DEPTH IS LESS THAN 7' BELOW BOTTOM OF REINFORCED ZONE. DO NOT USE STANDARD TEMPORARY WALLS IF GROUNDWATER OR FLOOD ELEVATION IS ABOVE BOTTOM OF REINFORCED ZONE.
- DO NOT USE A-2-4 SOIL FOR STANDARD TEMPORARY WALLS AROUND CULVERTS OR IN THE REINFORCED ZONE OF STANDARD TEMPORARY WALLS FOR SLOPE CASES. DO NOT USE CLASS VI SELECT MATERIAL IN THE REINFORCED ZONE OF STANDARD TEMPORARY WALLS WITH GEOTEXTILE REINFORCEMENT.
- WALL EMBEDMENT IS NOT REQUIRED FOR STANDARD TEMPORARY WALLS ON STRUCTURES OR ROCK AS DETERMINED BY THE ENGINEER.
- DO NOT USE MORE THAN 4 DIFFERENT REINFORCEMENT STRENGTHS FOR EACH STANDARD TEMPORARY WALL.
- GEOGRIDS FOR GEOGRID REINFORCEMENT ARE APPROVED FOR SHORT TERM DESIGN STRENGTHS (3-YEAR DESIGN LIFE) IN THE MD AND CD BASED ON MATERIAL TYPE. THE LIST OF APPROVED GEOGRIDS WITH DESIGN STRENGTHS IS AVAILABLE FROM: connect.ncdot.gov/resources/Geological/Pages/Products.aspx. DEFINE MATERIAL TYPE FROM THE WEBSITE ABOVE FOR SHORING BACKFILL AS FOLLOWS:

MATERIAL TYPE	SHORING BACKFILL
BORROW	A-2-4 SOIL
FINE AGGREGATE	CLASS II, TYPE 1 OR CLASS III SELECT MATERIAL
COARSE AGGREGATE	CLASS V OR VI SELECT MATERIAL

- FOR GEOGRID REINFORCEMENT WITH LESS THAN 100% COVERAGE, STAGGER REINFORCEMENT SO GEOGRIDS ARE CENTERED OVER GAPS IN THE REINFORCEMENT LAYER BELOW.
- AT THE CONTRACTOR'S OPTION, REINFORCEMENT MAY BE INSTALLED WITH THE MD PARALLEL TO THE WALL FACE IF BOTH OF THE FOLLOWING CONDITIONS OCCUR:
- W (REINFORCEMENT ROLL WIDTH) > (MINIMUM REQUIRED REINFORCEMENT LENGTH) + 4.5' AND
- REINFORCEMENT STRENGTH IN CD > MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD.
- SUBMIT A "STANDARD TEMPORARY WALL SELECTION FORM" AT LEAST 7 DAYS BEFORE STARTING TEMPORARY WALL CONSTRUCTION. STANDARD SHORING SELECTION FORMS ARE AVAILABLE FROM: connect.ncdot.gov/resources/Geological/Pages/Geotech_Forms_Details.aspx
- DO NOT PLACE SHORING BACKFILL OR REINFORCEMENT UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.
- FOR STANDARD TEMPORARY WALLS WITH PILE FOUNDATIONS IN THE REINFORCED ZONE, DRIVE PILES THROUGH REINFORCEMENT AFTER CONSTRUCTING TEMPORARY WALLS.
- DO NOT SPLICE OR OVERLAP REINFORCEMENT SO SEAMS ARE PARALLEL TO THE WALL FACE.
- CONTACT THE ENGINEER WHEN EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, PAVEMENTS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH REINFORCEMENT.
- FOR STANDARD TEMPORARY WALLS WITH INTERIOR ANGLES LESS THAN 90 DEGREES, WRAP GEOSYNTHETICS AT ACUTE CORNERS AS DIRECTED BY THE ENGINEER.
- FOR STANDARD TEMPORARY WALLS WITH TOP OF WALL WITHIN 5' OF FINISHED GRADE, REMOVE TOP FACING AND INCORPORATE TOP REINFORCEMENT LAYER INTO FILL WHEN PLACING FILL IN FRONT OF WALL.



WALL HEIGHT (H) + WALL EMBEDMENT (FT)	NUMBER OF REINFORCEMENT LAYERS*
2.5 - 4	3
4 - 5.5	4
5.5 - 7	5
7 - 8.5	6
8.5 - 10	7
10 - 11.5	8
11.5 - 13	9
13 - 14.5	10
14.5 - 16	11
16 - 17.5	12
17.5 - 19	13
19 - 20.5	14
20.5 - 22	15
22 - 23.5	16
23.5 - 25	17
25 - 26.5	18
26.5 - 28	19
28 - 29.5	20

*BASED ON VERTICAL REINFORCEMENT
SPACING SHOWN ON SHEET 1.

REINFORCEMENT LAYER NUMBER*	SHORING BACKFILL TYPE IN THE REINFORCED ZONE (SEE NOTE 7 ON SHEET 2)				
	SLOPE CASE		SURCHARGE CASE		
	CLASS II, TYPE 1 OR CLASS III SELECT MATERIAL	CLASS V OR CLASS VI SELECT MATERIAL	A-2-4 SOIL	CLASS II, TYPE 1 OR CLASS III SELECT MATERIAL	CLASS V OR CLASS VI SELECT MATERIAL
1	240	200	340	290	240
2	380	310	520	430	350
3	530	420	700	570	460
4	690	550	870	720	570
5	860	690	1050	860	680
6	1030	830	1220	1000	790
7	1200	970	1400	1150	900
8	1370	1110	1580	1290	1010
9	1550	1240	1750	1430	1120
10	1720	1380	1930	1580	1230
11	1890	1520	2100	1720	1340
12	2060	1660	2280	1860	1450
13	2240	1800	2450	2010	1560
14	2410	1940	2630	2150	1670
15	2580	2080	2800	2290	1780
16	2750	2220	2980	2440	1890
17	2930	2360	3160	2580	2000
18	3100	2500	3330	2720	2110
19	3270	2640	3510	2860	2220
20	3440	2780	3690	3000	2330

**GEOGRID REINFORCEMENT
SHORT-TERM DESIGN STRENGTH (LB/FT)**

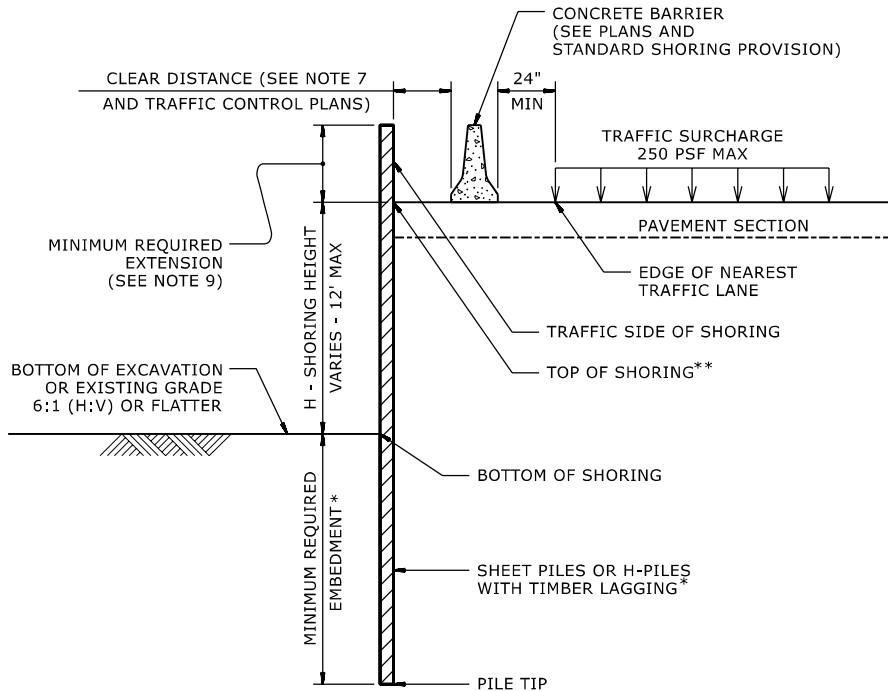
(SEE NOTE 10 ON SHEET 2.)

(SEE NOTE 9 ON SHEET 2.)
*SEE PARTIAL ELEVATION ON SHEET 1
FOR REINFORCEMENT LAYER NUMBERING.

GROUNDWATER CONDITION (SEE NOTE 6)	H SHORING HEIGHT (FT)	SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT					SURCHARGE CASE WITH TRAFFIC IMPACT				
		SHEET PILES		H-PILES WITH TIMBER LAGGING			SHEET PILES		H-PILES WITH TIMBER LAGGING		
		MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS (IN ⁴ /FT)	MINIMUM REQUIRED EMBEDMENT * (FT) (SEE NOTE 10)			MINIMUM REQUIRED EMBEDMENT (FT)	MINIMUM REQUIRED SECTION MODULUS (IN ⁴ /FT)	MINIMUM REQUIRED EMBEDMENT * (FT) (SEE NOTE 10)		
				HP 10x42	HP 12x53	HP 14x73			HP 10x42	HP 12x53	HP 14x73
GROUNDWATER ELEVATION BETWEEN BOTTOM OF SHORING AND PILE TIP	< 6	11.5	4.5	11.5	11.5	11.5	16.0	12.0	13.0	13.0	13.0
	7	13.0	7.0	13.0	13.0	13.0	17.0	14.5	14.5	14.5	14.5
	8	15.0	10.0	--	15.0	15.0	18.0	17.0	--	15.5	15.5
	9	17.0	14.0	--	17.0	17.0	19.0	20.0	--	17.0	17.0
	10	18.5	19.5	--	--	18.5	20.0	23.5	--	--	18.5
	11	20.5	26.0	--	--	--	21.0	28.0	--	--	20.0
	12	22.5	33.0	--	--	--	22.0	33.0	--	--	21.5
GROUNDWATER ELEVATION BELOW PILE TIP	< 6	7.5	3.0	8.0	8.0	8.0	11.0	10.0	9.5	9.5	9.5
	7	8.5	4.5	9.5	9.5	9.5	12.0	12.0	10.5	10.5	10.5
	8	10.0	6.5	10.5	10.5	10.5	12.5	14.0	11.5	11.5	11.5
	9	11.0	9.5	--	12.0	12.0	13.5	16.5	--	12.5	12.5
	10	12.5	13.0	--	--	13.5	14.0	19.5	--	13.5	13.5
	11	13.5	17.0	--	--	14.5	15.0	22.5	--	--	14.5
	12	15.0	21.5	--	--	16.0	16.0	25.5	--	--	15.5

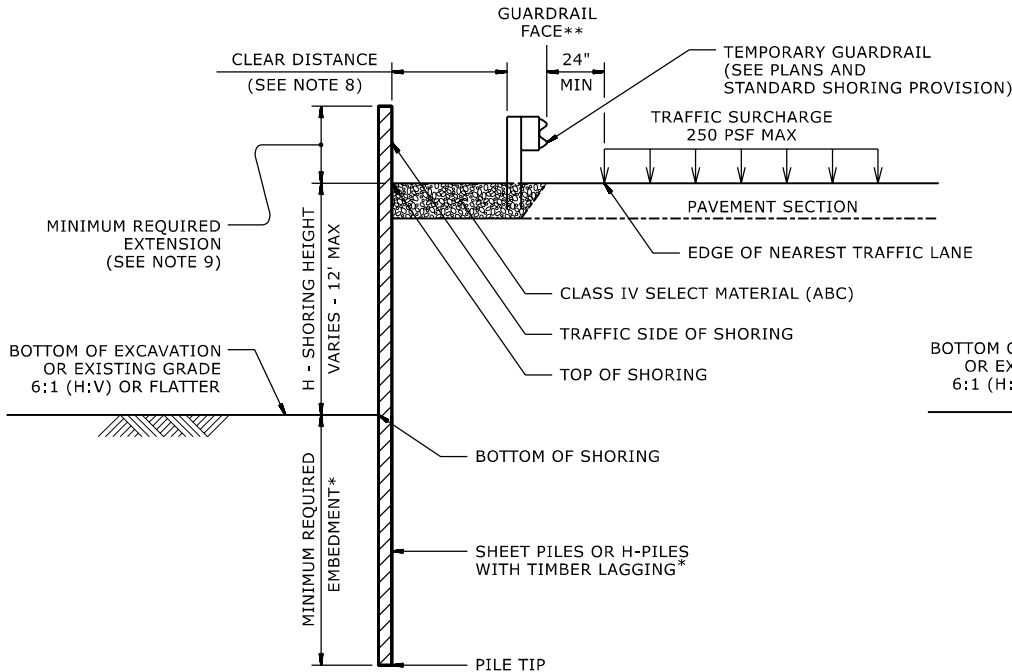
MINIMUM REQUIRED EMBEDMENT AND SECTION MODULUS

*DO NOT USE H-PILES WITH TIMBER LAGGING FOR GROUNDWATER CONDITION, SHORING HEIGHT AND H-PILE SIZE SHOWN IF MINIMUM REQUIRED EMBEDMENT IS "--".



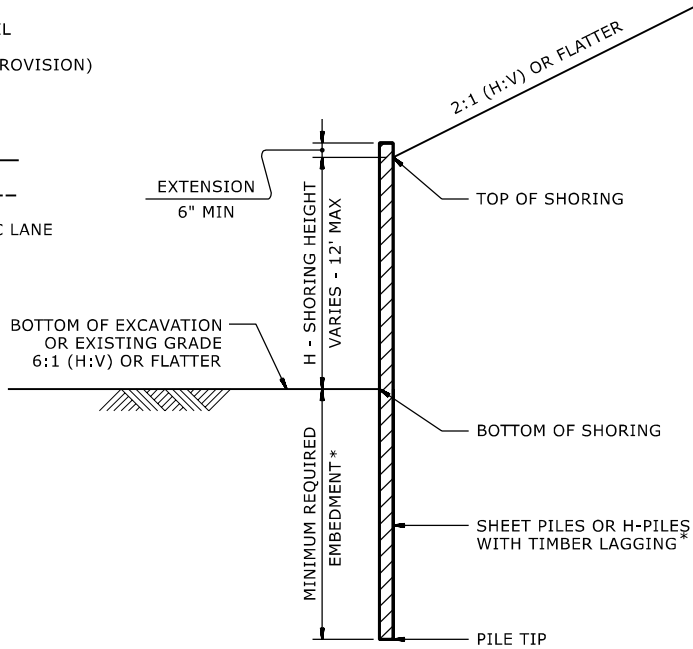
CONCRETE BARRIER

**TOP OF SHORING =
EDGE OF PAVEMENT



TEMPORARY GUARDRAIL

**GUARDRAIL FACE =
EDGE OF PAVEMENT



STANDARD TEMPORARY SHORING

(SLOPE CASE)
*SEE TABLE ABOVE.

NOTES:

1. AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY SHORING AS NOTED IN THE PLANS.
2. FOR STANDARD TEMPORARY SHORING, SEE STANDARD SHORING PROVISION.
3. STANDARD TEMPORARY SHORING IS BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:
UNIT WEIGHT, γ = 120 PCF
FRICTION ANGLE, ϕ = 30 DEGREES
COHESION, c = 0 PSF
4. DO NOT USE STANDARD TEMPORARY SHORING IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE.
5. DO NOT USE STANDARD TEMPORARY SHORING WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS WITHIN THE EMBEDMENT DEPTH.
6. USE GROUNDWATER ELEVATION NOTED IN THE PLANS. IF NO GROUNDWATER ELEVATION IS SHOWN IN THE PLANS, USE "GROUNDWATER ELEVATION BETWEEN BOTTOM OF SHORING AND PILE TIP" FOR GROUNDWATER CONDITION. DO NOT USE STANDARD TEMPORARY SHORING IF GROUNDWATER IS ABOVE BOTTOM OF SHORING.
7. AT THE CONTRACTOR'S OPTION OR IF AVAILABLE CLEAR DISTANCE IS LESS THAN THE MINIMUM REQUIRED FOR CONCRETE BARRIER, SET BARRIER NEXT TO AND UP AGAINST TRAFFIC SIDE OF PILES AND USE "SURCHARGE CASE WITH TRAFFIC IMPACT".
8. AT THE CONTRACTOR'S OPTION OR IF AVAILABLE CLEAR DISTANCE IS LESS THAN 4' FOR TEMPORARY GUARDRAIL, ATTACH GUARDRAIL TO TRAFFIC SIDE OF PILES AS SHOWN IN THE PLANS AND USE "SURCHARGE CASE WITH TRAFFIC IMPACT".
9. MINIMUM REQUIRED EXTENSION IS 6" FOR "SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT" AND 32" FOR "SURCHARGE CASE WITH TRAFFIC IMPACT".
10. MINIMUM REQUIRED EMBEDMENT FOR H-PILES WITH TIMBER LAGGING IS BASED ON DRIVEN H-PILES AT MAXIMUM 6' SPACING. AT THE CONTRACTOR'S OPTION, EMBEDMENT DEPTHS MAY BE REDUCED BY 25% FOR DRILLED-IN H-PILES.
11. SUBMIT A "STANDARD TEMPORARY SHORING SELECTION FORM" AT LEAST 7 DAYS BEFORE STARTING TEMPORARY SHORING CONSTRUCTION. UP TO 3 SHORING LOCATIONS MAY BE INCLUDED ON EACH FORM. STANDARD SHORING SELECTION FORMS ARE AVAILABLE FROM:
connect.ncdot.gov/resources/Geological/Pages/Geotech_Forms_Details.aspx
12. CONTACT THE ENGINEER IF PILES DO NOT ATTAIN THE MINIMUM REQUIRED EMBEDMENT.

BP13.R014

2G-4 -

NORTH CAROLINA
DEPARTMENT
OF TRANSPORTATION



GEOTECHNICAL
ENGINEERING UNIT

GEOTECHNICAL
ENGINEER



SEAL
022246

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

STANDARD
DETAIL NO. 1801.01

GEOTECHNICAL STANDARD DETAIL FOR
TEMPORARY SHORING

05/27/22

COMPUTED BY:	WHR	DATE:	10/22/2024
CHECKED BY:	TSH	DATE:	10/23/2024

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
BP13-R014	3B-1

SUMMARY OF EARTHWORK

STATION	STATION	UNCL. EXCAV.	EMBANK. + %	BORROW	WASTE
11 + 50.00 -L-	12 + 93.70 -L-	6	137	131	
10 + 10.00 -DR2-	10 + 45.00 -DR2-	1	10	9	
SUBTOTALS:		7	147	140	
13 + 76.99 -L-	16 + 59.00 -L-	185	55		130
10 + 10.00 -DR1-	10 + 50.00 -DR1-	1	22	21	
SUBTOTALS:		186	77	21	130
WASTE IN LIEU OF BORROW				-130	-130
PROJECT TOTALS:		193	224	43	
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT				2	
GRAND TOTALS:		193	224	45	
SAY:		200		50	

PER GEOTECH RECOMMENDATION, ESTIMATED 450 CUBIC YARDS OF TOTAL UNDERCUT (CONTINGENCY) AS FOLLOWS:
UNDERCUT FOR SLOPE AND EMBANKMENT STABILITY = 200 CY
UNDERCUT FOR SUBGRADE STABILITY = 200 CY
GRADE POINT UNDERCUT = 50 CY

SELECT GRANULAR MATERIAL = 400 CY (CONTINGENCY)

NOTE: Earthwork quantities are calculated by WSP's Roadway Design Unit. These earthwork quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.

NOTE: 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.

SUMMARY OF ASPHALT REMOVAL

STATION	STATION	LOCATION	AREA SF	SQ YD
11 + 50 -L-	11 + 82 -L-	LT	26.59	2.95
11 + 95 -L-	12 + 15 -L-	RT	9.67	1.07
12 + 67 -L-	13 + 17 -L-	RT	81.03	9.00
12 + 77 -L-	12 + 98 -L-	LT	11.45	1.27
13 + 60 -L-	13 + 80 -L-	LT	20.73	2.30
13 + 79 -L-	14 + 25 -L-	RT	46.79	5.20
14 + 46 -L-	14 + 60 -L-	LT	18.49	2.05
14 + 54 -L-	15 + 85 -L-	RT	174.81	19.42
14 + 87 -L-	16 + 59 -L-	LT	188.36	20.93
GRAND TOTALS:				64.21
SAY:				70

SHOULDER BERM GUTTER SUMMARY

SURVEY LINE	STATION	STATION	LENGTH (LF)
-L- (RT)	12 + 73.76	12 + 90.60	16.90
-L- (RT)	13 + 97.72	14 + 15.29	17.60
GRAND TOTALS:			34.40
SAY:			35

GUARDRAIL SUMMARY

"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

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH		W		ANCHORS										IMPACT ATTENUATOR TYPE 350	SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	TYPE III	GREU TL-2								EA	G	NG			
-L-	12 + 13.91	12 + 87.89	LT	75'				12 + 87.89	5'-5"	8'-5"		25'		0.5'	1	1													
-L-	12 + 45.52	13 + 05.73	RT	56.25'			13 + 05.73		5'-5"	8'-5"	25'		0.5'		1	1													
-L-	13 + 63.61	14 + 20.38	LT	56.25'			13 + 63.61		5'-5"	8'-5"	25'		0.5'		1	1													
-L-	13 + 83.78	14 + 47.16	RT	56.25'				13 + 83.78	3'-6"	6'-6"		25'		0.5'	1	1													
SUBTOTAL				243.75'																									
LESS ANCHORS DEDUCTIONS																													
		GREU TL-2	@ 25'	-100'																									
		TYPE III	@ 18.75'	-75'																									
			TOTAL	68.75'											4	4													
			SAY	75'											4	4													
(5 ADDITIONAL GUARDRAIL POSTS)																													

4:20:38 PM RDY_SUM-03B.dgn
9/11/2026

3:26:30 PM
560090-RDY_SUM-03D.dgn
9/11/2007

PROJECT REFERENCE NO.		SHEET NO.	
BP13-R014		3D-1	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
Drawn by: <u>Hunter R. Rid</u> (HUNTER RID)		Signed by: <u>James O. Brail</u> (JAMES O BRAIL)	
			
9/11/2026		9/11/2026	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

STATE OF NORTH CAROLINA

DIVISION OF HIGHWAYS

SUMMARY OF SUBSURFACE DRAINAGE

LINE	STATION	STATION	LOCATION LT/RT/CL	DRAIN TYPE* UD/BD/SD	LF
CONTINGENCY				SD	200
				TOTAL LF:	200

*UD ■ UNDERDRAIN
*BD ■ BLIND DRAIN
*SD ■ SUBSURFACE DRAIN

SUMMARY OF GEOTEXTILE
FOR SUBGRADE STABILIZATION

LINE	STATION	STATION		GEOTEXTILE FOR SUBGRADE STABILIZATION SY
CONTINGENCY				200
			TOTAL SY:	200*

*TOTAL SQUARE YARDS OF "GEOTEXTILE FOR SUBGRADE STABILIZATION" IS ONLY THE ESTIMATED QUANTITY FOR SUBGRADES AND MAY ONLY REPRESENT A PORTION OF THE GEOTEXTILE QUANTITY SHOWN IN THE ITEM SHEETS OF THE PROPOSAL.

SUMMARY OF AGGREGATE SUBGRADE /STABILIZATION

LINE	STATION	STATION	AGGREGATE TYPE* ASU(1/2)/AST	AGGREGATE THICKNESS INCHES [8" FOR ASU(2)]	SHALLOW UNDERCUT CY	CLASS IV SUBGRADE STABILIZATION TONS	GEOTEXTILE FOR SUBGRADE STABILIZATION SY	STABILIZER AGGREGATE TONS	CLASS IV AGGREGATE STABILIZATION TONS
CONTINGENCY			ASU(1)	12	100	200	300		
			TOTAL CY /TONS /SY:		100	200**	300**	0	0

*ASU (1/2) ■ AGGREGATE SUBGRADE (TYPE 1)
*AST ■ AGGREGATE STABILIZATION
**TOTAL TONS OF "CLASS IV SUBGRADE STABILIZATION" AND TOTAL SQUARE YARDS OF "GEOTEXTILE FOR SUBGRADE STABILIZATION" ARE ONLY THE ESTIMATED QUANTITIES FOR ASU(1/2)/AST AND MAY ONLY REPRESENT A PORTION OF THE SUBGRADE STABILIZATION AND GEOTEXTILE QUANTITIES SHOWN IN THE ITEM SHEETS OF THE PROPOSAL.

8/17/99

REVISIONS

R/W Rev 1: 8/20/2024 - Revised TUE on Parcel 1.

\\USRRAG100C\F501\Jobs\188360C - 2015 W Divisions Planning & Design On-Call\1188360 Division 13 Bridges\Management\RD14 HWY Roadway\Proj\560090.RDY_PSH4.dgn

11/19/2024

oldw

-L-	-DRI-	-DR2-
$PI\ Sta\ 11+09.21$ $\Delta = 3^{\circ}06'11.8" (RT)$ $D = 3^{\circ}49'11.0"$ $L = 81.24'$ $T = 40.63'$ $R = 1,500.00'$ $SE = EXISTING$	$PI\ Sta\ 14+62.81$ $\Delta = 46^{\circ}37'40.3" (RT)$ $D = 22^{\circ}28'08.2"$ $L = 207.52'$ $T = 109.89'$ $R = 255.00'$ $RO = 96'$ $SE = 0.06$	$PI\ Sta\ 17+07.22$ $\Delta = 3^{\circ}41'02.1" (LT)$ $D = 3^{\circ}49'11.0"$ $L = 96.44'$ $T = 48.24'$ $R = 1,500.00'$ $SE = EXISTING$
$PI\ Sta\ 10+18.31$ $\Delta = 62^{\circ}47'45.2" (LT)$ $D = 190^{\circ}59'09.4"$ $L = 32.88'$ $T = 18.31'$ $R = 30.00'$	$PI\ Sta\ 10+18.07$ $\Delta = 39^{\circ}43'47.8" (LT)$ $D = 114^{\circ}35'29.6"$ $L = 34.67'$ $T = 18.07'$ $R = 50.00'$	



PROJECT REFERENCE NO.
BPI3-R014

SHEET NO.
4

R/W SHEET NO.

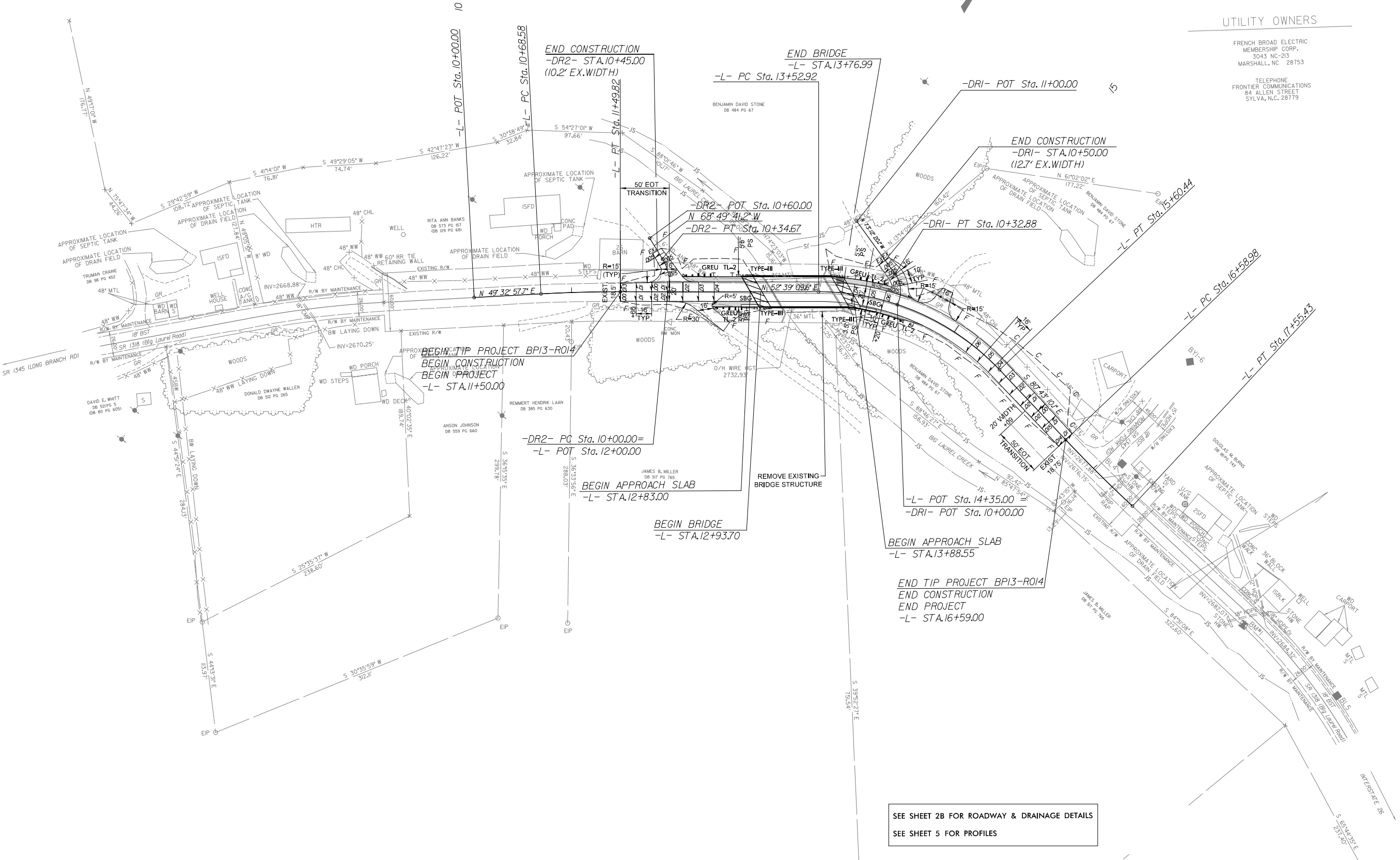
ROADWAY DESIGN ENGINEER
11/19/2024

HYDRAULICS ENGINEER
11/19/2024

Hunter Reid
Professional Engineer
Seal 049999
11/19/2024

James O. Britt
Professional Engineer
Seal 052432
11/19/2024

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

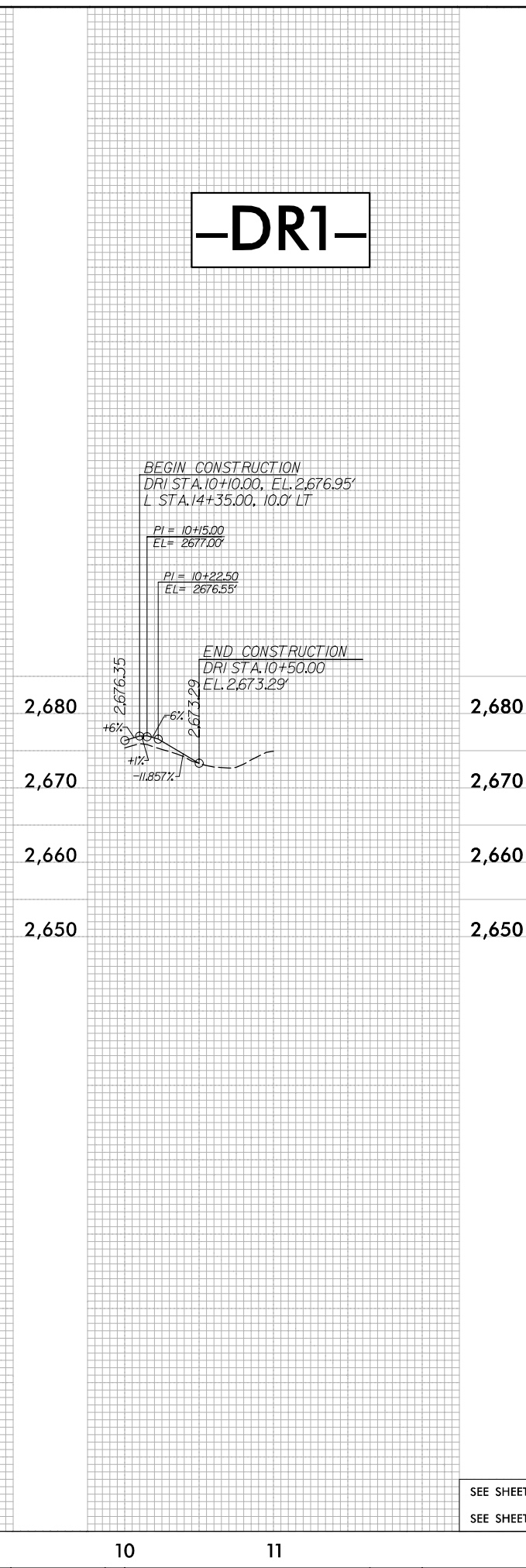
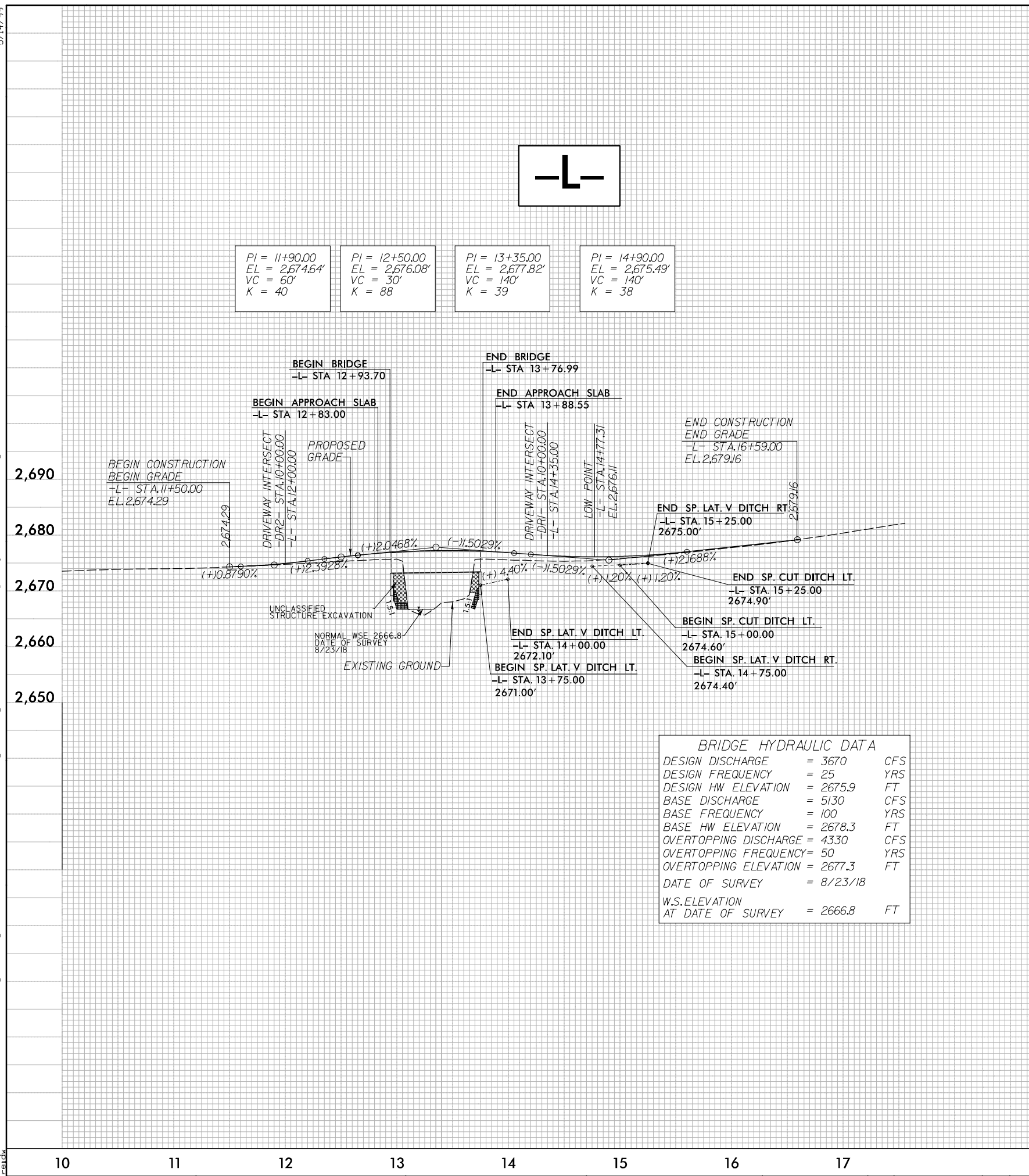


UTILITY OWNERS

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

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

SEE SHEET 2B FOR ROADWAY & DRAINAGE DETAILS
SEE SHEET 5 FOR PROFILES



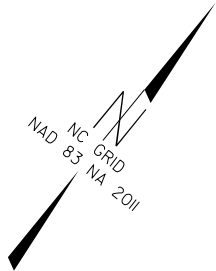
PROJECT REFERENCE NO.		SHEET NO.	
BPI3-R014		5	
ROADWAY DESIGN DESIGNER HUNTER REID 9/11/2026		HYDRAULICS ENGINEER JAMES O. BATTY 9/11/2026	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

–DR2–

SEE SHEET 4 FOR -L-, -DR1- & -DR2- PLAN

SEE SHEET 2B FOR ROADWAY DETAILS

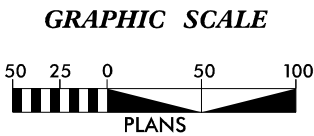
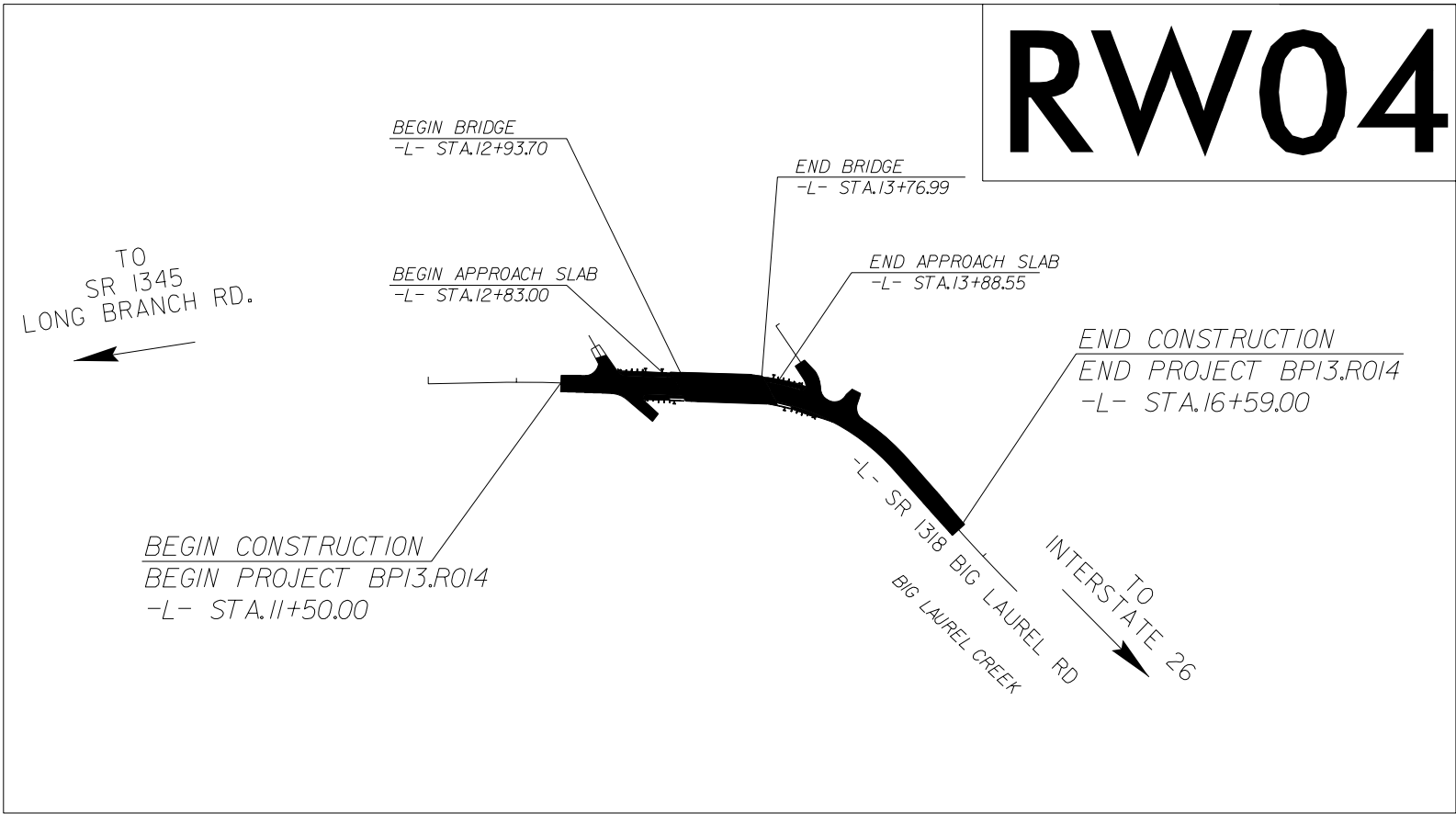
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP13-R014	RW01	6



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

MADISON COUNTY



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY OTHERS FOR MONUMENT "GPS2" WITH NAD 83/NSRS 2011 STATE PLANE GRID COORDINATES OF NORTHING: 809,150.905(ft) EASTING: 939,109.992(ft) ELEVATION: 2,672.93(ft) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999771336 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "GPS2" TO -L- STATION 10+00.00 IS S 39°30'03.2" W 66.827(ft) ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

Prepared in the Office of:



TGS ENGINEERS
201 WEST MARION STREET
SUITE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:

LETTING DATE:

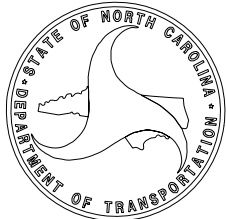
PROFESSIONAL LAND
SURVEYOR



Signed by:
Matthew Cornwell
ES&S 0005114736475
SIGNATURE:

6/22/2026

Date:



PROJECT REFERENCE NO.	SHEET NO.
BP13-R014	RW02C-2
Location and Surveys LOCATION & SURVEYS 786 DOGWOOD RD ASHEVILLE NC 28806	

EY1									
POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
PC	809437.422	939690.712							
CURVE			S 03°24'22.5" W	22.14	08°27'51.6"(RT)	38°11'49.9"	22.16	11.10	150.00
PT	809415.322	939689.397							
LINE			S 07°38'18.3" W	71.17					
POT	809344.781	939679.936							

I. 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

9/2023

22-JUN-2026 14:50
S:\Surveyors\projects\LIB\560090\2024 RW STK\REVISED 260622\560090_1s-r-w02d-1.dgn
mccornwell AT MCCORNWELL.ATOP

PROPOSED ALIGNMENT CONTROL SHEET

L			
TYPE	STATION	NORTH	EAST
POT	10+00.00	809099.3402	939067.4839
PC	10+68.58	809143.8315	939119.6675
PT	11+49.82	809194.8423	939182.8882
PC	13+52.92	809318.0523	939344.3475
PT	15+60.44	809366.9965	939540.1655
PC	16+58.98	809351.1052	939637.4153
PT	17+55.43	809338.6214	939733.0316
POT	17+55.43	809338.6214	939733.0316

DR1			
TYPE	STATION	NORTH	EAST
PC	10+00.00	809356.5791	939416.4228
PT	10+32.88	809379.8790	939395.5847
POT	11+00.00	809399.2726	939331.3274

DR2			
TYPE	STATION	NORTH	EAST
PC	10+00.00	809225.2841	939222.7803
PT	10+34.67	809247.5938	939197.1493
POT	10+60.00	809256.7418	939173.5299

PROJECT REFERENCE NO.
BP13-R014

SHEET NO.
RW02D-1

Location and Surveys



TGS ENGINEERS
201 WEST MARION STREET
SUITE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

PROJECT SURVEYOR

Signed by:
Matthew Cornwell
EB028F11473E475...

