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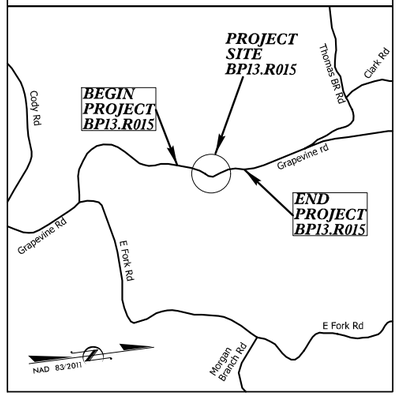
09/08/99

TIP PROJECT: BP13.R015

CONTRACT: DM00407

See Sheet 1A For Index of Sheets
See Sheet 1B For Standard Symbology Sheet

PROJECT VICINITY MAP



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

MADISON COUNTY

LOCATION: BRIDGE NO. 560098 ON SR 1370 (GRAPEVINE RD) OVER WEST FORK BULL CREEK

TYPE OF WORK: GRADING, PAVING, DRAINAGE & STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP13.R015	1	

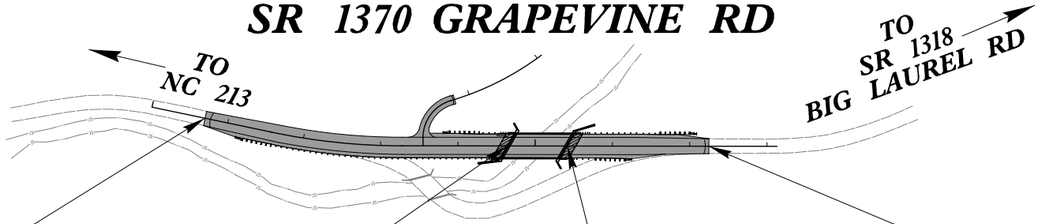
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
BP13.R015.1	N / A	PE
BP13.R015.2	N / A	ROW & UTILITIES
BP13.R015.3	N / A	CON



NAD 83/2011

4

–L–
SR 1370 GRAPEVINE RD



BEGIN BRIDGE
–L– STA. 14+64.20

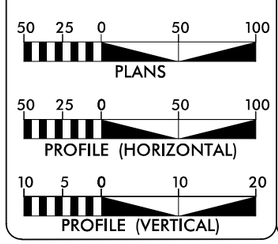
END BRIDGE
–L– STA. 15+41.80

BEGIN TIP PROJECT BP13.R015
–L– STA. 10+70.00

END TIP PROJECT BP13.R015
–L– STA. 17+25.00

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GRAPHIC SCALES



DESIGN DATA

ADT 2019 = 1,300 VPD

V = 60 MPH

FUNC CLASS =
MINOR COLLECTOR

SUB–REGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT BP13.R015 = 0.109 Miles

LENGTH OF STRUCTURE TIP PROJECT BP13.R015 = 0.015 Miles

TOTAL LENGTH OF TIP PROJECT BP13.R015 = 0.124 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 30, 2023

LETTING DATE:
NOVEMBER 18, 2026

SIERRA WOLF, P.E.
PROJECT ENGINEER

HUNTER REID, P.E.
PROJECT DESIGN ENGINEER

MARK HILL, P.E.
NCDOT CONTACT

HYDRAULICS ENGINEER

10/19/2026

NORTH CAROLINA PROFESSIONAL SEAL 052432 ENGINEER JAMES O BRITT

Signed by: James O. Britt

P.E.

SIGNATURE:

ROADWAY DESIGN ENGINEER

10/19/2026

NORTH CAROLINA PROFESSIONAL SEAL 039867 ENGINEER SIERRA HAYNES WOLF

Signed by: Sierra Wolf

SE181515F0149607

P.E.

SIGNATURE:

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

10/19/2026
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HaynesSI

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8/17/99

PROJECT REFERENCE NO.	SHEET NO.
BP13.R015	1-A

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 039867 ENGINEER SIERRA MONIQUE HAYNES

Signed by: Sierra Haynes
SE1815F614948F...
6/10/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

wsp
1001 Morehead Square Dr., Suite 610, Charlotte NC, 28203
NC LIC NO. F-0165

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1-A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS
1-B	CONVENTIONAL SYMBOLS
2A-1 THRU 2A-2	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2C-1 THRU 2C-5	DETAILS IN LIEU OF STANDARDS
3B-1	EARTHWORK, PAVEMENT REMOVAL, SHOULDER BERM GUTTER, GUARDRAIL, AND DRAINAGE SUMMARY SHEET
3G-1	GEOTECHNICAL SUMMARY SHEET
4 THRU 5	PLAN AND PROFILE SHEETS
RW-1 THRU RW03E-1	SURVEY CONTROL, EXISTING CENTERLINE & RIGHT OF WAY
RW-04	EASEMENT & PROPERTY TIES
TMP-1 THRU TMP-5	TRANSPORTATION MANAGEMENT PLANS
PMP-1 THRU PMP-2	PAVEMENT MARKING PLANS
EC-1 THRU EC-5	EROSION CONTROL PLANS
RF-1 THRU RF-2	REFORESTATION PLANS
UO-01 THRU UO-02	UTILITY BY OTHERS PLAN
X-1	CROSS-SECTIONS INDEX
X-1A	CROSS-SECTIONS SUMMARY
X-2 THRU X-10	CROSS-SECTIONS
S-1 THRU S-19	STRUCTURE PLANS

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.

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 AS "EXTRA WORK" IN ACCORDANCE WITH SECTION 104-7.

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.

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 or 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
846.01 Concrete Curb, Gutter and Curb & Gutter
846.04 Drop Inlet Installation in Shoulder Berm Gutter
862.01 Guardrail Placement
862.02 Guardrail Installation
862.03 Structure Anchor Units
876.02 Guide for Rip Rap at Pipe Outlets

$$$$$SYSTIME$$$$
$$$$$DGN$$$$$$$$$$$$$$$$$$$$
$$$$$CELENAME$$$

9/10/2021

PROJECT REFERENCE NO.	SHEET NO.
BP13.R015	1B

1001 Morehead Square Dr., Suite 610, Charlotte NC, 28203
NC LIC NO. F-0165

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

Note: Not to Scale

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin (EIP)
- Computed Property Corner
- Existing Concrete Monument (ECM)
- Parcel/Sequence Number
- 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 — CSX TRANSPORTATION
- RR Signal Milepost — MILEPOST 35
- Switch — SWITCH
- RR Abandoned
- RR Dismantled

RIGHT OF WAY & PROJECT CONTROL:

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

ROADS AND RELATED FEATURES:

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

VEGETATION:

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

EXISTING STRUCTURES:

MAJOR:

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

MINOR:

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

UTILITIES:

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

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole
- H–Frame Pole
- U/G Power Line Test Hole (SUE – LOS A)*
- U/G Power Line (SUE – LOS B)*
- U/G Power Line (SUE – LOS C)*
- U/G Power Line (SUE – LOS D)*

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

- Gas Valve
- Gas Meter
- U/G Gas Line Test Hole (SUE – LOS A)*
- U/G Gas Line (SUE – LOS B)*
- U/G Gas Line (SUE – LOS C)*
- U/G Gas Line (SUE – LOS D)*
- Above Ground Gas Line — A/G Gas

SANITARY SEWER:

- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line
- Above Ground Sanitary Sewer — A/G Sanitary Sewer
- SS Force Main Line Test Hole (SUE – LOS A)*
- SS Force Main Line (SUE – LOS B)*
- SS Force Main Line (SUE – LOS C)*
- SS Force Main Line (SUE – LOS D)*

MISCELLANEOUS:

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

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PROJECT REFERENCE NO.	SHEET NO.
BP13.R015	2A-1
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER 11/19/2024
NORTH CAROLINA PROFESSIONAL SEAL 051574 ENGINEER ALEJANDRA PORTILLO
Signed by: Alejandra Portillo

PAVEMENT DESIGN ENGINEER 11/19/2024
NORTH CAROLINA PROFESSIONAL SEAL 044590 ENGINEER ANDREW D. WARGO
Docusigned by: Andrew D. Wargo, PE, PMP

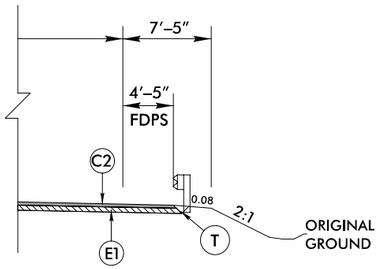
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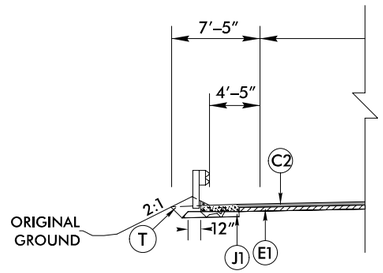
PAVEMENT SCHEDULE
(PAVEMENT DESIGN)

C1	PROP. APPROX. 1.5″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
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.
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 1.5″ IN DEPTH.
E1	PROP. APPROX. 4″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1″ DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3″ IN DEPTH OR GREATER THAN 5½″ IN DEPTH.
J1	6″ AGGREGATE BASE COURSE (ABC)
J2	8″ AGGREGATE BASE COURSE (ABC)
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	VARIABLE DEPTH MILLING
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE STANDARD WEDGING DETAIL ON THIS SHEET)

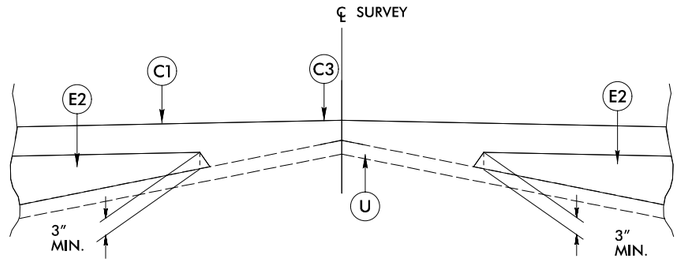
NOTES:
1. TYPICAL SECTIONS SHOWN FOR TANGENT SECTIONS ONLY SEE PLANS FOR SUPERELEVATION DETAILS
2. ALL PAVEMENT SLOPES 1:1 UNLESS NOTED OTHERWISE



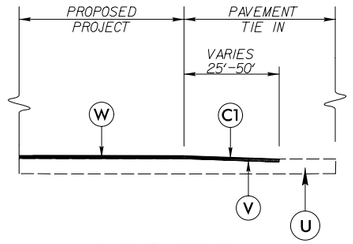
GUARDRAIL DETAIL
See Plan for Locations



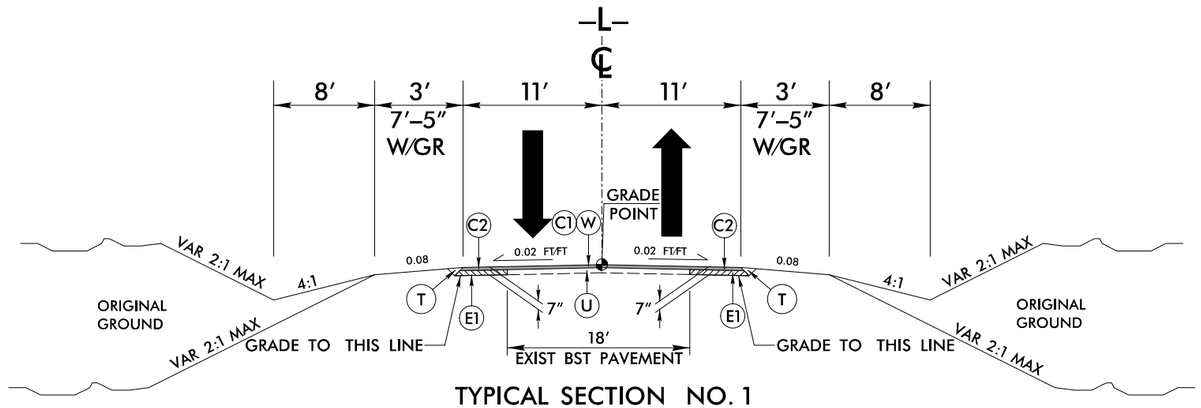
SHOULDER BERM GUTTER DETAIL
See Plan for Location



Detail Showing Method of Wedging
–L–



MILLING DETAIL
PROJECT TIE–INS



TYPICAL SECTION NO. 1
GRAPEVINE RD (SR 1370)
–L– STA. 10+70.00 TO STA. 12+70.00
–L– STA. 16+50.00 TO STA. 17+25.00

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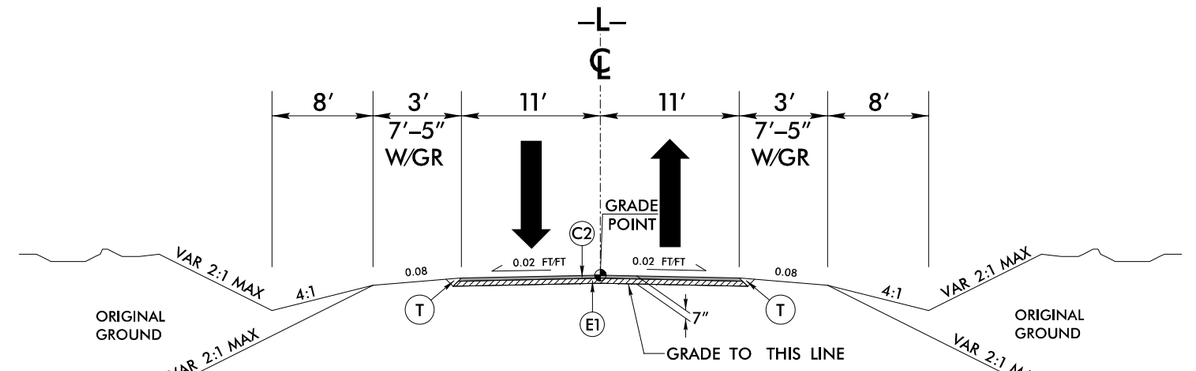
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BP13.R015	2A-2
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
11/19/2024
NORTH CAROLINA PROFESSIONAL SEAL 051574 ENGINEER ALEJANDRA PORTILLO
Signed by: Alejandra Portillo

HYDRAULICS ENGINEER
11/19/2024
NORTH CAROLINA PROFESSIONAL SEAL 044590 ENGINEER ANDREW D. WARGO
Docusigned by: Andrew D. Warga, PE, PhD

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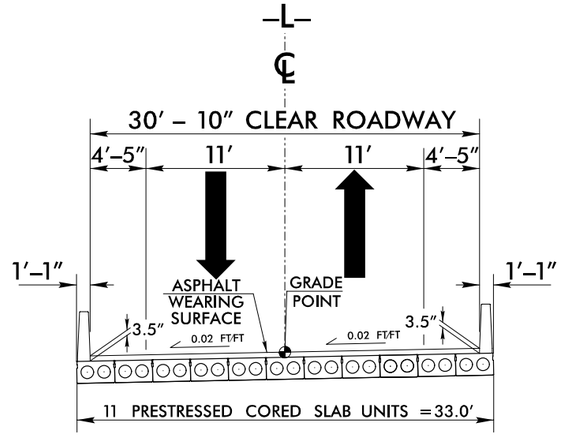
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NC LIC NO. F-0165



TYPICAL SECTION NO. 2

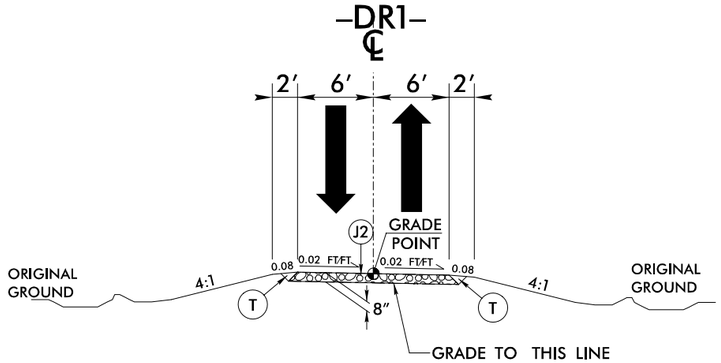
GRAPEVINE RD (SR 1370)
–L– STA. 12+70.00 TO STA. 14+64.20 (BEGIN BRIDGE)
–L– STA. 15+41.80 (END BRIDGE) TO STA. 16+50.00

PRELIMINARY PAVEMENT DESIGN	
C2	3″ S9.5B
E1	4″ B25.0C
J2	8″ ABC
T	EARTH MATERIAL



TYPICAL SECTION NO. 3

GRAPEVINE RD (SR 1370)
–L– STA. 14+64.20 TO STA. 15+41.80



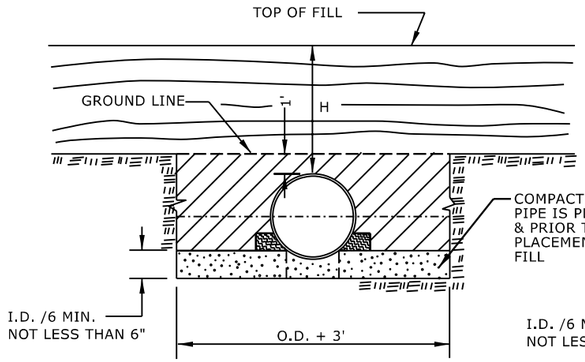
TYPICAL SECTION NO. 4

DRIVEWAY 1
–L– STA. 10+16.42 TO STA. 10+80.00

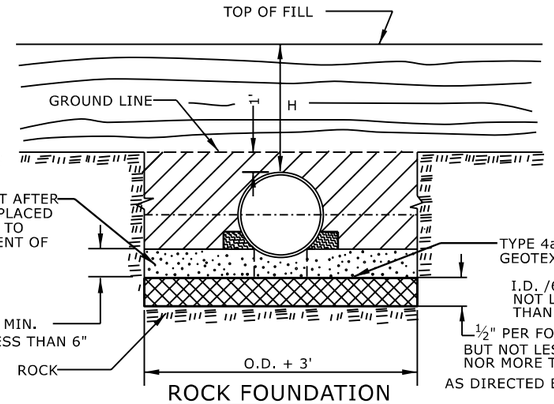
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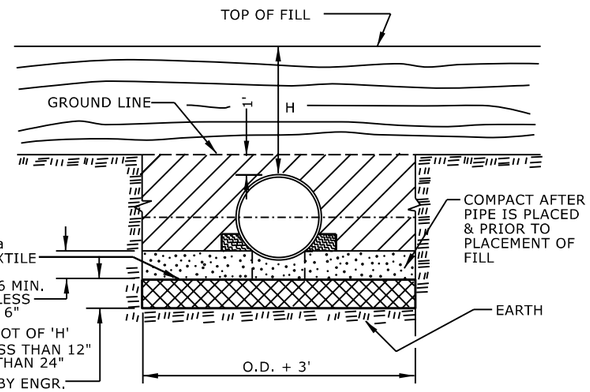
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BP10.R015	2C-1



NORMAL EARTH FOUNDATION

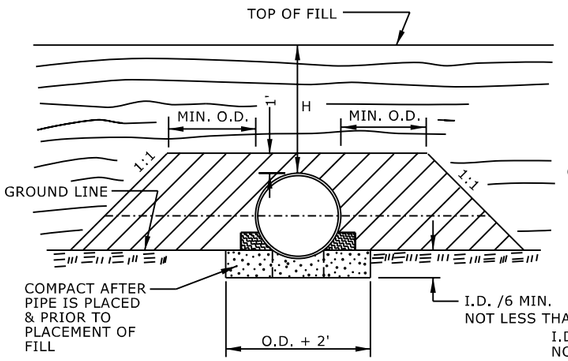


ROCK FOUNDATION

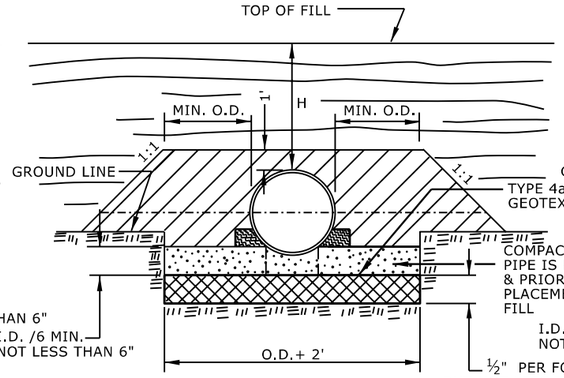


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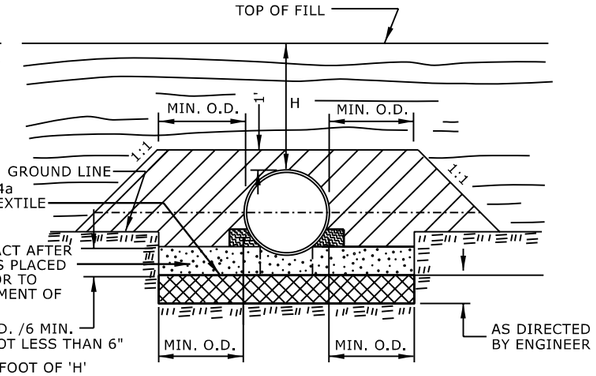
PIPE IN TRENCH



NORMAL EARTH FOUNDATION



ROCK FOUNDATION



UNSUITABLE MATERIAL FOUNDATION

PIPE ABOVE GROUND

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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ROADWAY DETAIL DRAWING FOR

METHOD OF PIPE INSTALLATION

FLEXIBLE PIPE

SHEET 1 OF 2

300.01

NORTH CAROLINA PROFESSIONAL SEAL 033144 ENGINEER NICOLE M. HACKLER

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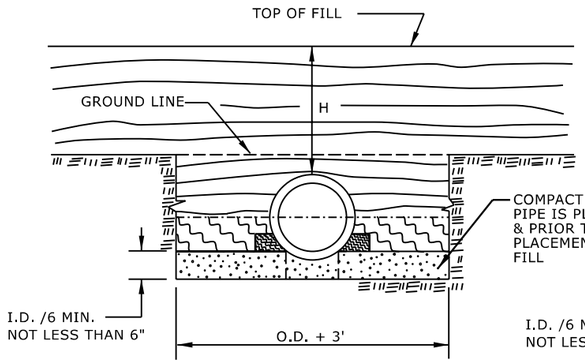
CONTRACTS STANDARDS AND DEVELOPMENT UNIT
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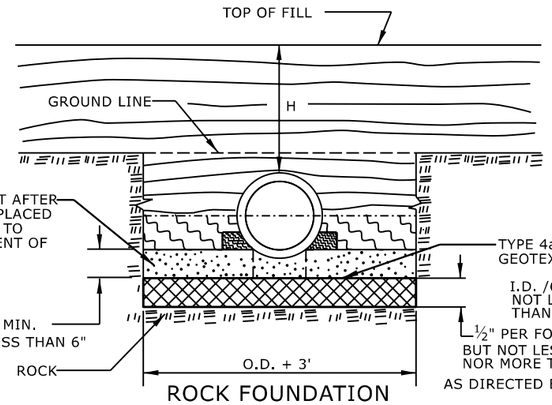
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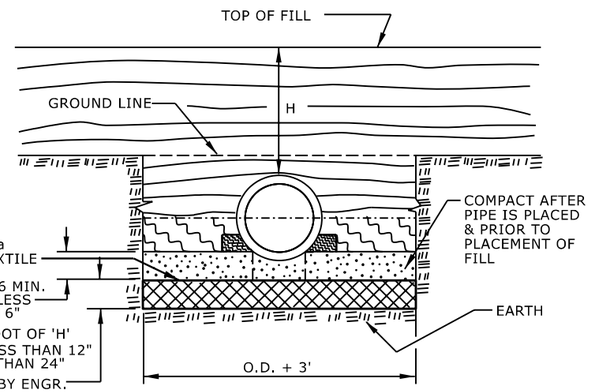
PROJECT REFERENCE NO.	SHEET NO.
BP10.R015	2C-2



NORMAL EARTH FOUNDATION

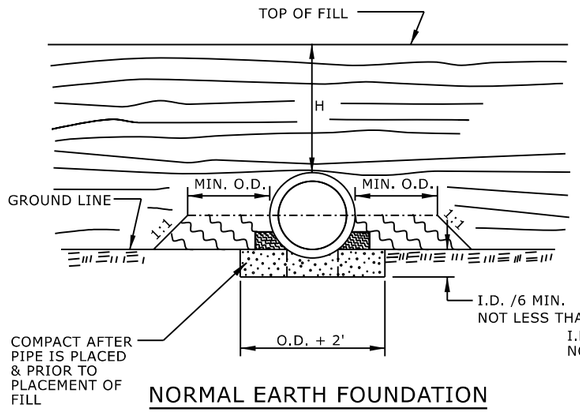


ROCK FOUNDATION

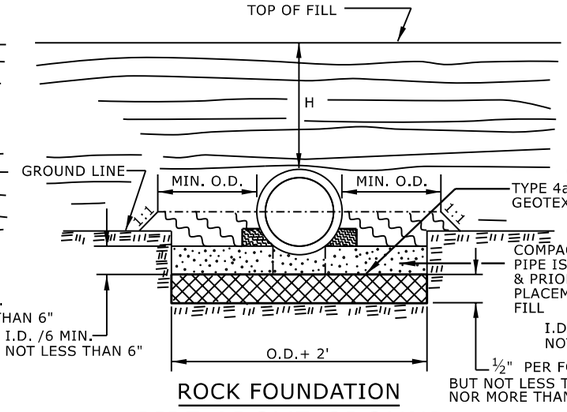


UNSUITABLE MATERIAL FOUNDATION

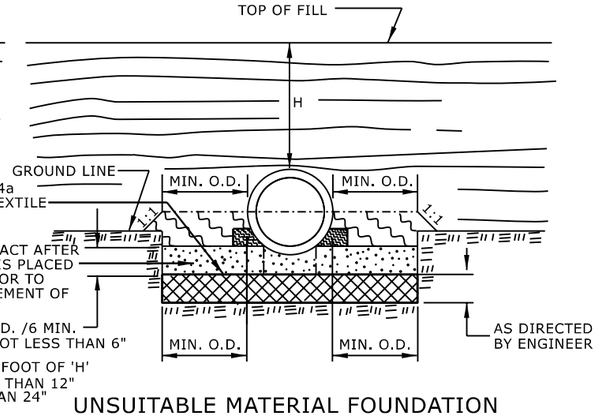
PIPE IN TRENCH



NORMAL EARTH FOUNDATION



ROCK FOUNDATION



UNSUITABLE MATERIAL FOUNDATION

PIPE ABOVE GROUND

GENERAL NOTES:

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

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SPRINGLINE OF PIPE

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UNDISTURBED EARTH MATERIAL

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ROADWAY DETAIL DRAWING FOR

METHOD OF PIPE INSTALLATION

RIGID PIPE

SHEET 2 OF 2

300.01

NORTH CAROLINA PROFESSIONAL SEAL 033144 ENGINEER NICOLE M. HACKLER

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CONTRACTS STANDARDS AND DEVELOPMENT UNIT

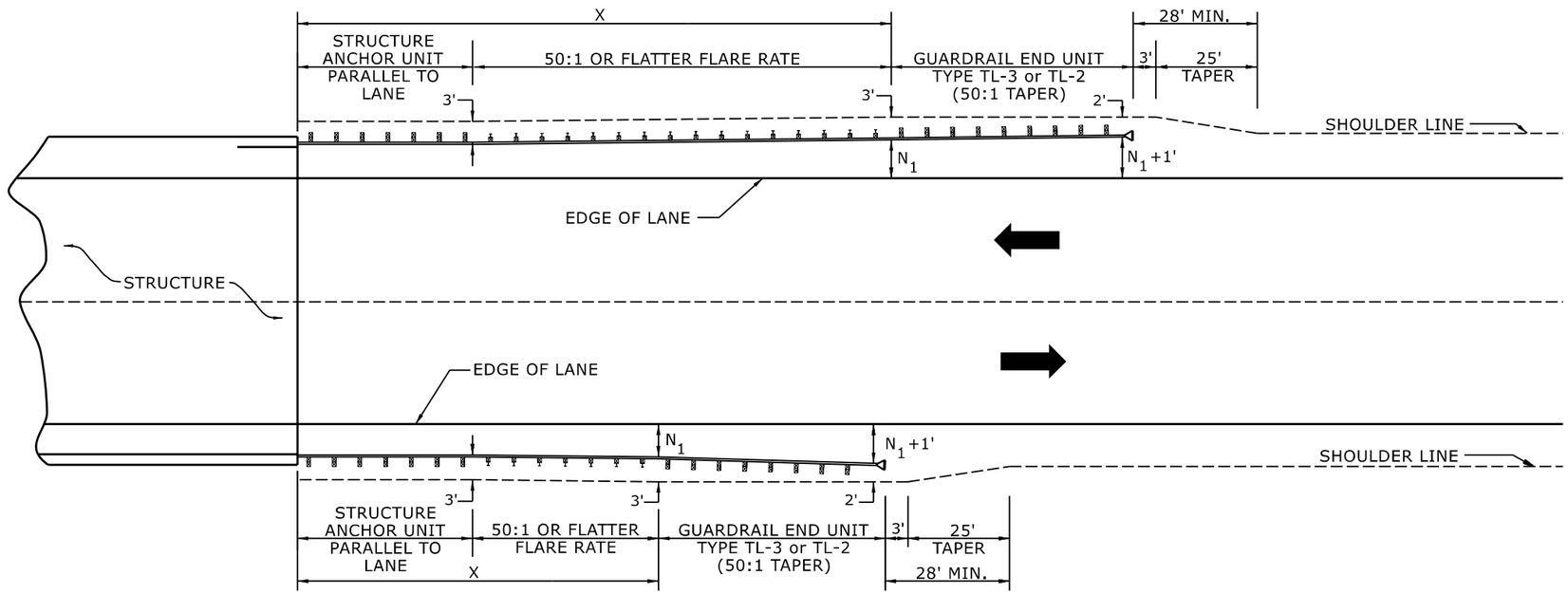
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USE FLARE RATE AS THE CONTROL IF THE "N_1" DISTANCE IS NOT OBTAINED.
("N_1" IS BASED ON SHOULDER WIDTHS IN THE ROADWAY DESIGN MANUAL)

SEE STD. 862.03 FOR STRUCTURE ANCHOR UNITS

FOR POSTED SPEEDS ≥ 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.

