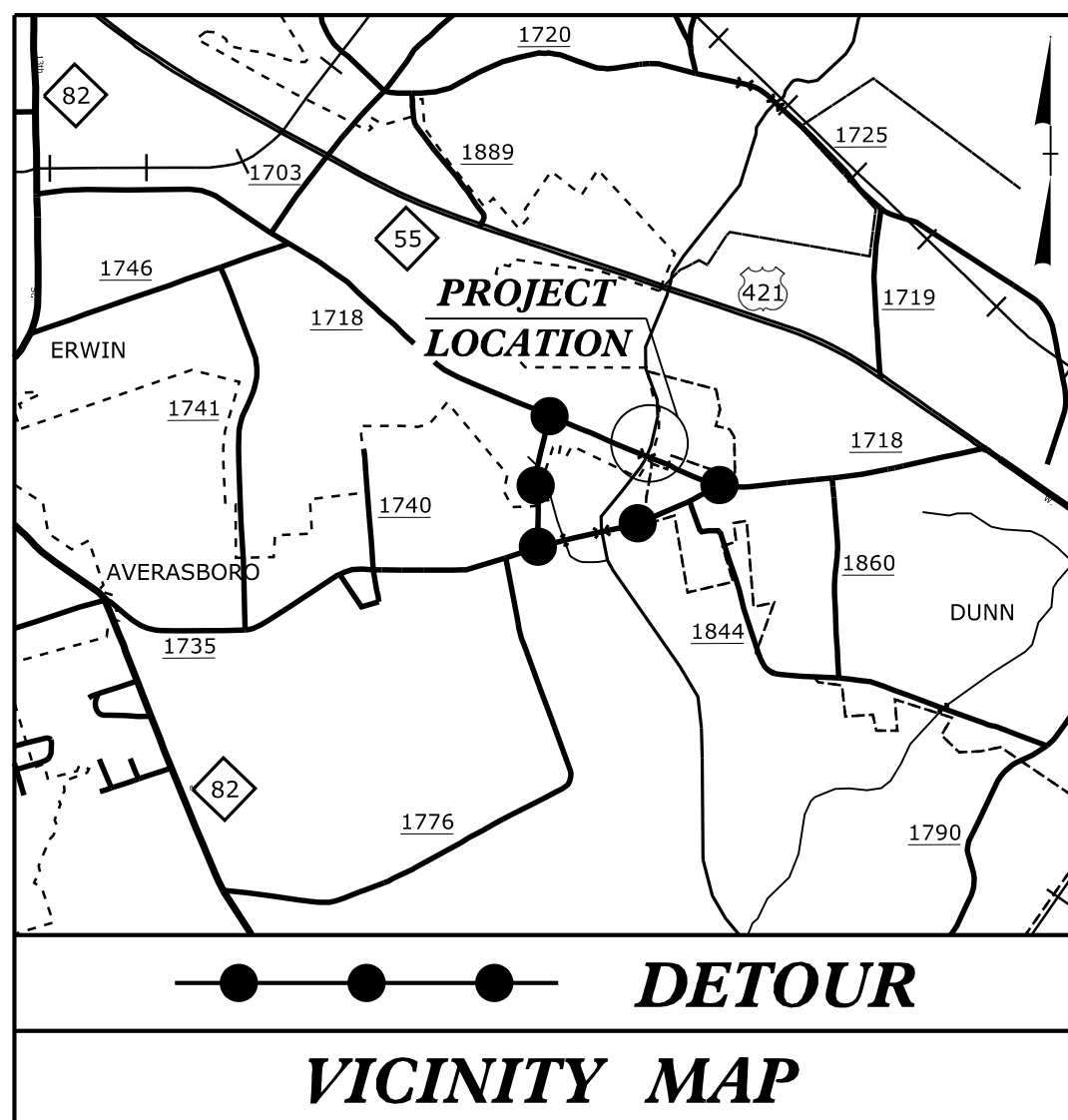


See Sheet 1A For Index of Sheets
 See Sheet 1B For Conventional Symbols
 See Sheet 1C-1 For Survey Control Sheet

STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.6.R.89	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
45658.1.1	BRSTP-1718(8)	PE	
17BP.6.R.89		ROW, UTIL	
17BP.6.R.89		CONST.	

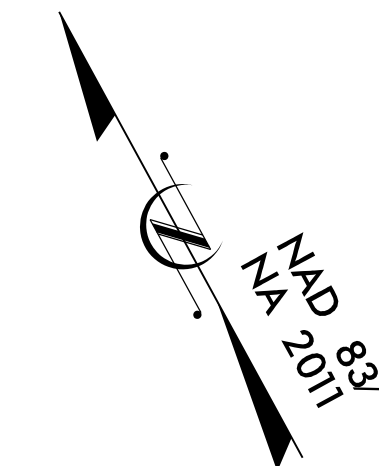
PROJECT: 17BP.6.R.89



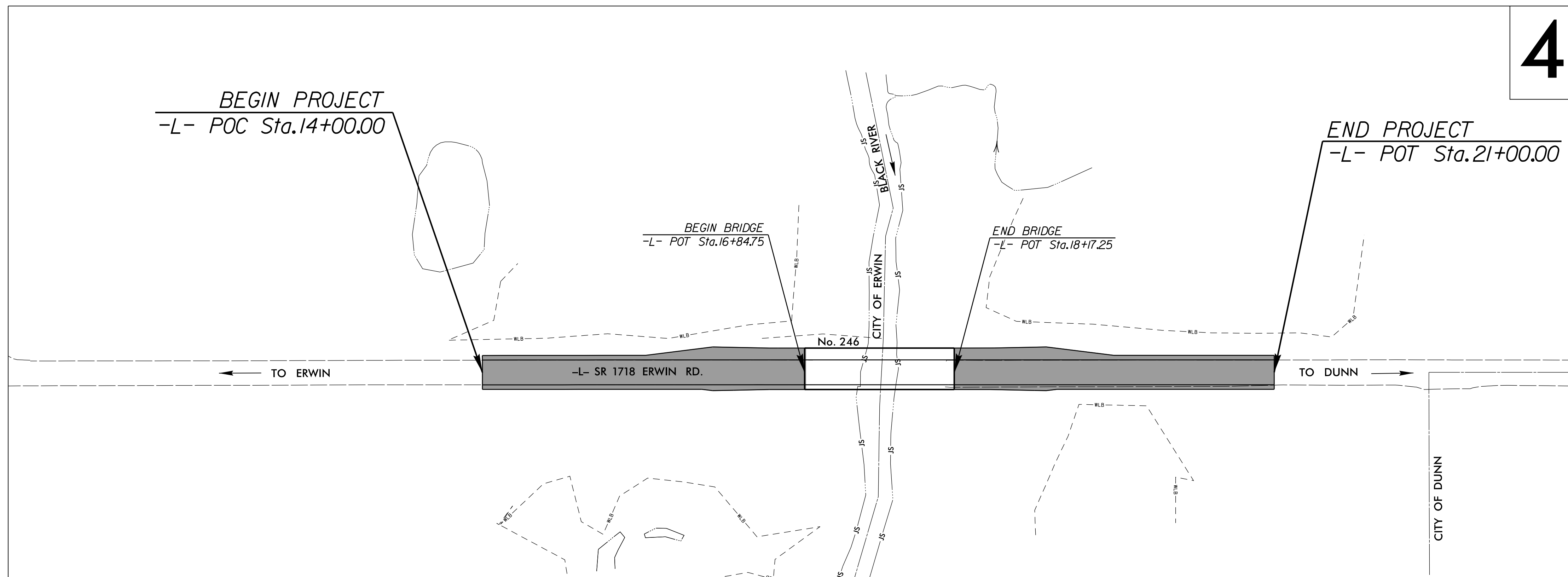
HARNETT COUNTY

**LOCATION: REPLACE BRIDGE 246 OVER BLACK RIVER
 ON SR 1718 (ERWIN ROAD)**

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



CONTRACT: DF000194

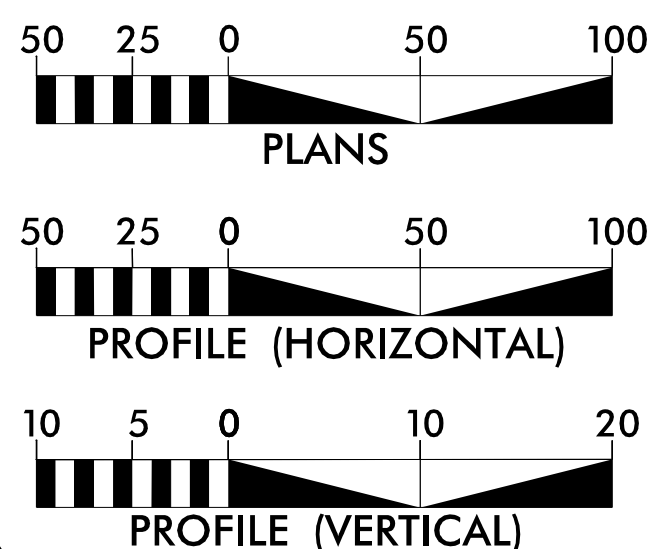


4

THERE IS NO CONTROL OF ACCESS ON THIS PROJECT.

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES



DESIGN DATA

ADT 2018 = 6973
 ADT 2038 = 10063
 K = 9 %
 D = 55 %
 T = 3 % *
 V = 50 MPH
 *(TTST=1% + DUAL=2%)
 FUNC CLASS =
 COLLECTOR
 SUB-REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY PROJECT 17.BP.6.R.89 = 0.108 MILE
 LENGTH STRUCTURE PROJECT 17.BP.6.R.89 = 0.025 MILE
 TOTAL LENGTH PROJECT 17.BP.6.R.89 = 0.133 MILE

PLANS PREPARED BY:



8601 SIX FORKS RD, SUITE 260
 RALEIGH, NC 27615
 919-926-4100

FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
 JUNE 20, 2017

LETTING DATE:
 JANUARY 16, 2018

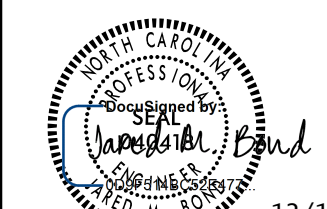
JENNIFER FARINO, PE
 PROJECT ENGINEER
 JARED BOND, PE
 PROJECT DESIGN ENGINEER
 CHRISTY W. HUFF, PE
 NCDOT CONTACT

HYDRAULICS ENGINEER

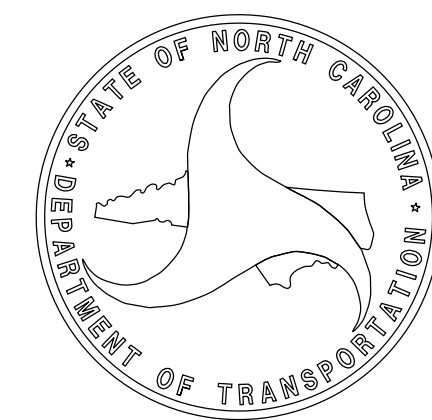


12/13/2017 P.E.

ROADWAY DESIGN ENGINEER



12/11/2017 P.E.



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

12/2/2016

BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin	○ EIP
Computed Property Corner	-----
Property Monument	□ ECM
Parcel/Sequence Number	①23
Existing Fence Line	-x-x-x-
Proposed Woven Wire Fence	○
Proposed Chain Link Fence	□
Proposed Barbed Wire Fence	◇
Existing Wetland Boundary	----- WLB
Proposed Wetland Boundary	----- WLB
Existing Endangered Animal Boundary	----- EAB
Existing Endangered Plant Boundary	----- EPB
Existing Historic Property Boundary	----- HPB
Known Contamination Area: Soil	☠-s-☠
Potential Contamination Area: Soil	☠-s-☠
Known Contamination Area: Water	☠-w-☠
Potential Contamination Area: Water	☠-w-☠
Contaminated Site: Known or Potential	☠?

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

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

RAILROADS:

Standard Gauge	-----
RR Signal Milepost	○ MILEPOST 35
Switch	□ SWITCH
RR Abandoned	-----
RR Dismantled	-----

RIGHT OF WAY & PROJECT CONTROL:

Secondary Horiz and Vert Control Point	◆
Primary Horiz Control Point	○
Primary Horiz and Vert Control Point	◆
Exist Permanent Easement Pin and Cap	◇
New Permanent Easement Pin and Cap	◆
Vertical Benchmark	▲
Existing Right of Way Marker	△
Existing Right of Way Line	-----
New Right of Way Line	----- R/W
New Right of Way Line with Pin and Cap	----- R/W ▲
New Right of Way Line with Concrete or Granite R/W Marker	----- R/W ▲
New Control of Access Line with Concrete C/A Marker	----- C/A
Existing Control of Access	----- C/A
New Control of Access	----- C/A
Existing Easement Line	----- E
New Temporary Construction Easement	----- E
New Temporary Drainage Easement	----- TDE
New Permanent Drainage Easement	----- PDE
New Permanent Drainage / Utility Easement	----- DUE
New Permanent Utility Easement	----- PUE
New Temporary Utility Easement	----- TUE
New Aerial Utility Easement	----- AUE

ROADS AND RELATED FEATURES:

Existing Edge of Pavement	-----
Existing Curb	-----
Proposed Slope Stakes Cut	----- C
Proposed Slope Stakes Fill	----- F
Proposed Curb Ramp	----- CR
Existing Metal Guardrail	-----
Proposed Guardrail	-----
Existing Cable Guiderail	-----
Proposed Cable Guiderail	-----
Equality Symbol	⊕
Pavement Removal	-----

VEGETATION:

Single Tree	☼
Single Shrub	☼

Note: Not to Scale

*S.U.E. = Subsurface Utility Engineering

Hedge	-----
Woods Line	-----
Orchard	☼
Vineyard	□ Vineyard

EXISTING STRUCTURES:

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

UTILITIES:

POWER:	
Existing Power Pole	●
Proposed Power Pole	○
Existing Joint Use Pole	●
Proposed Joint Use Pole	○
Power Manhole	⊕
Power Line Tower	⊗
Power Transformer	⊗
U/G Power Cable Hand Hole	-----
H-Frame Pole	●
U/G Power Line LOS B (S.U.E.*)	----- P
U/G Power Line LOS C (S.U.E.*)	----- P
U/G Power Line LOS D (S.U.E.*)	----- P

TELEPHONE:

Existing Telephone Pole	●
Proposed Telephone Pole	○
Telephone Manhole	⊕
Telephone Pedestal	⊕
Telephone Cell Tower	⊕
U/G Telephone Cable Hand Hole	-----
U/G Telephone Cable LOS B (S.U.E.*)	----- T
U/G Telephone Cable LOS C (S.U.E.*)	----- T
U/G Telephone Cable LOS D (S.U.E.*)	----- T
U/G Telephone Conduit LOS B (S.U.E.*)	----- TC
U/G Telephone Conduit LOS C (S.U.E.*)	----- TC
U/G Telephone Conduit LOS D (S.U.E.*)	----- TC
U/G Fiber Optics Cable LOS B (S.U.E.*)	----- T FO
U/G Fiber Optics Cable LOS C (S.U.E.*)	----- T FO
U/G Fiber Optics Cable LOS D (S.U.E.*)	----- T FO

WATER:

Water Manhole	⊕
Water Meter	○
Water Valve	⊗
Water Hydrant	⊕
U/G Water Line LOS B (S.U.E.*)	-----
U/G Water Line LOS C (S.U.E.*)	-----
U/G Water Line LOS D (S.U.E.*)	-----
Above Ground Water Line	----- A/G Water

TV:

TV Pedestal	⊕
TV Tower	⊗
U/G TV Cable Hand Hole	-----
U/G TV Cable LOS B (S.U.E.*)	----- TV
U/G TV Cable LOS C (S.U.E.*)	----- TV
U/G TV Cable LOS D (S.U.E.*)	----- TV
U/G Fiber Optic Cable LOS B (S.U.E.*)	----- TV FO
U/G Fiber Optic Cable LOS C (S.U.E.*)	----- TV FO
U/G Fiber Optic Cable LOS D (S.U.E.*)	----- TV FO

GAS:

Gas Valve	◇
Gas Meter	⊕
U/G Gas Line LOS B (S.U.E.*)	----- G
U/G Gas Line LOS C (S.U.E.*)	----- G
U/G Gas Line LOS D (S.U.E.*)	----- G
Above Ground Gas Line	----- A/G Gas

SANITARY SEWER:

Sanitary Sewer Manhole	⊕
Sanitary Sewer Cleanout	⊕
U/G Sanitary Sewer Line	----- SS
Above Ground Sanitary Sewer	----- A/G Sanitary Sewer
SS Forced Main Line LOS B (S.U.E.*)	----- FSS
SS Forced Main Line LOS C (S.U.E.*)	----- FSS
SS Forced Main Line LOS D (S.U.E.*)	----- FSS

MISCELLANEOUS:

Utility Pole	●
Utility Pole with Base	□
Utility Located Object	○
Utility Traffic Signal Box	⊕
Utility Unknown U/G Line LOS B (S.U.E.*)	----- 7U/L
U/G Tank; Water, Gas, Oil	□
Underground Storage Tank, Approx. Loc.	⊕
A/G Tank; Water, Gas, Oil	□
Geoenvironmental Boring	⊕
U/G Test Hole LOS A (S.U.E.*)	⊕
Abandoned According to Utility Records	AATUR
End of Information	E.O.I.

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
17BP.6.R.89	1C-1
Location and Surveys	

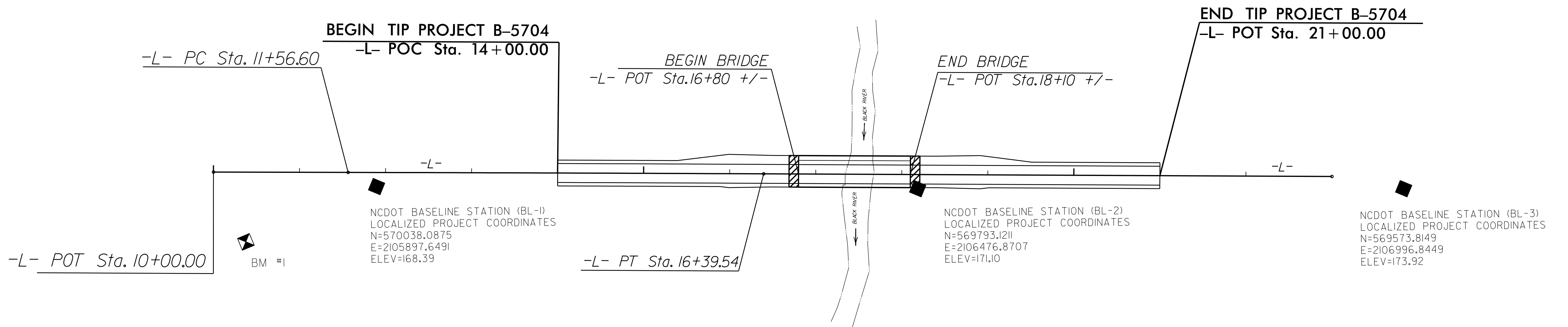
SURVEY CONTROL SHEET B-5704

BL	POINT	DESC.	NORTH	EAST	ELEVATION	L STATION	OFFSET
BL1	B5704 BL-1		570038.0875	2105897.6491	168.39	11+89.63	16.38 RT
BL2	B5704 BL-2		569793.1211	2106476.8707	171.10	18+18.56	16.49 RT
BL3	B5704 BL-3		569573.8149	2106996.8449	173.92	OUTSIDE PROJECT LIMITS	
BL4	B5704 BL-4		569359.3681	2107521.3507	183.56	OUTSIDE PROJECT LIMITS	

	L	NORTH	EAST
POT	10+00.00	570126.7370	2105729.2230
PC	11+56.60	570065.9954	2105873.5651
PT	16+39.54	569878.1401	2106318.4684
POT	23+00.00	569620.4965	2106926.6031



 BM1 ELEVATION - 168.04
 N 570037 E 2105733
 BL STATION 5+00.00
 S 89°46'55.15" W DIST 164.91
 RAILROAD SPIKE IN 13" PINE



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B-5704-2" WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF NORTHING: 570283.4530(±) EASTING: 2105316.9030(±) ELEVATION: 170.85(±)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9998694570

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B-5704-2" TO -L- STATION 10+00.00 IS
 S67°49'45.61"E 1362.53

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

NOTES:

- THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:
[HTTPS://CONNECT.NCDOT.GOV/RESOURCES/LOCATION/](https://connect.ncdot.gov/resources/location/)

THE FILES TO BE FOUND ARE AS FOLLOWS:
 B-5740_LS_CONTROL.TXT

SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

© INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.
 PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.
 NETWORK ESTABLISHED FROM EXISTING HARN MONUMENTATION
 SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

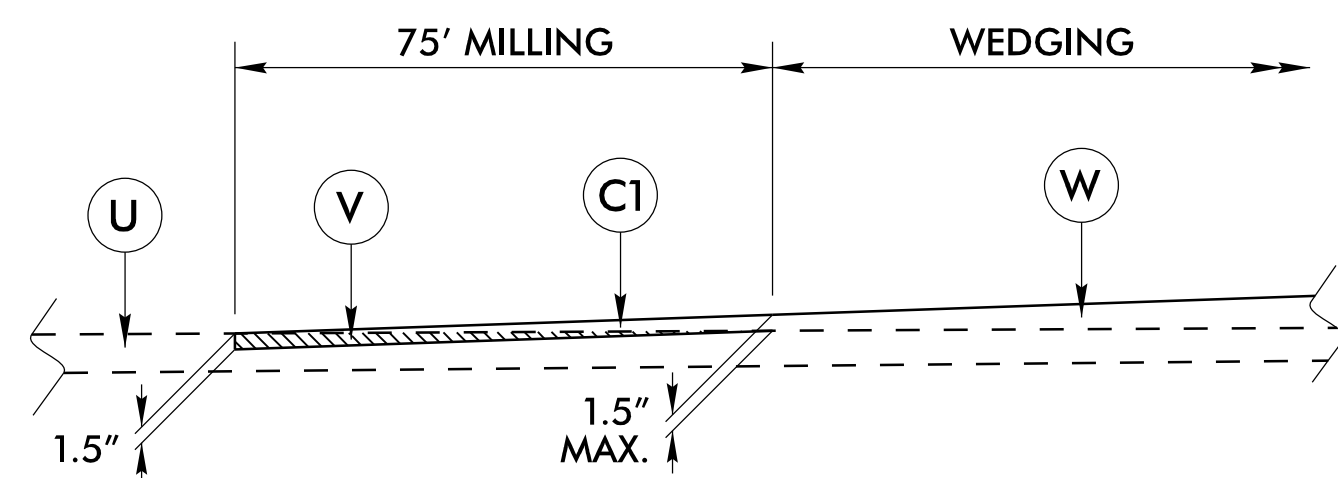
NOTE: DRAWING NOT TO SCALE

07 AUG 2017 15:25 B5704_1s_1c-1.dgn

PAVEMENT SCHEDULE (FINAL PAVEMENT DESIGN)

C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.
E1	PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 570 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 5½" IN DEPTH.
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	MILLING EXISTING PAVEMENT (0" TO 1½")
W	VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL)

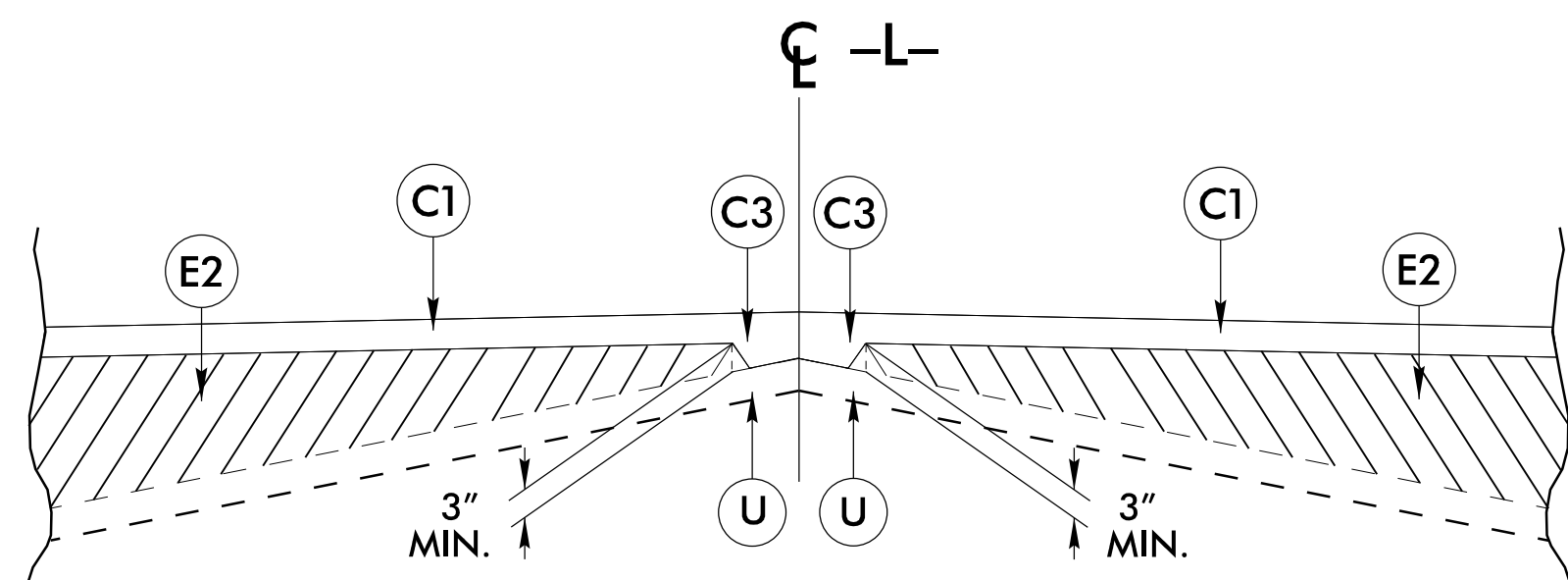
NOTE: ALL PAVEMENT SLOPES 1:1 UNLESS NOTED OTHERWISE



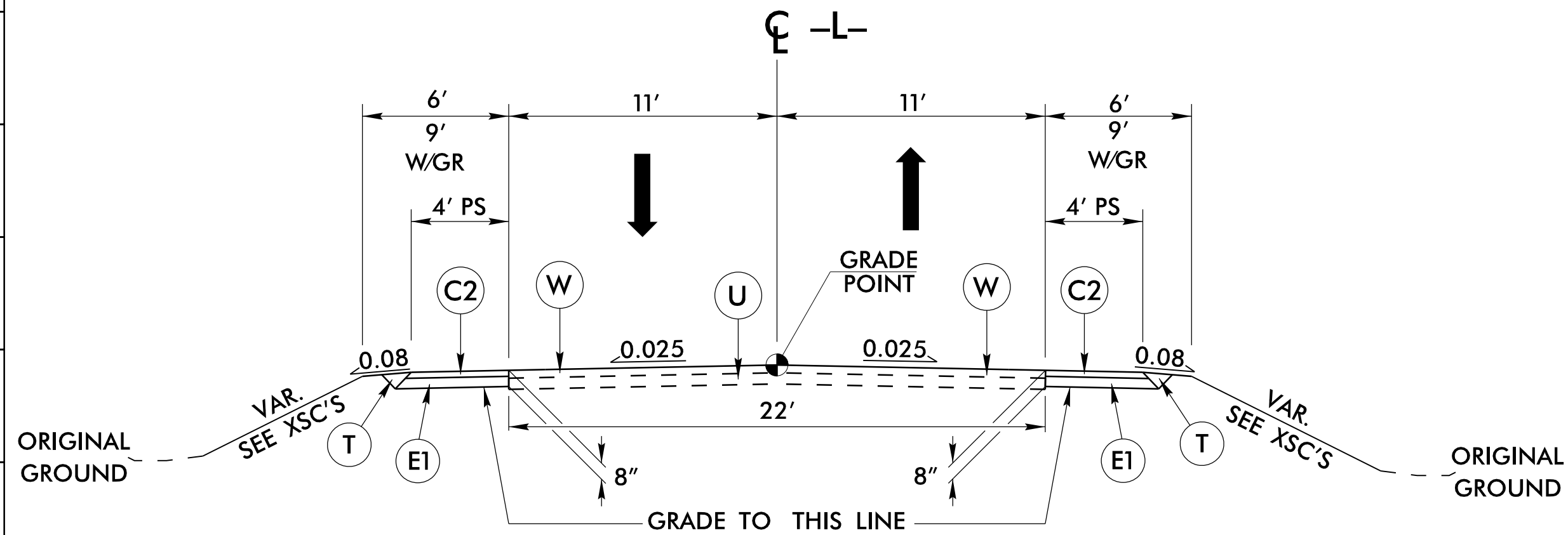
DETAIL OF MILLING AT PAVEMENT TIE-INS

***USE DETAIL**

-L- STA. 14+00.00 TO -L- STA. 14+75.00
 -L- STA. 20+25.00 TO -L- STA. 21+00.00

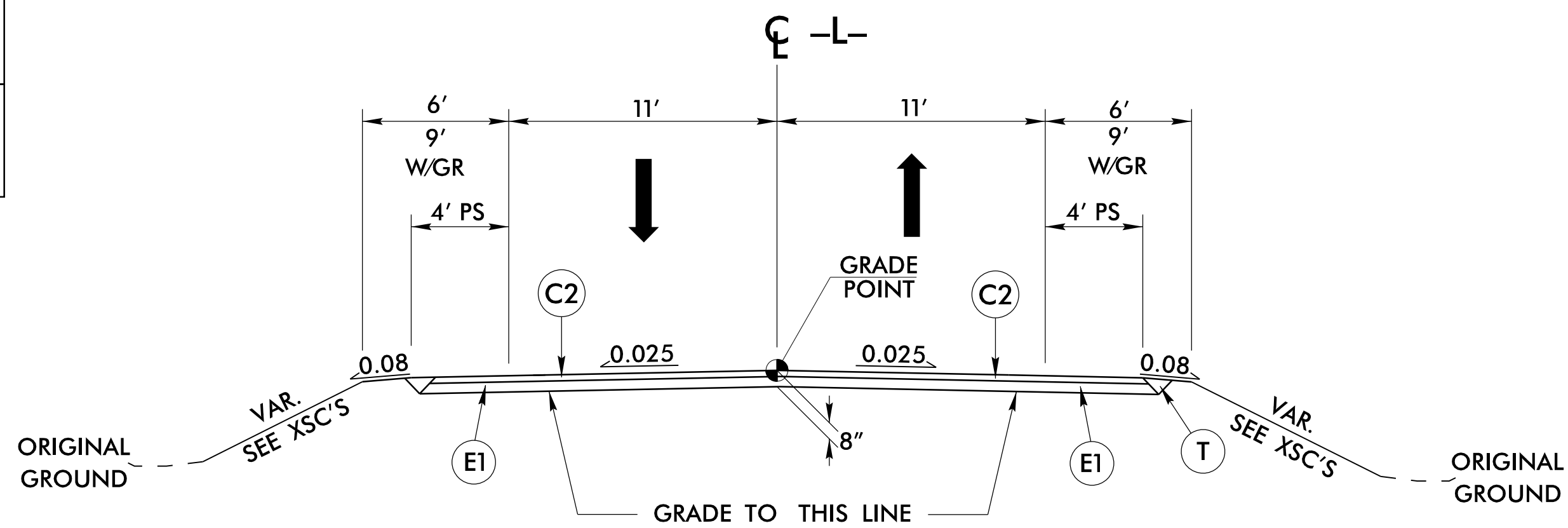


STANDARD WEDGING DETAIL



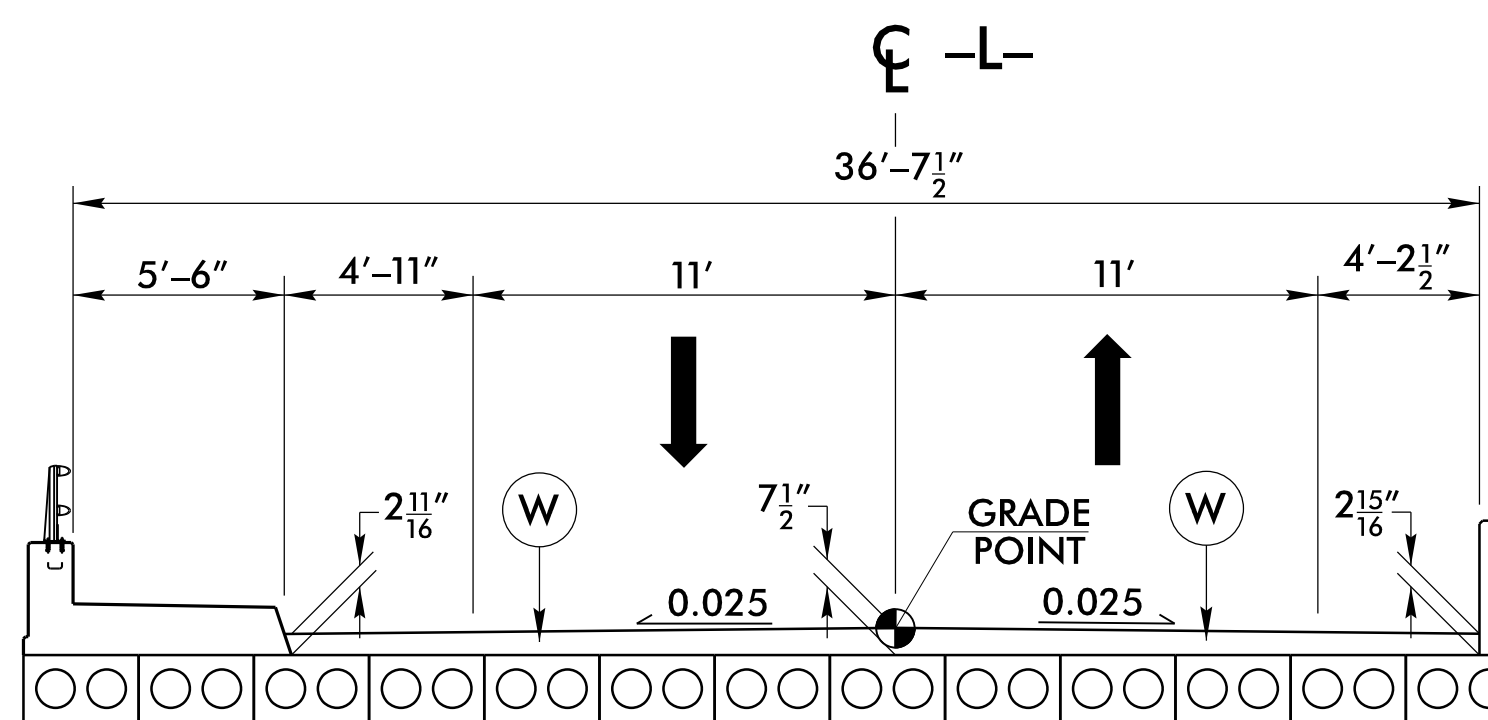
**TYPICAL SECTION NO. 1
*SEE DETAIL FOR LIMITS OF MILLING**

USE TYPICAL SECTION NO. 1
 -L- STA. 14+00.00 TO -L- STA. 15+30.00
 -L- STA. 20+25.00 TO -L- STA. 21+00.00



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2
 -L- STA. 15+30.00 TO -L- STA. 16+84.75 (BEGIN BRIDGE)
 -L- STA. 18+17.25 (END BRIDGE) TO -L- STA. 20+25.00



TYPICAL SECTION ON STRUCTURE

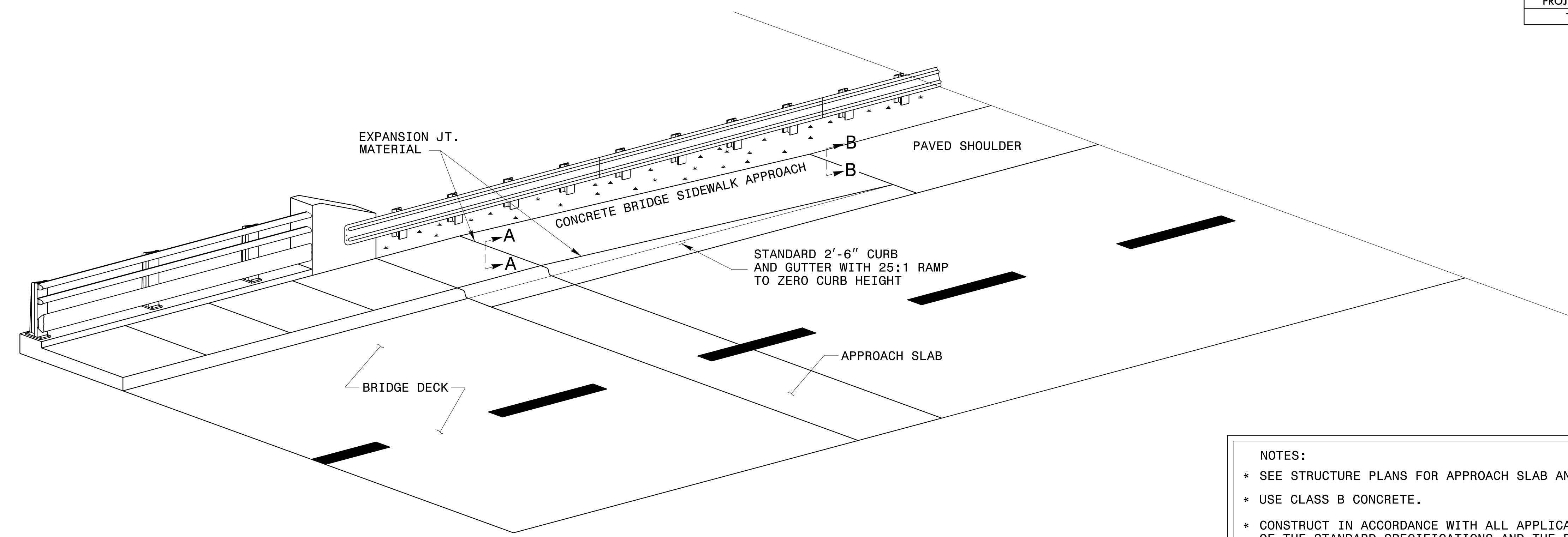
USE TYPICAL SECTION ON STRUCTURE
 -L- STA. 16+84.75 (BEGIN BRIDGE) TO -L- STA. 18+17.25 (END BRIDGE)

CONTRACTOR SHALL COORDINATE WITH LOCAL TRAFFIC SERVICES UNIT FOR SIGNS AND PLACEMENT OF ALL FINAL PAVEMENT MARKINGS.

FOR SIGNS AND FINAL PAVEMENT MARKINGS, CONTACT TRAFFIC SERVICES 910-364-0606 14 DAYS PRIOR TO PLACEMENT.

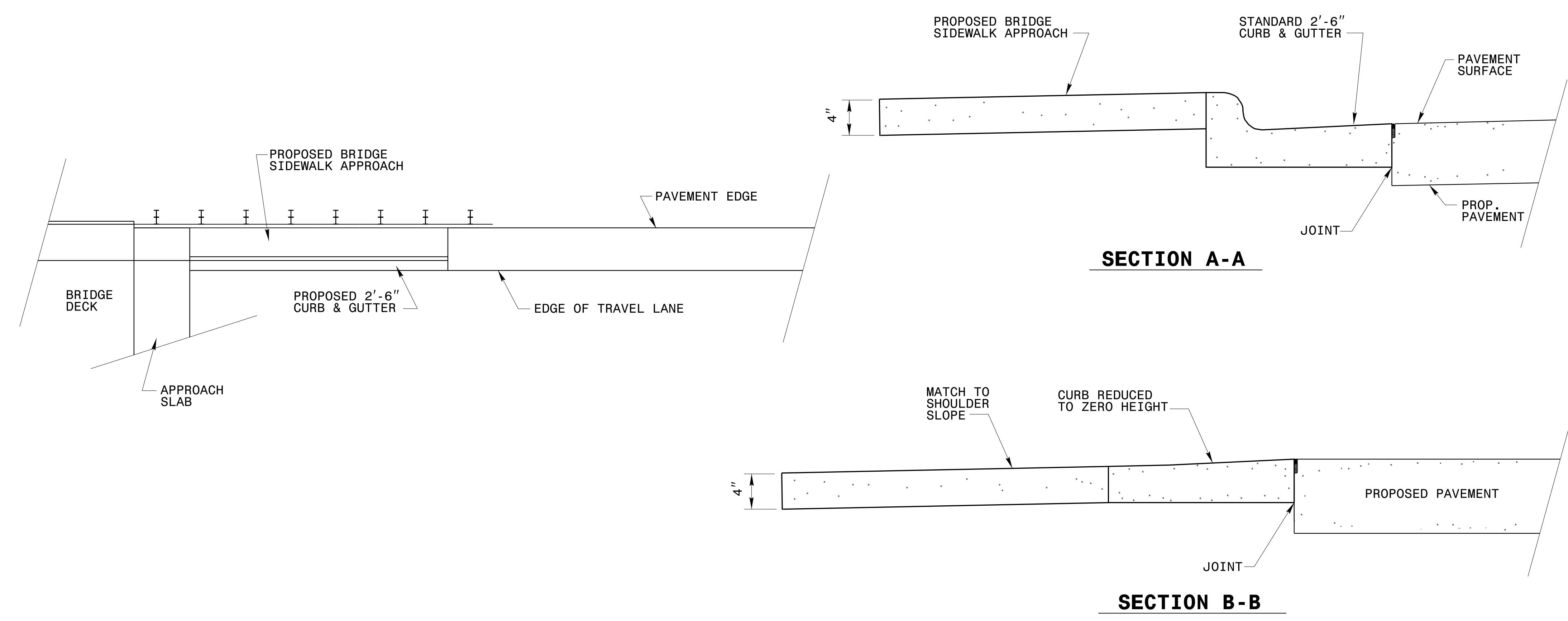
PROJECT REFERENCE NO. 17BP.6.R.89	SHEET NO. 2A-1
ROADWAY DESIGN ENGINEER 	PAVEMENT DESIGN ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	





DETAIL OF PROPOSED CONCRETE BRIDGE SIDEWALK APPROACH

- NOTES:**
- * SEE STRUCTURE PLANS FOR APPROACH SLAB AND CURB DIMENSIONS.
 - * USE CLASS B CONCRETE.
 - * CONSTRUCT IN ACCORDANCE WITH ALL APPLICABLE REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE ROADWAY DRAWINGS OR AS DIRECTED BY THE ENGINEER.
 - * DETERMINE WIDTH OF PROPOSED BRIDGE SIDEWALK APPROACH IN FIELD TO MATCH WALKWAY ON BRIDGE AND APPROACH SLAB OR AS DIRECTED BY THE ENGINEER.
 - * SEE ROADWAY PLANS FOR GUARDRAIL PLACEMENT.



DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

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

DETAIL OF CONCRETE BRIDGE SIDEWALK APPROACH

ORIGINAL BY: _____ DATE: _____
 MODIFIED BY: rnbritt DATE: 10-12-04
 CHECKED BY: _____ DATE: _____
 FILE SPEC.: details/nbritt/metric/misc/sidewalkapproach.dgn

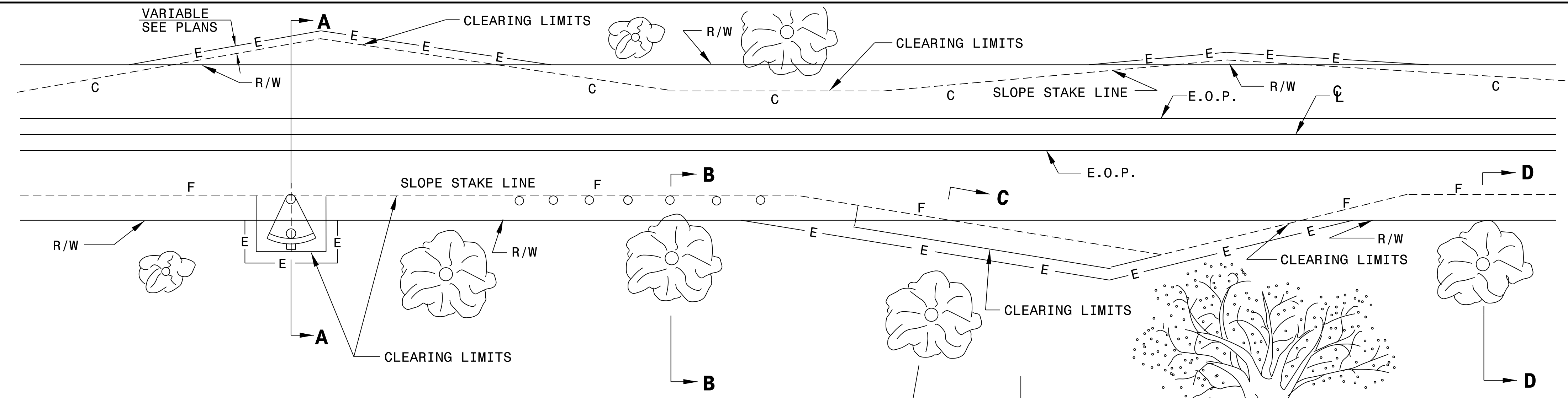
17 MAY 2017 07:22
 S:\Projects\Special Details\Howerton\Bridge Approach Sidewalk Transition.dgn
 Howerton AT CSD-282395

5/14/99

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

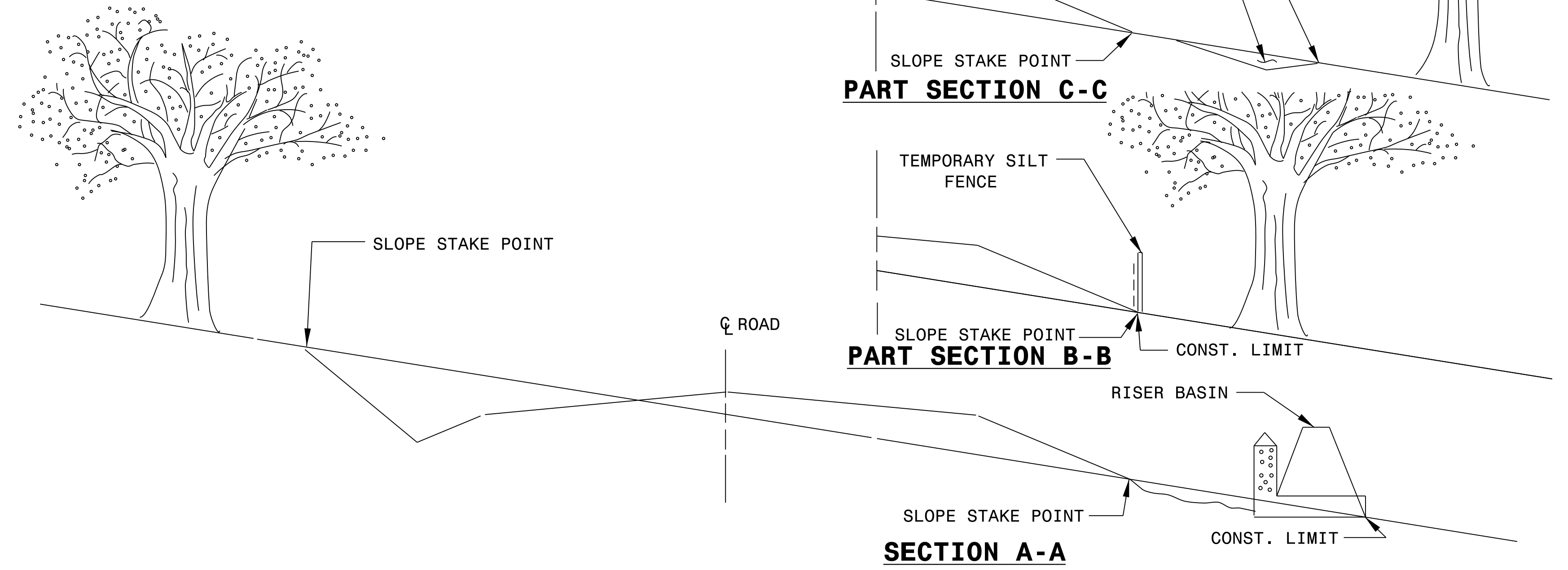
ENGLISH DETAIL DRAWING FOR
METHOD OF CLEARING
 MODIFIED METHOD - II
 HAND CLEARING ONLY

SHEET 1 OF 1
200d02



- GENERAL NOTES:**
1. REMOVE TREES OUTSIDE THE CLEARING LIMIT WHEN, IN THE OPINION OF THE ENGINEER, THE UTILITY OF A TREE WILL BE DESTROYED BY THE CONSTRUCTION OR THE CLEARING OPERATION.
 2. CLEAR IN ACCORDANCE WITH THIS STANDARD EXCEPT WHERE ADDITIONAL CLEARING IS REQUIRED FOR SAFETY AS SHOWN ON THE PLANS.
 3. FOR SECTIONS WITH WIDE MEDIANS WHERE TREES ARE TO REMAIN, CLEAR THE MEDIAN SIDE IN THE SAME MANNER AS ON THE OUTSIDE.
 4. ONLY HAND CLEARING WILL BE ALLOWED WITHIN THE PROJECT LIMITS.

CLEAR TO SLOPE STAKE LINE OR CONSTRUCTION LIMITS



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

ENGLISH DETAIL DRAWING FOR
METHOD OF CLEARING
 MODIFIED METHOD - II
 HAND CLEARING ONLY

SHEET 1 OF 1
200d02



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

SEE TITLE BLOCK

ORIGINAL BY: rnbritt DATE: 05-02-11
 MODIFIED BY: DATE:
 CHECKED BY: DATE:
 FILE SPEC.: details/rnbritt/english/urban/u3615aconcretefume.dgn

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

12/06/07

COMPUTED BY: JMB DATE: 2/17
 CHECKED BY: SMK DATE: 2/4/17

PROJECT REFERENCE NO. 17BP.6.R.89
 SHEET NO. 3B-1

STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS

SUMMARY OF EARTHWORK

IN CUBIC YARDS

STATION	STATION	UNCL. EXCAV.	EMBANK. +%	BORROW	WASTE
-L- 14+00.00	-L- 16+84.75 (BR)	13	519	506	
SUBTOTAL		13	519	506	
-L- 18+17.25 (BR)	-L- 21+00.00	146	85		61
SUBTOTAL		146	85		61
TOTALS:		159	604	506	61
EARTH WASTE TO REPLACE BORROW				-61	-61
PROJECT TOTALS:				445	
EST. 5% TO REPLACE SOIL IN BORROW PIT				22	
GRAND TOTALS:		159		467	
SAY:		170		480	

ASPHALT PAVEMENT REMOVAL SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD ²
-L-	15+30.00	16+92.92	CL	398.25
-L-	18+09.38	20+25.00	CL	527.07
TOTAL:				925.32
SAY:				930

SHOULDER BERM GUTTER SUMMARY

SURVEY LINE	STATION	STATION	LENGTH
-L- (RT.)	18+28.13	18+37.88	9.75'
TOTAL:			9.75'
SAY:			10'

EST UNDERCUT EXCAVATION = 300 CY CONTINGENCY (FROM GEOTECH RECS. DATED 12-19-16)
 EST SELECT GRANULAR MATERIAL = 300 CY CONTINGENCY (FROM GEOTECH RECS. DATED 12-19-16)

EARTHWORK QUANTITIES ARE CALCULATED BY THE ROADWAY DESIGN UNIT. THESE EARTHWORK QUANTITIES ARE BASED IN PART ON SUBSURFACE DATA PROVIDED BY THE GEOTECHNICAL ENGINEERING UNIT.

APPROXIMATE QUANTITIES ONLY. UNCLASSIFIED EXCAVATION, BORROW EXCAVATION, FINE GRADING, CLEARING AND GRUBBING, AND REMOVAL OF EXISTING PAVEMENT WILL BE PAID FOR AT THE LUMP SUM PRICE FOR "GRADING".



