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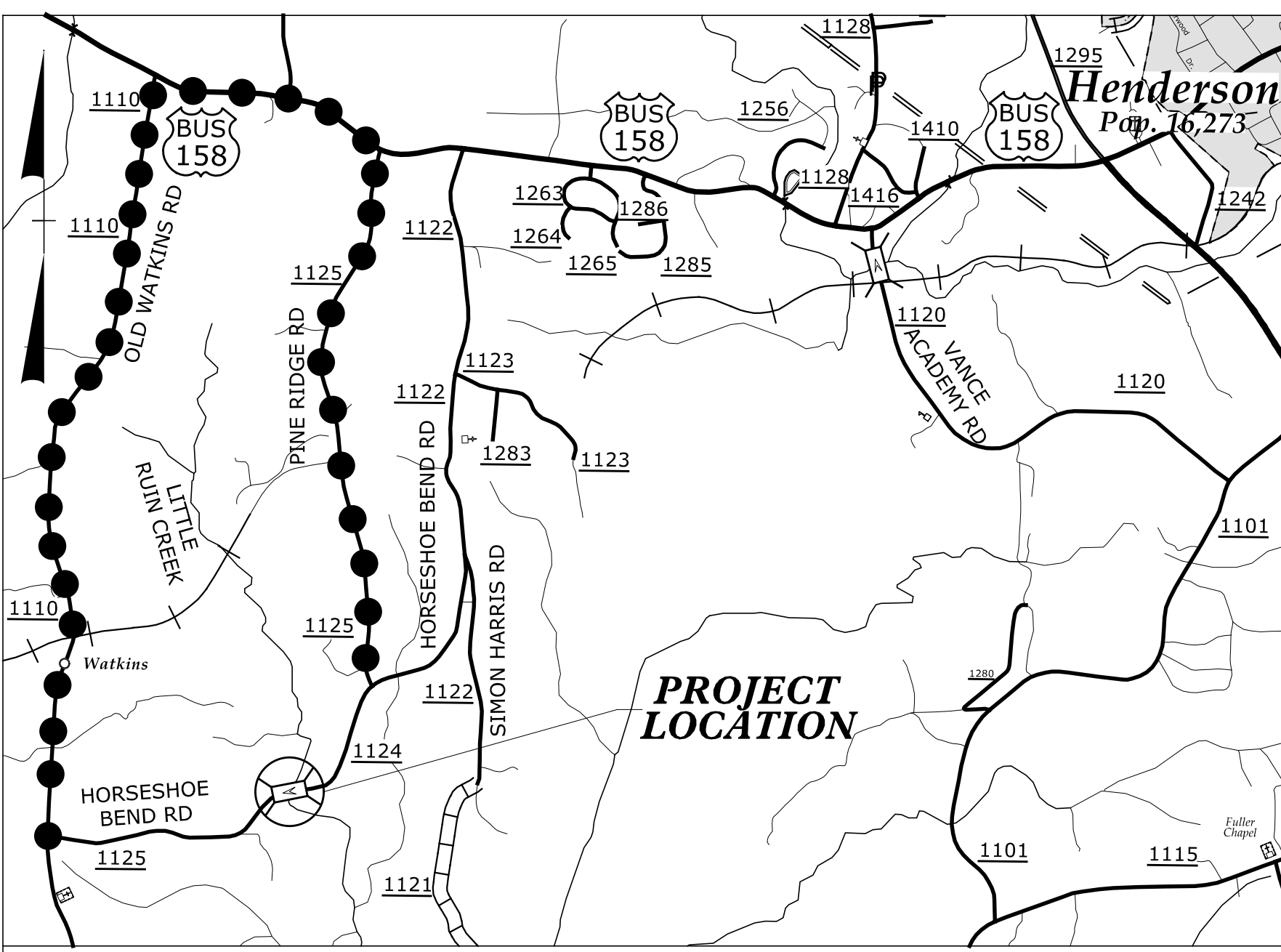
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09/08/24

**PROJECT: BP5.R131**

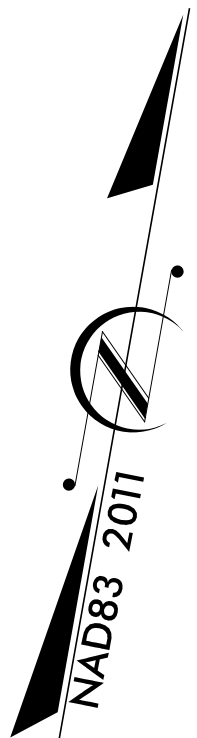
**CONTRACT: DE00376**

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



**VICINITY MAP**

●●●●● OFF-SITE DETOUR



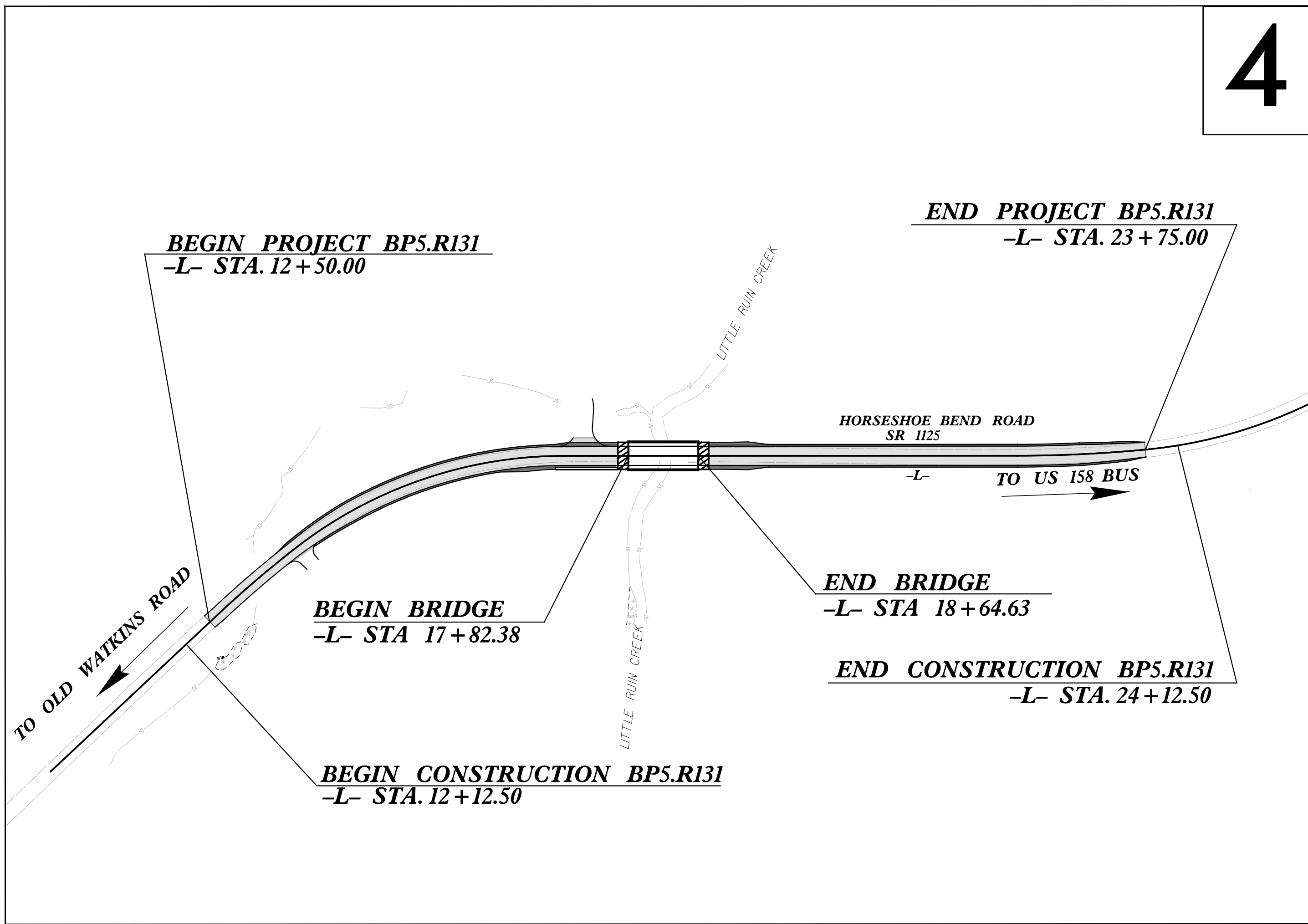
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**VANCE COUNTY**

**LOCATION: REPLACE BRIDGE NO.15 OVER LITTLE RUIN CREEK  
ON HORSESHOE BEND ROAD (SR 1125)**

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

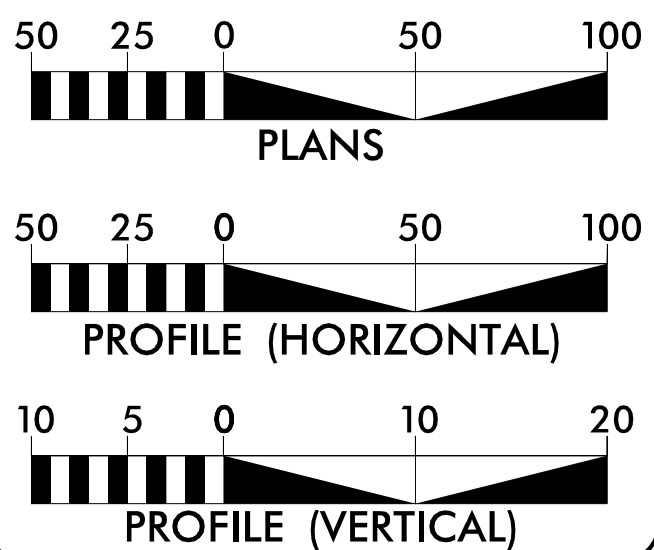
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	<b>BP5.R131</b>	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
BP5.R131.1	N/A	PE	
BP5.R131.2	N/A	RW	
BP5.R131.3	N/A	CONST.	



4

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

**GRAPHIC SCALES**



**DESIGN DATA**

ADT 2023 = 120 VPD  
ADT 2040 = 180 VPD

V = 45 MPH  
FUNC CLASS = LOCAL  
SUBREGIONAL TIER

**PROJECT LENGTH**

LENGTH ROADWAY PROJECT BP5.R131 = 0.197 Miles

LENGTH STRUCTURE PROJECT BP5.R131 = 0.016 Miles

TOTAL LENGTH OF PROJECT BP5.R131 = 0.213 Miles

Prepared in the Office of:

**LOCHNER**  
H. W. LOCHNER, INC.  
2840 PLAZA PLACE, SUITE 202  
RALEIGH, NC 27612  
(919) 571-7111  
NC License Number: F03939

**CHRISTINA YOKELEY, PE**  
PROJECT ENGINEER

**REID CROSSER, EI**  
PROJECT DESIGN ENGINEER

**LISA B. GILCHRIST, EI**  
NCDOT CONTACT

2024 STANDARD SPECIFICATIONS

**RIGHT OF WAY DATE:**  
FEBRUARY 10, 2023

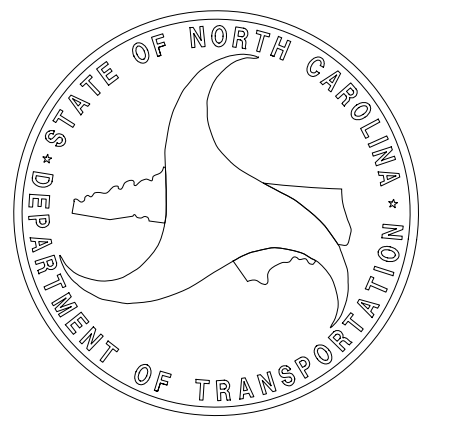
**LETTING DATE:**  
FEBRUARY 14, 2024

**HYDRAULICS ENGINEER**

DocuSigned by:  
*Reid B. Rosol*  
SIGNATURE: P.E. 1/4/2024

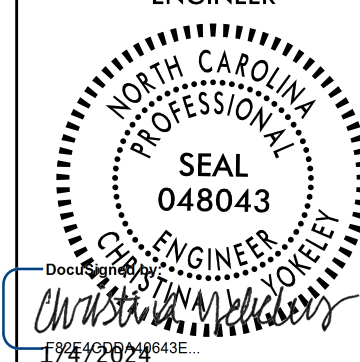
**ROADWAY DESIGN ENGINEER**

DocuSigned by:  
*Christina Yokeley*  
SIGNATURE: P.E. 1/4/2024



12/27/2023  
BP5.R131.RD.V.TSH.dgn  
CYOKELEY

8/17/2024

PROJECT REFERENCE NO. <i>BP5.R131</i>	SHEET NO. <i>1-A</i>
ROADWAY DESIGN ENGINEER	
	
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	

12/21/2023  
BP5.R131.P01.P01.PSH\_01A.dgn  
SYDNEY

SHEET NUMBER

1	TITLE SHEET
1-A	INDEX OF SHEETS
1-B	CONVENTIONAL SYMBOLS
2A-1	PAVEMENT SCHEDULE, TYPICAL SECTIONS, and WEDGING DETAILS
3B-1	GUARDRAIL, SHOULDER BERM GUTTER, PAVEMENT REMOVAL, AND EARTHWORK SUMMARY
3D-1	DRAINAGE SUMMARY
3G-1	SUMMARY OF AGGREGATE SUBGRADE / STABILIZATION
4	PLAN SHEET
5	PROFILE SHEET
RW01 thru RW04	RIGHT OF WAY PLANS
TMP-1 thru TMP-4	TRAFFIC MANAGEMENT PLANS
EC-1 thru EC-5	EROSION CONTROL PLANS
RF-1	REFORESTATION DETAIL SHEET
U0-1 thru U0-2	UTILITIES BY OTHERS PLANS
X-1 thru X-11	CROSS-SECTIONS
S-1 thru S-16	STRUCTURE PLANS

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

EFF. 01-16-2024  
REV.

2024 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Contracts Standards and Development Unit - N. C. Department of Transportation - Raleigh, N. C., Dated January 16, 2024 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.03	Method of Clearing - Method III
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
DIVISION 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
840.00	Concrete Base Pad for Drainage Structures
840.25	Anchorages for Frames - Brick or Concrete or Precast
840.29	Frames and Narrow Slot Flat Grates
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.46	Traffic Bearing Precast Drainage Structure
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
876.01	Rip Rap in Channels and Ditches
876.02	Guide for Rip Rap at Pipe Outlets

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

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

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

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.

SUBSURFACE PLANS:  
  
NO SUBSURFACE PLANS ARE AVAILABLE ON THIS PROJECT. THE CONTRACTOR SHOULD MAKE HIS OWN INVESTIGATION AS TO THE SUBSURFACE CONDITIONS.

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

UTILITIES:  
  
UTILITY OWNERS ON THIS PROJECT ARE  
  
BRIGHTSPEED / LUMEN / CENTURYLINK  
  
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.

# STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

## CONVENTIONAL PLAN SHEET SYMBOLS

9/10/2021

*Note: Not to Scale*

### BOUNDARIES AND PROPERTY:

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

### BUILDINGS AND OTHER CULTURE:

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

### HYDROLOGY:

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

### RAILROADS:

Standard Gauge	
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	
Single Tree	
Single Shrub	
Hedge	

### VEGETATION:

Woods Line	-----
Orchard	
Vineyard	

### EXISTING STRUCTURES:

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

### UTILITIES:

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

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

### TELEPHONE:

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

### WATER:

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

### TV:

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

### GAS:

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

### SANITARY SEWER:

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

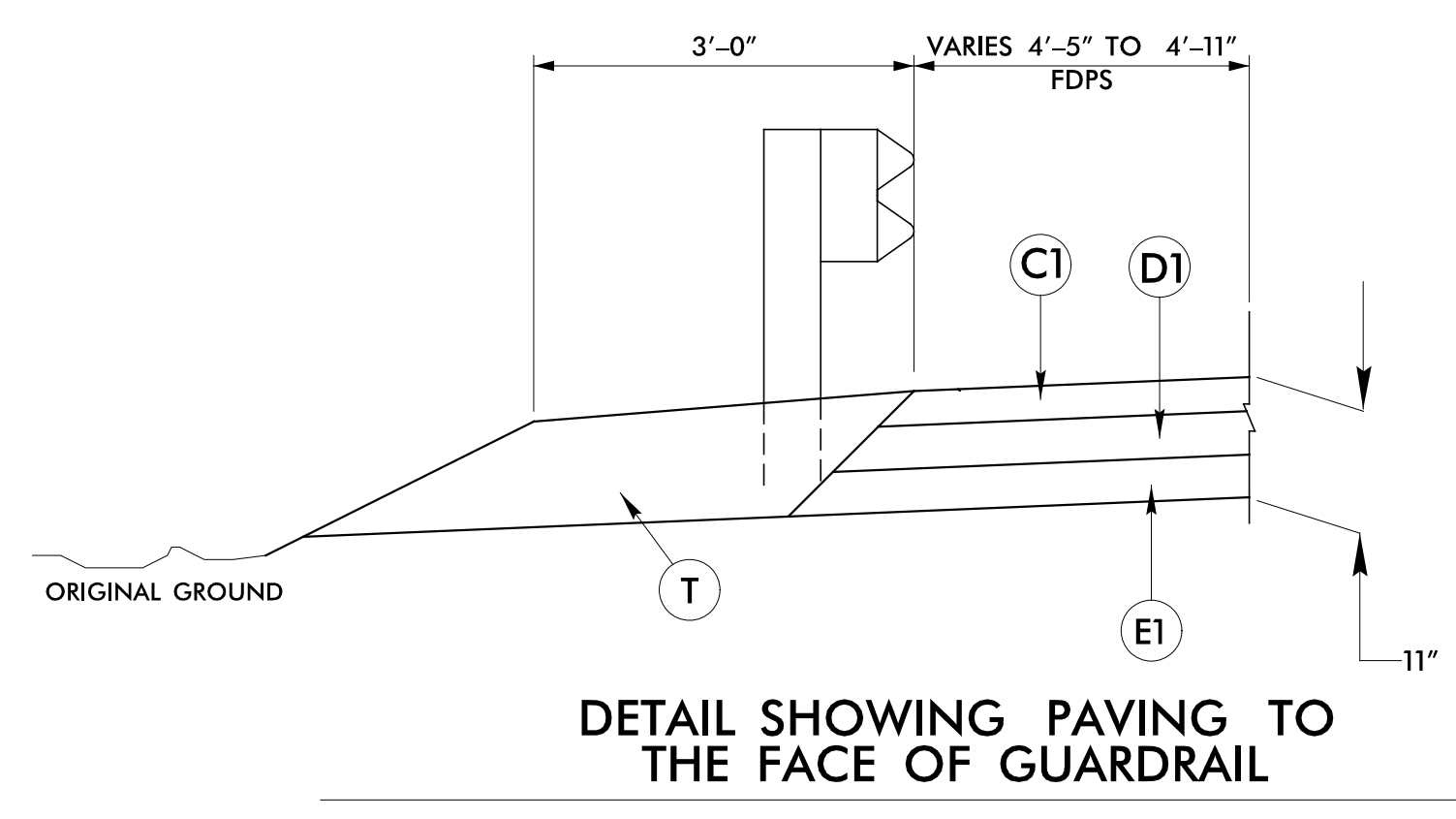
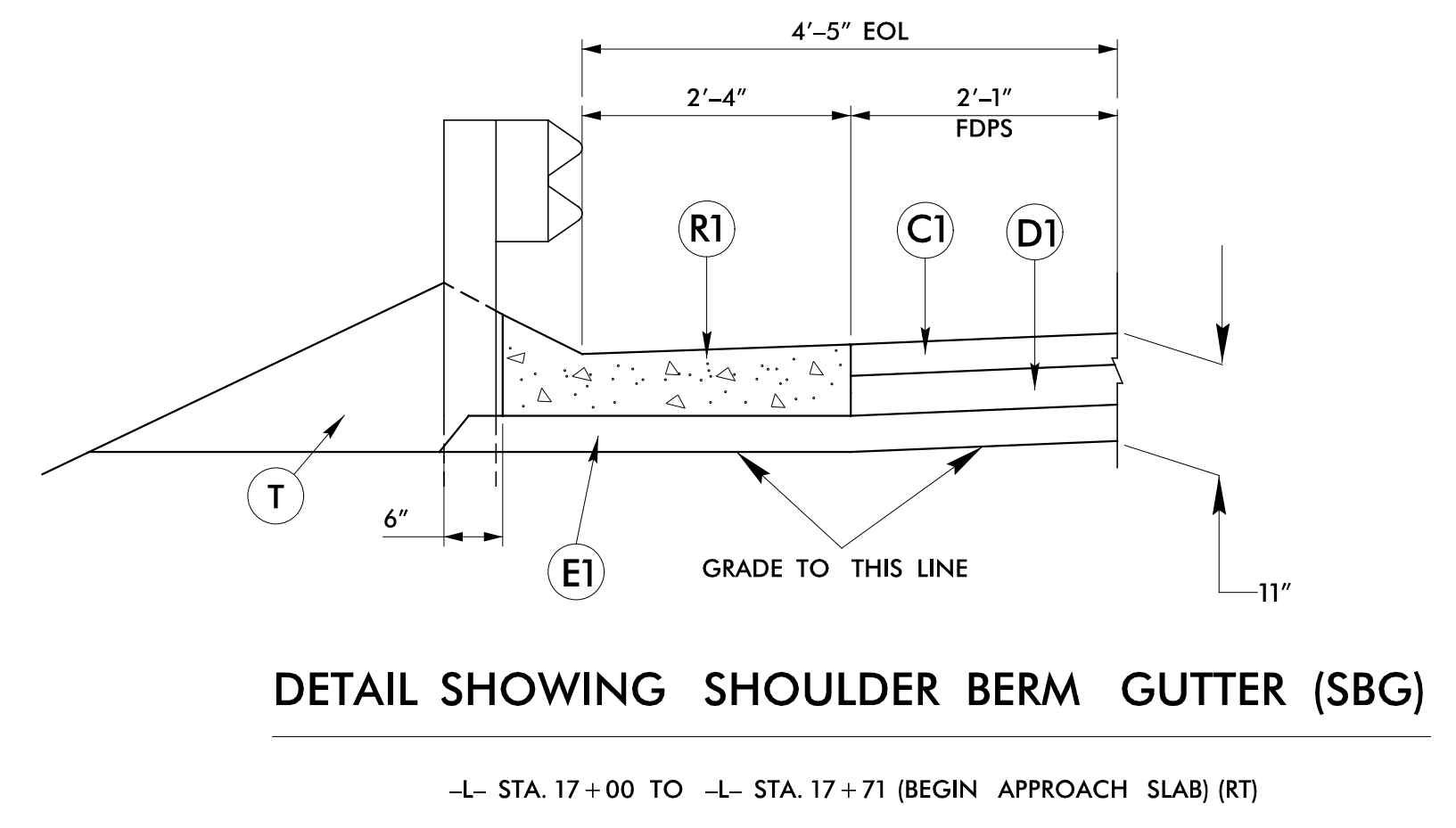
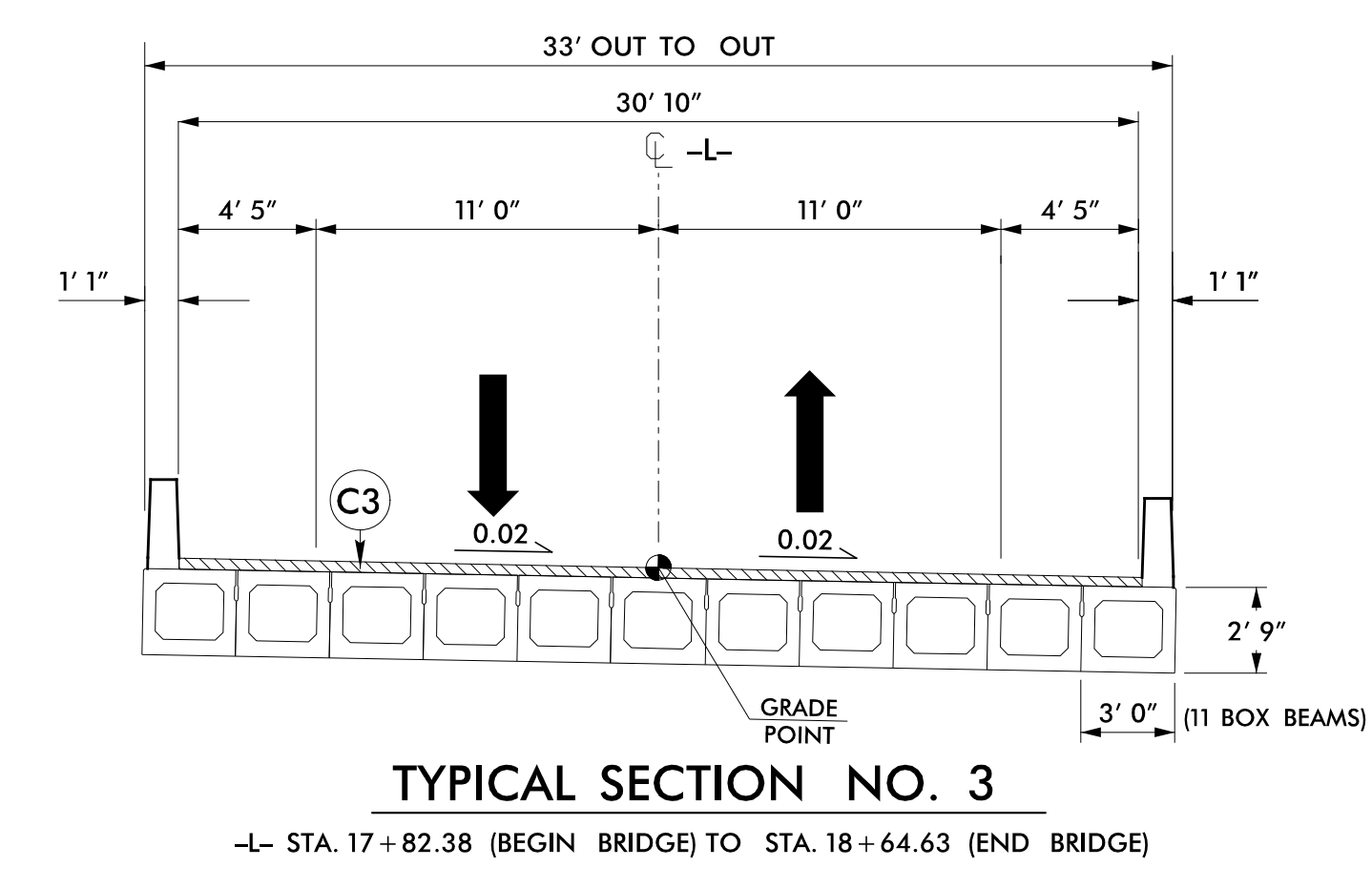
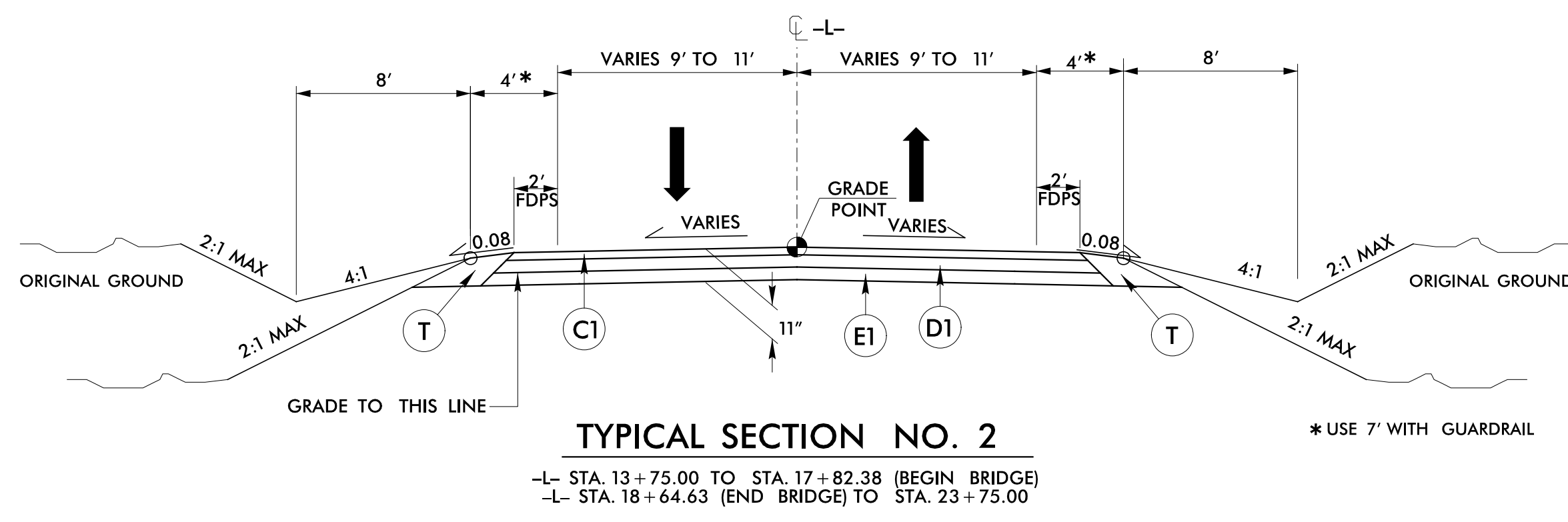
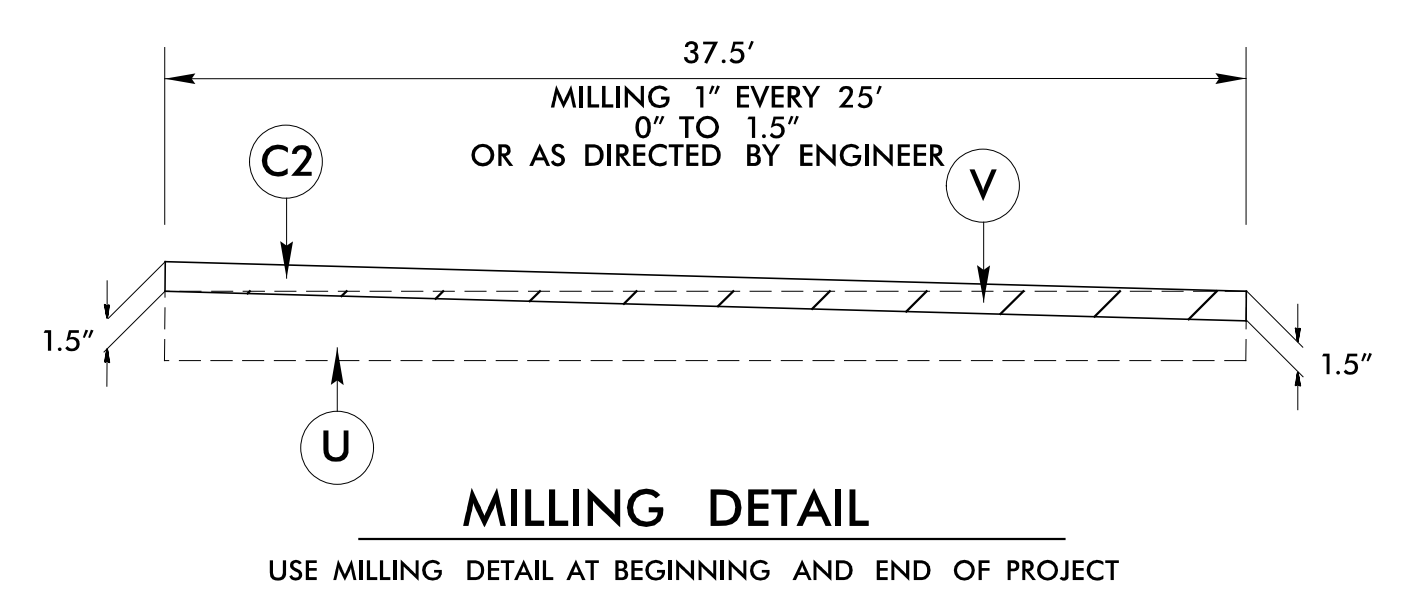
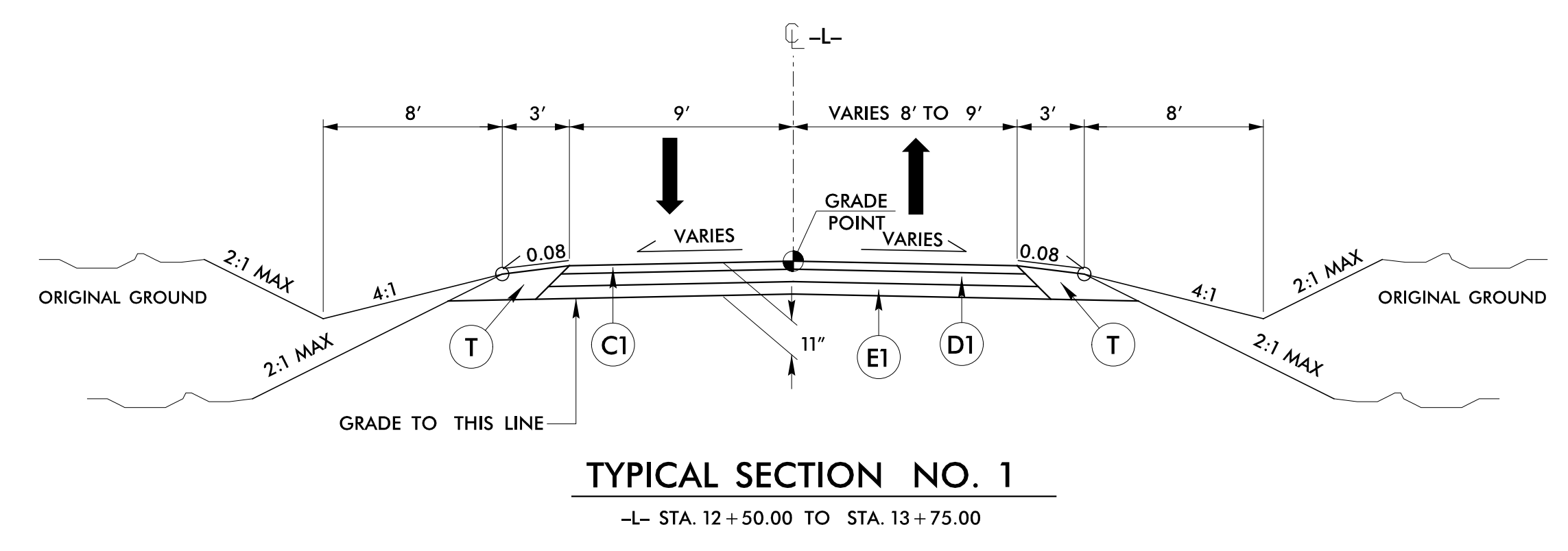
### MISCELLANEOUS:

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

# FINAL PAVEMENT SCHEDULE

C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF THE TWO LAYERS	D1	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	T	EARTH MATERIAL.
C2	PROP. APPROX. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.	E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.	U	EXISTING PAVEMENT.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110.0 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 1" OR TO EXCEED 1 1/2" IN DEPTH	R1	SHOULDER BERM GUTTER	V	VARIABLE DEPTH MILLING (0"-1.5")

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



PROJECT REFERENCE NO. BP5.R131	SHEET NO. 2A-1
ROADWAY DESIGN ENGINEER 	PAVEMENT DESIGN ENGINEER 
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
<b>LOCHNER</b>	
H. W. LOCHNER, INC. 2840 PLAZA PLACE, SUITE 202 RALEIGH, NC 27612 (919) 571-7111	
NC License Number F-0159	

6/21/00  
 COMPUTED BY: RUC DATE: 7/13/22  
 CHECKED BY: CLY DATE: 12/7/23

STATE OF NORTH CAROLINA  
 DIVISION OF HIGHWAYS

**LOCHNER**  
 H. W. LOCHNER, INC.  
 2840 PLAZA PLACE, SUITE 202  
 RALEIGH, NC 27612  
 (919)571-7111  
 NC License Number F-0159

PROJECT REFERENCE NO. SHEET NO.  
 BP5.R131 3B-1

**SUMMARY OF EARTHWORK  
 IN CUBIC YARDS**

LOCATION	EXCAVATION		EMBANKMENT		BORROW	WASTE TOTAL WASTE
	TOTAL UNCLASS.	UNDERCUT	EMBANK. + 20%			
<i>SUMMARY #1</i>						
-L- 12+50 TO 17+82.38	1,189	--	174	--		1,015
-L- 18+64.63 TO 23+75	713	--	154	--		559
--	--	--	--	--		--
--	--	--	--	--		--
TOTAL SUMMARY #1	1,902	--	328	--		1,574
TOTAL	1,902	--	328	--		1,574
LOSS DUE TO CLEARING & GRUBBING	-200	--	--	--		--
ADDITIONAL UNDERCUT	--	--	--	--		--
ROCK WASTE TO REPLACE BORROW	--	--	--	--		--
ADJUST FOR ROCK WASTE	--	--	--	--		--
WASTE IN LIEU OF BORROW	--	--	--	--		-200
EST.5% TO REPLACE TOP SOIL ON BORROW PIT				--		
GRAND TOTAL	1,702	--	328	--		1,374
SAY	1,800					

**PAVEMENT REMOVAL SUMMARY**

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD <sup>2</sup>
-L-	12+50.00	17+92.44	CL	1,046.90
-L-	18+59.19	23+75.00	CL	979.26
TOTAL:				2,026.2
SAY:				2,050.0

**SHOULDER BERM GUTTER SUMMARY**

SURVEY LINE	STATION	STATION	LENGTH
-L-	17+00.00	17+71.50	71.5
TOTAL:			71.5
SAY:			75.0

NOTE: EARTHWORK QUANTITIES ARE CALCULATED BY LOCHNER. THESE EARTHWORK QUANTITIES ARE BASED, IN PART, ON SUBSURFACE DATA PROVIDED BY THE GEOTECHNICAL ENGINEERING UNIT.  
 PER GEOTECH RECOMMENDATION, ESTIMATED 400 CUBIC YARDS OF UNDERCUT TO BE USED IN THE DISCRETION OF THE RESIDENT ENGINEER.  
 NOTE: APPROXIMATE QUANTITIES ONLY. UNCLASSIFIED EXCAVATION, FINE GRADING, CLEARING AND GRUBBING, AND REMOVAL OF EXISTING PAVEMENT WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR GRADING.  
 EST. SHOULDER BORROW = 210 CY

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

**GUARDRAIL SUMMARY**

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH		W		ANCHORS						IMPACT ATTENUATOR TYPE 350 EA G NG	SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS			
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	AT-1	TYPE III	GREU TL-2											
-L-	16+59.65	17+83.50	RT	118.75				17+83.50 (BRIDGE)	4.4'	7.4'	25'		0.5'															
-L-	18+63.50	19+19.75	RT	56.25'			18+63.50 (BRIDGE)		4.4'	7.4'		25'		0.5'														
-L-	18+63.50	19+19.75	LT	56.25'			18+63.50 (BRIDGE)		4.4'	7.4'		25'		0.5'														
-L-	17+44.79	17+83.50	LT	18.75'	39.04'			17+83.50 (BRIDGE)	4.4'	7.4'						1	1											
SUBTOTAL				250.0'																								
LESS ANCHOR DEDUCTIONS																												
GREU TL-2 3 x 25.00' =				-75.0'																								
TYPE III 4 x 18.75' =				-75.0'																								
AT-1 1 x 6.25' =				-6.25'																								
TOTAL				100.00'	32.79'																							
ADDITIONAL POSTS =				5 EA																								

18/27/2023  
 BP5.H131.PSH\_03B.dgn  
 BY: CLY



STATE OF NORTH CAROLINA  
 DIVISION OF HIGHWAYS

**SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION**

LINE	STATION	STATION	AGGREGATE TYPE* ASU /AST	AGGREGATE THICKNESS INCHES [8" FOR ASU]	SHALLOW UNDERCUT CY	CLASS IV SUBGRADE STABILIZATION TONS	GEOTEXTILE FOR SOIL STABILIZATION SY	STABILIZER AGGREGATE TONS	CLASS IV AGGREGATE STABILIZATION TONS
	CONTINGENCY		ASU		100	200	300		
			TOTAL CY/TONS/SY		100	200	300**		

\*ASU=Aggregate Subgrade  
 \*ATU=Aggregate Stabilization  
 \*\*Total square yards of "Geotextile for Soil Stabilization" is only the estimated quantity for ASU/AST and may only represent a portion of the geotextile quantity shown in the Item Sheets of the Proposal.

6/21/08

BP5.RI31.R01.F5H\_036.dgn  
 SYDNEY



# LOCHNER

H. W. LOCHNER, INC.  
2840 PLAZA PLACE, SUITE 202  
RALEIGH, NC 27612  
(919) 571-7111

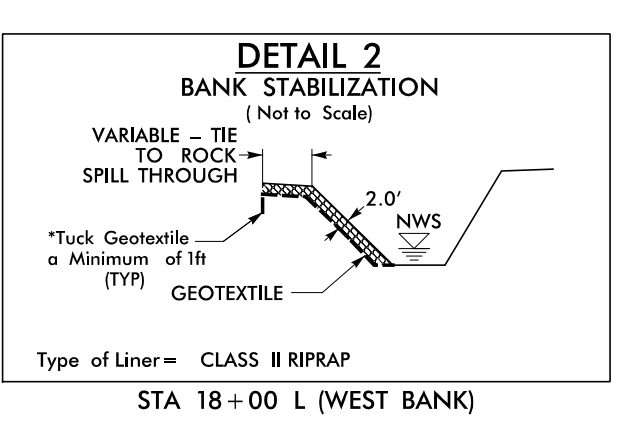
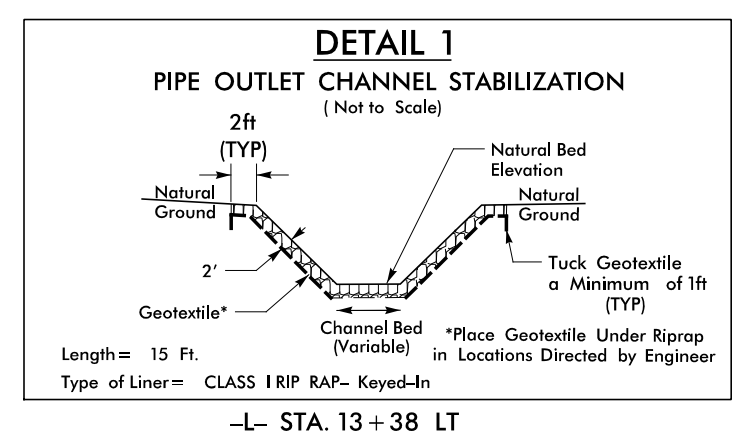
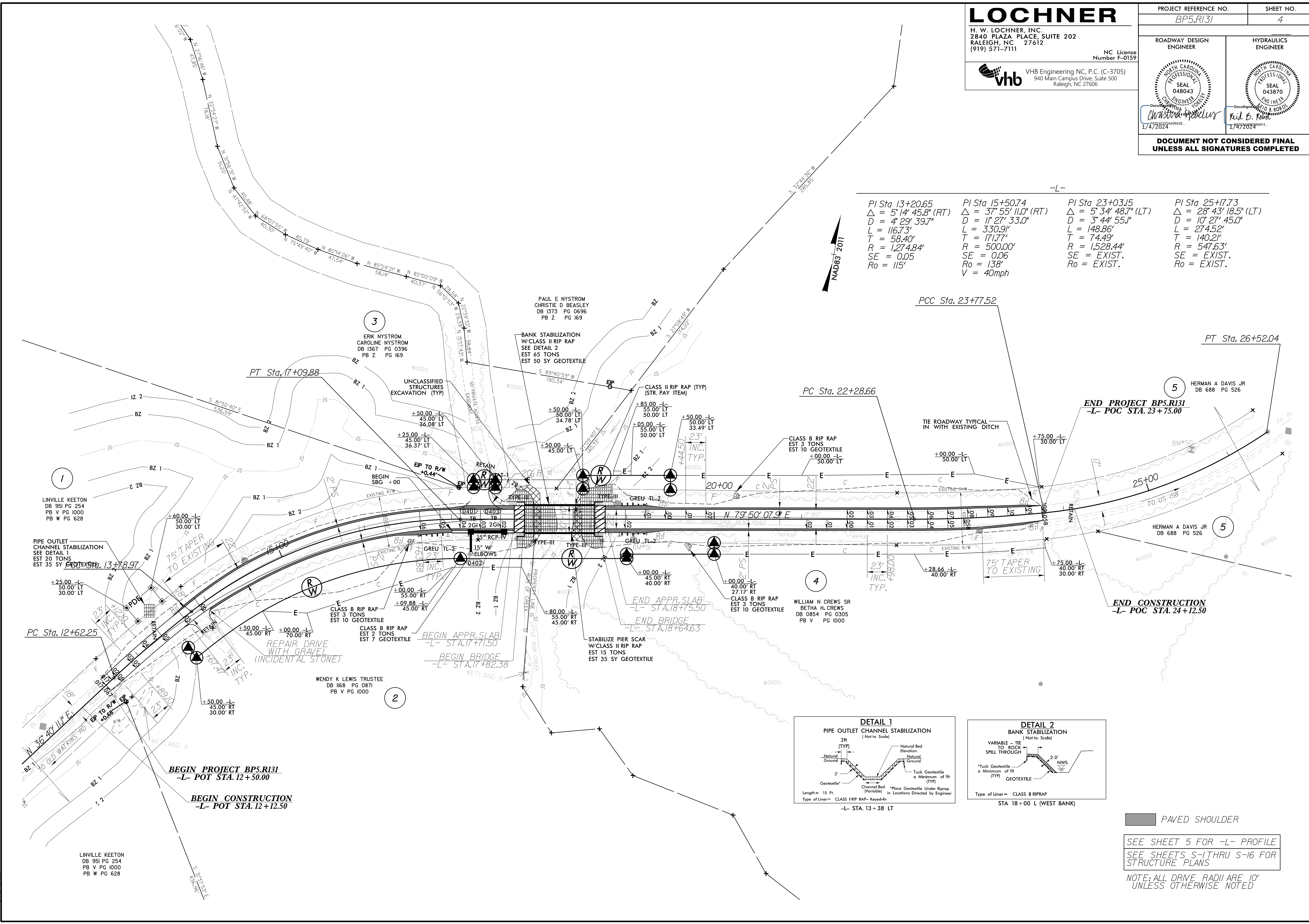
NC License  
Number F-0159

**vhb** VHB Engineering NC, P.C. (C-3705)  
940 Main Campus Drive, Suite 500  
Raleigh, NC 27606

PROJECT REFERENCE NO. <i>BP5.R131</i>	SHEET NO. 4
ROADWAY DESIGN ENGINEER <i>Christina ...</i>	HYDRAULICS ENGINEER <i>Raid B. ...</i>
<p><b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b></p>	

-L-

<b>PI Sta 13+20.65</b> $\Delta = 5' 14' 45.8''$ (RT) $D = 4' 29' 39.7''$ $L = 116.73'$ $T = 58.40'$ $R = 1,274.84'$ $SE = 0.05$ $Ro = 115'$	<b>PI Sta 15+50.74</b> $\Delta = 37' 55' 11.0''$ (RT) $D = 1' 27' 33.0''$ $L = 330.91'$ $T = 171.77'$ $R = 500.00'$ $SE = 0.06$ $Ro = 138'$ $V = 40$ mph	<b>PI Sta 23+03.15</b> $\Delta = 5' 34' 48.7''$ (LT) $D = 3' 44' 55.1''$ $L = 148.86'$ $T = 74.49'$ $R = 1,528.44'$ $SE = EXIST.$ $Ro = EXIST.$	<b>PI Sta 25+17.73</b> $\Delta = 28' 43' 18.5''$ (LT) $D = 10' 27' 45.0''$ $L = 274.52'$ $T = 140.21'$ $R = 547.63'$ $SE = EXIST.$ $Ro = EXIST.$
--	--	--	---



PAVED SHOULDER

SEE SHEET 5 FOR -L- PROFILE  
SEE SHEETS S-1THRU S-16 FOR STRUCTURE PLANS

NOTE: ALL DRIVE RADII ARE 10' UNLESS OTHERWISE NOTED

5/14/99

# LOCHNER

H. W. LOCHNER, INC.  
2840 PLAZA PLACE, SUITE 202  
RALEIGH, NC 27612  
(919) 571-7111

NC License  
Number F-0159



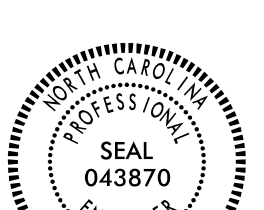
VHB Engineering NC, P.C. (C-3705)  
940 Main Campus Drive, Suite 500  
Raleigh, NC 27605

PROJECT REFERENCE NO.  
BP5.R131

SHEET NO.  
5

ROADWAY DESIGN  
ENGINEER

HYDRAULICS  
ENGINEER



1747262

1747262

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

## HORSESHOE BEND RD. (SR 1125)

BRIDGE HYDRAULIC DATA	
DESIGN DISCHARGE	= 850 CFS
DESIGN FREQUENCY	= 25 YR
DESIGN HW ELEVATION	= 308.8 FT
DRAINAGE AREA	= 2.1 SQ MI
BASE DISCHARGE	= 1200 CFS
BASE FREQUENCY	= 100 YR
BASE HW ELEVATION	= 310.2 FT
OVERTOPPING DISCHARGE	= 9000 CFS
OVERTOPPING FREQUENCY	= >500 YR
OVERTOPPING ELEVATION	= 320.1 FT
DATE OF SURVEY	= 05/25/2022
W.S. ELEVATION AT DATE OF SURVEY	= 302.7 FT

PIPE HYDRAULIC DATA	
36" RCP Sta. 13+19	
DRAINAGE AREA	= 7.3 AC
DESIGN FREQUENCY	= 50 YR
DESIGN DISCHARGE	= 22.6 CFS
DESIGN HW ELEVATION	= 327.3 FT
100 YEAR DISCHARGE	= 24.3 CFS
100 YEAR HW ELEVATION	= 327.3 FT
OVERTOPPING FREQUENCY	= 500+ YR
OVERTOPPING DISCHARGE	= 37 CFS
OVERTOPPING ELEVATION	= 328.0 FT

BM#51 ELEVATION = 319.98  
N 919634 E 2150101  
-BL- STATION 15+46.09 35' RIGHT  
-L- STATION 19+08.38 18.62' RT  
BENCHTIE IN 36" OAK

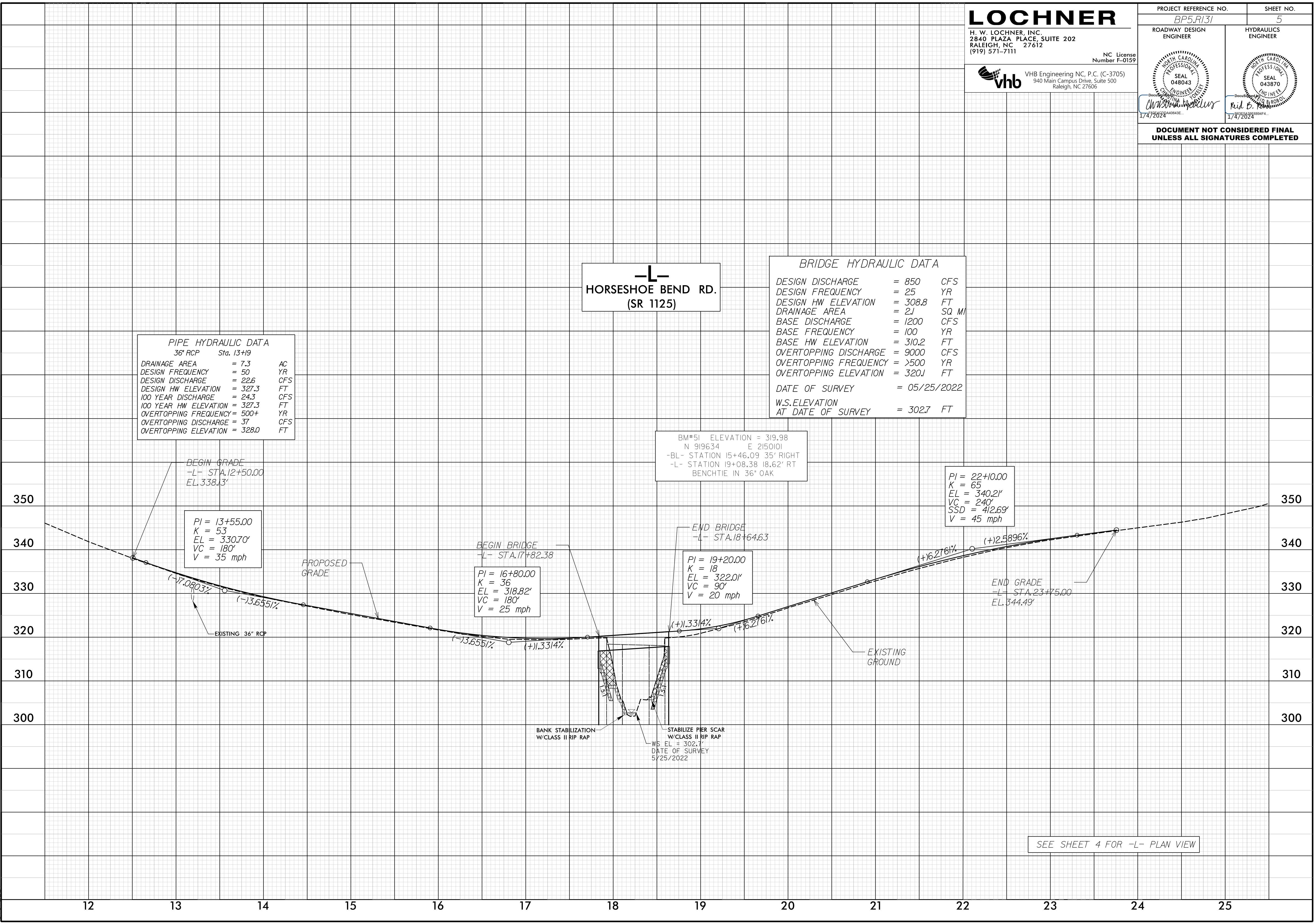
PI = 22+10.00  
K = 65  
EL = 340.21'  
VC = 240'  
SSD = 412.69'  
V = 45 mph

PI = 13+55.00  
K = 53  
EL = 330.70'  
VC = 180'  
V = 35 mph

BEGIN BRIDGE  
-L- STA. 17+82.38  
PI = 16+80.00  
K = 36  
EL = 318.82'  
VC = 180'  
V = 25 mph

END BRIDGE  
-L- STA. 18+64.63  
PI = 19+20.00  
K = 18  
EL = 322.01'  
VC = 90'  
V = 20 mph

END GRADE  
-L- STA. 23+75.00  
EL. 344.49'



12/27/2023  
BP5.R131\_P05\_PFL05.dgn  
C:\WORK\1125

# SURVEY CONTROL SHEET

## W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

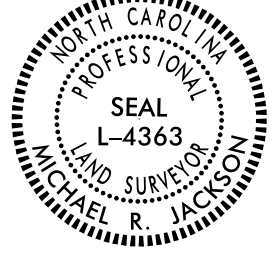
BP5-R131  
AZ-3

PROJECT REFERENCE NO. BP5.R131	SHEET NO. RW02C-1
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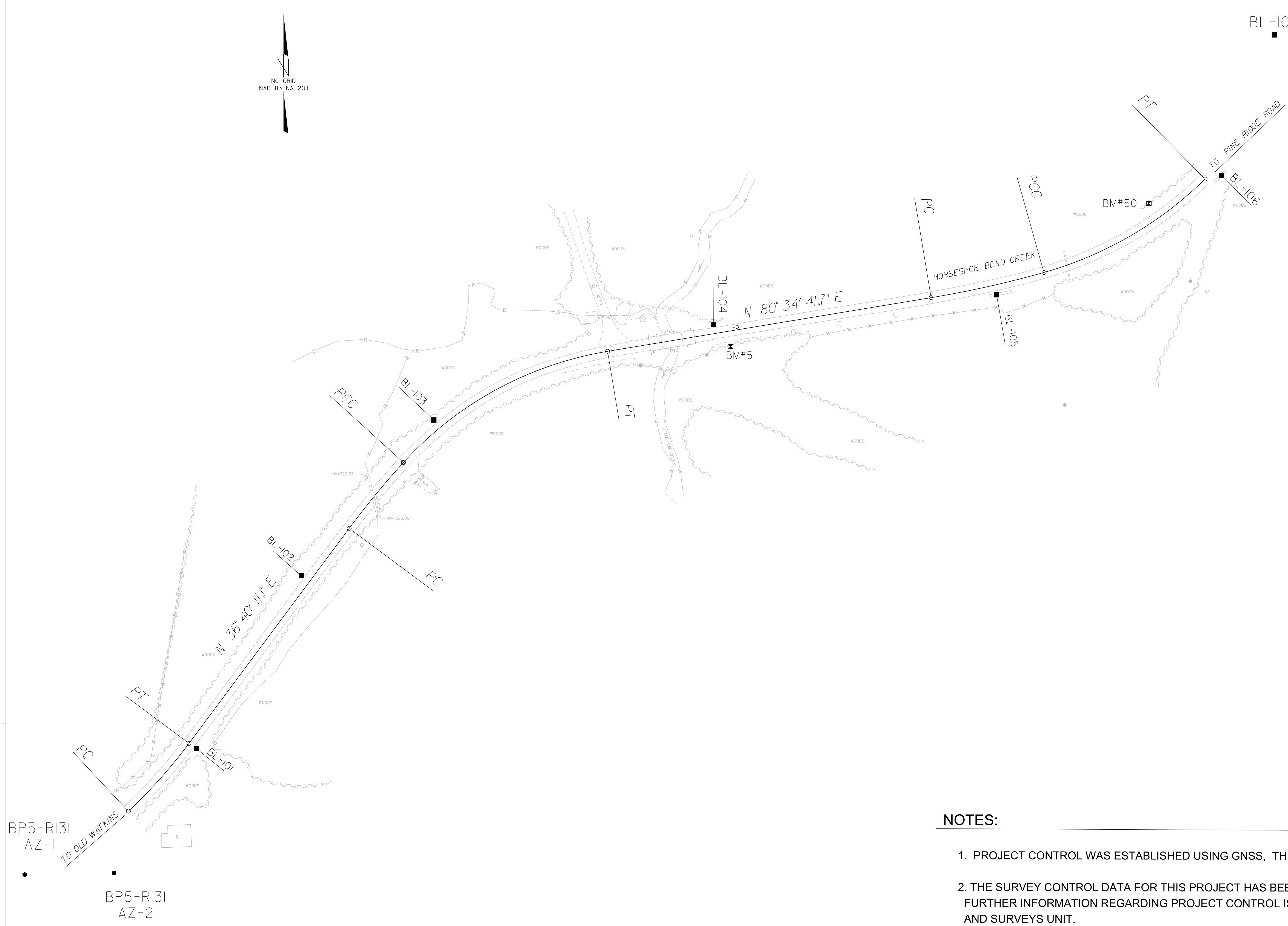
**Location and Surveys**

LOCATION & SURVEYS  
DIVISION 5  
3301 JONES SAUSAGE RD.  
GARNER, NC 27529  
984-920-8940

PROJECT SURVEYOR



DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED



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

Class of survey: **AA**  
 Type of GPS field procedure: RTN  
 Dates of survey: January 2022  
 Datum/Epoch: NAVD 88/2011  
 Published/Fixed-control use: N/A  
 Localized around: AZ-2  
 Northing: 918847.902  
 Easting: 2149132.283  
 Combined grid factor: 0.99998208  
 Geoid model: Geoid12B  
 Units: US Survey Feet

I also certify that the Baseline Control for this project was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:20,000 (Class AA) and Vertical accuracy to Class A. Field work was performed from January 2022 to March 2022, and all coordinates are based on NAVD 88; that this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 3rd day of January, 2024.