6/22/2026

NORTH CAROLINA
PROFESSIONAL
SEAL
L-4775
LAND SURVEYOR
MATTHEW T. CORNWELL

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

I, Matthew T. Cornwell, 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 6/22/2026

Signed by:
Matthew Cornwell
EB028F11473E475...

Professional Land Surveyor L-4775

REVISIONS

22-JUN-2026 14:52
S:\Surveyors\projects\LIB\560090\2024 RW STK\REVISED 260622\560090_Ls-rw03e-1.dgn
mccornwell AT MCCORNWELL.ATOP

RIGHT OF WAY & PERMANENT EASEMENT CONTROL SHEET

PROJECT REFERENCE NO.
BP13-R014

SHEET NO.
RW03E-1

Location and Surveys



TGS ENGINEERS
201 WEST MARION STREET
SUITE 200
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

PROJECT SURVEYOR

Signed by:
Matthew Cornwell
EBD06F11473E475...

6/22/2026



DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

ROW MARKER IRON PIN AND CAP				
ALIGN	STATION	OFFSET	NORTH	EAST
L	10+68.58	30.00	809121.0026	939139.1313
L	10+68.58	-30.00	809166.6605	939100.2037
L	11+12.89	-30.00	809195.4733	939135.0272
L	11+12.89	-23.00	809190.0147	939139.4094
L	11+64.03	30.07	809179.5572	939212.4234
L	11+64.54	-22.93	809221.9995	939180.6799
L	11+88.11	-22.70	809236.1177	939199.5565
L	11+88.18	-29.70	809241.7233	939195.3640
L	13+57.16	-28.10	809343.2150	939331.0624
L	13+57.63	31.90	809295.1671	939366.9984
L	15+13.35	-29.58	809399.8399	939492.5875
L	15+13.44	-19.58	809389.8451	939492.9093
L	15+48.38	-29.95	809398.4157	939531.6485
L	15+48.47	-19.95	809388.4709	939530.5998
L	15+63.41	29.90	809337.0056	939538.2679
L	15+63.47	-30.10	809396.2105	939548.0037
L	16+57.44	30.00	809321.7476	939631.0543
L	16+57.50	-30.00	809380.9524	939640.7901
L	16+78.35	-71.00	809418.3125	939667.0962
L	16+79.01	-30.00	809377.6764	939661.6465

NOT SET - FALLS IN BARN

NOT SET - FALLS IN CREEK

ROW MARKER PERMANENT EASEMENT				
ALIGN	STATION	OFFSET	NORTH	EAST
L	12+60.00	-29.01	809284.7419	939252.8815
L	12+60.00	-39.00	809292.6864	939246.8190
L	12+77.00	36.00	809243.3768	939305.8324
L	12+77.00	31.16	809247.2240	939302.8966
L	12+91.00	36.00	809251.8698	939316.9621
L	12+91.00	31.30	809255.6095	939314.1083
L	12+93.00	-39.00	809312.7061	939273.0536
L	12+93.00	-28.69	809304.5080	939279.3096
L	13+43.44	-28.20	809334.7169	939319.7000
L	13+44.00	-47.00	809350.0048	939308.7440
L	13+59.00	-50.00	809362.1432	939319.8485
L	13+79.00	-28.28	809356.9004	939351.0830
L	13+79.00	-38.00	809365.1915	939346.0048
L	14+00.00	46.00	809301.9358	939404.9098
L	14+00.00	31.54	809314.8420	939398.3991
L	14+14.00	46.00	809306.8201	939415.2912
L	14+14.00	31.42	809320.1795	939409.4482

NOT SET - FALLS IN CREEK

NOT SET - FALLS IN CREEK

PUNCHED HOLE IN ROCK

PUNCHED HOLE IN ROCK

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 9/11/2023 TO 10/30/2024.

I, Matthew T. Cornwell, 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 9/11/2023 to 10/30/2024, and all coordinates are based on NAD83/2011; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

6/22/2026

This

Signed by:
Matthew Cornwell
EBD06F11473E475...
Professional Land Surveyor L-4775

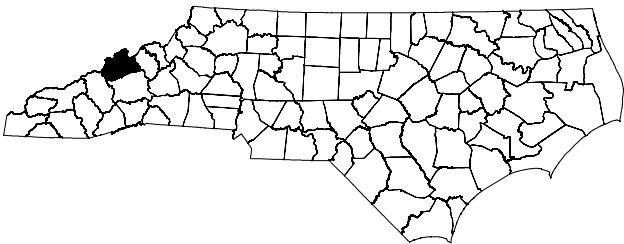
Pl Sta 10+18.07
 $\Delta = 39^\circ 43' 47.8''$ (LT)
 $D = 114^\circ 35' 29.6''$
 $L = 34.67'$
 $T = 18.07'$
 $R = 50.00'$



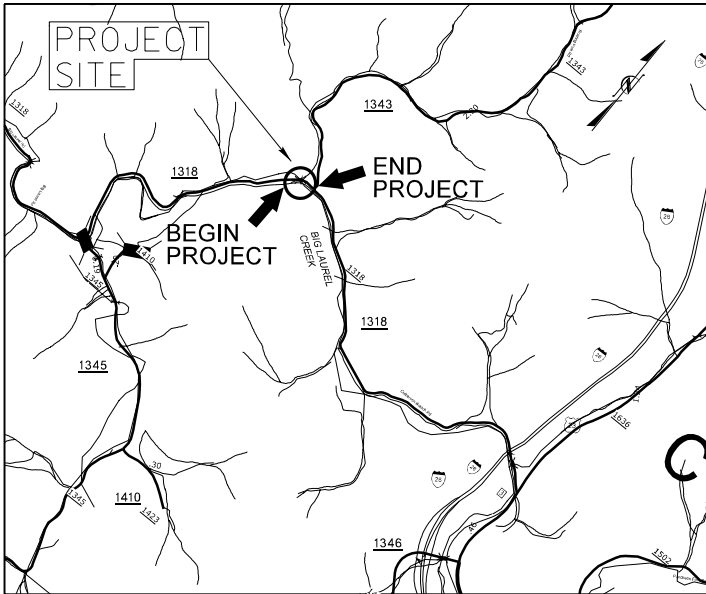
1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
3. RIGHT OF WAY MONUMENTATION ESTABLISHED 9/11/2023 TO 10/30/2024.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN
MADISON COUNTY



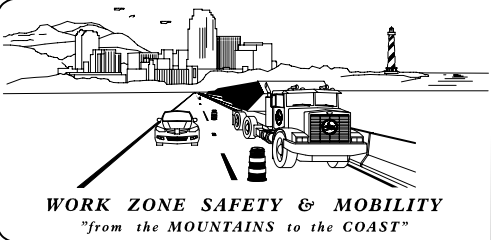
LOCATION: BRIDGE NO. 560090 ON SR 1318 (BIG LAUREL ROAD)
OVER BIG LAUREL CREEK
TYPE OF WORK: GRADING, PAVING, DRAINAGE, & STRUCTURE



INDEX OF SHEETS

SHEET NO.	TITLE
TMP-01	TITLE SHEET, VICINITY MAP, AND INDEX OF SHEETS
TMP-01A	ROADWAY STANDARD DRAWINGS AND LEGEND
TMP-01B	TRANSPORTATION OPERATIONS PLAN: MANAGEMENT STRATEGIES AND GENERAL NOTES
TMP-02	PORTABLE CONCRETE BARRIER AT TEMPORARY SHORING LOCATIONS
TMP-02A	TEMPORARY SHORING NOTES
TMP-03	TEMPORARY TRAFFIC CONTROL PHASING
TMP-04	TEMPORARY TRAFFIC CONTROL PHASE I STEPS 1 AND 2
TMP-05	TEMPORARY TRAFFIC CONTROL PHASE I STEPS 3 THRU 7
TMP-06	TEMPORARY TRAFFIC CONTROL PHASE II

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



PLANS PREPARED BY:

DAVID W BISSETTE, PE

NCDOT CONTACTS:

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FOR THE NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

APPROVED: _____

DATE: _____

SEAL

Signed by:
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9/11/2026



TIP PROJECT: BP13-R014

SHEET NO.

TMP-01

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ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS SHOWN IN "ROADWAY STANDARD DRAWINGS" - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2024 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1101.01	WORK ZONE WARNING SIGNS
1101.02	TEMPORARY LANE CLOSURES
1101.03	TEMPORARY ROAD CLOSURES
1101.04	TEMPORARY SHOULDER CLOSURES
1101.05	WORK ZONE VEHICLE ACCESSES
1101.06	WARNING SIGNS FOR BLASTING ZONES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1115.01	FLASHING ARROW BOARDS
1130.01	DRUMS
1135.01	CONES
1145.01	BARRICADES
1150.01	FLAGGING DEVICES
1160.01	TEMPORARY CRASH CUSHION
1165.01	TRUCK MOUNTED ATTENUATOR
1170.01	PORTABLE CONCRETE BARRIER
1180.01	SKINNY - DRUMS
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO LANE AND MULTILANE ROADWAYS
1205.03	PAVEMENT MARKINGS - EXITS AND ENTRANCE RAMPs
1205.04	PAVEMENT MARKINGS - INTERSECTIONS
1205.05	PAVEMENT MARKINGS - TURN LANES
1205.06	PAVEMENT MARKINGS - LANE DROPS
1205.07	PAVEMENT MARKINGS - PEDESTRIAN CROSSWALKS
1205.08	PAVEMENT MARKINGS - SYMBOLS AND WORD MESSAGES
1205.09	PAVEMENT MARKINGS - PAINTED ISLANDS
1205.10	PAVEMENT MARKINGS - SCHOOL AREAS
1205.11	PAVEMENT MARKINGS - RAILROAD CROSSINGS
1205.12	PAVEMENT MARKINGS - BRIDGES
1205.13	PAVEMENT MARKINGS - LANE REDUCTIONS
1205.14	PAVEMENT MARKINGS - ROUNDABOUTS
1205.15	PAVEMENT MARKINGS - SUPERSTREETS
1250.01	RAISED PAVEMENT MARKERS - INSTALLATION SPACING
1251.01	RAISED PAVEMENT MARKERS - (PERMANENT AND TEMPORARY)
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION
1264.01	OBJECT MARKERS - TYPES
1264.02	OBJECT MARKERS - INSTALLATION

LEGEND

GENERAL

 DIRECTION OF TRAFFIC FLOW

 DIRECTION OF PEDESTRIAN TRAFFIC FLOW

 EXIST. PVMT.

 NORTH ARROW

 PROPOSED PVMT.

 TEMP. SHORING (LOCATION PURPOSES ONLY)

 WORK AREA

 TEMPORARY PAVEMENT

SIGNALS

 EXISTING

 PROPOSED

 TEMPORARY

 PORTABLE

 DRIVEWAY

PAVEMENT MARKINGS

 EXISTING LINES

 TEMPORARY LINES

TRAFFIC CONTROL DEVICES

 BARRICADE (TYPE III)

 CONE

 DRUM

 SKINNY DRUM

 TUBULAR MARKER

 TEMPORARY CRASH CUSHION

 TEMPORARY CRASH CUSHION (NON-GATING)

 FLASHING ARROW BOARD

 FLAGGER

 LAW ENFORCEMENT

 TRUCK MOUNTED ATTENUATOR (TMA)

 CHANGEABLE MESSAGE SIGN

TEMPORARY SIGNING

 PORTABLE SIGN

 STATIONARY SIGN

 STATIONARY OR PORTABLE SIGN

PAVEMENT MARKERS

 CRYSTAL/CRYSTAL

 CRYSTAL/RED

 YELLOW/YELLOW

PAVEMENT MARKING SYMBOLS

 PAVEMENT MARKING SYMBOLS



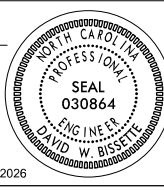


TEMPORARY PAVEMENT MARKING

4" PAINT
P1 WHITE EDGELINE
P5 2 FT - 6 FT/SP WHITE MINISKIP
P13 YELLOW DOUBLE CENTER

24" PAINT
P61 WHITE STOPBAR

APPROVED: _____
DATE: _____



Signed by:
David W. Bisette
8/20/2026



ROADWAY STANDARD
DRAWINGS & LEGEND

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

TRAFFIC MANAGEMENT STRATEGIES

- LANE SHIFTS OR CLOSURES
- SHOULDER CLOSURES
- ONE-LANE, TWO WAY OPERATION (SIGNALIZED)

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 UNDESIRABLE OVERLAPPING OF DEVICES. MODIFICATION MAY INCLUDE: MOVING, SUPPLEMENTING, COVERING, OR REMOVAL OF DEVICES AS DIRECTED BY THE ENGINEER.

LANE AND SHOULDER CLOSURE REQUIREMENTS

- A) 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.
- B) 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.
- C) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN 5 FT OF AN OPEN TRAVEL LANE ON AN UNDIVIDED FACILITY, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.
- D) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN A LANE OF TRAVEL OF AN UNDIVIDED OR DIVIDED FACILITY, CLOSE THE LANE ACCORDING TO THE TRANSPORTATION MANAGEMENT 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.
- E) 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.
- F) DO NOT INSTALL MORE THAN ONE LANE CLOSURE IN ANY ONE DIRECTION ON ANY ROAD.

PAVEMENT EDGE DROP OFF REQUIREMENTS

- ## TRAFFIC PATTERN ALTERATIONS

- ## SIGNING

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

TRAFFIC BARRIER

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

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.

M) 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.

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

- ## TRAFFIC CONTROL DEVICES

- PAVEMENT MARKINGS AND MARKERS

- | ROAD NAME | MARKING | MARKER |
|-----------|---------|--------|
| ALL ROADS | PAINT | NONE |

- T) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.

- U) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS BY THE END OF EACH DAY'S OPERATION.

MISCELLANEOUS

- V) 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) 1000 FEET AND 500 FEET RESPECTIVELY IN ADVANCE OF THE UNEVEN AREAS. USE DRUMS TO DELINEATE THE EDGE OF ROADWAY ALONG UNPAVED AREAS.

APPROVED: _____ DATE: _____		 TRANSPORTATION OPERATIONS PLAN
Signed By: <u>David W. Bissette</u> 8/20/2026 COMBINED PREPARED BY: DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		

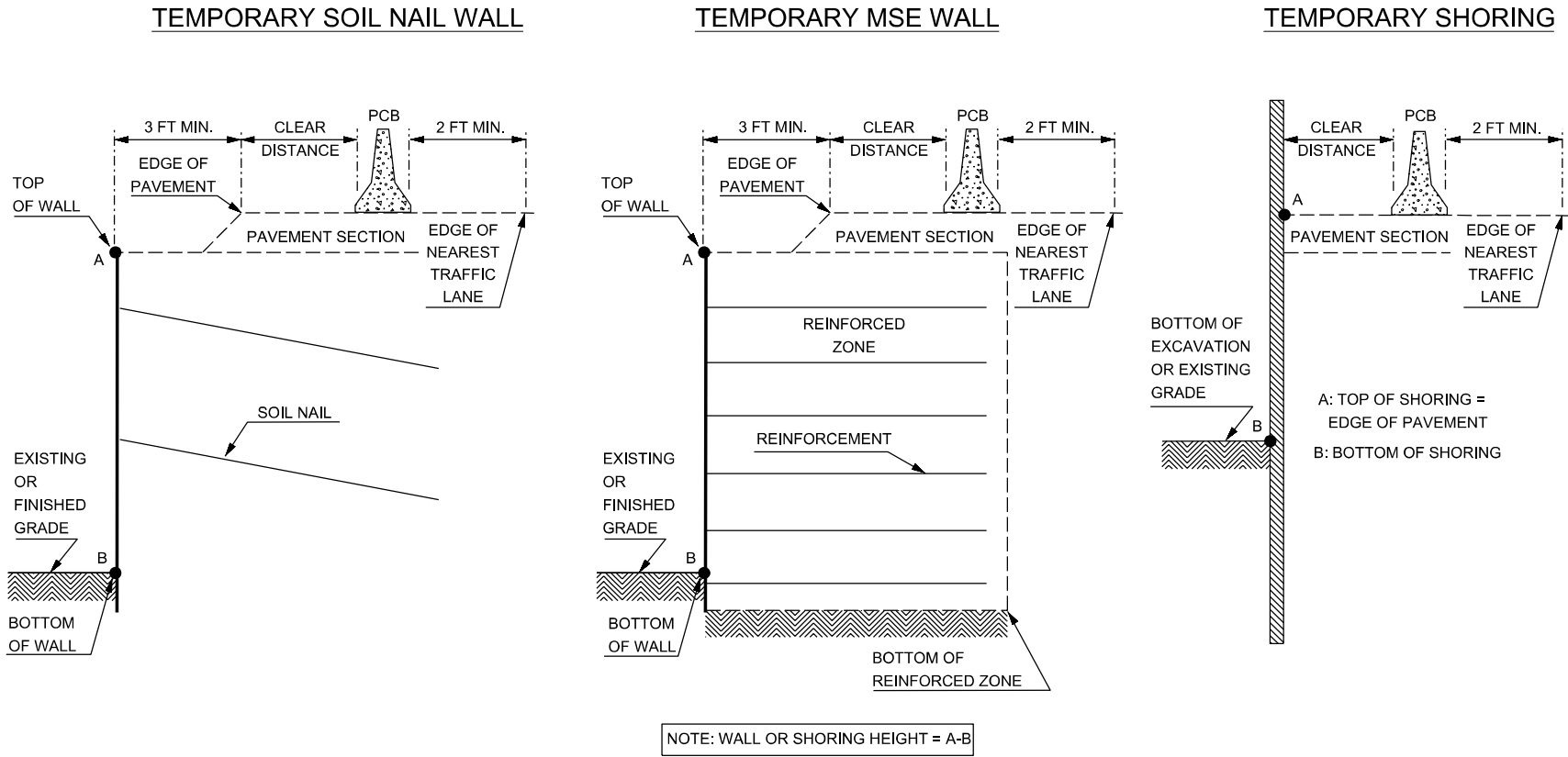


FIGURE A

NOTES

- 1- REFER TO THE TRAFFIC CONTROL PLANS FOR TEMPORARY SHORING LOCATIONS AND NOTES.
- 2- REFER TO THE "TEMPORARY SHORING" STANDARD PROVISION FOR INFORMATION ABOUT TEMPORARY SHORING AND PORTABLE CONCRETE BARRIER (PCB).
- 3- PCB IS REQUIRED IF TEMPORARY SHORING/WALL 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 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/WALLS 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- 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 OR APPROVED BY THE ENGINEER.
- 8- 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 THIS MINIMUM REQUIRED DISTANCE IS NOT AVAILABLE, CONTACT THE ENGINEER.
- 9- TABLE SHOWN IN FIGURE B IS BASED ON NCDOT RESEARCH PROJECT NO. 2005-010 WITH VEHICLE TYPE USED FOR NCHRP 350 CRASH TESTS.

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

* See Figure Below

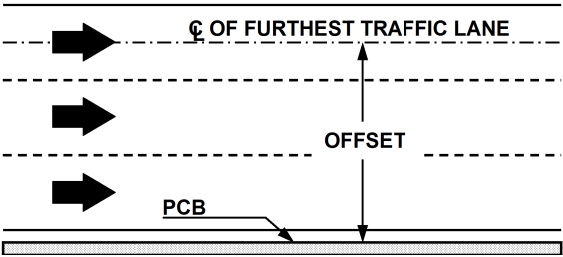


FIGURE B

APPROVED: _____

DATE: _____

Signed by:

David W. Bisette

8/20/2026

DOCUMENT NOT CONSIDERED FINAL

UNLESS ALL SIGNATURES COMPLETED

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030864

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STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

WORK ZONE TRAFFIC CONTROL

PORTABLE CONCRETE BARRIER

AT

TEMPORARY SHORING LOCATIONS

8/20/2026 J:\188360C - 2015 W Divisions Planning & Design On-Call\188360 Division 13 Bridges\Management\R014\TRF\TCP\200_020_BP13.R014_TC_TMP_02.dgn User:USDB189925

8/20/2026
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User:USD889925

TEMPORARY SHORING NOTES

SHORING LOCATION NOS. 1 AND 2

FOR TEMPORARY SHORING AND POSITIVE PROTECTION FOR TEMPORARY SHORING, SEE PLANS AND TEMPORARY SHORING PROVISION

TEMPORARY SHORING LOCATION RANGES:
LOCATION NO. 1 - -L- Sta. 12+83+/-, 5.3' RT TO -L- Sta. 13+11+/-, 5.3' RT
LOCATION NO. 2 - -L- Sta. 13+65+/-, 5.3' RT TO -L- Sta. 13+87+/-, 5.3' RT

BEFORE BEGINNING TEMPORARY SHORING DESIGN OR CONSTRUCTION, SURVEY EXISTING GROUND ELEVATIONS IN THE VICINITY OF SHORING LOCATIONS TO DETERMINE ACTUAL SHORING HEIGHTS.

DESIGN TEMPORARY SHORING LOCATION NOS. 1 AND 2, FOR THE FOLLOWING ASSUMED SOIL PARAMETERS AND GROUNDWATER ELEVATION:
UNIT WEIGHT (γ) = 30 PCF
FRICTION ANGLE (ϕ) = 120 DEGREES
COHESION (c) = 0 PSF
GROUNDWATER ELEVATION = 900 FT

LIMITED SUBSURFACE INFORMATION IS AVAILABLE IN THE VICINITY OF TEMPORARY SHORING LOCATION NOS. 1 AND 2. THE INFORMATION PROVIDED FOR TEMPORARY SHORING DESIGN WAS ASSUMED AND MAY NOT BE APPLICABLE TO THE ACTUAL SITE CONDITIONS ENCOUNTERED DURING CONSTRUCTION.

DRIVEN PILING FOR TEMPORARY SHORING LOCATION NOS. 1 AND 2 MAY NOT PENETRATE BELOW ELEVATION 902 FT DUE TO OBSTRUCTIONS, VERY DENSE OR HARD SOIL, BOULDERS OR WEATHERED OR HARD ROCK.

AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY SHORING FOR TEMPORARY SHORING LOCATION NOS. 1 AND 2. SEE GEOTECHNICAL STANDARD DETAIL NO. 1801.01 FOR STANDARD TEMPORARY SHORING.

IT MAY BE PREFERRED TO USE A TEMPORARY SOIL NAIL WALL FOR TEMPORARY SHORING LOCATION NOS. 1 AND 2. FOR TEMPORARY SOIL NAIL WALLS, SEE TEMPORARY SOIL NAIL WALLS PROVISION.

SHORING LOCATION NOS. 3 AND 4

FOR TEMPORARY SHORING AND POSITIVE PROTECTION FOR TEMPORARY SHORING, SEE PLANS AND TEMPORARY SHORING PROVISION

TEMPORARY SHORING LOCATION RANGES:
LOCATION NO. 3 - -L- Sta. 12+83+/-, 3.5' RT TO -L- Sta. 12+93+/-, 3.5' RT
LOCATION NO. 4 - -L- Sta. 13+77+/-, 3.5' RT TO -L- Sta. 13+87+/-, 3.5' RT

BEFORE BEGINNING TEMPORARY SHORING DESIGN OR CONSTRUCTION, SURVEY EXISTING GROUND ELEVATIONS IN THE VICINITY OF SHORING LOCATIONS TO DETERMINE ACTUAL SHORING HEIGHTS.

DESIGN TEMPORARY SHORING LOCATION NOS. 3 AND 4, FOR THE FOLLOWING ASSUMED SOIL PARAMETERS AND GROUNDWATER ELEVATION:
UNIT WEIGHT (γ) = 30 PCF
FRICTION ANGLE (ϕ) = 120 DEGREES
COHESION (c) = 0 PSF
GROUNDWATER ELEVATION = 900 FT

LIMITED SUBSURFACE INFORMATION IS AVAILABLE IN THE VICINITY OF TEMPORARY SHORING LOCATION NOS. 3 AND 4. THE INFORMATION PROVIDED FOR TEMPORARY SHORING DESIGN WAS ASSUMED AND MAY NOT BE APPLICABLE TO THE ACTUAL SITE CONDITIONS ENCOUNTERED DURING CONSTRUCTION.

AT THE CONTRACTOR'S OPTION, USE A STANDARD TEMPORARY WALL FOR TEMPORARY SHORING LOCATION NOS. 3 AND 4. SEE GEOTECHNICAL STANDARD DETAIL NO. 1801.02 FOR STANDARD TEMPORARY WALLS.

WHEN BACKFILL FOR BRIDGE APPROACH FILLS OVERLAPS WITH THE REINFORCED ZONE OF TEMPORARY WALLS, USE SHORING BACKFILL OR BACKFILL MATERIAL REQUIRED FOR BRIDGE APPROACH FILLS, WHICHEVER IS BETTER, IN THE REINFORCED ZONE OF TEMPORARY WALLS.

PROJ. REFERENCE NO.	SHEET NO.
BP13-R014	TMP-02A

PLANS PREPARED FOR THE NCDOT BY:

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TEL: 919.836.4040
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LICENSE NO. F-0165

THE TEMPORARY SHORING NOTES SHOWN ON THIS SHEET WERE PROVIDED THROUGH A SEALED DOCUMENT FROM THE GEOTECHNICAL ENGINEERING UNIT. THE DOCUMENT WAS SUBMITTED TO THE WZTC SECTION ON 8/17/2026 AND SEALED BY A PROFESSIONAL ENGINEER, SHANE C CLARK, LICENSE # 029869.

APPROVED: _____

DATE: _____

Signed by:
David W Bissette

8/20/2026

SEAL
030864
ENGINEER
DAVID W BISSETT

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

DIVISION OF HIGHWAYS

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

WORK ZONE TRAFFIC CONTROL

TEMPORARY SHORING NOTES

PROJ. REFERENCE NO.	SHEET NO.
BP13-R014	TMP-03

PLANS PREPARED FOR THE NCDOT BY:



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LICENSE NO. E-0065

PHASING

ALL ASPHALT PAVING WILL BE UP TO BUT NOT INCLUDING THE FINAL LAYER OF SURFACE COURSE UNLESS STATED OTHERWISE IN THE PHASING

PHASE I

- STEP 1. USING ROADWAY STANDARD DRAWING 1101.01, SHEET 3 OF 3, INSTALL THE WORK ZONE ADVANCE WARNING SIGNS
- STEP 2. USING ROADWAY STANDARD DRAWING 1101.02, SHEET 1 OF 19 COMPLETE THE TEMPORARY PAVEMENT IN THE FOLLOWING LOCATIONS: (SEE SHEET TMP-04)
- RIGHT OF -L- STA. 11+30+/- TO STA. 13+19+/-
 - RIGHT OF -L- STA. 13+82+/- TO STA. 13+98+/-
- STEP 3. USING ROADWAY STANDARD DRAWING 1101.02, SHEETS 1 AND 17 OF 19 AS NEEDED COMPLETE THE FOLLOWING: (SEE SHEET TMP-05)
- INSTALL TEMPORARY PAVEMENT MARKINGS -L- STA 10+40+/- TO STA 15+60+/-
 - INSTALL TEMPORARY SIGNALS AND SIGNS (SEE TEMPORARY PORTABLE TRAFFIC SIGNAL SYSTEM SPECIAL PROVISION FOR ADDITIONAL INFORMATION AND SIGNING)
 - PLACE TRAFFIC IN A ONE-LANE, TWO-WAY PATTERN AND ACTIVATE TEMPORARY SIGNALS
- STEP 4. USING ROADWAY STANDARD DRAWING 1101.02, SHEETS 1 AND 17 OF 19 AS NEEDED BEGIN THE FOLLOWING:
- PROPOSED ROADWAY SECTION LEFT OF -L- FROM STA. 11+50+/- TO STA. 12+83+/-
 - PROPOSED ROADWAY SECTION LEFT OF -L- FROM STA. 13+88+/- TO STA. 16+59+/-
 - CONSTRUCT -DR1- FROM STA. 10+00+/-+/- TO STA. 10+50+/-
 - CONSTRUCT -DR2- FROM STA. 10+00+/-+/- TO STA. 10+45+/-
 - INSTALL 18" DRAINAGE PIPE STR 0403
 - INSTALL 18" DRAINAGE PIPE STR 0404
- STEP 5. USING ROADWAY STANDARD DRAWING 1101.02, SHEETS 1 AND 17 OF 19 AS NEEDED COMPLETE THE FOLLOWING:
- INSTALL ANCHORED PORTABLE CONCRETE BARRIER -L- STA 12+48+/- TO STA 13+98+/-
 - INSTALL A NON-GATING CRASH CUSHION ON EACH END OF THE PORTABLE CONCRETE BARRIER
 - SAW CUT THE EXISTING BRIDGE BEHIND THE PORTABLE CONCRETE BARRIER AND REMOVE THE LEFT SIDE OF THE BRIDGE. (SEE STRUCTURE PLANS)
 - INSTALL PROPOSED TEMPORARY SHORING LOCATION NO. 1 AND NO. 2
- STEP 6. USING ROADWAY STANDARD DRAWING 1101.02, SHEETS 1 AND 17 OF 19 AS NEEDED COMPLETE THE FOLLOWING: (SEE SHEET TMP-05)
- PROPOSED STAGE I BRIDGE AND APPROACH SLABS LEFT OF -L- FROM STA 12+83+/- TO STA 13+88+/-
 - INSTALL PROPOSED TEMPORARY SHORING LOCATION NO. 3 AND NO. 4
- STEP 7. USING ROADWAY STANDARD DRAWING 1101.02, SHEETS 1 AND 17 OF 19 AS NEEDED COMPLETE THE FOLLOWING:
- PROPOSED ROADWAY SECTION LEFT OF -L- FROM STA. 11+50+/- TO STA. 12+83+/-
 - PROPOSED ROADWAY SECTION LEFT OF -L- FROM STA. 13+88+/- TO STA. 16+59+/-
 - CONSTRUCT -DR1- FROM STA. 10+00+/-+/- TO STA. 10+50+/-
 - CONSTRUCT -DR2- FROM STA. 10+00+/-+/- TO STA. 10+45+/-
 - INSTALL 18" DRAINAGE PIPE STR 0403
 - INSTALL 18" DRAINAGE PIPE STR 0404

PHASE II

- STEP 1. USING ROADWAY STANDARD DRAWING 1101.02, SHEETS 1 AND 17 OF 19 AS NEEDED COMPLETE THE FOLLOWING: (SEE SHEET TMP-05)
- INSTALL ANCHORED PORTABLE CONCRETE BARRIER LEFT OF -L- STA 12+72+/- TO STA 13+86+/-
 - INSTALL A NON-GATING CRASH CUSHION ON EACH END OF THE PORTABLE CONCRETE BARRIER LEFT OF -L-
- STEP 2. USING ROADWAY STANDARD DRAWING 1101.02, SHEETS 1 AND 17 OF 19 AS NEEDED COMPLETE THE FOLLOWING: (SEE SHEET TMP-05)
- INSTALL TEMPORARY PAVEMENT MARKINGS LEFT OF -L- STA 10+40+/- TO STA 14+52+/-
 - PLACE TRAFFIC IN A ONE-LANE, TWO-WAY PATTERN LEFT OF -L-
- STEP 3. USING ROADWAY STANDARD DRAWING 1101.02, SHEETS 1 AND 17 OF 19 AS NEEDED COMPLETE CONSTRUCTION OF THE FOLLOWING:
- REMOVE ANCHORED PORTABLE CONCRETE BARRIER RIGHT OF -L- STA. 12+48+/- TO STA 13+98+/-
 - REMOVE NON-GATING CRASH CUSHIONS RIGHT OF -L-
 - PROPOSED ROADWAY SECTION LEFT OF -L- FROM STA. 11+50+/- TO STA. 12+83+/-
 - PROPOSED ROADWAY SECTION LEFT OF -L- FROM STA. 13+88+/- TO STA. 16+59+/-
 - PROPOSED STAGE II BRIDGE AND APPROACH SLABS RIGHT OF -L- FROM STA 12+83+/- TO STA 13+88+/-
 - INSTALL 15" CSP FROM STR 401 TO STR 0402
 - CONSTRUCT TRAFFIC BEARING 2 GRATE INLET STR 0404
 - INSTALL CONCRETE FLUME STR 0405

PHASE III

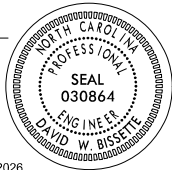
- STEP 1. USING ROADWAY STANDARD DRAWING 1101.02, SHEETS 1 AND 17 OF 19 AS NEEDED COMPLETE THE FOLLOWING:
- REMOVE ANCHORED PORTABLE CONCRETE BARRIER LEFT OF -L- STA 12+72+/- TO STA 13+19+/-
 - REMOVE NON-GATING CRASH CUSHION ON EACH END OF THE PORTABLE CONCRETE BARRIER LEFT OF -L-
- STEP 2. USING ROADWAY STANDARD DRAWING 1101.02, SHEETS 1 AND 17 OF 19 AS NEEDED COMPLETE THE FOLLOWING:
- PLACE TEMPORARY PAVEMENT MARKINGS IN THE FINAL LOCATIONS FROM -L- STA 10+00+/- TO -L- STA. 15+00+/-
 - REMOVE THE PORTABLE TEMPORARY SIGNALS AND SIGNS
- STEP 3. USING ROADWAY STANDARD DRAWING 1101.02, SHEET 1 OF 19 PLACE THE FINAL LAYER OF SURFACE COURSE FROM -L- STA 10+00+/- TO -L- STA. 14+64+/-
- STEP 4. USING ROADWAY STANDARD DRAWING 1101.02, SHEET 1 OF 19 PLACE THE FINAL PAVEMENT MARKINGS FROM -L- STA 10+00+/- TO -L- STA. 15+00+/-
- STEP 5. USING ROADWAY STANDARD DRAWING 1101.02, SHEET 1 OF 19 REMOVE ALL TEMPORARY TRAFFIC CONTROL DEVICES

9/1/2026
J:\188360C - 2015 W Divisions Planning & Design On-Call\188360 Division 13 Bridges\Management\R014\TRF\TCP\200_030_BP13-R014_TC_TMP_03.dgn
User:JUSB889925

APPROVED: _____

DATE: _____

Signed by:
David W. Bisette
9/1/2026





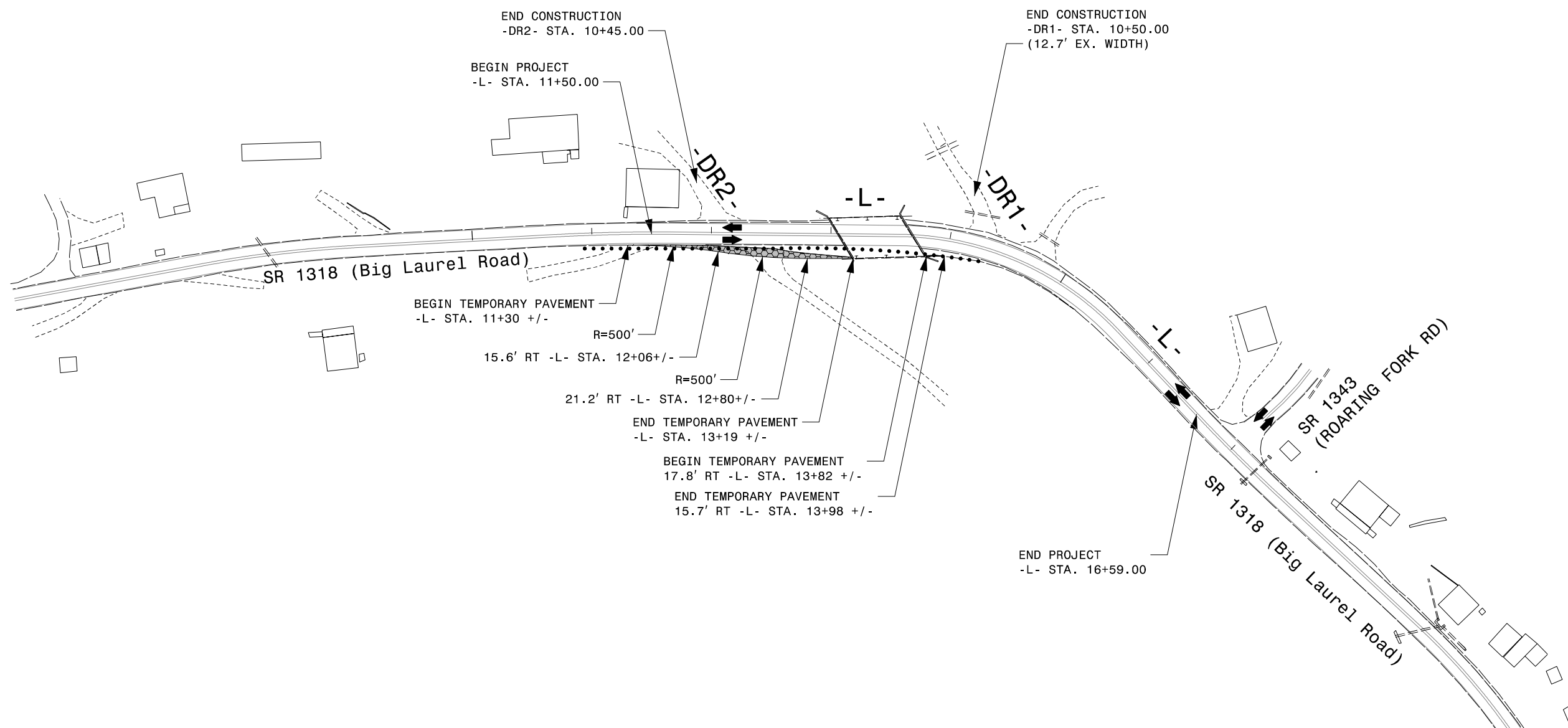
DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WORK ZONE TRAFFIC CONTROL

TEMPORARY TRAFFIC CONTROL PHASING

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

PROJ. REFERENCE NO.	SHEET NO.
BP13-R014	TMP-04

PLANS PREPARED FOR THE NCDOT BY:



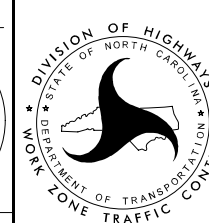
APPROVED: _____

DATE: _____

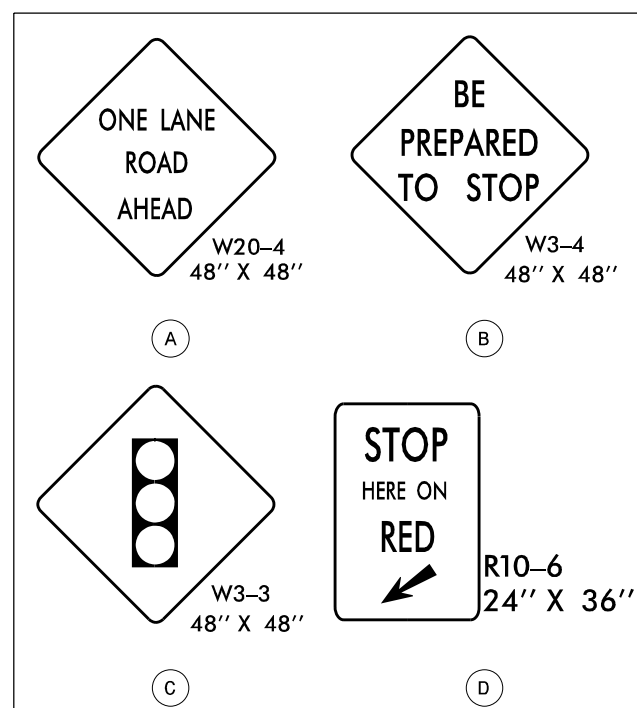
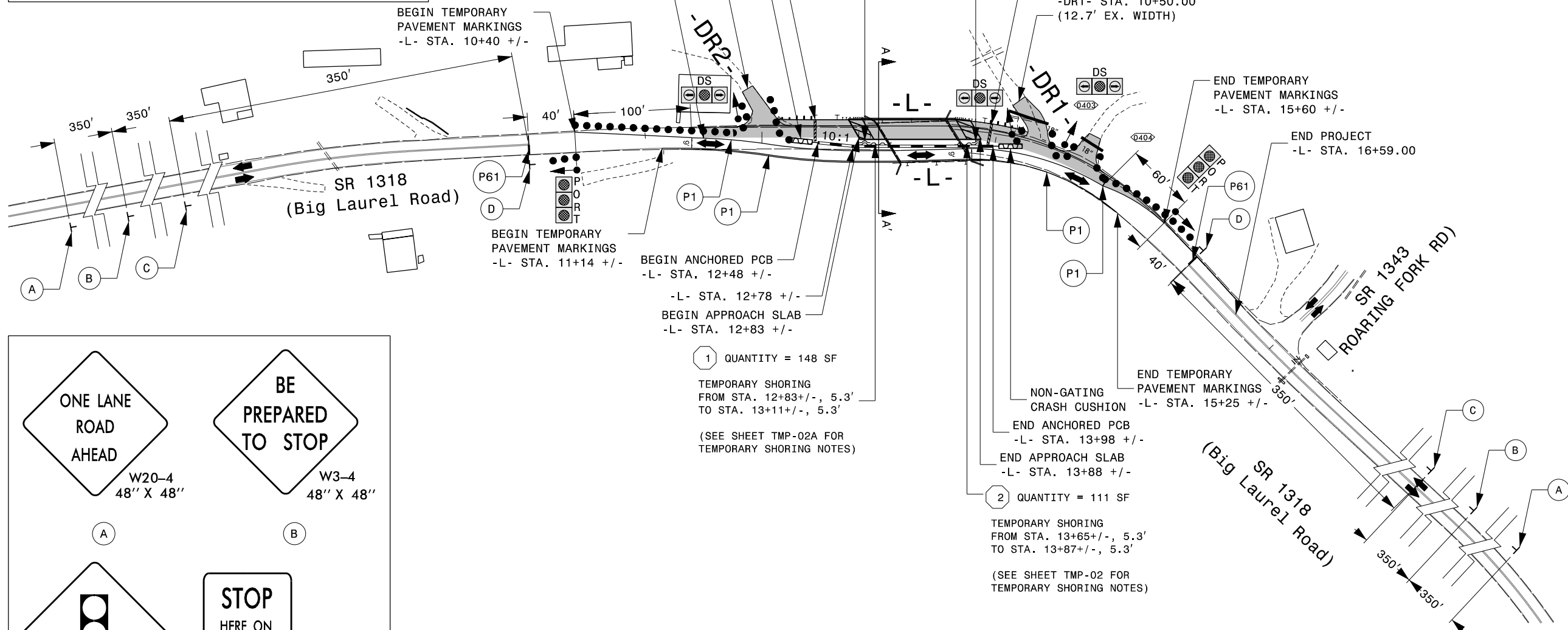
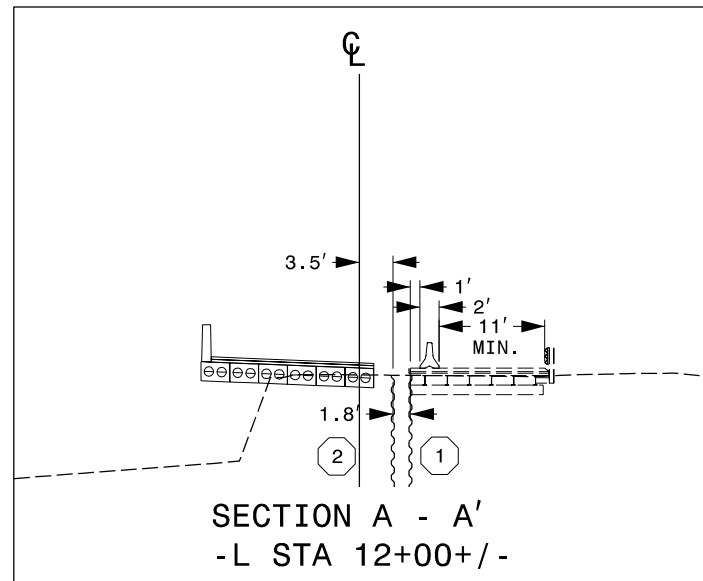
Signed by:
David W Bissette