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

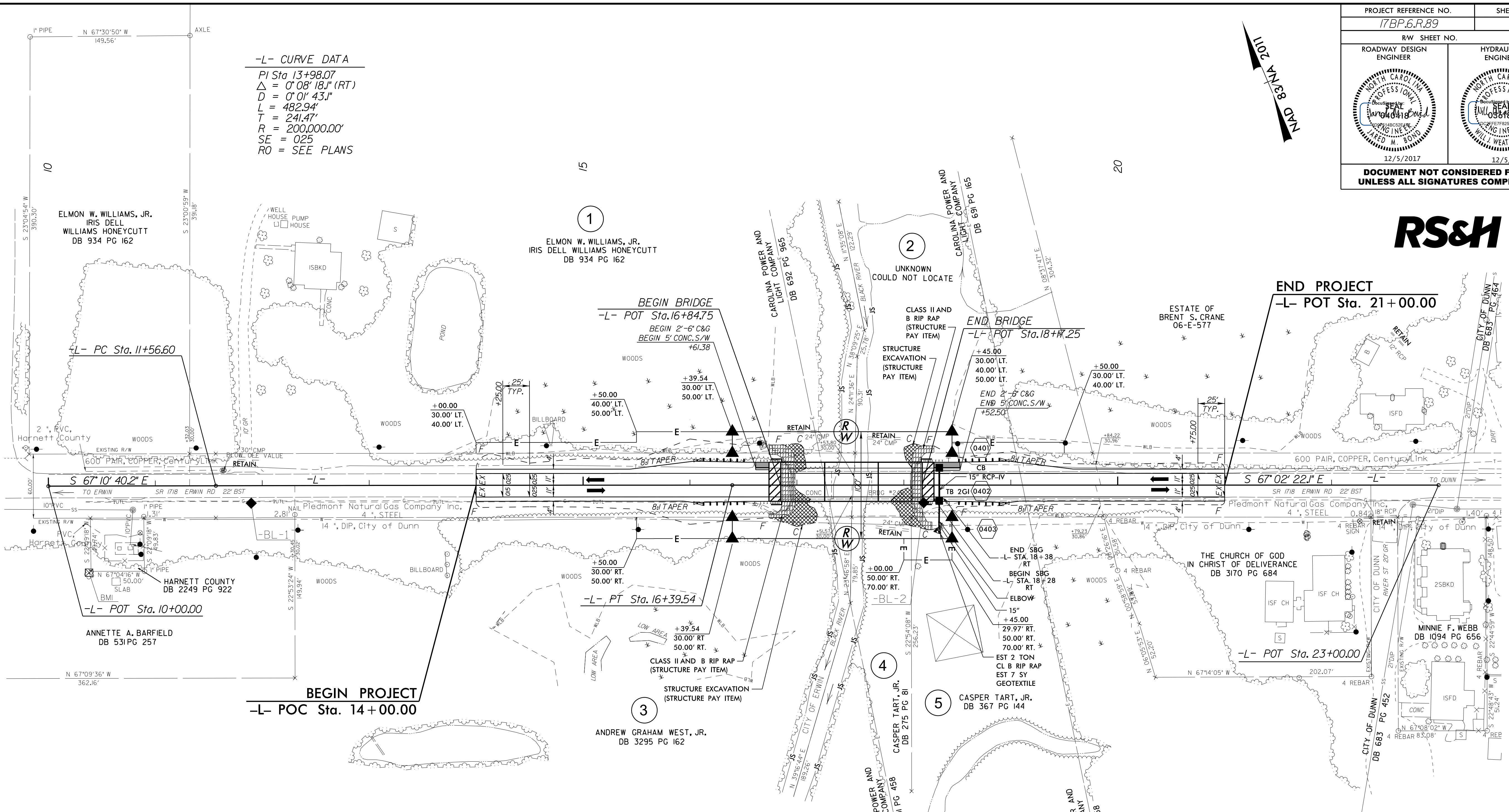
GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH		W		ANCHORS				IMPACT ATTENUATOR TYPE 350			SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS		
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	GREU TL-3	TYPE III	EA	G	NG								
-L-	16+03.50	16+84.75	LT	81.25				BRIDGE	10'-5"	13'-5"	50.00	50.00	1.00		1	1										GUARDRAIL CALCULATED USING SUBREGIONAL TIER GUIDELINES	
-L-	18+17.25	18+98.50	LT	81.25				BRIDGE	10'-5"	13'-5"	50.00		1.00		1	1										GUARDRAIL CALCULATED USING SUBREGIONAL TIER GUIDELINES	
-L-	16+03.50	16+84.75	RT	81.25				BRIDGE	4'-2 1/2"	7'-2 1/2"	50.00		1.00		1	1										GUARDRAIL CALCULATED USING SUBREGIONAL TIER GUIDELINES	
-L-	18+17.25	18+98.50	RT	81.25				BRIDGE	4'-2 1/2"	7'-2 1/2"		50.00		1.00	1	1										GUARDRAIL CALCULATED USING SUBREGIONAL TIER GUIDELINES	
SUBTOTALS				325.00																							
ANCHOR DEDUCTION				275.00																							
TOTAL				50.00											4	4											
SAY				75.00											4	4											

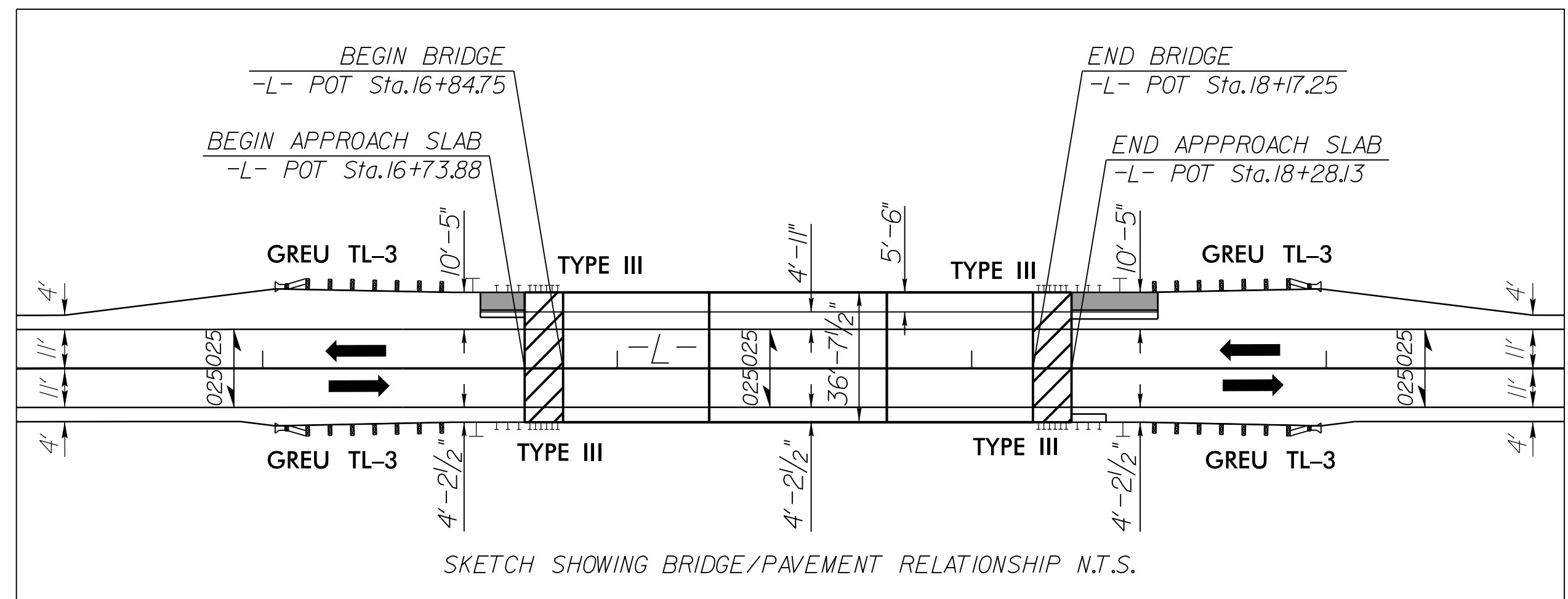
ANCHOR DEDUCTION
 GREU TL-3: 4 @ 50' = 200'
 TYPE III: 4 @ 18.75' = 75'
 GRAND TOTAL = 275'
 ADDITIONAL GUARDRAIL POSTS = 5

05-DEC-2017 11:18
 R:\Roadway\Projects\B57704_Rdy.sum_3B-1.dgn

PROJECT REFERENCE NO. 17BP.6.R.89	SHEET NO. 4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
	
12/5/2017	12/5/2017
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



-L- CURVE DATA
 PI Sta 13+98.07
 $\Delta = 0^{\circ}08'18.1''$ (RT)
 $D = 0^{\circ}01'43.1''$
 $L = 482.94'$
 $T = 241.47'$
 $R = 200,000.00'$
 $SE = 025$
 $RO = \text{SEE PLANS}$


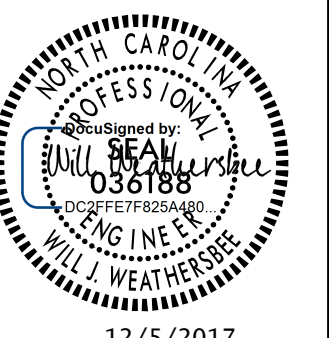


FOR -L- PROFILE, SEE SHEET NO. 5
 FOR STRUCTURE PLANS, SEE SHEETS S-1 THRU S-29

REVISIONS

8.17.7.99
 05-DEC-2017 11:54
 PC: H:\Projects\17BP.6.R.89\17BP.6.R.89.dgn
 \$\$\$\$DISPERNAME\$\$\$\$

5/14/99

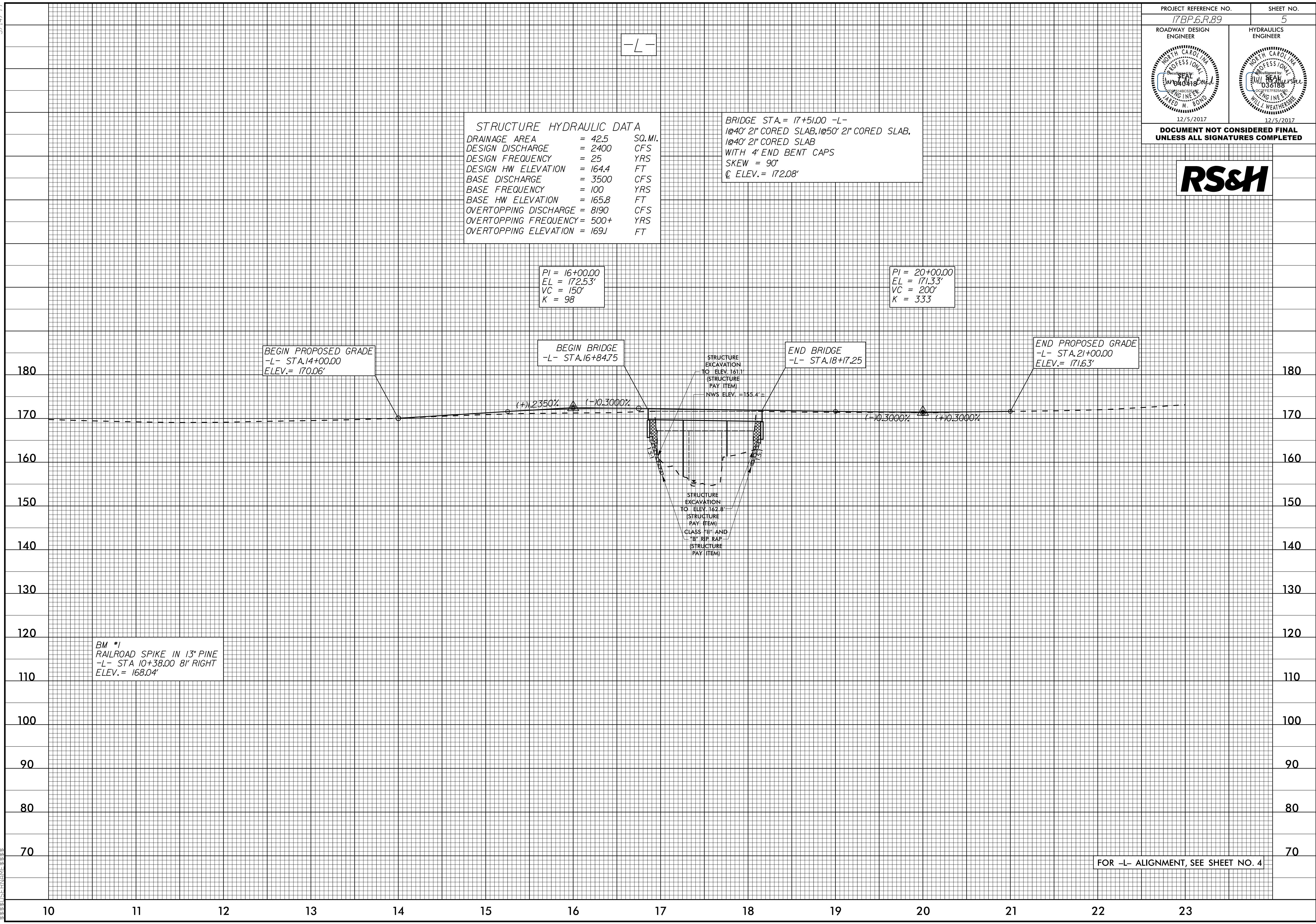
PROJECT REFERENCE NO. 17BP.6.R.89	SHEET NO. 5
ROADWAY DESIGN ENGINEER 	HYDRAULICS ENGINEER 
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



STRUCTURE HYDRAULIC DATA

DRAINAGE AREA	= 42.5	SQ. MI.
DESIGN DISCHARGE	= 2400	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 164.4	FT
BASE DISCHARGE	= 3500	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 165.8	FT
OVERTOPPING DISCHARGE	= 8190	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 169J	FT

BRIDGE STA. = 17+51.00 -L-
 1@40' 2" CORED SLAB, 1@50' 2" CORED SLAB,
 1@40' 2" CORED SLAB
 WITH 4' END BENT CAPS
 SKEW = 90°
 @ ELEV. = 172.08'

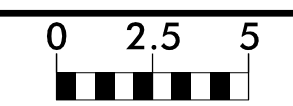


BM #1
 RAILROAD SPIKE IN 13" PINE
 -L- STA. 10+38.00 8' RIGHT
 ELEV. = 168.04'

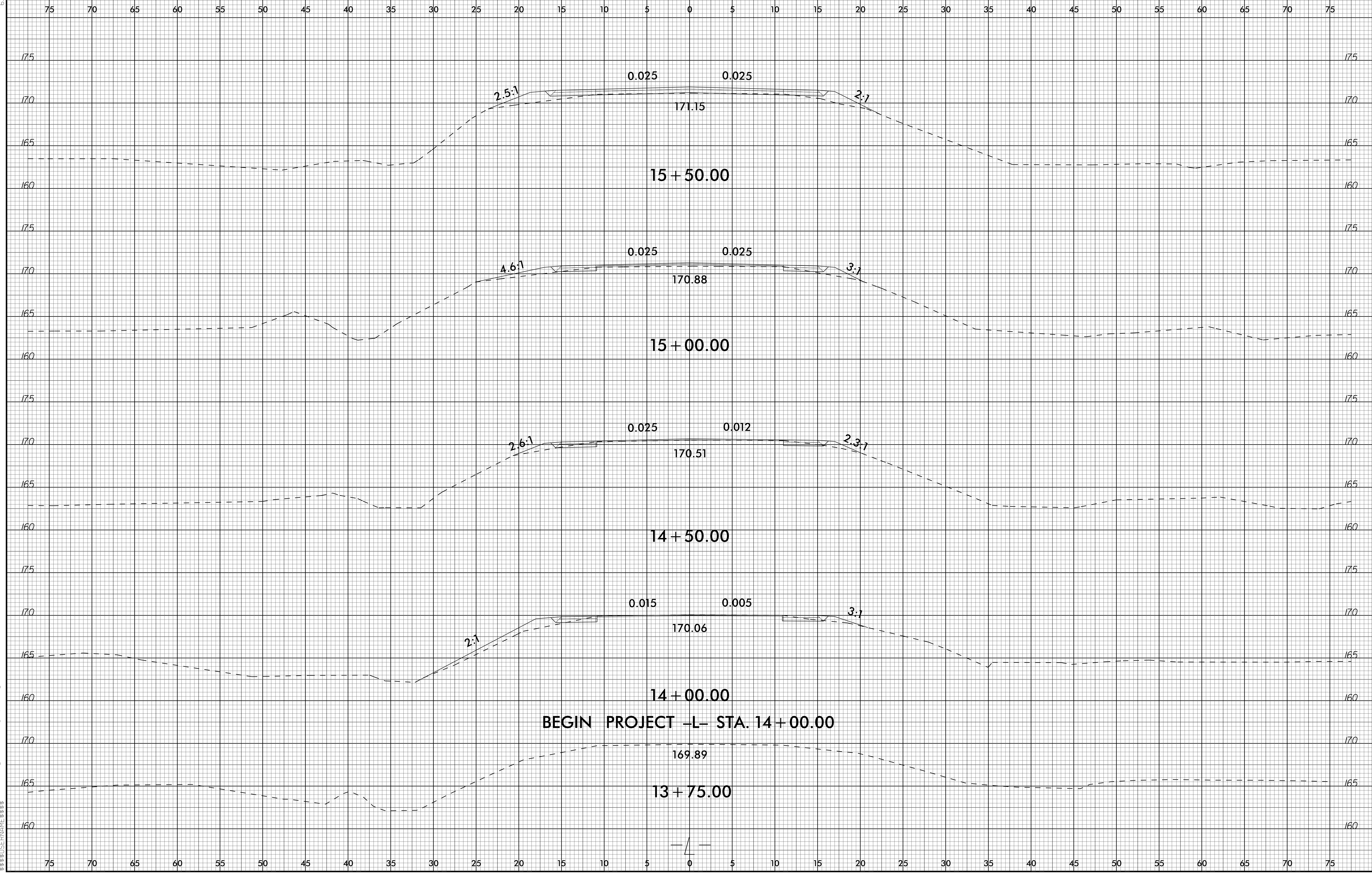
FOR -L- ALIGNMENT, SEE SHEET NO. 4

05-DEC-2017 11:36
 R:\Projects\17BP.6.R.89\17BP.6.R.89.dgn
 R:\Projects\17BP.6.R.89\17BP.6.R.89.dgn

6/23/16

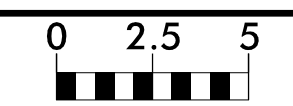


PROJ. REFERENCE NO.	SHEET NO.
17BP.6.R.89	X-1

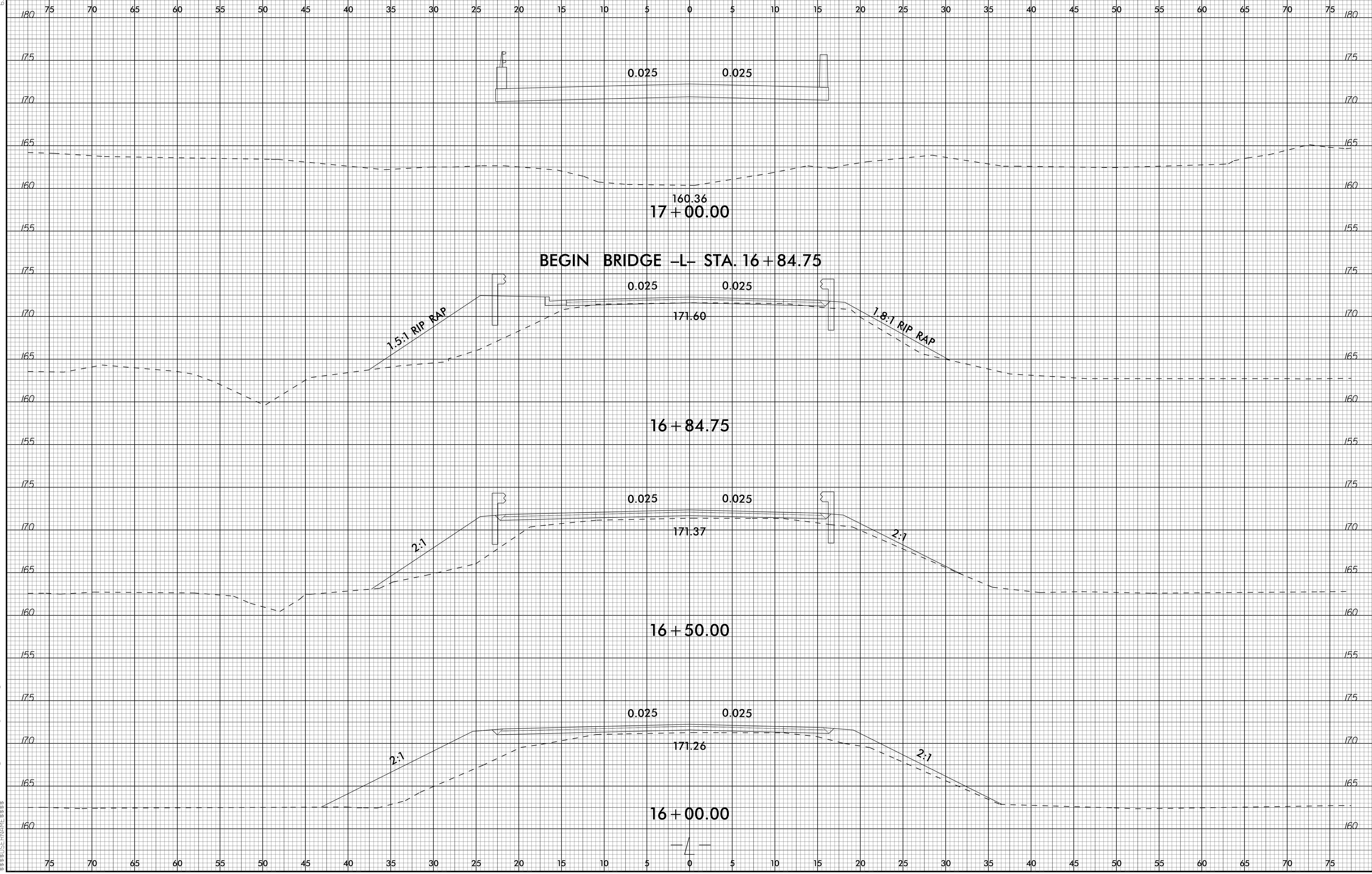


05-DEC-2017 11:36
S:\Projects\17BP.6.R.89\17BP.6.R.89-Modeling\B57041_Rdy_xpl.L.dgn
S:\Projects\17BP.6.R.89\17BP.6.R.89-Modeling\B57041_Rdy_xpl.L.dgn

6/23/16

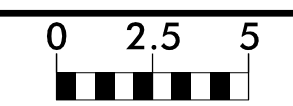


PROJ. REFERENCE NO.	SHEET NO.
17BP.6.R.89	X-2

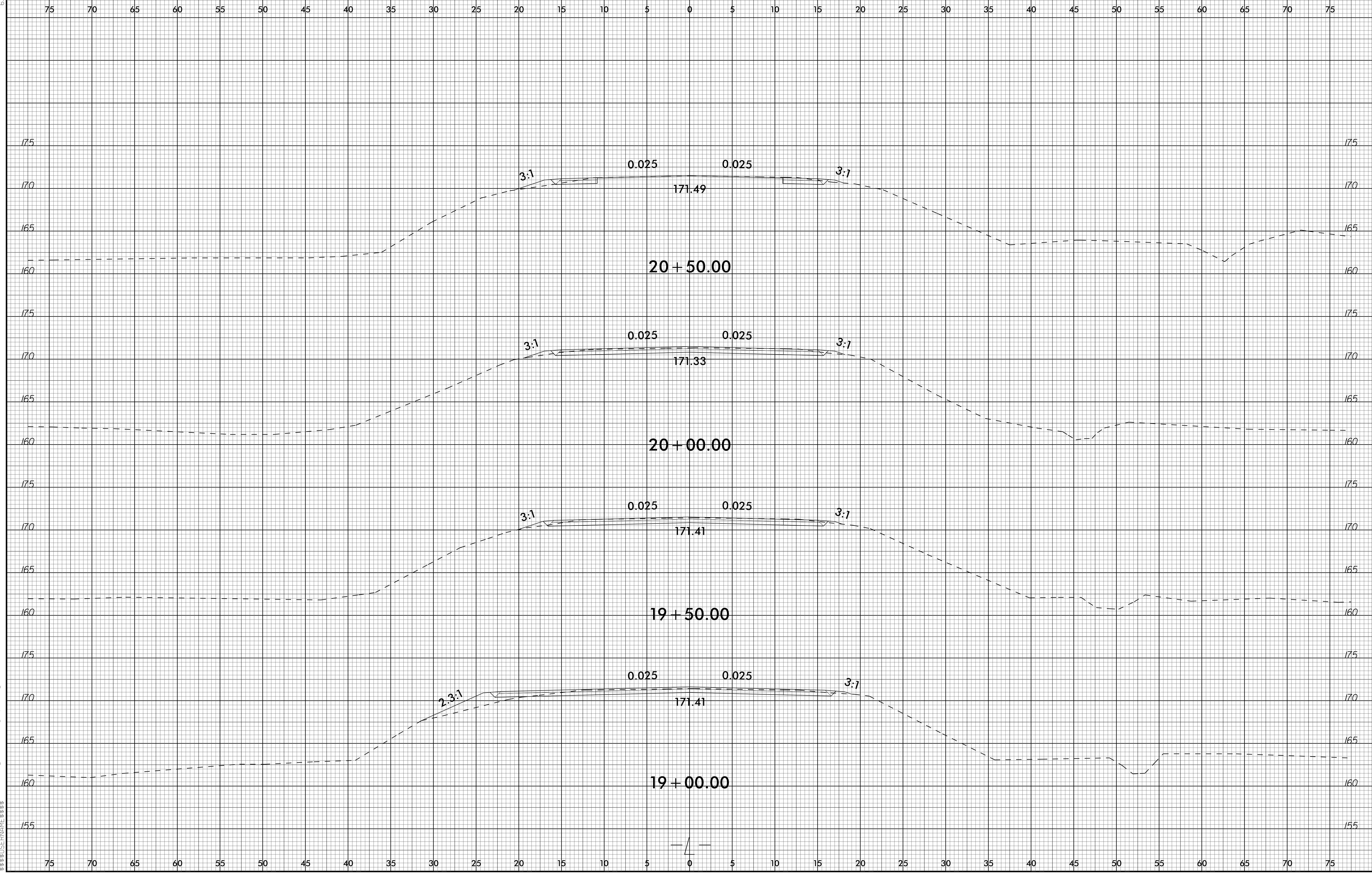


05-DEC-2017 11:37
S:\Projects\17BP.6.R.89-Modeling\B57041_Rdy_xpl.Ldgn
S:\Projects\17BP.6.R.89-Modeling\B57041_Rdy_xpl.Ldgn

6/23/16

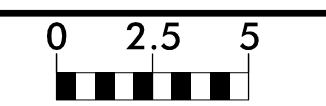


PROJ. REFERENCE NO.	SHEET NO.
17BP.6.R.89	X-4

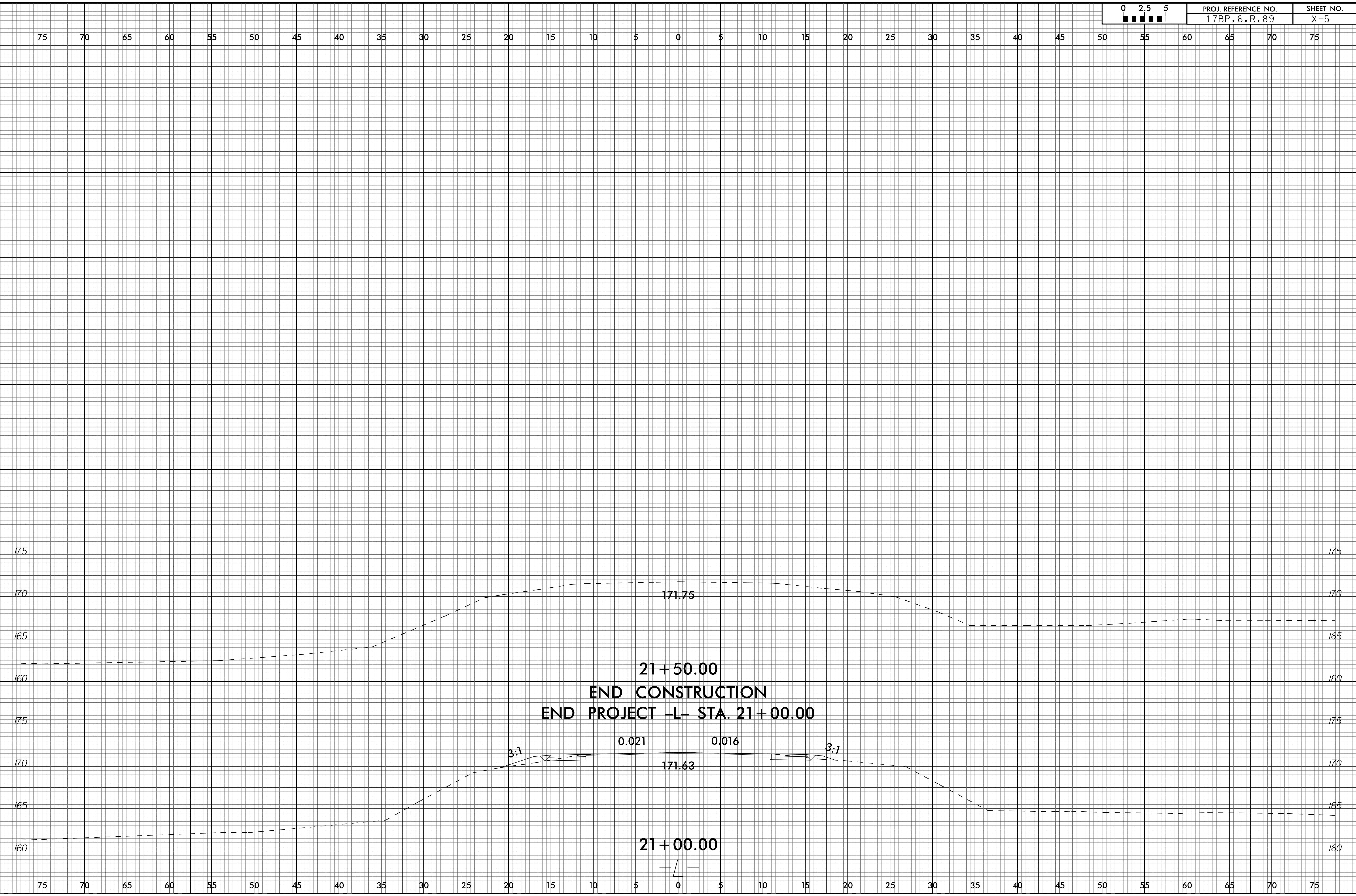


05-DEC-2017 11:37
S:\Projects\17BP.6.R.89\17BP.6.R.89-Modeling\17BP.6.R.89-Modeling\17BP.6.R.89-X-4.dgn

6/23/16
05-DEC-2017 11:38
S:\PROJECTS\17BP.6.R.89\17BP.6.R.89-Modeling\B5704_Rdy_xpl.Ldgn

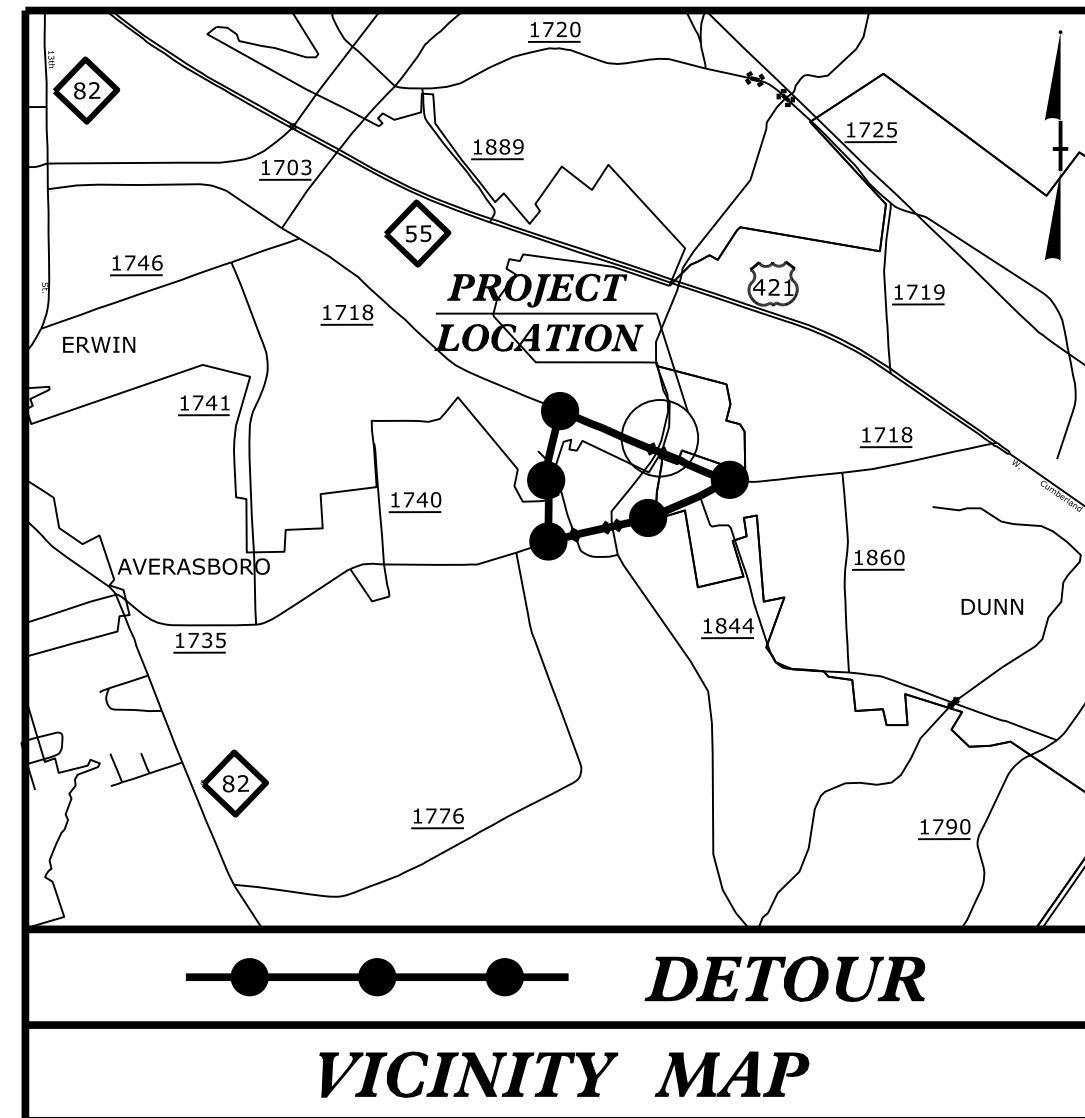


PROJ. REFERENCE NO.	SHEET NO.
17BP.6.R.89	X-5



TIP PROJECT: 17BP.6.R.89

CONTRACT: DF00194



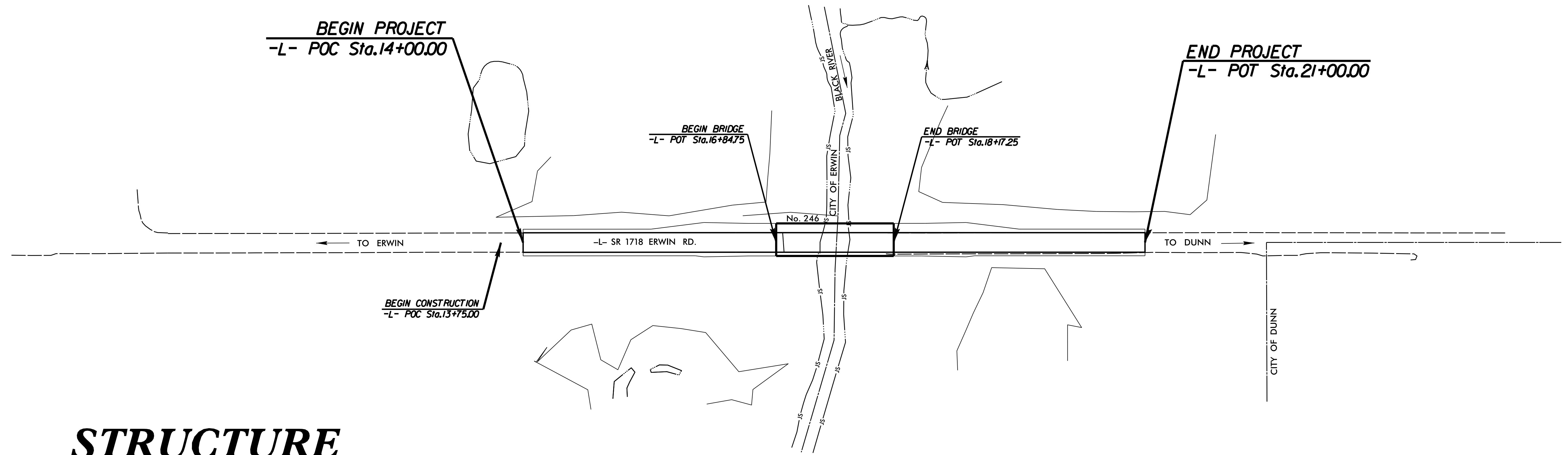
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

HARNETT COUNTY

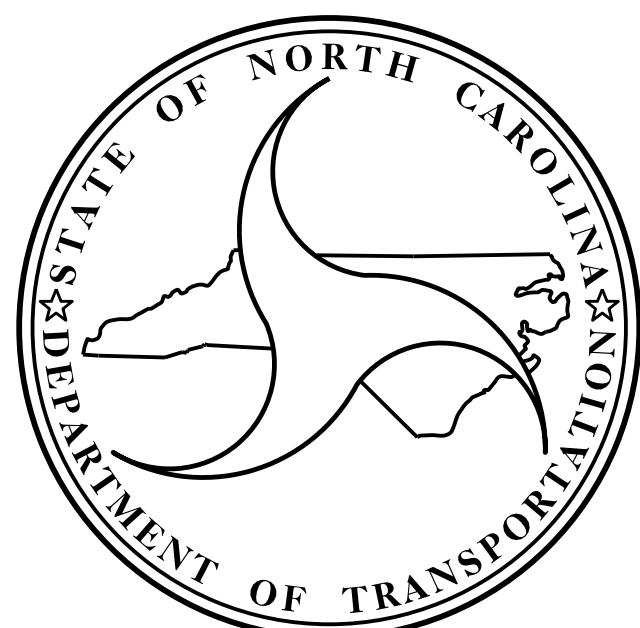
**LOCATION: REPLACE BRIDGE 246 OVER BLACK RIVER
ON SR 1718 (ERWIN ROAD)**

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.6.R.89		
STATE PROJ. NO.	P.A. PROJ. NO.	DESCRIPTION	
45658.1.1		P.E.	



STRUCTURE



DESIGN DATA

ADT 2018 = 6973
ADT 2038 = 10063
K = 9 %
D = 55 %
T = 3 % *
V = 50 MPH
* (TTST 1 %, DUAL 2 %)

FUNC CLASS = COLLECTOR
SUB-REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT 17.BP.6.R.89 = 0.108 MILE
LENGTH STRUCTURE TIP PROJECT 17.BP.6.R.89 = 0.025 MILE

TOTAL LENGTH TIP PROJECT 17.BP.6.R.89 = 0.133 MILE

Prepared in the Office of:
DIVISION OF HIGHWAYS
STRUCTURES MANAGEMENT UNIT
1000 BIRCH RIDGE DR.
RALEIGH, N.C. 27610

2018 STANDARD SPECIFICATIONS

LETTING DATE : JANUARY 16, 2018

GREG W. DICKEY, P.E.
PROJECT ENGINEER

ASTER G. ABRAHA, P.E.
PROJECT DESIGN ENGINEER

16+50 17+00 17+50 18+00 18+50

GRADE DATA

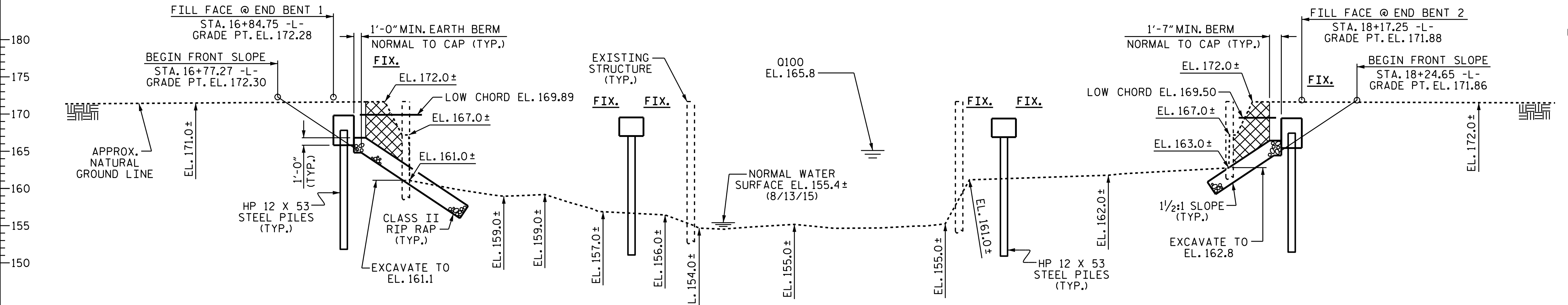
(+)1.2350% (-)0.3000%

PI = 16+00.00 -L-
EL = 172.53
VC = 150'

SPAN A

SPAN B

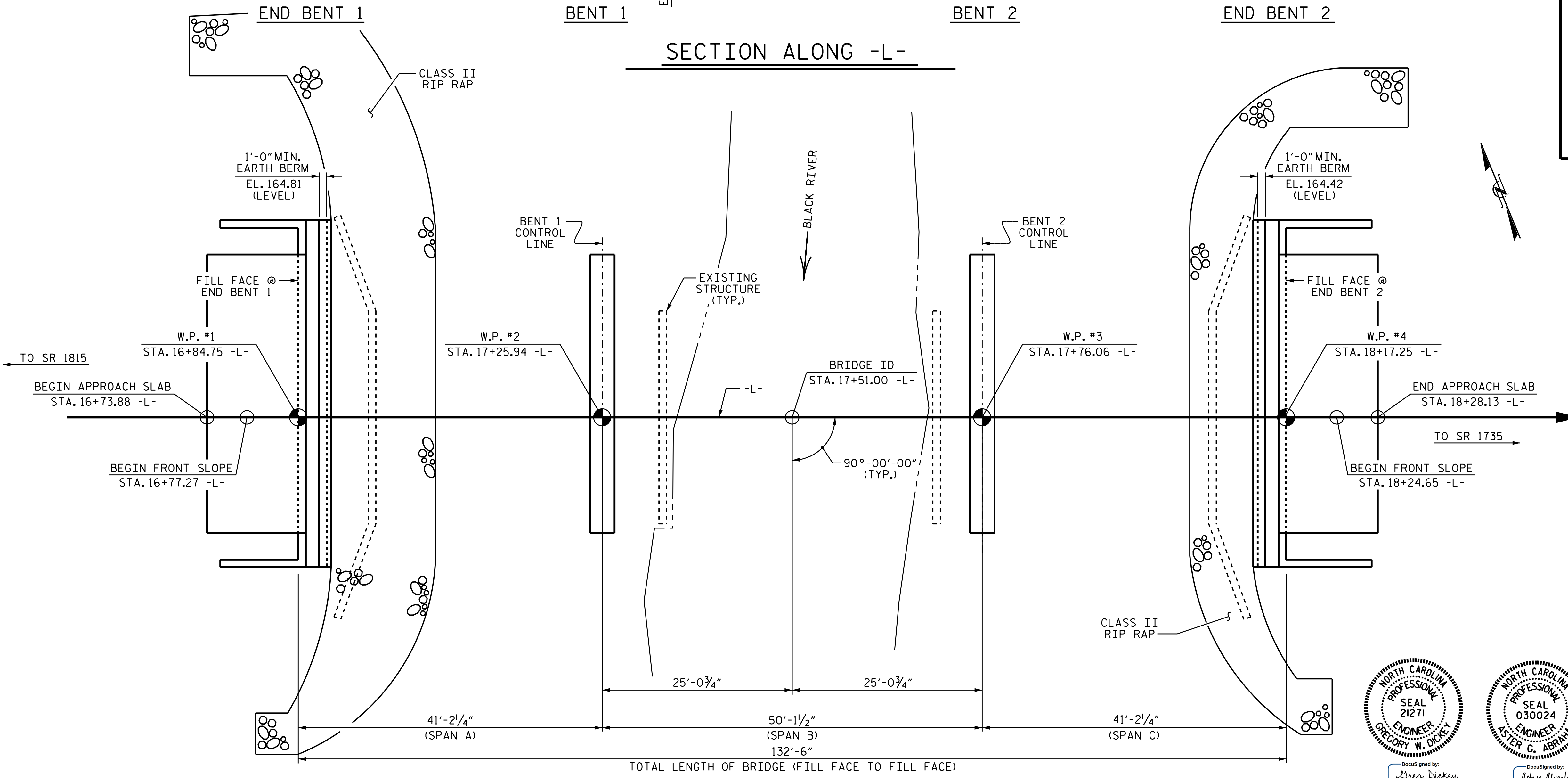
SPAN C



UNCLASSIFIED STRUCTURE EXCAVATION

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

SECTION ALONG -L-



PLAN

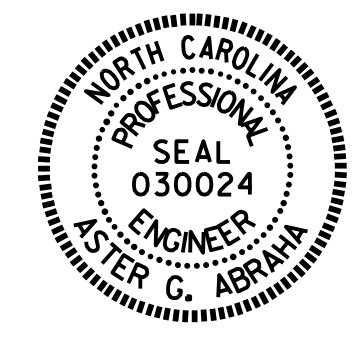
PILES NOT SHOWN FOR CLARITY

PROJECT NO. 17BP.6.R.89
HARNETT COUNTY
STATION: 17+51.00 -L-

SHEET 1 OF 3 REPLACES BRIDGE No. 246

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

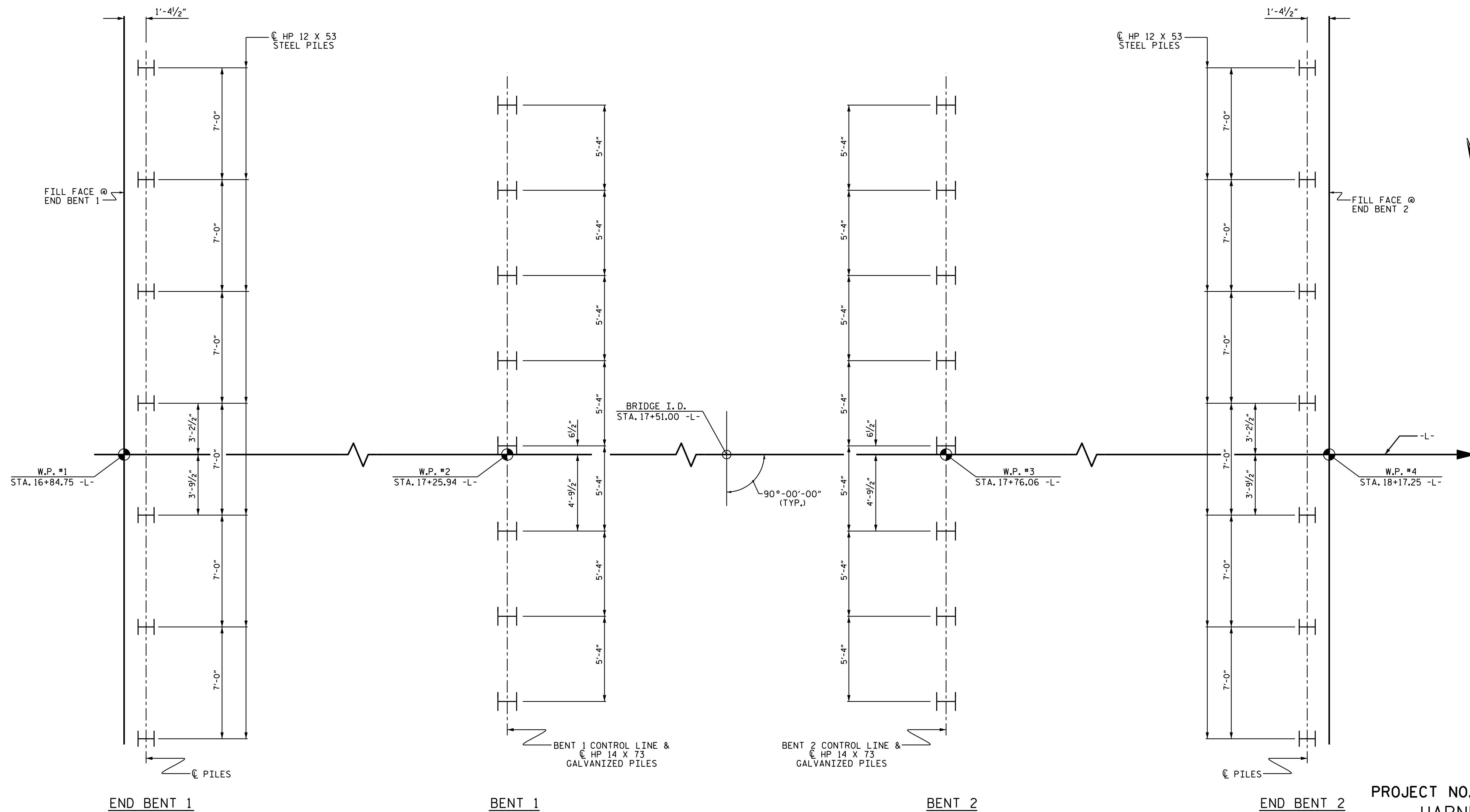
GENERAL DRAWING
FOR BRIDGE OVER BLACK RIVER ON SR 1718 (ERWIN ROAD) BETWEEN SR 1815 & SR 1735



DRAWN BY : S. B. WILLIAMS DATE : 8/28/17
CHECKED BY : M. AHMED DATE : 10/5/17
DESIGN ENGINEER OF RECORD : M. AHMED DATE : 06/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			29



FOUNDATION LAYOUT
DIMENSIONS LOCATING PILES ARE SHOWN TO PILE CENTERLINE.

NOTES:

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO.1 AND END BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 63 TONS PER PILE.

PILES AT BENT NO.1 AND BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 120 TONS PER PILE.

DRIVE PILES AT END BENT NO.1 AND END BENT NO.2 TO A REQUIRED DRIVING RESISTANCE OF 105 TONS PER PILE.

DRIVE PILES AT BENT NO.1 TO A REQUIRED DRIVING RESISTANCE OF 220 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR DOWNDRAG OR SCOUR.

DRIVE PILES AT BENT NO.2 TO A REQUIRED DRIVING RESISTANCE OF 220 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR DOWNDRAG OR SCOUR.

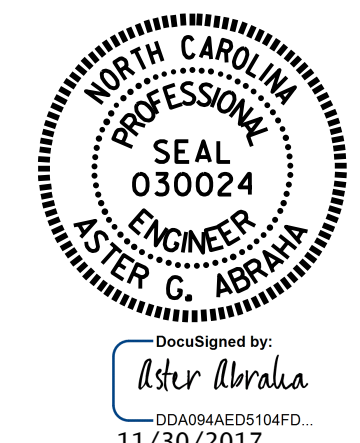
INSTALL PILES AT BENT NO.1 TO A TIP ELEVATION NO HIGHER THAN 136.5 FT.

INSTALL PILES AT BENT NO.2 TO A TIP ELEVATION NO HIGHER THAN 139.0 FT.

TESTING PILES WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING MAY BE REQUIRED. THE ENGINEER WILL DETERMINE THE NEED FOR PDA TESTING. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

THE SCOUR CRITICAL ELEVATION FOR BENT NO.1 AND BENT 2 IS ELEVATION 146.0 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

DRAWN BY : S. B. WILLIAMS DATE : 8-31-17
 CHECKED BY : M. AHMED DATE : 10-2-17
 DESIGN ENGINEER OF RECORD: M. AHMED DATE : 06/2017



PROJECT NO. 17BP.6.R.89
HARNETT COUNTY
 STATION: 17+51.00 -L-

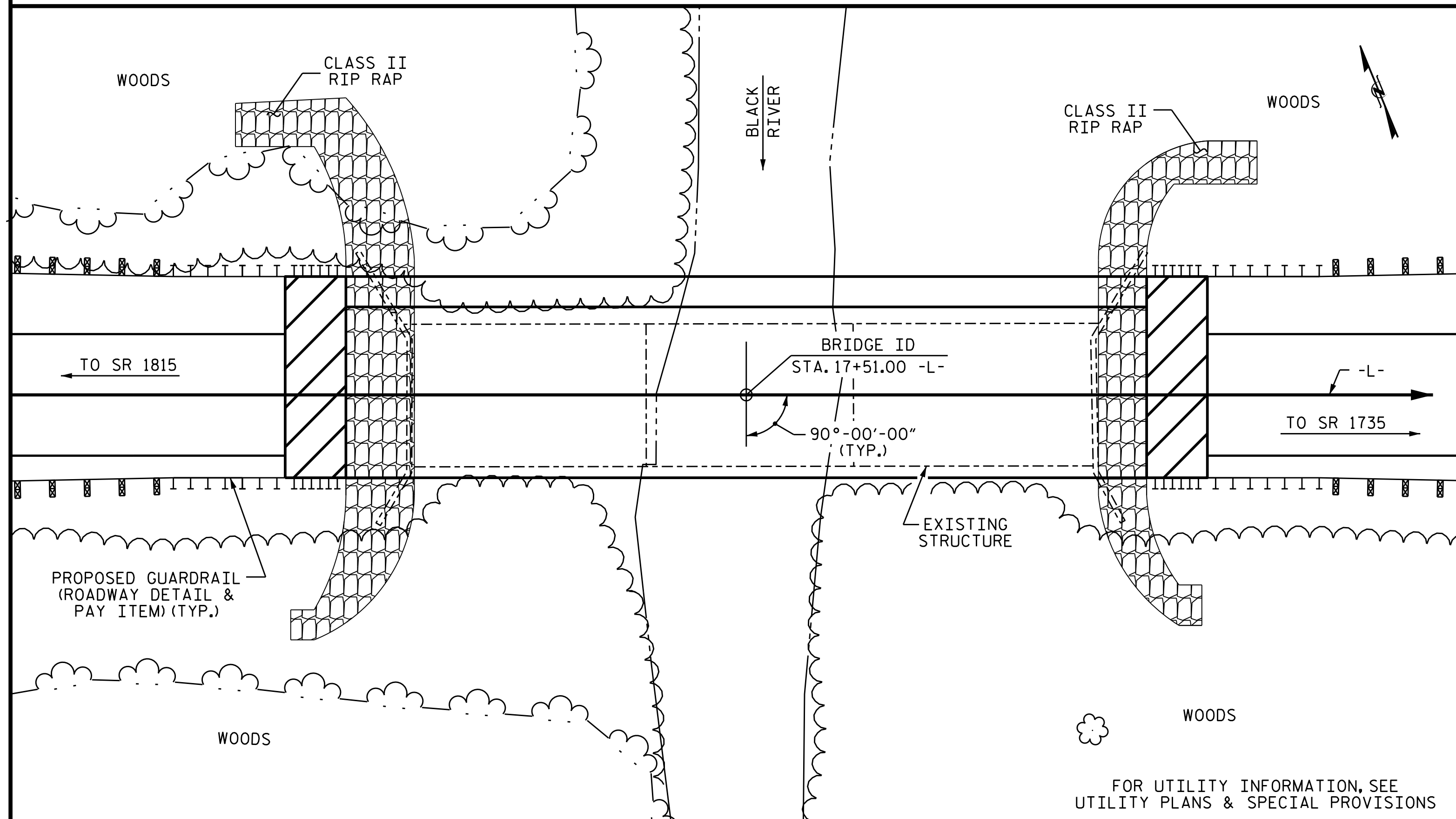
SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 FOR BRIDGE OVER BLACK RIVER ON SR 1718 (ERWIN ROAD) BETWEEN SR 1815 & SR 1735

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			29

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

BM #1: RR SPIKE IN 13" PINE, 81' RIGHT OF STA. 10+38.00 -L-, EL. 168.04



LOCATION SKETCH

NOTES

- ASSUMED LIVE LOAD = HL 93 OR ALTERNATE LOADING.
- THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
- THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.
- FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR FALSEWORK & FORMWORK, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
- THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA ON SHEET S-1 SHALL BE EXCAVATED FOR A DISTANCE OF 54 FT. LEFT & 50 FT. RIGHT OF -L- AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.
- THE EXISTING STRUCTURE CONSISTING OF 2 SPANS @ 38'-3", 1 SPAN @ 37'-6", WITH REINFORCED CONCRETE DECK GIRDERS AND FULL HEIGHT REINFORCED CONCRETE ABUTMENTS AND REINFORCED CONCRETE PIER WALLS AND CAPS WITH A CLEAR ROADWAY WIDTH OF 26'-0" LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED. FOR STRUCTURE REMOVAL, SEE SPECIAL PROVISIONS.
- REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED IN A MANNER THAT PREVENTS DEBRIS FROM FALLING INTO THE WATER. THE CONTRACTOR SHALL SUBMIT DEMOLITION PLANS FOR REVIEW AND REMOVE THE BRIDGE IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.
- THE 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.
- FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.
- THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH "HEC 18-EVALUATING SCOUR AT BRIDGES".
- FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
- ASPHALT WEARING SURFACE IS INCLUDED IN ROADWAY QUANTITY ON ROADWAY PLANS.
- AT THE CONTRACTOR'S OPTION, PRESTRESSED CONCRETE END BENT CAPS MAY BE SUBSTITUTED IN PLACE OF THE CAST-IN-PLACE CAPS. THE CONTRACTOR SHALL COORDINATE WITH THE RESIDENT ENGINEER TO RECEIVE REVISED PLANS AND DETAILS FROM THE STRUCTURES MANAGEMENT UNIT. THE REDESIGN AND ANY ADDITIONAL MATERIALS NEEDED WILL BE AT NO ADDITIONAL COST TO THE CONTRACTOR.
- THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS. PAYMENT FOR THE SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

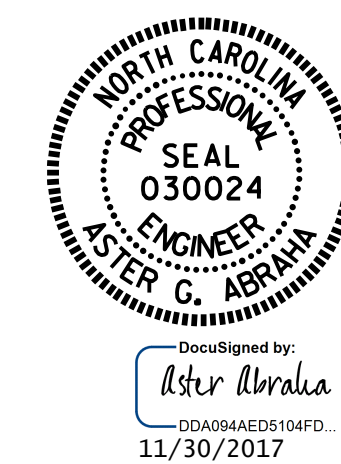
TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	PDA TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS AA CONCRETE	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	EPOXY REINFORCING STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 PILES	PILE DRIVING EQUIPMENT SETUP FOR HP 14x73 PILES	HP 12x53 STEEL PILES		HP 14x73 STEEL PILES		PILE REDRIVES	TWO BAR METAL RAIL	VERTICAL CONCRETE BARRIER RAIL	1'-2" x 3'-4 1/8" CONCRETE PARAPET	PLAIN RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLABS		ASBESTOS ASSESSMENT	
											NO.	LIN.FT.	NO.	LIN.FT.								EACH	LIN.FT.		LIN.FT.
SUPERSTRUCTURE	LUMP SUM	EACH	LUMP SUM	CU. YDS.	CU. YDS.	LUMP SUM	LBS.	LBS.	LBS.	LBS.						122.8	130.25	130.25				LUMP SUM	39	1690'-0"	LUMP SUM
END BENT 1			LUMP SUM		24.1		2933		7		7	245			4							LUMP SUM			
BENT 1					12.5		2464			8			8	400	4										
BENT 2					12.5		2464			8			8	400	4										
END BENT 2			LUMP SUM		24.1		2933		7		7	245			4										
TOTAL	LUMP SUM	1	LUMP SUM	22.1	73.2	LUMP SUM	10,794	1096	14	16	14	490	16	800	16	122.8	130.25	130.25		236	265	LUMP SUM	39	1690'-0"	LUMP SUM

PROJECT NO. 17BP.6.R.89
HARNETT COUNTY
 STATION: 17+51.00 -L-

SHEET 3 OF 3

HYDRAULIC DATA	
DESIGN DISCHARGE	= 2,400 C.F.S.
FREQUENCY OF DESIGN DISCHARGE	= 25 YEAR
DESIGN HIGH WATER ELEVATION	= 164.4
DRAINAGE AREA	= 42.5 SQ.MI.
BASE DISCHARGE (Q100)	= 3,500 C.F.S.
BASE HIGH WATER ELEVATION	= 165.8
OVERTOPPING DATA	
OVERTOPPING DISCHARGE	= 8,190 C.F.S.
FREQUENCY OF OVERTOPPING FLOOD	= 500+ YEARS
OVERTOPPING ELEVATION	= 169.1



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GENERAL DRAWING
 FOR BRIDGE OVER BLACK RIVER ON SR 1718 (ERWIN ROAD) BETWEEN SR 1815 & SR 1735

DRAWN BY : S. B. WILLIAMS DATE : 8/28/17
 CHECKED BY : M. AHMED DATE : 10/5/17
 DESIGN ENGINEER OF RECORD : M. AHMED DATE : 06/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-3
1			3			TOTAL SHEETS
2			4			29

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

LOAD FACTORS:

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

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			
						LIVELOAD FACTORS	MOMENT					SHEAR					LIVELOAD FACTORS	MOMENT						
							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)		DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN		GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING	HL-93(Inv)	N/A	1	1.319	--	1.75	0.278	1.76	40'	EL	19.5	0.549	1.32	40'	EL	1.95	0.80	0.278	1.55	40'	EL	19.5		
	HL-93(0pr)	N/A	--	1.709	--	1.35	0.278	2.28	40'	EL	19.5	0.549	1.71	40'	EL	1.95	N/A	--	--	--	--	--		
	HS-20(Inv)	36.000	2	1.540	55.449	1.75	0.278	2.21	40'	EL	19.5	0.549	1.54	40'	EL	1.95	0.80	0.278	1.94	40'	EL	19.5		
	HS-20(0pr)	36.000	--	1.997	71.878	1.35	0.278	2.86	40'	EL	19.5	0.549	2	40'	EL	1.95	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13.500	--	3.606	48.687	1.4	0.278	5.1	40'	EL	19.5	0.549	4.13	40'	EL	1.95	0.80	0.278	3.61	40'	EL	19.5	
		SNGARBS2	20.000	--	2.964	59.289	1.4	0.278	4.19	40'	EL	15.6	0.549	3.07	40'	EL	1.95	0.80	0.278	2.96	40'	EL	19.5	
		SNAGRIS2	22.000	--	2.906	63.929	1.4	0.278	4.09	40'	EL	15.6	0.549	2.91	40'	EL	1.95	0.80	0.278	2.92	40'	EL	15.6	
		SNCOTTS3	27.250	--	1.803	49.125	1.4	0.278	2.55	40'	EL	19.5	0.549	2.07	40'	EL	1.95	0.80	0.278	1.80	40'	EL	19.5	
		SNAGGRS4	34.925	--	1.623	56.667	1.4	0.278	2.29	40'	EL	19.5	0.549	1.82	40'	EL	1.95	0.80	0.278	1.62	40'	EL	19.5	
		SNS5A	35.550	--	1.578	56.107	1.4	0.278	2.23	40'	EL	19.5	0.549	1.9	40'	EL	1.95	0.80	0.278	1.58	40'	EL	19.5	
		SNS6A	39.950	--	1.502	59.992	1.4	0.278	2.12	40'	EL	19.5	0.549	1.77	40'	EL	1.95	0.80	0.278	1.50	40'	EL	19.5	
	SNS7B	42.000	3	1.432	60.149	1.4	0.278	2.02	40'	EL	19.5	0.549	1.81	40'	EL	1.95	0.80	0.278	1.43	40'	EL	19.5		
	TTST	TNAGRIT3	33.000	--	1.848	60.976	1.4	0.278	2.61	40'	EL	19.5	0.549	2.08	40'	EL	1.95	0.80	0.278	1.85	40'	EL	19.5	
		TNT4A	33.075	--	1.872	61.901	1.4	0.278	2.65	40'	EL	19.5	0.549	1.98	40'	EL	1.95	0.80	0.278	1.87	40'	EL	19.5	
		TNT6A	41.600	--	1.587	66.032	1.4	0.278	2.24	40'	EL	19.5	0.549	1.94	40'	EL	1.95	0.80	0.278	1.59	40'	EL	19.5	
		TNT7A	42.000	--	1.627	68.354	1.4	0.278	2.3	40'	EL	19.5	0.549	1.79	40'	EL	1.95	0.80	0.278	1.63	40'	EL	19.5	
		TNT7B	42.000	--	1.664	69.888	1.4	0.278	2.35	40'	EL	19.5	0.549	1.72	40'	EL	1.95	0.80	0.278	1.66	40'	EL	19.5	
		TNAGRIT4	43.000	--	1.619	69.61	1.4	0.278	2.28	40'	EL	15.6	0.549	1.65	40'	EL	1.95	0.80	0.278	1.62	40'	EL	19.5	
TNAGT5A		45.000	--	1.498	67.412	1.4	0.278	2.12	40'	EL	19.5	0.549	1.71	40'	EL	1.95	0.80	0.278	1.50	40'	EL	19.5		
TNAGT5B	45.000	--	1.455	65.486	1.4	0.278	2.06	40'	EL	19.5	0.549	1.56	40'	EL	1.95	0.80	0.278	1.46	40'	EL	19.5			

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.

