

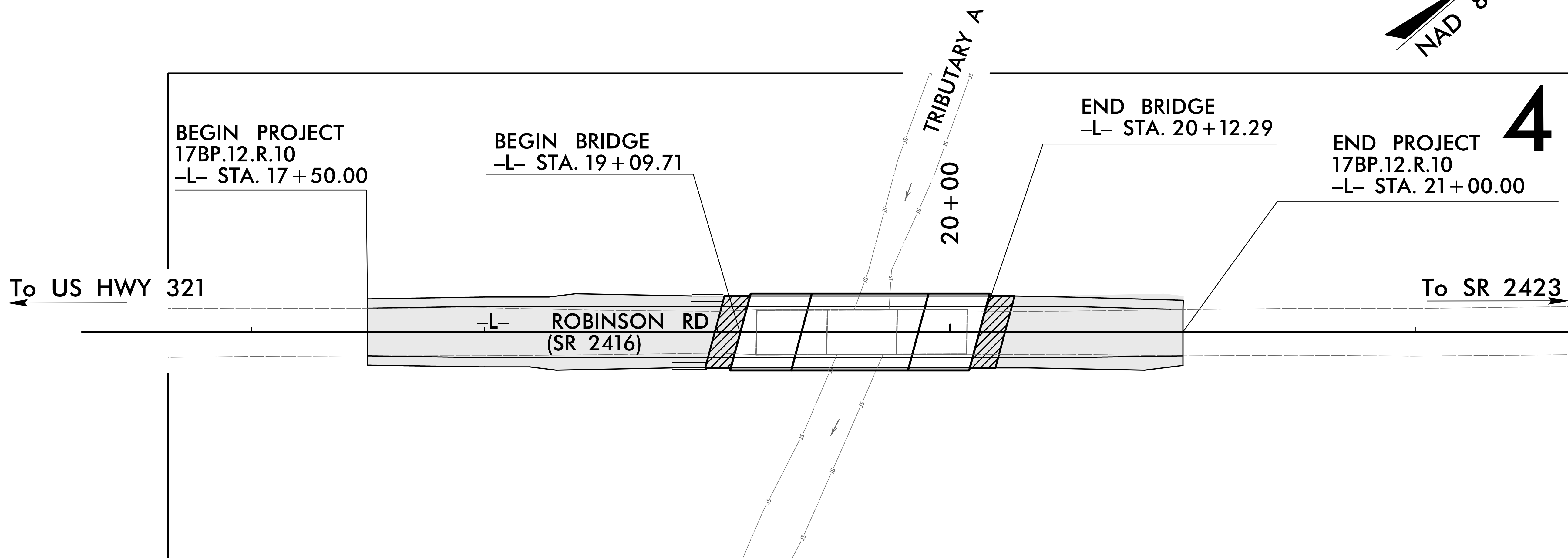
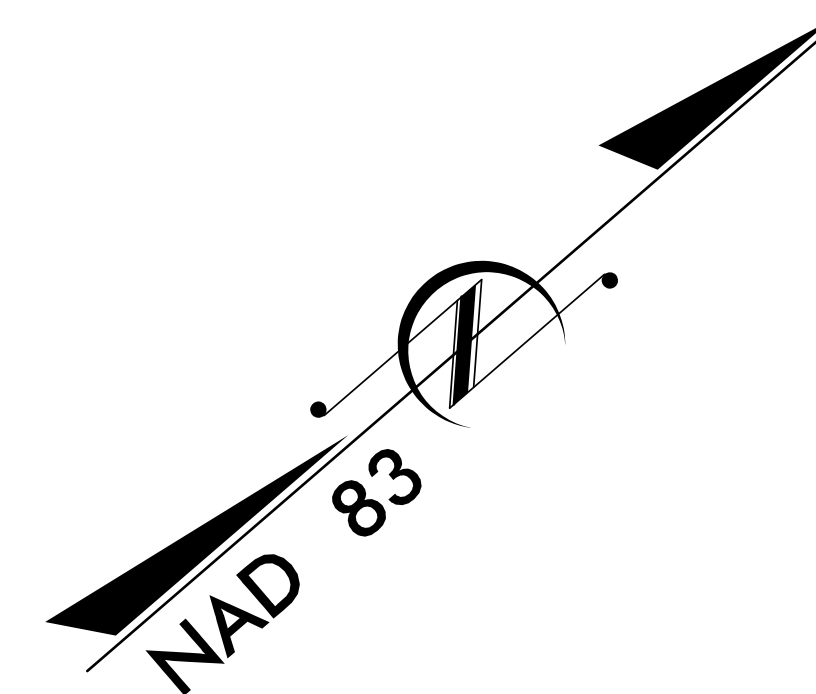
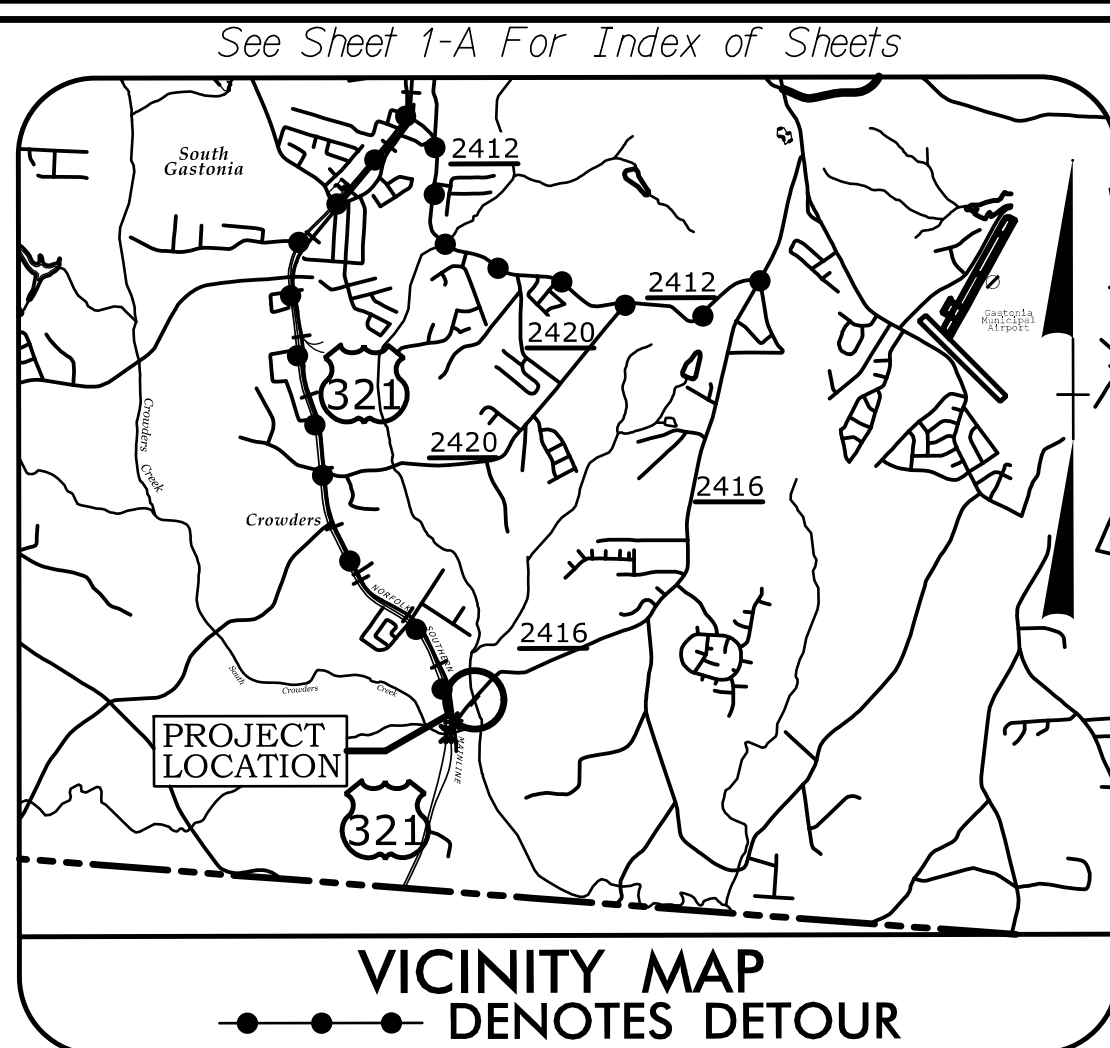
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.12.R.10	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
17BP.12.R.10		PE	
17BP.12.R.10		RW, UTIL.	
17BP.12.R.10		CONST.	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GASTON COUNTY

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

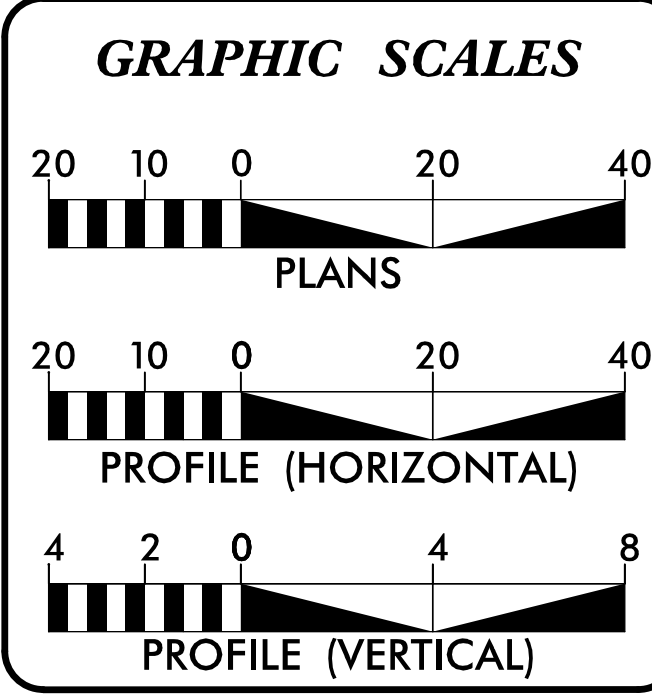
TYPE OF WORK: STRUCTURE, DRAINAGE, GRADING, AND PAVING



4

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

LETTING DATE: _____

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

LEONARD G. FLETCHER, PE
PROJECT ENGINEER

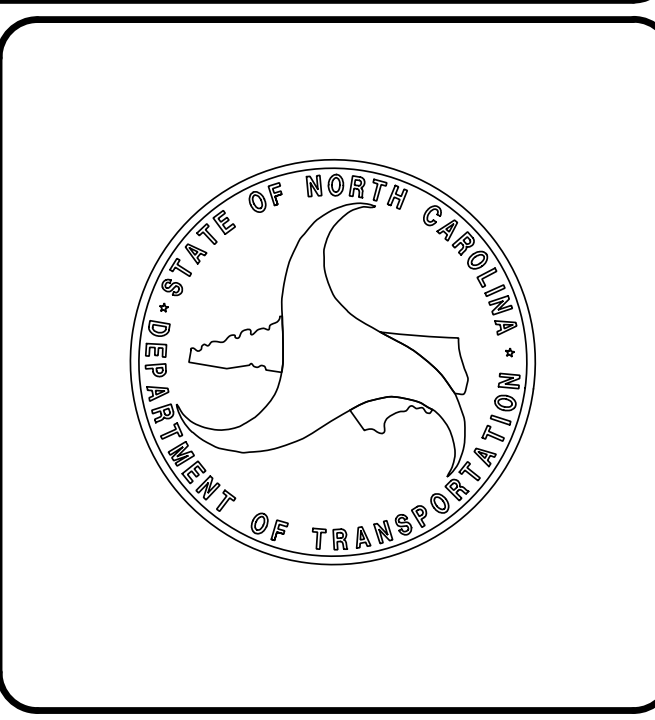
B. CHAD HOUSER, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

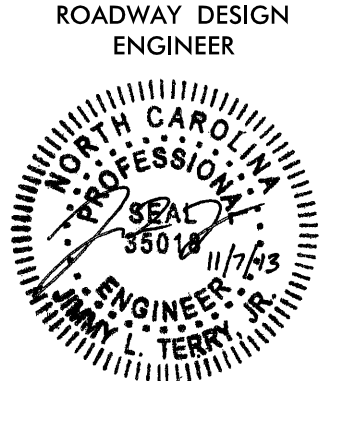
SIGNATURE: _____

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:\T\17BP12.R10\17BP12.R10_1A.dwg















STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS












Note: Not to Scale

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










BOUNDARIES AND PROPERTY:

State Line	_____
County Line	_____
Township Line	_____
City Line	_____
Reservation Line	_____
Property Line	_____
Existing Iron Pin	_____ 
Property Corner	_____ 
Property Monument	_____ 
Parcel/Sequence Number	_____ 
Existing Fence Line	_____ 
Proposed Woven Wire Fence	_____ 
Proposed Chain Link Fence	_____ 
Proposed Barbed Wire Fence	_____ 
Existing Wetland Boundary	_____ 
Proposed Wetland Boundary	_____ 
Existing Endangered Animal Boundary	_____ 
Existing Endangered Plant Boundary	_____ 
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	_____ 
Small Mine	_____ 
Foundation	_____ 
Area Outline	_____ 
Cemetery	_____ 
Building	_____ 
School	_____ 
Church	_____ 
Dam	_____ 

















HYDROLOGY:

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












RAILROADS:

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





RIGHT OF WAY:



Baseline Control Point	_____ 
Existing Right of Way Marker	_____ 
Existing Right of Way Line	_____ 
Proposed Right of Way Line	_____ 
Proposed Right of Way Line with Iron Pin and Cap Marker	_____ 
Proposed Right of Way Line with Concrete or Granite Marker	_____ 
Existing Control of Access	_____ 
Proposed Control of Access	_____ 
Existing Easement Line	_____ 
Proposed Temporary Construction Easement	_____ 
Proposed Temporary Drainage Easement	_____ 
Proposed Permanent Drainage Easement	_____ 
Proposed Permanent Drainage / Utility Easement	_____ 
Proposed Permanent Utility Easement	_____ 
Proposed Temporary Utility Easement	_____ 
Proposed Aerial Utility Easement	_____ 

ROADS AND RELATED FEATURES:










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

VEGETATION:












Single Tree	_____ 
Single Shrub	_____ 
Hedge	_____ 
Woods Line	_____ 

Orchard	_____ 
Vineyard	_____ 














EXISTING STRUCTURES:

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








UTILITIES:

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	_____ 
Designated U/G Power Line (S.U.E.*)	_____ 









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	_____ 
Designated U/G Telephone Cable (S.U.E.*)	_____ 
Recorded U/G Telephone Conduit	_____ 
Designated U/G Telephone Conduit (S.U.E.*)	_____ 
Recorded U/G Fiber Optics Cable	_____ 
Designated U/G Fiber Optics Cable (S.U.E.*)	_____ 






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	_____ 







TV:

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













GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

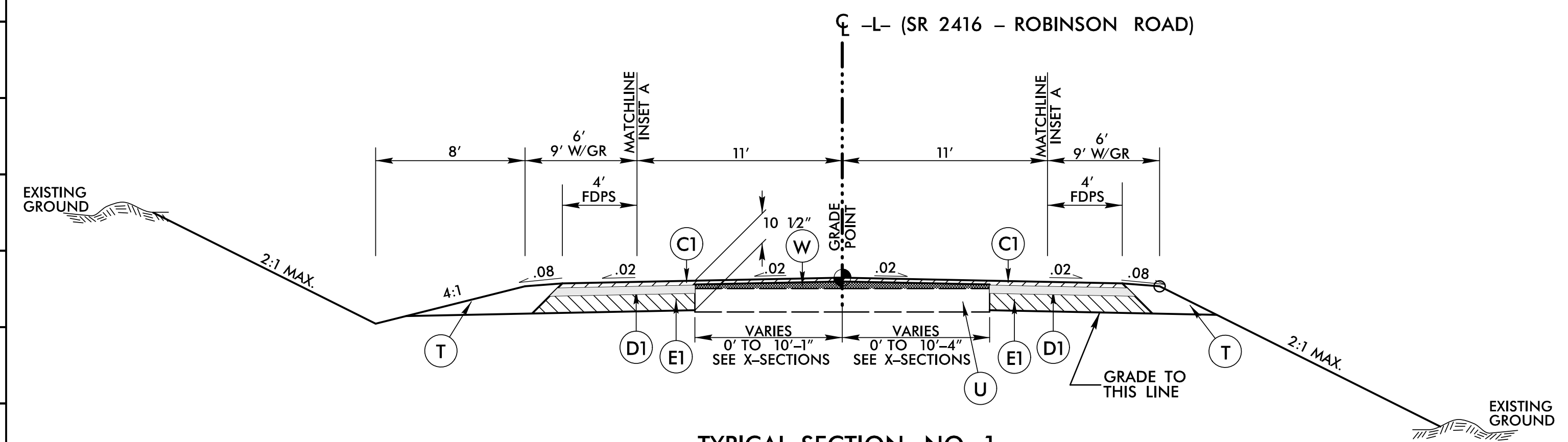
Utility Pole	_____ 
Utility Pole with Base	_____ 
Utility Located Object	_____ 
Utility Traffic Signal Box	_____ 
Utility Unknown U/G Line	_____ 
U/G Tank; Water, Gas, Oil	_____ 
Underground Storage Tank, Approx. Loc.	_____ 
A/G Tank; Water, Gas, Oil	_____ 
Geoenvironmental Boring	_____ 
U/G Test Hole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

6/2/99

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

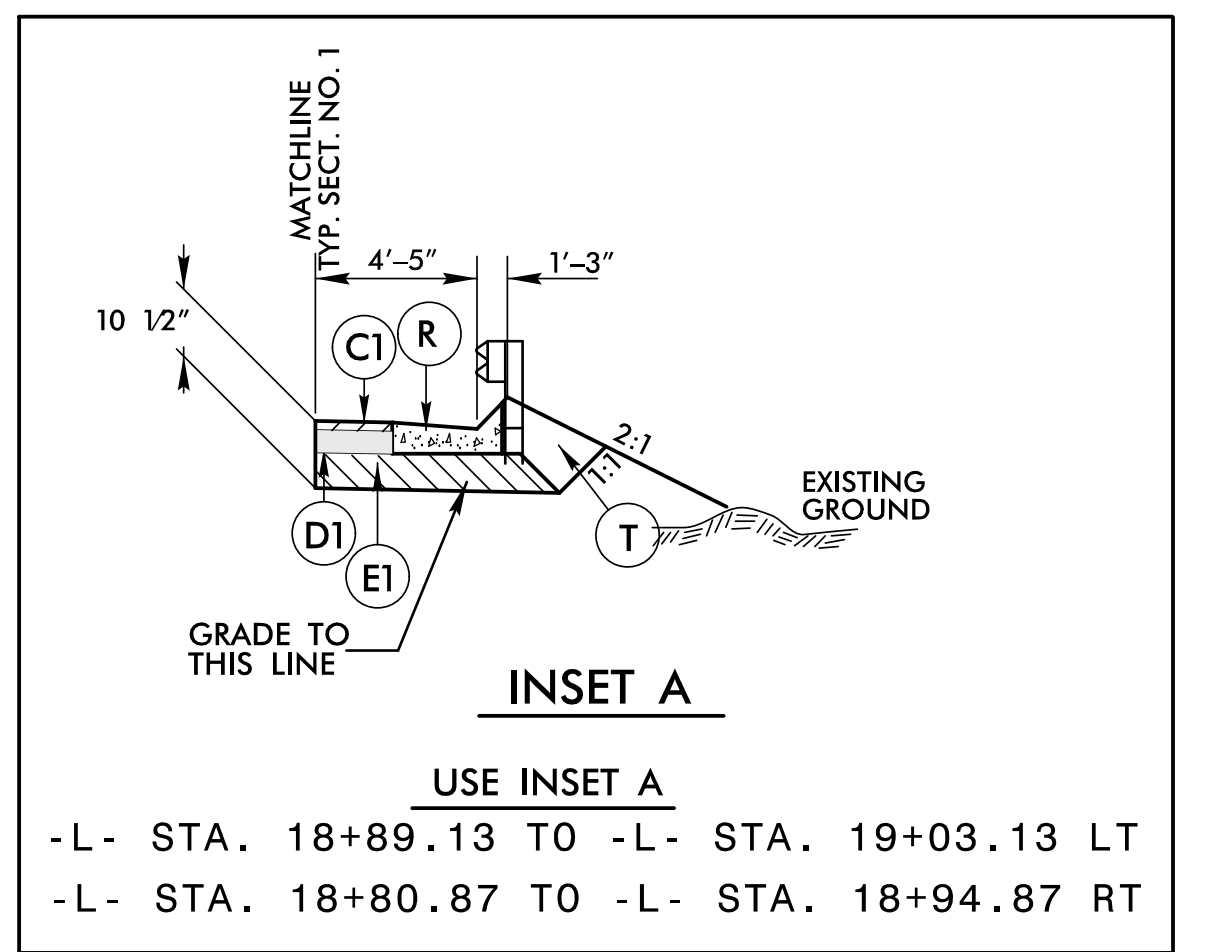
PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.
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.



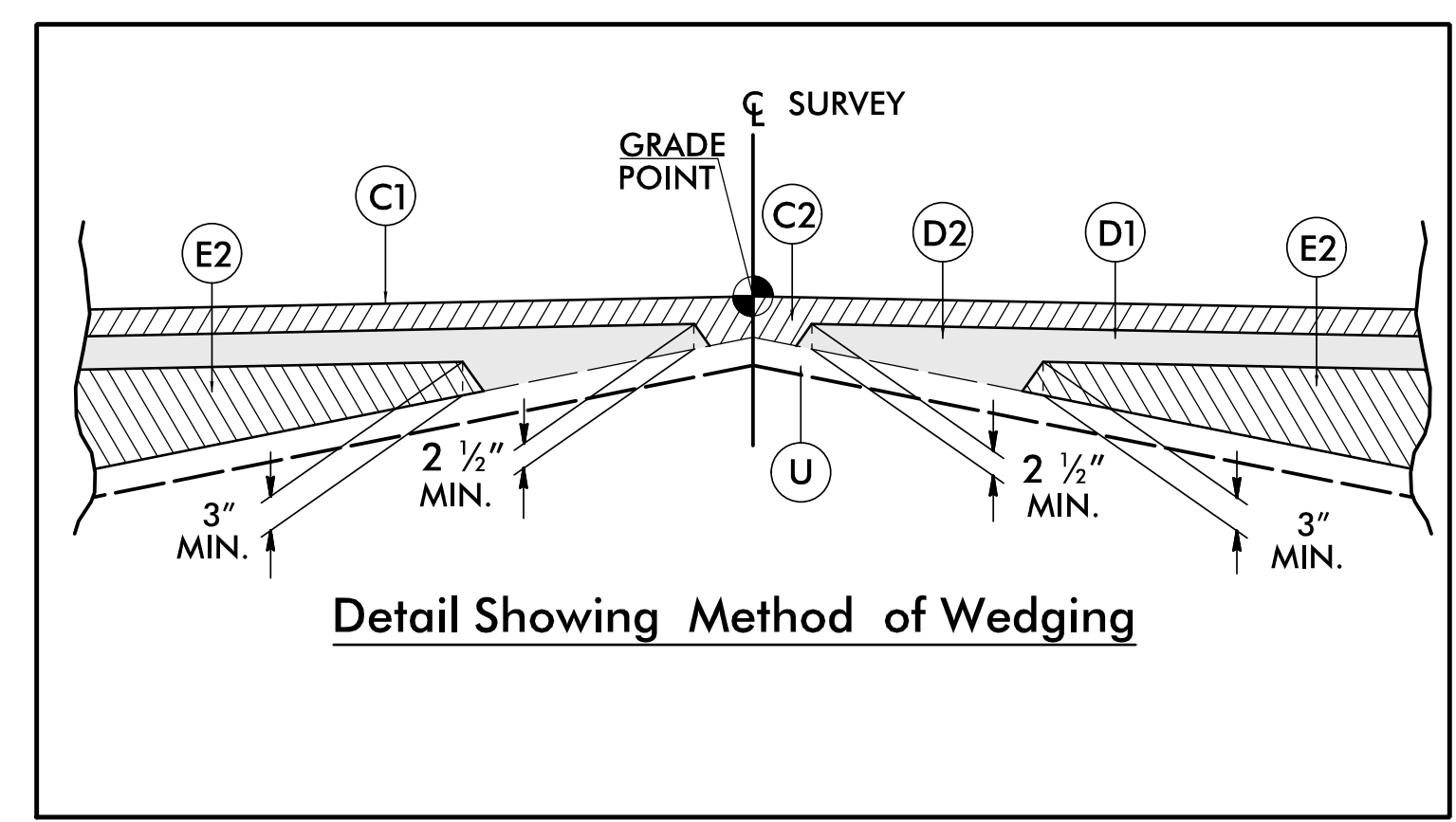
TYPICAL SECTION NO. 1
USE TYPICAL SECTION NO. 1

-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

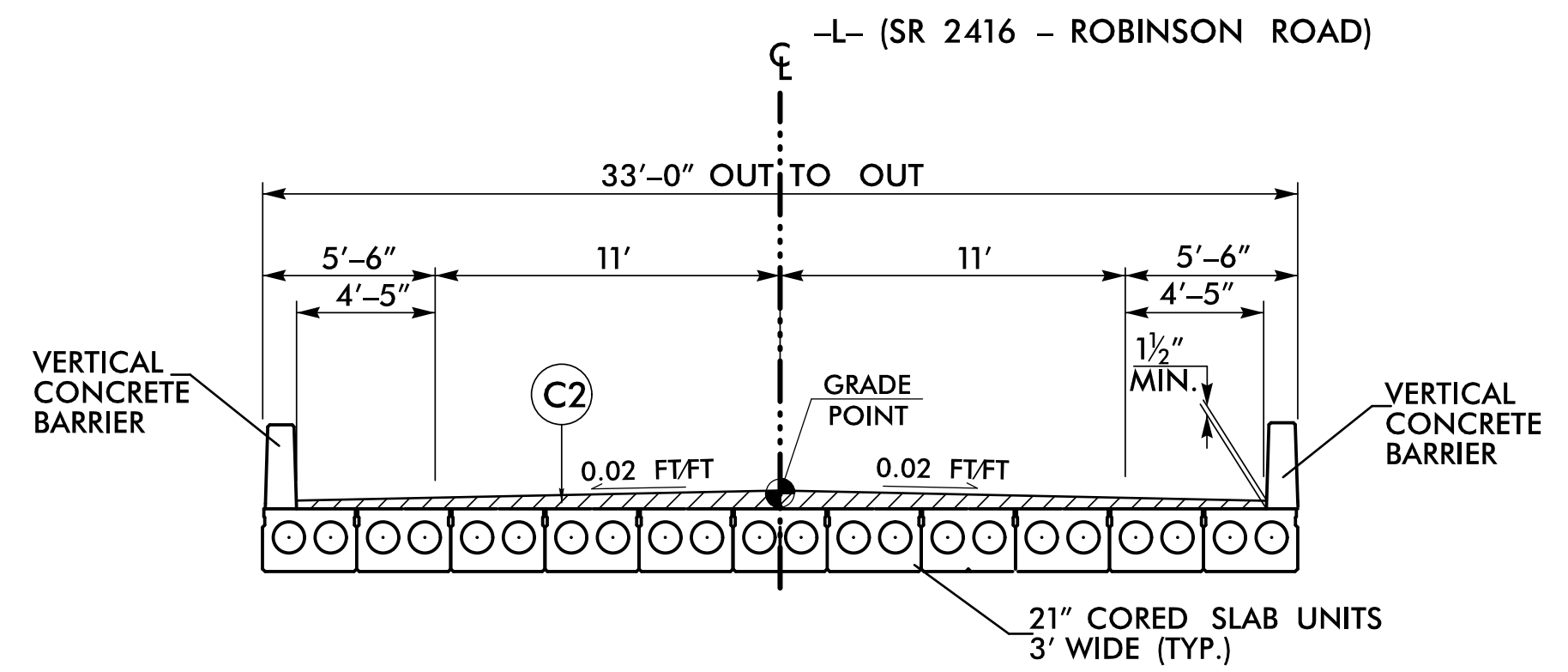


INSET A
USE INSET A

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

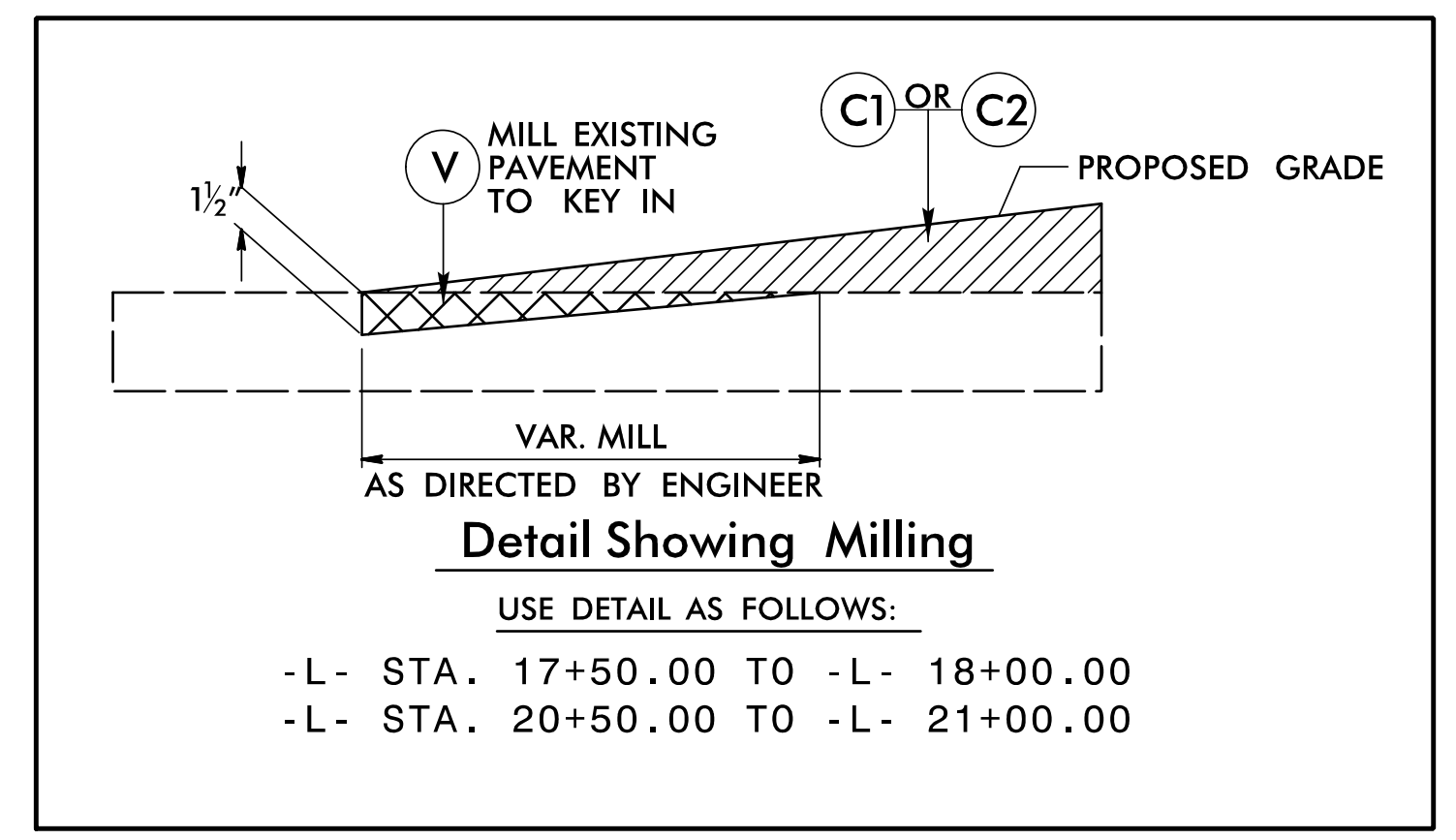


Detail Showing Method of Wedging



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

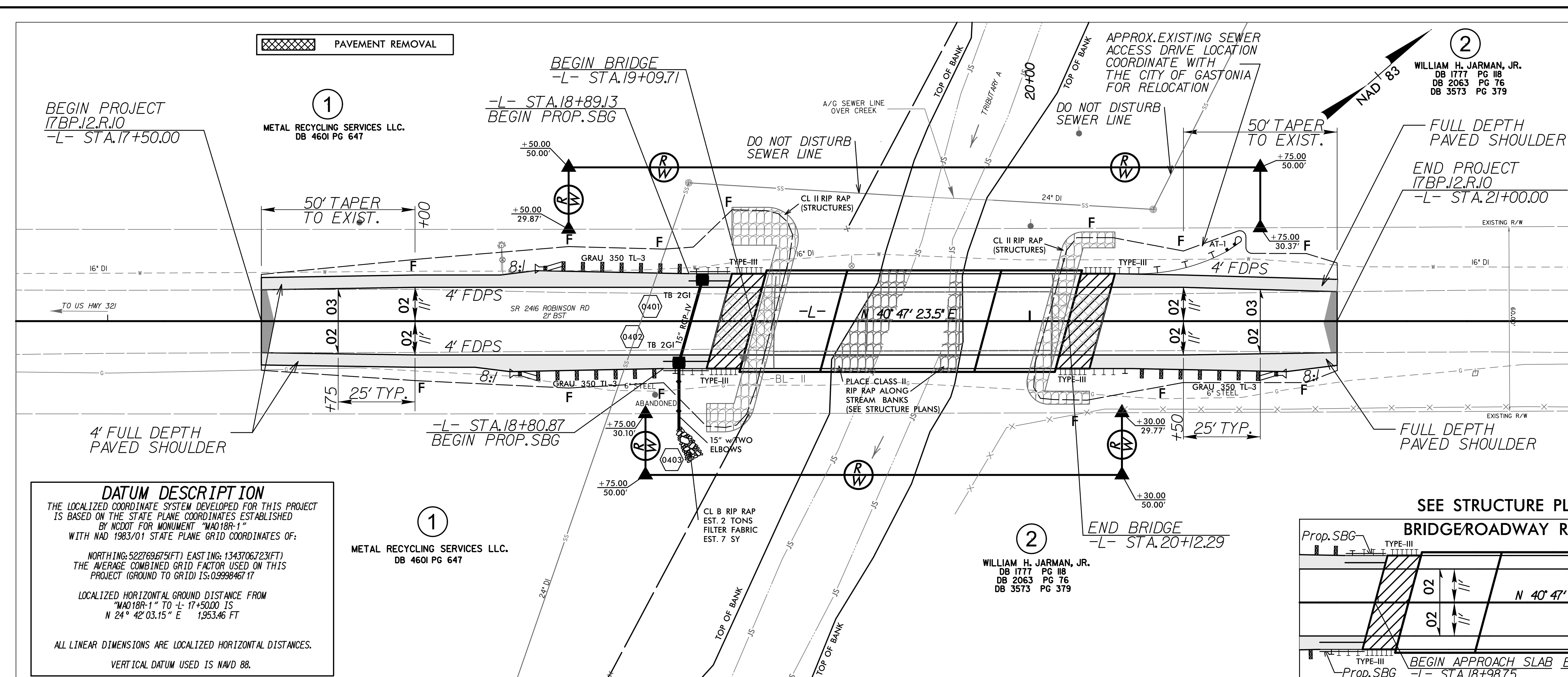
Station	Station	Uncl. Excav.	Embank. +%	Borrow	Waste
17+50.00	19+09.71	23	20		3
BRIDGE					
20+12.29	21+00.00	16	6		10
TOTALS					
		39	26		13
WASTE IN LIEU OF BORROW					
PROJECT TOTALS:					
		39	26		13
SAY:		50			

"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

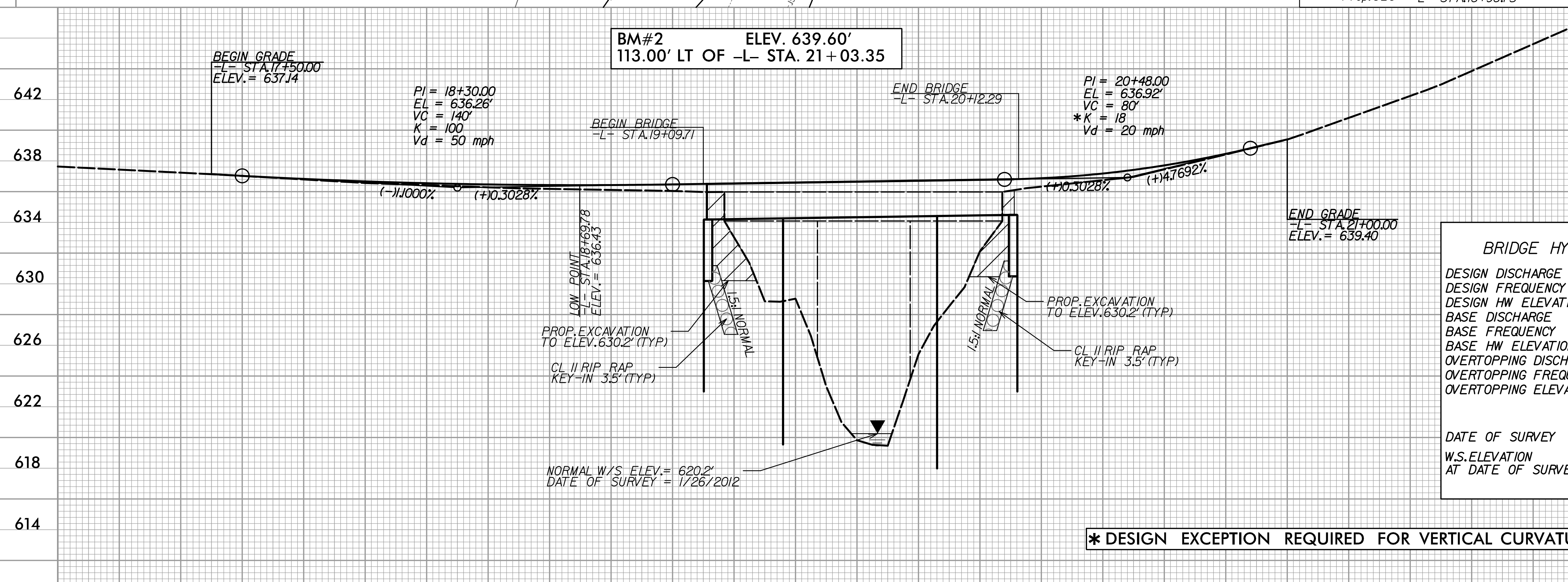
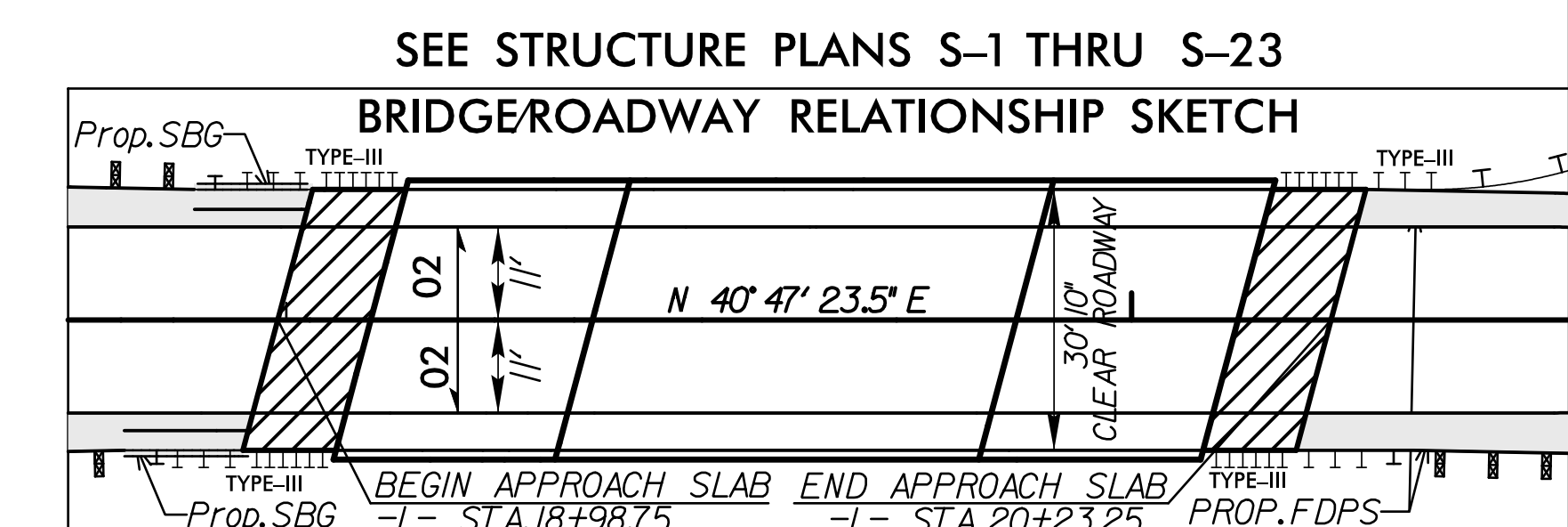
GUARDRAIL SUMMARY

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									
SUB-TOTALS:				243.75	31.25										4	3	1								
LESS ANCHOR DEDUCTIONS																									
	GRAU-350	3@50 ft		150																					
	TYPE AT-1	1@6.25 ft			6.25																				
	TYPE III	4@18.75 ft		75																					
ANCHOR TOTALS				225	6.25																				
GRAND TOTALS				18.75	25										4	3	1								
SAY				25	50																				

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 "MA018R-1" WITH NAD 1983/01 STATE PLANE GRID COORDINATES OF:
 NORTHING: 522169.67 (51 FT) EASTING: 1343706.72 (31 FT)
 THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999846717
 LOCALIZED HORIZONTAL GROUND DISTANCE FROM "MA018R-1" TO 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.



BRIDGE HYDRAULIC DATA

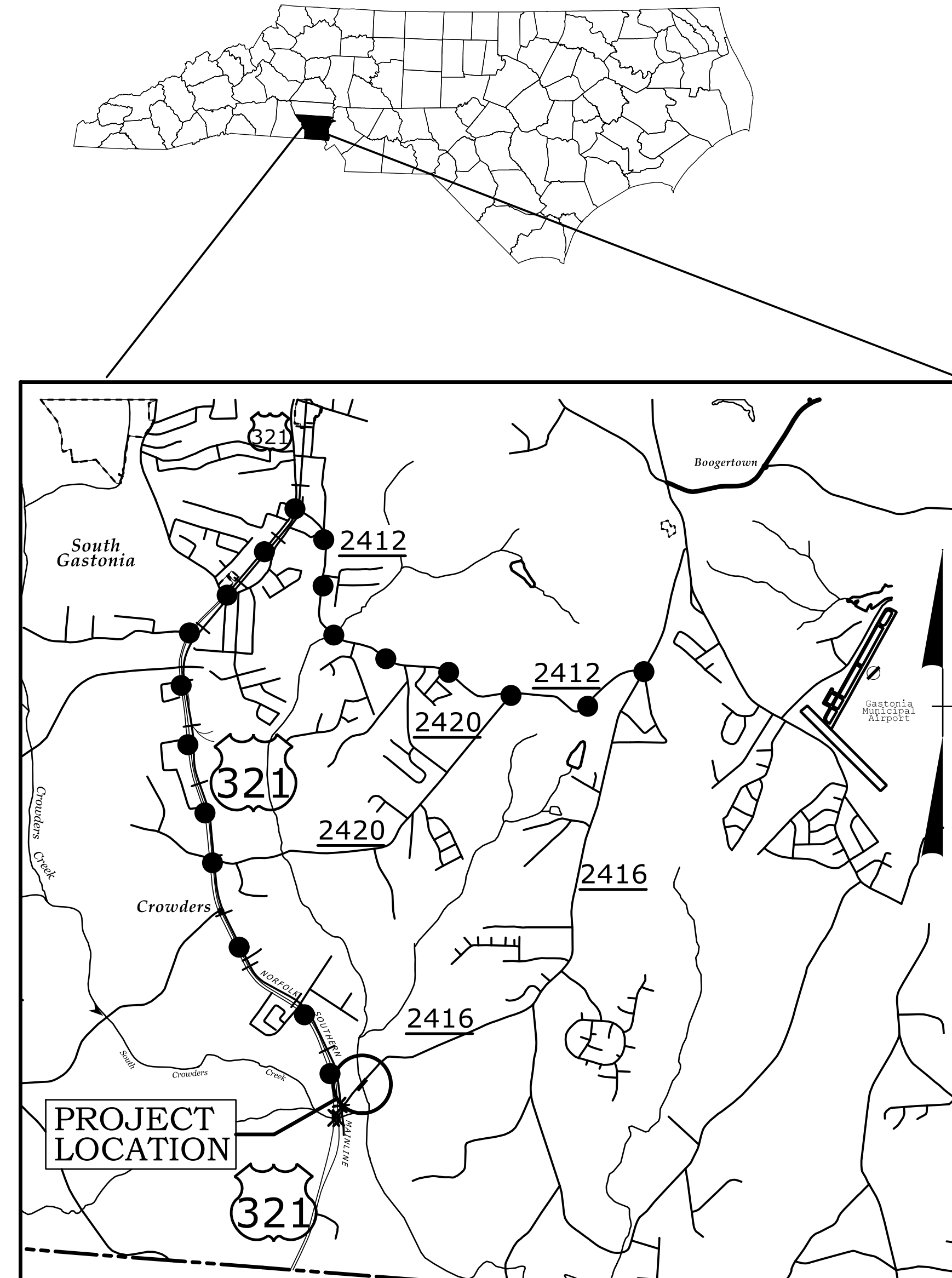
DESIGN DISCHARGE	= 1,720	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 629.9	FT
BASE DISCHARGE	= 3,416	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 632.7	FT
OVERTOPPING DISCHARGE	= 4,630+	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 636.4	FT
	= SAG ELEV. AT	
	-L- STA 18+70	
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

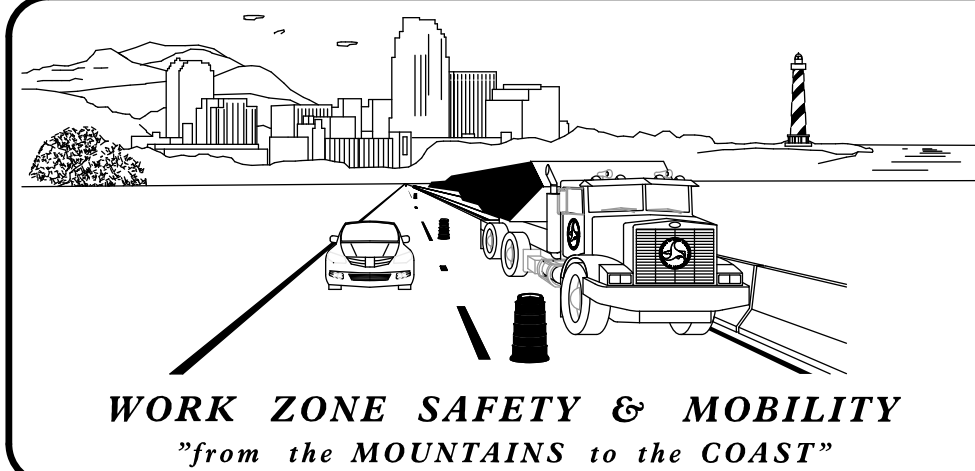
GASTON COUNTY



VICINITY MAP

OFFSITE DETOUR

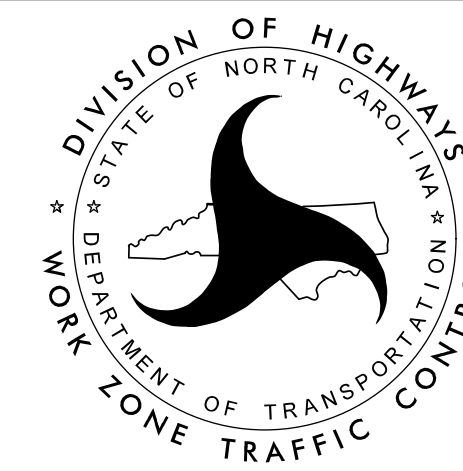
NC DOT CONTACT INFORMATION:
Phone: 919 250 4234 Fax: 919 212 5711
RODGER ROCHELLE, PE
State Alternative Delivery Engineer
TOM BACON, PE
VIRGINIA MABRY
Design-Build Project Engineer



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



INDEX OF SHEETS

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

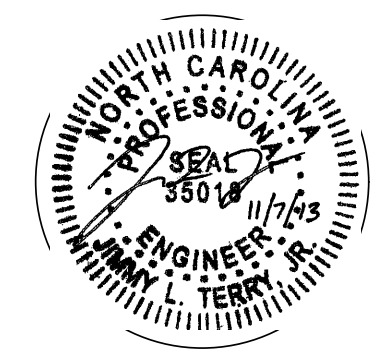
SHEET NO.
TMP-1

TIP PROJECT: 17BP.12.R.10

CONTRACT: DL00039

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

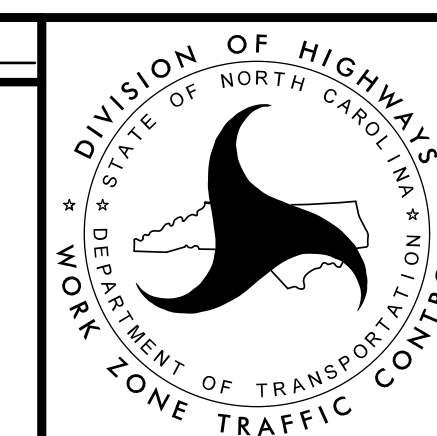
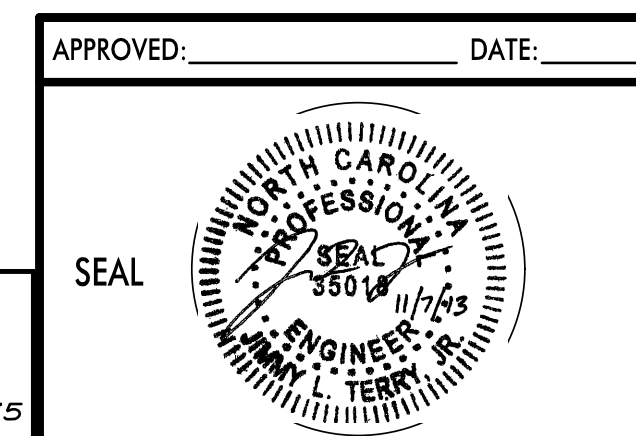
- H) INSTALL PAVEMENT MARKINGS AND PAVEMENT MARKERS ON THE FINAL SURFACE AS SHOWN IN THE PAVEMENT MARKING PLAN.
- I) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.
- J) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS BY THE END OF EACH DAY'S OPERATION.
- K) PASSING ZONE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

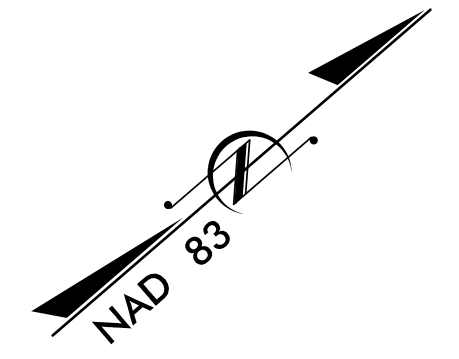
TGS
 ENGINEERS
 804-C W. LAFAYETTE ST
 SHELBY, NC 27511
 PH (704) 476-0003
 CORP. LICENSE NO.: C-0275



**TRANSPORTATION
OPERATIONS
PLAN**

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

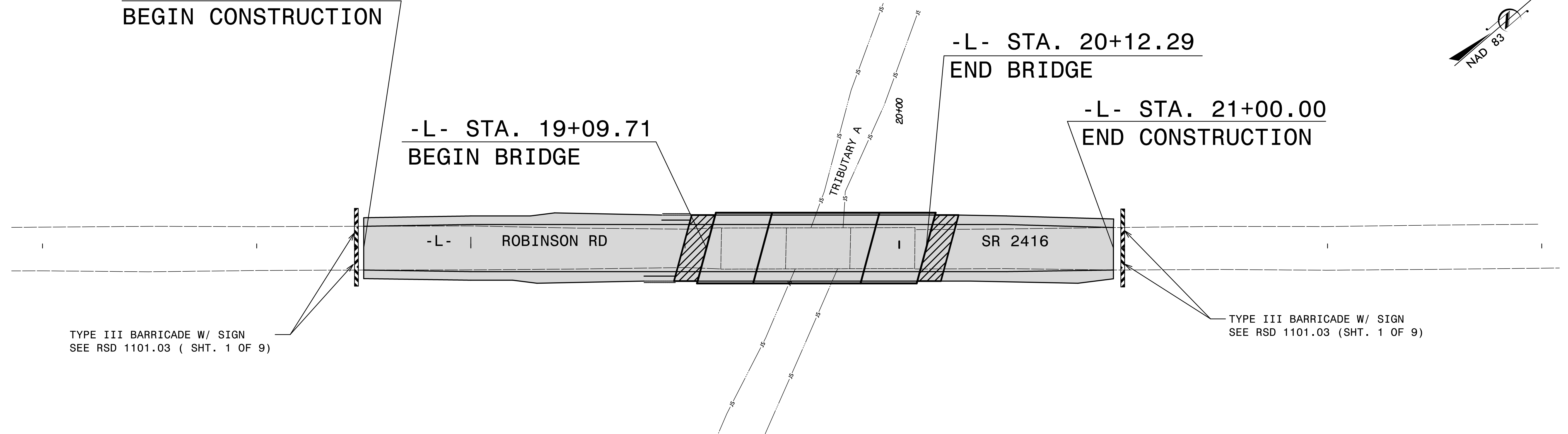
NOTE: SEE SHEETS TMP-3 AND SD-1 FOR DETOUR LOCATION AND SIGNING



**-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

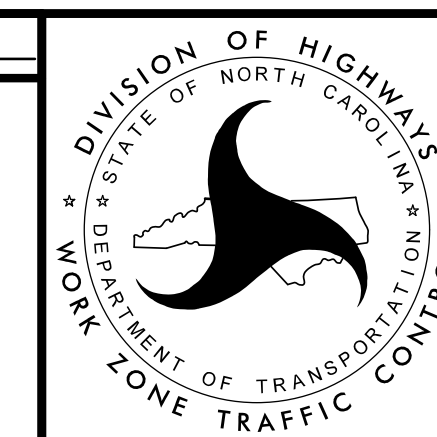
- STEP 1: INSTALL ALL DETOUR ROUTE SIGNS AS SHOWN ON TMP-3.
- STEP 2: AFTER PLACING TYPE III BARRICADES AND SIGNS CLOSE ROBINSON RD. (-L-) TO TRAFFIC AS SHOWN IN ROADWAY STANDARD DRAWING 1101.03 (SHEET 1 OF 9) AND ON SHEET TMP-2 AND TMP-3.
- STEP 3: DEMOLISH AND REMOVE THE EXISTING BRIDGE OVER TRIBUTARY 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 \$\$\$\$\$\$
\$\$\$\$\$ DATE \$\$\$\$\$\$
\$\$\$\$\$ USER NAME \$\$\$\$\$\$
\$\$\$\$\$

