

09/28/25

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ROWAN COUNTY

**LOCATION: REPLACE BRIDGE #108 ON SR 1004
(STOKES FERRY RD) OVER TUCKERTOWN RESERVOIR**
TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE

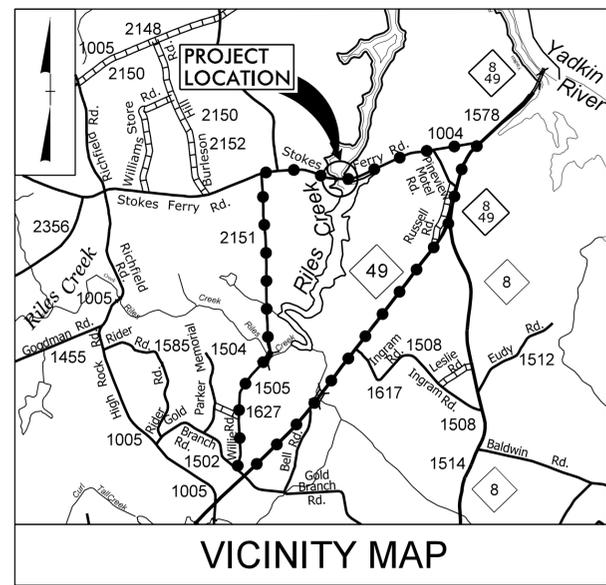
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP9-R012	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
BP9.R012.1	N/A	PE	
BP9.R012.2	N/A	RW & UTILITIES	
BP9.R012.3	N/A	CONSTRUCTION	



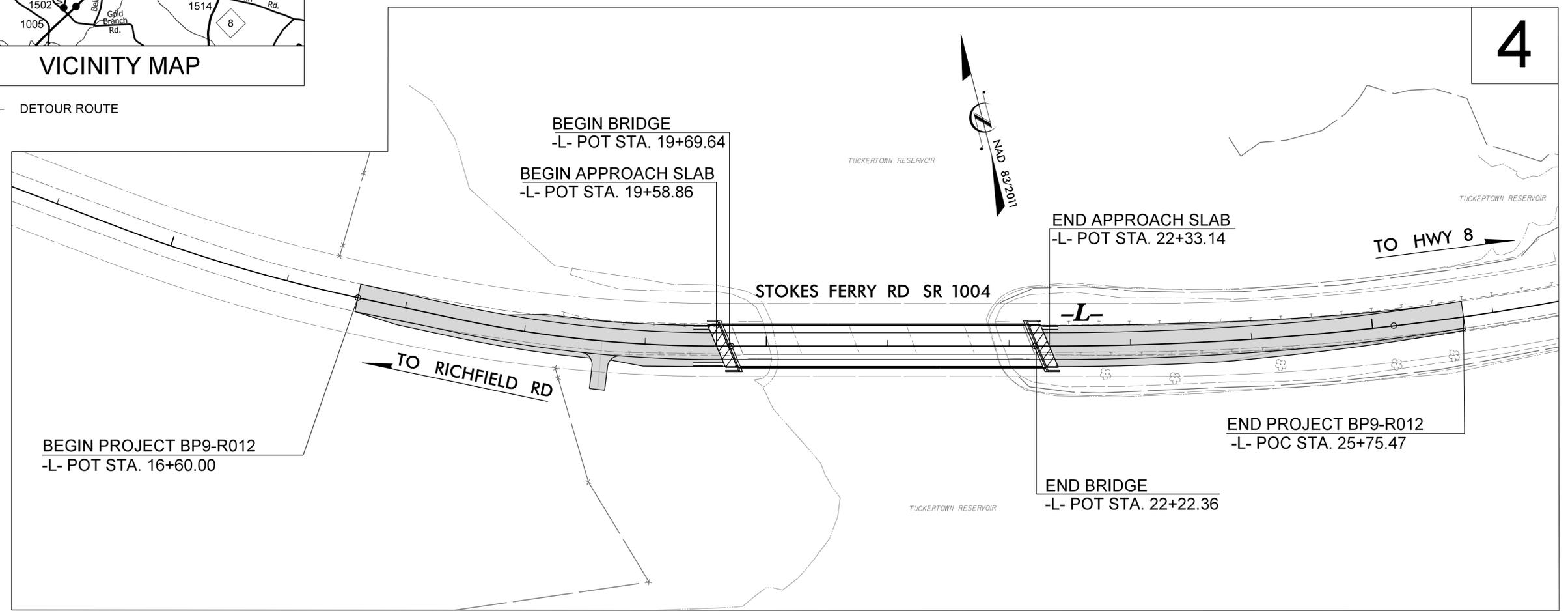
WBS: BP9-R012

CONTRACT: DI00371

See Sheet 1A For Index of Sheets (Not Included)
See Sheet 1B For Symbology Sheet

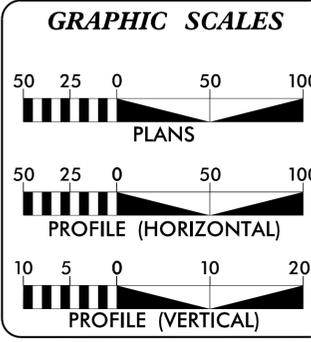


●-●-●- DETOUR ROUTE



4

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DESIGN DATA

ADT 2025 =	1400
ADT 2045 =	3200
V =	60 MPH
K =	10%
D =	60%
TTST =	1%
DUALS =	3%

* SUB-REGIONAL TIER GUIDELINES
FUNC CLASS = MAJOR COLLECTOR
STATUTORY SPEED LIMIT 55 MPH

PROJECT LENGTH

LENGTH ROADWAY PROJECT BP9-R012	=	0.125 MI
LENGTH STRUCTURE PROJECT BP9-R012	=	0.048 MI
TOTAL LENGTH PROJECT BP9-R012	=	0.173 MI

Prepared in the Office of
WSP
WSP USA
544 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1-919-836-4040
FAX: 1-919-836-4099
LICENSE NO. F-0165

FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
MAY 2, 2024

LETTING DATE:
AUGUST 27, 2025

NCDOT CONTACT: JEREMY L. KEATON, PE, PLS
DIVISION 9 BRIDGE PROGRAM MANAGER

SHANE SHARPE, PE
PROJECT ENGINEER

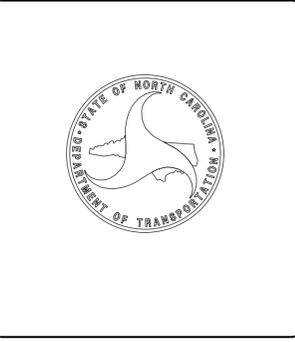
DREW DAACK, EIT
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

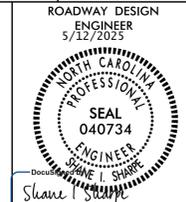
Signed by: *Jeffrey M. Becker*
SIGNATURE: [Stamp: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 054260 JEFFREY M. BECKER P.E. 6/12/2025]

ROADWAY DESIGN ENGINEER

DocuSigned by: *Shane L. Sharpe*
SIGNATURE: [Stamp: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 040734 SHANE L. SHARPE P.E. 6/12/2025]



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WSP



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PLANS PREPARED BY:



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434 FAYETTEVILLE STREET
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RALEIGH, NC 27601
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LICENSE NO. F-0165

INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
2A-1	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2C-1 THRU 2C-4	SPECIAL DETAILS
2G-1 THRU 2G-2	GEOTECHNICAL DETAILS
3B-1	ROADWAY SUMMARIES
3D-1	DRAINAGE SUMMARY
3G-1	GEOTECHNICAL SUMMARY
4	PLAN SHEET AND PROFILE SHEET
RW01 THRU RW04	SURVEY CONTROL, EXISTING CENTERLINES, RIGHT OF WAY, EASEMENT AND PROPERTY TIES
TMP-01 THRU TMP-04	TRAFFIC MANAGEMENT PLANS
PMP-1 THRU PMP-2	PAVEMENT MARKING PLANS
EC-1 THRU EC-5	EROSION CONTROL PLANS
SIGN-1 THRU SIGN-2	SIGNING PLANS
X-1A	CROSS-SECTION SUMMARY SHEET
X-1 THRU X-11	CROSS-SECTIONS
S-1 THRU S-24	STRUCTURE PLANS
SN	STANDARD NOTES

GENERAL NOTES: 2024 SPECIFICATIONS
EFFECTIVE: 01-16-2024
REVISED:

GRADING AND SURFACING OR RESURFACING AND WIDENING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. WHERE NO GRADE LINES ARE SHOWN, THE PROFILES SHOWN DENOTE THE TOP ELEVATION OF THE EXISTING PAVEMENT ALONG THE CENTER LINE OF SURVEY ON WHICH THE PROPOSED RESURFACING WILL BE PLACED. GRADE LINES MAY BE ADJUSTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

CLEARING:

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

SUPERELEVATION:

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

SHOULDER CONSTRUCTION:

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

SIDE ROADS:

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

SUBSURFACE DRAINS:

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

DRIVEWAYS:

DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. 848.03 AT LOCATIONS SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER.

GUARDRAIL:

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

TEMPORARY SHORING:

SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC WILL BE PAID FOR AS "EXTRA WORK" IN ACCORDANCE WITH SECTION 104-7.

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE UNION POWER (DISTRIBUTION)
PNG GAS (DISTRIBUTION), AT&T AND 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 CONTRACT.

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	
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	
806.01	Concrete Right-of-Way Marker
815.02	Subsurface Drain
840.00	Concrete Base Pad for Drainage Structures
840.20	Frames and Wide Slot Flat Grates
840.25	Anchorage for Frames – Brick or Concrete or Precast
840.35	Traffic Bearing Grated Drop Inlet – for Cast Iron Double Frame and Grates
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
862.01	Guardrail Placement (Use Details in Lieu of Standards for Sheets 4, 6, 12, and 14 of 15)
862.02	Guardrail Installation
862.03	Structure Anchor Units (Use Detail in Lieu of Standard for Sheet 8 of 9)
876.01	Rip Rap in Channels and Ditches
876.02	Guide for Rip Rap at Pipe Outlets
876.04	Drainage Ditches with Class 'B' Rip Rap

EFF. 01-16-2024
REV.

Note: Not to Scale

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

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	(23)
Existing Fence Line	-x-x-x-
Proposed Woven Wire Fence	○
Proposed Chain Link Fence	□
Proposed Barbed Wire Fence	◇
Existing Wetland Boundary	WLB
Proposed Wetland Boundary	WLB
Existing Endangered Animal Boundary	EAB
Existing Endangered Plant Boundary	EPB
Existing Historic Property Boundary	HPSB
Known Contamination Area: Soil	☒-s-☒-s-
Potential Contamination Area: Soil	☒-s-☒-s-
Known Contamination Area: Water	☒-w-☒-w-
Potential Contamination Area: Water	☒-w-☒-w-
Contaminated Site: Known or Potential	☠☑

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

Stream or Body of Water	-----
Hydro, Pool or Reservoir	□
Jurisdictional Stream	JS
Buffer Zone 1	BZ 1
Buffer Zone 2	BZ 2
Flow Arrow	←
Disappearing Stream	→
Spring	○
Wetland	↓
Proposed Lateral, Tail, Head Ditch	←
False Sump	▽

RAILROADS:

Standard Gauge	-----
RR Signal Milepost	○
Switch	□
RR Abandoned	-----
RR Dismantled	-----

RIGHT OF WAY & PROJECT CONTROL:

Primary Horiz Control Point	○
Primary Horiz and Vert Control Point	●
Secondary Horiz and Vert Control Point	◆
Vertical Benchmark	⊠
Existing Right of Way Monument	△
Proposed Right of Way Monument (Rebar and Cap)	▲
Proposed Right of Way Monument (Concrete)	▲
Existing Permanent Easement Monument	◇
Proposed Permanent Easement Monument (Rebar and Cap)	◆
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:

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

UTILITIES:

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

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

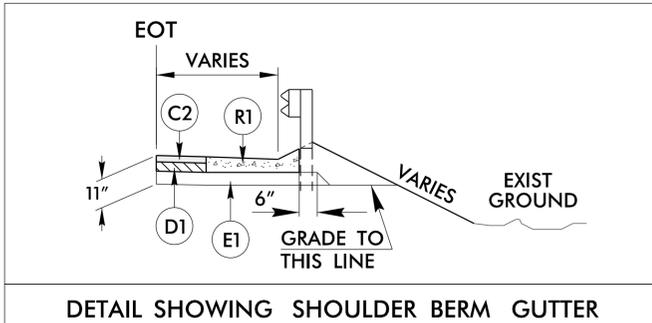
MISCELLANEOUS:

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

6/2/99

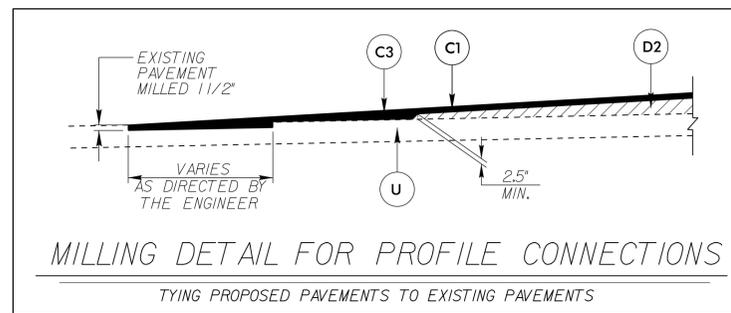
PAVEMENT SCHEDULE (AWAITING FINAL PAVEMENT DESIGN)	
C1	PROP. APPROX. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
C2	PROP. APPROX. 3.0" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. 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
D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 2.5" OR GREATER THAN 4" 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 3.0" OR GREATER THAN 5.5" IN DEPTH.
R1	SHOULDER BERM GUTTER
T	EARTH MATERIAL.
U	EXISTING PAVEMENT
W	WEDGING DETAIL

NOTES:
1. ALL SLOPES ARE 1:1 UNLESS OTHERWISE NOTED.

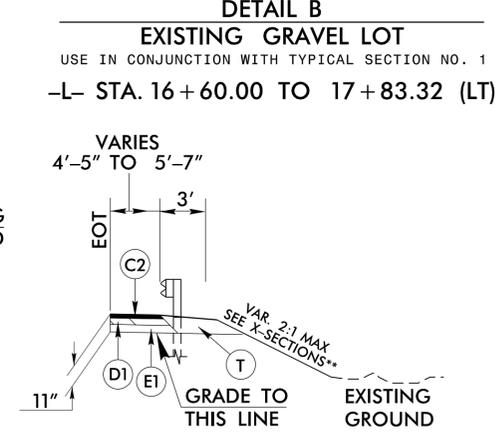
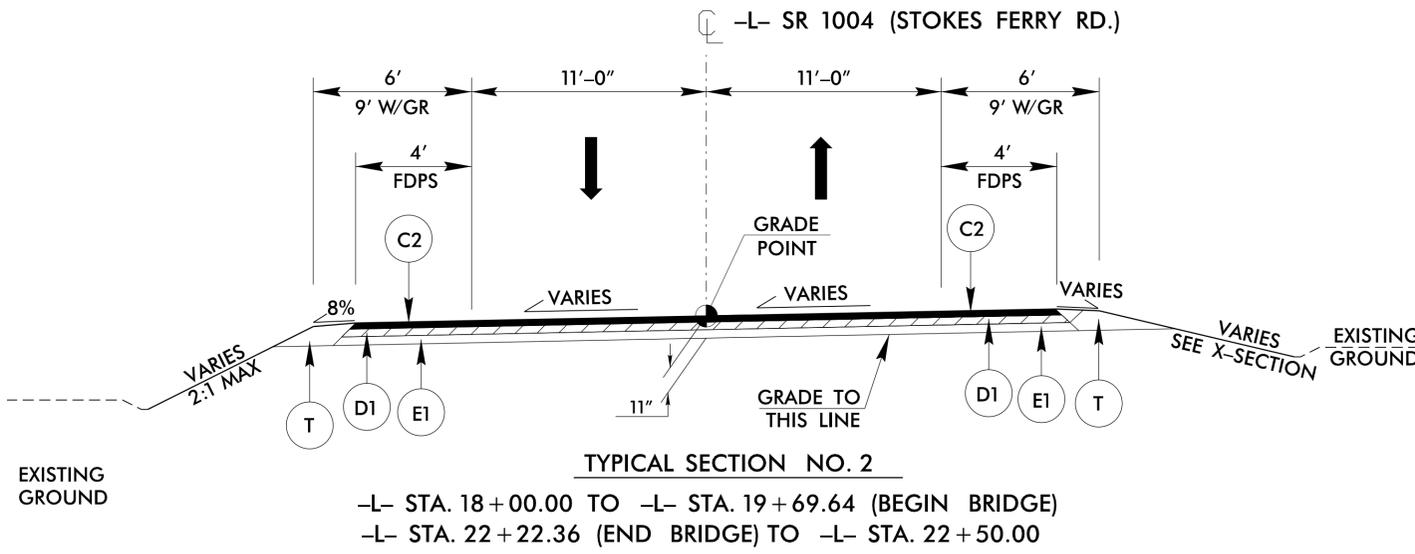
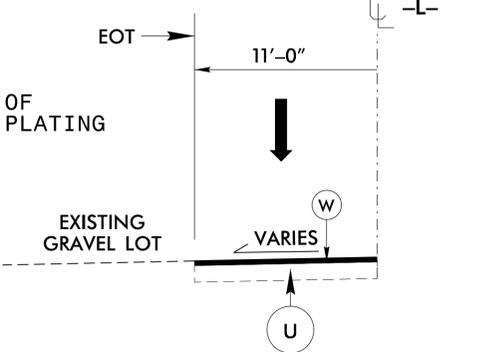
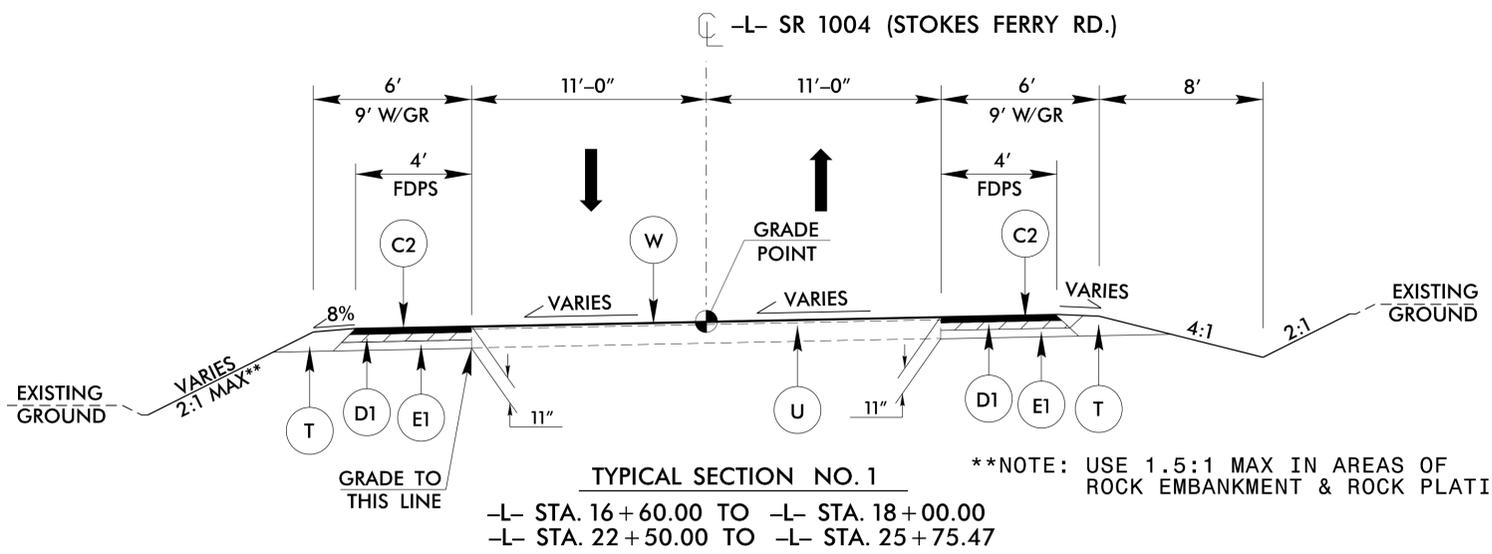


USE DETAIL IN CONJUNCTION WITH TYPICAL SECTION NO. 2

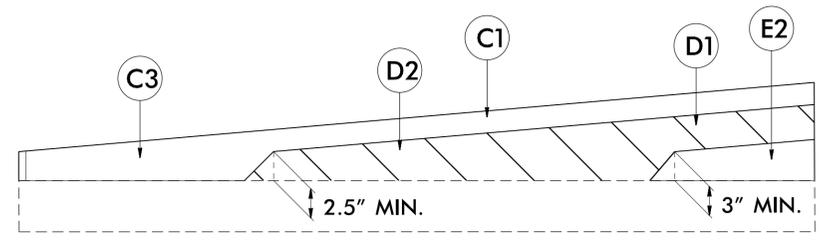
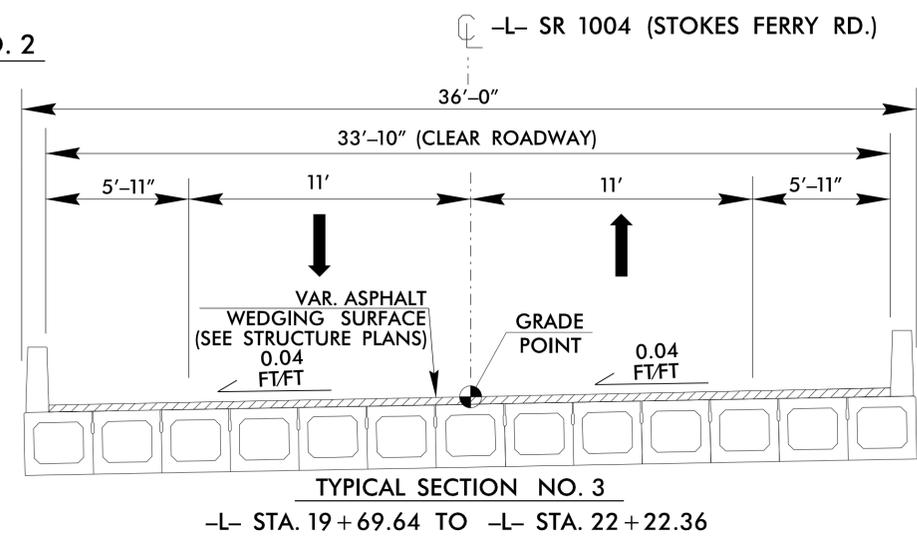
-L- STA. 19+39.44 TO STA. 19+52.91 LT
 -L- STA. 19+39.57 TO STA. 19+64.67 RT
 -L- STA. 22+27.30 TO STA. 22+40.29 LT



PROJECT REFERENCE NO. BP9-R012	SHEET NO. 2A-1
RW SHEET NO. ENGINEER 5/12/2025	PAVEMENT DESIGN ENGINEER 5/9/2025
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
PLANS PREPARED BY: 	
WSP USA 434 PAVETTENVILLE STREET SUITE 1500 RALEIGH, NC 27601 TEL: 1.919.836.4040 FAX: 1.919.836.4099 LICENSE NO. F-0165	

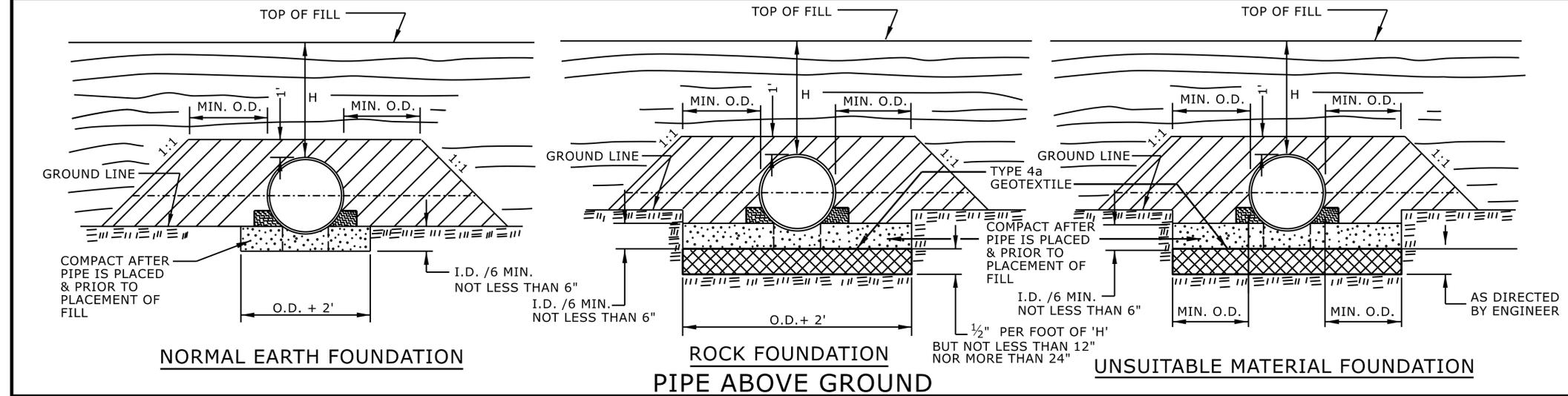
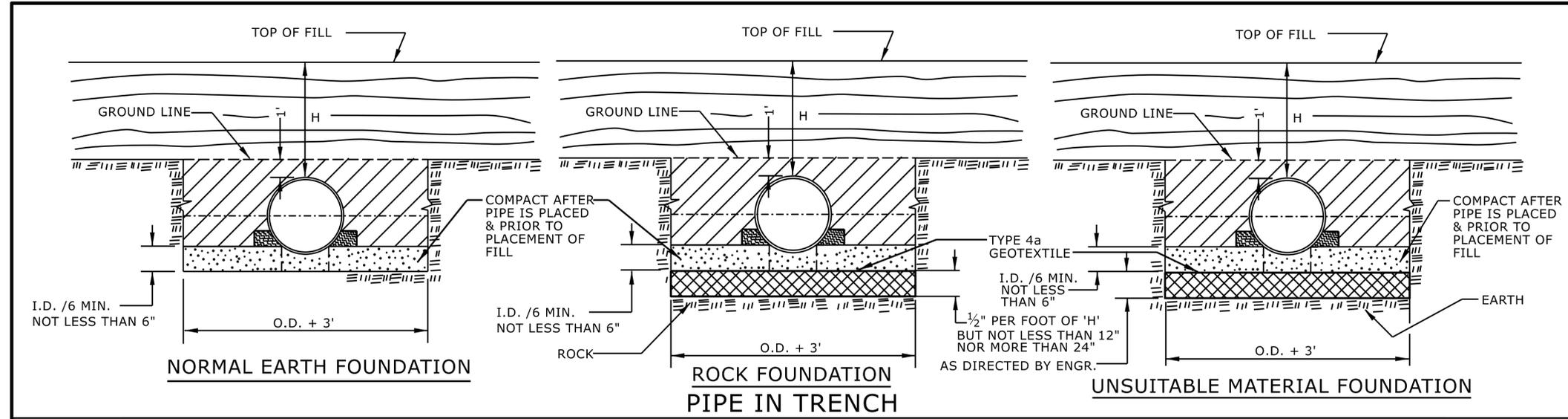


USE IN CONJUNCTION WITH TYPICAL SECTION NO. 1,2
 -L- STA. 18+14.95 TO 19+39.44 (LT)
 -L- STA. 18+99.60 TO 19+39.57 (RT)
 -L- STA. 22+40.29 TO 25+75.47 (LT)
 -L- STA. 22+21.00 TO 25+75.47 (RT)
 **NOTE: USE 1.5:1 MAX IN AREAS OF ROCK EMBANKMENT & ROCK PLATING



Wedging Detail For Resurfacing

08-MAY-2025 11:11 AM \\goadway\proj\BP9-R012-rdy-typp.dgn

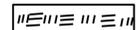


GENERAL NOTES:
 I.D. = THE MAXIMUM HORIZONTAL INSIDE DIAMETER DIMENSION.
 O.D. = THE MAXIMUM HORIZONTAL OUTSIDE DIAMETER DIMENSION.
 H = THE FILL HEIGHT MEASURED VERTICALLY AT ANY POINT ALONG THE PIPE FROM THE TOP OF THE PIPE TO THE TOP OF THE EMBANKMENT AT THAT POINT.

 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.

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

ROADWAY DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION
FLEXIBLE PIPE

SHEET 1 OF 2
300.01

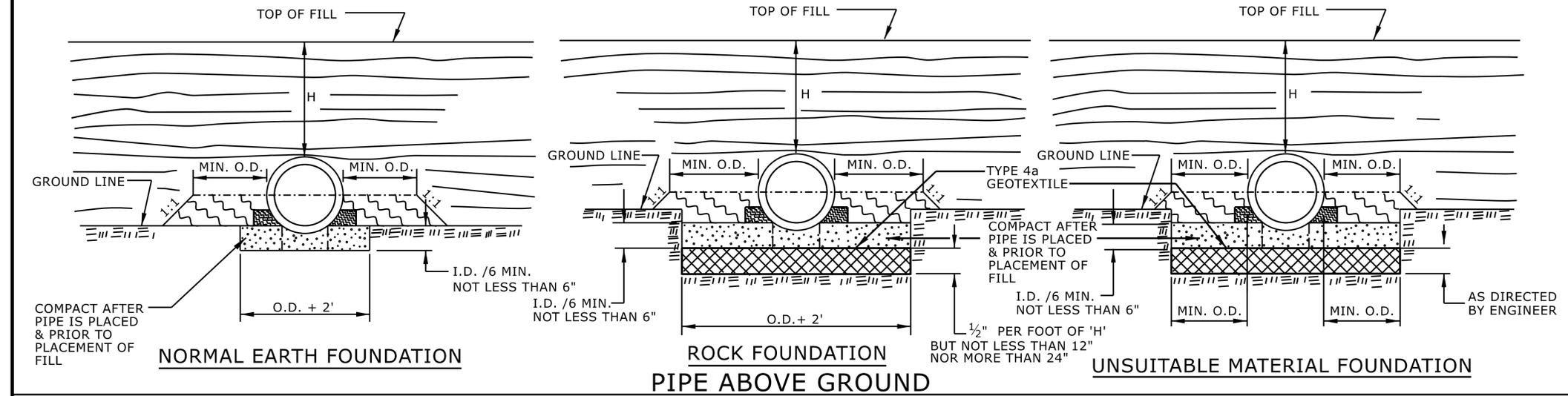
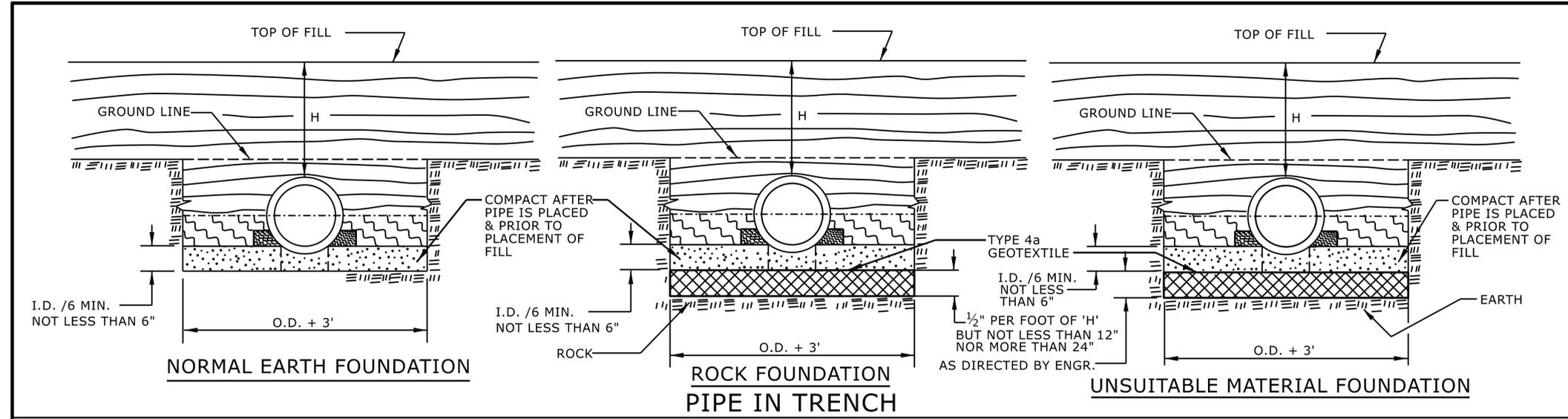


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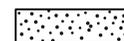
CONTRACTS STANDARDS AND DEVELOPMENT UNIT
Office 919-707-6950 FAX 919-250-4119

SEE TITLE BLOCK

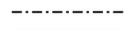
ORIGINAL BY: S.CALHOUN DATE: 7-25-2024
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.: DATE:



GENERAL NOTES:
 I.D. = THE MAXIMUM HORIZONTAL INSIDE DIAMETER DIMENSION.
 O.D. = THE MAXIMUM HORIZONTAL OUTSIDE DIAMETER DIMENSION.
 H = THE FILL HEIGHT MEASURED VERTICALLY AT ANY POINT ALONG THE PIPE FROM THE TOP OF THE PIPE TO THE TOP OF THE EMBANKMENT AT THAT POINT.

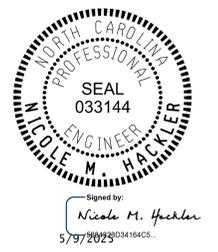
 APPROVED SUITABLE LOCAL MATERIAL.
 TAKE CARE TO FULLY COMPACT HAUNCH ZONE OF PIPE BACKFILL.
 LOOSELY PLACED SELECT MATERIAL CLASS III OR CLASS II, TYPE 1 FOR PIPE BEDDING. LEAVE SECTION DIRECTLY BENEATH PIPE UNCOMPACTED AS PIPE SEATING AND BACKFILL WILL ACCOMPLISH COMPACTION.

DO NOT OPERATE HEAVY EQUIPMENT OVER ANY PIPE CULVERT UNTIL THE PIPE CULVERT HAS BEEN PROPERLY BACKFILLED AND COVERED WITH AT LEAST 3 FEET OF APPROVED MATERIAL.
 REFER TO NCDOT PIPE MATERIAL SELECTION GUIDE AND STANDARD SPECIFICATIONS FOR ALLOWABLE PIPE FILL HEIGHTS AND PIPE SPECIFICATIONS.

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

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

ROADWAY DETAIL DRAWING FOR
METHOD OF PIPE INSTALLATION
RIGID PIPE



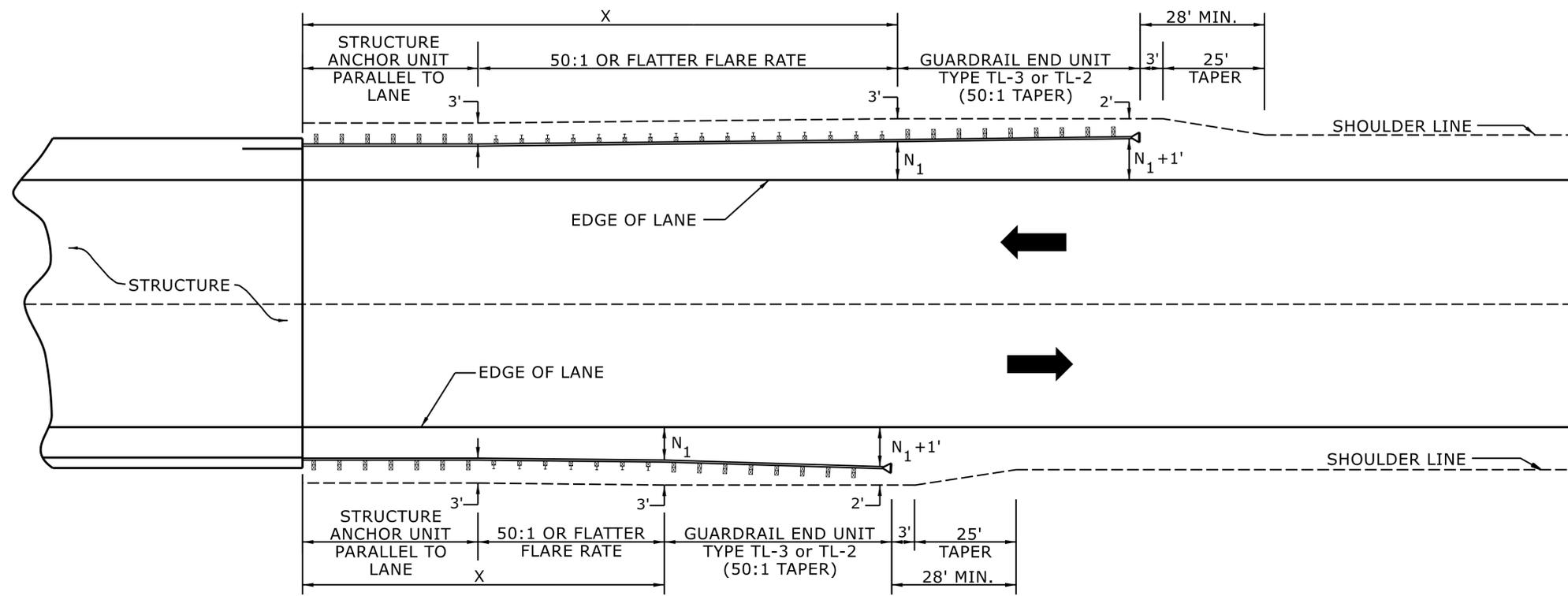
SHEET 2 OF 2
300.01

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

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

SEE TITLE BLOCK

ORIGINAL BY: S.CALHOUN DATE: 7-25-2024
 MODIFIED BY: DATE:
 CHECKED BY: DATE:
 FILE SPEC.:



USE FLARE RATE AS THE CONTROL IF THE "N₁" DISTANCE IS NOT OBTAINED.
 ("N₁" 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

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT



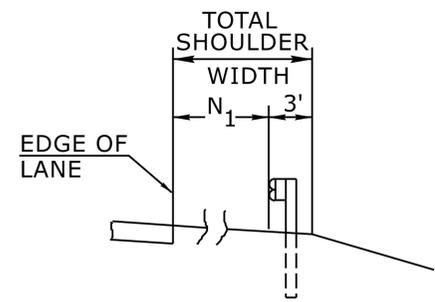
SHEET 4 OF 15
862D01

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

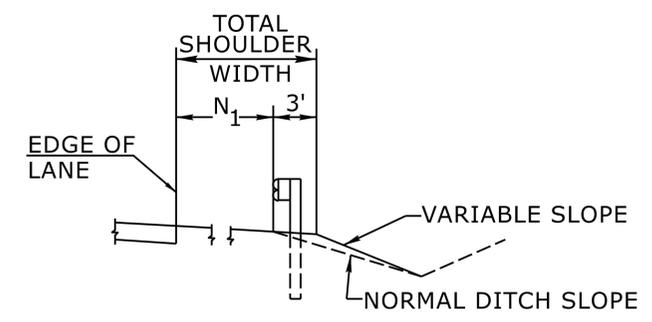
**CONTRACTS STANDARDS
 AND DEVELOPMENT UNIT**
 Office 919-707-6950 FAX 919-250-4119