CONTROLLING LOAD RATING

1 DESIGN LOAD RATING (HL-93)

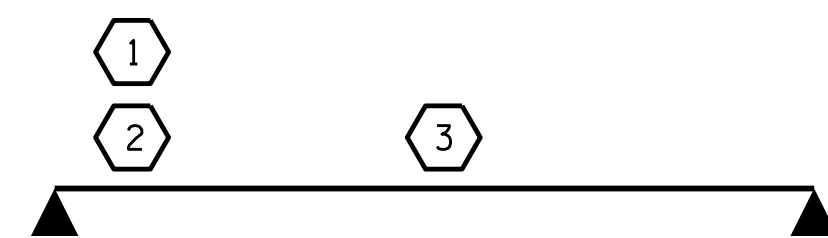
2 DESIGN LOAD RATING (HS-20)

3 LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

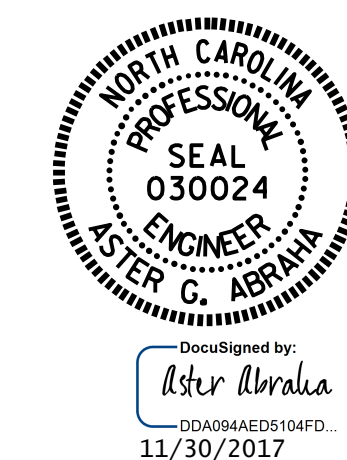
GIRDER LOCATION

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



LRFR SUMMARY
FOR SPAN "A" & "C"

PROJECT NO. 17BP.6.R.89
HARNETT COUNTY
STATION: 17+51.00 -L-



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
LRFR SUMMARY FOR
40' CORED SLAB UNIT
90° SKEW
(NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			29

ASSEMBLED BY : S. B. WILLIAMS DATE : 11-17
CHECKED BY : A. ABRAHA DATE : 11/2017

DRAWN BY : CVC 6/10
CHECKED BY : DNS 6/10

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

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	1.394	--	1.75	0.276	1.57	50'	EL	24.5	0.531	1.39	50'	EL	2.45	0.80	0.276	1.44	50'	EL	24.5		
	HL-93(0pr)	N/A	--	1.807	--	1.35	0.276	2.03	50'	EL	24.5	0.531	1.81	50'	EL	2.45	N/A	--	--	--	--	--		
	HS-20(Inv)	36.000	2	1.667	60.007	1.75	0.276	1.95	50'	EL	24.5	0.531	1.67	50'	EL	2.45	0.80	0.276	1.79	50'	EL	24.5		
	HS-20(0pr)	36.000	--	2.161	77.787	1.35	0.276	2.52	50'	EL	24.5	0.531	2.16	50'	EL	2.45	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13.500	--	3.635	49.079	1.4	0.276	4.95	50'	EL	24.5	0.531	4.7	50'	EL	2.45	0.80	0.276	3.64	50'	EL	24.5	
		SNGARBS2	20.000	--	2.871	57.42	1.4	0.276	3.91	50'	EL	24.5	0.531	3.42	50'	EL	2.45	0.80	0.276	2.87	50'	EL	24.5	
		SNAGRIS2	22.000	--	2.778	61.109	1.4	0.276	3.78	50'	EL	19.6	0.531	3.21	50'	EL	2.45	0.80	0.276	2.78	50'	EL	24.5	
		SNCOTTS3	27.250	--	1.814	49.418	1.4	0.276	2.47	50'	EL	24.5	0.531	2.36	50'	EL	2.45	0.80	0.276	1.81	50'	EL	24.5	
		SNAGGRS4	34.925	--	1.577	55.063	1.4	0.276	2.15	50'	EL	24.5	0.531	2.01	50'	EL	2.45	0.80	0.276	1.58	50'	EL	24.5	
		SNS5A	35.550	--	1.537	54.657	1.4	0.276	2.09	50'	EL	24.5	0.531	2.07	50'	EL	2.45	0.80	0.276	1.54	50'	EL	24.5	
		SNS6A	39.950	--	1.438	57.43	1.4	0.276	1.96	50'	EL	24.5	0.531	1.91	50'	EL	2.45	0.80	0.276	1.44	50'	EL	24.5	
	SNS7B	42.000	--	1.370	57.54	1.4	0.276	1.87	50'	EL	24.5	0.531	1.91	50'	EL	2.45	0.80	0.276	1.37	50'	EL	24.5		
	TTST	TNAGRIT3	33.000	--	1.761	58.118	1.4	0.276	2.4	50'	EL	24.5	0.531	2.25	50'	EL	2.45	0.80	0.276	1.76	50'	EL	24.5	
		TNT4A	33.075	--	1.777	58.759	1.4	0.276	2.42	50'	EL	24.5	0.531	2.17	50'	EL	2.45	0.80	0.276	1.78	50'	EL	24.5	
		TNT6A	41.600	--	1.480	61.558	1.4	0.276	2.01	50'	EL	24.5	0.531	2.08	50'	EL	2.45	0.80	0.276	1.48	50'	EL	24.5	
		TNT7A	42.000	--	1.502	63.087	1.4	0.276	2.05	50'	EL	24.5	0.531	1.94	50'	EL	2.45	0.80	0.276	1.50	50'	EL	24.5	
		TNT7B	42.000	--	1.566	65.773	1.4	0.276	2.13	50'	EL	24.5	0.531	1.84	50'	EL	2.45	0.80	0.276	1.57	50'	EL	24.5	
		TNAGRIT4	43.000	--	1.486	63.902	1.4	0.276	2.02	50'	EL	24.5	0.531	1.77	50'	EL	2.45	0.80	0.276	1.49	50'	EL	24.5	
TNAGT5A		45.000	--	1.388	62.47	1.4	0.276	1.89	50'	EL	24.5	0.531	1.8	50'	EL	2.45	0.80	0.276	1.39	50'	EL	24.5		
TNAGT5B	45.000	3	1.360	61.206	1.4	0.276	1.85	50'	EL	24.5	0.531	1.68	50'	EL	2.45	0.80	0.276	1.36	50'	EL	24.5			

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.

CONTROLLING LOAD RATING

1 DESIGN LOAD RATING (HL-93)

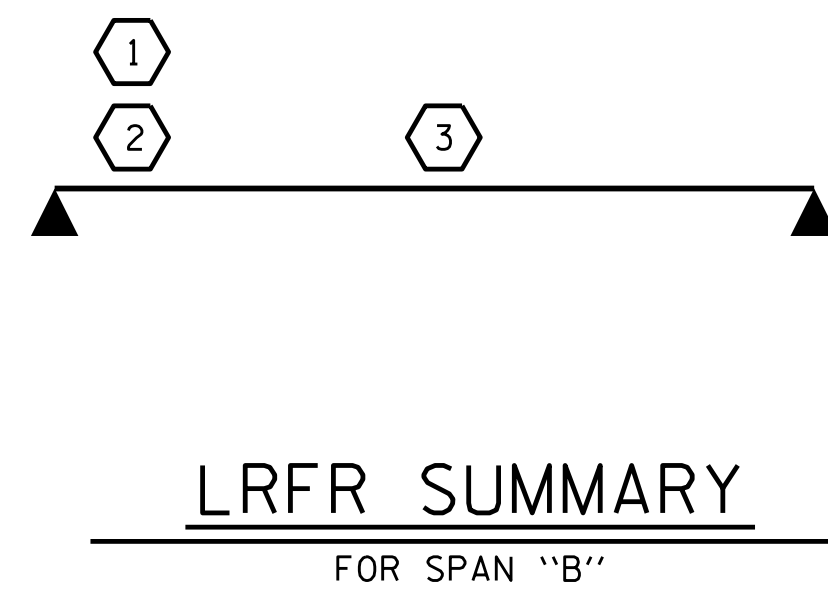
2 DESIGN LOAD RATING (HS-20)

3 LEGAL LOAD RATING **

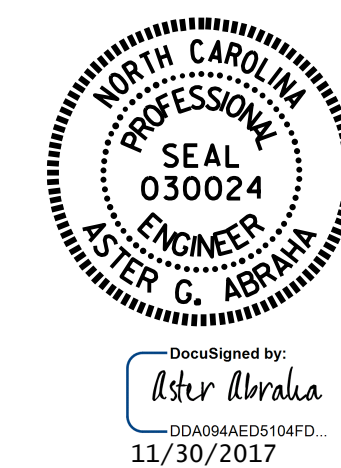
** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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



PROJECT NO. 17BP.6.R.89
HARNETT COUNTY
STATION: 17+51.00 -L-



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

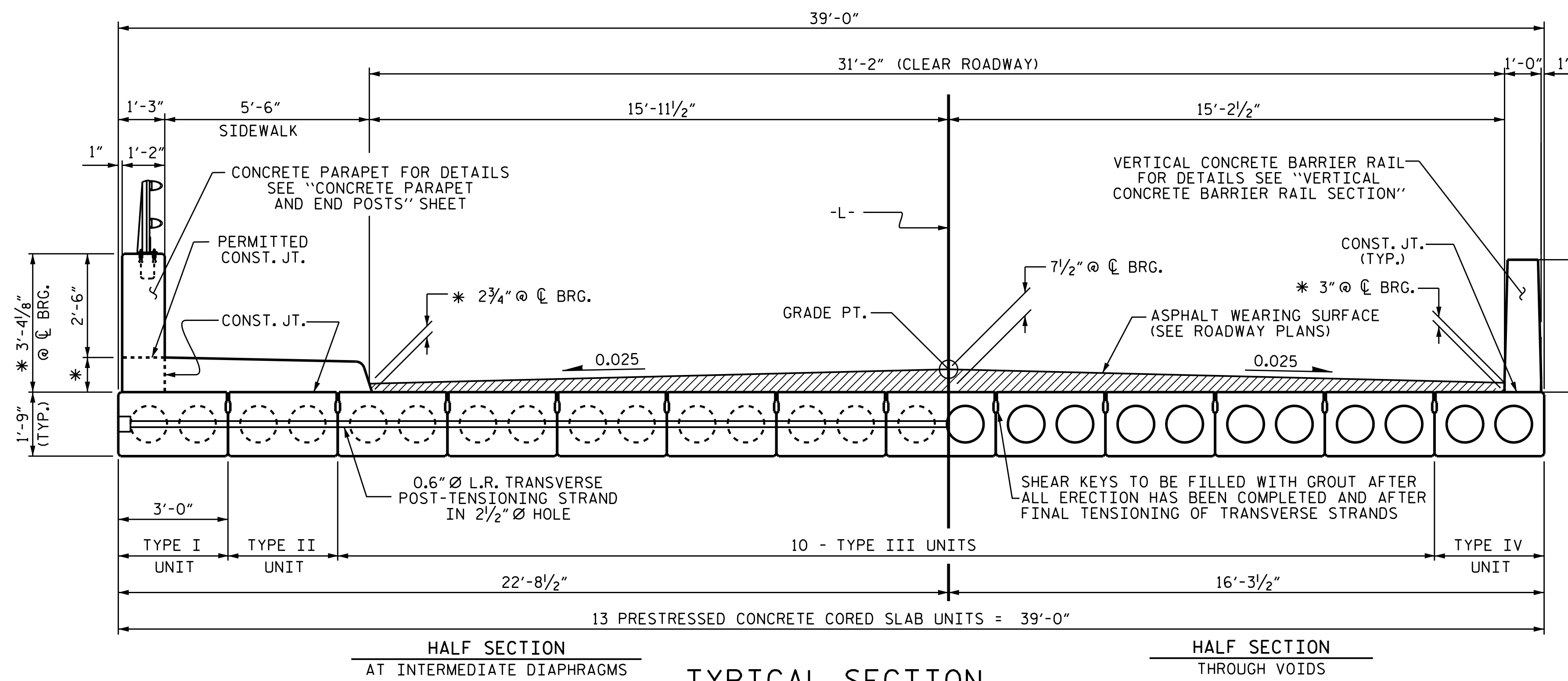
STANDARD
LRFR SUMMARY FOR
50' CORED SLAB UNIT
90° SKEW
(NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-5
1			3			TOTAL SHEETS
2			4			29

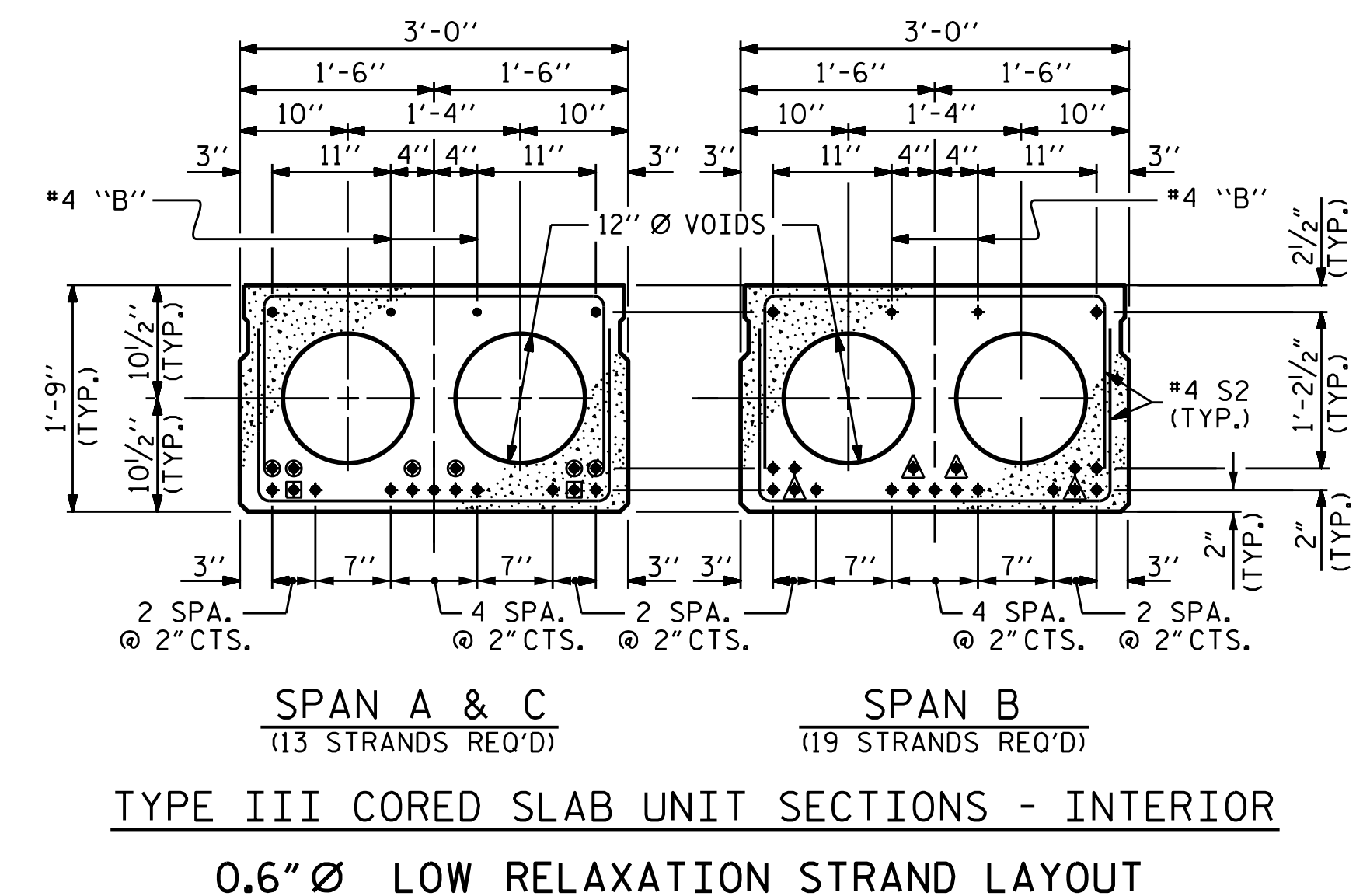
ASSEMBLED BY : S. B. WILLIAMS DATE : 11-17
CHECKED BY : A. ABRAHA DATE : 11/2017

DRAWN BY : CVC 6/10
CHECKED BY : DNS 6/10

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

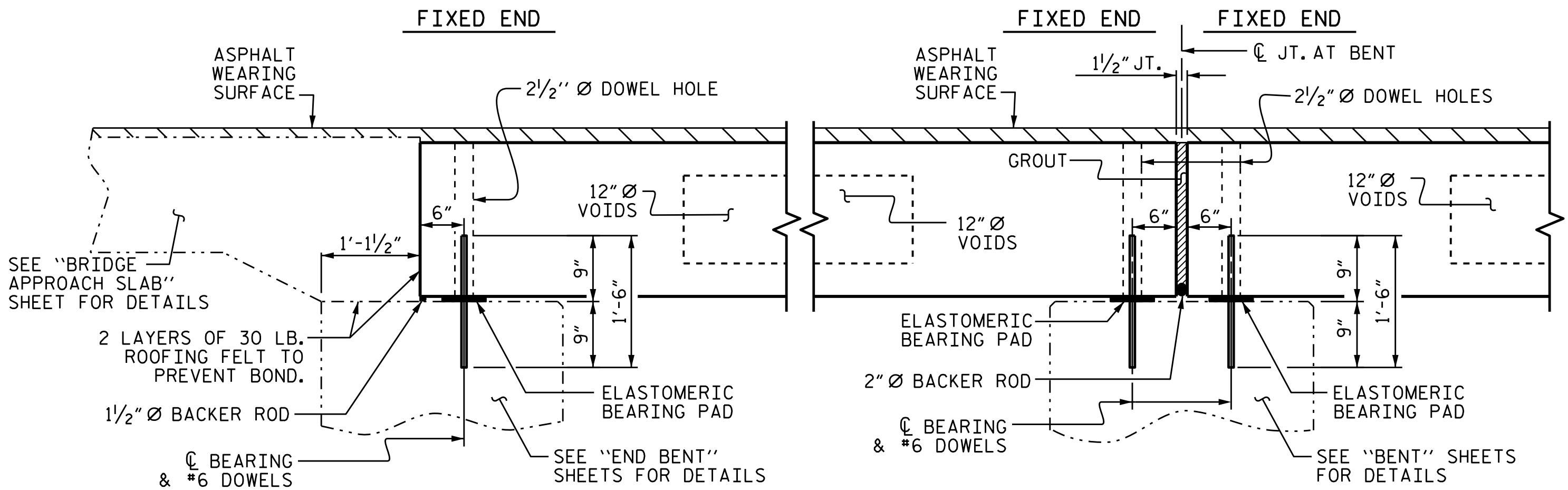


* THE MAXIMUM PARAPET HEIGHT, BARRIER RAIL HEIGHT AND ASPHALT THICKNESS ARE SHOWN. THE HEIGHT OF THE PARAPET, BARRIER RAIL AND ASPHALT THICKNESS VARIES WHILE THE TOP OF THE SIDEWALK AND PARAPET, BARRIER RAIL AND SIDEWALK FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR SIDEWALK AND PARAPET HEIGHT, SEE "SIDEWALK DETAILS" SHEET. FOR VERTICAL CONCRETE BARRIER RAIL HEIGHT DETAILS, SEE THE "VERTICAL CONCRETE BARRIER RAIL" SHEET. FOR ASPHALT OVERLAY THICKNESS, SEE SHEET S-8.



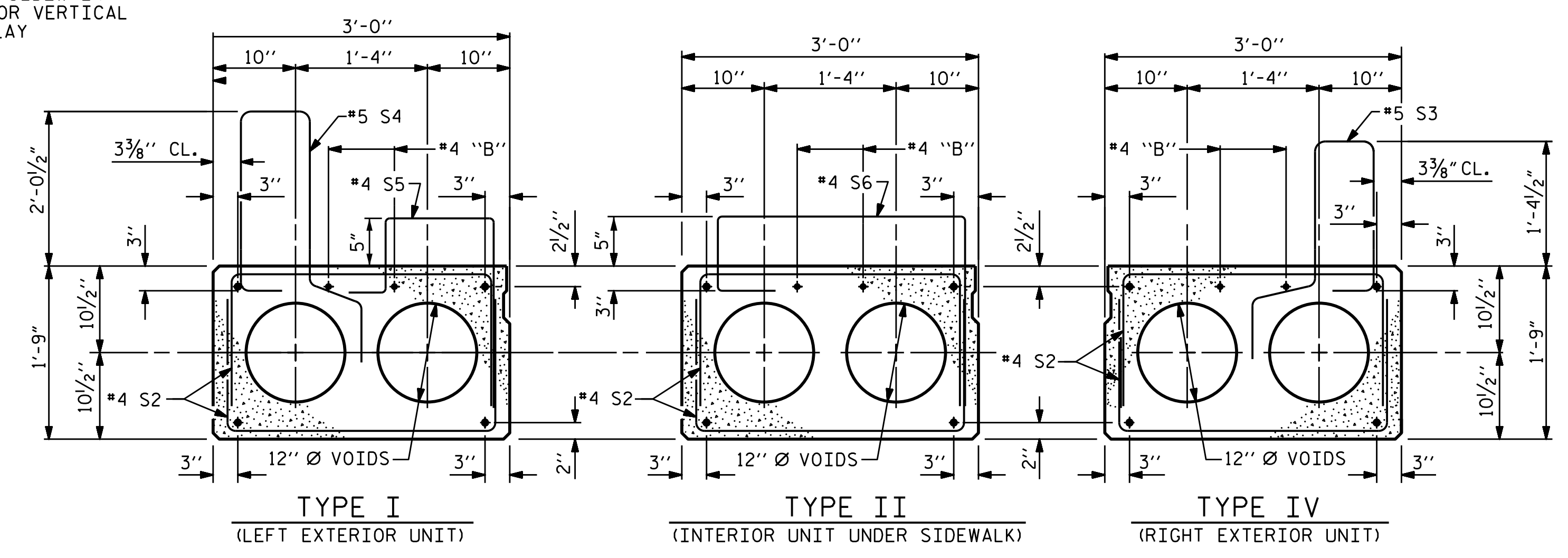
▲ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 6'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.
 ● OPTIONAL FULL LENGTH DEBONDED STRANDS. THESE STRANDS ARE NOT REQUIRED, IF THE FABRICATOR CHOOSES TO INCLUDE THESE STRANDS IN THE CORED SLAB UNIT, THE STRANDS SHALL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

DEBONDING LEGEND

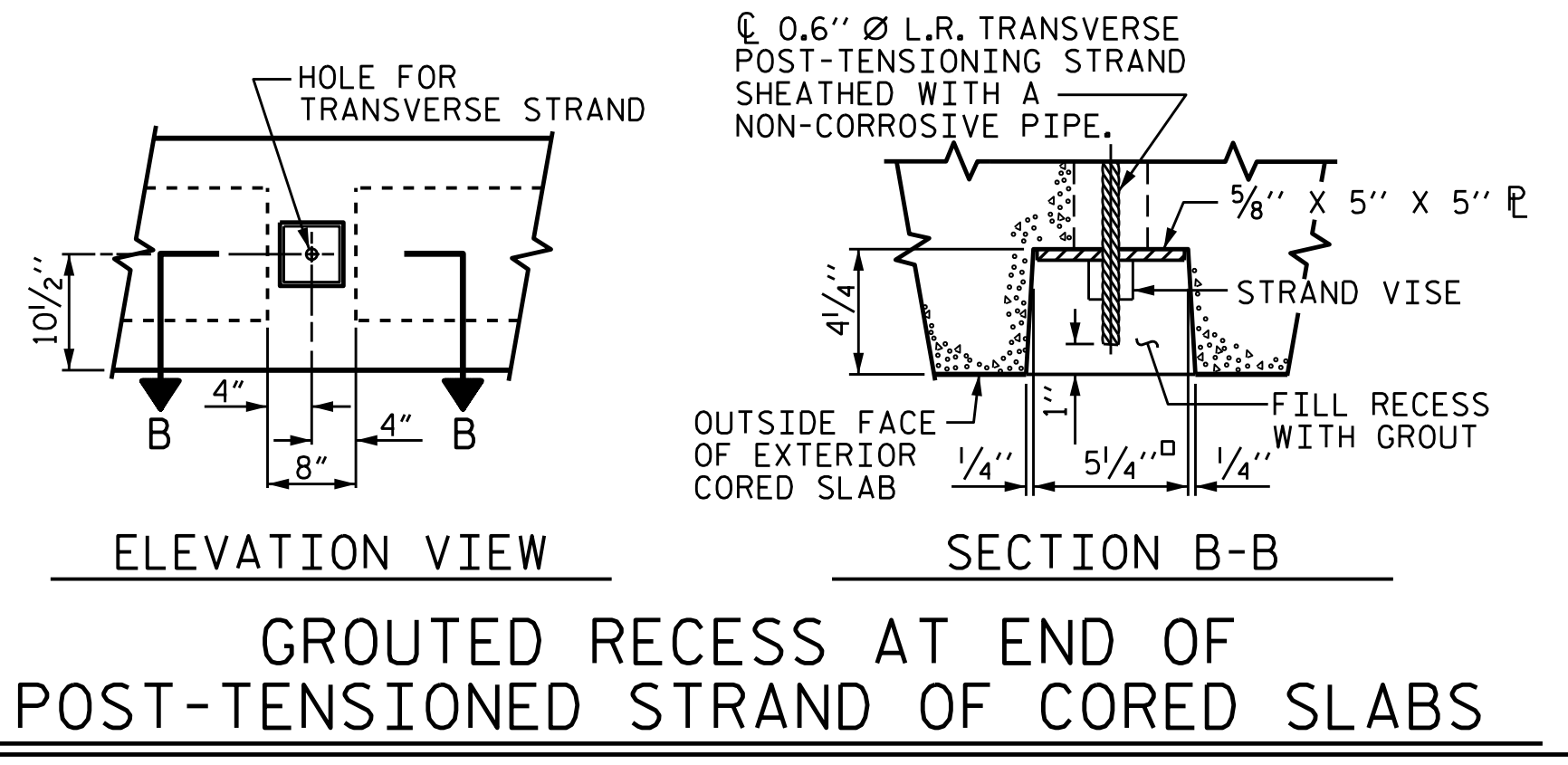


SECTION AT END BENT

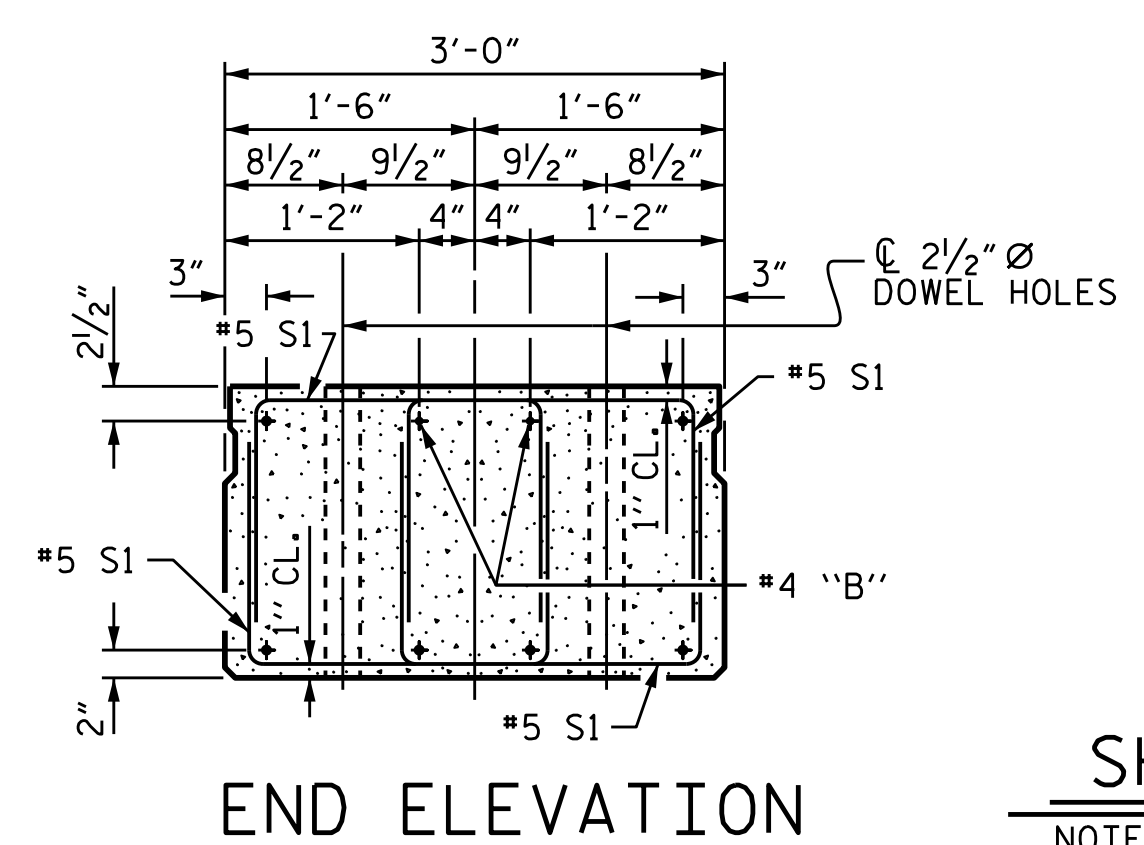
SECTION AT BENT



CORED SLAB UNIT SECTIONS
 FOR PRESTRESSED STRAND LAYOUT, SEE TYPE III CORED SLAB UNIT SECTIONS - INTERIOR.

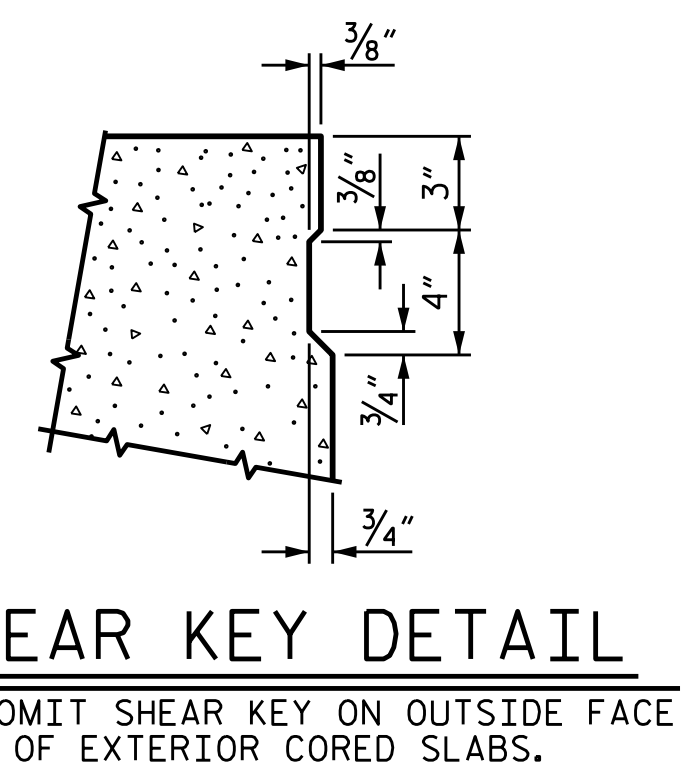


GROUTED RECESS AT END OF POST-TENSIONED STRAND OF CORED SLABS

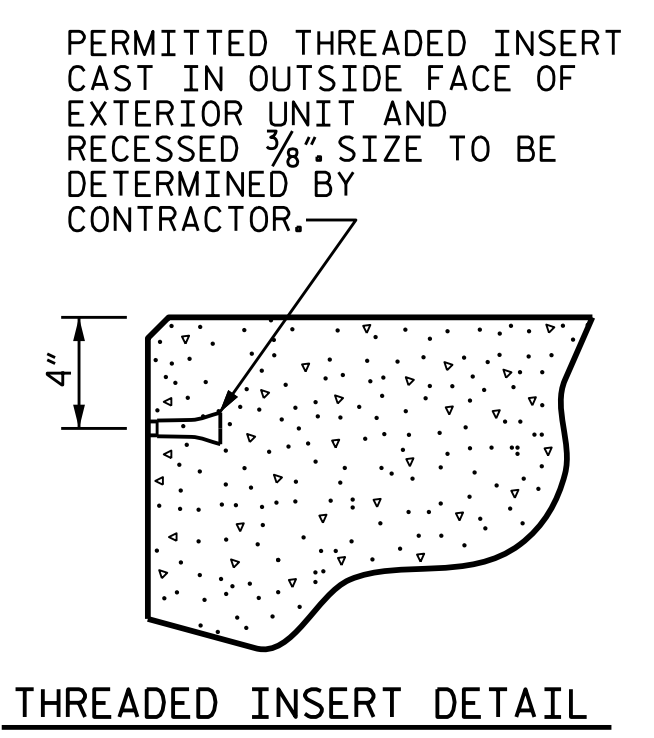


END ELEVATION

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

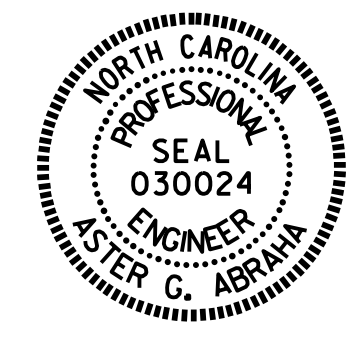


THREADED INSERT DETAIL

PROJECT NO. 17BP.6.R.89
 HARNETT COUNTY
 STATION: 17+51.00 -L-

SHEET 1 OF 4

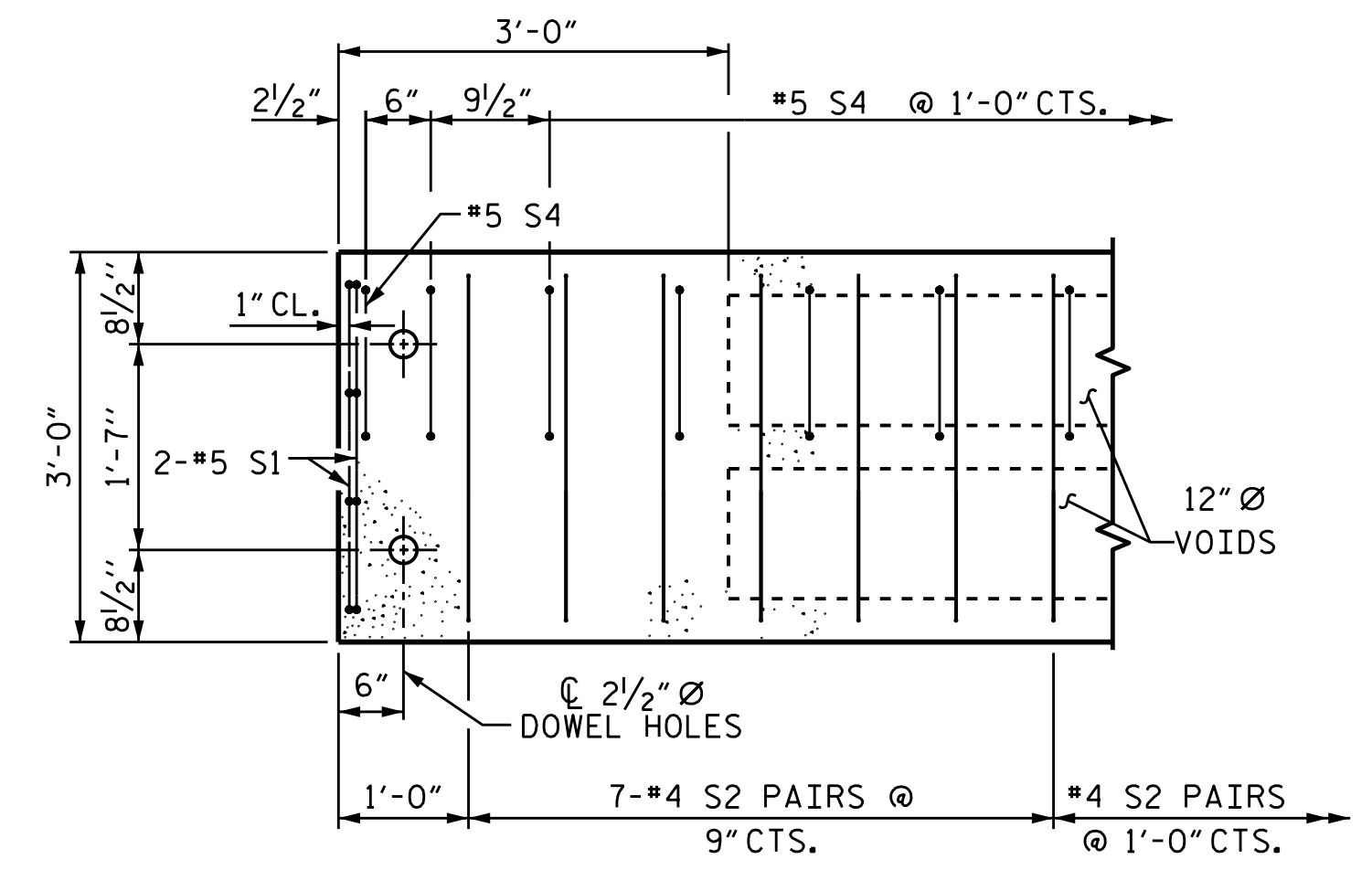
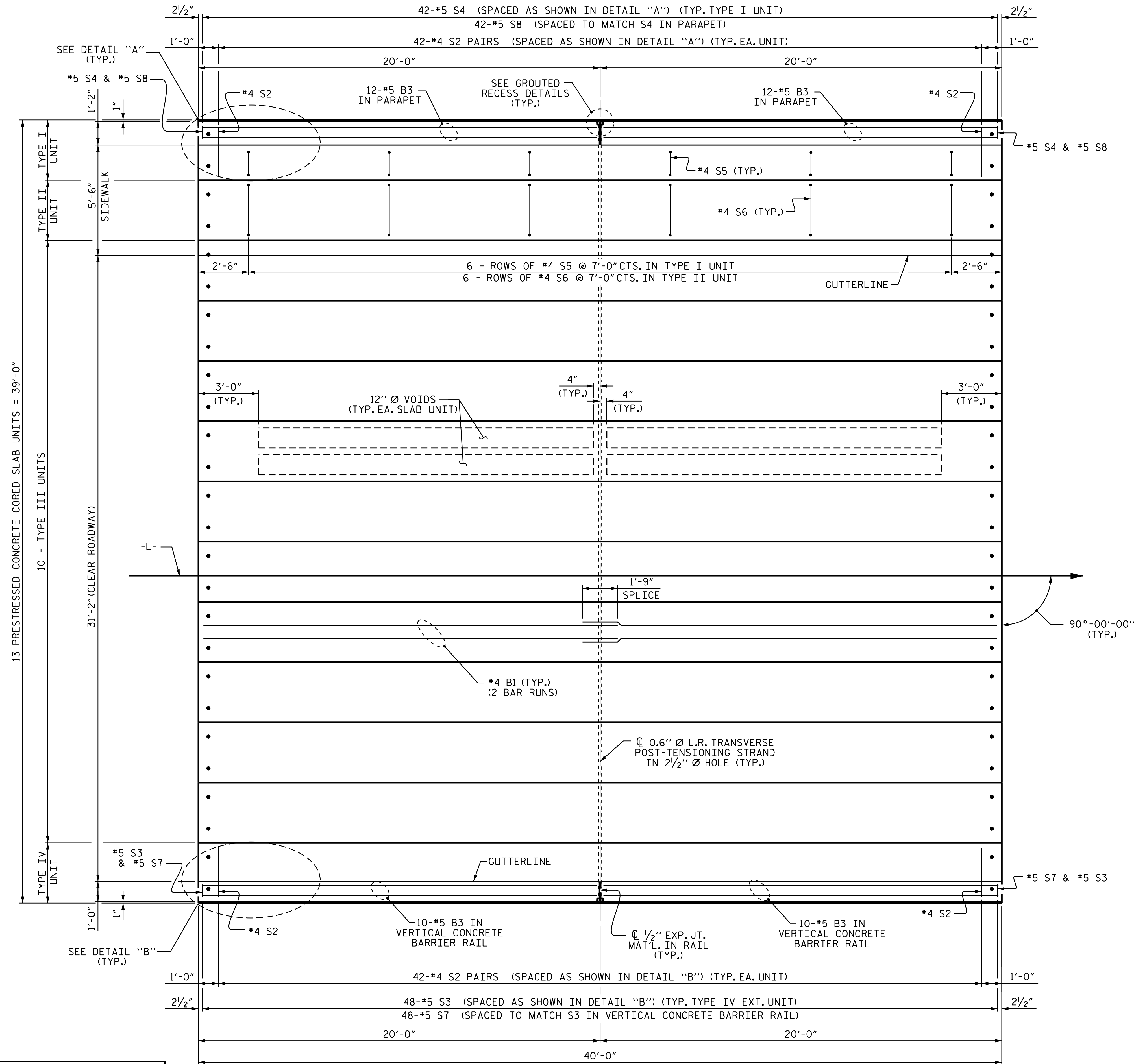
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 3'-0" X 1'-9"
 PRESTRESSED CONCRETE
 CORED SLAB UNIT
 90° SKEW



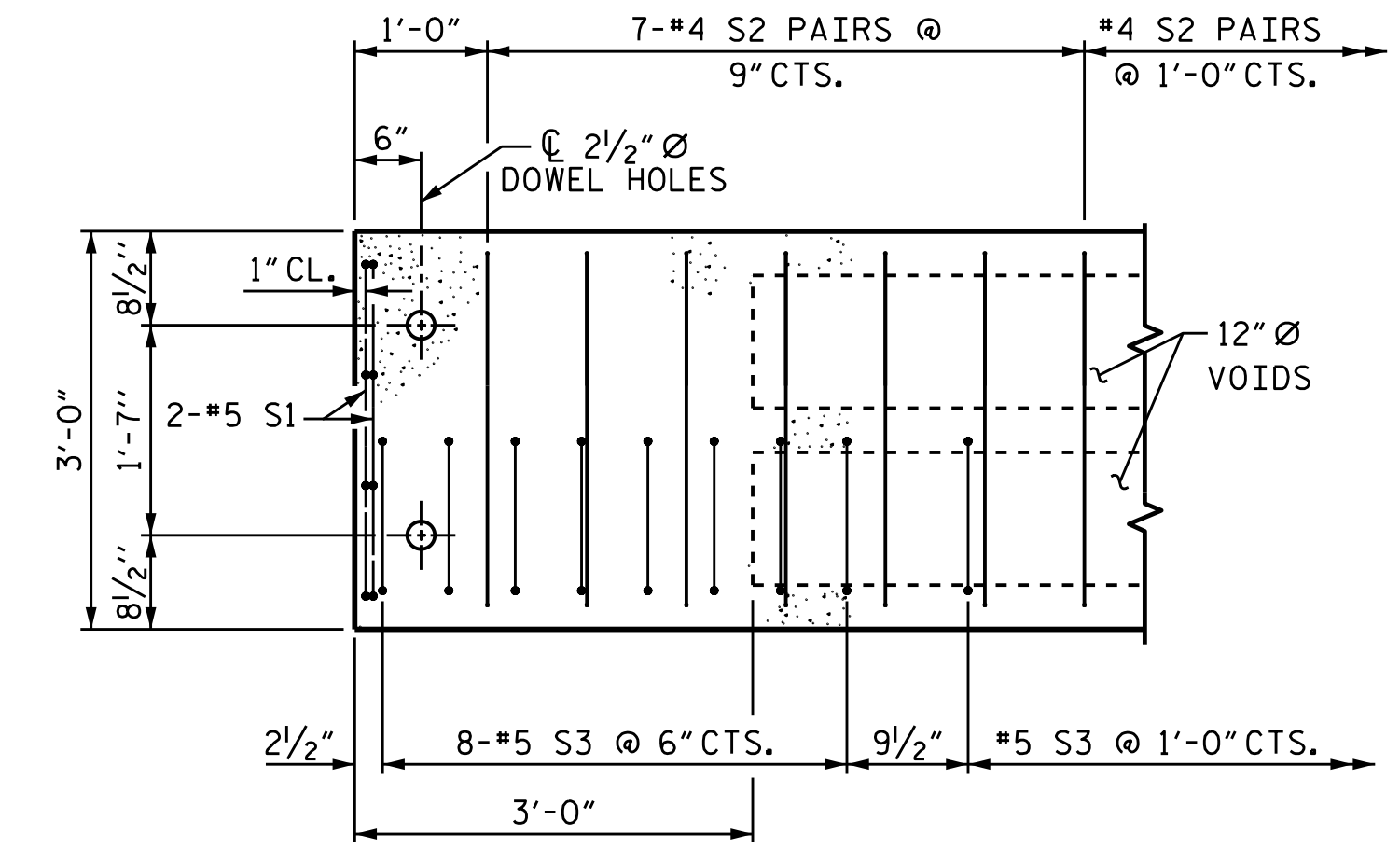
DRAWN BY : S. WANCE	DATE : 9-17
CHECKED BY : S. B. WILLIAMS	DATE : 10/17
DESIGN ENGINEER OF RECORD : M. AHMED	DATE : 06/2017
DRAWN BY : DGE 5/09	REV. 9/14
CHECKED BY : BCH 6/09	MAA/TMG

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			29



DETAIL "A"
 (TYPICAL EACH END OF UNIT)
 NOTE: TYPE I LEFT EXTERIOR UNIT SHOWN - TYPE II AND TYPE III INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S4 BARS, #4 S5 BAR NOT SHOWN FOR CLARITY.



DETAIL "B"
 (TYPICAL EACH END OF UNIT)
 NOTE: TYPE IV RIGHT EXTERIOR UNIT SHOWN - TYPE III INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S3 BARS.

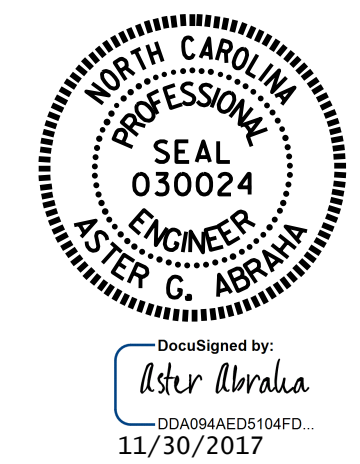
PLAN OF SPAN A & C

ASSEMBLED BY : S. WANCE	DATE : 09/2017
CHECKED BY : S. B. WILLIAMS	DATE : 09/2017
DRAWN BY : DGE 6/09	REV. 12/5/11 MAA/AAC
CHECKED BY : BCH 6/09	REV. 8/14 MAA/TMG

30-NOV-2017 10:07
 R:\Structures\FINAL PLANS\17BP.6.R.89.SMU. CS*.420246.dgn
 adbrano

PROJECT NO. 17BP.6.R.89
 HARNETT COUNTY
 STATION: 17+51.00 -L-

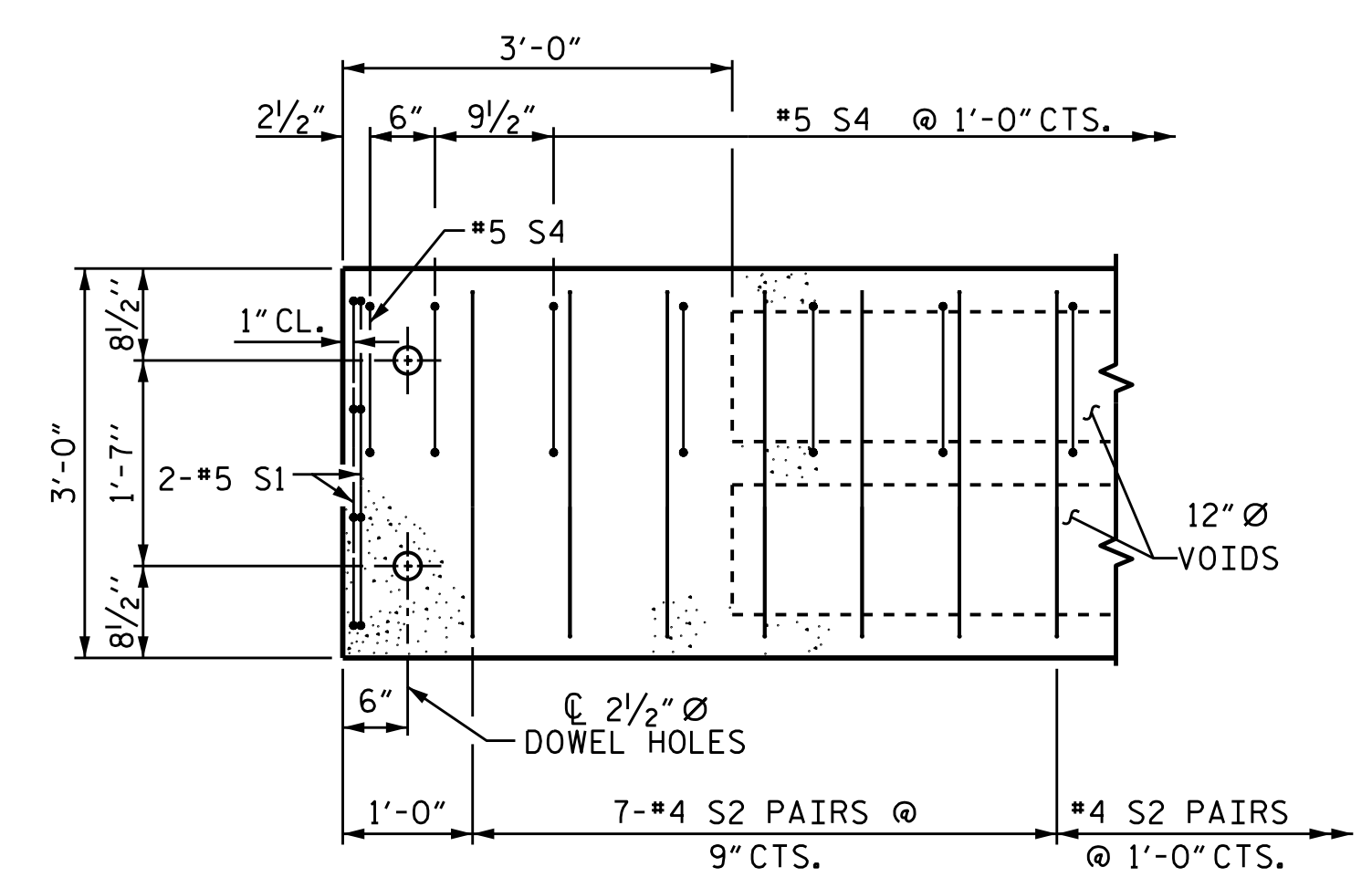
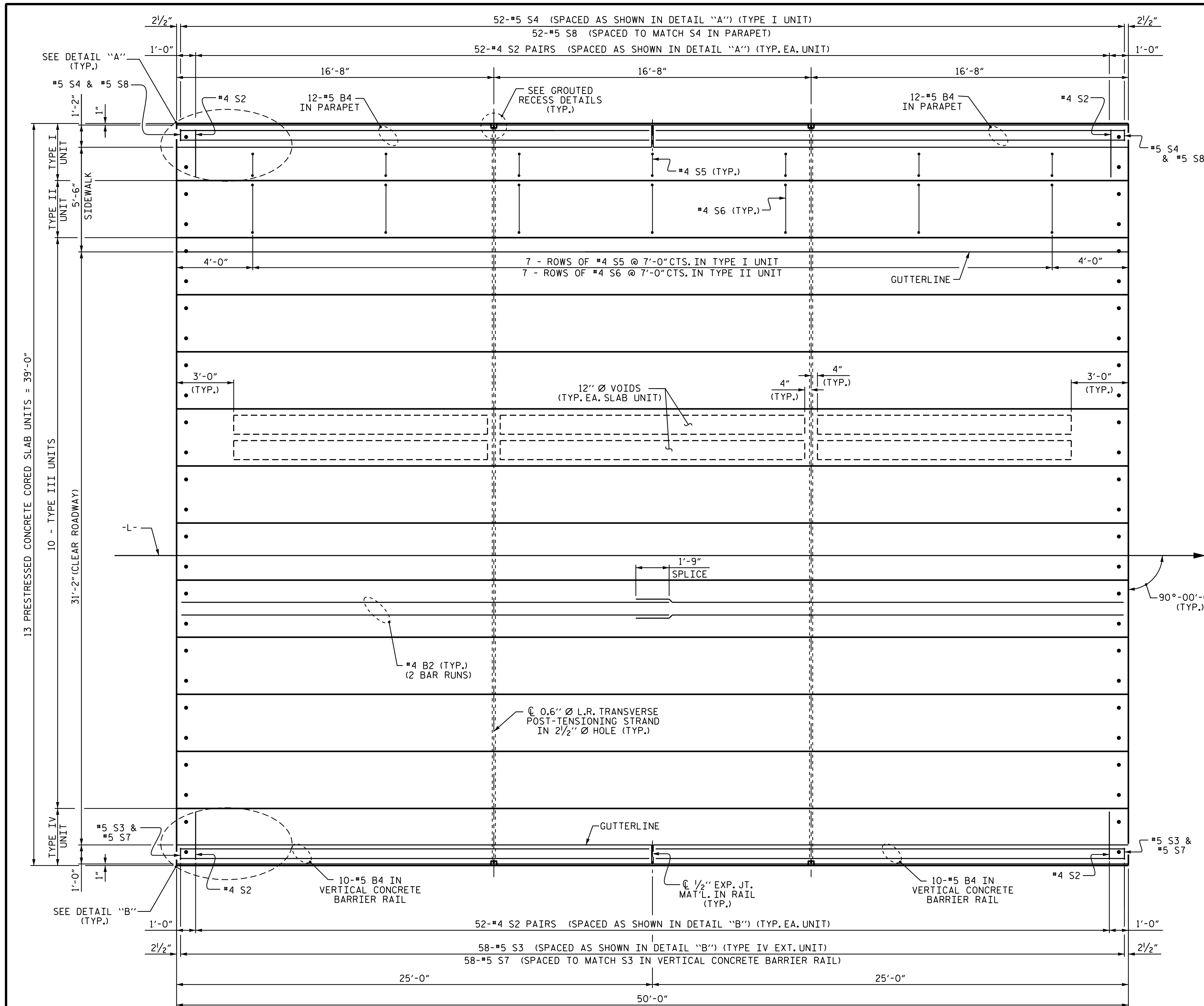
SHEET 2 OF 4



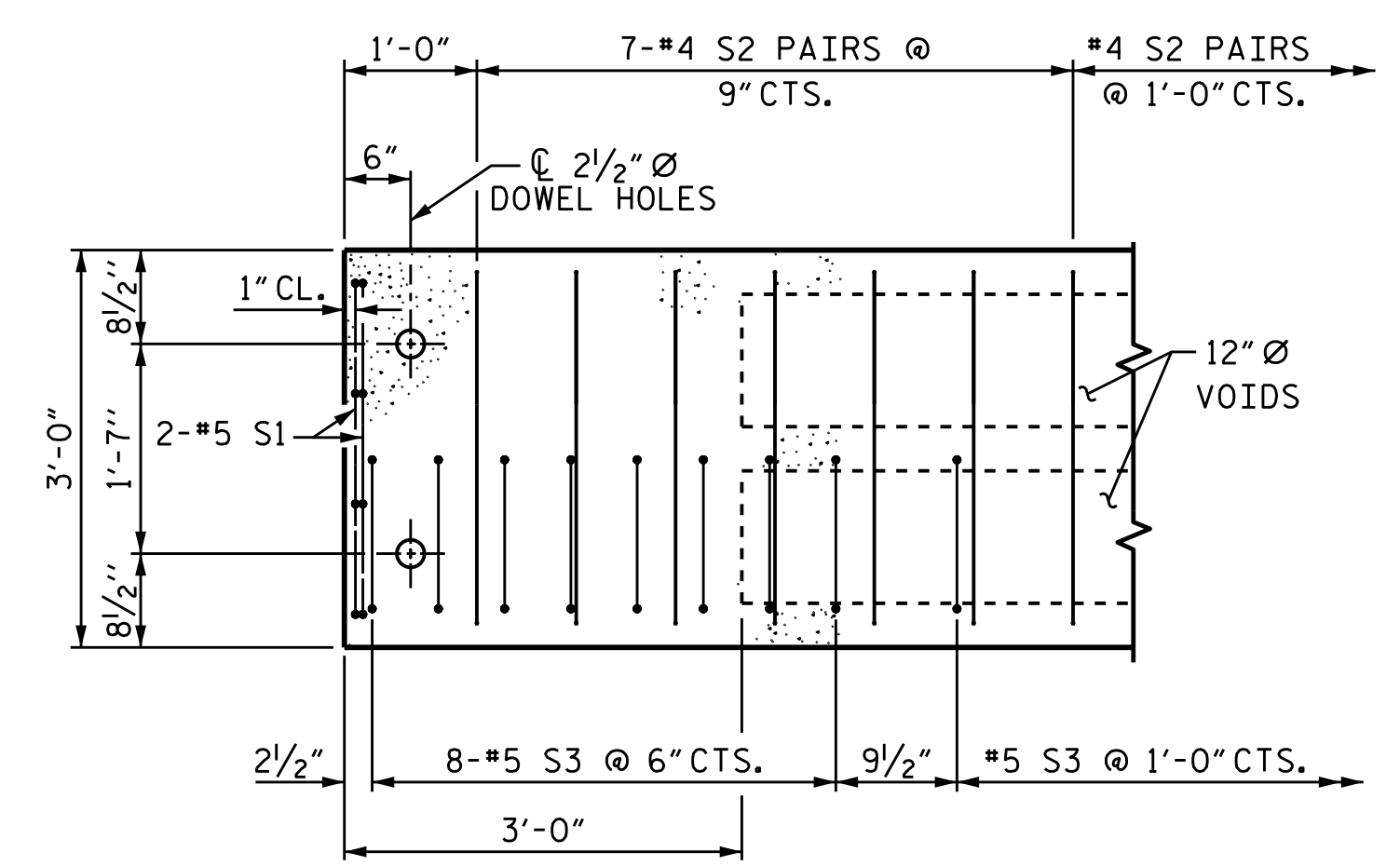
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 PLAN OF 40' UNIT
 31'-2" CLEAR ROADWAY
 90° SKEW
 (SPAN A & C)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7	
1			3			TOTAL SHEETS	
2			4			29	



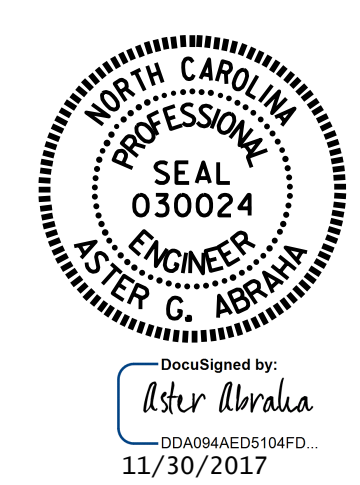
DETAIL "A"
 (TYPICAL EACH END OF UNIT)
 NOTE: TYPE I LEFT EXTERIOR UNIT SHOWN - TYPE II AND TYPE III INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S4 BARS. #4 S5 BAR NOT SHOWN FOR CLARITY.



DETAIL "B"
 (TYPICAL EACH END OF UNIT)
 NOTE: TYPE IV RIGHT EXTERIOR UNIT SHOWN - TYPE III INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S3 BARS.

PROJECT NO. 17BP.6.R.89
 HARNETT COUNTY
 STATION: 17+51.00 -L-

SHEET 3 OF 4



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 PLAN OF 50' UNIT
 31'-2" CLEAR ROADWAY
 90° SKEW
 (SPAN B)

ASSEMBLED BY : S. WANCE	DATE : 09/2017
CHECKED BY : S. B. WILLIAMS	DATE : 09/2017
DRAWN BY : DGE	6/09
CHECKED BY : BCH	6/09
REV. 12/5/11	MAA/AAC
REV. 8/14	MAA/TMG

PLAN OF SPAN B

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8	
1			3			TOTAL SHEETS	
2			4			29	

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.

ALL REINFORCING STEEL IN PARAPETS, END POSTS, SIDEWALK, AND VERTICAL CONCRETE BARRIER RAIL SHALL BE EPOXY COATED.

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.

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.

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.

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

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS.

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

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

FLAME CUTTING OF THE TRANSVERSE POST-TENSIONING STRAND IS NOT ALLOWED.

