

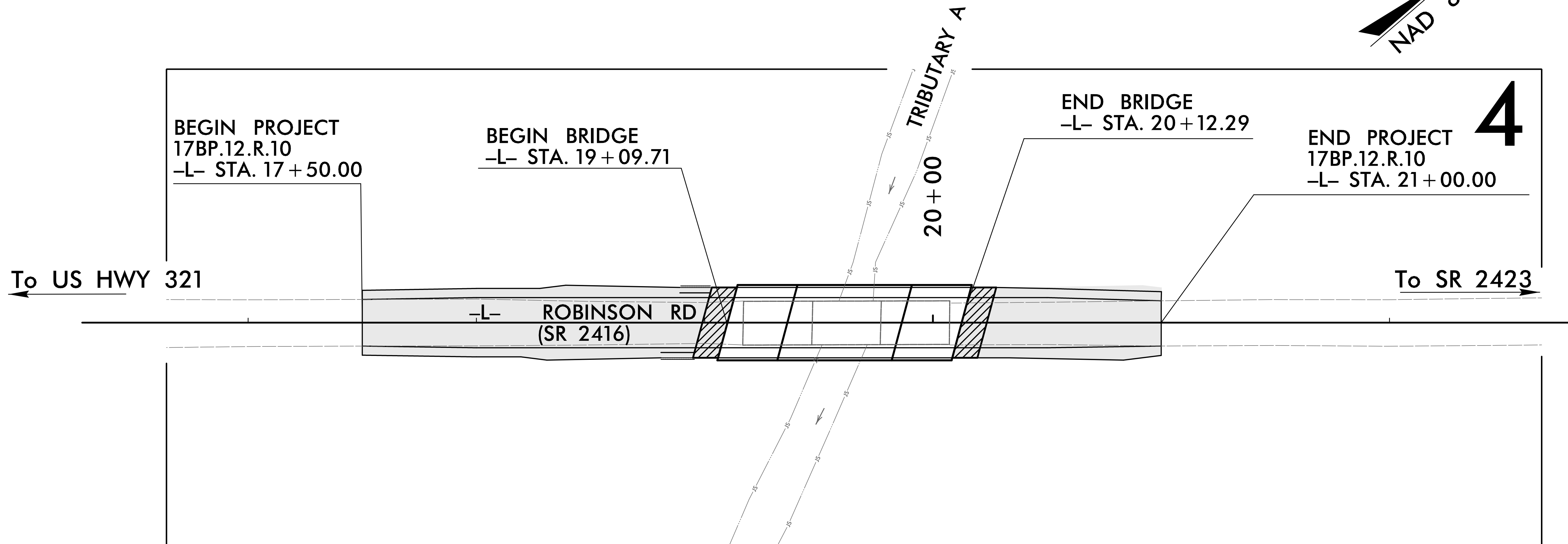
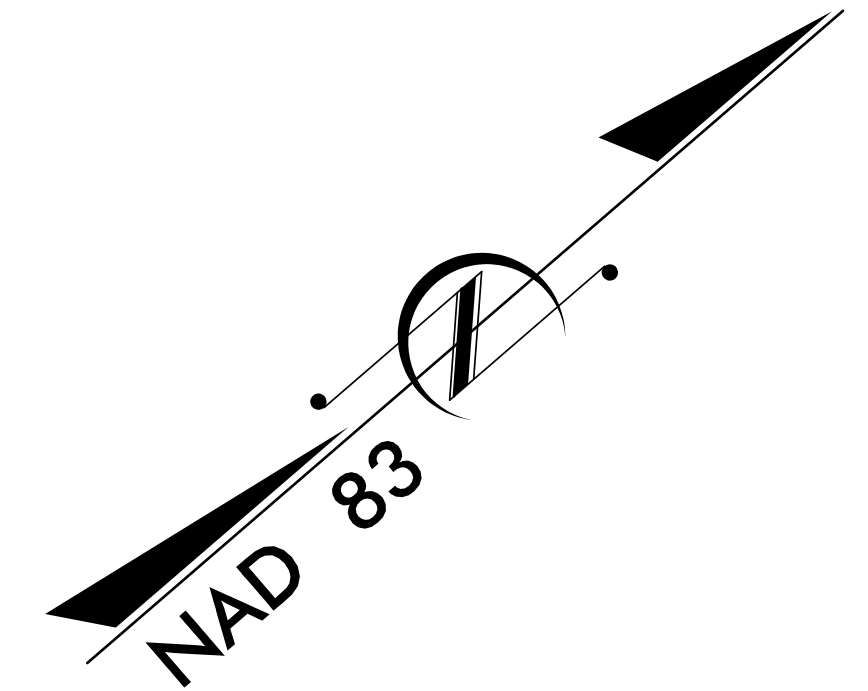
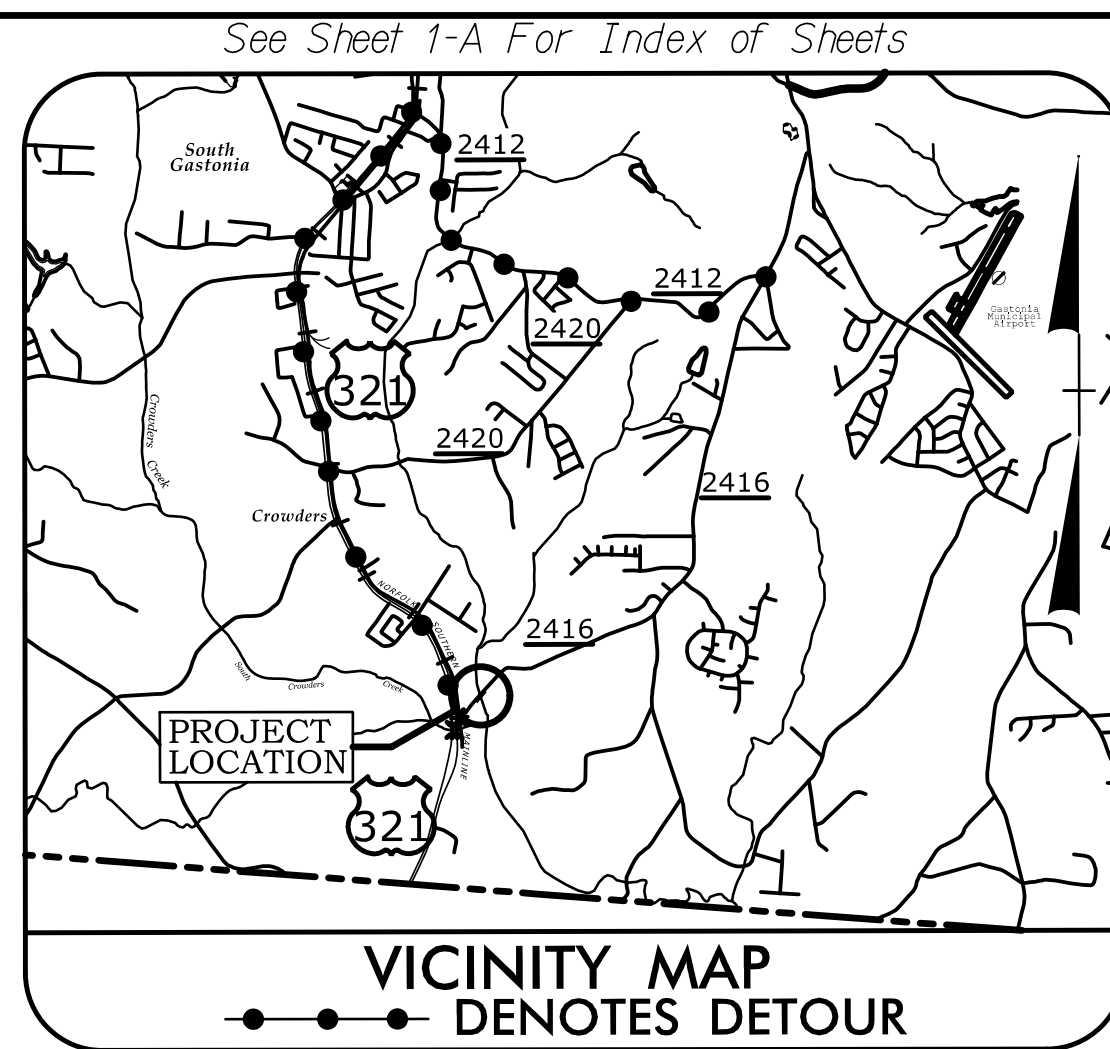
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.12.R.10	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
17BP.12.R.10		PE	
17BP.12.R.10		RW, UTIL.	
17BP.12.R.10		CONST.	

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**GASTON COUNTY**

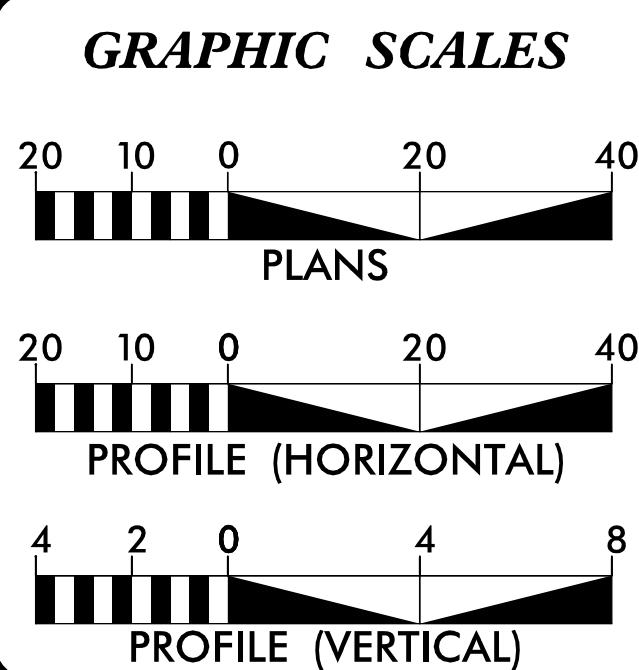
LOCATION: BRIDGE #350028 ON SR 2416 (ROBINSON RD)  
OVER TRIBUTARY A

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



TIP PROJECT: 17BP.12.R.10

CONTRACT: DL00039



**DESIGN DATA**  
 ADT 2012 = 8100  
 ADT 2032 = 12570  
 TTST = 6%  
 V = 45 MPH  
 FUNC CLASS =  
 RURAL COLLECTOR  
 SUB REGIONAL TIER  
 DESIGN EXCEPTION  
 REQUIRED FOR VERTICAL  
 CURVATURE AND  
 VERTICAL SSD

**PROJECT LENGTH**

TOTAL LENGTH ROADWAY PROJECT	=	0.047	MILES
TOTAL LENGTH STRUCTURE PROJECT	=	0.019	MILES
TOTAL LENGTH PROJECT	=	0.066	MILES

Prepared In the Office of:  
**TGS ENGINEERS**  
 804-C W. LAFAYETTE ST  
 SHELBY, NC 28150  
 PH (704) 476 0003  
 CORP. LICENSE NO.: C-0275  
 2012 STANDARD SPECIFICATIONS

Prepared For:  
**DIVISION 12**  
 1710 East Marion St.  
 Shelby, NC 28152

LETTING DATE: \_\_\_\_\_

LEONARD G. FLETCHER, PE  
PROJECT ENGINEER

B. CHAD HOUSER, PE  
PROJECT DESIGN ENGINEER

**HYDRAULICS ENGINEER**

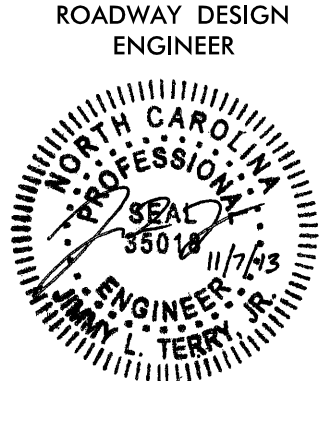
SIGNATURE: \_\_\_\_\_

**ROADWAY DESIGN ENGINEER**

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



\$\$\$\$\$SYTIME\$\$\$\$\$  
 \$\$\$CDN\$\$\$\$\$  
 \$\$\$USERNAME\$\$\$\$\$



# INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1-A	INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS
1-B	CONVENTIONAL SYMBOLS
2	PAVEMENT SCHEDULE, TYPICAL SECTIONS, AND WEDGING DETAILS
3	SUMMARY OF GUARDRAIL, EARTHWORK SUMMARY, AND ASPHALT PAVEMENT REMOVAL SUMMARY
3-A	SUMMARY OF DRAINAGE QUANTITIES
4	PLAN/PROFILE SHEET
TMP-1 THRU TMP-3	TRAFFIC MANAGEMENT PLANS
PM-1	PAVEMENT MARKING PLANS
SD-1	DETOUR SIGNING PLANS
EC-1 THRU EC-5	EROSION CONTROL PLANS
UC-1 THRU UC-4	UTILITIES PLANS
X-1 THRU X-4	CROSS-SECTIONS
S-1 THRU S-23	STRUCTURE PLANS

# GENERAL NOTES

GENERAL NOTES: 2012 SPECIFICATIONS EFFECTIVE: 01-17-12  
REVISED: 11/01/11

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.

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

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

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

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

UTILITIES:  
UTILITY OWNERS ON THIS PROJECT ARE AT&T, PSNC, CITY OF GASTONIA/TWO RIVERS UTILITIES, AND DUKE ENERGY.  
ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON PLANS.

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

# STANDARD DRAWINGS

2012 ROADWAY ENGLISH 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, 2012 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.02	Method of Clearing - Method II
225.02	Guide for Grading Subgrade - Secondary and Local
225.04	Method of Obtaining Superelevation - Two Lane Pavement
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
310.10	Driveway Pipe Construction
DIVISION 4 - MAJOR STRUCTURES	
422.11	Reinforced Bridge Approach Fills - Sub Regional Tier
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 8 - INCIDENTALS	
840.00	Concrete Base Pad for Drainage Structures
840.25	Anchorage for Frames - Brick or Concrete or Precast
840.36	Traffic Bearing Grated Drop Inlet - for Steel (840.37) Double Frame and Grates
840.37	Steel Grate and Frame
840.46	Traffic Bearing Precast Drainage Structure
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units (Details in Lieu of Standard Drawing as March 2013 Letting)
876.02	Guide for Rip Rap at Pipe Outlets

8/17/09  
C:\Users\jgarcia\Documents\17BP12.R10\17BP12.R10\_1-A.dwg

Note: Not to Scale

\*S.U.E. = Subsurface Utility Engineering

# CONVENTIONAL PLAN SHEET SYMBOLS

## BOUNDARIES AND PROPERTY:

State Line	—————
County Line	-----
Township Line	- - - - -
City Line	_____
Reservation Line	-----
Property Line	—————
Existing Iron Pin	⊙ EIP
Property Corner	⊗
Property Monument	⊠ ECM
Parcel/Sequence Number	Ⓜ 123
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
Known Soil Contamination: Area or Site	☠
Potential Soil Contamination: Area or Site	?

## BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or U/G Tank Cap	○
Sign	⊙
Well	⊙ W
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	⊙ MILEPOST 35
Switch	⊠ SWITCH
RR Abandoned	-----
RR Dismantled	-----

## RIGHT OF WAY:

Baseline Control Point	◆
Existing Right of Way Marker	△
Existing Right of Way Line	—
Proposed Right of Way Line	— (RW) —
Proposed Right of Way Line with Iron Pin and Cap Marker	— (RW) ▲ —
Proposed Right of Way Line with Concrete or Granite Marker	— (RW) ⊠ —
Existing Control of Access	⊙
Proposed Control of Access	⊙
Existing Easement Line	— E —
Proposed Temporary Construction Easement	— E —
Proposed Temporary Drainage Easement	— TDE —
Proposed Permanent Drainage Easement	— PDE —
Proposed Permanent Drainage / Utility Easement	— DUE —
Proposed Permanent Utility Easement	— PUE —
Proposed Temporary Utility Easement	— TUE —
Proposed Aerial Utility Easement	— AUE —

## ROADS AND RELATED FEATURES:

Proposed Permanent Easement with Iron Pin and Cap Marker	◆
Existing Edge of Pavement	-----
Existing Curb	-----
Proposed Slope Stakes Cut	— C —
Proposed Slope Stakes Fill	— F —
Proposed Curb Ramp	⊠ CR
Existing Metal Guardrail	— T —
Proposed Guardrail	— T —
Existing Cable Guiderail	— ⊠ —
Proposed Cable Guiderail	— ⊠ —

## VEGETATION:

Equality Symbol	⊙
Pavement Removal	⊠
Single Tree	⊙
Single Shrub	⊙
Hedge	~~~~~
Woods Line	~~~~~

Orchard	⊙
Vineyard	⊠ Vineyard

## EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	⊠ CONC
Bridge Wing Wall, Head Wall and End Wall	⊠ CONC WW ⊠
MINOR:	
Head and End Wall	⊠ CONC HW ⊠
Pipe Culvert	⊠
Footbridge	⊠
Drainage Box: Catch Basin, DI or JB	⊠ CB
Paved Ditch Gutter	-----
Storm Sewer Manhole	⊙
Storm Sewer	— S —

## UTILITIES:

POWER:	
Existing Power Pole	⊙
Proposed Power Pole	⊙
Existing Joint Use Pole	⊙
Proposed Joint Use Pole	⊙
Power Manhole	⊙
Power Line Tower	⊠
Power Transformer	⊠
U/G Power Cable Hand Hole	⊠
H-Frame Pole	⊙
Recorded U/G Power Line	— P —
Designated U/G Power Line (S.U.E.*)	— P —

## TELEPHONE:

Existing Telephone Pole	⊙
Proposed Telephone Pole	⊙
Telephone Manhole	⊙
Telephone Booth	⊠
Telephone Pedestal	⊠
Telephone Cell Tower	⊙
U/G Telephone Cable Hand Hole	⊠
Recorded U/G Telephone Cable	— T —
Designated U/G Telephone Cable (S.U.E.*)	— T —
Recorded U/G Telephone Conduit	— TC —
Designated U/G Telephone Conduit (S.U.E.*)	— TC —
Recorded U/G Fiber Optics Cable	— T FO —
Designated U/G Fiber Optics Cable (S.U.E.*)	— T FO —

## WATER:

Water Manhole	⊙
Water Meter	⊙
Water Valve	⊙
Water Hydrant	⊙
Recorded U/G Water Line	—
Designated U/G Water Line (S.U.E.*)	—
Above Ground Water Line	— A/G Water —

## TV:

TV Satellite Dish	⊙
TV Pedestal	⊠
TV Tower	⊙
U/G TV Cable Hand Hole	⊠
Recorded U/G TV Cable	— TV —
Designated U/G TV Cable (S.U.E.*)	— TV —
Recorded U/G Fiber Optic Cable	— TV FO —
Designated U/G Fiber Optic Cable (S.U.E.*)	— TV FO —

## GAS:

Gas Valve	⊙
Gas Meter	⊙
Recorded U/G Gas Line	— G —
Designated U/G Gas Line (S.U.E.*)	— G —
Above Ground Gas Line	— A/G Gas —

## SANITARY SEWER:

Sanitary Sewer Manhole	⊙
Sanitary Sewer Cleanout	⊙
U/G Sanitary Sewer Line	— SS —
Above Ground Sanitary Sewer	— A/G Sanitary Sewer —
Recorded SS Forced Main Line	— FSS —
Designated SS Forced Main Line (S.U.E.*)	— FSS —

## MISCELLANEOUS:

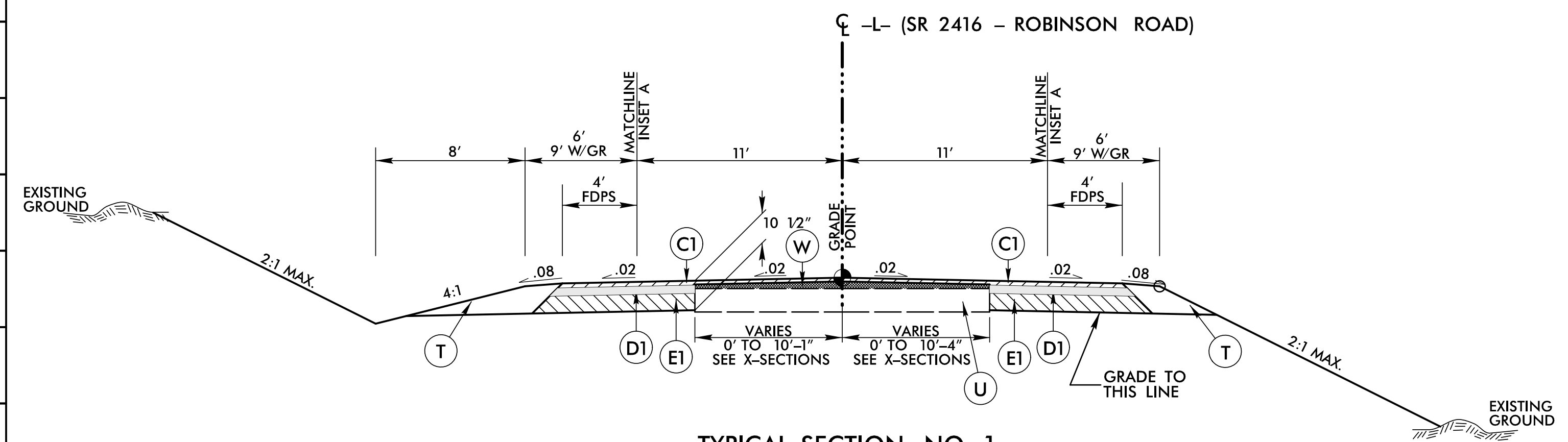
Utility Pole	⊙
Utility Pole with Base	⊠
Utility Located Object	⊙
Utility Traffic Signal Box	⊠
Utility Unknown U/G Line	— UTL —
U/G Tank; Water, Gas, Oil	⊠
Underground Storage Tank, Approx. Loc.	⊠ UST
A/G Tank; Water, Gas, Oil	⊠
Geoenvironmental Boring	⊙
U/G Test Hole (S.U.E.*)	⊙
Abandoned According to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

6/2/99

PROJECT REFERENCE NO. <b>17BP12R10</b>	SHEET NO. <b>2</b>
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER
<b>TGS ENGINEERS</b> 804-C N. LAFAYETTE ST SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO. C-0275	

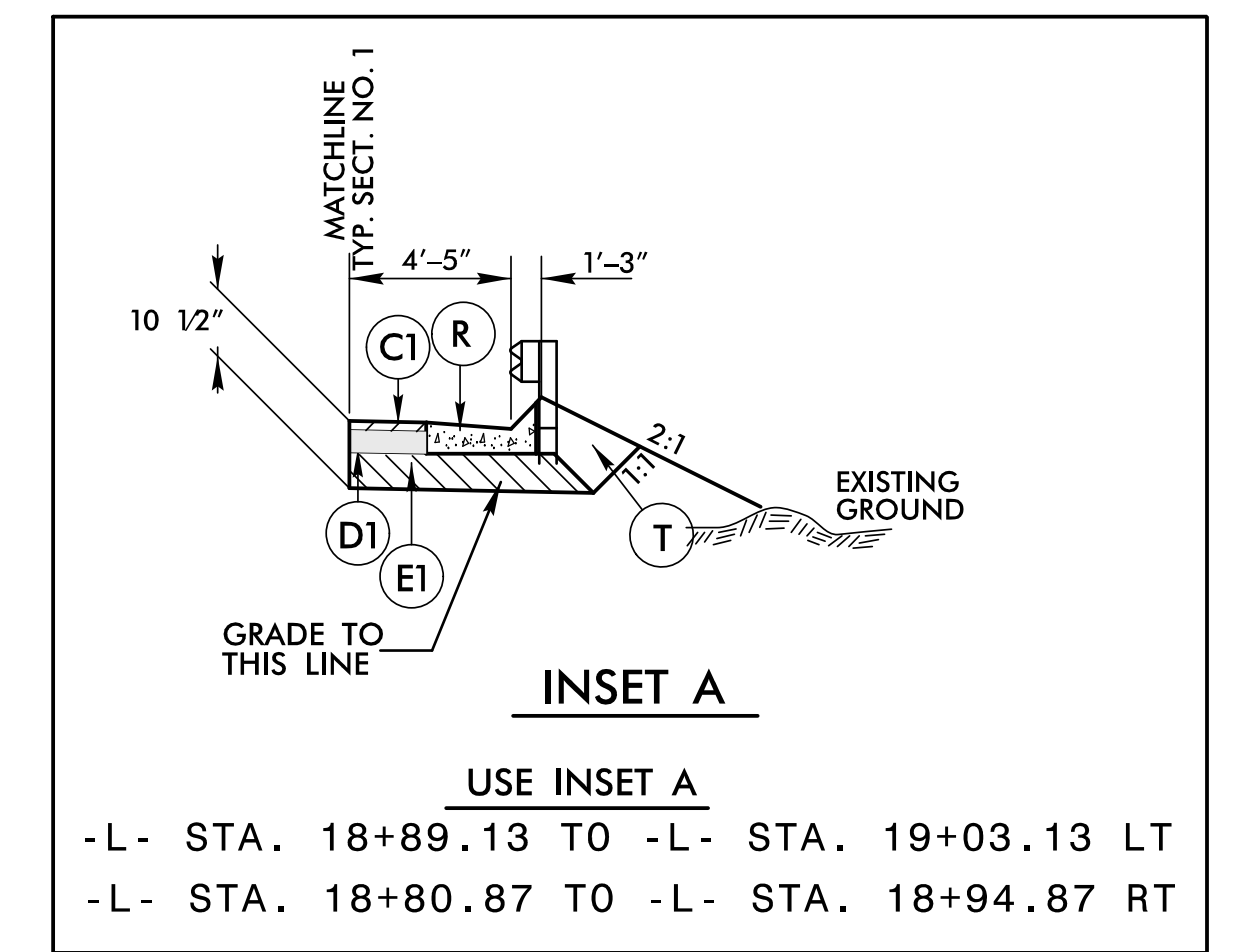
PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.
D1	PROP. APPROX. 3 1/2" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 399 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 2 1/2" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 5 1/2" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD.
E2	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, 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 5 1/2" IN DEPTH.
R	SHOULDER BERM GUTTER
T	EARTH MATERIAL.
U	EXISTING PAVEMENT
V	MILLING EXISTING PAVEMENT (SEE MILLING DETAIL THIS SHEET).
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL THIS SHEET).

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



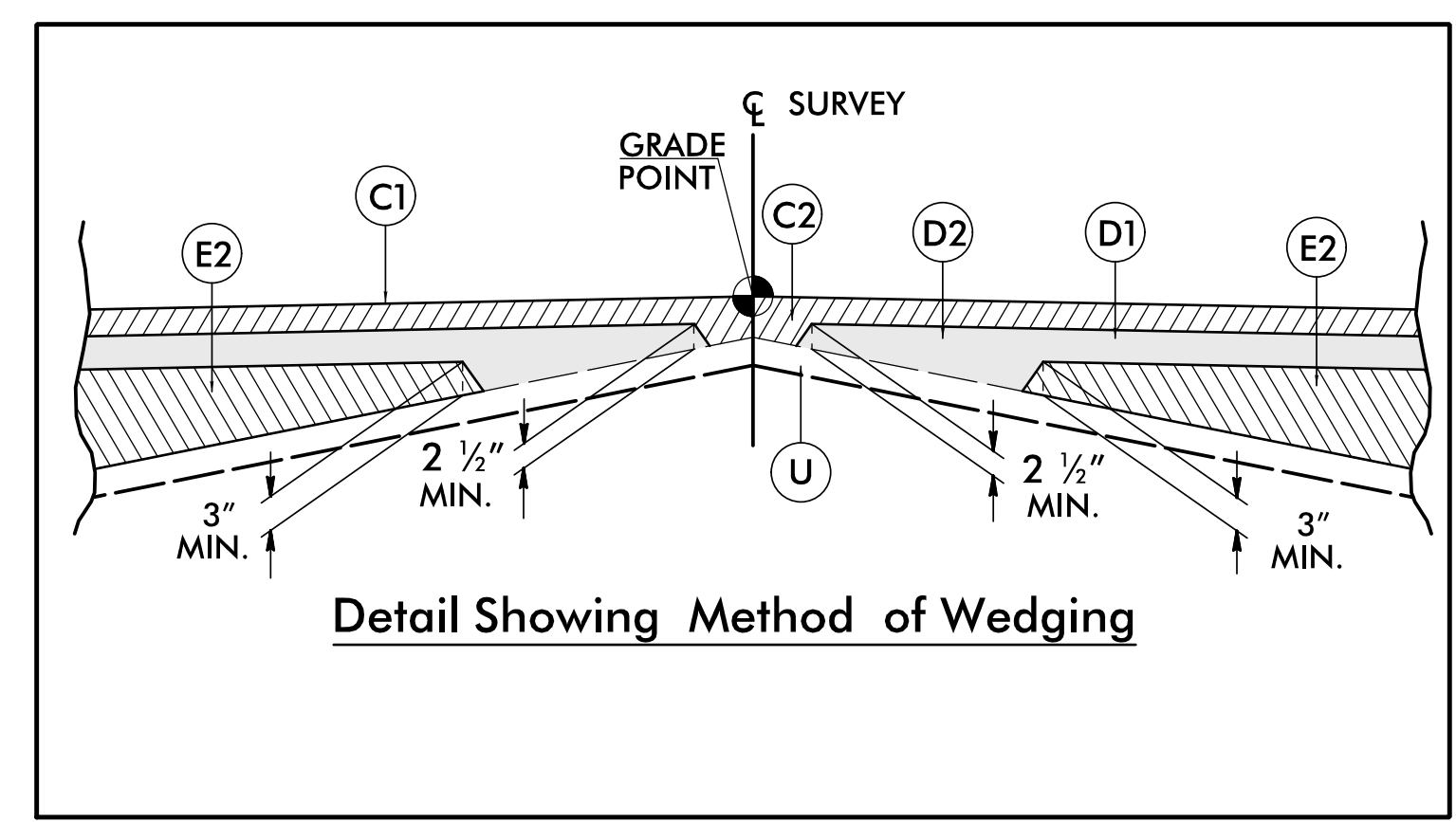
**TYPICAL SECTION NO. 1**  
USE TYPICAL SECTION NO. 1

-L- STA. 18+00.00 TO -L- STA. 19+09.71 (BEGIN BRIDGE)  
 -L- STA. 20+12.29 (END BRIDGE) TO -L- STA. 20+50.00  
 NOTE: TRANSITION BETWEEN EXISTING AND TYP. SECT. NO. 1 AS FOLLOWS:  
 -L- STA. 17+50.00 TO -L- STA. 18+00.00  
 -L- STA. 20+50.00 TO -L- STA. 21+00.00

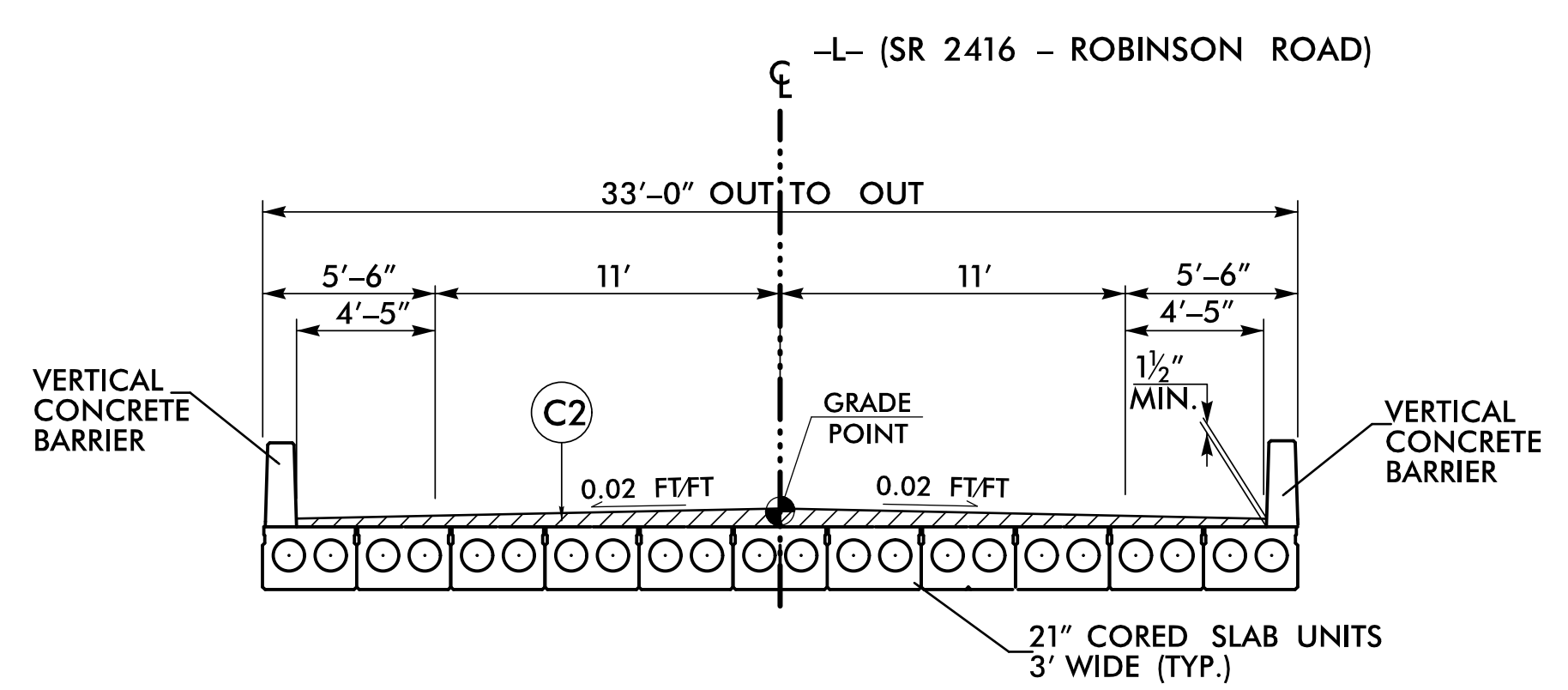


**INSET A**  
USE INSET A

-L- STA. 18+89.13 TO -L- STA. 19+03.13 LT  
 -L- STA. 18+80.87 TO -L- STA. 18+94.87 RT

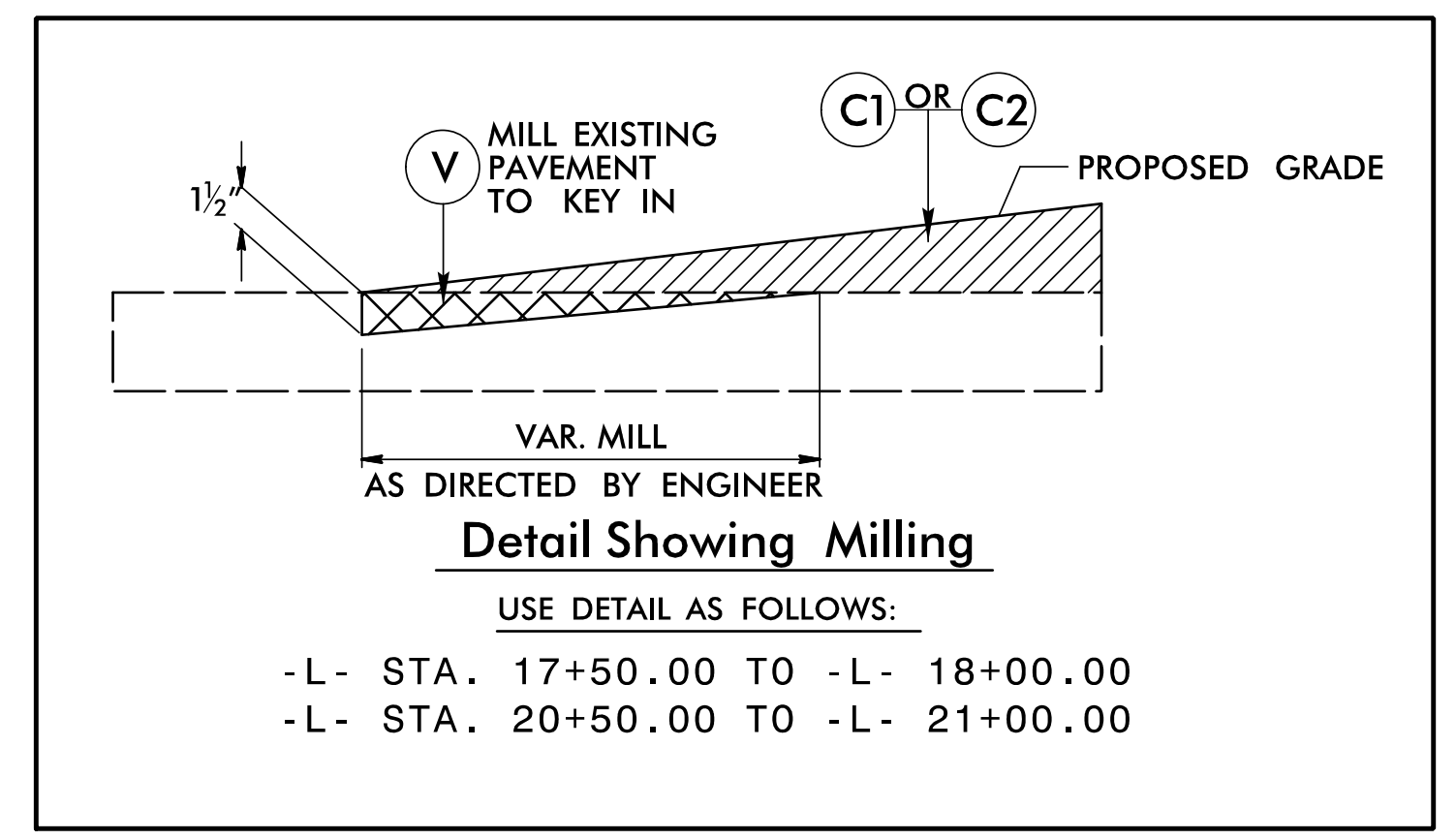


**Detail Showing Method of Wedging**



**TYPICAL SECTION NO. 2**  
USE TYPICAL SECTION NO. 2

-L- STA. 19+09.71 (BEGIN BRIDGE) TO -L- STA. 20+12.29 (END BRIDGE)



**Detail Showing Milling**  
USE DETAIL AS FOLLOWS:

-L- STA. 17+50.00 TO -L- 18+00.00  
 -L- STA. 20+50.00 TO -L- 21+00.00

RD244542

COMPUTED BY: AHC DATE: JULY 23, 2012  
 CHECKED BY: JLT DATE: MARCH 13, 2013

PROJECT NO.	SHEET NO.
17BP.12.R.10	3

## STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

### SUMMARY OF EARTHWORK

Station	Station	Uncl. Excav.	Embank. +%	Borrow	Waste
17+50.00	19+09.71	23	20		3
<b>BRIDGE</b>					
20+12.29	21+00.00	16	6		10
<b>TOTALS</b>					
		39	26		13
WASTE IN LIEU OF BORROW					
<b>PROJECT TOTALS:</b>					
		39	26		13
<b>SAY:</b>		<b>50</b>			

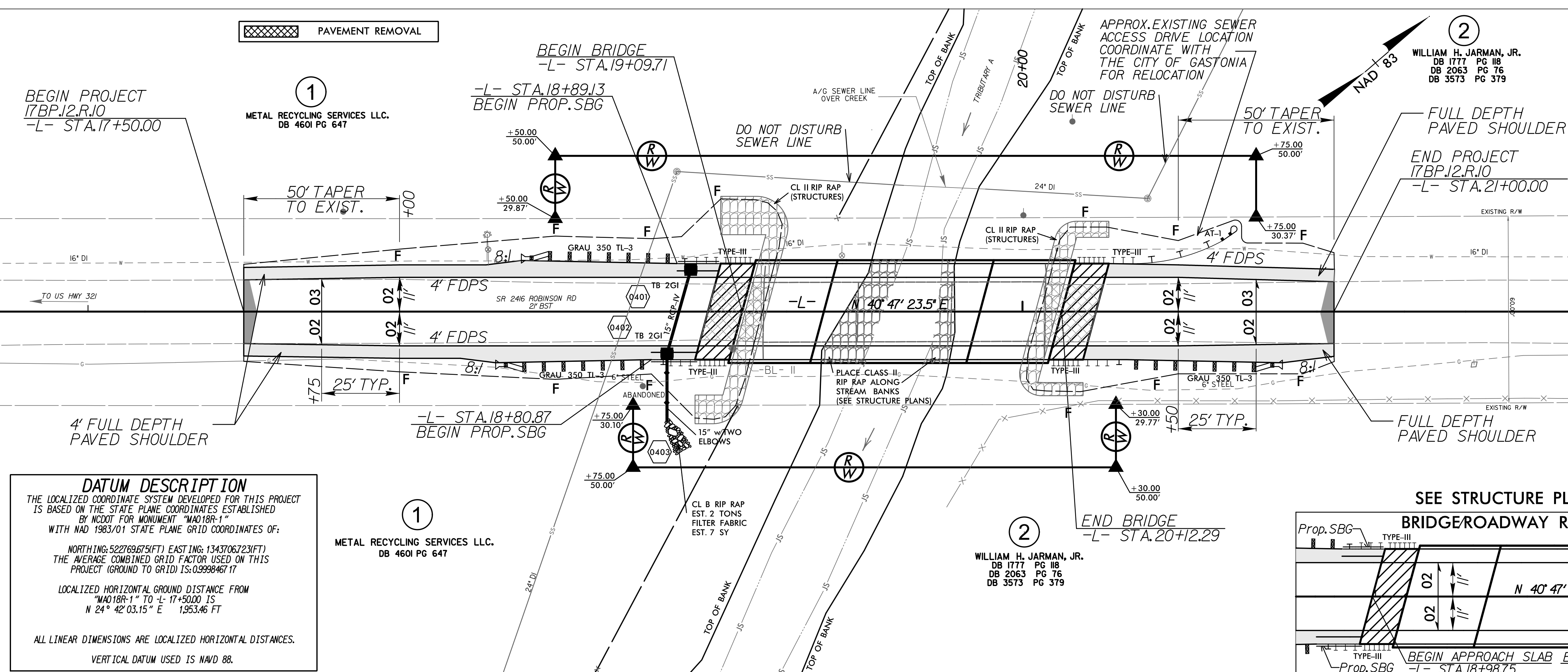
"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL  
 TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.  
 FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL.  
 W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL. 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

### GUARDRAIL SUMMARY

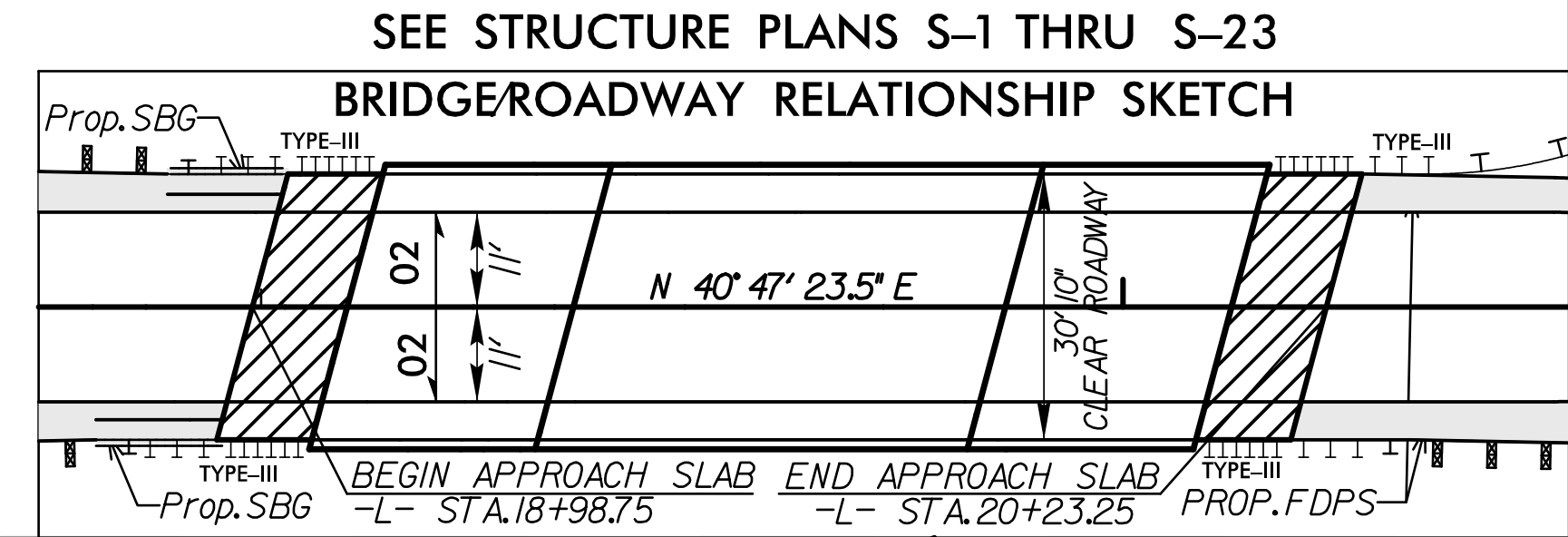
LINE	BEG. STA.	END STA.	LOC.	LENGTH			WARRANT POINT		"N" DIST FROM E.O.L.	TOTAL SHLDR WIDTH	FLAIR LENGTH		W		ANCHORS					IMP. ATTEN. TYPE 350			REMOVE EXISTING GRDRAIL	REMARKS	
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPR. END	TRAIL. END			APPR. END	TRAIL. END	APPR. END	TRAIL. END	III	GRAU 350 (TL-3)	AT-1	EA	G	NG					
-L-	18+38.84	19+13.84	LT	75				19+13.84	4.42'	8.67'	56.25'		1.125'		1	1									
-L-	18+30.58	19+05.58	RT	75				19+05.58	4.42'	8.67'	56.25'		1.125'		1	1									
-L-	20+16.42	20+68+/-	LT	18.75	31.25			20+16.42	4.42'	-					1		1								SHOP CURVED GUARDRAIL RADIUS = 20'
-L-	20+08.16	20+83.16	RT	75				20+08.16	4.42'	8.67'	56.25'		1.125'		1	1									
<b>SUB-TOTALS:</b>				243.75	31.25										4	3	1								
<b>LESS ANCHOR DEDUCTIONS</b>																									
	GRAU-350	3@50 ft		150																					
	TYPE AT-1	1@6.25 ft			6.25																				
	TYPE III	4@18.75 ft		75																					
<b>ANCHOR TOTALS</b>				225	6.25																				
<b>GRAND TOTALS</b>				18.75	25											4	3	1							
<b>SAY</b>				<b>25</b>	<b>50</b>																				

ADDITIONAL GUARDRAIL POSTS = 5 EA

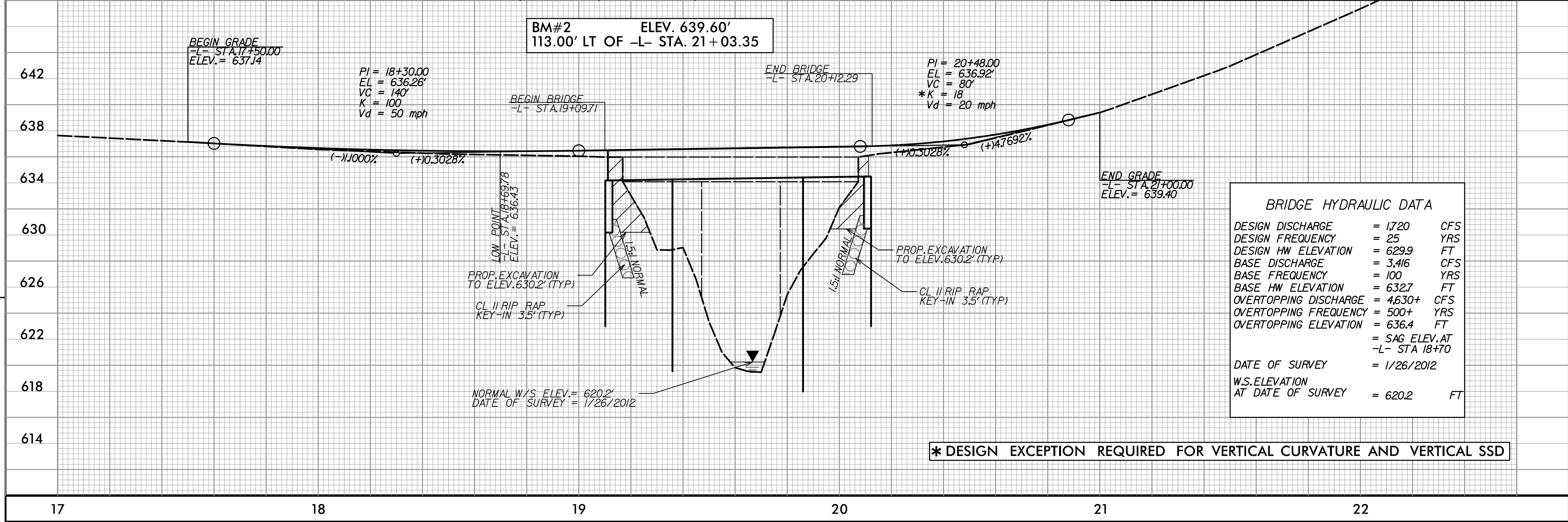




**DATUM DESCRIPTION**  
 THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "M4018R-1" WITH NAD 1983/01 STATE PLANE GRID COORDINATES OF:  
 NORTHING: 52216967.51 FT EASTING: 134370672.31 FT  
 THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999846717  
 LOCALIZED HORIZONTAL GROUND DISTANCE FROM "M4018R-1" TO -L- STA 17+50.00 IS  
 N 24° 42' 03.15" E 1.953.46 FT  
 ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES.  
 VERTICAL DATUM USED IS NAVD 88.



REVISIONS



**BRIDGE HYDRAULIC DATA**

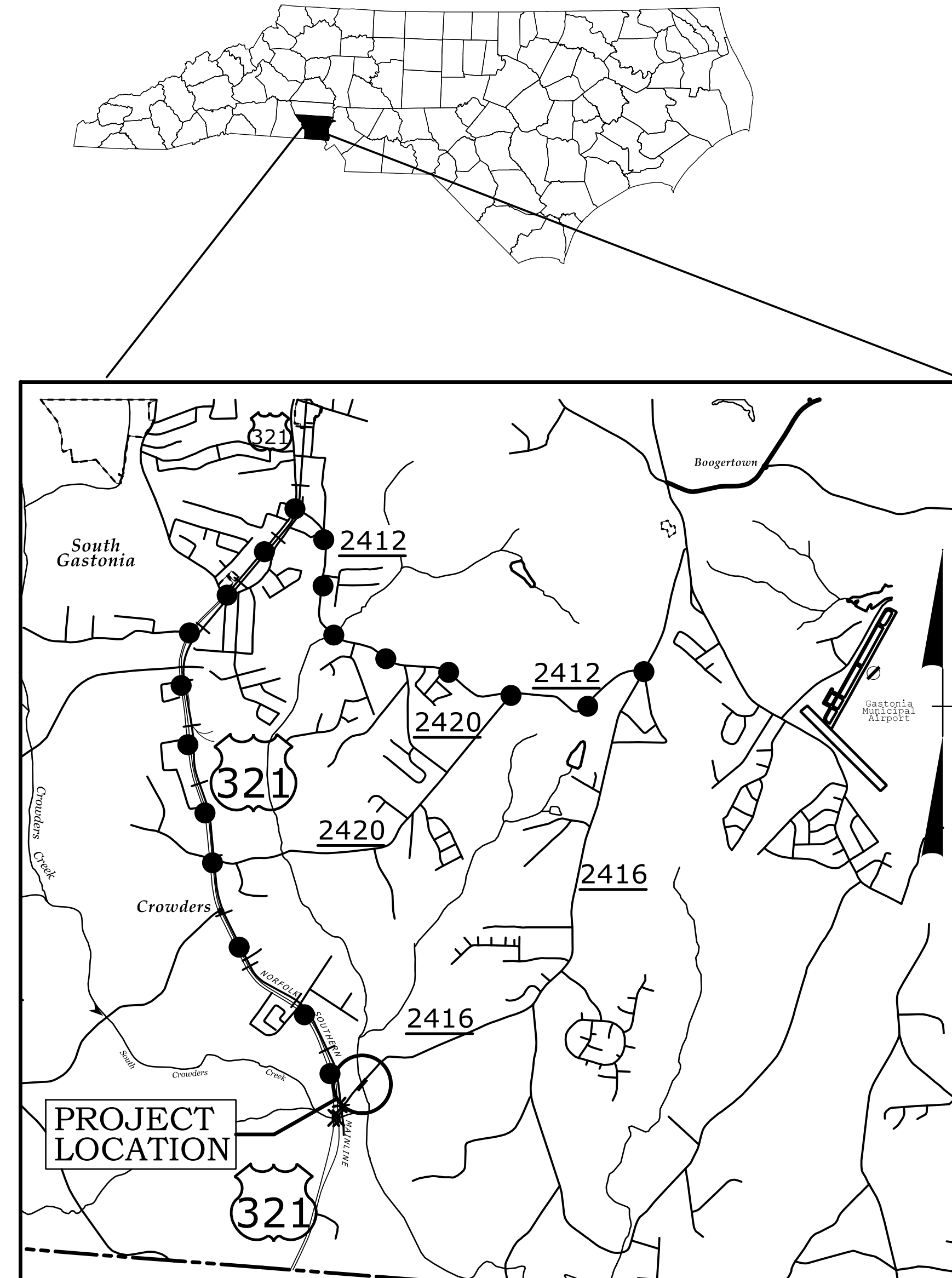
DESIGN DISCHARGE	= 1,720	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 629.9	FT
BASE DISCHARGE	= 3,416	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 632.7	FT
OVERTOPPING DISCHARGE	= 4,630+	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 636.4	FT
= SAG ELEV. AT -L- STA 18+70		
DATE OF SURVEY	= 1/26/2012	
W.S. ELEVATION AT DATE OF SURVEY	= 620.2	FT

**\* DESIGN EXCEPTION REQUIRED FOR VERTICAL CURVATURE AND VERTICAL SSD**

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**TRANSPORTATION MANAGEMENT PLAN**

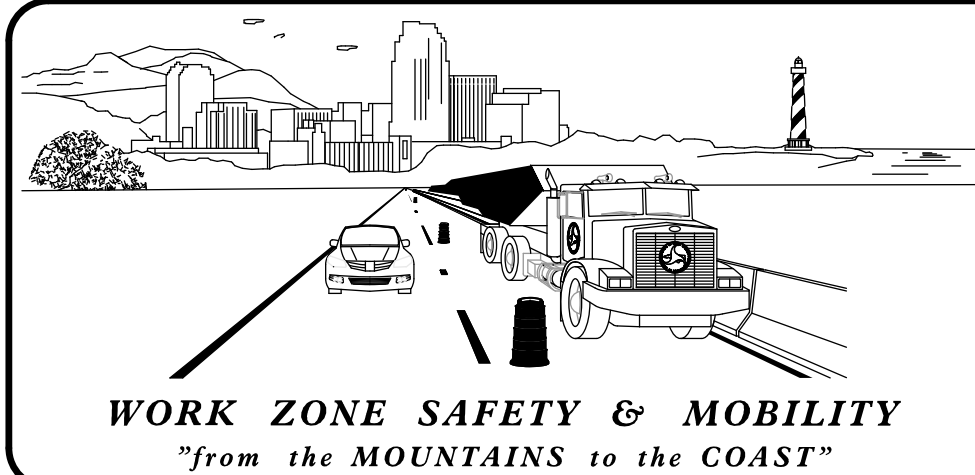
**GASTON COUNTY**



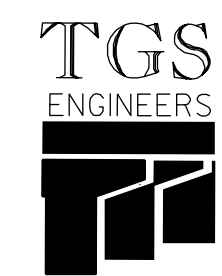
**VICINITY MAP**

●●●●●●●●●● OFFSITE DETOUR

**NC DOT CONTACT INFORMATION:**  
Phone: 919 250 4234 Fax: 919 212 5711  
**RODGER ROCHELLE, PE**  
State Alternative Delivery Engineer  
**TOM BACON, PE**  
**VIRGINIA MABRY**  
Design-Build Project Engineer



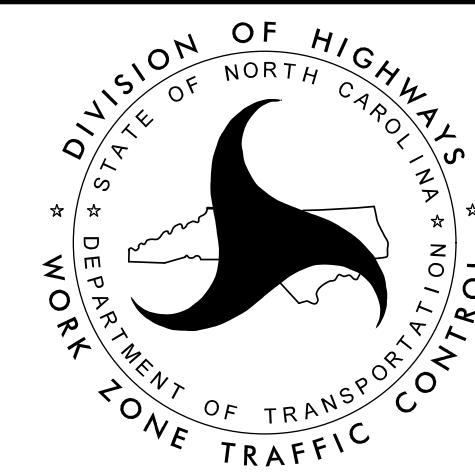
PLAN PREPARED FOR N.C.D.O.T. BY:



**TGS ENGINEERS**  
804-C N. LAFAYETTE ST  
SHELBY, NC 28150  
PH (704) 476-0003

CORP. LICENSE NO.: C-0275

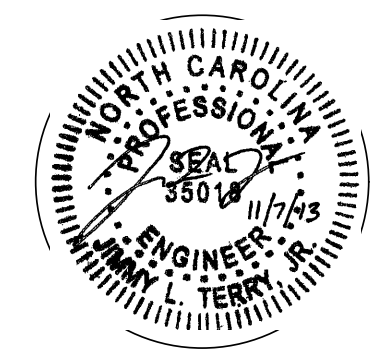
**JIMMY L. TERRY, PE** PROJECT ENGINEER  
**ANDREW H. COCHRANE, EI** DESIGN ENGINEER



SHEET NO.	TITLE
TMP-1	TITLE SHEET, AND INDEX OF SHEETS
TMP-1A	LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS AND LEGEND
TMP-1B	TRANSPORTATION OPERATIONS PLAN: (MANAGEMENT STRATEGIES AND GENERAL NOTES)
TMP-2	OVERVIEW AND PHASING
TMP-3	OFFSITE DETOUR LOCATION AND BARRICADE PLACEMENT
PMP-1	FINAL PAVEMENT MARKING PLAN AND SCHEDULE
SD-1	DETOUR SIGN LAYOUT

APPROVED: \_\_\_\_\_  
DATE: \_\_\_\_\_

SEAL



\$\$\$\$\$ SYSTEM \$\$\$\$\$\$  
\$\$\$\$\$ USER NAME \$\$\$\$\$\$  
\$\$\$\$\$ PASSWORD \$\$\$\$\$\$  
\$\$\$\$\$





## GENERAL NOTES

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

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

### TRAFFIC PATTERN ALTERATIONS

- A) NOTIFY THE ENGINEER TWENTY ONE (21) 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 PERMANENT SIGNING.
- D) 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.

- E) 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.

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

### TRAFFIC CONTROL DEVICES

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

### PAVEMENT MARKINGS AND MARKERS

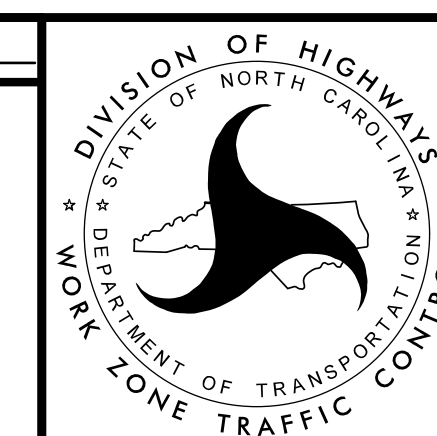
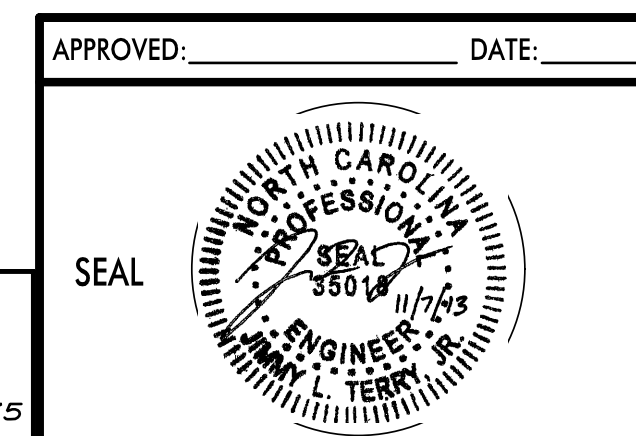
- H) INSTALL PAVEMENT MARKINGS AND PAVEMENT MARKERS ON THE FINAL SURFACE AS SHOWN IN THE PAVEMENT MARKING PLAN.
- I) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.
- J) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS BY THE END OF EACH DAY'S OPERATION.
- K) PASSING ZONE WILL BE DETERMINED IN THE FIELD AND MUST BE APPROVED BY THE ENGINEER.

## MANAGEMENT STRATEGIES

DURING CONSTRUCTION OF PROPOSED STRUCTURE, SR 2416 (ROBINSON ROAD) WILL BE CLOSED TO THROUGH TRAFFIC. ROBINSON ROAD TRAFFIC WILL BE MAINTAINED ON THE FOLLOWING OFFSITE DETOUR: FROM SR 2416 TO US-321 S/YORK HWY, TO SR 2412 (LITTLE MOUNTAIN RD), BACK TO SR 2416.

\$\$\$ SYSTEMS \$\$\$  
 \$\$\$ DESIGN \$\$\$  
 \$\$\$ DRAWING \$\$\$  
 \$\$\$ CHECKING \$\$\$  
 \$\$\$ REVISIONS \$\$\$  
 \$\$\$ DATE \$\$\$  
 \$\$\$ USER NAME \$\$\$  
 \$\$\$ 01/18 \$\$\$

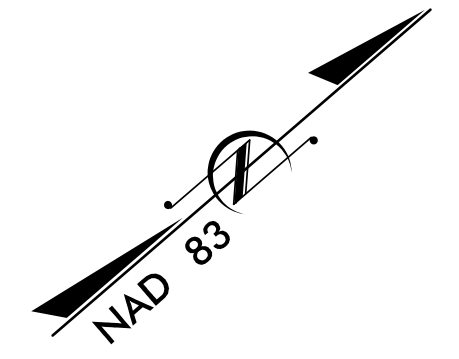
**TGS**  
 ENGINEERS  
 804-C W. LAFAYETTE ST  
 SHELBY, NC 27511  
 PH (704) 476-0003  
 CORP. LICENSE NO.: C-0275



**TRANSPORTATION  
OPERATIONS  
PLAN**

**-L- STA. 17+50.00  
BEGIN CONSTRUCTION**

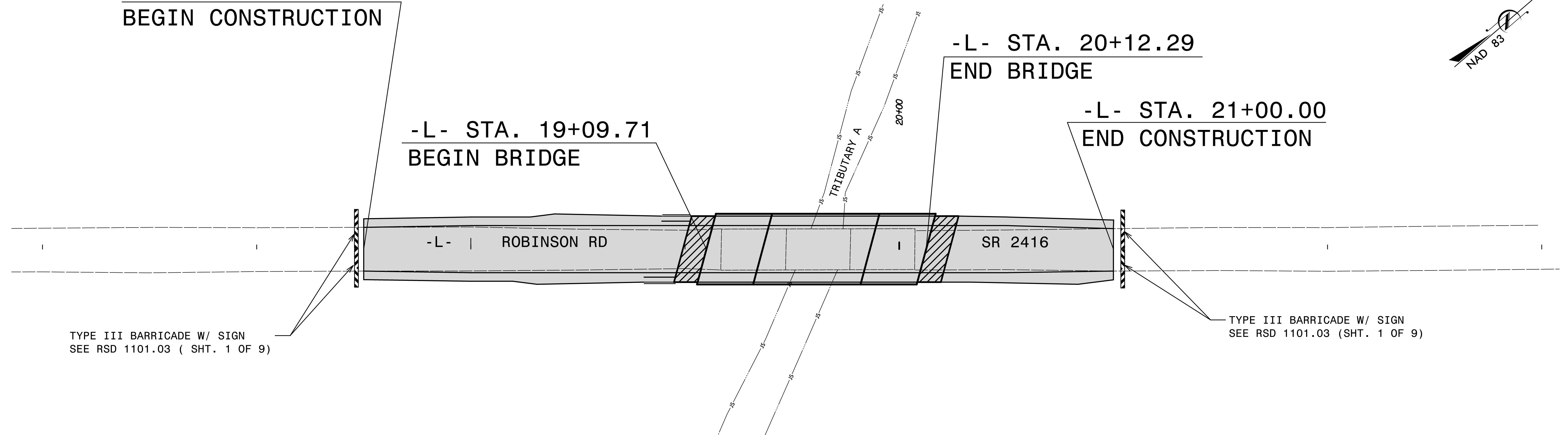
NOTE: SEE SHEETS TMP-3 AND SD-1 FOR DETOUR LOCATION AND SIGNING



**-L- STA. 19+09.71  
BEGIN BRIDGE**

**-L- STA. 20+12.29  
END BRIDGE**

**-L- STA. 21+00.00  
END CONSTRUCTION**



TYPE III BARRICADE W/ SIGN  
SEE RSD 1101.03 ( SHT. 1 OF 9)

TYPE III BARRICADE W/ SIGN  
SEE RSD 1101.03 (SHT. 1 OF 9)

### PHASING NOTES

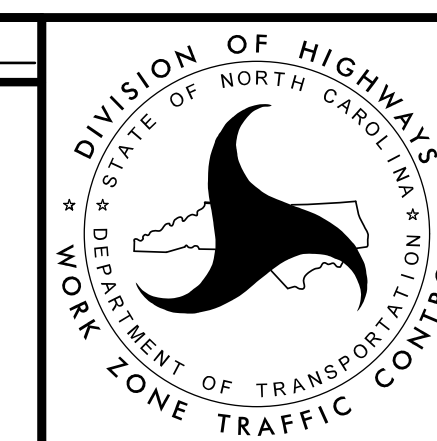
- STEP 1: INSTALL ALL DETOUR ROUTE SIGNS AS SHOWN ON TMP-3.
- STEP 2: AFTER PLACING TYPE III BARRICADES AND SIGNS CLOSE ROBINSON RD. (-L-) TO TRAFFIC AS SHOWN IN ROADWAY STANDARD DRAWING 1101.03 (SHEET 1 OF 9) AND ON SHEET TMP-2 AND TMP-3.
- STEP 3: DEMOLISH AND REMOVE THE EXISTING BRIDGE OVER TRIBUTARY A. CONSTRUCT THE NEW BRIDGE OVER TRIBUTARY A AND THE FOLLOWING UP TO AND INCLUDING THE FINAL LAYER OF SURFACE COURSE:  
ROBINSON RD (SR 2416) FROM STA. 17+50.00 TO 19+09.71 (BEGIN BRIDGE)  
ROBINSON RD (SR 2416) FROM STA. 20+12.29 (END BRIDGE) TO 21+00.00
- STEP 4: REFERRING TO SHEET PM-1, PLACE FINAL PAVEMENT MARKINGS AND PERMANENT RAISED REFLECTIVE PAVEMENT MARKERS ON THE FOLLOWING:  
ROBINSON RD (SR 2416) FROM STA. 17+50.00 TO 21+00.00
- STEP 5: REMOVE BARRICADES AND ALL TEMPORARY SIGNS AND OPEN ROBINSON RD (SR 2416) TO TRAFFIC IN FINAL PATTERN.