SEE TITLE BLOCK

ORIGINAL BY: S.CALHOUN DATE: 7-25-2024
 MODIFIED BY: _____ DATE: _____
 CHECKED BY: _____ DATE: _____
 FILE SPEC.: _____

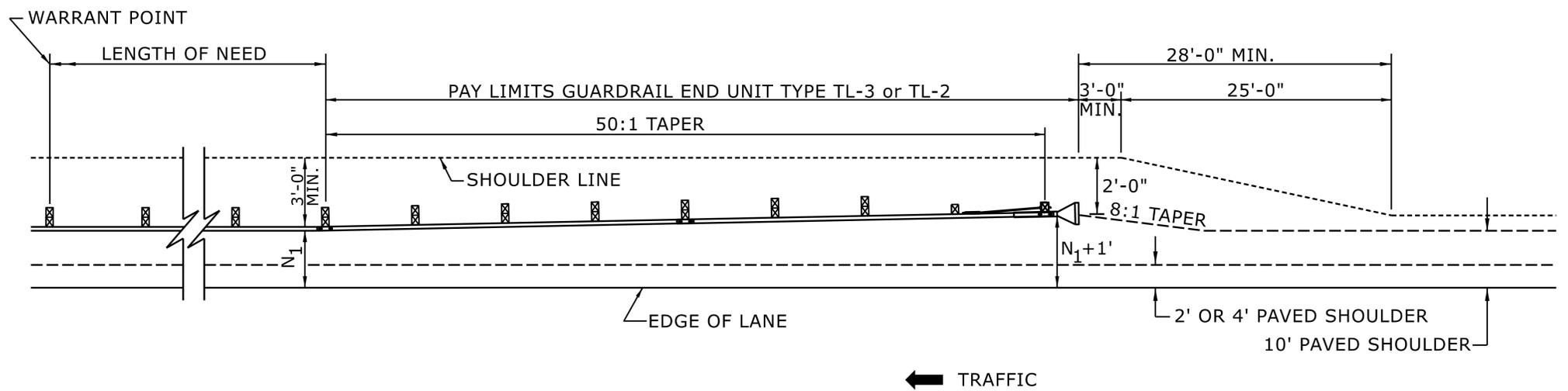


FILL SECTION



CUT SECTION

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



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

DETAIL OF BEGINNING OF GUARDRAIL IN CUT OR FILL SECTION

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

ROADWAY DETAIL DRAWING FOR
GUARDRAIL PLACEMENT



Signed by:
Nicole M. Hackler
5/9/2025

SHEET 6 OF 15
862D01

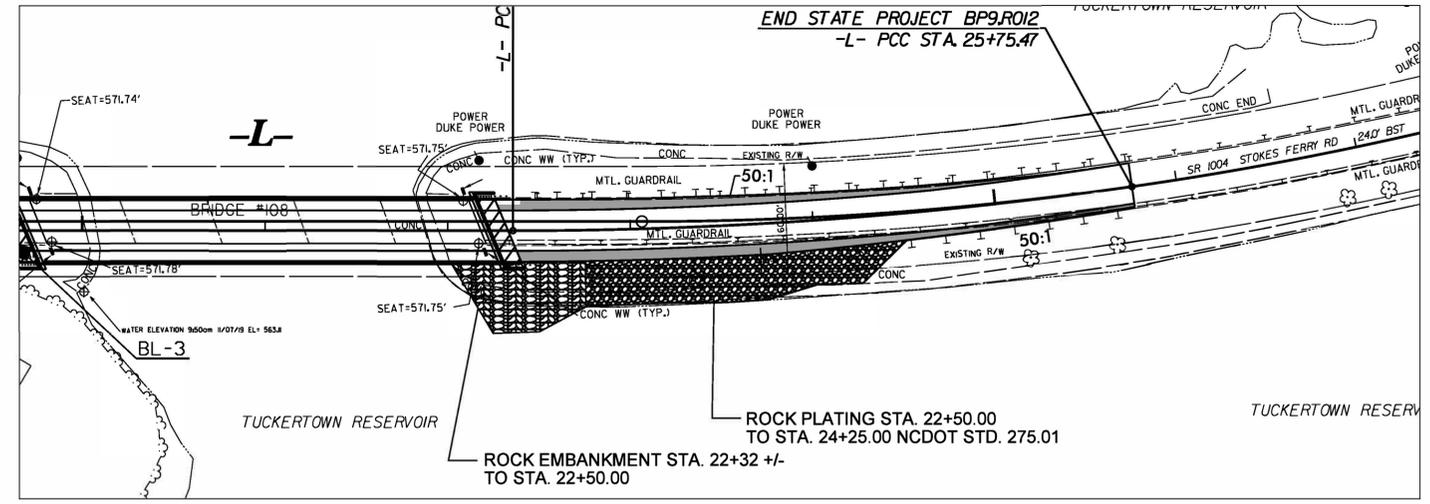
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

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

SEE TITLE BLOCK

ORIGINAL BY: S.CALHOUN	DATE: 7-25-2024
MODIFIED BY:	DATE:
CHECKED BY:	DATE:
FILE SPEC.:	

PROJECT REFERENCE NO. SF-790108	SHEET NO. 2G-1
GEOTECHNICAL ENGINEER  Signed by: <i>Kelly Mathison</i> 06/03/2025 <small>DATE</small>	ENGINEER <small>SIGNATURE</small> <small>DATE</small>
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

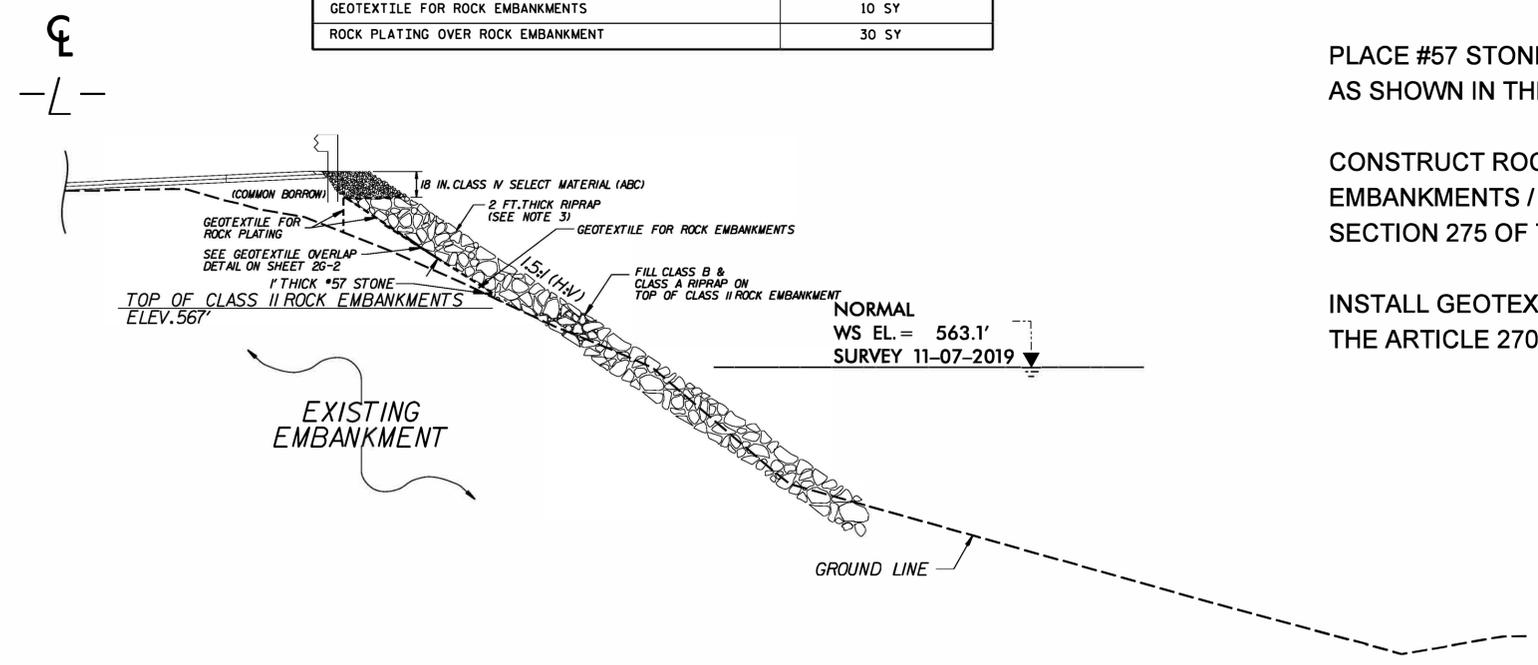


**ROCK EMBANKMENT DETAIL FOR USE IN THE FOLLOWING LOCATIONS, OR AS DIRECTED BY THE ENGINEER.
STATIONS: -L- 22+32 TO 22+50, RT**

ESTIMATED QUANTITIES ROCK EMBANKMENTS	
CLASS 2 RIP RAP FOR ROCK EMBANKMENTS	100 TON
RIP RAP CLASS A	25 TON
RIP RAP CLASS B	25 TON
SELECT MATERIAL, CLASS VI FOR ROCK EMBANKMENTS	10 TON
SELECT MATERIAL, CLASS IV FOR ROCK EMBANKMENTS	10 TON
GEOTEXTILE FOR ROCK EMBANKMENTS	10 SY
ROCK PLATING OVER ROCK EMBANKMENT	30 SY

NOTES:

- FOR ROCK EMBANKMENTS, SEE ROCK EMBANKMENTS PROVISION
- USE CLASS 2 RIP RAP TO CONSTRUCT ROCK EMBANKMENTS TO THE ELEVATION SHOWN.
- FILL VOIDS IN THE TOP OF ROCK EMBANKMENTS WITH CLASS B AND CLASS A RIP RAP.
- PLACE #57 STONE (SELECT MATERIAL, CLASS VI) UP TO 1 FT. ABOVE ROCK EMBANKMENTS AS SHOWN IN THE PLAN
- CONSTRUCT ROCK PLATING ABOVE ROCK EMBANKMENTS FROM ELEVATION SHOWN IN THE ROCK EMBANKMENTS / ROCK PLATING DETAIL TO THE SHOULDER HINGE POINT AND ACCORDING TO SECTION 275 OF THE STANDARD SPECIFICATIONS
- INSTALL GEOTEXTILE FOR ROCK EMBANKMENTS ON TOP OF NO. 57 STONE IN ACCORDANCE WITH THE ARTICLE 270-3 OF THE STANDARD SPECIFICATIONS



ROCK EMBANKMENTS WITH ROCK PLATING DETAIL NO. 1 – TYPICAL SECTION

-L- 22+32 TO 22+50, RT

PREPARED BY: K. DE MONTBRUN, P.E.	DATE: 05/13/24
REVIEWED BY: M. WALKO, P.E.	DATE: 05/13/24

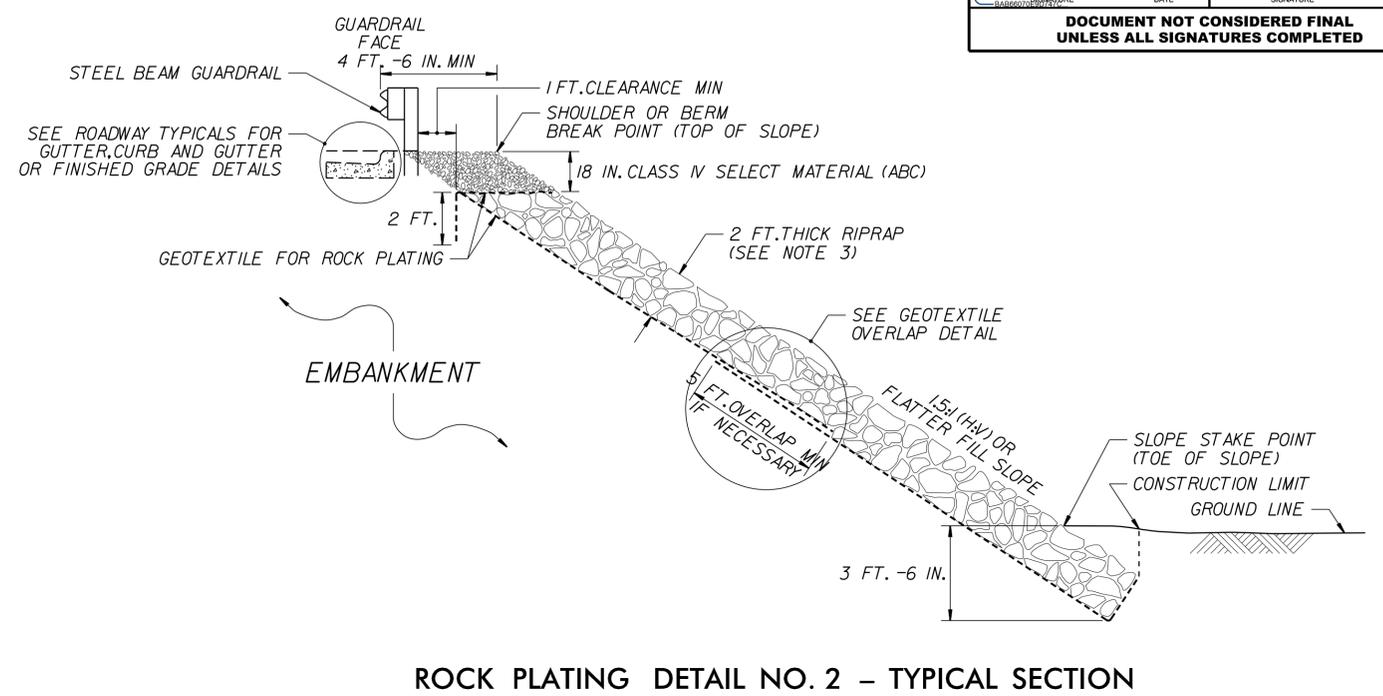
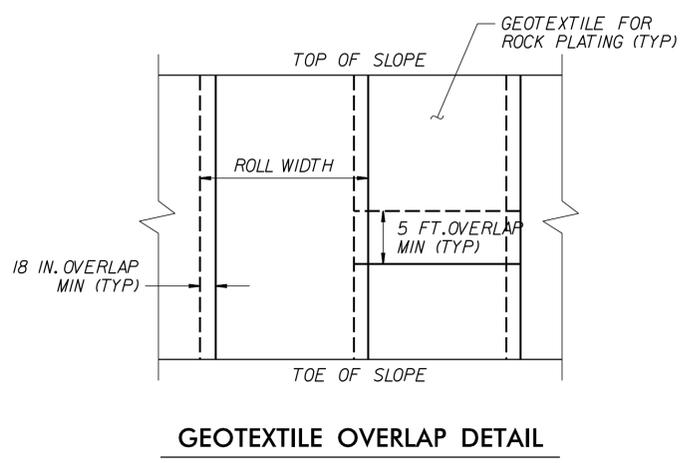
Prepared in the Office of:



**CAROLINAS
GEOTECHNICAL
GROUP**
2400 CROWNPOINT EXECUTIVE DRIVE
SUITE 800
CHARLOTTE, NC 28227
(980) 339-8684

**GEOTECHNICAL
CONSTRUCTION DETAILS -
ROCK EMBANKMENTS -
WIDENED FILL DETAIL**

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



ROCK PLATING
 FOR ROCK PLATING, SEE SECTION 275 OF THE STANDARD SPECIFICATIONS
 USE ROCK PLATING AT THE FOLLOWING LOCATIONS:

LINE	BEGINNING SLOPE	APPROX. STATION	ENDING SLOPE	APPROX. STATION	LOCATION LT/RT	ROCK PLATING DETAIL NO. 1/2/3	RIPRAP CLASS* 1/2/B	SY
-L-	1.5:1	22 + 32	1.5:1	22 + 50	RT	1	*	30
-L-	1.5:1	22 + 50	1.5:1	24 + 25	RT	2	*	450

*USE CLASS 1, 2 OR B RIPRAP UNLESS REQUIRED OTHERWISE IN THE ROADWAY SUMMARY SHEETS.

ESTIMATED TOTAL QUANTITY OF ROCK PLATING = 480 SY

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
-L-	16+60	17+75	ASU1	12	110	220	330		
CONTINGENCY			ASU1	12	100	200	300		
TOTAL CY/TONS/SY:					210	420**	630**	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.

SUMMARY OF ROCK PLATING

LINE	Beginning Slope (H:V)	Approx. Station	Ending Slope (H:V)	Approx. Station	Location LT/RT	Rock Plating Detail No. 1/2/3/4	Riprap Class* 1/2/B	Rock Plating SY
-L-	1.5:1	22+32	1.5:1	22+50	RT	1		30
-L-	1.5:1	22+50	1.5:1	24+25	RT	2		450
TOTAL SY:								480

*Use Class 1, 2 or B riprap if riprap class is not shown for rock plating location.

8/17/99

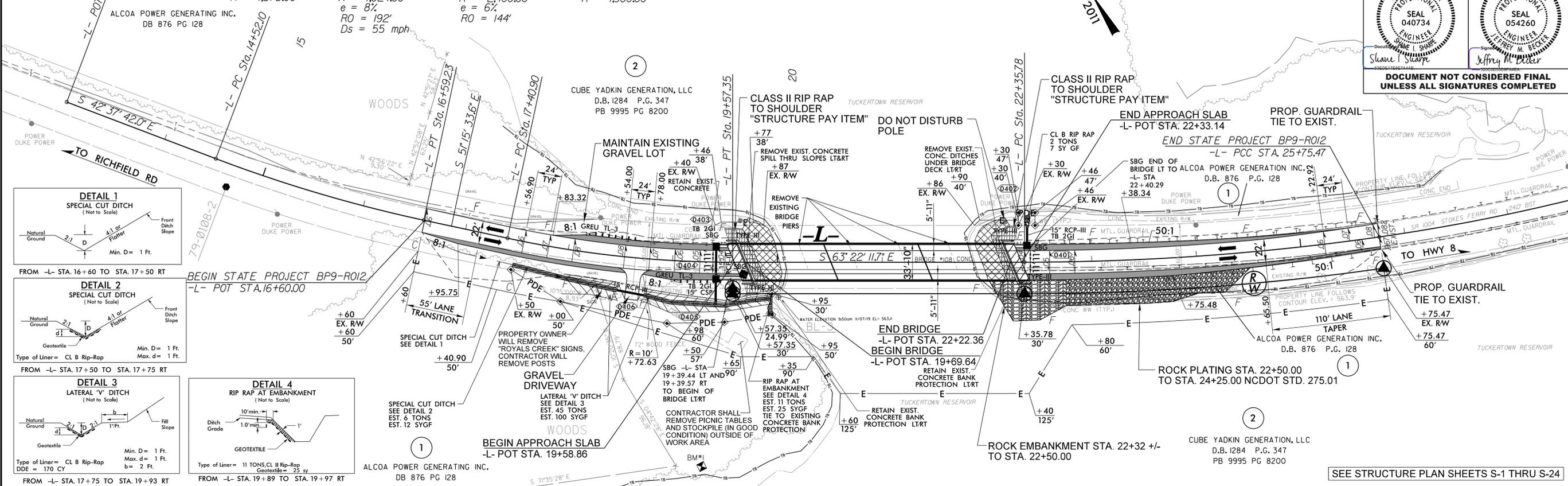
CURVE DATA (-L-)

PI Sta 15+55.86 Δ = 8° 37' 51.6" (LT) D = 4' 10' 01.1" L = 207.13' T = 103.76' R = 1,375.00'	PI Sta 18+49.53 Δ = 12° 06' 38.2" (LT) D = 5' 35' 43.0" L = 216.44' T = 108.63' R = 1,024.00' e = 8% RO = 192' Ds = 55 mph	PI Sta 24+05.91 Δ = 8° 06' 34.6" (LT) D = 2' 23' 14.4" L = 339.69' T = 170.13' R = 2,400.00' e = 6% RO = 144'	PI Sta 28+34.24 Δ = 15° 30' 39.7" (LT) D = 3' 00' 56.0" L = 514.37' T = 258.76' R = 1,900.00'
---	--	--	--

PLANS PREPARED BY:

WSP USA
434 EAVETTVILLE STREET
SUITE 500
RALEIGH, NC 27601
TEL: 1.919.836.4049
FAX: 1.919.836.4099
LICENSE NO. 14-0165

PROJECT REFERENCE NO. BP9-R012	SHEET NO. 4
ROADWAY DESIGN ENGINEER 6/30/2025	HYDRAULICS ENGINEER 6/30/2025
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



DETAIL 1
SPECIAL CUT DITCH
(Not to Scale)

FROM -L- STA. 16+60 TO STA. 17+50 RT

DETAIL 2
SPECIAL CUT DITCH
(Not to Scale)

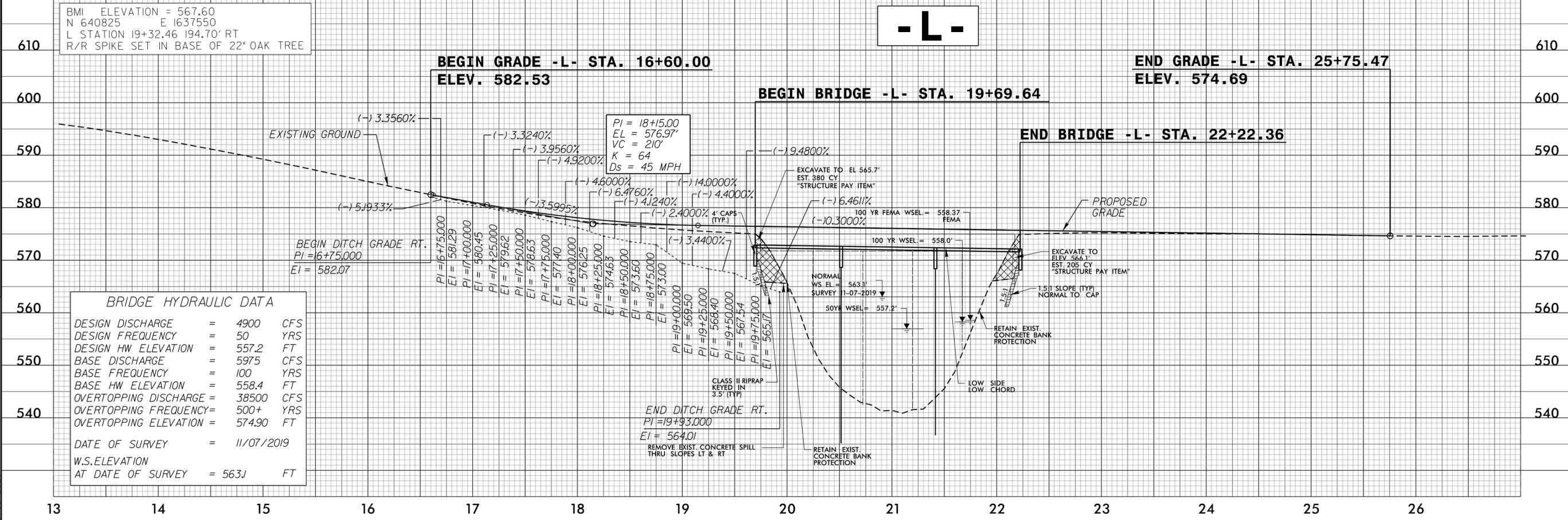
FROM -L- STA. 17+50 TO STA. 17+75 RT

DETAIL 3
LATERAL 'V' DITCH
(Not to Scale)

FROM -L- STA. 17+75 TO STA. 19+93 RT

DETAIL 4
RIP RAP AT EMBANKMENT
(Not to Scale)

FROM -L- STA. 19+89 TO STA. 19+97 RT



BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	=	4900	CFS
DESIGN FREQUENCY	=	50	YRS
DESIGN HW ELEVATION	=	557.2	FT
BASE DISCHARGE	=	5975	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	558.4	FT
OVERTOPPING DISCHARGE	=	38500	CFS
OVERTOPPING FREQUENCY	=	500+	YRS
OVERTOPPING ELEVATION	=	574.90	FT
DATE OF SURVEY	=	11/07/2019	
W.S. ELEVATION AT DATE OF SURVEY	=	563.1	FT

REVISIONS

T:28:40 AM
8/30/2025
6:30/2025

SEE STRUCTURE PLAN SHEETS S-1 THRU S-24

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	79-0108	RW01	05

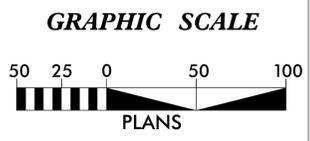
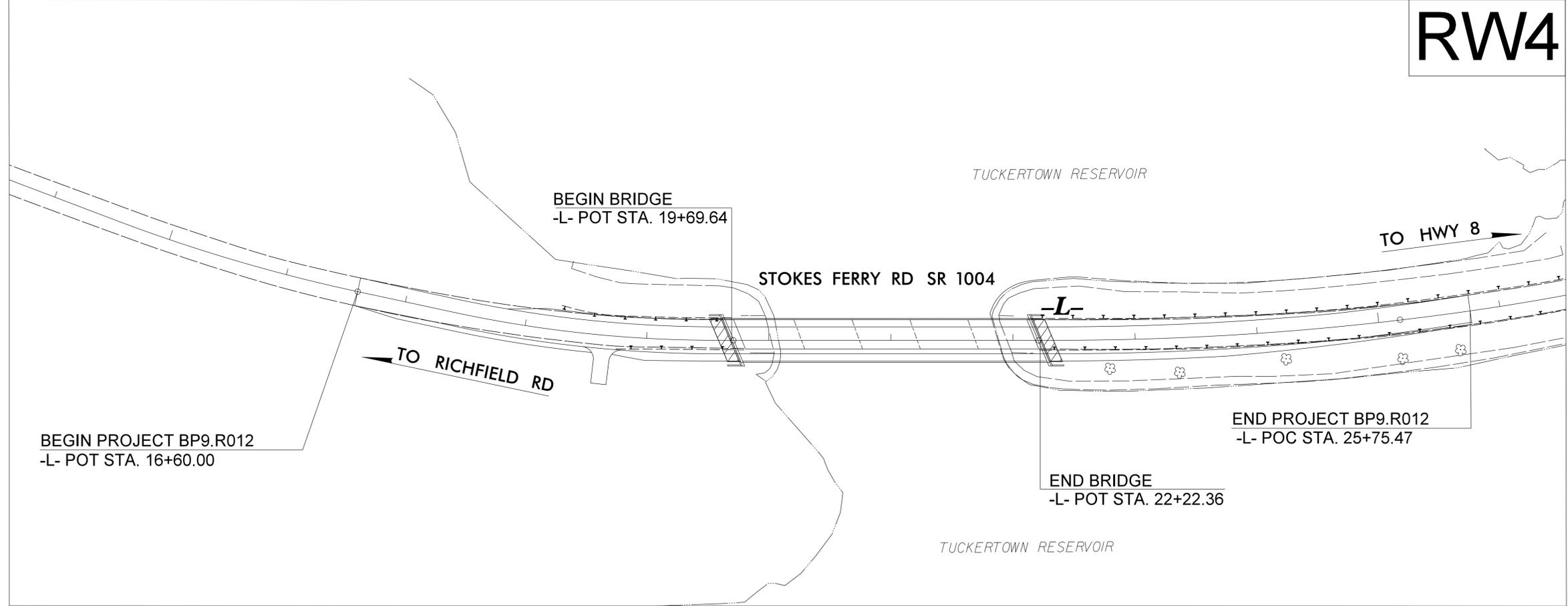
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

ROWAN COUNTY



TIP PROJECT: 79-0108



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "79-0108-2" WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF NORTHING: 641,266.4172(ft) EASTING: 1,637,263.3991(ft) ELEVATION: 592.26(ft)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999858826

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "79-0108-2" TO -L- STATION 13+00.00 IS N 35°24'30.14" W 172.19(ft)

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

Prepared in the Office of:

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: 6/27/2025	LETTING DATE: 3/27/2025
--	-----------------------------------

PROFESSIONAL LAND SURVEYOR

DocuSigned by:
Michael L. Moysinger
FOBPETRE29348E
SIGNATURE:



Date: 04/22/2025



22-APR-2025 11:13 S:\Units\Div09\Winston\Ruiths Computer\Bridge\Division_LowImpact\79-0108_Stokes Ferry Rd\RightofWay\survey_controlsheets\tobechecked\79-0108_LS-rw01.dgn AT LS-328808L

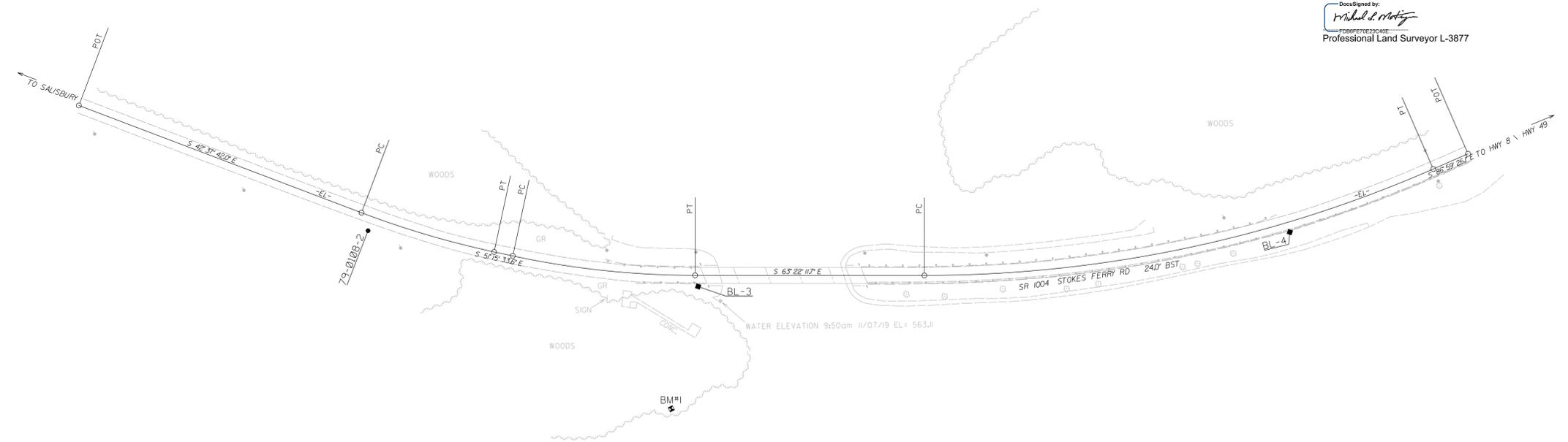
SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

PROJECT REFERENCE NO.	SHEET NO.
79-0108	RW02C-1
Location and Surveys	
INSERT CONSULTANT'S NAME	
PROJECT SURVEYOR	
	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



79-0108-1



SEE SHEET RW02C-2 FOR FURTHER ALIGNMENT DETAILS

I, Michael L. Motsinger, PLS, certify that the Project Control was [performed/verified] under my supervision from an actual GPS survey made under my supervision and the following information was used to perform the survey:

Class of survey: AA
 Type of GPS field procedure: RTN
 Dates of survey: 9-25-2019
 Datum/Epoch: NAD 83/2011
 Published/Fixed-control use: [Project Control if applicable, N/A for RTN]
 Localized around: GPS-2
 Northing: 641,266.4172
 Easting: 1,637,263.3991
 Combined grid factor: 0.9998588263
 Geoid model: G12BNC
 Units: English

I also certify that the Baseline Control for this project was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:20,000 (Class AA) and Vertical accuracy to Class A. Field work was performed from 10-2019 to 11-2019, and all coordinates are based on NAD 83/2011 and all elevations are based on NAVD 88; that this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 22nd day of April, 2025.

DocuSigned by:

 Professional Land Surveyor L-3877

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.

SURVEY CONTROL SHEET

BASELINE AND BENCHMARKS

BL	POINT	DESC.	NORTH	EAST	ELEVATION
1		79-0108-1	642019.4933	1636573.4335	614.00
2		79-0108-2	641266.4172	1637263.3991	592.26
3		BL-3	640970.6671	1637667.5214	574.32
4		BL-4	640646.6506	1638495.4043	575.13
5		BL-5	640632.5320	1639138.8600	575.29

.....
 BM1 ELEVATION = 567.60'
 N 640825 E 1637550
 R/R SPIKE SET IN BASE OF 22" OAK TREE

 BM2 ELEVATION = 575.29'
 N 640632 E 1639138
 BASELINE REBAR & CAP (79-0108-5)

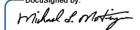
PROJECT REFERENCE NO. 79-0108	SHEET NO. RW02C-2
Location and Surveys	
INSERT CONSULTANT'S NAME	
	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

I, Michael L. Motsinger, PLS, certify that the Project Control was [performed/verified] under my supervision from an actual GPS survey made under my supervision and the following information was used to perform the survey:

Class of survey: AA
 Type of GPS field procedure: RTN
 Dates of survey: 9-25-2019
 Datum/Epoch: NAD 83/2011
 Published/Fixed-control use: [Project_Control_if_applicable_N/A_for_RTN]
 Localized around: GPS-2
 Northing: 641,266.4172
 Easting: 1,637,263.3991
 Combined grid factor: 0.9998588263
 Geoid model: G12BNC
 Units: English

I also certify that the Baseline Control for this project was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:20,000 (Class AA) and Vertical accuracy to Class A. Field work was performed from 10-2019 to 11-2019, and all coordinates are based on NAD 83/2011 and all elevations are based on NAVD 88; that this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 22nd day of April, 2025.

DocuSigned by:

 Professional Land Surveyor L-3877

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

EL POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
POT	641627.486	1636960.461							
LINE			S 42°37'42.0" E	452.10					
PC	641294.848	1637266.642							
CURVE			S 46°56'37.8" E	206.93	08°37'51.6"(LT)	04°10'01.1"	207.13	103.76	1375.00
PT	641153.571	1637417.845							
LINE			S 51°15'33.6" E	28.56					
PC	641135.696	1637440.124							
CURVE			S 57°18'52.7" E	274.27	12°06'38.2"(LT)	04°24'26.5"	274.78	137.90	1300.00
PT	640987.584	1637670.963							
LINE			S 63°22'11.7" E	342.99					
PC	640833.847	1637977.567							
CURVE			S 75°10'48.9" E	777.76	23°37'14.3"(LT)	03°00'56.0"	783.29	397.29	1900.00
PT	640634.913	1638729.450							
LINE			S 86°59'26.1" E	56.78					
POT	640631.932	1638786.151							

PROPOSED ALIGNMENT

		L NORTH	EAST
TYPE	STATION		
POT	13+00.00	641406.7578	1637163.6333
PC	14+52.10	641294.8475	1637266.6423
PT	16+59.23	641153.5711	1637417.8453
PC	17+40.90	641102.4600	1637481.5496
PT	19+57.35	640985.7929	1637663.3794
PC	22+35.78	640860.9923	1637912.2741
PCC	25+75.47	640730.6935	1638225.6783
PT	30+89.84	640634.9133	1638729.4500
POT	31+46.62	640631.9324	1638786.1508

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.

Location and Surveys

PROJECT SURVEYOR



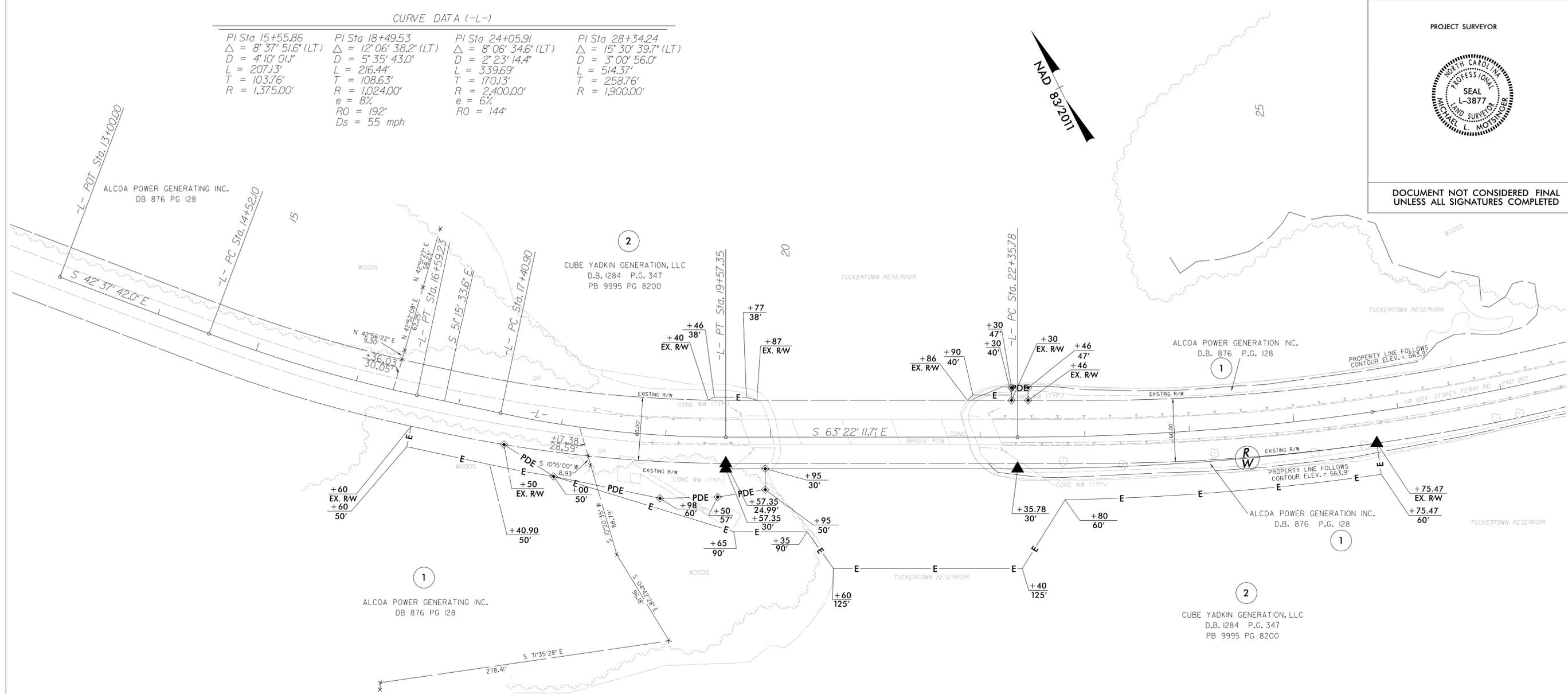
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CURVE DATA (-L-)

PI Sta 15+55.86 Δ = 8° 37' 51.6" (LT) D = 4° 10' 01.1" L = 207.13' T = 103.76' R = 1,375.00'	PI Sta 18+49.53 Δ = 12° 06' 38.2" (LT) D = 5° 35' 43.0" L = 216.44' T = 108.63' R = 1,024.00' e = 8% RO = 192' Ds = 55 mph	PI Sta 24+05.91 Δ = 8° 06' 34.6" (LT) D = 2° 23' 14.4" L = 339.69' T = 170.13' R = 2,400.00' e = 6% RO = 144'	PI Sta 28+34.24 Δ = 15° 30' 39.7" (LT) D = 3° 00' 56.0" L = 514.37' T = 258.76' R = 1,900.00'
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REVISIONS

6/2/2025 14:03
C:\Users\motsinger\Documents\Projects\79-0108\Stokes Ferry Rd\RightofWay\Revision 2025-07-01\79-0108_LS_RW04 - Copy.dgn
dbodenthamer



ROW MARKER IRON PIN AND CAP-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	19+57.35	24.99	640963.4569	1637652.1797
L	19+57.35	30.00	640958.9753	1637649.9326
L	22+35.78	30.00	640834.1747	1637898.8273
L	25+75.47	30.00	640702.2471	1638216.1490

ROW MARKER PERMANENT EASEMENT-E

ALIGN	STATION	OFFSET	NORTH	EAST
L	17+50.00	28.57	641074.3539	1637470.9868
L	18+00.00	50.00	641026.0889	1637499.6968
L	18+98.00	60.00	640961.9284	1637581.1735
L	19+50.00	57.00	640938.3406	1637630.9102
L	19+95.00	50.00	640924.2196	1637674.6272
L	19+95.00	30.00	640942.0980	1637683.5917
L	22+30.00	-47.00	640905.5961	1637928.1763
L	22+30.00	-35.00	640894.8691	1637922.7976
L	22+46.00	-47.00	640898.5333	1637942.3096
L	22+46.00	-34.98	640887.7642	1637936.9671

I, Michael L. Motsinger, 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 March 2025 to July 2025, and all coordinates are based on NAD83/2011; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 2nd day of July, 2025.