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

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ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

NORTH CAROLINA PROFESSIONAL SEAL 033144 ENGINEER NICOLE M. HACKLER

DocuSigned by:
Nicole Hackler
5884323D34164C5...
10/6/2026

SHEET 4 OF 15

862D01

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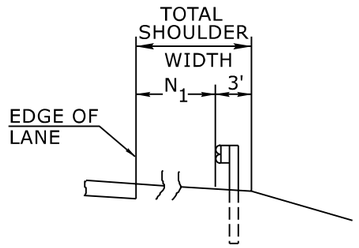
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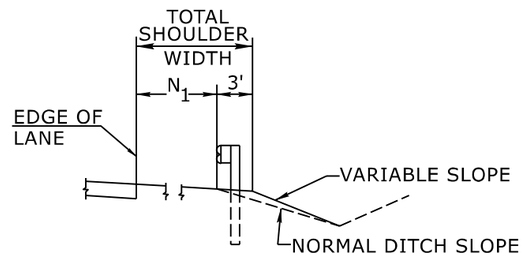
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PROJECT REFERENCE NO.	SHEET NO.
BP10.R015	2C-4

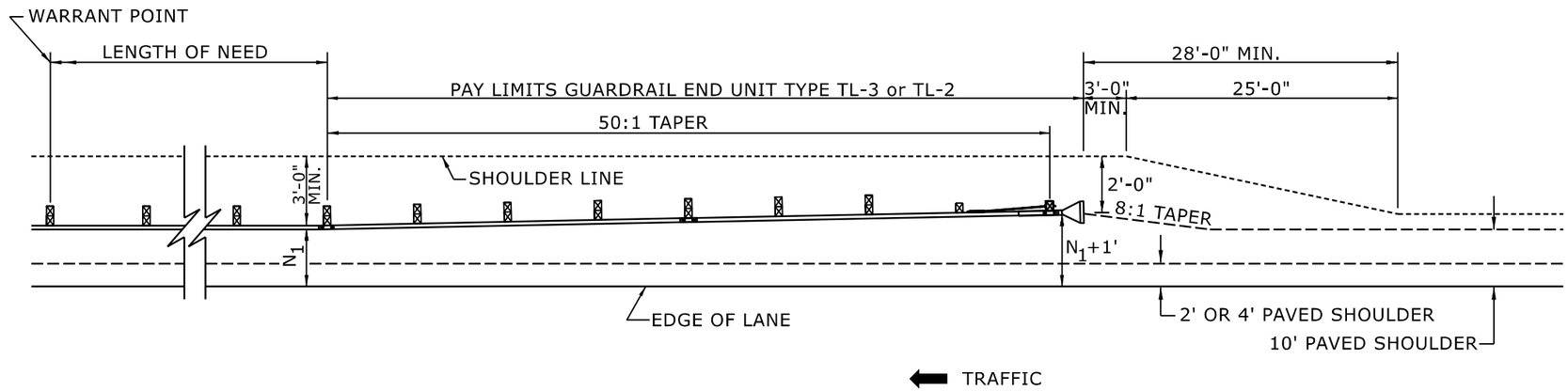


FILL SECTION



CUT SECTION

"N_1"= 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

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ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 6 OF 15

862D01

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 033144 NICOLE M. HACKLER

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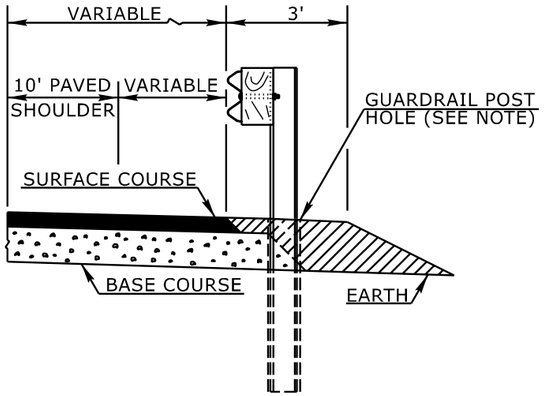
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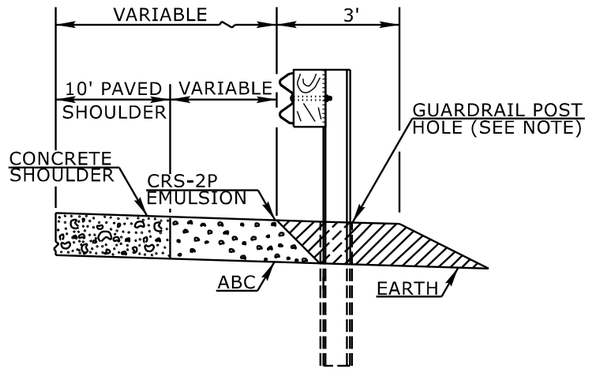
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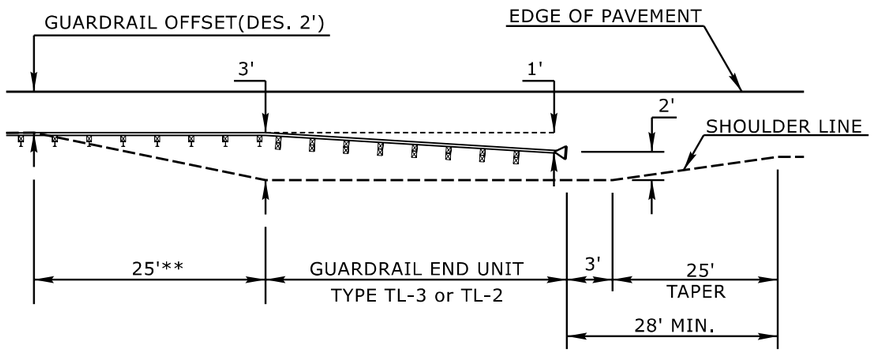
PROJECT REFERENCE NO.	SHEET NO.
BP10.R015	2C-5



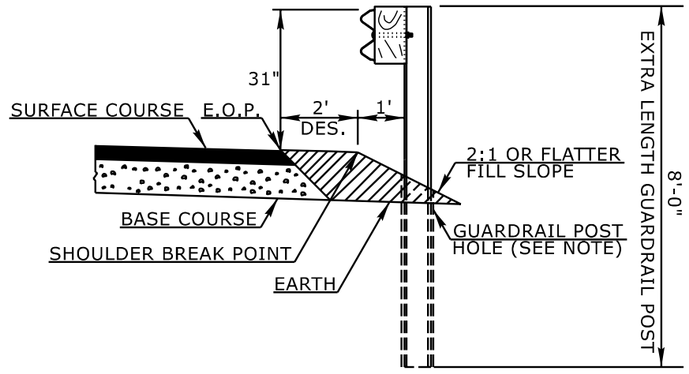
FLEXIBLE PAVED SHOULDER



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 ≤ 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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ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 11OF 15

862D01

NORTH CAROLINA PROFESSIONAL SEAL 033144 ENGINEER NICOLE M. HACKLER

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COMPUTED BY: AP DATE: 03/08/2023
CHECKED BY: SHW DATE: 09/16/2026

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT REFERENCE NO.	SHEET NO.
BP13.R015	3B-1

WSP
1001 Morehead Square Dr., Suite 610, Charlotte NC, 28203
NC LIC NO. F-0165

SUMMARY OF EARTHWORK

STATION	STATION	UNCL. EXCAV.	EMBANK. +%	BORROW	WASTE
–L– 10+70.00	–L– 14+64.20	218	1,912	1,694	
–DR1– 10+25.00	–DR1– 10+80.00	5	124	119	
SUBTOTALS:		223	2,036	1,813	
–L– 15+41.80	–L– 17+25.00	11	896	885	
SUBTOTALS:		11	896	885	
PROJECT TOTALS:		234	2,932	2,698	
EST 5% TO REPLACE TOPSOIL ON BORROW PIT				135	
GRAND TOTALS:		234	2,932	2,833	
SAY:		240		2,840	

EST DDE: 15 CUBIC YARDS

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 the Roadway Design Unit.
These earthwork quantities are based in part on subsurface data
provided by the Geotechnical Engineering Unit.

ASPHALT REMOVAL SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD²
–L–	12+70.00	12+78.59	LT	0.78
–L–	12+14.90	13+63.70	RT	213.26
–L–	16+31.45	17+25.00	LT	36.58
–L–	13+64.13	17+19.87	RT	616.16
			TOTAL:	866.78
			SAY:	870

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.

SHOULDER BERM GUTTER SUMMARY

SURVEY LINE	STATION	STATION	LENGTH (LF)
–L–	14+51.00	14+62.40	11.40'
		TOTAL:	11.40'
		SAY:	12'

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: STRAIGHT	LENGTH: SHOP CURVED	LENGTH: DOUBLE FACED	WARRANT POINT: APPROACH END	WARRANT POINT: TRAILING END	"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH: APPROACH END	FLARE LENGTH: TRAILING END	W: APPROACH END	W: TRAILING END	ANCHORS: TYPE III	ANCHORS: GREU TL-3	IMPACT ATTENUATOR TYPE 350: EA	IMPACT ATTENUATOR TYPE 350: G	IMPACT ATTENUATOR TYPE 350: NG	SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
–L–	11+13.33	14+56.60	RT	345'			13+00.00		4'–5"	7'–5"	50'		1'		1	1							
–L–	15+31.60	16+25.35	RT	93.75'				15+31.60	4'–5"	7'–5"		50'		1'	1	1							
–L–	13+80.65	14+74.40	LT	93.75'				14+74.40	4'–5"	7'–5"		50'		1'	1	1							
–L–	15+49.40	17+09.10	LT	160'			15+49.40		4'–5"	7'–6"	50'		1'		1	1							
			SUBTOTAL	692.5'																			
	LESS ANCHORS DEDUCTIONS																						
		GREU TL-3	4 @ 50'	–200'																			
		TYPE III	4 @ 18.75'	–75'																			
			TOTAL	417.5'											4	4							
			SAY	425'											4	4							

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

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

| STATION | LOCATION (LT,RT, OR CL) | STRUCTURE NO. FROM | STRUCTURE NO. TO | TOP ELEVATION | INVERT ELEVATION | INVERT ELEVATION | SLOPE CRITICAL | DRAINAGE PIPE (RCP, CSP, CAAP, HDPE, or PVC): 12" | 15" | 18" | 24" | 30" | 36" | 42" | 48" | C.S. PIPE (UNLESS NOTED OTHRWISE): 12" | 15" | 18" | 24" | 30" | 36" | 42" | 48" | CLASS III R.C. PIPE (UNLESS OTHERWISE NOTED): 12" | 15" | 18" | 24" | 30" | 36" | 42" | 48" | 15" SIDE DRAIN PIPE | 18" SIDE DRAIN PIPE | 24" SIDE DRAIN PIPE | ENDWALLS: STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE): CU. YDS. R.C.P. | CU. YDS. C.S.P. | QUANTITIES FOR DRAINAGE STRUCTURES: PER EACH (0' THRU 5.0') | LIN. FT. A: 5.0' THRU 10.0' | LIN. FT. B: 10.0' AND ABOVE | * TOTAL LF FOR PAY QUANTITY SHALL BE COL. A" + (1.3 X COL. B') | C.B. STD. 840.01 OR STD. 840.02 | FRAME, GRATES AND HOOD STANDARD 840.03: TYPE OF GRATE E | F | G | D.I. STD. 840.14 OR STD. 840.15 | D.I. FRAME & GRATE STD. 840.16 | G.D.I. TYPE "A" STD. 840.17 OR 840.26 | G.D.I. TYPE "B" STD. 840.18 OR 840.27 | G.D.I. TYPE "D" STD. 840.19 OR 840.28 | G.D.I. FRAME WITH GRATE STD. 840.22 | G.D.I. FRAME WITH TWO GRATES STD. 840.22 | G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24 | G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24 | J.B. STD. 840.31 OR 840.32 | G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.29 | T.B.D.I. STD. 840.35 | CORR. STEEL ELBOWS NO. & SIZE | CONC. COLLARS CL. "B" C.Y. STD 840.72 | CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71 | PIPE REMOVAL LIN.FT. | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---

COMPUTED BY: __Crystal D. Johnson DATE: _06/22/2023
CHECKED BY: _Shiping Yang_ DATE: __06/22/2023

(2-3-23)

PROJECT NO.	SHEET NO.
BP13.R015	3G-1

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 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

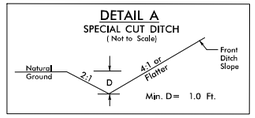
***ASU(1/2) = Aggregate Subgrade (Type 1 or 2)**
***AST = Aggregate Stabilization**
****Total tons of "Class IV Subgrade Stabilization" and total square yards of "Geotextile for Subgrade Stabilization" are only the estimated quantities for ASU(1/2)/AST and may only represent a portion of the subgrade stabilization and geotextile quantities shown in the Item Sheets of the Proposal.**

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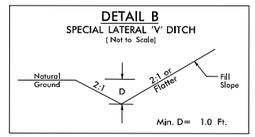
-L-		-DRI-	
PI Sta 12+43.37	PI Sta 12+43.37	PI Sta 10+48.07	PI Sta 11+41.60
△ = 11° 41' 34.1" (LT)	△ = 11° 41' 34.1" (LT)	△ = 73° 34' 27.4" (RT)	△ = 20° 26' 25.9" (LT)
D = 6° 52' 41.7"	D = 6° 52' 41.7"	D = 114° 35' 29.6"	D = 15° 29' 07.2"
L = 170.00'	L = 170.00'	L = 64.21'	L = 132.00'
T = 85.29'	T = 85.29'	T = 37.39'	T = 66.71'
R = 833.00'	R = 833.00'	R = 50.00'	R = 370.00'
e = 06	e = 06		
Lr = SEE PLANS	Lr = 132'		
SE = SEE PLANS	SE = 0.06		
DS = 50 MPH	DS = 50 MPH		

DETAIL A
SPECIAL CUT DITCH
(Not to Scale)



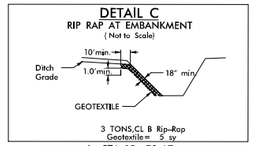
FROM -L- STA. 10+70 TO STA. 13+00 LT

DETAIL B
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



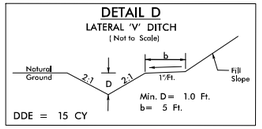
FROM -L- STA. 13+80 TO STA. 14+50 LT

DETAIL C
RIP RAP AT EMBANKMENT
(Not to Scale)



-L- STA. 15+70 LT

DETAIL D
LATERAL 'V' DITCH
(Not to Scale)



DDE = 15 CY

FROM -L- STA. 15+75 TO STA. 17+00 LT

PROJECT REFERENCE NO.	SHEET NO.
BP13.R015	04
RW SHEET NO.	

ROADWAY DESIGN ENGINEER
11/11/2024
NORTH CAROLINA PROFESSIONAL SEAL 051574 ENGINEER ALEJANDRA PORTILLO
Signed by: Alejandra Portillo

HYDRAULICS ENGINEER
11/11/2024
NORTH CAROLINA PROFESSIONAL SEAL 052432 ENGINEER JAMES O. BRITT
Signed by: James O. Britt

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

WSP
1001 Morehead Square Dr., Suite 610, Charlotte NC, 28203
NC LIC NO. F-0165

50 25 0 50 100

NAD 83/2011

1
LUCILLE SPRINKLE POINDEXTER
DB 267 PG 272

2
LISA CLARK RICE
DB 26 PG 278
DB 191PG 246

3
HARLON ADAMS
DB 227 PG 773

4
ARTHUR HAROLD PAYNE
DB 686 PG 102
DB 267 PG 275

4
ARTHUR HAROLD PAYNE
DB 686 PG 102
DB 267 PG 275

*40 MPH DESIGN SPEED USED FOR CURVE RUNOFF TO CONNECT TO EXISTING CROSS SLOPE

SPECIAL CUT DITCH SEE DETAIL "A"

SPECIAL LATERAL 'V' DITCH SEE DETAIL "B"

LATERAL 'V' DITCH SEE DETAIL "D"

TIE TO EXISTING DITCH

RIP RAP AT EMBANKMENT SEE DETAIL 'C'

CLASS B RIP RAP EST 2 TN EST 7 SY GF

CLASS B RIP RAP EST 1 TN EST 5 SY GF

CLASS I RIP RAP (STR PAY ITEM)

15" CSP

REMOVE BRIDGE

RETAIN

5' x 10' Rock

100' TRANSITION LT/RT

90' TRANSITION LT/RT

-L- POT Sta.10+00.00

-L- PC Sta.11+58.08

-L- PT Sta.13+28.08

-L- PC Sta.18+13.10

-DRI- PC Sta. 10+10.69

-DRI- PRC Sta. 10+74.89

END CONSTRUCTION

-DRI- POC Sta.10+80.00

-DRI- PT Sta. 12+06.89

END APPROACH SLAB
-L- POT Sta.15+52.50

END BRIDGE
-L- POT Sta.15+41.80

BEGIN TIP PROJECT BP13.R015
-L- POT Sta.10+70.00

END TIP PROJECT BP13.R015
-L- POT Sta.17+25.00

-L- POT Sta.13+55.00=
-DRI- POT Sta.10+00.00
BA= N 82° 24' 44.8" W

BEGIN APPROACH SLAB
-L- POT Sta.14+53.50

BEGIN BRIDGE
-L- POT Sta.14+64.20

S 84°25'05" W 70.62'

N 19° 16' 33" E

S 15°04'55" E 181.50'

S 08°25'05" W 99.00'

S 31°55'05" W 16.50'

S 17°22'36" W 172.42'

N 92°07'31" W 127.74'

N 71° 35' 16" E

N 40°09'57" W 30.00'

HIGH WATER MARK PER WATER ELEVATION CALCULATION

PROPOSED PAVEMENT REMOVAL
PROPOSED PAVED SHOULDER

SEE SHEET 5 FOR -L- PROFILE
SEE SHEETS S-1 THRU S-19 FOR STRUCTURE PLANS

8/15/2024
Portillo
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5/28/99

PROJECT REFERENCE NO.	SHEET NO.
BP13.R015	05

ROADWAY DESIGN ENGINEER 11/11/2024

NORTH CAROLINA PROFESSIONAL SEAL 051574 ENGINEER ALEXANDRA PORTILLO

Signed by: Alexandra Portillo

HYDRAULICS ENGINEER 11/11/2024

NORTH CAROLINA PROFESSIONAL SEAL 052432 ENGINEER JAMES O. BRITT

Signed by: James O. Britt

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

msp
1001 Morehead Square Dr., Suite 610, Charlotte NC, 28203
NC LIC NO. F-0165

–L–

BMI ELEVATION = 2,044.29
N 781347.13 E 928706.21
30.94' LEFT OF L STA.15+06.92

BEGIN TIP PROJECT BP13.R015
–L– STA. 10+70.00
EL. 2,042.00'

END TIP PROJECT BP13.R015
–L– STA. 17+25.00
EL. 2,054.10'

PI = 11+20.00
EL = 2,042.58'
VC = 100'
K = 72
DS = 40 MPH

PI = 13+70.00
EL = 2,048.91'
VC = 130'
K = 111
DS = 50 MPH

PI = 16+70.00
EL = 2,053.00'
VC = 100'
K = 156

BEGIN BRIDGE –L– STA.14+64.20 EL. 2,050.20'

END BRIDGE –L– STA.15+41.80 EL. 2,051.25'

2,054.10

PROPOSED GRADE

(+)1.1500%
(+)0.84%
(+)2.5353%
(–)1.00%
(+)1.00%
(+)1.00%
(+)1.3609%
(+)2.00%
(+)2.0000%

EXISTING GROUND

–L– STA= 10+70 EL= 2040.83 BEG.SPEC.CUT DITCH LT

STA= 11+50 EL= 2041.50

STA= 12+50 EL= 2040.50

–L– STA= 13+00 EL= 2041.00 END SPEC.CUT DITCH LT

–L– STA= 13+80 EL= 2040.80 BEG.SPEC.LAT 'V' DITCH LT

10YR WSEL EL. 2046.1'

100YR WSEL EL. 2047.8'

–L– STA= 14+50 EL= 2042.50 END SPEC.LAT 'V' DITCH LT

WSE 2039.5 DATE OF SURVEY 08/22/18

–L– STA= 15+75 EL= 2043.40 BEG.LAT 'V' DITCH LT

–L– STA= 17+00 EL= 2045.90 END LAT 'V' DITCH LT

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 1290	CFS
DESIGN FREQUENCY	= <10	YRS
DESIGN HW ELEVATION	= 2046.1	FT
BASE DISCHARGE	= 2460	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 2047.8	FT
OVERTOPPING DISCHARGE	= 1290	CFS
OVERTOPPING FREQUENCY	= 10	YRS
OVERTOPPING ELEVATION	= 2046.1	FT
DATE OF SURVEY	= 8/22/18	
W.S.ELEVATION AT DATE OF SURVEY	= 2039.5	FT

SEE SHEET 4 FOR –L– PLAN

2,100 2,090 2,080 2,070 2,060 2,050 2,040 2,030 2,020 2,010

10+00 11+00 12+00 13+00 14+00 15+00 16+00 17+00 18+00 19+00

–DR1–

BEGIN CONSTRUCTION
–DR1– STA. 10+11.00
EL. 2,048.11'

PI = 10+25.00
EL = 2,047.90'

PI = 10+35.00
EL = 2,047.30'

PI = 10+65.00
EL = 2,044.15'

PROPOSED GRADE

(–)1.5%
(–)1.6%
(–)1.5%
(–)1.6%
(–)1.6869%

EXISTING GROUND

PI = 10+50.00
EL = 2,045.05'

END CONSTRUCTION
–DR1– STA. 10+80.00
EL. 2,043.90'

SEE SHEET 4 FOR –DR1– PLAN

2,100 2,090 2,080 2,070 2,060 2,050 2,040 2,030 2,020 2,010

10+00 11+00 12+00 13+00

8/15/2024
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PortilloA

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP13.R015	RW01	6

9/2023

TIP PROJECT: BP13.R015

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

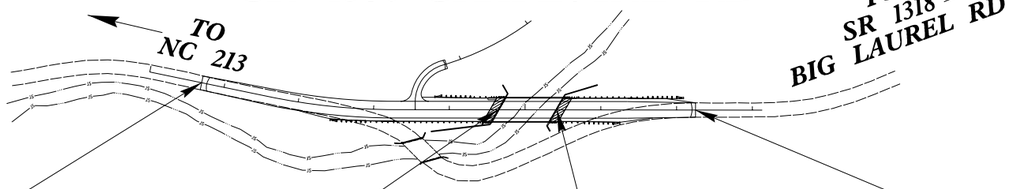
SURVEY CONTROL, EXISTING CENTERLINES, RIGHT OF WAY, EASEMENTS AND PROPERTY TIES

MADISON COUNTY

RW04

NAD 83/2011

–L–
SR 1370 GRAPEVINE RD



BEGIN TIP PROJECT BP13.R015
–L– STA. 10+70.00

BEGIN BRIDGE
–L– STA. 14+64.20

END BRIDGE
–L– STA. 15+41.80

END TIP PROJECT BP13.R015
–L– STA. 17+25.00

GRAPHIC SCALE

50 25 0 50 100
PLANS

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY MATTERN AND CRAIG FOR MONUMENT "GPS4" WITH NAD 83/NSRS 2011 STATE PLANE GRID COORDINATES OF NORTHING: 781,461.9400(ft) EASTING: 928,749.0550(ft) ELEVATION: 2051.16(ft) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999881498 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "GPS4" TO -L- STATION 10+00.00 IS S 11°47'21.4" W 623.605(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:*
5/30/2023	*10/21/2026*

PROFESSIONAL LAND SURVEYOR

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

Signed by: Matthew Cornwell EBD36F11473E475... 10/30/2025

SIGNATURE: *Date:*

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION ·

30-OCT-2025 10:58
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mcornwell AT MCORNWELLLAPTOP

PROJECT REFERENCE NO.	SHEET NO.
560098	rw02c-1
Location and Surveys	
MATTERN AND CRAIG	

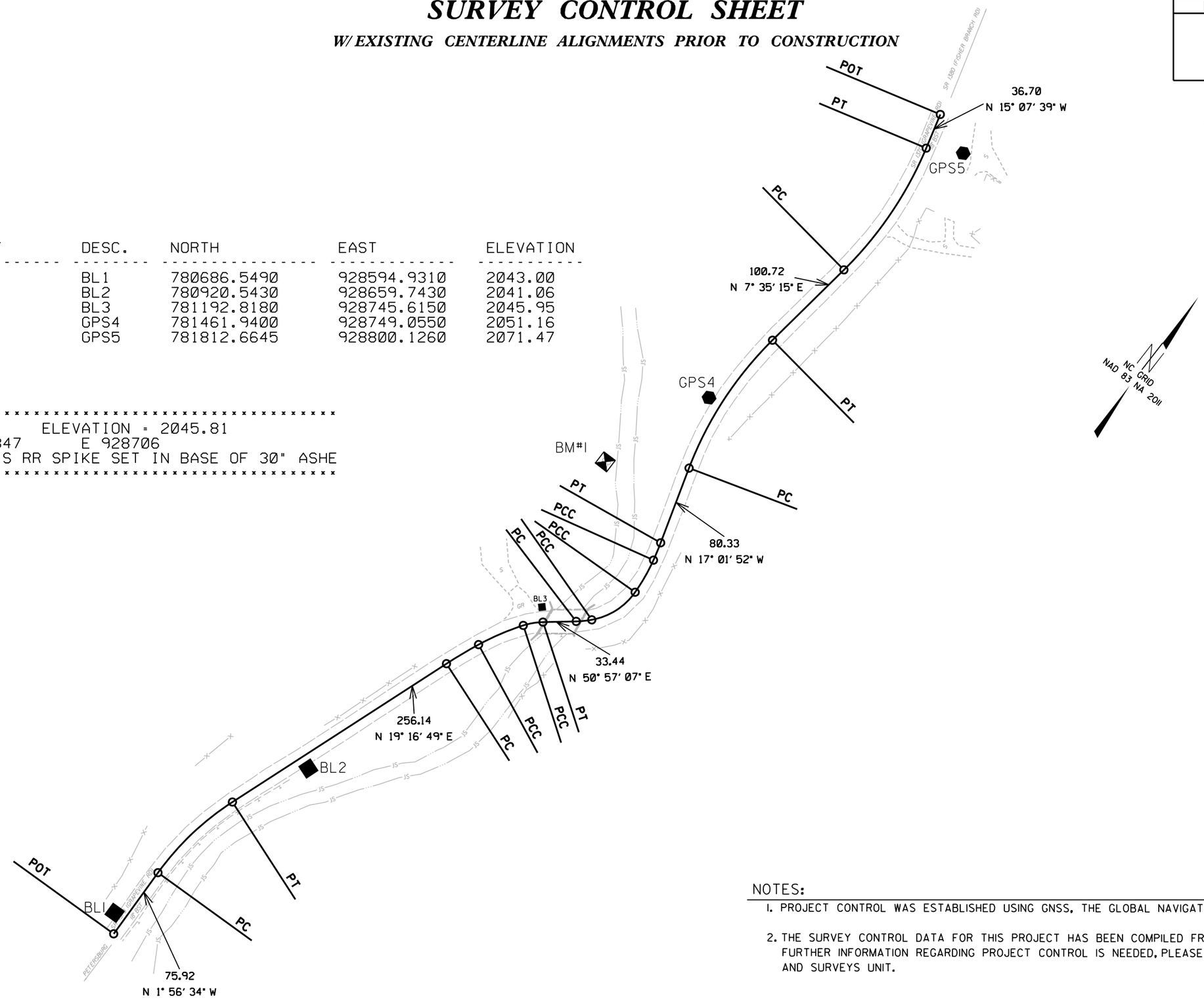
SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

SEE SHEET RW02C-2 FOR FURTHER ALIGNMENT DETAILS

BL POINT	DESC.	NORTH	EAST	ELEVATION
1	BL1	780686.5490	928594.9310	2043.00
2	BL2	780920.5430	928659.7430	2041.06
3	BL3	781192.8180	928745.6150	2045.95
4	GPS4	781461.9400	928749.0550	2051.16
5	GPS5	781812.6645	928800.1260	2071.47

****
BM1 ELEVATION = 2045.81
N 781347 E 928706
BM#1 IS RR SPIKE SET IN BASE OF 30" ASHE
****



NOTES:

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

6/2/99

REVISIONS

14-NOV-2018 14:38
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Administrator at ASHE-THELEN

PROJECT REFERENCE NO.	SHEET NO.
560098	rw02c-2
Location and Surveys	
MATTERN AND CRAIG	

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

POINT	N	E	EL BEARING	DIST	DELTA	D	L	T	R
POT	780669.358	928607.167							
LINE			N 01°56'34" W	75.92					
PC	780745.232	928604.593							
CURVE			N 08°40'08" E	103.12	21°13'23"(RT)	20°27'46"	103.72	52.46	280.00
PT	780847.177	928620.136							
LINE			N 19°16'49" E	256.14					
PC	781088.954	928704.712							
CURVE			N 21°25'44" E	37.49	04°17'49"(RT)	11°27'33"	37.50	18.76	500.00
PT	781123.853	928718.409							
LINE			S 23°34'39" W	0.00					
PC	781123.852	928718.409							
CURVE			N 28°55'45" E	48.92	10°42'13.5"(RT)	21°50'59"	48.99	24.57	262.23
PT	781166.665	928742.071							
LINE			S 34°16'52" W	0.00					
PC	781166.665	928742.071							
CURVE			N 42°36'59" E	20.05	16°40'14"(RT)	82°51'39"	20.12	10.13	69.15
PT	781181.418	928755.645							
LINE			N 50°57'06" E	33.44					
PC	781202.484	928781.614							
CURVE			N 46°26'11" E	15.70	09°01'50"(LT)	57°26'41"	15.72	7.88	99.74
PCC	781213.306	928792.994							
CURVE			N 19°40'13" E	51.67	44°30'06"(LT)	83°59'07"	52.99	27.91	68.22
PCC	781261.957	928810.385							
CURVE			N 08°05'42" W	37.17	11°01'45"(LT)	29°37'45"	37.22	18.67	193.38
PCC	781298.754	928805.151							
CURVE			N 15°19'14" W	18.83	03°25'17"(LT)	18°09'51"	18.84	9.42	315.44
PT	781316.918	928800.175							
LINE			N 17°01'52" W	80.33					
PC	781393.727	928776.646							
CURVE			N 04°43'18" W	153.50	24°37'07"(RT)	15°54'56"	154.68	78.55	360.00
PT	781546.703	928764.011							
LINE			N 07°35'15" E	100.72					
PC	781646.538	928777.310							
CURVE			N 03°46'12" W	147.70	22°42'54"(LT)	15°16'44"	148.67	75.32	375.00
PT	781793.916	928767.598							
LINE			N 15°07'39" W	36.70					
POT	781829.345	928758.021							

NOTES:

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

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

6/2/99

REVISIONS

$$$$SYSTIME$$$$
$$$$FILENAME$$$$ $$$$DGN$$$$

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9/2023

REVISIONS

PROPOSED ALIGNMENT CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
BP13.R015	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

DocuSigned by:
Matthew Cornwell
EBD36F11473E475...

9/18/2023

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 9/18/2023

DocuSigned by:
Matthew Cornwell
EBD36F11473E475...

Professional Land Surveyor L-4775

L

TYPE	STATION	NORTH	EAST
POT	10+00.00	780851.4892	928621.6445
PC	11+58.08	781000.7023	928673.8408
PT	13+28.08	781165.7610	928713.2667
PC	18+13.10	781646.5377	928777.3097
PT	19+61.77	781793.9160	928767.5985

DR1

TYPE	STATION	NORTH	EAST
POT	10+00.00	781192.4493	928716.8218
PC	10+10.69	781193.8604	928706.2282
PRC	10+74.89	781235.7404	928663.4239
PT	12+06.89	781359.8437	928620.5502

NOTES:

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

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

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mcornwell A1 McDRNWELLLAPTOP

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9/2023

REVISIONS

RIGHT OF WAY & PERMANENT EASEMENT CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
BP13.R015	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

DocuSigned by:
Matthew Cornwell
EBD36F11473E475...

9/18/2023

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ROW MARKER IRON PIN AND CAP

ALIGN	STATION	OFFSET	NORTH	EAST	
L	10+70.00	-30.00	780927.4689	928616.4404	PUNCH AND CHISEL ON ROCK FACE
L	10+70.00	-14.00	780922.1859	928631.5430	
L	10+70.00	30.00	780907.6575	928673.0753	
L	10+70.00	14.00	780912.9405	928657.9726	
L	11+58.08	30.00	780990.7966	928702.1582	
L	11+58.08	-30.00	781010.6081	928645.5233	
L	13+01.10	30.00	781134.1576	928738.8652	
L	13+21.29	45.46	781152.6641	928757.3591	NOT SET – FALLS IN UNSTABLE ROCK
L	13+23.81	46.76	781155.1182	928759.0101	
L	13+26.56	40.94	781158.7794	928753.6392	
L	13+28.08	-30.00	781169.7223	928683.5294	
L	13+29.36	42.50	781161.4262	928755.5609	
L	13+35.12	54.84	781165.4976	928768.5600	NOT SET – FALLS IN CREEK
L	13+56.18	74.74	781183.7500	928791.0610	
L	13+63.83	73.03	781191.5621	928790.3737	
L	13+77.84	84.31	781203.9528	928803.4108	
L	14+38.72	97.35	781262.5872	928824.3707	
L	14+65.00	-40.00	781306.7678	928691.6965	
L	14+65.00	-30.00	781305.4474	928701.6090	
L	14+77.10	86.57	781302.0481	928818.7581	
L	14+95.22	78.92	781321.0183	928813.5611	
L	15+68.25	45.45	781397.8276	928790.0325	
L	16+01.00	-40.00	781441.5770	928709.6541	
L	16+01.00	-30.00	781440.2566	928719.5666	
L	16+08.00	30.12	781439.2569	928780.0853	
L	17+25.00	14.00	781557.3611	928779.5544	
L	17+25.00	-14.00	781561.0582	928751.7996	
L	17+25.00	-30.00	781563.1709	928735.9397	

ROW MARKER PERMANENT EASEMENT

ALIGN	STATION	OFFSET	NORTH	EAST
L	11+94.00	-30.00	781043.5295	928656.2487
L	12+42.00	30.00	781074.1697	928726.6871
L	12+43.00	51.00	781070.2965	928747.3534
L	12+58.00	30.00	781090.3235	928730.4040
L	12+58.00	50.00	781086.0263	928749.9368
L	12+82.00	-41.00	781127.9322	928665.6435
L	15+62.35	-40.00	781403.2677	928704.5510
L	15+68.17	-47.10	781409.9680	928698.2789
L	15+76.45	-53.68	781419.0452	928692.8555
L	16+01.00	-45.00	781442.2372	928704.6979
L	17+25.00	-44.00	781565.0195	928722.0622

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 9/12/2023 to 9/14/2023, and all coordinates are based on NAD83/2011; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 9/18/2023

DocuSigned by:
Matthew Cornwell
EBD36F11473E475...

Professional Land Surveyor L-4775

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 9/12/2023 TO 9/14/2023.

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mcornwell AT MCORNWELL_LAPTOP

PROJECT REFERENCE NO.	SHEET NO.
BP13.R015	RW04

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
EBC09F11473E475...

