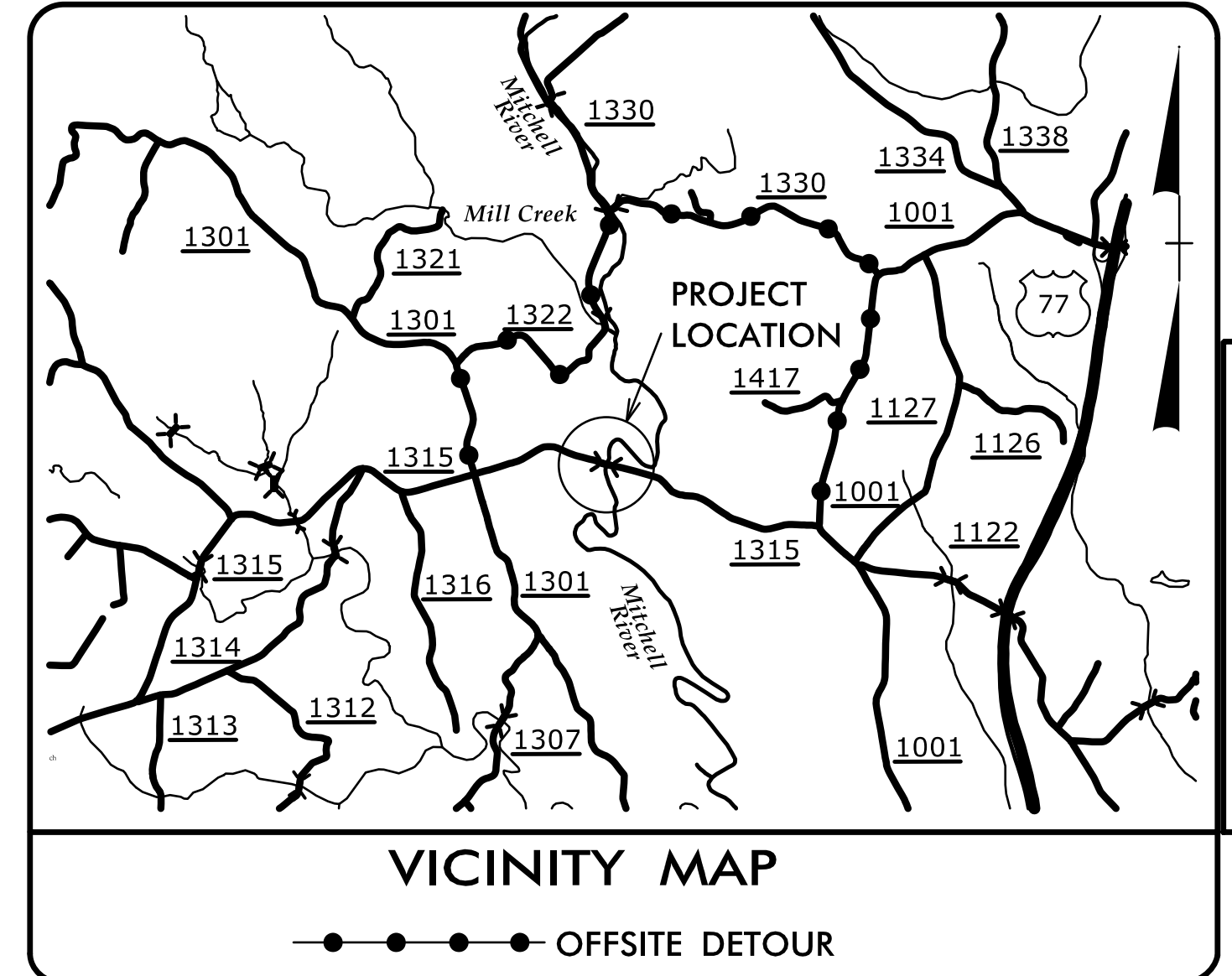


09\_08/2019

**PROJECT: BP11.R005**

**CONTRACT: DK00346**

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

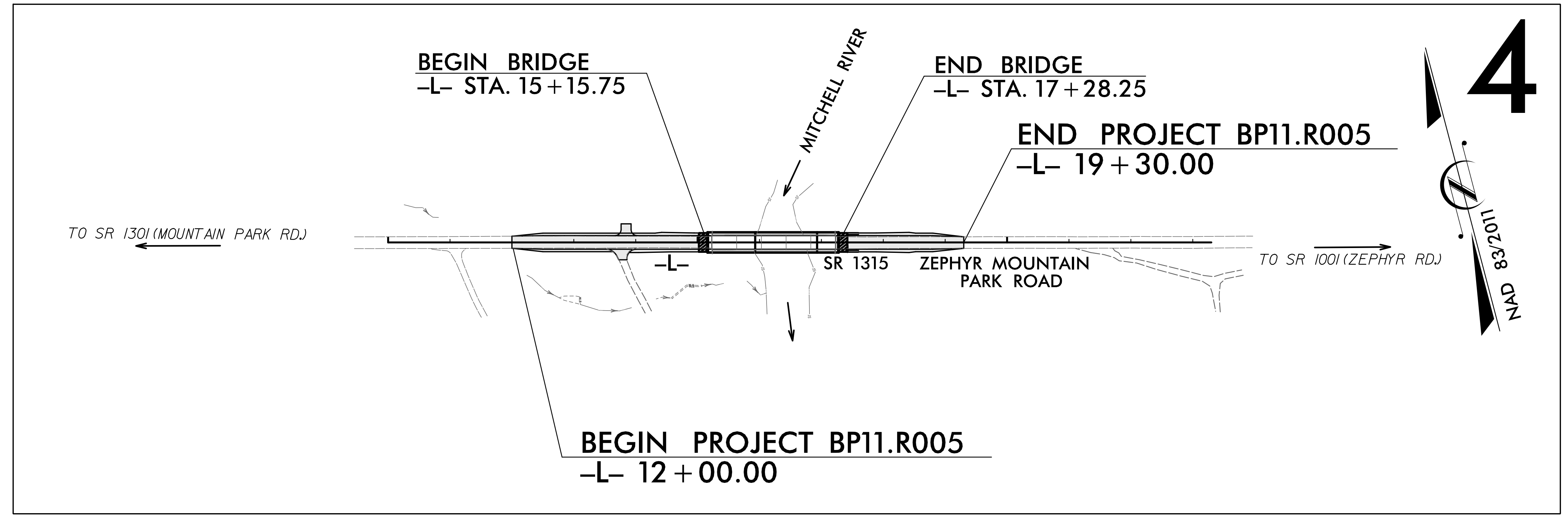


**FINAL PLANS**

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS  
**SURRY COUNTY**

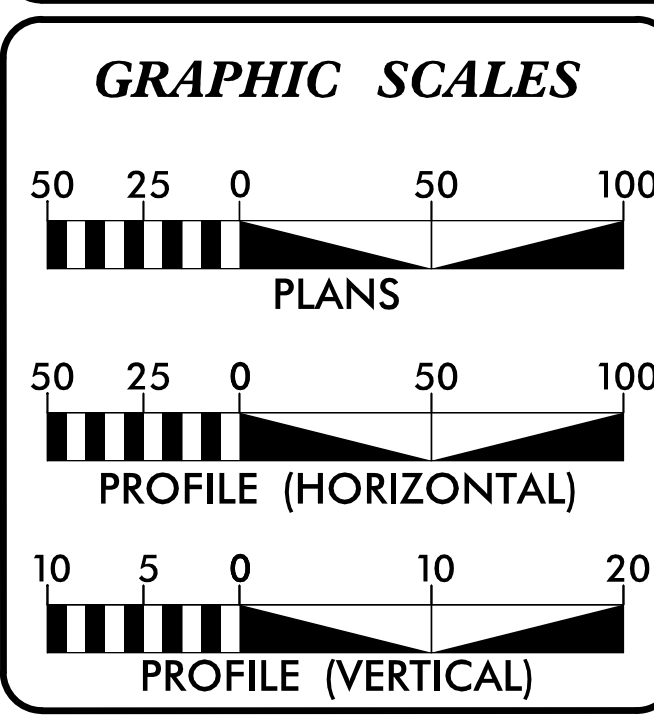
**LOCATION: BRIDGE #850015 ON SR 1315 (ZEPHYR MOUNTAIN PARK RD.)  
OVER MITCHELL RIVER**  
**TYPE OF WORK: GRADING, PAVING, DRAINAGE, & STRUCTURE**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BP11.R005	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
BP11.R005.1	N/A	PE	
BP11.R005.2	N/A	ROW, UTIL.	
BP11.R005.3	N/A	CONST.	



A DESIGN EXCEPTION WILL BE REQUIRED FOR GRADE, SAG VERTICAL CURVE K, AND VERTICAL SSD

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED



**DESIGN DATA**

ADT 2023 =	1,261
ADT 2045 =	1,570
K =	- %
D =	- %
T =	7 % *
V =	60 MPH
* TTST = 3% DUAL = 4%	
FUNC CLASS =	
MAJOR COLLECTOR	
REGIONAL TIER	

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT BP11.R005	=	0.098 MILES
LENGTH STRUCTURE TIP PROJECT BP11.R005	=	0.040 MILES
TOTAL LENGTH TIP PROJECT BP11.R005	=	0.138 MILES

**NC DOT CONTACT: ROB WEISZ, PE**

<b>PLANS PREPARED BY:</b> TGS ENGINEERS 201 W. MARION ST STE 200 SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275	<b>PLANS PREPARED FOR:</b> NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION 11 801 Statesville Rd North Wilkesboro, NC 28659
<b>RIGHT OF WAY DATE:</b> MARCH 1, 2022	<b>JIMMY L. TERRY, PE</b> PROJECT ENGINEER
<b>LETTING DATE:</b> NOVEMBER 16, 2023	<b>AUSTIN R. TURNER, PE</b> PROJECT DESIGN ENGINEER

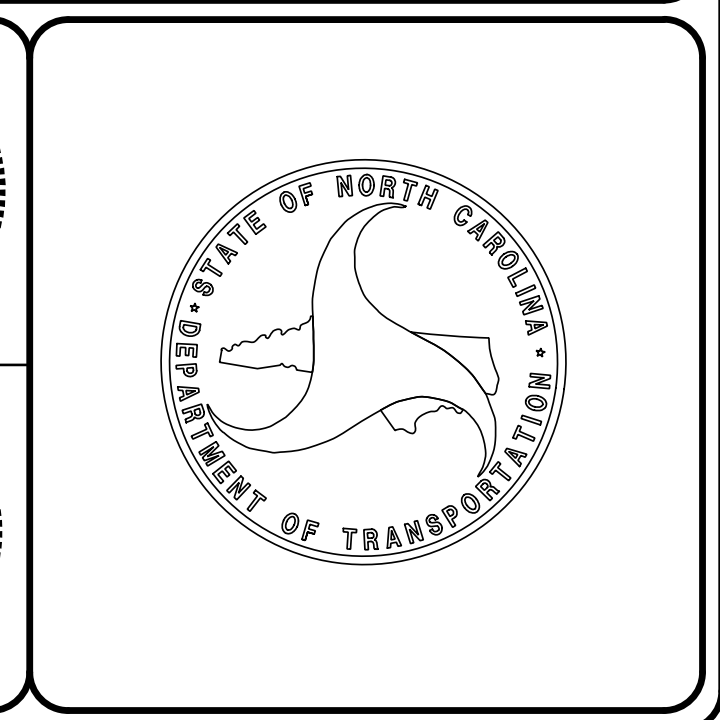
2018 STANDARD SPECIFICATIONS

**HYDRAULICS ENGINEER**  
10/2/2023

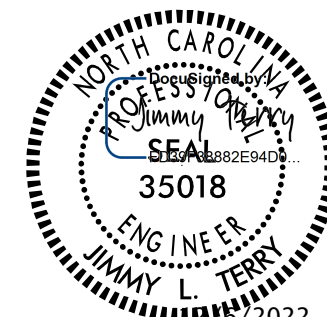
DocuSigned by:  
*Randy Henegar*  
SIGNATURE P.E.

**ROADWAY DESIGN ENGINEER**  
10/2/2023

DocuSigned by:  
*Jimmy Terry*  
SIGNATURE P.E.



10/2/2023  
X:\NCDOT\Div. II Surry 15\Roadway\Proj\Surry\_15\_Rdy\_1sh.dgn  
User:cbpue11

PROJECT REFERENCE NO. <i>BP11.R005</i>	SHEET NO. <i>1A</i>
ROADWAY DESIGN ENGINEER	
	

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

# INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
2A-1	PAVEMENT SCHEDULE AND TYPICAL SECTIONS
2C-1	SPECIAL DETAIL - W BEAM RAIL SECTION
2C-2	SPECIAL DETAIL - STRUCTURAL ANCHOR UNITS - TYPE III
3B-1	ROADWAY SUMMARIES
3D-1	DRAINAGE SUMMARY
4	PLAN SHEET
5	PROFILE SHEET
RW-01 THRU RW-04	SURVEY CONTROL SHEETS
TMP-1 THRU TMP-3	TRANSPORTATION MANAGEMENT PLANS
PMP-1 THRU PMP-2	PAVEMENT MARKING PLANS
EC-1 THRU EC-5	EROSION CONTROL PLANS
RF-1	REFORESTATION DETAIL SHEET
UO-1 THRU UO-2	UTILITIES BY OTHERS PLANS
X-1A	CROSS-SECTION SUMMARY SHEET
X-1 THRU X-5	CROSS-SECTIONS
S-1 THRU S-33	STRUCTURE PLANS

# GENERAL NOTES

**GENERAL NOTES:**

2018 SPECIFICATIONS  
EFFECTIVE: 01-16-2018  
REVISED:

**GRADE LINE:  
GRADING AND SURFACING:**

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

**CLEARING:**

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

**SUPERELEVATION:**

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

**SHOULDER CONSTRUCTION:**

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

**SIDE ROADS:**

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

**SUBSURFACE DRAINS:**

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

**GUARDRAIL:**

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

**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 SURRY TELEPHONE MC AND CENTURY LINK.

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

**RIGHT-OF-WAY MARKERS:**

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

# STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated January, 2018 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
<b>DIVISION 2 - EARTHWORK</b>	
200.02	Method of Clearing - Method II
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
<b>DIVISION 3 - PIPE CULVERTS</b>	
300.01	Method of Pipe Installation
310.10	Driveway Pipe Construction
<b>DIVISION 4 - MAJOR STRUCTURES</b>	
422.02	Bridge Approach Fills - Type II Modified Approach Fill
<b>DIVISION 5 - SUBGRADE, BASES AND SHOULDERS</b>	
560.01	Method of Shoulder Construction - High Side of Superelevated Curve - Method I
<b>DIVISION 8 - INCIDENTALS</b>	
815.02	Subsurface Drain
840.00	Concrete Base Pad for Drainage Structures
840.29	Frames and Narrow Slot Flat Grates
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.66	Drainage Structure Steps
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets



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

Note: Not to Scale

## BOUNDARIES AND PROPERTY:

State Line	_____
County Line	_____
Township Line	_____
City Line	_____
Reservation Line	_____
Property Line	_____
Existing Iron Pin (EIP)	○
Computed Property Corner	×
Existing Concrete Monument (ECM)	□
Parcel/Sequence Number	(23)
Existing Fence Line	-x-x-x-
Proposed Woven Wire Fence	○
Proposed Chain Link Fence	□
Proposed Barbed Wire Fence	◇
Existing Wetland Boundary	-WLB-
Proposed Wetland Boundary	-WLB-
Existing Endangered Animal Boundary	-EAB-
Existing Endangered Plant Boundary	-EPB-
Existing Historic Property Boundary	-HPB-
Known Contamination Area: Soil	-S-S-
Potential Contamination Area: Soil	-S-S-
Known Contamination Area: Water	-W-W-
Potential Contamination Area: Water	-W-W-
Contaminated Site: Known or Potential	☠ ☡

## BUILDINGS AND OTHER CULTURE:

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

## HYDROLOGY:

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

## RAILROADS:

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

## RIGHT OF WAY & PROJECT CONTROL:

Primary Horiz Control Point	○
Primary Horiz and Vert Control Point	●
Secondary Horiz and Vert Control Point	◆
Vertical Benchmark	⊠
Existing Right of Way Monument	△
Proposed Right of Way Monument (Rebar and Cap)	▲
Proposed Right of Way Monument (Concrete)	⊙
Existing Permanent Easement Monument	◇
Proposed Permanent Easement Monument (Rebar and Cap)	◆
Existing C/A Monument	△
Proposed C/A Monument (Rebar and Cap)	▲
Proposed C/A Monument (Concrete)	⊙
Existing Right of Way Line	_____
Proposed Right of Way Line	_____
Existing Control of Access Line	_____
Proposed Control of Access Line	_____
Proposed ROW and CA Line	_____
Existing Easement Line	_____
Proposed Temporary Construction Easement	_____
Proposed Temporary Drainage Easement	_____
Proposed Permanent Drainage Easement	_____
Proposed Permanent Drainage/Utility Easement	_____
Proposed Permanent Utility Easement	_____
Proposed Temporary Utility Easement	_____
Proposed Aerial Utility Easement	_____

## ROADS AND RELATED FEATURES:

Existing Edge of Pavement	_____
Existing Curb	_____
Proposed Slope Stakes Cut	_____
Proposed Slope Stakes Fill	_____
Proposed Curb Ramp	_____
Existing Metal Guardrail	_____
Proposed Guardrail	_____
Existing Cable Guiderail	_____
Proposed Cable Guiderail	_____
Equality Symbol	⊕
Pavement Removal	_____
VEGETATION:	
Single Tree	○
Single Shrub	○
Hedge	_____

Woods Line	_____
Orchard	_____
Vineyard	_____

## EXISTING STRUCTURES:

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:

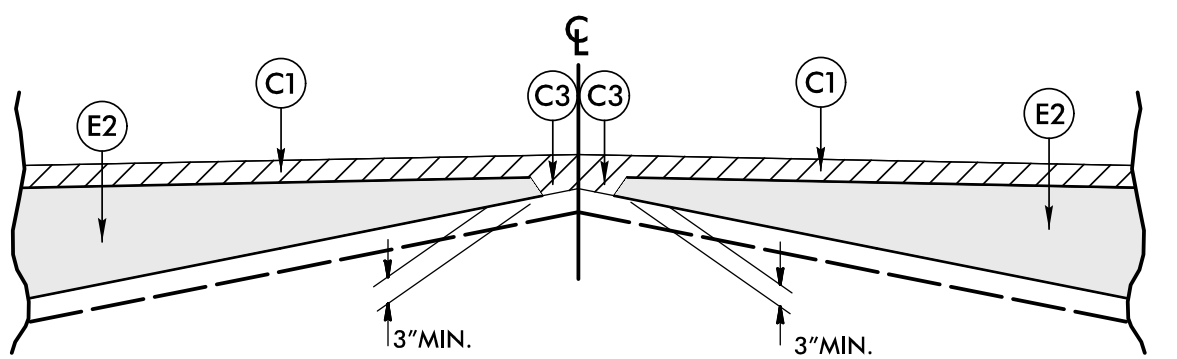
Utility Pole	●
Utility Pole with Base	□
Utility Located Object	○
Utility Traffic Signal Box	⊠
Utility Unknown U/G Line (SUE - LOS B)*	_____
U/G Tank; Water, Gas, Oil	_____
Underground Storage Tank, Approx. Loc.	_____
A/G Tank; Water, Gas, Oil	_____
Geoenvironmental Boring	⊕
Abandoned According to Utility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

6/2/2022

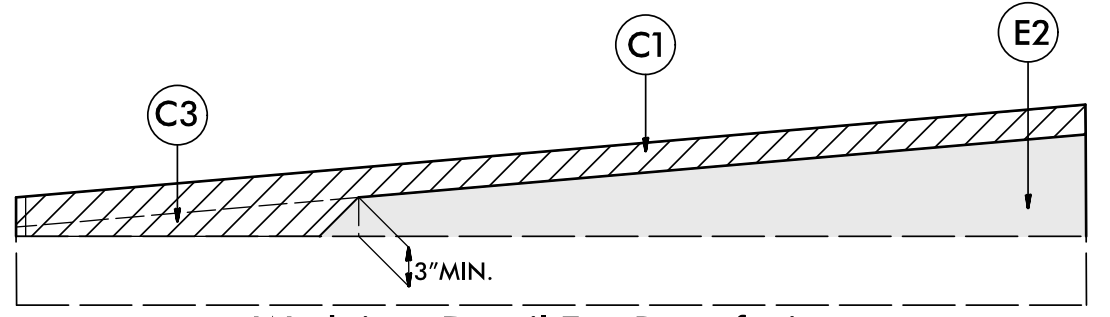
# PAVEMENT SCHEDULE

C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1½" IN DEPTH.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH.
R1	SHOULDER BERM GUTTER
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V	MILLING ASPHALT PAVEMENT, SEE THIS SHEET FOR DETAIL
W	WEDGING EXISTING PAVEMENT, SEE THIS SHEET FOR DETAIL

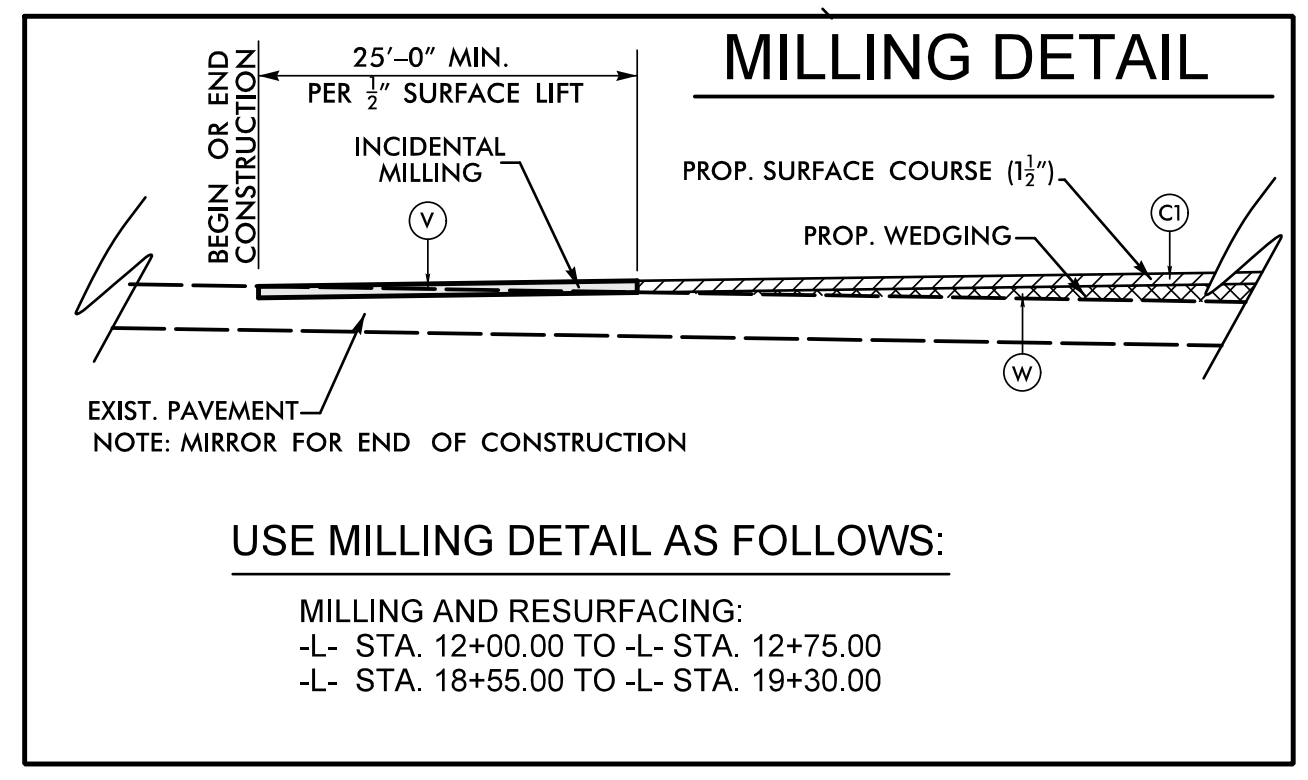
PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



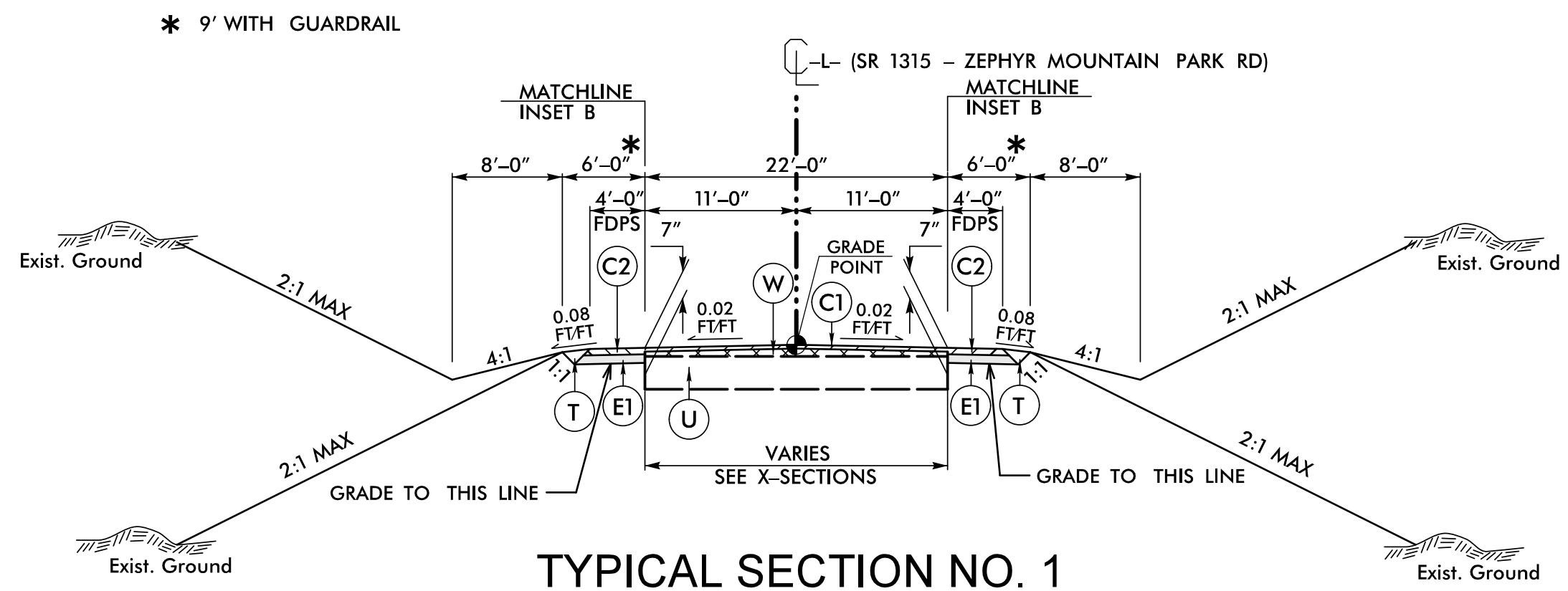
Detail Showing Method of Wedging



Wedging Detail For Resurfacing



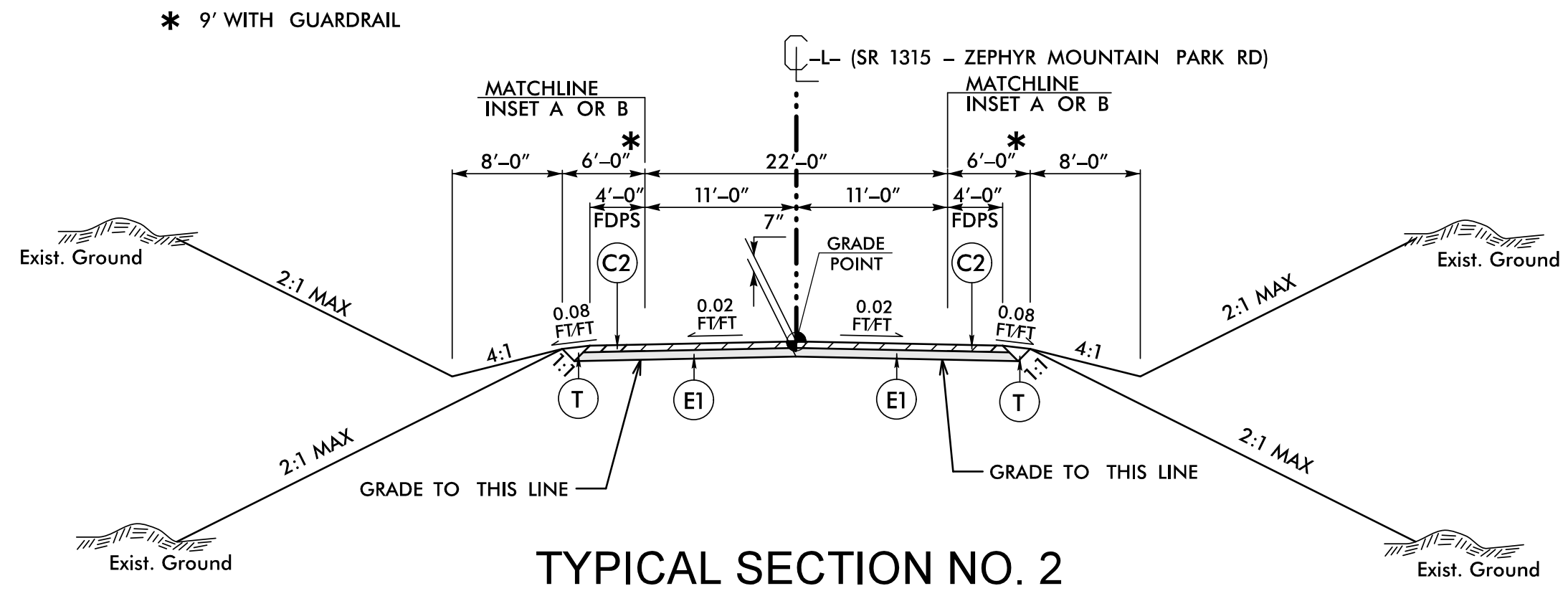
**USE MILLING DETAIL AS FOLLOWS:**  
 MILLING AND RESURFACING:  
 -L- STA. 12+00.00 TO -L- STA. 12+75.00  
 -L- STA. 18+55.00 TO -L- STA. 19+30.00



## TYPICAL SECTION NO. 1

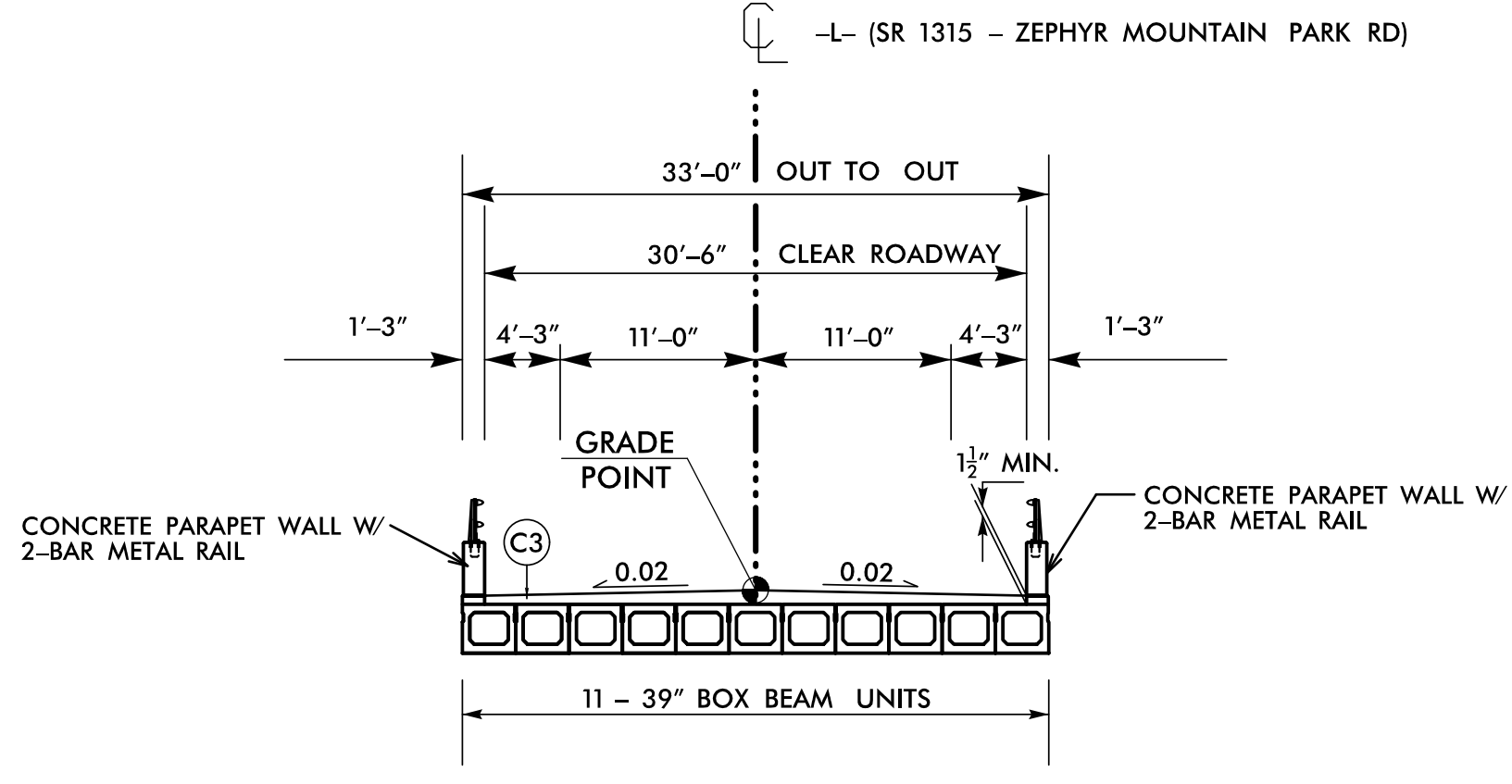
USE TYPICAL SECTION NO. 1  
 -L- STA. 12+50.00 TO -L- STA. 14+50.00  
 -L- STA. 18+00.00 TO -L- STA. 18+80.00

NOTE: TRANSITION BETWEEN EXISTING AND TYP. SECT. NO.1 AS FOLLOWS:  
 -L- STA. 12+00.00 TO -L- STA. 12+50.00  
 -L- STA. 18+80.00 TO -L- STA. 19+30.00



## TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2  
 -L- STA. 14+50.00 TO -L- STA. 15+15.75 (BEGIN BRIDGE)  
 -L- STA. 17+28.25 (END BRIDGE) TO -L- STA. 18+00.00

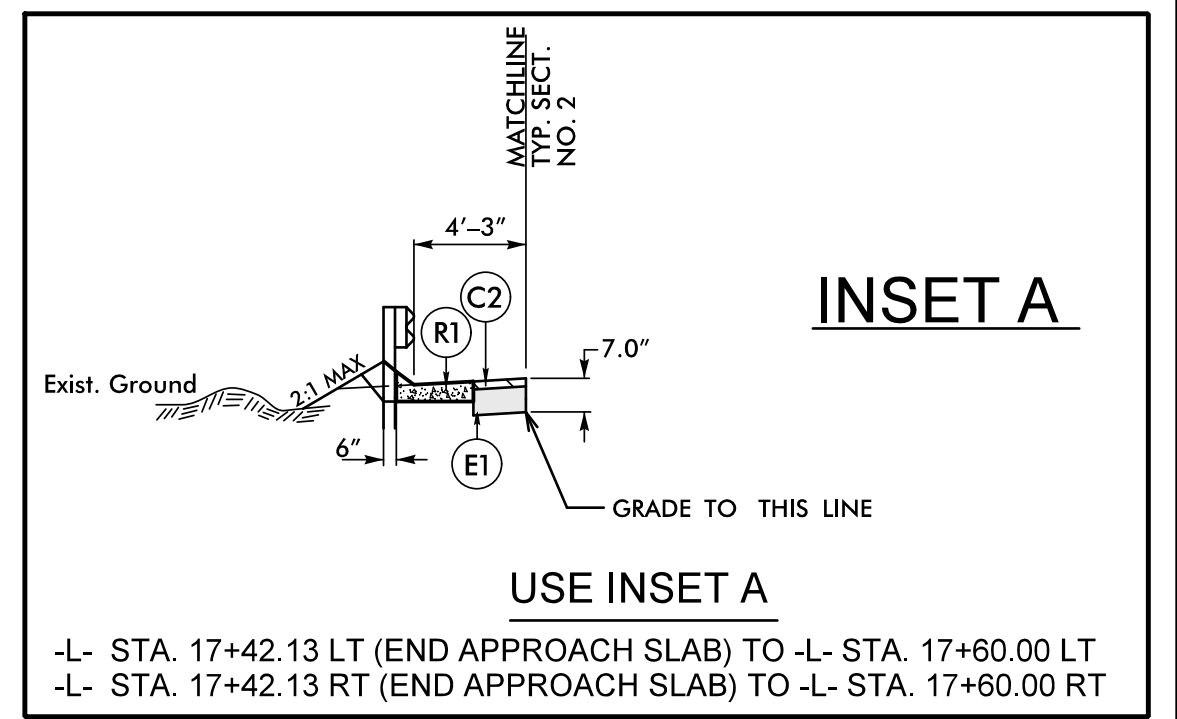


## TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3  
 -L- STA. 15+15.75 TO -L- STA. 17+28.25

SURRY COUNTY  
 BRIDGE #850015

PROJECT REFERENCE NO. BPII.R005	SHEET NO. 2A-1
ROADWAY DESIGN ENGINEER JIMMY L. TERRY 35018 12/6/2022	PAVEMENT DESIGN ENGINEER RAME A. SHAW 049851 12/7/2022
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
 TGS ENGINEERS 201 W. MARION ST. STE. 200 SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275	



## INSET A

USE INSET A  
 -L- STA. 17+42.13 LT (END APPROACH SLAB) TO -L- STA. 17+60.00 LT  
 -L- STA. 17+42.13 RT (END APPROACH SLAB) TO -L- STA. 17+60.00 RT

\* ADD 3' FOR GUARDRAIL LOCATIONS

NOTE:  
 AT GUARDRAIL LOCATIONS PAVE TO FACE OF GUARDRAIL UNLESS SHOWN OTHERWISE ON PLANS.

## USE INSET B

** FDPS WIDTH	STA. TO STA.
0'-0" TO 4'-0"	-L- STA. 12+00.00 TO -L- STA. 12+50.00 LT/RT
4'-0" TO 5'-3"	-L- STA. 13+89.40 TO -L- STA. 15+01.88 (BEGIN APPROACH SLAB) RT
	-L- STA. 14+31.29 TO -L- STA. 15+01.88 (BEGIN APPROACH SLAB) LT
5'-3" TO 4'-0"	-L- STA. 17+60.00 (END SBG) TO -L- STA. 18+52.24 LT/RT
4'-0" TO 0'-0"	-L- STA. 18+80.00 TO -L- STA. 19+30.00 LT/RT

K:\2022\2022\Div 11\_Surry\_15\Roadway\Proj\Surry\_15\_Rdy\_tjup.dgn  
 User:Smalvin



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

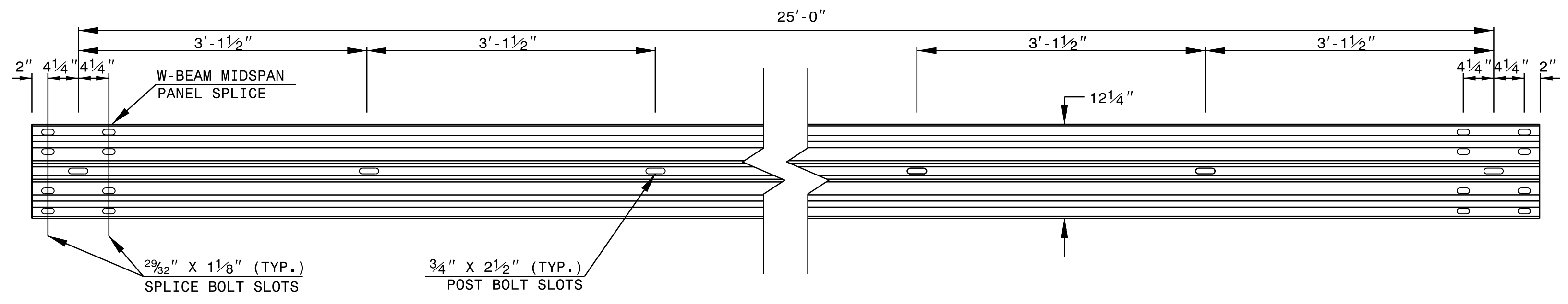
ROADWAY DETAIL DRAWING FOR  
**GUARDRAIL INSTALLATION**

SHEET 6 OF 8  
**862D02**

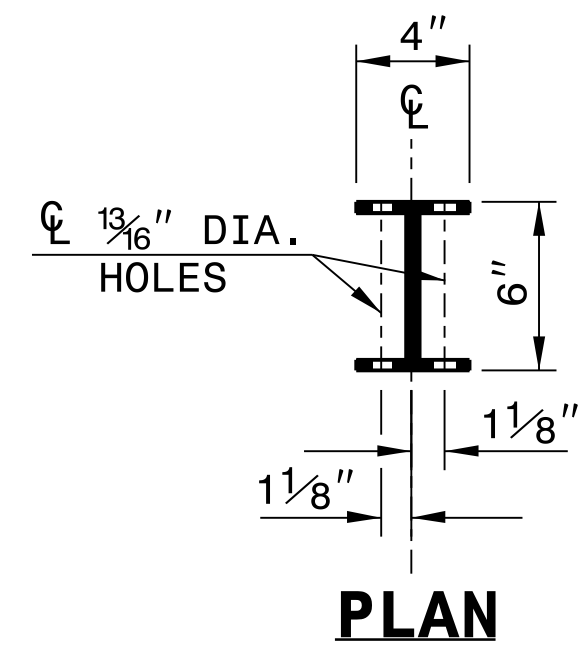
STATE OF NORTH CAROLINA  
DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR  
**GUARDRAIL INSTALLATION**

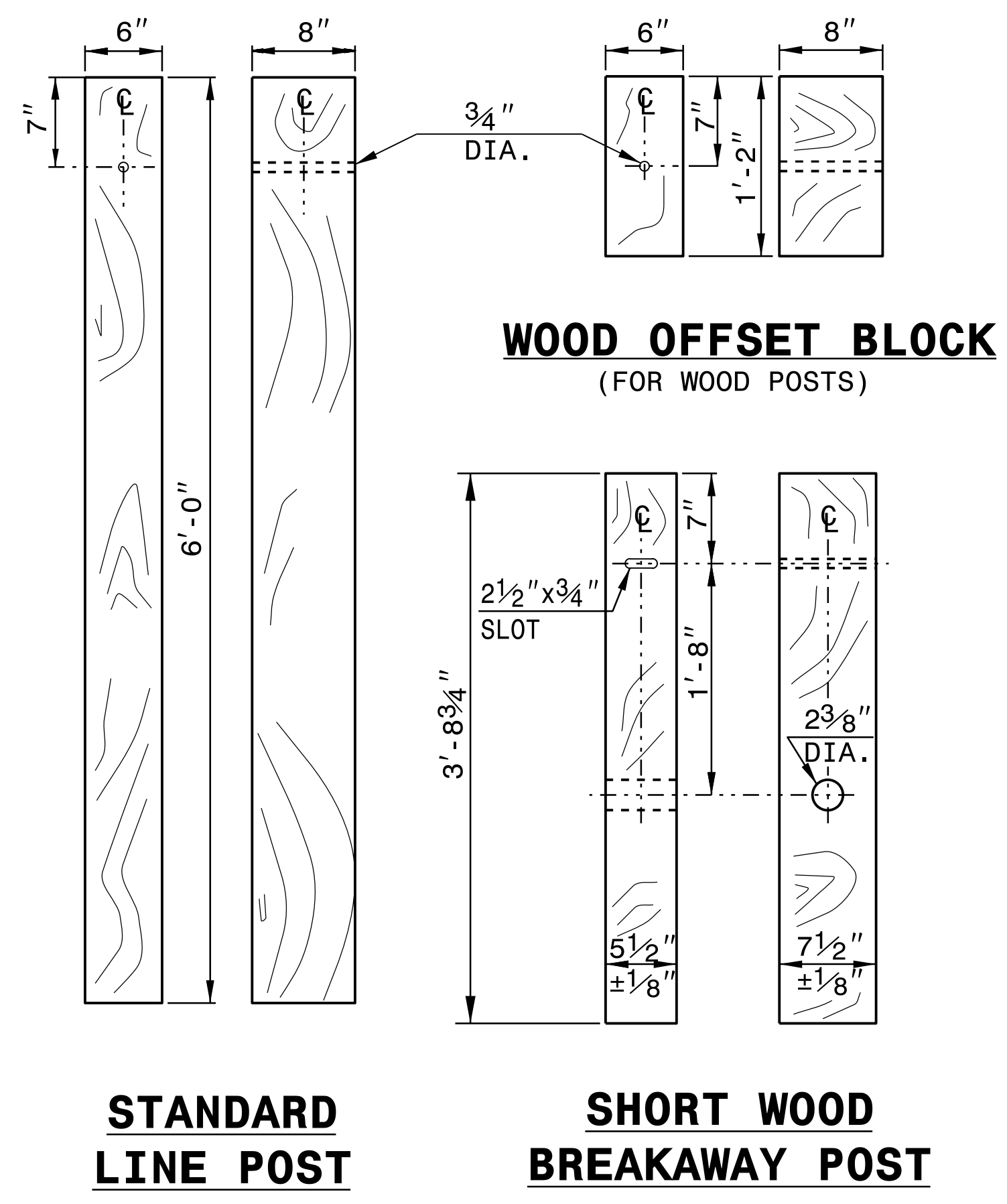
SHEET 6 OF 8  
**862D02**



**STANDARD W-BEAM GUARDRAIL**



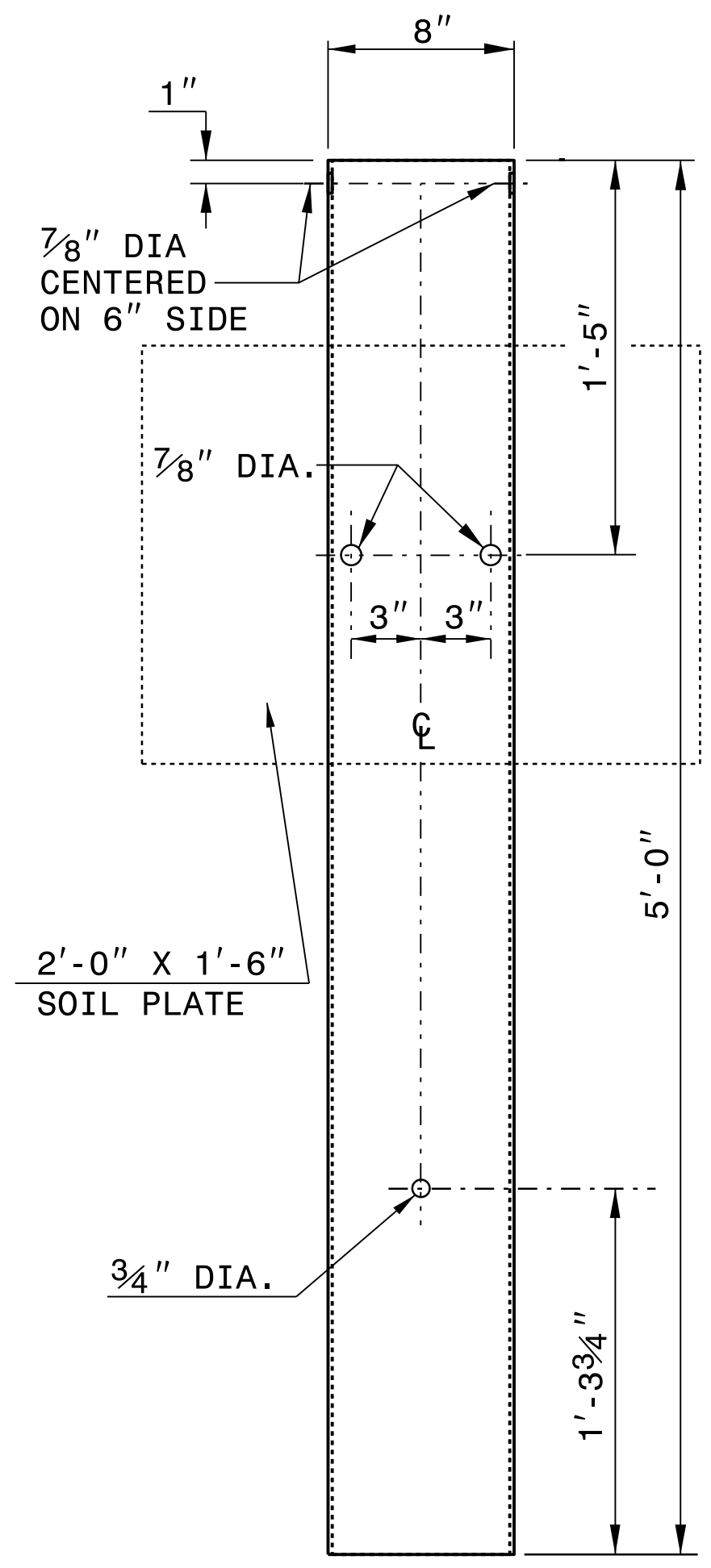
**PLAN**



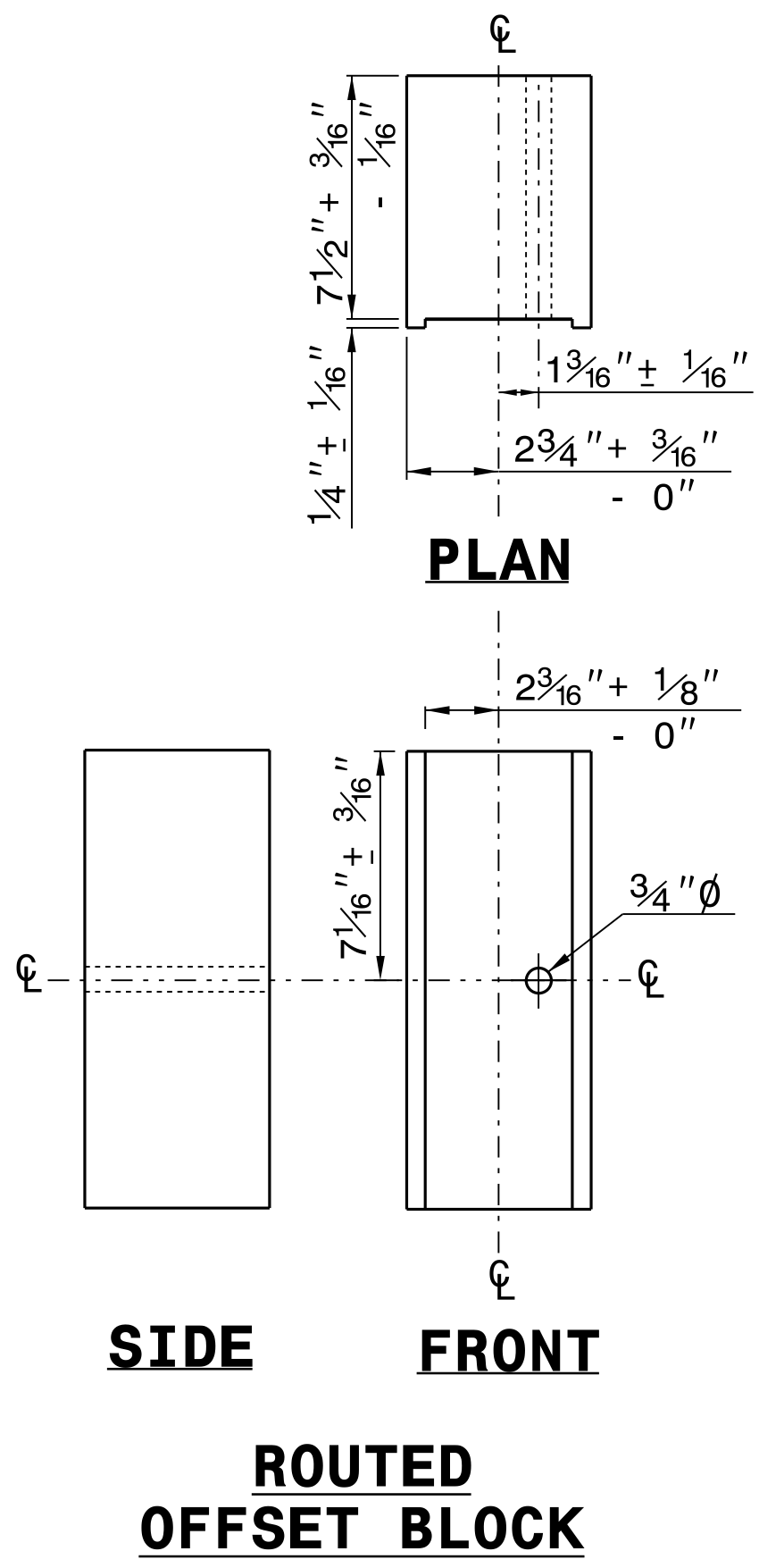
**WOOD OFFSET BLOCK  
(FOR WOOD POSTS)**

**STANDARD  
LINE POST**

**SHORT WOOD  
BREAKAWAY POST**



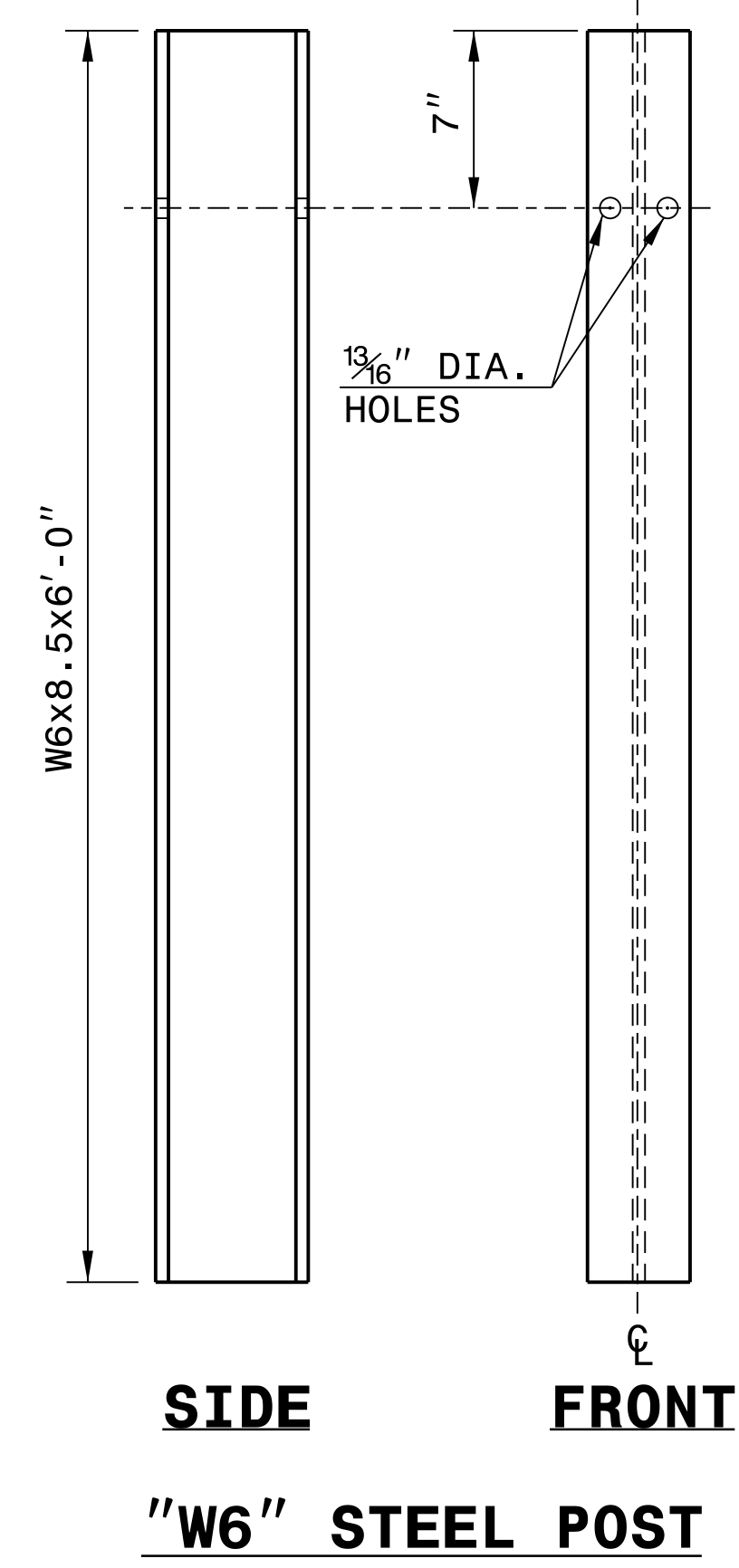
**STEEL TUBE  
TS 6"x8"x0.1875"**



**SIDE**

**FRONT**

**ROUTED  
OFFSET BLOCK**

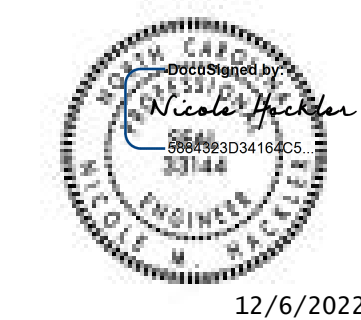


**SIDE**

**FRONT**

**"W6" STEEL POST**

**SYSTEM PARTS**



12/6/2022

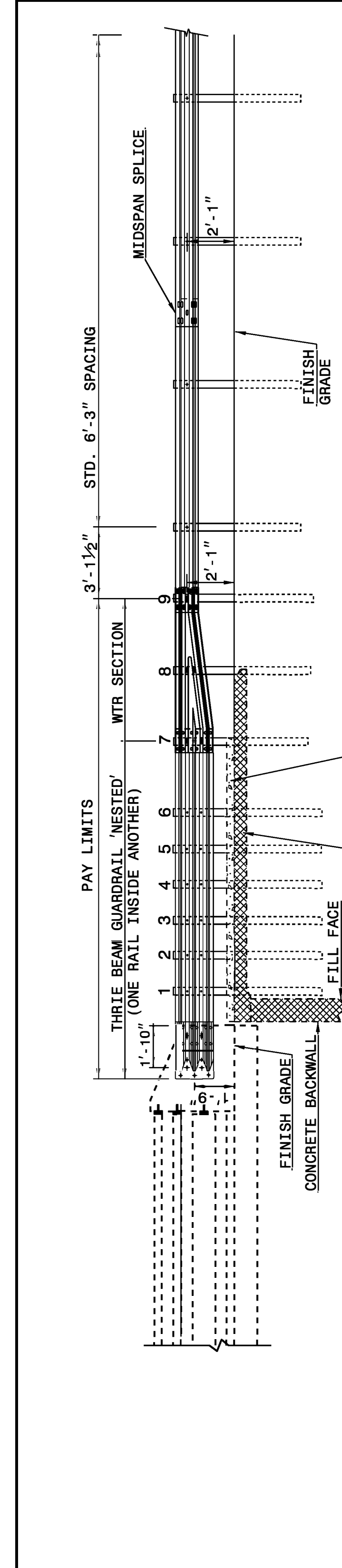
**CONTRACTS STANDARDS  
AND DEVELOPMENT UNIT**  
Office 919-707-6950 FAX 919-250-4119

**SEE TITLE BLOCK**

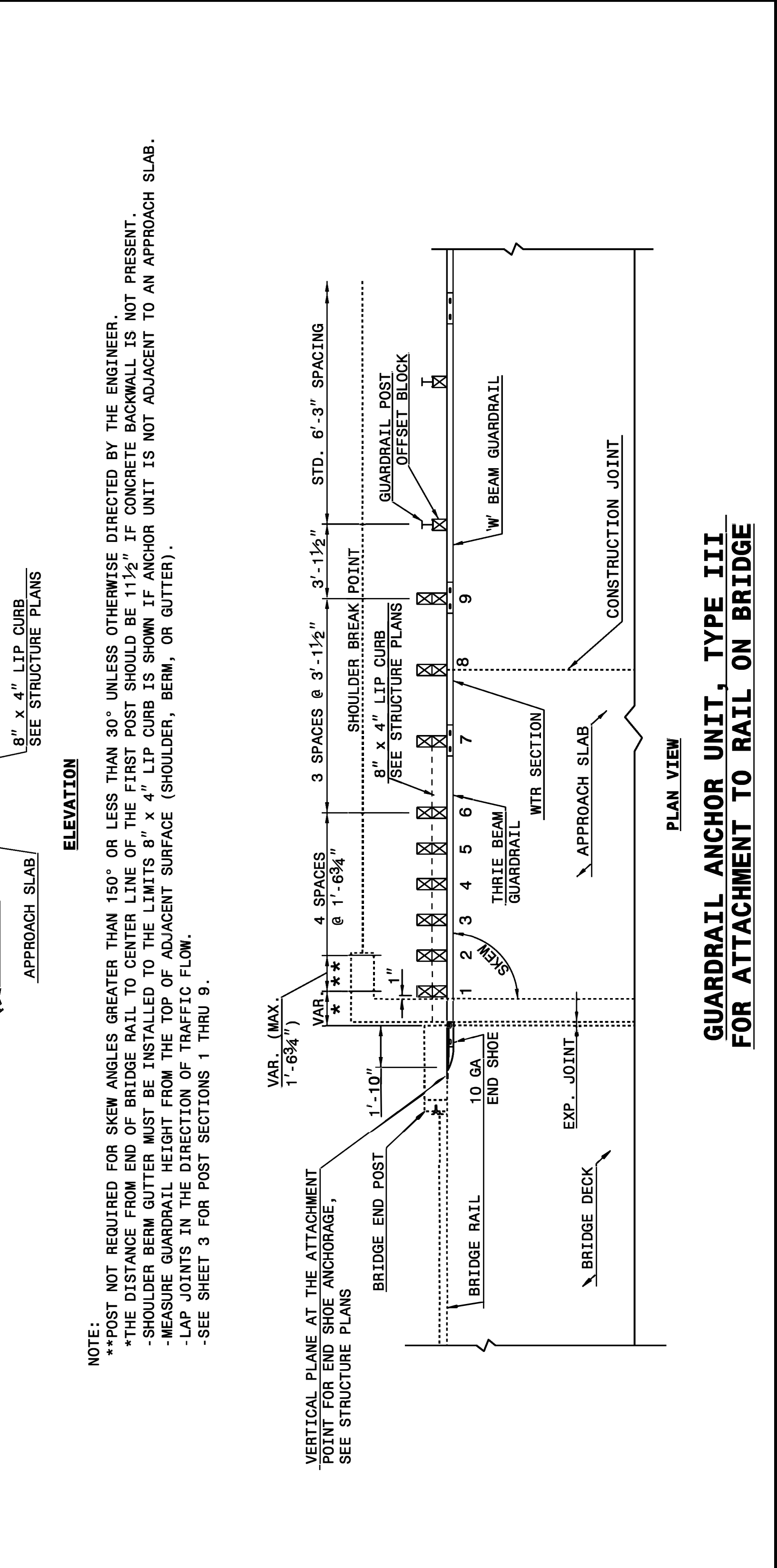
ORIGINAL BY: J. HOWERTON	DATE: 3-7-2018
MODIFIED BY:	DATE:
CHECKED BY:	DATE:
FILE SPEC.:	

14-DEC-2017 10:36 S:\Contracts\2018\Standard Drawings\Special Details\Standard Drawings\Division 8\0862d0301.dgn  
Jhowerton AT: CSO-212855

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

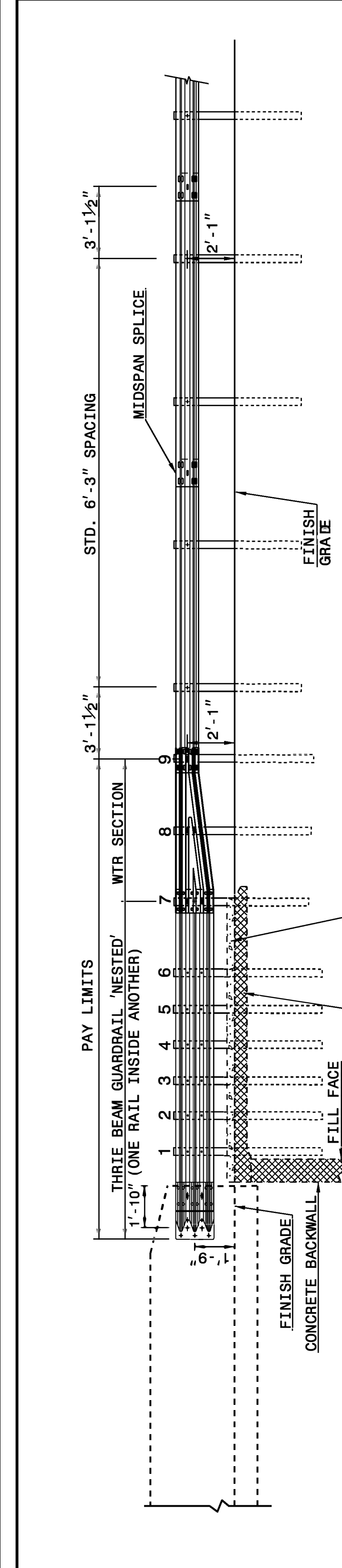


ROADWAY DETAIL DRAWING FOR STRUCTURE ANCHOR UNITS GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE

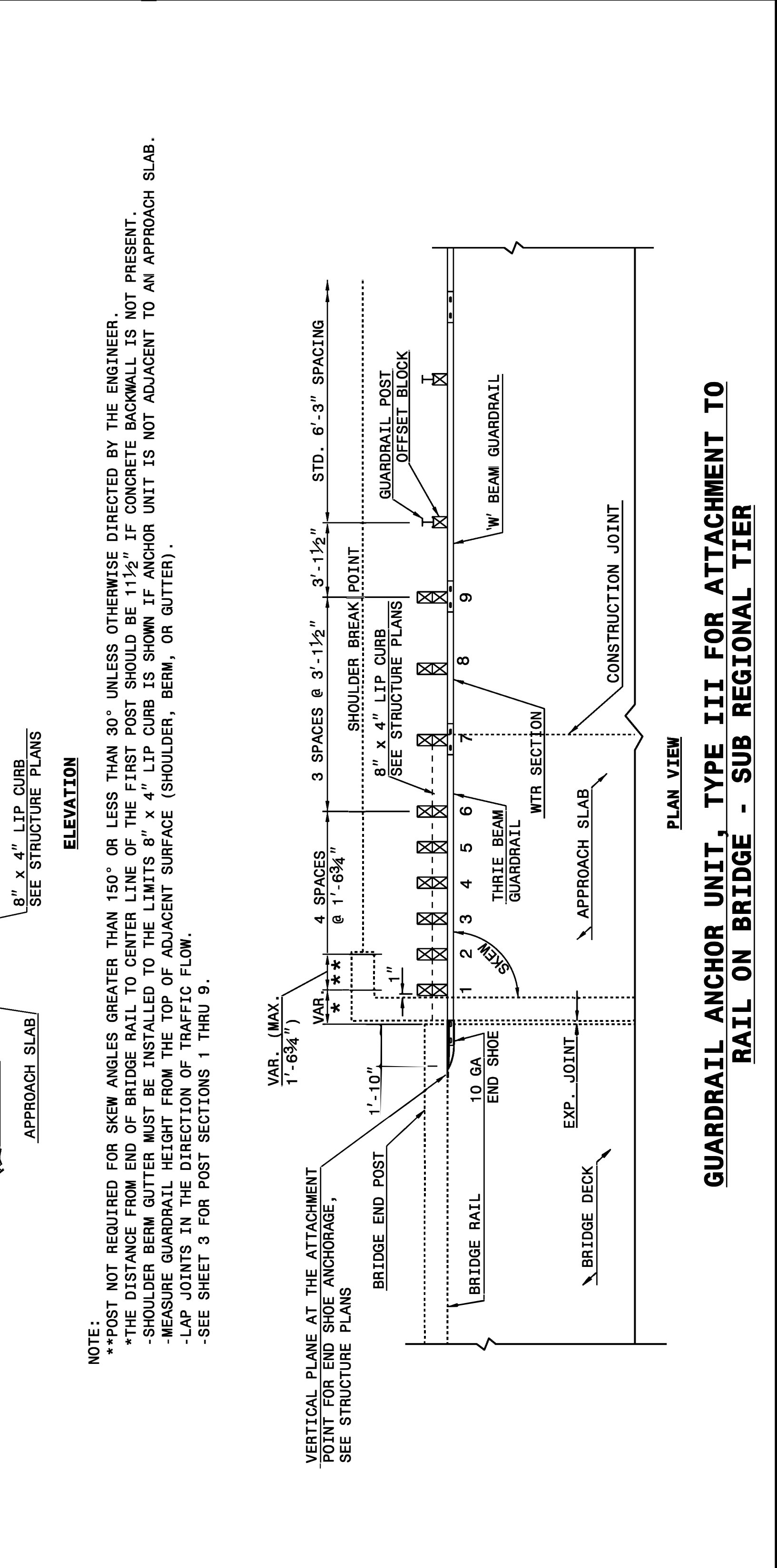


STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

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



ROADWAY DETAIL DRAWING FOR STRUCTURE ANCHOR UNITS GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE - SUB REGIONAL TIER