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

PAYMENT FOR SIDEWALK SHALL BE INCLUDED IN THE PAY ITEMS IN "TOTAL BILL OF MATERIAL" FOR CLASS AA CONCRETE AND EPOXY COATED REINFORCING STEEL.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

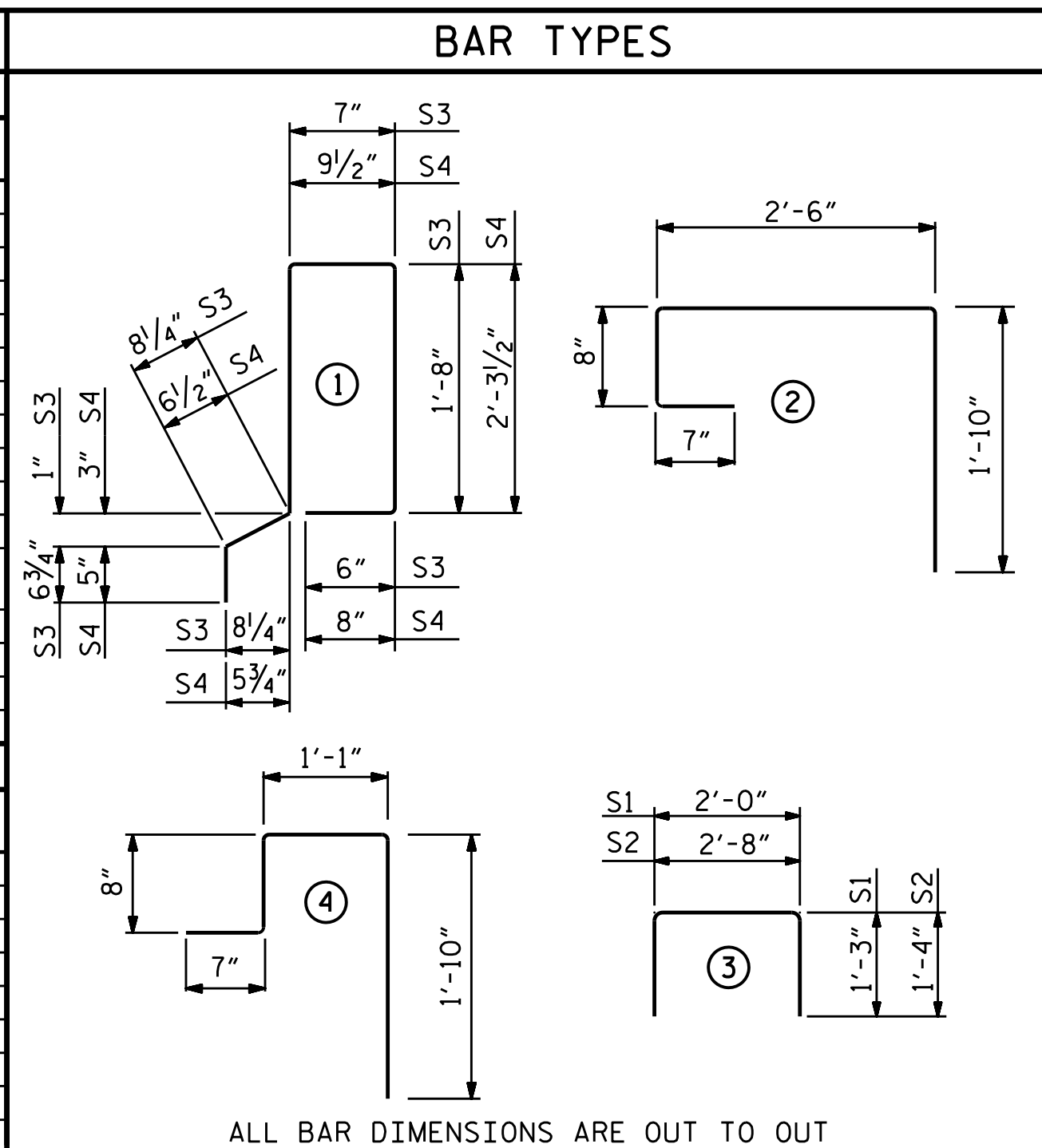
THE PERMITTED THREADED INSERTS ARE DETAILED AS AN OPTION FOR THE CONTRACTOR TO ATTACH FALSEWORK AND FORMWORK DURING CONSTRUCTION.

THE PERMITTED THREADED INSERTS IN THE EXTERIOR UNITS SHALL BE SIZED BY THE CONTRACTOR, SPACED AT 4'-0" CENTERS AND GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS. STAINLESS STEEL THREADED INSERTS MAY BE USED AS AN ALTERNATE.

THE PERMITTED THREADED INSERTS SHALL BE GROUTED BY THE CONTRACTOR IMMEDIATELY FOLLOWING REMOVAL OF THE FALSEWORK.

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

BILL OF MATERIAL FOR ONE CORED SLAB UNIT											
SPAN A & C (40' CORED SLAB UNIT)											
UNIT			TYPE I		TYPE II		TYPE III		TYPE IV		
BAR NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT	LENGTH	WEIGHT	LENGTH	WEIGHT	
B1	4	#4	STR	20'-9"	55	20'-9"	55	20'-9"	55	20'-9"	55
S1	8	#5	3	4'-3"	35	4'-3"	35	4'-3"	35	4'-3"	35
S2	84	#4	3	5'-4"	299	5'-4"	299	5'-4"	299	5'-4"	299
*S3	48	#5	1							5'-8"	284
*S4	42	#5	1	7'-0"	307						
*S5	6	#4	4	4'-2"	17						
*S6	6	#4	2			5'-7"	22				
REINFORCING STEEL	LBS.		389		389		389		389		
*EPOXY COATED REINFORCING STEEL	LBS.		324		22				284		
5000 P.S.I. CONCRETE	CU. YDS.		5.8		5.8		5.8		5.8		
0.6" Ø L.R. STRANDS	No.		13		13		13		13		
SPAN B (50' CORED SLAB UNIT)											
UNIT			TYPE I		TYPE II		TYPE III		TYPE IV		
BAR NUMBER	SIZE	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT	LENGTH	WEIGHT	LENGTH	WEIGHT	
B2	4	#4	STR	25'-9"	69	25'-9"	69	25'-9"	69	25'-9"	69
S1	8	#5	3	4'-3"	35	4'-3"	35	4'-3"	35	4'-3"	35
S2	104	#4	3	5'-4"	371	5'-4"	371	5'-4"	371	5'-4"	371
*S3	58	#5	1							5'-8"	343
*S4	52	#5	1	7'-0"	380						
*S5	7	#4	4	4'-2"	19						
*S6	7	#4	2			5'-7"	26				
REINFORCING STEEL	LBS.		475		475		475		475		
*EPOXY COATED REINFORCING STEEL	LBS.		399		26				343		
6500 P.S.I. CONCRETE	CU. YDS.		7.1		7.1		7.1		7.1		
0.6" Ø L.R. STRANDS	No.		19		19		19		19		



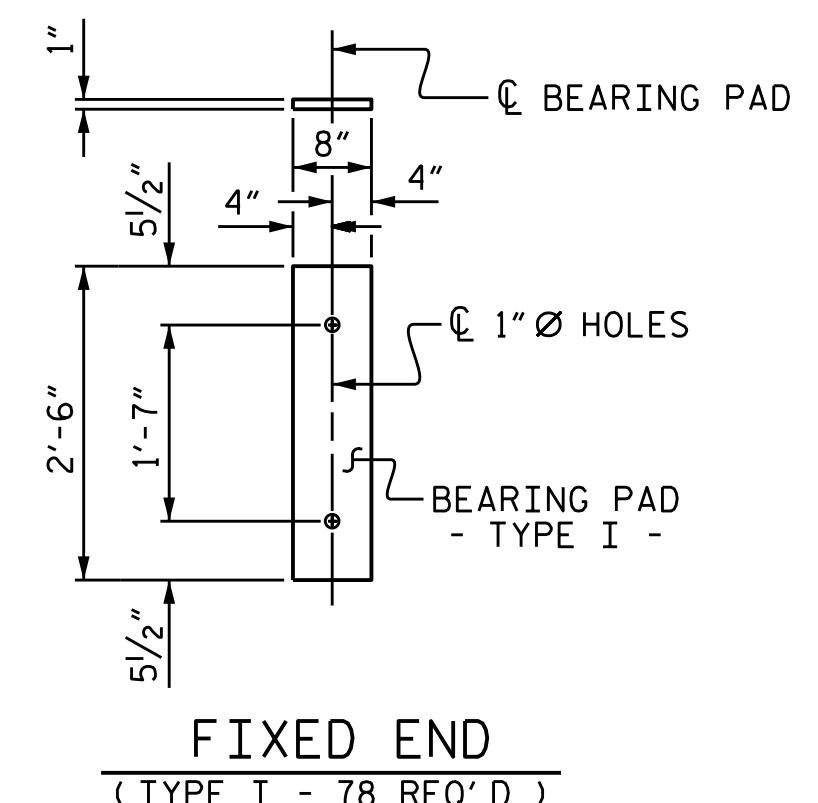
21" CORED SLABS REQUIRED			
UNIT	NUMBER	LENGTH	TOTAL LENGTH
SPAN A & C			
TYPE I	2	40'-0"	80'-0"
TYPE II	2	40'-0"	80'-0"
TYPE III	20	40'-0"	800'-0"
TYPE IV	2	40'-0"	80'-0"
TOTAL	26		1040'-0"
SPAN B			
TYPE I	1	50'-0"	50'-0"
TYPE II	1	50'-0"	50'-0"
TYPE III	10	50'-0"	500'-0"
TYPE IV	1	50'-0"	50'-0"
TOTAL	13		650'-0"

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

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

DEAD LOAD DEFLECTION AND CAMBER		
3'-0" x 1'-9" CORED SLAB	40' UNIT (SPAN A & C)	50' UNIT (SPAN B)
0.6" Ø L.R. STRAND		
CAMBER (SLAB ALONE IN PLACE)	7/8" ↑	1 1/2" ↑
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD	1/8" ↓	3/8" ↓
FINAL CAMBER	3/4" ↑	1 1/8" ↑

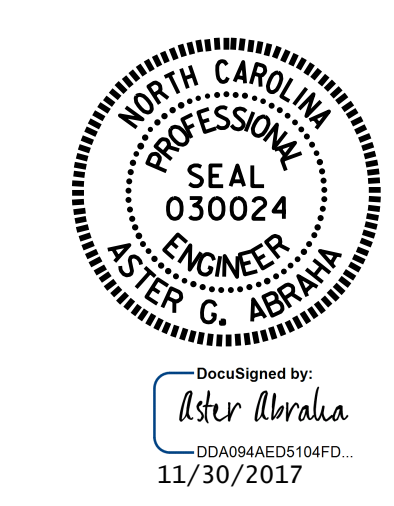
ASPHALT OVERLAY THICKNESS						
	ASPHALT OVERLAY THICKNESS @ MID-SPAN			ASPHALT OVERLAY THICKNESS @ BEARINGS		
	LEFT GUTTER	GRADE PT.	RIGHT GUTTER	LEFT GUTTER	GRADE PT.	RIGHT GUTTER
40' UNITS	2"	6 3/4"	2 1/4"	2 3/4"	7 1/2"	3"
50' UNITS	1 5/8"	6 3/8"	1 1/8"	2 3/4"	7 1/2"	3"



ELASTOMERIC BEARING DETAILS
ELASTOMER IN ALL BEARINGS SHALL BE 50 DUROMETER HARDNESS

PROJECT NO. 17BP.6.R.89
HARNETT COUNTY
STATION: 17+51.00 -L-

SHEET 4 OF 4



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
3'-0" X 1'-9"
PRESTRESSED CONCRETE
CORED SLAB UNIT
90° SKEW

DRAWN BY: S. WANCE DATE: 9-17
CHECKED BY: S. B. WILLIAMS DATE: 10-17
DESIGN ENGINEER OF RECORD: M. AHMED DATE: 06/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

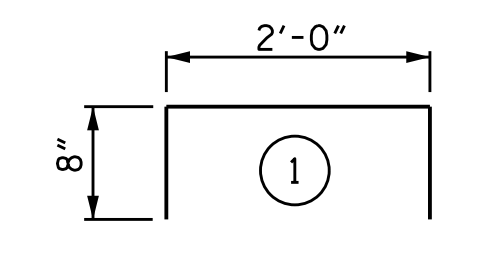
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			29

BILL OF MATERIAL

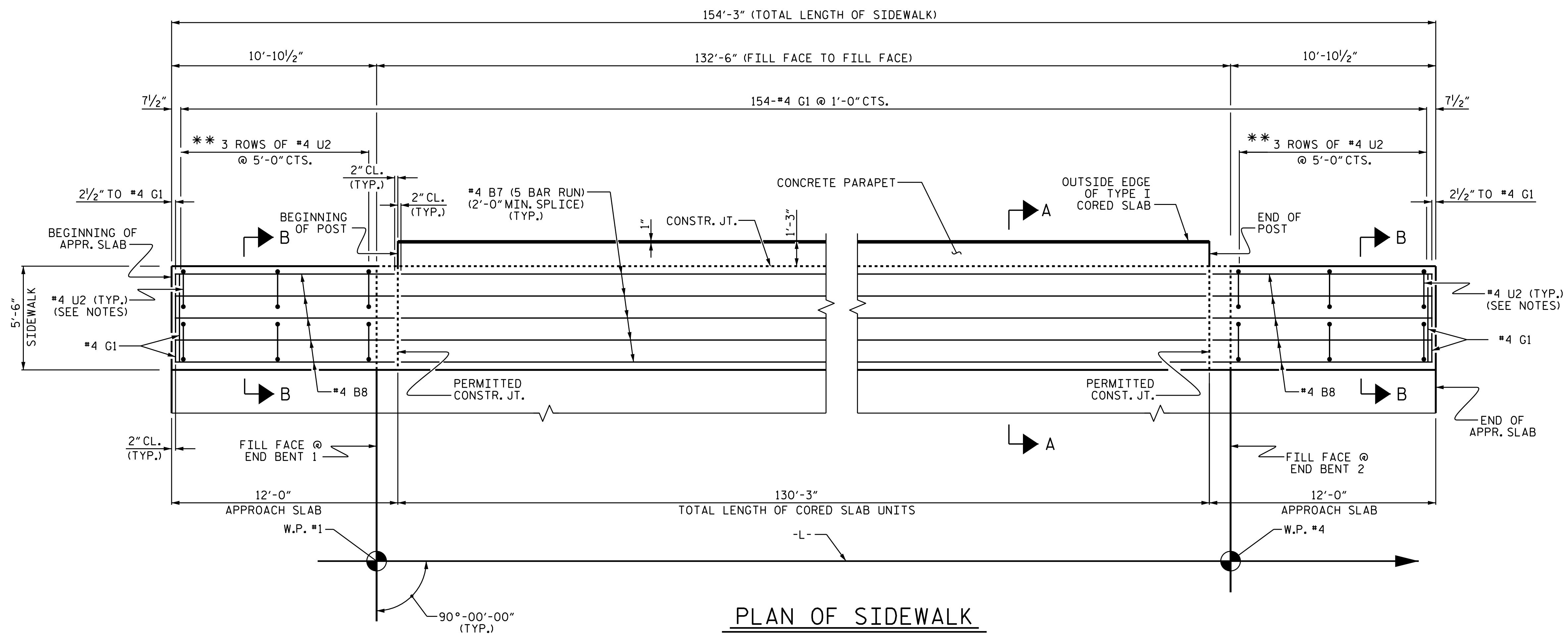
SIDEWALK					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B7	25	#4	STR	27'-9"	463
*B8	10	#4	STR	11'-8"	78
*G1	158	#4	STR	5'-0"	528
*U2	12	#4	1	3'-4"	27

* EPOXY COATED REINF. STEEL 1,096 LBS
 CLASS AA CONCRETE 22.1 C. Y.

BAR TYPE



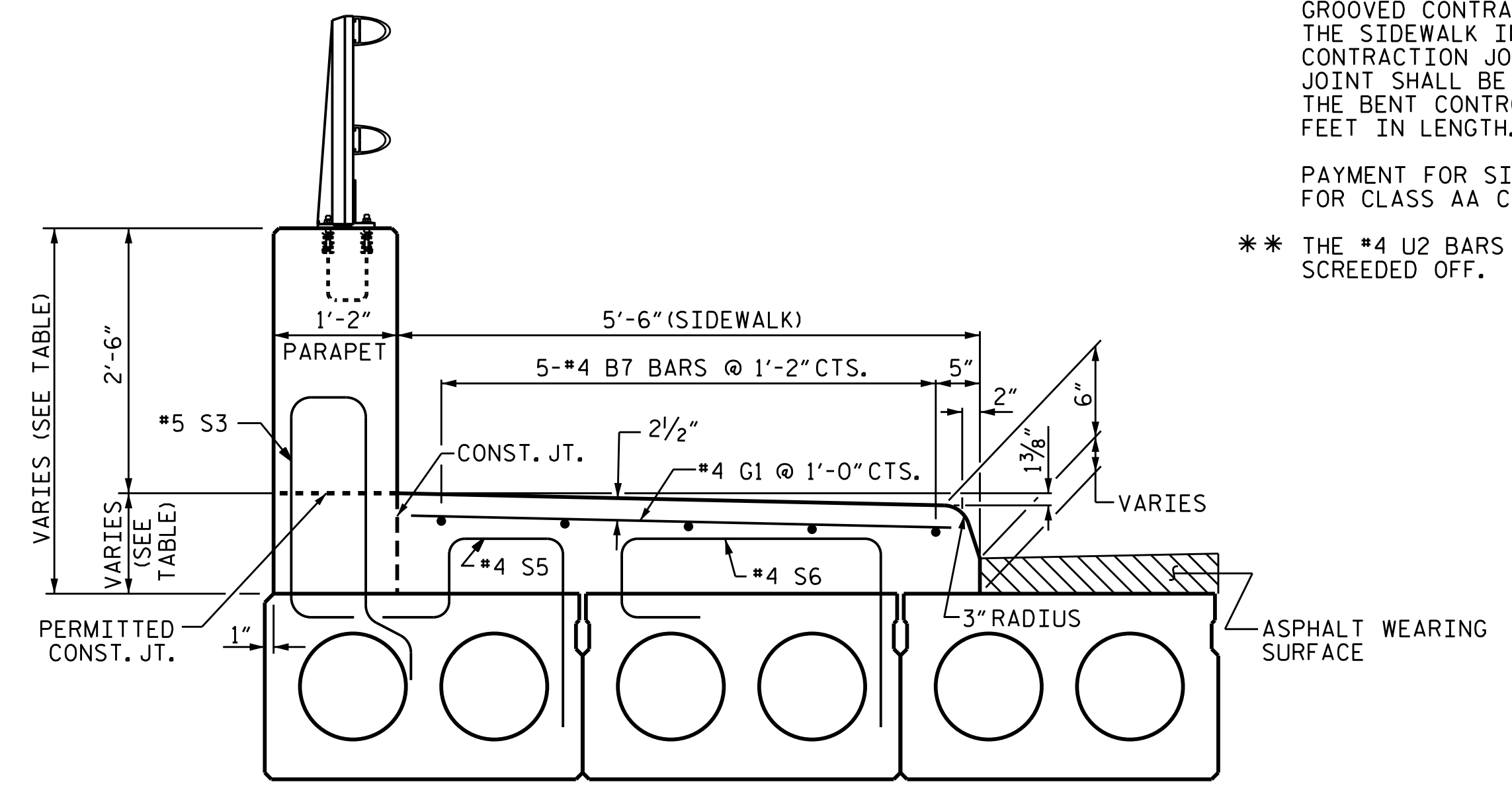
BAR DIMENSIONS ARE OUT TO OUT



PLAN OF SIDEWALK

NOTES:

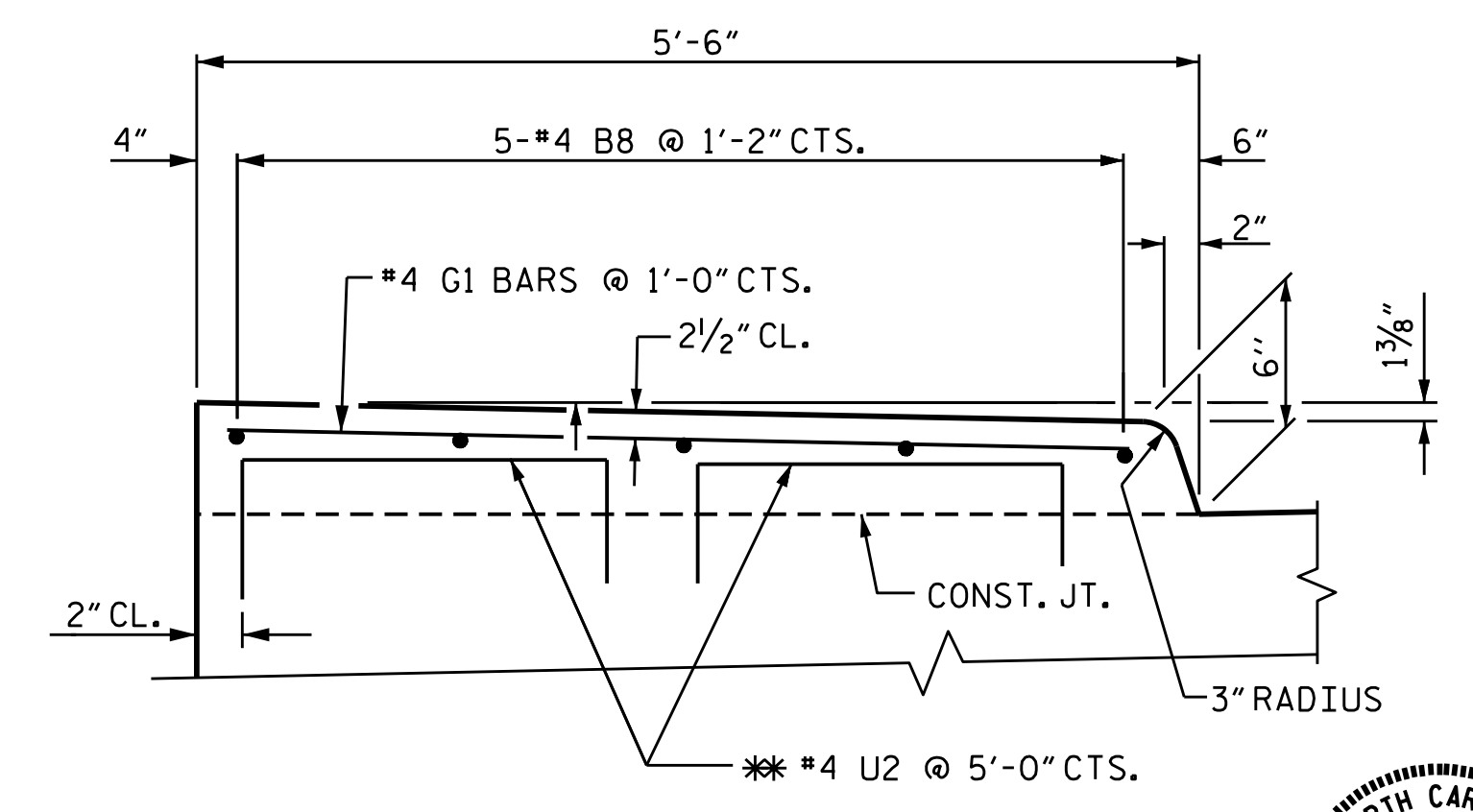
- ALL REINFORCING STEEL IN THE SIDEWALK SHALL BE EPOXY COATED.
- GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE SIDEWALK IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS THE CONTRACTION JOINT SHALL BE LOCATED AT A SPACING OF 8 TO 10 FT. IN ADDITION, A CONTRACTION JOINT SHALL BE LOCATED AT THE CONSTRUCTION OR PERMITTED JOINT AT THE END BENTS AND ALONG THE BENT CONTROL LINES. NO CONTRACTION JOINT WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FEET IN LENGTH.
- PAYMENT FOR SIDEWALK SHALL BE INCLUDED IN THE PAY ITEMS IN "TOTAL OF BILL OF MATERIAL" FOR CLASS AA CONCRETE AND EPOXY COATED REINFORCING STEEL.
- ** THE #4 U2 BARS MAY BE PUSHED INTO GREEN CONCRETE AFTER APPROACH SLAB HAS BEEN SCREEDDED OFF.



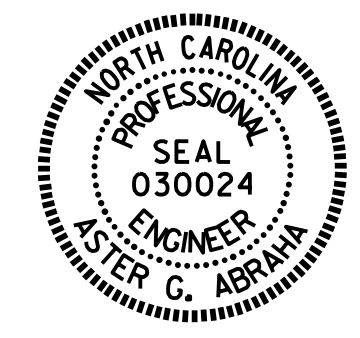
SECTION A-A
SECTION THRU PARAPET AND SIDEWALK
SEE SIDEWALK HEIGHT TABLE

SIDEWALK HEIGHT TABLE		
SPAN	@ C BEARINGS	@ MID-SPAN
A	10 1/8"	9 3/8"
B	10 1/8"	9"
C	10 1/8"	9 3/8"

SIDEWALK HEIGHT IS BASED ON PREDICTED FINAL CAMBER & THEORETICAL GRADE LINE ELEVATIONS AND VARIES BETWEEN C BEARING AND MID-SPAN FOR ALL SPANS.



SECTION B-B
ON APPROACH SLABS



PROJECT NO. 17BP.6.R.89
HARNETT COUNTY
 STATION: 17+51.00 -L-

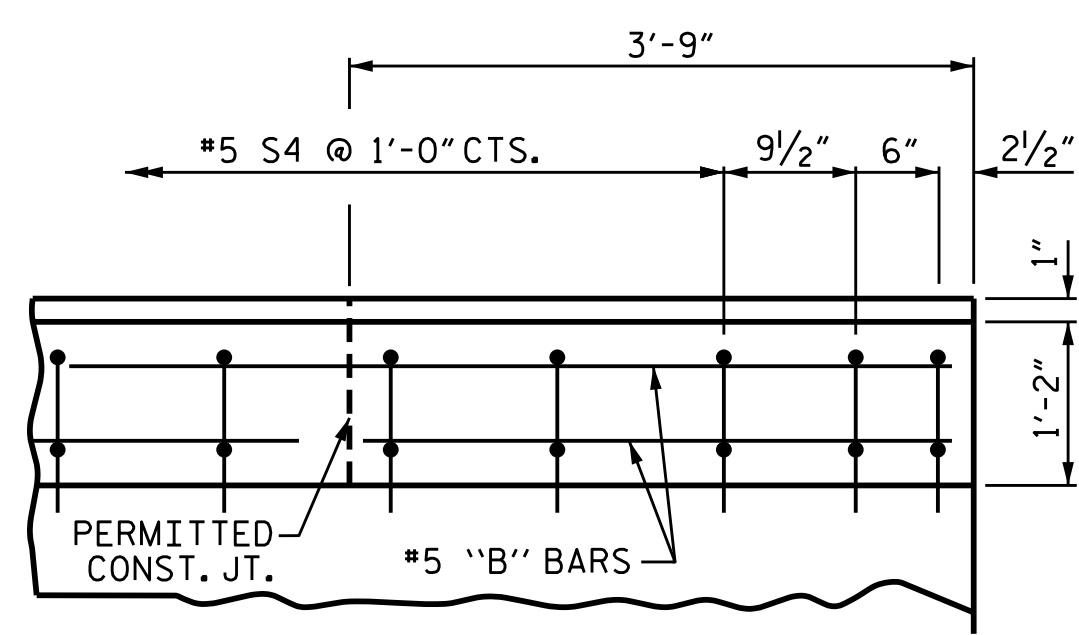
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**SUPERSTRUCTURE
 SIDEWALK DETAILS**

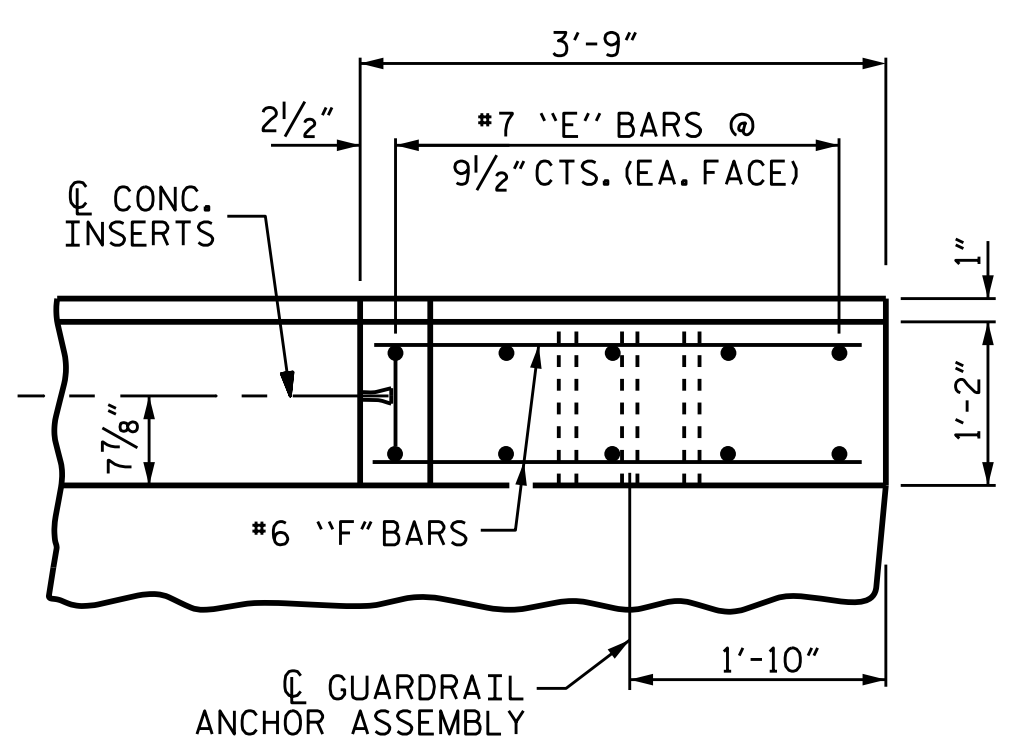
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS 29
2			4			

DRAWN BY : S. B. WILLIAMS DATE : 9-17
 CHECKED BY : S. WANCE DATE : 9-17

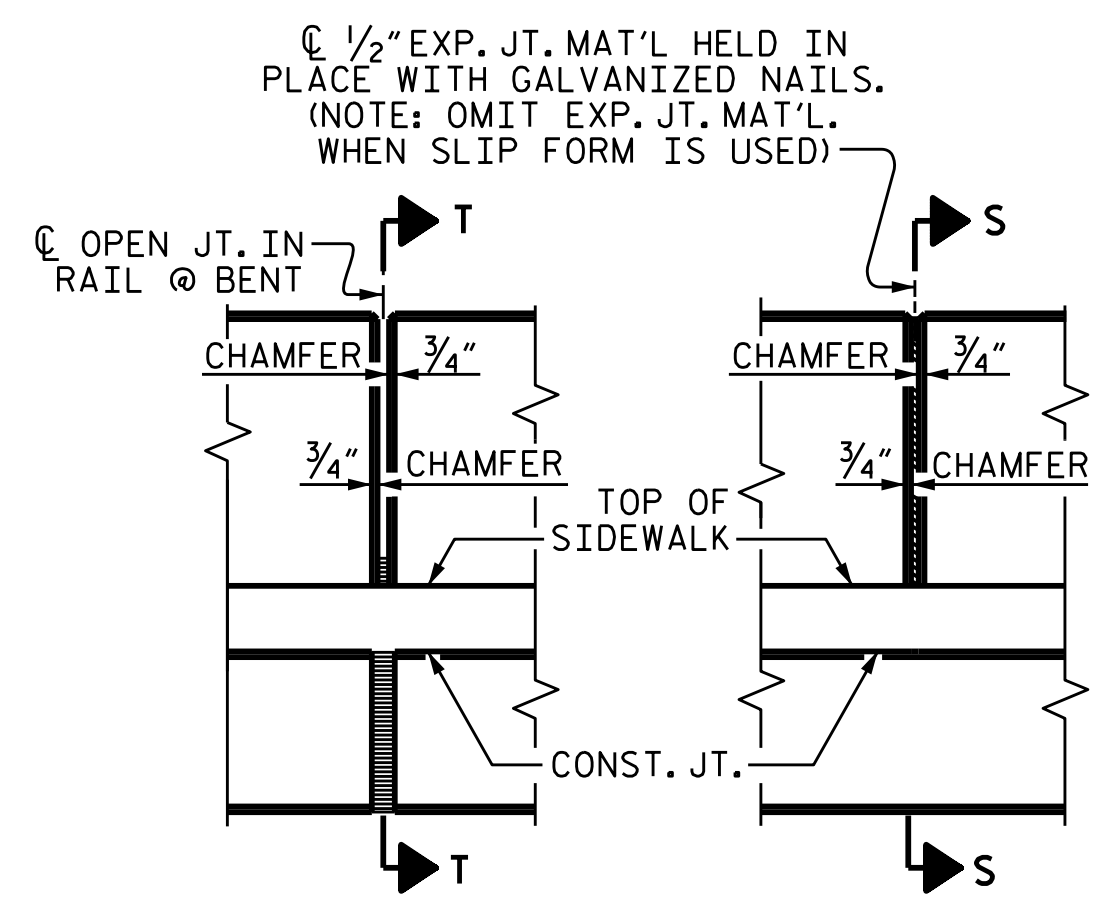
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



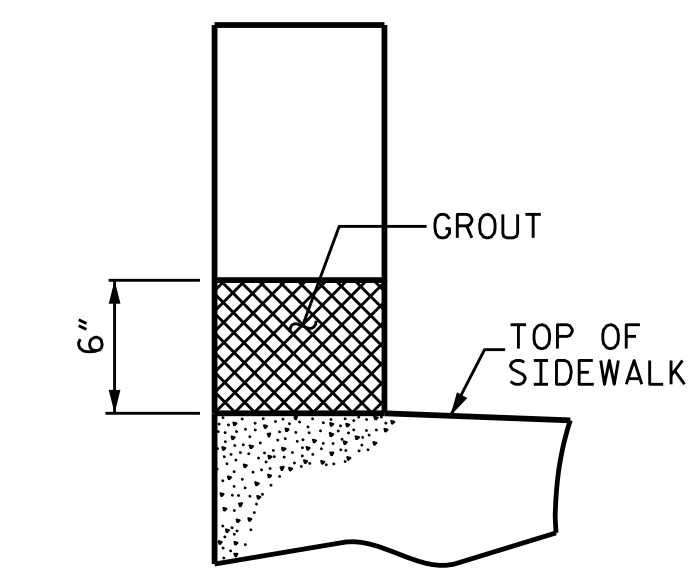
PLAN OF PARAPET
END BENT 2, SEE "PLAN OF SPANS" FOR DETAILS AT END BENT 1



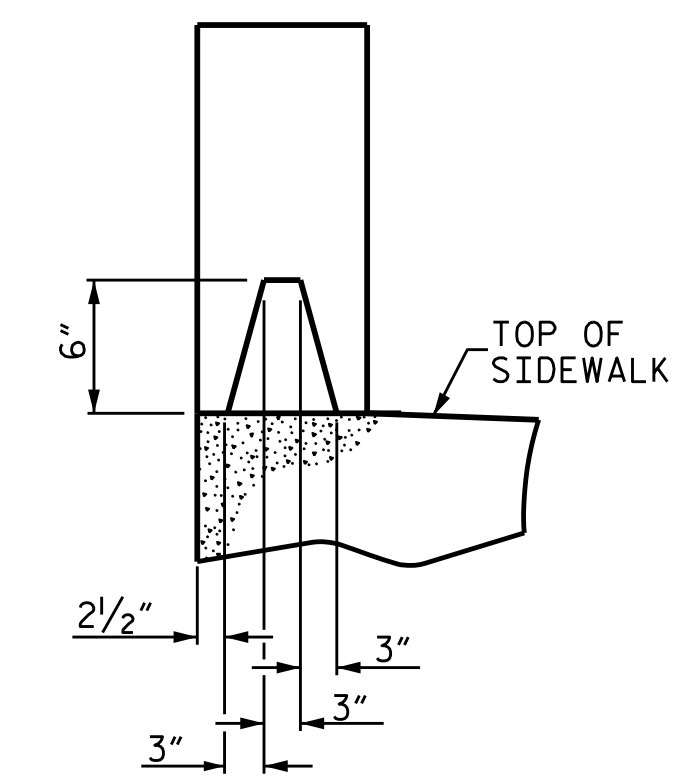
PLAN OF END POST



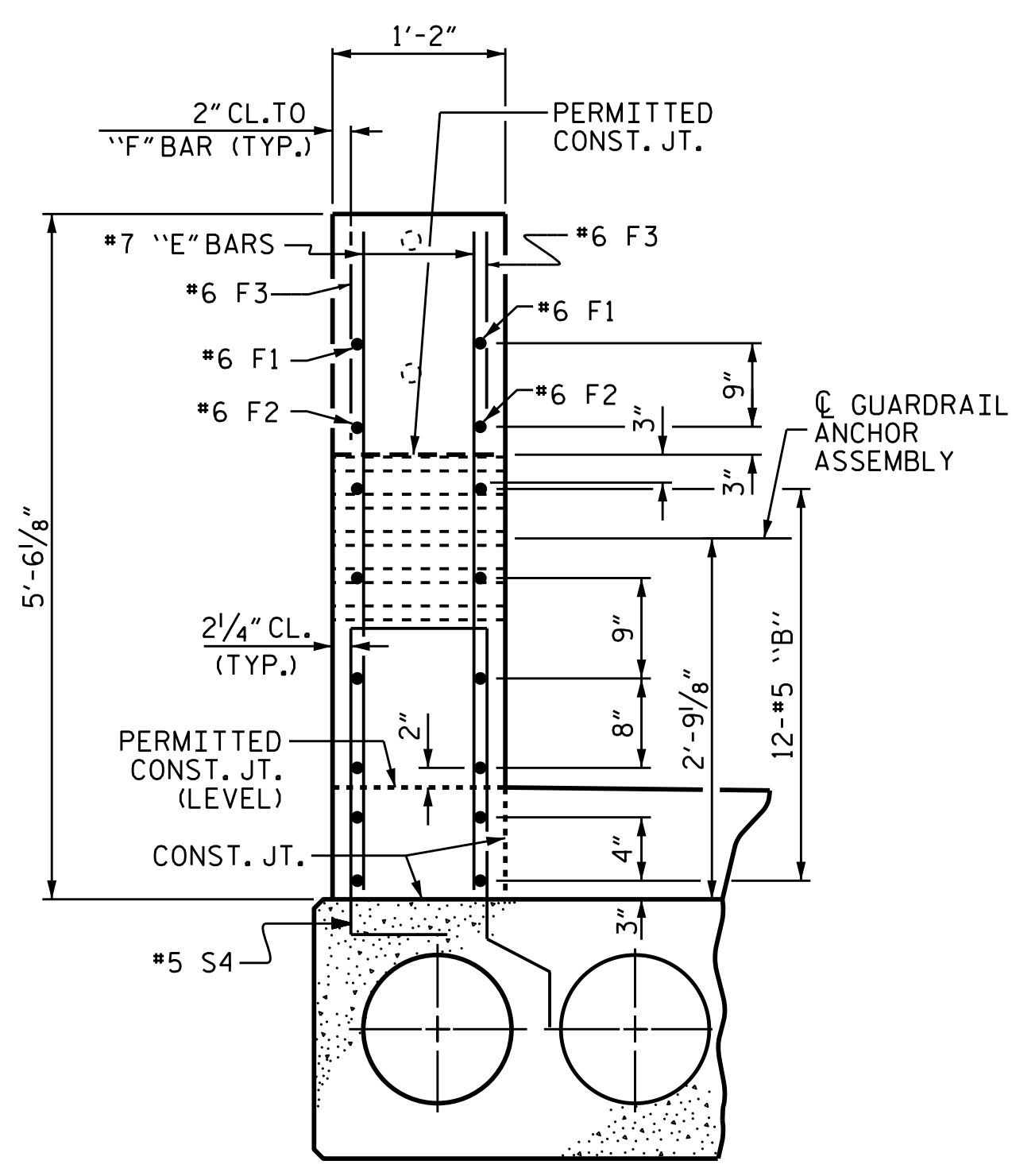
ELEVATION AT EXPANSION JOINTS
PARAPET WITH SIDEWALK



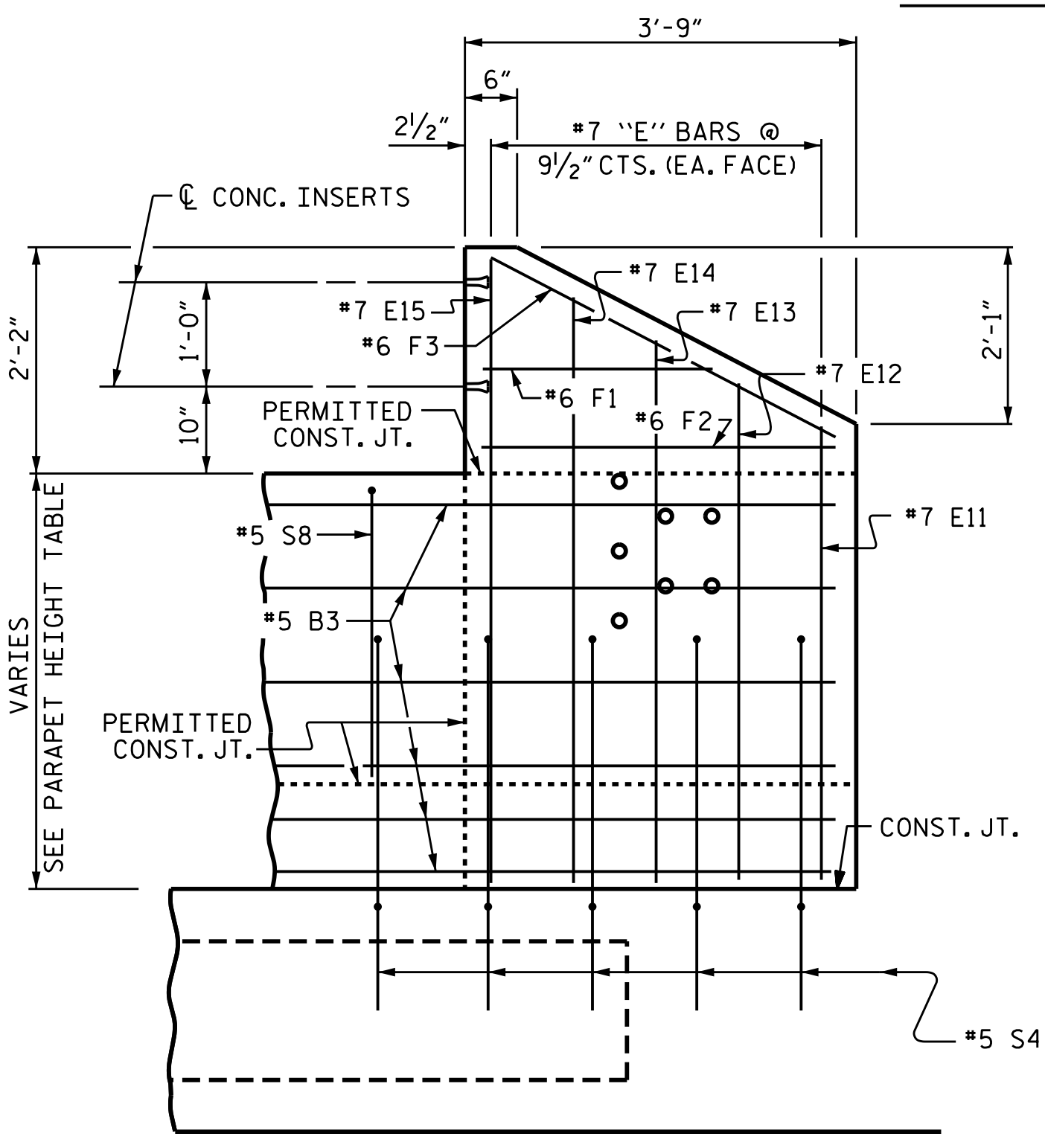
SECTION T-T
AT OPEN JOINT AT BENT
(THIS IS TO BE USED WHERE FOAM JOINT IS NOT USED)



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

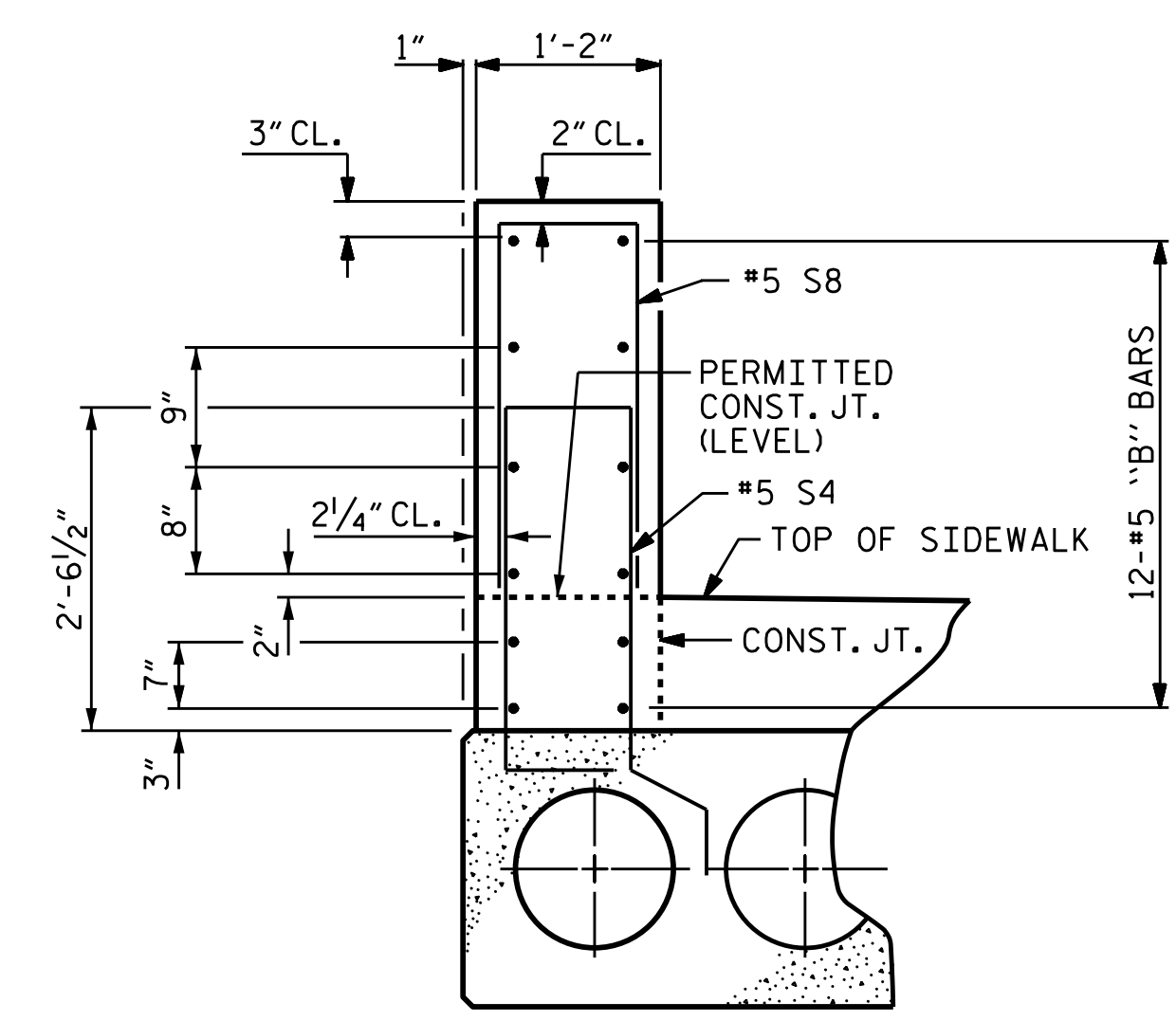


END VIEW



ELEVATION

FIELD BEND #5 B3 BARS TO AVOID GUARDRAIL ANCHORAGE ASSEMBLY



SECTION THRU SIDEWALK & PARAPET

BILL OF MATERIAL					
FOR 1 PARAPET & 2 END POSTS					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
*B3	48	#5	STR	19'-7"	980
*B4	24	#5	STR	24'-7"	615
*E11	4	#7	STR	3'-3"	27
*E12	4	#7	STR	3'-9"	31
*E13	4	#7	STR	4'-3"	35
*E14	4	#7	STR	4'-9"	39
*E15	4	#7	STR	5'-3"	43
*F1	4	#6	STR	1'-10"	11
*F2	4	#6	STR	3'-0"	18
*F3	4	#6	STR	3'-10"	23
*S8	136	#5	1	5'-5"	768
* EPOXY COATED REINFORCING STEEL				LBS.	2547
CLASS AA CONCRETE				CU.YDS.	19.6
TOTAL LIN. FT. OF CONCRETE PARAPET					130.25

BAR TYPES	
①	9 1/2" 2'-3 3/4"

ALL BAR DIMENSIONS ARE OUT TO OUT

PARAPET HEIGHT		
SPAN	@ BEARINGS	@ MID-SPAN
A	3'-4 1/8"	3'-3 3/8"
B	3'-4 1/8"	3'-3"
C	3'-4 1/8"	3'-3 3/8"

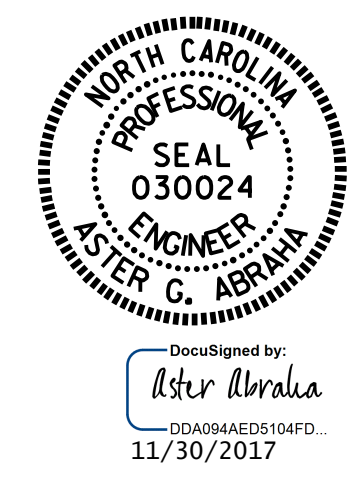
PROJECT NO. 17BP.6.R.89
HARNETT COUNTY
STATION: 17+51.00 -L-

PARAPET AND END POST FOR TWO BAR RAIL

SEE "GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS" SHEET FOR LOCATION OF GUARDRAIL ATTACHMENT.

CONCRETE PARAPET DETAILS

FOR PLAN VIEW OF CONCRETE PARAPET, SEE "PLAN OF SPAN" SHEETS

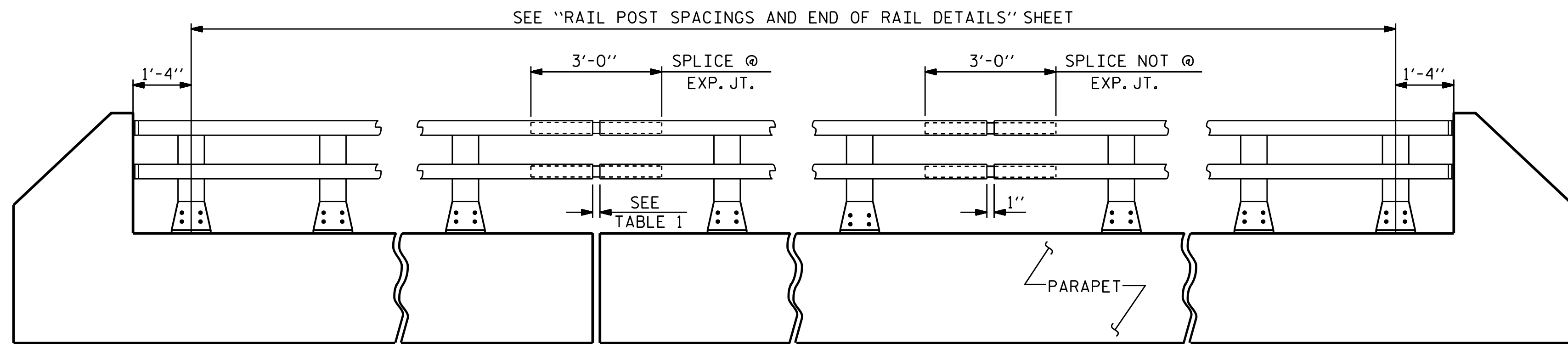


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
CONCRETE PARAPET AND END POSTS
(LEFT SIDE)

ASSEMBLED BY: S. B. WILLIAMS	DATE: 9-17
CHECKED BY: S. WANCE	DATE: 10-17
DRAWN BY: WJH 4/89	REV. 5/7/03RRR RWW/JTE
CHECKED BY: FCJ 5/89	REV. 5/1/06R TLA/GM
	REV. 10/1/11 MAA/GM

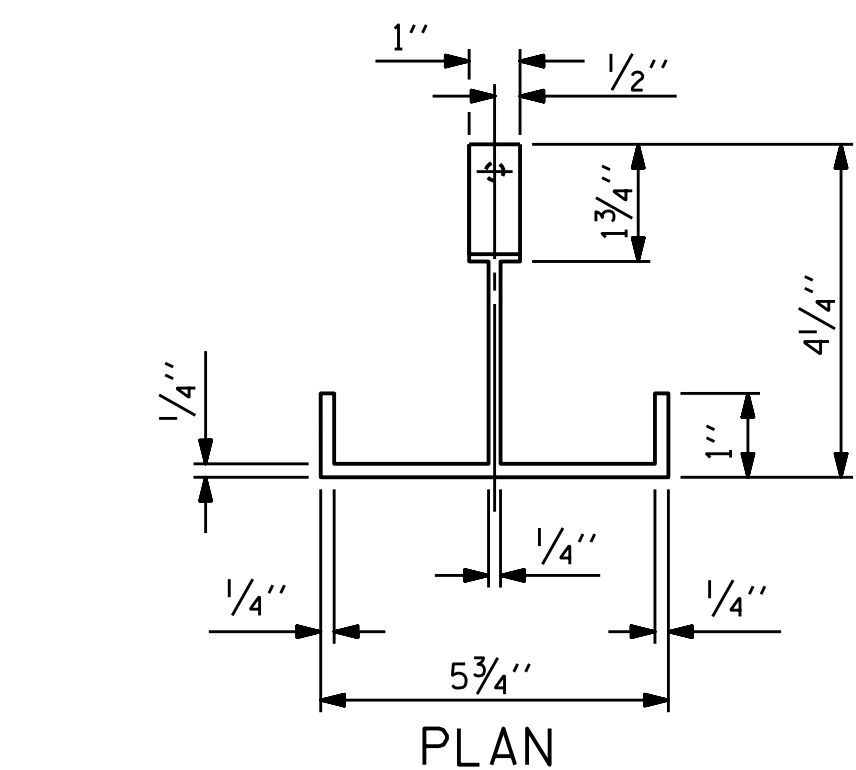
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11	
1			3			TOTAL SHEETS 29	
2			4				

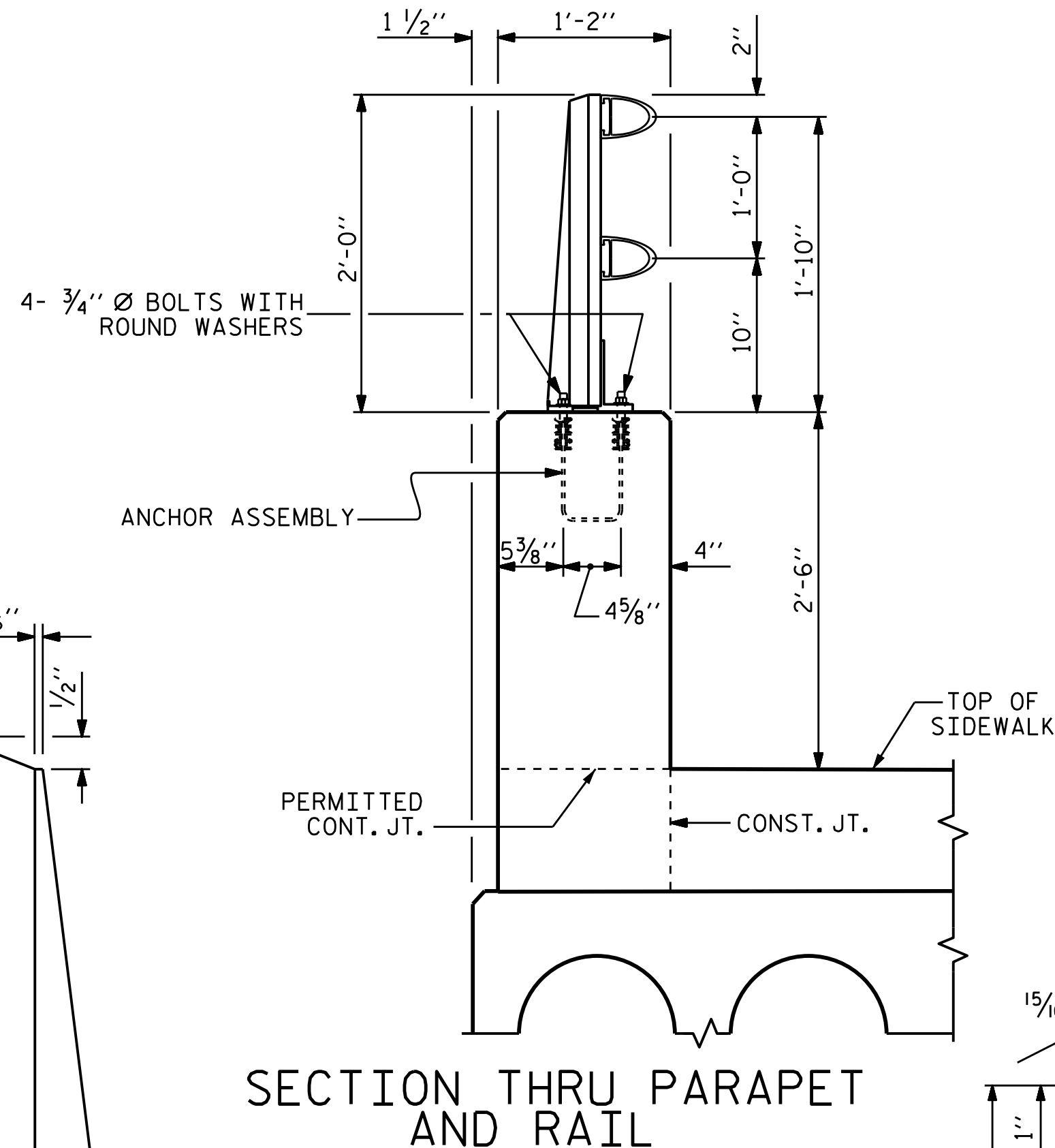


ELEVATION

NOTE : FOR ATTACHMENT OF METAL RAIL TO END POST, SEE STANDARD NO. BMR2.