4/21/2025

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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 9/12/2023 to 9/14/2023, and all coordinates are based on NAD83/2011; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

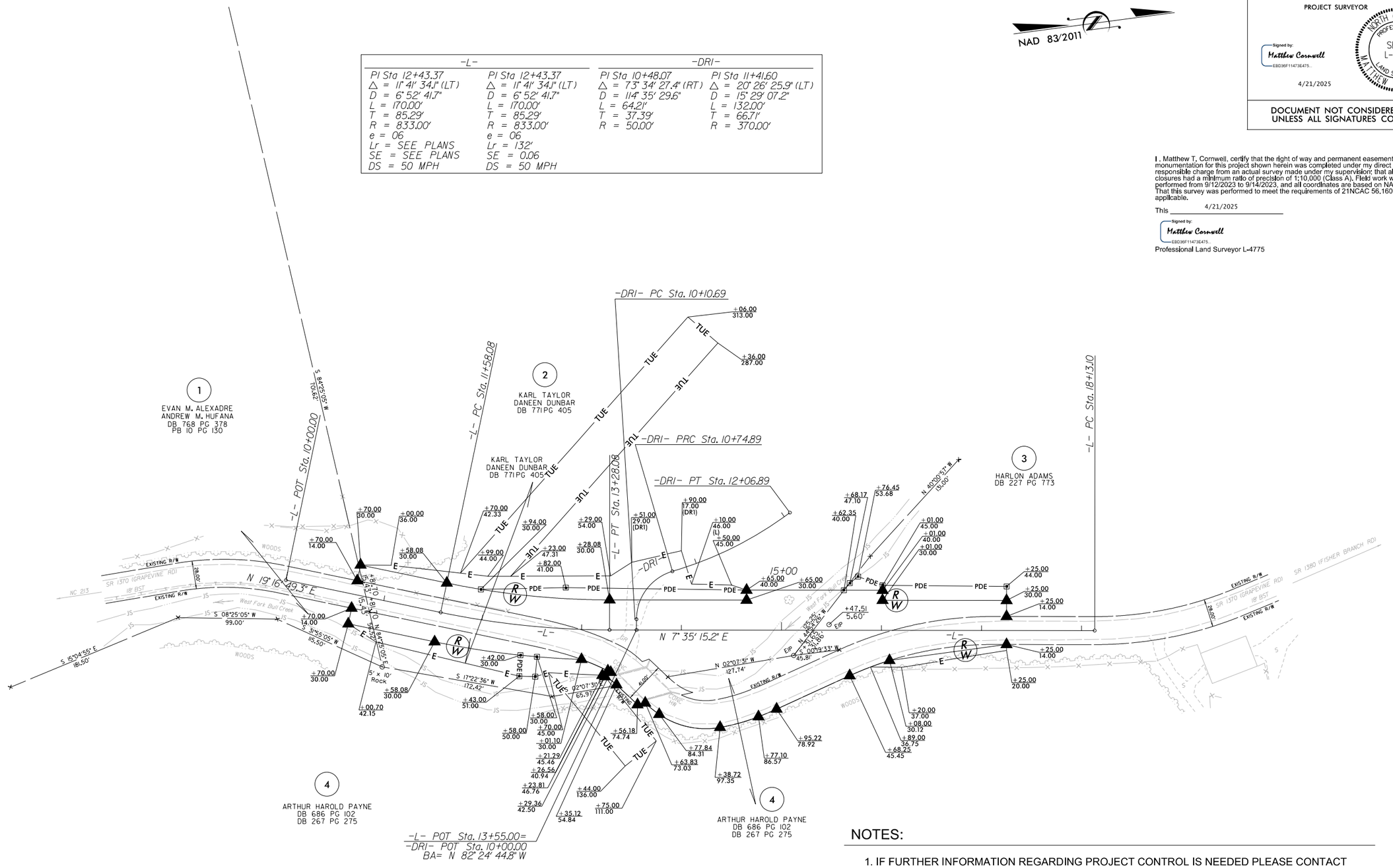
This 4/21/2025

Signed by: Matthew Cornwell
EBC09F11473E475...

Professional Land Surveyor L-4775

NAD 83/2011

-L-		-DRI-	
PI Sta 12+43.37	PI Sta 12+43.37	PI Sta 10+48.07	PI Sta 11+41.60
△ = 11° 41' 34.1" (LT)	△ = 11° 41' 34.1" (LT)	△ = 73° 34' 27.4" (RT)	△ = 20° 26' 25.9" (LT)
D = 6° 52' 41.7"	D = 6° 52' 41.7"	D = 114° 35' 29.6"	D = 15° 29' 07.2"
L = 170.00'	L = 170.00'	L = 64.21'	L = 132.00'
T = 85.29'	T = 85.29'	T = 37.39'	T = 66.71'
R = 833.00'	R = 833.00'	R = 50.00'	R = 370.00'
e = 06	e = 06		
Lr = SEE PLANS	Lr = 132'		
SE = SEE PLANS	SE = 0.06		
DS = 50 MPH	DS = 50 MPH		



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REVISIONS 4/2025

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mcornwell AT McDONWELL_APTOP

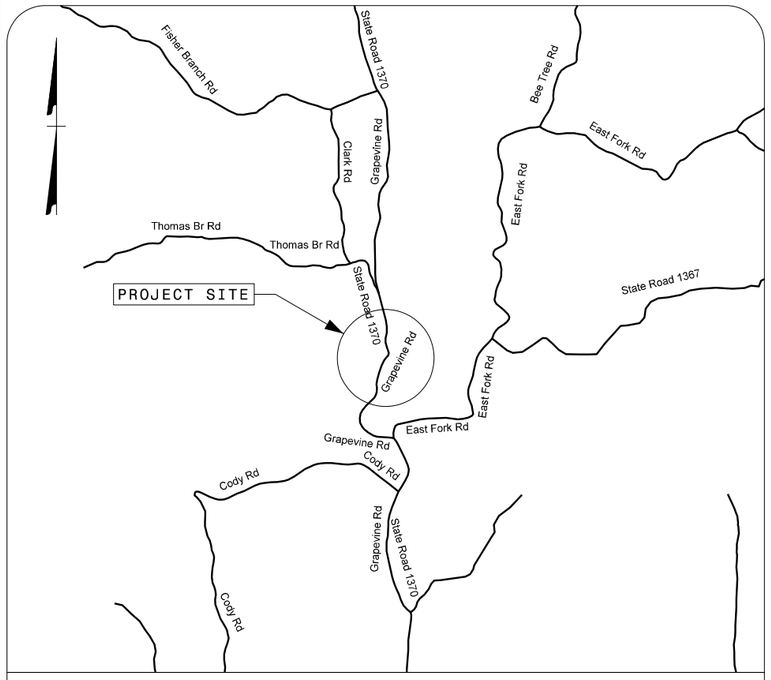
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STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

MADISON COUNTY





VICINITY MAP

LOCATION: BRIDGE NO. 560098 ON SR 1370 (GRAPEVINE RD) OVER WEST FORK BULL CREEK

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

INDEX OF SHEETS

SHEET NO.	TITLE
TMP-1	TITLE SHEET, VICINITY MAP, AND INDEX OF SHEETS
TMP-1A	LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, AND LEGEND
TMP-2	TRANSPORTATION OPERATIONS PLAN: (MANAGEMENT STRATEGIES AND GENERAL NOTES)
TMP-3	TRANSPORTATION OPERATIONS PLAN: (MANAGEMENT STRATEGIES, GENERAL NOTES, AND PHASING)
TMP-4	TEMPORARY TRAFFIC CONTROL PHASE I DETAIL
TMP-5	TEMPORARY TRAFFIC CONTROL PHASE II DETAIL

SHEET NO.
TMP-1

TIP PROJECT: BP13-R015



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

PLANS PREPARED BY:
DAVID W BISSETTE, PE

NCDOT CONTACTS:
MARK HILL, PE
PROJECT MANAGER

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

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RALEIGH, NC 27601
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FAX: 1.919.836.4099
LICENSE NO. F-0165

APPROVED: Signed by: David W Bissette
10/5/2026
DATE:

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 030864 ENGINEER DAVID W. BISSETTE

10/2/2026
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PROJ. REFERENCE NO.	SHEET NO.
BP13-R015	TMP-1A

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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
- REMOVAL

SIGNALS

EXISTING · PROPOSED · TEMPORARY · PORTABLE

DS

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

24" PAINT
P61 WHITE STOPBAR

Signed by: David W Bissette
APPROVED: 03AB3C445BCD4EB...
DATE: 10/5/2026

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 030864 ENGINEER DAVID W. BISSETTE

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

ROADWAY STANDARD DRAWINGS & LEGEND

9/30/2026
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PROJ. REFERENCE NO.	SHEET NO.
BP13-R015	TMP-2

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LICENSE NO. F-0165

MANAGEMENT STRATEGIES

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

GENERAL NOTES

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

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

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

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

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

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

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

H) DO NOT EXCEED A DIFFERENCE OF 2 INCHES IN ELEVATION BETWEEN OPEN LANES OF TRAFFIC FOR NOMINAL LIFTS OF 1.5 INCHES. INSTALL ADVANCE WARNING "UNEVEN LANES" SIGNS (W8-11) 500 FEET IN ADVANCE AND A MINIMUM OF EVERY HALF MILE THROUGHOUT THE UNEVEN AREA.

TRAFFIC PATTERN ALTERATIONS

I) NOTIFY THE ENGINEER THIRTY (30) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

SIGNING

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

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

TRAFFIC CONTROL DEVICES

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

M) PLACE ADDITIONAL SETS OF THREE CHANNELIZING DEVICES PERPENDICULAR TO THE EDGE OF TRAVELWAY ON 500 FT CENTERS WHEN UNOPENED LANES ARE CLOSED TO TRAFFIC.

PAVEMENT MARKINGS AND MARKERS

N) INSTALL TEMPORARY PAVEMENT MARKINGS AND TEMPORARY PAVEMENT MARKERS ON INTERIM LAYERS OF PAVEMENT AS FOLLOWS:

ROAD NAME	MARKING	MARKER
ALL ROADS	PAINT	NONE

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

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

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

MISCELLANEOUS

R) 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) 400 FEET AND 200 FEET RESPECTIVELY IN ADVANCE OF THE UNEVEN AREAS. USE DRUMS TO DELINEATE THE EDGE OF ROADWAY ALONG UNPAVED AREAS.

APPROVED: Signed by: David W Bissette
DATE: 10/5/2026
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 030864 ENGINEER DAVID W. BISSETTE

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

TRANSPORTATION OPERATIONS PLAN

9/30/2026
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PROJ. REFERENCE NO.	SHEET NO.
BP13-R015	TMP-3

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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, SHEETS 1 AND 17 OF 19 AS NEEDED COMPLETE THE FOLLOWING: (SEE SHEET TMP-04)
- INSTALL TEMPORARY PAVEMENT MARKINGS -L- STA 6+60+/- TO STA 19+85+/-
- 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 ON THE RIGHT SIDE OF THE EXISTING ALIGNMENT AND ACTIVATE TEMPORARY SIGNALS

STEP 3. USING ROADWAY STANDARD DRAWING 1101.02, SHEETS 1 AND 17 OF 19 AS NEEDED CONSTRUCT THE FOLLOWING:
- PROPOSED ROADWAY SECTION LEFT OF -L- FROM STA. 10+70+/- TO STA. 14+53+/-
- PROPOSED BRIDGE AND APPROACH SLABS FROM -L- 14+53+/- TO STA 15+52+/
- PROPOSED ROADWAY SECTION LEFT OF -L- FROM STA. 15+52+/- TO STA. 17+25+/-
- CONSTRUCT -DR1- FROM STA. 10+00+/-+/- TO STA. 10+80+/-
- INSTALL 18″ RCP-III STR 0403
- INSTALL 15″ RCP-III STR 0404
- INSTALL 15″ CSP FROM STR 0401 TO STR 0402
- INSTALL STR 0402

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 TEMPORARY PAVEMENT MARKINGS LEFT OF -L- STA 6+60+/- TO STA 19+85+/-
- PLACE TRAFFIC IN A ONE-LANE, TWO-WAY PATTERN LEFT OF -L-

STEP 2. USING ROADWAY STANDARD DRAWING 1101.02, SHEETS 1 AND 17 OF 19 AS NEEDED CONSTRUCT THE FOLLOWING:
- PROPOSED ROADWAY SECTION RIGHT OF -L- FROM STA. 10+70+/- TO STA. 14+53+/-
- PROPOSED ROADWAY SECTION RIGHT OF -L- FROM STA. 15+52+/- TO STA. 17+25+/-

PHASE III

STEP 1. USING ROADWAY STANDARD DRAWING 1101.02, SHEETS 1 AND 17 OF 19 AS NEEDED COMPLETE THE FOLLOWING:
- DEMO EXISTING PAVEMENT AND STRUCTURE.
- PLACE TEMPORARY PAVEMENT MARKINGS IN THE FINAL LOCATIONS FROM -L- STA 6+60+/- TO -L- STA. 19+85+/-
- REMOVE THE PORTABLE TEMPORARY SIGNALS AND SIGNS

STEP 2. USING ROADWAY STANDARD DRAWING 1101.02, SHEET 1 OF 19 PLACE THE FINAL LAYER OF SURFACE COURSE FROM -L- STA 10+70+/- TO -L- STA. 17+25+/-

STEP 4. USING ROADWAY STANDARD DRAWING 1101.02, SHEET 1 OF 19 PLACE THE FINAL PAVEMENT MARKINGS FROM -L- STA 6+60+/- TO -L- STA. 19+85+/-

STEP 5. USING ROADWAY STANDARD DRAWING 1101.02, SHEET 1 OF 19 REMOVE ALL TEMPORARY TRAFFIC CONTROL DEVICES

Signed by: David W Bissette
APPROVED: 03A93C445BCD4F8...
DATE: 10/5/2026
SEAL

NORTH CAROLINA PROFESSIONAL SEAL 030864 ENGINEER DAVID W. BISSETTE

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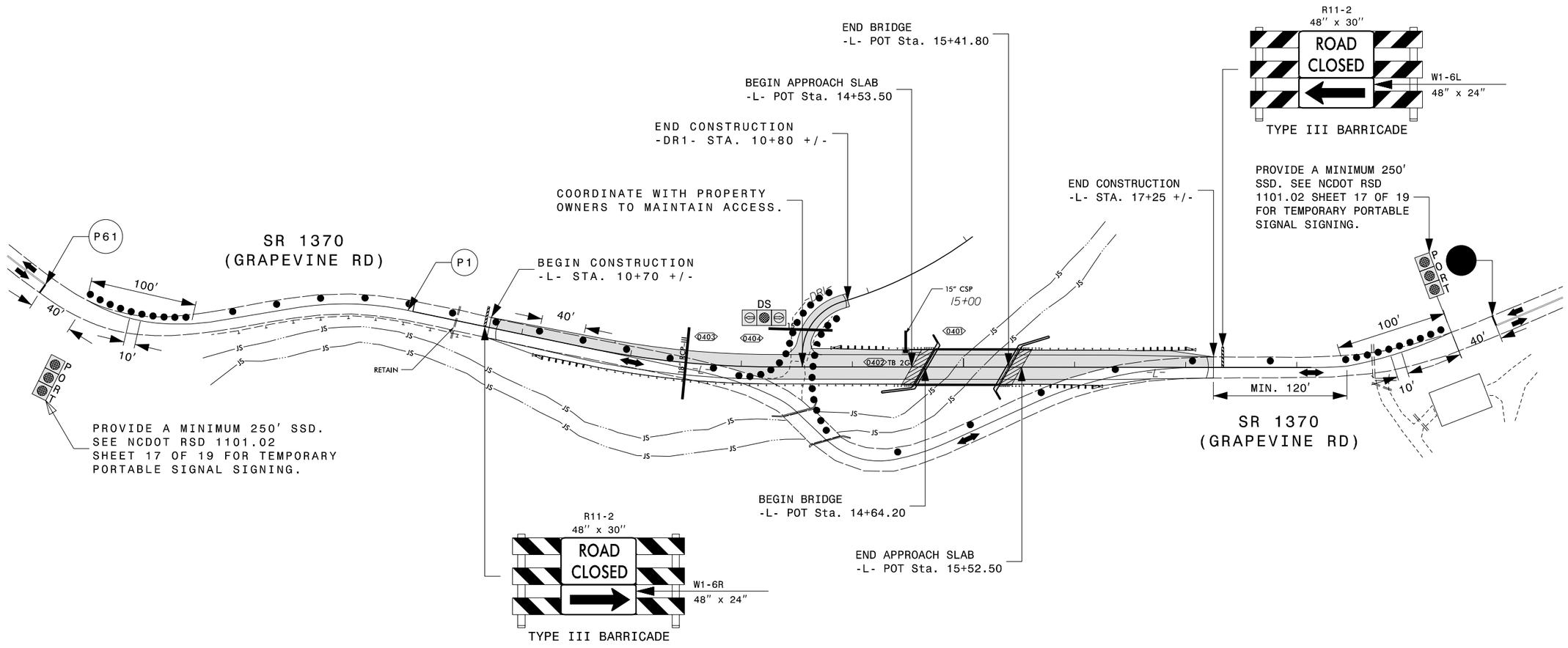
TRANSPORTATION OPERATIONS PLAN

9/30/2025
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PROJ. REFERENCE NO.	SHEET NO.
BP13-R015	TMP-4

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LICENSE NO. F-0165



35 MPH
STOPPING SIGHT DISTANCE 250'
BUFFER 120'

APPROVED: Signed by: David W Bissette
DATE: 10/5/2026
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 030864 ENGINEER DAVID W BISSETTE

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

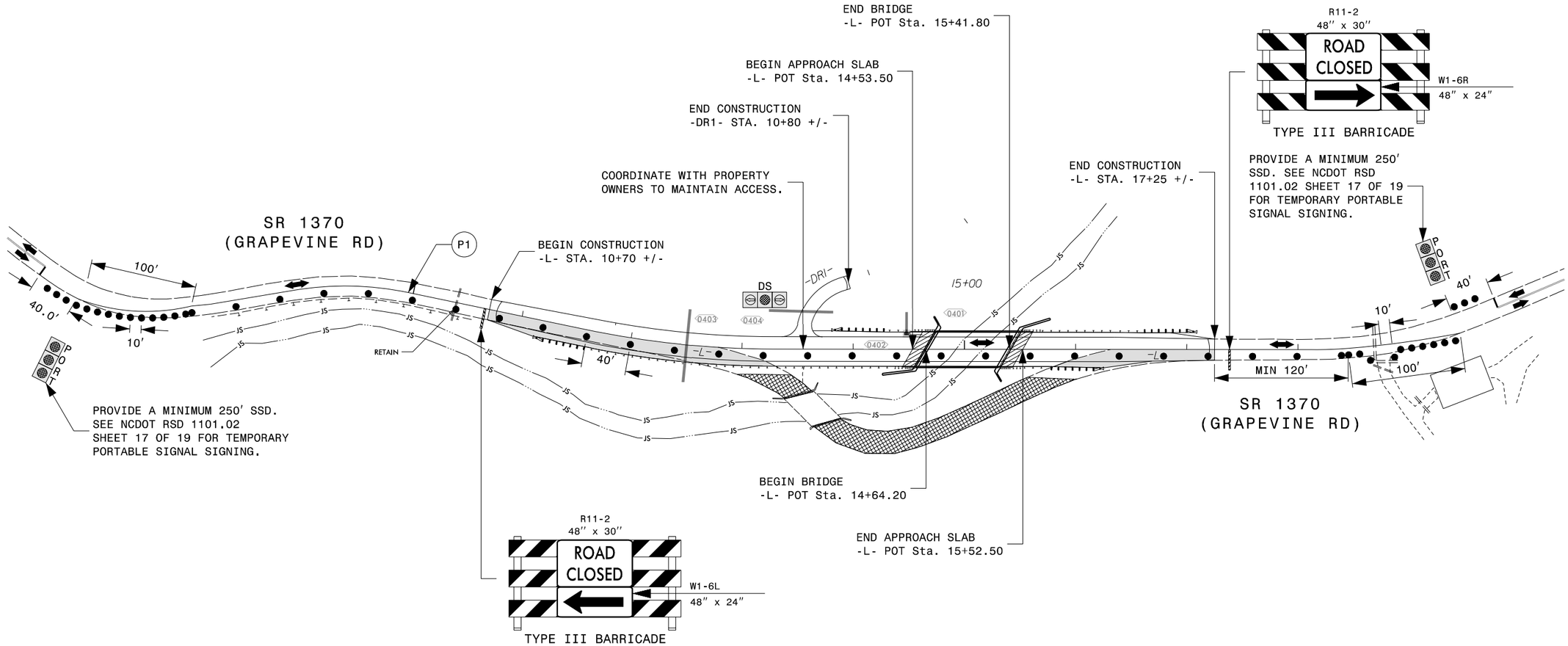
TEMPORARY TRAFFIC CONTROL
PHASE I

9/30/2026
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PROJ. REFERENCE NO.	SHEET NO.
BP13-R015	TMP-5

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Signed by: David W Bissette
APPROVED: 03AB3C445BCD4F8...
DATE: 10/5/2026
SEAL

NORTH CAROLINA PROFESSIONAL SEAL 030864 ENGINEER DAVID W BISSETTE

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

TEMPORARY TRAFFIC CONTROL PHASE II

10/2/2026
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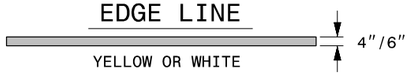
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PROJECT REFERENCE NO.	SHEET NO.
BP10.R015	PMP-01A

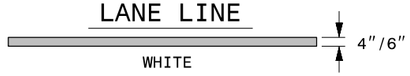
CONTINUOUS LINES

EDGE LINE



YELLOW OR WHITE

LANE LINE



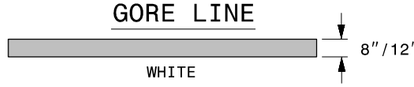
WHITE

CENTER LINE



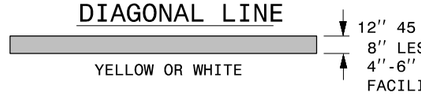
YELLOW

GORE LINE



WHITE

DIAGONAL LINE



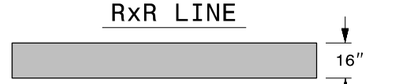
YELLOW OR WHITE

CROSSWALK LINE



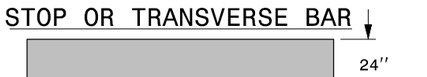
WHITE

RxR LINE



WHITE

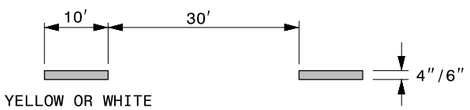
STOP OR TRANSVERSE BAR



WHITE

10′-30′/SP SKIP LINE

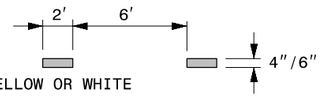
UNLESS OTHERWISED SHOWN, USE 10′-30′/SP SKIPS FOR SKIP LANE LINES AND SKIP CENTER LINES.



YELLOW OR WHITE

2′-6′/SP MINI-SKIP LINE

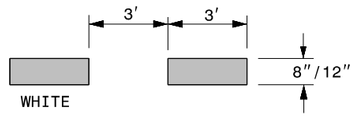
UNLESS OTHERWISED SHOWN, USE 2′-6′/SP MINI-SKIPS FOR LANE LINE EXTENSIONS THROUGH INTERSECTIONS, EDGE LINE EXTENSIONS THROUGH INTERSECTIONS AND BICYCLE LANE EXTENSIONS.



YELLOW OR WHITE

3′-3′/SP MINI-SKIP LINE

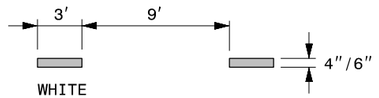
UNLESS OTHERWISED SHOWN, USE 3′-3′/SP MINI-SKIPS FOR THE WHITE EDGE LINE ENTENSIONS AT ROUNDABOUTS.



WHITE

3′-9′/SP MINI-SKIP LINE

UNLESS OTHERWISED SHOWN, USE 3′-9′/SP MINI-SKIPS FOR MINI-SKIP LANE LINES, LINE EXTENSIONS THROUGH TAPERS, AND MINI-SKIPS USED FOR BICYCLE LANE LINES.



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.

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

ROADWAY DETAIL DRAWING FOR

PAVEMENT MARKINGS

LINE TYPES AND OFFSETS

SHEET 1 OF 2

1205D01

NORTH CAROLINA PROFESSIONAL SEAL 042546 ENGINEER MATTHEW V. SPRINGER

Signed by: Matthew V. Springer, PE
BC80F6E8B6584403...

10/6/2026

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.: _____

Docusign Envelope ID: 847460D1-C64D-4C08-BDA4-B3262BE6C2C6

PAVEMENT MARKING SCHEDULE
TIP PROJECT # BP13.R015

SYMBOL	DESCRIPTION
	PAINT (4")
P1	WHITE EDGELINE
P13	YELLOW DOUBLE CENTER

TIP NO.	SHEET NO.
BP13.R015	PMP-02

APPROVED: _____

DATE: _____

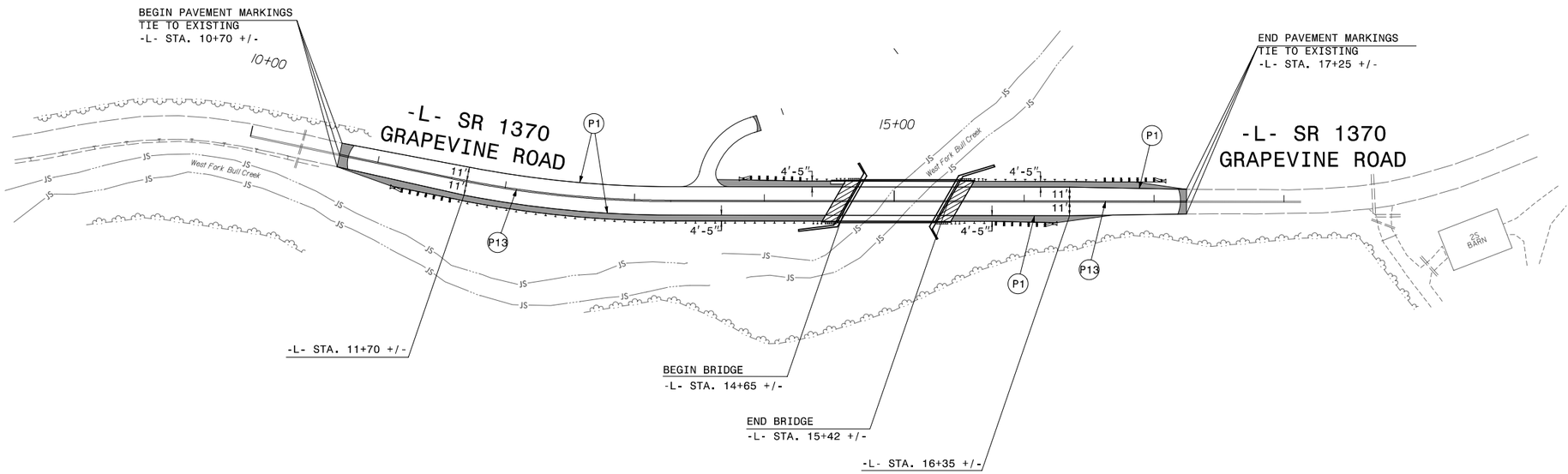
SEAL

NORTH CAROLINA PROFESSIONAL SEAL 043754 ENGINEER ERIC W. BOWMAN

Signed by: Eric W Bowman 11/20/2024

DOCUSIGNED

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



PAVEMENT MARKING PLAN SHEET

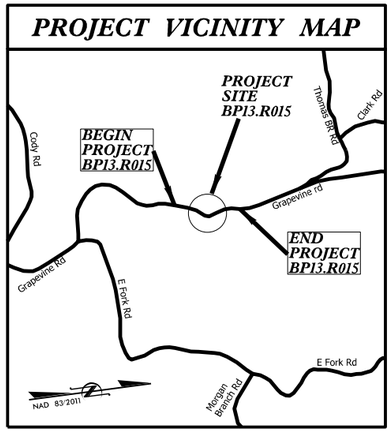
8/19/2024
c:\bms\2_\lbususer\d0162586\2042955_pmp_psh_2.dgn
USEB0442I

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP13.R015	EC-1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
BP13.R015.01	N / A	PE

TIP PROJECT: BP13.R015

PROJECT VICINITY MAP



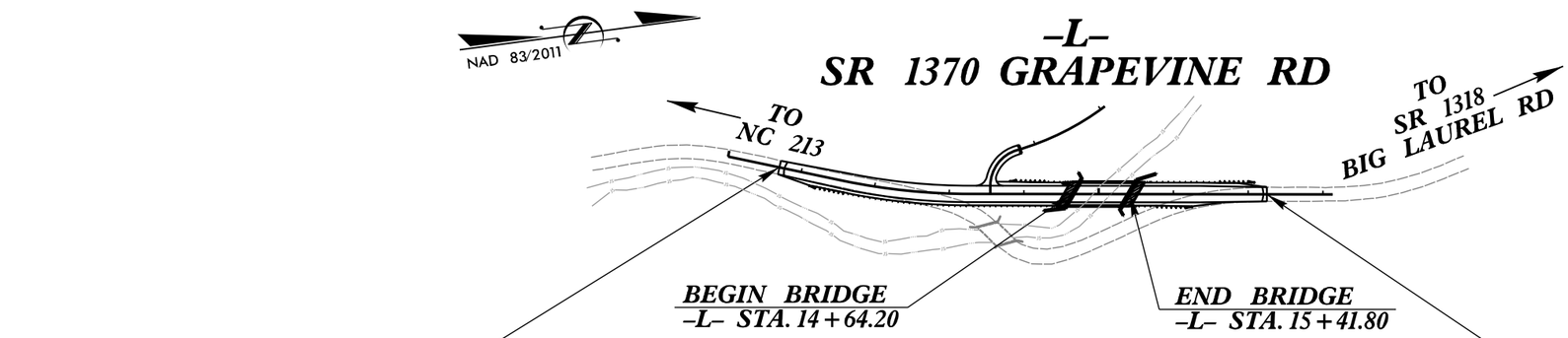
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

MADISON COUNTY

LOCATION: BRIDGE NO. 98 ON SR 1370 (GRAPEVINE RD) OVER WEST FORK BULL CREEK

TYPE OF WORK: PAVING, GRADING, DRAINAGE & STRUCTURE



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

GRAPHIC SCALE

50 25 0 50 100

PLANS

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 ENERGY, MINERAL AND LAND RESOURCES.

Prepared In the Office of:

WSP USA
1001 MOREHEAD SQUARE DRIVE
SUITE 610
CHARLOTTE, NC 28203
TEL: 1.704.342.5401

LICENSE NO. F–0165

Designed by:

James Owen Britt, P.E. *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 revison thereto are applicable to this project and by reference hereby are considered a part of these plans.

C:\Projects\BP13.R015\716\BP13.R015_EC_01.dgn
6/21/2024

PROJECT REFERENCE NO.	SHEET NO.
BP13.R015	EC-02
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

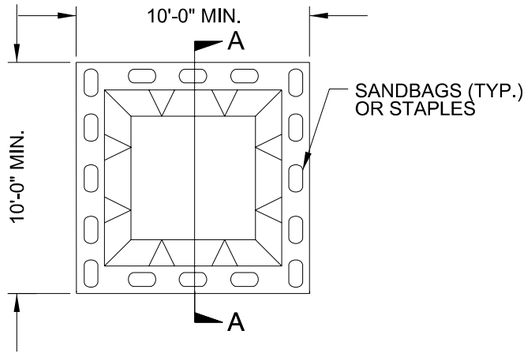
EROSION & SEDIMENT CONTROL LEGEND

Std. #	Description	Symbol
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	
1622.01	Temporary Berms and Slope Drains	
1630.02	Silt Basin Type B	
1630.03	Temporary Silt Ditch	TSD
1630.04	Stilling Basin	
1630.05	Temporary Diversion	TD
1630.06	Special Stilling Basin	
1630.07	Skimmer Basin	
1630.08	Tiered Skimmer Basin	
1630.09	Earthen Dam with Skimmer	
	Infiltration Basin	
	Rock Inlet Sediment Trap:	
1632.01	Type A	A
1632.02	Type B	B
1632.03	Type C	C

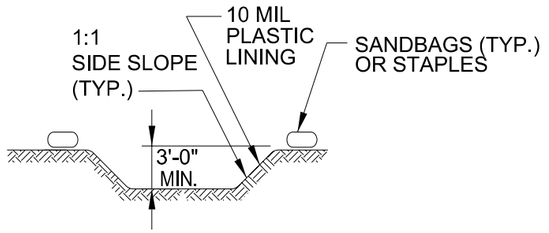
Std. #	Description	Symbol
1633.01	Temporary Rock Silt Check Type A	
1633.02	Temporary Rock Silt Check Type B	
1633.03	Temporary Rock Silt Check Type A with Excelsior Matting and Flocculant	
1634.01	Temporary Rock Sediment Dam Type A	
1634.02	Temporary Rock Sediment Dam Type B	
1635.01	Rock Pipe Inlet Sediment Trap Type A	A
1635.02	Rock Pipe Inlet Sediment Trap Type B	B
1636.01	Excelsior Wattle Check	
1636.01	Excelsior Wattle Check with Flocculant	
1636.01	Coir Fiber Wattle Check	
1636.01	Coir Fiber Wattle Check with Flocculant	
1636.02	Silt Fence Excelsior Wattle Break	EW
	Silt Fence Coir Fiber Wattle Break	CFW
1636.03	Excelsior Wattle Barrier	EW EW EW
1636.03	Coir Fiber Wattle Barrier	CFW CFW CFW

PROJECT REFERENCE NO.	SHEET NO.
BP13.R015	EC-2A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

ONSITE CONCRETE WASHOUT STRUCTURE WITH LINER



PLAN



SECTION A-A



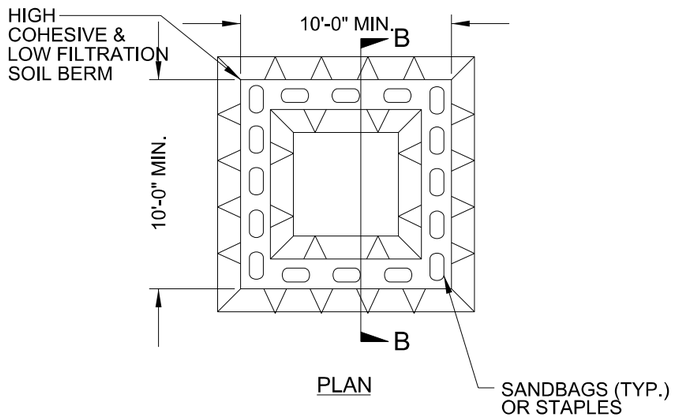
NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD

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.