\$\$\$\$\$ SYSTEM \$\$\$\$\$\$  
\$\$\$\$\$ CADD \$\$\$\$\$\$  
\$\$\$\$\$ USER NAME \$\$\$\$\$\$  
\$\$\$\$\$

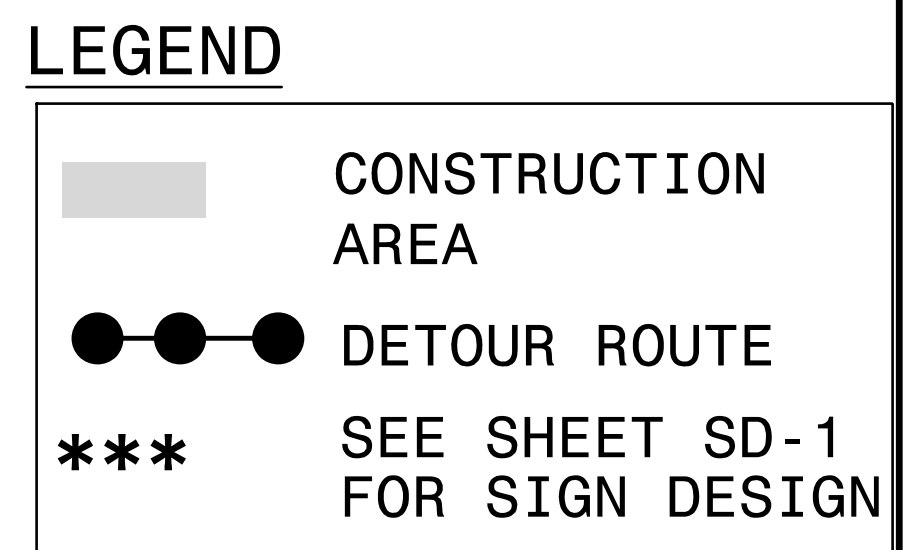
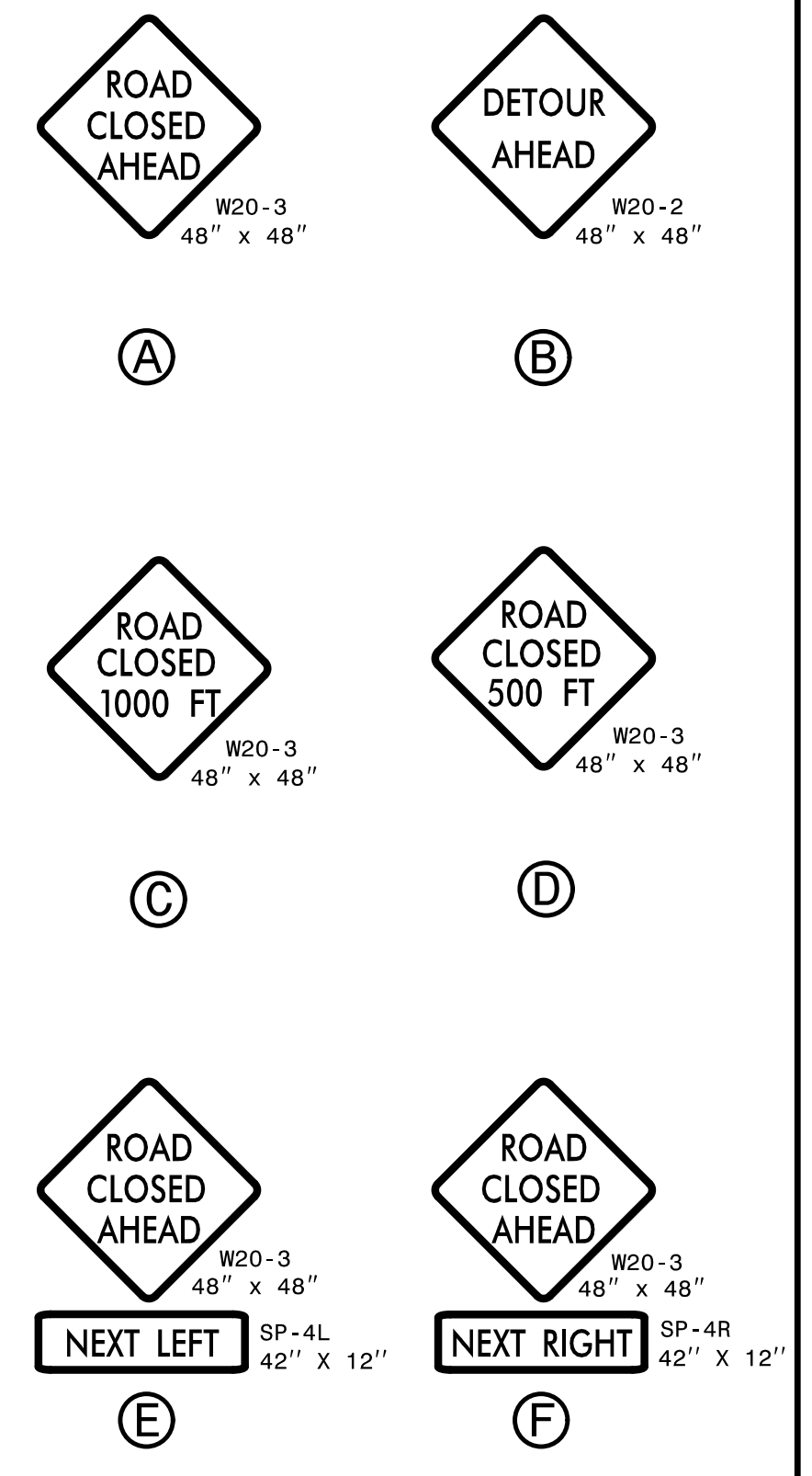
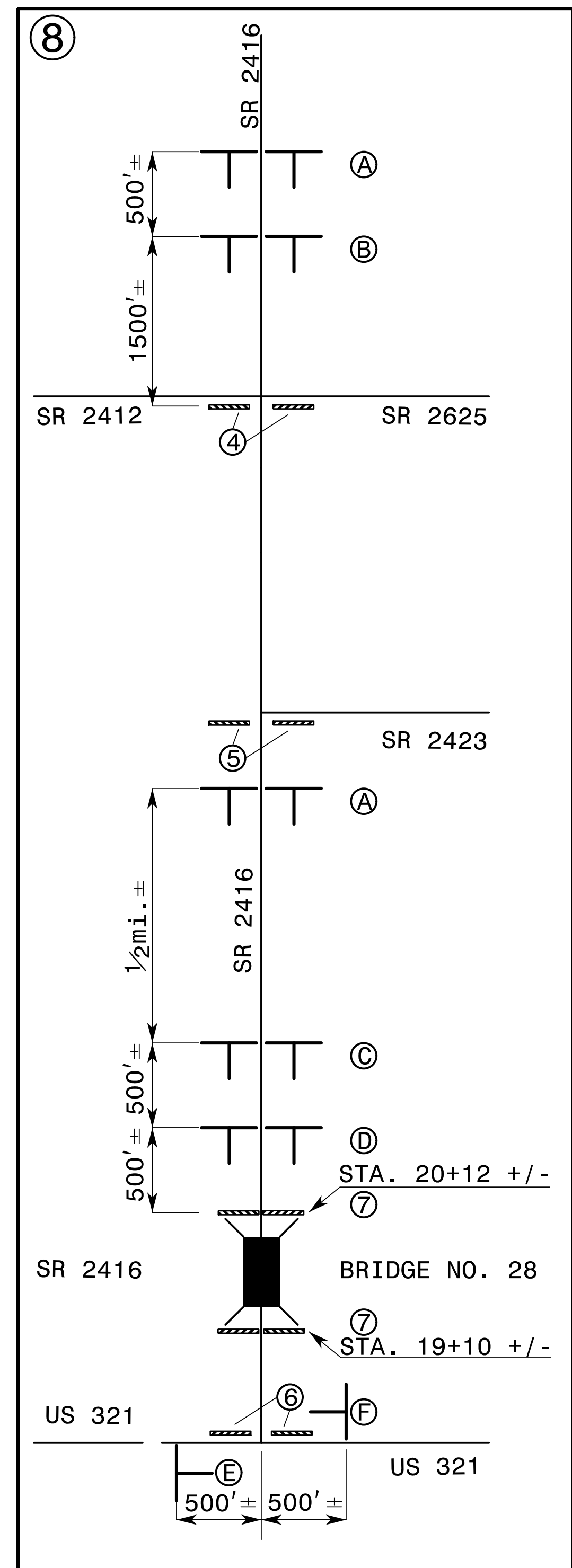
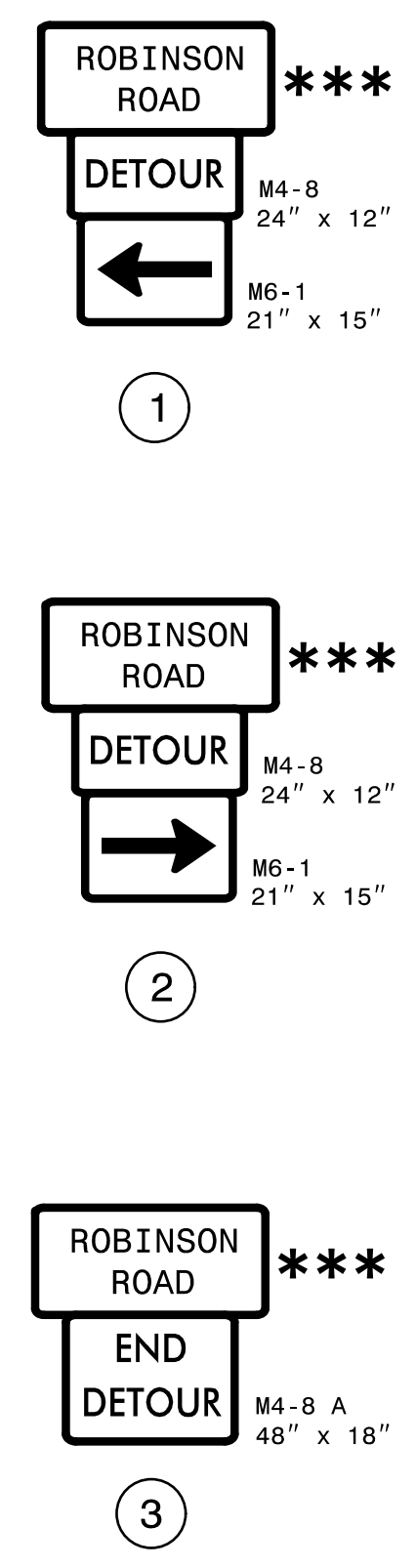
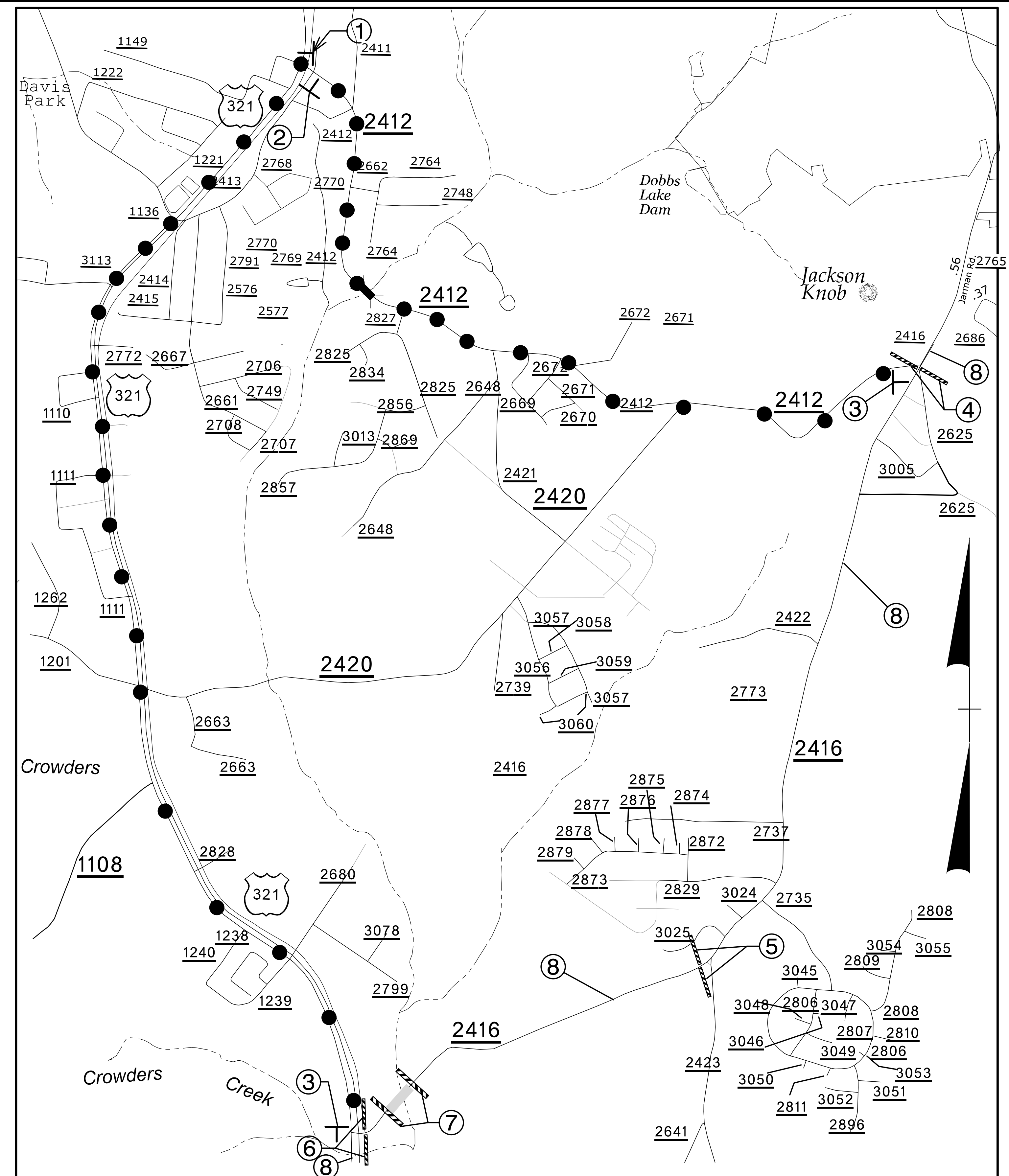
**TGS ENGINEERS**  
804-C LAFAYETTE ST  
SHELBY, NC 28150  
PH (704) 476-0003  
CORP. LICENSE NO.: C-0275

APPROVED: \_\_\_\_\_ DATE: \_\_\_\_\_

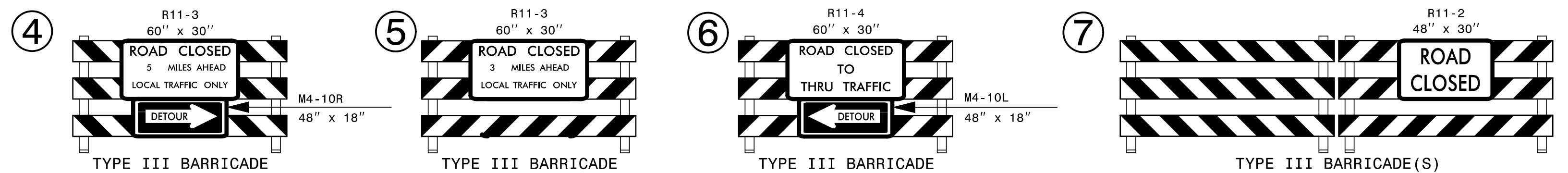
SEAL



**OVERVIEW  
AND PHASING**

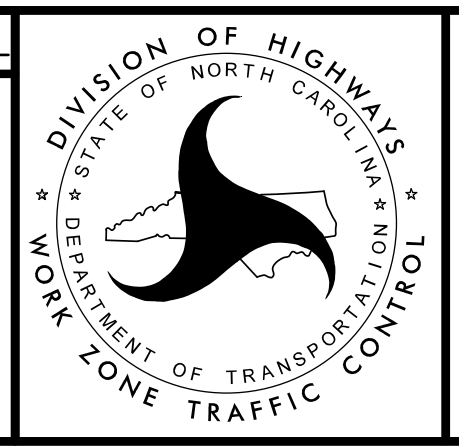


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 SHELBY, NC 28150  
 PH (704) 476-0003  
 CORP. LICENSE NO. 1C-0275



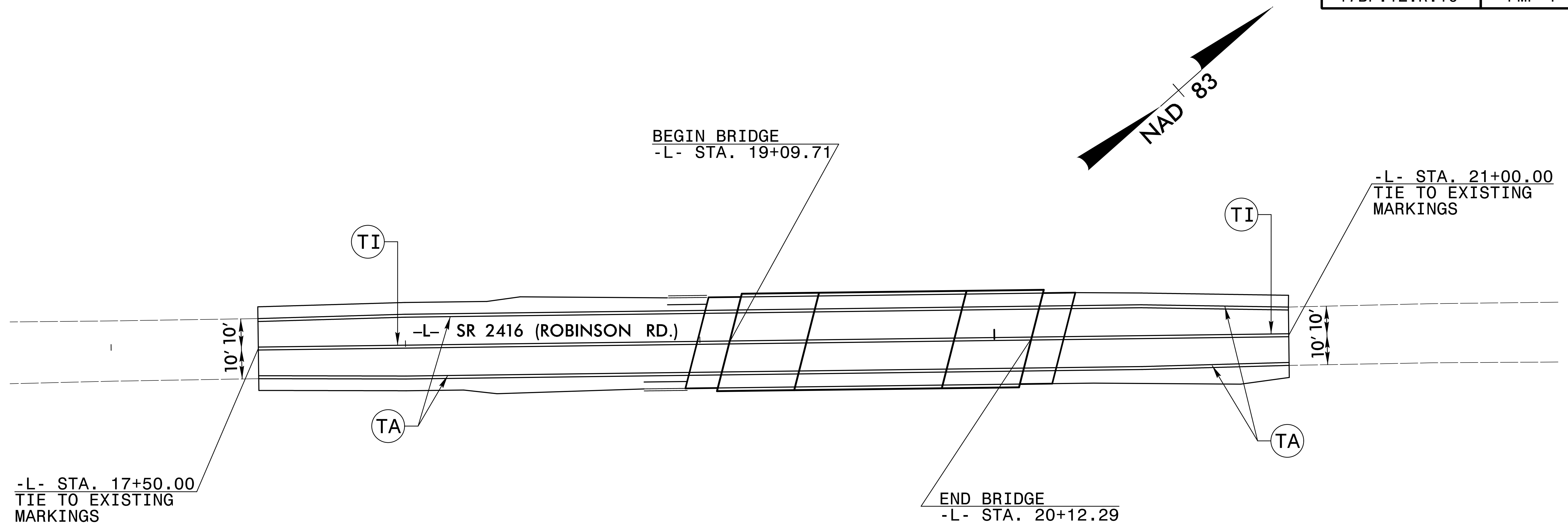
APPROVED: \_\_\_\_\_ DATE: \_\_\_\_\_

SEAL



**OFFSITE DETOUR ROUTE AND BARRICADE PLACEMENT**

\$\$\$\$\$SYTIME\$\$\$\$\$  
 \$\$\$DDON\$\$\$\$\$  
 \$\$\$USERNAME\$\$\$\$\$



**FINAL PAVEMENT MARKING SCHEDULE**

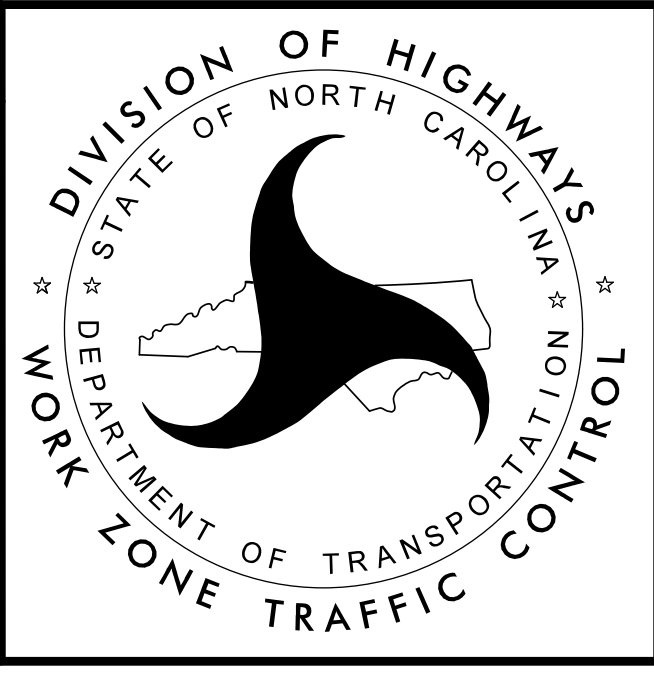
SYMBOL	DESCRIPTION	PAY ITEM	TOTAL QUANTITY
TA	WHITE EDGELINE	THERMOPLASTIC PAVEMENT MARKING LINES (4", 120 MILS)	700 LF
TI	YELLOW DOUBLE CENTER	THERMOPLASTIC PAVEMENT MARKING LINES (4", 120 MILS)	700 LF
	YELLOW & YELLOW	PERMANENT SNOWPLOWABLE PAVEMENT MARKERS	5 EA

\$\$\$\$\$ SYSTEM \$\$\$\$\$\$  
\$\$\$\$\$ CADD \$\$\$\$\$\$  
\$\$\$\$\$ USER \$\$\$\$\$\$  
\$\$\$\$\$ NAME \$\$\$\$\$\$  
\$\$\$\$\$ \$\$\$\$\$\$

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

APPROVED: \_\_\_\_\_ DATE: \_\_\_\_\_

SEAL



FINAL PAVEMENT MARKING  
PLAN AND SCHEDULE

SIGN NUMBER: <b>DET-1</b>	BACKG COLOR: <b>Fluorescent Orange</b>	DESIGN BY: <b>AHC</b>	CHECKED BY: <b>___</b>
TYPE: <b>STATIONARY</b>	COPY COLOR: <b>Black</b>	PROJECT ID: <b>17BP.12.R.10</b>	DIV: <b>12</b>
QUANTITY: <b>SEE PLANS</b>			DATE: <b>7/26/2012</b>

SYMBOL	X	Y	WID	HT

SIGN WIDTH: **4'-0"**  
 HEIGHT: **1'-6"**  
 TOTAL AREA: **6.0 Sq. Ft**

BORDER TYPE: **INSET**  
 RECESS: **0.38"**  
 WIDTH: **0.63"**  
 RADII: **1.5"**

NO. Z BARS: **MAT'L: 0.080" (2.0mm) ALUMINUM**  
 LENGTH:

USE NOTES: 1,2

- Legend and border shall be direct applied black non-reflective sheeting.
- Background shall be Type VII, VIII, or IX (prismatic) fluorescent orange retroreflective sheeting.

Spacing Factor is 1 unless specified otherwise

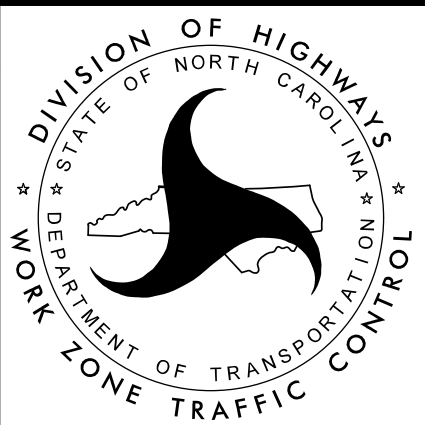
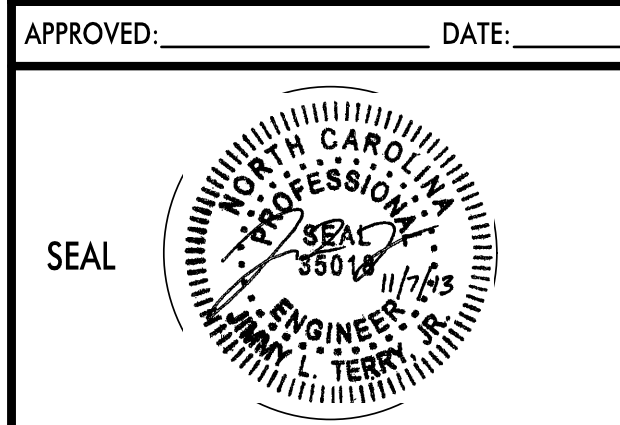
LETTER POSITIONS

Letter spacings are to start of next letter

Letter Spacing Data													Series/Size Text Length	
	<b>R</b>	<b>O</b>	<b>B</b>	<b>I</b>	<b>N</b>	<b>S</b>	<b>O</b>	<b>N</b>	<b>R</b>	<b>D</b>				<b>C 2000</b>
	5.1	3.6	3.9	3.8	1.9	3.8	3.6	3.9	2.7	4.1	3.8	2.7	5.1	<b>37.8</b>

\$\$\$ SYSTEM \$\$\$  
 \$\$\$ DESIGNER \$\$\$  
 \$\$\$ USER NAME \$\$\$  
 \$\$\$ DATE \$\$\$

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



SIGN DESIGN

**TIP PROJECT: 17BP.12.R.10**

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

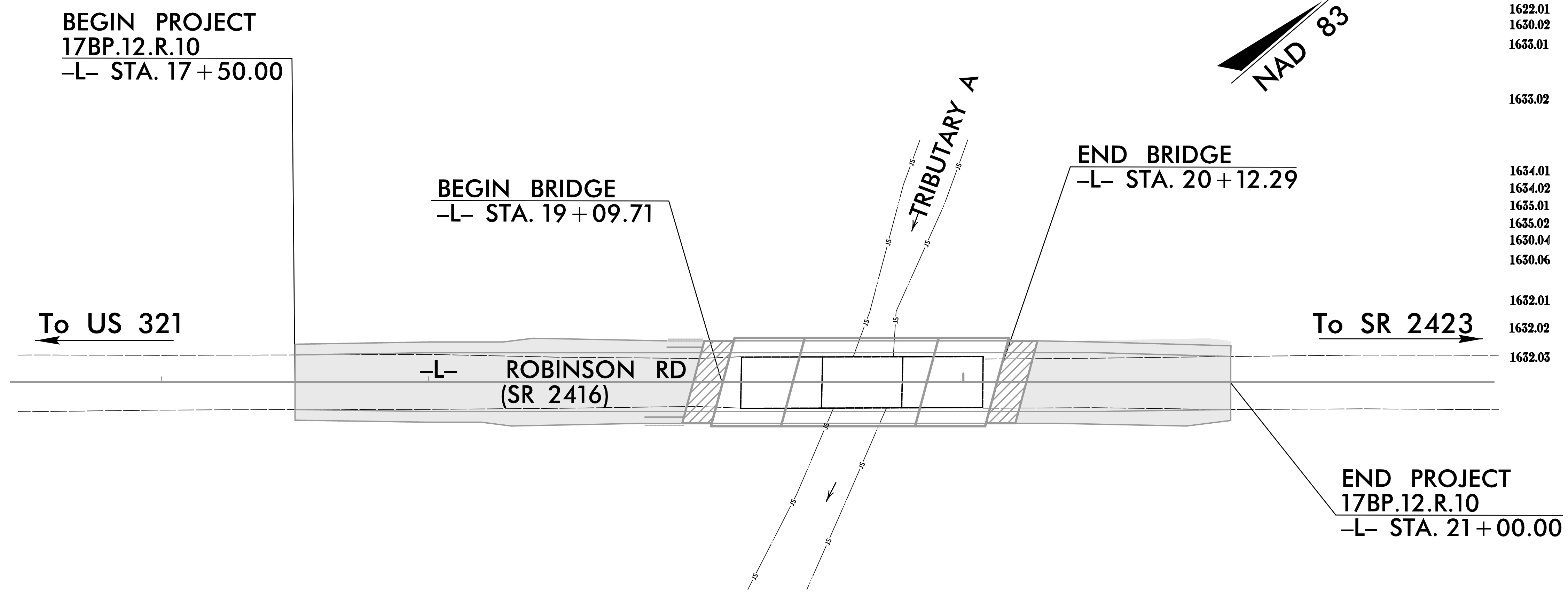
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PLAN FOR PROPOSED  
HIGHWAY EROSION CONTROL  
GASTON COUNTY

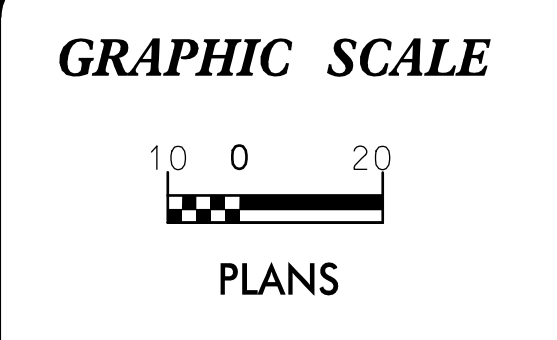
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.12.R.10	EC-1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	

**EROSION AND SEDIMENT CONTROL MEASURES**

Sed. #	Description	Symbol
1630.05	Temporary Silt Ditch	TD
1630.05	Temporary Diversion	TD
1605.01	Temporary Silt Fence	TSF
1606.01	Special Sediment Control Fence	SSCF
1622.01	Temporary Berms and Slope Drains	TBSD
1630.02	Silt Basin Type B	SB
1633.01	Temporary Rock Silt Check Type-A	TRSCA
	Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM)	TRSCA-PAM
1633.02	Temporary Rock Silt Check Type-B	TRSCB
	Wattle / Coir Fiber Wattle	WCFW
	Wattle / Coir Fiber Wattle with Polyacrylamide (PAM)	WCFW-PAM
1634.01	Temporary Rock Sediment Dam Type-A	TRSDA
1634.02	Temporary Rock Sediment Dam Type-B	TRSDB
1635.01	Rock Pipe Inlet Sediment Trap Type-A	RPISTRA
1635.02	Rock Pipe Inlet Sediment Trap Type-B	RPISTRB
1630.04	Stilling Basin	SB
1630.06	Special Stilling Basin	SSB
	Rock Inlet Sediment Trap:	
1632.01	Type A	A
1632.02	Type B	B
1632.03	Type C	C
	Skimmer Basin	SKB
	Tiered Skimmer Basin	TSKB
	Infiltration Basin	IB



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



ROADSIDE ENVIRONMENTAL UNIT  
DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE REGULATIONS SET FORTH BY THE NCG-010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE AUGUST 3, 2011 ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES DIVISION OF WATER QUALITY.

PLANS PREPARED BY:

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

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**JIMMY L. TERRY**  
PROJECT ENGINEER  
LEVEL III CERTIFICATION  
NUMBER 3145

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2012 STANDARD SPECIFICATIONS

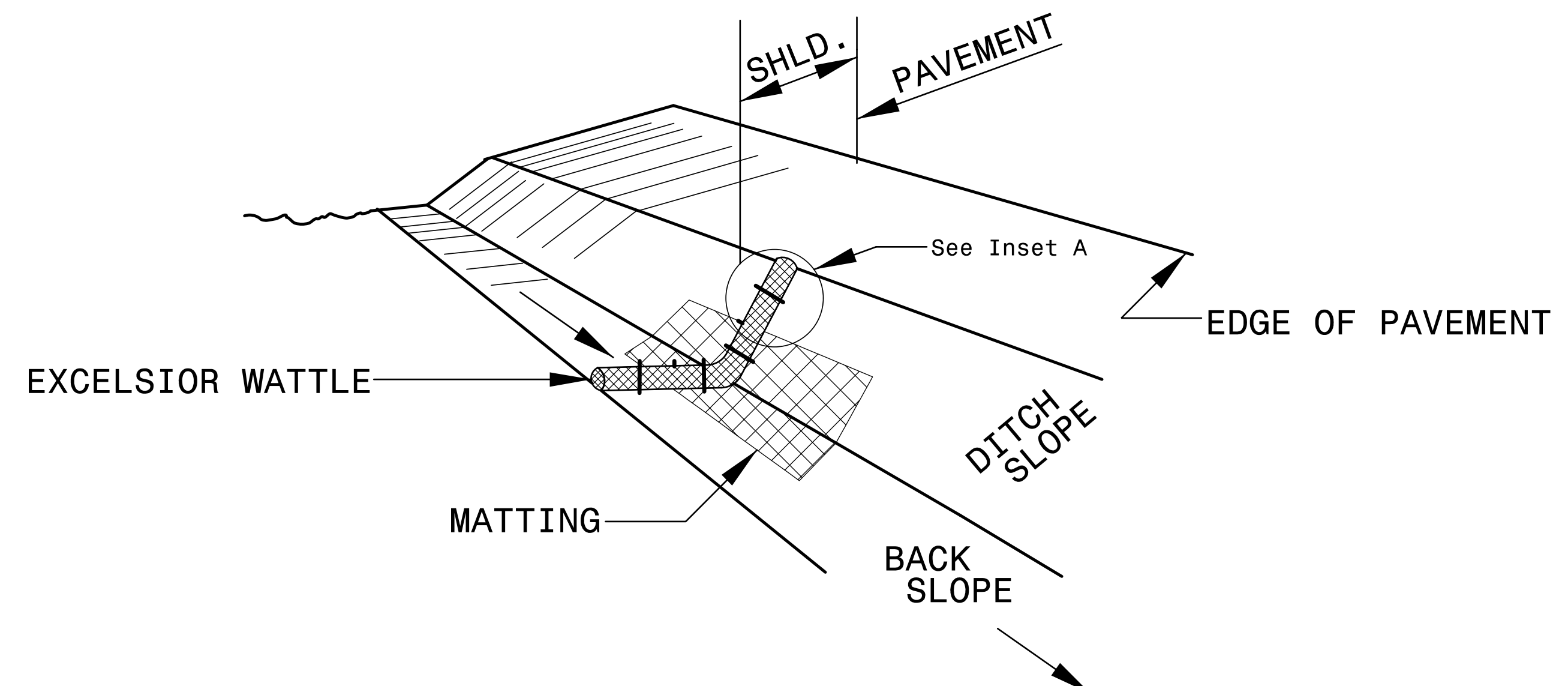
Roadway Standard Drawings

The following roadway english standards as appear in "Roadway Standard Drawings"- Roadway Design Unit - N. C. Department of Transportation - Raleigh, N. C., dated January 2012 and the latest revision thereto are applicable to this project and by reference hereby are considered a part of these plans.

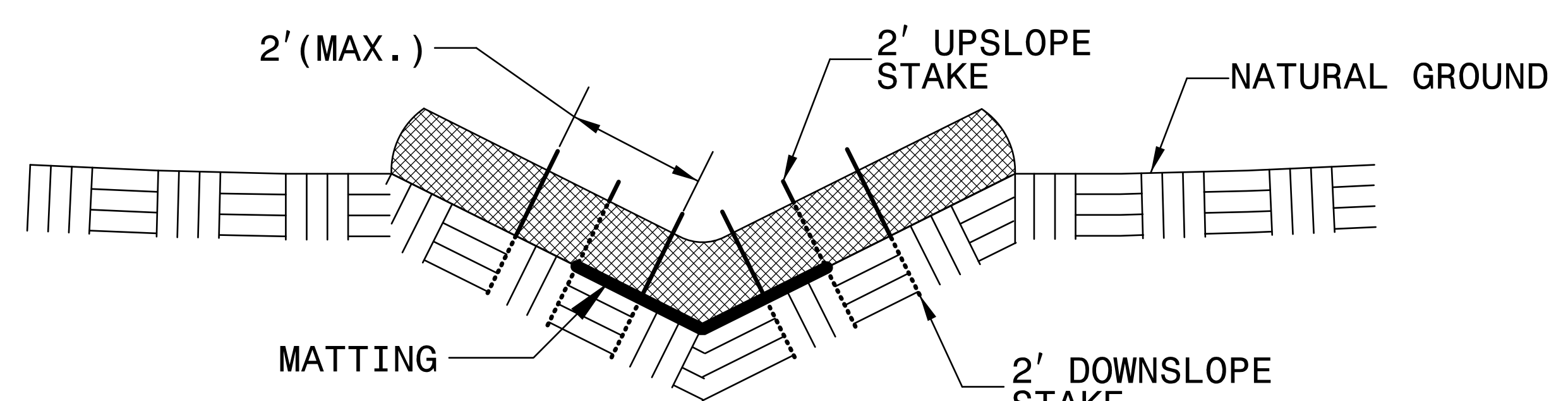
1604.01 Railroad Erosion Control Detail	1632.01 Rock Inlet Sediment Trap Type A
1605.01 Temporary Silt Fence	1632.02 Rock Inlet Sediment Trap Type B
1606.01 Special Sediment Control Fence	1632.03 Rock Inlet Sediment Trap Type C
1607.01 Gravel Construction Entrance	1633.01 Temporary Rock Silt Check Type A
1622.01 Temporary Berms and Slope Drains	1633.02 Temporary Rock Silt Check Type B
1630.01 Riser Basin	1634.01 Temporary Rock Sediment Dam Type A
1630.02 Silt Basin Type B	1634.02 Temporary Rock Sediment Dam Type B
1630.03 Temporary Silt Ditch	1635.01 Rock Pipe Inlet Sediment Trap Type A
1630.04 Stilling Basin	1635.02 Rock Pipe Inlet Sediment Trap Type B
1630.05 Temporary Diversion	1640.01 Coir Fiber Baffle
1630.06 Special Stilling Basin	1645.01 Temporary Stream Crossing
1631.01 Matting Installation	

PROJECT REFERENCE NO. 17BP12.R.10	SHEET NO. EC-2
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

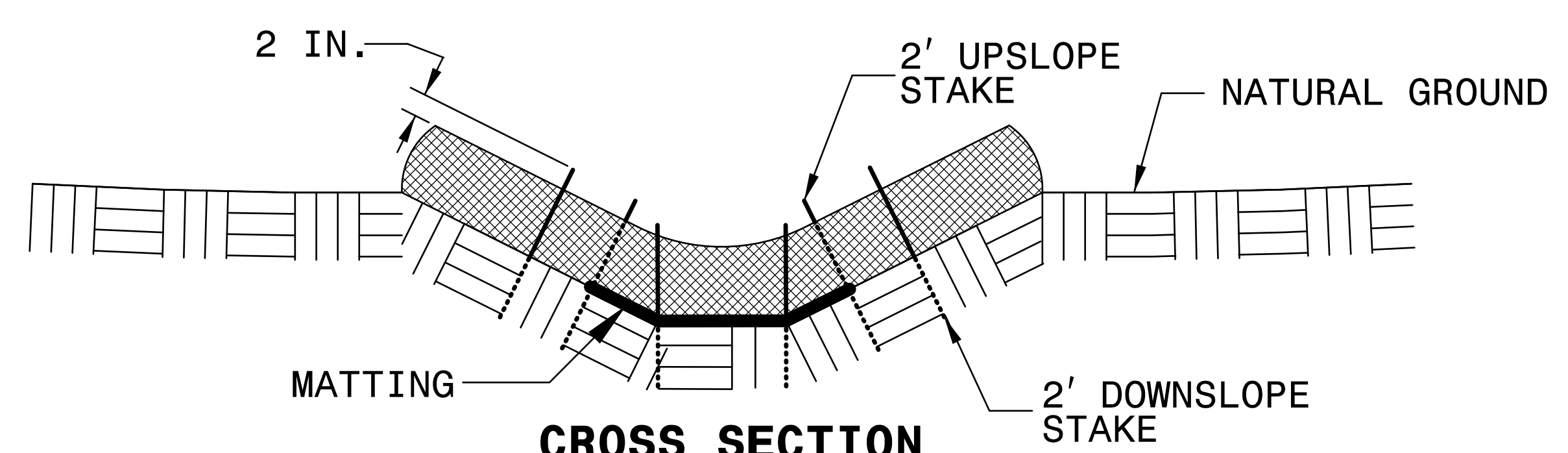
# WATTLE DETAIL



**ISOMETRIC VIEW**



**CROSS SECTION VEE DITCH**



**CROSS SECTION TRAPEZOIDAL DITCH**

**NOTES:**

USE MINIMUM 12 IN. DIAMETER EXCELSIOR WATTLE.

USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

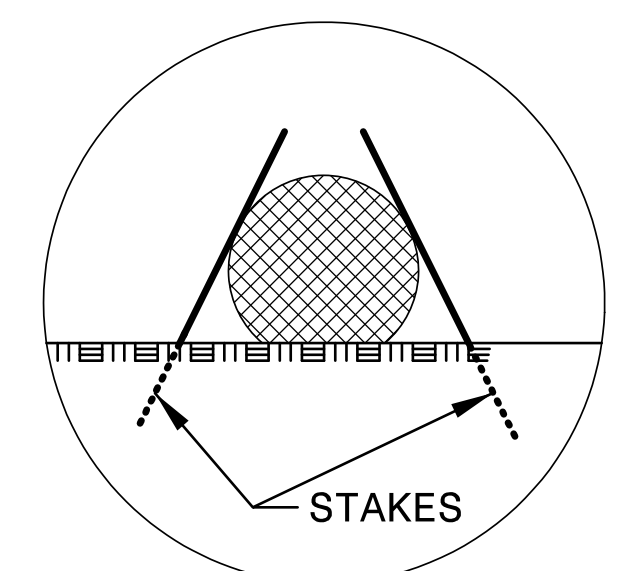
ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.

INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.

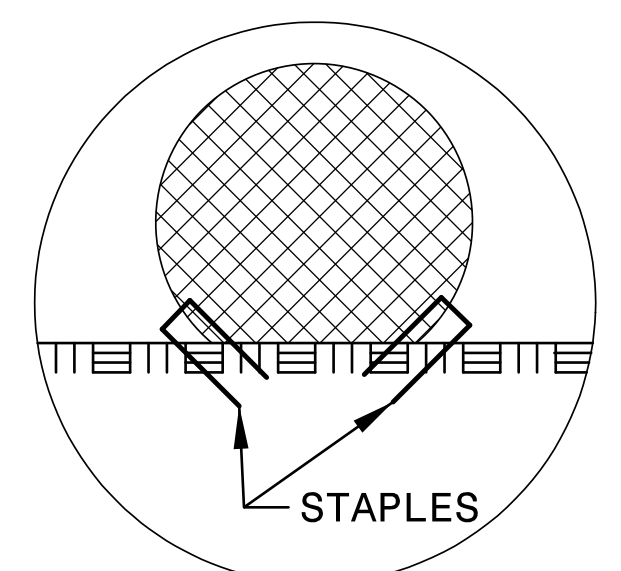
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.

INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

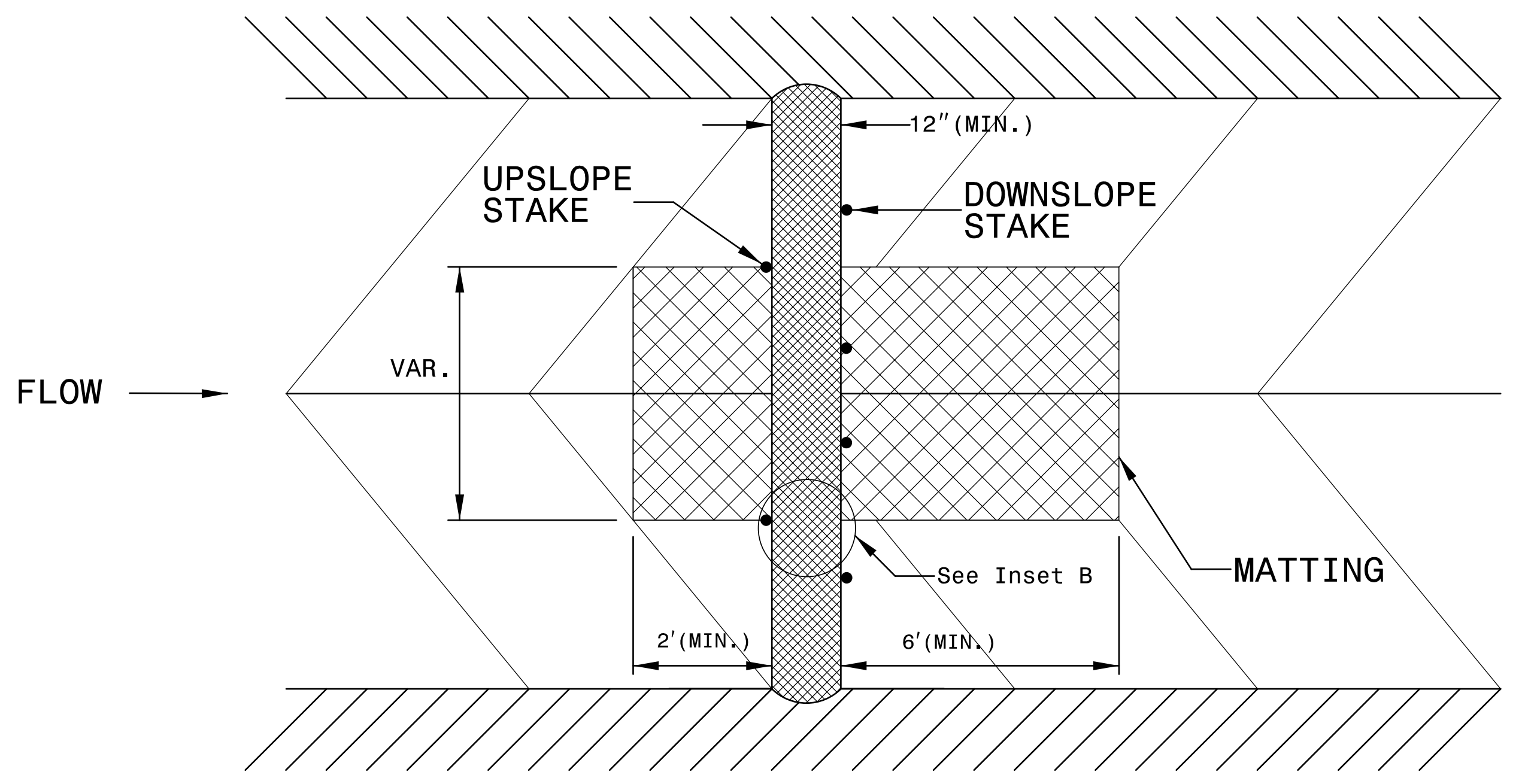
INSTALL MATTING IN ACCORDANCE WITH SECTION 1631 OF THE STANDARD SPECIFICATIONS.



**INSET A**



**INSET B**

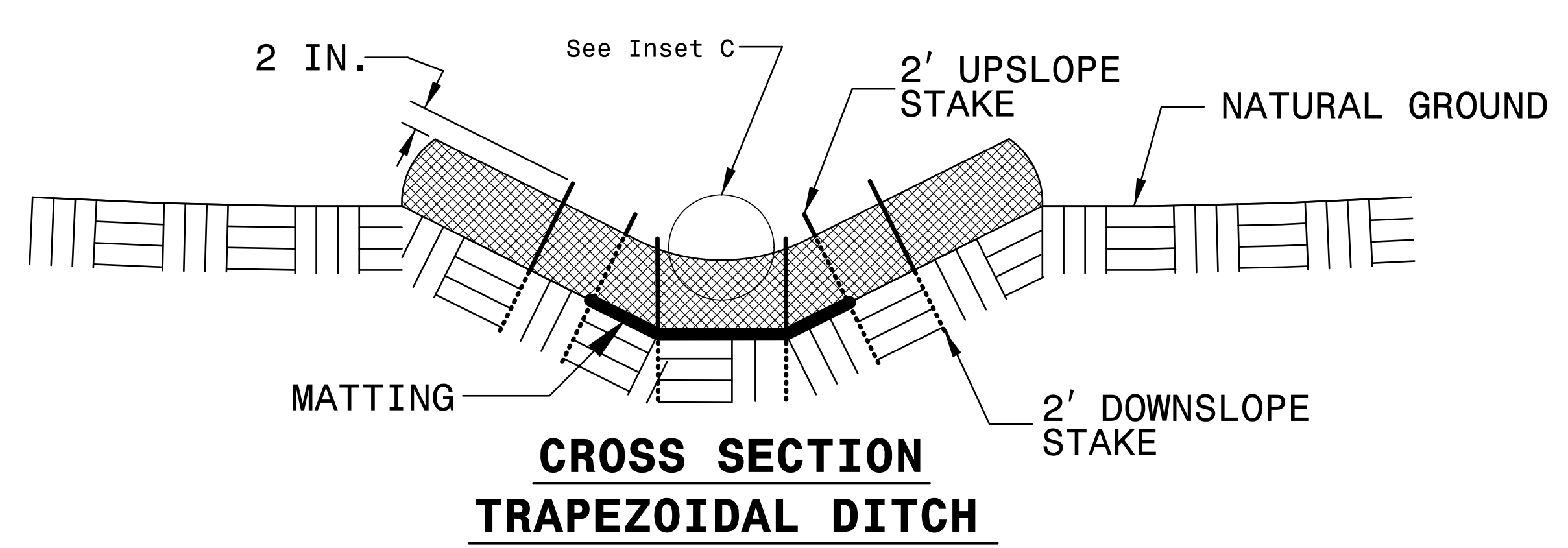
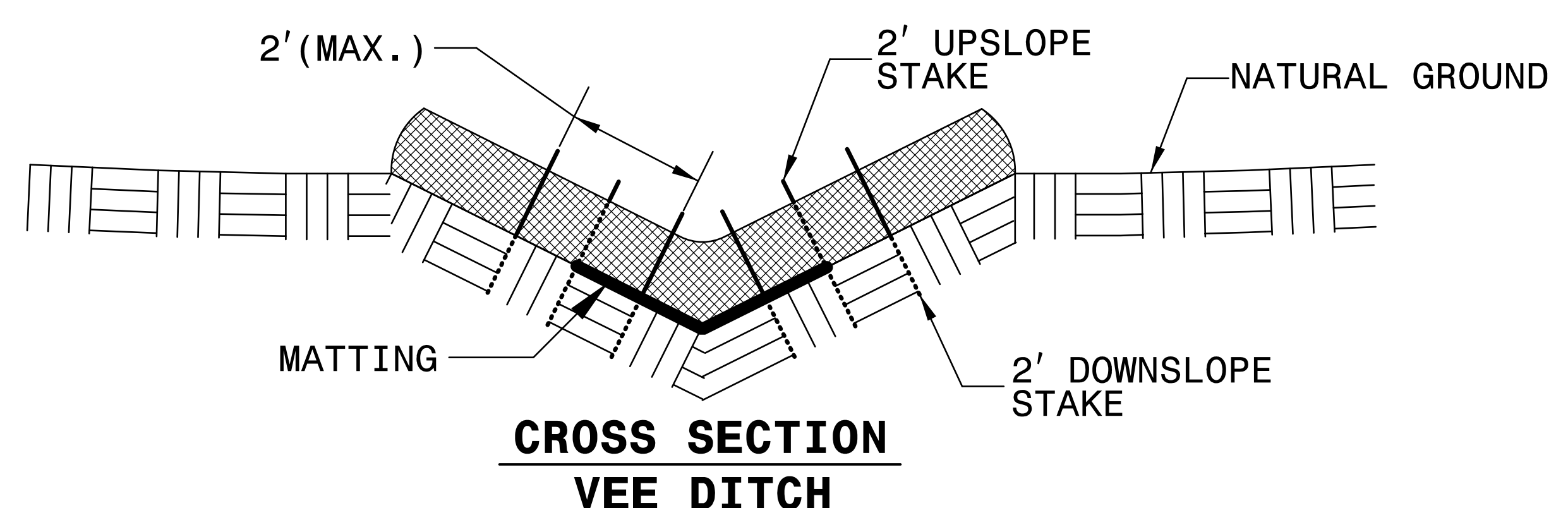
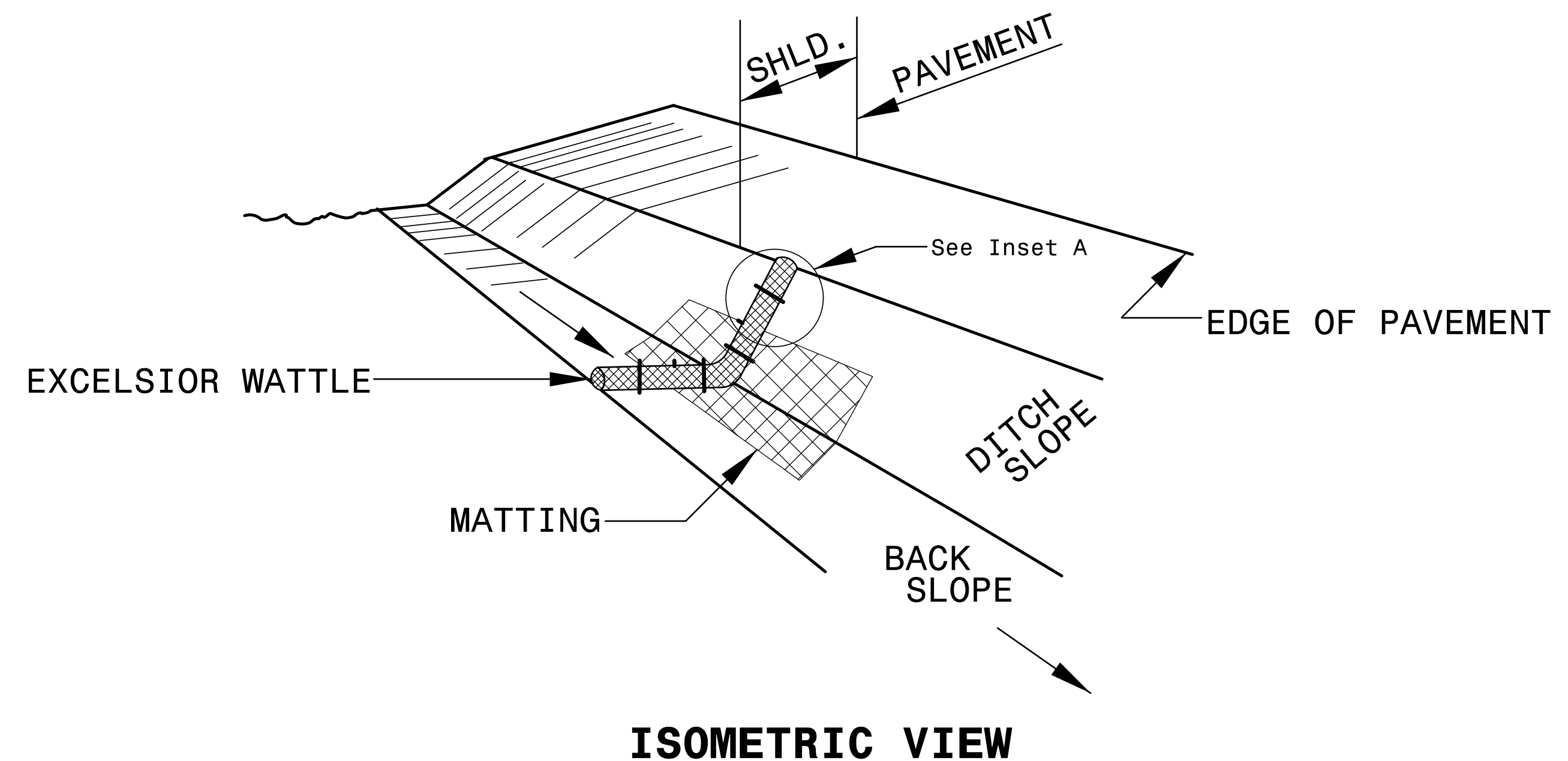


**TOP VIEW**



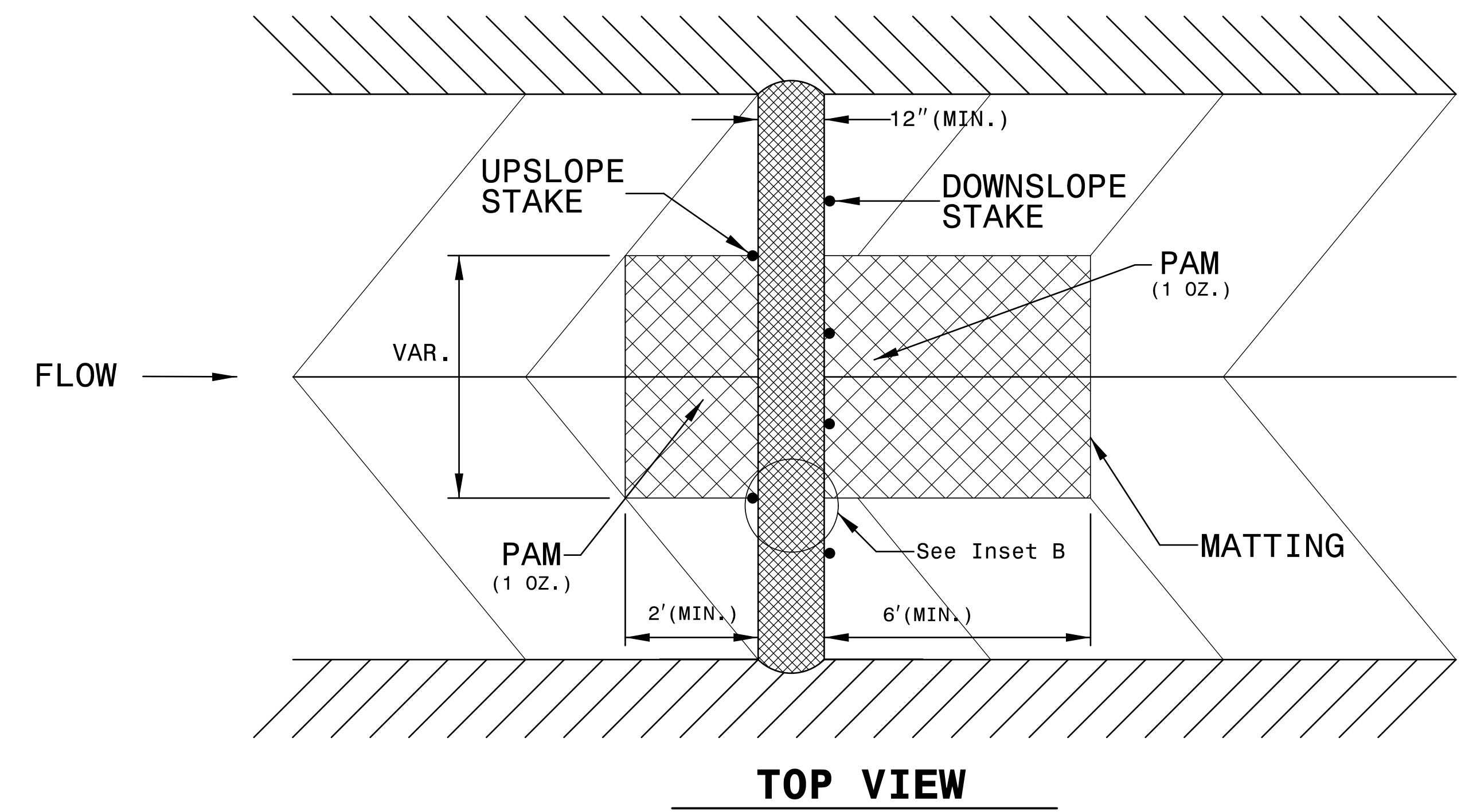
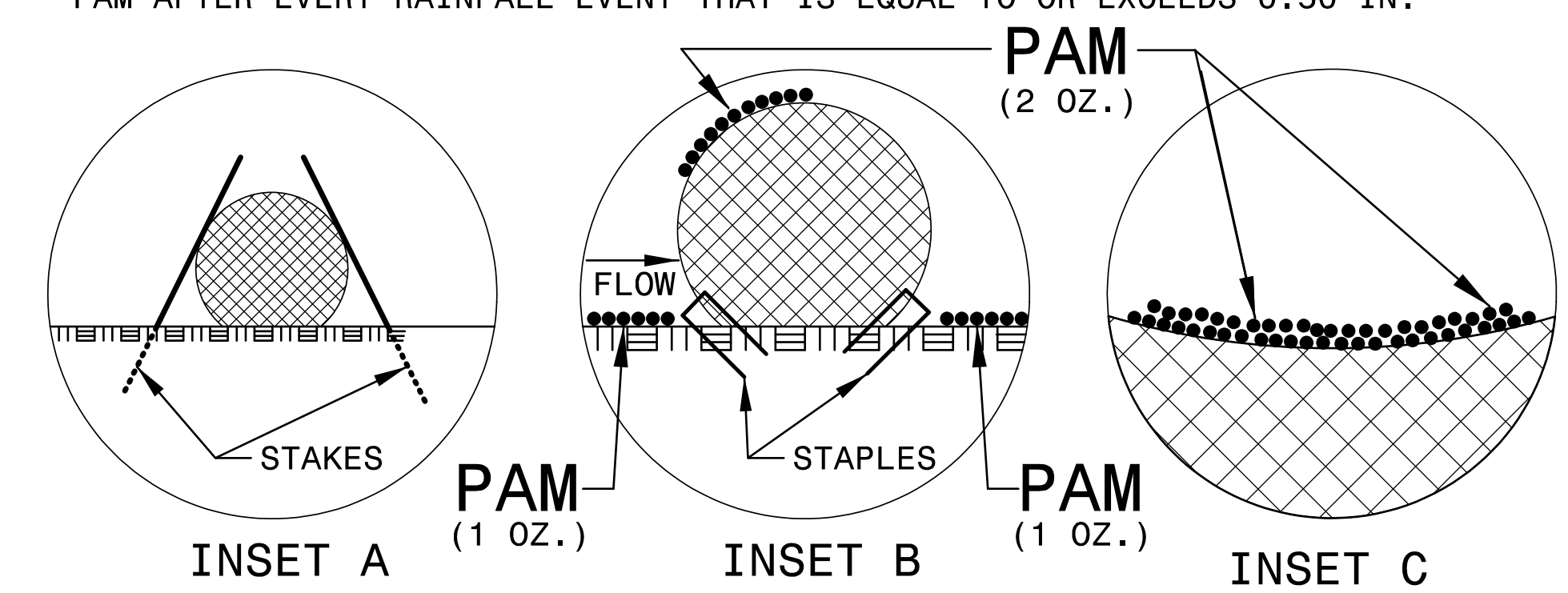
PROJECT REFERENCE NO. 17BP12.R.10	SHEET NO. EC-2A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

# WATTLE WITH POLYACRYLAMIDE (PAM) DETAIL



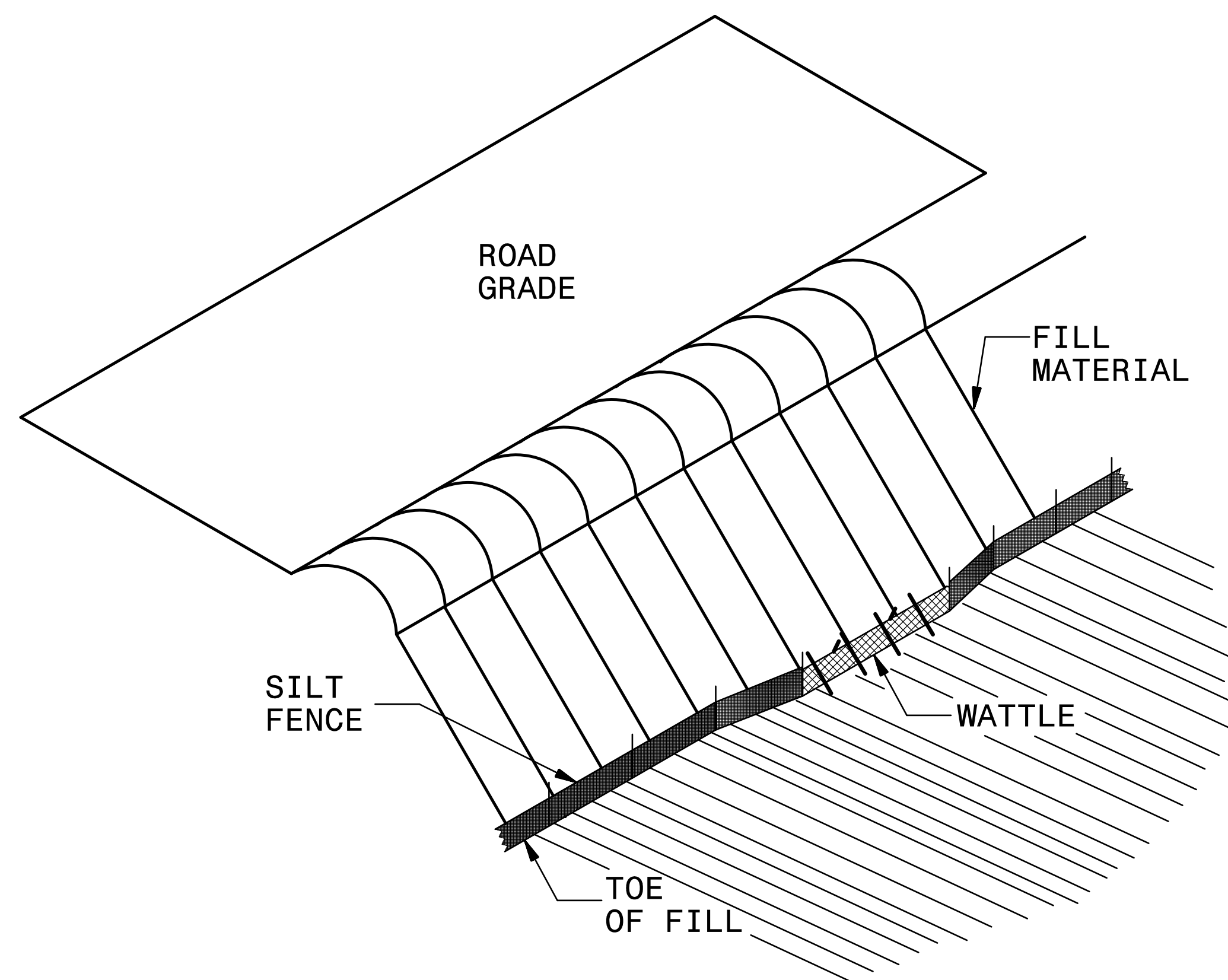
**NOTES:**

- USE MINIMUM 12 IN. DIAMETER EXCELSIOR WATTLE.
- USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.
- ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.
- INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.
- PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.
- INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.
- INSTALL MATTING IN ACCORDANCE WITH SECTION 1631 OF THE STANDARD SPECIFICATIONS.
- 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 WATTLE.
- INITIALLY APPLY 2 OUNCES OF ANIONIC OR NEUTRALLY CHARGED PAM OVER WATTLE WHERE WATER WILL FLOW AND 1 OUNCE OF PAM ON MATTING ON EACH SIDE OF WATTLE. REAPPLY PAM AFTER EVERY RAINFALL EVENT THAT IS EQUAL TO OR EXCEEDS 0.50 IN.