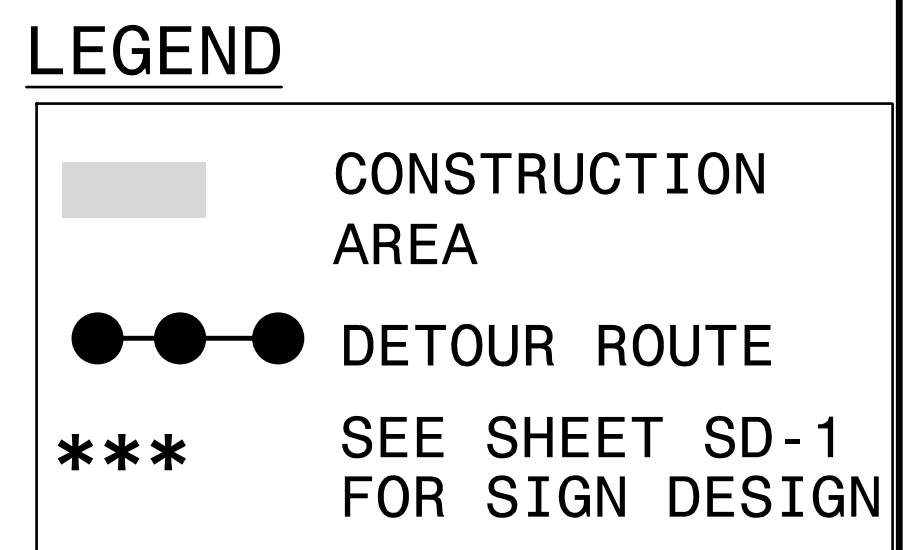
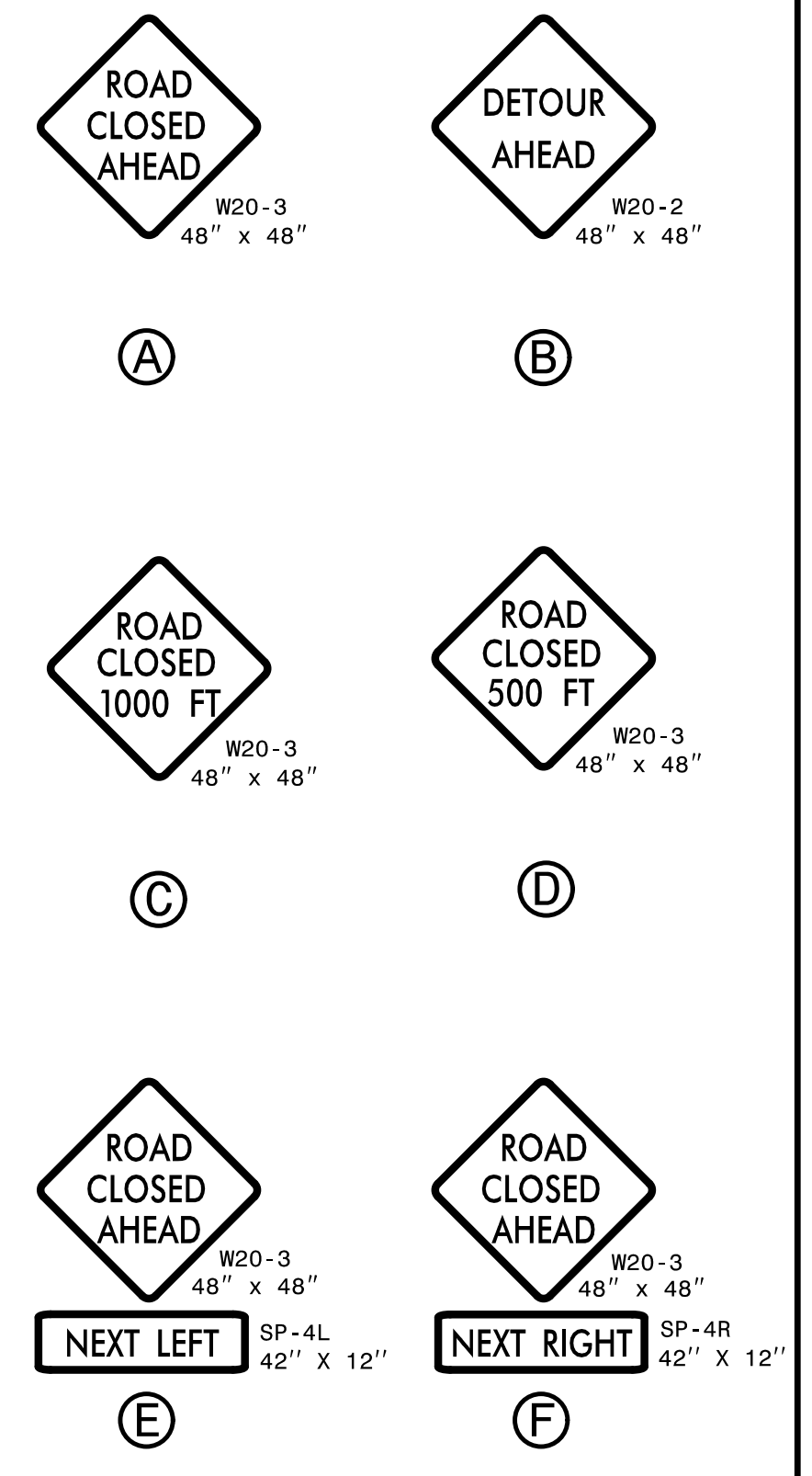
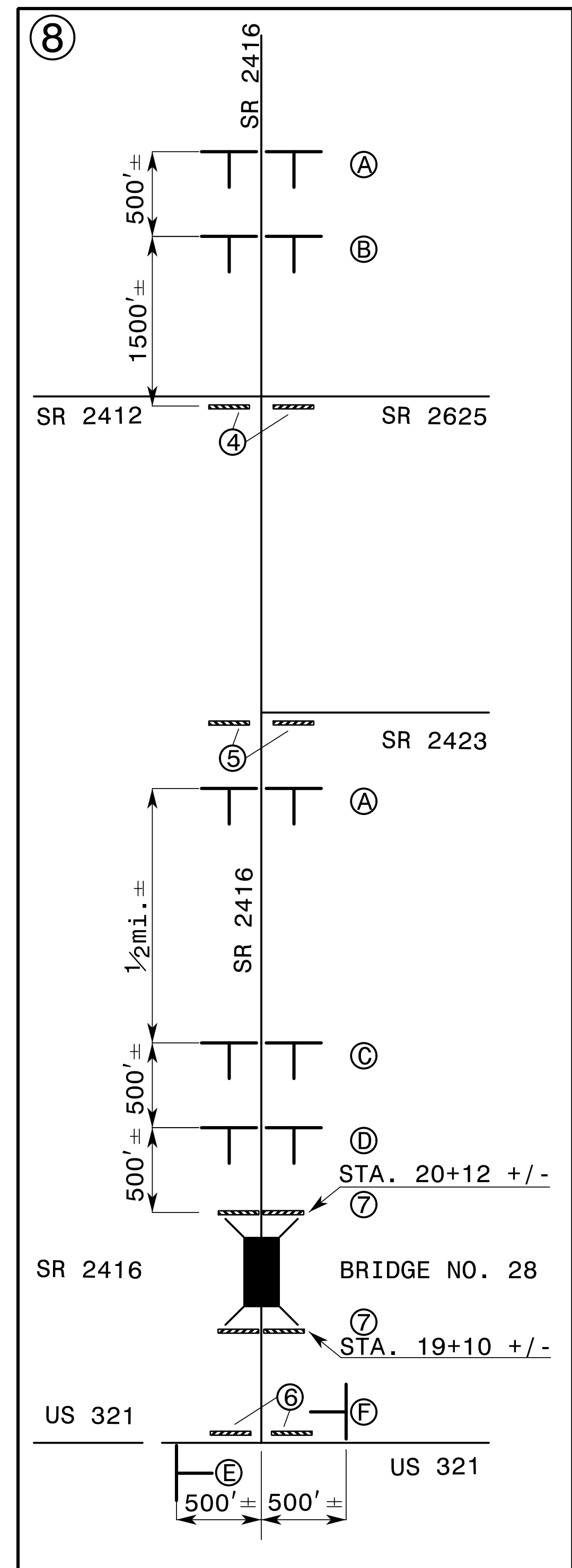
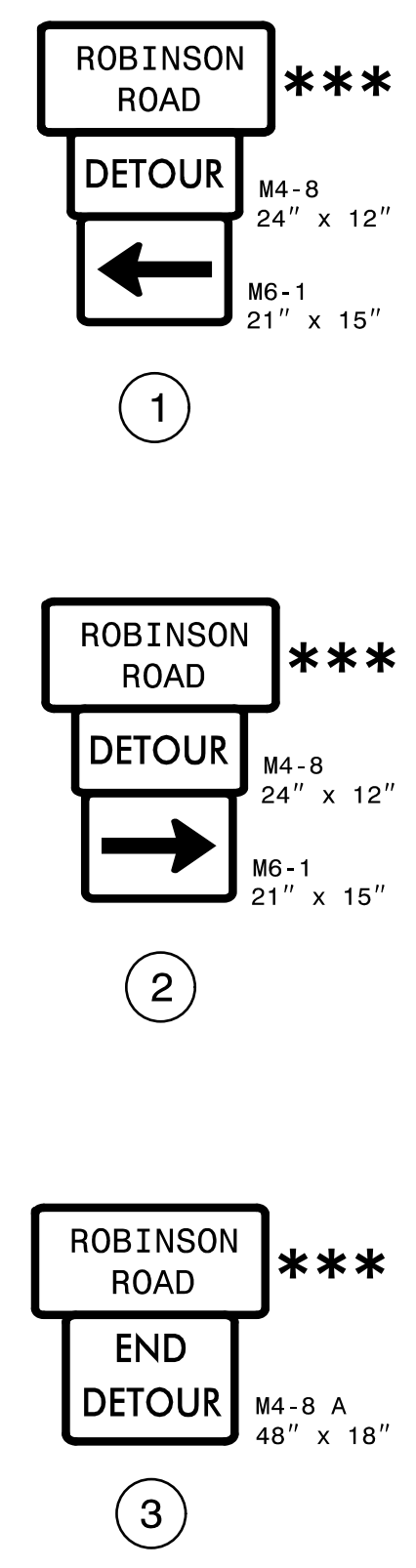
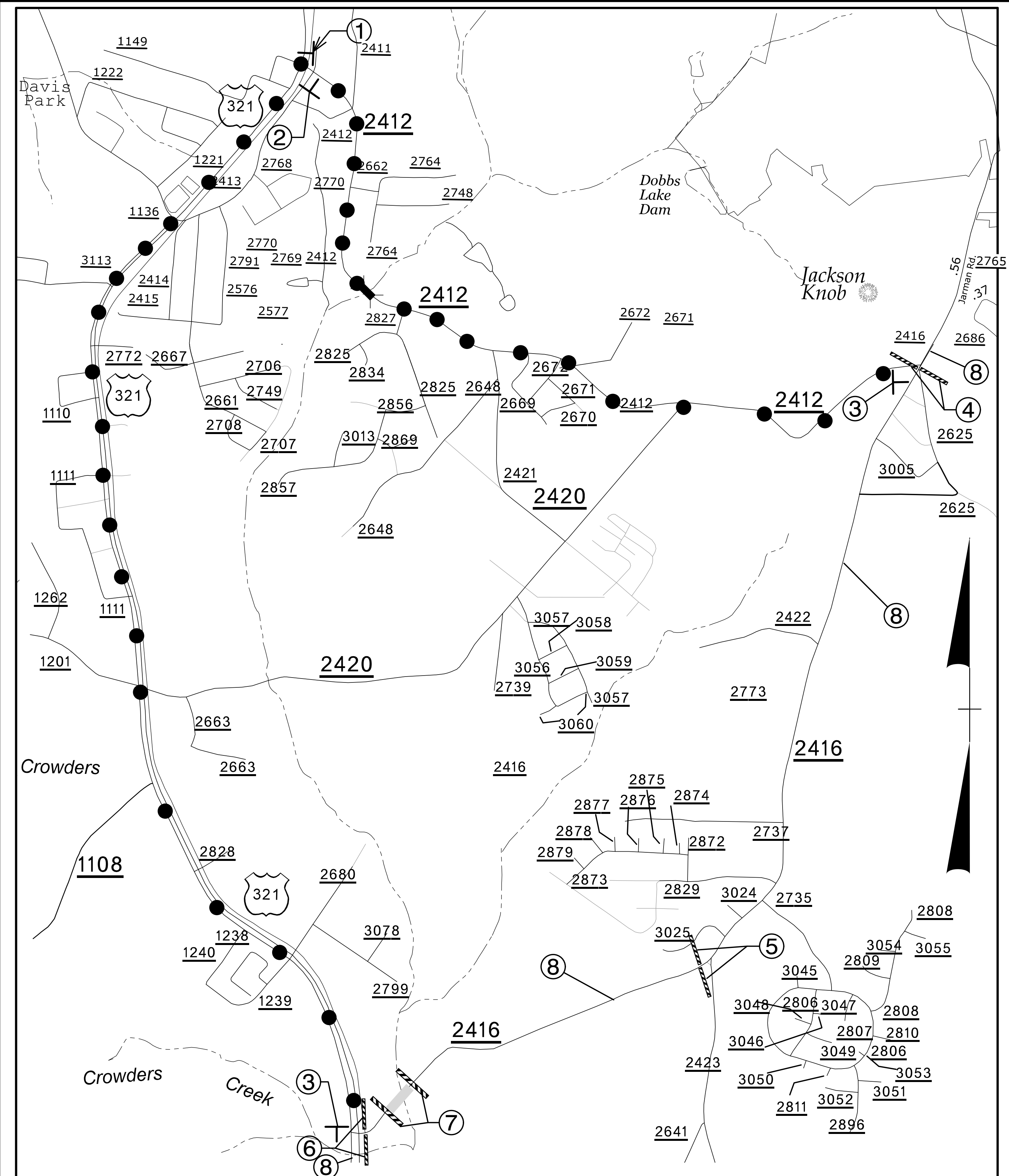
TGS ENGINEERS
804-C LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO.: C-0275

APPROVED: _____ DATE: _____

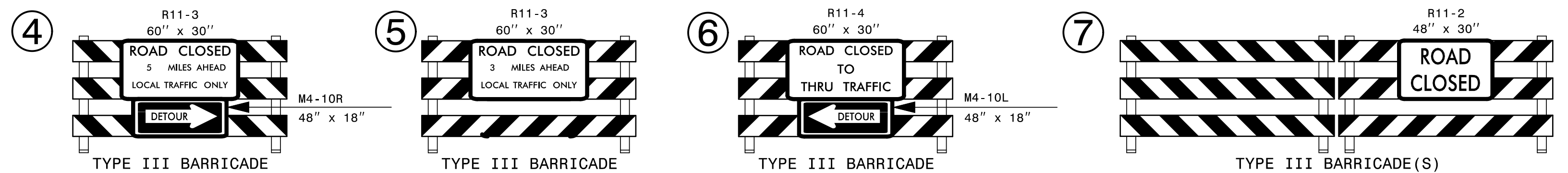
SEAL



**OVERVIEW
AND PHASING**

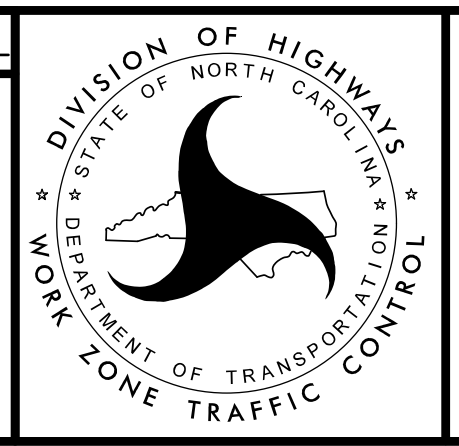


TGS ENGINEERS
804-C LAFAYETTE ST
SHELBY, NC 28150
PH (704) 476-0003
CORP. LICENSE NO. 1C-0275



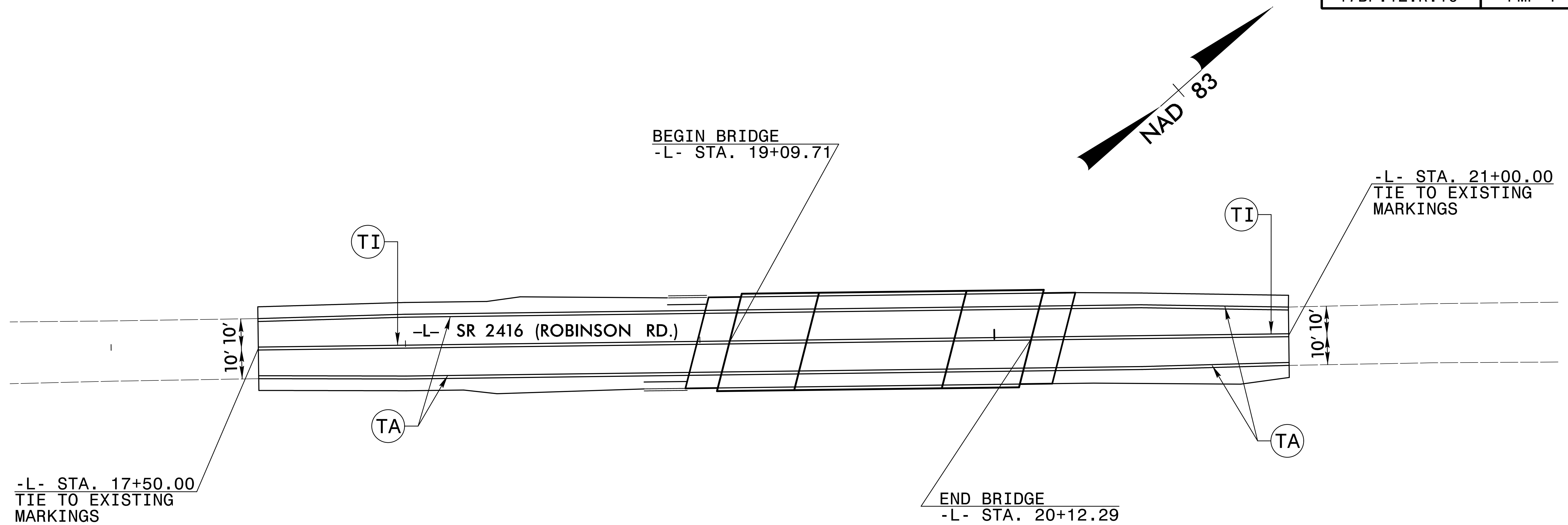
APPROVED: _____ DATE: _____

SEAL



OFFSITE DETOUR ROUTE AND BARRICADE PLACEMENT

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



FINAL PAVEMENT MARKING SCHEDULE

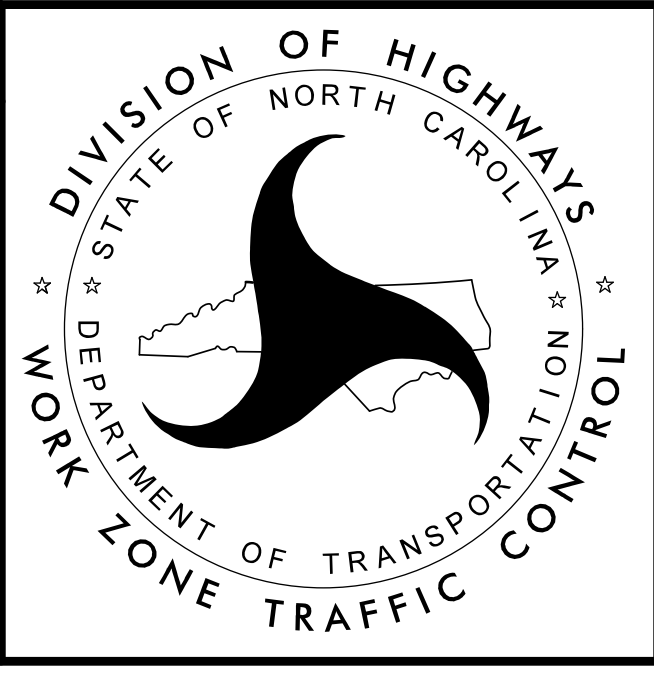
SYMBOL	DESCRIPTION	PAY ITEM	TOTAL QUANTITY
TA	WHITE EDGELINE	THERMOPLASTIC PAVEMENT MARKING LINES (4", 120 MILS)	700 LF
TI	YELLOW DOUBLE CENTER	THERMOPLASTIC PAVEMENT MARKING LINES (4", 120 MILS)	700 LF
	YELLOW & YELLOW	PERMANENT SNOWPLOWABLE PAVEMENT MARKERS	5 EA

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

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

<p>SIGN NUMBER: DET-1</p> <p>TYPE: STATIONARY</p> <p>QUANTITY: SEE PLANS</p> <p>SIGN WIDTH: 4'-0"</p> <p>HEIGHT: 1'-6"</p> <p>TOTAL AREA: 6.0 Sq. Ft</p> <p>BORDER TYPE: INSET</p> <p>RECESS: 0.38"</p> <p>WIDTH: 0.63"</p> <p>RADII: 1.5"</p> <p>NO. Z BARS:</p> <p>LENGTH:</p>	<p>BACKG COLOR: Fluorescent Orange</p> <p>COPY COLOR: Black</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>SYMBOL</th> <th>X</th> <th>Y</th> <th>WID</th> <th>HT</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table> <p>MAT'L: 0.080" (2.0mm) ALUMINUM</p>	SYMBOL	X	Y	WID	HT																																									<p>DESIGN BY: AHC</p> <p>PROJECT ID: 17BP.12.R.10</p> <p>CHECKED BY: ___</p> <p>DIV: 12</p> <p>DATE: 7/26/2012</p> <div style="text-align: center;"> <p style="text-align: center; font-size: 2em; font-weight: bold;">ROBINSON RD</p> </div> <p style="text-align: right; font-size: 0.8em;">Spacing Factor is 1 unless specified otherwise</p>
SYMBOL	X	Y	WID	HT																																											

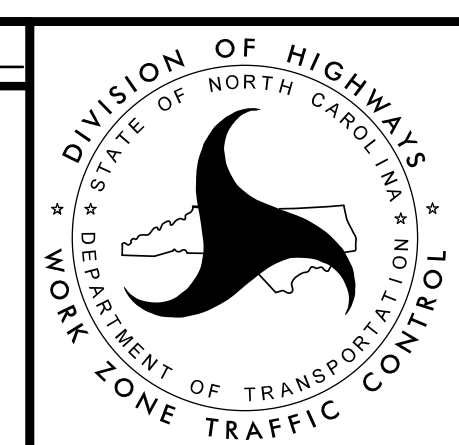
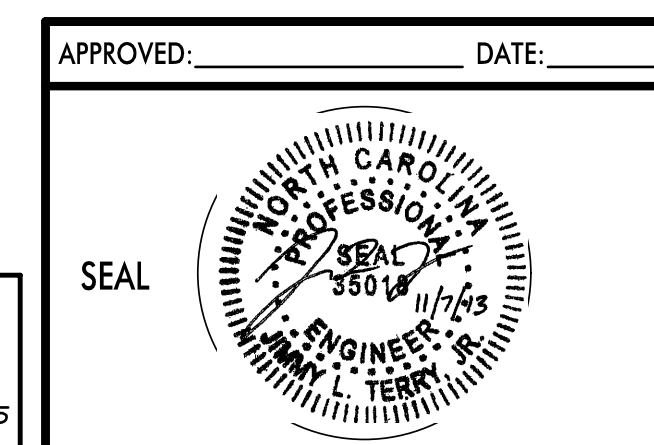
LETTER POSITIONS

Letter spacings are to start of next letter

Letter Spacing													Series/Size	
	R	O	B	I	N	S	O	N	R	D				C 2000
	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	37.8

\$\$\$ SYSTEM \$\$\$
 \$\$\$ DESIGNER \$\$\$
 \$\$\$ CHECKER \$\$\$
 \$\$\$ DATE \$\$\$

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



SIGN DESIGN

TIP PROJECT: 17BP.12.R.10

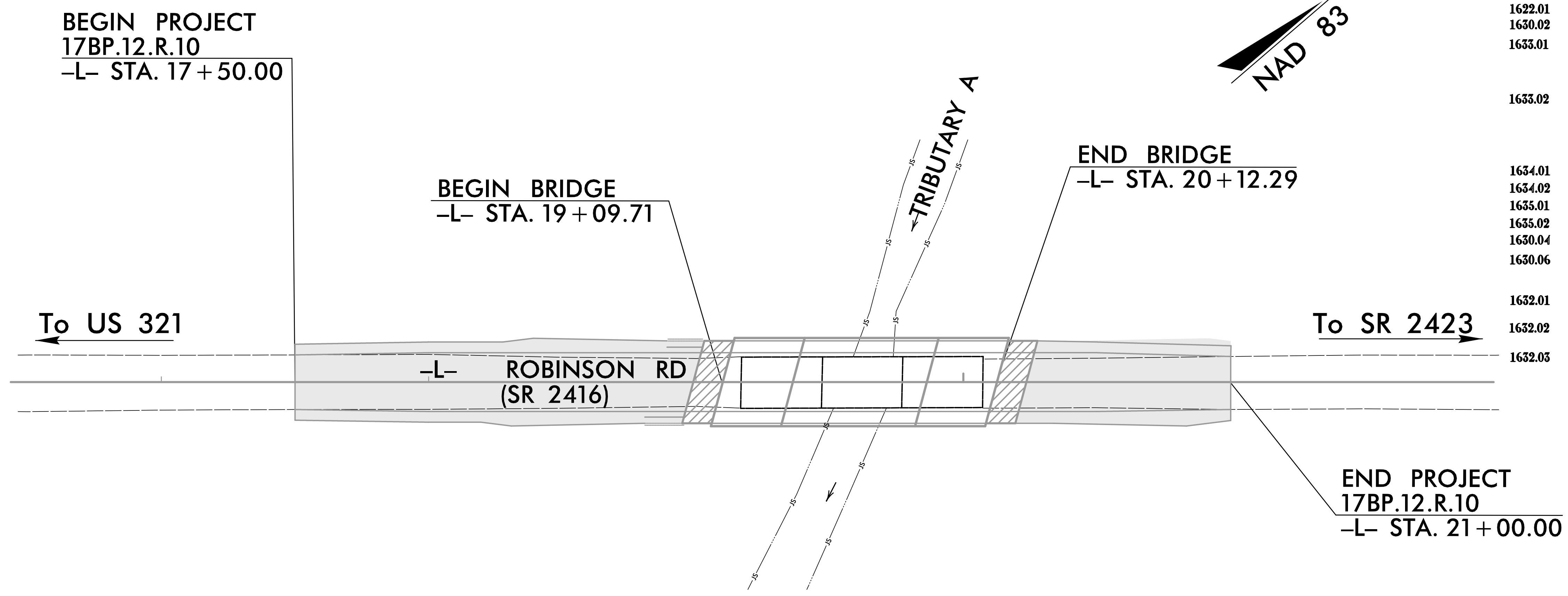
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL
GASTON COUNTY

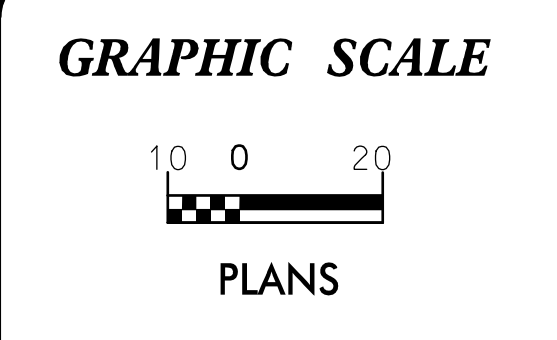
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.12.R.10	EC-1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	

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

JIMMY L. TERRY
 PROJECT ENGINEER
 LEVEL III CERTIFICATION
 NUMBER 3145

2012 STANDARD SPECIFICATIONS

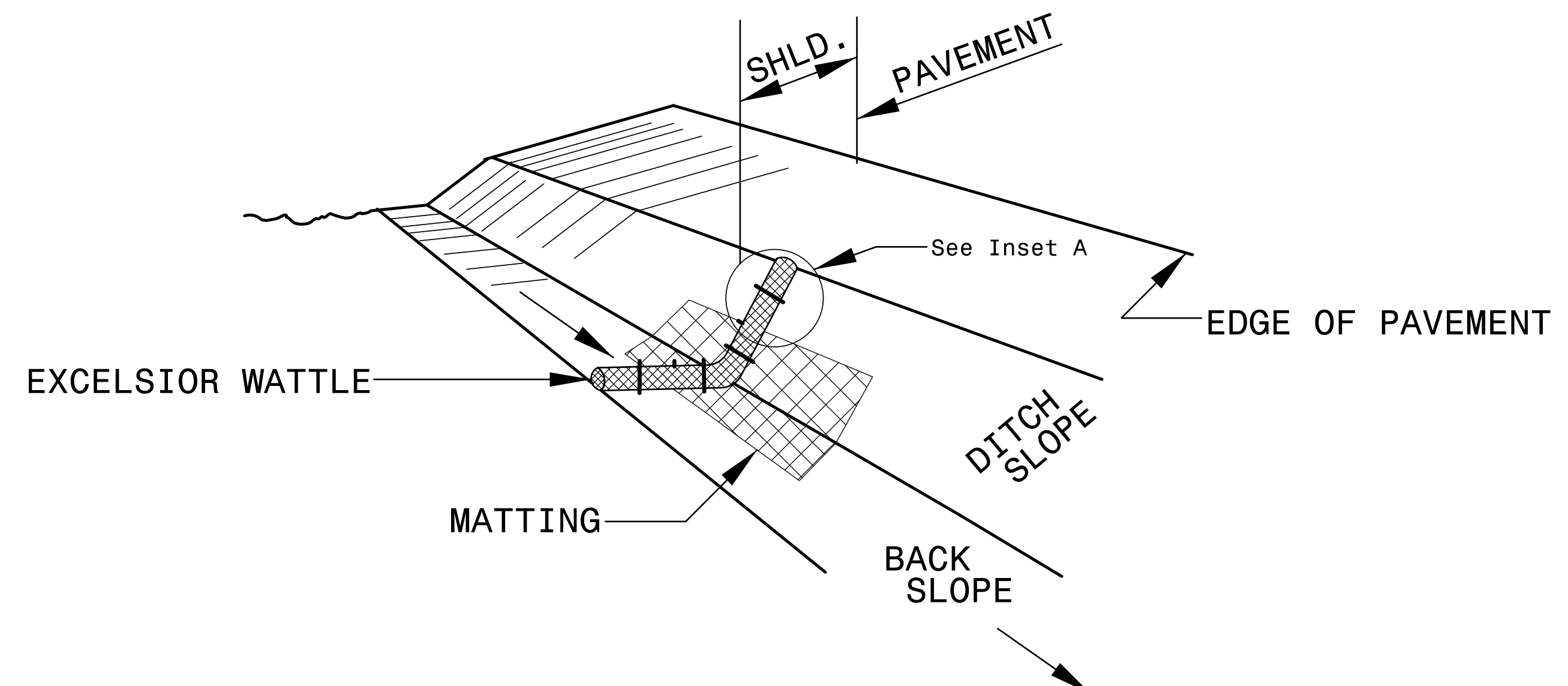
Roadway Standard Drawings

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.

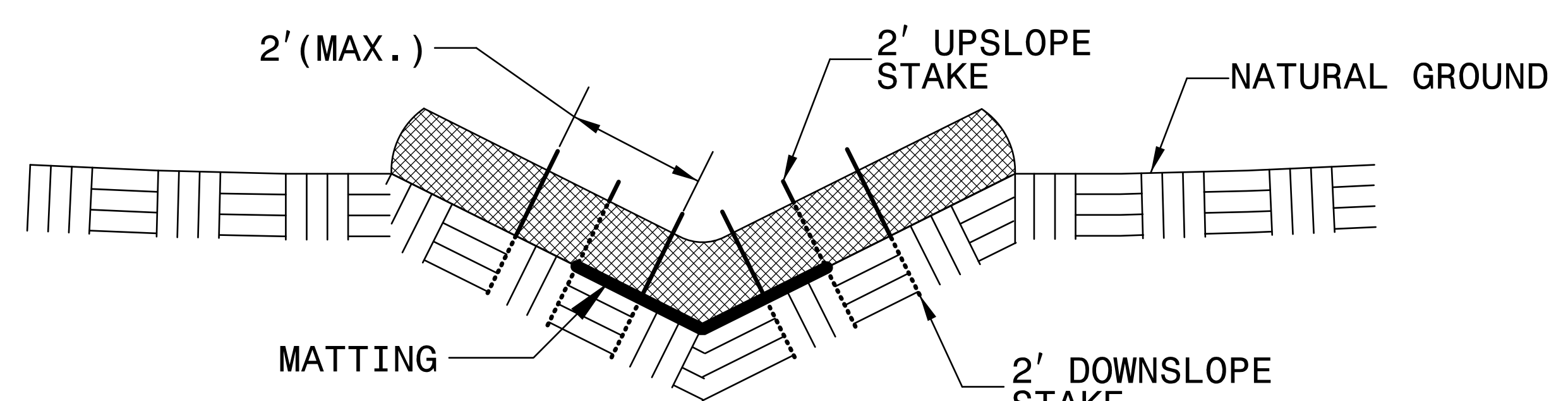
1604.01 Railroad Erosion Control Detail	1632.01 Rock Inlet Sediment Trap Type A
1605.01 Temporary Silt Fence	1632.02 Rock Inlet Sediment Trap Type B
1606.01 Special Sediment Control Fence	1632.03 Rock Inlet Sediment Trap Type C
1607.01 Gravel Construction Entrance	1633.01 Temporary Rock Silt Check Type 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

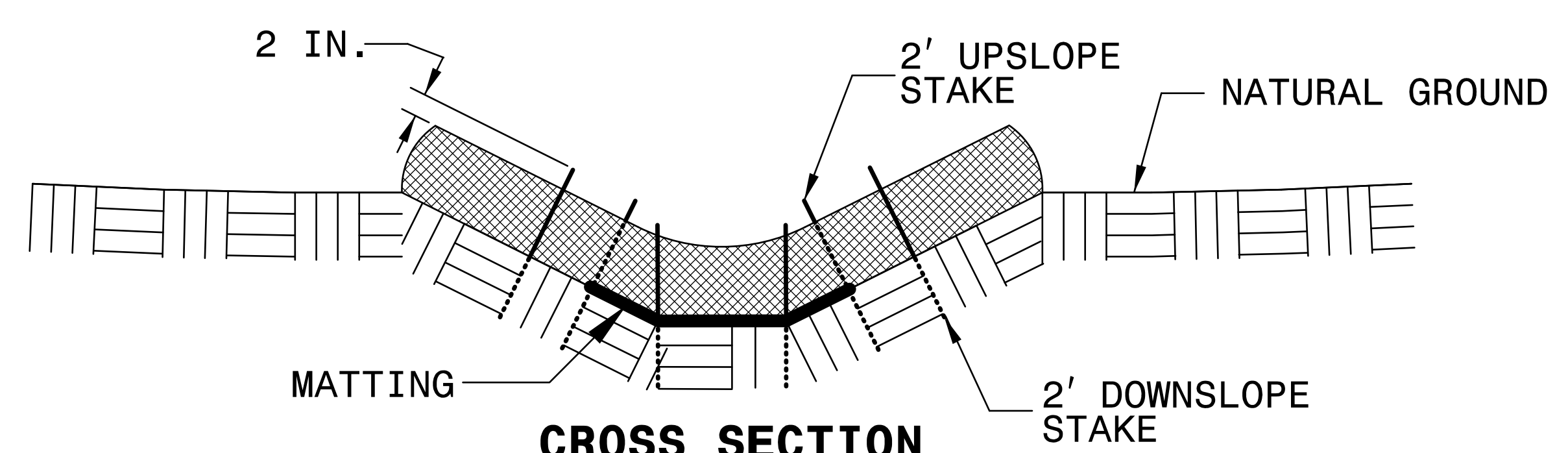
WATTLE DETAIL



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.

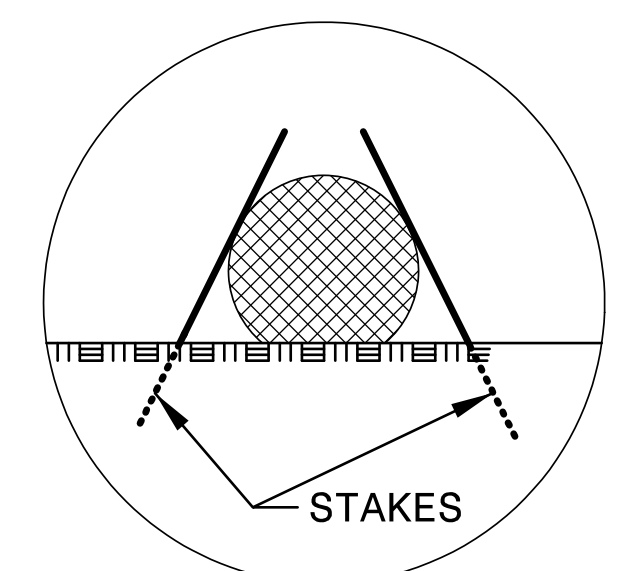
ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.

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

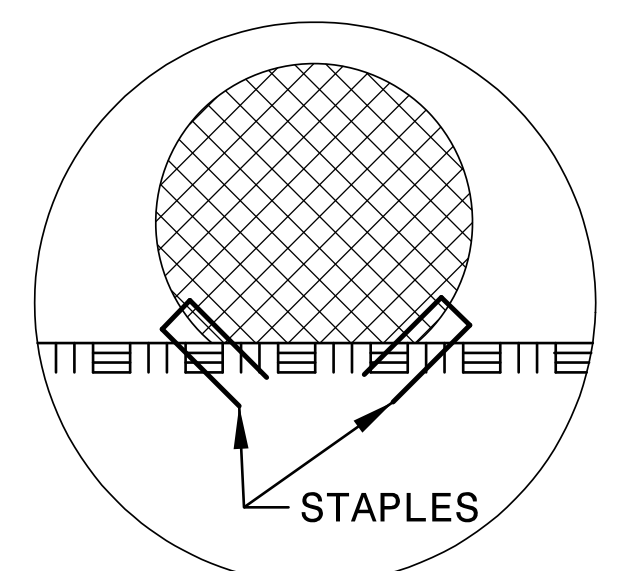
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.

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

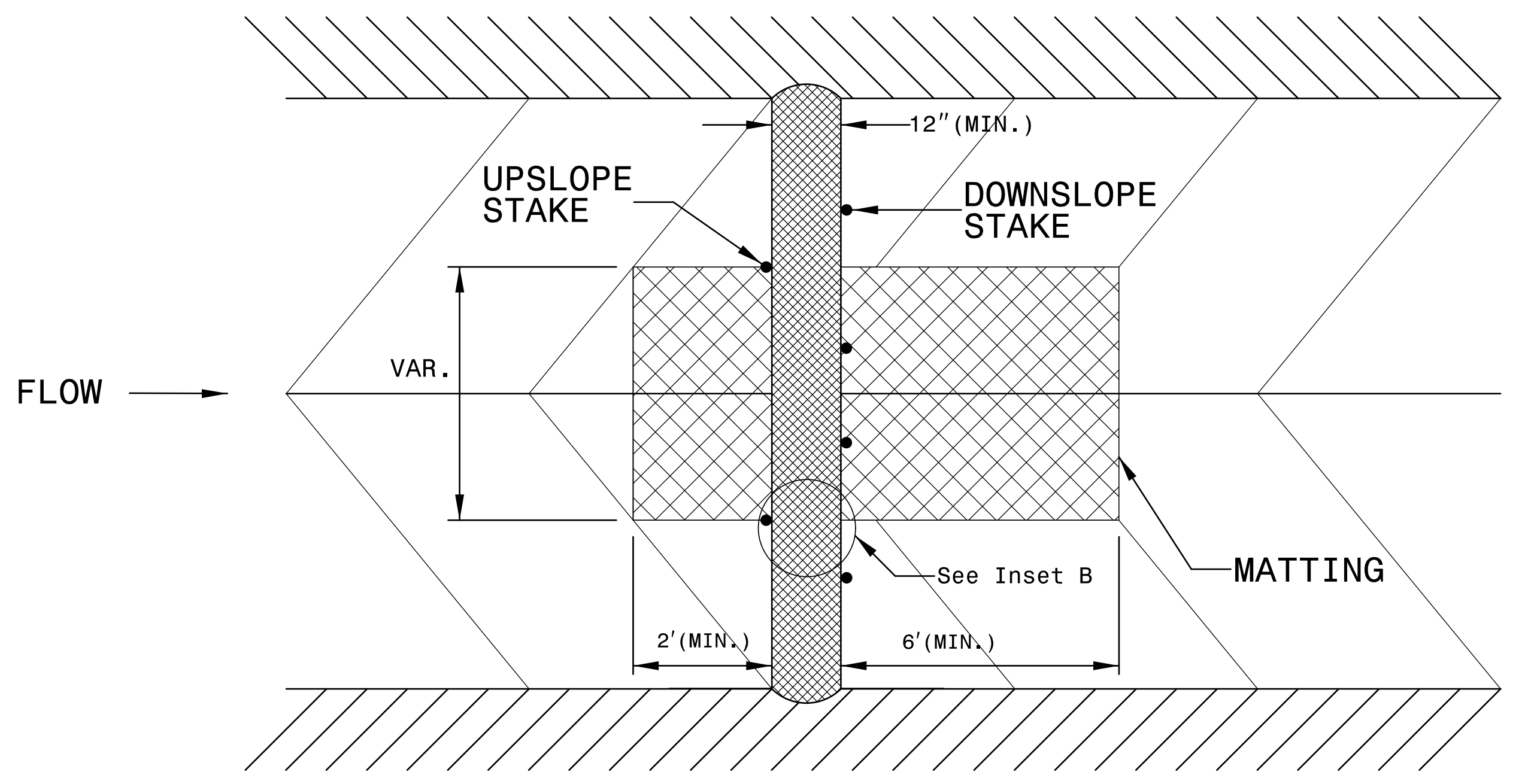
INSTALL MATTING IN ACCORDANCE WITH SECTION 1631 OF THE STANDARD SPECIFICATIONS.



INSET A



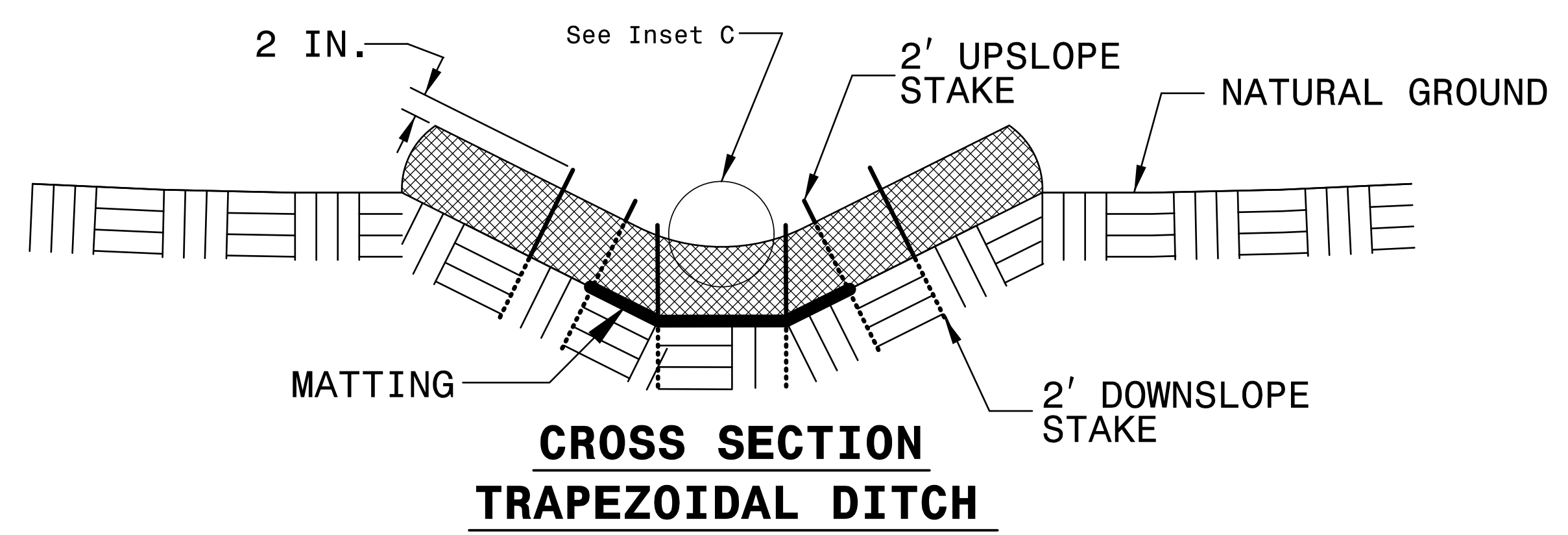
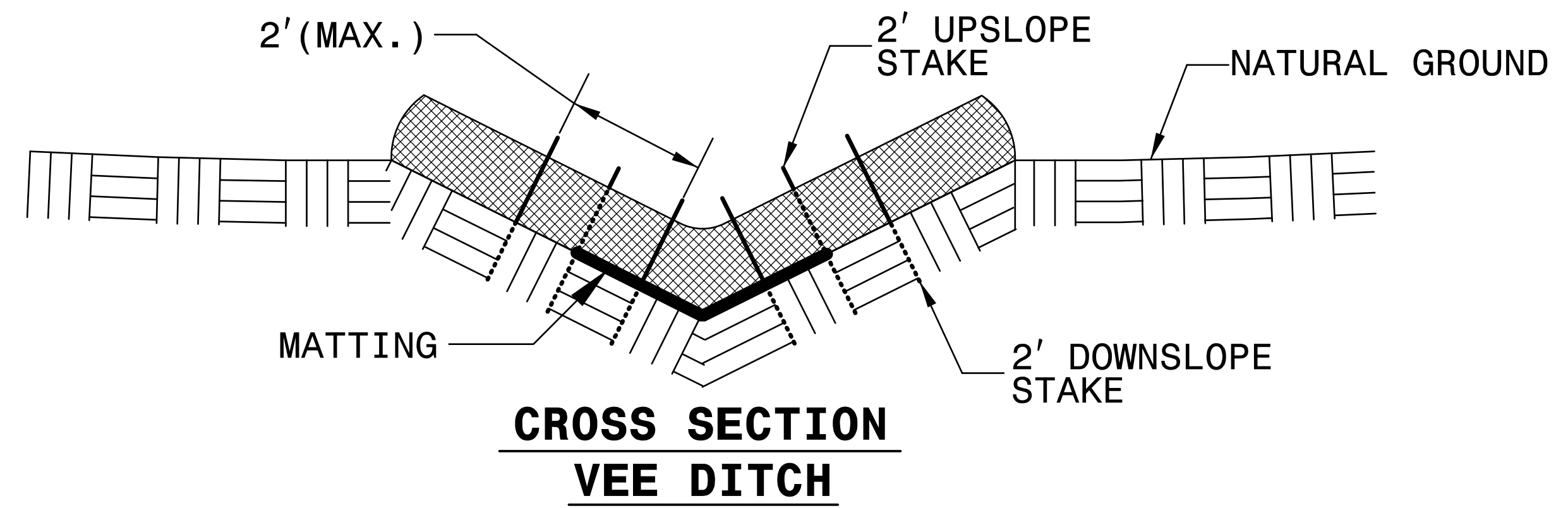
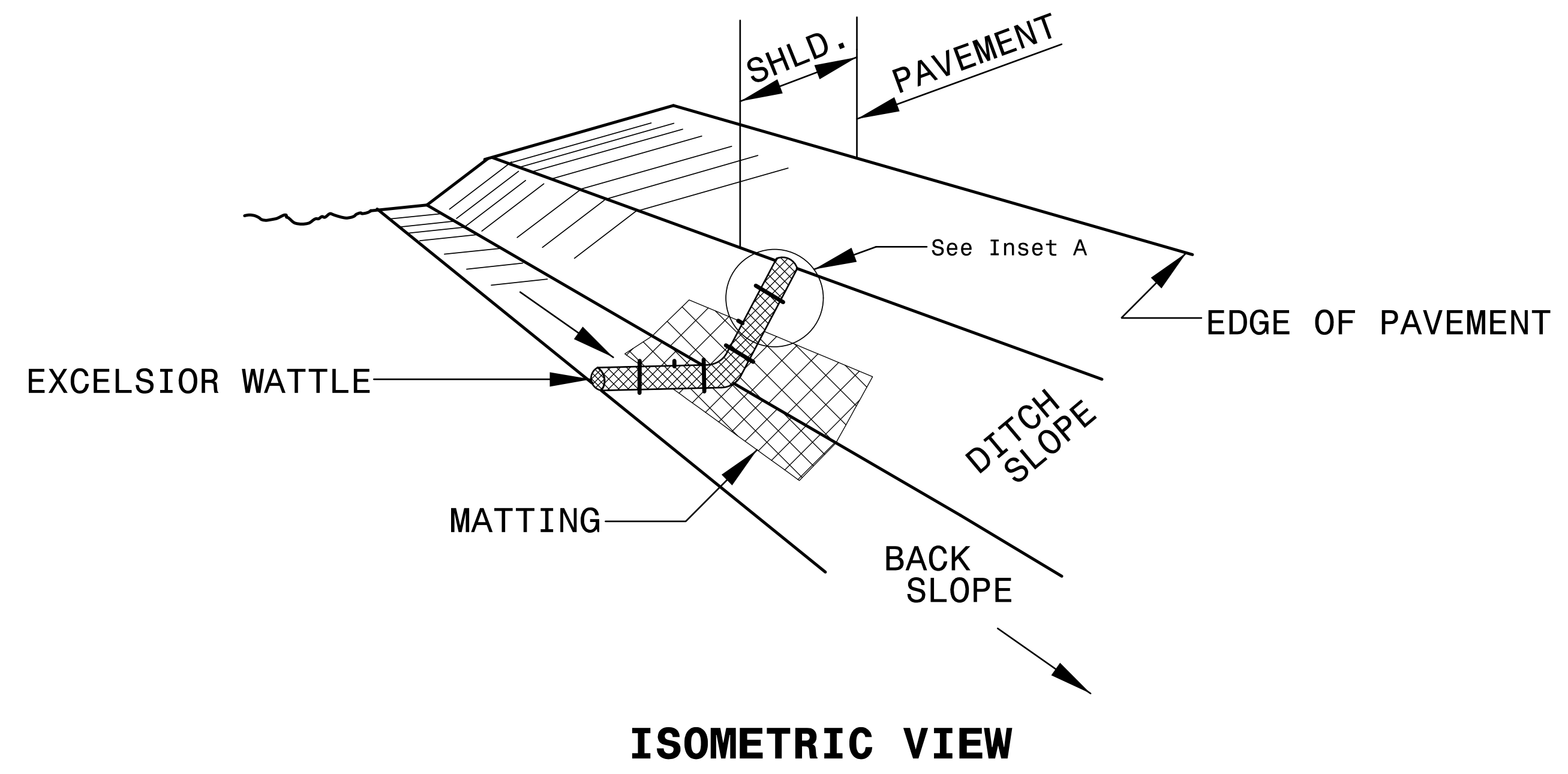
INSET B



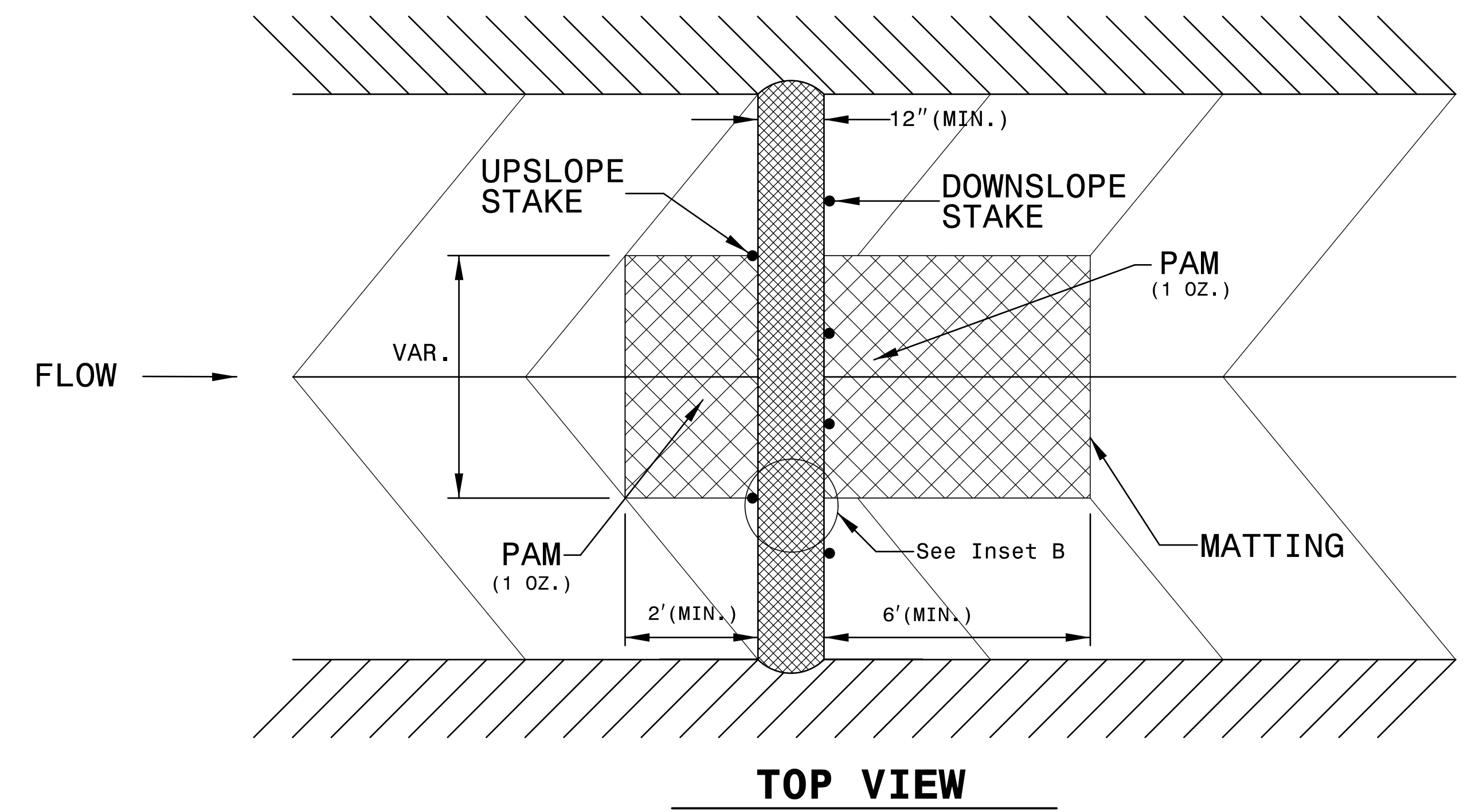
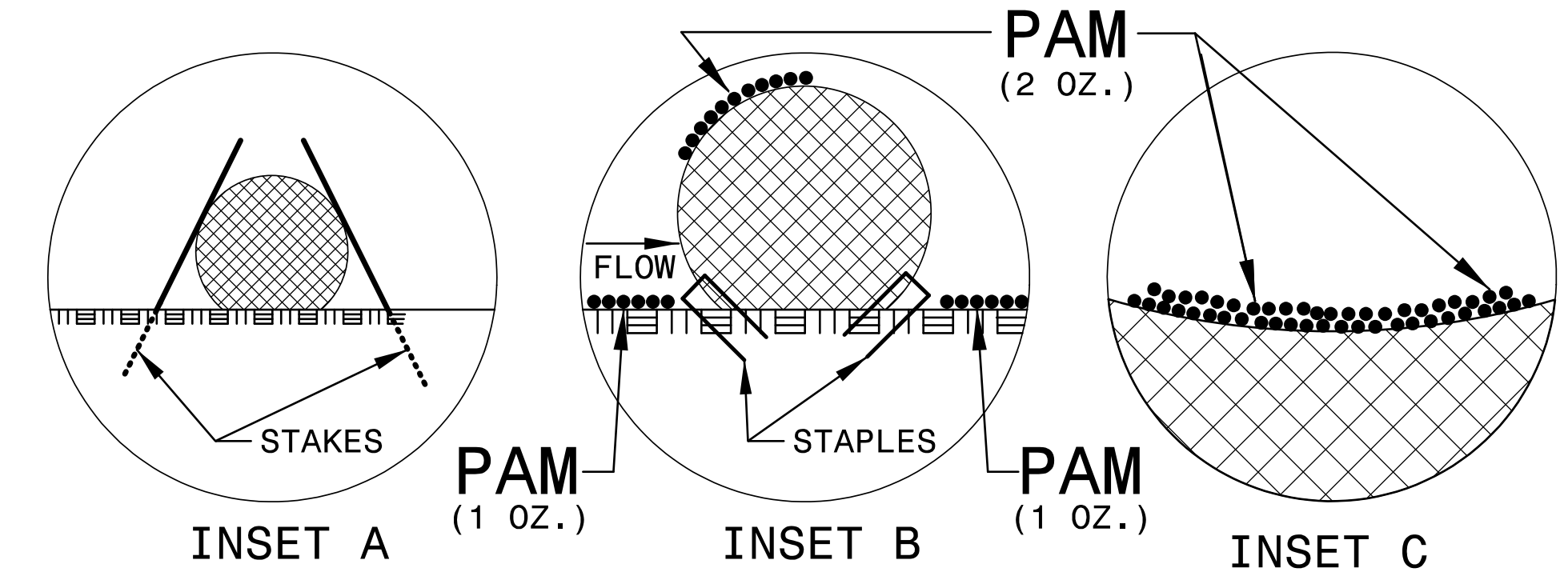
TOP VIEW

PROJECT REFERENCE NO. 17BP12.R10	SHEET NO. EC-2A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

WATTLE WITH POLYACRYLAMIDE (PAM) DETAIL

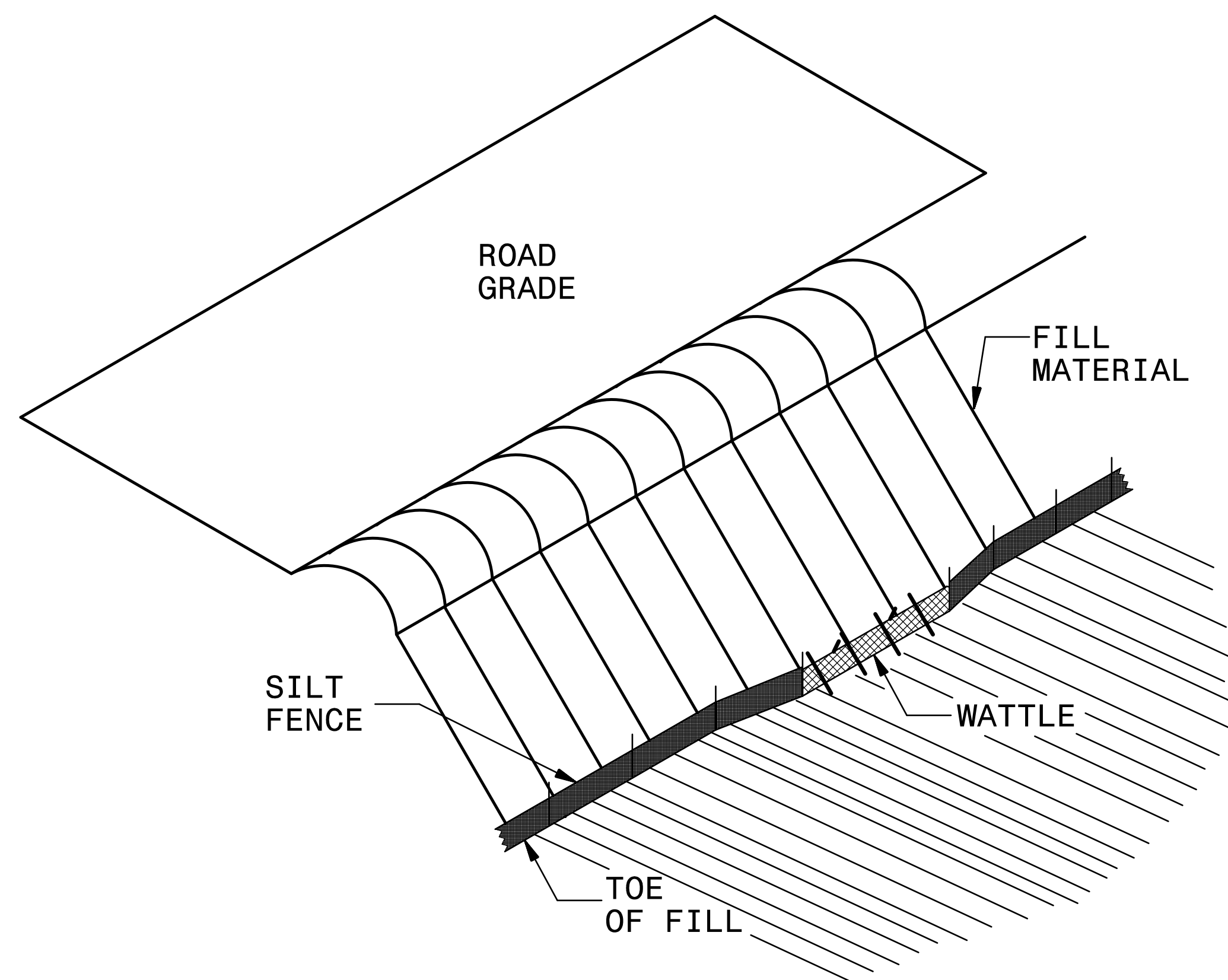


- NOTES:
- USE MINIMUM 12 IN. DIAMETER EXCELSIOR WATTLE.
 - USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.
 - ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.
 - INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE 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.