DocuSigned by:

 Professional Land Surveyor L-3877

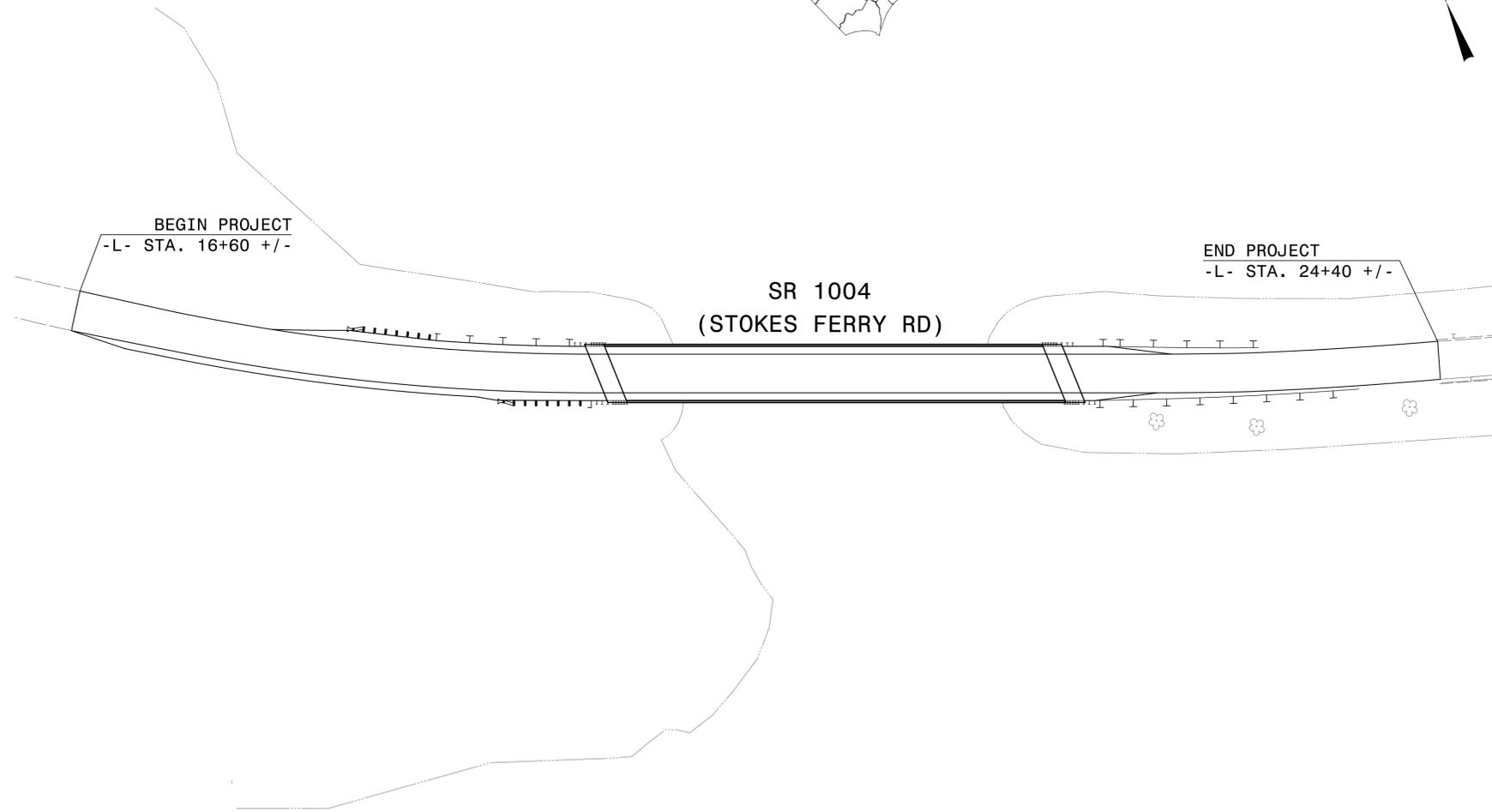
NOTES:

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 ____ TO ____.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

ROWAN COUNTY



<u>SHEET NO.</u>	<u>TITLE</u>
TMP-01	TITLE SHEET, VICINITY MAP AND INDEX OF SHEETS
TMP-02	ROADWAY STANDARD DRAWINGS AND LEGEND
TMP-02A	SIGN DESIGN
TMP-03	GENERAL NOTES AND WRITTEN PHASING
TMP-04	OFFSITE DETOUR ROUTE SIGNING

SHEET NO.
TMP-01

5/6/2025
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PLANS PREPARED BY:

RICHARD ODYSKI, PE

DERRICK DOHM, EI

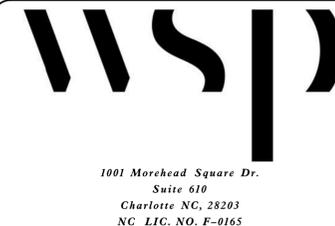
NCDOT CONTACTS:

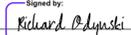
KEN THORNEWELL, PE
PROJECT ENGINEER

MIKE STEELMAN
PROJECT DESIGN ENGINEER



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UNLESS ALL SIGNATURES COMPLETED**



APPROVED: 
DATE: 5/6/2025

SEAL



TIP PROJECT: BP9.R012

ROADWAY STANDARD DRAWINGS

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

<u>STD. NO.</u>	<u>TITLE</u>
1101.01	WORK ZONE ADVANCE WARNING SIGNS
1101.02	TEMPORARY LANE CLOSURES
1101.03	TEMPORARY ROAD CLOSURES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1130.01	DRUMS
1135.01	CONES
1145.01	BARRICADES
1150.01	FLAGGERS
1180.01	SKINNY DRUMS
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTI-LANE ROADWAYS
1250.01	RAISED PAVEMENT MARKERS - INSTALLATION SPACING
1251.01	RAISED PAVEMENT MARKERS - PERMANENT AND TEMPORARY

LEGEND

GENERAL

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

WORK AREA

TRAFFIC CONTROL DEVICES

- BARRICADE (TYPE III)
- CONE
- DRUM SKINNY DRUM
- TEMPORARY CRASH CUSHION
- FLASHING ARROW BOARD
- FLAGGER
- LAW ENFORCEMENT
- TRUCK MOUNTED ATTENUATOR (TMA)
- CHANGEABLE MESSAGE SIGN

TEMPORARY SIGNING

- PORTABLE SIGN
- STATIONARY SIGN
- STATIONARY OR PORTABLE SIGN

5/6/2025
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APPROVED: DATE: 5/6/2025 		<p style="text-align: center;">TRANSPORTATION MANAGEMENT PLAN ROADWAY STANDARD DRAWINGS & LEGEND</p>
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		



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 UNDESIRE 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 ON THE SHOULDER ADJACENT TO AN UNDIVIDED FACILITY AND WITHIN 5 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.

WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON THE SHOULDER ADJACENT TO A DIVIDED FACILITY AND WITHIN 10 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN TRAVEL LANE USING ROADWAY STANDARD DRAWING NO. 1101.02 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.

- 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 TRAFFIC CONTROL PLANS, ROADWAY STANDARD DRAWINGS, OR AS DIRECTED BY THE ENGINEER. CONDUCT THE WORK SO THAT ALL PERSONNEL AND/OR EQUIPMENT REMAIN WITHIN THE CLOSED TRAVEL LANE.
- 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.

PAVEMENT EDGE DROP OFF REQUIREMENTS

- F) 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.

- G) 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 FT IN ADVANCE AND A MINIMUM OF EVERY HALF MILE THROUGHOUT THE UNEVEN AREA.

TRAFFIC PATTERN ALTERATIONS

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

SIGNING

- I) 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.
- J) PROVIDE SIGNING AND DEVICES REQUIRED TO CLOSE THE ROAD ACCORDING TO THE ROADWAY STANDARD DRAWINGS AND TRAFFIC CONTROL PLANS.

PROVIDE SIGNING REQUIRED FOR THE OFF-SITE DETOUR ROUTE AS SHOWN IN THE TRAFFIC CONTROL PLANS.
- K) COVER OR REMOVE ALL SIGNS AND DEVICES REQUIRED TO CLOSE THE ROAD WHEN ROAD CLOSURE IS NOT IN OPERATION.

COVER OR REMOVE ALL SIGNS REQUIRED FOR THE OFF-SITE DETOUR WHEN THE DETOUR IS NOT IN OPERATION.
- M) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.

TRAFFIC CONTROL DEVICES

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

PAVEMENT MARKINGS AND MARKERS

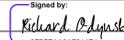
- O) INSTALL TEMPORARY PAVEMENT MARKINGS AND TEMPORARY PAVEMENT MARKERS ON INTERIM LAYERS OF PAVEMENT AS FOLLOWS:

ROAD NAME	MARKING	MARKER
ALL ROADS	PAINT	NONE
- P) 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.
- Q) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.
- R) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS BY THE END OF EACH DAY'S OPERATION.

PHASING NOTES

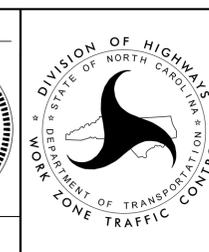
- STEP 1: USING ROADWAY STANDARD DRAWING NO. 1101.03, SHEET 1 OF 9, AND SHEET TMP-04, INSTALL ROAD CLOSURE AND DETOUR SIGNS FOR STOKES FERRY RD. COVER SIGNS UNTIL DETOUR IS READY FOR OPERATION.
- STEP 2: WHEN DETOUR IS READY UNCOVER SIGNS AND CLOSE STOKES FERRY RD. CONSTRUCT STRUCTURE AND ROADWAY IMPROVEMENTS ALONG STOKES FERRY RD.
- STEP 3: REMOVE ROAD CLOSURE DEVICES AND SIGNS ONCE CONSTRUCTION IS COMPLETE. OPEN STOKES FERRY RD. TO TRAFFIC.

5/6/2025
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APPROVED: 
DATE: 5/6/2025

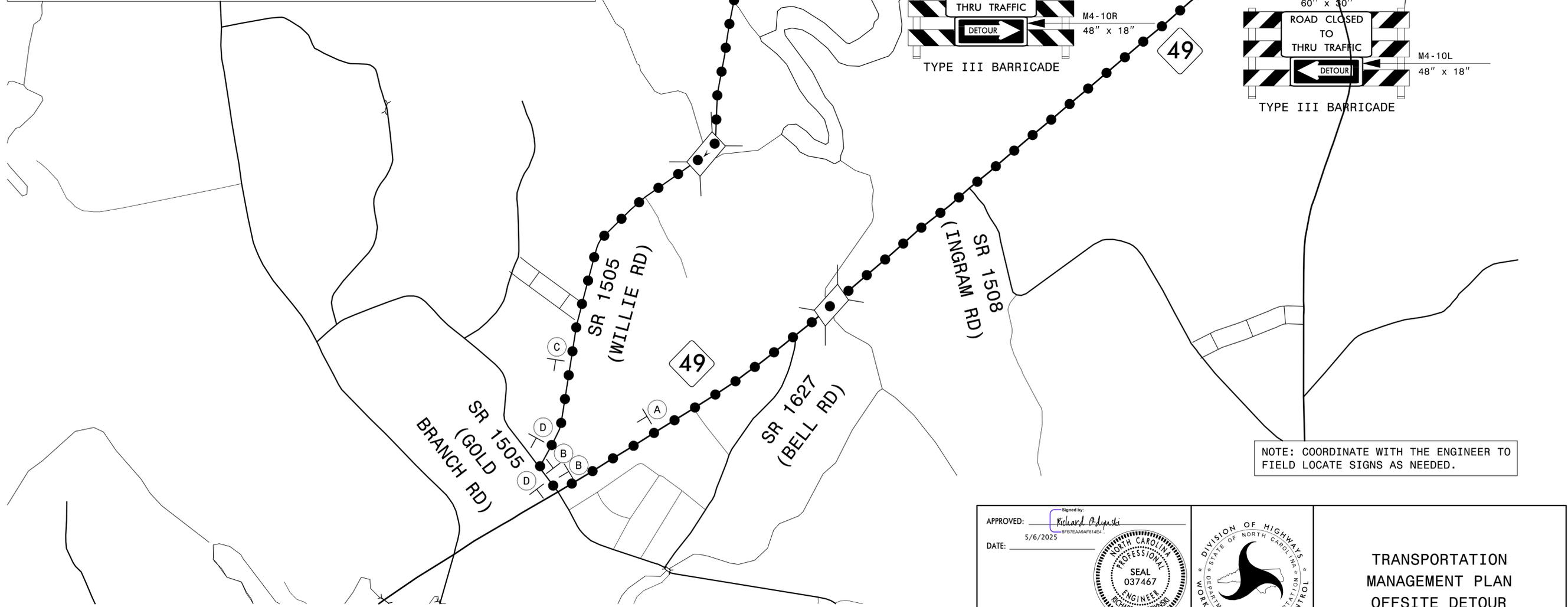

 RICHARD A. ODINSON
 ENGINEER
 SEAL
 037467
 NORTH CAROLINA PROFESSIONAL ENGINEERS

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



TRANSPORTATION
MANAGEMENT PLAN
GENERAL NOTES AND
WRITTEN PHASING

STOKES FERRY RD SP-01 48" X 12" DETOUR M4-8 24" X 12" M5-1 21" X 15" (A)	STOKES FERRY RD SP-01 48" X 12" DETOUR M4-8 24" X 12" M6-1 21" X 15" (B)	STOKES FERRY RD SP-01 48" X 12" DETOUR M4-8 24" X 12" M5-1 L 21" X 15" (C)	STOKES FERRY RD SP-01 48" X 12" DETOUR M4-8 24" X 12" M6-1 L 21" X 15" (D)
STOKES FERRY RD SP-01 48" X 12" DETOUR M4-8 24" X 12" M6-3 21" X 15" (E)	END DETOUR M4-8 A 24" X 18" (F)	ROAD CLOSED AHEAD W20-3 48" X 48" (G)	DETOUR AHEAD W20-2 48" X 48" (H)
ROAD CLOSED 500 FT W20-3 48" X 48" (J)	ROAD CLOSED AHEAD W20-3 48" X 48" (K)	ROAD CLOSED AHEAD W20-3 48" X 48" (L)	ROAD CLOSED 1000 FT W20-3 48" X 48" (I)
	NEXT LEFT SP-4L 42" X 12" (K)	NEXT RIGHT SP-4R 42" X 12" (L)	



NOTE: COORDINATE WITH THE ENGINEER TO FIELD LOCATE SIGNS AS NEEDED.

APPROVED: *Richard Adamski*
 DATE: 5/6/2025

Seal: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 037467 RICHARD A. ADAMSKI

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



TRANSPORTATION MANAGEMENT PLAN OFFSITE DETOUR ROUTE SIGNING

5/6/2025
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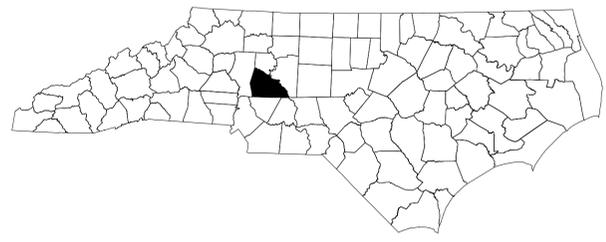
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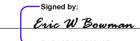
PROJECT: BP9.R012

CONTRACT:

**STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION**

**PAVEMENT MARKING PLANS
ROWAN COUNTY**



TIP NO. BP9.R012	SHEET NO. PMP - 1
APPROVED:  DATE: 6/4/2025	
SEAL 	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

GENERAL NOTES

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

- A) INSTALL PAVEMENT MARKINGS AND PAVEMENT MARKERS ON THE FINAL SURFACE AS FOLLOWS:

ROAD NAME	MARKING	MARKER
ALL	THERMOPLASTIC	NONE
BRIDGE	THERMOPLASTIC	NONE
- B) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.
- C) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS.
- D) PASSING ZONES WILL BE DETERMINED IN THE FIELD AND MUST BE APPROVED BY THE ENGINEER.
- E) SEE ROADWAY PLANS FOR GUARD/GUIDE RAIL DETAILS.

INDEX

SHEET NO.	DESCRIPTION
PMP - 1	TITLE SHEET, INDEX, GENERAL NOTES & ROADWAY STANDARD DRAWINGS
PMP - 2	PROPOSED PAVEMENT MARKING PLAN SHEET

ROADWAY STANDARD DRAWING

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

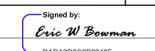
STD. NO.	TITLE
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTILANE ROADWAYS
1205.12	PAVEMENT MARKINGS - BRIDGES
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL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



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

PLAN PREPARED BY:

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

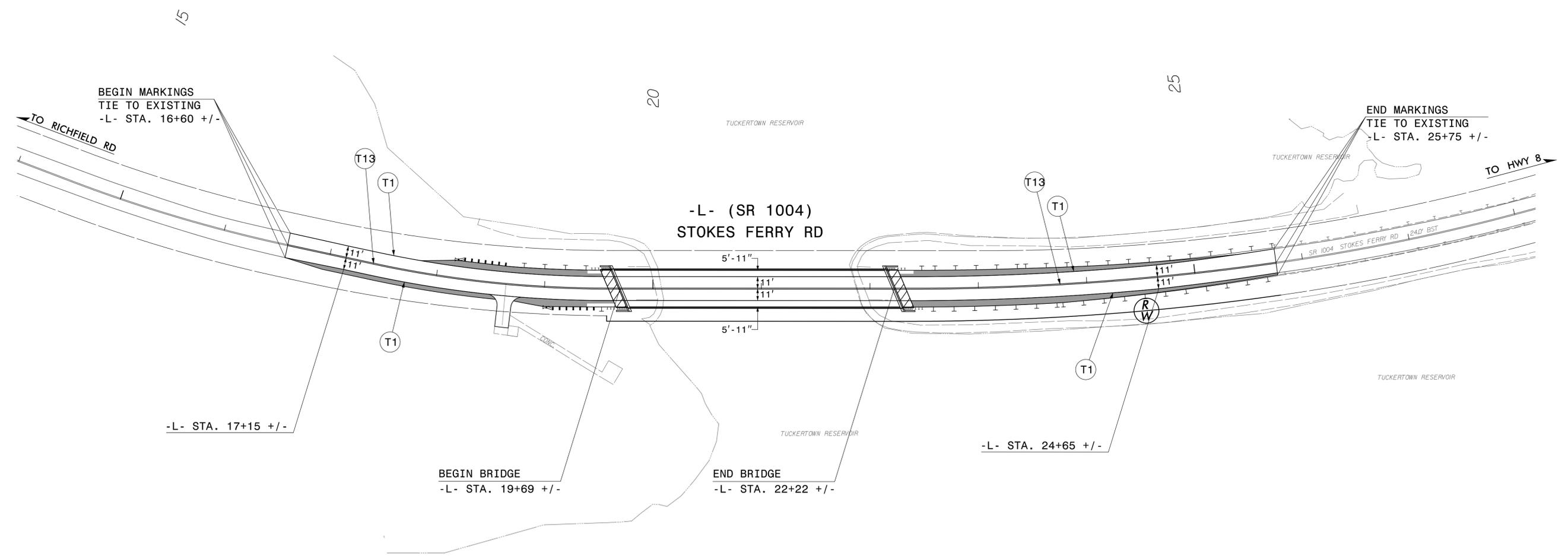
TIP NO. BP9.R012	SHEET NO. PMP-2
APPROVED:  DATE: 6/4/2025	
SEAL 	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

PAVEMENT MARKING SCHEDULE
TIP PROJECT # BP9.R012

SYMBOL	DESCRIPTION
	THERMOPLASTIC (4", 90 MIL.)
T1	WHITE EDGELINE
T13	YELLOW DOUBLE CENTER LINE

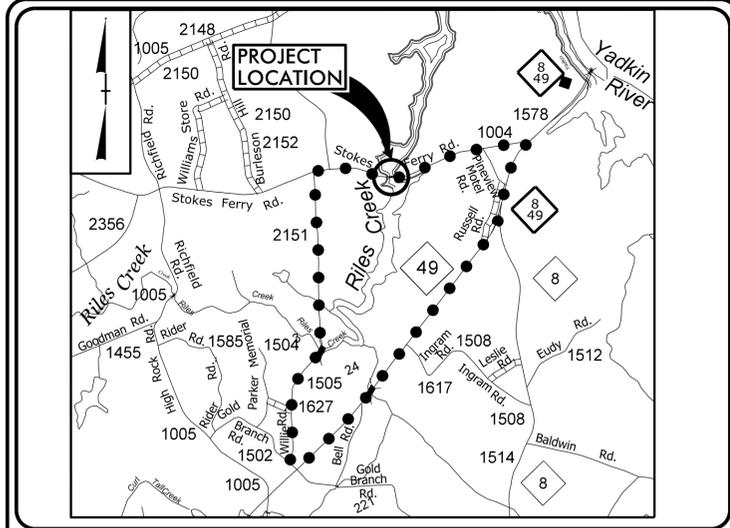


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**PAVEMENT MARKING
PLAN SHEET**

TIP PROJECT: BP9-R012



VICINITY MAP
NOT TO SCALE

●●● DETOUR ROUTE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

ROWAN COUNTY

**LOCATION: REPLACE BRIDGE #108 ON SR 1004
(STOKES FERRY RD) OVER TUCKERTOWN RESERVOIR**

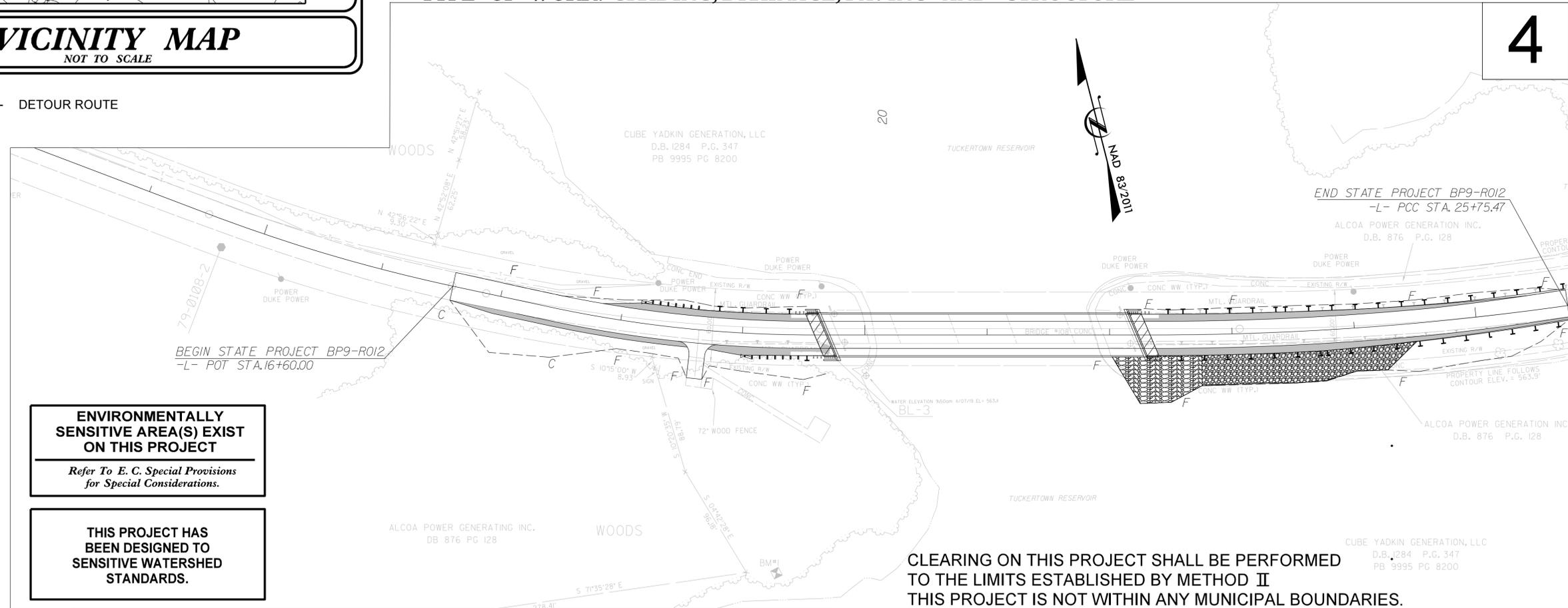
TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP9-R012	EC-1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	

HIGH QUALITY WATER(S) EXIST ON THIS PROJECT

High Quality Water Zone(s) Exist
From Sta. Begin
to Sta. End
Refer To E. C. Special Provisions for Special Considerations.

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

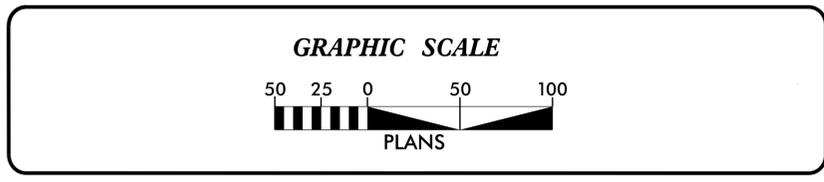


ENVIRONMENTALLY SENSITIVE AREA(S) EXIST ON THIS PROJECT

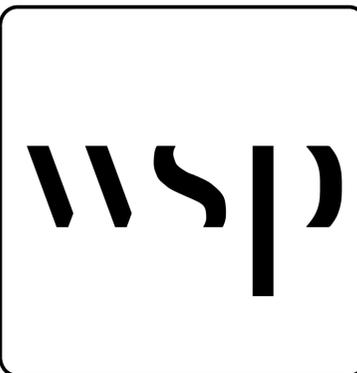
Refer To E. C. Special Provisions for Special Considerations.

THIS PROJECT HAS BEEN DESIGNED TO SENSITIVE WATERSHED STANDARDS.

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II
THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.



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



WSP

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

Designed by:

Cameron Baker, PE 4384
NAME LEVEL III CERTIFICATION NO.

Roadway Standard Drawings

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

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

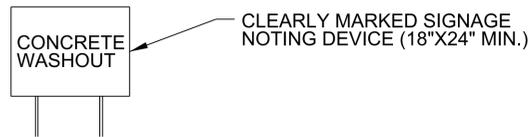
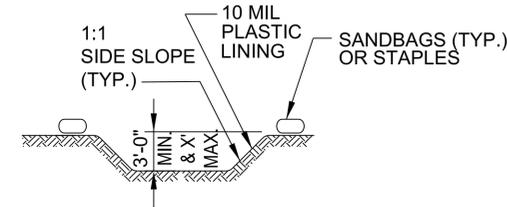
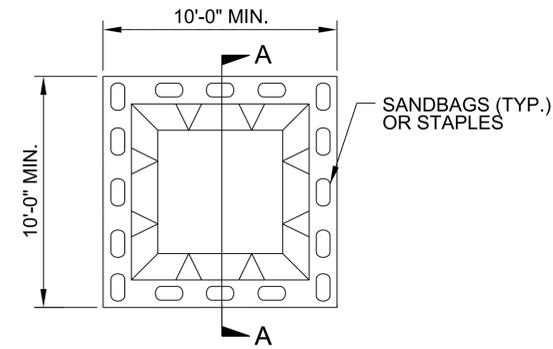
PROJECT REFERENCE NO. BP9-012	SHEET NO. EC-1A
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

EROSION & SEDIMENT CONTROL LEGEND

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

PROJECT REFERENCE NO.	SHEET NO.
BP9.R012	EC-2A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

ONSITE CONCRETE WASHOUT STRUCTURE WITH LINER



SECTION A-A

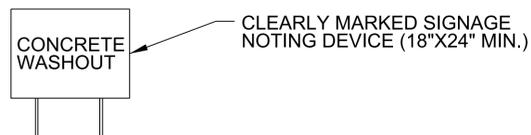
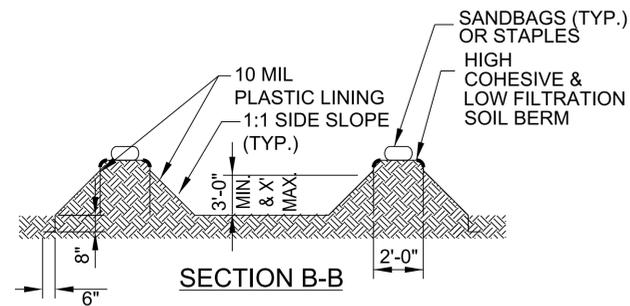
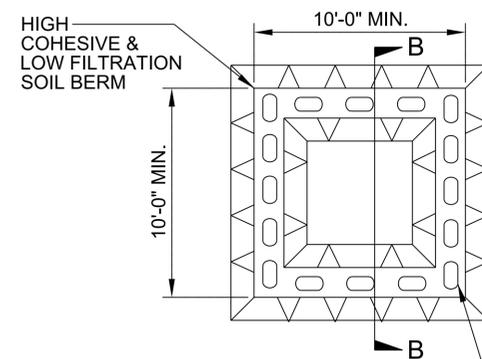
NOTES:

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

PLAN

BELOW GRADE WASHOUT STRUCTURE

NOT TO SCALE



NOTES:

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

PLAN

ABOVE GRADE WASHOUT STRUCTURE

NOT TO SCALE

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

PROJECT REFERENCE NO. <i>BP9-R012</i>	SHEET NO. <i>EC-3</i>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

SOIL STABILIZATION TIMEFRAMES

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

8/17/99

PLANS PREPARED BY:

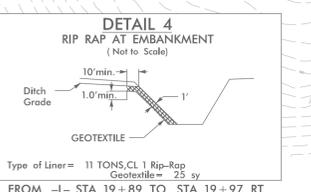
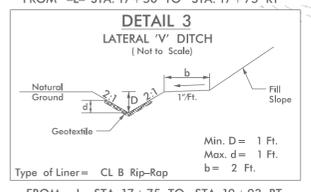
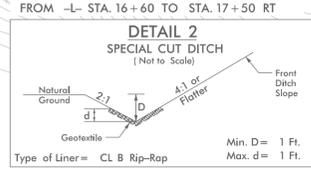
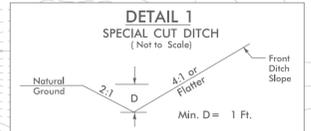
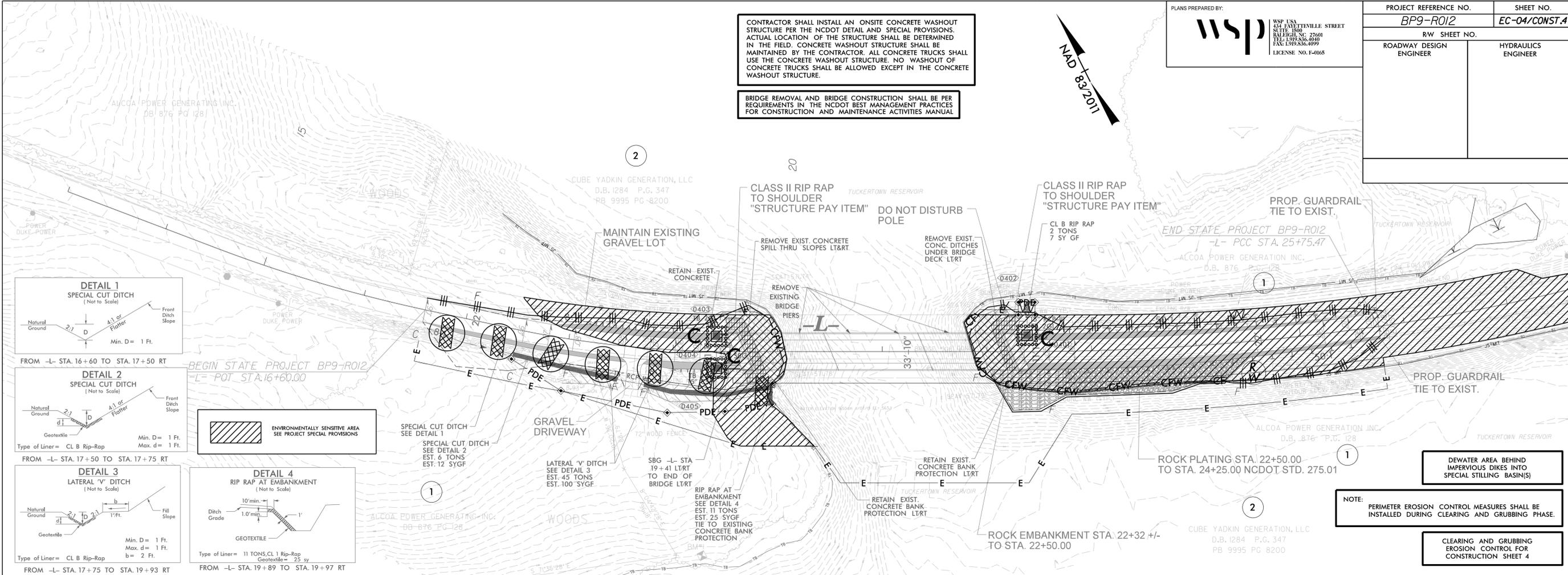
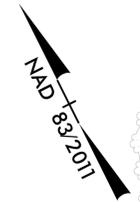


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LICENSE NO. F-0165

PROJECT REFERENCE NO. BP9-R012	SHEET NO. EC-04/CONST.4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

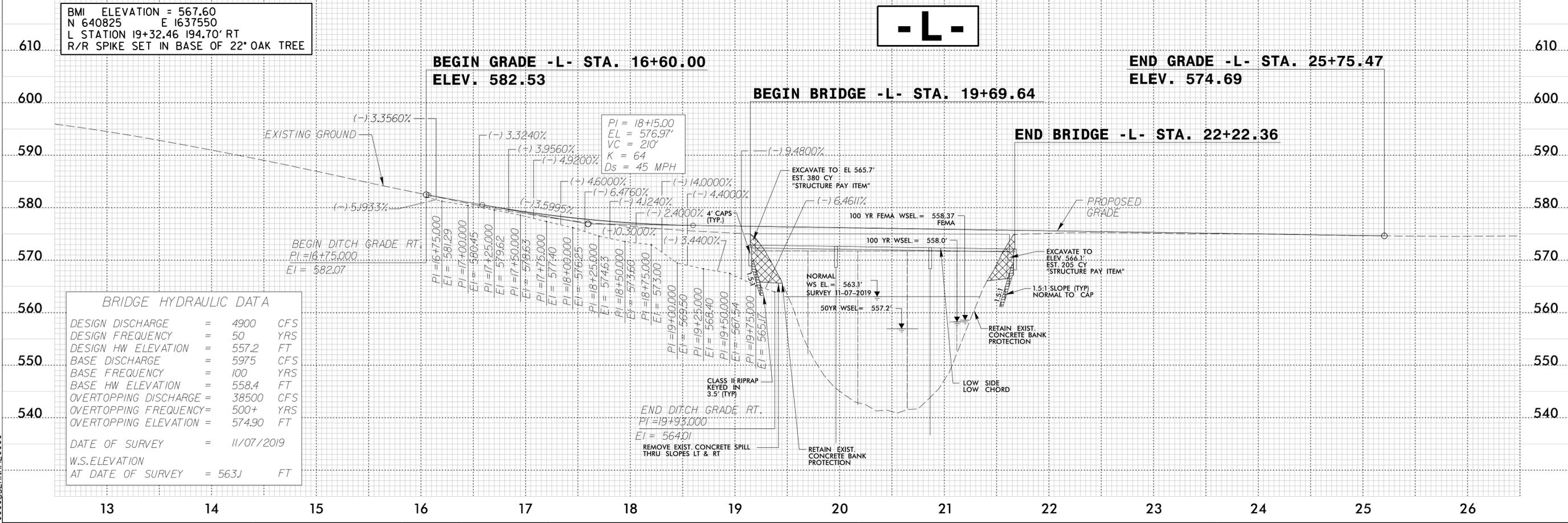
CONTRACTOR SHALL INSTALL AN ONSITE CONCRETE WASHOUT STRUCTURE PER THE NCDOT DETAIL AND SPECIAL PROVISIONS. ACTUAL LOCATION OF THE STRUCTURE SHALL BE DETERMINED IN THE FIELD. CONCRETE WASHOUT STRUCTURE SHALL BE MAINTAINED BY THE CONTRACTOR. ALL CONCRETE TRUCKS SHALL USE THE CONCRETE WASHOUT STRUCTURE. NO WASHOUT OF CONCRETE TRUCKS SHALL BE ALLOWED EXCEPT IN THE CONCRETE WASHOUT STRUCTURE.

BRIDGE REMOVAL AND BRIDGE CONSTRUCTION SHALL BE PER REQUIREMENTS IN THE NCDOT BEST MANAGEMENT PRACTICES FOR CONSTRUCTION AND MAINTENANCE ACTIVITIES MANUAL



ENVIRONMENTALLY SENSITIVE AREA
SEE PROJECT SPECIAL PROVISIONS

BMI ELEVATION = 567.60
N 640825 E 1637550
L STATION 19+32.46 194.70' RT
R/R SPIKE SET IN BASE OF 22' OAK TREE

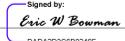


DEWATER AREA BEHIND IMPERVIOUS DIKES INTO SPECIAL STILLING BASIN(S)

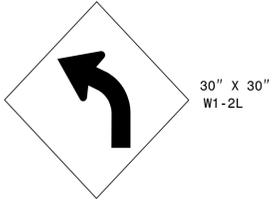
NOTE: PERIMETER EROSION CONTROL MEASURES SHALL BE INSTALLED DURING CLEARING AND GRUBBING PHASE.

CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 4

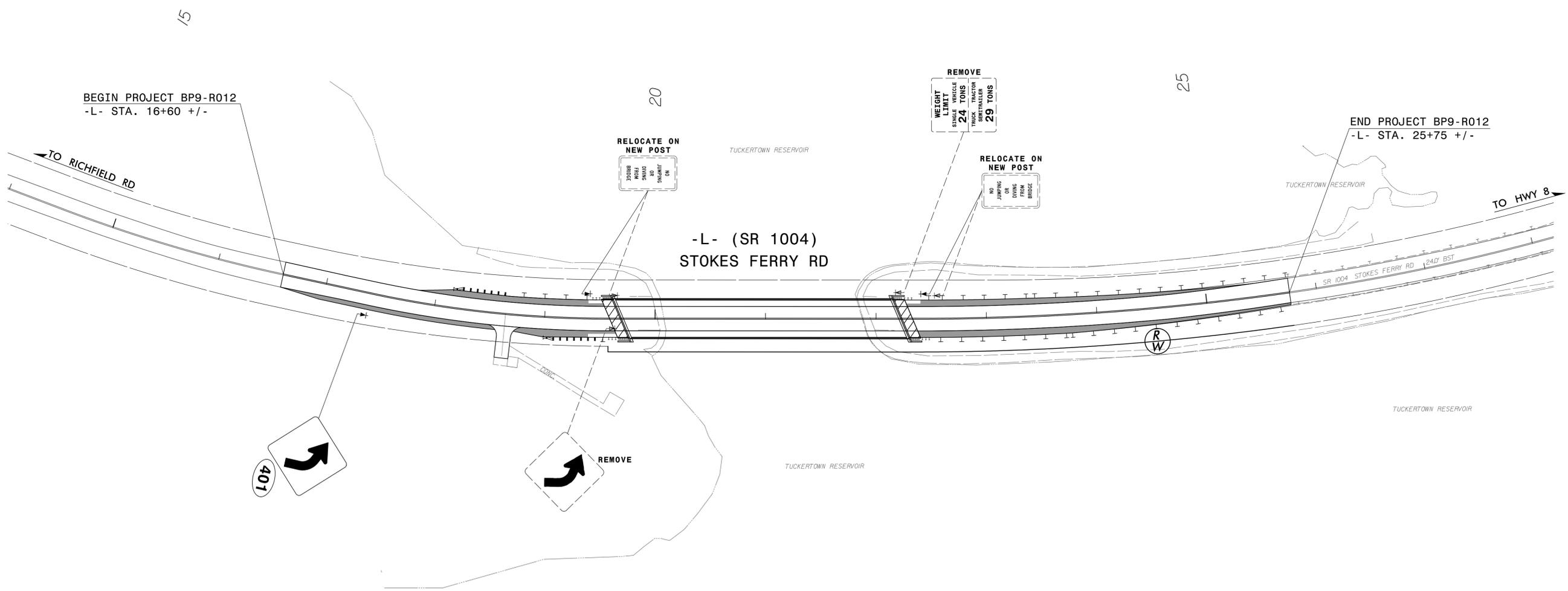
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TIP NO. BP9.R012	SHEET NO. SIGN-2
APPROVED:  DATE: 6/4/2025	
SEAL 	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

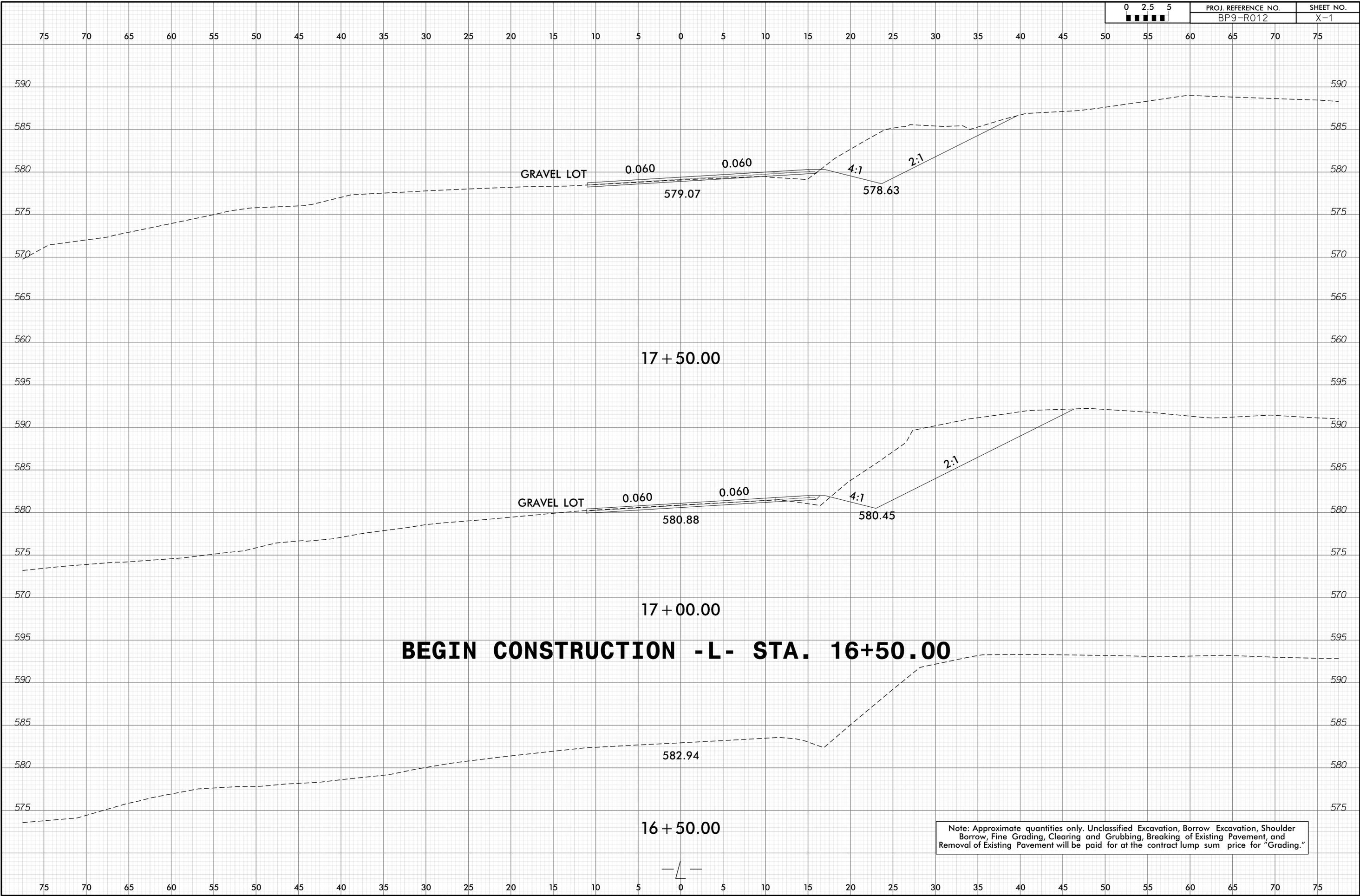
401 QUANTITY REQ'D 1

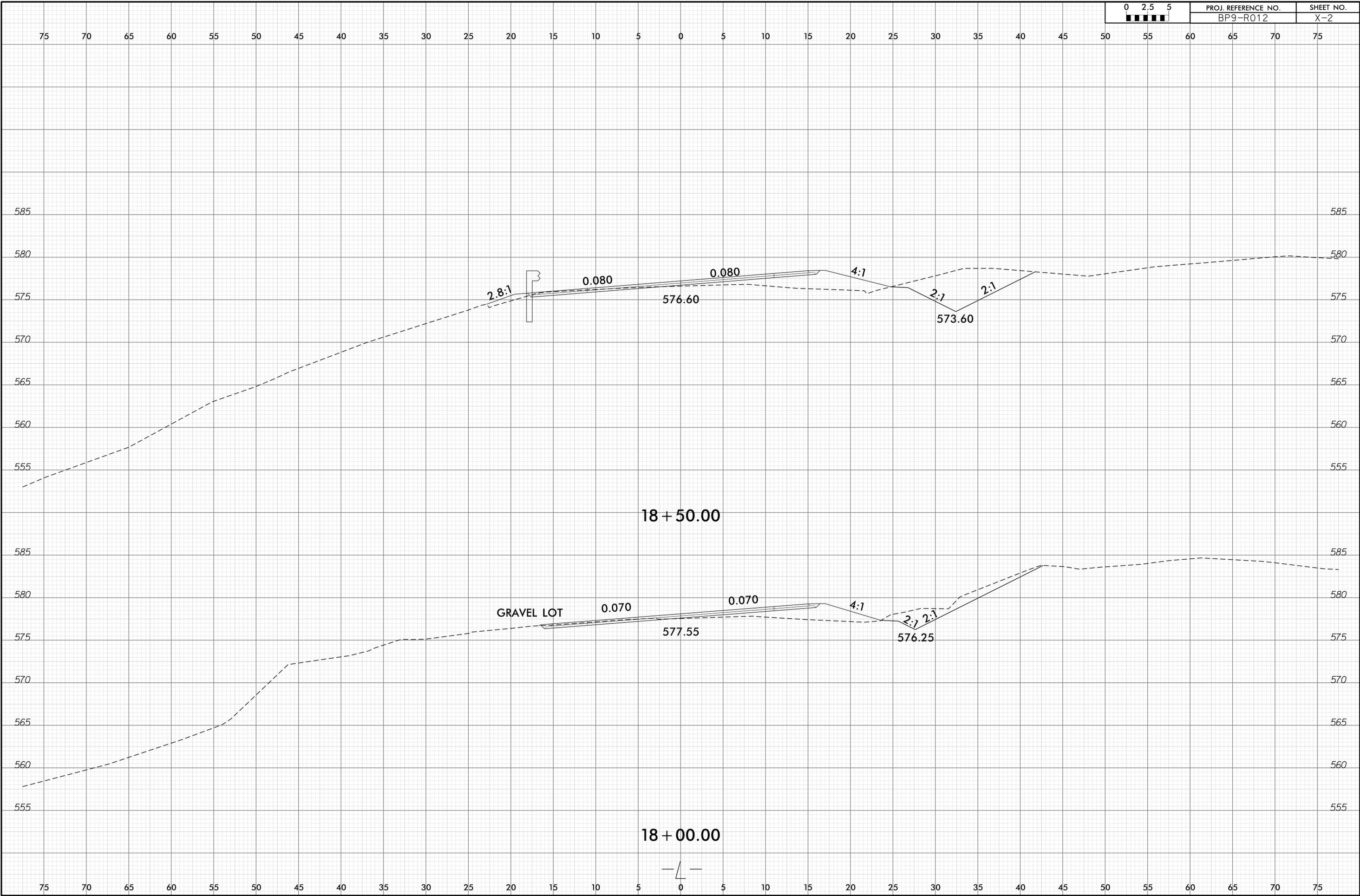


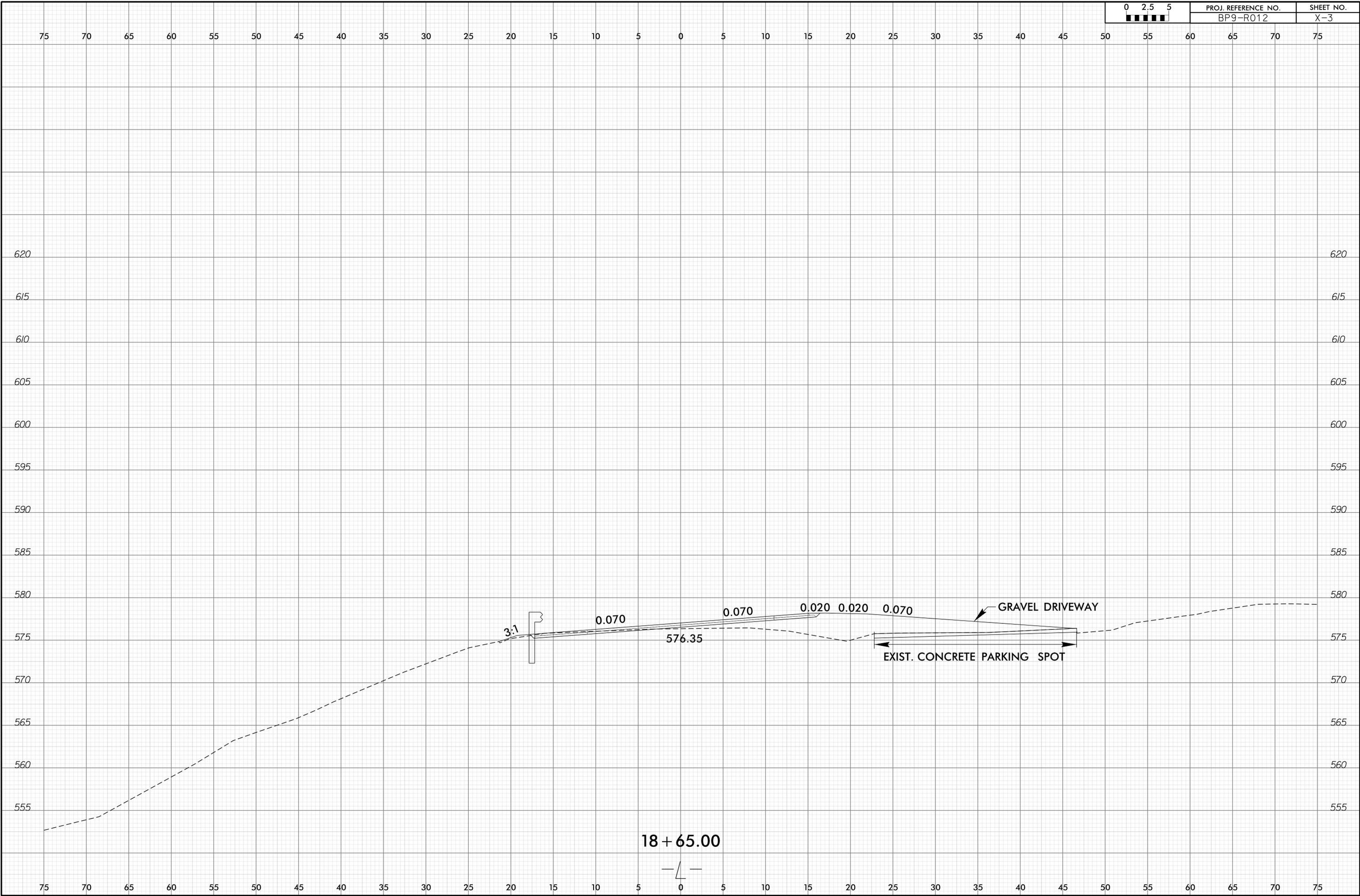
ONE "U" POST PER SIGN



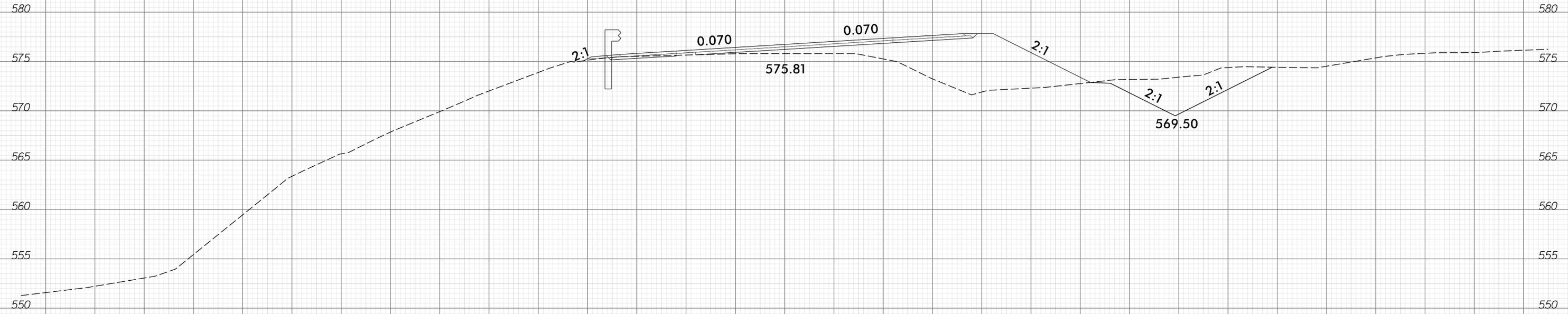
**SIGNING
PLAN SHEET**



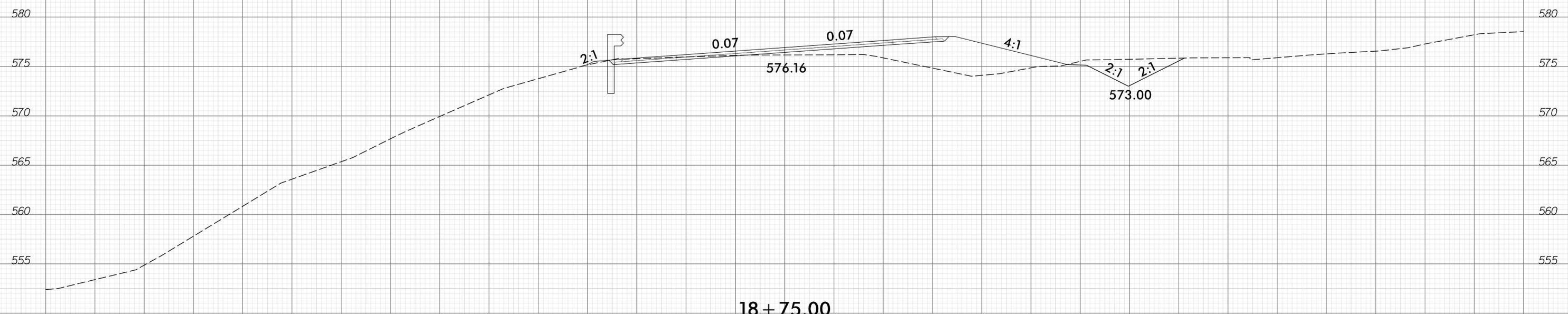




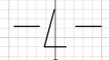
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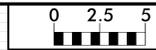


19 + 00.00

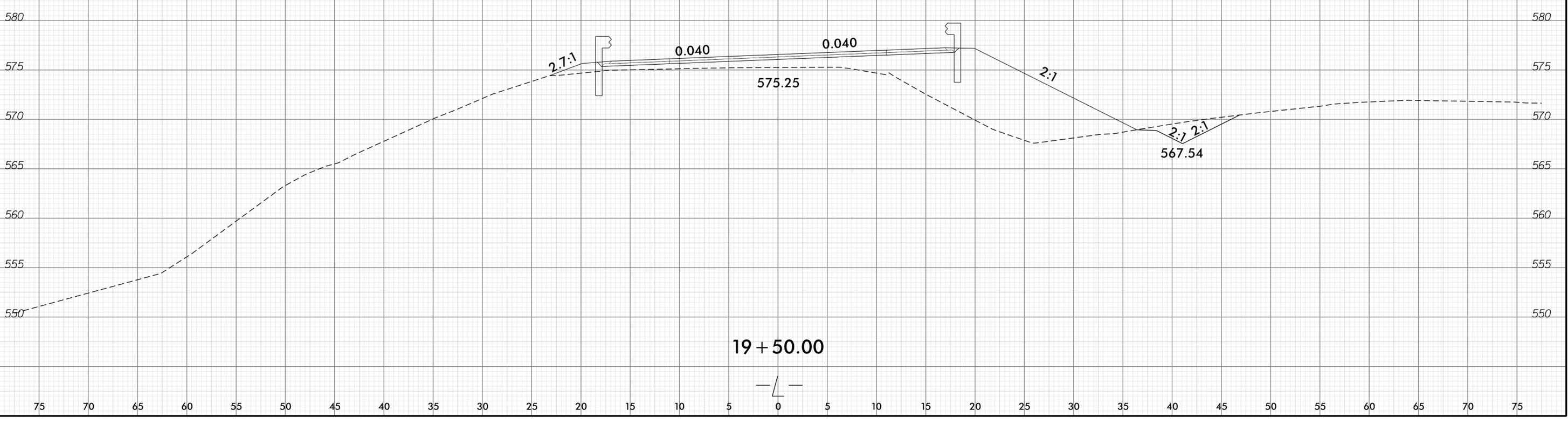
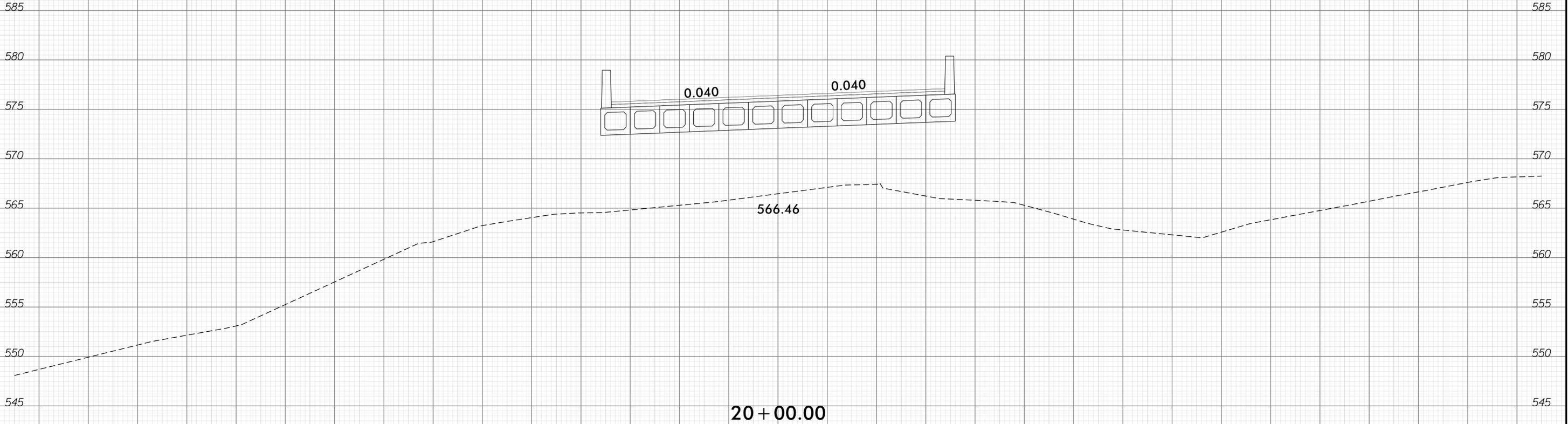


18 + 75.00





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585 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 75 585

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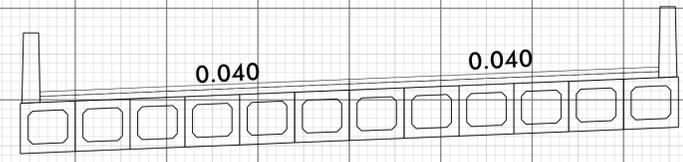
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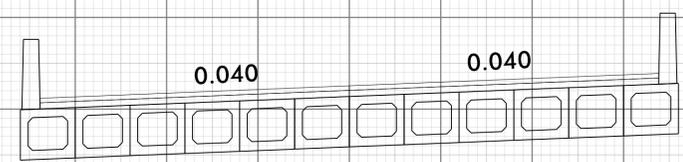
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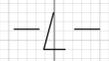
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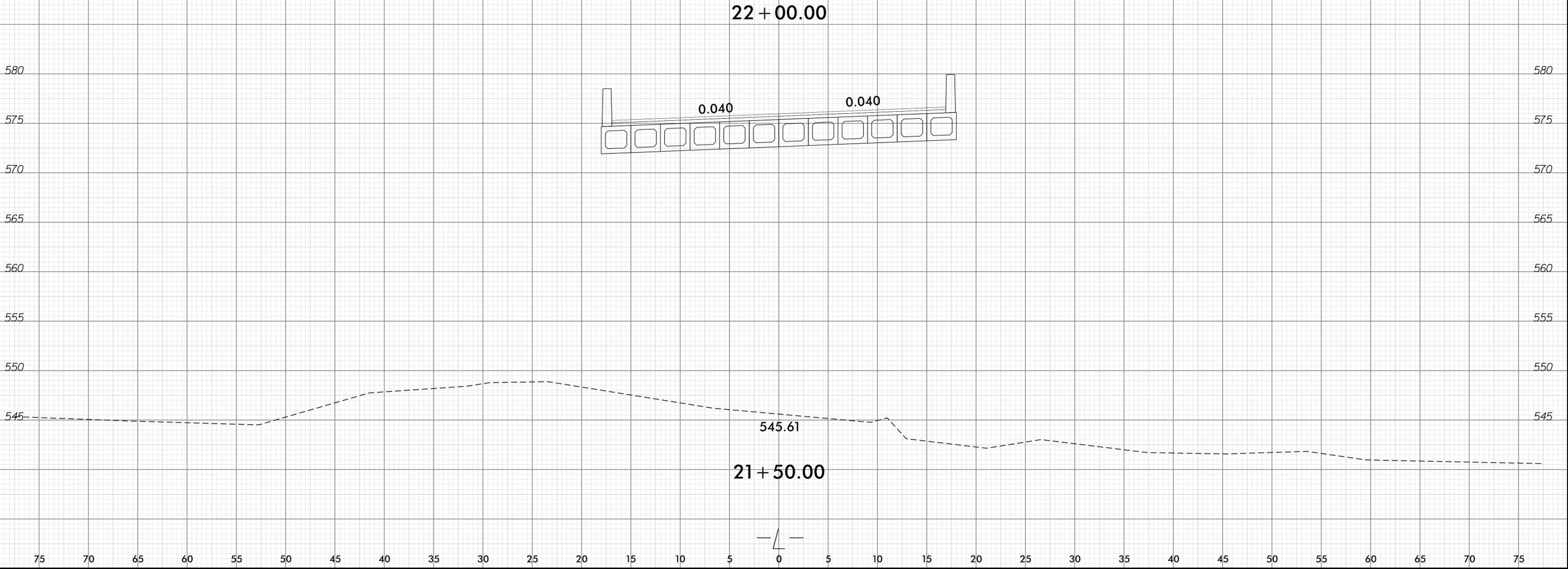
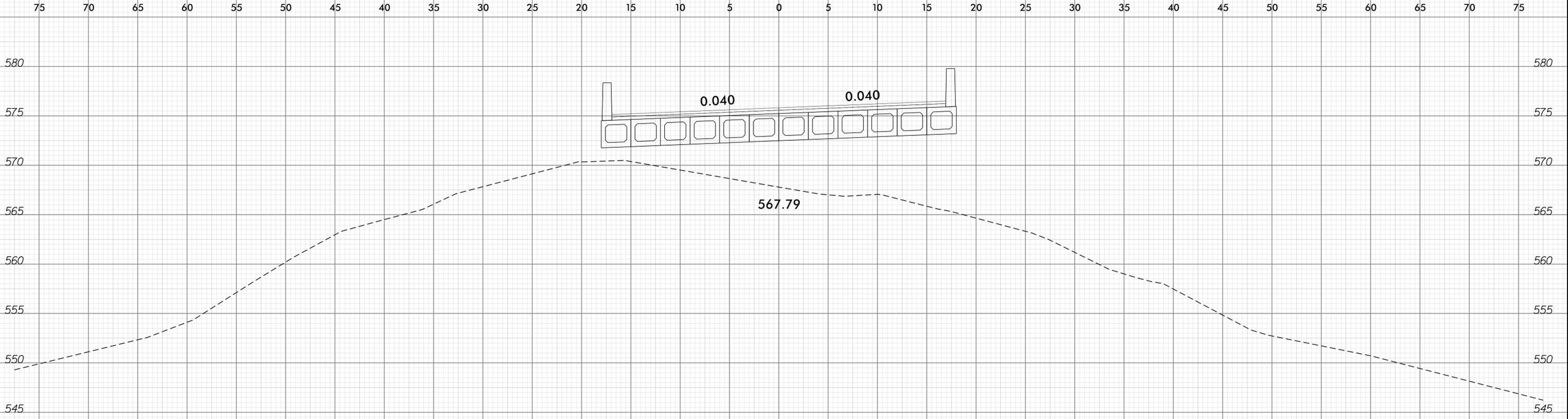


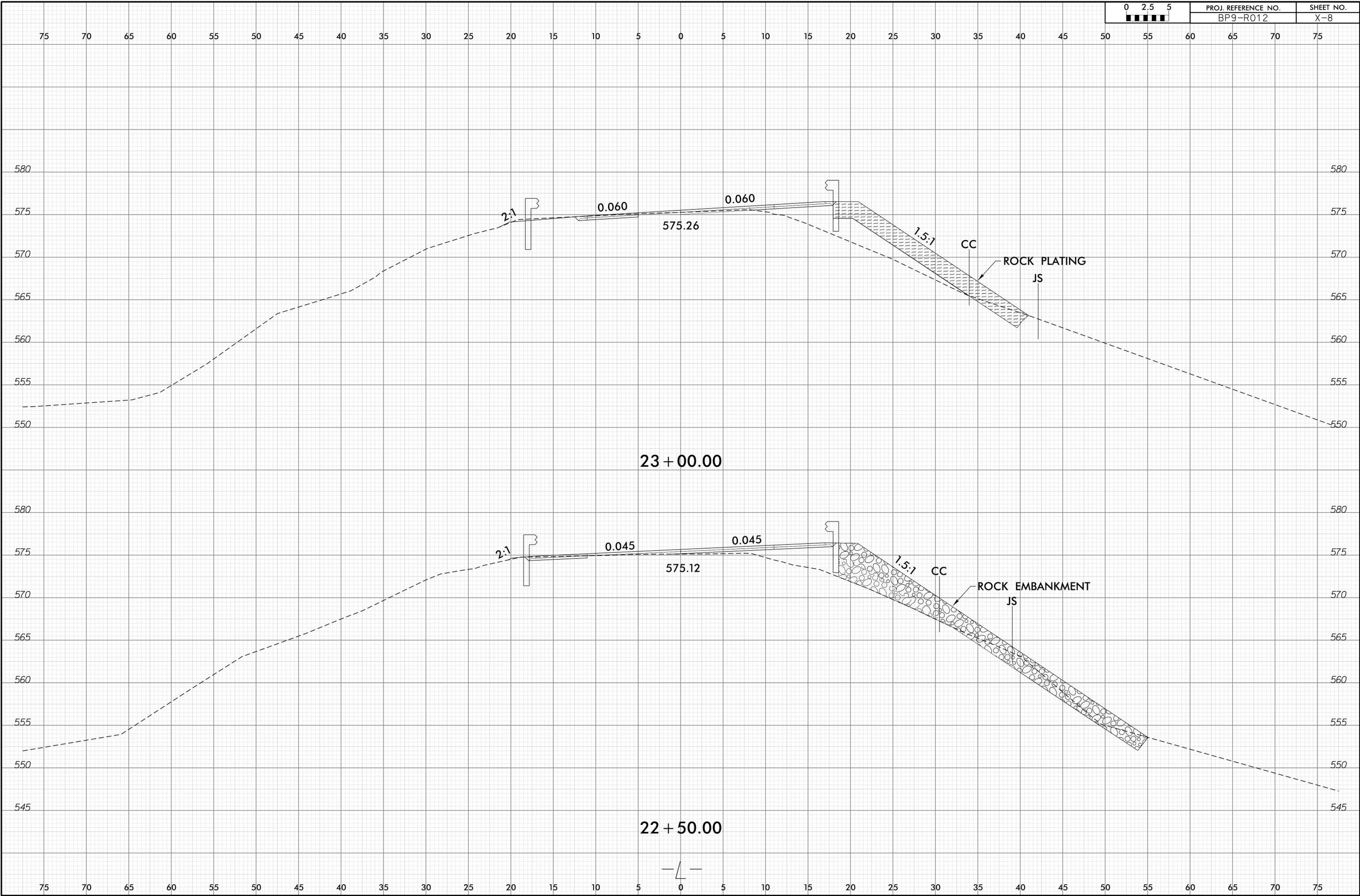
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21 + 00.00

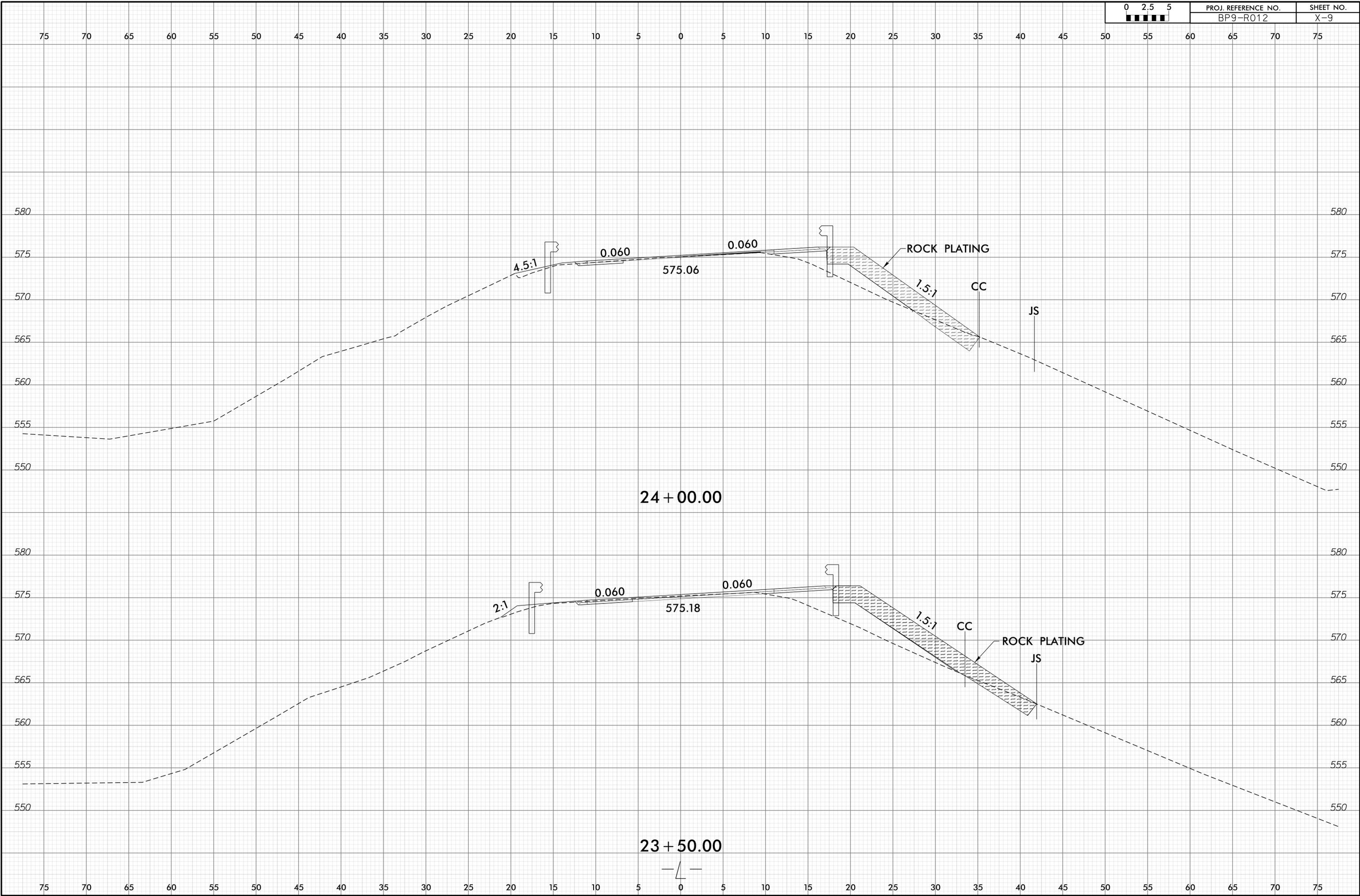


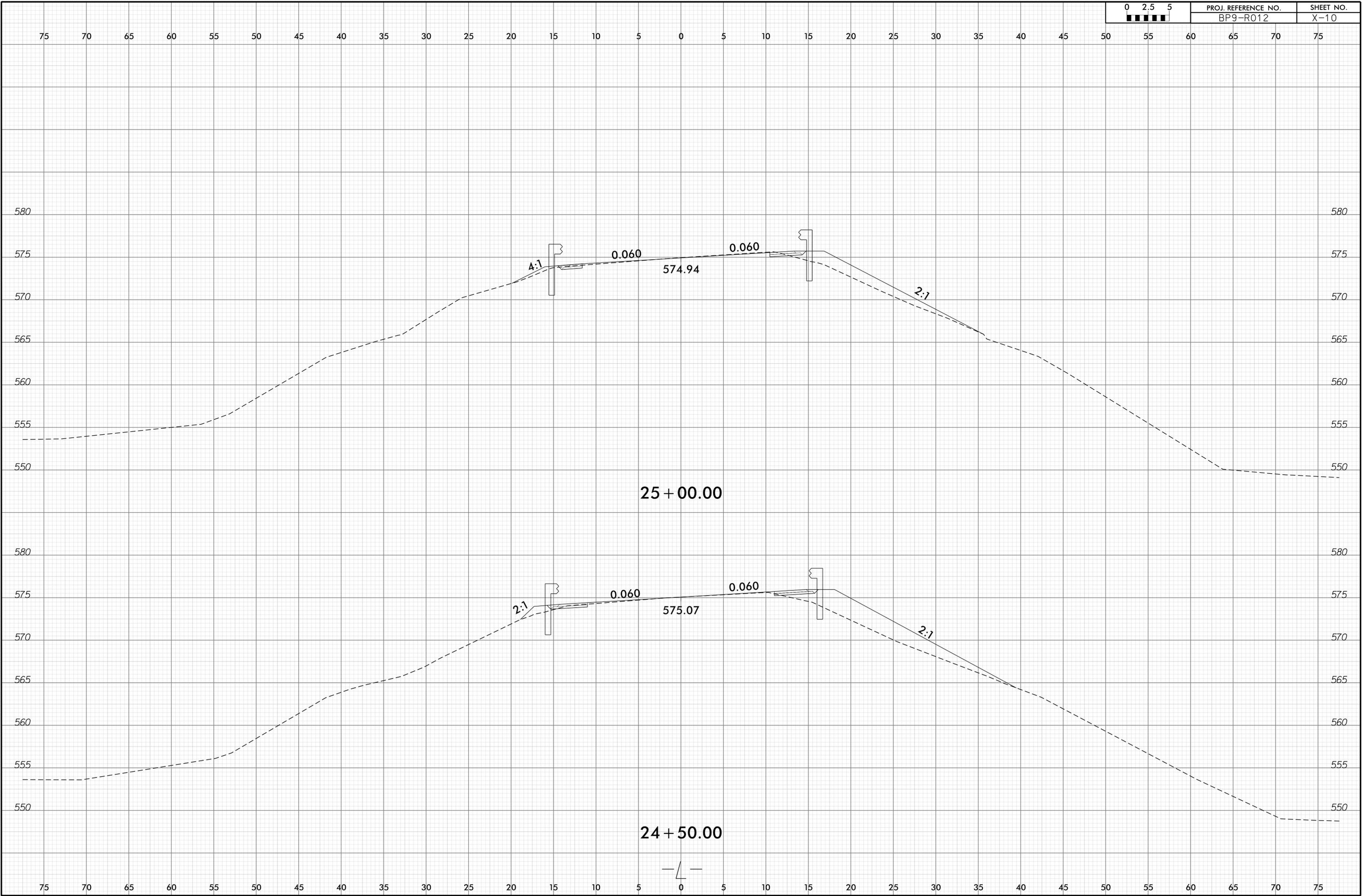
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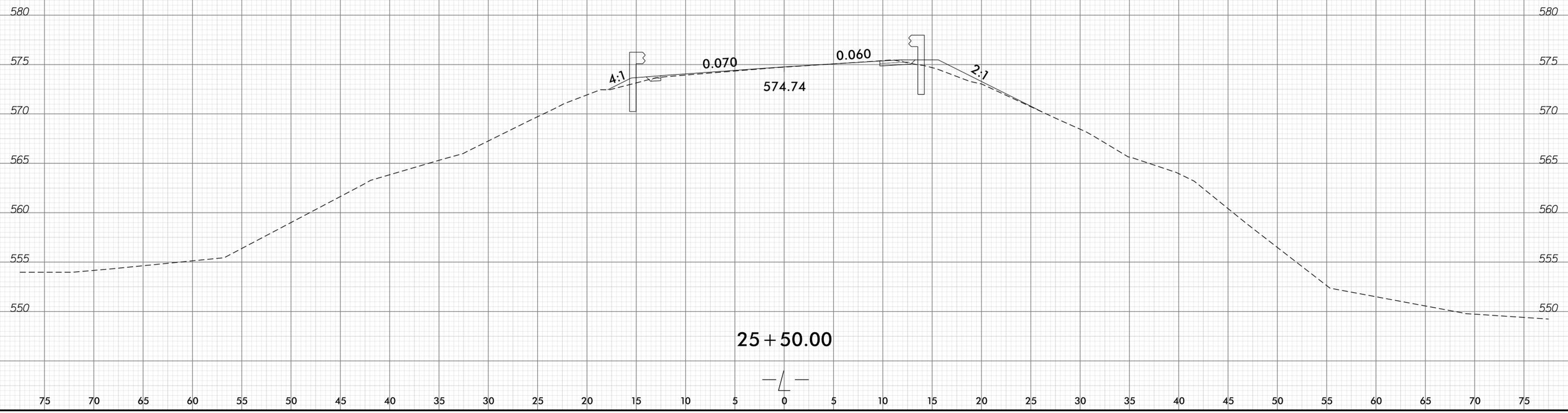




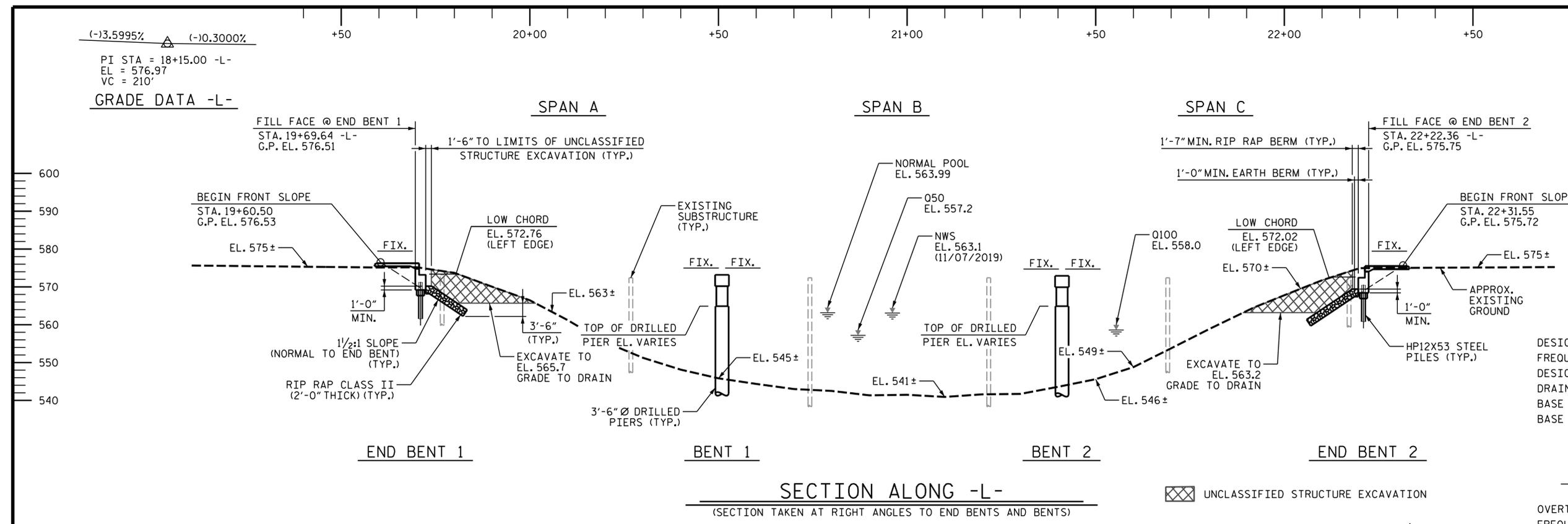


75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

END PROJECT 25+75.47



(-13.5995% (-)0.3000%
 PI STA = 18+15.00 -L-
 EL = 576.97
 VC = 210'
GRADE DATA -L-

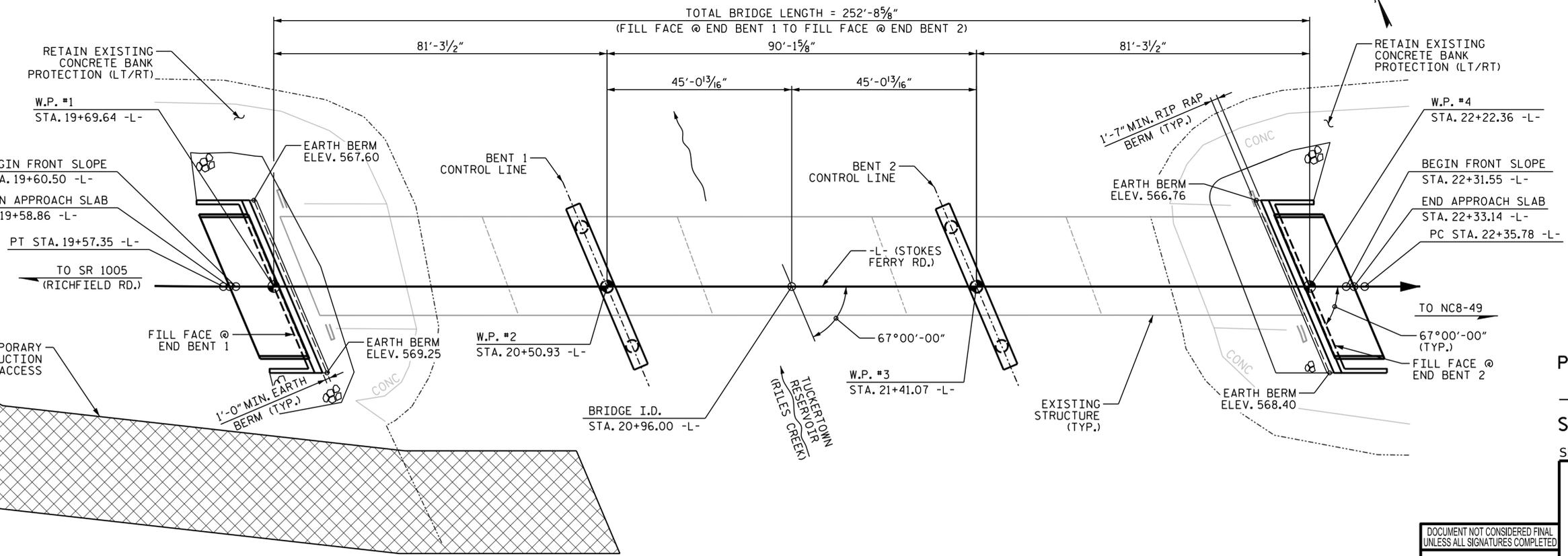


HYDRAULIC DATA

DESIGN DISCHARGE	4900 CFS
FREQUENCY OF DESIGN FLOOD	50 YRS.
DESIGN HIGH WATER ELEVATION	557.2
DRAINAGE AREA	27.97 SQ.MI.
BASE DISCHARGE (Q100)	5975 CFS
BASE HIGH WATER ELEVATION	558.4