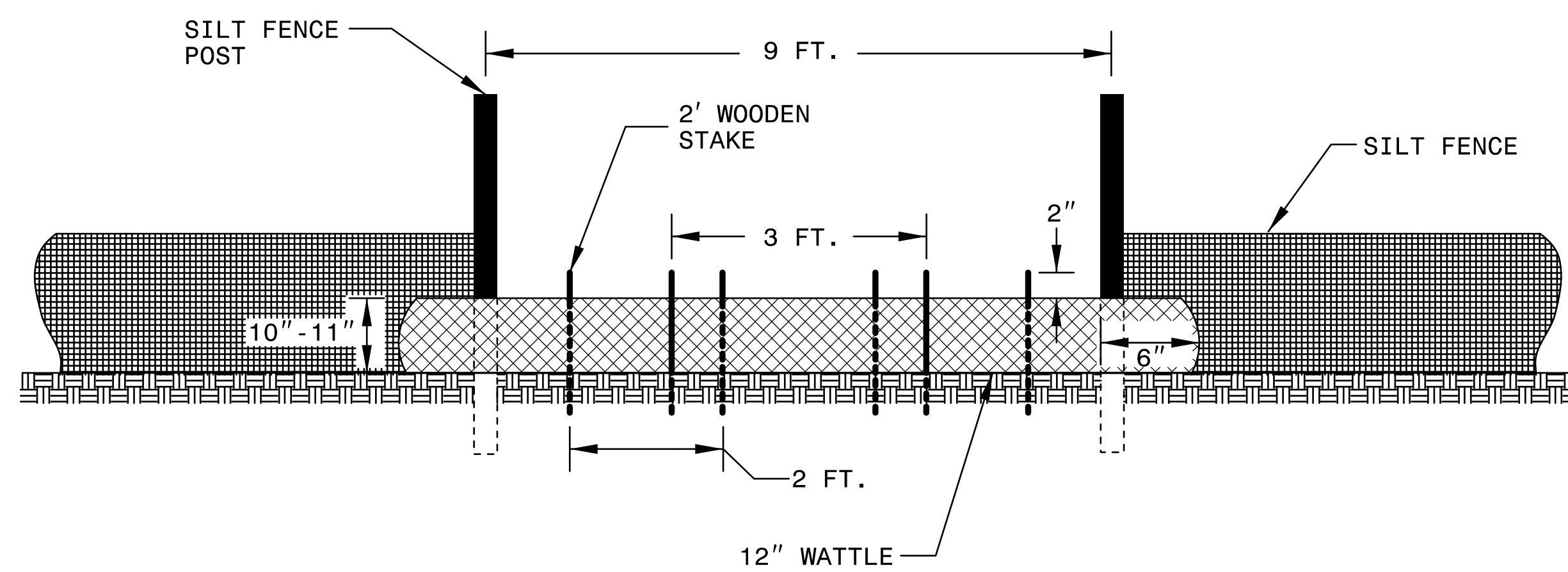


PROJECT REFERENCE NO. 17BP-J2.R.10	SHEET NO. EC-2B
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

# SILT FENCE WATTLE BREAK DETAIL



**ISOMETRIC VIEW**

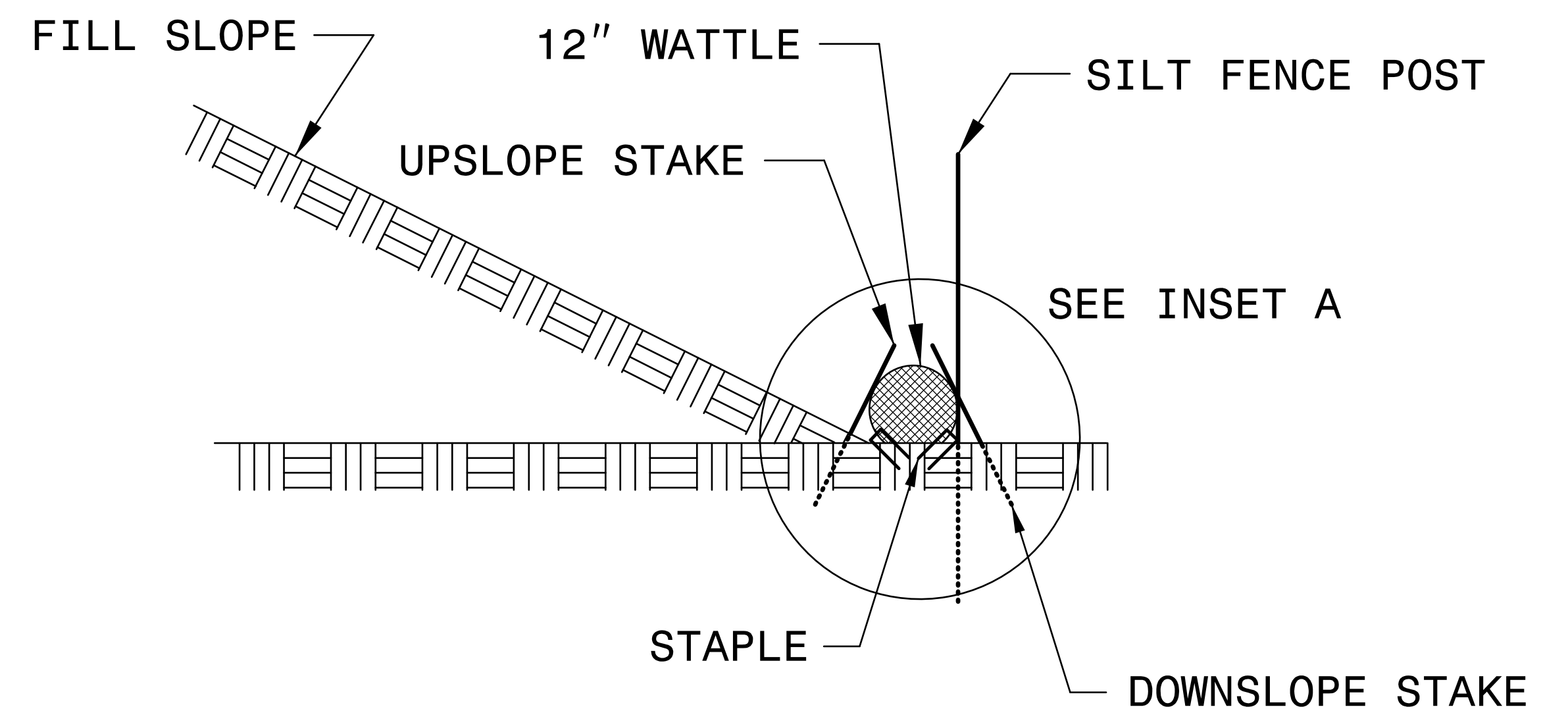
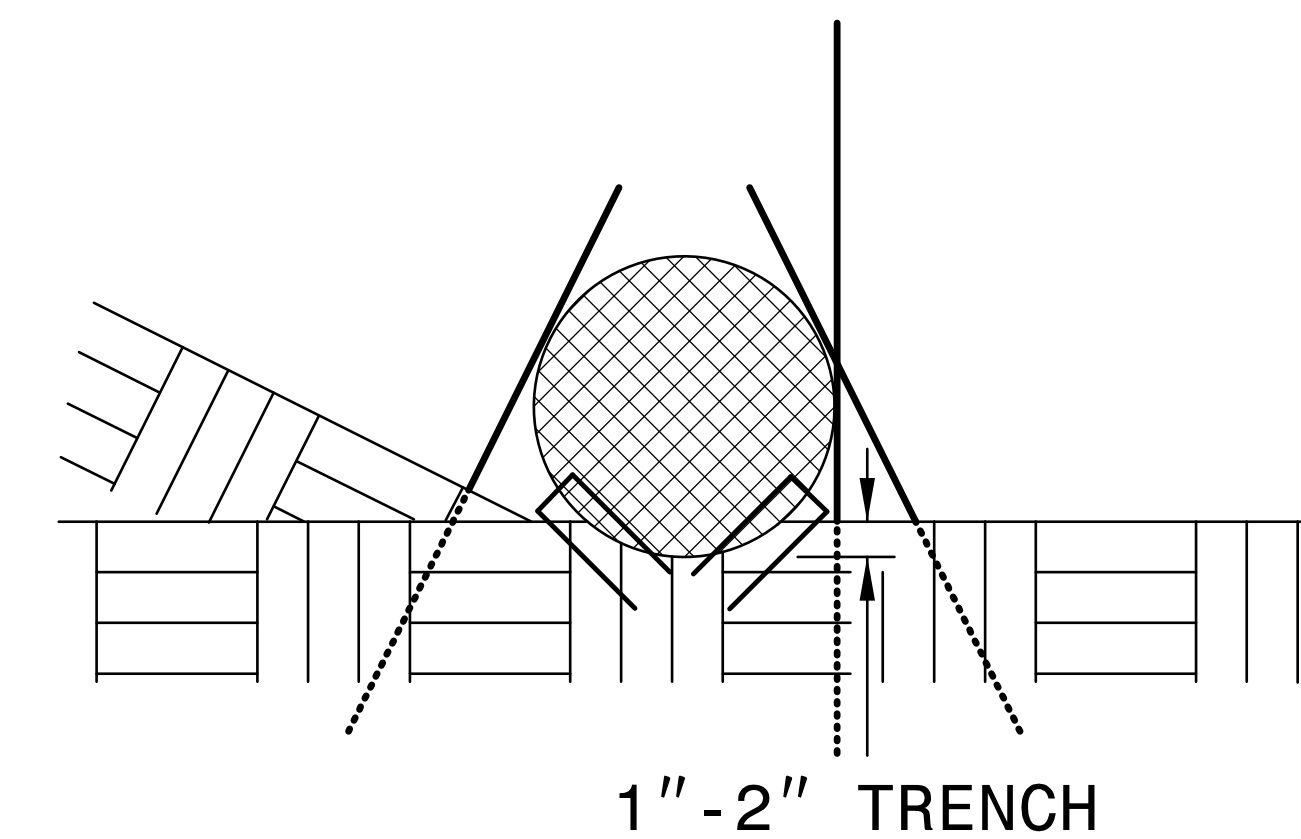


**VIEW FROM SLOPE**

**NOTES:**

- USE MINIMUM 12 IN. DIAMETER EXCELSIOR WATTLE AND LENGTH OF 10 FT.
- EXCAVATE A 1 TO 2 INCH TRENCH FOR WATTLE TO BE PLACED.
- DO NOT PLACE WATTLE ON TOE OF SLOPE.
- USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.
- INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO GROUND.
- PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.
- INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.
- WATTLE INSTALLATION CAN BE ON OUTSIDE OF THE SILT FENCE AS DIRECTED.
- INSTALL TEMPORARY SILT FENCE IN ACCORDANCE WITH SECTION 1605 OF THE STANDARD SPECIFICATIONS.

**INSET A**



**SIDE VIEW**

DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

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PROJECT REFERENCE NO. <i>17BP12.R10</i>	SHEET NO. <i>EC-3</i>
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

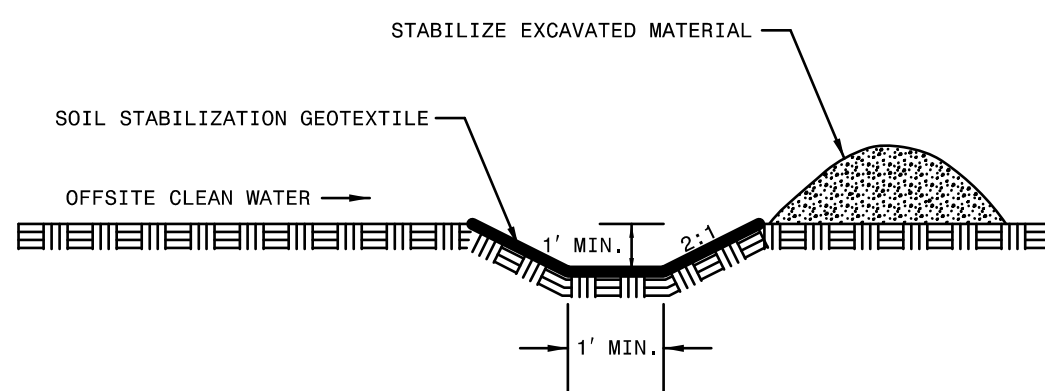
# ***SOIL STABILIZATION TIMEFRAMES***

<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.

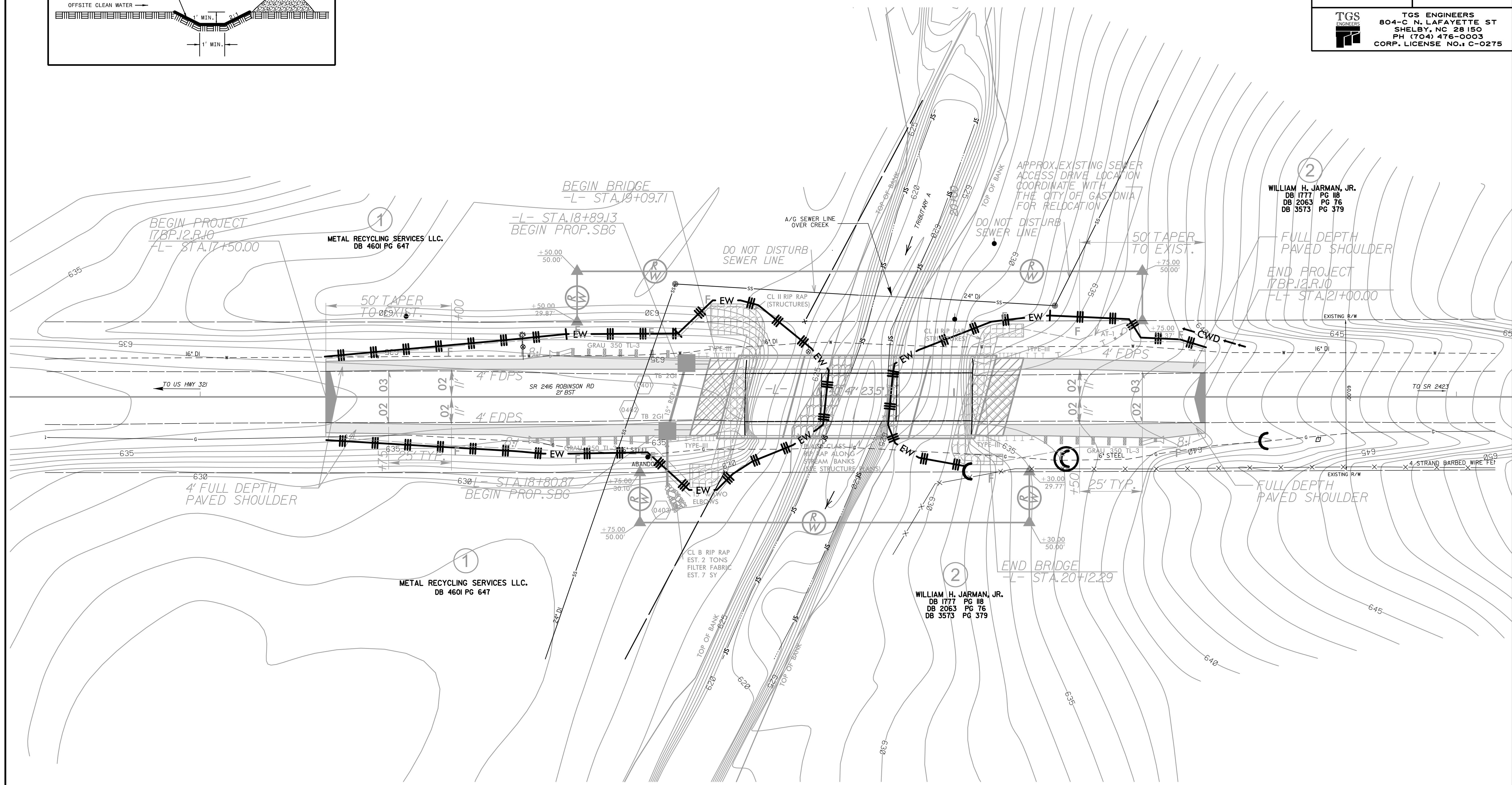
# CLEAN WATER DIVERSION

--- CWD --- CWD --- CWD --- CWD --- CWD --- CWD --- CWD --- CWD ---

(Not to Scale)



PROJECT REFERENCE NO. <b>17BP12.R.10</b>		SHEET NO. <b>EC-4/CONST.4</b>	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
		<b>TGS ENGINEERS</b> 804-C N. LAFAYETTE ST SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275	




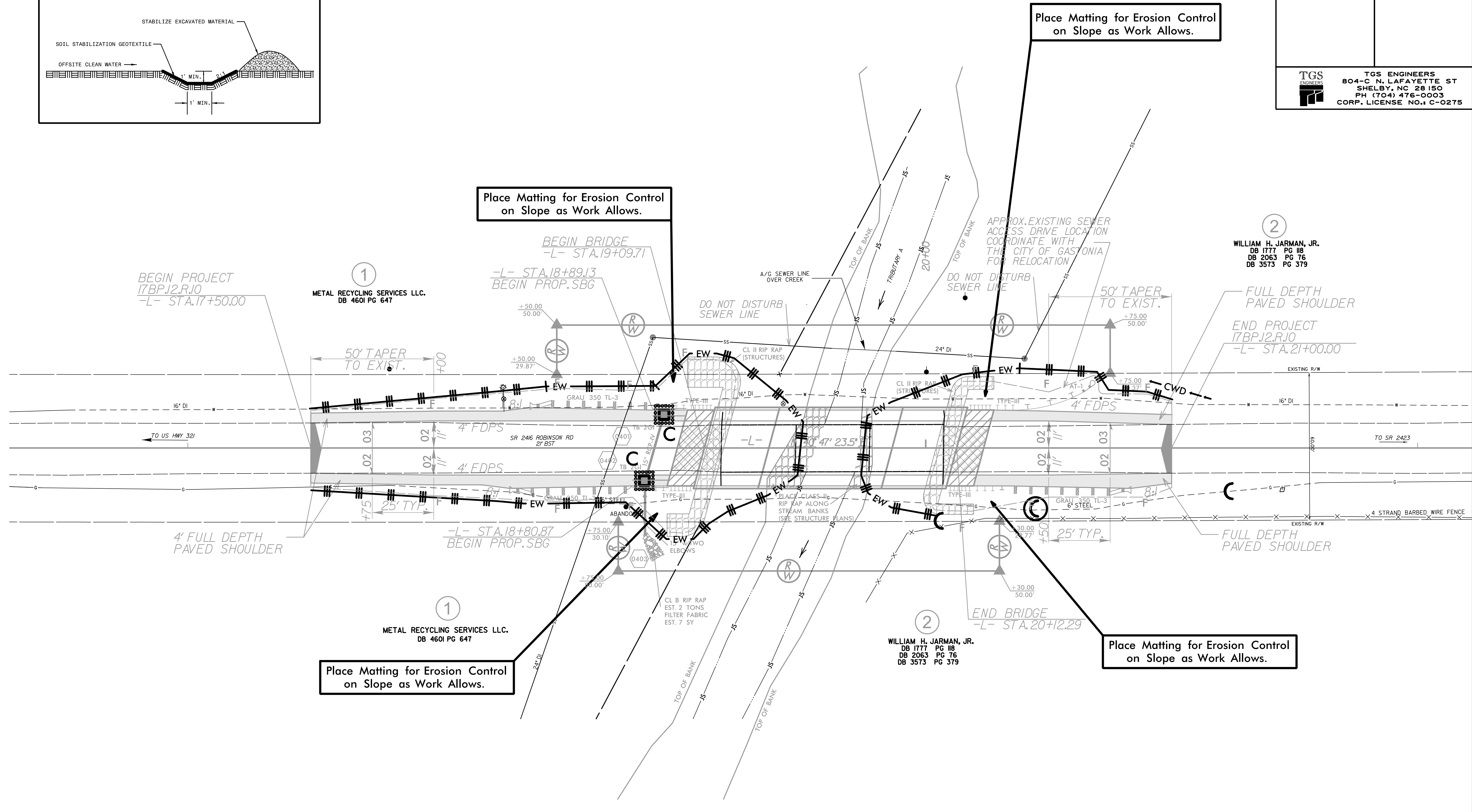
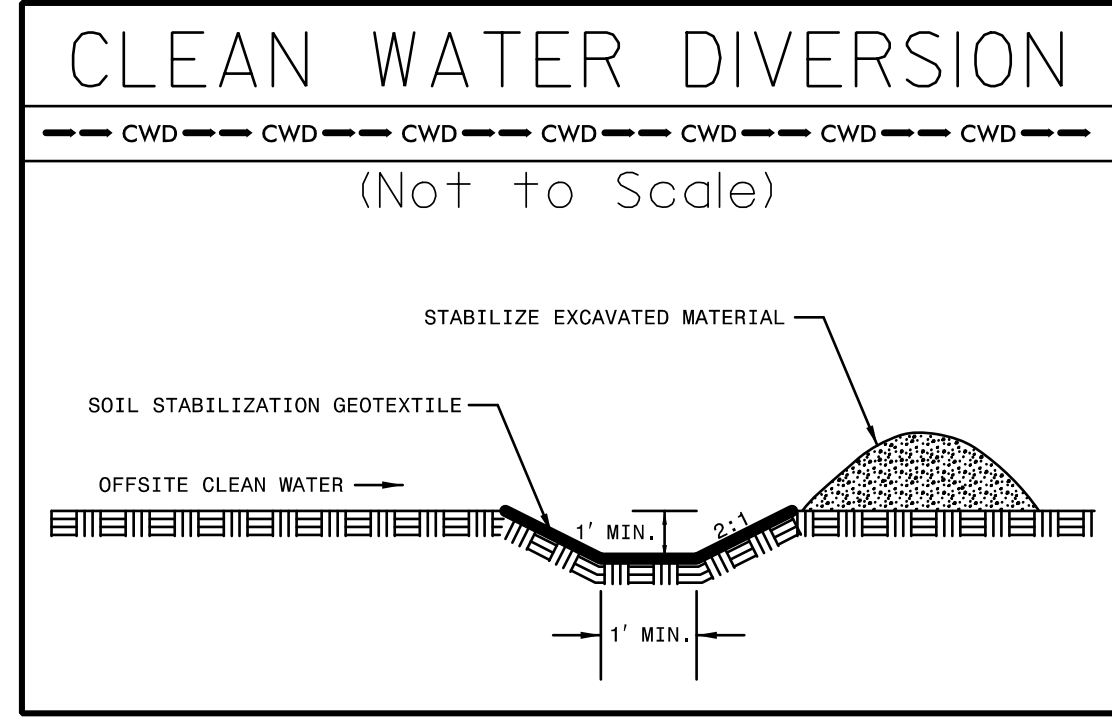
1  
METAL RECYCLING SERVICES LLC.  
DB 4601 PG 647

1  
METAL RECYCLING SERVICES LLC.  
DB 4601 PG 647

2  
WILLIAM H. JARMAN, JR.  
DB 1777 PG 118  
DB 2063 PG 76  
DB 3573 PG 379

2  
WILLIAM H. JARMAN, JR.  
DB 1777 PG 118  
DB 2063 PG 76  
DB 3573 PG 379

PROJECT REFERENCE NO. 17BP12.R10	SHEET NO. EC-5/CONST.4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
 <b>TGS ENGINEERS</b> 804-C N. LAFAYETTE ST SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275	



Place Matting for Erosion Control on Slope as Work Allows.

Place Matting for Erosion Control on Slope as Work Allows.

Place Matting for Erosion Control on Slope as Work Allows.

Place Matting for Erosion Control on Slope as Work Allows.

2  
 WILLIAM H. JARMAN, JR.  
 DB 1777 PG 18  
 DB 2063 PG 76  
 DB 3573 PG 379

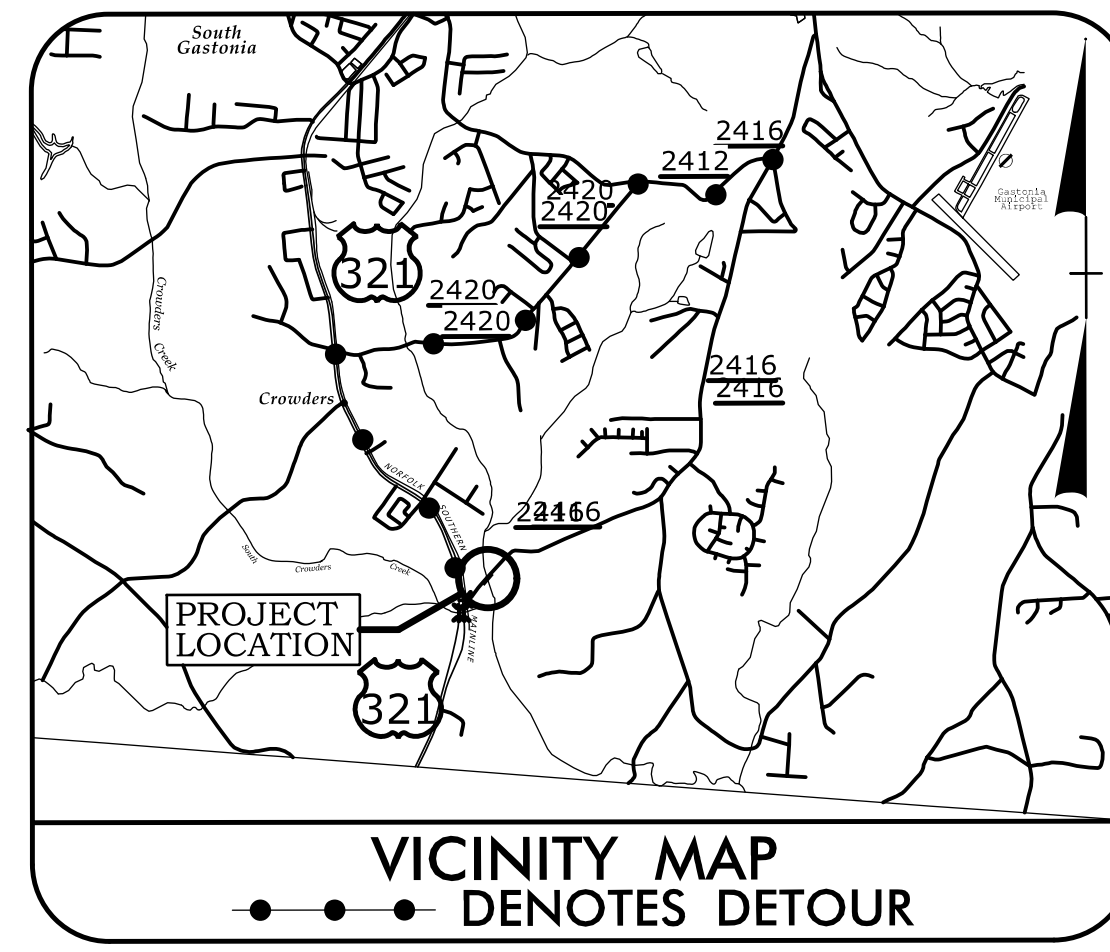
1  
 METAL RECYCLING SERVICES LLC.  
 DB 4601 PG 647

2  
 WILLIAM H. JARMAN, JR.  
 DB 1777 PG 18  
 DB 2063 PG 76  
 DB 3573 PG 379

09/08/99

TIP NO. 17BP.12.R.10

CONTRACT: DL00039



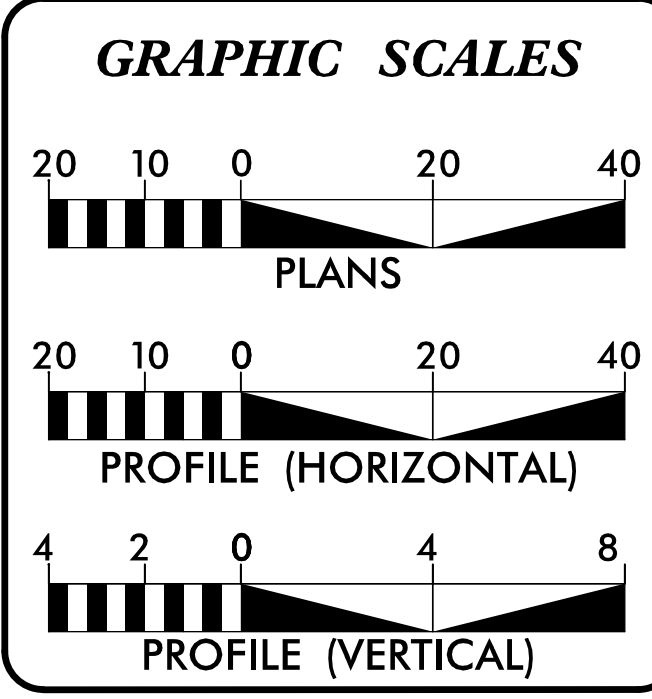
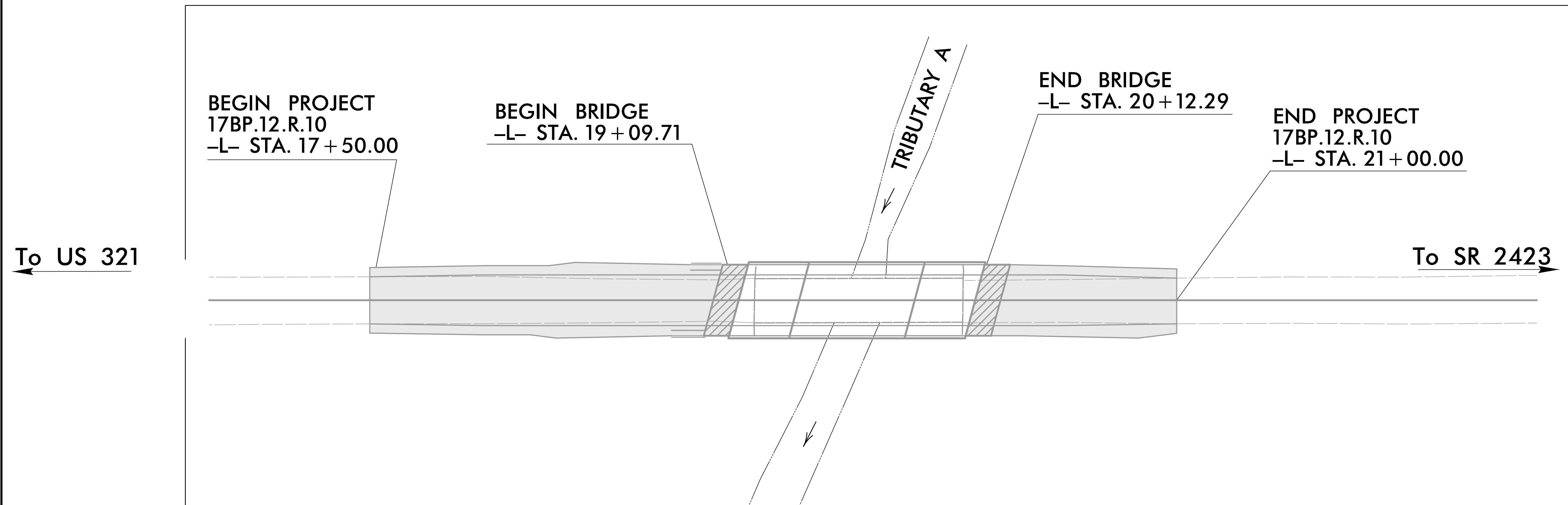
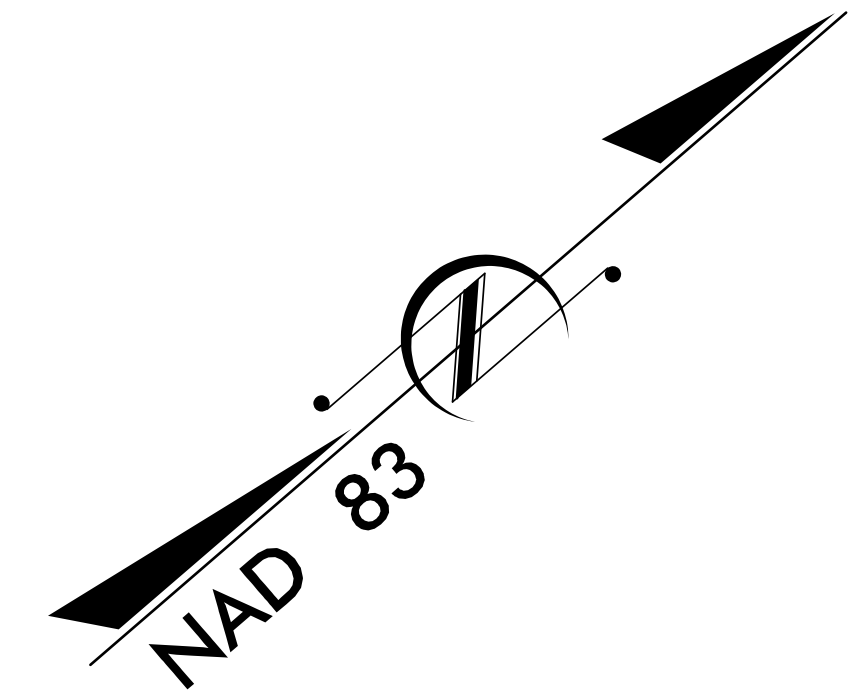
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

T.I.P. NO.	SHEET NO.
17BP.12.R.10	UC-1

**UTILITY CONSTRUCTION PLANS**  
**GASTON COUNTY**

LOCATION: BRIDGE #350028 ON SR 2416 (ROBINSON RD)  
OVER UNNAMED TRIBUTARY A

TYPE OF WORK: UTILITY CONSTRUCTION

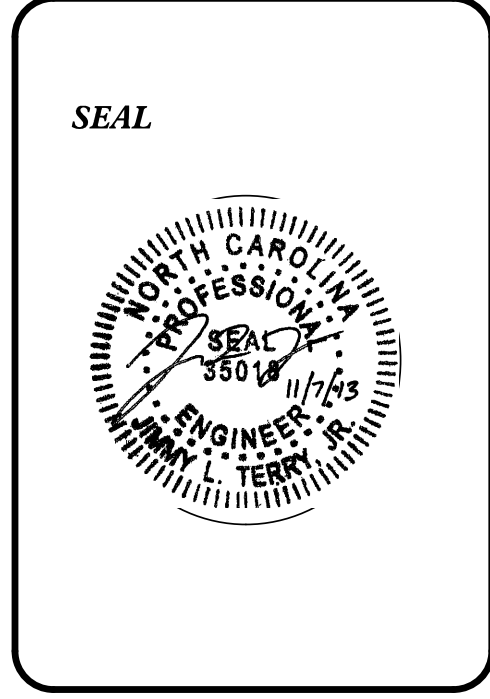


**INDEX OF SHEETS**

SHEET NO.	DESCRIPTION
UC-1	TITLE SHEET
UC-2	SYMBOLGY SHEET
UC-3	STANDARD DETAIL SHEET
UC-4	UTILITY CONSTRUCTION PLANPROFILE SHEET

**WATER AND SEWER OWNERS ON PROJECT**

(1) WATER AND SANITARY SEWER - CITY OF GASTONIA & TWO RIVERS UTILITIES



PLANS PREPARED BY:

**TGS ENGINEERS**  
804-C N. LAFAYETTE ST  
SHELBY, NC 28150  
PH (704) 476-0003

2012 STANDARD SPECIFICATIONS

PLANS PREPARED FOR:

**JIMMY TERRY, PE**  
PROJECT ENGINEER

**ANDREW COCHRANE, EI**  
DESIGN ENGINEER

\$\$\$\$\$SYTIME\$\$\$\$\$  
\$\$\$\$\$DCN\$\$\$\$\$  
\$\$\$\$\$USERNAME\$\$\$\$\$

# STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

## UTILITIES PLAN SHEET SYMBOLS

### PROPOSED WATER SYMBOLS

Water Line (Sized as Shown) .....	
11¼ Degree Bend .....	
22½ Degree Bend .....	
45 Degree Bend .....	
90 Degree Bend .....	
Plug .....	
Tee .....	
Cross .....	
Reducer .....	
Gate Valve .....	
Butterfly Valve .....	
Tapping Valve .....	
Line Stop .....	
Line Stop with Bypass .....	
Blow Off .....	
Fire Hydrant .....	
Relocate Fire Hydrant .....	
Remove Fire Hydrant .....	REM FH
Water Meter .....	
Relocate Water Meter .....	
Remove Water Meter .....	REM WM
Water Pump Station .....	
RPZ Backflow Preventer .....	
DCV Backflow Preventer .....	
Relocate RPZ Backflow Preventer .....	
Relocate DCV Backflow Preventer .....	

### PROPOSED SEWER SYMBOLS

Gravity Sewer Line (Sized as Shown) .....	
Force Main Sewer Line (Sized as Shown) .....	
Manhole (Sized per Note) .....	
Sewer Pump Station .....	

### PROPOSED MISCELLANEOUS UTILITIES SYMBOLS

Power Pole .....	
Telephone Pole .....	
Joint Use Pole .....	
Telephone Pedestal .....	
Utility Line by Others (Type as Shown) .....	
Trenchless Installation .....	
Encasement by Open Cut .....	
Encasement .....	

Thrust Block .....	
Air Release Valve .....	
Utility Vault .....	
Concrete Pier .....	
Steel Pier .....	
Plan Note .....	
Pay Item Note .....	

NOTE  
PAY ITEM

### EXISTING UTILITIES SYMBOLS

Power Pole .....		*Underground Power Line .....	
Telephone Pole .....		*Underground Telephone Cable .....	
Joint Use Pole .....		*Underground Telephone Conduit .....	
Utility Pole .....		*Underground Fiber Optics Telephone Cable .....	
Utility Pole with Base .....		*Underground TV Cable .....	
H-Frame Pole .....		*Underground Fiber Optics TV Cable .....	
Power Transmission Line Tower .....		*Underground Gas Pipeline .....	
Water Manhole .....		Aboveground Gas Pipeline .....	A/G Gas
Power Manhole .....		*Underground Water Line .....	
Telephone Manhole .....		Aboveground Water Line .....	A/G Water
Sanitary Sewer Manhole .....		*Underground Gravity Sanitary Sewer Line .....	
Hand Hole for Cable .....		Aboveground Gravity Sanitary Sewer Line .....	A/G Sanitary Sewer
Power Transformer .....		*Underground SS Forced Main Line .....	
Telephone Pedestal .....		Underground Unknown Utility Line .....	
CATV Pedestal .....		SUE Test Hole .....	
Gas Valve .....		Water Meter .....	
Gas Meter .....		Water Valve .....	
Located Miscellaneous Utility Object .....		Fire Hydrant .....	
Abandoned According to Utility Records ...	AATUR	Sanitary Sewer Cleanout .....	
End of Information .....	E.O.I.		

\*For Existing Utilities  
Utility Line Drawn from Record (Type as Shown) .....

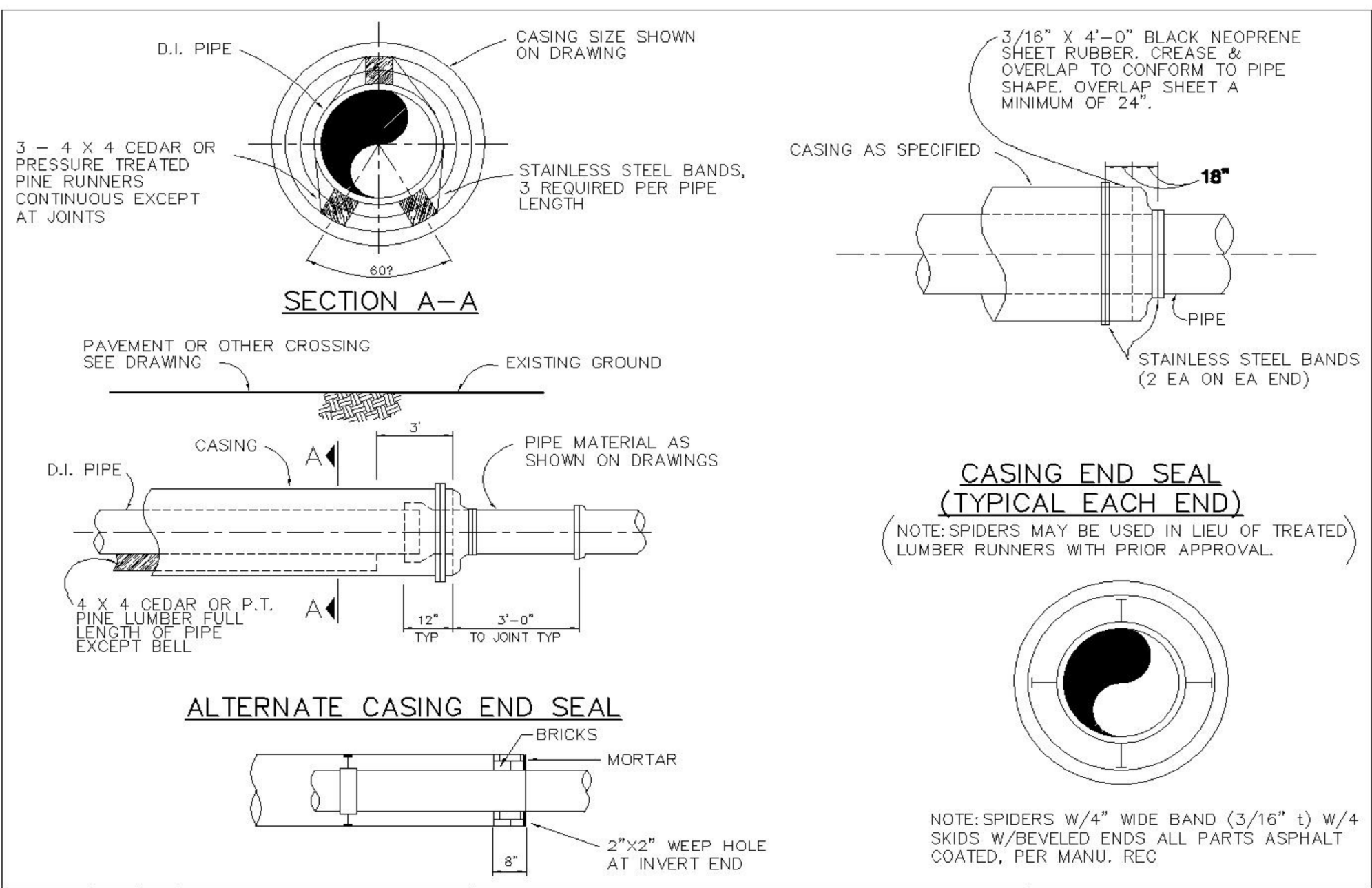
Designated Utility Line (Type as Shown) .....

5/14/99  
REV: 2/1/2012

5/14/99

PROJECT REFERENCE NO. 17BP.12.R.10	SHEET NO. UC-3
DESIGNED BY: AHC	
DRAWN BY: AHC	
CHECKED BY: JLT	
APPROVED BY:	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	

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



REVISED	F.B.	PG.	DATE: NOV. 3, 1988	<b>STANDARD DETAIL</b> <b>DRY BORE AND JACK ENCASUREMENT AND CARRIER DETAIL</b>	OFFICE OF THE CITY ENGINEER GASTONIA, N.C. FILE NO. <b>71B-25</b>
			SCALE: NONE		
			DRAWN BY: DBD		
			CHECKED BY: PNR, FAP		
			CITY ENGINEER: DEC		

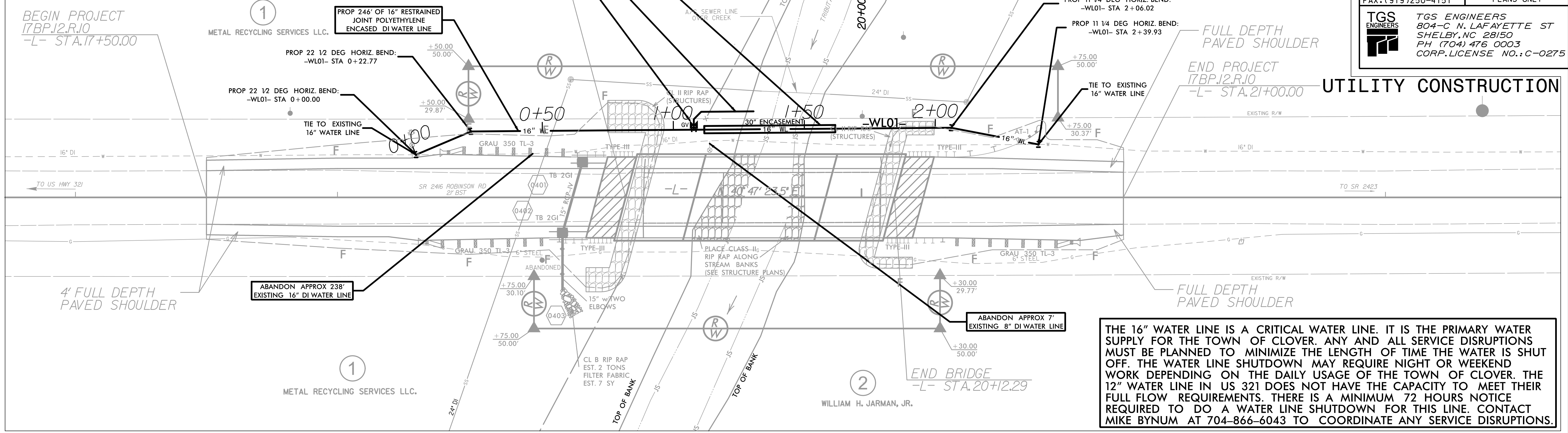
5/14/99



8/17/99

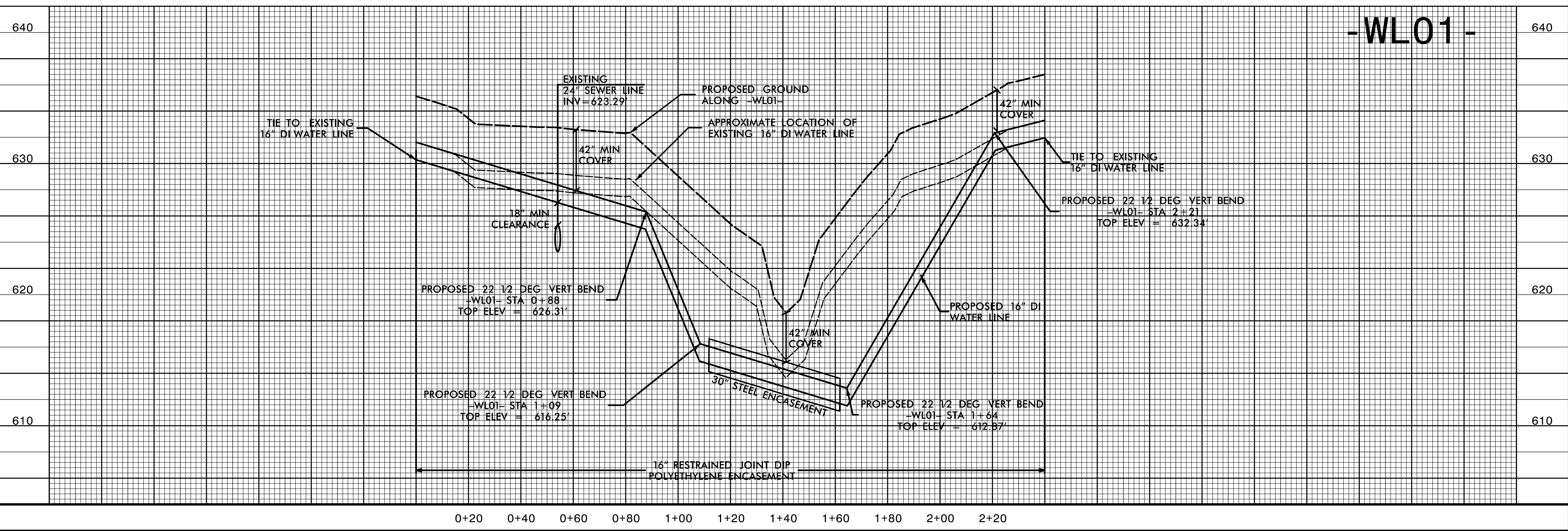
**NOTES:**  
 USE THE TRENCH METHOD OF INSTALLATION FOR THE PROPOSED WATER LINE CONSTRUCTION (UNLESS OTHERWISE NOTED ON PLANS).  
 PROVIDE THRUST RESTRAINT FOR PIPE & APPURTENANCES IN ACCORDANCE WITH THE CITY OF GASTONIA STANDARD SPECIFICATIONS AND DETAILS.  
 ALL WATER LINE CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CITY OF GASTONIA STANDARD SPECIFICATIONS, AND NCDOT STANDARD SPECIFICATIONS SECTION 1500.  
 IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL UTILITIES AND THEIR LOCATIONS AFFECTED BY THE CONSTRUCTION. THE CONTRACTOR SHALL PROTECT ALL UTILITIES DURING CONSTRUCTION IN ACCORDANCE WITH SECTION 105-8 OF THE NCDOT STANDARD SPECIFICATIONS.  
 VALVES FOR ISOLATION ARE LOCATED APPROXIMATELY 890 FEET TO THE SOUTHWEST AT THE INTERSECTION WITH US 321 AND APPROXIMATELY 650 FEET TO THE NORTHEAST AT A FIRE HYDRANT AND SHOULD ONLY BE OPERATED BY TWO RIVERS UTILITIES EMPLOYEES.

PROJECT REFERENCE NO. 17BP.12.R.10	SHEET NO. UC-4
DESIGNED BY: AHC	
DRAWN BY: AHC	
CHECKED BY: JLT	
APPROVED BY:	
REVISED:	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151
TGS ENGINEERS	TGS ENGINEERS 804-C N. LAFAYETTE ST SHELBY, NC 28150 PH: (704) 476 0003 CORP. LICENSE NO.: C-0275



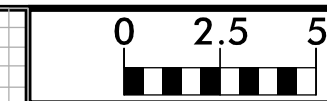
THE 16" WATER LINE IS A CRITICAL WATER LINE. IT IS THE PRIMARY WATER SUPPLY FOR THE TOWN OF CLOVER. ANY AND ALL SERVICE DISRUPTIONS MUST BE PLANNED TO MINIMIZE THE LENGTH OF TIME THE WATER IS SHUT OFF. THE WATER LINE SHUTDOWN MAY REQUIRE NIGHT OR WEEKEND WORK DEPENDING ON THE DAILY USAGE OF THE TOWN OF CLOVER. THE 12" WATER LINE IN US 321 DOES NOT HAVE THE CAPACITY TO MEET THEIR FULL FLOW REQUIREMENTS. THERE IS A MINIMUM 72 HOURS NOTICE REQUIRED TO DO A WATER LINE SHUTDOWN FOR THIS LINE. CONTACT MIKE BYNUM AT 704-866-6043 TO COORDINATE ANY SERVICE DISRUPTIONS.

REVISIONS



CUSTOMER USE ONLY

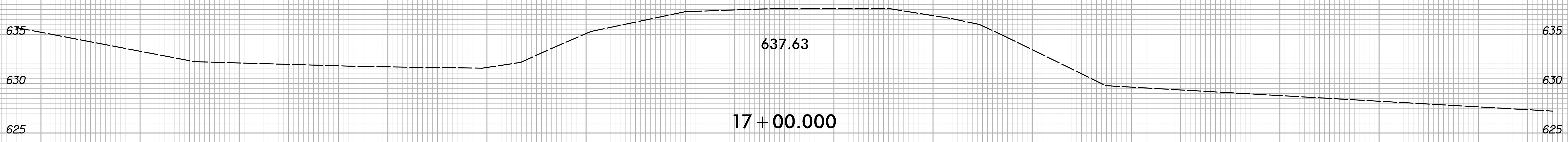
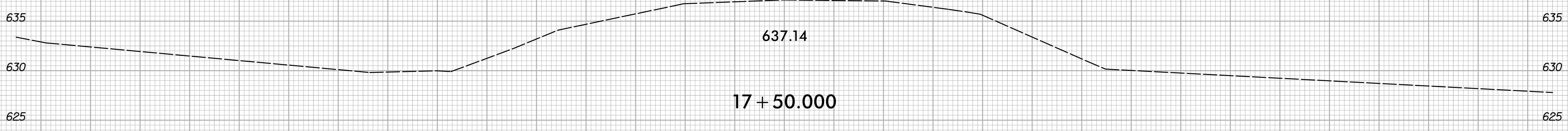
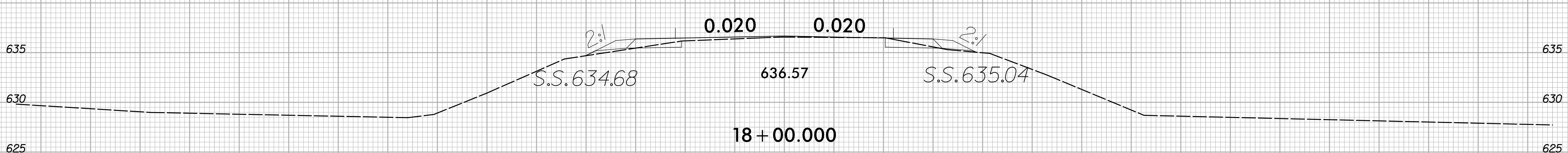
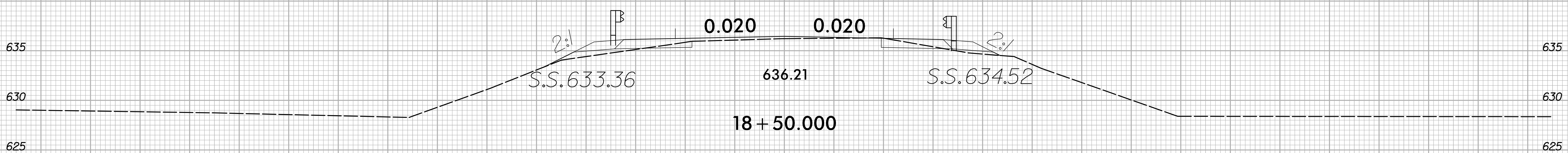
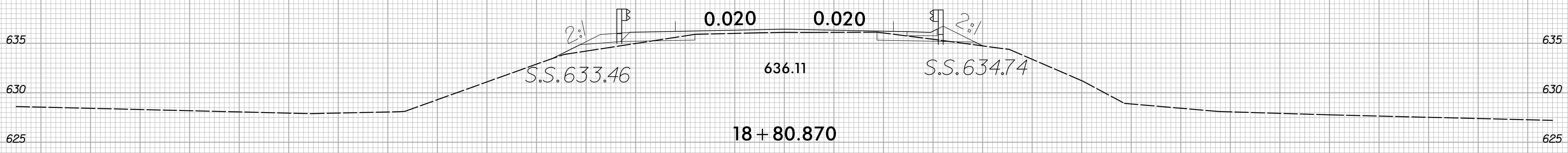
8/23/99



PROJ. REFERENCE NO.  
17BP.12.R.10

SHEET NO.  
X-1

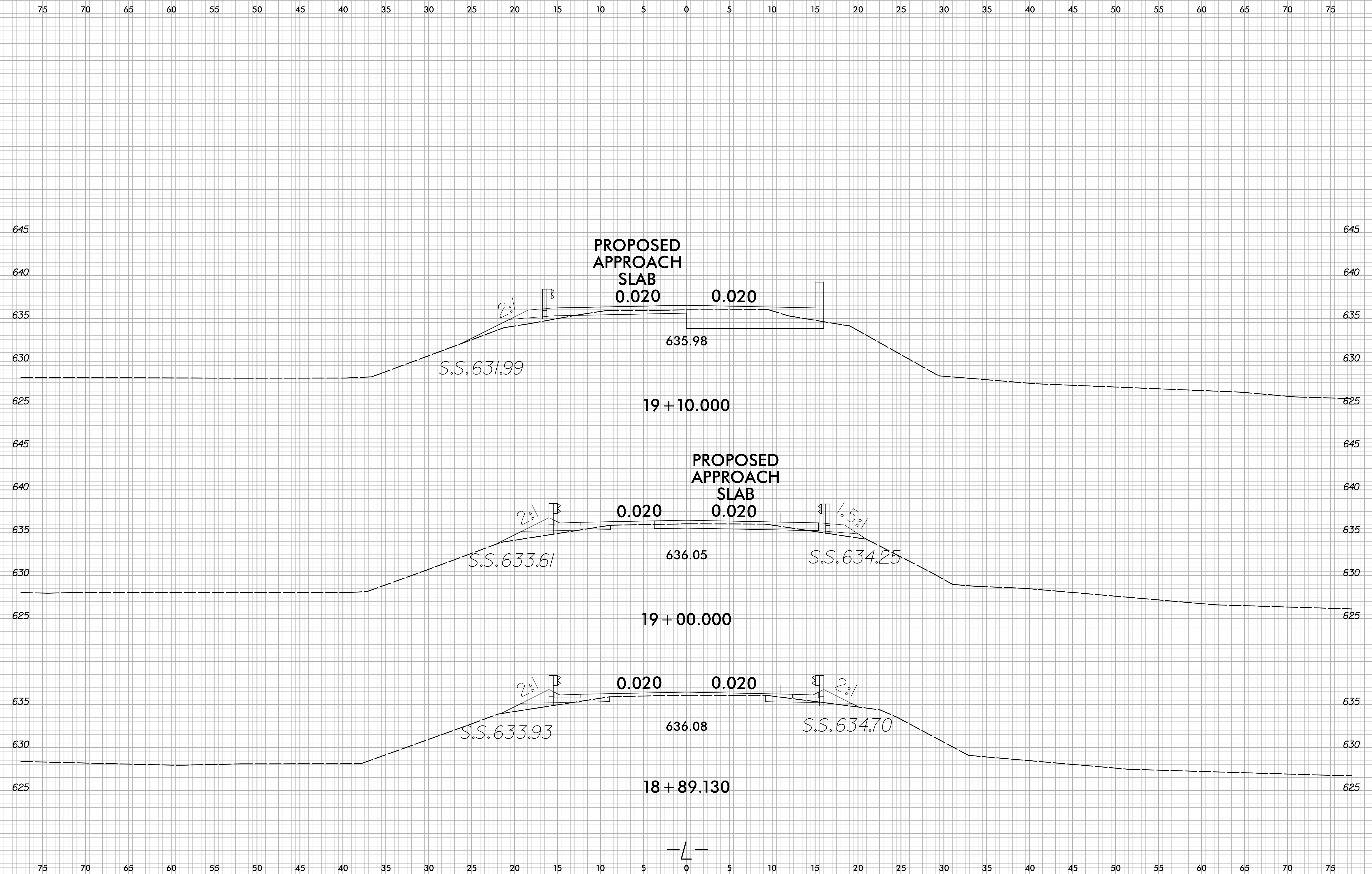
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—/—

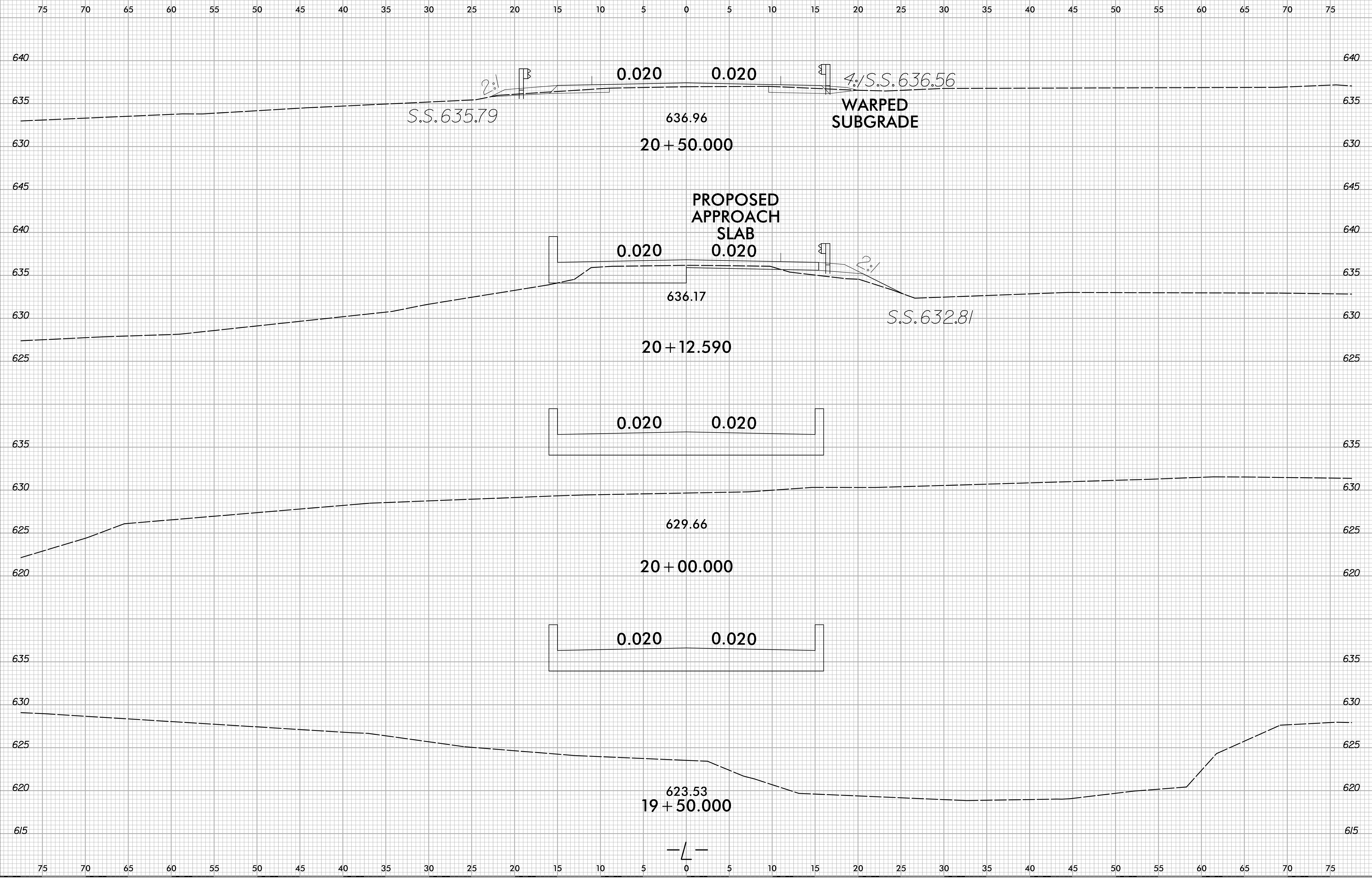
SYTIME  
DGN  
PRIN  
0

8/23/99



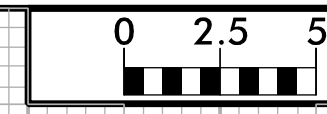
SYSTEM TIME: 08:14:50  
DATE: 8/23/99  
USER: C:\WINDOWS\SYSTEM32\COMMAND.COM