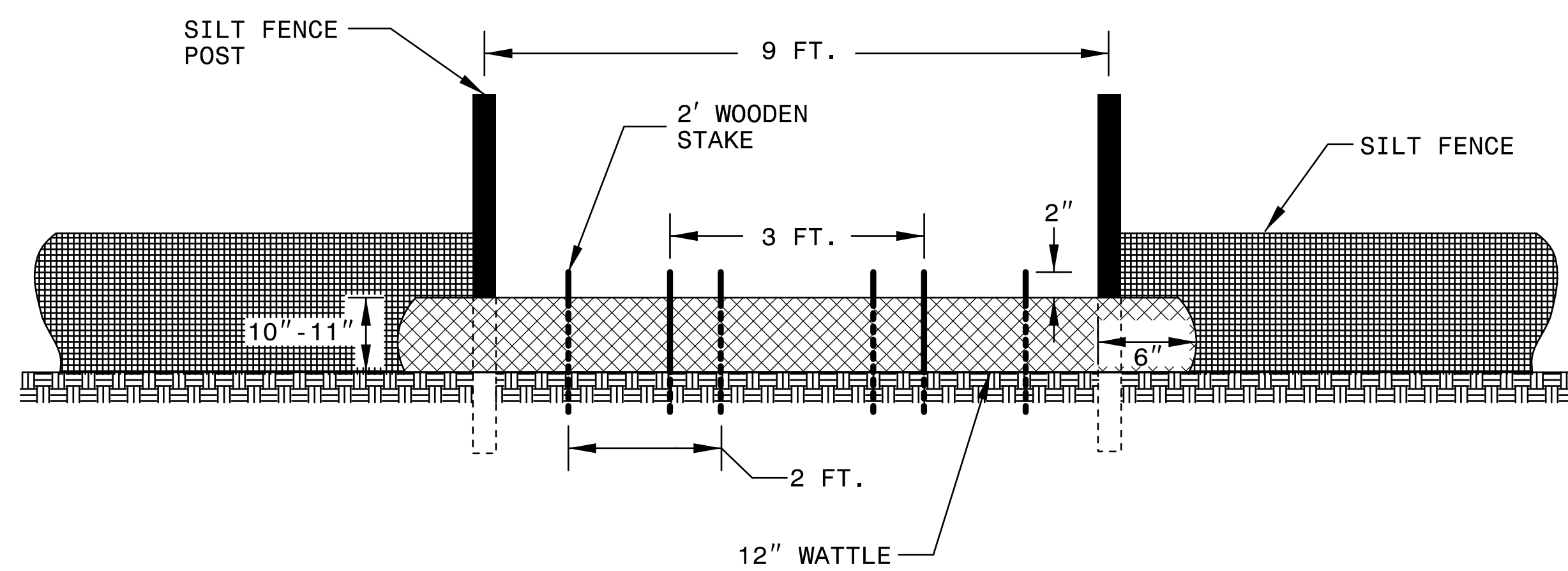


PROJECT REFERENCE NO. 17BP-J2.R.10	SHEET NO. EC-2B
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

SILT FENCE WATTLE BREAK DETAIL



ISOMETRIC VIEW

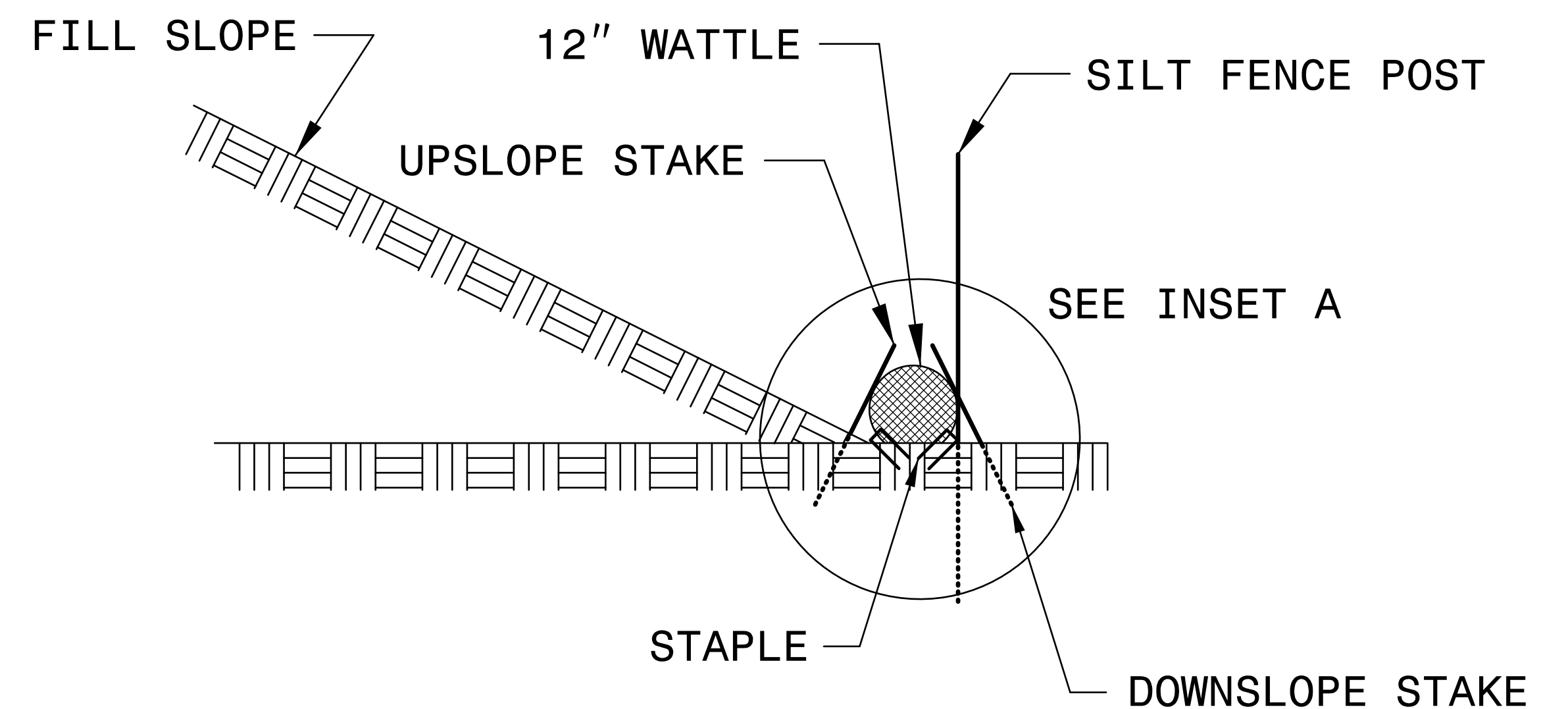
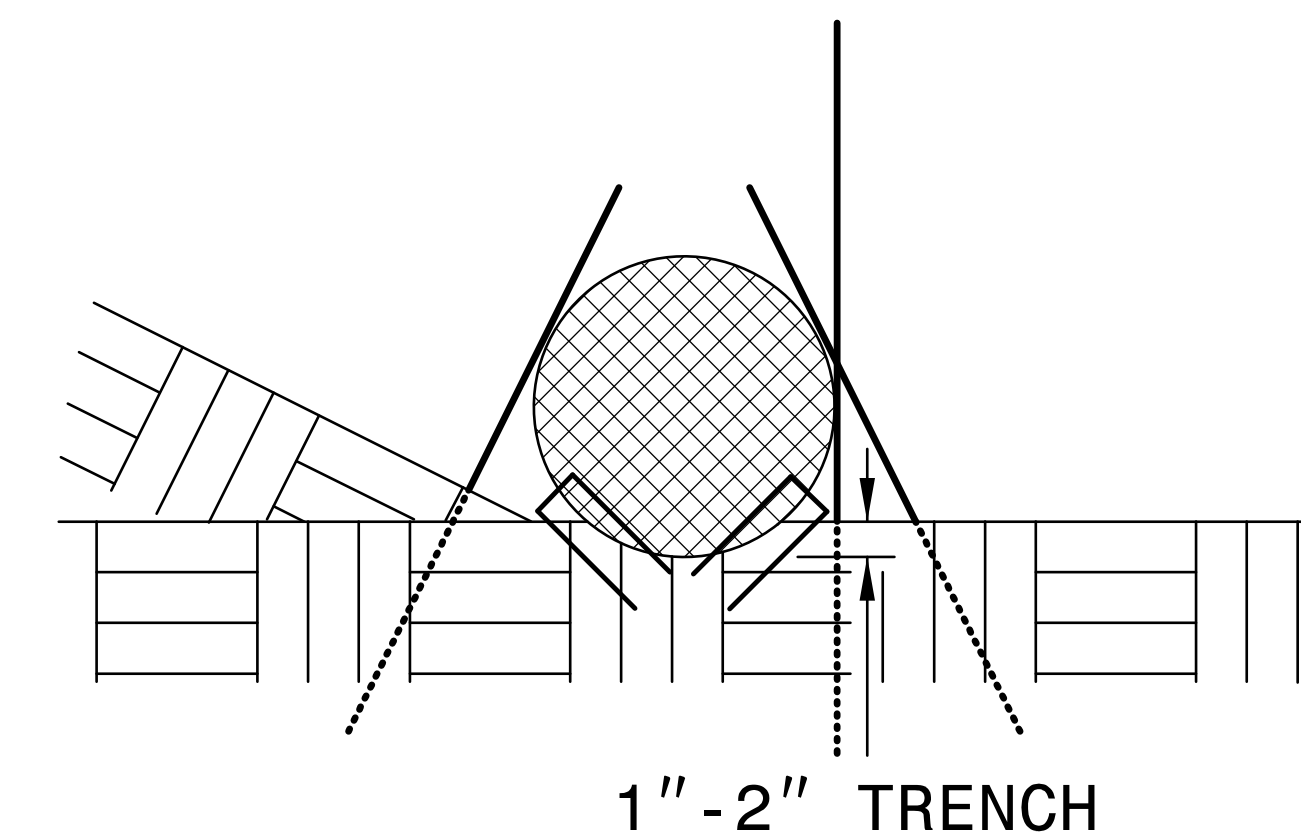


VIEW FROM SLOPE

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

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

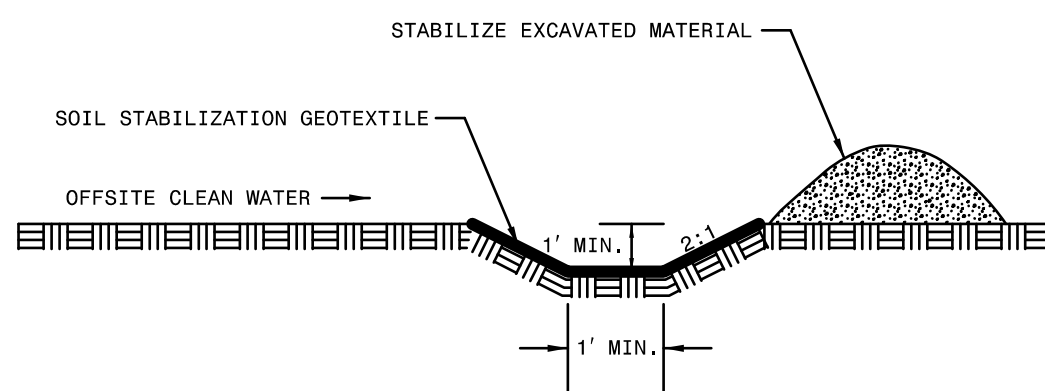
SOIL STABILIZATION TIMEFRAMES

<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.

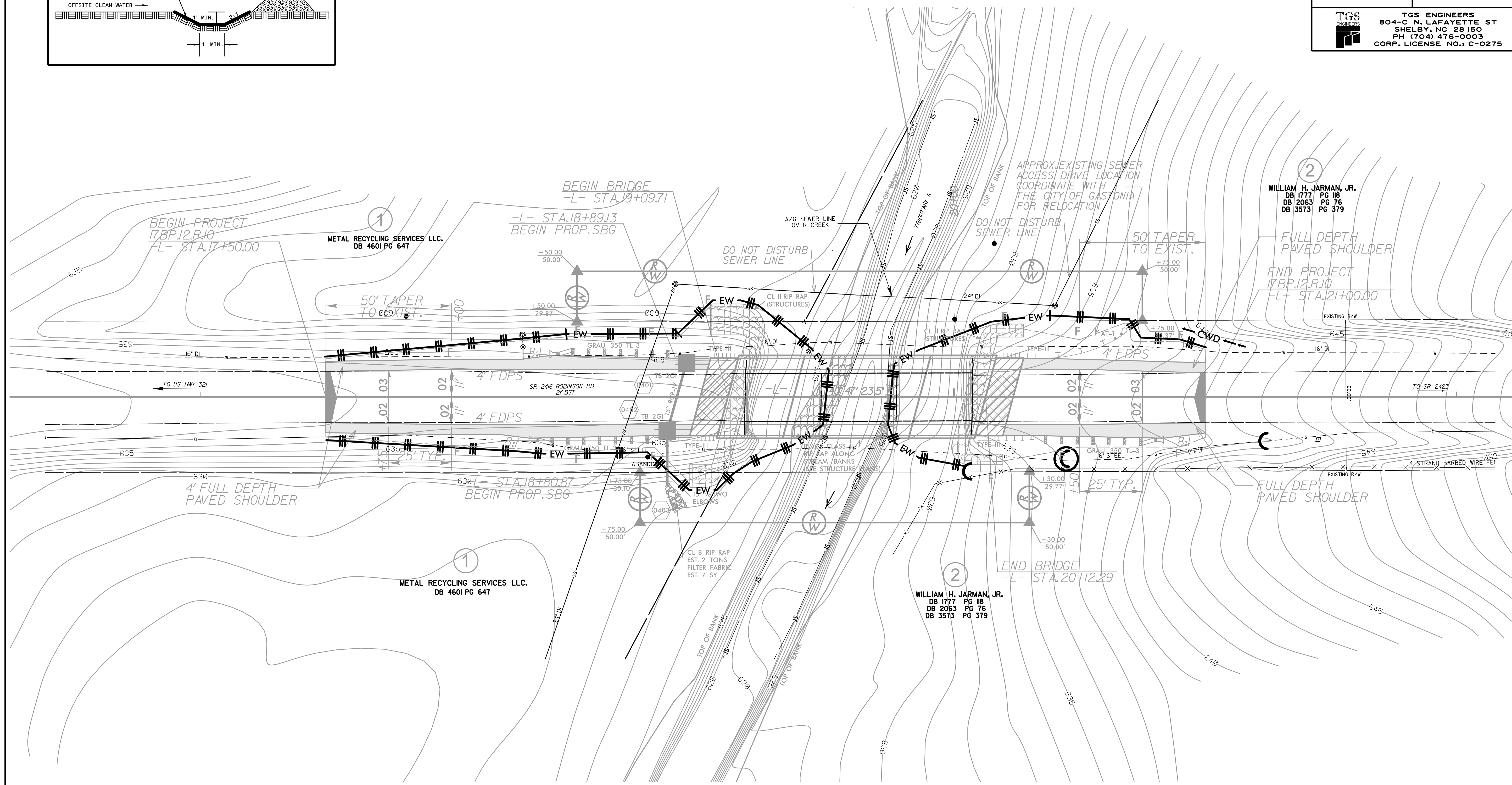
CLEAN WATER DIVERSION

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

(Not to Scale)



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




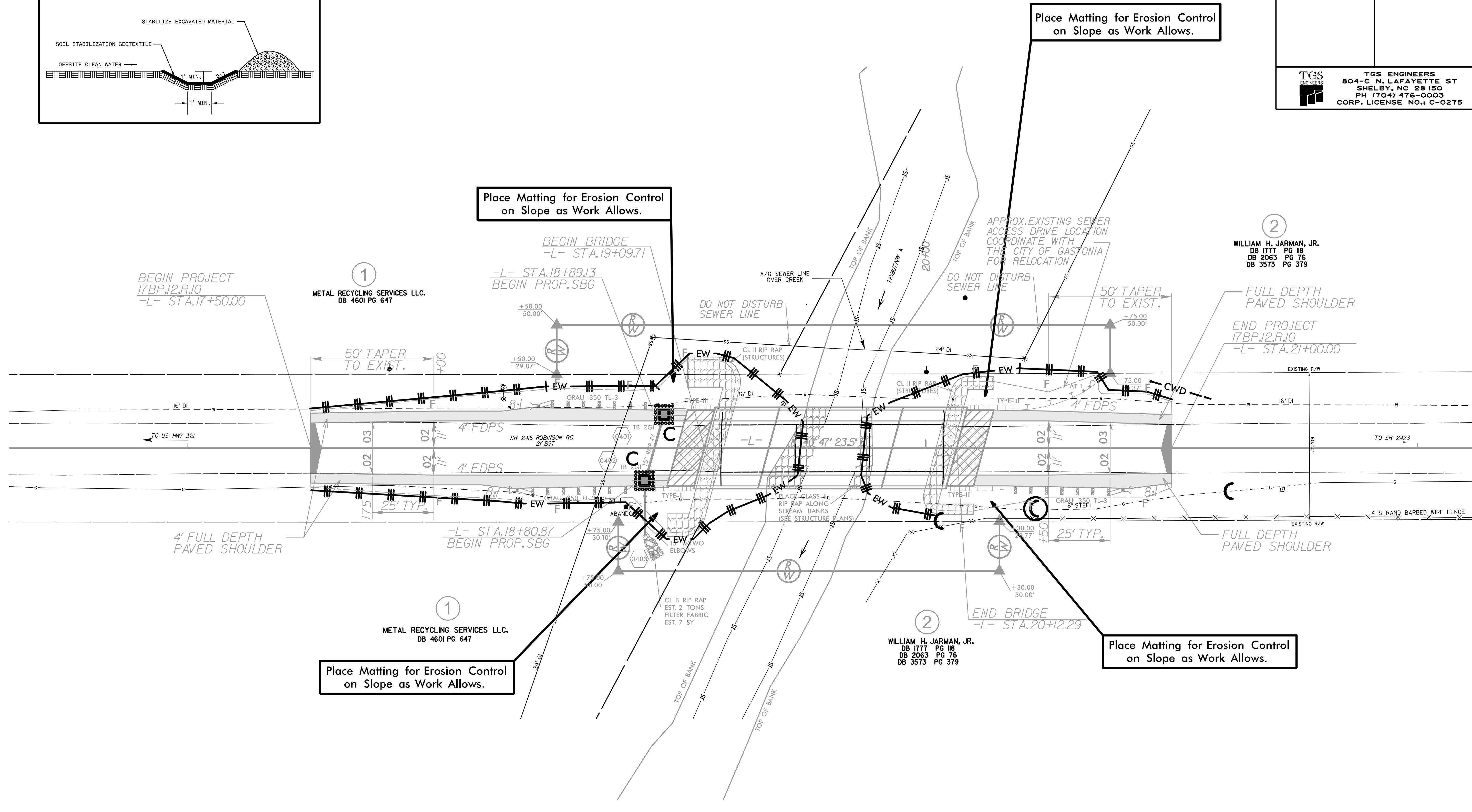
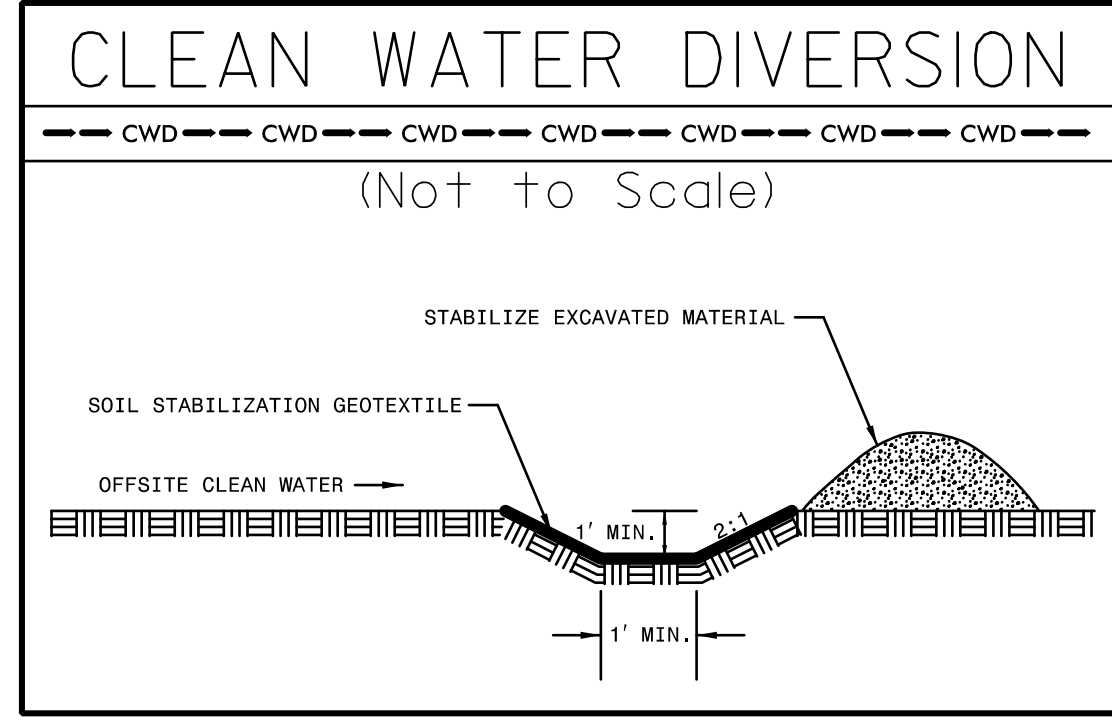
1
METAL RECYCLING SERVICES LLC.
DB 4601 PG 647

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

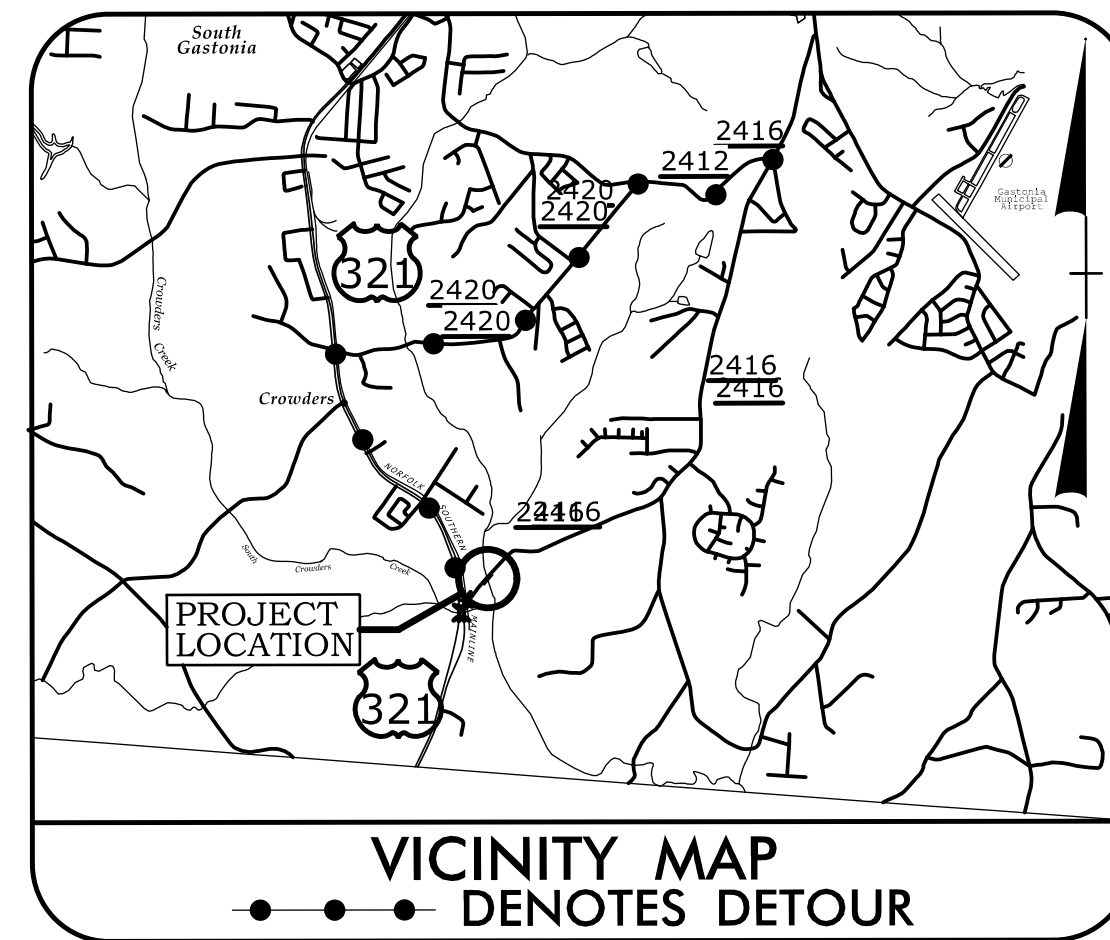
PROJECT REFERENCE NO. 17BP12.R10	SHEET NO. EC-5/CONST.4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
 TGS ENGINEERS 804-C N. LAFAYETTE ST SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275	



09/08/99

TIP NO. 17BP.12.R.10

CONTRACT: DL00039



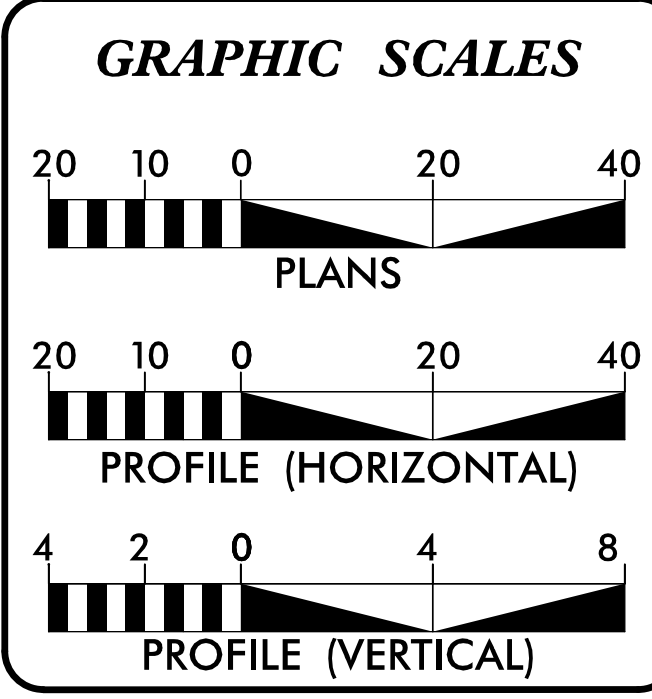
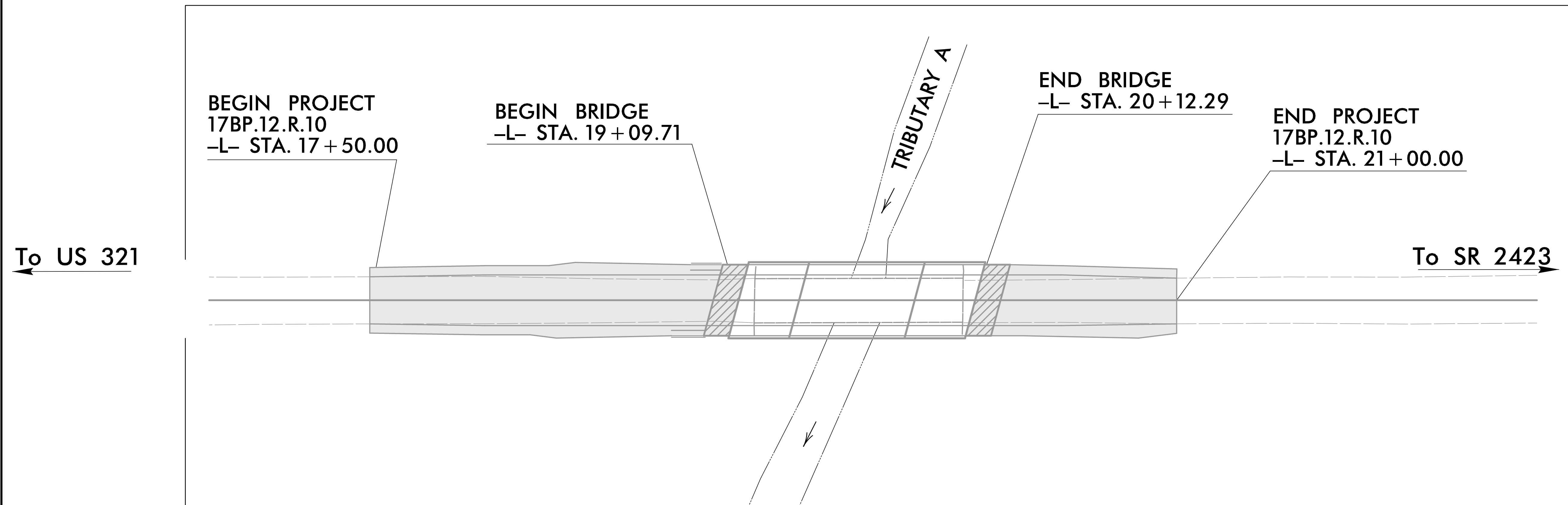
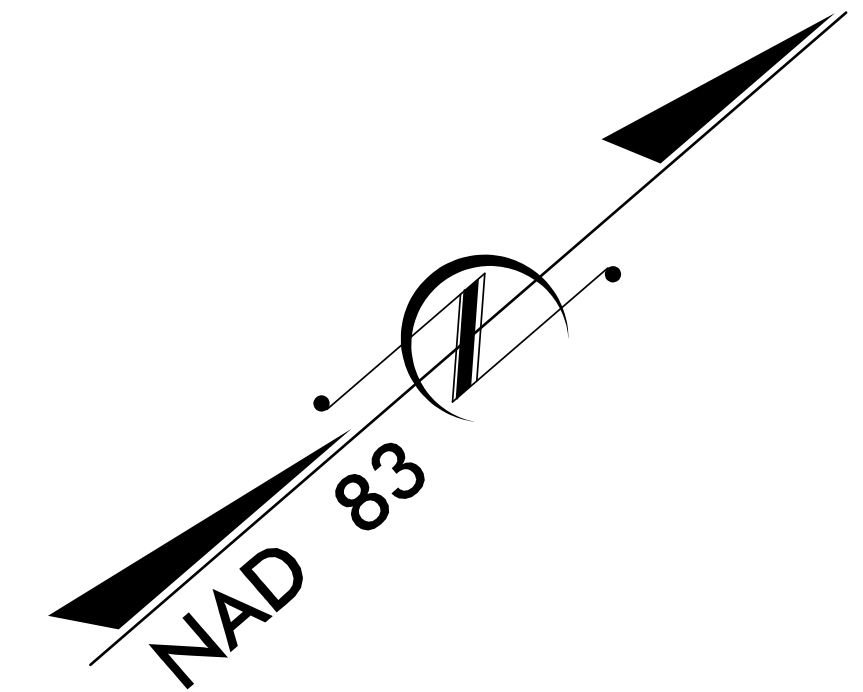
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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

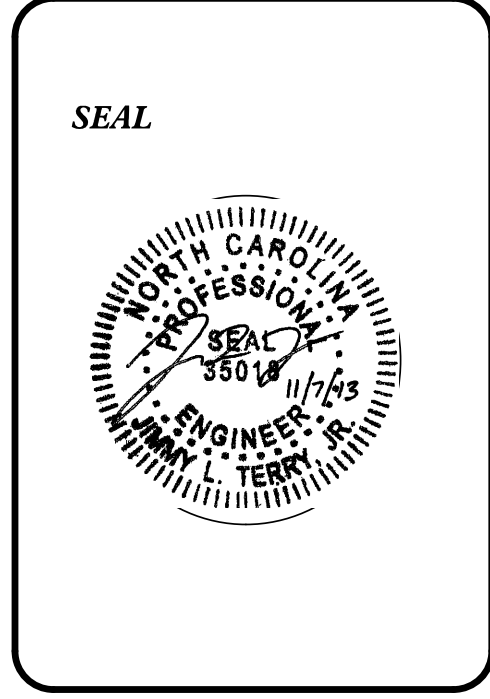


INDEX OF SHEETS

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	GV
Butterfly Valve	BV
Tapping Valve	TGV
Line Stop	LS
Line Stop with Bypass	LS/BP
Blow Off	BO
Fire Hydrant	PEH
Relocate Fire Hydrant	REH
Remove Fire Hydrant	REM FH
Water Meter	PWM
Relocate Water Meter	REW
Remove Water Meter	REM WM
Water Pump Station	PST(W)
RPZ Backflow Preventer	PRPZ
DCV Backflow Preventer	PBFP
Relocate RPZ Backflow Preventer	RRPZ
Relocate DCV Backflow Preventer	RBFP

PROPOSED SEWER SYMBOLS

Gravity Sewer Line (Sized as Shown)	—————
Force Main Sewer Line (Sized as Shown)	—————
Manhole (Sized per Note)	•
Sewer Pump Station	PST(SS)

PROPOSED MISCELLANEOUS UTILITIES SYMBOLS

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

Thrust Block	⊥
Air Release Valve	AR
Utility Vault	UV
Concrete Pier	CP
Steel Pier	SP
Plan Note	↖ NOTE
Pay Item Note	↖ PAY ITEM

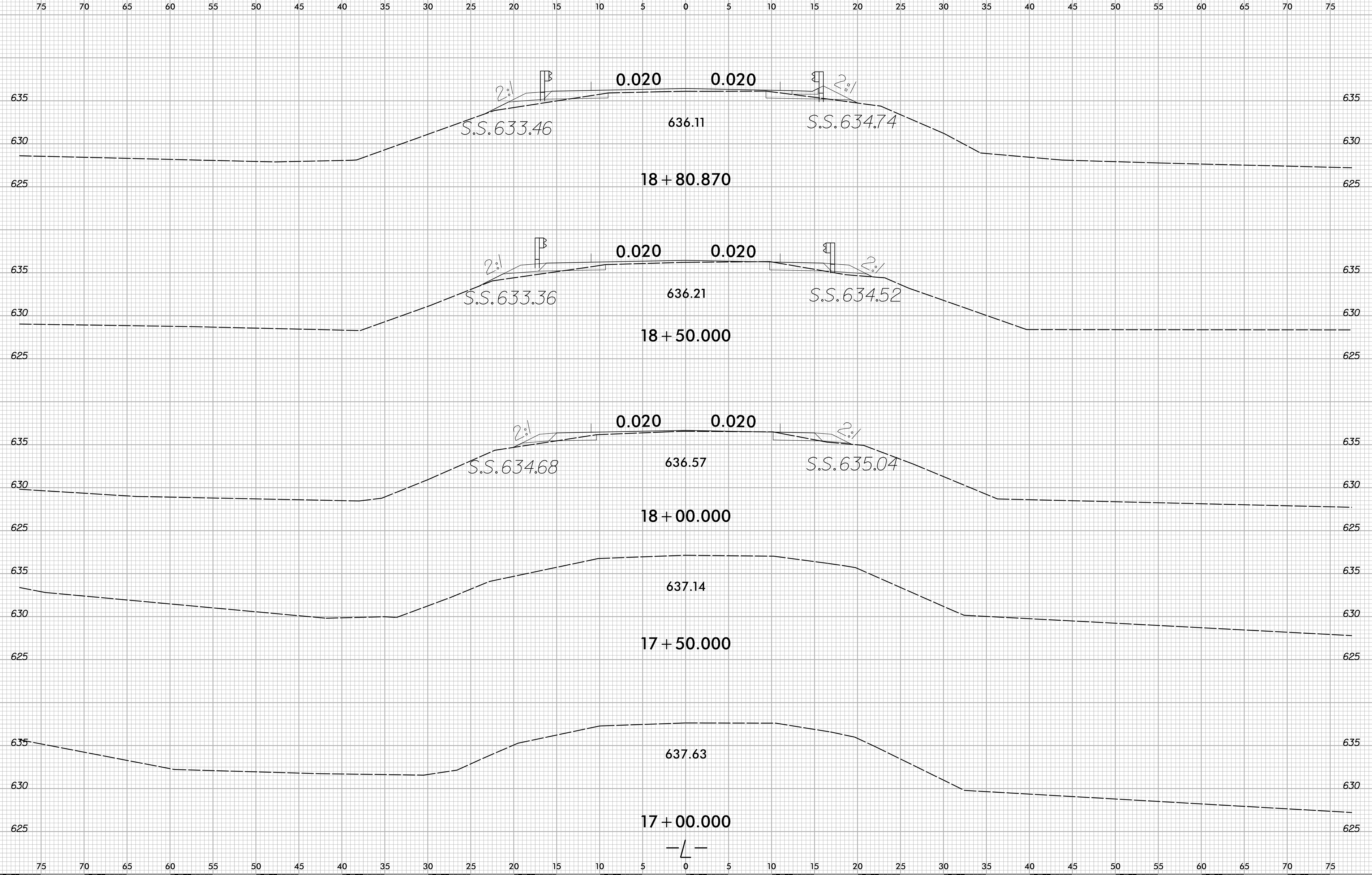
EXISTING UTILITIES SYMBOLS

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.		

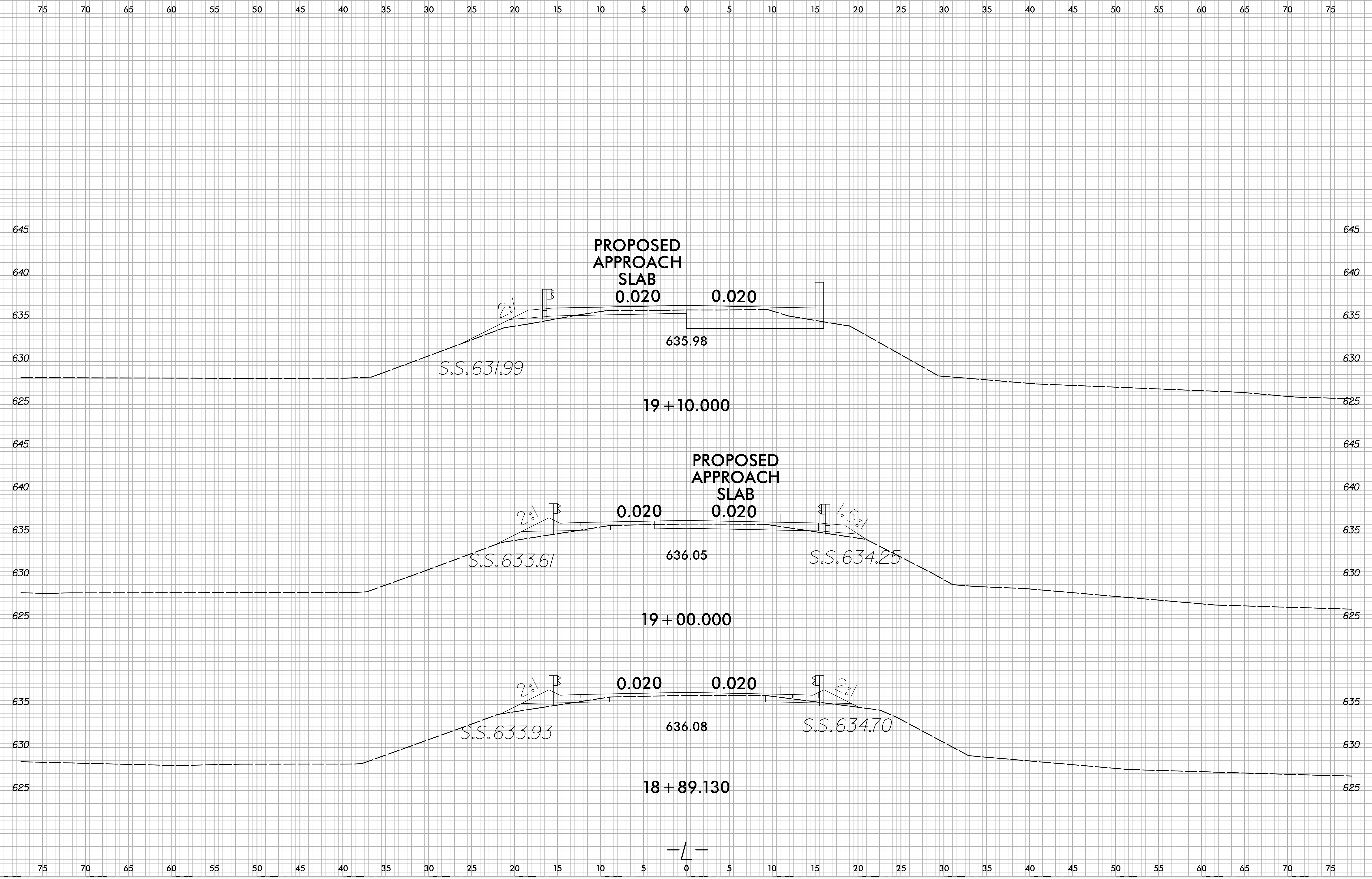
*For Existing Utilities
 Utility Line Drawn from Record (Type as Shown)
 Designated Utility Line (Type as Shown)

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

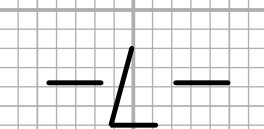
8/23/99



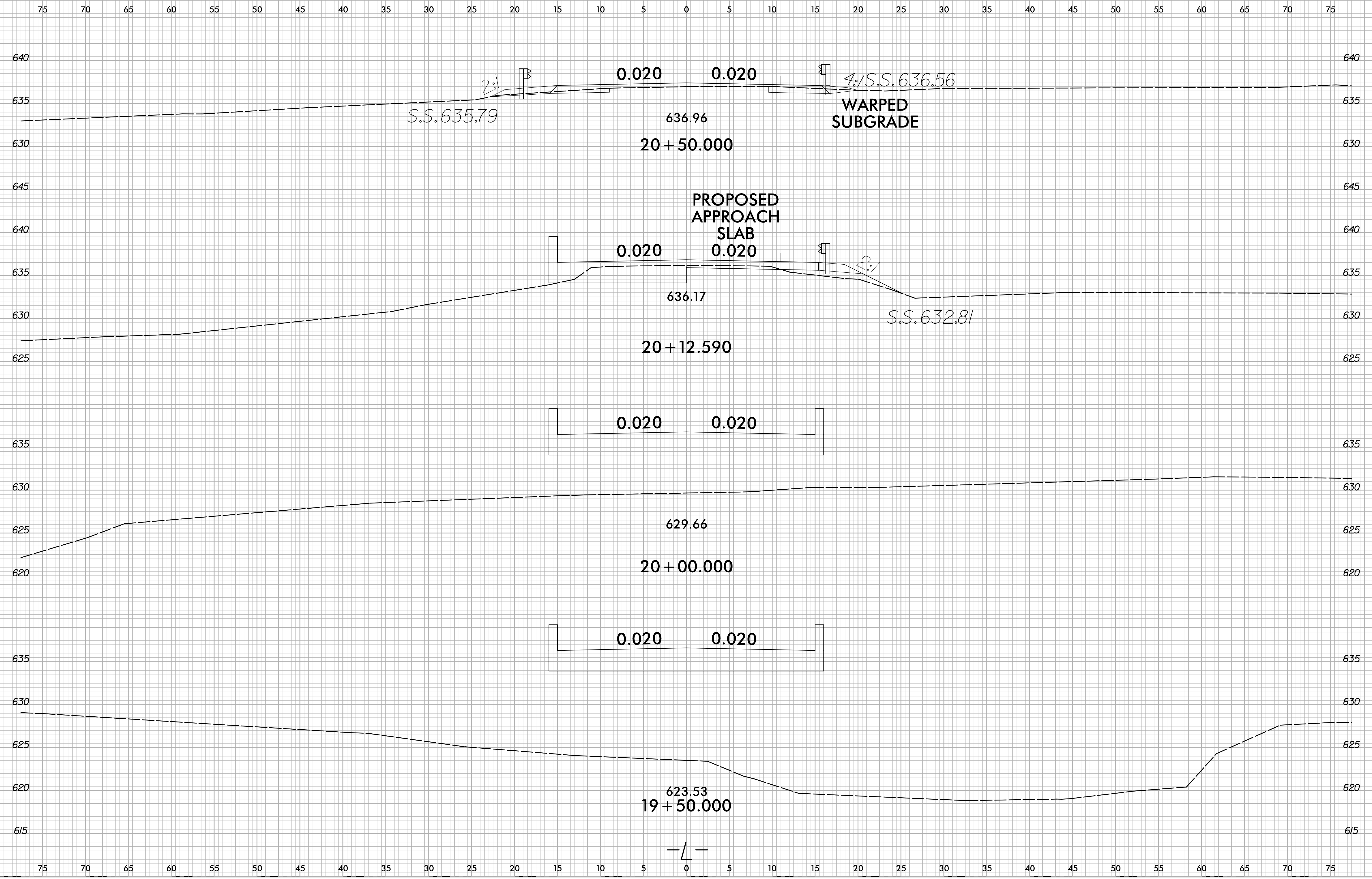
8/23/99



SYSTEMS TIME DESIGN CONSULTANTS

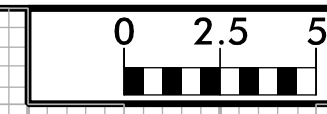


8/23/99



*****SYTIME*****
*****SUDPRIN*****

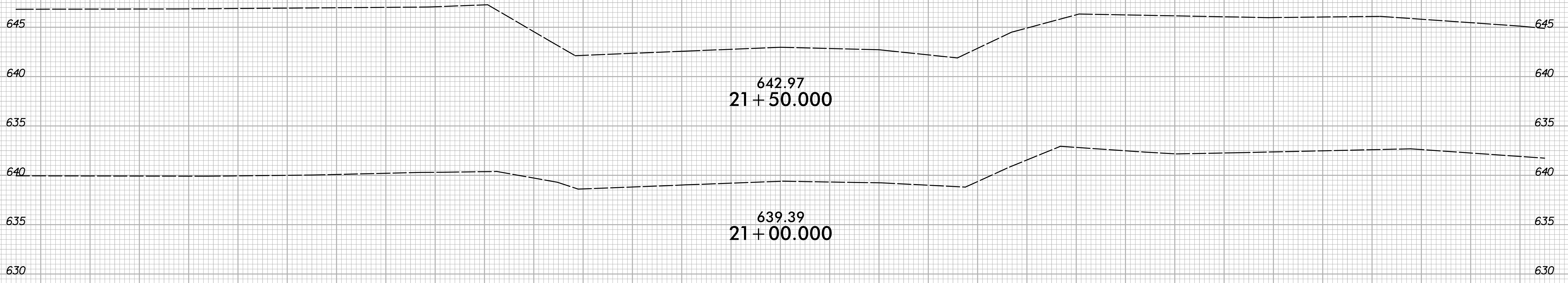
8/23/99



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

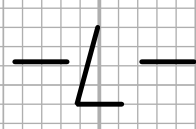
SHEET NO.
X-4

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



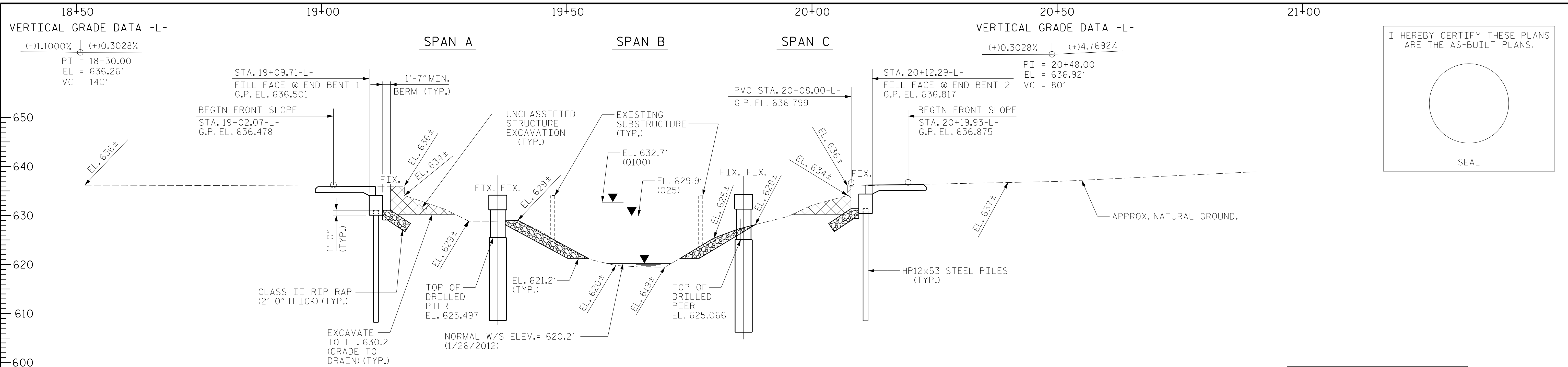
642.97
21+50.00

639.39
21+00.00



SYSTEMS TIME
DRAWING

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'

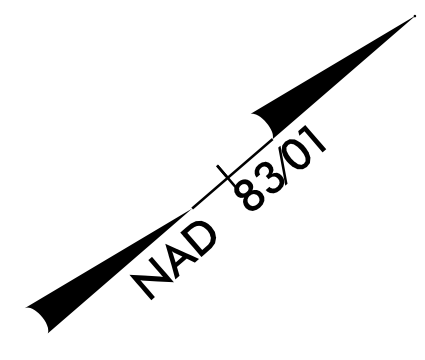
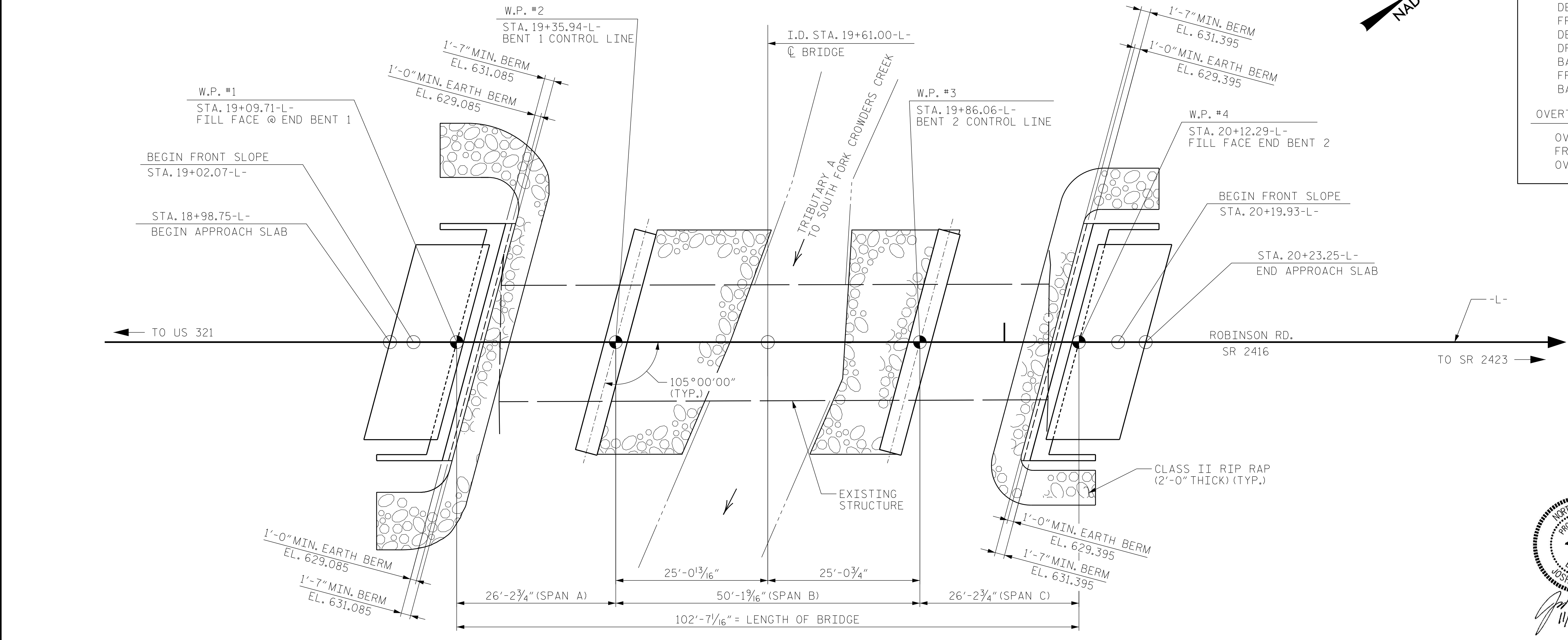
HYDRAULIC DATA:

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

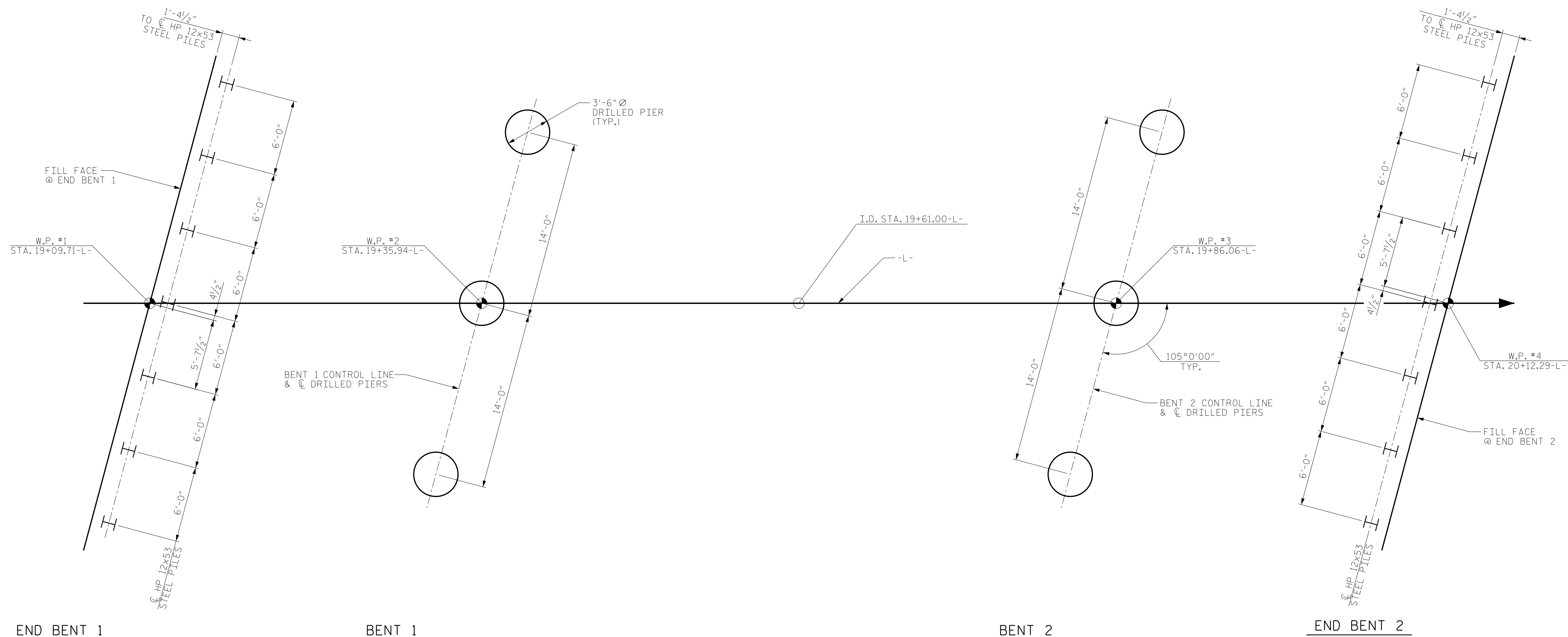
PROJECT NO. 17BP.12.R.10
 GASTON COUNTY
 STATION: 19+61.00-L-

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.