DocuSigned by:  
*Michael Jackson*  
148787710751467  
Professional Land Surveyor L-4363

REVISIONS

### NOTES:

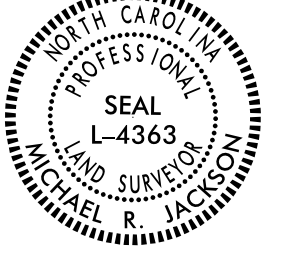
1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
2. THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

BP5-R131  
AZ-1

BP5-R131  
AZ-2

# SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

PROJECT REFERENCE NO.	SHEET NO.
BP5.R131	RW02C-2
<b>Location and Surveys</b>	
LOCATION & SURVEYS DIVISION 5 3301 JONES SAUSAGE RD. GARNER, NC 27529 984-920-8940	
PROJECT SURVEYOR	
	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

BL	POINT	DESC.	NORTH	EAST	ELEVATION
101		BL - 101	919048.2077	2149322.5121	374.76
102		BL - 102	919300.6989	2149474.9836	344.09
103		BL - 103	919527.9362	2149668.5569	327.22
104		BL - 104	919667.5371	2150076.7503	319.96
105		BL - 105	919710.6617	2150489.4346	342.69
106		BL - 106	919884.4947	2150816.9882	358.57
107		BL - 107	920167.5930	2150968.9347	370.90

\*\*\*\*\*  
 50            ELEVATION = 352.21  
 N 919844        E 2150712  
 BENCHTIE IN 24" OAK  
 \*\*\*\*\*

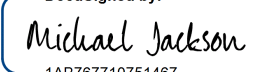
\*\*\*\*\*  
 51            ELEVATION = 319.98  
 N 919635        E 2150101  
 BENCHTIE IN 36" OAK  
 \*\*\*\*\*

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

Class of survey: **AA**  
 Type of GPS field procedure: RTN  
 Dates of survey: January 2022  
 Datum/Epoch: NAVD 88/2011  
 Published/Fixed-control use: N/A  
 Localized around: AZ-2  
 Northing: 918847.902  
 Easting: 2149132.283  
 Combined grid factor: 0.99998208  
 Geoid model: Geoid 12B  
 Units: US Survey Feet

I also certify that the Baseline Control for this project was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:20,000 (Class AA) and Vertical accuracy to Class A. Field work was performed from January 2022 to March 2022, 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 3rd day of January, 2024.

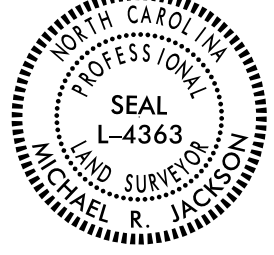
DocuSigned by:  
  
 Professional Land Surveyor L-4363

**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

## W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

PROJECT REFERENCE NO. BP5.R131	SHEET NO. RW02C-3
Location and Surveys	
LOCATION & SURVEYS DIVISION 5 3301 JONES SAUSAGE RD. GARNER, NC 27529 984-920-8940	
PROJECT SURVEYOR	
	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

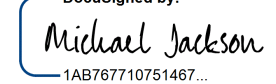
EL POINT	N	E	BEARING	DIST	DELTA	D	L	T	R
PC	918957.036	2149223.021							
CURVE			N 41°47'23.7" E	132.79	10°14'25.1"(LT)	07°42'04.9"	132.97	66.66	743.97
PT	919056.043	2149311.513							
LINE			N 36°40'11.1" E	391.15					
PC	919369.779	2149545.107							
CURVE			N 39°28'05.0" E	124.48	05°35'47.9"(RT)	04°29'39.7"	124.53	62.31	1274.84
PCC	919465.873	2149624.230							
CURVE			N 61°25'20.3" E	339.12	38°18'43.9"(RT)	11°05'17.3"	345.52	179.50	516.73
PT	919628.092	2149922.037							
LINE			N 80°34'41.7" E	478.35					
PC	919706.398	2150393.935							
CURVE			N 77°25'00.4" E	168.59	06°19'22.4"(LT)	03°44'55.1"	168.67	84.42	1528.44
PCC	919743.126	2150558.472							
CURVE			N 59°53'40.0" E	271.66	28°43'18.7"(LT)	10°27'45.0"	274.52	140.21	547.63
PT	919879.388	2150793.483							

I, Michael R. Jackson, 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: January 2022  
 Datum/Epoch: NAVD 88/2011  
 Published/Fixed-control use: N/A  
 Localized around: AZ-2  
 Northing: 918847.902  
 Easting: 2149132.283  
 Combined grid factor: 0.99998208  
 Geoid model: 12B  
 Units: US Survey Feet

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This 3rd day of January, 2024.

  
DocuSigned by:  
1420107710731487  
 Professional Land Surveyor L-4363

**NOTES:**

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
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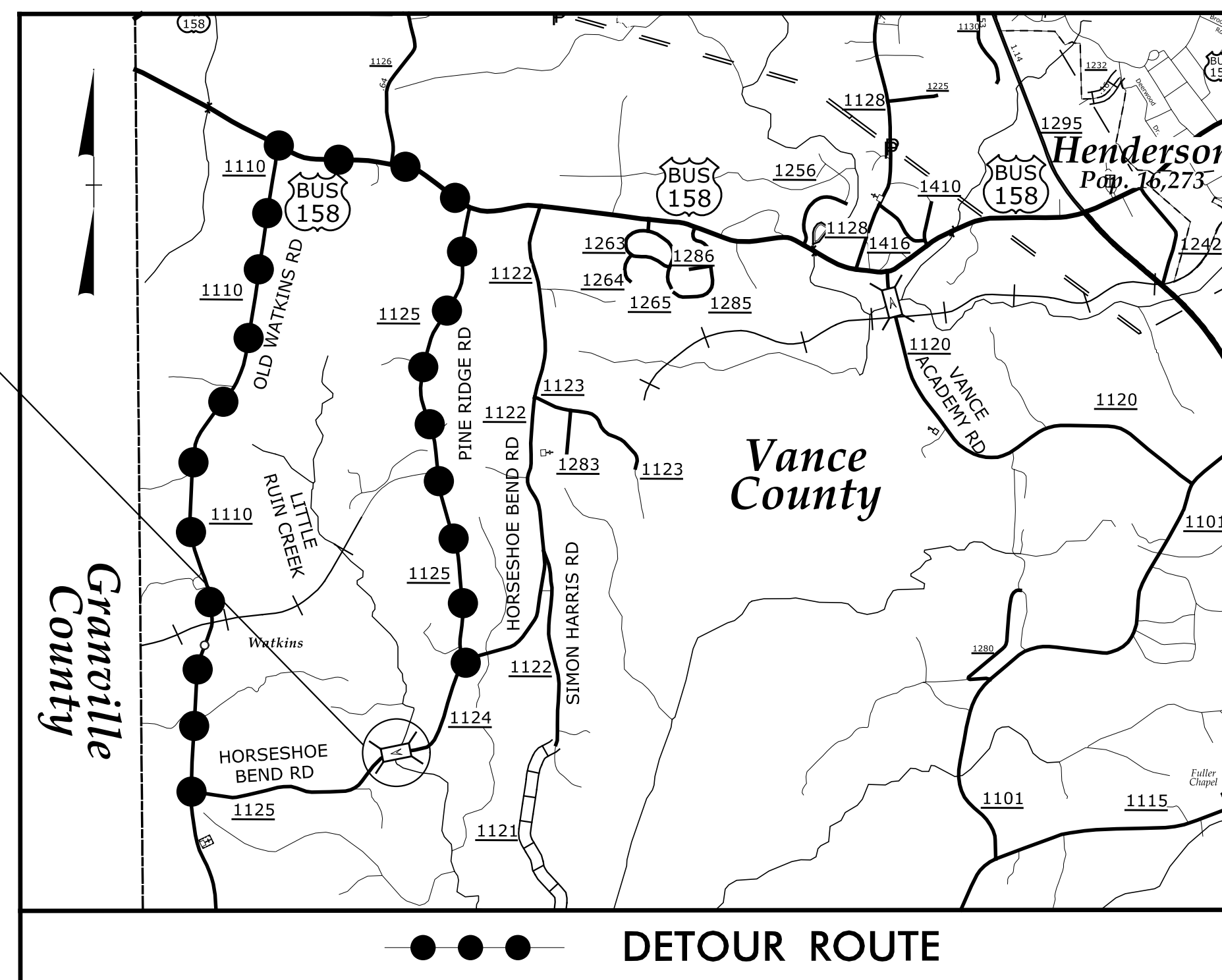
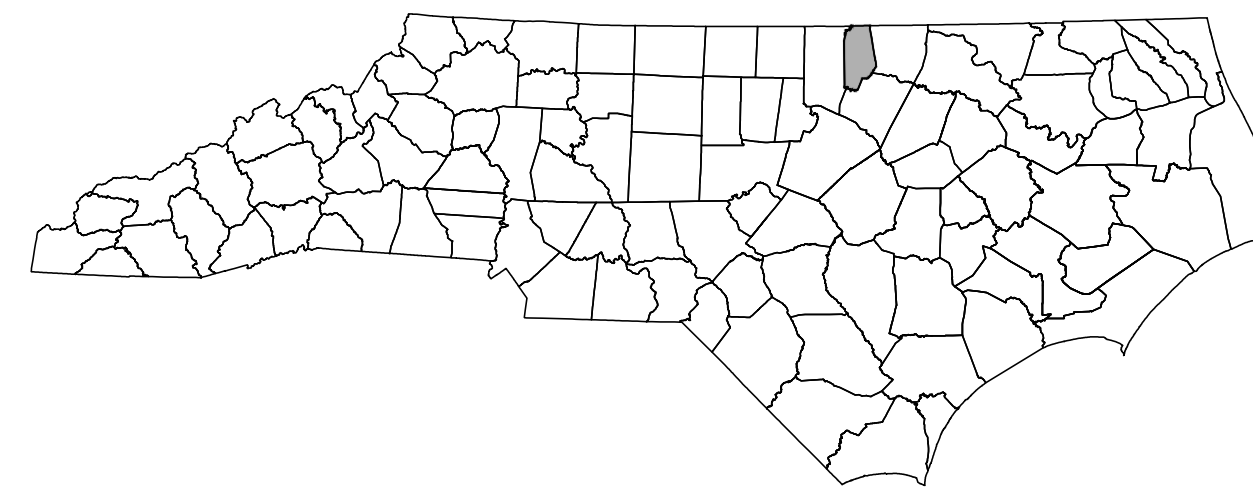
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**TRANSPORTATION MANAGEMENT PLAN**

**VANCE COUNTY**

LOCATION: BRIDGE NO. 15 OVER LITTLE RUIN CREEK  
ON HORSESHOE BEND ROAD (SR 1125)

**FINAL SUBMITTAL**



BRIDGE #15  
TO BE REPLACED

**INDEX OF SHEETS**

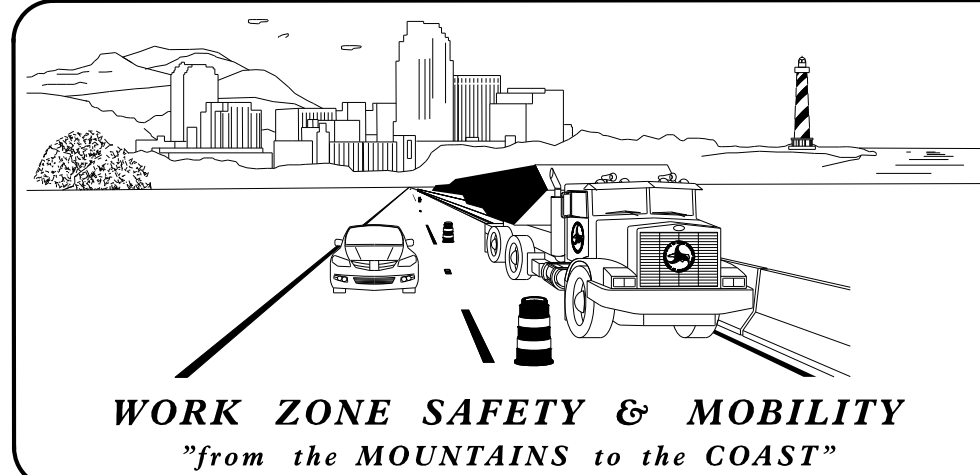
SHEET NO.	TITLE
TMP-1	TITLE SHEET AND INDEX OF SHEETS
TMP-2	LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, GENERAL NOTES, PHASING AND FINAL PAVEMENT MARKING SCHEDULE
TMP-3	TEMPORARY TRAFFIC CONTROL PLAN
TMP-4	SPECIAL SIGN DESIGN

SHEET NO.  
TMP-1

**BP5.R131**

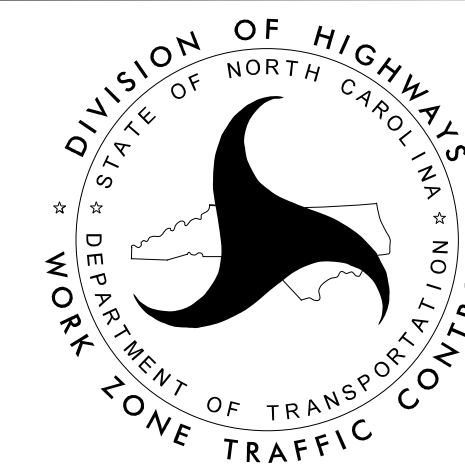
**PROJECT: DE00376**

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED



PREPARED IN THE OFFICE OF H.W. LOCHNER FOR  
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

BK EASON, PE TRAFFIC CONTROL PROJECT ENGINEER  
REID CROSSER TRAFFIC CONTROL PROJECT DESIGNER



**LOCHNER**  
H. W. LOCHNER, INC.  
2840 PLAZA PLACE, SUITE 202  
RALEIGH, NC 27612  
(919) 571-7111  
NC License Number F-0159

APPROVED: *Brian Eason*  
DATE: 1/5/2024

SEAL



12/28/2023  
BP5.R131.TMP\_01.dgn  
CYOKELEY

# TRAFFIC MANAGEMENT PLAN

## 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.

### TRAFFIC PATTERN ALTERATIONS

- A) NOTIFY THE ENGINEER, VANCE COUNTY EMS AND VANCE COUNTY SCHOOLS THIRTY (30) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.
- B) JAVIER PLUMMER WITH VANCE COUNTY EMS WILL BE CONTACTED BY THE RESIDENT ENGINEER AT LEAST ONE MONTH PRIOR TO ROAD CLOSURE AND CAN BE CONTACTED AT (252) 738-9010.  
DAVID PARRISH WITH VANCE COUNTY SCHOOLS WILL BE CONTACTED BY THE RESIDENT ENGINEER AT LEAST ONE MONTH PRIOR TO ROAD CLOSURE AND CAN BE CONTACTED AT (252) 438-5012, EXT 3.

### SIGNING

- C) 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 ON SHEET TMP-3.

- D) 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.

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

### TRAFFIC CONTROL DEVICES

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

### PAVEMENT MARKINGS AND MARKERS

- G) INSTALL PAVEMENT MARKINGS AND AND MARKERS ON THE FINAL SURFACE ACCORDING TO THE ROADWAY STANDARD DRAWINGS.
- H) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.

## NCDOT ROADWAY STANDARD DRAWINGS

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

STD. NO.	TITLE
1101.03	TEMPORARY ROAD CLOSURES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1145.01	BARRICADES
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTI-LANE ROADWAYS
1205.12	PAVEMENT MARKINGS - BRIDGES
1250.01	RAISED PAVEMENT MARKERS - INSTALLATION SPACING
1251.01	RAISED PAVEMENTS MARKERS - PERMANENT AND TEMPORARY
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION

## PHASING

NOTE: MAINTAIN ACCESS TO ALL RESIDENCES. PRIOR TO INCORPORATION, OBTAIN WRITTEN APPROVAL FROM THE ENGINEER ON METHOD TO MAINTAIN ACCESS.

- STEP 1: INSTALL ADVANCED WARNING SIGNS IN ACCORDANCE WITH ROADWAY STANDARD DRAWING NUMBERS 1101.03, SHEET 1 OF 9. INSTALL AND COVER DETOUR SIGNING AS SHOWN ON TMP-3.
- STEP 2: UNCOVER DETOUR SIGNING AND INSTALL TYPE III BARRICADES TO CLOSE SR 1125 (HORSESHOE BEND RD) TO THRU TRAFFIC.
- STEP 3: PLACE TRAFFIC ONTO OFF-SITE DETOUR. PERFORM PROPOSED ROADWAY AND BRIDGE CONSTRUCTION. INSTALL FINAL PAVEMENT MARKINGS AND MARKERS.
- STEP 4: REMOVE TYPE III BARRICADES FROM SR 1125 (HORSESHOE BEND RD) AND REOPEN ROADWAY TO TRAFFIC. REMOVE ALL DETOUR SIGNING.

## FINAL PAVEMENT MARKING SCHEDULE

DESCRIPTION	QUANTITY
THERMOPLASTIC PAVEMENT MARKING LINES (4", 90 MILS)	4,800 LF
PERMANENT RAISED PAVEMENT MARKERS (YELLOW & YELLOW)	21 EA

12/28/2023  
BP5.R131.TMP\_02.dgn  
CYOKELEY

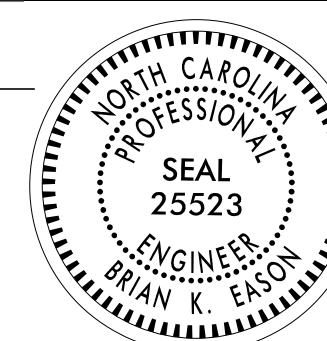
LOCHNER

H. W. LOCHNER, INC.  
2840 PLAZA PLACE, SUITE 202  
RALEIGH, NC 27612  
(919)571-7111

NC License  
Number F-0159

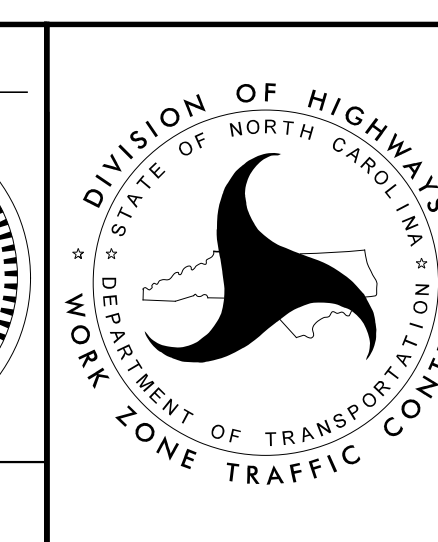
APPROVED: *Brian Eason*

DATE: 1/5/2024

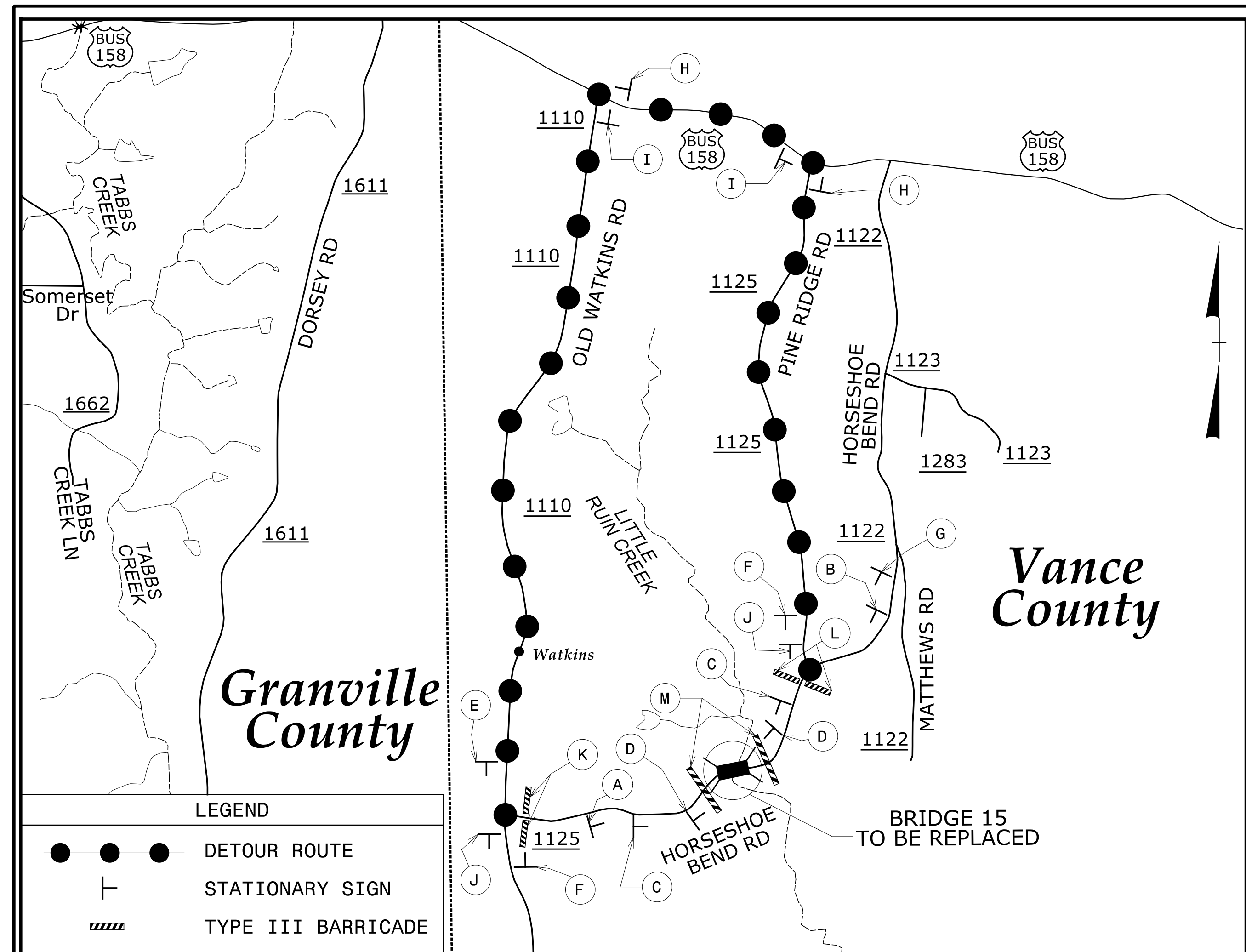


SEAL

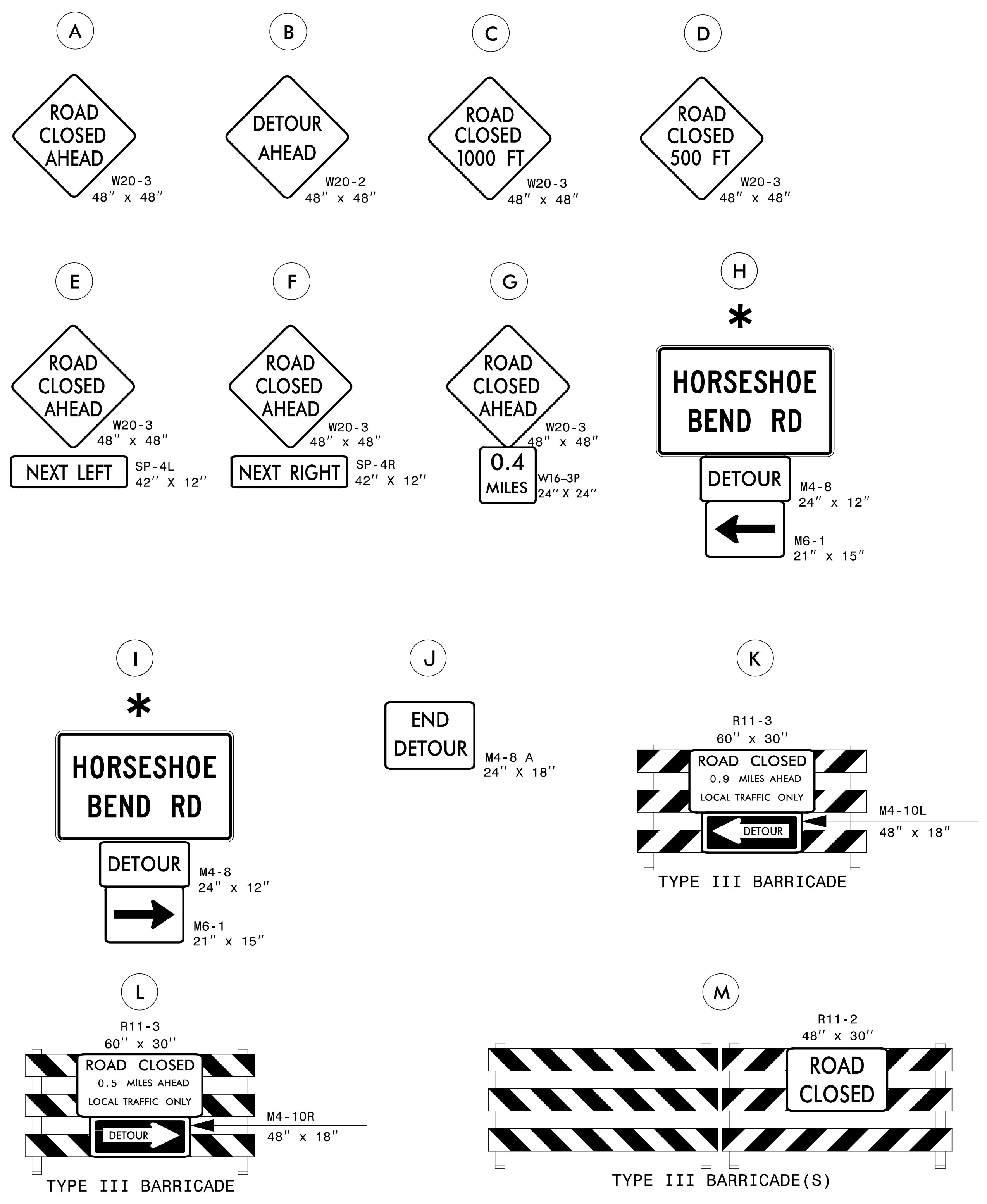
DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED



GENERAL NOTES  
ROADWAY STANDARD DRAWINGS  
PHASING  
PAVEMENT MARKING SCHEDULE



### TRAFFIC CONTROL TEMPORARY SIGNING AND DEVICES



12/28/2023  
BP5.R131.TMP\_03.dgn  
CYOKELEY

**LOCHNER**  
H. W. LOCHNER, INC.  
2840 PLAZA PLACE, SUITE 202  
RALEIGH, NC 27612  
(919)571-7111  
NC License Number F-0159

APPROVED: *Brian Eason*  
DATE: 1/5/2024  
SEAL  
NORTH CAROLINA PROFESSIONAL ENGINEER  
SEAL 25523  
BRIAN K. EASON

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

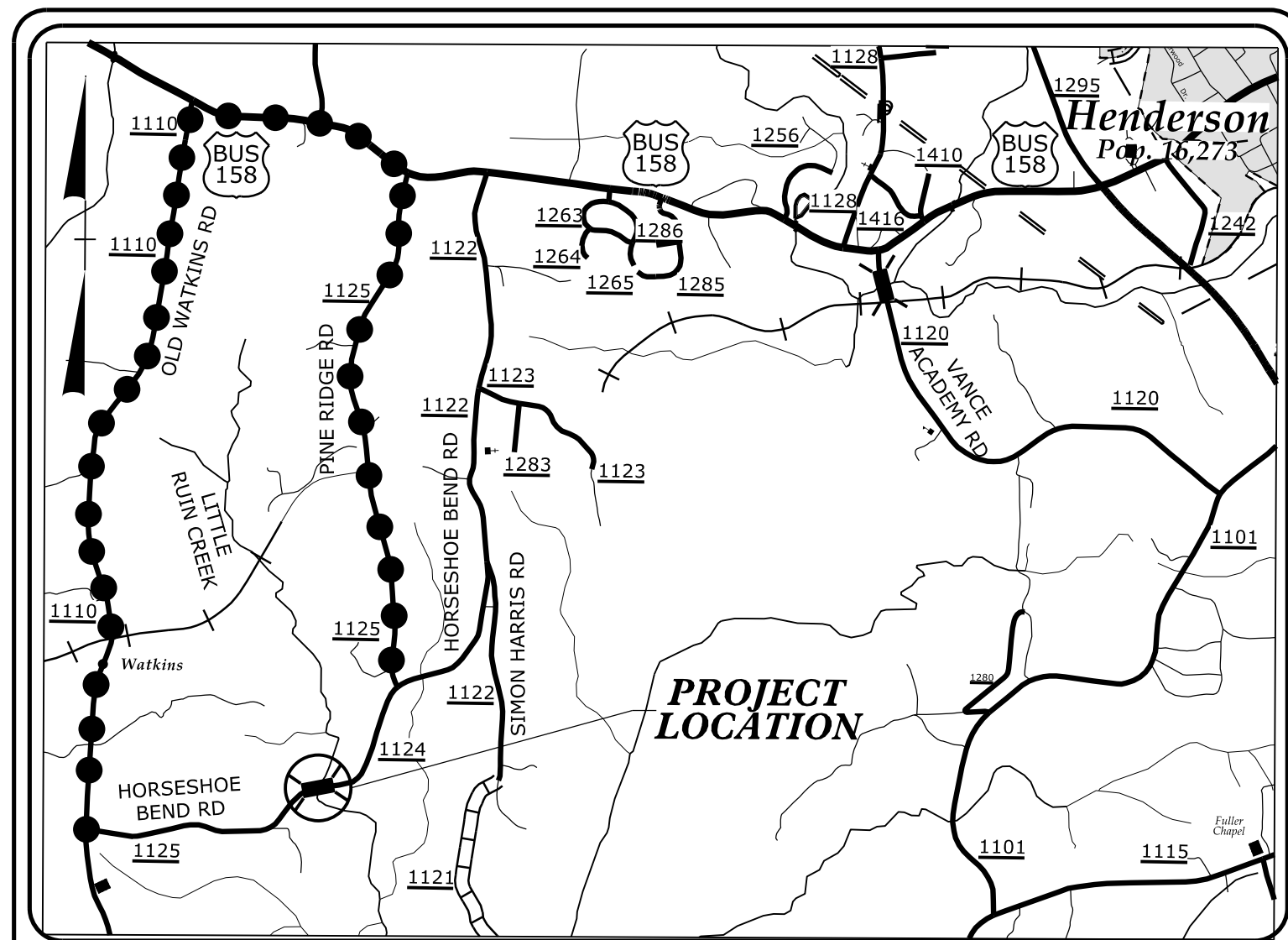
**HORSESHOE BEND RD  
OFF-SITE DETOUR  
TRAFFIC CONTROL  
TEMPORARY  
SIGNING AND DEVICES**





STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP5.R131	EC-1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
BP5.R131.1	N/A	PE	
BP5.R131.2	N/A	RW	
BP5.R131.3	N/A	CONST.	

**PROJECT: BP5.R131**



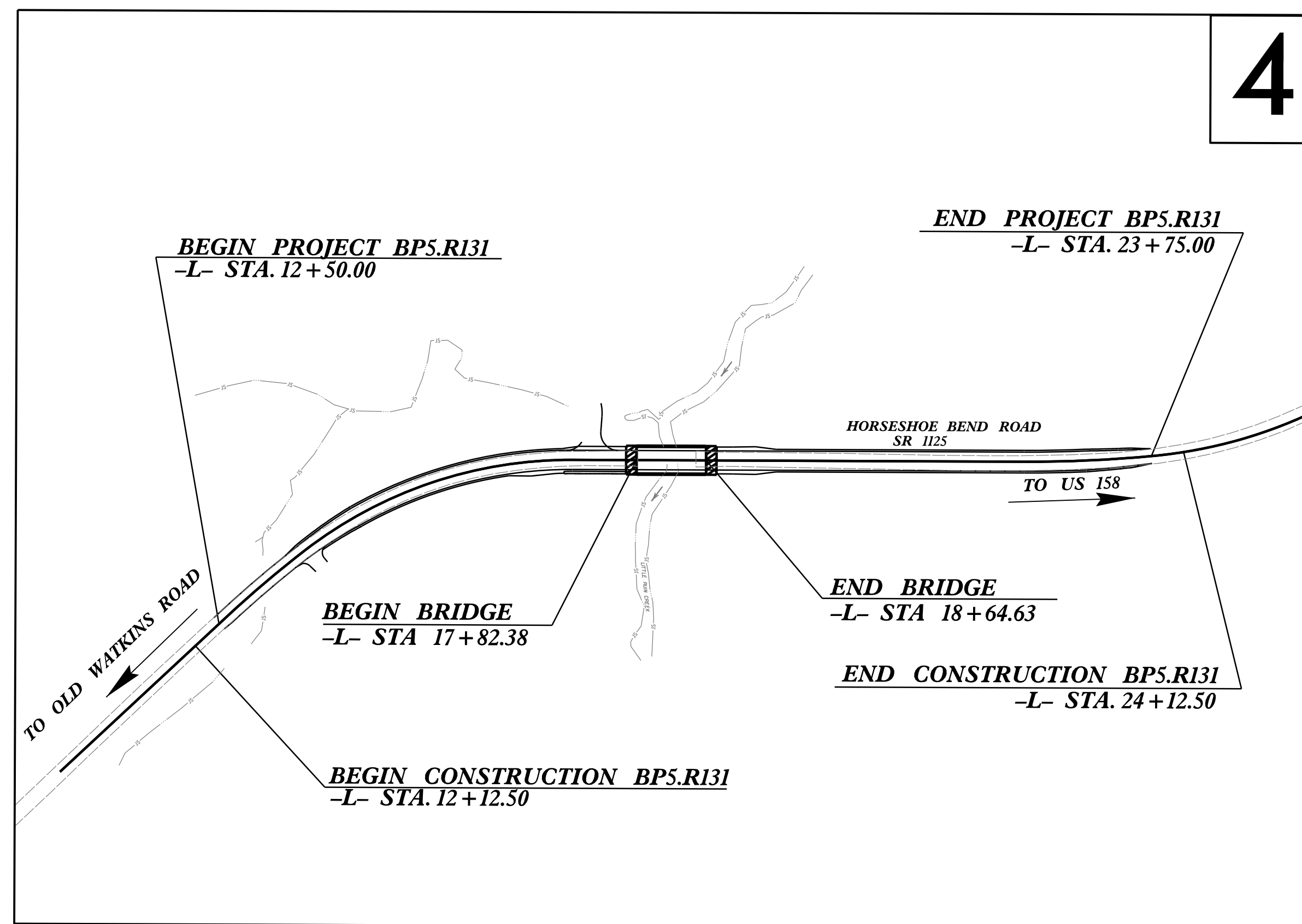
**VICINITY MAP**  
NOT TO SCALE

●●●●● OFF-SITE DETOUR

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

**LOCATION: REPLACE BRIDGE NO. 15 OVER LITTLE RUIN CREEK  
ON HORSESHOE BEND ROAD (SR 1125)**

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



- o Special sediment control fence NCDOT Standard No. 1606.01 or a combination of special sediment control fence and standard silt fence will be installed between the top of the stream bank and bridge embankment. Once the disturbed areas of the project draining to these areas have been stabilized, the special sediment control fence and/or standard silt fence and all built up sediment adjacent to these devices will be removed to natural ground and stabilized with appropriate seed mix. Native grass mix will be used on the floodplain.
- o All sedimentation and erosion control measures will be appropriately maintained following NCDOT standards to ensure proper function of the measures. This project must adhere to conditions of General Permit NCG01000 to Discharge Stormwater under the National Pollutant Discharge Elimination System for Construction Activities. The project design and construction activities are required to "select, install, implement and maintain best management practices (BMPs) and control measures that minimize pollutants in the discharge to meet the requirements of the permit." Among these conditions, the permit requires:
  - I. All erosion and sedimentation control measures must be inspected at least once every seven calendar days and
  - II. Within 24 hours after any storm event of greater than 1.0 inch of rain per 24 hour period. It is understood that these requirements and implementation of other appropriate BMPs are monitored through multiple layers of oversight. At a minimum, the following personnel monitor erosion control measures:
    - A) Contractor Project Manager
    - B) NCDOT Division Environmental Officer and Environmental Specialist
    - C) NCDOT Roadside Environmental Field Operations staff
- o In the event that visible sediment loss from the project is observed at the bridge site, a review of turbidity levels will be made upstream and downstream 400 meters (0.25 mile) to determine if sedimentation effects are occurring beyond 400m downstream. If visual observation of turbidity levels downstream appear to be elevated beyond upstream observations, the project inspector will contact the Division Environmental Officer. If determined that the project-related sedimentation is occurring beyond 400 meters, the Division Environmental Officer must immediately contact the USFWS to discuss potential remediation.

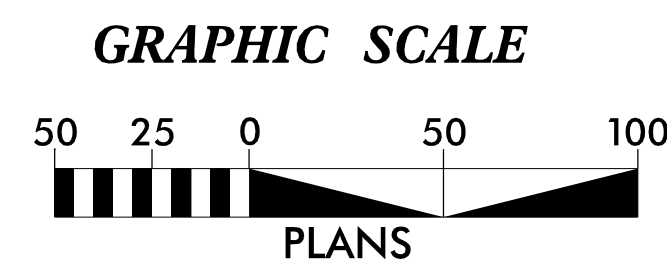
**THIS PROJECT CONTAINS  
EROSION CONTROL PLANS  
FOR CLEARING AND  
GRUBBING PHASE OF  
CONSTRUCTION.**

**THIS PROJECT HAS  
BEEN DESIGNED TO  
SENSITIVE WATERSHED  
STANDARDS.**

**ENVIRONMENTALLY  
SENSITIVE AREA(S) EXIST  
ON THIS PROJECT**

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


**CONTRACT: DE00376**



**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.**

  
VHB Engineering NC, P.C. (C-3705)  
940 Main Campus Drive, Suite 500  
Raleigh, NC 27606

*Prepared in the Office of:*

 VHB Engineering NC, P.C. (C-3705)  
940 Main Campus Drive, Suite 500  
Raleigh, NC 27606

*Designed by:*

**GRAYSON AVERETTE** **4468**  
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. <b>BP5.R131</b>	SHEET NO. <b>EC-2</b>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

## EROSION & SEDIMENT CONTROL LEGEND

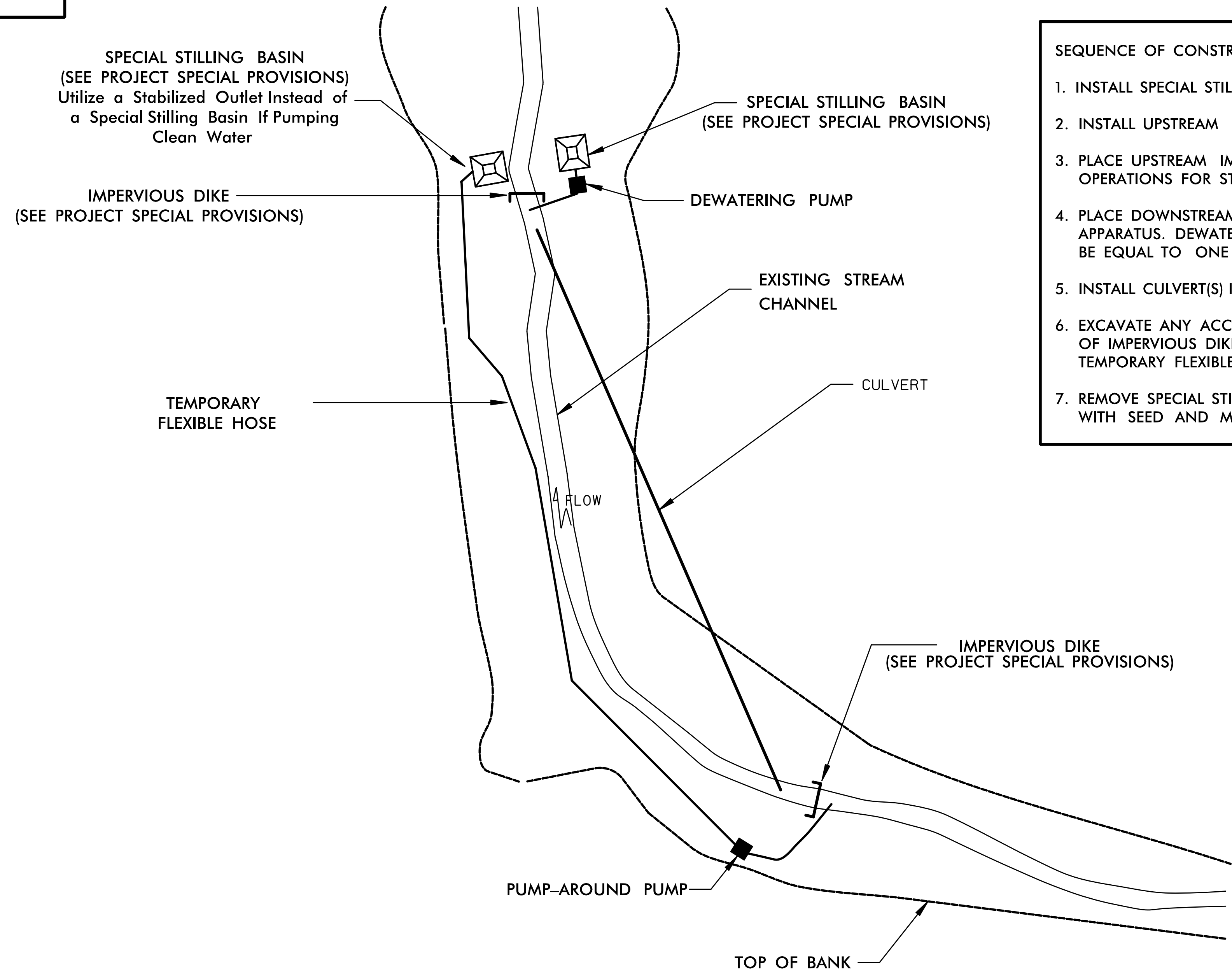
Std. #	Description	Symbol	Std. #	Description	Symbol
1605.01	Temporary Silt Fence		1633.01	Temporary Rock Silt Check Type A	
1606.01	Special Sediment Control Fence		1633.02	Temporary Rock Silt Check Type B	
1622.01	Temporary Berms and Slope Drains		1633.03	Temporary Rock Silt Check Type A with Excelsior 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.
BP5.R131	EC-2A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

# EXAMPLE OF PUMP-AROUND OPERATION

-L- STA 13+38  
 IF NEEDED, TO MANAGE STREAM FLOW DURING  
 INSTALLATION OF PIPE OUTLET CHANNEL STABILIZATION

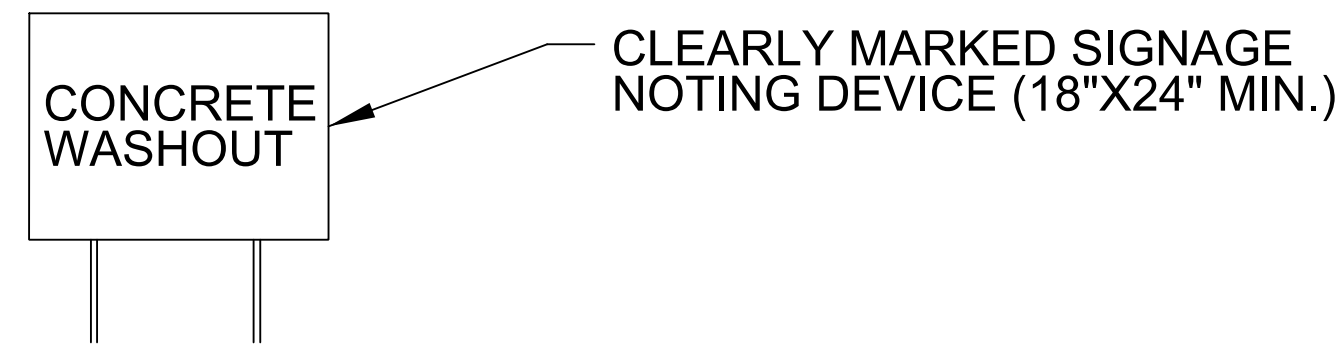
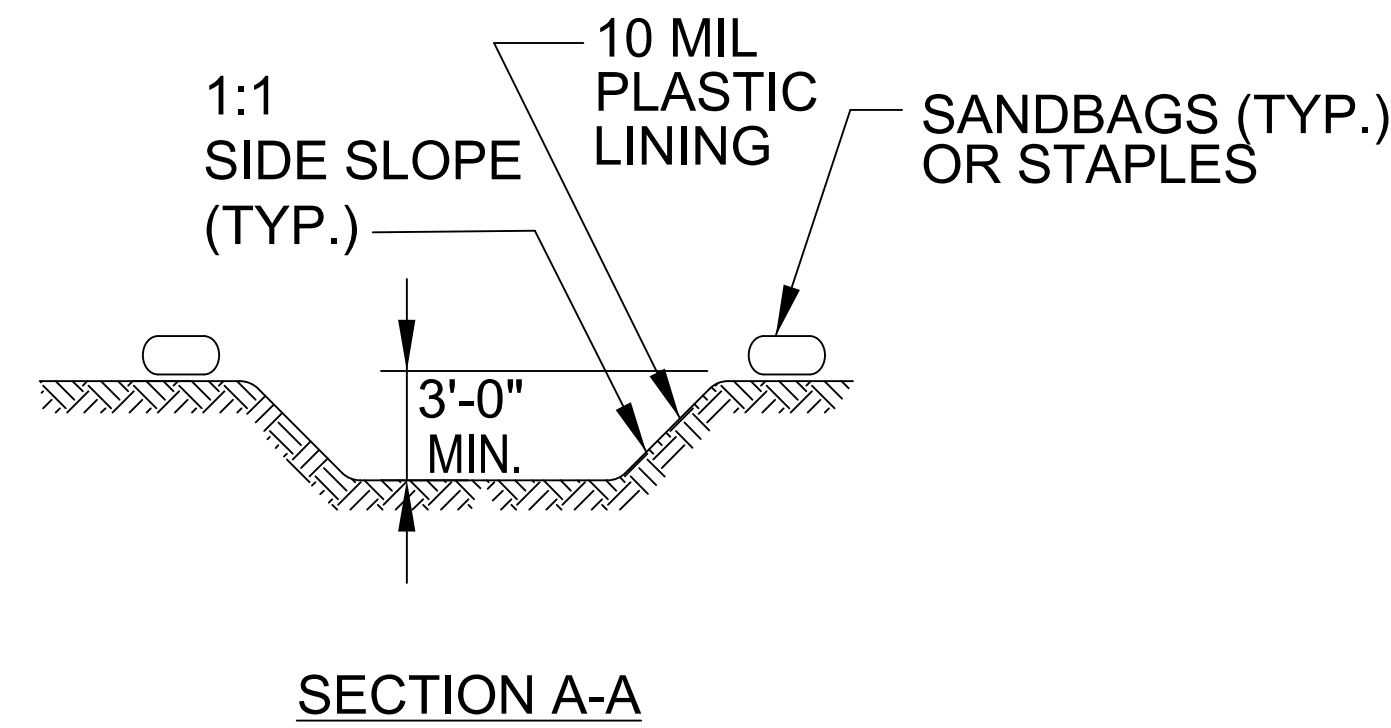
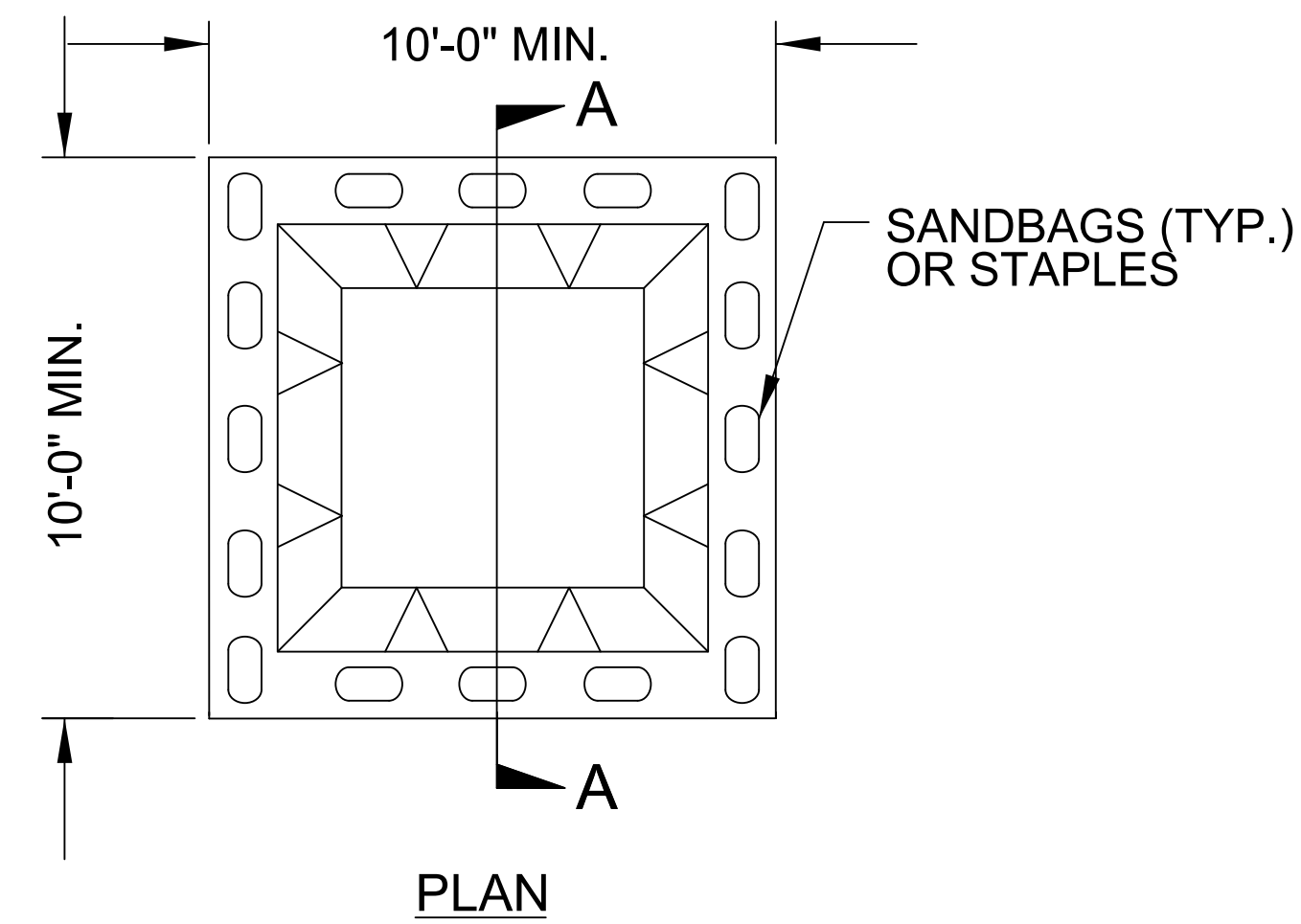
- NOTES:
- 1) All excavation shall be performed in only dry or isolated areas of the work zone.
  - 2) Impervious dikes are to be used to isolate work from stream flow when necessary.
  - 3) Maintenance of stream flow operations shall be incidental to the work. This includes polyethylene sheeting, diversion pipes, pumps and hoses.
  - 4) Pumps and hoses shall be of sufficient size to dewater the work area.