8/23/99



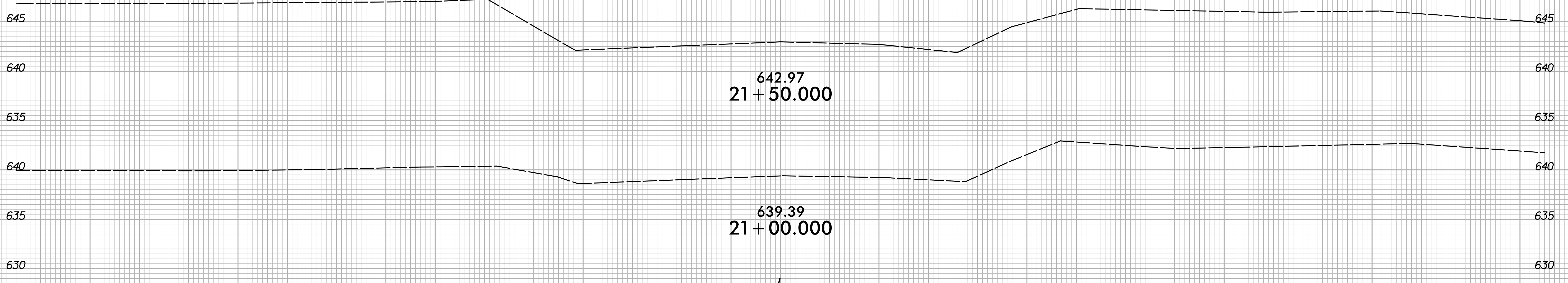
\*\*\*\*\*SYTIME\*\*\*\*\*  
\*\*\*\*\*SHEET NUMBER\*\*\*\*\*

8/23/99



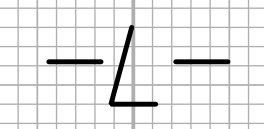
PROJ. REFERENCE NO.	SHEET NO.
17BP.12.R.10	X-4

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



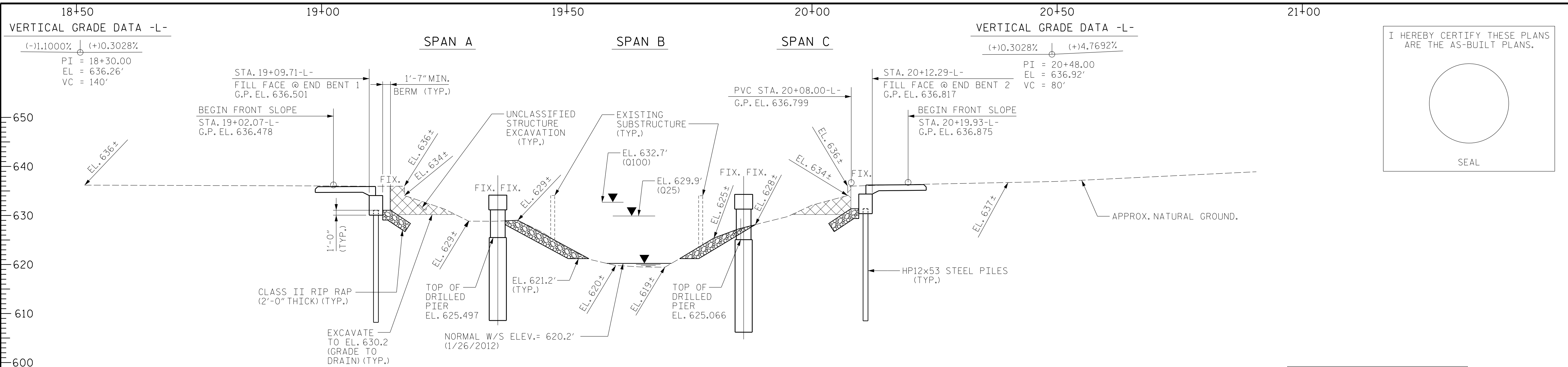
642.97  
21+50.000

639.39  
21+00.000



SYTIME  
DUPLICATE

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



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

SEAL

LOW CHORD ELEVATIONS		
SPAN A	EB1 634.168'	B1 634.247'
SPAN B	B1 634.247'	B2 634.399'
SPAN C	B2 634.399'	EB2 634.483'

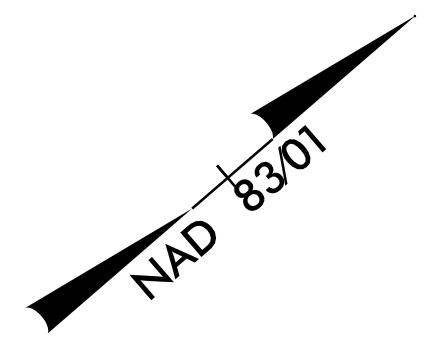
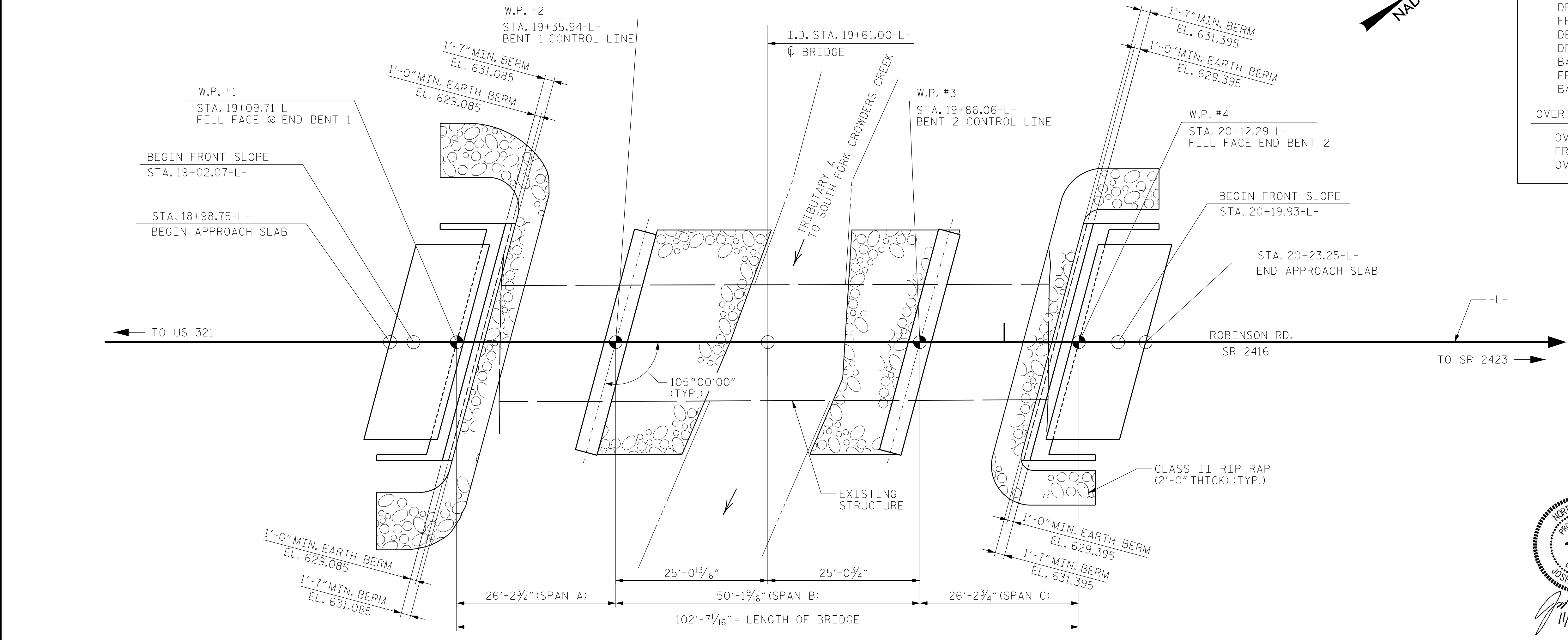
HYDRAULIC DATA:

DESIGN DISCHARGE	1720 CFS
FREQUENCY OF DESIGN FLOOD	25 YRS.
DESIGN HIGH WATER ELEVATION	629.9'
DRAINAGE AREA	6.8 SQ. MI.
BASE DISCHARGE	3416 CFS
FREQUENCY OF BASE DISCHARGE	100 YRS.
BASE HIGH WATER ELEVATION	632.7'

OVERTOPPING FLOOD DATA:

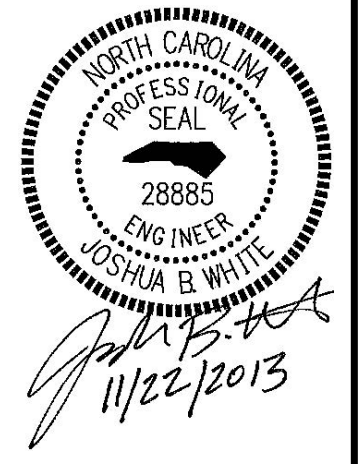
OVERTOPPING DISCHARGE	4630± CFS
FREQUENCY OF OVERTOPPING FLOOD	500+ YRS.
OVERTOPPING FLOOD ELEVATION	636.4' **

\*\* OT ELEVATION REPRESENTS C/L ELEVATION @ SAG STA. 18+69.78-L-



DRAWN BY : RTJ DATE : 2/13  
 CHECKED BY : RDE DATE : 2/13

PREPARED BY  
 TOS ENGINEERS  
 107-A WICA AVENUE  
 MORGANTON, NC 28655



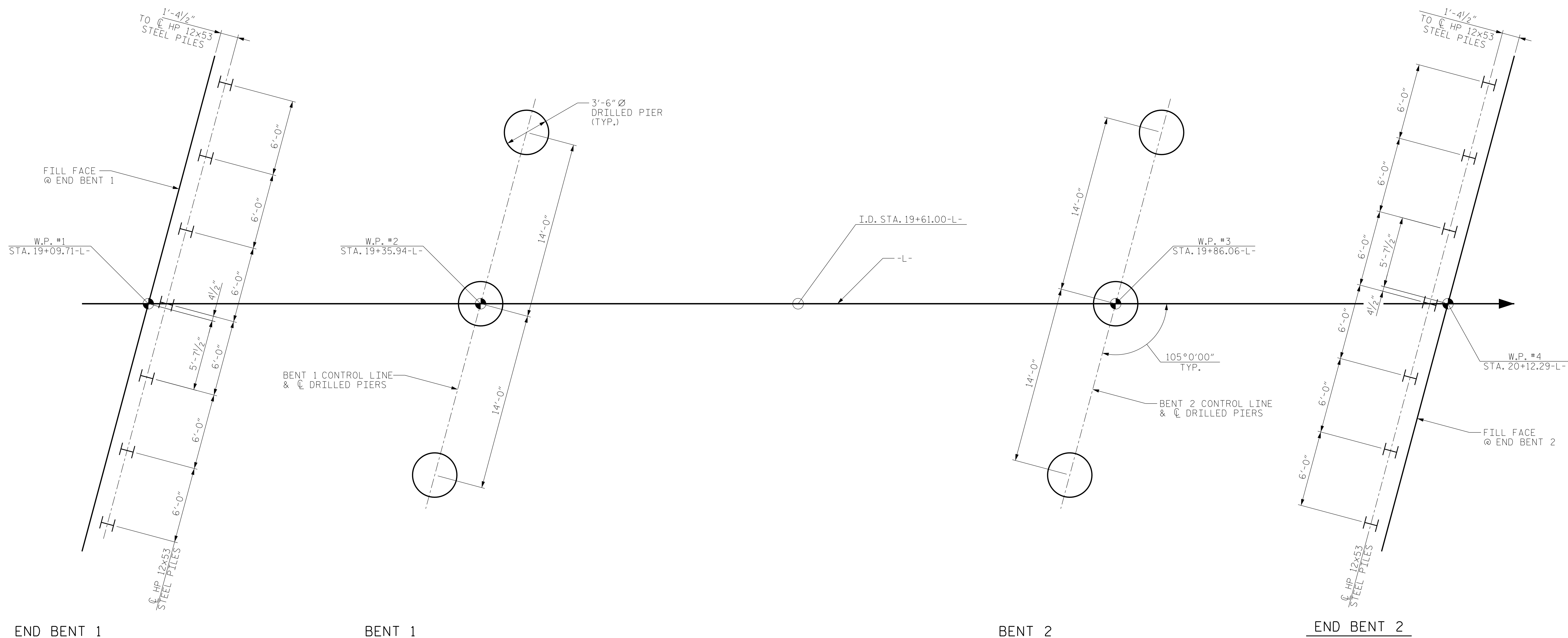
PROJECT NO. 17BP.12.R.10  
 GASTON COUNTY  
 STATION: 19+61.00-L-

SHEET 1 OF 4 REPLACES BR. NO. 350028

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

GENERAL DRAWING  
 FOR BRIDGE OVER TRIBUTARY A  
 TO SOUTH FORK CROWDERS CREEK  
 ON SR 2416 BETWEEN  
 US 321 AND SR 2423

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



### FOUNDATION LAYOUT

ALL PILES ARE HP 12x53 STEEL PILES. DIMENSIONS LOCATING PILES AND DRILLED PIERS ARE SHOWN TO THE CENTERLINE OF PILES AND DRILLED PIERS. ORIENT PILES AS SHOWN.

**NOTES:**

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED. FOR PDA TESTING, SEE SPECIAL PROVISIONS.

PILES FOR END BENTS NO.1 AND 2 SHALL BE DRIVEN TO A MINIMUM BEARING CAPACITY OF 45 TONS EACH.

WHEN DRIVING PILES, THE MAXIMUM BLOW COUNTS SHALL NOT BE EXCEEDED.

THE DRILLED PIERS AT BENTS NO.1 AND 2 HAVE BEEN DESIGNED FOR BOTH SKIN AND TIP BEARING. THE REQUIRED TIP BEARING CAPACITY IS 25 TSF.

THE REQUIRED TIP BEARING AT BENT NO.1 AND 2 SHALL BE VERIFIED.

DRILLED PIERS FOR BENTS NO.1 AND 2 HAVE BEEN DESIGNED FOR AN APPLIED LOAD OF 330 TONS EACH AT THE TOP OF THE COLUMN.

DRILLED PIERS AT BENT NO.1 SHALL EXTEND TO AN ELEVATION NO HIGHER 588 FEET AND SATISFY THE REQUIRED TIP BEARING CAPACITY.

DRILLED PIERS AT BENT NO.2 SHALL EXTEND TO AN ELEVATION NO HIGHER 588 FEET LEFT AND 596 FEET RIGHT AND SATISFY THE REQUIRED TIP BEARING CAPACITY.

PERMANENT STEEL CASING MAY BE REQUIRED FOR DRILLED PIERS AT BENT NO.1. IF REQUIRED, THE CASING SHALL NOT EXTEND BELOW ELEVATION 600 FEET WITHOUT THE ENGINEER'S PERMISSION. THE NEED FOR PERMANENT STEEL CASING WILL BE DETERMINED BY THE ENGINEER.

PERMANENT STEEL CASING MAY BE REQUIRED FOR DRILLED PIERS AT BENT NO.2. IF REQUIRED, THE CASING SHALL NOT EXTEND BELOW ELEVATION 600 FEET LEFT AND 607 FEET RIGHT WITHOUT THE ENGINEER'S PERMISSION. THE NEED FOR PERMANENT STEEL CASING WILL BE DETERMINED BY THE ENGINEER.

FOR PERMANENT STEEL CASING, SEE SPECIAL PROVISION FOR DRILLED PIERS.

SPT TESTING IS NOT REQUIRED TO DETERMINE THE TIP BEARING CAPACITY OF THE DRILLED PIERS AT BENTS NO.1 AND 2.

SLURRY CONSTRUCTION SHALL NOT BE USED FOR THIS PROJECT.

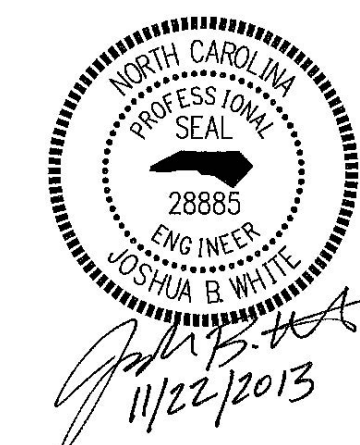
SID INSPECTION ARE NOT REQUIRED TO DETERMINE THE BOTTOM CLEANLINESS OF THE DRILLED PIERS AT BENTS NO.1 AND 2.

FOR DRILLED PIERS, SEE SPECIAL PROVISIONS.

THE SCOUR CRITICAL ELEVATIONS FOR BENTS NO.1 AND 2 ARE 606 FEET. THE SCOUR CRITICAL ELEVATIONS ARE FOR USE BY MAINTENANCE FORCES TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

DRAWN BY : JLA DATE : 2/13  
 CHECKED BY : JBW DATE : 2/13

PREPARED BY  
 TGS ENGINEERS  
 107-A WICA AVENUE  
 MORGANTON, NC 28655



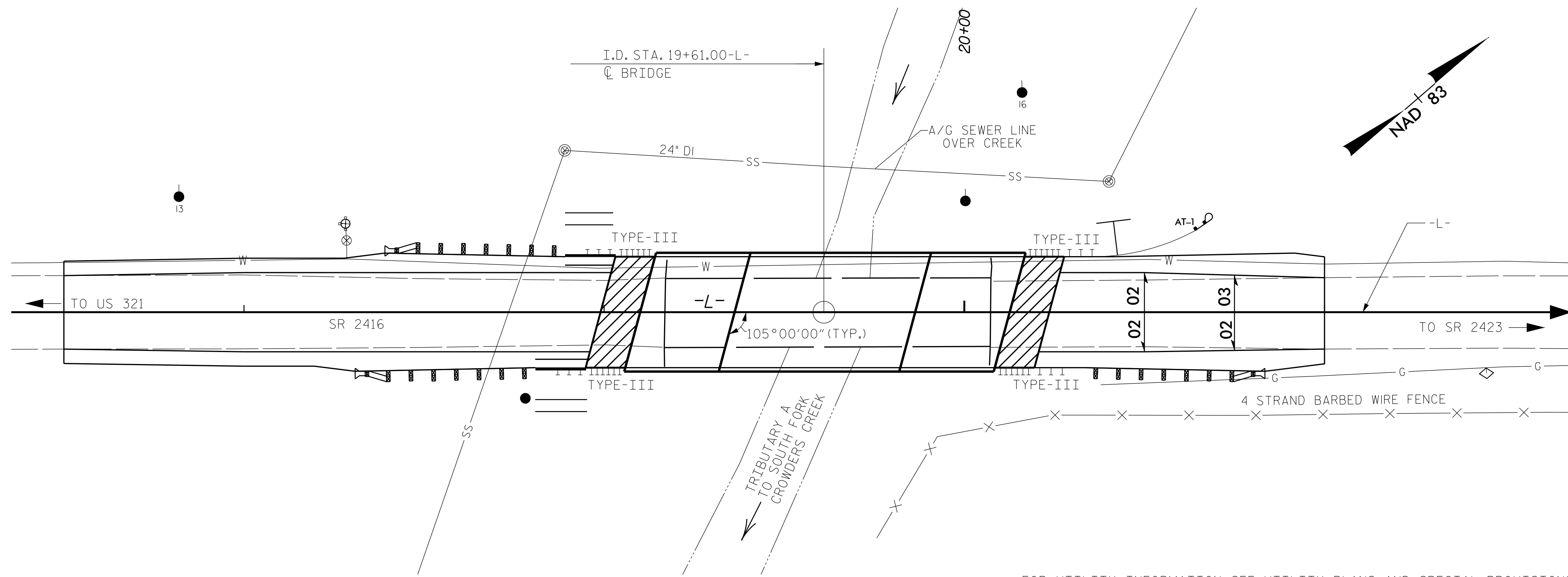
PROJECT NO. 17BP.12.R.10  
 GASTON COUNTY  
 STATION: 19+61.00-L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 GENERAL DRAWING  
 FOR BRIDGE OVER TRIBUTARY A  
 TO SOUTH FORK CROWDERS CREEK  
 ON SR 2416 BETWEEN  
 US 321 AND SR 2423

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

BENCH MARK: RR SPIKE IN 18" OAK, 113' LT OF -L- STA. 21+03. ELEV. = 641.21'



FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

### LOCATION SKETCH

### NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.

THE EXISTING STRUCTURE CONSISTING OF 3 SPANS (1 @ 30'-4", 1 @ 30'-2" AND 1 @ 30'-4") TIMBER DECK ON STEEL BEAMS; END BENTS AND INTERIOR BENTS WITH TIMBER CAPS ON TIMBER PILES AND TIMBER BULKHEADS SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED BELOW THE LEGAL LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE FURTHER DETERIORATE, THIS LOAD LIMIT MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO WATER, THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR THE DISTANCE OF 20 FT. EACH SIDE OF THE CENTERLINE OF THE BRIDGE 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 SPECIAL PROVISIONS.

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

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

THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH HEC 18, "EVALUATING SCOUR AT BRIDGE", MAY, 2001.

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 19+61.00-L-."

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

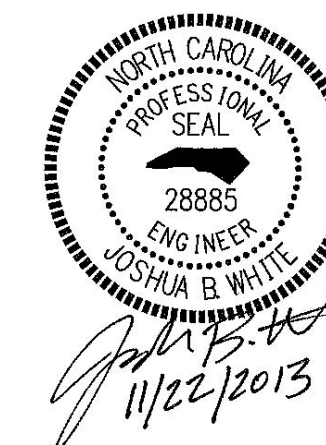
FOR CRANE SAFTY, SEE SPECIAL PROVISIONS.

FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.

FOR CURING CONCRETE, SEE SPECIAL PROVISIONS.

DRAWN BY : RTJ DATE : 2/13  
 CHECKED BY : RDE DATE : 2/13

PREPARED BY  
 TGS ENGINEERS  
 107-A MICA AVENUE  
 MORGANTON, NC 28655



PROJECT NO. 17BP.12.R.10  
 GASTON COUNTY  
 STATION: 19+61.00-L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

GENERAL DRAWING  
 FOR BRIDGE OVER TRIBUTARY A  
 TO SOUTH FORK CROWDERS CREEK  
 ON SR 2416 BETWEEN  
 US 321 AND SR 2423

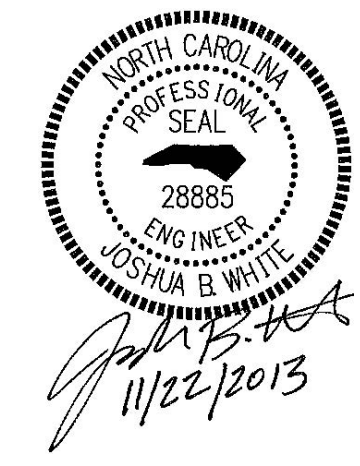
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			S-3
2			4			23



TOTAL BILL OF MATERIAL										
ITEM	REMOVAL OF EXISTING STRUCTURE	3'-6"Ø DRILLED PIERS IN SOIL	3'-6"Ø DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 3'-6" DIA. DRILLED PIER	PDA TESTING	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS "A" CONCRETE (BRIDGE)	BRIDGE APPROACH SLABS	
	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	EA.	EA.	LUMP SUM	C.Y.	LUMP SUM	
SUPERSTRUCTURE									LUMP SUM	
END BENT 1					1			22.2		
BENT 1		76	38	77		1		20.1		
BENT 2		65	37	65		1		20.4		
END BENT 2					1			22.2		
TOTALS	LUMP SUM	141	75	142	2	2	LUMP SUM	84.9	LUMP SUM	
ITEM	REINFORCING STEEL (BRIDGE)	SPIRAL COLUMN REINFORCING STEEL (BRIDGE)	HP12x53 STEEL PILES		VERTICAL CONCRETE BARRIER RAIL	RIP RAP, CLASS II (2'-0" THK.)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" x 1'-9" PRESTRESSED CORED SLABS	
	LBS.	LBS.	NO.	LIN. FT.	LIN. FT.	TON	S.Y.	LUMP SUM	NO.	LIN. FT.
SUPERSTRUCTURE					200.75			LUMP SUM	33	1,100
END BENT 1	2,714		7	245		67	73			
BENT 1	11,139	2,802				66	73			
BENT 2	10,595	2,584				61	67			
END BENT 2	2,714		7	245		70	76			
TOTALS	27,162	5,386	14	490	200.75	264	289	LUMP SUM	33	1,100

PROJECT NO. 17BP.12.R.10  
 GASTON COUNTY  
 STATION: 19+61.00-L-

SHEET 4 OF 4



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 GENERAL DRAWING  
 FOR BRIDGE OVER TRIBUTARY A  
 TO SOUTH FORK CROWDERS CREEK  
 ON SR 2416 BETWEEN  
 US-321 AND SR 2423

PREPARED BY  
 TOS ENGINEERS  
 107-A WICA AVENUE  
 MORGANTON, NC 28655

DRAWN BY : JLA DATE : 3/13  
 CHECKED BY : JBW DATE : 3/13

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

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>	1.233	--	1.75	0.279	2.57	25'	EL	11.982	0.637	<b>1.23</b>	25'	EL	<b>1.198</b>	0.80	0.279	2.37	25'	EL	11.982		
	HL-93(Oper)	N/A	--	1.598	--	1.35	0.279	3.34	25'	EL	11.982	0.637	1.6	25'	EL	1.198	N/A	--	--	--	--	--		
	HS-20(Inv)	36.000	<b>2</b>	1.428	51.406	1.75	0.279	3.82	25'	EL	11.982	0.637	<b>1.43</b>	25'	EL	<b>1.198</b>	0.80	0.279	3.52	25'	EL	11.982		
	HS-20(Oper)	36.000	--	1.851	66.637	1.35	0.279	4.95	25'	EL	11.982	0.637	1.85	25'	EL	1.198	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13.500	--	3.307	44.639	1.4	0.279	6.95	25'	EL	11.982	0.637	3.31	25'	EL	1.198	0.80	0.279	5.11	25'	EL	11.982	
		SNGARBS2	20.000	--	2.65	53	1.4	0.279	6.5	25'	EL	11.982	0.637	2.65	25'	EL	1.198	0.80	0.279	4.79	25'	EL	11.982	
		SNAGRIS2	22.000	--	2.596	57.117	1.4	0.279	6.95	25'	EL	11.982	0.637	2.6	25'	EL	1.198	0.80	0.279	5.11	25'	EL	11.982	
		SNCOTTS3	27.250	--	1.678	45.729	1.4	0.279	3.64	25'	EL	11.982	0.637	1.68	25'	EL	1.198	0.80	0.279	2.68	25'	EL	11.982	
		SNAGGRS4	34.925	--	1.615	56.393	1.4	0.279	3.62	25'	EL	11.982	0.637	1.61	25'	EL	1.198	0.80	0.279	2.66	25'	EL	11.982	
		SNS5A	35.550	--	1.687	59.981	1.4	0.279	3.51	25'	EL	11.982	0.637	1.69	25'	EL	1.198	0.80	0.279	2.58	25'	EL	11.982	
		SNS6A	39.950	--	1.618	64.639	1.4	0.279	3.29	25'	EL	11.982	0.637	1.62	25'	EL	1.198	0.80	0.279	2.42	25'	EL	11.982	
	SNS7B	42.000	--	1.63	68.445	1.4	0.279	3.29	25'	EL	11.982	0.637	1.63	25'	EL	1.198	0.80	0.279	2.41	25'	EL	11.982		
	TTST	TNAGRIT3	33.000	--	1.982	65.415	1.4	0.279	4.64	25'	EL	11.982	0.637	1.98	25'	EL	1.198	0.80	0.279	3.41	25'	EL	11.982	
		TNT4A	33.075	--	1.798	59.466	1.4	0.279	4.02	25'	EL	11.982	0.637	1.8	25'	EL	1.198	0.80	0.279	2.96	25'	EL	11.982	
		TNT6A	41.600	--	1.694	70.481	1.4	0.279	3.78	25'	EL	11.982	0.637	1.69	25'	EL	1.198	0.80	0.279	2.78	25'	EL	11.982	
		TNT7A	42.000	--	1.687	70.851	1.4	0.279	3.9	25'	EL	11.982	0.637	1.69	25'	EL	1.198	0.80	0.279	2.87	25'	EL	11.982	
		TNT7B	42.000	--	1.628	68.365	1.4	0.279	3.52	25'	EL	11.982	0.637	1.63	25'	EL	1.198	0.80	0.279	2.59	25'	EL	11.982	
		TNAGRIT4	43.000	--	1.625	69.855	1.4	0.279	3.78	25'	EL	11.982	0.637	1.62	25'	EL	1.198	0.80	0.279	2.77	25'	EL	11.982	
TNAGT5A		45.000	--	1.657	74.558	1.4	0.279	3.78	25'	EL	11.982	0.637	1.66	25'	EL	1.198	0.80	0.279	2.77	25'	EL	11.982		
TNAGT5B	45.000	<b>3</b>	1.503	67.632	1.4	0.279	3.72	25'	EL	9.586	0.637	<b>1.5</b>	25'	EL	<b>1.198</b>	0.80	0.279	2.75	25'	EL	9.586			

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	



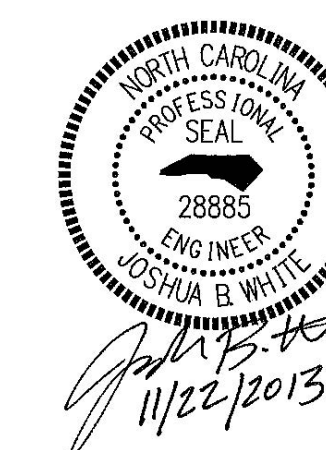
LRFR SUMMARY  
FOR SPANS 'A' & 'C'

PROJECT NO. 17BP.12.R.10

GASTON COUNTY

STATION: 19+61.00-L-

SHEET 1 OF 2



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
LRFR SUMMARY FOR  
25' CORED SLAB UNIT  
75° SKEW & 105° SKEW  
(NON-INTERSTATE TRAFFIC)

ASSEMBLED BY : JLA DATE : 9/12  
CHECKED BY : JBW DATE : 11/12  
DRAWN BY : CVC 6/10  
CHECKED BY : DNS 6/10

PREPARED BY  
TOS ENGINEERS  
107-A WICA AVENUE  
MORGANTON, NC 28655

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			23

STD. NO. 21LRFR1\_75&105S\_25L

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	1	1.205	--	1.75	0.271	1.59	50'	EL	24.482	0.616	1.2	50'	EL	4.896	0.80	0.271	1.46	50'	EL	24.482		
	HL-93(0pr)	N/A	--	1.562	--	1.35	0.271	2.06	50'	EL	24.482	0.616	1.56	50'	EL	4.896	N/A	--	--	--	--	--		
	HS-20(Inv)	36.000	2	1.434	51.614	1.75	0.271	1.97	50'	EL	24.482	0.616	1.43	50'	EL	4.896	0.80	0.271	1.81	50'	EL	24.482		
	HS-20(0pr)	36.000	--	1.859	66.906	1.35	0.271	2.56	50'	EL	24.482	0.616	1.86	50'	EL	4.896	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13.500	--	3.678	49.655	1.4	0.271	5.02	50'	EL	24.482	0.616	4	50'	EL	4.896	0.80	0.271	3.68	50'	EL	24.482	
		SNGARBS2	20.000	--	2.905	58.101	1.4	0.271	3.97	50'	EL	24.482	0.616	2.93	50'	EL	4.896	0.80	0.271	2.91	50'	EL	24.482	
		SNAGRIS2	22.000	--	2.748	60.456	1.4	0.271	3.83	50'	EL	19.586	0.616	2.75	50'	EL	4.896	0.80	0.271	2.81	50'	EL	24.482	
		SNCOTTS3	27.250	--	1.835	49.998	1.4	0.271	2.5	50'	EL	24.482	0.616	2.01	50'	EL	4.896	0.80	0.271	1.83	50'	EL	24.482	
		SNAGGRS4	34.925	--	1.595	55.714	1.4	0.271	2.18	50'	EL	24.482	0.616	1.72	50'	EL	4.896	0.80	0.271	1.60	50'	EL	24.482	
		SNS5A	35.550	--	1.556	55.303	1.4	0.271	2.12	50'	EL	24.482	0.616	1.77	50'	EL	4.896	0.80	0.271	1.56	50'	EL	24.482	
		SNS6A	39.950	--	1.455	58.112	1.4	0.271	1.99	50'	EL	24.482	0.616	1.64	50'	EL	4.896	0.80	0.271	1.45	50'	EL	24.482	
	SNS7B	42.000	--	1.386	58.224	1.4	0.271	1.89	50'	EL	24.482	0.616	1.65	50'	EL	4.896	0.80	0.271	1.39	50'	EL	24.482		
	TTST	TNAGRIT3	33.000	--	1.782	58.809	1.4	0.271	2.43	50'	EL	24.482	0.616	1.94	50'	EL	4.896	0.80	0.271	1.78	50'	EL	24.482	
		TNT4A	33.075	--	1.798	59.458	1.4	0.271	2.45	50'	EL	24.482	0.616	1.86	50'	EL	4.896	0.80	0.271	1.80	50'	EL	24.482	
		TNT6A	41.600	--	1.497	62.293	1.4	0.271	2.04	50'	EL	24.482	0.616	1.8	50'	EL	4.896	0.80	0.271	1.50	50'	EL	24.482	
		TNT7A	42.000	--	1.52	63.842	1.4	0.271	2.08	50'	EL	24.482	0.616	1.67	50'	EL	4.896	0.80	0.271	1.52	50'	EL	24.482	
		TNT7B	42.000	--	1.585	66.559	1.4	0.271	2.16	50'	EL	24.482	0.616	1.59	50'	EL	4.896	0.80	0.271	1.58	50'	EL	24.482	
		TNAGRIT4	43.000	--	1.504	64.667	1.4	0.271	2.05	50'	EL	24.482	0.616	1.53	50'	EL	4.896	0.80	0.271	1.50	50'	EL	24.482	
TNAGT5A		45.000	--	1.405	63.217	1.4	0.271	1.92	50'	EL	24.482	0.616	1.56	50'	EL	4.896	0.80	0.271	1.40	50'	EL	24.482		
TNAGT5B	45.000	3	1.376	61.936	1.4	0.271	1.88	50'	EL	24.482	0.616	1.45	50'	EL	4.896	0.80	0.271	1.38	50'	EL	24.482			

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)

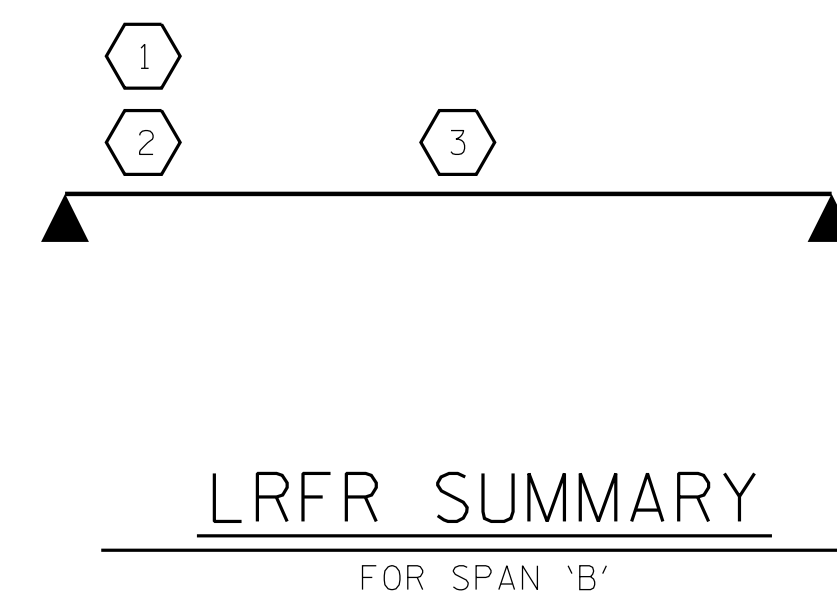
2 DESIGN LOAD RATING (HS-20)

3 LEGAL LOAD RATING \*\*

\*\* SEE CHART FOR VEHICLE TYPE

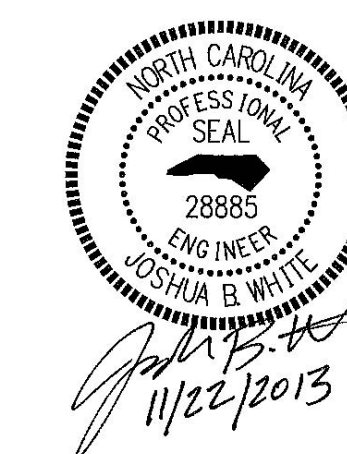
GIRDER LOCATION

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



PROJECT NO. 17BP.12.R.10  
GASTON COUNTY  
STATION: 19+61.00-L-

SHEET 2 OF 2



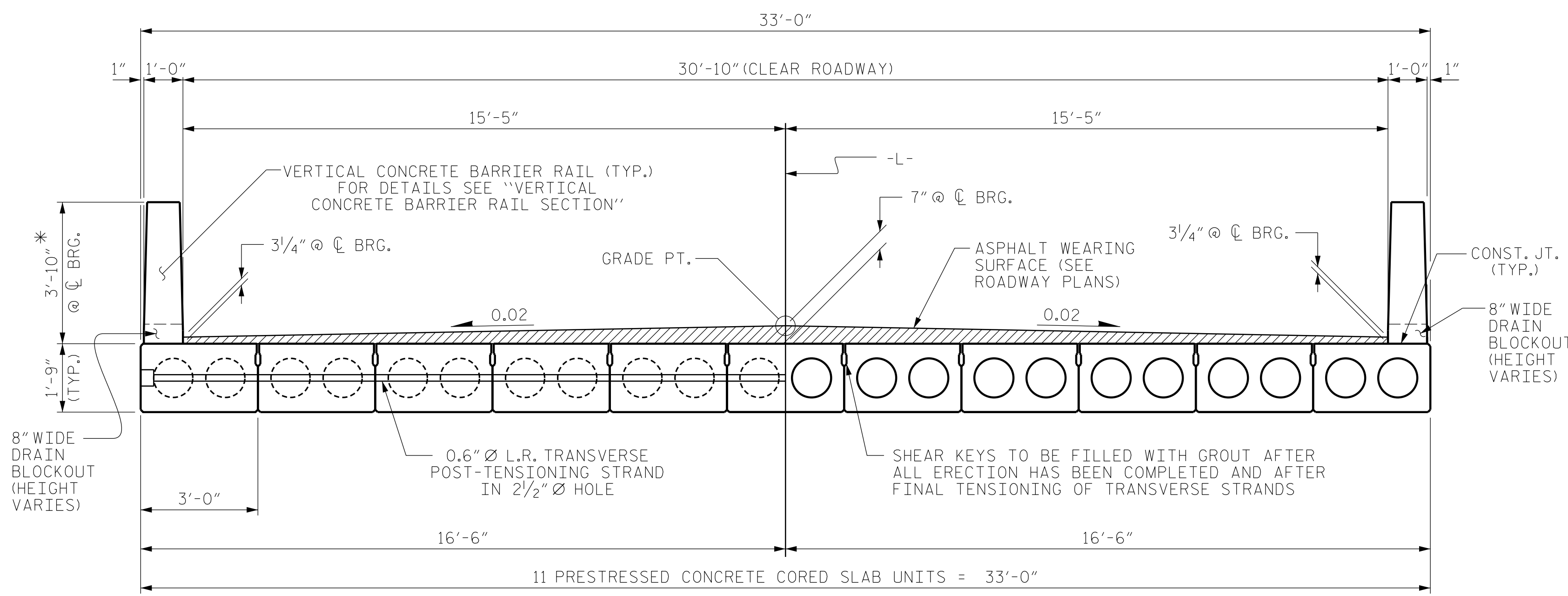
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
LRFR SUMMARY FOR  
50' CORED SLAB UNIT  
75° SKEW & 105° SKEW  
(NON-INTERSTATE TRAFFIC)

ASSEMBLED BY : JLA DATE : 9/12  
CHECKED BY : JBW DATE : 11/12  
DRAWN BY : CVC 6/10  
CHECKED BY : DNS 6/10

PREPARED BY  
TGS ENGINEERS  
107-A MICA AVENUE  
MORGANTON, NC 28655

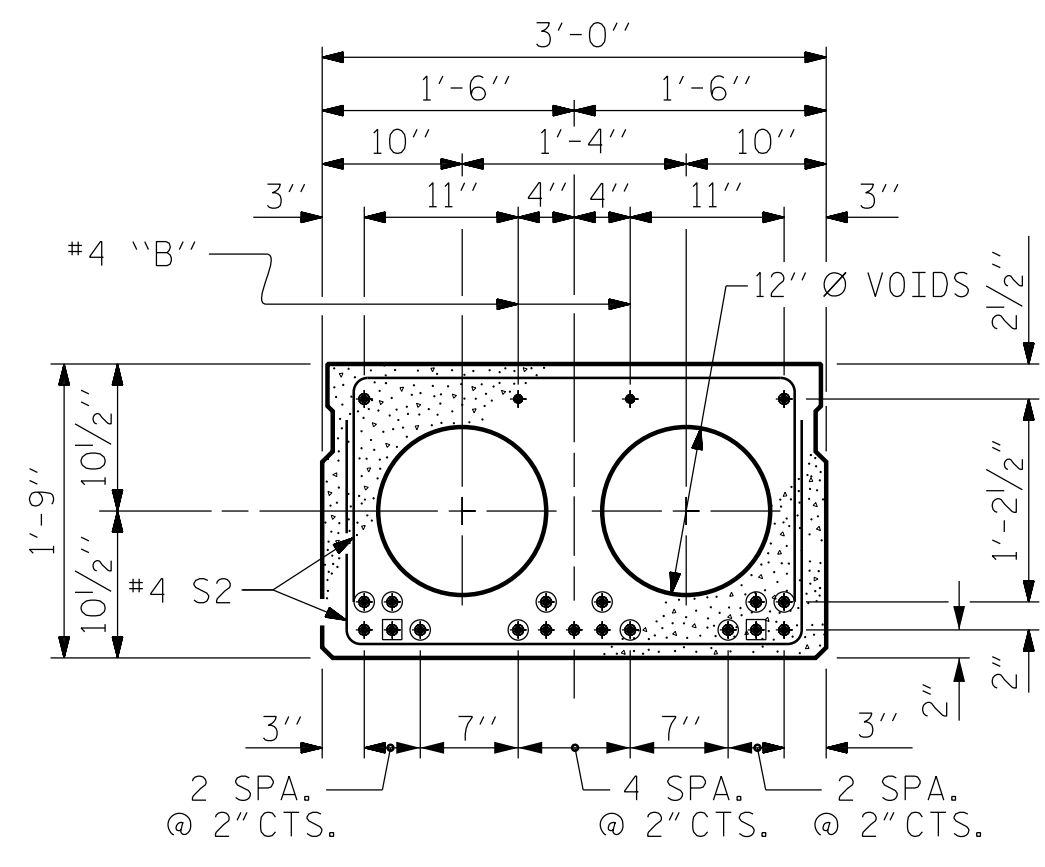
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			5-6
2			4			23

STD. NO. 21LRFR1.75&105S\_50L

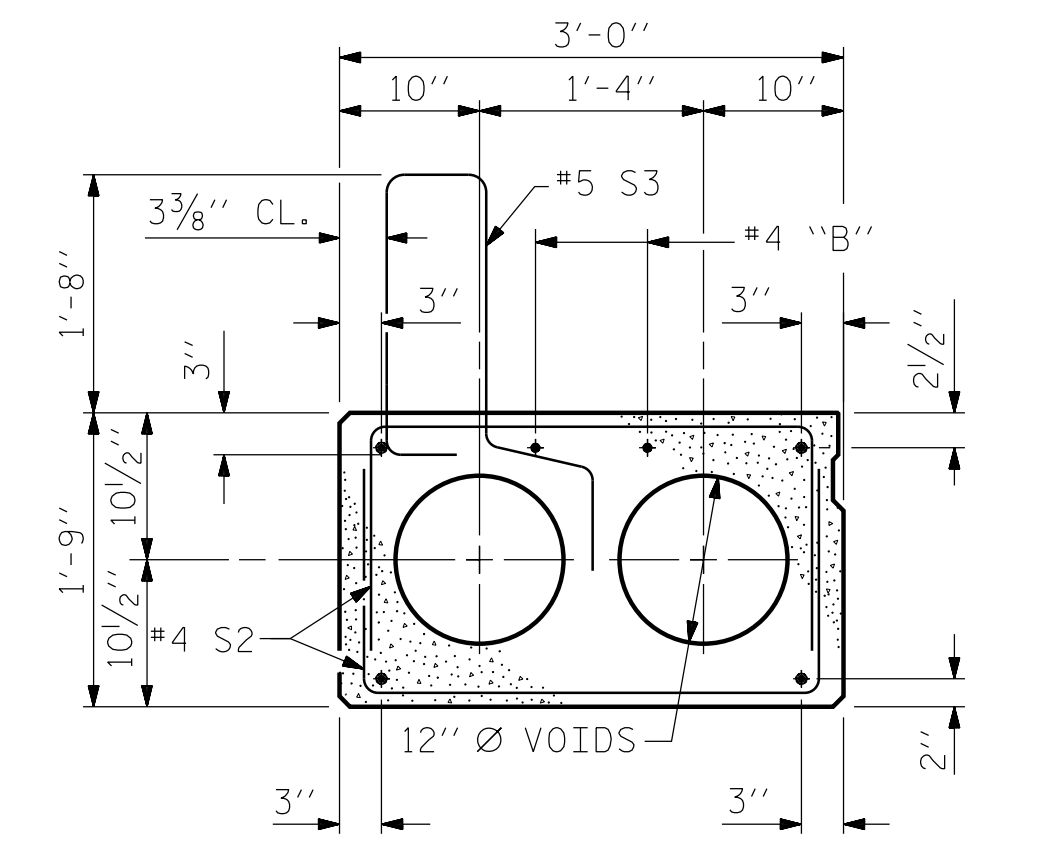


HALF SECTION AT INTERMEDIATE DIAPHRAGMS  
 HALF SECTION THROUGH VOIDS  
**TYPICAL SECTION**

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

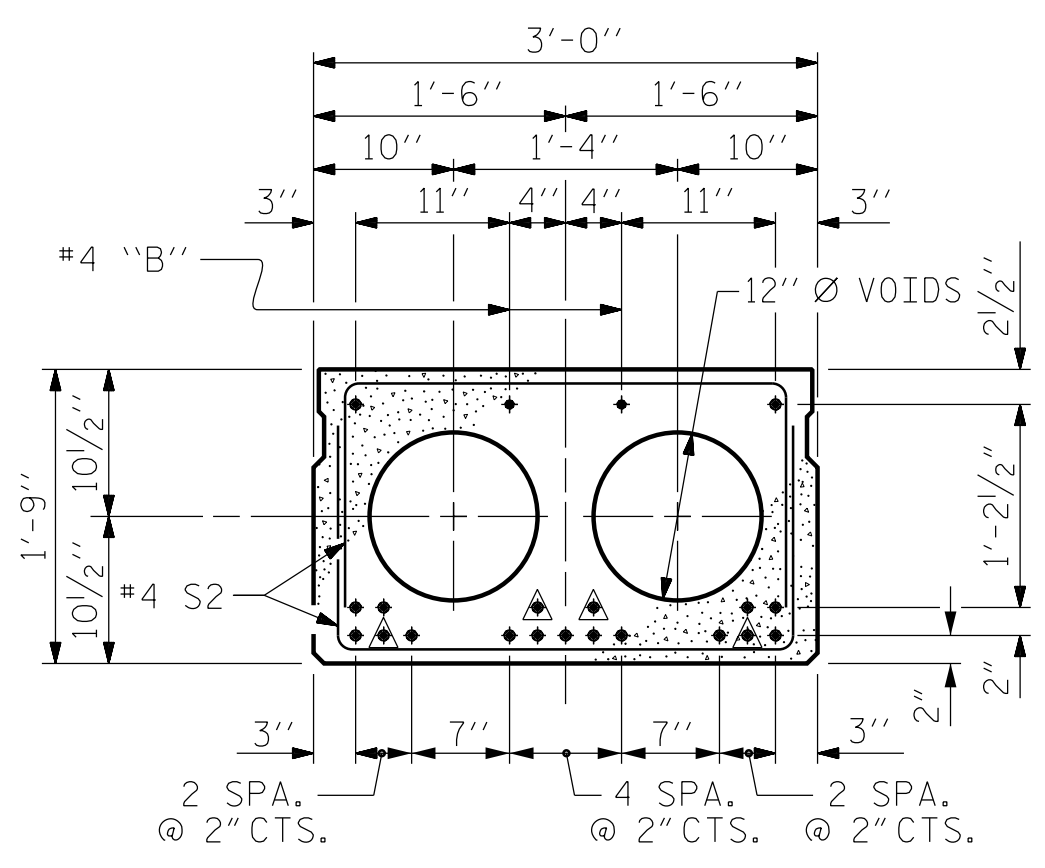


**INTERIOR SLAB SECTION (25' UNIT)**  
 (9 STRANDS REQUIRED)



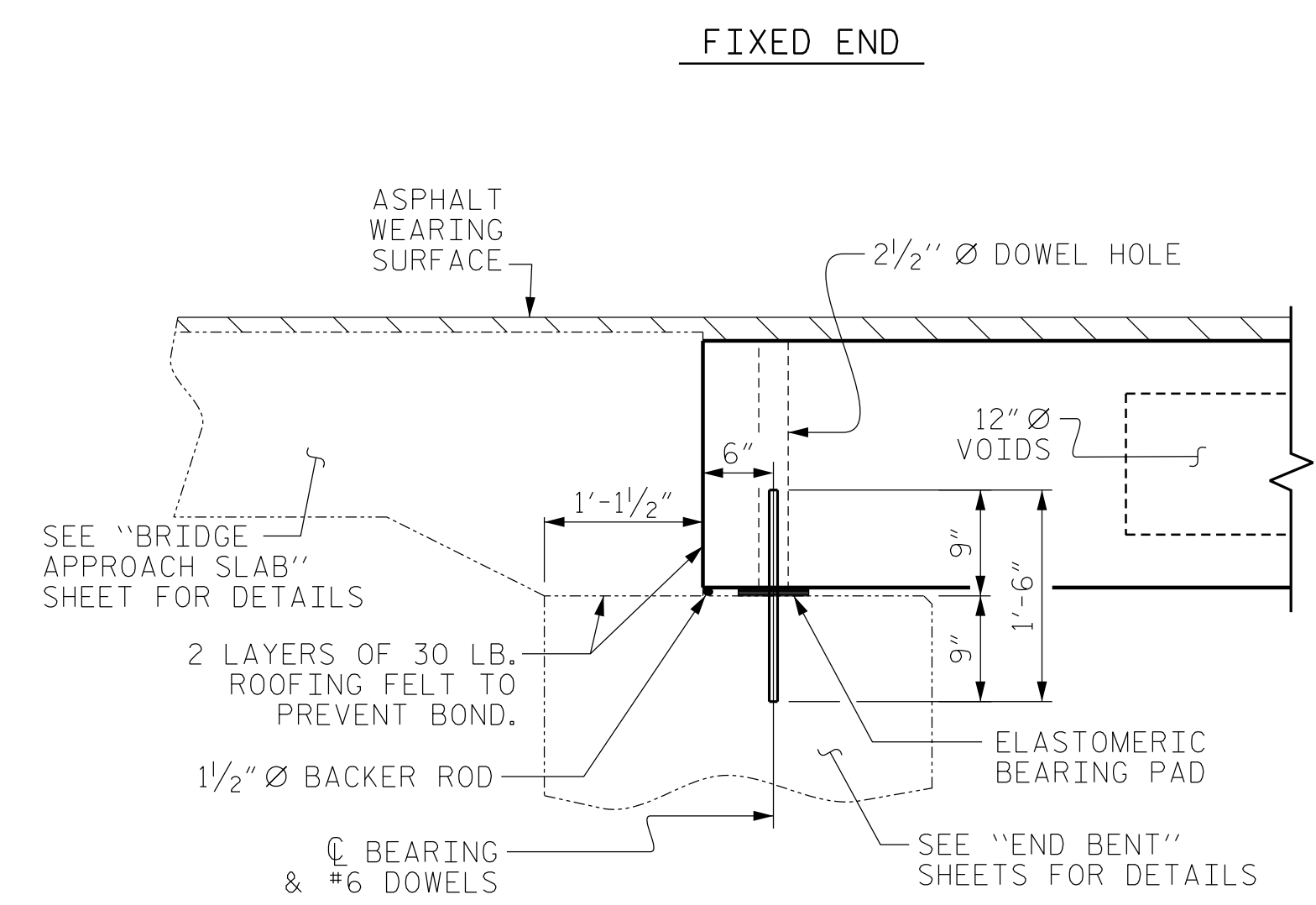
**EXT. SLAB SECTION**  
 (FOR PRESTRESSED STRAND LAYOUT, SEE INTERIOR SLAB SECTION.)

- DEBONDING LEGEND**
- ⊙ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 6'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.
  - ⊙ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 2'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.
  - ⊙ OPTIONAL FULL LENGTH DEBONDED STRANDS. THESE STRANDS ARE NOT REQUIRED. IF THE FABRICATOR CHOOSES TO INCLUDE THESE STRANDS IN THE CORED SLAB UNIT, THE STRANDS SHALL BE DEBONDED FOR THE FULL LENGTH OF THE UNIT AT NO ADDITIONAL COST. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

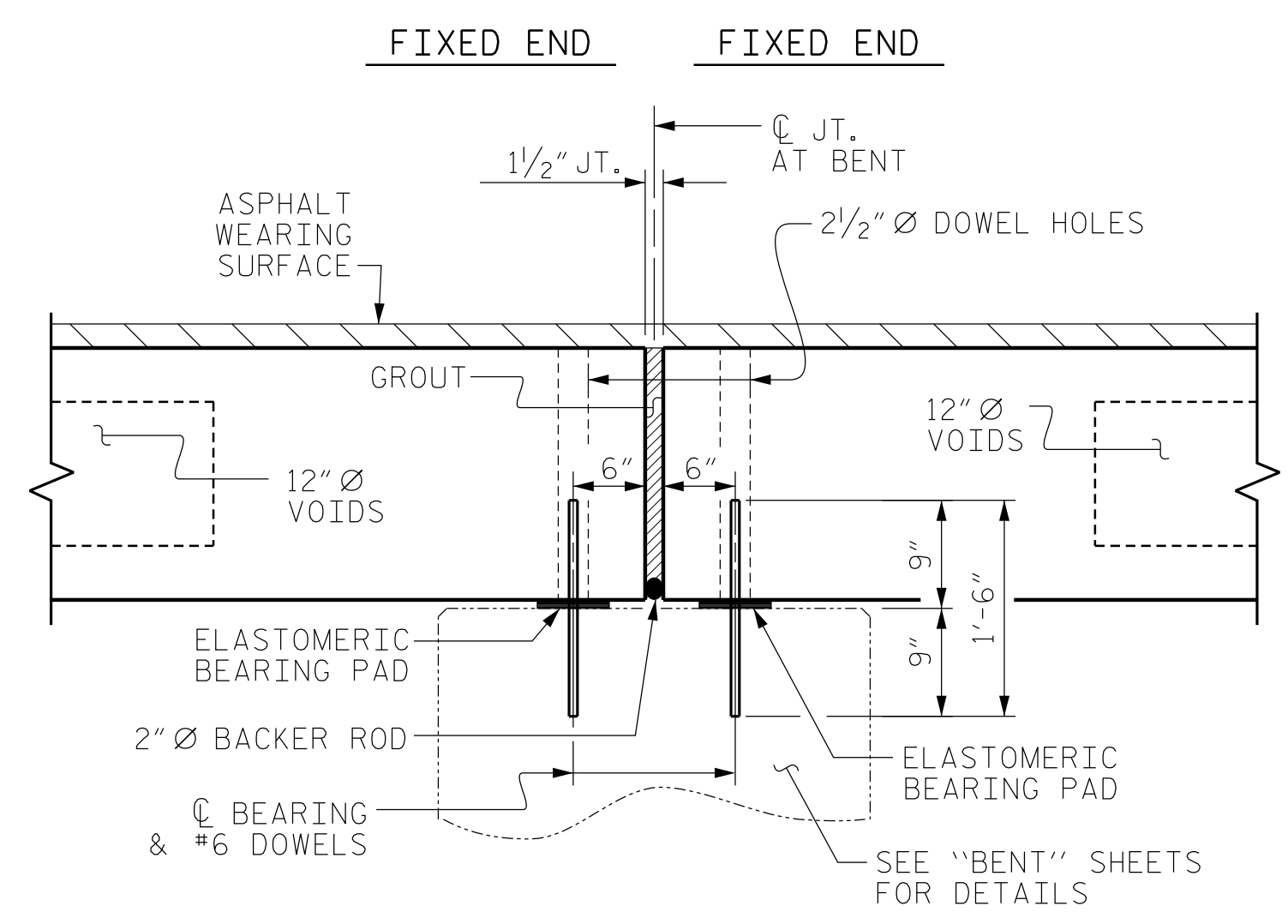


**INTERIOR SLAB SECTION (50' UNIT)**  
 (19 STRANDS REQUIRED)

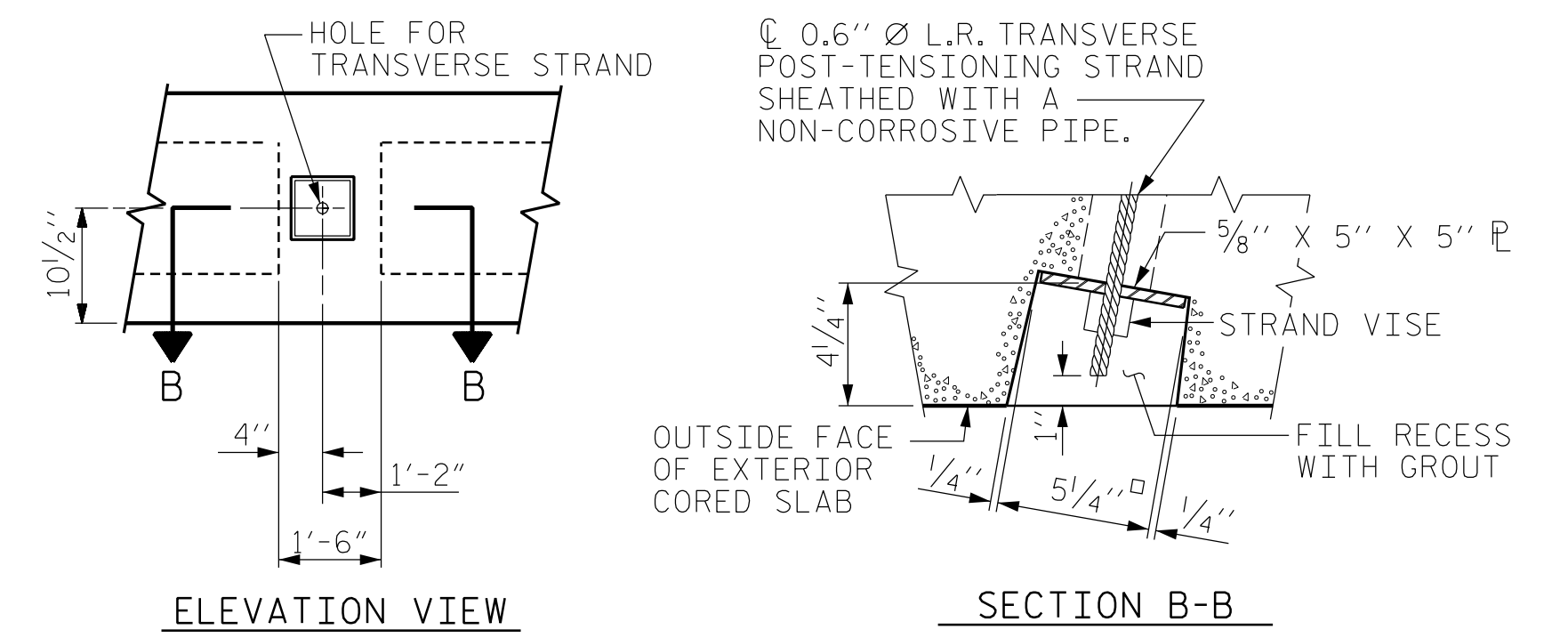
**0.6" Ø LOW RELAXATION STRAND LAYOUT**



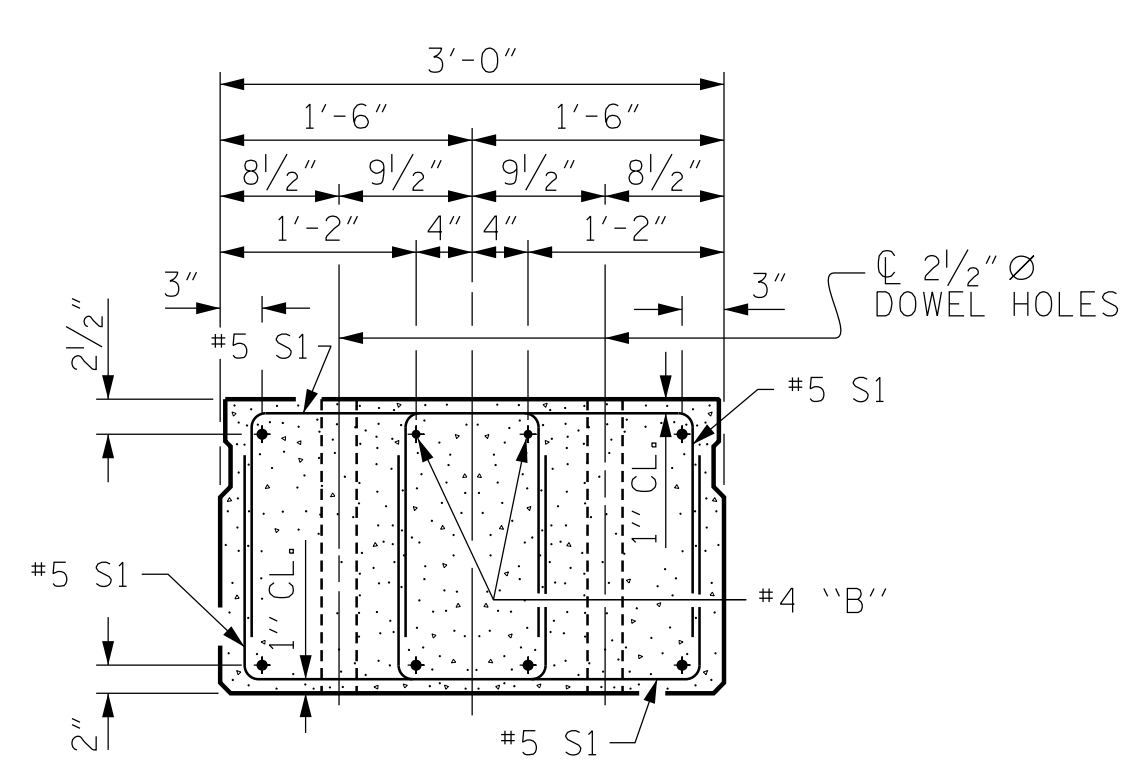
**SECTION AT END BENT**



**SECTION AT BENT**

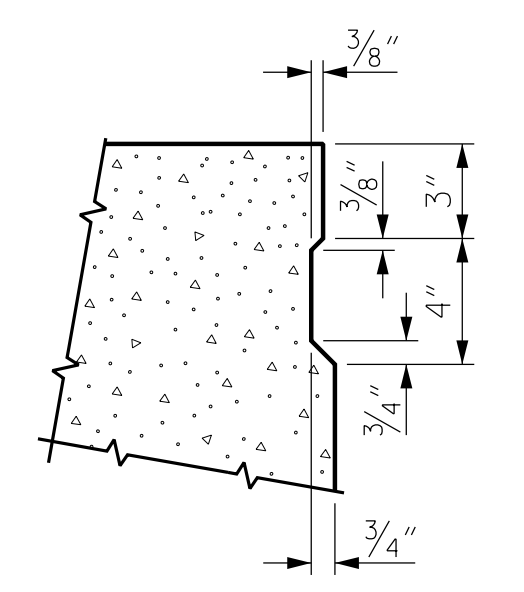


**GROUTED RECESS AT END OF POST-TENSIONED STRAND OF CORED SLABS**



**END ELEVATION**

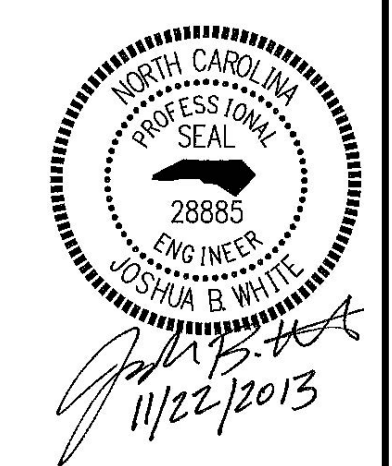
SHOWING PLACEMENT OF DOUBLE STIRRUPS AND LOCATION OF DOWEL HOLES. (STRAND LAYOUT NOT SHOWN.) INTERIOR SLAB UNIT SHOWN-EXTERIOR SLAB UNIT SIMILAR EXCEPT SHEAR KEY LOCATION.