9/1/2026

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



TEMPORARY TRAFFIC CONTROL
PHASE I, STEPS 1 AND 2



3 QUANTITY = 34 SF

TEMPORARY SHORING
FROM STA. 12+83+/-, 3.5'
TO STA. 12+93+/-, 3.5'

(SEE SHEET TMP-02A FOR
TEMPORARY SHORING NOTES)

4 QUANTITY = 32 SF

TEMPORARY SHORING
FROM STA. 13+77+/-, 3.5'
TO STA. 13+87+/-, 3.5'

(SEE SHEET TMP-02A FOR
TEMPORARY SHORING NOTES)

1 QUANTITY = 148 SF

TEMPORARY SHORING
FROM STA. 12+83+/-, 5.3'
TO STA. 13+11+/-, 5.3'

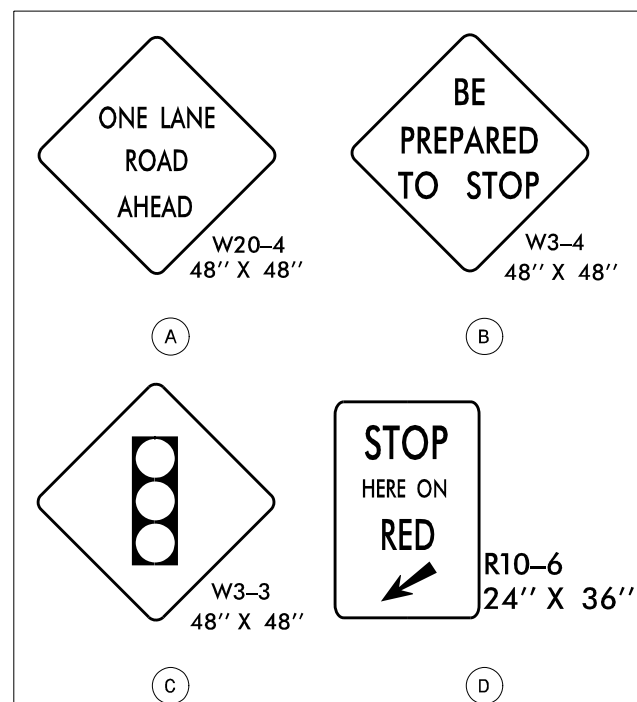
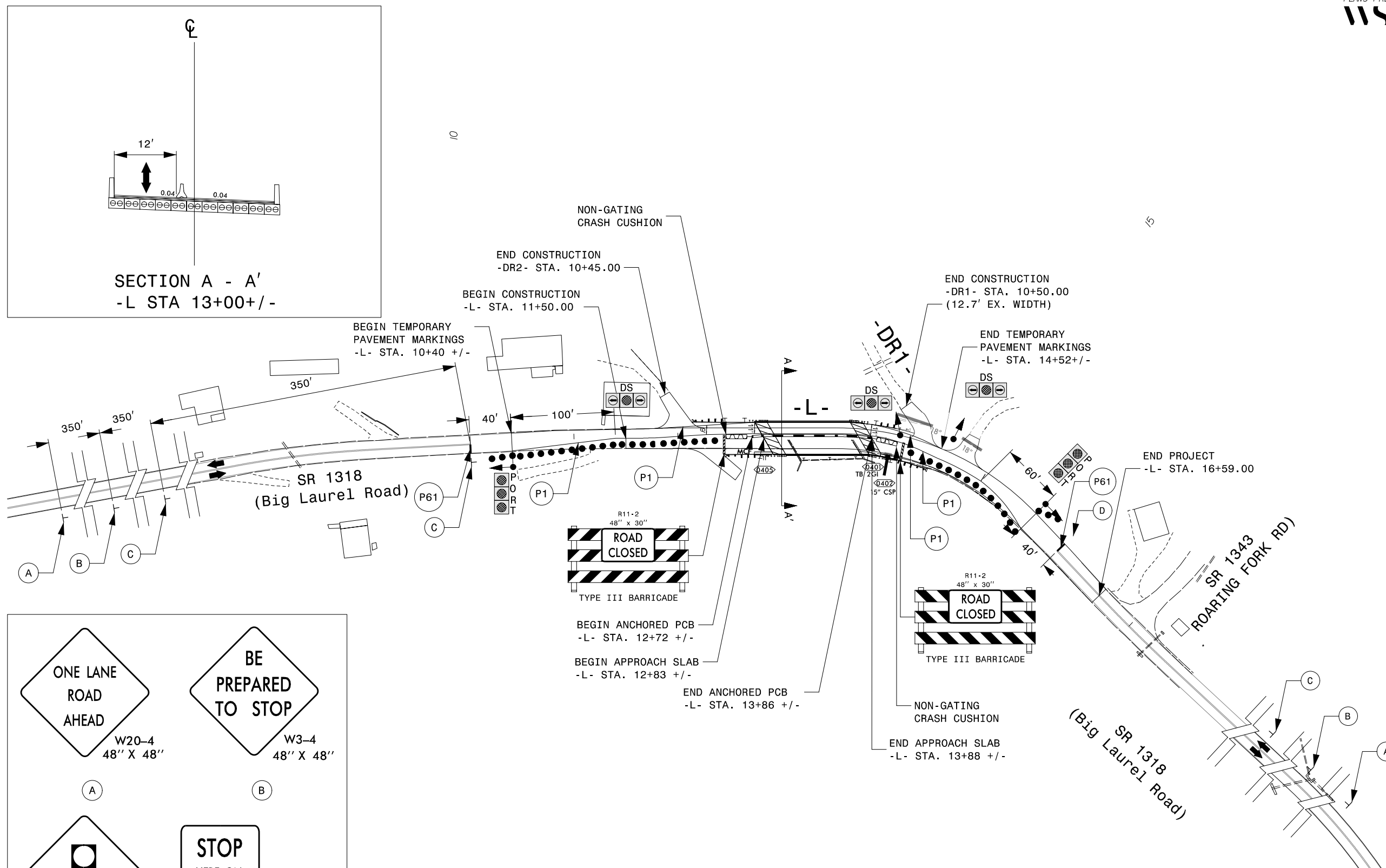
(SEE SHEET TMP-02A FOR
TEMPORARY SHORING NOTES)

2 QUANTITY = 111 SF

TEMPORARY SHORING
FROM STA. 13+65+/-, 5.3'
TO STA. 13+87+/-, 5.3'

(SEE SHEET TMP-02 FOR
TEMPORARY SHORING NOTES)

APPROVED: _____ DATE: _____ Signed by: <i>David W. Bisette</i> 8/20/2026 DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	 	TEMPORARY TRAFFIC CONTROL PHASE I, STEPS 3 THRU 7
---	------	--



APPROVED: _____

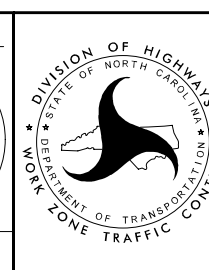
DATE: _____

Signed By: _____

David W. Bisette

9/1/2026

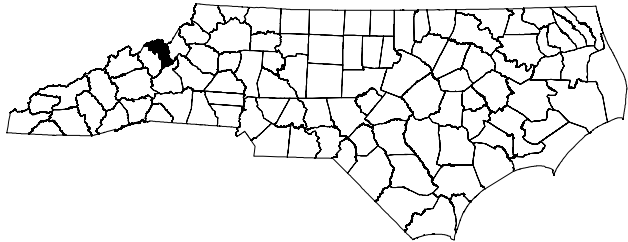
**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**



TEMPORARY TRAFFIC CONTROL
PHASE II

14:26:57 PM
600090 PMP - tsh.dgn
9/11/2026

CONTRACT: DM00401 PROJECT: BP13-R014



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING PLANS
MADISON COUNTY

LOCATION: BRIDGE NO. 560090 ON SR 1318 (BIG LAUREL ROAD)
OVER BIG LAUREL CREEK

GENERAL NOTES

- 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.
- A) INSTALL PAVEMENT MARKINGS AND PAVEMENT MARKERS ON THE FINAL SURFACE AS FOLLOWS:
- | ROAD NAME | MARKING | MARKER |
|-----------|---------|--------|
| ALL | PAINT | NONE |
| BRIDGE | PAINT | NONE |
- B) PLACE TWO APPLICATIONS OF PAINT PAVEMENT MARKINGS ON THE FINAL WEARING SURFACE. PLACE THE SECOND APPLICATION OF PAINT UPON SUFFICIENT DRYING TIME OF THE FIRST.
- C) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.
- D) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS.
- E) PASSING ZONES WILL BE DETERMINED IN THE FIELD AND MUST BE APPROVED BY THE ENGINEER.
- F) MARKERS ARE TO BE SPACED ACCORDING TO THE ROADWAY STANDARD DRAWINGS.
- G) SEE ROADWAY PLANS FOR GUARD/GUIDE RAIL DETAILS.

INDEX

SHEET NO.	DESCRIPTION
PMP-1	TITLE SHEET, INDEX, GENERAL NOTES & ROADWAY STANDARD DRAWINGS
PMP-1A	DETAIL IN LIEU OF STANDARD; PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
PMP-2	PROPOSED PAVEMENT MARKING PLAN SHEET

ROADWAY STANDARD DRAWING

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2024 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTILANE ROADWAYS
1205.12	PAVEMENT MARKINGS - BRIDGES
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION



WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
NC LIC. NO. F-0165

PLAN PREPARED BY:

ERIC W BOWMAN, PE SR. TRANSPORTATION DESIGNER
SAYMA AFREEN TRANSPORATION DESIGNER

TIP NO.	SHEET NO.
BP13-R014	PMP - 1
APPROVED: _____	
DATE: _____	
SEAL	
	
9/11/2026	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

PROJECT REFERENCE NO.	SHEET NO.
BP13-R014	PMP-1A

CONTINUOUS LINES EDGE LINE YELLOW OR WHITE 4" / 6" LANE LINE WHITE 4" / 6" CENTER LINE YELLOW 4" / 6" GORE LINE WHITE 8" / 12" DIAGONAL LINE YELLOW OR WHITE 12" 45 MPH OR HIGHER 8" LESS THAN 45 MPH 4"-6" FOR BICYCLE FACILITIES CROSSWALK LINE WHITE 8" TRANSVERSE 24" LONGITUDINAL RxR LINE WHITE 16" STOP OR TRANSVERSE BAR WHITE 24"	10'-30'/SP SKIP LINE UNLESS OTHERWISE SHOWN, USE 10'-30'/SP SKIPS FOR SKIP LANE LINES AND SKIP CENTER LINES. 10' 30' 4" / 6" YELLOW OR WHITE	2'-6'/SP MINI-SKIP LINE UNLESS OTHERWISE SHOWN, USE 2'-6'/SP MINI-SKIPS FOR LANE LINE EXTENSIONS THROUGH INTERSECTIONS, EDGE LINE EXTENSIONS THROUGH INTERSECTIONS AND BICYCLE LANE EXTENSIONS. 2' 6' 4" / 6" YELLOW OR WHITE	STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.
	3'-3'/SP MINI-SKIP LINE UNLESS OTHERWISE SHOWN, USE 3'-3'/SP MINI-SKIPS FOR THE WHITE EDGE LINE EXTENSIONS AT ROUNDABOUTS. 3' 3' 8" / 12" WHITE	3'-9'/SP MINI-SKIP LINE UNLESS OTHERWISE SHOWN, USE 3'-9'/SP MINI-SKIPS FOR MINI-SKIP LANE LINES, LINE EXTENSIONS THROUGH TAPERS, AND MINI-SKIPS USED FOR BICYCLE LANE LINES. 3' 9' 4" / 6" WHITE	
GENERAL NOTES: 1- USE 6" LANE, EDGE, AND CENTER LINES ON ALL FULL CONTROL OF ACCESS FACILITIES AND OTHER ROUTES AS DIRECTED BY THE ENGINEER. 2- LANE LINES INDICATED AS "WIDE" ON THE ROADWAY STANDARD DRAWINGS SHALL BE AT LEAST TWICE THE WIDTH OF THE NORMAL LINE. 3- GORE LINES SHALL BE TWICE THE WIDTH OF THE NORMAL LINE.		ROADWAY DETAIL DRAWING FOR PAVEMENT MARKINGS LINE TYPES AND OFFSETS	
		SHEET 1 OF 2 1205D01	

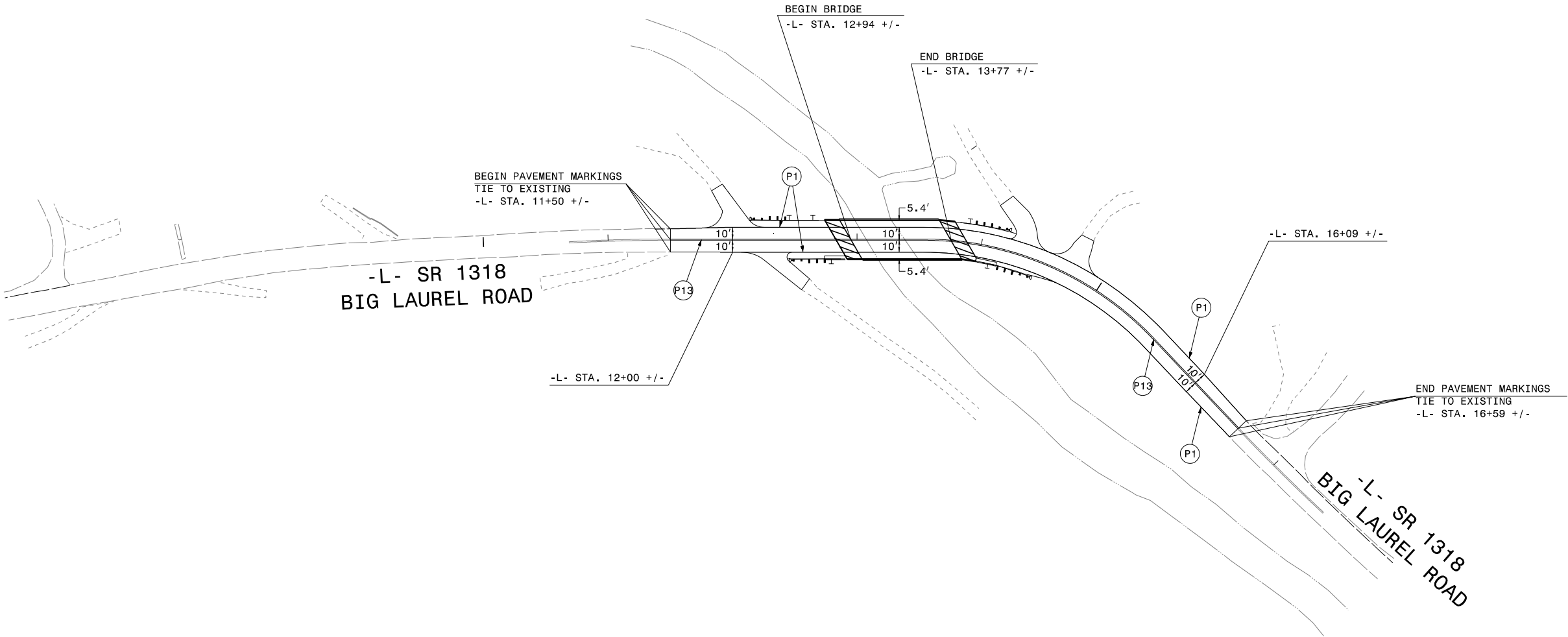


Signed by:
Matthew V. Springer, PE
SC20001600594432

9/11/2026

CONTRACTS STANDARDS AND DEVELOPMENT UNIT	
Office 919-707-8950	FAX 919-250-4119
SEE TITLE BLOCK	
ORIGINAL BY: M.V. SPRINGER DATE: 2-15-24	
MODIFIED BY: _____	DATE: _____
CHECKED BY: _____	DATE: _____
FILE SPEC.: _____	

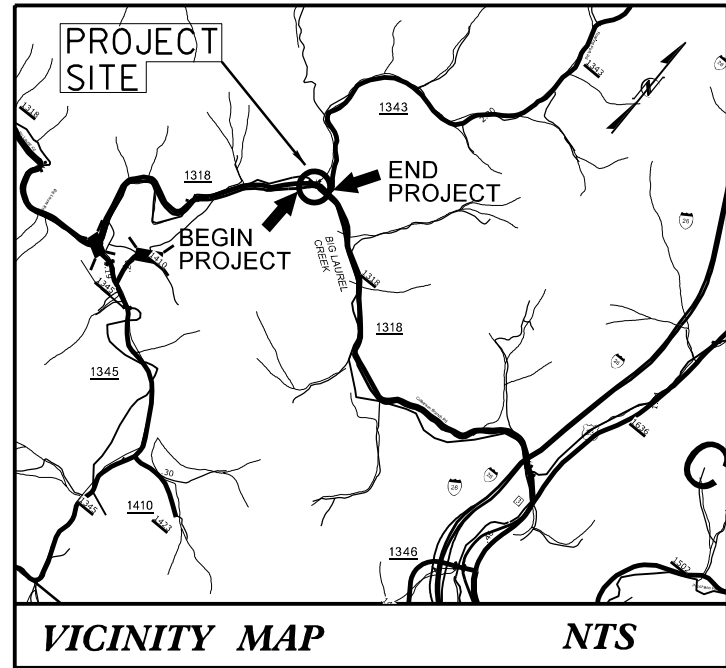
<u>SYMBOL</u>	<u>DESCRIPTION</u>
	<u>PAINT (4")</u>
P1	WHITE EDGELINE
P13	YELLOW DOUBLE CENTER



PAVEMENT MARKING PLAN SHEET

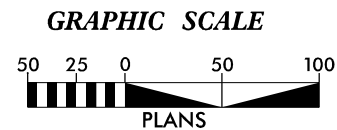
9/10/2026
Parsons Brinckerhoff
ations, Parsons Brinckerhoff, Division 13 Bridges Management, R013.VHW\Erosion Control\CADD\560090_EC_01.dgn

TIP PROJECT: BP13-R014



INDEX OF EROSION CONTROL SHEETS:

SHEET NUMBER	SHEET DESCRIPTION
EC-1	EROSION CONTROL TITLE SHEET
EC-2	EROSION CONTROL LEGEND
EC-2A	CONCRETE WASHOUT DETAIL
EC-3	SOIL STABILIZATION SUMMARY
EC-3A	SOIL STABILIZATION TIMEFRAMES
EC-4 THRU EC-5	EROSION CONTROL PLAN SHEETS

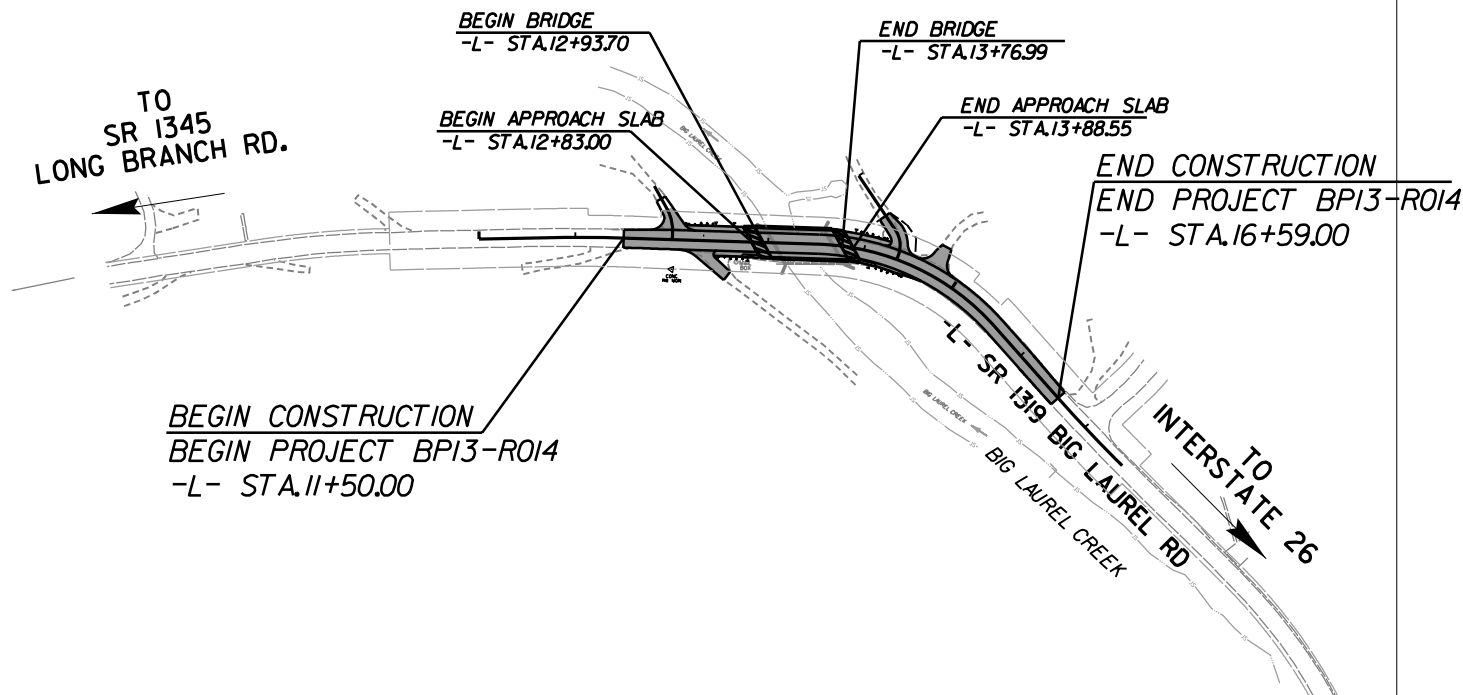


THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE APPLICABLE REGULATIONS SET FORTH BY THE NCG-010000 GENERAL CONSTRUCTION PERMIT ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY DIVISION OF ENERGY, MINERAL AND LAND RESOURCES.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL
MADISON COUNTY

LOCATION: BRIDGE NO. 560090 ON SR 1318 (BIG LAUREL ROAD)
OVER BIG LAUREL CREEK

TYPE OF WORK: GRADING, PAVING, DRAINAGE, & STRUCTURE



STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP13-R014	EC-1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
BP13.R014	N/A	PE	
BP13.R014	N/A	R/W & UTIL.	

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

ENVIRONMENTALLY SENSITIVE AREA(S) EXIST ON THIS PROJECT

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

HIGH QUALITY WATER(S) EXIST ON THIS PROJECT

High Quality Water Zone(s) Exist
From Sta. -L- 10+00
to Sta. -L- 16+60
Refer To E. C. Special Provisions for Special Considerations.

THIS PROJECT HAS BEEN DESIGNED TO SENSITIVE WATERSHED STANDARDS.

wsp

Prepared In the Office of:
WSP USA
434 FAYETTEVILLE STREET, SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

Designed by:
James Owen Britt 4228
NAME LEVEL III CERTIFICATION NO.

Roadway Standard Drawings

The "Roadway Standard Drawings"- Roadway Design Unit - N. C. Department of Transportation - Raleigh, N. C., dated January 2024 and the latest revision thereto are applicable to this project and by reference hereby are considered a part of these plans.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

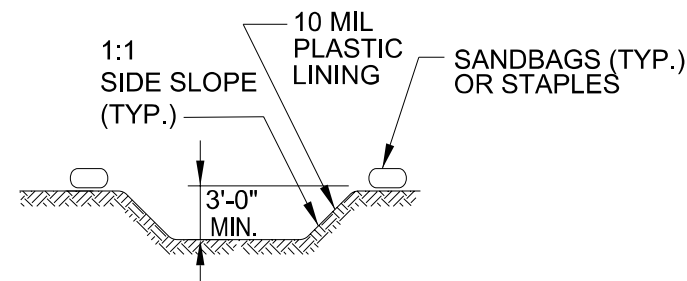
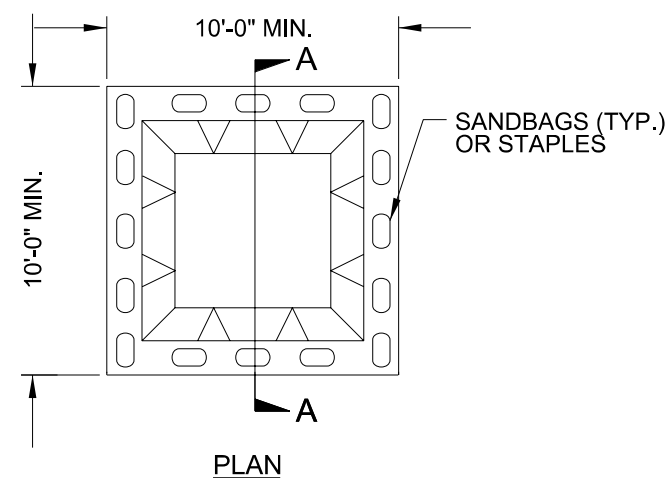
PROJECT REFERENCE NO.	SHEET NO.
BP13-R014	EC-02
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

EROSION & SEDIMENT CONTROL LEGEND

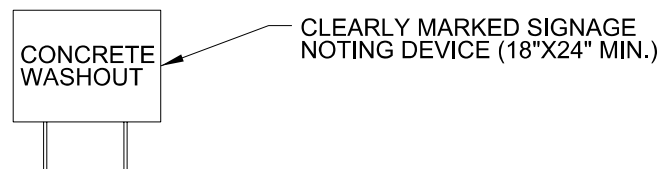
Std. #	Description	Symbol	Std. #	Description	Symbol
1605.01	Temporary Silt Fence		1633.01	Temporary Rock Silt Check Type A	
1606.01	Special Sediment Control Fence		1633.02	Temporary Rock Silt Check Type B	
1622.01	Temporary Berms and Slope Drains		1633.03	Temporary Rock Silt Check Type A with Excelsior Matting and Flocculant	
1630.02	Silt Basin Type B		1634.01	Temporary Rock Sediment Dam Type A	
1630.03	Temporary Silt Ditch		1634.02	Temporary Rock Sediment Dam Type B	
1630.04	Stilling Basin		1635.01	Rock Pipe Inlet Sediment Trap Type A	
1630.05	Temporary Diversion		1635.02	Rock Pipe Inlet Sediment Trap Type B	
1630.06	Special Stilling Basin		1636.01	Excelsior Wattle Check	
1630.07	Skimmer Basin		1636.01	Excelsior Wattle Check with Flocculant	
1630.08	Tiered Skimmer Basin		1636.01	Coir Fiber Wattle Check	
1630.09	Earthen Dam with Skimmer		1636.01	Coir Fiber Wattle Check with Flocculant	
	Infiltration Basin		1636.02	Silt Fence Excelsior Wattle Break	
	Rock Inlet Sediment Trap:			Silt Fence Coir Fiber Wattle Break	
1632.01	Type A		1636.03	Excelsior Wattle Barrier	
1632.02	Type B		1636.03	Coir Fiber Wattle Barrier	
1632.03	Type C				

ONSITE CONCRETE WASHOUT STRUCTURE WITH LINER

PROJECT REFERENCE NO.	SHEET NO.
<i>BPI3-R014</i>	<i>EC-2A</i>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

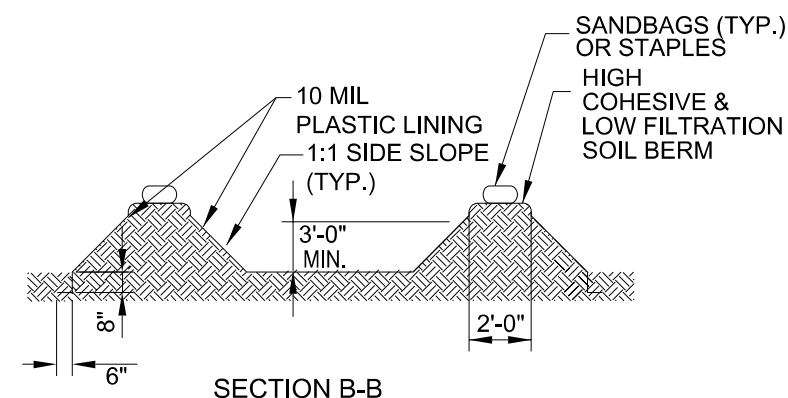
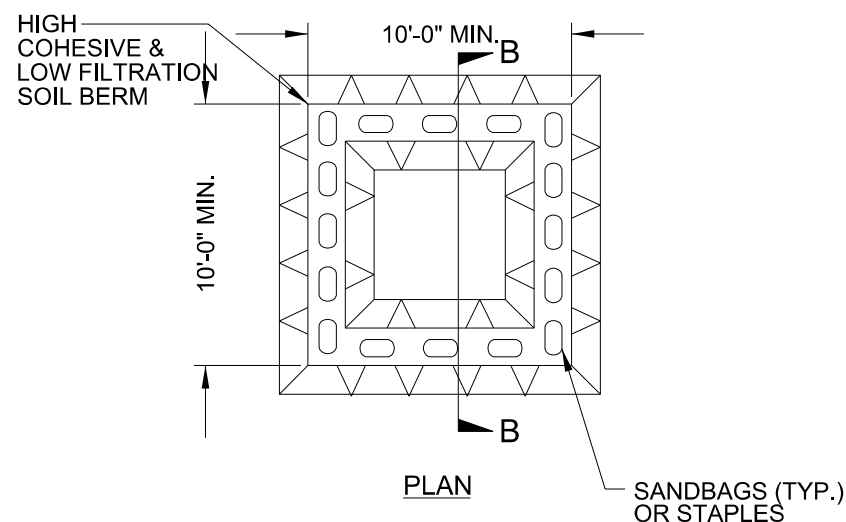


SECTION A-A

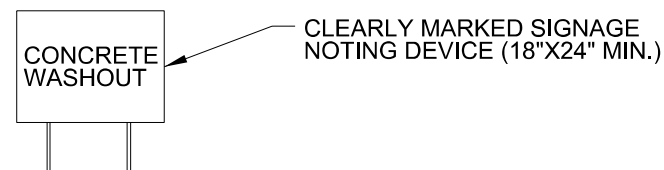


BELOW GRADE WASHOUT STRUCTURE
NOT TO SCALE

- NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD
 2. THE CONCRETE WASHOUT STRUCTURES SHALL BE MAINTAINED WHEN THE LIQUID AND/OR SOLID REACHES 75% OF THE STRUCTURES CAPACITY TO PROVIDE ADEQUATE HOLDING CAPACITY WITH A MINIMUM 12 INCHES OF FREEBOARD.
 3. CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARLY MARKED WITH SIGNAGE NOTING DEVICE.



SECTION B-B



ABOVE GRADE WASHOUT STRUCTURE
NOT TO SCALE

- NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD
 2. THE CONCRETE WASHOUT STRUCTURES SHALL BE MAINTAINED WHEN THE LIQUID AND/OR SOLID REACHES 75% OF THE STRUCTURES CAPACITY TO PROVIDE ADEQUATE HOLDING CAPACITY WITH A MINIMUM 12 INCHES OF FREEBOARD.
 3. CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARLY MARKED WITH SIGNAGE NOTING DEVICE.

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

PROJECT REFERENCE NO.

SHEET NO.

BPI3-R014

EC-03

ROADWAY DESIGN
ENGINEER

HYDRAULICS
ENGINEER

SOIL STABILIZATION SUMMARY SHEET

STRAW MATTING FOR EROSION CONTROL

[illegible]

STRAW MATTING FOR EROSION CONTROL

[illegible]

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

PROJECT REFERENCE NO.	SHEET NO.
BP13-R014	EC-03A
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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 TO 4:1	14 DAYS	7 DAYS FOR SLOPES GREATER THAN 50' IN LENGTH WITH SLOPES STEEPER THAN 4:1. 7 DAYS FOR PERIMETER DIKES, SWALES, DITCHES PERIMETER SLOPES, AND HQW ZONES
ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1	14 DAYS	7 DAYS FOR PERIMETER DIKES, SWALES, DITCHES PERIMETER SLOPES, AND HQW ZONES

PROJECT REFERENCE NO.	SHEET NO.
BPI3-RO14	EC-4/CONST.4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	PAYMENT DESIGN ENGINEER

EROSION CONTROL PLAN

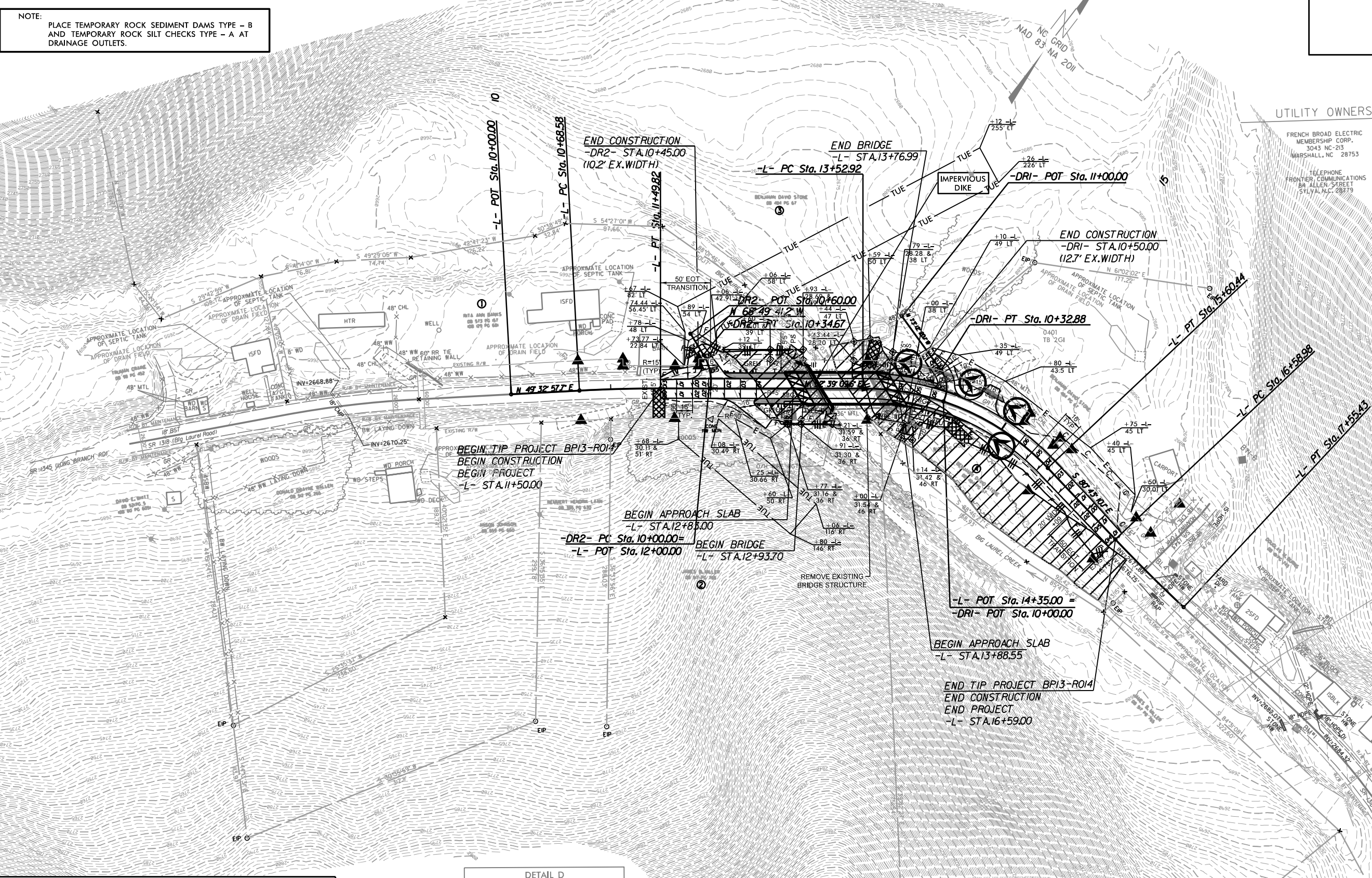
CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 4

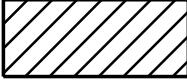
NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE - B
AND TEMPORARY ROCK SILT CHECKS TYPE - A AT
DRAINAGE OUTLETS.

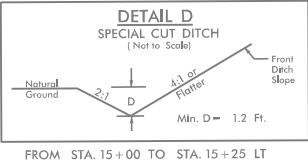
UTILITY OWNERS

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

TELEPHONE
FRONTIER COMMUNICATIONS
84 ALLEN STREET
STAYA, NC 28773



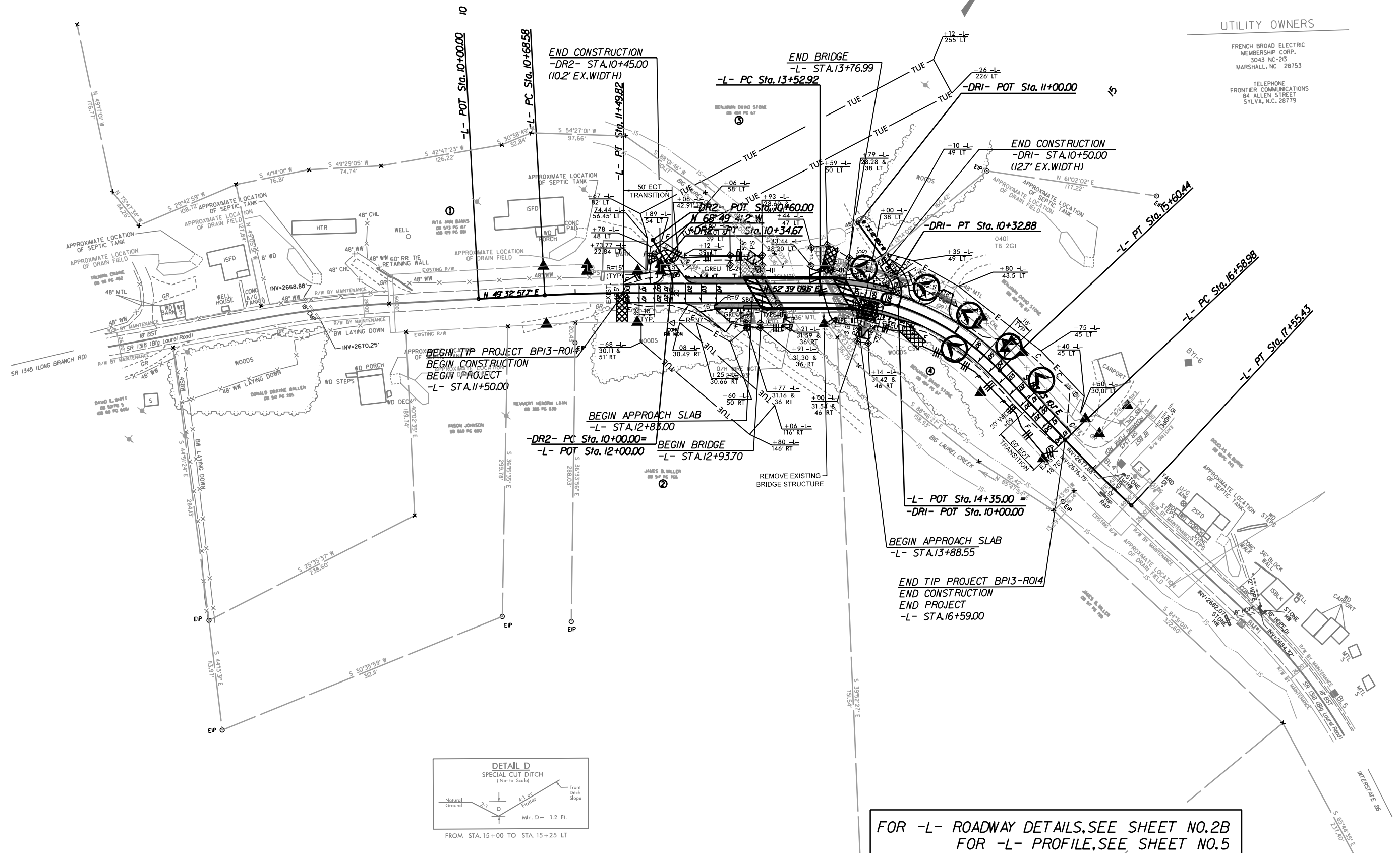
 ENVIRONMENTALLY SENSITIVE AREA
SEE PROJECT SPECIAL PROVISIONS



FOR -L- ROADWAY DETAILS, SEE SHEET NO. 2B
FOR -L- PROFILE, SEE SHEET NO. 5

8/17/99
8/28/2024
C:\Users\jg01\OneDrive\Documents\Projects\BPI3-RO14\Bridges\Management\BPI3-RO14\HWY\Erosion Control\CADD\560090-EC-04.dgn
2015 W Divisions Planning & Design On-Call\1188360 Division 13 Bridges\Management\BPI3-RO14\HWY\Erosion Control\CADD\560090-EC-04.dgn

EROSION CONTROL PLAN



FOR -L- ROADWAY DETAILS, SEE SHEET NO.2B
FOR -L- PROFILE, SEE SHEET NO.5

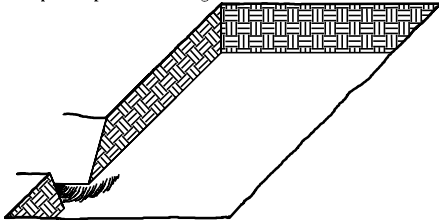
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP13-R014	RF-1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	

PLANTING DETAILS

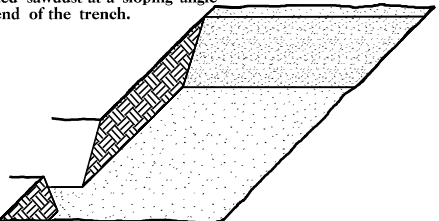
SEEDLING / LINER BAREROOT PLANTING DETAIL

HEALING IN

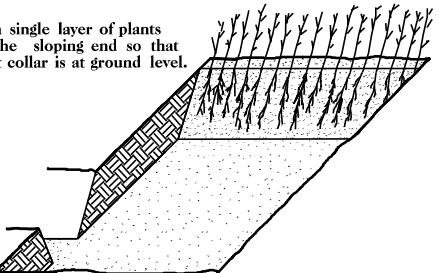
1. Locate a healing-in site in a shady, well protected area.
2. Excavate a flat bottom trench 12 inches deep and provide drainage.



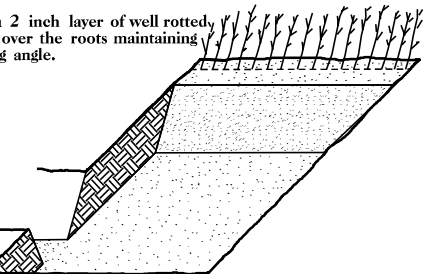
3. Backfill the trench with 2 inches well rotted sawdust. Place a 2 inch layer of well rotted sawdust at a sloping angle at one end of the trench.



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

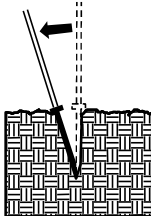


5. Place a 2 inch layer of well rotted sawdust over the roots maintaining a sloping angle.

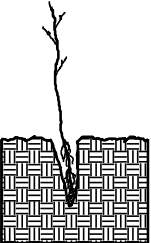


6. Repeat layers of plants and sawdust as necessary and water thoroughly.

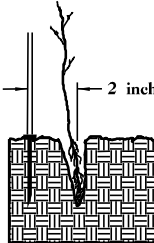
DIBBLE PLANTING METHOD USING THE KBC PLANTING BAR



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



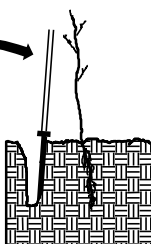
2. Remove planting bar and place seedling at correct depth.