- SEQUENCE OF CONSTRUCTION FOR TYPICAL WORK AREA
1. INSTALL SPECIAL STILLING BASIN(S).
  2. INSTALL UPSTREAM PUMP AND TEMPORARY FLEXIBLE HOSE.
  3. PLACE UPSTREAM IMPERVIOUS DIKE AND BEGIN PUMPING OPERATIONS FOR STREAM DIVERSION.
  4. PLACE DOWNSTREAM IMPERVIOUS DIKE AND PUMPING APPARATUS. DEWATER ENTRAPPED AREA. AREA TO BE DEWATERED SHALL BE EQUAL TO ONE DAY'S WORK.
  5. INSTALL CULVERT(S) IN ACCORDANCE WITH THE PLANS.
  6. EXCAVATE ANY ACCUMULATED SILT AND DEWATER BEFORE REMOVAL OF IMPERVIOUS DIKES. REMOVE IMPERVIOUS DIKES, PUMPS, AND TEMPORARY FLEXIBLE HOSE. (DOWNSTREAM IMPERVIOUS DIKES FIRST).
  7. REMOVE SPECIAL STILLING BASIN(S) AND BACKFILL. STABILIZE DISTURBED AREA WITH SEED AND MULCH.

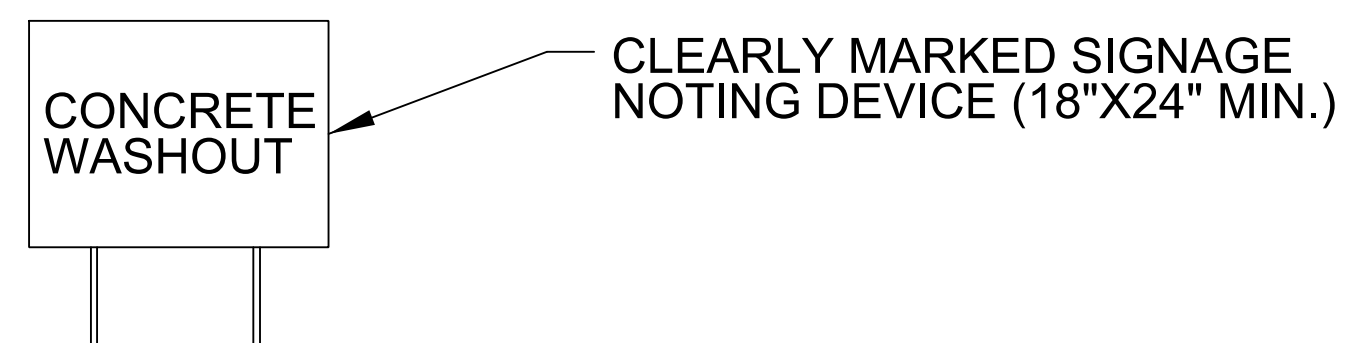
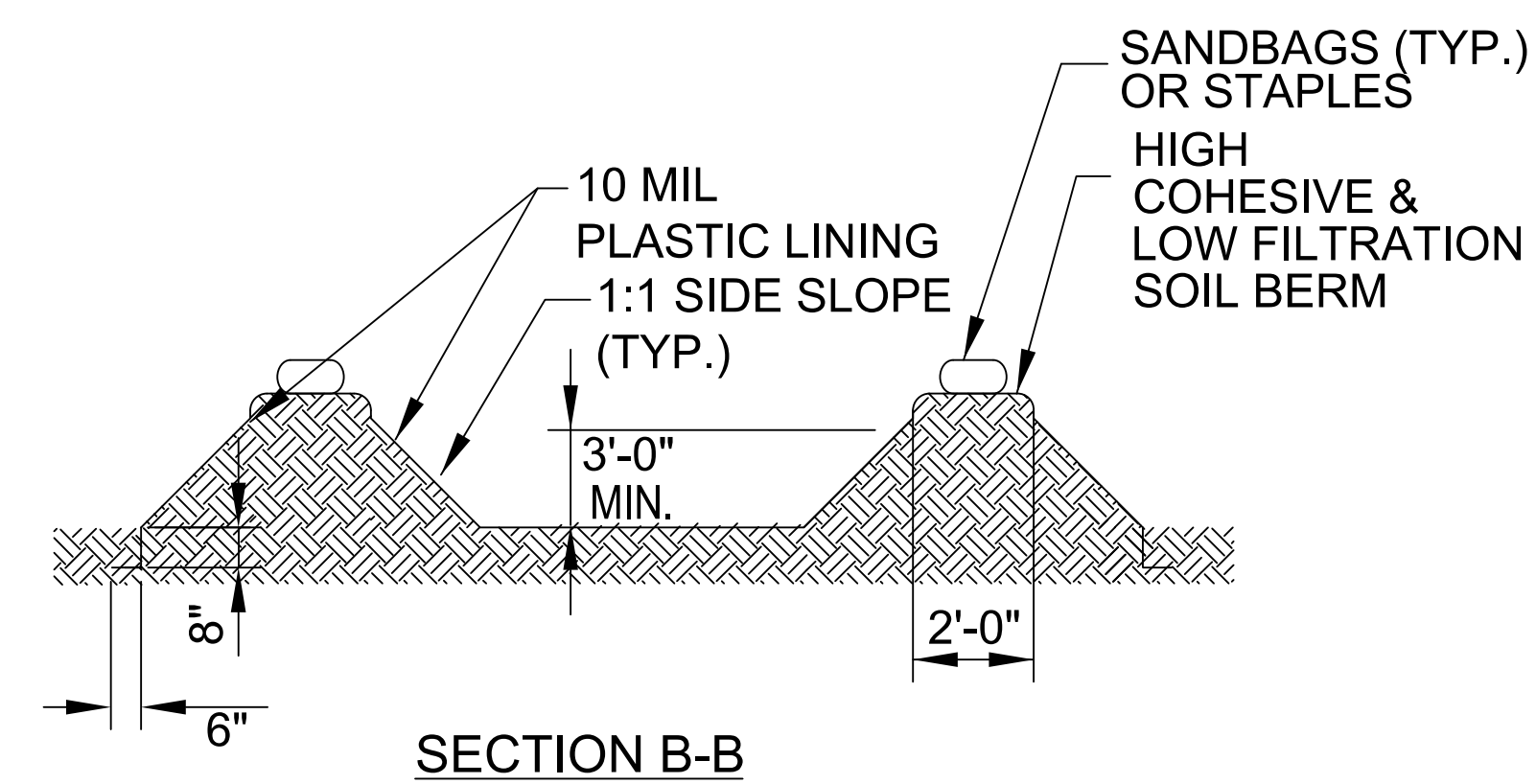
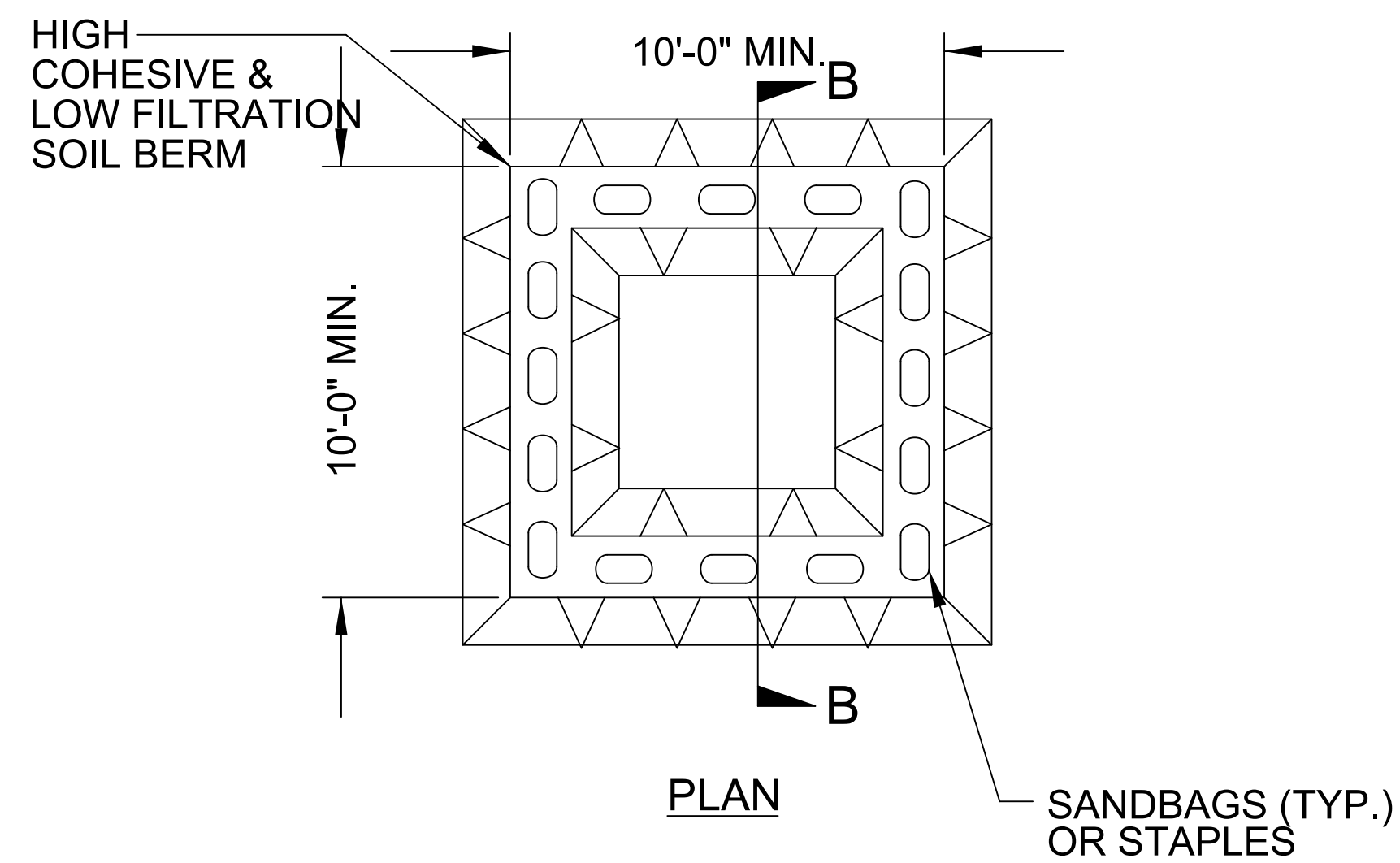
PROJECT REFERENCE NO. <i>BP5.R131</i>	SHEET NO. <i>EC-2B</i>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

# ONSITE CONCRETE WASHOUT STRUCTURE WITH LINER



**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.



**ABOVE GRADE WASHOUT STRUCTURE**  
NOT TO SCALE

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



DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

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PROJECT REFERENCE NO. <i>BP5.R131</i>	SHEET NO. <i>EC-3A</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.

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# LOCHNER

H. W. LOCHNER, INC.  
2840 PLAZA PLACE, SUITE 202  
RALEIGH, NC 27612  
(919) 371-7111

NC License  
Number F-0159

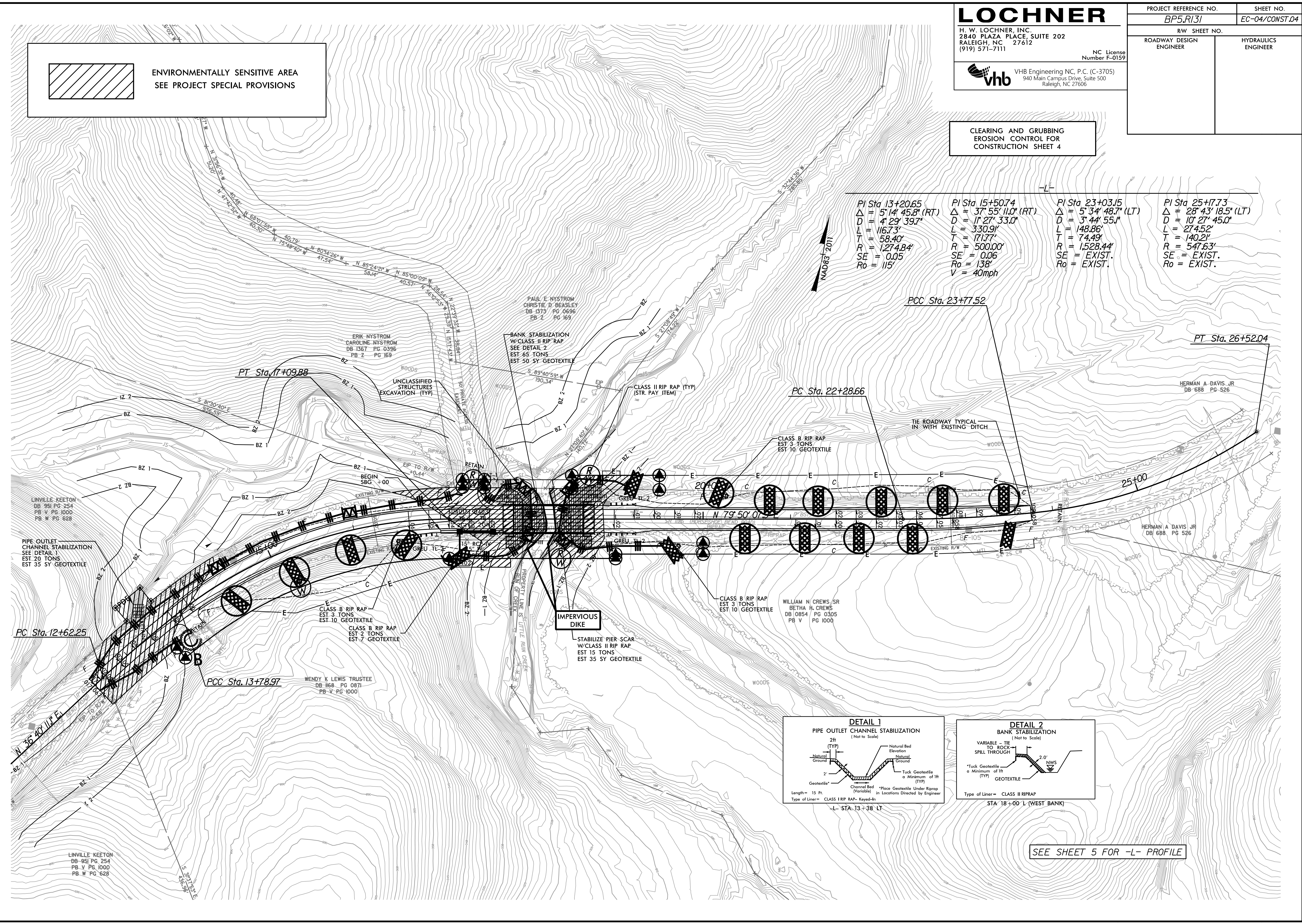


VHB Engineering NC, P.C. (C-3705)  
940 Main Campus Drive, Suite 500  
Raleigh, NC 27606

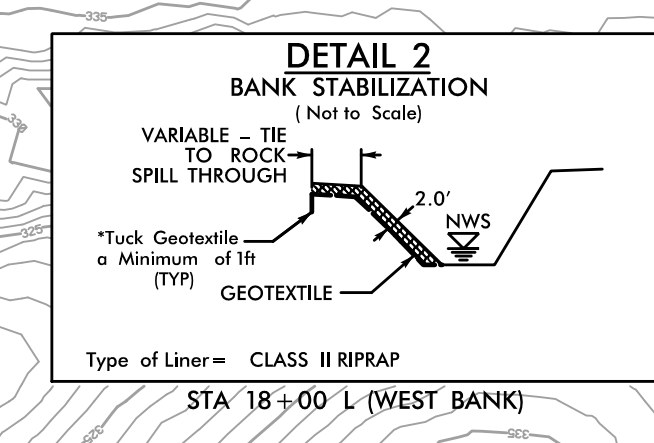
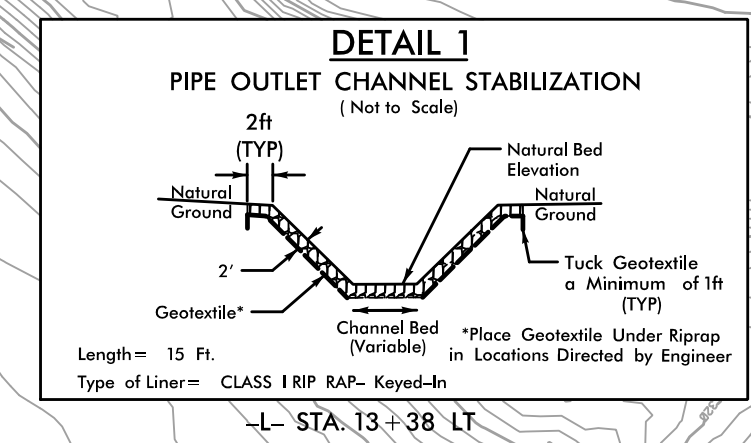
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RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

ENVIRONMENTALLY SENSITIVE AREA  
SEE PROJECT SPECIAL PROVISIONS

CLEARING AND GRUBBING  
EROSION CONTROL FOR  
CONSTRUCTION SHEET 4




<p>PI Sta 13+20.65 Δ = 5'14" 45.8" (RT) D = 4' 29" 39.7" L = 116.73' T = 58.40' R = 1,274.84' SE = 0.05 Ro = 115'</p>	<p>PI Sta 15+50.74 Δ = 37' 55" 11.0" (RT) D = 11' 27" 33.0" L = 330.91' T = 171.77' R = 500.00' SE = 0.06 Ro = 138' V = 40mph</p>	<p>PI Sta 23+03.15 Δ = 5' 34" 48.7" (LT) D = 3' 44" 55.1" L = 148.86' T = 74.49' R = 1,528.44' SE = EXIST. Ro = EXIST.</p>	<p>PI Sta 25+17.73 Δ = 28' 43" 18.5" (LT) D = 10' 27" 45.0" L = 274.52' T = 140.21' R = 547.63' SE = EXIST. Ro = EXIST.</p>
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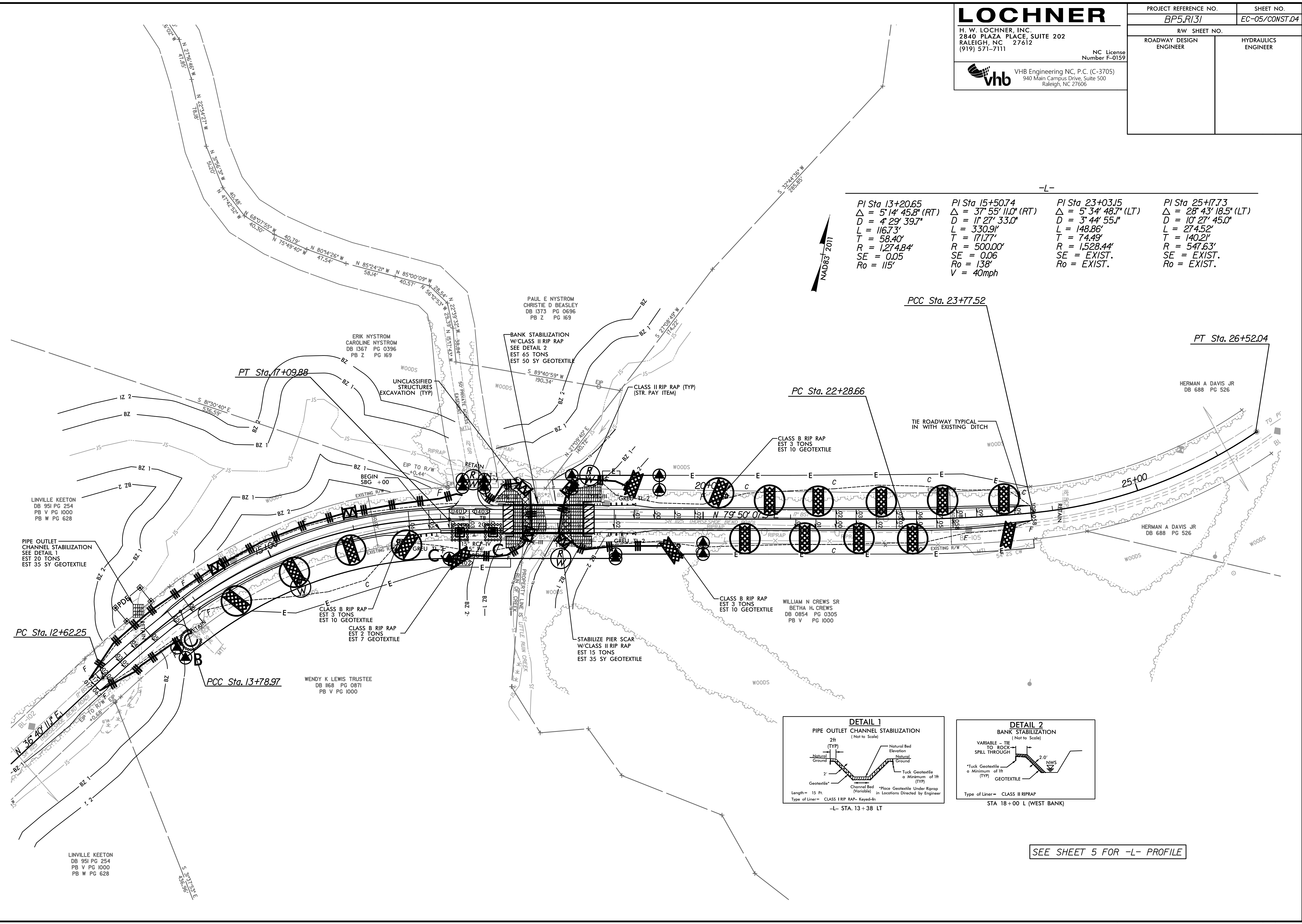


SEE SHEET 5 FOR -L- PROFILE



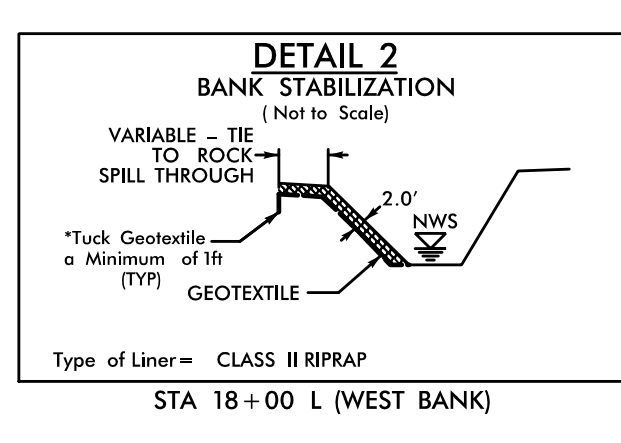
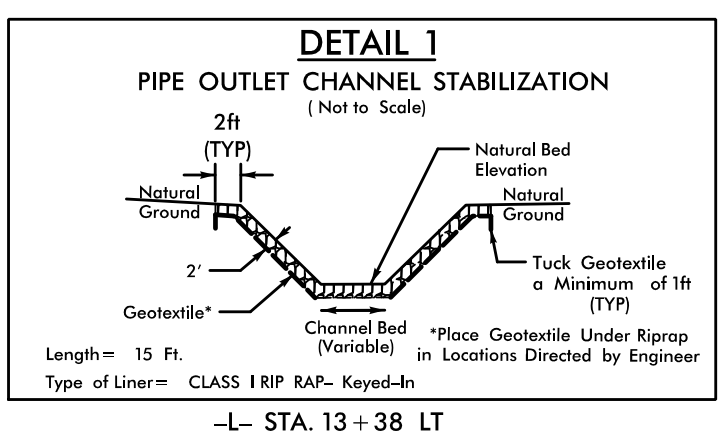
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<b>LOCHNER</b>	
H. W. LOCHNER, INC. 2840 PLAZA PLACE, SUITE 202 RALEIGH, NC 27612 (919) 371-7111	
NC License Number F-0159	
 VHB Engineering NC, P.C. (C-3705) 940 Main Campus Drive, Suite 500 Raleigh, NC 27606	
PROJECT REFERENCE NO. <i>BP5.R131</i>	SHEET NO. <i>EC-05/CONST.04</i>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



-L-

<b>PI Sta 13+20.65</b> $\Delta = 5' 14' 45.8''$ (RT) $D = 4' 29' 39.7''$ $L = 116.73'$ $T = 58.40'$ $R = 1,274.84'$ $SE = 0.05$ $Ro = 115'$	<b>PI Sta 15+50.74</b> $\Delta = 37' 55' 11.0''$ (RT) $D = 11' 27' 33.0''$ $L = 330.91'$ $T = 171.77'$ $R = 500.00'$ $SE = 0.06$ $Ro = 138'$ $V = 40\text{mph}$	<b>PI Sta 23+03.15</b> $\Delta = 5' 34' 48.7''$ (LT) $D = 3' 44' 55.1''$ $L = 148.86'$ $T = 74.49'$ $R = 1,528.44'$ $SE = EXIST.$ $Ro = EXIST.$	<b>PI Sta 25+17.73</b> $\Delta = 28' 43' 18.5''$ (LT) $D = 10' 27' 45.0''$ $L = 274.52'$ $T = 140.21'$ $R = 547.63'$ $SE = EXIST.$ $Ro = EXIST.$
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SEE SHEET 5 FOR -L- PROFILE

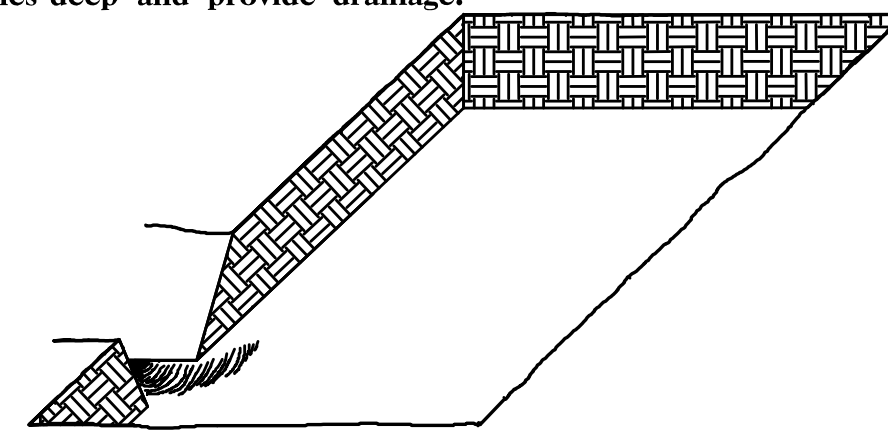
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP5.R131	RF-1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	

# PLANTING DETAILS

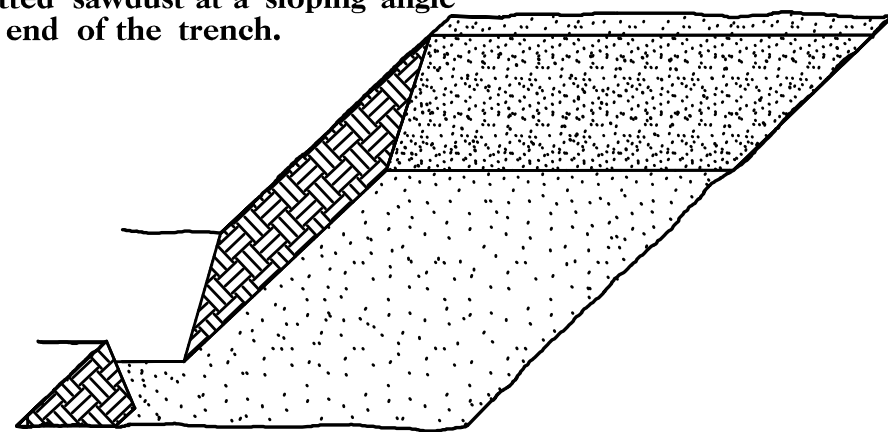
## SEEDLING / LINER BAREROOT PLANTING DETAIL

### HEALING IN

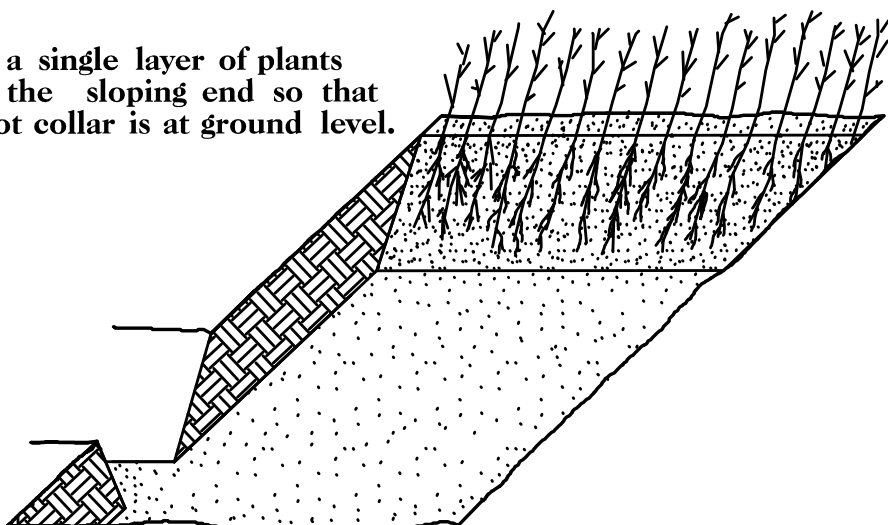
1. Locate a healing-in site in a shady, well protected area.
2. Excavate a flat bottom trench 12 inches deep and provide drainage.



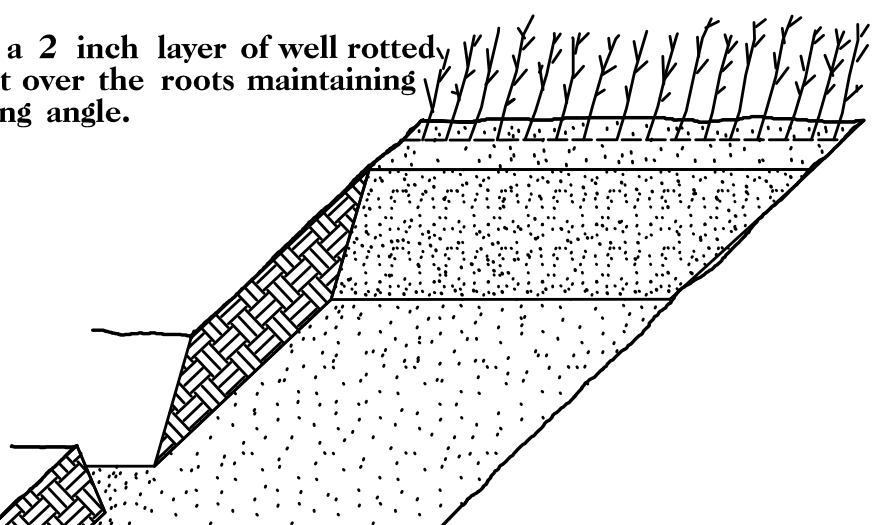
3. Jackfill the trench with 2 inches well rotted sawdust. Place a 2 inch layer of well rotted sawdust at a sloping angle at one end of the trench.



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

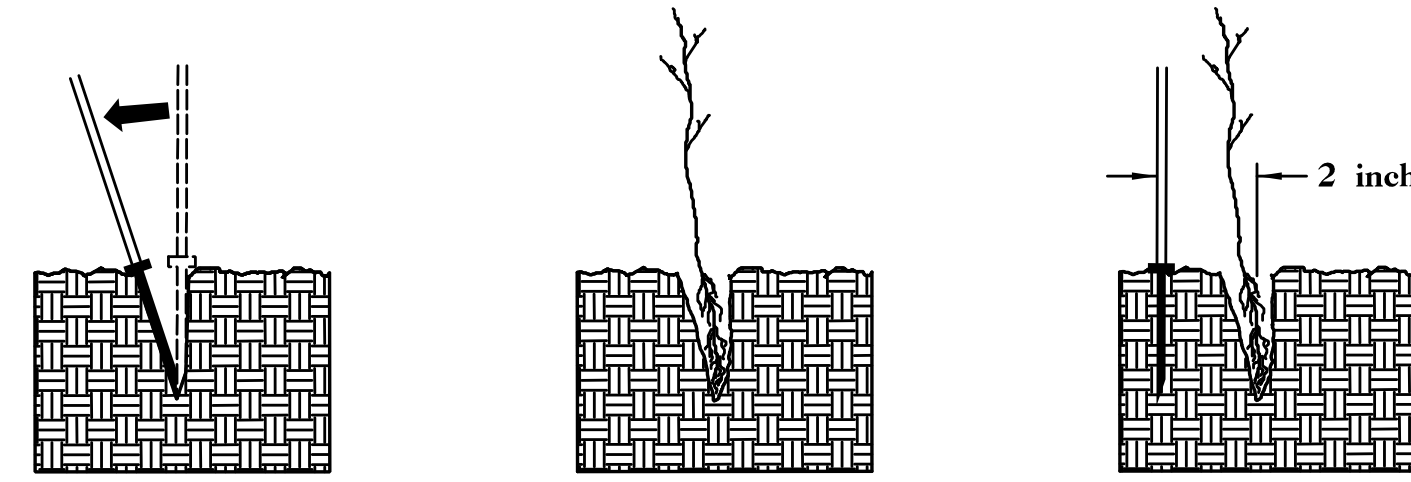


5. Place a 2 inch layer of well rotted sawdust over the roots maintaining a sloping angle.

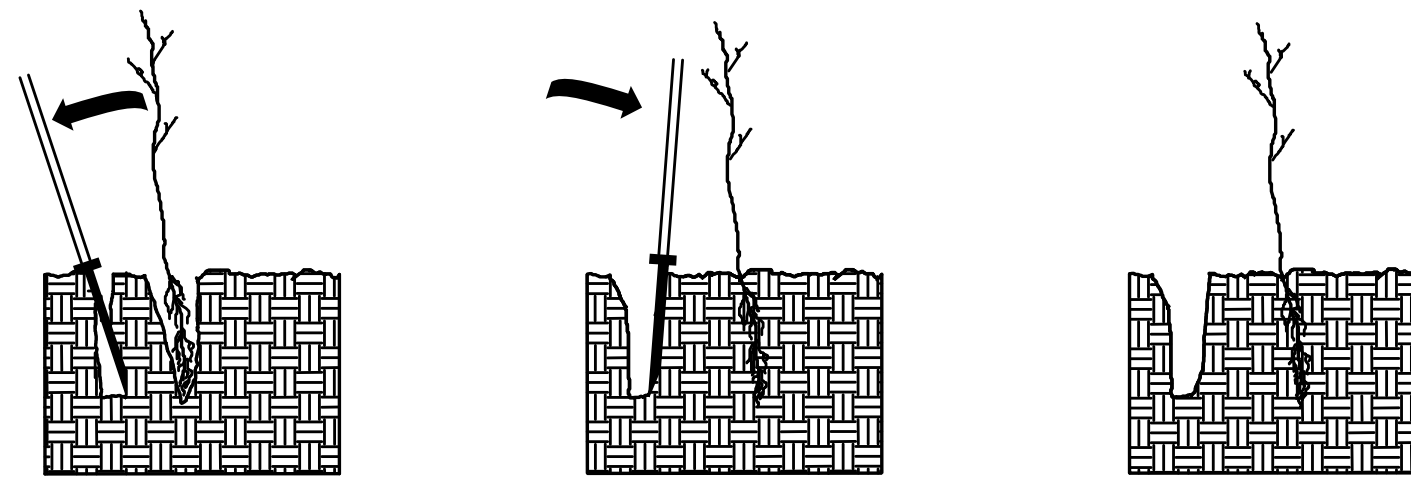


6. Repeat layers of plants and sawdust as necessary and water thoroughly.

### DIBBLE PLANTING METHOD USING THE KBC PLANTING BAR



1. Insert planting bar as shown and pull handle toward planter.
2. Remove planting bar and place seedling at correct depth.
3. Insert planting bar 2 inches toward planter from seedling.



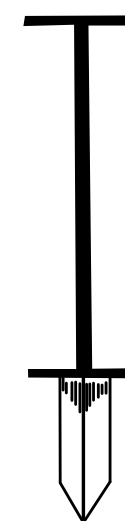
4. Pull handle of bar toward planter, firming soil at bottom.
5. Push handle forward firming soil at top.
6. Leave compaction hole open. Water thoroughly.

### PLANTING NOTES:

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



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



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

## REFORESTATION

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

### REFORESTATION

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

33%	LIRIODENDRON TULIPIFERA	TULIP POPLAR	12 in - 18 in 3R
33%	PLATANUS OCCIDENTALIS	AMERICAN SYCAMORE	12 in - 18 in 3R
34%	BETULA NIGRA	RIVER BIRCH	12 in - 18 in 3R

## REFORESTATION DETAIL SHEET

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

09/08/2011

PROJECT: BP5.R131

CONTRACT: DE00376

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

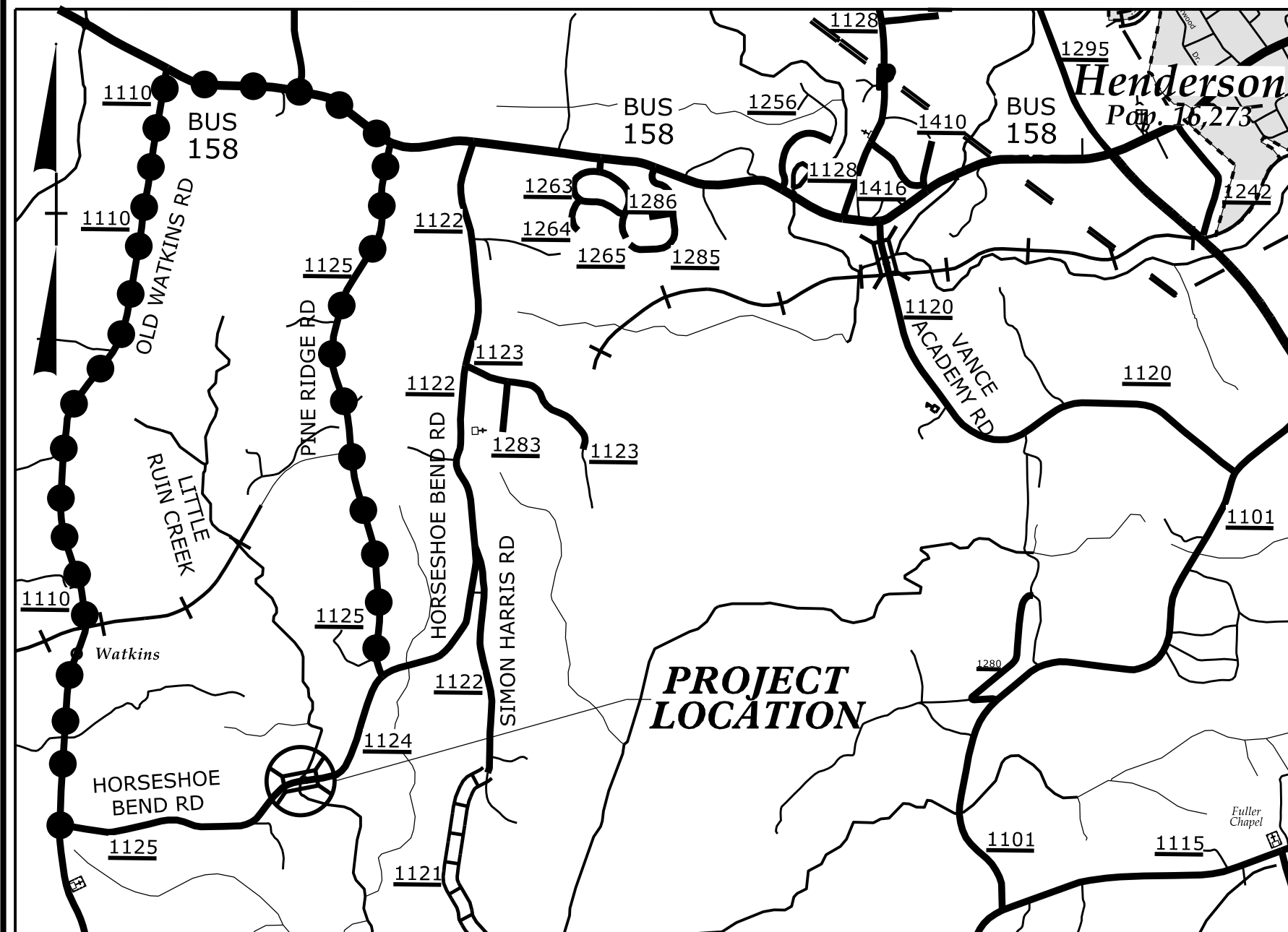
T.I.P. NO.	SHEET NO.
BP5.R131	UO-1

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

# UTILITIES BY OTHERS PLANS VANCE COUNTY

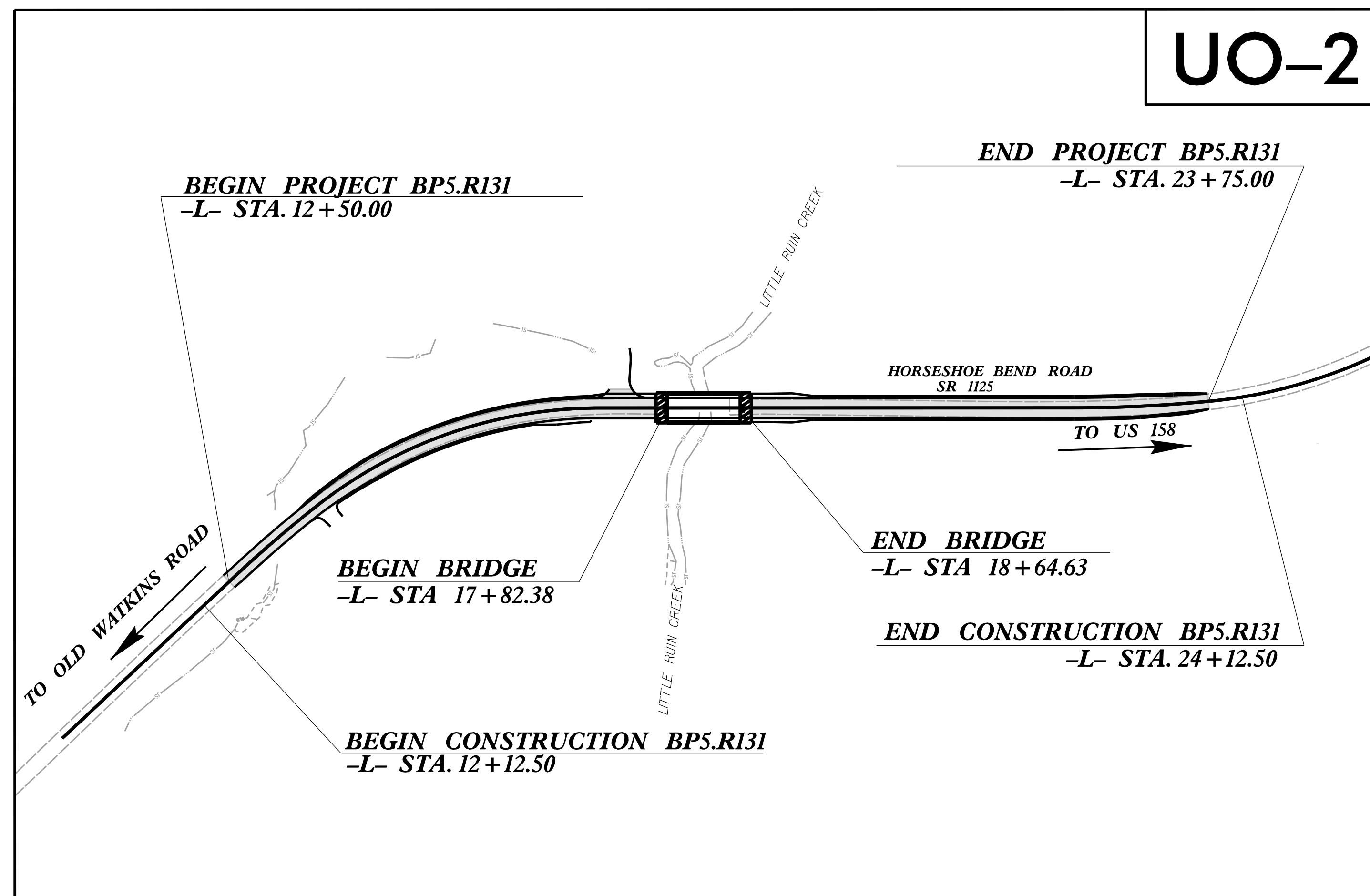
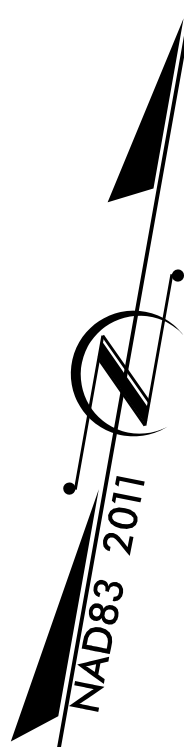
LOCATION: REPLACE BRIDGE NO. 15 OVER LITTLE RUIN CREEK  
ON HORSESHOE BEND ROAD (SR 1125)

TYPE OF WORK: UTILITY BY OTHERS RELOCATIONS



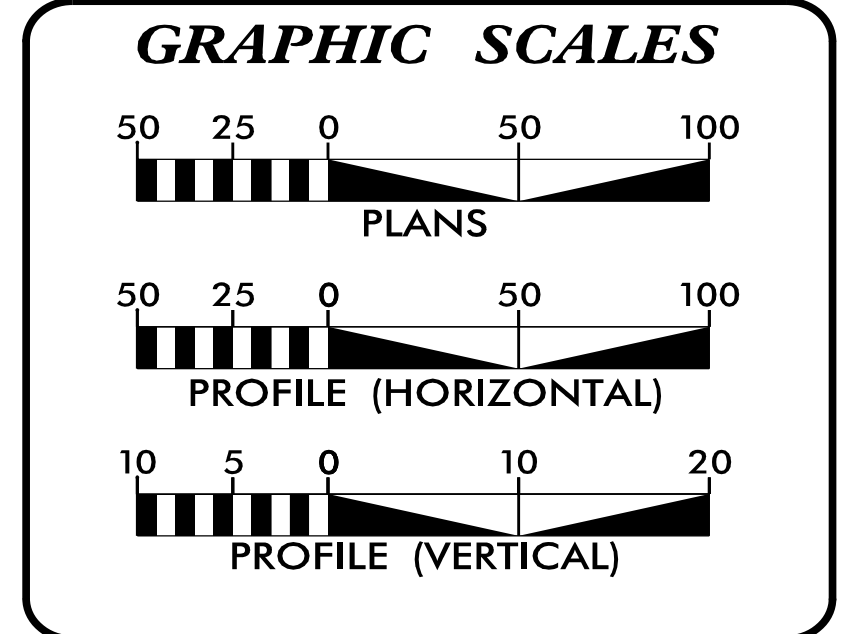
VICINITY MAP

●●●●● OFF-SITE DETOUR



UO-2

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED



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

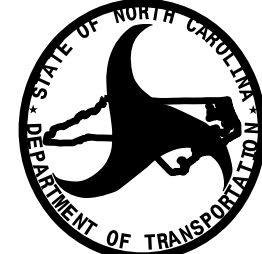
UTILITY OWNERS WITH CONFLICTS
(A) COMMUNICATIONS - BRIGHTSPEED / LUMEN / CENTURYLINK

PREPARED IN THE OFFICE OF:

## Wooten

120 North Boylan Avenue • Raleigh, NC 27603-1423  
(919) 828-0531 • thewootencompany.com  
License Number: F-0115

WEBB WHITE UTILITY PROJECT MANAGER  
TOMMY MARTIN PROJECT UTILITY COORDINATOR



DIVISION OF HIGHWAYS  
DIVISION 5  
2612 DUKE STREET  
DURHAM, NC 27704

LISA BULLARD-GILCHRIST BRIDGE PROGRAM MANAGER

UTILITIES BY OTHERS

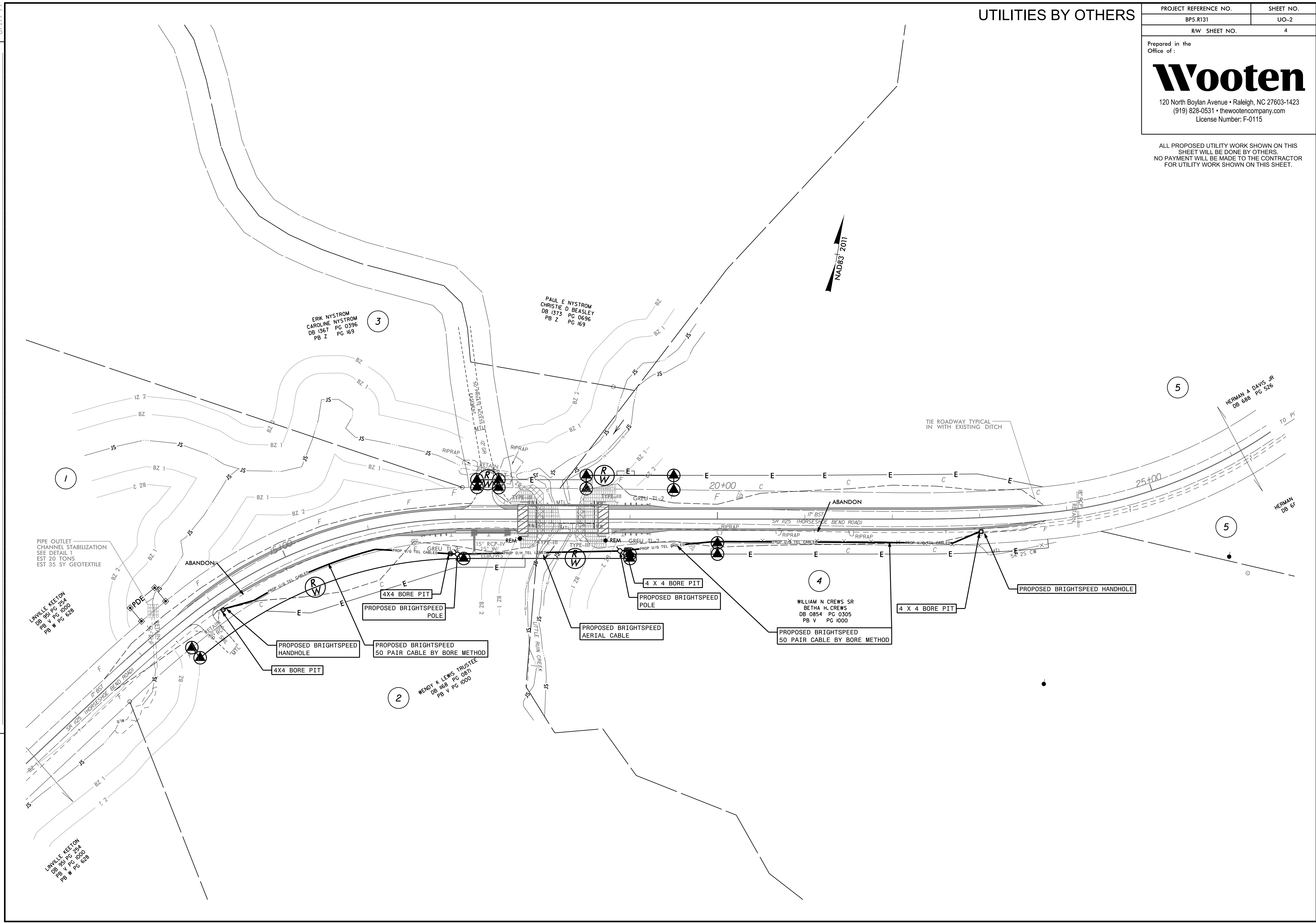
PROJECT REFERENCE NO.	SHEET NO.
BP5.R131	UO-2
RW SHEET NO.	4

Prepared in the Office of:  
**Wooten**  
 120 North Boylan Avenue • Raleigh, NC 27603-1423  
 (919) 828-0531 • thewootencompany.com  
 License Number: F-0115

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

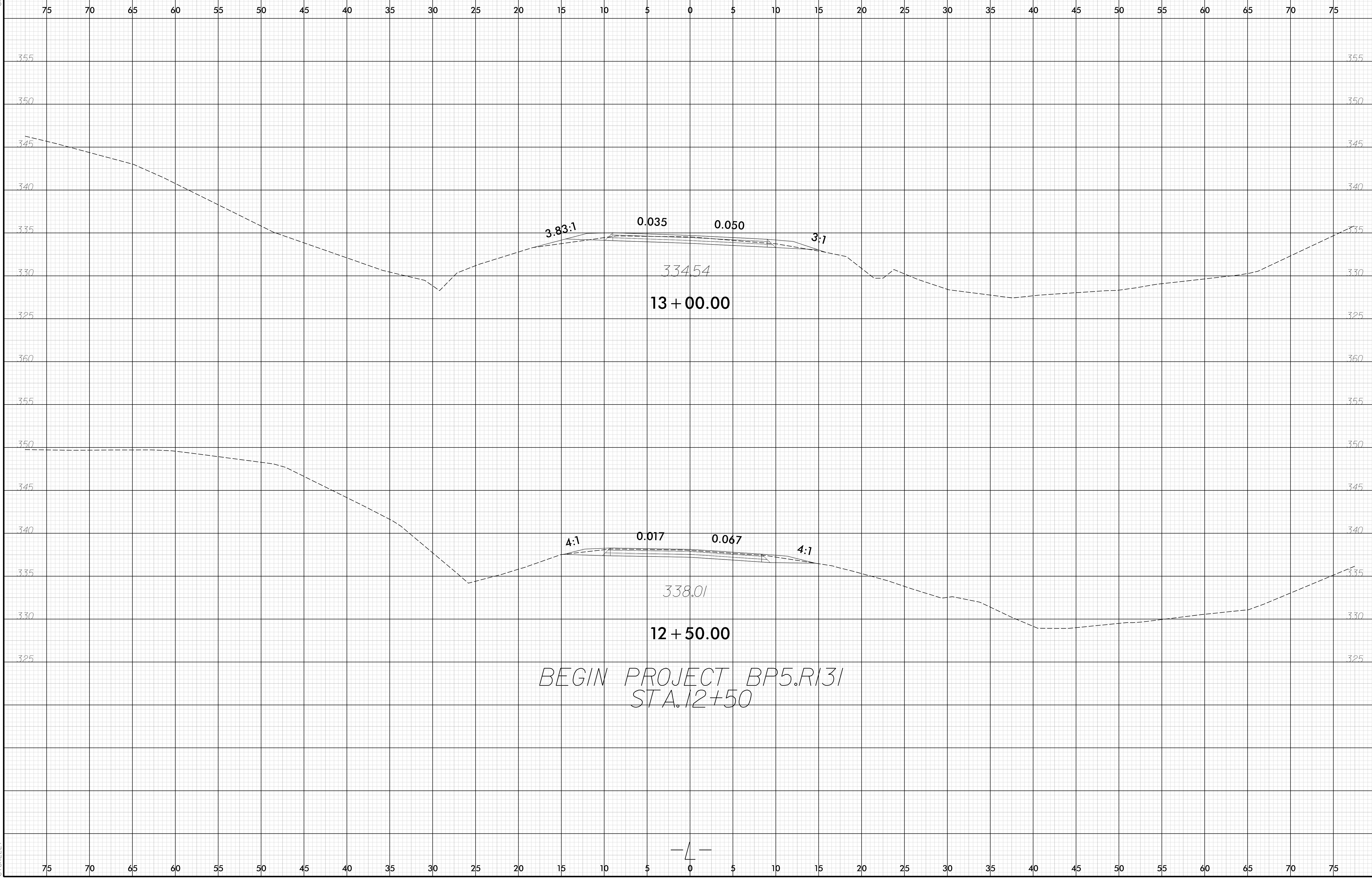
8/17/99

REVISIONS

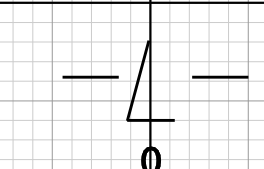


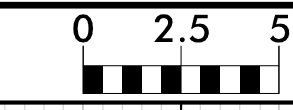


6/23/16

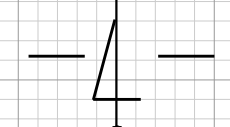
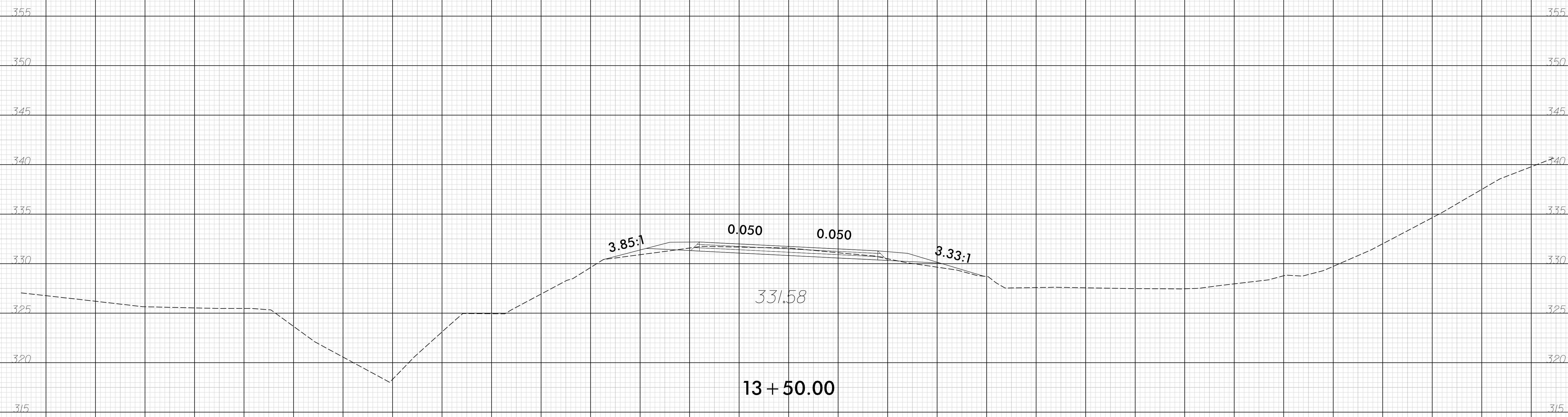
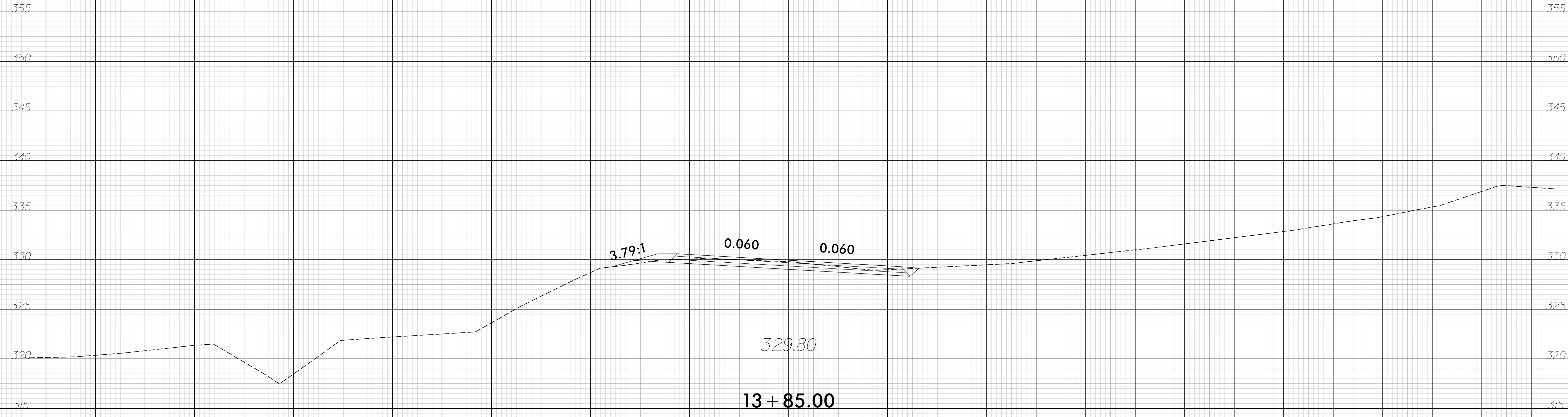


6/27/2023  
BP5.R131  
CYO/LEF

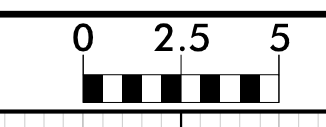




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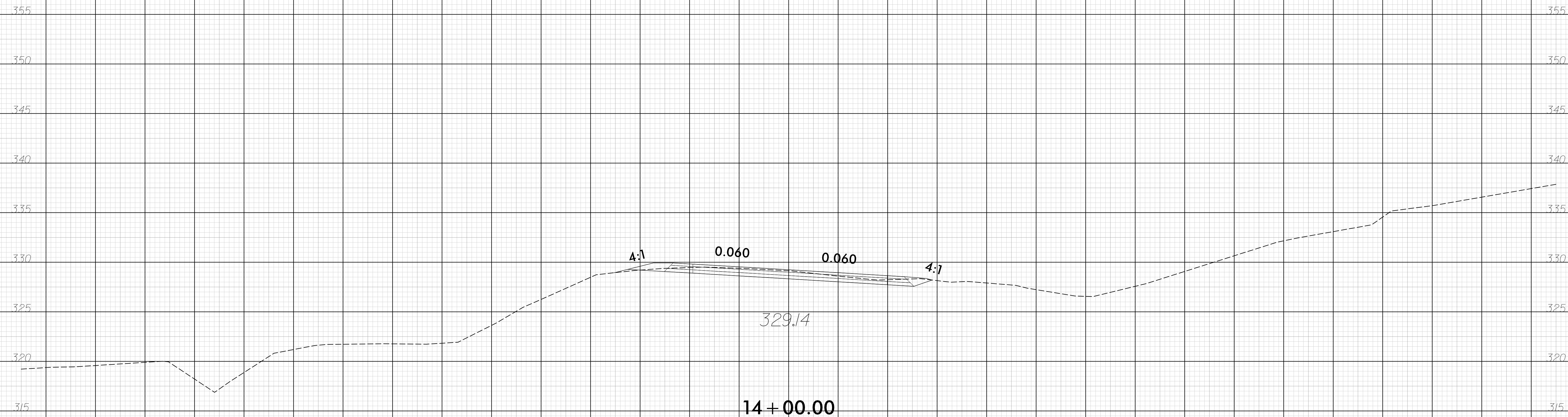
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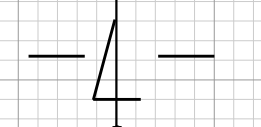
PROJ. REFERENCE NO.  
BP5.R131

SHEET NO.  
X-4

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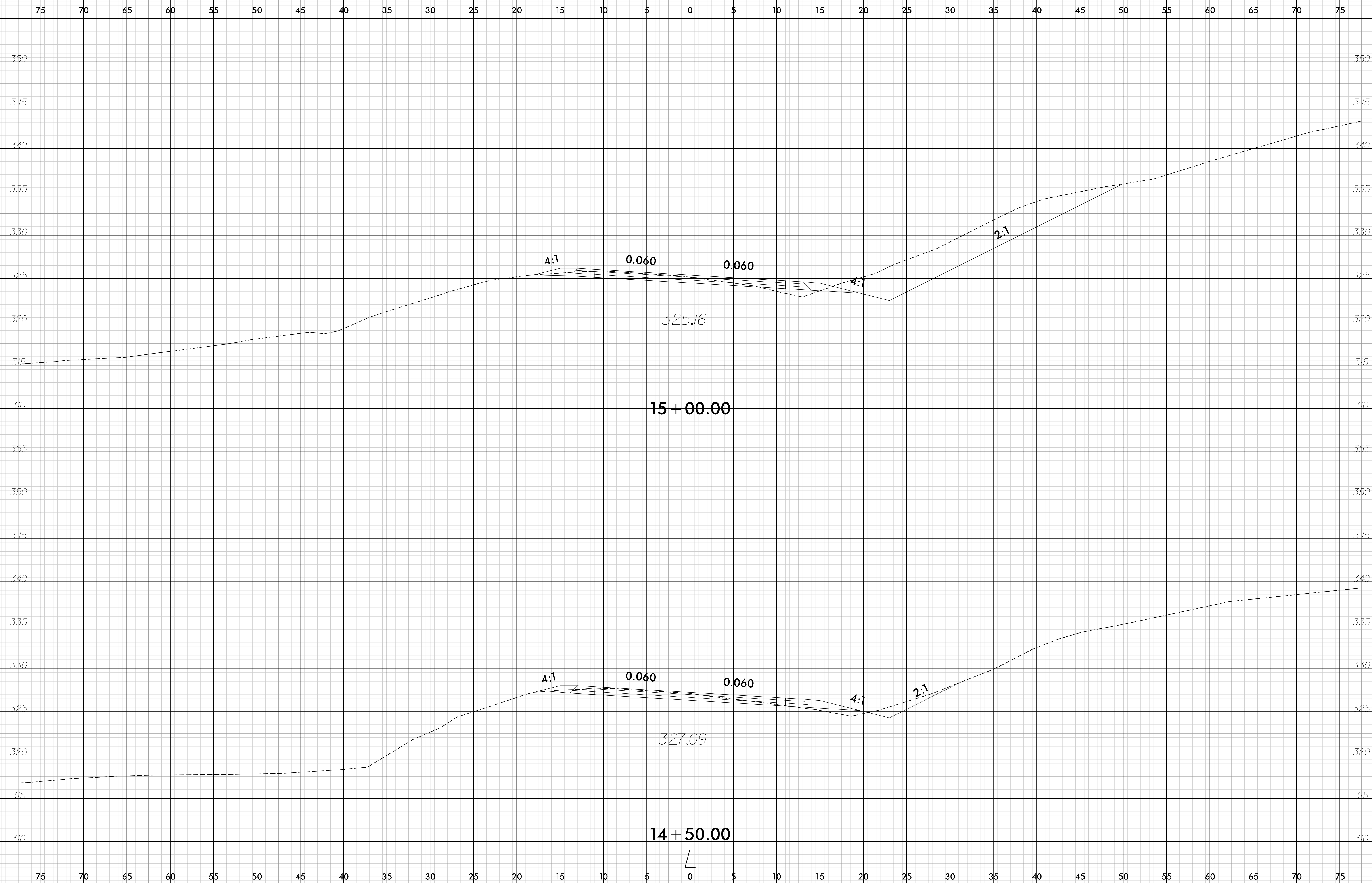
6/27/2023  
BP5.R131  
CYO/LEF



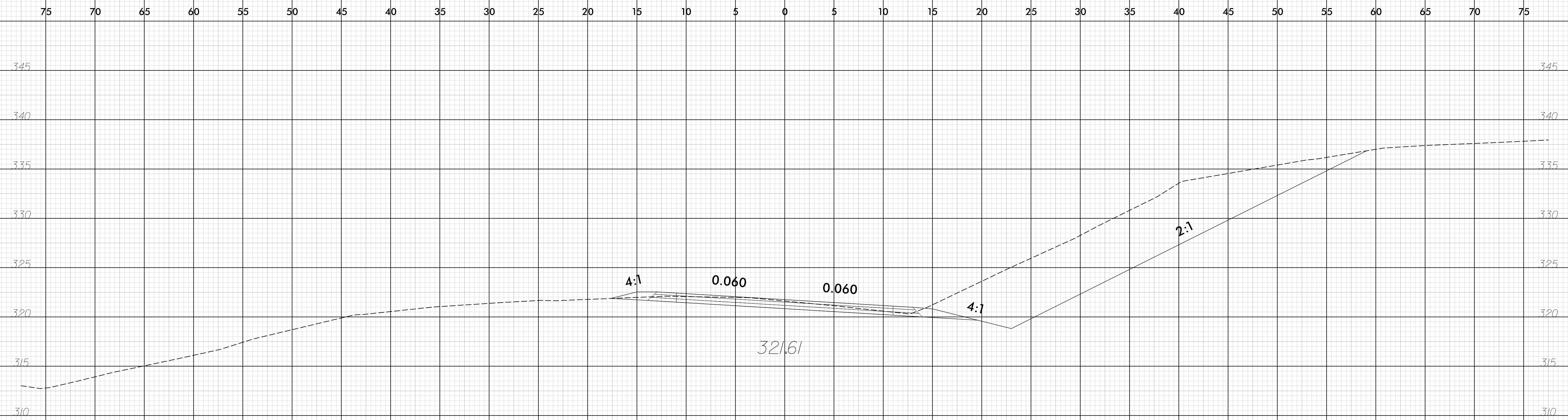
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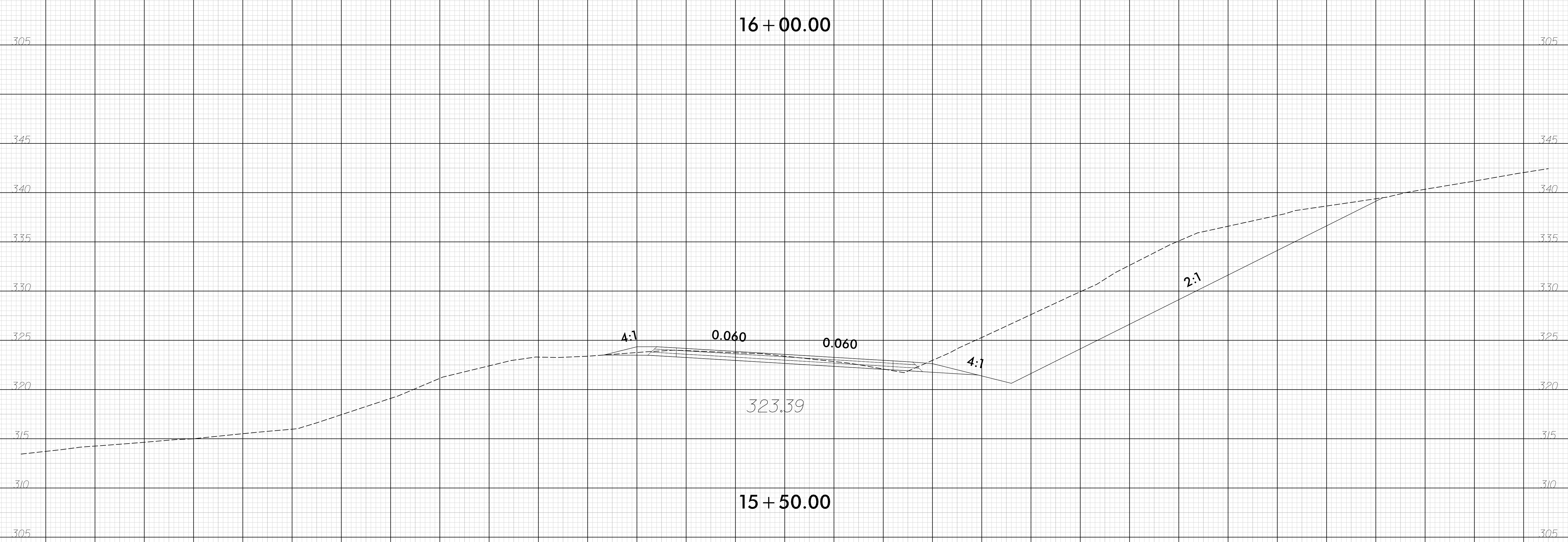
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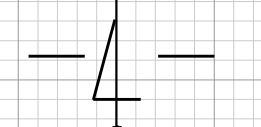
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16 + 00.00



15 + 50.00



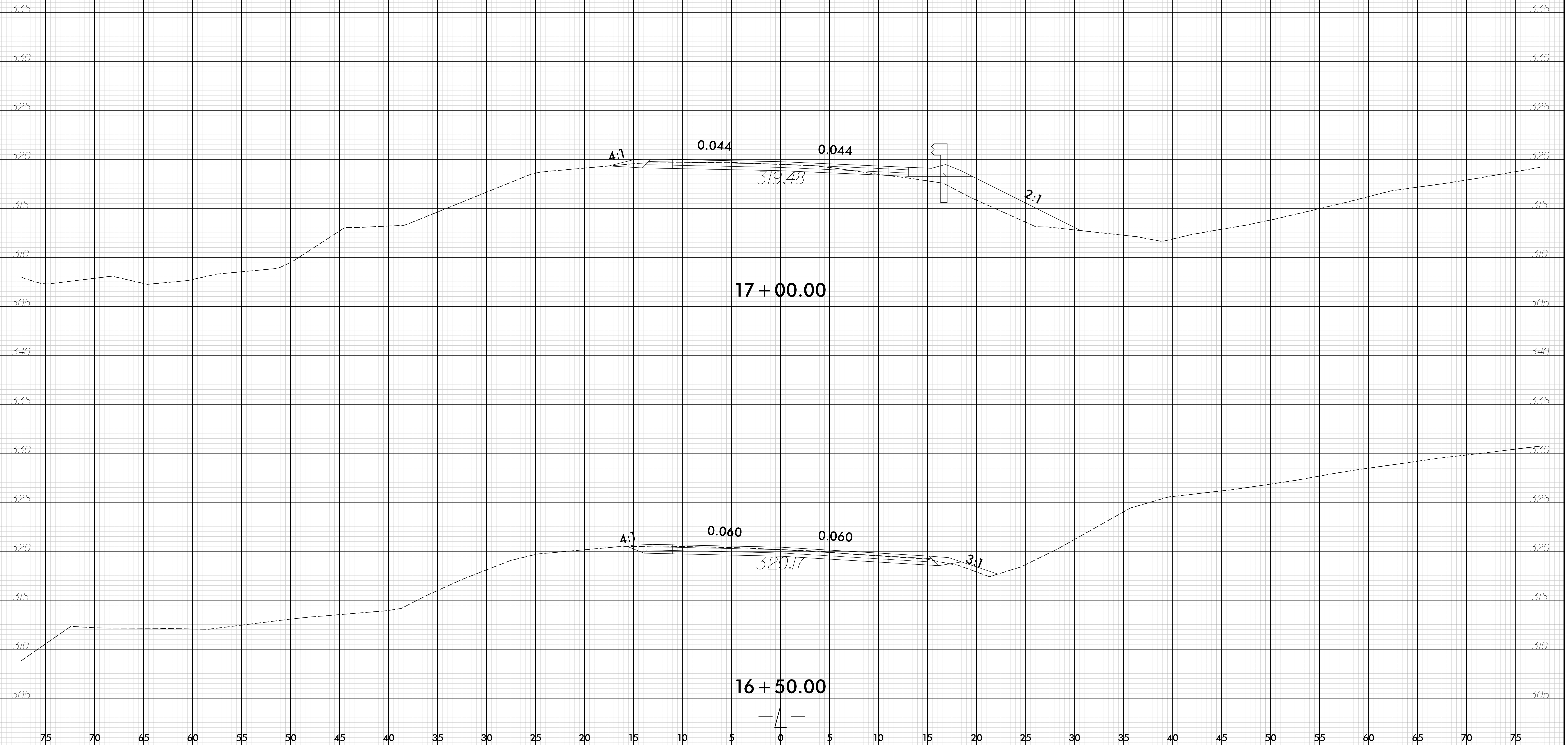
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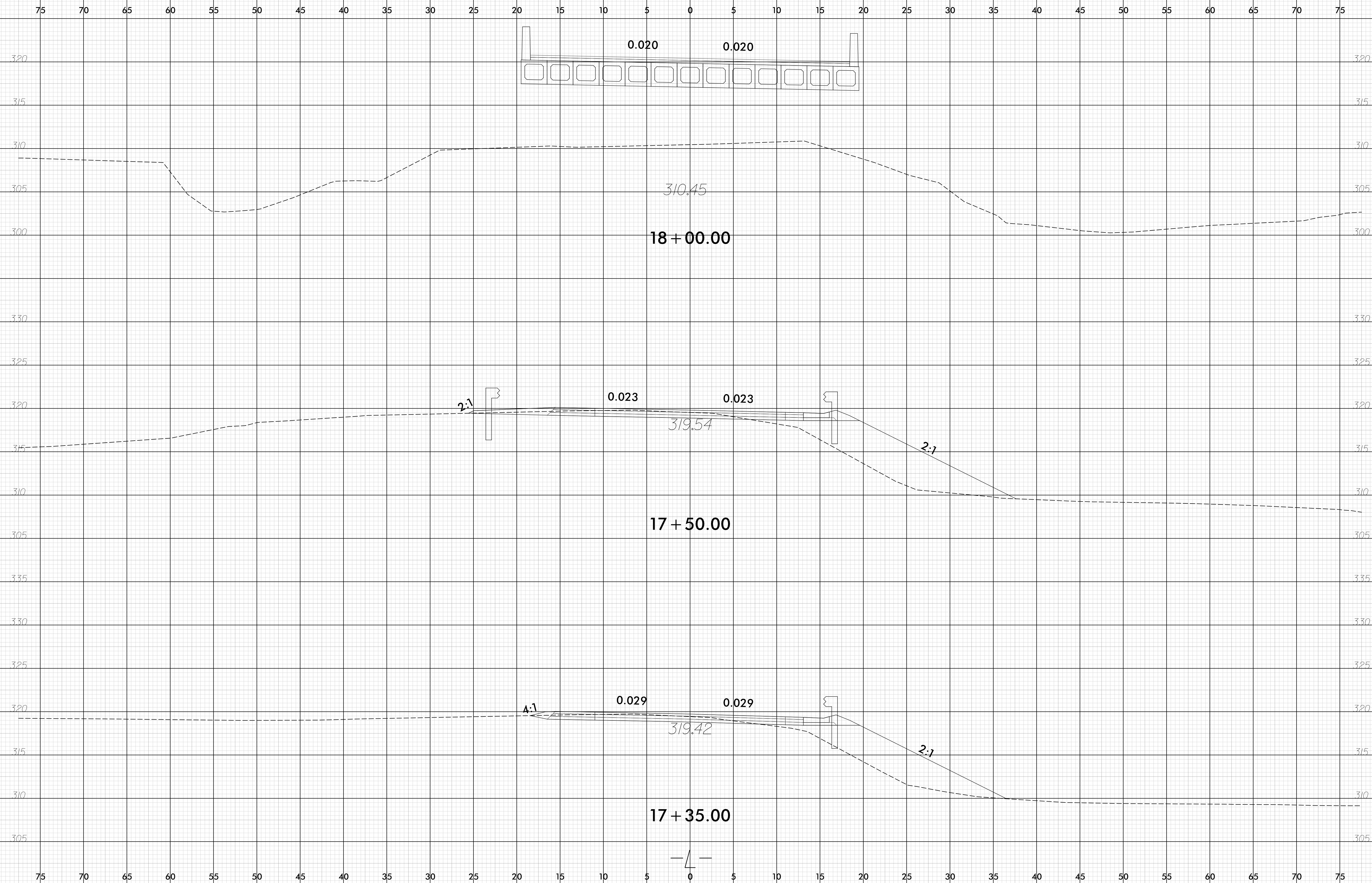
PROJ. REFERENCE NO.  
BP5.R131

SHEET NO.  
X-7

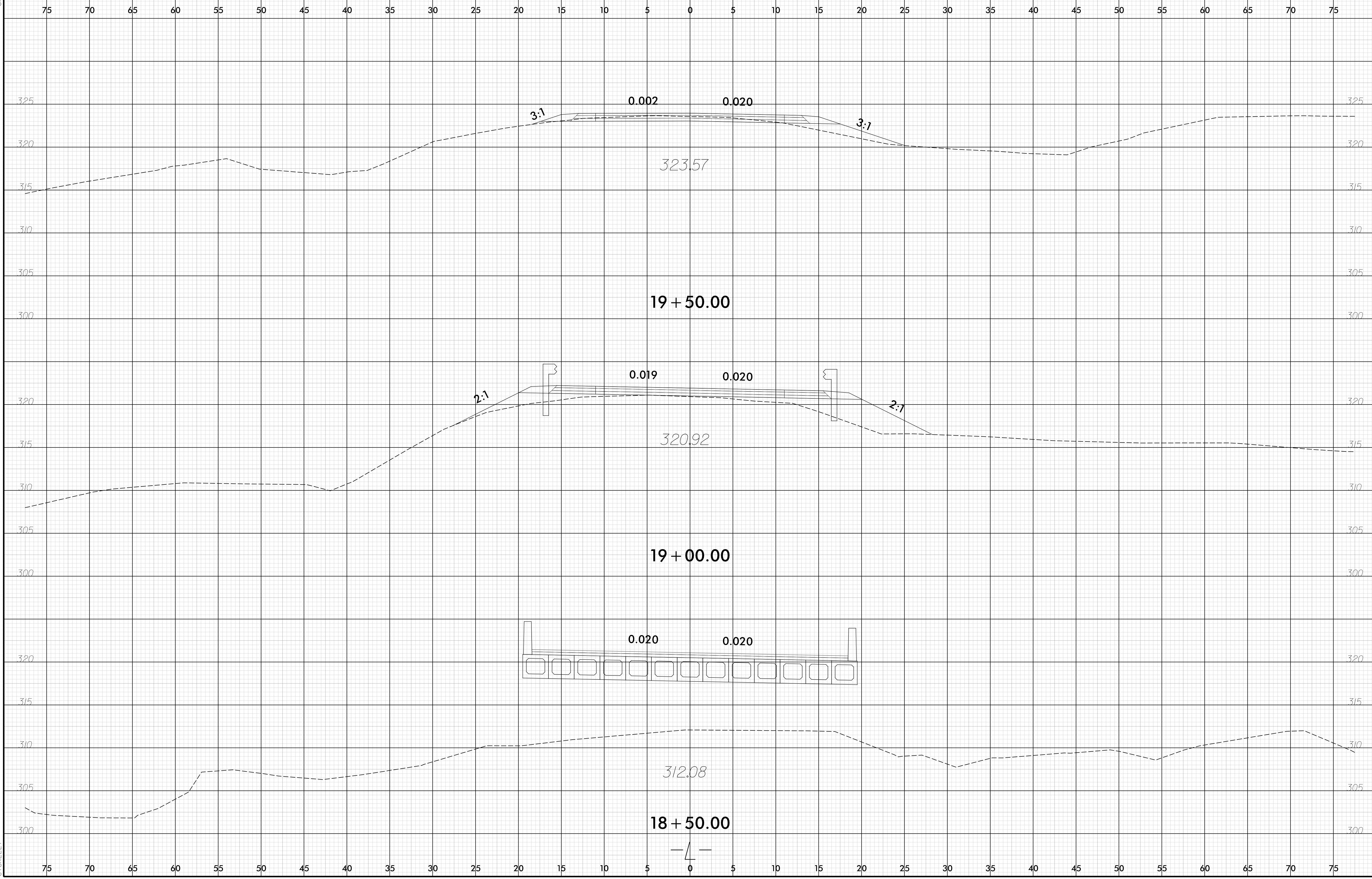
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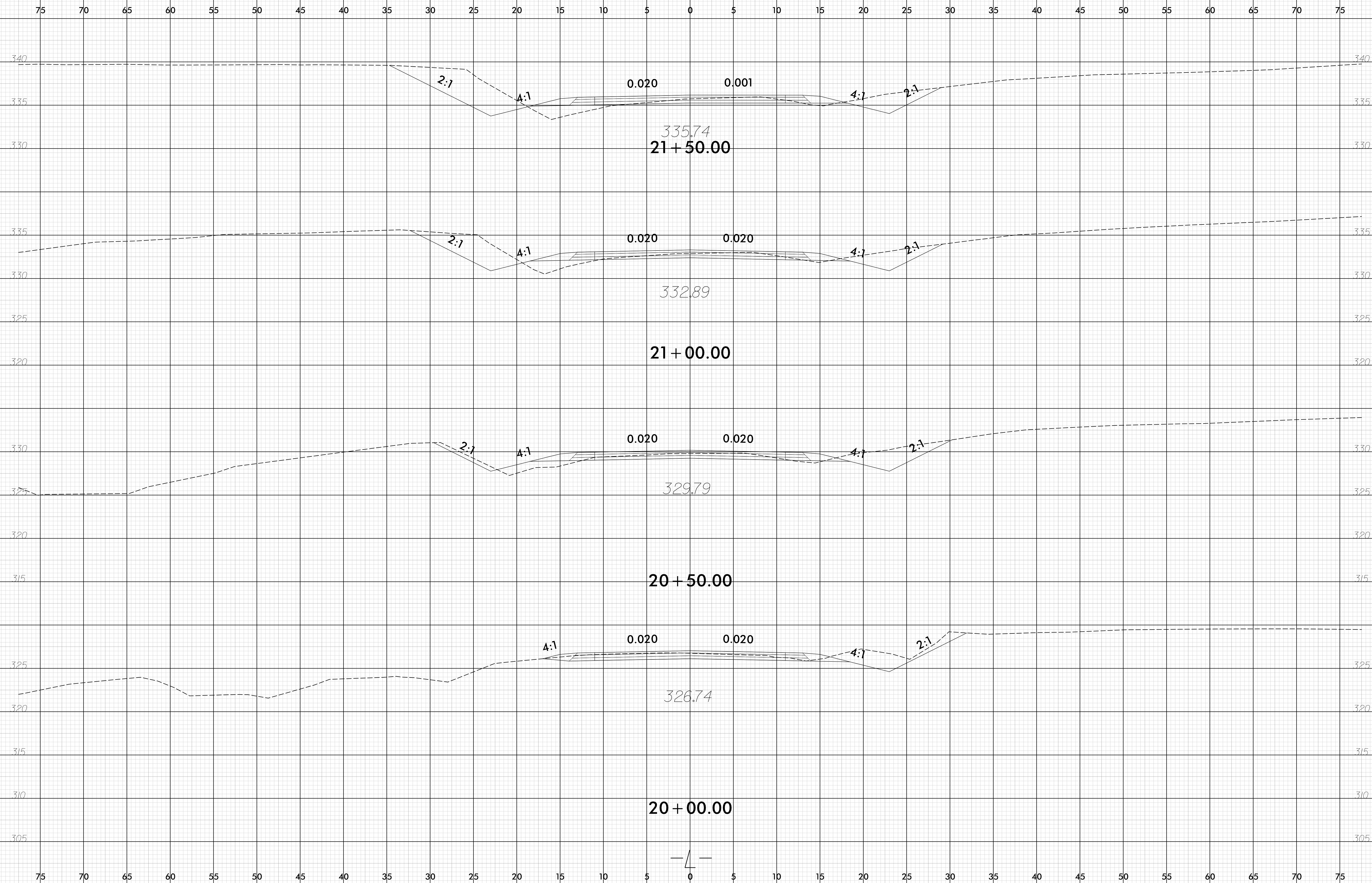


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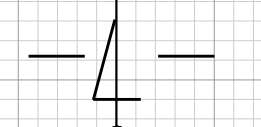


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6/23/16



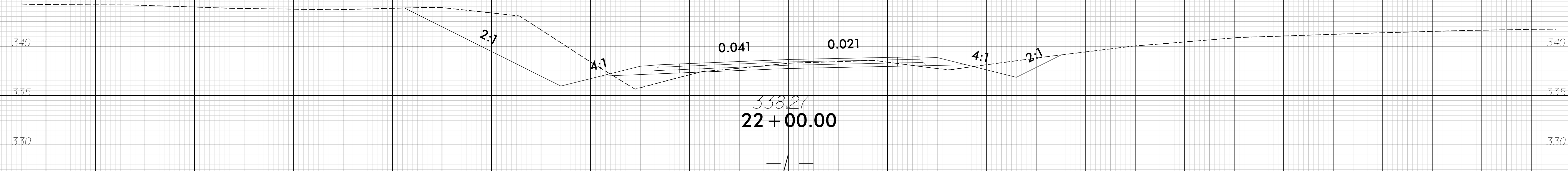
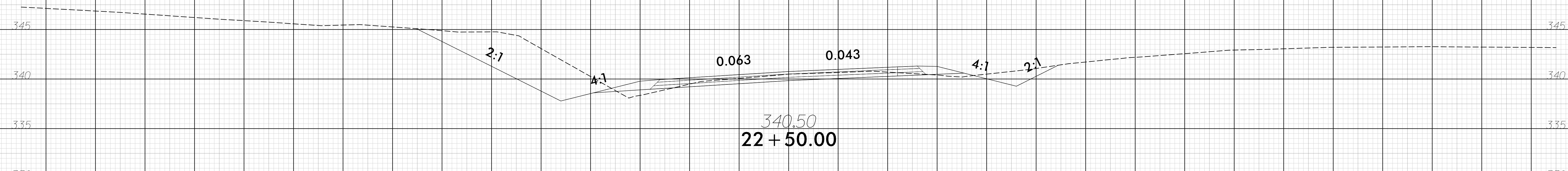
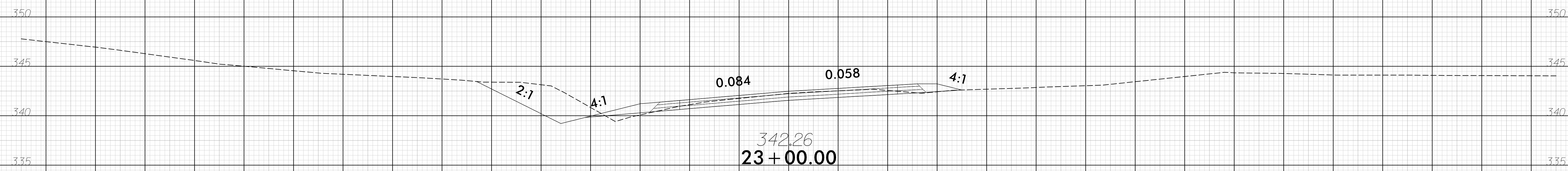
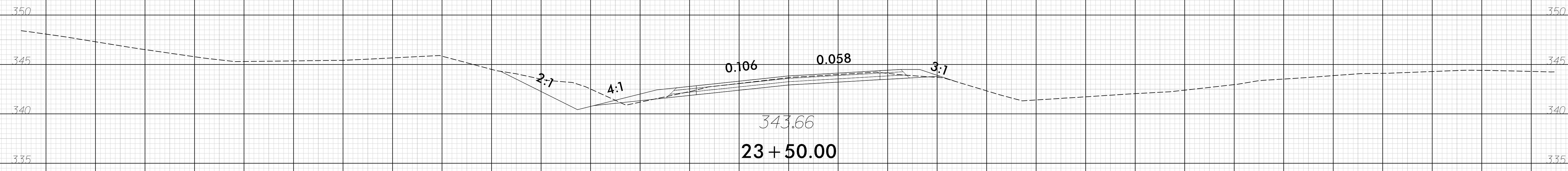
6/27/2023  
CYO/LEF



6/23/16

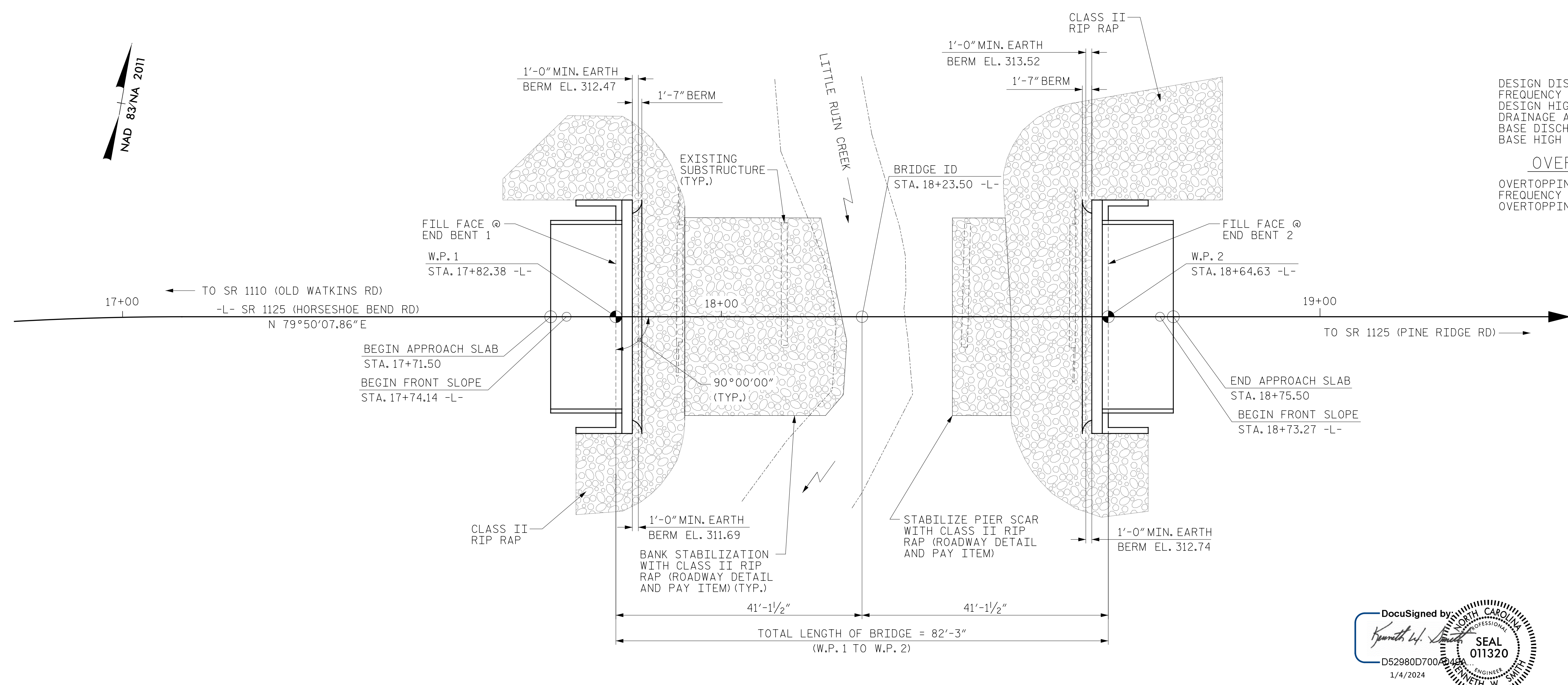
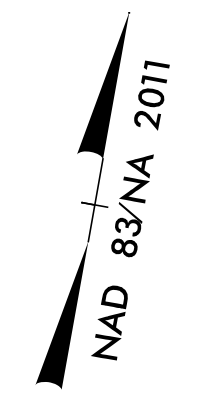
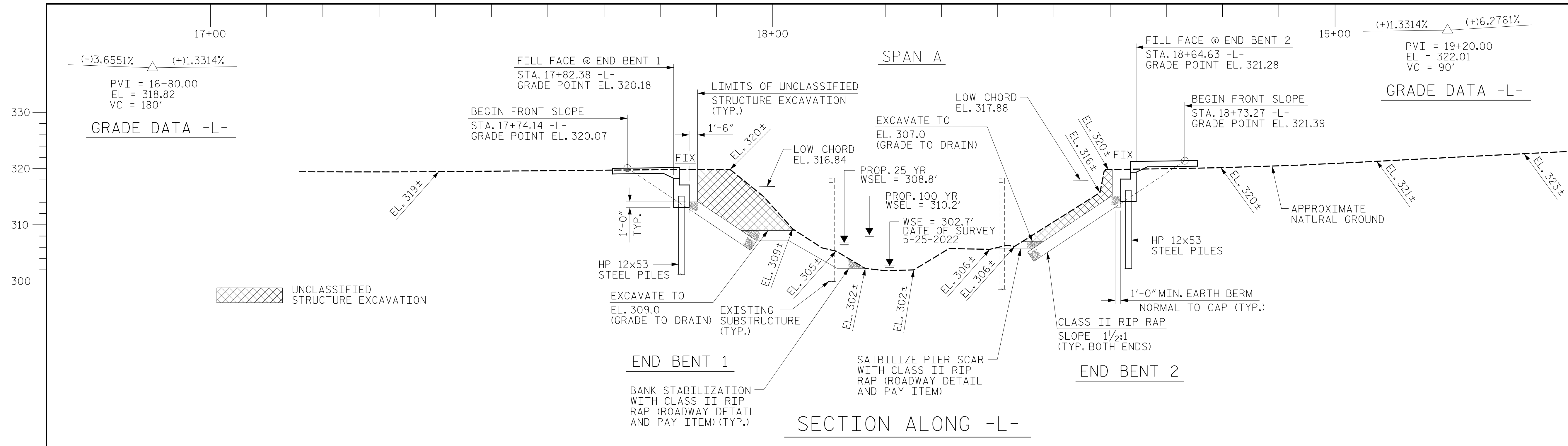
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END PROJECT BP5.R131  
STA. 23+75



6/27/2023  
BP5.R131  
CYO/LEF

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



**HYDRAULIC DATA**

DESIGN DISCHARGE	= 850 CFS
FREQUENCY OF DESIGN FLOOD	= 25 YRS.
DESIGN HIGH WATER ELEVATION	= 308.8'
DRAINAGE AREA	= 2.1 SQ. MI.
BASE DISCHARGE (Q100)	= 1,200 CFS
BASE HIGH WATER ELEVATION	= 310.20'

**OVERTOPPING FLOOD DATA**

OVERTOPPING DISCHARGE	= 9,000 CFS
FREQUENCY OF OVERTOPPING FLOOD	= > 500 YRS.
OVERTOPPING FLOOD ELEVATION	= 320.1' *

\* APPROX. 17+20 -L- @ EOT

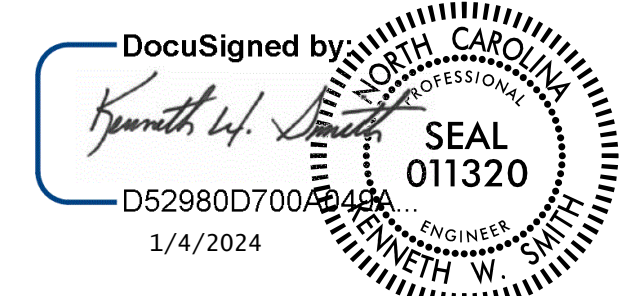
**PLAN**  
(PILES NOT SHOWN FOR CLARITY)

PROJECT NO. BP5.R131  
VANCE COUNTY  
 STATION: 18+23.50 -L-

SHEET 1 OF 2 REPLACES BRIDGE No. 900015

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**GENERAL DRAWING**  
 BRIDGE ON SR 1125 OVER  
 LITTLE RUIN CREEK BETWEEN  
 SR 1110 AND SR 1125



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		REVISIONS		SHEET NO.
<b>LOCHNER</b>	NO.	BY:	DATE:	S-1
H. W. LOCHNER, INC. 2840 PLAZA PLACE, SUITE 202 RALEIGH, NC 27612 (819) 771-7111	1			TOTAL SHEETS
NC License Number F-01169	2			16

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DRAWN BY : R. KNIGHT	DATE : 2/2023
CHECKED BY : K. SMITH	DATE : 3/2023
DESIGN ENGINEER	
OF RECORD: K. SMITH	DATE : 3/2023



**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 Exc 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 No. 1, Piles 1-4	100	See Substructure Plans	20			170							
End Bent No. 1, Piles 5-7	100		15			170							
End Bent No. 2, Piles 1-3	100		15			170							
End Bent No. 2, Piles 4-7	100		20			170							

\*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 DPT/PILE ORDER LENGTHS**

(Blank entries indicate item is not applicable to structure)

Dynamic Pile Testing (DPT)				Pile Order Lengths	
End Bent/ Bent No	DPT Testing Required? YES or MAYBE	DPT Test Pile Length FT	Total DPT Testing Quantity EACH	End Bent/ Bent No(s)	Pile Order Length Basis* EST or DPT
End Bent No. 1	MAYBE	25	1		
End Bent No. 2	MAYBE	25			

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

**PILE DESIGN INFORMATION**  
(Blank entries indicate item is not applicable to structure)

End Bent/ Bent No. Pile(s) # (e.g., "Bent 1, Piles 1-5")	Factored Axial Load per Pile 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 No. 1, Piles 1-7	97			0.60			
End Bent No. 2, Piles 1-7	97			0.60			

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

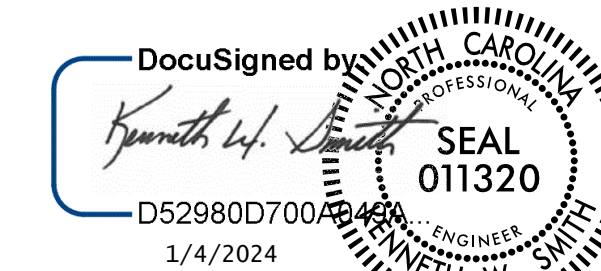
**SUMMARY OF PILE ACCESSORIES**  
(Blank entries indicate item is not applicable to structure)

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 No. 1, Piles 1-7				Y	
End Bent No. 2, Piles 1-7				Y	
<b>TOTAL QTY:</b>				14	

**NOTES:**

- The Pile Foundation Tables are based on the bridge substructure design and foundation recommendations sealed by a North Carolina Professional Engineer (W. Scott Hunsberger, 036283) on 12/05/2023.
- 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 DPT Testing when DPT may be required.