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

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

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

**SEE TITLE BLOCK**

ORIGINAL BY: J HOWERTON DATE: 06-22-12  
MODIFIED BY: DATE:  
CHECKED BY: DATE:  
FILE SPEC.: DATE:



12/6/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SHEET 1 OF 7 862D03

ROADWAY DETAIL DRAWING FOR STRUCTURE ANCHOR UNITS GUARDRAIL ANCHOR UNIT, TYPE III FOR ATTACHMENT TO RAIL ON BRIDGE - SUB REGIONAL TIER

SHEET 2 OF 7 862D03

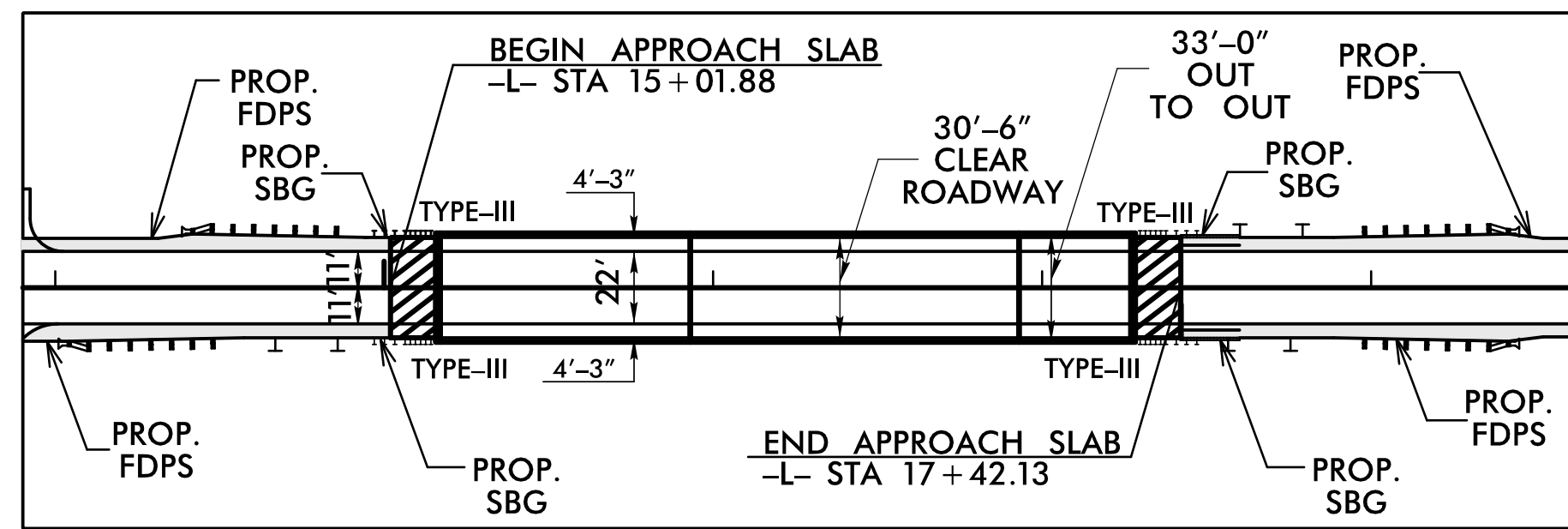




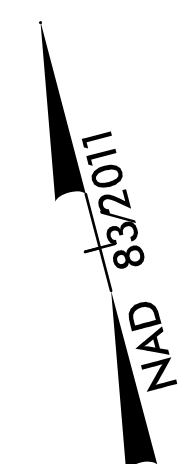




8/17/99

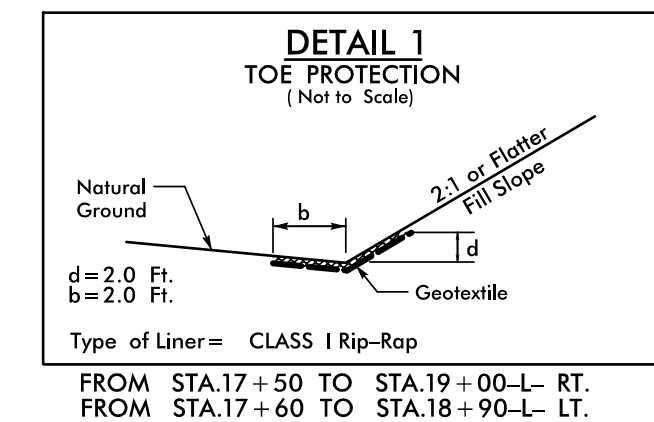
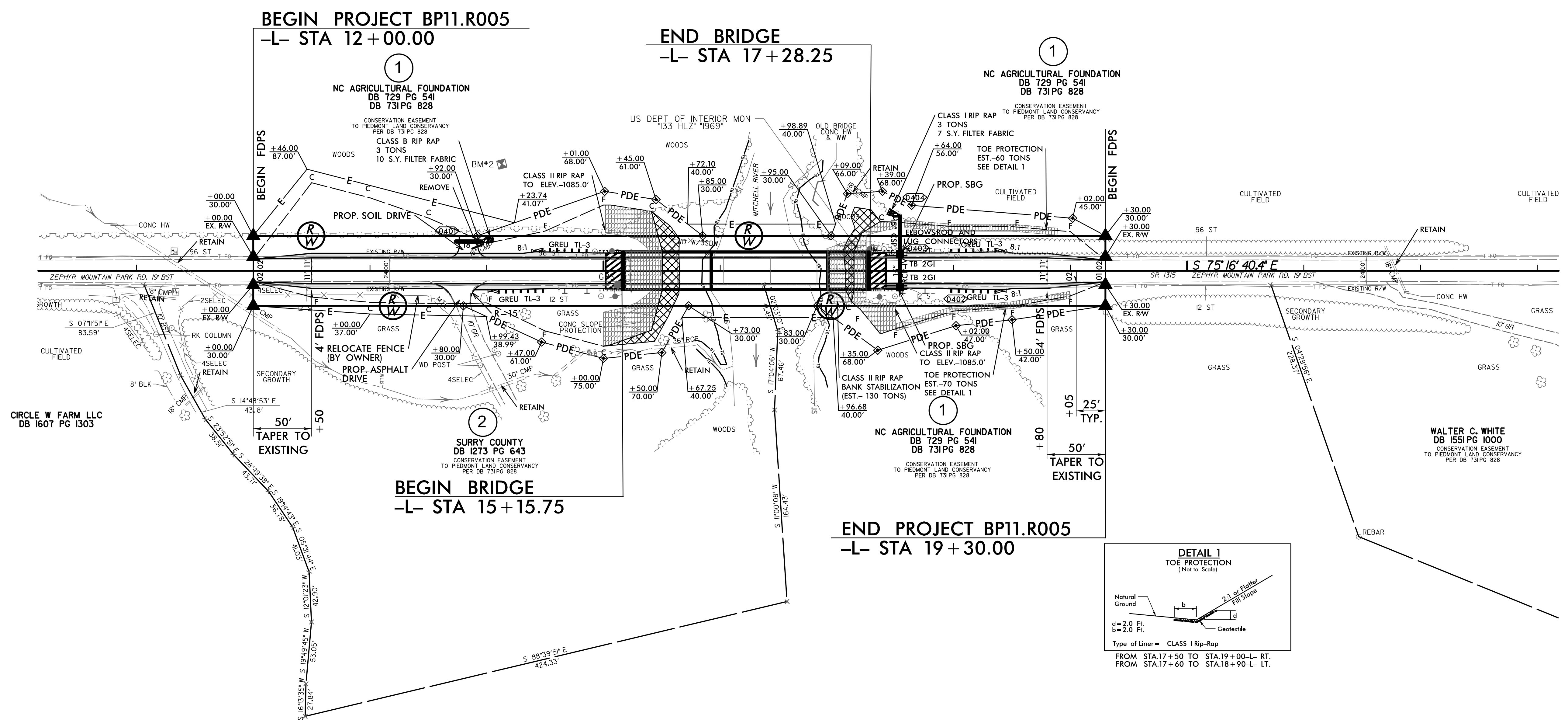


FOR STRUCTURE PLANS, SEE SHEET S-1 THRU S-33



PROJECT REFERENCE NO. <i>BP11.R005</i>		SHEET NO. 4	
RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER		ENGINEER	
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>			
<b>TGS ENGINEERS</b> 201 W. MARION ST STE 200 SHELBY, NC 28150 PH: (704) 476-0003 CORP. LICENSE NO.: C-0275			

REVISIONS



ALL DRIVE RADII ARE 20' UNLESS OTHERWISE NOTED

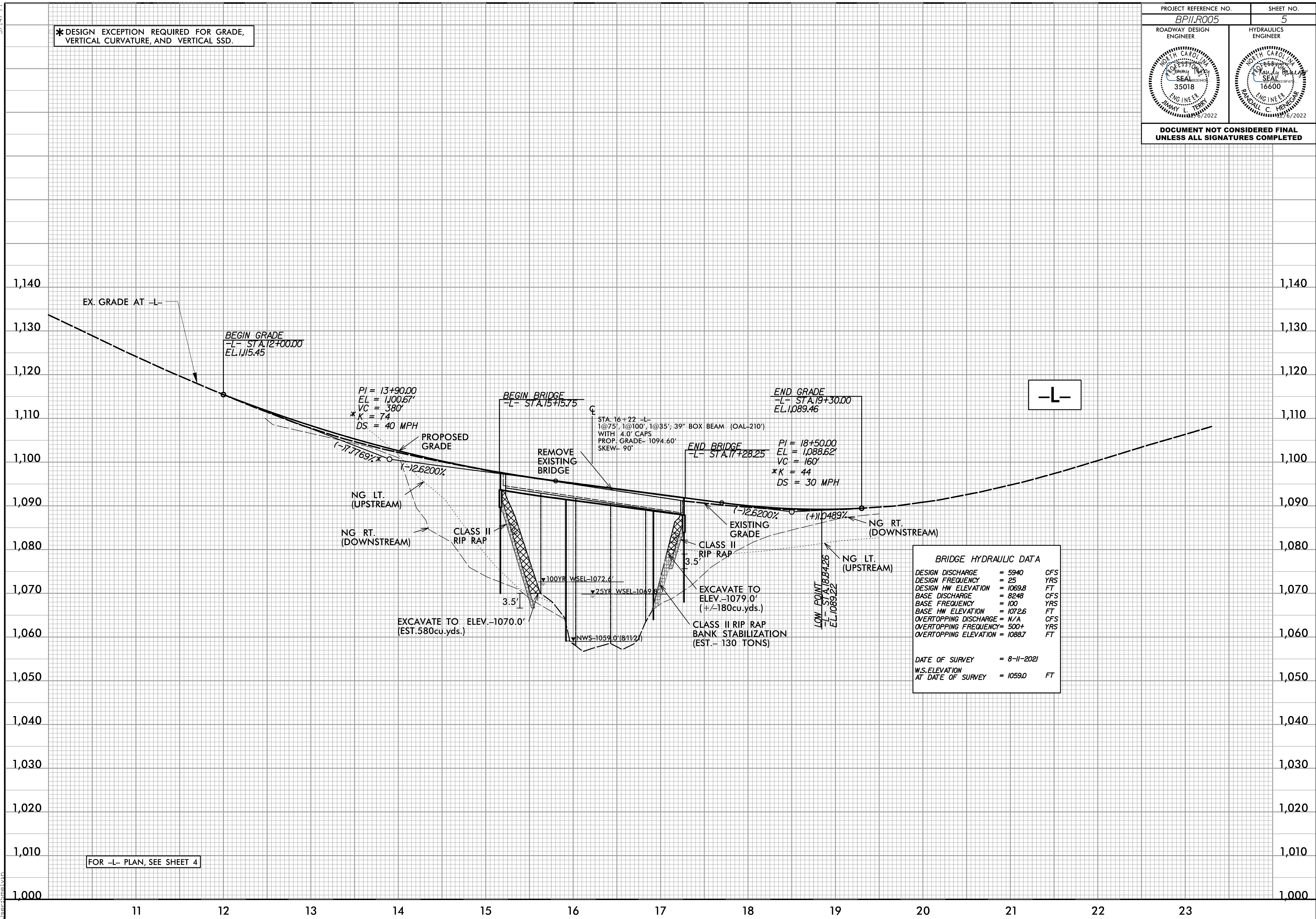
SEE SHEET 5 FOR -L- GRADE

12/6/2022  
 K:\KORNER\Div 11\_Surry\_15\Roadway\Proj\Surry\_15\RDY\_psh04.dgn  
 User:smelvin

5/14/99

\* DESIGN EXCEPTION REQUIRED FOR GRADE, VERTICAL CURVATURE, AND VERTICAL SSD.

PROJECT REFERENCE NO. <i>BPII.R005</i>	SHEET NO. 5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	





09/06/99

**TIP PROJECT: 85-0015**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	85-0015	RW01	04

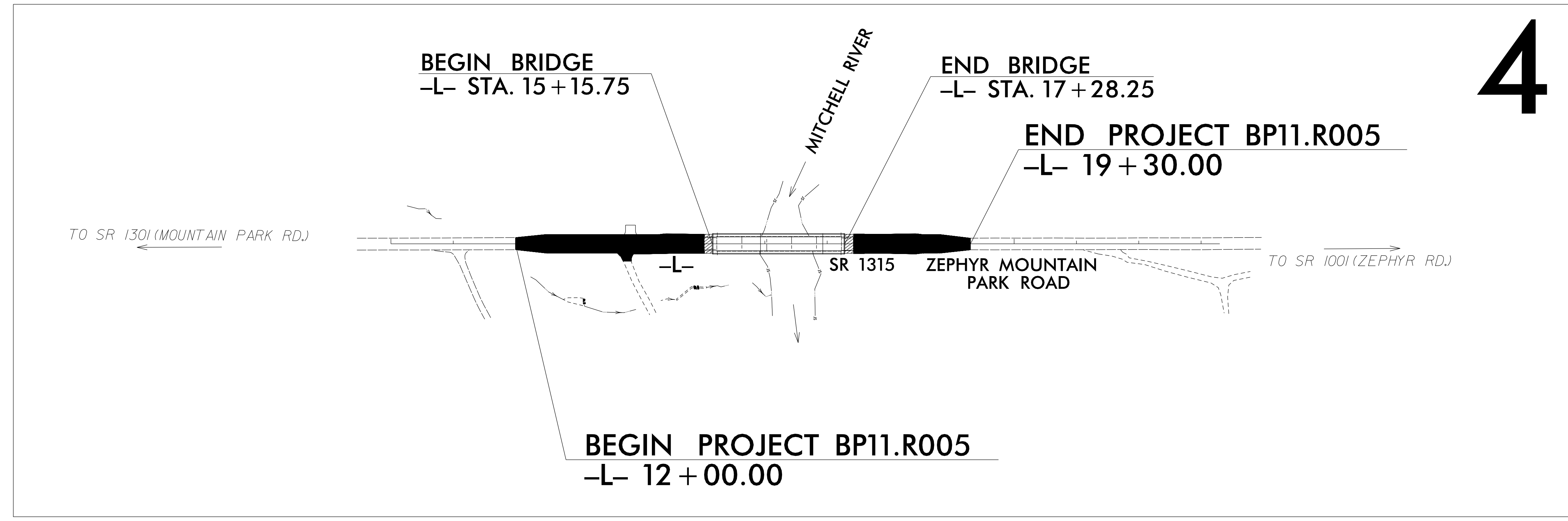
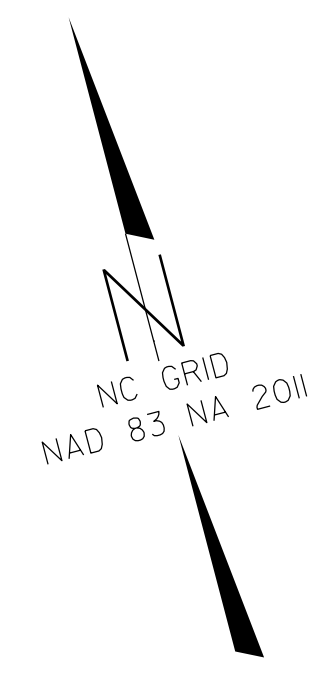
STATE OF NORTH CAROLINA  
 DIVISION OF HIGHWAYS

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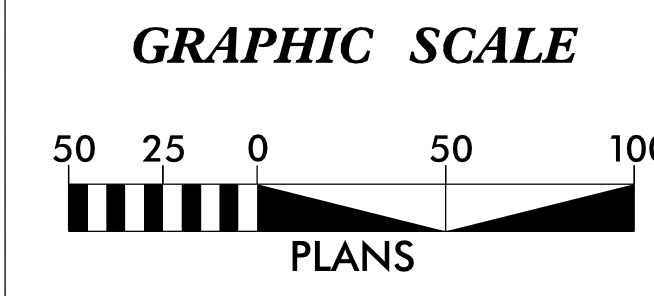
SURVEY CONTROL, EXISTING CENTERLINES,  
 RIGHT OF WAY, EASEMENTS AND PROPERTY TIES

---

**SURRY COUNTY**



09-JUN-2022 15:05  
 Y:\Projects\PA220503\dgn\850015\_ls\_r\_w01.dgn  
 apd AT APAL-PC



**DATUM DESCRIPTION**

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "850015-GPS2" WITH NAD 83/NSRS 2011 STATE PLANE GRID COORDINATES OF NORTHING: 960,569.037(ft) EASTING: 1,457,984.919(ft) ELEVATION: 1,097.46(ft)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.00001764

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "850015-GPS2" TO -L- STATION 10+00.00 IS N 73°56'21.4" E, 512.21(ft)

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

Prepared in the Office of:

ALLIED ASSOCIATES, P.A.  
 4720 KESTER MILL ROAD  
 WINSTON SALEM, NC 27103  
 WWW.ALLIEDAPA.COM C-2198  
 (336)765-2377

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2018 STANDARD SPECIFICATIONS

**RIGHT OF WAY DATE:** 03/01/2022

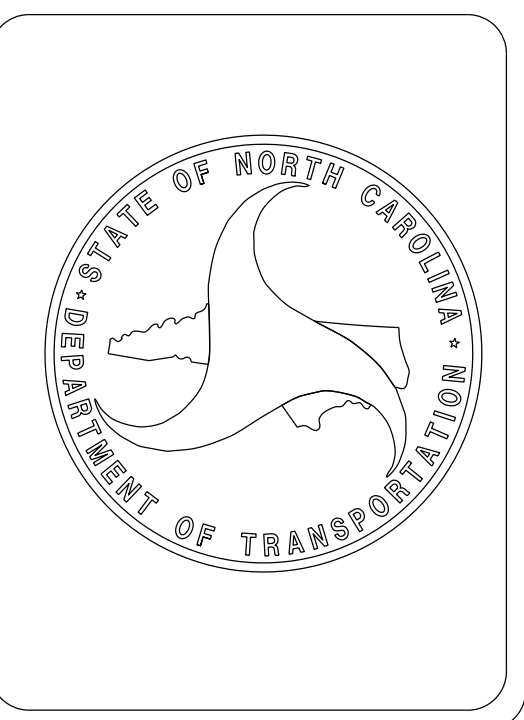
**LETTING DATE:** 03/01/2023

**PROFESSIONAL LAND SURVEYOR**

DocuSigned by:  
 Clinton B. Osborne  
 046F6B08F6449B

7/12/2022

SIGNATURE: \_\_\_\_\_ Date: \_\_\_\_\_



# SURVEY CONTROL SHEET

**W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION**

PROJECT REFERENCE NO. 850015	SHEET NO. RW02C-1
<b>Location and Surveys</b>	
<div style="display: inline-block; vertical-align: middle; margin-left: 10px;">                 TGS ENGINEERS                  804-C N. LAFAYETTE ST                  SHELBY, NC 28150                  PH (704) 476-0003                  CORP. LICENSE NO.: C-0275             </div>	
PROJECT SURVEYOR	
<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;"> <p>SEAL L-4775 MATTHEW T. CORNWELL</p> </div> <div style="text-align: center;"> <p>DocuSigned by: <i>Matthew Cornwell</i> EBD30F11473E475</p> </div> </div>	
7/9/2021	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

## EXISTING ALIGNMENT

EL POINT	N	E	BEARING	DIST
POT	960724.597	1457439.978	S 75°16'40.4" E	1451.10
LINE				
POT	960355.828	1458843.435		

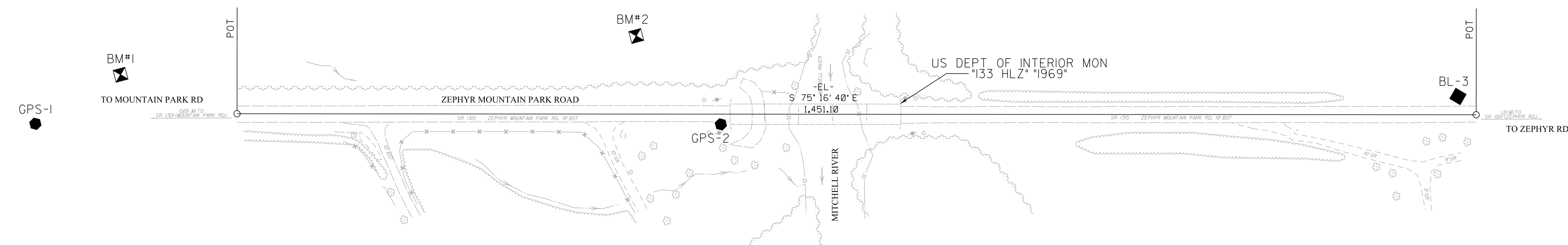


I, Matthew T. Cornwell, PLS, certify that the Project Control was performed under my supervision from an actual GPS survey made under my supervision and the following information was used to perform the survey:

Class of survey: **AA**  
 Type of GPS field procedure: RTN  
 Dates of survey: 5/6/2021  
 Datum/Epoch: NAD83/2011  
 Published/Fixed-control use: N/A  
 Localized around: GPS-2  
 Northing: 960569.037  
 Easting: 1457984.919  
 Combined grid factor: 1.00001764  
 Geoid model: GEOID18B  
 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 6/14/2021 to 6/15/2021, 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 9th day of July, 2021.  
 DocuSigned by:  
  
 7/9/2021  
 EBD30F11473E475  
 Professional Land Surveyor L-4775



## BASELINE

BL	POINT	DESC.	NORTH	EAST	ELEVATION	EL STATION	OFFSET
1	GPS-1		960773.0870	1457208.5240	1158.79	OUTSIDE PROJECT LIMITS	
2	GPS-2		960569.0370	1457984.9190	1097.46	15+66.58	11.97 RT
3	BL-3		960381.9382	1458828.1689	1110.06	24+29.70	21.37 LT

## BENCHMARKS

```

.....
BM1      ELEVATION + 1147.70
N 960803      E 1457320
EL STATION 10+00.00
N 56+50' 17.7" W      DIST 143.86
RR SPIKE IN BASE OF 10' MAPLE
.....

BM2      ELEVATION + 1100.58
N 960694      E 1457915
EL STATION 14+67.00 91 LEFT
RR SPIKE IN BASE OF 12' POPLAR
.....
    
```

## NOTES:

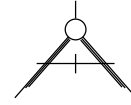
1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
2. THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

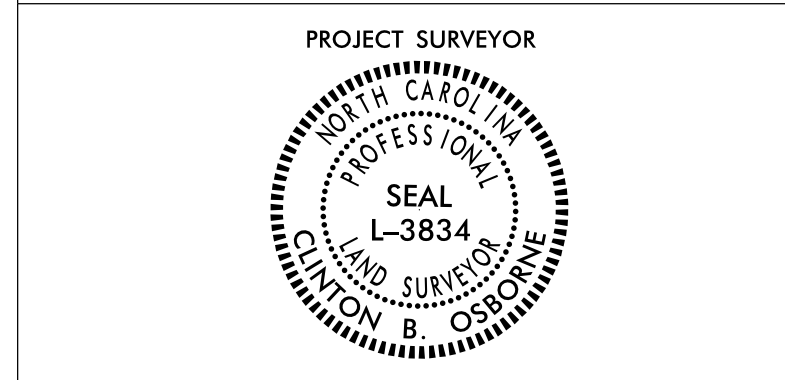


# PROPOSED ALIGNMENT CONTROL SHEET

PROJECT REFERENCE NO.	SHEET NO.
85-0015	RW02D-1

### Location and Surveys

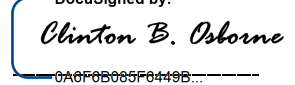

 ALLIED ASSOCIATES, P.A.  
 4720 KESTER MILL ROAD  
 WINSTON SALEM, NC 27103  
 WWW.ALLIEDAPA.COM C-2198  
 (336)765-2377



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

This 12th day of July 2022

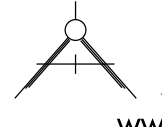
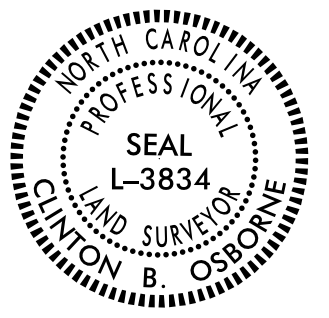
DocuSigned by:  
  
 Clinton B. Osborne  
 Professional Land Surveyor L-3834

L			
TYPE	STATION	NORTH	EAST
POT	10+00.00	960710.7441	1457492.6975
POT	23+30.00	960372.7497	1458779.0333

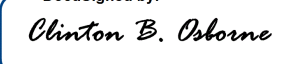
### NOTES:

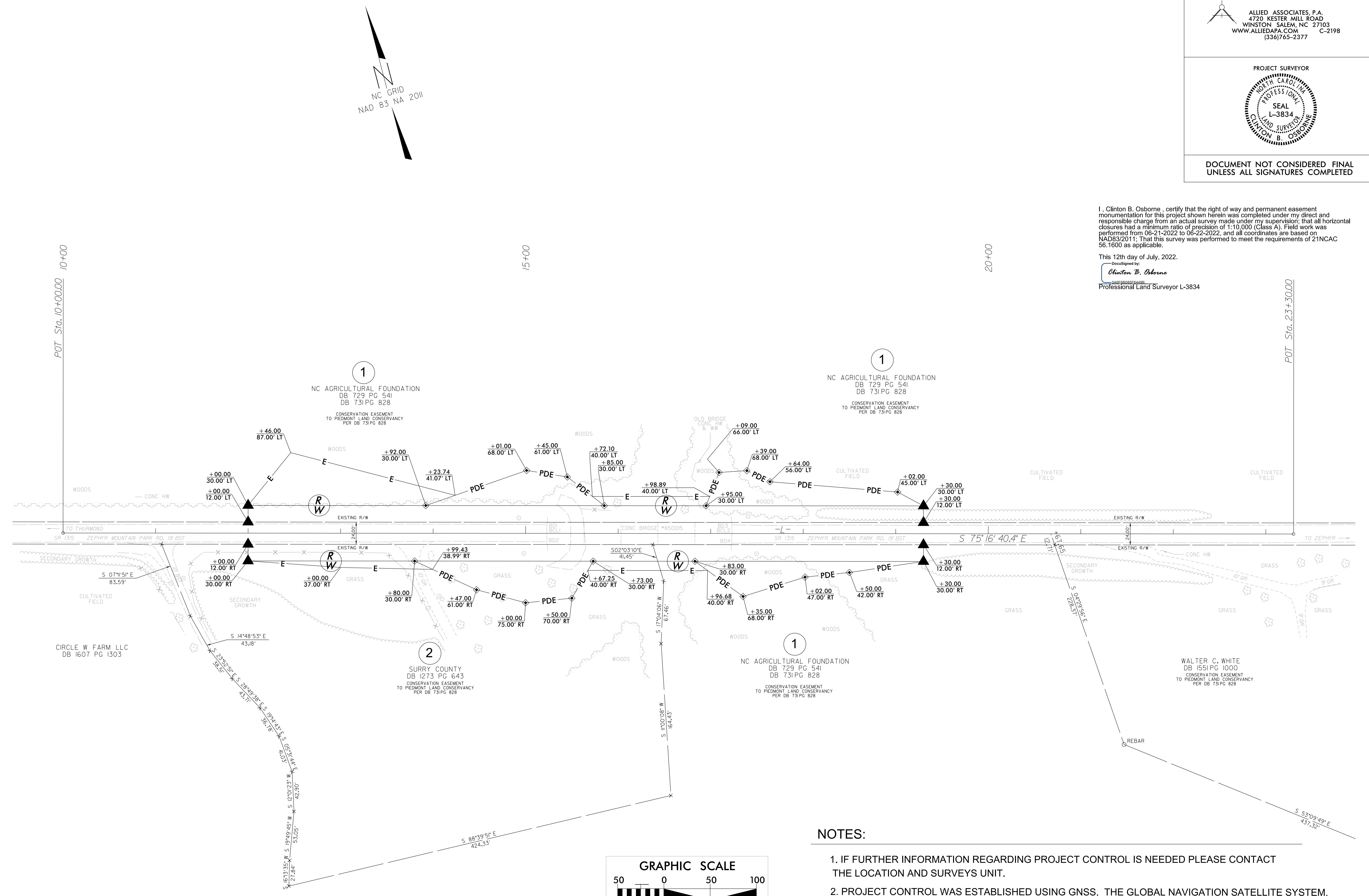
1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
2. THE PROPOSED ALIGNMENT CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.



PROJECT REFERENCE NO. 850015	SHEET NO. RW04
<b>Location and Surveys</b>	
 ALLIED ASSOCIATES, P.A. 4720 KESTER MILL ROAD WINSTON SALEM, NC 27103 WWW.ALLIEDAPA.COM C-2198 (336)765-2377	
PROJECT SURVEYOR 	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

I, Clinton B. Osborne, certify that the right of way and permanent easement monumentation for this project shown herein was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:10,000 (Class A). Field work was performed from 06-21-2022 to 06-22-2022, and all coordinates are based on NAD83/2011; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 12th day of July, 2022.  
 Digitally signed by:  
  
 Clinton B. Osborne  
 Professional Land Surveyor L-3834



**NOTES:**

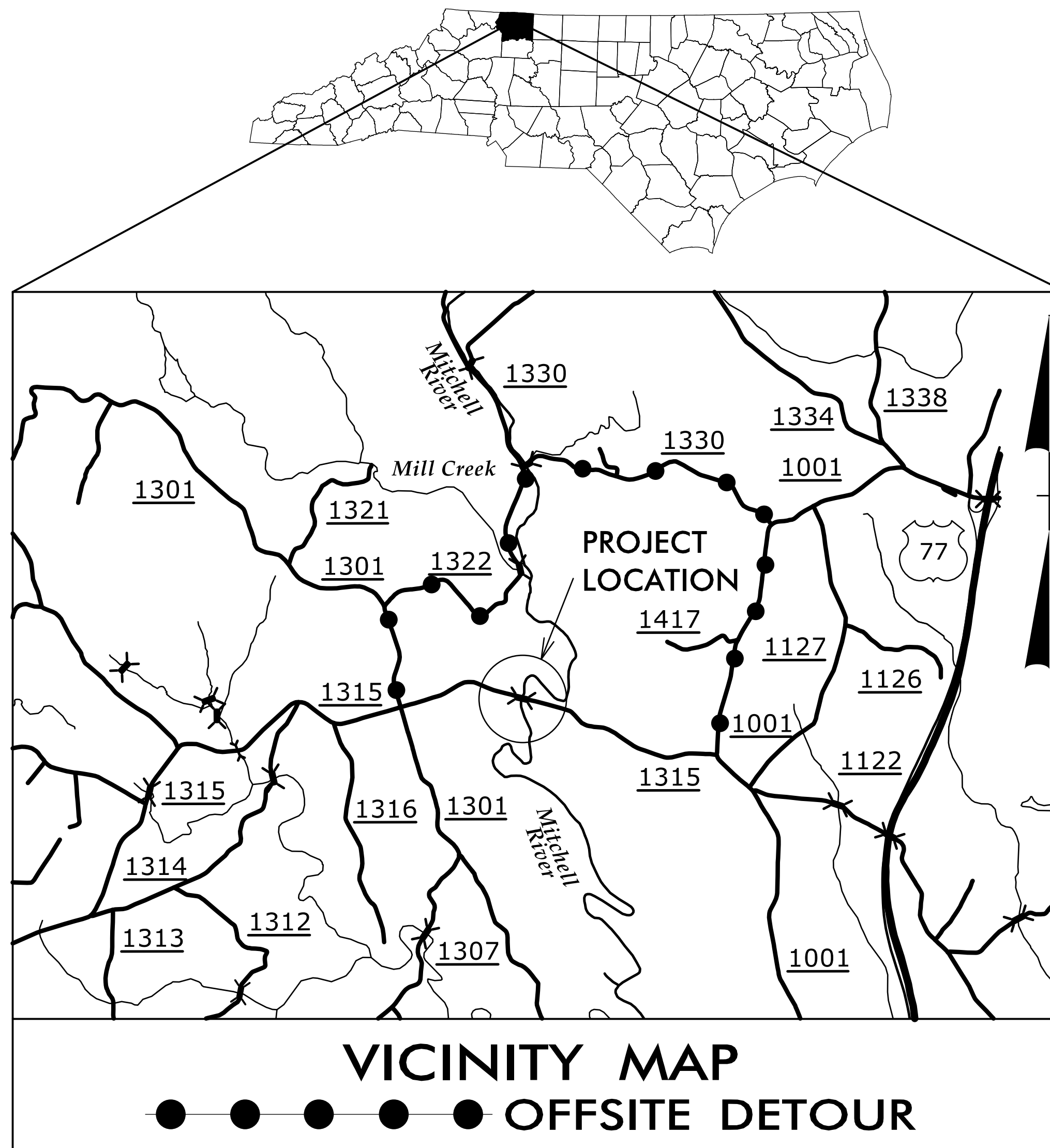
1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
3. RIGHT OF WAY MONUMENTATION ESTABLISHED 06-21-2022 TO 06-22-2022 .



STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**TRANSPORTATION MANAGEMENT PLAN**

**SURRY COUNTY  
BRIDGE #850015**



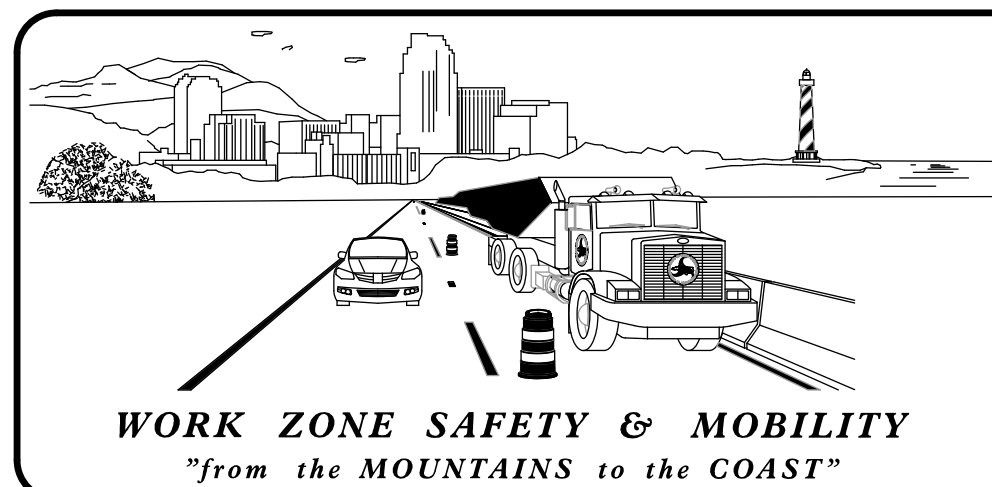
**INDEX OF SHEETS**

SHEET NO.	TITLE
TMP-1	TITLE SHEET, VICINITY MAP, AND INDEX OF SHEETS
TMP-1A	LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, AND LEGEND
TMP-1B	TRANSPORTATION OPERATIONS PLAN: (MANAGEMENT STRATEGIES, GENERAL NOTES, AND LOCAL NOTES)
TMP-1C	SPECIAL SIGN DESIGN
TMP-2	OVERVIEW AND PHASING
TMP-3	OFFSITE DETOUR LOCATION AND BARRICADE PLACEMENT

SHEET NO.  
TMP-1

**PROJECT: BPI1.R005**

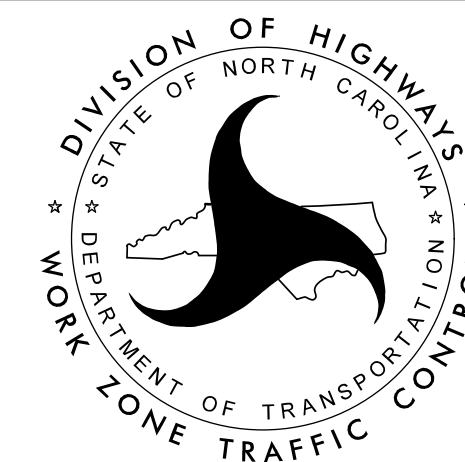
**NCDOT CONTACT INFORMATION:**  
 Phone: 336 903 9138  
**MARK JOHNSON**  
 Division II Bridge  
 Program Manager



PLAN PREPARED FOR N.C.D.O.T. BY:

**TGS ENGINEERS**  
 201 W. MARION ST  
 SHELBY, NC 28150  
 PH (704) 476-0003  
 CORP. LICENSE NO.: C-0275

JIMMY TERRY, PE  
 CLAYTON PRUETT



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

12/6/2022



12/6/2022 X:\NCDOT\_Div II\Surry\IS\TrafficControl\TC\Surry\_850015\_TC\_TMP\_01(TSH).dgn User:Smelvin

# ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS SHOWN IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2018 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1101.01	WORK ZONE ADVANCE WARNING SIGNS
1101.02	TEMPORARY LANE CLOSURES
1101.03	TEMPORARY ROAD CLOSURES
1101.11	TRAFFIC CONTROL DESIGN TABLES
1110.01	STATIONARY WORK ZONE SIGNS
1110.02	PORTABLE WORK ZONE SIGNS
1130.01	DRUM
1135.01	CONES
1145.01	BARRICADES
1150.01	FLAGGING DEVICES
1205.01	PAVEMENT MARKINGS - LINE TYPES AND OFFSETS
1205.02	PAVEMENT MARKINGS - TWO-LANE AND MULTI-LANE ROADWAYS
1205.12	PAVEMENT MARKINGS - BRIDGES
1261.01	GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING
1261.02	GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING
1262.01	GUARDRAIL END DELINEATION

# LEGEND

## GENERAL

- DIRECTION OF TRAFFIC FLOW
- DIRECTION OF PEDESTRIAN TRAFFIC FLOW
- EXIST. PVMT.
- NORTH ARROW
- PROPOSED PVMT.
- TEMP. SHORING (LOCATION PURPOSES ONLY)



## SIGNALS

- EXISTING
- PROPOSED
- TEMPORARY

## PAVEMENT MARKINGS

- EXISTING LINES
- TEMPORARY LINES

## TRAFFIC CONTROL DEVICES

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

## TEMPORARY SIGNING

- PORTABLE SIGN
- STATIONARY SIGN
- STATIONARY OR PORTABLE SIGN

## PAVEMENT MARKERS

- CRYSTAL/CRYSTAL
- CRYSTAL/RED
- YELLOW/YELLOW

## PAVEMENT MARKING SYMBOLS

- PAVEMENT MARKING SYMBOLS

12/6/2022 X:\NC\DOT\Div 11\Surry 15\TrafficControl\TCP\Surry\_850015\_TC\_TMP\_01MSTA & LEGEND.dgn User:Smelvin

APPROVED: DATE: 12/6/2022			<h2>ROADWAY STANDARD DRAWINGS &amp; LEGEND</h2>
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>			



## 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 UNDESIRABLE 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 THIRTY (30) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

### SIGNING

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

- 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 ON THE FINAL SURFACE.
- H) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.
- I) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS BY THE END OF EACH DAY'S OPERATION.

## MANAGEMENT STRATEGIES

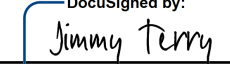
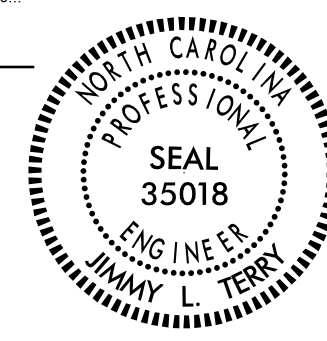

DURING CONSTRUCTION OF THE PROPOSED STRUCTURE, SR 1315 (ZEPHYR MOUNTAIN PARK RD) WILL BE CLOSED TO THROUGH TRAFFIC. SR 1315 (ZEPHYR MOUNTAIN PARK RD) TRAFFIC WILL BE MAINTAINED ON THE FOLLOWING DETOUR:

SR 1315 (ZEPHYR MOUNTAIN PARK RD) TO SR 1301 (MOUNTAIN PARK RD) TO SR 1322 (DEVOTION RD) TO SR 1330 (KAPPS MILL RD) TO SR 1001 (ZEPHYR RD) TO SR 1315 (ZEPHYR MOUNTAIN PARK RD).

## LOCAL NOTES

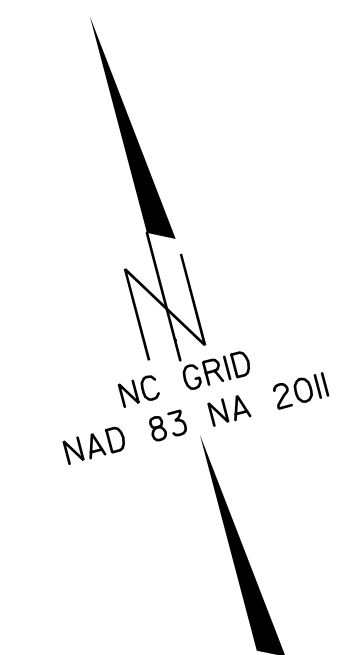
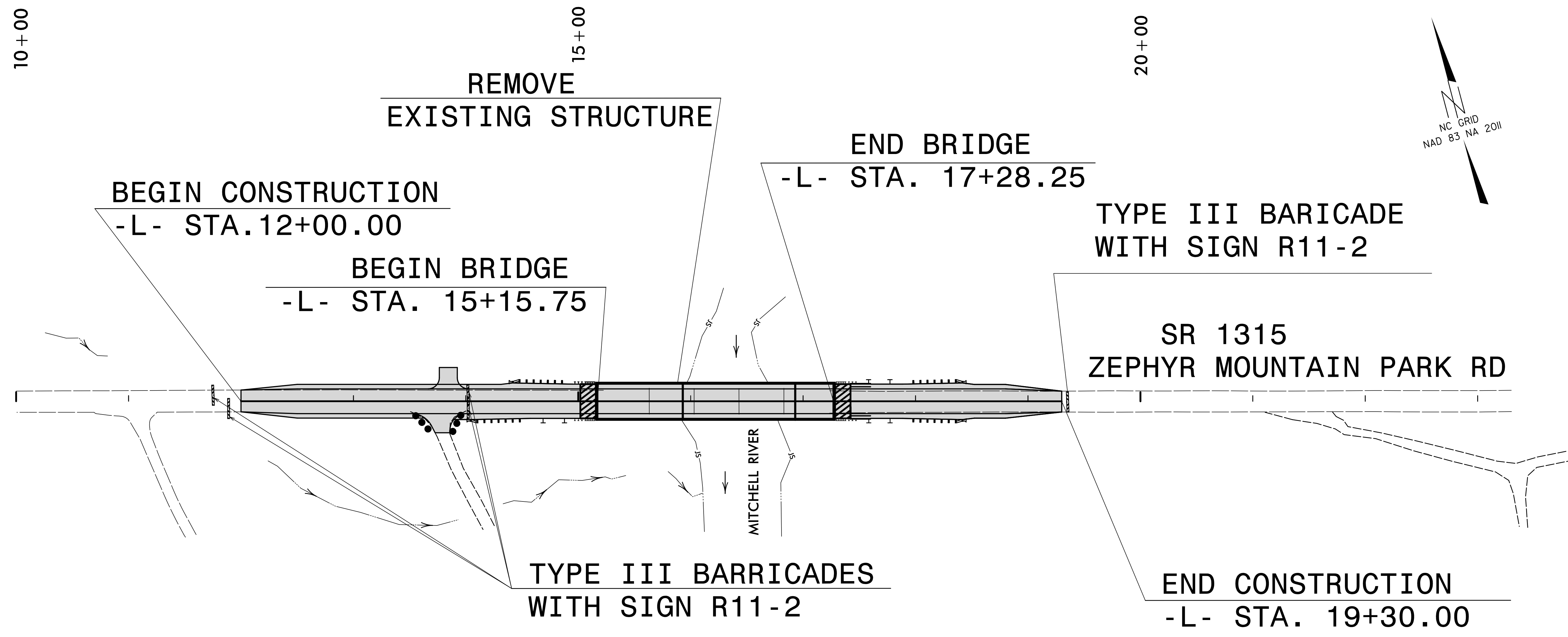
LOCAL ACCESS TO ALL DRIVEWAYS WILL BE MAINTAINED BETWEEN THE CLOSURE POINTS AT ALL TIMES DURING THE COSTRUCTION.

12/6/2022 X:\NCDOT\Div 15\Traffic\TrafficControl\TCP\Surry-850015\_TC\_TMP\_01B(TOP).dgn User:smelvin

APPROVED:  DATE: 12/6/2022			<h3 style="margin: 0;">TRANSPORTATION OPERATIONS PLAN</h3>
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>			







PHASING NOTES

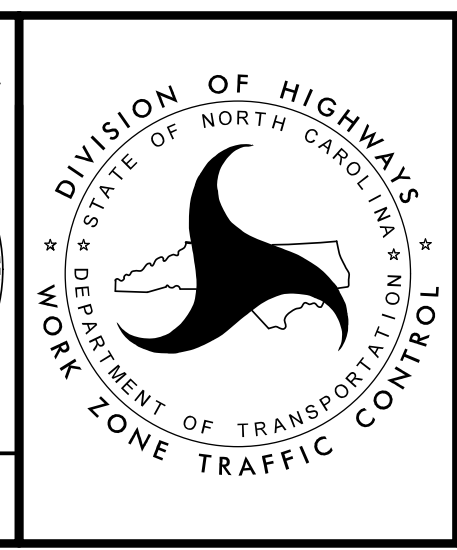
- STEP 1: INSTALL ALL ADVANCE WARNING SIGNS USING RSD 1101.01 SHEET 3 OF 3.
  - STEP 2: INSTALL TYPE III BARRICADES AND DETOUR SIGNS, AND CLOSE SR 1315 (ZEPHYR MOUNTAIN PARK RD) TO TRAFFIC AS SHOWN IN ROADWAY STANDARD DRAWING 1101.03 (SHEET 1 OF 9) AND TMP-2 AND TMP-3.  
PLACE TRAFFIC ON DETOUR.
  - STEP 3: DEMOLISH AND REMOVE THE EXISTING BRIDGE OVER MITCHELL RIVER.  
CONSTRUCT THE NEW BRIDGE OVER MITCHELL RIVER FROM -L- STA. 15+15.75 TO 17+28.25.  
CONSTRUCT THE ROADWAY ON SR 1315 (ZEPHYR MOUNTAIN PARK RD) FROM -L- STA. 12+00.00 TO -L- STA. 15+15.75 (BEGIN BRIDGE) AND FROM -L- STA. 17+28.25 (END BRIDGE) TO 19+30.00 UP TO AND INCLUDING THE FINAL LAYER OF SURFACE COURSE.
  - STEP 4: REFERRING TO SHEET PMP-1, PLACE PERMANENT PAVEMENT MARKINGS ON THE FOLLOWING: SR 1315 (ZEPHYR MOUNTAIN PARK RD) FROM STA. 12+00.00 TO STA. 19+30.00.
  - STEP 5: REMOVE BARRICADES, SIGNS, AND ALL OTHER TRAFFIC CONTROL DEVICES AND OPEN SR 1315 (ZEPHYR MOUNTAIN PARK RD) TO TRAFFIC IN FINAL PATTERN.
- NOTE: SEE SHEETS TMP-1C AND TMP-3 FOR DETOUR LOCATION AND SIGNING.

12/6/2022 X:\NCDOT\Div\_II\Surry\_15\TrafficControl\TC\Surry\_850015\_TC\_TMP\_02(10V).dgn User:tpuett

APPROVED: Jimmy Terry  
DATE: 12/6/2022

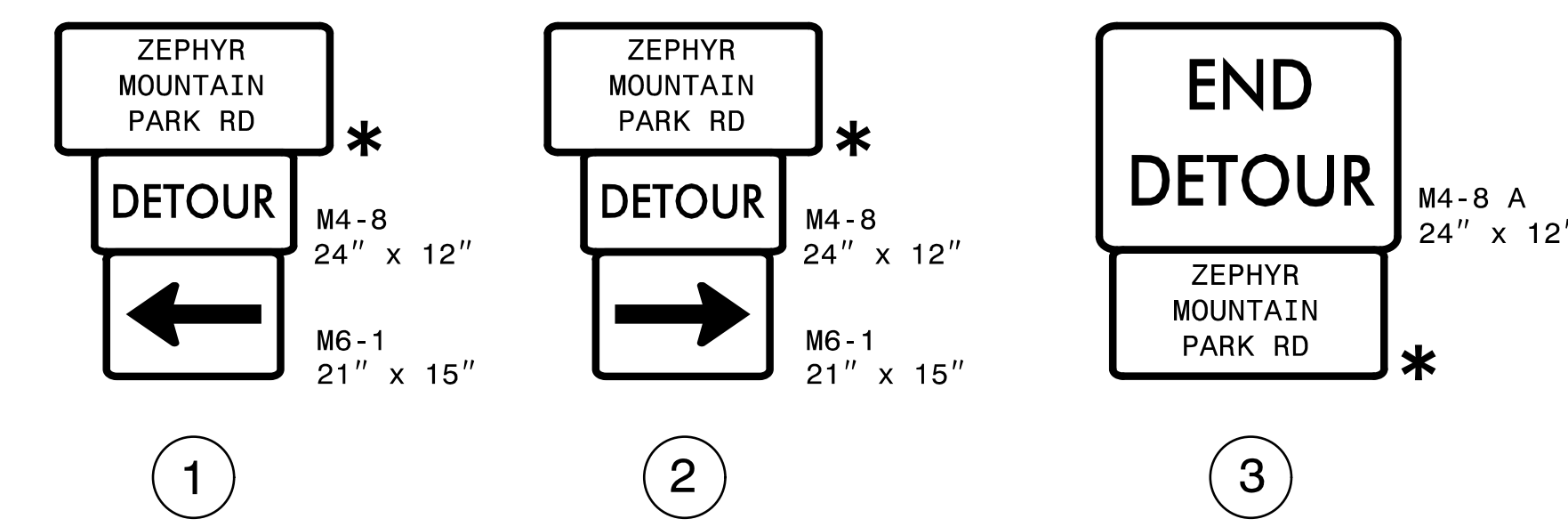
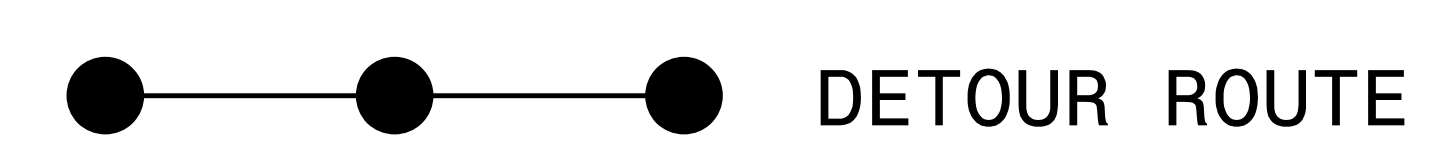
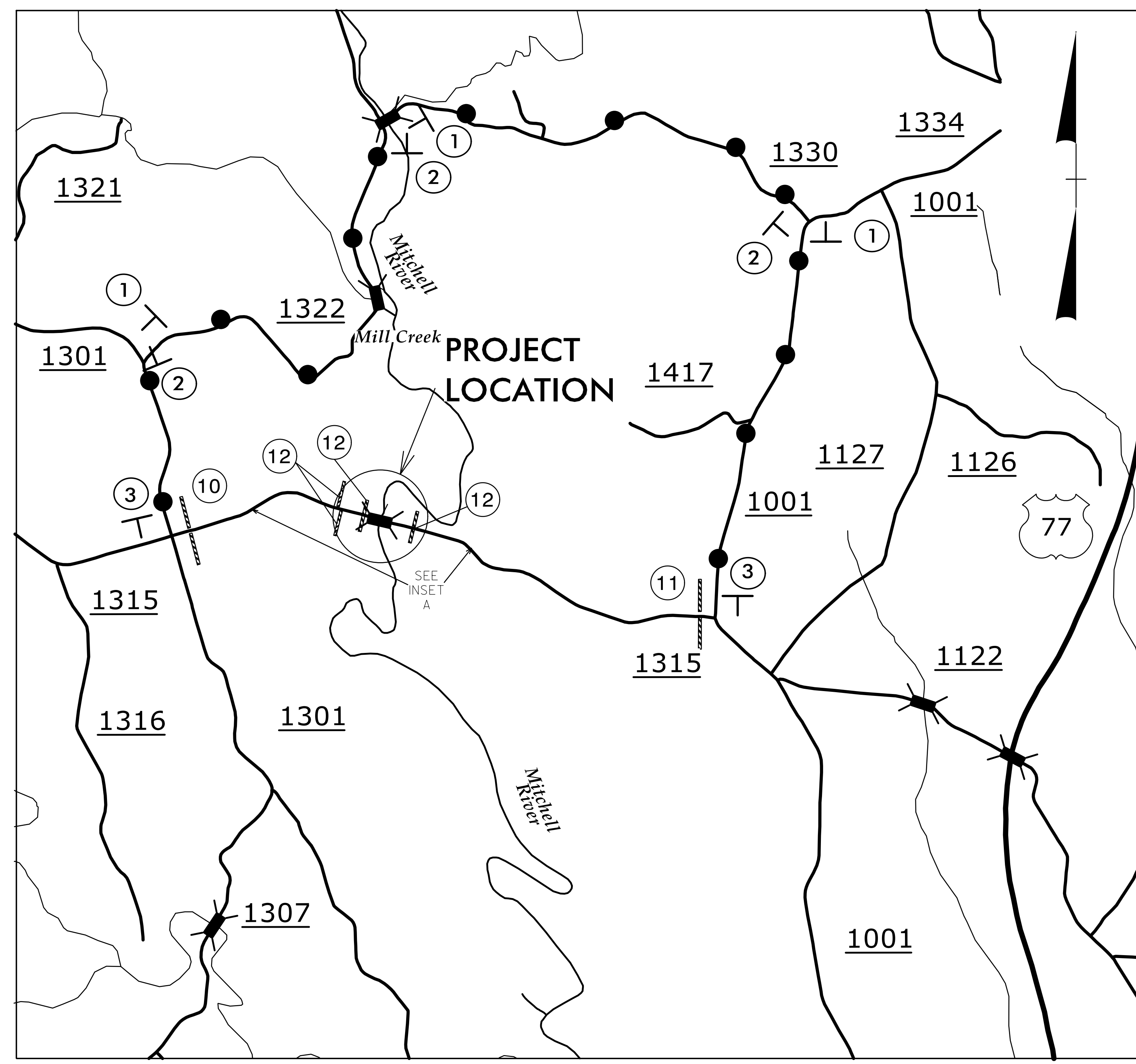
SEAL

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

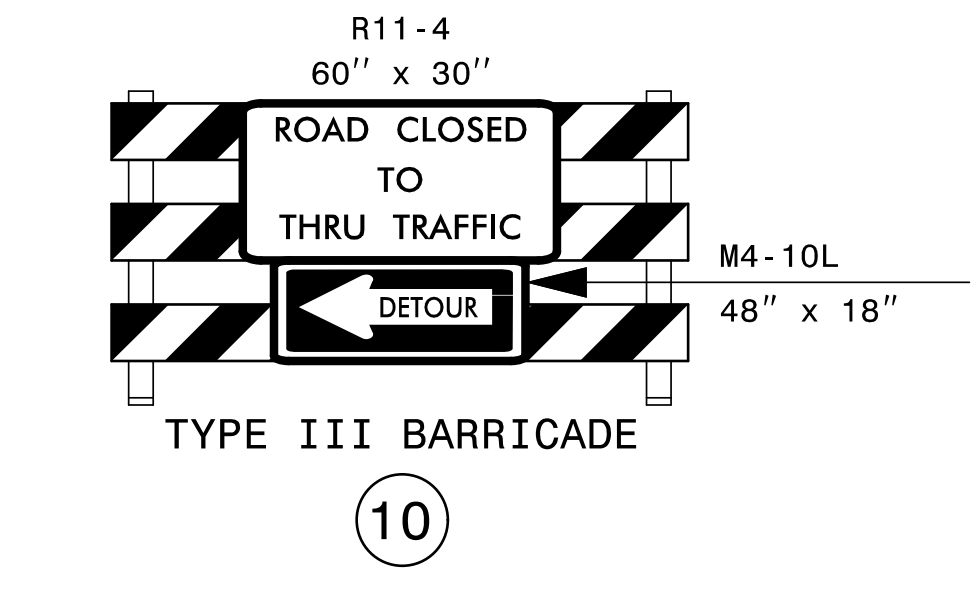
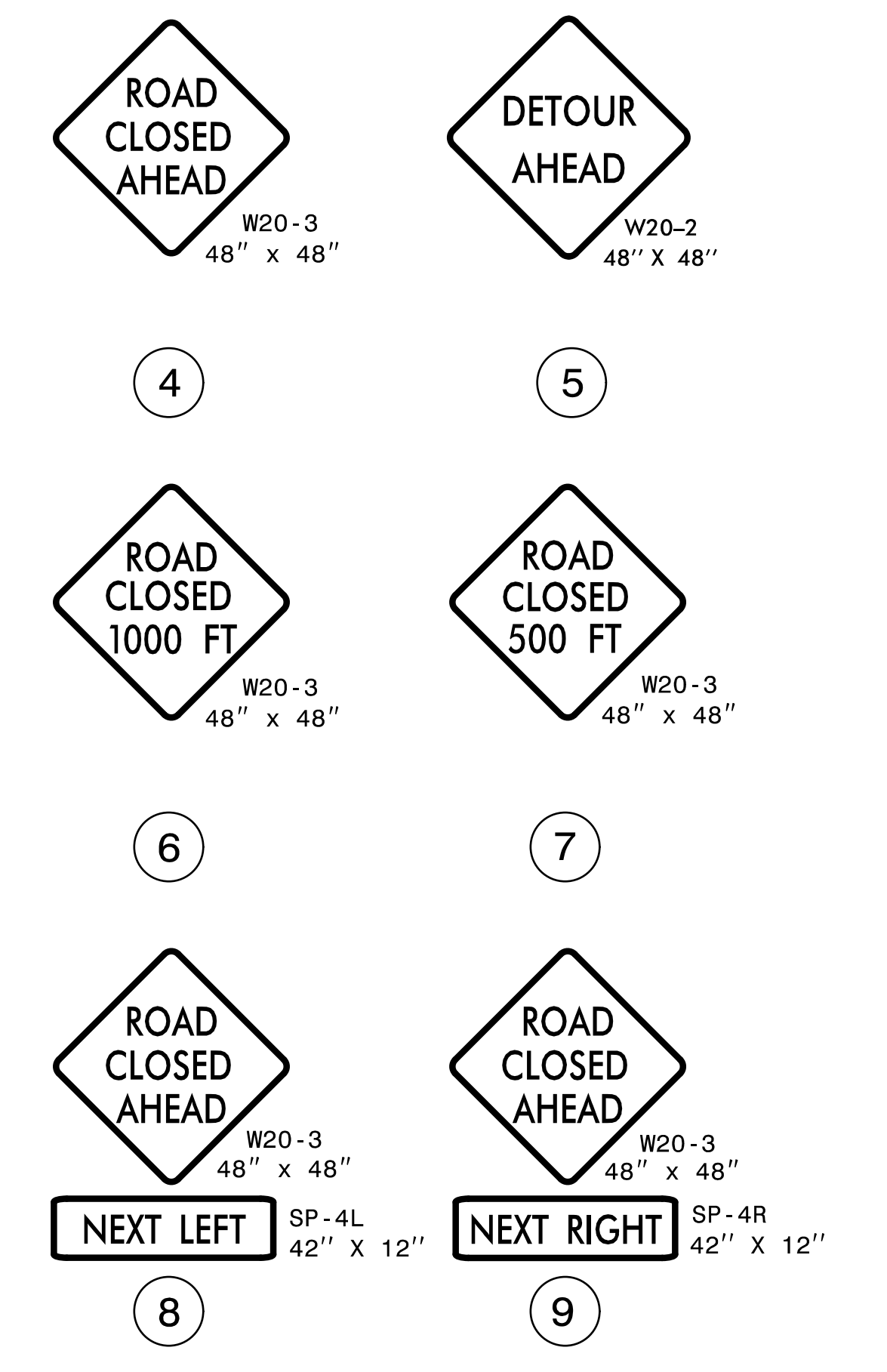
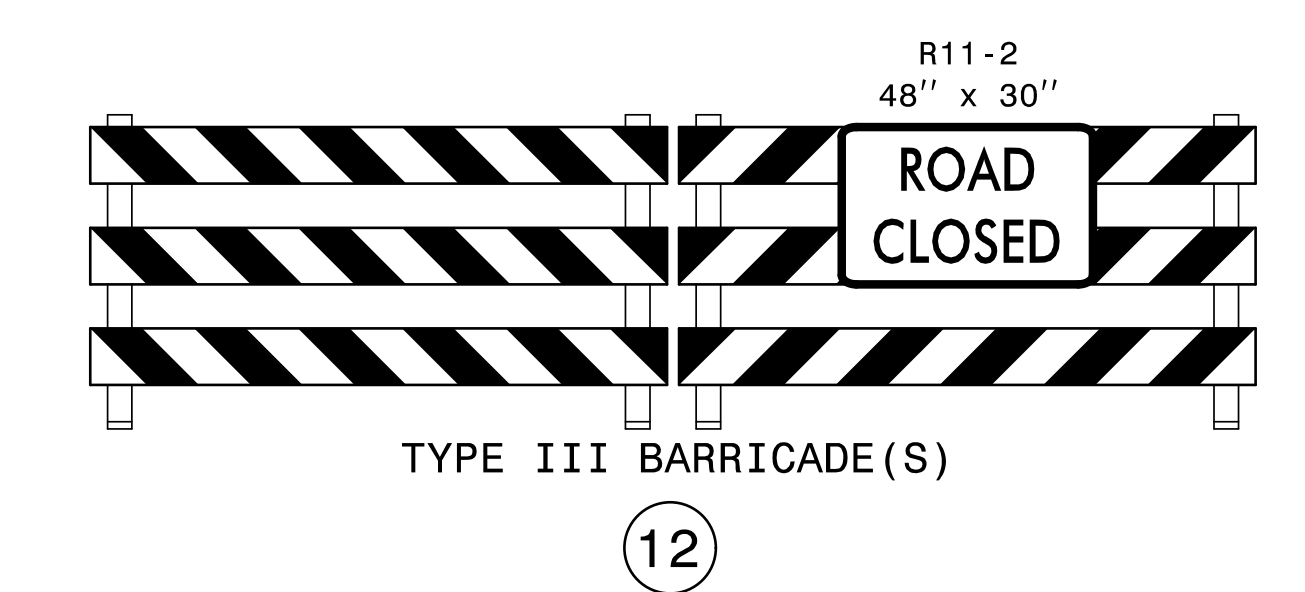
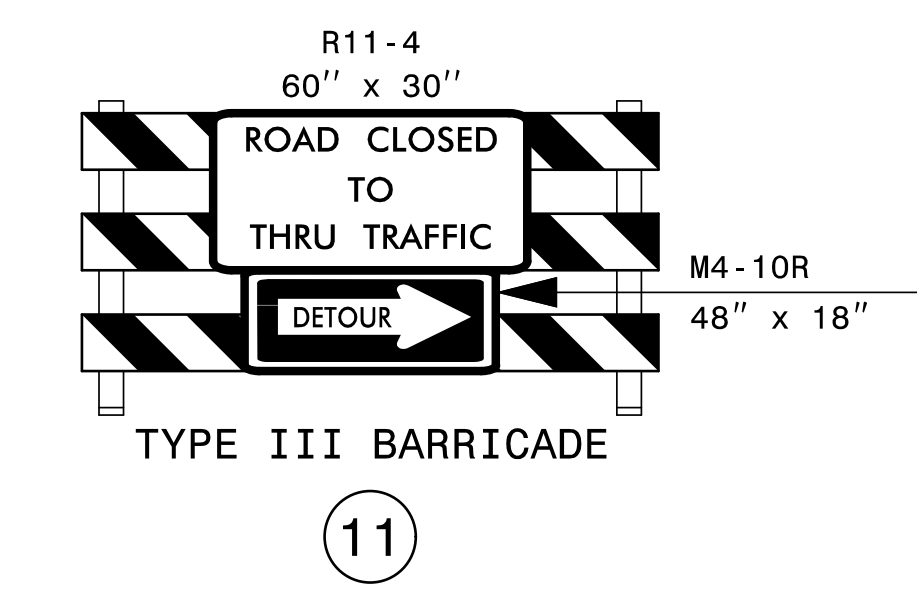
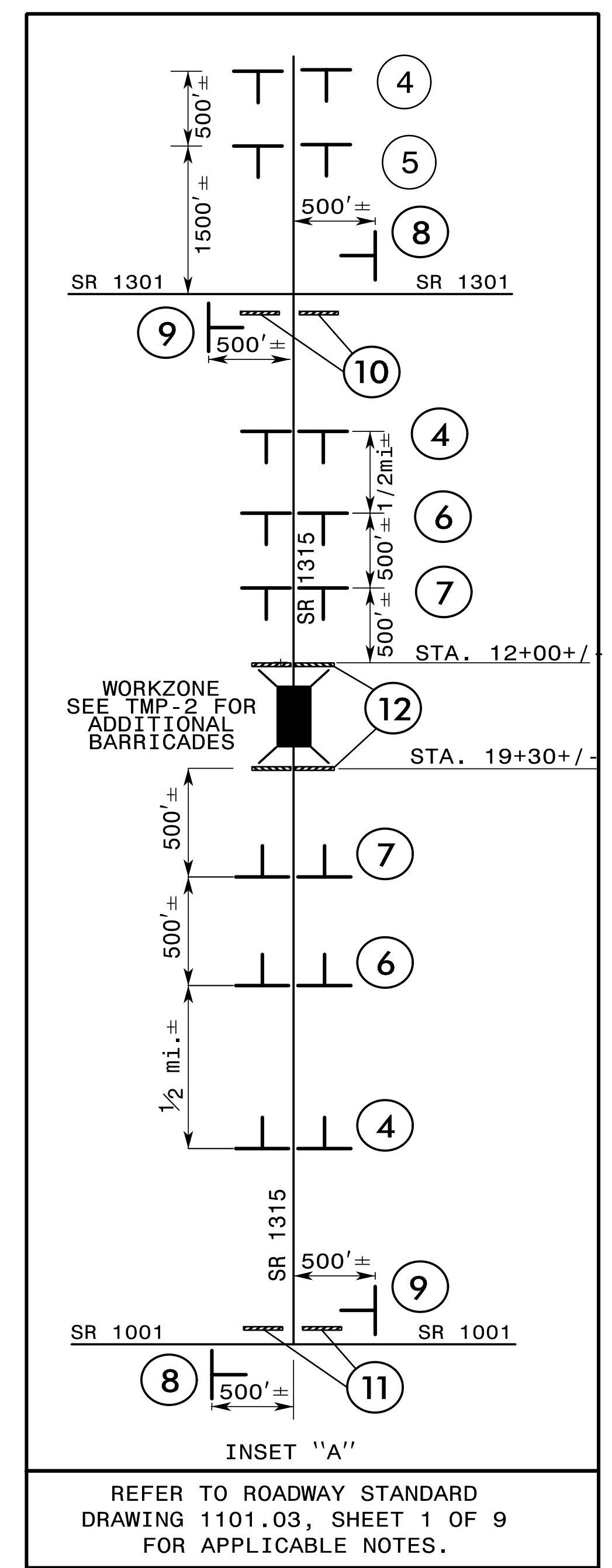


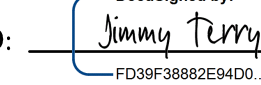
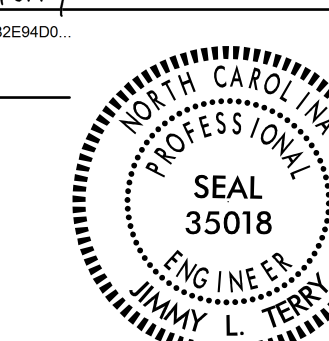
**OVERVIEW  
AND PHASING**

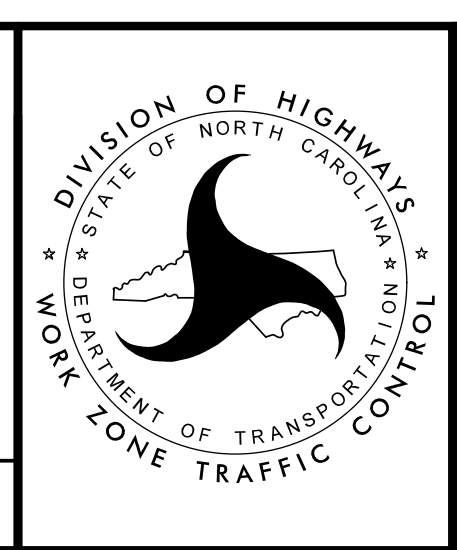




\* SEE SHEET TMP-1C FOR SIGN DESIGN




APPROVED:   
 DATE: 12/6/2022  
  
**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**



**OFFSITE DETOUR ROUTE AND BARRICADE PLACEMENT**

12/6/2022  
 X:\NCDD01\Div 11\Surry 15\TrafficControl\TC\Surry\_850015\_TC\_TMP\_03\DETOUR.dgn  
 User:Smelvin

PROJECT NO.	SHEET NO.
BP11.R005	PMP-1
APPROVED: 	
DATE: 12/6/2022	
SEAL	
	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
 TGS ENGINEERS 201 W. MARION ST SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275	

**STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION**

**PAVEMENT MARKING PLAN  
SURRY COUNTY**

**LOCATION: BRIDGE #850015 OVER MITCHELL RIVER ON SR 1315 (ZEPHYR MOUNTAIN PARK RD)**

**PROJECT: BP11.R005**

**ROADWAY STANDARD DRAWING**

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2018 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

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

**GENERAL NOTES**

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

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

ROAD NAME	MARKING	MARKER
ZEPHYR MOUNTAIN PARK RD	PAINT	NONE
- B) PLACE TWO APPLICATIONS OF PAINT PAVEMENT MARKINGS ON THE FINAL WEARING SURFACE. PLACE THE SECOND APPLICATION OF PAINT UPON SUFFICIENT DRYING TIME OF THE FIRST.
- C) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.
- D) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS.