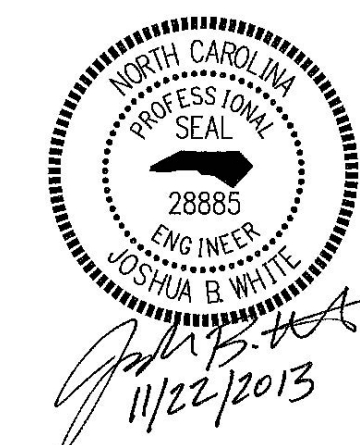
SID INSPECTION ARE NOT REQUIRED TO DETERMINE THE BOTTOM CLEANLINESS OF THE DRILLED PIERS AT BENTS NO.1 AND 2.

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



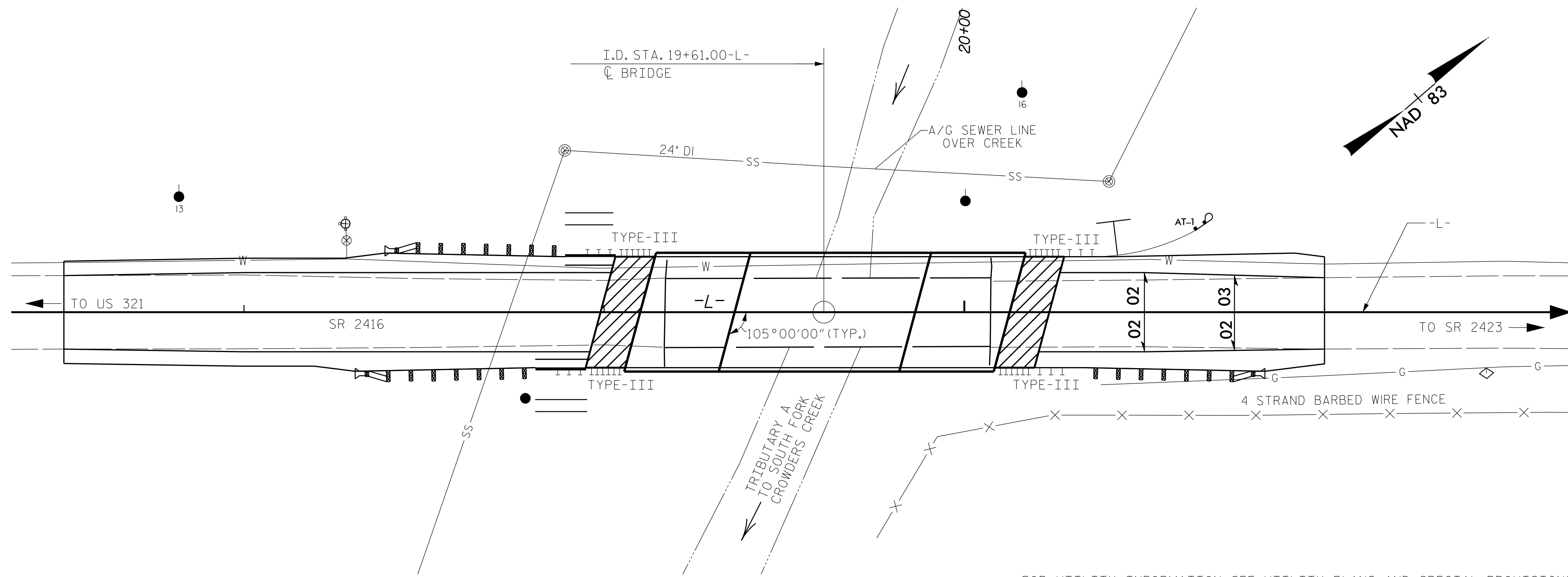
PROJECT NO. 17BP.12.R.10
 GASTON COUNTY
 STATION: 19+61.00-L-

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.

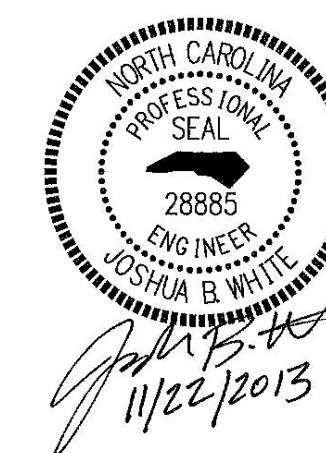
FOR CRANE SAFTY, SEE SPECIAL PROVISIONS.

FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.

FOR CURING CONCRETE, SEE SPECIAL PROVISIONS.

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

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

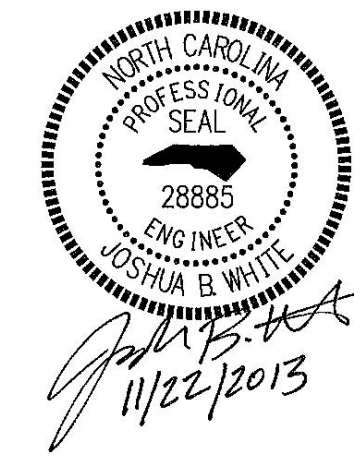
PREPARED BY
 TGS ENGINEERS
 107-A MICA AVENUE
 MORGANTON, NC 28655

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
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	1	1.233	--	1.75	0.279	2.57	25'	EL	11.982	0.637	1.23	25'	EL	1.198	0.80	0.279	2.37	25'	EL	11.982		
	HL-93(Opr)	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	2	1.428	51.406	1.75	0.279	3.82	25'	EL	11.982	0.637	1.43	25'	EL	1.198	0.80	0.279	3.52	25'	EL	11.982		
	HS-20(Opr)	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	3	1.503	67.632	1.4	0.279	3.72	25'	EL	9.586	0.637	1.5	25'	EL	1.198	0.80	0.279	2.75	25'	EL	9.586			

LOAD FACTORS:

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

NOTES:

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

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

COMMENTS:

- 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



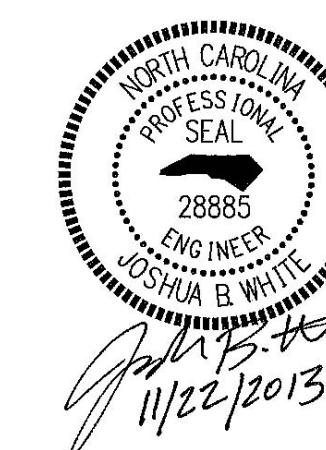
LRFR SUMMARY
FOR SPANS 'A & C'

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	γ_{DC}	γ_{DW}
	STRENGTH I	1.25	1.50
	SERVICE III	1.00	1.00

NOTES:

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

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

COMMENTS:

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

CONTROLLING LOAD RATING

1 DESIGN LOAD RATING (HL-93)

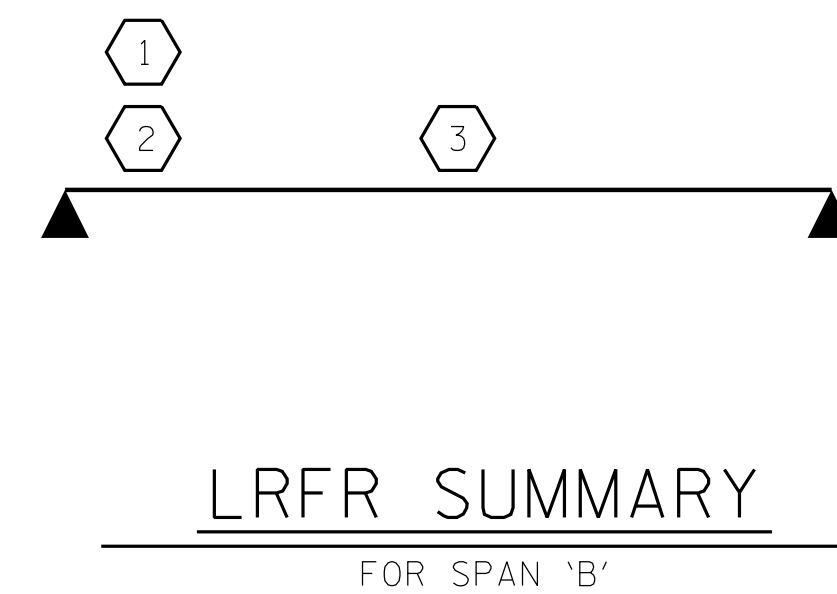
2 DESIGN LOAD RATING (HS-20)

3 LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

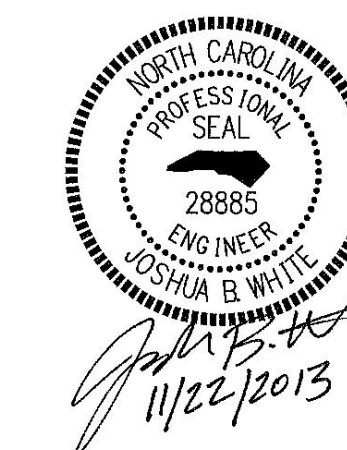
GIRDER LOCATION

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

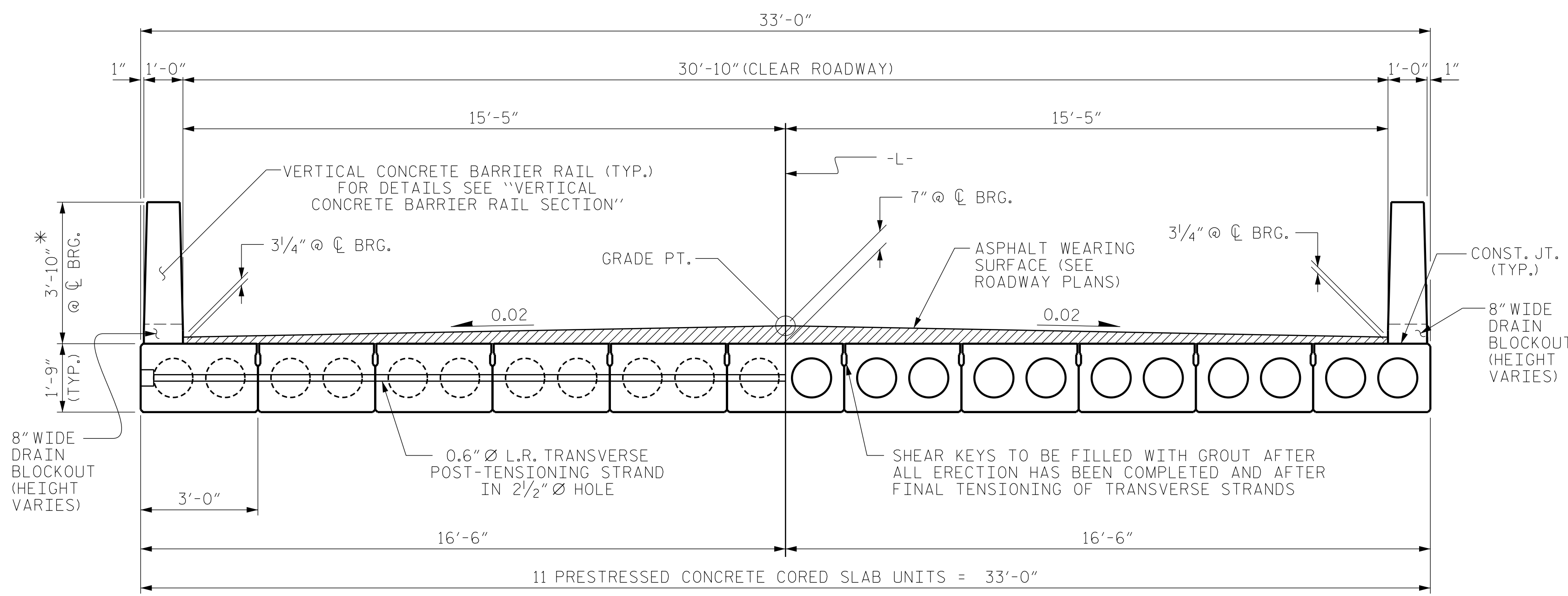


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
LRFR SUMMARY FOR
50' CORED SLAB UNIT
75° SKEW & 105° SKEW
(NON-INTERSTATE TRAFFIC)

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

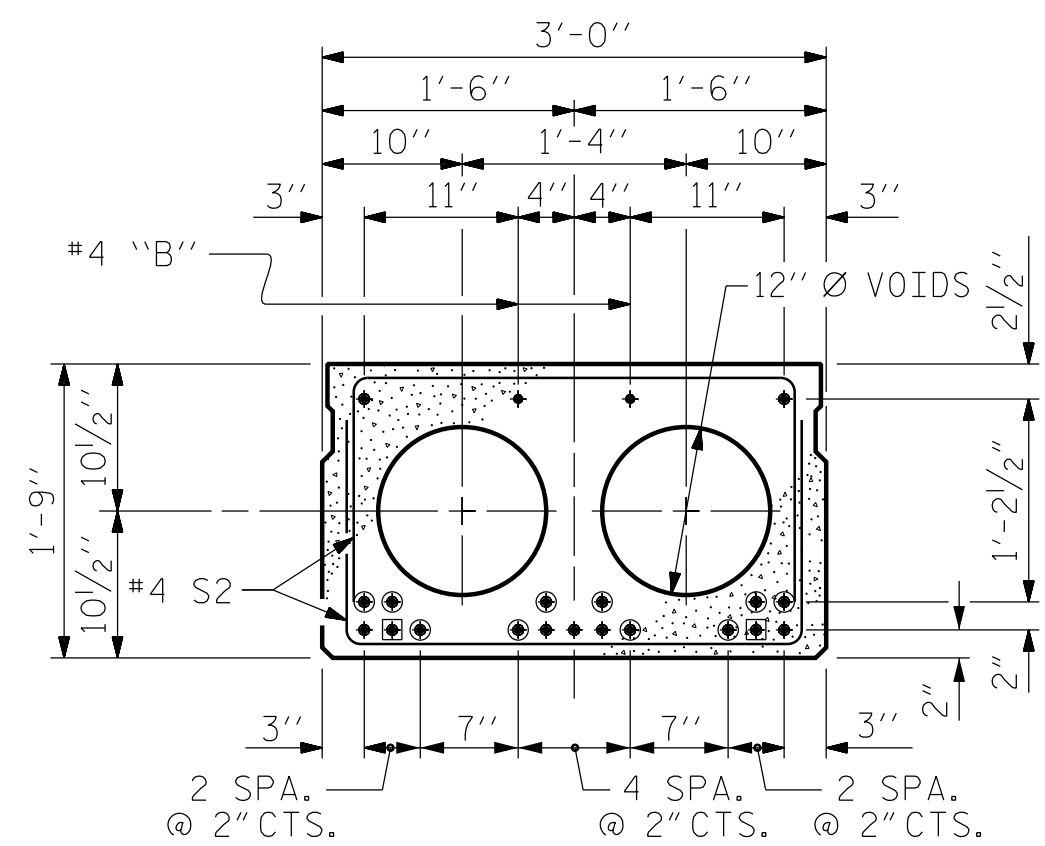
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	TOTAL SHEETS
1			3			5-6
2			4			23



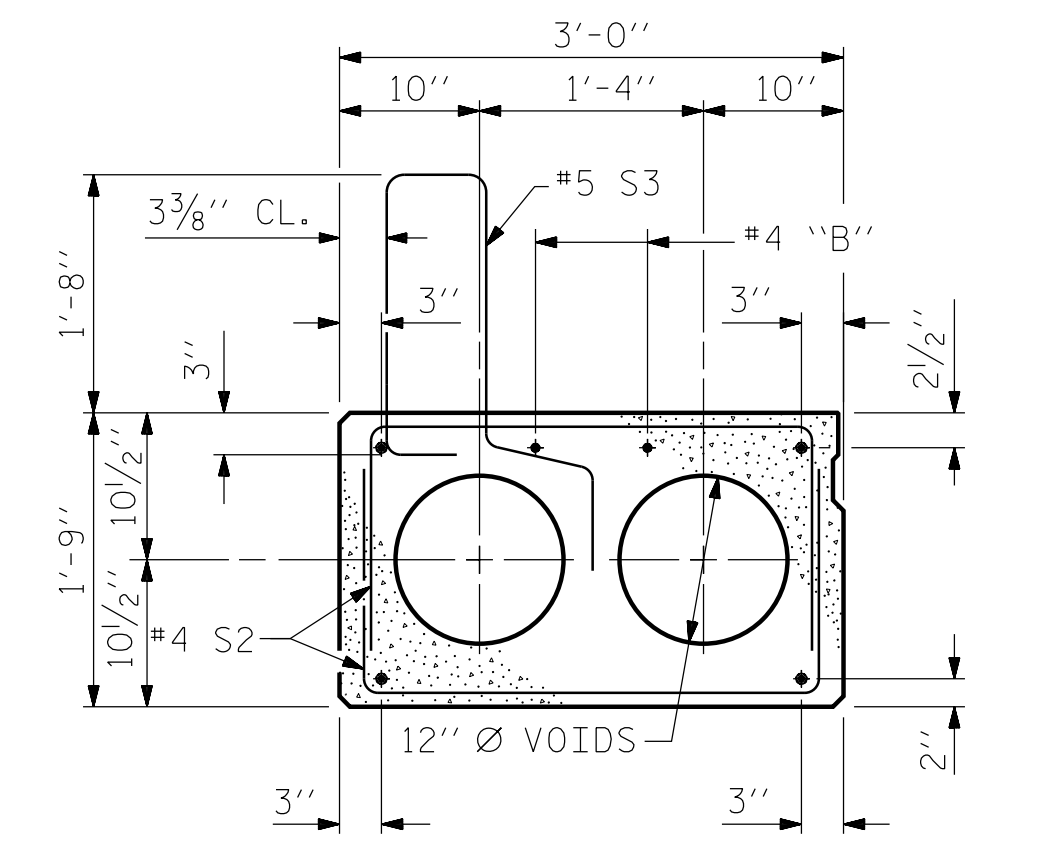
HALF SECTION AT INTERMEDIATE DIAPHRAGMS
HALF SECTION THROUGH VOIDS

TYPICAL SECTION

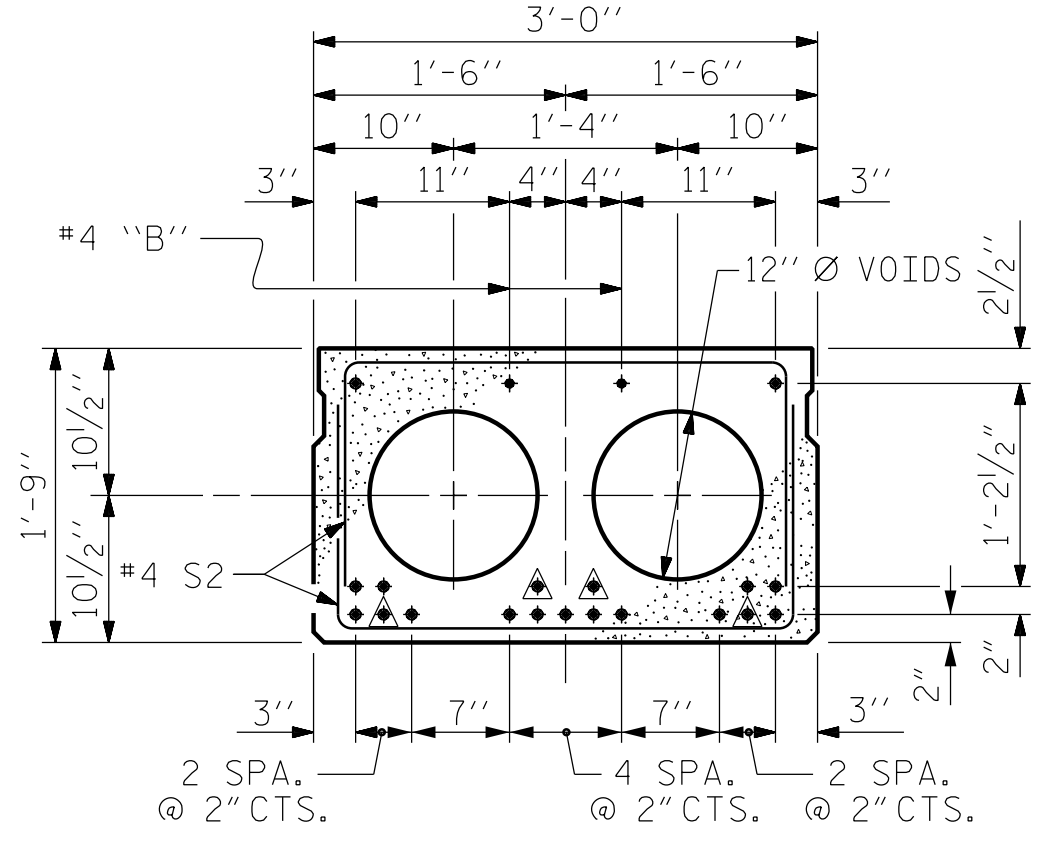
* - THE MAXIMUM BARRIER RAIL HEIGHT AND ASPHALT THICKNESS IS SHOWN. THE HEIGHT OF THE BARRIER RAIL AND ASPHALT THICKNESS VARIES WHILE THE TOP OF THE BARRIER RAIL FOLLOWS THE PROFILE OF THE CUTTERLINE. FOR RAIL HEIGHT DETAILS AND ASPHALT THICKNESS SEE THE "VERTICAL CONCRETE BARRIER RAIL SECTION" DETAIL.



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



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

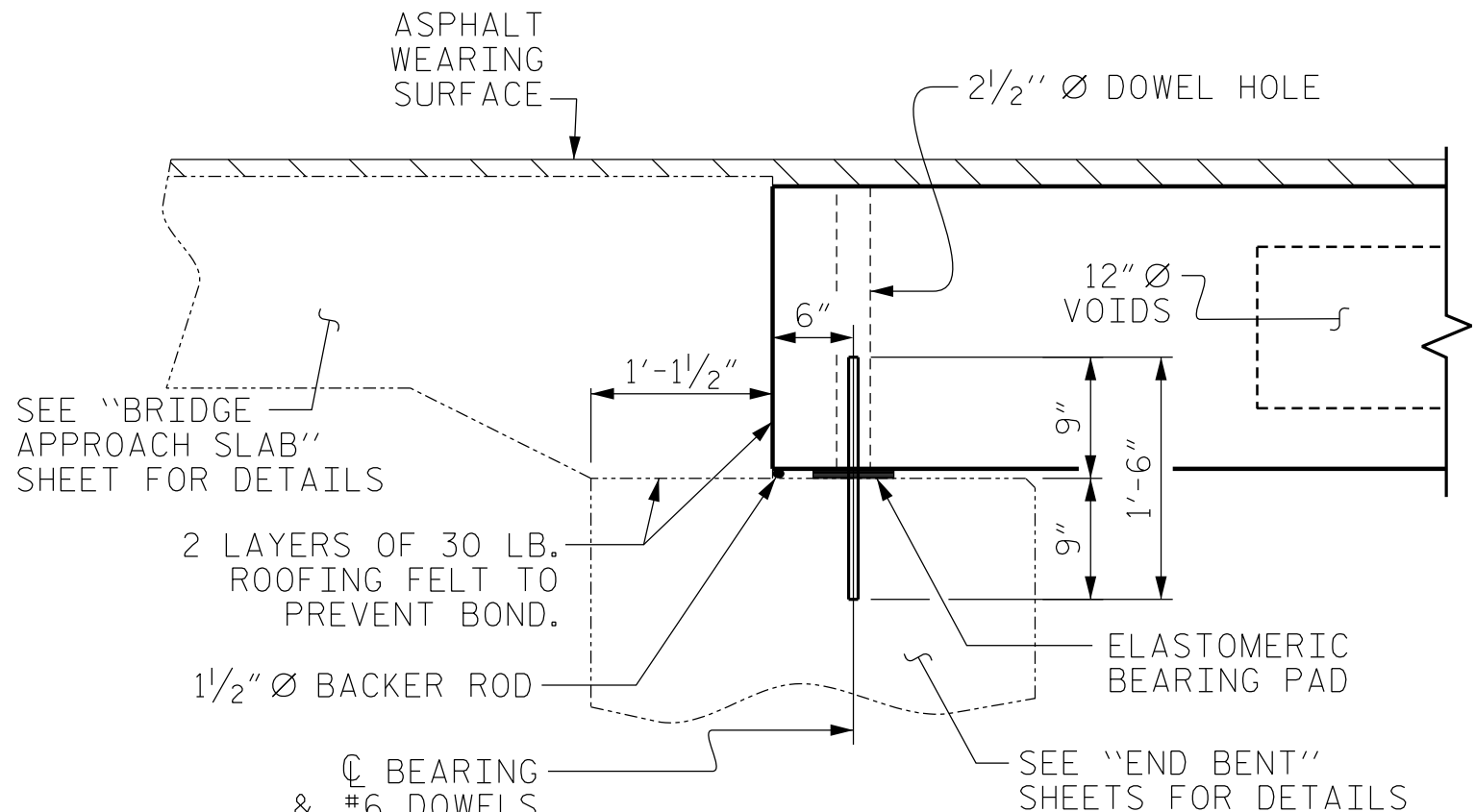


INTERIOR SLAB SECTION (50' UNIT)
(19 STRANDS REQUIRED)

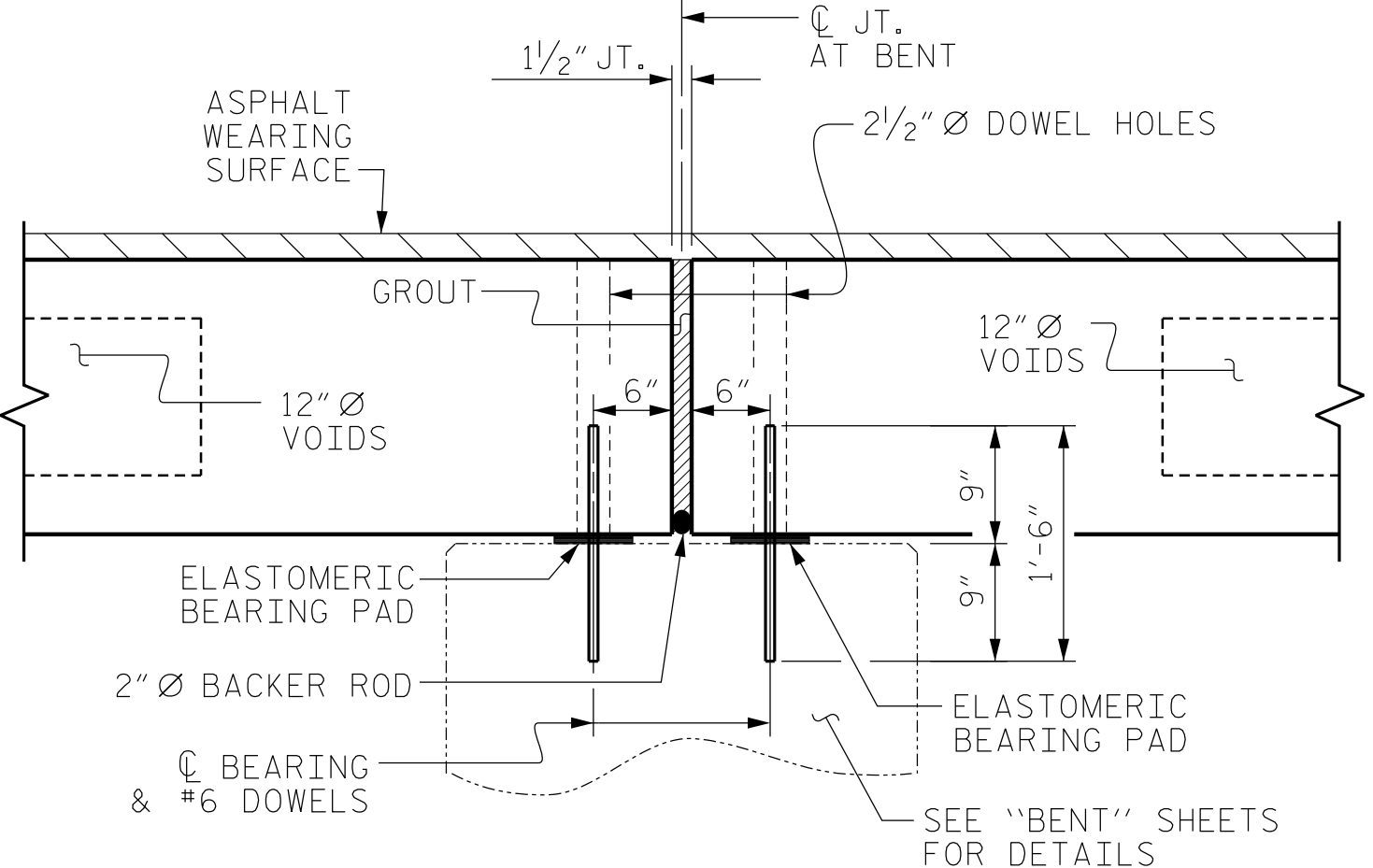
0.6" Ø LOW RELAXATION STRAND LAYOUT

- 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.

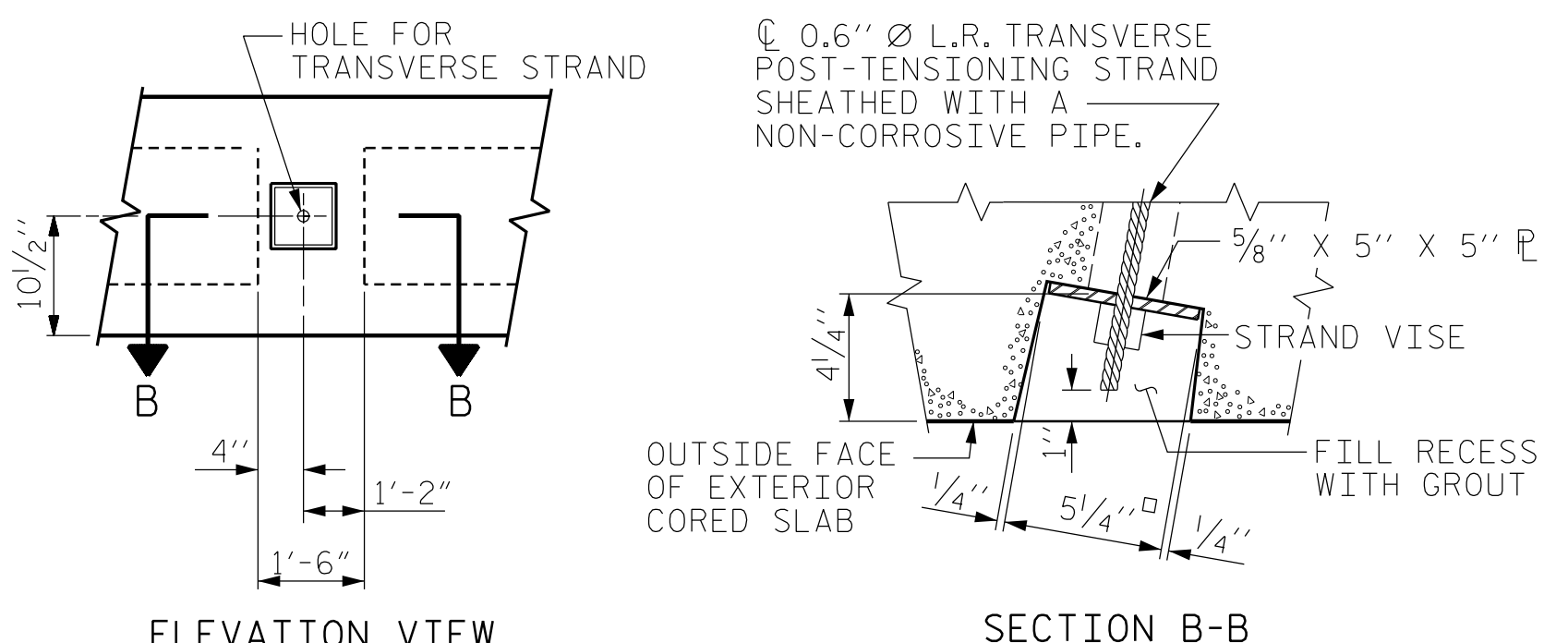
DEBONDING LEGEND



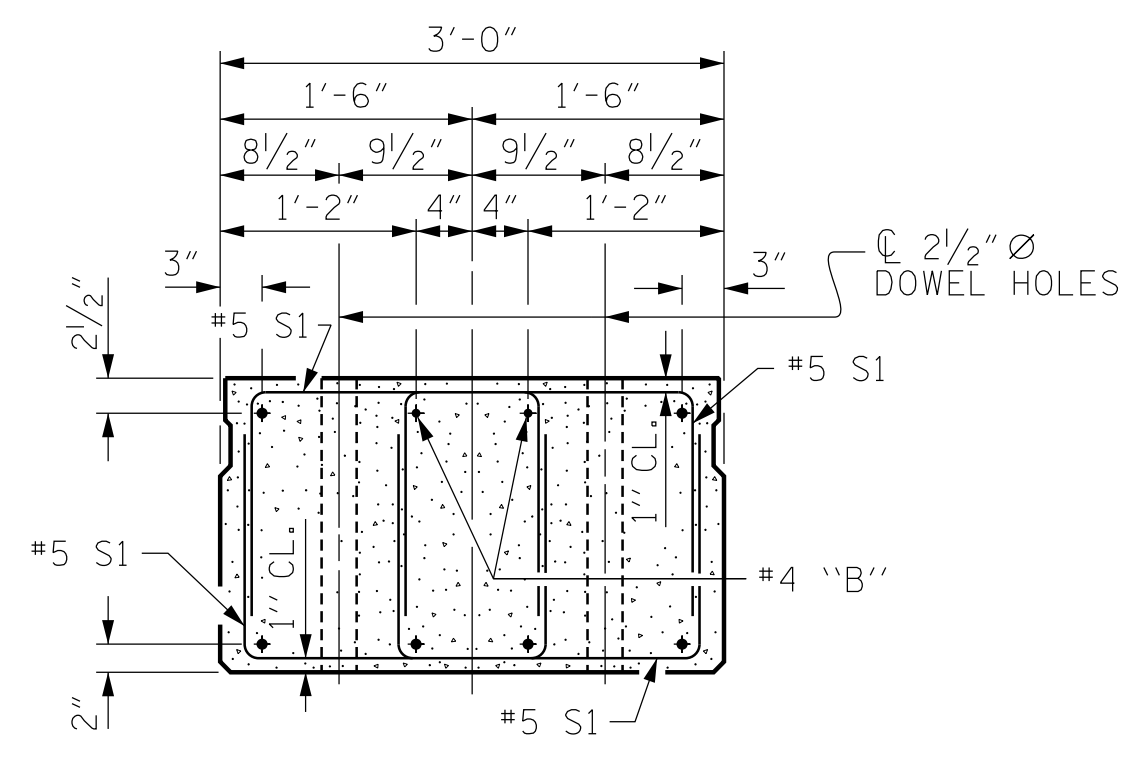
SECTION AT END BENT



SECTION AT BENT

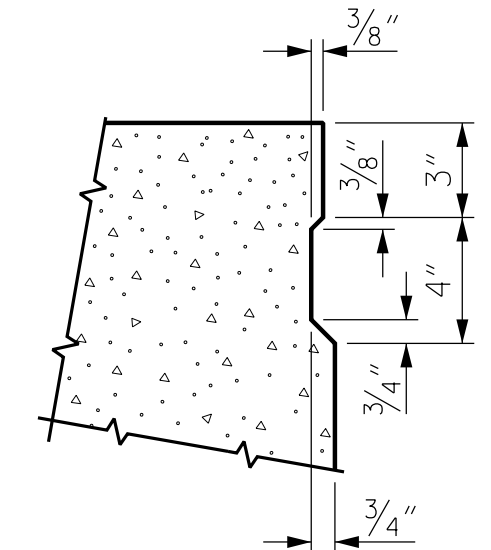


GROUTED RECESS AT END OF POST-TENSIONED STRAND OF CORED SLABS



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		

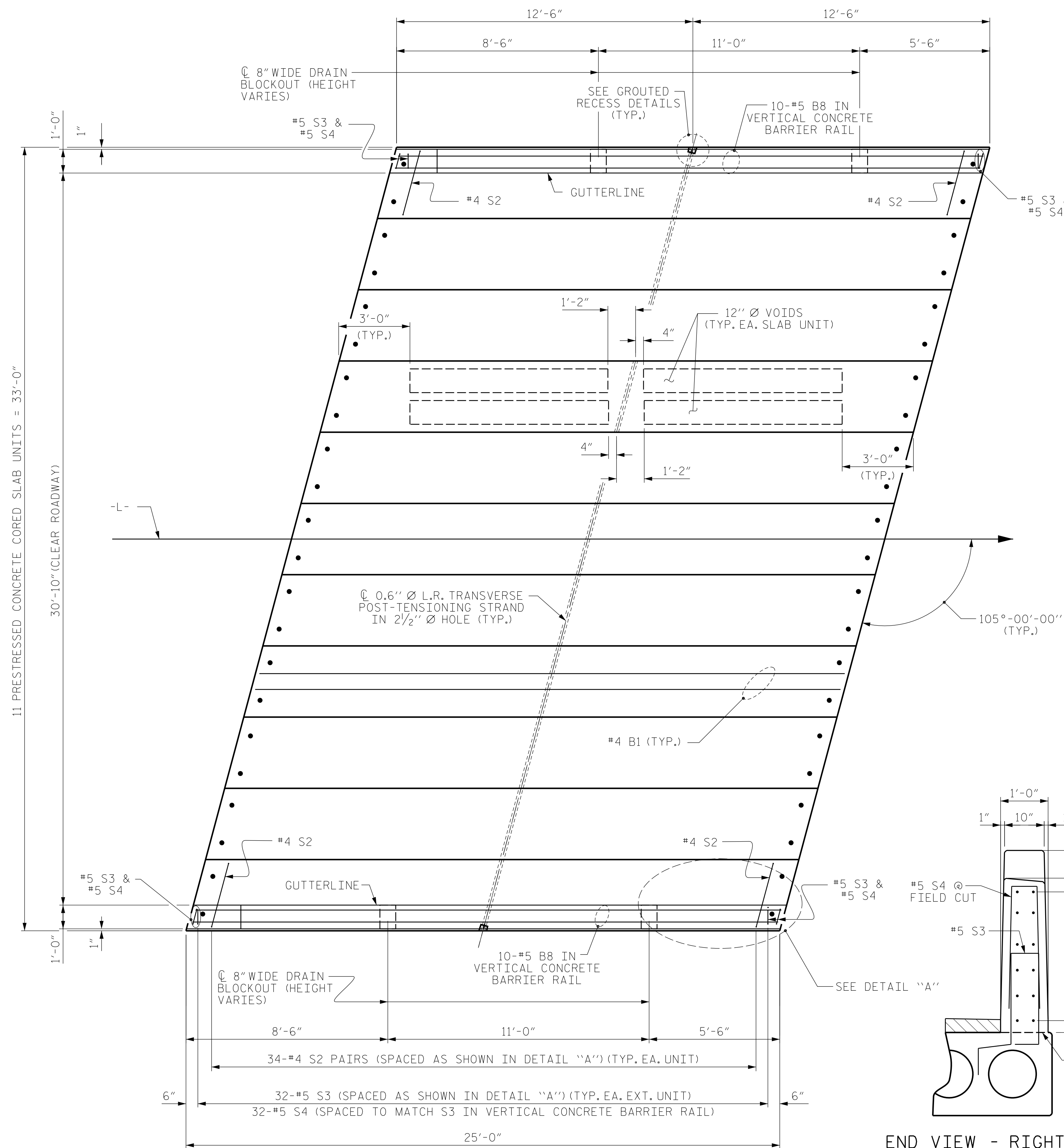
PREPARED BY
TOS ENGINEERS
107-A WICA AVENUE
MORGANTON, NC 28655



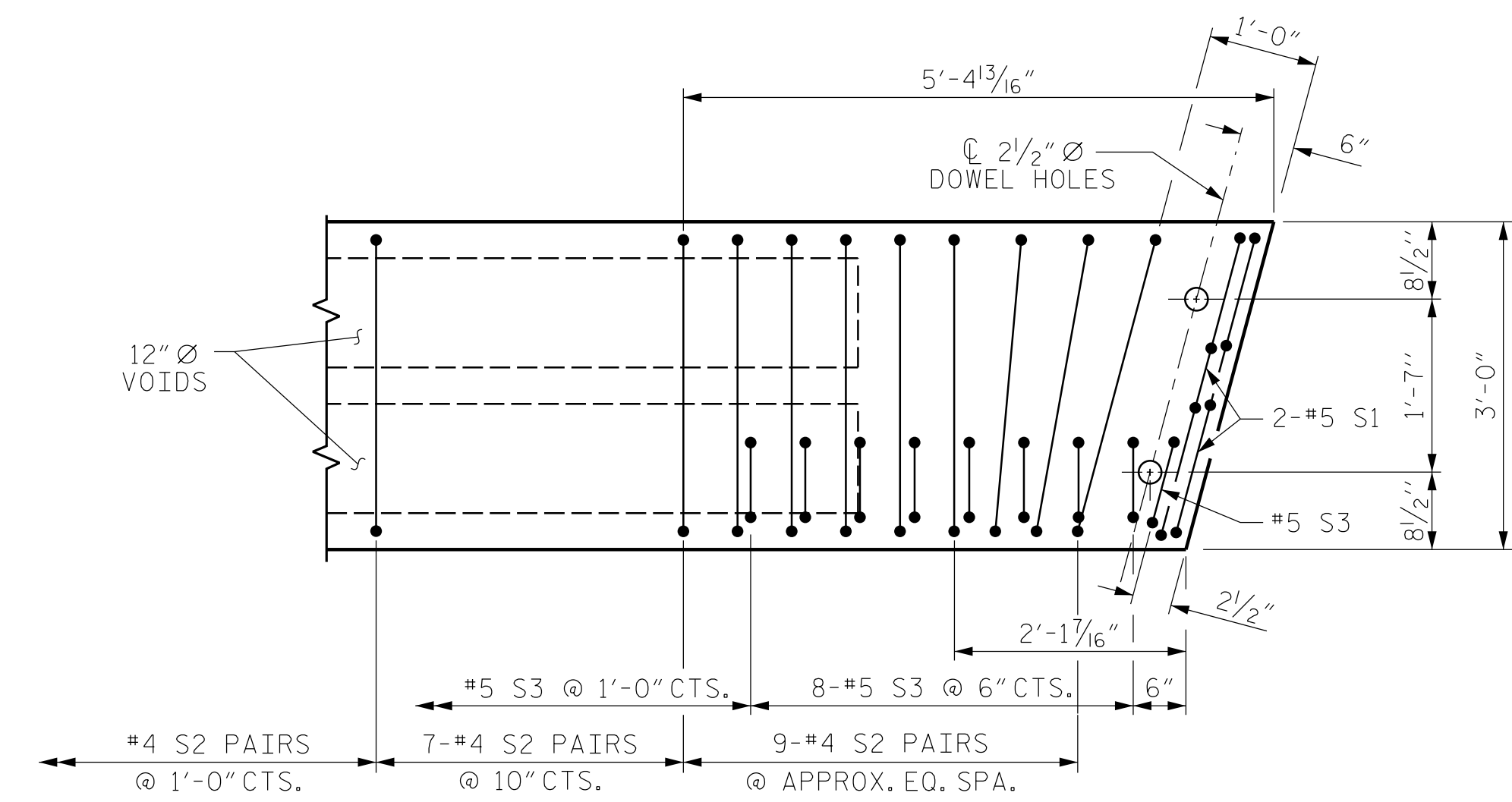
PROJECT NO. 17BP.12.R.10
GASTON COUNTY
STATION: 19+61.00-L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH						SHEET NO.
STANDARD 3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLAB UNIT 105° SKEW SPANS A, B, & C						S-7
REVISIONS						TOTAL SHEETS
NO.	BY:	DATE:	NO.	BY:	DATE:	23
1			3			
2			4			

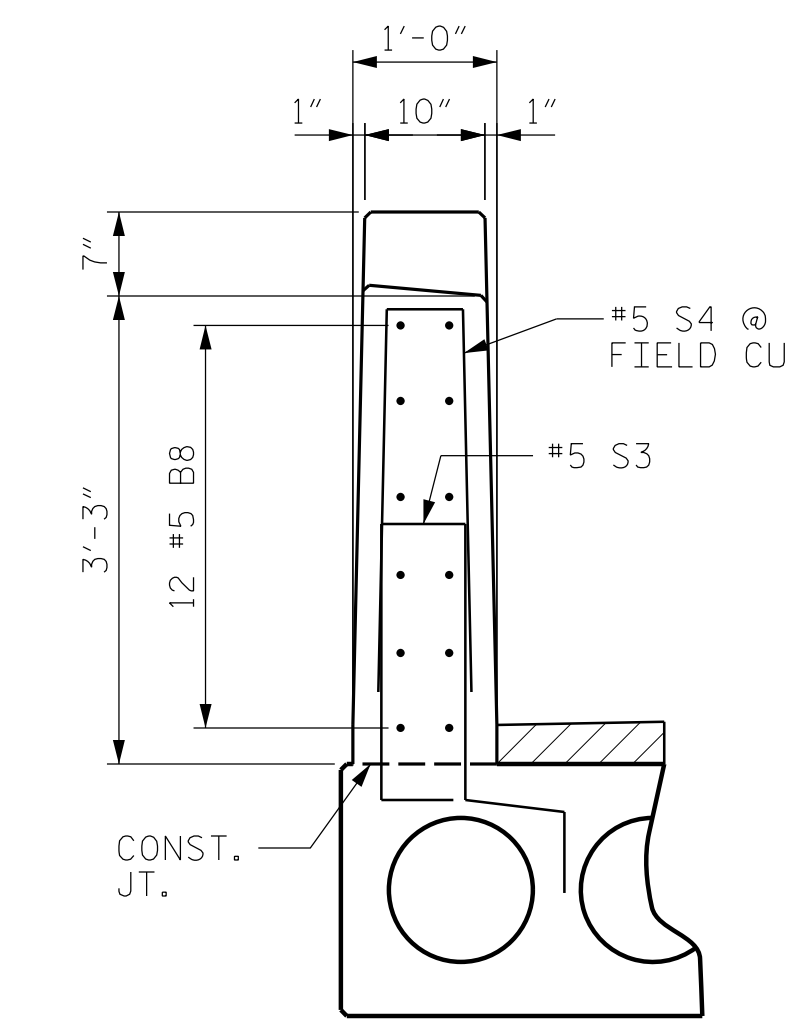


PLAN OF UNIT - SPAN A

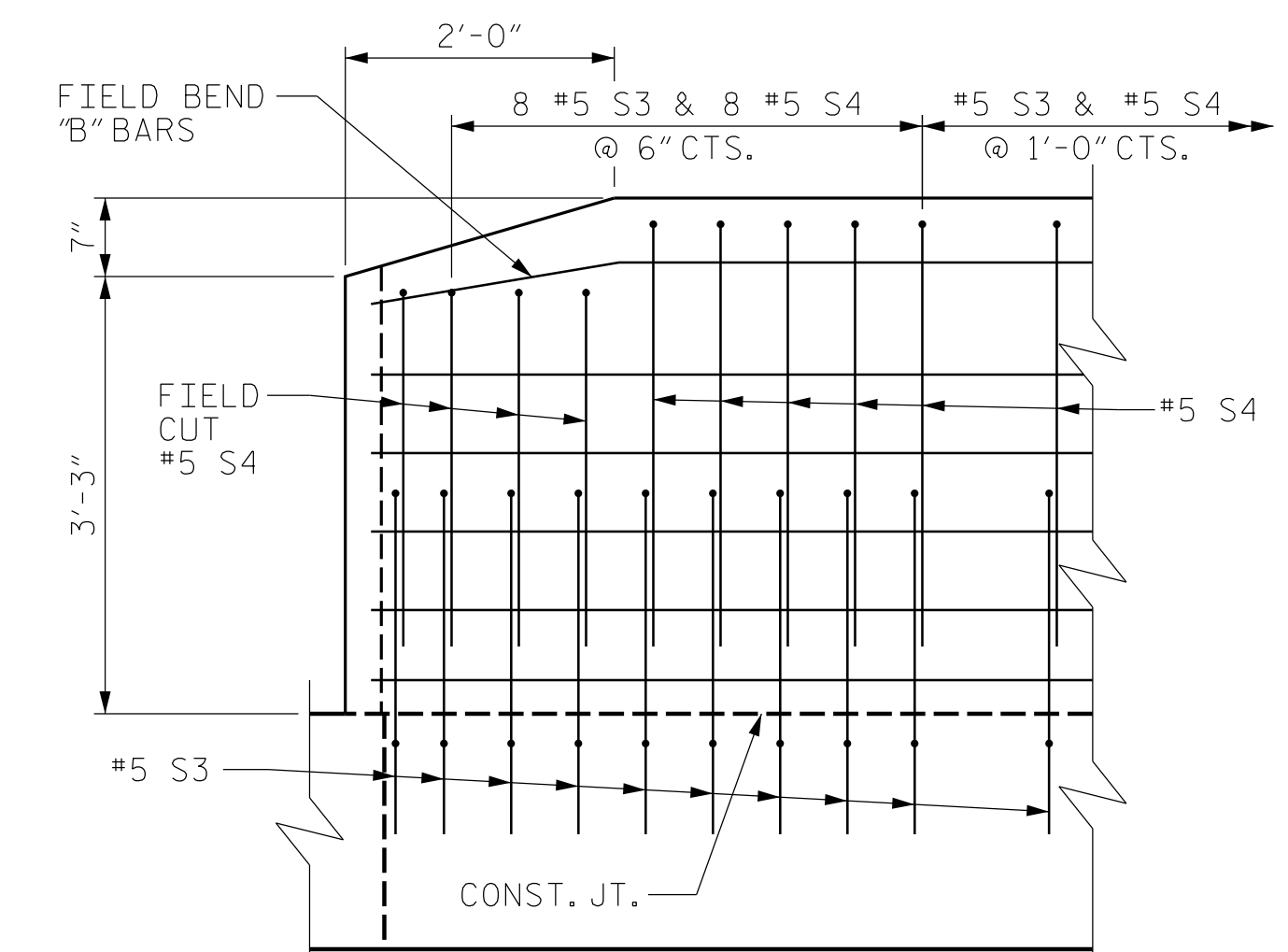


DETAIL "A"

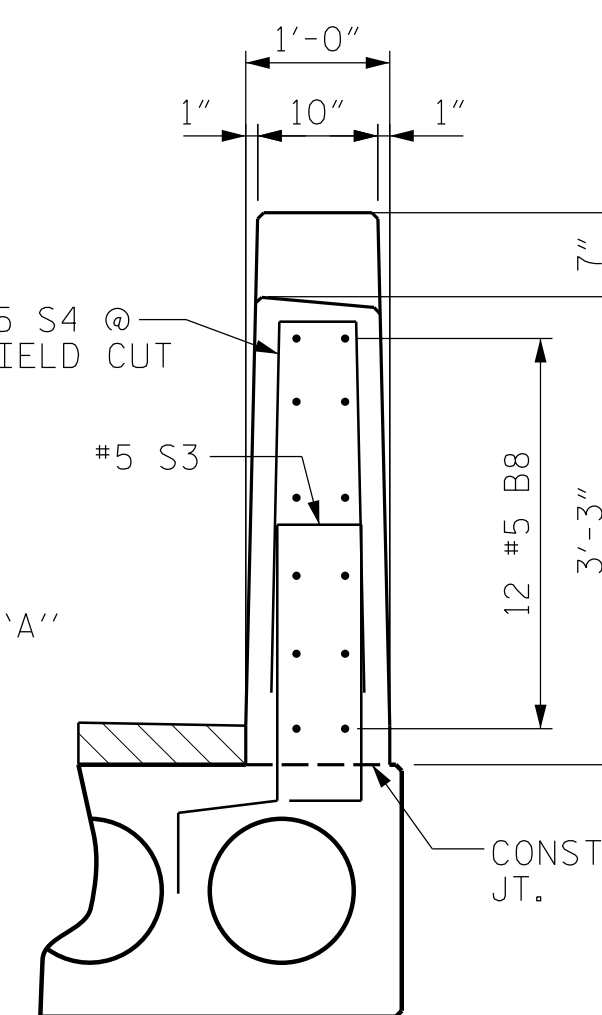
NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S3 BARS.