PROJECT NO. BP5.R131  
VANCE COUNTY  
 STATION: 18+23.50 -L-

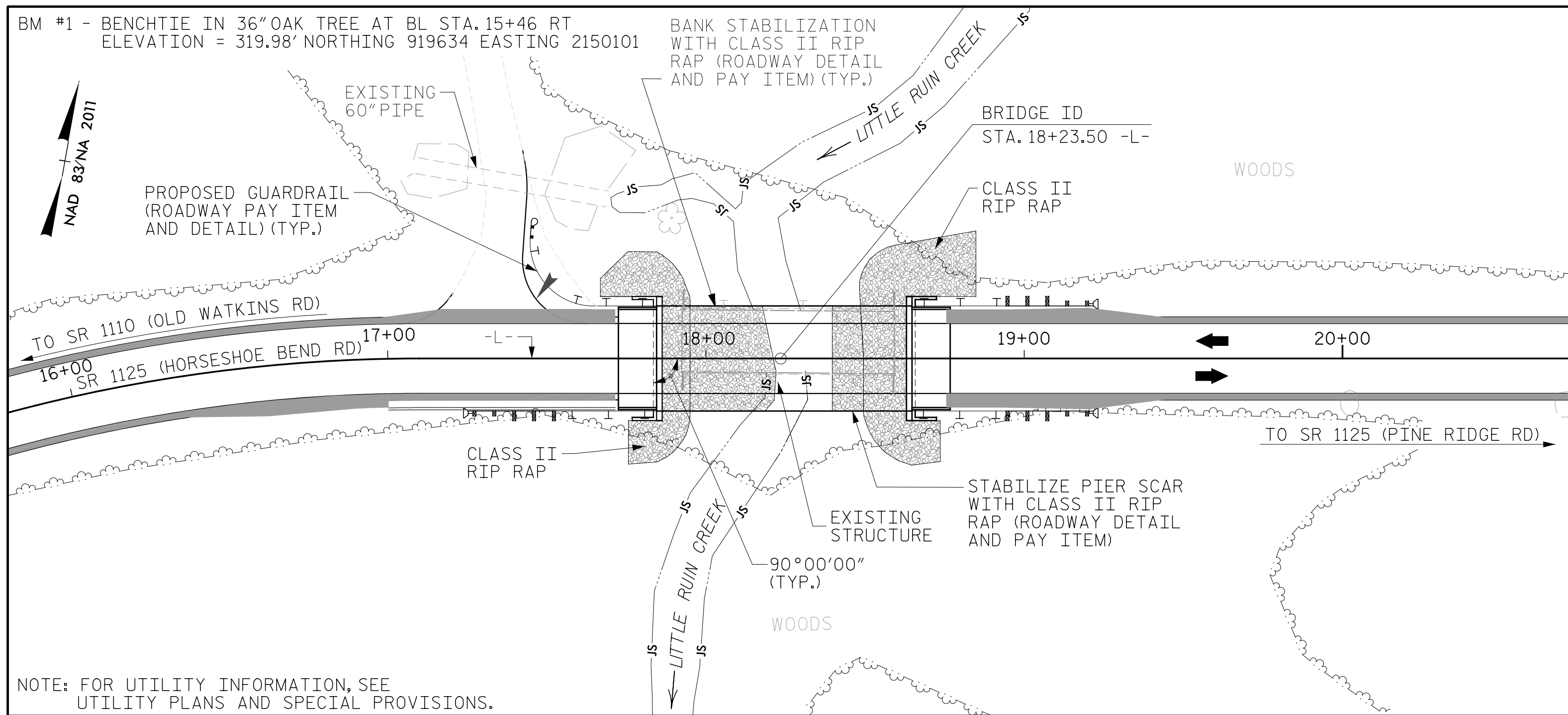


STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**PILE  
 FOUNDATION  
 TABLES**

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED				REVISIONS				SHEET NO. S-2
<b>LOCHNER</b>	NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS 16	
H. W. LOCHNER, INC. 2840 PLAZA PLACE, SUITE 202 RALEIGH, NC 27612 (819) 271-7111	1			3				
NC License Number-F-0169	2			4				

DRAWN BY : R. KNIGHT	DATE : 2/2023
CHECKED BY : K. SMITH	DATE : 3/2023
DESIGN ENGINEER	
OF RECORD: K. SMITH	DATE : 3/2023



LOCATION SKETCH

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.

THE EXISTING STRUCTURE CONSISTING OF 3 SPANS [1 @ 18'-3", 1 @ 30'-6", 1 @ 18'-3" WITH ASPHALT WEARING SURFACE ON TIMBER DECKING SUPPORTED ON STEEL I-BEAMS SUPPORTED BY TIMBER CAPS AND POSTS AT END BENT AND INTERIOR BENTS] AND LOCATED AT THE SITE OF THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, THE LOAD LIMIT MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT. ALL END BENTS AND INTERIOR BENTS SHALL BE COMPLETELY REMOVED TO 1' BELOW THE MUD LINE.

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".

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.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 39.5 FT LEFT AND 33.5 FT RIGHT AT END BENT 1 AND 46.0 FT LEFT AND 26.0 FT RIGHT AT END BENT 2 OF THE CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

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

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

THE BRIDGE WILL BE REMOVED FROM THE TOP DOWN, FIRST REMOVING THE ASPHALT WITH CONTAINMENT MEASURES IN PLACE TO PREVENT COMPONENTS OF THE BRIDGE DECK FROM DROPPING INTO THE STREAM. THE METHOD OF CONTAINMENT WILL BE PROPOSED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER. THIS WILL BE FOLLOWED BY THE REMOVAL OF THE SUBSTRUCTURE INCLUDING THE WOODEN PILES. AN ATTEMPT WILL BE MADE TO COMPLETELY REMOVE THE PILES; HOWEVER, IF THIS CANNOT BE ACCOMPLISHED WITH MINIMAL SUBSTRATE DISTURBANCE, THE PILES WILL BE PINCHED OFF ONE FOOT BELOW THE MUD LINE AS DIRECTED BY THE ENGINEER.

FOUNDATION NOTES

FOR PILES, SEE PILES PROVISION AND SECTION 450 OF THE STANDARD SPECIFICATIONS.

TOTAL BILL OF MATERIAL

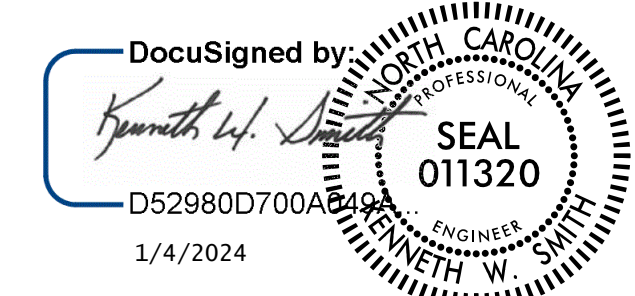
	REMOVAL OF EXISTING STRUCTURE	ASBESTOS ASSESMENT	PDA TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	HP 12 X 53 STEEL PILES		STEEL PILE POINTS	PILE REDRIVES	VERTICAL CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" X 2'-9" PRESTRESSED CONCRETE BOX BEAMS	
	LUMP SUM	LUMP SUM	EACH	LUMP SUM	CU. YDS.	LUMP SUM	LBS.	EACH	NO.	LIN. FT.	EACH	EACH	LIN. FT.	TON	SQ. YDS.	LUMP SUM	NO.	LIN. FT.
SUPERSTRUCTURE						LUMP SUM							160.00			LUMP SUM	11	880.00
END BENT 1				LUMP SUM	25.5		3576	7	7	125	7			55	61			
END BENT 2				LUMP SUM	25.5		3576	7	7	125	7			85	94			
TOTAL	LUMP SUM	LUMP SUM	1	LUMP SUM	51.0	LUMP SUM	7152	14	14	250	14	7	160.00	140	155	LUMP SUM	11	880.00

PROJECT NO. BP5.R131  
VANCE COUNTY  
 STATION: 18+23.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

GENERAL DRAWING  
 BRIDGE ON SR 1125 OVER  
 LITTLE RUIN CREEK BETWEEN  
 SR 1110 AND SR 1125



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

DRAWN BY : R. KNIGHT DATE : 2/2023  
 CHECKED BY : K. SMITH DATE : 3/2023  
 DESIGN ENGINEER  
 OF RECORD: K. SMITH DATE : 3/2023

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## LOAD AND RESISTANCE FACTOR RATING (LRFD) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS

LEVEL	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								
						LIVELOAD FACTORS	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)	LIVELOAD FACTORS	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93(Inv)	N/A	<b>1</b>	1.155	--	1.75	0.273	1.72	80'	EL	39.25	0.502	1.51	80'	EL	7.85	0.80	0.273	<b>1.15</b>	80'	EL	<b>39.25</b>		
	HL-93(Opr)	N/A	--	1.958	--	1.35	0.273	2.23	80'	EL	39.25	0.502	1.96	80'	EL	7.85	N/A	--	--	80'	--	--		
	HS-20(Inv)	36.000	<b>2</b>	1.533	55.181	1.75	0.273	2.28	80'	EL	39.25	0.502	1.91	80'	EL	7.85	0.80	0.273	<b>1.53</b>	80'	EL	<b>39.25</b>		
	HS-20(Opr)	36.000	--	2.473	89.021	1.35	0.273	2.96	80'	EL	39.25	0.502	2.47	80'	EL	7.85	N/A	--	--	80'	--	--		
LEGAL LOAD RATING	SV	SNSH	13.500	--	3.509	47.376	1.4	0.273	6.53	80'	EL	39.25	0.502	5.73	80'	EL	7.85	0.80	0.273	3.51	80'	EL	39.25	
		SNGARBS2	20.000	--	2.594	51.88	1.4	0.273	4.82	80'	EL	39.25	0.502	4.06	80'	EL	7.85	0.80	0.273	2.59	80'	EL	39.25	
		SNAGRIS2	22.000	--	2.448	53.85	1.4	0.273	4.55	80'	EL	39.25	0.502	3.76	80'	EL	7.85	0.80	0.273	2.45	80'	EL	39.25	
		SNCOTTS3	27.250	--	1.746	47.571	1.4	0.273	3.25	80'	EL	39.25	0.502	2.86	80'	EL	7.85	0.80	0.273	1.75	80'	EL	39.25	
		SNAGGRS4	34.925	--	1.451	50.667	1.4	0.273	2.7	80'	EL	39.25	0.502	2.36	80'	EL	7.85	0.80	0.273	1.45	80'	EL	39.25	
		SNS5A	35.550	--	1.419	50.453	1.4	0.273	2.64	80'	EL	39.25	0.502	2.38	80'	EL	7.85	0.80	0.273	1.42	80'	EL	39.25	
		SNS6A	39.950	--	1.299	51.885	1.4	0.273	2.42	80'	EL	39.25	0.502	2.17	80'	EL	7.85	0.80	0.273	1.30	80'	EL	39.25	
	SNS7B	42.000	--	1.237	51.941	1.4	0.273	2.3	80'	EL	39.25	0.502	2.13	80'	EL	7.85	0.80	0.273	1.24	80'	EL	39.25		
	TTST	TNAGRIT3	33.000	--	1.583	52.231	1.4	0.273	2.94	80'	EL	39.25	0.502	2.59	80'	EL	7.85	0.80	0.273	1.58	80'	EL	39.25	
		TNT4A	33.075	--	1.589	52.55	1.4	0.273	2.96	80'	EL	39.25	0.502	2.53	80'	EL	7.85	0.80	0.273	1.59	80'	EL	39.25	
		TNT6A	41.600	--	1.296	53.907	1.4	0.273	2.41	80'	EL	39.25	0.502	2.25	80'	EL	7.85	0.80	0.273	1.30	80'	EL	39.25	
		TNT7A	42.000	--	1.301	54.625	1.4	0.273	2.42	80'	EL	39.25	0.502	2.21	80'	EL	7.85	0.80	0.273	1.30	80'	EL	39.25	
		TNT7B	42.000	--	1.341	56.333	1.4	0.273	2.49	80'	EL	39.25	0.502	2.08	80'	EL	7.85	0.80	0.273	1.34	80'	EL	39.25	
TNAGRIT4		43.000	--	1.279	55.001	1.4	0.273	2.38	80'	EL	39.25	0.502	2.02	80'	EL	7.85	0.80	0.273	1.28	80'	EL	39.25		
EMERGENCY VEHICLE (EV)	EV2	28.750	--	2.214	63.644	1.3	0.273	3.73	80'	EL	39.25	0.502	3.03	80'	EL	7.85	0.80	0.273	2.21	80'	EL	39.25		
	EV3	43.000	<b>4</b>	1.452	62.446	1.3	0.273	2.45	80'	EL	39.25	0.502	2.04	80'	EL	7.85	0.80	0.273	1.45	80'	EL	39.25		

**LOAD FACTORS:**

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

**NOTES:**

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

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

**COMMENTS:**

- 1.
- 2.
- 3.
- 4.

**# CONTROLLING LOAD RATING**

① DESIGN LOAD RATING (HL-93)

② DESIGN LOAD RATING (HS-20)

③ LEGAL LOAD RATING \*\*

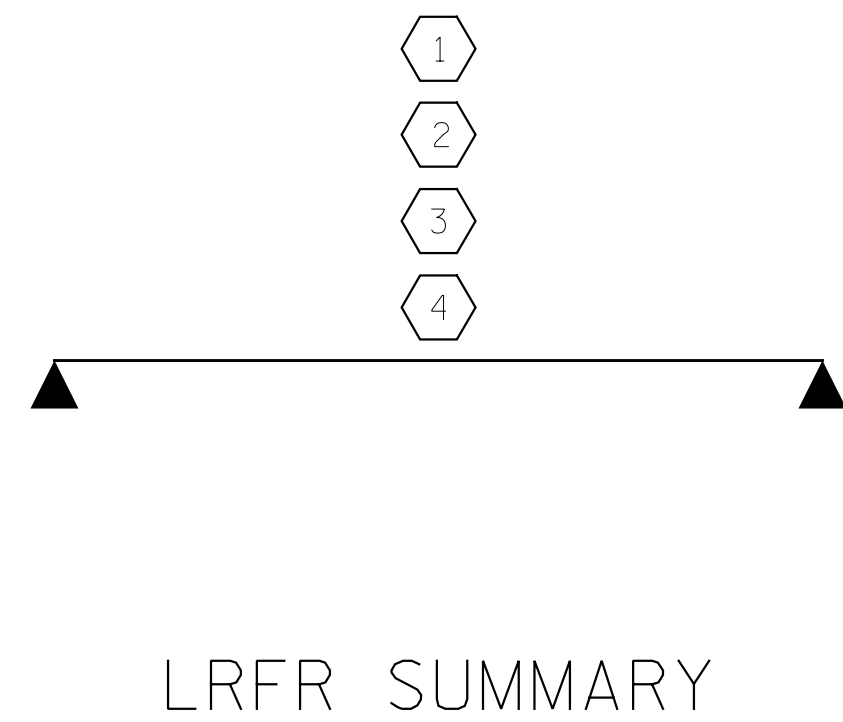
④ EMERGENCY VEHICLE LOAD RATING

\*\* SEE CHART FOR VEHICLE TYPE

---

**GIRDER LOCATION**

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



PROJECT NO. BP5.R131  
VANCE COUNTY  
 STATION: 18+23.50 -L-

ASSEMBLED BY : R. KNIGHT DATE : 2/2023  
 CHECKED BY : K. SMITH DATE : 3/2023  
 DESIGN ENGINEER  
 OF RECORD : K. SMITH DATE : 3/2023  
 DRAWN BY : TMG II/II REV. 06/23 AKP/AAL  
 CHECKED BY : AAC II/II

DocuSigned by  
*Kenneth W. Smith*  
 D52980D700A...  
 1/4/2024

DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

**LOCHNER**  
 H. W. LOCHNER, INC.  
 2840 PLAZA PLACE, SUITE 202  
 RALEIGH, NC 27612  
 (919) 771-1111

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD LRFR SUMMARY FOR 80' BOX BEAM UNIT 90° SKEW (NON-INTERSTATE TRAFFIC)					
REVISIONS			SHEET NO.		
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S-4
					TOTAL SHEETS 16

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.

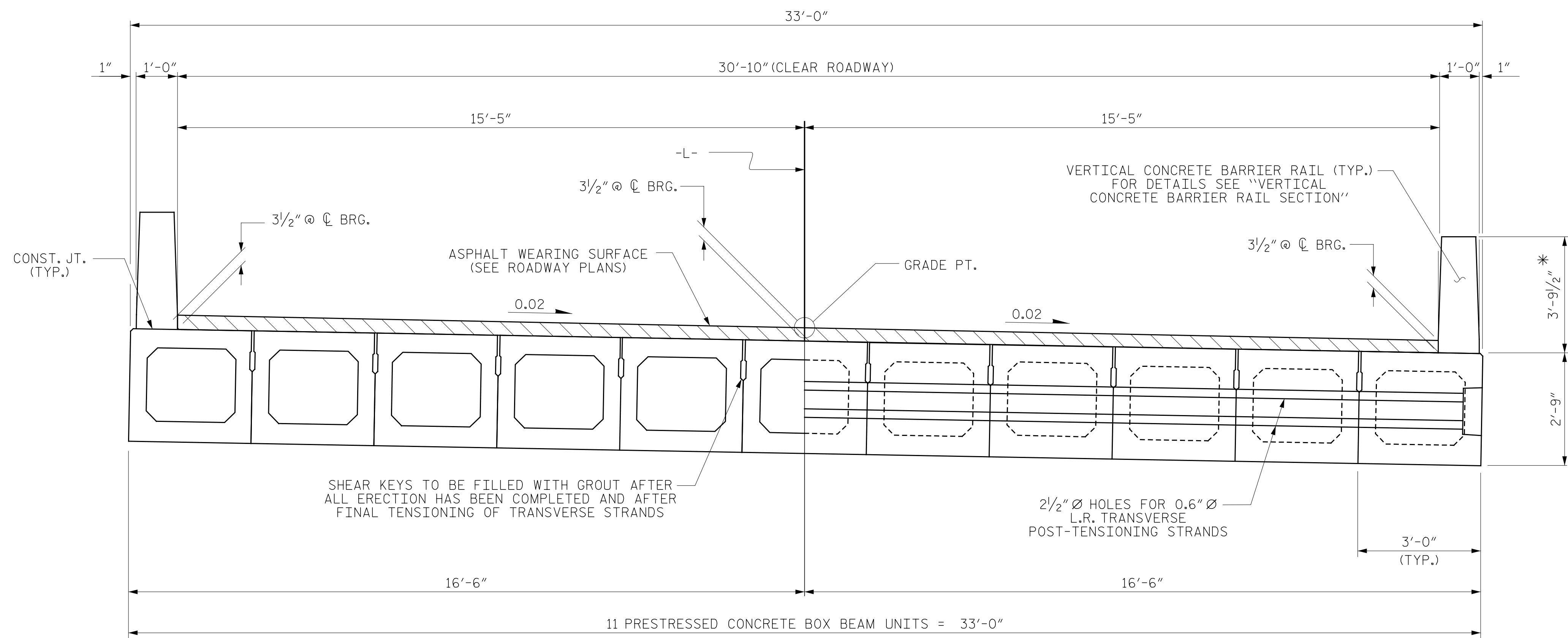
FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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.

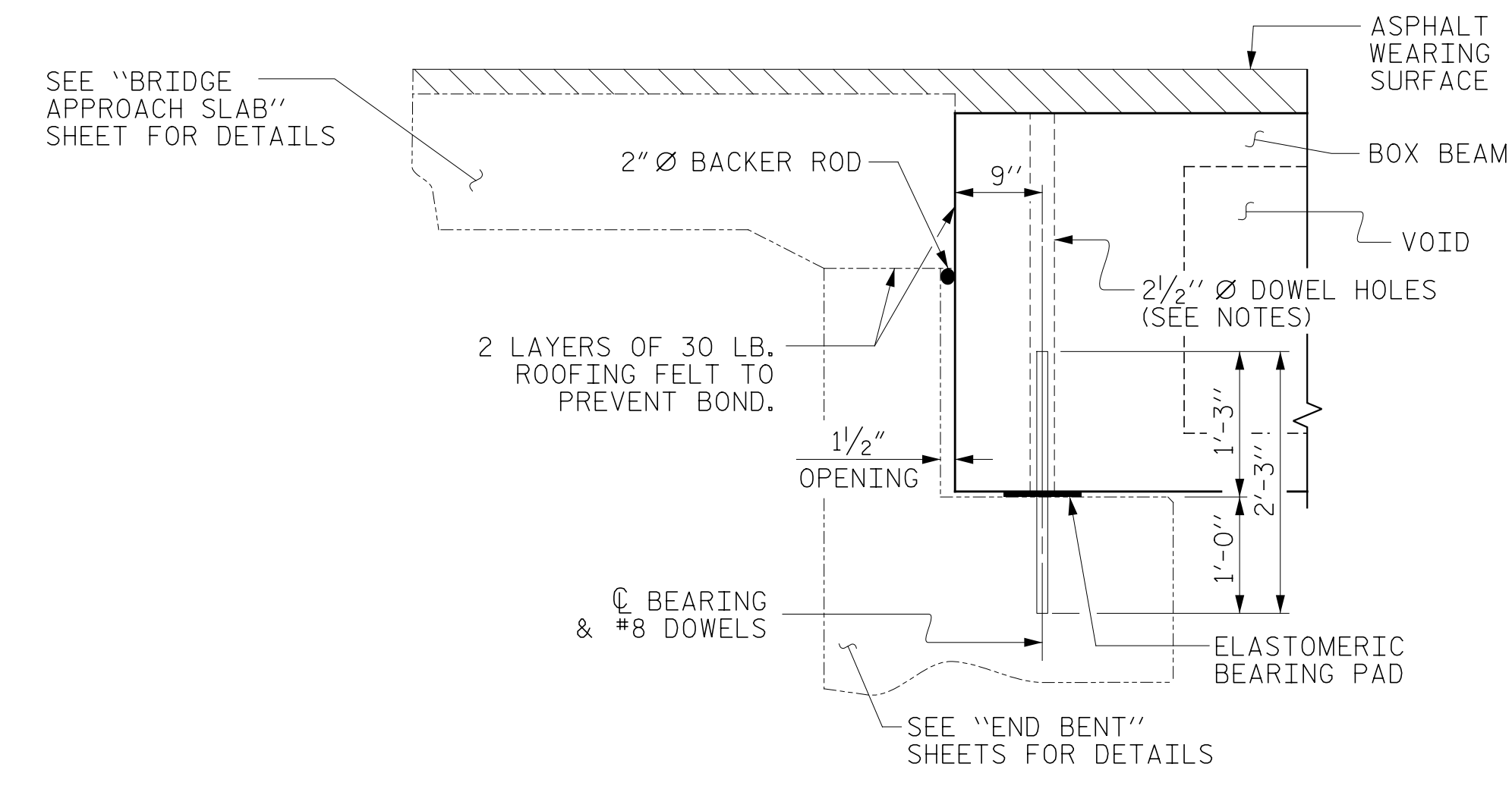
THE COST OF THE PERMITTED THREADED INSERTS SHALL BE INCLUDED IN THE PRICE BID FOR THE PRECAST UNITS.



HALF SECTION THROUGH VOIDS      HALF SECTION AT INTERMEDIATE DIAPHRAGMS

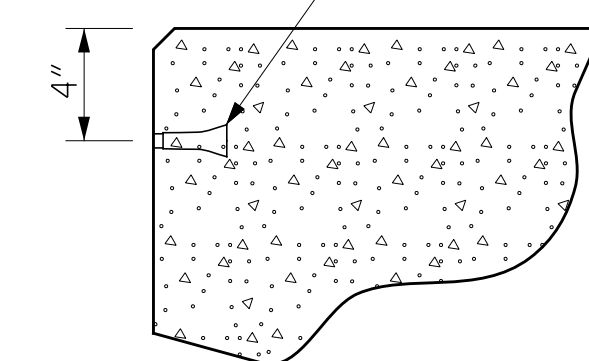
TYPICAL SECTION

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



SECTION AT END BENT

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

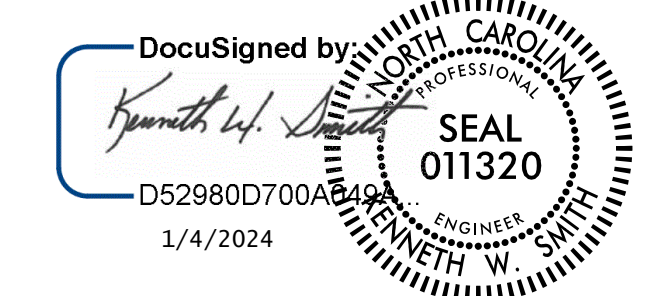


THREADED INSERT DETAIL

PROJECT NO. BP5.R131  
VANCE COUNTY  
 STATION: 18+23.50 -L-

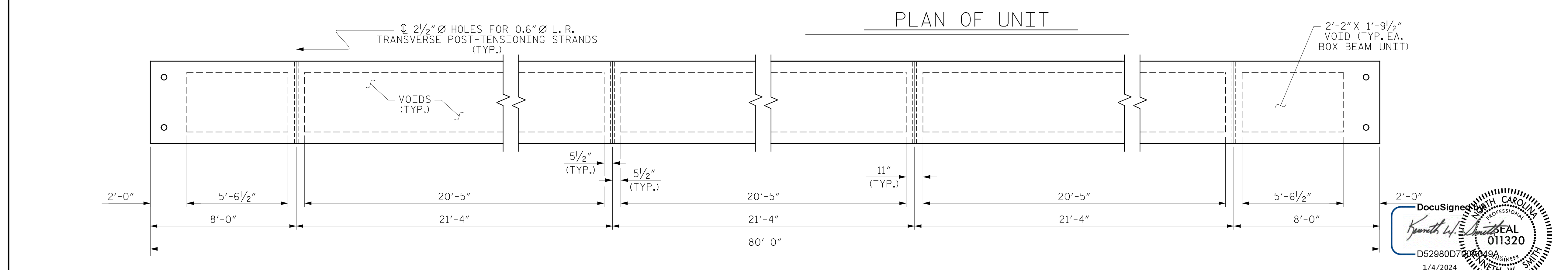
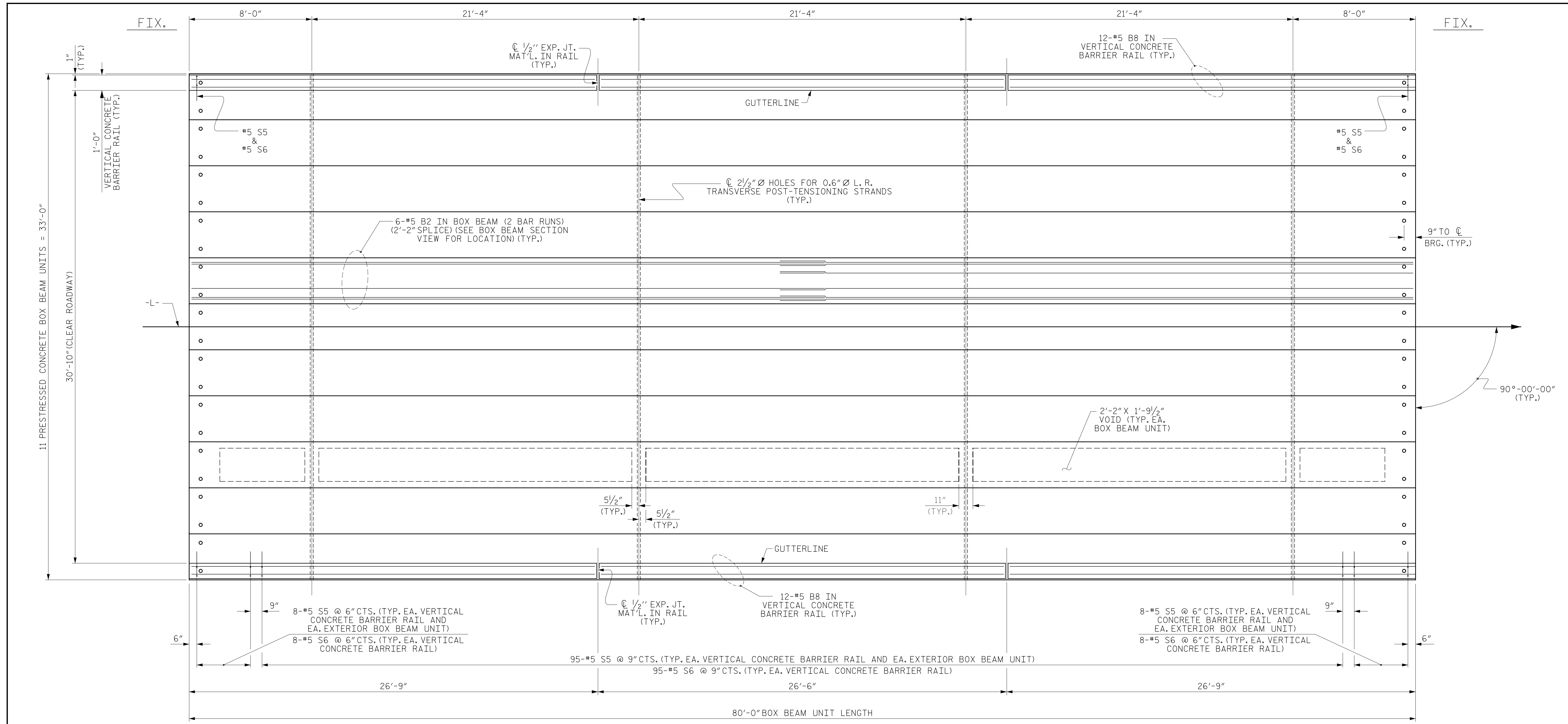
SHEET 1 OF 5

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



ASSEMBLED BY : R. KNIGHT	DATE : 2/2023
CHECKED BY : K. SMITH	DATE : 3/2023
DESIGN ENGINEER OF RECORD : K. SMITH	DATE : 3/2023
DRAWN BY : DGE 8/II	REV. 9/14 MAA/TMG
CHECKED BY : TMG II/II	

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED					
<b>LOCHNER</b>					
H. W. LOCHNER, INC. 2840 PLAZA PLACE, SUITE 202 RALEIGH, NC 27612 (919) 877-1111					
REVISIONS			SHEET NO.		
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					TOTAL SHEETS
					16



PROJECT NO. BP5.131  
 VANCE COUNTY  
 STATION: 18+23.20 -L-  
 SHEET 2 OF 5

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

PLAN OF 80' UNIT  
 30'-10" CLEAR ROADWAY  
 90° SKEW

ASSEMBLED BY :	R. KNIGHT	DATE :	2/2023
CHECKED BY :	K. SMITH	DATE :	3/2023
DESIGN ENGINEER OF RECORD :	K. SMITH	DATE :	3/2023
DRAWN BY :	DCE 8/II	REV. 8/14	MAA/TMG
CHECKED BY :	TMG 11/II		

DIAPHRAGM AND VOID LAYOUT

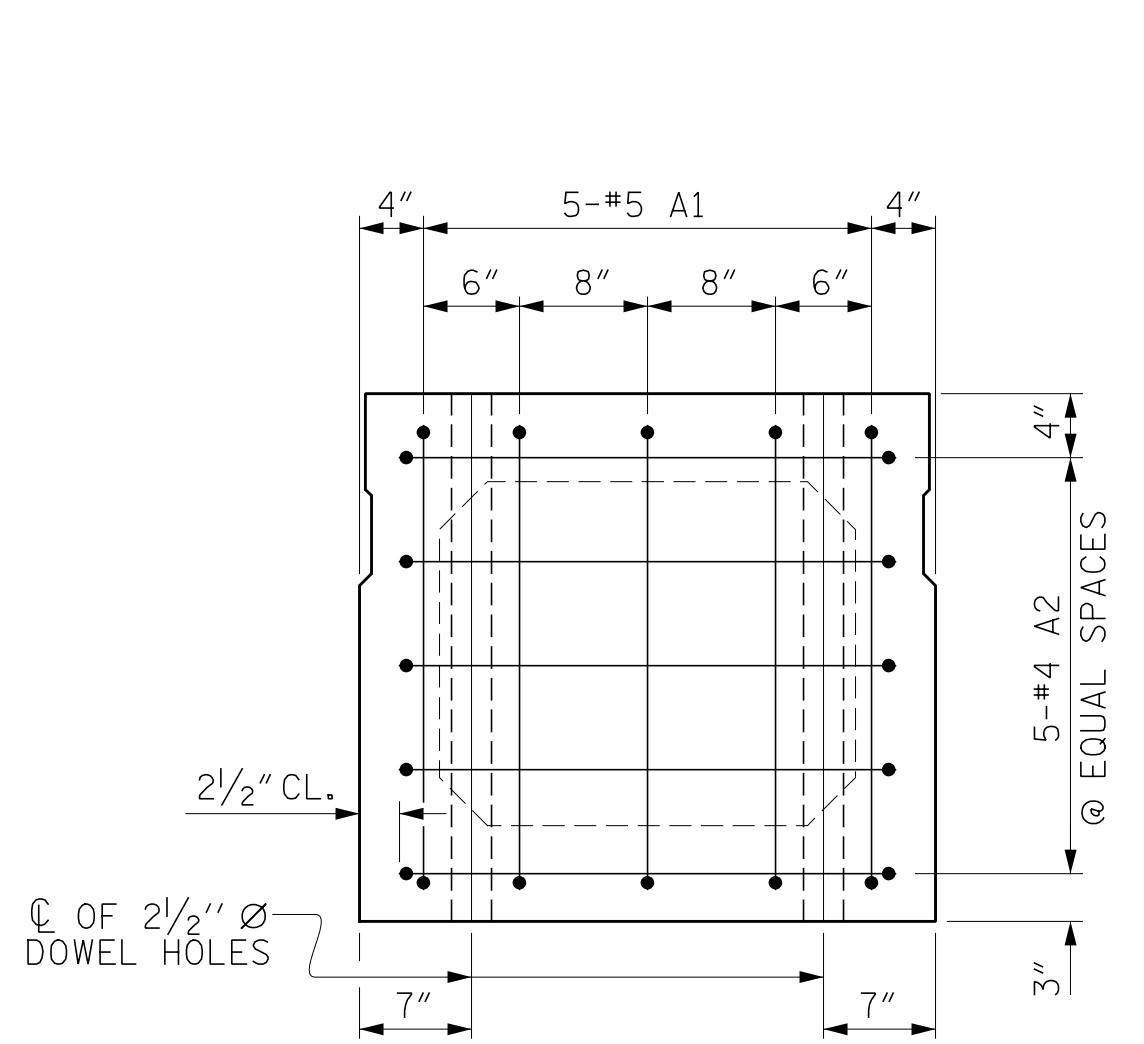
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

**LOCHNER**

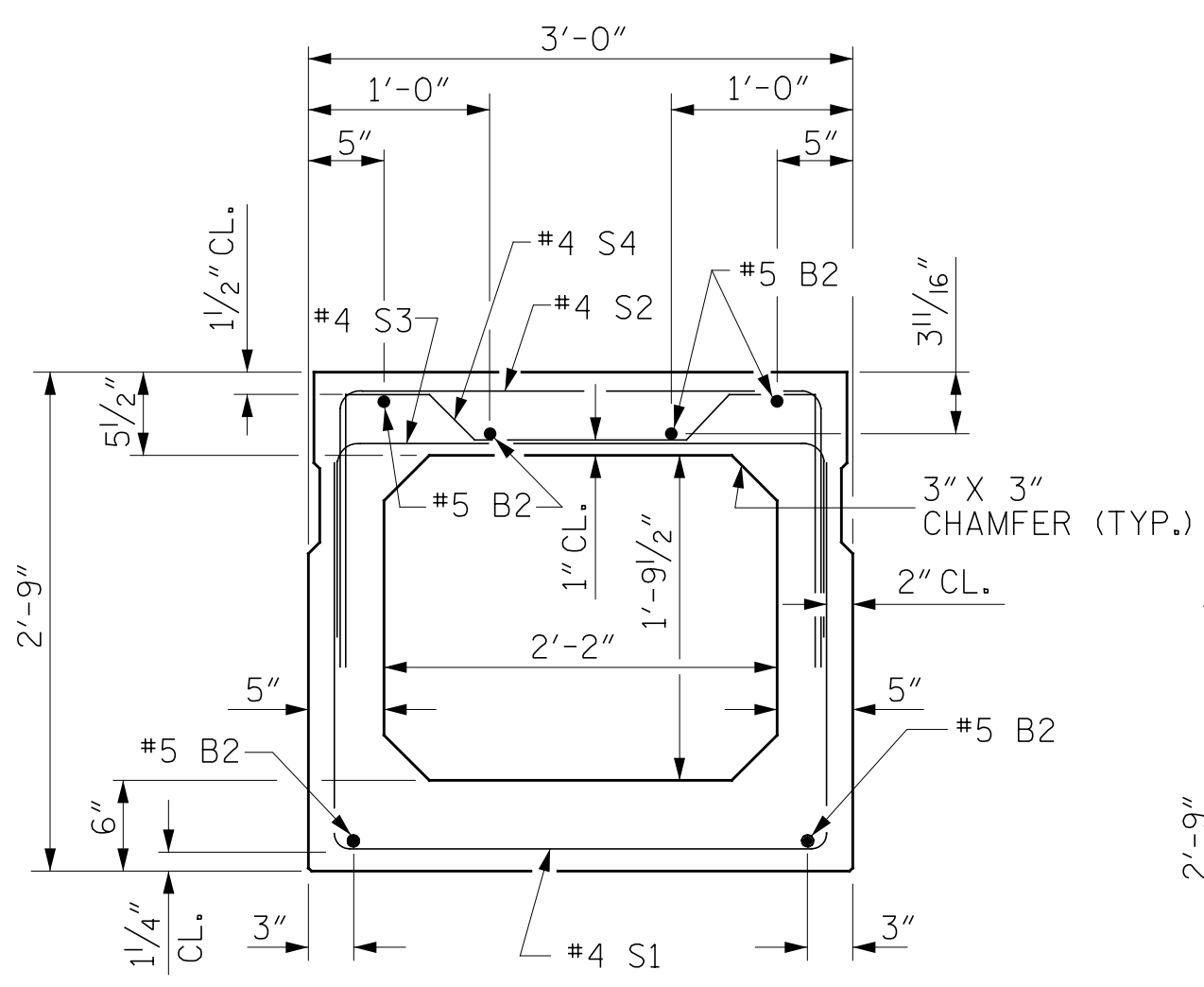
H. W. LOCHNER, INC.  
 2840 PLAZA PLACE, SUITE 202  
 RALEIGH, NC 27612  
 (919) 571-7111

NC License Number F-0159

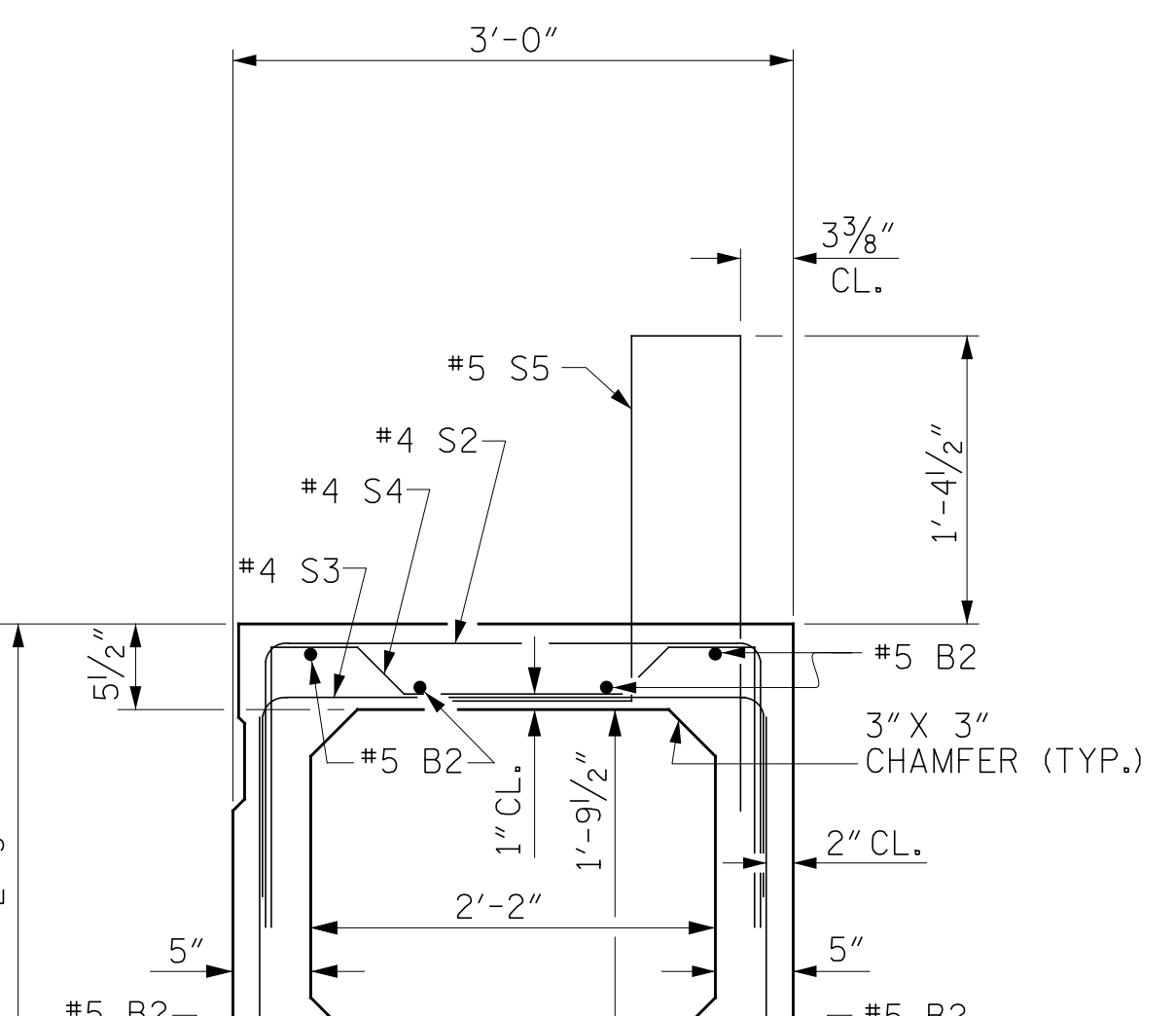
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			16



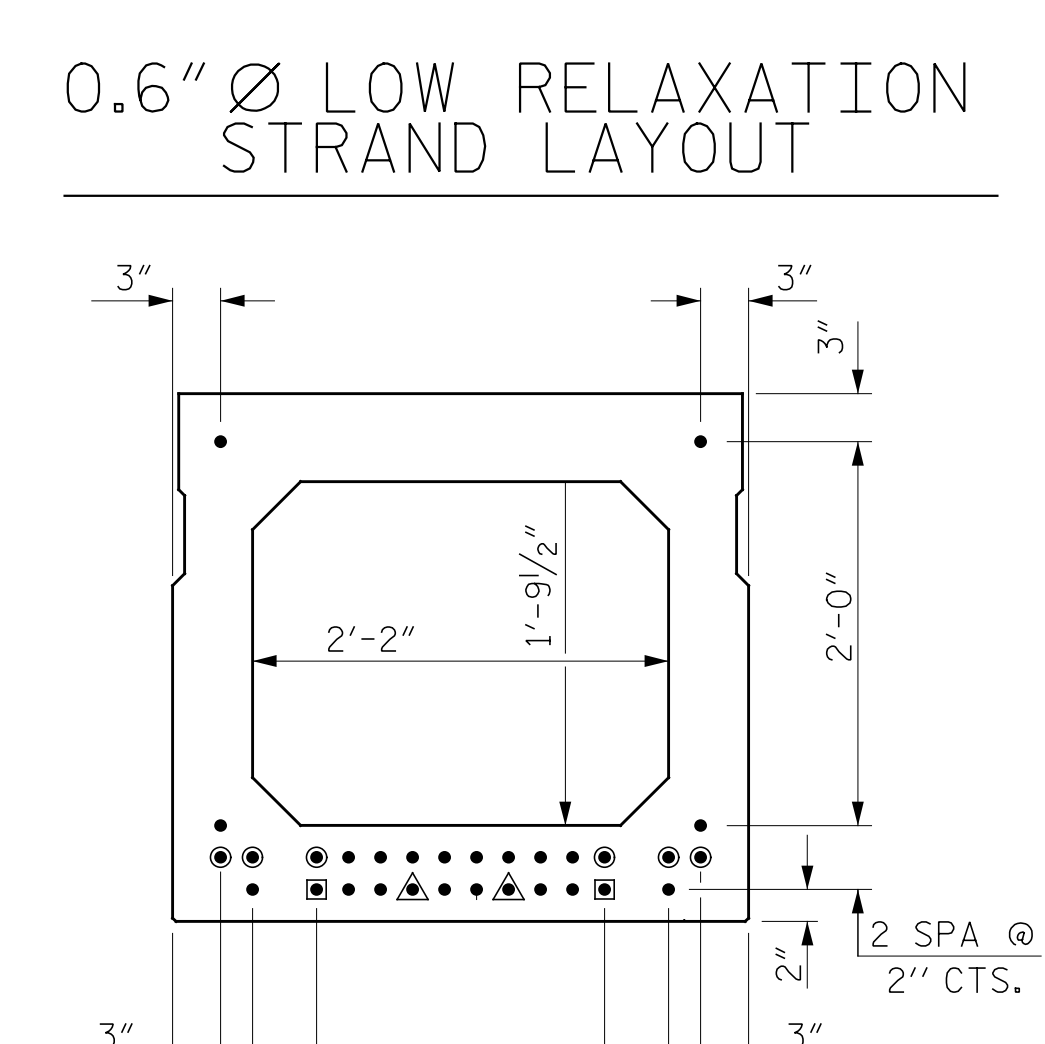
**END ELEVATION**  
SHOWING PLACEMENT OF #5 & #4 "A" BARS AND LOCATION OF DOWEL HOLES. (INTERIOR BOX BEAM SECTION SHOWN-EXTERIOR SECTION SIMILAR EXCEPT SHEAR KEY LOCATION. STRAND LAYOUT NOT SHOWN.)



**INTERIOR BOX BEAM SECTION**  
(STRAND LAYOUT NOT SHOWN)



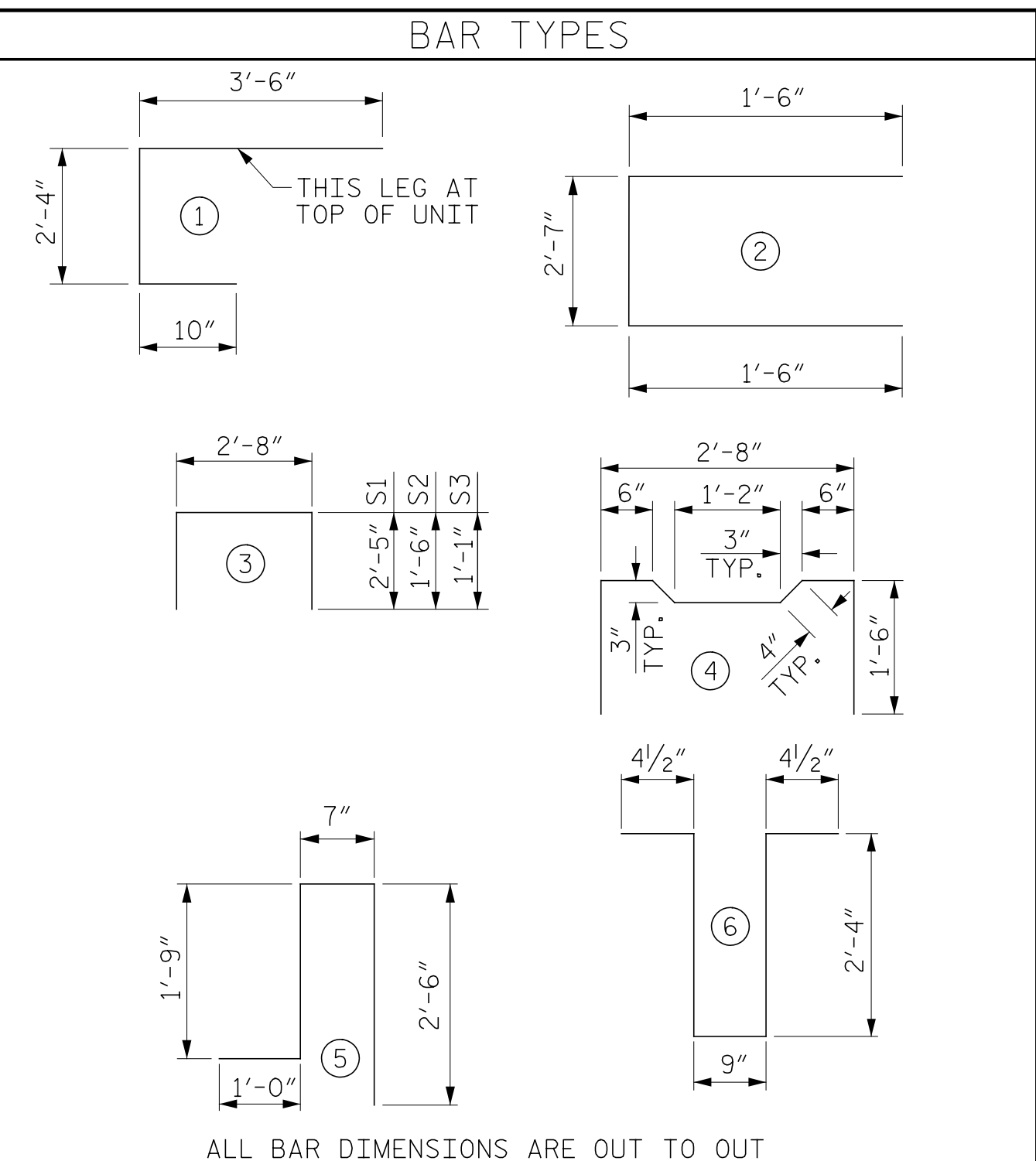
**EXTERIOR BOX BEAM SECTION**  
(STRAND LAYOUT NOT SHOWN)



**TYPICAL STRAND LOCATION**  
(24 STRANDS REQUIRED)  
**DEBONDING LEGEND**

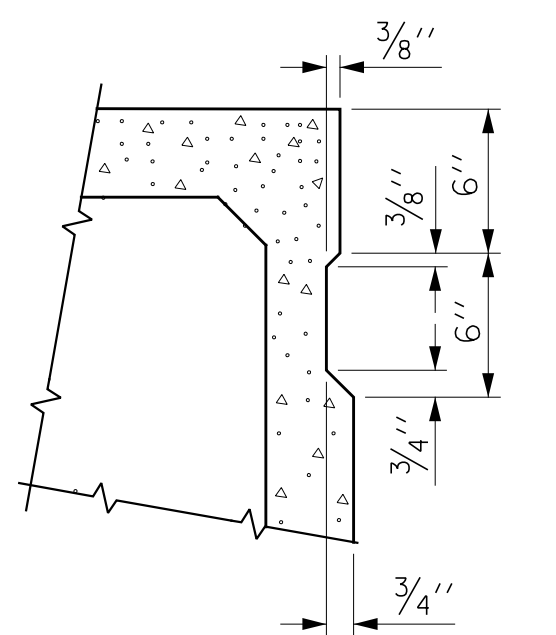
- FULLY BONDED STRANDS
- ◻ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- ◻ STRANDS DEBONDED FOR 10'-0" FROM END OF GIRDER
- OPTIONAL FULL LENGTH DEBONDED STRANDS. THESE STRANDS ARE NOT REQUIRED. IF THE FABRICATOR CHOOSES TO INCLUDE THESE STRANDS IN THE BOX BEAM UNIT, THE STRANDS SHALL BE DEBONDED FOR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

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



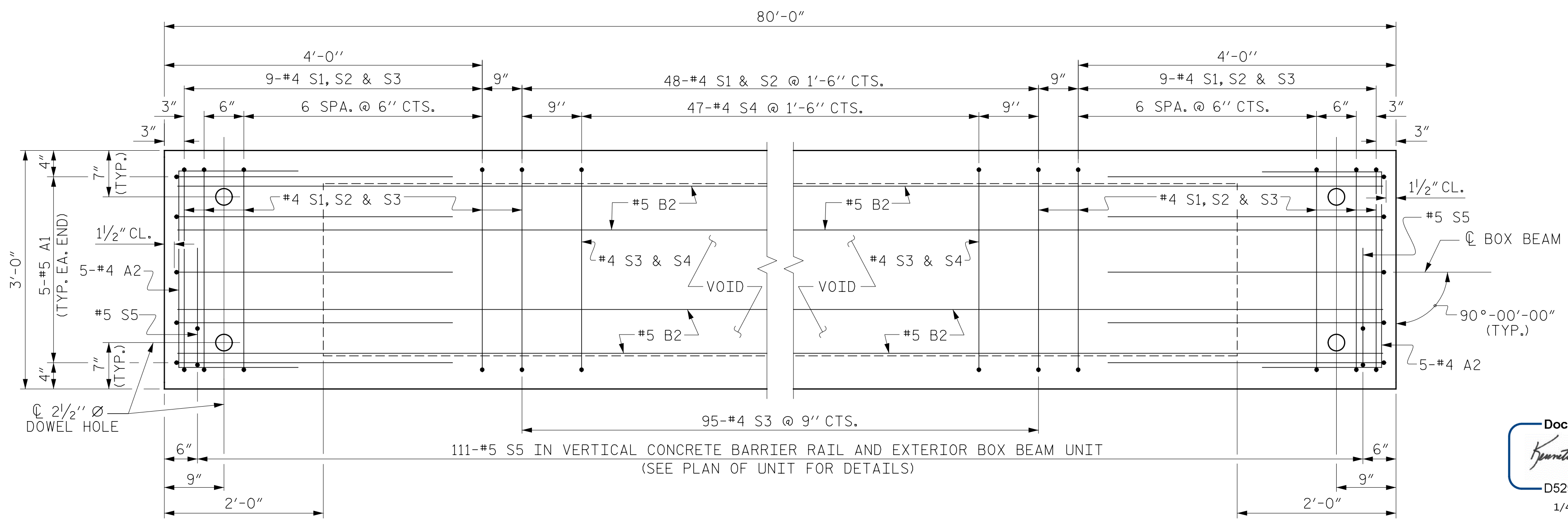
**BILL OF MATERIAL FOR ONE BOX BEAM SECTION**

BAR	NUMBER	SIZE	TYPE	EXTERIOR UNIT		INTERIOR UNIT	
				LENGTH	WEIGHT	LENGTH	WEIGHT
A1	10	#5	1	6'-8"	70	6'-8"	70
A2	34	#4	2	5'-7"	127	5'-7"	127
B2	12	#5	STR	40'-11"	512	40'-11"	512
K1	12	#4	6	6'-2"	49	6'-2"	49
K2	8	#4	STR	2'-7"	14	2'-7"	14
S1	66	#4	3	7'-6"	331	7'-6"	331
S2	66	#4	3	5'-8"	250	5'-8"	250
S3	113	#4	3	4'-10"	365	4'-10"	365
S4	47	#4	4	5'-10"	183	5'-10"	183
* S5	111	#5	5	5'-10"	675	--	--
REINFORCING STEEL				1901	LBS.	1901	LBS.
* EPOXY COATED REINF. STEEL				675	LBS.		
8000 P.S.I. CONCRETE				14.2	CU. YDS.	14.1	CU. YDS.
0.6" Ø L.R. STRANDS				No. 24		No. 24	



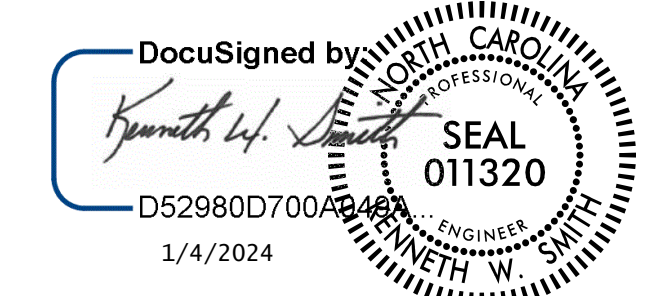
**SHEAR KEY DETAIL**  
NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR BOX BEAMS.