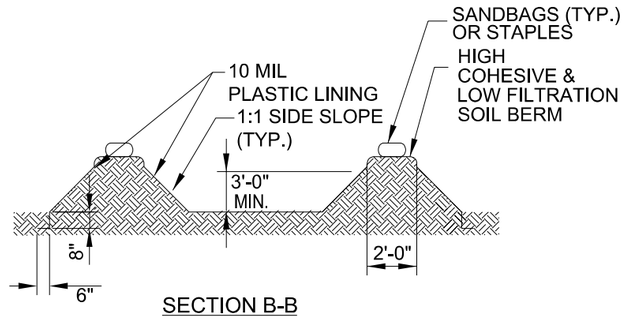
3.CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARY MARKED WITH SIGNAGE NOTING DEVICE.

BELOW GRADE WASHOUT STRUCTURE

NOT TO SCALE



PLAN



SECTION B-B



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 CLEARY MARKED WITH SIGNAGE NOTING DEVICE.

ABOVE GRADE WASHOUT STRUCTURE

NOT TO SCALE

PROJECT REFERENCE NO.	SHEET NO.
BP13.R015	EC-3
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION TIMEFRAMES

SITE DESCRIPTION	STABILIZATION TIME	TIMEFRAME EXCEPTIONS
PERIMETER DIKES, SWALES, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HQW) ZONES	7 DAYS	NONE
SLOPES STEEPER THAN 3:1	7 DAYS	IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1, 14 DAYS ARE ALLOWED.
SLOPES 3:1 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

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
BP13.R015	EC-3A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION SUMMARY SHEET

MATTING FOR EROSION CONTROL

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
4	L	11+50	12+50	LT	80 - STRAW
4	L	12+50	14+50	LT	80 - STRAW
4	L	15+75	17+25	LT	85 - STRAW
4	L	16+00	17+25	RT	80 - STRAW
				SUBTOTAL	325
MISCELLANEOUS MATTING TO BE INSTALLED AS DIRECTED BY THE ENGINEER					2000
				TOTAL	2325
				SAY	2325

MATTING FOR EROSION CONTROL

CONST SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)

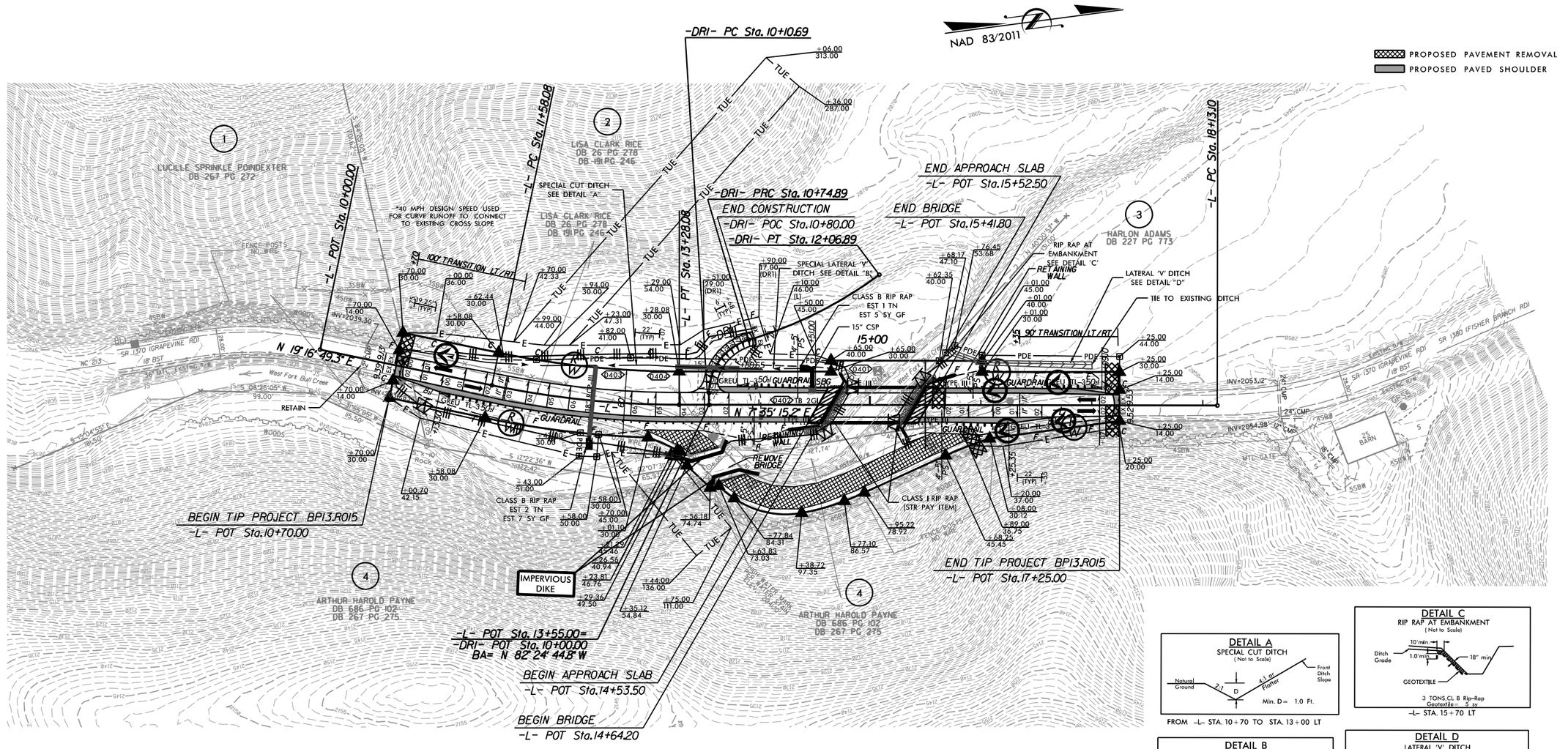
5/14/99

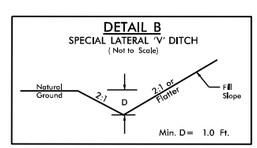
CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 4

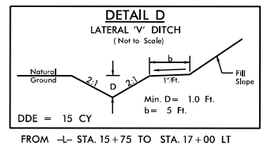
NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE – B AND TEMPORARY ROCK SILT CHECKS TYPE – A AT DRAINAGE OUTLETS.

PROJECT REFERENCE NO.	SHEET NO.
BP13.R015	EC-04/CONST.4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

EROSION CONTROL PLAN







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5/21/2024
Parsons, Brinckerhoff

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
BP13.R015	EC-05/CONST.4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

EROSION CONTROL PLAN

PROPOSED PAVEMENT REMOVAL
PROPOSED PAVED SHOULDER

NAD 83/2011

-DRI- PC Sta. 10+10.69
-L- PC Sta. 11+58.08
-L- POT Sta. 10+00.00
-L- PT Sta. 13+28.08
-L- PC Sta. 18+13.10

1 LUCILLE SPRINKLE POINDEXTER DB 267 PG 272

2 LISA CLARK RICE DB 26 PG 278 DB 191PG 246

3 HARLON ADAMS DB 227 PG 773

4 ARTHUR HAROLD PAYNE DB 686 PG 102 DB 267 PG 275

*40 MPH DESIGN SPEED USED FOR CURVE RUNOFF TO CONNECT TO EXISTING CROSS SLOPE

SPECIAL CUT DITCH SEE DETAIL "A"

-DRI- PRC Sta. 10+74.89
END CONSTRUCTION
-DRI- POC Sta. 10+80.00
-DRI- PT Sta. 12+06.89

SPECIAL LATERAL 'V' DITCH SEE DETAIL "B"

CLASS B RIP RAP EST 1 TN EST 5 SY GF

15" CSP

END APPROACH SLAB
-L- POT Sta. 15+52.50

END BRIDGE
-L- POT Sta. 15+41.80

RIP RAP AT EMBANKMENT SEE DETAIL 'C'

RETAINING WALL

LATERAL 'V' DITCH SEE DETAIL "D"

TIE TO EXISTING DITCH

100' TRANSITION LT/RT

90' TRANSITION LT/RT

N 19°16'49.3" E

N 7°35'15.2" E

S 15°04'55" E 181.50

S 08°25'05" W 99.00'

S 3°56'05" W 115.50'

S 17°22'36" W 122.42'

RETAIN

REMOVE BRIDGE

CLASS B RIP RAP EST 2 TN EST 7 SY GF

CLASS I RIP RAP (STR PAY ITEM)

5' x 10' Rock

BEGIN TIP PROJECT BP13.R015
-L- POT Sta. 10+70.00

END TIP PROJECT BP13.R015
-L- POT Sta. 17+25.00

-L- POT Sta. 13+55.00=
-DRI- POT Sta. 10+00.00
BA= N 82°24'44.8"W

BEGIN APPROACH SLAB
-L- POT Sta. 14+53.50

BEGIN BRIDGE
-L- POT Sta. 14+64.20

0.02 AC STREAMBANK REFORESTATION, SEE DETAIL RF-2, RF-3 AND SPECIAL PROVISIONS

INV=2039.30'
INV=2053.12'
INV=2054.98'

SR 1370 (GRAPEVINE RD)
SR 1380 (FISHER BRANCH RD)
NC 213
West Fork Bull Creek
WOODS
MTL GATE
BARN
GPS5

DETAIL A
SPECIAL CUT DITCH
(Not to Scale)

Natural Ground, 2:1, D, 4:1 or Flatter, Front Ditch Slope
Min. D= 1.0 Ft.

FROM -L- STA. 10+70 TO STA. 13+00 LT

DETAIL B
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

Natural Ground, 2:1, D, 2:1 or Flatter, Fill Slope
Min. D= 1.0 Ft.

FROM -L- STA. 13+80 TO STA. 14+50 LT

DETAIL C
RIP RAP AT EMBANKMENT
(Not to Scale)

Ditch Grade, 1.0' min., D, 10' min., 18" min., GEOTEXTILE
3 TONS CL B Rip-Rap
Geotextile= 5 sy

-L- STA. 15+70 LT

DETAIL D
LATERAL 'V' DITCH
(Not to Scale)

Natural Ground, 2:1, D, 2:1, b, 1'/Ft., Fill Slope
Min. D= 1.0 Ft.
b= 5 Ft.

DDE = 15 CY

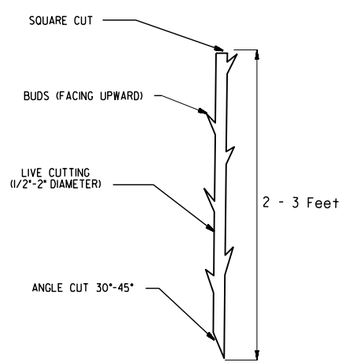
FROM -L- STA. 15+75 TO STA. 17+00 LT

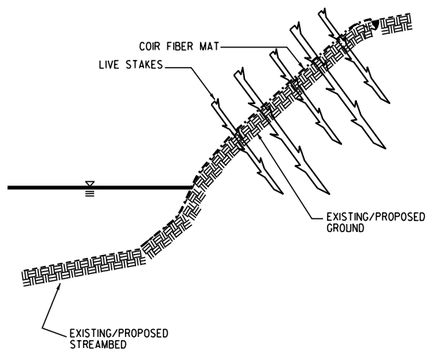
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5/21/2024
PARKER, BENJAMIN

PROJECT REFERENCE NO.	SHEET NO.
BP13.R015	RF-2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PLANTING DETAILS

LIVE STAKES PLANTING DETAIL

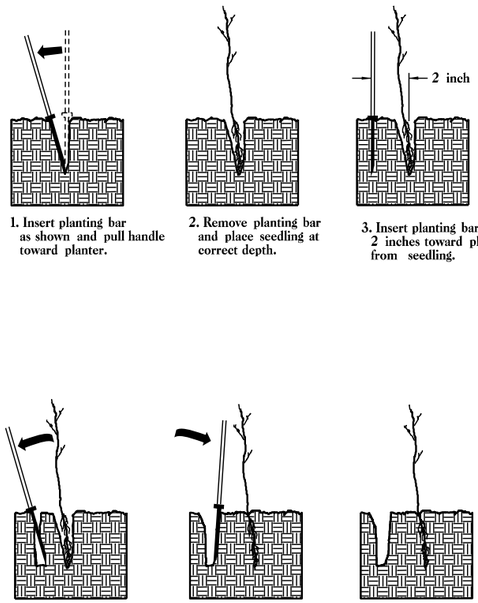




BANK STABILIZATION WITH LIVE STAKES

NOTE:
LIVE STAKES SHALL BE SPACED APPROXIMATELY 4 FEET ON CENTER
LIVE STAKES SHALL BE DRIVEN UNTIL APPROXIMATELY 3/4 OF LIVE STAKE IS WITHIN GROUND

BAREROOT PLANTING DETAIL 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.



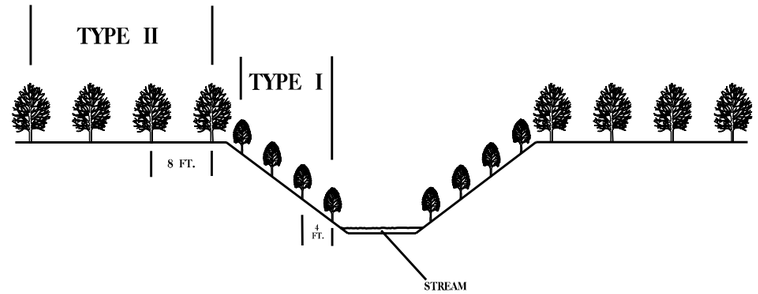
ROOT PRUNING
All seedlings shall be root pruned, if necessary, so that no roots extend more than 10 inches below the root collar.

☐ TYPE 1 STREAMBANK REFORESTATION SHALL BE PLANTED 3 FT. TO 5 FT. ON CENTER, RANDOM SPACING, AVERAGING 4 FT. ON CENTER, APPROXIMATELY 2724 PLANTS PER ACRE.

☐ TYPE 2 STREAMBANK REFORESTATION SHALL BE PLANTED 6 FT. TO 10 FT. ON CENTER, RANDOM SPACING, AVERAGING 8 FT. ON CENTER, APPROXIMATELY 680 PLANTS PER ACRE.

☐ NOTE: TYPE 1 AND TYPE 2 STREAMBANK REFORESTATION SHALL BE PAID FOR AS "STREAMBANK REFORESTATION"

STREAMBANK REFORESTATION TYPICAL



STREAMBANK REFORESTATION

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

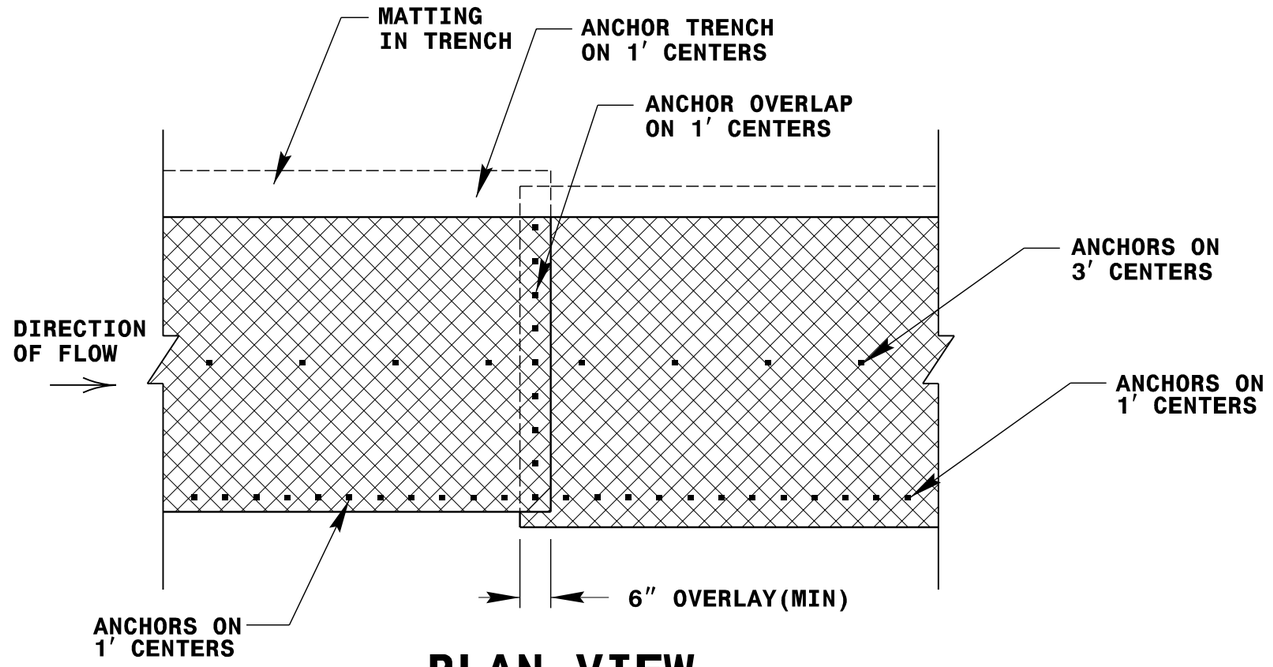
TYPE 1		
50% SALIX NIGRA	BLACK WILLOW	2 ft – 3 ft LIVE STAKES
50% CORNUS AMOMUM	SILKY DOGWOOD	2 ft – 3 ft LIVE STAKES
TYPE 2		
25% LIRIODENDRON TULIPIFERA	TULIP POPLAR	12 in – 18 in BR
25% PLATANUS OCCIDENTALIS	SYCAMORE	12 in – 18 in BR
25% PRUNUS SEROTINA	BLACK CHERRY	12 in – 18 in BR
25% BETULA NIGRA	RIVER BIRCH	12 in – 18 in BR

☐ SEE PLAN SHEETS FOR AREAS TO BE PLANTED

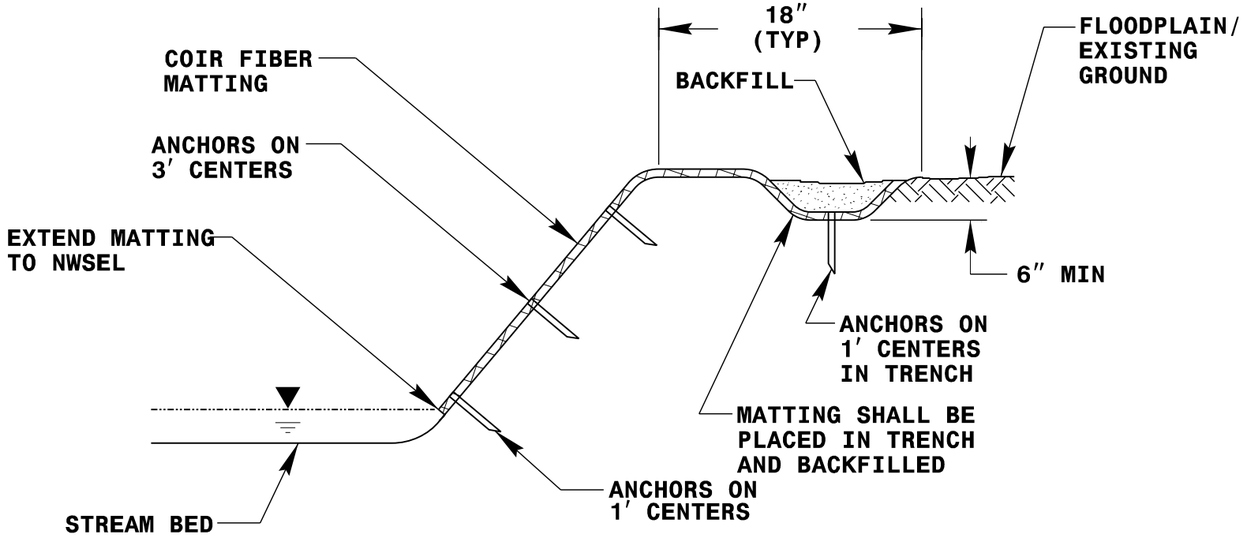
STREAMBANK REFORESTATION DETAIL SHEET 1 OF 2

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

PROJECT REFERENCE NO.	SHEET NO.
BP13.R015	RF-3
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

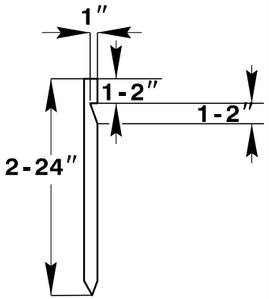


PLAN VIEW

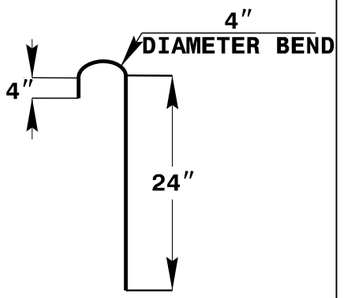


TYPICAL CROSS SECTION

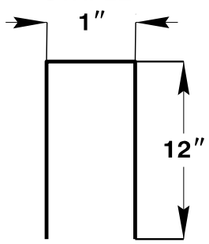
2″ x 2″ (nominal) WOODEN STAKE



#10 STEEL REINFORCEMENT BAR



1″ (nominal) STAPLE



ANCHOR OPTIONS

COIR FIBER MATTING DETAIL

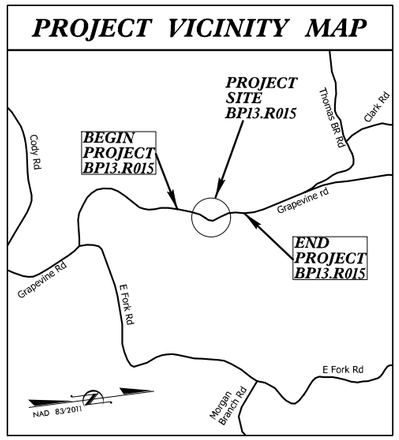
NOT TO SCALE

STREAMBANK REFORESTATION
DETAIL SHEET 2 OF 2
N.C.D.O.T.- ROADSIDE ENVIRONMENTAL UNIT

09/08/99

TIP PROJECT: BP13.R015

CONTRACT: DM00407



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITIES BY OTHERS PLANS
MADISON COUNTY

T.I.P. NO.	SHEET NO.
BP13.R015	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.

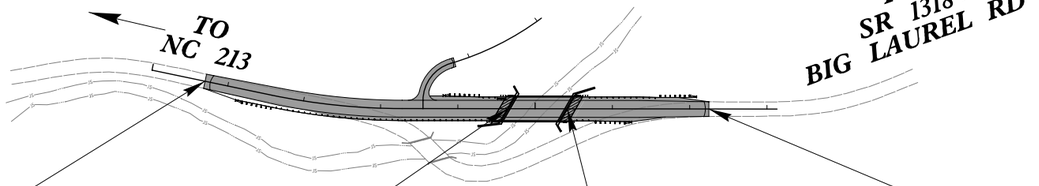
LOCATION: BRIDGE NO. 560098 ON SR 1370 (GRAPEVINE RD) OVER WEST FORK BULL CREEK

TYPE OF WORK: PAVING, GRADING, DRAINAGE & STRUCTURE

UO–2

NAD 83/2011

–L–
SR 1370 GRAPEVINE RD



BEGIN BRIDGE
–L– STA. 14 + 64.20

END BRIDGE
–L– STA. 15 + 41.80

BEGIN TIP PROJECT BP13.R015
–L– STA. 10 + 70.00

END TIP PROJECT BP13.R015
–L– STA. 17 + 25.00

GRAPHIC SCALES

50 25 0 50 100
PLANS

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 COMMUNICTIONS

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

CHRISTOPHER E. LEE, PE — UTILITY PROJECT MANAGER
BRIAN R. PEASE, EI — 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

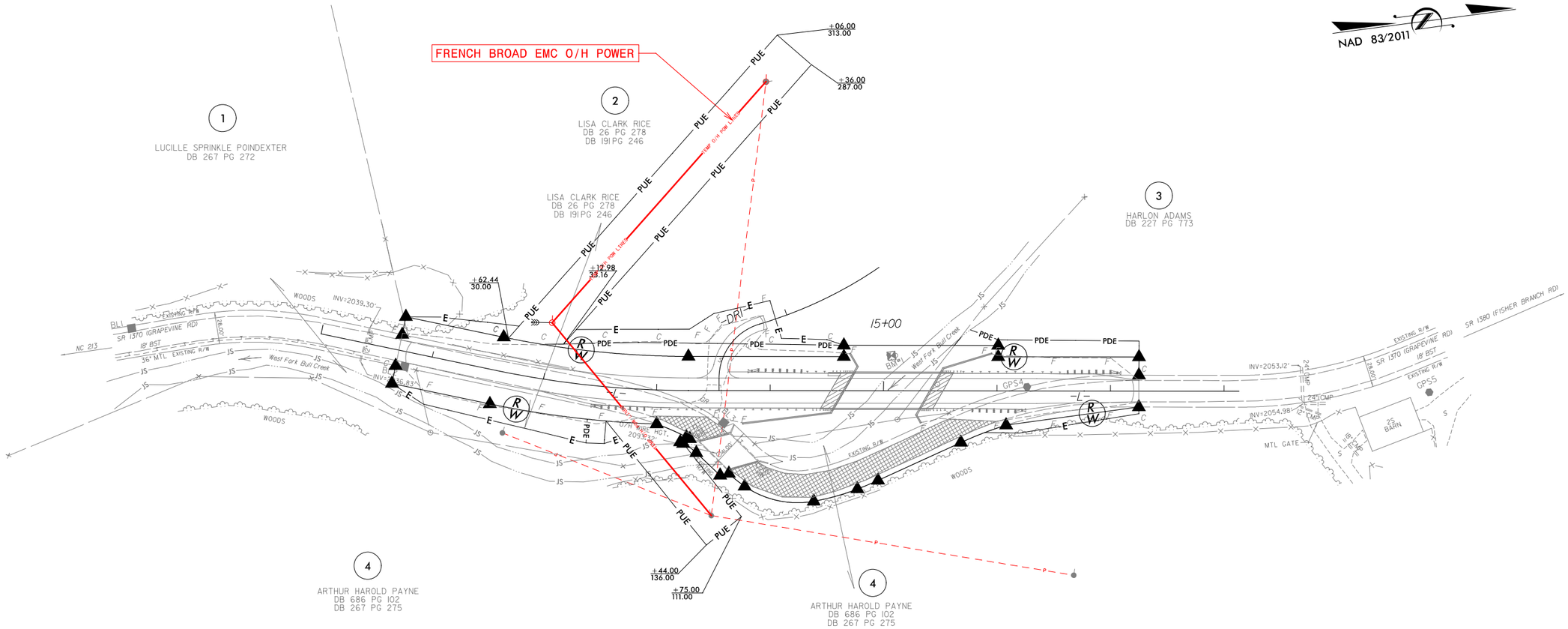
9/16/2026
C:\bms\2\lbususer\d0168386\BP13.R015_RDY_TSH.dgn
HaynesSJ

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
BP13.R015	U0-2
THIS SHEET CORRESPONDS TO RDY-04	

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.