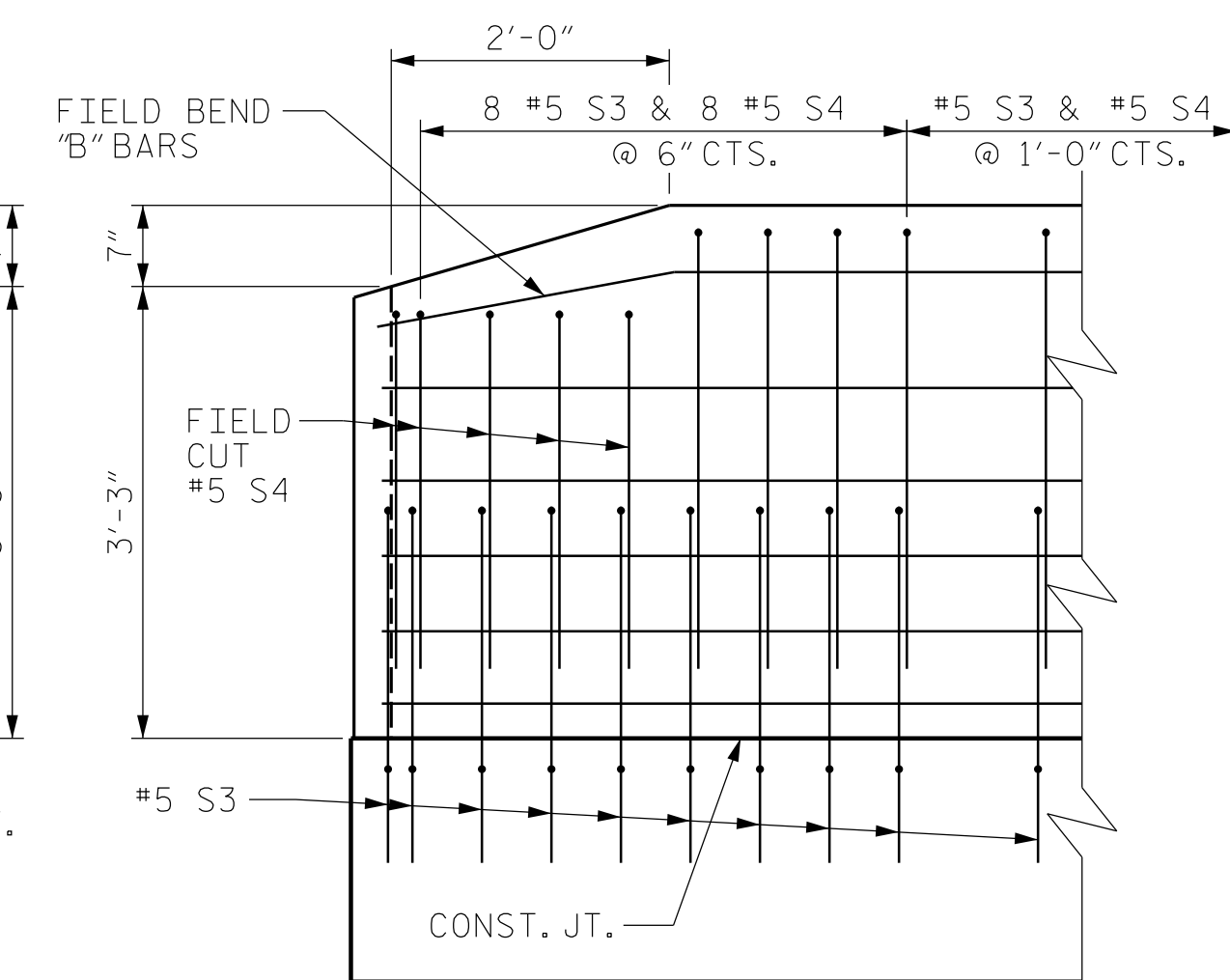
END VIEW - LEFT SIDE



SIDE VIEW - LEFT SIDE



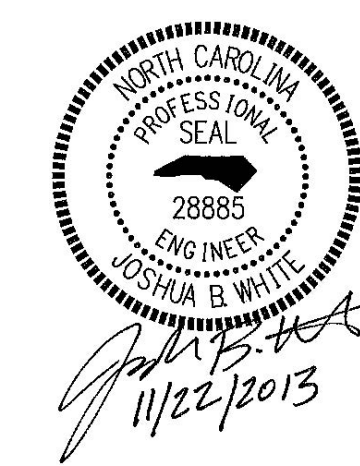
END VIEW - RIGHT SIDE



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
TOS ENGINEERS
107-A MICA AVENUE
MORGANTON, NC 28655



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

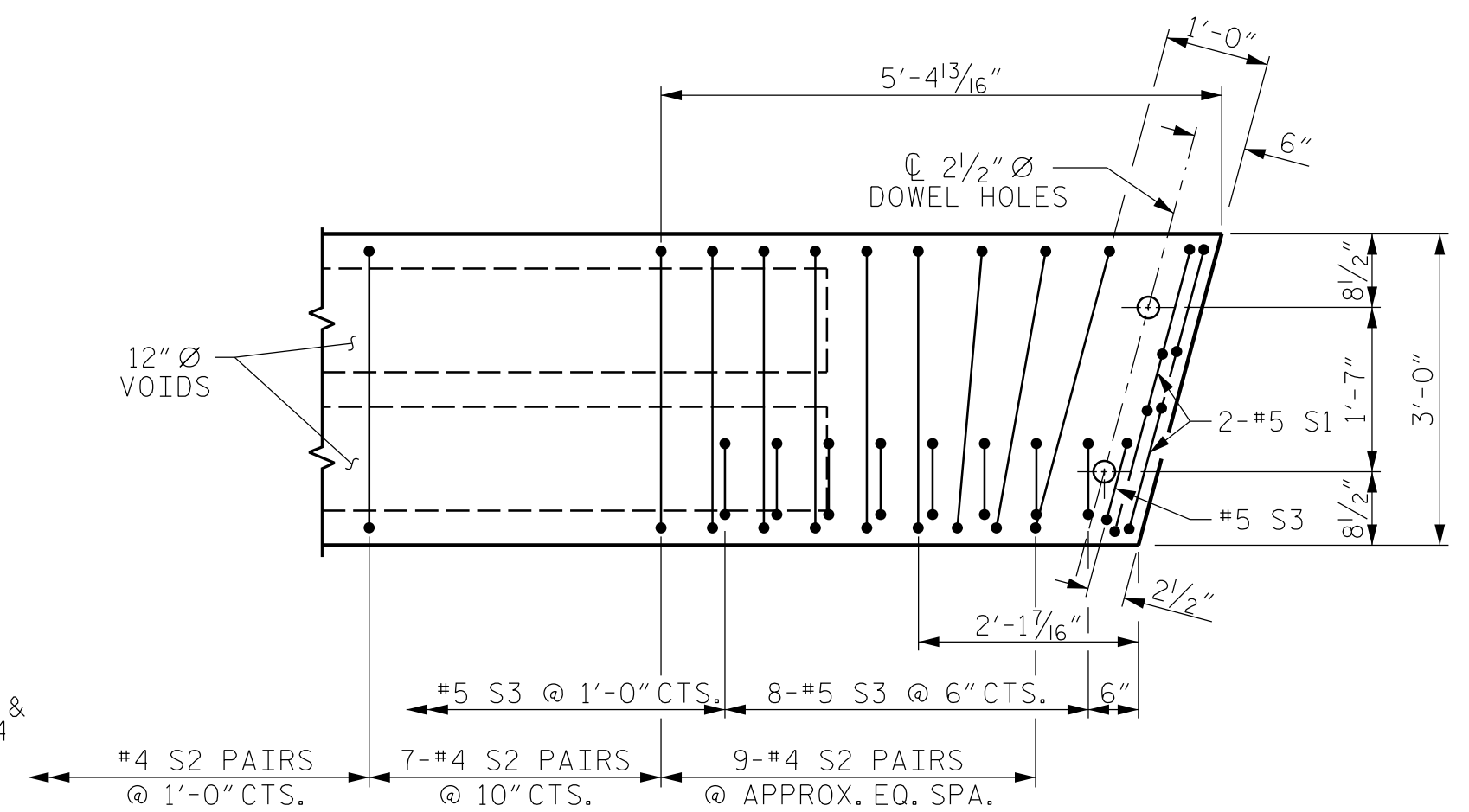
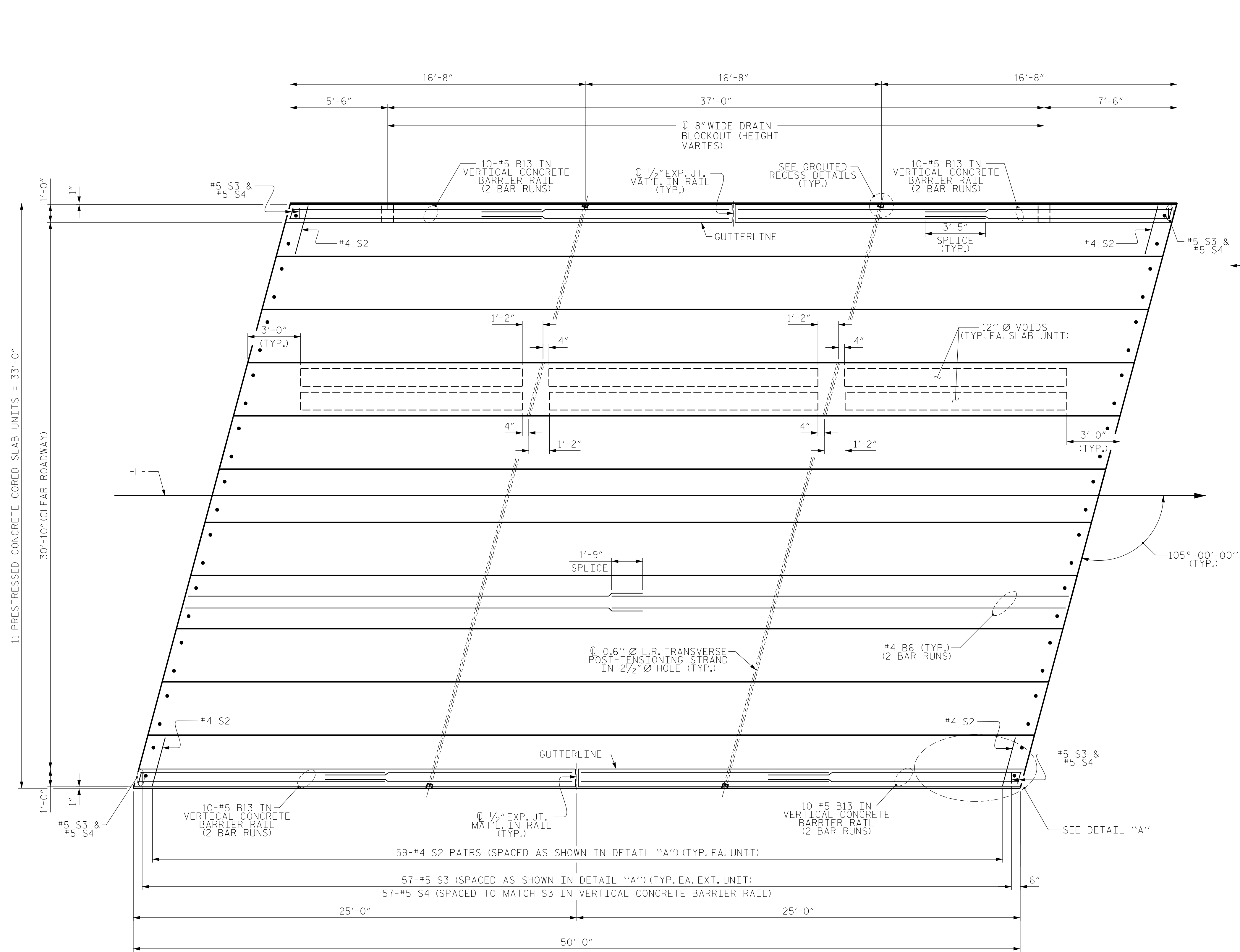
SHEET 2 OF 5

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

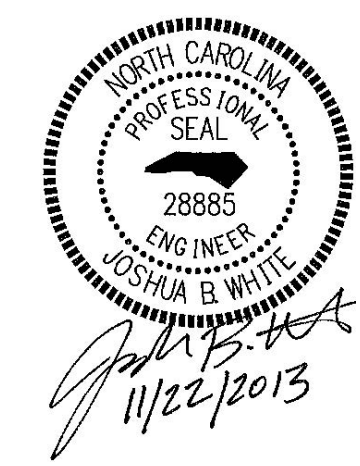


DETAIL "A"
 NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S3 BARS.

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

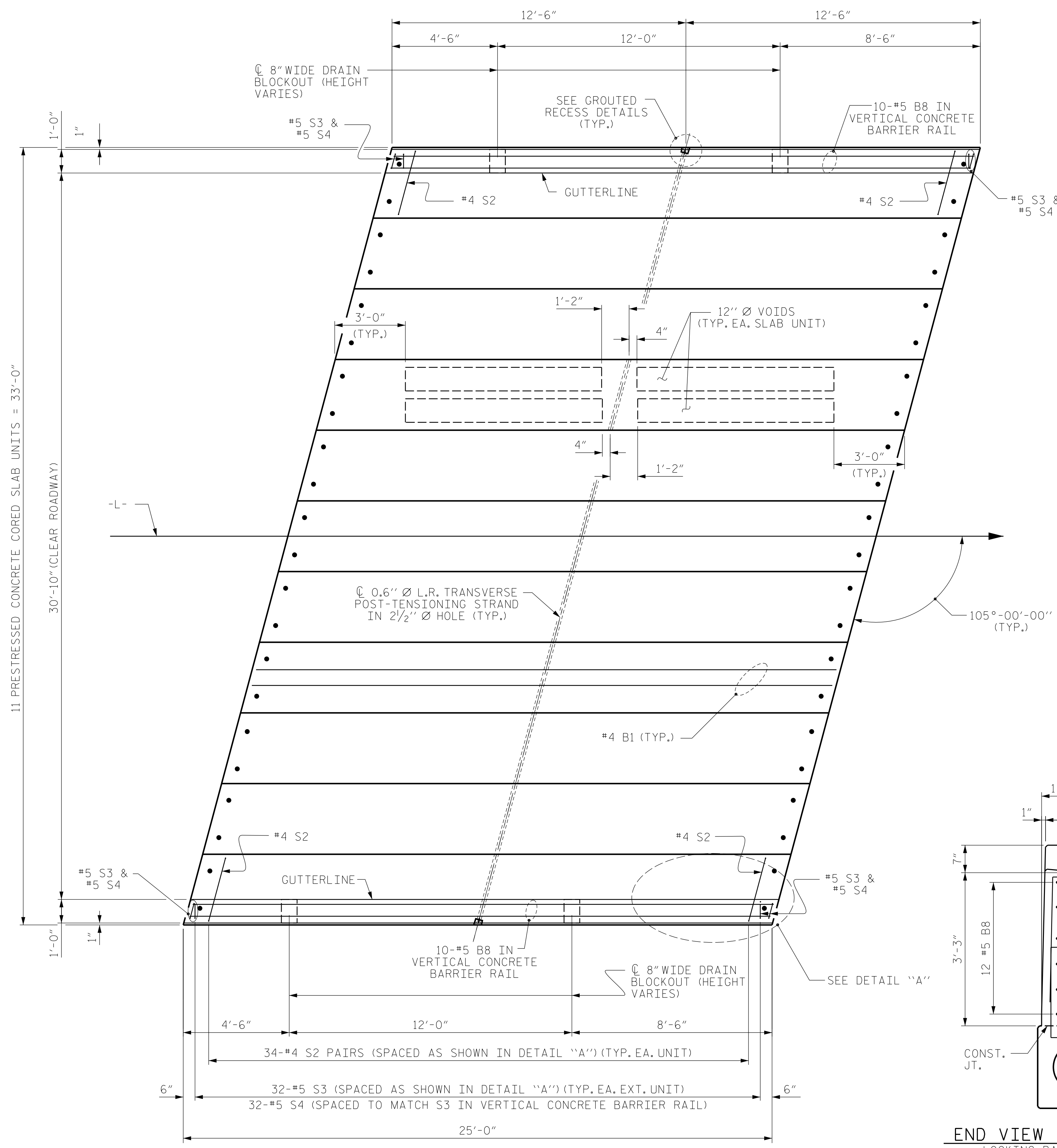
PLAN OF 50' UNIT
 30'-10" CLEAR ROADWAY
 105° SKEW

SPAN B

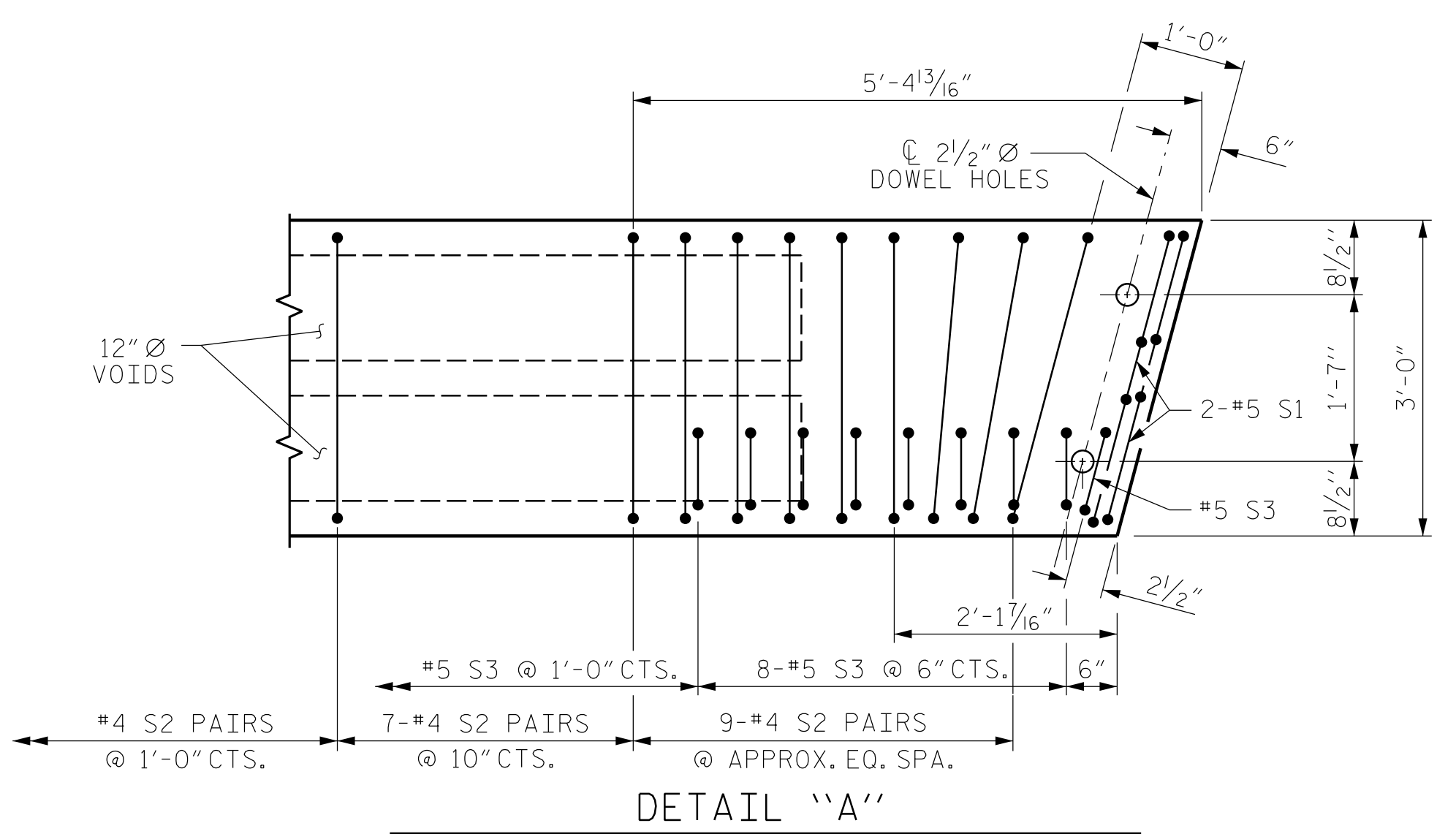
ASSEMBLED BY :	JLA	DATE :	2/13
CHECKED BY :	JBW	DATE :	2/13
DRAWN BY :	DGE 5/09	REV. 12/5/11	MAA/AAC
CHECKED BY :	BCH 6/09		

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

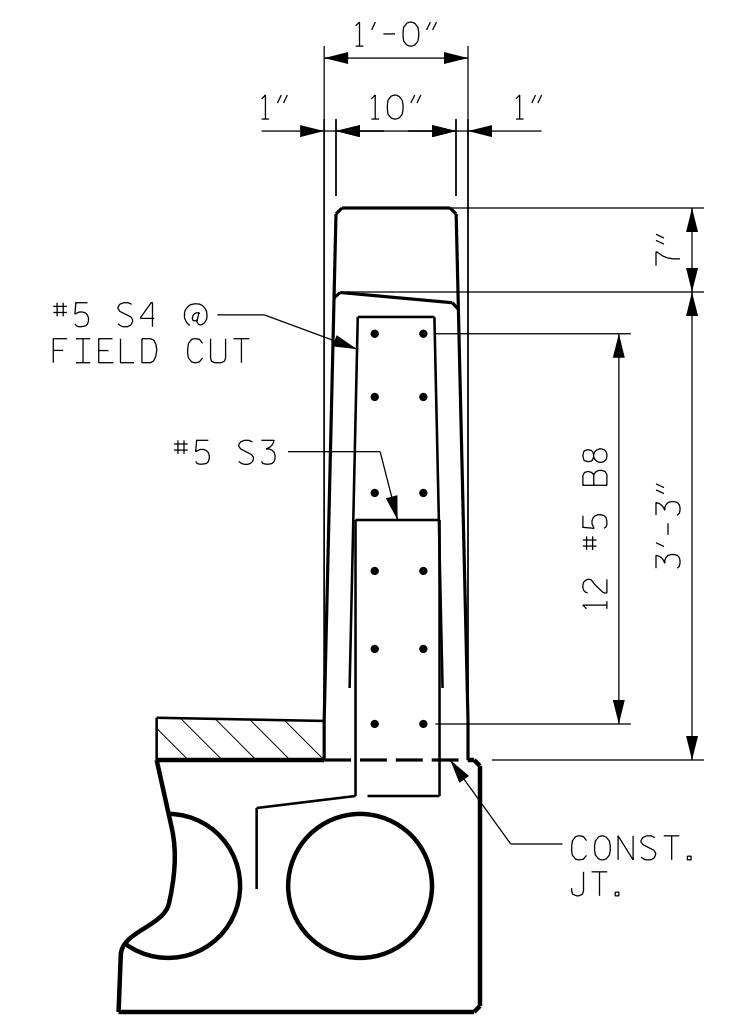
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			23



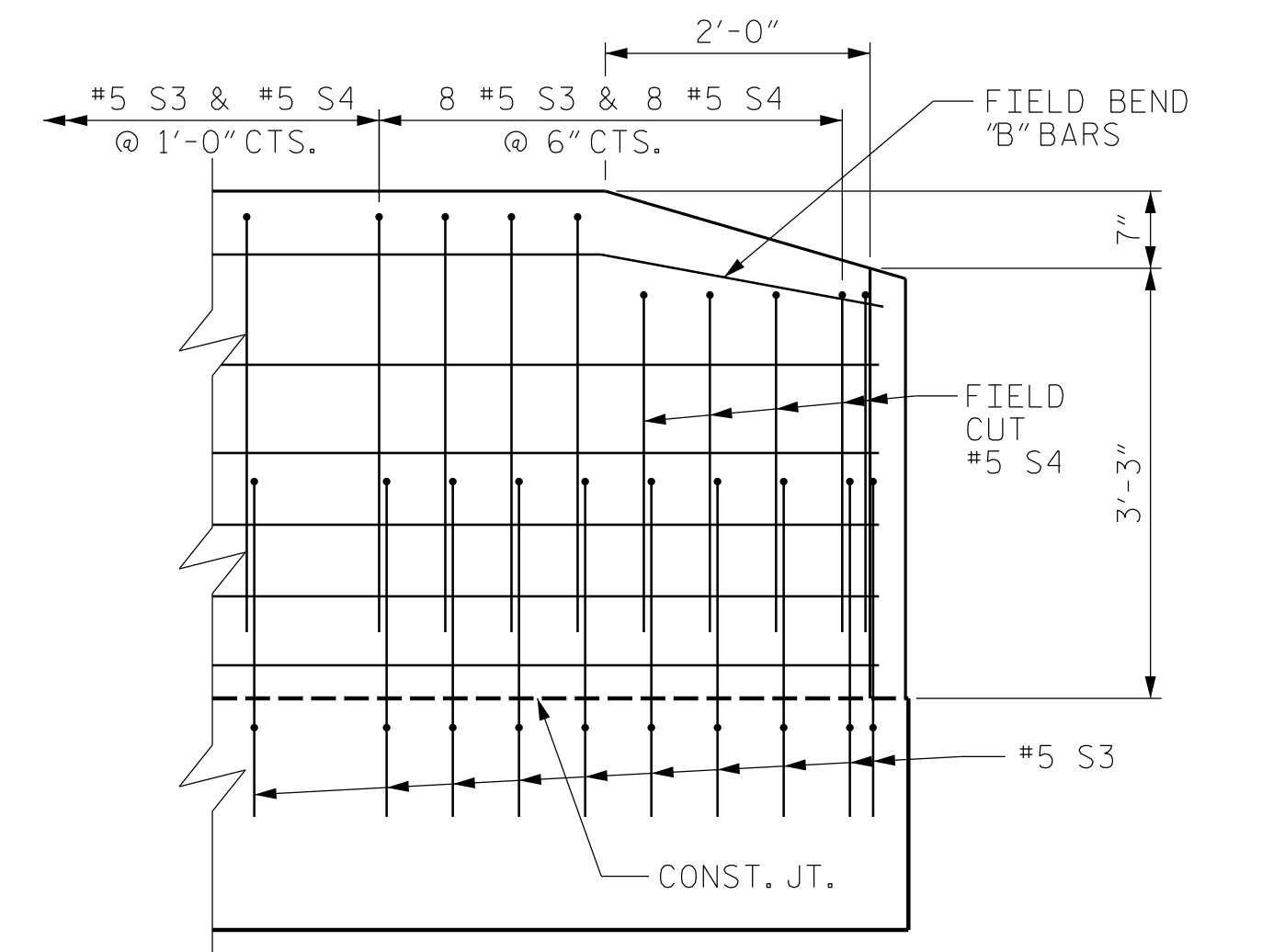
PLAN OF UNIT - SPAN C



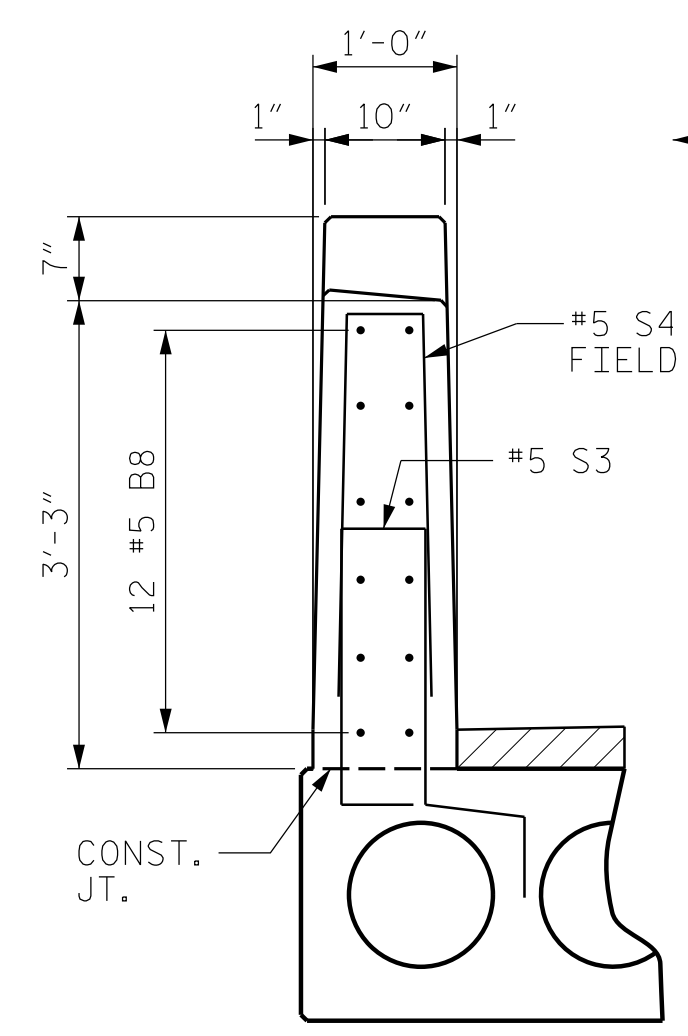
DETAIL "A"



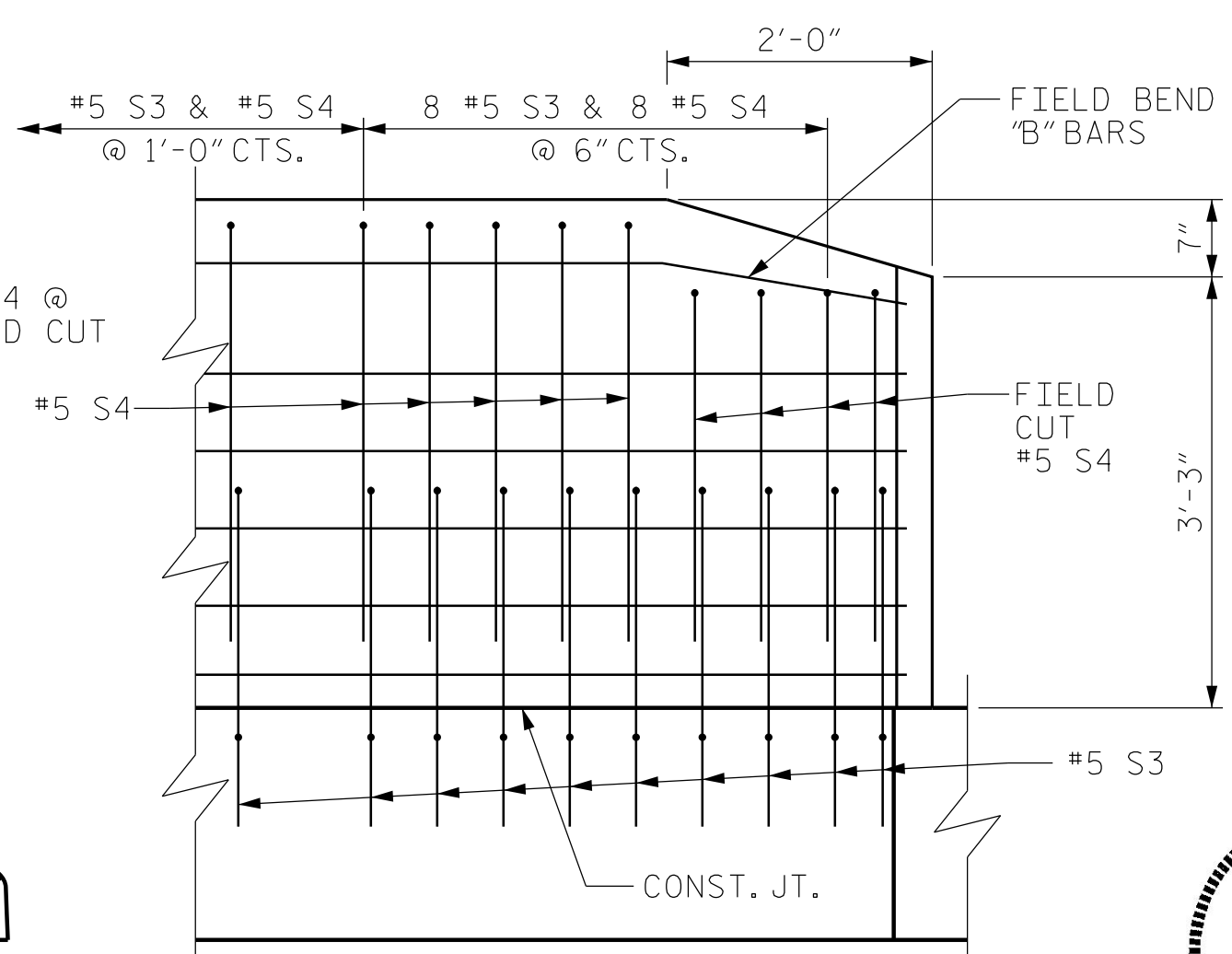
END VIEW - LEFT SIDE
LOOKING BACK STATION



SIDE VIEW - LEFT SIDE



END VIEW - RIGHT SIDE
LOOKING BACK STATION



SIDE VIEW - RIGHT SIDE

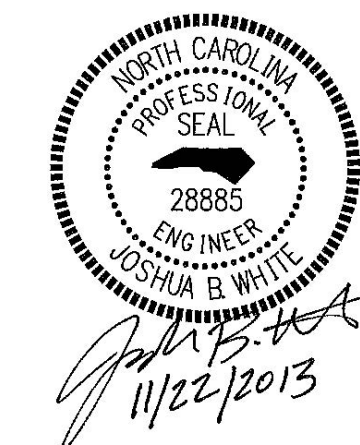
END OF VERTICAL CONCRETE BARRIER RAIL DETAILS

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

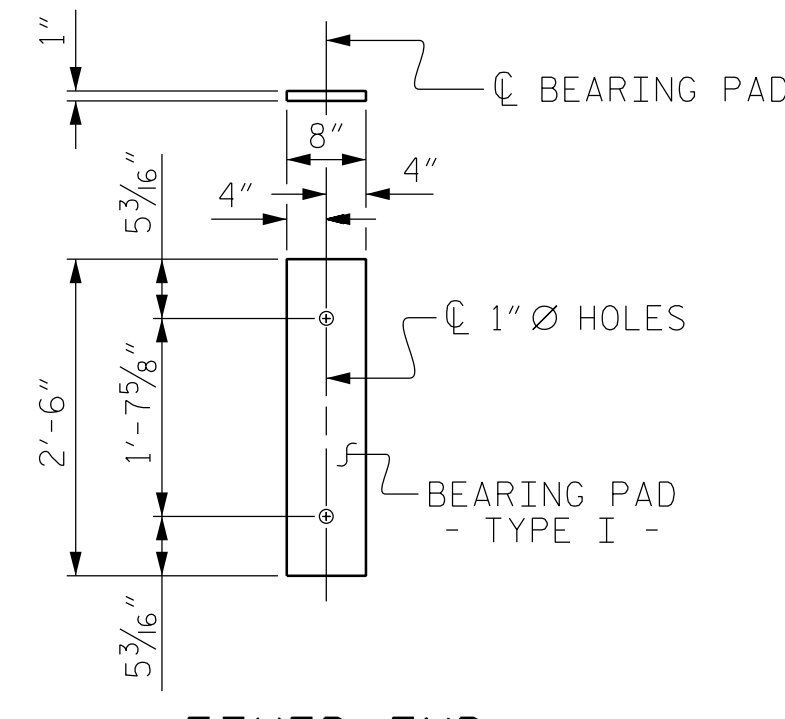


ASSEMBLED BY : JLA	DATE : 2/13
CHECKED BY : JBW	DATE : 2/13
DRAWN BY : DGE 3/09	REV. 12/5/11 MAA/AAC
CHECKED BY : BCH 3/09	

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

STD. NO. 21" PCS_33.105S_25L



FIXED END
(TYPE I - 66 REQ'D)

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
25' UNITS	NORMAL CROWN SECTION 2 7/8"	3'-9 5/8"
50' UNITS	1"	3'-7 3/4"

DEAD LOAD DEFLECTION AND CAMBER	
25' CORED SLAB UNIT	3'-0" x 1'-9" 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

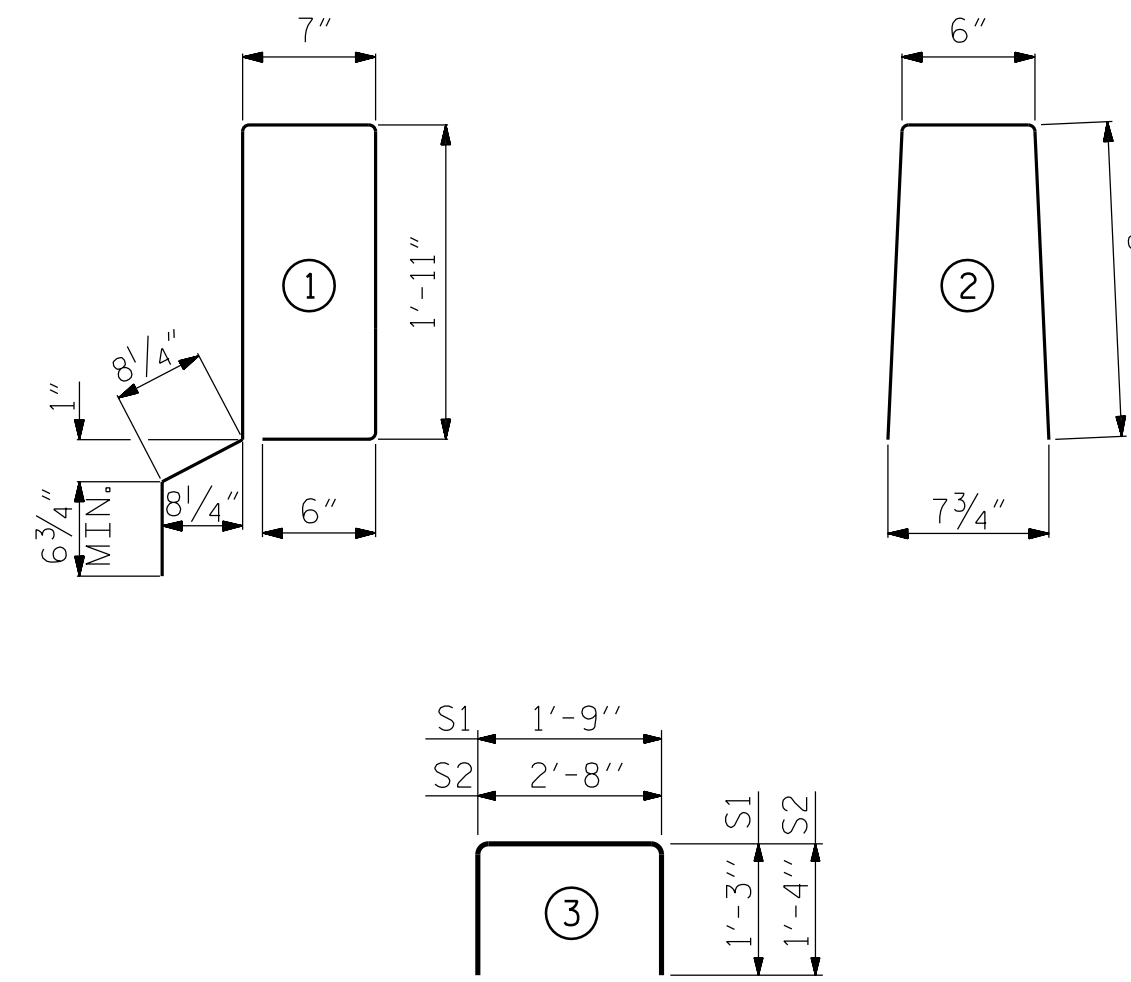
DEAD LOAD DEFLECTION AND CAMBER	
50' CORED SLAB UNIT	3'-0" x 1'-9" 0.6" Ø L.R. STRAND
CAMBER (SLAB ALONE IN PLACE)	2 1/2" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD**	1/4" ↓
FINAL CAMBER	2 1/4" ↑

** INCLUDES FUTURE WEARING SURFACE

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

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

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL FOR ONE 25' CORED SLAB UNIT

BAR	NUMBER	SIZE	TYPE	EXTERIOR UNIT		INTERIOR UNIT	
				LENGTH	WEIGHT	LENGTH	WEIGHT
B1	2	#4	STR	24'-7"	33	24'-7"	33
S1	8	#5	3	4'-3"	35	4'-3"	35
S2	68	#4	3	5'-4"	242	5'-4"	242
*S3	34	#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	#4	STR	25'-9"	69	25'-9"	69
S1	8	#5	3	4'-3"	35	4'-3"	35
S2	118	#4	3	5'-4"	420	5'-4"	420
*S3	59	#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.

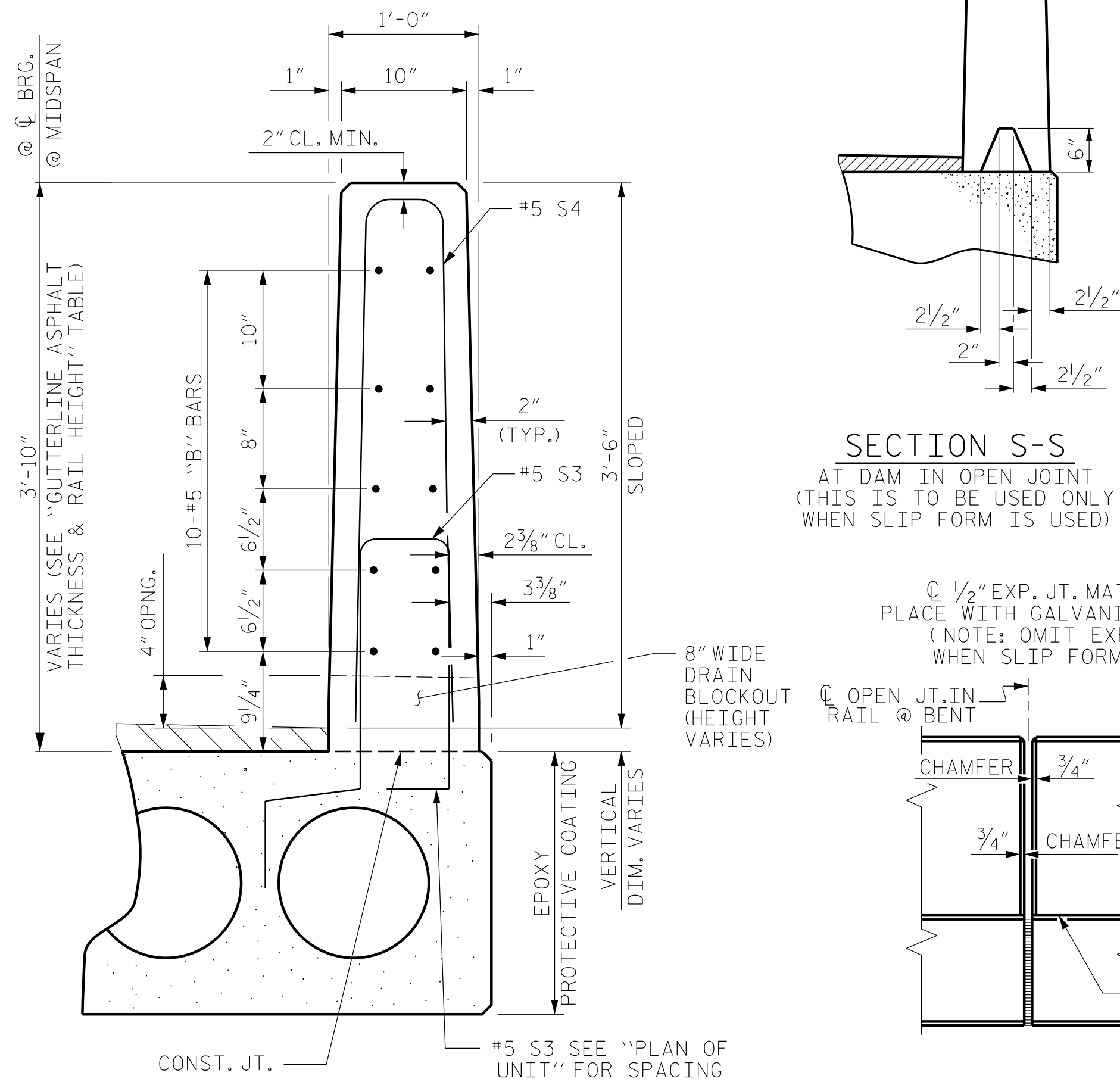
APPLY EPOXY PROTECTIVE COATING TO EXTERIOR FACE OF THE EXTERIOR CORED SLAB UNITS THAT REQUIRE DRAINS IN THE BARRIER RAIL.

CORED SLABS REQUIRED

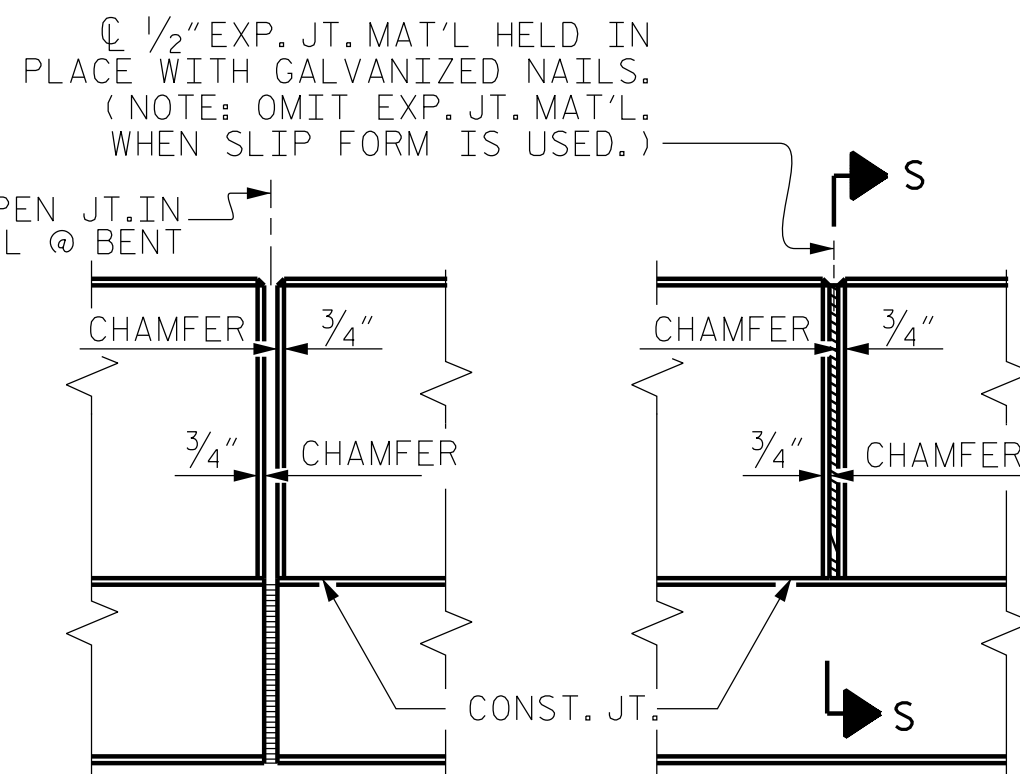
	NUMBER	LENGTH	TOTAL LENGTH
25' UNIT			
EXTERIOR C.S.	4	25'-0"	100
INTERIOR C.S.	18	25'-0"	450
TOTAL	22		550

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



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

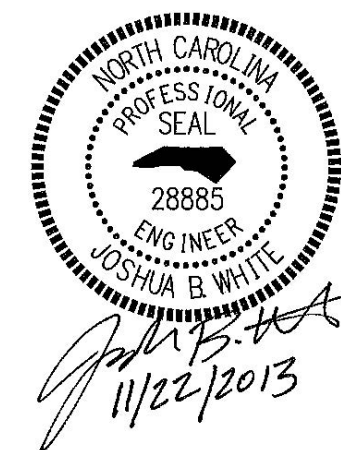


ELEVATION AT EXPANSION JOINTS

VERTICAL CONCRETE BARRIER RAIL SECTION

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

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

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
TOS ENGINEERS
107-A WICA AVENUE
MORGANTON, NC 28655

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.)

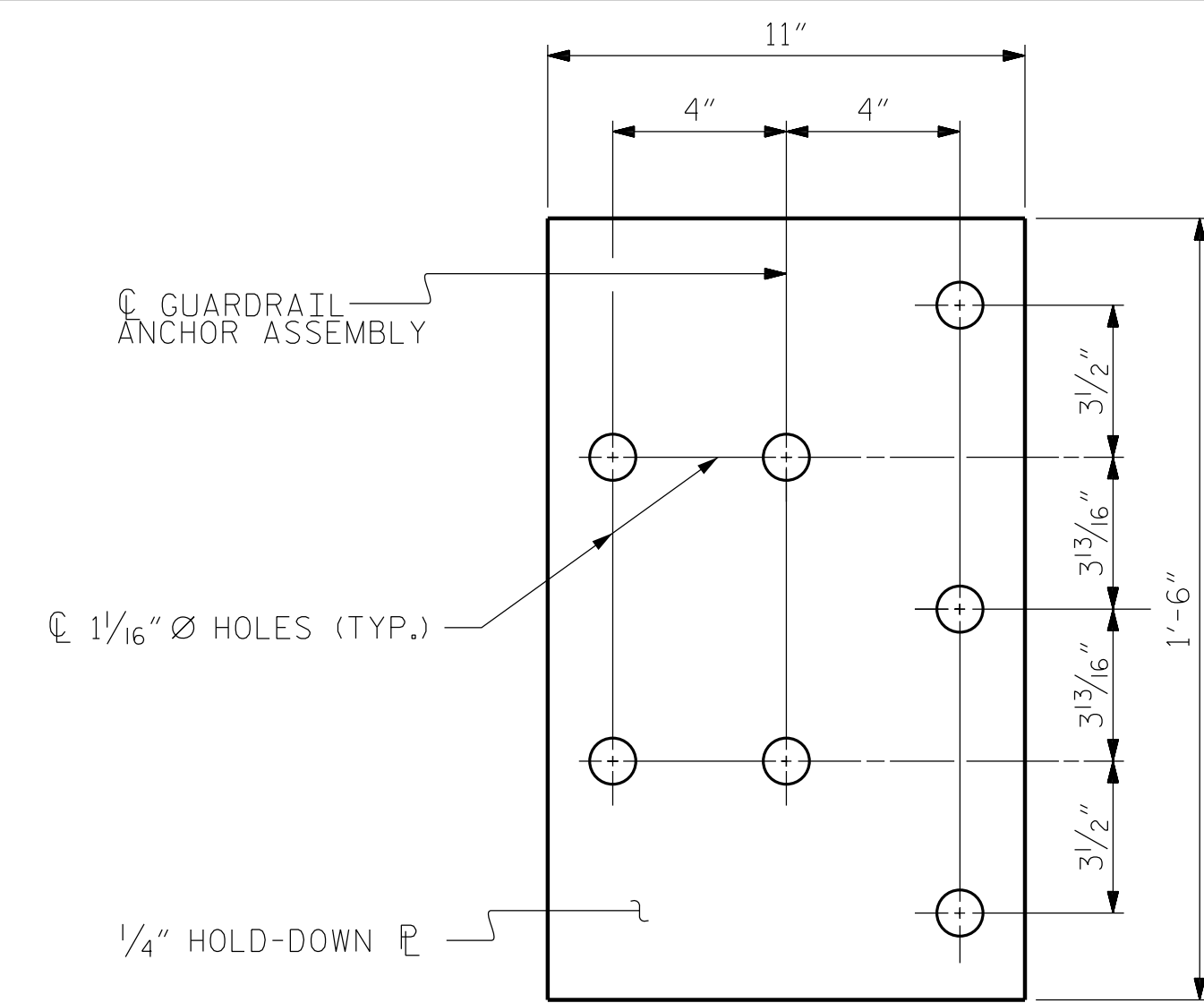
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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.