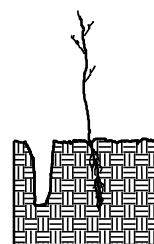
3. Insert planting bar 2 inches toward planter from seedling.



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



KBC PLANTING BAR
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 BE 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 BR
25% PLATANUS OCCIDENTALIS	AMERICAN SYCAMORE	12 in - 18 in BR
25% NYSSA SYLVATICA	BLACK GUM	12 in - 18 in BR
25% BETULA NIGRA	RIVER BIRCH	12 in - 18 in BR

REFORESTATION DETAIL SHEET

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

9/14/2026
U:\Projects\001_Preconstruction\Div 13\BP13-R014_Madison\CADD_Files\560090_SGN_Signing.dgn
User: jmartinez

CONTRACT: DM00401 T.I.P.: BP13-R014

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

SIGNING PLAN
MADISON COUNTY

LOCATION: BRIDGE No. 560090 ON SR 1318 (BIG LAUREL ROAD)
OVER BIG LAUREL CREEK

PROJECT REFERENCE NO.
BP13-R014

SHEET NO.
SIGN-01

APPROVED:

DocuSigned by:
Jose G. Martinez
4476B41BCB6451

DATE: 09/14/2026

SEAL


DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

SUMMARY OF QUANTITIES

ITEM NO.		ITEM DESCRIPTION	QUANTITY	UNIT
DESC. NO.	SECT. NO.			
4072000000	903	SUPPORTS, 3 LB STEEL U-CHANNEL	200	L.F.
4102000000	904	SIGN ERECTION, TYPE E	14	EA.

GENERAL NOTES

- . SIGNS FURNISHED BY STATE
- . CONFIRM IN WRITING AT LEAST 4 MONTHS IN ADVANCE, THE ACTUAL DATE THE DEPARTMENT FURNISHED SIGNS WILL BE REQUIRED.
- . IF REMOVAL OR RELOCATION OF SIGNS ON PRIVATE STREET (NON-STATE MAINTAINED) IS REQUIRED DUE TO CONSTRUCTION, THE CONTRACTOR SHALL INFORM THE ENGINEER. THE WORK WILL BE COMPLETED BY OTHERS.
- . WHEN NOT STATIONED OR DIMENSIONED ON PLANS, ALL 'E' AND 'F' SIGNS SHALL BE FIELD LOCATED BY THE ENGINEER
- . ALL EXISTING SIGNS ON "U" CHANNEL POST WITHIN THE PROJECT LIMITS SHALL BE REMOVED AND DISPOSED OF UNLESS OTHERWISE NOTED ON PLANS.
- . WHEN EXISTING SIGNS ARE REMOVED AND INSTALLED ON NEW SUPPORTS, THE RE-ERECTION SHALL IMMEDIATELY FOLLOW THE REMOVAL.
- . THE BACKGROUND FOR TYPE E & F SIGNS SHALL BE TYPE C REFLECTIVE SHEETING.
- . SEE ROADWAY PLANS FOR GUARD/GUIDE RAIL DETAILS.

E SIGNS

401 QUANTITY REQ'D _1_  30" X 30" W1-1R ONE "U" POST PER SIGN	402 QUANTITY REQ'D _1_  30" X 30" W1-1L ONE "U" POST PER SIGN	403 QUANTITY REQ'D _1_  30" X 30" W1-1aR ONE "U" POST PER SIGN	404 QUANTITY REQ'D _1_  30" X 30" W1-1aL ONE "U" POST PER SIGN
405 QUANTITY REQ'D _4_  18" X 24" W1-8R ONE "U" POST PER SIGN	406 QUANTITY REQ'D _4_  18" X 24" W1-8L ONE "U" POST PER SIGN	407 QUANTITY REQ'D _2_ 25 M P H 18" X 18" W13-1P MOUNT BELOW SIGN 401 IN .1. INSTALLATIONS MOUNT BELOW SIGN 402 IN .1. INSTALLATIONS	

ROADWAY STANDARD DRAWING

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2024 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
904.10	ORIENTATION OF GROUND MOUNTED SIGNS
904.50	MOUNTING OF TYPE 'D', 'E' AND 'F' SIGNS ON 'U' CHANNEL POSTS

INDEX

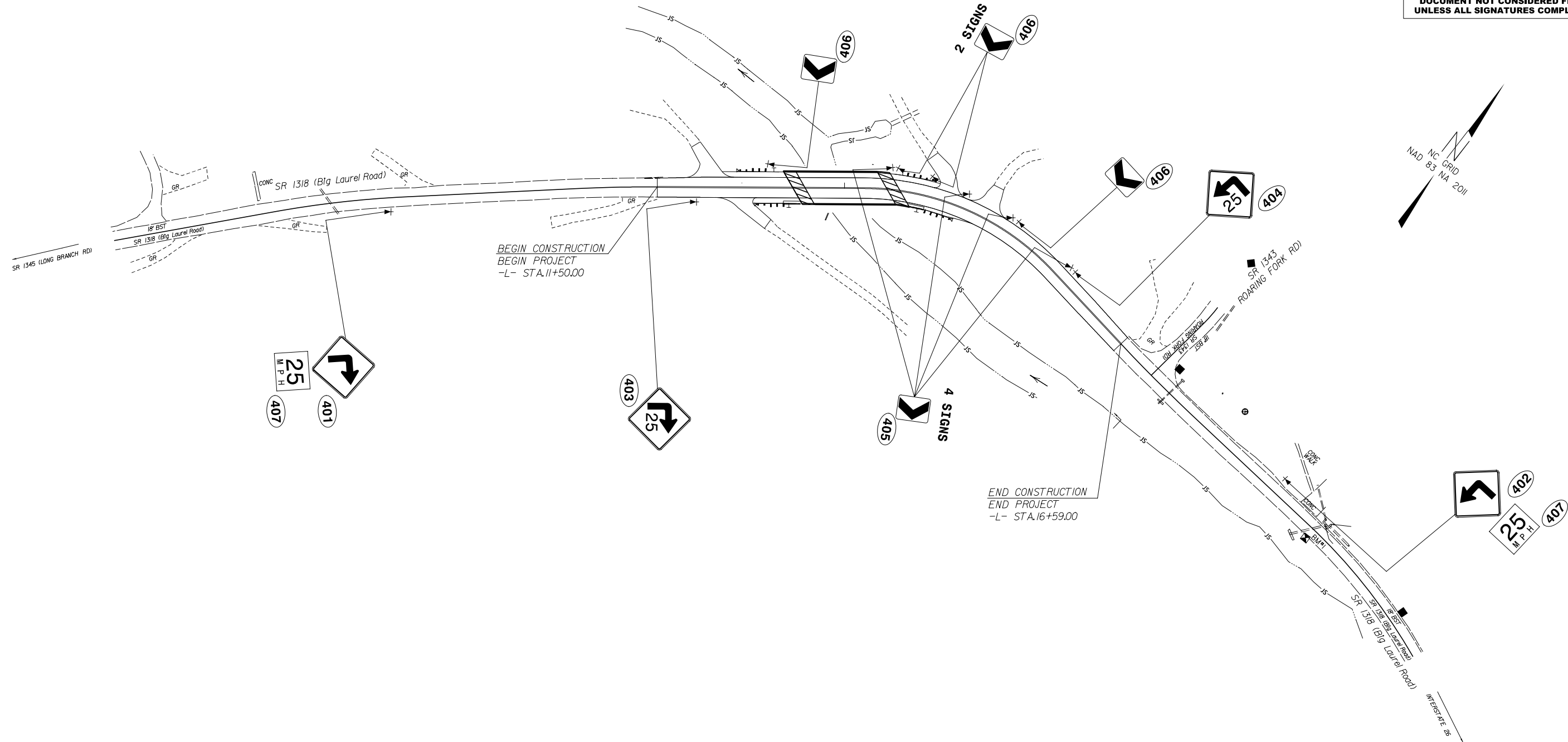
SHEET NO.	DESCRIPTION
SIGN-1	TITLE SHEET, E SIGNS
SIGN-2	SIGNING PLAN SHEET

PLAN PREPARED BY: N.C.D.O.T. SIGNING AND DELINEATION UNIT

K. L. JORDAN SIGNING & DELINEATION STATE ENGINEER
J. G. MARTINEZ, PE SIGNING & DELINEATION REGIONAL ENGINEER



7/16/2026
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User: jmartinez

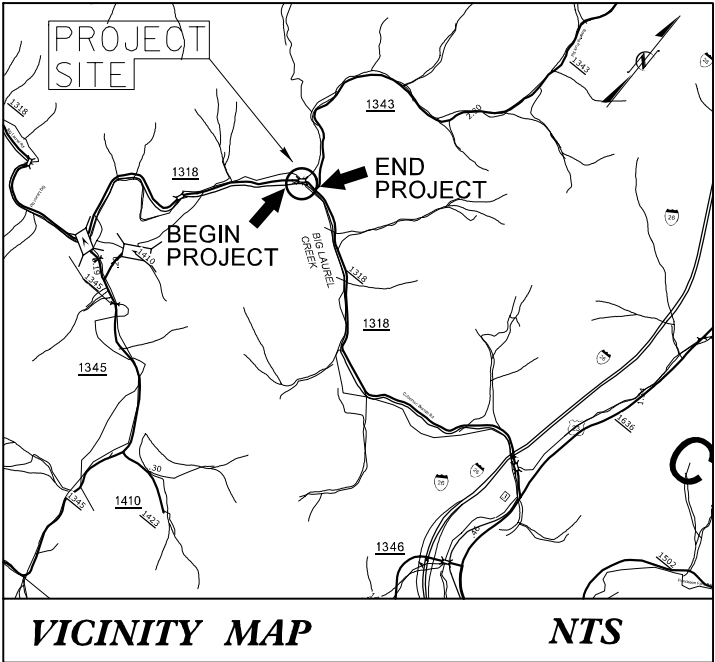


PROJECT REFERENCE NO. BP13-R014	SHEET NO. SIGN-02
APPROVED: <i>Jose G. Martinez</i> 447086418C886491	
DATE: 07/16/2026	
SEAL 	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

PROPOSED SIGNS

TIP PROJECT: BPI3.R014

CONTRACT: DM00401



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

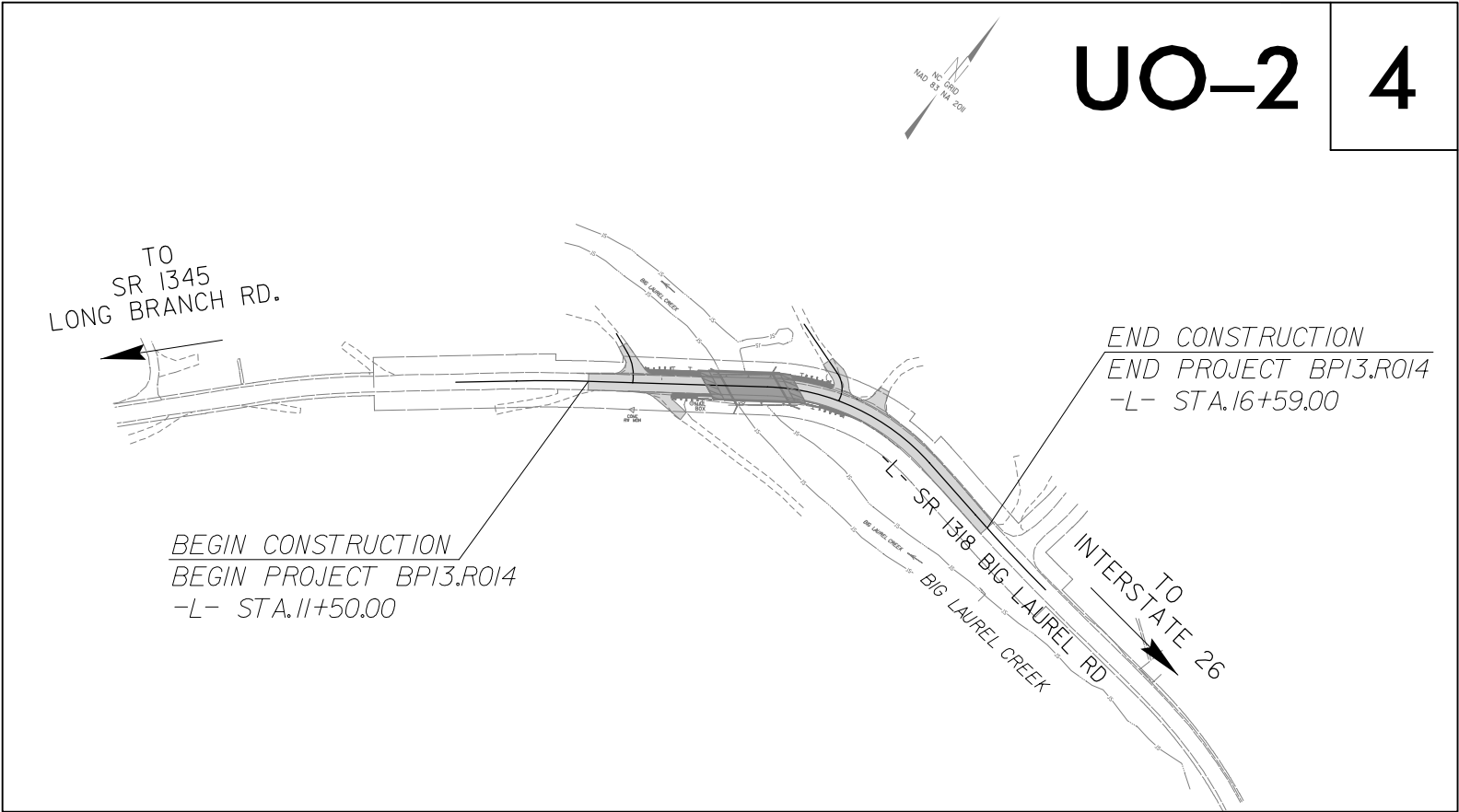
UTILITIES BY OTHERS PLANS
MADISON COUNTY

LOCATION: BRIDGE NO. 560090 ON SR 1318 (BIG LAUREL ROAD)
OVER BIG LAUREL CREEK

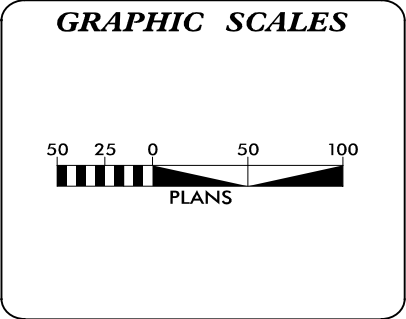
TYPE OF WORK: GRADING, PAVING, DRAINAGE, & STRUCTURE

T.I.P.NO.	SHEET NO.
BP13.R014	UO-1

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



UBO PLANS ARE FOR INFORMATION ONLY AND ARE NOT TO BE USED FOR CONSTRUCTION. ALL PROPOSED RELOCATION INFORMATION SHOWN ON THE UBO PLANS WAS PROVIDED BY 3RD PARTIES. WSP USA, E&i ASSUMES NO RESPONSIBILITY OR LIABILITY FOR THE ACCURACY OR VALIDITY OF 3RD PARTY INFORMATION.



INDEX OF SHEETS	
SHEET NO.:	DESCRIPTION:
UO-1	TITLE SHEET
UO-2	UBO PLAN SHEET

UTILITY OWNERS WITH CONFLICTS
(A) POWER - FRENCH BROAD EMC (B) COMMUNICATION - FRONTIER COMMUNICATIONS

PREPARED IN THE OFFICE OF:

WSP USA
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
FAX: 1.919.836.4099
LICENSE NO. F-0165

BRANDT BROUGHTON, PE PROJECT UTILITY COORDINATOR

DIVISION OF HIGHWAYS
UTILITIES UNIT
1555 MAIL SERVICES CENTER
RALEIGH, NC 27699-1555
PHONE (919) 707-6690
FAX (919) 250-4151

R. KEITH RADCLIFF DIVISION SENIOR UTILITY COORDINATOR
JOHN D. METCALF DIVISION UTILITY COORDINATOR

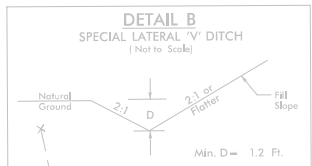
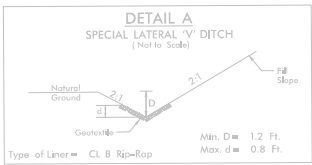
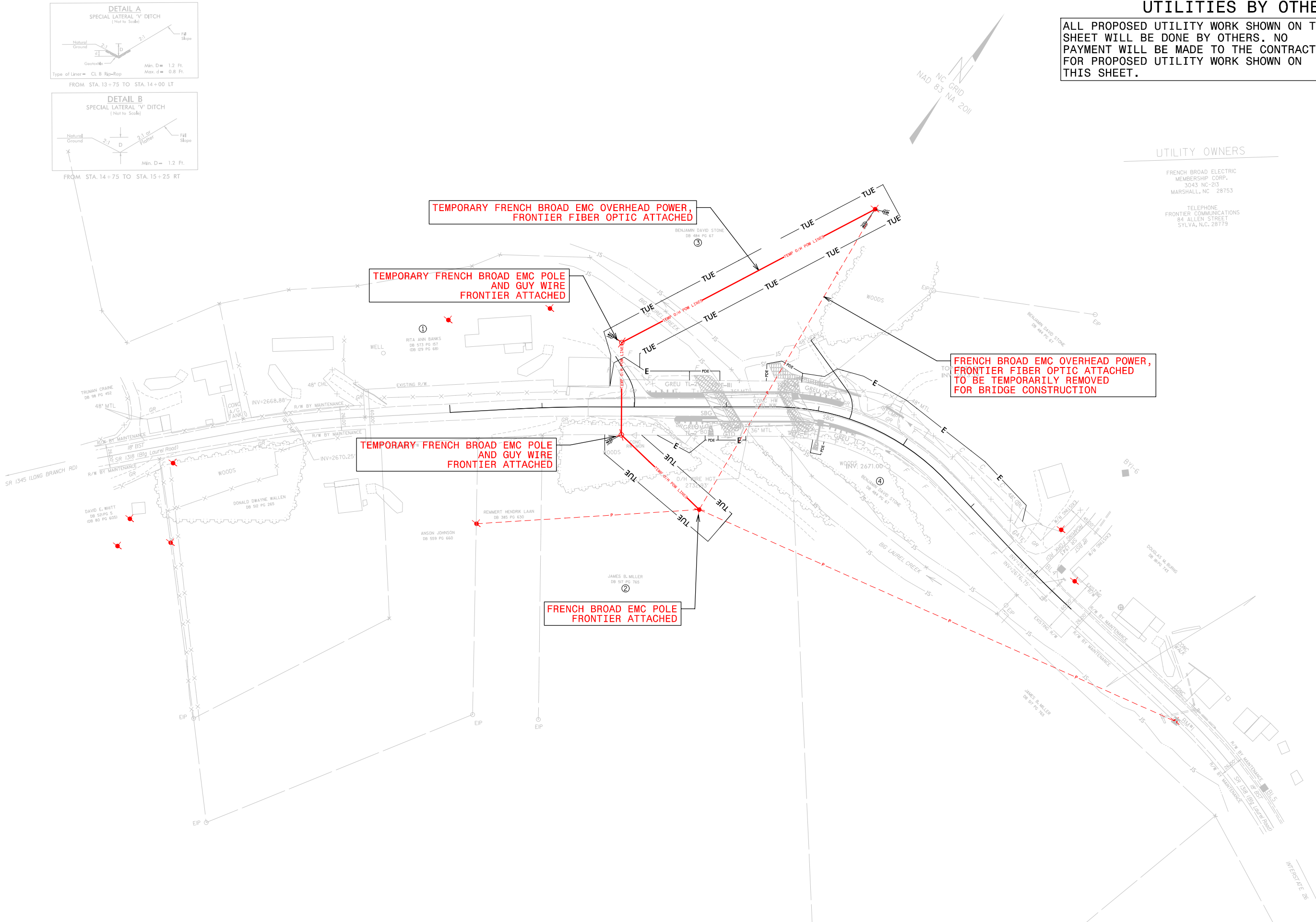
UTILITIES BY OTHERS

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

UTILITY OWNERS

FRENCH BROAD ELECTRIC
MEMBERSHIP CORP.
3043 NC-253
MARSHALL, NC 28753

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

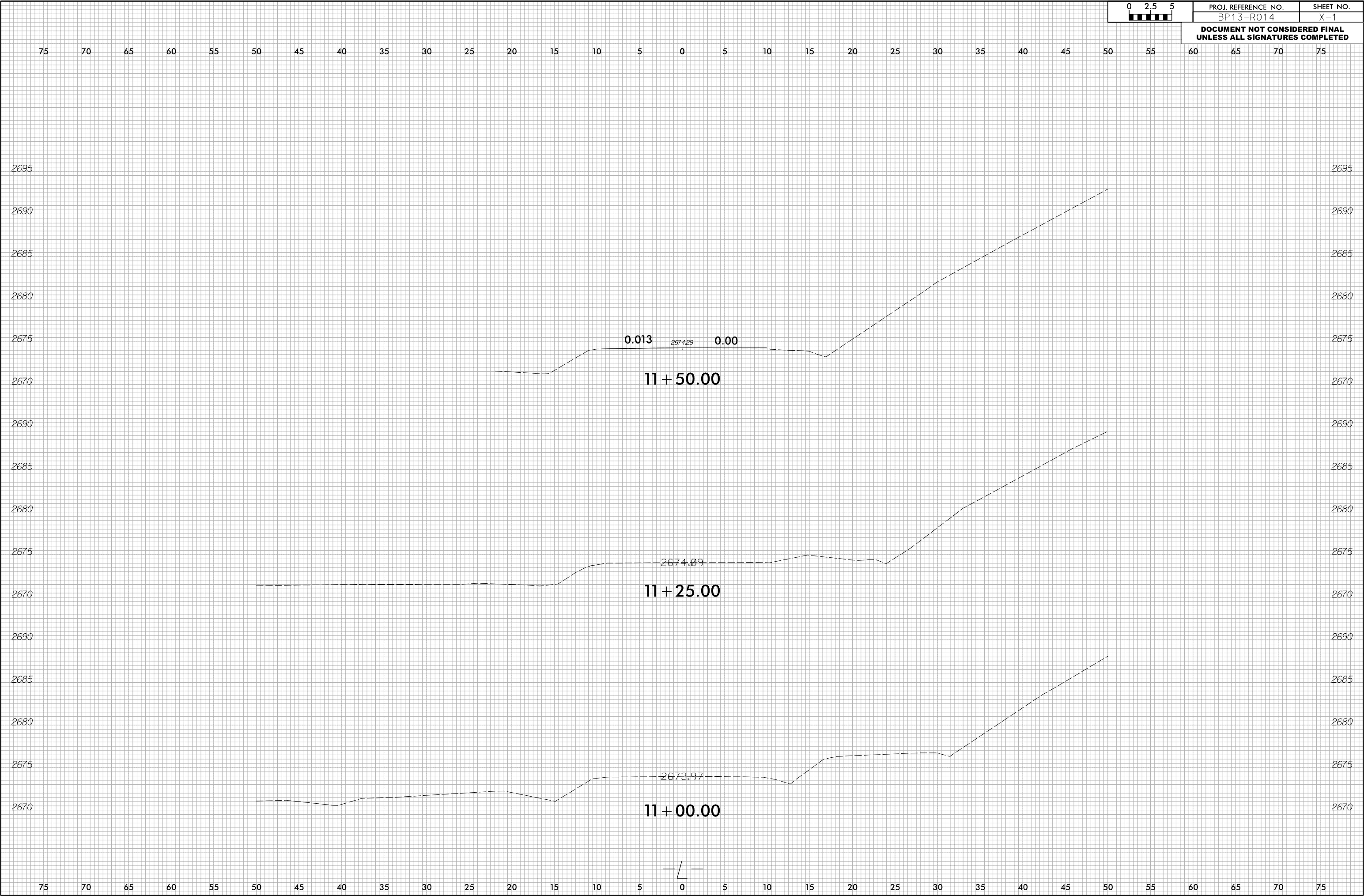


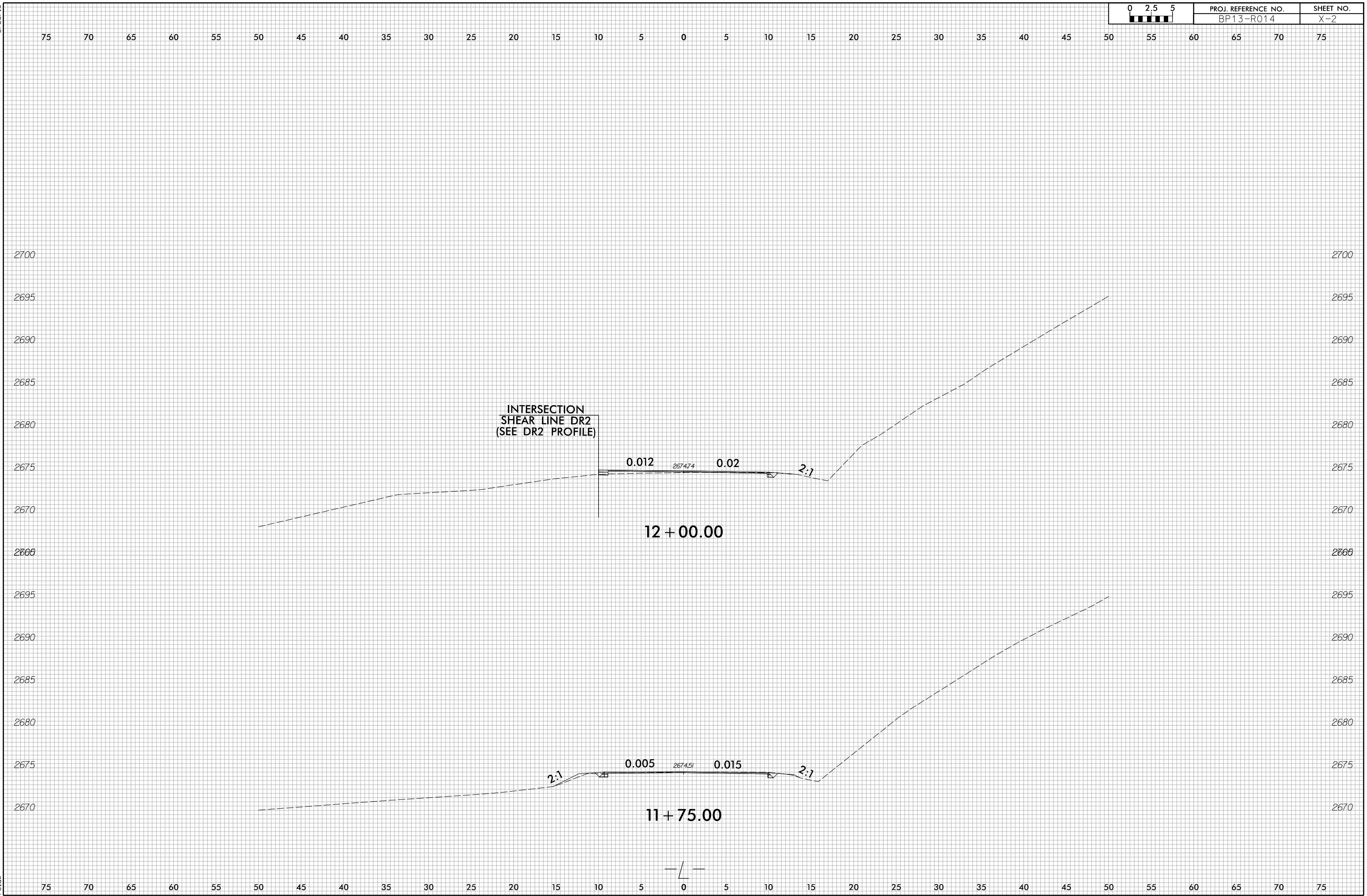
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10/24/2024
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DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

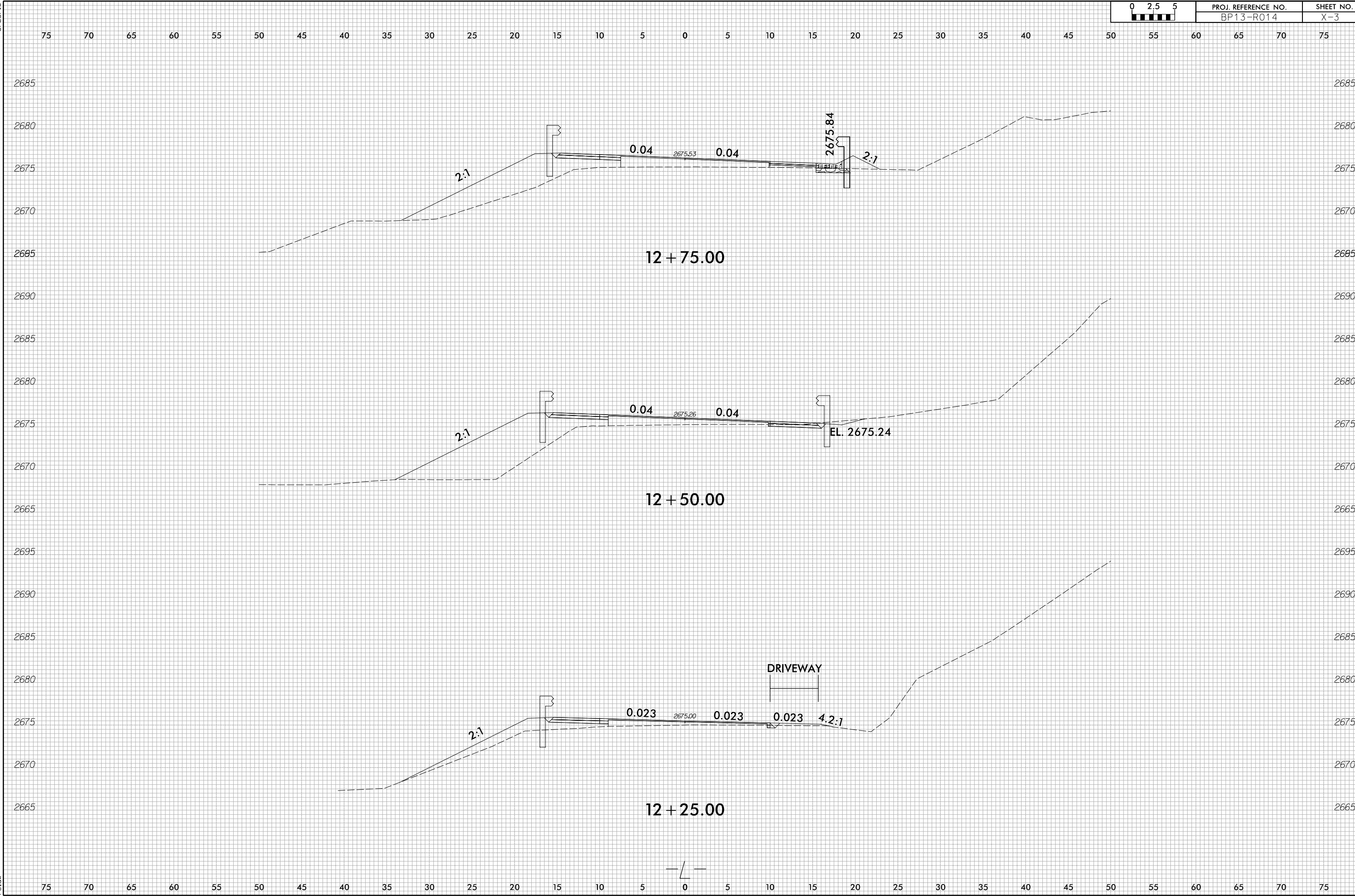




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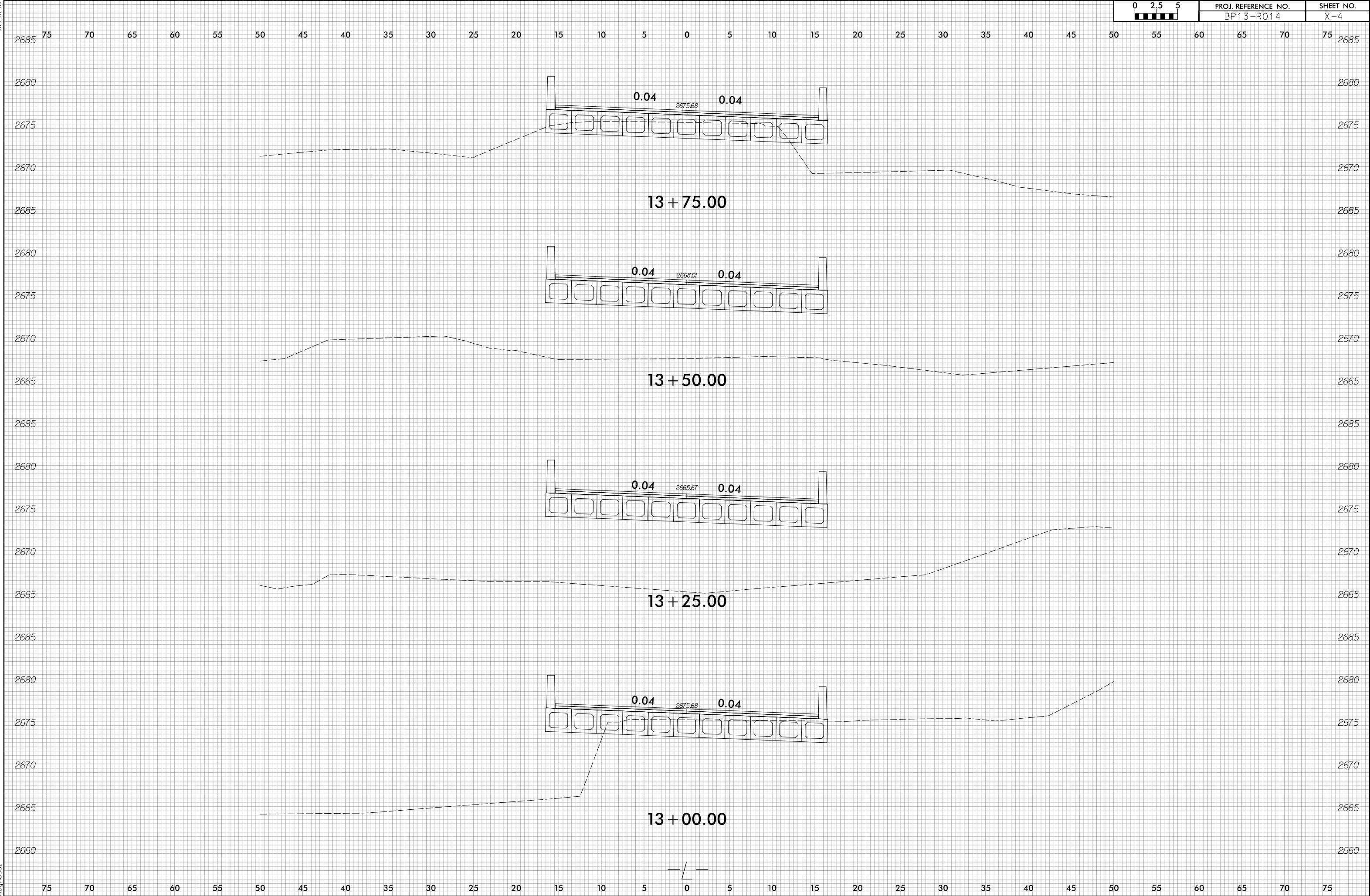
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6/23/16

9/1/2026
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Haynes

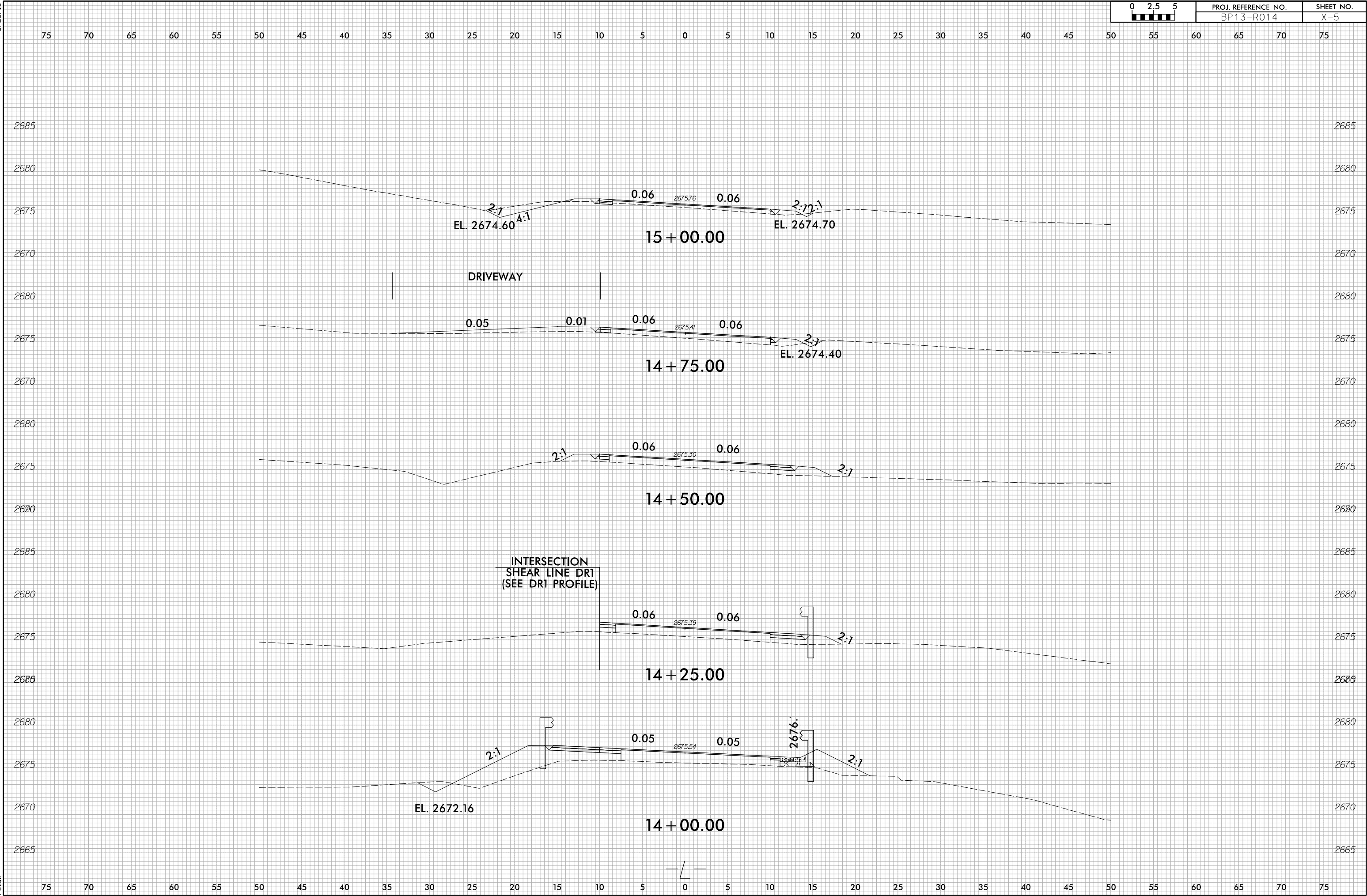
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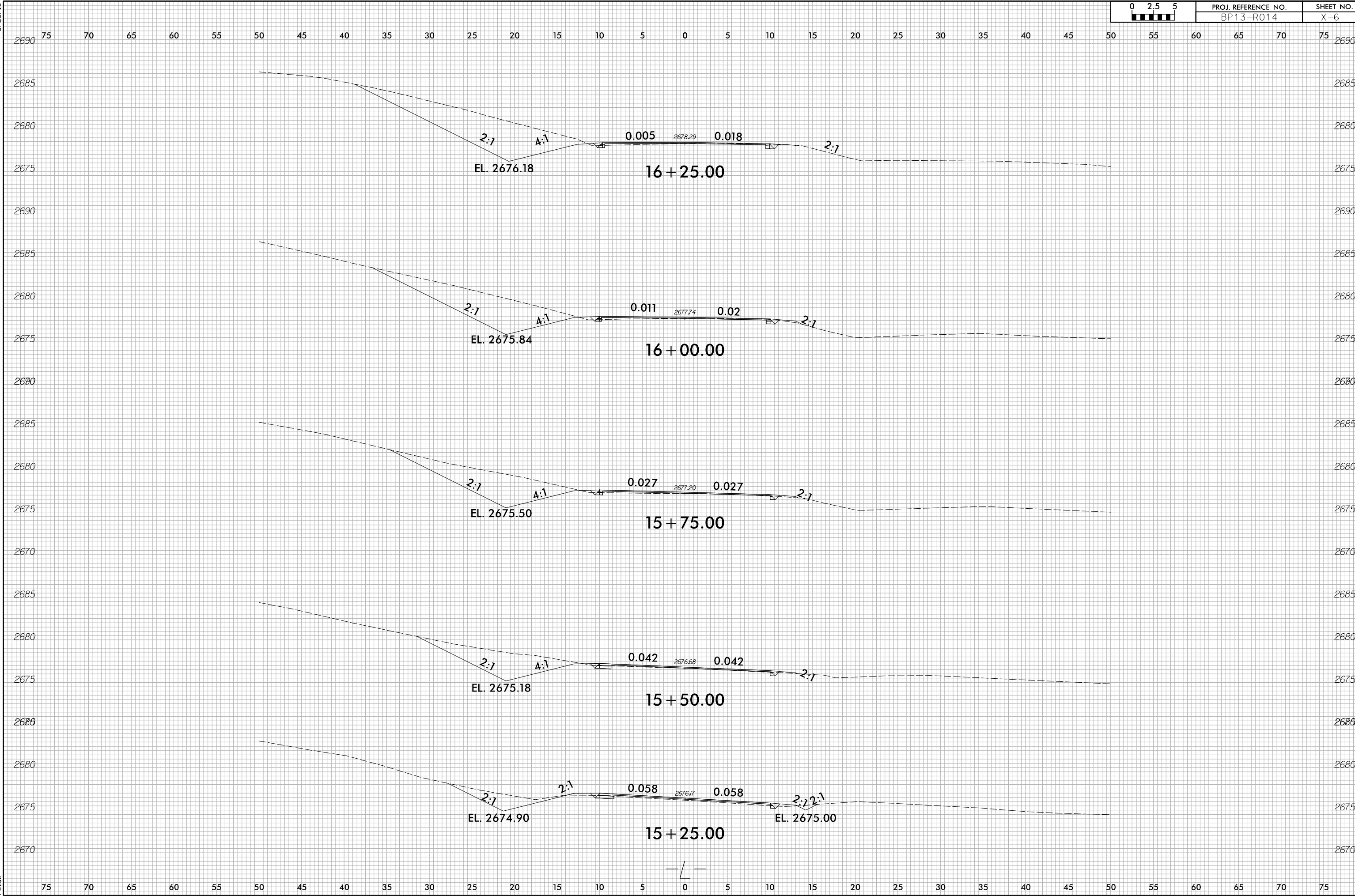
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6/23/16