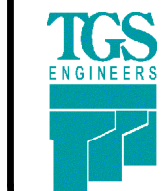
**INDEX**

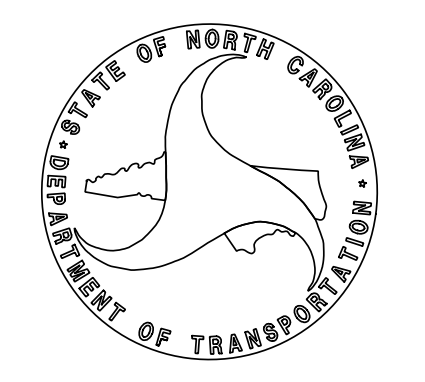
SHEET NO.	DESCRIPTION
PMP-1	PAVEMENT MARKING PLAN TITLE AND SCHEDULE SHEET
PMP-2	PAVEMENT MARKING DETAIL

**FINAL PAVEMENT MARKING SCHEDULE**

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


PLAN PREPARED FOR N.C.D.O.T. BY:

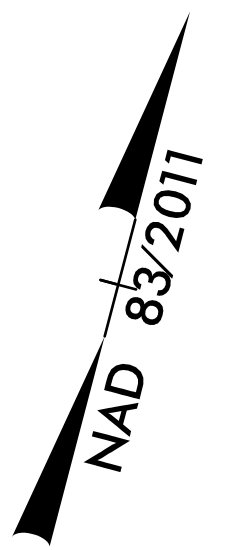
 TGS ENGINEERS 201 W. MARION ST SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275	JIMMY TERRY, PE PROJECT ENGINEER
	CLAYTON PRUETT DESIGN TECHNICIAN





SURRY COUNTY  
BRIDGE #850015

PROJECT NO. BP11.R005	SHEET NO. PMP-2
APPROVED: <i>Jimmy Terry</i> <small>DESIGNED BY</small>	
DATE: 12/6/2022 <small>FILED 388525400</small>	
SEAL	
	
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
 <b>TGS ENGINEERS</b> 201 W. MARION ST SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275	



10+00

15+00

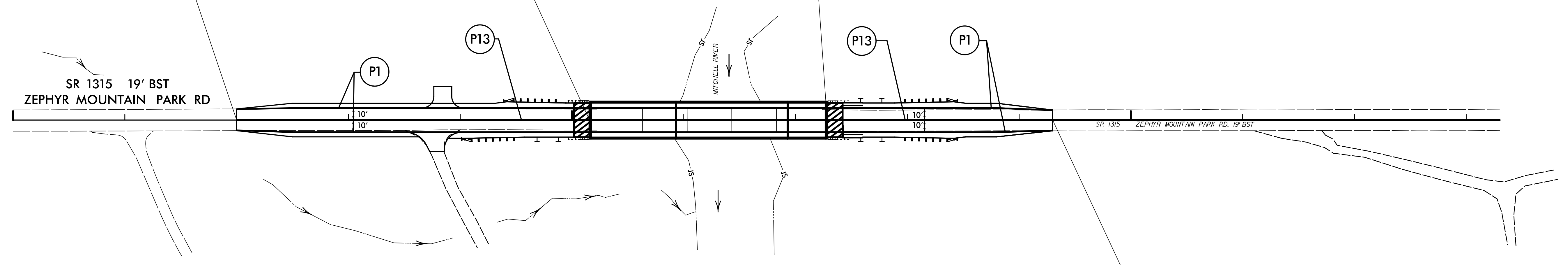
20+00

**-L- STA. 12+00.00**  
TIE INTO EXISTING MARKINGS

**BEGIN BRIDGE**  
**-L- STA. 15+15.75**

**END BRIDGE**  
**-L- STA. 17+28.25**

**-L- STA. 19+30.00**  
TIE INTO EXISTING MARKINGS



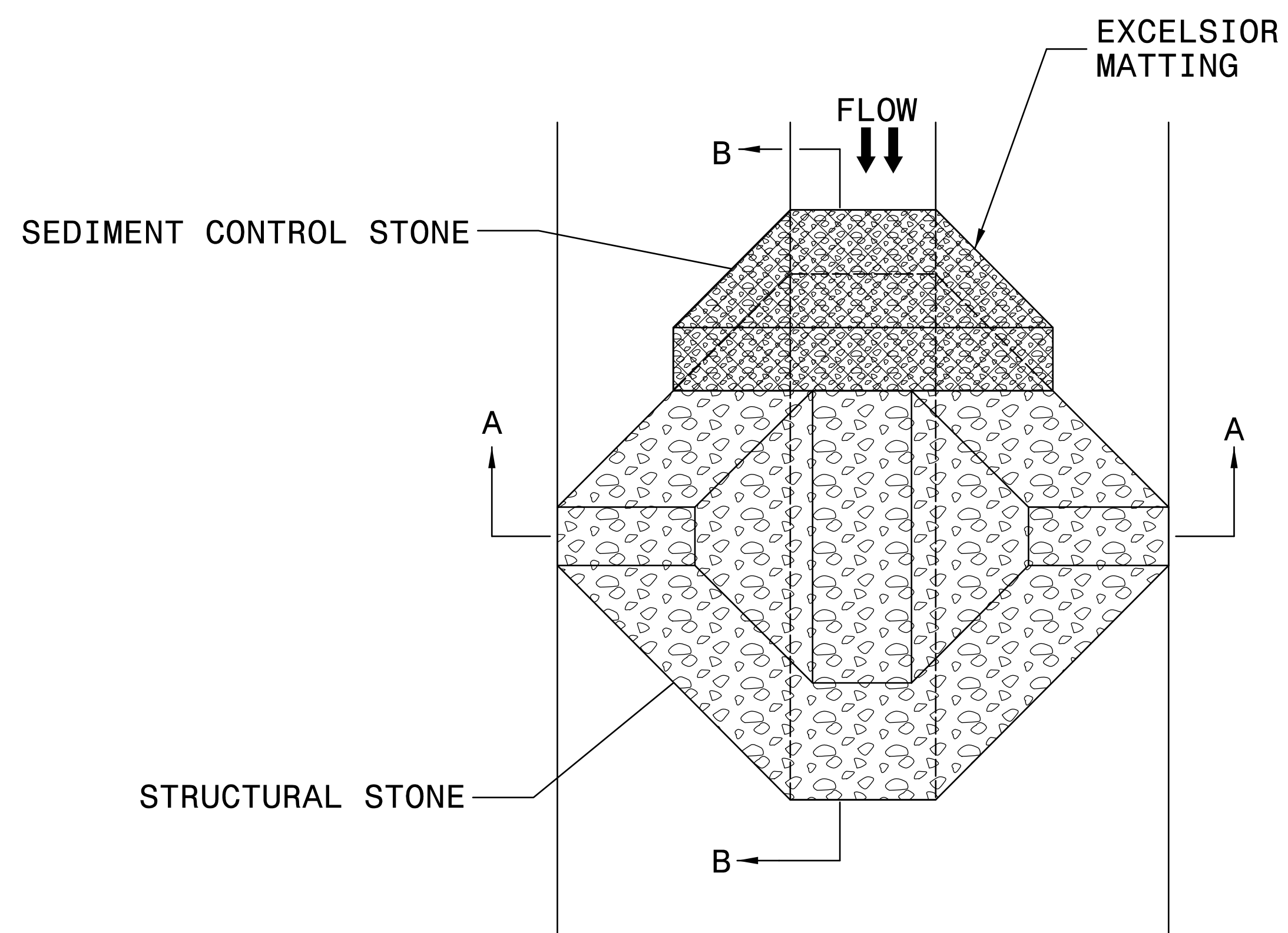
**PAVEMENT MARKING DETAIL**





PROJECT REFERENCE NO. <i>BPII.R005</i>	SHEET NO. <i>EC-2</i>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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



PLAN

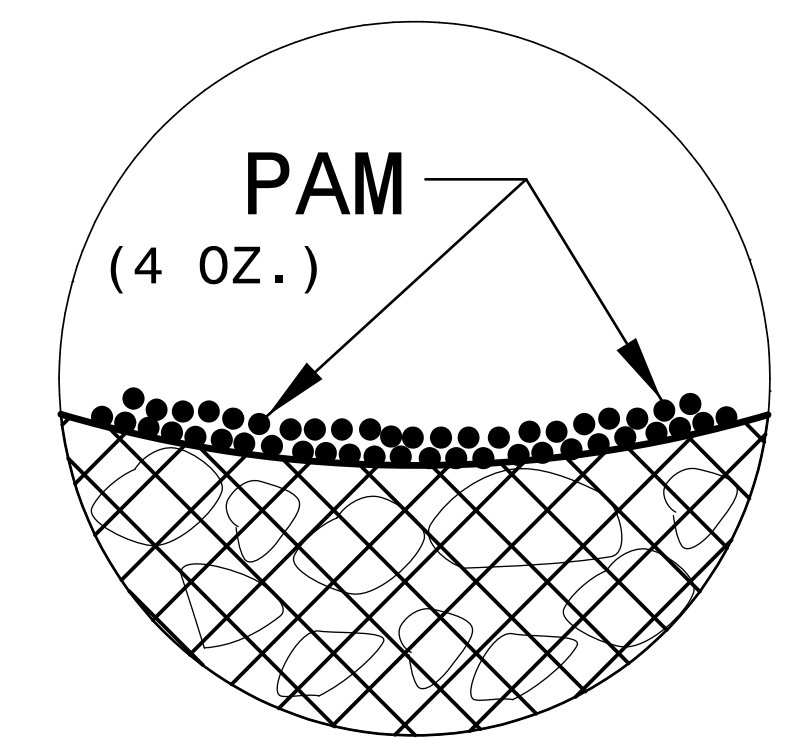
NOTES:

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

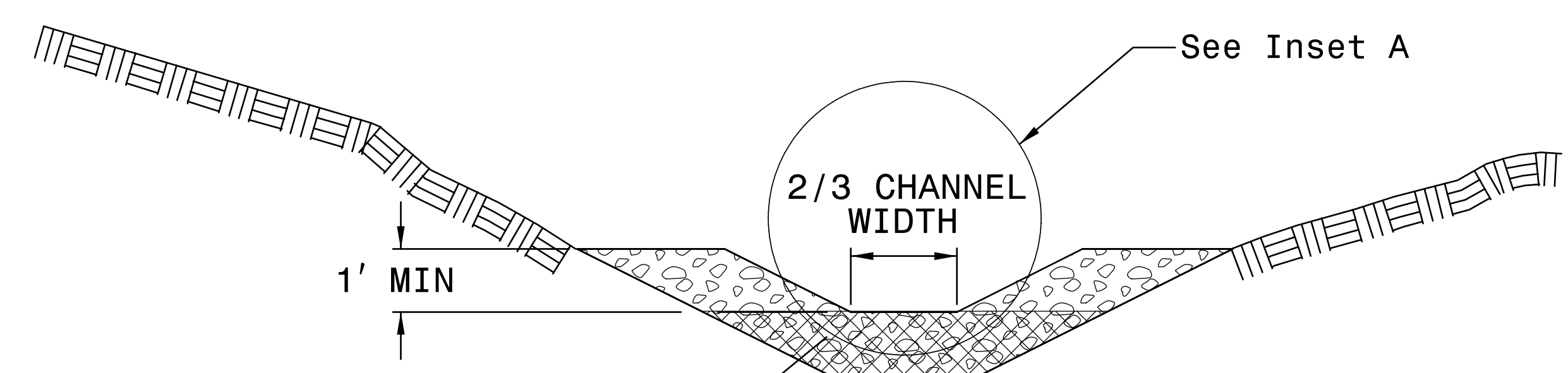
USE EXCELSIOR FOR MATTING MATERIAL AND ANCHOR MATTING SECTION AT TOP AND BOTTOM WITH CLASS B STONE.

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

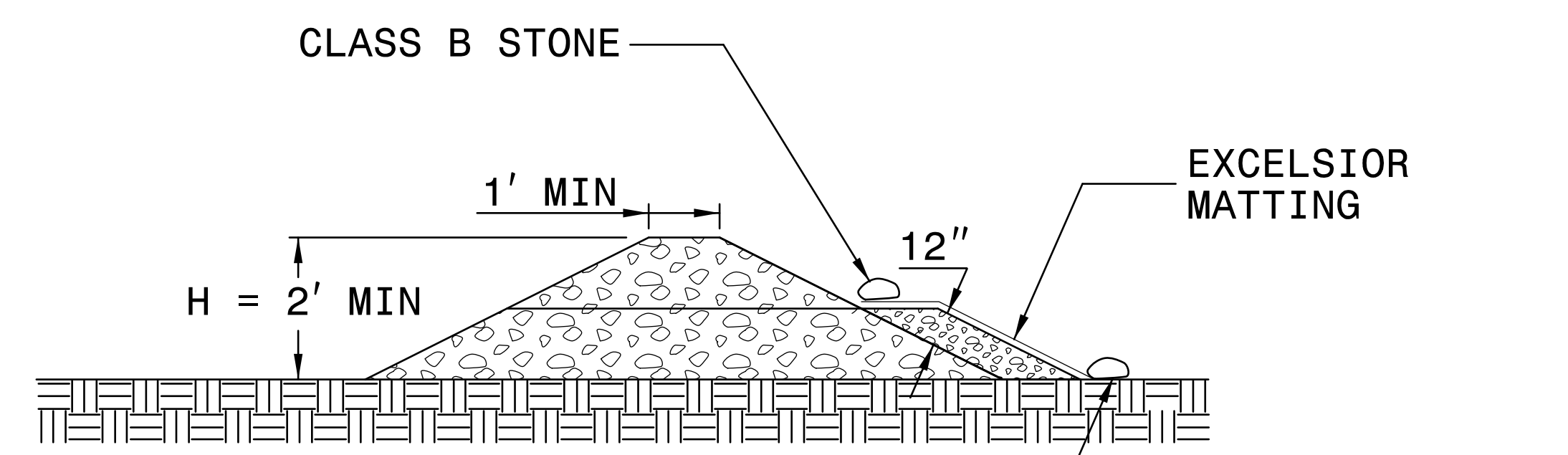
INITIALLY APPLY 4 OUNCES OF POLYACRYLAMIDE (PAM) TO TOP OF MATTING SECTION AND AFTER EVERY RAINFALL EVENT THAT EQUALS OR EXCEEDS 0.50 INCHES.



INSET A



SECTION A-A



SECTION B-B

NOT TO SCALE

DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

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PROJECT REFERENCE NO. <i>BPII.R005</i>	SHEET NO. <i>EC-3</i>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

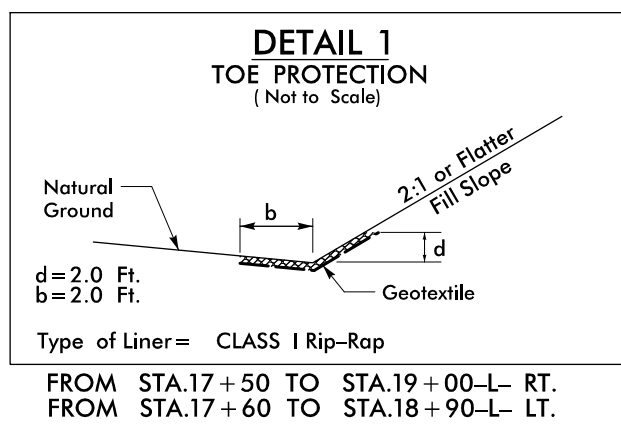
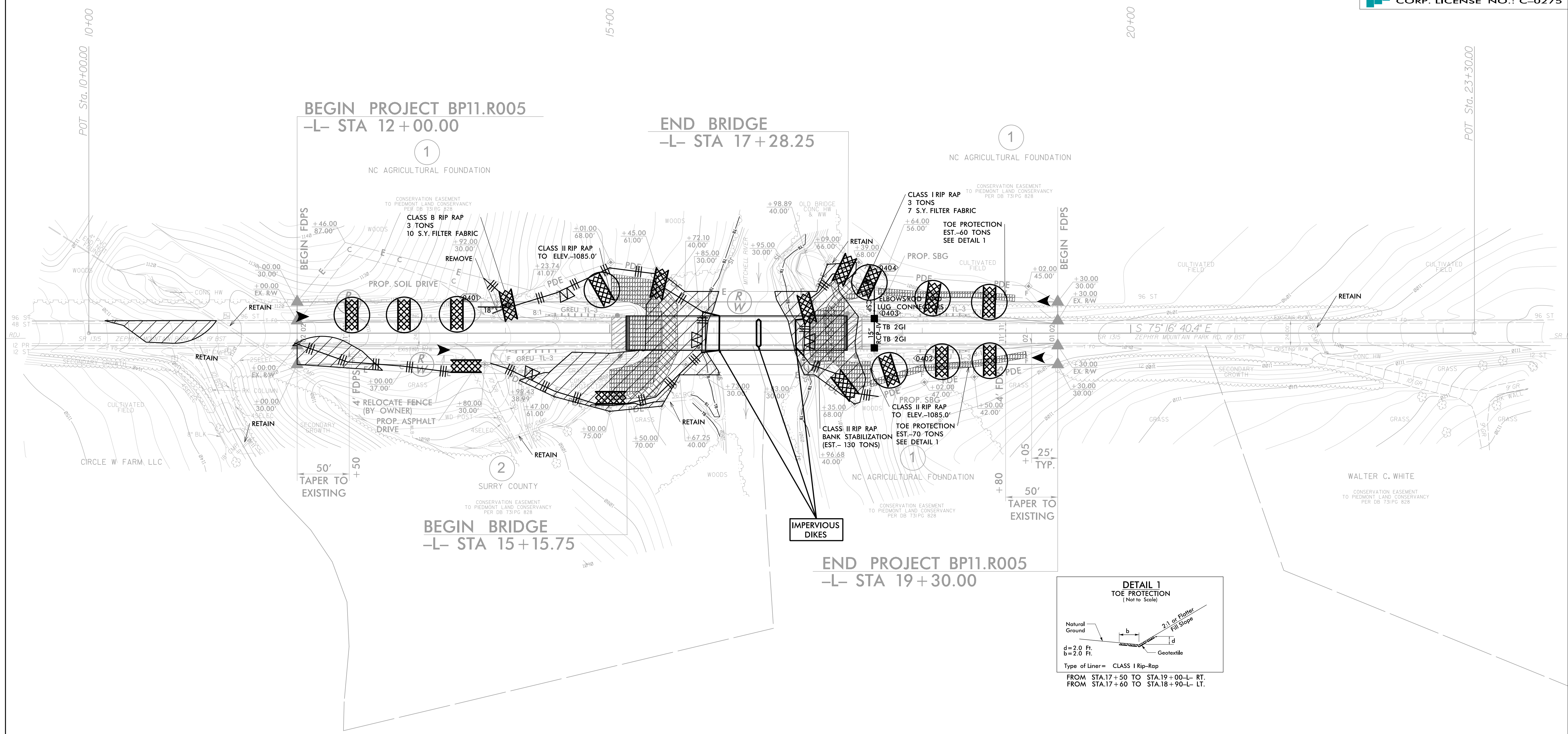
# ***SOIL STABILIZATION TIMEFRAMES***

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



# Surry County Bridge #850015

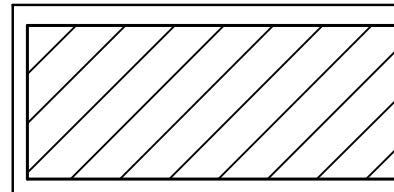
PROJECT REFERENCE NO. <i>BP11.R005</i>	SHEET NO. <i>EC-4/CONST.4</i>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
 <b>TGS ENGINEERS</b> 201 W. MARION ST-STE 200 SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275	



NOTE: UTILIZE TEMPORARY SEDIMENT BASIN OR SPECIAL STILLING BASIN(S) AS STILLING BASIN WHERE APPLICABLE.

CLEARING AND GRUBBING EROSION CONTROL FOR CONSTRUCTION SHEET 4


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



ENVIRONMENTALLY SENSITIVE AREA  
SEE PROJECT SPECIAL PROVISIONS



# Surry County Bridge #850015

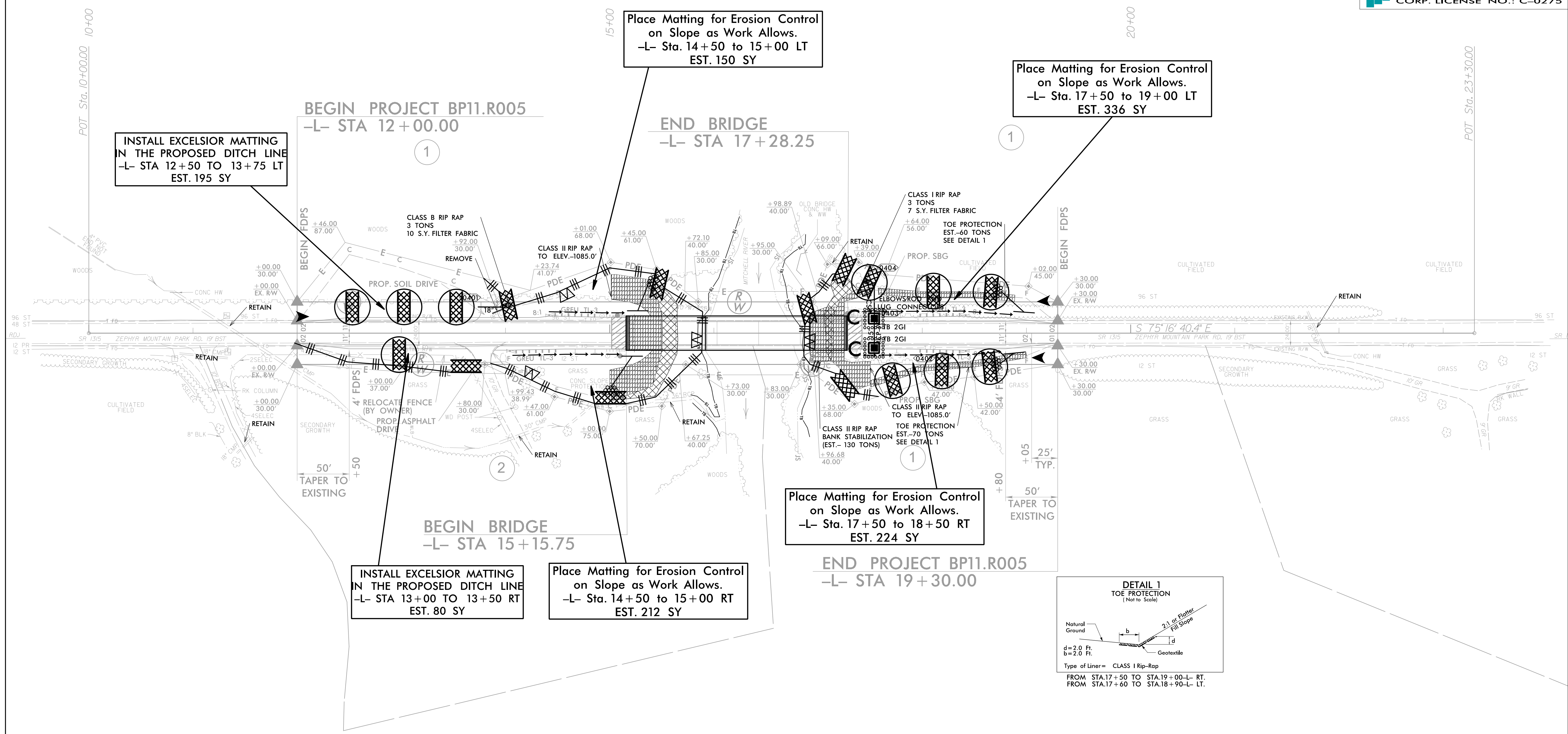
PROJECT REFERENCE NO. <i>BP11.R005</i>	SHEET NO. <i>EC-5/CONST. 4</i>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
 <b>TGS ENGINEERS</b> 201 W. MARION ST-STE 200 SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275	



For Slopes Excavated Greater Than 10 feet  
Install Matting for Erosion Control on  
Entire Slope as Work Allows.

IN LIEU OF ROCK INLET SEDIMENT TRAP TYPE C,  
UTILIZE FABRIC INSERT INLET PROTECTION  
DEVICES IN AREAS WHERE WATER MAY  
POND ON ROAD OPEN TO LIVE TRAFFIC.

Place Matting for Erosion Control  
on Slopes Adjacent to Permitted  
Wetlands as Work Allows.



INSTALL EXCELSIOR MATTING  
IN THE PROPOSED DITCH LINE  
-L- STA 12+50 TO 13+75 LT  
EST. 195 SY

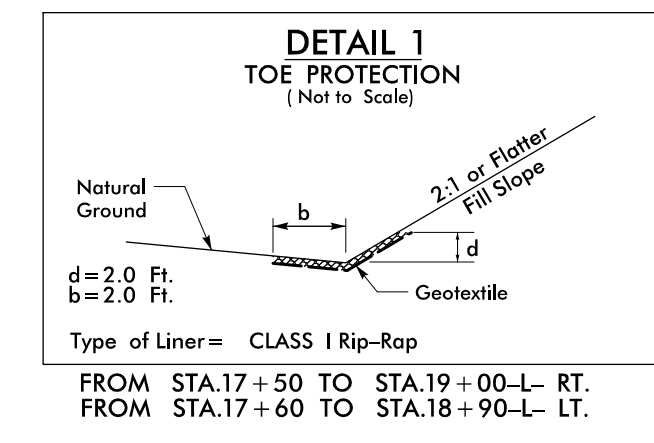
Place Matting for Erosion Control  
on Slope as Work Allows.  
-L- Sta. 14+50 to 15+00 LT  
EST. 150 SY

Place Matting for Erosion Control  
on Slope as Work Allows.  
-L- Sta. 17+50 to 19+00 LT  
EST. 336 SY

INSTALL EXCELSIOR MATTING  
IN THE PROPOSED DITCH LINE  
-L- STA 13+00 TO 13+50 RT  
EST. 80 SY

Place Matting for Erosion Control  
on Slope as Work Allows.  
-L- Sta. 14+50 to 15+00 RT  
EST. 212 SY

Place Matting for Erosion Control  
on Slope as Work Allows.  
-L- Sta. 17+50 to 18+50 RT  
EST. 224 SY



NOTE: UTILIZE TEMPORARY SEDIMENT BASIN OR SPECIAL STILLING  
BASIN(S) AS STILLING BASIN WHERE APPLICABLE.



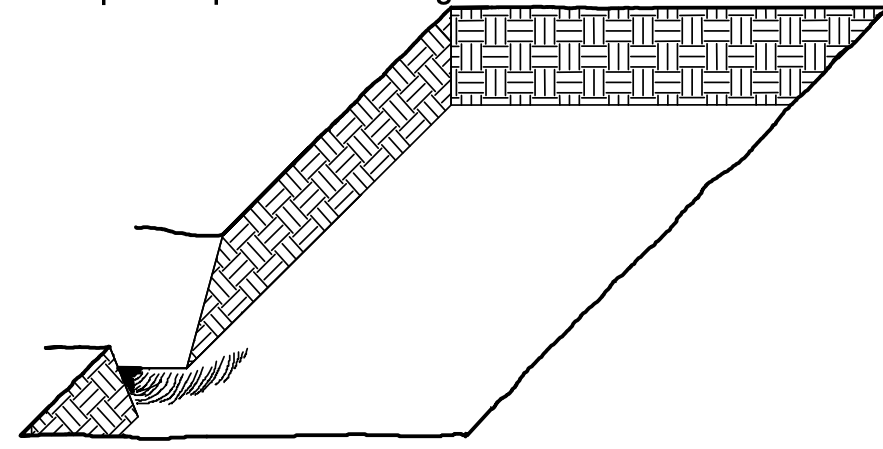
STATE	STATE PROJECT REFERENCE NO.	SHEET	SQUARES
N.C.	BP11.R005	RF-1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	

# PLANTING DETAILS

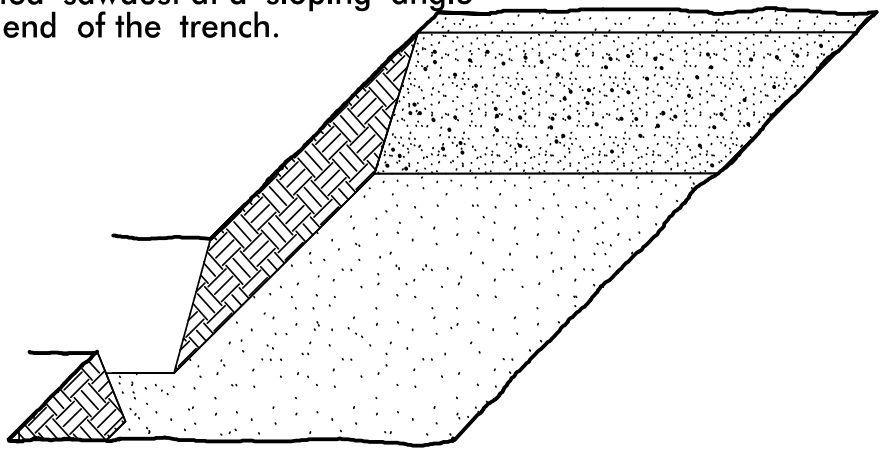
## SEEDLING / LINER BAREROOT PLANTING DETAIL

### HEALING IN

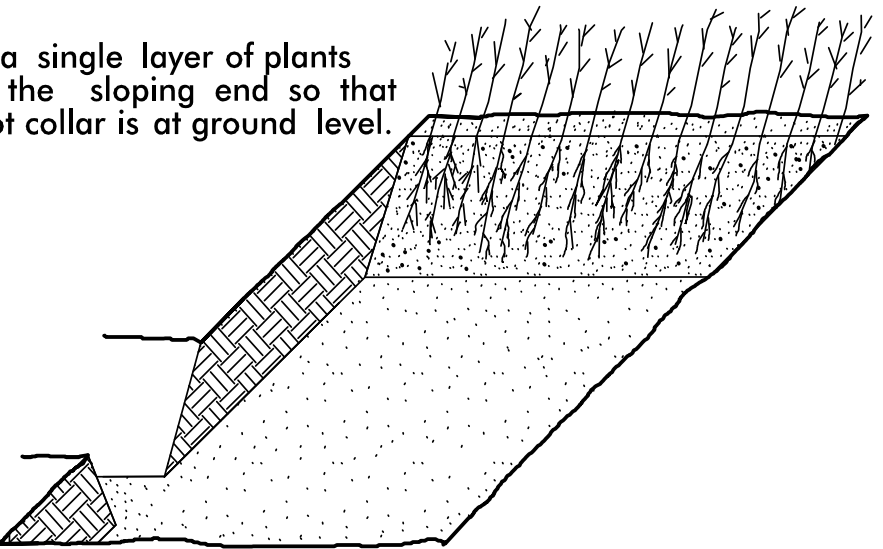
1. Locate a healing-in site in a shady, well protected area.
2. Excavate a flat bottom trench 12 inches deep and provide drainage.



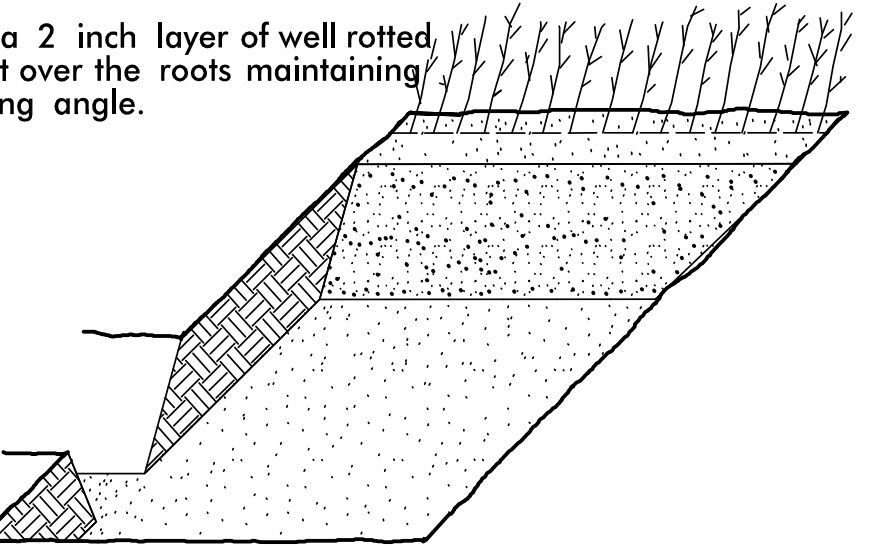
3. Backfill the trench with 2 inches well rotted sawdust. Place a 2 inch layer of well rotted sawdust at a sloping angle at one end of the trench.



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

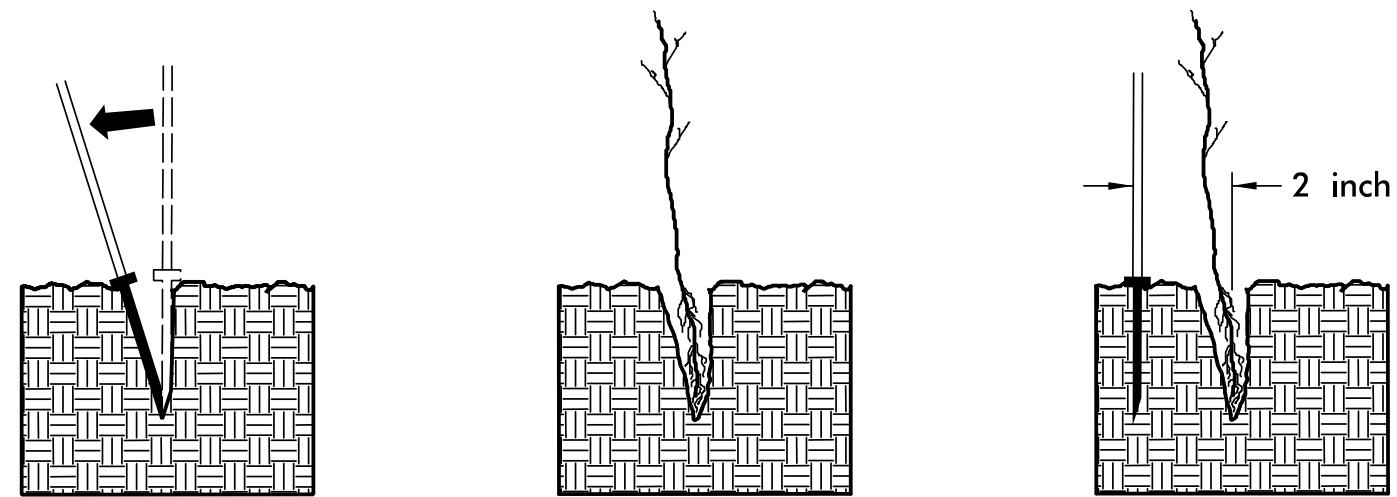


5. Place a 2 inch layer of well rotted sawdust over the roots maintaining a sloping angle.

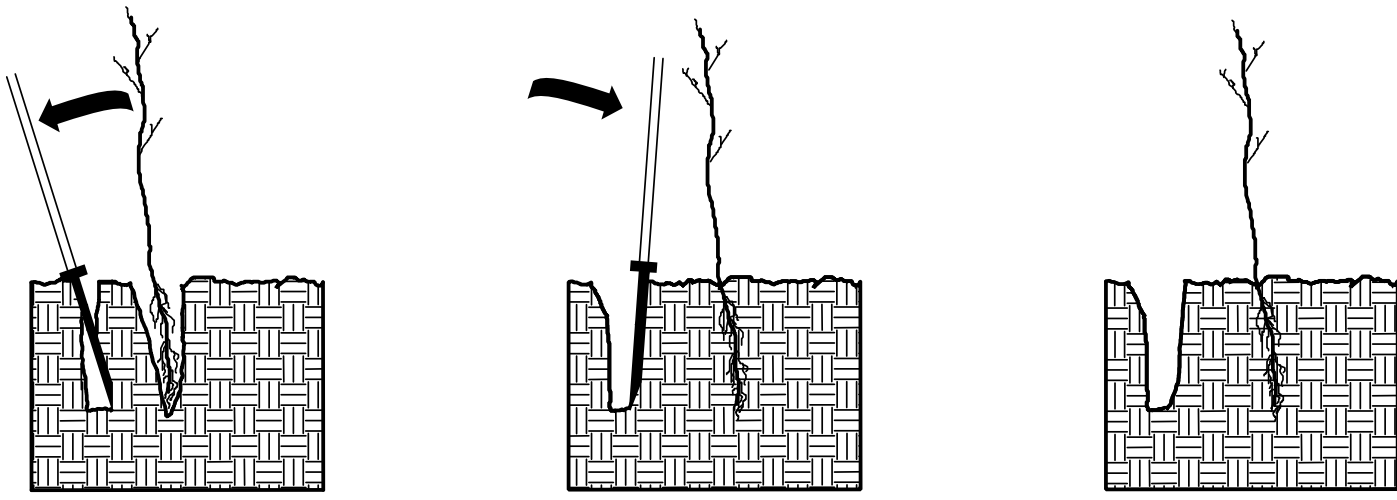


6. Repeat layers of plants and sawdust as necessary and water thoroughly.

### DIBBLE PLANTING METHOD USING THE KBC PLANTING BAR



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



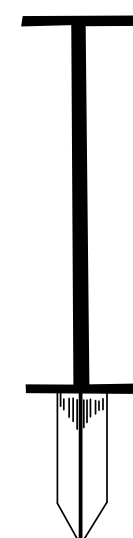
4. Pull handle of bar toward planter, firming soil at bottom.
5. Push handle forward firming soil at top.
6. Leave compaction hole open. Water thoroughly.

### PLANTING NOTES:

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



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



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

# REFORESTATION

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

### REFORESTATION

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

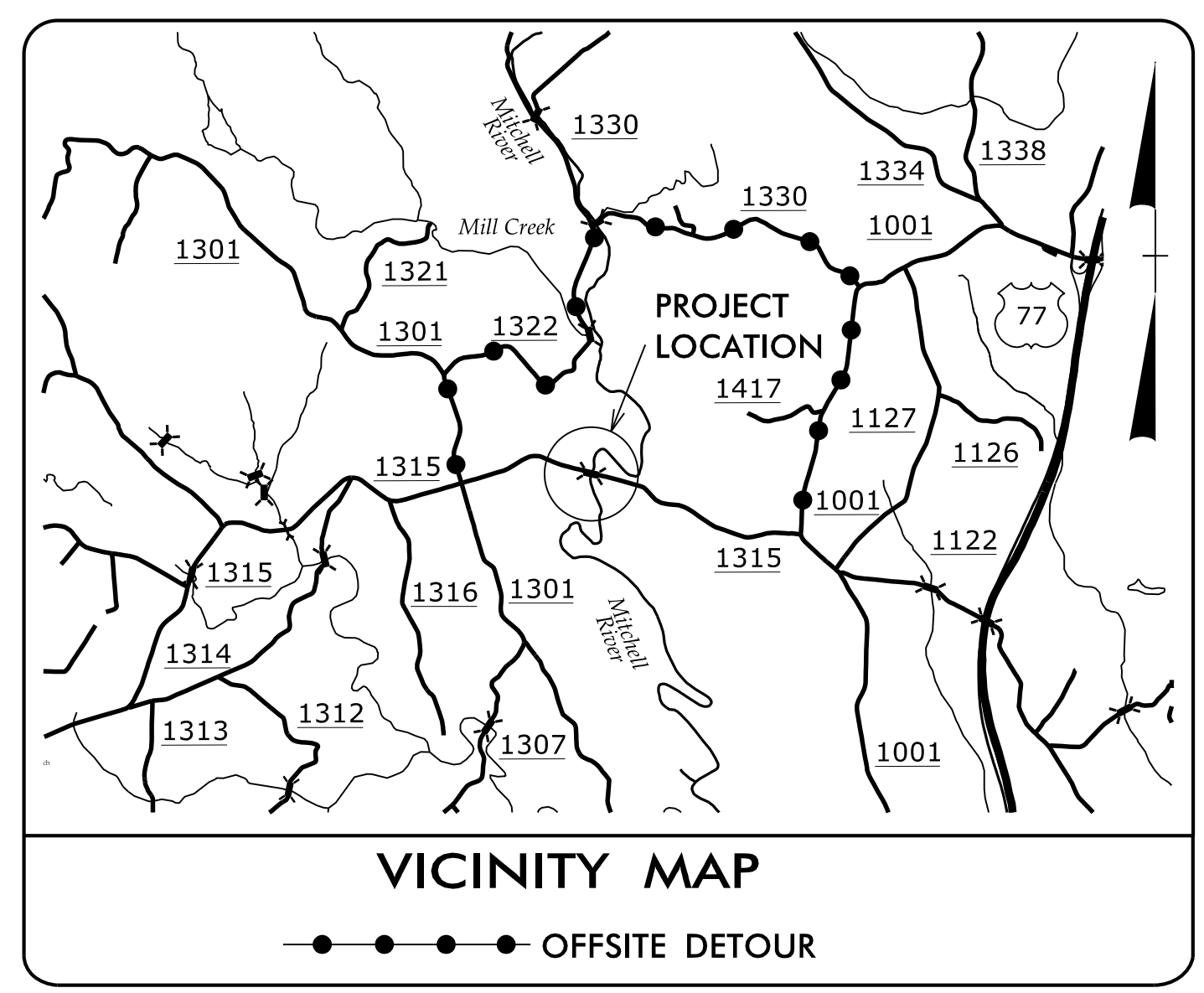
25%	LIRIODENDRON TULIPIFERA	TULIP POPLAR	12 in - 18 in BR
25%	PLATANUS OCCIDENTALIS	SYCAMORE	12 in - 18 in BR
25%	BETULA NIGRA	RIVER BIRCH	12 in - 18 in BR
25%	NYSSA SYLVATICA	BLACK GUM	12 in - 18 in BR

## REFORESTATION DETAIL SHEET

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

09/28/09  
15-NOV-2022 02:41  
C:\U001\PROJECTS\2022\Surry #15 (BP11.R005)\UBOs\Utilities\Engineering\UBO\Proj\BP11.R005\_ut\_tsh\_U001.psh.dgn  
\$\$\$\$\$SERVNAME\$\$\$\$\$

**TIP PROJECT: BP11.R005**



STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

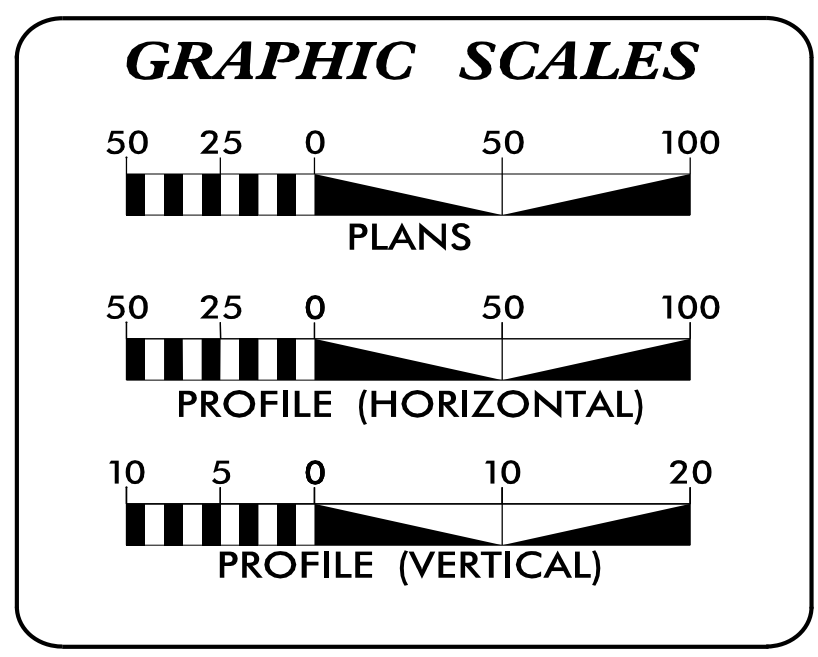
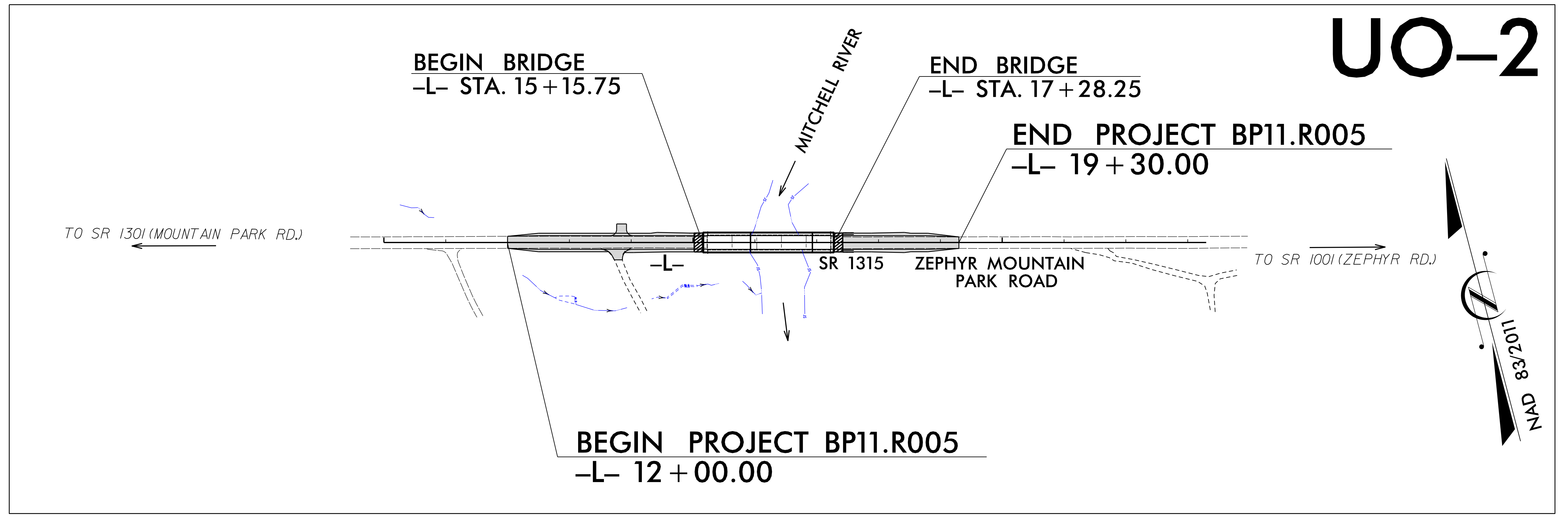
**UTILITIES BY OTHERS PLANS  
SURRY COUNTY**

**LOCATION: BRIDGE #850015 ON SR 1315 (ZEPHYR MOUNTAIN PARK RD.)  
OVER MITCHELL RIVER**

**TYPE OF WORK: COMMUNICATIONS**

T.I.P. NO.	SHEET NO.
BP11.R005	UO-1

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



**INDEX OF SHEETS**

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

**UTILITY OWNERS WITH CONFLICTS**

(A) COMMUNICATIONS - CENTURYLINK  
(B) COMMUNICATIONS - SURRY TELEPHONE

PREPARED IN THE OFFICE OF:

**TELICS**

1598 WESTBROOK PLAZA DR.  
SUITE 202  
WINSTON-SALEM, NC 27103  
(336) 705-8844

CORY WOOD UTILITY PROJECT MANAGER  
CORY WOOD PROJECT UTILITY COORDINATOR

**DIVISION OF HIGHWAYS  
DIVISION II**

801 STATESVILLE RD  
NORTH WILKESBORO, NC 28659

BRANDON GREER PROJECT ENGINEER  
SUSAN HOFFMAN UTILITY ENGINEER



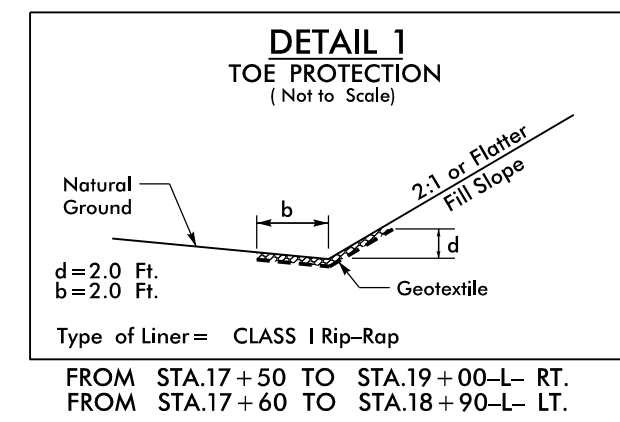
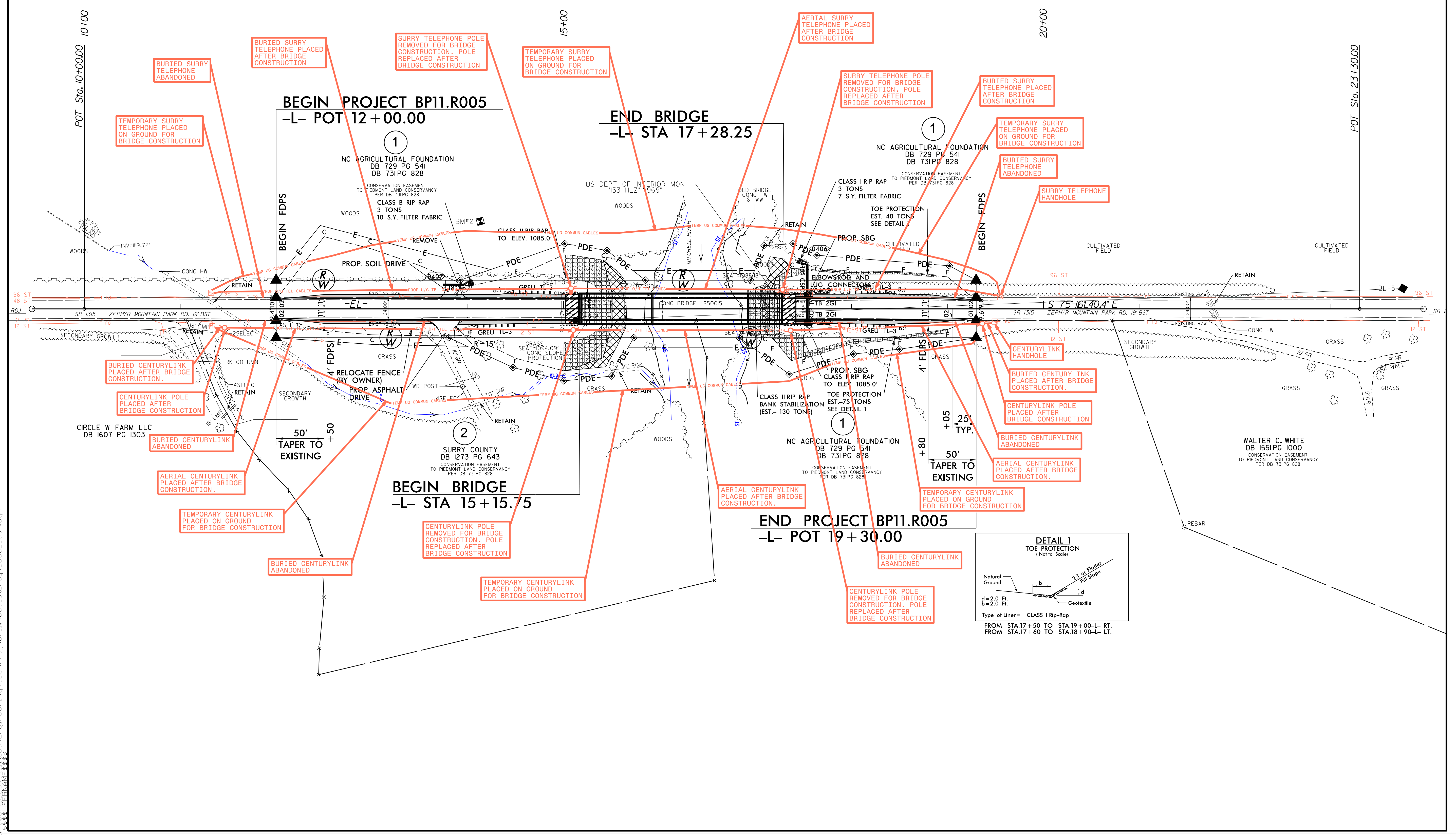
### UTILITIES BY OTHERS

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

Point	North	East	Elevation
BCL1	960577.79	1457998.53	1097.30
BCL2	960527.03	1458191.67	1091.23
BD1	960589.33	1458001.37	1096.89
BD2	960566.20	1457995.47	1096.99
BD3	960538.47	1458194.95	1090.86
BD4	960515.44	1458188.83	1090.85



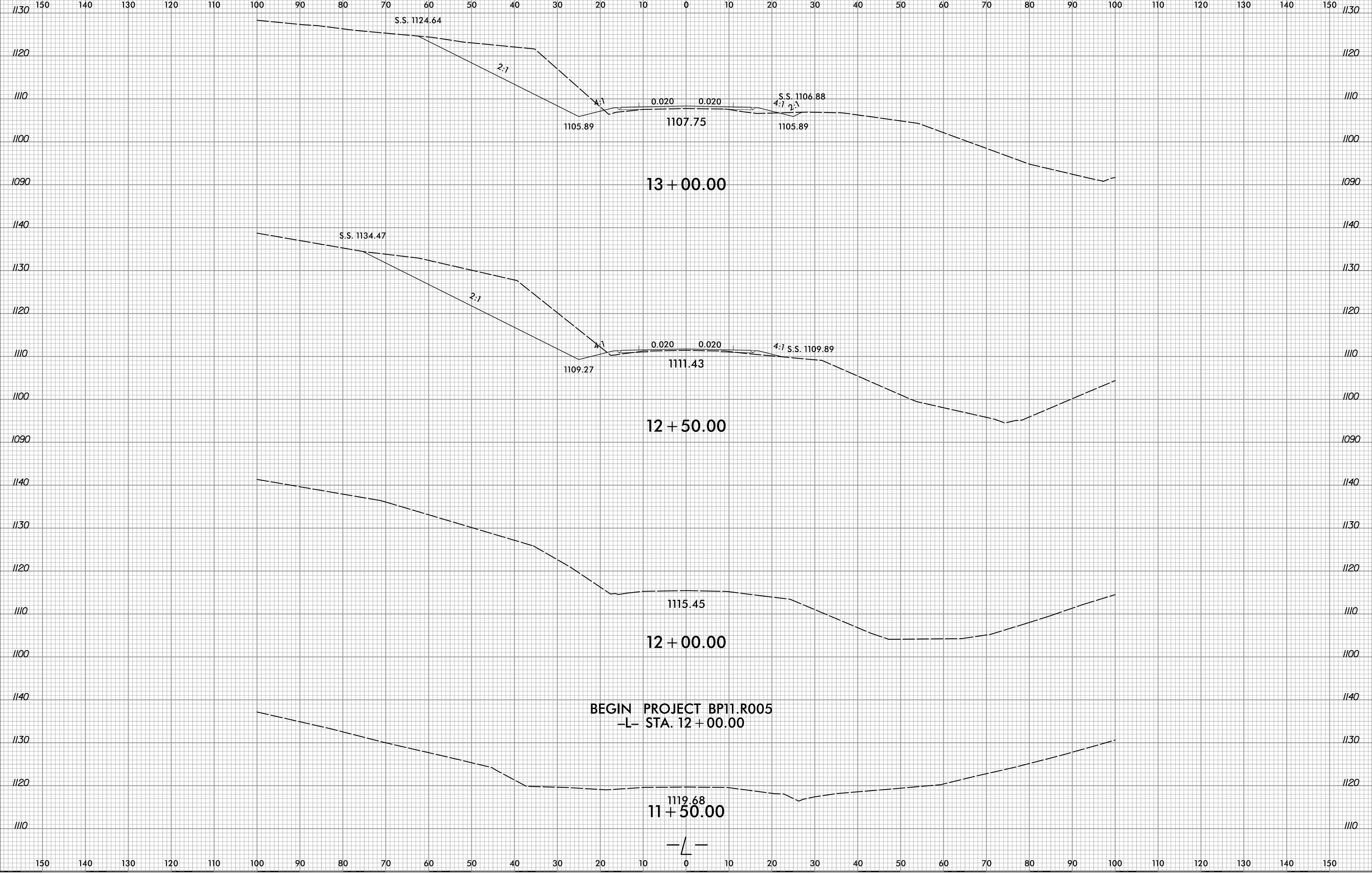
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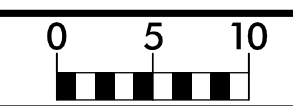
6/23/16  
2/16/2022  
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	PROJ. REFERENCE NO.	SHEET NO.
	BP11.R005	X-1

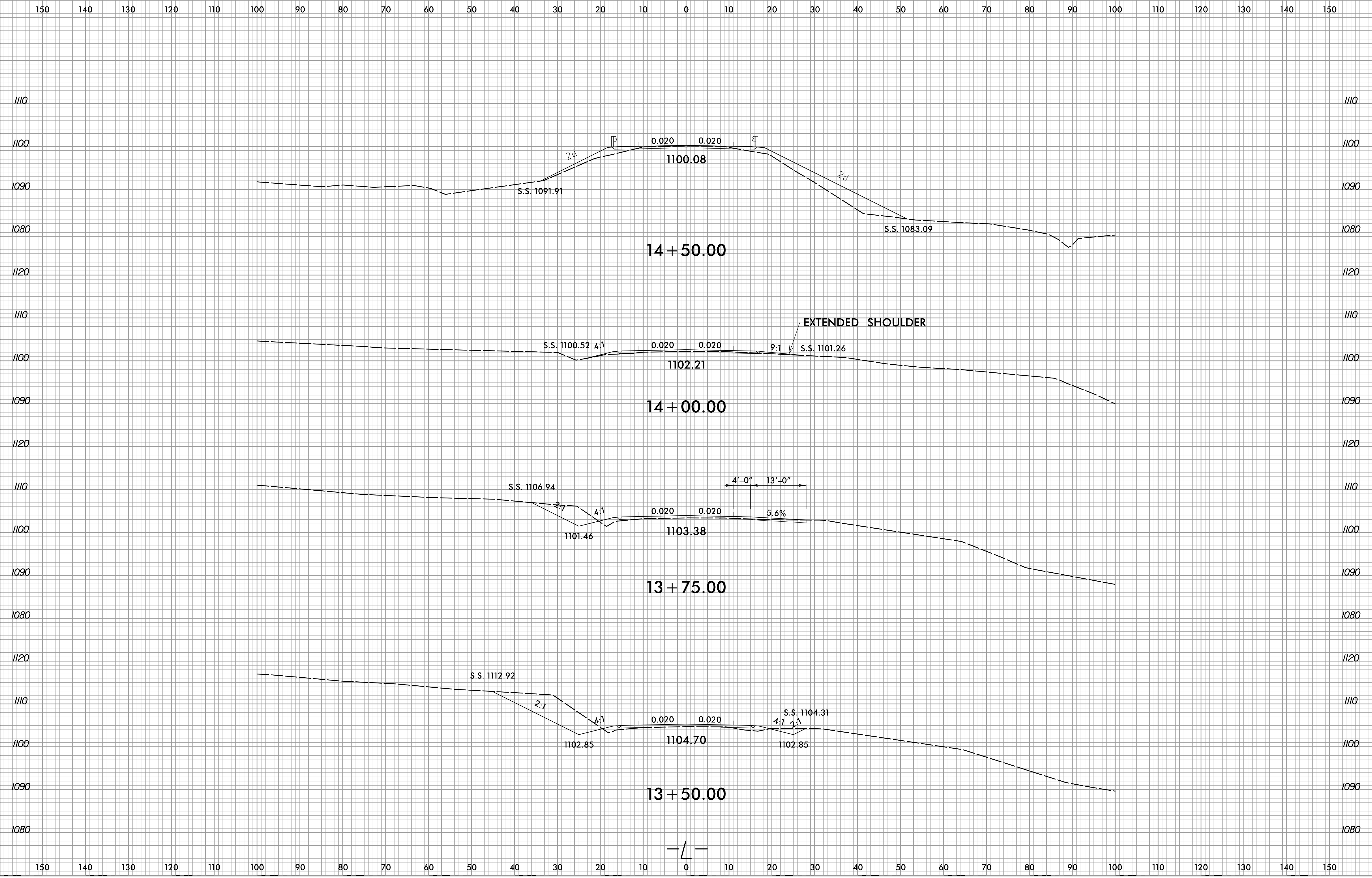




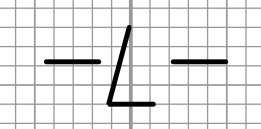
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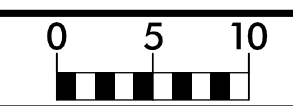
PROJ. REFERENCE NO.	SHEET NO.
BP11.R005	X-2



2/6/2022 11:11 AM \\Roadway\XSC\Surry\_15.Rdy\_xpl.dgn

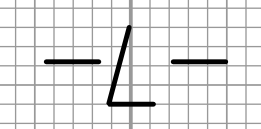
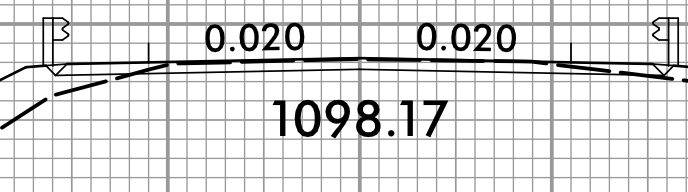
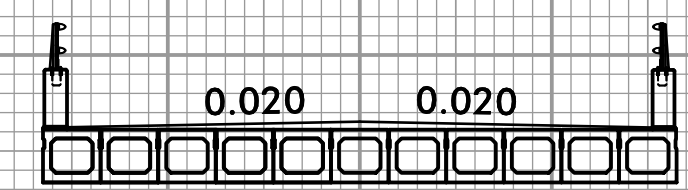
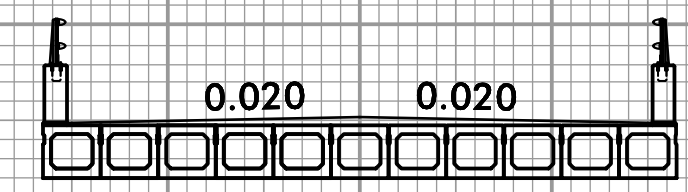
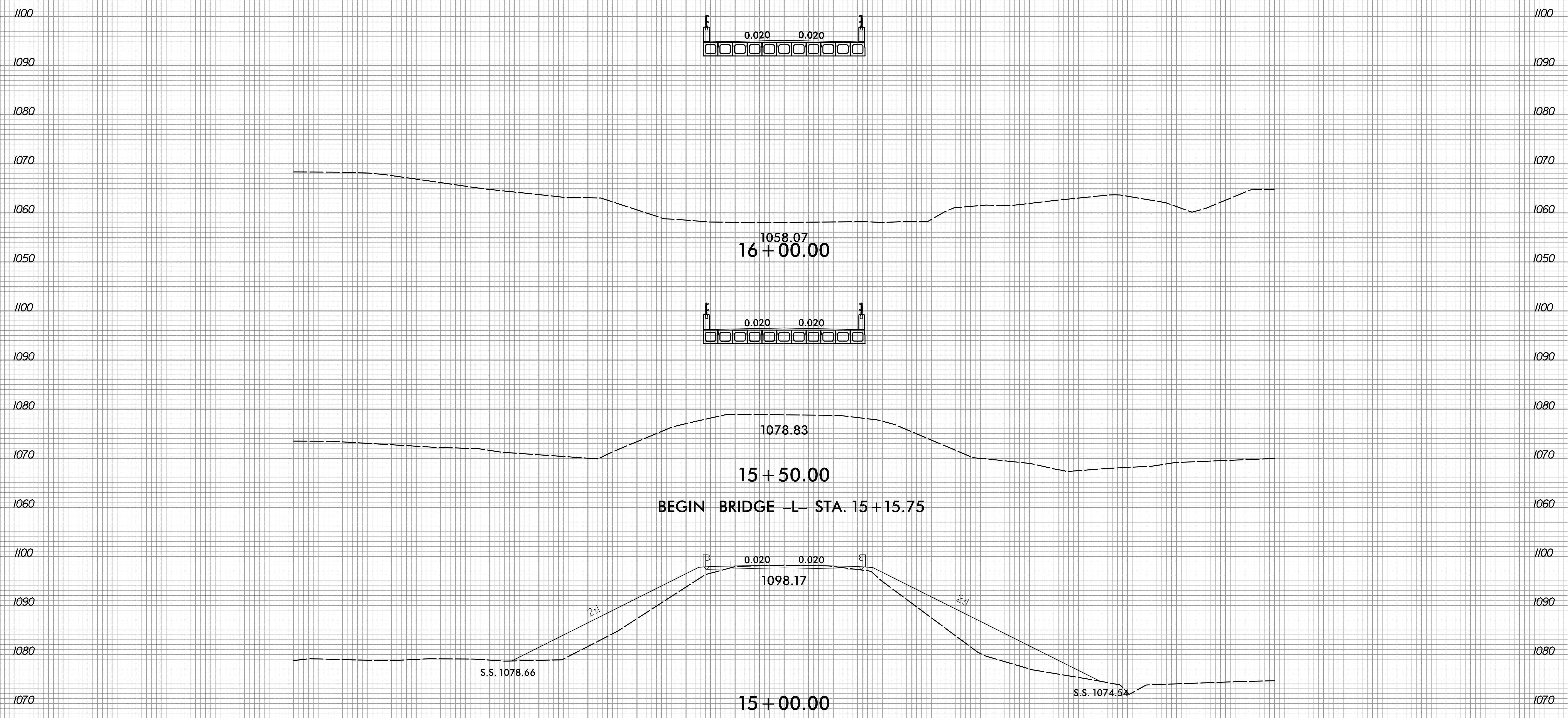