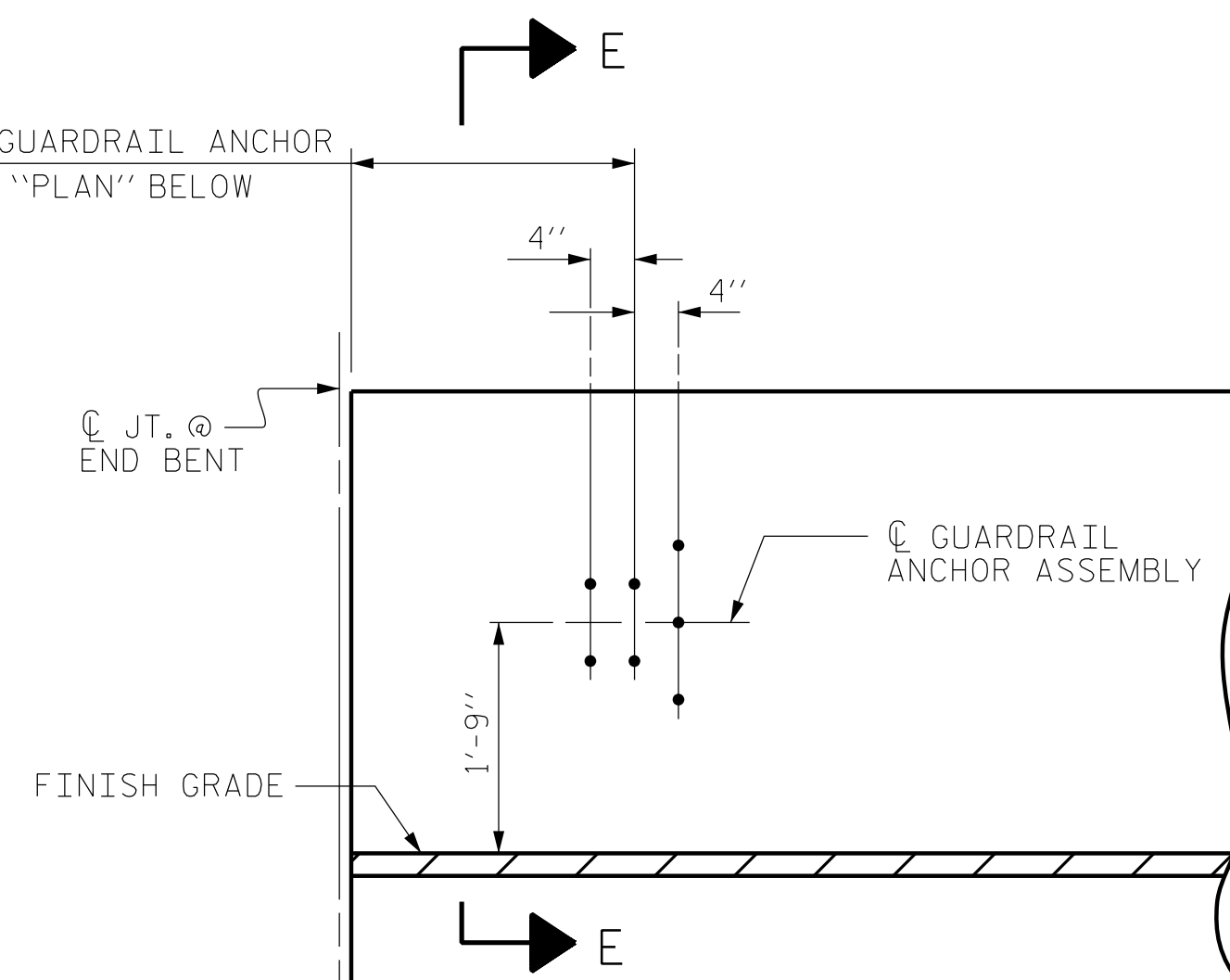
THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE VERTICAL CONCRETE BARRIER RAIL TO CLEAR ASSEMBLY BOLTS.

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.

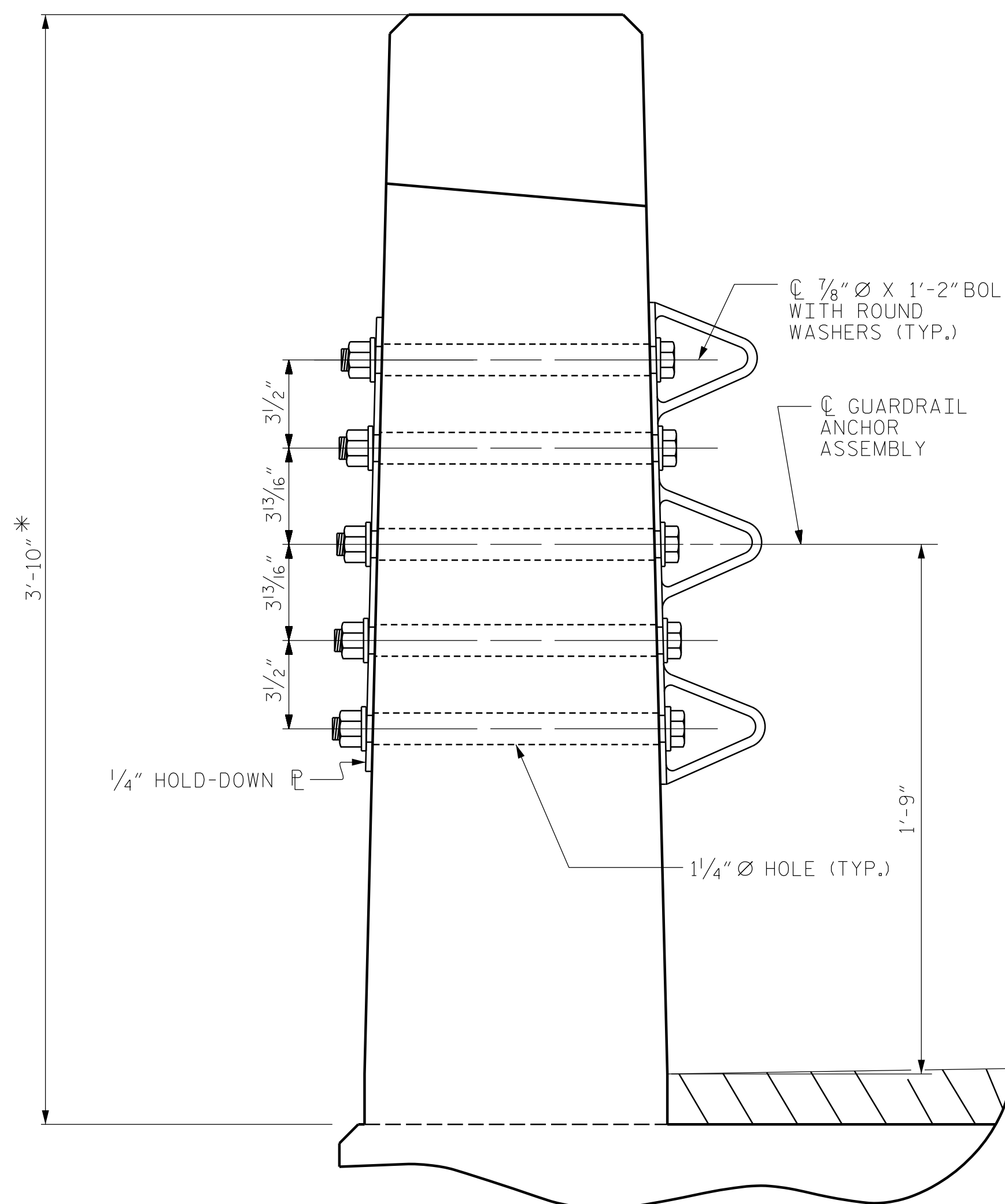


PLAN

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

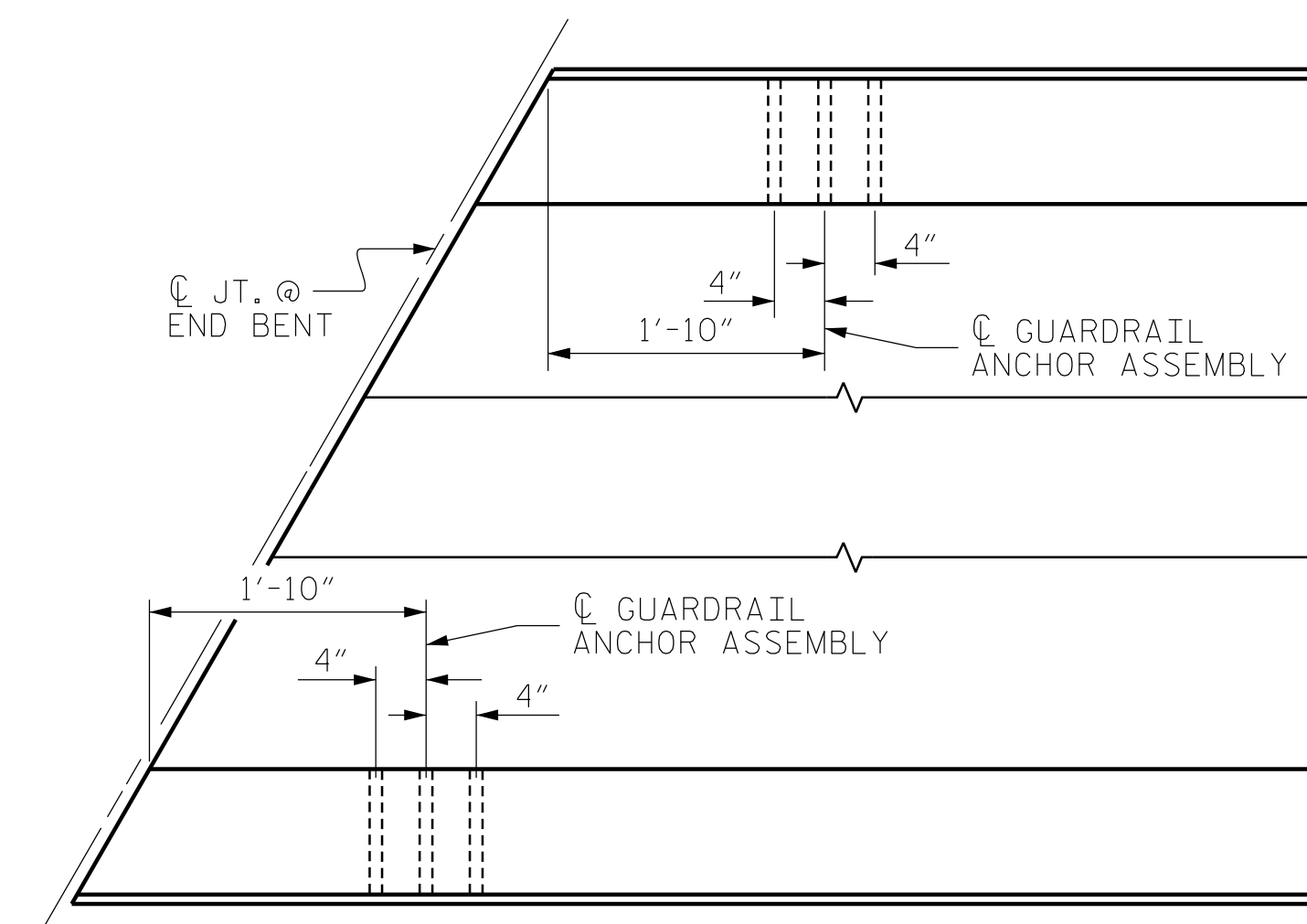


ELEVATION



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

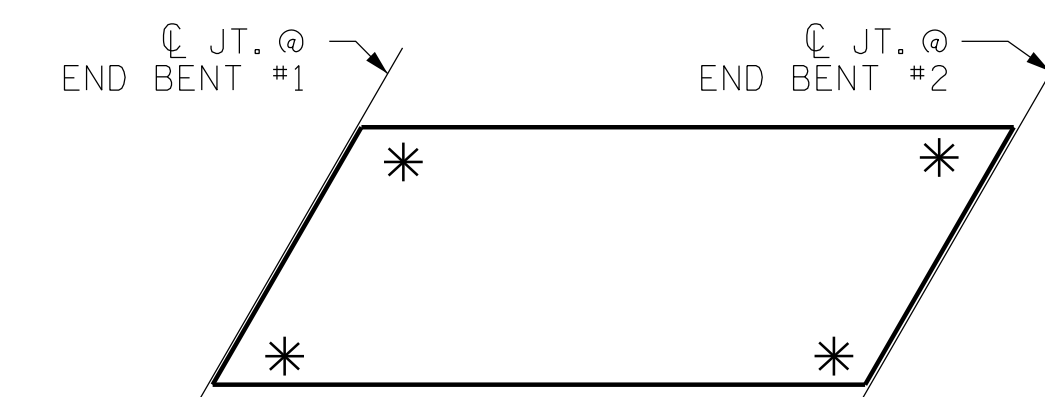
GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

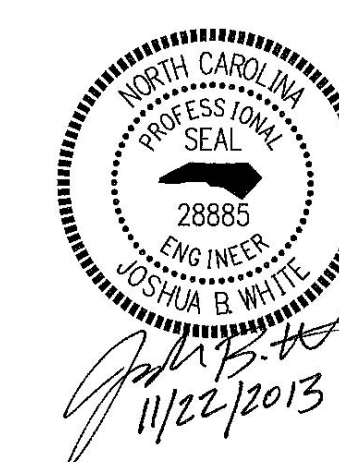
END BENT #1 SHOWN, END BENT #2 SIMILAR.



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
	REV. 12/5/11
	MAA/GM
	MAA/GM

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

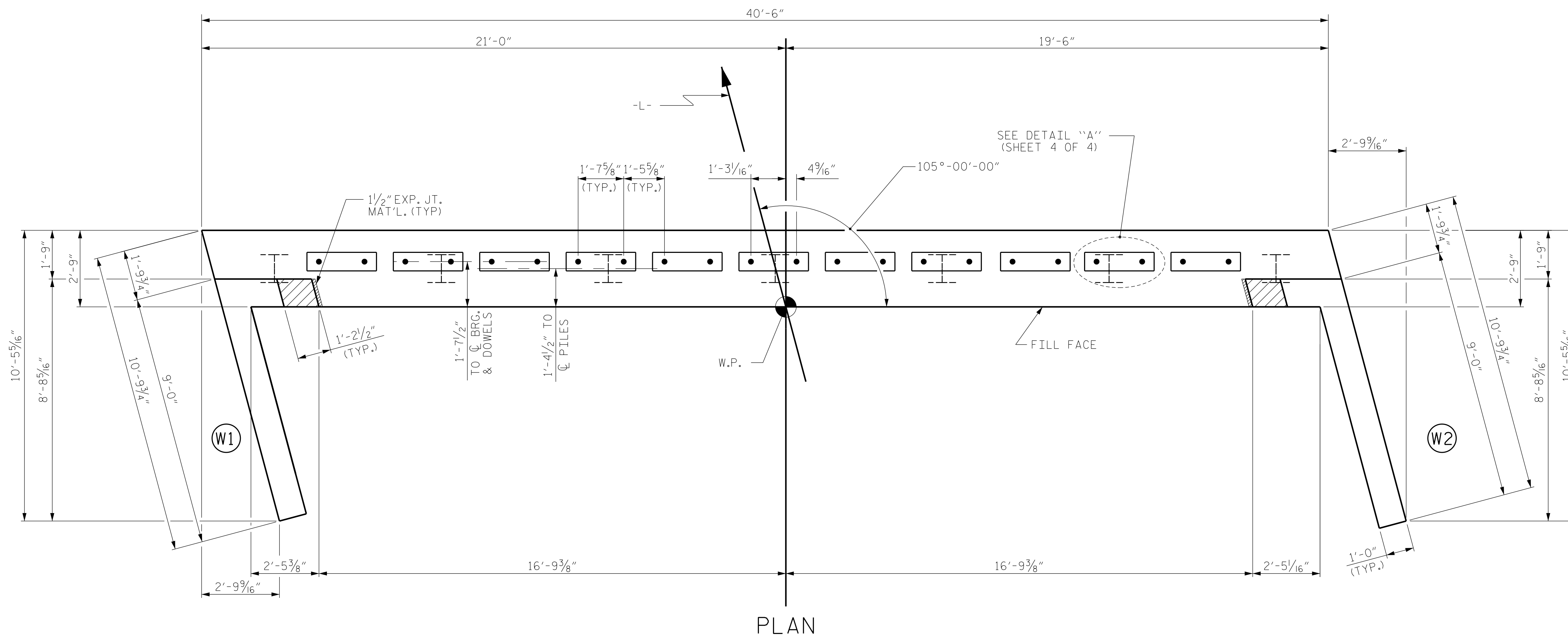
NOTES

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

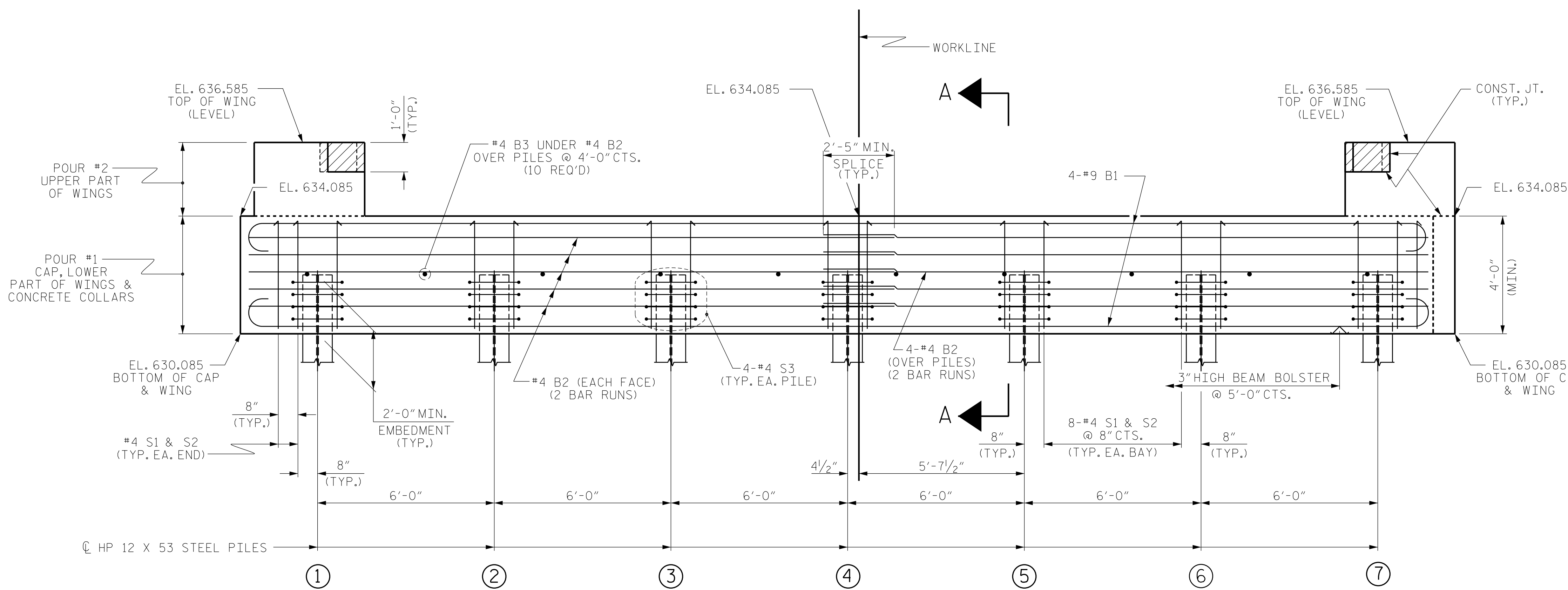
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.



PLAN

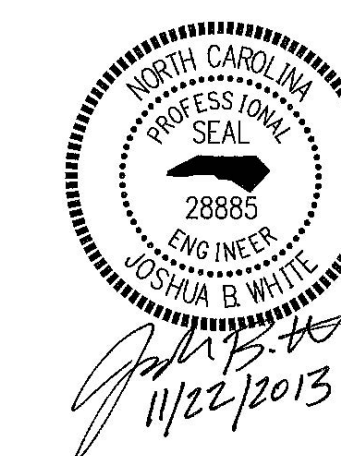


ELEVATION

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.

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

STD. NO. EB_33_105S4

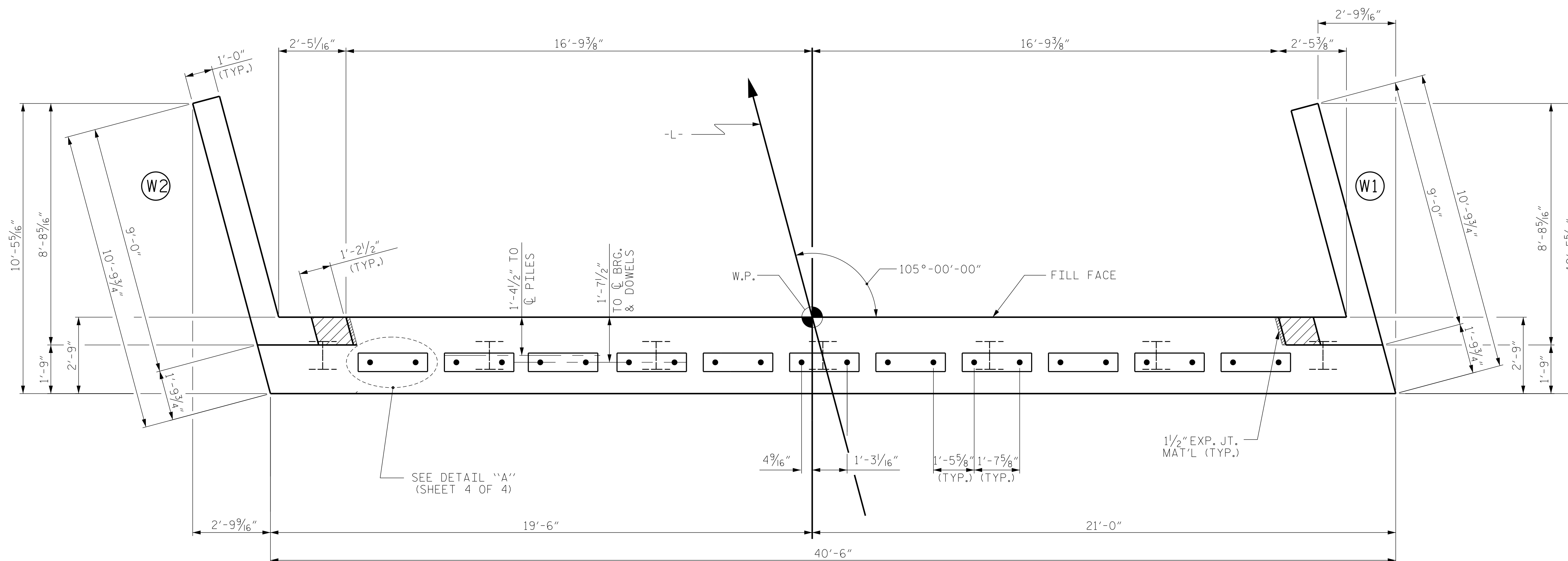
NOTES

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

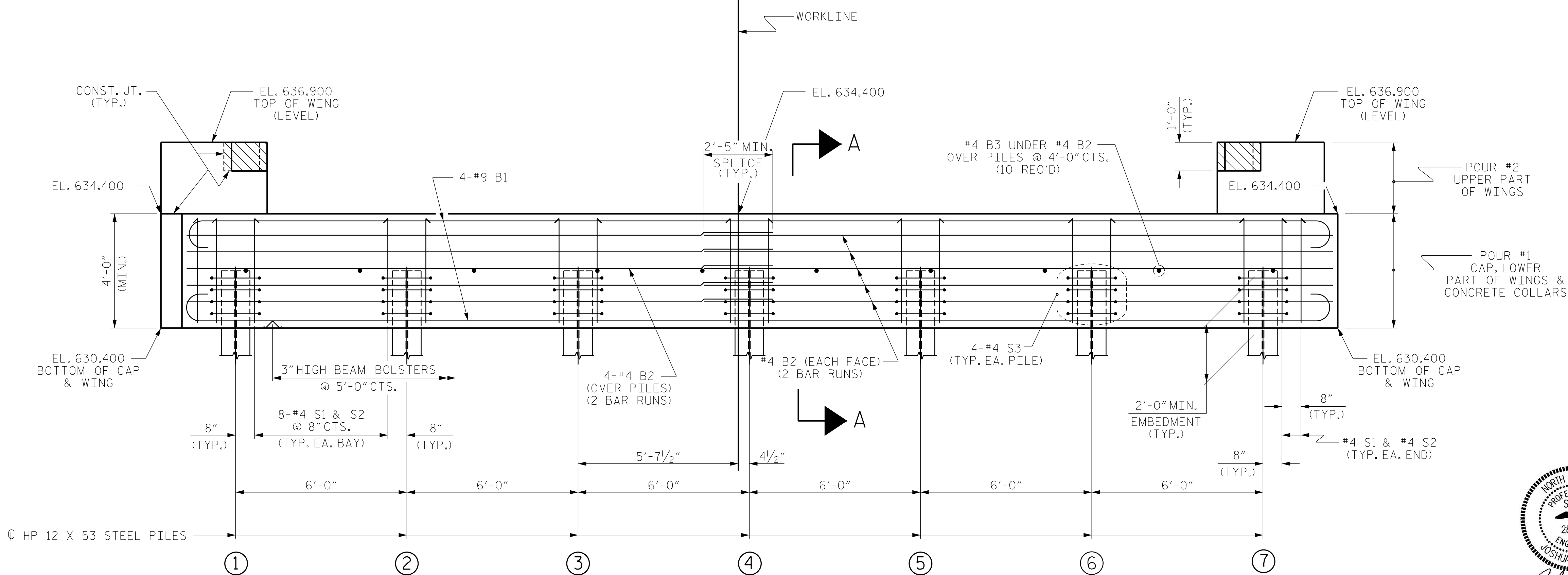
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.



PLAN

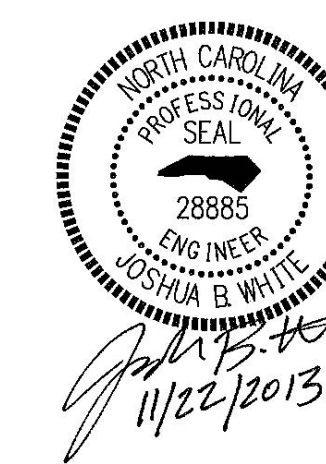


ELEVATION

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

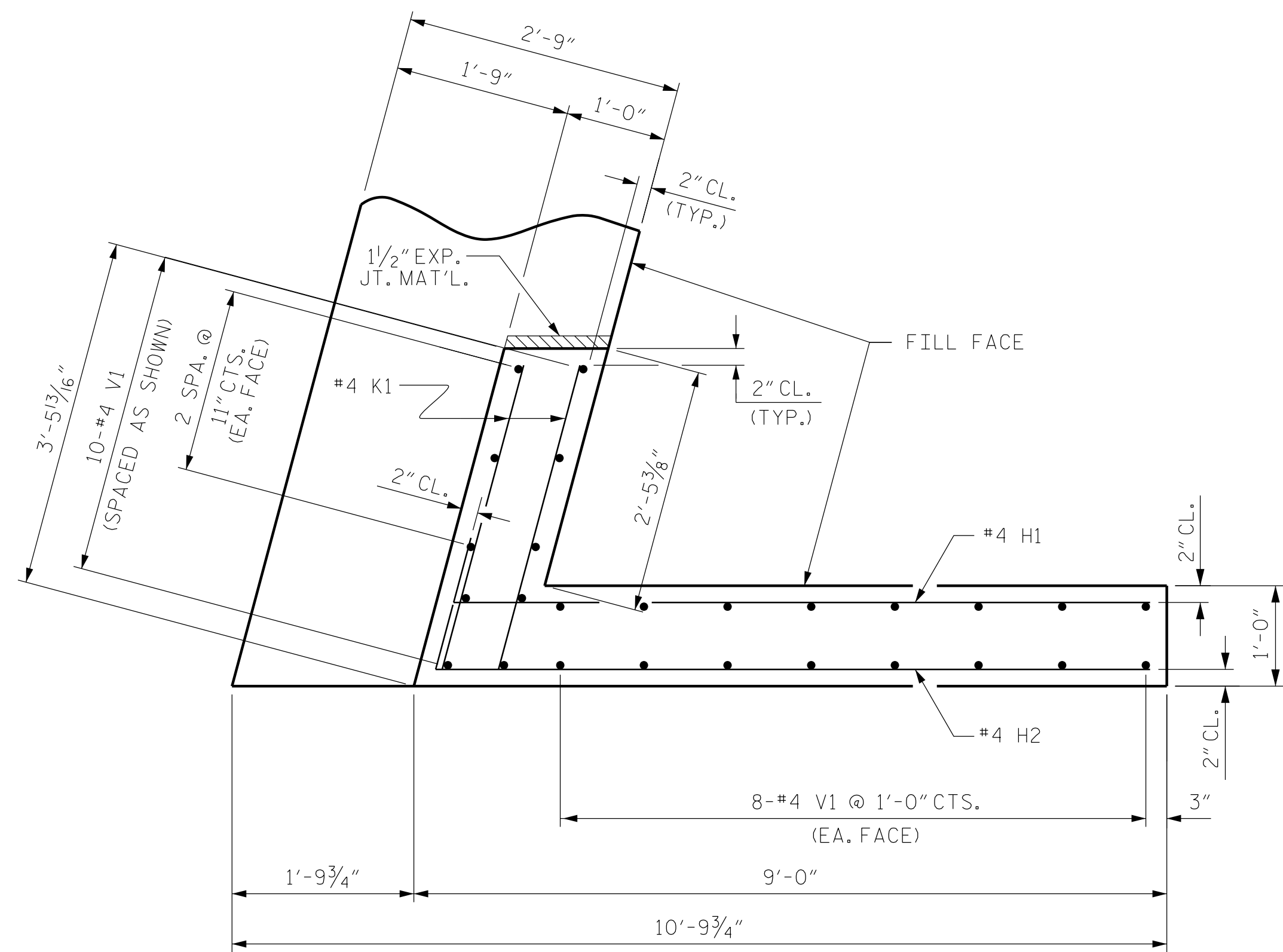


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
END BENT No. 2

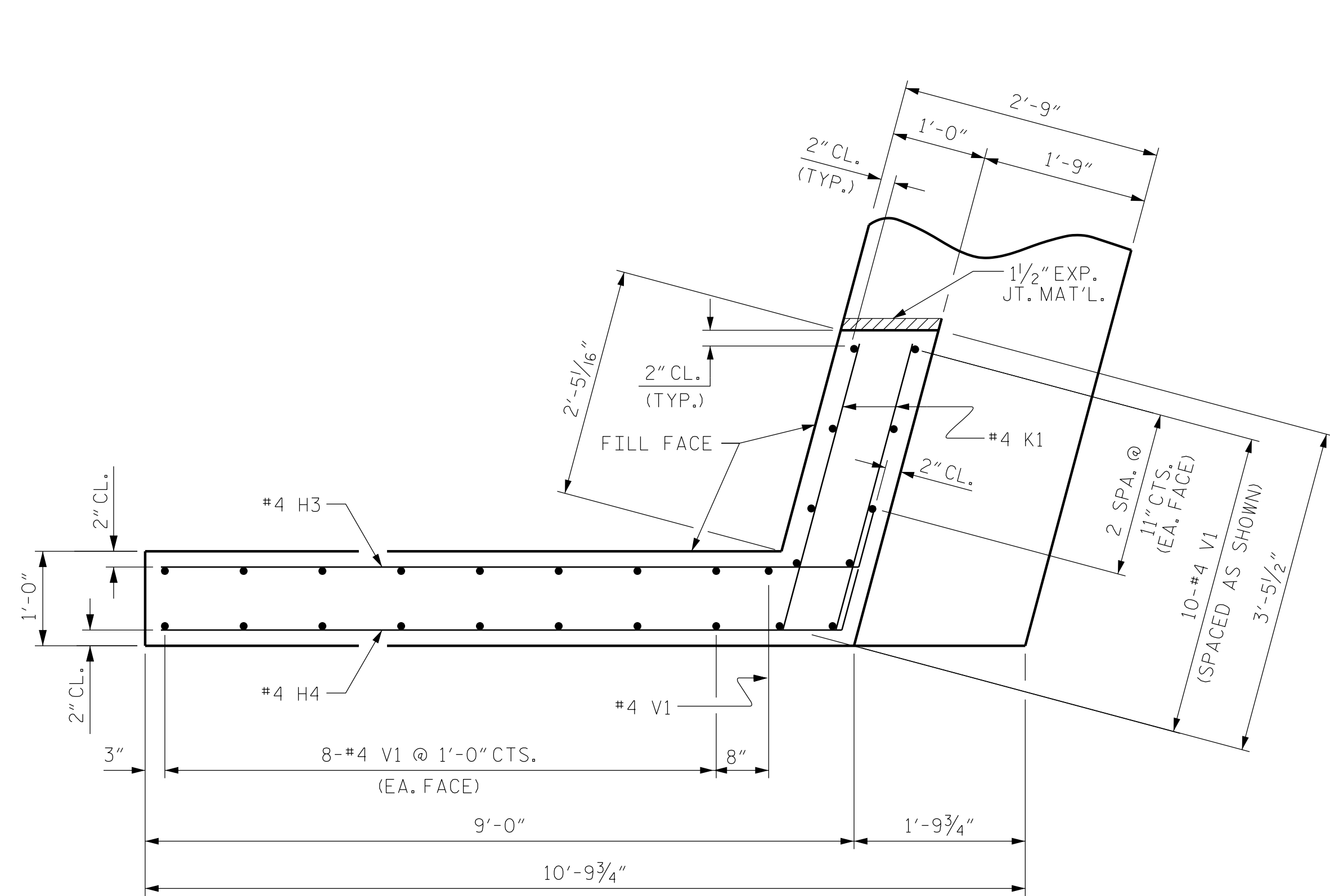
ASSEMBLED BY : JLA	DATE : 10/12
CHECKED BY : JBW	DATE : 11/12
DRAWN BY : WJH 12/11	
CHECKED BY : AAC 12/11	

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

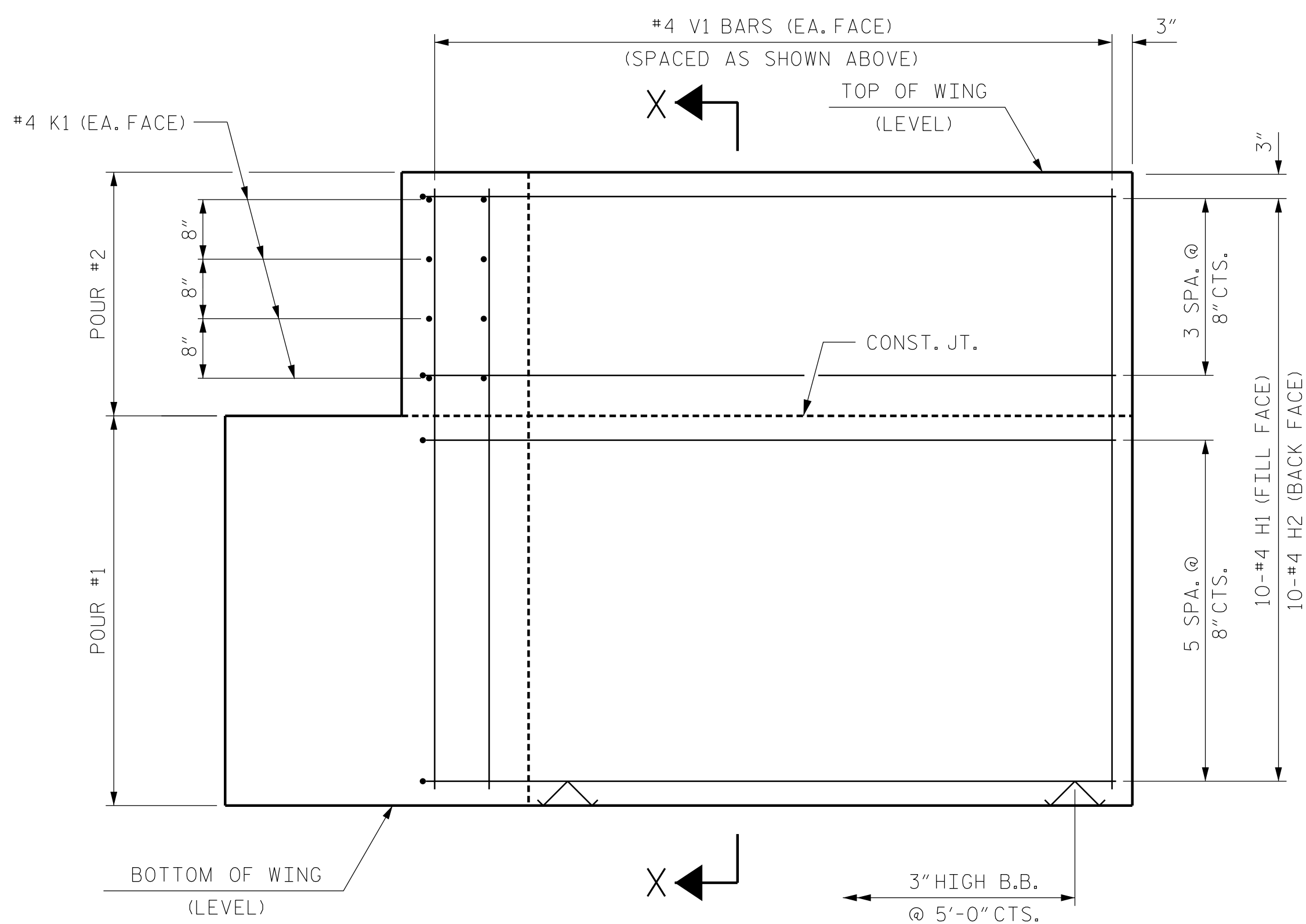
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			23



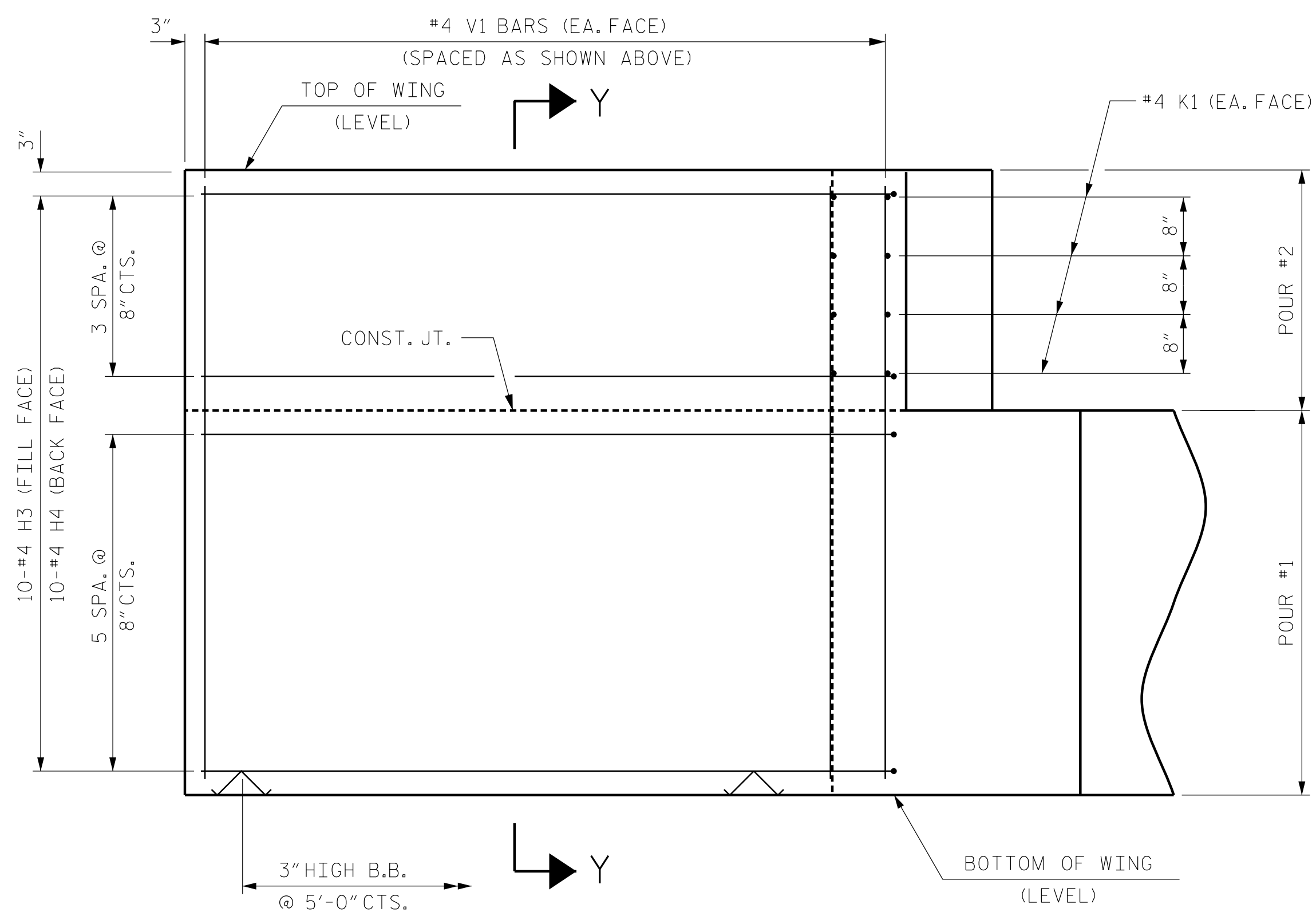
PLAN OF WING (W1)



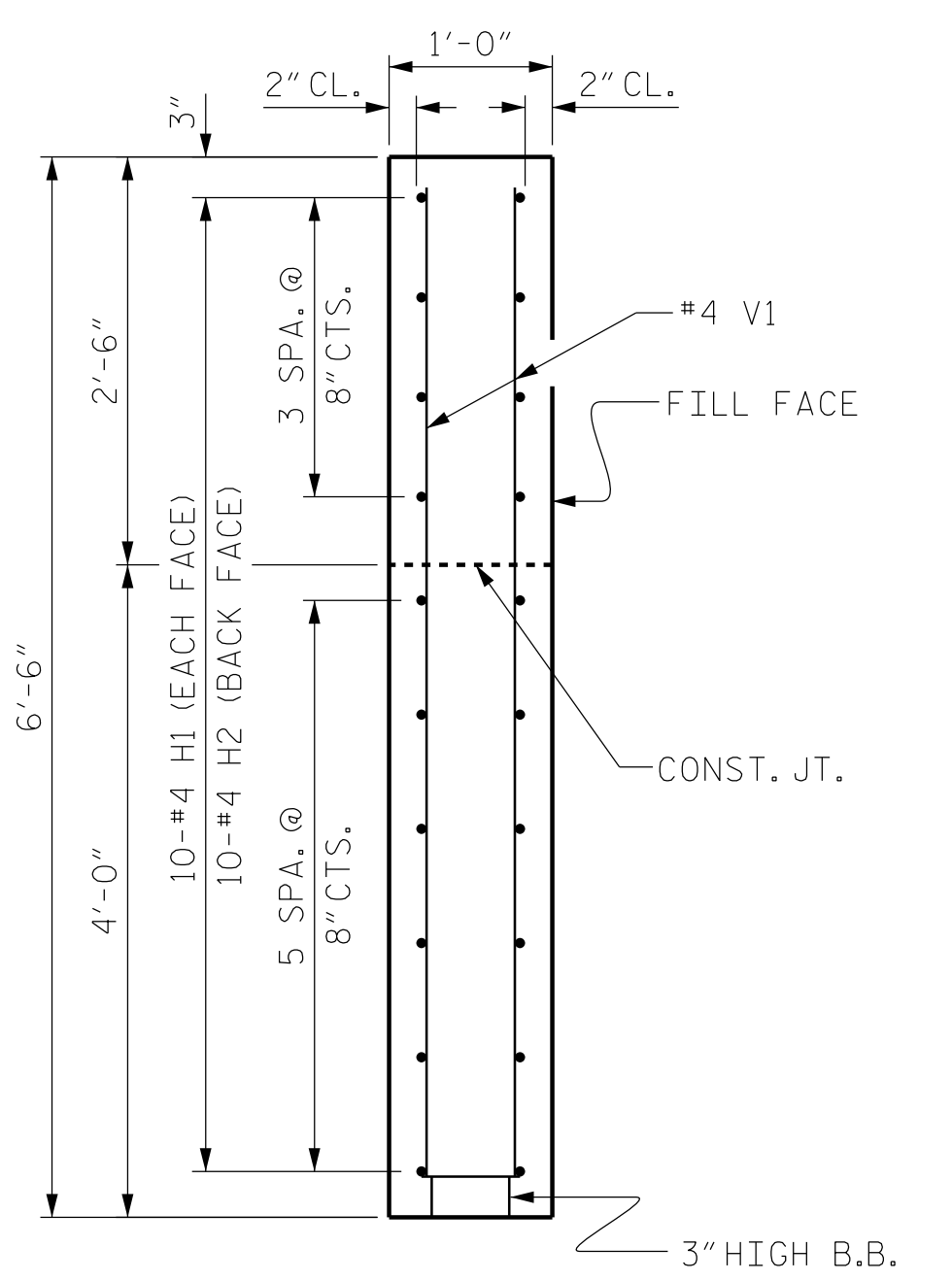
PLAN OF WING (W2)



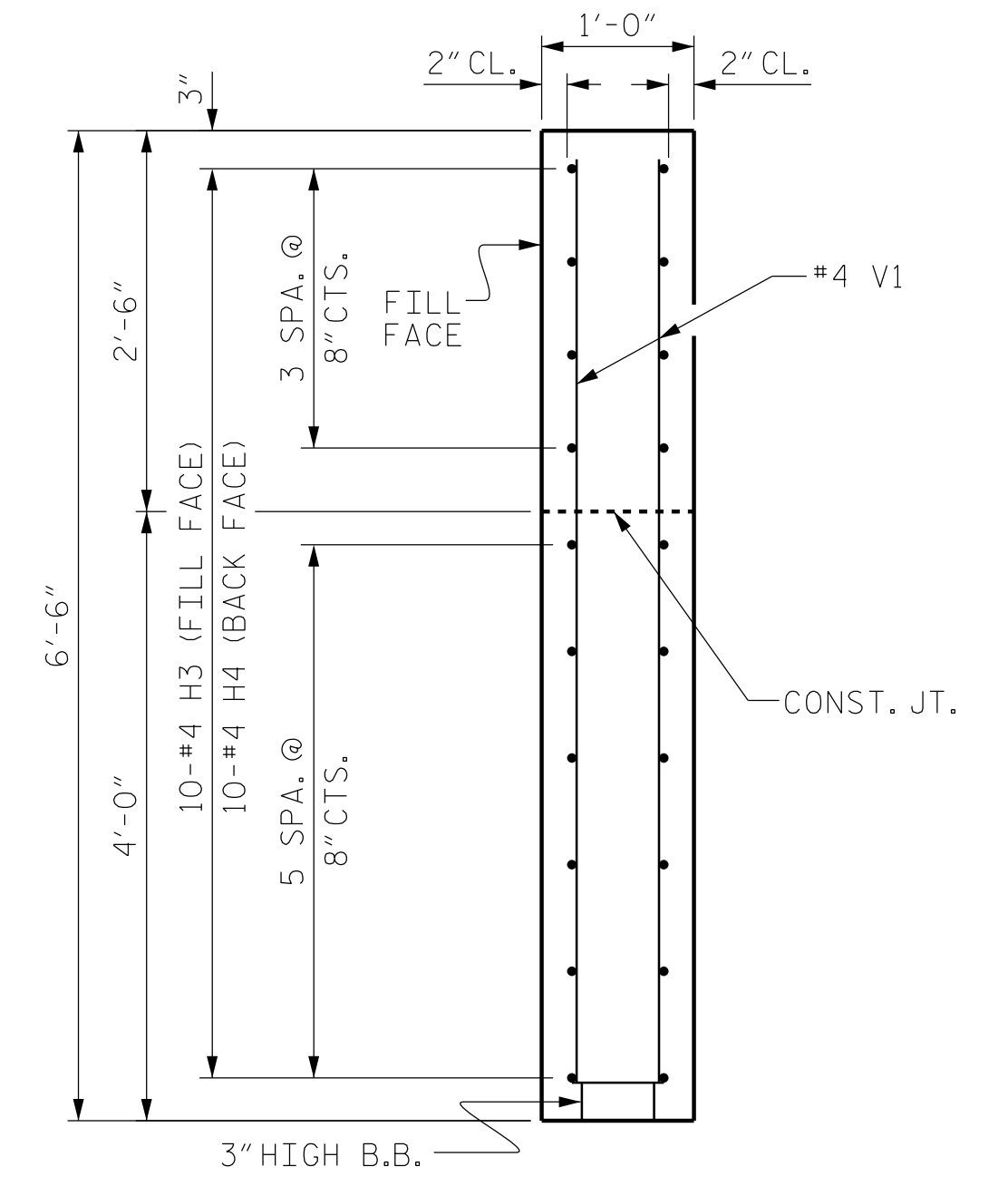
ELEVATION OF WING (W1)



ELEVATION OF WING (W2)



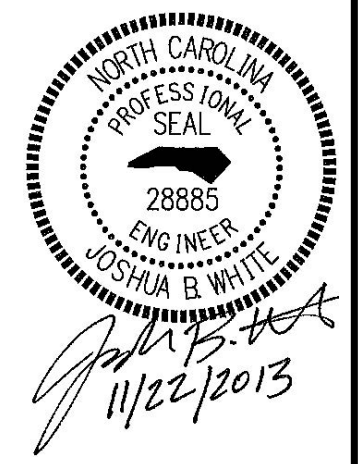
SECTION X-X



SECTION Y-Y

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

SHEET 3 OF 4



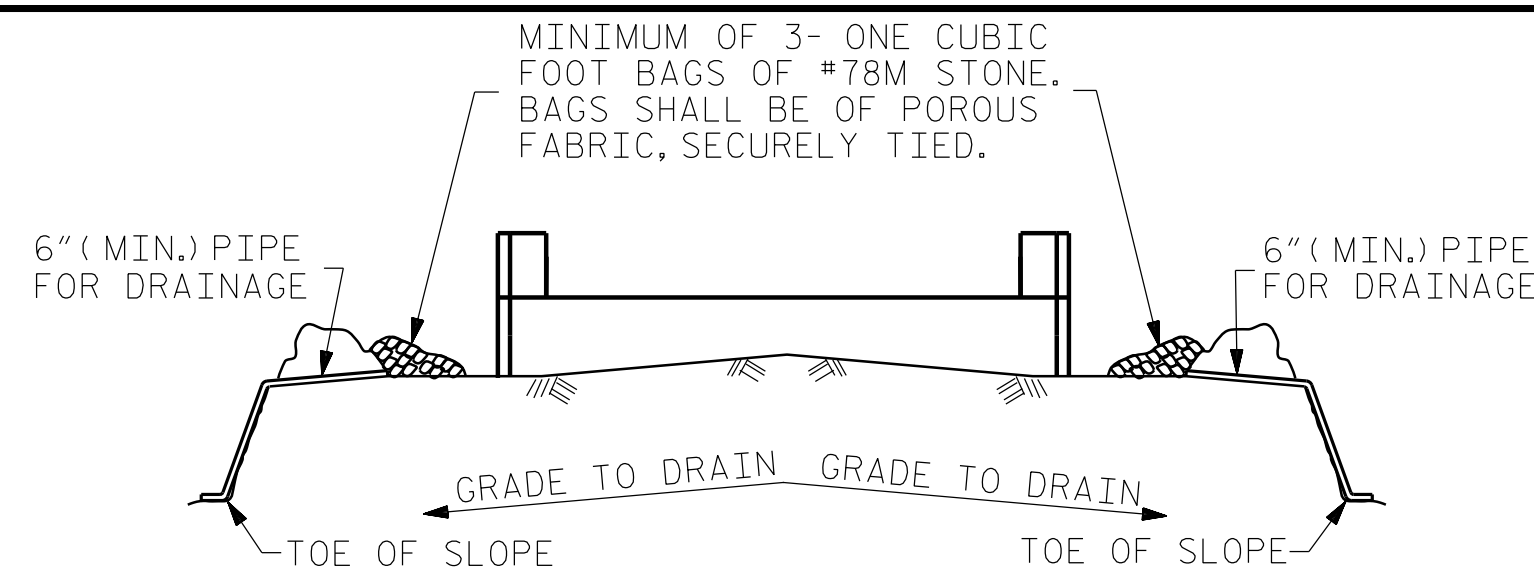
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT
 WING DETAILS

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	

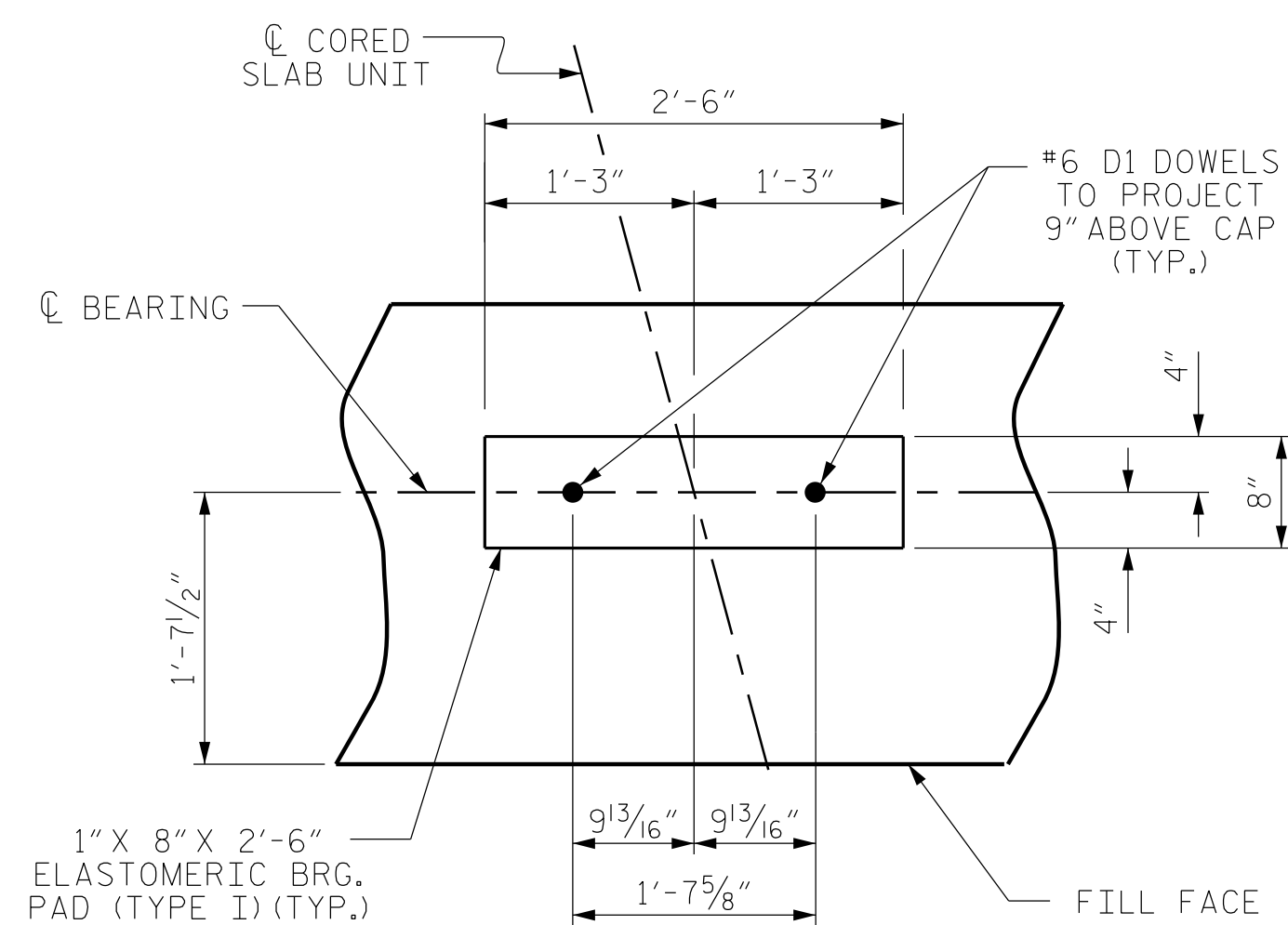


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

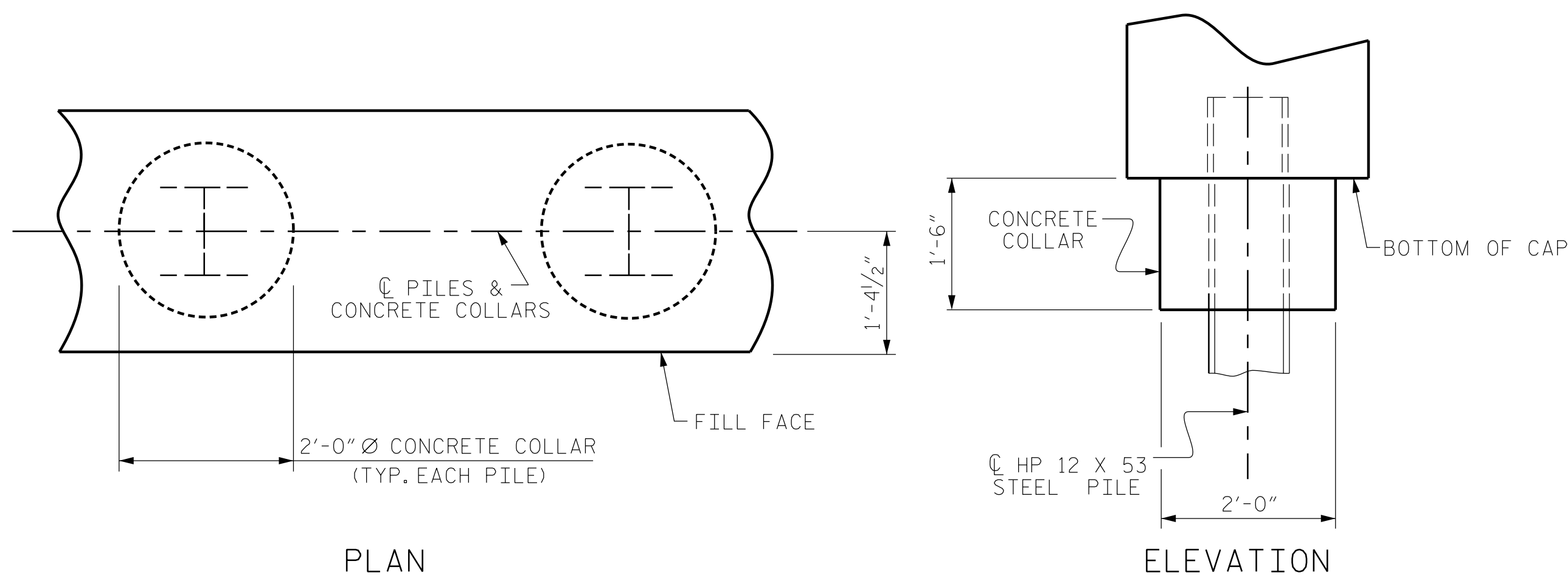
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