10/24/2024
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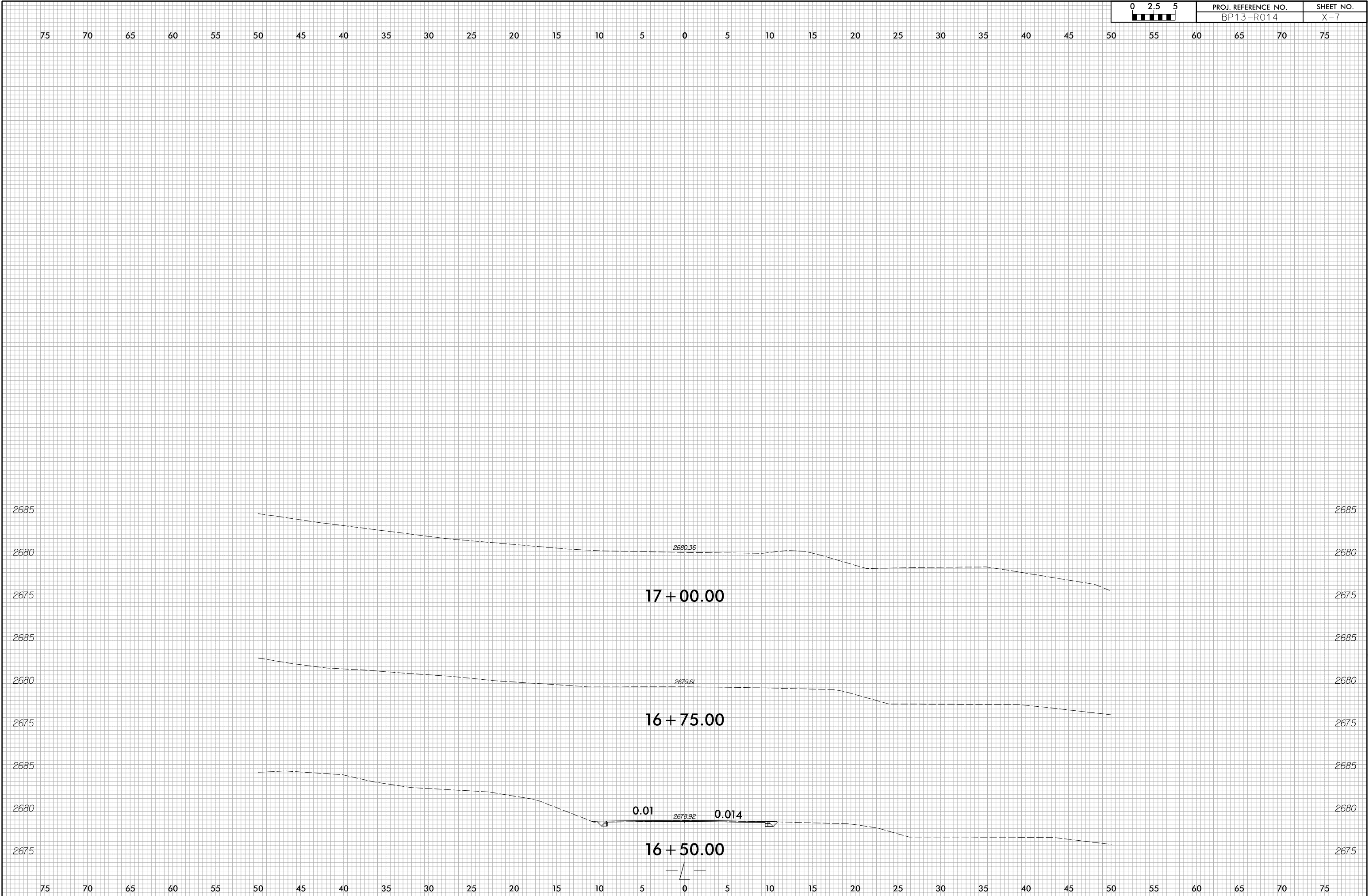
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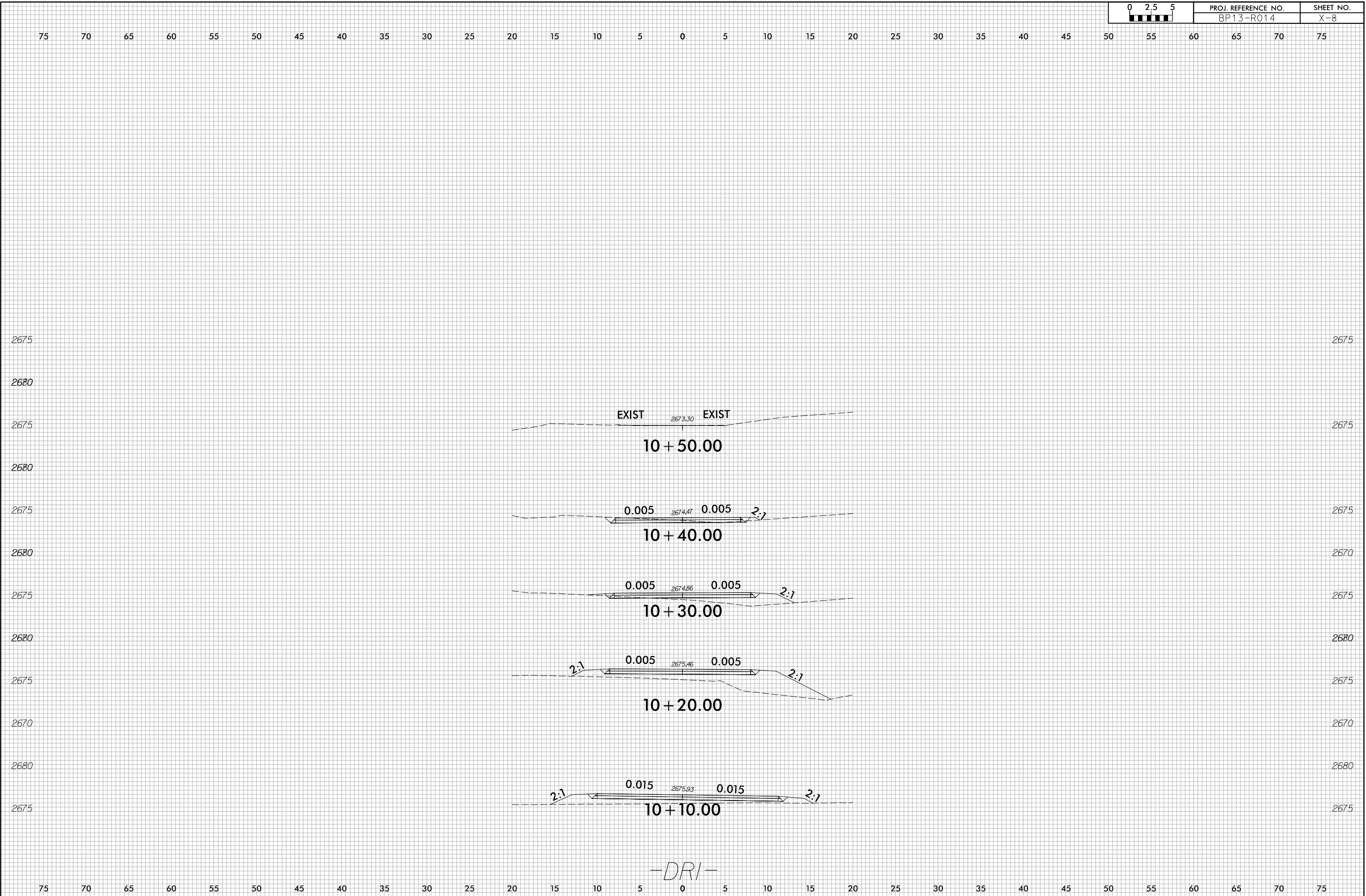


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6/23/16

10/24/2024
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2675

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10 + 30.00

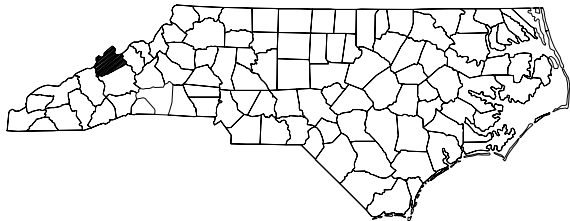
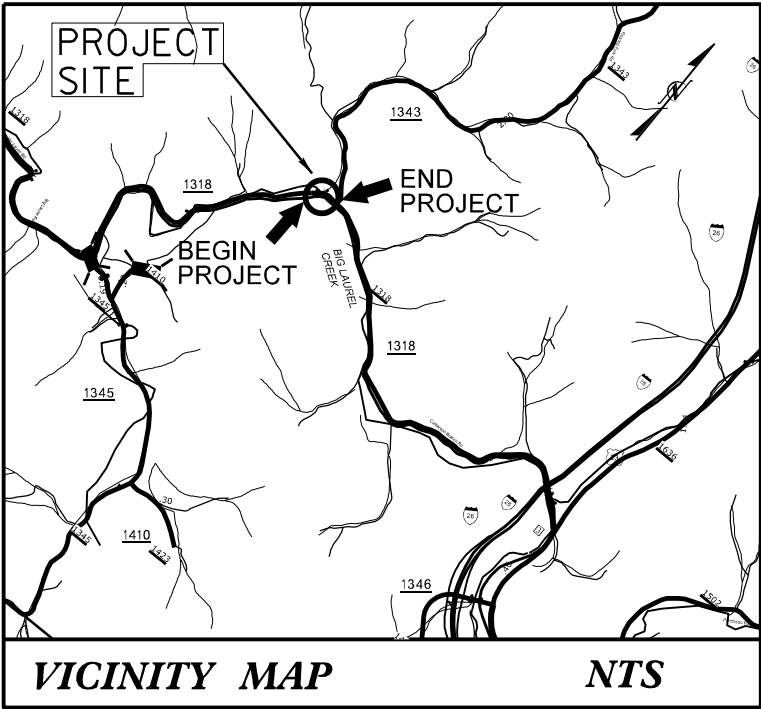
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-DR2-

TIP PROJECT: BP13-R014

CONTRACT: DM00401



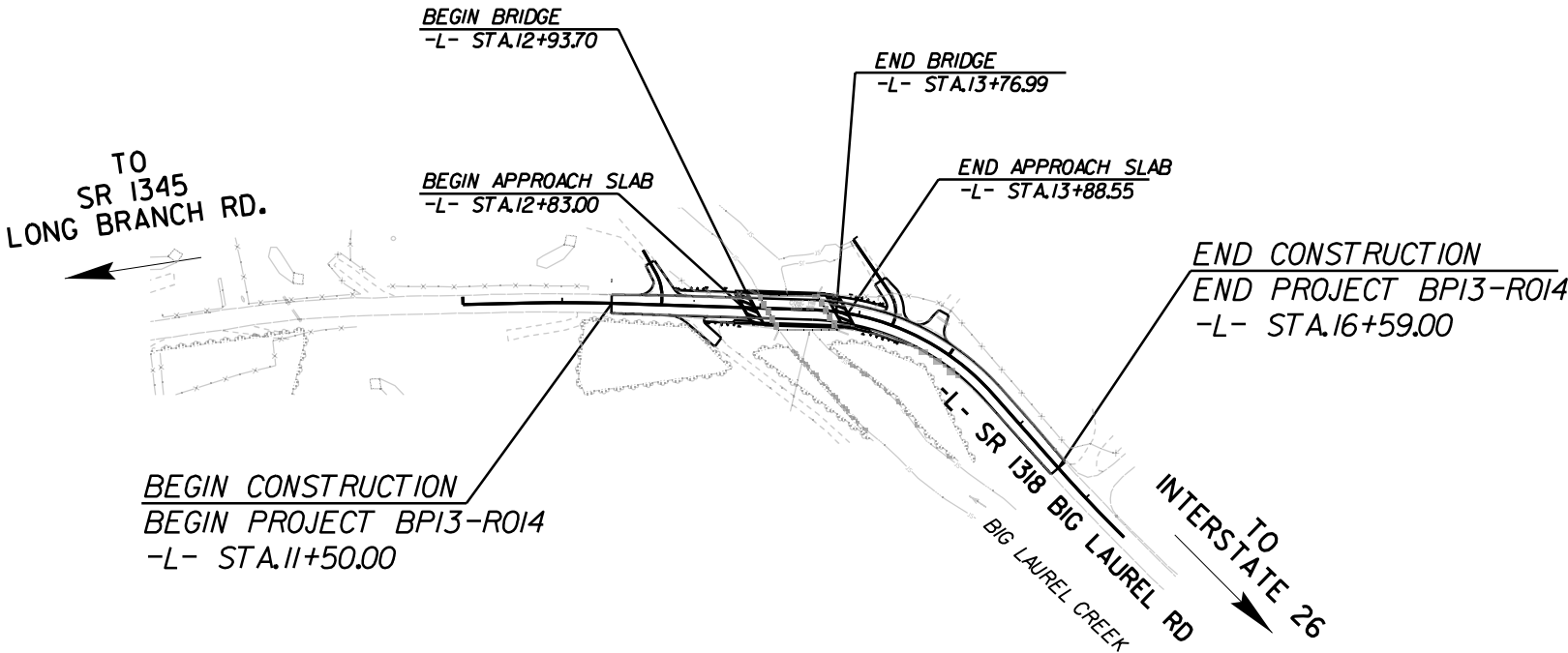
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

MADISON COUNTY

LOCATION: BRIDGE NO. 560090 ON SR 1318 (BIG LAUREL ROAD)
OVER BIG LAUREL CREEK

TYPE OF WORK: GRADING, PAVING, DRAINAGE, & STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP13-R014	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
BP13.R014.1	N/A	PE	
BP13.R014.2	N/A	RW & UTIL.	
BP13.R014.3	N/A	CONSTRUCTION	



STRUCTURES

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

DESIGN DATA
ADT = 650
V = 30 MPH
FUNC CLASS =
RURAL LOCAL
SUBREGIONAL TIER

PROJECT LENGTH
LENGTH ROADWAY PROJECT = 0.080 MILES
LENGTH STRUCTURES PROJECT = 0.016 MILES
TOTAL LENGTH PROJECT = 0.096 MILES

Prepared In the Office of:
wsp
1001 Morehead Square Dr., Suite 610, Charlotte NC, 28203
NC LIC NO. F-0165

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: MAY 31, 2023

LETTING DATE: OCTOBER 7, 2026

ELIZABETH F. LAWES, P.E.
PROJECT ENGINEER

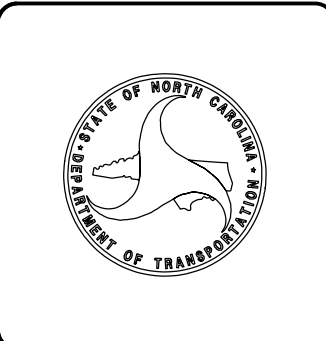
PATRICK GALLAGHER, P.E.
PROJECT DESIGN ENGINEER

MARK HILL, P.E.
(NCDOT CONTACT)

Seal of Elizabeth F. Lawes, P.E., NC License 044167.

Signed by: Elizabeth F. Lawes, P.E. 9/14/2026

SIGNATURE:



(+2.0468% (-)1.5029%)

PI STA = 13+35.00 -L-
EL = 2,677.82
VC = 140'

GRADE DATA -L-

2,700
2,690
2,680
2,670
2,660

EL. 2,675±

BEGIN FRONT SLOPE
STA. 12+84.24 -L-
G.P. EL. 2,676.73

APPROACH SLAB
(TYP.)
1'-0" (TYP.)

EXCAVATE TO
EL. 2,668.0
(GRADE TO DRAIN)

END BENT 1

1'-6"
TO UNCLASSIFIED
STRUCTURE
EXCAVATION
(TYP.)

25YR WS
EL. 2,675.9

LOW CHORD
EL. 2,673.31 (RIGHT)

NWS
EL. 2,666.8
(08/23/18)

EL. 2,675±

EL. 2,667±

CLASS II
RIP RAP
(2'-0" THICK)
(TYP.)

SPAN A

1'-7" MIN.
RIP RAP BERM (TYP.)
1'-0" MIN.
EARTH BERM
(TYP.)

Q100 WS
EL. 2,678.3

LOW CHORD
EL. 2,673.55 (RIGHT)

EL. 2,668±

EXISTING
SUBSTRUCTURE (TYP.)

3'-6" EMBED
EXCAVATE TO
EL. 2,669.7
(GRADE TO DRAIN)

1 1/2:1 SLOPE
(NORMAL TO END BENT)
(TYP.)

END BENT 2

FILL FACE @ END BENT 2
STA. 13+76.99 -L-
G.P. EL. 2,677.09

BEGIN FRONT SLOPE
STA. 13+85.91
G.P. EL. 2,677.01

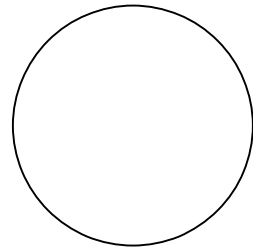
UNCLASSIFIED
STRUCTURE
EXCAVATION

9.625" Ø MICROPILES (TYP.)

APPROXIMATE
EXISTING GROUND

EL. 2,675±

I HEREBY CERTIFY THESE PLANS
ARE THE AS-BUILT PLANS



SECTION ALONG -L- AND EXTENDED TANGENT

(SECTION TAKEN AT RIGHT ANGLES TO END BENTS AND BENTS)

24'-0 3/8"

23'-4 1/2"

12'-0"

FILL FACE @ END BENT 2
STA. 13+76.99 -L-

7 7/8"

1'-1 5/8"

EXTENDED TANGENT

1'-5 5/8"

60°00'00"

2'-5 3/16"

60°00'00"

END APPROACH SLAB
STA. 13+88.55 -L-

DETAIL "A"

PC STA. 13+52.92 -L-

-L- SR 1318
(BIG LAUREL RD.)

W.P. #2

FILL FACE END BENT 2

1'-0" BACKWALL

PT STA. 10+32.88 -DRI-

POC STA. 14+35.00 -L-
POC STA. 10+00.00 -DRI-

PROJECT NO. BP13-R014

MADISON COUNTY

STATION: 13+35.00 -L-

SHEET 1 OF 4 REPLACES BRIDGE NO. 560090

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE OVER BIG LAUREL CREEK
ON SR 1318 (BIG LAUREL RD.)
BETWEEN SR 1345 AND I-26

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

S-1
TOTAL
SHEETS
21

HORIZONTAL CURVE DATA

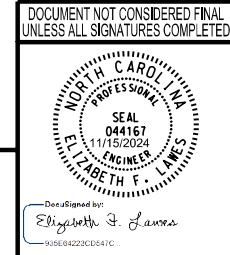
P.I. = 14+62.81 -L-
Δ = 46°-37'-40.3" (RT)
D = 22°-28'-08.2"
L = 207.52'
T = 109.89'
R = 255.00'

PLAN

(FOR CLARITY, MICROPILES ARE NOT SHOWN IN PLAN VIEW)

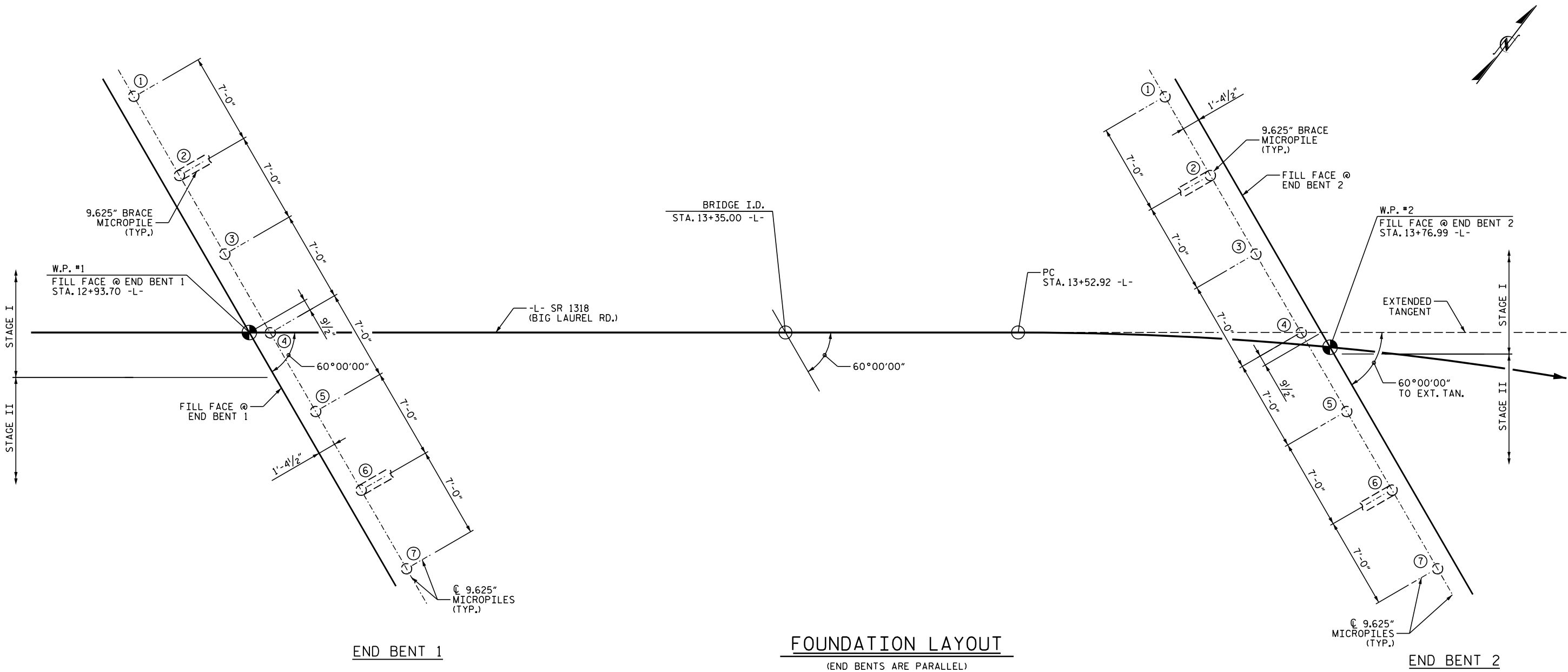


WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.856.4040
LICENSE NO. F-0165



DESIGNED BY: E. LAWES DATE: JAN 2024
DRAWN BY: J. WHEATLEY DATE: JAN 2024
CHECKED BY: T. KIRSCHBAUM DATE: JAN 2024
DESIGN ENGINEER OF RECORD: E. LAWES DATE: SEPT 2024

11/15/2024
401.001_BP13-R014_SMU.GD01.dgn



FOUNDATION LAYOUT
(END BENTS ARE PARALLEL)

NOTES

FOR NOTES, SEE "MICROPILE FOUNDATION TABLES" SHEET.

PROJECT NO. BP13-R014
MADISON COUNTY
STATION: 13+35.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

FOUNDATION LAYOUT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-2
2			4			

DESIGNED BY:	E. LAWES	DATE :	JAN 2024
DRAWN BY:	J. WHEATLEY	DATE :	JAN 2024
CHECKED BY:	T. KIRSCHBAUM	DATE :	JAN 2024
DESIGN ENGINEER			
OF RECORD:	E. LAWES	DATE :	SEPT 2024



WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



Elizabeth F. Lawes
908694222C01041C

11/15/2024
401_003_BP13-R014_SMU_G002.dgn

SUMMARY OF MICROPILE INFORMATION/INSTALLATION

(Blank entries indicate item is not applicable to structure)

End Bent / Bent No, Pile(s) #(#) (e.g., "Bent 1, Piles 1-5")	Factored Resistance per Pile KIPS	Minimum Reinforcing CasingTip (Tip No Higher Than) Elevation FT	Minimum Reinforcing Casing Penetration Into Rock/Weathered Rock per Pile LIN FT	Scour Critical Elevation FT	No Reinforcing Casing Joints Between Elevations FT - FT	Galvanizing Exposed Reinforcing Casing EACH
End Bent No. 1, Piles 1-4	194	2633	20			
End Bent No. 1, Piles 5-7	194	2635	20			
End Bent No. 2, Piles 1-4	194	2634	20			
End Bent No. 2, Piles 5-7	194	2636	20			

SUMMARY OF MICROPILE TESTING

(Blank entries indicate item is not applicable to structure)

End Bent / Bent No, Pile(s) #(-#) (e.g., "Bent 1, Piles 1-5")	Demonstration Micropile(s) EACH	Load Testing			
		Proof Load Test(s) EACH	Verification Load Test(s) EACH	Factored Design Load (FDL) KIPS	Permissible Total Vertical Movement at Top of Pile INCHES
End Bent No. 1, Piles 1-7		YES		194	1 *
TOTAL QTY:		1			

* Load test acceptance and permissible total vertical movement in accordance with Davidson Acceptance Criteria.

NOTES:

1. The Micropile and Spread Footing Foundation Tables are based on the bridge substructure design and foundation recommendations sealed by a North Carolina Professional Engineer (Shiping Yang, #031361) on 09-3-2024.
2. For Micropiles, see 9 5/8" X 0.5" Micropiles Special Provision.
3. No reinforcing casing joints allowed within 10' of bottom of cap or 2' into rock, whichever is shallower.
4. Open hole drilling will not be allowed in the installation of micropiles.
5. Proof load tests are required for micropiles at End Bent No. 1 as shown.

PROJECT NO. BP13-R014

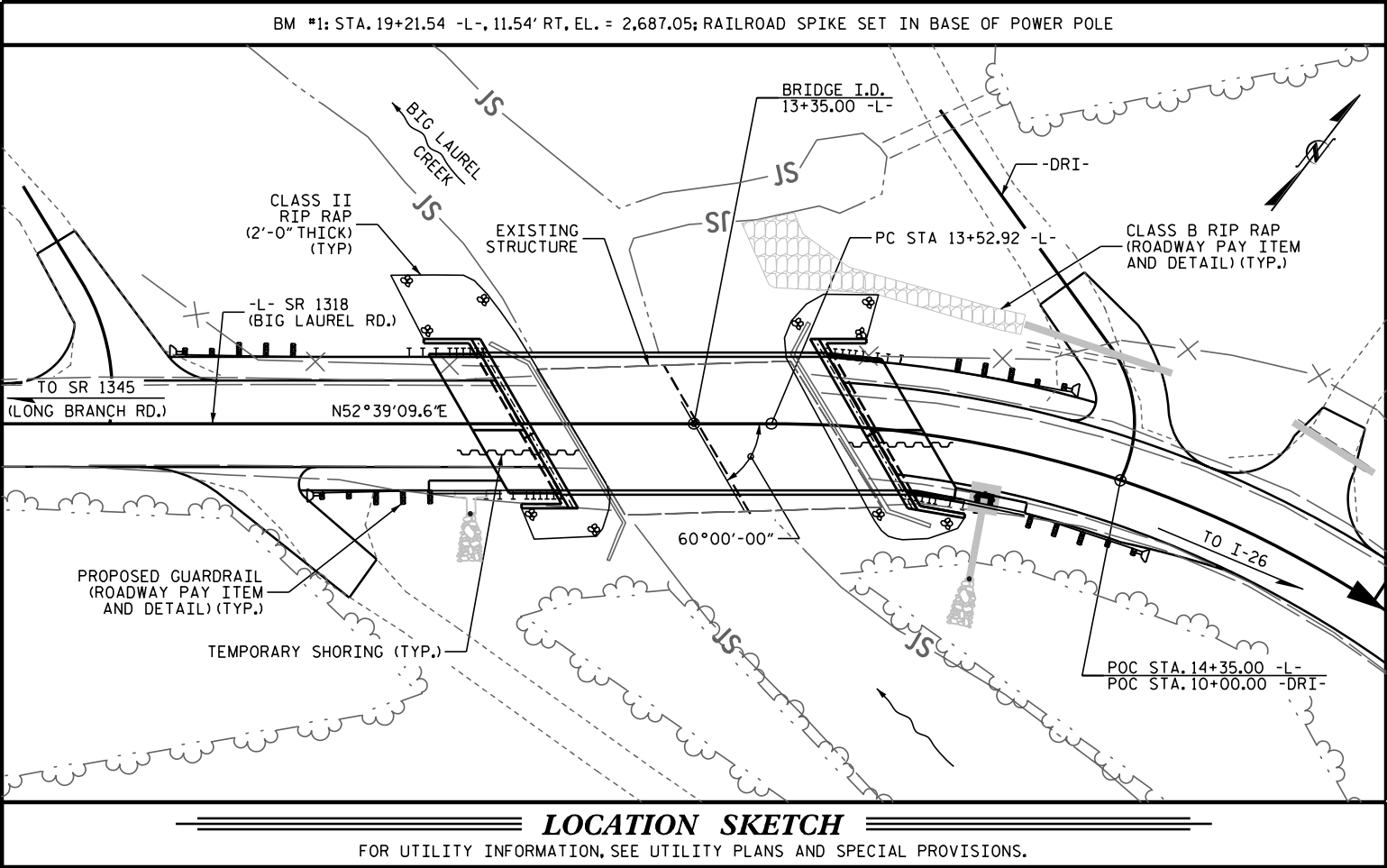
Madison COUNTY

STATION: 13+35.00 -L-

SHEET 3 OF 4

Bridge #90

	STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH MICROPILE AND SPREAD FOOTING FOUNDATION TABLES																																
11/15/2024																																	
Designed by:  SIGNATURE DATE	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="6" style="text-align: center;">REVISIONS</th> <th style="text-align: center;">SHEET NO. S-3</th> </tr> <tr> <th>NO.</th> <th>BY:</th> <th>DATE:</th> <th>NO.</th> <th>BY:</th> <th>DATE:</th> <th rowspan="4" style="text-align: center; vertical-align: middle;">TOTAL SHEETS 21</th> </tr> <tr> <td style="text-align: center;">1</td> <td></td> <td></td> <td style="text-align: center;">3</td> <td></td> <td></td> </tr> <tr> <td style="text-align: center;">2</td> <td></td> <td></td> <td style="text-align: center;">4</td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>	REVISIONS						SHEET NO. S-3	NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS 21	1			3			2			4								
REVISIONS						SHEET NO. S-3																											
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS 21																											
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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED																																	



NOTES

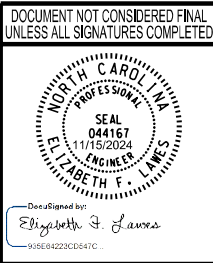
- ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
- THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
- THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR GROUT FOR STRUCTURES, 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 STA. 13+35.00 -L".
- THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA ON SHEET S-1 SHALL BE EXCAVATED FOR A DISTANCE OF 15 FT (LEFT) AND 35 FT. (RIGHT) OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.
- STEEL SHEET PILING REQUIRED FOR SHORING SHALL BE HOT ROLLED.
- TEMPORARY SHORING WILL BE REQUIRED IN THE AREAS INDICATED IN THE PLAN VIEW.
- 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.
- AFTER SERVING AS A TEMPORARY STRUCTURE, THE EXISTING STRUCTURE CONSISTING OF ONE 29'-0" SPAN AND ONE 32'-0" LONG SPAN OF STEEL I-BEAMS; 34'-3" CLEAR ROADWAY WIDTH AND CONCRETE DECK WITH ASPHALT WEARING SURFACE ON ONE CONCRETE BENT AND TWO CONCRETE ABUTMENTS AND LOCATED AT EXISTING STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.
- THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.
- REMOVAL OF THE EXISTING BRIDGE 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.
- THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH "HEC-18 - EVALUATING SCOUR AT BRIDGES."
- ASPHALT WEARING SURFACE IS INCLUDED IN THE ROADWAY QUANTITY ON ROADWAY PLANS.
- FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.
- FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
- FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SN.

TOTAL BILL OF MATERIAL															
	REMOVAL OF EXISTING STRUCTURE @ STA. 13+35.00 -L-	ASBESTOS ASSESSMENT	UNCLASSIFIED STRUCTURE EXCAVATION @ 13+35.00 -L-	CLASS A CONCRETE	BRIDGE APPROACH SLABS @ 13+35.00 -L-	REINFORCING STEEL	9 5/8" X 0.5" Ø MICROPILES		MICROPILE PROOF TEST	VERTICAL CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" X 2'-9" PRESTRESSED CONCRETE BOX BEAMS	
	LUMP SUM	LUMP SUM	LUMP SUM	CU. YDS.	LUMP SUM	LBS.	No.	LIN. FT.	EA.	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	No.	LIN. FT.
SUPERSTRUCTURE	LUMP SUM	LUMP SUM			LUMP SUM					160			LUMP SUM	11	880
END BENT 1			LUMP SUM	27.0		3,894	7	266	1		147	163			
END BENT 2			LUMP SUM	27.3		4,100	7	289			126	140			
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	54.3	LUMP SUM	7,994	14	555	1	160	273	303	LUMP SUM	11	880

PROJECT NO. BP13-R014
MADISON COUNTY
STATION: 13+35.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
GENERAL DRAWING FOR BRIDGE OVER BIG LAUREL CREEK ON SR 1318 (BIG LAUREL RD.) BETWEEN SR 1345 AND I-26					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS 21



DESIGNED BY:	<u>E. LAWES</u>	DATE :	<u>JAN 2024</u>
DRAWN BY:	<u>J. WHEATLEY</u>	DATE :	<u>JAN 2024</u>
CHECKED BY:	<u>T. KIRSCHBAUM</u>	DATE :	<u>JAN 2024</u>
DESIGN ENGINEER OF RECORD:	<u>E. LAWES</u>	DATE :	<u>SEPT 2024</u>

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 AND SERVICE III LIMIT STATES.

ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

COMMENTS:

1.

2.

3.

4.

CONTROLLING LOAD RATING

1

DESIGN LOAD RATING (HL-93)

2

DESIGN LOAD RATING (HS-20)

3

LEGAL LOAD RATING **

4

EMERGENCY VEHICLE LOAD RATING**

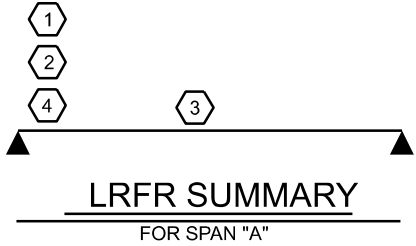
** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

I - INTERIOR GIRDER
EL - EXTERIOR LEFT GIRDER
ER - EXTERIOR RIGHT GIRDER

PROJECT NO. BP13-R014
MADISON COUNTY
STATION: 13+35.00 -L-

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS																								
LOAD TYPE	VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING ⬡	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE										SERVICE III LIMIT STATE						COMMENT NUMBER		
						LIVE-LOAD FACTORS (γ LL)	MOMENT			SHEAR				LIVE-LOAD FACTORS (γ LL)	MOMENT									
							DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR		SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION		DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD	HL-93 (INVENTORY)	N/A	⬡1	1.162	—	1.75	0.247	1.91	80'	EL	39.134	0.623	1.16	80'	EL	7.827	0.80	0.247	1.29	80'	EL	39.134		
	HL-93 (OPERATING)	N/A	•	1.507	—	1.35	0.247	2.48	80'	EL	39.134	0.623	1.51	80'	EL	7.827	N/A	—	—	--	—	—		
	HS-20 (INVENTORY)	36.000	⬡2	1.469	52.874	1.75	0.247	2.53	80'	EL	39.134	0.623	1.47	80'	EL	7.827	0.80	0.247	1.71	80'	EL	39.134		
	HS-20 (OPERATING)	36.000		1.904	68.541	1.35	0.247	3.29	80'	EL	39.134	0.623	1.90	80'	EL	7.827	N/A	—	—	--	—	—		
LEGAL LOAD	SINGLE VEHICLE (SV)	SNSH	13.500		3.905	52.721	1.4	0.247	7.25	80'	EL	39.134	0.623	4.41	80'	EL	7.827	0.80	0.247	3.91	80'	EL	39.134	
		SNGARBS2	20.000		2.888	57.750	1.4	0.247	5.36	80'	EL	39.134	0.623	3.12	80'	EL	7.827	0.80	0.247	2.89	80'	EL	39.134	
		SNAGRIS2	22.000		2.725	59.952	1.4	0.247	5.06	80'	EL	39.134	0.623	2.89	80'	EL	7.827	0.80	0.247	2.73	80'	EL	39.134	
		SNCOTTS3	27.250		1.943	52.939	1.4	0.247	3.61	80'	EL	39.134	0.623	2.20	80'	EL	7.827	0.80	0.247	1.94	80'	EL	39.134	
		SNAGGRS4	34.925		1.615	56.395	1.4	0.247	3.00	80'	EL	39.134	0.623	1.82	80'	EL	7.827	0.80	0.247	1.61	80'	EL	39.134	
		SNS5A	35.550		1.580	56.157	1.4	0.247	2.93	80'	EL	39.134	0.623	1.84	80'	EL	7.827	0.80	0.247	1.58	80'	EL	39.134	
		SNS6A	39.950		1.446	57.756	1.4	0.247	2.68	80'	EL	39.134	0.623	1.67	80'	EL	7.827	0.80	0.247	1.45	80'	EL	39.134	
		SNS7B	42.000		1.377	57.818	1.4	0.247	2.56	80'	EL	39.134	0.623	1.64	80'	EL	7.827	0.80	0.247	1.38	80'	EL	39.134	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.762	58.142	1.4	0.247	3.27	80'	EL	39.134	0.623	1.99	80'	EL	7.827	0.80	0.247	1.76	80'	EL	39.134	
		TNT4A	33.075		1.769	58.499	1.4	0.247	3.28	80'	EL	39.134	0.623	1.95	80'	EL	7.827	0.80	0.247	1.77	80'	EL	39.134	
		TNT6A	41.600		1.443	60.014	1.4	0.247	2.68	80'	EL	39.134	0.623	1.74	80'	EL	7.827	0.80	0.247	1.44	80'	EL	39.134	
		TNT7A	42.000		1.448	60.817	1.4	0.247	2.69	80'	EL	39.134	0.623	1.70	80'	EL	7.827	0.80	0.247	1.45	80'	EL	39.134	
		TNT7B	42.000		1.493	62.726	1.4	0.247	2.77	80'	EL	39.134	0.623	1.60	80'	EL	7.827	0.80	0.247	1.49	80'	EL	39.134	
		TNAGRIT4	43.000		1.424	61.237	1.4	0.247	2.64	80'	EL	39.134	0.623	1.55	80'	EL	7.827	0.80	0.247	1.42	80'	EL	39.134	
		TNAGT5A	45.000		1.344	60.496	1.4	0.247	2.50	80'	EL	39.134	0.623	1.54	80'	EL	7.827	0.80	0.247	1.34	80'	EL	39.134	
		TNAGT5B	45.000	⬡3	1.330	59.828	1.4	0.247	2.47	80'	EL	39.134	0.623	1.48	80'	EL	7.827	0.80	0.247	1.33	80'	EL	39.134	
EMERGENCY VEHICLE (EV)	EV2	28.750		2.280	65.550	1.3	0.247	4.14	80'	EL	39.134	0.623	2.28	80'	EL	7.827	0.80	0.247	2.46	80'	EL	39.134		
	EV3	43.000	⬡4	1.536	66.034	1.3	0.247	2.72	80'	EL	39.134	0.623	1.54	80'	EL	7.827	0.80	0.247	1.62	80'	EL	39.134		



DESIGNED BY: E. LAWES DATE : JAN 2024

DRAWN BY: J. WHEATLEY DATE : JAN 2024

CHECKED BY: T. KIRSCHBAUM DATE : JAN 2024

DESIGN ENGINEER OF RECORD: E. LAWES DATE : SEPT 2024

DRAWN BY : TMG II/II

CHECKED BY : AAC II/II

REV. 06/23

AKP/AAI

wsp

WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
PROFESSIONAL
SEAL
044167
11/15/2024
ENGINEER
ELIZABETH F. LAWES

Digitized by:
Elizabeth F. Lawes
006164225C161641C

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
LRFR SUMMARY FOR
80' BOX BEAM UNIT
60° SKEW & 120° SKEW
(NON-INTERSTATE TRAFFIC)