3/12/2024
BP13.R015_UT_PSH04_U0-02.dgn
kds pr10 release

6/23/16

PROJ. REFERENCE NO.	SHEET NO.
BP13.R015	X-1

wsp
1001 Morehead Square Dr., Suite 610, Charlotte NC, 28203
NC LIC NO. F-0165

VOLUME # 1
CROSS-SECTIONS INDEX OF SHEETS

-L- ..... X-2 THRU X-9

-DRI- X-10

8/15/2024
G:\Users\Portilla\Desktop\PRINT\BP13.R015_RDY_XPL_TSH.dgn
Portilla

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJ. REFERENCE NO.	SHEET NO.
BP13.R015	X-1A

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

CROSS-SECTION SUMMARY

NOTE: EMBANKMENT COLUMN DOES NOT INCLUDE BACKFILL FOR UNDERCUT

Station L	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
10+70.00	0	0
11+00.00	3	6
11+50.00	9	44
12+00.00	24	89
12+50.00	58	112
13+00.00	76	99
13+50.00	36	217
14+00.00	5	461
14+50.00	6	519
14+65.50	1	116

Station L	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
15+40.40	0	0
15+50.00	0	53
15+80.00	0	241
16+00.00	0	144
16+50.00	1	222
17+00.00	6	101
17+25.00	4	18

Station DR1	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
10+25.00	0	0
10+50.00	0	86
10+75.00	4	22
10+80.00	1	0

6/23/16

0 2,5 5

PROJ. REFERENCE NO.	SHEET NO.
BP13.R015	X-2

wsp
1001 Morehead Square Dr., Suite 610, Charlotte NC, 28203
NC LIC NO. F-0165

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

2065 2060 2055 2050 2045 2040 2035

S.S.2042.05 2:1 4:1 0.010 0.007 2:1 S.S.2038.94

2041.10 2042.23

11+00.00

0.002 0.022

2042.00

10+70.00

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

8/15/2024
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Portillo

6/23/16

0 2,5 5	PROJ. REFERENCE NO.	SHEET NO.
	BP13.R015	X-3

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

2065 2060 2055 2050 2045 2040 2035 2030

S.S.2043.45 2:1 4:1 2041.00 0.045 0.045 2043.59 2:1 S.S.2039.46

12+00.00

2060 2055 2050 2045 2040 2035

S.S.2042.88 2:1 4:1 2041.50 0.019 0.019 2042.78 2:1 S.S.2038.85

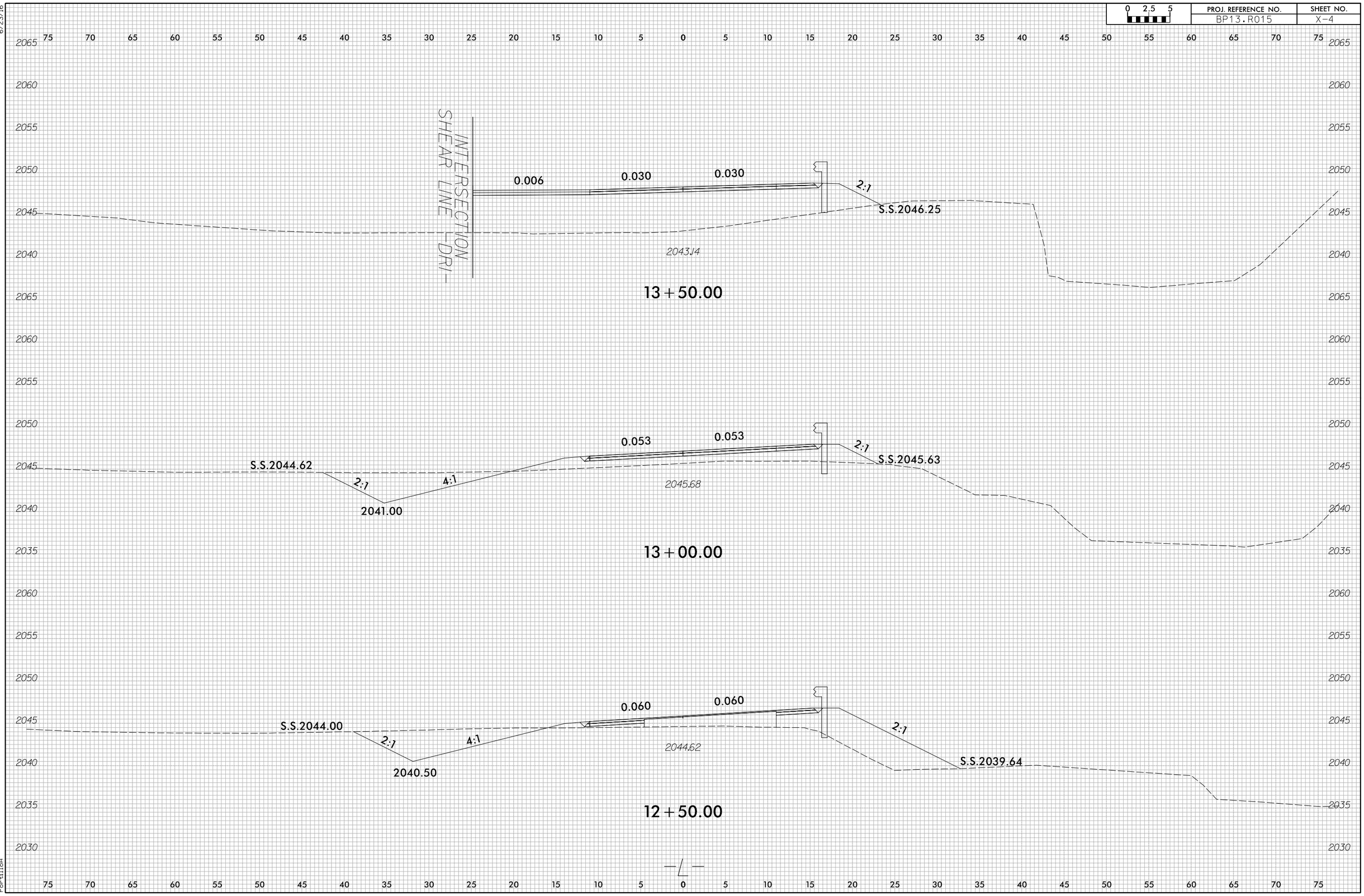
11+50.00

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8/15/2024
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Portt110A

6/23/16

0 2,5 5	PROJ. REFERENCE NO.	SHEET NO.
	BP13.R015	X-4



8/15/2024
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Portillo

6/23/16

0 2,5 5	PROJ. REFERENCE NO.	SHEET NO.
	BP13.R015	X-5

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

2070 2065 2060 2055 2050 2045 2040

0.020 0.020 2:1 2:1 2:1

S.S.2043.52 2042.50 2043.02

14+50.00

2070 2065 2060 2055 2050 2045 2040

0.020 0.020 2:1 2:1 2:1

S.S.2043.66 2042.00 2042.60 S.S.2042.00

14+00.00

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

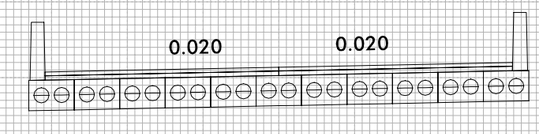
8/15/2024
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Portillo

6/23/16

0 2,5 5	PROJ. REFERENCE NO.	SHEET NO.
	BP13.R015	X-6

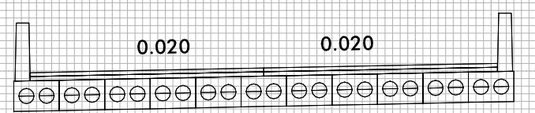
75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

2070
2065
2060
2055
2050
2045
2040



2038.56

15 + 00.00



2043.19

14 + 64.20

8/15/2024
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Portillo

6/23/16

0 2,5 5	PROJ. REFERENCE NO.	SHEET NO.
	BP13.R015	X-7

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

2070
2065
2060
2055
2050
2045
2040

0.020 0.020 2:1

S.S.2048.54

2043.67

15+50.00

0.020 0.020

2043.25

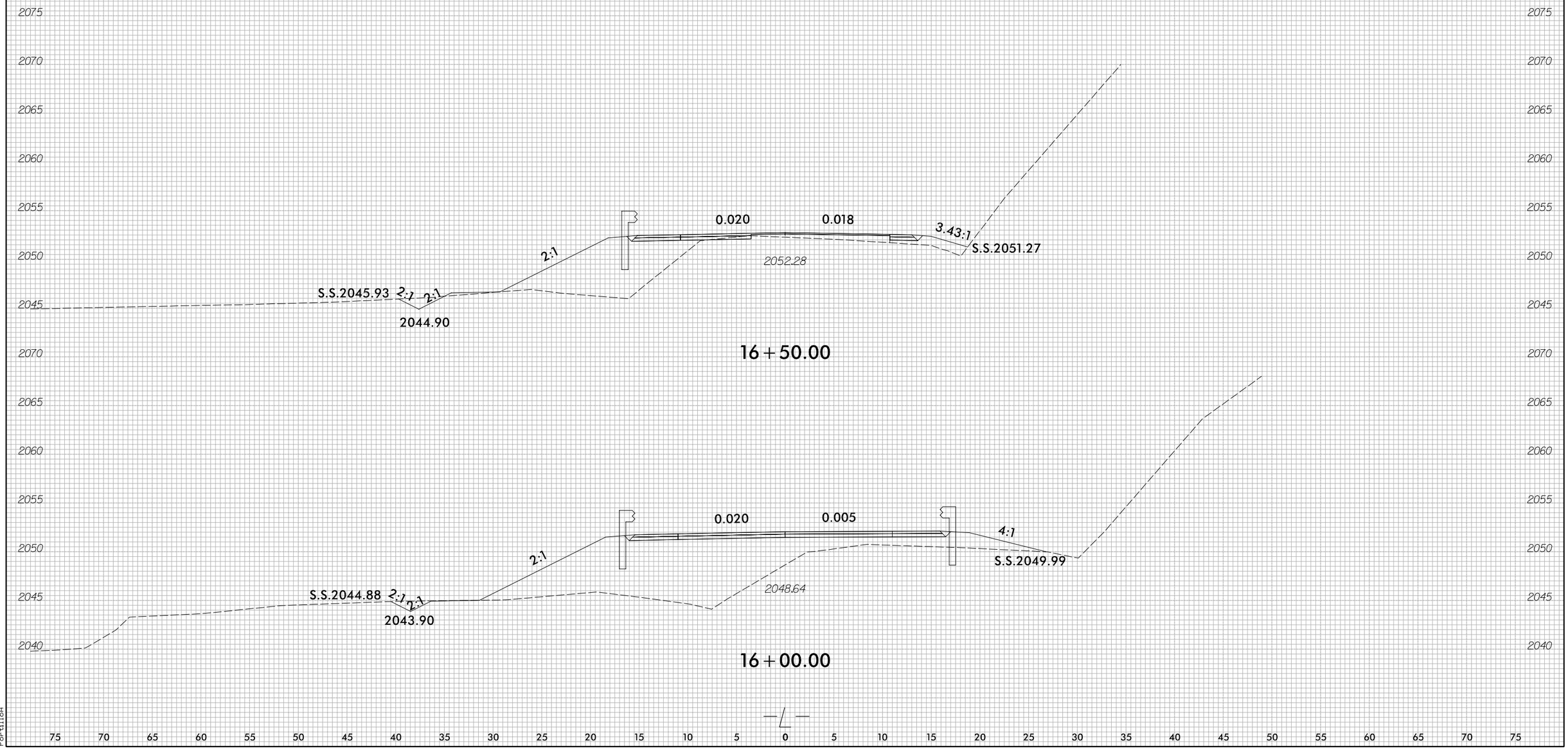
15+41.80

8/5/2024
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Portillo

6/23/16

0 2,5 5	PROJ. REFERENCE NO.	SHEET NO.
	BP13.R015	X-8

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



8/15/2024
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Portilla

6/23/16

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	BP13.R015	X-9

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

2075
2070
2065
2060
2055
2050
2045

0.016 0.022

2054.10

17+25.00

0.020 0.020

2.40:1

2:1

2053.46

S.S.2052.28

S.S.2047.20 2:1 2:1

2045.90

17+00.00

8/15/2024
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Portillo

6/23/16

0 2,5 5	PROJ. REFERENCE NO.	SHEET NO.
	BP13.R015	X-10

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

2060 2055 2050 2045 2040

0.080 0.075

2043.91

10+80.00

0.072 0.071 4:1

S.S.2044.41 S.S.2043.17

2043.89

10+75.00

0.034 0.034

4:1 4:1

S.S.2043.27 S.S.2042.78

2042.65

10+50.00

0.018 0.018

4:1 4:1

S.S.2043.47 S.S.2043.10

2042.44

10+40.00

0.003 0.003

4:1 4:1

S.S.2044.01

2042.44

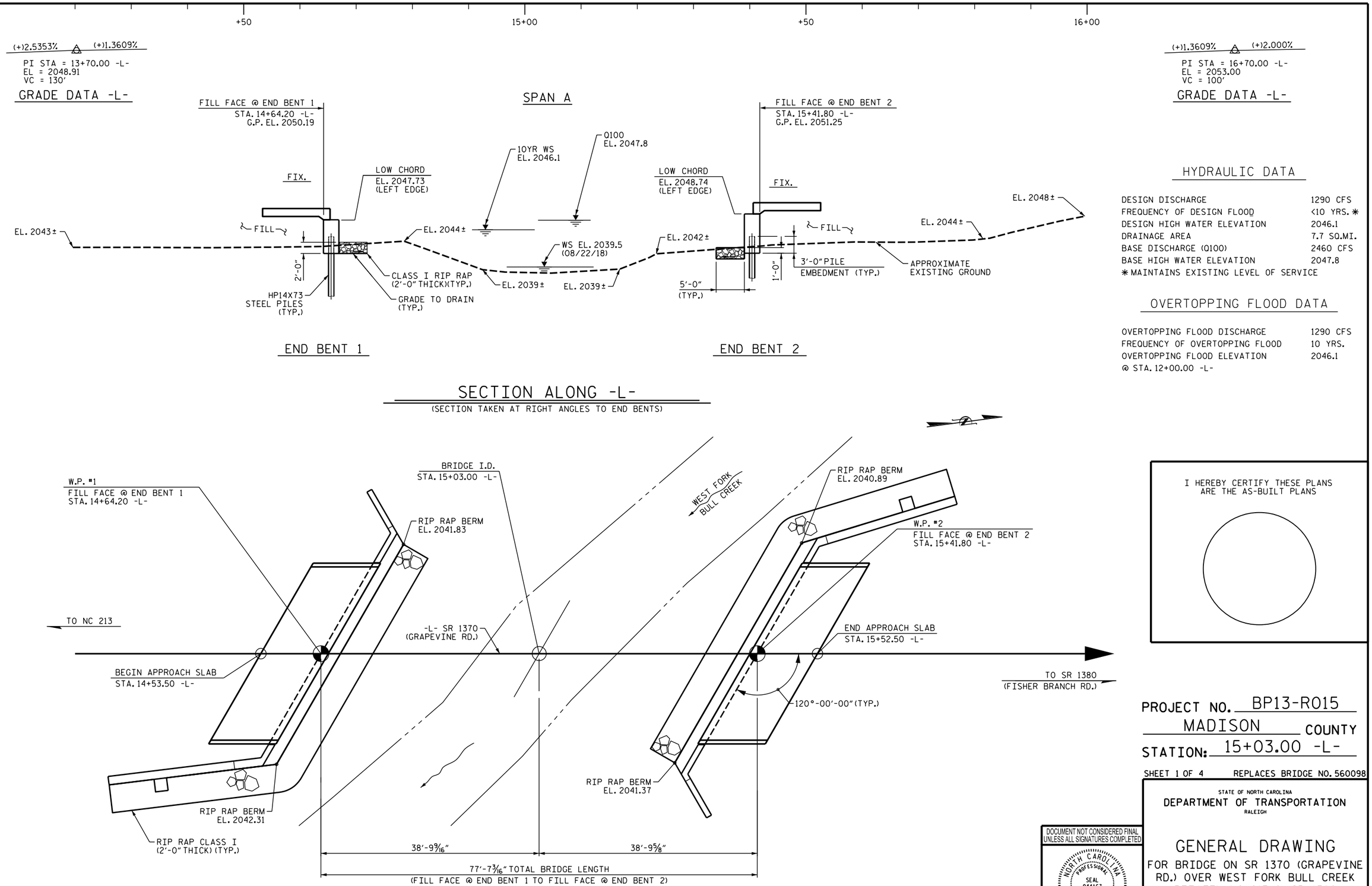
10+30.00

INTERSECTION SHEAR LINE -L-

-DRI-

8/15/2024
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Portilla

Docusign Envelope ID: 405E0BE1-B9F9-46DE-9CCF-300AC6532053



SECTION ALONG -L-

(SECTION TAKEN AT RIGHT ANGLES TO END BENTS)

PLAN

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

HYDRAULIC DATA

DESIGN DISCHARGE	1290 CFS
FREQUENCY OF DESIGN FLOOD	<10 YRS. *
DESIGN HIGH WATER ELEVATION	2046.1
DRAINAGE AREA	7.7 SQ.MI.
BASE DISCHARGE (Q100)	2460 CFS
BASE HIGH WATER ELEVATION	2047.8

* MAINTAINS EXISTING LEVEL OF SERVICE

OVERTOPPING FLOOD DATA

OVERTOPPING FLOOD DISCHARGE	1290 CFS
FREQUENCY OF OVERTOPPING FLOOD	10 YRS.
OVERTOPPING FLOOD ELEVATION	2046.1

@ STA. 12+00.00 -L-

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

PROJECT NO. BP13-R015

MADISON COUNTY

STATION: 15+03.00 -L-

SHEET 1 OF 4 REPLACES BRIDGE NO. 560098

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON SR 1370 (GRAPEVINE RD.) OVER WEST FORK BULL CREEK BETWEEN NC 213 & SR 1380

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 044167 ENGINEER ELIZABETH F. LAWES
11/7/2024
DocuSigned by: Elizabeth F. Lawes 935E84223CD547C...

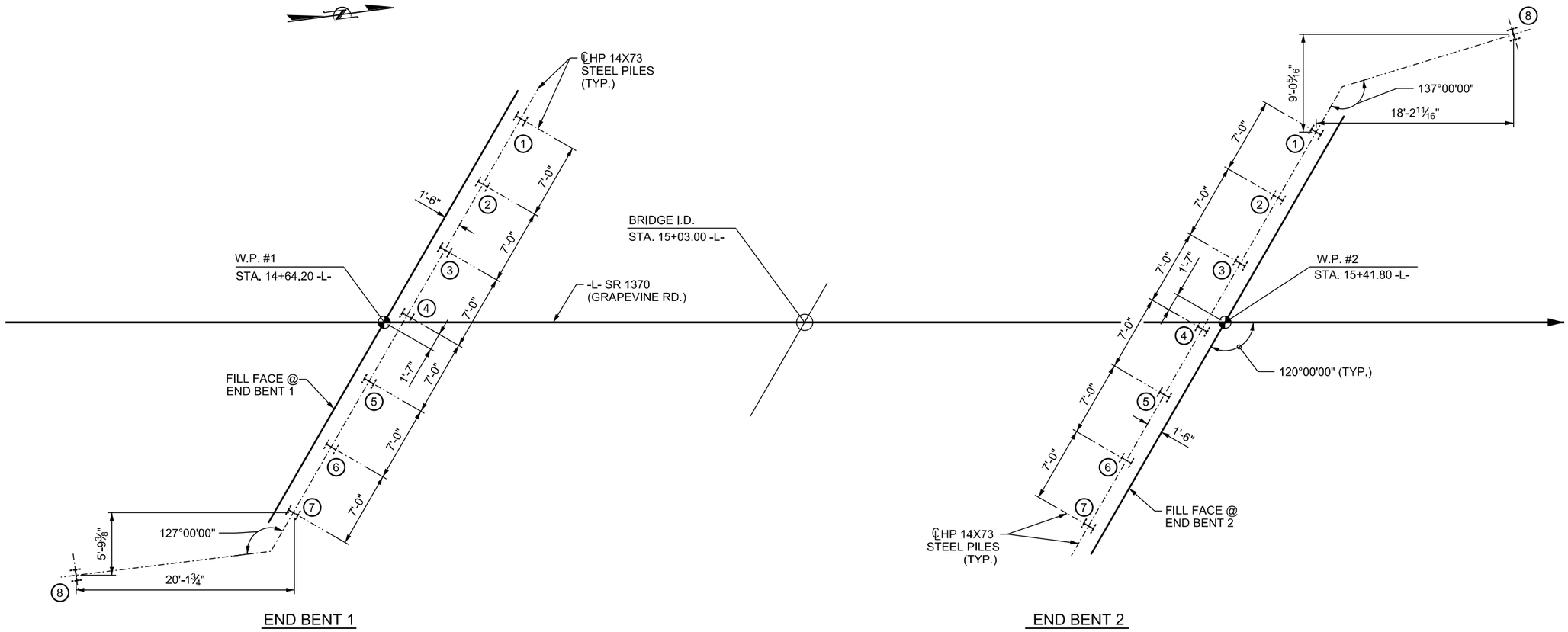
WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

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

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 : NOV 2024

11/7/2024
\\USRAG1OOCIFSO1\Jobs\188360C - 2015 W Divisions Planning & Design On-Call\I188360 Division 13 Bridges\Management\R015\STR\Madison 98\2.0 Drafting\DGNs\401.001.BP13.R015.SMU.G001.dgn

Docusign Envelope ID: 405E0BE1-B9F9-46DE-9CCF-300AC6532053



END BENT 1

END BENT 2

FOUNDATION LAYOUT

(END BENTS ARE PARALLEL)

PROJECT NO. BP13-R015

MADISON COUNTY

STATION: 15+03.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON SR 1370 (GRAPEVINE RD.) OVER WEST FORK BULL CREEK BETWEEN NC 213 & SR 1380

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 044167 ENGINEER ELIZABETH F. LAWES
11/7/2024
DocuSigned by: Elizabeth F. Lawes
935E64223C0647C...

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 : NOV 2024

11/7/2024
\\USRAGIOCIFS01\Jobs\188360C - 2015 W Divisions Planning & Design On-Call\I188360 Division 13 Bridges\Management\R015\STR\Madison 98\2.0 Drafting\DGNs\401_003_BP13_R015_SWL_G002.dgn

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SUMMARY OF PILE INFORMATION/INSTALLATION

(Blank entries indicate item is not applicable to structure)

End Bent / Bent No, Pile(s) #(-#) (e.g., "Bent 1, Piles 1-5")	Number of Piles per Line	Factored Resistance per Pile KIPS	Pile Cut-Off (Top of Pile) Elevation FT	Estimated Pile Length per Pile FT	Scour Critical Elevation FT	Driven Piles			Predrilling for Piles **			Drilled-In Piles		
						Minimum Pile Tip (Tip No Higher Than) Elevation FT	Required Driving Resistance (RDR)* per pile KIPS	Pile Redrives Quantity EACH	Predrilling Length per Pile LIN FT	Predrilling Elevation (Elevation Not To Predrill Below) FT	Maximum Predrilling Diameter INCHES	Pile Excavation (Bottom of Hole) Elevation FT	Pile Excavation Not In Soil per Pile LIN FT	Pile Excavation In Soil per Pile LIN FT
End Bent No. 1, Piles 1-7	7	260	See Structure Drawings	20	N/A		N/A					2026	6	9
Wingwalls at End Bent No. 1, Pile 8	1	260		20	N/A		N/A					2026	6	9
End Bent No. 2, Piles 1-4	4	260		20	N/A		N/A					2026	6	9.5
End Bent No. 2, Piles 5-7	3	260		15	N/A		N/A					2030	6	6
Wingwalls at End Bent No. 2, Pile 8	1	260		20	N/A		N/A					2026	6	9.5
TOTAL QUANTITY:													96	137.5

$$* \; RDR = \frac{Factored\ Resistance\ +\ Factored\ Drag\ Load\ +\ Factored\ Dead\ Load}{Dynamic\ Resistance\ Factor} + Nominal\ Drag\ Load\ Resistance + \ Nominal\ Resistance\ from\ Scourable\ Material$$

** Predrilling for Piles is required for end bents/bents with a predrilling length and at the Contractor's option for end bents/bents with predrilling information but no predrilling length.

SUMMARY OF DPT/PILE ORDER LENGTHS

(Blank entries indicate item is not applicable to structure)

Dynamic Pile Testing (DPT)		
End Bent/ Bent No (e.g., "Bent 1 - Bent 3")	DPT Test Pile Length FT	DPT Testing Quantity EACH
TOTAL QUANTITY:		

Pile Order Lengths for Concrete Piles	
End Bent/ Bent No (e.g., "Bent 1 - Bent 3")	Pile Order Length Basis* EST or DPT

* EST = Pile order lengths from estimated pile lengths; DPT = Pile order lengths based on Dynamic Pile Testing. For groups of end bents/bents with pile order lengths based on DPT testing, the first end bent/bent no. listed for each group is the representative end bent/bent with the DPT.

PILE DESIGN INFORMATION

(Blank entries indicate item is not applicable to structure)

End Bent / Bent No, Pile(s) #(-#) (e.g., "Bent 1, Piles 1-5")	Factored Axial Load per Pile KIPS	Factored Drag Load per Pile KIPS	Factored Dead Load * per Pile KIPS	Dynamic Resistance Factor	Nominal Drag Resistance per Pile KIPS	Nominal Scour Resistance per Pile KIPS
End Bent 1, Piles 1-8	260					
End Bent 2, Piles 1-8	260					

* Factored Dead Load is factored weight of pile above the ground line.

SUMMARY OF PILE ACCESSORIES

(Blank entries indicate item is not applicable to structure)

End Bent / Bent No, Pile(s) #(-#) (e.g., "Bent 1, Piles 1-5")	Pipe Pile Plates EACH	Steel Pile Points		
		Pipe Pile Cutting Shoes EACH	Pipe Pile Conical Points EACH	H-Pile Points EACH
TOTAL QUANTITY:				

NOTES:

1. The Pile Foundation Tables are based on the bridge substructure design and foundation recommendations sealed by a North Carolina Professional Engineer (Shiping Yang, #031361) on 08-23-2024.
2. Total Pile Driving Equipment Setup quantity (not shown in Pile Foundation Tables) equals the number of driven piles, i.e., the number of piles with a Required Driving Resistance.
3. The Engineer may adjust the quantity for DPT Testing and Pipe Pile Plates when necessary.
4. For piles, see Section 450 of the Standard Specifications.
5. Concrete is required to fill holes for Pile Excavation at End Bent Nos. 1 and 2.
6. Pile excavation for End Bent Nos. 1 and 2 and Wingwalls will extend a minimum of 6 feet into rock.

PROJECT NO. BP13-R015

Madison COUNTY

STATION: 15+03.00 -L-

SHEET 3 OF 4

Bridge #98

NORTH CAROLINA PROFESSIONAL SEAL 044167 ENGINEER ELIZABETH F. LAWES

11/7/2024

DocuSigned by: Elizabeth F. Lawes

SIGNATURE DATE

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PILE FOUNDATION TABLES

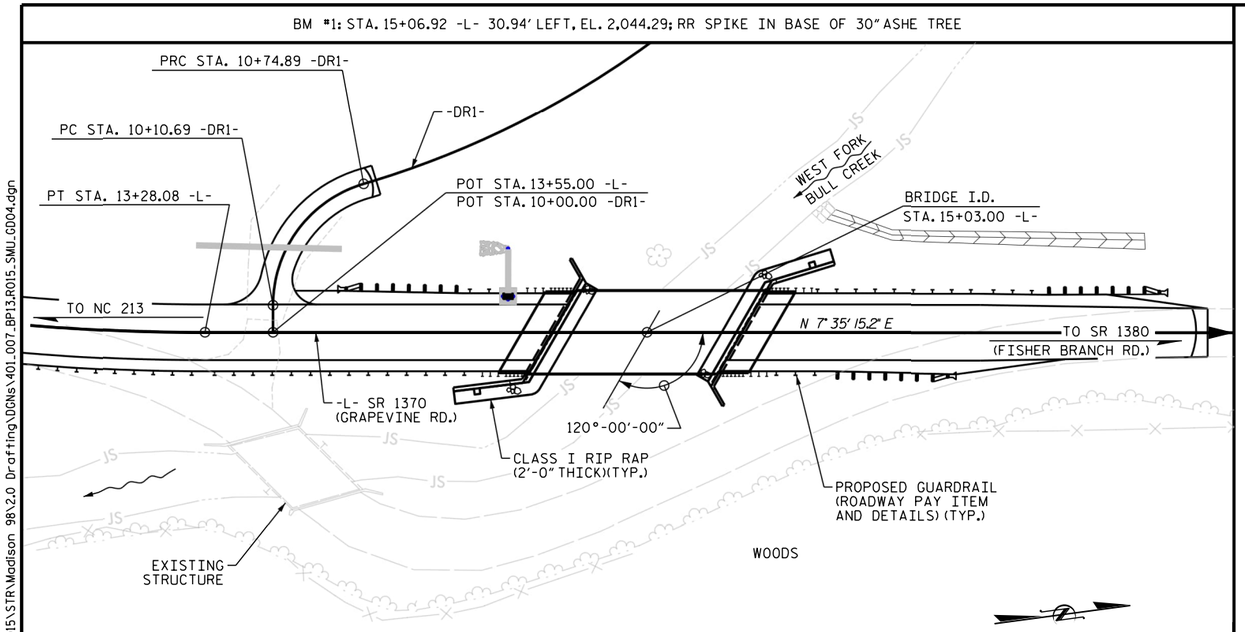
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REVISIONS

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

SHEET NO. S-3

TOTAL SHEETS 19



LOCATION SKETCH

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

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. 15+03.00 -L-".

THE EXISTING STRUCTURE CONSISTING OF ONE 36 FT LONG SPAN OF STEEL I-BEAMS; 24FT CLEAR ROADWAY WIDTH AND TIMBER DECK WITH ASPHALT WEARING SURFACE ON CONCRETE ABUTMENTS AND LOCATED AT EXISTING STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY 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. 15+03.00 -L-	ASBESTOS ASSESSMENT	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	PILE DRIVING EQUIPMENT FOR SETUP OF HP 14 X 73 STEEL PILES	HP 14 X 73 STEEL PILES		VERTICAL CONCRETE BARRIER RAIL	RIP RAP CLASS I (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" X 2'-0" PRESTRESSED CONCRETE CORED SLABS	
	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	LUMP SUM	CU. YDS.	LUMP SUM	LBS.	EA.	No.	LIN. FT.	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	No.	LIN. FT.
SUPERSTRUCTURE							LUMP SUM					150			LUMP SUM	11	825
END BENT 1			72	48.0	LUMP SUM	47.2		5,844	8	8	184		39	43			
END BENT 2			65.5	48.0	LUMP SUM	53.4		6,413	8	8	169		38	42			
TOTAL	LUMP SUM	LUMP SUM	137.5	96.0	LUMP SUM	100.6	LUMP SUM	12,257	16	16	353	150	77	85	LUMP SUM	11	825

PROJECT NO. BP13-R015

MADISON COUNTY

STATION: 15+03.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE ON SR 1370 (GRAPEVINE RD.) OVER WEST FORK BULL CREEK BETWEEN NC 213 & SR 1380

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

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NORTH CAROLINA PROFESSIONAL SEAL 044167 ENGINEER 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 : NOV 2024

6/15/2026
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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
								MOMENT					SHEAR					MOMENT						
							LIVE-LOAD FACTORS (γ LL)	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)	LIVE-LOAD FACTORS (γ LL)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD		HL-93 (INVENTORY)	N/A	1	2.21	–	1.75	0.21	2.21	75'	EL	36.92	0.32	3.07	75'	EL	66.92	0.80	0.21	2.26	75'	EL	36.92	
		HL-93 (OPERATING)	N/A	·	2.87	–	1.35	0.21	2.87	75'	EL	36.92	0.32	4.04	75'	EL	66.92	N/A	–	–	--	–	–	
		HS-20 (INVENTORY)	36.000	2	2.90	101.88	1.75	0.21	2.90	75'	EL	36.92	0.32	3.92	75'	EL	6.92	0.80	0.21	2.97	75'	EL	36.92	
		HS-20 (OPERATING)	36.000		3.76	132.12	1.35	0.21	3.76	75'	EL	36.92	0.32	5.14	75'	EL	6.92	N/A	–	–	--	–	–	
LEGAL LOAD	SINGLE VEHICLE (SV)	SNSH	13.500		6.72	87.62	1.4	0.21	8.22	75'	EL	36.92	0.32	12.09	75'	EL	6.92	0.80	0.21	6.72	75'	EL	36.92	
		SNGARBS2	20.000		5.00	96.40	1.4	0.21	6.11	75'	EL	36.92	0.32	8.53	75'	EL	6.92	0.80	0.21	5.00	75'	EL	36.92	
		SNAGRIS2	22.000		4.73	100.32	1.4	0.21	5.78	75'	EL	36.92	0.32	7.90	75'	EL	6.92	0.80	0.21	4.73	75'	EL	36.92	
		SNCOTTS3	27.250		3.34	88.02	1.4	0.21	4.09	75'	EL	36.92	0.32	5.91	75'	EL	66.92	0.80	0.21	3.34	75'	EL	36.92	
		SNAGGRS4	34.925		2.79	93.95	1.4	0.21	3.41	75'	EL	36.92	0.32	4.88	75'	EL	6.92	0.80	0.21	2.79	75'	EL	36.92	
		SNS5A	35.550		2.73	93.50	1.4	0.21	3.34	75'	EL	36.92	0.32	4.94	75'	EL	6.92	0.80	0.21	2.73	75'	EL	36.92	
		SNS6A	39.950		2.50	96.28	1.4	0.21	3.06	75'	EL	36.92	0.32	4.49	75'	EL	6.92	0.80	0.21	2.50	75'	EL	36.92	
		SNS7B	42.000		2.38	96.60	1.4	0.21	2.91	75'	EL	36.92	0.32	4.41	75'	EL	6.92	0.80	0.21	2.38	75'	EL	36.92	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		3.05	97.02	1.4	0.21	3.73	75'	EL	36.92	0.32	5.39	75'	EL	6.92	0.80	0.21	3.05	75'	EL	36.92	
		TNT4A	33.075		3.06	97.57	1.4	0.21	3.75	75'	EL	36.92	0.32	5.25	75'	EL	6.92	0.80	0.21	3.06	75'	EL	36.92	
		TNT6A	41.600		2.50	100.26	1.4	0.21	3.06	75'	EL	36.92	0.32	4.66	75'	EL	6.92	0.80	0.21	2.50	75'	EL	36.92	
		TNT7A	42.000		2.52	101.64	1.4	0.21	3.08	75'	EL	36.92	0.32	4.60	75'	EL	6.92	0.80	0.21	2.52	75'	EL	36.92	
		TNT7B	42.000		2.60	105.00	1.4	0.21	3.18	75'	EL	36.92	0.32	4.30	75'	EL	6.92	0.80	0.21	2.60	75'	EL	36.92	
		TNAGRIT4	43.000		2.47	102.34	1.4	0.21	3.03	75'	EL	36.92	0.32	4.16	75'	EL	6.92	0.80	0.21	2.47	75'	EL	36.92	
		TNAGT5A	45.000		2.33	101.25	1.4	0.21	2.86	75'	EL	36.92	0.32	4.13	75'	EL	6.92	0.80	0.21	2.33	75'	EL	36.92	
		TNAGT5B	45.000	3	2.31	99.90	1.4	0.21	2.82	75'	EL	36.92	0.32	3.94	75'	EL	6.92	0.80	0.21	2.31	75'	EL	36.92	
EMERGENCY VEHICLE (EV)		EV2	28.750		3.53	97.75	1.3	0.21	4.65	75'	EL	36.92	0.32	6.37	75'	EL	66.92	0.80	0.21	3.53	75'	EL	36.92	
		EV3	43.000	4	2.31	95.89	1.3	0.21	3.05	75'	EL	36.92	0.32	4.24	75'	EL	6.92	0.80	0.21	2.31	75'	EL	36.92	

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γDC	γDW
	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

1
2
3
4

LRFR SUMMARY
FOR SPAN "A"

PROJECT NO. BP13-R015
MADISON COUNTY
STATION: 15+03.00 -L-

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 : OCT 2024

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

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044167 11/20/2024 ELIZABETH F. LAWES
DocuSigned by: Elizabeth F. Lawes 935E64223CD547C...