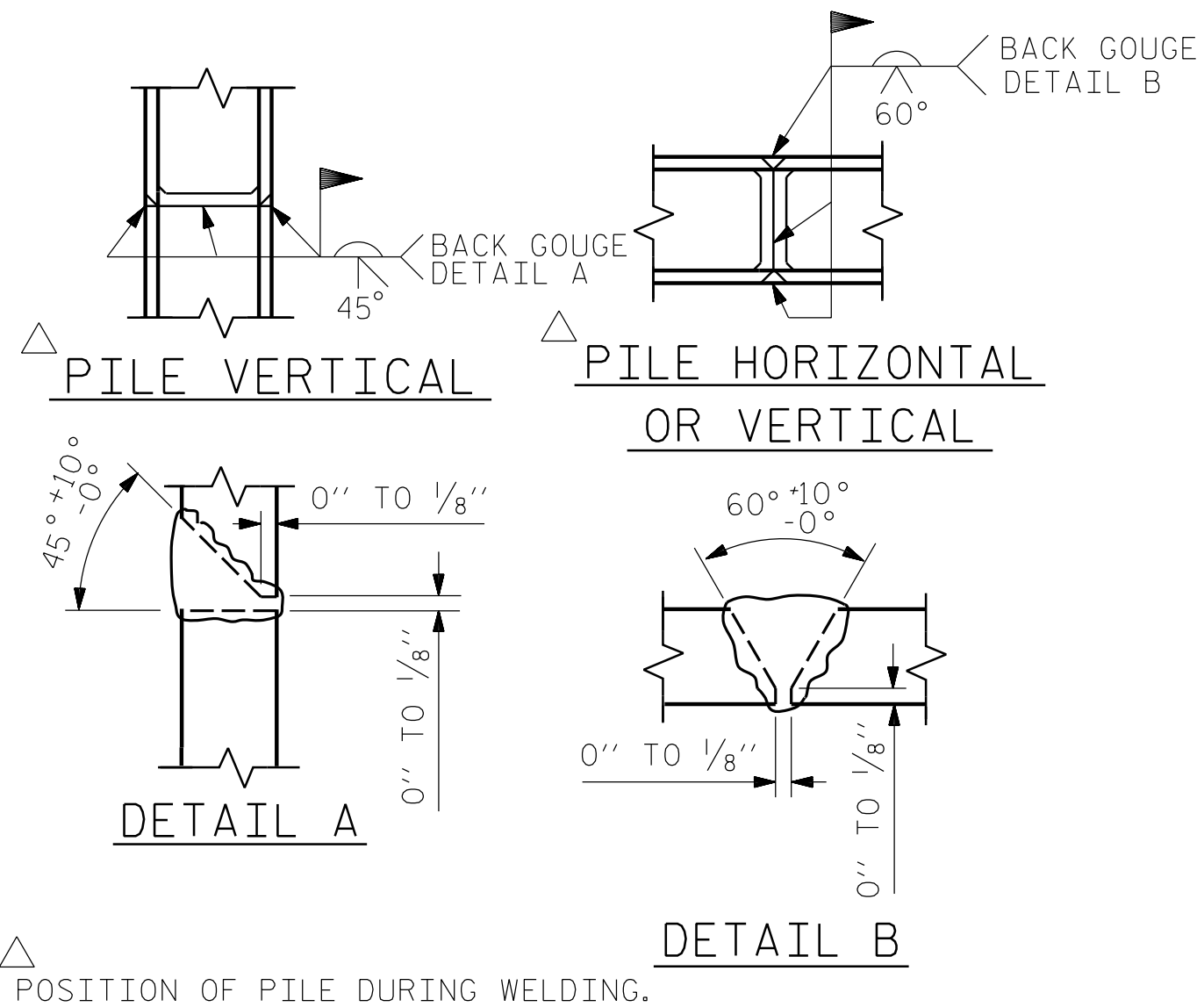
DETAIL "A"

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



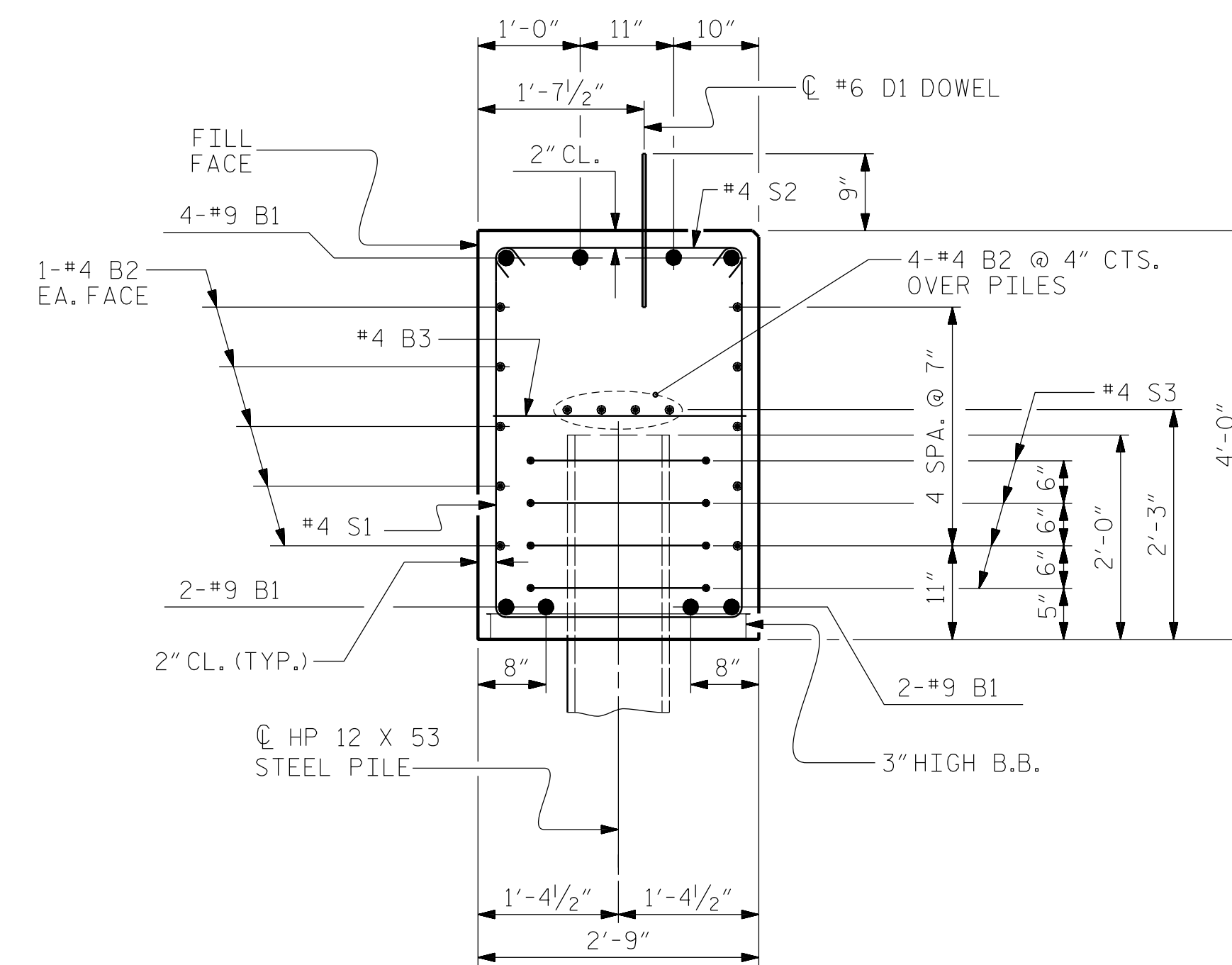
CORROSION PROTECTION FOR STEEL PILES DETAIL

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

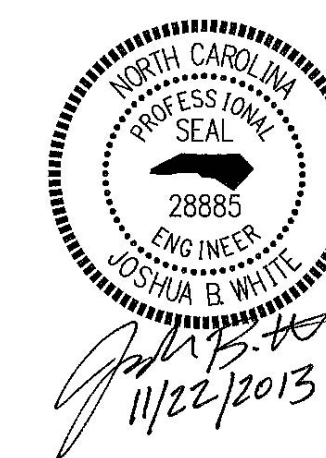


BAR TYPES	
<p>1</p>	<p>2</p>
<p>3</p>	<p>4</p>
<p>5</p>	<p>6</p>
ALL BAR DIMENSIONS ARE OUT TO OUT.	
END BENT No. 1 HP 12 X 53 STEEL PILES NO: 7 LIN. FT. = 245	END BENT No. 2 HP 12 X 53 STEEL PILES NO: 7 LIN. FT. = 245

BILL OF MATERIAL FOR ONE END BENT					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	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	2	9'-1"	61
H2	10	#4	2	9'-3"	62
H3	10	#4	3	9'-6"	63
H4	10	#4	3	9'-4"	62
K1	16	#4	STR	3'-1"	33
S1	52	#4	4	10'-5"	362
S2	52	#4	5	3'-2"	110
S3	28	#4	6	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.



(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.

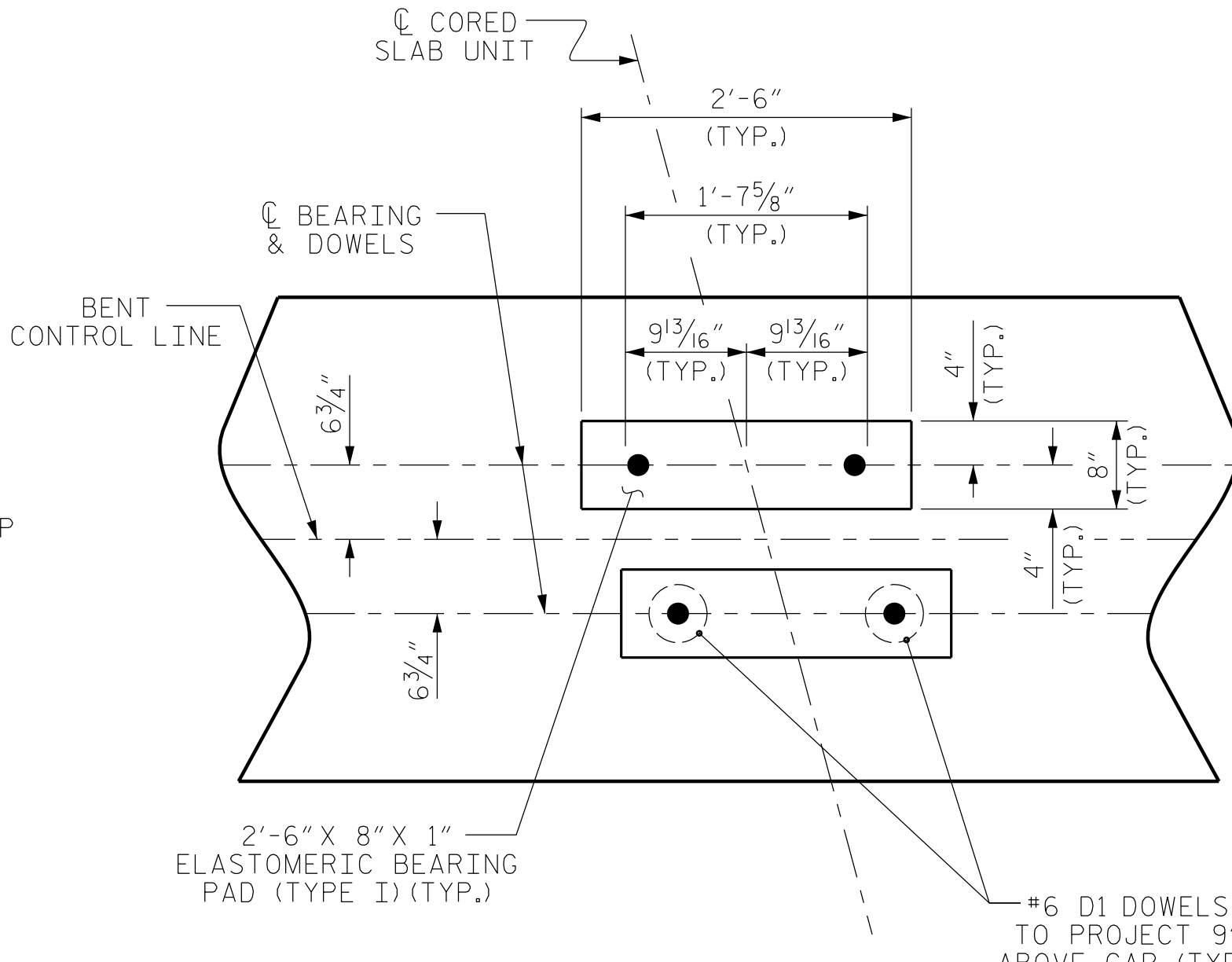
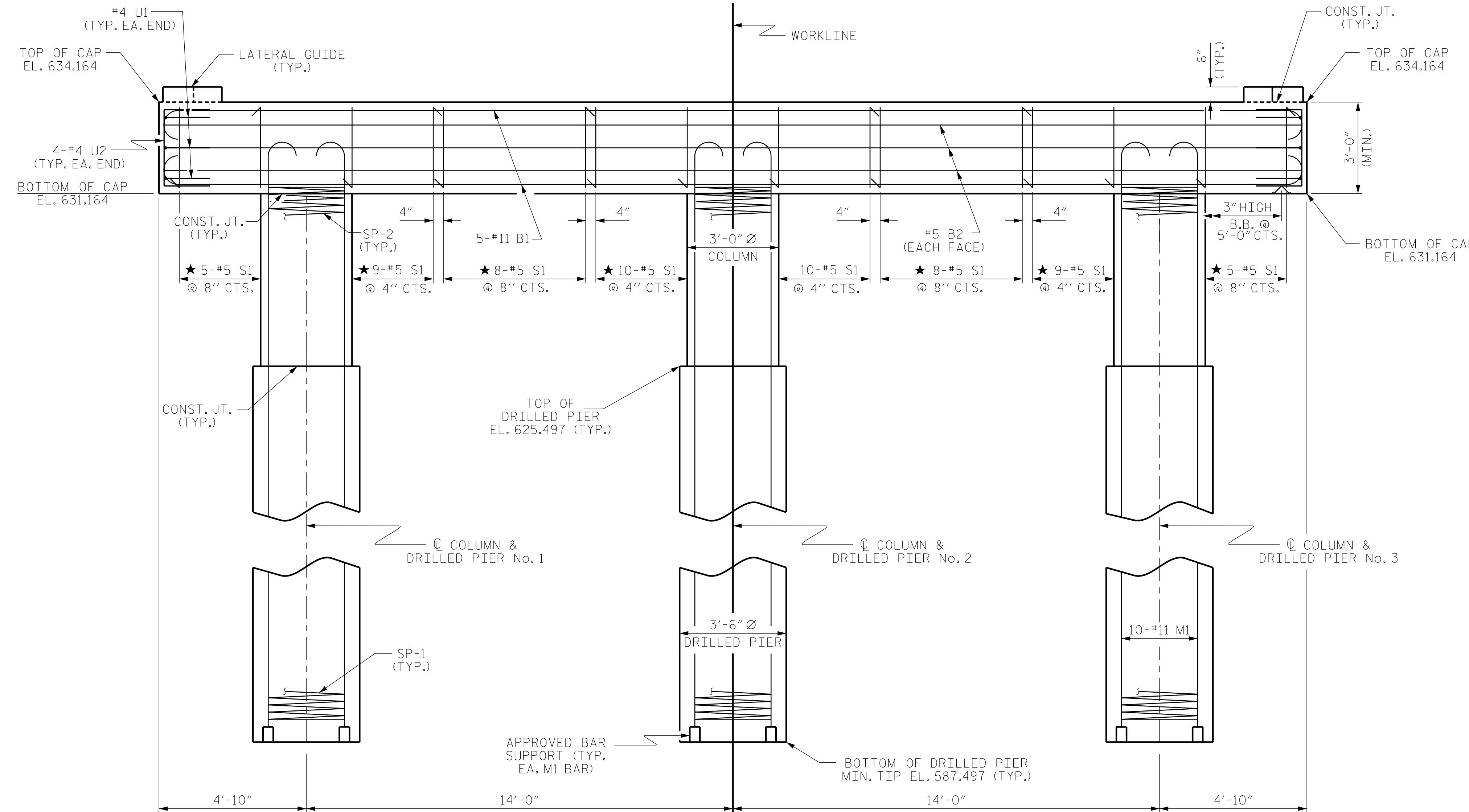
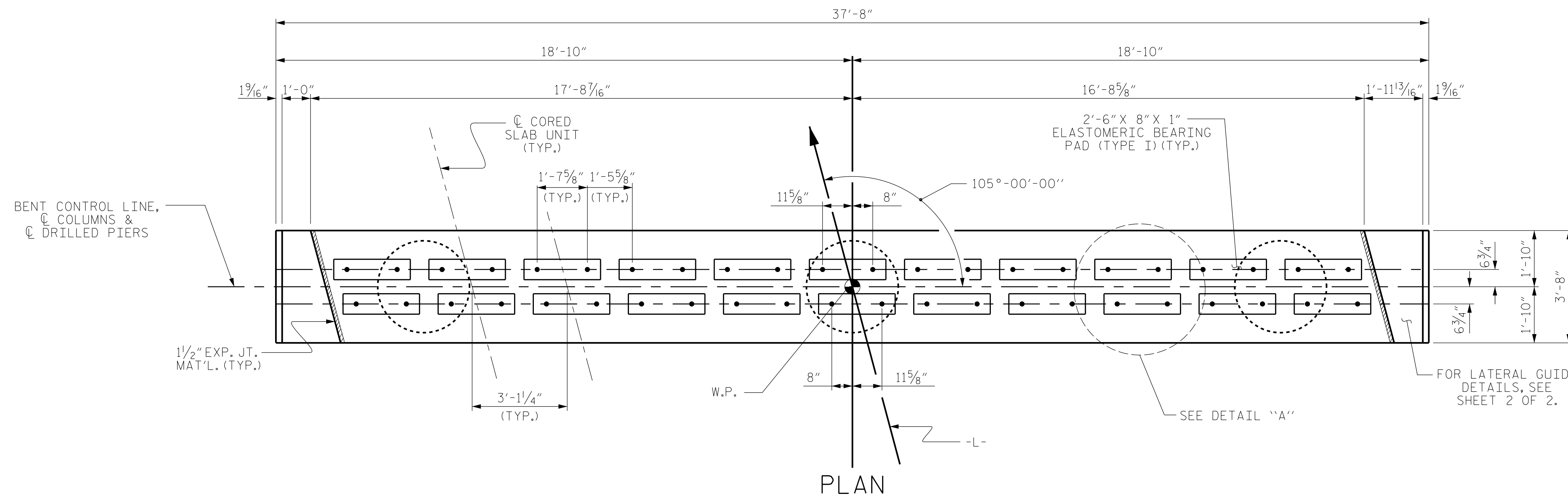
THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND LINE ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT ONE FOOT BELOW THE GROUND LINE.

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.



DETAIL "A"

(DIMENSIONS ARE TYPICAL EACH BEARING)

PROJECT NO. 17BP.12.R.10

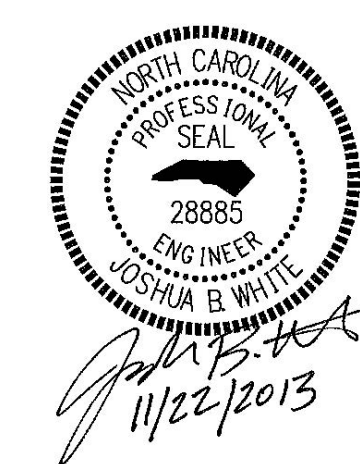
GASTON COUNTY

STATION: 19+61.00-L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT No. 1



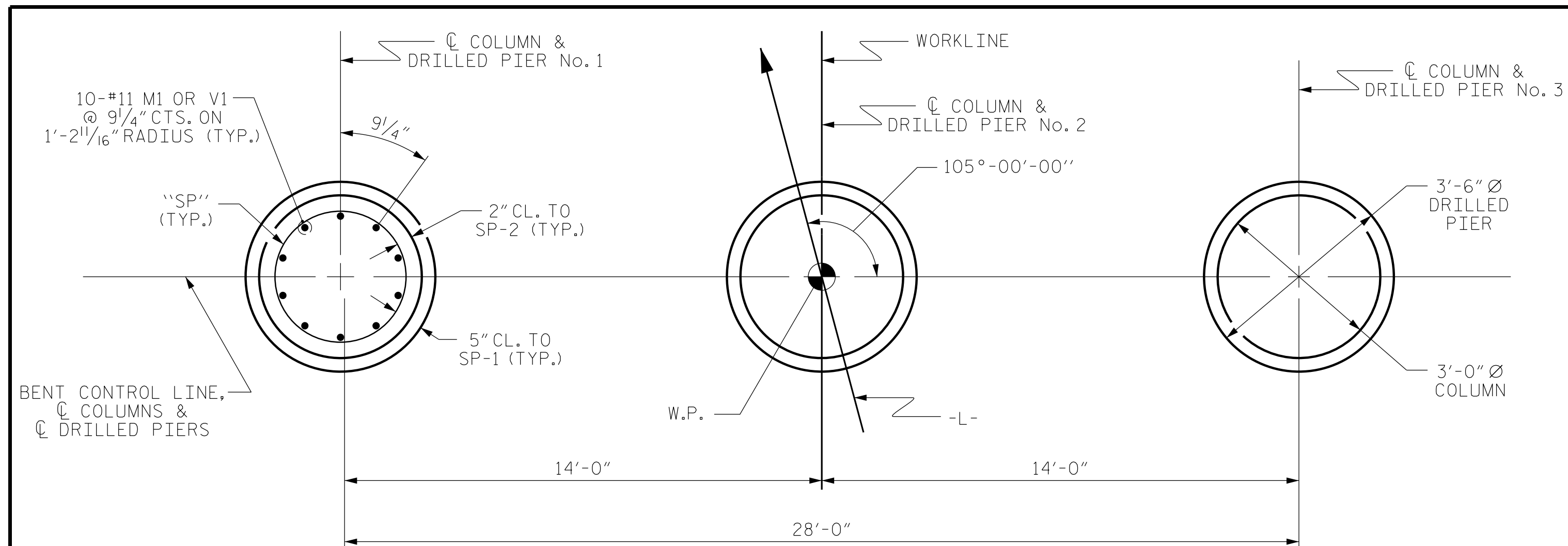
ASSEMBLED BY :	JLA	DATE :	11/12
CHECKED BY :	JBW	DATE :	11/12
DRAWN BY :	DGE	04/10	
CHECKED BY :	MKT	04/10	

ELEVATION

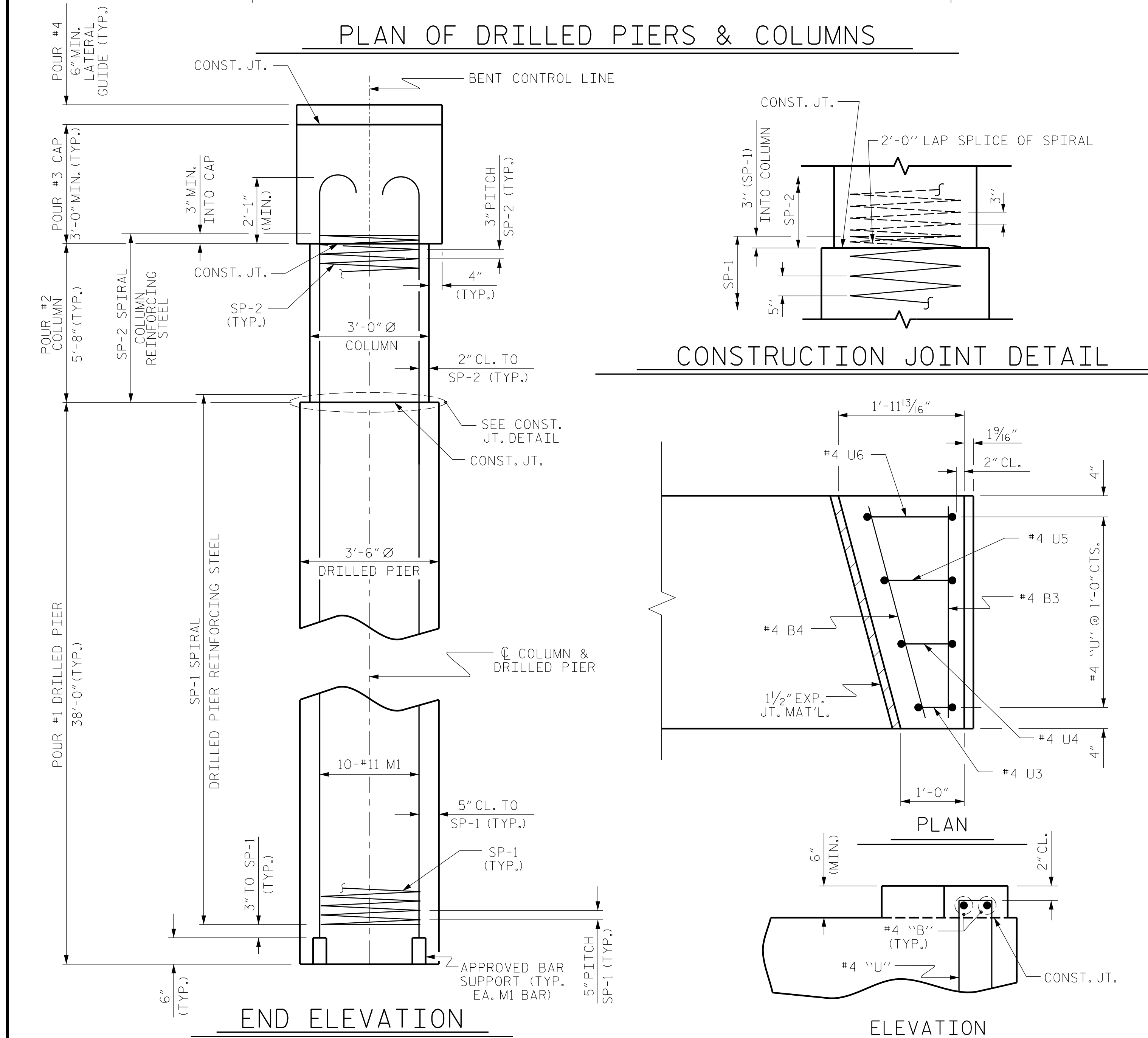
DIMENSIONS & REINFORCING STEEL ARE TYPICAL FOR EACH COLUMN & DRILLED PIER UNLESS OTHERWISE NOTED.

PREPARED BY
TOS 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

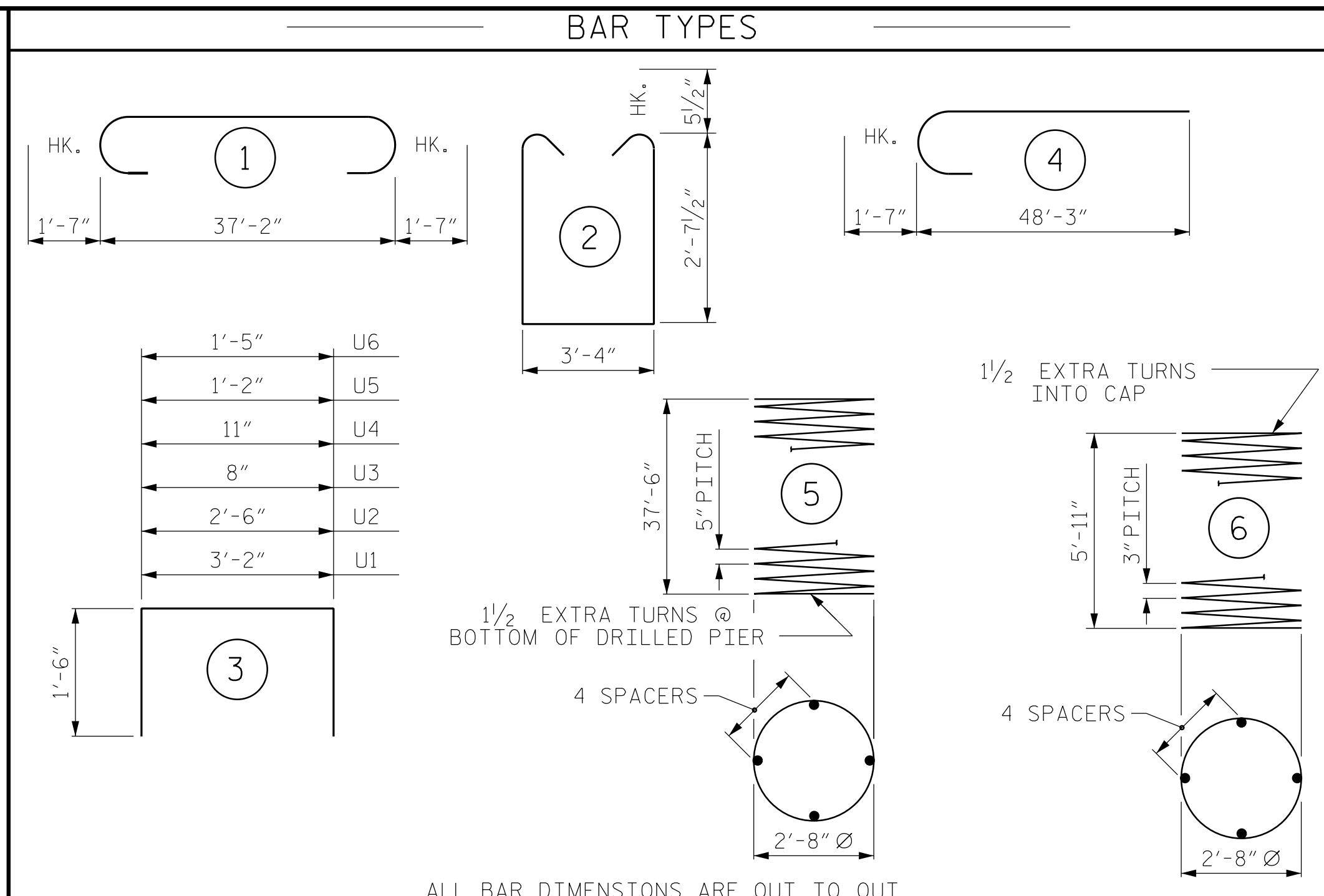


END ELEVATION

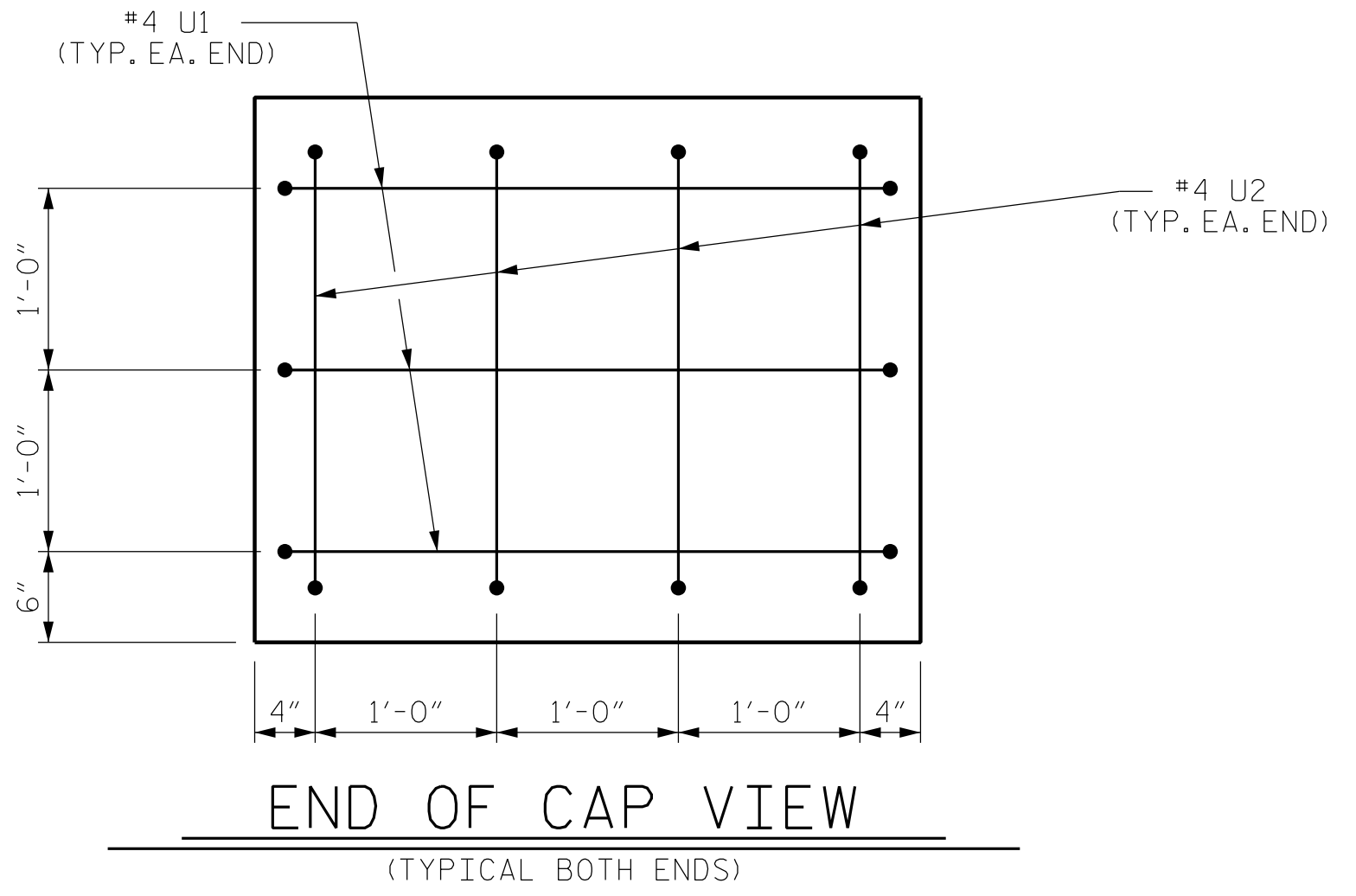
ELEVATION

LATERAL GUIDE DETAILS

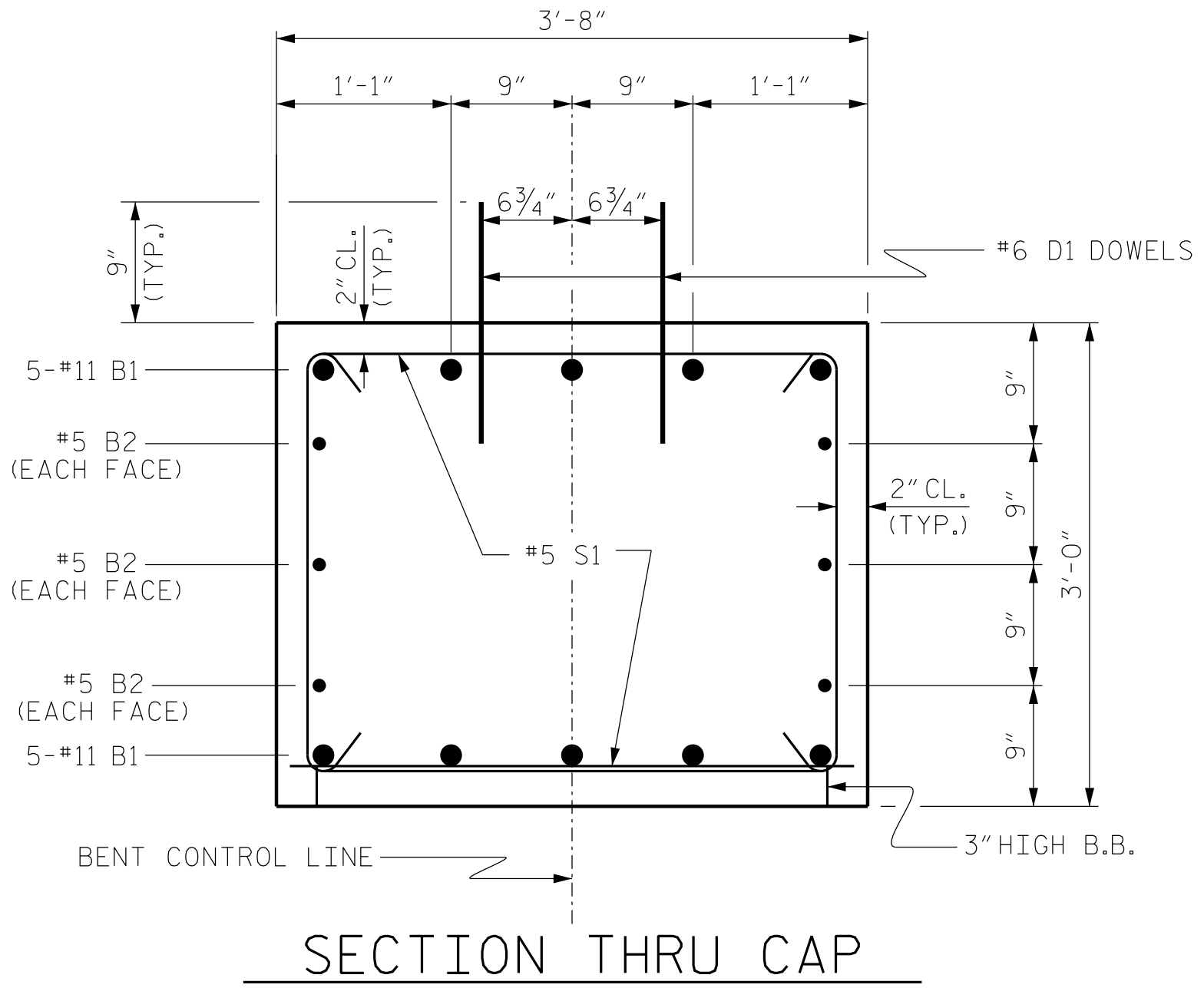
(RIGHT LATERAL GUIDE SHOWN, LEFT SIDE SIMILAR)



ALL BAR DIMENSIONS ARE OUT TO OUT



END OF CAP VIEW



SECTION THRU CAP

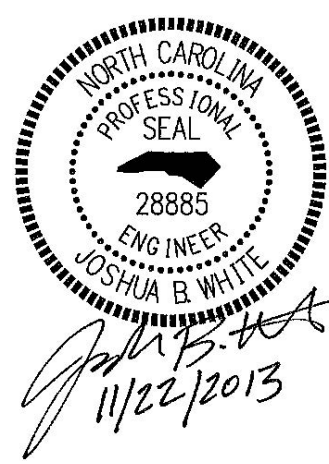
BILL OF MATERIAL FOR ONE BENT					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	10	#11		40'-4"	2,143
B2	6	#5	STR	37'-4"	234
B3	2	#4	STR	3'-4"	4
B4	2	#4	STR	3'-5"	5
D1	44	#6	STR	1'-6"	99
M1	30	#11		49'-10"	7,944
S1	64	#5		9'-6"	634
U1	6	#4		6'-2"	25
U2	8	#4		5'-6"	29
U3	2	#4		3'-8"	5
U1	2	#4		3'-11"	5
U2	2	#4		4'-2"	6
U3	2	#4		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

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.

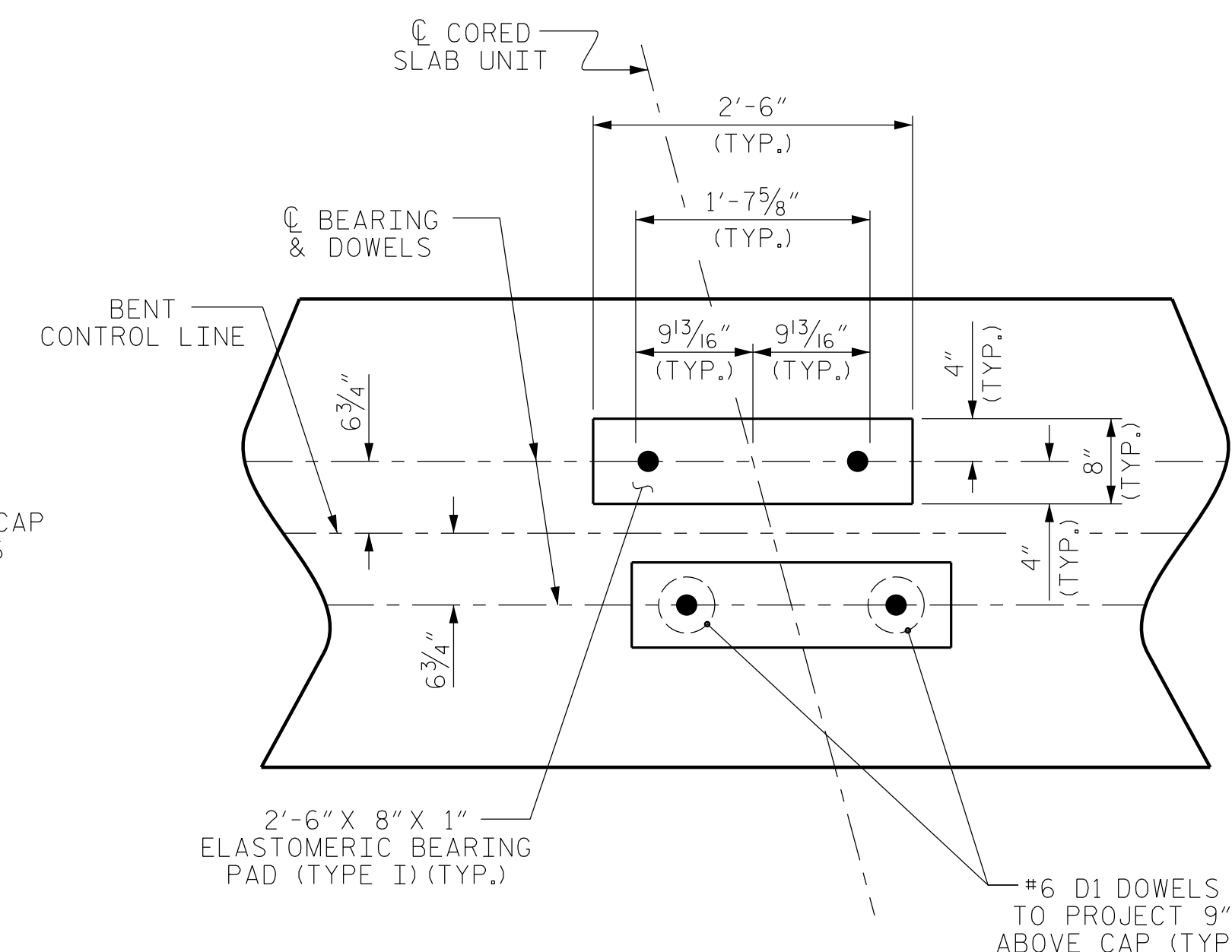
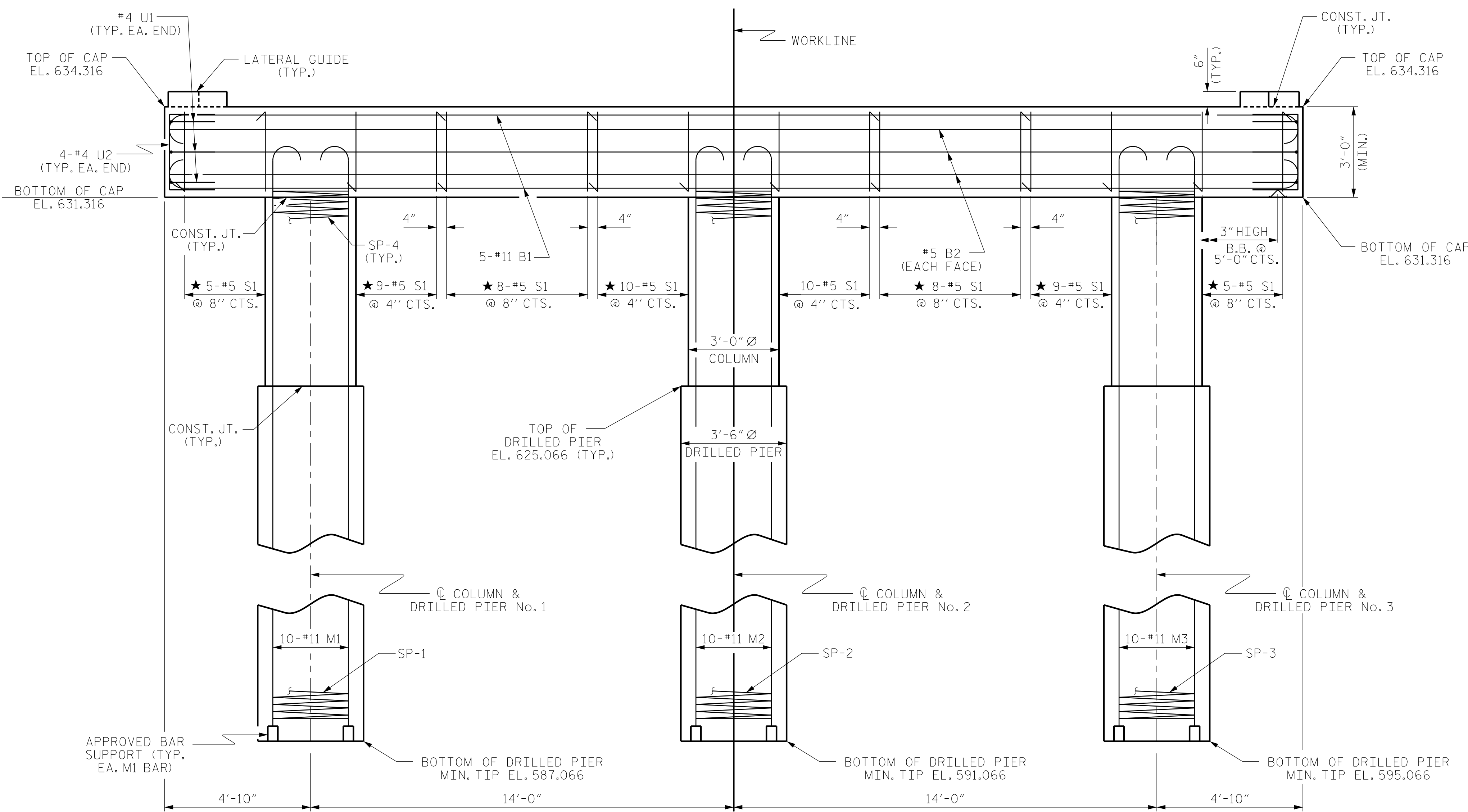
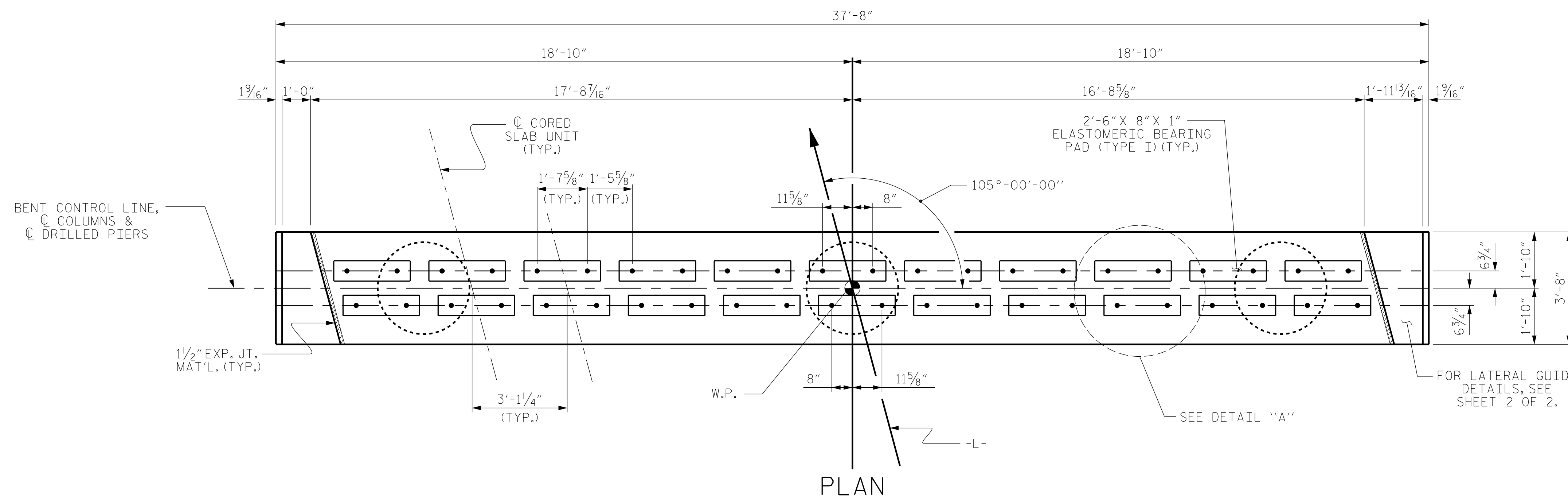
THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND LINE ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT ONE FOOT BELOW THE GROUND LINE.

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.