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

ASSEMBLED BY :	JLA	DATE :	2/13
CHECKED BY :	JBW	DATE :	2/13
DRAWN BY :	DGE 5/09	REV. 12/11	MAA/AAC
CHECKED BY :	BCH 6/09		

PREPARED BY  
 TOS ENGINEERS  
 107-A WICA AVENUE  
 MORGANTON, NC 28655



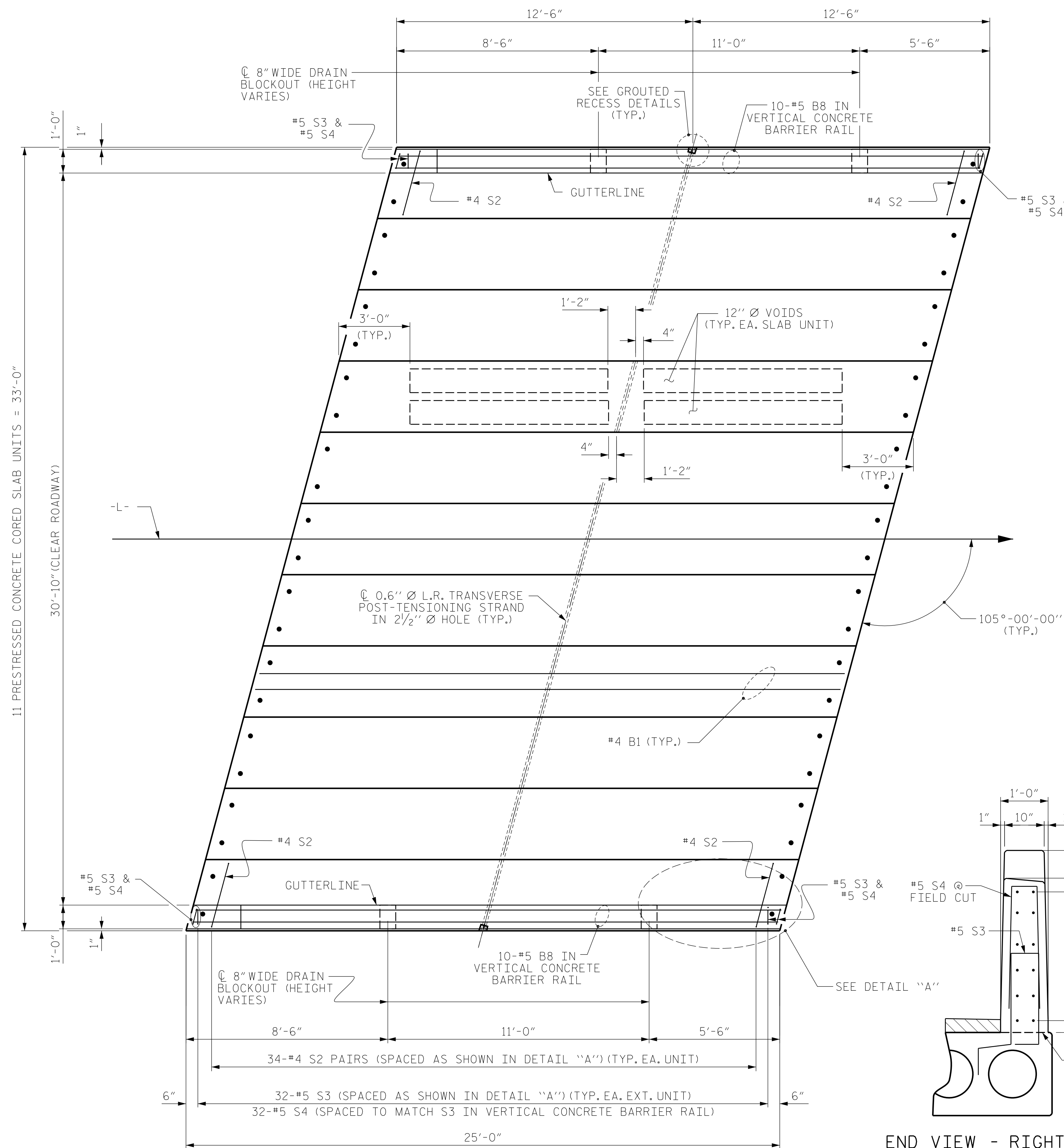
PROJECT NO. 17BP.12.R.10  
 GASTON COUNTY  
 STATION: 19+61.00-L-

SHEET 1 OF 5

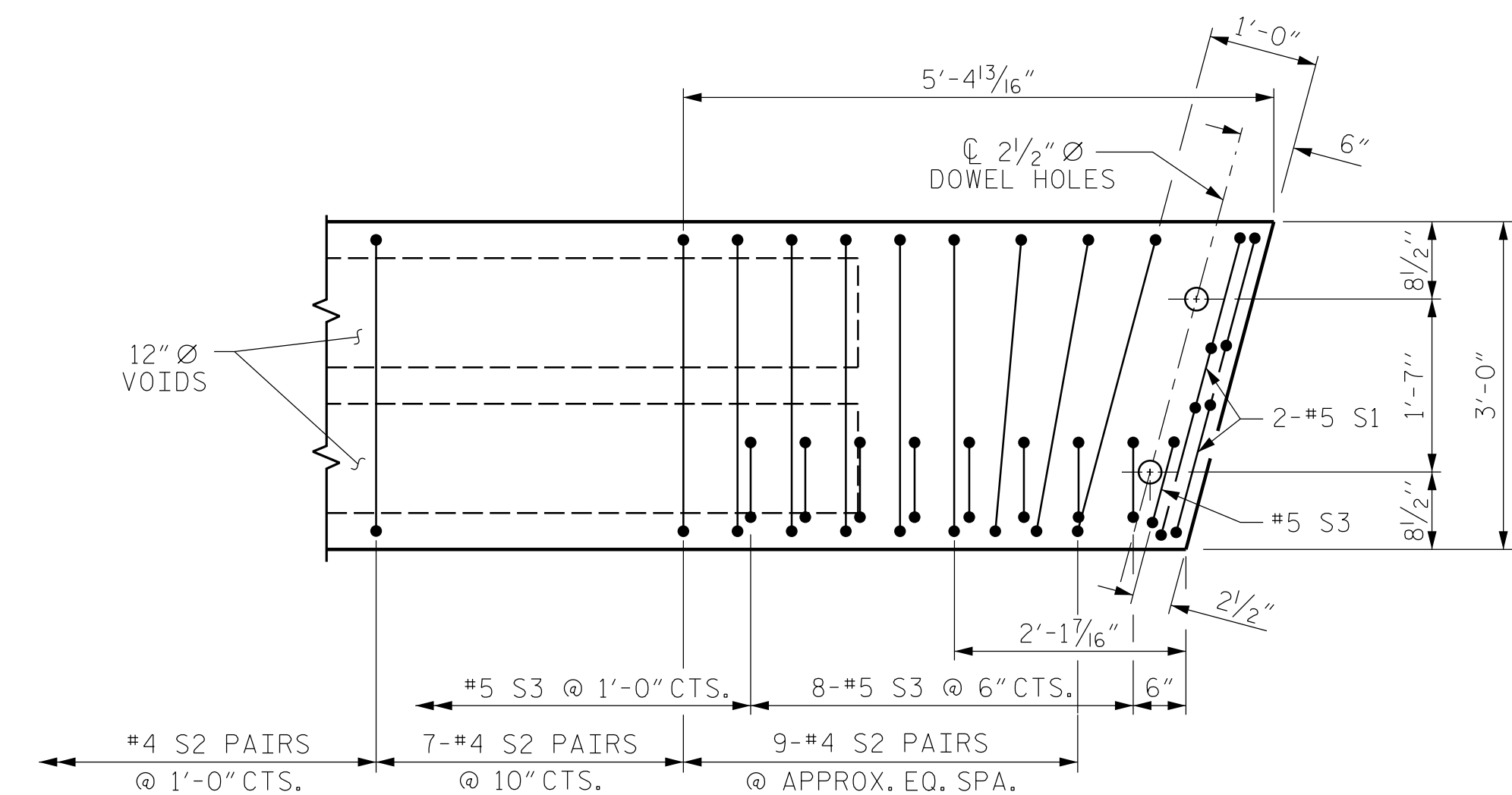
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 3'-0" X 1'-9"  
 PRESTRESSED CONCRETE  
 CORED SLAB UNIT  
 105° SKEW  
 SPANS A, B, & C

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			23

STD. NO. 21" PCS2\_33\_105S

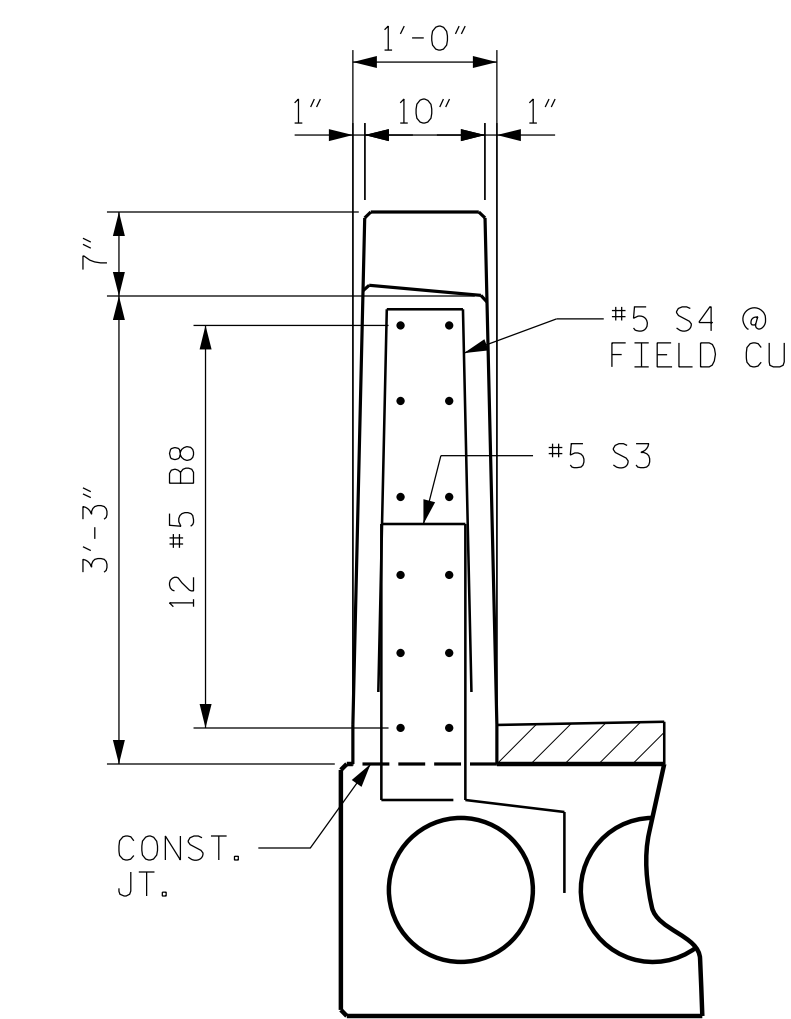


PLAN OF UNIT - SPAN A

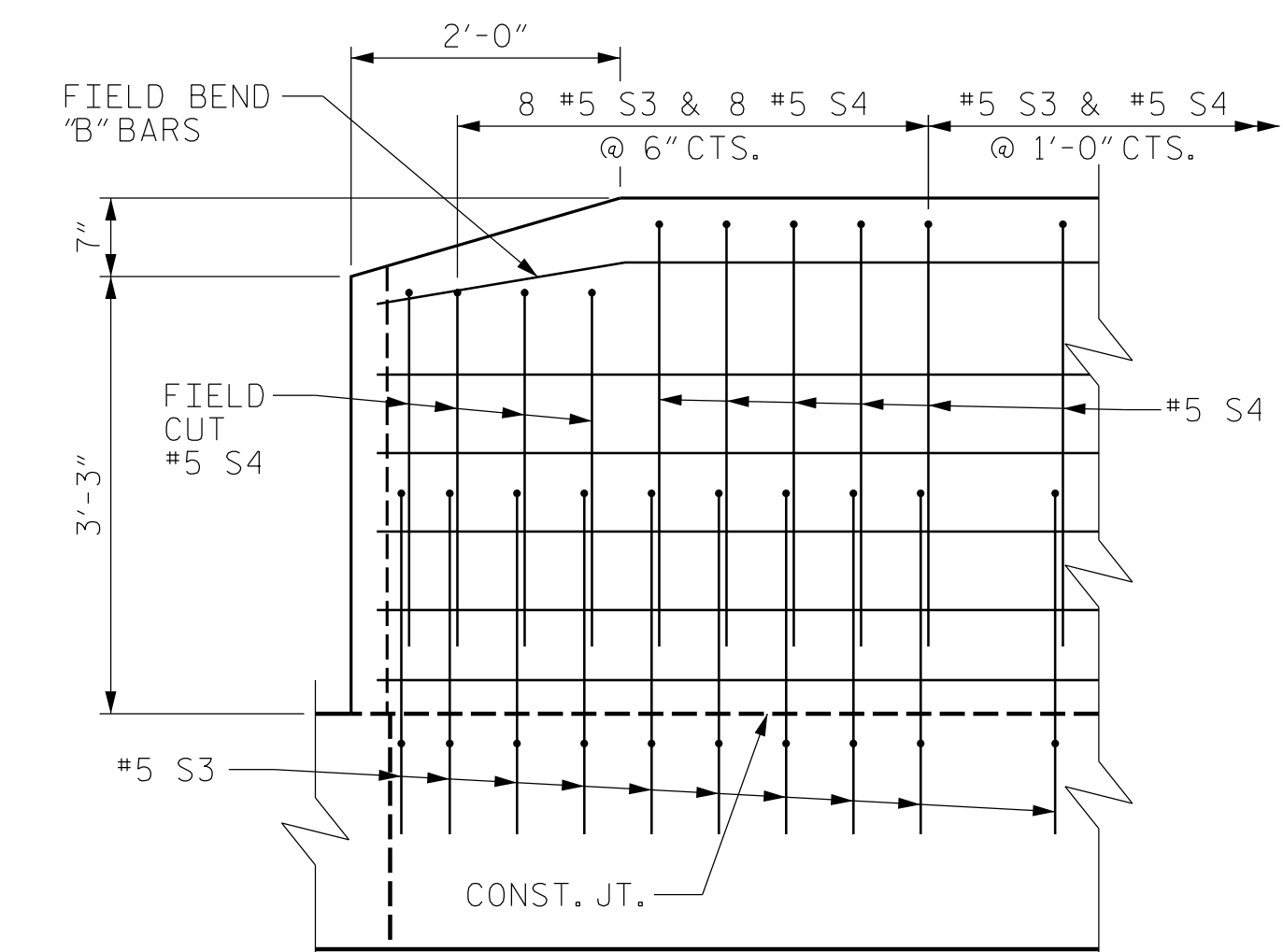


DETAIL "A"

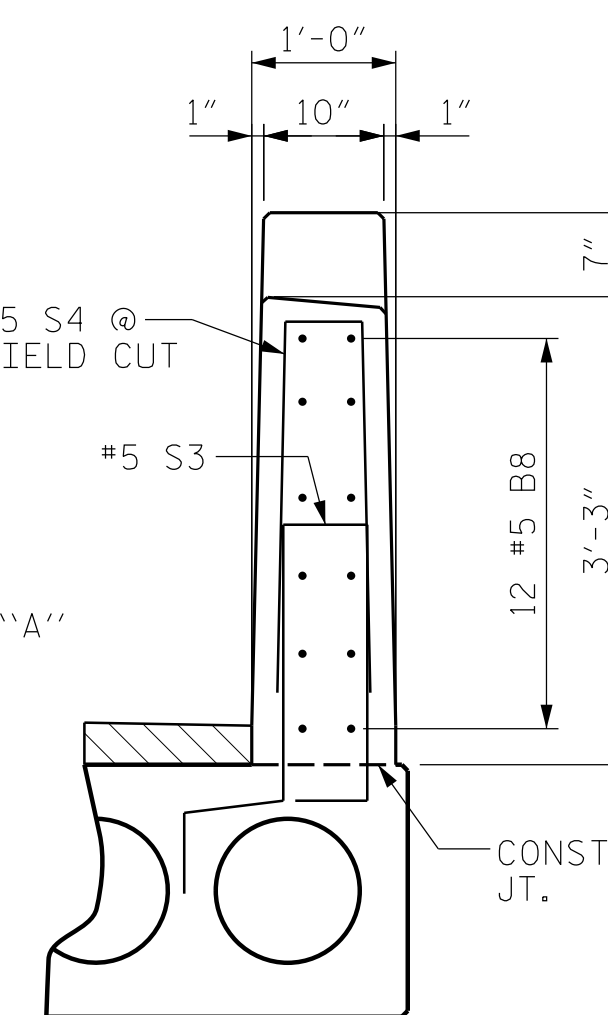
NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S3 BARS.



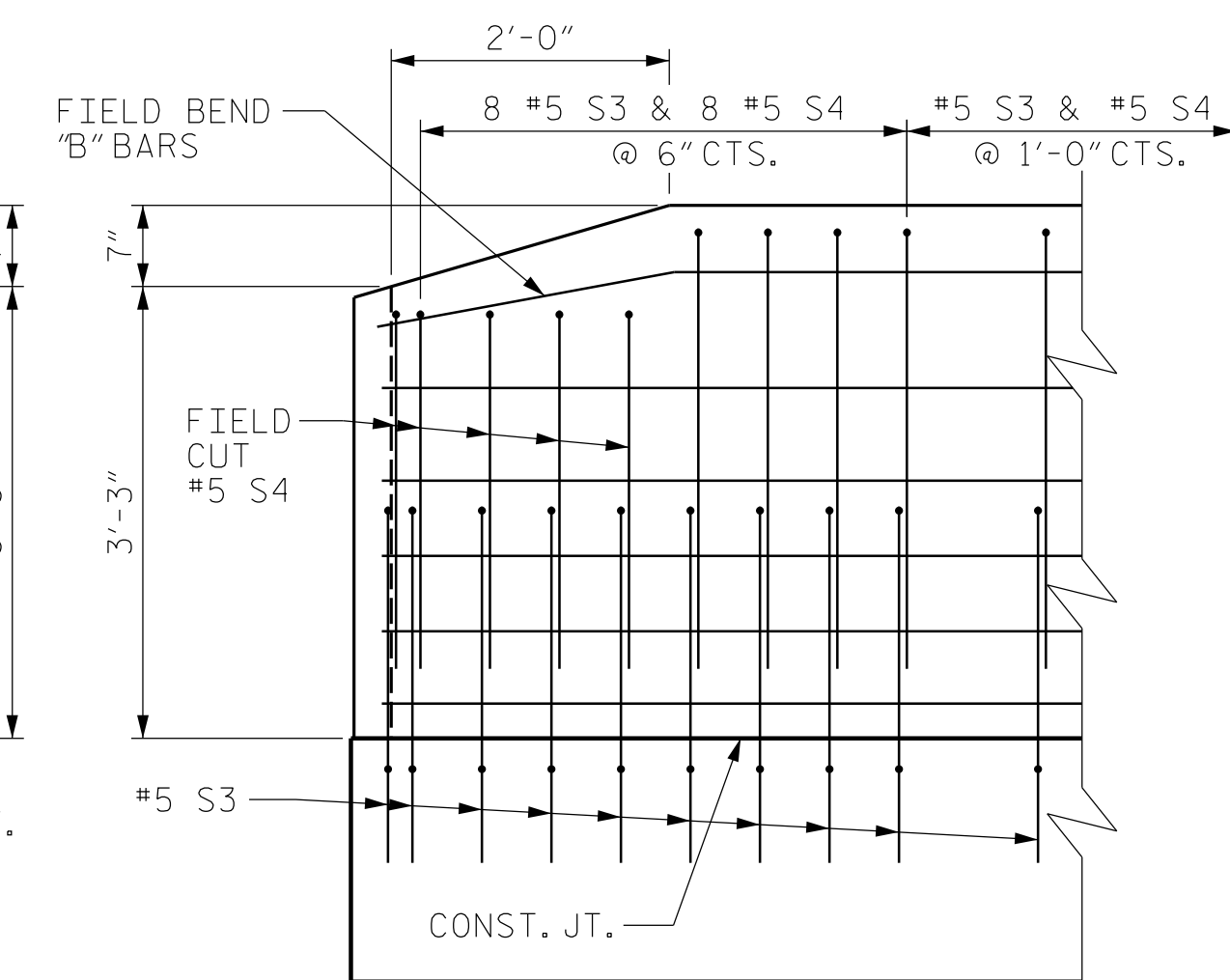
END VIEW - LEFT SIDE



SIDE VIEW - LEFT SIDE



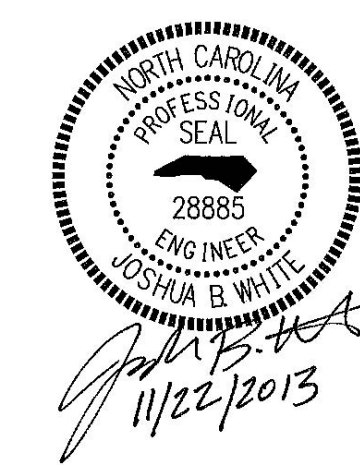
END VIEW - RIGHT SIDE



SIDE VIEW - RIGHT SIDE

ASSEMBLED BY :	JLA	DATE :	2/13
CHECKED BY :	JBW	DATE :	2/13
DRAWN BY :	DGE 3/09	REV.	12/5/11 MAA/AAC
CHECKED BY :	BCH 3/09		

PREPARED BY  
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107-A MICA AVENUE  
MORGANTON, NC 28655



PROJECT NO. 17BP.12.R.10  
GASTON COUNTY  
STATION: 19+61.00-L-

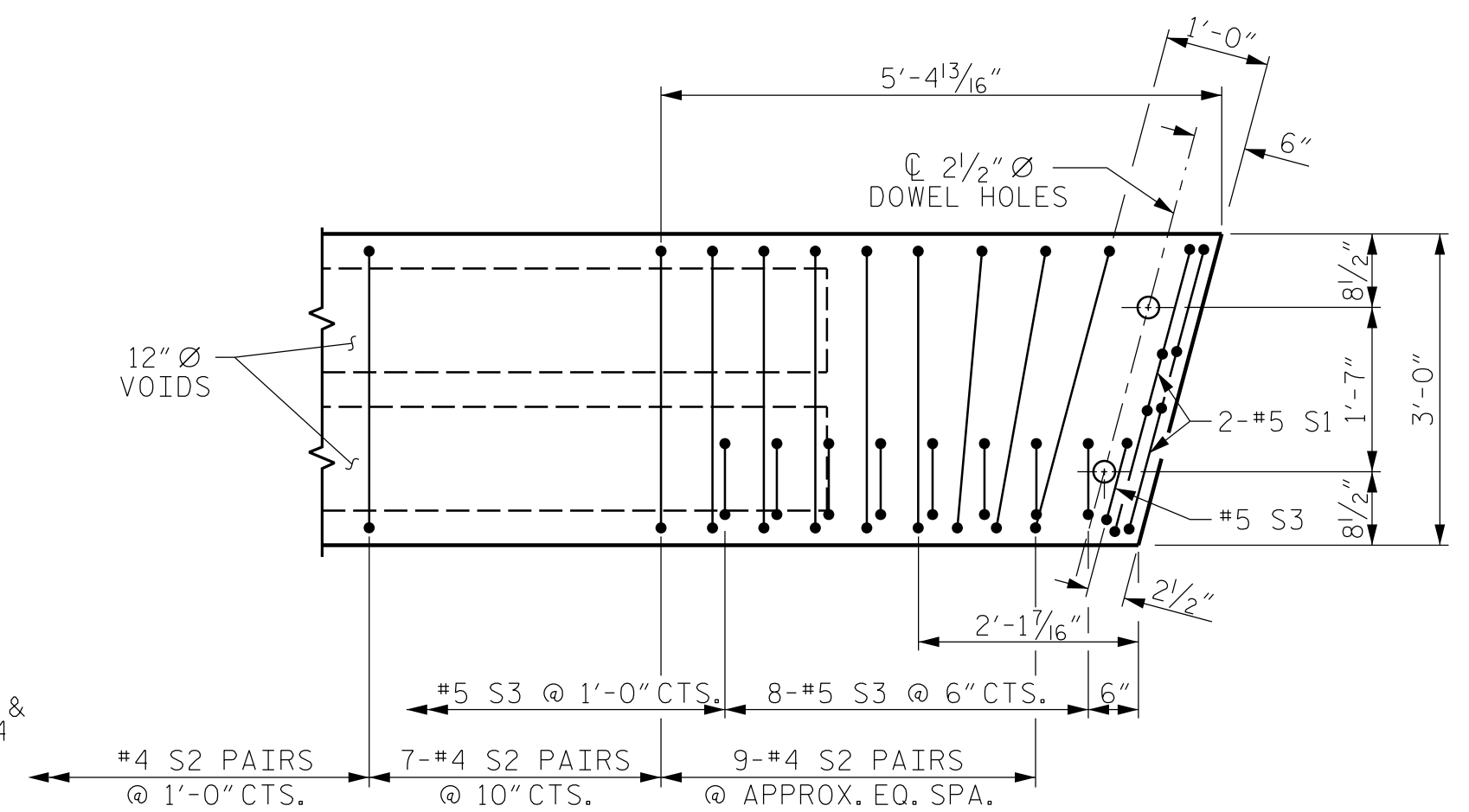
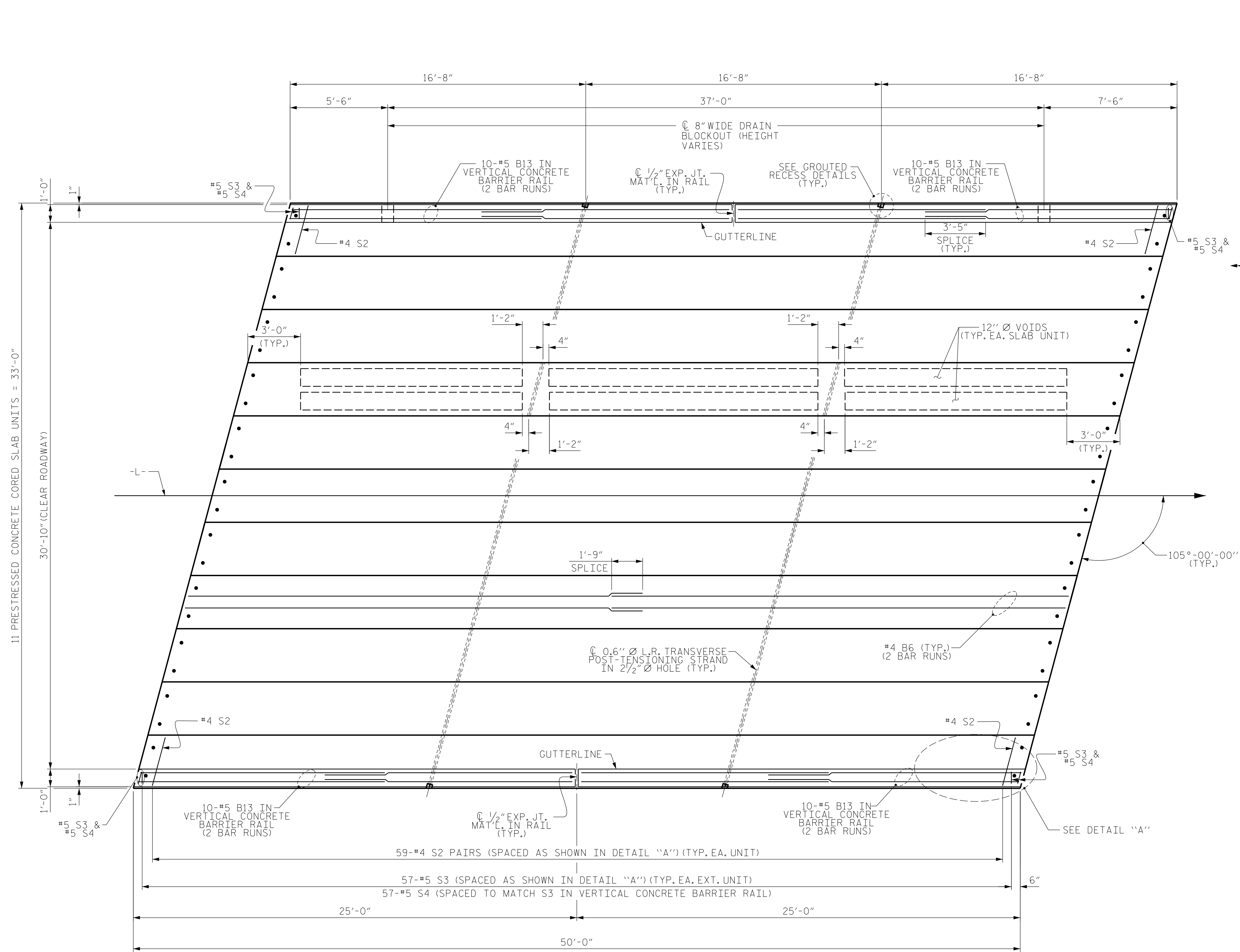
SHEET 2 OF 5

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

PLAN OF 25' UNIT  
30'-10" CLEAR ROADWAY  
105° SKEW  
SPAN A

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			23

STD. NO. 21" PCS\_33.105S\_25L

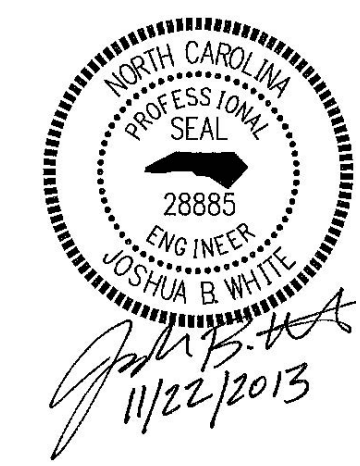


DETAIL "A"  
NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S3 BARS.

PLAN OF UNIT - SPAN B

PROJECT NO. 17BP.12.R.10  
GASTON COUNTY  
STATION: 19+61.00-L-

SHEET 3 OF 5



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

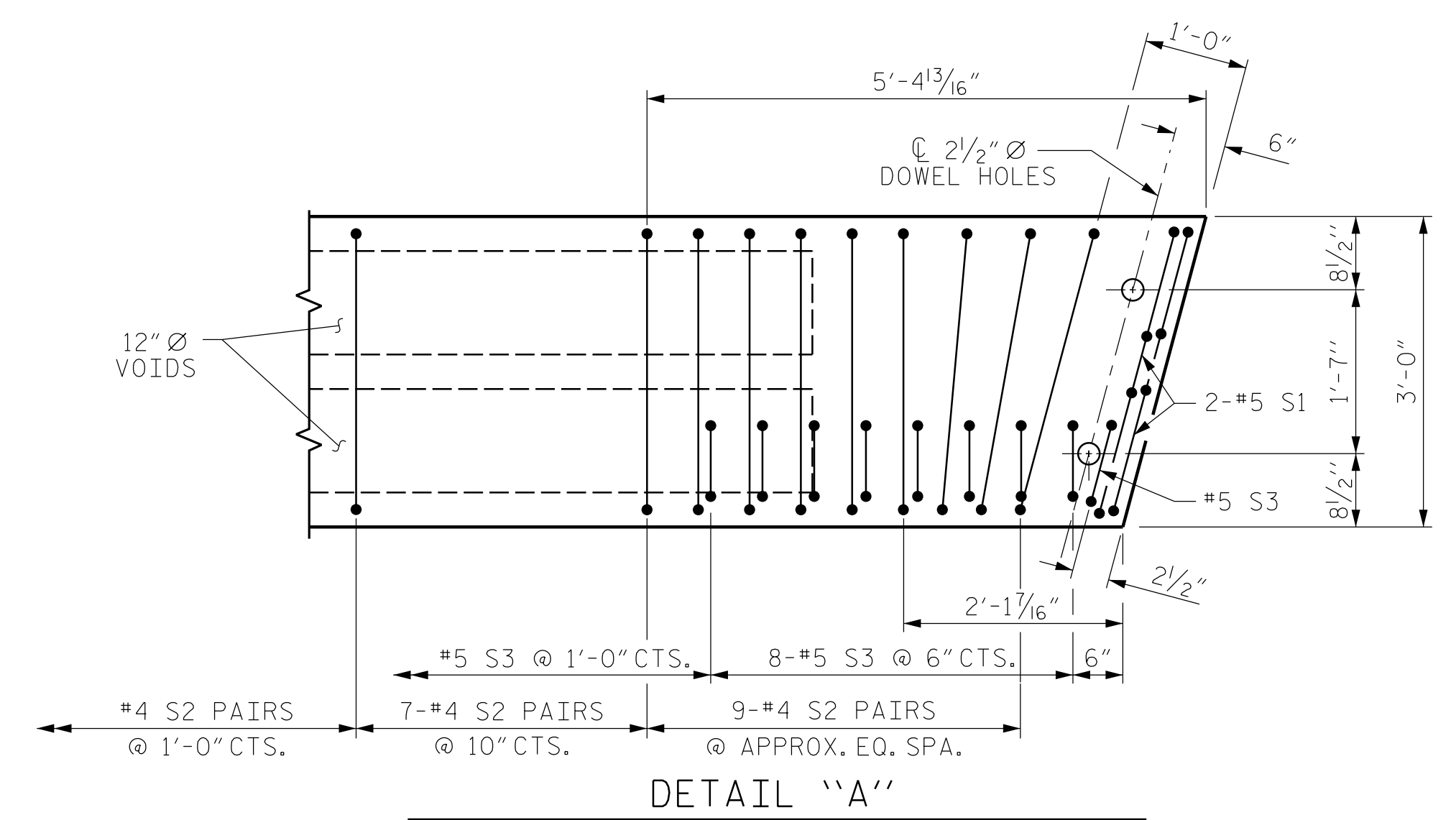
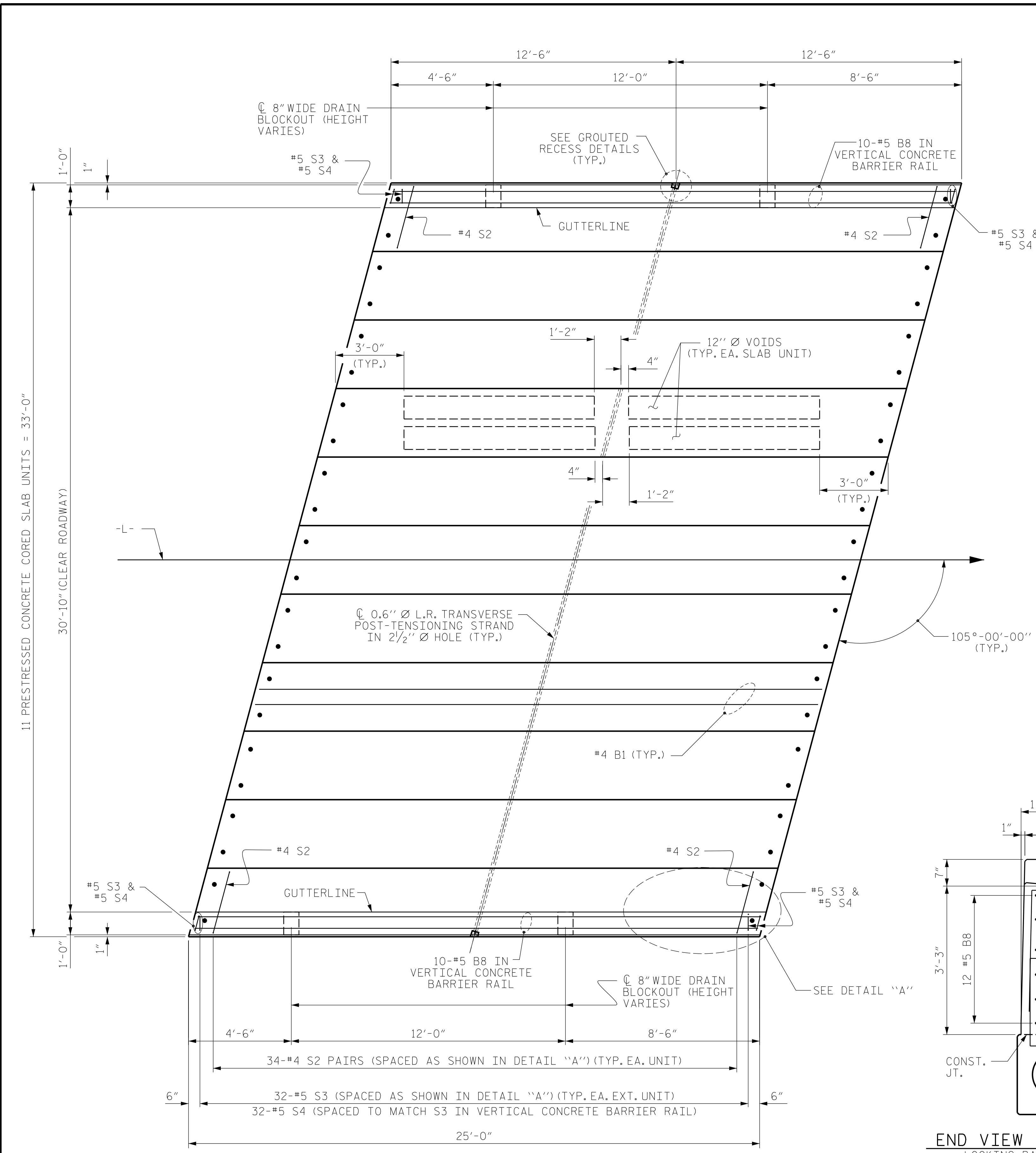
PLAN OF 50' UNIT  
30'-10" CLEAR ROADWAY  
105° SKEW  
SPAN B

ASSEMBLED BY :	JLA	DATE :	2/13
CHECKED BY :	JBW	DATE :	2/13
DRAWN BY :	DGE 5/09	REV. 12/5/11	MAA/AAC
CHECKED BY :	BCH 6/09		

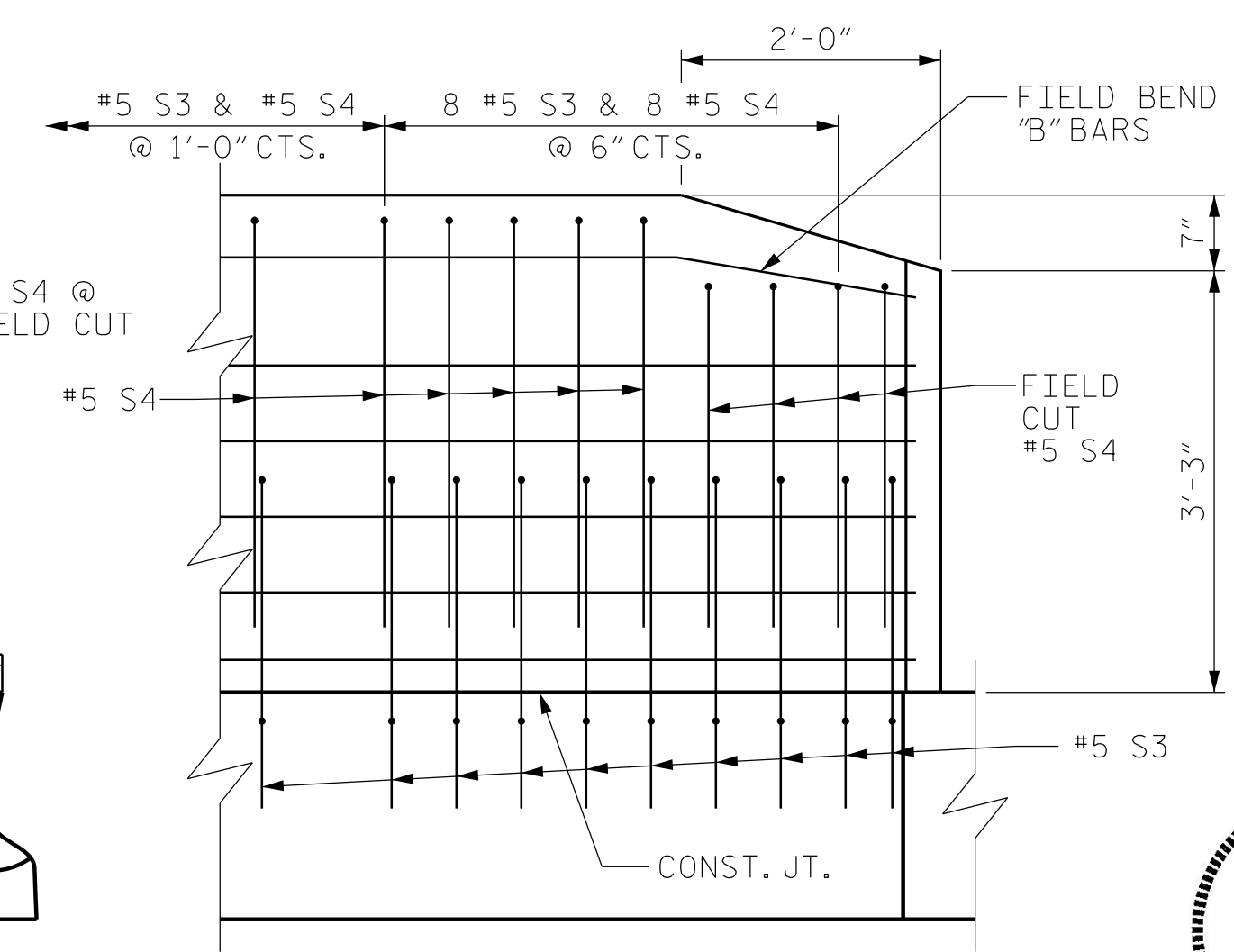
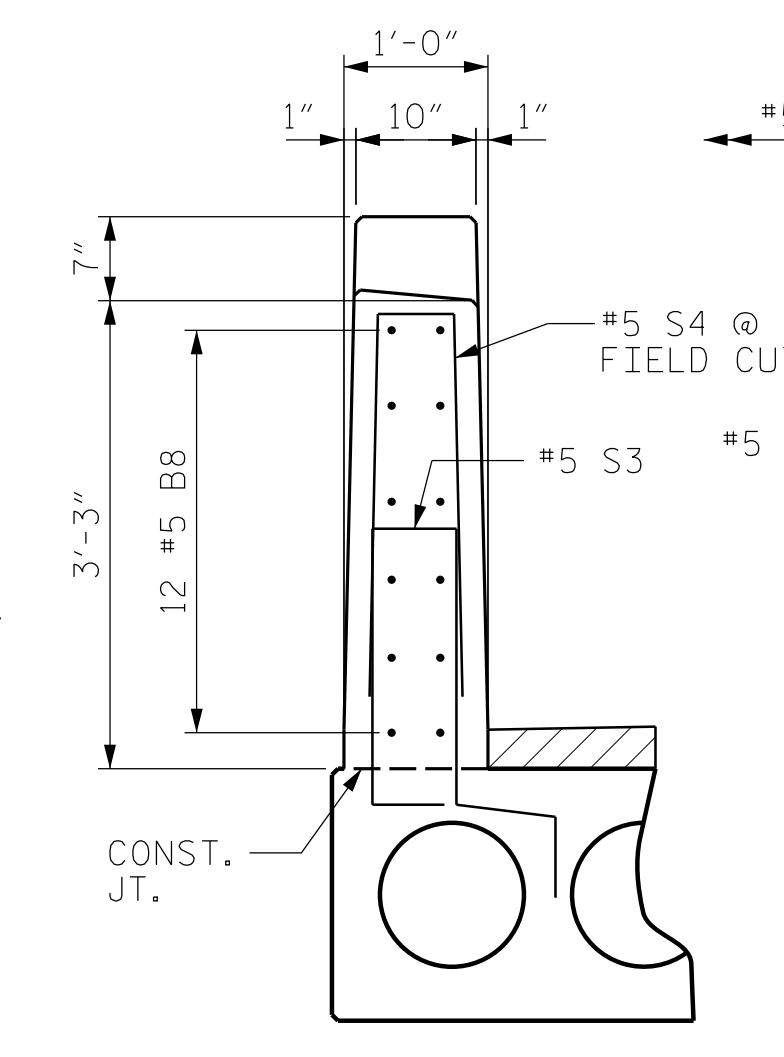
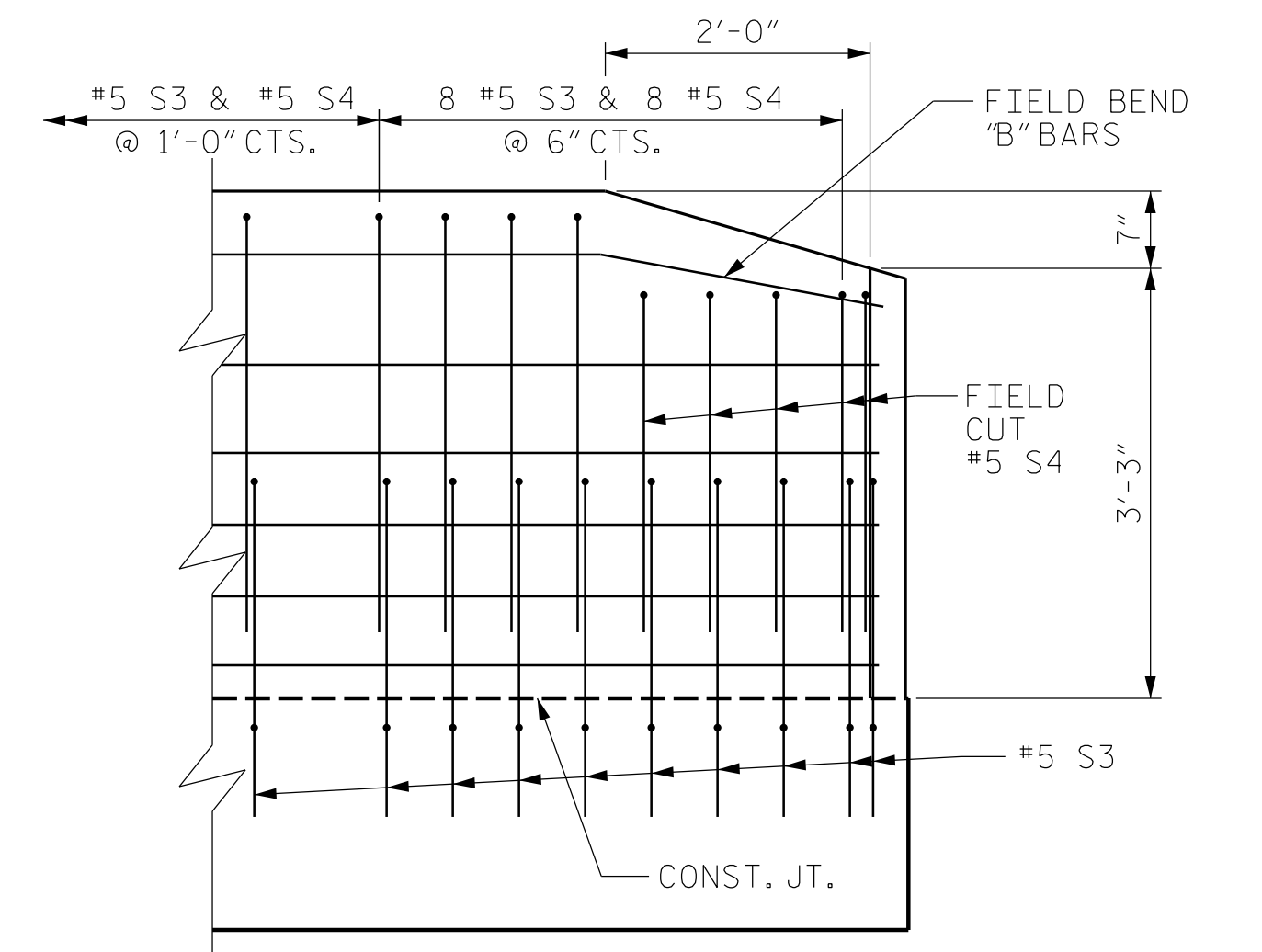
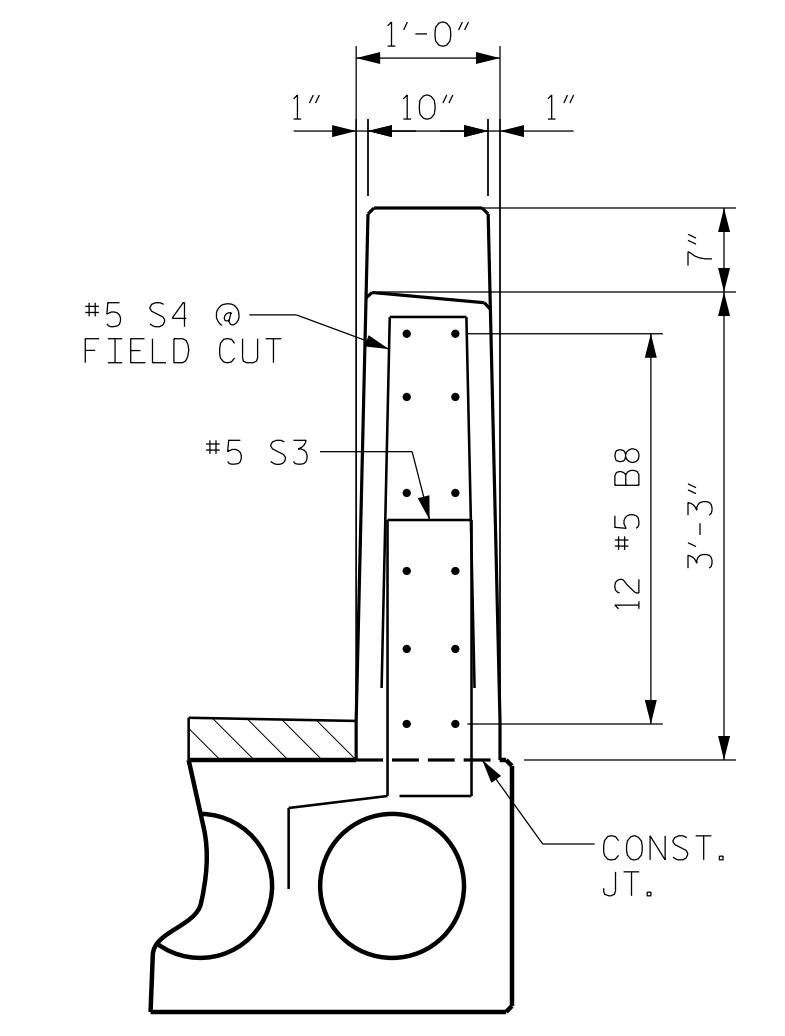
PREPARED BY  
TGS ENGINEERS  
107-A WICA AVENUE  
MORGANTON, NC 28655

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			23

STD. NO. 21" PCS\_33\_105S\_50L



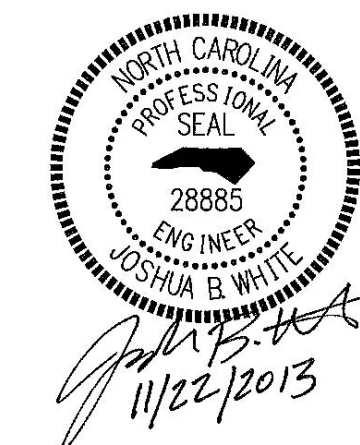
NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S3 BARS.



END OF VERTICAL CONCRETE BARRIER RAIL DETAILS

PROJECT NO. 17BP.12.R.10  
GASTON COUNTY  
STATION: 19+61.00-L-

SHEET 4 OF 5



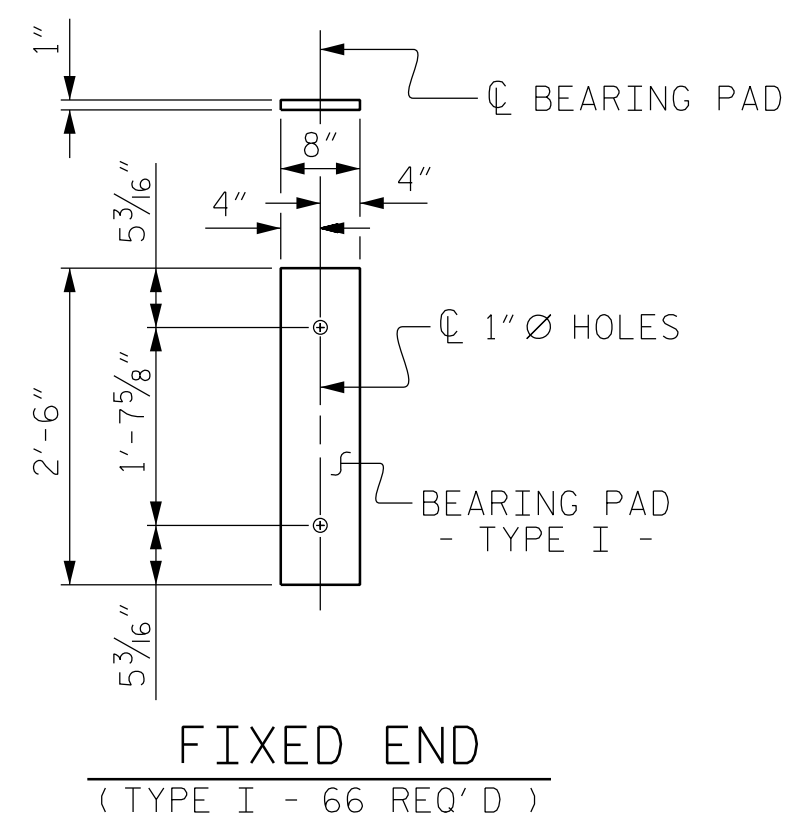
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

PLAN OF 25' UNIT  
30'-10" CLEAR ROADWAY  
105° SKEW  
SPAN C

ASSEMBLED BY :	JLA	DATE :	2/13
CHECKED BY :	JBW	DATE :	2/13
DRAWN BY :	DGE 3/09	REV. 12/5/11	MAA/AAC
CHECKED BY :	BCH 3/09		

PREPARED BY  
TOS ENGINEERS  
107-A WICA AVENUE  
MORGANTON, NC 28655

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			23



### ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 50 DUROMETER HARDNESS.

GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT		
30'-10" CLEAR ROADWAY	ASPHALT OVERLAY THICKNESS @ MID-SPAN	RAIL HEIGHT @ MID-SPAN
	NORMAL CROWN SECTION	
25' UNITS	2 7/8"	3'-9 5/8"
50' UNITS	1"	3'-7 3/4"

DEAD LOAD DEFLECTION AND CAMBER	
	3'-0" x 1'-9"
25' CORED SLAB UNIT	0.6" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	1/2" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	1/8" ↓
FINAL CAMBER	3/8" ↑

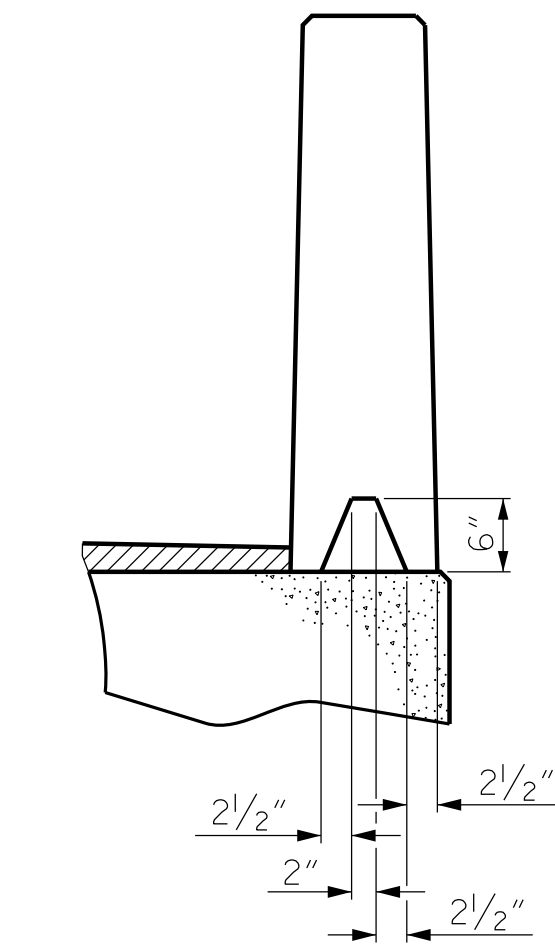
\*\* INCLUDES FUTURE WEARING SURFACE

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

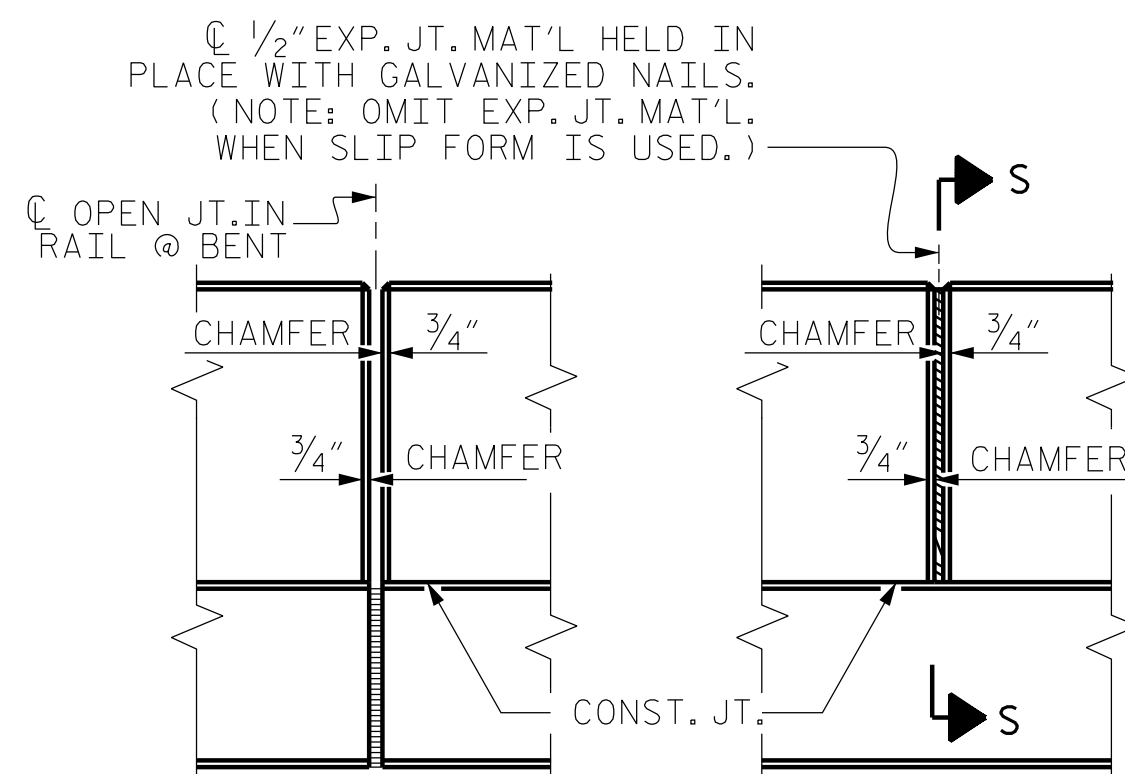
\*\* INCLUDES FUTURE WEARING SURFACE

CONCRETE RELEASE STRENGTH	
UNIT	PSI
25' UNITS	4000
50' UNITS	4900

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

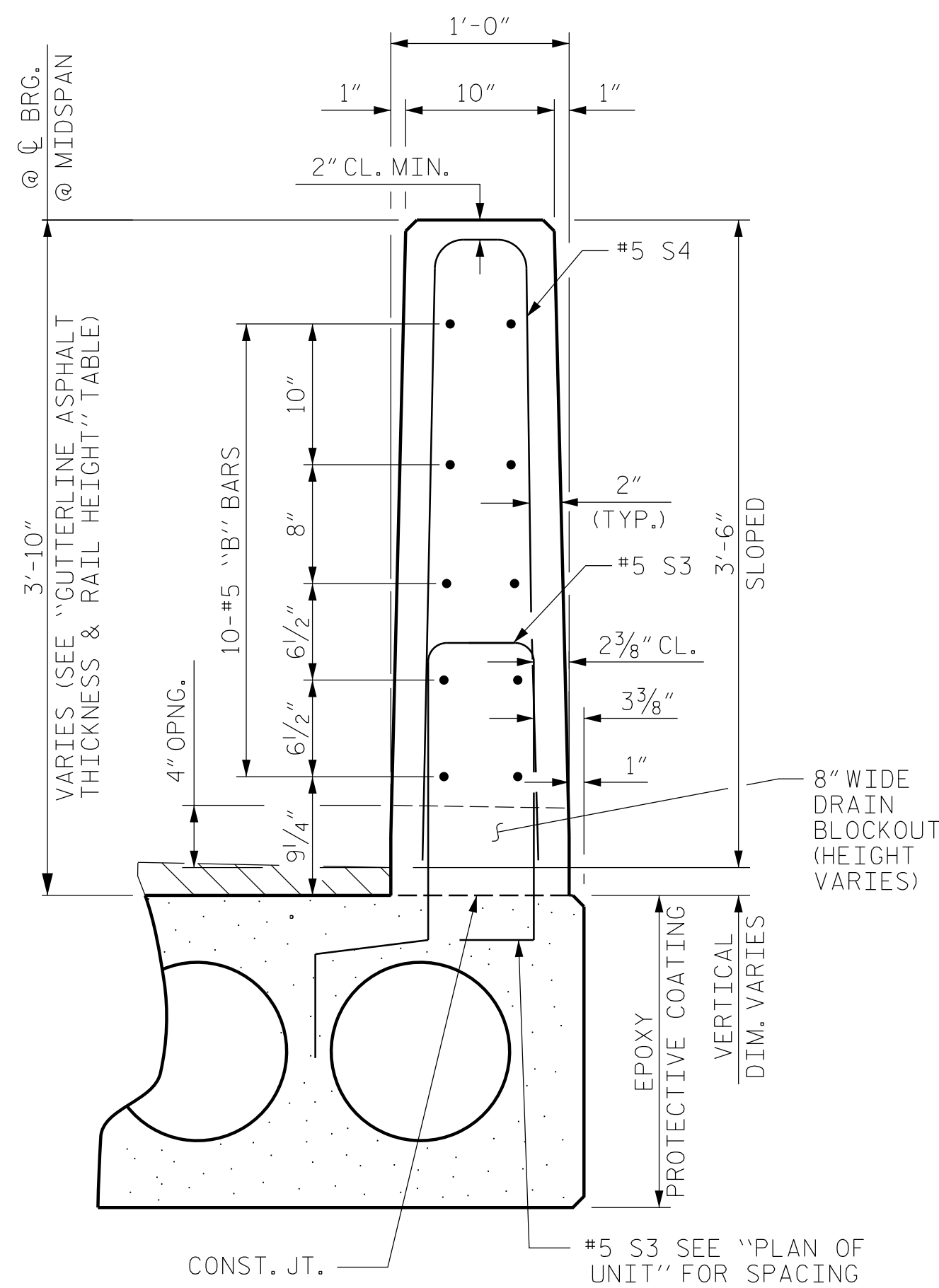


SECTION S-S  
AT DAM IN OPEN JOINT  
(THIS IS TO BE USED ONLY  
WHEN SLIP FORM IS USED)

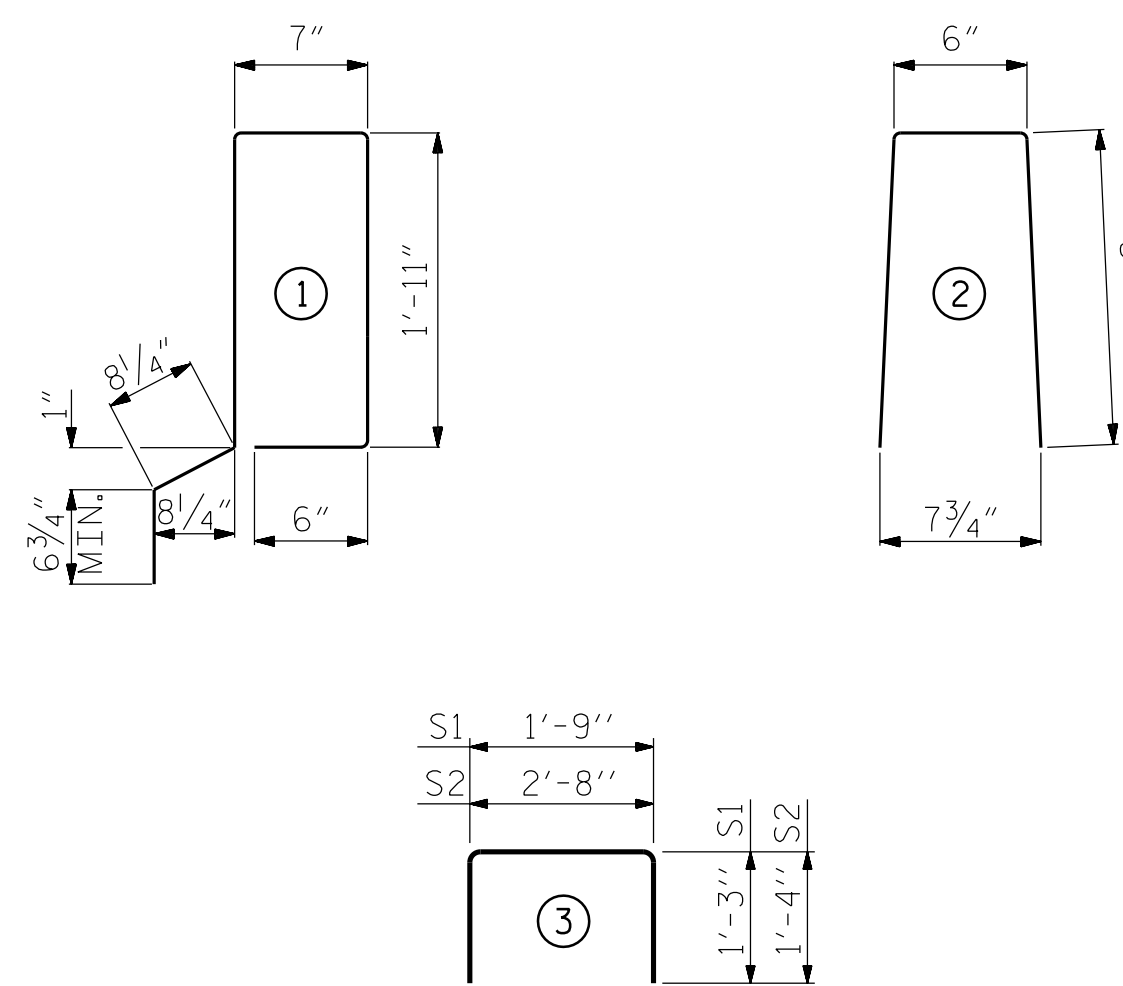


ELEVATION AT EXPANSION JOINTS

### VERTICAL CONCRETE BARRIER RAIL SECTION



### BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

### BILL OF MATERIAL FOR ONE 25' CORED SLAB UNIT

BAR NUMBER	SIZE	TYPE	EXTERIOR UNIT		INTERIOR UNIT	
			LENGTH	WEIGHT	LENGTH	WEIGHT
B1	#4	STR	24'-7"	33	24'-7"	33
S1	#5	3	4'-3"	35	4'-3"	35
S2	#4	3	5'-4"	242	5'-4"	242
* S3	#5	1	6'-2"	219		
REINFORCING STEEL	LBS.			310		310
* EPOXY COATED REINFORCING STEEL	LBS.			219		
5000 P.S.I. CONCRETE	CU. YDS.			3.8		3.8
0.6" Ø L.R. STRANDS	No.			9		9

### BILL OF MATERIAL FOR ONE 50' CORED SLAB UNIT

BAR NUMBER	SIZE	TYPE	EXTERIOR UNIT		INTERIOR UNIT	
			LENGTH	WEIGHT	LENGTH	WEIGHT
B6	#4	STR	25'-9"	69	25'-9"	69
S1	#5	3	4'-3"	35	4'-3"	35
S2	#4	3	5'-4"	420	5'-4"	420
* S3	#5	1	6'-2"	379		
REINFORCING STEEL	LBS.			524		524
* EPOXY COATED REINFORCING STEEL	LBS.			379		
6500 P.S.I. CONCRETE	CU. YDS.			7.3		7.3
0.6" Ø L.R. STRANDS	No.			19		19

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL						
BAR	BARS PER PAIR OF EXTERIOR UNITS	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
					25' UNIT	
* B8	20	40	#5	STR	24'-6"	1,022
* S4	68	136	#5	2	7'-2"	1,016
* EPOXY COATED REINFORCING STEEL					LBS.	2,038
CLASS AA CONCRETE					CU. YDS.	13.2
TOTAL VERTICAL CONCRETE BARRIER RAIL					LN. FT.	100.5

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL						
BAR	BARS PER PAIR OF EXTERIOR UNITS	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
					50' UNIT	
* B13	80	80	#5	STR	14'-2"	1182
* S4	118	118	#5	2	7'-2"	882
* EPOXY COATED REINFORCING STEEL					LBS.	2064
CLASS AA CONCRETE					CU. YDS.	13.1
TOTAL VERTICAL CONCRETE BARRIER RAIL					LN. FT.	100.25

### NOTES

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

ALL REINFORCING STEEL CAST WITH THE CORED SLAB SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE CORED SLABS.