OVERTOPPING FLOOD DATA

OVERTOPPING FLOOD DISCHARGE	38,500 CFS
FREQUENCY OF OVERTOPPING FLOOD	500+ YRS.
OVERTOPPING FLOOD ELEVATION	574.9
@ APPROX. STA. 25+40.00 -L-	



I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

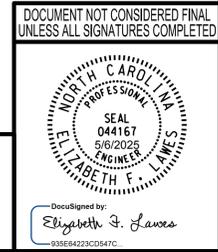
HORIZONTAL CURVE DATA

P.I. = 18+49.53 -L-	P.I. = 24+05.91 -L-
Δ = 12°-06'-38.2" (LT)	Δ = 8°-06'-34.6" (LT)
D = 5°-35'-43.0"	D = 2°-23'-14.4"
L = 216.44'	L = 339.69'
T = 108.63'	T = 170.13'
R = 1,024.00'	R = 2,400.00'

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

PROJECT NO. **BP9-R012**
ROWAN COUNTY
 STATION: **20+96.00 -L-**
 SHEET 1 OF 4 REPLACES BRIDGE 790108

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 BRIDGE OVER TUCKERTOWN
 RESERVOIR ON SR 1004 (STOKES
 FERRY RD.) BETWEEN SR 1005
 AND NC 8-49

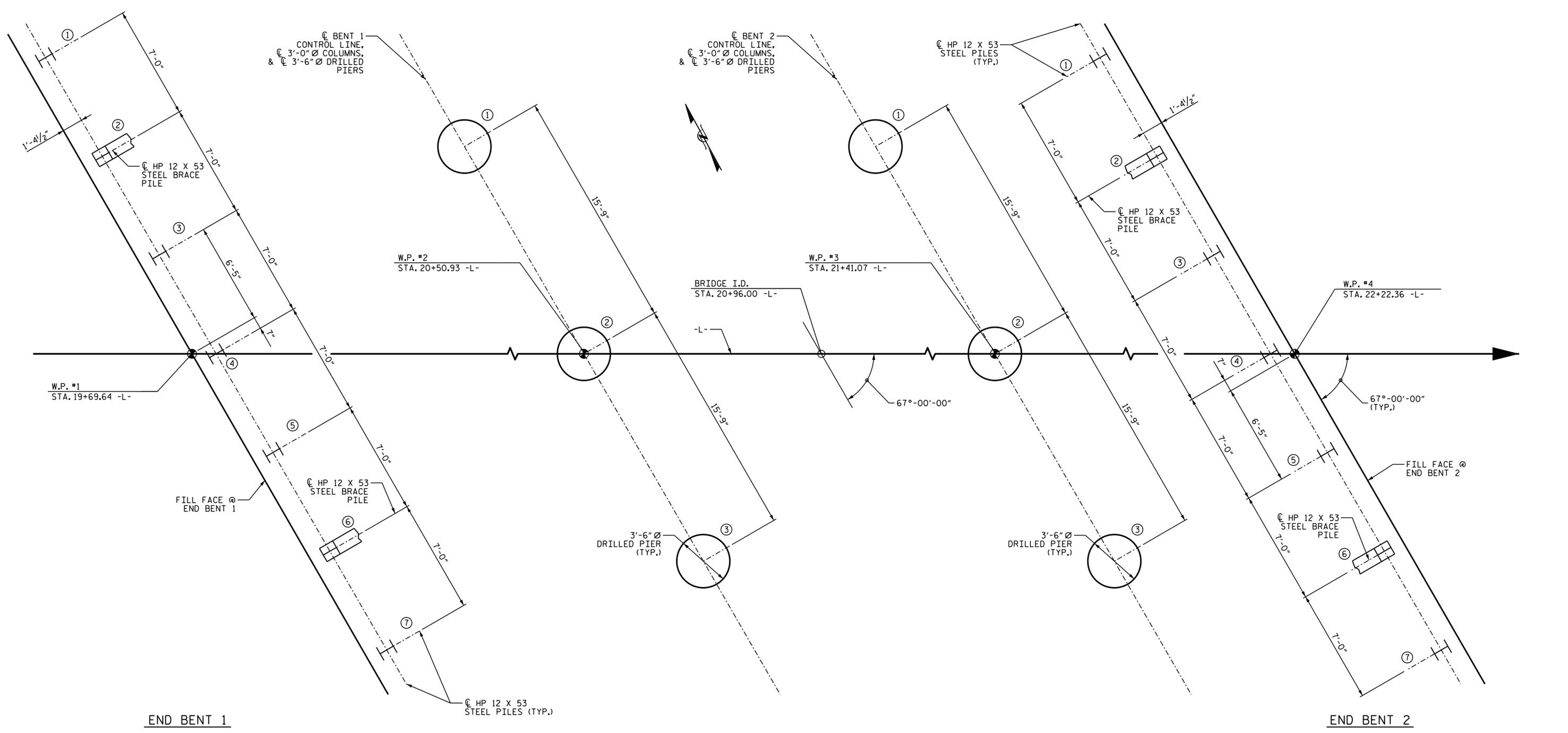


wsp
 WSP USA Inc.
 434 FAYETTEVILLE STREET
 SUITE 1500
 RALEIGH, NC 27601
 TEL: 1.919.836.4040
 LICENSE NO. F-0165

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

S-1
 TOTAL SHEETS
 24

DESIGNED BY: A. D'AIUTO DATE: MAY 2024
 DRAWN BY: A. D'AIUTO DATE: MAY 2024
 CHECKED BY: E. LAWES DATE: JUNE 2024
 DESIGN ENGINEER OF RECORD: E. LAWES DATE: JUNE 2024



FOUNDATION LAYOUT
 DIMENSIONS LOCATING PILES AND DRILLED PIERS ARE SHOWN TO THE CENTERLINE

PROJECT NO. **BP9-R012**
ROWAN COUNTY
 STATION: **20+96.00 -L-**
 SHEET 2 OF 4

NOTES
 FOR SUMMARY OF PILE AND DRILLED PIER INFORMATION, SEE SHEET 3 OF 4.

DESIGNED BY:	A. D'AIUTO	DATE:	MAY 2024
DRAWN BY:	A. D'AIUTO	DATE:	MAY 2024
CHECKED BY:	E. LAWES	DATE:	JUNE 2024
DESIGN ENGINEER OF RECORD:	E. LAWES	DATE:	JUNE 2024

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

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STATE OF NORTH CAROLINA
 PROFESSIONAL ENGINEER
 SEAL 044167
 5/6/2025
 ELIZABETH F. LAWES

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 BRIDGE OVER TUCKERTOWN RESERVOIR ON SR 1004 (STOKES FERRY RD.) BETWEEN SR 1005 AND NC 8-49

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

TOTAL SHEETS: 24

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")	Factored Resistance per Pile TONS	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		
					Min Pile Tip (Tip No Higher Than) Elev FT	Required Driving Resistance (RDR)** per Pile TONS	Total Pile Redrives Quantity EACH	Predrilling Length per Pile Lin FT	Predrilling Elevation (Elev Not To Predrill Below) FT	Maximum Predrilling Dia INCHES	Pile Excavation (Bottom of Hole) Elev FT	Pile Exc Not In Soil per Pile Lin FT	Pile Exc In Soil per Pile Lin FT
End Bent 1, Piles 1-3	105	See Substructure Plans	30			175							
End Bent 1, Piles 4-7	105		35			175							
End Bent 2, Piles 1-7	105		35			175							

*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.

**RDR = $\frac{\text{Factored Resistance} + \text{Factored Downdrag Load} + \text{Factored Dead Load}}{\text{Dynamic Resistance Factor}} + \frac{\text{Nominal Downdrag Resistance} + \text{Nominal Scour Resistance}}{\text{Scour Resistance Factor}}$

SUMMARY OF PDA/PILE ORDER LENGTHS

(Blank entries indicate item is not applicable to structure)

Pile Driving Analyzer (PDA)				Pile Order Lengths	
End Bent/ Bent No	PDA Testing Required? YES or MAYBE	PDA Test Pile Length FT	Total PDA Testing Quantity EACH	End Bent/ Bent No(s)	Pile Order Length Basis* EST or PDA
End Bent 1, Piles 1-7	MAYBE		1		
End Bent 2, Piles 1-7	MAYBE				

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

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 TONS	Factored Downdrag Load per Pile TONS	Factored Dead Load* per Pile TONS	Dynamic Resistance Factor	Nominal Downdrag Resistance per Pile TONS	Nominal Scour Resistance per Pile TONS	Scour Resistance Factor (Default = 1.00)
End Bent 1, Piles 1-7	102			0.60			1.00
End Bent 2, Piles 1-7	102			0.60			1.00

*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 Required? YES or MAYBE	Steel Pile Points			Steel Pile Tips Required? YES
		Pipe Pile Cutting Shoes Required? YES	Pipe Pile Conical Points Required? YES	H-Pile Points Required? YES	
End Bent 1, Piles 1-7				Yes	
End Bent 2, Piles 1-7				Yes	
TOTAL QTY:				14	

SUMMARY OF DRILLED PIER INFORMATION/INSTALLATION

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pier(s) #(-#) (e.g., "Bent 1, Piers 1-3")	Factored Resistance per Pier TONS	Minimum Pier Tip (Tip No Higher Than) Elevation FT	Required Tip Resistance per Pier TSF	Scour Critical Elevation FT	Minimum Drilled Pier Penetration Into Rock per Pier Lin FT	Drilled Pier Length* per Pier Lin FT	Drilled Pier Length Not In Soil* per Pier Lin FT	Drilled Pier Length In Soil* per Pier Lin FT	Permanent Steel Casing Required? YES or MAYBE	Permanent Steel Casing Tip Elevation (Elev Not To Extend Casing Below) FT	Permanent Steel Casing Length** per Pier Lin FT
Bent No. 1, Pier 1	380	512.5	5	537	10.0	51.8			YES	536.8	27.5
Bent No. 1, Pier 2	380	512.5	5	537	10.0	51.7			YES	536.8	27.3
Bent No. 1, Pier 3	380	528.5	5	539	10.0	35.8			YES	538.7	25.5
Bent No. 2, Pier 1	380	523.0	5	538	15.0	41.3			YES	538.1	26.2
Bent No. 2, Pier 2	380	517.0	5	536	15.0	47.2			YES	531.8	32.3
Bent No. 2, Pier 3	380	517.0	5	536	15.0	47.3			YES	531.8	32.4

*Drilled Pier Length, Drilled Pier Length Not in Soil and Drilled Pier Length in Soil represent estimated drilled pier quantities and are measured and paid for as either "___" Dia. Drilled Piers" or "___" Dia. Drilled Piers Not in Soil" and "___" Dia. Drilled Piers in Soil" in accordance with Article 411-7 of the NCDOT Standard Specifications.

**Permanent Steel Casing Length equals the difference between the ground line or top of drilled pier elevation, whichever is higher, and the permanent casing tip elevation and is measured and paid for as "Permanent Steel Casting for ___" Dia. Drilled Pier" in accordance with Article 411-7 of the NCDOT Standard Specifications.

SUMMARY OF DRILLED PIER TESTING

(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No, Pier(s) #(-#) (e.g., "Bent 1, Piers 1-3")	Standard Penetration Test (SPT) Required? YES or MAYBE	Crosshole Sonic Logging (CSL) Required?*	Total CSL Tube Length (For All Tubes) per Pier Lin FT	Shaft Inspection Device (SID) Required? YES or MAYBE	Pile Integrity Test (PIT) Required? MAYBE
Bent No. 1, Pier 1		YES	214.0	YES	
Bent No. 1, Pier 2		YES	213.0	YES	
Bent No. 1, Pier 3		YES	149.0	YES	
Bent No. 2, Pier 1		YES	172.0	YES	
Bent No. 2, Pier 2		YES	195.0	YES	
Bent No. 2, Pier 3		YES	195.0	YES	
TOTAL QTY:		6	1138.0		

*CSL Tubes are required if CSL Testing is or may be required. The number of CSL Tubes per drilled pier is equal to one tube per foot of design pier diameter with at least 4 tubes per pier. The length of each CSL Tube is equal to the drilled pier length plus 1.5 ft.

PROJECT NO. BP9-R012

ROWAN COUNTY

STATION: 20+96.00 -L-

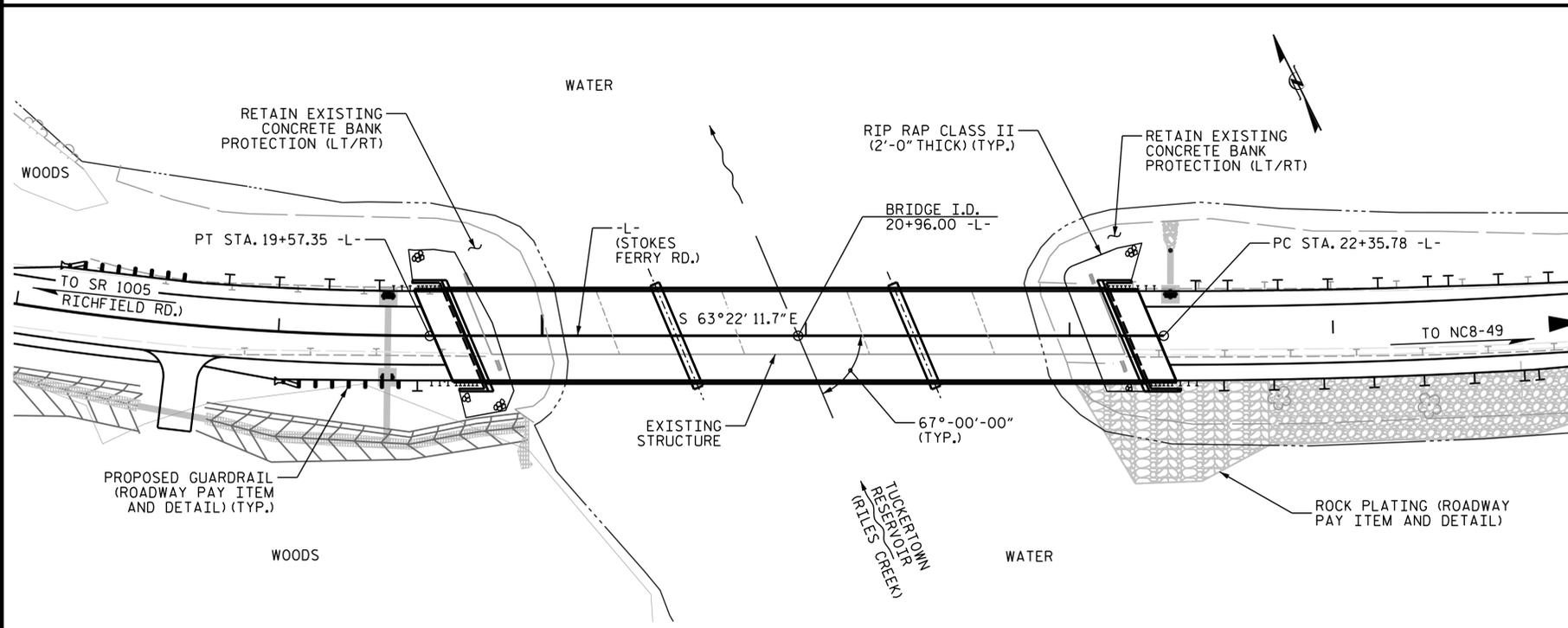
SHEET 3 OF 4

NOTES:

- The Pile and Drilled Pier Foundation Tables are based on the bridge substructure design and foundation recommendations sealed by a North Carolina Professional Engineer (Kelly de Montbrun, 045542) on 06/04/2024.
- 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.
- The Engineer will determine the need for PDA Testing, Pipe Pile Plates, Permanent Steel Casing, SPTs, CSL Testing, SID Inspections and PITs when these items may be required.

 Documented by: <i>Elizabeth F. Laves</i> SIGNATURE DATE	STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH		PILE AND DRILLED PIER FOUNDATION TABLES		SHEET NO. S-3 TOTAL SHEETS 24
	REVISIONS				
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	NO. 1	BY:	DATE:	NO. 3	DATE:
	2			4	

BM #1: STA. 19+32.46 -L-, 194.70' RT., EL. 567.60 RR SPIKE IN BASE OF 22" OAK TREE



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 OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
- 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. 20+96.00 -L-".
- THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA ON SHEET S-1 SHALL BE EXCAVATED FOR A DISTANCE OF 32 FT. LEFT AND 29 FT. RIGHT OF CENTERLINE ROADWAY AT END BENT 1 AND 35 FT. LEFT AND 18 FT. RIGHT OF CENTERLINE ROADWAY AT END BENT 2 AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.
- THE EXISTING STRUCTURE CONSISTING OF FIVE SPANS: 1 @ 47'-10"; 3 @ 47'-6"; AND 1 @ 47'-10" WITH A REINFORCED CONCRETE DECK ON STEEL I-BEAMS AND A 24'-0" CLEAR ROADWAY WIDTH ON REINFORCED CONCRETE CAPS ON H-PILES AT END BENTS AND REINFORCED CONCRETE POST AND BEAMS AT INTERIOR BENTS AND LOCATED AT EXISTING STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED FOR LOAD LIMIT. DURING CONSTRUCTION OF THE PROPOSED BRIDGE, THE EXISTING BRIDGE SHALL BE CLOSED TO TRAFFIC AND SHALL REMAIN CLOSED TO TRAFFIC FOR THE DURATION OF THE BRIDGE REPLACEMENT WORK.

AT THE CONTRACTOR'S OPTION, AND UPON REMOVAL OF THE CAUSEWAY, THE CLASS II RIP RAP USED IN THE CAUSEWAY MAY BE PLACED AS RIP RAP SLOPE PROTECTION. SEE SPECIAL PROVISIONS FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STATION 19+69.64 -L-.

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

THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH "HEC-18 - EVALUATING SCOUR AT BRIDGES."

THE SCOUR CRITICAL ELEVATION FOR BENT NO. 1 IS ELEVATION 540.0 FT AND 538.5 FT FOR BENT NO. 2. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

ASPHALT WEARING SURFACE IS INCLUDED IN THE ROADWAY QUANTITY ON ROADWAY PLANS.

FOR SECURING OF VESSELS, SEE SPECIAL PROVISIONS.

FOR ASBESTOS ASSESSMENT, SEE SPECIAL PROVISIONS.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

TOTAL BILL OF MATERIAL

	CONSTRUCTION, MAINTENANCE & REMOVAL OF TEMP ACCESS	REMOVAL OF EXISTING STRUCTURE @ STA. 20+96.00 -L-	ASBESTOS ASSESSMENT	3'-6" DIA. DRILLED PIERS	PERMANENT STEEL CASING FOR 3'-6" DIA. DRILLED PIERS	SID INSPECTIONS	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL
	LUMP SUM	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	EACH	EACH	LUMP SUM	CU. YDS.	LUMP SUM	LBS.
SUPERSTRUCTURE										LUMP SUM	
END BENT 1								LUMP SUM	28.5		4020
BENT 1				139.3	80.4				25.8		10280
BENT 2				135.8	90.9				25.6		9594
END BENT 2								LUMP SUM	28.5		4020
TOTAL	LUMP SUM	LUMP SUM	LUMP SUM	275.1	171.3	6	6	LUMP SUM	108.4	LUMP SUM	27914

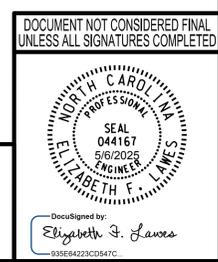
TOTAL BILL OF MATERIAL CONT.

	SPIRAL COLUMN REINFORCING STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	HP 12 X 53 STEEL PILES	STEEL PILES POINTS	DYNAMIC PILE TESTING	VERTICAL CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" X 2'-9" PRESTRESSED CONCRETE BOX BEAMS	
	LBS.	No.	No.	LIN. FT.	No.	EA.	TONS	SQ. YDS.	LUMP SUM	No.	LIN. FT.
SUPERSTRUCTURE									LUMP SUM	36	3000
END BENT 1		7	7	230	7		146	162			
BENT 1	3290										
BENT 2	3215										
END BENT 2		7	7	245	7		143	159			
TOTAL	6505	14	14	475	14	1	500.00	321	LUMP SUM	36	3000

PROJECT NO. **BP9-R012**
ROWAN COUNTY
 STATION: **20+96.00 -L-**

SHEET 4 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 BRIDGE OVER TUCKERTOWN
 RESERVOIR ON SR 1004 (STOKES
 FERRY RD.) BETWEEN SR 1005
 AND NC 8-49



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

DESIGNED BY: A. D'AIUTO DATE: MAY 2024
 DRAWN BY: A. D'AIUTO DATE: MAY 2024
 CHECKED BY: E. LAWES DATE: JUNE 2024
 DESIGN ENGINEER OF RECORD: E. LAWES DATE: JUNE 2024

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

S-4
 TOTAL SHEETS
 24

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

LOAD FACTORS:

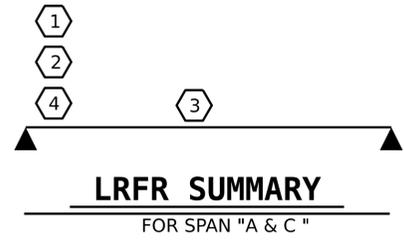
DESIGN LOAD RATING FACTORS	LIMIT STATE	YDC	YDW
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

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:
NCDOT STANDARD LRFR SUMMARY TABLES FOR 80' BOX BEAM WITH 60 AND 75 DEGREE SKEWS ARE SIMILAR. BOX BEAMS FOR BOTH SKEWS HAVE THE SAME STRAND PATTERN AND CONCRETE STRENGTH, THEREFORE THE CONTROLLING LRFR FOR 60 DEGREE SKEW HAS BEEN SHOWN FOR THIS PROJECT WHICH HAS A 67 DEGREE SKEW.

#	CONTROLLING LOAD RATING
1	DESIGN LOAD RATING (HL-93)
2	DESIGN LOAD RATING (HS-20)
3	LEGAL LOAD RATING **
4	EMERGENCY VEHICLE LOAD RATING **
** SEE CHART FOR VEHICLE TYPE	
GIRDER LOCATION	
I - INTERIOR GIRDER	
EL - EXTERIOR LEFT GIRDER	
ER - EXTERIOR RIGHT GIRDER	



PROJECT NO. **BP9-R012**
ROWAN COUNTY
 STATION: **20+96.00 -L-**

DESIGNED BY: A. D'AIUTO DATE: MAY 2024
 DRAWN BY: A. D'AIUTO DATE: MAY 2024
 CHECKED BY: E. LAWES DATE: JUNE 2024
 DESIGN ENGINEER OF RECORD: E. LAWES DATE: JUNE 2024

DRAWN BY: TMG II/II REV. 06/23 AKP/AAI
 CHECKED BY: AAC II/II

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

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

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

REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	DATE:	S-5
1			3		TOTAL SHEETS
2			4		24

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS (SEE COMMENTS)																								
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	1.034	--	1.75	0.246	1.63	90'	ER	44.134	0.627	1.03	90'	ER	8.827	0.80	0.246	1.23	90'	ER	44.134		
	HL-93 (OPERATING)	N/A		1.343	--	1.35	0.246	2.11	90'	ER	44.134	0.627	1.34	90'	ER	8.827	N/A	--	--	--	--	--		
	HS-20 (INVENTORY)	36.000	2	1.343	48.336	1.75	0.246	2.21	90'	ER	44.134	0.627	1.34	90'	ER	8.827	0.80	0.246	1.67	90'	ER	44.134		
	HS-20 (OPERATING)	36.000		1.741	62.658	1.35	0.246	2.87	90'	ER	44.134	0.627	1.74	90'	ER	8.827	N/A	--	--	--	--	--		
LEGAL LOAD	SINGLE VEHICLE (SV)	SNSH	13.500		3.909	52.766	1.4	0.246	6.46	90'	ER	44.134	0.627	4.08	90'	ER	8.827	0.80	0.246	3.91	90'	ER	44.134	
		SNGARBS2	20.000		2.857	57.143	1.4	0.246	4.72	90'	ER	44.134	0.627	2.88	90'	ER	8.827	0.80	0.246	2.86	90'	ER	44.134	
		SNAGRIS2	22.000		2.658	58.474	1.4	0.246	4.44	90'	ER	44.134	0.627	2.66	90'	ER	8.827	0.80	0.246	2.68	90'	ER	44.134	
		SNCOTTS3	27.250		1.943	52.958	1.4	0.246	3.21	90'	ER	44.134	0.627	2.04	90'	ER	8.827	0.80	0.246	1.94	90'	ER	44.134	
		SNAGGRS4	34.925		1.603	55.974	1.4	0.246	2.65	90'	ER	44.134	0.627	1.67	90'	ER	8.827	0.80	0.246	1.60	90'	ER	44.134	
		SNS5A	35.550		1.569	55.767	1.4	0.246	2.59	90'	ER	44.134	0.627	1.68	90'	ER	8.827	0.80	0.246	1.57	90'	ER	44.134	
		SNS6A	39.950		1.431	57.149	1.4	0.246	2.36	90'	ER	44.134	0.627	1.53	90'	ER	8.827	0.80	0.246	1.43	90'	ER	44.134	
	SNS7B	42.000		1.362	57.202	1.4	0.246	2.25	90'	ER	44.134	0.627	1.49	90'	ER	8.827	0.80	0.246	1.36	90'	ER	44.134		
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		1.742	57.481	1.4	0.246	2.88	90'	ER	44.134	0.627	1.82	90'	ER	8.827	0.80	0.246	1.74	90'	ER	44.134	
		TNT4A	33.075		1.747	57.786	1.4	0.246	2.89	90'	ER	44.134	0.627	1.78	90'	ER	8.827	0.80	0.246	1.75	90'	ER	44.134	
		TNT6A	41.600		1.420	59.082	1.4	0.246	2.35	90'	ER	44.134	0.627	1.57	90'	ER	8.827	0.80	0.246	1.42	90'	ER	44.134	
		TNT7A	42.000		1.423	59.764	1.4	0.246	2.35	90'	ER	44.134	0.627	1.54	90'	ER	8.827	0.80	0.246	1.42	90'	ER	44.134	
		TNT7B	42.000		1.461	61.373	1.4	0.246	2.42	90'	ER	44.134	0.627	1.46	90'	ER	8.827	0.80	0.246	1.46	90'	ER	44.134	
		TNAGRIT4	43.000		1.398	60.120	1.4	0.246	2.31	90'	ER	44.134	0.627	1.42	90'	ER	8.827	0.80	0.246	1.40	90'	ER	44.134	
TNAGT5A		45.000		1.322	59.491	1.4	0.246	2.19	90'	ER	44.134	0.627	1.40	90'	ER	8.827	0.80	0.246	1.32	90'	ER	44.134		
TNAGT5B	45.000		3	1.309	58.923	1.4	0.246	2.16	90'	ER	44.134	0.627	1.35	90'	ER	8.827	0.80	0.246	1.31	90'	ER	44.134		
EMERGENCY VEHICLE (EV)	EV2	28.750		2.019	58.058	1.3	0.246	3.60	90'	ER	44.130	0.627	2.02	90'	ER	8.827	0.80	0.246	2.55	90'	ER	44.134		
	EV3	43.000		4	1.359	58.431	1.3	0.246	2.37	90'	ER	44.130	0.627	1.36	90'	ER	8.827	0.80	0.246	1.68	90'	ER	44.134	

LOAD FACTORS:

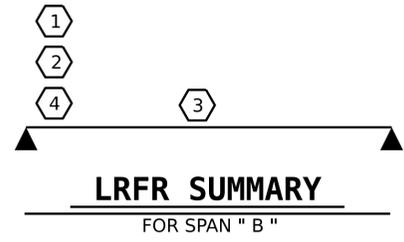
DESIGN LOAD RATING FACTORS	LIMIT STATE	γ _{DC}	γ _{DW}
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

NOTES:
MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.

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

COMMENTS:
NCDOT STANDARD LRFR SUMMARY TABLES FOR 90' BOX BEAM WITH 60 AND 75 DEGREE SKEWS ARE SIMILAR. BOX BEAMS FOR BOTH SKEWS HAVE THE SAME STRAND PATTERN AND CONCRETE STRENGTH, THEREFORE THE CONTROLLING LRFR FOR 60 DEGREE SKEW HAS BEEN SHOWN FOR THIS PROJECT WHICH HAS A 67 DEGREE SKEW.

#	CONTROLLING LOAD RATING
1	DESIGN LOAD RATING (HL-93)
2	DESIGN LOAD RATING (HS-20)
3	LEGAL LOAD RATING **
4	EMERGENCY VEHICLE LOAD RATING **
** SEE CHART FOR VEHICLE TYPE	
GIRDER LOCATION	
I - INTERIOR GIRDER	
EL - EXTERIOR LEFT GIRDER	
ER - EXTERIOR RIGHT GIRDER	



PROJECT NO. **BP9-R012**
ROWAN COUNTY
 STATION: **20+96.00 -L-**

DESIGNED BY: A. D'AIUTO DATE: MAY 2024
 DRAWN BY: A. D'AIUTO DATE: MAY 2024
 CHECKED BY: E. LAWES DATE: JUNE 2024
 DESIGN ENGINEER OF RECORD: E. LAWES DATE: JUNE 2024

DRAWN BY: TMG II/II REV. 06/23 AKP/AAI
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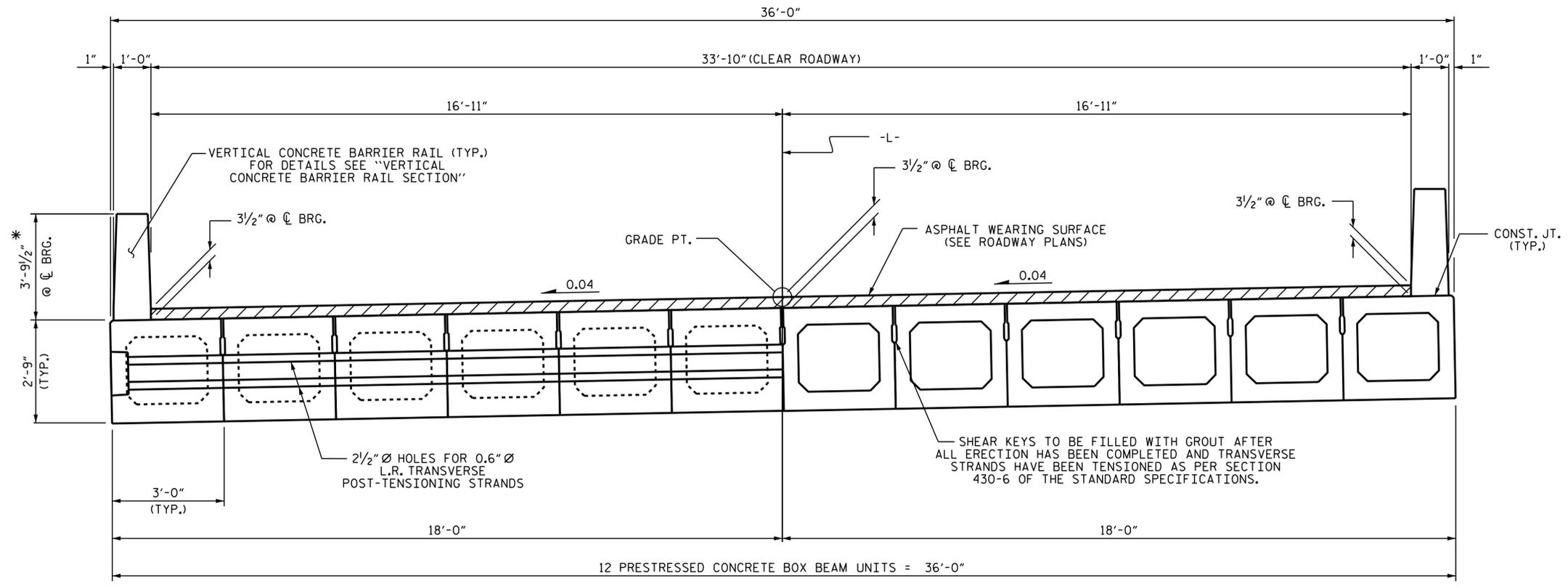
DOCUMENT NOT CONSIDERED FINAL
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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
**LRFR SUMMARY FOR
 90' BOX BEAM UNIT
 60° SKEW**
 (NON-INTERSTATE TRAFFIC)

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

S-6
 TOTAL SHEETS: 24



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.

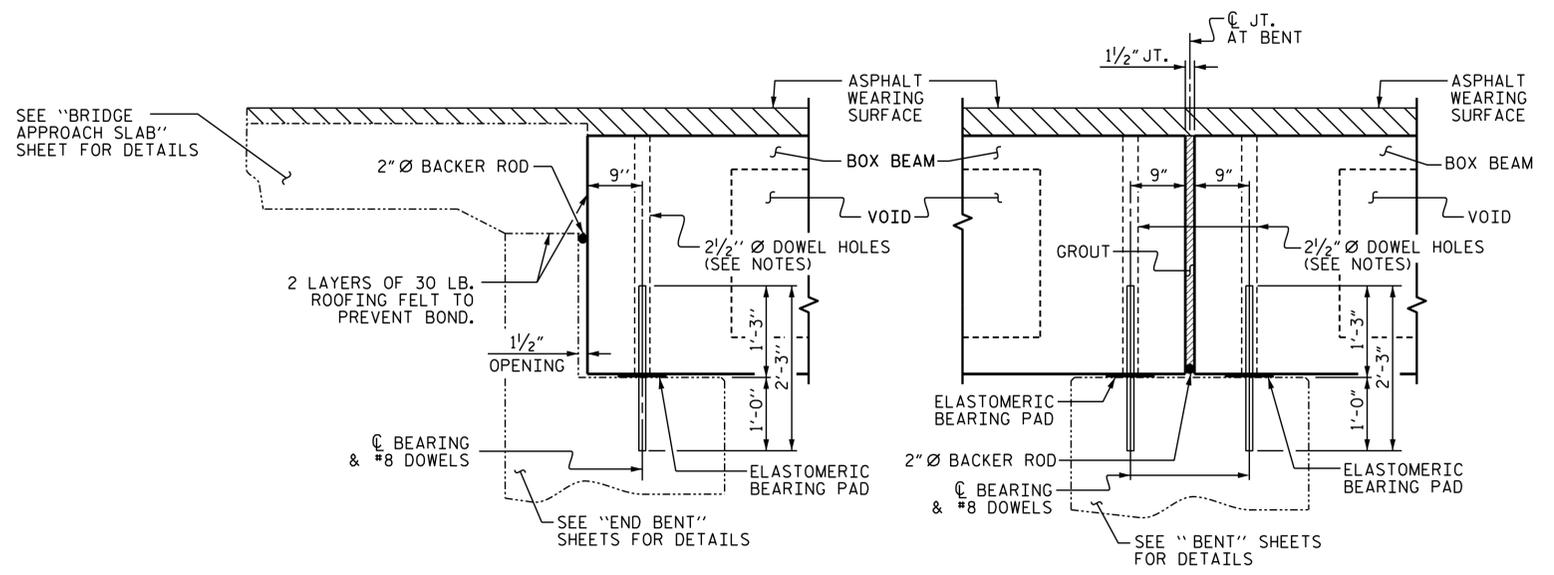
NOTES

- ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW RELAXATION GRADE 270 STRANDS AND SHALL CONFORM TO AASHTO M203 EXCEPT FOR SAMPLING REQUIREMENTS WHICH SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
- ALL REINFORCING STEEL CAST WITH THE BOX BEAM SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE BOX BEAMS.
- FLAME CUTTING OF THE TRANSVERSE POST-TENSIONING STRAND IS NOT ALLOWED.
- RECESSES FOR TRANSVERSE STRANDS SHALL BE GROUTED AFTER THE TENSIONING OF THE STRANDS.
- THE 2 1/2" Ø DOWEL HOLES AT FIXED ENDS OF BOX BEAM 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.
- THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE BOX BEAM UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 6000 PSI.
- ALL REINFORCING STEEL IN VERTICAL CONCRETE BARRIER RAILS SHALL BE EPOXY COATED.
- PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE BOX BEAM UNIT ENDS.
- APPLY EPOXY PROTECTIVE COATING TO BOX BEAM UNIT ENDS.
- VERTICAL GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A VERTICAL CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF BARRIER RAIL SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.
- THE LOCATION OF THE VOID DRAINS MAY BE SHIFTED SLIGHTLY WHERE NECESSARY TO CLEAR PRESTRESSING STRANDS OR TRANSVERSE REINFORCING STEEL.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
- THE PERMITTED THREADED INSERTS ARE DETAILED AS AN OPTION FOR THE CONTRACTOR TO ATTACH FALSEWORK AND FORMWORK DURING CONSTRUCTION.
- THE PERMITTED THREADED INSERTS IN THE EXTERIOR UNITS SHALL BE SIZED BY THE CONTRACTOR, SPACED AT 4'-0" CENTERS AND GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS. STAINLESS STEEL THREADED INSERTS MAY BE USED AS AN ALTERNATE.
- THE PERMITTED THREADED INSERTS SHALL BE GROUTED BY THE CONTRACTOR IMMEDIATELY FOLLOWING REMOVAL OF THE FALSEWORK.
- THE COST OF THE PERMITTED THREADED INSERTS SHALL BE INCLUDED IN THE PRICE BID FOR THE PRECAST UNITS.

FIXED END

FIXED END

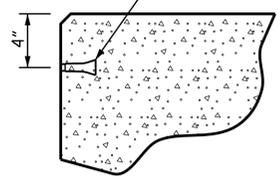
FIXED END



SECTION AT END BENT

SECTION AT BENT

PERMITTED THREADED INSERT CAST IN OUTSIDE FACE OF EXTERIOR UNIT AND RECESSED 3/8". SIZE TO BE DETERMINED BY CONTRACTOR.