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

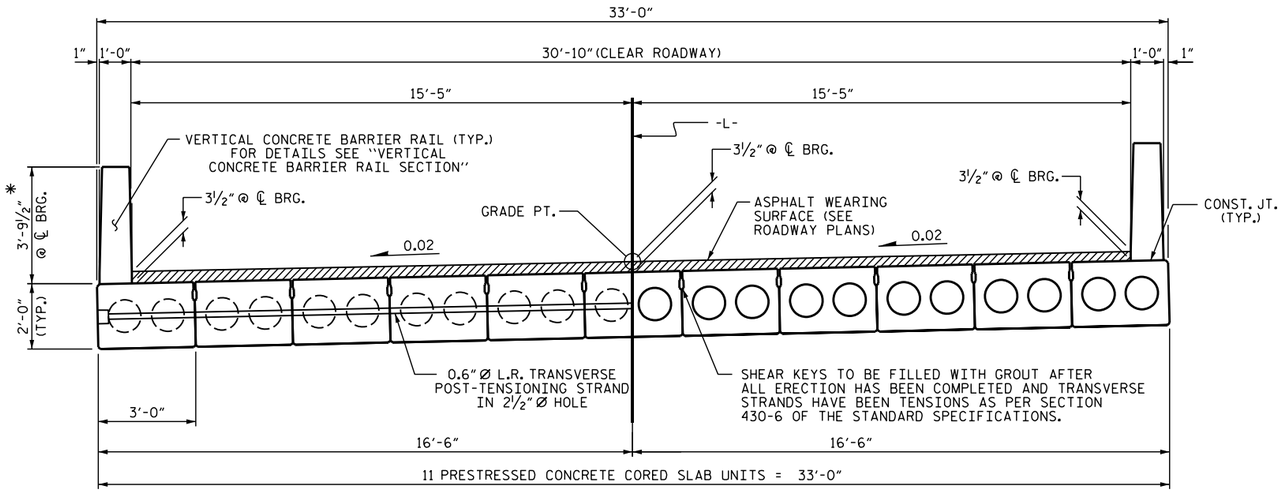
LRFR SUMMARY FOR 75' BOX BEAM UNIT 120° SKEW

(NON-INTERSTATE TRAFFIC)

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NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			19

10/22/2024
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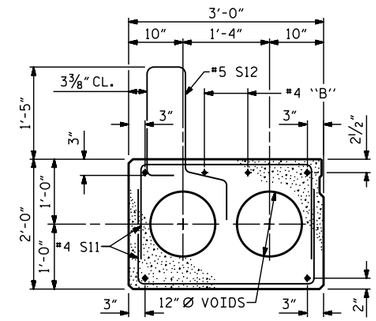


HALF SECTION
AT INTERMEDIATE DIAPHRAGMS

HALF SECTION
THROUGH VOIDS

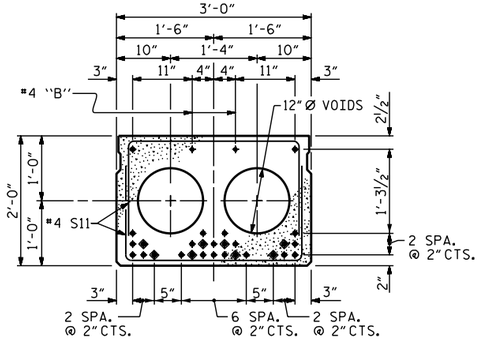
TYPICAL SECTION

* - 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.



EXTERIOR SLAB SECTION

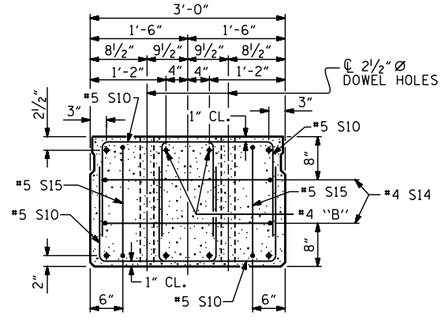
(FOR PRESTRESSED STRAND LAYOUT, SEE INTERIOR SLAB SECTION.)



INTERIOR SLAB SECTION (70' UNIT)

(28 STRANDS REQUIRED)

0.6" Ø LOW RELAXATION STRAND LAYOUT



END ELEVATION

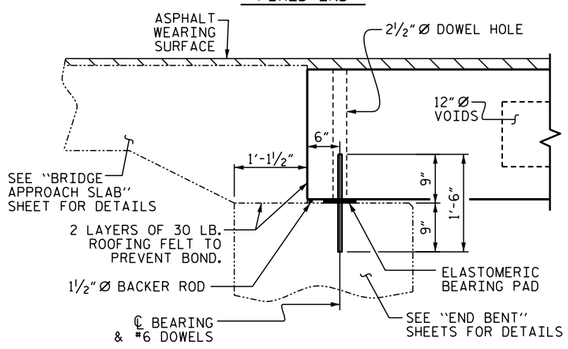
SHOWING PLACEMENT OF DOUBLE STIRRUPS AND LOCATION OF DOWEL HOLES. (STRAND LAYOUT NOT SHOWN.) INTERIOR SLAB UNIT SHOWN-EXTERIOR SLAB UNIT SIMILAR EXCEPT SHEAR KEY LOCATION.

◈ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 12'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

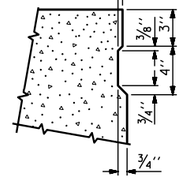
◉ OPTIONAL FULL LENGTH DEBONDED STRANDS. THESE STRANDS ARE NOT REQUIRED. IF THE FABRICATOR CHOOSES TO INCLUDE THESE STRANDS IN THE CORED SLAB UNIT, THE STRANDS SHALL BE DEBONDED FOR THE FULL LENGTH OF THE UNIT AT NO ADDITIONAL COST. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

DEBONDING LEGEND

FIXED END



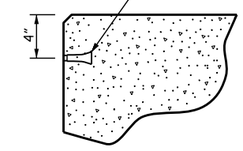
SECTION AT END BENT



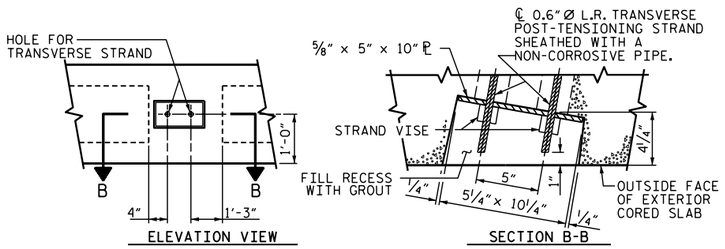
SHEAR KEY DETAIL

NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR CORED SLABS.

PERMITTED THREADED INSERT CAST IN OUTSIDE FACE OF EXTERIOR UNIT AND RECESSED ⅜". SIZE TO BE DETERMINED BY CONTRACTOR.



THREADED INSERT DETAIL



GROUTED RECESS AT END OF POST-TENSIONED STRAND CORED SLABS

PROJECT NO. BP13-R015
MADISON COUNTY
STATION: 15+03.00 -L-
SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

3'-0" X 2'-0" PRESTRESSED CONCRETE CORED SLAB UNIT

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 :	NOV 2024

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

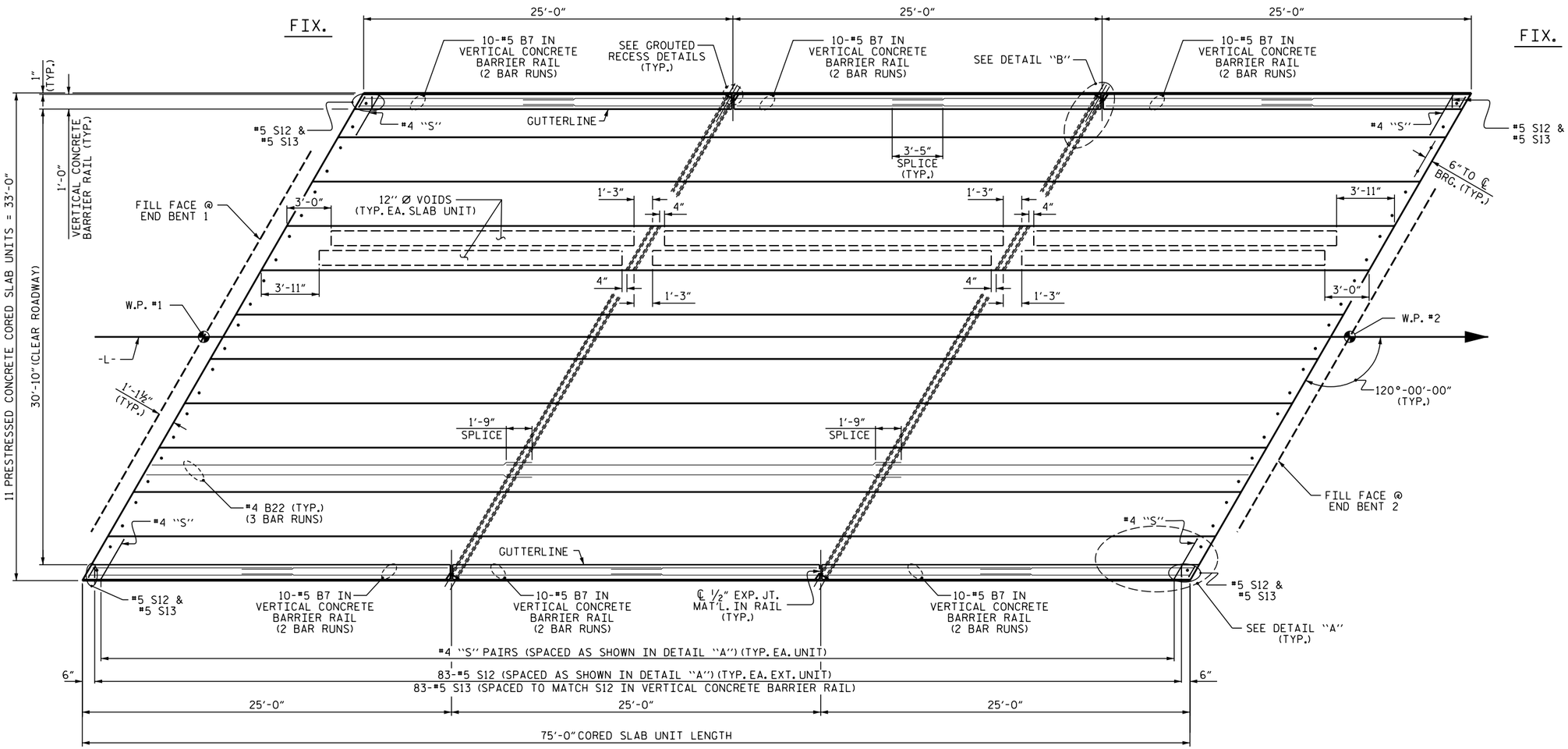
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NORTH CAROLINA PROFESSIONAL SEAL 044167 ENGINEER ELIZABETH F. LAWES
11/7/2024
DocuSigned by: Elizabeth F. Lawes
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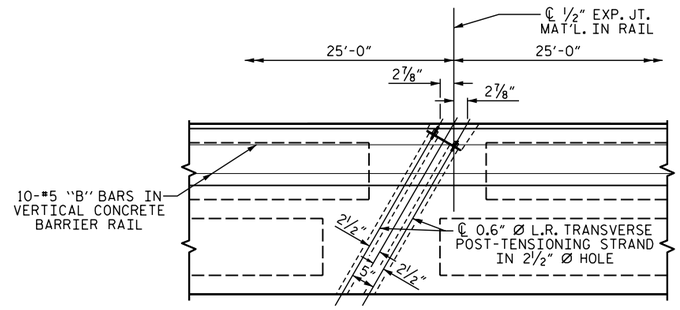
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1			3			TOTAL SHEETS
2			4			19

11/7/2024
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USEL722989

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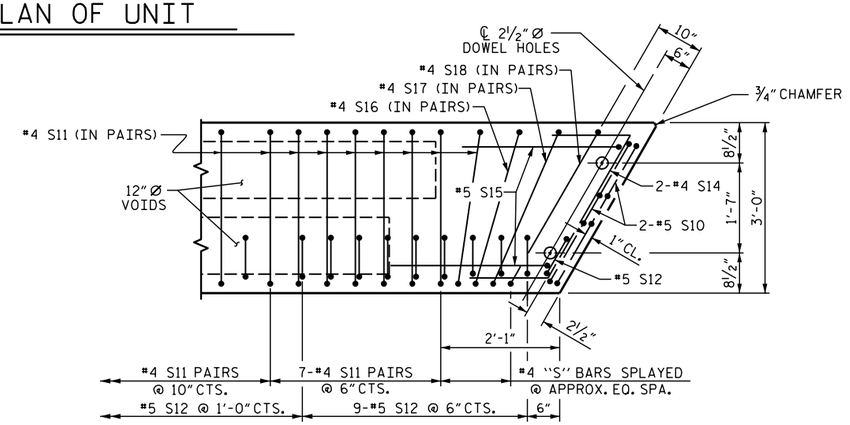


PLAN OF UNIT



DETAIL "B"

#4 S11 BARS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO GROUTED RECESS AND 2½" Ø TRANSVERSE POST-TENSIONING STRAND HOLES



DETAIL "A"

(SIMILAR EACH END OF UNIT)
NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S12 BARS.

PROJECT NO. BP13-R015
MADISON COUNTY
STATION: 15+03.00 -L-
SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PLAN OF 75' UNIT 30'-10" CLEAR ROADWAY 120° SKEW

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 :	NOV 2024

WSP USA Inc.
434 FAYETTEVILLE STREET
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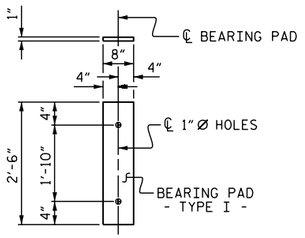
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NORTH CAROLINA PROFESSIONAL SEAL 044167 ENGINEER ELIZABETH F. LAWES
11/7/2024
DocuSigned by: Elizabeth F. Lawes
93E64229CD547C...

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NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			19

11/7/2024
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FIXED END
(TYPE I - 22 REQ'D)

ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL

BAR	BARS PER PAIR OF EXTERIOR UNITS	SIZE	TYPE	LENGTH	WEIGHT
	75' UNIT				
✱ B7	120	#5	STR	14'-6"	1815
✱S13	170	#5	2	7'-2"	1271
✱EPOXY COATED REINFORCING STEEL			LBS.		3086
CLASS AA CONCRETE			CU.YDS.		19.3
TOTAL VERTICAL CONCRETE BARRIER RAIL			LN. FT.		150.0

DEAD LOAD DEFLECTION AND CAMBER

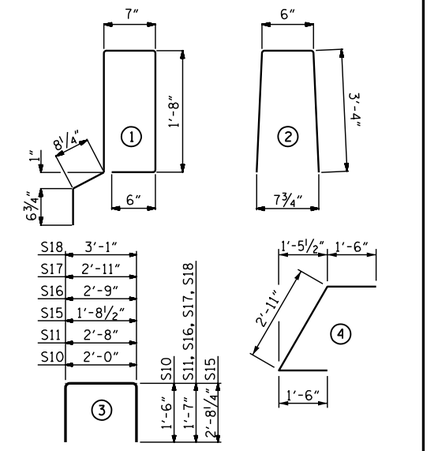
	3'-0" x 2'-0"
75' CORED SLAB UNIT	0.6" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	2⅛" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD✱✱	⅞" ↓
FINAL CAMBER	1¼" ↑

✱✱ INCLUDES FUTURE WEARING SURFACE

CORED SLABS REQUIRED

	NUMBER	LENGTH	TOTAL LENGTH
75' UNIT			
EXTERIOR C.S.	2	75'-0"	150'-0"
INTERIOR C.S.	9	75'-0"	675'-0"
TOTAL	11	75'-0"	825'-0"

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT

	ASPHALT OVERLAY THICKNESS @ MID-SPAN	RAIL HEIGHT @ MID-SPAN
75' UNITS	2 3/16"	3'-8 3/16"

GRADE 270 STRANDS

	0.6" Ø L.R.
AREA (SQUARE INCHES)	0.217
ULTIMATE STRENGTH (LBS. PER STRAND)	58,600
APPLIED PRESTRESS (LBS. PER STRAND)	43,950

BILL OF MATERIAL FOR ONE 75' CORED SLAB UNIT

				EXTERIOR UNIT		INTERIOR UNIT	
BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT
B22	6	#4	STR	26'-1"	105	26'-1"	105
S10	8	#5	3	5'-0"	42	5'-0"	42
S11	182	#4	3	5'-10"	709	5'-10"	709
✱S12	85	#5	1	5'-8"	502		
S14	4	#4	4	5'-11"	16	5'-11"	16
S15	4	#5	3	7'-1"	30	7'-1"	30
S16	4	#4	3	5'-11"	16	5'-11"	16
S17	4	#4	3	6'-1"	16	6'-1"	16
S18	4	#4	3	6'-3"	17	6'-3"	17
REINFORCING STEEL			LBS.		951		951
✱EPOXY COATED REINFORCING STEEL			LBS.		502		
7000 P.S.I. CONCRETE			CU. YDS.		12.0		12.0
0.6" Ø L.R. STRANDS			No.		28		28

CONCRETE RELEASE STRENGTH

UNIT	PSI
75' UNITS	5500

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 CORED SLAB SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE CORED SLABS.

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

THE 2½" Ø DOWEL HOLES AT FIXED ENDS OF SLAB SECTIONS SHALL BE FILLED WITH NON-SHRINK GROUT.

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

WHEN CORED SLABS ARE CAST, AN INTERNAL HOLD-DOWN SYSTEM SHALL BE EMPLOYED TO PREVENT VOIDS FROM RISING OR MOVING SIDEWAYS. AT LEAST SIX WEEKS PRIOR TO CASTING CORED SLABS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR REVIEW AND COMMENT, DETAILED DRAWINGS OF THE PROPOSED HOLD-DOWN SYSTEM. IN ADDITION TO STRUCTURAL DETAILS, LOCATION AND SPACING OF THE HOLD-DOWNS SHALL BE INDICATED.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE CORED SLAB UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN THE REQUIRED STRENGTH SHOWN IN THE "CONCRETE RELEASE STRENGTH" TABLE.

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

PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE CORED SLAB UNIT ENDS.

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS.

GROOVED CONTRACTION JOINTS, ½" 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 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.

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

MAINTAIN A SYMMETRIC TENSION FORCE BETWEEN EACH PAIR OF TRANSVERSE POST TENSIONING STRANDS IN THE DIAPHRAGM.

THE #4 S11 STIRRUPS MAY BE SHIFTED AS NECESSARY TO MAINTAIN 1" CLEAR TO THE GROUTED RECESS.

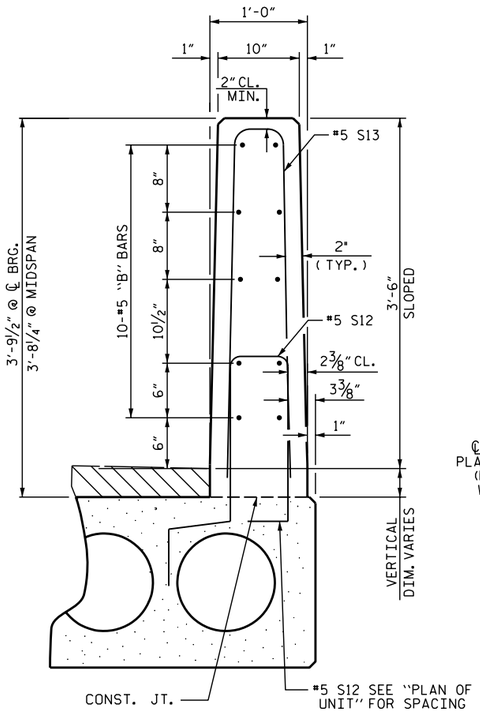
FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

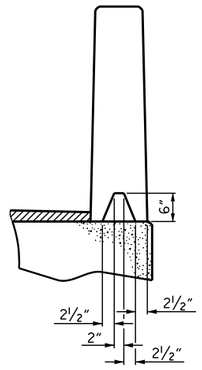
THE PERMITTED THREADED INSERTS IN THE EXTERIOR UNITS SHALL BE SIZED BY THE CONTRACTOR, SPACED AT 4'-0" CENTERS AND GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS. STAINLESS STEEL THREADED INSERTS MAY BE USED AS AN ALTERNATE.

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

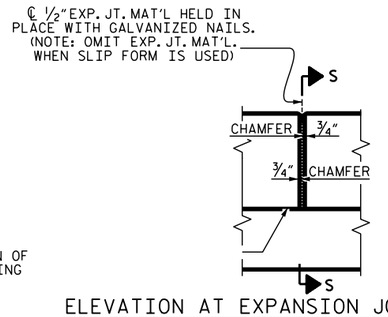
THE COST OF THE PERMITTED THREADED INSERTS SHALL BE INCLUDED IN THE PRICE BID FOR THE PRECAST UNITS.



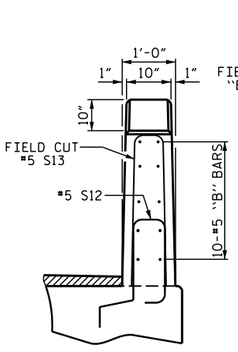
SECTION THRU RAIL



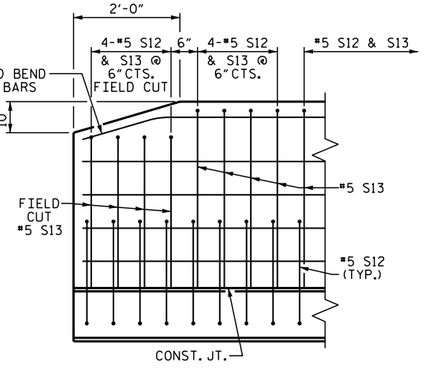
SECTION S-S
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)



ELEVATION AT EXPANSION JOINTS



END VIEW



SIDE VIEW

VERTICAL CONCRETE BARRIER RAIL DETAILS

END OF RAIL DETAILS

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 : NOV 2024

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

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11/7/2024
DocuSigned by: Elizabeth F. Lawes
935E64223CD547C...

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MADISON COUNTY
STATION: 15+03.00 -L-
SHEET 3 OF 3

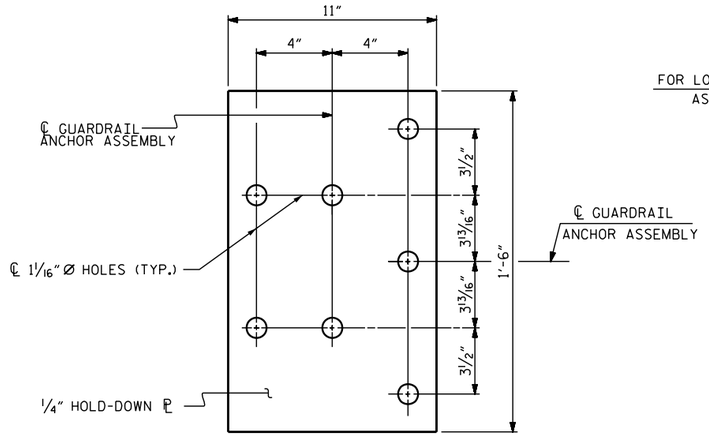
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DEPARTMENT OF TRANSPORTATION
RALEIGH

3'-0" X 2'-0" PRESTRESSED CONCRETE CORED SLAB UNIT

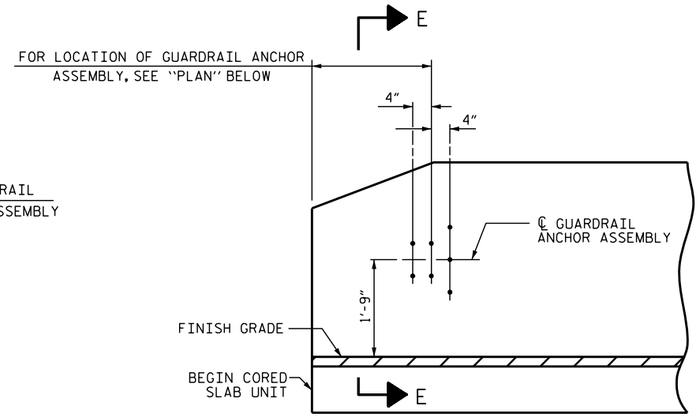
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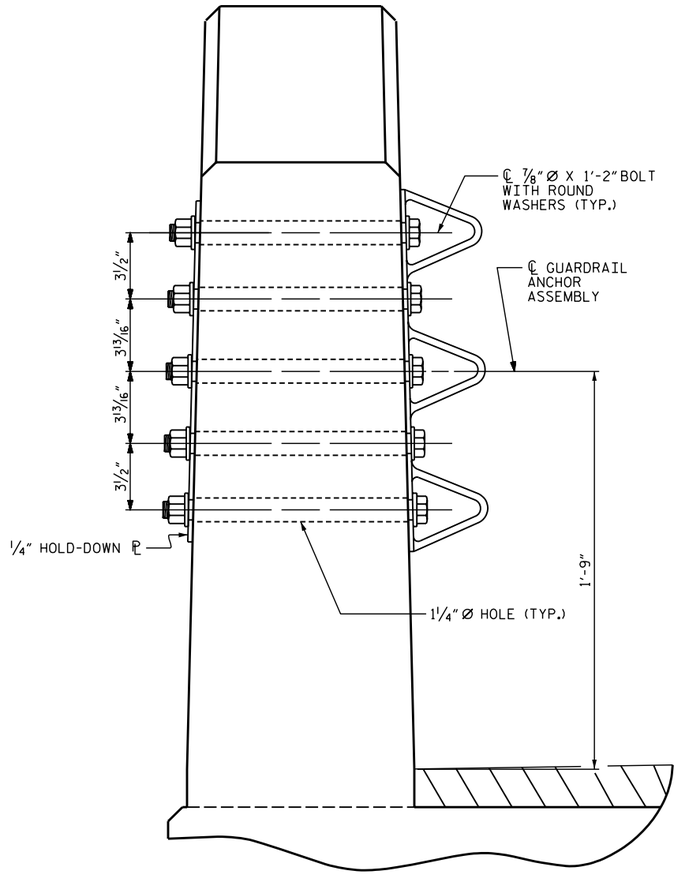
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PLAN

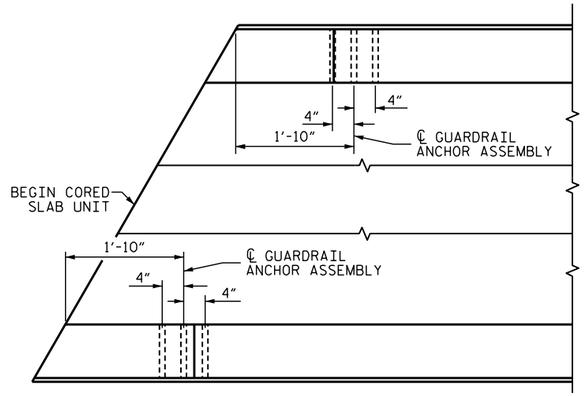


ELEVATION



SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

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

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD DOWN PLATE AND 7 - 7/8" 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 7/8" 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.)

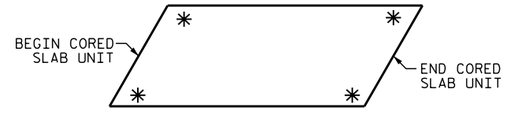
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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.



SKETCH SHOWING POINTS OF ATTACHMENT

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. BP13-R015

MADISON COUNTY

STATION: 15+03.00 -L-

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 :	NOV 2024

DRAWN BY :	MAA 5/10
CHECKED BY :	GM 5/10

REV.	1/15	MAA/TMG
REV.	12/17	MAA/THC
REV.	5/18	MAA/THC

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RALEIGH

STANDARD
GUARDRAIL ANCHORAGE DETAILS FOR VERTICAL CONCRETE BARRIER RAIL

REVISIONS						SHEET NO.
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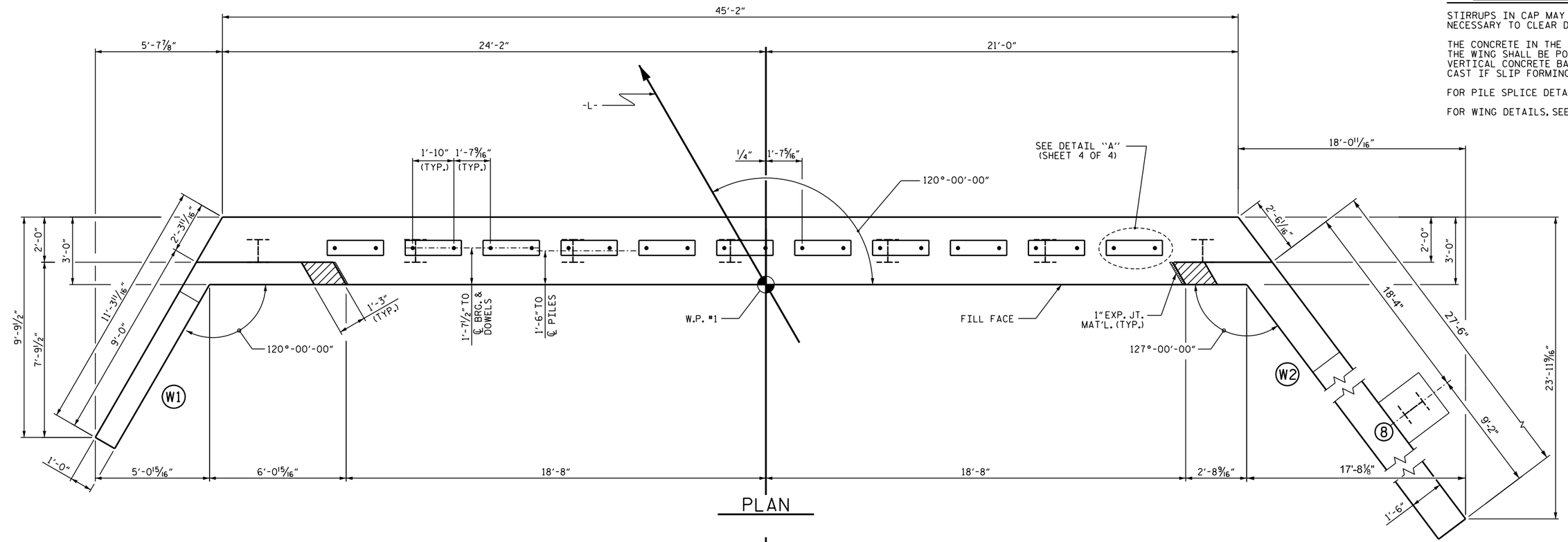
NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

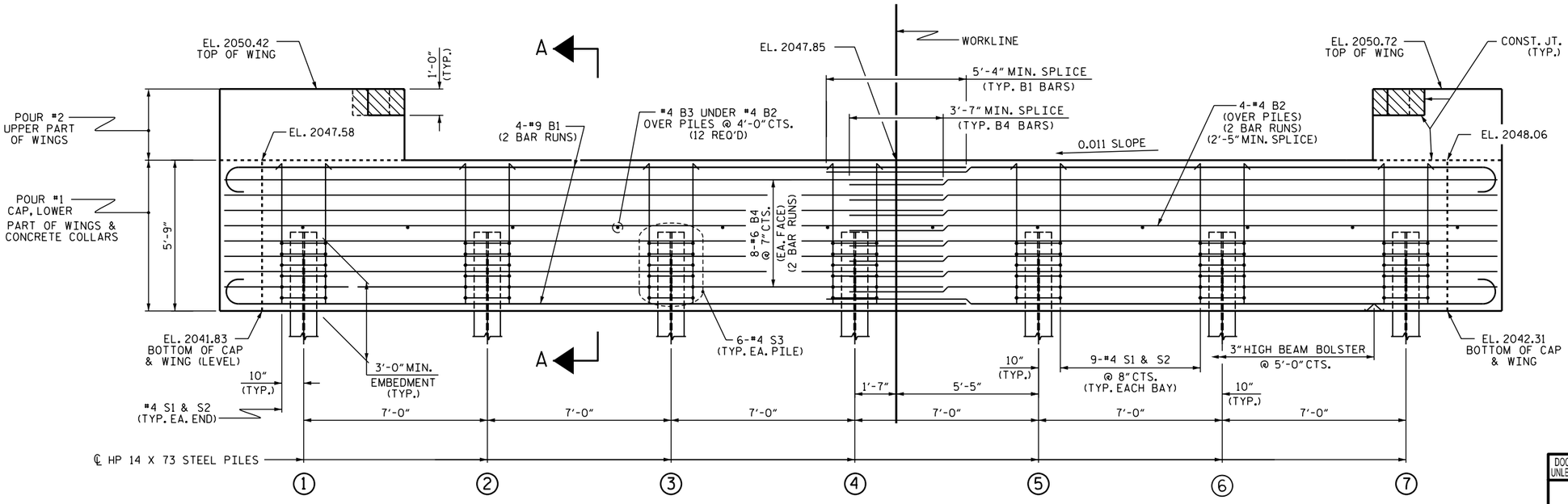
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEETS 2 & 3 OF 4.



PLAN



ELEVATION

WINGS NOT SHOWN FOR CLARITY.
FOR SECTION A-A, SEE SHEET 4 OF 4.
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.