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

THE 2 1/2" Ø DOWEL HOLES AT FIXED ENDS OF SLAB SECTIONS SHALL BE FILLED WITH NON-SHRINK GROUT.

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

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

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

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

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS.

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

TRANSVERSE POST TENSIONING OF THE CORED SLAB UNITS SHALL BE DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

THE DRAIN OPENING AT THE GUTTERLINE SHALL BE 4" X 8". THE HEIGHT OF THE BLOCKOUT IN THE VERTICAL CONCRETE BARRIER RAIL SHALL EXTEND FROM THE TOP OF THE CORED SLAB UNIT TO THE TOP OF THE DRAIN OPENING.

APPLY EPOXY PROTECTIVE COATING TO EXTERIOR FACE OF THE EXTERIOR CORED SLAB UNITS THAT REQUIRE DRAINS IN THE BARRIER RAIL.

CORED SLABS REQUIRED			
	NUMBER	LENGTH	TOTAL LENGTH
25' UNIT			
EXTERIOR C.S.	4	25'-0"	100
INTERIOR C.S.	18	25'-0"	450
TOTAL	22		550

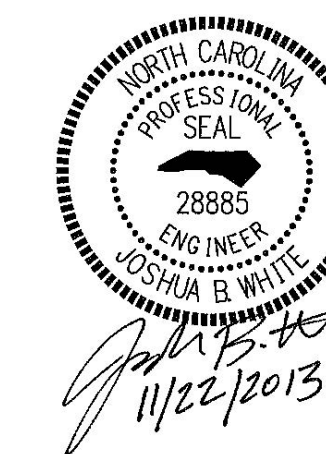
CORED SLABS REQUIRED			
	NUMBER	LENGTH	TOTAL LENGTH
50' UNIT			
EXTERIOR C.S.	2	50'-0"	100
INTERIOR C.S.	9	50'-0"	450
TOTAL	11		550

PROJECT NO. 17BP.12.R.10

GASTON COUNTY

STATION: 19+61.00-L-

SHEET 5 OF 5



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
3'-0" X 1'-9"  
PRESTRESSED CONCRETE  
CORED SLAB UNIT  
105° SKEW  
SPANS A, B, & C

ASSEMBLED BY :	JLA	DATE :	10/12
CHECKED BY :	JBW	DATE :	11/12
DRAWN BY :	DGE 5/09	REV. 12/11	MAA/AAC
CHECKED BY :	BCH 6/09		

PREPARED BY  
TGS ENGINEERS  
107-A WICA AVENUE  
MORGANTON, NC 28655

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			23



NOTES

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

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

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL

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

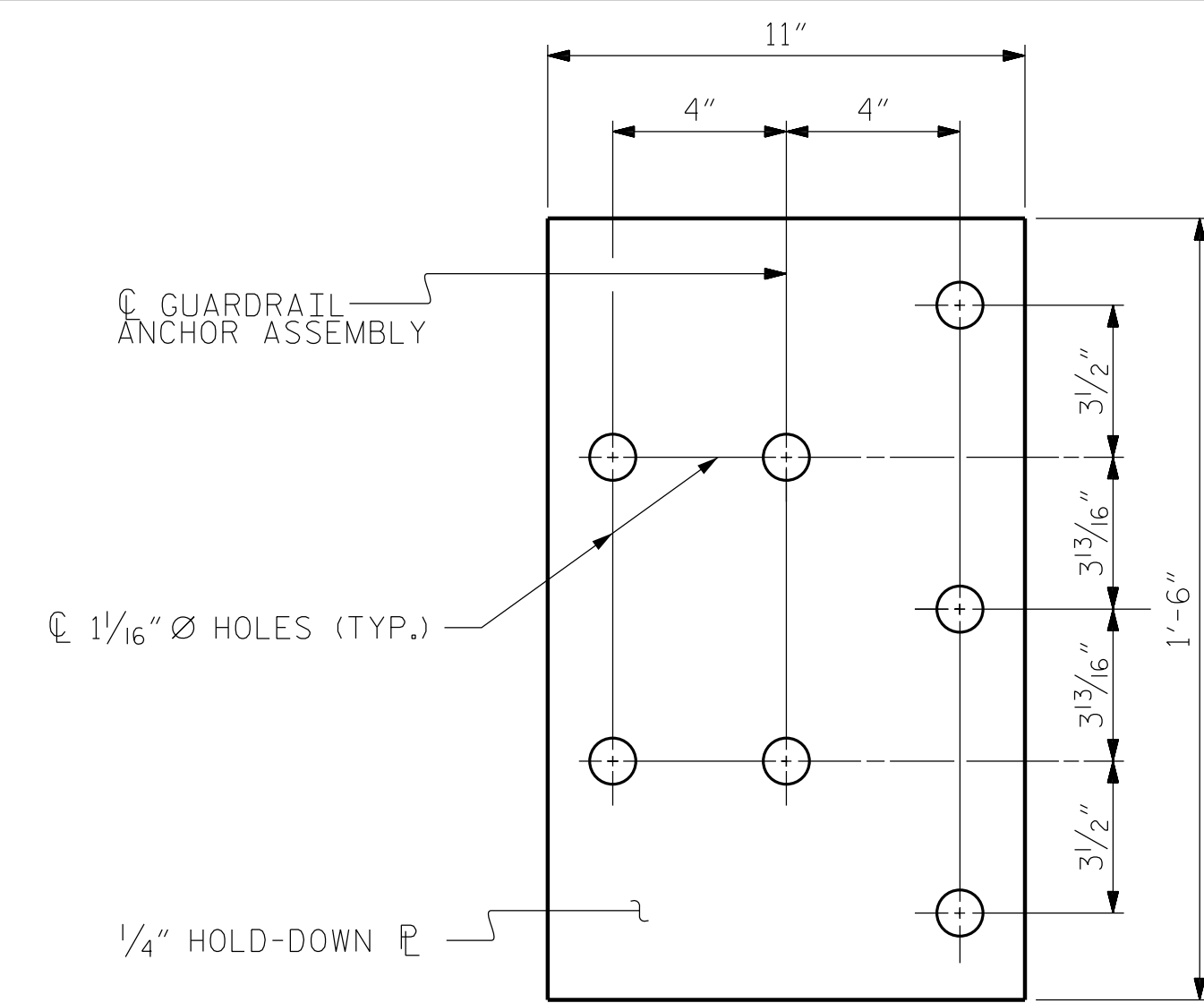
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

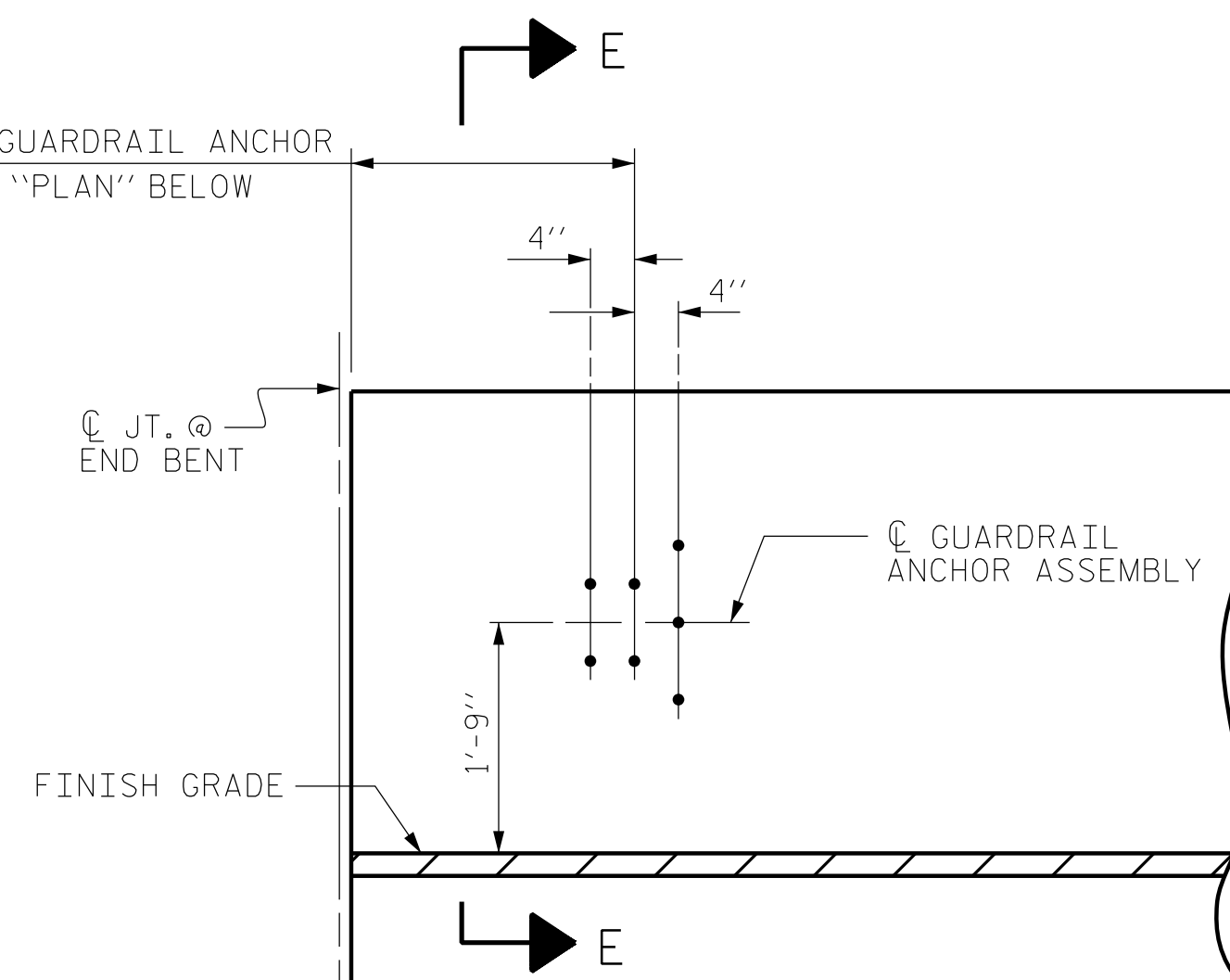
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE VERTICAL CONCRETE BARRIER RAIL TO CLEAR ASSEMBLY BOLTS.

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

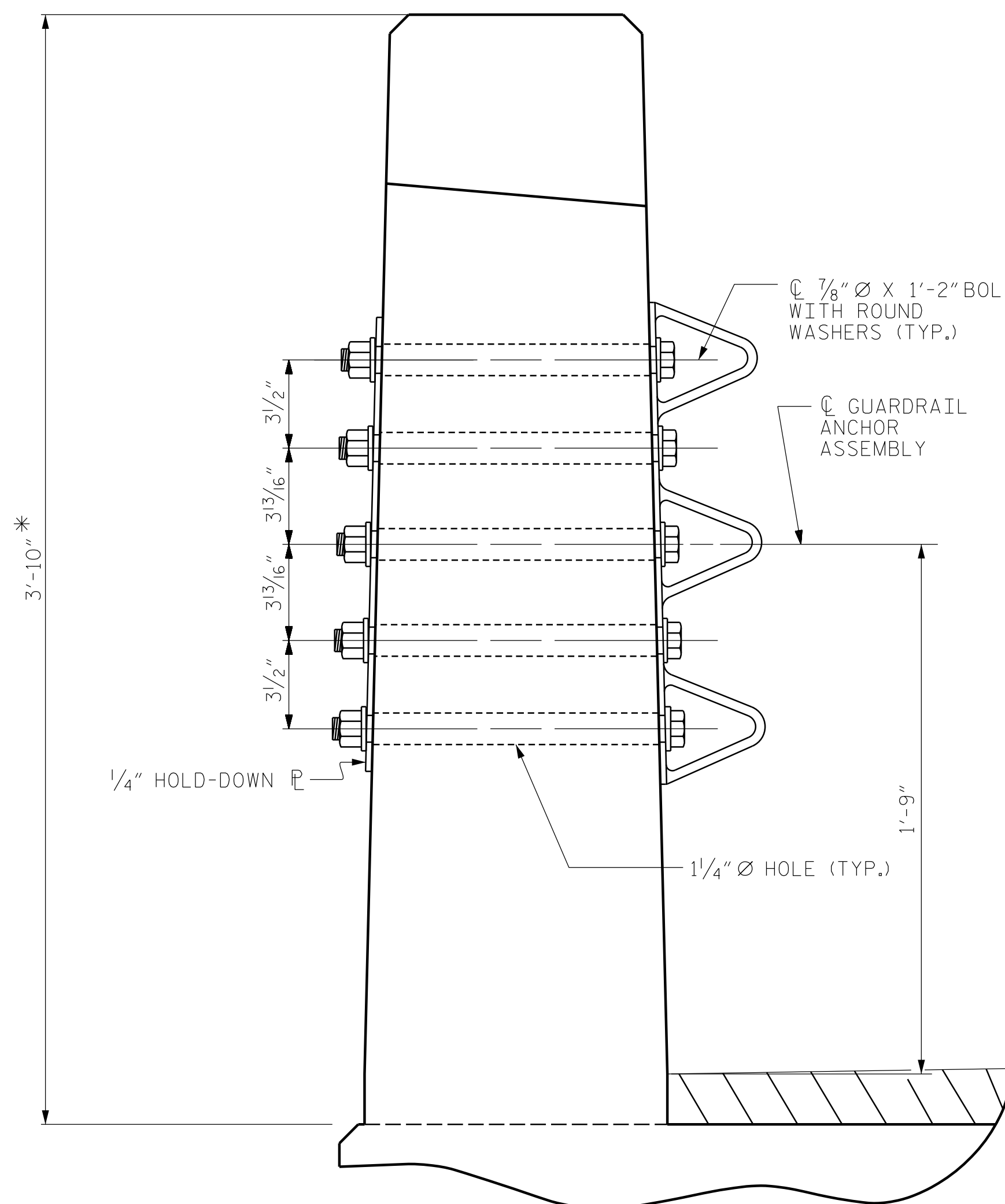


PLAN

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

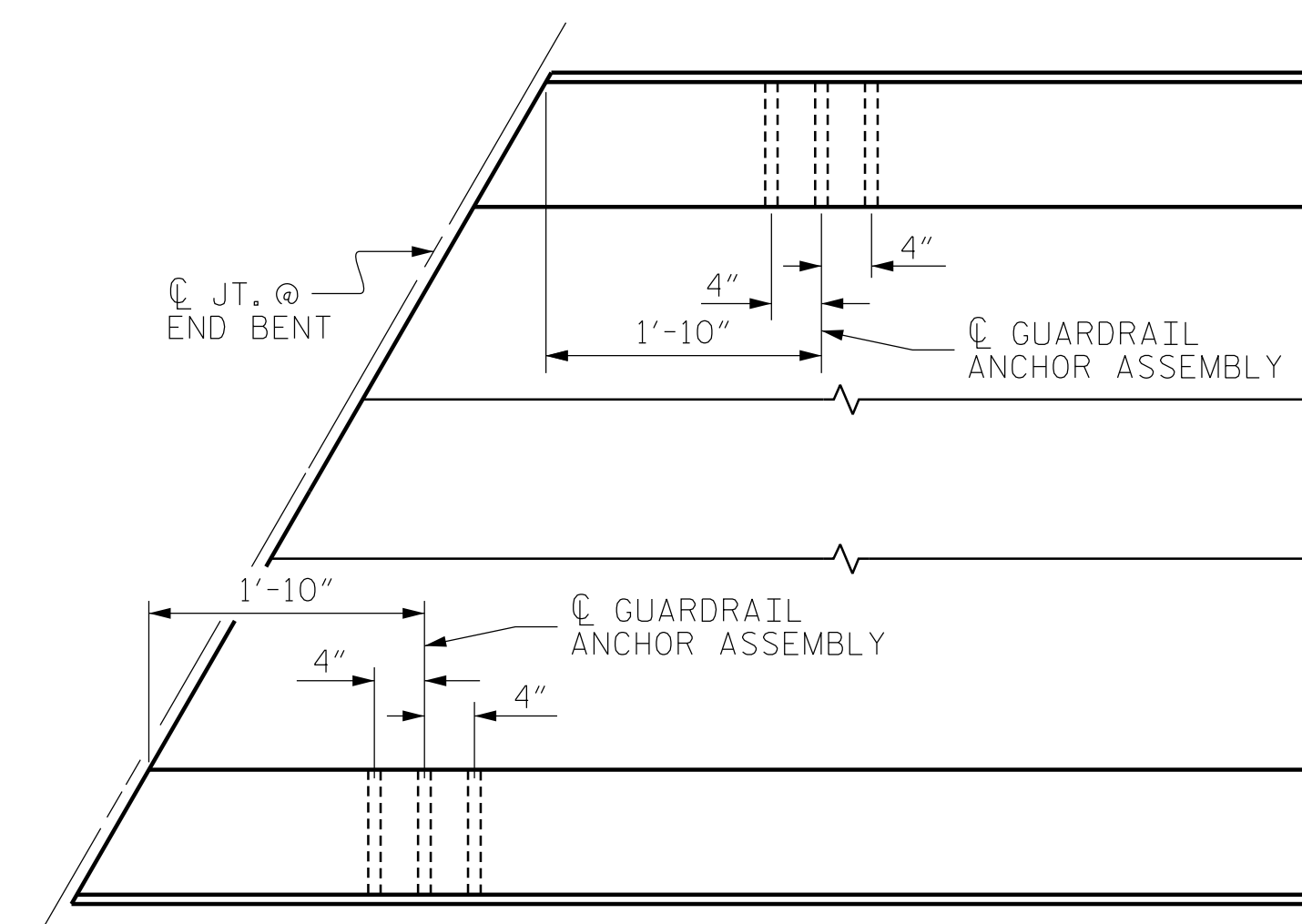


ELEVATION



SECTION E-E  
(VERTICAL CONCRETE BARRIER RAIL)  
\* BASED ON 3/4" WEARING SURFACE

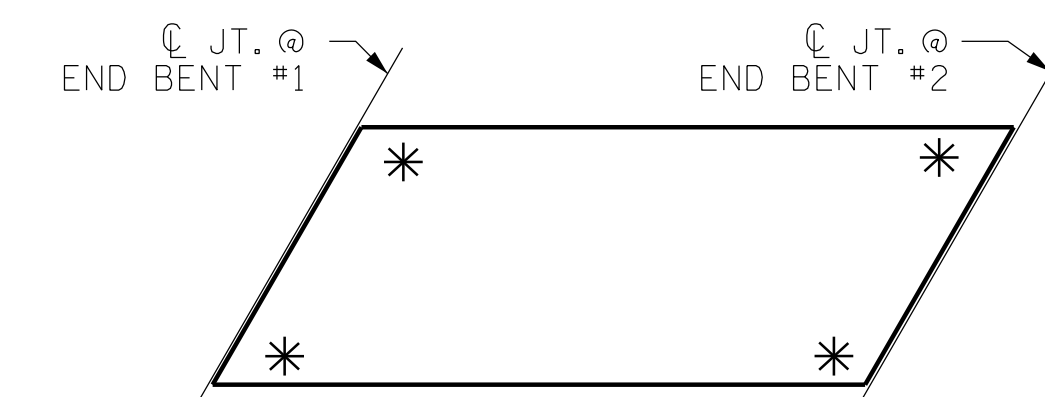
GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

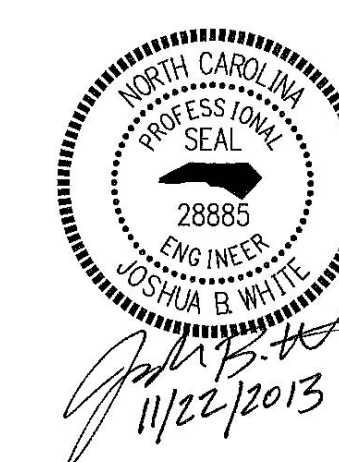
END BENT #1 SHOWN, END BENT #2 SIMILAR.



SKETCH SHOWING POINTS OF ATTACHMENT

\* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. 17BP.12.R.10  
GASTON COUNTY  
STATION: 19+61.00-L-



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

ASSEMBLED BY :	JLA	DATE :	2/13
CHECKED BY :	JBW	DATE :	2/13
DRAWN BY :	MAA 5/10	ADDED 5/6/10	
CHECKED BY :	GM 5/10	REV. 10/1/11	MAA/GM
		REV. 12/5/11	MAA/GM

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12	
1			3			TOTAL SHEETS	23
2			4				

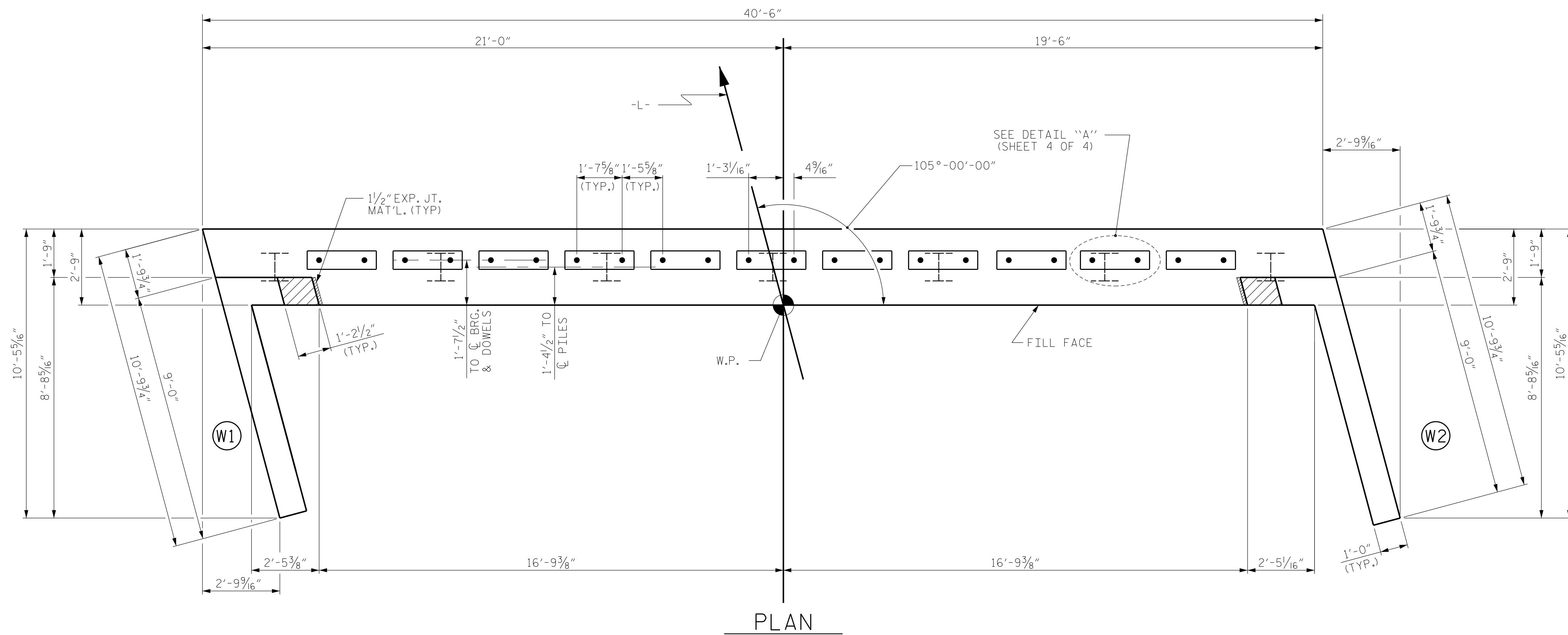
# NOTES

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

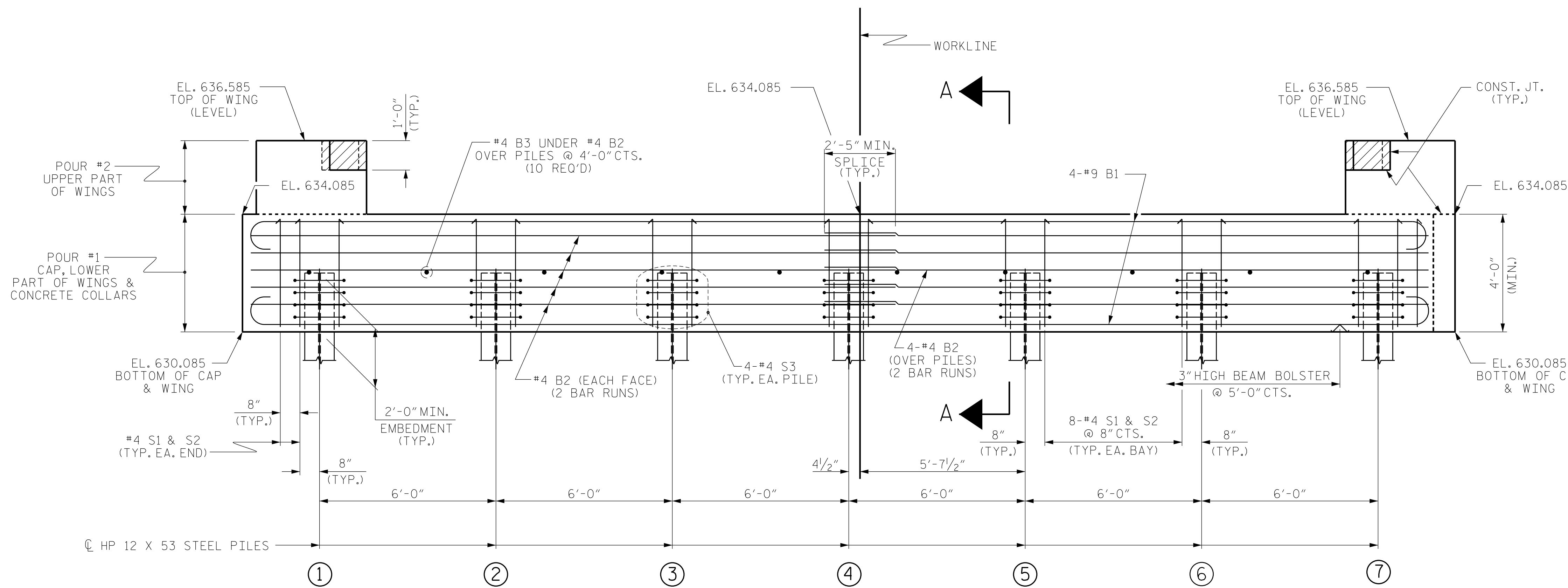
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE Poured AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.



PLAN

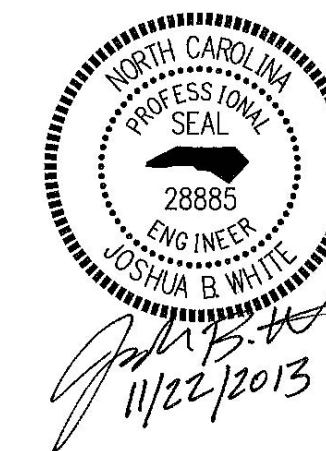


ELEVATION

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.

ASSEMBLED BY : JLA	DATE : 10/12
CHECKED BY : JBW	DATE : 11/12
DRAWN BY : WJH 12/II	
CHECKED BY : AAC 12/II	

PREPARED BY  
TGS ENGINEERS  
107-A WICA AVENUE  
MORGANTON, NC 28655



PROJECT NO. 17BP.12.R.10  
GASTON COUNTY  
STATION: 19+61.00-L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE  
END BENT No. 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			23

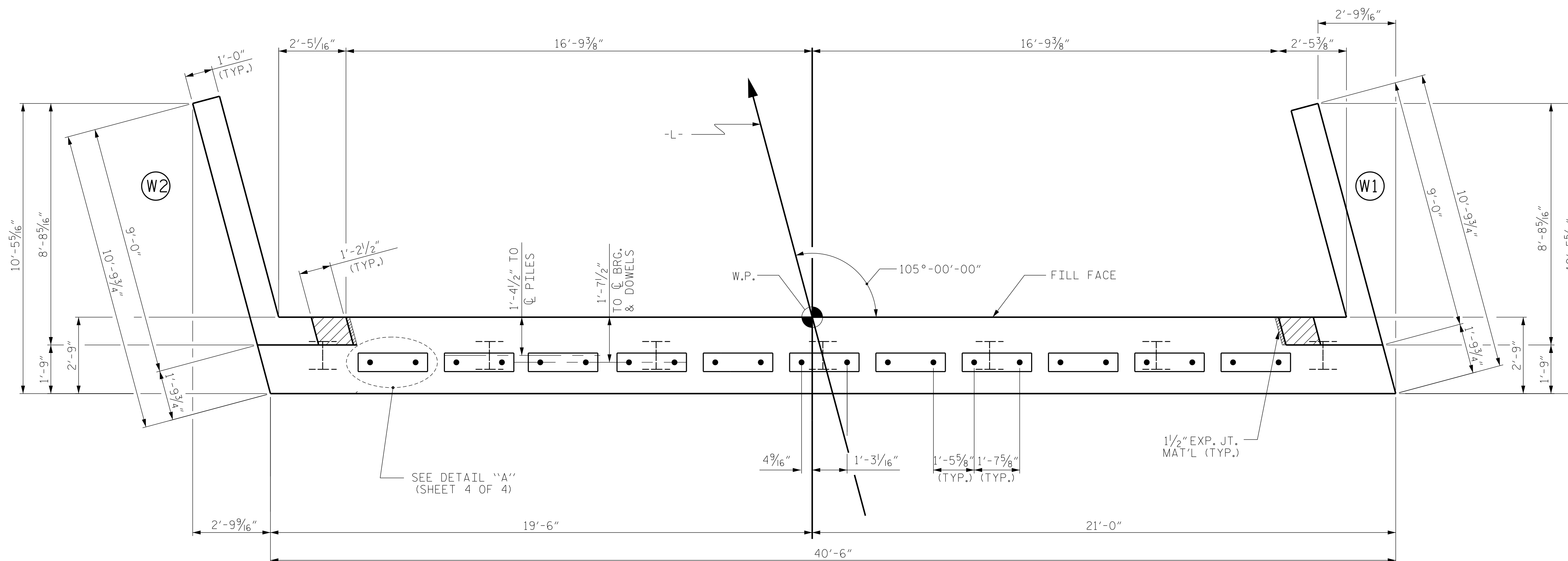
NOTES

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

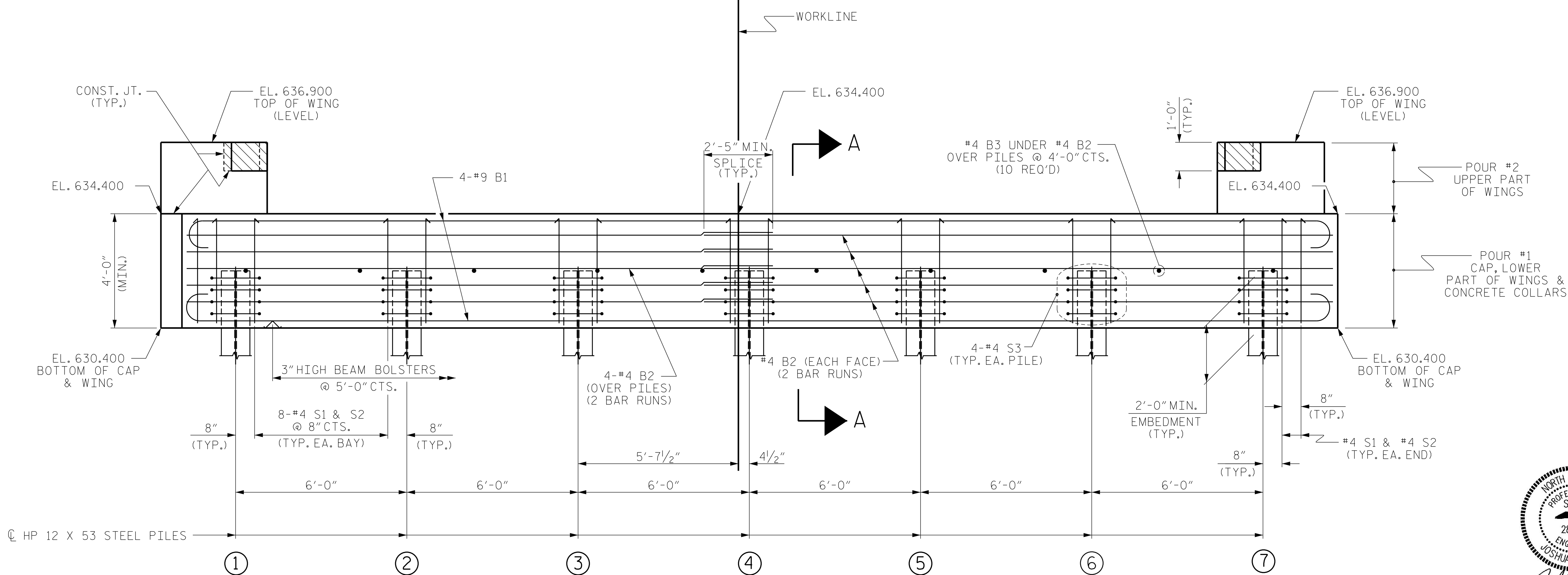
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.



PLAN

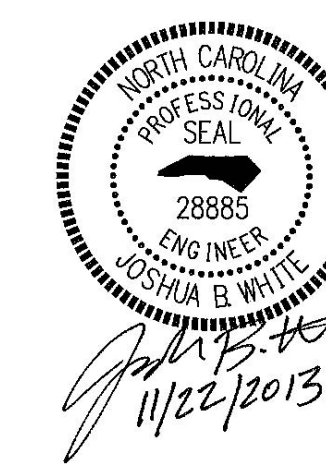


ELEVATION

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

PROJECT NO. 17BP.12.R.10  
GASTON COUNTY  
STATION: 19+61.00-L-

SHEET 2 OF 4

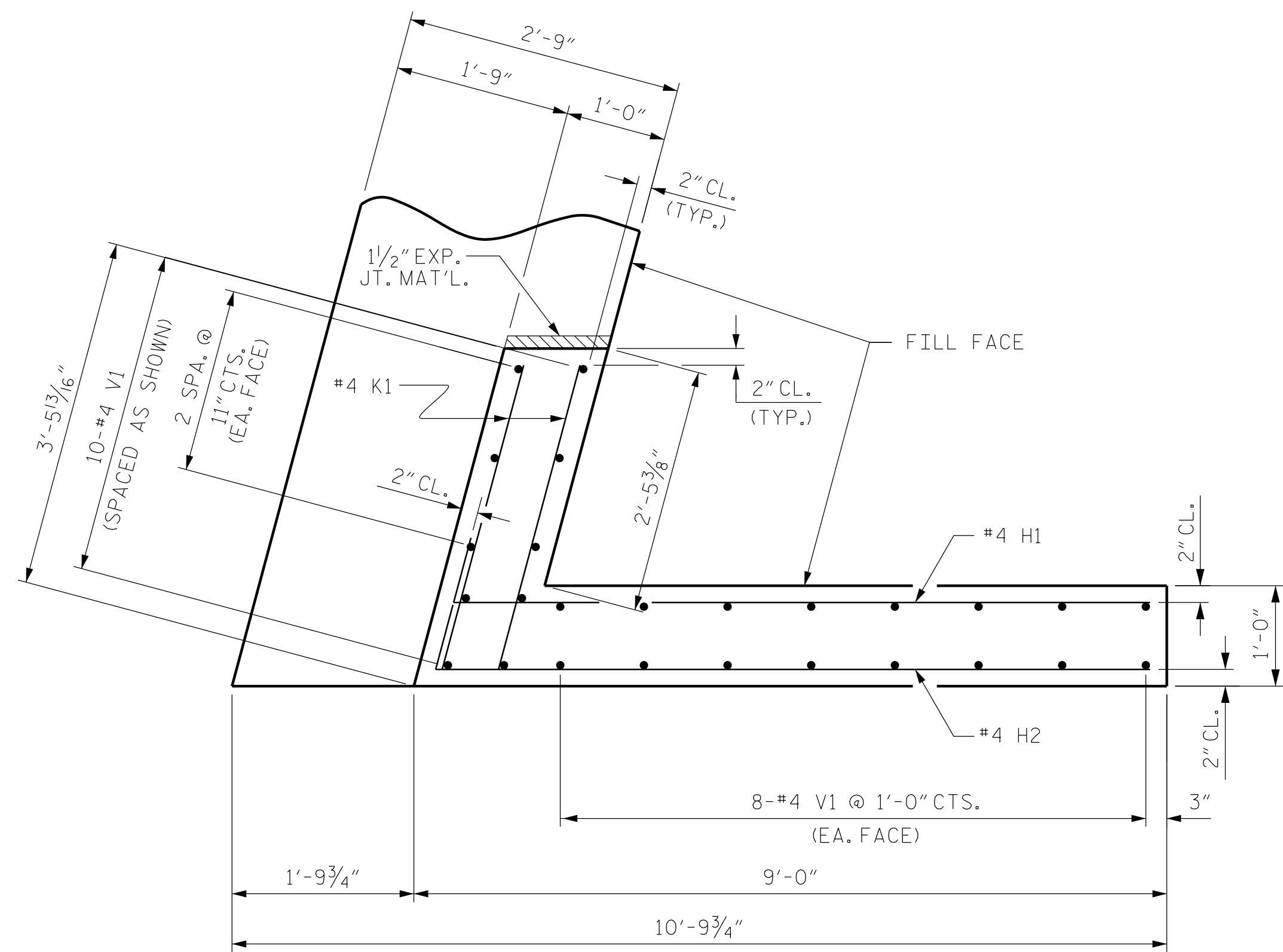


STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
SUBSTRUCTURE  
END BENT No. 2

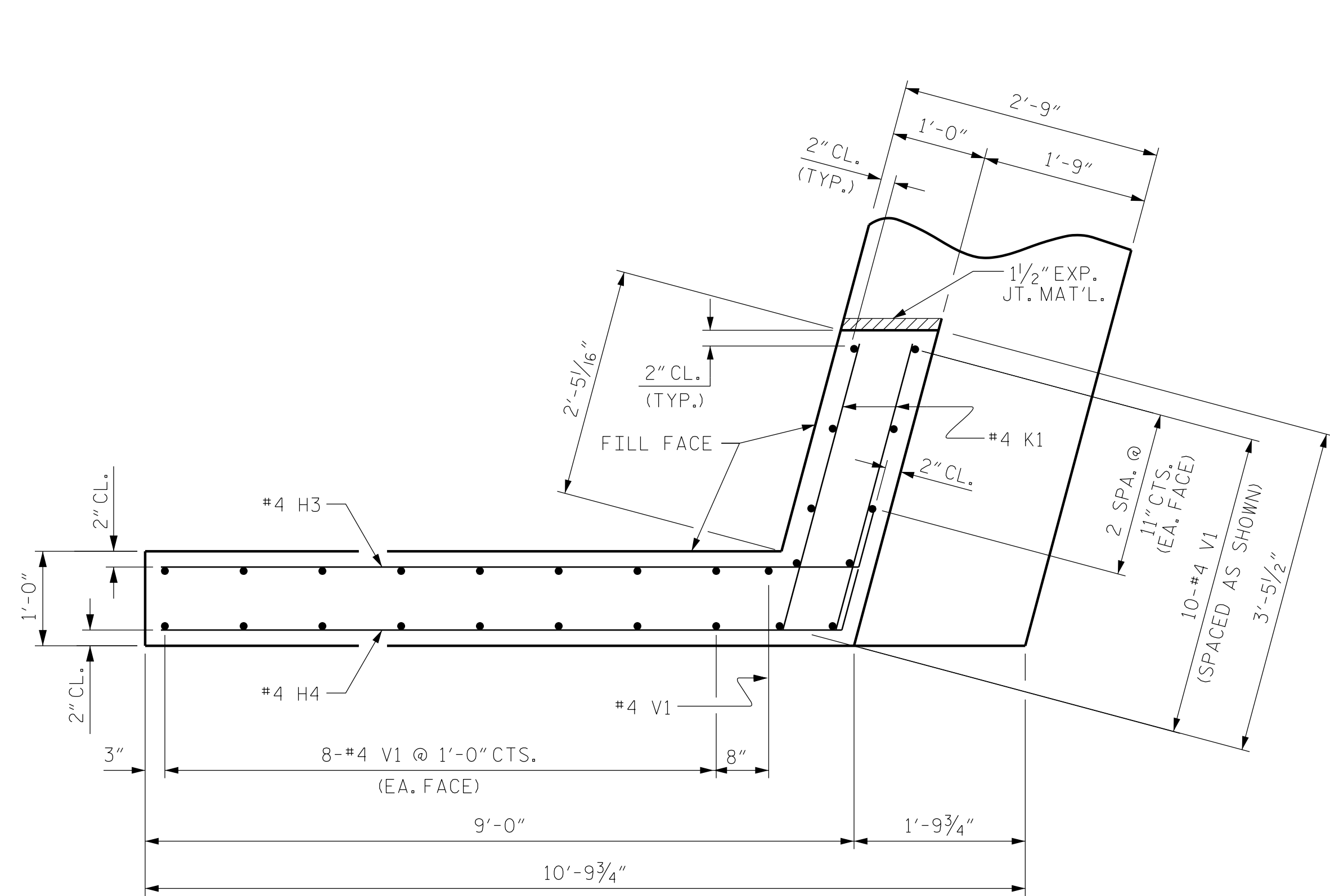
ASSEMBLED BY : JLA	DATE : 10/12
CHECKED BY : JBW	DATE : 11/12
DRAWN BY : WJH 12/11	
CHECKED BY : AAC 12/11	

PREPARED BY  
TOS ENGINEERS  
107-A WICA AVENUE  
MORGANTON, NC 28655

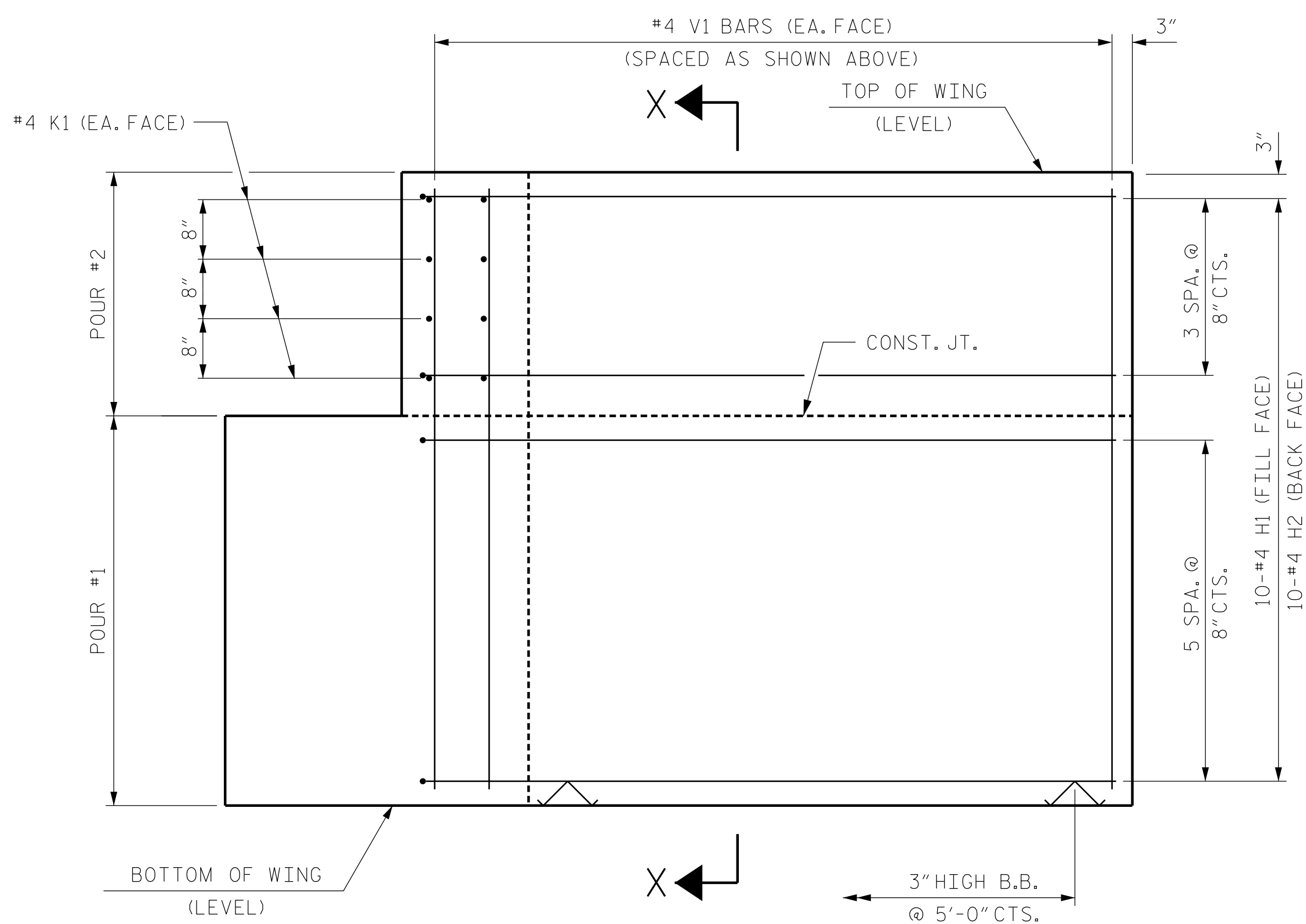
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			23



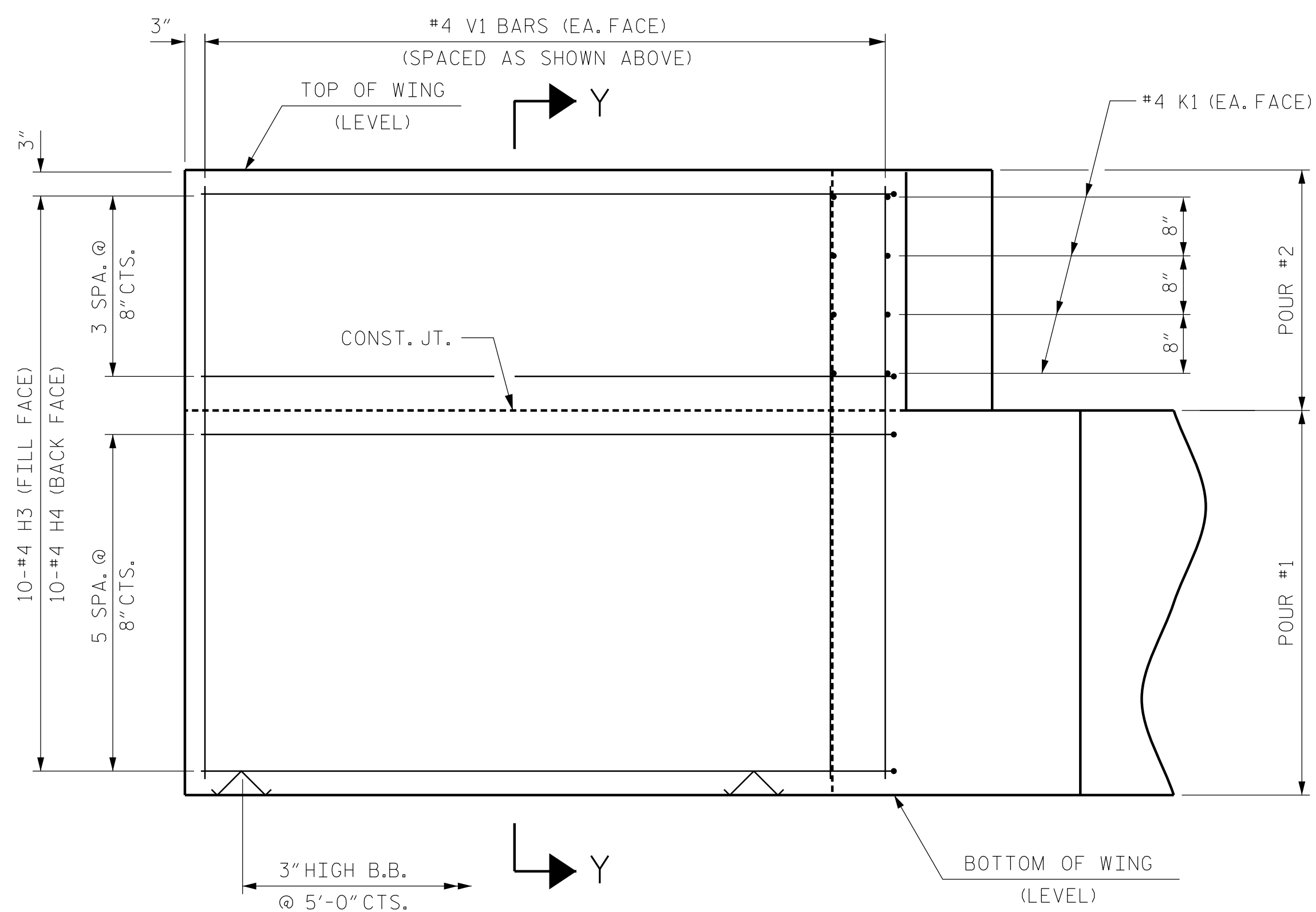
PLAN OF WING (W1)



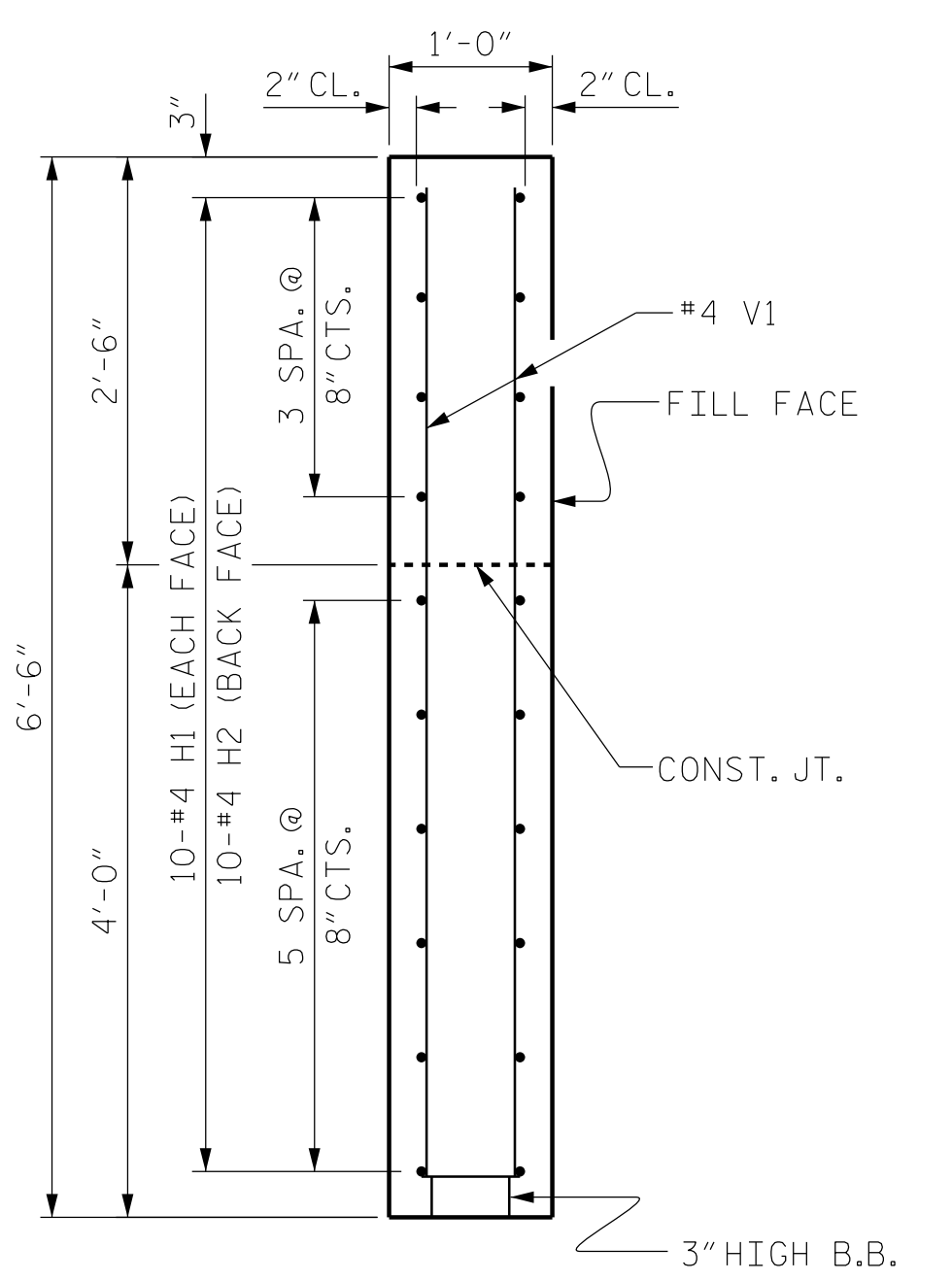
PLAN OF WING (W2)



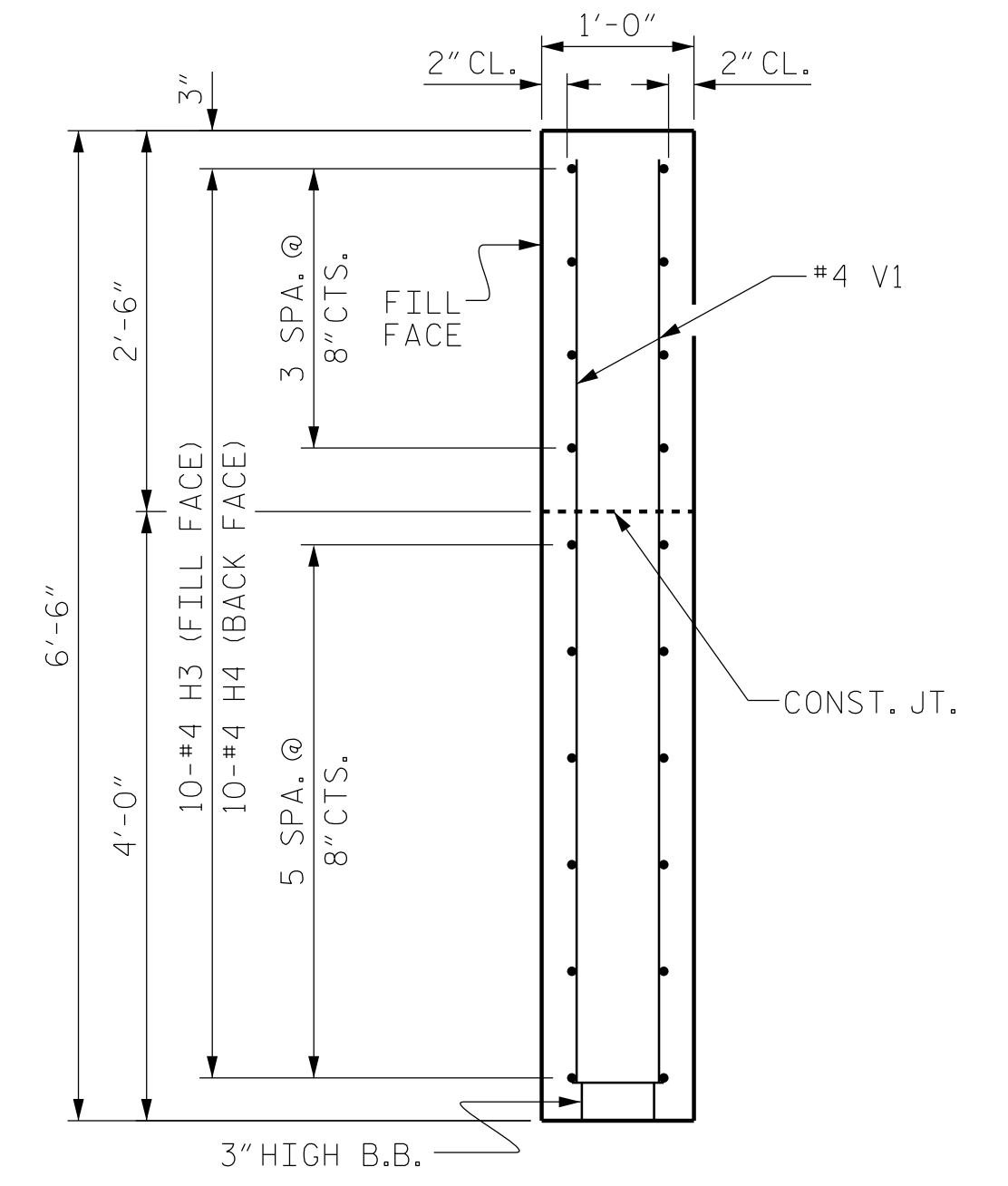
ELEVATION OF WING (W1)



ELEVATION OF WING (W2)



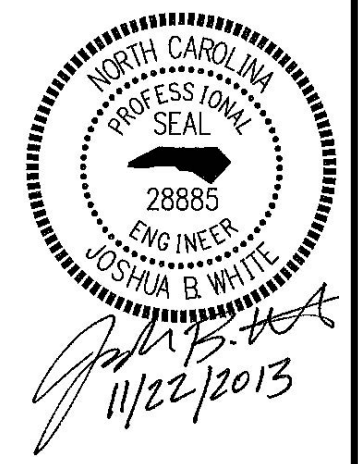
SECTION X-X



SECTION Y-Y

PROJECT NO. 17BP.12.R.10  
 GASTON COUNTY  
 STATION: 19+61.00-L-

SHEET 3 OF 4



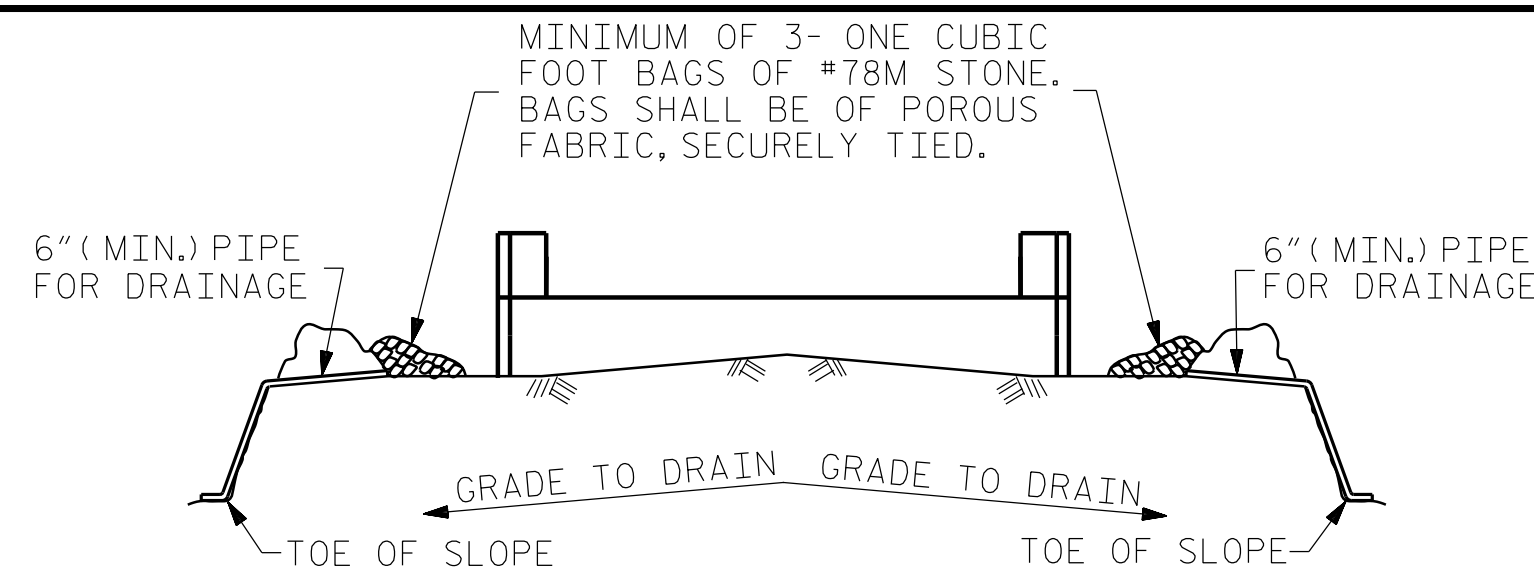
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 END BENT  
 WING DETAILS