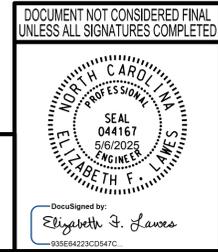


THREADED INSERT DETAIL

PROJECT NO. **BP9-R012**
ROWAN COUNTY
 STATION: **20+96.00 -L-**
 SHEET 1 OF 7

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

3'-0" X 2'-9"
 PRESTRESSED CONCRETE
 BOX BEAM UNIT
 67° SKEW

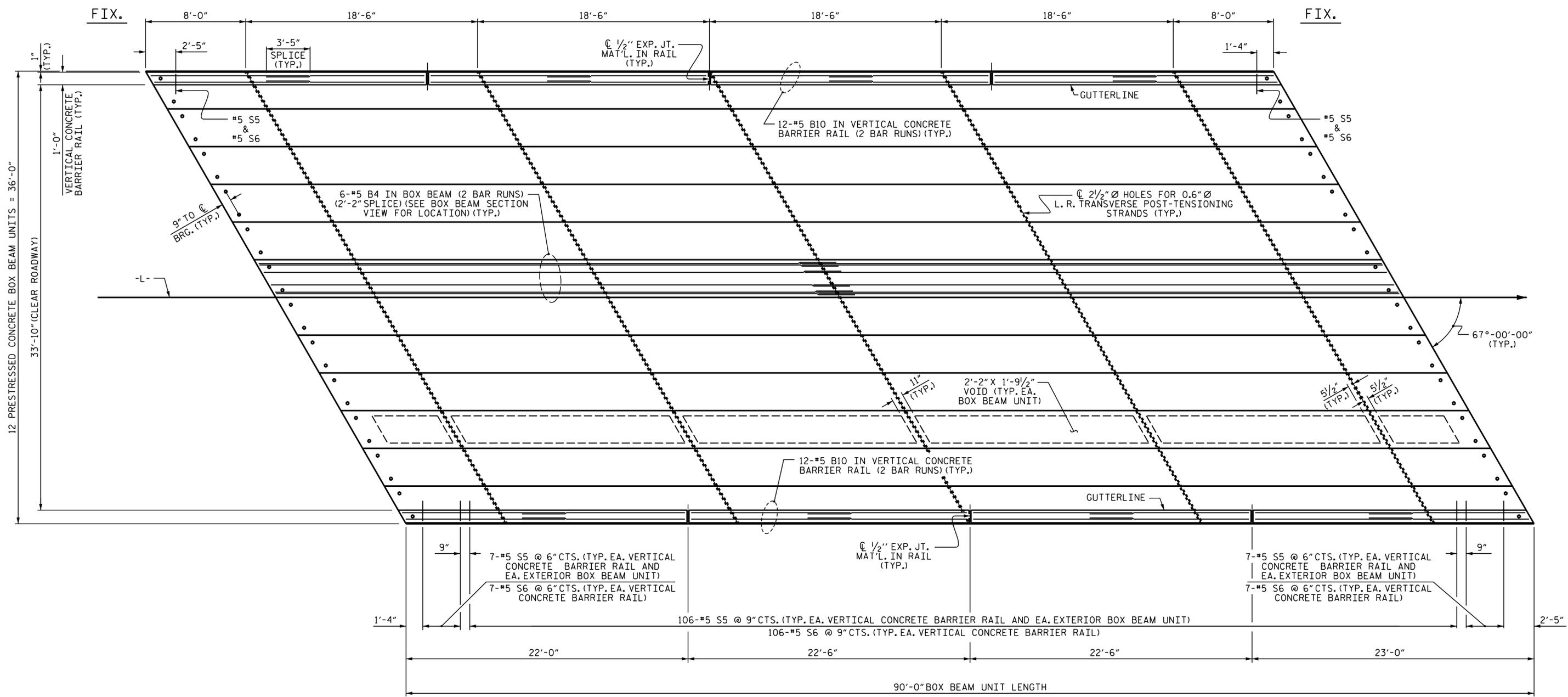


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DRAWN BY:	A. D'AIUTO	DATE:	MAY 2024
CHECKED BY:	E. LAWES	DATE:	JUNE 2024
DESIGN ENGINEER OF RECORD:	E. LAWES	DATE:	JUNE 2024

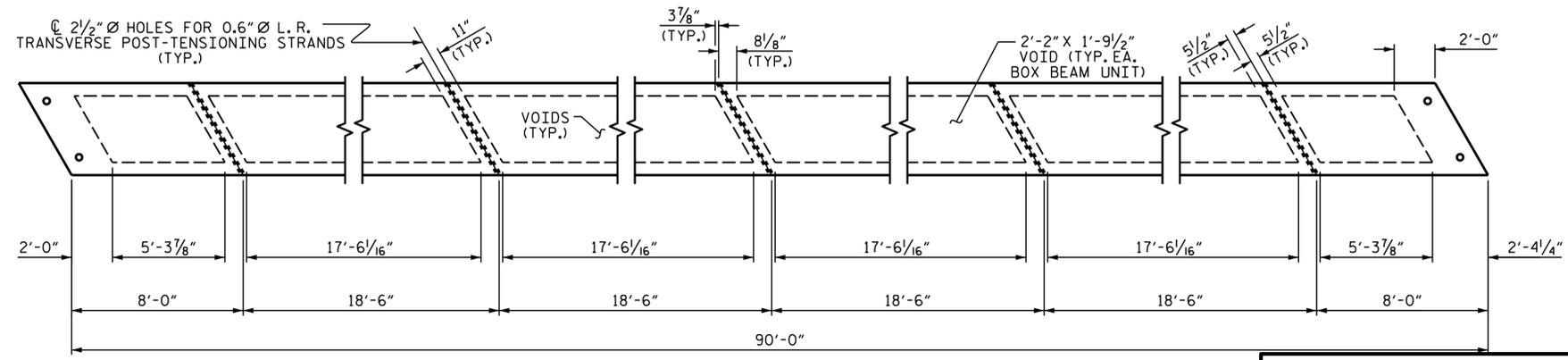
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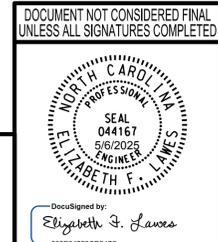
PLAN OF 90' UNIT



DIAPHRAGM AND VOID LAYOUT

PROJECT NO. **BP9-R012**
ROWAN COUNTY
 STATION: **20+96.00 -L-**
 SHEET 3 OF 7

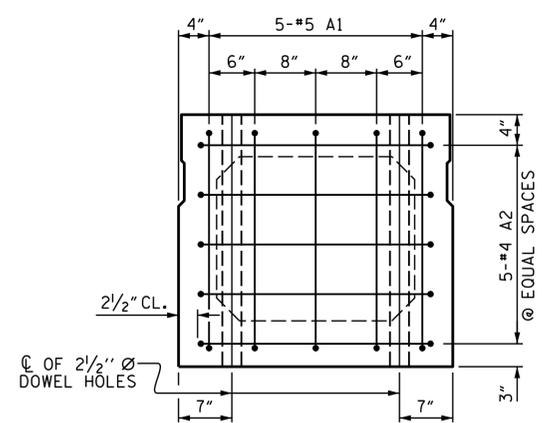
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
PLAN OF 90' UNIT
33'-10" CLEAR ROADWAY
67° SKEW



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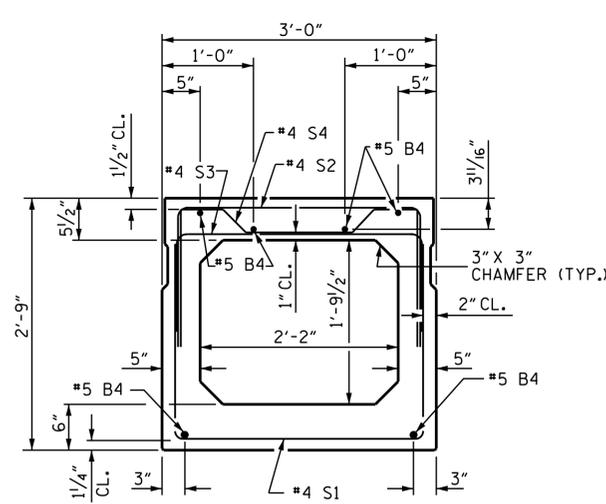
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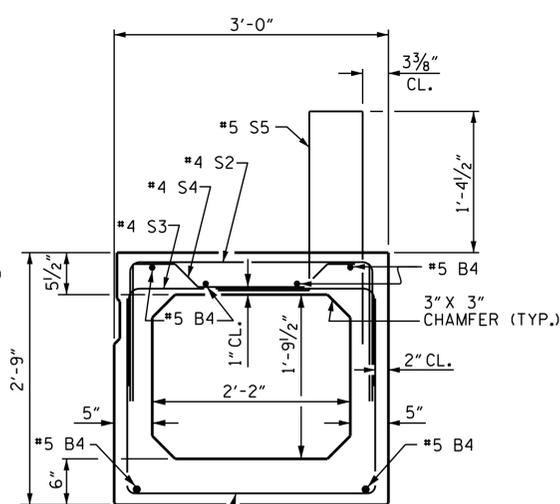
END ELEVATION

SHOWING PLACEMENT OF #5 & #4 "A" BARS AND LOCATION OF DOWEL HOLES. (INTERIOR BOX BEAM SECTION SHOWN-EXTERIOR SECTION SIMILAR EXCEPT SHEAR KEY LOCATION, STRAND LAYOUT NOT SHOWN.)



INTERIOR BOX BEAM SECTION

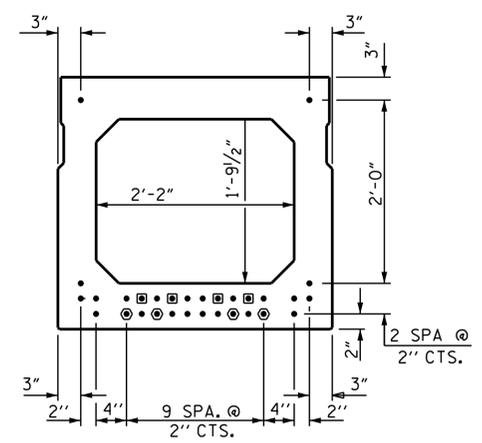
(STRAND LAYOUT NOT SHOWN)



EXTERIOR BOX BEAM SECTION

(STRAND LAYOUT NOT SHOWN)

0.6" Ø LOW RELAXATION STRAND LAYOUT



TYPICAL STRAND LOCATION

(30 STRANDS REQUIRED)

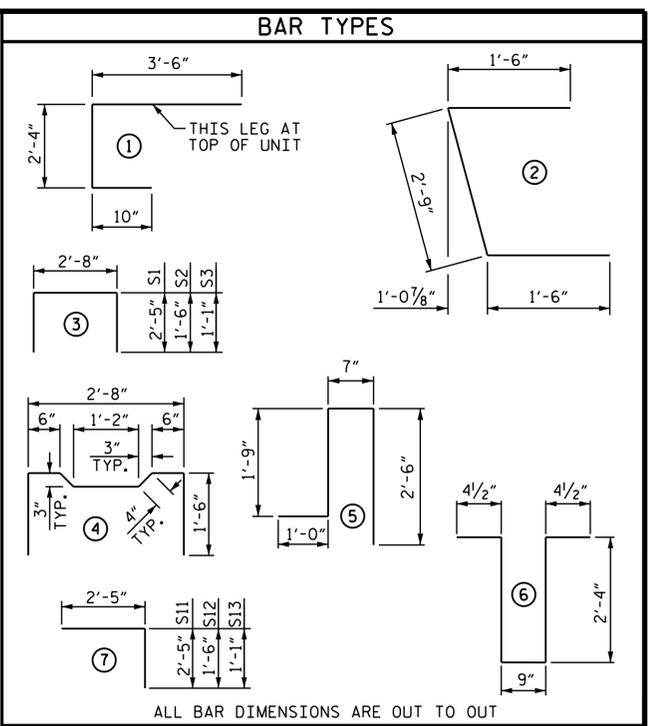
DEBONDING LEGEND

- FULLY BONDED STRANDS
- ◐ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- ◑ STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER

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

GRADE 270 STRANDS

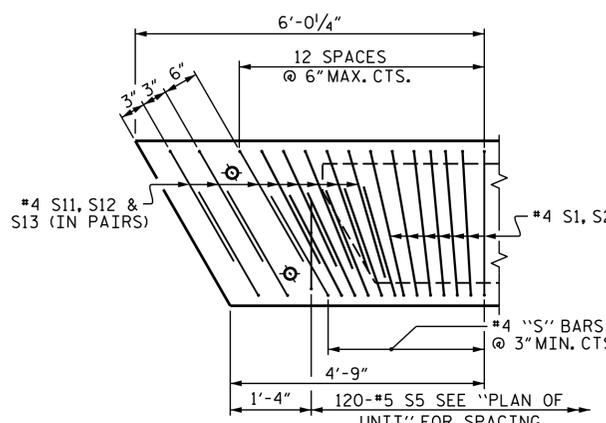
	0.6" Ø L.R.
AREA (SQUARE INCHES)	0.217
ULTIMATE STRENGTH (LBS. PER STRAND)	58,600
APPLIED PRESTRESS (LBS. PER STRAND)	43,950



ALL BAR DIMENSIONS ARE OUT TO OUT

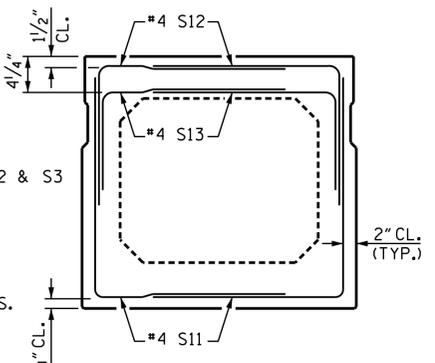
BILL OF MATERIAL FOR ONE 90' BOX BEAM SECTION

BAR	NUMBER	SIZE	TYPE	EXTERIOR UNIT		INTERIOR UNIT	
				LENGTH	WEIGHT	LENGTH	WEIGHT
A1	10	#5	1	6'-8"	70	6'-8"	70
A2	40	#4	2	5'-9"	154	5'-9"	154
B4	12	#5	STR	45'-11"	575	45'-11"	575
K1	15	#4	6	6'-2"	62	6'-2"	62
K2	10	#4	STR	2'-10"	19	2'-10"	19
S1	67	#4	3	7'-6"	336	7'-6"	336
S2	67	#4	3	5'-8"	254	5'-8"	254
S3	119	#4	3	4'-10"	384	4'-10"	384
S4	52	#4	4	5'-10"	203	5'-10"	203
S11	32	#4	7	4'-10"	103	4'-10"	103
S12	32	#4	7	3'-11"	84	3'-11"	84
S13	32	#4	7	3'-6"	75	3'-6"	75
* S5	120	#5	5	5'-10"	730	--	--
REINFORCING STEEL					2319 LBS.		2319 LBS.
* EPOXY COATED REINF. STEEL					730 LBS.		--
8000 P.S.I. CONCRETE				16.1	CU. YDS.	16.0	CU. YDS.
0.6" Ø L.R. STRANDS				No.	30	No.	30



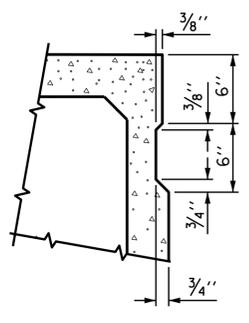
DETAIL "B"

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



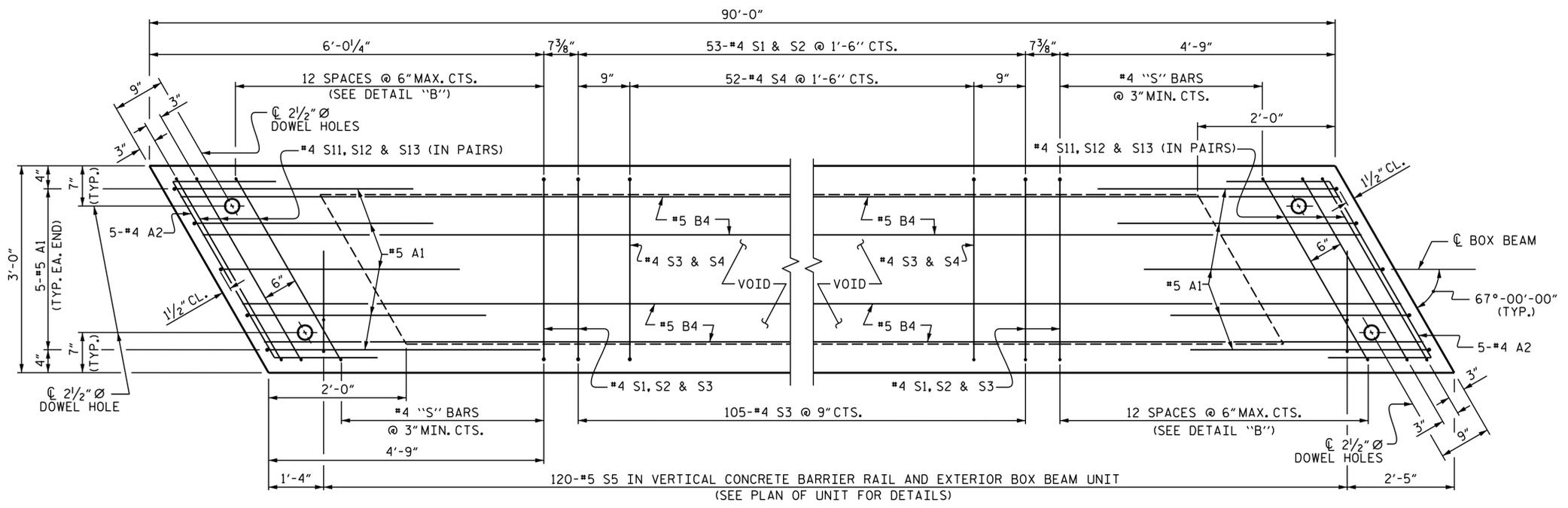
END VIEW

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



SHEAR KEY DETAIL

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



PLAN OF 90' BOX BEAM

EXTERIOR UNIT SHOWN, INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S5 BARS. FOR LOCATION OF DIAPHRAGMS, SEE "PLAN OF 90' UNIT". FOR THREADED INSERTS, SEE "THREADED INSERT DETAIL". FOR REINFORCING STEEL IN DIAPHRAGMS, SEE "DOUBLE DIAPHRAGM DETAILS".

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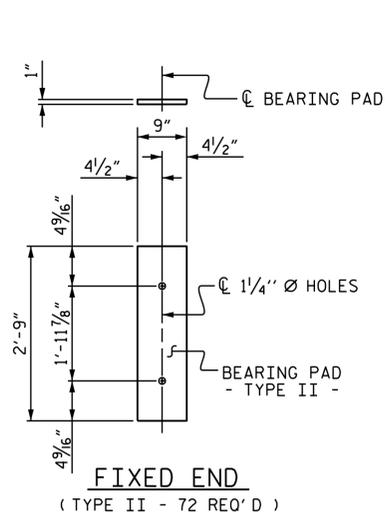
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ROWAN COUNTY
 STATION: **20+96.00 -L-**
 SHEET 5 OF 7

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

3'-0" X 2'-9" PRESTRESSED CONCRETE BOX BEAM UNIT 67° SKEW

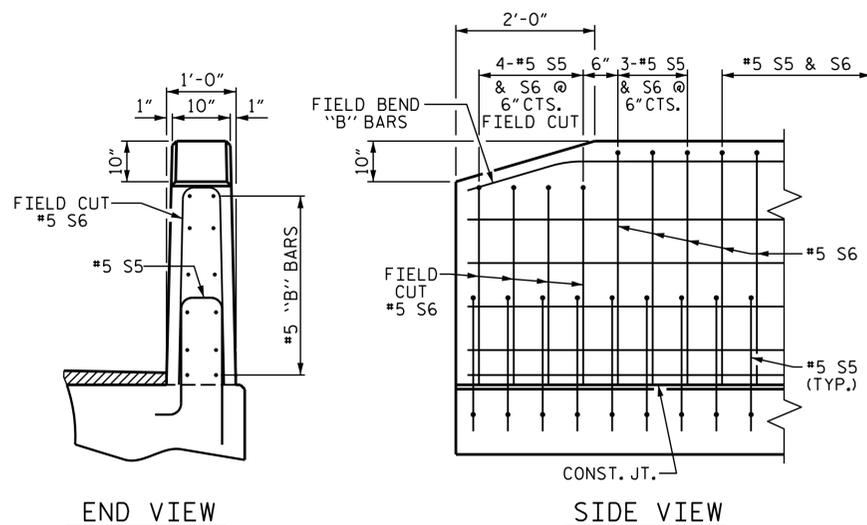
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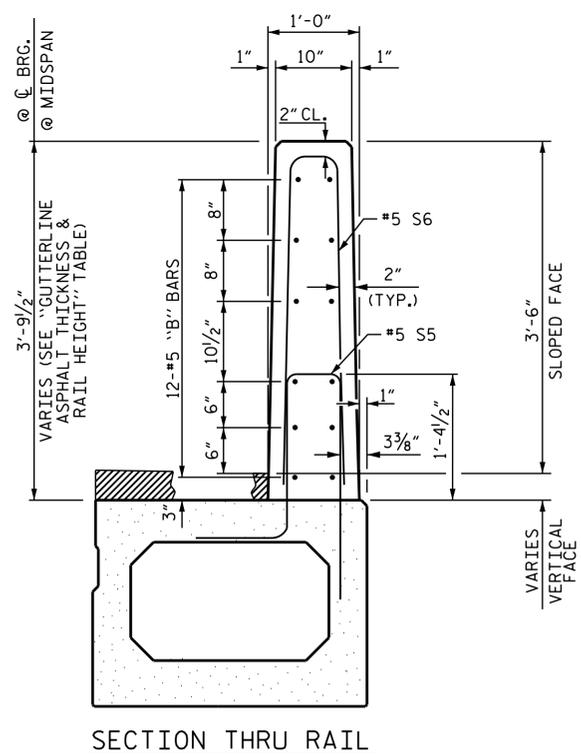


ELASTOMERIC BEARING DETAILS

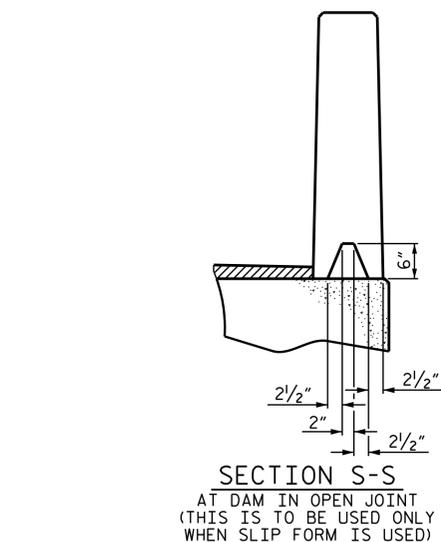
ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.



END OF RAIL DETAILS



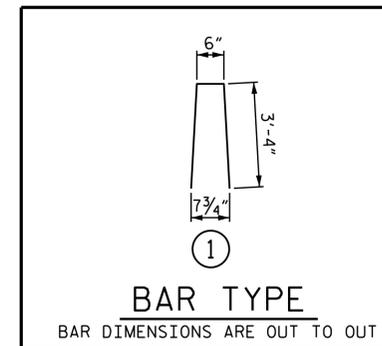
SECTION THRU RAIL



ELEVATION AT EXPANSION JOINTS

BOX BEAM UNITS REQUIRED			
SPANS A & C	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR B.B.	4	80'-0"	320'-0"
INTERIOR B.B.	20	80'-0"	1600'-0"
TOTAL	24		1920'-0"

BOX BEAM UNITS REQUIRED			
SPAN B	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR B.B.	2	90'-0"	180'-0"
INTERIOR B.B.	10	90'-0"	900'-0"
TOTAL	12		1080'-0"



BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL					
BAR	BARS PER PAIR OF EXTERIOR UNITS	SIZE	TYPE	LENGTH	WEIGHT
80' UNIT (SPANS A & C)					
* B8	144	#5	STR	15'-1"	2265
* S6	214	#5	1	7'-2"	1600
* EPOXY COATED REINFORCING STEEL				LBS. (PER SPAN)	3865
CLASS AA CONCRETE				CU.YDS. (PER SPAN)	20.7
TOTAL VERTICAL CONCRETE BARRIER RAIL				LN. FT. (PER SPAN)	160.0

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL					
BAR	BARS PER PAIR OF EXTERIOR UNITS	SIZE	TYPE	LENGTH	WEIGHT
90' UNIT (SPAN B)					
* B10	192	#5	STR	13'-0"	2603
* S6	240	#5	1	7'-2"	1794
* EPOXY COATED REINFORCING STEEL				LBS.	4397
CLASS AA CONCRETE				CU.YDS.	23.3
TOTAL VERTICAL CONCRETE BARRIER RAIL				LN. FT.	180.0

GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT		
	ASPHALT OVERLAY THICKNESS @ MID-SPAN	RAIL HEIGHT @ MID-SPAN
80' UNITS (SPANS A & C)	2 1/4"	3'-8 1/4"
90' UNITS (SPAN B)	1 1/2"	3'-7 1/2"

PROJECT NO. **BP9-R012**
ROWAN COUNTY
 STATION: **20+96.00 -L-**
 SHEET 7 OF 7

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
3'-0" X 2'-9"
PRESTRESSED CONCRETE
BOX BEAM UNIT
67° SKEW

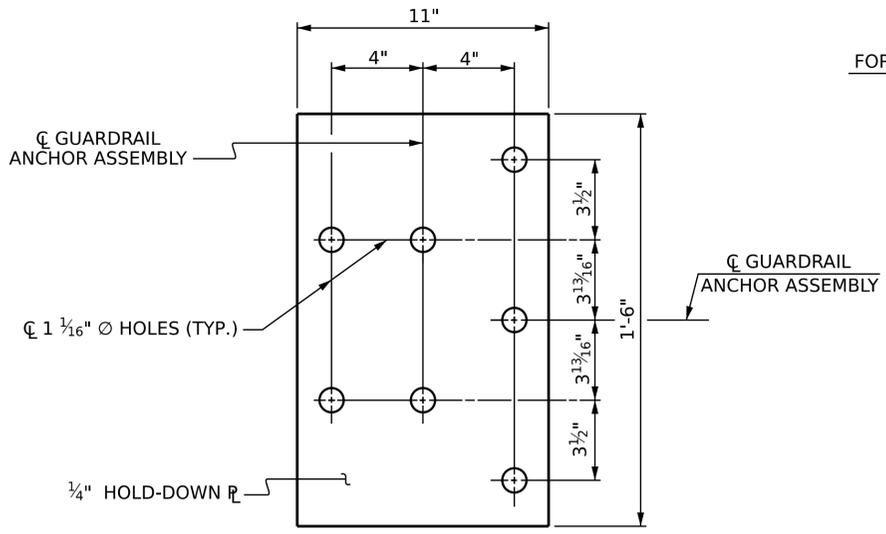
DESIGNED BY: A. D'AIUTO DATE: MAY 2024
 DRAWN BY: A. D'AIUTO DATE: MAY 2024
 CHECKED BY: E. LAWES DATE: JUNE 2024
 DESIGN ENGINEER OF RECORD: E. LAWES DATE: JUNE 2024

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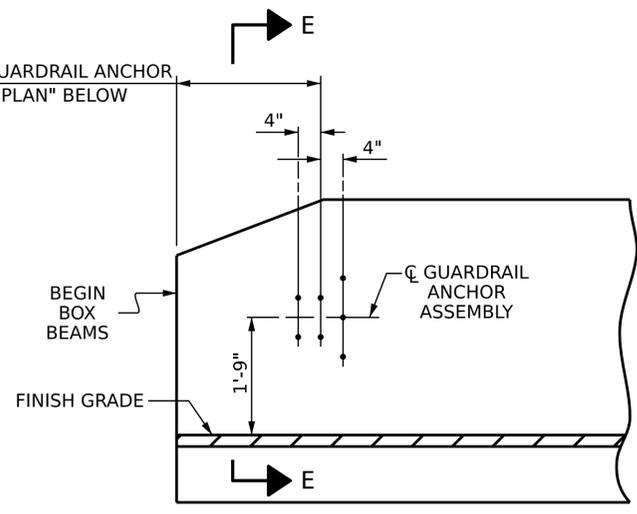
 Elizabeth F. Lawes

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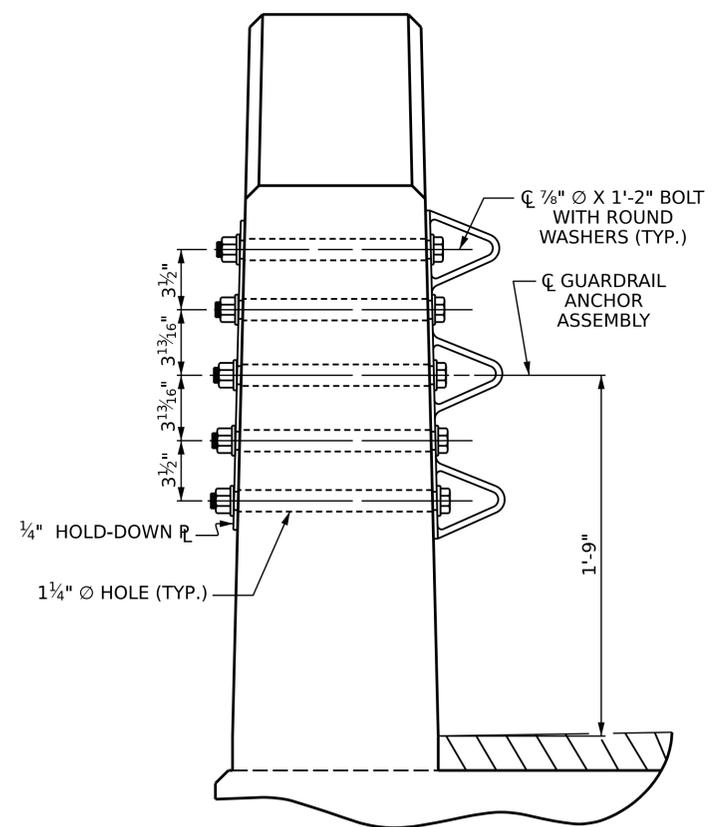


PLAN

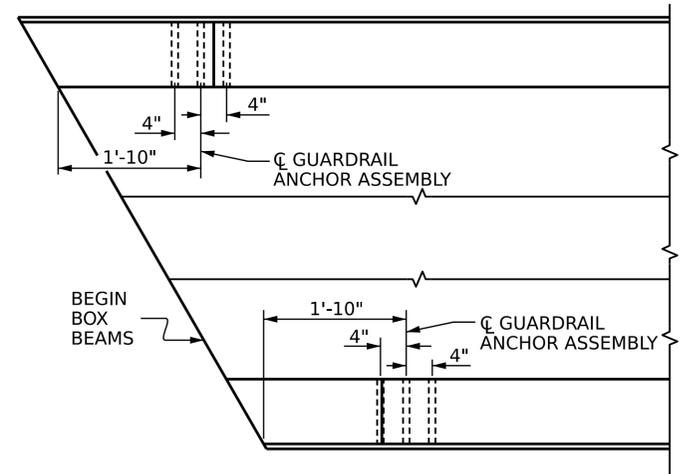
FOR LOCATION OF GUARDRAIL ANCHOR ASSEMBLY, SEE "PLAN" BELOW



ELEVATION



SECTION E-E
GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

END BENT #1 SHOWN, END BENT #2 SIMILAR



SKETCH SHOWING POINTS OF ATTACHMENT

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

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 BURIED 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.

PROJECT NO. **BP9-R012**
 ROWAN COUNTY
 STATION: **20+96.00 -L-**

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

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CHECKED BY :	GM 5/10	REV. 12/17	MAA/THC
		REV. 5/18	MAA/THC

NOTES

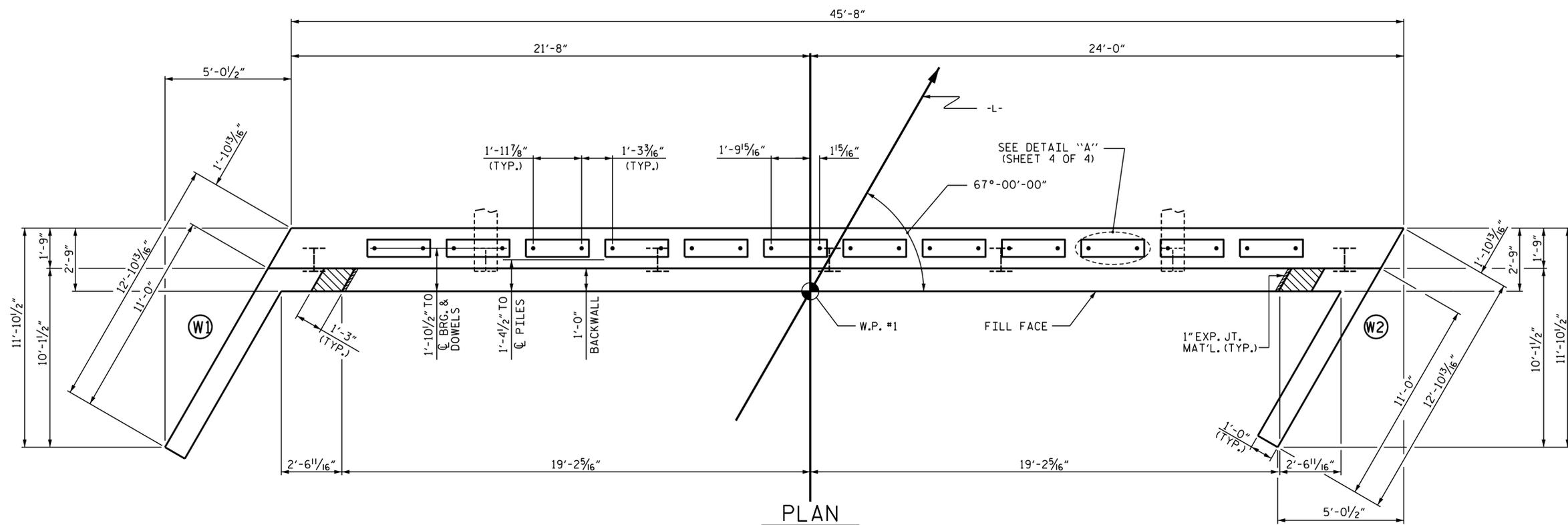
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

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 PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

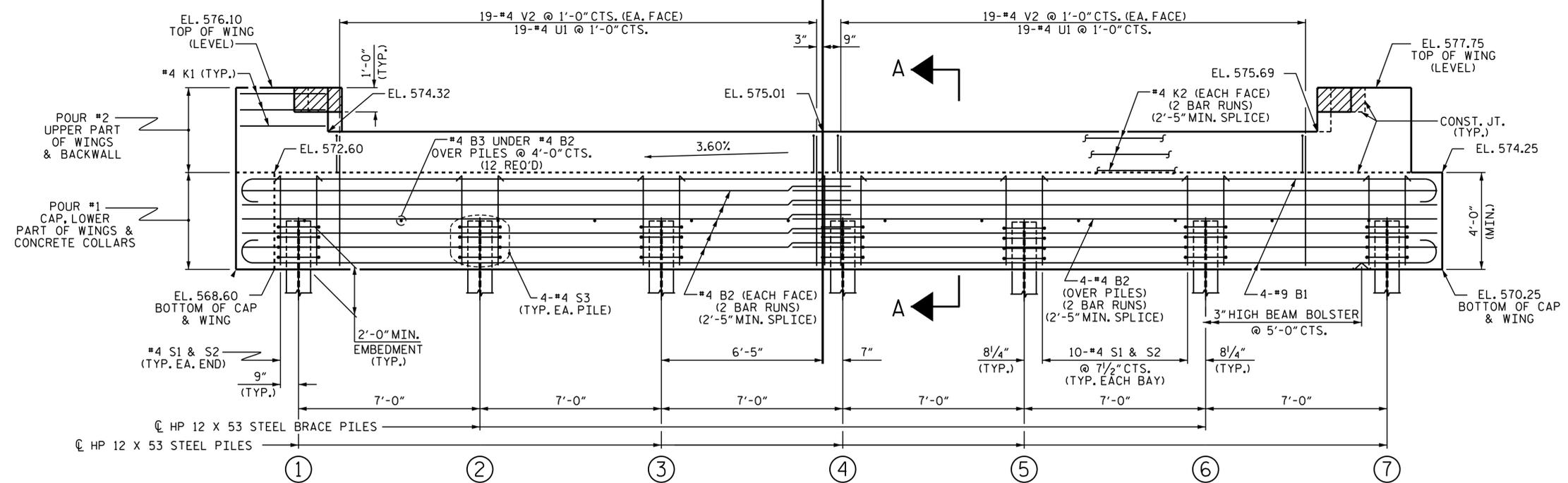
FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.



PLAN

TOP OF PILE ELEVATIONS	
①	570.69
②	570.94
③	571.19
④	571.44
⑤	571.69
⑥	571.95
⑦	572.20



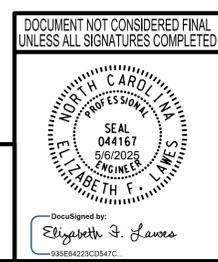
ELEVATION

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.

PROJECT NO. **BP9-R012**
ROWAN COUNTY
 STATION: **20+96.00 -L-**
 SHEET 1 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT No. 1



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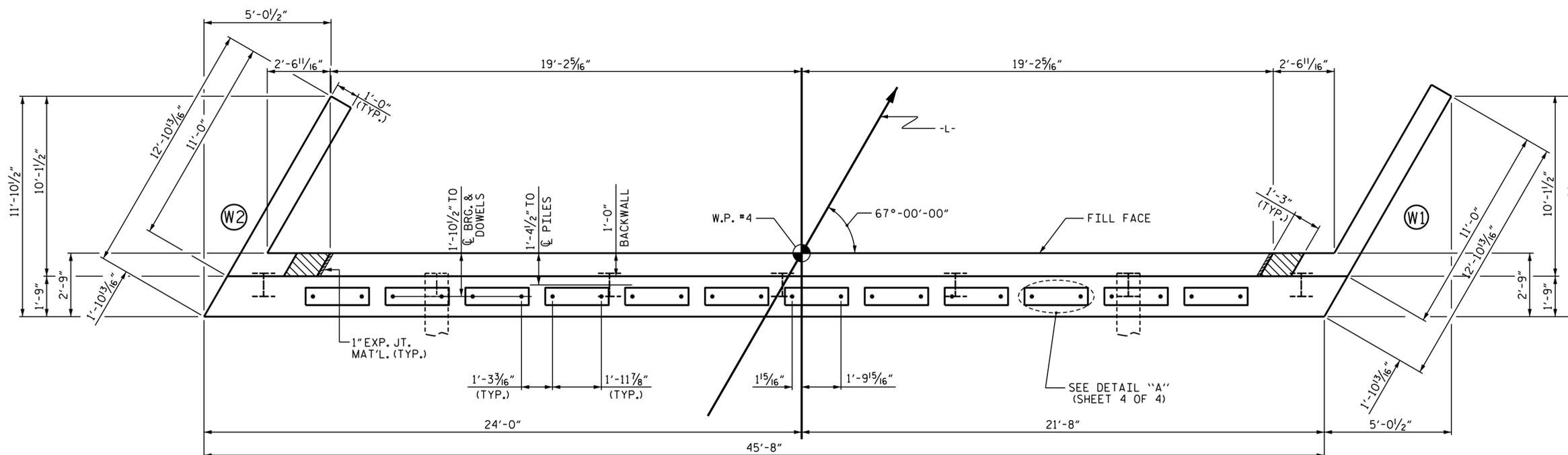
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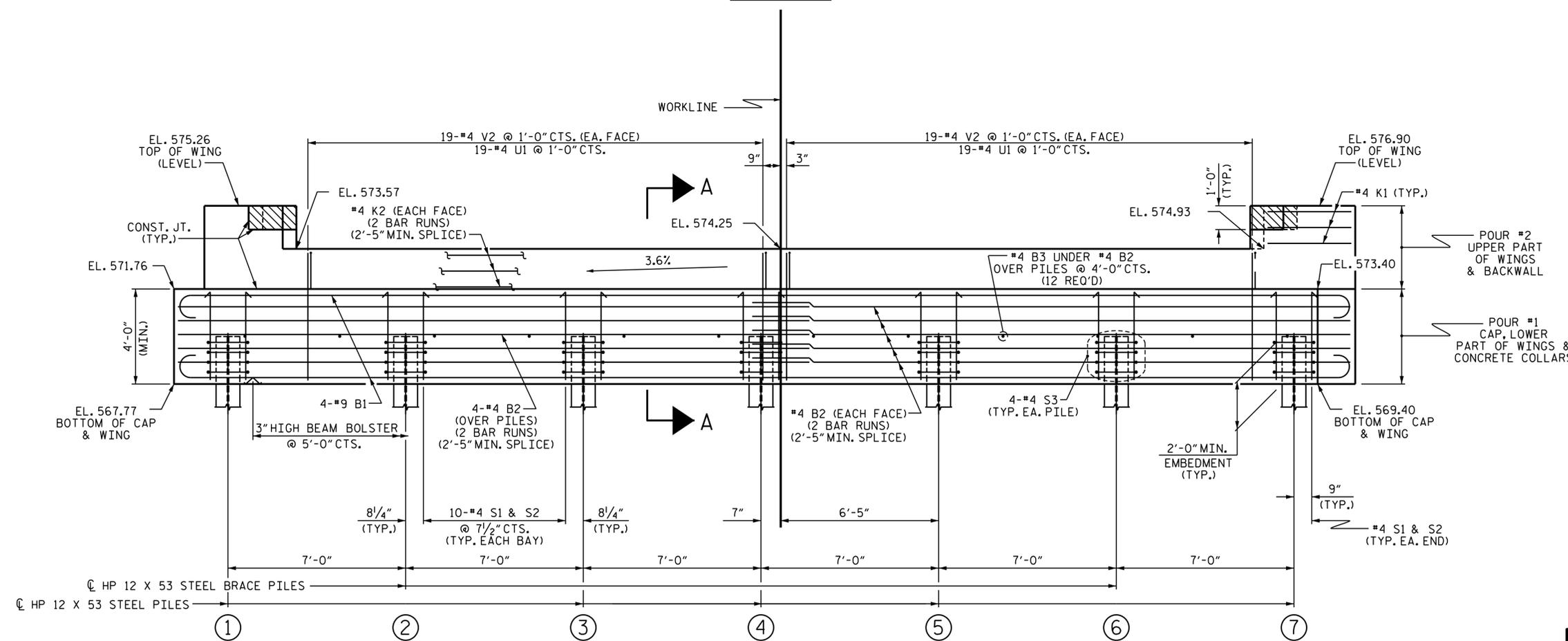
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 DRAWN BY: A. D'AIUTO DATE: MAY 2024
 CHECKED BY: E. LAWES DATE: JUNE 2024
 DESIGN ENGINEER OF RECORD: E. LAWES DATE: JUNE 2024

NOTES

SEE SHEET 1 OF 4 FOR NOTES.



PLAN



ELEVATION

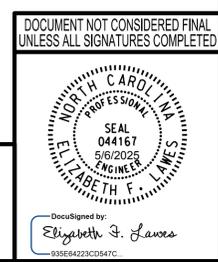
WINGS NOT SHOWN FOR CLARITY.
 FOR SECTION A-A, SEE SHEET 4 OF 4.
 CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
 SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.