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



**PLAN OF BOX BEAM**

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



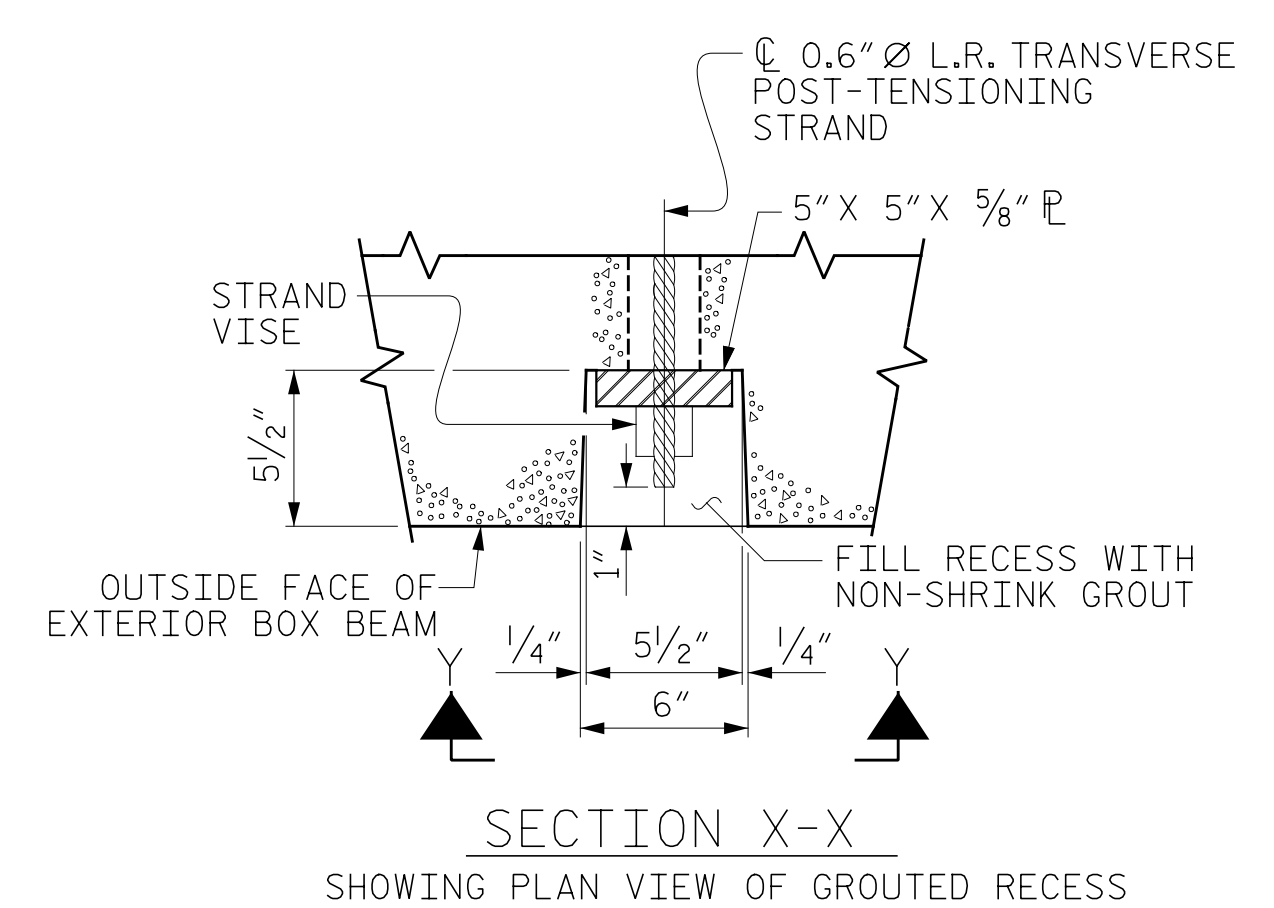
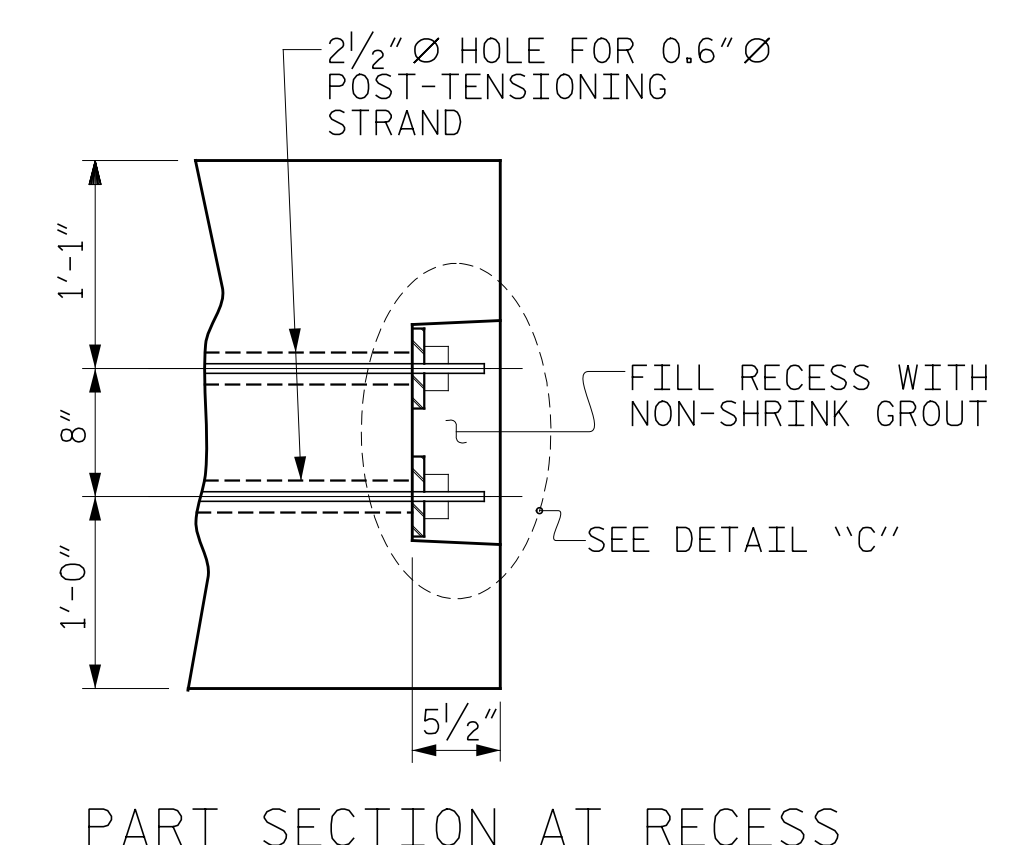
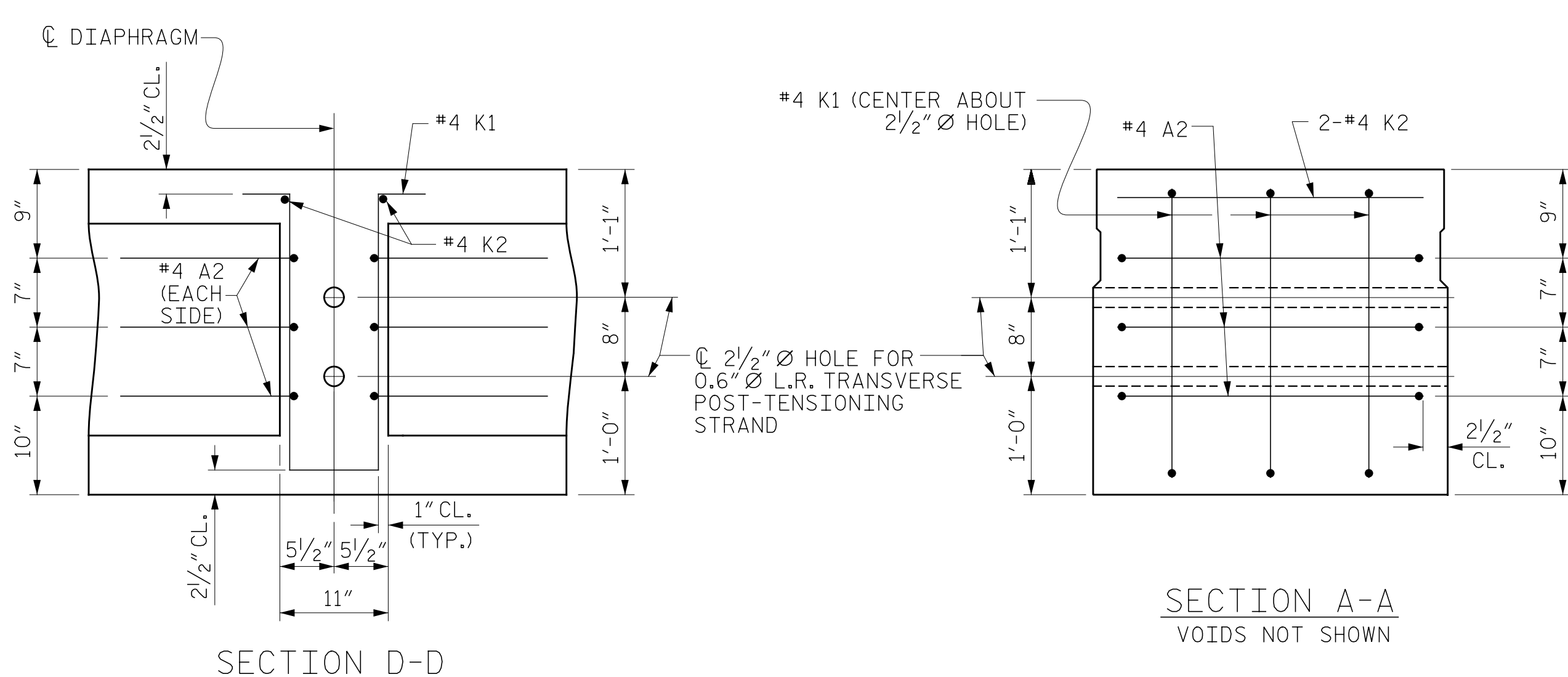
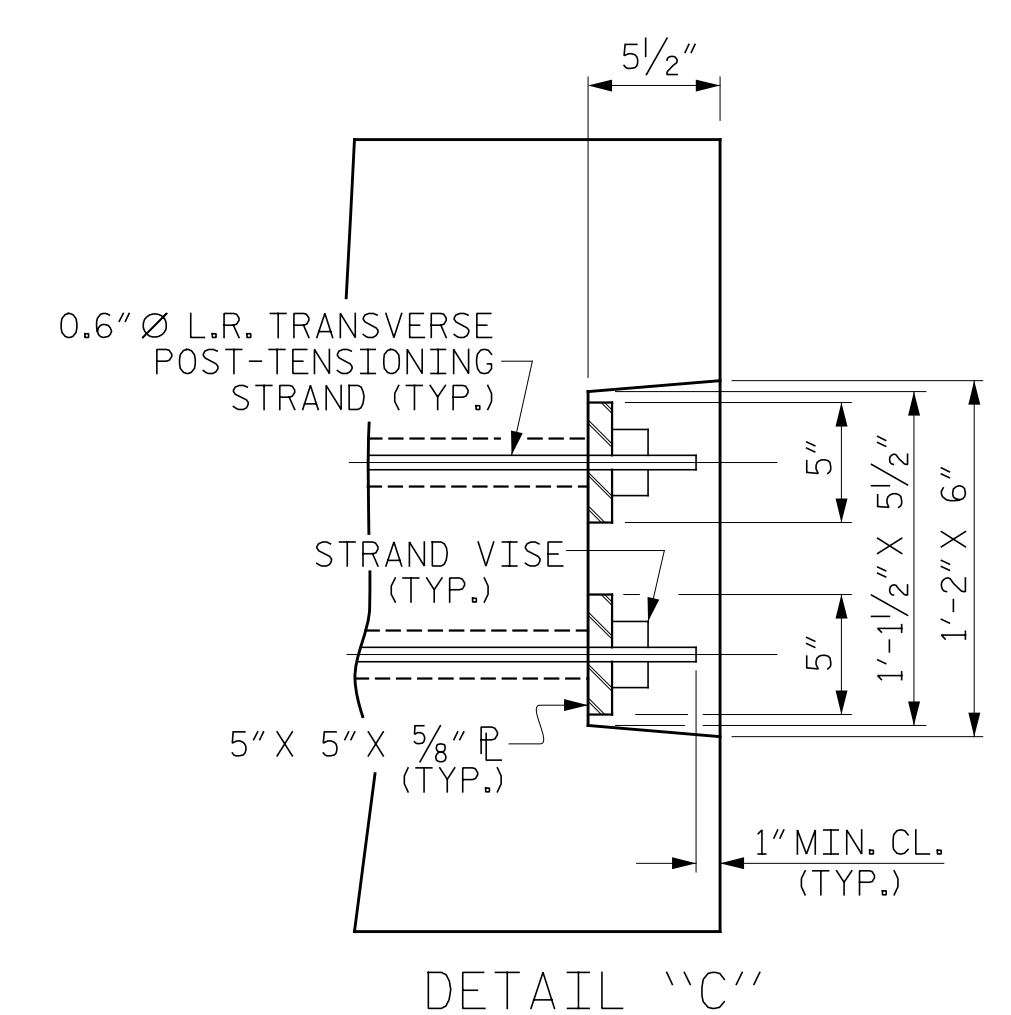
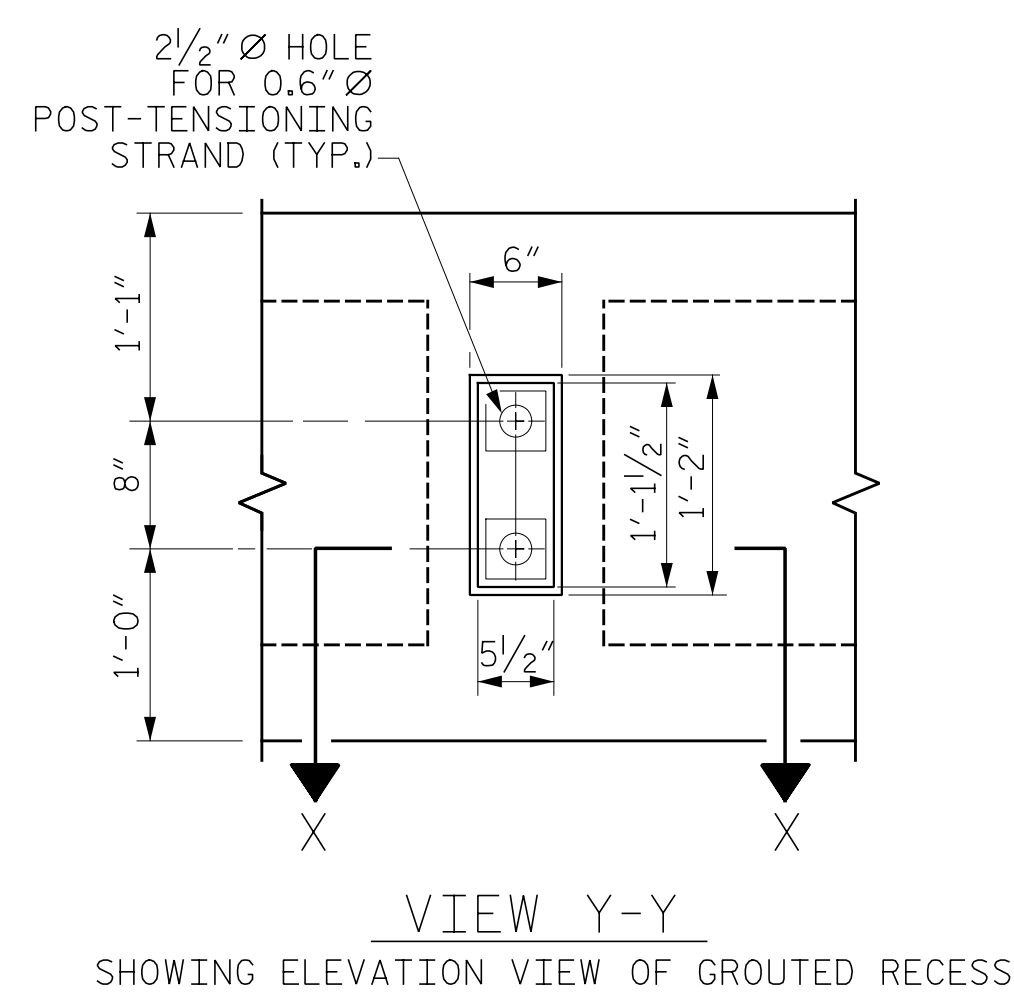
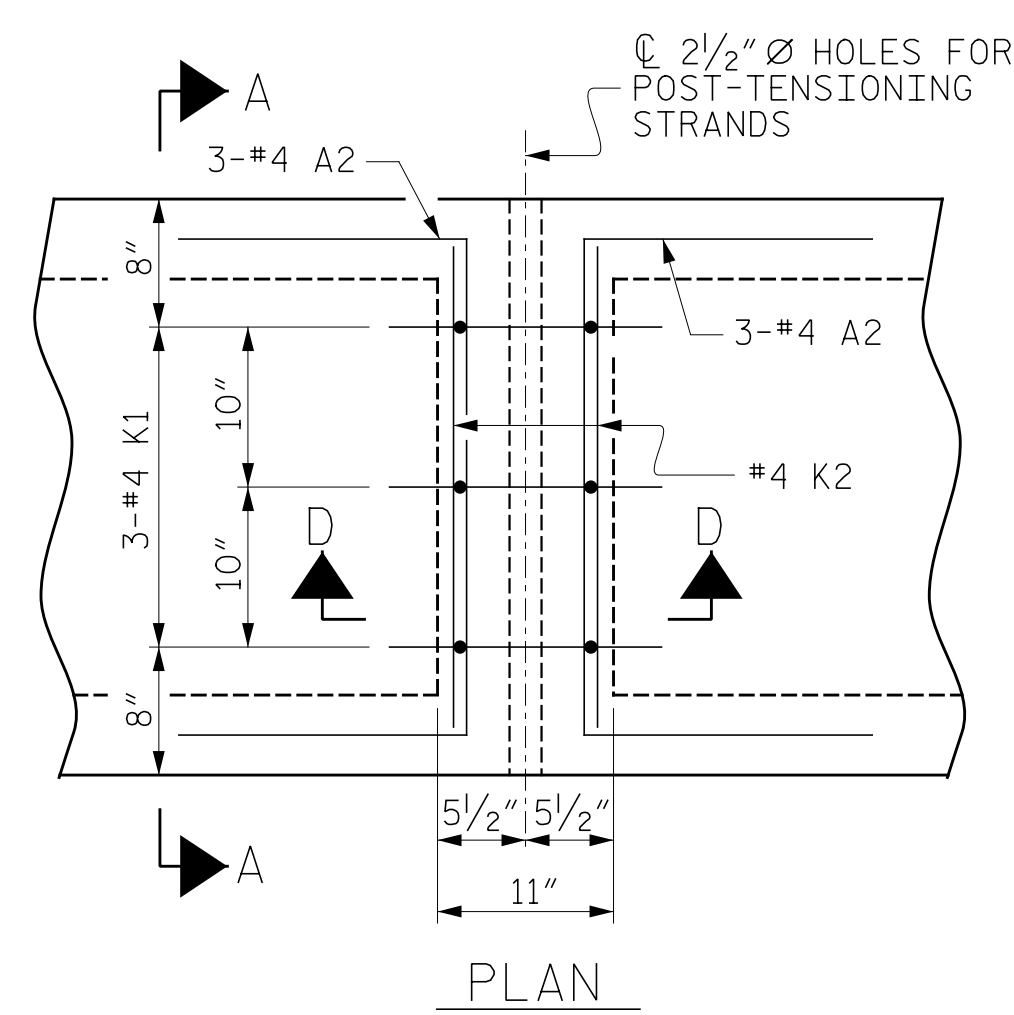
PROJECT NO. BP5.131  
VANCE COUNTY  
STATION: 18+23.20 -L-  
SHEET 3 OF 5

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

ASSEMBLED BY : R. KNIGHT	DATE : 2/2023
CHECKED BY : K. SMITH	DATE : 3/2023
DESIGN ENGINEER OF RECORD : K. SMITH	DATE : 3/2023
DRAWN BY : DGE 10/II	REV. 9/14
CHECKED BY : TMG 11/II	MAA/TMG



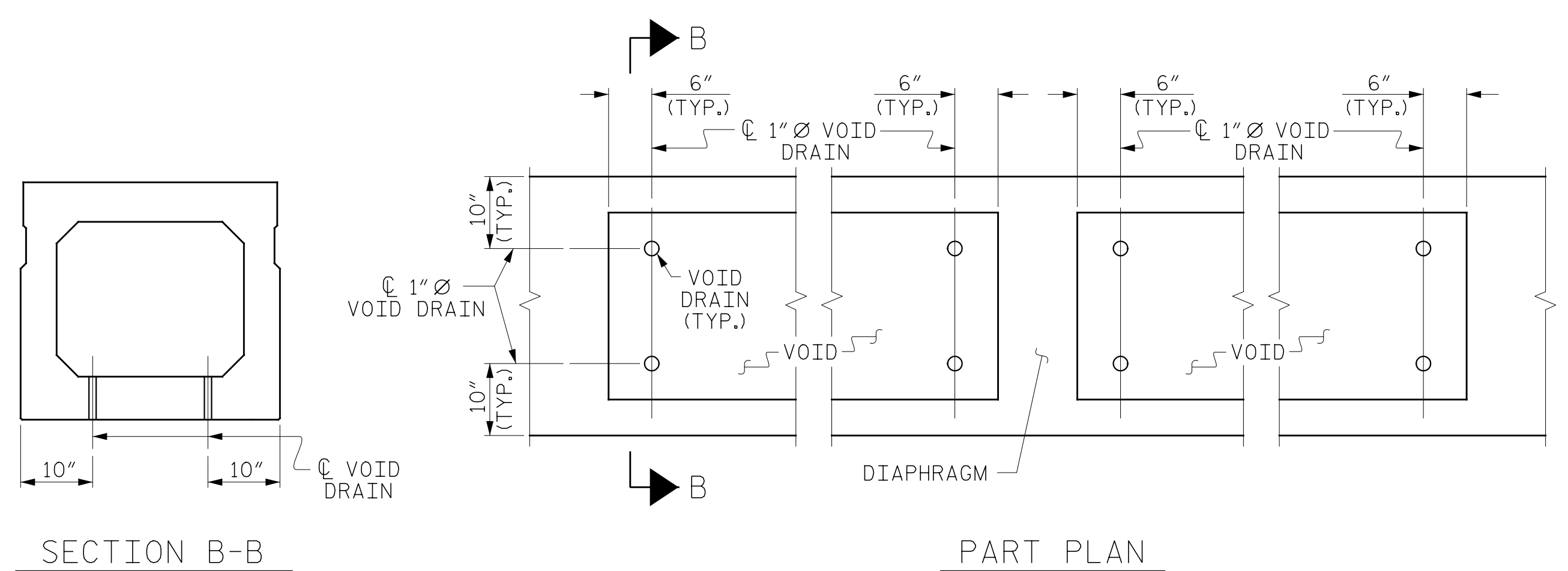
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS 16
2			4			



DOUBLE DIAPHRAGM DETAILS

#4 "S" BARS NOT SHOWN. #4 "S" BARS MAY BE SHIFTED SLIGHTLY TO CLEAR 2 1/2" Ø HOLE.

GROUTED RECESS DETAIL AT END OF POST-TENSIONED STRANDS OF EXTERIOR BOX BEAM



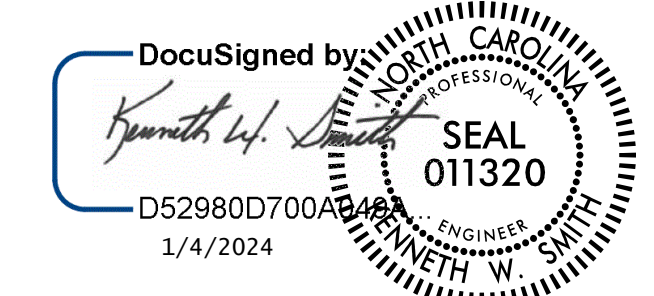
VOID DRAIN DETAILS

(DIMENSIONS SHOWN ARE TYPICAL FOR EACH VOID)

DEAD LOAD DEFLECTION AND CAMBER	
80' BOX BEAM UNIT (SE)	3'-0" x 2'-9" 0.6" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	1 3/4" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	1/2" ↓
FINAL CAMBER	1 1/4" ↑

\*\* INCLUDES FUTURE WEARING SURFACE

PROJECT NO. BP5.R131  
VANCE COUNTY  
 STATION: 18+23.50 -L-  
 SHEET 4 OF 5



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

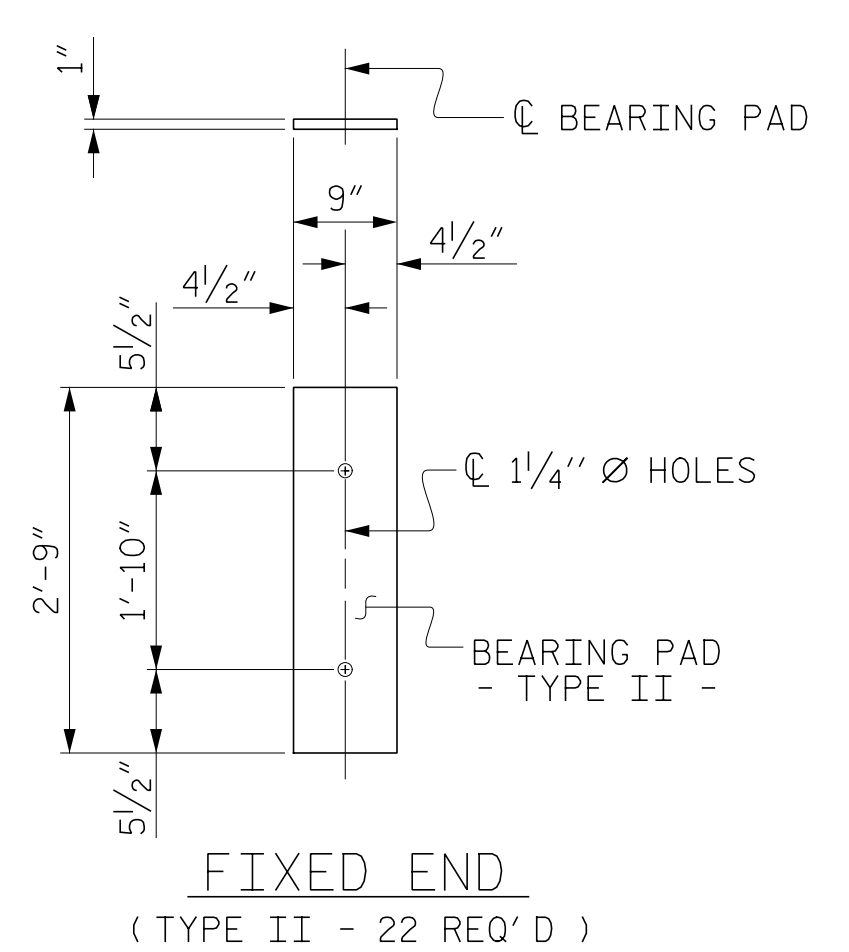
ASSEMBLED BY : R. KNIGHT DATE : 2/2023  
 CHECKED BY : K. SMITH DATE : 3/2023  
 DESIGN ENGINEER  
 OF RECORD : K. SMITH DATE : 3/2023

DRAWN BY : DGE 10/11 REV. 8/14 MAA/TMG  
 CHECKED BY : TMG 11/11

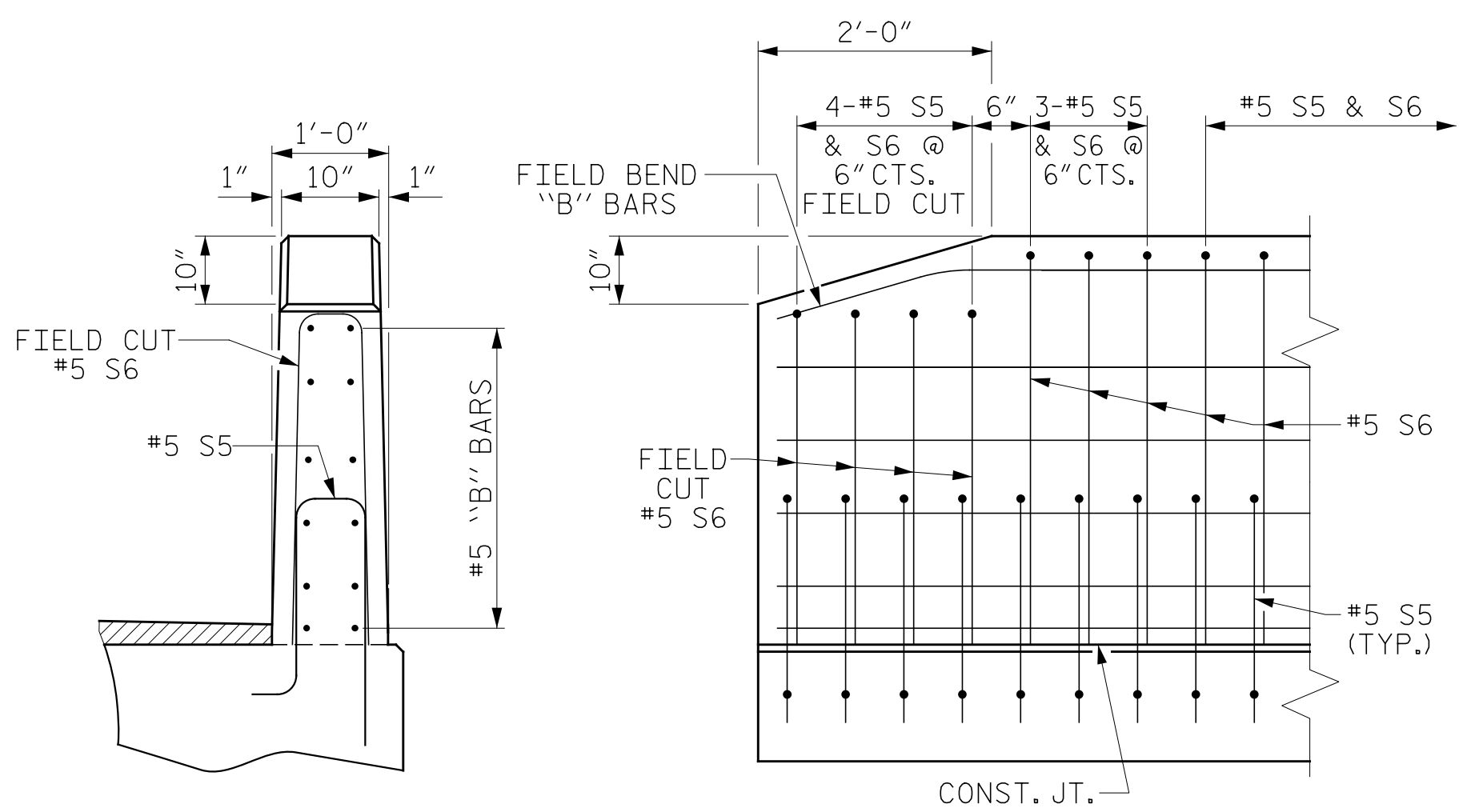
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**LOCHNER**  
 H. W. LOCHNER, INC.  
 2840 PLAZA PLACE, SUITE 202  
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			16



**FIXED END**  
(TYPE II - 22 REQ'D)

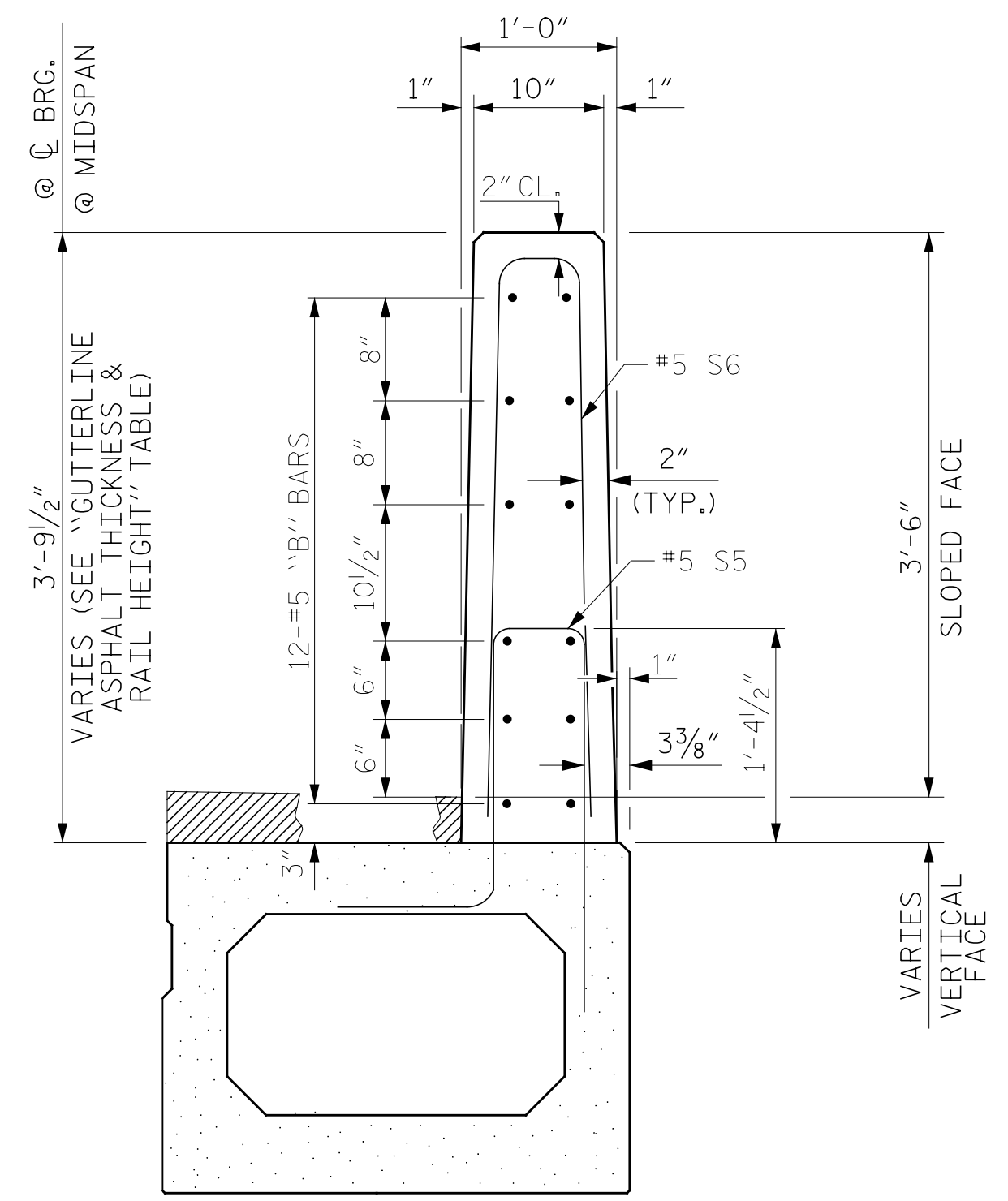
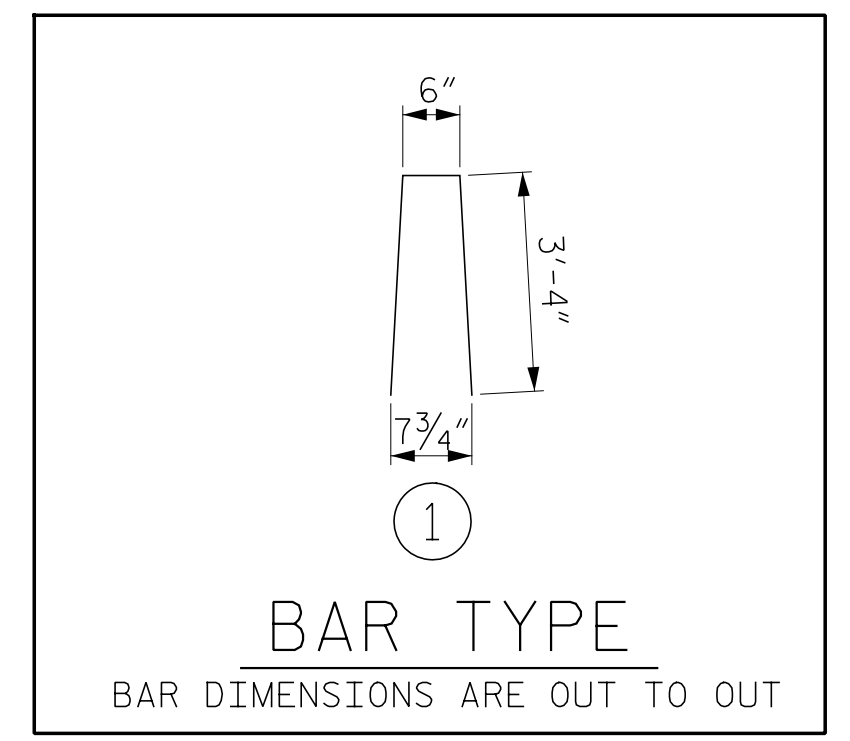


**END VIEW**      **SIDE VIEW**

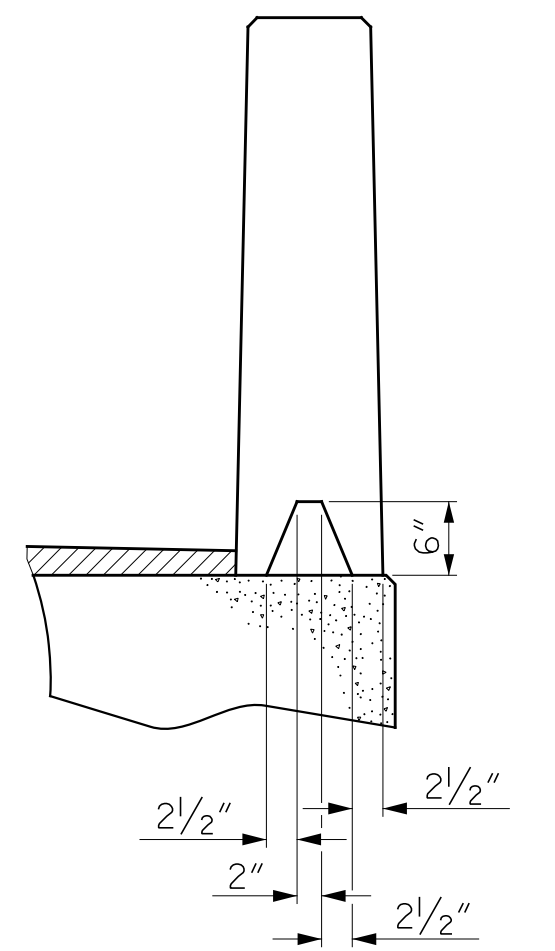
**ELASTOMERIC BEARING DETAILS**

ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

**END OF RAIL DETAILS**

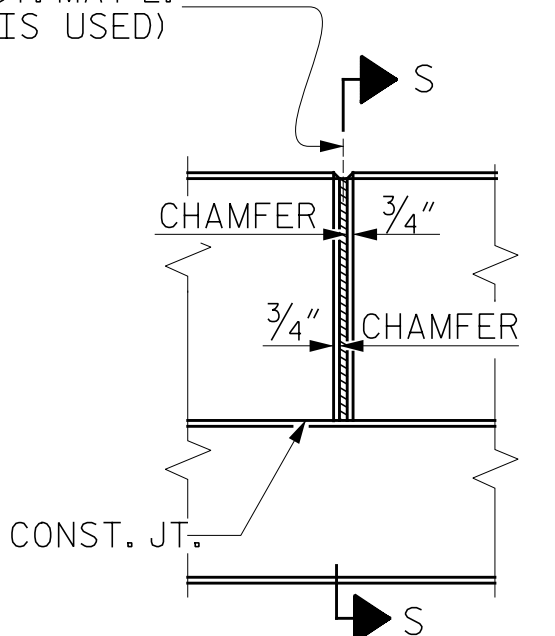


**SECTION THRU RAIL**



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

1/2" EXP. JT. MAT'L HELD IN PLACE WITH GALVANIZED NAILS.  
(NOTE: OMIT EXP. JT. MAT'L WHEN SLIP FORM IS USED)



**ELEVATION AT EXPANSION JOINTS**

**VERTICAL CONCRETE BARRIER RAIL DETAILS**

**BOX BEAM UNITS REQUIRED**

	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR B.B.	2	80'-0"	160'-0"
INTERIOR B.B.	9	80'-0"	720'-0"
TOTAL	11		880'-0"

**GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT**

	ASPHALT OVERLAY THICKNESS @ MID-SPAN	RAIL HEIGHT @ MID-SPAN
80' UNITS	2/4"	3'-8 1/4"

**BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL**

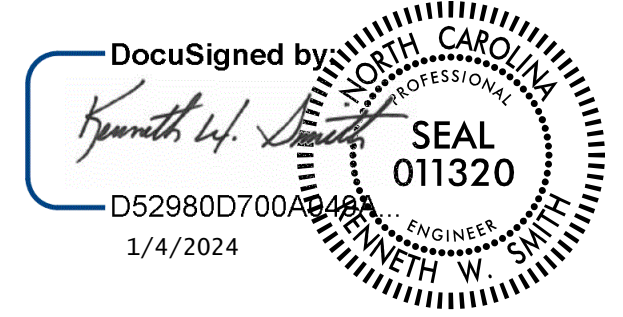
BAR	BARS PER PAIR OF EXTERIOR UNITS	SIZE	TYPE	LENGTH	WEIGHT
	80' UNIT				
* B8	72	#5	STR	26'-3"	1971
* S6	222	#5	1	7'-2"	1659
* EPOXY COATED REINFORCING STEEL					LBS. 3630
CLASS AA CONCRETE					CU.YDS. 20.7
TOTAL VERTICAL CONCRETE BARRIER RAIL					LN. FT. 160.0

PROJECT NO. BP5.R131  
VANCE COUNTY  
STATION: 18+23.50 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

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



ASSEMBLED BY : R. KNIGHT	DATE : 2/2023
CHECKED BY : K. SMITH	DATE : 3/2023
CHECKED BY : K. SMITH	DATE : 3/2023
DRAWN BY : DGE IO/II	REV. 5/18
CHECKED BY : TMG II/II	MAA/THC

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

**LOCHNER**  
H. W. LOCHNER, INC.  
2840 PLAZA PLACE, SUITE 202  
RALEIGH, NC 27612  
(919) 877-1111

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS 16
2			4			



NOTES

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

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

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

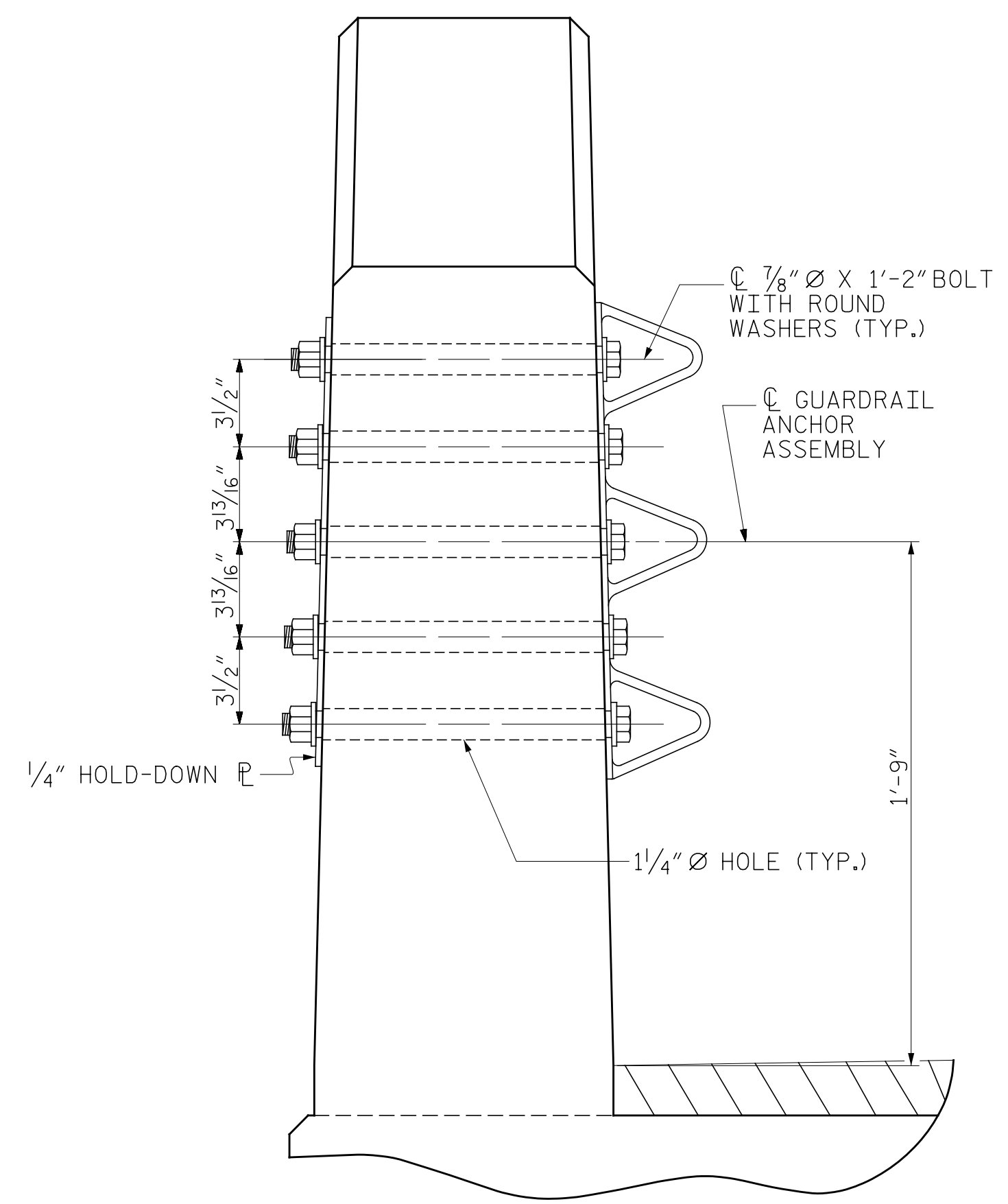
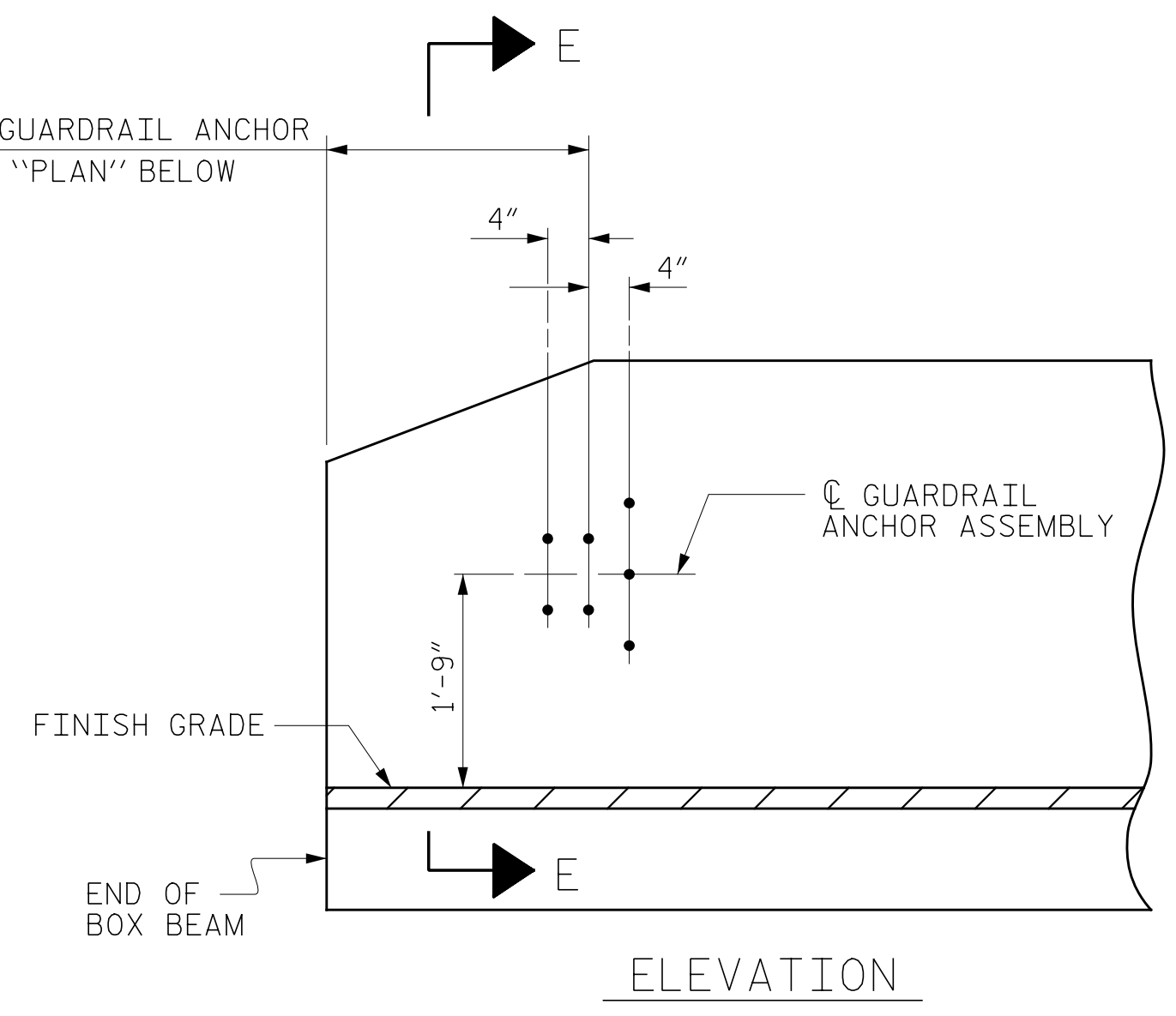
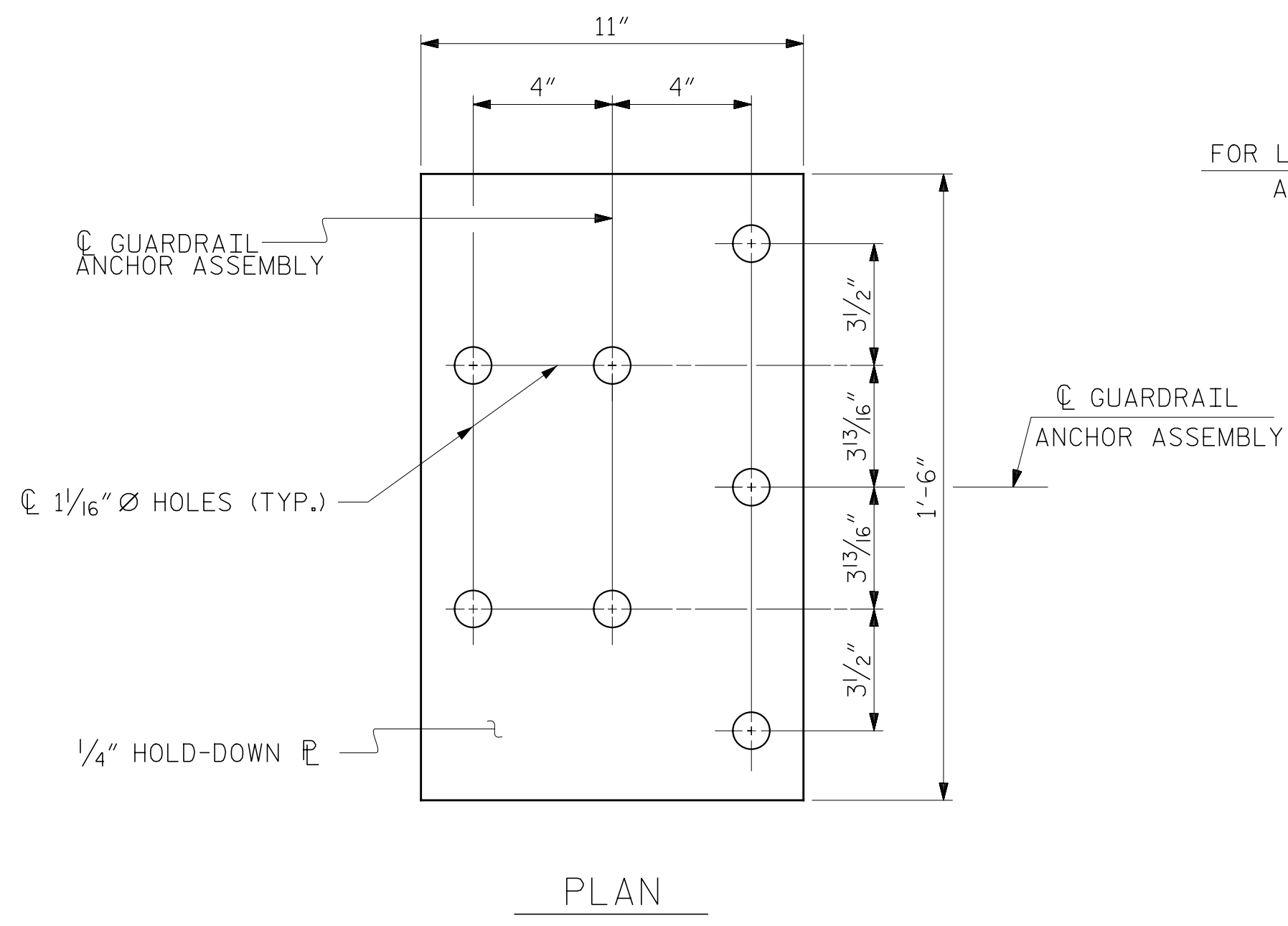
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

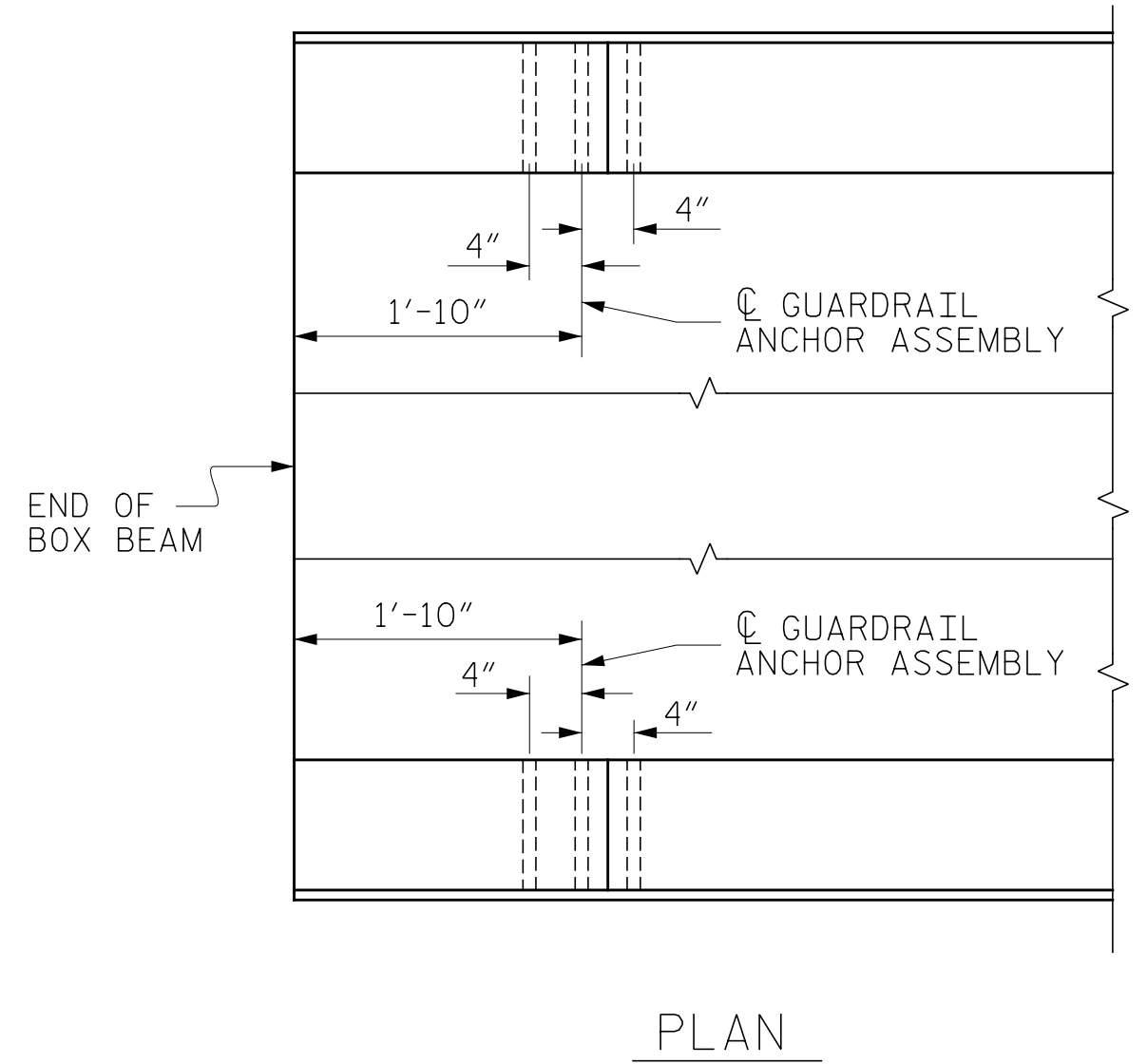
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR VERTICAL CONCRETE BARRIER RAIL.