ASSEMBLED BY : JLA	DATE : 10/12
CHECKED BY : JBW	DATE : 11/12
DRAWN BY : WJH 12/11	
CHECKED BY : AAC 12/11	

WING DETAILS

PREPARED BY  
 TOS ENGINEERS  
 107-A WICA AVENUE  
 MORGANTON, NC 28655

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15	
1			3			TOTAL SHEETS	
2			4			23	

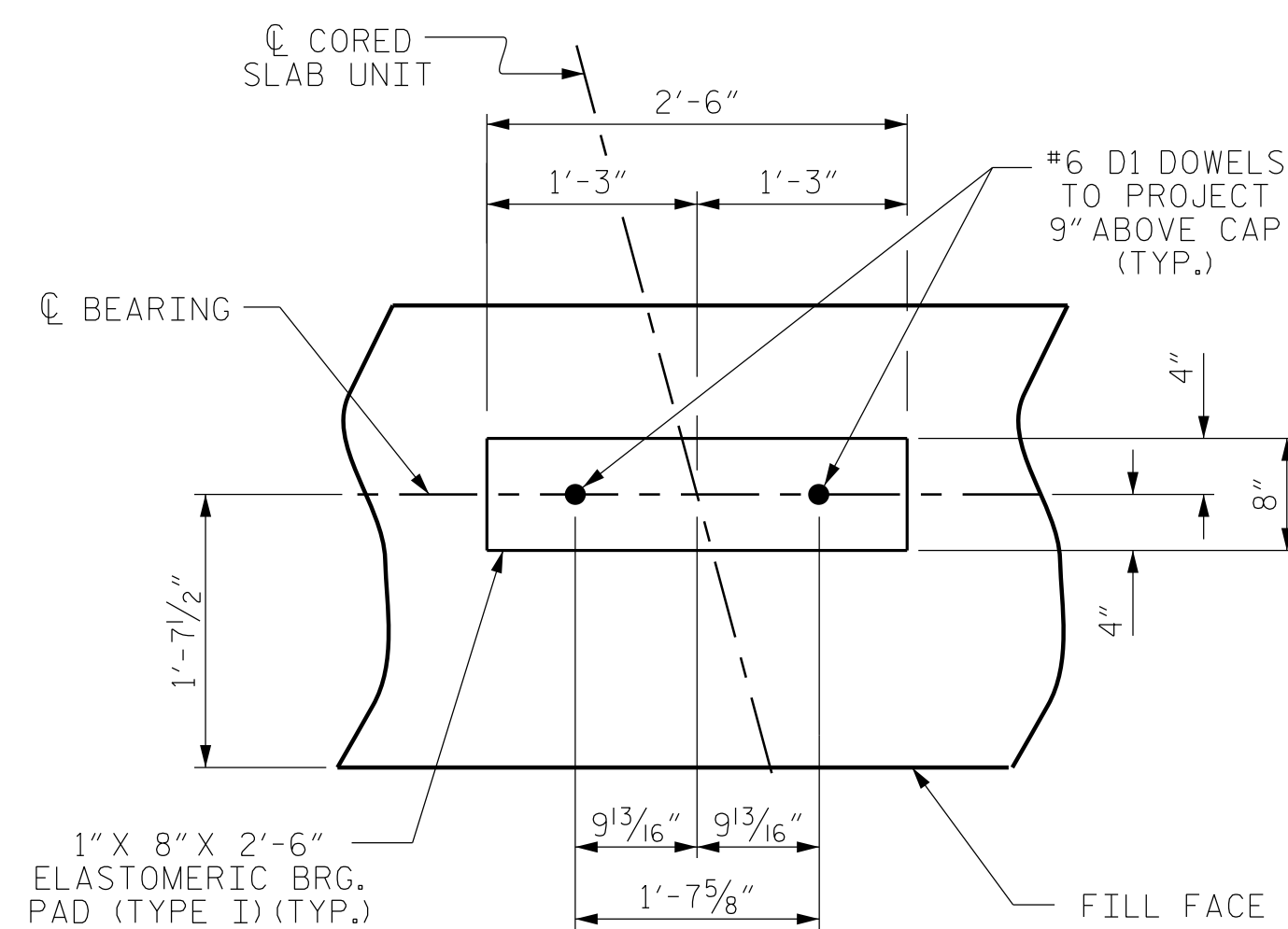


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

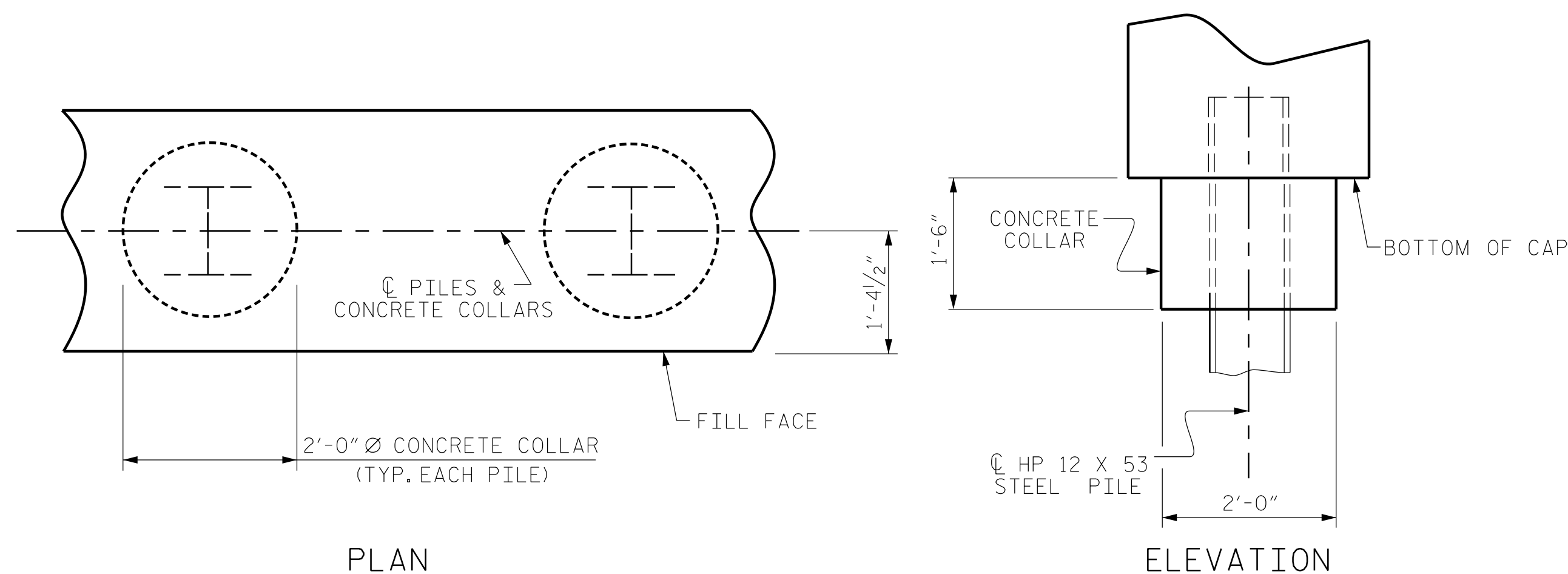
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

### TEMPORARY DRAINAGE AT END BENT



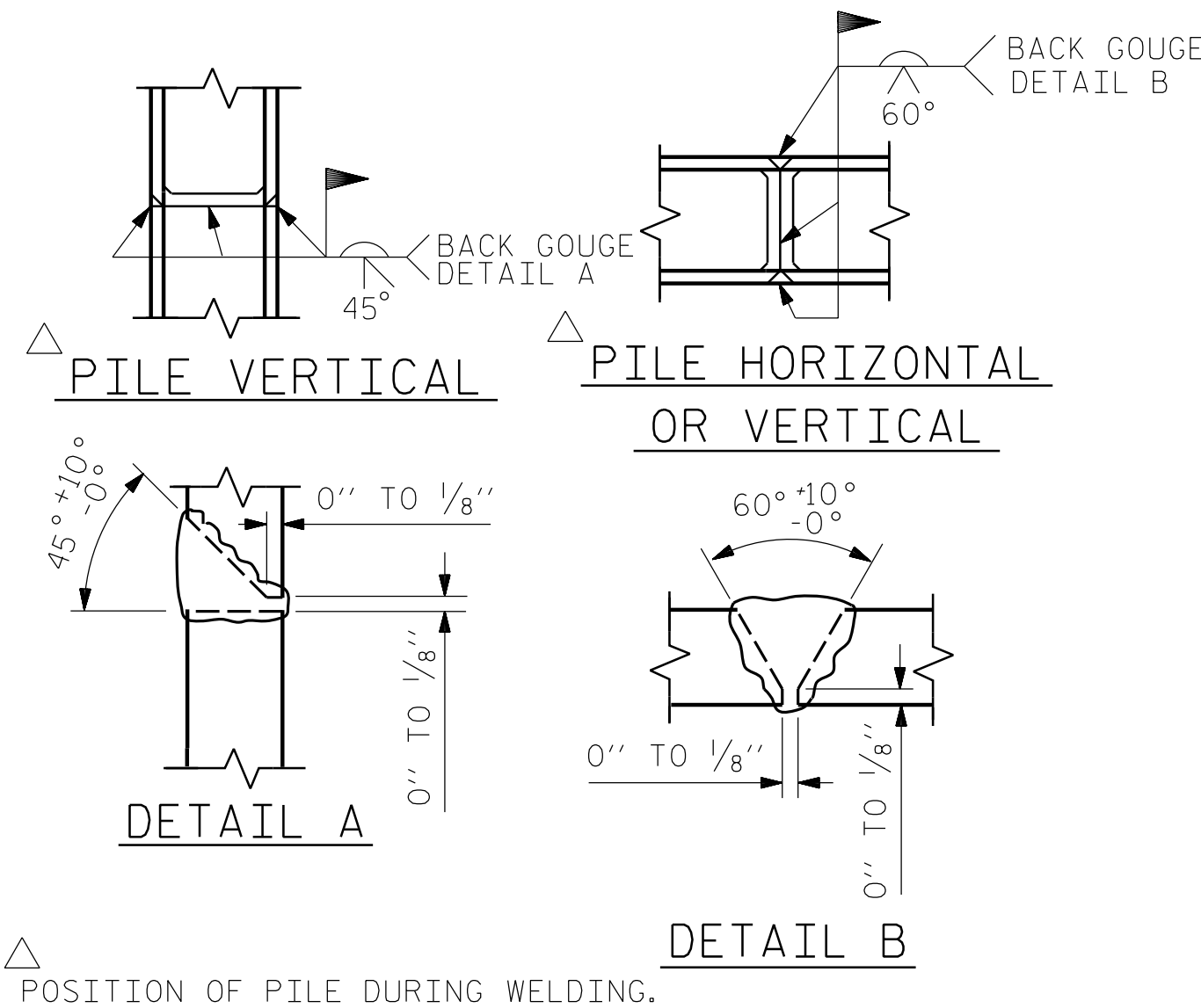
#### DETAIL "A"

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

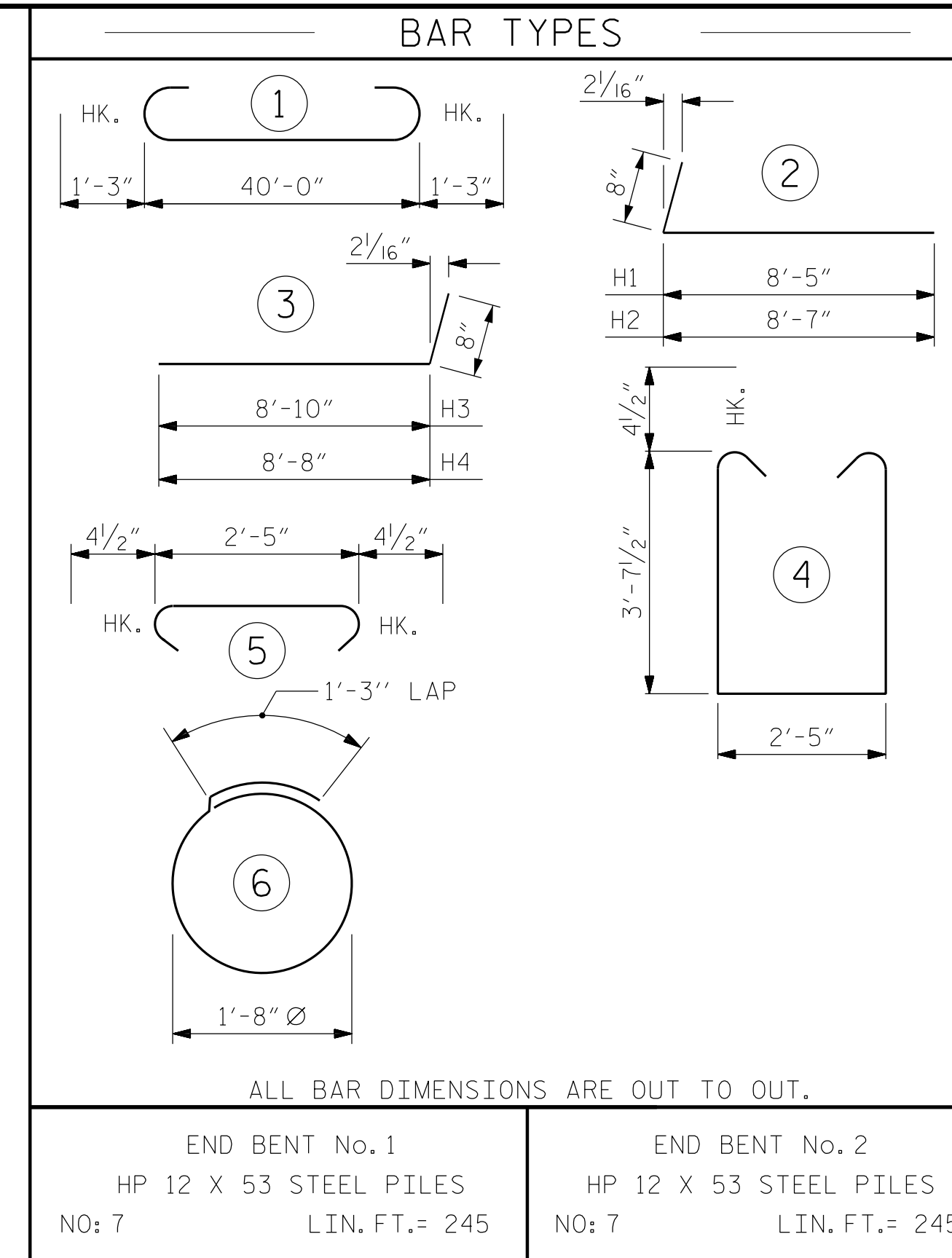


### CORROSION PROTECTION FOR STEEL PILES DETAIL

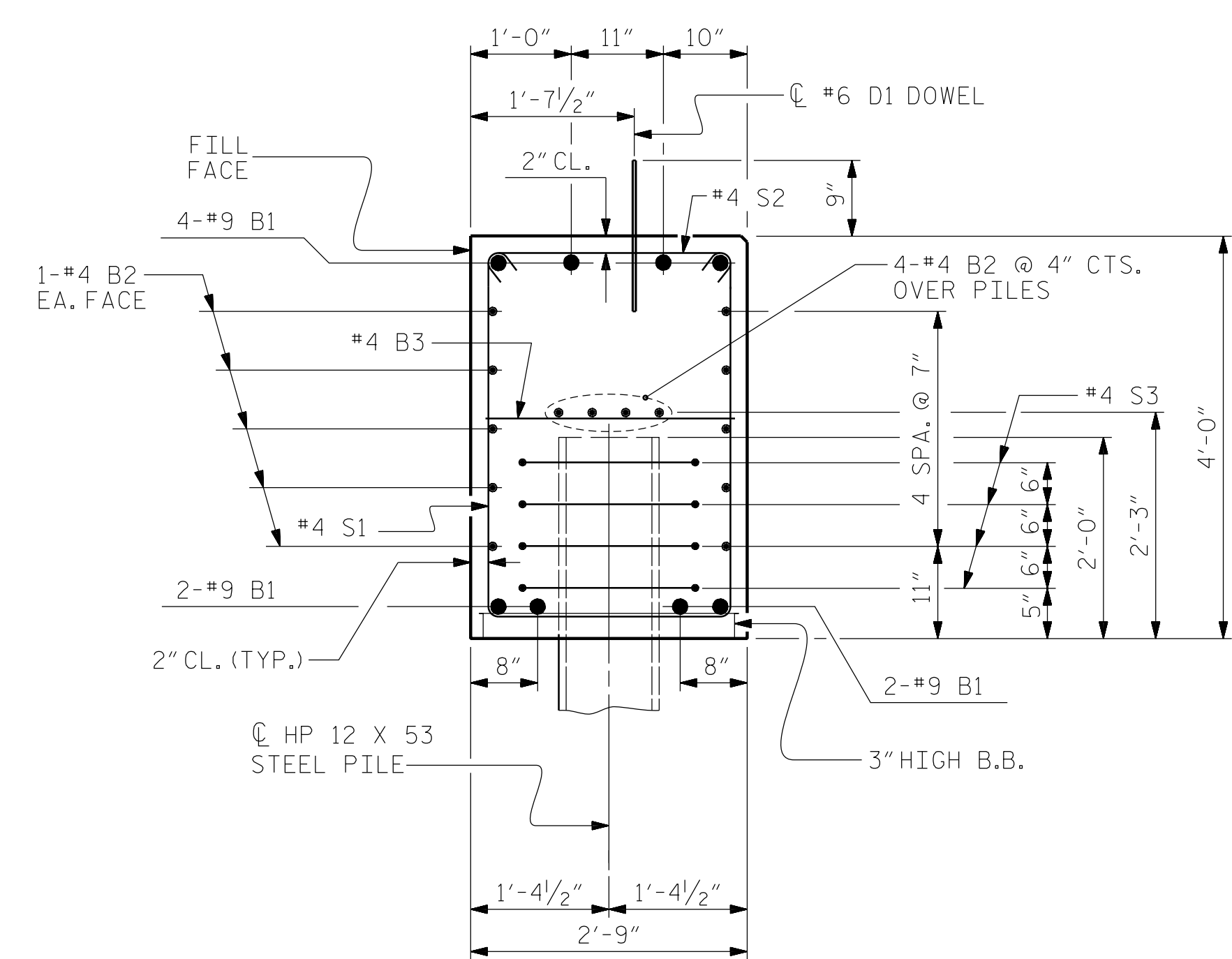
(END BENT No. 1 SHOWN, END BENT No. 2 SIMILAR BY ROTATION)



### PILE SPLICE DETAILS



BILL OF MATERIAL FOR ONE END BENT					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9		42'-6"	1156
B2	28	#4	STR	21'-4"	399
B3	10	#4	STR	2'-5"	16
D1	22	#6	STR	1'-6"	50
H1	10	#4		9'-1"	61
H2	10	#4		9'-3"	62
H3	10	#4		9'-6"	63
H4	10	#4		9'-4"	62
K1	16	#4	STR	3'-1"	33
S1	52	#4		10'-5"	362
S2	52	#4		3'-2"	110
S3	28	#4		6'-6"	122
V1	53	#4	STR	6'-2"	218
REINFORCING STEEL (FOR ONE END BENT)					2714 LBS.
CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)					
POUR #1 CAP, LOWER PART OF WINGS & COLLARS					20.1 C.Y.
POUR #2 UPPER PART OF WINGS					2.1 C.Y.
TOTAL CLASS A CONCRETE					22.2 C.Y.



#### SECTION A-A

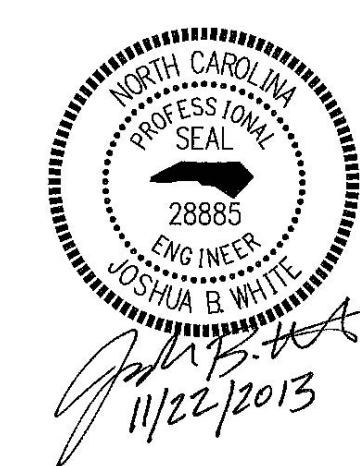
(CONCRETE COLLAR NOT SHOWN FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL.")

PROJECT NO. 17BP.12.R.10  
GASTON COUNTY  
STATION: 19+61.00-L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE  
END BENT No. 1 & 2  
DETAILS



ASSEMBLED BY :	JLA	DATE :	10/12
CHECKED BY :	JBW	DATE :	11/12
DRAWN BY :	WJH 12/11		
CHECKED BY :	AAC 12/11		

PREPARED BY  
TOS ENGINEERS  
107-A WICA AVENUE  
MORGANTON, NC 28655

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-16
1			3			TOTAL SHEETS
2			4			23

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 SPECIAL PROVISIONS.

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

THE LATERAL GUIDES ARE NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.

★ INVERT ALTERNATE STIRRUPS.

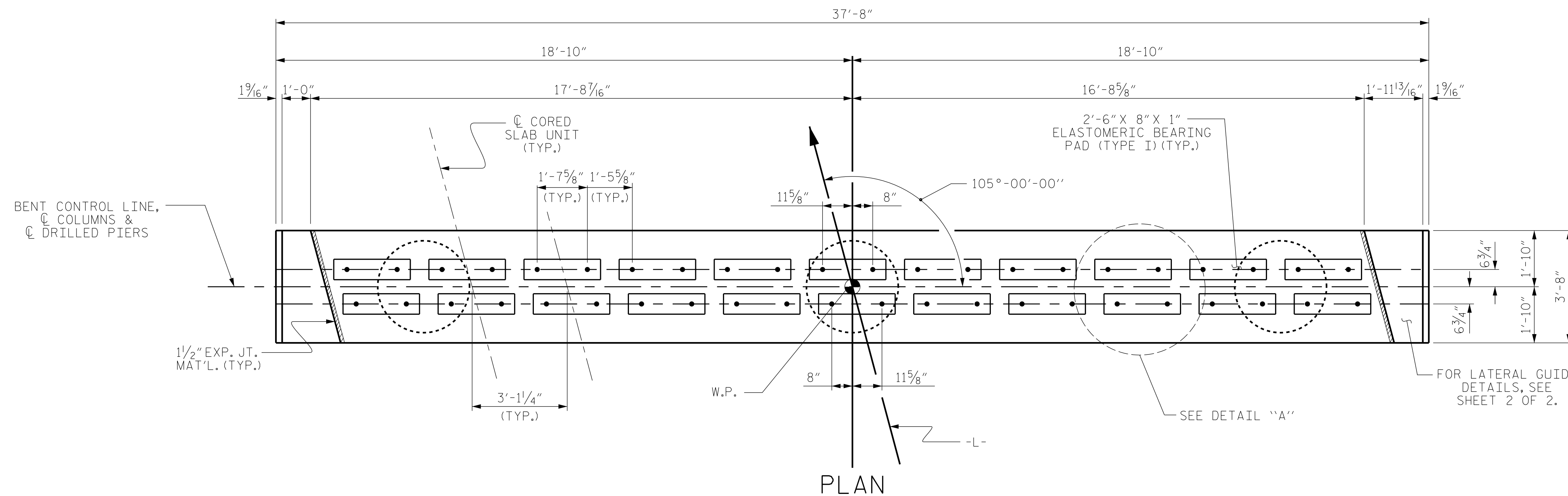
THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND LINE ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT ONE FOOT BELOW THE GROUND LINE.

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

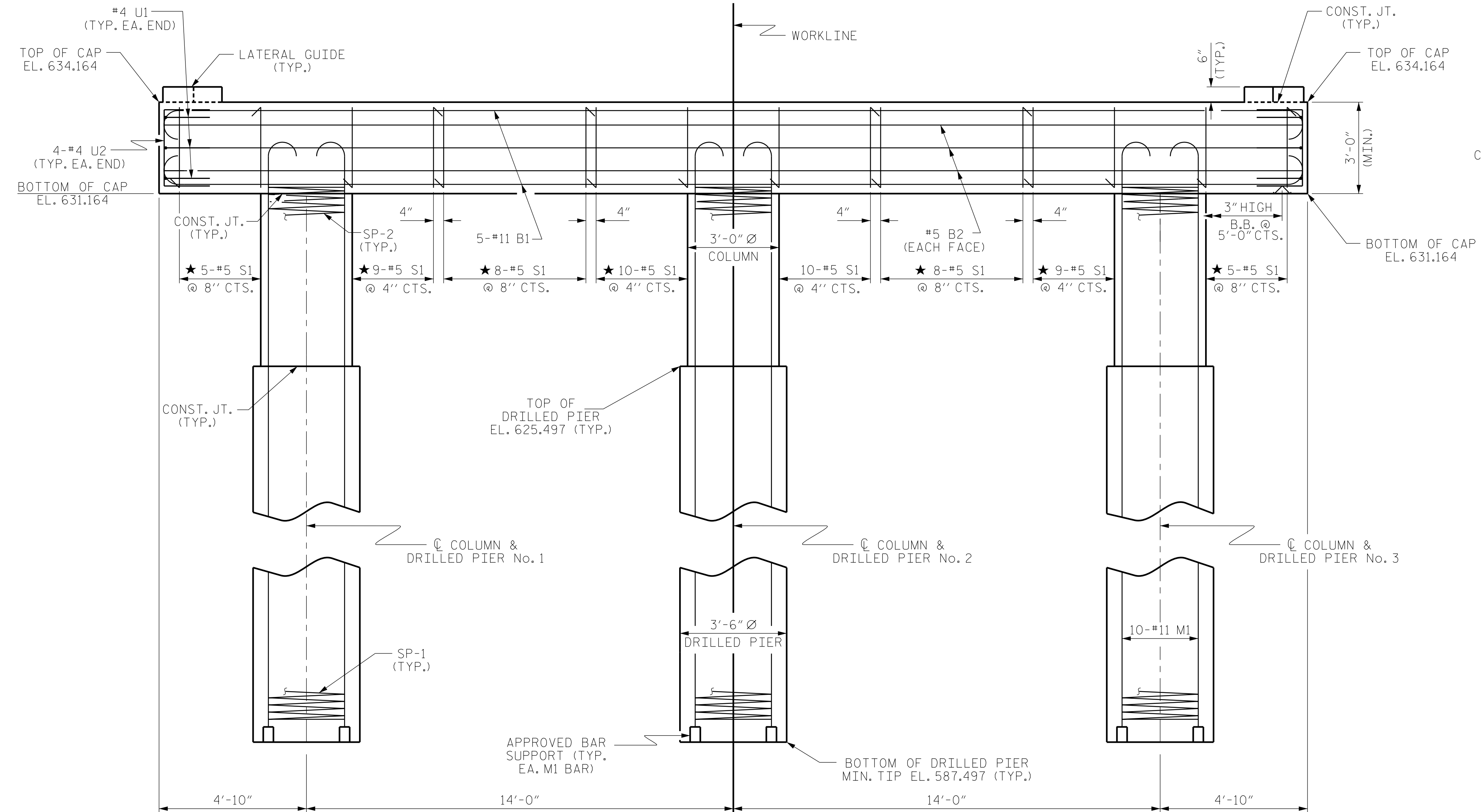
THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.

FOR PERMANENT STEEL CASING, SEE DRILLED PIER SPECIAL PROVISIONS.

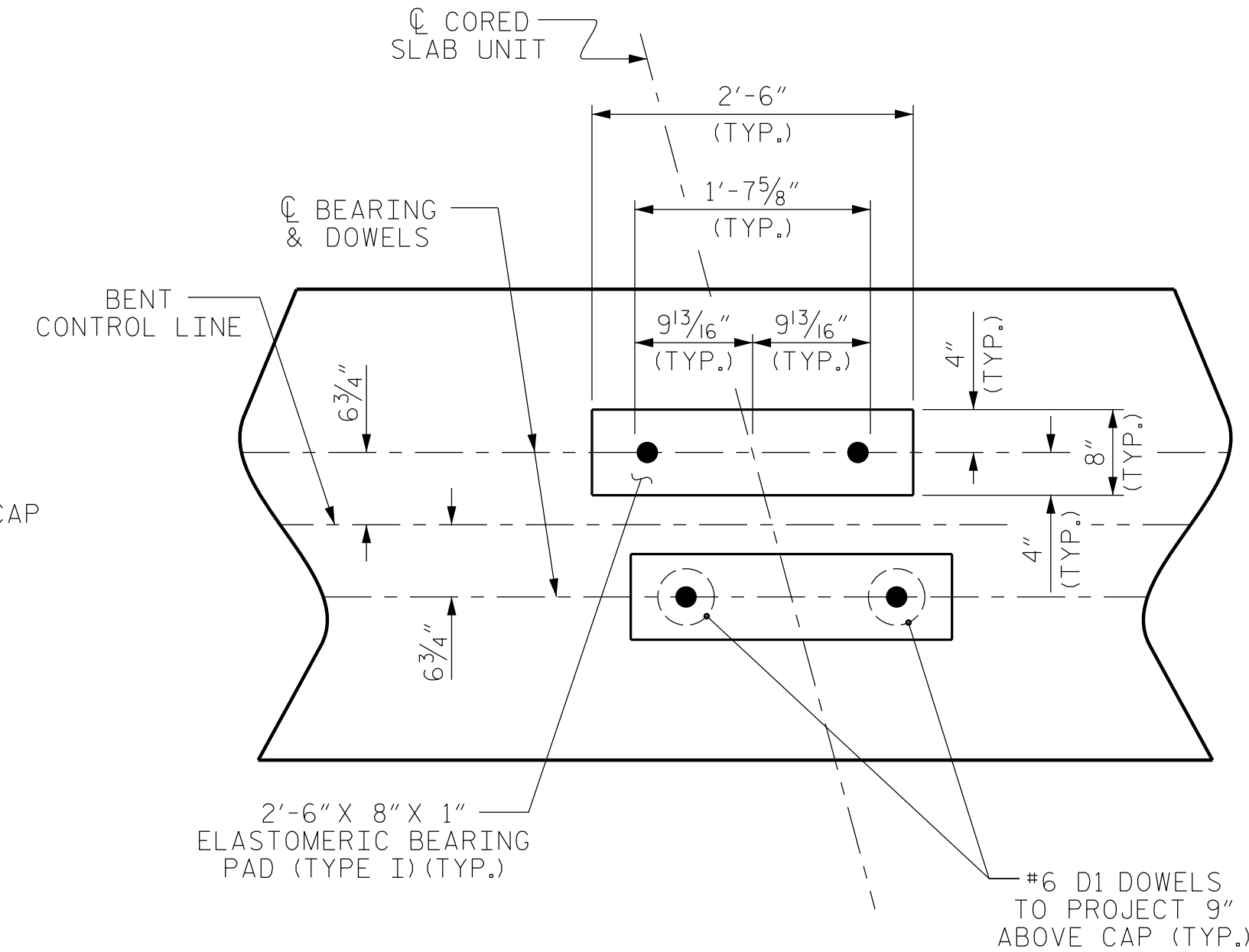
THE CONTRACTOR HAS THE OPTION TO OMIT THE LATERAL GUIDE IF APPROVED BY THE ENGINEER.



PLAN



ELEVATION

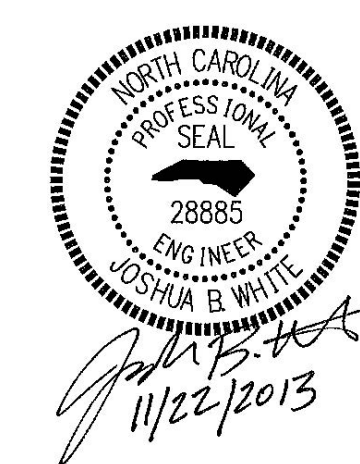


DETAIL "A"

(DIMENSIONS ARE TYPICAL EACH BEARING)

PROJECT NO. 17BP.12.R.10  
 GASTON COUNTY  
 STATION: 19+61.00-L-

SHEET 1 OF 2



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

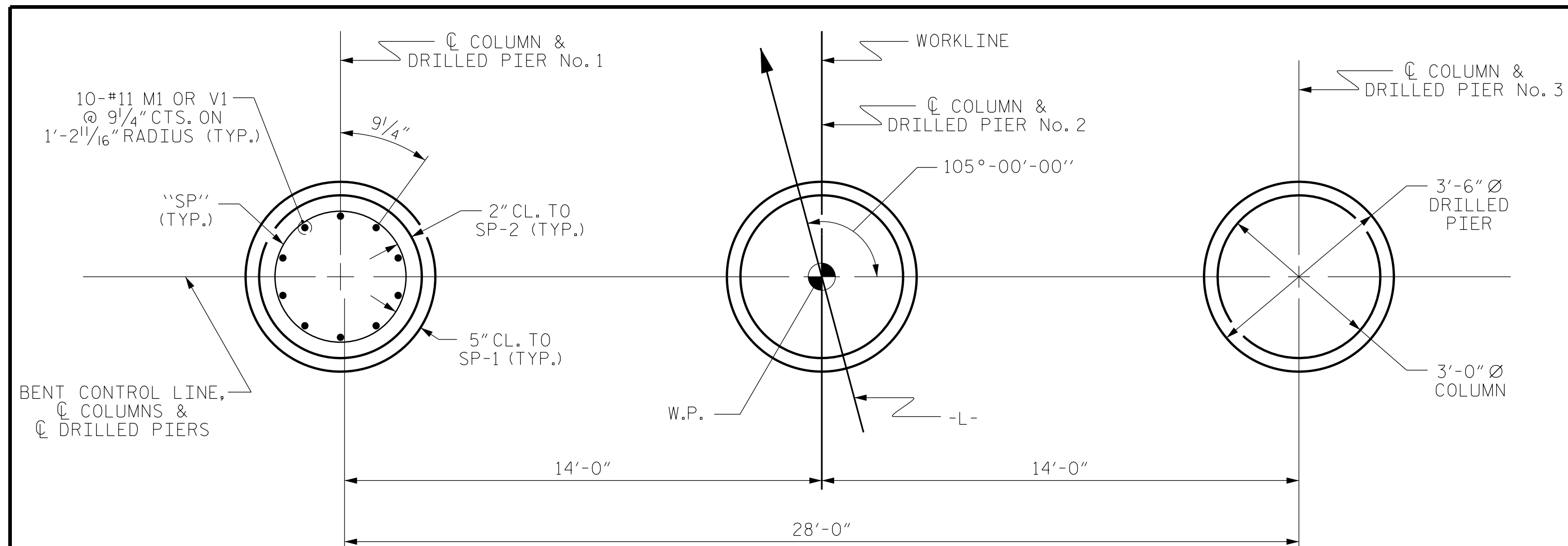
SUBSTRUCTURE  
 BENT No. 1

ASSEMBLED BY :	JLA	DATE :	11/12
CHECKED BY :	JBW	DATE :	11/12
DRAWN BY :	DGE	04/10	
CHECKED BY :	MKT	04/10	

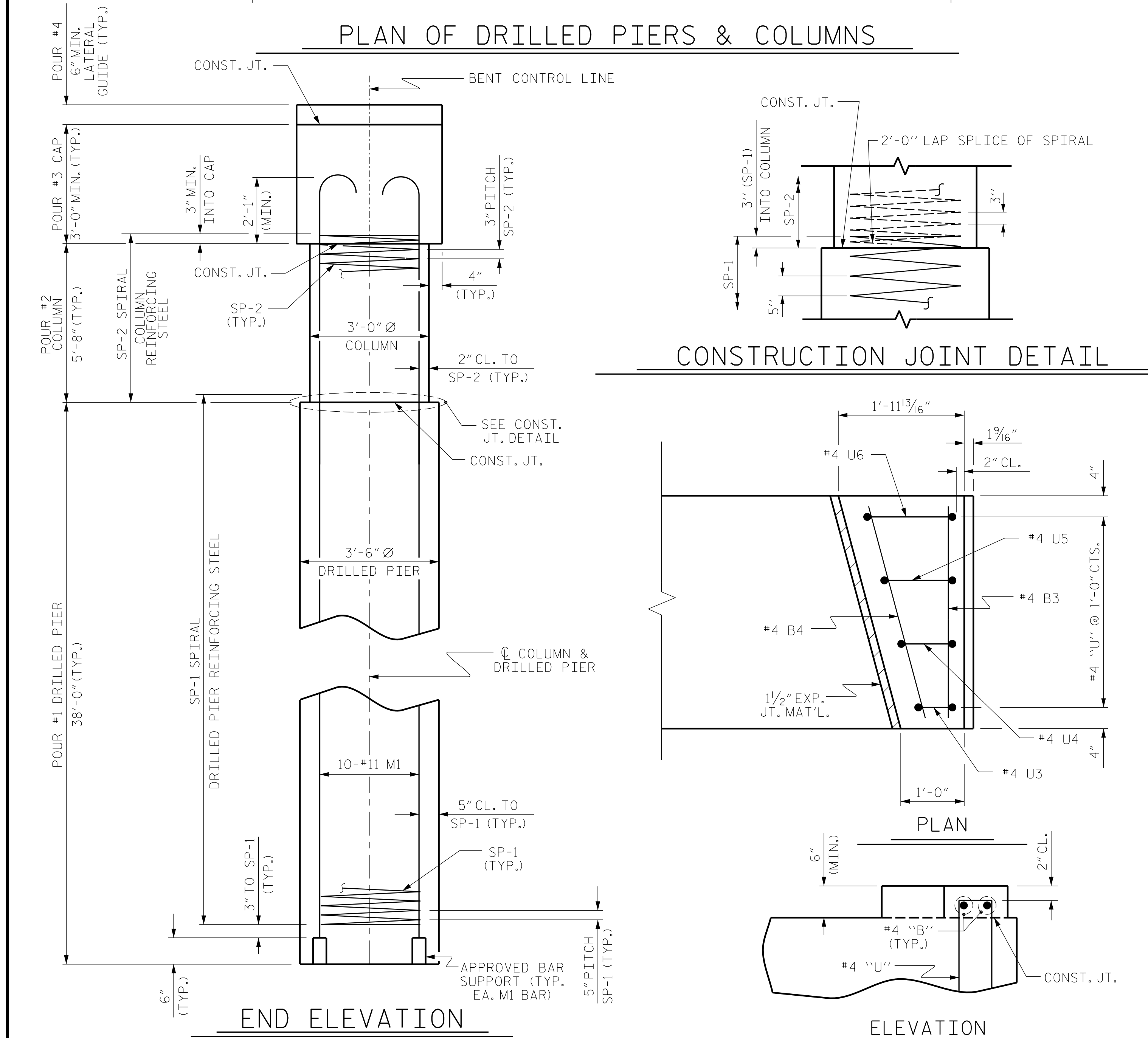
DIMENSIONS & REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN & DRILLED PIER UNLESS OTHERWISE NOTED.

PREPARED BY  
 TGS ENGINEERS  
 107-A WICA AVENUE  
 MORGANTON, NC 28655

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17
1			3			TOTAL SHEETS
2			4			23



PLAN OF DRILLED PIERS & COLUMNS

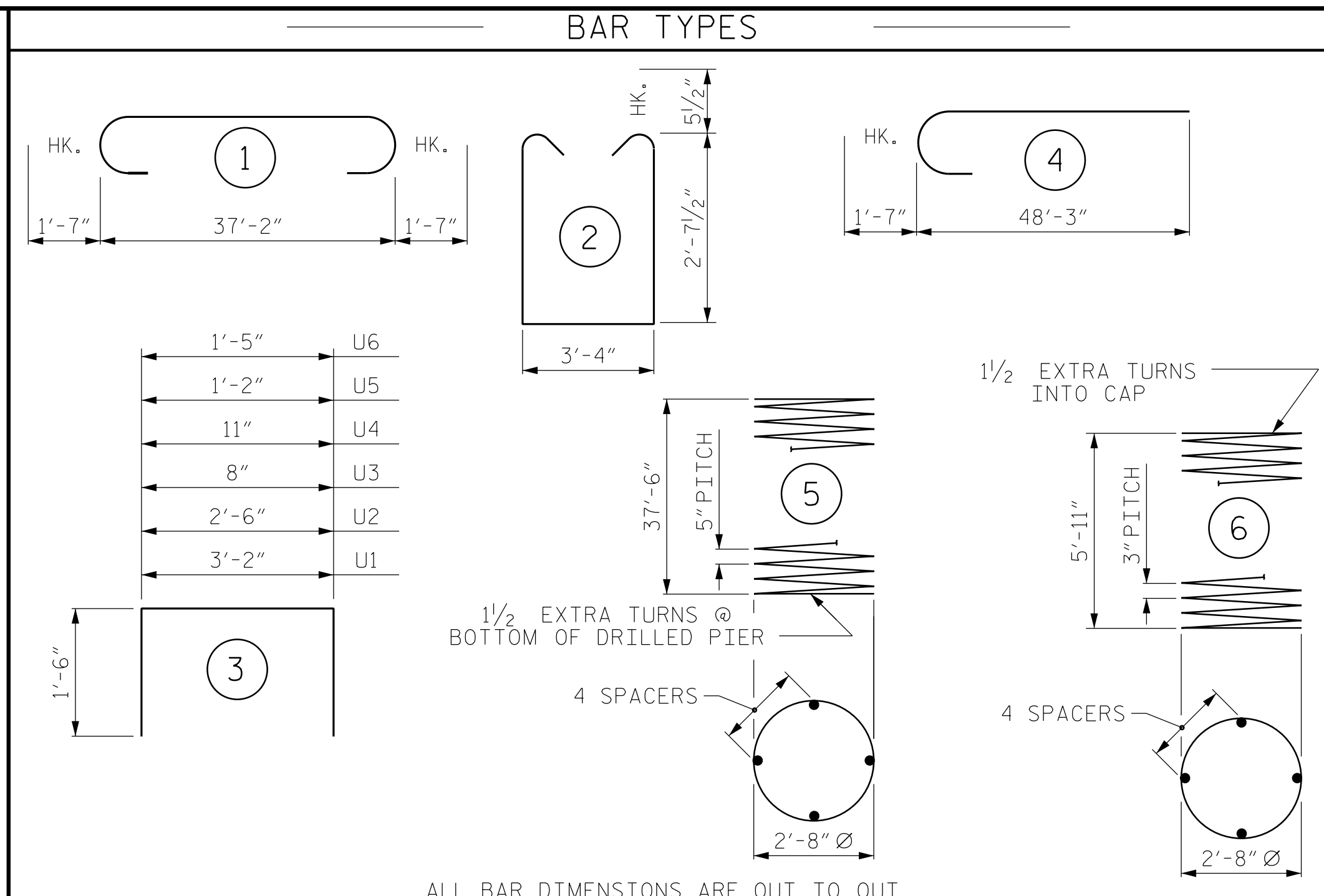


END ELEVATION

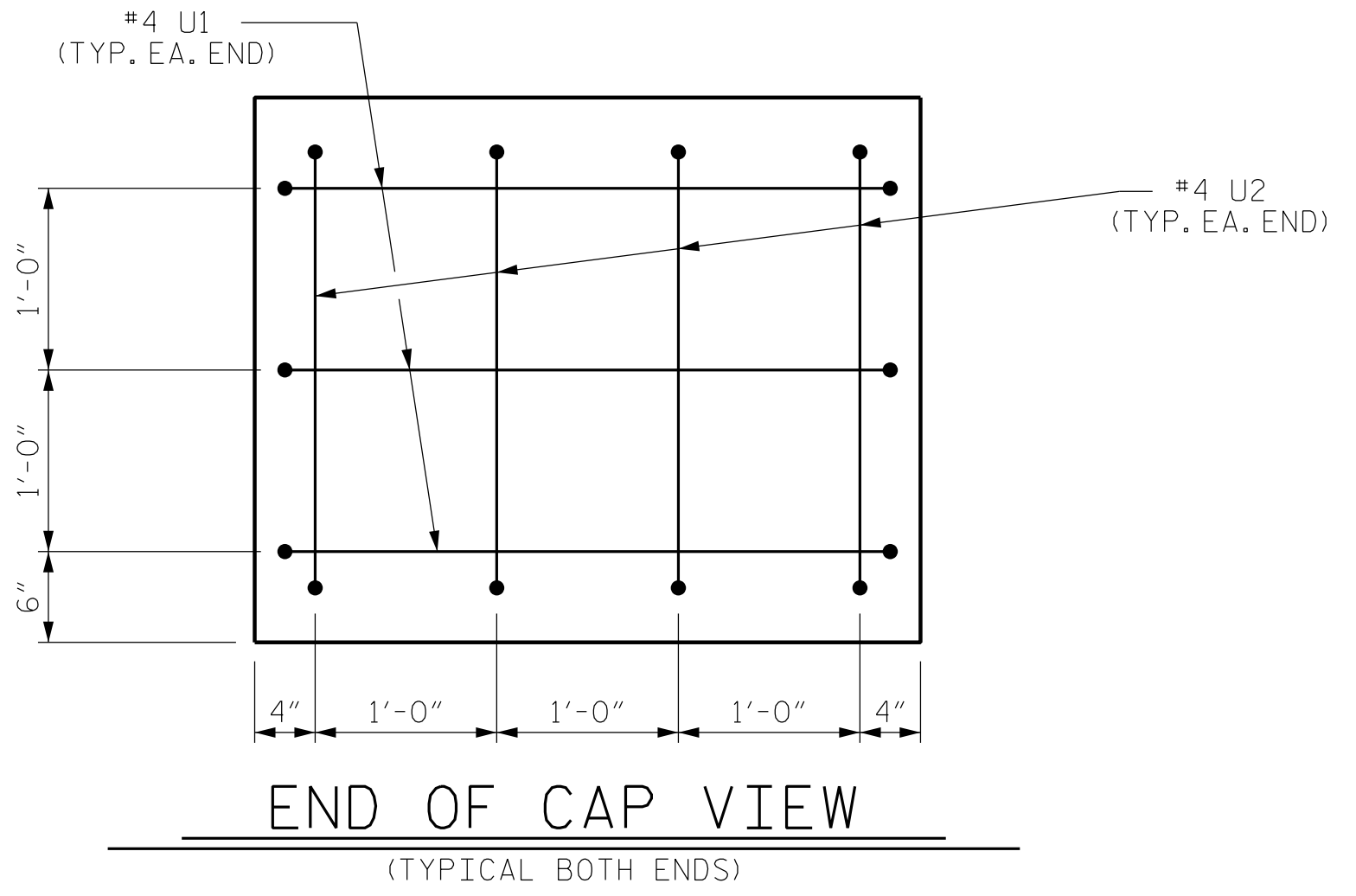
ELEVATION

LATERAL GUIDE DETAILS

(RIGHT LATERAL GUIDE SHOWN, LEFT SIDE SIMILAR)

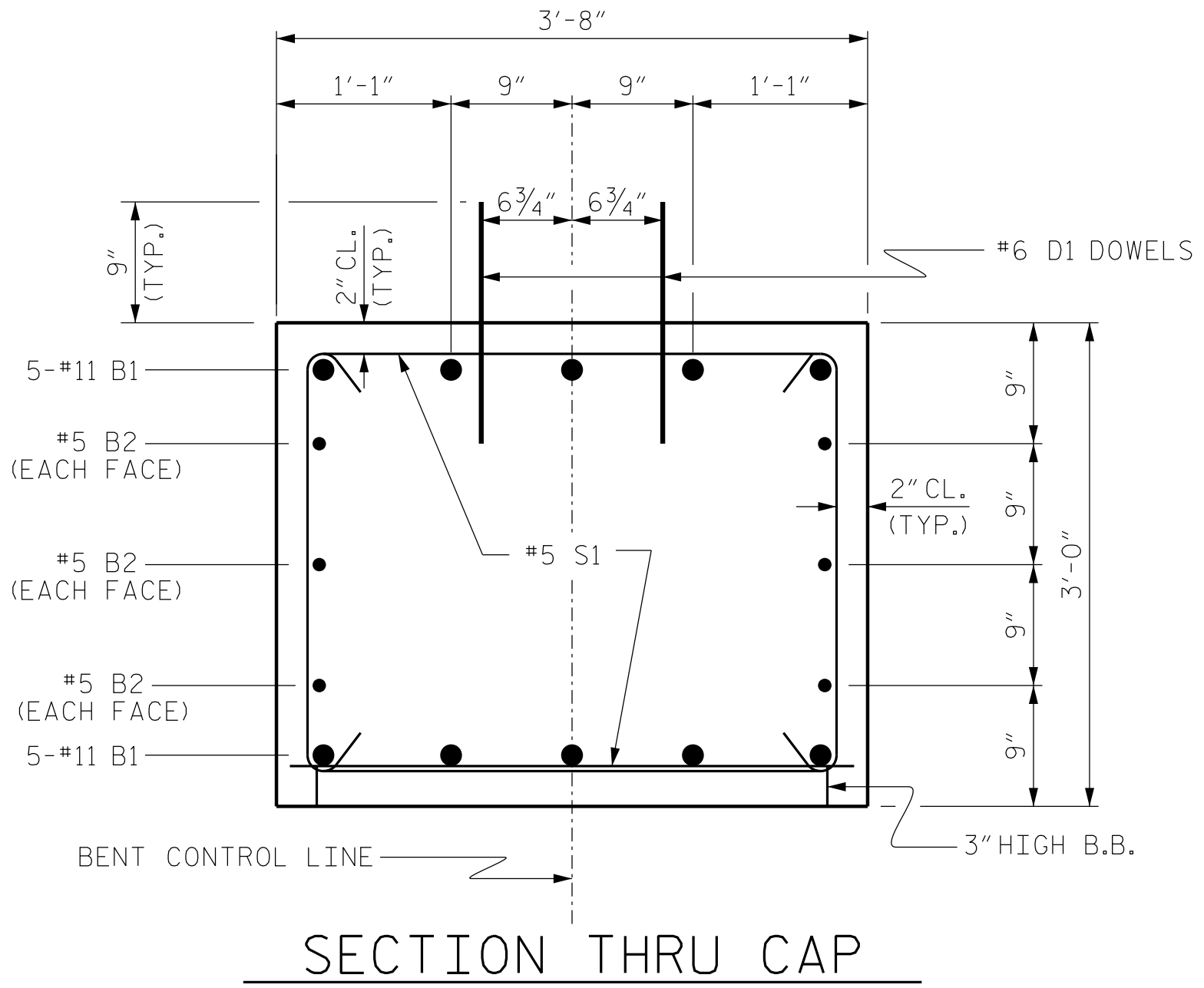


ALL BAR DIMENSIONS ARE OUT TO OUT



END OF CAP VIEW

(TYPICAL BOTH ENDS)



SECTION THRU CAP

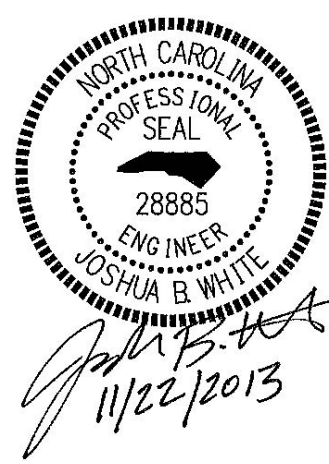
BILL OF MATERIAL FOR ONE BENT					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#11		40'-4"	2,143
B2	6	#5	STR	37'-4"	234
B3	2	#4	STR	3'-4"	4
B4	2	#4	STR	3'-5"	5
D1	44	#6	STR	1'-6"	99
M1	30	#11	4	49'-10"	7,944
S1	64	#5	2	9'-6"	634
U1	6	#4	3	6'-2"	25
U2	8	#4	3	5'-6"	29
U3	2	#4	3	3'-8"	5
U1	2	#4	3	3'-11"	5
U2	2	#4	3	4'-2"	6
U3	2	#4	3	4'-5"	6
REINFORCING STEEL (FOR ONE BENT)					11,139 LBS.
SP-1	3	*	5	756'-8"	2,370
SP-2	3	**	6	214'-7"	432
SPIRAL COLUMN REINFORCING STEEL (FOR ONE BENT)					2,802 LBS.
* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR					
** THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR					
CLASS A CONCRETE BREAKDOWN (FOR ONE BENT)					
POUR #2 (COLUMNS)					4.5 C.Y.
POUR #3 (CAP)					15.4 C.Y.
POUR #4 (LATERAL GUIDE)					0.2 C.Y.
TOTAL CLASS A CONCRETE					20.1 C.Y.
DRILLED PIERS: (FOR ONE BENT)					
DRILLED PIER CONCRETE					
POUR #1 (DRILLED PIERS)					40.5 C.Y.
3'-6" Ø DRILLED PIER NOT IN SOIL					38 LIN. FT.
3'-6" Ø DRILLED PIER IN SOIL					76 LIN. FT.
PERMANENT STEEL CASING FOR 3'-6" Ø DRILLED PIER					77 LIN. FT.
CSL TUBES					474 LIN. FT.

PROJECT NO. 17BP.12.R.10  
 GASTON COUNTY  
 STATION: 19+61.00-L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 BENT No. 1



ASSEMBLED BY : JLA	DATE : 2/13
CHECKED BY : JBW	DATE : 2/13
DRAWN BY : DGE 03/10	
CHECKED BY : MKT 03/10	

PREPARED BY  
 TOS ENGINEERS  
 107-A WICA AVENUE  
 MORGANTON, NC 28655

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
2			4			23

NOTES

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FOR DRILLED PIERS, SEE SPECIAL PROVISIONS.

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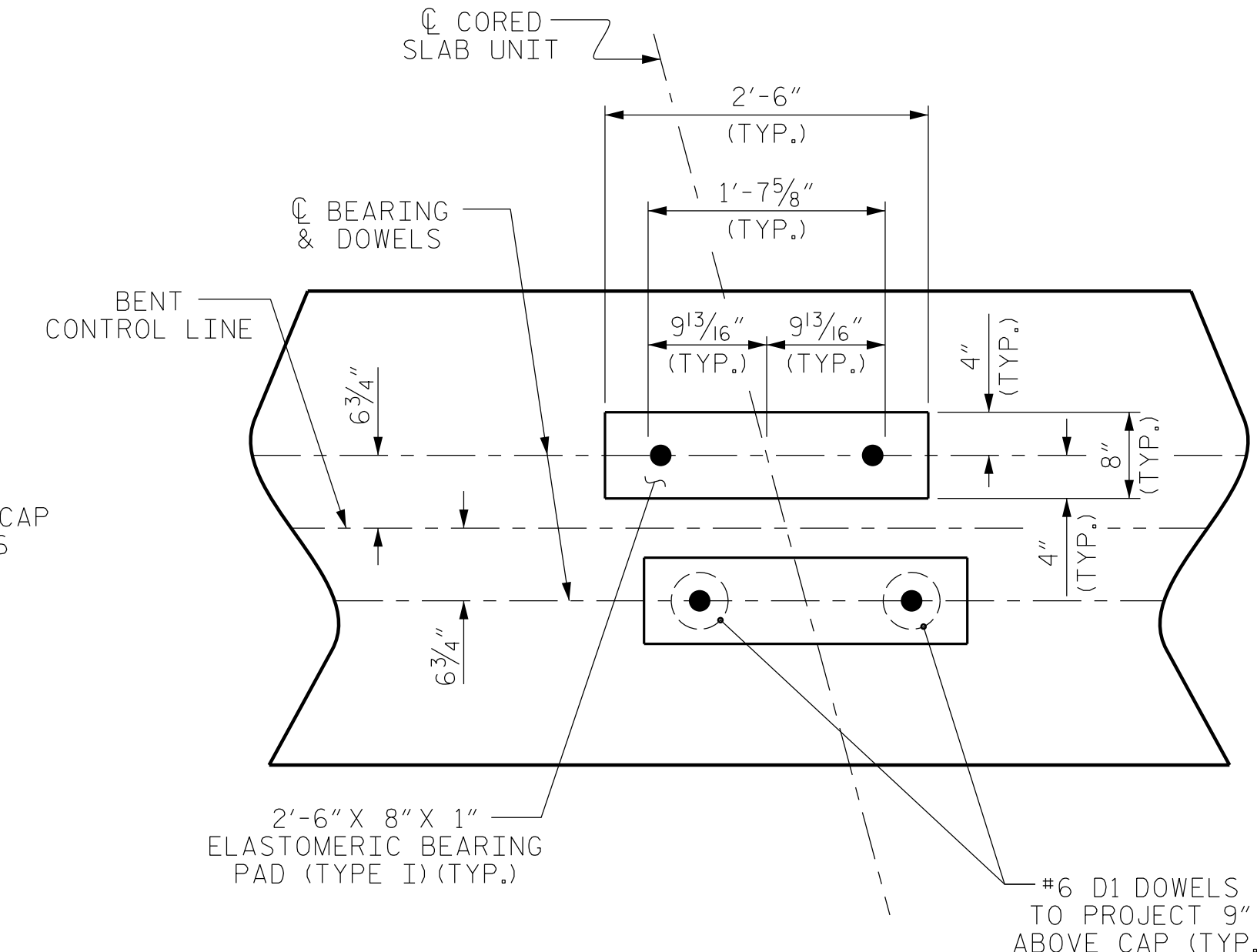
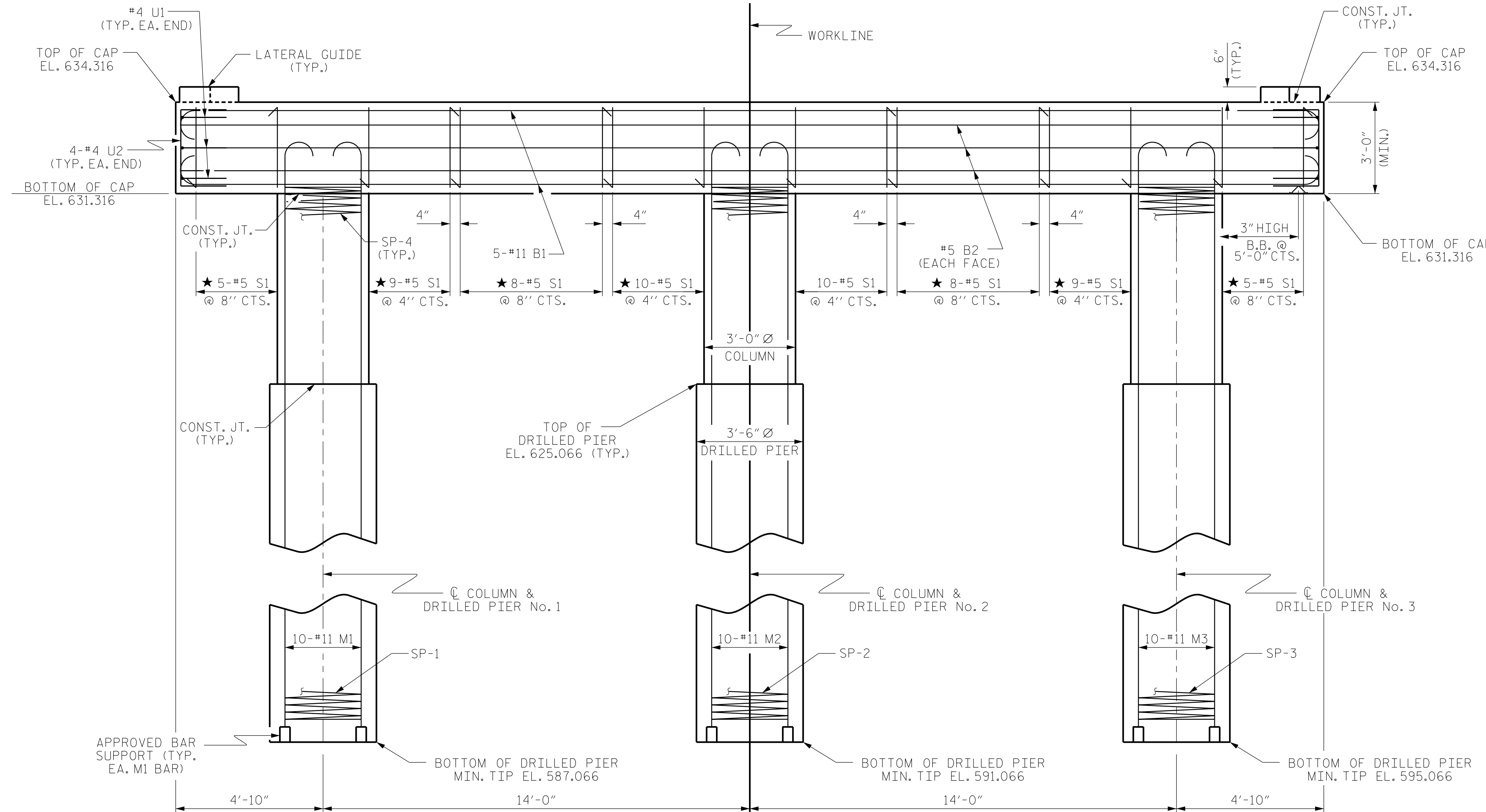
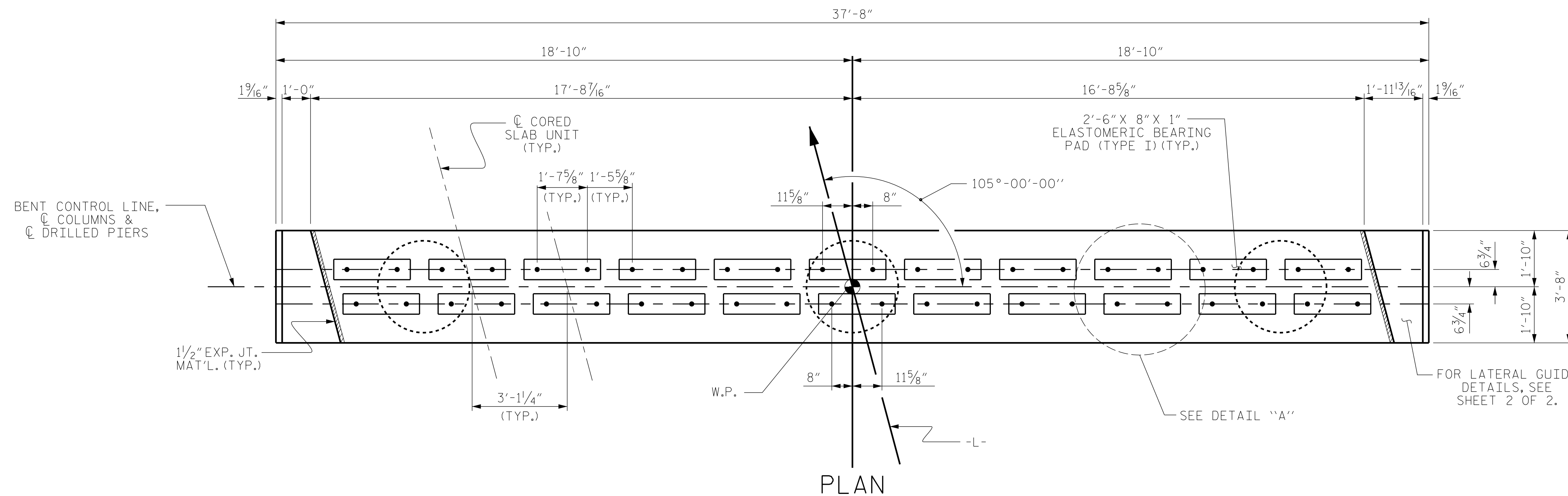
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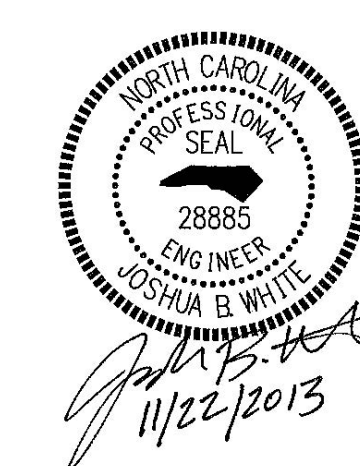
FOR PERMANENT STEEL CASING, SEE DRILLED PIER SPECIAL PROVISIONS.