6/23/16



PROJ. REFERENCE NO.	SHEET NO.
BP11.R005	X-3

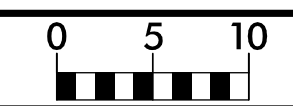
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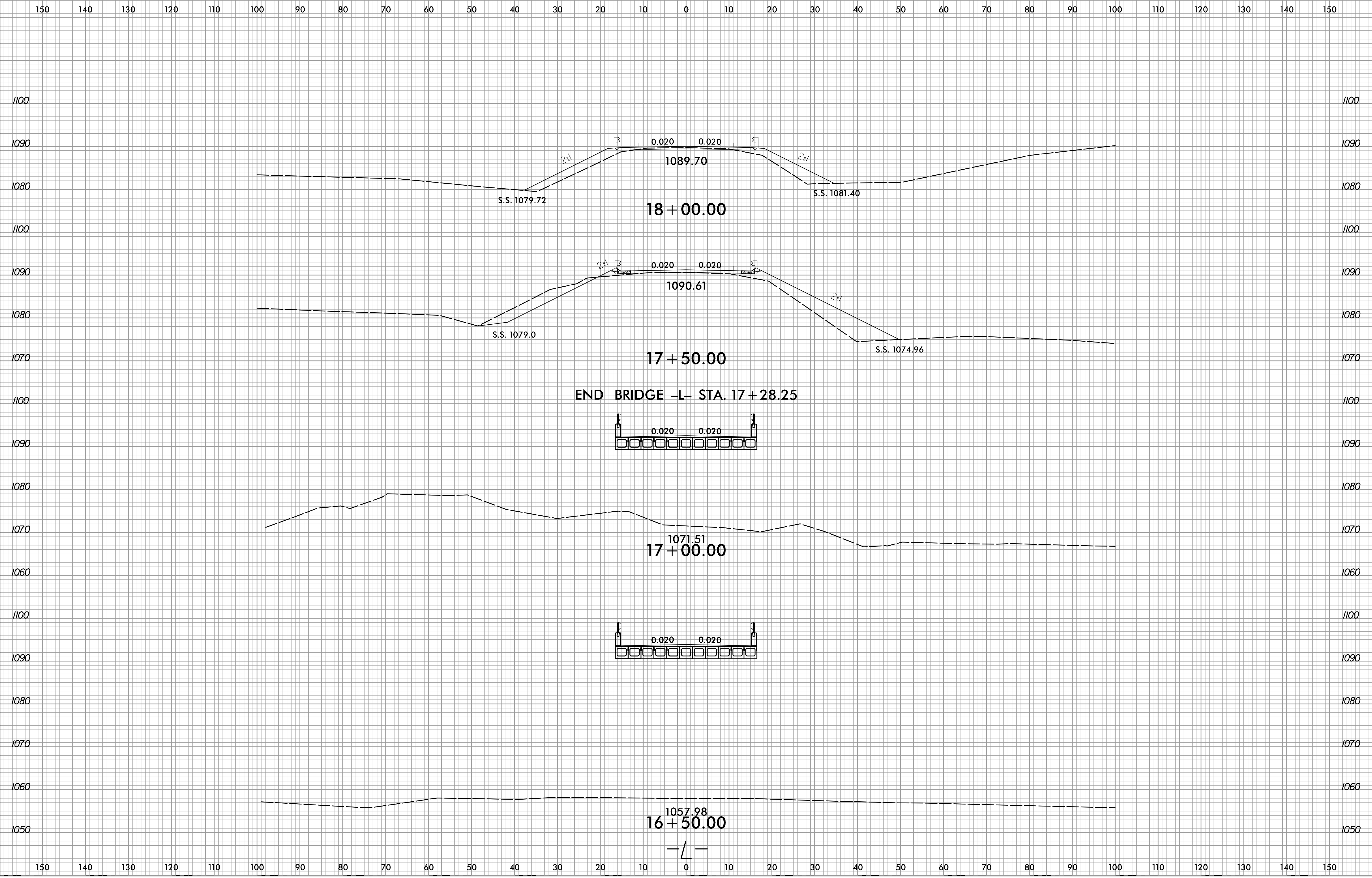
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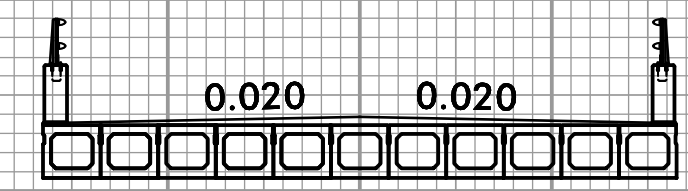
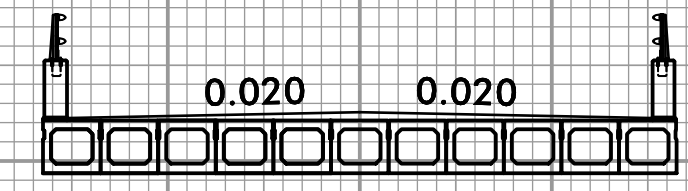
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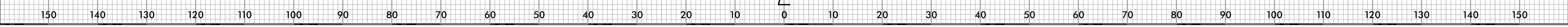
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BP11.R005	X-4



END BRIDGE -L- STA. 17+28.25

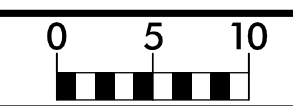


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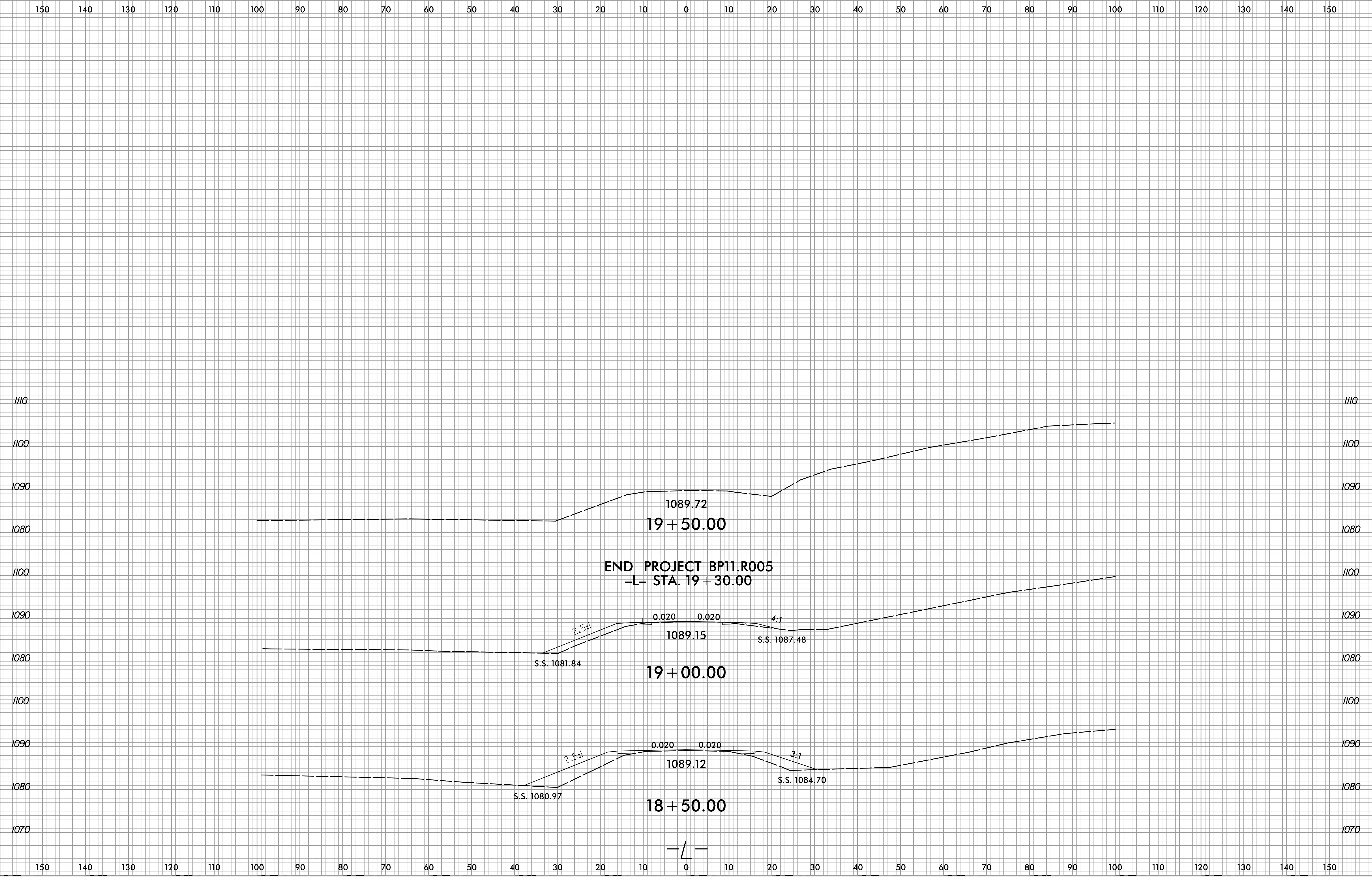




6/23/16



PROJ. REFERENCE NO.	SHEET NO.
BP11.R005	X-5

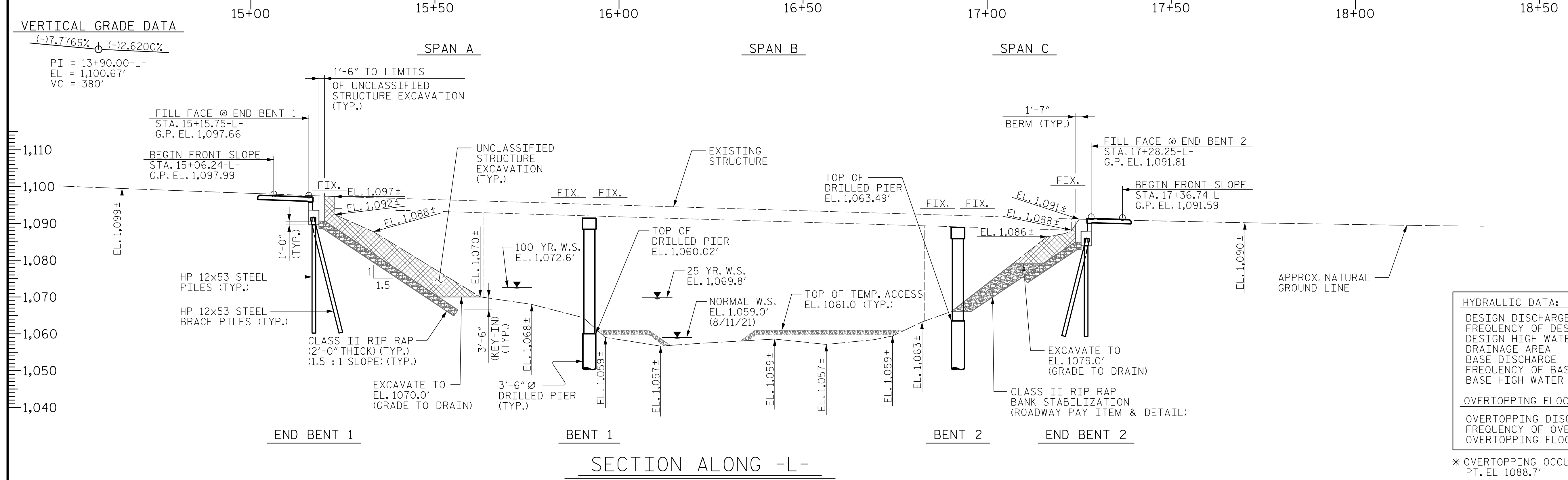
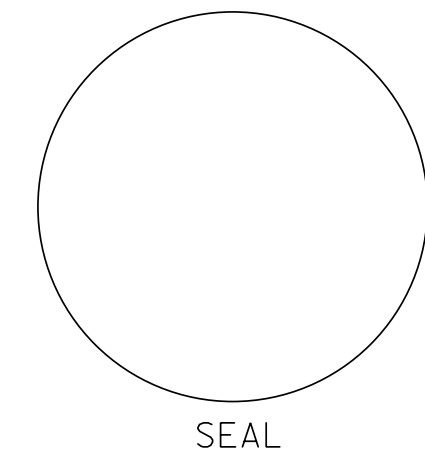


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VERTICAL GRADE DATA

(-)7.7769% (-)2.6200%  
 PI = 13+90.00-L-  
 EL = 1,100.67'  
 VC = 380'

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS.



**HYDRAULIC DATA:**

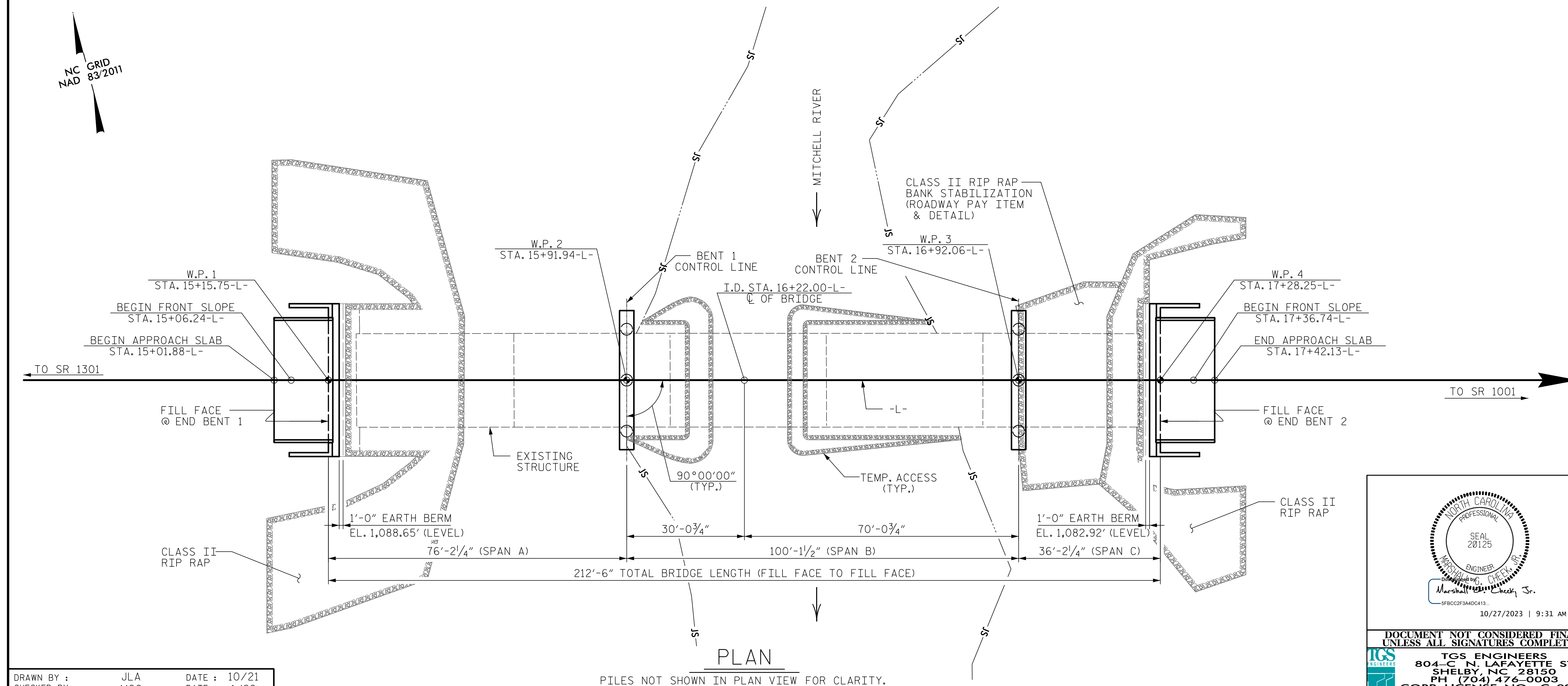
DESIGN DISCHARGE	5,940 CFS
FREQUENCY OF DESIGN FLOOD	25 YRS.
DESIGN HIGH WATER ELEVATION	1,069.8'
DRAINAGE AREA	45.9 SQ. MI.
BASE DISCHARGE	8,248 CFS
FREQUENCY OF BASE DISCHARGE	100 YRS.
BASE HIGH WATER ELEVATION	1,072.6'

**OVERTOPPING FLOOD DATA:**

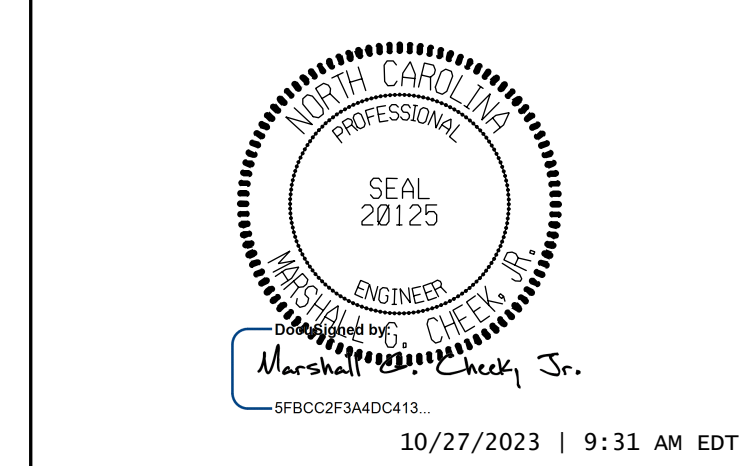
OVERTOPPING DISCHARGE	N/A
FREQUENCY OF OVERTOPPING FLOOD	500+ YRS.
OVERTOPPING FLOOD ELEVATION	1,088.7'

\* OVERTOPPING OCCURS AT 18+84.00-L- LT. SHOULDER PT. EL. 1088.7'

LOW CHORD ELEVATION	
EB1	1,093.73'
EB2	1,088.00'



PROJECT NO. BP11.R005  
 SURRY COUNTY  
 STATION: 16+22.00 -L-  
 SHEET 1 OF 5 REPLACES BRIDGE NO. 850015



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING**  
 FOR BRIDGE OVER  
 MITCHELL RIVER  
 ON SR 1315 BETWEEN  
 SR 1301 AND SR 1001

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

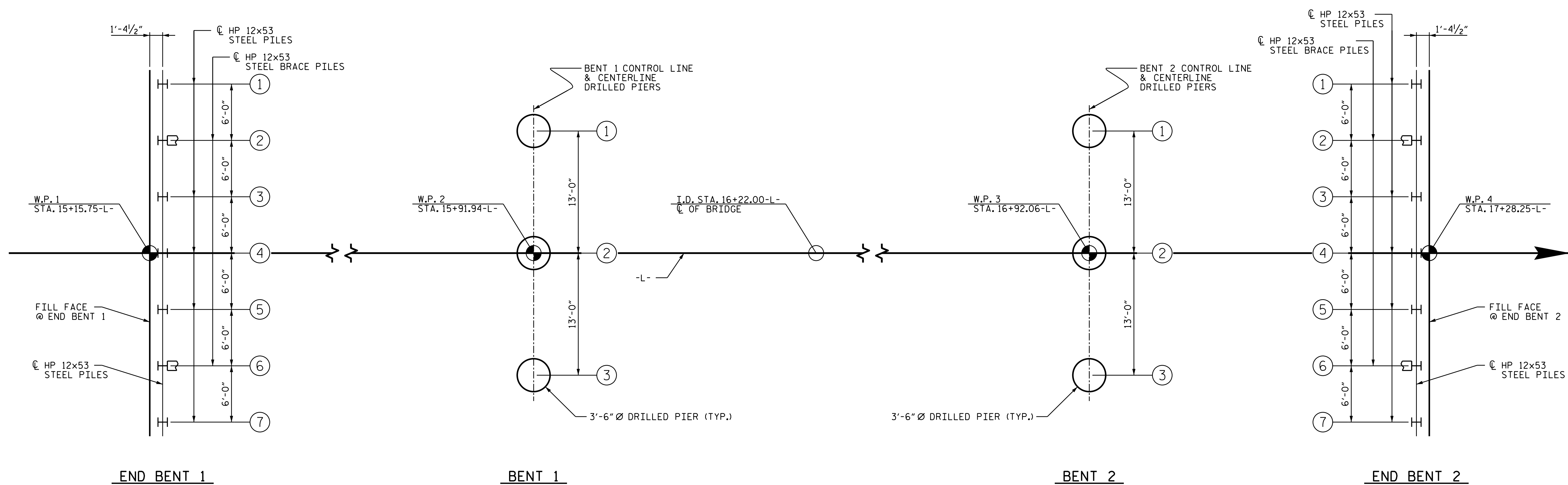
TGS ENGINEERS  
 804-C N. LAFAYETTE ST  
 SHELBY, NC 28150  
 PH (704) 476-0003  
 CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			33

DRAWN BY : JLA DATE : 10/21  
 CHECKED BY : MGC DATE : 1/22

PLAN  
 PILES NOT SHOWN IN PLAN VIEW FOR CLARITY.



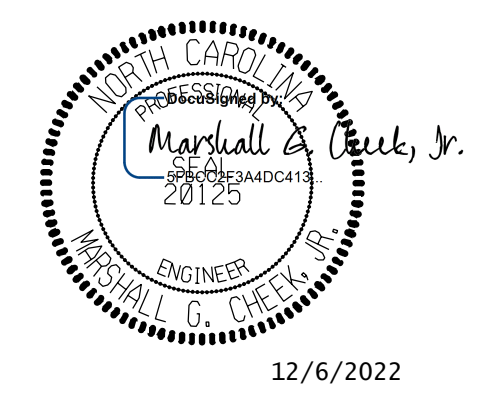


### FOUNDATION LAYOUT PLAN

ALL PILES ARE HP12x53 STEEL PILES.  
 DIMENSIONS LOCATING PILES ARE SHOWN TO THE CENTERLINE OF PILES.  
 END BENT BRACE PILES ARE BATTERED 3:12.  
 DIMENSIONS LOCATING DRILLED PIERS ARE TO THE CENTERLINE OF DRILLED PIERS.

PROJECT NO. BP11.R005  
SURRY COUNTY  
 STATION: 16+22.00 -L-

SHEET 2 OF 5



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
**GENERAL DRAWING  
 FOR BRIDGE OVER  
 MITCHELL RIVER  
 ON SR 1315 BETWEEN  
 SR 1301 AND SR 1001**

DRAWN BY : JLA DATE : 10/21  
 CHECKED BY : MGC DATE : 10/22

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED						SHEET NO. S-2	
TGS ENGINEERS 804-C N. LAFAYETTE ST SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275						TOTAL SHEETS 33	
REVISIONS							
NO.	BY	DATE	NO.	BY	DATE		
1			3				
2			4				

### 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 1, Piles 1-7	94	SEE STRUCTURE PLANS	25			160								
End Bent 2, Piles 1-7	94		20			160								

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

### SUMMARY OF PDA / PILE ORDER LENGTHS

(BLANK ENTRIES INDICATE ITEM IS NOT APPLICABLE TO STRUCTURE)

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

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

### 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 Cutting Required? YES OR MAYBE	Steel Pile Points			Steel Pile Tips Required? YES
		Pipe Pile Cutting Shoes Required? YES	Pipe Pile Conical Points Required? YES	H-Pile Points Required? YES	
End Bent 1, Piles 1-7				YES	
End Bent 2, Piles 1-7				YES	
TOTAL QUANTITY:					14

### SUMMARY OF DRILLED PIER TESTING

(BLANK ENTRIES INDICATE ITEM IS NOT APPLICABLE TO STRUCTURE)

End Bent/ Bent No. PIER(s) #-* (e.g., "Bent 1, Piers 1-3")	Standard Penetration Test (SPT) Required? YES OR MAYBE	Crosshole Sonic Logging (CSL) Required? * YES OR MAYBE	Total CSL Tube Length (For All Tubes) per Pier LIN FT	Shaft Inspection Device (SID) Required? YES OR MAYBE	Pile Integrity Test (PIT) Required? MAYBE
Bent 1, Piers 1-3		MAYBE	68.00	MAYBE	
Bent 2, Piers 1		MAYBE	47.00	MAYBE	
Bent 2, Piers 2-3		MAYBE	59.00	MAYBE	
TOTAL QUANTITY:		1	369.00	1	

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

### SUMMARY OF DRILLED PIER INFORMATION/INSTALLATION

(BLANK ENTRIES INDICATE ITEM IS NOT APPLICABLE TO STRUCTURE)

End Bent/ Bent No. Piers #-* (e.g., "Bent 1, Piers 1-3")	Factored Resistance per Pier TONS	Minimum Pier Tip (Tip No Higher Than) Elevation FT	Required Tip Resistance Per Pier TSF	Scour Critical Elevation FT	Minimum Drilled Pier Penetration Into Rock per Pier LIN FT	Drilled Pier Length per Pier LIN FT	Drilled Pier Length Not In Soil per Pier LIN FT	Drilled Pier Length In Soil per Pier LIN FT	Permanent Steel Casing Required? YES OR MAYBE	Permanent Steel Casing Tip Elevation (Elev Not To Extend Casing Below) FT	Permanent Steel Casing Length * per Pier LIN FT
Bent 1, Piers 1-2	545	1045.0	125	1051	9.0		10.80	4.28	MAYBE	1054.0	6.50
Bent 1, Pier 3	545	1045.0	125	1051	9.0		9.80	5.28	MAYBE	1054.0	6.50
Bent 2, Pier 1	470	1055.0	110	1061	7.0		7.70	0.80	NO		
Bent 2, Piers 2-3	470	1052.0	110	1061	7.0		7.50	4.00	NO		


\* Permanent Steel Casing Length equals the difference between the ground line or top of drilled pier elevation, whichever is higher, and the permanent casing tip elevation.

**NOTES:**

- The Pile and Drilled Pier Foundation Tables are based on the bridge substructure design and foundation recommendations sealed by a North Carolina Professional Engineer (D. Matthew Brewer, 041986) on 9/29/2022.
- Total Pile Driving Equipment Setup quantity (not shown in Pile Foundation Tables) equals the number of driven piles, ie., the number of piles with a required Driving Resistance.
- The Engineer will determine the need for PDA Testing, Pipe Pile Plates, Permanent Steel Casings, SPTs, CSL Testing, SID Inspections and PITs when these items may be required.
- For Piles, See Piles Provision and Section 450 of the Standard Specifications.
- For Drilled Piers, See Section 411 of the Standard Specifications.
- Install Permanent Steel Casing at Bent 1 by Vibrating, Screwing, or Driving Permanent Casing before excavating or disturbing any material below Elevation 1054.0 ft.

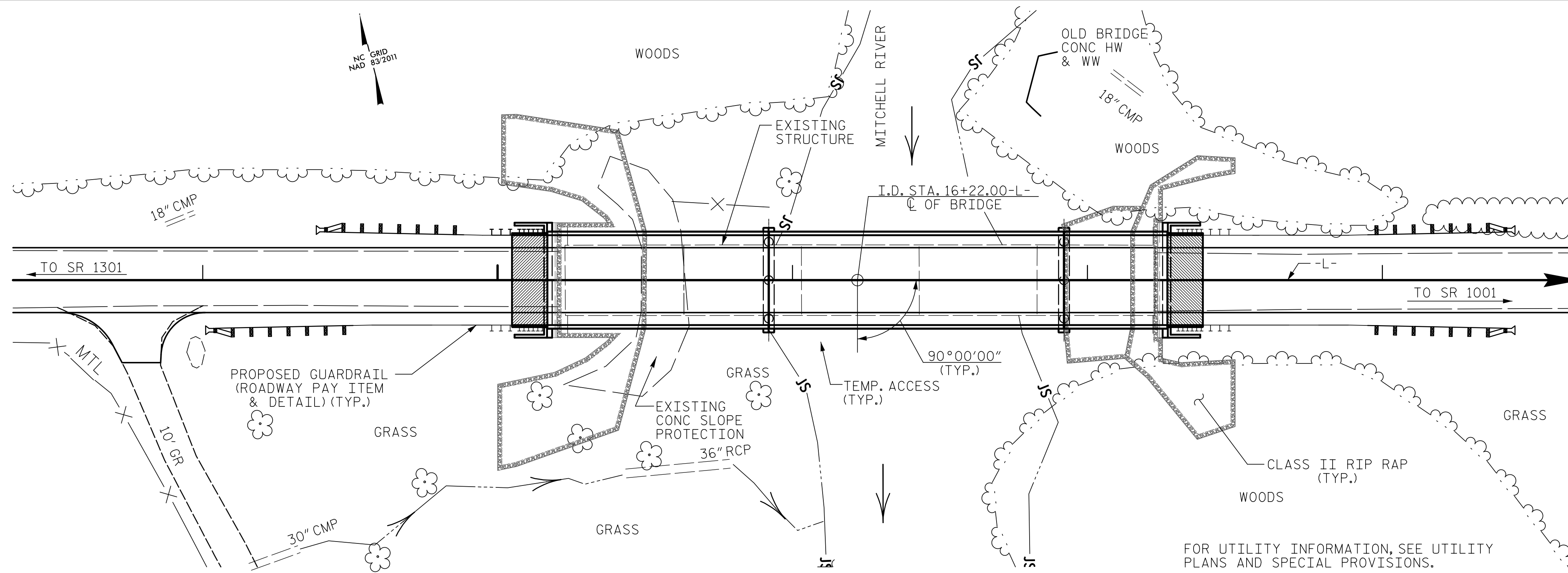
DRAWN BY : JLA      DATE : 8/22  
 CHECKED BY : MGC      DATE : 11/22

PROJECT NO. BP11.R005  
SURRY COUNTY  
 STATION: 16+22.00 -L-

 12/6/2022	STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH  <b>PILE AND DRILLED PIER                  FOUNDATION                  TABLES</b>
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	REVISIONS
TGS ENGINEERS 804-C N. LAFAYETTE ST SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275	SHEET NO. S-3 TOTAL SHEETS 33



BENCHMARK #2: RR SPIKE IN BASE OF 12" POPLAR: 91 FT LEFT OF STA. 14+13 -L-; ELEV. 1,100.58'



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 (S-33).

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

THE EXISTING STRUCTURE CONSISTING OF 5 SPANS (1 @ 40'-3"; 3 @ 40'-0" AND 1 @ 40'-3") WITH A REINFORCED CONCRETE DECK SLAB ON STEEL I-BEAMS WITH 2" ASPHALT WEARING SURFACE AND A CLEAR ROADWAY WIDTH OF 24'-0", AND A SUBSTRUCTURE CONSISTING OF REINFORCED CONCRETE CAPS ON H-PILES END BENTS AND REINFORCED CONCRETE POST & BEAM INTERIOR BENTS AND LOCATED AT THE SAME SITE OF THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED BELOW THE LEGAL LOAD LIMIT. SHOULD THE INTEGRITY OF THE BRIDGE DETERIORATE, THIS LOAD LIMIT MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT. FOR REMOVAL OF EXISTING STRUCTURE, SEE SPECIAL PROVISIONS.

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

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. 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.

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

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

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

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

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 16+22.00-L-."

THE MATERIAL SHOWN IN THE HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 50'-0" LT. AND 65'-0" RT. OF CENTERLINE OF BRIDGE AT END BENT 1 AND 55'-0" LT. AND 25'-0" OF CENTERLINE OF BRIDGE AT END BENT 2 AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION, SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

THE CONTRACTOR WILL BE REQUIRED TO CONSTRUCT, MAINTAIN AND AFTERWARDS REMOVE A TEMPORARY ACCESS AT STATION 16+22.00 -L- FOR USE DURING CONSTRUCTION OF THE PROPOSED STRUCTURE. FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS, SEE SPECIAL PROVISIONS.

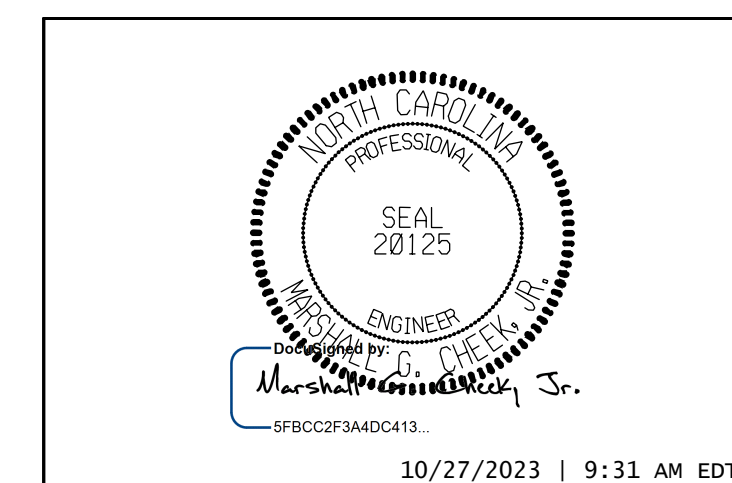
AT THE CONTRACTOR'S OPTION, AND UPON REMOVAL OF THE CAUSEWAY, THE CLASS II RIP RAP USED IN THE CAUSEWAY MAY BE PLACED AS RIP RAP SLOPE PROTECTION. SEE SPECIAL PROVISIONS FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS AT STATION 16+22.00 -L-.

PROJECT NO. BP11.R005

SURRY COUNTY

STATION: 16+22.00 -L-

SHEET 4 OF 5



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

GENERAL DRAWING  
FOR BRIDGE OVER  
MITCHELL RIVER  
ON SR 1315 BETWEEN  
SR 1301 AND SR 1001

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS  
804-C N. LAFAYETTE ST  
SHELBY, NC 28150  
PH (704) 476-0003  
CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			33

DRAWN BY : JLA DATE : 10/21  
CHECKED BY : MGC DATE : 1/22





## 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>	1.56	--	1.75	0.260	<b>1.56</b>	A	EL	<b>36.75</b>	0.430	1.90	A	EL	6.75	0.80	0.260	1.79	A	EL	36.75		
	HL-93(0pr)	N/A	--	2.03	--	1.35	0.260	2.03	A	EL	36.75	0.430	2.51	A	EL	6.75	N/A	--	--	--	--	--		
	HS-20(Inv)	36.000	<b>2</b>	2.05	73.80	1.75	0.260	<b>2.05</b>	A	EL	<b>36.75</b>	0.430	2.44	A	EL	6.75	0.80	0.260	2.35	A	EL	36.75		
	HS-20(0pr)	36.000	--	2.66	95.76	1.35	0.260	2.66	A	EL	36.75	0.430	3.21	A	EL	6.75	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13,500	--	5.31	71.69	1.4	0.260	5.80	A	EL	36.75	0.430	7.59	A	EL	6.75	0.80	0.260	5.31	A	EL	36.75	
		SNGARBS2	20,000	--	3.95	79.00	1.4	0.260	4.32	A	EL	36.75	0.430	5.34	A	EL	6.75	0.80	0.260	3.95	A	EL	36.75	
		SNAGRIS2	22,000	--	3.74	82.28	1.4	0.260	4.08	A	EL	36.75	0.430	4.95	A	EL	6.75	0.80	0.260	3.74	A	EL	36.75	
		SNCOTTS3	27,250	--	2.64	71.94	1.4	0.260	2.89	A	EL	36.75	0.430	3.69	A	EL	6.75	0.80	0.260	2.64	A	EL	36.75	
		SNAGGRS4	34,925	--	2.21	77.18	1.4	0.260	2.41	A	EL	36.75	0.430	3.04	A	EL	6.75	0.80	0.260	2.21	A	EL	36.75	
		SNS5A	35,550	--	2.16	76.79	1.4	0.260	2.36	A	EL	36.75	0.430	3.08	A	EL	6.75	0.80	0.260	2.16	A	EL	36.75	
		SNS6A	39,950	--	1.98	79.10	1.4	0.260	2.16	A	EL	36.75	0.430	2.80	A	EL	6.75	0.80	0.260	1.98	A	EL	36.75	
	TTST	SNS7B	42,000	--	1.88	78.96	1.4	0.260	2.06	A	EL	36.75	0.430	2.74	A	EL	6.75	0.80	0.260	1.88	A	EL	36.75	
		TNAGRIT3	33,000	--	2.41	79.53	1.4	0.260	2.63	A	EL	36.75	0.430	3.36	A	EL	6.75	0.80	0.260	2.41	A	EL	36.75	
		TNT4A	33,075	--	2.42	80.04	1.4	0.260	2.65	A	EL	36.75	0.430	3.27	A	EL	6.75	0.80	0.260	2.42	A	EL	36.75	
		TNT6A	41,600	--	1.98	82.37	1.4	0.260	2.16	A	EL	36.75	0.430	2.90	A	EL	6.75	0.80	0.260	1.98	A	EL	36.75	
		TNT7A	42,000	--	1.99	83.58	1.4	0.260	2.17	A	EL	36.75	0.430	2.87	A	EL	6.75	0.80	0.260	1.99	A	EL	36.75	
		TNT7B	42,000	--	2.06	86.52	1.4	0.260	2.25	A	EL	36.75	0.430	2.68	A	EL	6.75	0.80	0.260	2.06	A	EL	36.75	
		TNAGRIT4	43,000	--	1.96	84.28	1.4	0.260	2.14	A	EL	36.75	0.430	2.59	A	EL	6.75	0.80	0.260	1.96	A	EL	36.75	
TNAGT5A	45,000	--	1.85	83.25	1.4	0.260	2.02	A	EL	36.75	0.430	2.57	A	EL	6.75	0.80	0.260	1.85	A	EL	36.75			
TNAGT5B	45,000	<b>3</b>	1.82	81.90	1.4	0.260	1.99	A	EL	36.75	0.430	2.45	A	EL	6.75	0.80	0.260	<b>1.82</b>	A	EL	<b>36.75</b>			

**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)

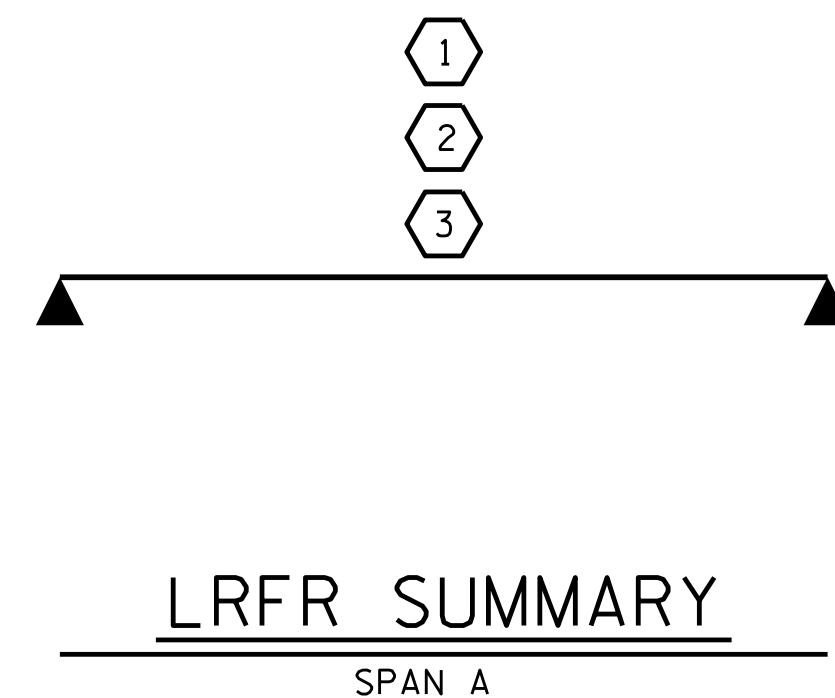
3 LEGAL LOAD RATING \*\*

\*\* SEE CHART FOR VEHICLE TYPE

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**GIRDER LOCATION**

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



PROJECT NO. BP11.R005

SURRY COUNTY

STATION: 16+22.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**LRFR SUMMARY FOR  
75' BOX BEAM UNIT  
90° SKEW**

(NON-INTERSTATE TRAFFIC)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			S-6
2			4			TOTAL SHEETS 33

DRAWN BY : ZCS DATE : 11/22  
 CHECKED BY : MGC DATE : 11/22  
 DESIGN ENGINEER OF RECORD : ZCS DATE : 11/22

## 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>	1.035	--	1.75	0.272	1.26	B	EL	49.25	0.489	1.34	B	EL	4.925	0.80	0.272	<b>1.04</b>	B	EL	<b>49.25</b>		
	HL-93(0pr)	N/A	--	1.633	--	1.35	0.272	1.63	B	EL	49.25	0.489	1.73	B	EL	4.925	N/A	--	--	--	--	--		
	HS-20(Inv)	36.000	<b>2</b>	1.44	51.84	1.75	0.272	1.75	B	EL	49.25	0.489	1.81	B	EL	4.925	0.80	0.272	<b>1.44</b>	B	EL	<b>49.25</b>		
	HS-20(0pr)	36.000	--	2.271	81.756	1.35	0.272	2.27	B	EL	49.25	0.489	2.35	B	EL	4.925	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13,500	--	3.413	46.079	1.4	0.272	5.19	B	EL	49.25	0.489	5.59	B	EL	4.925	0.80	0.272	3.41	B	EL	49.25	
		SNGARBS2	20,000	--	2.473	49.452	1.4	0.272	3.76	B	EL	49.25	0.489	3.91	B	EL	4.925	0.80	0.272	2.47	B	EL	49.25	
		SNAGRIS2	22,000	--	2.313	50.885	1.4	0.272	3.52	B	EL	49.25	0.489	3.6	B	EL	4.925	0.80	0.272	2.31	B	EL	49.25	
		SNCOTTS3	27,250	--	1.696	46.228	1.4	0.272	2.58	B	EL	49.25	0.489	2.78	B	EL	4.925	0.80	0.272	1.70	B	EL	49.25	
		SNAGGRS4	34,925	--	1.39	48.556	1.4	0.272	2.11	B	EL	49.25	0.489	2.26	B	EL	4.925	0.80	0.272	1.39	B	EL	49.25	
		SNS5A	35,550	--	1.361	48.398	1.4	0.272	2.07	B	EL	49.25	0.489	2.27	B	EL	4.925	0.80	0.272	1.36	B	EL	49.25	
		SNS6A	39,950	--	1.238	49.456	1.4	0.272	1.88	B	EL	49.25	0.489	2.05	B	EL	4.925	0.80	0.272	1.24	B	EL	49.25	
	TTST	SNS7B	42,000	--	1.178	49.496	1.4	0.272	1.79	B	EL	49.25	0.489	2	B	EL	4.925	0.80	0.272	1.18	B	EL	49.25	
		TNAGRIT3	33,000	--	1.506	49.709	1.4	0.272	2.29	B	EL	49.25	0.489	2.46	B	EL	4.925	0.80	0.272	1.51	B	EL	49.25	
		TNT4A	33,075	--	1.51	49.942	1.4	0.272	2.3	B	EL	49.25	0.489	2.41	B	EL	4.925	0.80	0.272	1.51	B	EL	49.25	
		TNT6A	41,600	--	1.224	50.926	1.4	0.272	1.86	B	EL	49.25	0.489	2.09	B	EL	4.925	0.80	0.272	1.22	B	EL	49.25	
		TNT7A	42,000	--	1.225	51.442	1.4	0.272	1.86	B	EL	49.25	0.489	2.05	B	EL	4.925	0.80	0.272	1.22	B	EL	49.25	
		TNT7B	42,000	--	1.254	52.657	1.4	0.272	1.91	B	EL	49.25	0.489	1.96	B	EL	4.925	0.80	0.272	1.25	B	EL	49.25	
		TNAGRIT4	43,000	--	1.203	51.711	1.4	0.272	1.83	B	EL	49.25	0.489	1.91	B	EL	4.925	0.80	0.272	1.20	B	EL	49.25	
TNAGT5A	45,000	--	1.139	51.236	1.4	0.272	1.73	B	EL	49.25	0.489	1.87	B	EL	4.925	0.80	0.272	1.14	B	EL	49.25			
TNAGT5B	45,000	<b>3</b>	1.129	50.805	1.4	0.272	1.72	B	EL	49.25	0.489	1.82	B	EL	4.925	0.80	0.272	<b>1.13</b>	B	EL	<b>49.25</b>			

**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)

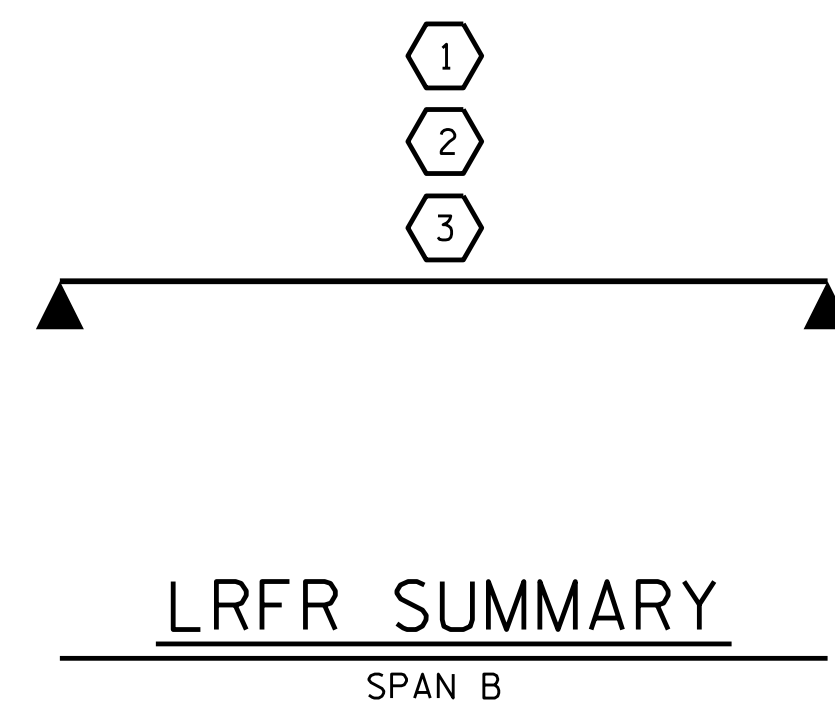
3 LEGAL LOAD RATING \*\*

\*\* SEE CHART FOR VEHICLE TYPE

---

**GIRDER LOCATION**

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



PROJECT NO. BP11.R005  
SURRY COUNTY  
STATION: 16+22.00 -L-

SHEET 2 OF 3

12/6/2022

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			33

TGS ENGINEERS  
804-C N. LAFAYETTE ST  
SHELBY, NC 28150  
PH (704) 476-0003  
CORP. LICENSE NO.: C-0275

ASSEMBLED BY : JLA      DATE : 12/21  
CHECKED BY : MGC      DATE : 1/22

DRAWN BY : TMC      11/11  
CHECKED BY : AAC      11/11



## 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>	1.85	--	1.75	0.286	<b>1.85</b>	C	EL	<b>16.75</b>	0.574	2.96	C	EL	9.75	0.80	0.286	3.20	C	EL	16.75		
	HL-93(OPr)	N/A	--	2.40	--	1.35	0.286	2.40	C	EL	16.75	0.574	3.99	C	EL	6.25	N/A	--	--	--	--	--		
	HS-20(InV)	36.000	<b>2</b>	2.46	88.56	1.75	0.286	<b>2.46</b>	C	EL	<b>13.25</b>	0.574	3.49	C	EL	6.25	0.80	0.286	4.26	C	EL	13.25		
	HS-20(OPr)	36.000	--	3.19	114.84	1.35	0.286	3.19	C	EL	13.25	0.574	4.56	C	EL	6.25	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13,500	--	5.28	71.28	1.4	0.286	5.28	C	EL	16.75	0.574	8.62	C	EL	6.25	0.80	0.286	7.30	C	EL	16.75	
		SNGARBS2	20,000	--	4.52	90.40	1.4	0.286	4.52	C	EL	13.25	0.574	6.67	C	EL	6.25	0.80	0.286	6.25	C	EL	13.25	
		SNAGRIS2	22,000	--	4.48	98.56	1.4	0.286	4.48	C	EL	13.25	0.574	6.44	C	EL	6.25	0.80	0.286	6.20	C	EL	13.25	
		SNCOTTS3	27,250	--	2.64	71.94	1.4	0.286	2.64	C	EL	16.75	0.574	4.30	C	EL	6.25	0.80	0.286	3.66	C	EL	16.75	
		SNAGGRS4	34,925	--	2.45	85.57	1.4	0.286	2.45	C	EL	16.75	0.574	3.92	C	EL	6.25	0.80	0.286	3.39	C	EL	16.75	
		SNS5A	35,550	--	2.38	84.61	1.4	0.286	2.38	C	EL	16.75	0.574	4.16	C	EL	6.25	0.80	0.286	3.29	C	EL	16.75	
		SNS6A	39,950	--	2.29	91.49	1.4	0.286	2.29	C	EL	16.75	0.574	3.96	C	EL	6.25	0.80	0.286	3.17	C	EL	16.75	
	SNS7B	42,000	<b>3</b>	2.19	91.98	1.4	0.286	<b>2.19</b>	C	EL	<b>16.75</b>	0.574	4.04	C	EL	6.25	0.80	0.286	3.03	C	EL	16.75		
	TTST	TNAGRIT3	33,000	--	2.85	94.05	1.4	0.286	2.85	C	EL	16.75	0.574	4.74	C	EL	6.25	0.80	0.286	3.94	C	EL	16.75	
		TNT4A	33,075	--	2.83	93.60	1.4	0.286	2.83	C	EL	16.75	0.574	4.39	C	EL	6.25	0.80	0.286	3.92	C	EL	16.75	
		TNT6A	41,600	--	2.49	103.58	1.4	0.286	2.49	C	EL	16.75	0.574	4.18	C	EL	6.25	0.80	0.286	3.44	C	EL	16.75	
		TNT7A	42,000	--	2.57	107.94	1.4	0.286	2.57	C	EL	16.75	0.574	3.98	C	EL	6.25	0.80	0.286	3.56	C	EL	16.75	
		TNT7B	42,000	--	2.52	105.84	1.4	0.286	2.52	C	EL	16.75	0.574	3.94	C	EL	6.25	0.80	0.286	3.49	C	EL	16.75	
		TNAGRIT4	43,000	--	2.55	109.65	1.4	0.286	2.55	C	EL	13.25	0.574	3.82	C	EL	6.25	0.80	0.286	3.53	C	EL	16.75	
TNAGT5A		45,000	--	2.37	106.65	1.4	0.286	2.37	C	EL	16.75	0.574	4.06	C	EL	6.25	0.80	0.286	3.28	C	EL	16.75		
TNAGT5B	45,000	--	2.28	102.60	1.4	0.286	2.28	C	EL	16.75	0.574	3.53	C	EL	6.25	0.80	0.286	3.16	C	EL	16.75			

**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)

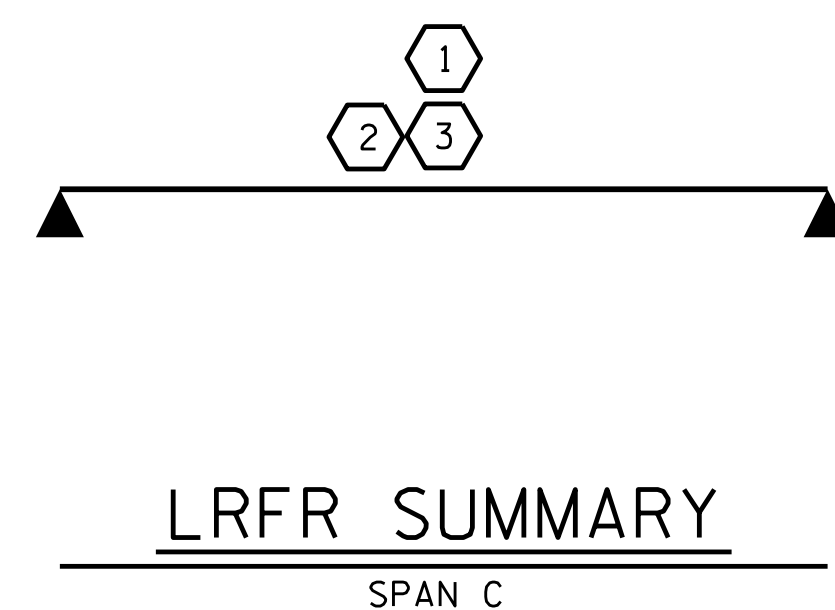
3 LEGAL LOAD RATING \*\*

\*\* SEE CHART FOR VEHICLE TYPE

---

**GIRDER LOCATION**

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



PROJECT NO. BP11.R005

SURRY COUNTY

STATION: 16+22.00 -L-

SHEET 3 OF 3

12/6/2022

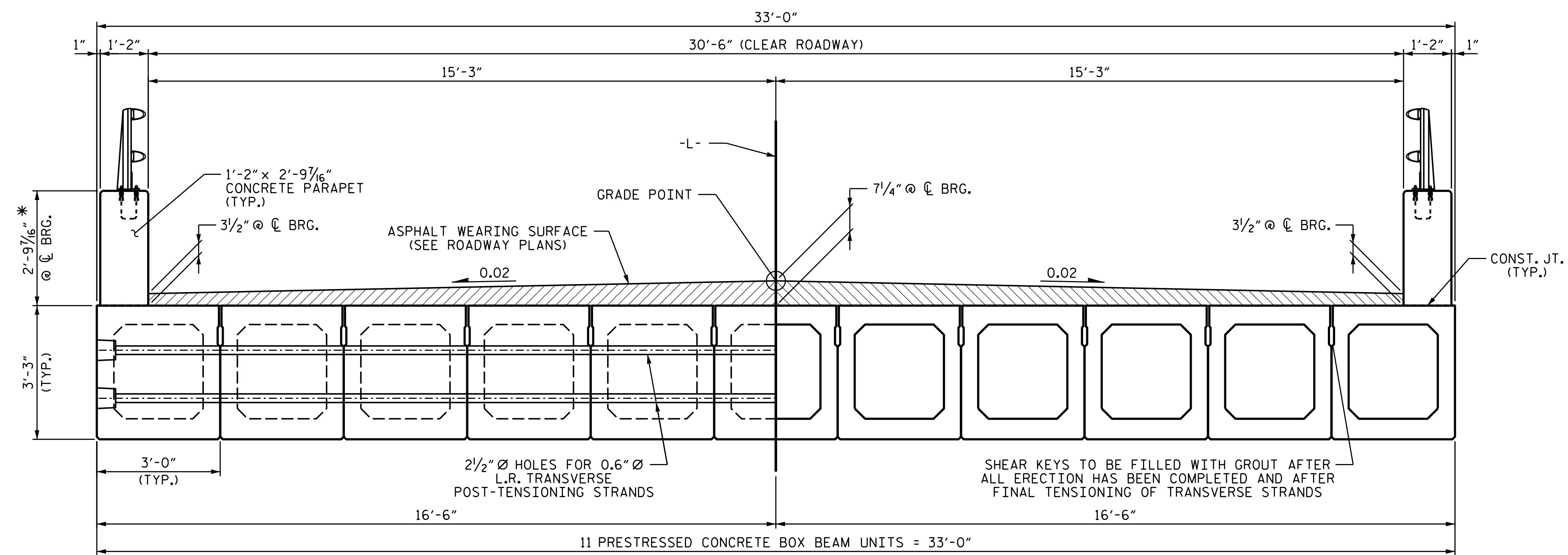
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED						REVISIONS						SHEET NO.
TGS ENGINEERS		TGS ENGINEERS		TGS ENGINEERS		NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
804-C N. LAFAYETTE ST		804-C N. LAFAYETTE ST		804-C N. LAFAYETTE ST		1			3			TOTAL SHEETS
SHELBY, NC 28150		SHELBY, NC 28150		SHELBY, NC 28150		2			4			33
PH (704) 476-0003		PH (704) 476-0003		PH (704) 476-0003								
CORP. LICENSE NO.: C-0275		CORP. LICENSE NO.: C-0275		CORP. LICENSE NO.: C-0275								

DRAWN BY : ZCS      DATE : 11/22  
 CHECKED BY : MGC      DATE : 11/22  
 DESIGN ENGINEER OF RECORD : ZCS      DATE : 11/22





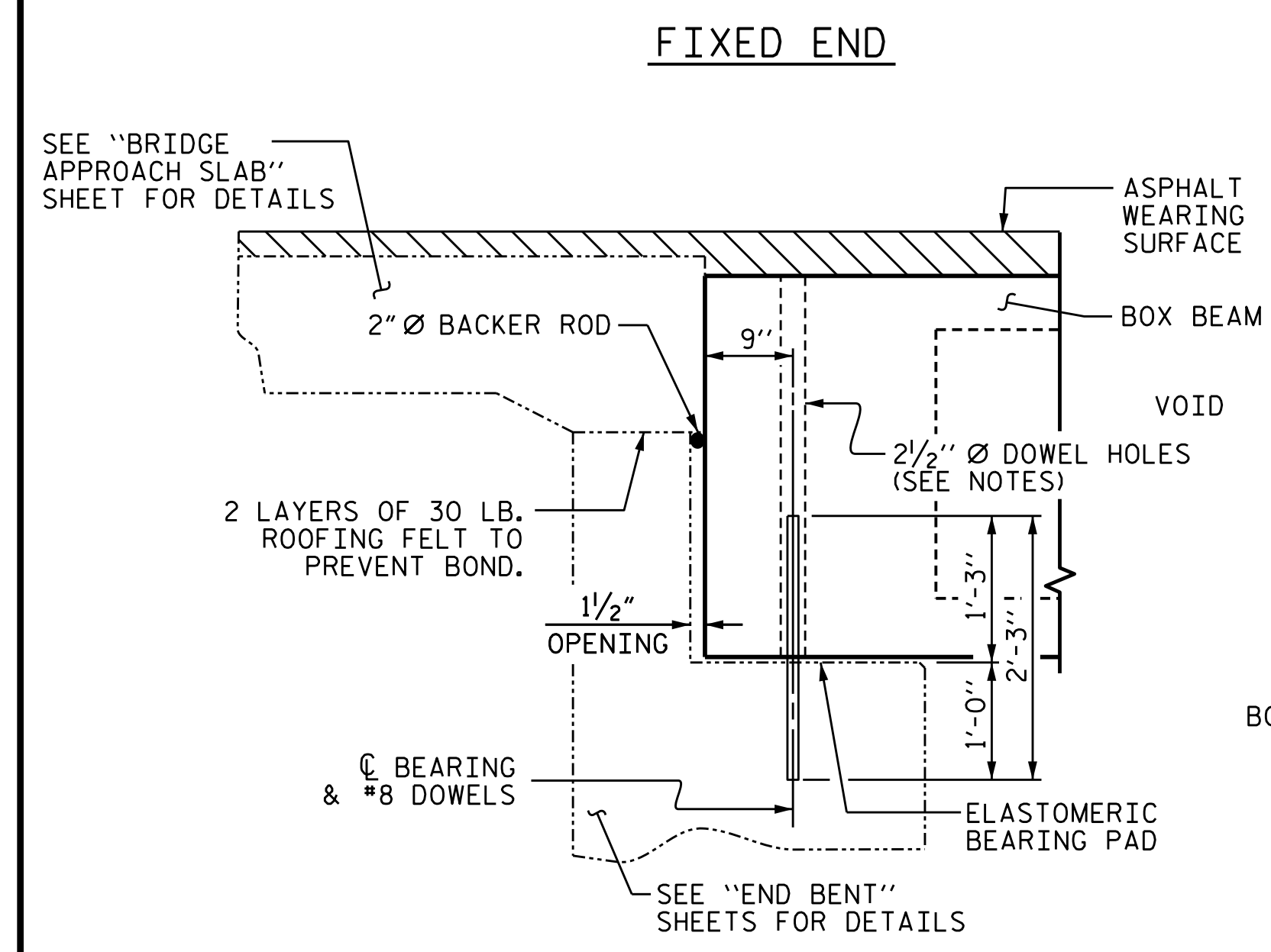
HALF SECTION AT INTERMEDIATE DIAPHRAGMS      HALF SECTION THROUGH VOIDS

**TYPICAL SECTION**

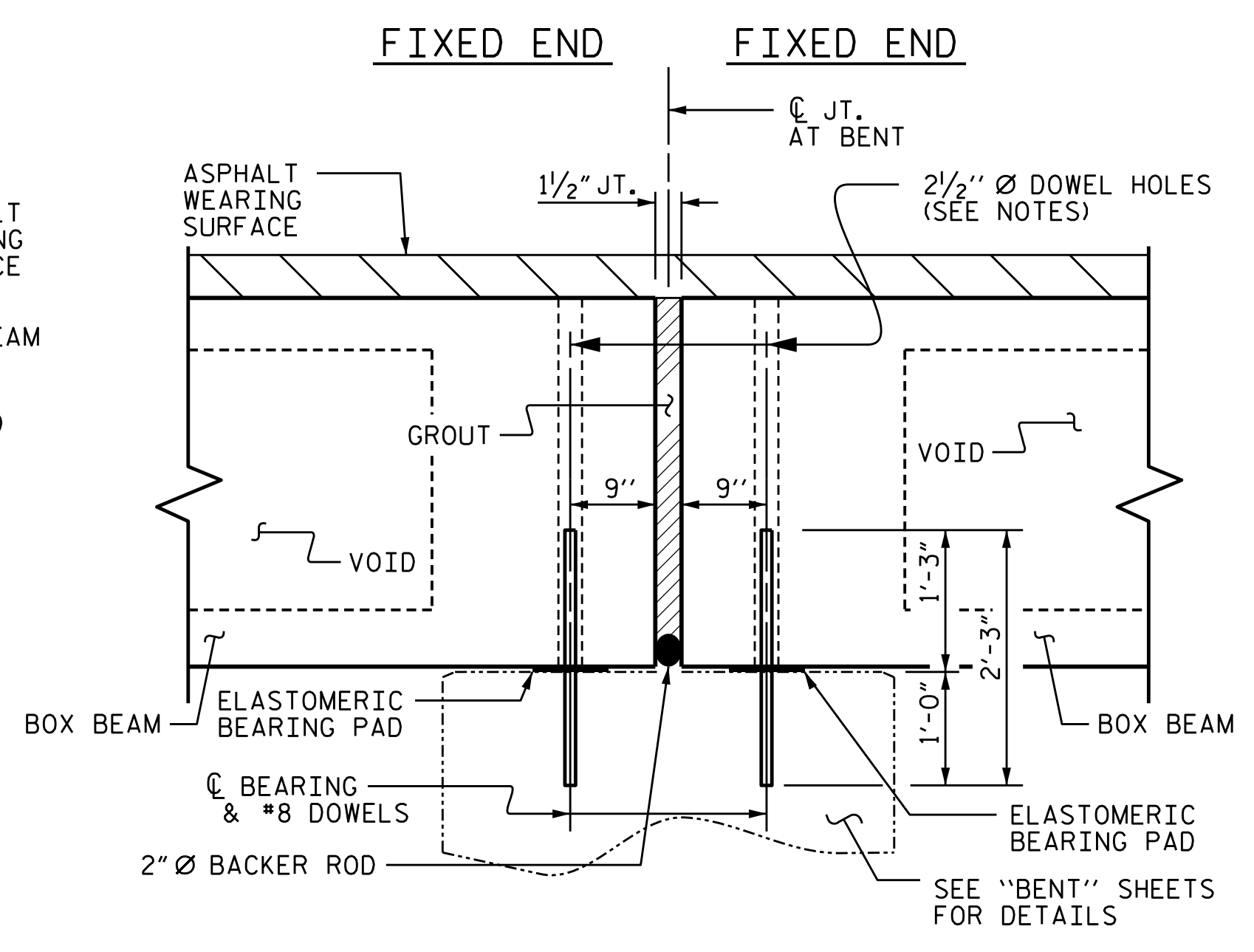
\* THE MAXIMUM PARAPET HEIGHT AND ASPHALT THICKNESS IS SHOWN. THE HEIGHT OF THE PARAPET AND ASPHALT THICKNESS VARIES WHILE THE TOP OF THE PARPET FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR PARAPET HEIGHT DETAILS AND ASPHALT THICKNESS, SEE THE "SECTION THRU PARAPET" DETAIL.

**NOTES**

- ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW RELAXATION GRADE 270 STRANDS AND SHALL CONFORM TO AASHTO M203 EXCEPT FOR SAMPLING REQUIREMENTS WHICH SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
- ALL REINFORCING STEEL CAST WITH THE BOX BEAM SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE BOX BEAMS.
- FLAME CUTTING OF THE TRANSVERSE POST-TENSIONING STRAND IS NOT ALLOWED.
- RECESSES FOR TRANSVERSE STRANDS SHALL BE GROUTED AFTER THE TENSIONING OF THE STRANDS.
- THE 2 1/2" Ø DOWEL HOLES AT FIXED ENDS OF BOX BEAM SECTIONS SHALL BE FILLED WITH NON-SHRINK GROUT.
- THE BACKER RODS SHALL CONFORM TO THE REQUIREMENTS OF TYPE M BOND BREAKER. SEE SECTION 1028 OF THE STANDARD SPECIFICATIONS.
- THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE BOX BEAM UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4,000 PSI FOR SPANS A&C AND 5,500 PSI FOR SPAN B.
- ALL REINFORCING STEEL IN PARAPET 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 PARAPET AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A VERTICAL CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN PARAPET EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF PARPET 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.