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

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

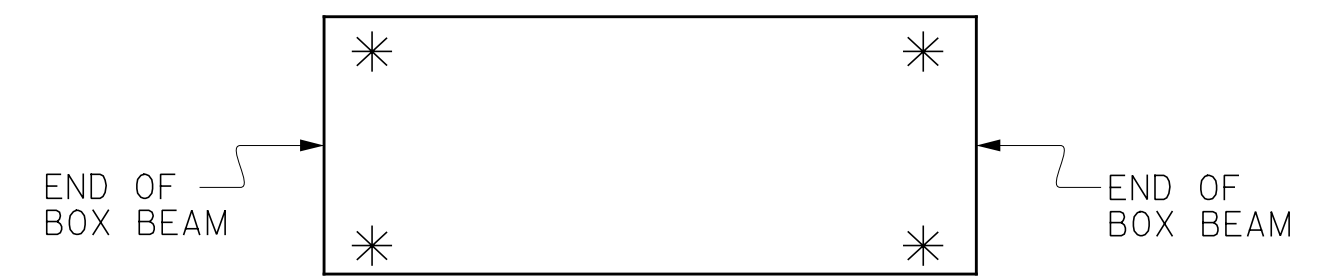


SECTION E-E  
GUARDRAIL ANCHOR ASSEMBLY DETAILS



LOCATION OF ANCHORS FOR GUARDRAIL

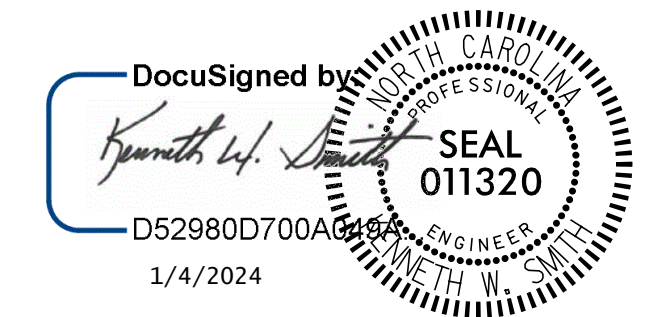
END BENT #1 SHOWN, END BENT #2 SIMILAR.



SKETCH SHOWING POINTS OF ATTACHMENT

\* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. BP5.R131  
VANCE COUNTY  
 STATION: 18+23.50 -L-



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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED  
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 RALEIGH, NC 27612  
 (919) 571-7111  
 NC License Number F-0159

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			16

12/28/2023 1:43:14 PM I:\RAL\PRJ\000020081\BP5-R131\Structures\BP5-R131-SMUJ\_GRA.dgn  
 NCDOT\_Structures.pdf.pltcf \$PENTBL \$

ASSEMBLED BY : R. KNIGHT	DATE : 2/2023
CHECKED BY : K. SMITH	DATE : 3/2023
DESIGN ENGINEER OF RECORD: K. SMITH	DATE : 3/2023
DRAWN BY : MAA 5/10	REV. 1/15 MAA/TMG
CHECKED BY : GM 5/10	REV. 12/17 MAA/THC
	REV. 5/18 MAA/THC

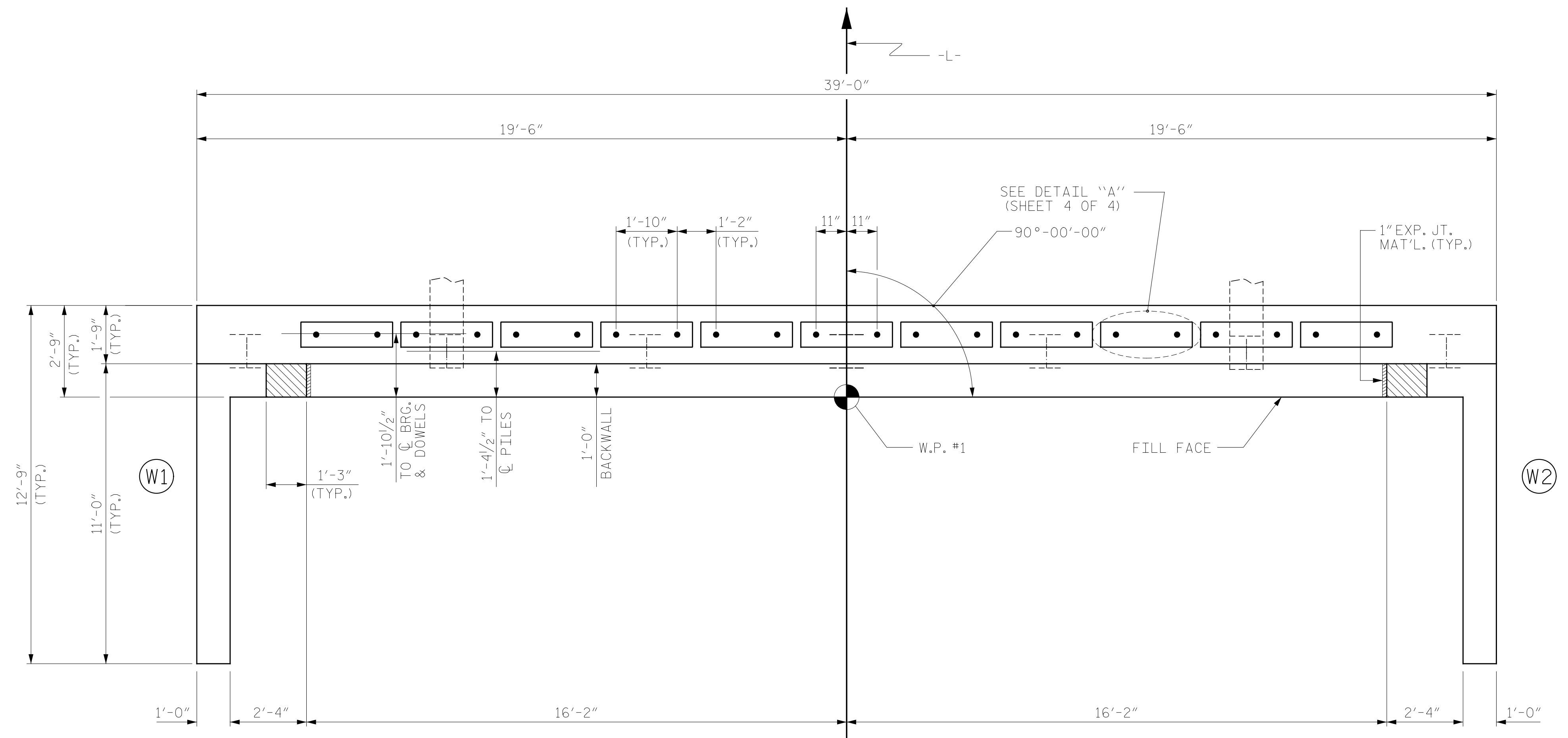
NOTES

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

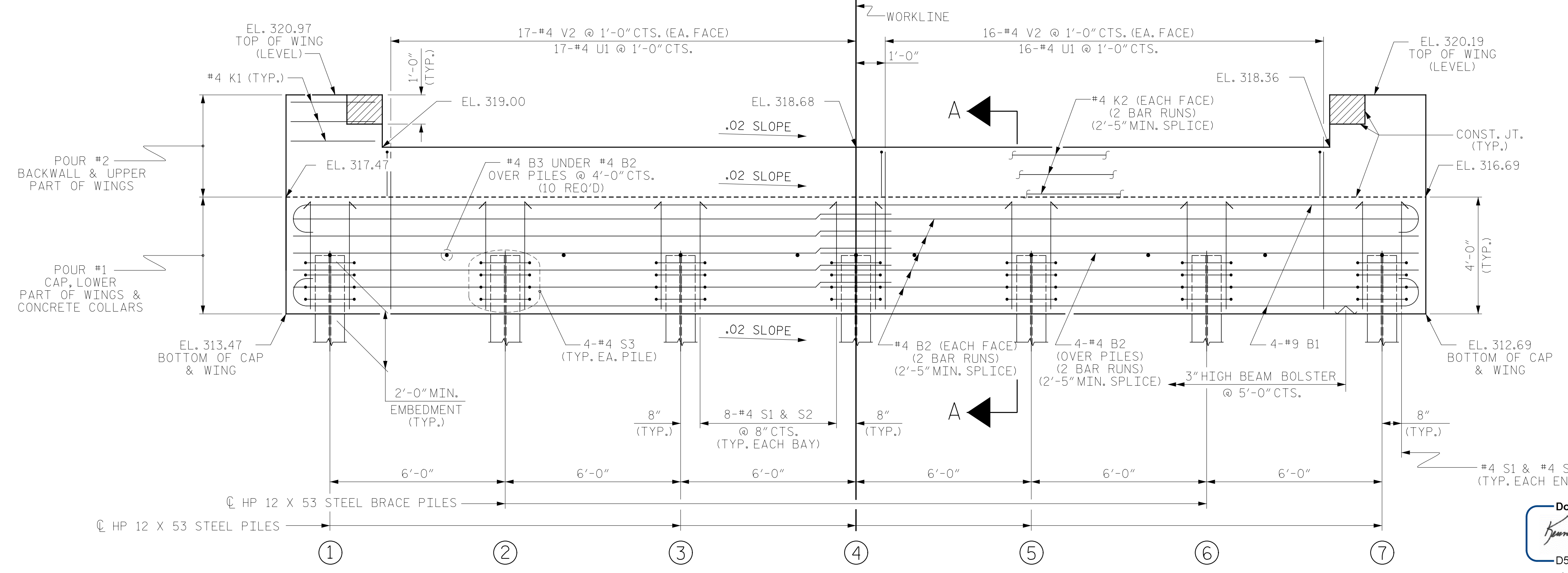
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.



PLAN



ELEVATION

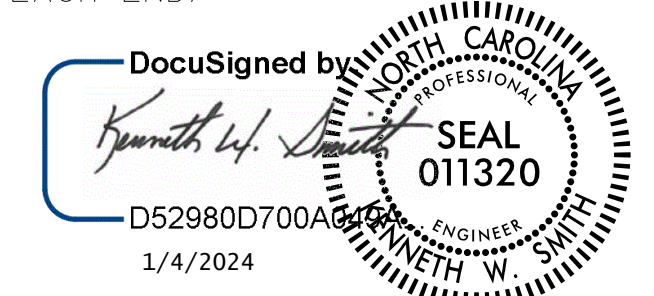
TOP OF PILE ELEVATIONS	
①	315.44
②	315.32
③	315.20
④	315.08
⑤	314.96
⑥	314.84
⑦	314.72

PROJECT NO. BP5.R131  
VANCE COUNTY  
 STATION: 18+23.50 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT No. 1



ASSEMBLED BY :	R. KNIGHT	DATE :	2/2023
CHECKED BY :	K. SMITH	DATE :	3/2023
DESIGN ENGINEER OF RECORD :	K. SMITH	DATE :	3/2023
DRAWN BY :	WJH	REV. 4/15	MAA/TMG
CHECKED BY :	AAC	12/11	

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.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		REVISIONS		SHEET NO.
<b>LOCHNER</b>	H. W. LOCHNER, INC. 2640 PLAZA PLACE, SUITE 202 RALEIGH, NC 27612 (919) 871-7111	NO.	BY:	DATE:
		1		
		3		
		4		
				S-11
				TOTAL SHEETS
				16

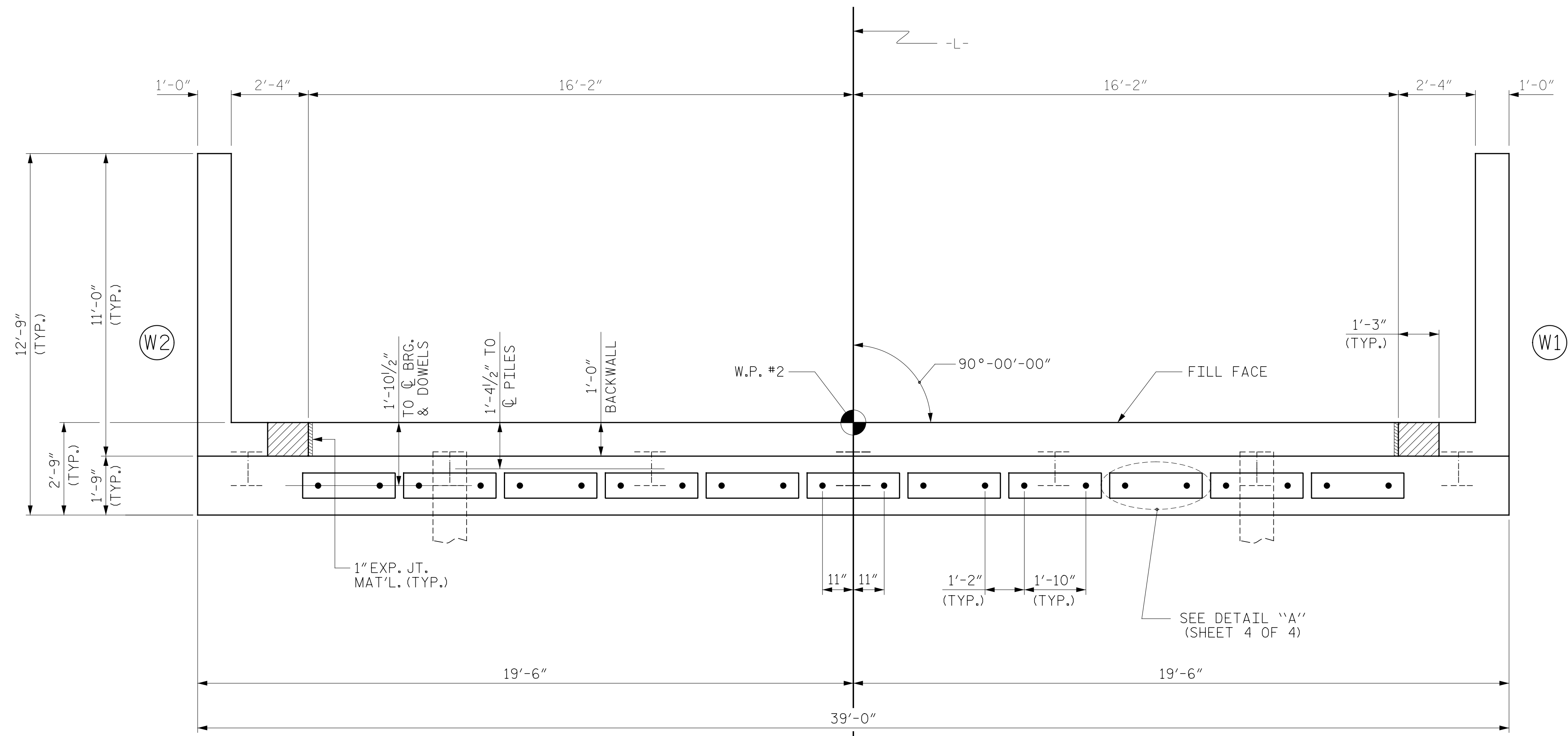
NOTES

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

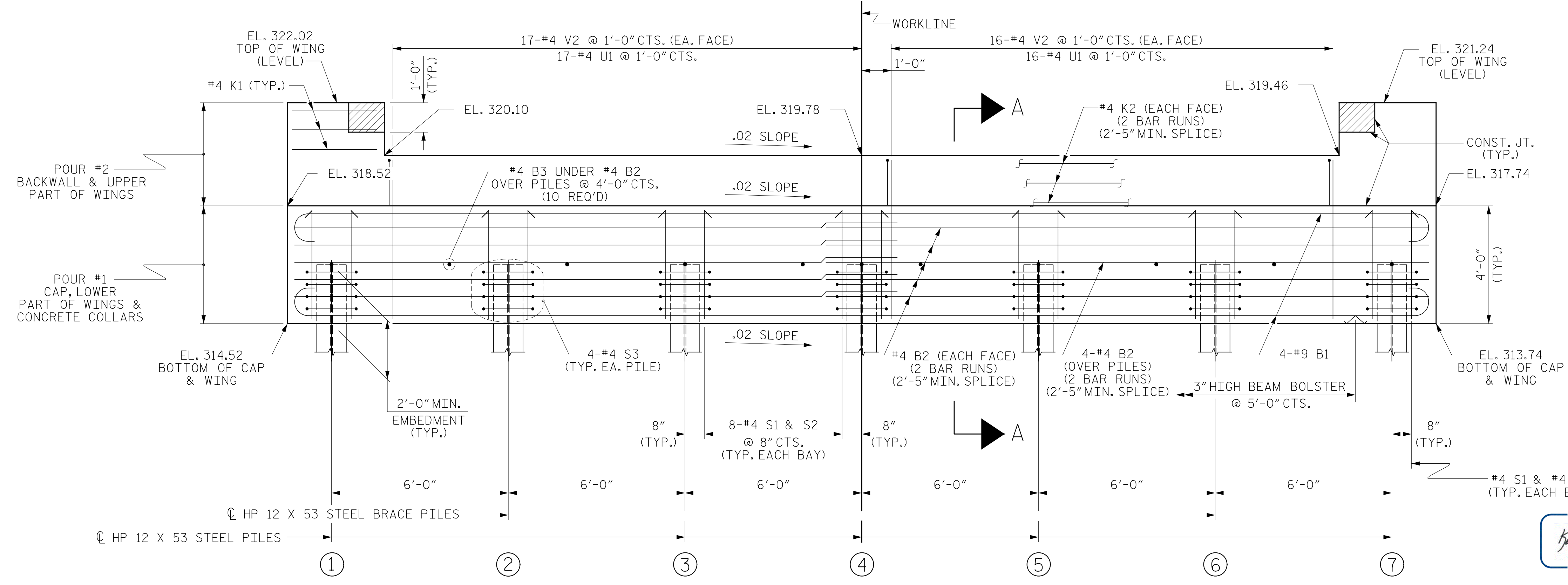
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.



PLAN



ELEVATION

TOP OF PILE ELEVATIONS	
①	316.49
②	316.37
③	316.25
④	316.13
⑤	316.01
⑥	315.89
⑦	315.77

PROJECT NO. BP5.R131  
VANCE COUNTY  
 STATION: 18+23.50 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT No. 2



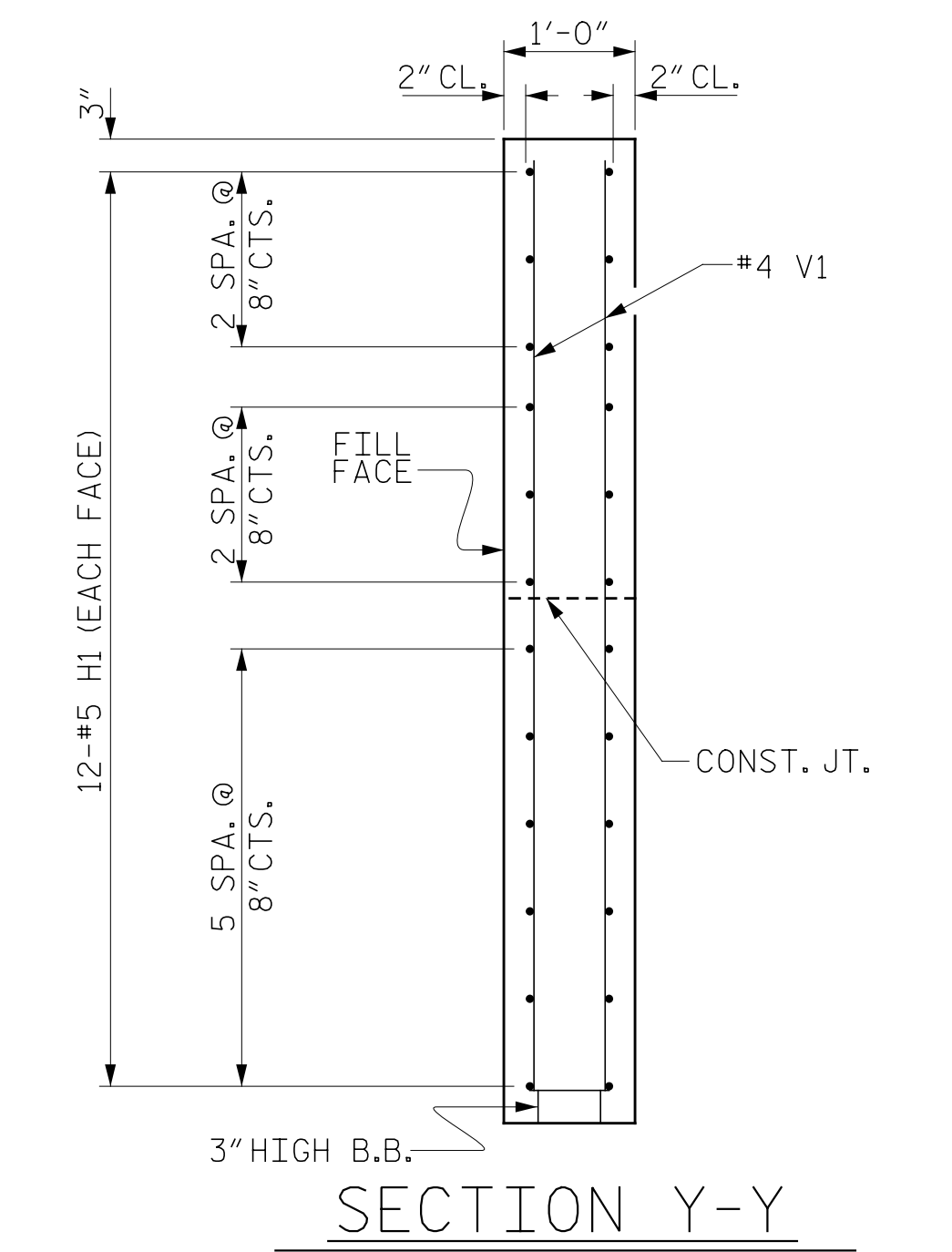
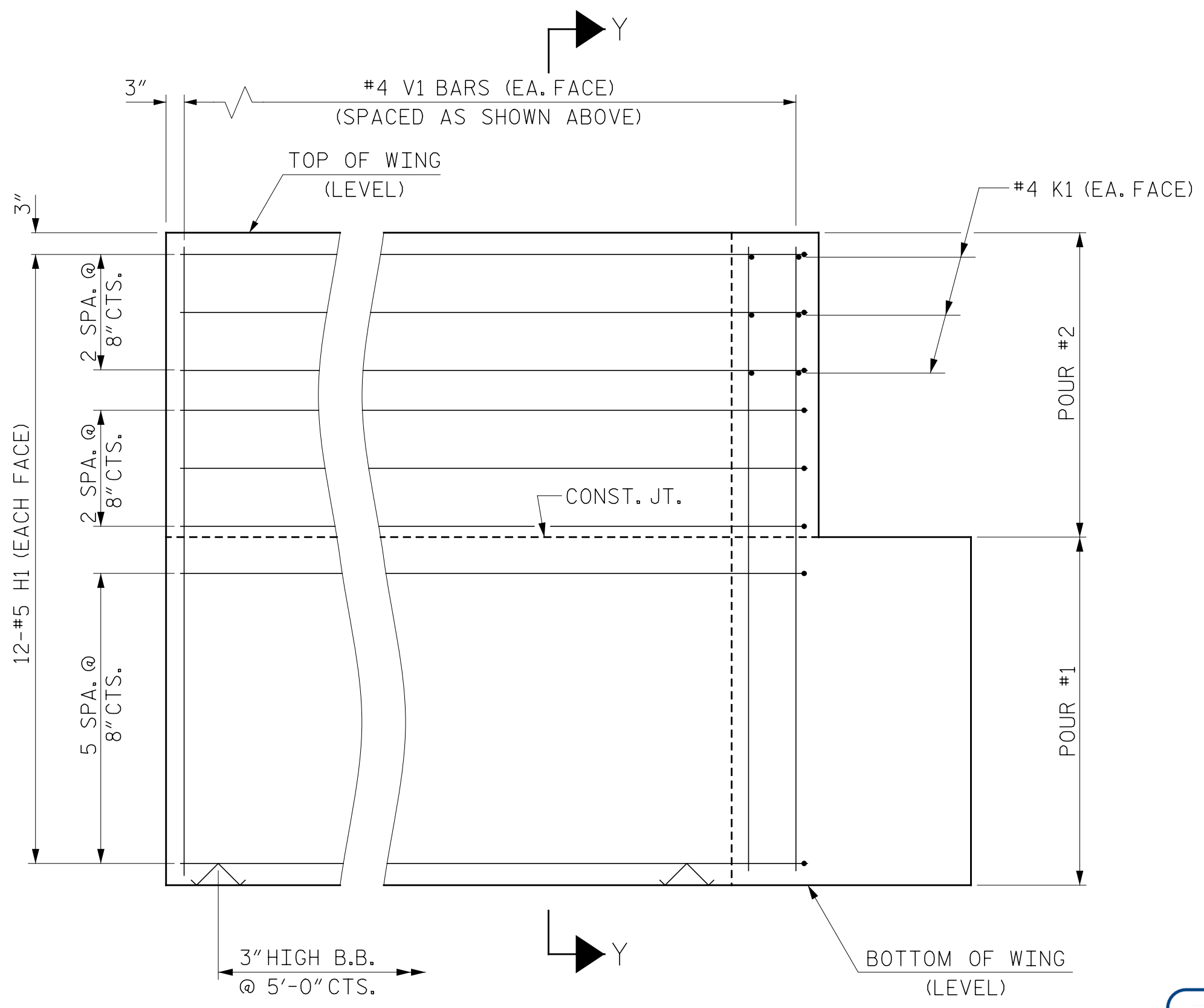
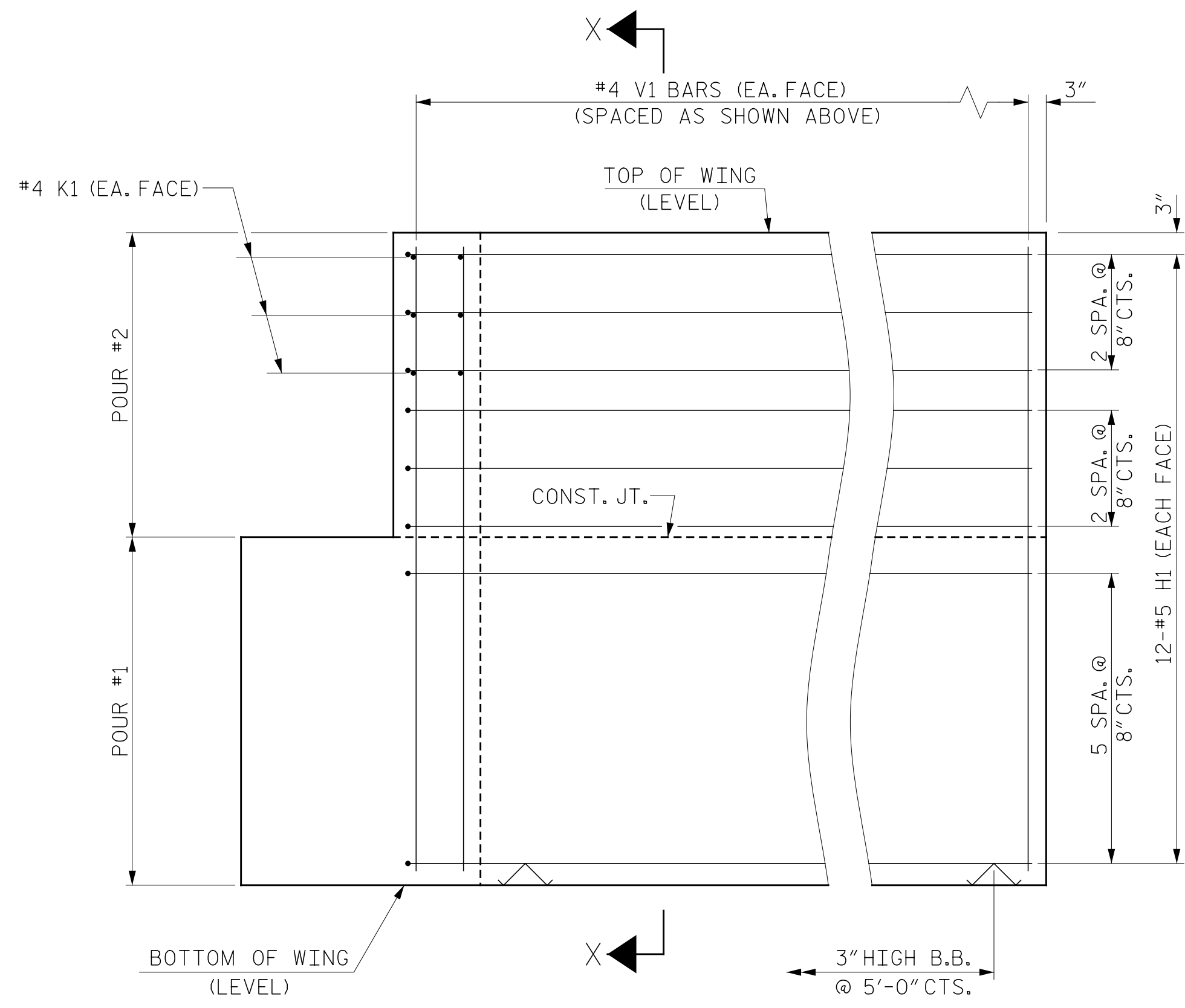
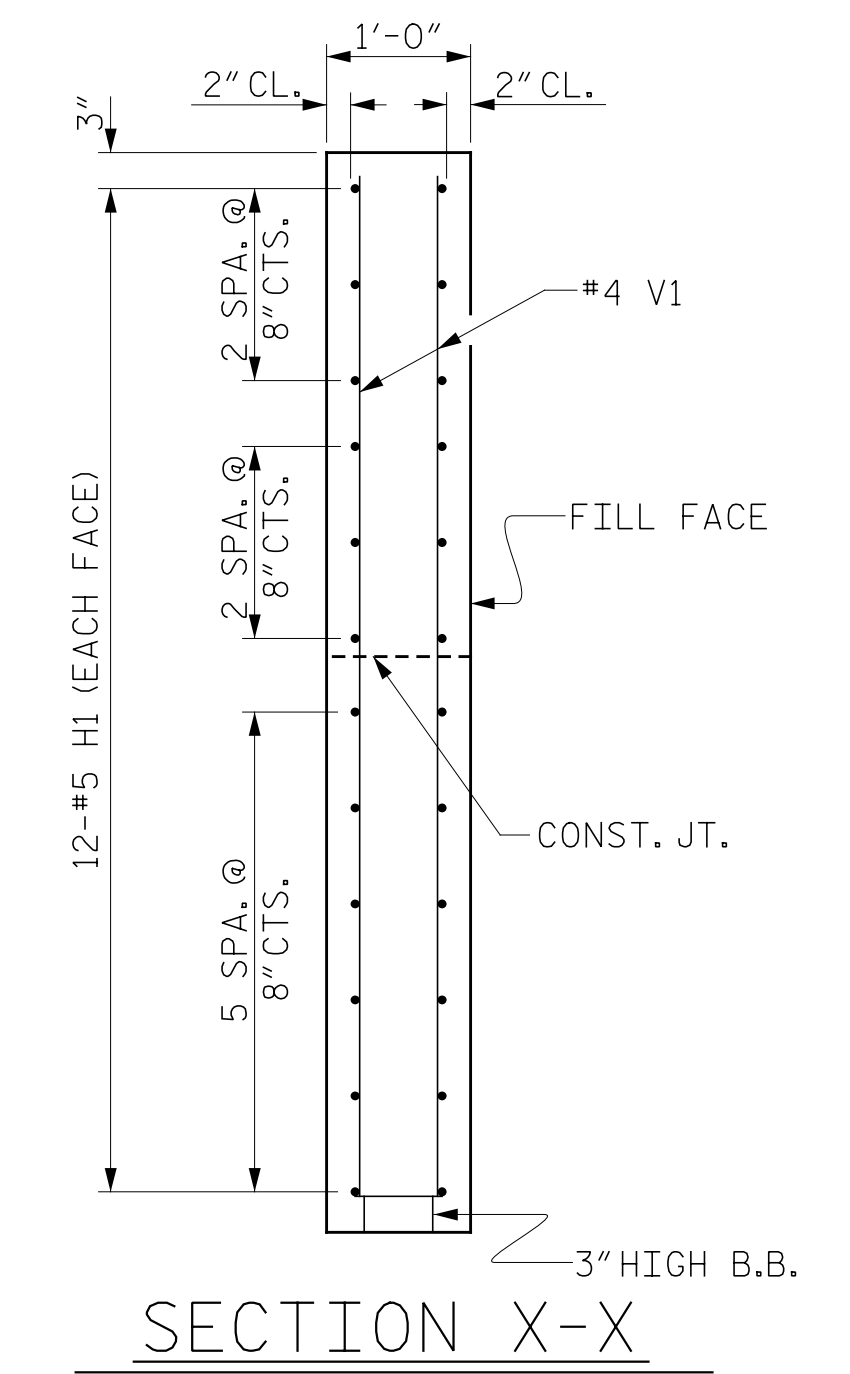
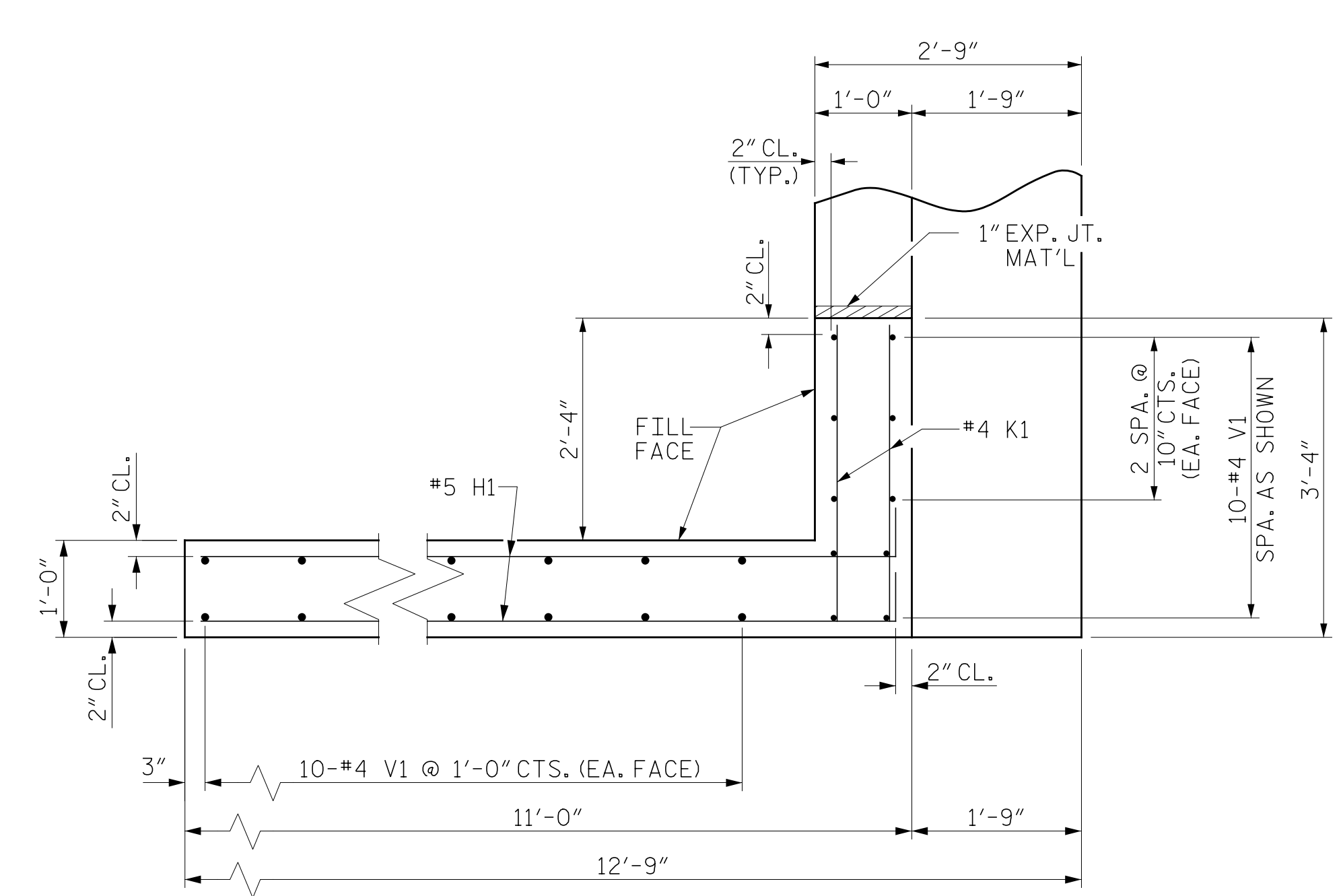
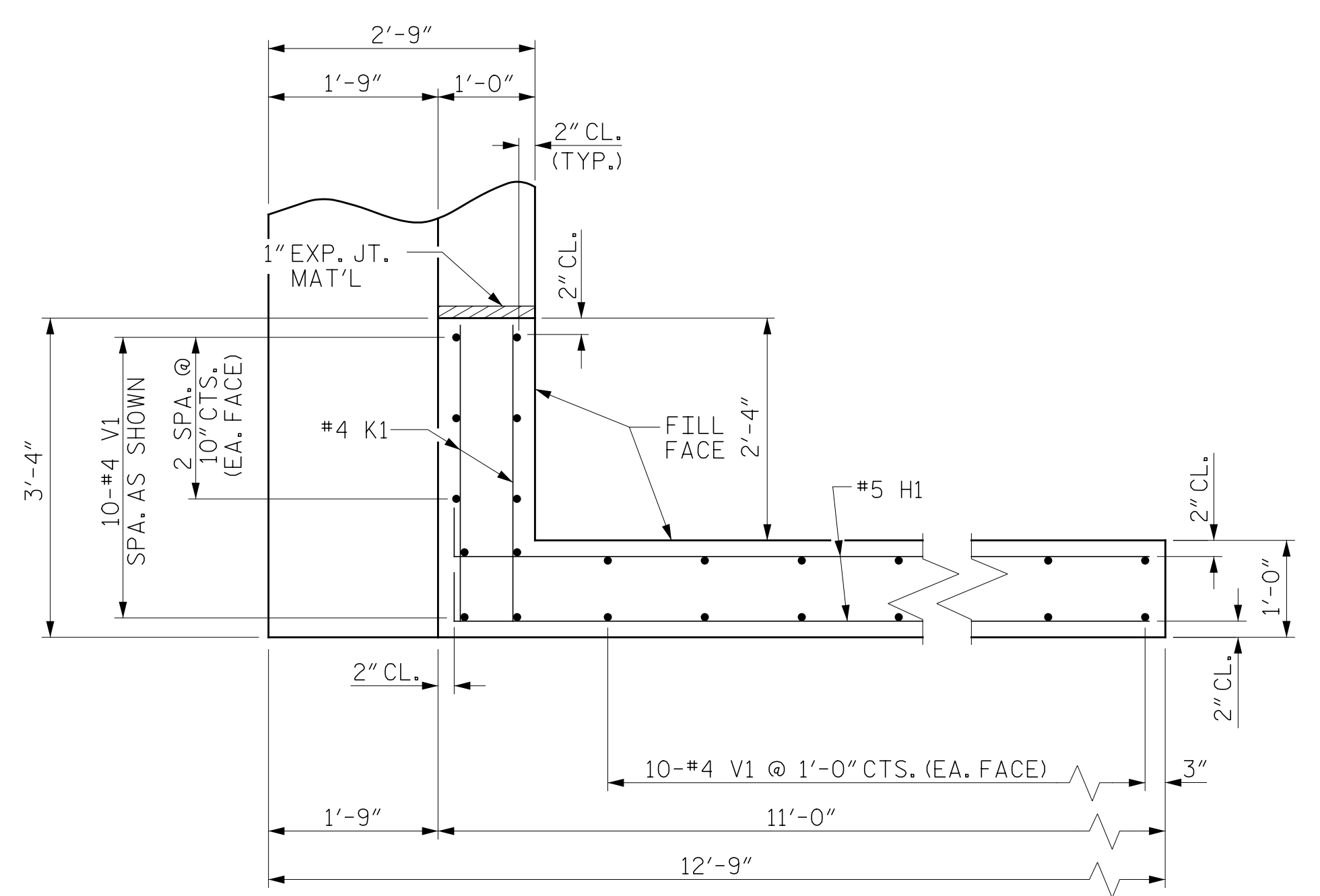
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			16

ASSEMBLED BY :	R. KNIGHT	DATE :	2/2023
CHECKED BY :	K. SMITH	DATE :	3/2023
CHECKED BY :	K. SMITH	DATE :	3/2023
DRAWN BY :	WJH	REV.	4/15
CHECKED BY :	AAC	DATE :	12/11
		DATE :	12/11

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.