TOP OF PILE ELEVATIONS	
①	569.84
②	570.10
③	570.35
④	570.60
⑤	570.85
⑥	571.10
⑦	571.36

PROJECT NO. **BP9-R012**
ROWAN COUNTY
 STATION: **20+96.00 -L-**
 SHEET 2 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

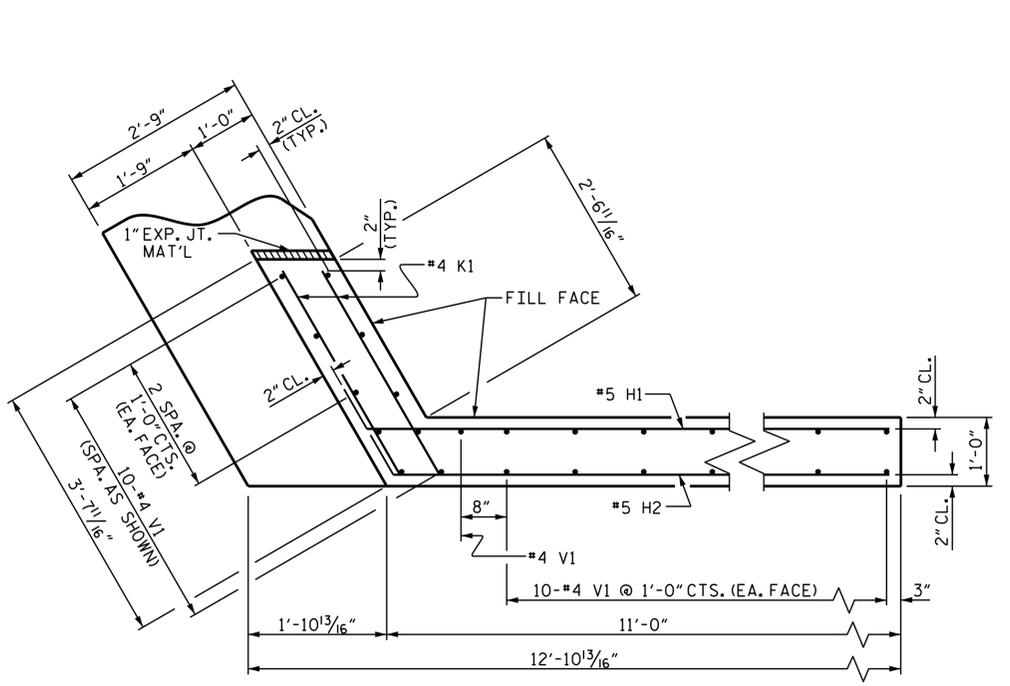
SUBSTRUCTURE
 END BENT No. 2



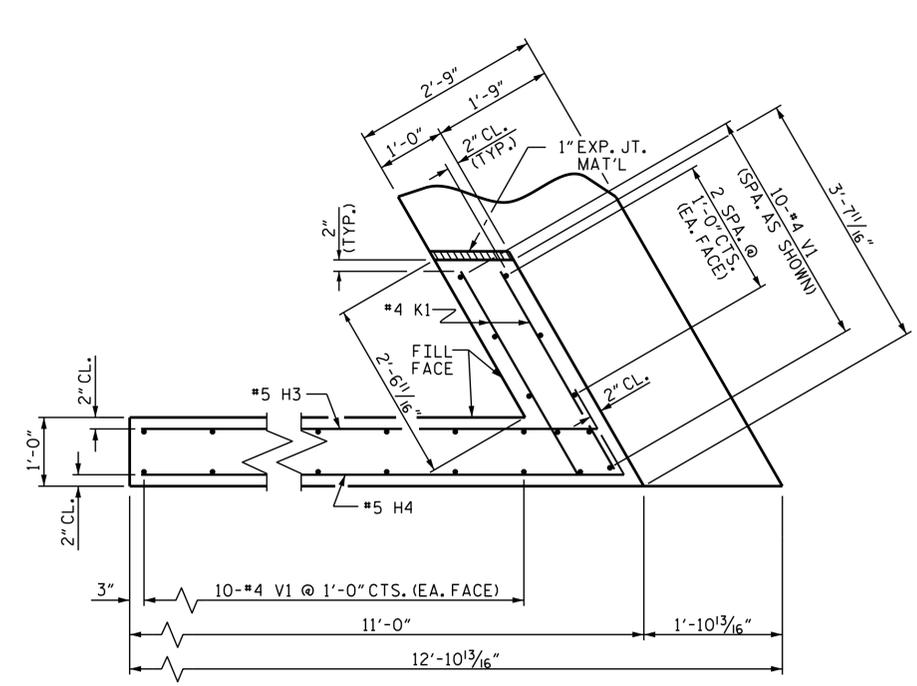
WSP
 WSP USA Inc.
 434 FAYETTEVILLE STREET
 SUITE 1500
 RALEIGH, NC 27601
 TEL: 1.919.836.4040
 LICENSE NO. F-0165

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-16
2			4			TOTAL SHEETS 24

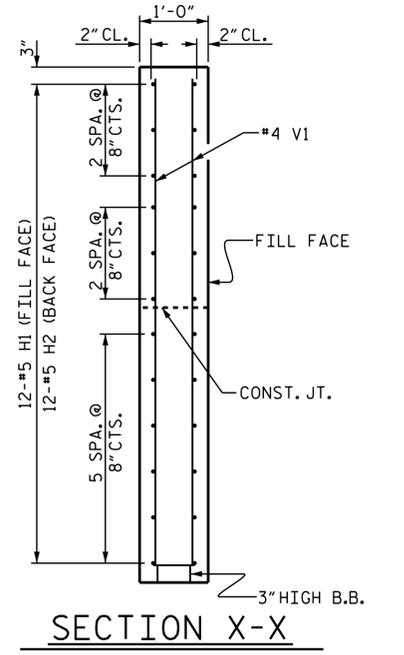
DESIGNED BY:	A. D'AIUTO	DATE:	MAY 2024
DRAWN BY:	A. D'AIUTO	DATE:	MAY 2024
CHECKED BY:	E. LAWES	DATE:	JUNE 2024
DESIGN ENGINEER OF RECORD:	E. LAWES	DATE:	JUNE 2024



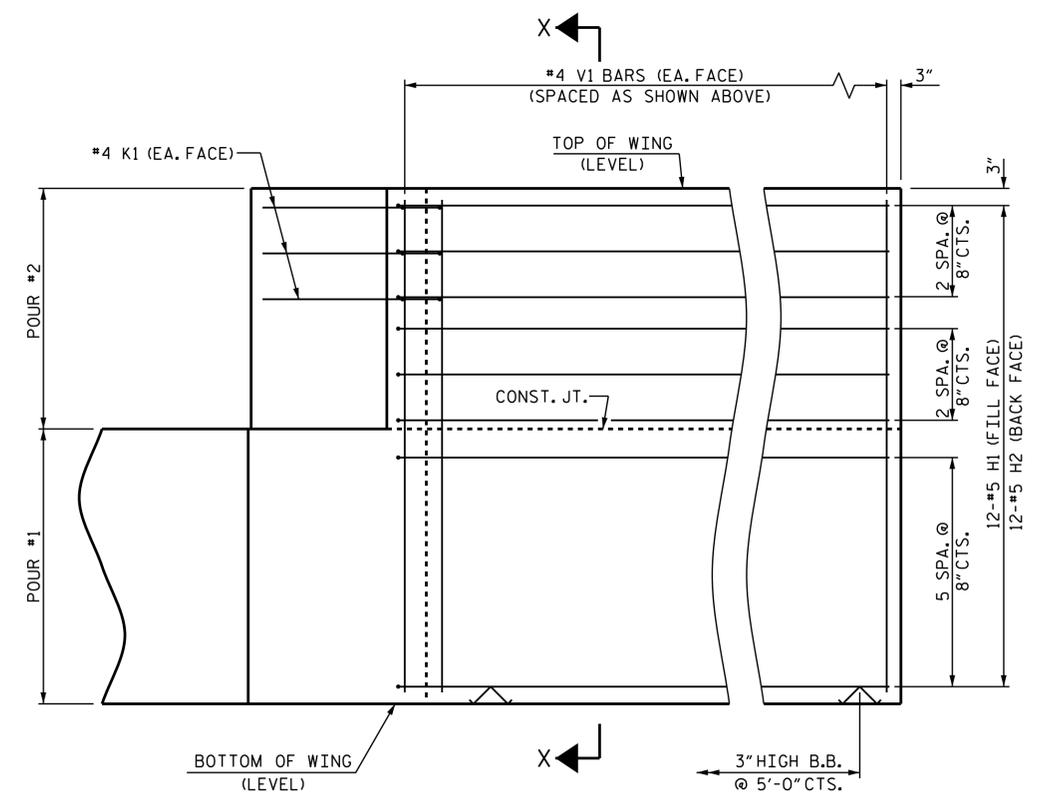
PLAN OF WING (W1)



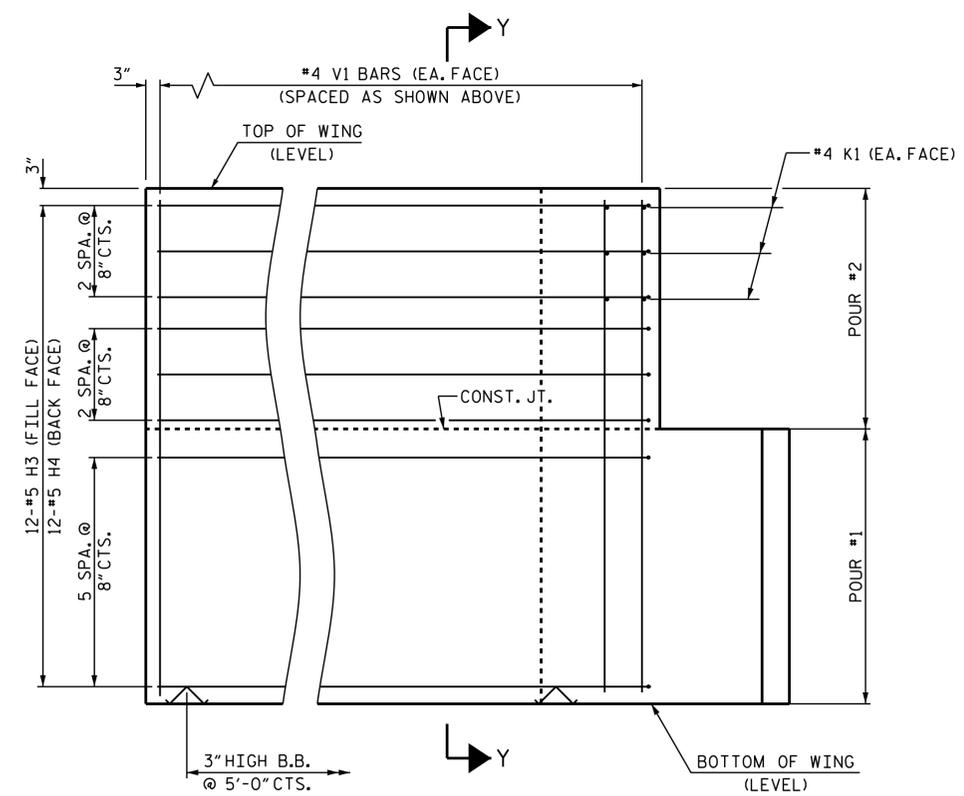
PLAN OF WING (W2)



SECTION X-X

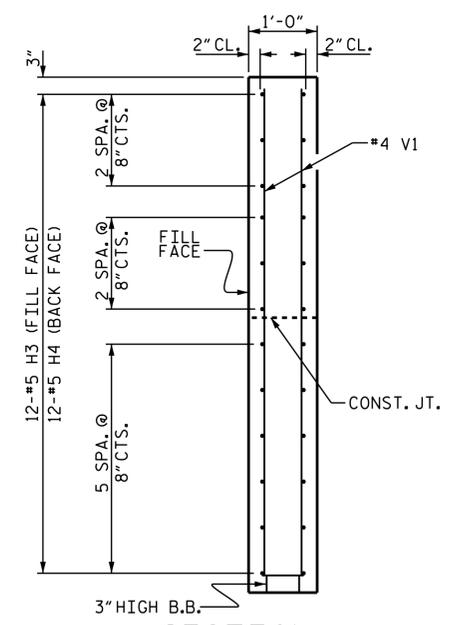


ELEVATION OF WING (W1)



ELEVATION OF WING (W2)

WING DETAILS



SECTION Y-Y

PROJECT NO. **BP9-R012**
ROWAN COUNTY
 STATION: **20+96.00 -L-**
 SHEET 3 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT
 WING DETAILS

DESIGNED BY:	A. D'AIUTO	DATE:	MAY 2024
DRAWN BY:	A. D'AIUTO	DATE:	MAY 2024
CHECKED BY:	E. LAWES	DATE:	JUNE 2024
DESIGN ENGINEER OF RECORD:	E. LAWES	DATE:	JUNE 2024

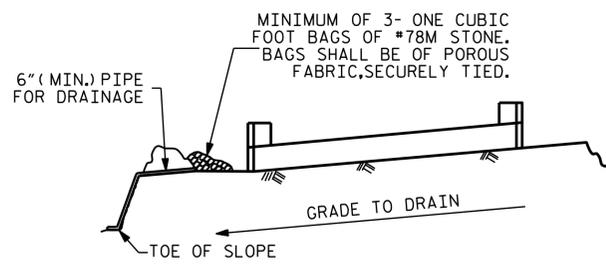
wsp
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 SUITE 1500
 RALEIGH, NC 27601
 TEL: 1.919.836.4040
 LICENSE NO. F-0165

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STATE OF NORTH CAROLINA
 PROFESSIONAL ENGINEER
 SEAL 044167
 5/6/2025
 ELIZABETH F. LAWES

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

TOTAL SHEETS: 24

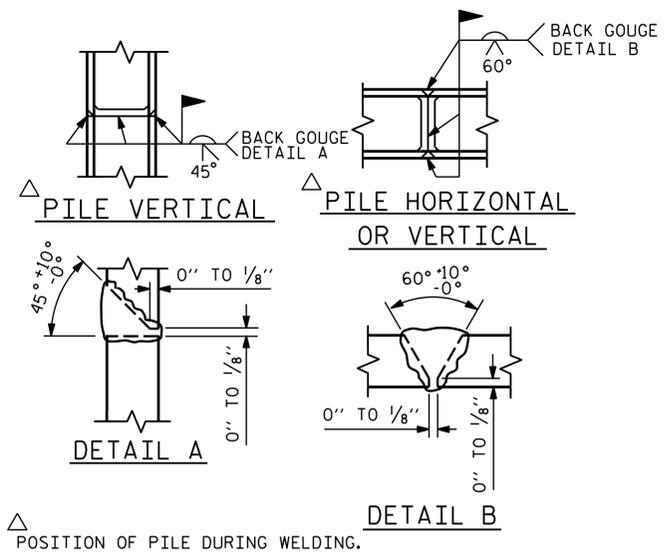


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

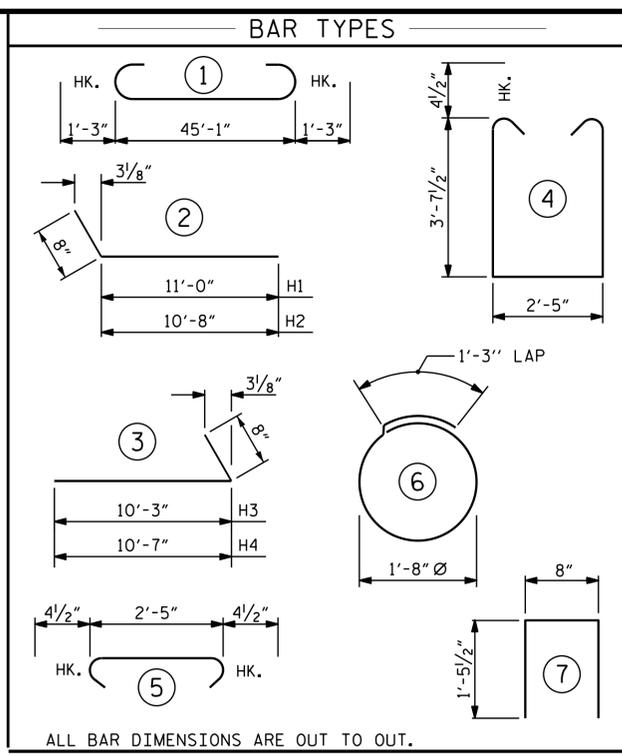
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETEIORATED AND LOST THEIR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

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

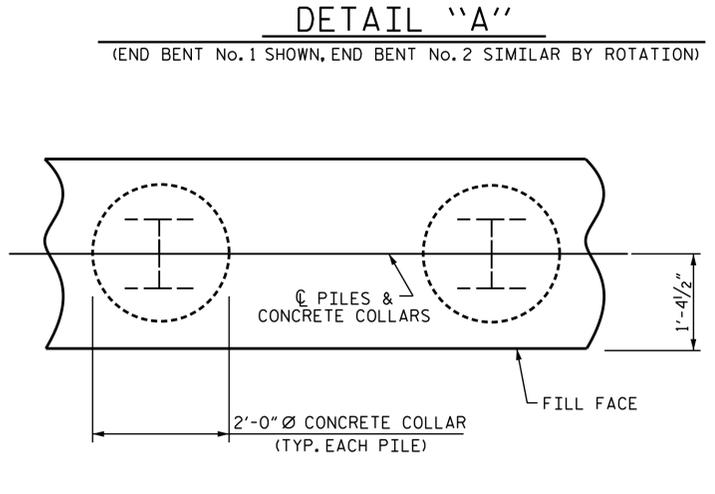
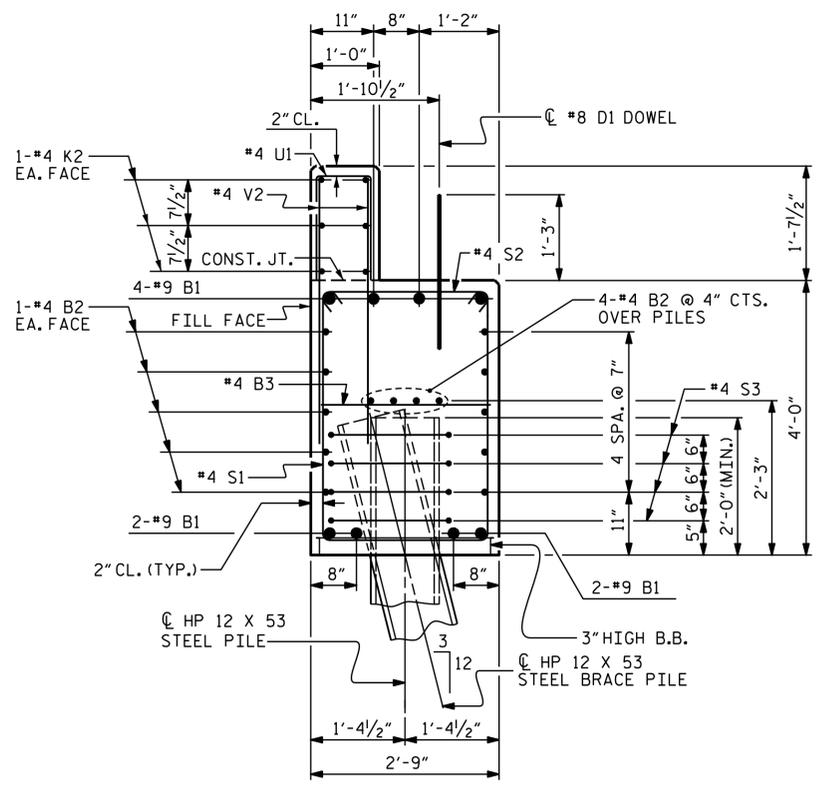
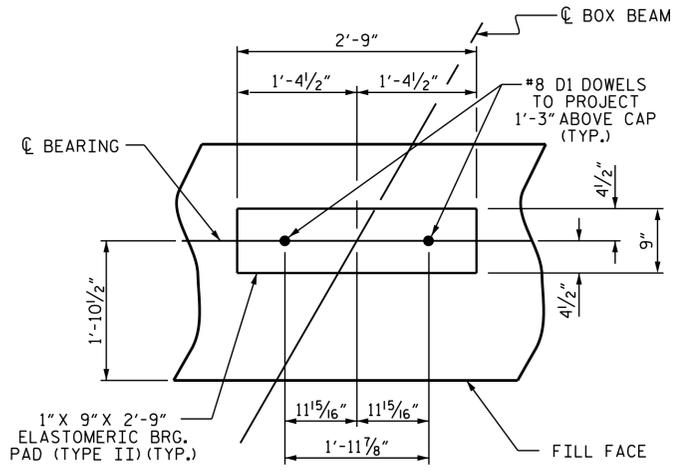
TEMPORARY DRAINAGE AT END BENT



PILE SPLICE DETAILS

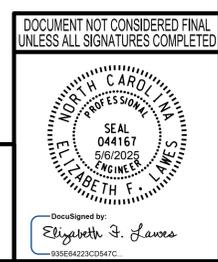


BILL OF MATERIAL FOR ONE END BENT					
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9		47'-7"	1294
B2	28	#4	STR	23'-10"	446
B3	12	#4	STR	2'-5"	19
D1	24	#8	STR	2'-3"	144
H1	12	#5	2	11'-8"	146
H2	12	#5	2	11'-4"	142
H3	12	#5	3	10'-11"	137
H4	12	#5	3	11'-3"	141
K1	12	#4	STR	3'-3"	26
K2	12	#4	STR	23'-10"	191
S1	62	#4	4	10'-5"	431
S2	62	#4	5	3'-2"	131
S3	28	#4	6	6'-6"	122
U1	38	#4	7	3'-7"	91
V1	61	#4	STR	7'-2"	292
V2	76	#4	STR	5'-3"	267
REINFORCING STEEL (FOR ONE END BENT)					4020 LBS.
CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)					
POUR #1	CAP, LOWER PART OF WINGS & COLLARS				22.7 C.Y.
POUR #2	BACKWALL & UPPER PART OF WINGS				5.8 C.Y.
TOTAL CLASS A CONCRETE					28.5 C.Y.



PROJECT NO. **BP9-R012**
ROWAN COUNTY
STATION: **20+96.00 -L-**
SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
END BENT No. 1 & 2
DETAILS



WSP
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.	DATE:
1			3	
2			4	

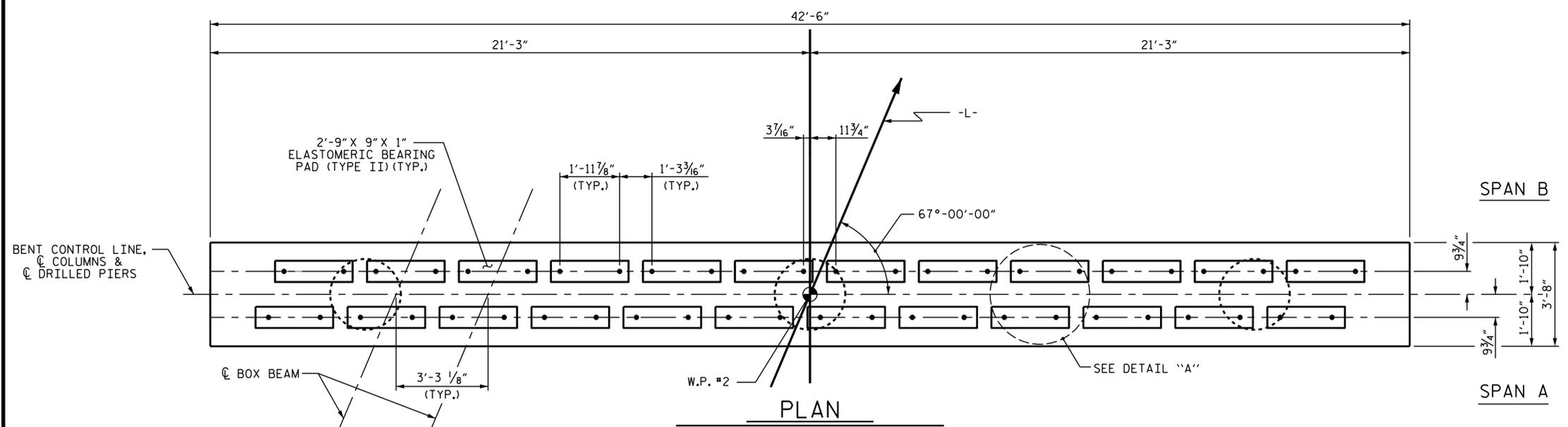
TOTAL SHEETS: 24

DESIGNED BY: A. D'AIUTO DATE: MAY 2024
DRAWN BY: A. D'AIUTO DATE: MAY 2024
CHECKED BY: E. LAWES DATE: JUNE 2024
DESIGN ENGINEER OF RECORD: E. LAWES DATE: JUNE 2024

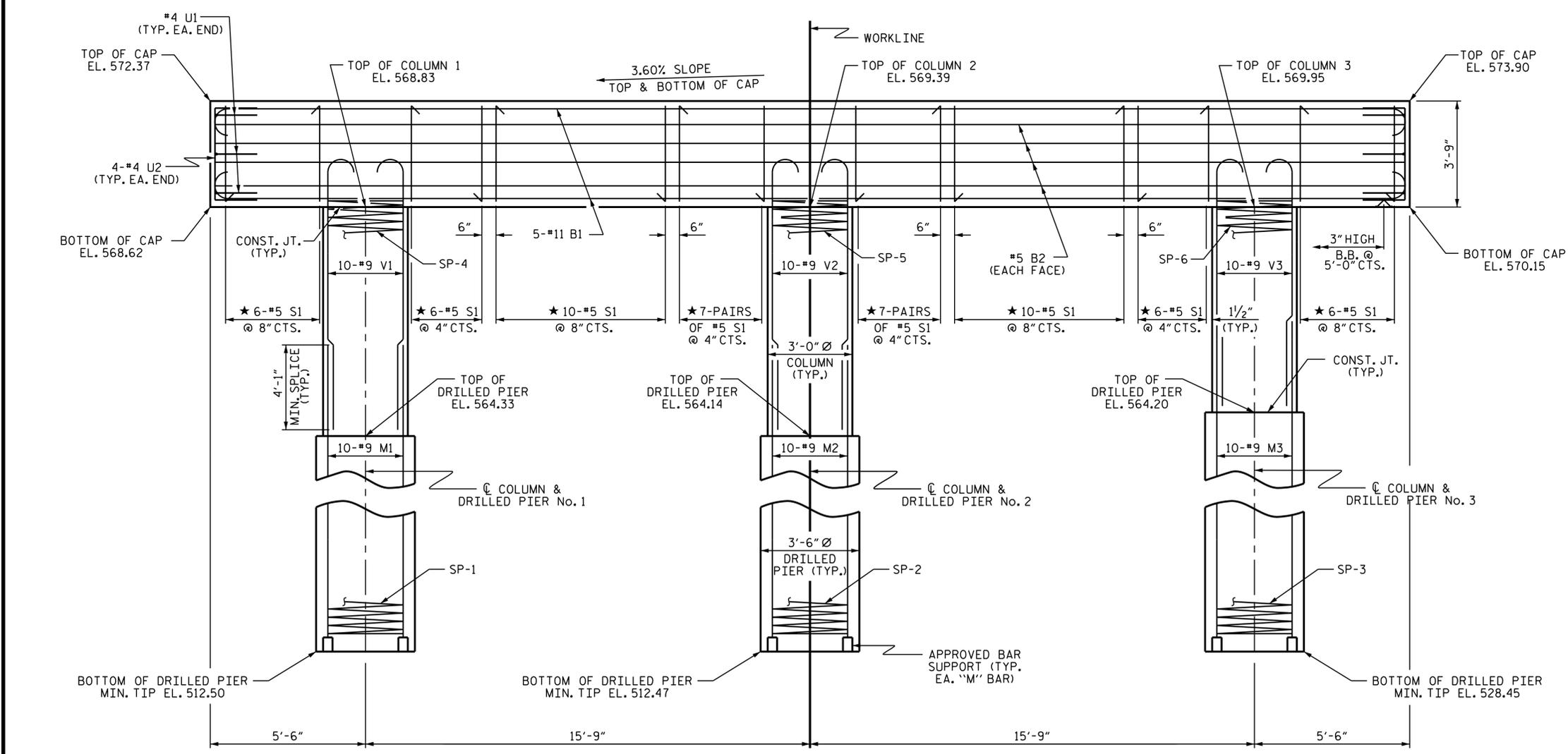
NOTES

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.
- HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
- FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
- INSTALL PERMANENT STEEL CASINGS AT BENT NO.1 BY VIBRATING, SCREWING OR DRIVING PERMANENT CASINGS BEFORE EXCAVATING OR DISTURBING ANY MATERIAL BELOW ELEVATION 536.8 FT (PIERS 1-2) AND 538.7 FT (PIER 3).
- POLYMER SLURRY IS REQUIRED FOR DRILLED PIERS AT BENT NO.1.
- ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL."

- ★ INVERT ALTERNATE STIRRUPS.
- DRILLED PIERS SHALL BE TERMINATED ONE FOOT ± ABOVE NORMAL WATER SURFACE ELEVATION FOR SHAFTS LOCATED IN WATER.
- THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.

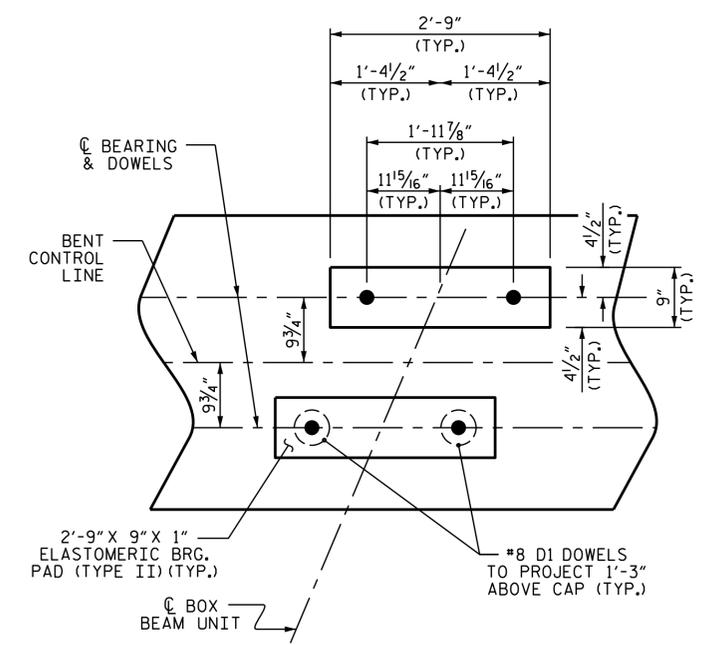


PLAN



ELEVATION

DIMENSIONS & REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN & DRILLED PIER UNLESS OTHERWISE NOTED.



DETAIL "A"

(DIMENSIONS ARE TYPICAL EACH BEARING)

PROJECT NO. **BP9-R012**
ROWAN COUNTY
 STATION: **20+96.00 -L-**
 SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
SUBSTRUCTURE
BENT No. 1

DESIGNED BY:	A. D'AIUTO	DATE:	MAY 2024
DRAWN BY:	A. D'AIUTO	DATE:	MAY 2024
CHECKED BY:	E. LAWES	DATE:	JUNE 2024
DESIGN ENGINEER OF RECORD:	E. LAWES	DATE:	JUNE 2024

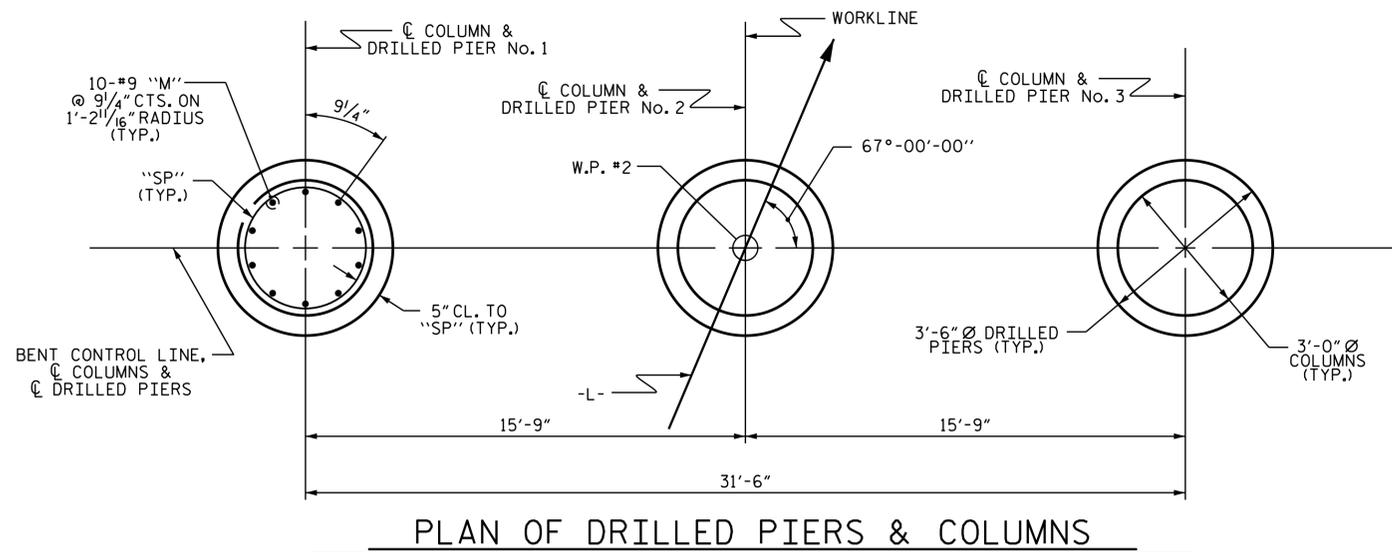
WSP
 WSP USA Inc.
 434 FAYETTEVILLE STREET
 SUITE 1500
 RALEIGH, NC 27601
 TEL: 1.919.836.4040
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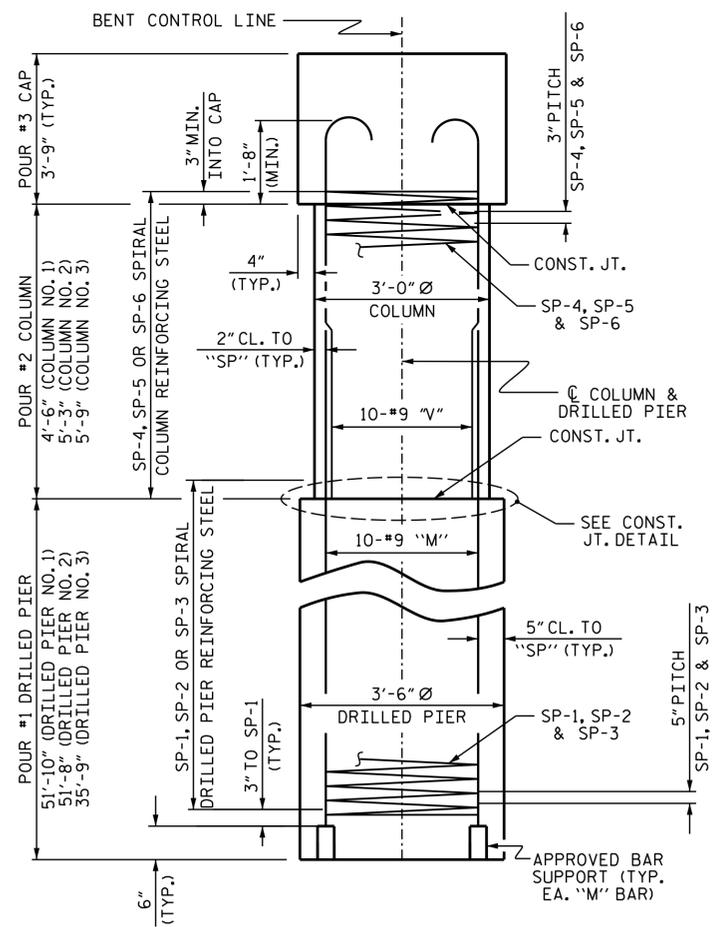
DocuSigned by:
 Elizabeth F. Lawes
 936E94232C2D547C

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

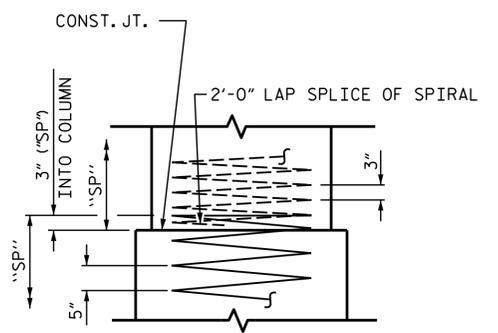
TOTAL SHEETS: 24



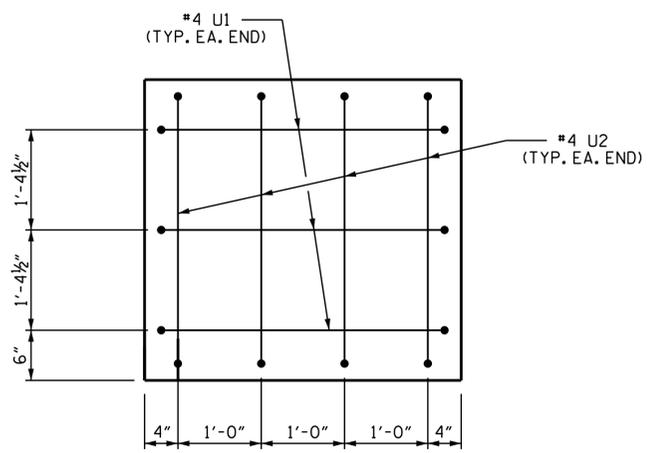
PLAN OF DRILLED PIERS & COLUMNS



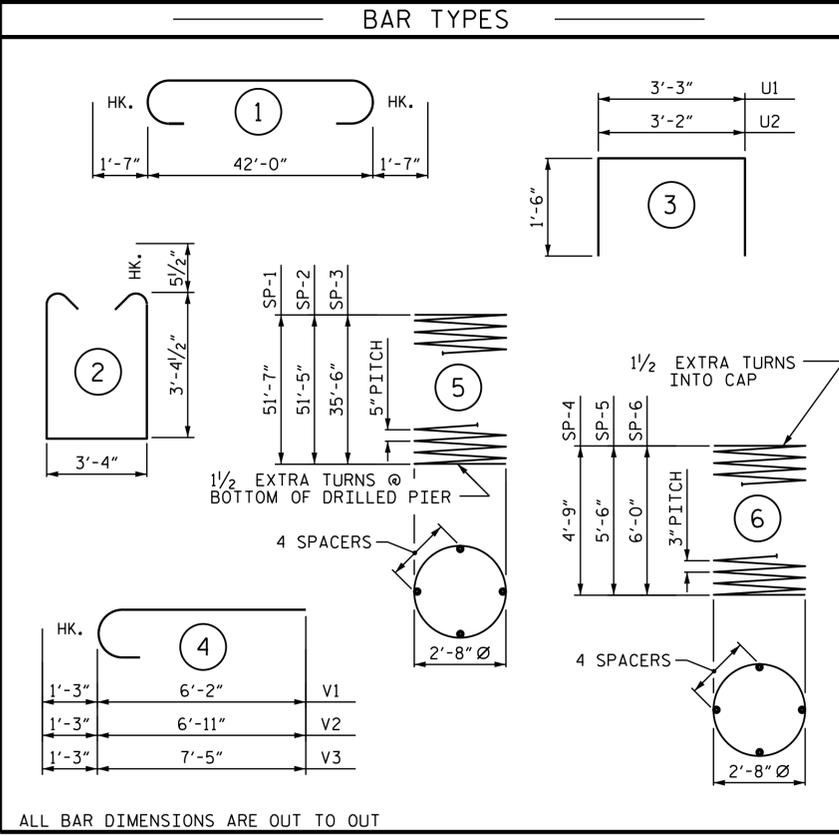
END ELEVATION



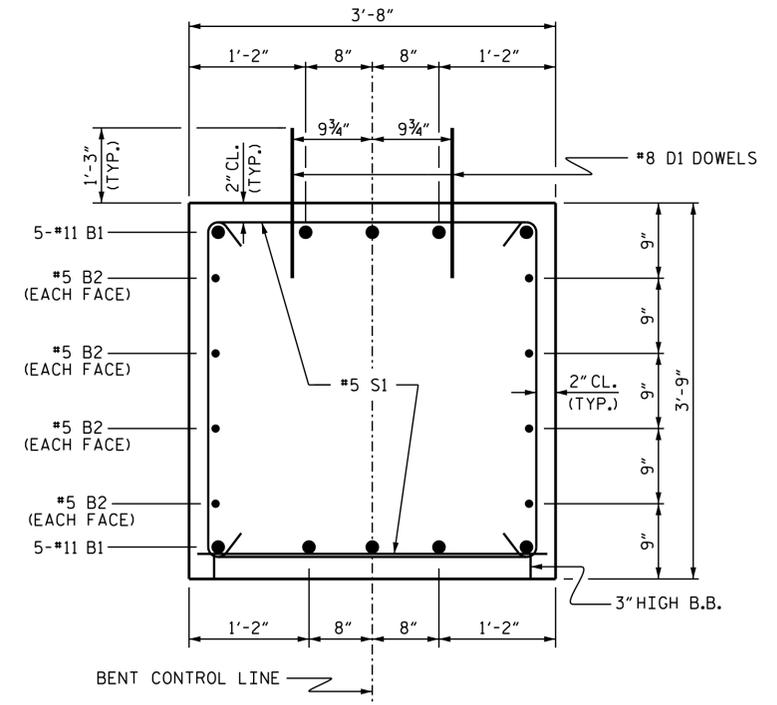
CONSTRUCTION JOINT DETAIL



END OF CAP VIEW
(TYPICAL BOTH ENDS)



ALL BAR DIMENSIONS ARE OUT TO OUT

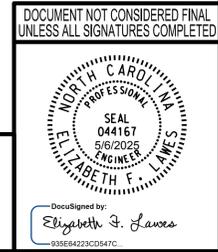


SECTION THRU CAP

BILL OF MATERIAL					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#11	1	45'-2"	2400
B2	8	#5	STR	42'-2"	352
D1	48	#8	STR	2'-3"	288
M1	10	#9	STR	58'-7"	1992
M2	10	#9	STR	58'-5"	1986
M3	10	#9	STR	45'-8"	1553
S1	72	#5	2	11'-0"	826
U1	6	#4	3	6'-3"	25
U2	8	#4	3	6'-2"	33
V1	10	#9	4	7'-5"	252
V2	10	#9	4	8'-2"	278
V3	10	#9	4	8'-8"	295
REINFORCING STEEL					10,280 LBS.
SP-1	1	*	5	1036'-4"	1081
SP-2	1	*	5	1028'-1"	1072
SP-3	1	*	5	715'-7"	746
SP-4	1	**	6	173'-4"	116
SP-5	1	**	6	198'-1"	132
SP-6	1	**	6	214'-7"	143
SPIRAL COLUMN REINFORCING STEEL					3,290 LBS.
* THE SP-1, SP-2 AND SP-3 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR					
** THE SP-4, SP-5 AND SP-6 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR					
CLASS A CONCRETE BREAKDOWN					
POUR #2 (COLUMNS)					4.1 C.Y.
POUR #3 (CAP)					21.7 C.Y.
TOTAL CLASS A CONCRETE					25.8 C.Y.
DRILLED PIERS:					
DRILLED PIER CONCRETE					49.6 C.Y.