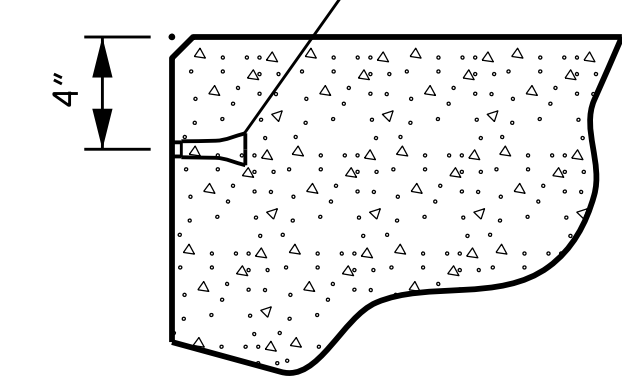


**SECTION AT END BENT**



**SECTION AT BENT**

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



**THREADED INSERT DETAIL**

PROJECT NO. BP11.R005  
SURRY COUNTY  
 STATION: 16+22.00 -L-

SHEET 1 OF 9

ASSEMBLED BY :	JLA	DATE :	11/21
CHECKED BY :	MGC	DATE :	1/22
DRAWN BY :	DGE	8/11	REV. 10/15
CHECKED BY :	TMG	11/11	MAA/TMG

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

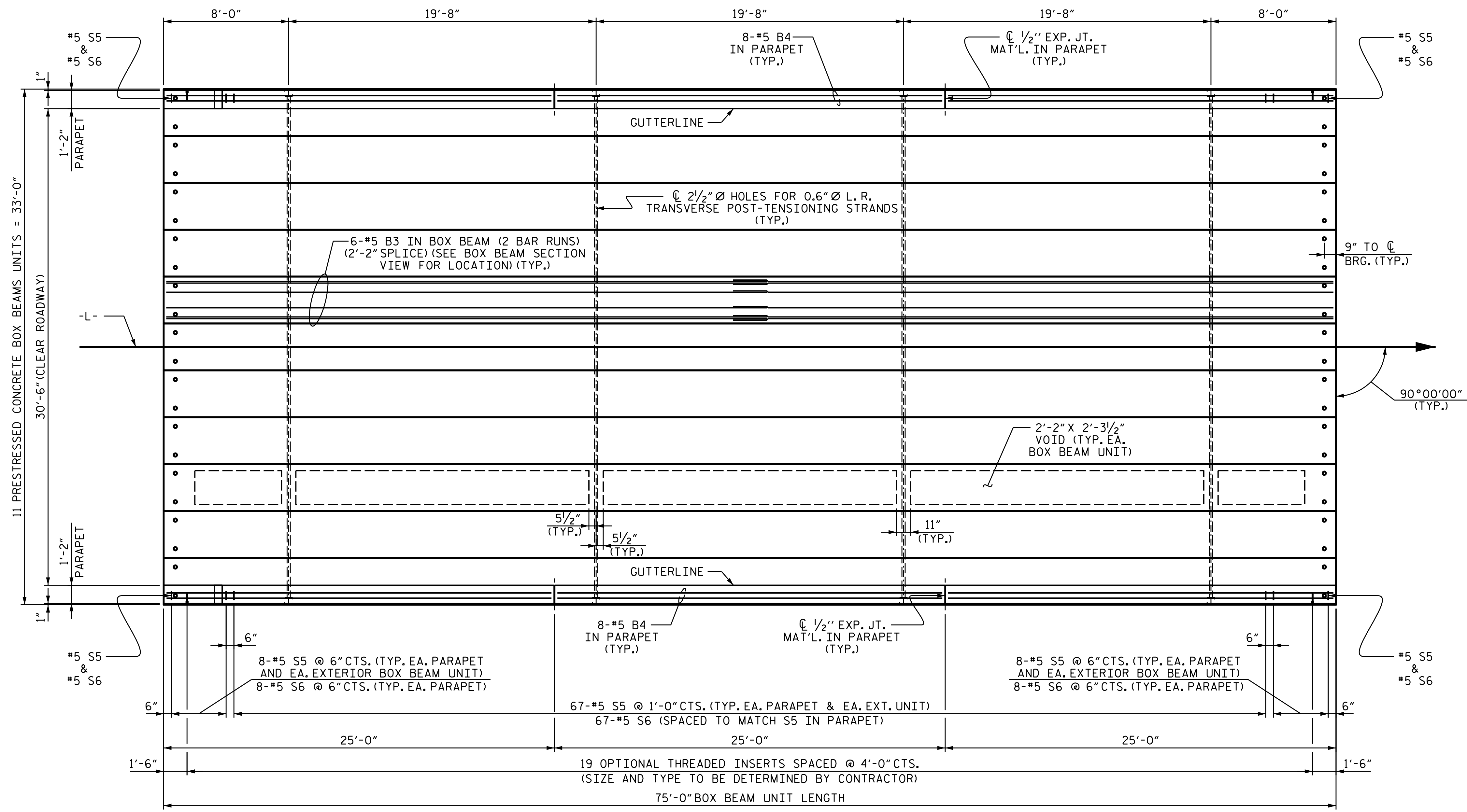
STANDARD  
 3'-0" X 3'-3"  
 PRESTRESSED CONCRETE  
 BOX BEAM UNIT

12/6/2022

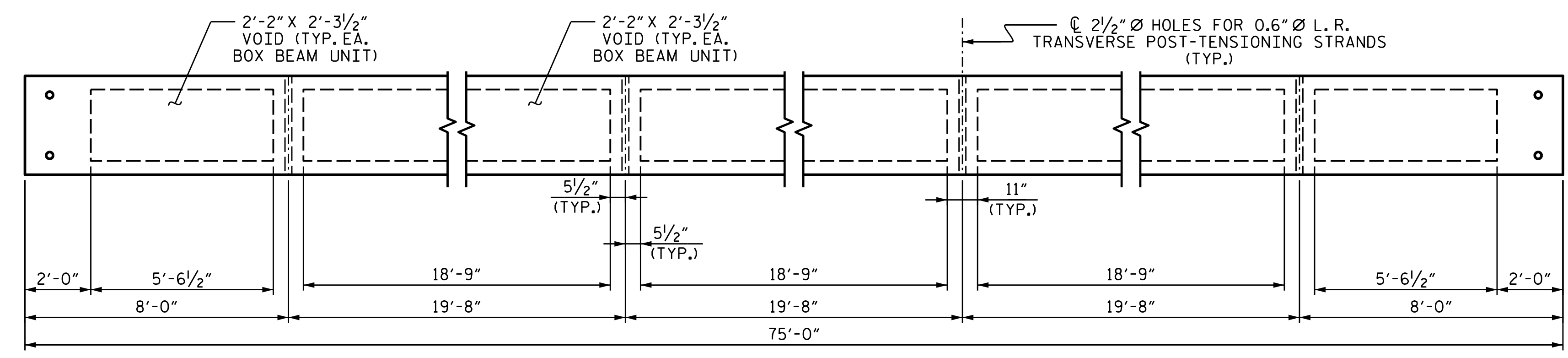
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS  
 804-C N. LAFAYETTE ST  
 SHELBY, NC 28150  
 PH (704) 476-0003  
 CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			33



SPAN A - PLAN OF UNIT



DIAPHRAGM AND VOID LAYOUT

PROJECT NO. BP11.R005  
SURRY COUNTY  
 STATION: 16+22.00 -L-  
 SHEET 2 OF 9

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

12/6/2022

Marshall G. Cheek, Jr.  
 ENGINEER  
 MARSHALL G. CHEEK, JR.  
 PROFESSIONAL ENGINEER  
 20125

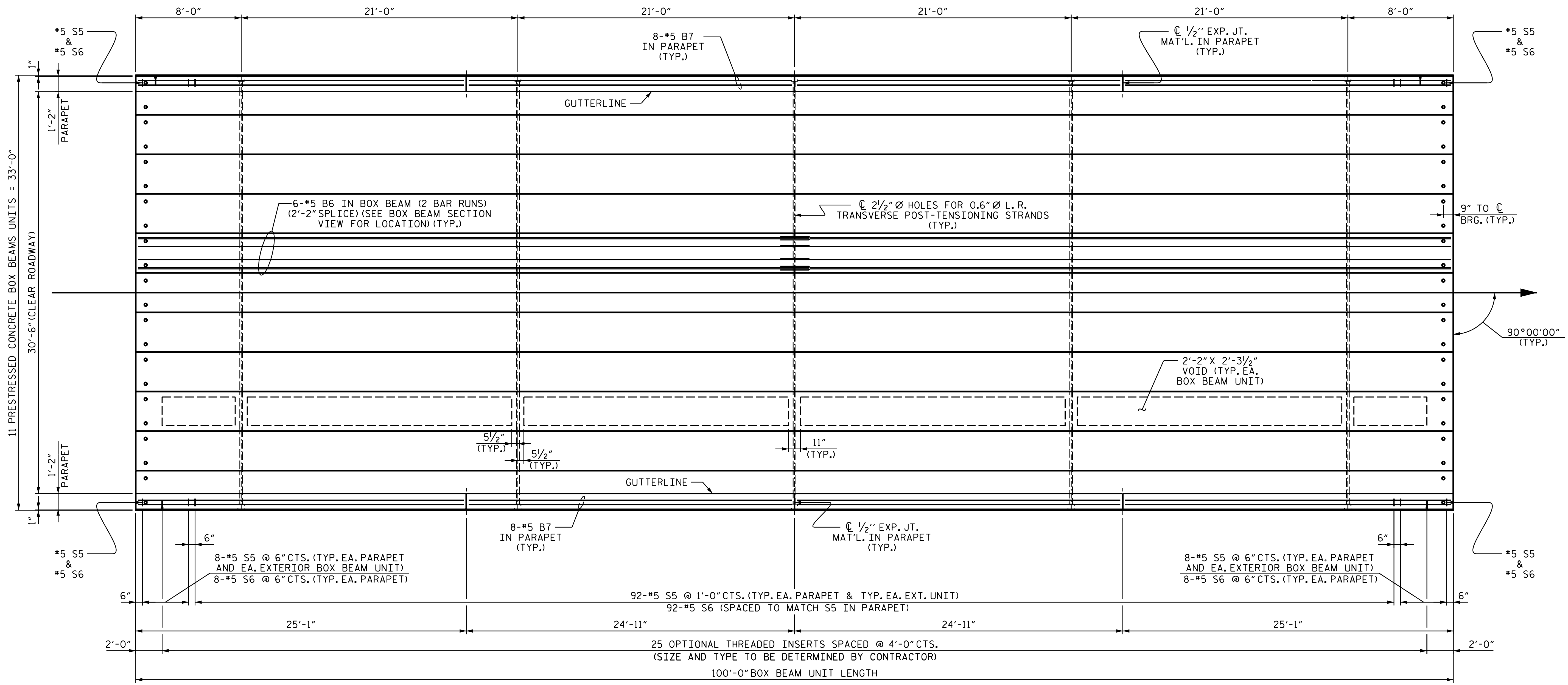
DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS  
 804-C N. LAFAYETTE ST  
 SHELBY, NC 28150  
 PH (704) 476-0003  
 CORP. LICENSE NO.: C-0275

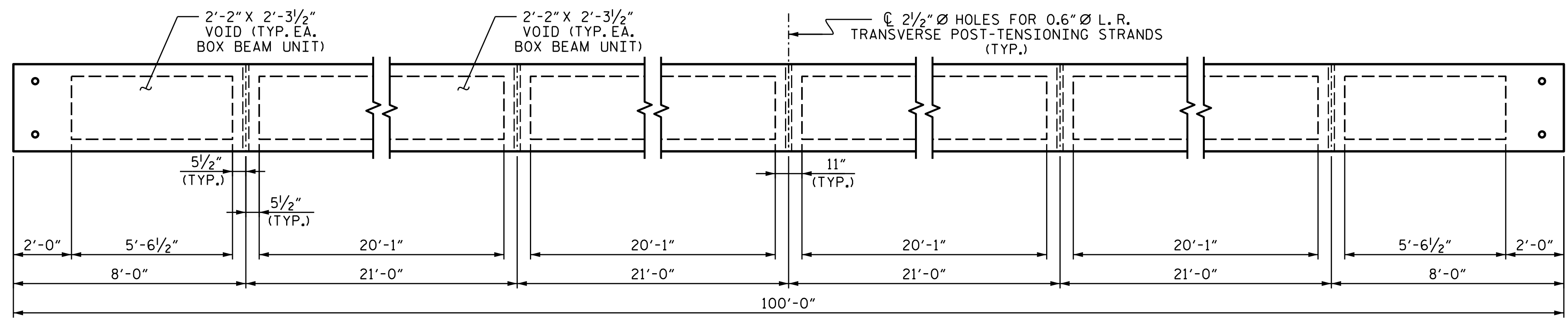
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			33

DRAWN BY : JLA DATE : 11/21  
 CHECKED BY : MGC DATE : 1/22





SPAN B - PLAN OF UNIT



DIAPHRAGM AND VOID LAYOUT

PROJECT NO. BP11.R005  
 SURRY COUNTY  
 STATION: 16+22.00 -L-  
 SHEET 3 OF 9

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

PLAN OF 100' UNIT  
 30'-6" CLEAR ROADWAY  
 90° SKEW

12/6/2022

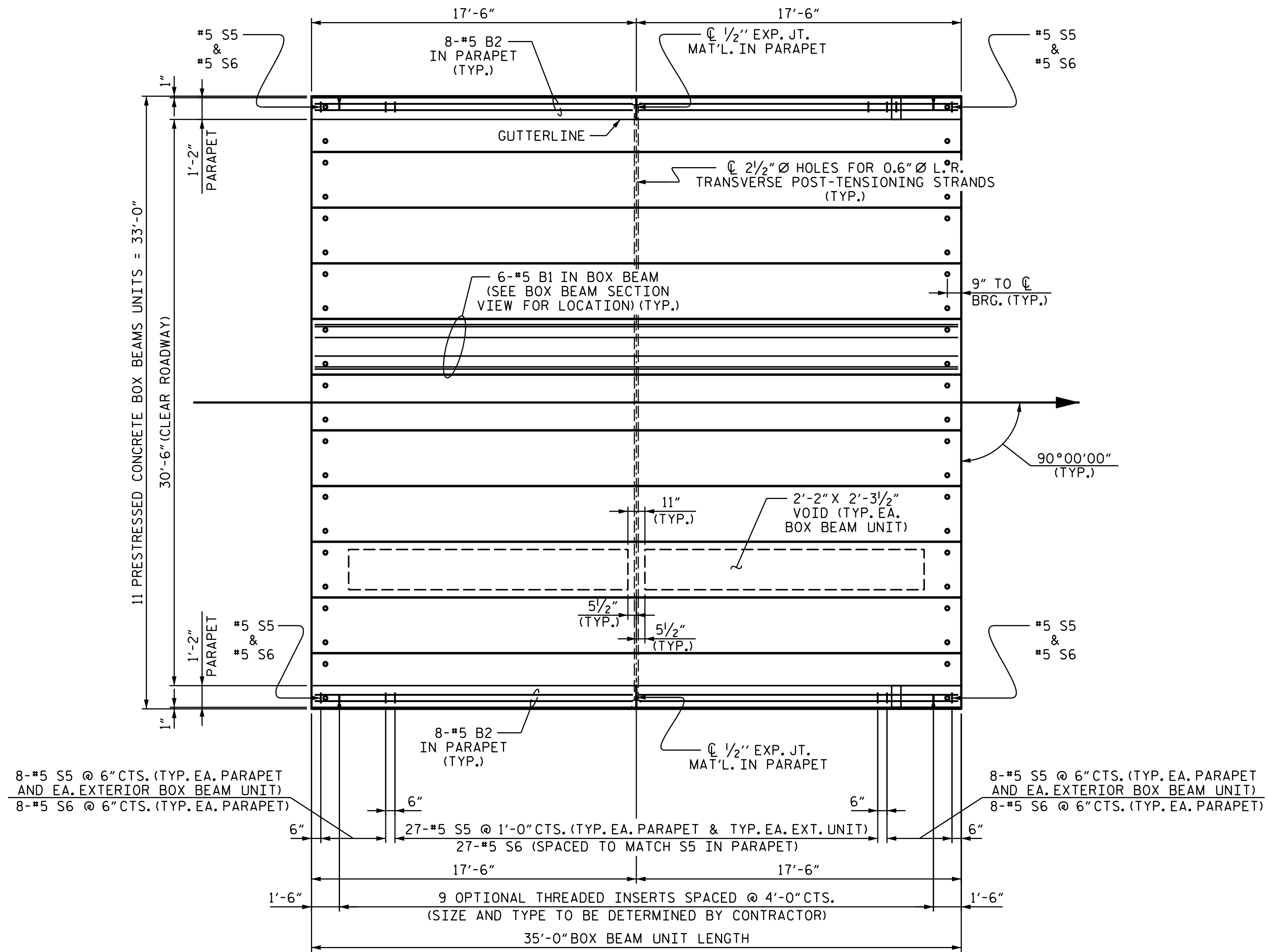
DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS  
 804-C N. LAFAYETTE ST  
 SHELBY, NC 28150  
 PH (704) 476-0003  
 CORP. LICENSE NO.: C-0275

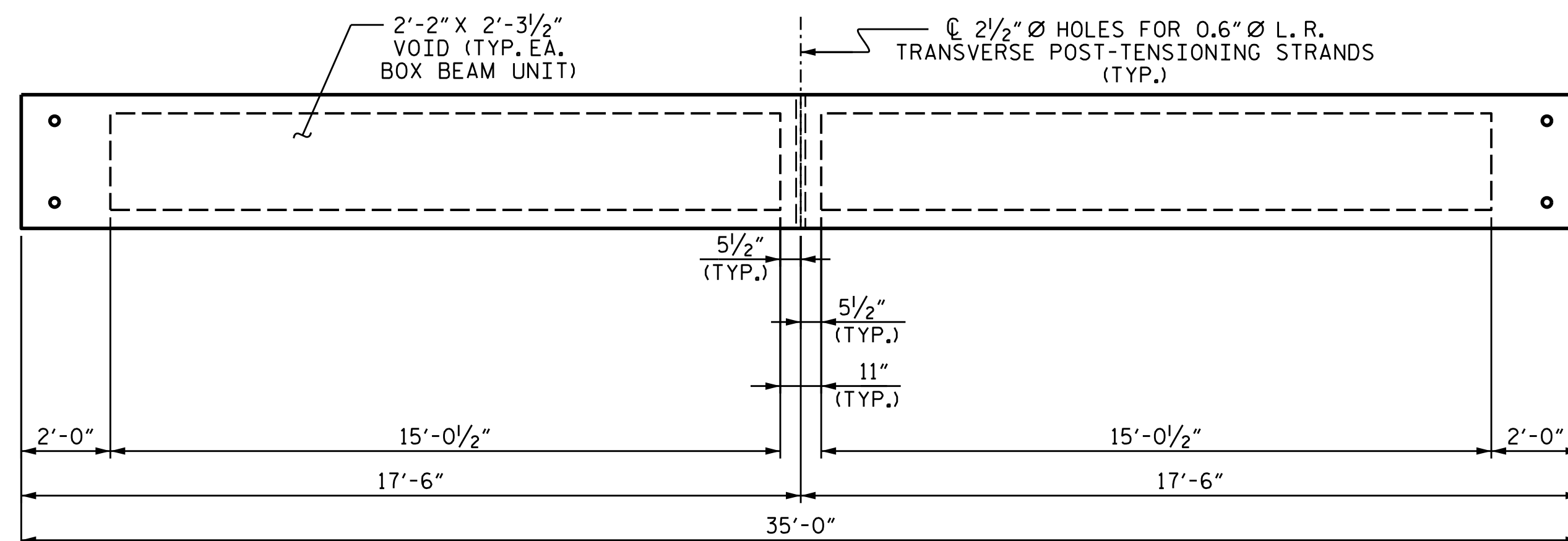
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			33

ASSEMBLED BY :	JLA	DATE :	11/21
CHECKED BY :	MGC	DATE :	1/22
DRAWN BY :	GGE	REV. 8/14	MAA/TMG
CHECKED BY :	TMG	11/11	





SPAN C - PLAN OF UNIT



DIAPHRAGM AND VOID LAYOUT

PROJECT NO. BP11.R005

SURRY COUNTY

STATION: 16+22.00 -L-

SHEET 4 OF 9



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

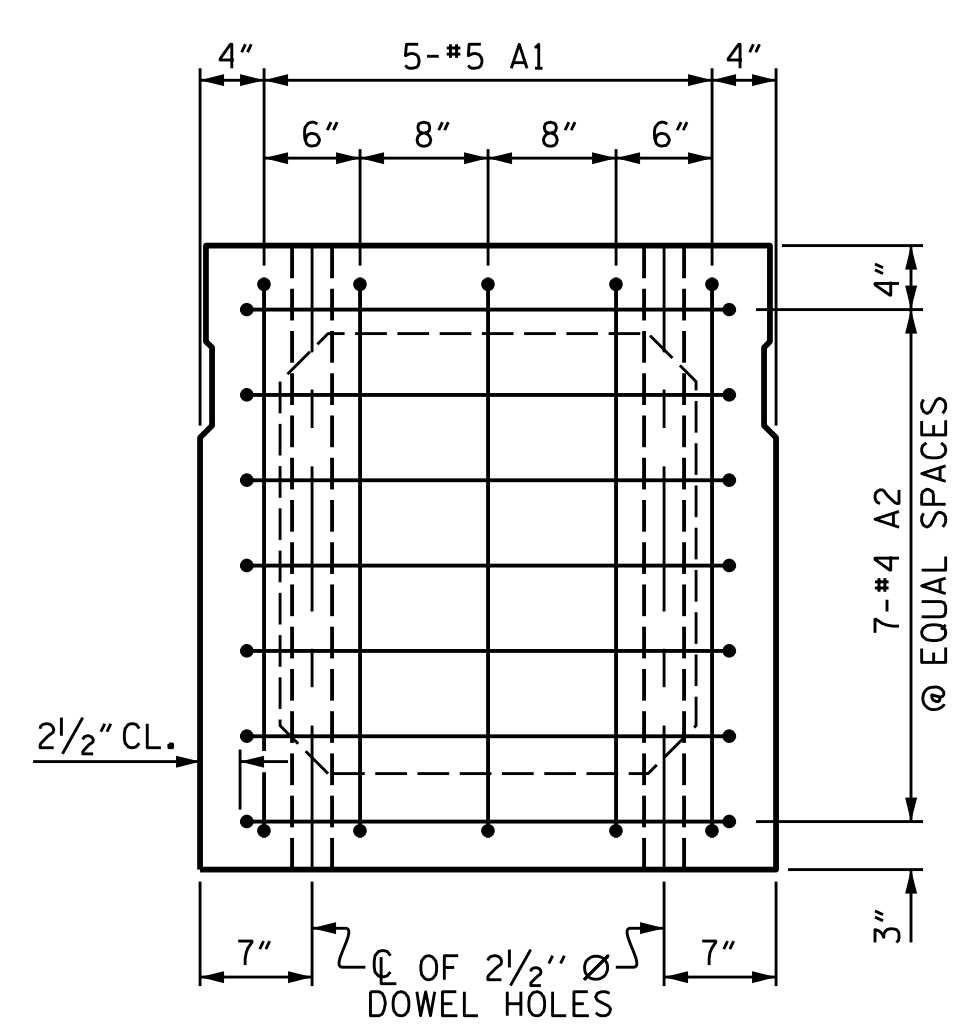
PLAN OF 35' UNIT  
30'-6" CLEAR ROADWAY  
90° SKEW

DRAWN BY : JLA DATE : 11/21  
CHECKED BY : MGC DATE : 1/22

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UNLESS ALL SIGNATURES COMPLETED

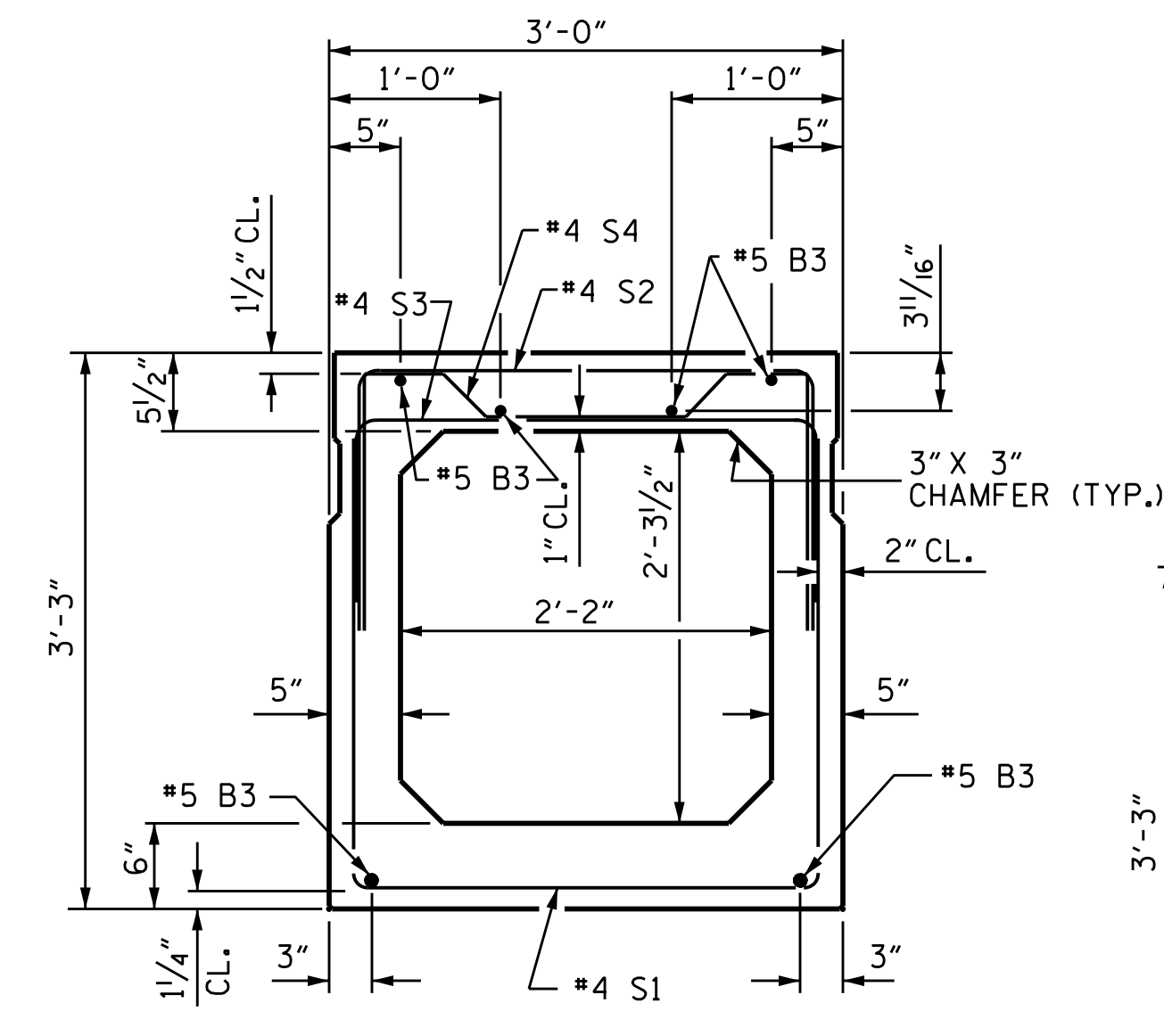
TGS ENGINEERS  
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SHELBY, NC 28150  
PH (704) 476-0003  
CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			33



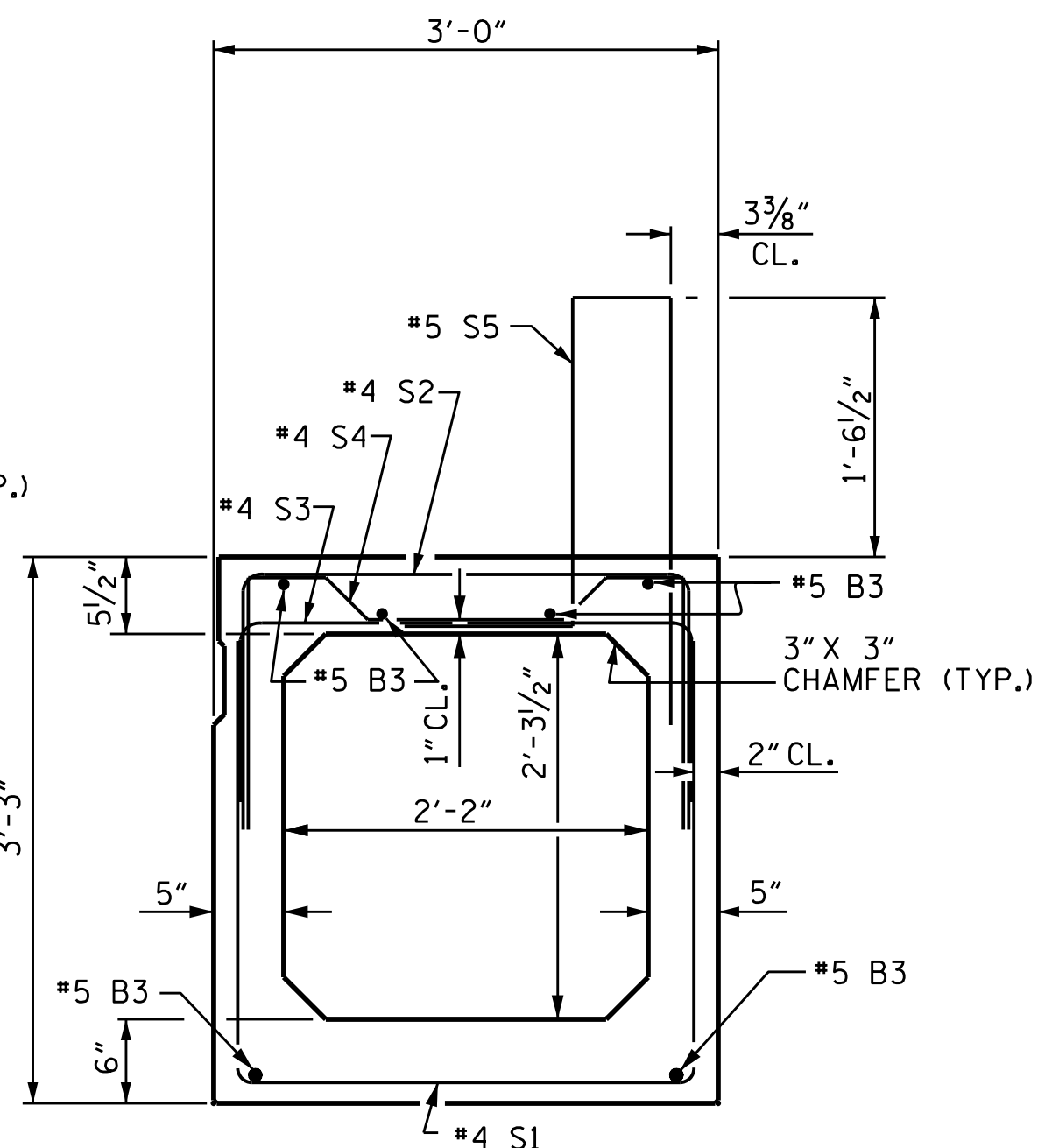
**END ELEVATION**

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



**INTERIOR BOX BEAM SECTION**

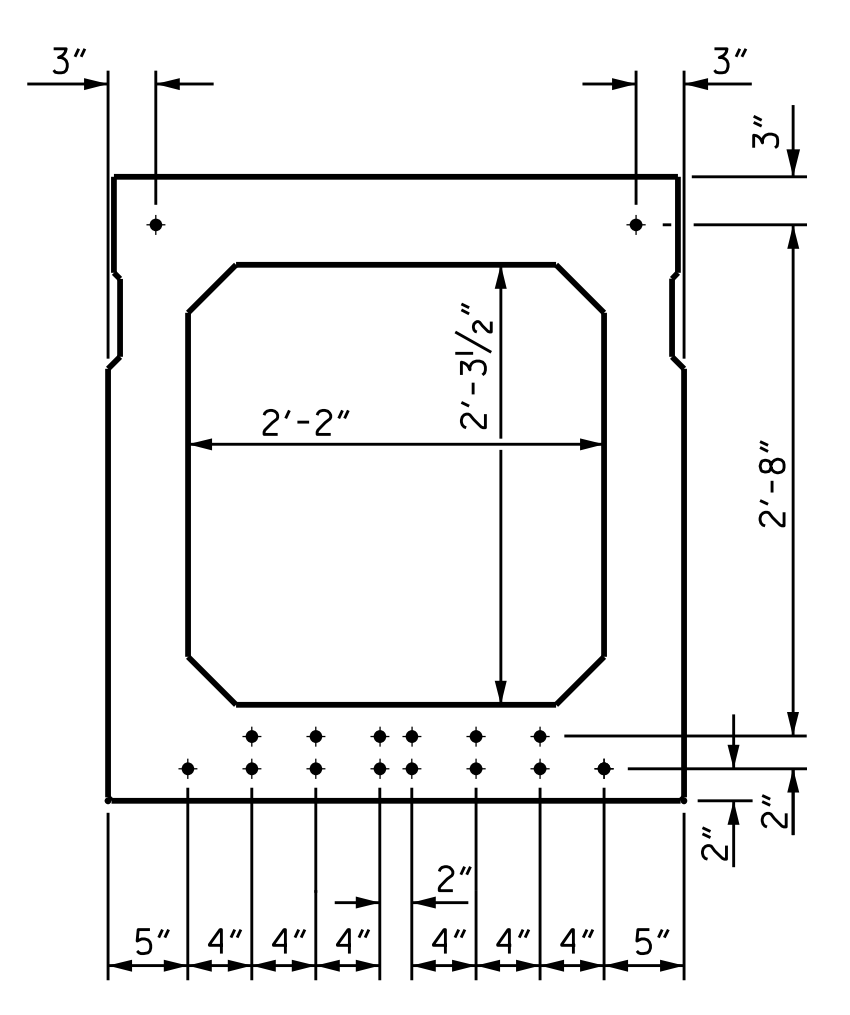
(STRAND LAYOUT NOT SHOWN)



**EXTERIOR BOX BEAM SECTION**

(STRAND LAYOUT NOT SHOWN)

**0.6" Ø LOW RELAXATION STRAND LAYOUT**

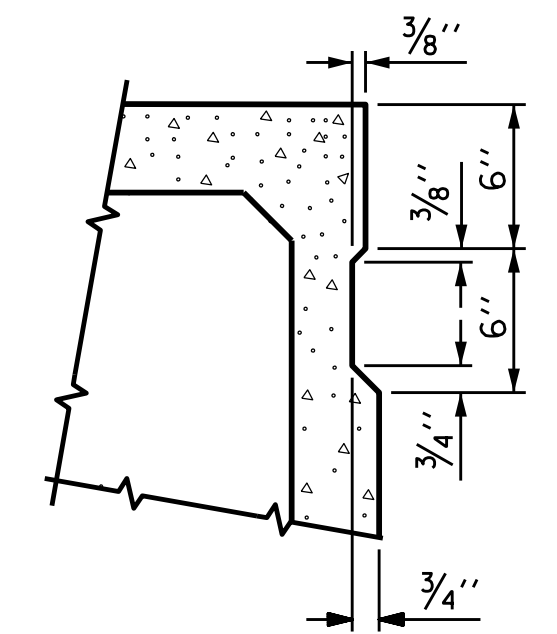


**TYPICAL STRAND LOCATION**

(16 STRANDS REQUIRED)

**DEBONDING LEGEND**

- FULLY BONDED STRANDS



**SHEAR KEY DETAIL**

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

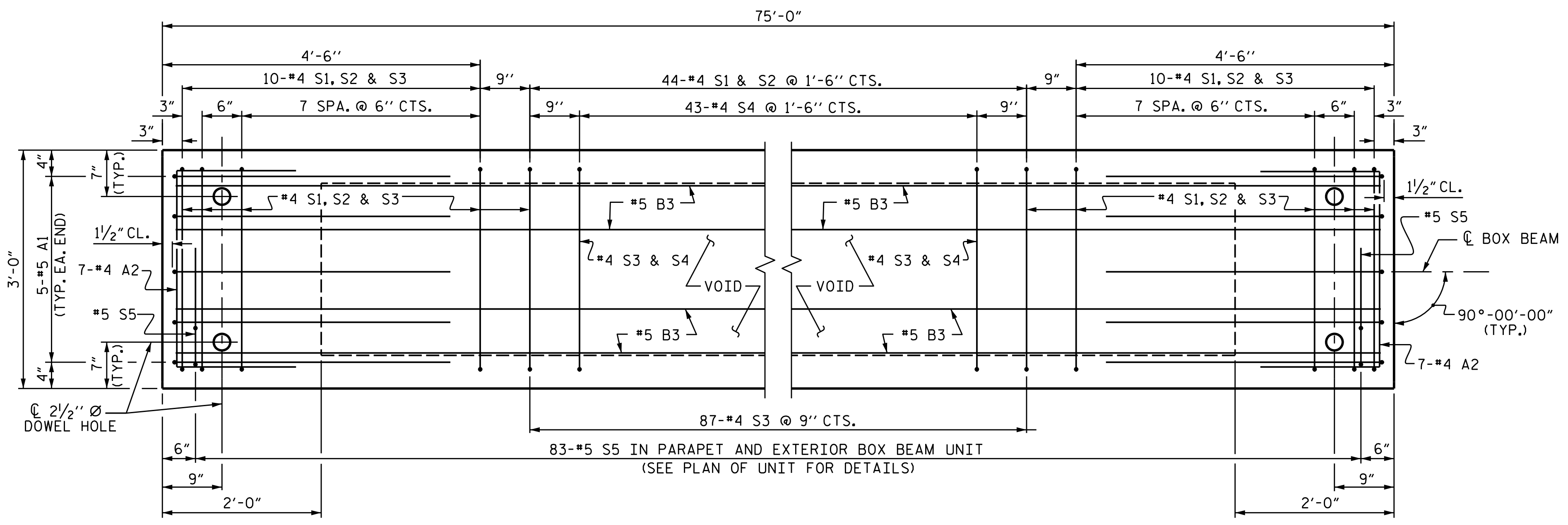
GRADE 270 STRANDS	
	0.6" Ø L.R.
AREA ( SQUARE INCHES )	0.217
ULTIMATE STRENGTH ( LBS. PER STRAND )	58,600
APPLIED PRESTRESS ( LBS. PER STRAND )	43,950

**BAR TYPES**

ALL BAR DIMENSIONS ARE OUT TO OUT

**BILL OF MATERIAL FOR ONE 75' BOX BEAM SECTION**

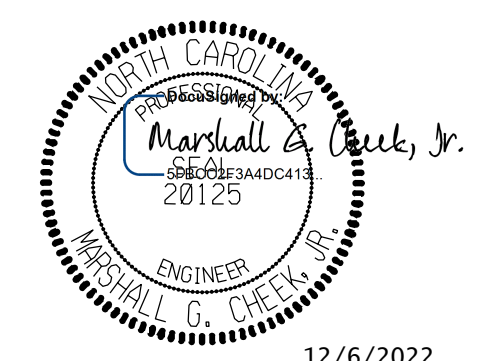
BAR NUMBER	SIZE	TYPE	EXTERIOR UNIT		INTERIOR UNIT	
			LENGTH	WEIGHT	LENGTH	WEIGHT
A1	#5	1	7'-2"	75	7'-2"	75
A2	#4	2	5'-7"	142	5'-7"	142
B3	#5	STR	38'-5"	481	38'-5"	481
K1	#4	6	7'-2"	57	7'-2"	57
K2	#4	STR	2'-7"	14	2'-7"	14
S1	#4	3	8'-6"	363	8'-6"	363
S2	#4	3	5'-8"	242	5'-8"	242
S3	#4	3	4'-10"	345	4'-10"	345
S4	#4	4	5'-10"	168	5'-10"	168
* S5	#5	5	6'-4"	548	--	--
REINFORCING STEEL			1,887	LBS.	1,887	LBS.
* EPOXY COATED REINF. STEEL			548	LBS.		
5000 P.S.I. CONCRETE			14.9	CU. YDS.	14.7	CU. YDS.
0.6" Ø L.R. STRANDS			No. 16		No. 16	



**PLAN OF BOX BEAM - SPAN A**

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. BP11.R005  
 SURRY COUNTY  
 STATION: 16+22.00 -L-  
 SHEET 5 OF 9



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

DRAWN BY : ZCS DATE : 8/22  
 CHECKED BY : MGC DATE : 8/22  
 DESIGN ENGINEER OF RECORD : ZCS DATE : 11/22

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED						REVISIONS			SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-13			
1			3			TOTAL SHEETS			
2			4			33			

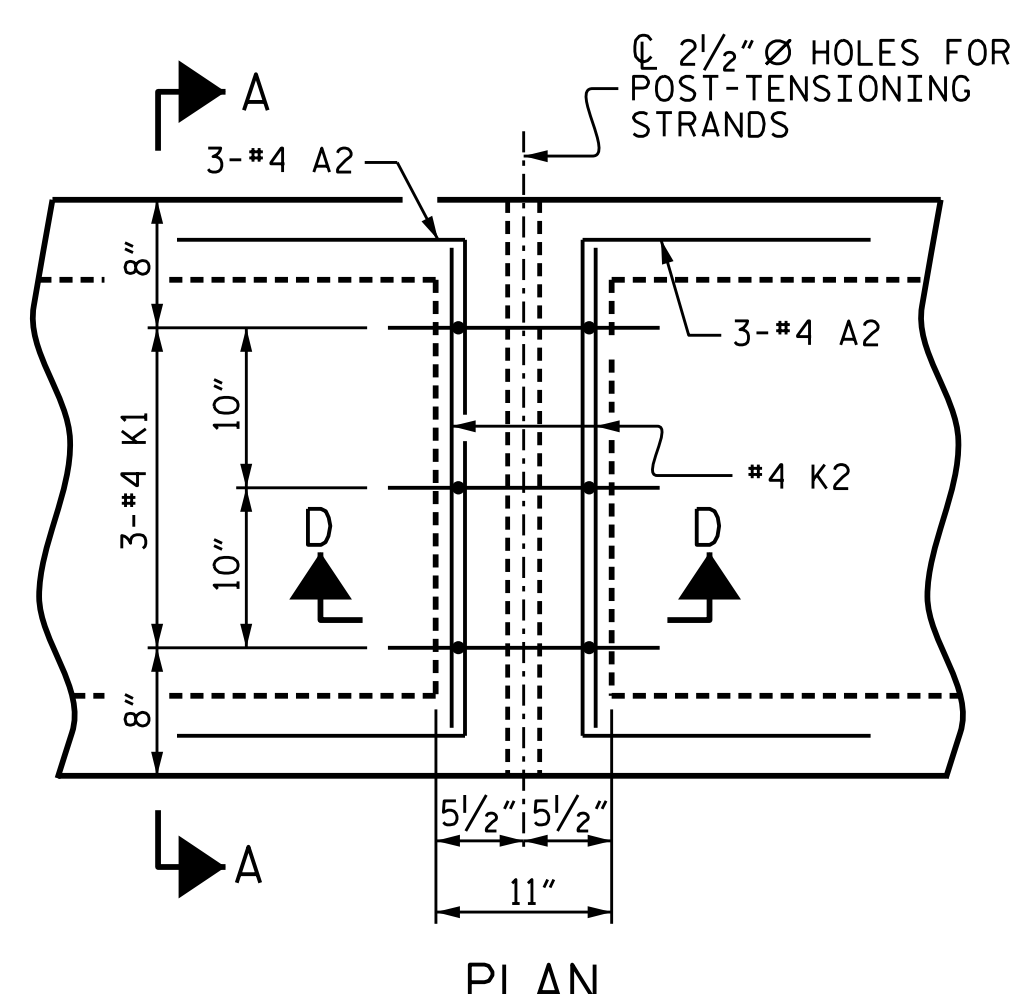
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 804-C N. LAFAYETTE ST  
 SHELBY, NC 28150  
 PH (704) 476-0003  
 CORP. LICENSE NO.: C-0275



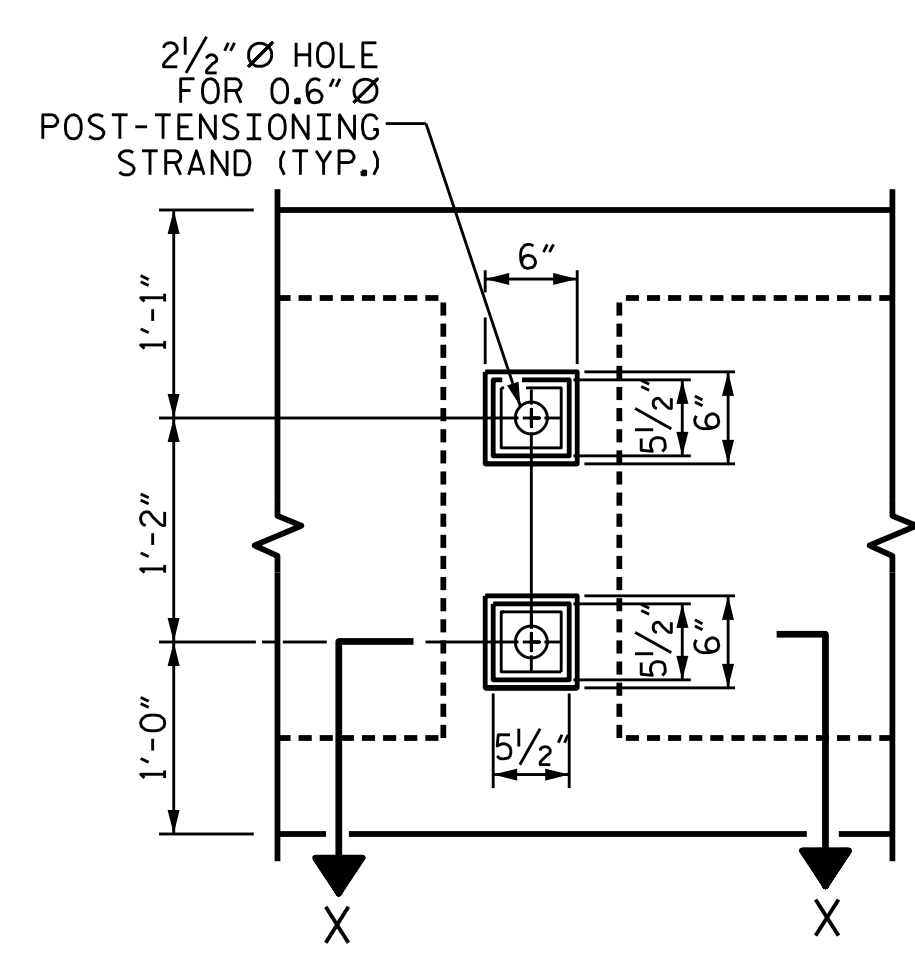




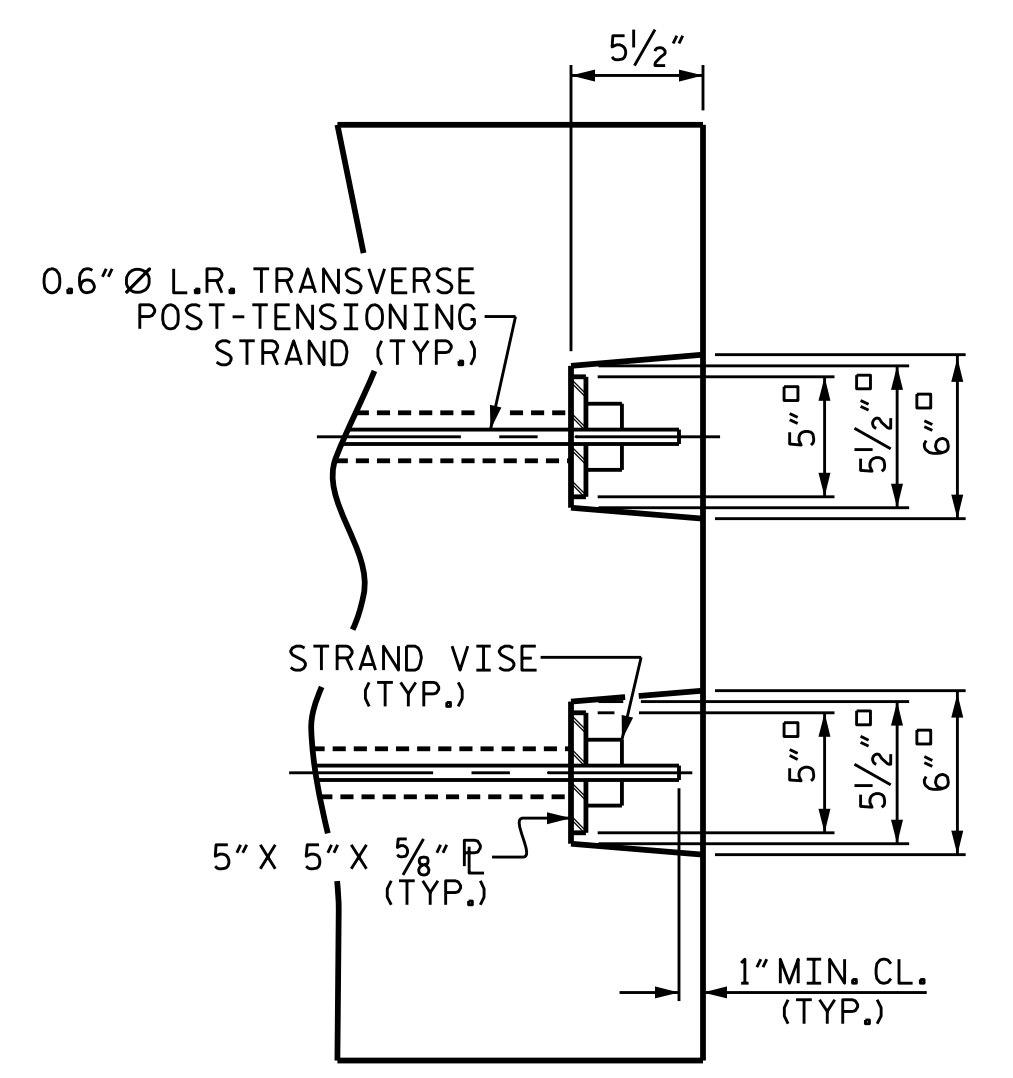




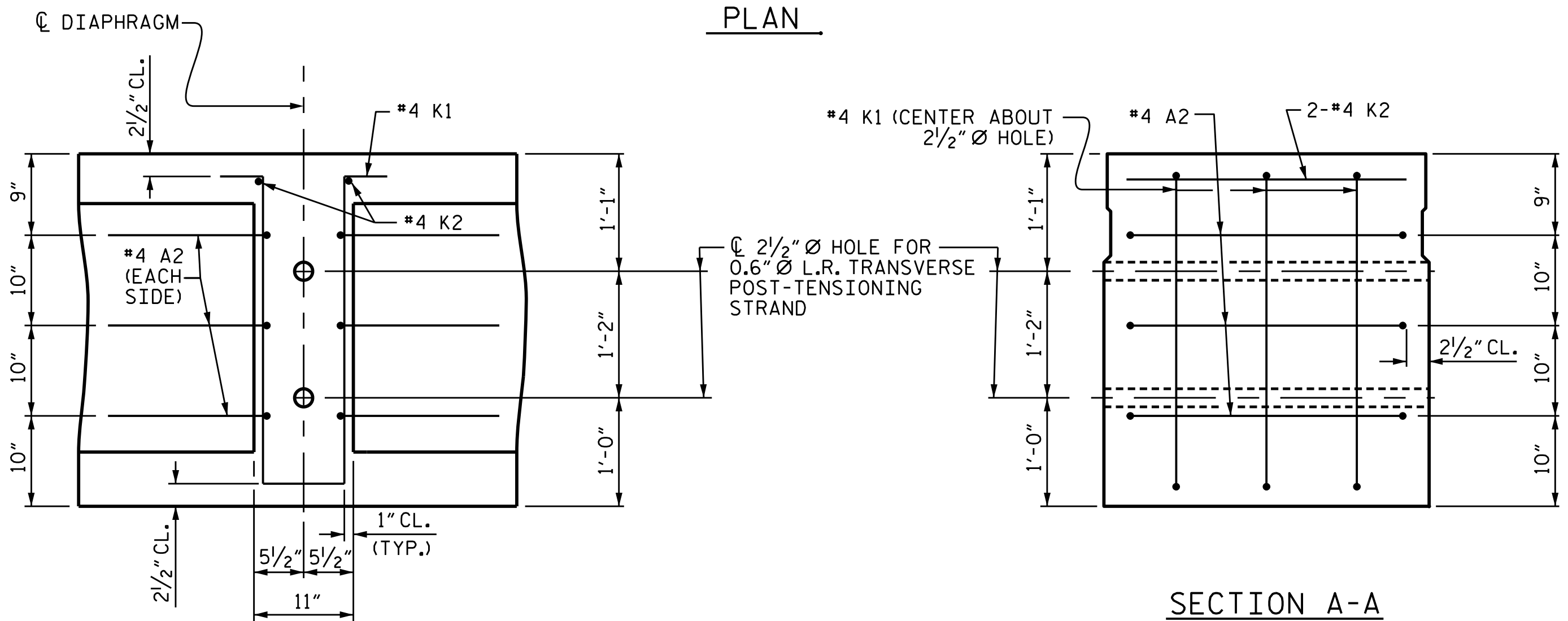
PLAN



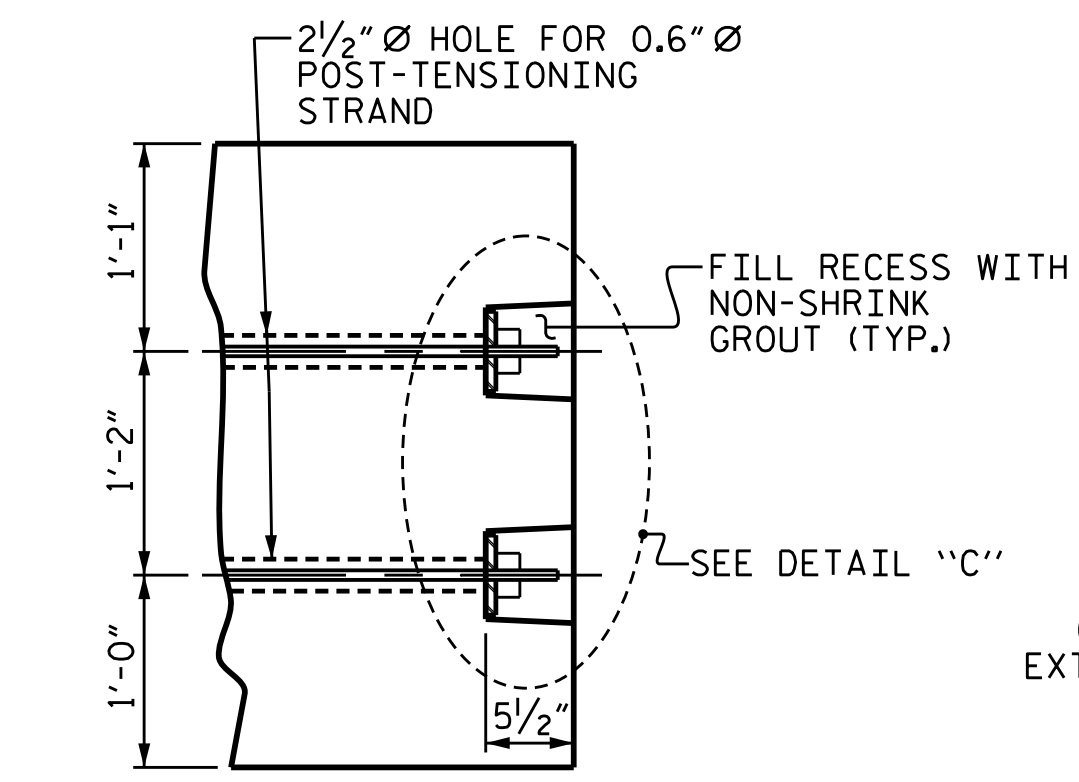
VIEW Y-Y  
SHOWING ELEVATION VIEW OF GROUTED RECESS



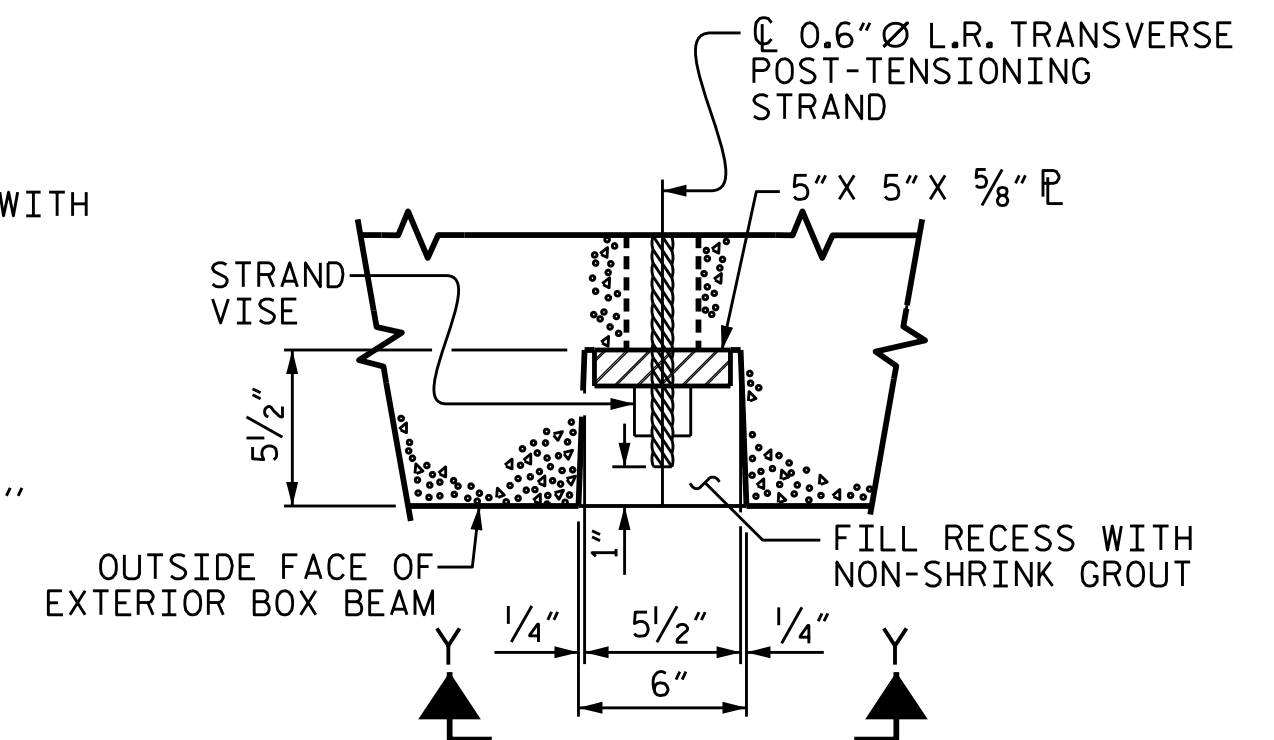
DETAIL "C"



SECTION A-A  
VOIDS NOT SHOWN



PART SECTION AT RECESS



SECTION X-X  
SHOWING PLAN VIEW OF GROUTED RECESS

SECTION D-D

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

DEAD LOAD DEFLECTION AND CAMBER	
75' BOX BEAM UNIT	3'-0" x 3'-3"
CAMBER (SLAB ALONE IN PLACE)	0.6" Ø L.R. STRAND 5/8" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	3/8" ↓
FINAL CAMBER	1/4" ↑

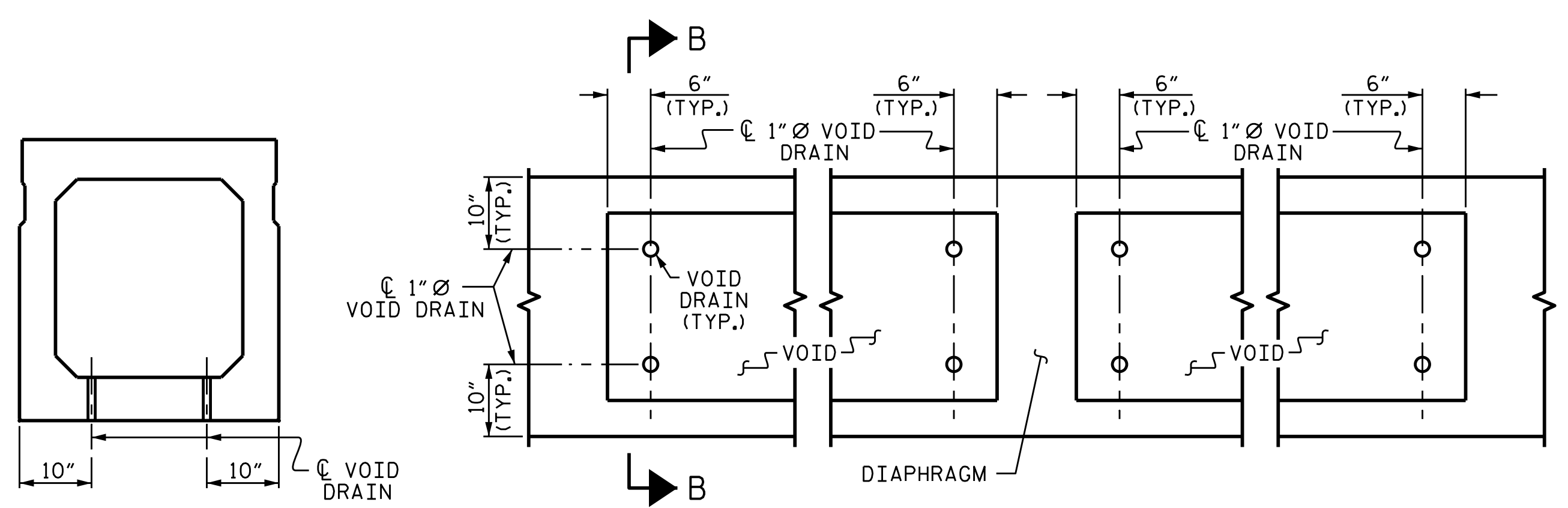
\*\* INCLUDES FUTURE WEARING SURFACE

DEAD LOAD DEFLECTION AND CAMBER	
100' BOX BEAM UNIT	3'-0" x 3'-3"
CAMBER (SLAB ALONE IN PLACE)	0.6" Ø L.R. STRAND 2" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	7/8" ↓
FINAL CAMBER	1/8" ↑

\*\* INCLUDES FUTURE WEARING SURFACE

DEAD LOAD DEFLECTION AND CAMBER	
35' BOX BEAM UNIT	3'-0" x 3'-3"
CAMBER (SLAB ALONE IN PLACE)	0.6" Ø L.R. STRAND 1/8" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	1/16" ↓
FINAL CAMBER	1/16" ↑

\*\* INCLUDES FUTURE WEARING SURFACE



SECTION B-B

PART PLAN

VOID DRAIN DETAILS

(DIMENSIONS SHOWN ARE TYPICAL FOR EACH VOID)

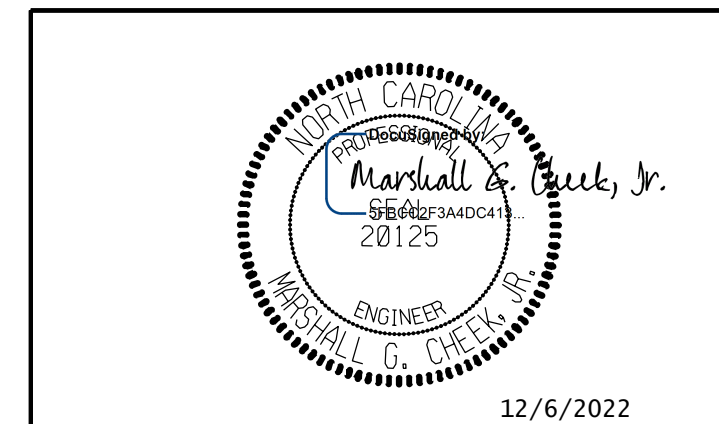
DRAWN BY : JLA DATE : 11/21  
CHECKED BY : MGC DATE : 1/22

PROJECT NO. BP11.R005

SURRY COUNTY

STATION: 16+22.00 -L-

SHEET 8 OF 9

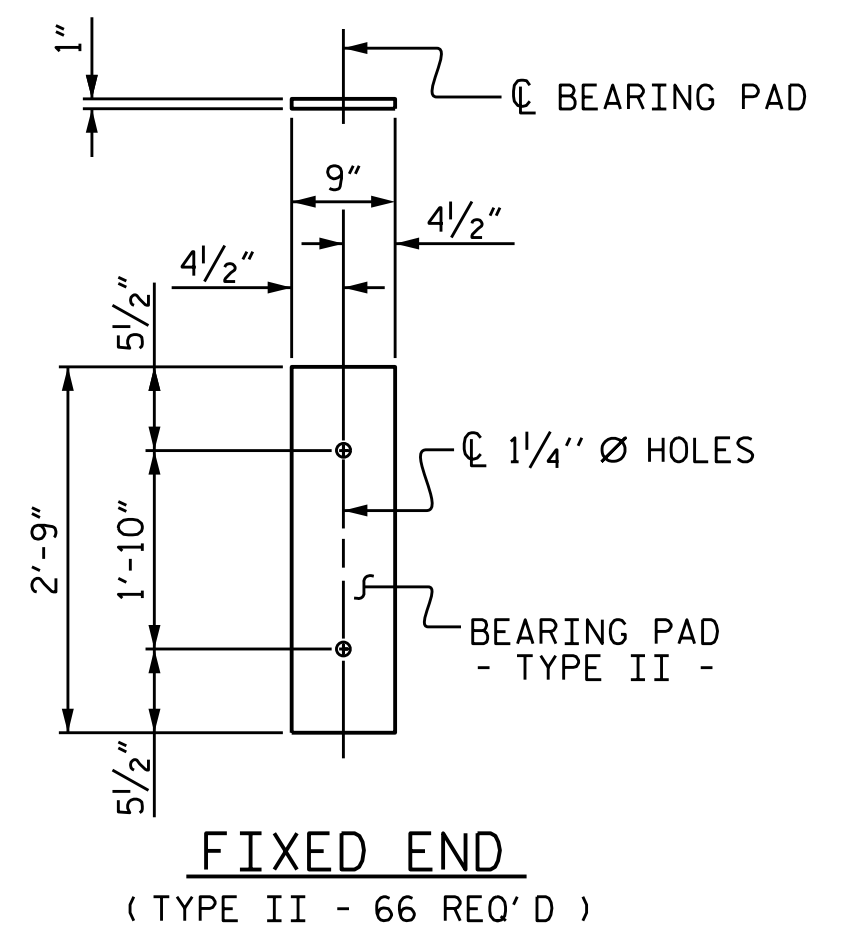


STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
3'-0" X 3'-3"  
PRESTRESSED CONCRETE  
BOX BEAM UNIT

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CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			33





**ELASTOMERIC BEARING DETAILS**  
ELASTOMER IN ALL BEARINGS SHALL BE 60 DUROMETER HARDNESS.

**BOX BEAM UNITS REQUIRED**

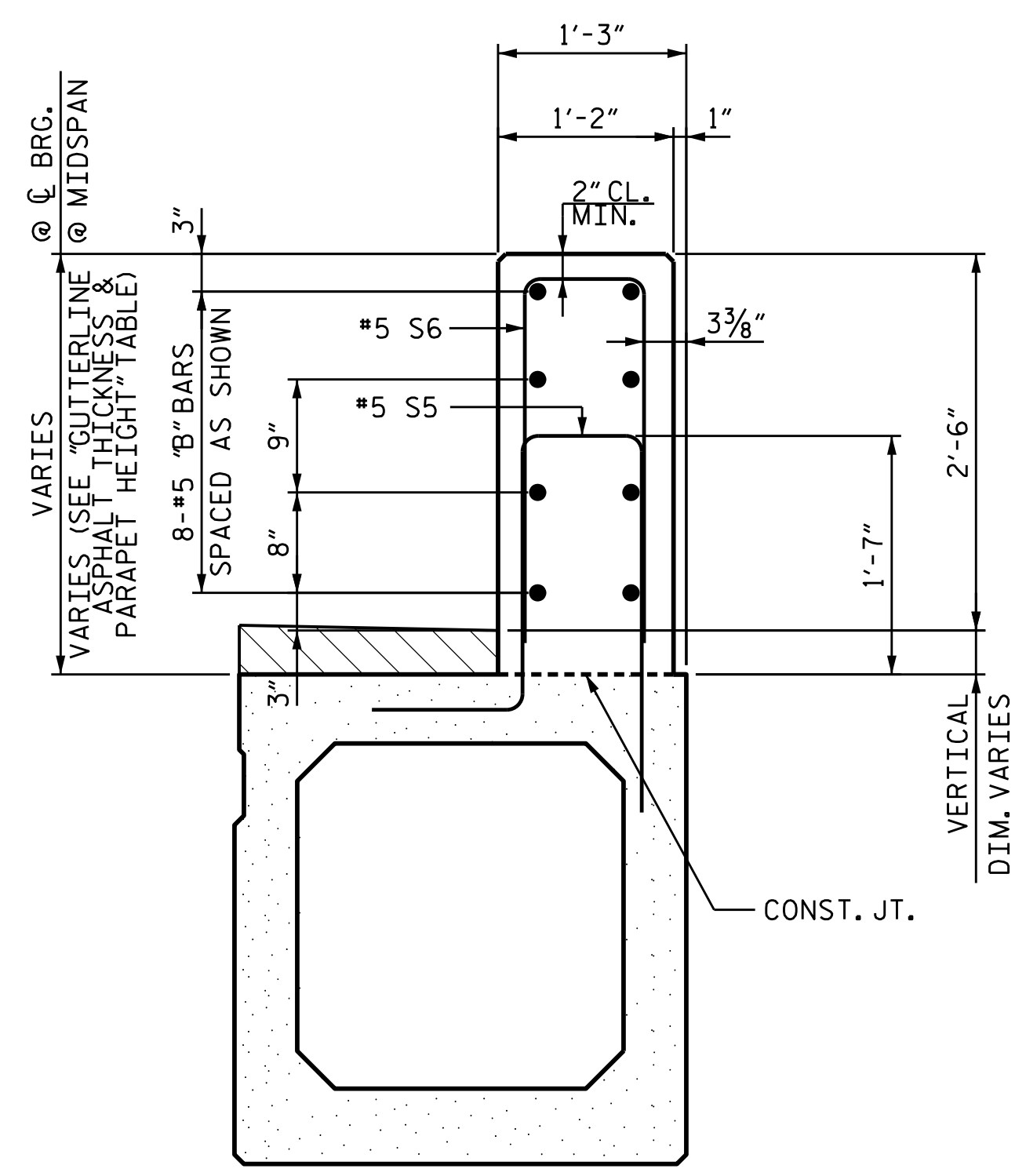
SPAN A	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR B.B.	2	75'-0"	150'-0"
INTERIOR B.B.	9	75'-0"	675'-0"
TOTAL	11		825'-0"

**BOX BEAM UNITS REQUIRED**

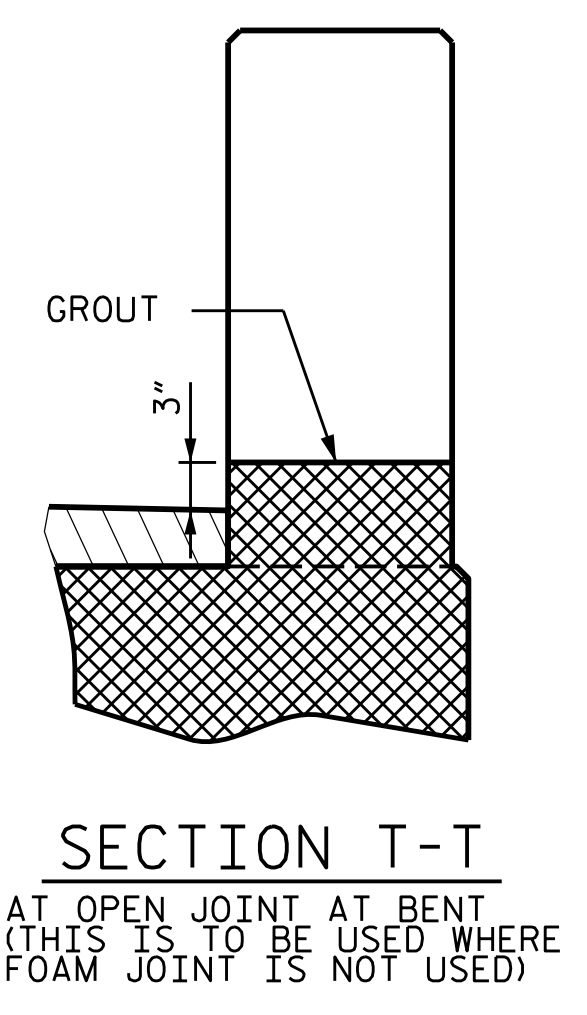
SPAN B	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR B.B.	2	100'-0"	200'-0"
INTERIOR B.B.	9	100'-0"	900'-0"
TOTAL	11		1100'-0"

**BOX BEAM UNITS REQUIRED**

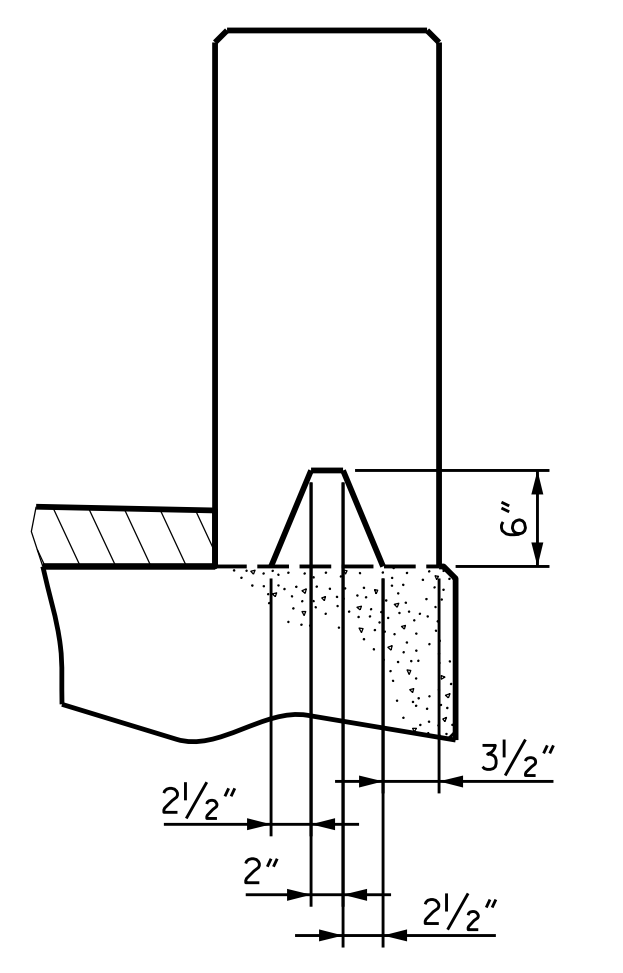
SPAN C	NUMBER	LENGTH	TOTAL LENGTH
EXTERIOR B.B.	2	35'-0"	70'-0"
INTERIOR B.B.	9	35'-0"	315'-0"
TOTAL	11		385'-0"



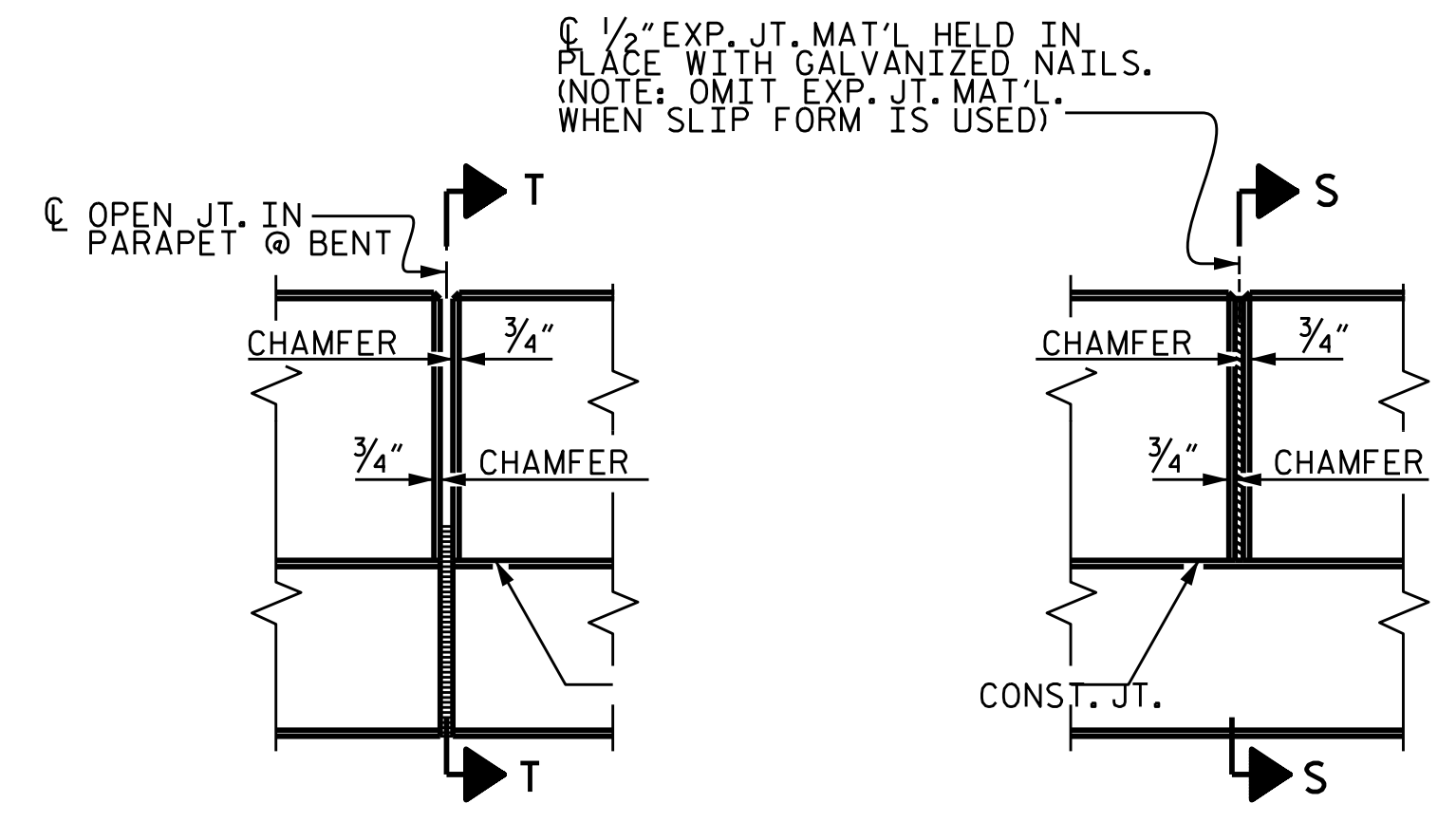
**SECTION THRU PARAPET FOR TWO BAR METAL RAIL**  
FOR PARAPET BILL OF MATERIAL, SEE "END POST DETAILS" SHEET.