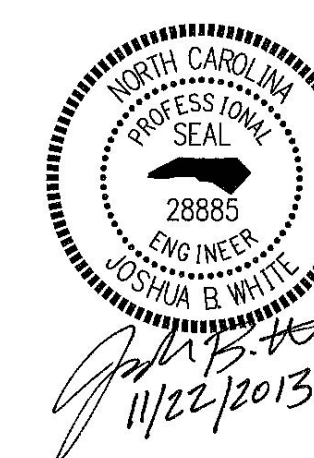


DETAIL "A"

(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. 2

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

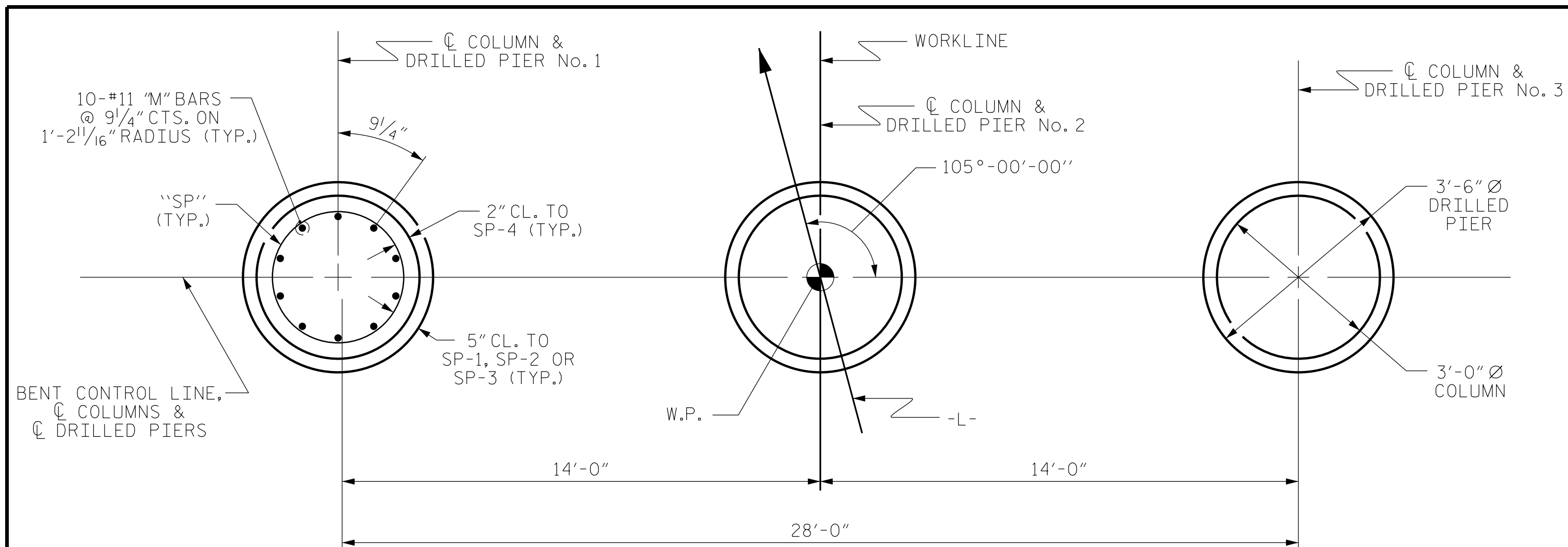
ELEVATION

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

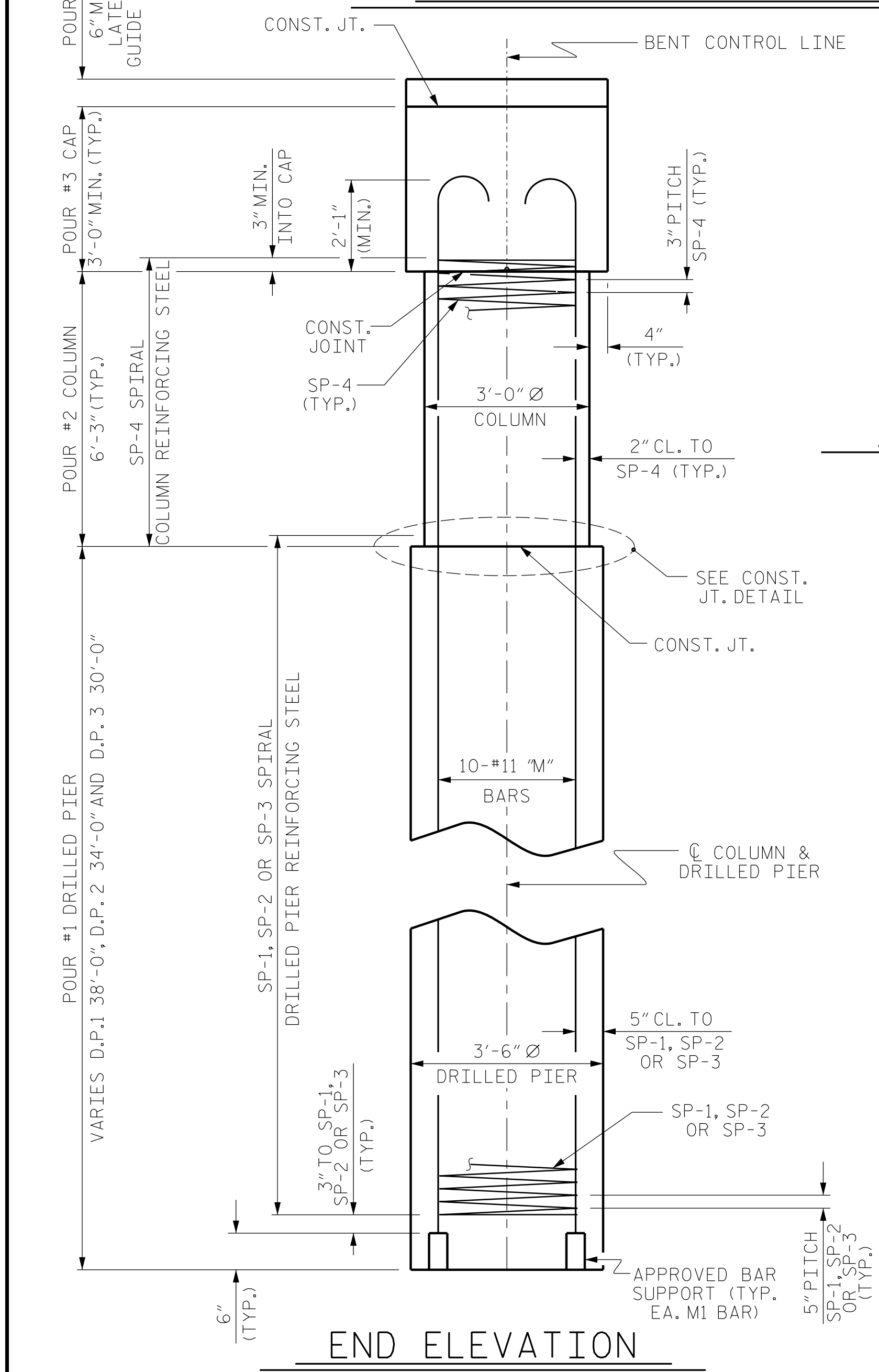
PREPARED BY
TOS ENGINEERS
107-A WICA AVENUE
MORGANTON, NC 28655

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

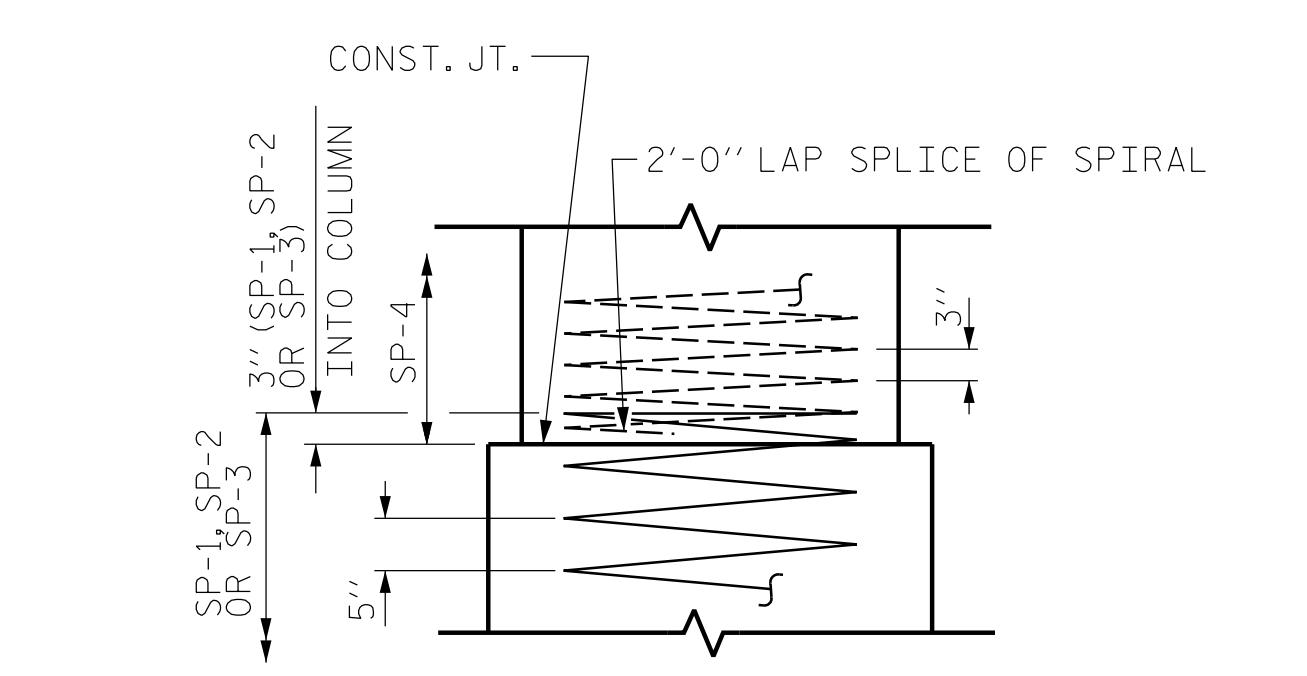
STD. NO. DP_BT_33_105S->50'



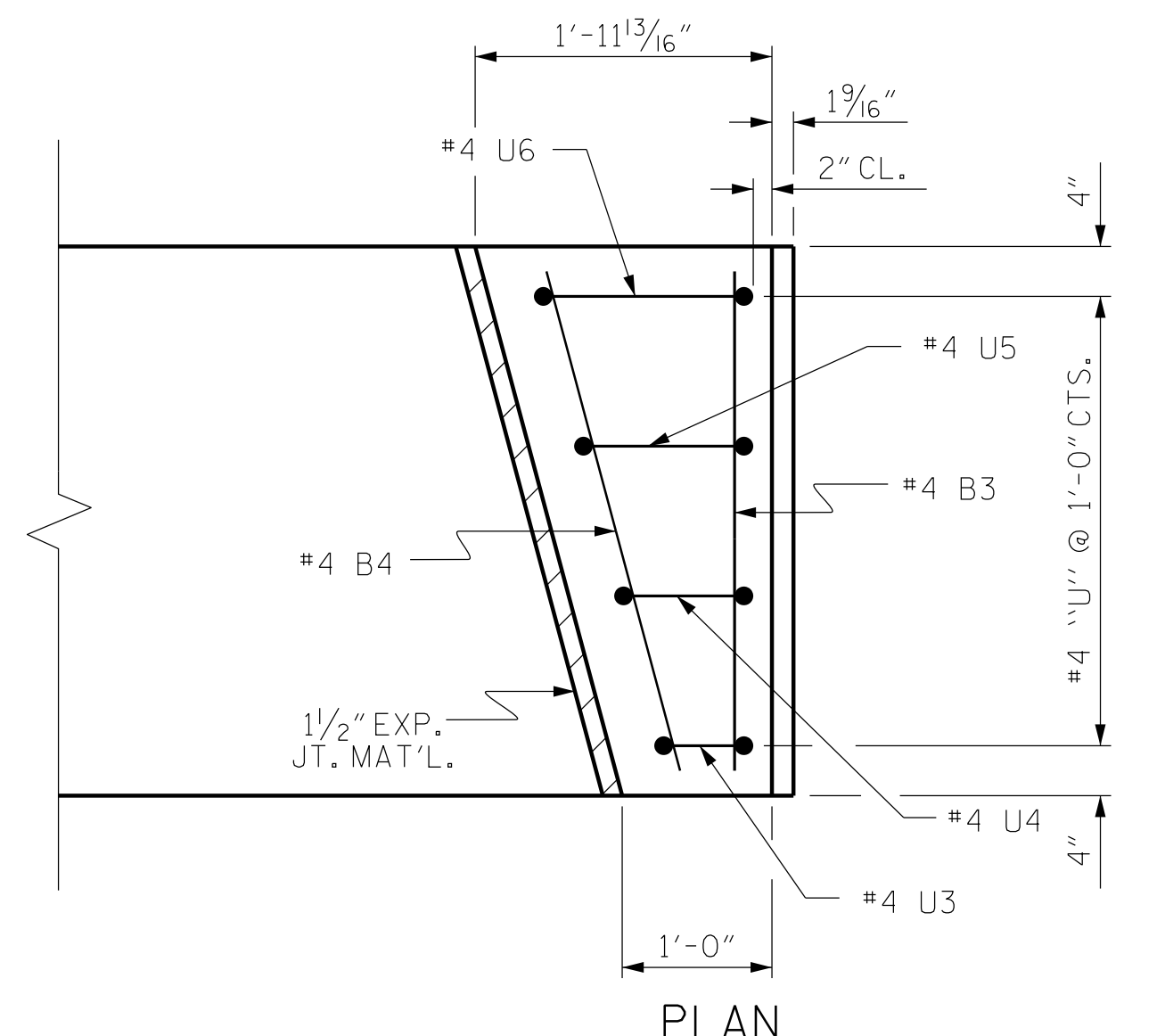
PLAN OF DRILLED PIERS & COLUMNS



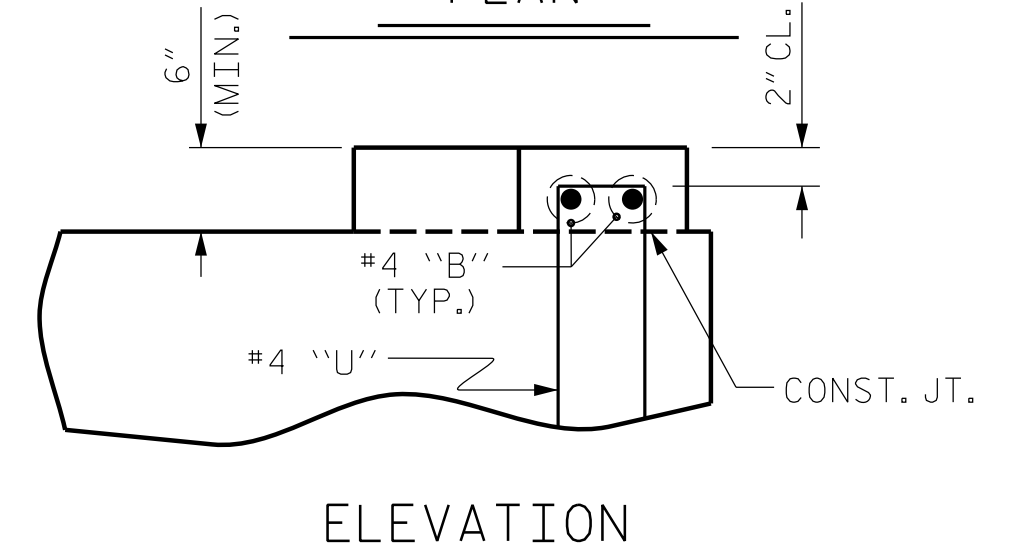
END ELEVATION



CONSTRUCTION JOINT DETAIL



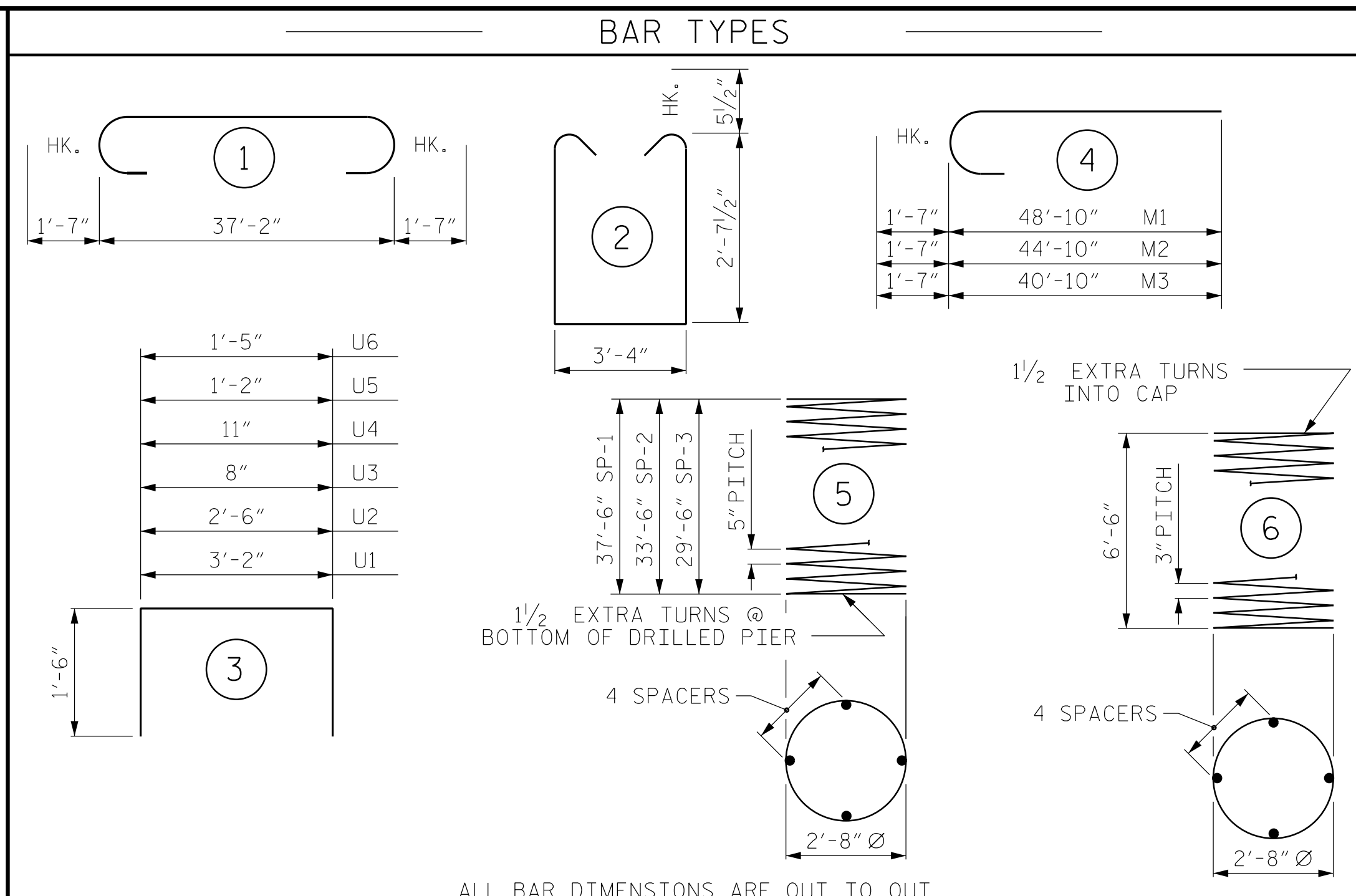
PLAN



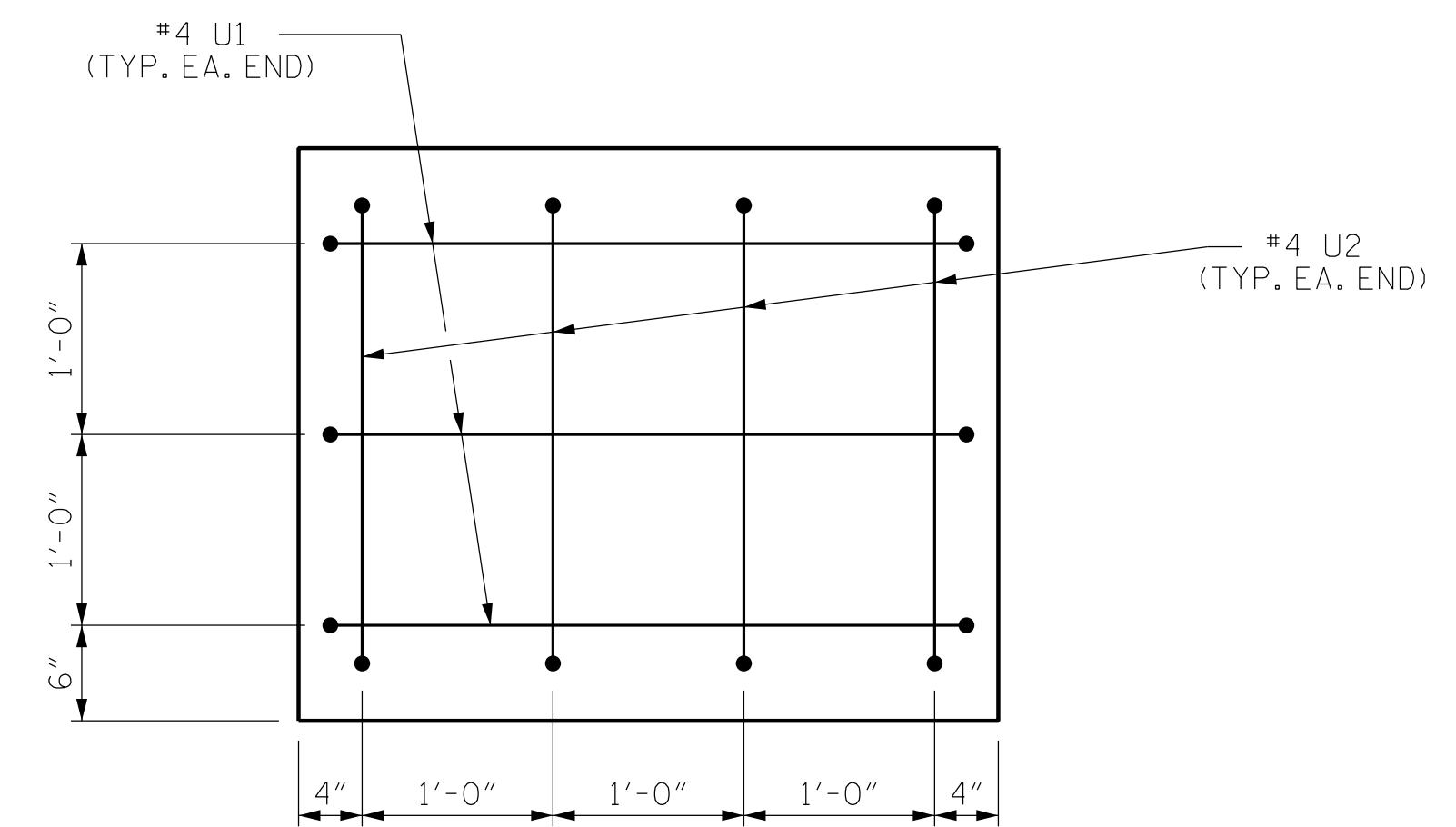
ELEVATION

LATERAL GUIDE DETAILS

(RIGHT LATERAL GUIDE SHOWN, LEFT SIDE SIMILAR)

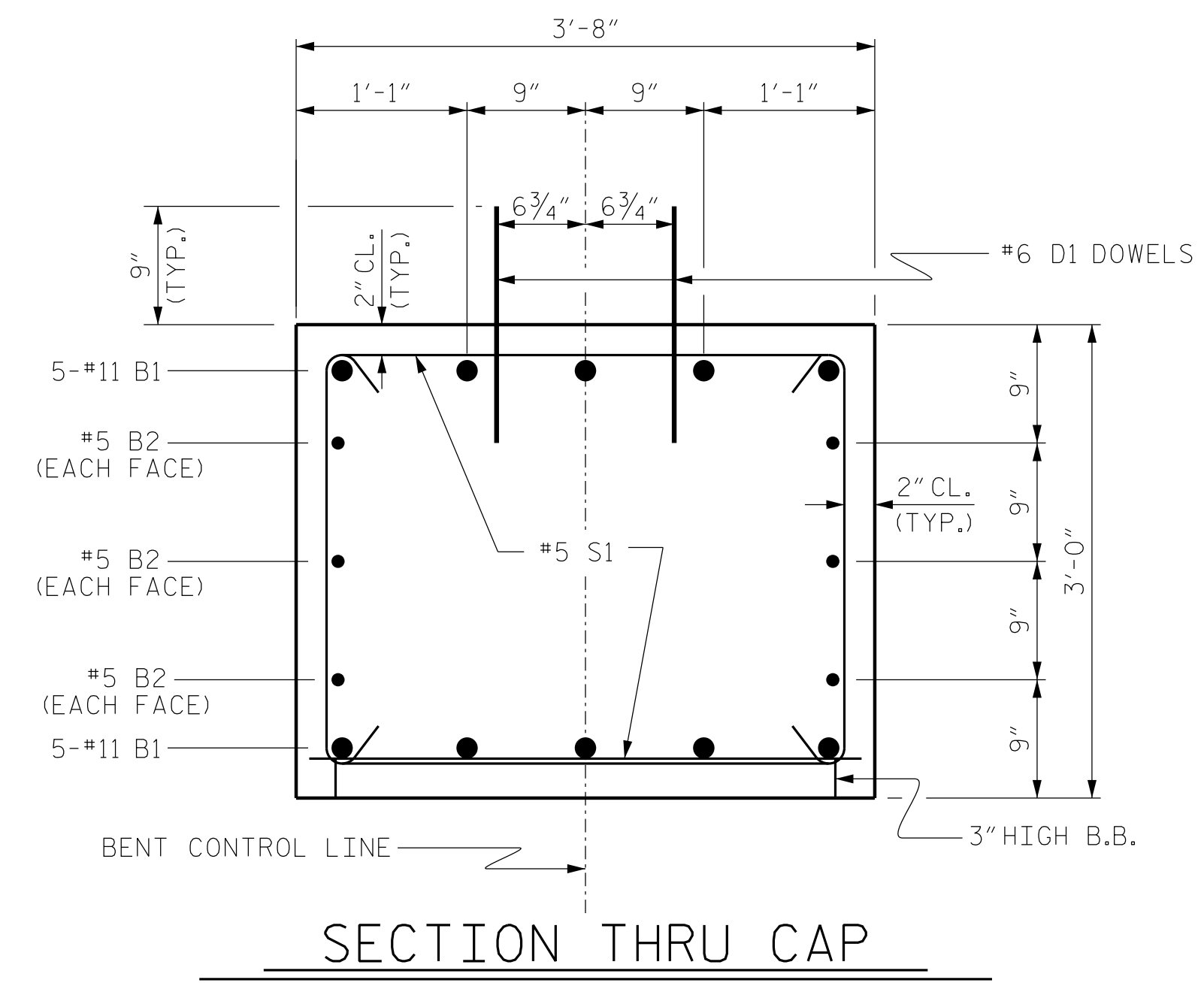


ALL BAR DIMENSIONS ARE OUT TO OUT



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)

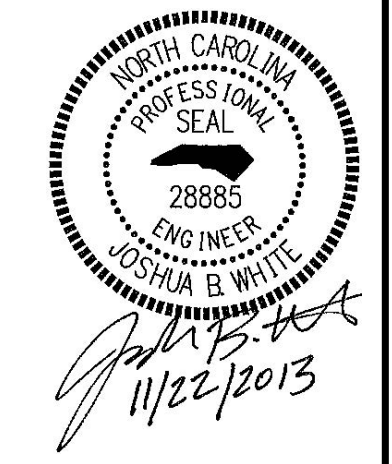
DRILLED PIER CONCRETE	
POUR #1 (DRILLED PIERS)	36.3 C.Y.
3'-6" Ø DRILLED PIER NOT IN SOIL	37 LIN. FT.
3'-6" Ø DRILLED PIER IN SOIL	65 LIN. FT.
PERMANENT STEEL CASING FOR 3'-6" Ø DRILLED PIER	65 LIN. FT.
CSL TUBES	426 LIN. FT.

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

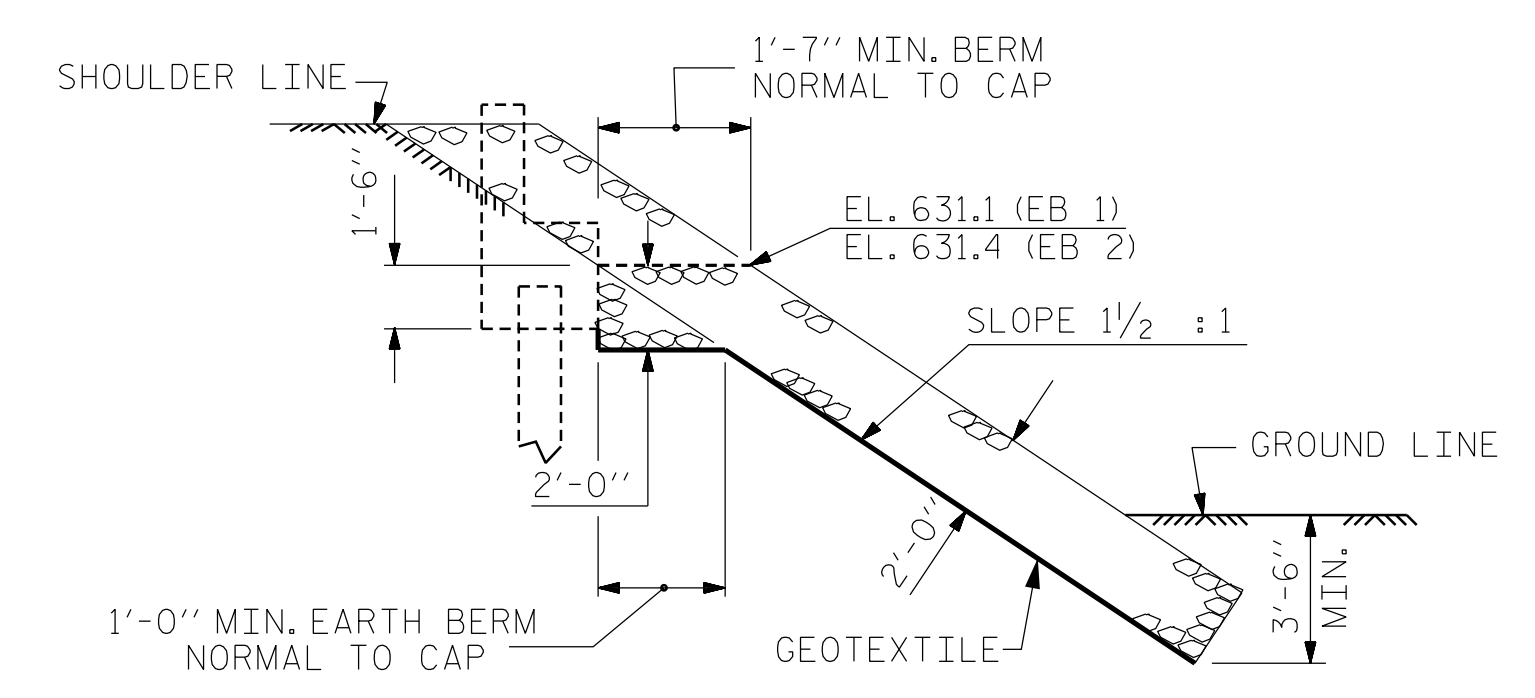
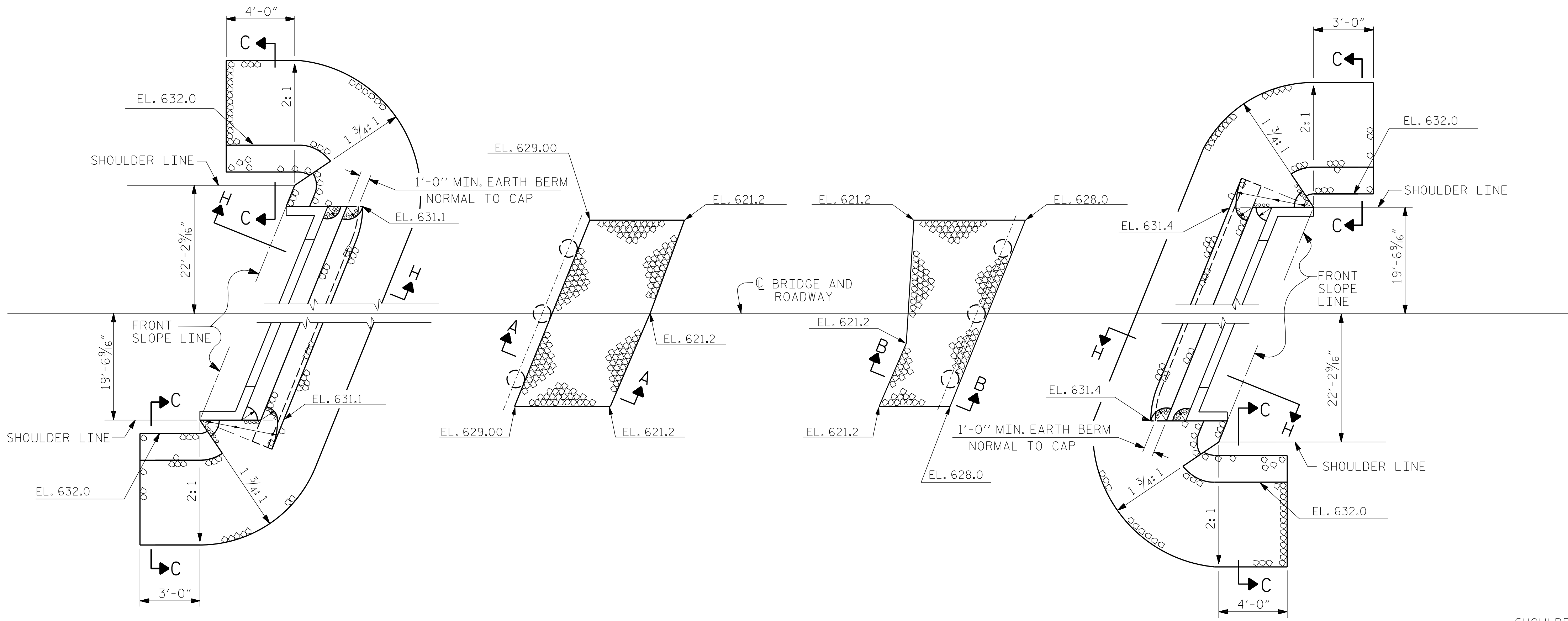


ASSEMBLED BY : JLA	DATE : 2/13
CHECKED BY : JWB	DATE : 2/13
DRAWN BY : DGE 03/10	
CHECKED BY : MKT 03/10	

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

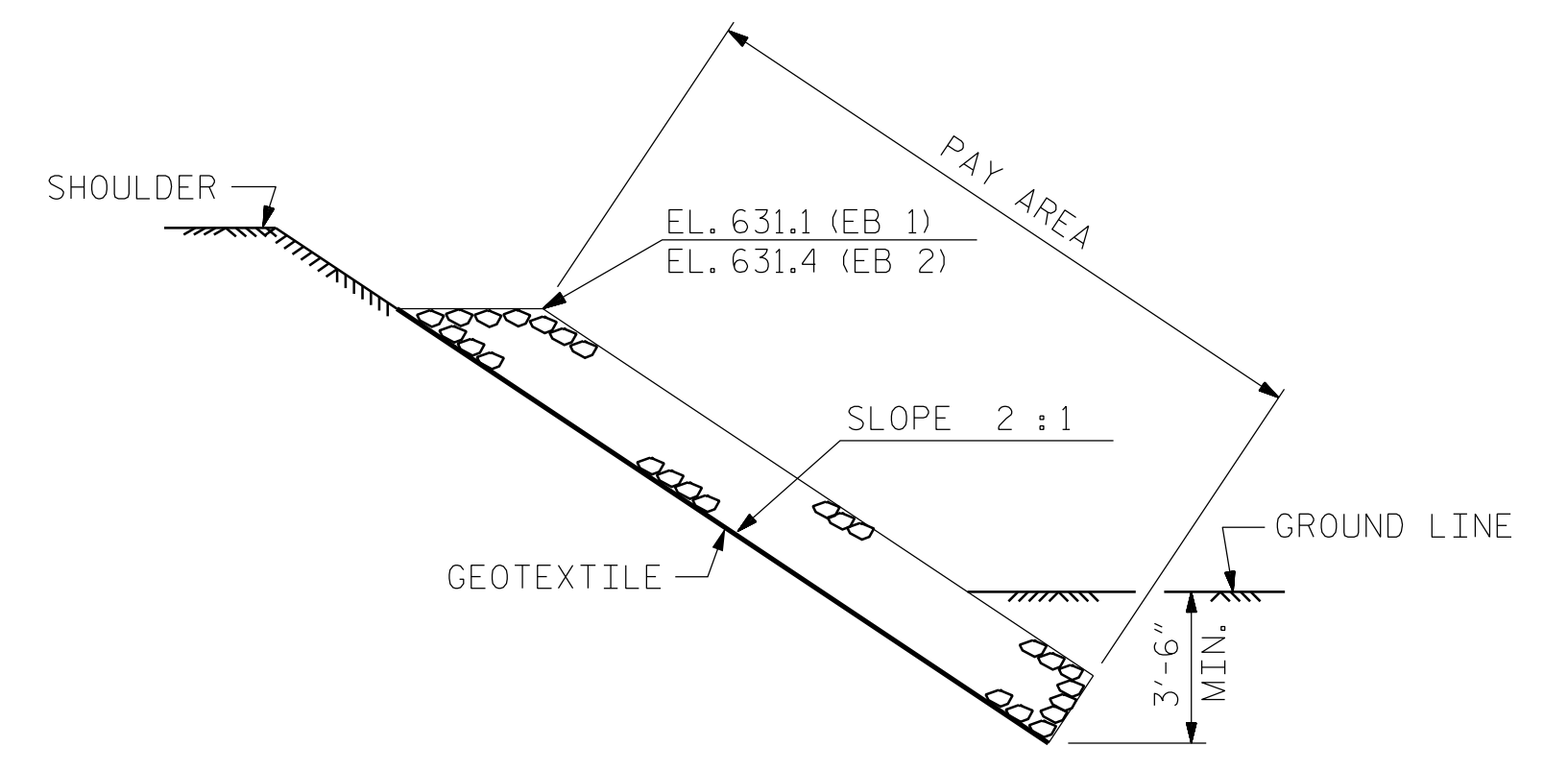
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NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS
2			4			23

NOTES :
FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.

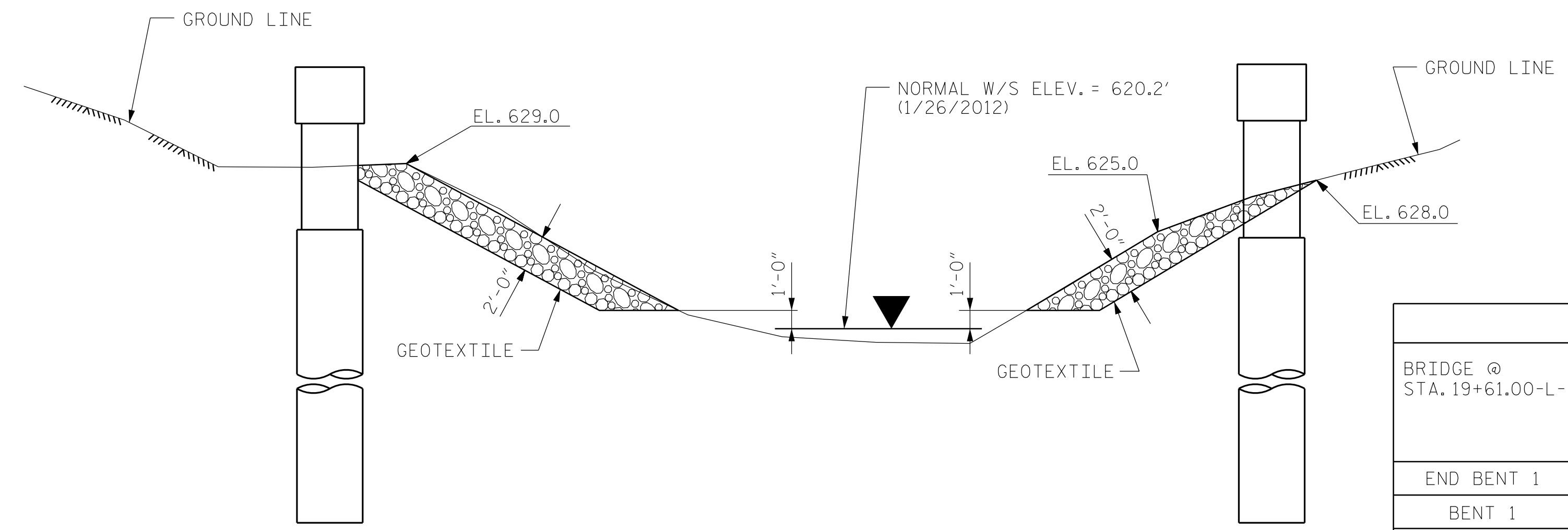


SECTION H-H

SHOULDER RIP RAP IS HIGHER THAN BERM RIP RAP



SECTION C-C



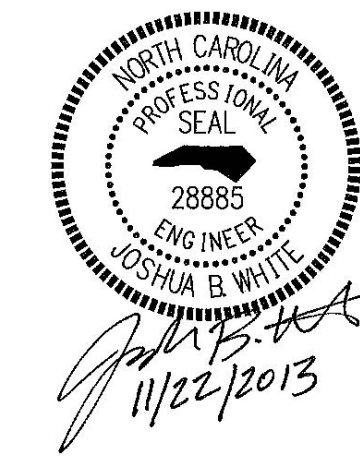
SECTION A-A

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

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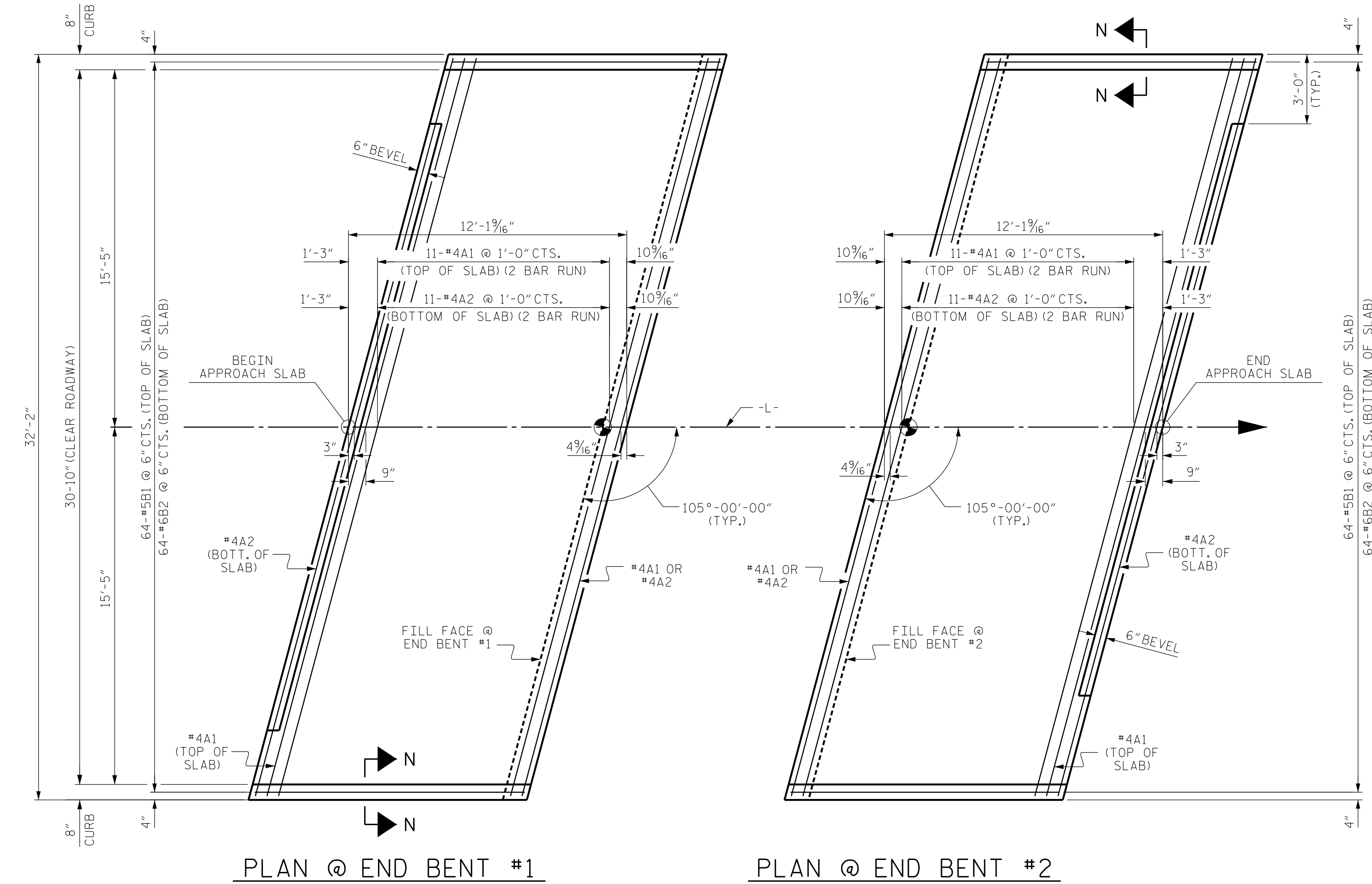


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
RIP RAP DETAILS

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

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PLAN @ END BENT #1

PLAN @ END BENT #2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS

NOTES

FOR BRIDGE APPROACH FILL 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.

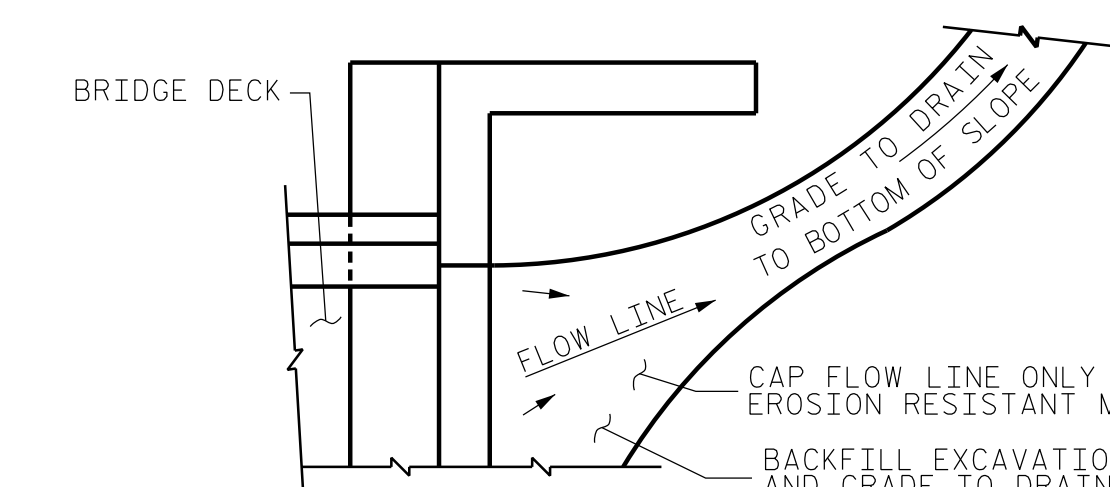
#78M STONE BACKFILL (CLASS V SELECT MATERIAL) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

#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.

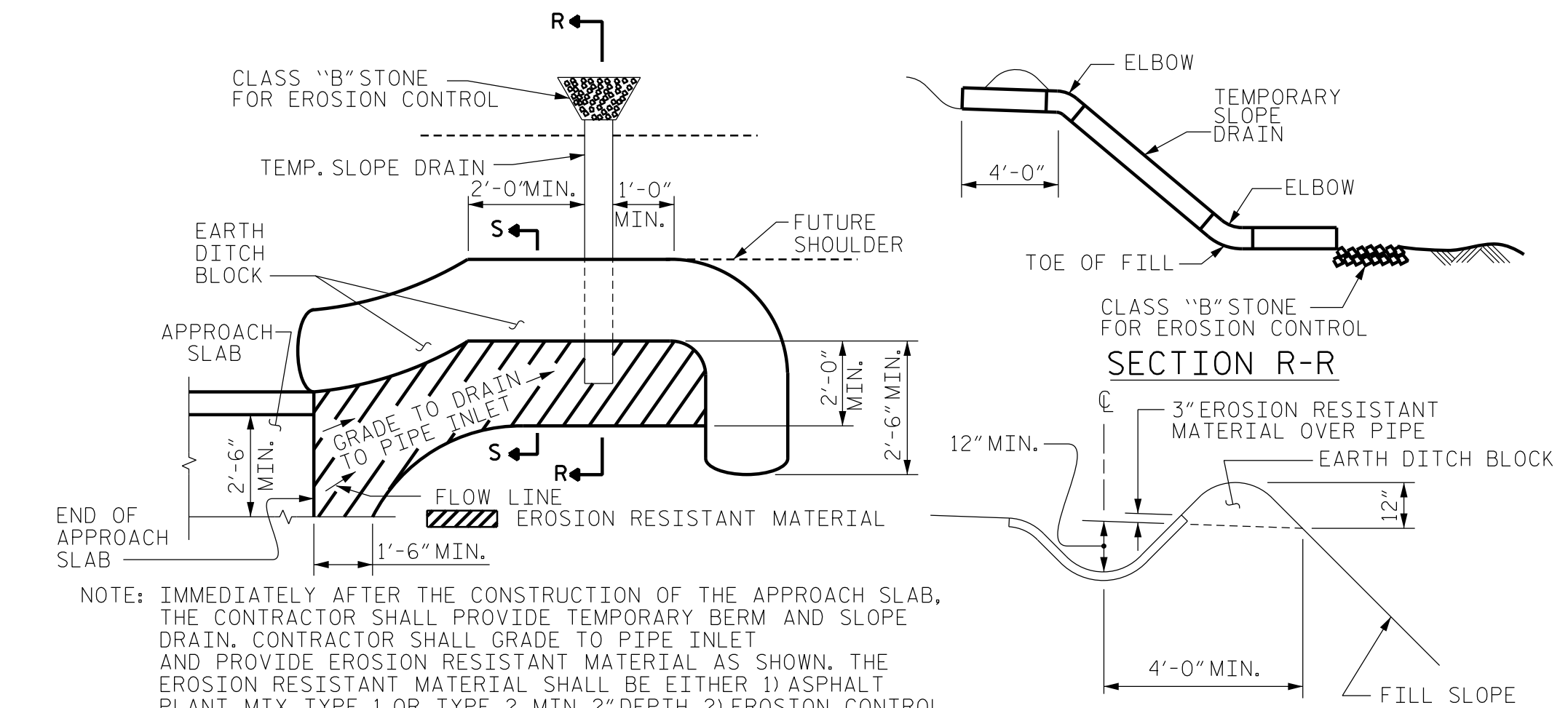
AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

APPROACH SLAB GROOVING IS NOT REQUIRED.



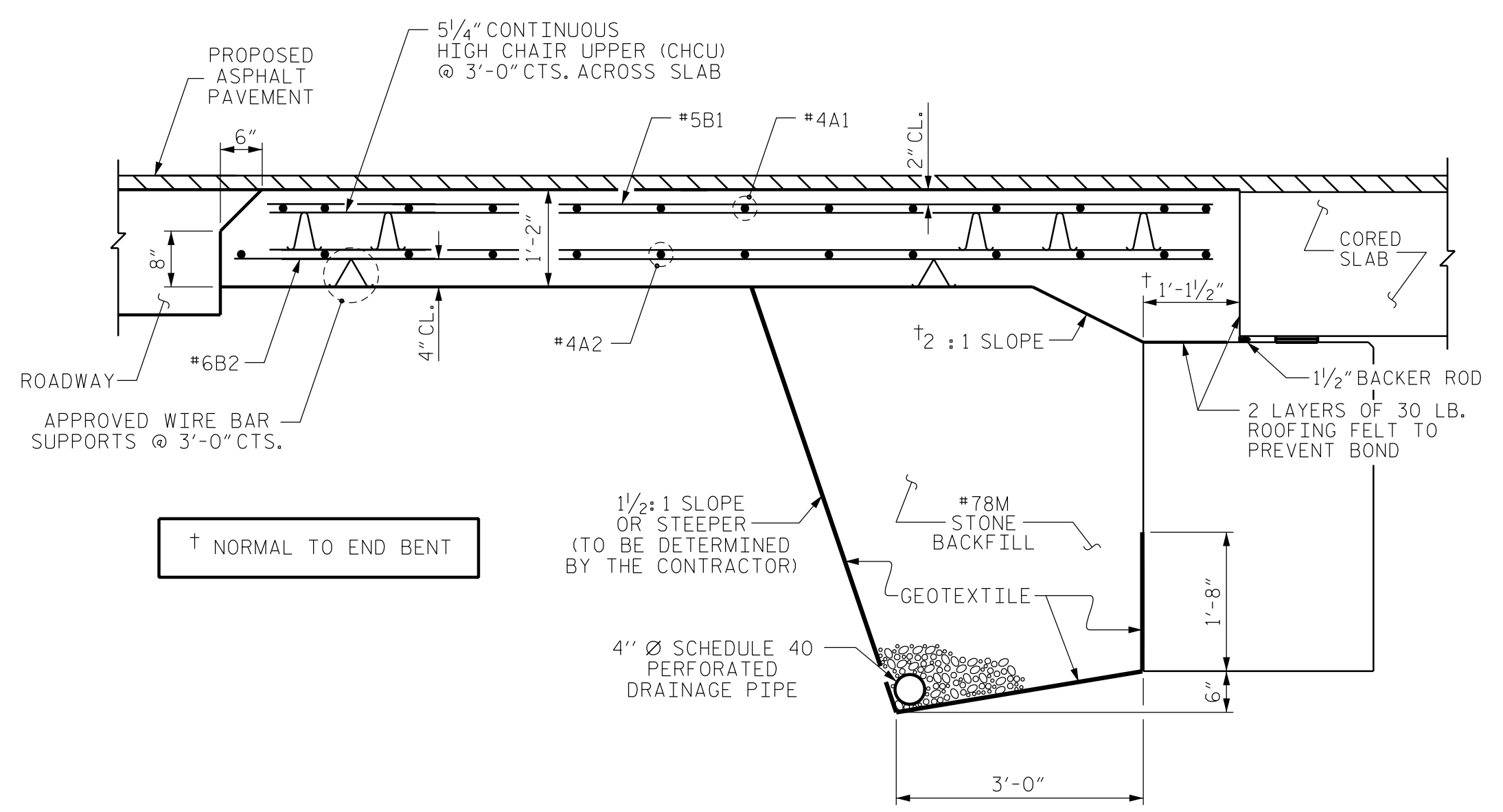
NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL

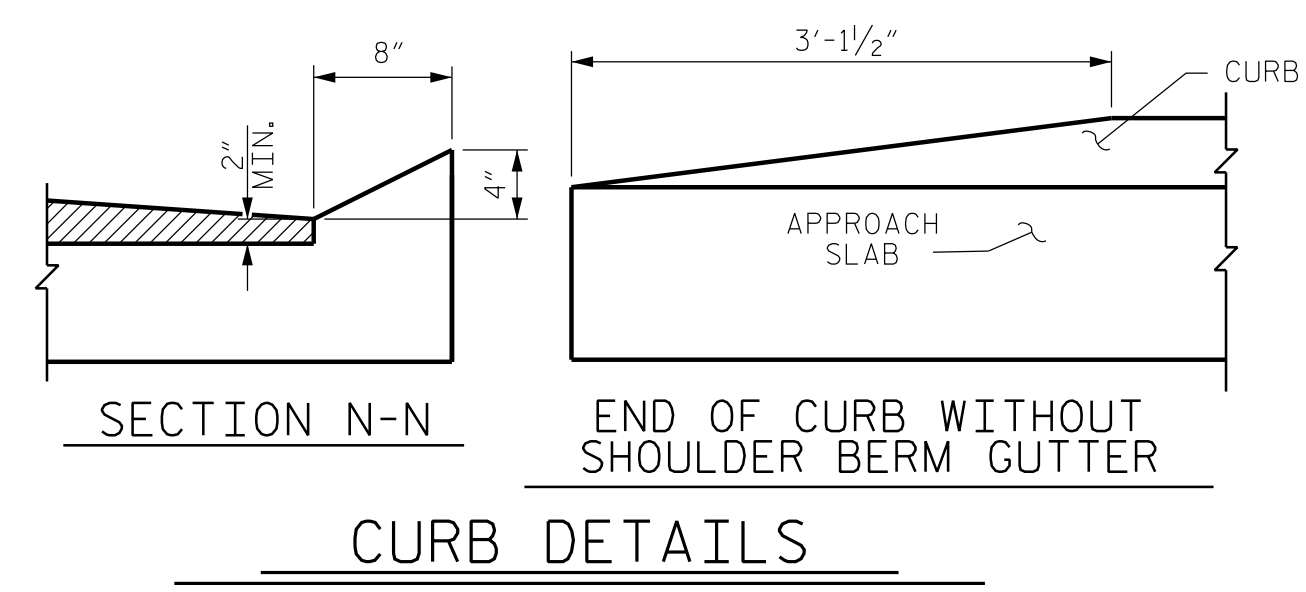


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

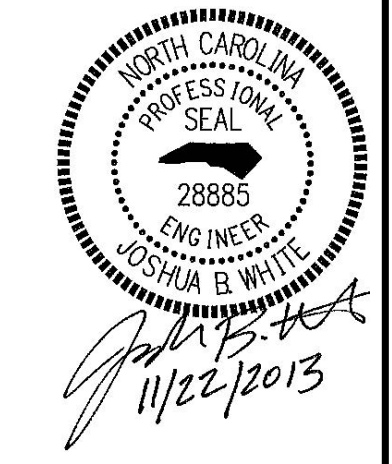


SECTION N-N
END OF CURB WITHOUT SHOULDER BERM GUTTER
CURB DETAILS

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

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



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

REVISIONS						SHEET NO.
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1			3			TOTAL SHEETS
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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.

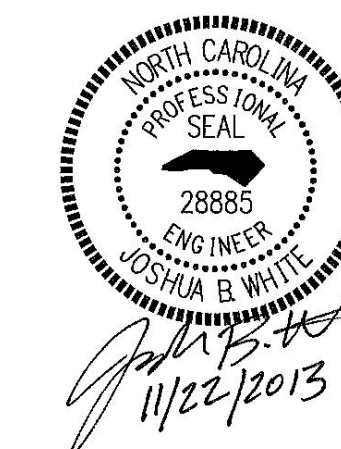
METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINIS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL 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
 TGS 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		
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					S-23
					TOTAL SHEETS 23