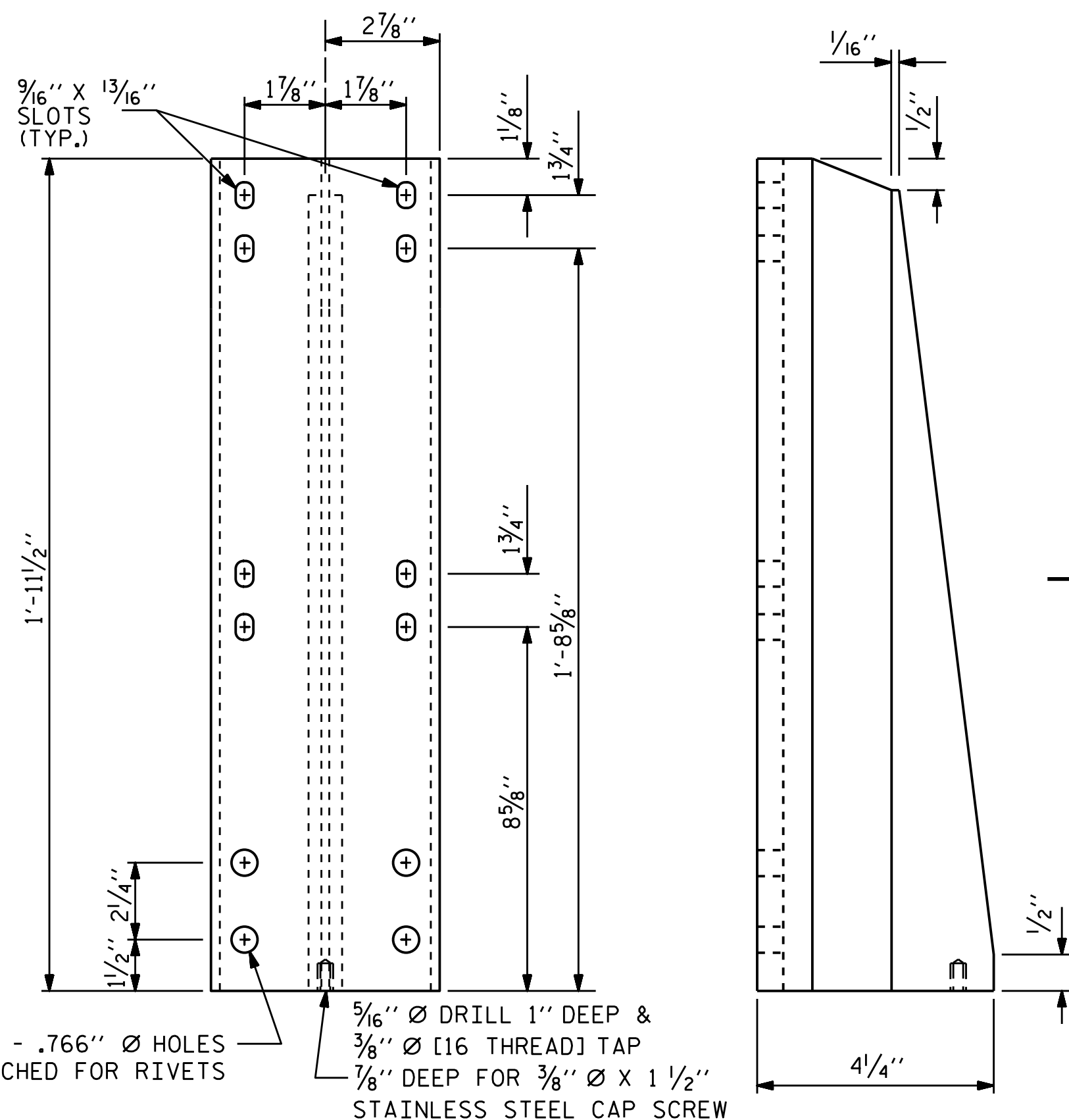


PLAN



SECTION THRU PARAPET AND RAIL

TABLE 1	
EXP. JT. @	RAIL OPENING
BENT 1	1 1/2"
BENT 2	1 1/2"

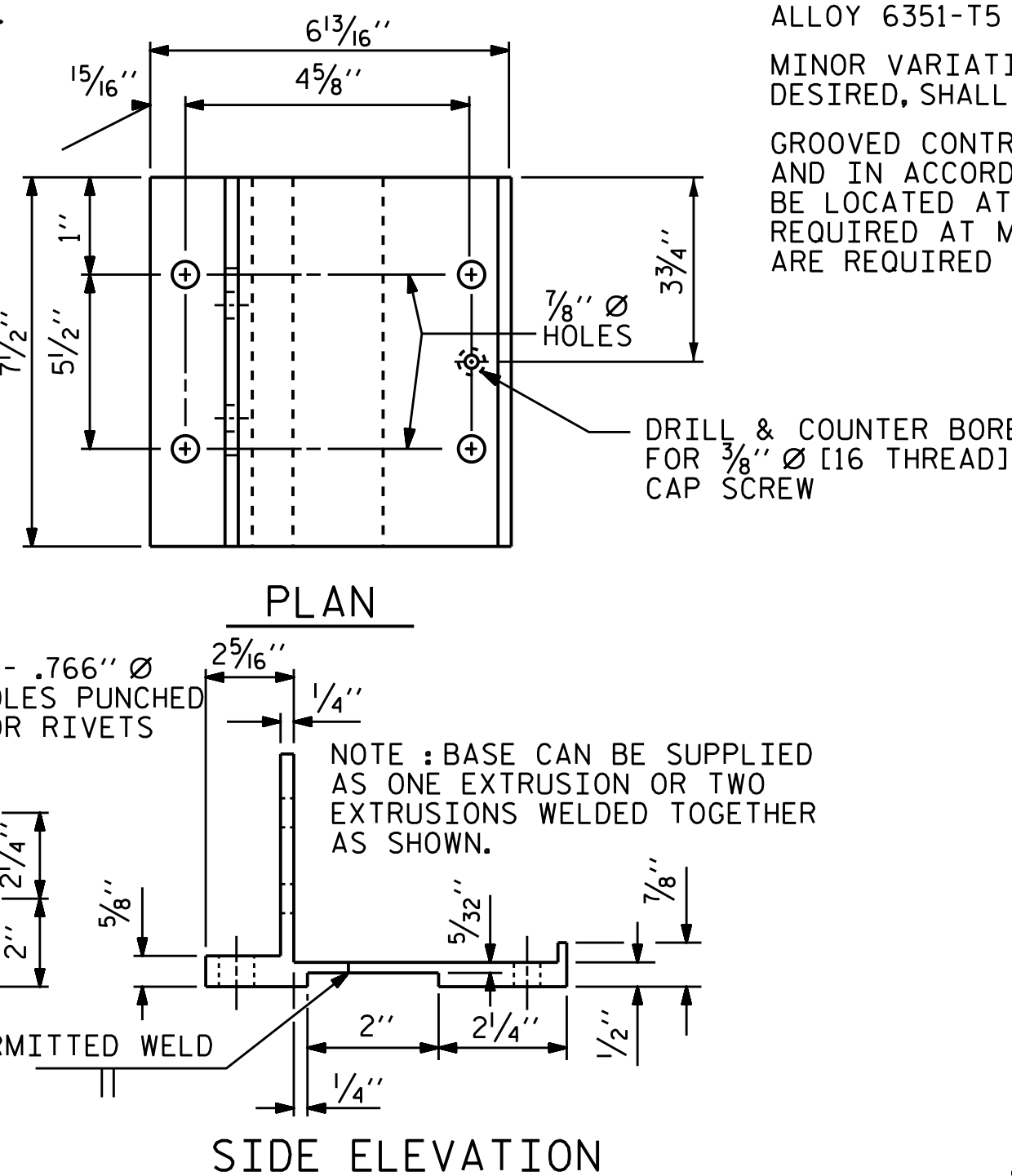


FRONT ELEVATION

SIDE ELEVATION

DETAILS OF POST

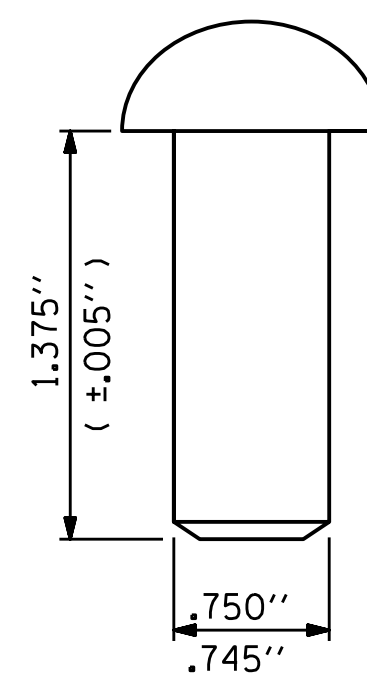
ASSEMBLED BY : S. B. WILLIAMS	DATE : 9-11-17
CHECKED BY : M. K. BEARD	DATE : 10-12-17
DRAWN BY : EEM 6/94	REV. 5/1/06 TLA/GM
CHECKED BY : RGW 6/94	REV. 10/1/11 MAA/GM
	REV. 6/13 MAA/GM



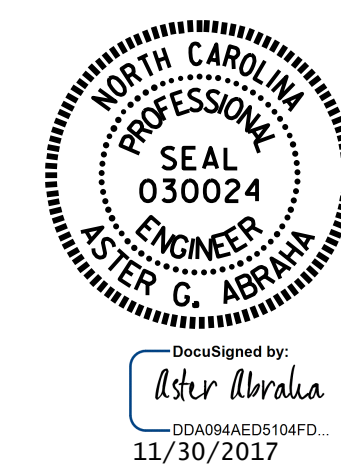
FRONT ELEVATION

SIDE ELEVATION

POST BASE DETAILS



RIVET DETAIL



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NOTES

AT THE CONTRACTOR'S OPTION, METAL RAIL MAY BE EITHER ALUMINUM OR GALVANIZED STEEL IN ACCORDANCE WITH THE REQUIREMENTS OF THE GENERAL NOTES AND THE FOLLOWING SPECIFICATIONS FOR THE ALTERNATE MATERIALS; HOWEVER, THE CONTRACTOR WILL BE REQUIRED TO USE THE SAME RAIL MATERIAL ON ALL STRUCTURES ON THE PROJECT FOR WHICH METAL RAIL IS DESIGNATED.

UNLESS OTHERWISE REQUIRED IN THE CONTRACT DOCUMENTS, THE CONTRACTOR HAS THE OPTION TO USE AN ALTERNATE TO THE 2 BAR METAL RAIL. THE ALTERNATE RAIL SHALL MEET THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS AND MUST BE LISTED ON THE DEPARTMENT'S APPROVED PRODUCTS LIST (APL) UNDER "2 BAR METAL RAIL ALTERNATE". ADJUSTMENTS TO THE CONCRETE PARAPET WILL NOT BE ALLOWED.

ALUMINUM RAILS

MATERIAL FOR POSTS, BASES AND RAILS, EXPANSION BARS AND CLAMP BARS SHALL BE ASTM B-221 ALLOY 6061-T6. MATERIAL FOR RIVETS SHALL BE ASTM B316 ALLOY 6061-T6. RIVETS SHALL BE STANDARD BUTTON HEAD AND CONE POINT COLD DRIVEN AS PER DRAWING.

THE BASE OF RAIL POSTS, OR ANY OTHER ALUMINUM SURFACE IN CONTACT WITH CONCRETE SHALL BE THOROUGHLY COATED WITH AN ALUMINUM IMPREGNATED CAULKING COMPOUND OF APPROVED QUALITY.

MATERIAL FOR SHIMS TO BE ASTM B209 ALLOY 6061-T6.

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

POST, POST BASES, RAILS, EXPANSION BARS AND CLAMP BARS: AASHTO M270 GRADE 36 STRUCTURAL STEEL - GALVANIZED TO AASHTO M111.

RIVETS: RIVETS SHALL MEET THE REQUIREMENTS OF ASTM A502 FOR GRADE 1 RIVETS.

THE CUT ENDS OF GALVANIZED STEEL RAILING, AFTER GRINDING SMOOTH SHALL BE GIVEN TWO COATS OF ZINC RICH PAINT MEETING THE REQUIREMENTS OF FEDERAL SPECIFICATION MIL-P-26915 USAF TYPE 1, OR OF FEDERAL SPECIFICATIONS TT-P-641.

SHIMS: SHIMS SHALL MEET THE REQUIREMENTS OF ASTM A570 FOR GRADE 33 OR A611 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111.

RAIL CAPS: RAIL CAPS SHALL MEET THE REQUIREMENTS OF ASTM A570 FOR GRADE 33 OR A611 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111.

GENERAL NOTES

RAILING SHALL BE CONTINUOUS FROM END POST TO END POST OF BRIDGE. EACH JOINT IN RAIL LENGTH SHALL BE SPLICED AS DETAILED. PANEL LENGTHS OF RAIL SHALL BE ATTACHED TO A MINIMUM OF THREE POSTS.

FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE STANDARD NO. BMR2.

CAP SCREWS SHALL BE ASTM F593 ALLOY 305 STAINLESS STEEL. WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.

CERTIFIED MILL REPORTS ARE REQUIRED FOR RAILS AND POSTS. SHOP INSPECTION IS NOT REQUIRED.

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

METHOD OF MEASUREMENT FOR METAL RAILS: FOR LENGTH OF METAL RAILS TO BE PAID FOR, SEE THE STANDARD SPECIFICATIONS.

CURVED RAIL USAGE: WHERE RAILS ARE TO BE USED ON BRIDGES ON HORIZONTAL AND/OR VERTICAL CURVATURE THE CONTRACTOR MAY, AT HIS OPTION, HAVE THE REQUIRED CURVATURE IN THE RAIL FORMED IN THE SHOP OR IN THE FIELD. IN EITHER EVENT, THE RAIL SHALL CONFORM WITHOUT BUCKLING OR KINKING TO THE REQUIRED CURVATURE IN A UNIFORM MANNER ACCEPTABLE TO THE ENGINEER.

TO INSURE FUTURE IDENTIFICATION OF THE FABRICATOR, A PERMANENT IDENTIFYING MARK SHALL BE PLACED ON EACH POST. THE METHOD OF MARKING AND LOCATION SHALL BE SUCH THAT IT DOES NOT DETRACT FROM THE APPEARANCE OF THE POST, BUT REMAINS VISIBLE AFTER RAIL PLACEMENT.

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

ALLOY 6351-T5 MAY BE SUBSTITUTED FOR ALLOY 6061-T6 WHERE APPLICABLE.

MINOR VARIATIONS IN DETAILS OF METAL RAIL WILL BE CONSIDERED. DETAILS OF SUCH VARIATIONS, IF DESIRED, SHALL BE SUBMITTED FOR APPROVAL.

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

PAY LENGTH = 122.8 LIN. FT.

PROJECT NO. 17BP.6.R.89
HARNETT COUNTY
STATION: 17+51.00 -L-

SHEET 1 OF 3

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

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS 29
2			4			

NOTES

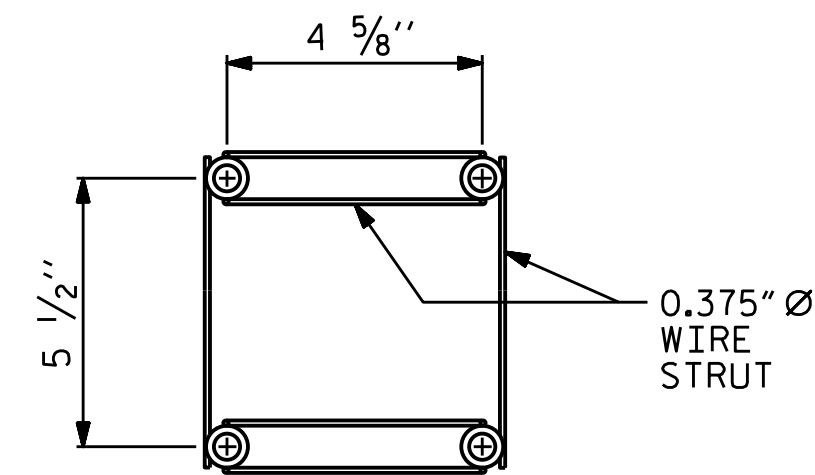
STRUCTURAL CONCRETE ANCHOR ASSEMBLY

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

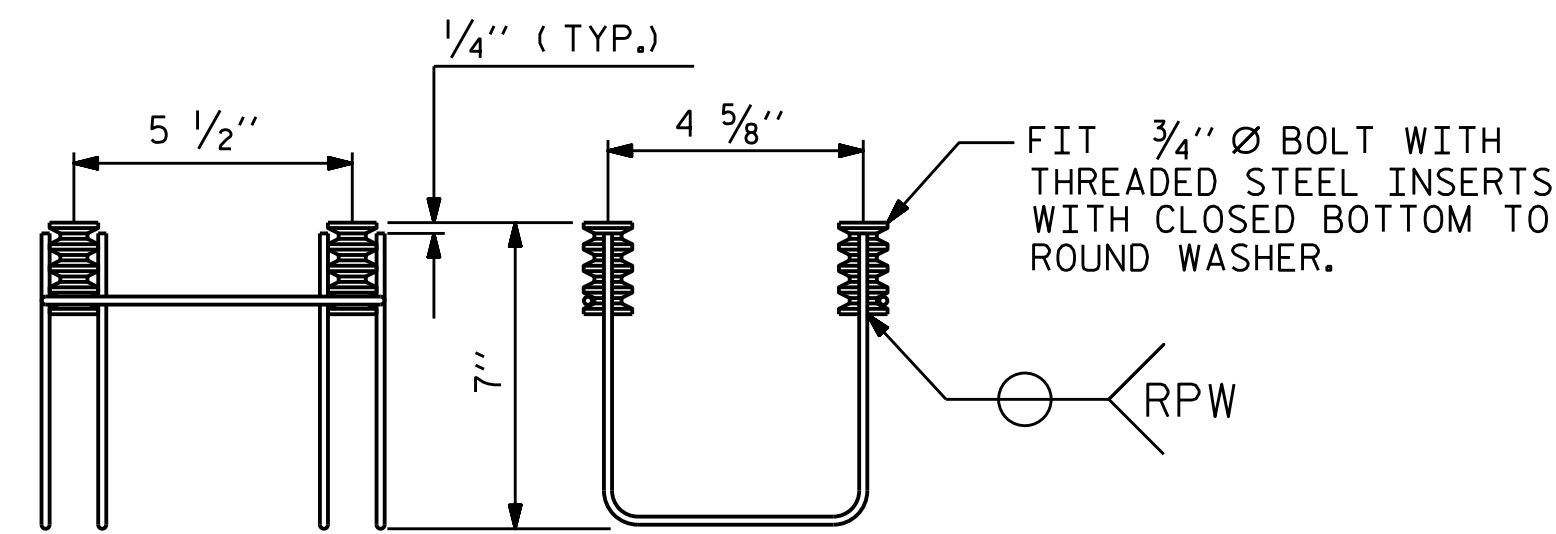
- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2" FOR 3/4" FERRULES.
- B. 4 - 3/4" Ø X 2 1/2" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT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

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

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



PLAN

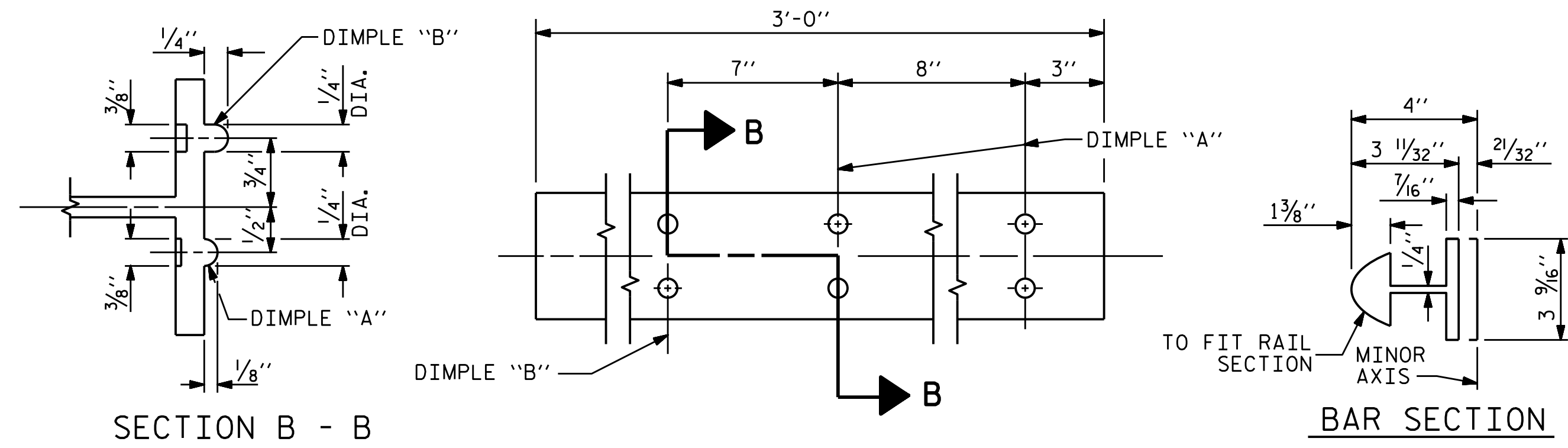


SIDE VIEW

ELEVATION

4-BOLT METAL RAIL ANCHOR ASSEMBLY

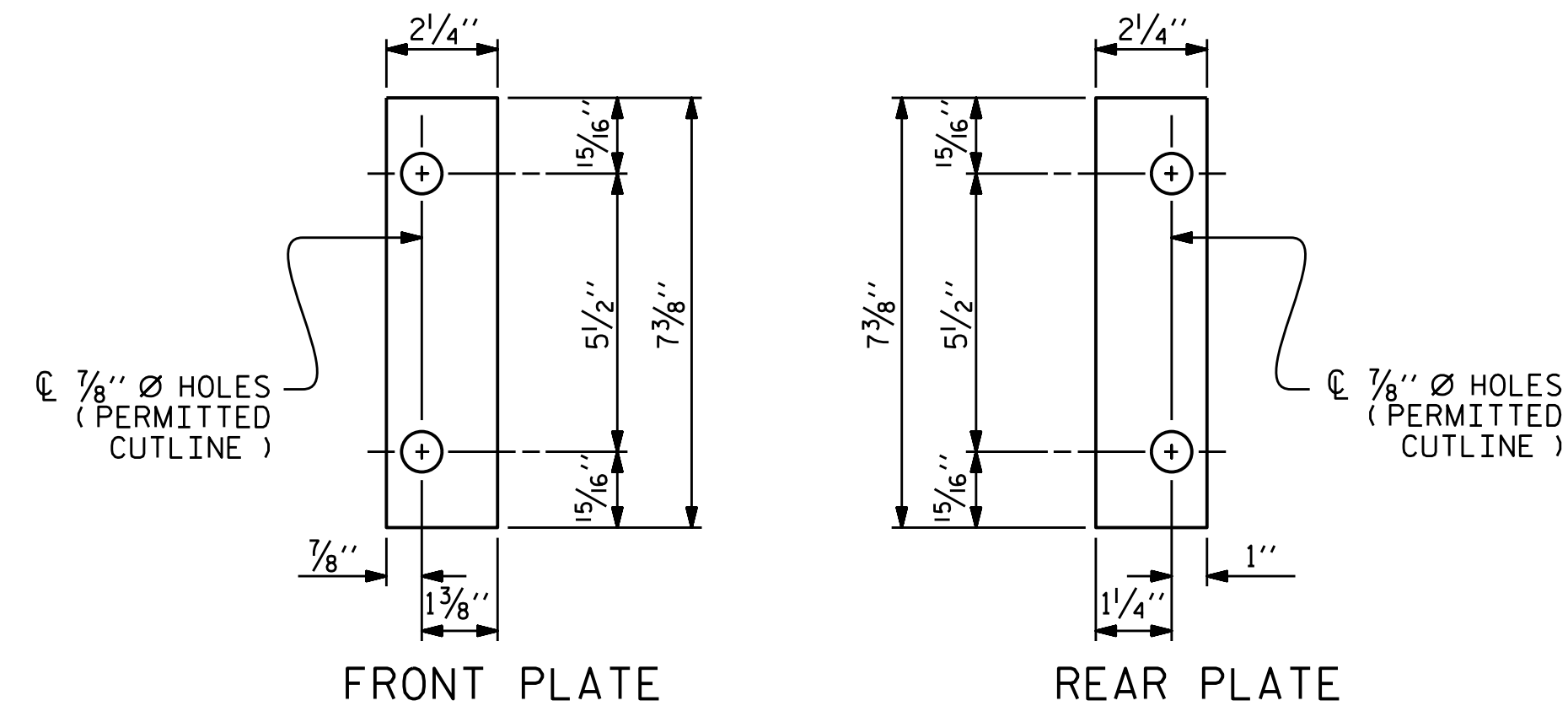
(22 ASSEMBLIES REQUIRED)



SECTION B - B

EXPANSION BAR DETAILS

BAR SECTION

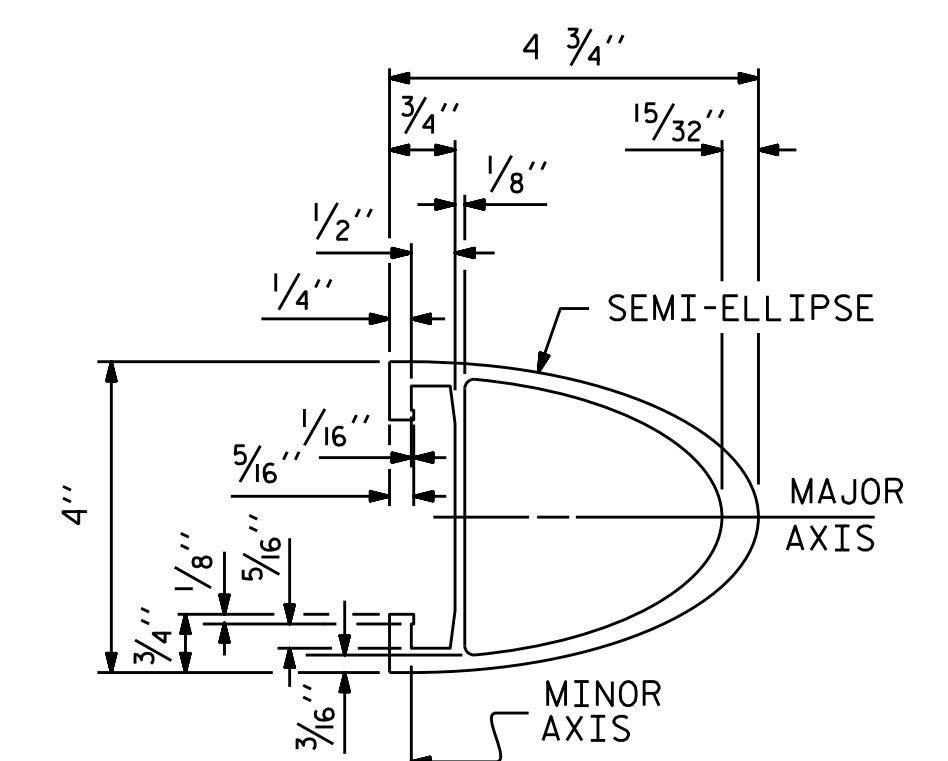


FRONT PLATE

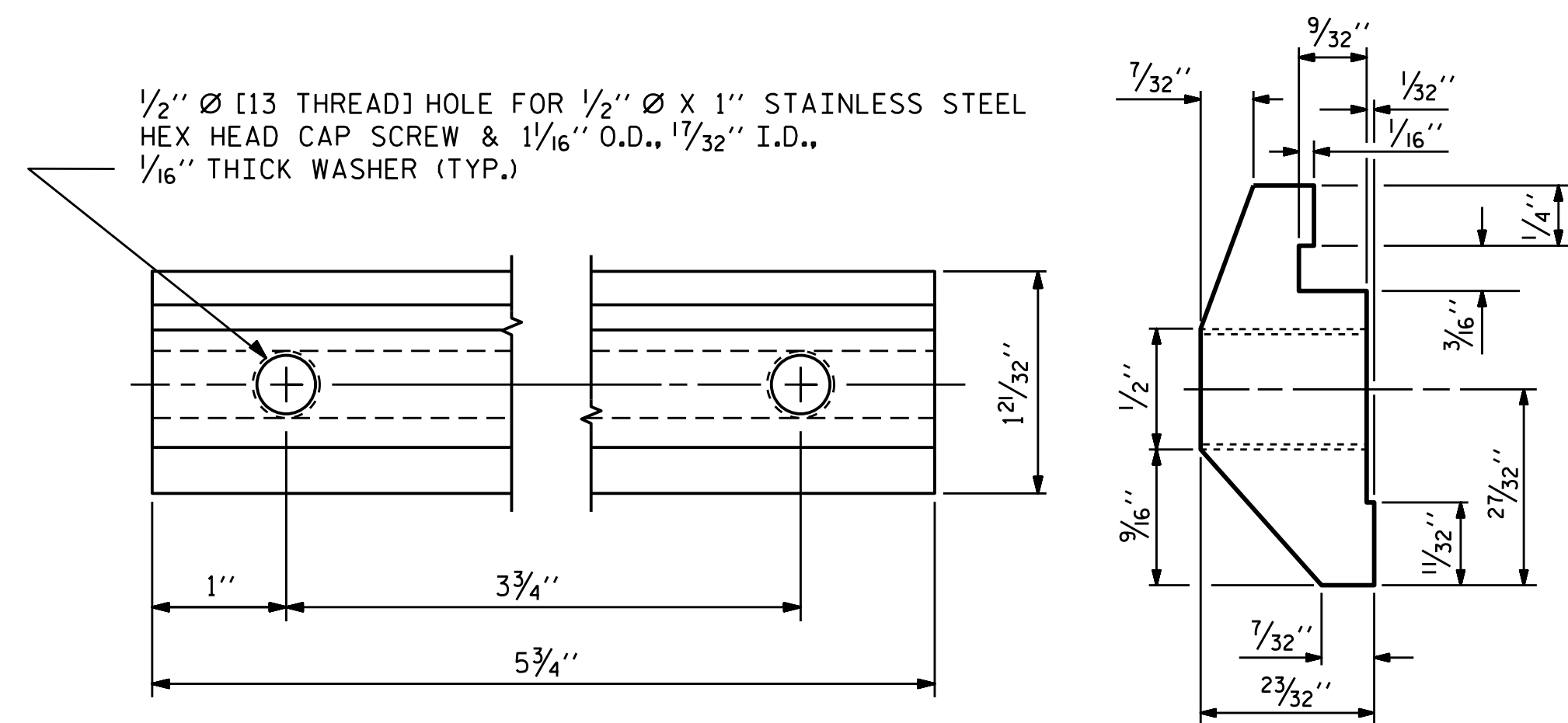
REAR PLATE

SHIM DETAILS

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

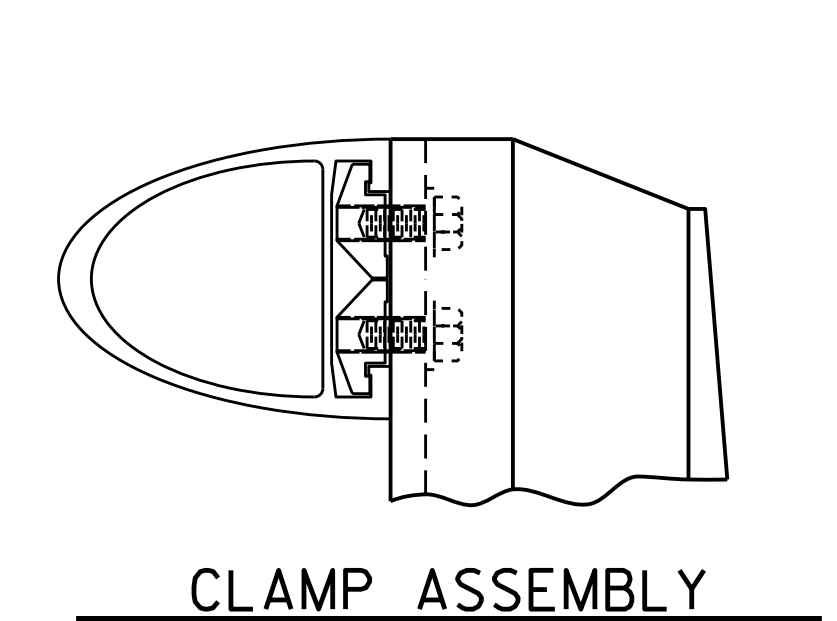


RAIL SECTION

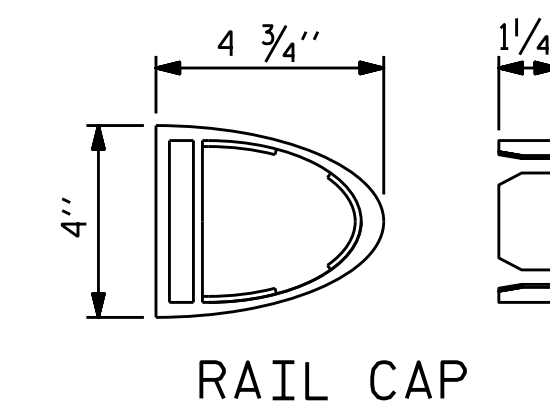


CLAMP BAR DETAIL

(4 REQUIRED PER POST)



CLAMP ASSEMBLY

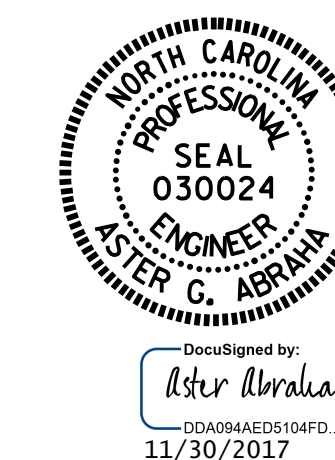


RAIL CAP

PROJECT NO. 17BP.6.R.89
HARNETT COUNTY
STATION: 17+51.00 -L-

SHEET 2 OF 3

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

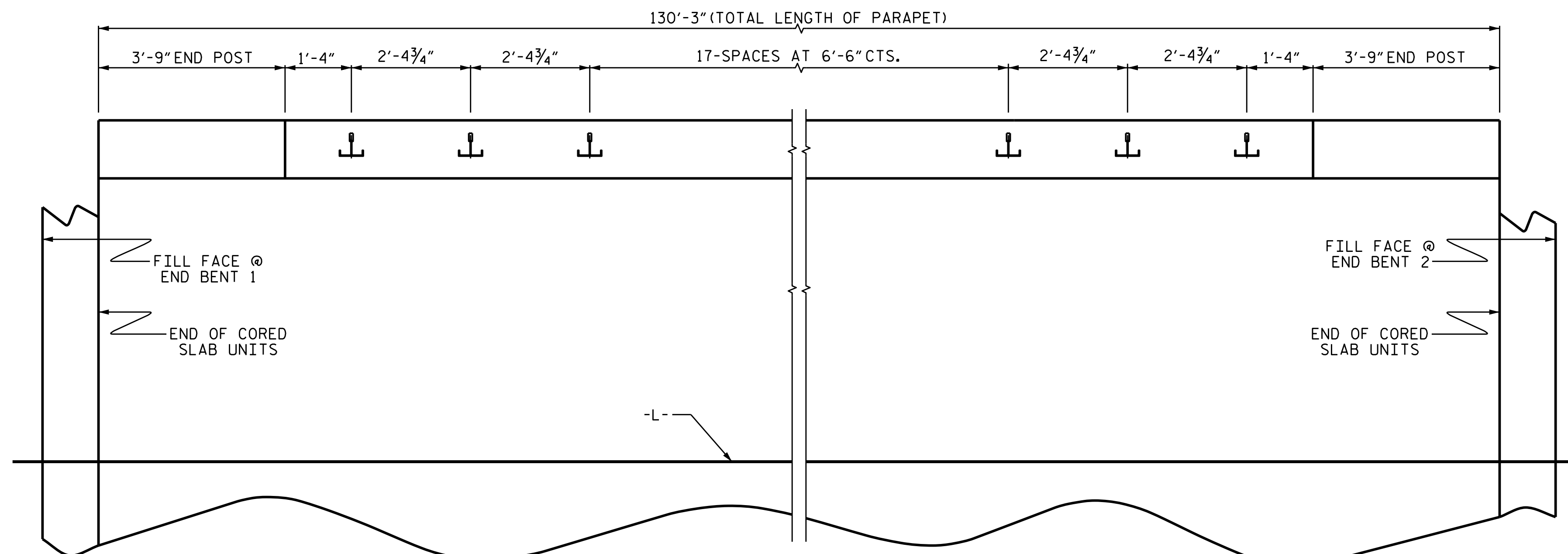


DocuSigned by:
Aster Abramo
11/30/2017

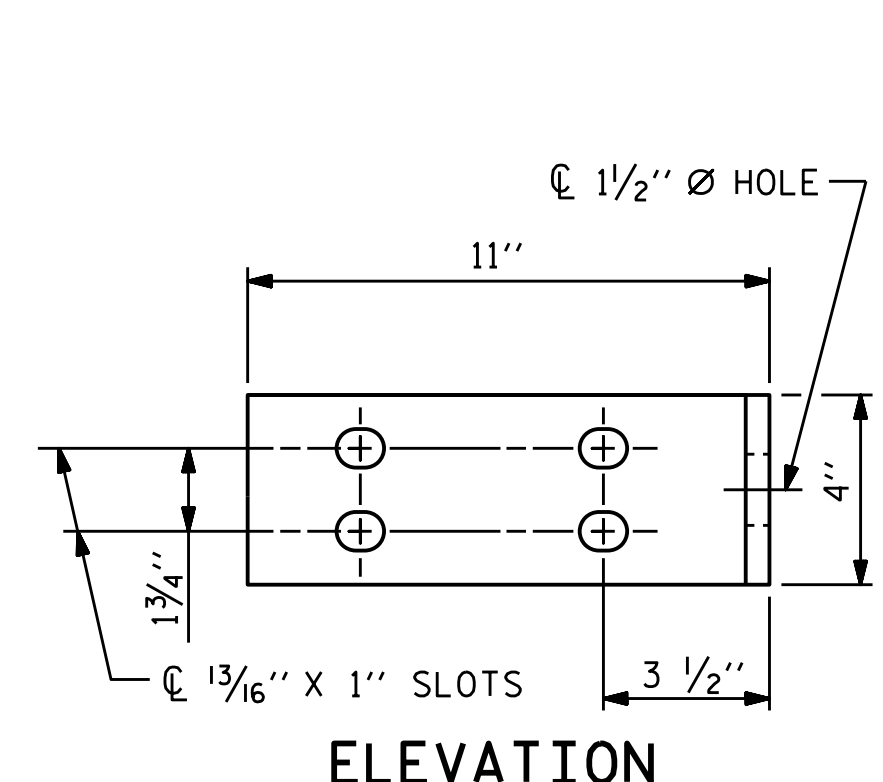
DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13	
1			3			TOTAL SHEETS 29	
2			4				

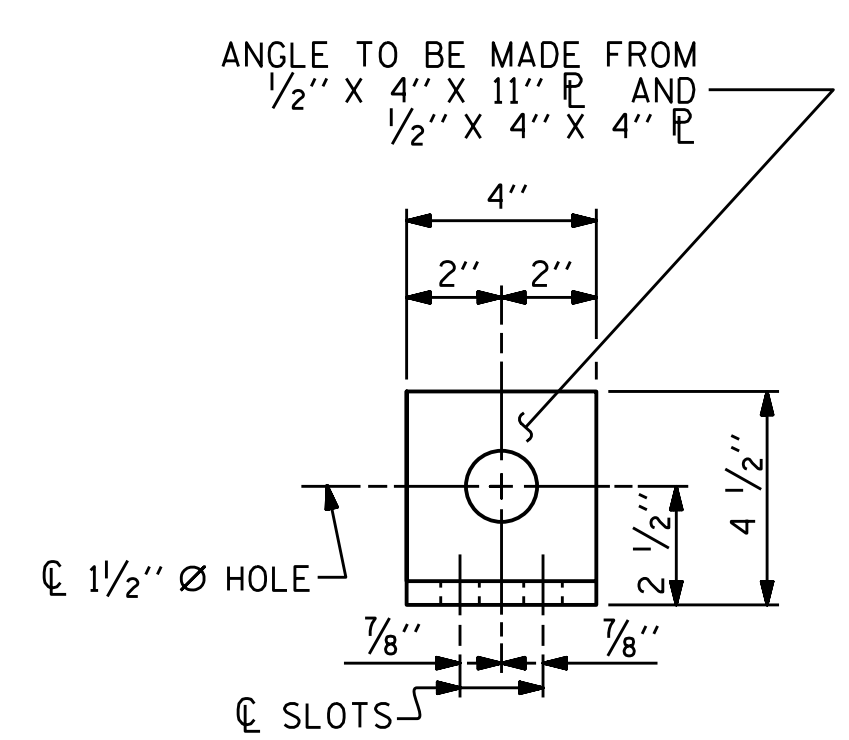
ASSEMBLED BY : S.B. WILLIAMS	DATE : 9-11-17
CHECKED BY : M. K. BEARD	DATE : 10-12-17
DRAWN BY : EEM 6/94	REV. 8/16/99 MAB/LES
CHECKED BY : RGW 6/94	REV. 5/1/06R KMM/GM
	REV. 10/1/11 MAA/GM



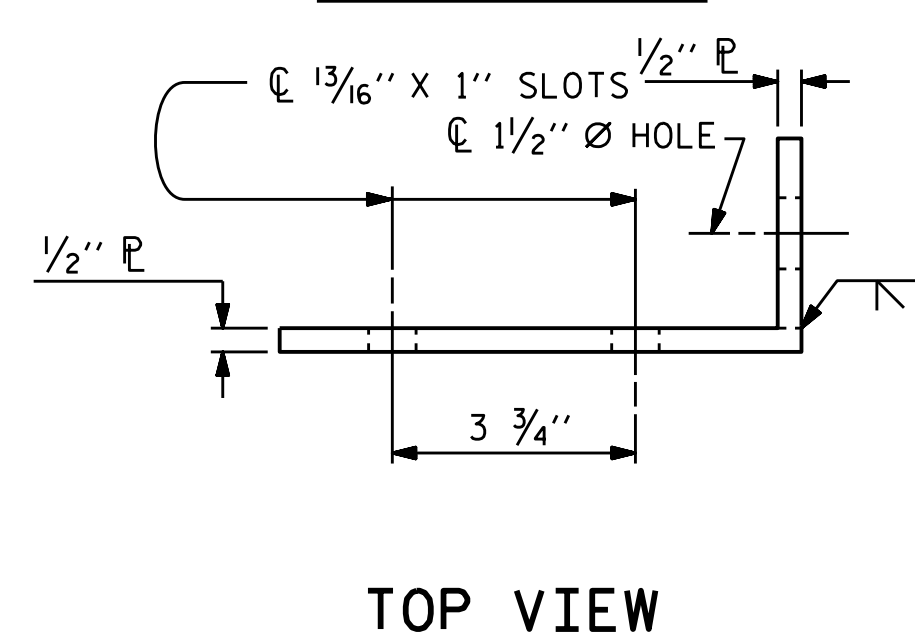
PLAN OF RAIL POST SPACINGS



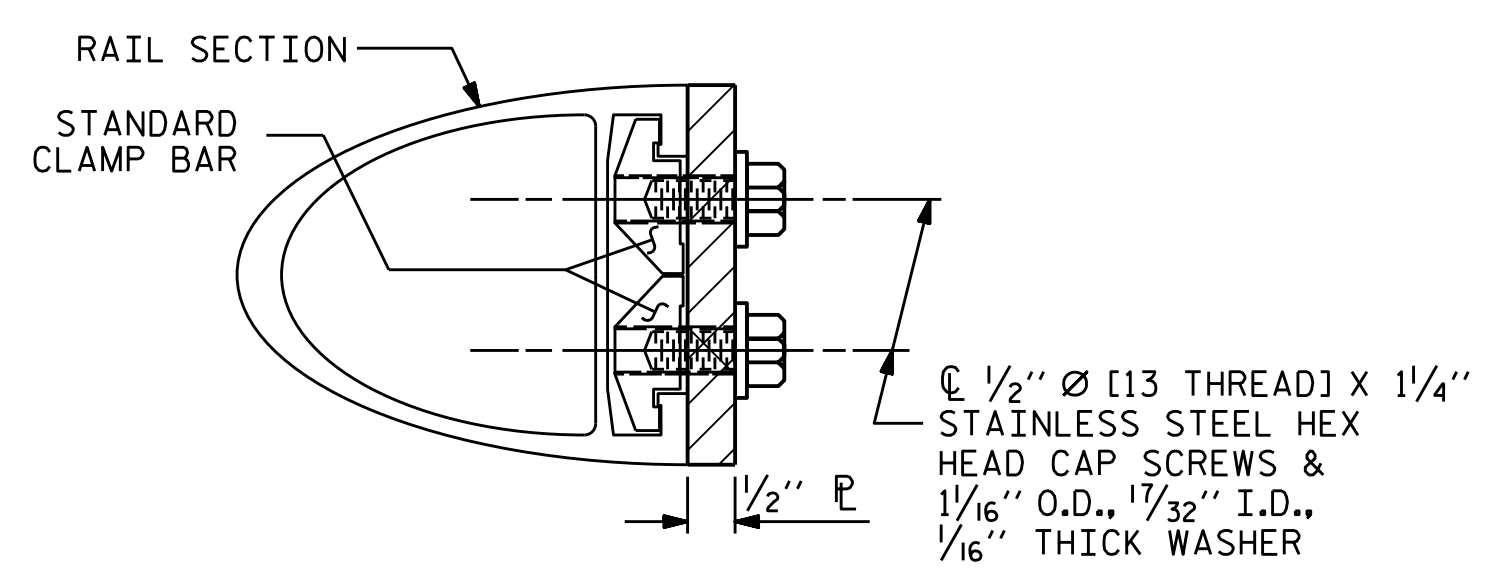
ELEVATION



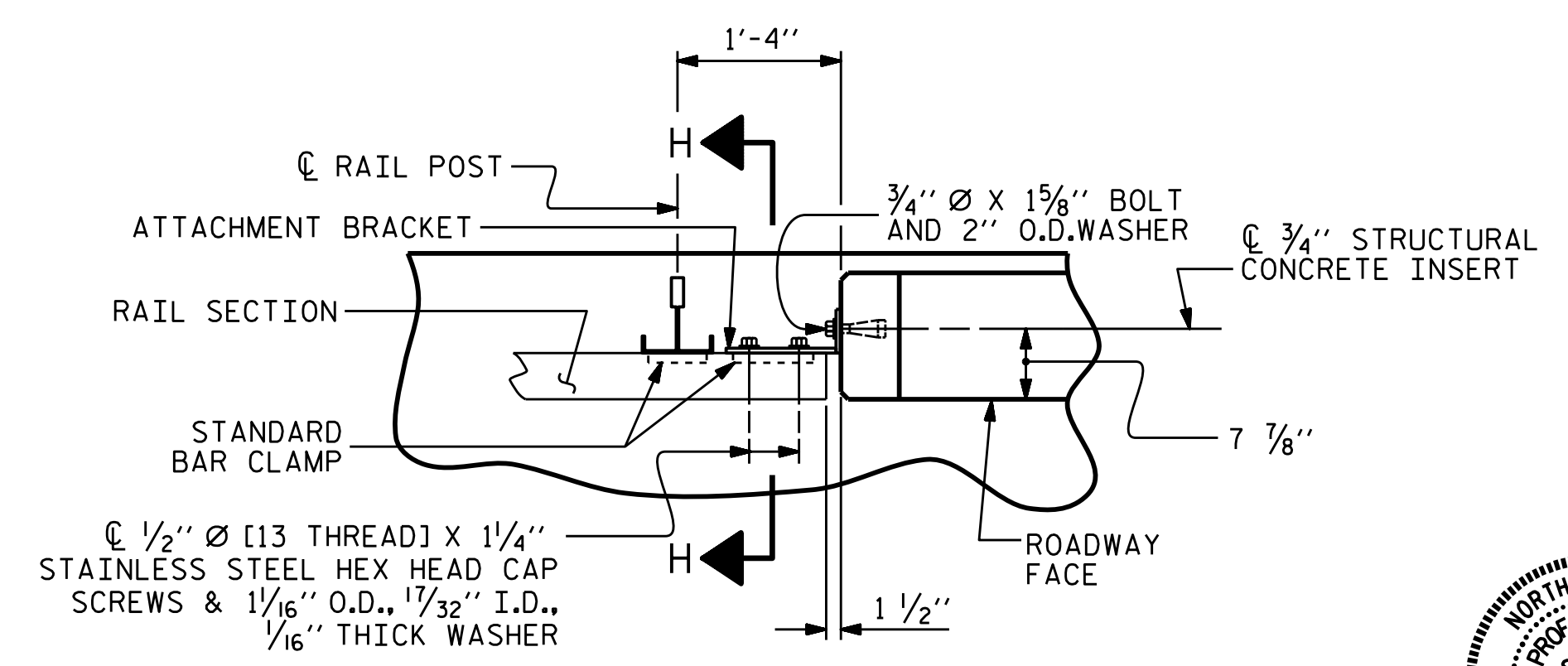
END VIEW



TOP VIEW

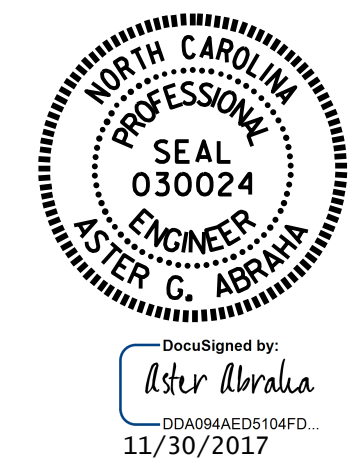


SECTION H-H



PLAN - RAIL AND END POST

DETAILS FOR ATTACHING METAL RAIL TO END POST



DocuSigned by:
Aster Abrahams
11/30/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NO. 1 BY: 2 DATE: 3 NO. 4 BY: 5 DATE: 6

TOTAL SHEETS 29

NOTES
STRUCTURAL CONCRETE INSERT

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

NOTES
METAL RAIL TO END POST CONNECTION

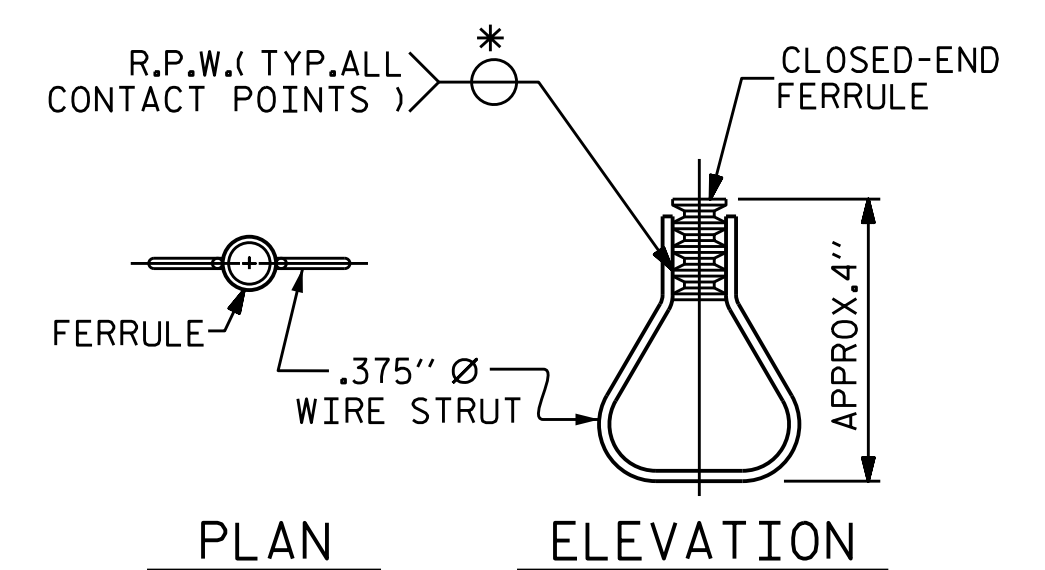
- THE METAL RAIL TO END POST CONNECTION SHALL CONSIST OF THE FOLLOWING COMPONENTS:
- A. 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
 - B. 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A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

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

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

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

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



PLAN ELEVATION

STRUCTURAL CONCRETE INSERT

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

PROJECT NO. 17BP.6.R.89
HARNETT COUNTY
STATION: 17+51.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
RAIL POST SPACINGS
AND
END OF RAIL DETAILS
FOR TWO BAR METAL RAILS

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14	
1			3			TOTAL SHEETS	
2			4			29	

STD. NO. BMR2

ASSEMBLED BY : S. B. WILLIAMS	DATE : 9-11-17
CHECKED BY : M. K. BEARD	DATE : 10-12-17
DRAWN BY : FCJ 1/88	REV. 5/7/03 RWW/JTE
CHECKED BY : CRK 3/89	REV. 5/1/06 TLA/GM
	REV. 10/1/11 MAA/GM

NOTES

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

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

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

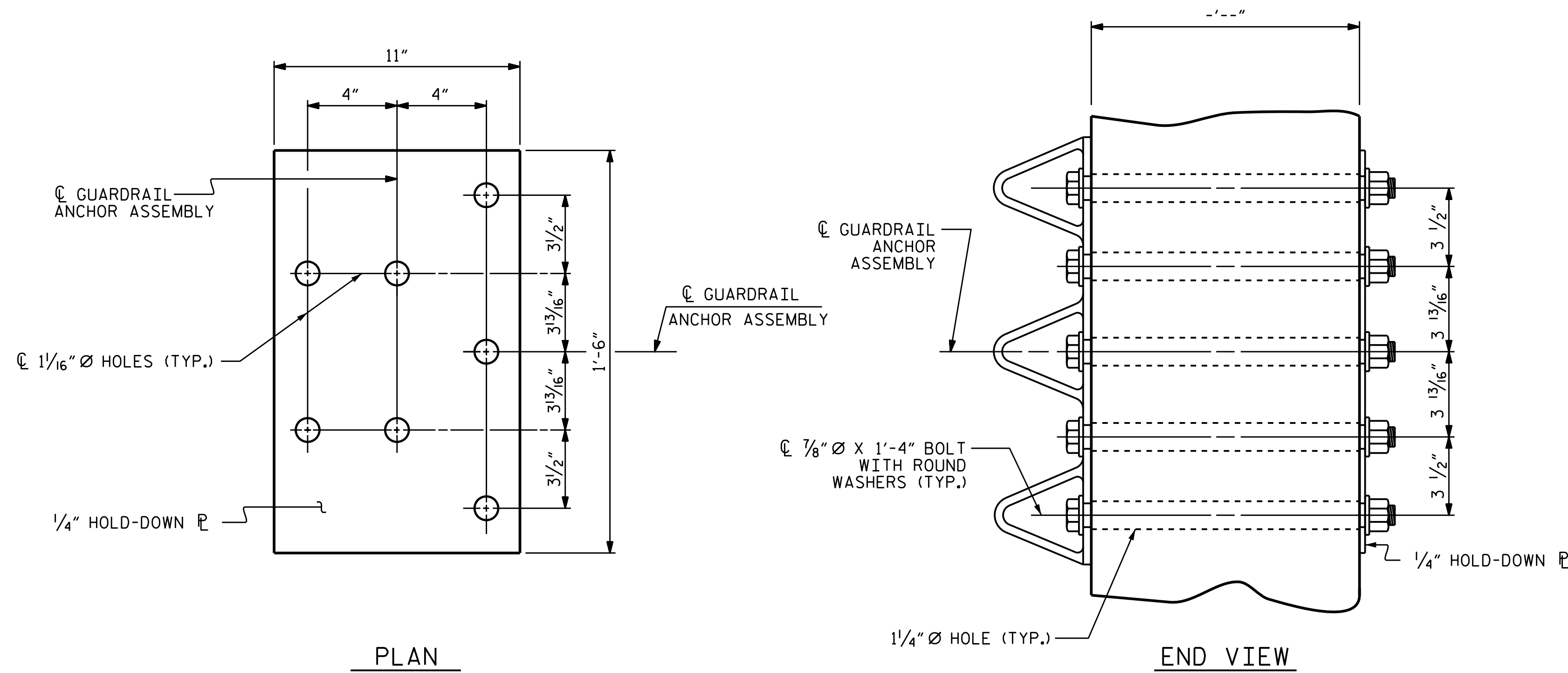
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

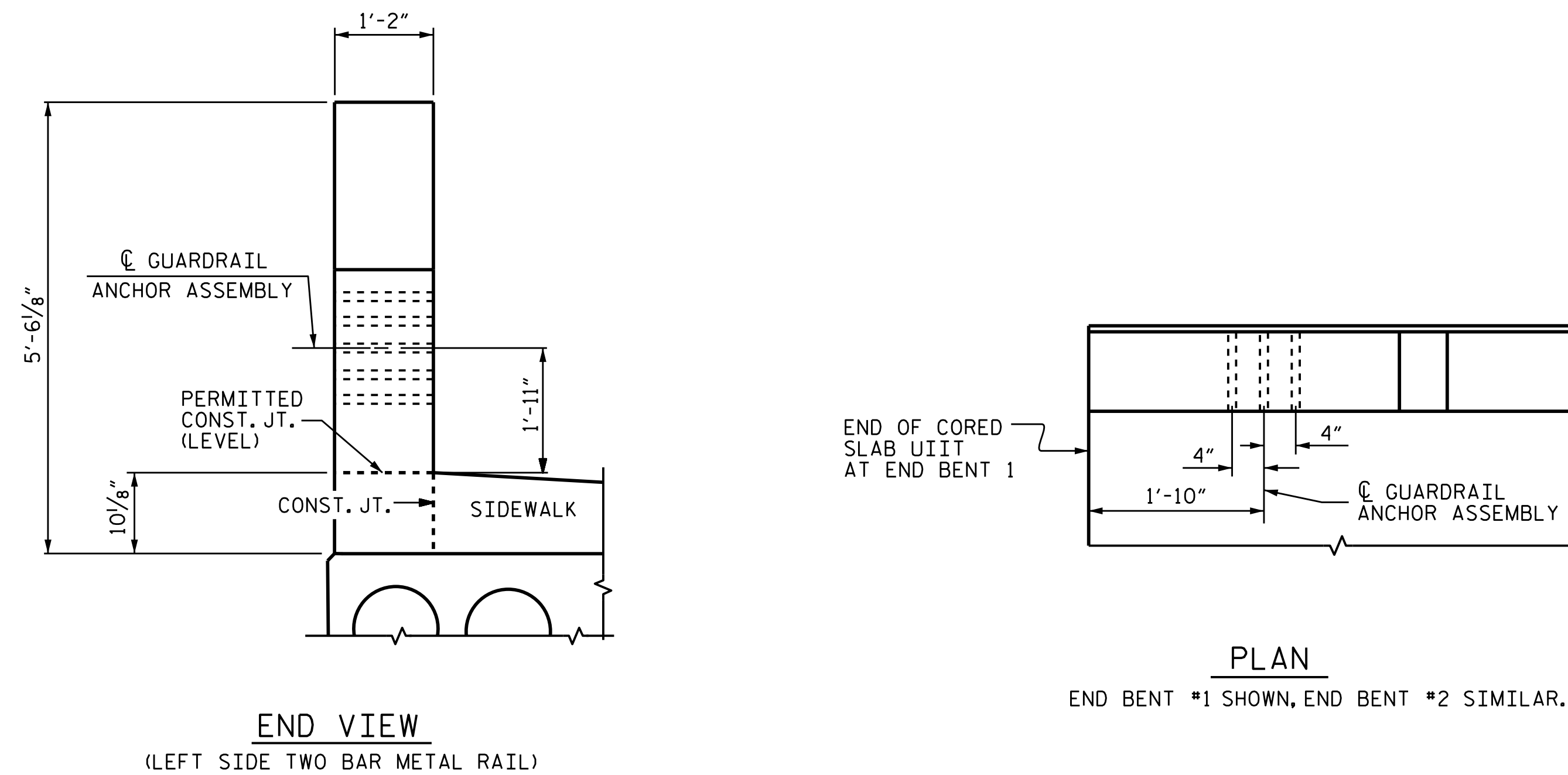
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE END POST TO CLEAR ASSEMBLY BOLTS.