**SECTION T-T**  
AT OPEN JOINT AT BENT  
(THIS IS TO BE USED WHERE FOAM JOINT IS NOT USED)



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



**ELEVATION AT EXPANSION JOINTS**

**GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT**

	ASPHALT OVERLAY THICKNESS @ MID-SPAN	PARAPET HEIGHT @ MID-SPAN
35' UNITS	3 7/16"	2'-9 7/16"
75' UNITS	3 5/16"	2'-9 9/16"
100' UNITS	2 3/8"	2'-8 3/8"

PROJECT NO. BP11.R005  
SURRY COUNTY  
STATION: 16+22.00 -L-  
SHEET 9 OF 9

Professional Engineer Seal for Marshall G. Cheek, Jr., License No. 20125, State of North Carolina. Date: 12/6/2022.

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CORP. LICENSE NO.: C-0275

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS 33
2			4			

ASSEMBLED BY :	JLA	DATE :	11/21
CHECKED BY :	MGC	DATE :	1/22
DRAWN BY :	DGE	10/11	REV. 5/18
CHECKED BY :	TMG	11/11	MAA/THC





**NOTES**

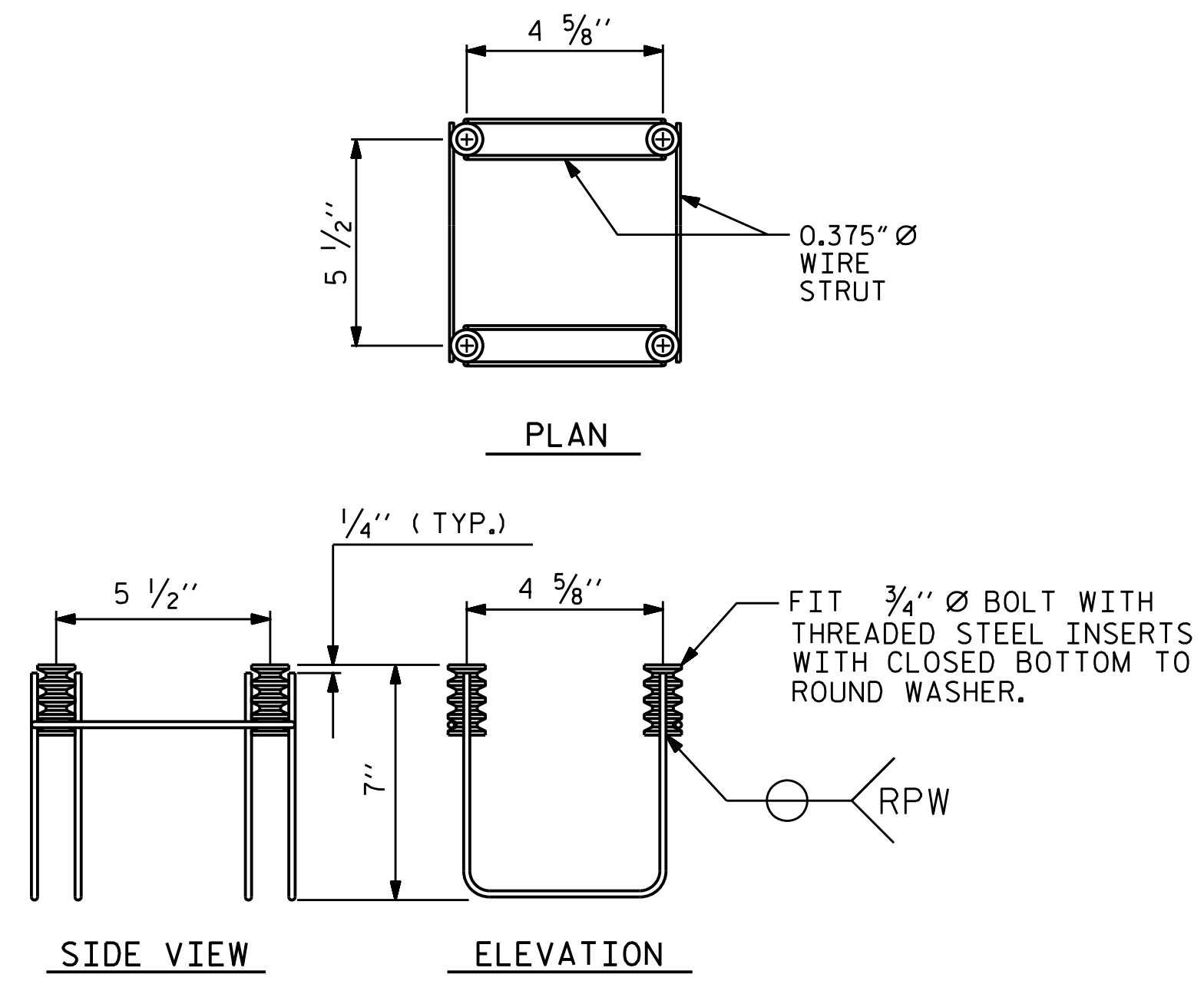
**STRUCTURAL CONCRETE ANCHOR ASSEMBLY**

THE STRUCTURAL CONCRETE ANCHOR ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS :

- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2" FOR 3/4" FERRULES.
- B. 4 - 3/4" Ø X 2 1/2" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø X 2 1/2" GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.
- C. WIRE STRUT SHOWN IN THE CONCRETE ANCHOR ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.
- D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.
- E. THE COST OF THE METAL RAIL ANCHOR ASSEMBLY WITH BOLTS AND WASHERS COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR LINEAR FEET OF METAL RAIL.
- F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

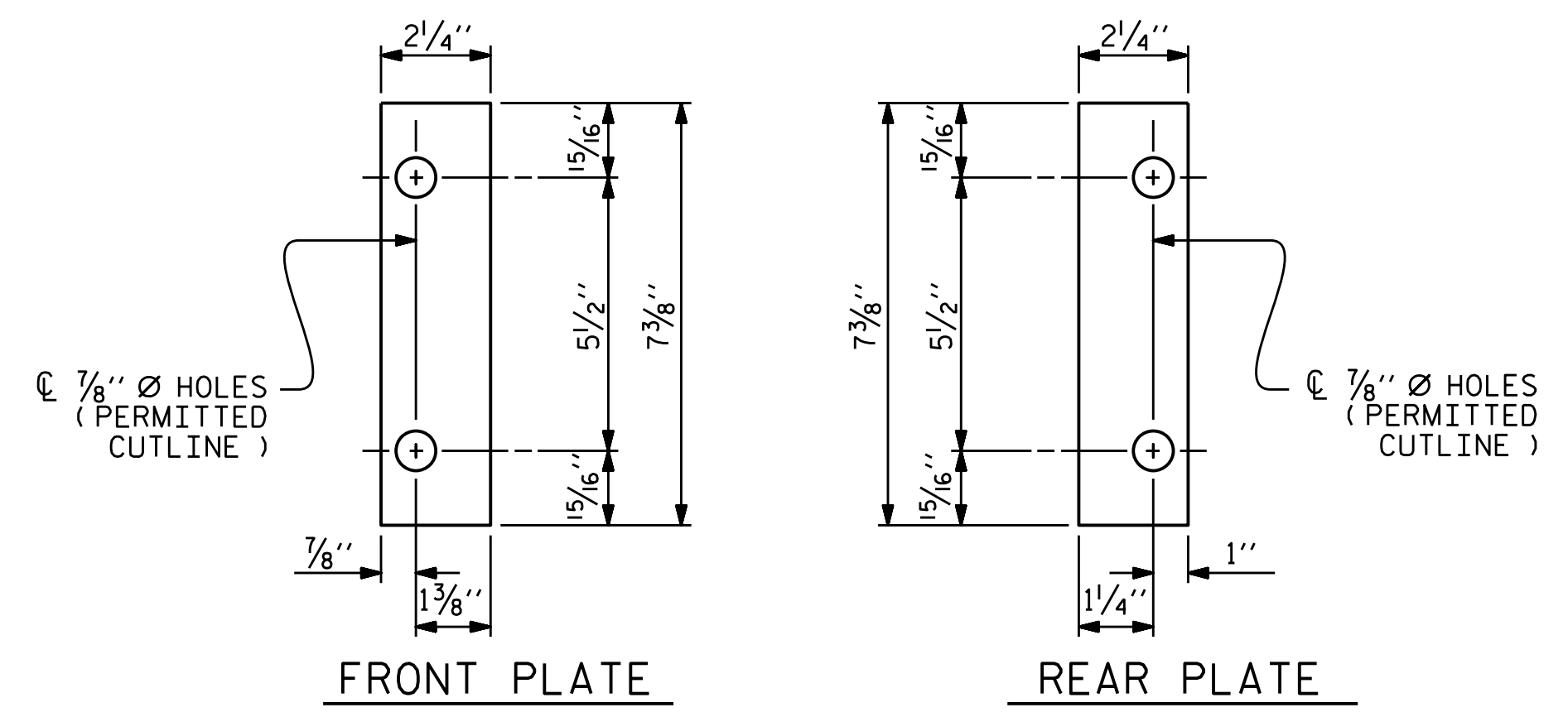
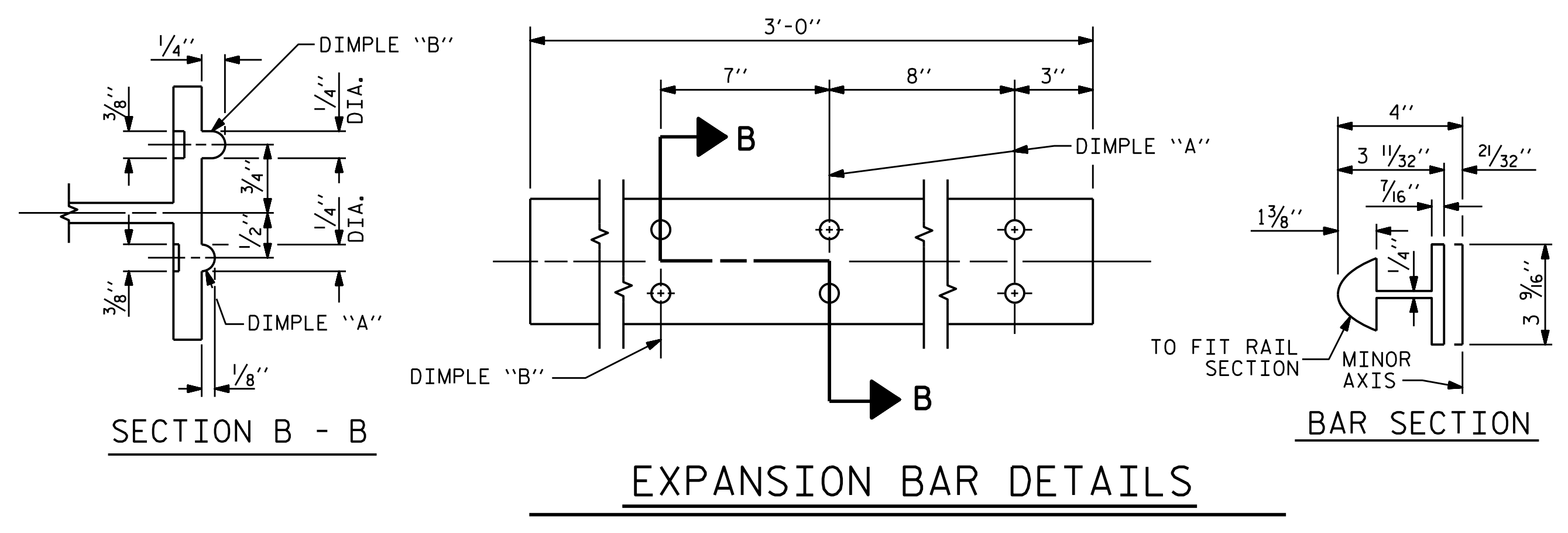
THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF THE METAL RAIL ANCHOR ASSEMBLY. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 10 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE THE STANDARD SPECIFICATIONS.

WHEN ADHESIVELY ANCHORED ANCHOR BOLTS ARE USED, BOLTS SHALL MEET THE REQUIREMENTS OF ASTM F593 ALLOY 304 STAINLESS STEEL WITH MINIMUM 75,000 PSI ULTIMATE STRENGTH. NUTS SHALL MEET THE REQUIREMENTS OF ASTM F594 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.



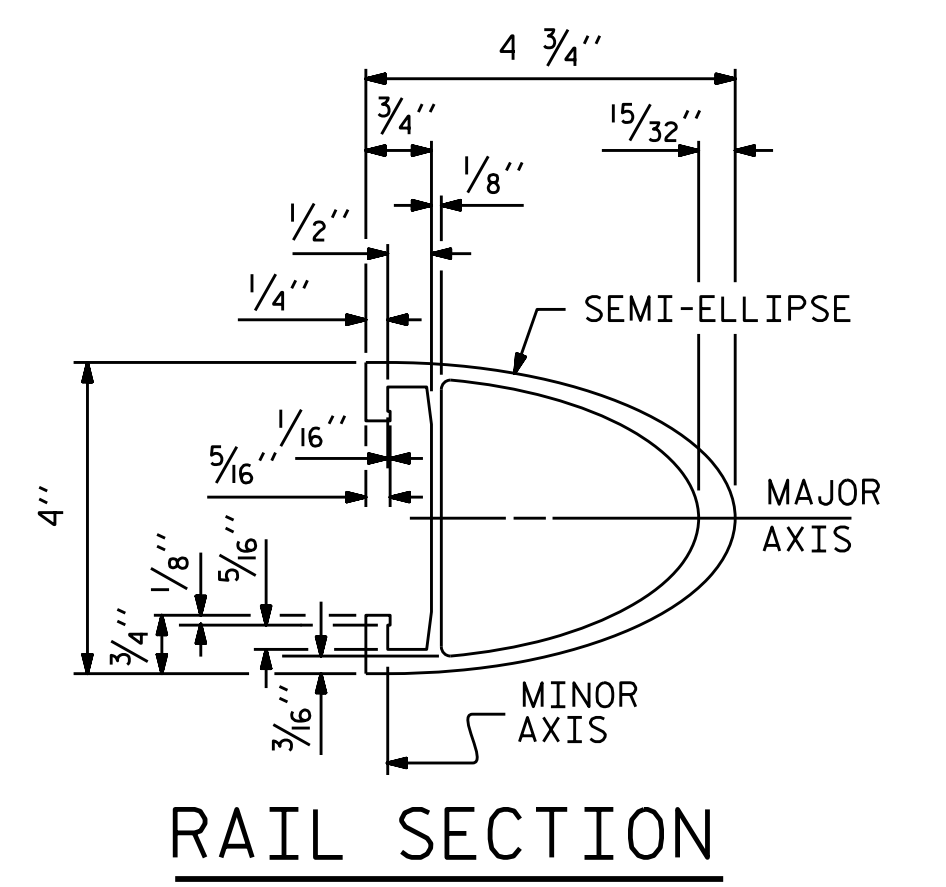
**4-BOLT METAL RAIL ANCHOR ASSEMBLY**

( 72 ASSEMBLIES REQUIRED )

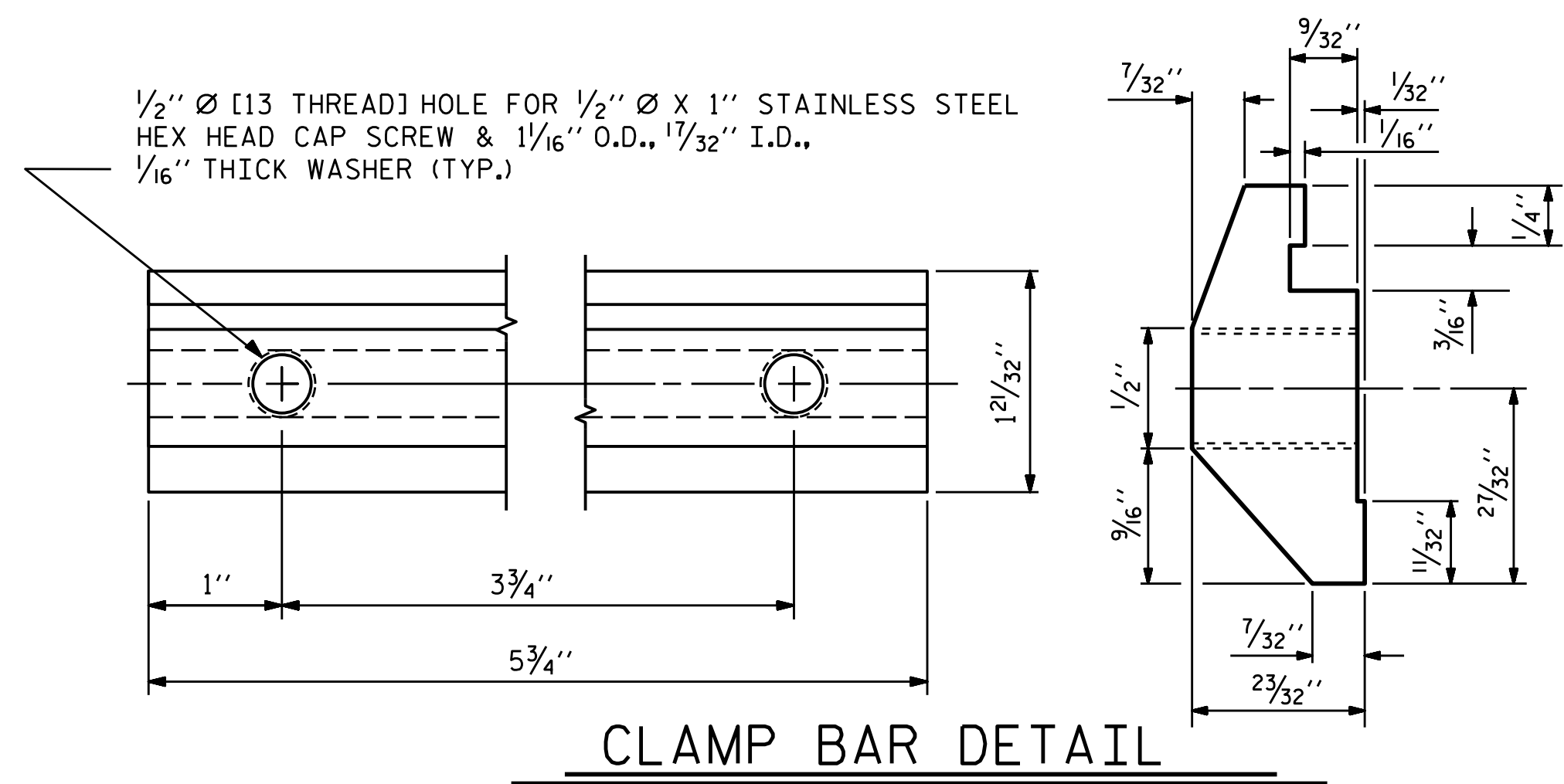


**SHIM DETAILS**

NOTE : SHIMS MAY BE CUT ALONG PERMITTED CUTLINE OR SLOTTED TO EDGE OF PLATE TO FACILITATE PLACEMENT.

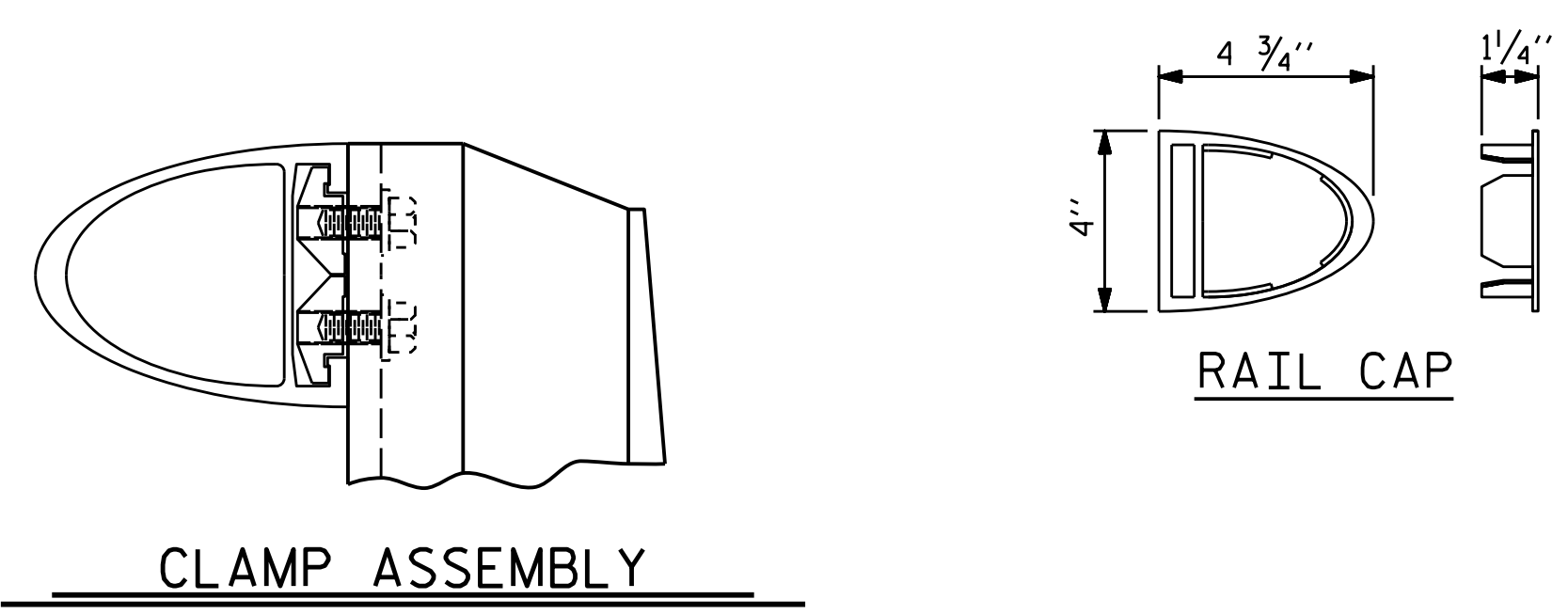


**RAIL SECTION**

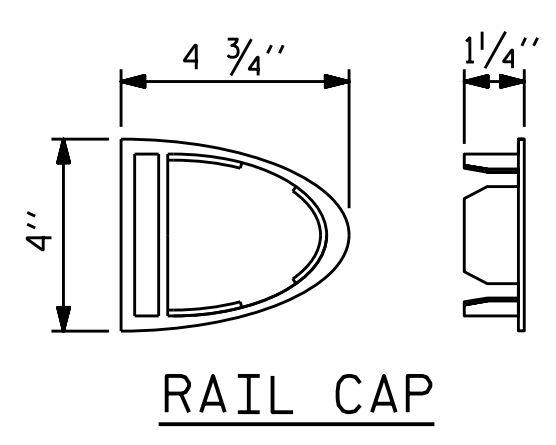


**CLAMP BAR DETAIL**

( 4 REQUIRED PER POST )



**CLAMP ASSEMBLY**



**RAIL CAP**

PROJECT NO. BP11.R005  
 SURRY COUNTY  
 STATION: 16+22.00 -L-  
 SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 2 BAR METAL RAIL

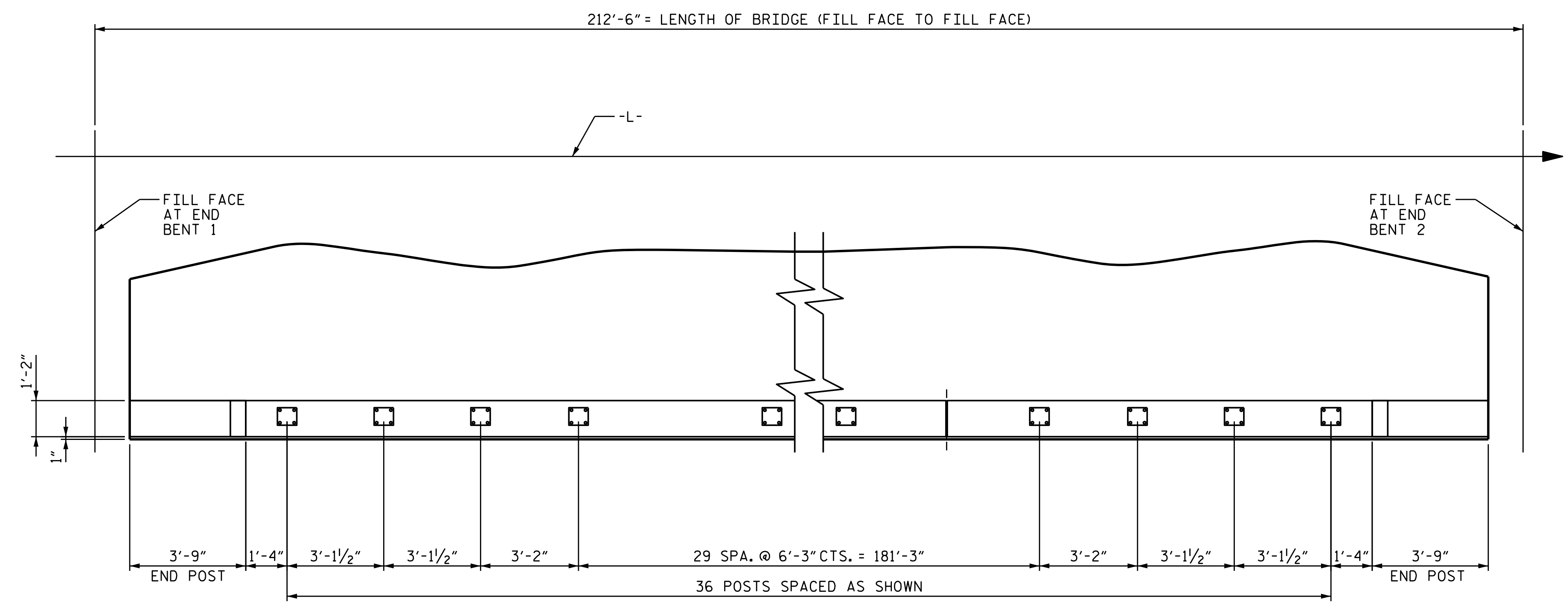
12/6/2022

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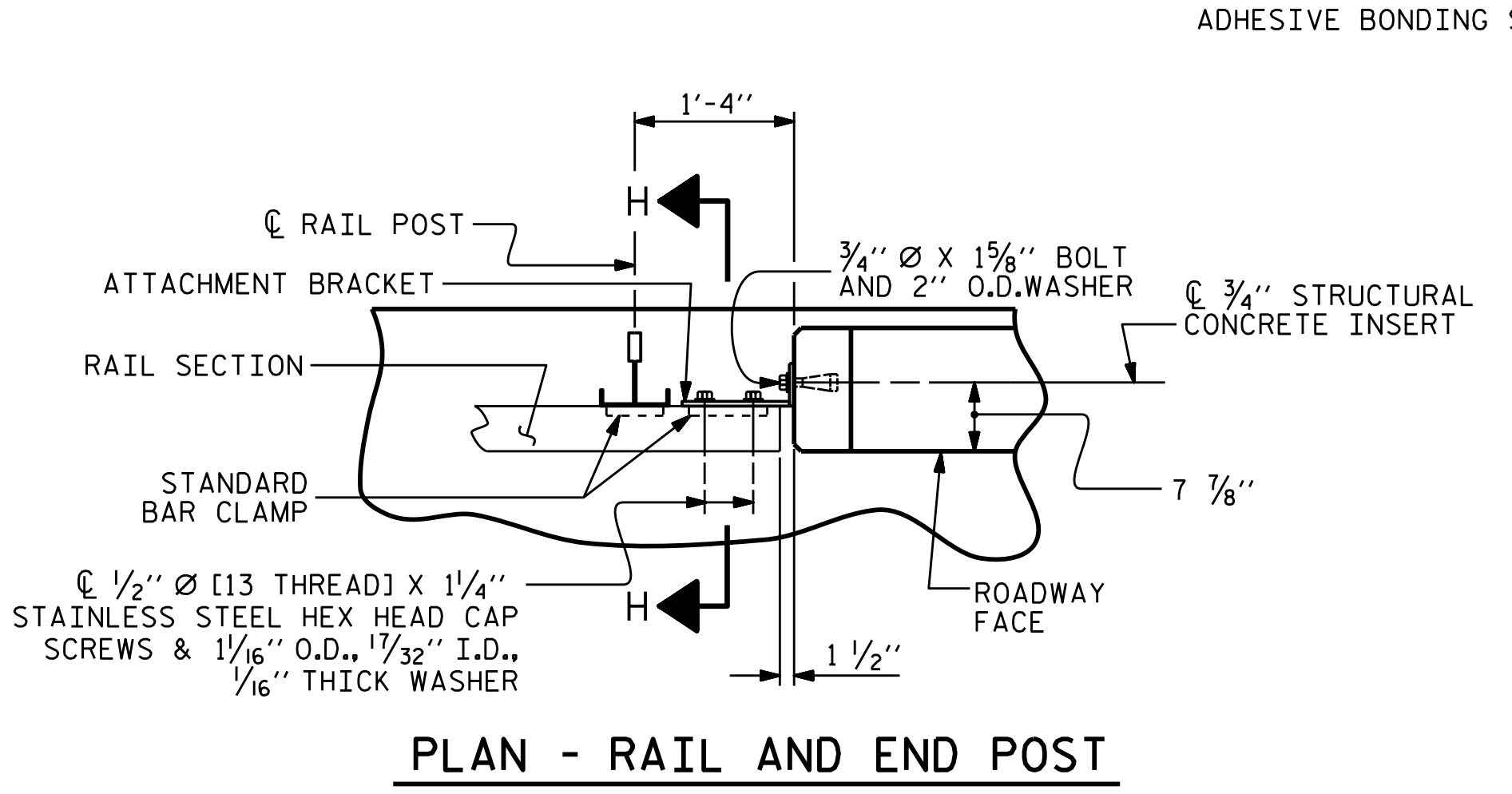
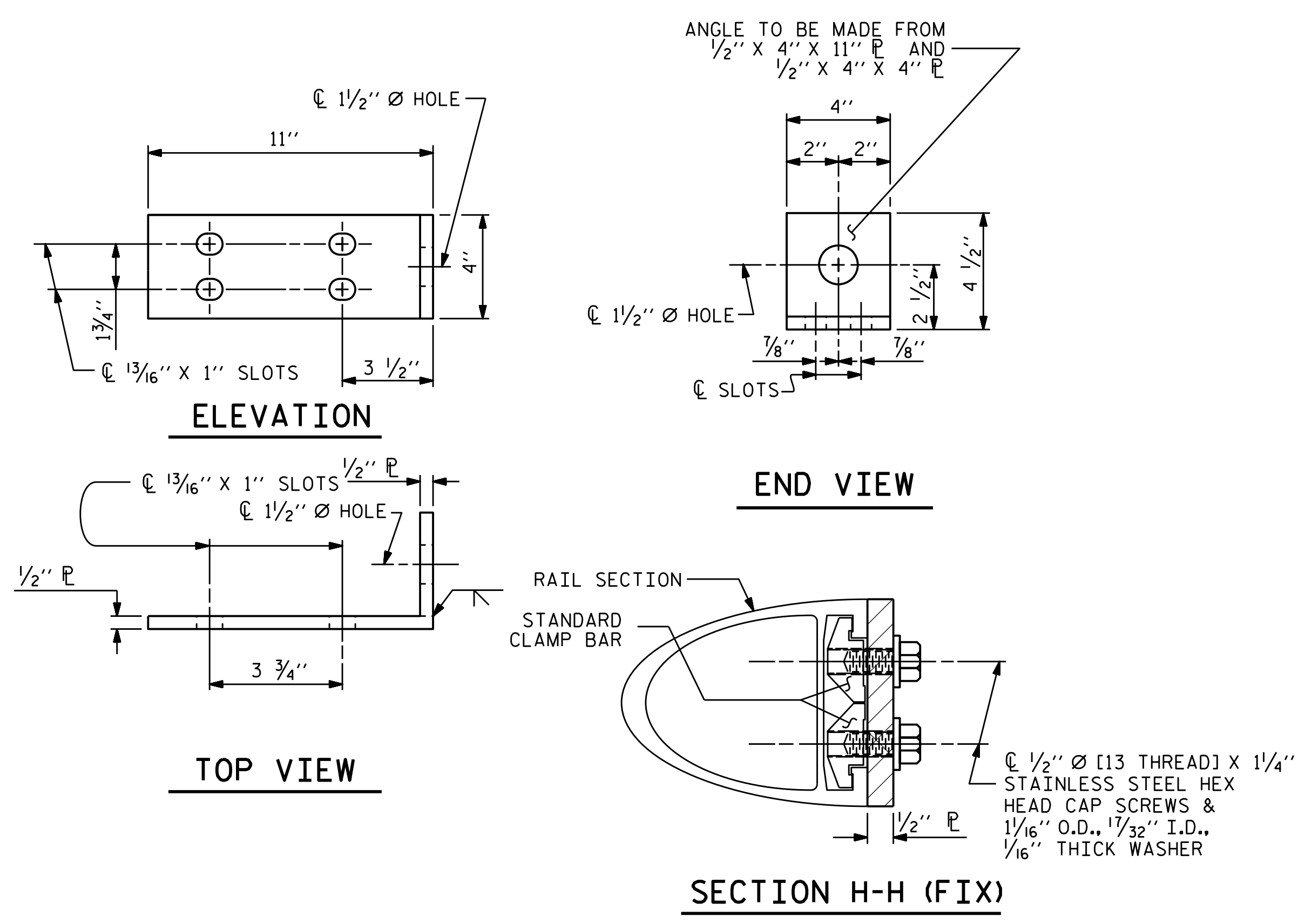
TGS ENGINEERS  
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 SHELBY, NC 28150  
 PH (704) 476-0003  
 CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			33
2			4			33

ASSEMBLED BY :	JLA	DATE :	11/21
CHECKED BY :	MGC	DATE :	1/22
DRAWN BY :	EEM	REV. 5/1/06R	KMM/GM
CHECKED BY :	RGW	REV. 10/1/11	MAA/GM
		REV. 12/17	MAA/THC



**PLAN OF RAIL POST SPACINGS**  
RIGHT SIDE SHOWN, LEFT SIDE SIMILAR



**PLAN - RAIL AND END POST**

**NOTES**

**STRUCTURAL CONCRETE INSERT**

- THE STRUCTURAL CONCRETE INSERT ASSEMBLY SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1/2".
  - B. 1 - 3/4" Ø X 1 5/8" BOLT WITH WASHER, BOLT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLT AND WASHER SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLT AND WASHER MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø X 1 5/8" GALVANIZED BOLT AND WASHER, THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)
  - C. WIRE STRUT SHOWN IN THE CONCRETE INSERT ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 3/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

**NOTES**

**METAL RAIL TO END POST CONNECTION**

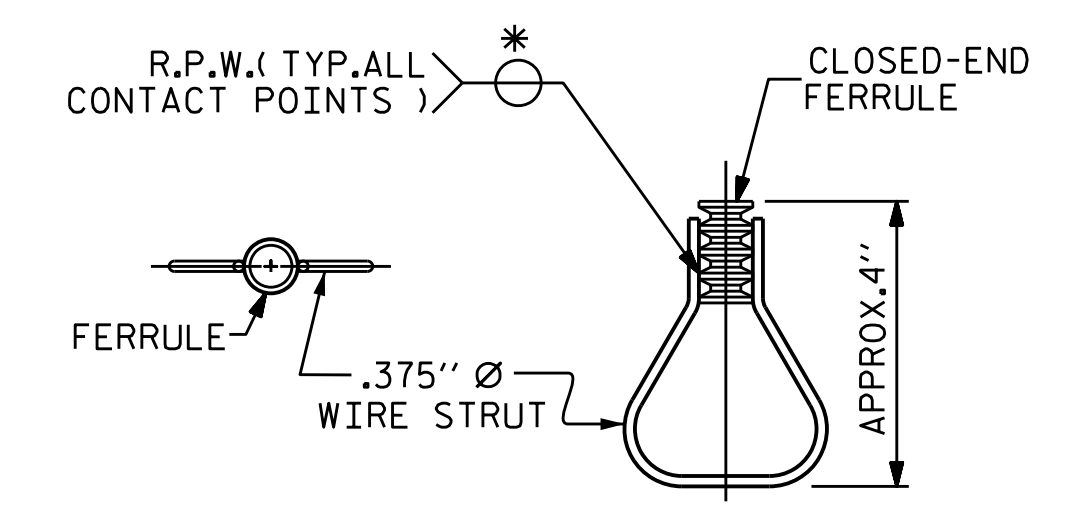
- THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- A. 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
  - B. 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4" Ø X 1 5/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4" Ø X 1 5/8" BOLT SHALL HAVE N.C. THREADS.
  - C. CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALL 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60° F.
  - D. STANDARD CLAMP BARS (SEE METAL RAIL SHEET).
  - E. 1/2" Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.

THE COST OF THE STANDARD CLAMP BARS AND CAP SCREWS USED IN THE METAL RAIL TO END POST CONNECTION SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR LINEAR FEET OF 1 OR 2 BAR METAL RAILS.

THE 3/4" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.

THE COST OF THE 3/4" STRUCTURAL CONCRETE INSERT ASSEMBLY, AND THE 1/2" PLATES COMPLETE IN PLACE SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE 3/4" Ø X 1 5/8" BOLT WITH WASHER SHALL BE REPLACED WITH A 3/4" Ø X 6 1/2" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE 3/4" Ø X 1 5/8" BOLT SHALL APPLY TO THE 3/4" Ø X 6 1/2" BOLT. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.



**PLAN ELEVATION**  
**STRUCTURAL CONCRETE INSERT**

\* EACH WELDED ATTACHMENT OF WIRE TO FERRULE SHALL DEVELOP THE TENSILE STRENGTH OF THE WIRE.

PROJECT NO. BP11.R005  
SURRY COUNTY  
STATION: 16+22.00 -L-

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
RAIL POST SPACINGS  
AND  
END OF RAIL DETAILS

12/6/2022

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS  
804-C N. LAFAYETTE ST  
SHELBY, NC 28150  
PH (704) 476-0003  
CORP. LICENSE NO.: C-0275

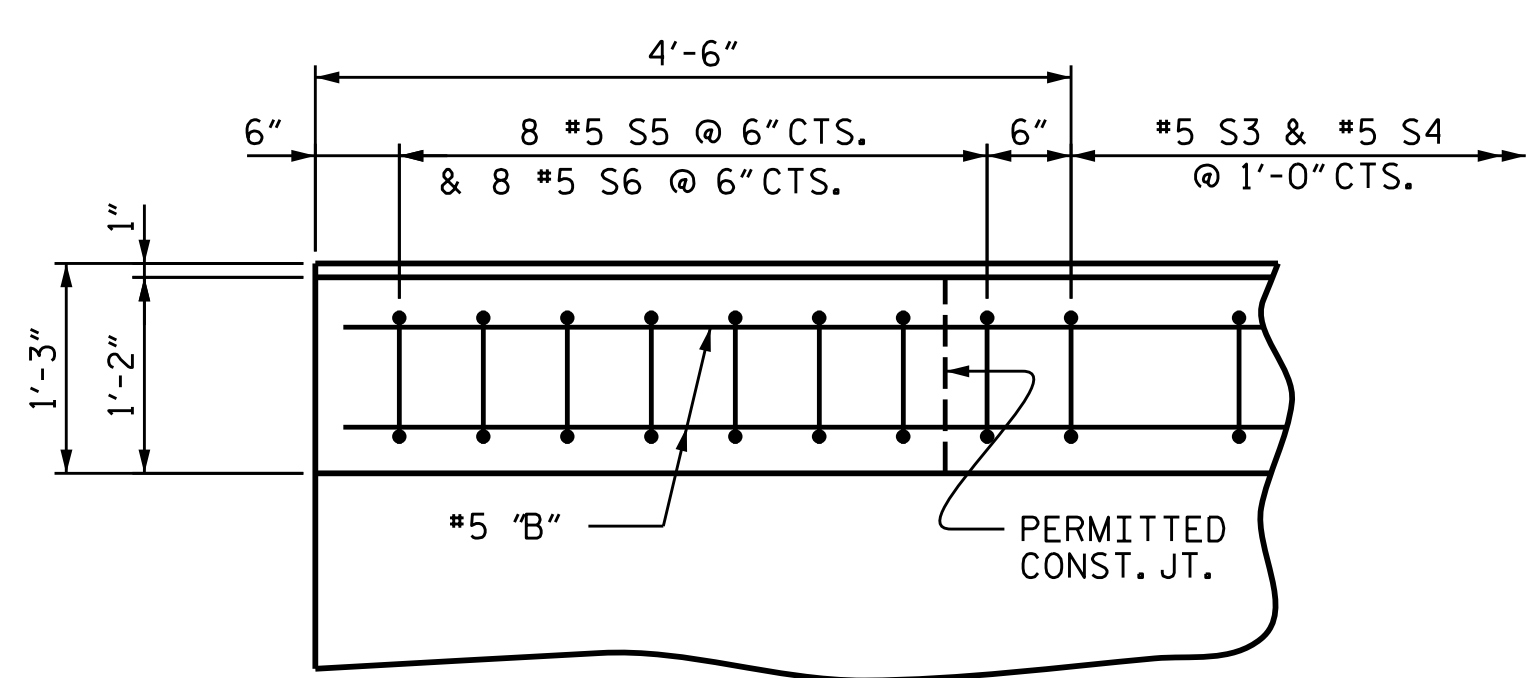
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			33
2			4			

ASSEMBLED BY : JLA DATE : 11/21  
CHECKED BY : MGC DATE : 1/22

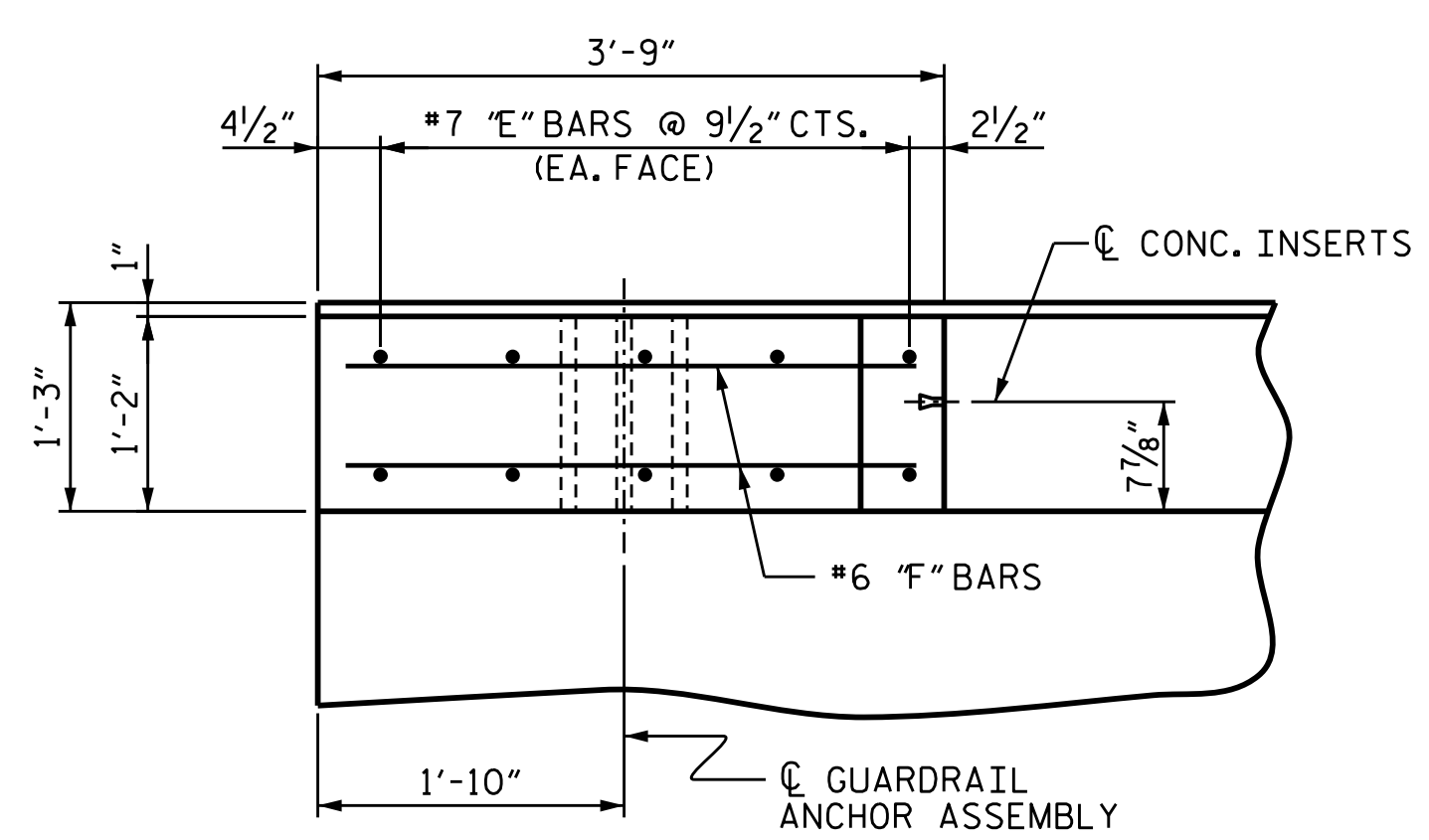
DRAWN BY : FCJ 1/88 REV. 5/1/06 TLA/GM  
CHECKED BY : CRK 3/89 REV. 10/1/11 MAA/GM  
REV. 12/17 MAA/THC

**DETAILS FOR ATTACHING METAL RAIL TO END POST**

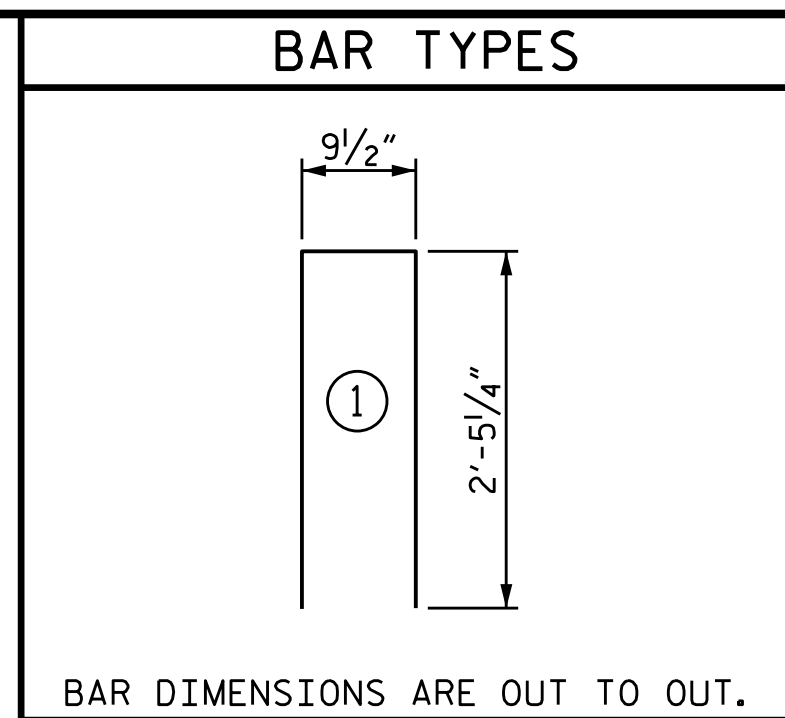




PLAN OF PARAPET

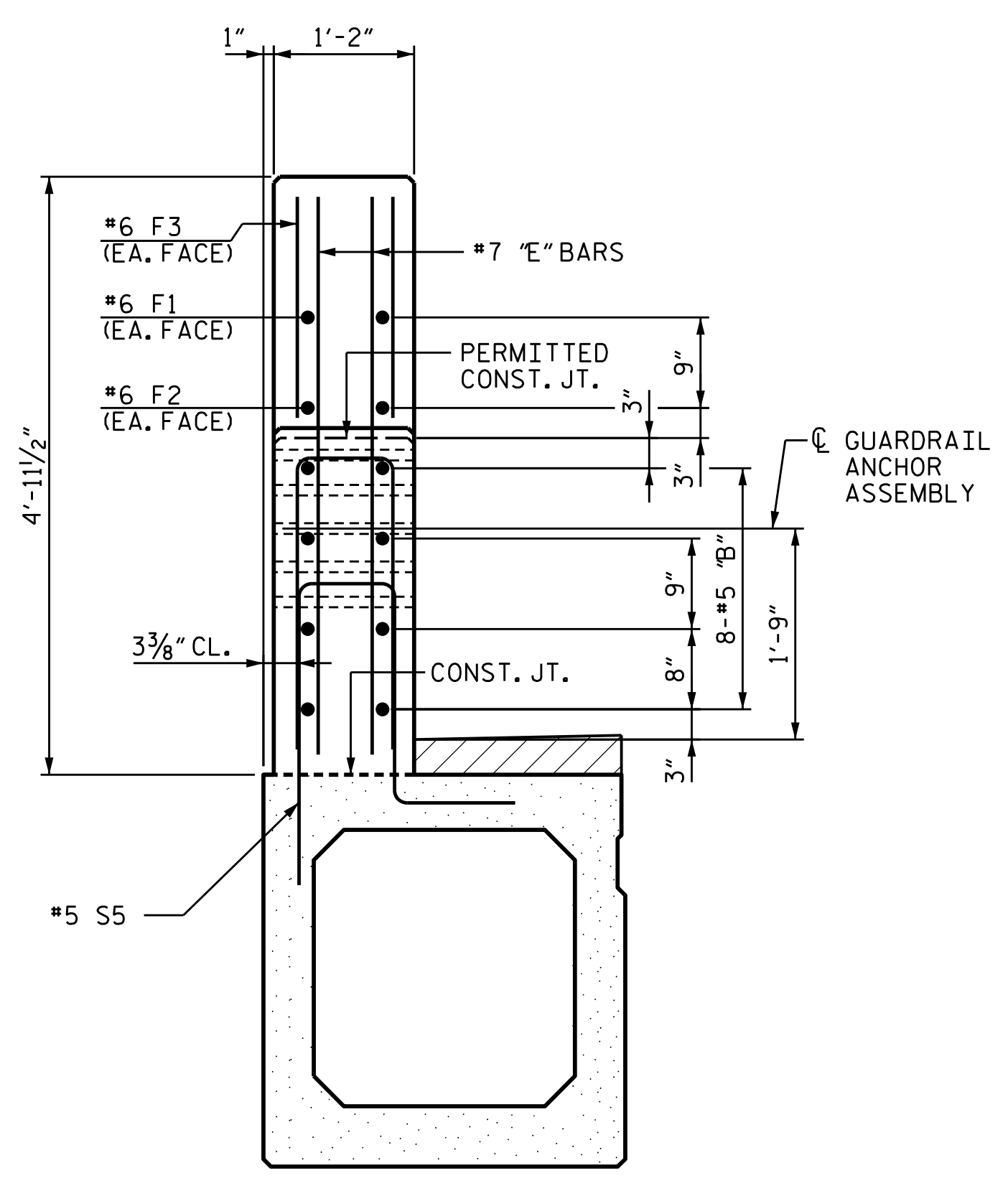


PLAN OF END POST

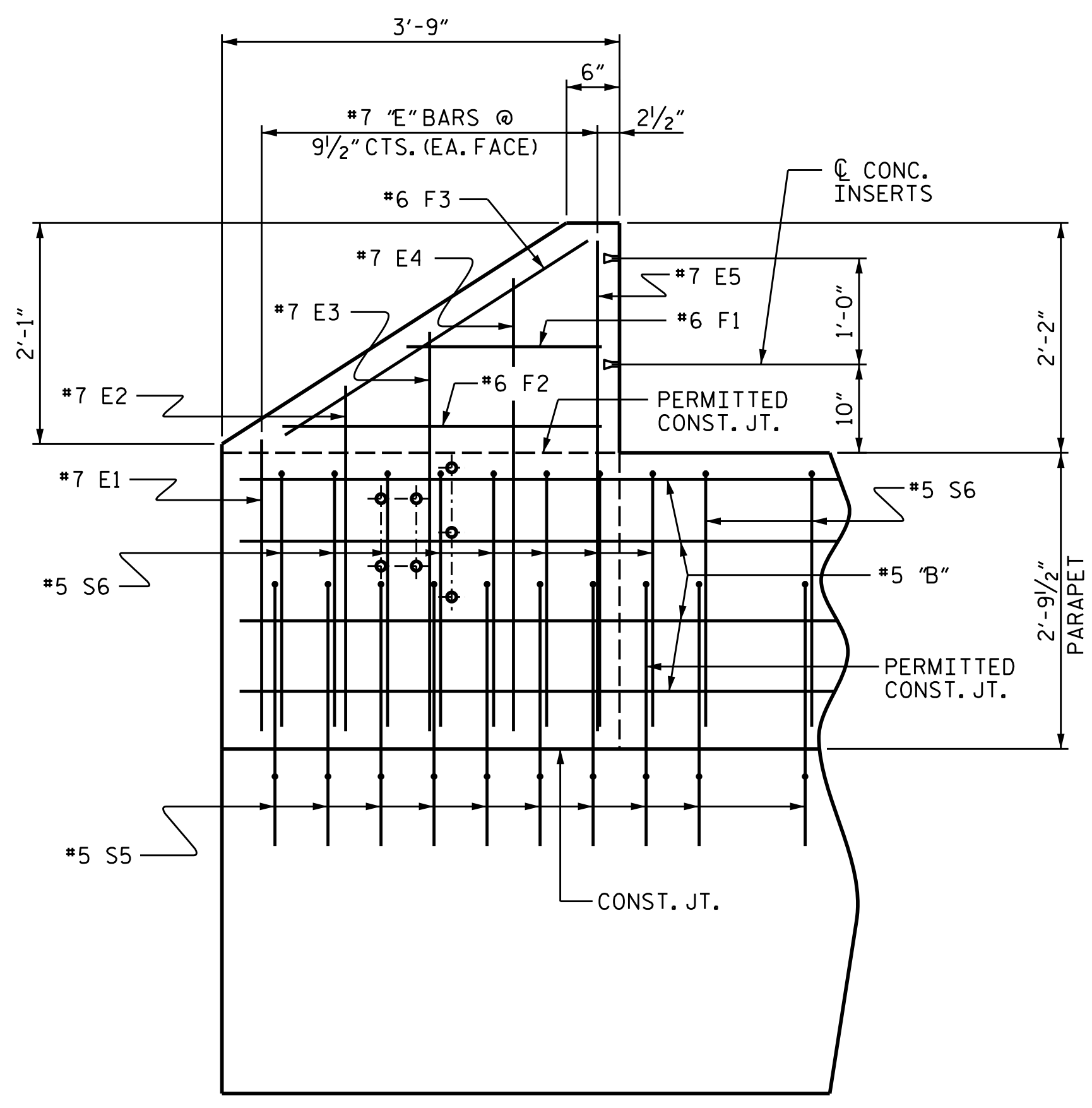


BILL OF MATERIAL FOR PARAPETS @ SPANS A, B, C & FOUR END POSTS					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B2	32	#5	STR.	17'-1"	570
* B4	48	#5	STR.	24'-7"	1,231
* B7	64	#5	STR.	24'-6"	1,635
* E1	8	#7	STR.	2'-9"	45
* E2	8	#7	STR.	3'-3"	53
* E3	8	#7	STR.	3'-9"	61
* E4	8	#7	STR.	4'-3"	69
* E5	8	#7	STR.	4'-7"	75
* F1	8	#6	STR.	1'-10"	22
* F2	8	#6	STR.	3'-0"	36
* F3	8	#6	STR.	3'-4"	40
* S6	468	#5	1	5'-8"	2,766
* EPOXY COATED REINFORCING STEEL					6,603 LBS.
CLASS "AA" CONCRETE					51.5 C.Y.
1'-2" x 2'-9 1/6" CONCRETE PARAPET					420.50 L.F.

NOTES:  
 QUANTITIES FOR THE #5 S5 BARS ARE SHOWN IN THE BOX BEAM UNIT BILL OF MATERIAL.



END VIEW



ELEVATION

PROJECT NO. BP11.R005  
SURRY COUNTY  
 STATION: 16+22.00 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

*Marshall G. Cheek, Jr.*  
 ENGINEER  
 12/6/2022

DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS  
 804-C N. LAFAYETTE ST  
 SHELBY, NC 28150  
 PH (704) 476-0003  
 CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			33

PARAPET AND END POST FOR TWO BAR METAL RAIL  
 END BENT 1 SHOWN; END BENT 2 SIMILAR

DRAWN BY : JLA DATE : 11/21  
 CHECKED BY : MCC DATE : 1/22

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.

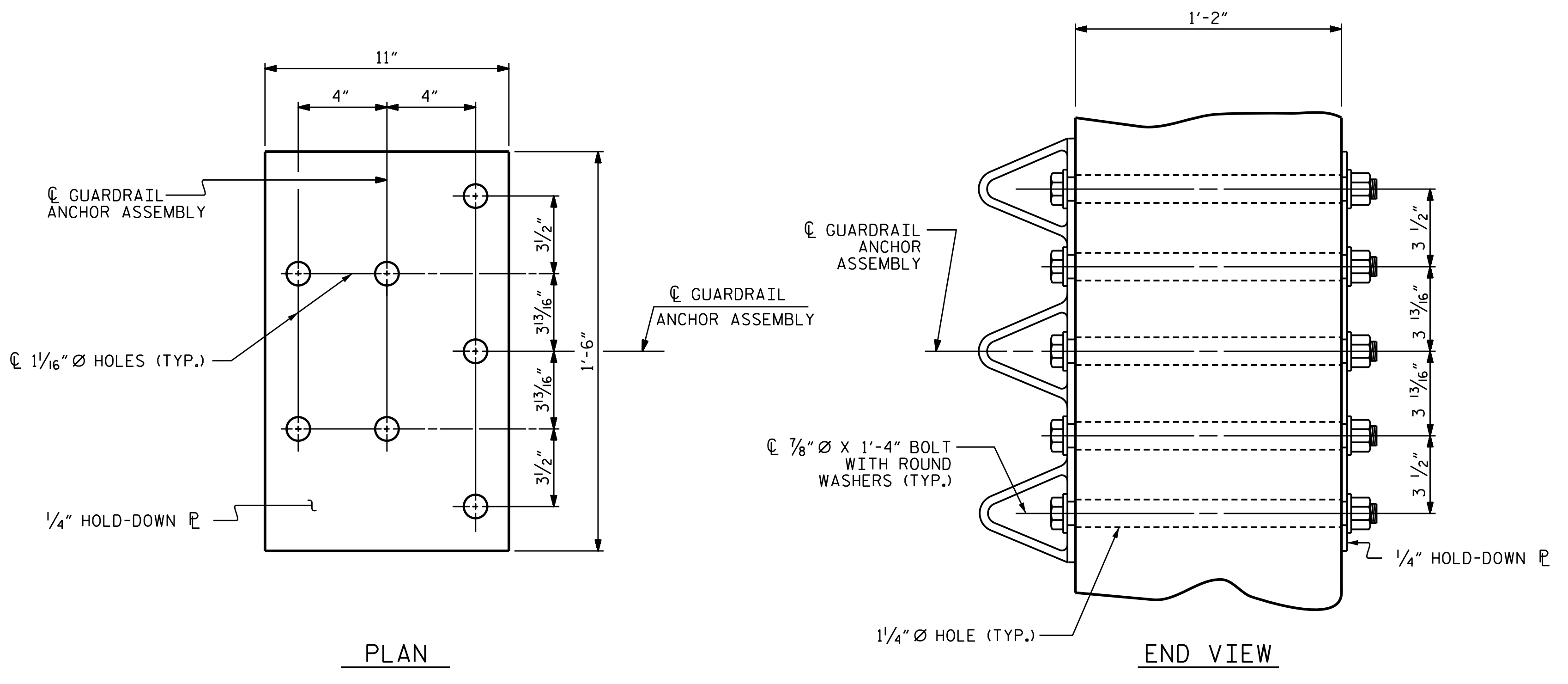
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

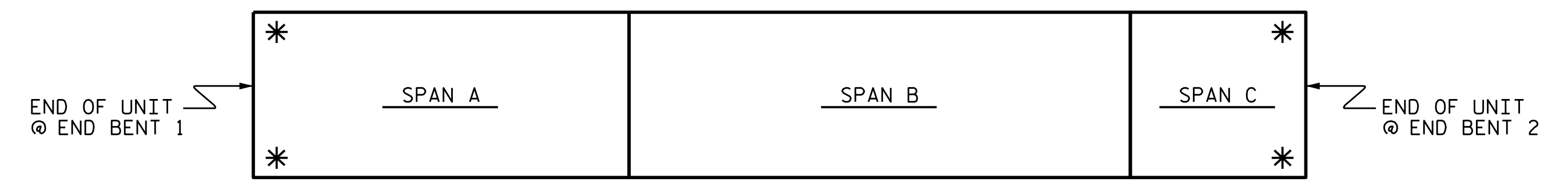
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST 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.