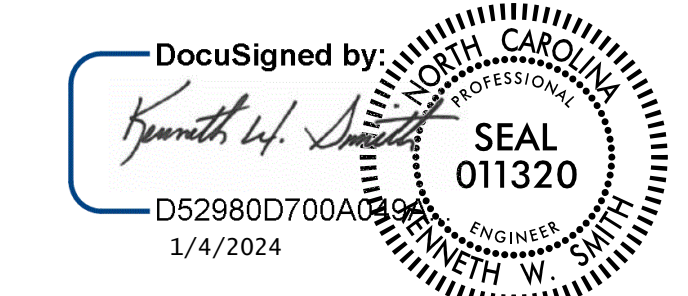


ELEVATION OF WING (W1)

ELEVATION OF WING (W2)

WING DETAILS

ASSEMBLED BY : R. KNIGHT	DATE : 2/2023
CHECKED BY : K. SMITH	DATE : 3/2023
DESIGN ENGINEER	
OF RECORD : K. SMITH	DATE : 3/2023
DRAWN BY : WJH 12/11	REV. 4/15
CHECKED BY : AAC 12/11	MAA/TMG

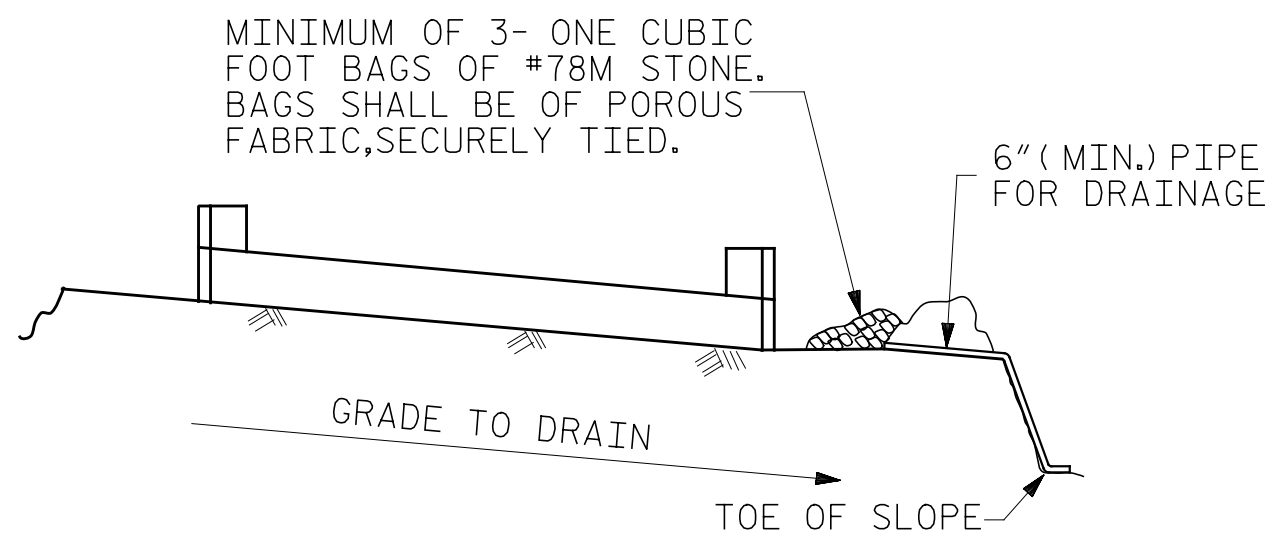


PROJECT NO. BP5.R131  
VANCE COUNTY  
STATION: 18+23.50 -L-  
SHEET 3 OF 4

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE  
END BENT  
WING DETAILS

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1			3		
2			4		
					TOTAL SHEETS
					16

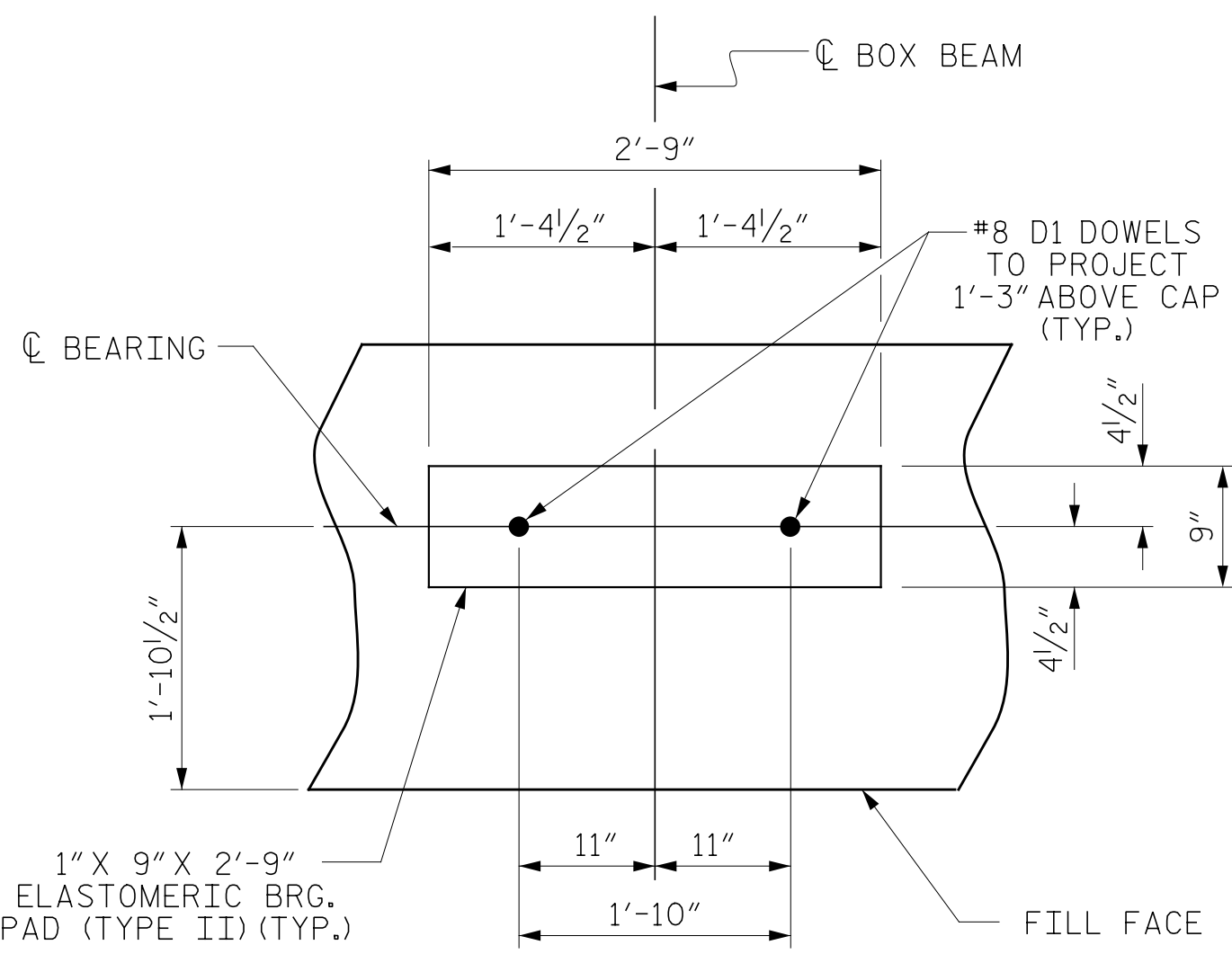


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

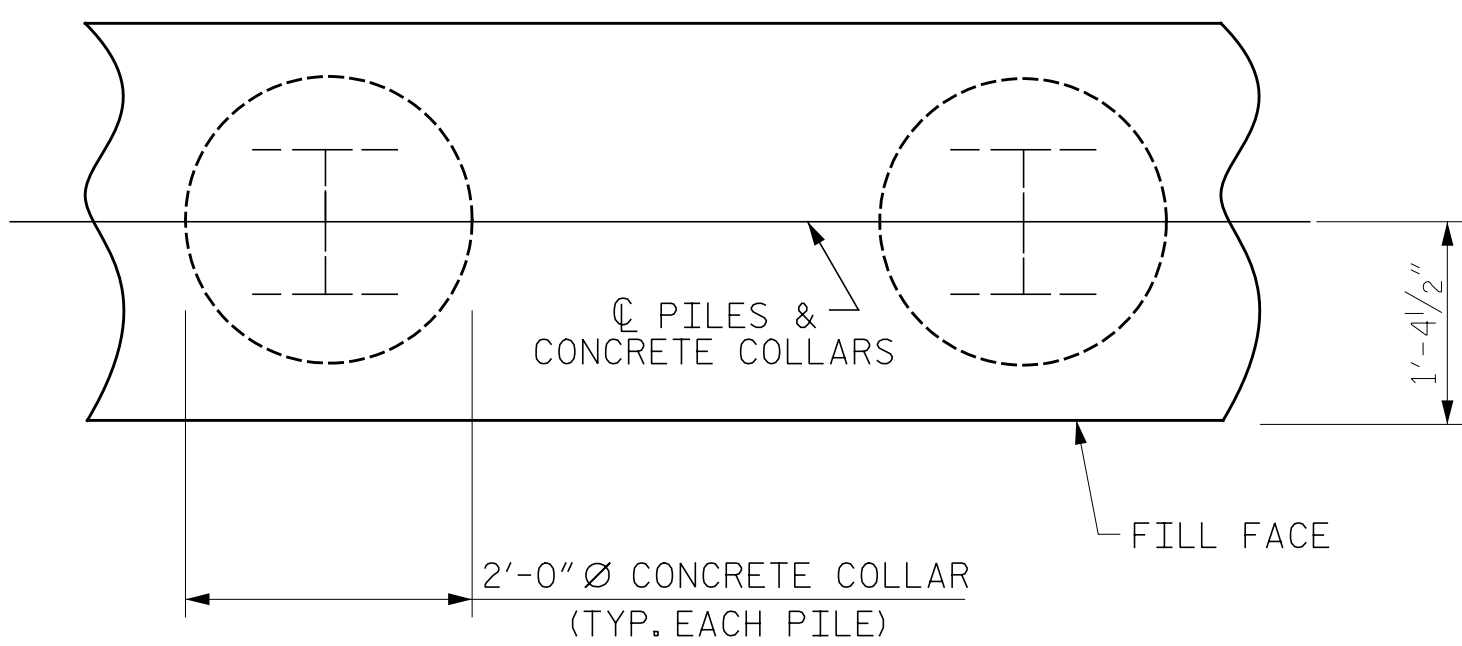
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

### TEMPORARY DRAINAGE AT END BENT



DETAIL "A"

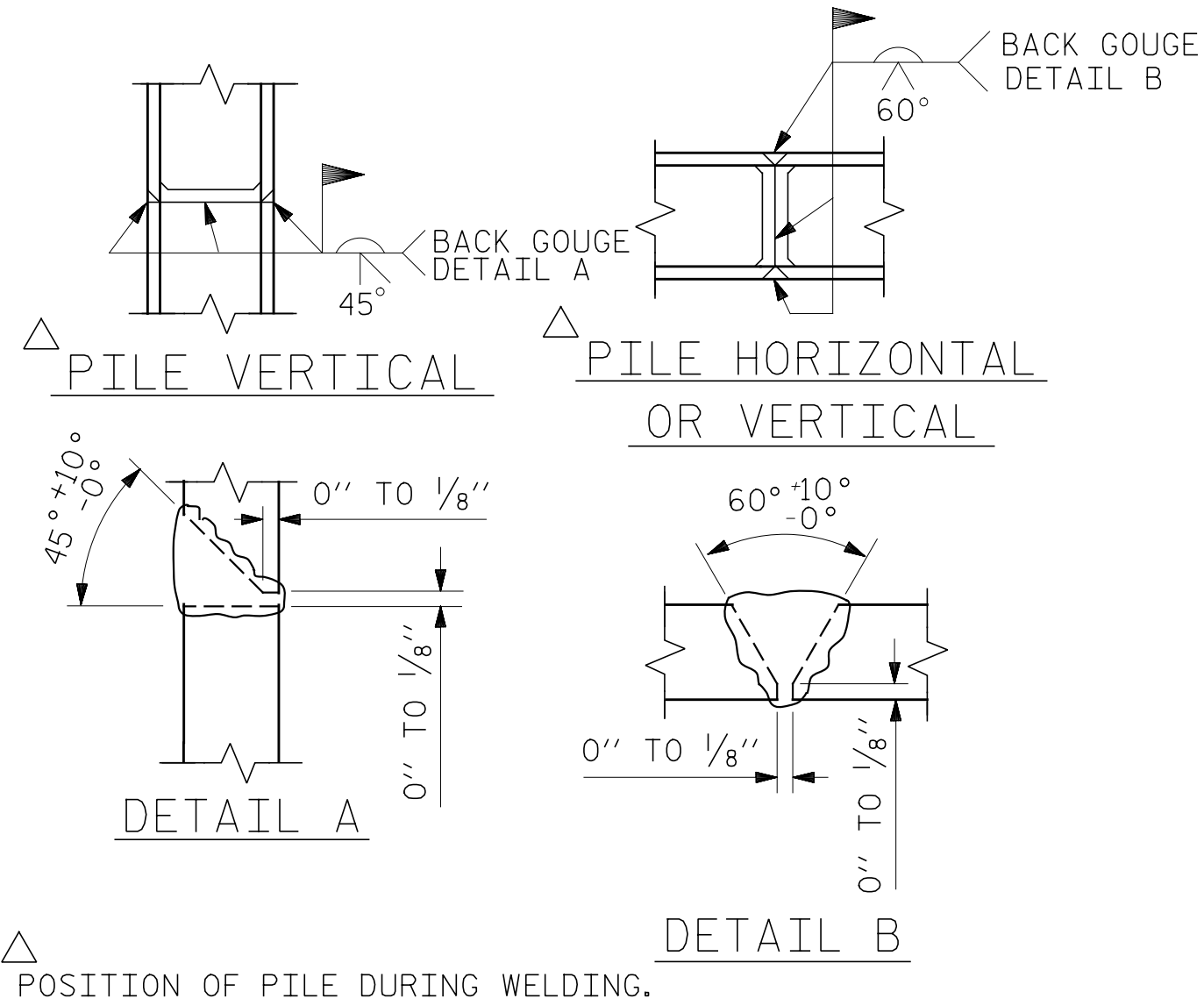
(END BENT No. 1 SHOWN, END BENT No. 2 SIMILAR BY ROTATION)



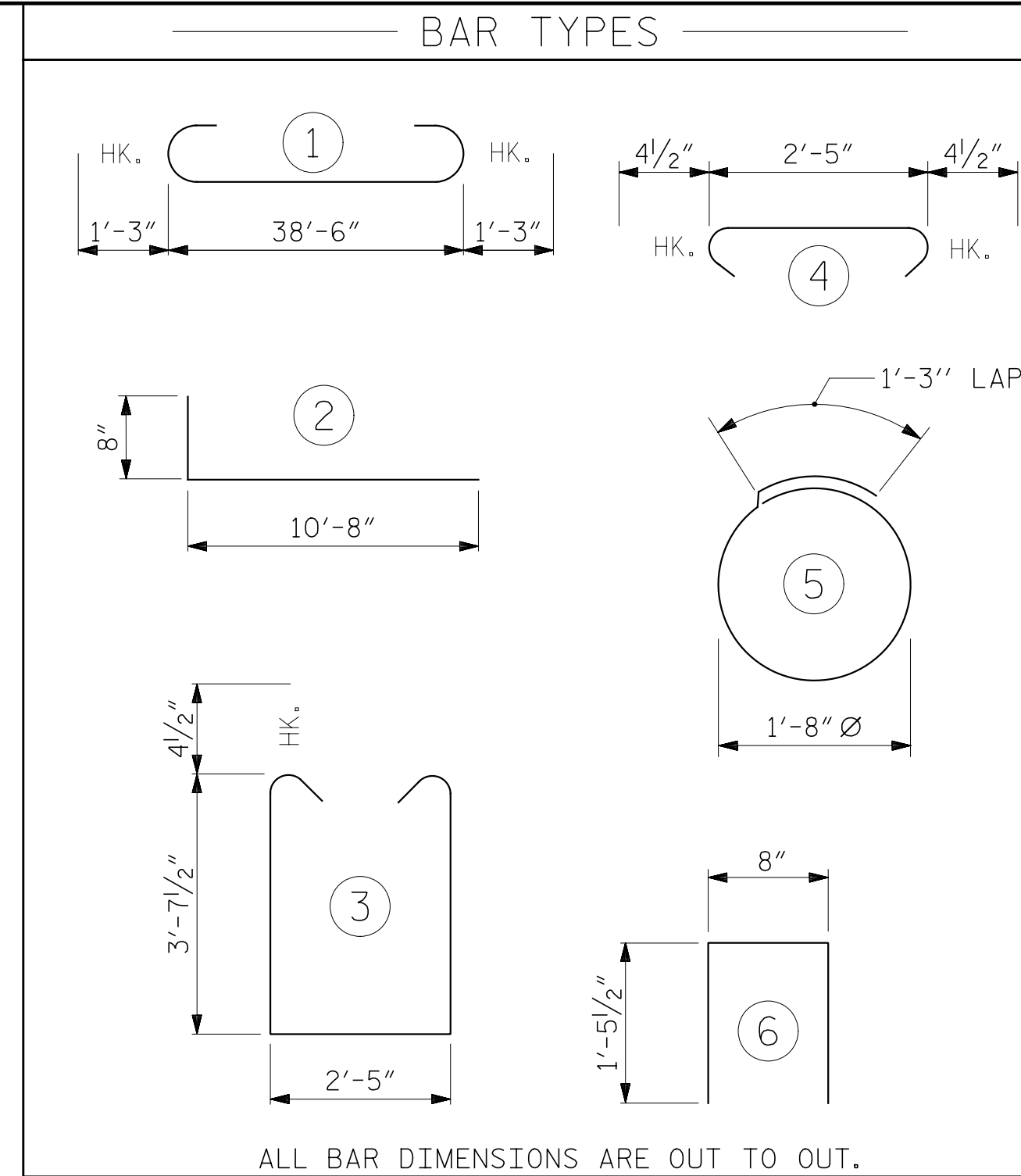
PLAN

### CORROSION PROTECTION FOR STEEL PILES DETAIL

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



### PILE SPLICE DETAILS



### BILL OF MATERIAL

#### FOR ONE END BENT

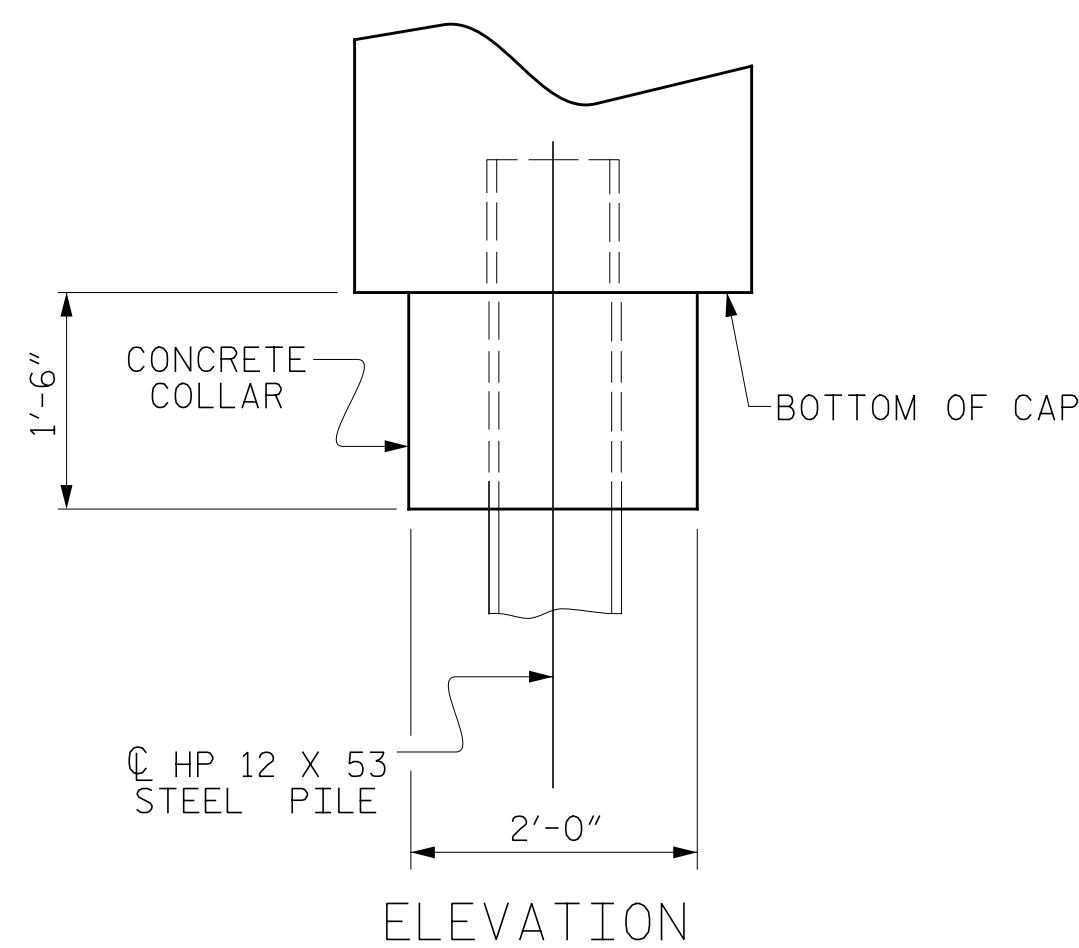
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	41'-0"	1115
B2	28	#4	STR	20'-7"	385
B3	10	#4	STR	2'-5"	16
D1	22	#8	STR	2'-3"	132
H1	48	#5	2	11'-4"	567
K1	12	#4	STR	2'-11"	23
K2	12	#4	STR	20'-7"	165
S1	50	#4	3	10'-5"	348
S2	50	#4	4	3'-2"	106
S3	28	#4	5	6'-6"	122
U1	33	#4	6	3'-7"	79
V1	60	#4	STR	7'-2"	287
V2	66	#4	STR	5'-3"	231

REINFORCING STEEL (FOR ONE END BENT) 3576 LBS.

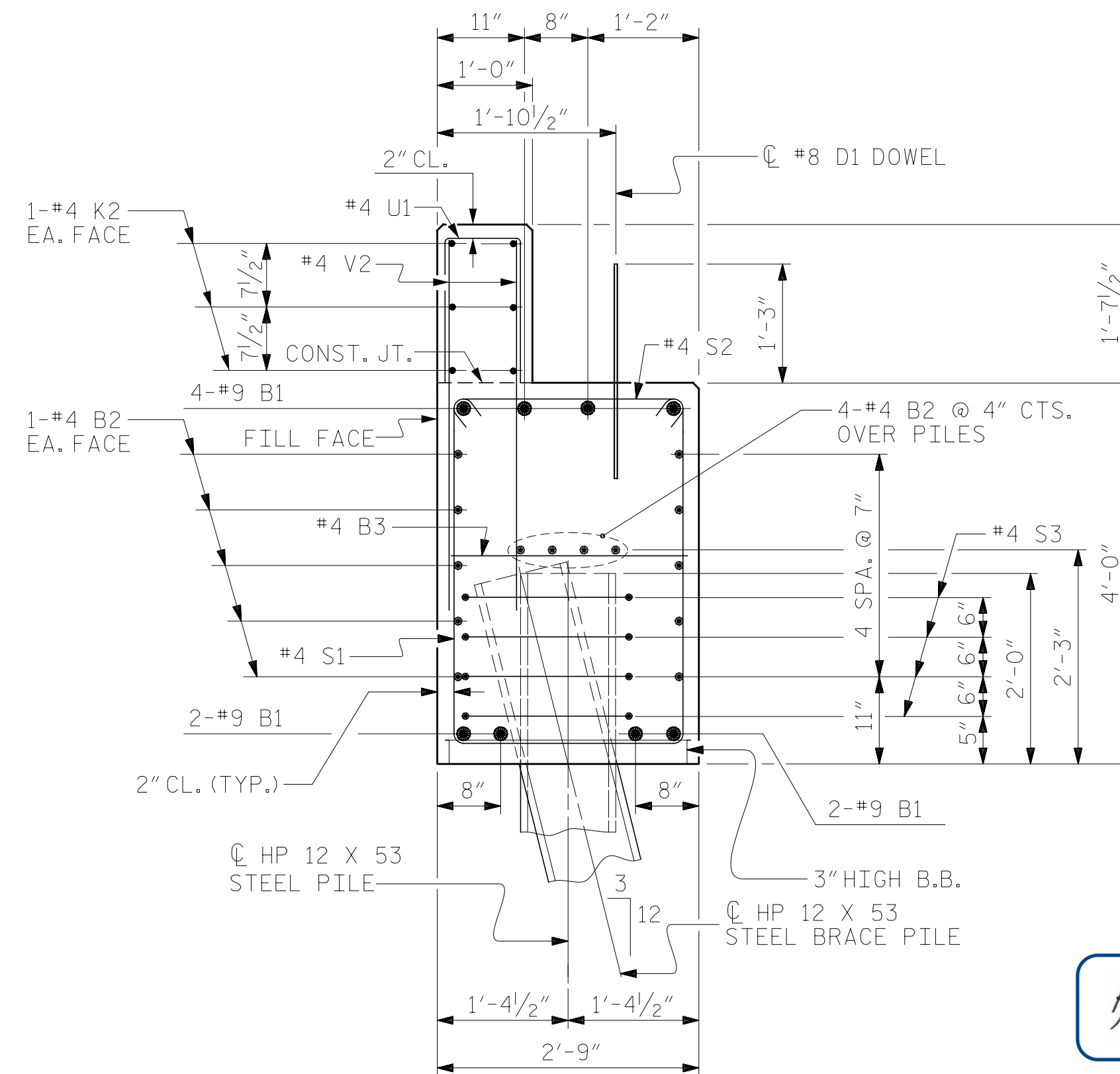
#### CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)

POUR #1	CAP, LOWER PART OF WINGS & COLLARS	20.1 C.Y.
POUR #2	BACKWALL & UPPER PART OF WINGS	5.4 C.Y.

TOTAL CLASS A CONCRETE 25.5 C.Y.



ELEVATION



### SECTION A-A

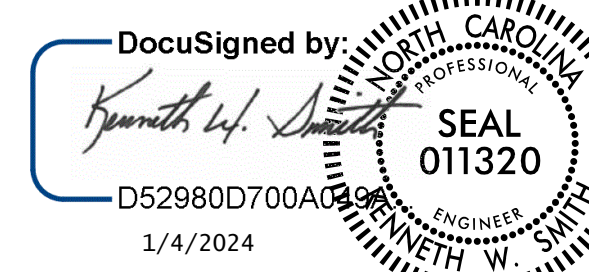
(CONCRETE COLLAR NOT SHOWN FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL.")

PROJECT NO. BP5.R131  
 VANCE COUNTY  
 STATION: 18+23.50 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT No. 1 & 2  
 DETAILS

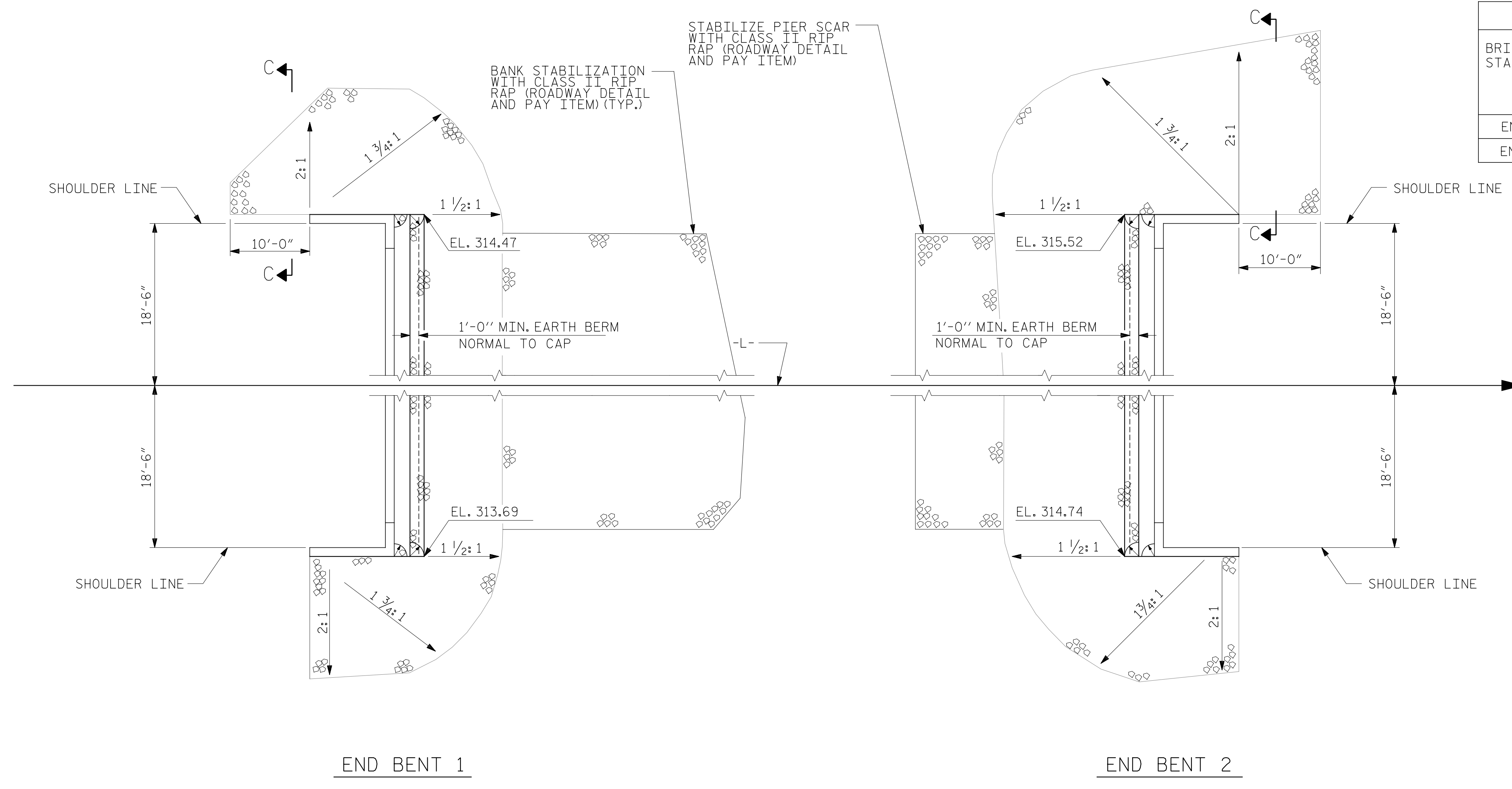


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1			3			TOTAL SHEETS
2			4			16

ASSEMBLED BY : R. KNIGHT	DATE : 2/2023
CHECKED BY : K. SMITH	DATE : 3/2023
CHECKED BY : K. SMITH	DATE : 3/2023
DRAWN BY : WJH 12/11	REV. 4/17
CHECKED BY : AAC 12/11	MAA/THC

12/28/2023 1:43:29 PM I:\RAL\PRJ\000020081\BP5-R131\Structures\BP5-R131-SMU-RR.dgn  
 NCDOT\_Structures.pdf.pltcf \$PENTBL\$

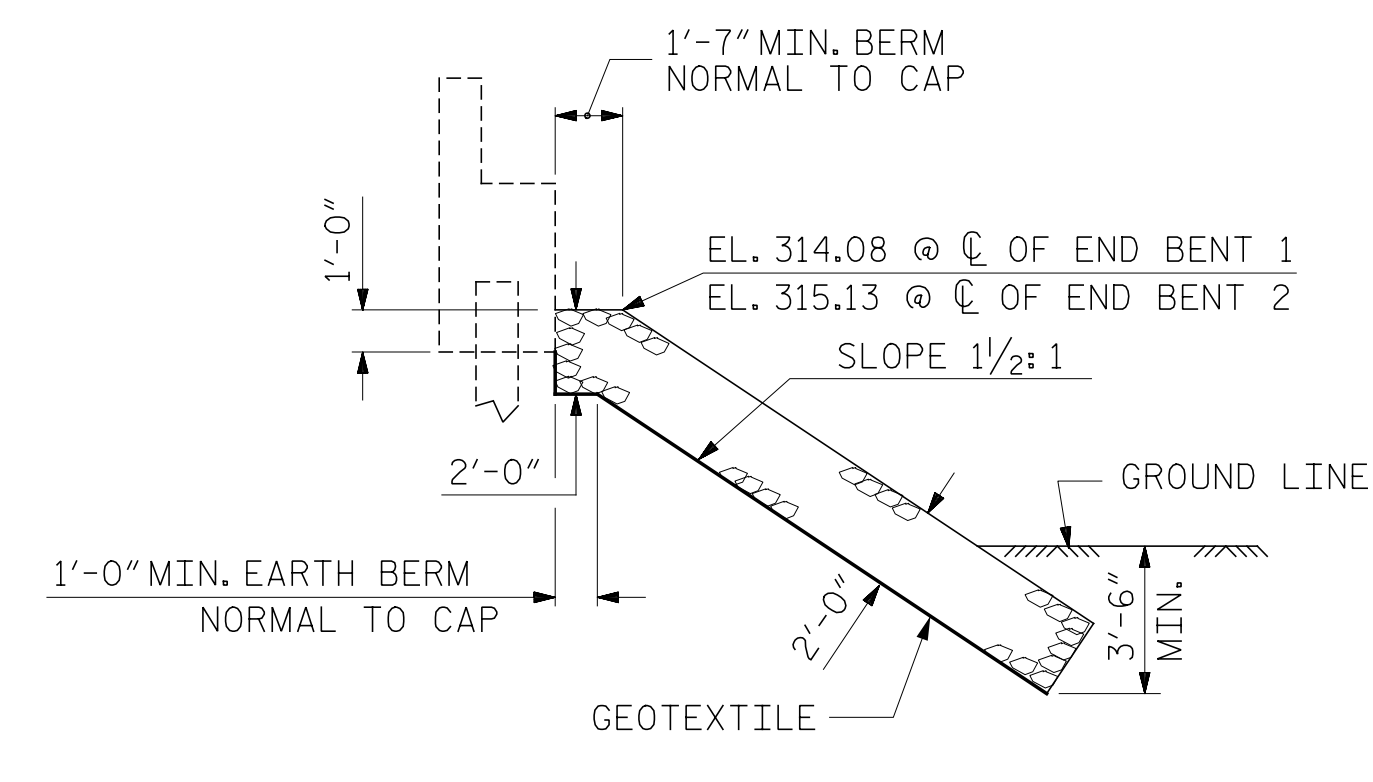


ESTIMATED QUANTITIES		
BRIDGE @ STA. 18+23.50 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	55	61
END BENT 2	85	94

END BENT 1

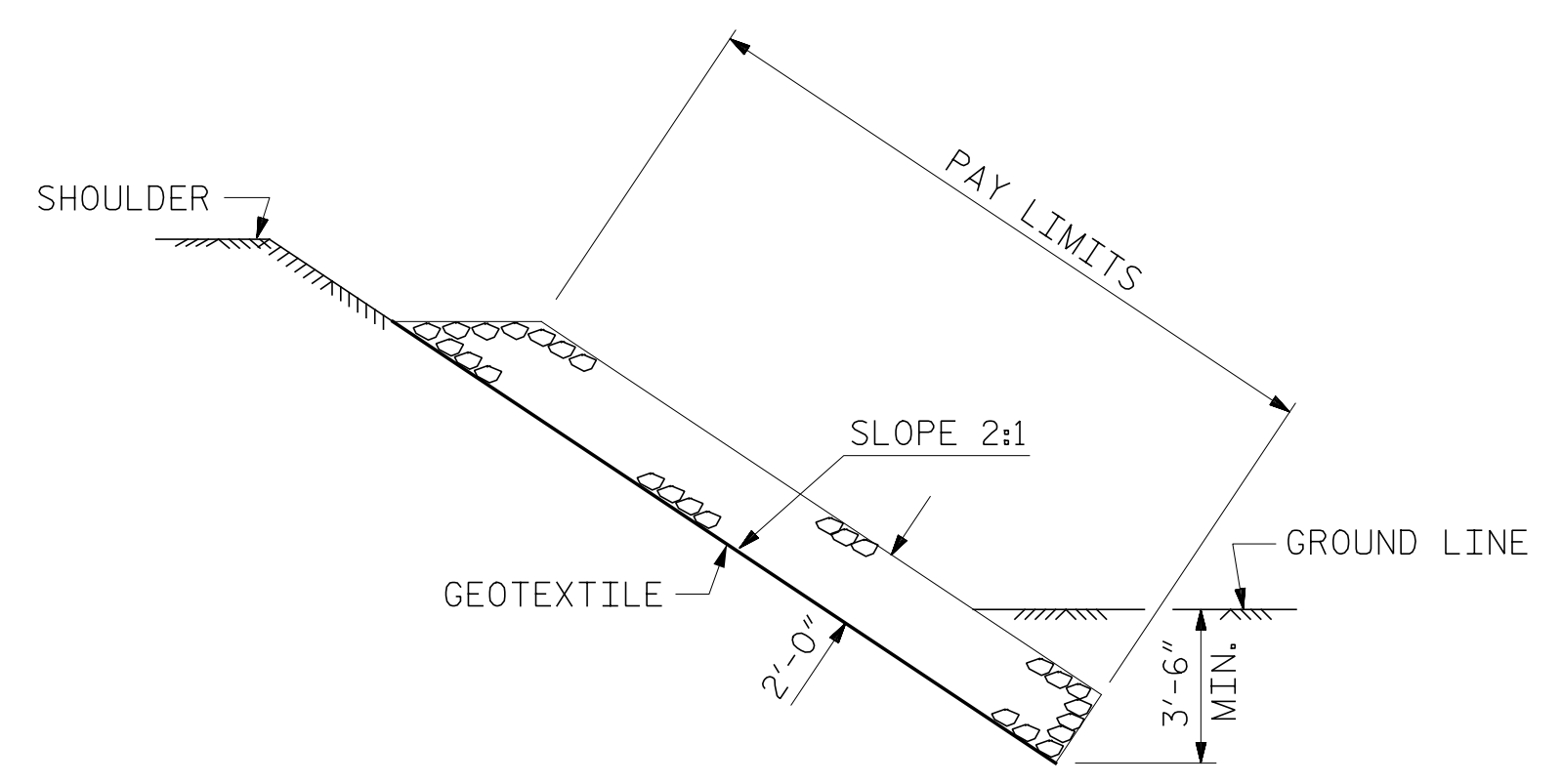
END BENT 2

PLAN OF RIP RAP



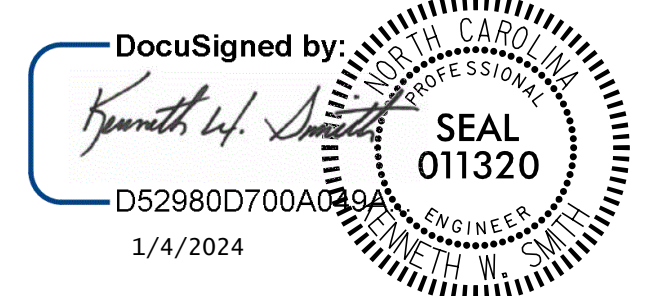
C SECTION  
BERM RIP RAPPED

BANK STABILIZATION  
NOT SHOWN FOR CLARITY.



SECTION C-C

PROJECT NO. BP5.R131  
VANCE COUNTY  
 STATION: 18+23.50 -L-



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

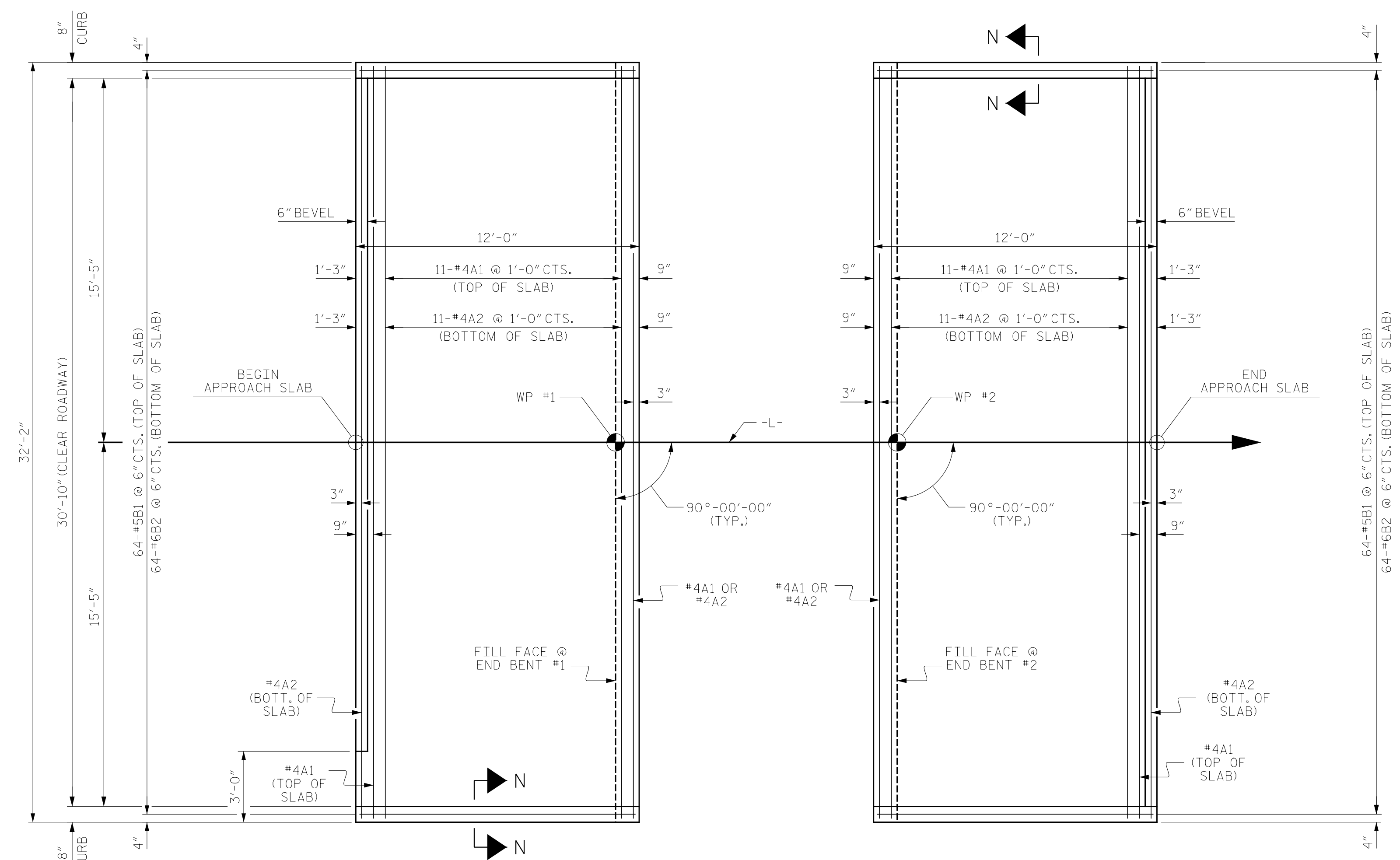
ASSEMBLED BY : R. KNIGHT	DATE : 2/2023
CHECKED BY : K. SMITH	DATE : 3/2023
DESIGN ENGINEER OF RECORD: K. SMITH	DATE : 3/2023
DRAWN BY : REK 1/84	REV. 10/1/11 MAA/GM
CHECKED BY : RDU 1/84	REV. 12/21/11 MAA/GM
	REV. 12/17 MAA/THC

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NC License  
 Number F-0259

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS
2			4			16



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

**NOTES**

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 4"Ø DRAINAGE PIPE, AND SELECT MATERIAL BACKFILL, SEE ROADWAY PLANS.

GEOTEXTILE SHALL BE TYPE 1 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.

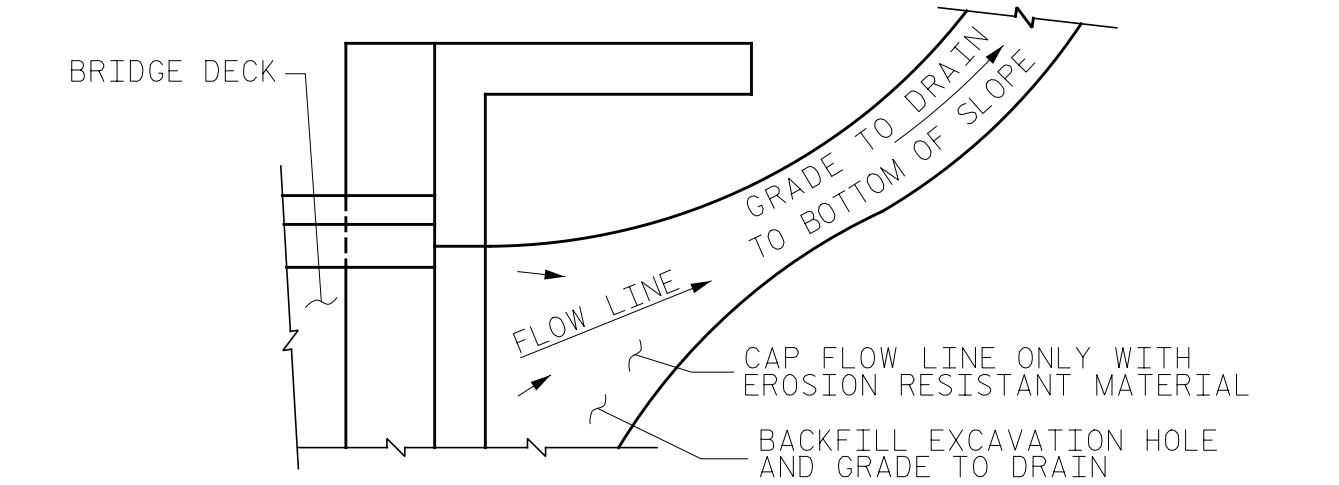
SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

SELECT MATERIAL BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.

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.

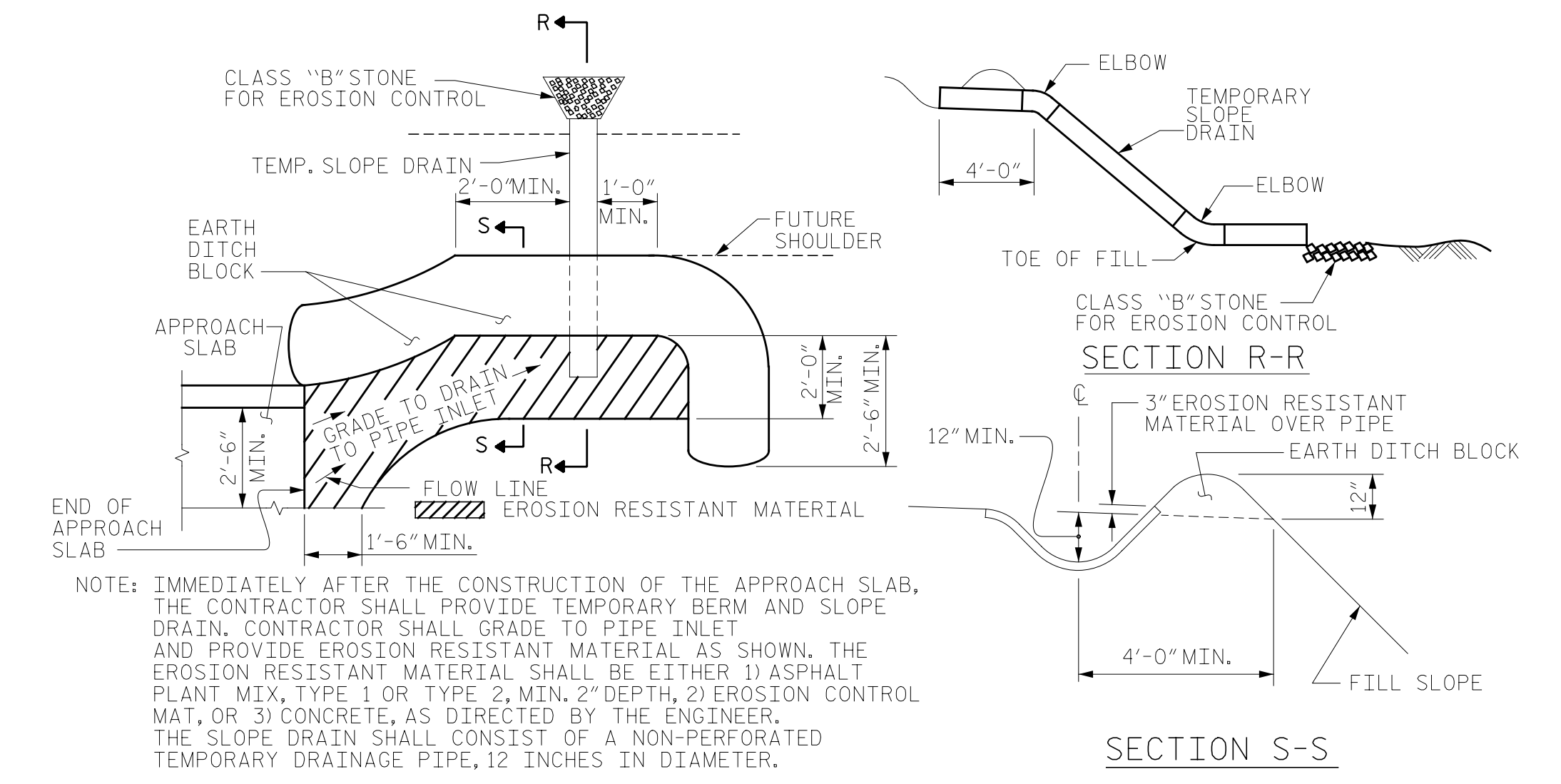
FOR THE 4"Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

APPROACH SLAB GROOVING IS NOT REQUIRED.

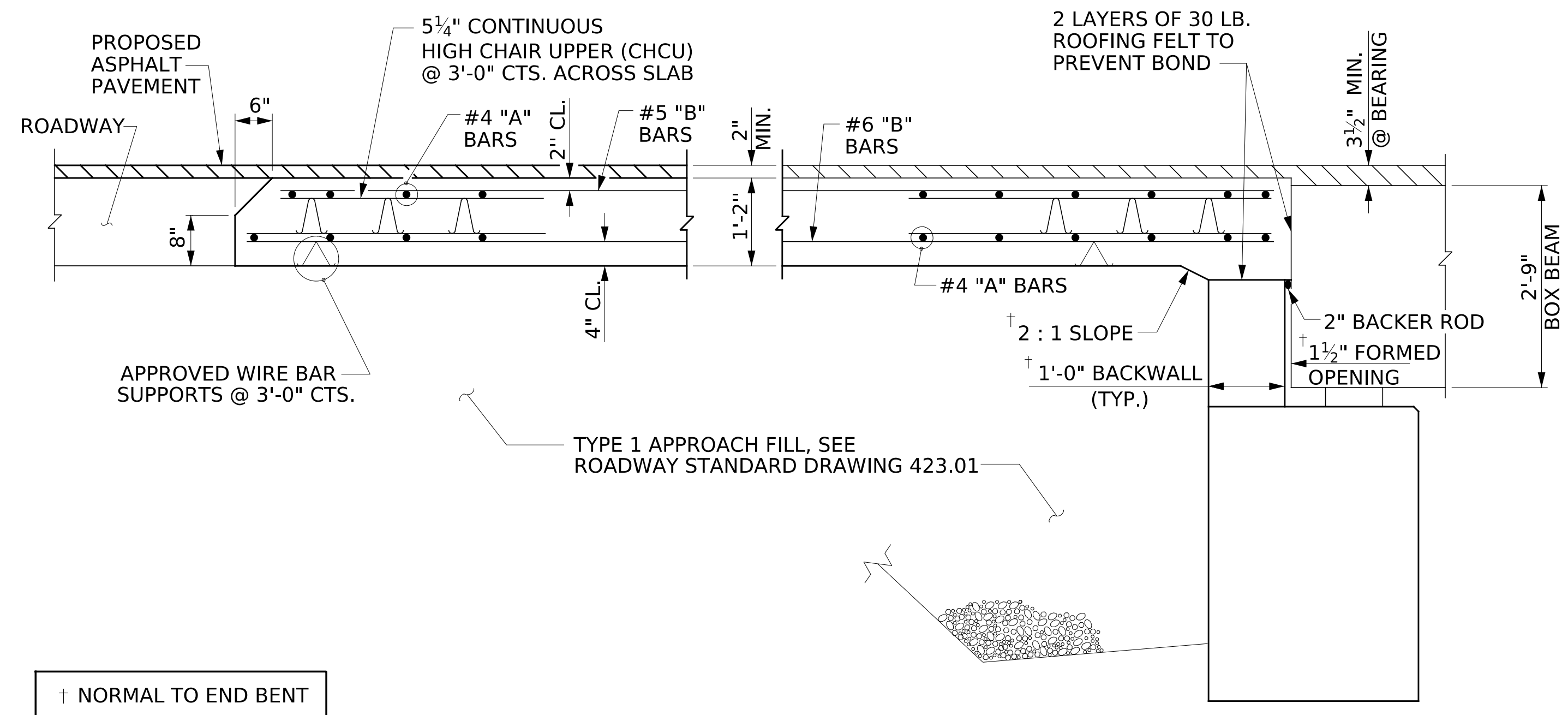


**NOTE:** IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

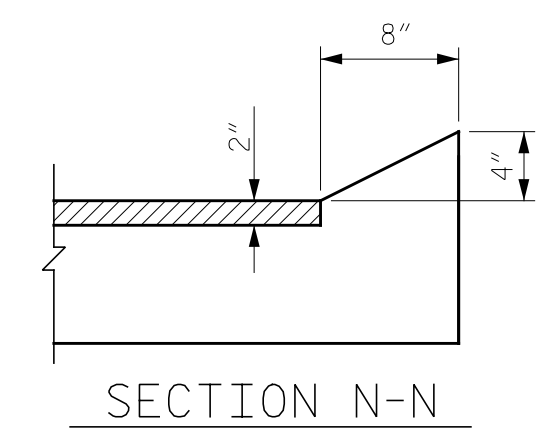
**TEMPORARY DRAINAGE DETAIL**



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



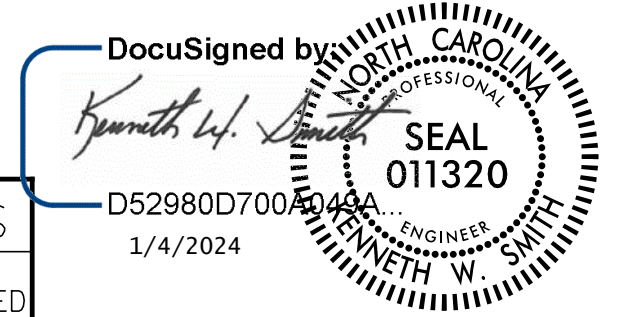
**SECTION THRU SLAB**



**CURB DETAILS**

**SPLICE LENGTHS**

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



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 (919) 877-1111

**BILL OF MATERIAL**

**APPROACH SLAB AT EB #1**

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
*A1	13	#4	STR	31'-10"	276	
A2	13	#4	STR	31'-10"	276	
*B1	64	#5	STR	11'-2"	745	
B2	64	#6	STR	11'-8"	1121	
REINFORCING STEEL					LBS.	1397
* EPOXY COATED REINFORCING STEEL					LBS.	1021
CLASS AA CONCRETE					C. Y.	17.0

**APPROACH SLAB AT EB #2**

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
*A1	13	#4	STR	31'-10"	276	
A2	13	#4	STR	31'-10"	276	
*B1	64	#5	STR	11'-2"	745	
B2	64	#6	STR	11'-8"	1121	
REINFORCING STEEL					LBS.	1397
* EPOXY COATED REINFORCING STEEL					LBS.	1021
CLASS AA CONCRETE					C. Y.	17.0

ASSEMBLED BY : R. KNIGHT DATE : 2/2023  
 CHECKED BY : K. SMITH DATE : 3/2023  
 DESIGN ENGINEER OF RECORD : K. SMITH DATE : 3/2023  
 DRAWN BY : MAA 11/11 REV. 12-17 MAA/THC  
 CHECKED BY : AAC 11/11 REV. 08-19 BNB/THC  
 REV. 07/23 BNB/SNM

PROJECT NO. BP5.R131  
VANCE COUNTY  
 STATION: 18+23.50 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**STANDARD BRIDGE APPROACH SLAB FOR PRESTRESSED CONCRETE BOX BEAM UNIT (SUB-REGIONAL TIER) 90° SKEW**

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

TOTAL SHEETS: 16

## STANDARD NOTES

### DESIGN DATA:

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

### MATERIAL AND WORKMANSHIP:

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

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

### CONCRETE:

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

### CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED  $\frac{3}{4}$ " WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO  $\frac{1}{2}$ " RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A  $\frac{1}{4}$ " FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A  $\frac{1}{4}$ " RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

### DOWELS:

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

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

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

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

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

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

### REINFORCING STEEL:

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

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

### STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE  $\frac{7}{8}$ "  $\emptyset$  SHEAR STUDS FOR THE  $\frac{3}{4}$ "  $\emptyset$  STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 -  $\frac{7}{8}$ "  $\emptyset$  STUDS FOR 4 -  $\frac{3}{4}$ "  $\emptyset$  STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF  $\frac{7}{8}$ "  $\emptyset$  STUDS ALONG THE BEAM AS SHOWN FOR  $\frac{3}{4}$ "  $\emptyset$  STUDS BASED ON THE RATIO OF 3 -  $\frac{7}{8}$ "  $\emptyset$  STUDS FOR 4 -  $\frac{3}{4}$ "  $\emptyset$  STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST  $\frac{3}{16}$ " IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

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

### HANDRAILS AND POSTS:

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

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

### SPECIAL NOTES:

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

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