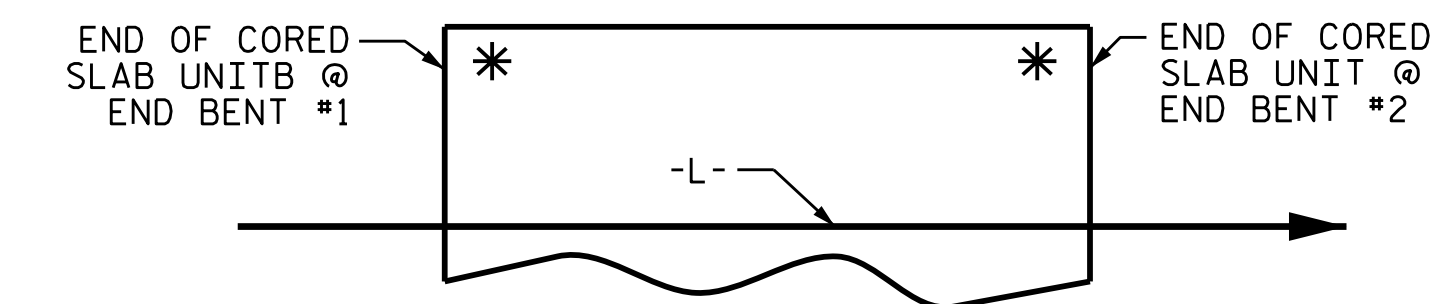
THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



GUARDRAIL ANCHOR ASSEMBLY DETAILS



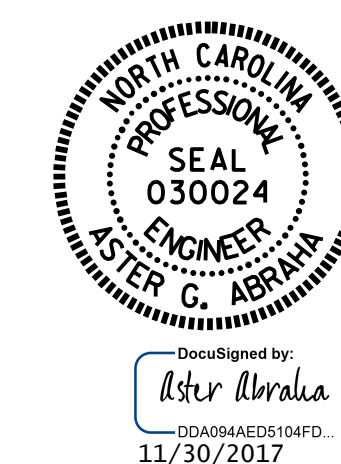
LOCATION OF GUARDRAIL ANCHOR AT END POST



SKETCH SHOWING POINTS OF ATTACHMENT

* LOCATION OF GUARDRAIL ATTACHMENT FOR LEFT SIDE 2 BAR METAL RAIL END POST

PROJECT NO. 17BP.6.R.89
HARNETT COUNTY
 STATION: 17+51.00 -L-



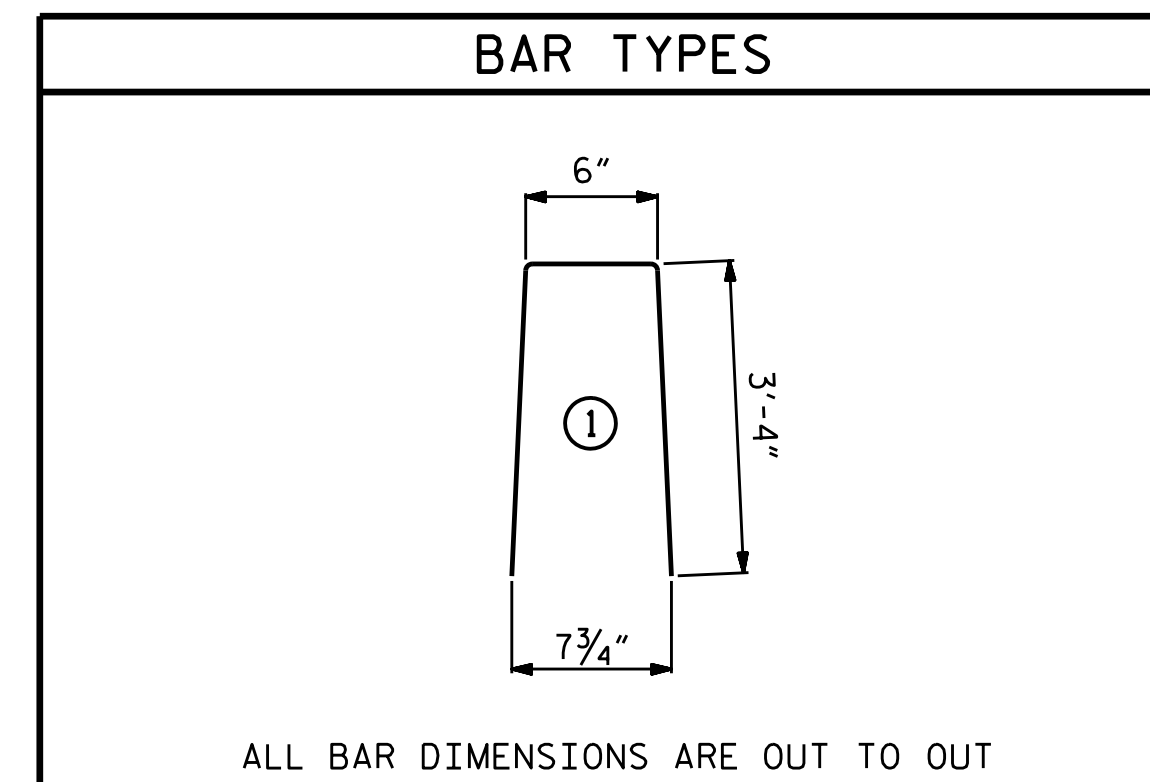
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 GUARDRAIL ANCHORAGE
 DETAILS
 FOR METAL RAILS

ASSEMBLED BY : S. B. WILLIAMS	DATE : 10-2017
CHECKED BY : S. WANCE	DATE : 10-2017
DRAWN BY : MAA 5/10	REV. 12/5/11 MAA/GM
CHECKED BY : GM 5/10	REV. 6/13 MAA/GM
	REV. 1/15 MAA/TMG

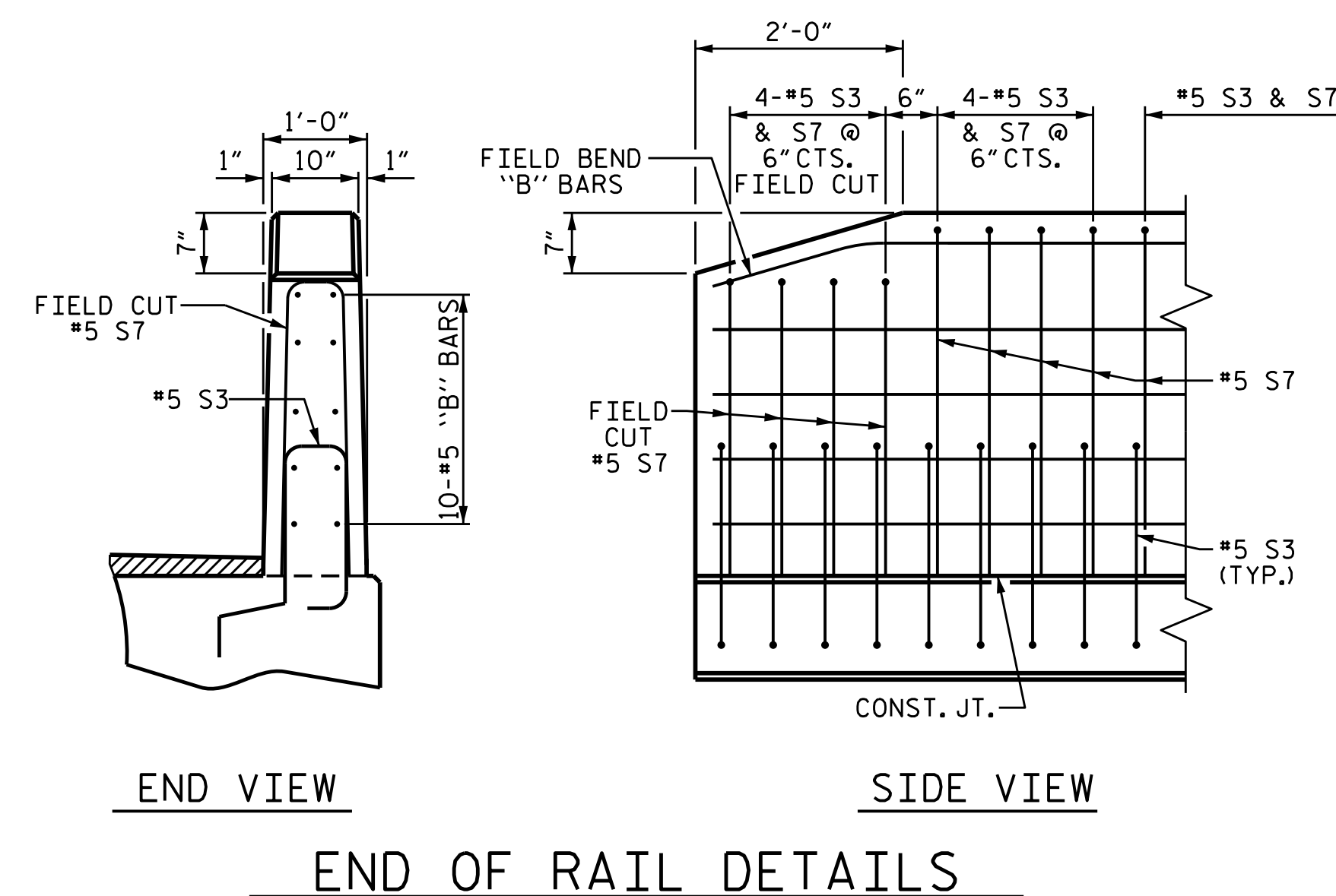
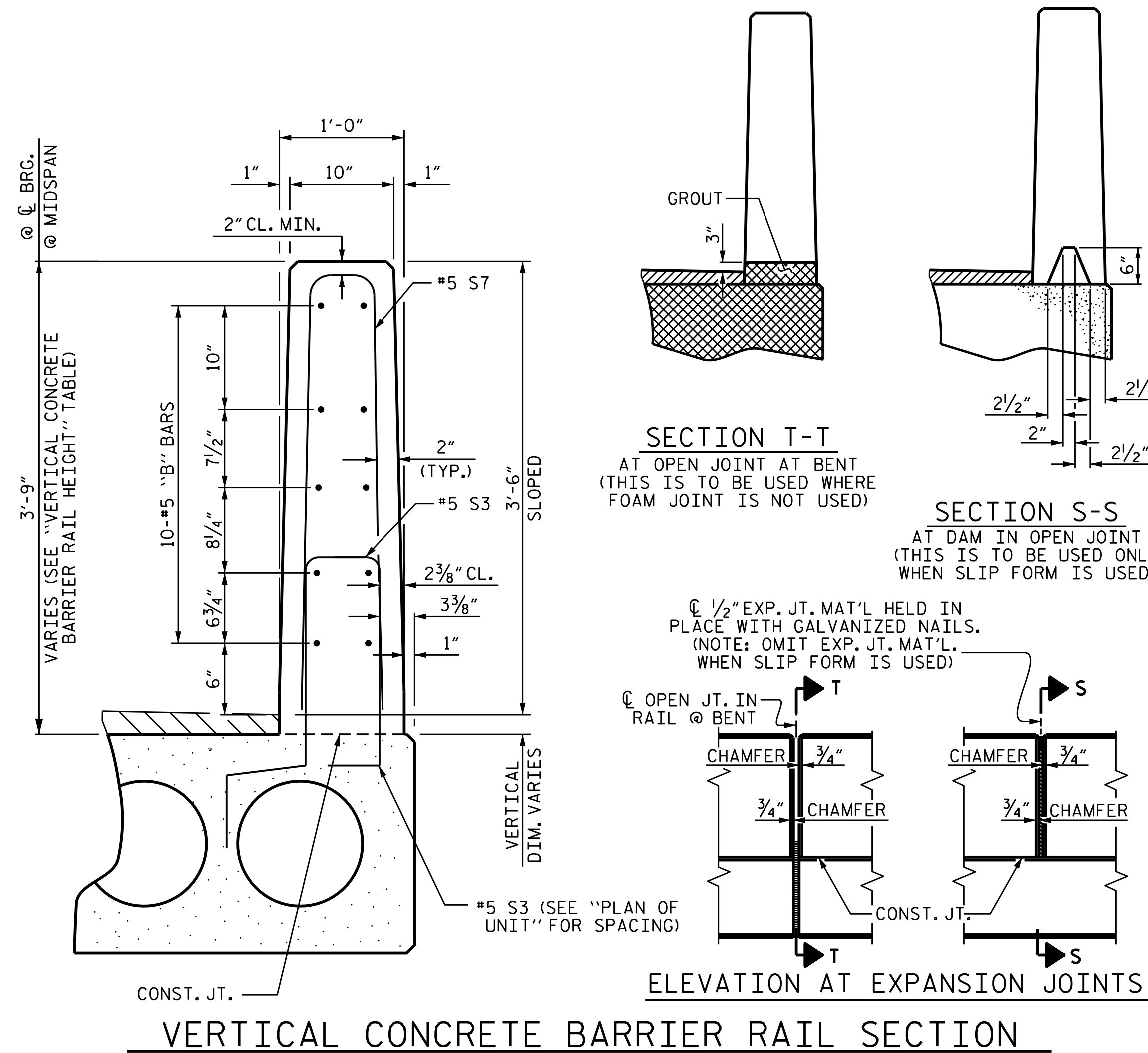
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-15
1			3			TOTAL SHEETS 29
2			4			

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL						
BAR	BARS PER EXTERIOR UNIT	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
40' UNIT						
* B3	20	40	*5	STR	19'-7"	817
* S7	48	96	*5	1	7'-2"	718
* EPOXY COATED REINFORCING STEEL						LBS. 1535
CLASS AA CONCRETE						CU.YDS. 10.2
TOTAL VERTICAL CONCRETE BARRIER RAIL						LIN. FT. 80.125
BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL						
BAR	BARS PER EXTERIOR UNIT	TOTAL NO.	SIZE	TYPE	LENGTH	WEIGHT
50' UNIT						
* B4	20	20	*5	STR	24'-7"	513
* S7	58	58	*5	1	7'-2"	434
* EPOXY COATED REINFORCING STEEL						LBS. 947
CLASS AA CONCRETE						CU.YDS. 6.4
TOTAL VERTICAL CONCRETE BARRIER RAIL						LIN. FT. 50.125



VERTICAL CONCRETE BARRIER RAIL HEIGHT		
	RAIL HEIGHT @ MID-SPAN	RAIL HEIGHT @ CL BEARING
40' UNITS	3'-8 1/4"	3'-9"
50' UNITS	3'-7 7/8"	3'-9"



PROJECT NO. 17BP.6.R.89
HARNETT COUNTY
STATION: 17+51.00 -L-



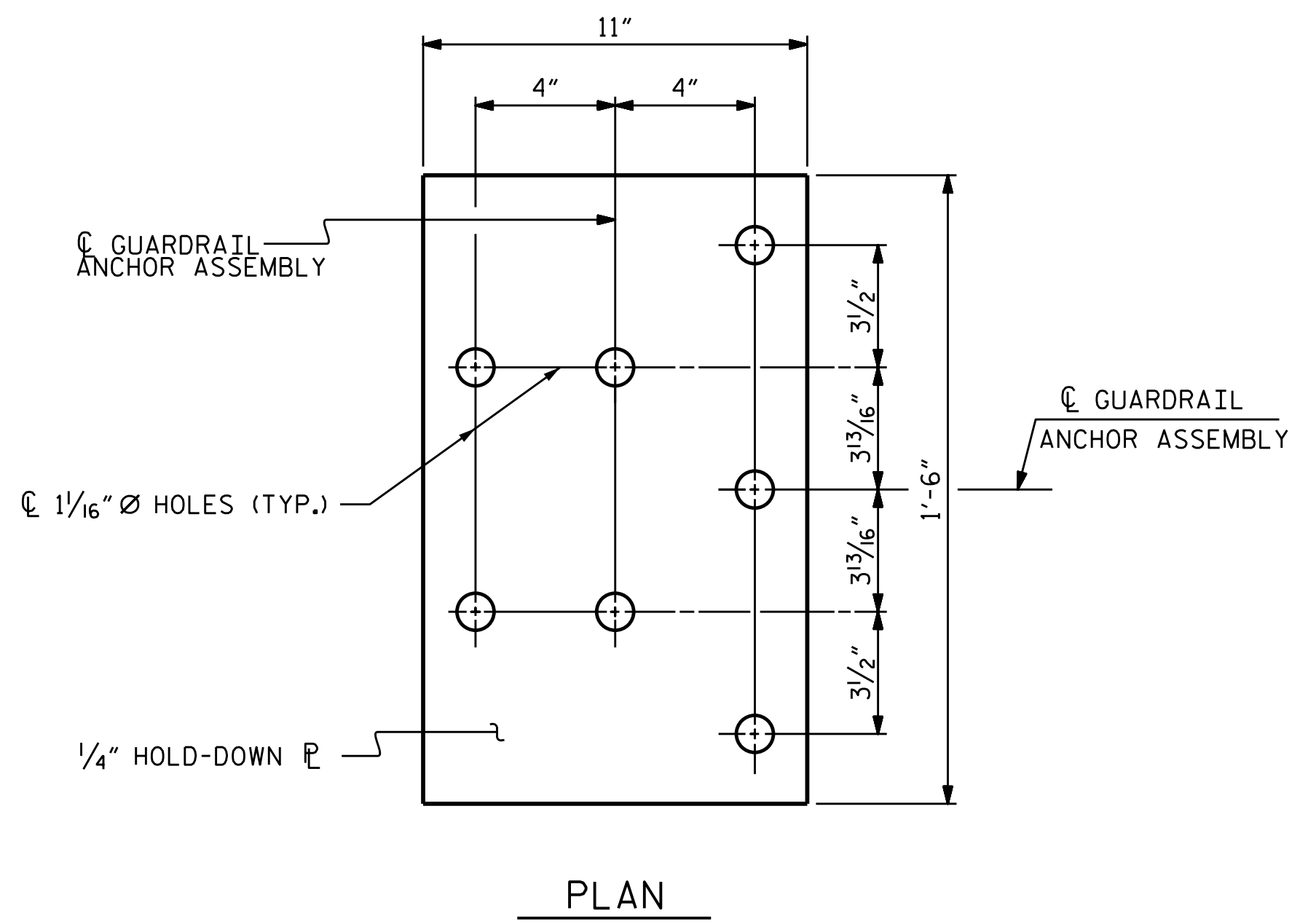
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
VERTICAL CONCRETE BARRIER RAIL					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

DocuSigned by:
Aster Abramo
11/30/2017

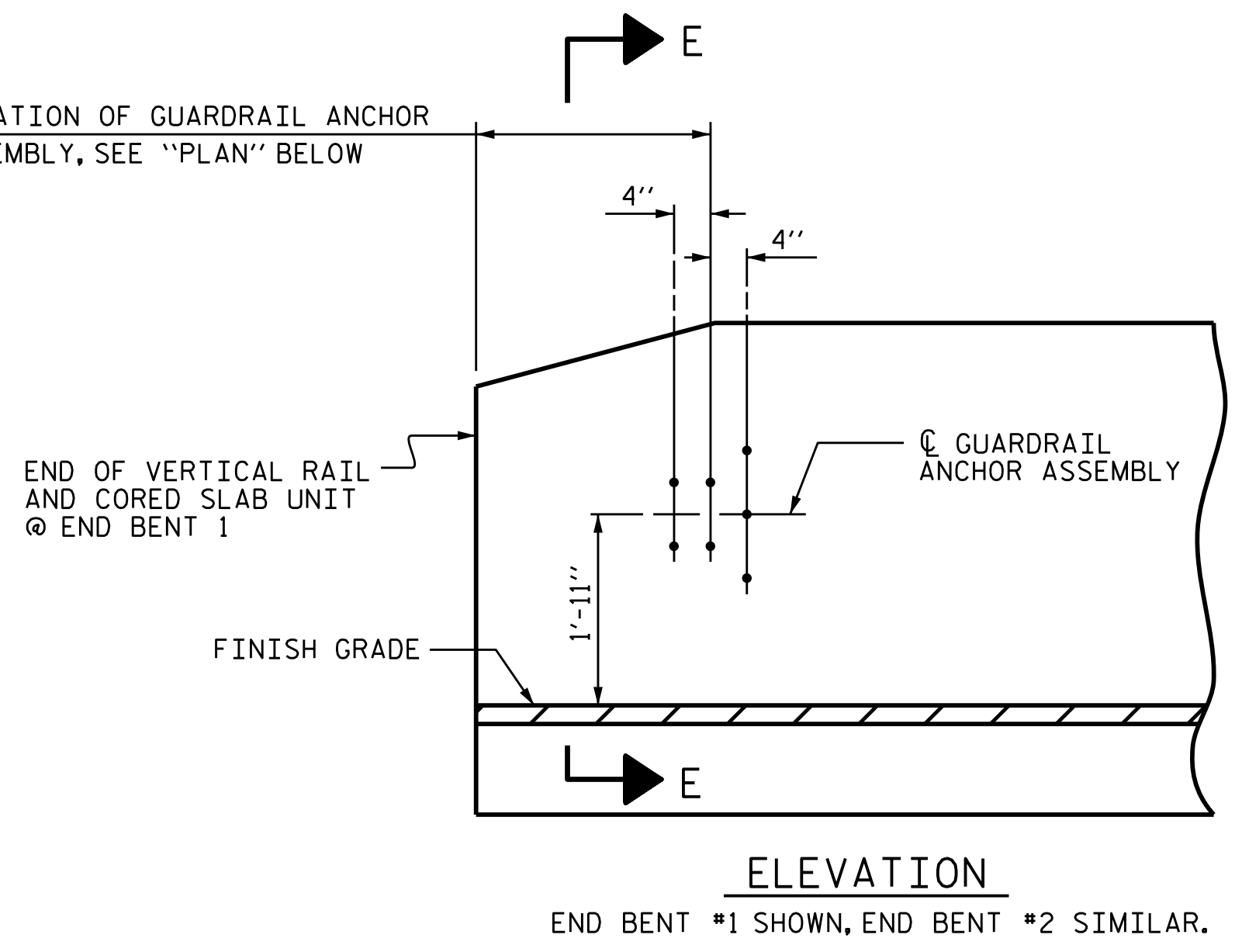
SHEET NO.	
S-16	TOTAL SHEETS 29

ASSEMBLED BY : S. B. WILLIAMS	DATE : 9/17
CHECKED BY : S. WANCE	DATE : 10/17
DRAWN BY : DGE	5/09
CHECKED BY : BCH	6/09
REV. 11/14	MAA/TMC

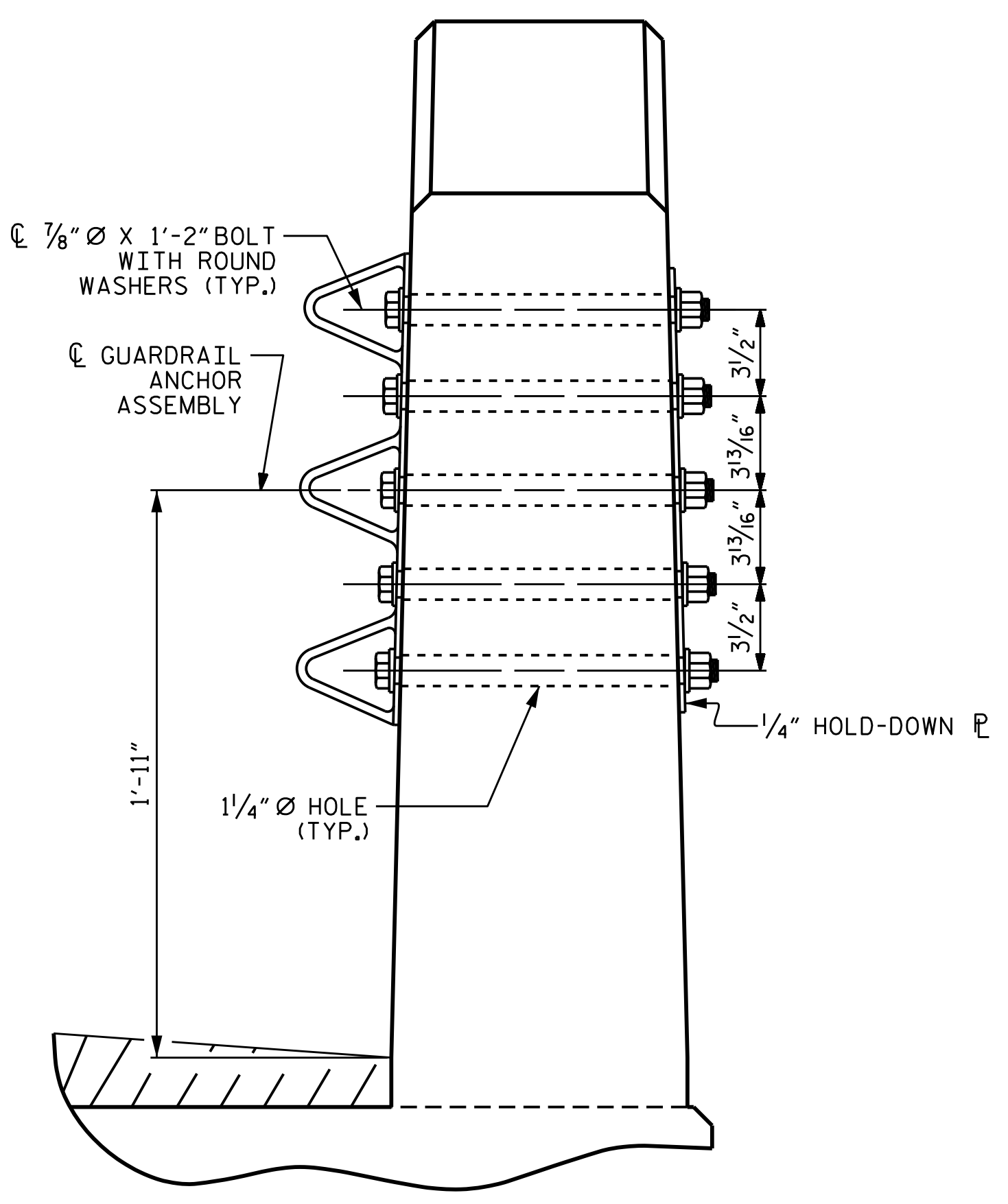
DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED



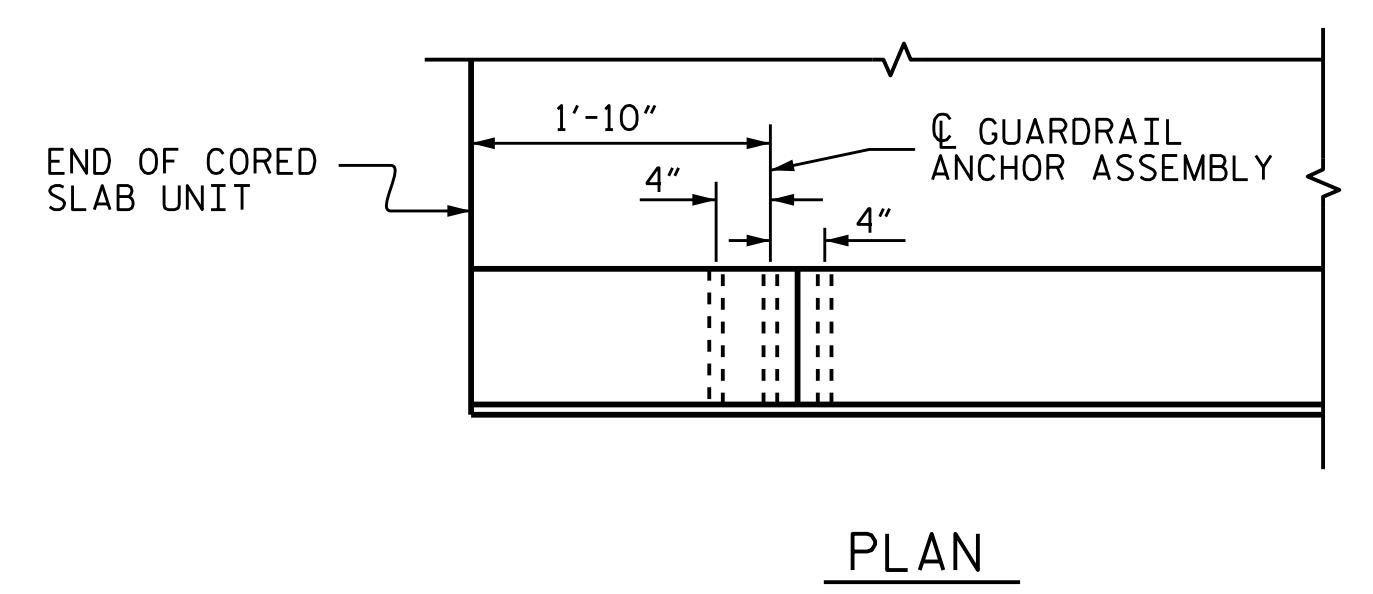
FOR LOCATION OF GUARDRAIL ANCHOR ASSEMBLY, SEE "PLAN" BELOW



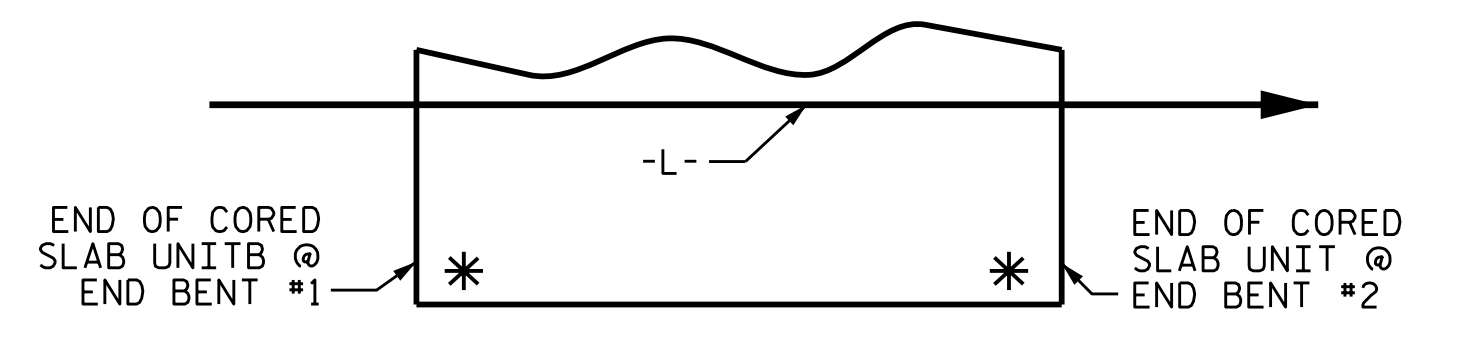
ELEVATION
END BENT #1 SHOWN, END BENT #2 SIMILAR.



SECTION E-E
GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN
LOCATION OF ANCHORS FOR GUARDRAIL
END BENT #1 SHOWN, END BENT #2 SIMILAR.



SKETCH SHOWING POINTS OF ATTACHMENT

* LOCATION OF GUARDRAIL ATTACHMENT FOR RIGHT SIDE VERTICAL CONCRETE RAIL

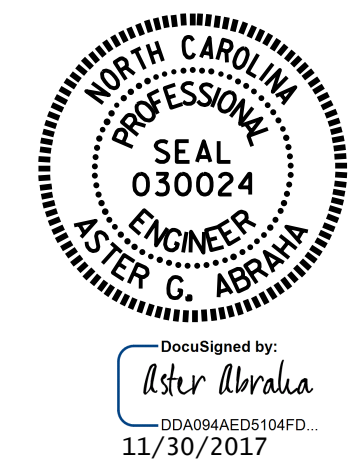
NOTES

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

PROJECT NO. 17BP.6.R.89
HARNETT COUNTY
 STATION: 17+51.00 -L-

SHEET OF

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



DocuSigned by:
 Aster Alwaha
 02049848E0504EFD
 11/30/2017

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-17	
1			3			TOTAL SHEETS	
2			4			29	

ASSEMBLED BY : S. B. WILLIAMS	DATE : 09/2017
CHECKED BY : S. WANCE	DATE : 09/2017
DRAWN BY : MAA 5/10	REV. 12/5/11 MAA/GM
CHECKED BY : GM 5/10	REV. 6/13 MAA/GM
	REV. 1/15 MAA/TMG

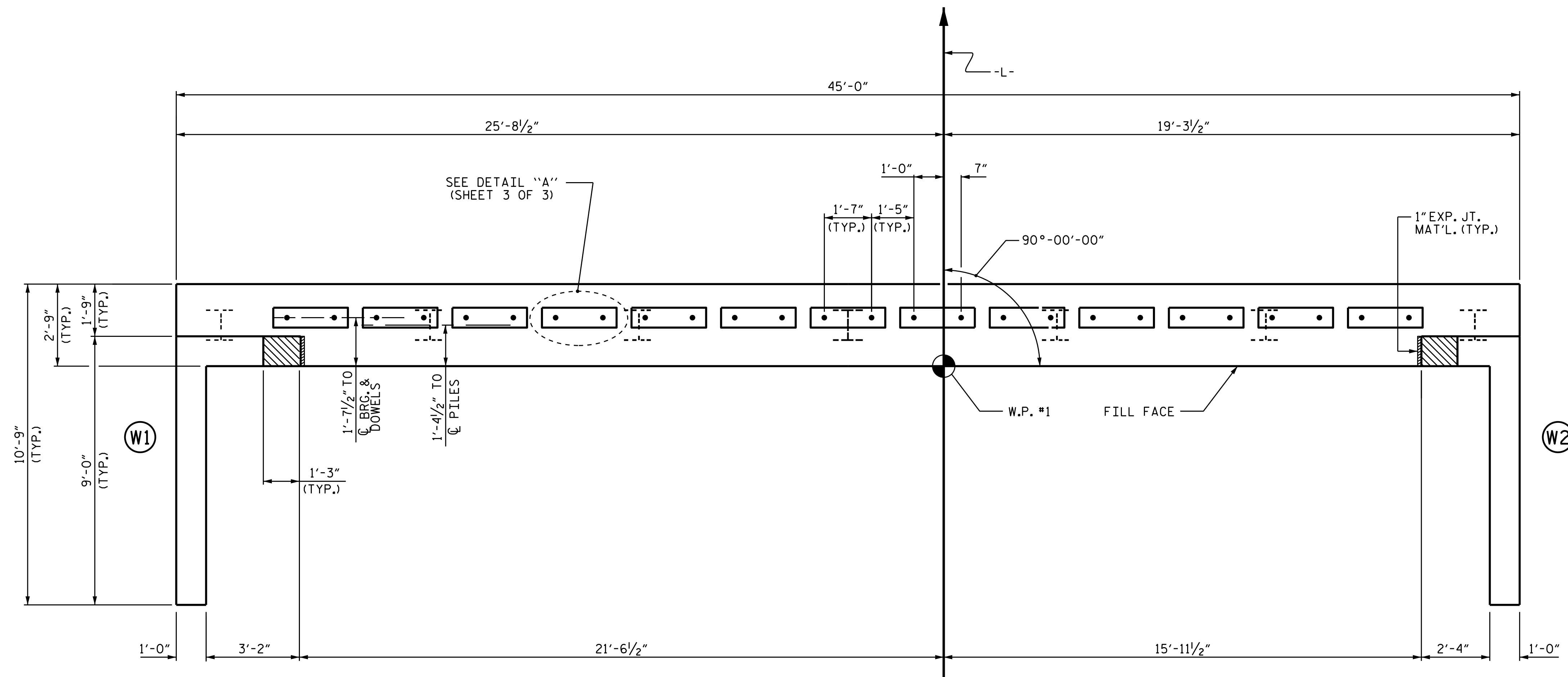
NOTES

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

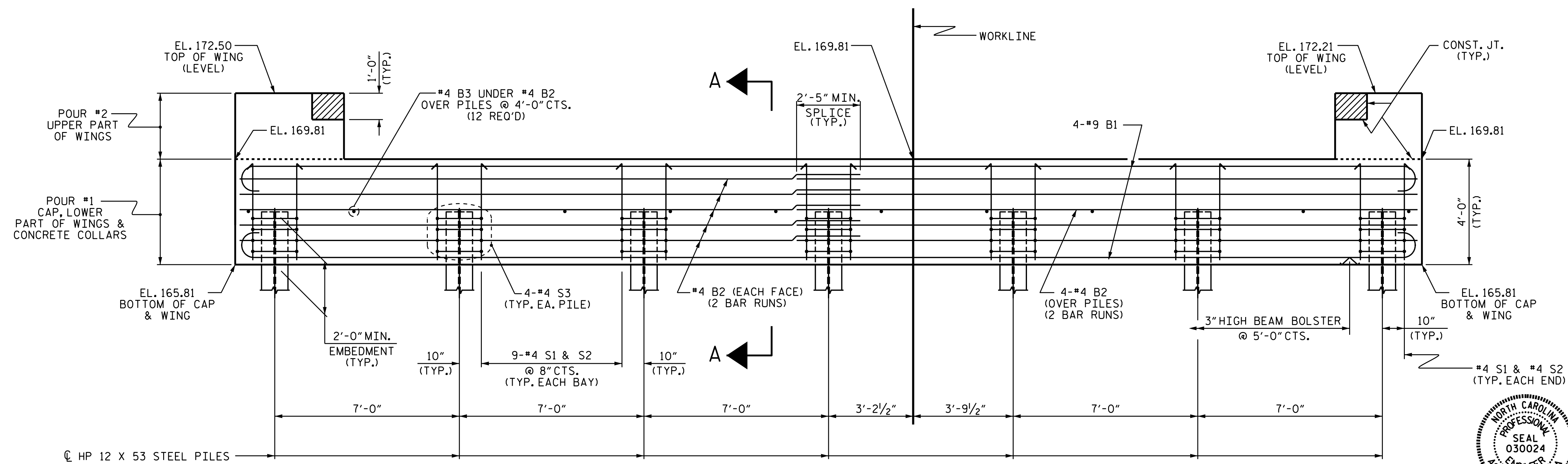
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.



PLAN



ELEVATION

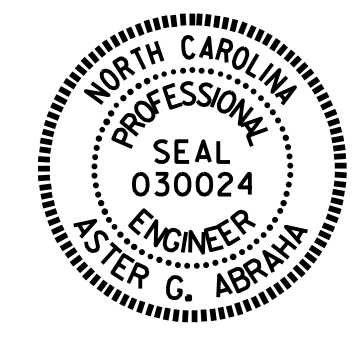
WINGS NOT SHOWN FOR CLARITY.
FOR SECTION A-A, SEE SHEET 4 OF 4.
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 3 OF 3.

PROJECT NO. 17BP.6.R.89
HARNETT COUNTY
STATION: 17+51.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT No. 1

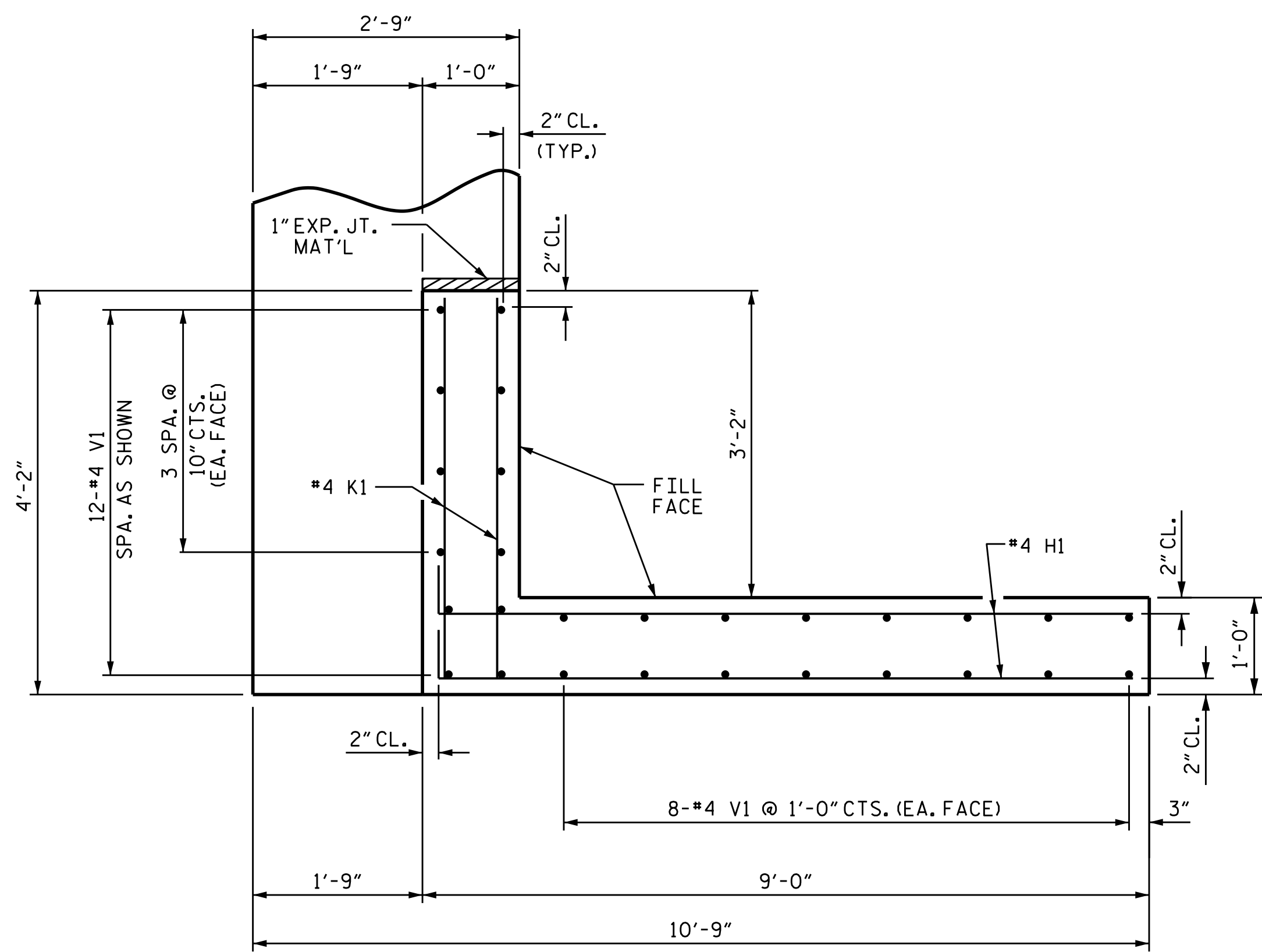


DocuSigned by:
Aster Abraham
11/30/2017

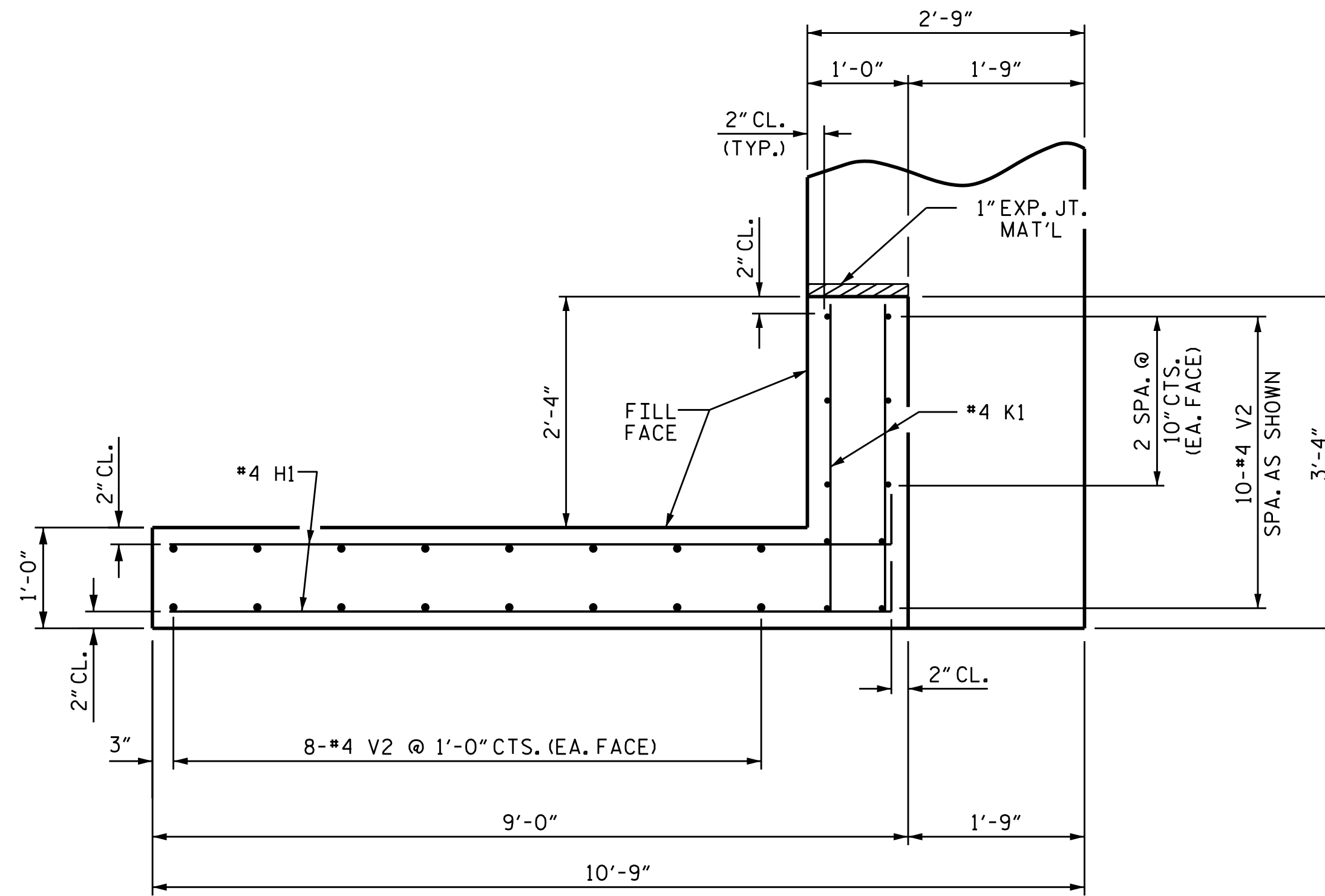
ASSEMBLED BY : S. B. WILLIAMS	DATE : 9-17
CHECKED BY : S. WANCE	DATE : 10/2017
DRAWN BY : WJH	12/11
CHECKED BY : AAC	12/11
REV. 4/15	MAA/TMG

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

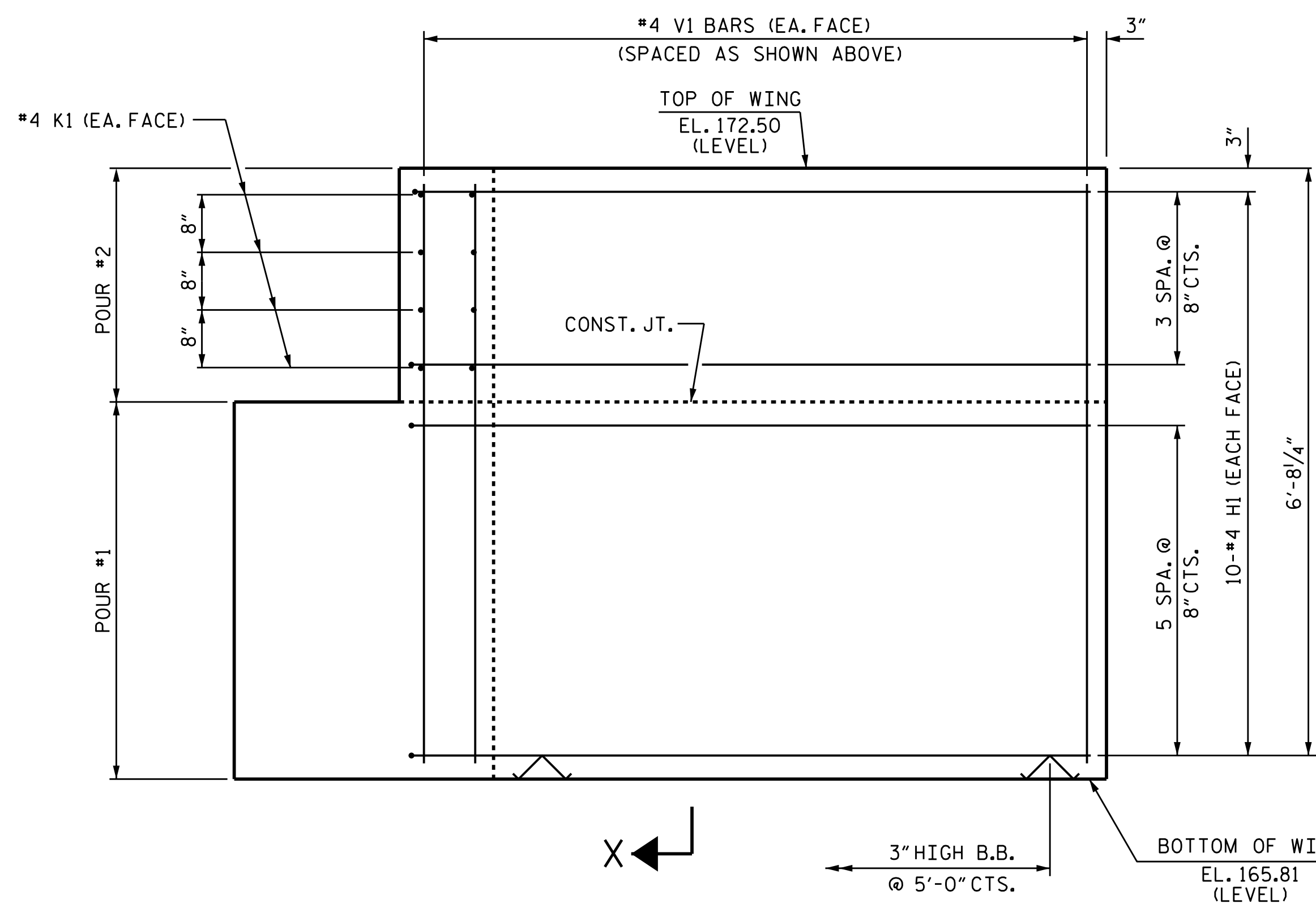
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS 29
2			4			



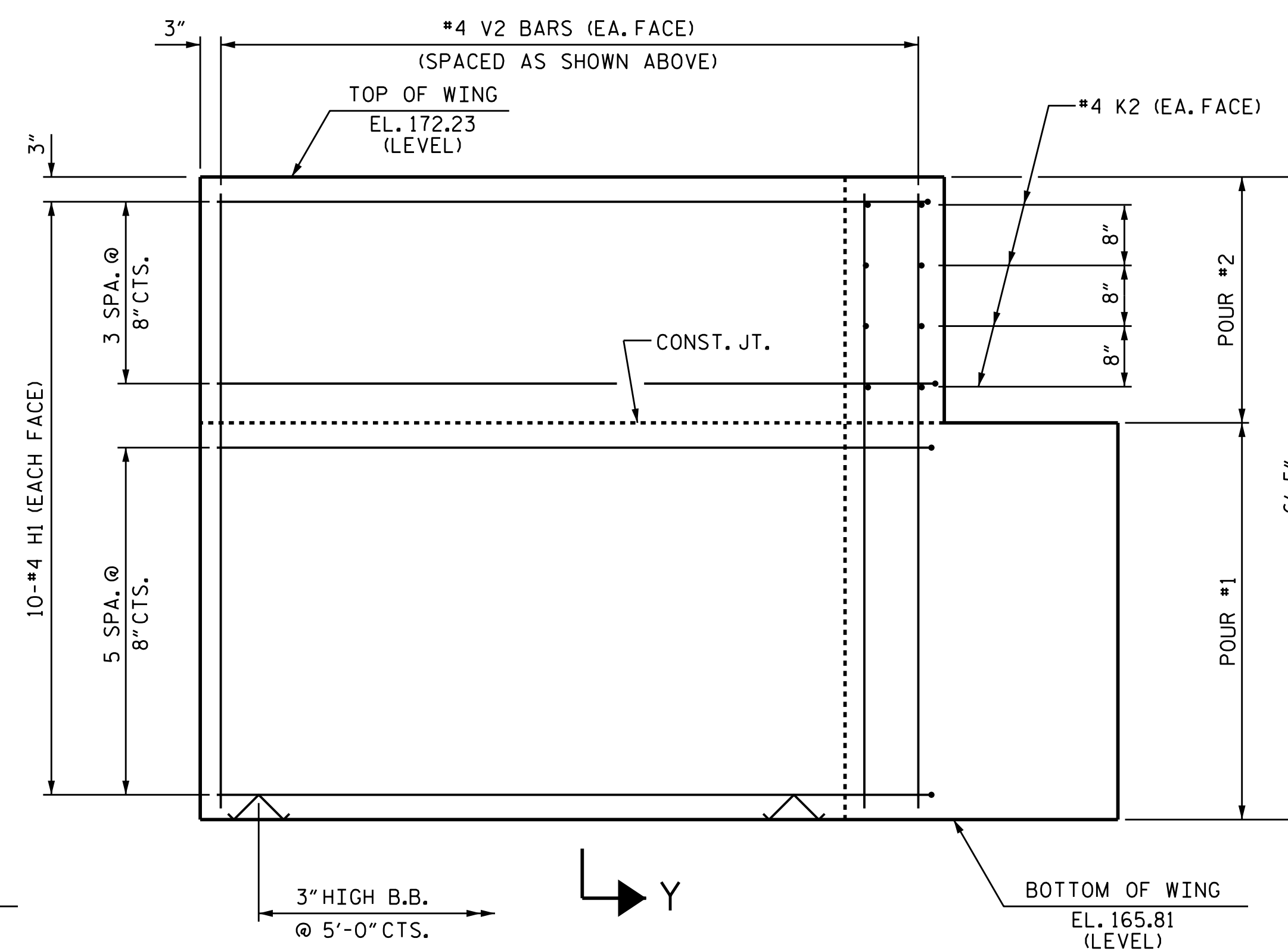
PLAN OF WING (W1)



PLAN OF WING (W2)

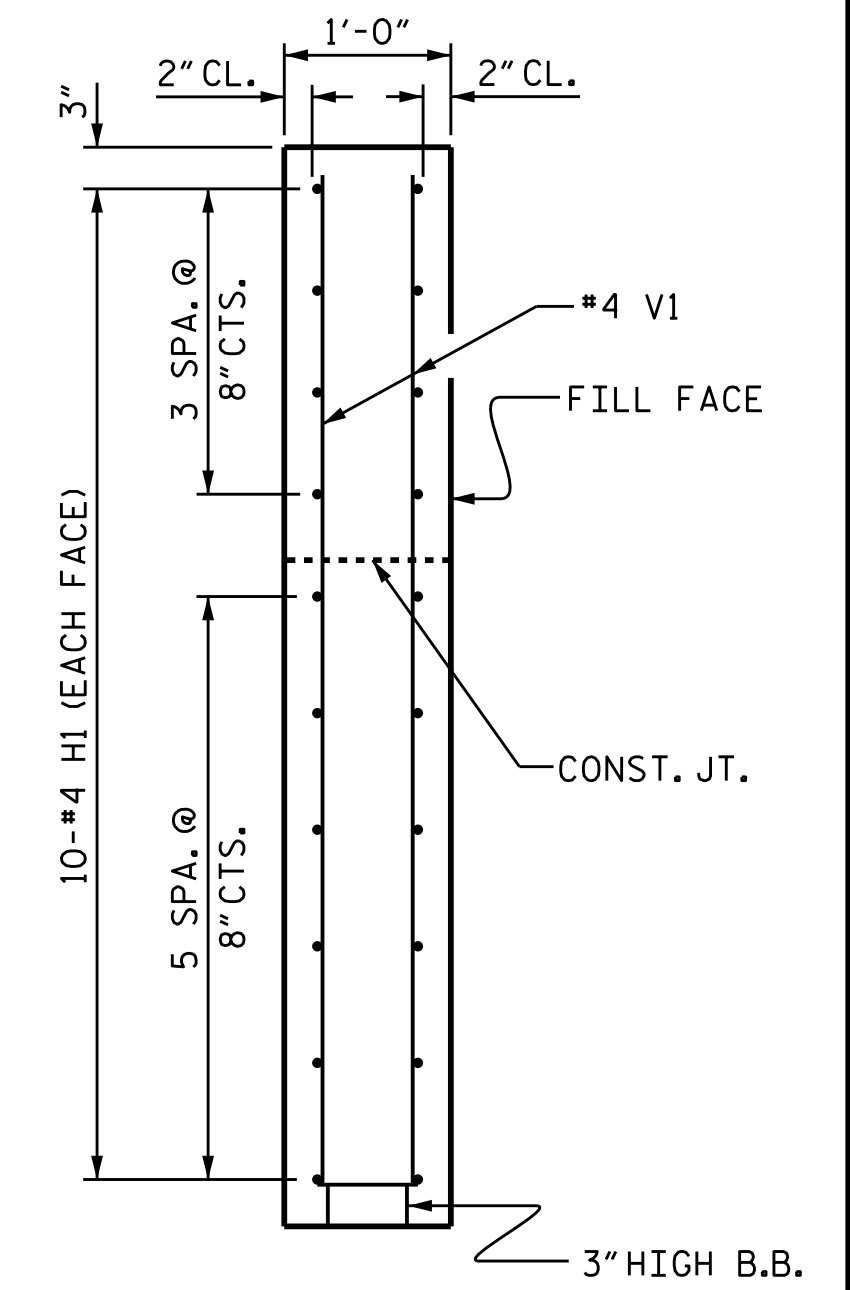


ELEVATION OF WING (W1)

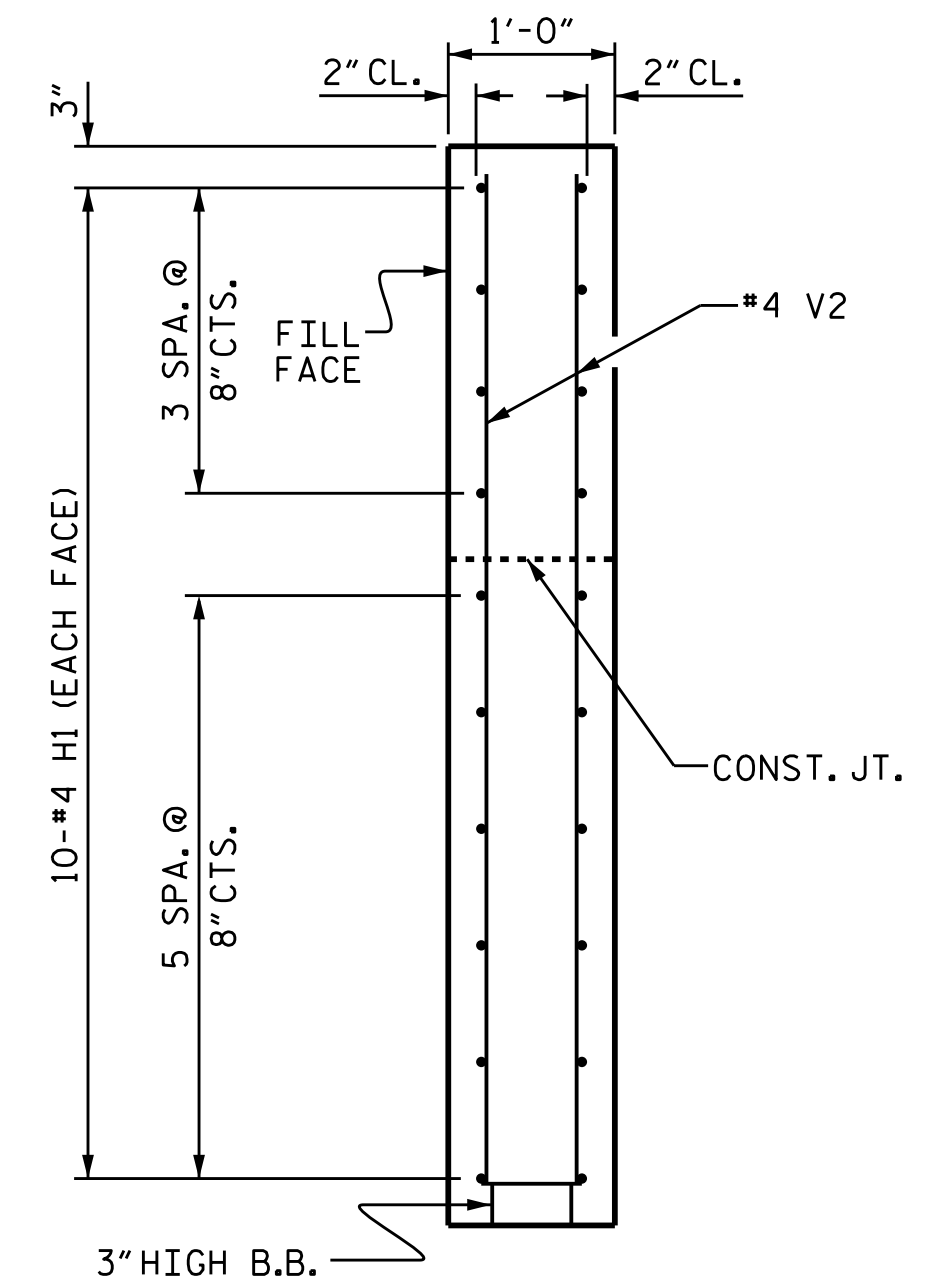


ELEVATION OF WING (W2)