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:
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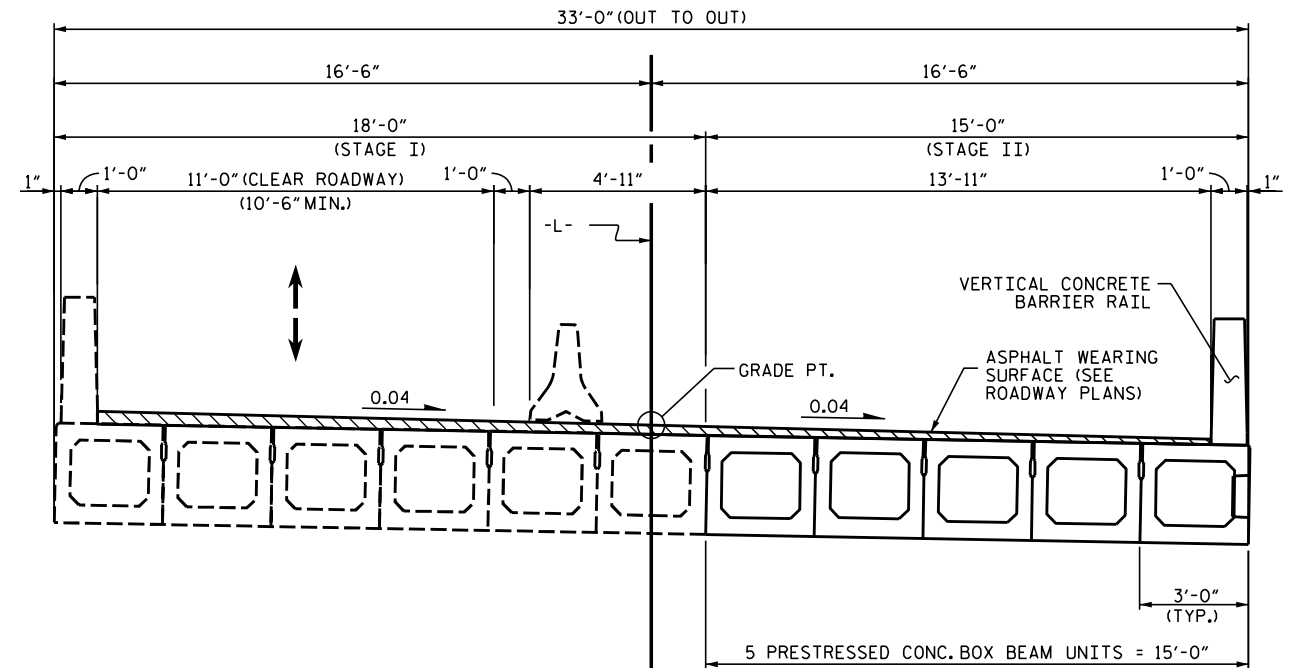
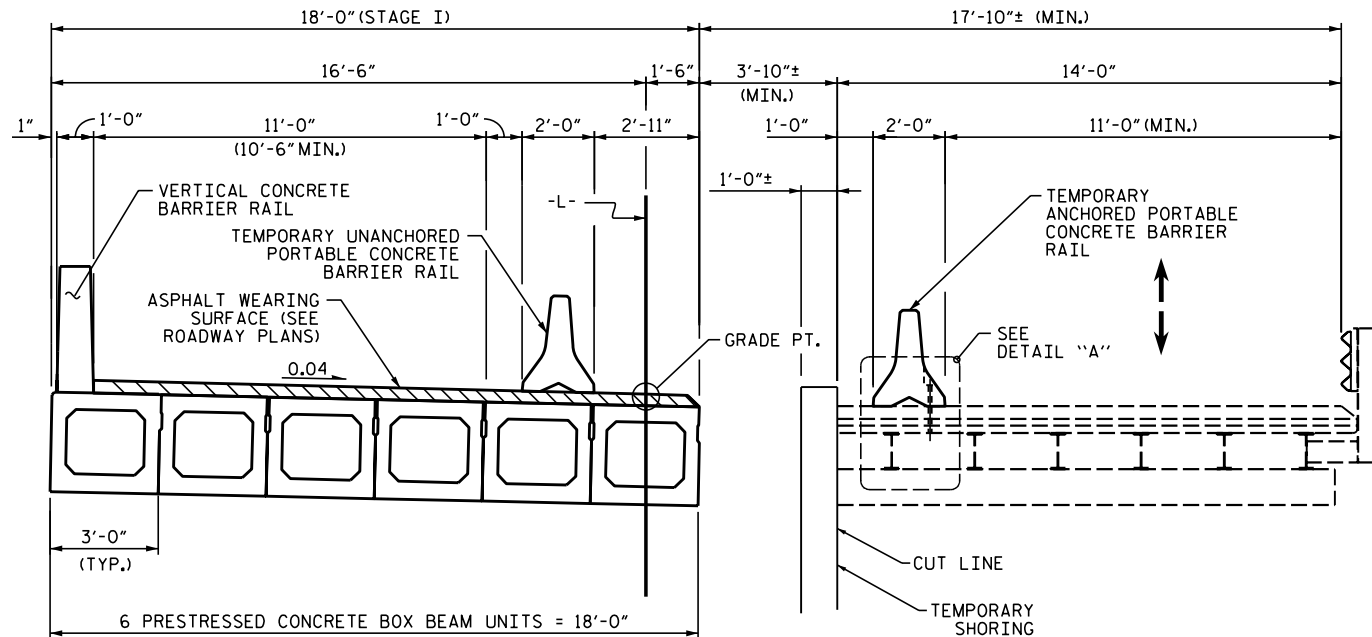
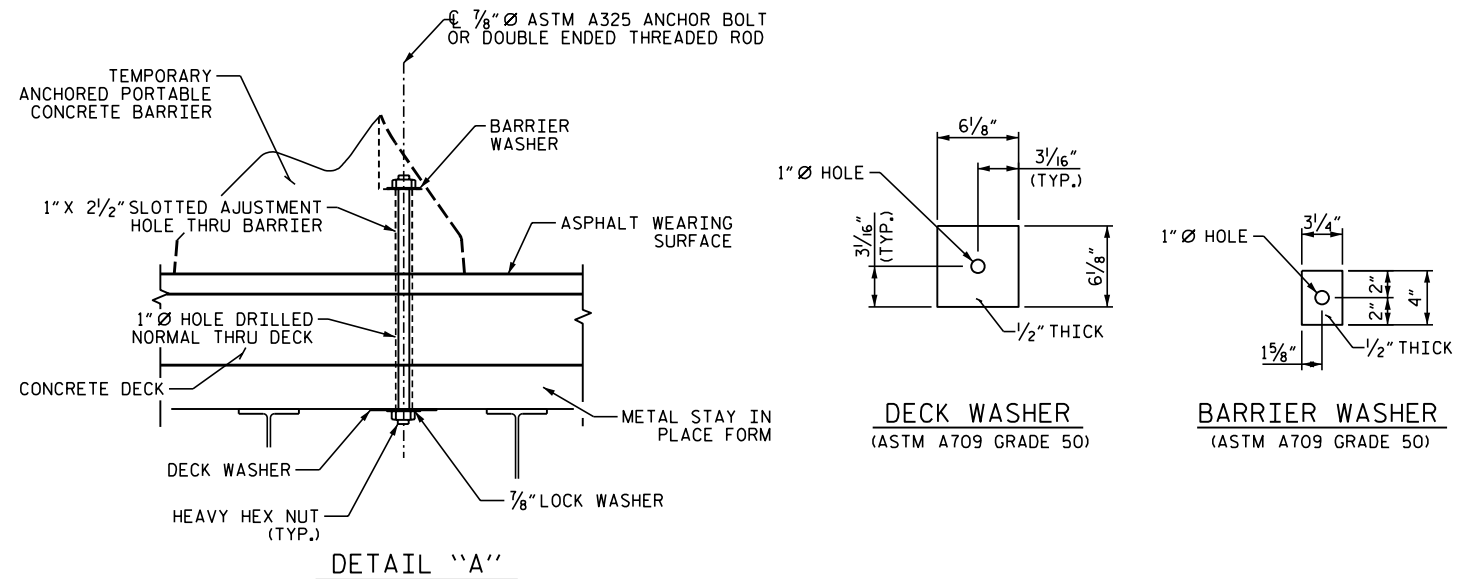
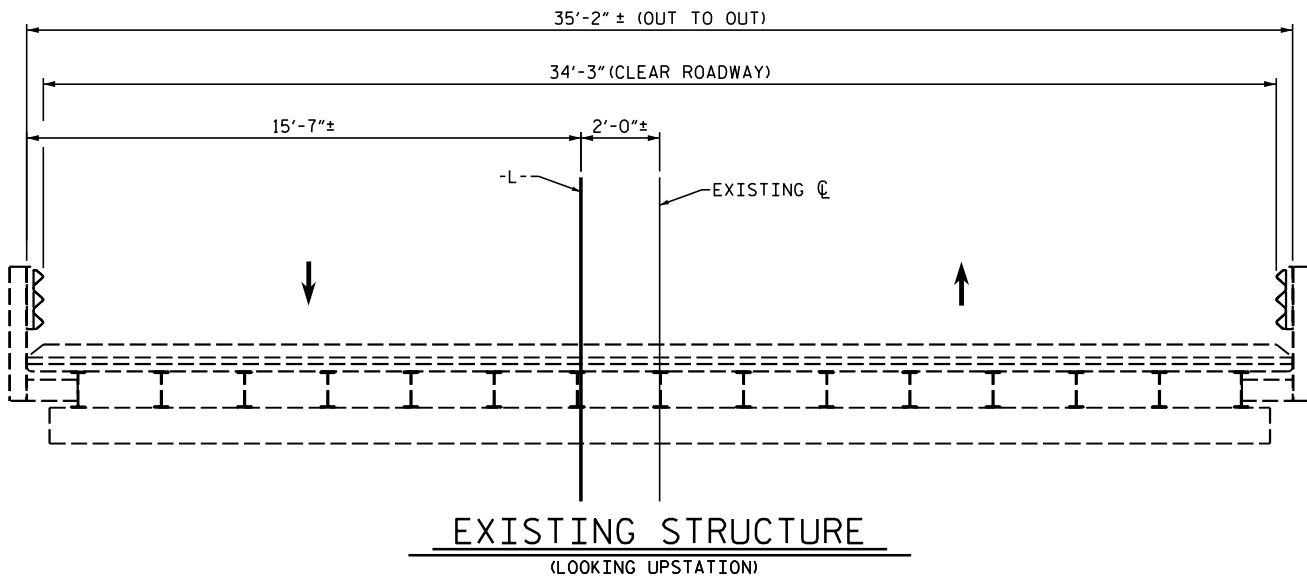
SHEET NO.

S-5

TOTAL SHEETS

21

STD. NO. 33LRFR1_60&120S_80L



STAGE I

STAGE II

PROJECT NO. BP13-R014
MADISON COUNTY
STATION: 13+35.00 -L-

NOTES

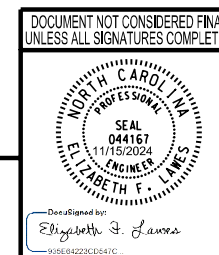
FOR TRAFFIC PHASING, SEE TRAFFIC CONTROL PLANS.

THE TEMPORARY GUARDRAIL ANCHORED TO DECK IS A TRAFFIC CONTROL PAY ITEM.

SEE TRAFFIC CONTROL PLANS FOR LOCATION AND PAY LIMITS OF THE TEMPORARY BARRIER.

DESIGNED BY: E. LAWES DATE: JAN 2024
DRAWN BY: J. WHEATLEY DATE: JAN 2024
CHECKED BY: T. KIRSCHBAUM DATE: JAN 2024
DESIGN ENGINEER OF RECORD: E. LAWES DATE: SEPT 2024

wsp
WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
PHASE CONSTRUCTION					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-6
TOTAL SHEETS					21

NOTES

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW RELAXATION GRADE 270 STRANDS AND SHALL CONFORM TO AASHTO M203 EXCEPT FOR SAMPLING REQUIREMENTS WHICH SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ALL REINFORCING STEEL CAST WITH THE BOX BEAM SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE BOX BEAMS.

FLAME CUTTING OF THE TRANSVERSE POST-TENSIONING STRAND IS NOT ALLOWED.

RECESSES FOR TRANSVERSE STRANDS SHALL BE GROUTED AFTER THE TENSIONING OF THE STRANDS.

THE ANCHOR BOLT HOLE BLOCKOUTS AT FIXED ENDS OF BOX BEAM SECTIONS SHALL BE FILLED WITH NON-SHRINK GROUT PRIOR TO PLACEMENT OF WEARING SURFACE.

THE BACKER RODS SHALL CONFORM TO THE REQUIREMENTS OF TYPE M BOND BREAKER. SEE SECTION 1028 OF THE STANDARD SPECIFICATIONS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE BOX BEAM UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6000 PSI.

ALL REINFORCING STEEL IN VERTICAL CONCRETE BARRIER RAILS SHALL BE EPOXY COATED.

PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE BOX BEAM UNIT ENDS.

APPLY EPOXY PROTECTIVE COATING TO BOX BEAM UNIT ENDS.

VERTICAL GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A VERTICAL CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF BARRIER RAIL SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

THE LOCATION OF THE VOID DRAINS MAY BE SHIFTED SLIGHTLY WHERE NECESSARY TO CLEAR PRESTRESSING STRANDS OR TRANSVERSE REINFORCING STEEL.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

THE PERMITTED THREADED INSERTS ARE DETAILED AS AN OPTION FOR THE CONTRACTOR TO ATTACH FALSEWORK AND FORMWORK DURING CONSTRUCTION.

THE PERMITTED THREADED INSERTS IN THE EXTERIOR UNITS SHALL BE SIZED BY THE CONTRACTOR, SPACED AT 4'-0" CENTERS AND GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS. STAINLESS STEEL THREADED INSERTS MAY BE USED AS AN ALTERNATE.

THE PERMITTED THREADED INSERTS SHALL BE GROUTED BY THE CONTRACTOR IMMEDIATELY FOLLOWING REMOVAL OF THE FALSEWORK.

THE COST OF THE PERMITTED THREADED INSERTS SHALL BE INCLUDED IN THE PRICE BID FOR THE PRECAST UNITS.

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLTS, NUTS, WASHERS, AND PLATES. SHOP INSPECTION IS REQUIRED.

CONTRACTOR TO ENSURE THAT HOLES IN BEARING PAD ALIGN WITH 2 1/2" Ø HOLES IN BOX BEAMS PRIOR TO POST-TENSIONING. INSTALL SWEDGE ANCHOR BOLTS AFTER POST-TENSIONING EACH STAGED UNIT.

SWEDGE ANCHOR BOLTS, NUTS, WASHERS, AND HOLD DOWN PLATES SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

AT ALL FIXED ENDS OF BOX BEAM SECTIONS WITH HOLD-DOWN ANCHOR BOLTS, NUTS FOR ANCHOR BOLTS SHALL BE FINGER-TIGHTENED AND THE BACKED OFF 1/2 TURN. THE THREAD OF THE NUT AND BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL.

THE 2 1/2" Ø HOLES AT FIXED ENDS OF BOX BEAM SECTIONS WITH HOLD-DOWN ANCHOR BOLTS SHALL BE FILLED WITH NON-SHRINK GROUT TO THE BOTTOM OF THE ANCHOR BOLT BLOCKOUT PRIOR TO INSTALLING THE ANCHOR PLATES, WASHERS AND NUTS.

PROJECT NO. BP13-R014
MADISON COUNTY
STATION: 13+35.00 -L-

SHEET 1 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

3'-0" X 2'-9"
PRESTRESSED CONCRETE
BOX BEAM UNIT

REVISIONS

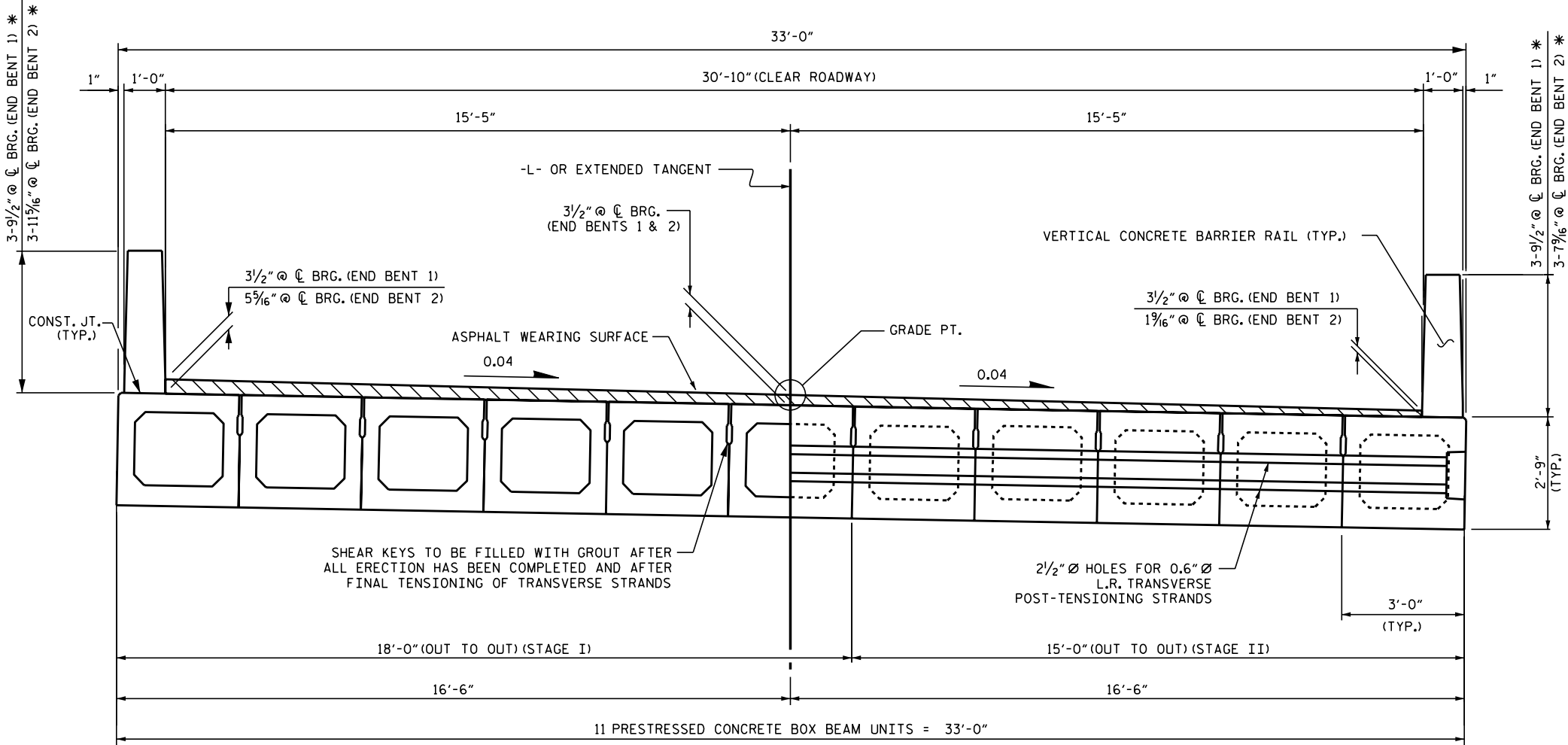
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SHEET NO.

S-7

TOTAL SHEETS

21

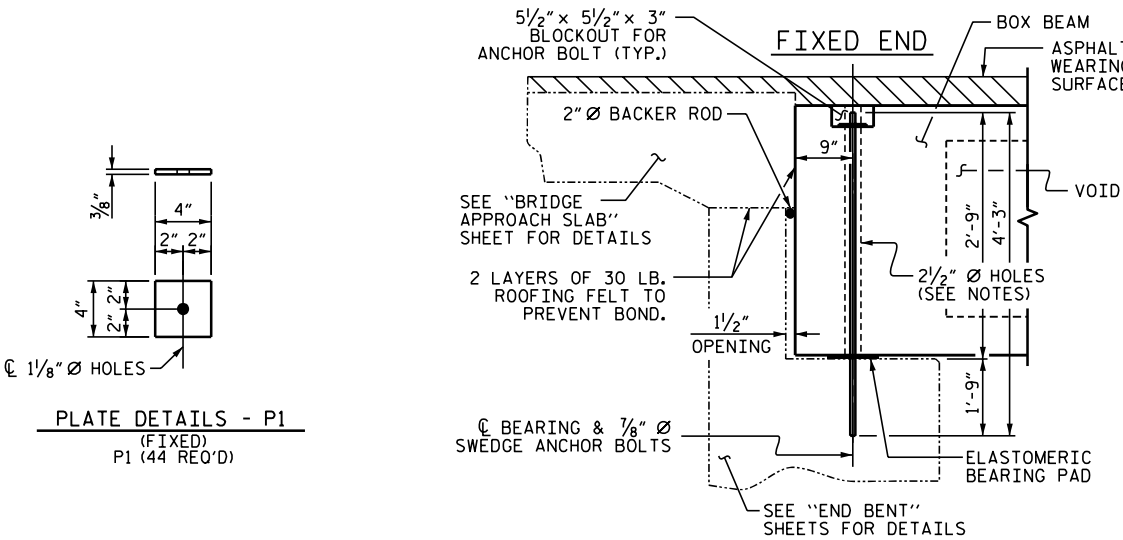


HALF SECTION
THROUGH VOIDS

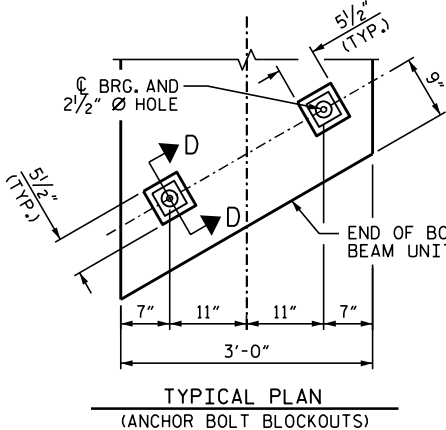
HALF SECTION
AT INTERMEDIATE DIAPHRAGMS

TYPICAL SECTION

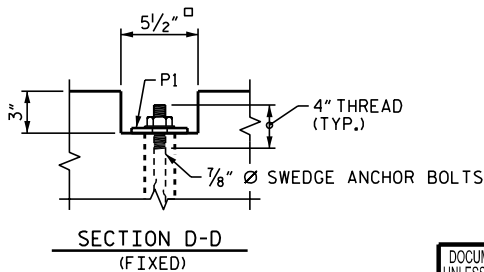
*THE MAXIMUM BARRIER RAIL HEIGHT AND ASPHALT THICKNESS IS SHOWN. THE HEIGHT OF THE BARRIER RAIL AND ASPHALT THICKNESS VARIES WHILE THE TOP OF THE BARRIER RAIL FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR RAIL HEIGHT DETAILS AND ASPHALT THICKNESS, SEE THE "VERTICAL CONCRETE BARRIER RAIL SECTION" DETAIL.



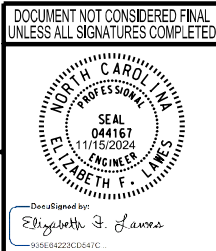
SECTION AT END BENT



BLOCKOUT DETAIL FOR ANCHOR BOLTS

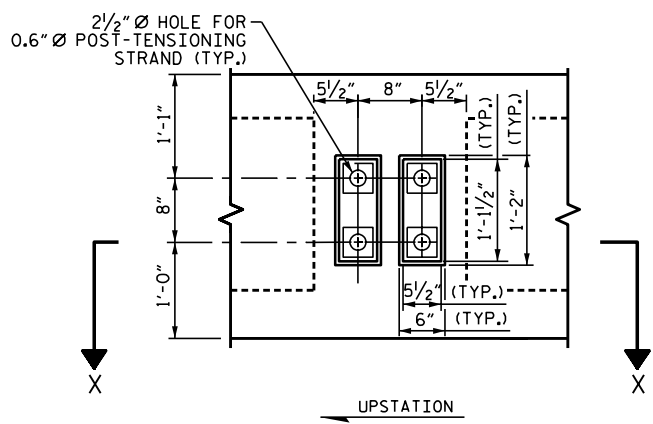


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RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

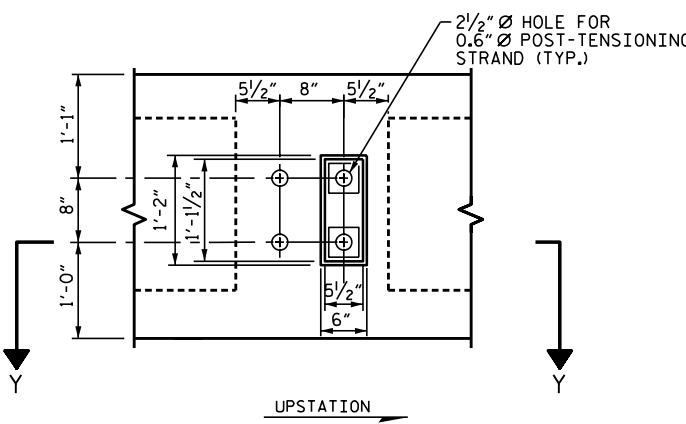


DESIGNED BY: E. LAWES DATE: JAN 2024
DRAWN BY: J. WHEATLEY DATE: JAN 2024
CHECKED BY: T. KIRSCHBAUM DATE: JAN 2024
DESIGN ENGINEER OF RECORD: E. LAWES DATE: SEPT 2024

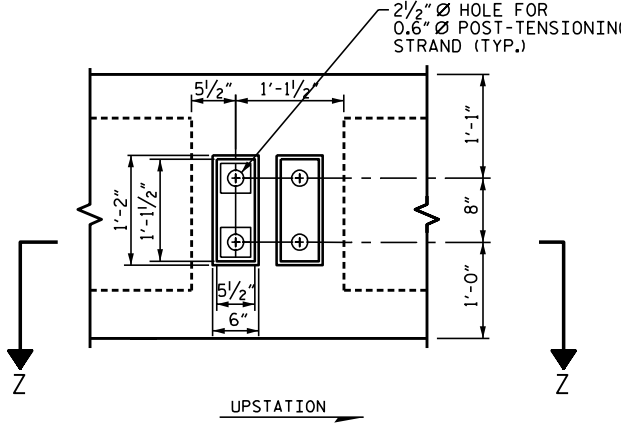
11/15/2024
401.013.BP13.R014.SMJ.BB01.dgn



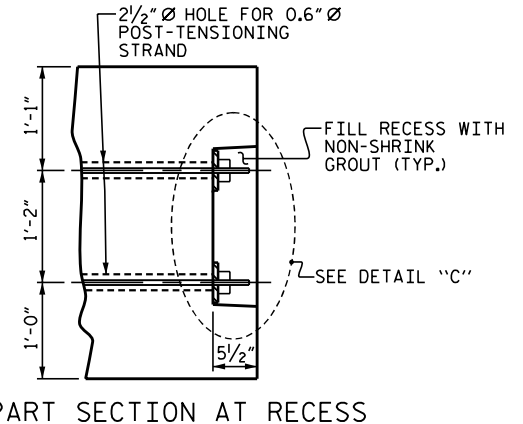
VIEW A-A



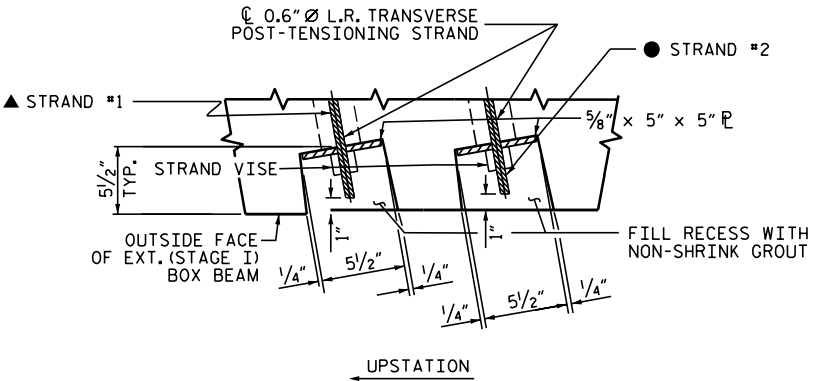
VIEW B-B



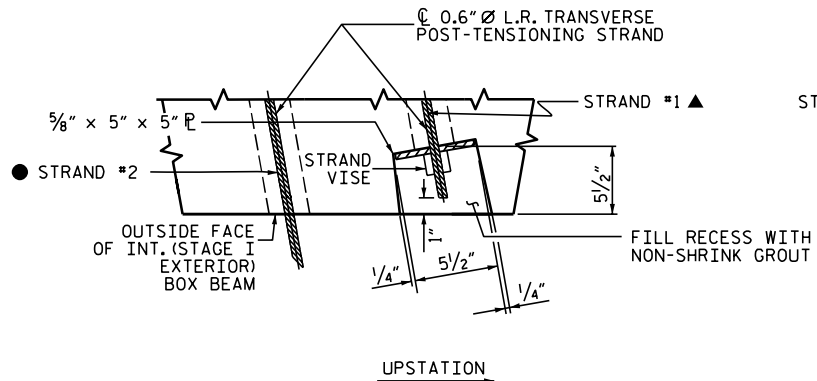
VIEW C-C



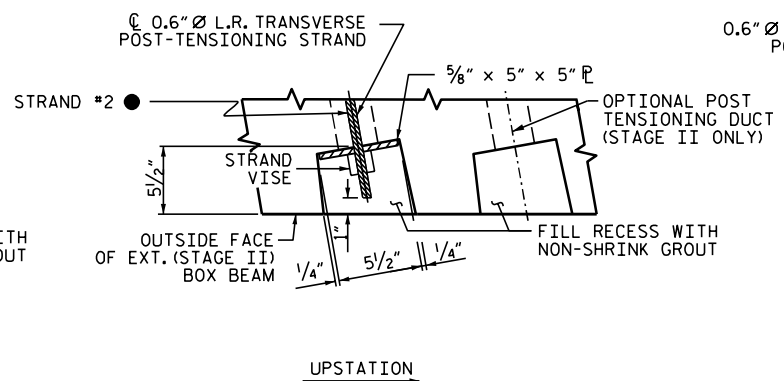
PART SECTION AT RECESS



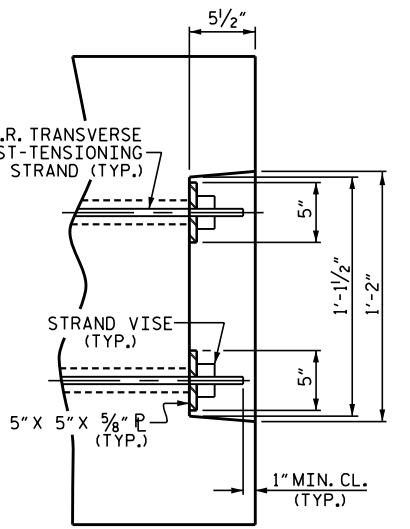
SECTION X-X



SECTION Y-Y



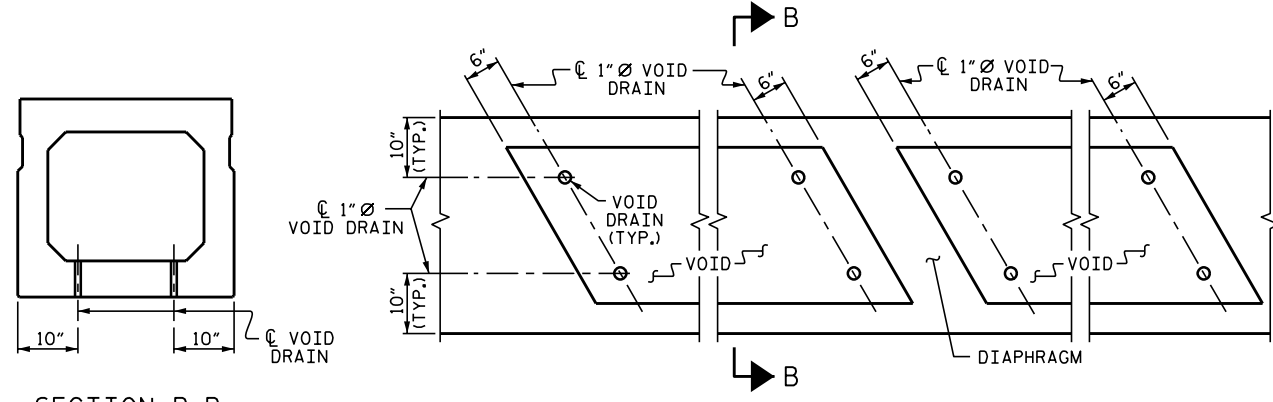
SECTION Z-Z



DETAIL 'C'

GROUTED RECESS AT END OF POST-TENSIONED STRAND BOX BEAMS

- ▲ STRAND #1 GOES THROUGH 6 BOX BEAM UNITS (TO BE TENSIONED DURING STAGE I CONSTRUCTION)
- STRAND #2 GOES THROUGH ALL 10 BOX BEAM UNITS (TO BE TENSIONED DURING STAGE II CONSTRUCTION)

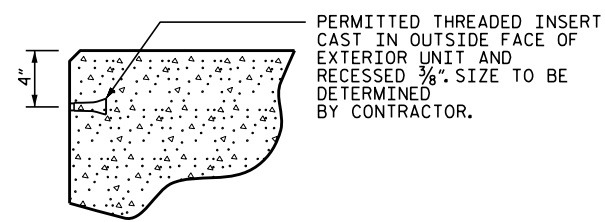


SECTION B-B

PART PLAN

VOID DRAIN DETAILS

(DIMENSIONS SHOWN ARE TYPICAL FOR EACH VOID)



THREADED INSERT DETAIL

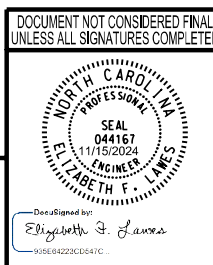
PROJECT NO. BP13-R014
MADISON COUNTY
STATION: 13+35.00 -L-

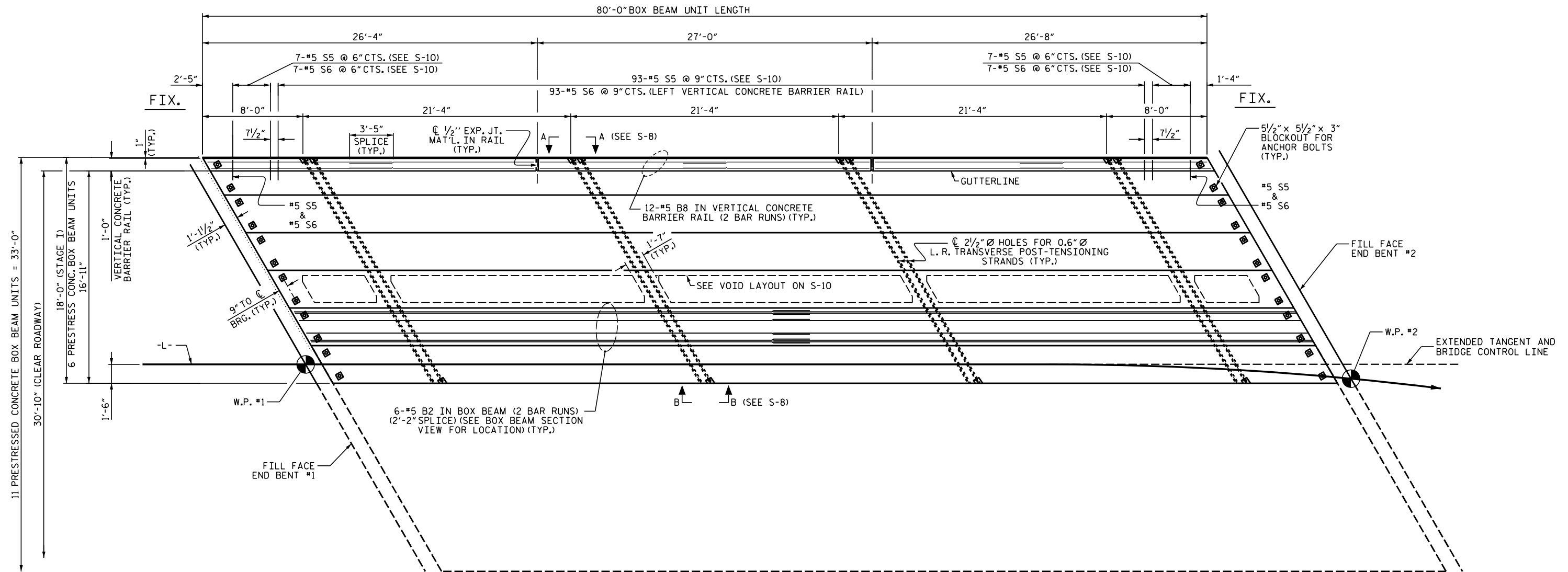
SHEET 2 OF 6

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
3'-0" X 3'-3" PRESTRESSED CONCRETE BOX BEAM UNIT					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-8
TOTAL SHEETS					21

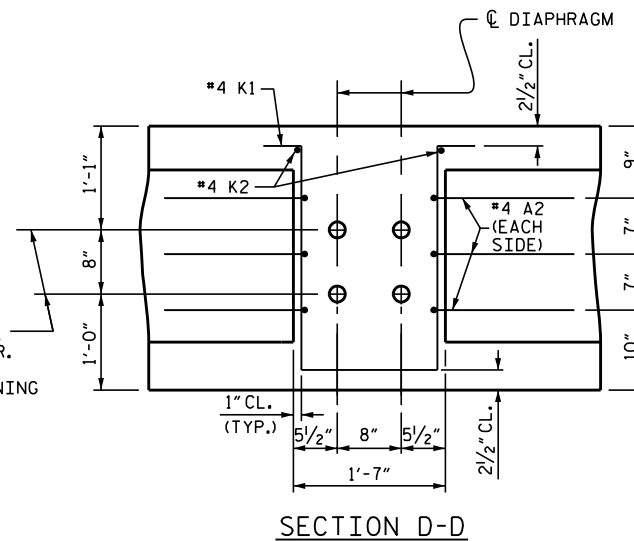
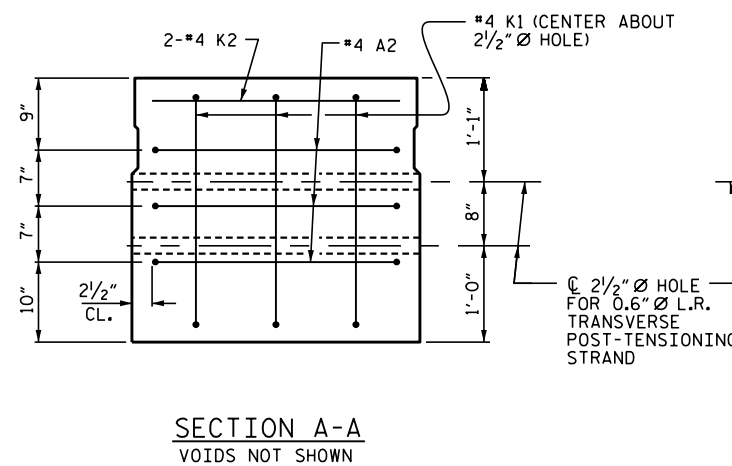
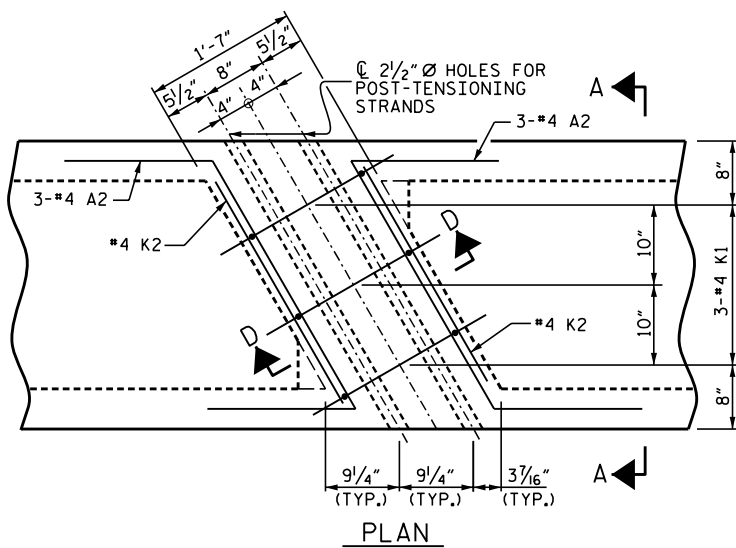
DESIGNED BY: E. LAWES DATE: JAN 2024
DRAWN BY: J. WHEATLEY DATE: JAN 2024
CHECKED BY: T. KIRSCHBAUM DATE: JAN 2024
DESIGN ENGINEER OF RECORD: E. LAWES DATE: SEPT 2024

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LICENSE NO. F-0165





PLAN OF SPAN A - STAGE I



DOUBLE DIAPHRAGM DETAILS

*4 "S" BARS NOT SHOWN. *4 "S" BARS MAY BE SHIFTED SLIGHTLY TO CLEAR 2 1/2" Ø HOLE. (STAGE I SHOWN; STAGE II SIMILAR)

PROJECT NO. BP13-R014
MADISON COUNTY
STATION: 13+35.00 -L-

SHEET 3 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF 80' UNIT
30'-10" CLEAR ROADWAY
60° SKEW (STAGE I)

REVISIONS

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

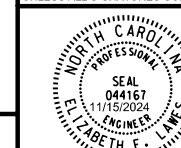
SHEET NO.

S-9

TOTAL SHEETS

21

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

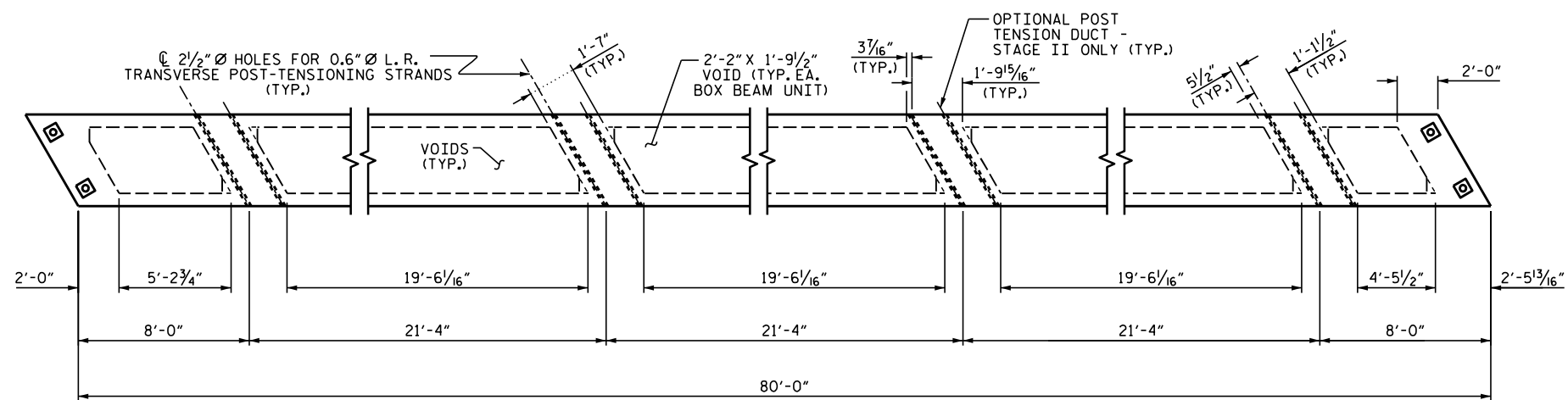
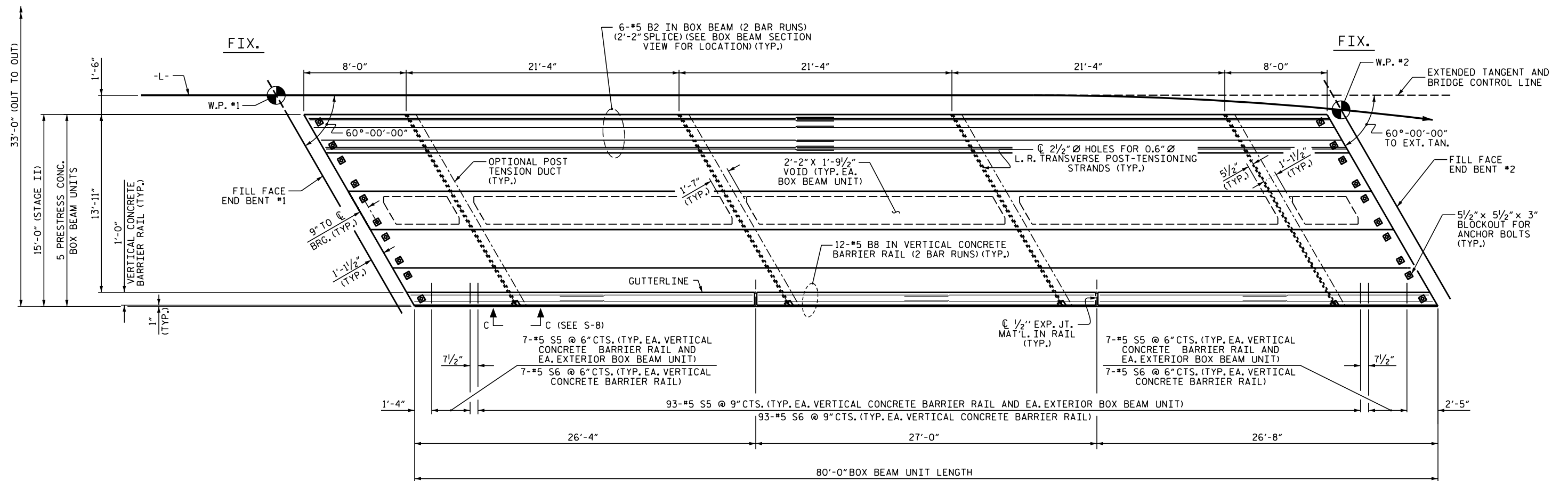


Designed by:
Elizabeth F. Lawes



WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

DESIGNED BY: E. LAWES DATE: JAN 2024
DRAWN BY: J. WHEATLEY DATE: JAN 2024
CHECKED BY: T. KIRSCHBAUM DATE: JAN 2024
DESIGN ENGINEER OF RECORD: E. LAWES DATE: SEPT 2024



PROJECT NO. BP13-R014
MADISON COUNTY
 STATION: 13+35.00 -L-

SHEET 4 OF 6

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

PLAN OF 80' UNIT
 30'-10" CLEAR ROADWAY
 60° SKEW (STAGE II)

REVISIONS

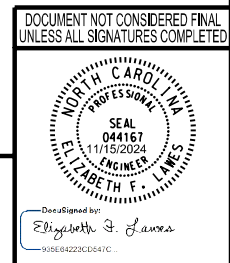
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO.