PROJECT NO. **BP9-R012**
ROWAN COUNTY
 STATION: **20+96.00 -L-**
 SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 BENT No. 1
 DETAILS

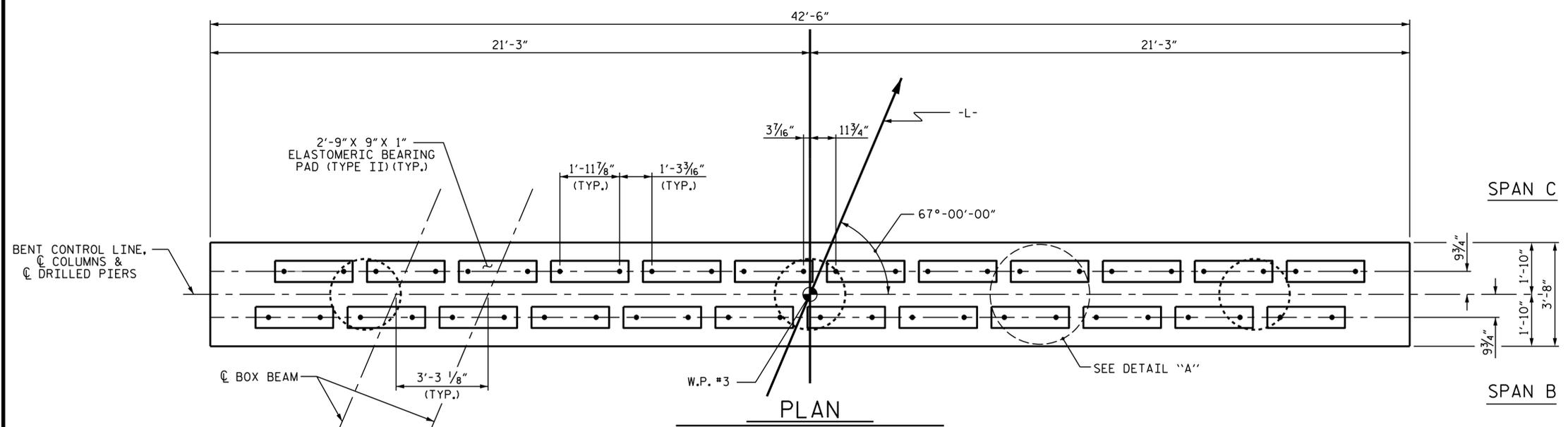


wsp
 WSP USA Inc.
 434 FAYETTEVILLE STREET
 SUITE 1500
 RALEIGH, NC 27601
 TEL: 1.919.836.4040
 LICENSE NO. F-0165

DESIGNED BY: A. D'AIUTO DATE: MAY 2024
 DRAWN BY: A. D'AIUTO DATE: MAY 2024
 CHECKED BY: E. LAWES DATE: JUNE 2024
 DESIGN ENGINEER OF RECORD: E. LAWES DATE: JUNE 2024

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

TOTAL SHEETS: 24



NOTES

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

HOOKS ON "M" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

INSTALL PERMANENT STEEL CASINGS AT BENT NO. 2 BY VIBRATING, SCREWING OR DRIVING PERMANENT CASINGS BEFORE EXCAVATING OR DISTURBING ANY MATERIAL BELOW ELEVATION 538.1 FT (PIER 1) AND 531.8 FT (PIERS 2-3).

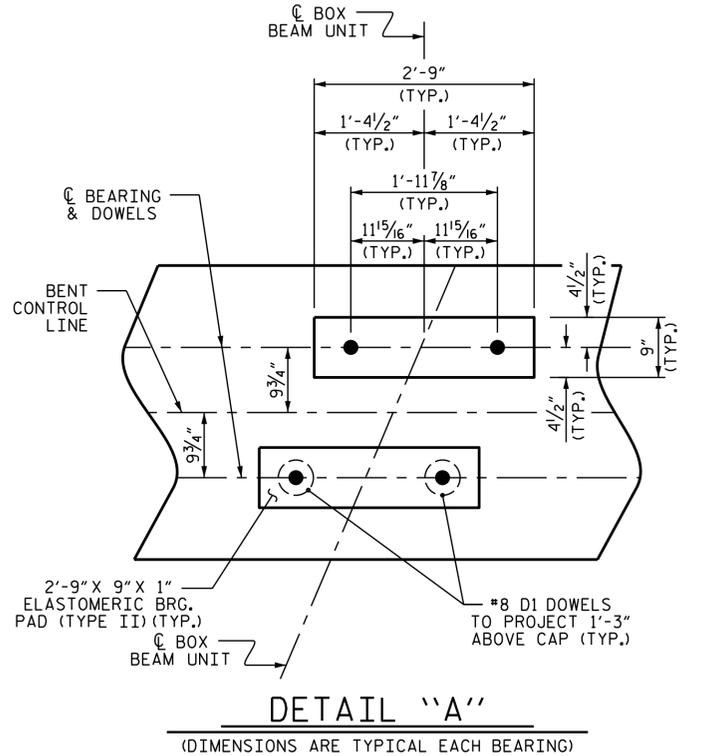
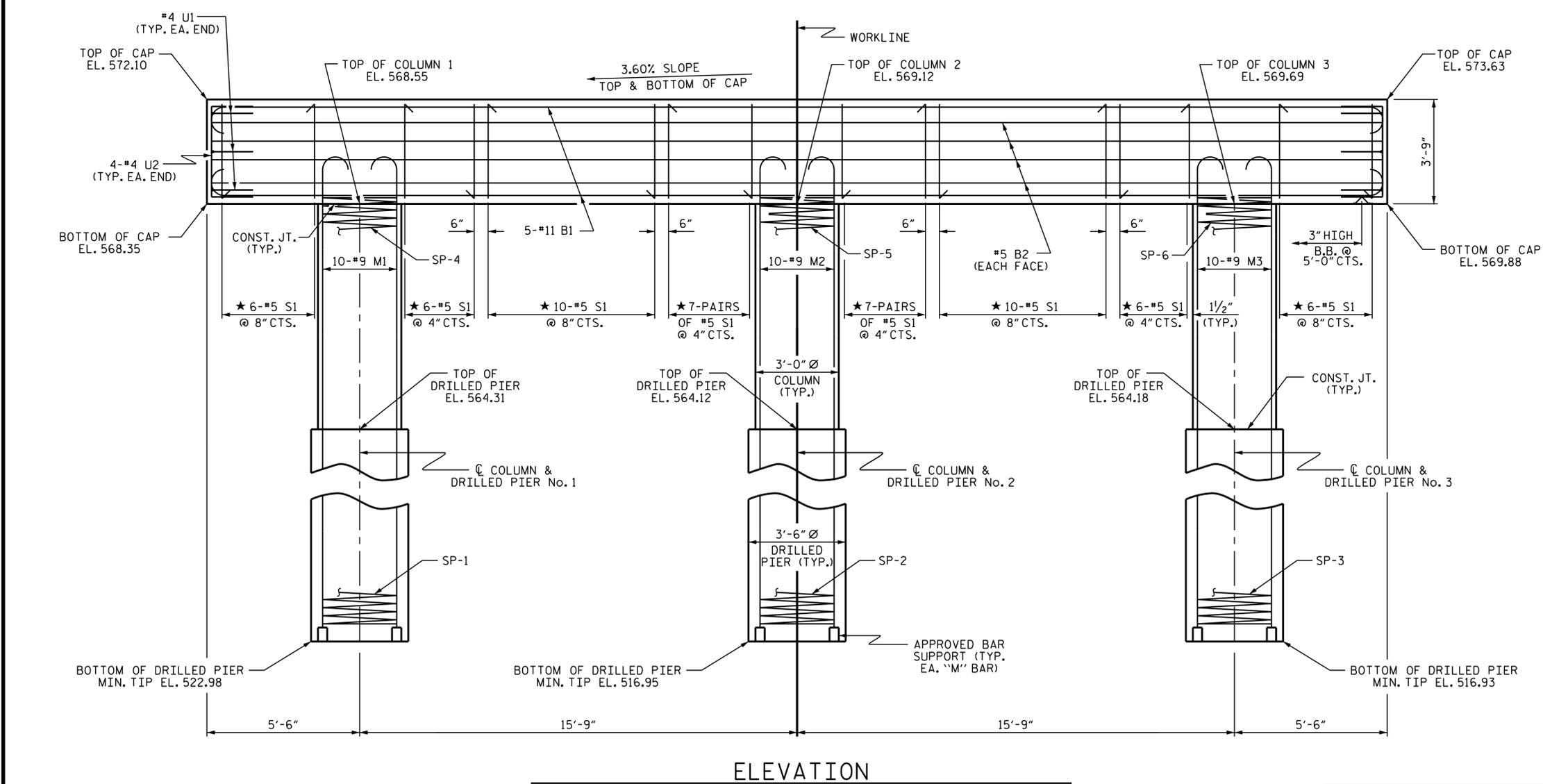
POLYMER SLURRY IS REQUIRED FOR DRILLED PIERS AT BENT NO. 2.

ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL."

★ INVERT ALTERNATE STIRRUPS.

DRILLED PIERS SHALL BE TERMINATED ONE FOOT ± ABOVE NORMAL WATER SURFACE ELEVATION FOR SHAFTS LOCATED IN WATER.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.



ELEVATION

DIMENSIONS & REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN & DRILLED PIER UNLESS OTHERWISE NOTED.

PROJECT NO. **BP9-R012**
ROWAN COUNTY
 STATION: **20+96.00 -L-**
 SHEET 1 OF 2

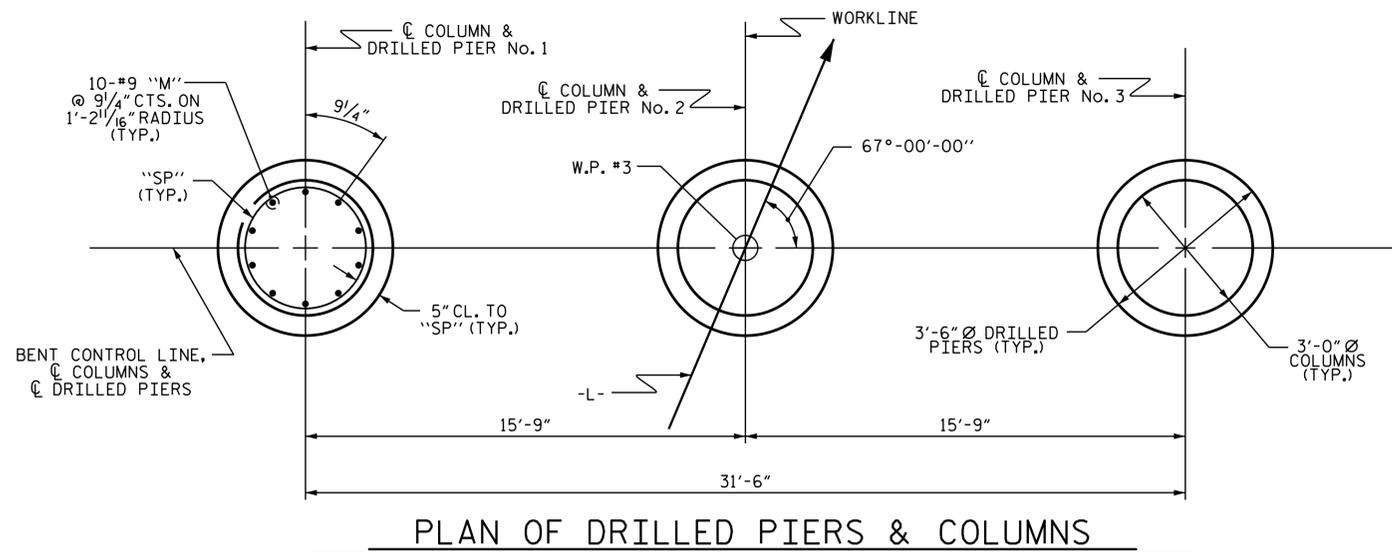
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH		SUBSTRUCTURE BENT No. 2	
REVISIONS			
NO.	BY:	DATE:	NO.
1			3
2			4
			SHEET NO. S-21 TOTAL SHEETS 24

DESIGNED BY: A. D'AIUTO DATE: MAY 2024
 DRAWN BY: A. D'AIUTO DATE: MAY 2024
 CHECKED BY: E. LAWES DATE: JUNE 2024
 DESIGN ENGINEER OF RECORD: E. LAWES DATE: JUNE 2024

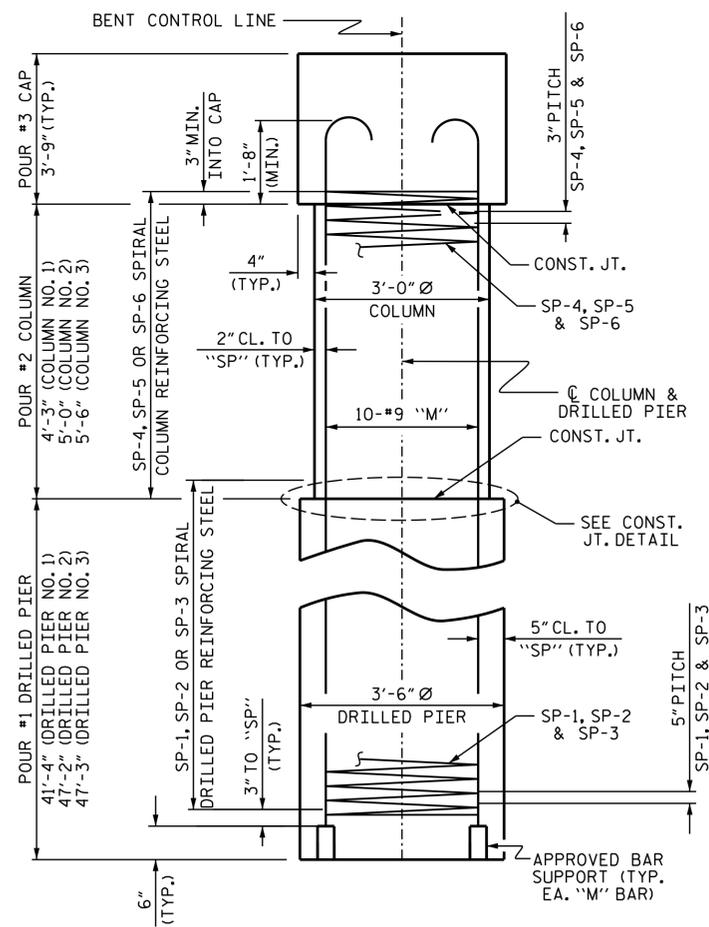
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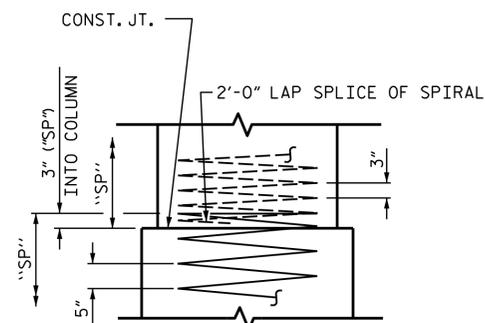
SEAL
 NORTH CAROLINA
 PROFESSIONAL ENGINEER
 044167
 5/6/2025
 ELIZABETH F. LAWES



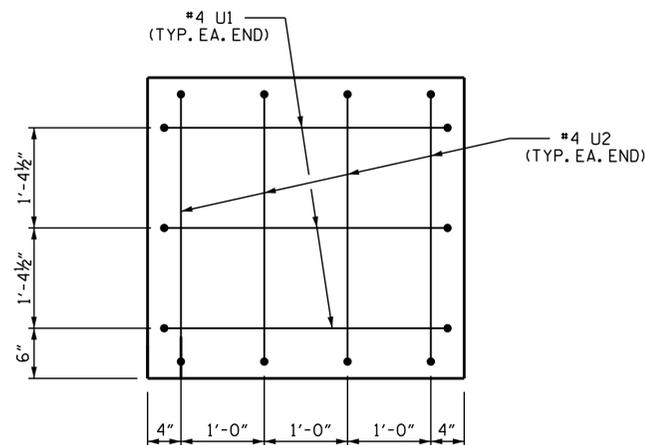
PLAN OF DRILLED PIERS & COLUMNS



END ELEVATION

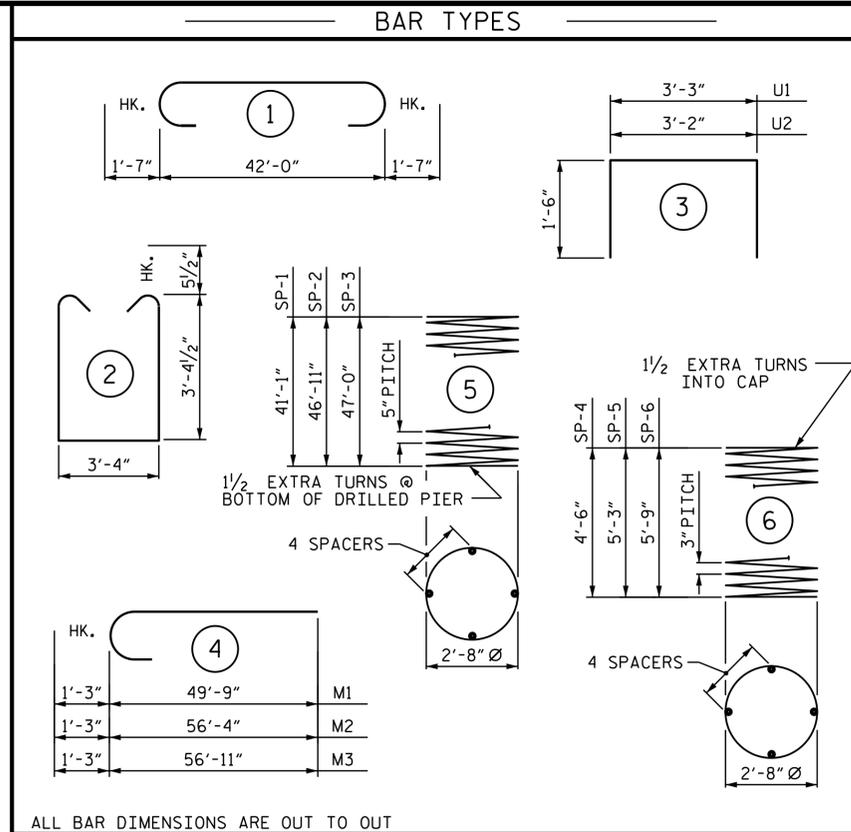


CONSTRUCTION JOINT DETAIL

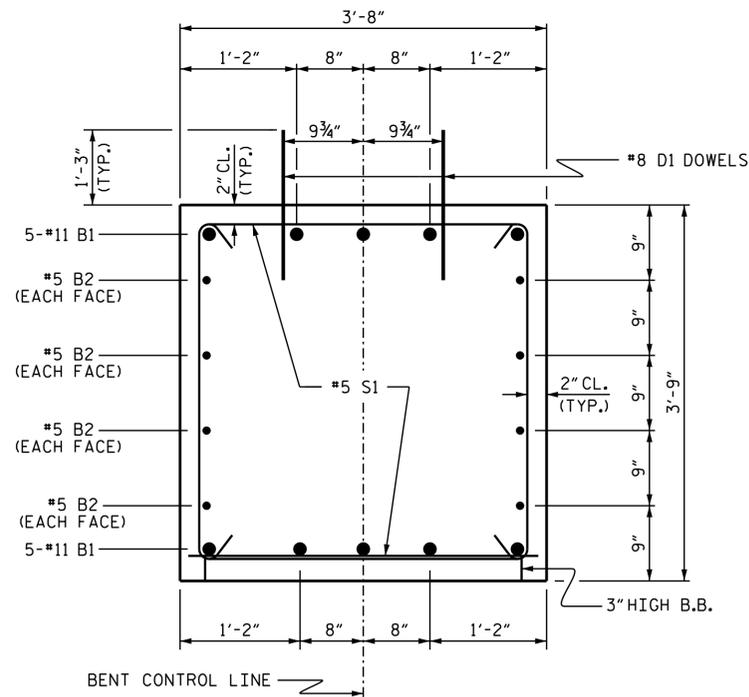


END OF CAP VIEW

(TYPICAL BOTH ENDS)



ALL BAR DIMENSIONS ARE OUT TO OUT



SECTION THRU CAP

BILL OF MATERIAL					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#11	1	45'-2"	2400
B2	8	#5	STR	42'-2"	352
D1	48	#8	STR	2'-3"	288
M1	10	#9	4	51'-0"	1734
M2	10	#9	4	57'-7"	1958
M3	10	#9	4	58'-2"	1978
S1	72	#5	2	11'-0"	826
U1	6	#4	3	6'-3"	25
U2	8	#4	3	6'-2"	33
REINFORCING STEEL					9,594 LBS.
SP-1	1	*	5	830'-9"	866
SP-2	1	*	5	945'-10"	987
SP-3	1	*	5	945'-10"	987
SP-4	1	**	6	165'-1"	110
SP-5	1	**	6	189'-10"	127
SP-6	1	**	6	206'-4"	138
SPIRAL COLUMN REINFORCING STEEL					3,215 LBS.
* THE SP-1, SP-2 AND SP-3 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR					
** THE SP-4, SP-5 AND SP-6 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR					
CLASS A CONCRETE BREAKDOWN					
POUR #2 (COLUMNS)					3.9 C.Y.
POUR #3 (CAP)					21.7 C.Y.
TOTAL CLASS A CONCRETE					25.6 C.Y.
DRILLED PIERS:					
DRILLED PIER CONCRETE					
POUR #1 (DRILLED PIERS)					48.4 C.Y.

PROJECT NO. **BP9-R012**

ROWAN COUNTY

STATION: **20+96.00 -L-**

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

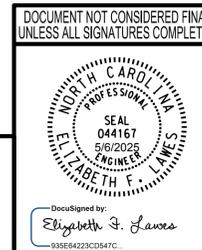
SUBSTRUCTURE
BENT No. 2
DETAILS

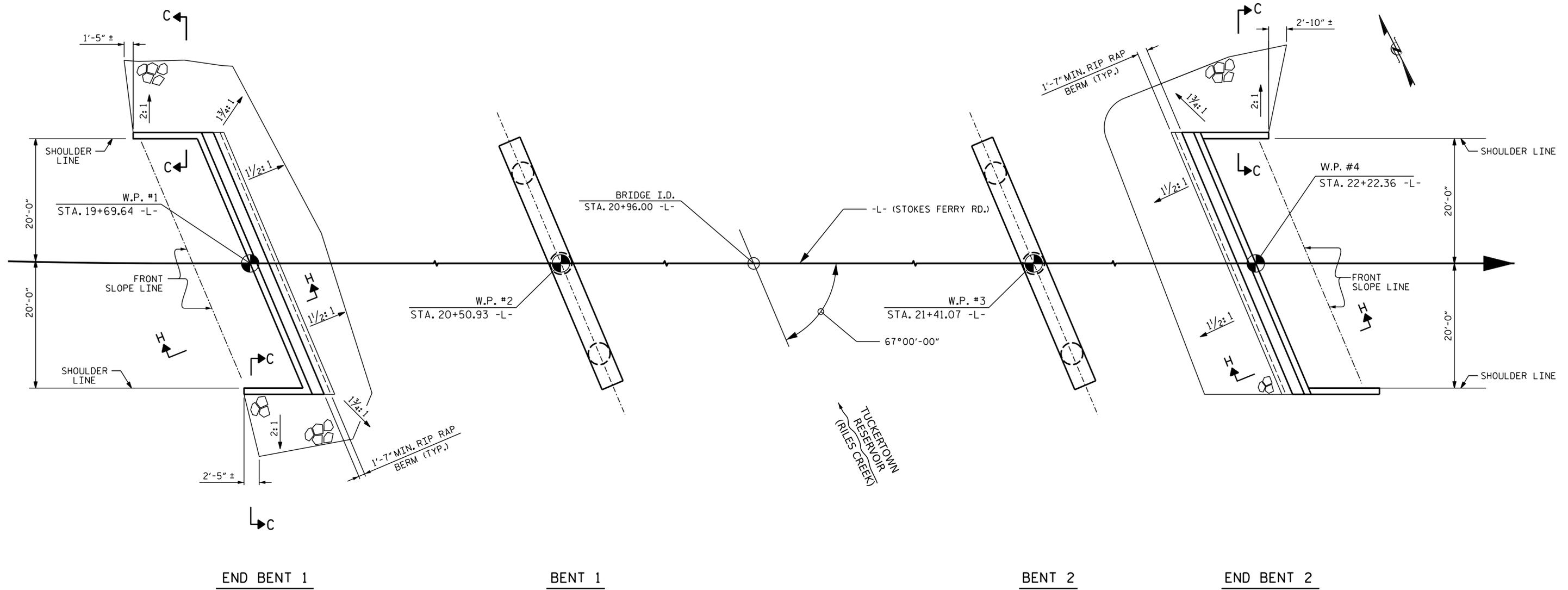
REVISIONS				SHEET NO.
NO.	BY:	DATE:	NO.	DATE:
1			3	
2			4	
				TOTAL SHEETS 24

DESIGNED BY: A. D'AIUTO DATE: MAY 2024
DRAWN BY: A. D'AIUTO DATE: MAY 2024
CHECKED BY: E. LAWES DATE: JUNE 2024
DESIGN ENGINEER OF RECORD: E. LAWES DATE: JUNE 2024

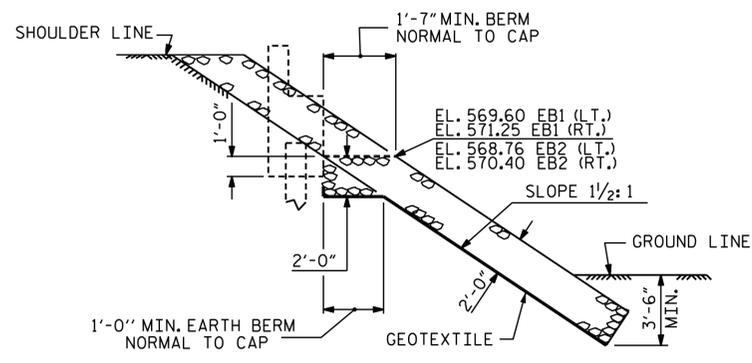


WSP USA Inc.
434 FAYETTEVILLE STREET
SUITE 1500
RALEIGH, NC 27601
TEL: 1.919.836.4040
LICENSE NO. F-0165

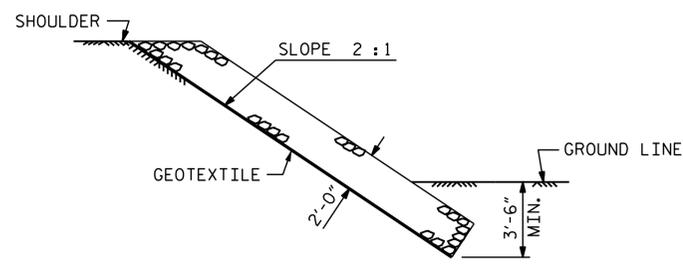




PLAN



SECTION H-H

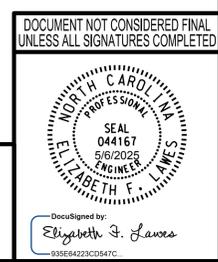


SECTION C-C

ESTIMATED QUANTITIES		
BRIDGE @ STA. 20+96.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	146	162
END BENT 2	143	159

PROJECT NO. **BP9-R012**
ROWAN COUNTY
 STATION: **20+96.00 -L-**

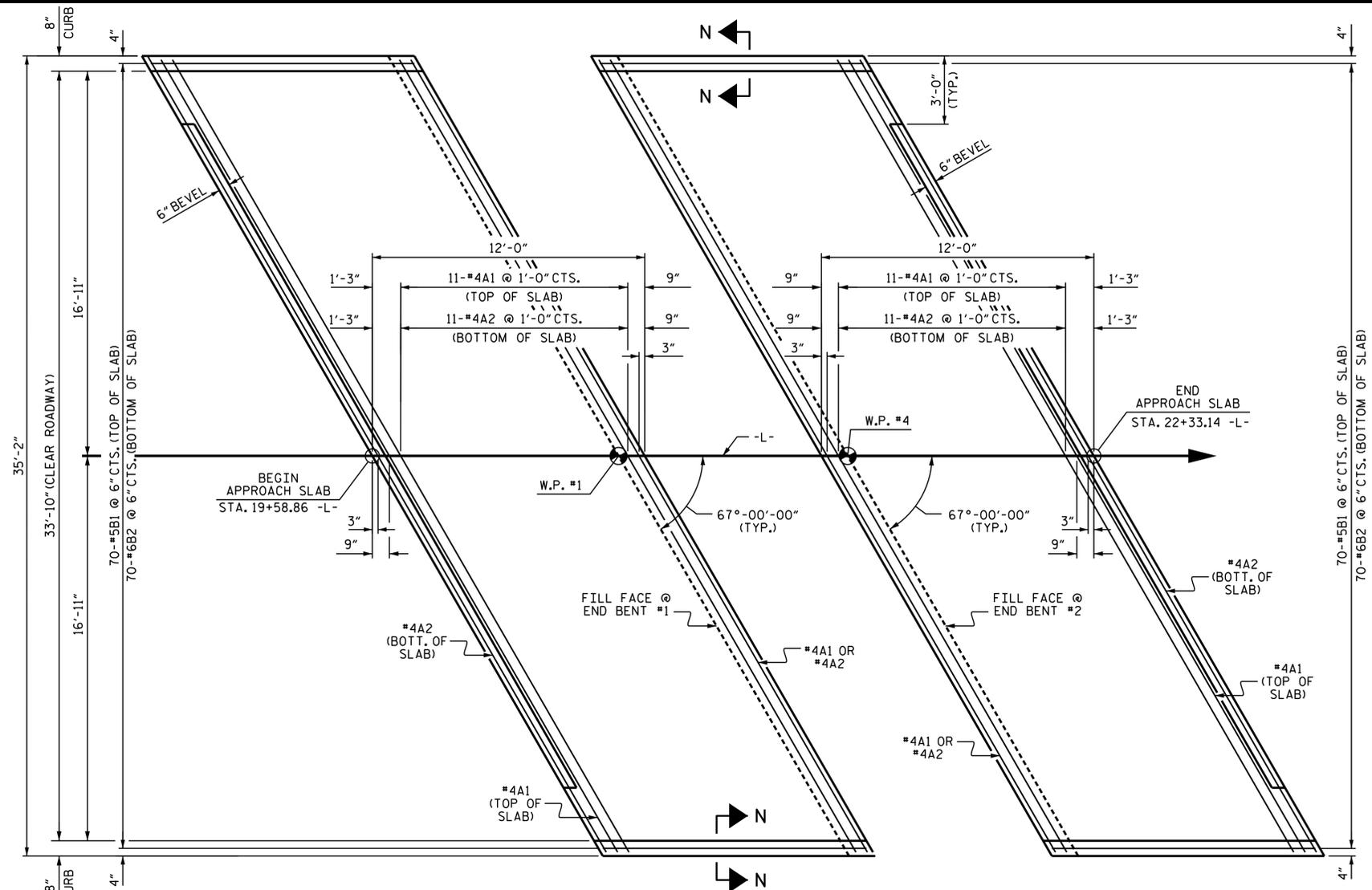
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
RIP RAP DETAILS



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 434 FAYETTEVILLE STREET
 SUITE 1500
 RALEIGH, NC 27601
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DESIGNED BY: A. D'AIUTO	DATE: MAY 2024	DRAWN BY: A. D'AIUTO	DATE: MAY 2024	CHECKED BY: E. LAWES	DATE: JUNE 2024	DESIGN ENGINEER OF RECORD: E. LAWES	DATE: JUNE 2024
DRAWN BY: REK 1/84		REV. 10/1/11	MAA/GM	CHECKED BY: RDU 1/84		REV. 12/21/11	MAA/GM
		REV. 12/17	MAA/THC				

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			24
2			4			



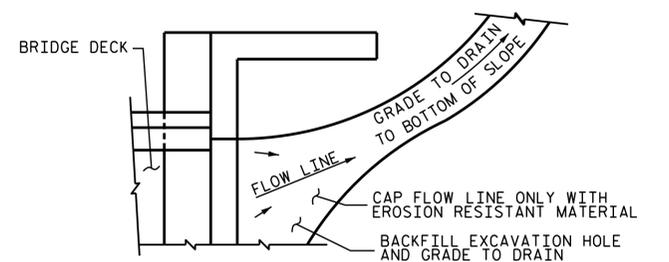
PLAN @ END BENT #1 **PLAN @ END BENT #2**
 DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS

NOTES

FOR BRIDGE APPROACH FILL, SEE ROADWAY PLANS.

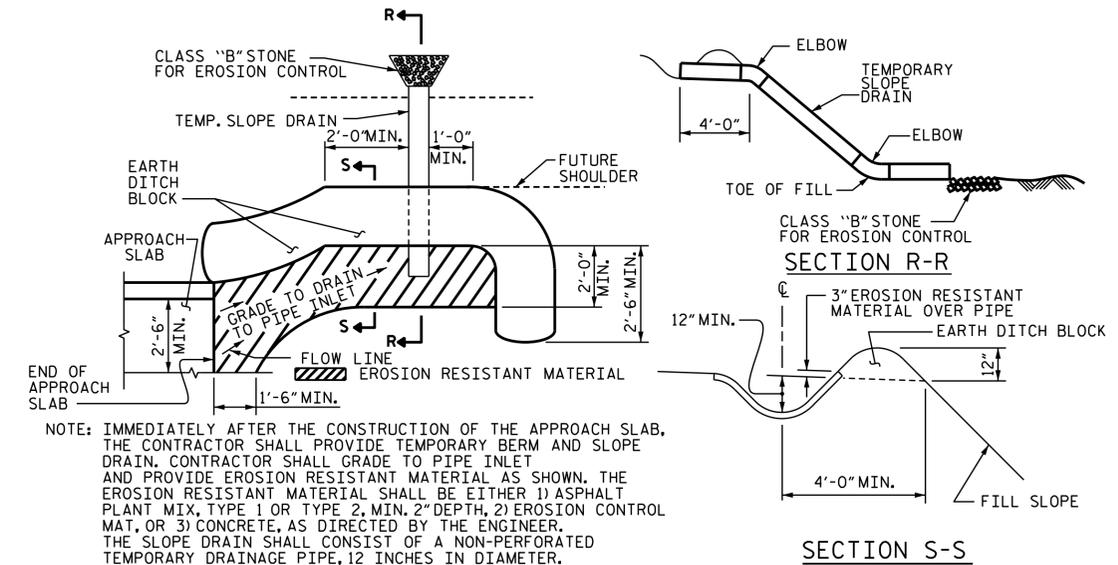
AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

APPROACH SLAB GROOVING IS NOT REQUIRED.



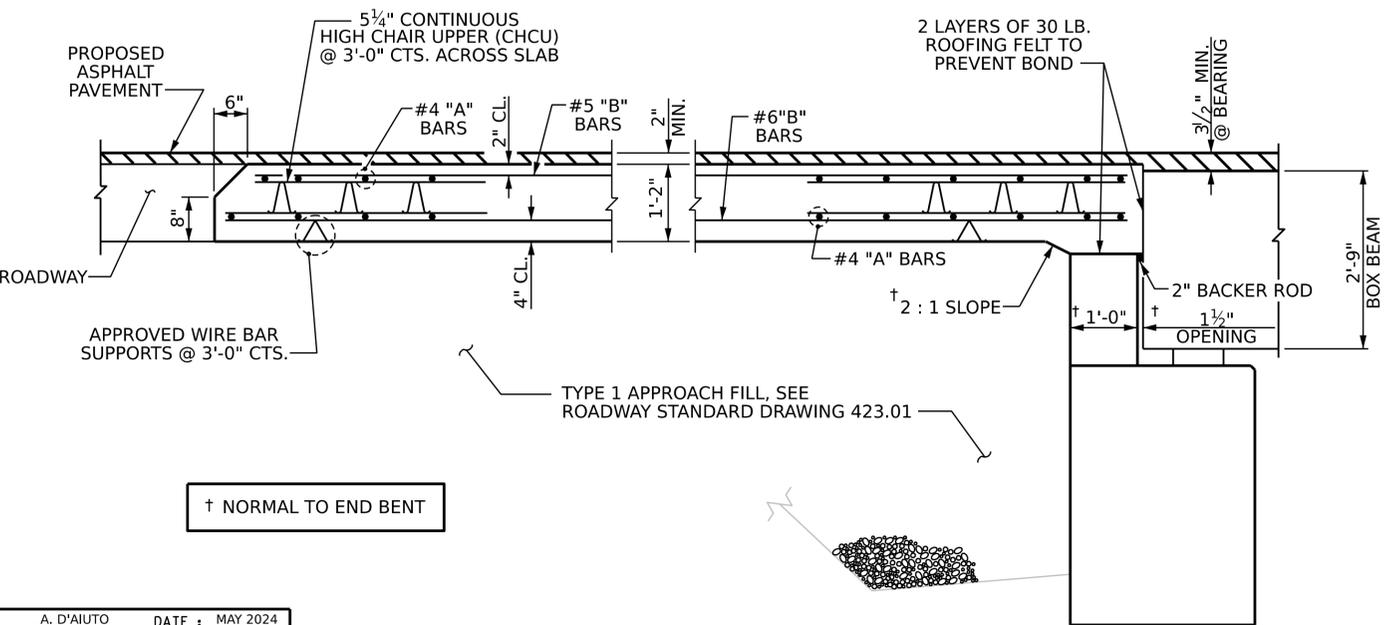
NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL

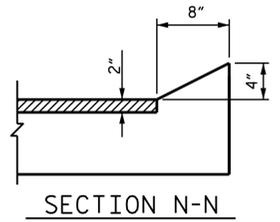


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN. 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.

PLAN VIEW
TEMPORARY BERM AND SLOPE DRAIN DETAILS
 (TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



SECTION THRU SLAB



CURB DETAILS

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

PROJECT NO. **BP9-R012**
ROWAN COUNTY
 STATION: **20+96.00 -L-**

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

BRIDGE APPROACH SLAB FOR PRESTRESSED CONCRETE BOX BEAM UNIT (SUB-REGIONAL TIER) 67° SKEW

REVISIONS				SHEET NO.	
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2			4		24

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DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
 PROFESSIONAL ENGINEER
 SEAL 044167
 5/6/2025
 ELIZABETH F. LAWES