WING DETAILS



SECTION X-X



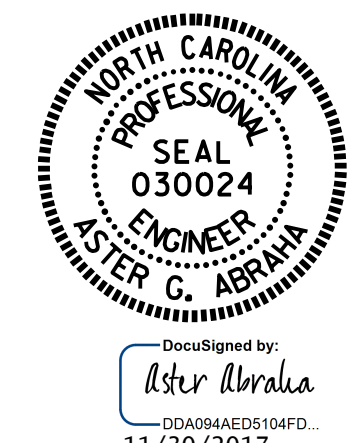
SECTION Y-Y

PROJECT NO. 17BP.6.R.89
 HARNETT COUNTY
 STATION: 17+51.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

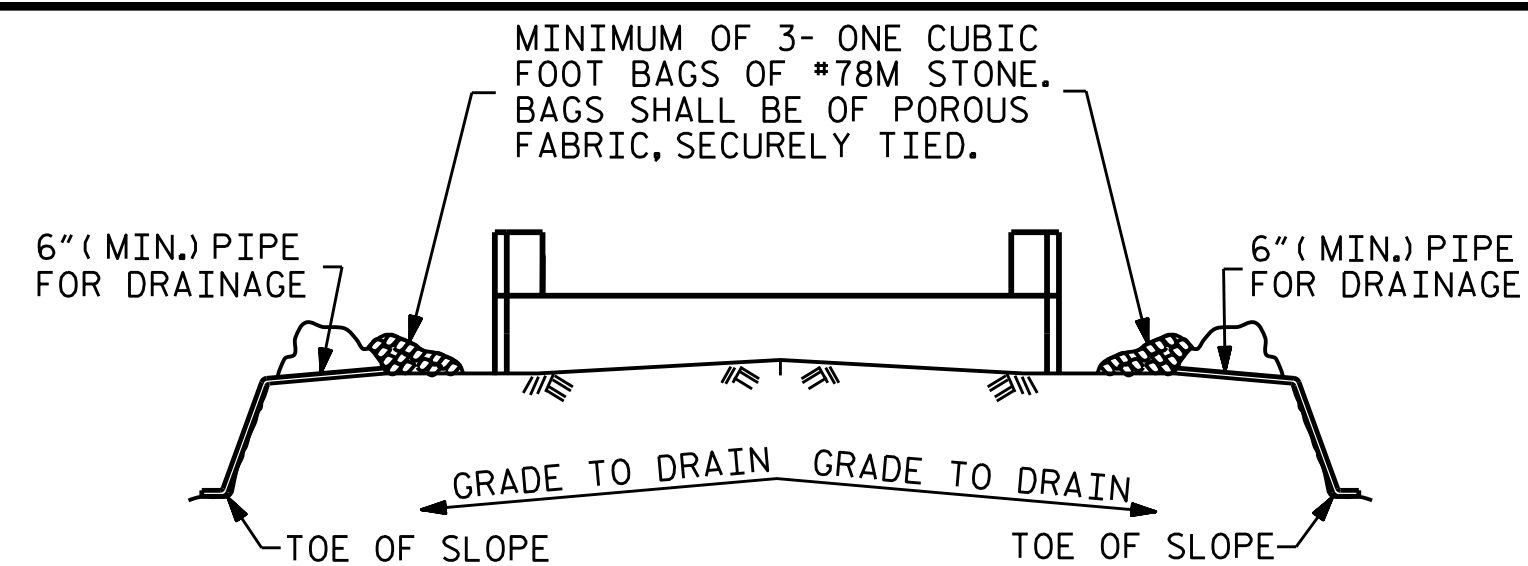
SUBSTRUCTURE
 END BENT 1
 WING DETAILS



ASSEMBLED BY : S. B. WILLIAMS	DATE : 9-17
CHECKED BY : S. WANCE	DATE : 10/2017
DRAWN BY : WJH	12/11
CHECKED BY : AAC	12/11
REV. 4/15	MAA/TMG

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19	
1			3			TOTAL SHEETS	
2			4			29	

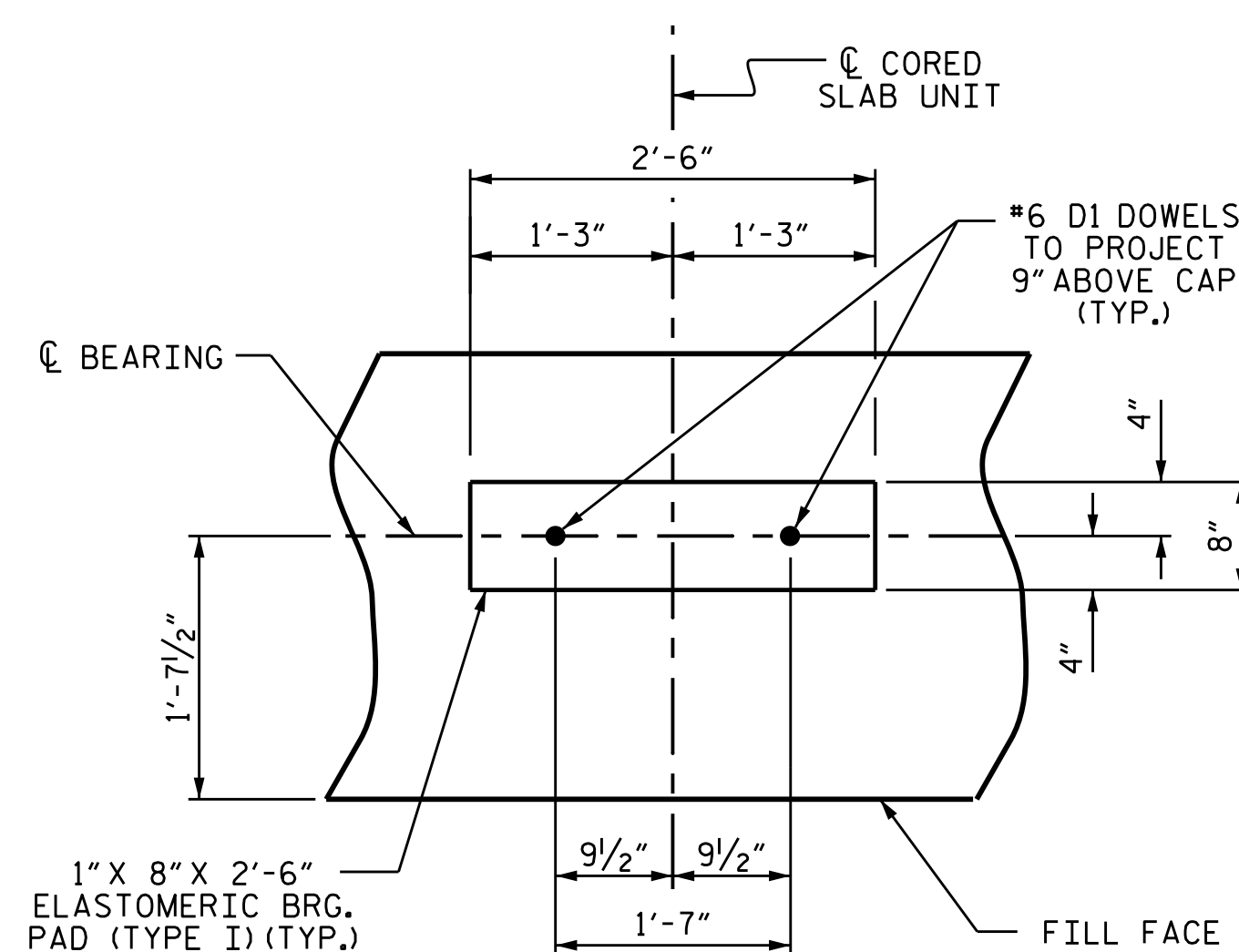


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

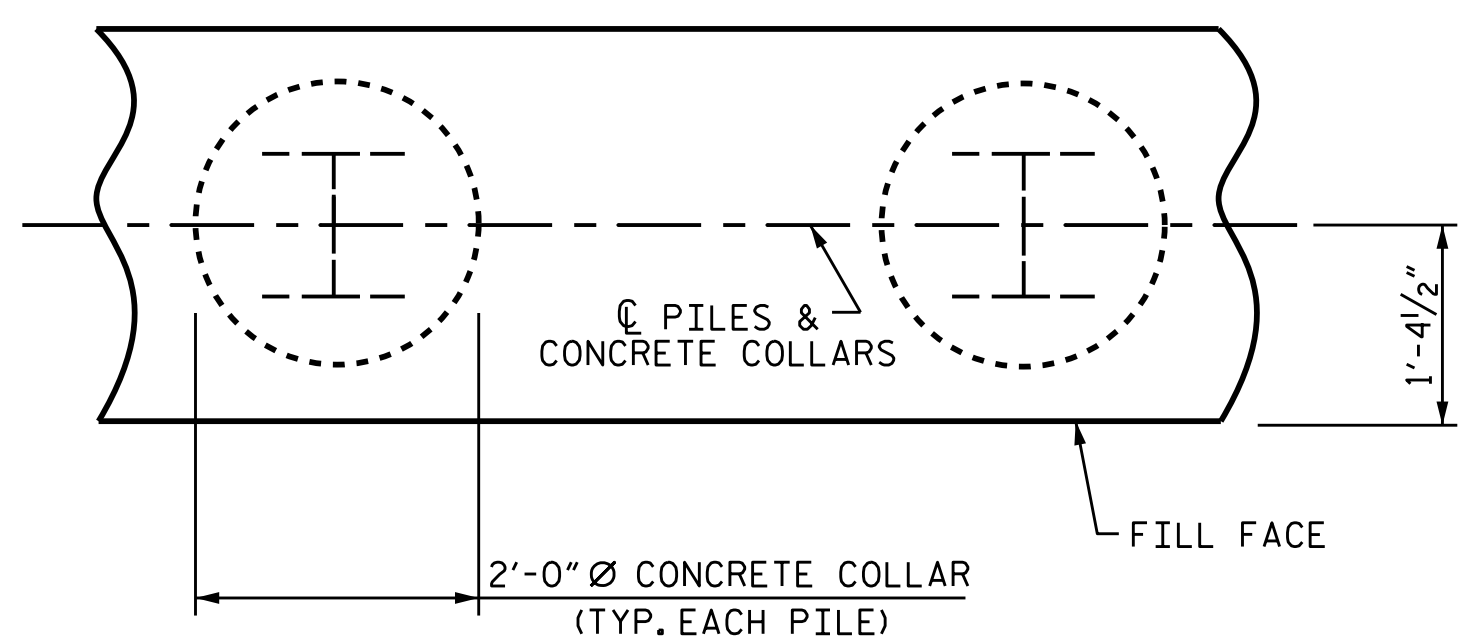
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

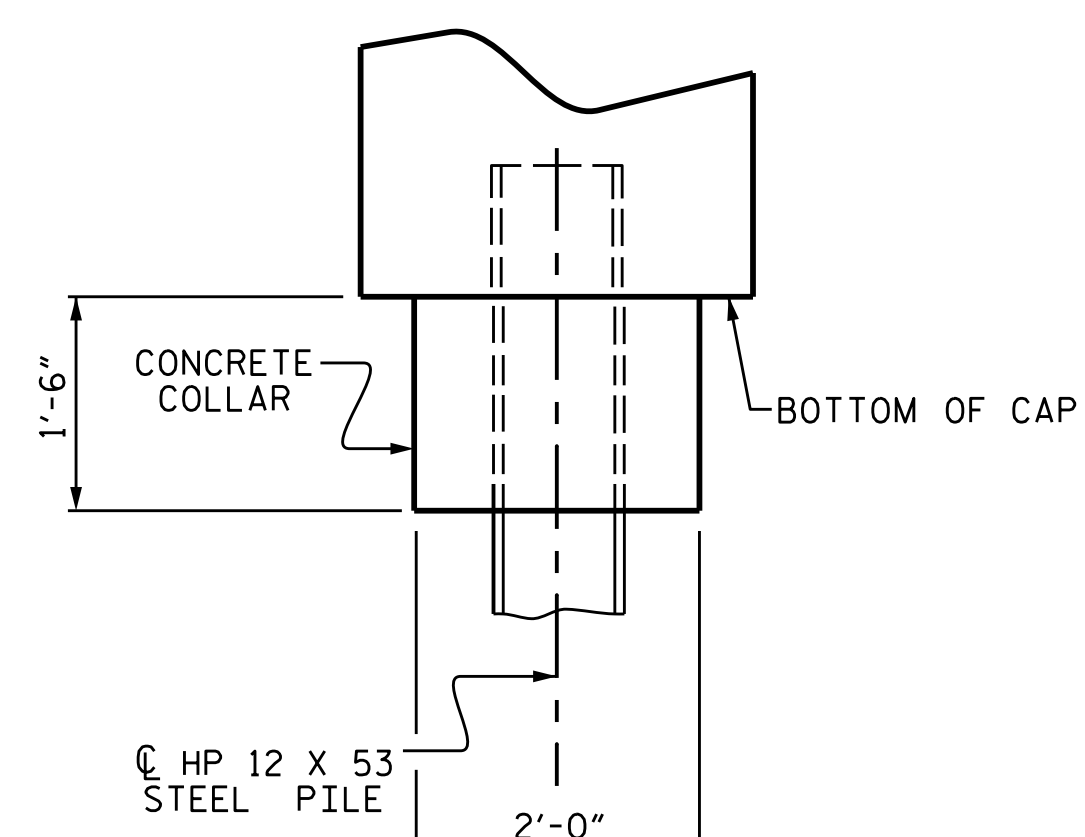


DETAIL "A"

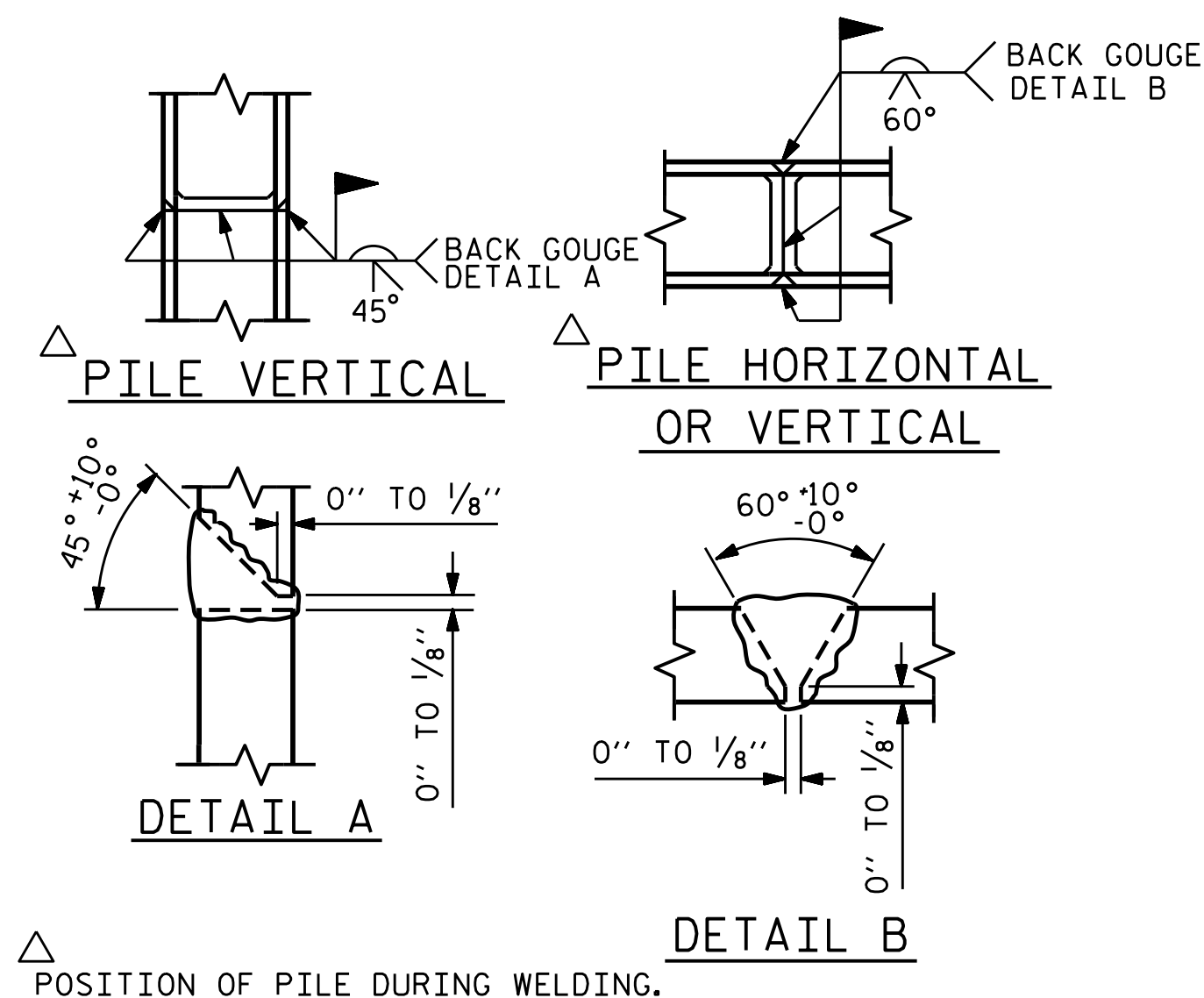


PLAN

CORROSION PROTECTION FOR STEEL PILES DETAIL

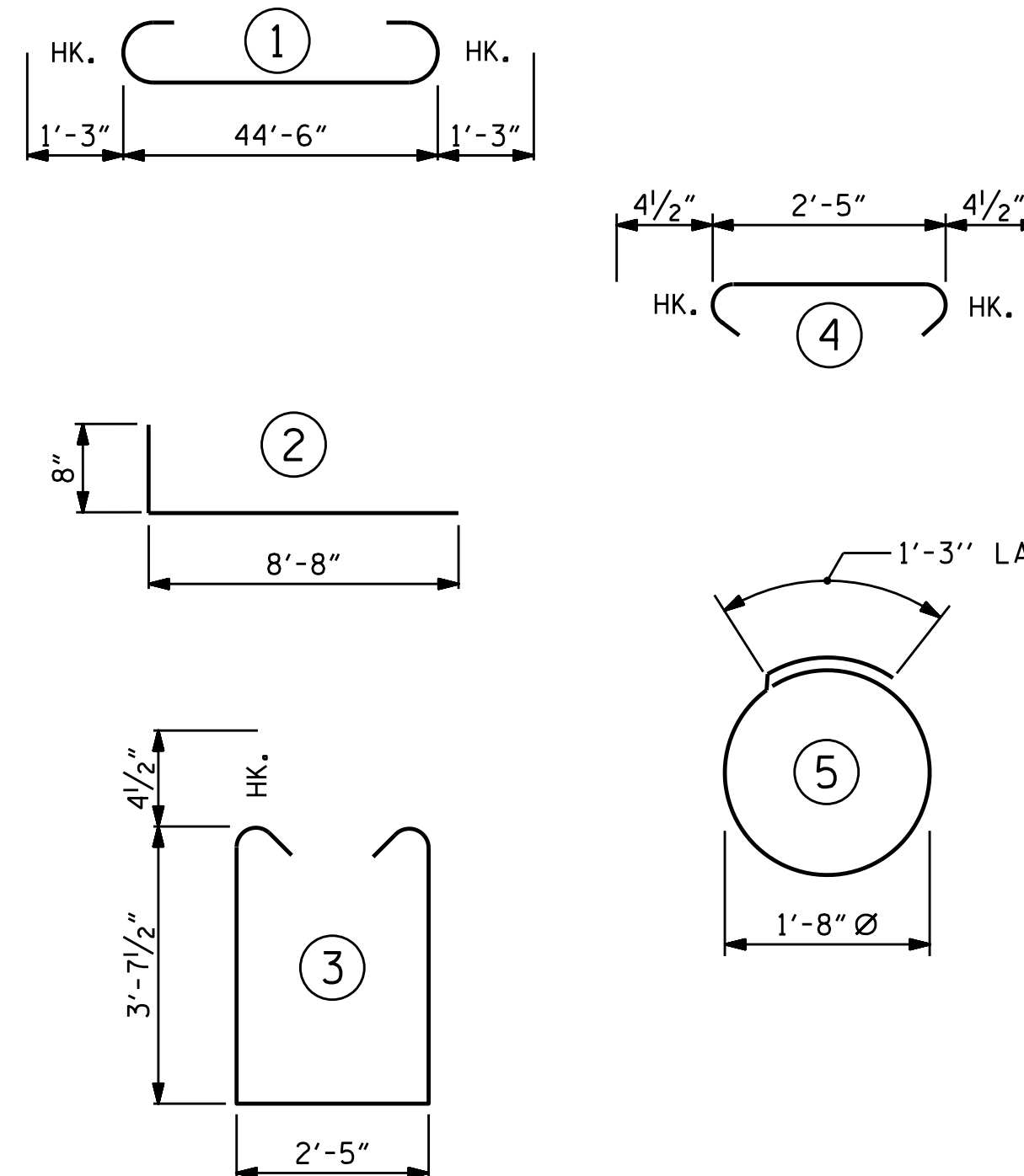


ELEVATION



PILE SPLICE DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 1

BAR NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	#9	1	47'-0"	1278
B2	#4	STR	23'-7"	441
B3	#4	STR	2'-5"	19
D1	#6	STR	1'-6"	59
H1	#4	2	9'-4"	249
K1	#4	STR	3'-9"	20
K2	#4	STR	2'-11"	16
S1	#4	3	10'-5"	390
S2	#4	4	3'-2"	118
S3	#4	5	6'-6"	122
V1	#4	STR	6'-3"	117
V2	#4	STR	6'-0"	104

REINFORCING STEEL 2933 LBS.

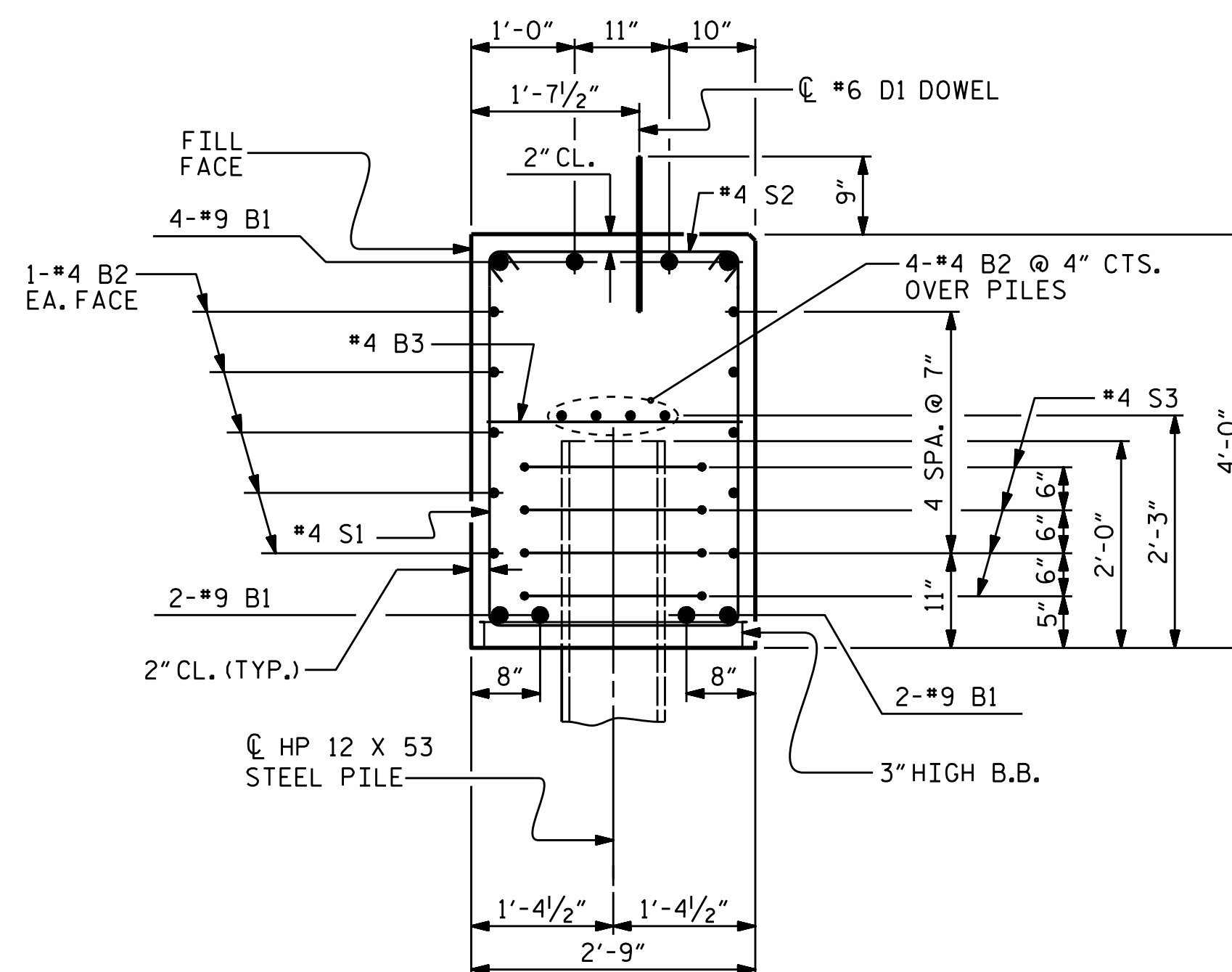
CLASS A CONCRETE BREAKDOWN

POUR #1	CAP, LOWER PART OF WINGS & COLLARS	21.9 C.Y.
POUR #2	UPPER PART OF WINGS	2.2 C.Y.
TOTAL CLASS A CONCRETE		24.1 C.Y.

HP 12 X 53 STEEL PILES
NO: 7 LIN. FT. = 245

PILE DRIVING EQUIPMENT
SETUP FOR
HP 12 X 53 STEEL PILES
NO: 7

PILE REDRIVES NO: 4



SECTION A-A

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

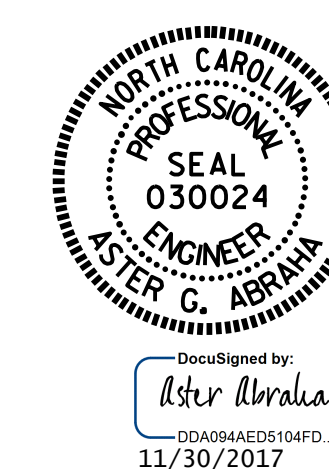
PROJECT NO. 17BP.6.R.89
HARNETT COUNTY
STATION: 17+51.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 1
DETAILS



DocuSigned by:
Aster Abramo
02A09A8E05104FD
11/30/2017

ASSEMBLED BY : S. B. WILLIAMS DATE : 9-17
CHECKED BY : S. WANCE DATE : 10/2017
DRAWN BY : WJH 12/11
CHECKED BY : AAC 12/11
REV. 4/17 MAA/THC

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-20
1			3			TOTAL SHEETS 29
2			4			

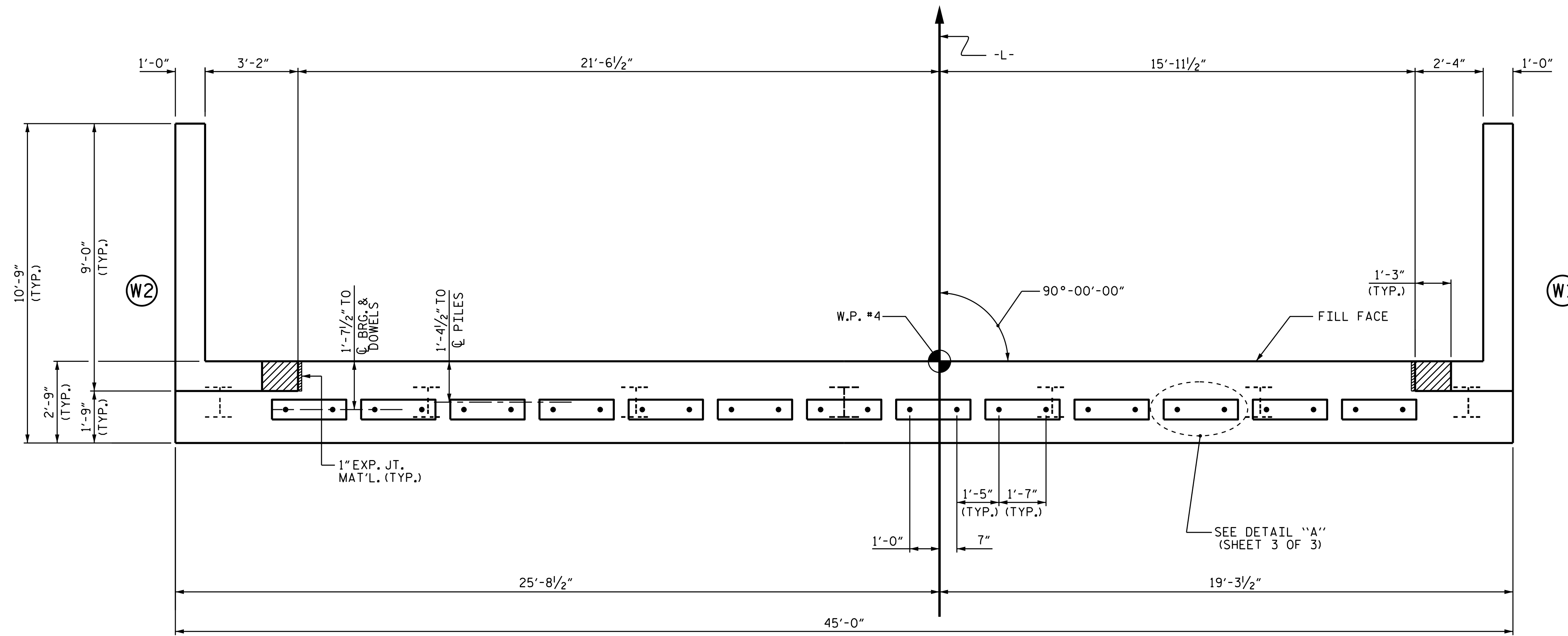
NOTES

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

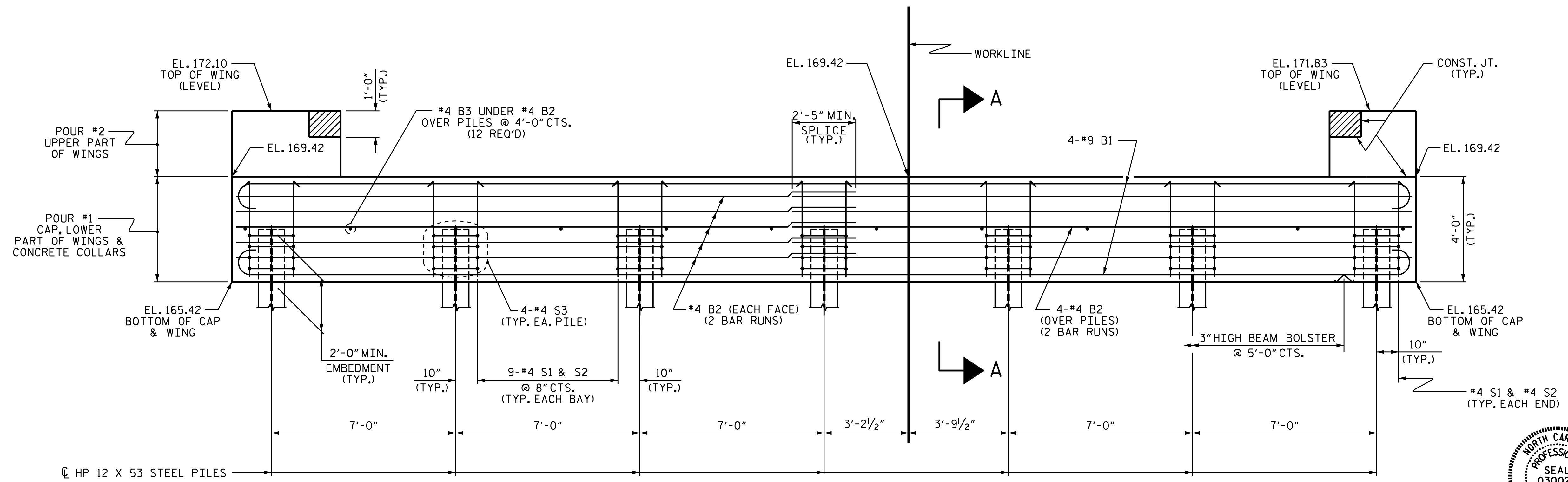
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.



PLAN



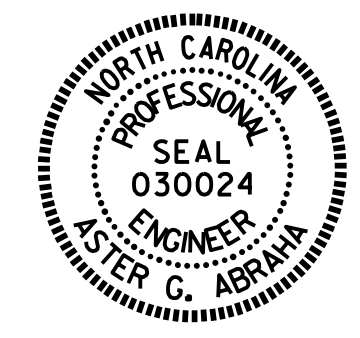
ELEVATION

WINGS NOT SHOWN FOR CLARITY.
FOR SECTION A-A, SEE SHEET 4 OF 4.
CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 3 OF 3.

PROJECT NO. 17BP.6.R.89
HARNETT COUNTY
STATION: 17+51.00 -L-

SHEET 1 OF 3

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

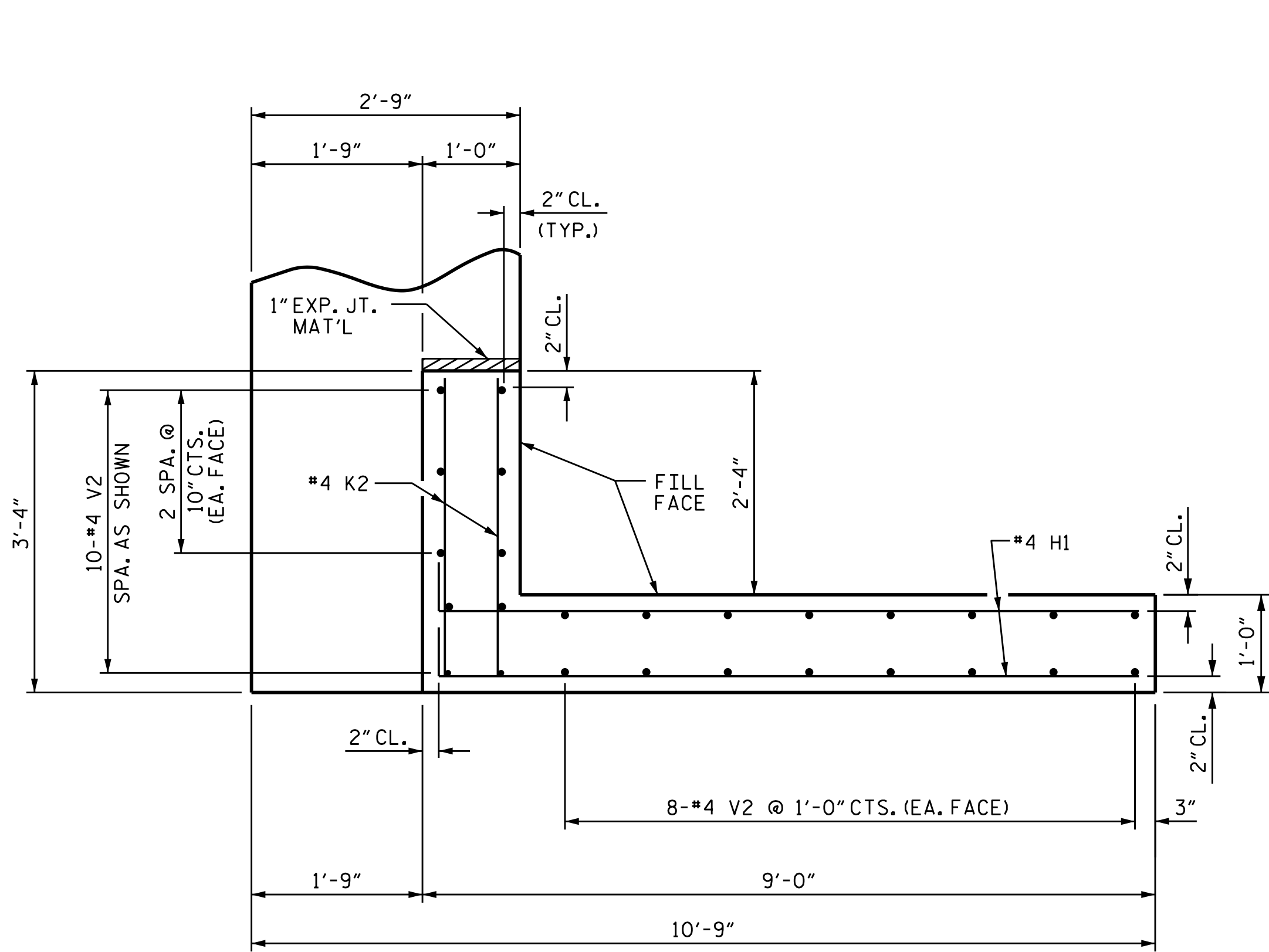


DocuSigned by:
Aster Abraham
11/30/2017

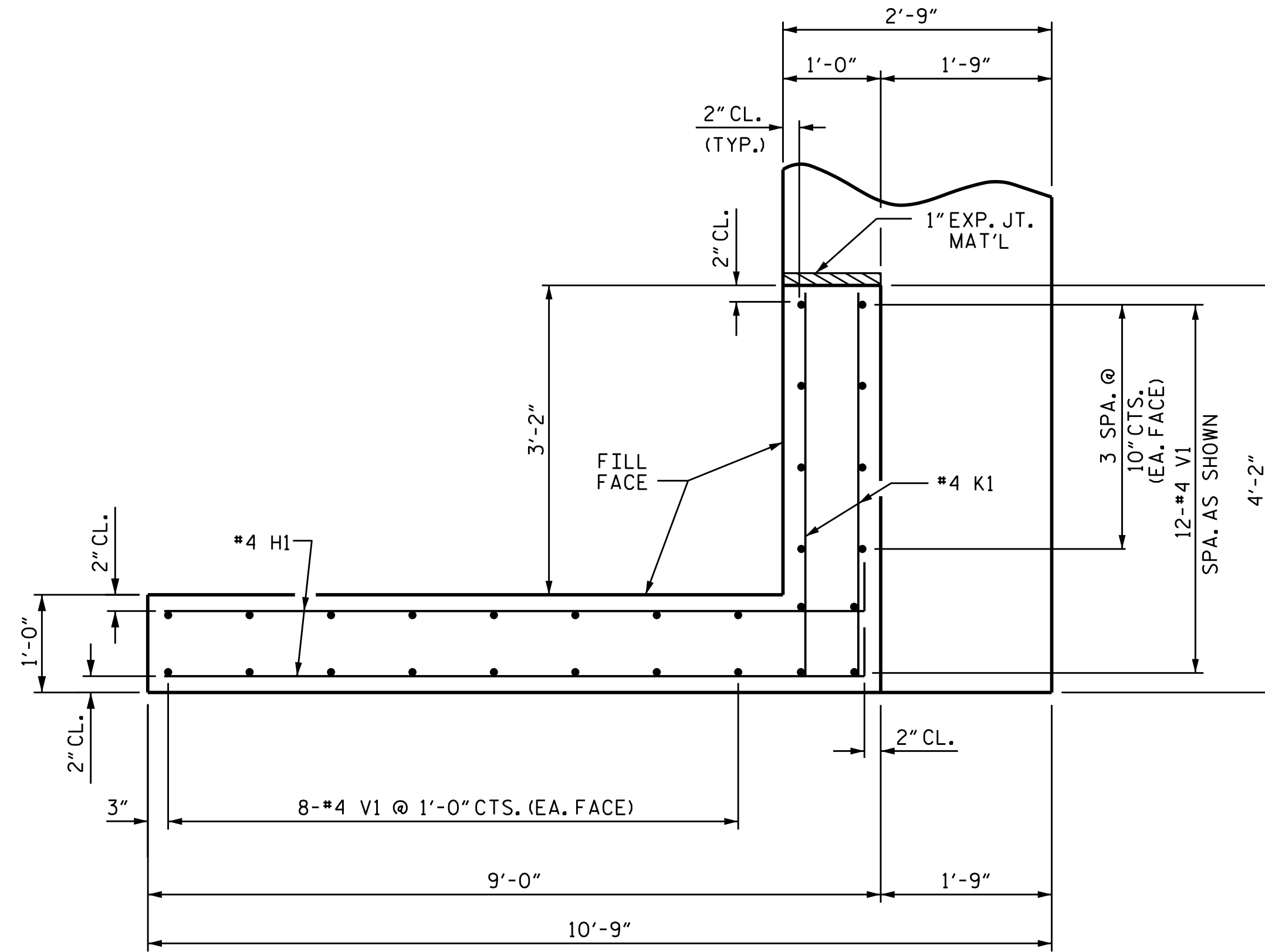
ASSEMBLED BY : S. B. WILLIAMS	DATE : 9-17
CHECKED BY : S. WANCE	DATE : 10/2017
DRAWN BY : WJH	12/11
CHECKED BY : AAC	12/11
REV. 4/15	MAA/TMG

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

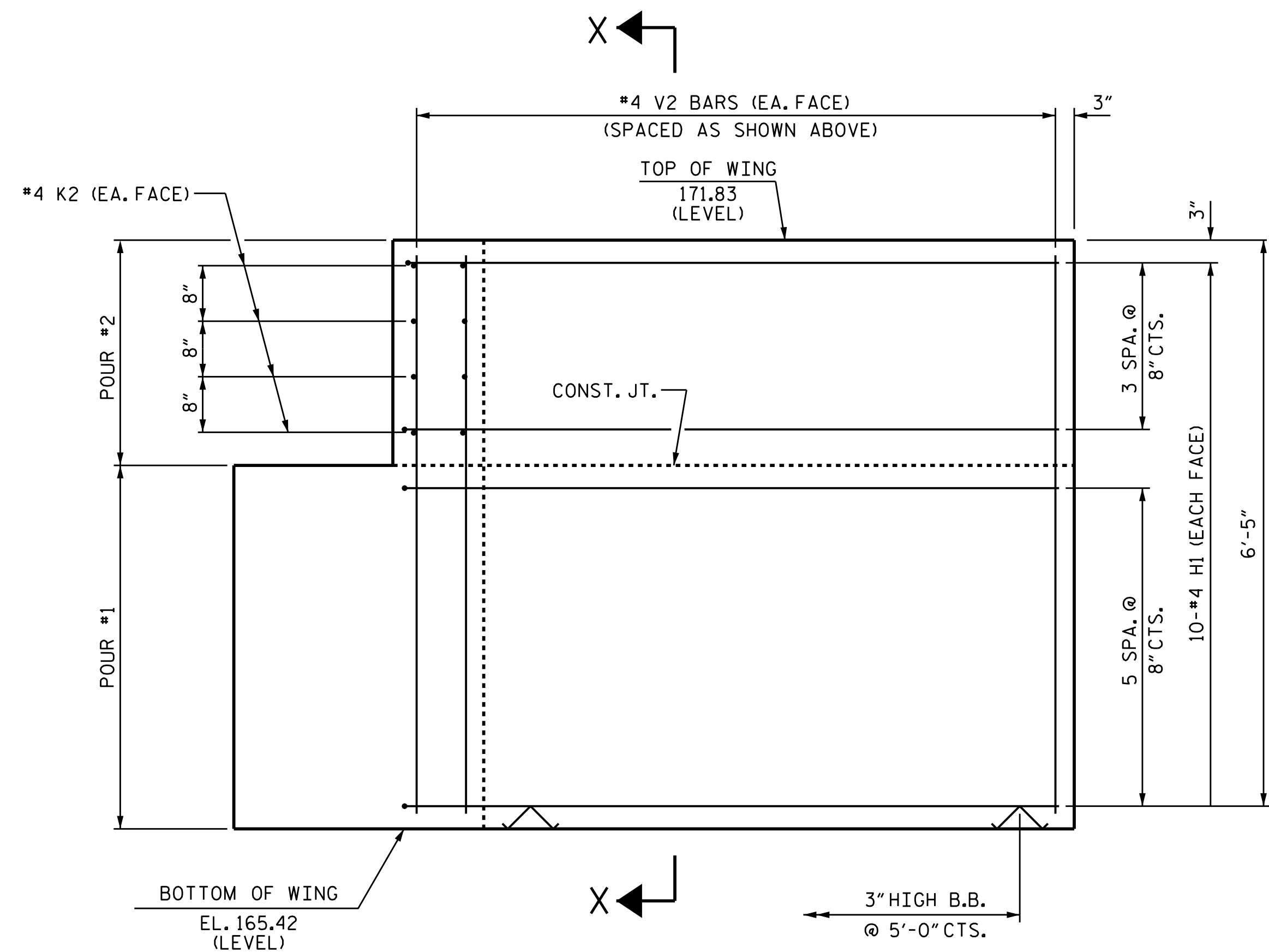
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS 29
2			4			



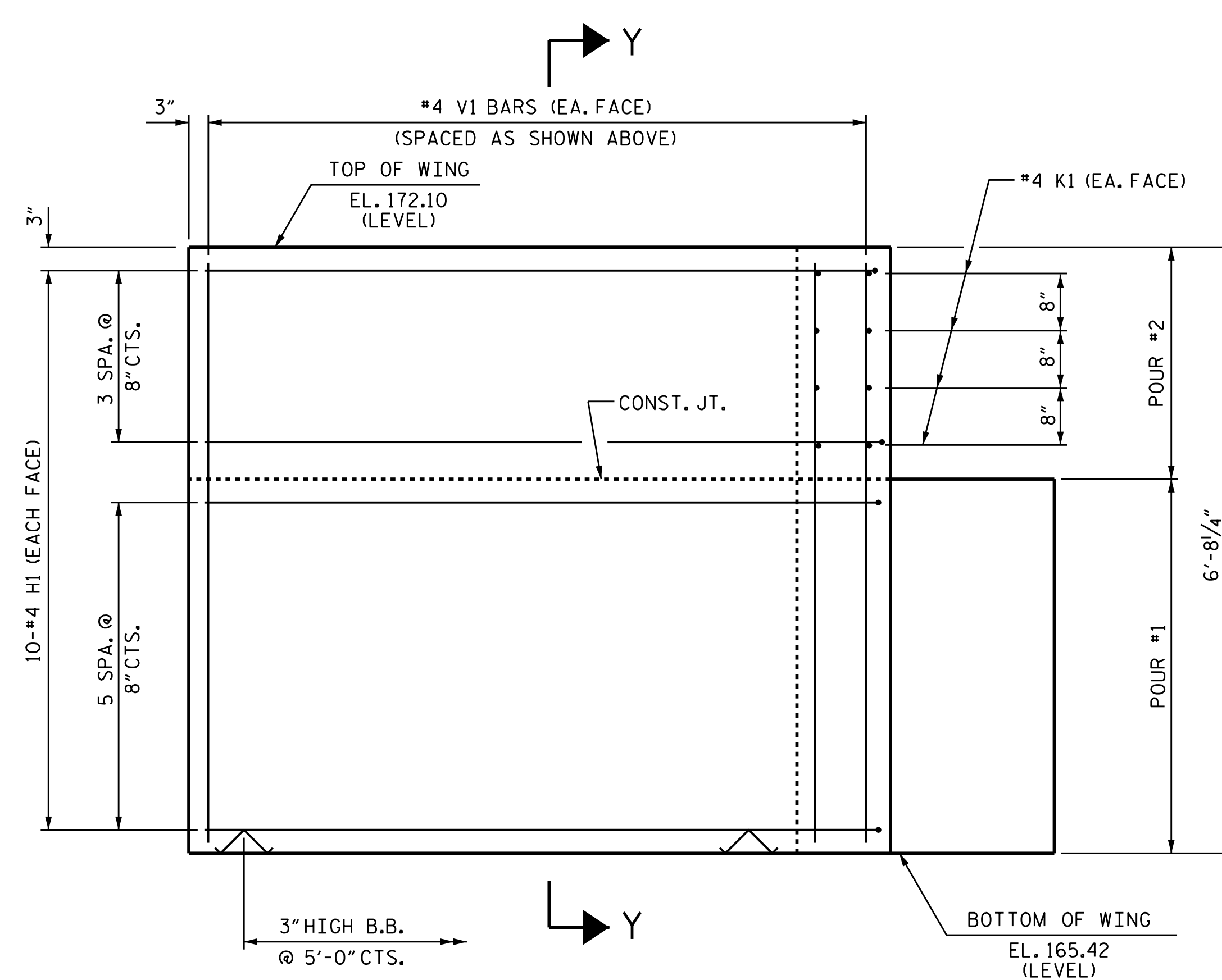
PLAN OF WING (W1)



PLAN OF WING (W2)

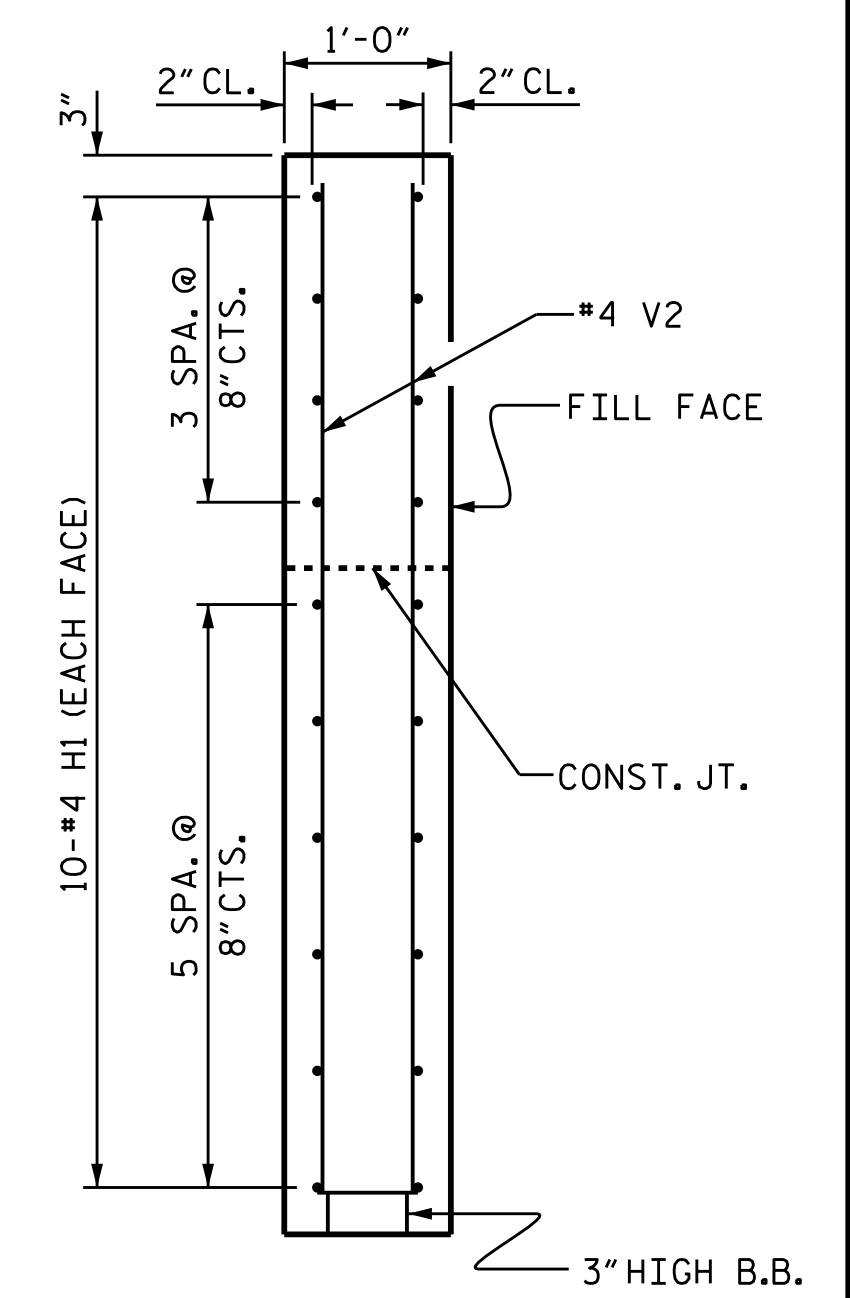


ELEVATION OF WING (W1)

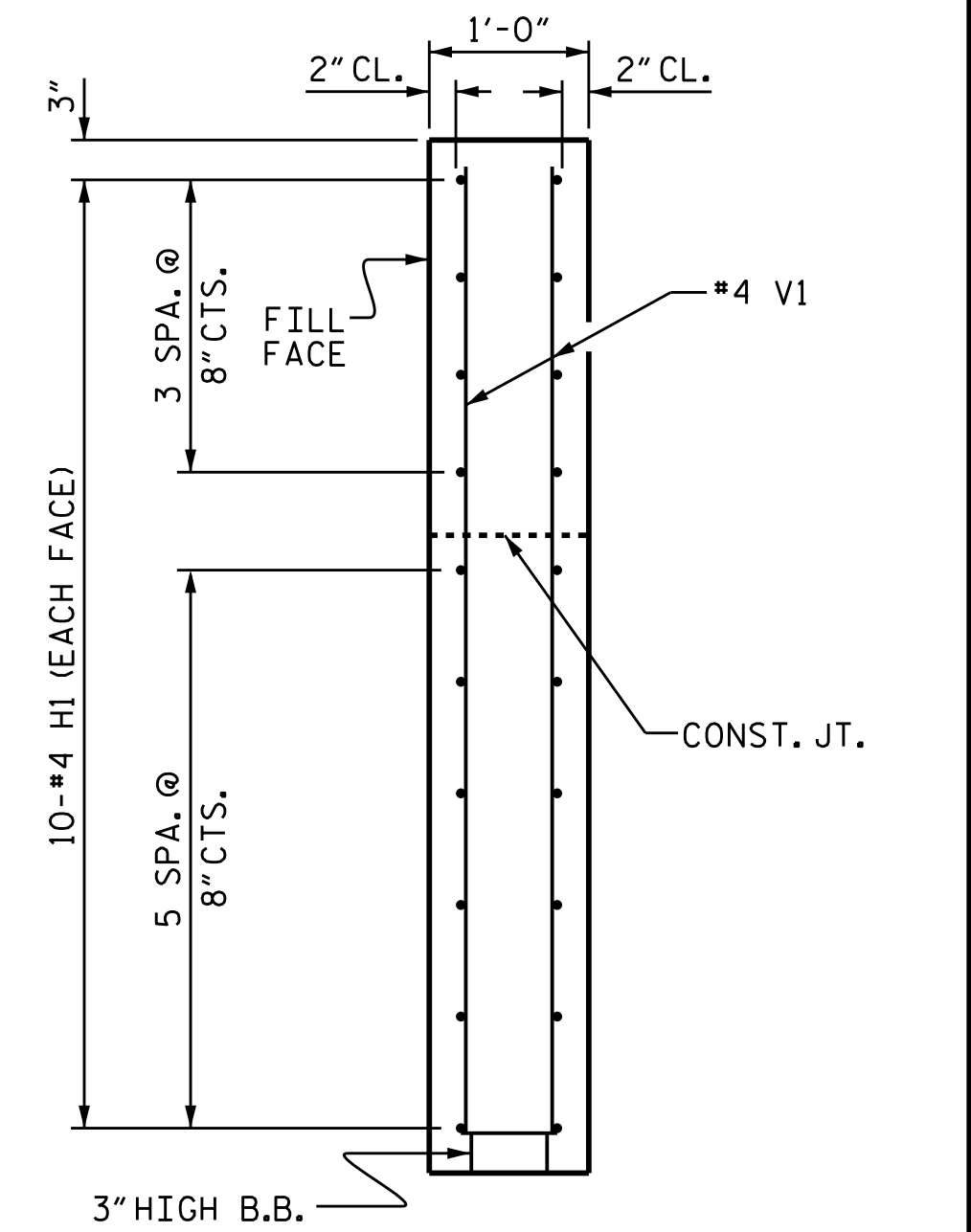


ELEVATION OF WING (W2)

WING DETAILS



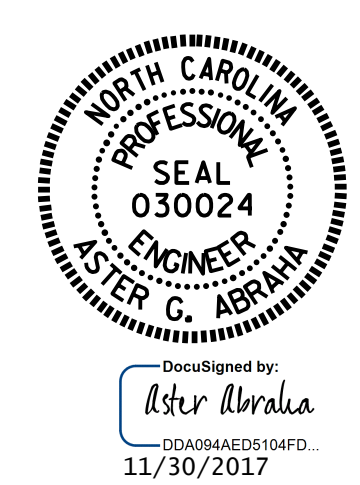
SECTION X-X



SECTION Y-Y

PROJECT NO. 17BP.6.R.89
 HARNETT COUNTY
 STATION: 17+51.00 -L-

SHEET 2 OF 3

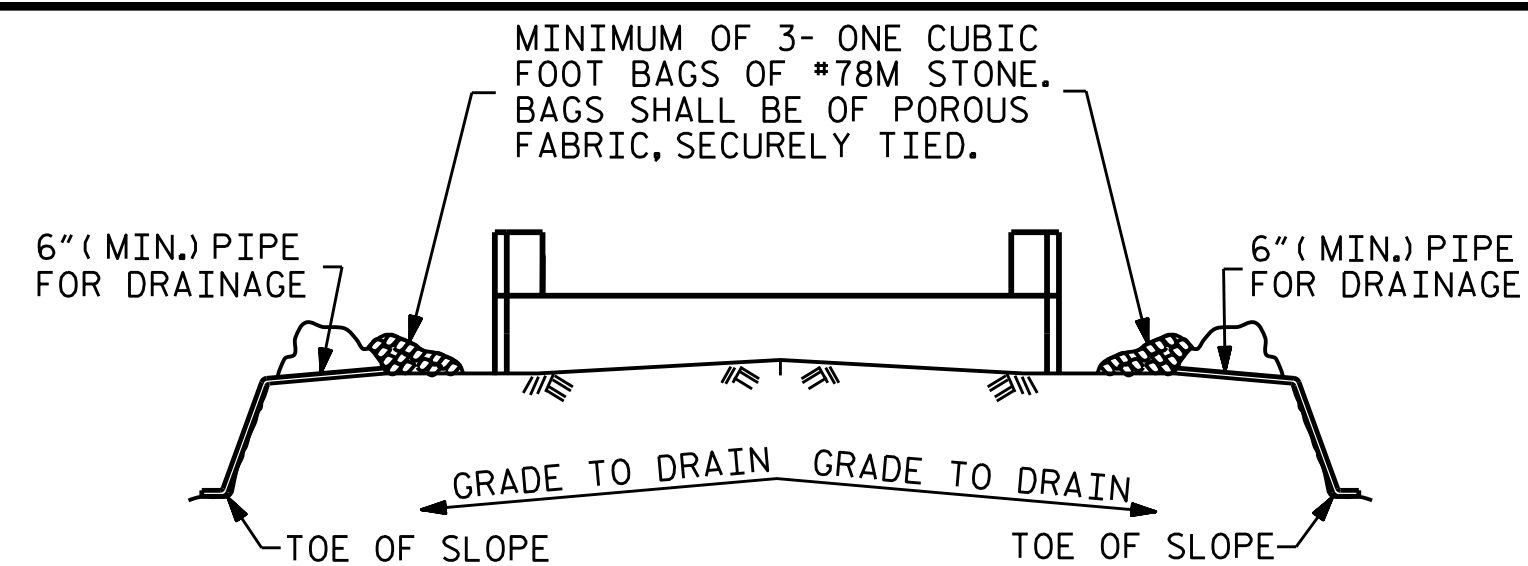


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT 2
 WING DETAILS

ASSEMBLED BY : S. B. WILLIAMS	DATE : 9-17
CHECKED BY : S. WANCE	DATE : 10/2017
DRAWN BY : WJH	12/11
CHECKED BY : AAC	12/11
REV. 4/15	MAA/TMG