S-10

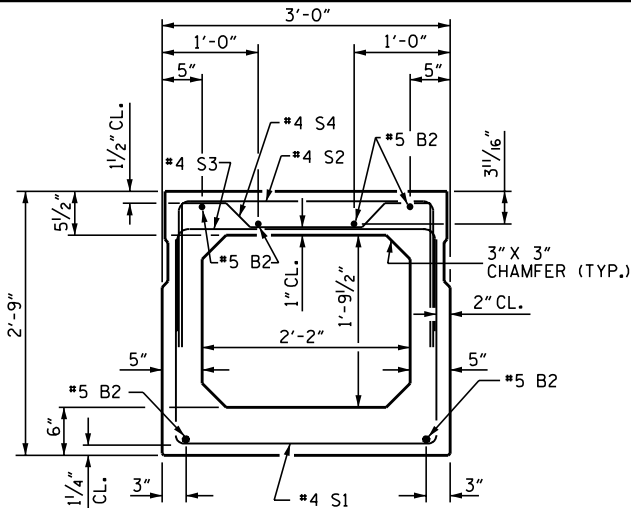
TOTAL SHEETS

21

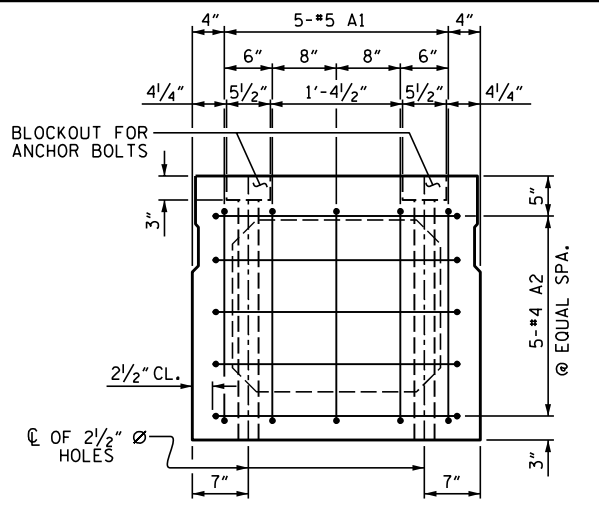


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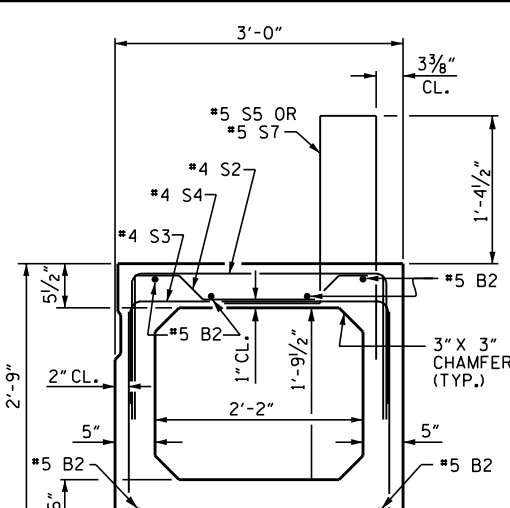
DESIGNED BY: E. LAWES DATE: JAN 2024
 DRAWN BY: J. WHEATLEY DATE: JAN 2024
 CHECKED BY: T. KIRSCHBAUM DATE: JAN 2024
 DESIGN ENGINEER OF RECORD: E. LAWES DATE: SEPT 2024



INTERIOR BOX BEAM SECTION
(STRAND LAYOUT NOT SHOWN)

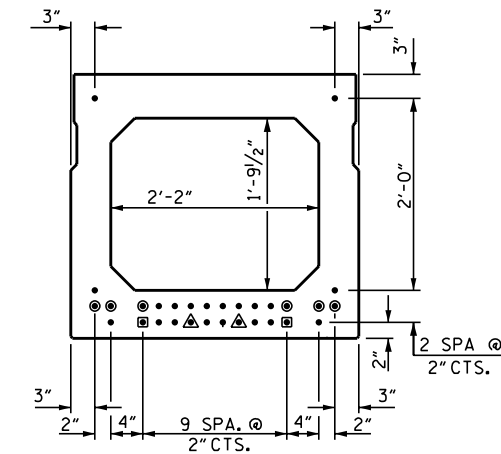


END ELEVATION
SHOWING PLACEMENT OF #5 & #4 "A" BARS AND LOCATION OF BLOCKOUTS FOR ANCHOR BOLT HOLES. (INTERIOR BOX BEAM SECTION SHOWN-EXTERIOR SECTION SIMILAR EXCEPT SHEAR KEY LOCATION. STRAND LAYOUT NOT SHOWN.)



EXTERIOR BOX BEAM SECTION
(STRAND LAYOUT NOT SHOWN)

0.6" Ø LOW RELAXATION STRAND LAYOUT

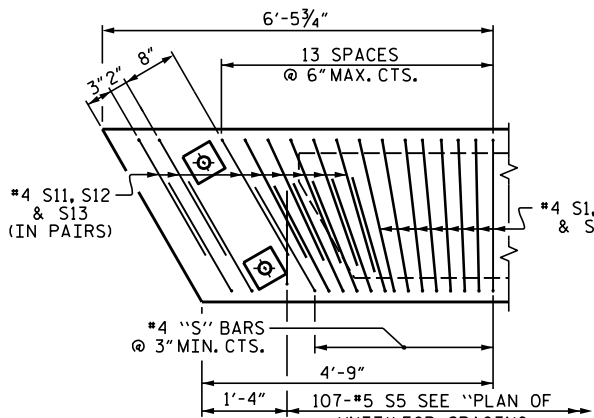


TYPICAL STRAND LOCATION
(24 STRANDS REQUIRED)

DEBONDING LEGEND

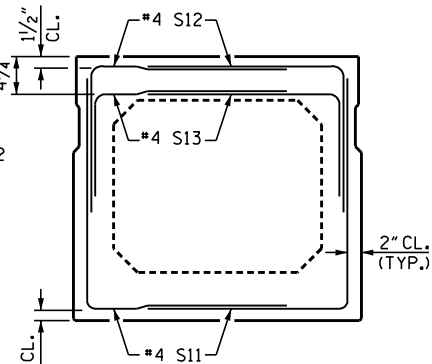
- FULLY BONDED STRANDS
- STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 10'-0" FROM END OF GIRDER
- OPTIONAL FULL LENGTH DEBONDED STRANDS. THESE STRANDS ARE NOT REQUIRED. IF THE FABRICATOR CHOOSES TO INCLUDE THESE STRANDS IN THE BOX BEAM UNIT, THE STRANDS SHALL BE DEBONDED FOR THE FULL LENGTH OF THE UNIT AT NO ADDITIONAL COST.

BOND SHALL BE BROKEN ON STRANDS AS SHOWN FOR THE SPECIFIED LENGTH FROM EACH END OF THE BOX BEAM. SEE STANDARD SPECIFICATIONS ARTICLE 1078-7.



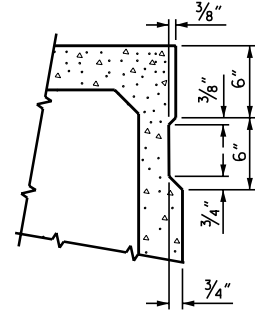
DETAIL "B"

EXTERIOR UNIT SHOWN, INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S5 BARS. "B" BARS AND "A" BARS NOT SHOWN.



END VIEW

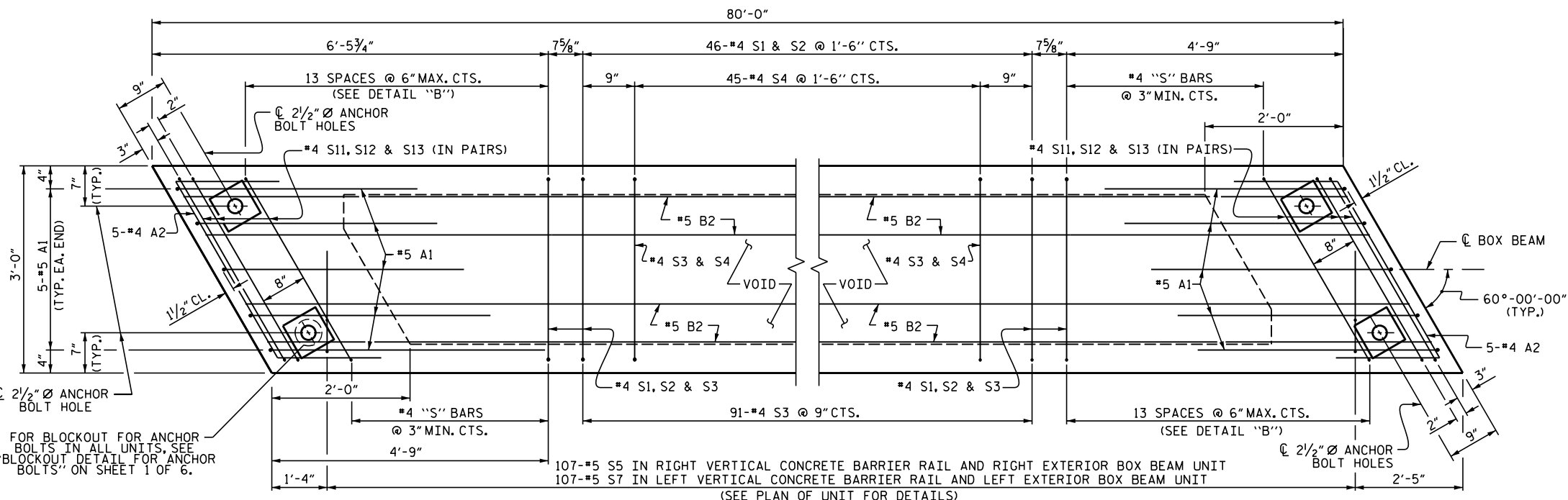
(SHOWING #4 "S" BARS IN END OF BEAM)

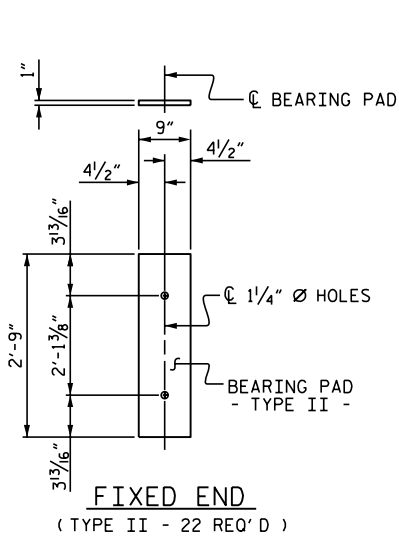


SHEAR KEY DETAIL

NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR BOX BEAMS.

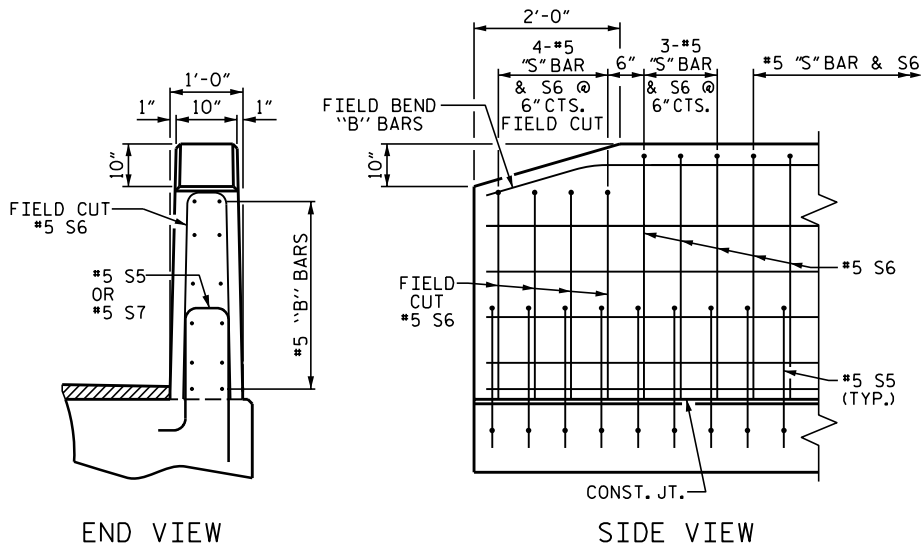
GRADE 270 STRANDS	
AREA (SQUARE INCHES)	0.217
ULTIMATE STRENGTH (LBS. PER STRAND)	58,600
APPLIED PRESTRESS (LBS. PER STRAND)	43,950



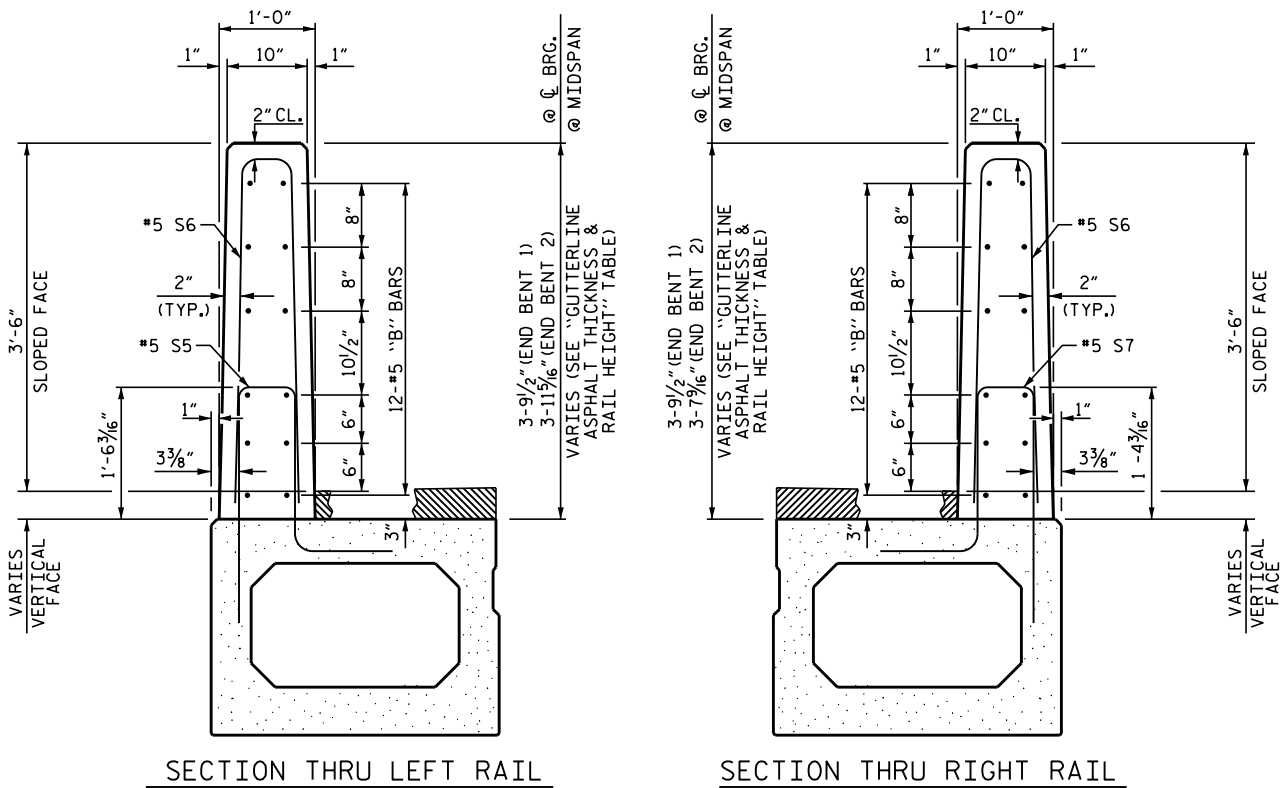


ELASTOMERIC BEARING DETAILS

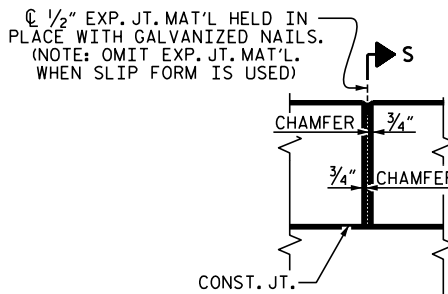
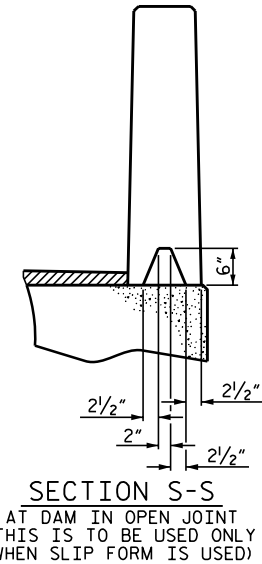
ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.



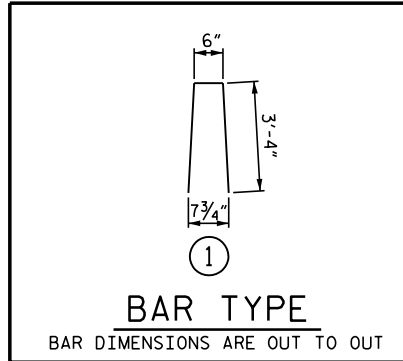
END OF RAIL DETAILS



VERTICAL CONCRETE BARRIER RAIL DETAILS



BOX BEAM UNITS REQUIRED			
STAGE I	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR B.B.	1	80'-0"	80'-0"
INTERIOR B.B.	5	80'-0"	400'-0"
STAGE II	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR B.B.	1	80'-0"	80'-0"
INTERIOR B.B.	4	80'-0"	320'-0"
TOTAL	11	—	880'-0"



BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL						
BAR	BARS PER PAIR OF EXTERIOR UNITS		SIZE	TYPE	LENGTH	WEIGHT
	80' UNIT					
* B8	144		*5	STR	15'-1"	2265
* S6	214		*5	1	7'-2"	1600
*EPOXY COATED REINFORCING STEEL				LBS.		3865
CLASS AA CONCRETE				CU.YDS.		21.0
TOTAL VERTICAL CONCRETE BARRIER RAIL				LN. FT.		160.0

GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT

	ASPHALT OVERLAY THICKNESS @ MID-SPAN	RAIL HEIGHT @ MID-SPAN
LEFT GUTTERLINE	3 3/8"	3'-9 3/8"
RIGHT GUTTERLINE	1 1/2"	3'-7 1/2"

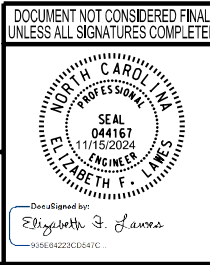
DEAD LOAD DEFLECTION AND CAMBER	
80' BOX BEAM UNIT	3'-0" x 2'-9" 0.6" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	1 9/16" ↓
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	1/2" ↓
FINAL CAMBER	1 1/16" ↑

** INCLUDES FUTURE WEARING SURFACE

PROJECT NO. BP13-R014
MADISON COUNTY
STATION: 13+35.00 -L-

SHEET 6 OF 6

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH STANDARD 3'-0" X 2'-9" PRESTRESSED CONCRETE BOX BEAM UNIT					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-12
TOTAL SHEETS					21



11/15/2024
401.023_BP13.R014_SMU_BB06.dgn

DESIGNED BY: <u>E. LAWES</u>	DATE: <u>JAN 2024</u>	DRAWN BY: <u>DCE</u>	DATE: <u>10/11</u>	REV. 5/18	MAA/THC
DRAWN BY: <u>J. WHEATLEY</u>	DATE: <u>JAN 2024</u>	CHECKED BY: <u>T. KIRSCHBAUM</u>	DATE: <u>JAN 2024</u>	CHECKED BY: <u>TMG</u>	DATE: <u>11/11</u>
CHECKED BY: <u>T. KIRSCHBAUM</u>	DATE: <u>JAN 2024</u>	DESIGN ENGINEER OF RECORD: <u>E. LAWES</u>	DATE: <u>SEPT 2024</u>		

STD. NO. 33PCBB8-60&120S

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD DOWN PLATE AND 7 - 1/8" Ø BOLTS WITH NUTS AND WASHERS.

THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111.

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 1/8" Ø GALVANIZED BOLTS, NUTS 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.)

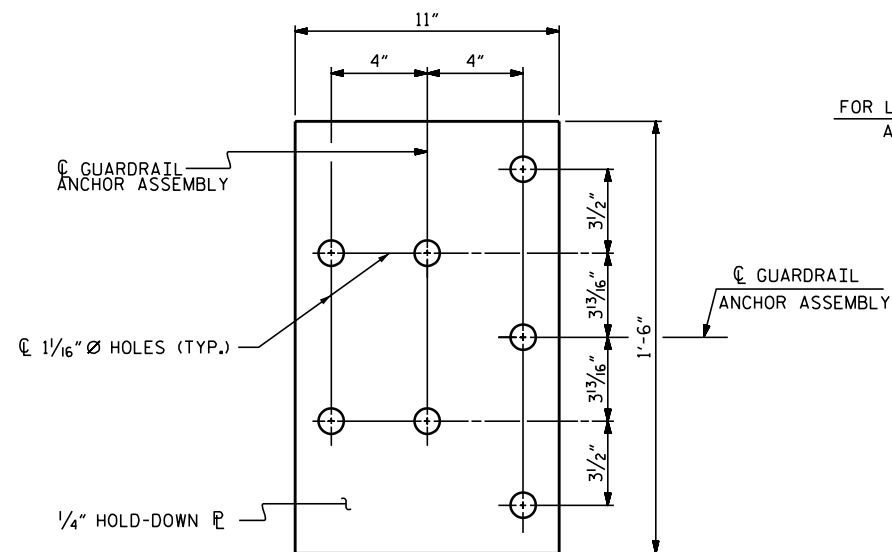
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL.

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR VERTICAL CONCRETE BARRIER RAIL.

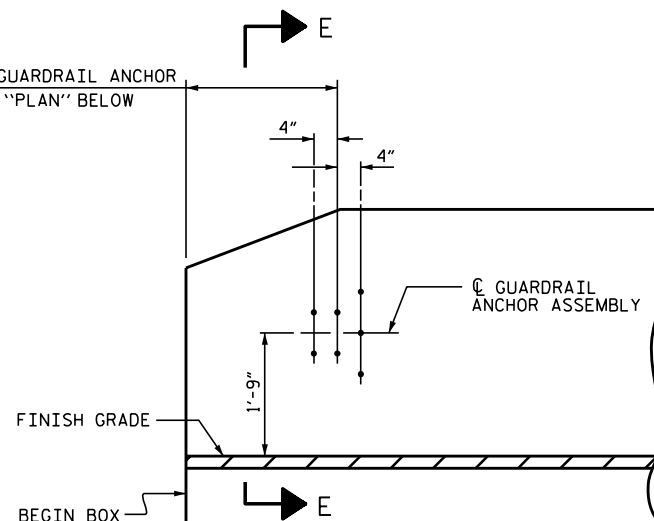
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE VERTICAL CONCRETE BARRIER RAIL TO CLEAR ASSEMBLY BOLTS.

THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

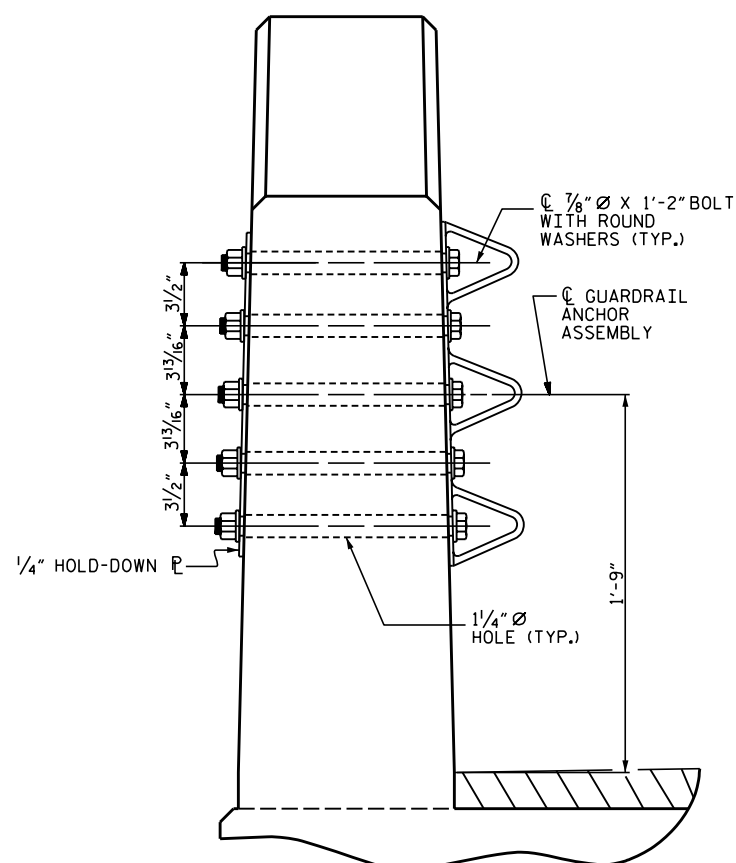


PLAN

FOR LOCATION OF GUARDRAIL ANCHOR ASSEMBLY, SEE "PLAN" BELOW

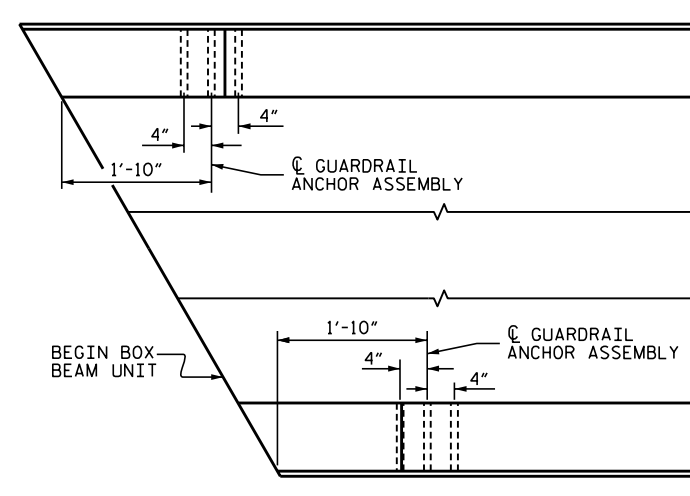


ELEVATION



SECTION E-E

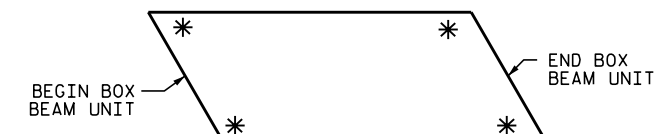
GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

END BENT #1 SHOWN, END BENT #2 SIMILAR.



SKETCH SHOWING POINTS OF ATTACHMENT

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. BP13.R014
MADISON COUNTY
STATION: 13+35.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
GUARDRAIL ANCHORAGE
DETAILS
FOR VERTICAL CONCRETE
BARRIER RAIL

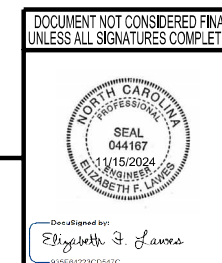
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-13
2			4			
TOTAL SHEETS						21

STD. NO. GRA3

ASSEMBLED BY: <u>J. WHEATLEY</u>	DATE: <u>DEC 2023</u>	DRAWN BY: <u>MAA</u>	5/10	REV. <u>1/15</u>	<u>MAA/TMG</u>
CHECKED BY: <u>T. KIRSCHBAUM</u>	DATE: <u>JAN 2024</u>	CHECKED BY: <u>GM</u>	5/10	REV. <u>12/17</u>	<u>MAA/THC</u>
DESIGN ENGINEER OF RECORD: <u>E. LAWES</u>	DATE: <u>JAN 2024</u>			REV. <u>5/18</u>	<u>MAA/THC</u>

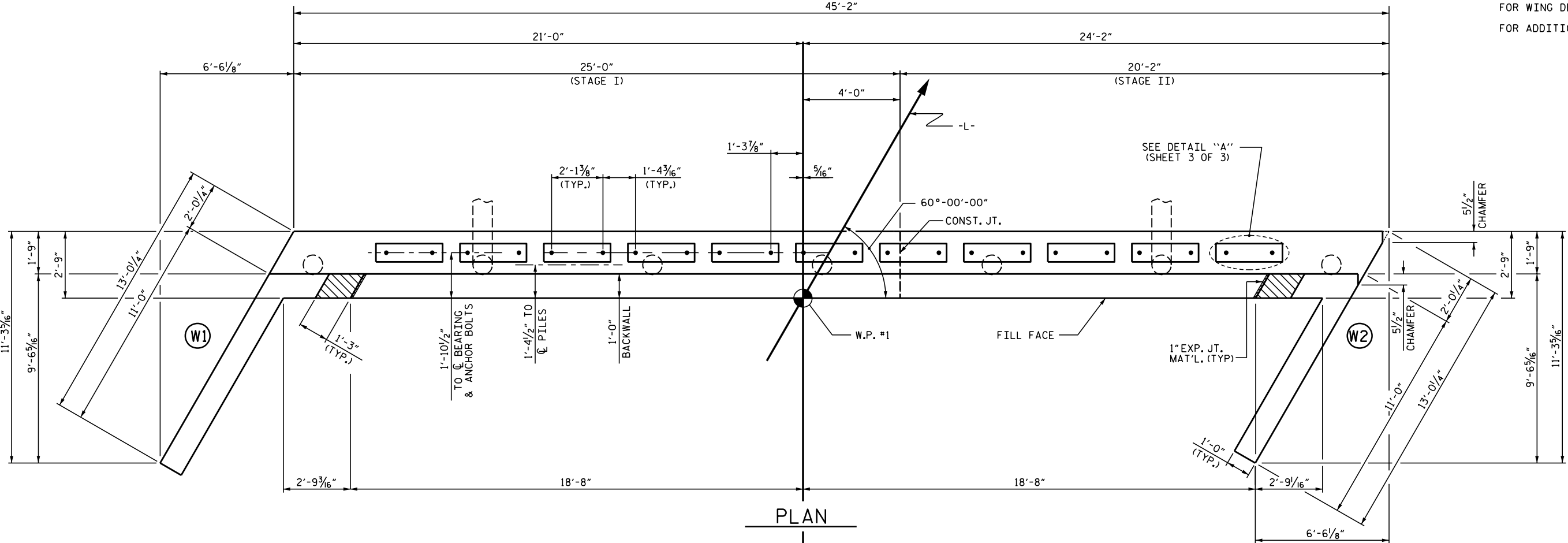


WSP USA Inc.
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RALEIGH, NC 27601
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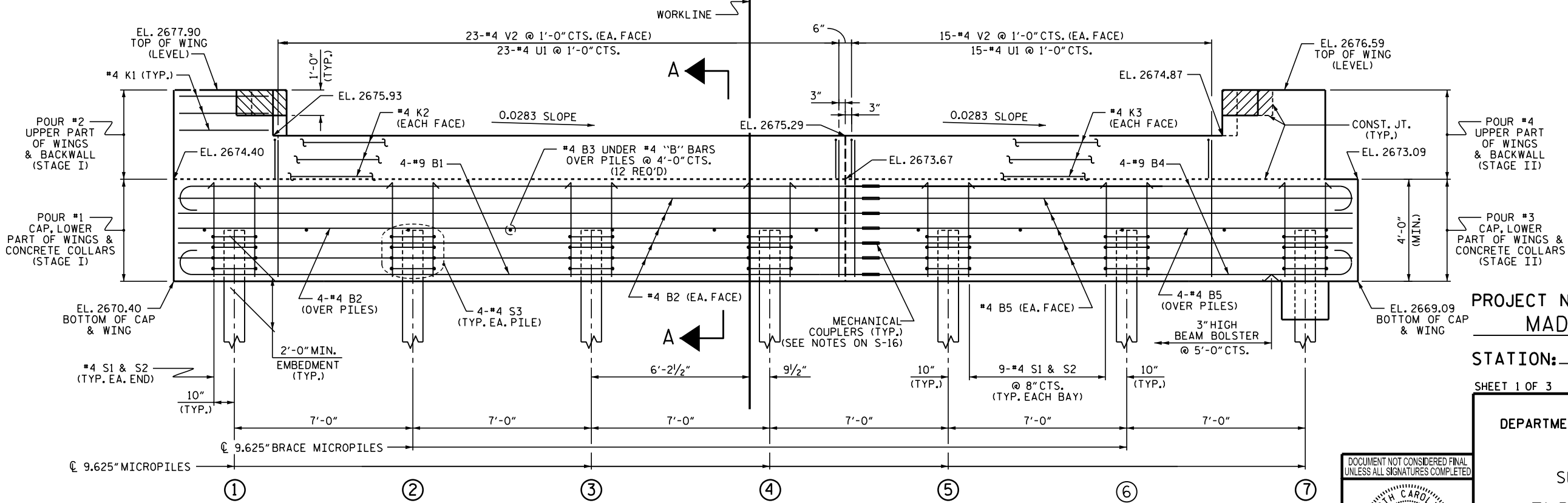
NOTES

FOR WING DETAILS, SEE SHEET 2 OF 3.
FOR ADDITIONAL NOTES, SEE SHEET 3 OF 3.



PLAN

TOP OF PILE ELEVATIONS	
①	2672.37
②	2672.17
③	2671.98
④	2671.78
⑤	2671.58
⑥	2671.38
⑦	2671.18



ELEVATION

WINGS NOT SHOWN FOR CLARITY.
FOR SECTION A-A, SEE SHEET 3 OF 3.
CONCRETE COLLARS FOR MICROPILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
SEE "CORROSION PROTECTION FOR MICROPILES DETAIL", SHEET 3 OF 3.

PROJECT NO. BP13-R014
MADISON COUNTY
STATION: 13+35.00 -L-

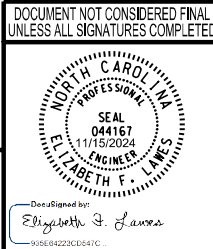
SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 1

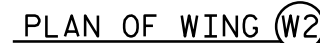
REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

TOTAL SHEETS: 21



WSP USA Inc.
434 FAYETTEVILLE STREET
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RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

DESIGNED BY: E. LAWES
DRAWN BY: J. WHEATLEY
CHECKED BY: T. KIRSCHBAUM
DESIGN ENGINEER OF RECORD: E. LAWES
DATE: JAN 2024
DATE: JAN 2024
DATE: JAN 2024
DATE: SEPT 2024



SHEET 2 OF 3

SUBSTRUCTURE
END BENT No.1
WING DETAILS

REVISIONS						SHEET NO. S-15 TOTAL SHEETS 21
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

STD. NO. FR 33 60S4 33RR

DESIGNED BY:	<u>E. LAWES</u>	DATE :	<u>JAN 2024</u>
DRAWN BY:	<u>J. WHEATLEY</u>	DATE :	<u>JAN 2024</u>
CHECKED BY:	<u>T. KIRSCHBAUM</u>	DATE :	<u>JAN 2024</u>
DESIGN ENGINEER OF RECORD:	<u>E. LAWES</u>	DATE :	<u>SEPT 2024</u>

DRAWN BY : WJH 12/11	REV. 4/15	MAA/TMC
CHECKED BY : AAC 12/11		

WING DETAILS

WSP |

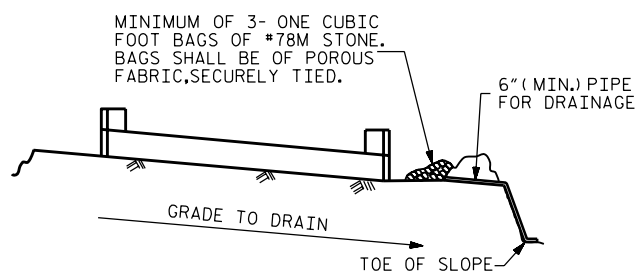
WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040

LICENSE NO. F-0165

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETE

NORTH CAROLINA
PROFESSIONAL
SEAL
044167
11/15/2024
ENGINEER
ELIZABETH F. LAWES

Designated by:
Elizabeth F. Lawes
90564222CD547C

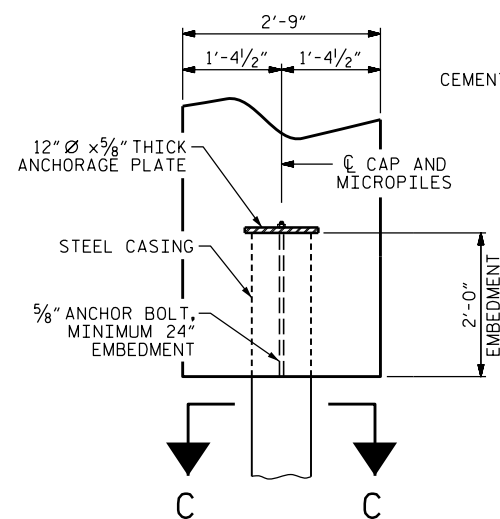


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR EFFECTIVENESS.

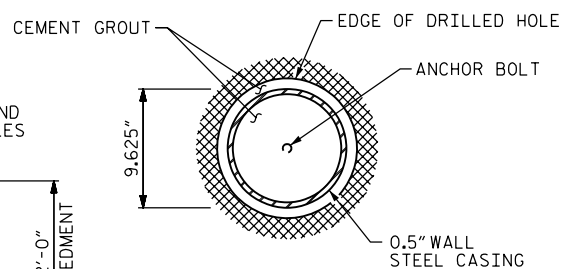
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

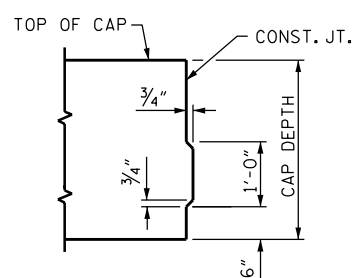


MICROPILE DETAIL

(TYP. EA. MICROPILE)



SECTION C-C



SHEAR KEY DETAIL
(STAGE I)

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR WING DETAILS, SEE SHEET 2 OF 3.

THE COST OF THE 7/8" DIA. ANCHOR BOLTS, NUTS, WASHERS AND PLATES CAST WITH THE END BENT CAP SHALL BE INCLUDED IN THE BOX BEAM PAY ITEM.

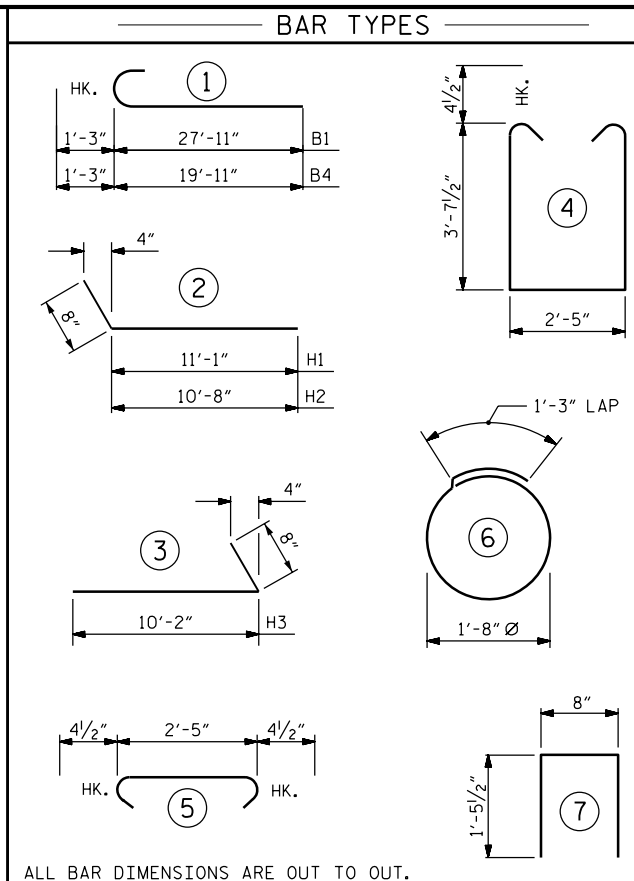
THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LENGTHS OF THE #9 AND #4 BARS AT THE CONSTRUCTION JOINT MAY NEED TO BE ADJUSTED DUE TO THE TYPE OF MECHANICAL BUTT SPLICE CHOSEN BY THE CONTRACTOR. NO ADDITIONAL PAYMENT WILL BE MADE FOR ANY ADJUSTMENTS.

MECHANICAL COUPLERS SHALL BE USED TO JOIN THE #9 AND #4 HORIZONTAL BARS IN STAGE I WITH THE #9 AND #4 HORIZONTAL BARS IN STAGE II IN BOTH THE END BENT CAPS AND BACKWALLS. THE LOCATION OF THE COUPLERS SHALL BE STAGGERED ON ALTERNATING BY 1 FOOT AND THE BARS SHALL BE CUT ACCORDINGLY TO ALLOW A MINIMUM OF 1'-0" INTO STAGE II CONSTRUCTION.

FOR MECHANICAL COUPLERS, SEE MECHANICAL BUTT SPLICES FOR REINFORCING STEEL IN STANDARD SPECIFICATIONS.

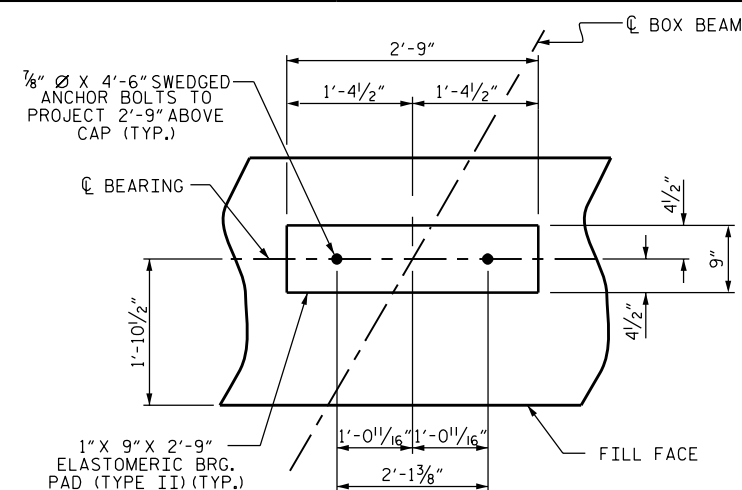
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449.
ANCHOR PLATES, WASHERS, AND NUTS SHALL MEET THE REQUIREMENTS
OF THE STANDARD SPECIFICATIONS. ANCHOR BOLTS, ANCHOR PLATES,
WASHERS, AND NUTS SHALL BE GALVANIZED IN ACCORDANCE WITH THE
STANDARD SPECIFICATIONS.

NO SEPARATE PAYMENT SHALL BE MADE FOR THE ANCHOR BOLTS, ANCHOR PLATES, WASHERS, AND NUTS. THE COST OF THE MATERIAL AND INSTALLATION SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.



BILL OF MATERIAL

STAGE I						STAGE II					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	29'-2"	793	B3	5	#4	STR	2'-5"	8
B2	14	#4	STR	28'-0"	262	B4	8	#9	1	21'-2"	576
B3	7	#4	STR	2'-5"	11	B5	14	#4	STR	20'-0"	187
H1	12	#5	2	11'-9"	147	H3	24	#5	3	10'-10"	271
H2	12	#5	2	11'-4"	142						
						K1	6	#4	STR	3'-3"	13
K1	6	#4	STR	3'-3"	13	K3	6	#4	STR	20'-0"	80
K2	6	#4	STR	28'-0"	112						
						S1	24	#4	4	10'-5"	167
S1	32	#4	4	10'-5"	223	S2	24	#4	5	3'-2"	51
S2	32	#4	5	3'-2"	68	S3	12	#4	6	6'-6"	52
S3	16	#4	6	6'-6"	69						
						U1	15	#4	7	3'-7"	36
U1	23	#4	7	3'-7"	55						
						V1	30	#4	STR	7'-2"	144
V1	31	#4	STR	7'-2"	148	V2	30	#4	STR	5'-3"	105
V2	46	#4	STR	5'-3"	161						
REINFORCING STEEL (FOR STAGE I) 2204 LBS.						REINFORCING STEEL (FOR STAGE II) 1690 LBS.					
CLASS A CONCRETE BREAKDOWN (FOR STAGE I)						CLASS A CONCRETE BREAKDOWN (FOR STAGE II)					
POUR #1	CAP & LOWER PART OF WING				12.0 C.Y.	POUR #1	CAP, LOWER PART OF WING & COLLARS				9.3 C.Y.
POUR #2	BACKWALL & UPPER PART OF WING				3.1 C.Y.	POUR #2	BACKWALL & UPPER PART OF WING				2.6 C.Y.
TOTAL CLASS A CONCRETE					15.1 C.Y.	TOTAL CLASS A CONCRETE					11.9 C.Y.