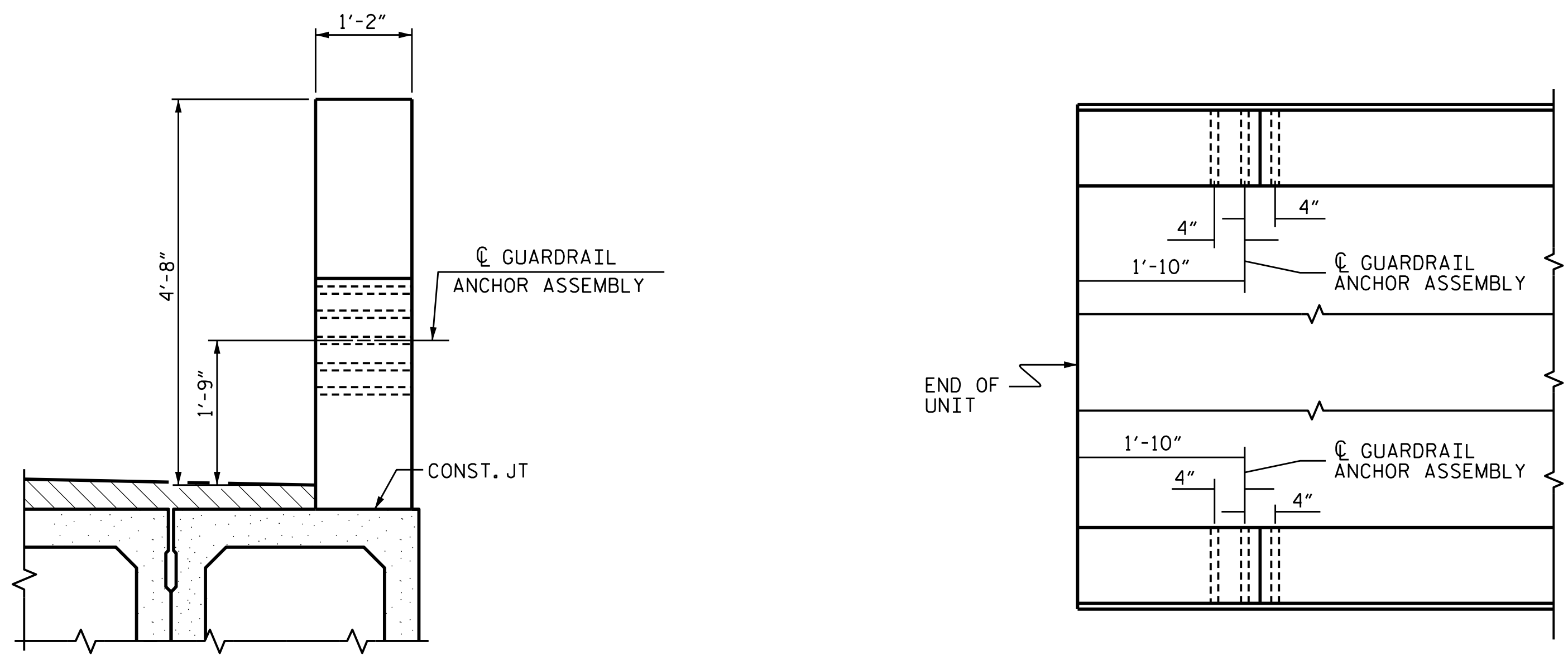


GUARDRAIL ANCHOR ASSEMBLY DETAILS



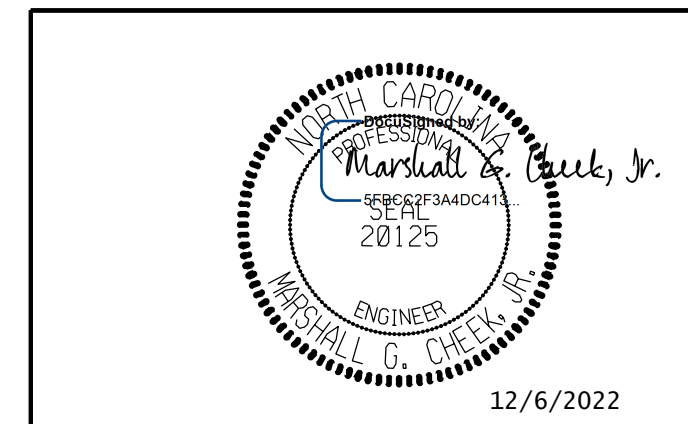
SKETCH SHOWING POINTS OF ATTACHMENT

\* LOCATION OF GUARDRAIL ATTACHMENT



LOCATION OF GUARDRAIL ANCHOR AT END POST

PROJECT NO. BP11.R005  
 SURRY COUNTY  
 STATION: 16+22.00 -L-



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 GUARDRAIL ANCHORAGE  
 DETAILS  
 FOR METAL RAILS

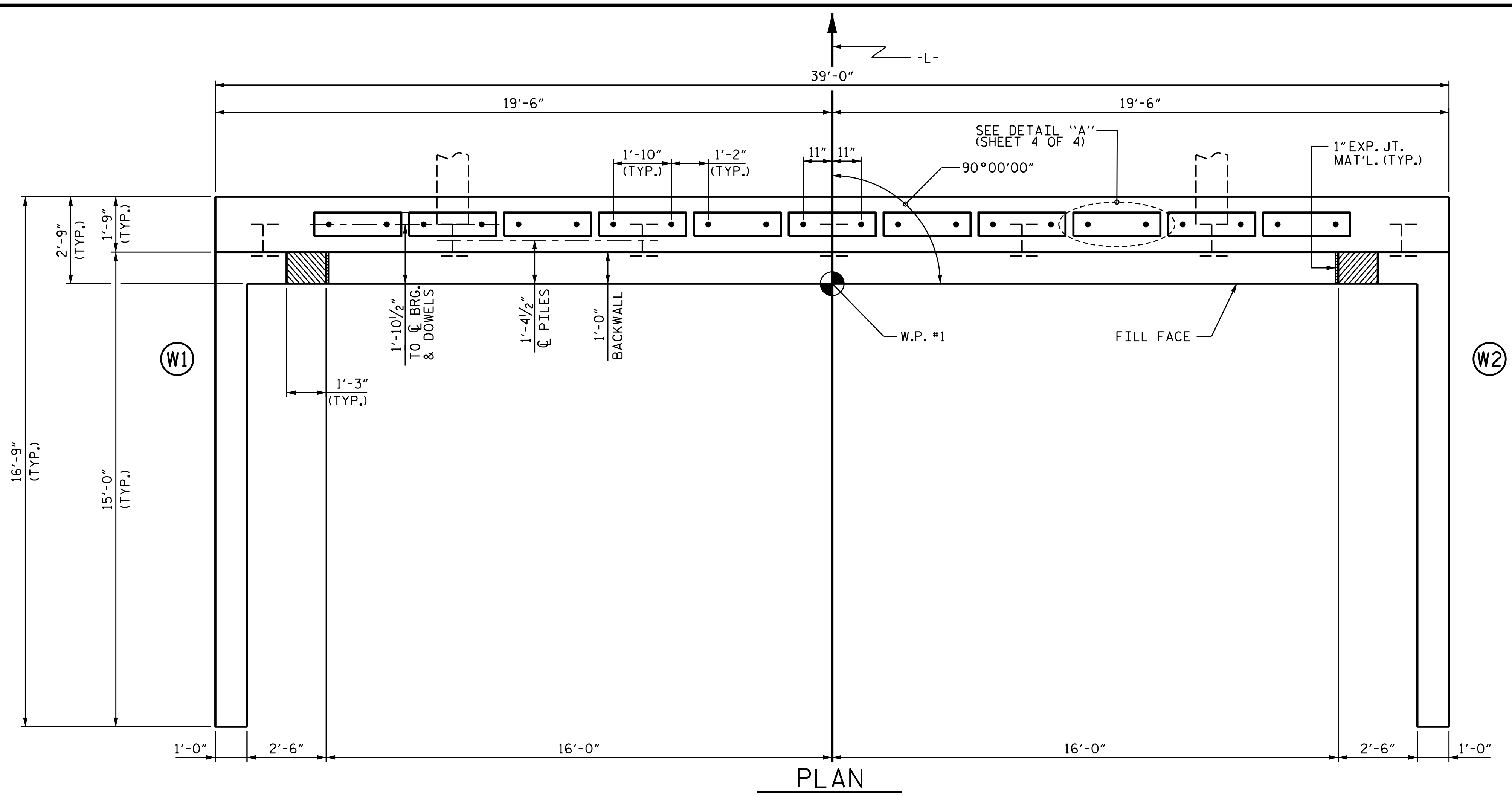
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CHECKED BY :	MGC	DATE :	1/22
DRAWN BY :	MAA	REV. 1/15	MAA/TMG
CHECKED BY :	GM	REV. 12/17	MAA/THC
		REV. 5/18	MAA/THC

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TGS ENGINEERS 804-C N. LAFAYETTE ST SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275						NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
						1			3			TOTAL SHEETS
						2			4			33

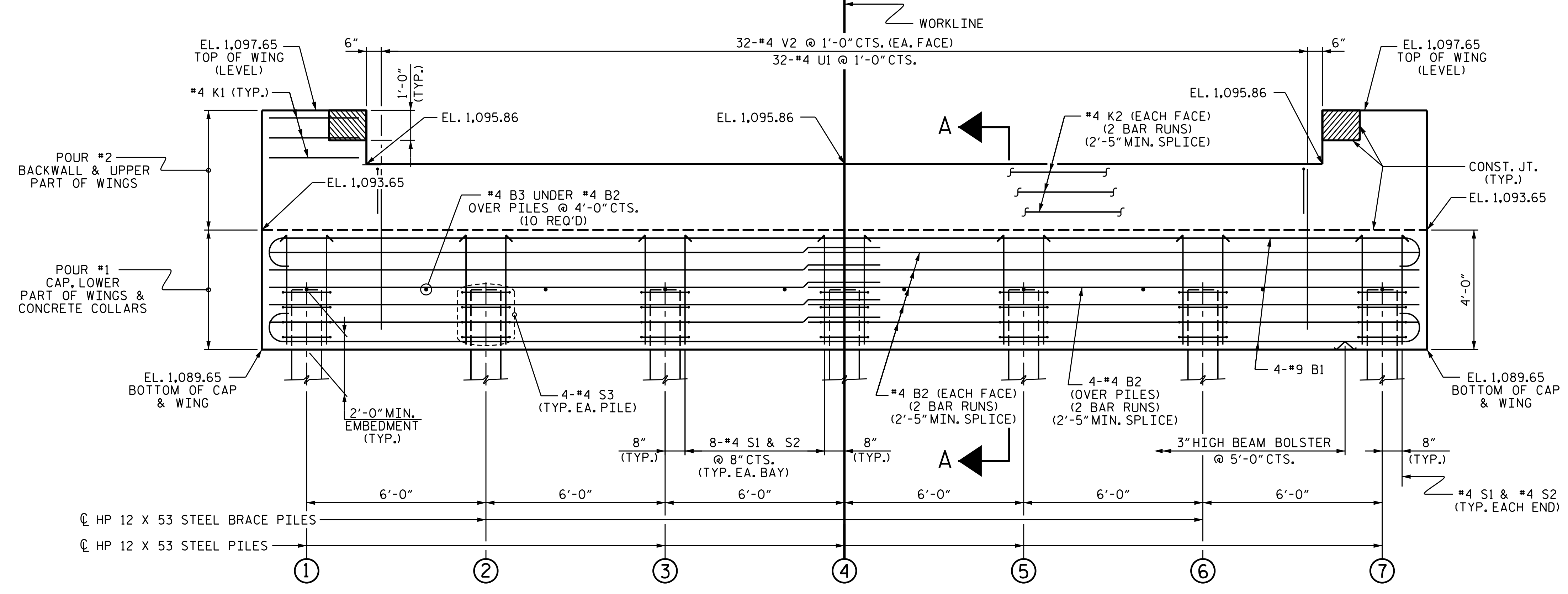


**NOTES**

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 PAPERET 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**

PROJECT NO. BP11.R005  
 SURRY COUNTY  
 STATION: 16+22.00 -L-  
 SHEET 1 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

*Marshall G. Cheek, Jr.*  
 ENGINEER  
 12/6/2022

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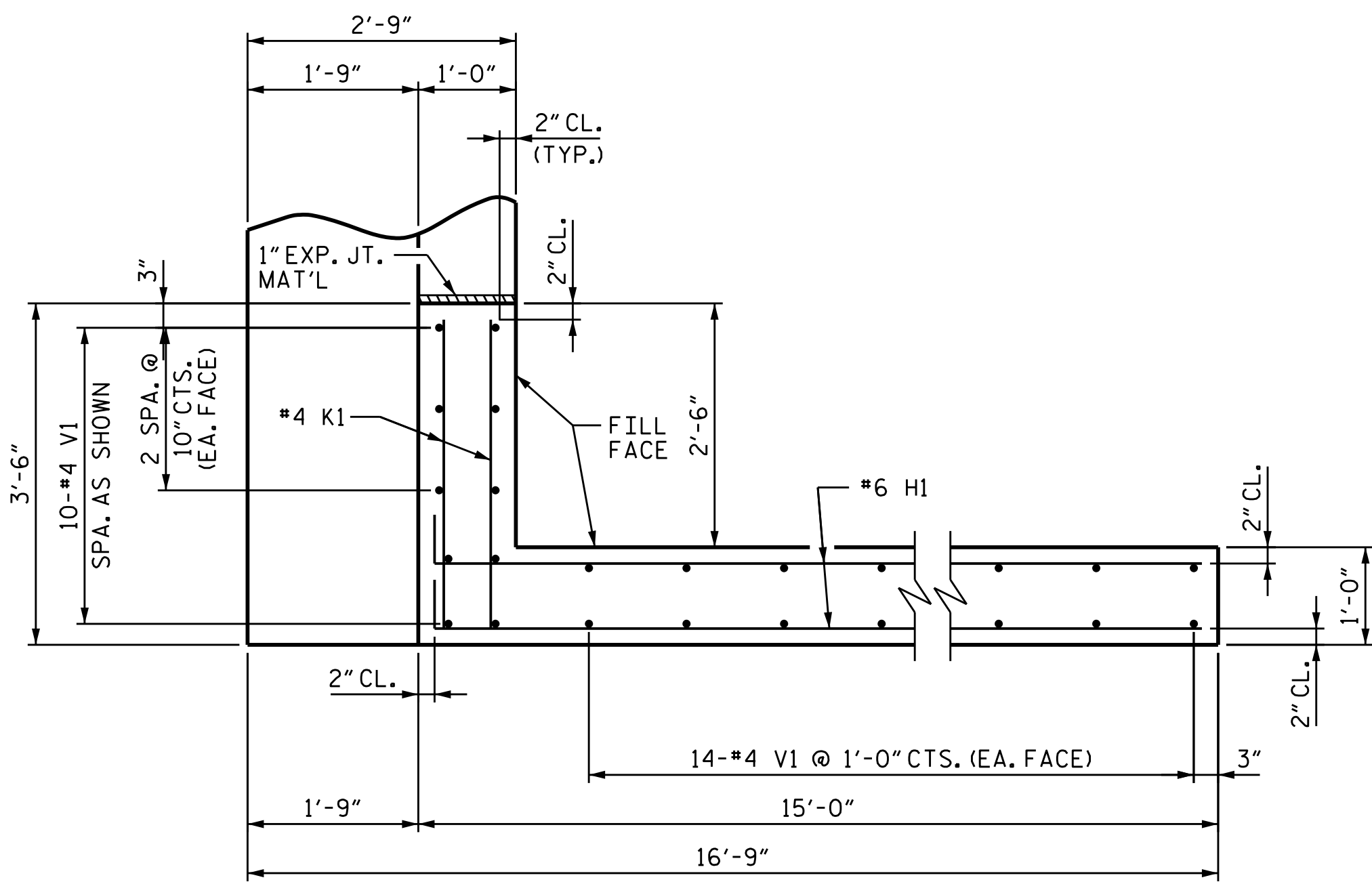
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			S-23
2			4			33

ASSEMBLED BY :	JLA	DATE :	11/21
CHECKED BY :	MGC	DATE :	1/22
DRAWN BY :	WJH	REV. 4/15	MAA/TMG
CHECKED BY :	AAC		

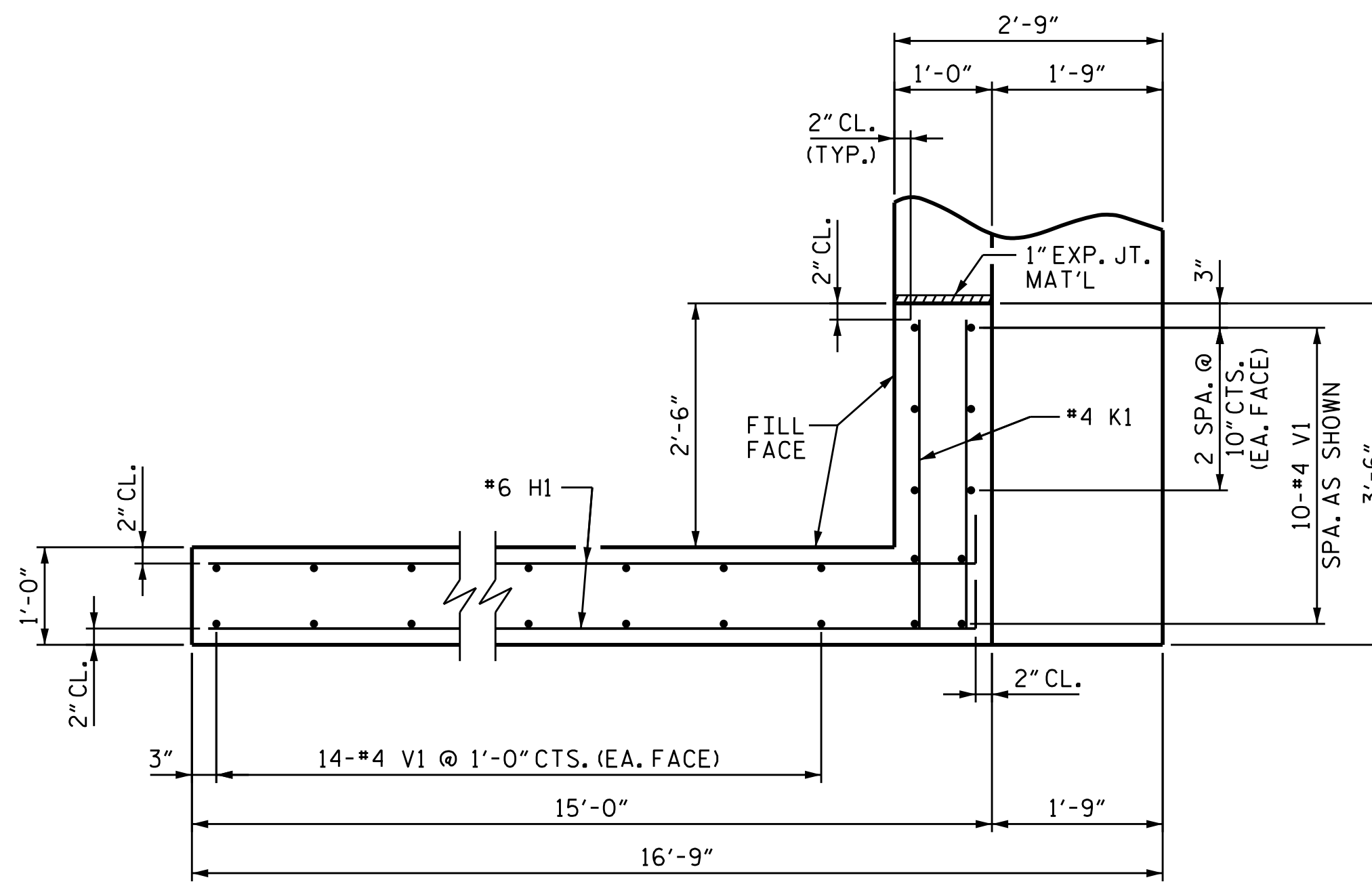
WINGS NOT SHOWN FOR CLARITY.  
 FOR SECTION A-A, SEE SHEET 4 OF 4.  
 CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.  
 SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.



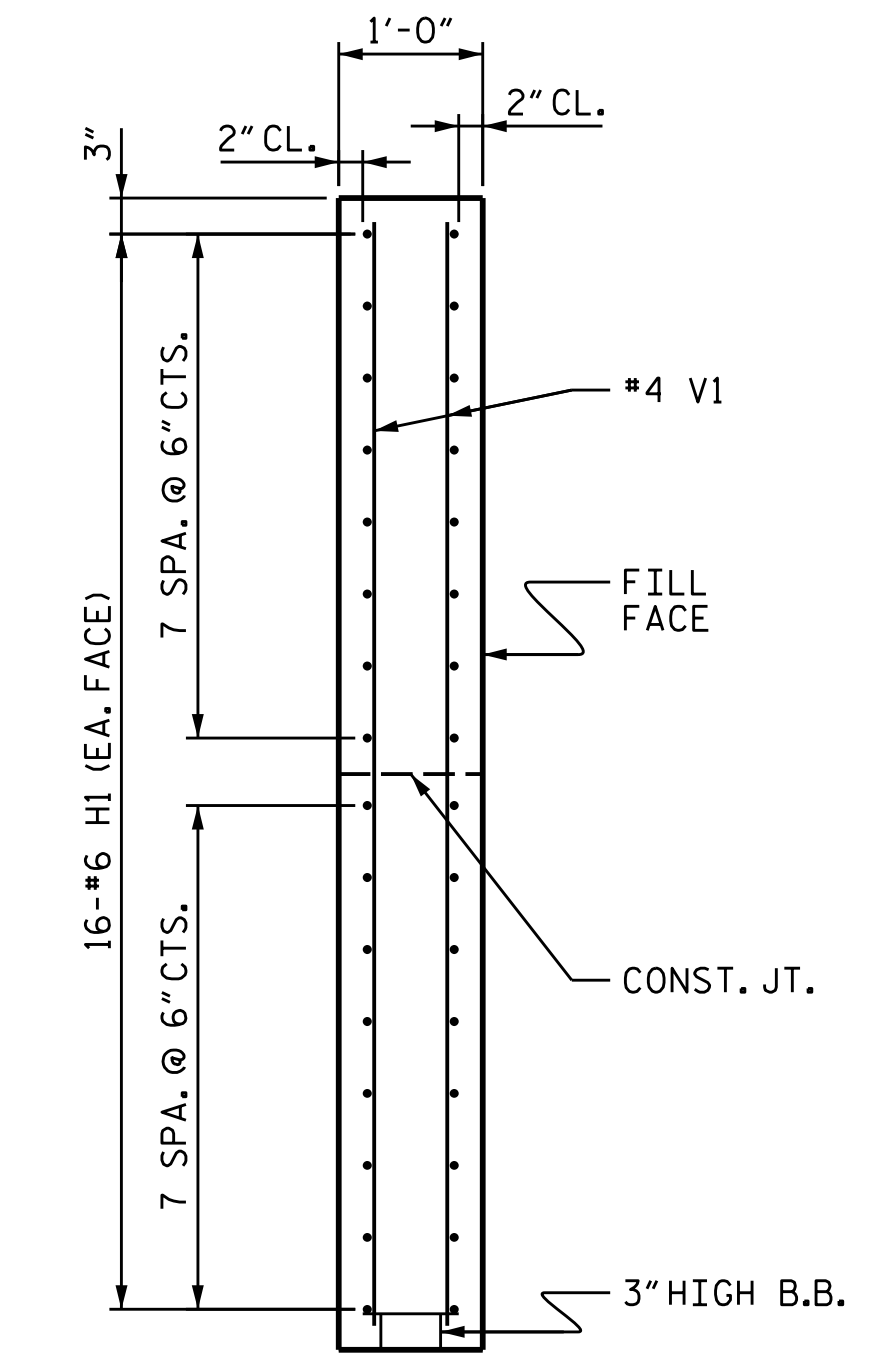




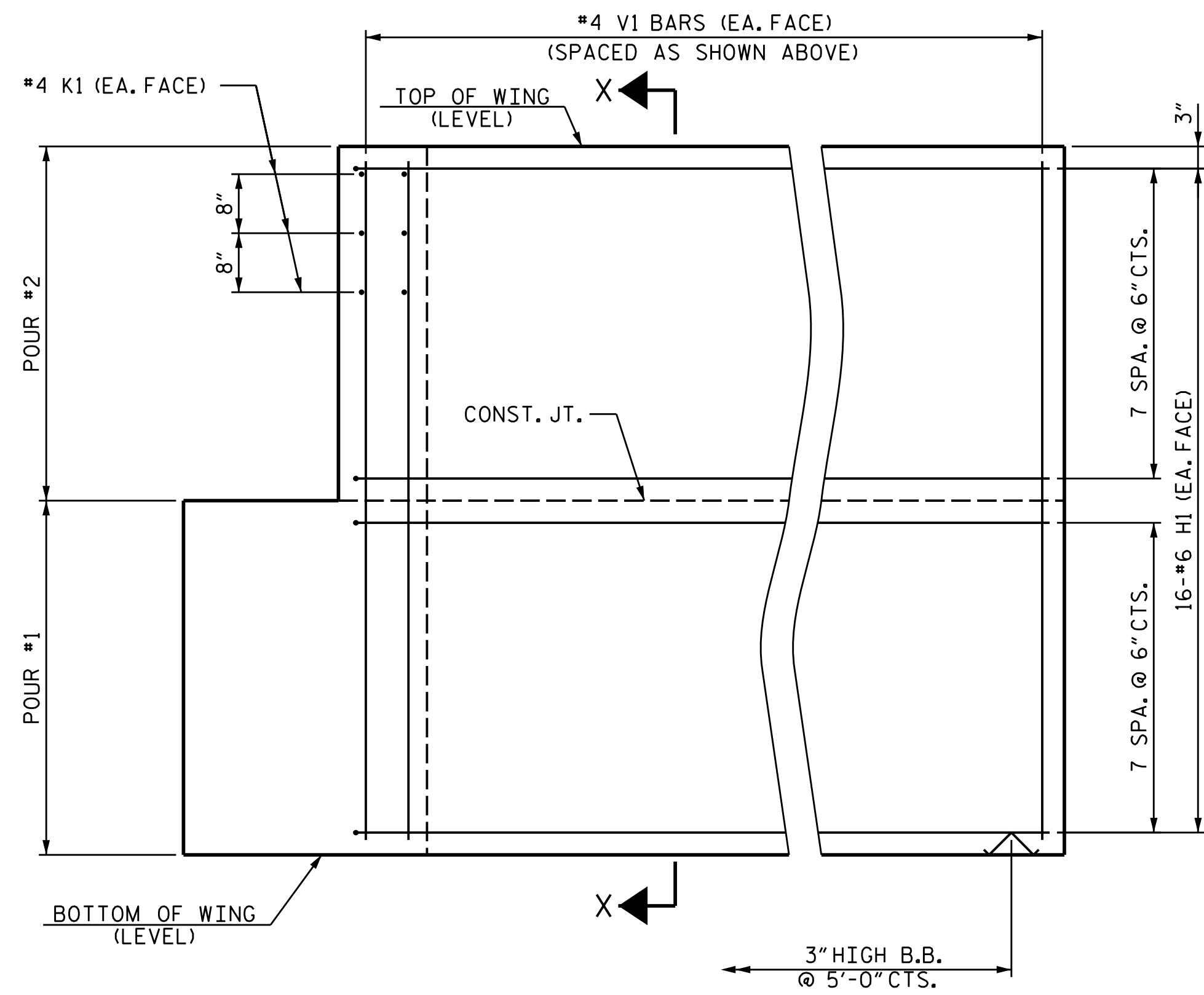
PLAN OF WING (W1)



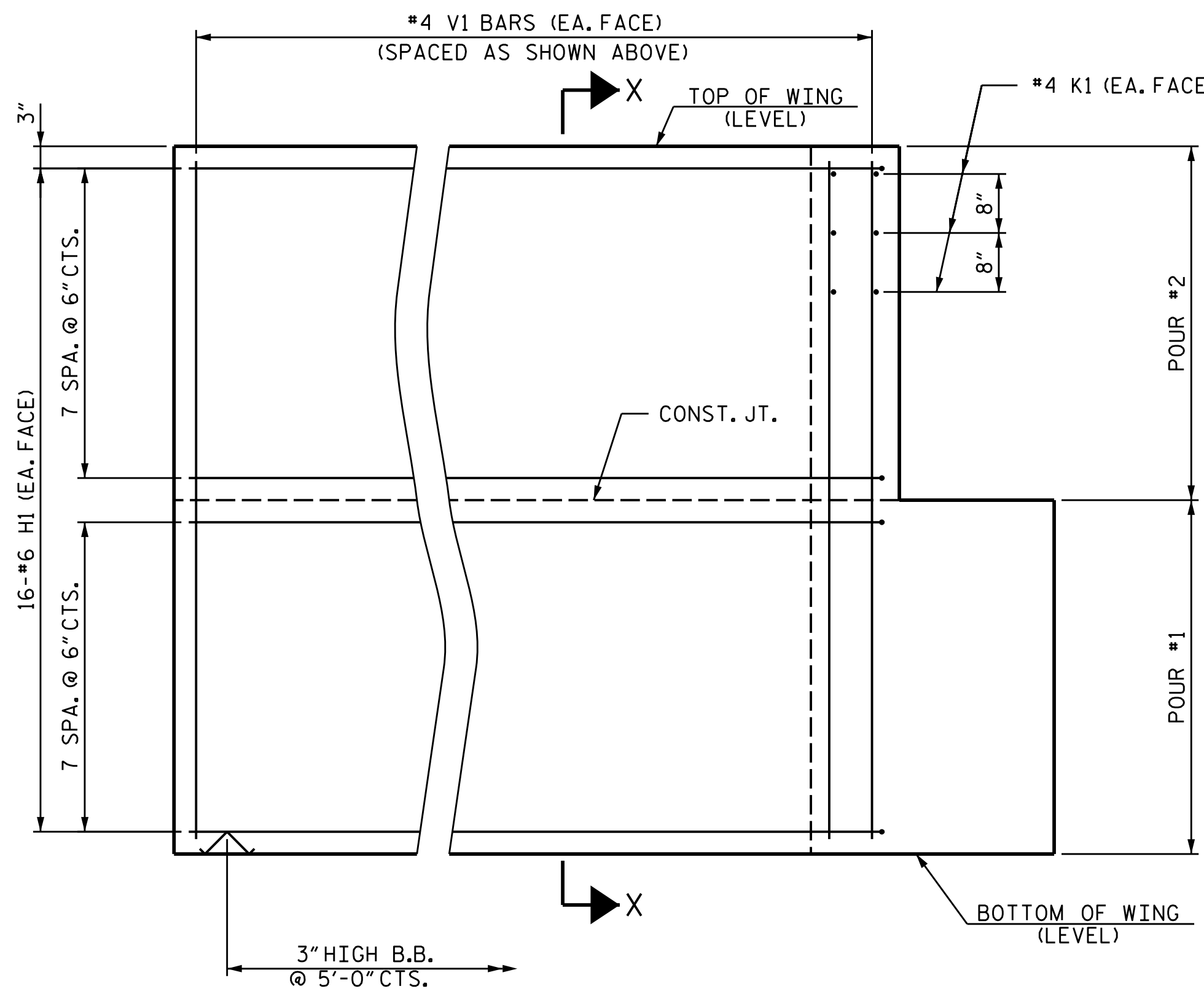
PLAN OF WING (W2)



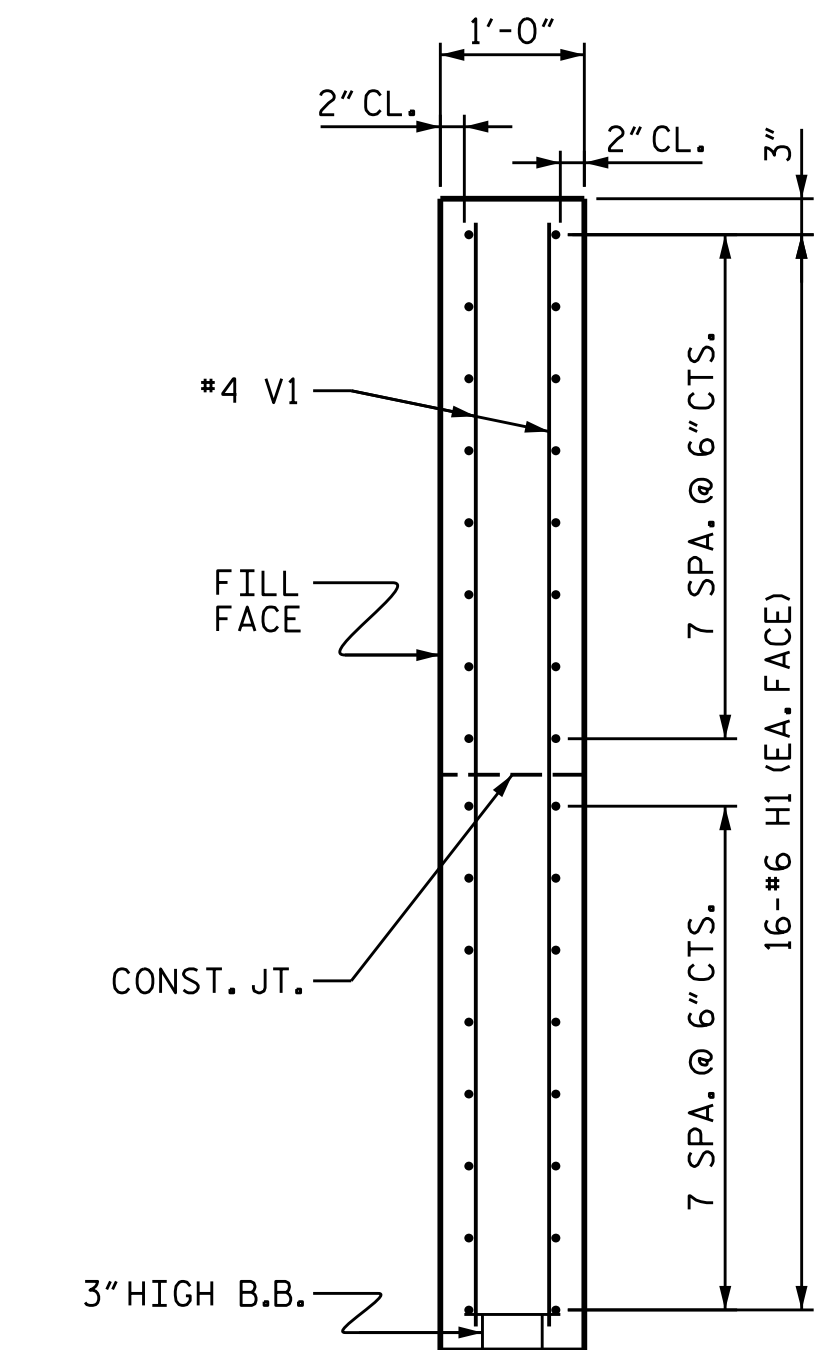
SECTION X-X



ELEVATION OF WING (W1)



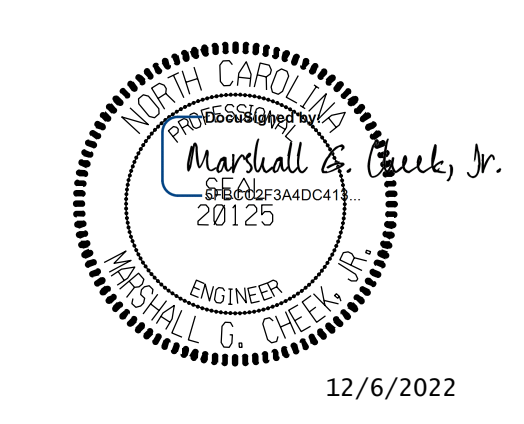
ELEVATION OF WING (W2)



SECTION Y-Y

PROJECT NO. BP11.R005  
 SURRY COUNTY  
 STATION: 16+22.00 -L-

SHEET 3 OF 4



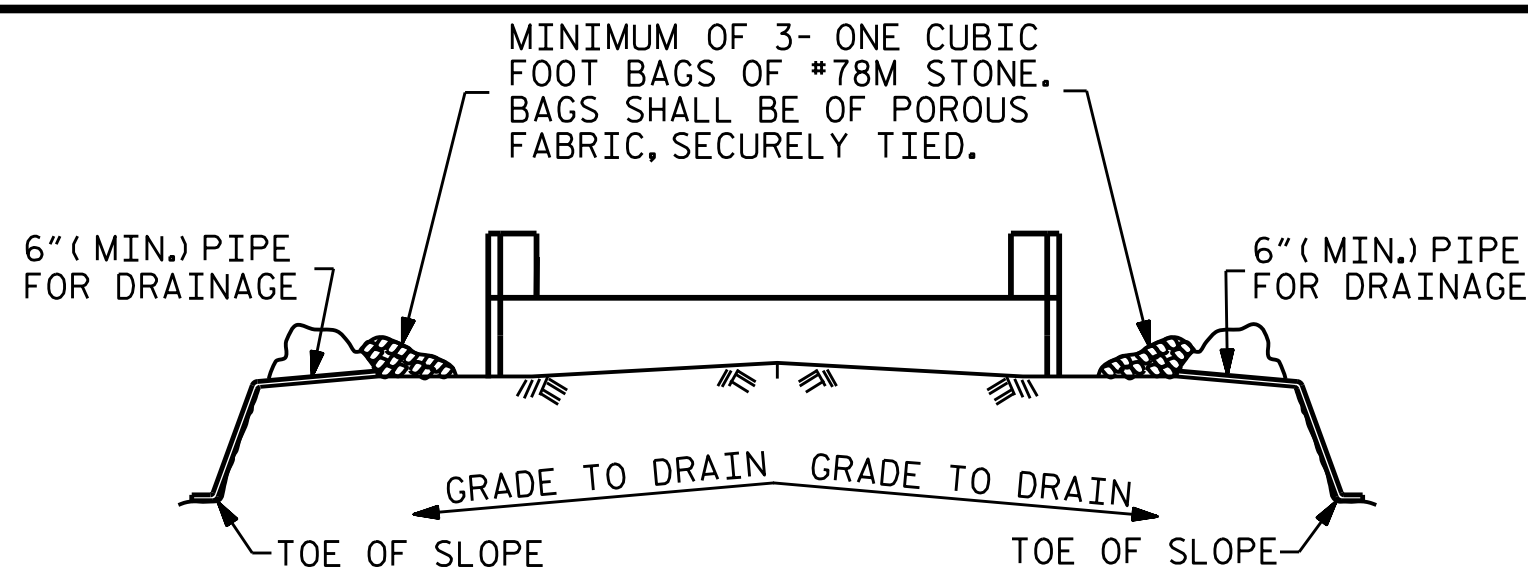
12/6/2022

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT  
 WING DETAILS

ASSEMBLED BY : JLA	DATE : 12/21
CHECKED BY : MGC	DATE : 1/22
DRAWN BY : WJH	REV. 4/15
CHECKED BY : AAC	12/11

WING DETAILS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED						SHEET NO. S-25	
TGS ENGINEERS 804-C N. LAFAYETTE ST SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275						TOTAL SHEETS 33	
REVISIONS							
NO.	BY:	DATE:	NO.	BY:	DATE:		
1			3				
2			4				

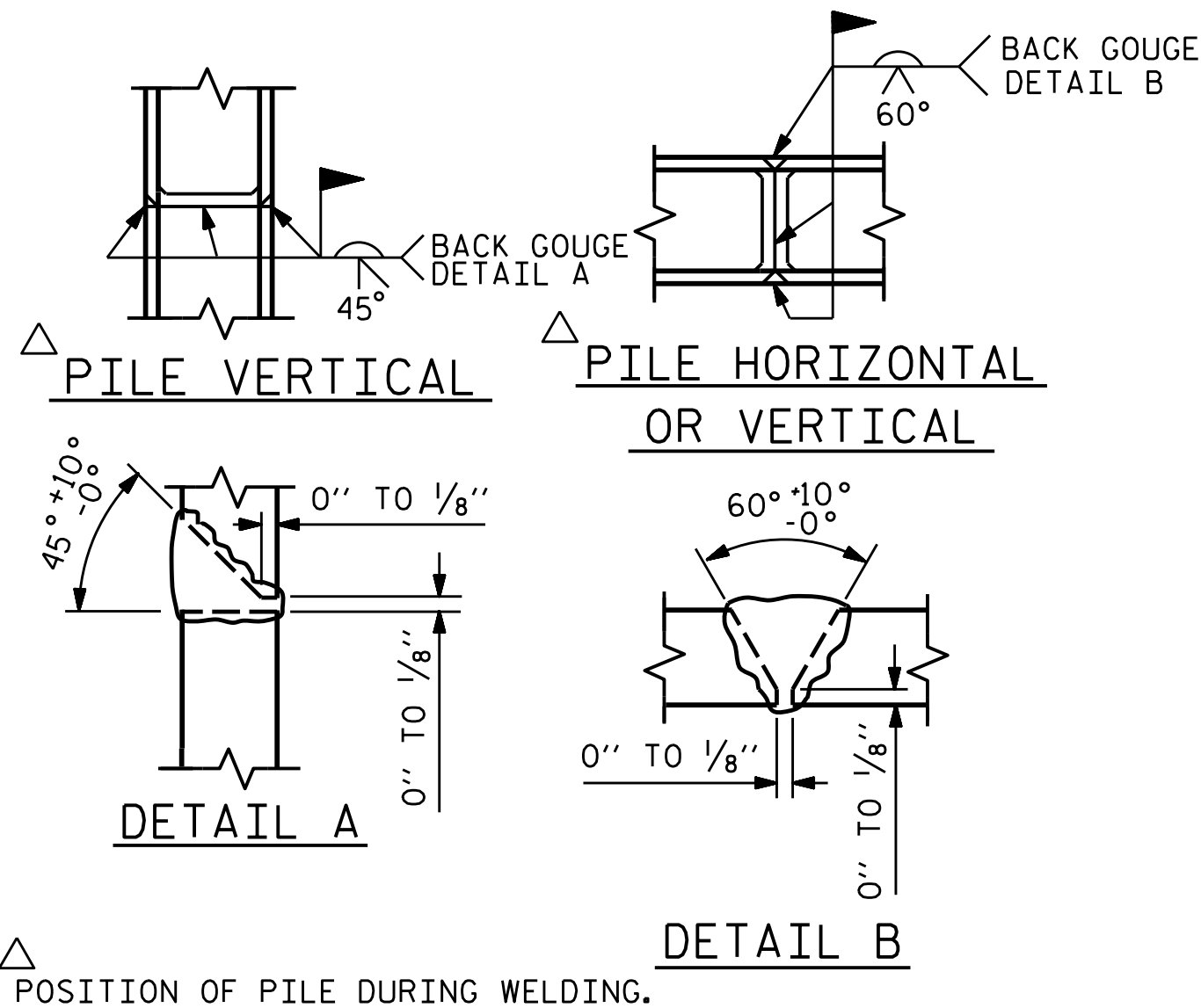


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

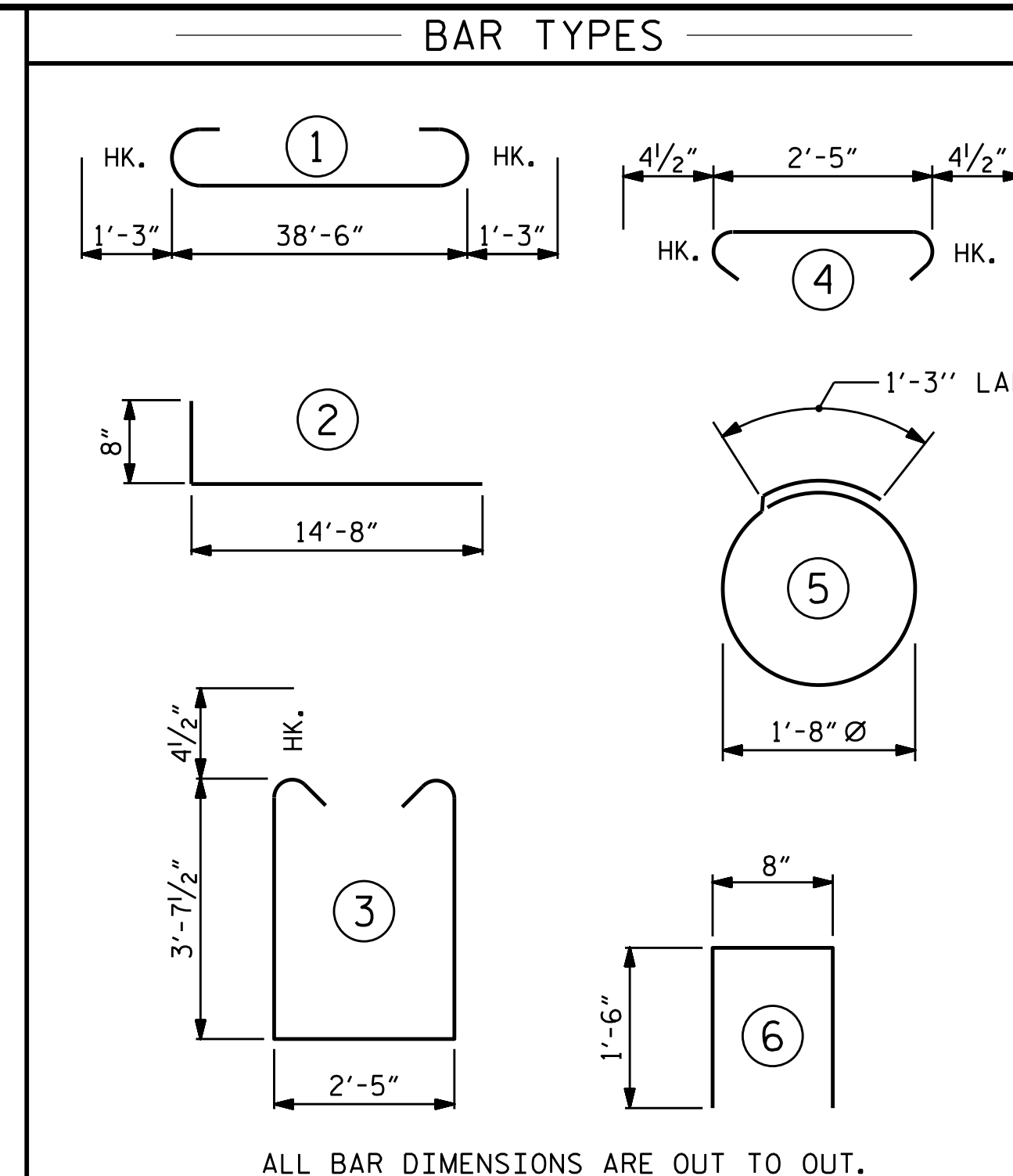
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

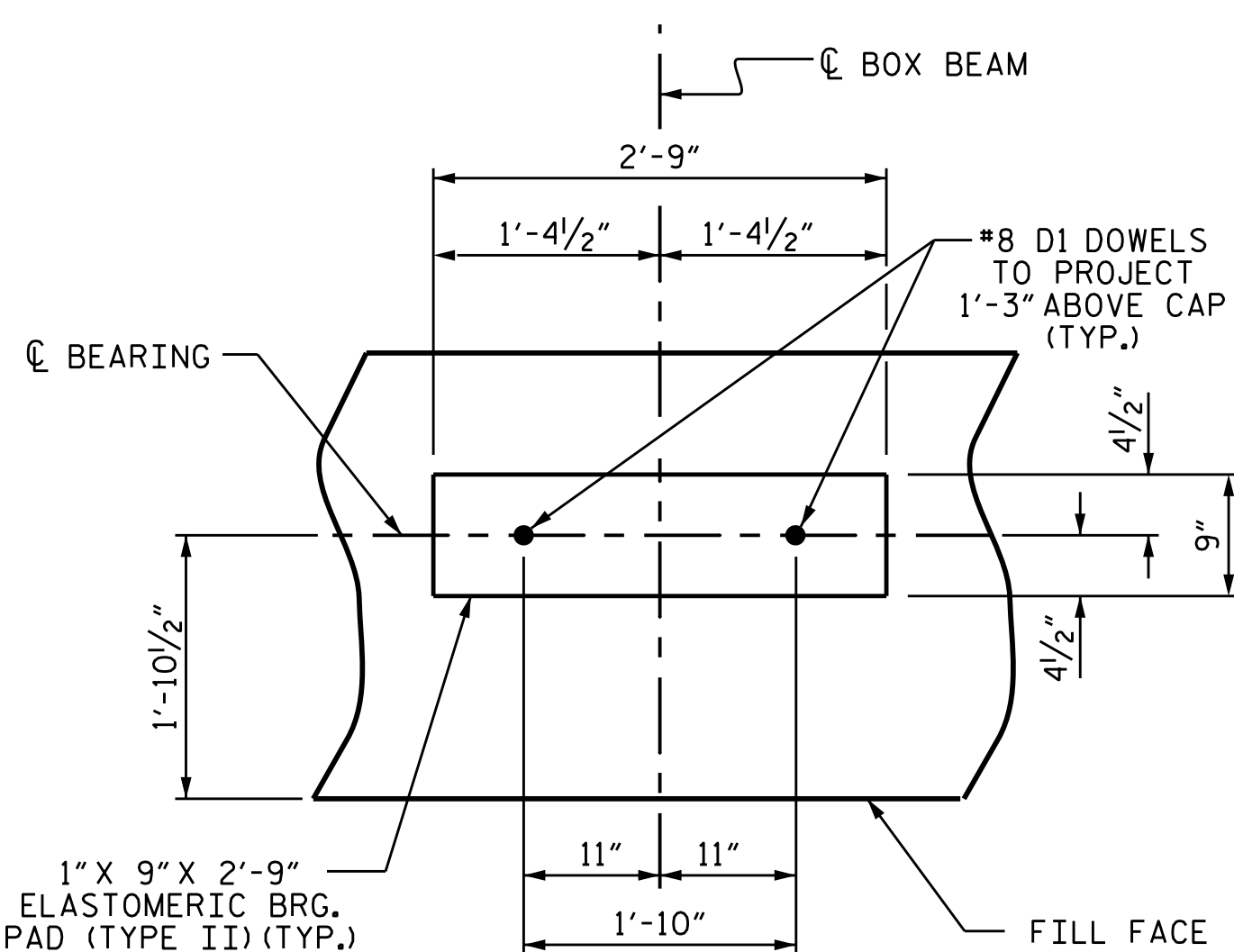
### TEMPORARY DRAINAGE AT END BENT



### PILE SPLICE DETAILS

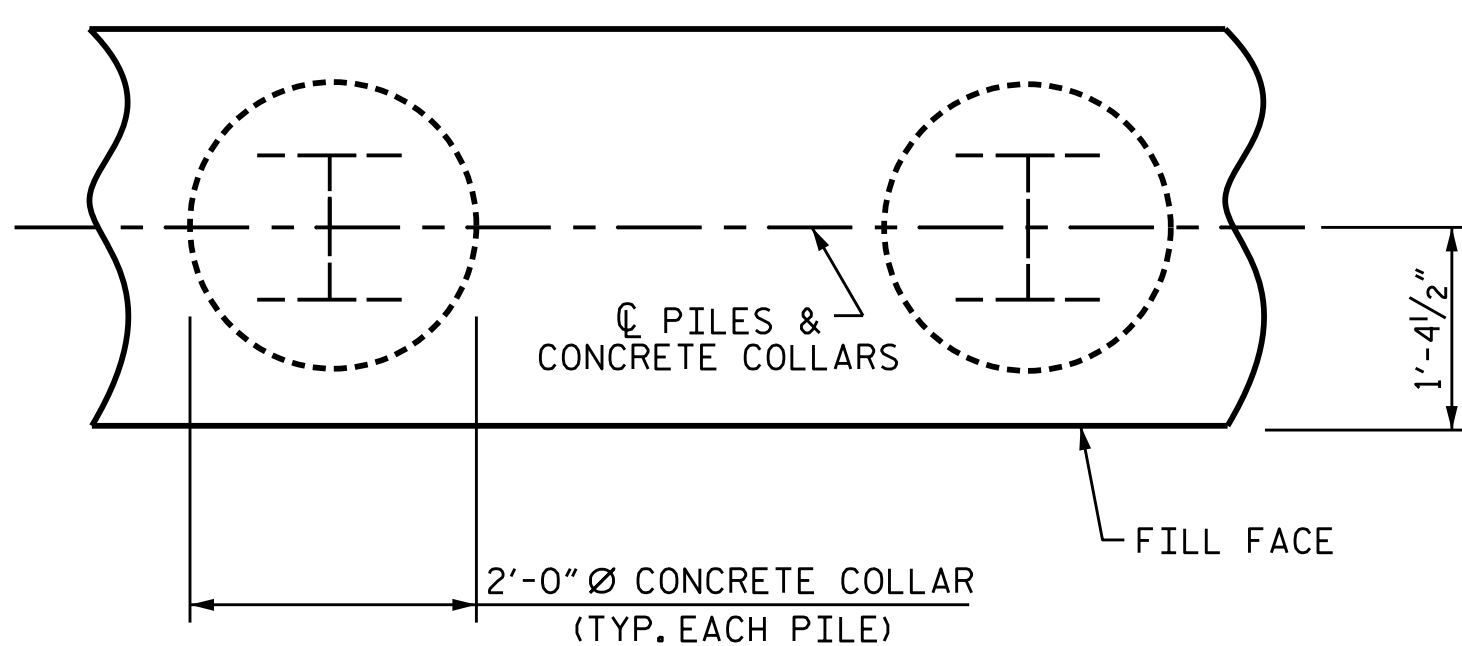


BILL OF MATERIAL FOR ONE END BENT					
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT	
B1	#9	1	41'-0"	1115	
B2	#4	STR	20'-7"	385	
B3	#4	STR	2'-5"	16	
D1	#8	STR	2'-3"	132	
H1	#6	2	15'-4"	1474	
K1	#4	STR	3'-2"	25	
K2	#4	STR	20'-7"	165	
S1	#4	3	10'-5"	348	
S2	#4	4	3'-2"	106	
S3	#4	5	6'-6"	122	
U1	#4	6	3'-8"	78	
V1	#4	STR	7'-8"	389	
V2	#4	STR	5'-9"	246	
REINFORCING STEEL (FOR ONE END BENT)				4601 LBS.	
CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)					
POUR #1	CAP, LOWER PART OF WINGS & COLLARS				21.3 C.Y.
POUR #2	BACKWALL & UPPER PART OF WINGS				7.7 C.Y.
TOTAL CLASS A CONCRETE				29.0 C.Y.	



### DETAIL "A"

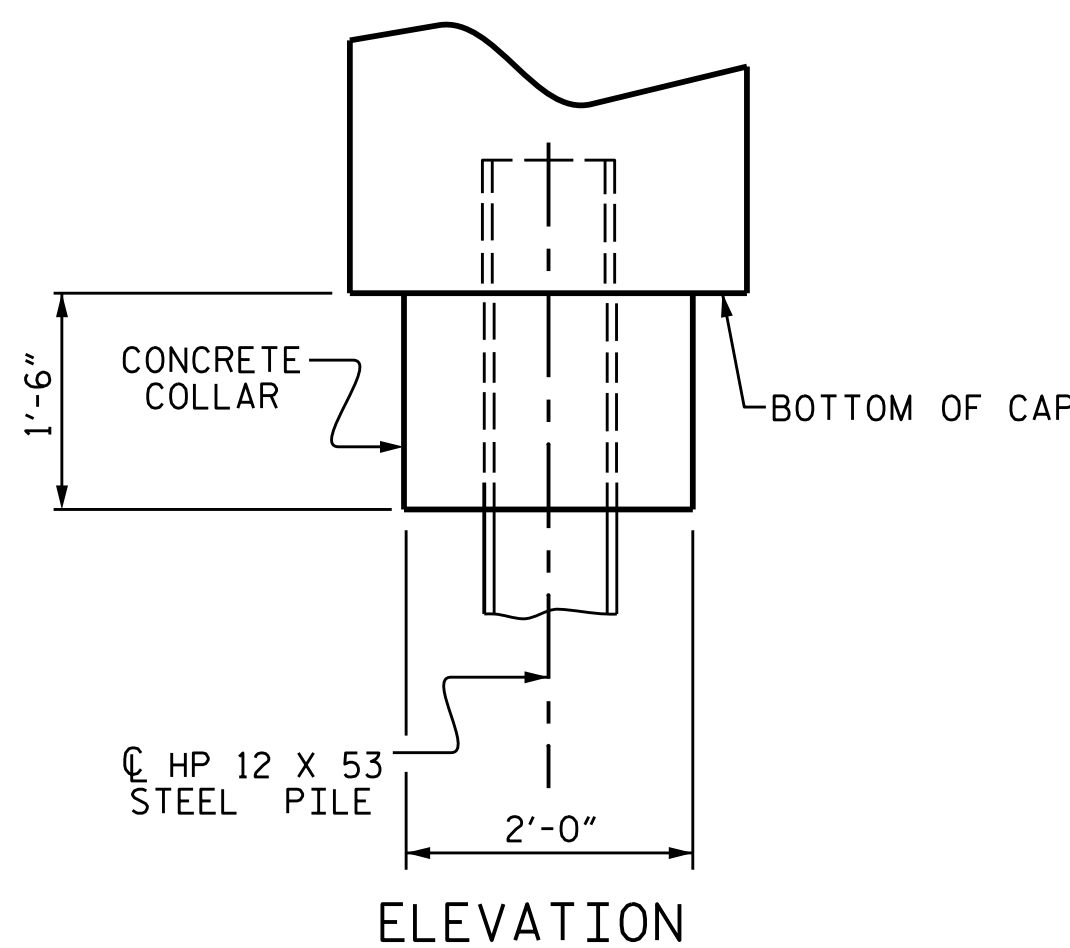
(END BENT 1 SHOWN, END BENT 2 SIMILAR BY ROTATION)



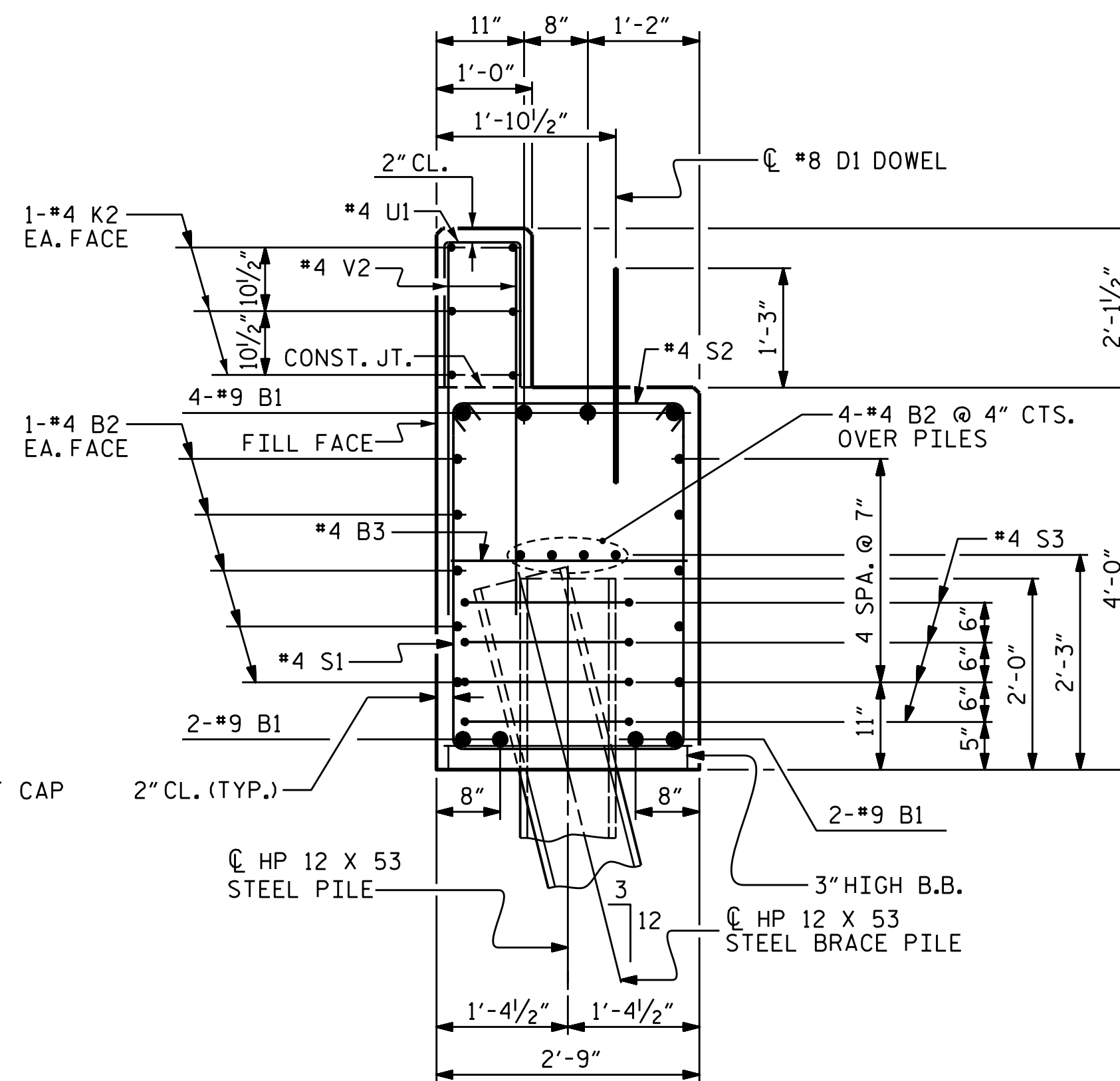
### PLAN

### CORROSION PROTECTION FOR STEEL PILES DETAIL

(END BENT 1 SHOWN, END BENT 2 SIMILAR BY ROTATION)



### ELEVATION



### SECTION A-A

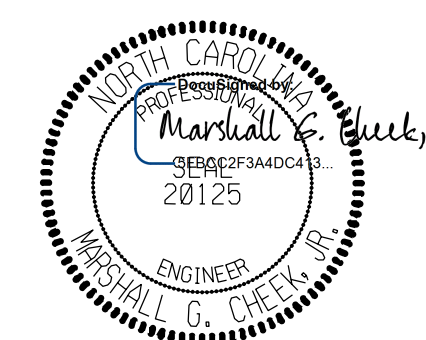
(CONCRETE COLLAR NOT SHOWN FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL.")

PROJECT NO. BP11.R005

SURRY COUNTY

STATION: 16+22.00 -L-

SHEET 4 OF 4



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE

END BENT 1 & 2  
DETAILS

ASSEMBLED BY :	JLA	DATE :	11/21
CHECKED BY :	MGC	DATE :	1/22
DRAWN BY :	WJH	12/11	REV. 4/17
CHECKED BY :	AAC	12/11	MAA/THC

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### REVISIONS

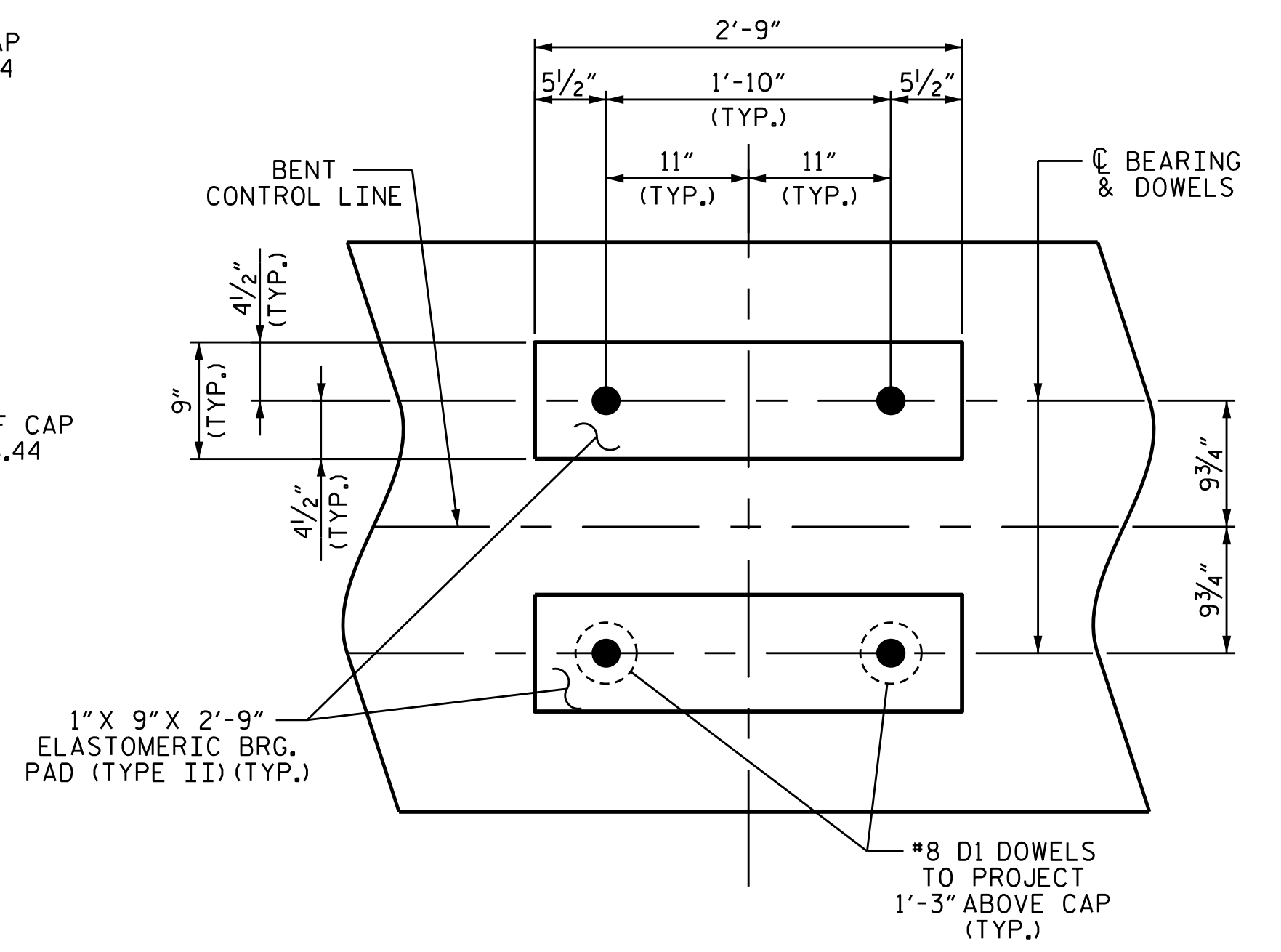
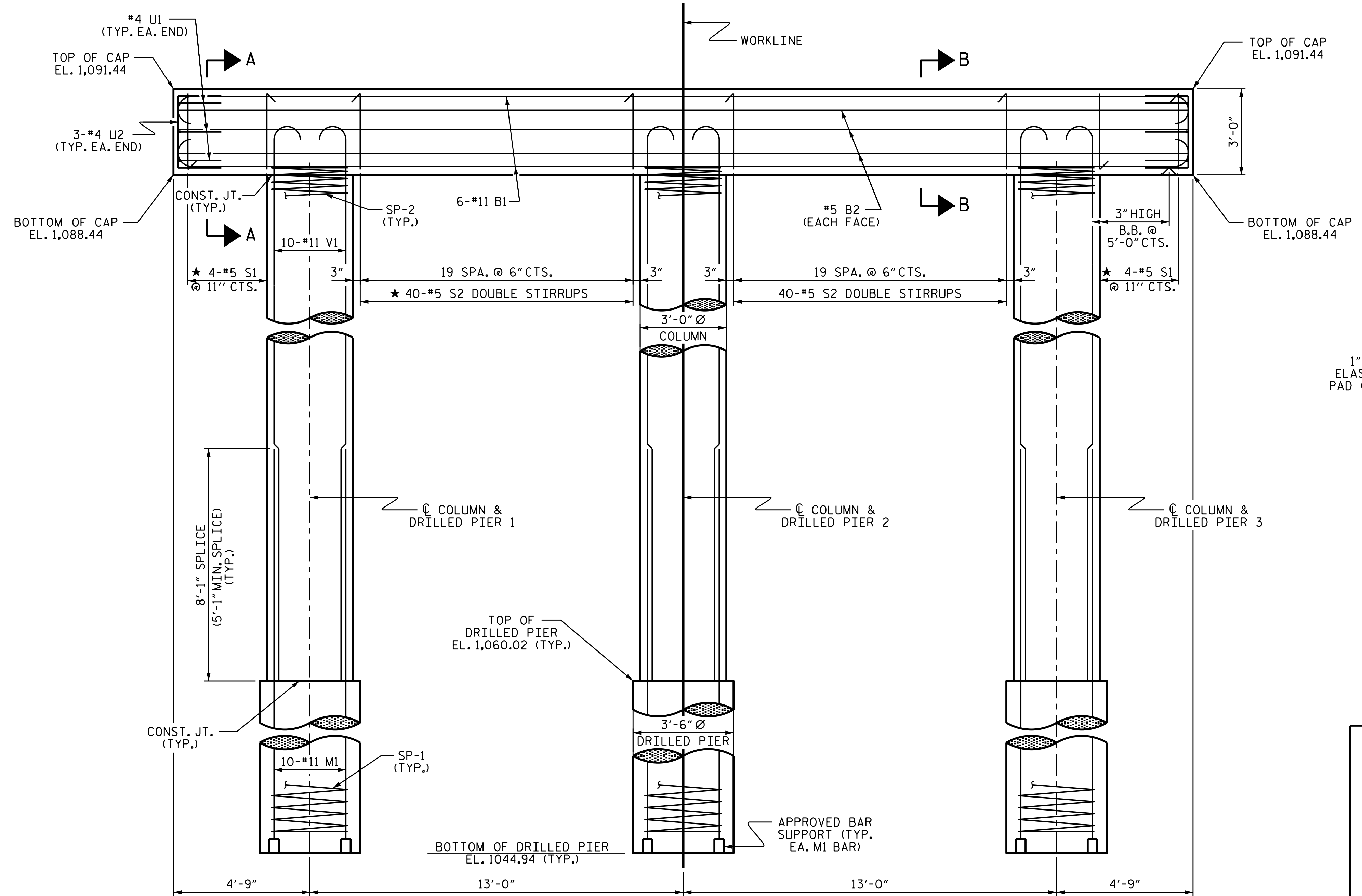
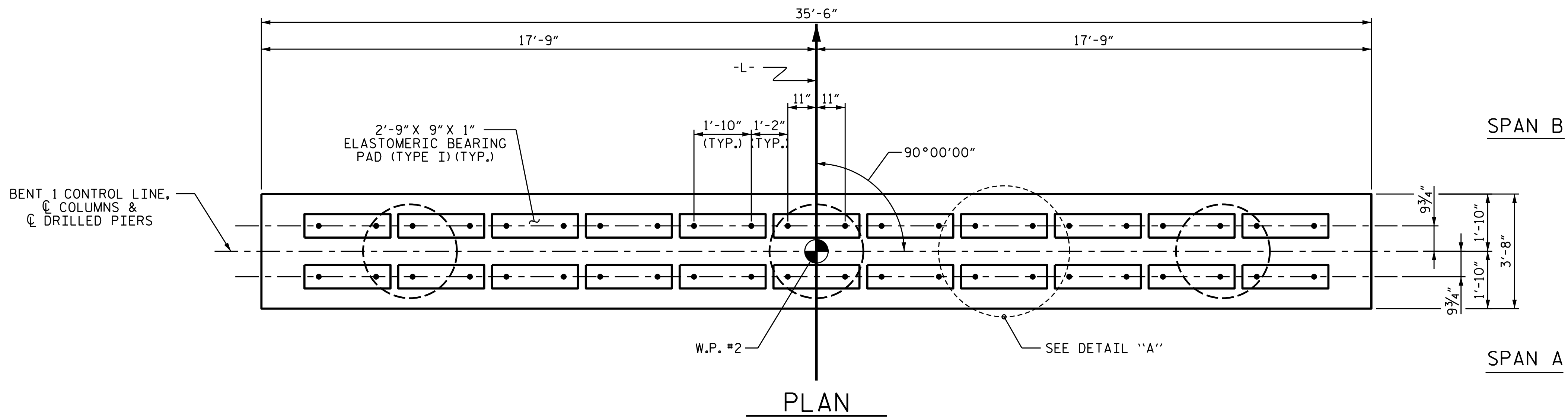
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1			3		
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SHEET NO.	S-26
TOTAL SHEETS	33



**NOTES**

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.
- HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
- FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
- ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL."
- ★ INVERT ALTERNATE STIRRUPS.
- DRILLED PIERS SHALL BE TERMINATED ONE FOOT ± ABOVE NORMAL WATER SURFACE ELEVATION FOR SHAFTS LOCATED IN WATER.
- THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.