TOP OF PILE ELEVATIONS

1	2044.86	5	2045.15
2	2044.93	6	2045.22
3	2045.00	7	2045.30
4	2045.08	8	2044.31

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MADISON COUNTY
STATION: 15+03.00 -L-
SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 1

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

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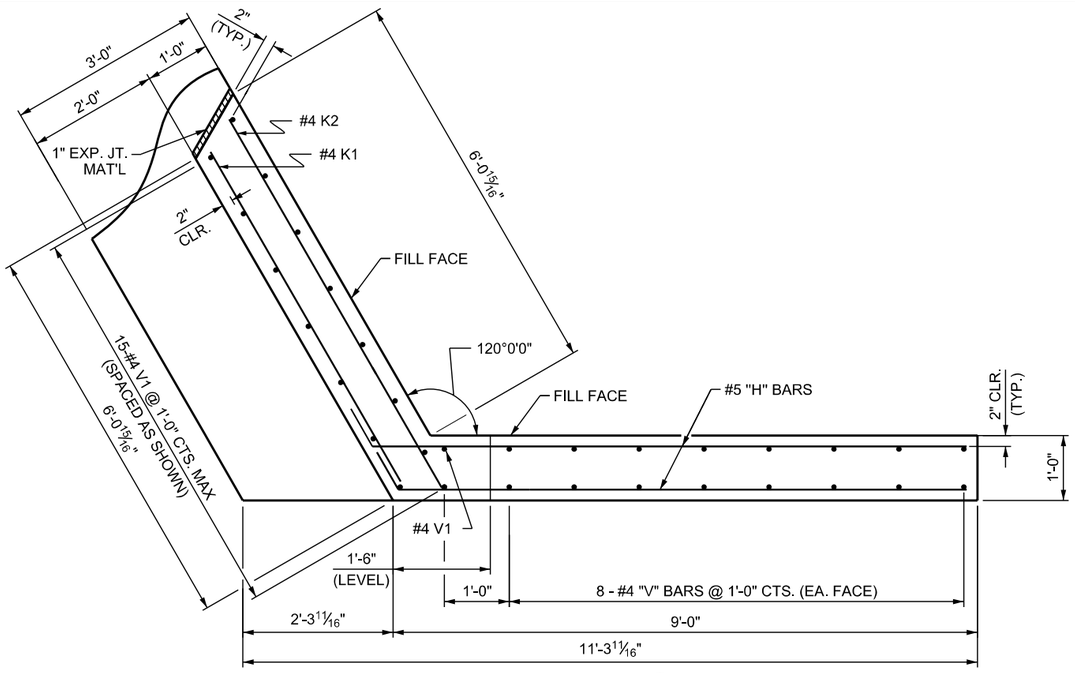
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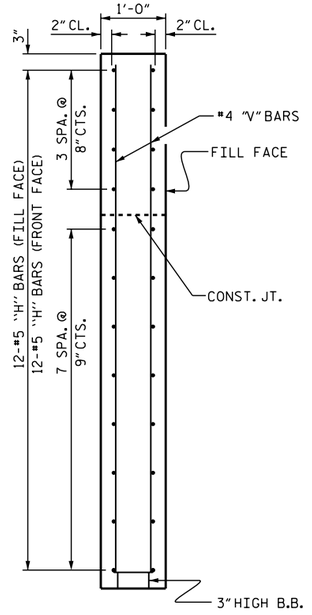
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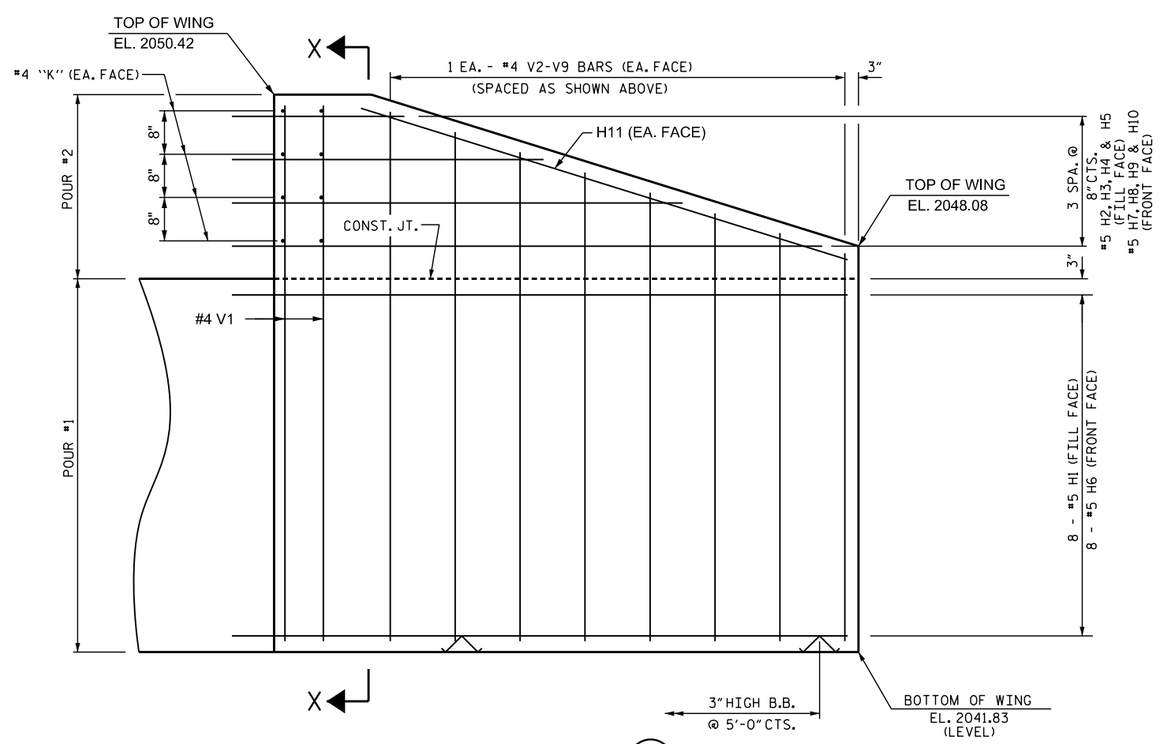
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PLAN OF WING (W1)



SECTION X-X



ELEVATION OF WING (W1)

WING DETAILS

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MADISON COUNTY

STATION: 15+03.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
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RALEIGH

SUBSTRUCTURE
END BENT No. 1
WING DETAILS (1 OF 2)

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

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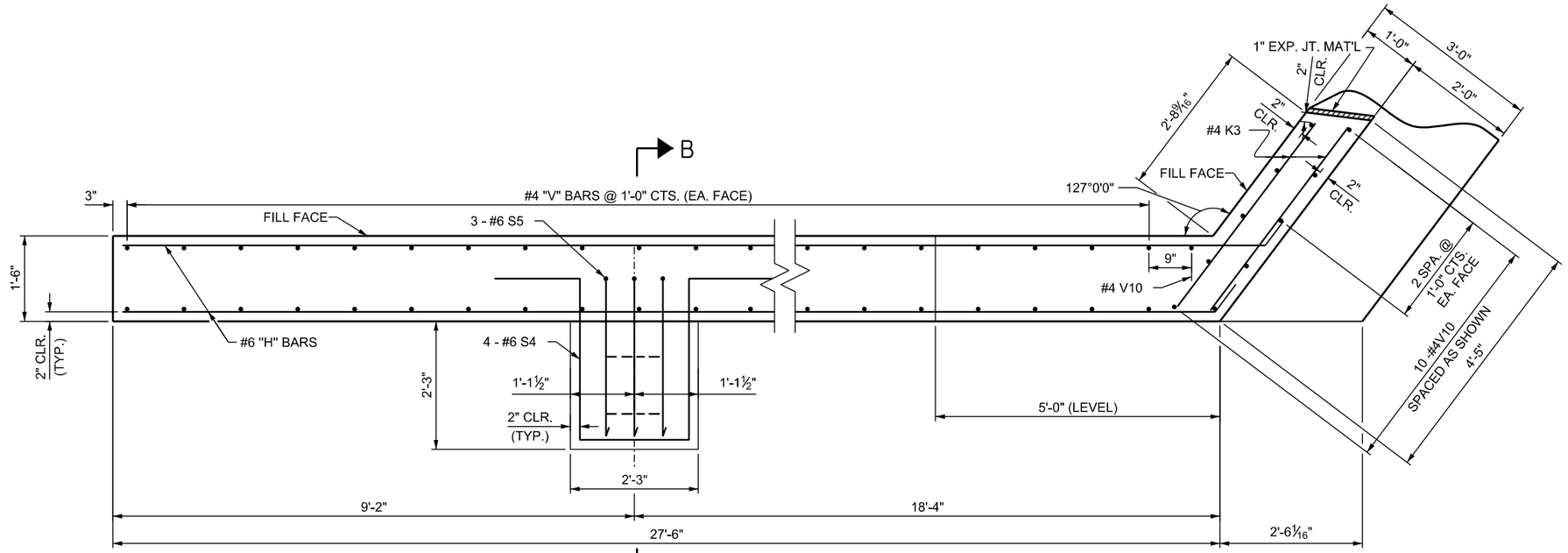
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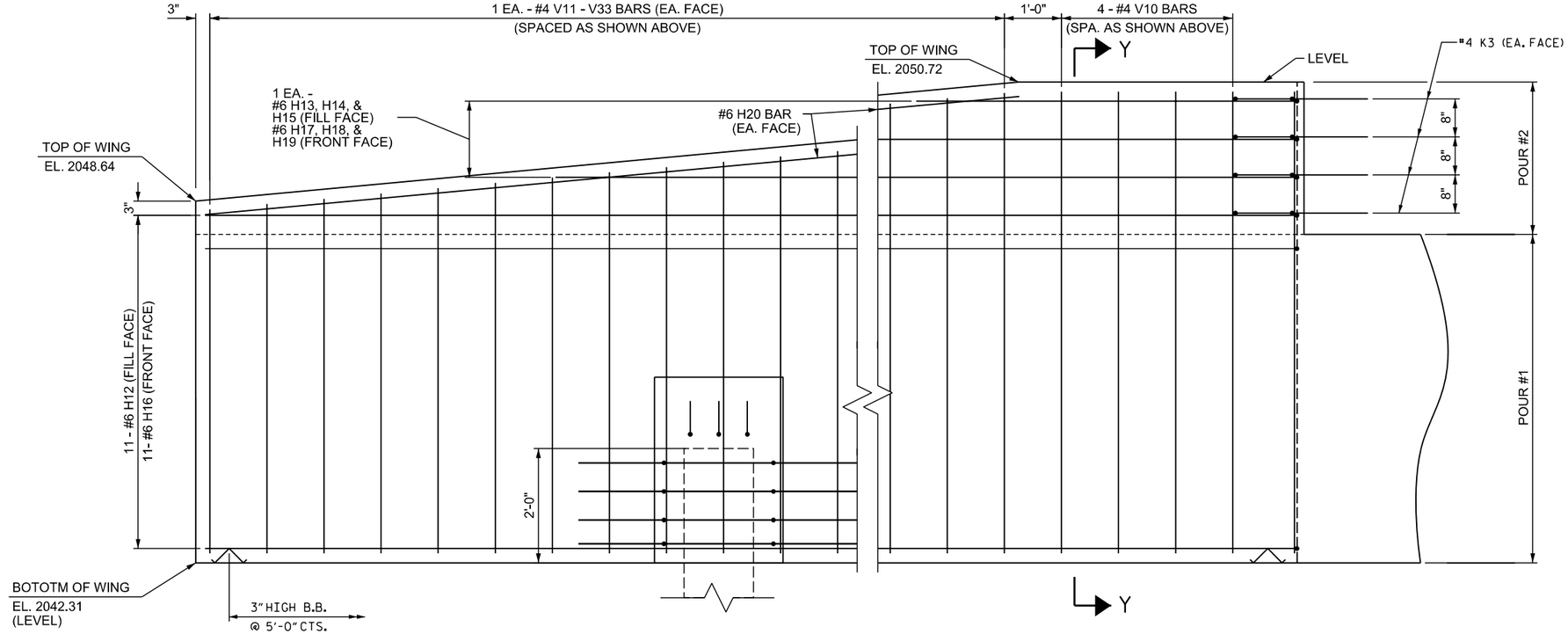
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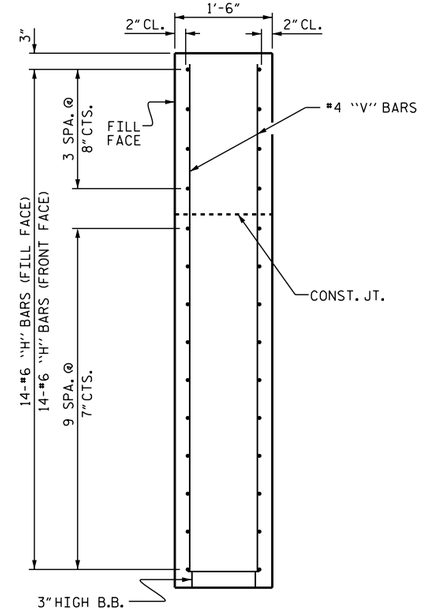


PLAN OF WING (W2)

FOR SECTION B-B, SEE SHEET 4 OF 4.



ELEVATION OF WING (W2)



SECTION Y-Y

WING DETAILS

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DRAWN BY:	J. WHEATLEY	DATE :	JAN 2024
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DESIGN ENGINEER OF RECORD:	E. LAWES	DATE :	NOV 2024

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MADISON COUNTY
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SHEET 3 OF 4

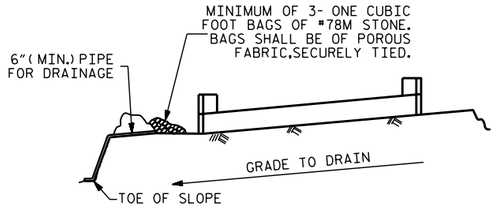
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SUBSTRUCTURE
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WING DETAILS (2 OF 2)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			19

11/7/2024
\\USRAL100CIFS01\Jobs\I88360C - 2015 W Divisions Planning & Design On-Call\I188360 Division 13 Bridges\Management\R015\STR\Madison 98\2.0 Drafting\DGNs\401_023_BP13_R015_SMU_EB103.dgn
USEL722989

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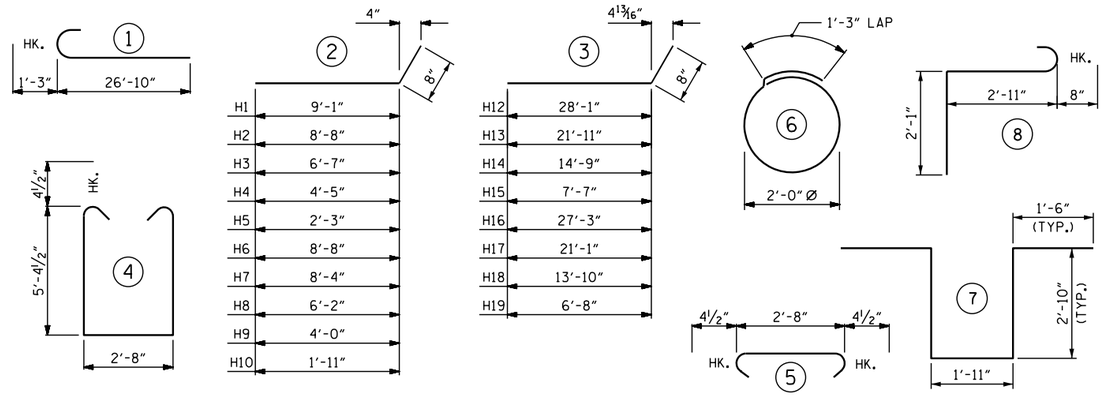
BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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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

BAR TYPES



H1	9'-1"
H2	8'-8"
H3	6'-7"
H4	4'-5"
H5	2'-3"
H6	8'-8"
H7	8'-4"
H8	6'-2"
H9	4'-0"
H10	1'-11"
H12	28'-1"
H13	21'-11"
H14	14'-9"
H15	7'-7"
H16	27'-3"
H17	21'-1"
H18	13'-10"
H19	6'-8"

ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	16	#9	1	28'-1"	1528	S1	56	#4	4	14'-2"	530
B2	8	#4	STR	25'-0"	134	S2	56	#4	5	3'-5"	128
B3	12	#4	STR	2'-8"	21	S3	42	#4	6	7'-7"	213
B4	32	#6	STR	26'-1"	1254	S4	4	#6	7	10'-7"	64
						S5	3	#6	8	5'-8"	26
D1	22	#6	STR	1'-6"	50						
						V1	16	#4	STR	8'-3"	88
H1	8	#5	2	9'-9"	81	V2	2	#4	STR	8'-1"	11
H2	1	#5	2	9'-4"	10	V3	2	#4	STR	7'-10"	10
H3	1	#5	2	7'-3"	8	V4	2	#4	STR	7'-6"	10
H4	1	#5	2	5'-1"	5	V5	2	#4	STR	7'-2"	10
H5	1	#5	2	2'-11"	3	V6	2	#4	STR	6'-10"	9
H6	8	#5	2	9'-4"	78	V7	2	#4	STR	6'-7"	9
H7	1	#5	2	9'-0"	9	V8	2	#4	STR	6'-3"	8
H8	1	#5	2	6'-10"	7	V9	2	#4	STR	5'-11"	8
H9	1	#5	2	4'-8"	5	V10	19	#4	STR	8'-0"	102
H10	1	#5	2	2'-7"	3	V11	2	#4	STR	8'-0"	11
H11	2	#5	STR	7'-10"	16	V12	2	#4	STR	7'-11"	11
H12	11	#6	3	28'-9"	475	V13	2	#4	STR	7'-10"	10
H13	1	#6	3	22'-7"	34	V14	2	#4	STR	7'-9"	10
H14	1	#6	3	15'-5"	23	V15	2	#4	STR	7'-8"	10
H15	1	#6	3	8'-3"	12	V16	2	#4	STR	7'-7"	10
H16	11	#6	3	27'-11"	461	V17	2	#4	STR	7'-6"	10
H17	1	#6	3	21'-9"	33	V18	2	#4	STR	7'-4"	10
H18	1	#6	3	14'-6"	22	V19	2	#4	STR	7'-3"	10
H19	1	#6	3	7'-4"	11	V20	2	#4	STR	7'-2"	10
H20	2	#6	STR	22'-5"	67	V21	2	#4	STR	7'-1"	9
						V22	2	#4	STR	7'-0"	9
K1	4	#4	STR	5'-10"	16	V23	2	#4	STR	6'-11"	9
K2	4	#4	STR	6'-6"	17	V24	2	#4	STR	6'-10"	9
K3	8	#4	STR	4'-0"	21	V25	2	#4	STR	6'-9"	9
						V26	2	#4	STR	6'-8"	9
						V27	2	#4	STR	6'-6"	9
						V28	2	#4	STR	6'-5"	9
						V29	2	#4	STR	6'-4"	8
						V30	2	#4	STR	6'-3"	8
						V31	2	#4	STR	6'-2"	8
						V32	2	#4	STR	6'-1"	8
						V33	2	#4	STR	6'-0"	8

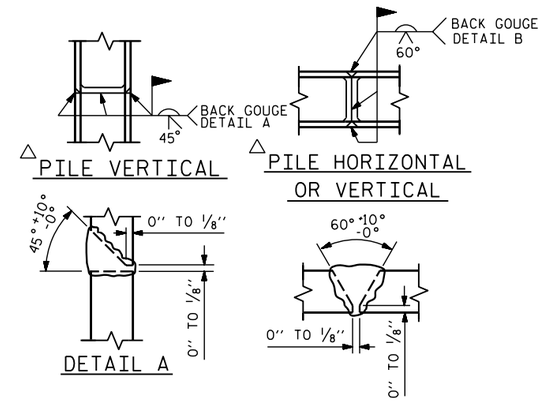
REINFORCING STEEL 5844 LBS.

CLASS A CONCRETE BREAKDOWN

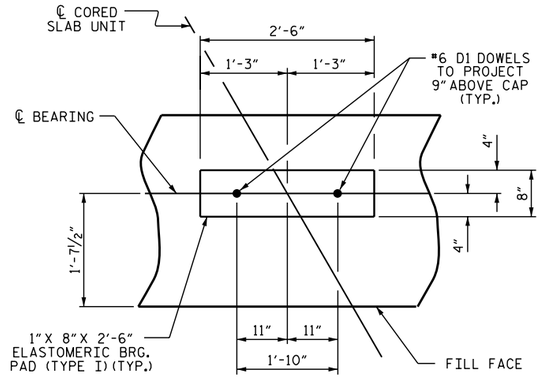
POUR #1 CAP, LOWER PART OF WINGS & COLLARS 42.7 C.Y.

POUR #2 UPPER PART OF WINGS 4.5 C.Y.

TOTAL CLASS A CONCRETE 47.2 C.Y.

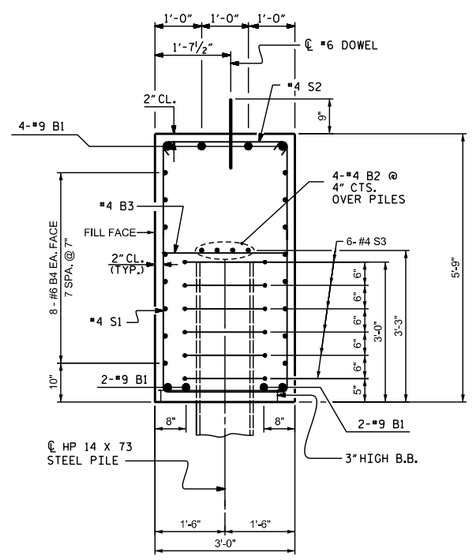


△ POSITION OF PILE DURING WELDING.



DETAIL "A"

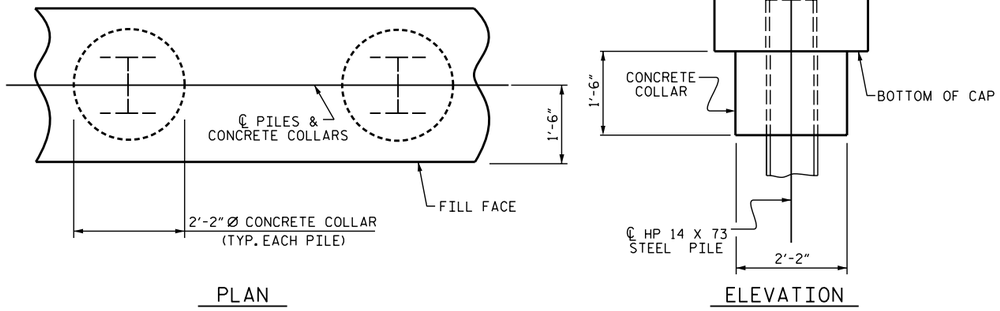
(END BENT No. 1 SHOWN, END BENT No. 2 SIMILAR BY ROTATION)



SECTION A-A

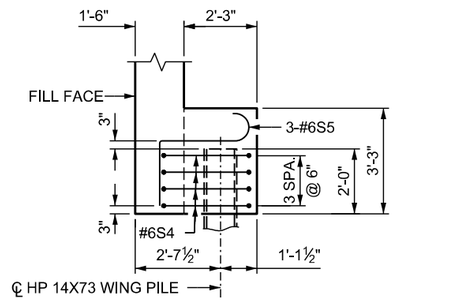
(CONCRETE COLLAR NOT SHOWN FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL.")

PILE SPLICE DETAILS



CORROSION PROTECTION FOR STEEL PILES DETAIL

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



SECTION B-B

(CONCRETE COLLAR NOT SHOWN FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL.")

PROJECT NO. BP13-R015

MADISON COUNTY

STATION: 15+03.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 1 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			19

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044167 11/7/2024 ELIZABETH F. LAWES

DocuSigned by: Elizabeth F. Lawes 935E64223CD547C...

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 :	NOV 2024

11/7/2024
\\USRAG100CIFS01\Jobs\188360C - 2015 W Divisions Planning & Design On-Call\I188360 Division 13 Bridges\Management\R015\STR\Madison 98\2.0 Drafting\DGNs\401_025_BP13_R015_SMU_EB104.dgn
USEL722989

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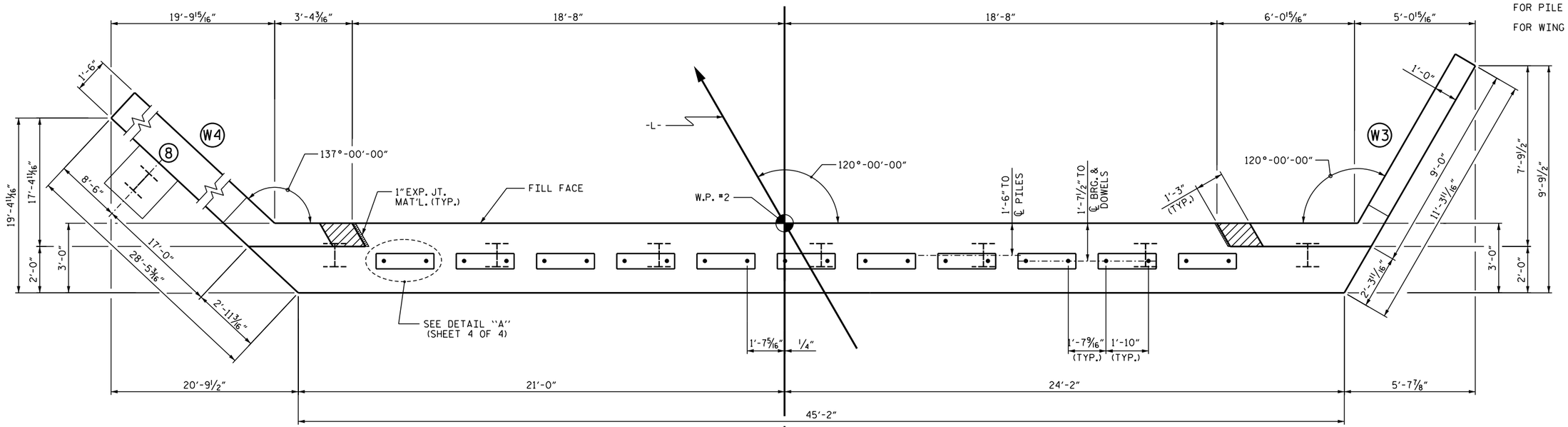
NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

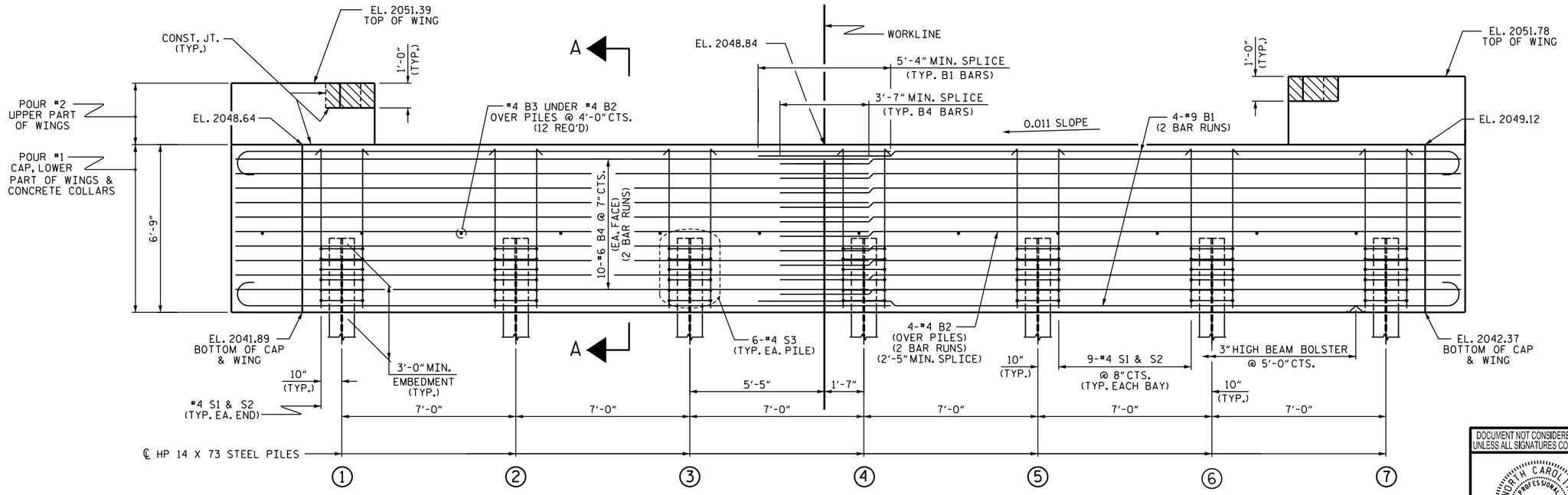
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEETS 2 & 3 OF 4.



PLAN



ELEVATION

WINGS NOT SHOWN FOR CLARITY.
FOR SECTION A-A, SEE SHEET 4 OF 4.
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.

TOP OF PILE ELEVATIONS

1	2044.91
2	2044.99
3	2045.06
4	2045.13
5	2045.21
6	2045.28
7	2045.36
8	2043.89

PROJECT NO. BP13-R015
MADISON COUNTY
STATION: 15+03.00 -L-
SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 2

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: NOV 2024

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

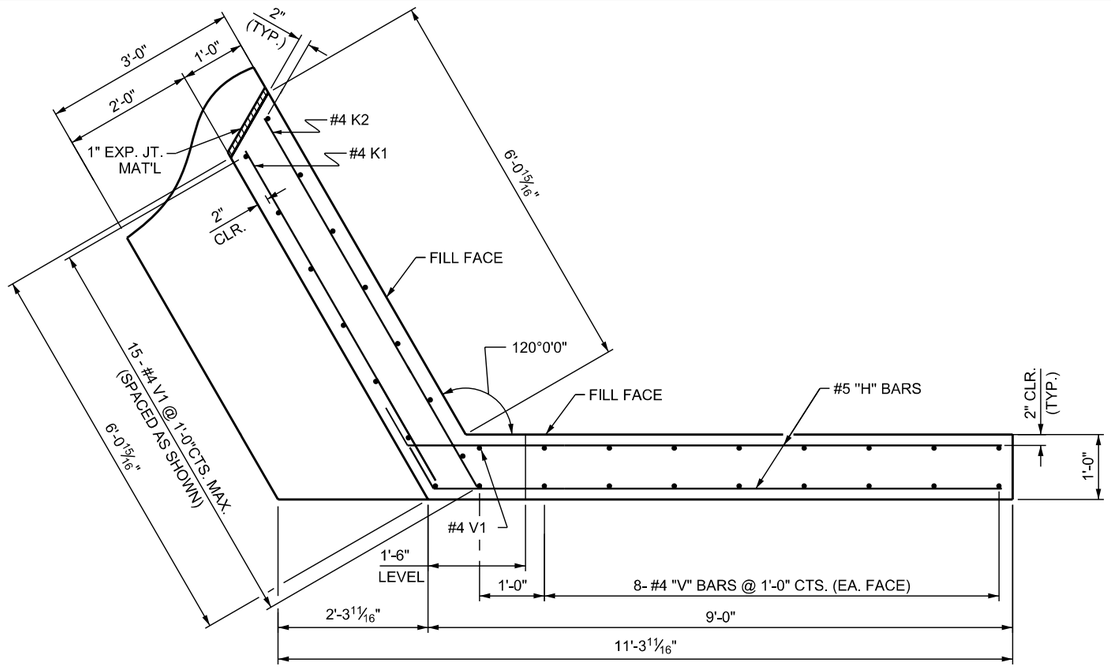
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NORTH CAROLINA PROFESSIONAL SEAL 044167 ENGINEER ELIZABETH F. LAWES
11/7/2024
DocuSigned by: Elizabeth F. Lawes
936E64223CD547C...