DETAIL "A"

(END BENT No.1 SHOWN,END BENT No.2 SIMILAR BY ROTATION)

PROJECT NO. BP13-R014
MADISON COUNTY
 STATION: 13+35.00 -L-

SHEET 3 OF 3

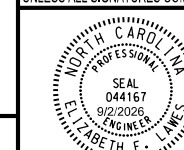
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE

END BENT No. 1
 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16 TOTAL SHEETS 21
1			3			
2			4			

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETE

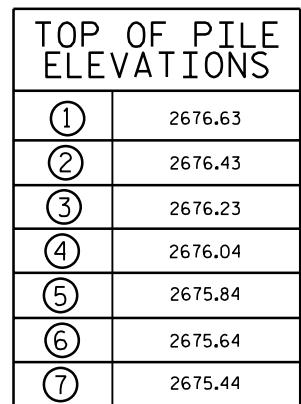


DocuSigned by:
Elizabeth F. Lawrence
626584003CDE43C

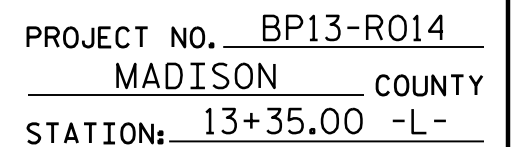
WSP |

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434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040

LICENSE NO. E-0165



WORKLINE



SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 2

REVISIONS						SHEET NO. S-17 TOTAL SHEETS 21
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

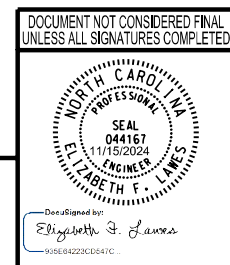
WINGS NOT SHOWN FOR CLARITY.
FOR SECTION A-A, SEE SHEET 3 OF 3.
CONCRETE COLLARS FOR MICROPILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
SEE "CORROSION PROTECTION FOR MICROPILES DETAIL", SHEET 3 OF 3.

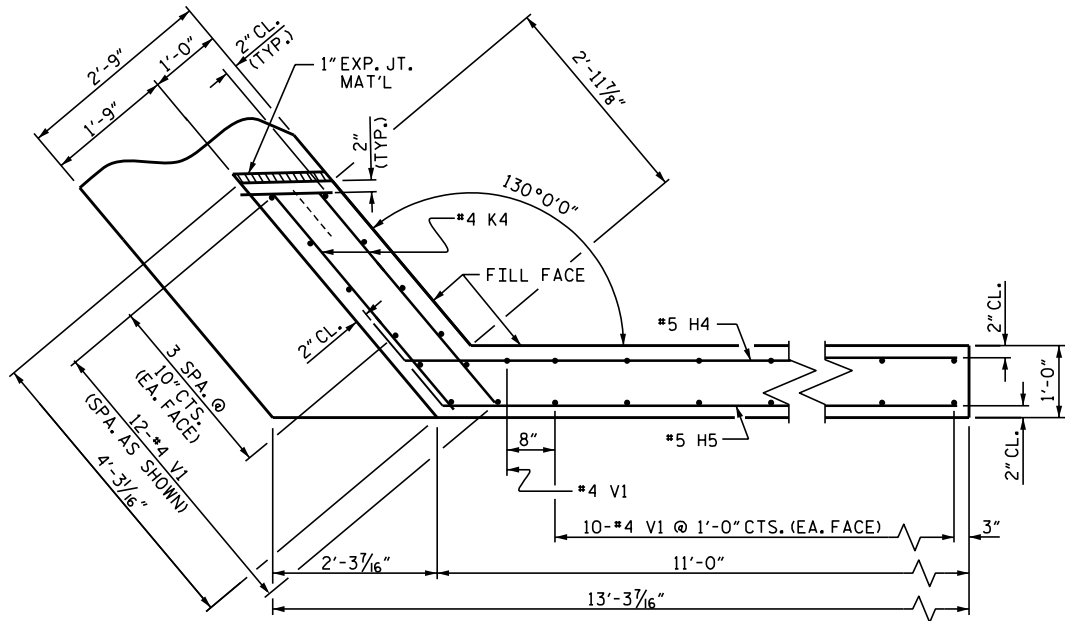
DESIGNED BY:	<u>E. LAWES</u>	DATE :	<u>JAN 2024</u>
DRAWN BY:	<u>J. WHEATLEY</u>	DATE :	<u>JAN 2024</u>
CHECKED BY:	<u>T. KIRSCHBAUM</u>	DATE :	<u>JAN 2024</u>
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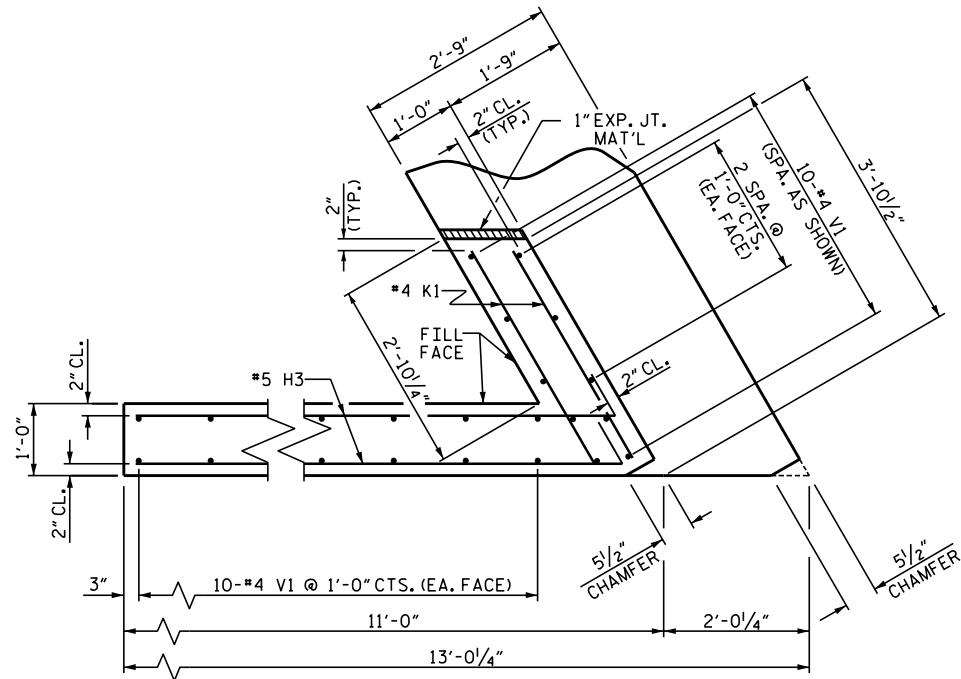
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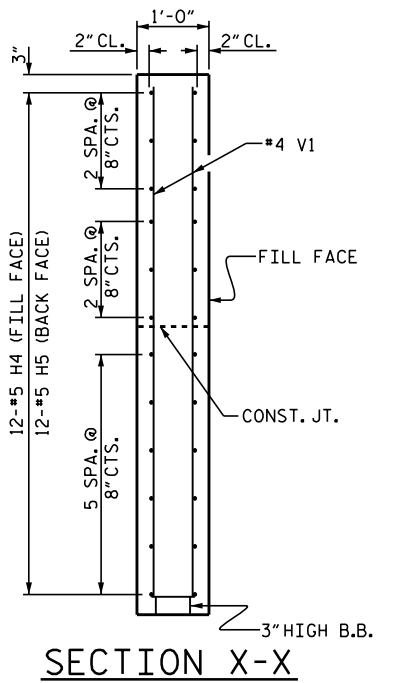




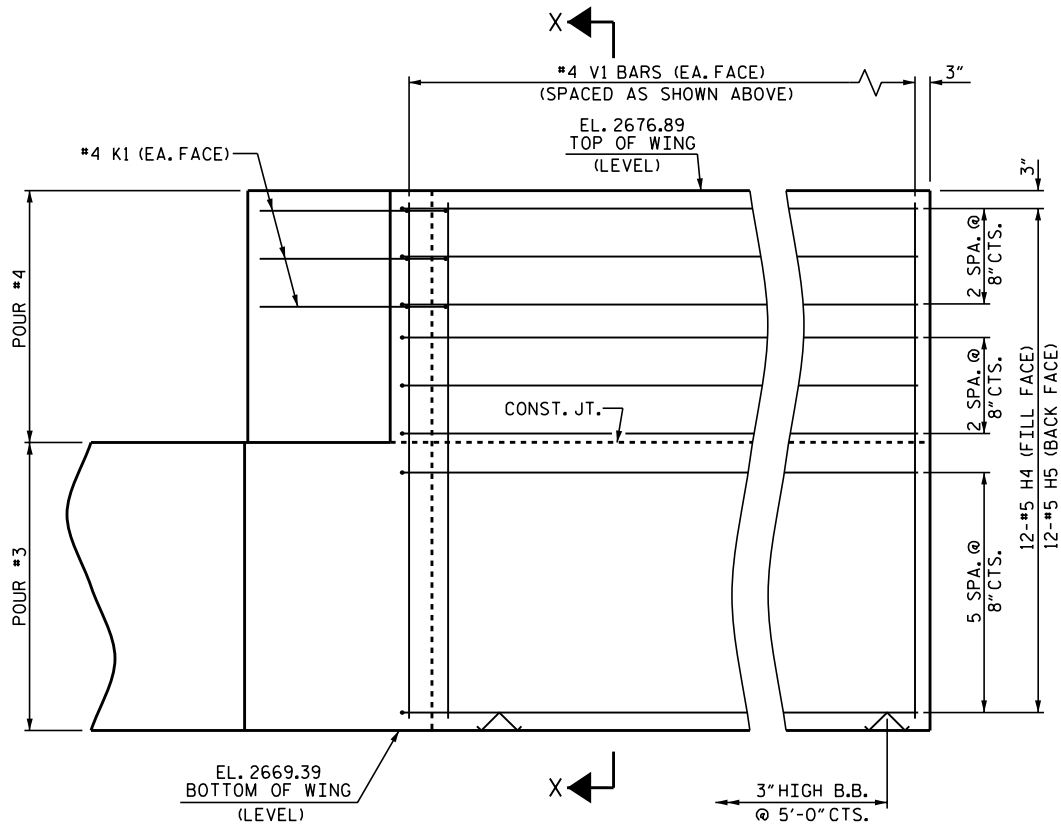
PLAN OF WING (W3)



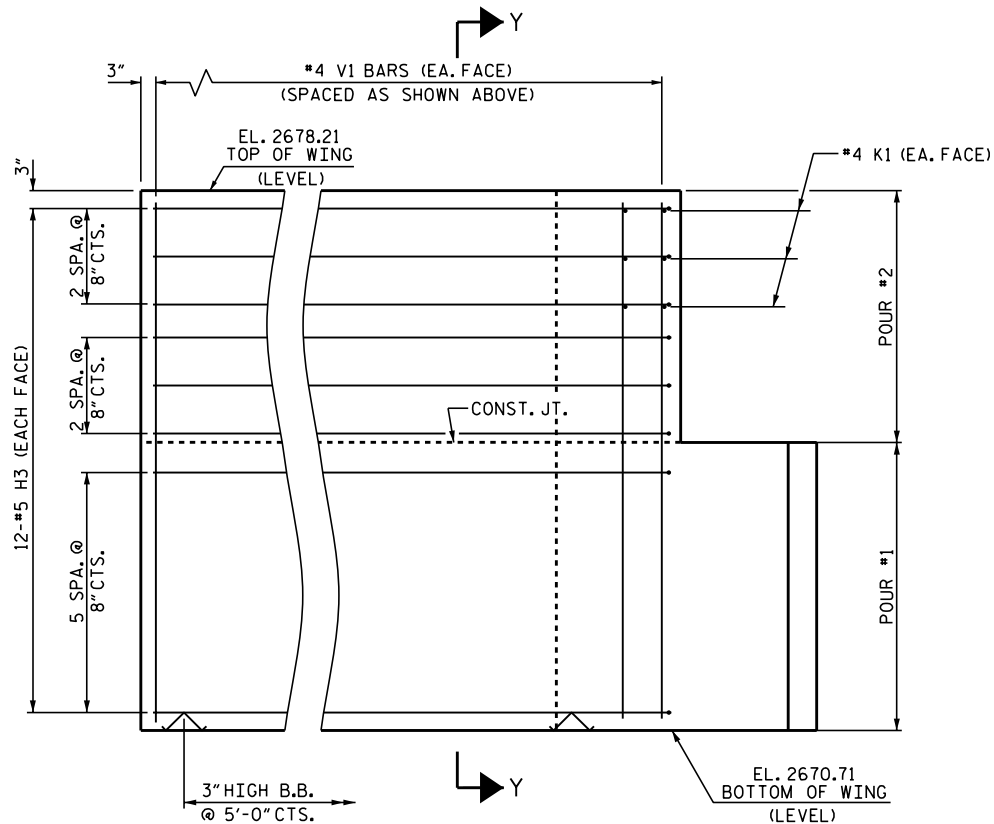
PLAN OF WING (W4)



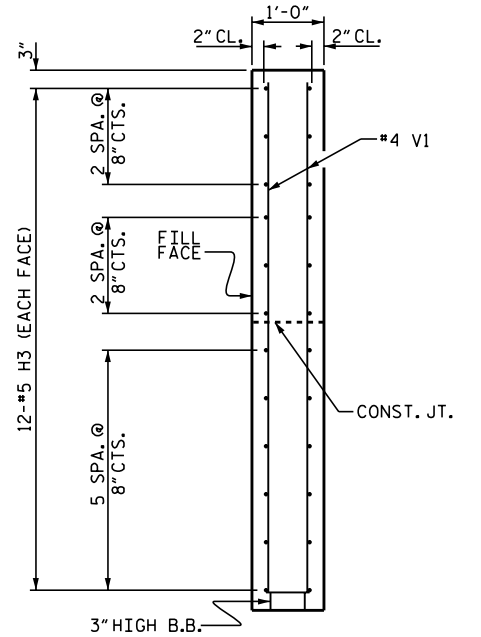
SECTION X-X



ELEVATION OF WING (W3)



ELEVATION OF WING (W4)



SECTION Y-Y

PROJECT NO. BP13-R014
MADISON COUNTY
STATION: 13+35.00 -L-

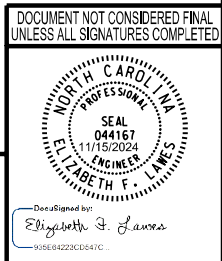
SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 2
WING DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-18
2			4			

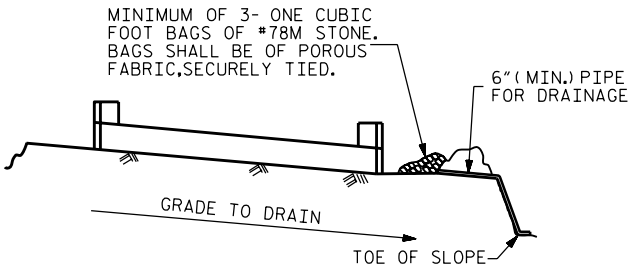
TOTAL SHEETS
21



WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

DESIGNED BY: E. LAWES DATE: JAN 2024
DRAWN BY: J. WHEATLEY DATE: JAN 2024
CHECKED BY: T. KIRSCHBAUM DATE: JAN 2024
DESIGN ENGINEER OF RECORD: E. LAWES DATE: SEPT 2024

WING DETAILS



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TEMPORARY DRAINAGE AT END BENT

NOTES

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FOR WING DETAILS, SEE SHEET 2 OF 3.

THE COST OF THE 7/8" DIA. ANCHOR BOLTS, NUTS, WASHERS AND PLATES CAST WITH THE END BENT CAP SHALL BE INCLUDED IN THE BOX BEAM PAY ITEM.

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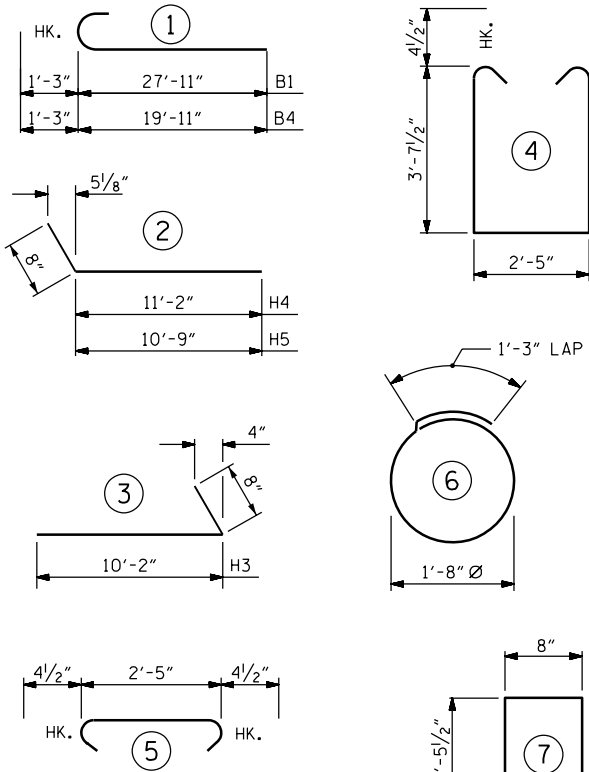
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ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449, ANCHOR PLATES, WASHERS, AND NUTS SHALL MEET THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS. ANCHOR BOLTS, ANCHOR PLATES, WASHERS, AND NUTS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

STAGE I

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	29'-2"	793
B2	14	#4	STR	28'-0"	262
B3	7	#4	STR	2'-5"	11

H3	24	#5	3	10'-10"	271
K1	6	#4	STR	3'-3"	13
K2	12	#4	STR	28'-0"	224

S1	31	#4	4	10'-5"	216
S2	31	#4	5	3'-2"	66
S3	16	#4	6	6'-6"	69

U1	21	#4	7	3'-7"	50
V1	30	#4	STR	7'-2"	144
V2	42	#4	STR	5'-3"	147

U1	17	#4	7	3'-7"	41
V1	33	#4	STR	7'-2"	158
V2	34	#4	STR	5'-3"	119

REINFORCING STEEL (FOR STAGE I) 2266 LBS.

CLASS A CONCRETE BREAKDOWN (FOR STAGE I)

POUR #1 CAP & LOWER PART OF WING 11.7 C.Y.

POUR #2 BACKWALL & UPPER PART OF WING 3.0 C.Y.

TOTAL CLASS A CONCRETE 14.7 C.Y.

STAGE II

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B3	5	#4	STR	2'-5"	8
B4	8	#9	1	21'-2"	576
B5	14	#4	STR	20'-0"	187

H4	12	#5	2	11'-10"	148
H5	12	#5	2	11'-5"	143
K3	12	#4	STR	20'-0"	160

K4	6	#4	STR	3'-9"	15
S1	25	#4	4	10'-5"	174
S2	25	#4	5	3'-2"	53

S3	12	#4	6	6'-6"	52
U1	17	#4	7	3'-7"	41
V1	33	#4	STR	7'-2"	158

V2	34	#4	STR	5'-3"	119

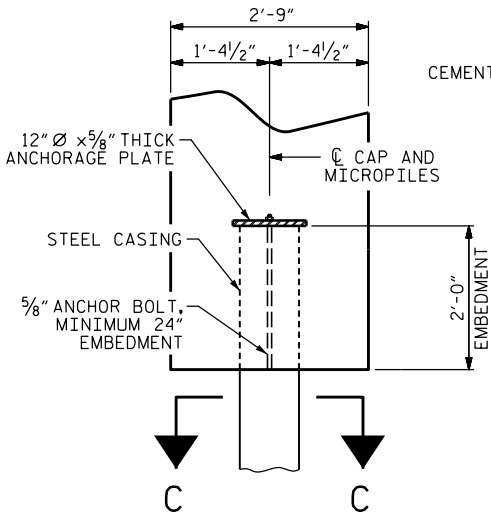
REINFORCING STEEL (FOR STAGE II) 1834 LBS.

CLASS A CONCRETE BREAKDOWN (FOR STAGE II)

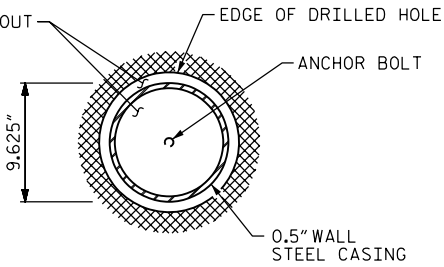
POUR #1 CAP & LOWER PART OF WING 9.7 C.Y.

POUR #2 BACKWALL & UPPER PART OF WING 2.9 C.Y.

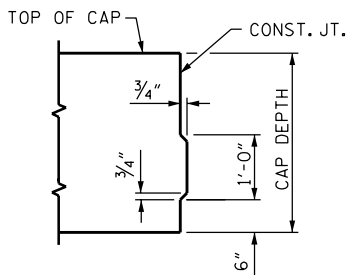
TOTAL CLASS A CONCRETE 12.6 C.Y.



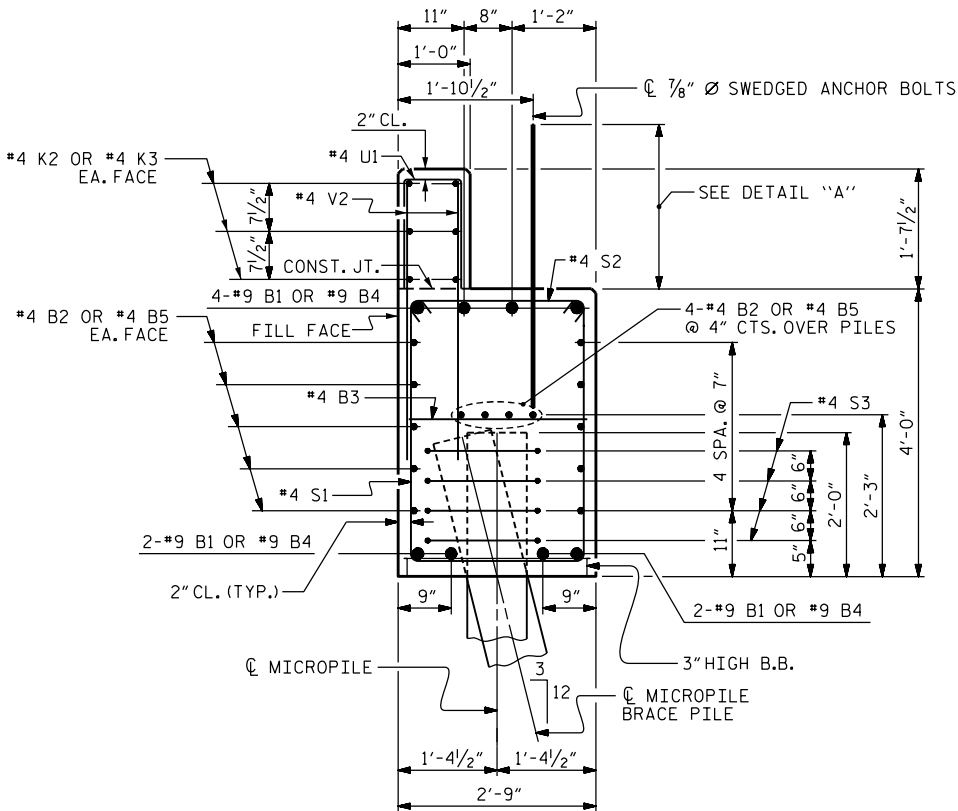
MICROPILE DETAIL (TYP. EA. MICROPILE)



SECTION C-C

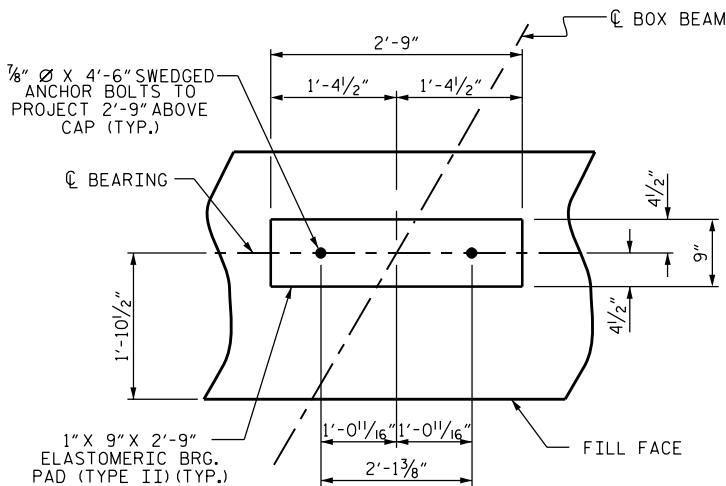


SHEAR KEY DETAIL (STAGE I)



SECTION A-A

SEE "CORROSION PROTECTION FOR MICROPILES DETAIL."



DETAIL "A"

(END BENT No. 1 SHOWN, END BENT No. 2 SIMILAR BY ROTATION)

PROJECT NO. BP13-R014
MADISON COUNTY
STATION: 13+35.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

END BENT No. 2
DETAILS

REVISIONS

NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.
1			3			S-19
2			4			TOTAL SHEETS 21

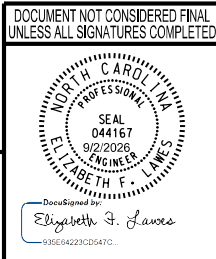
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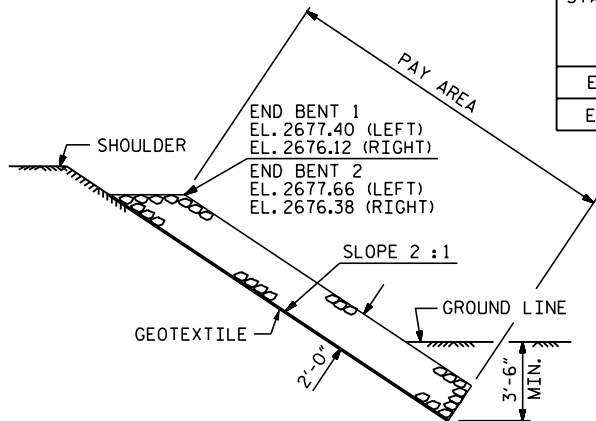
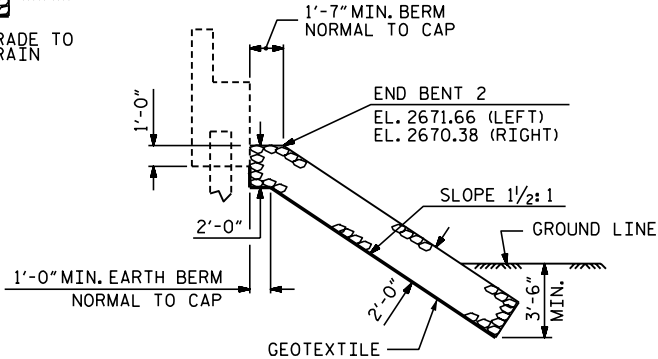
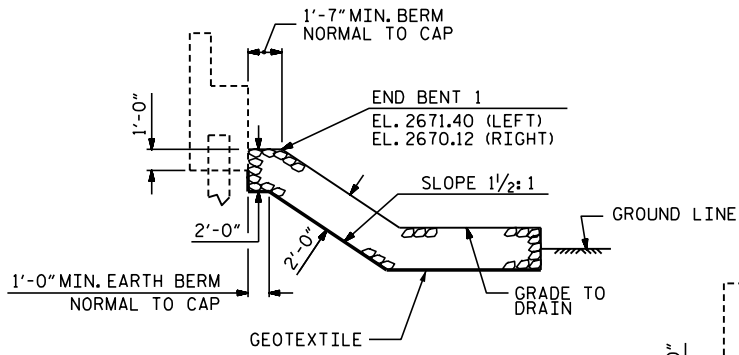
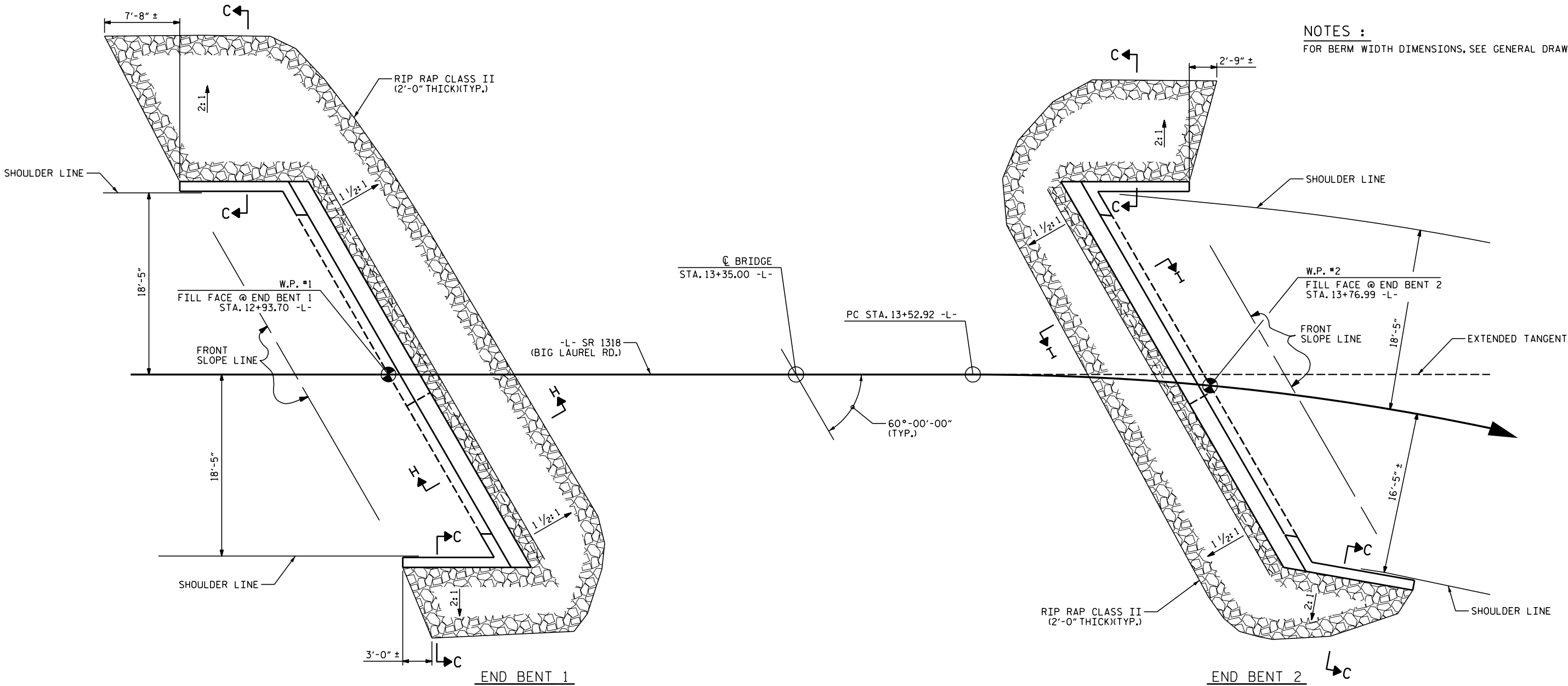
DESIGNED BY: E. LAWES DATE: JAN 2024
DRAWN BY: J. WHEATLEY DATE: JAN 2024
CHECKED BY: T. KIRSCHBAUM DATE: JAN 2024
DESIGN ENGINEER OF RECORD: E. LAWES DATE: SEPT 2024

DRAWN BY: WJH 12/11
CHECKED BY: AAC 12/11
REV. 4/17 MAA/THC

wsp

WSP USA Inc.
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RALEIGH, NC 27601
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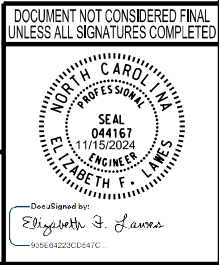




ESTIMATED QUANTITIES		
BRIDGE @ STA. 13+35.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	147	163
END BENT 2	126	140

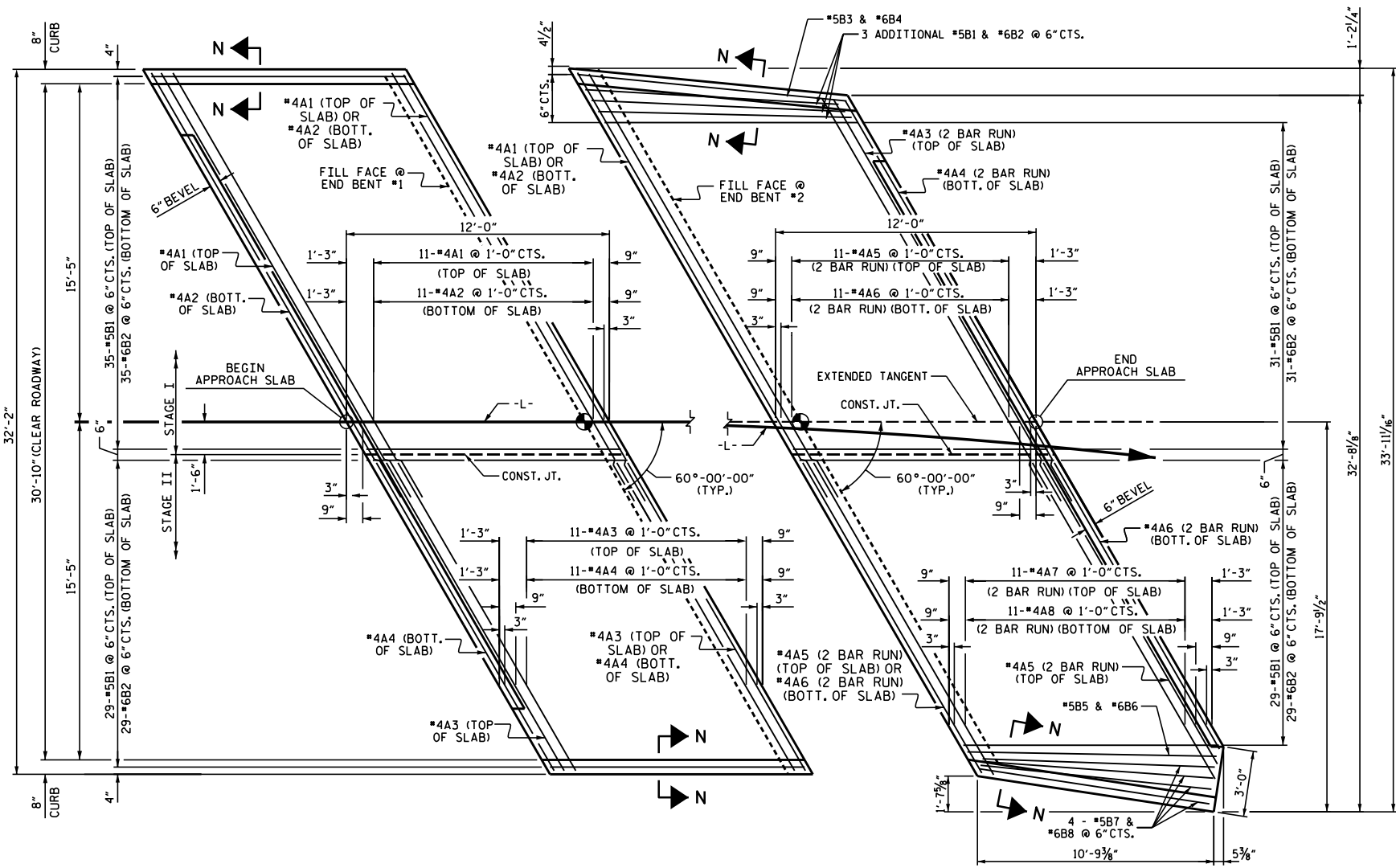
PROJECT NO. BP13-R014
MADISON COUNTY
STATION: 13+35.00 -L-

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
RIP RAP DETAILS					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO.					S-20
TOTAL SHEETS					21



11/15/2024
401_039_BP13-R014_SMU_RB.dgn

DESIGNED BY:	E. LAWES	DATE :	JAN 2024
DRAWN BY:	J. WHEATLEY	DATE :	JAN 2024
CHECKED BY:	T. KIRSCHBAUM	DATE :	JAN 2024
DESIGN ENGINEER OF RECORD:	E. LAWES	DATE :	SEPT 2024



PLAN @ END BENT #1

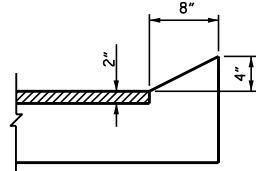
PLAN @ END BENT #2

NOTES

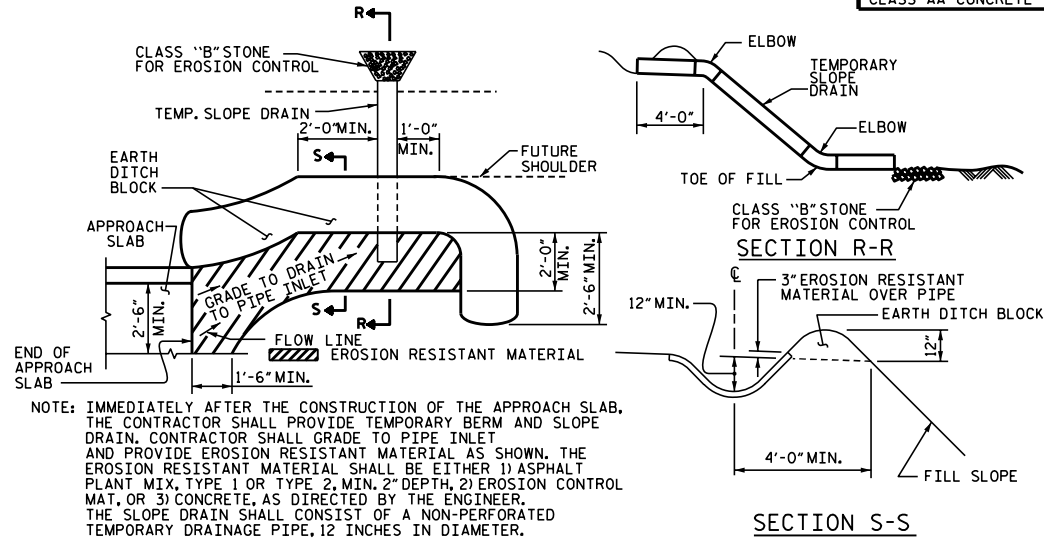
FOR BRIDGE APPROACH FILL, SEE ROADWAY PLANS.

AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

APPROACH SLAB GROOVING IS NOT REQUIRED.



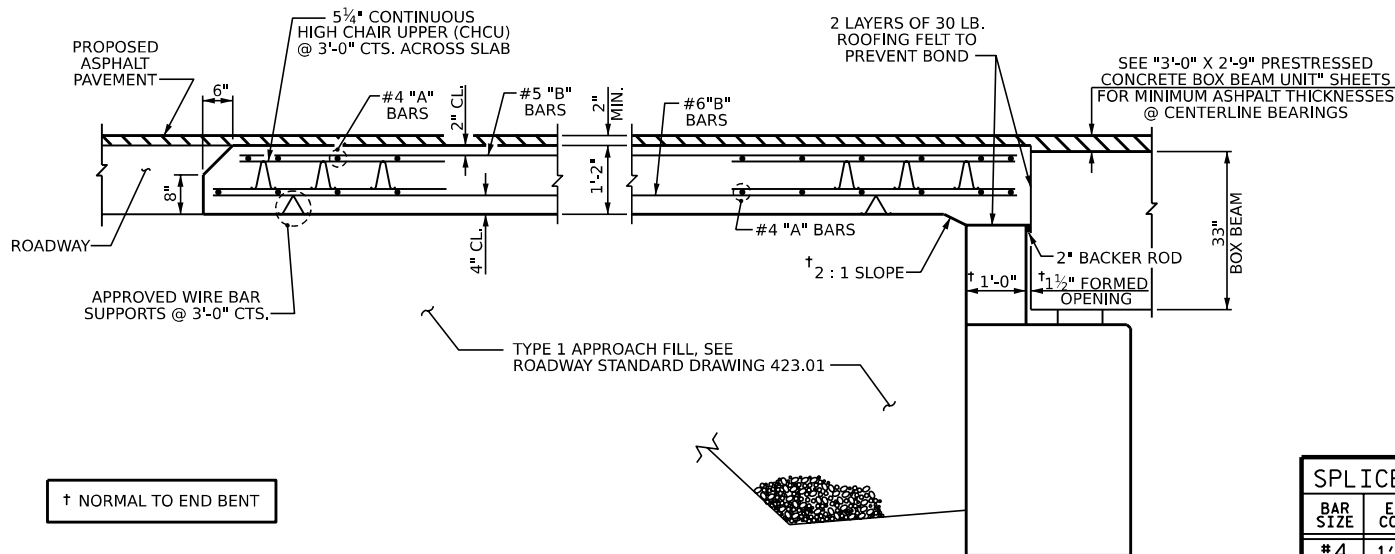
SECTION N-N
CURB DETAILS



PLAN VIEW

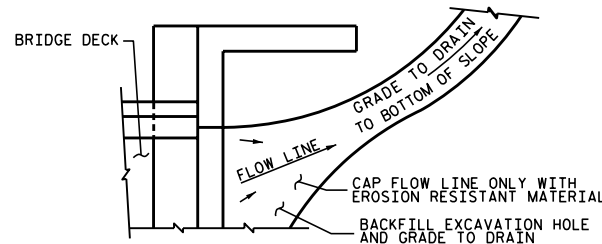
TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



SECTION THRU SLAB

SPLICE LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#4	1'-11"	1'-7"
#5	2'-5"	2'-0"
#6	3'-7"	2'-5"

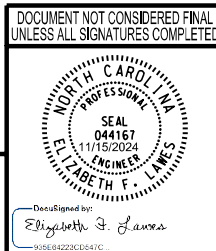


NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT TO THE STRUCTURE. THE CONTRACTOR WILL BE REQUIRED TO REMOVE THESE MATERIALS PRIOR TO CONSTRUCTION OF THE APPROACH SLAB.

TEMPORARY DRAINAGE DETAIL



WSP USA, Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.856.4040
LICENSE NO. P-0165



PROJECT NO. BP13-R014
MADISON COUNTY
STATION: 13+35.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

BRIDGE APPROACH SLAB
FOR PRESTRESSED CONCRETE
BOX BEAM UNIT
(SUB-REGIONAL TIER)
60° SKEW

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

TOTAL SHEETS
21

STD. NO. BAS3

DESIGNED BY: E. LAWES DATE: JAN 2024
DRAWN BY: J. WHEATLEY DATE: JAN 2024
CHECKED BY: T. KIRSCHBAUM DATE: JAN 2024
DESIGN ENGINEER OF RECORD: E. LAWES DATE: SEPT 2024

DRAWN BY: FCJ 6/87
CHECKED BY: EGA 6/87

REV. 12/17
REV. 06/19
REV. 07/23

MAA/THC
BNB/THC
BNB/SNM

STANDARD NOTES

DESIGN DATA:

SPECIFICATIONS	-----	AASHTO (CURRENT)
LIVE LOAD	-----	SEE PLANS
IMPACT ALLOWANCE	-----	SEE AASHTO
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 AASHTO
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 2024 "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 7⁄8" Ø SHEAR STUDS FOR THE ¾" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7⁄8" Ø STUDS FOR 4 - ¾" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7⁄8" Ø STUDS ALONG THE BEAM AS SHOWN FOR ¾" Ø STUDS BASED ON THE RATIO OF 3 - 7⁄8"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" 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. FINIS 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.