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PROJECT NO. 17BP.12.R.10  
 GASTON COUNTY  
 STATION: 19+61.00-L-

SHEET 1 OF 2



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 SUBSTRUCTURE  
 BENT No. 2

ASSEMBLED BY :	JLA	DATE :	11/12
CHECKED BY :	JBW	DATE :	11/12
DRAWN BY :	DGE	04/10	
CHECKED BY :	MKT	04/10	

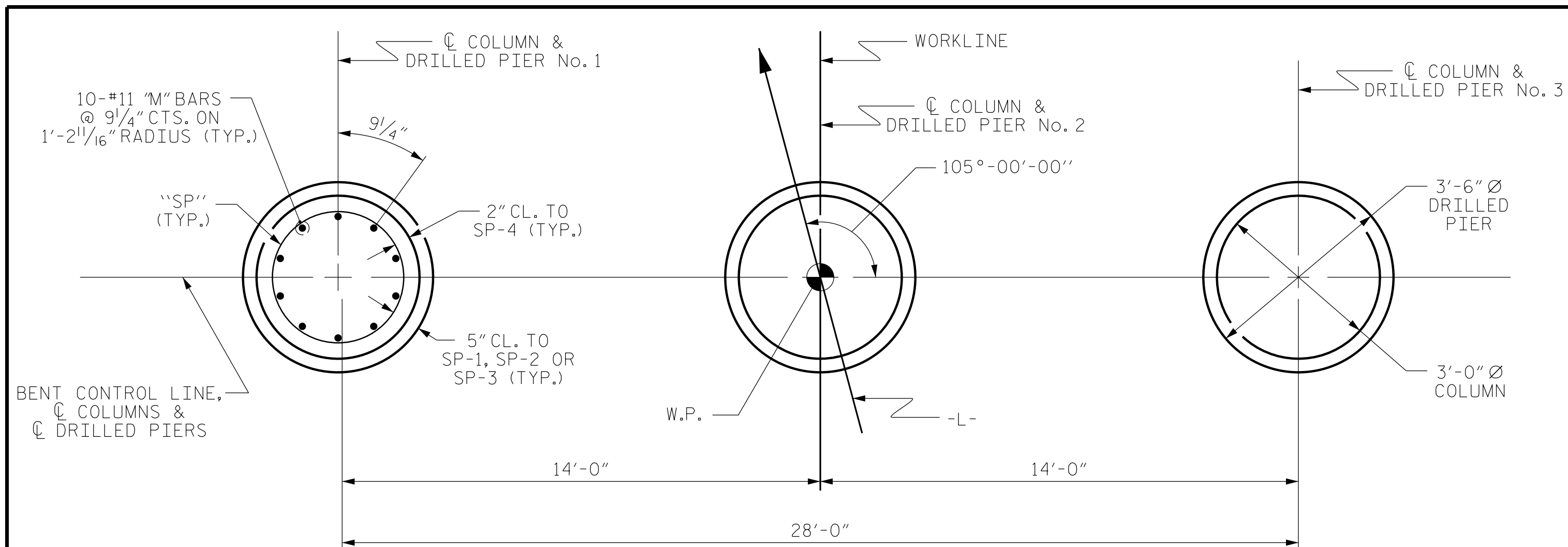
DIMENSIONS & REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN & DRILLED PIER UNLESS OTHERWISE NOTED.

PREPARED BY  
 TGS ENGINEERS  
 107-A WICA AVENUE  
 MORGANTON, NC 28655

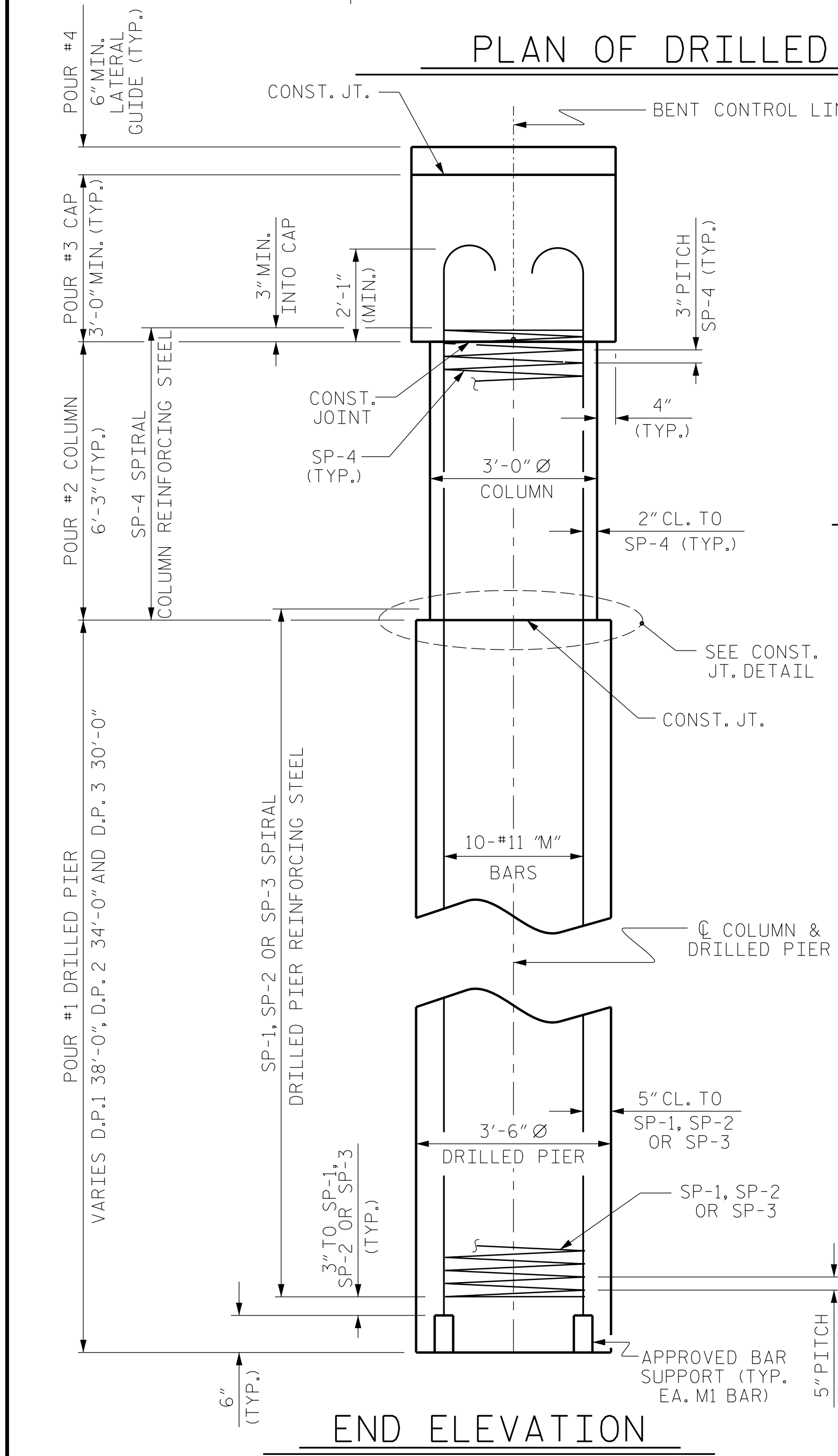
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			23

STD. NO. DP\_BT\_33\_105S->50'

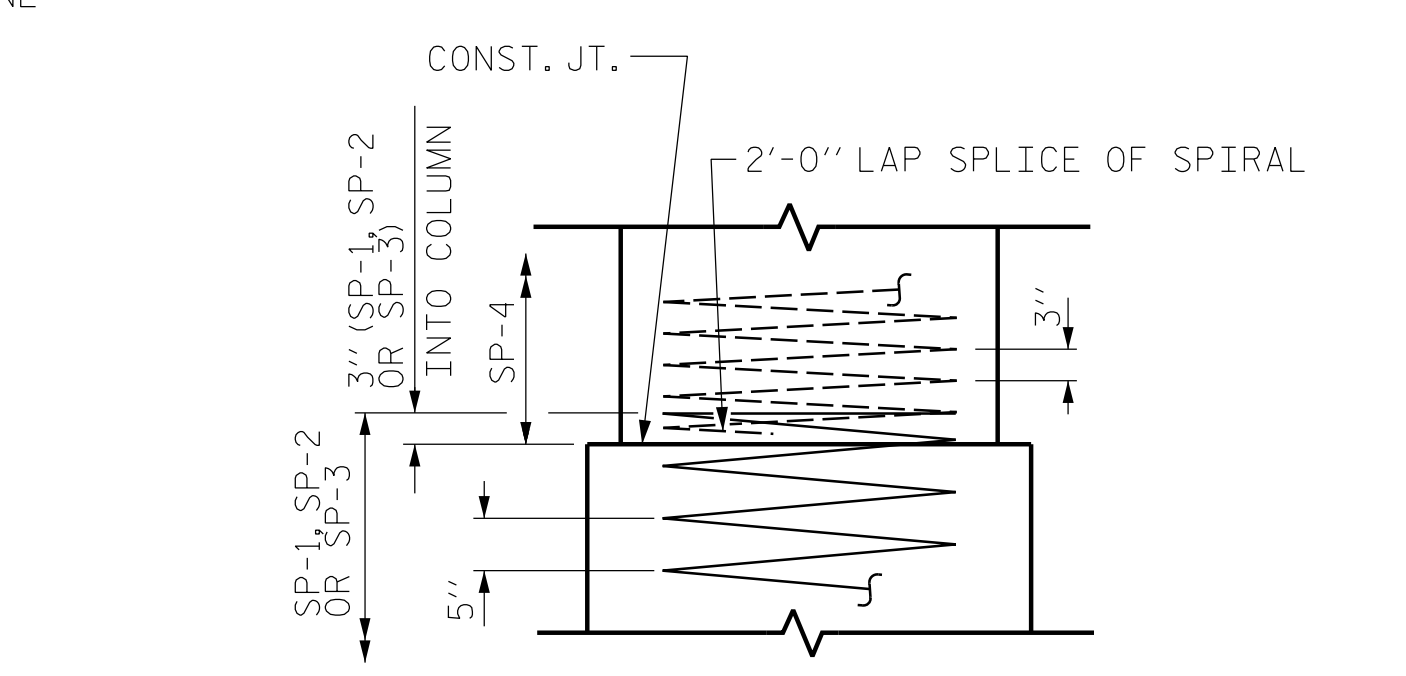




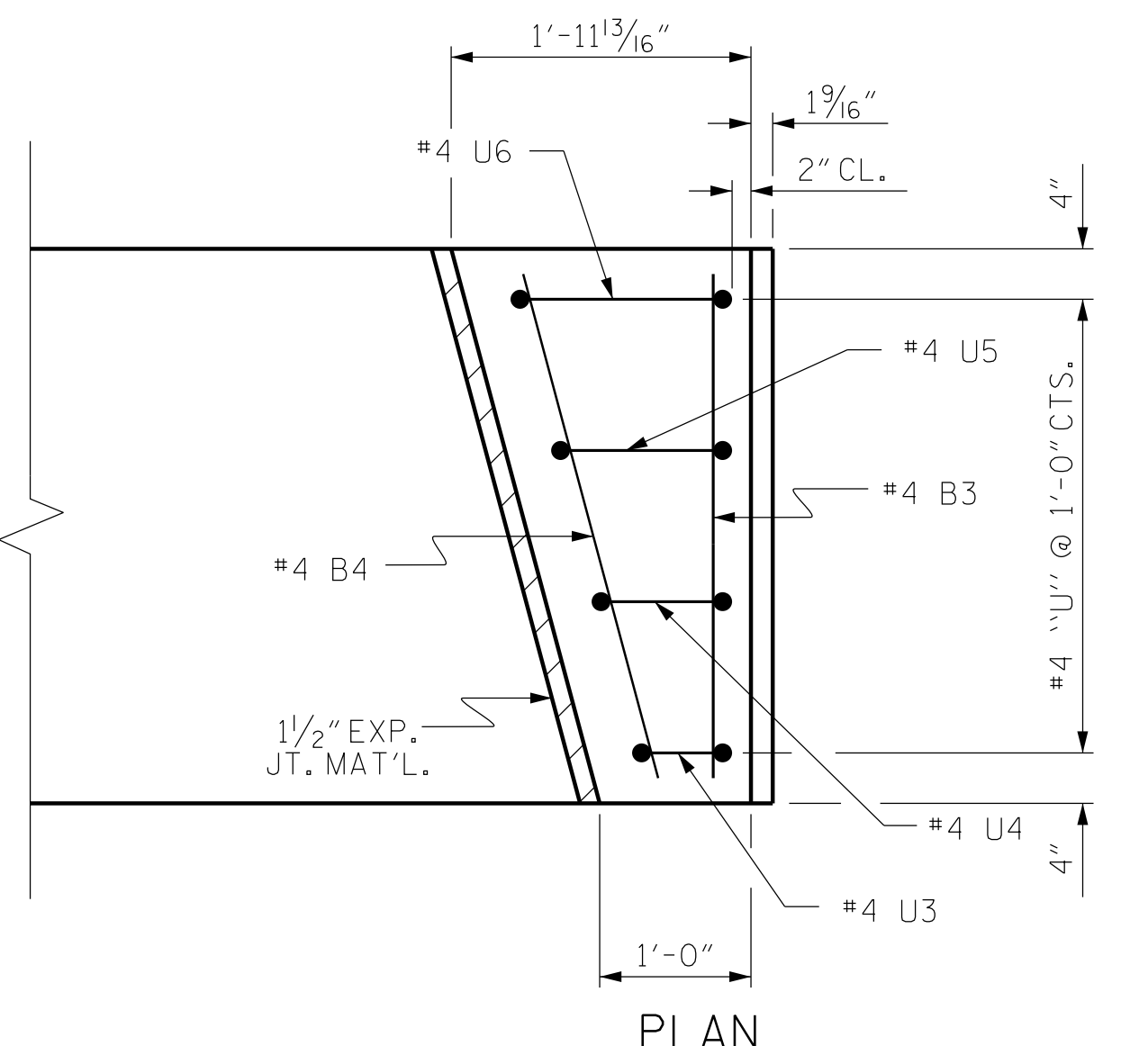
PLAN OF DRILLED PIERS & COLUMNS



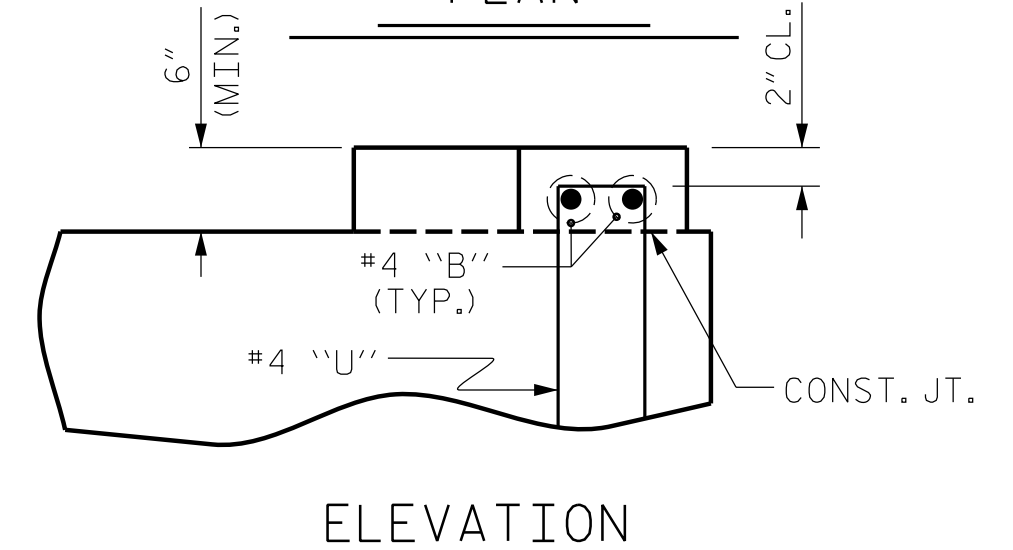
END ELEVATION



CONSTRUCTION JOINT DETAIL



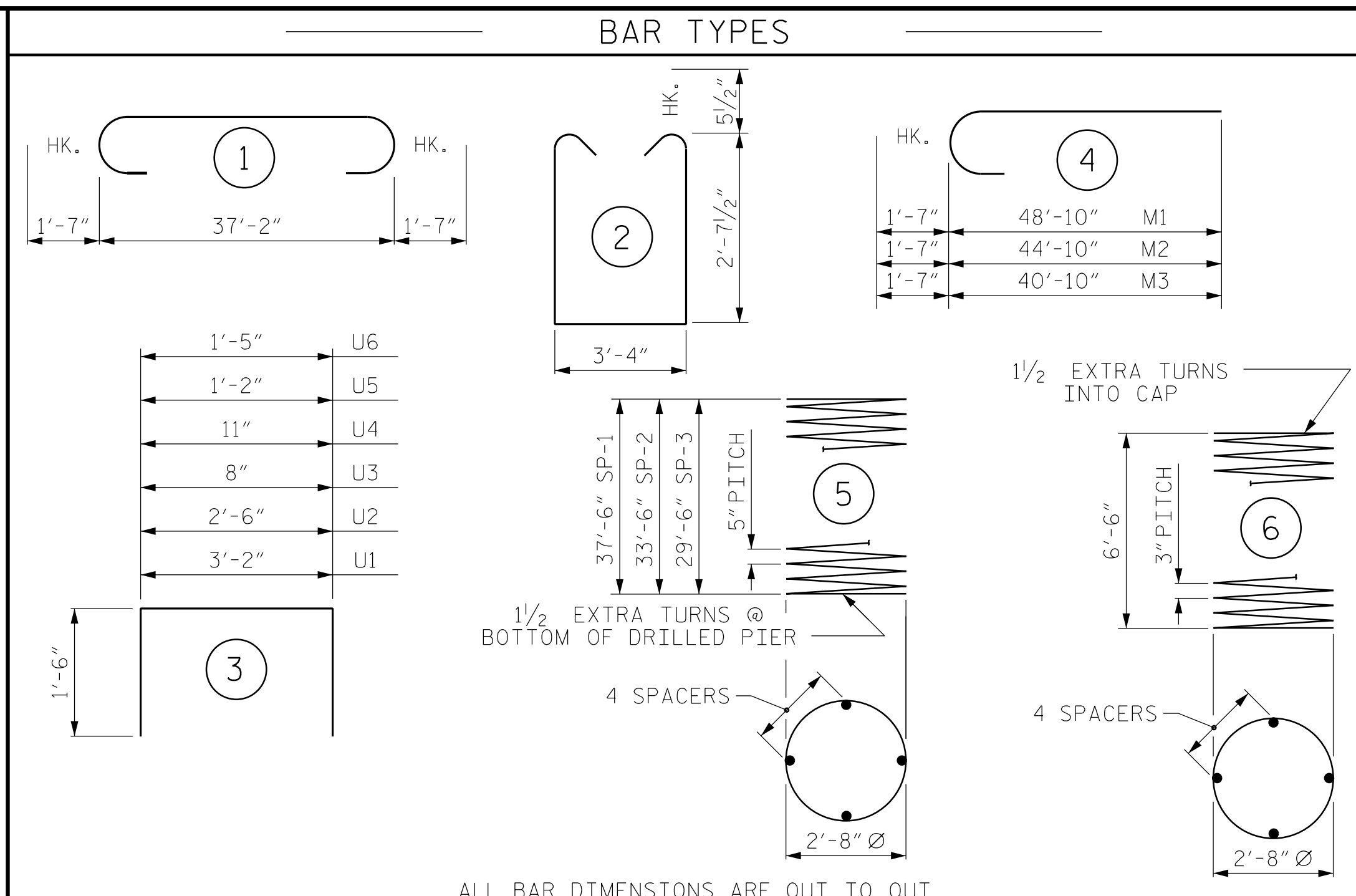
PLAN



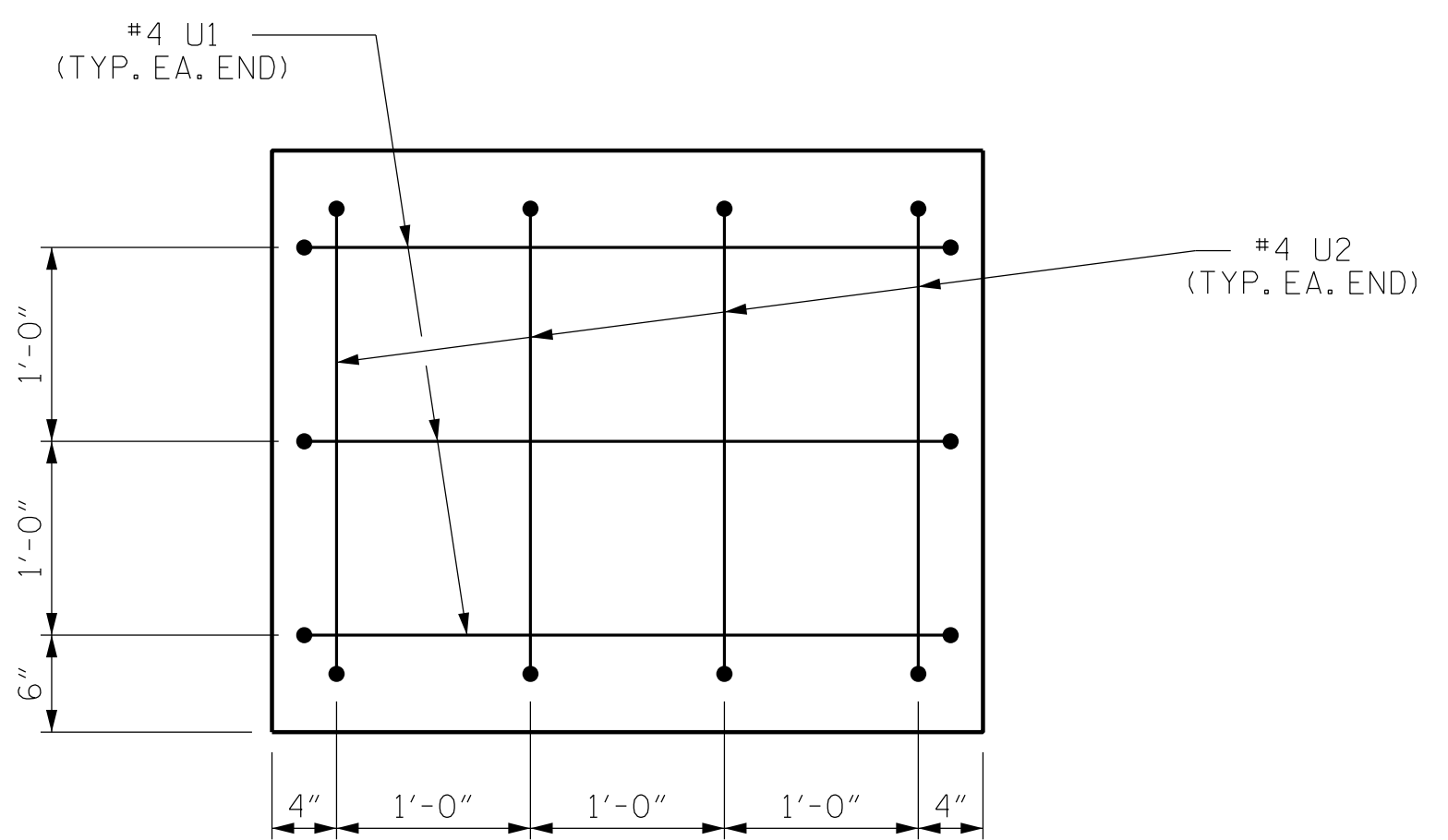
ELEVATION

LATERAL GUIDE DETAILS

(RIGHT LATERAL GUIDE SHOWN, LEFT SIDE SIMILAR)

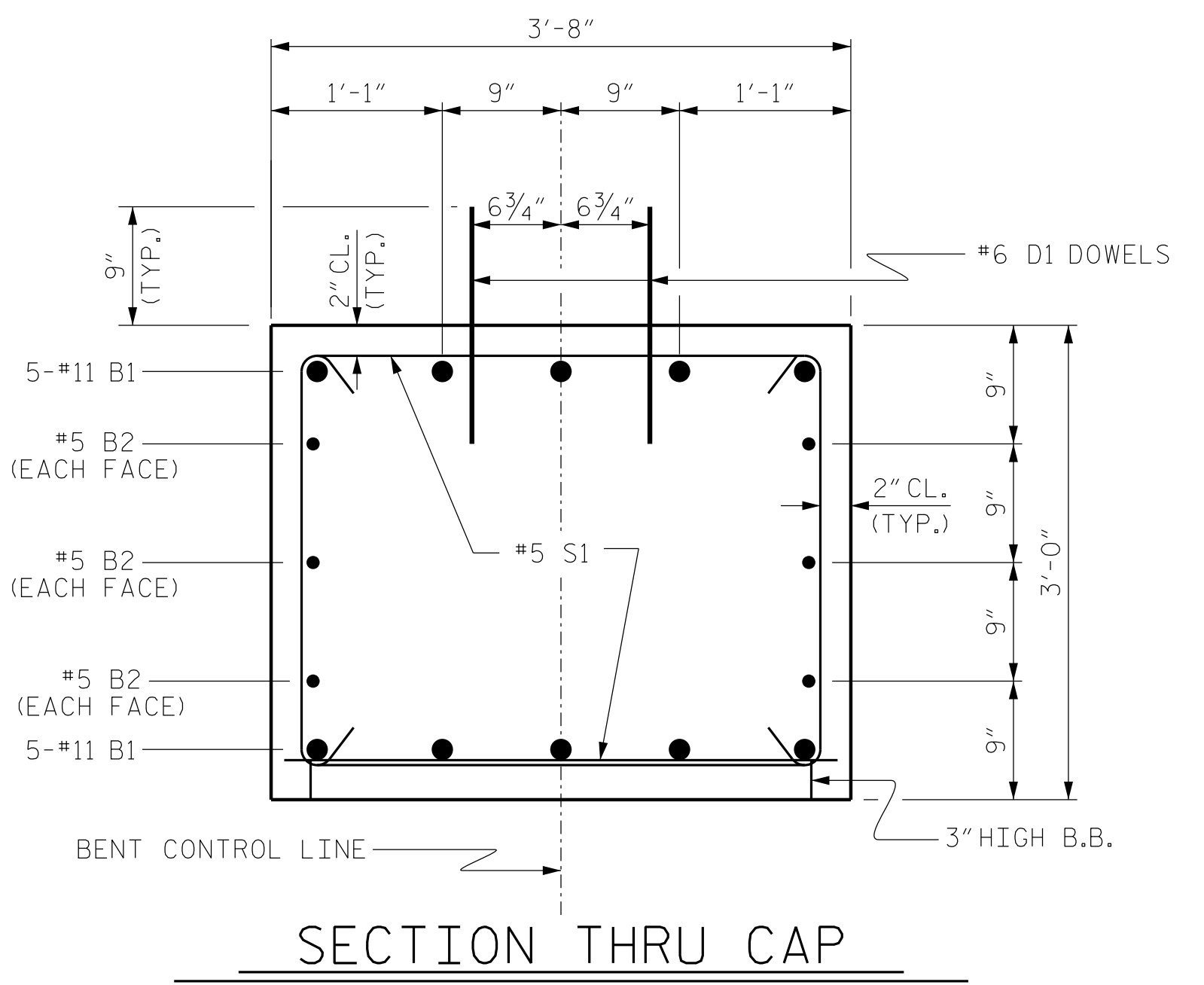


ALL BAR DIMENSIONS ARE OUT TO OUT



END OF CAP VIEW

(TYPICAL BOTH ENDS)



SECTION THRU CAP

BILL OF MATERIAL FOR ONE BENT

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#11		40'-4"	2,143
B2	6	#5	STR	37'-4"	234
B3	2	#4	STR	3'-4"	4
B4	2	#4	STR	3'-5"	5
D1	44	#6	STR	1'-6"	99
M1	10	#11	STR	50'-5"	2,679
M2	10	#11	STR	46'-5"	2,467
M3	10	#11	STR	42'-5"	2,254
S1	64	#5	2	9'-6"	634
U1	6	#4	3	6'-2"	25
U2	8	#4	3	5'-6"	29
U3	2	#4	3	3'-8"	5
U1	2	#4	3	3'-11"	5
U2	2	#4	3	4'-2"	6
U3	2	#4	3	4'-5"	6

REINFORCING STEEL (FOR ONE BENT) 10,595 LBS.

SP-1	1	*	5	756'-8"	790
SP-2	1	*	5	674'-5"	704
SP-3	1	*	5	600'-5"	627
SP-4	3	**	6	231'-1"	463

SPIRAL COLUMN REINFORCING STEEL (FOR ONE BENT) 2,584 LBS.

\* THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR

\*\* THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR

CLASS A CONCRETE BREAKDOWN (FOR ONE BENT)

POUR #2 (COLUMNS)	4.8 C.Y.
POUR #3 (CAP)	15.4 C.Y.
POUR #4 (LATERAL GUIDE)	0.2 C.Y.
TOTAL CLASS A CONCRETE	20.4 C.Y.

DRILLED PIERS: (FOR ONE BENT)

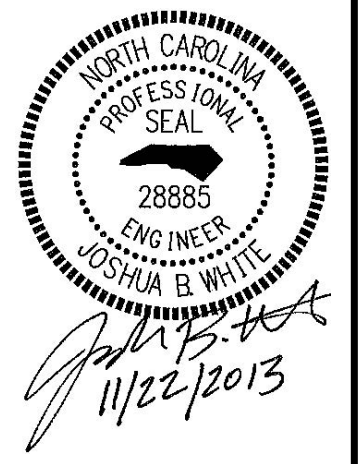
DRILLED PIER CONCRETE	
POUR #1 (DRILLED PIERS)	36.3 C.Y.
3'-6" Ø DRILLED PIER NOT IN SOIL	37 LIN. FT.
3'-6" Ø DRILLED PIER IN SOIL	65 LIN. FT.
PERMANENT STEEL CASING FOR 3'-6" Ø DRILLED PIER	65 LIN. FT.
CSL TUBES	426 LIN. FT.

PROJECT NO. 17BP.12.R.10  
GASTON COUNTY  
STATION: 19+61.00-L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE  
BENT No. 2



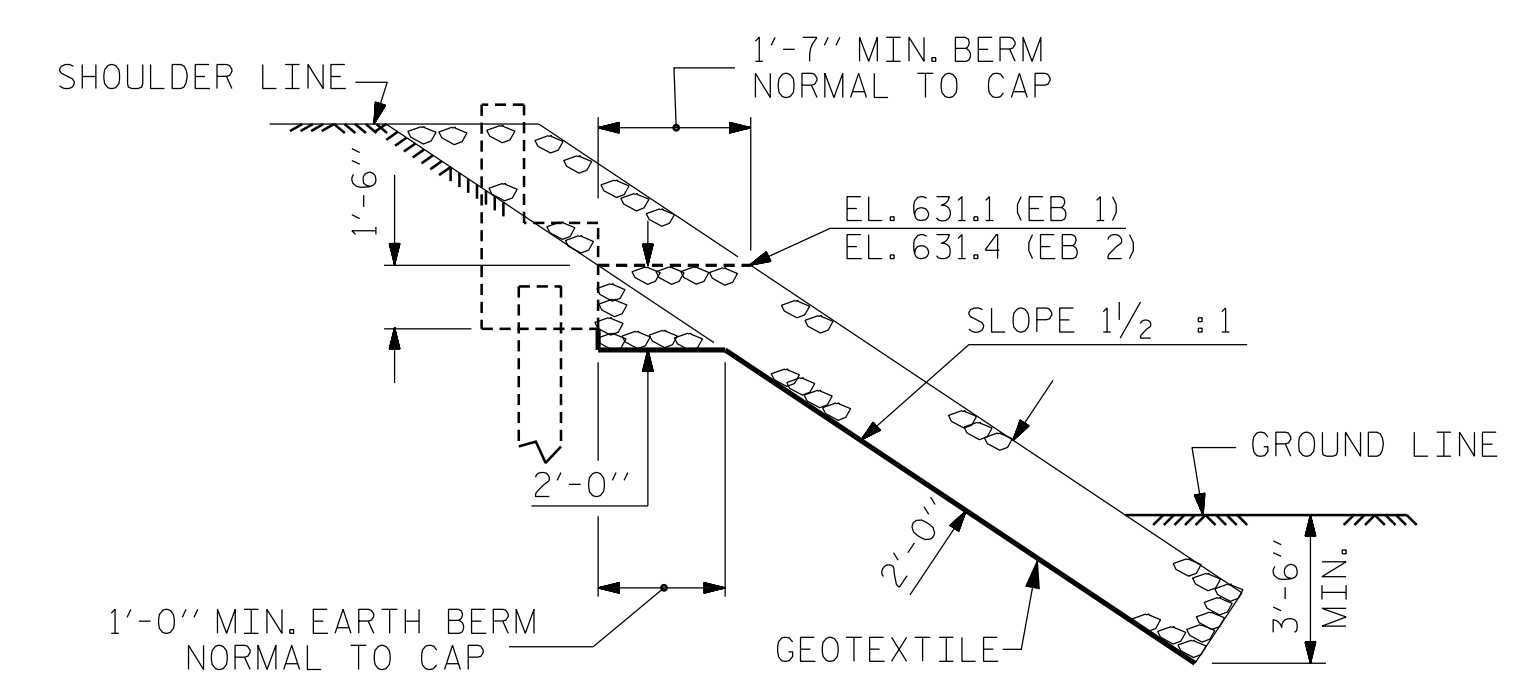
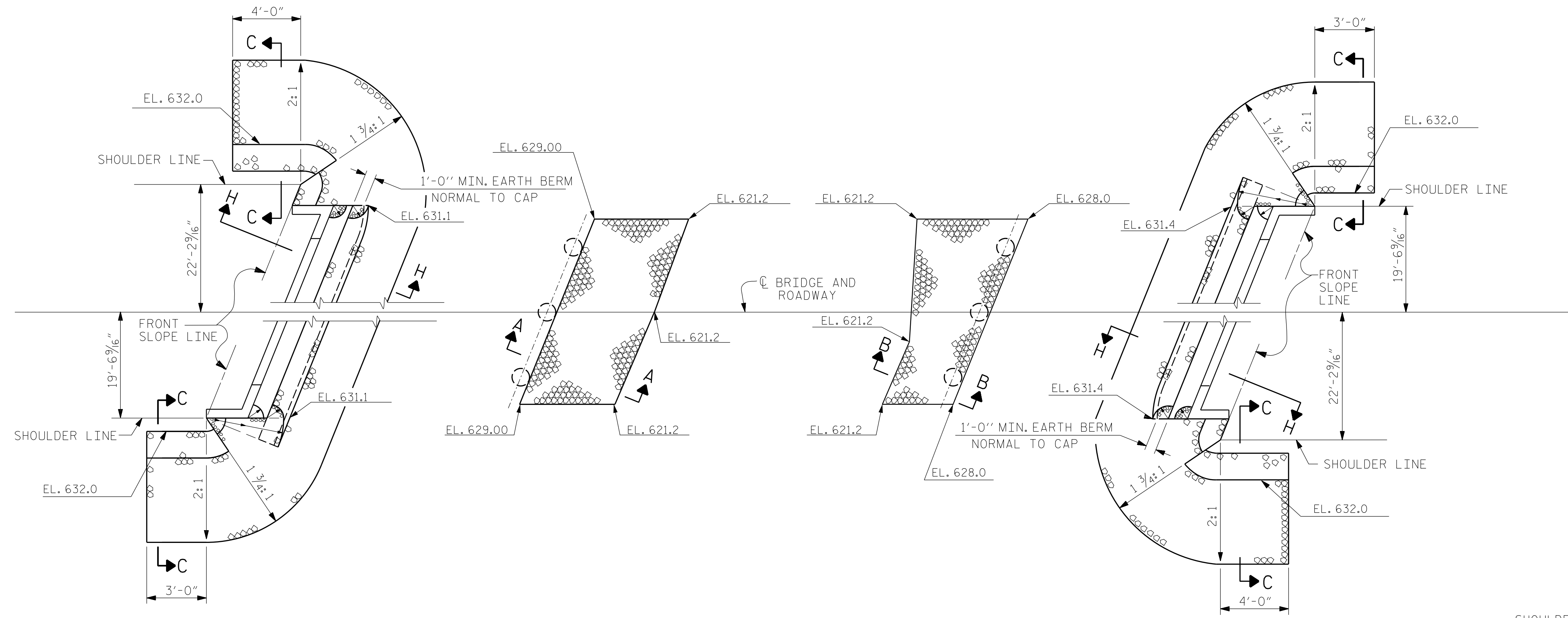
ASSEMBLED BY : JLA	DATE : 2/13
CHECKED BY : JWB	DATE : 2/13
DRAWN BY : DGE 03/10	
CHECKED BY : MKT 03/10	

PREPARED BY  
TOS ENGINEERS  
107-A WICA AVENUE  
MORGANTON, NC 28655

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			23

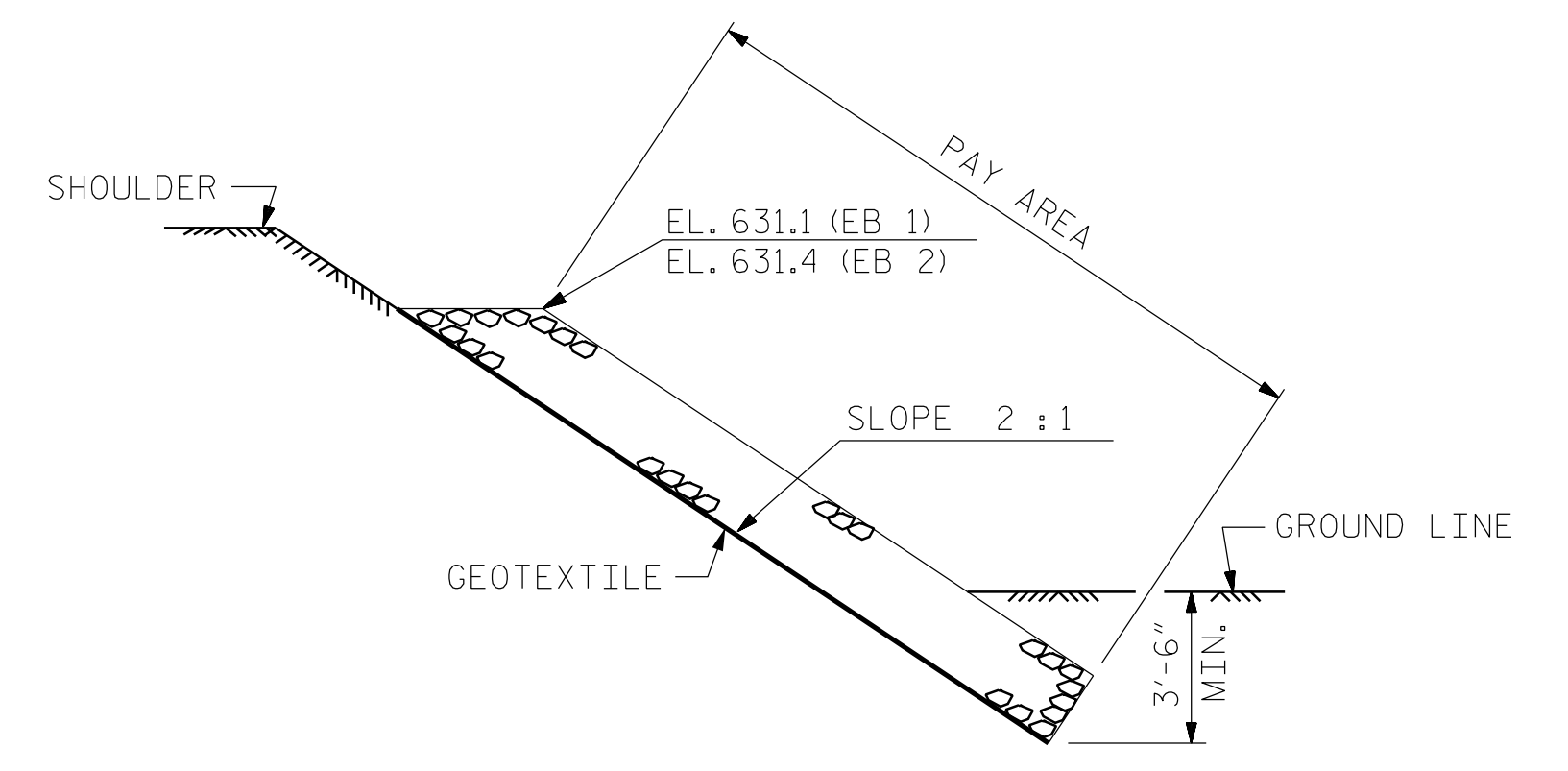
STD. NO. DP\_BT\_33\_105S\_>50'

NOTES :  
FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.

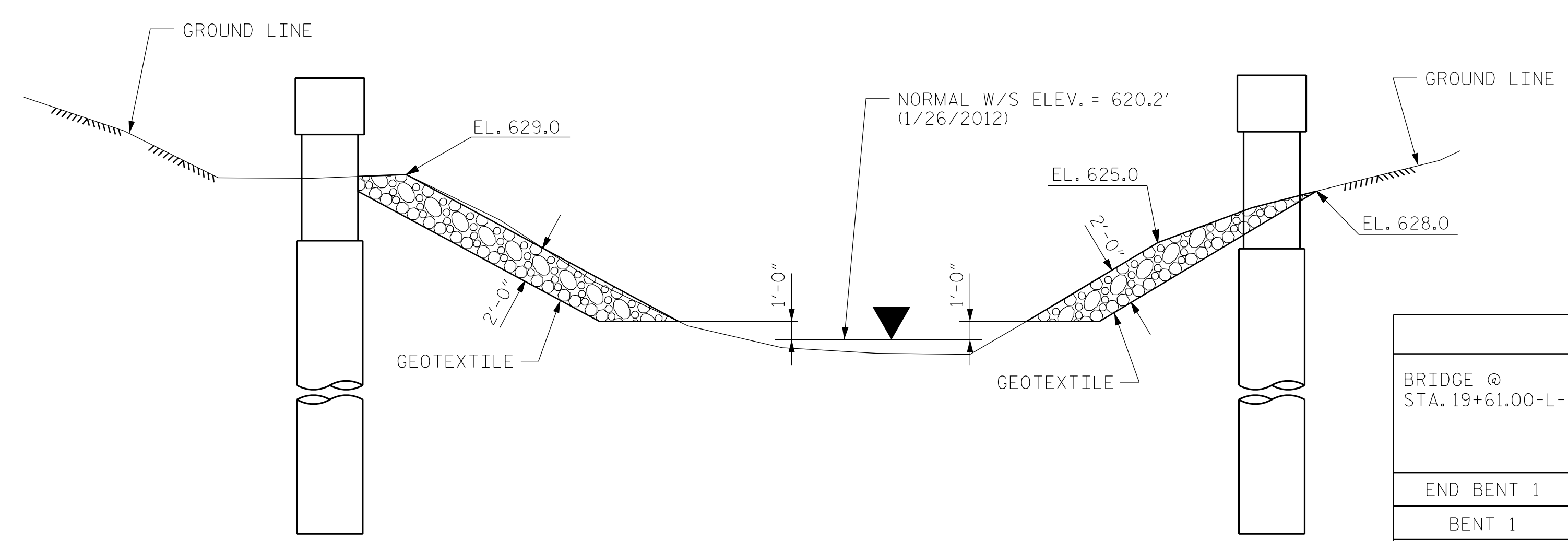


SECTION H-H

SHOULDER RIP RAP IS HIGHER THAN BERM RIP RAP



SECTION C-C



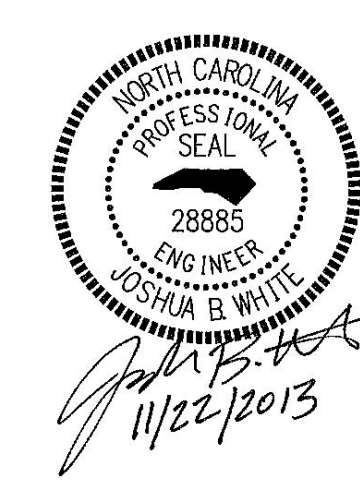
SECTION A-A

SECTION B-B

NOTE:  
INSTALL RIP RAP ON CREEK BANK TO OF BANK ELEVATION ALONG NATURAL GROUND LINE.

ESTIMATED QUANTITIES		
BRIDGE @ STA. 19+61.00-L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	67	73
BENT 1	66	73
BENT 2	61	67
END BENT 2	70	76

PROJECT NO. 17BP.12.R.10  
GASTON COUNTY  
STATION: 19+61.00-L-

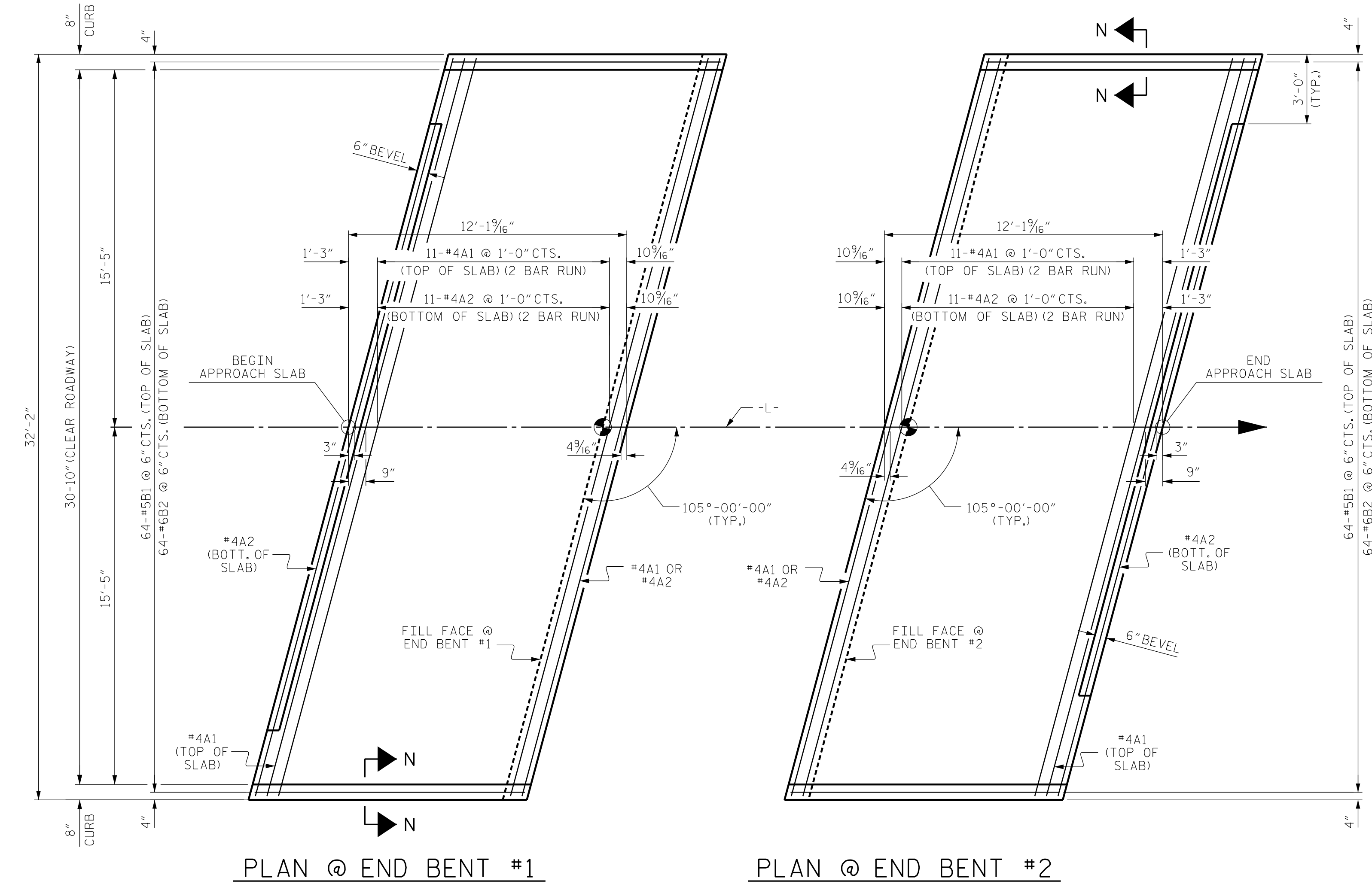


STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
RIP RAP DETAILS

ASSEMBLED BY : JLA	DATE : 2/13
CHECKED BY : JBW	DATE : 2/13
DRAWN BY : REK 1/84	REV. 5/1/06R TLA/GM
CHECKED BY : RDU 1/84	REV. 10/1/11 MAA/GM
	REV. 12/21/11 MAA/GM

PREPARED BY  
TOS ENGINEERS  
107-A WICA AVENUE  
MORGANTON, NC 28655

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			23



PLAN @ END BENT #1

PLAN @ END BENT #2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS

**NOTES**

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 4" Ø DRAINAGE PIPE, AND #78M STONE BACKFILL, SEE ROADWAY PLANS.

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

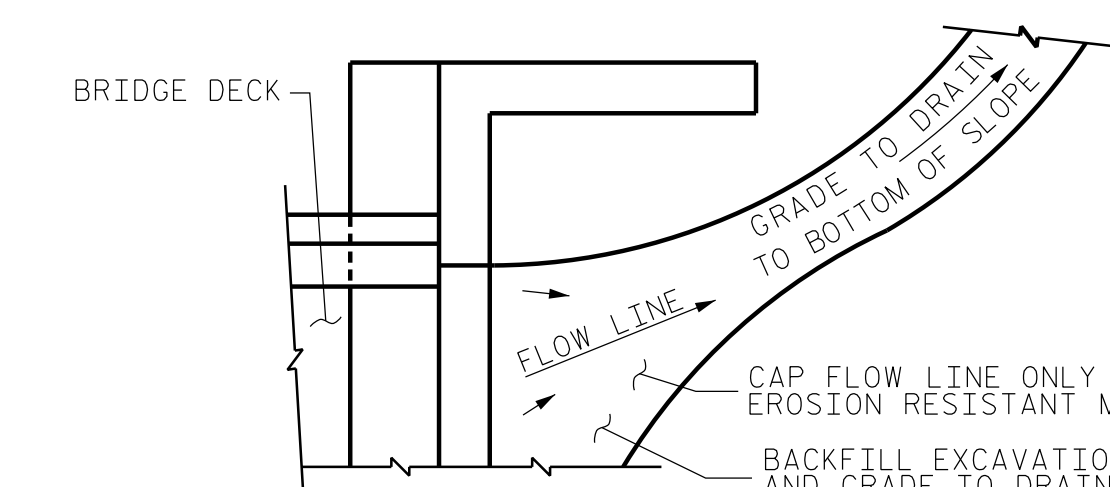
#78M STONE BACKFILL (CLASS V SELECT MATERIAL) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

#78M STONE BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.

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

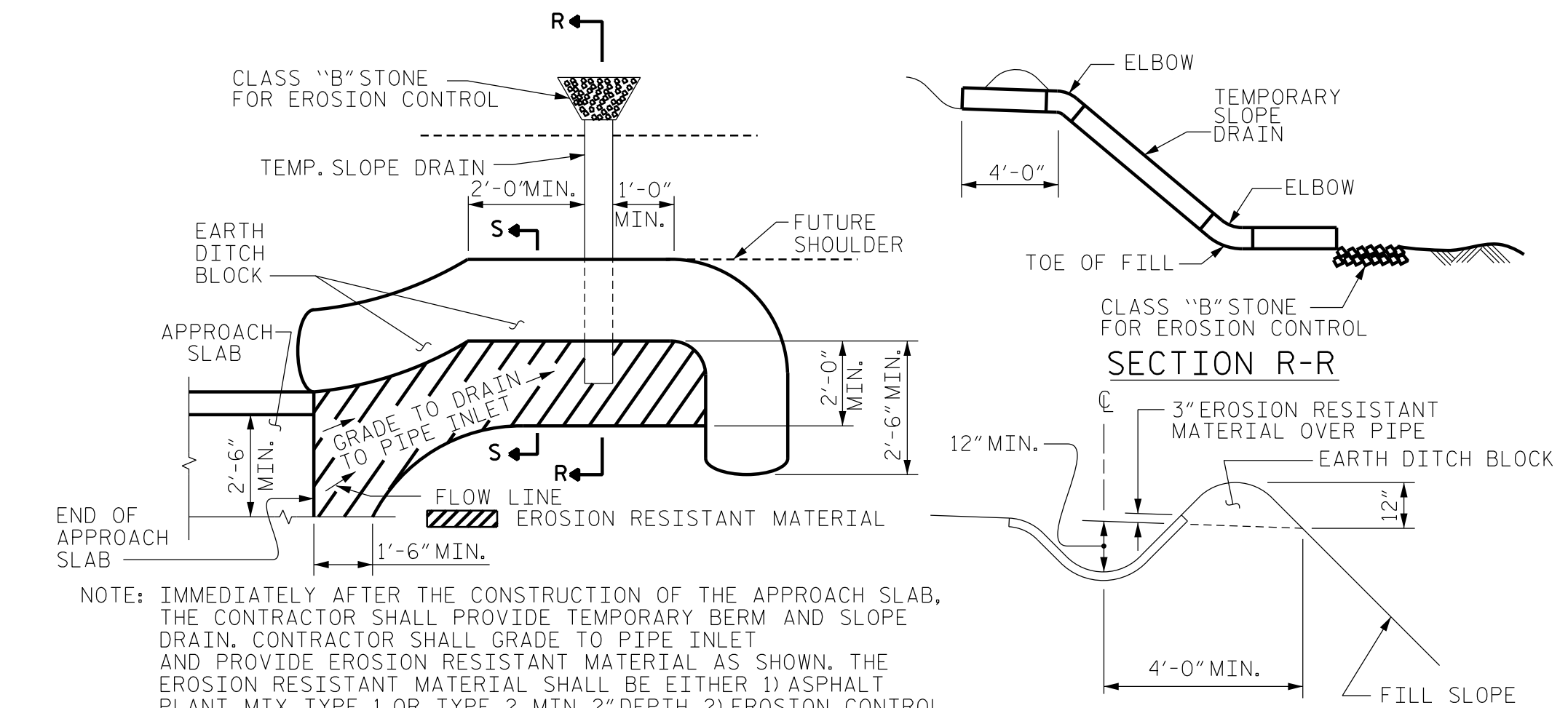
AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

APPROACH SLAB GROOVING IS NOT REQUIRED.



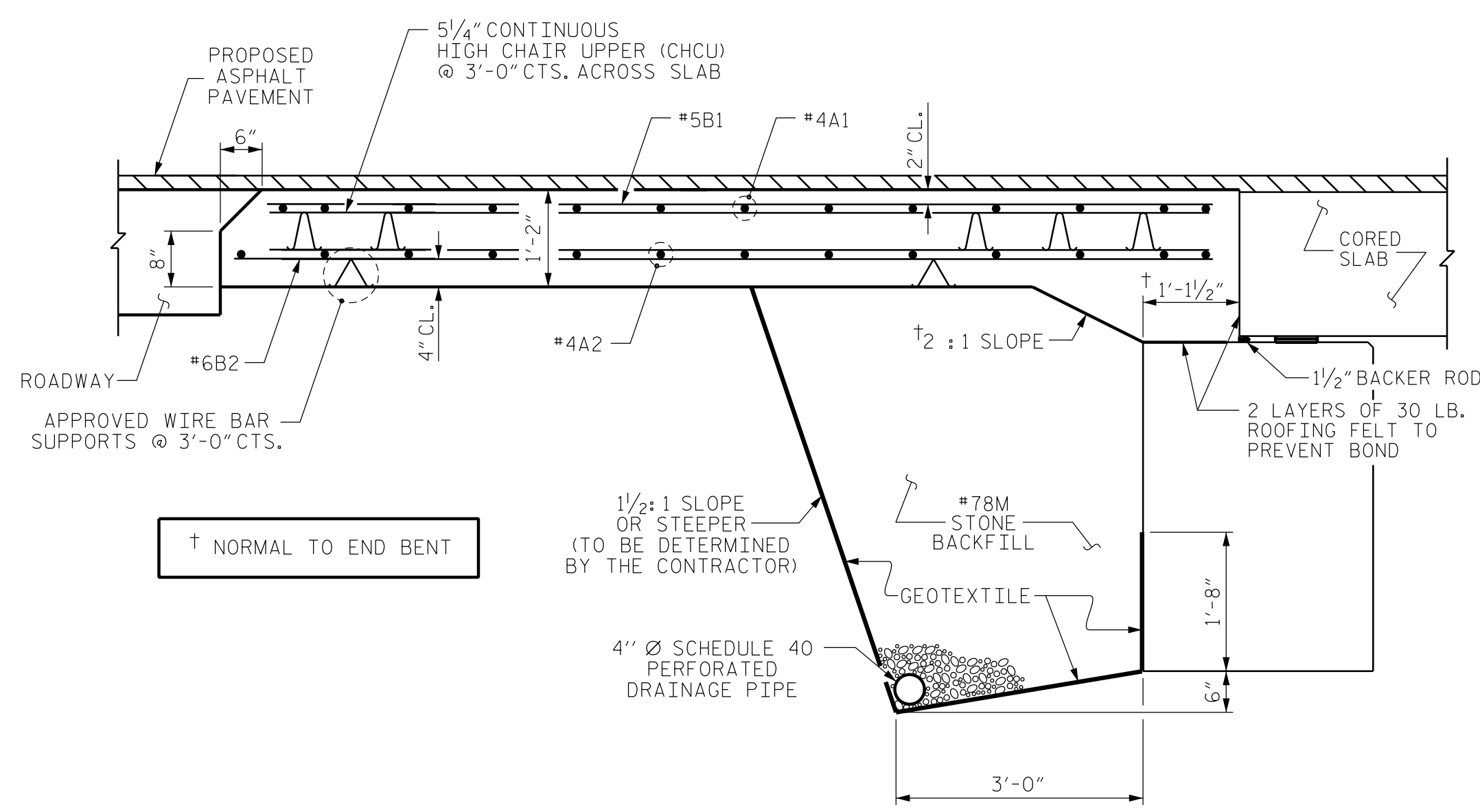
**NOTE:** IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL

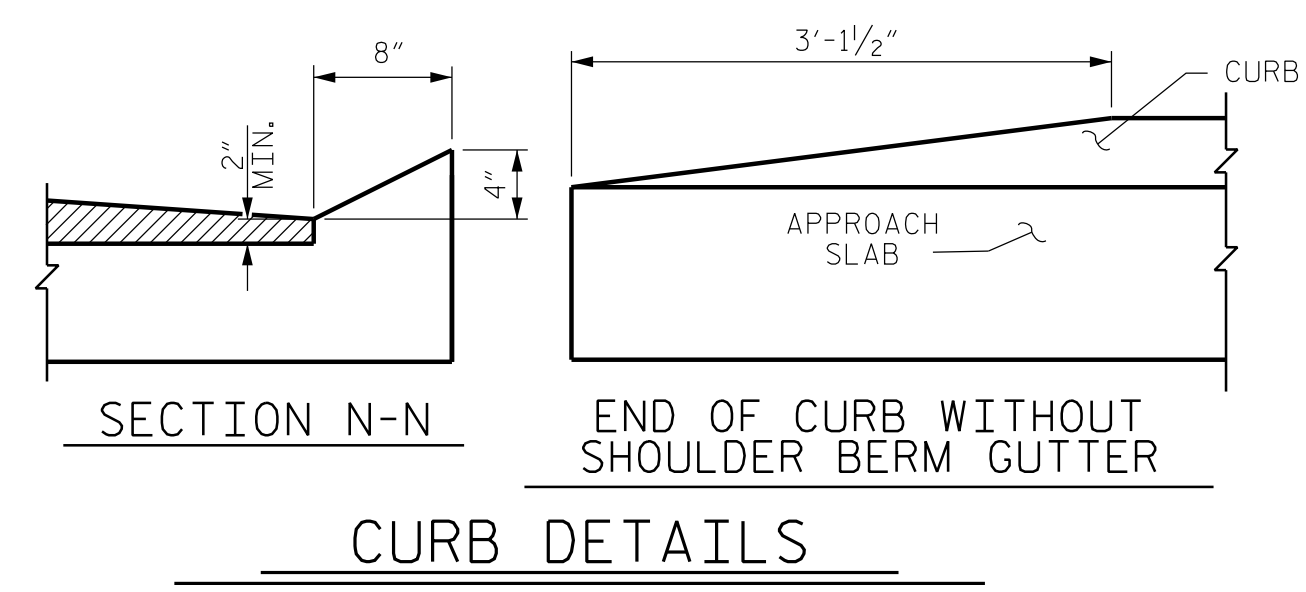


**NOTE:** IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2,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

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



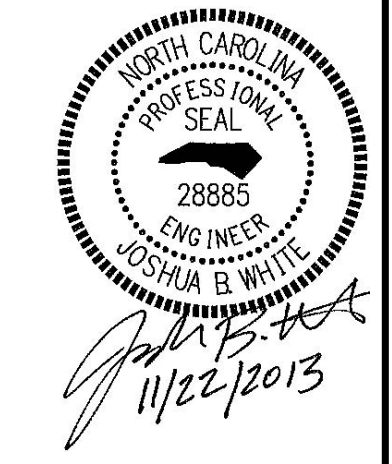
SECTION THRU SLAB



SECTION N-N  
END OF CURB WITHOUT SHOULDER BERM GUTTER  
SECTION S-S  
CURB DETAILS

SPlice LENGTHS		
BAR SIZE	EPOXY COATED	UNCOATED
#4	2'-0"	1'-9"
#5	2'-6"	2'-2"
#6	3'-10"	2'-7"

BILL OF MATERIAL						
APPROACH SLAB AT EB #1						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
*A1	26	#4	STR	17'-6"	304	
A2	26	#4	STR	17'-5"	302	
*B1	64	#5	STR	11'-1"	740	
B2	64	#6	STR	11'-7"	1113	
REINFORCING STEEL					LBS.	1415
*EPOXY COATED REINFORCING STEEL					LBS.	1044
CLASS AA CONCRETE					C. Y.	18.7
APPROACH SLAB AT EB #2						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
*A1	26	#4	STR	17'-6"	304	
A2	26	#4	STR	17'-5"	302	
*B1	64	#5	STR	11'-1"	740	
B2	64	#6	STR	11'-7"	1113	
REINFORCING STEEL					LBS.	1415
*EPOXY COATED REINFORCING STEEL					LBS.	1044
CLASS AA CONCRETE					C. Y.	18.7



PROJECT NO. 17BP.12.R.10  
GASTON COUNTY  
STATION: 19+61.00-L-

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
BRIDGE APPROACH SLAB  
FOR PRESTRESSED CONCRETE  
CORED SLAB UNIT  
(SUB-REGIONAL TIER)  
105° SKEW

ASSEMBLED BY : JLA DATE : 11/12  
CHECKED BY : JBW DATE : 11/12  
DRAWN BY : SHS/MAA 5-09 REV. 12-11 MAA/AAC  
CHECKED BY : BCH 5-09

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			23

## STANDARD NOTES

### DESIGN DATA:

SPECIFICATIONS	-----	A.A.S.H.T.O. (CURRENT)
LIVE LOAD	-----	SEE PLANS
IMPACT ALLOWANCE	-----	SEE A.A.S.H.T.O.
STRESS IN EXTREME FIBER OF		
STRUCTURAL STEEL - AASHTO M270 GRADE 36	-	20,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50W	-	27,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50	-	27,000 LBS. PER SQ. IN.
REINFORCING STEEL IN TENSION		
GRADE 60	--	24,000 LBS. PER SQ. IN.
CONCRETE IN COMPRESSION	-----	1,200 LBS. PER SQ. IN.
CONCRETE IN SHEAR	-----	SEE A.A.S.H.T.O.
STRUCTURAL TIMBER - TREATED OR		
UNTREATED - EXTREME FIBER STRESS	-----	1,800 LBS. PER SQ. IN.
COMPRESSION PERPENDICULAR TO GRAIN OF TIMBER	-----	375 LBS. PER SQ. IN.
EQUIVALENT FLUID PRESSURE OF EARTH	-----	30 LBS. PER CU. FT.
		(MINIMUM)

### MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2006 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

### CONCRETE:

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

### CONCRETE CHAMFERS:

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

### DOWELS:

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

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

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

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

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

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

### REINFORCING STEEL:

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

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

### STRUCTURAL STEEL:

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

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

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

### HANDRAILS AND POSTS:

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

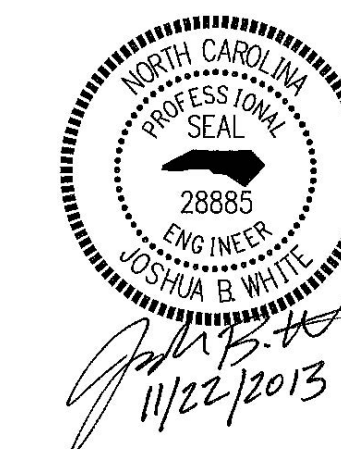
METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINIS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL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

### SPECIAL NOTES:

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

DRAWN BY : JLA      DATE : 11/12  
CHECKED BY : JBW      DATE : 11/12

PREPARED BY  
TOS ENGINEERS  
107-A WICA AVENUE  
MORGANTON, NC 28655



PROJECT NO. 17BP.12.R.10  
GASTON COUNTY  
STATION: 19+61.00-L-

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
STANDARD NOTES					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
					S-23
					TOTAL SHEETS 23