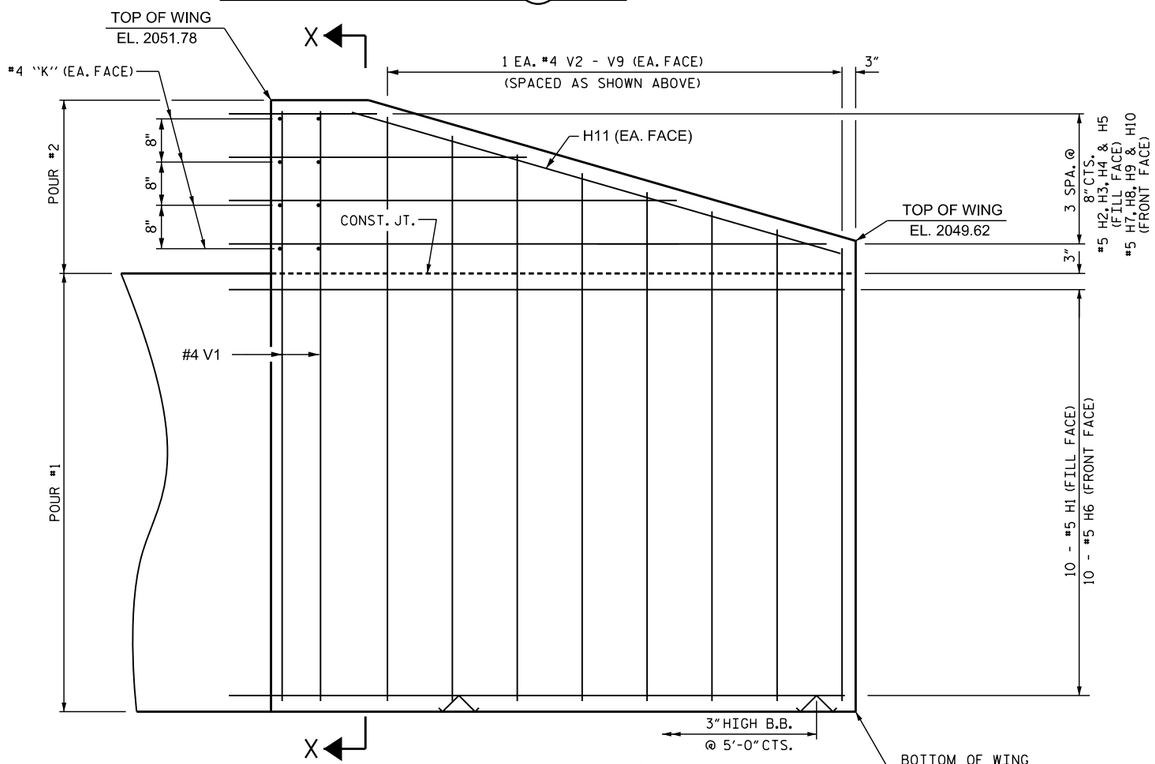
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			19

11/7/2024
\\USRALQDOCIFS01\Jobs\I88360C - 2015 W Divisions Planning & Design On-Call\I188360 Division 13 Bridges\Management\R015\STR\Madison 98\2.0 Drafting\DGNs\401_027_BP13_R015_SMU_EB201.dgn
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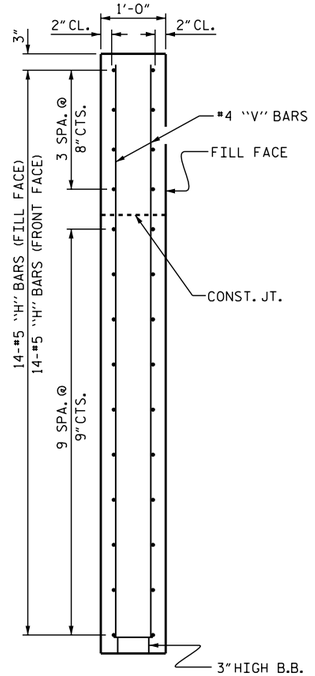
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PLAN OF WING (W3)



ELEVATION OF WING (W3)



SECTION X-X

WING DETAILS

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 :	NOV 2024

11/7/2024
\\USRAG100CIFS01\Jobs\188360C - 2015 W Divisions Planning & Design On-Call\I188360 Division 13 Bridges\Management\R015\STR\Madison 98\2.0 Drafting\DGNs\401_029_BP13_R015_SMU_EB202.dgn
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434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040

LICENSE NO. F-0165

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NORTH CAROLINA PROFESSIONAL SEAL 044167 ENGINEER ELIZABETH F. LAWES
DocuSigned by: Elizabeth F. Lawes 935E64223CD547C...

PROJECT NO. BP13-R015
MADISON COUNTY
STATION: 15+03.00 -L-
SHEET 2 OF 4

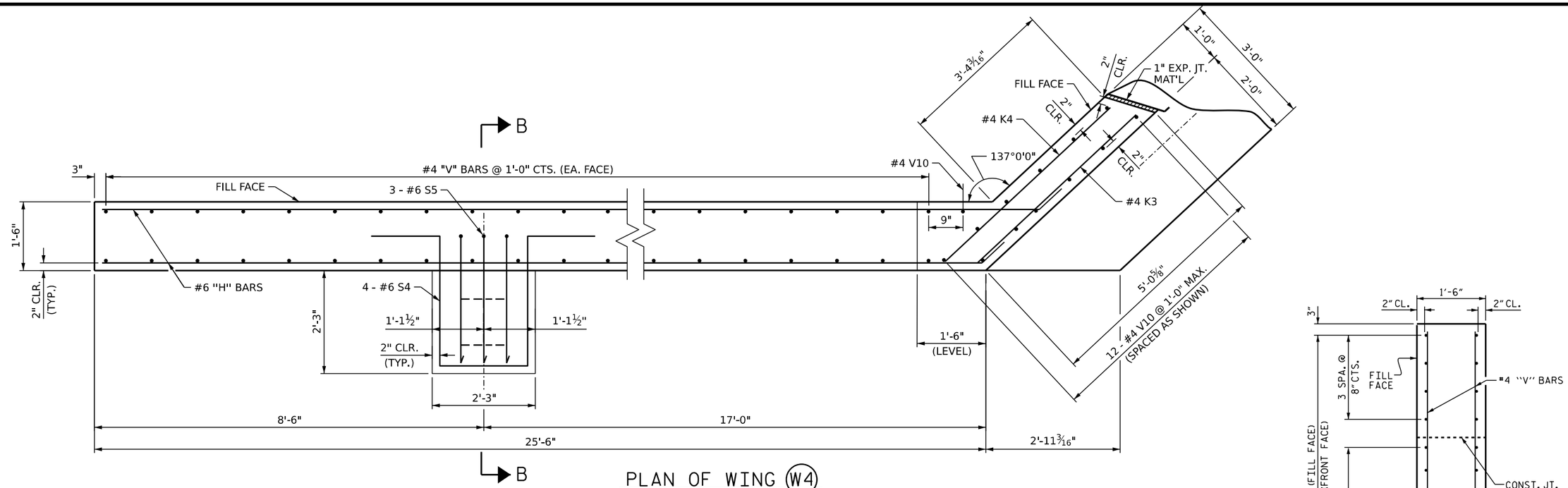
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 2
WING DETAILS (1 OF 2)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			19

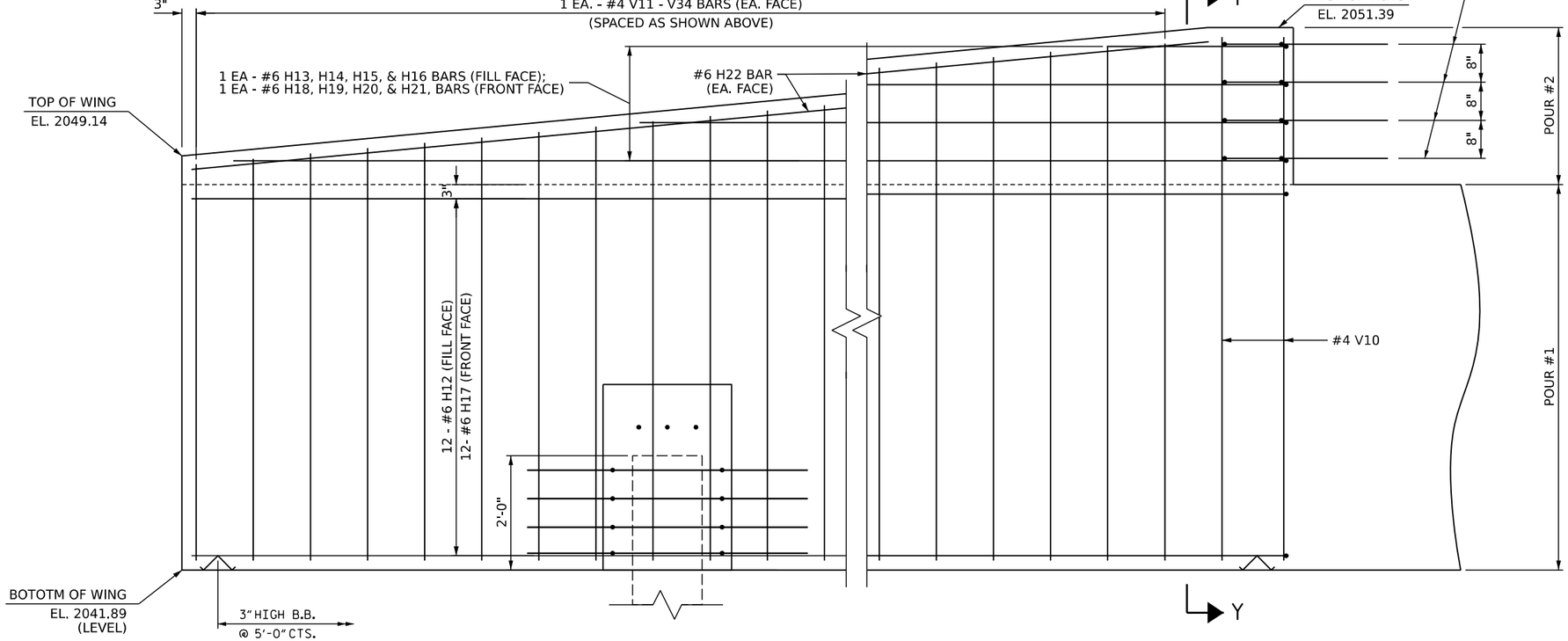
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8/26/21

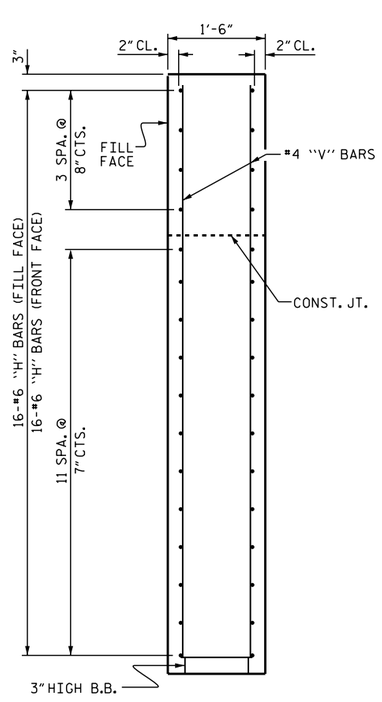


PLAN OF WING (W4)

FOR SECTION B-B, SEE SHEET 4 OF 4



ELEVATION OF WING (W4)



SECTION Y-Y

WING DETAILS

PROJECT NO. **BP13-R015**

MADISON COUNTY

STATION: **15+03.00 -L-**

SHEET 3 OF 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 :	JAN 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

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044167 11/20/2024 ELIZABETH F. LAWES

DocuSigned by: Elizabeth F. Lawes 935E64223CD547C...

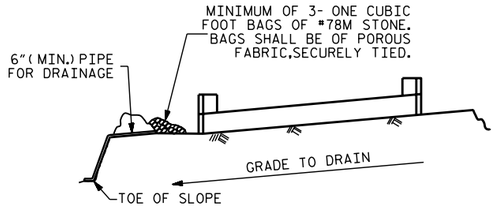
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 2
WING DETAILS (2 OF 2)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			19

10/22/2024
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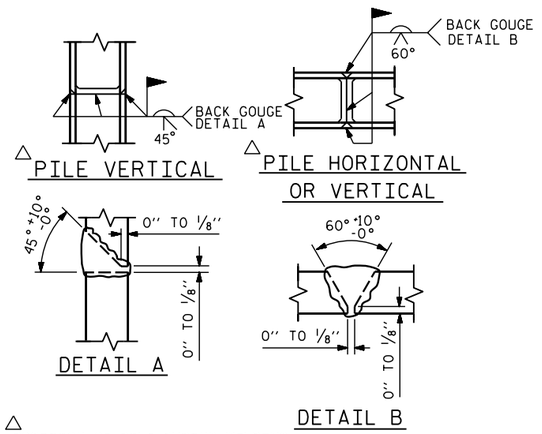


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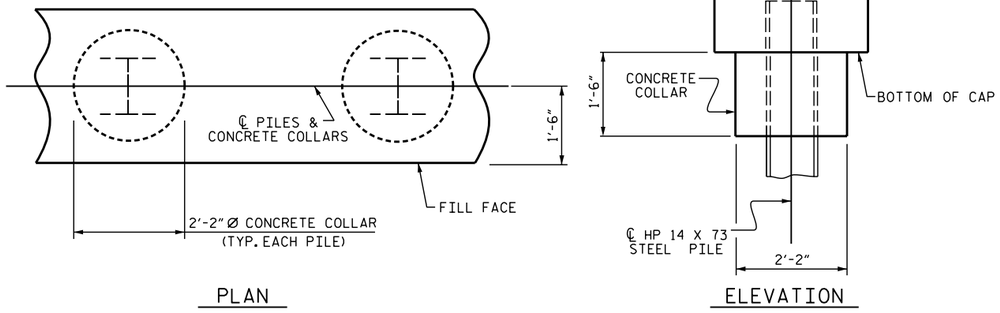
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



△ POSITION OF PILE DURING WELDING.

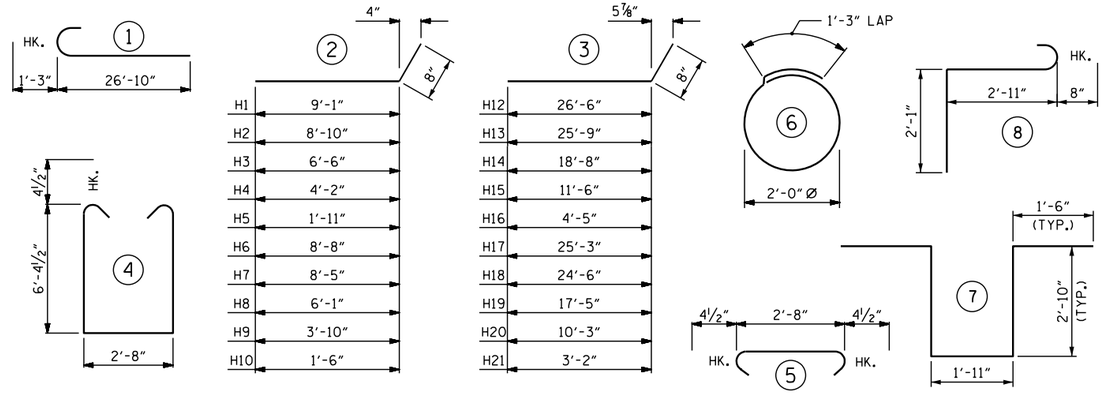
PILE SPLICE DETAILS



CORROSION PROTECTION FOR STEEL PILES DETAIL

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

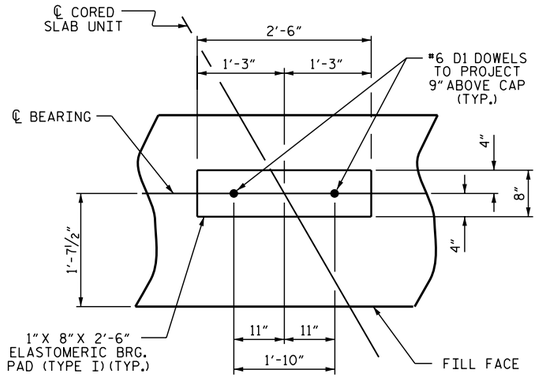
BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	16	#9	1	28'-7"	1553	S1	56	#4	4	16'-2"	605
B2	8	#4	STR	25'-3"	135	S2	56	#4	5	3'-5"	128
B3	12	#4	STR	2'-8"	21	S3	42	#4	6	7'-7"	213
B4	40	#6	STR	26'-6"	1592	S4	4	#6	7	10'-7"	64
						S5	3	#6	8	5'-8"	26
D1	22	#6	STR	1'-6"	50						
						V1	16	#4	STR	9'-1"	97
H1	10	#5	2	9'-9"	102	V2	2	#4	STR	8'-11"	12
H2	1	#5	2	9'-6"	10	V3	2	#4	STR	8'-8"	12
H3	1	#5	2	7'-2"	7	V4	2	#4	STR	8'-5"	11
H4	1	#5	2	4'-10"	5	V5	2	#4	STR	8'-1"	11
H5	1	#5	2	2'-7"	3	V6	2	#4	STR	7'-10"	10
H6	10	#5	2	9'-4"	97	V7	2	#4	STR	7'-6"	10
H7	1	#5	2	9'-1"	9	V8	2	#4	STR	7'-3"	10
H8	1	#5	2	6'-9"	7	V9	2	#4	STR	6'-11"	9
H9	1	#5	2	4'-6"	5	V10	15	#4	STR	9'-2"	92
H10	1	#5	2	2'-2"	2	V11	2	#4	STR	9'-1"	12
H11	2	#5	STR	7'-10"	16	V12	2	#4	STR	9'-0"	12
H12	12	#6	3	27'-2"	490	V13	2	#4	STR	8'-10"	12
H13	1	#6	3	26'-5"	40	V14	2	#4	STR	8'-9"	12
H14	1	#6	3	19'-4"	29	V15	2	#4	STR	8'-8"	12
H15	1	#6	3	12'-2"	18	V16	2	#4	STR	8'-7"	11
H16	1	#6	3	5'-1"	8	V17	2	#4	STR	8'-6"	11
H17	12	#6	3	25'-11"	467	V18	2	#4	STR	8'-5"	11
H18	1	#6	3	25'-2"	38	V19	2	#4	STR	8'-4"	11
H19	1	#6	3	18'-1"	27	V20	2	#4	STR	8'-3"	11
H20	1	#6	3	10'-11"	16	V21	2	#4	STR	8'-1"	11
H21	1	#6	3	3'-10"	6	V22	2	#4	STR	8'-0"	11
H22	2	#6	STR	23'-11"	36	V23	2	#4	STR	7'-11"	11
						V24	2	#4	STR	7'-10"	10
K1	4	#4	STR	5'-11"	16	V25	2	#4	STR	7'-9"	10
K2	4	#4	STR	6'-7"	18	V26	2	#4	STR	7'-8"	10
K3	4	#4	STR	4'-8"	12	V27	2	#4	STR	7'-7"	10
K4	4	#4	STR	5'-0"	13	V28	2	#4	STR	7'-6"	10
						V29	2	#4	STR	7'-4"	10
						V30	2	#4	STR	7'-3"	10
						V31	2	#4	STR	7'-2"	10
						V32	2	#4	STR	7'-1"	9
						V33	2	#4	STR	7'-0"	9
						V34	2	#4	STR	6'-11"	9

REINFORCING STEEL 6413 LBS.

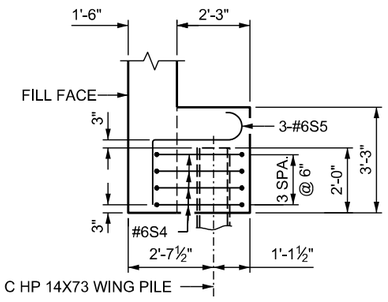
CLASS A CONCRETE BREAKDOWN

POUR #1	CAP, LOWER PART OF WINGS & COLLARS	49.3 C.Y.
POUR #2	UPPER PART OF WINGS	4.1 C.Y.
TOTAL CLASS A CONCRETE		53.4 C.Y.



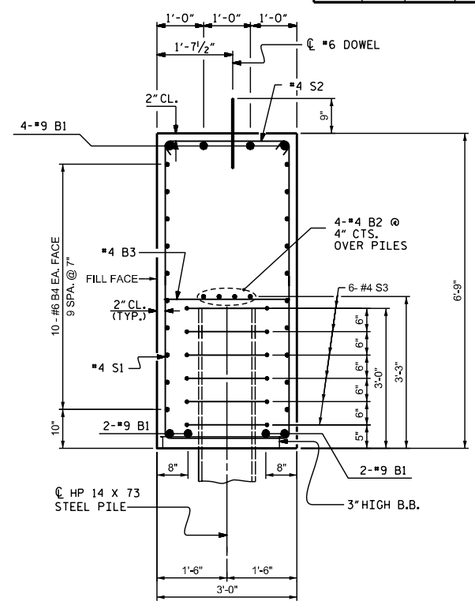
DETAIL "A"

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



SECTION B-B

(CONCRETE COLLAR NOT SHOWN FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL.")



SECTION A-A

(CONCRETE COLLAR NOT SHOWN FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL.")

PROJECT NO. BP13-R015

MADISON COUNTY

STATION: 15+03.00 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 2 DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			19

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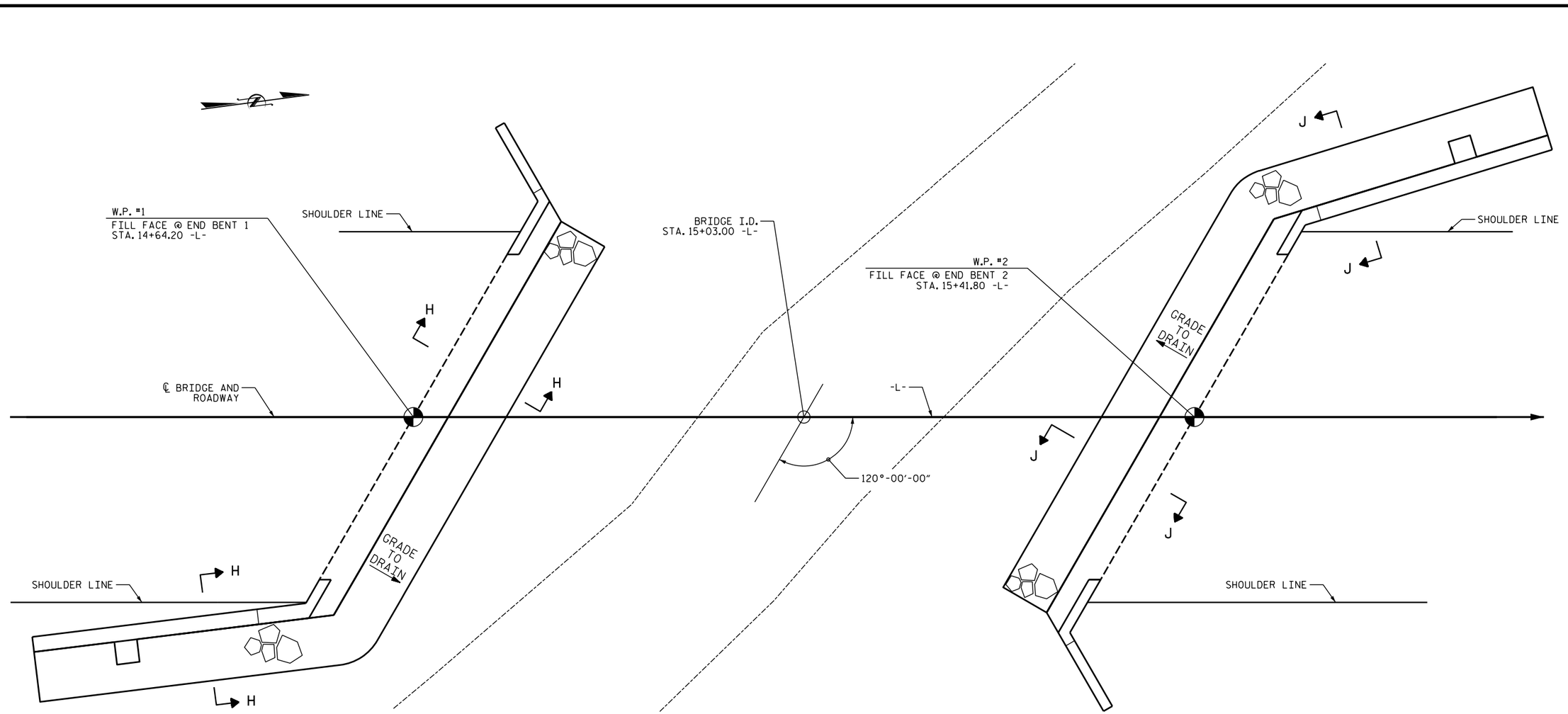
NORTH CAROLINA PROFESSIONAL SEAL 044167 ENGINEER ELIZABETH F. LAWES
11/7/2024
DocuSigned by: Elizabeth F. Lawes
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WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

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 :	NOV 2024

11/7/2024
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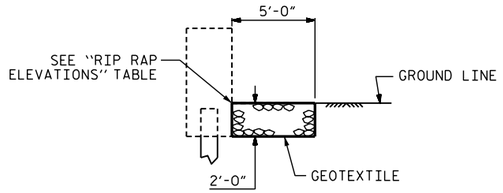


END BENT 1

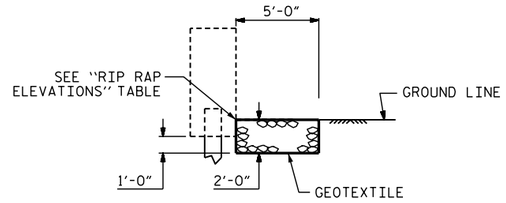
END BENT 2

PLAN

ESTIMATED QUANTITIES		
BRIDGE @ STA. 15+03.00 -L-	RIP RAP CLASS I (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	39	43
END BENT 2	38	42



SECTION H-H



SECTION J-J

RIP RAP ELEVATIONS		
	LEFT	RIGHT
END BENT 1	2043.83	2044.31
END BENT 2	2042.89	2043.37

PROJECT NO. BP13-R015

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STATE OF NORTH CAROLINA
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RALEIGH

RIP RAP DETAILS

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044167 11/7/2024 ELIZABETH F. LAWES

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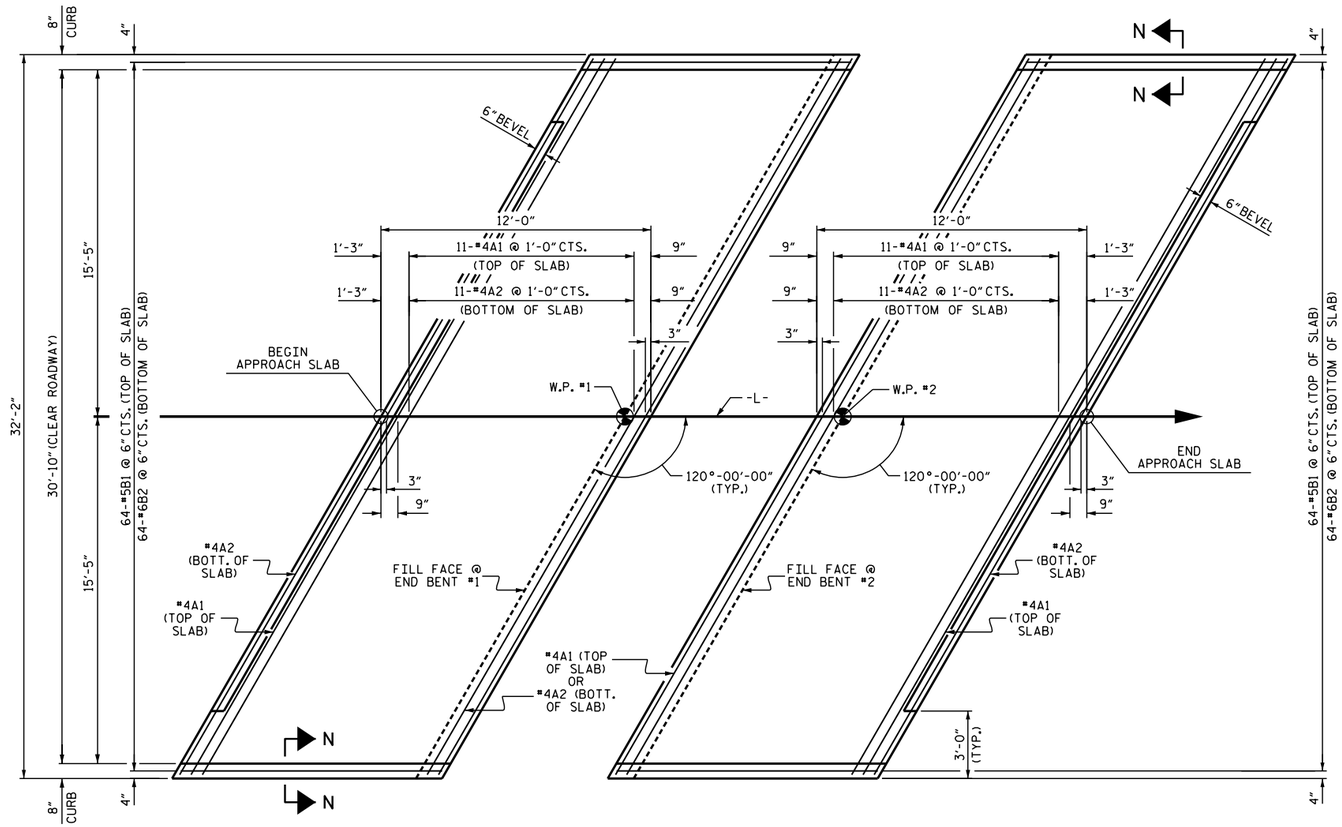
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11/7/2024
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PLAN @ END BENT #1

PLAN @ END BENT #2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS

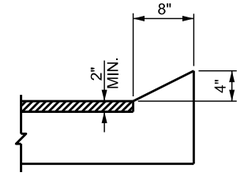
NOTES

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.

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



SECTION N-N

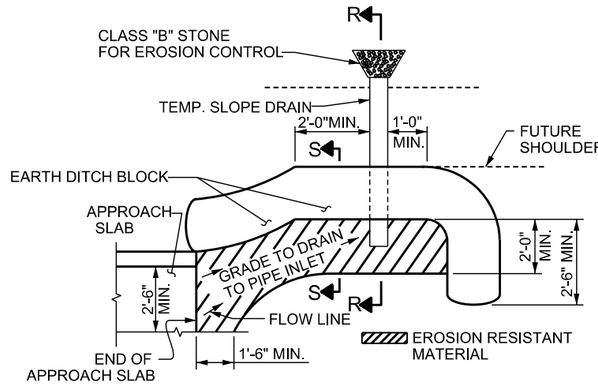
BILL OF MATERIAL

APPROACH SLAB AT EB #1

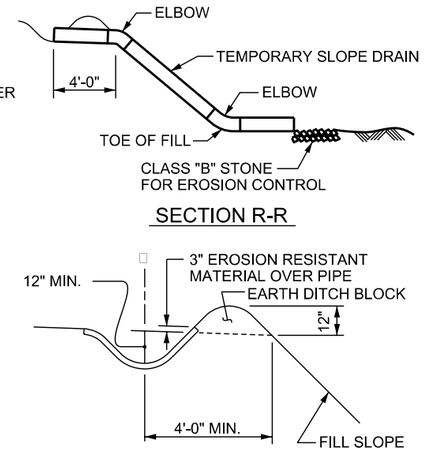
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	13	#4	STR	36'-8"	318
A2	13	#4	STR	36'-8"	318
* B1	64	#5	STR	11'-1"	740
B2	64	#6	STR	11'-7"	1113
REINFORCING STEEL				LBS.	1431
* EPOXY COATED REINFORCING STEEL				LBS.	1058
CLASS AA CONCRETE				C.Y.	19.8

APPROACH SLAB AT EB #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	13	#4	STR	36'-8"	318
A2	13	#4	STR	36'-8"	318
* B1	64	#5	STR	11'-1"	740
B2	64	#6	STR	11'-7"	1113
REINFORCING STEEL				LBS.	1431
* EPOXY COATED REINFORCING STEEL				LBS.	1058
CLASS AA CONCRETE				C.Y.	19.8

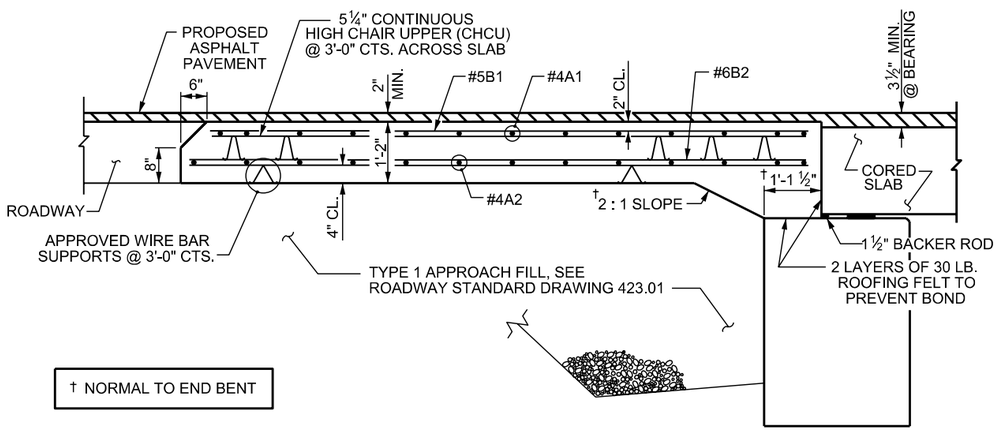


NOTE:
IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN. 2" DEPTH, 2) EROSION CONTROL MAT, OR 3) CONCRETE, AS DIRECTED BY THE ENGINEER. THE SLOPE DRAIN SHALL CONSIST OF A NON-PERFORATED TEMPORARY DRAINAGE PIPE, 12 INCHES IN DIAMETER.



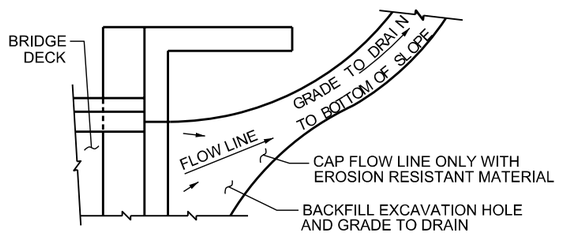
SECTION R-R

SECTION S-S



† NORMAL TO END BENT

SECTION THRU SLAB



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

PLAN VIEW

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

PROJECT NO. BP13-R015

MADISON COUNTY

STATION: 15+03.00 -L-

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NORTH CAROLINA PROFESSIONAL SEAL 044167 ENGINEER ELIZABETH F. LAWES 11/7/2024

DocuSigned by: Elizabeth F. Lawes

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR PRESTRESSED CONCRETE CORED SLAB UNIT

(SUB-REGIONAL TIER)

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8/26/21

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 ½" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A ¼" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A ¼" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST $\frac{5}{16}$" 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 $\frac{1}{16}$" 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. FINS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

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