**DETAIL "A"**  
(DIMENSIONS ARE TYPICAL EACH BEARING)

PROJECT NO. BP11.R005  
SURRY COUNTY  
 STATION: 16+22.00 -L-  
 SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**ENGINEER**  
 MARSHALL G. CHESTNUT, JR.  
 12/6/2022

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 CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	TOTAL SHEETS
1			3			S-27
2			4			33

DRAWN BY : JLA DATE : 12/21  
 CHECKED BY : MGC DATE : 10/22  
 DESIGN ENGINEER OF RECORD : STM DATE : 10/22

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

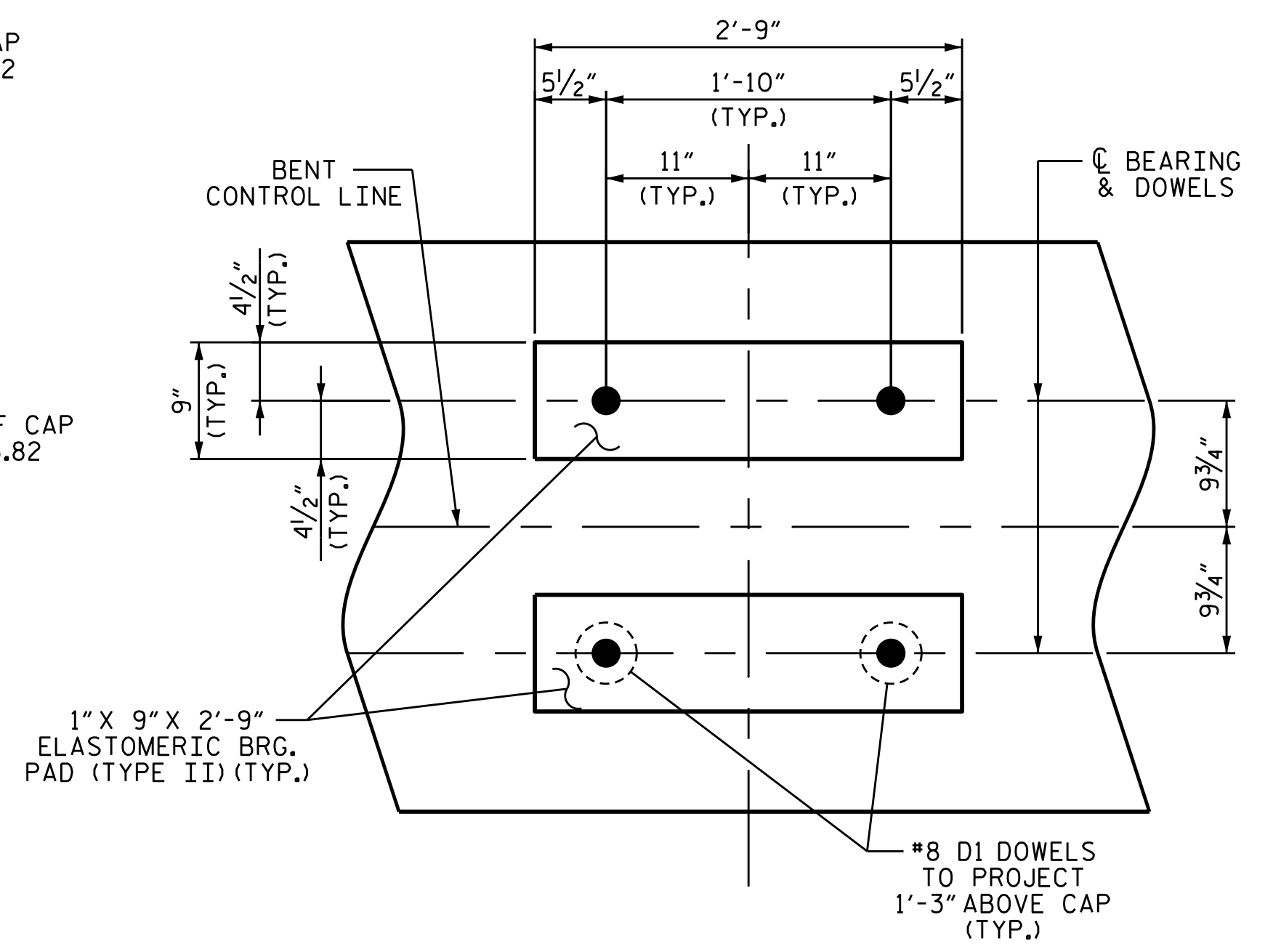
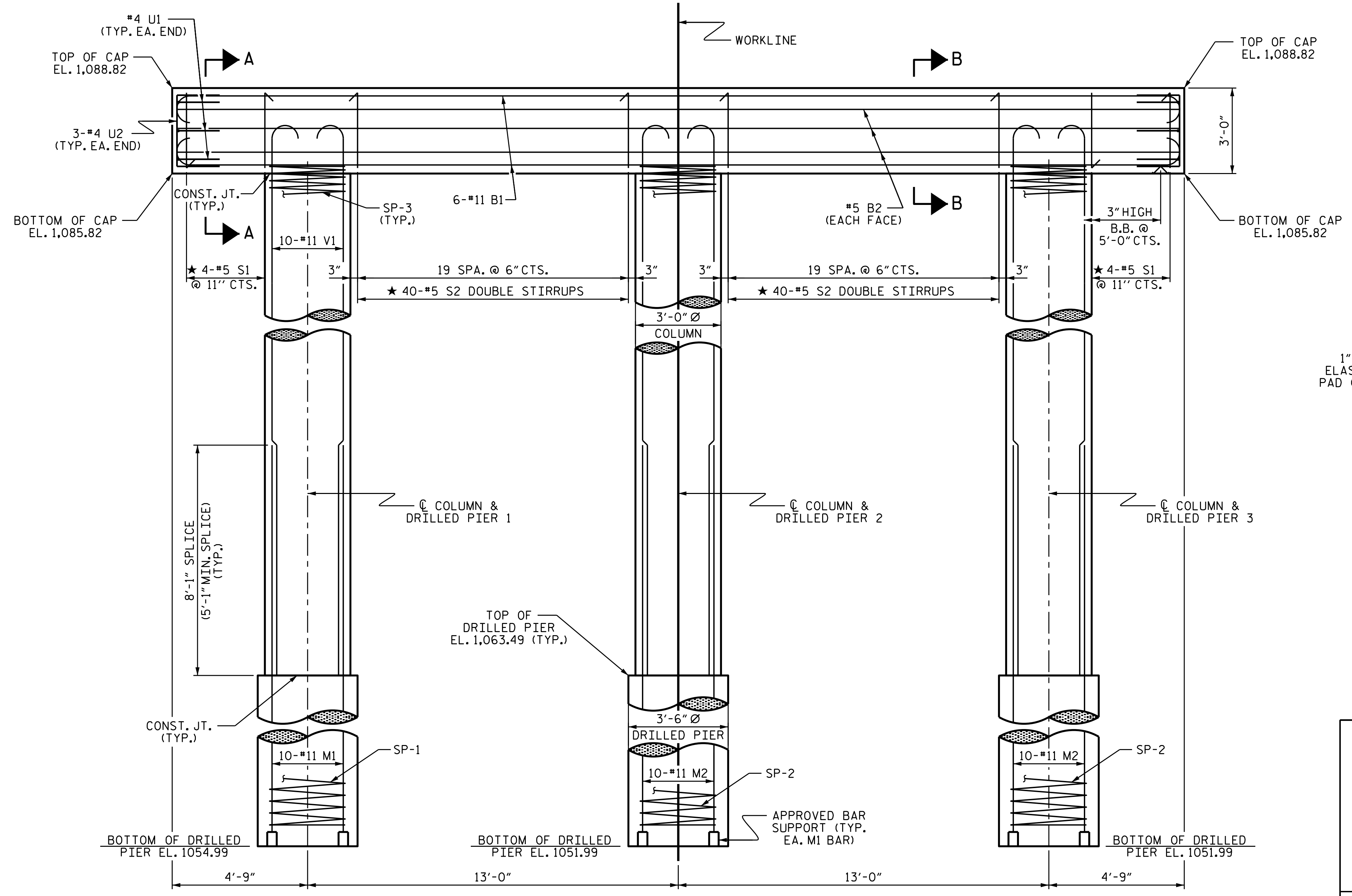
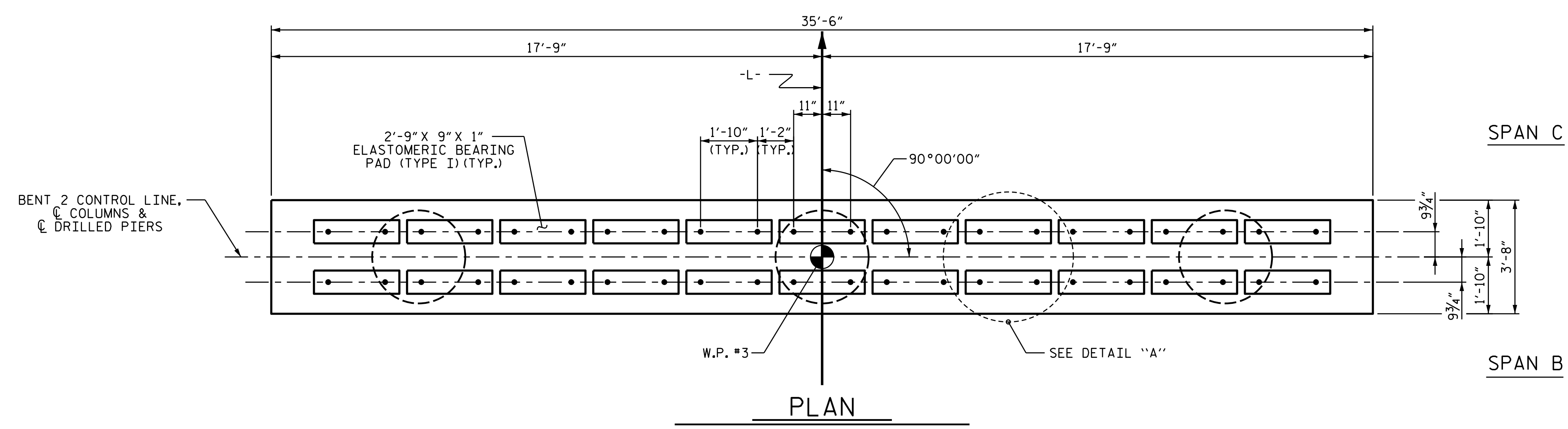
**ELEVATION**





**NOTES**

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.
- HOOKS ON "V" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
- FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.
- ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL."
- ★ INVERT ALTERNATE STIRRUPS.
- THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION 1 FOOT BELOW THE GROUND LINE.
- THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.



**DETAIL "A"**  
(DIMENSIONS ARE TYPICAL EACH BEARING)

PROJECT NO. BP11.R005  
SURRY COUNTY  
 STATION: 16+22.00 -L-  
 SHEET 1 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

**ENGINEER**  
 Marshall G. Cheek, Jr.  
 12/6/2022

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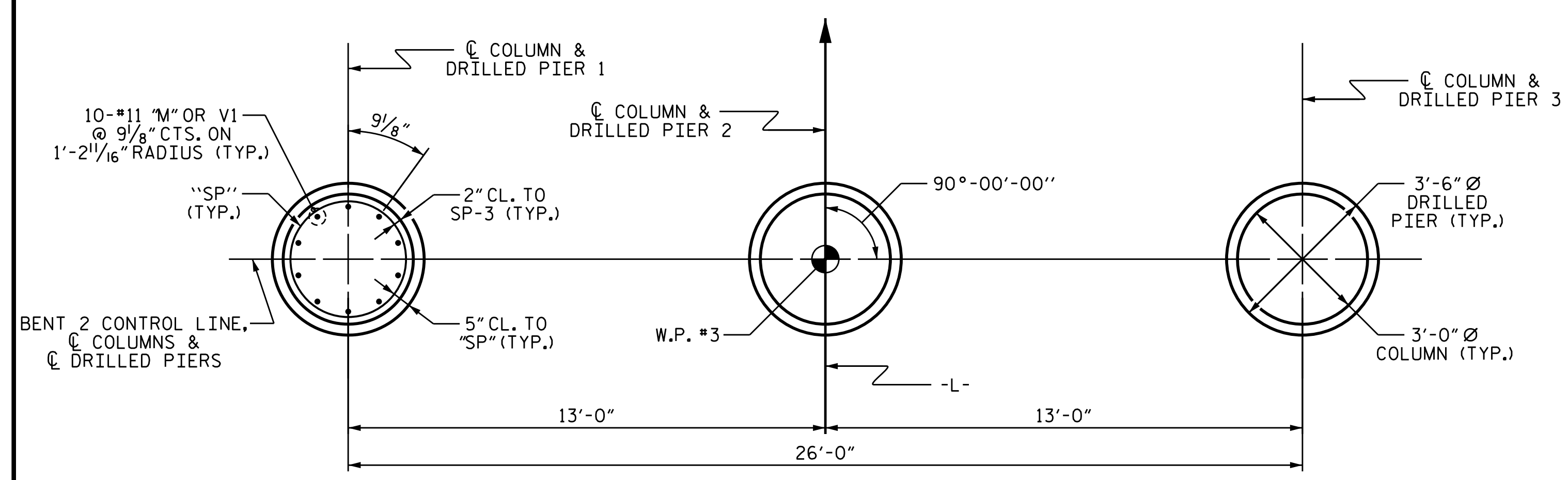
TGS ENGINEERS  
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1			3			33
2			4			

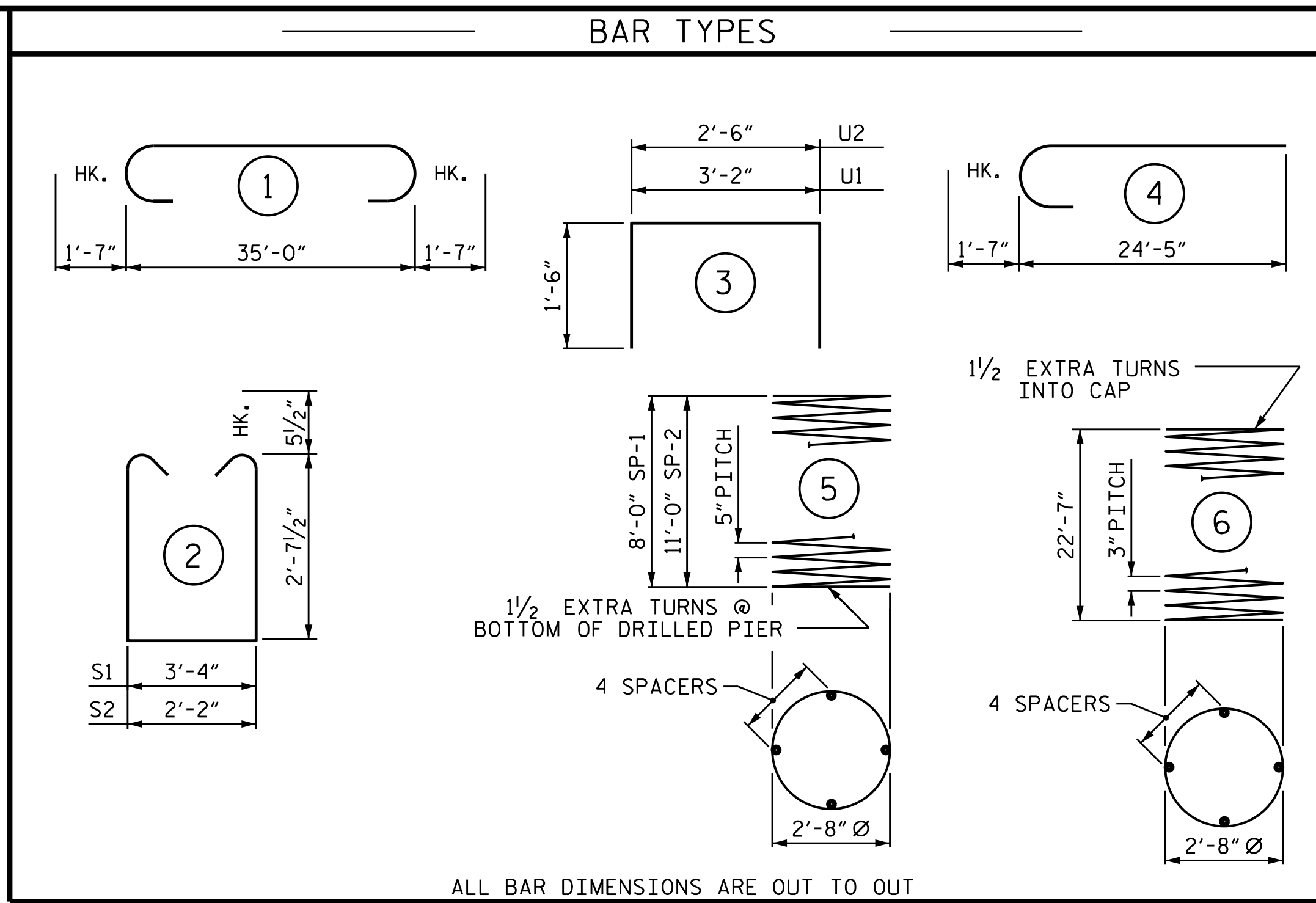
DRAWN BY : JLA DATE : 12/21  
 CHECKED BY : MGC DATE : 10/22  
 DESIGN ENGINEER OF RECORD : STM DATE : 10/22

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

**ELEVATION**

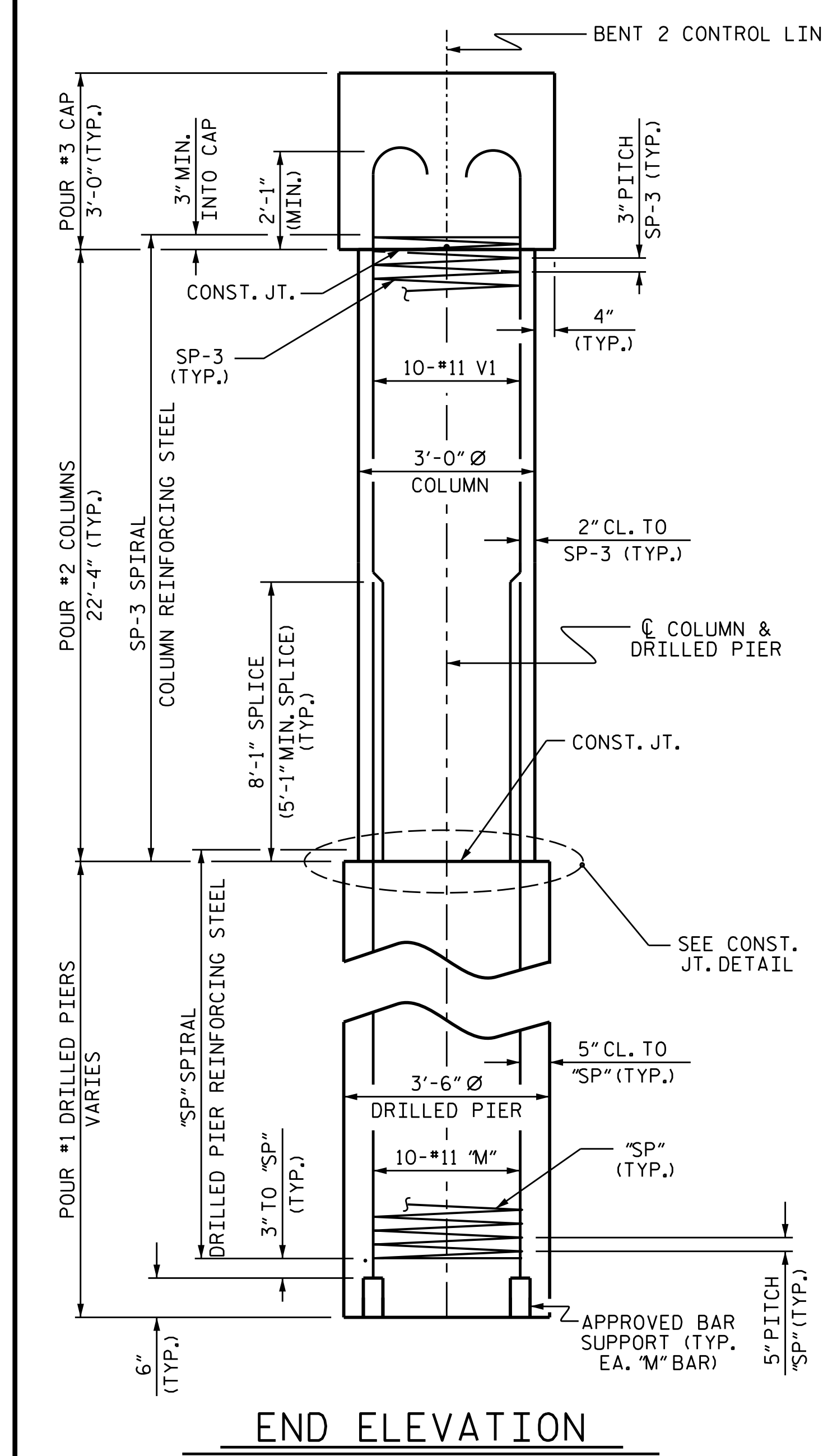


PLAN OF DRILLED PIERS & COLUMNS

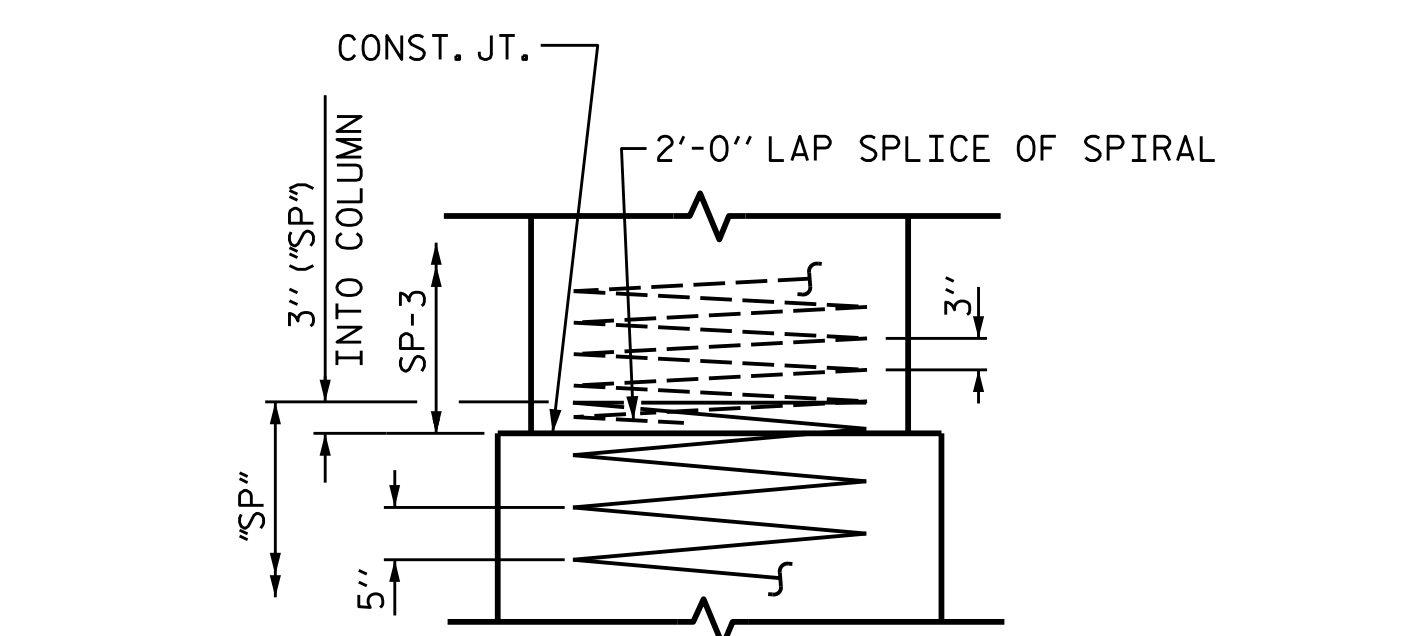


ALL BAR DIMENSIONS ARE OUT TO OUT

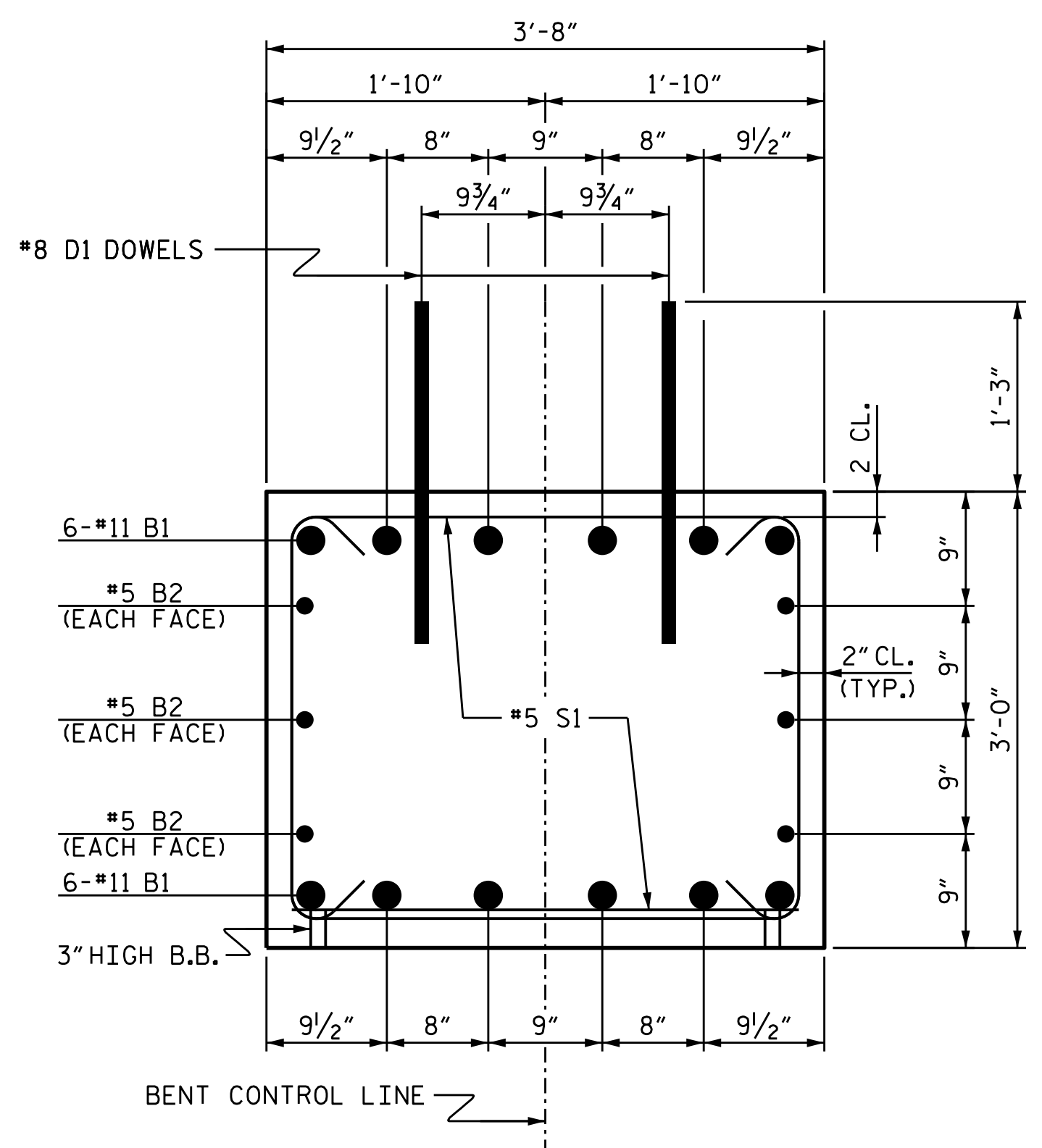
BILL OF MATERIAL FOR BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	#11	1	38'-2"	2,433
B2	6	#5	STR	35'-2"	220
D1	44	#8	STR	2'-3"	264
M1	10	#11	STR	16'-1"	855
M2	20	#11	STR	19'-1"	2,028
S1	8	#5	2	9'-6"	79
S2	80	#5	2	8'-4"	695
U1	6	#4	3	6'-2"	25
U2	6	#4	3	5'-6"	22
V1	30	#11	4	26'-0"	4,144
REINFORCING STEEL					10,765 LBS.
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
SP-1	1	*	5	172'-9"	180
SP-2	2	*	5	230'-4"	480
SP-3	3	**	6	759'-1"	1,521
SPIRAL COLUMN REINFORCING STEEL					2,181 LBS.
* THE SP-1 & SP-2 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR					
** THE SP-3 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR					
CLASS A CONCRETE BREAKDOWN					
POUR #2 (COLUMNS)					17.5 C.Y.
POUR #3 (CAP)					14.5 C.Y.
TOTAL CLASS A CONCRETE					32.0 C.Y.
DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)					11.2 C.Y.



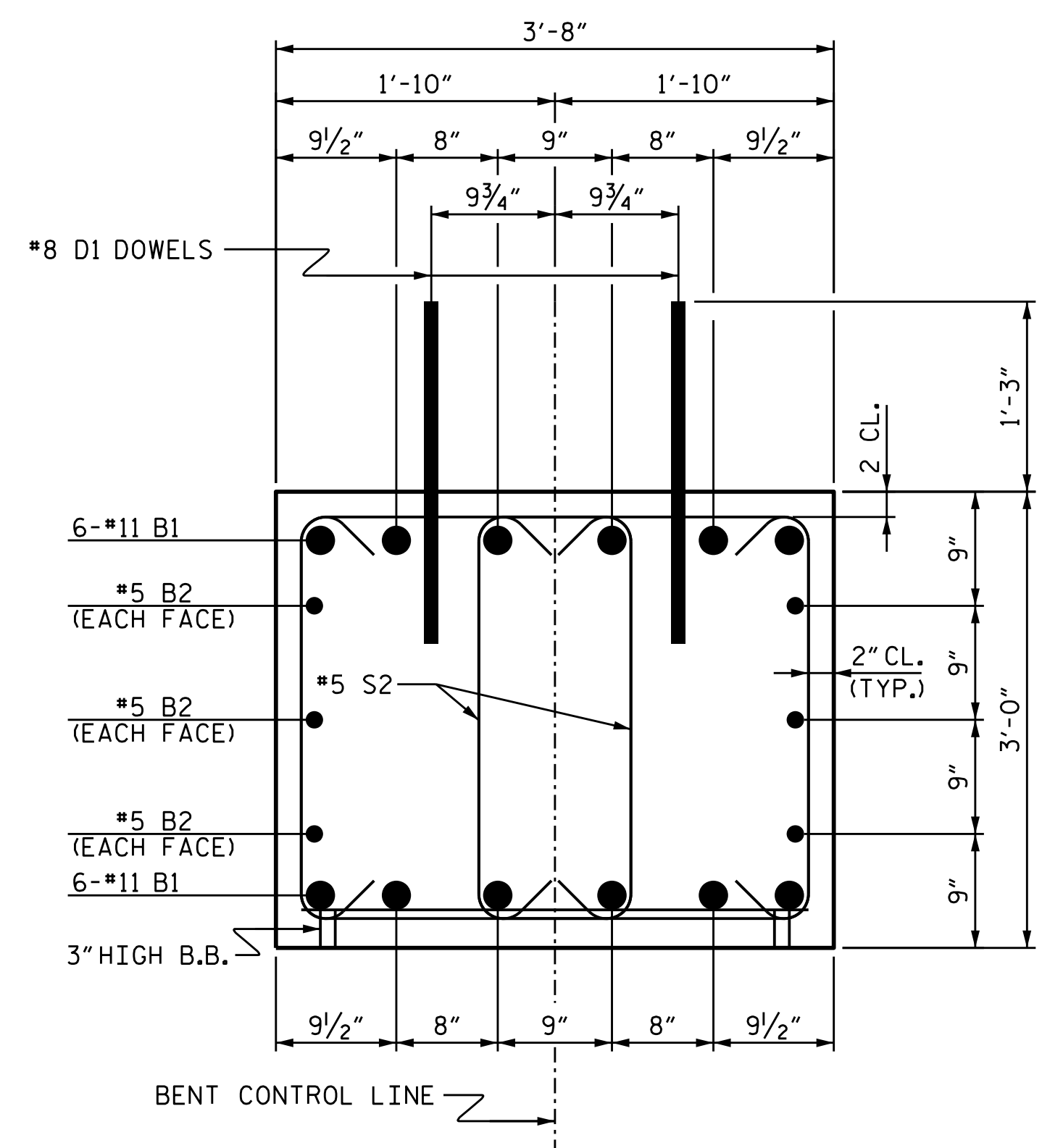
END ELEVATION



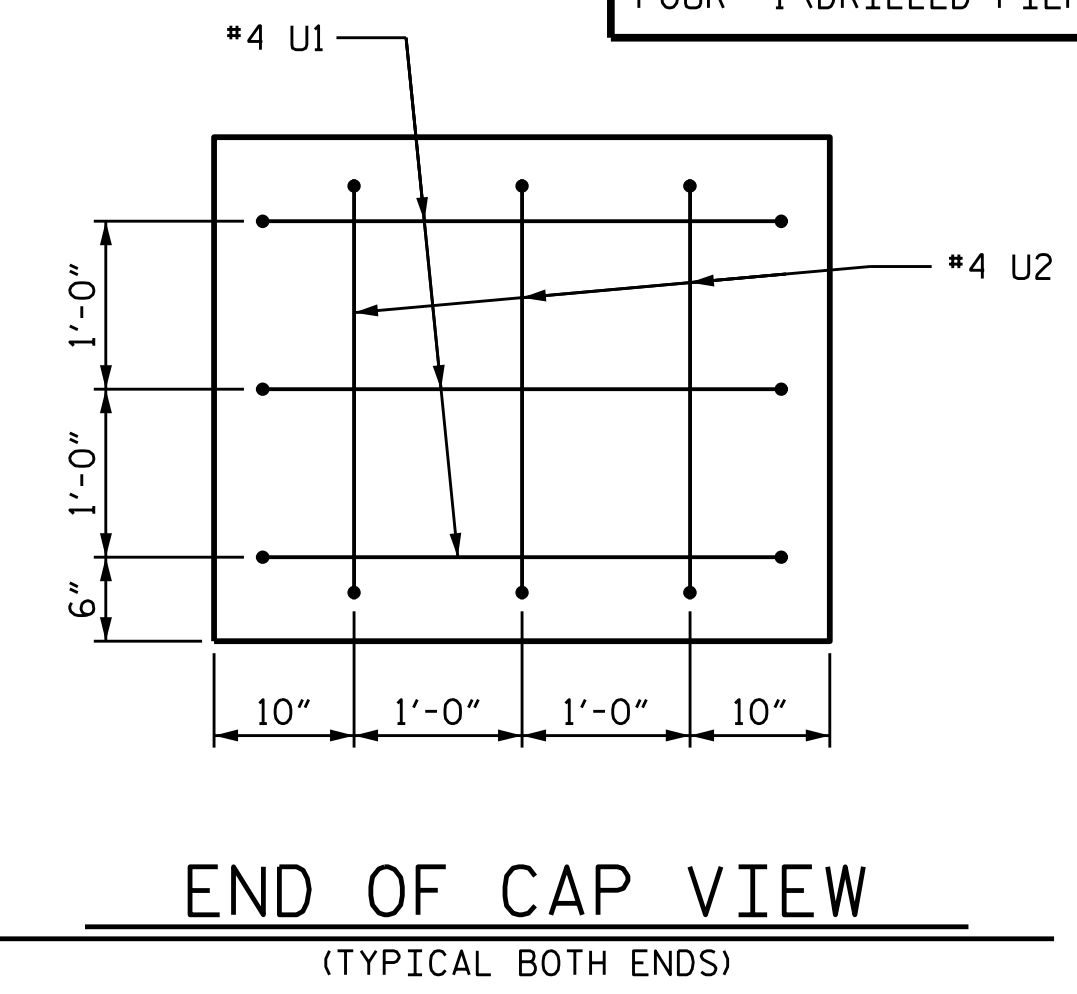
CONSTRUCTION JOINT DETAIL



SECTION A-A



SECTION B-B



END OF CAP VIEW (TYPICAL BOTH ENDS)

PROJECT NO. BP11.R005  
 SURRY COUNTY  
 STATION: 16+22.00 -L-  
 SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 BENT 2  
 DETAILS

12/6/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

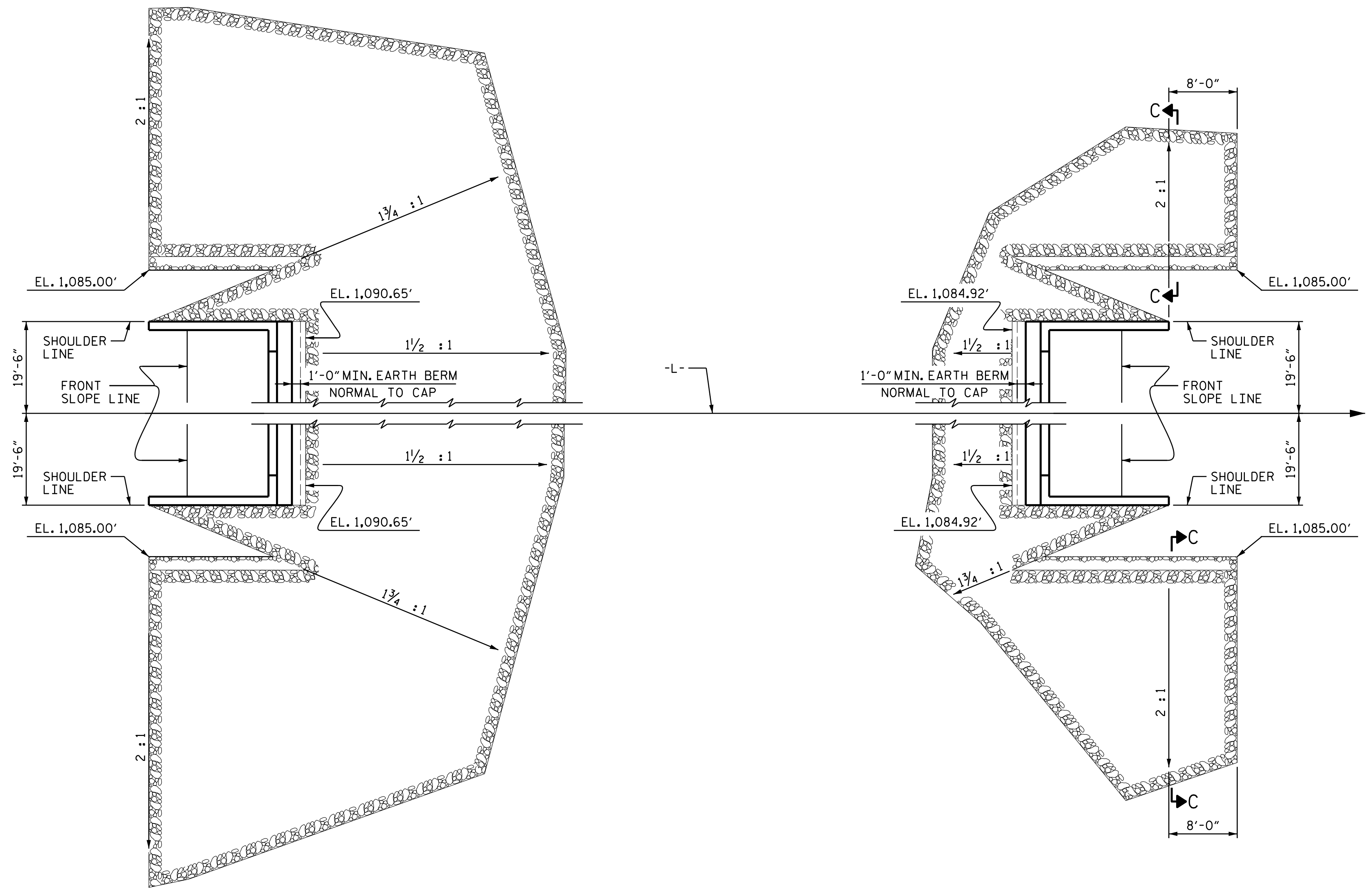
TGS ENGINEERS  
 804-C N. LAFAYETTE ST  
 SHELBY, NC 28150  
 PH (704) 476-0003  
 CORP. LICENSE NO.: C-0275

REVISIONS						SHEET NO.
NO.	BY	DATE	NO.	BY	DATE	S-30
1			3			TOTAL SHEETS
2			4			33

DRAWN BY: JLA DATE: 12/21  
 CHECKED BY: MGC DATE: 10/22  
 DESIGN ENGINEER OF RECORD: STM DATE: 10/22



NOTES :  
FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.

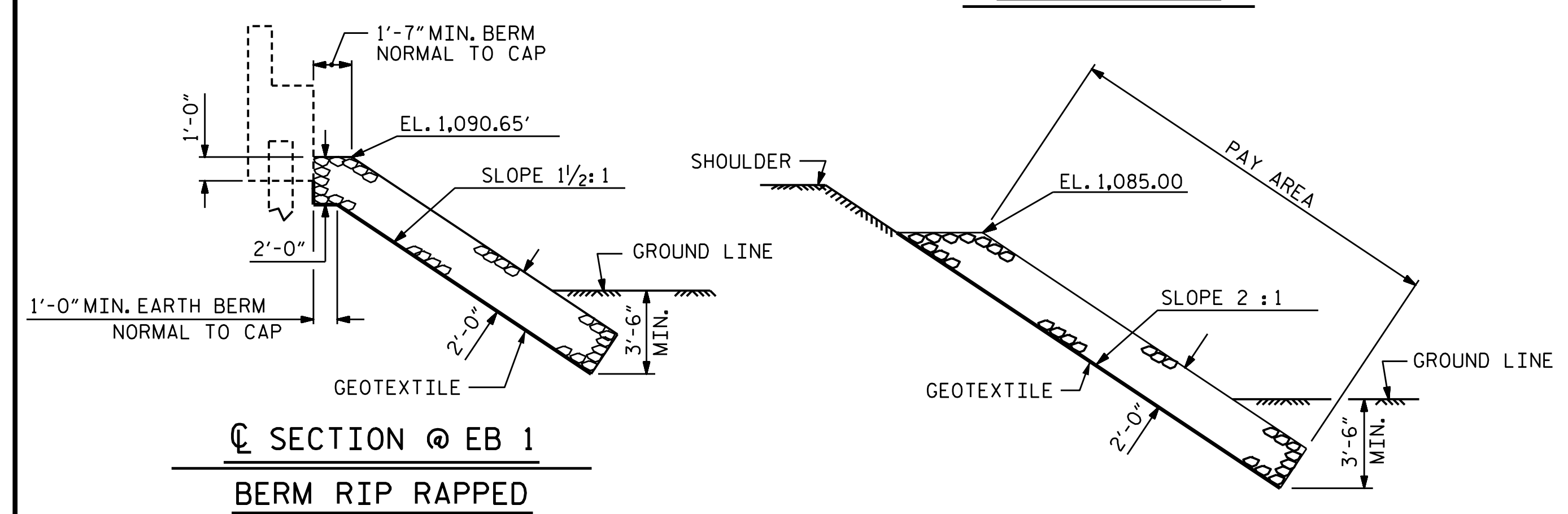


ESTIMATED QUANTITIES		
BRIDGE @ STA. 16+22.00-L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	760	880
END BENT 2	260	290

END BENT 1

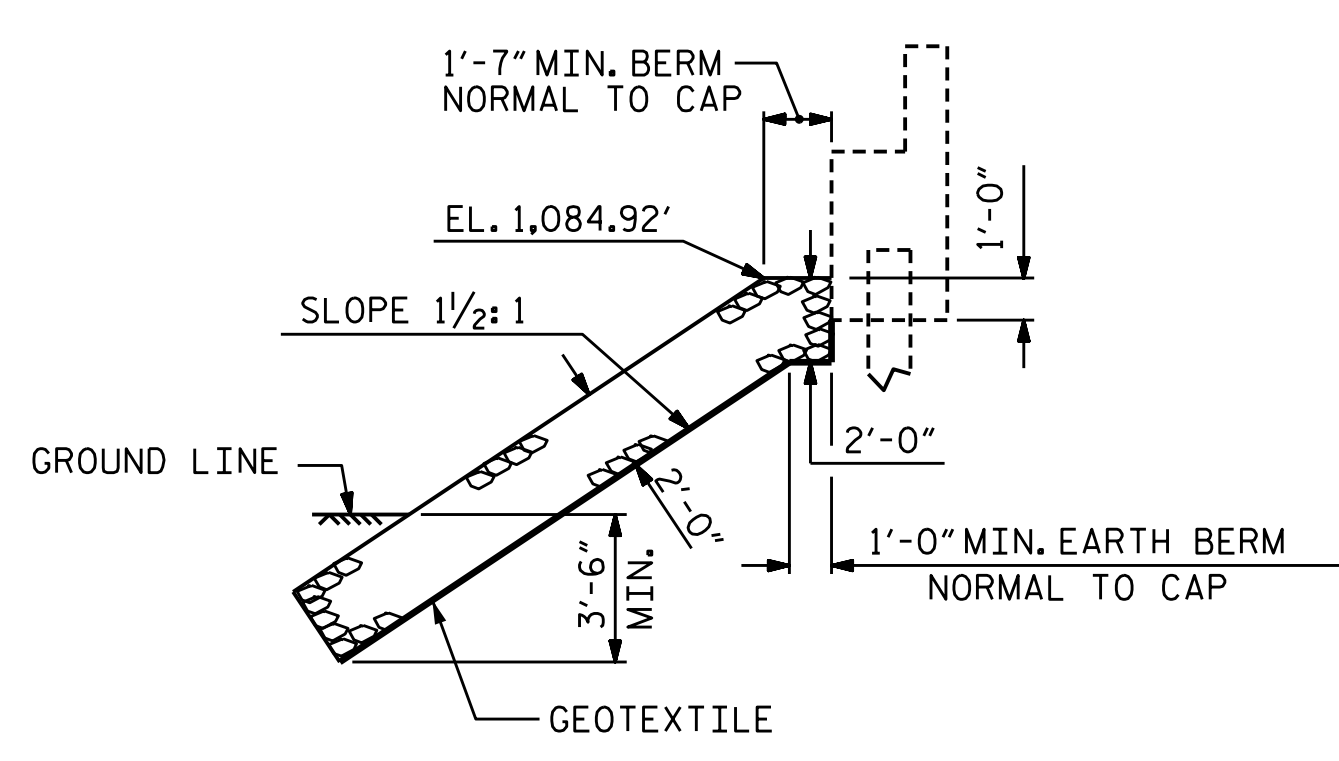
END BENT 2

PLAN



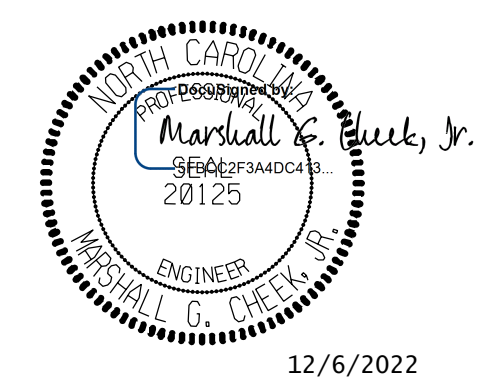
SECTION @ EB 1  
BERM RIP RAPPED

SECTION C-C



SECTION @ EB 2  
BERM RIP RAPPED

PROJECT NO. BP11.R005  
SURRY COUNTY  
STATION: 16+22.00 -L-



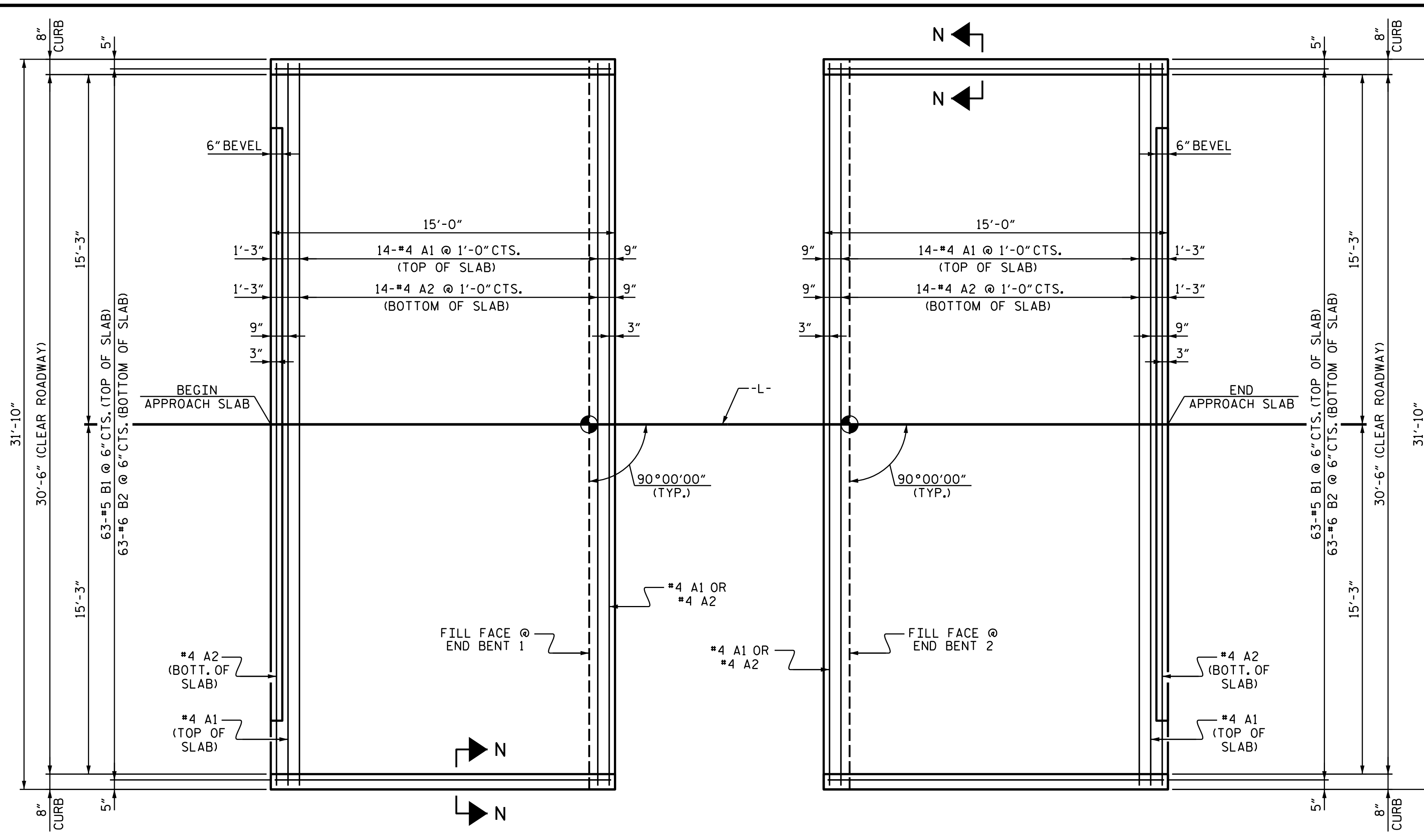
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

RIP RAP DETAILS

DRAWN BY : JLA DATE : 12/21  
CHECKED BY : MGC DATE : 1/22

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NO.	BY:	DATE:	NO.	BY:	DATE:				S-31
1			3						TOTAL SHEETS
2			4						33

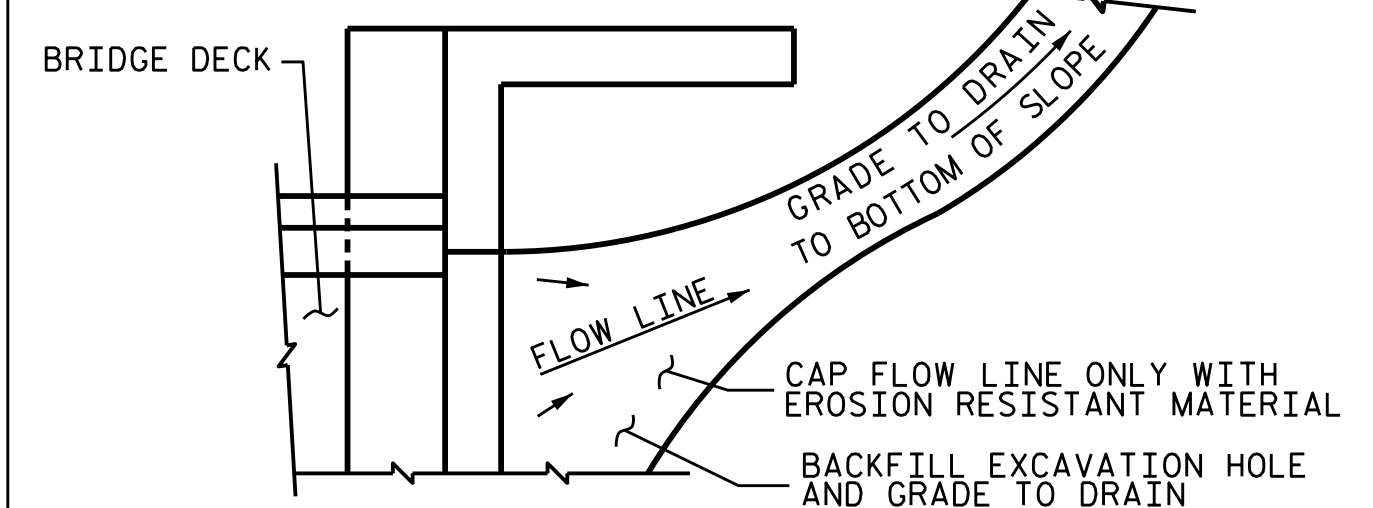
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SHELBY, NC 28150  
PH (704) 476-0003  
CORP. LICENSE NO.: C-0275



PLAN @ END BENT 1

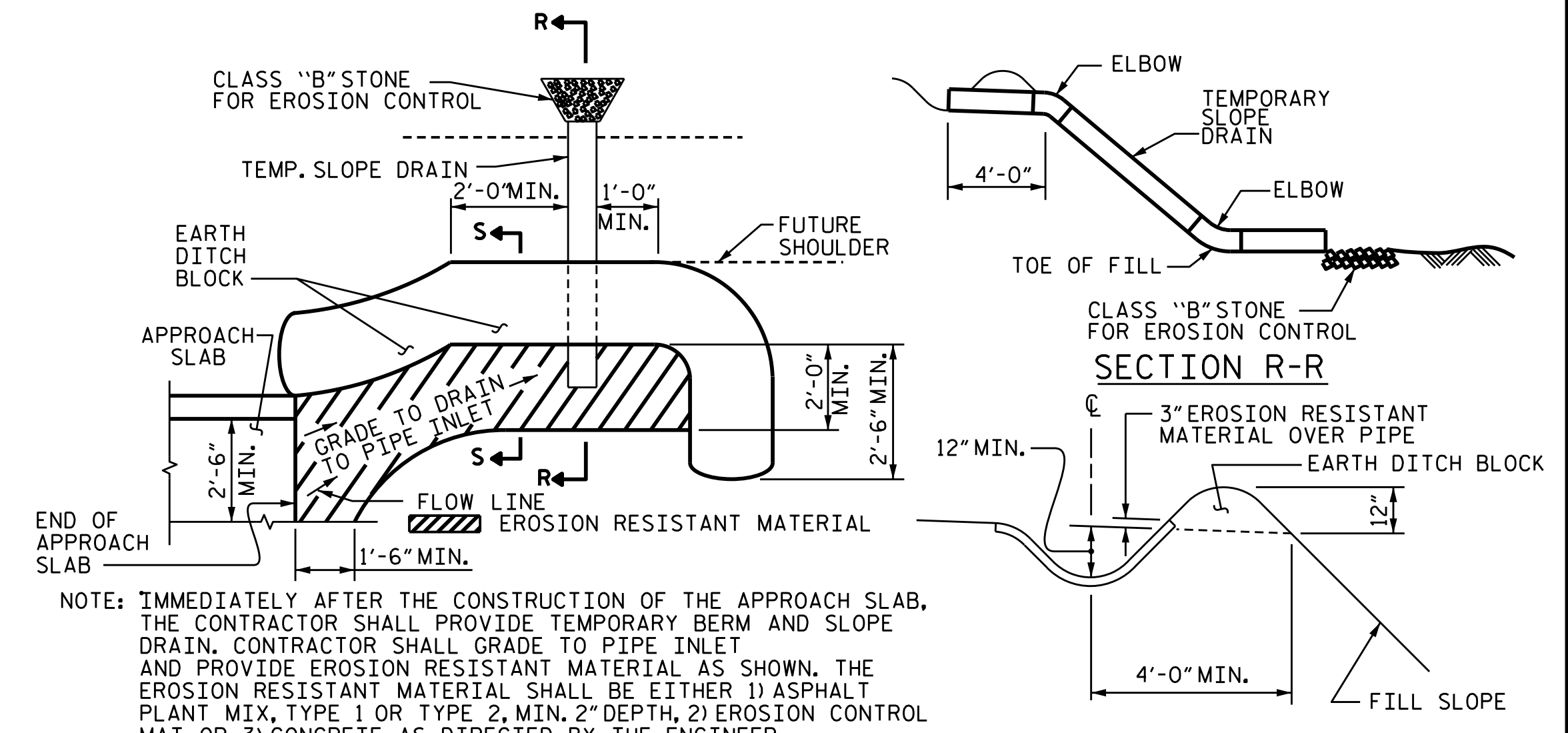
PLAN @ END BENT 2

BILL OF MATERIAL						
APPROACH SLAB AT EB 1						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
* A1	16	#4	STR	31'-6"	337	
A2	16	#4	STR	31'-6"	337	
* B1	63	#5	STR	14'-2"	931	
B2	63	#6	STR	14'-8"	1388	
REINFORCING STEEL					LBS.	1725
* EPOXY COATED REINFORCING STEEL					LBS.	1268
CLASS AA CONCRETE					C. Y.	21.0
APPROACH SLAB AT EB 2						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
* A1	16	#4	STR	31'-6"	337	
A2	16	#4	STR	31'-6"	337	
* B1	63	#5	STR	14'-2"	931	
B2	63	#6	STR	14'-8"	1388	
REINFORCING STEEL					LBS.	1725
* EPOXY COATED REINFORCING STEEL					LBS.	1268
CLASS AA CONCRETE					C. Y.	21.0



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

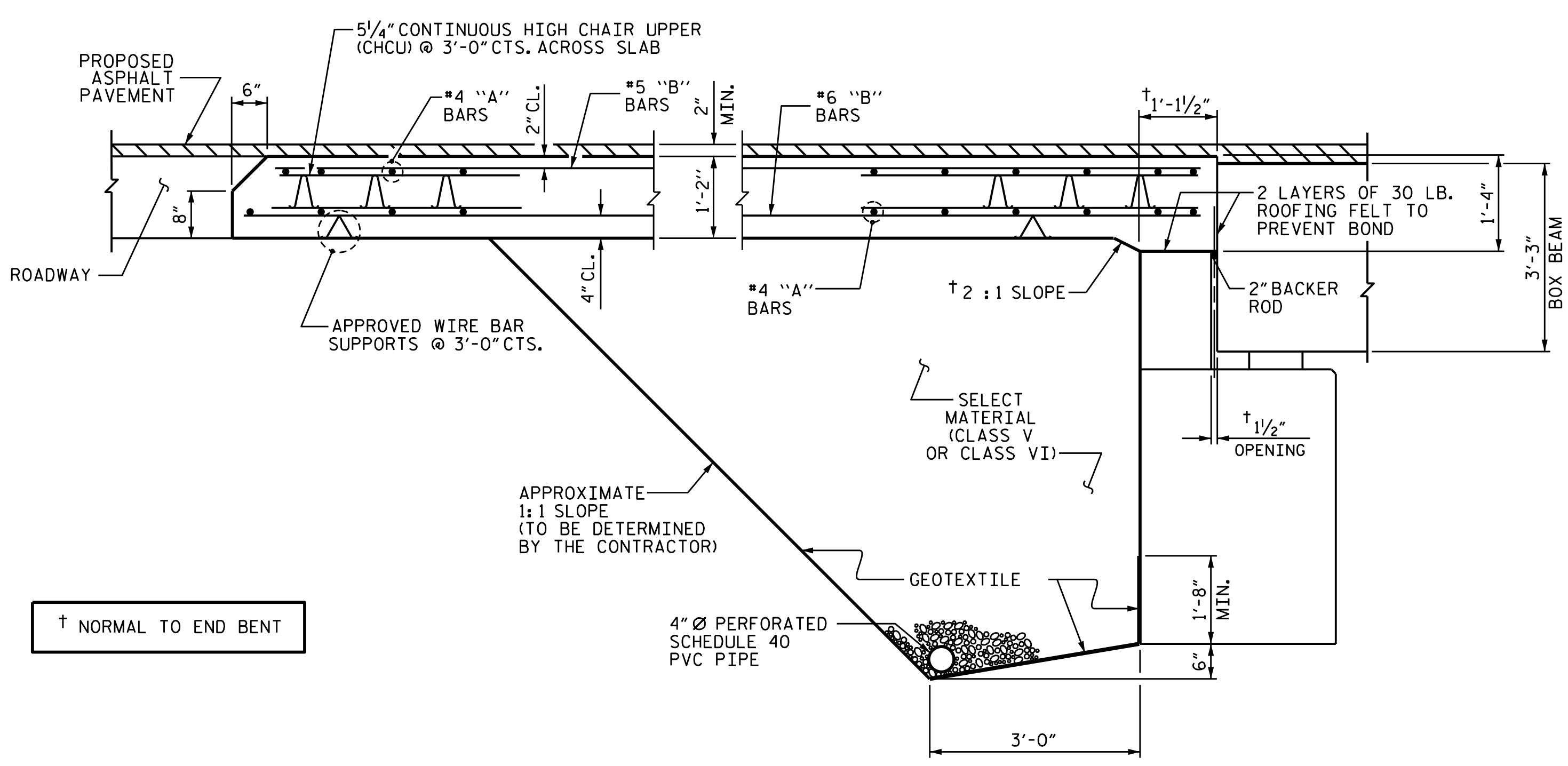
TEMPORARY DRAINAGE DETAIL



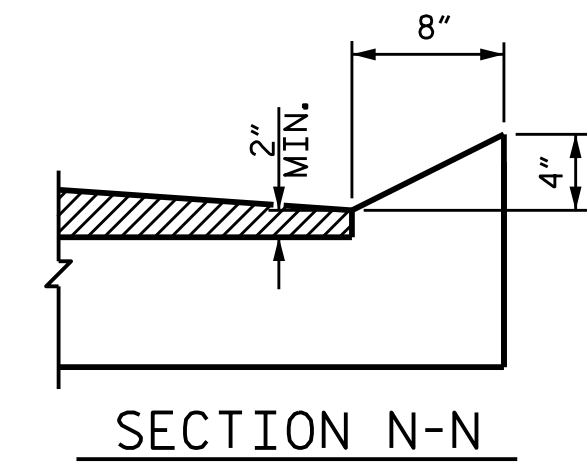
NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

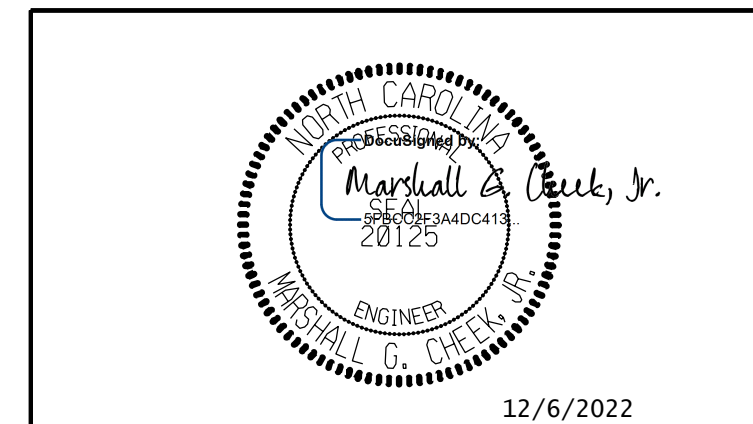


SECTION THRU SLAB  
(TYPE II - MODIFIED APPROACH FILL)



SECTION N-N  
CURB DETAILS

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



PROJECT NO. BP11.R005  
 SURRY COUNTY  
 STATION: 16+22.00 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 BRIDGE APPROACH SLAB  
 FOR PRESTRESSED CONCRETE  
 BOX BEAM UNIT  
 90° SKEW

DRAWN BY : JLA DATE : 12/21  
 CHECKED BY : MGC DATE : 1/22

DOCUMENT NOT CONSIDERED FINAL  
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TGS ENGINEERS  
 804-C N. LAFAYETTE ST  
 SHELBY, NC 28150  
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			S-32
2			4			33