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			29

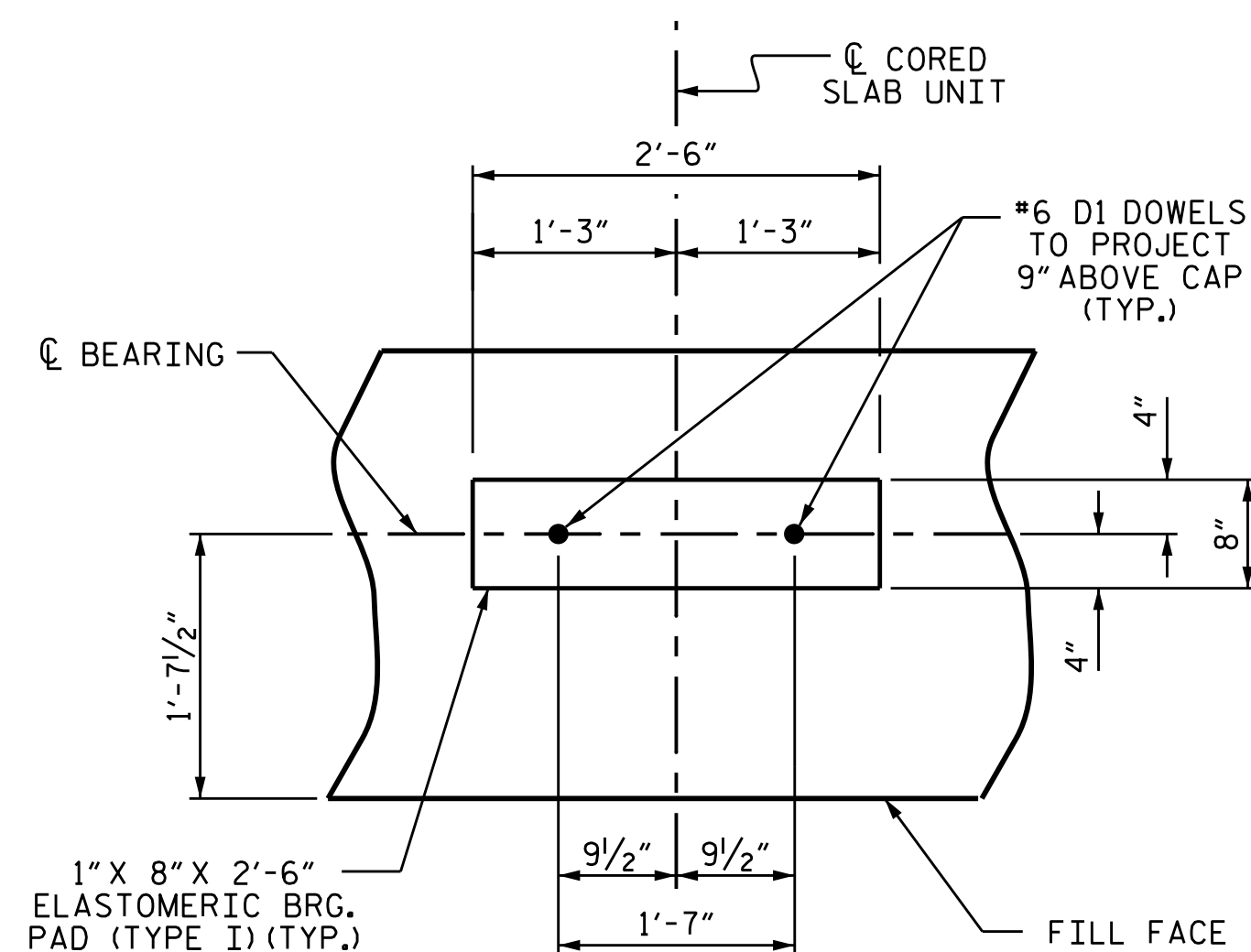


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

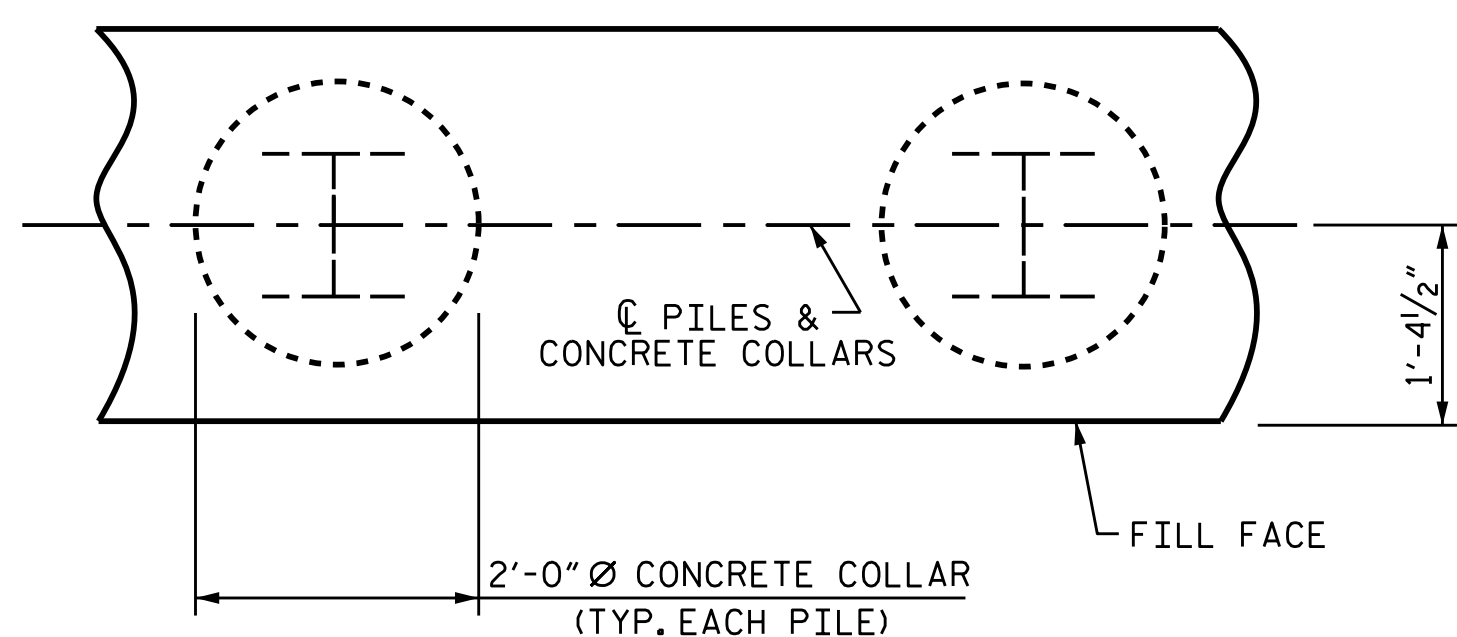
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR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

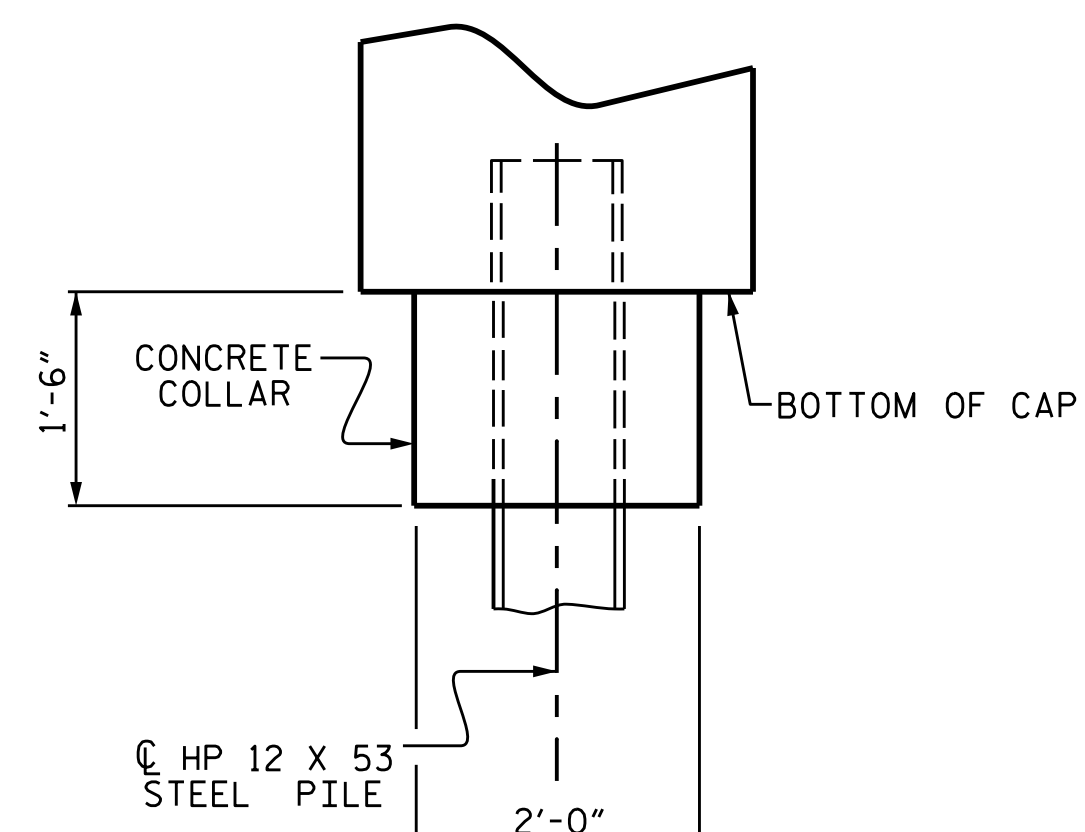


DETAIL "A"

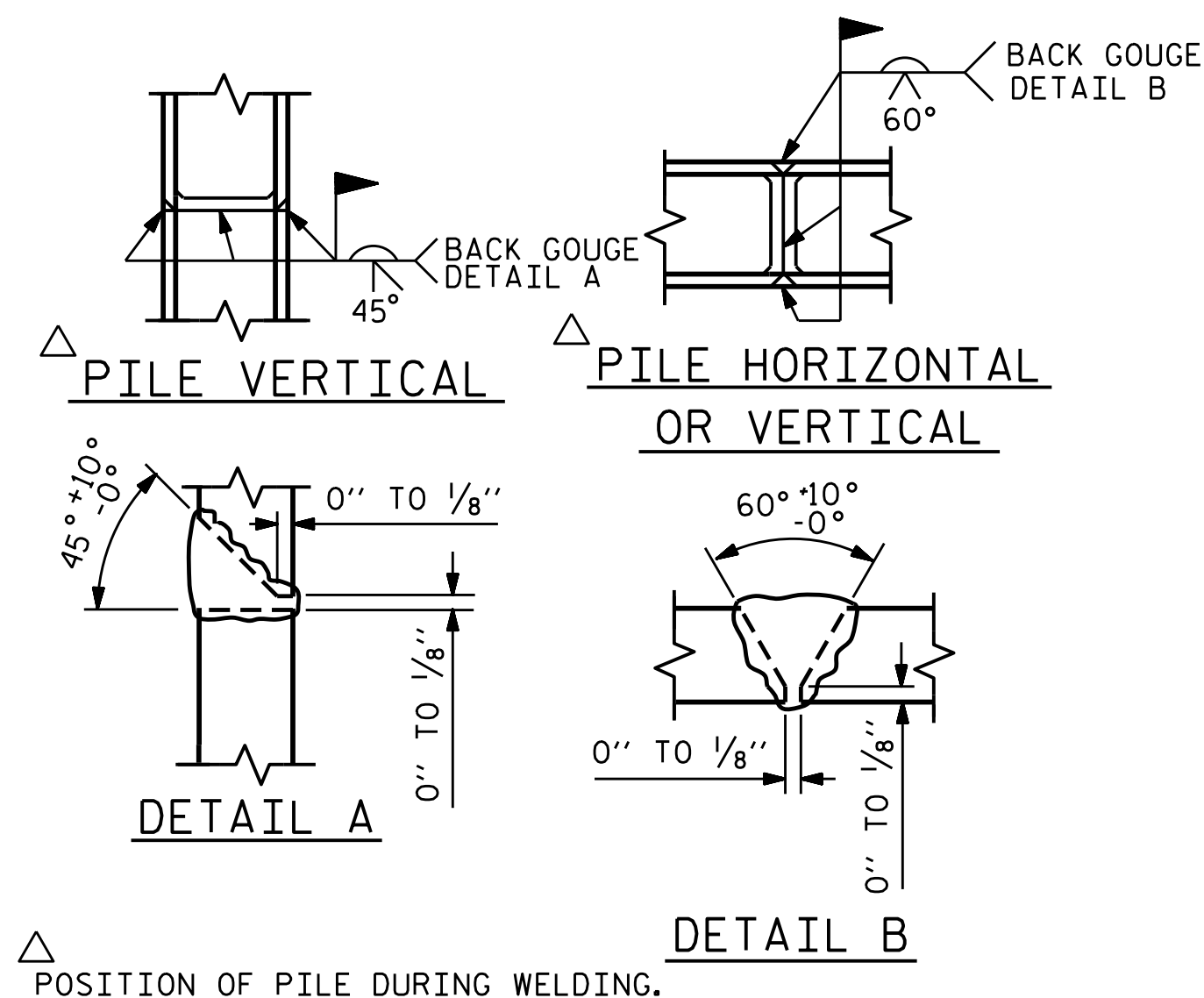


PLAN

CORROSION PROTECTION FOR STEEL PILES DETAIL

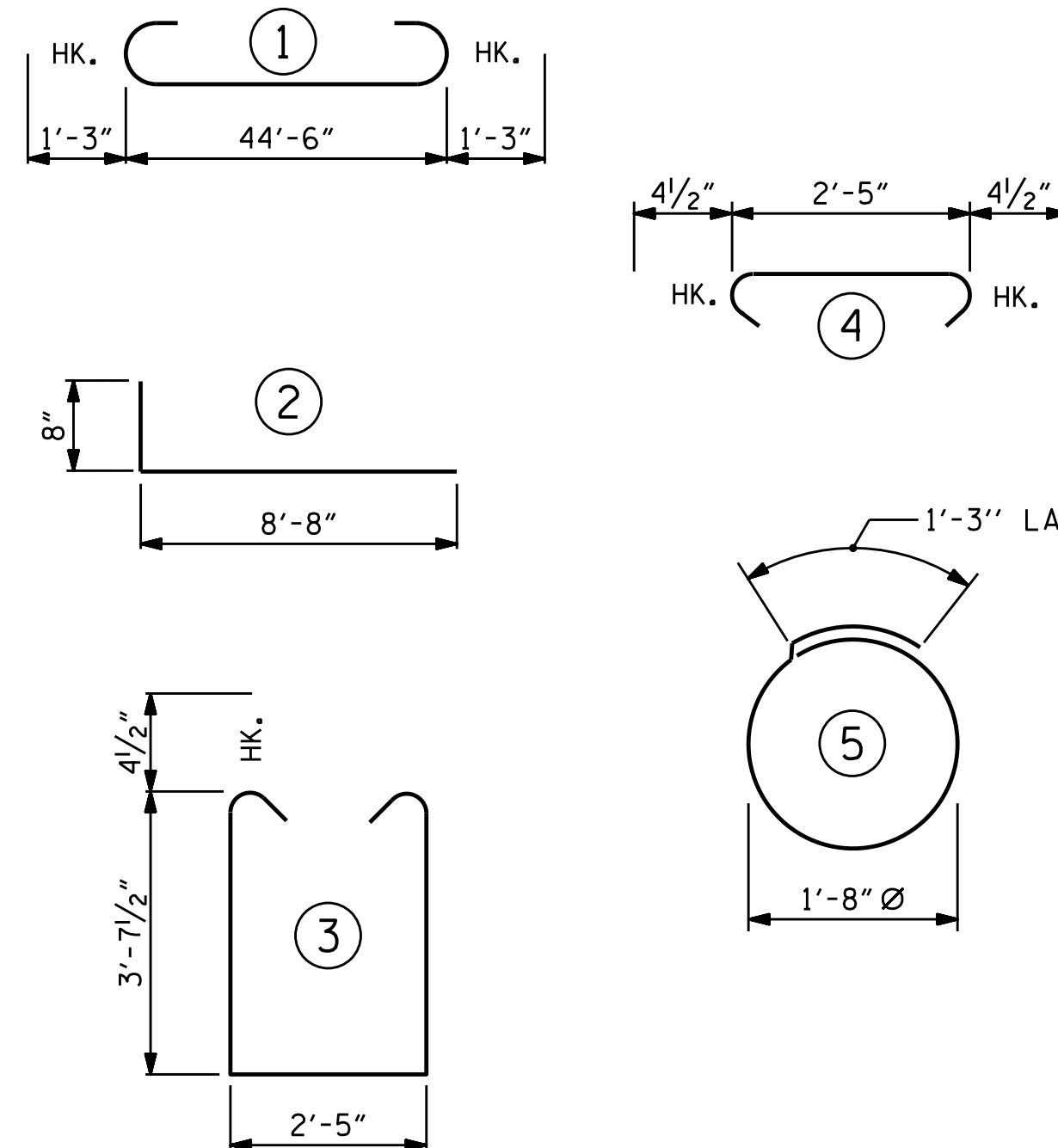


ELEVATION



PILE SPLICE DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 2

BAR NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	#9	1	47'-0"	1278
B2	#4	STR	23'-7"	441
B3	#4	STR	2'-5"	19
D1	#6	STR	1'-6"	59
H1	#4	2	9'-4"	249
K1	#4	STR	3'-9"	20
K2	#4	STR	2'-11"	16
S1	#4	3	10'-5"	390
S2	#4	4	3'-2"	118
S3	#4	5	6'-6"	122
V1	#4	STR	6'-3"	117
V2	#4	STR	6'-0"	104

REINFORCING STEEL 2933 LBS.

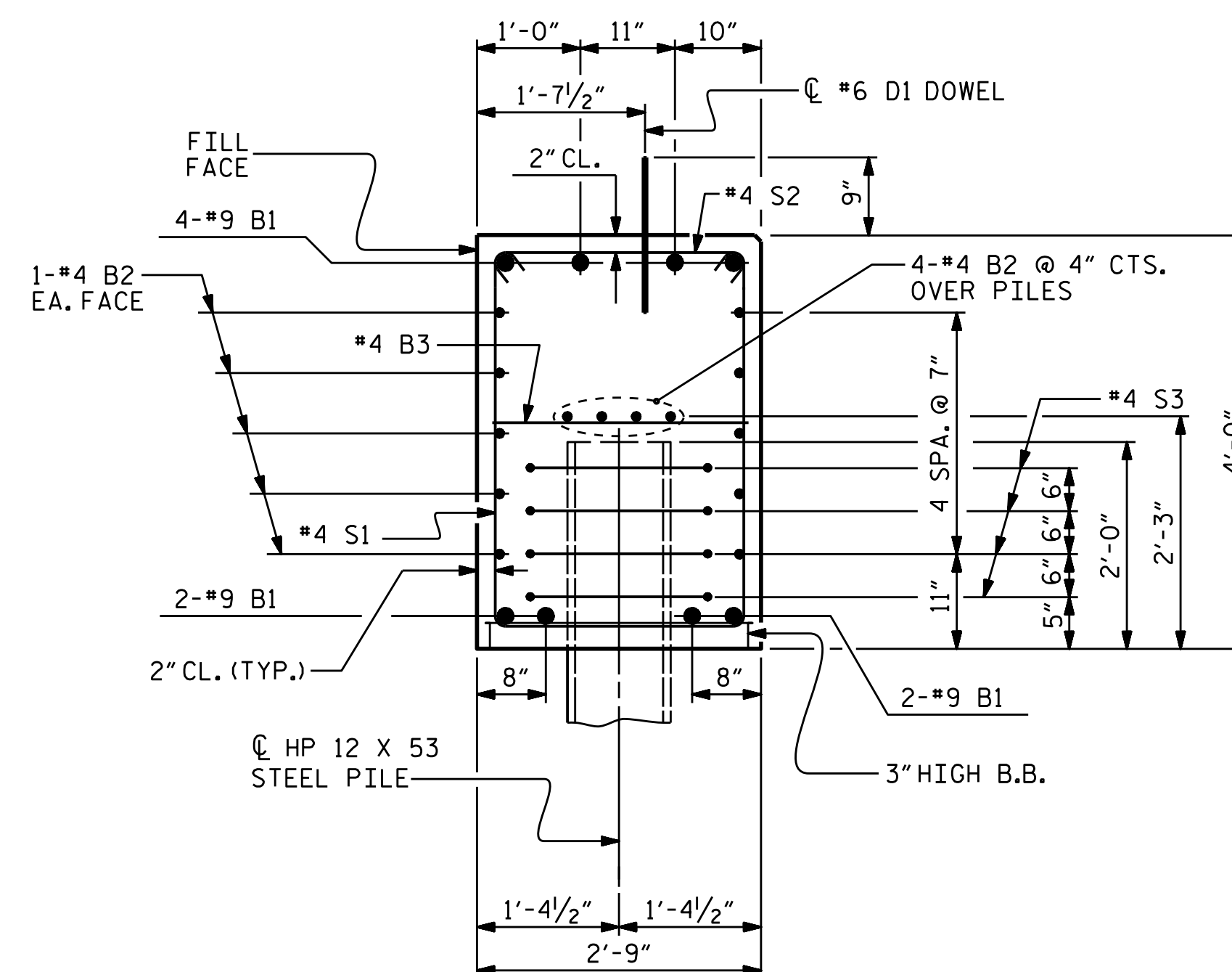
CLASS A CONCRETE BREAKDOWN

POUR #1	CAP, LOWER PART OF WINGS & COLLARS	21.9 C.Y.
POUR #2	UPPER PART OF WINGS	2.2 C.Y.
TOTAL CLASS A CONCRETE		24.1 C.Y.

HP 12 X 53 STEEL PILES
NO: 7 LIN. FT. = 245

PILE DRIVING EQUIPMENT
SETUP FOR
HP 12 X 53 STEEL PILES
NO: 7

PILE REDRIVES
NO: 4



SECTION A-A

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

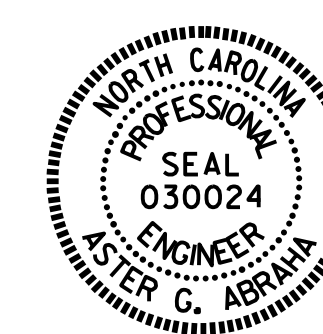
PROJECT NO. 17BP.6.R.89
HARNETT COUNTY
STATION: 17+51.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 2
DETAILS



DocuSigned by:
Aster Abraham
11/30/2017

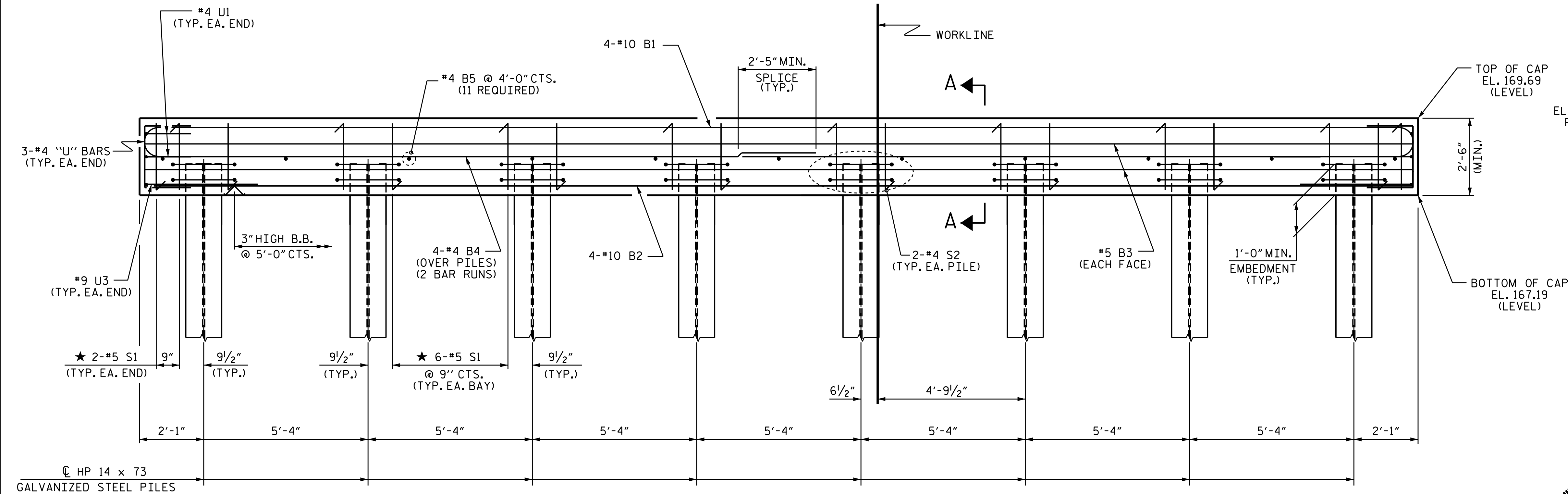
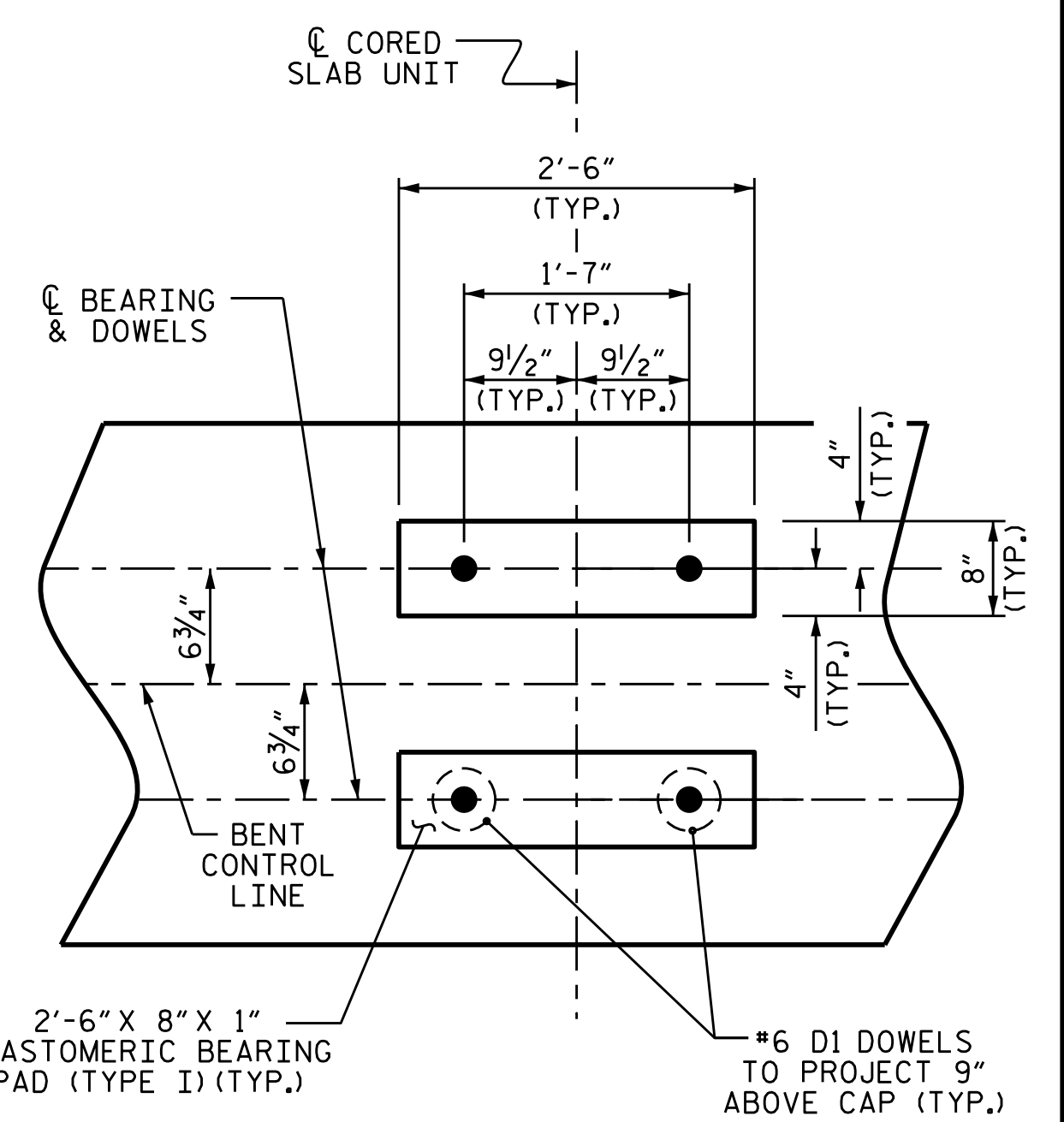
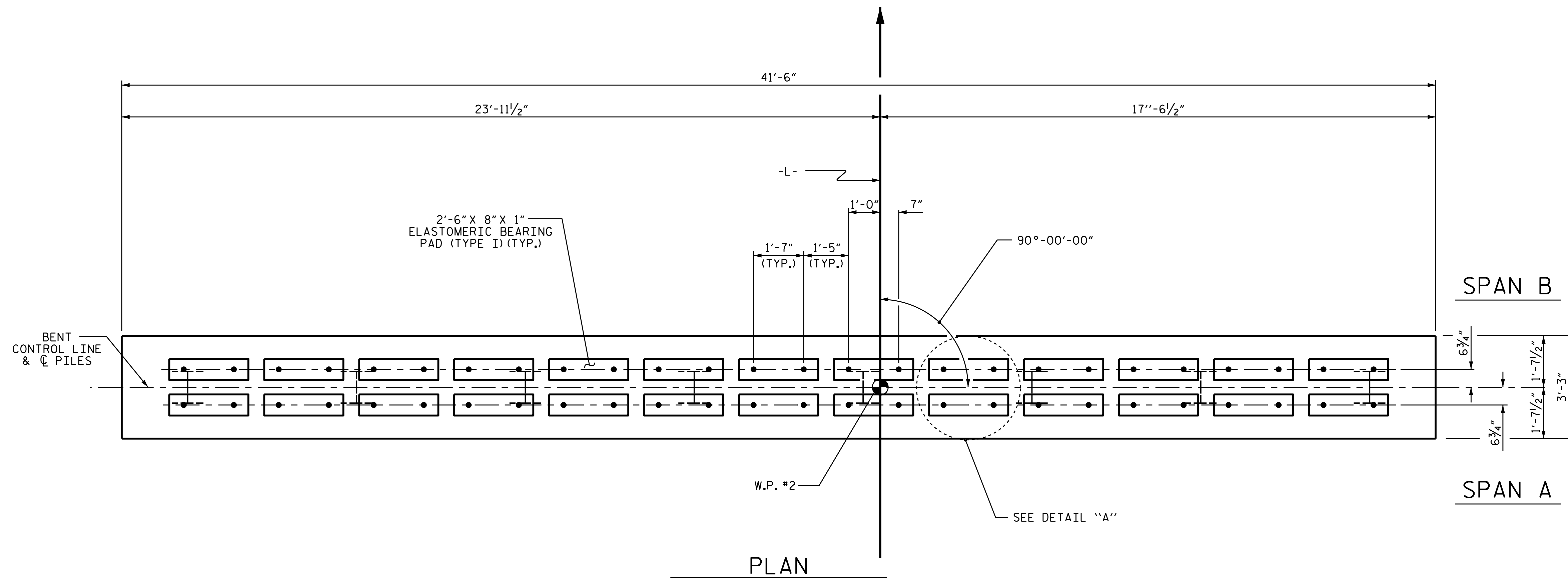
ASSEMBLED BY : S. B. WILLIAMS DATE : 9-17
CHECKED BY : S. WANCE DATE : 10/2017
DRAWN BY : WJH 12/11
CHECKED BY : AAC 12/11
REV. 4/17 MAA/THC

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS 29
2			4			

NOTES

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.
- ★ INVERT ALTERNATE STIRRUPS.
- GALVANIZE THE TOP OF EACH INTERIOR BENT PILE A MINIMUM OF 32.0 FEET. GALVANIZE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.



PROJECT NO. 17BP.6.R.89
 HARNETT COUNTY
 STATION: 17+51.00 -L-
 SHEET 1 OF 2

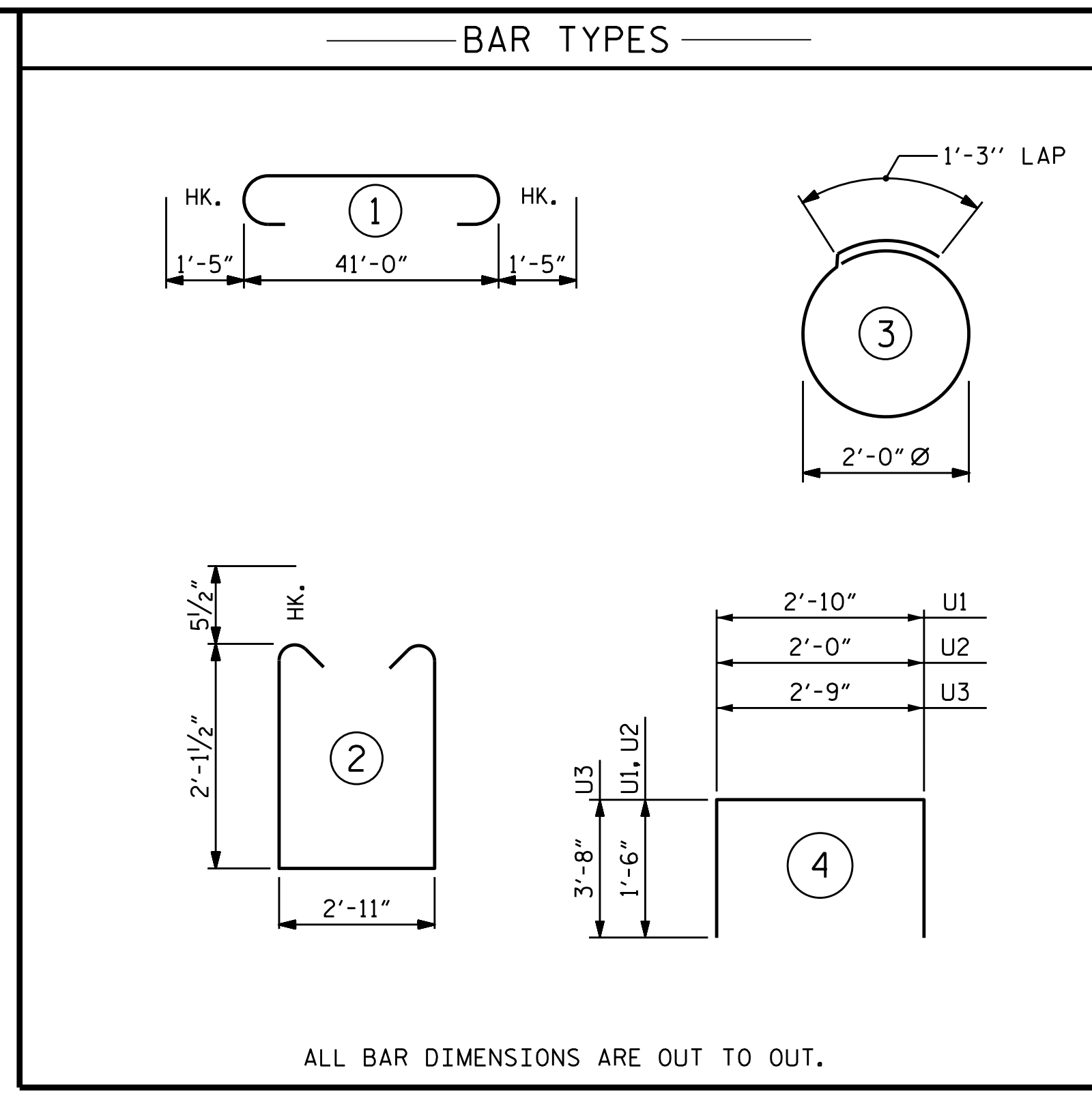
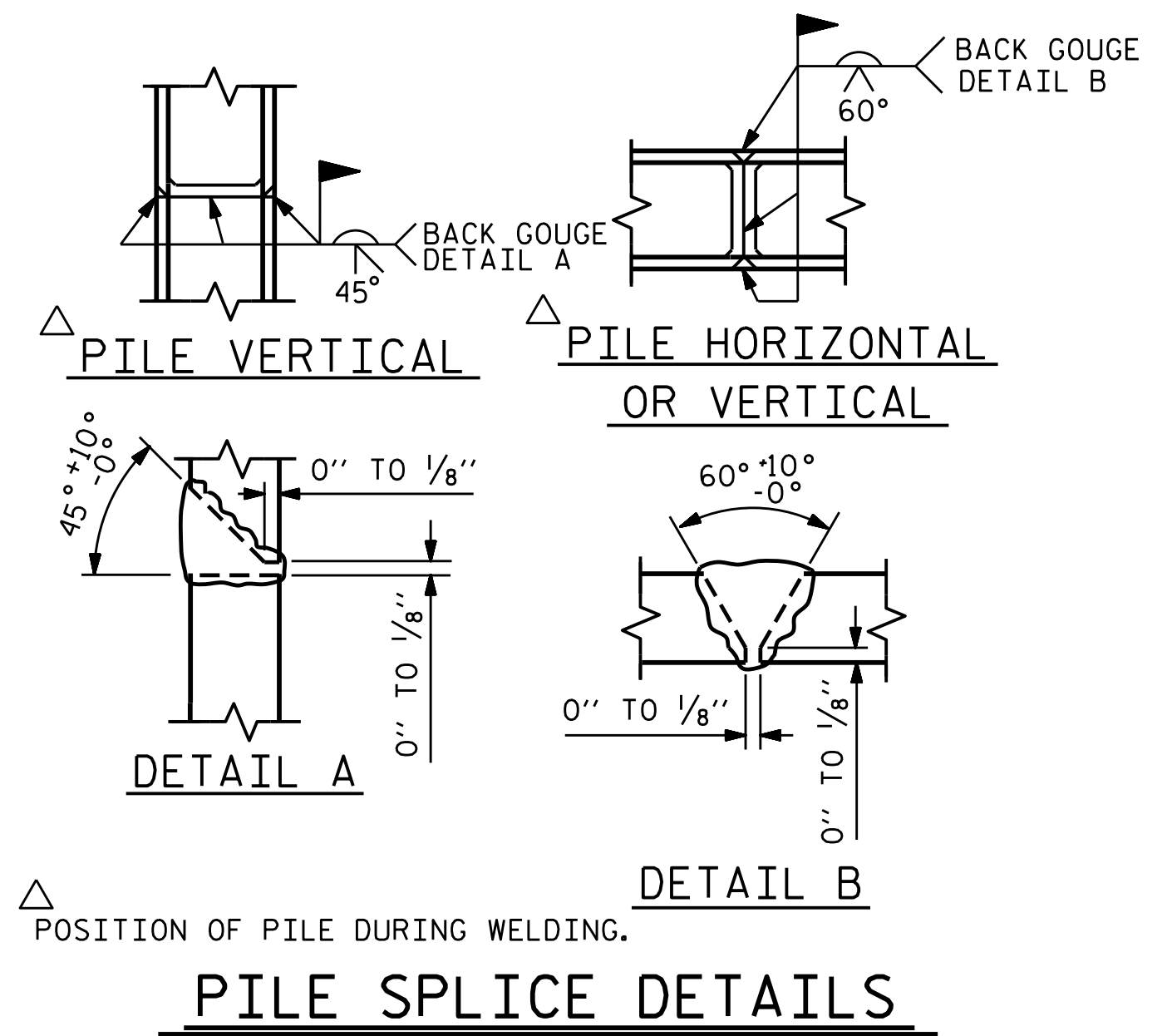


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

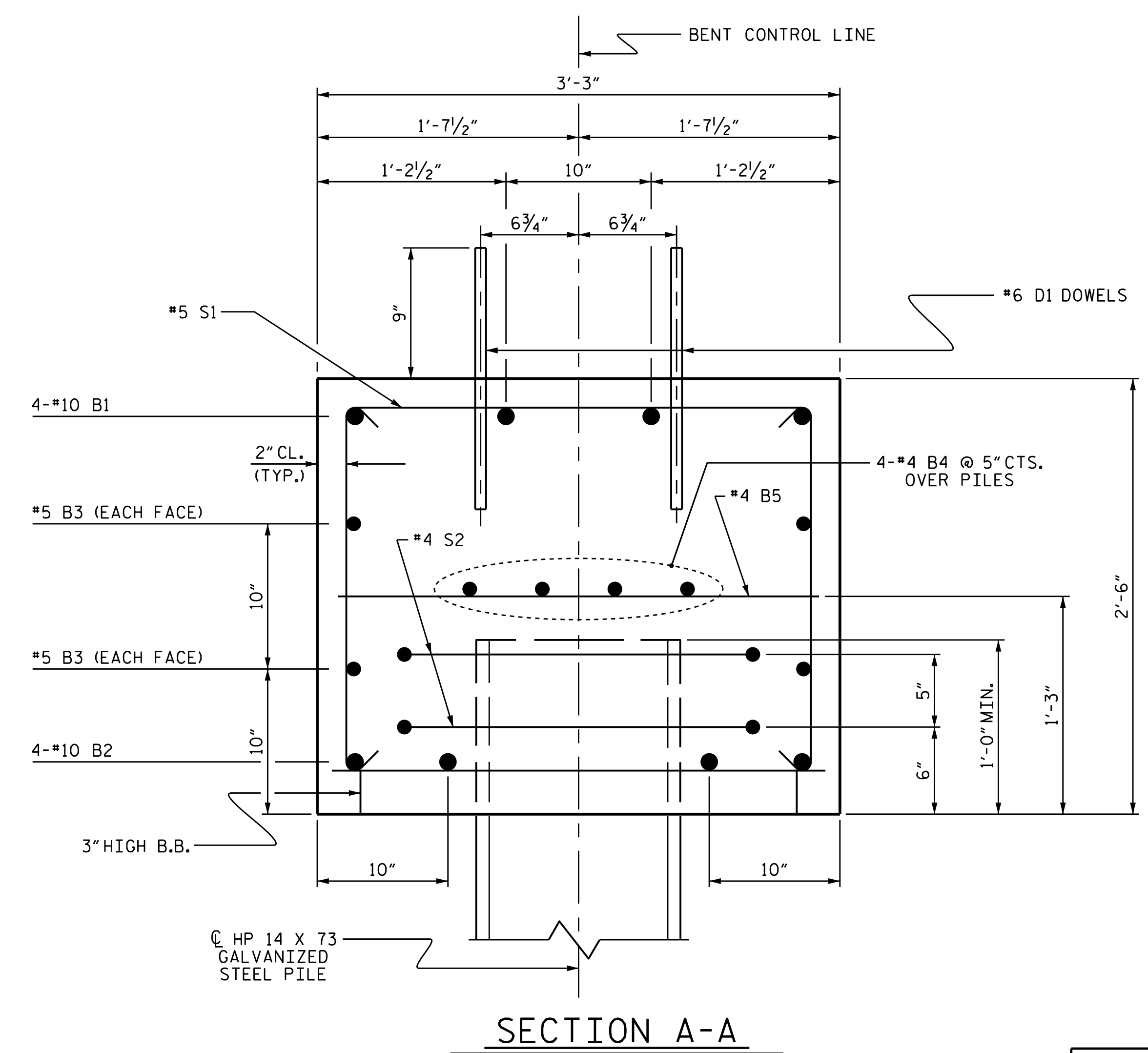
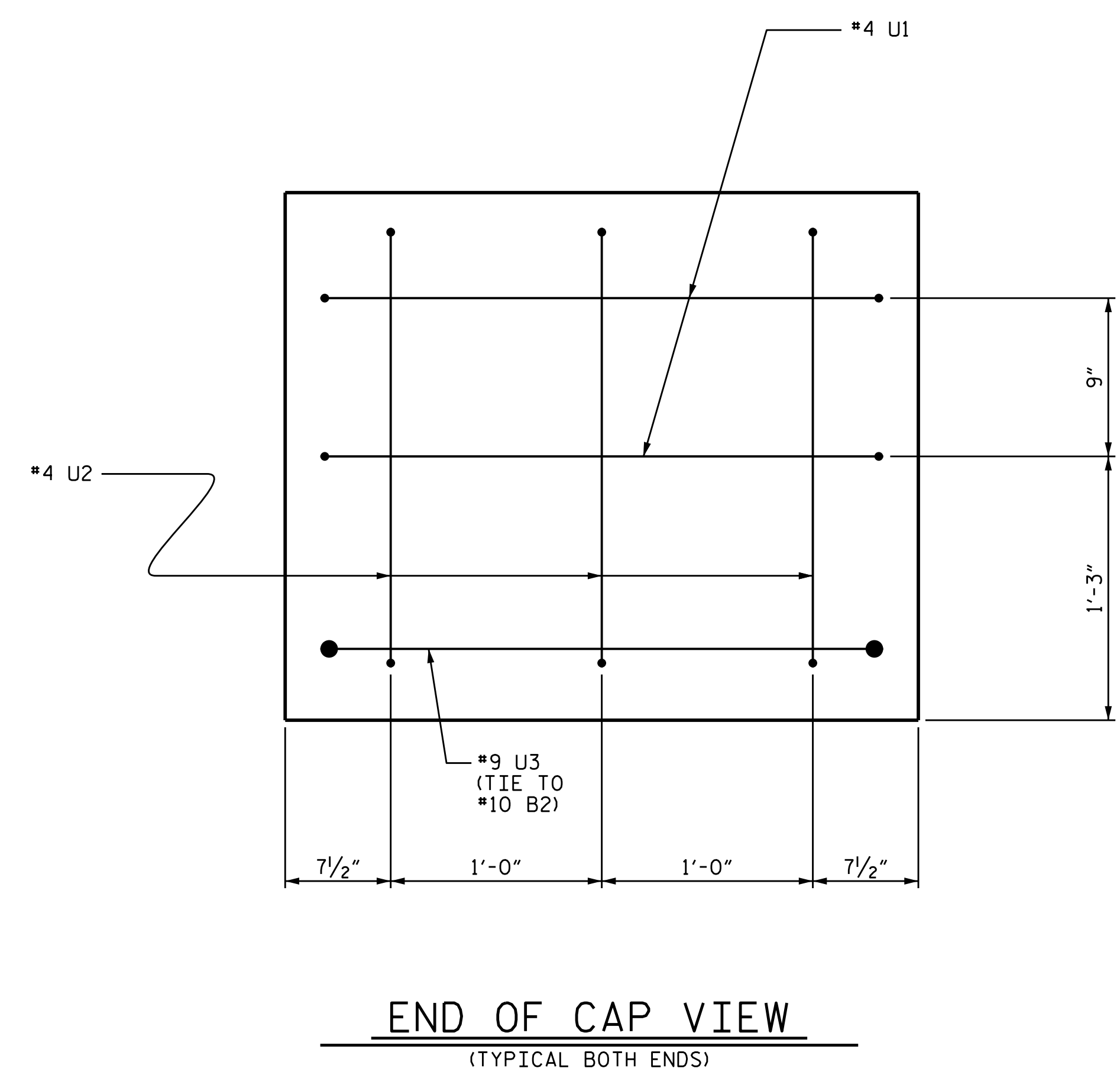
**SUBSTRUCTURE
 BENT No. 1**

ASSEMBLED BY : S. B. WILLIAMS	DATE : 9-17
CHECKED BY : S. WANCE	DATE : 10/2017
DRAWN BY : DGE	05/10
CHECKED BY : MKT	05/10
REV. 6/17	MAA/THC

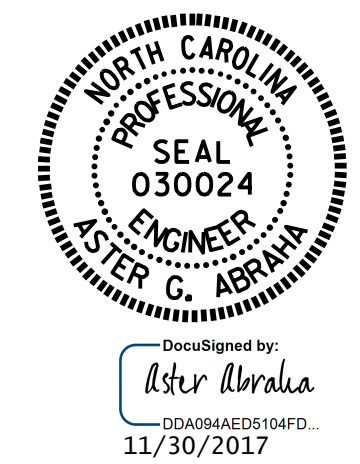
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS S-29
2			4			



BILL OF MATERIAL					
BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#10	1	43'-10"	754
B2	4	#10	STR	41'-2"	709
B3	4	#5	STR	41'-2"	172
B4	8	#4	STR	21'-10"	117
B5	11	#4	STR	2'-11"	21
D1	52	#6	STR	1'-6"	117
S1	46	#5	2	8'-1"	388
S2	16	#4	3	7'-7"	81
U1	4	#4	4	5'-10"	16
U2	6	#4	4	5'-0"	20
U3	2	#9	4	10'-1"	69
REINFORCING STEEL					2464 LBS
CLASS A CONCRETE BREAKDOWN					
TOTAL CLASS A CONCRETE					12.5 C.Y.
HP 14 X 73 GALVANIZED STEEL PILES					
No. 8					LIN. FT. 400
PILE DRIVING EQUIPMENT SETUP FOR HP 14 X 73 GALVANIZED STEEL PILES					NO: 8
PILE REDRIVES					NO: 4



PROJECT NO. 17BP.6.R.89
HARNETT COUNTY
STATION: 17+51.00 -L-
SHEET 2 OF 2



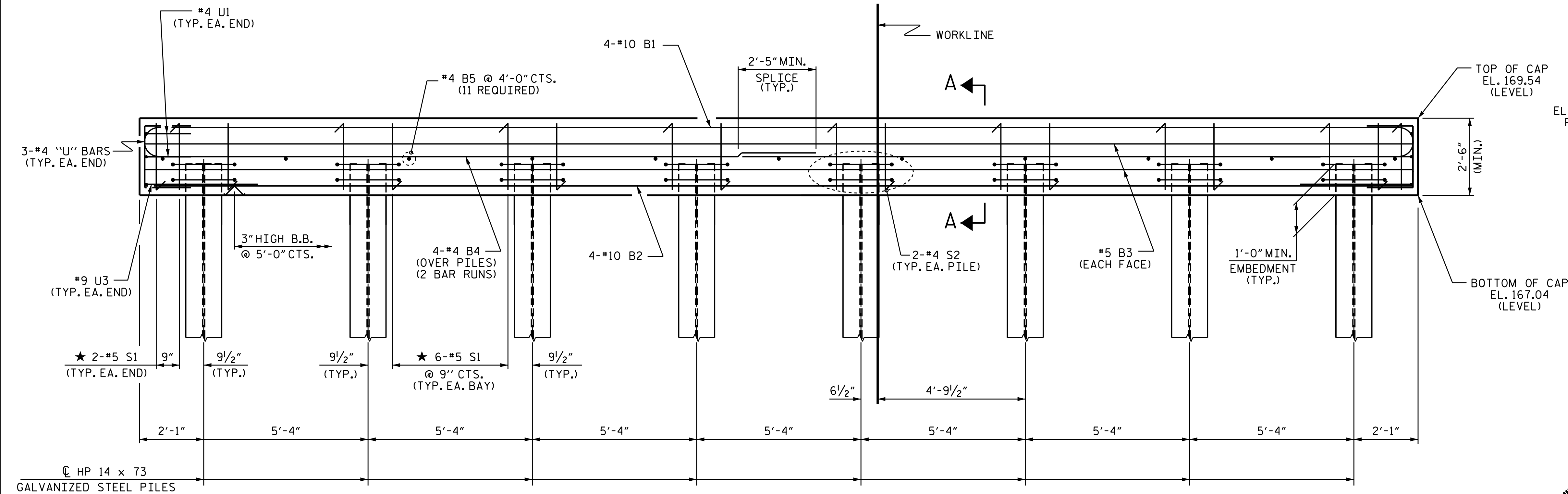
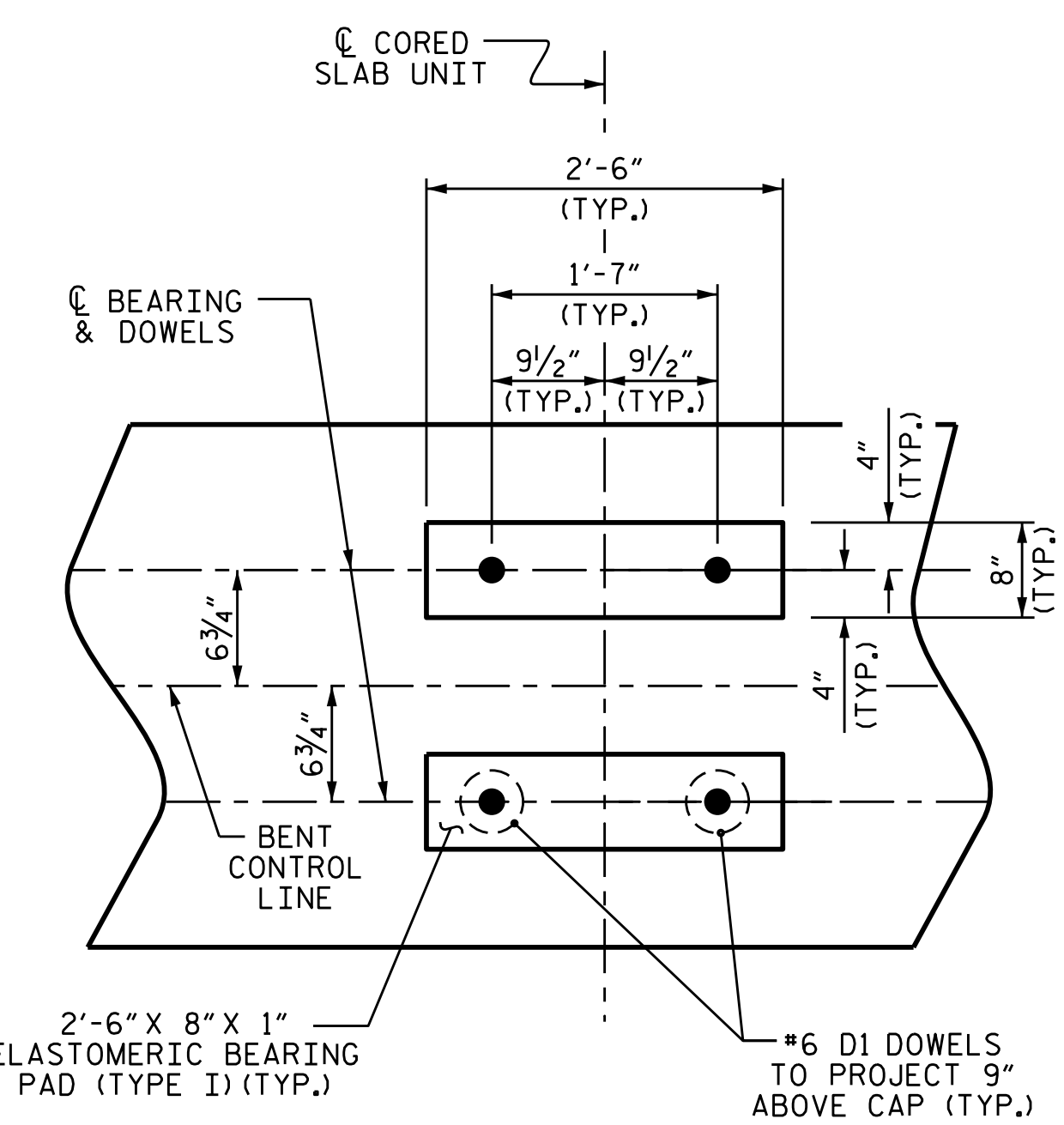
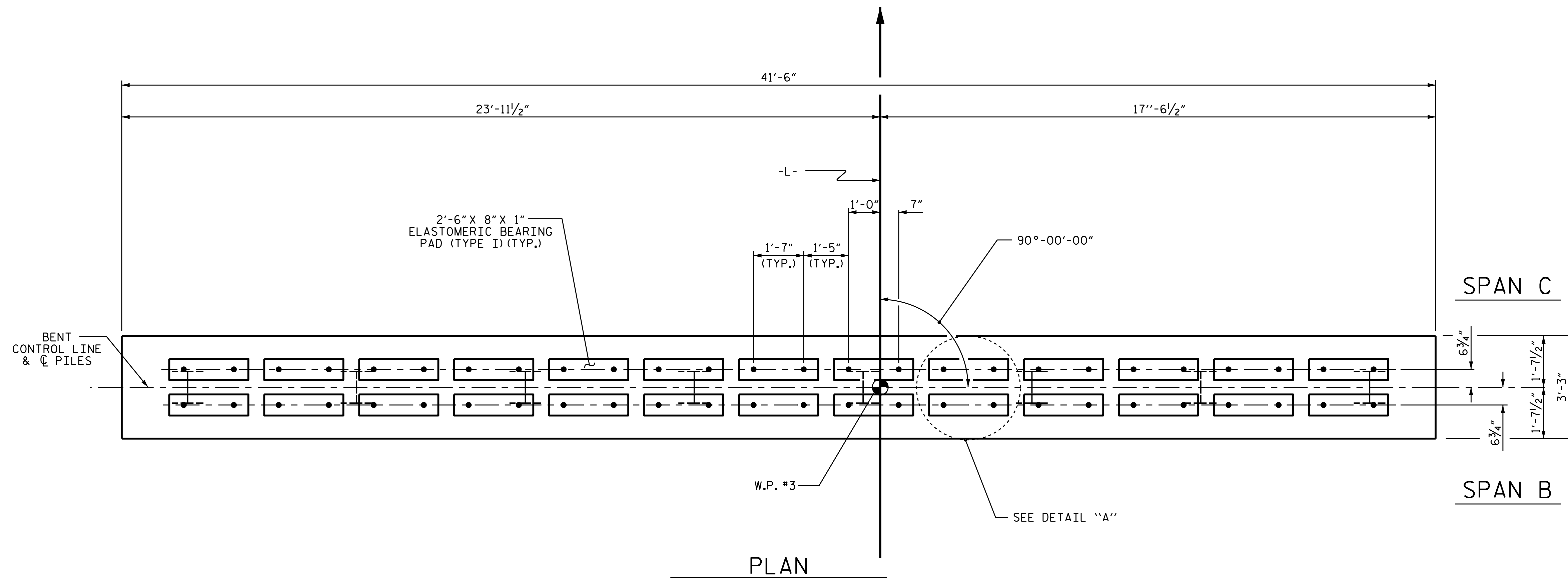
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE BENT No. 1					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S-25					TOTAL SHEETS 29

ASSEMBLED BY : S. B. WILLIAMS	DATE : 9-17
CHECKED BY : S. WANCE	DATE : 10/2017
DRAWN BY : DGE 05/10	REV. 6/17
CHECKED BY : MKT 05/10	MAA/THC

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NOTES

- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.
- ★ INVERT ALTERNATE STIRRUPS.
- GALVANIZE THE TOP OF EACH INTERIOR BENT PILE A MINIMUM OF 32.0 FEET. GALVANIZE IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.



PROJECT NO. 17BP.6.R.89
HARNETT COUNTY
 STATION: 17+51.00 -L-
 SHEET 1 OF 2

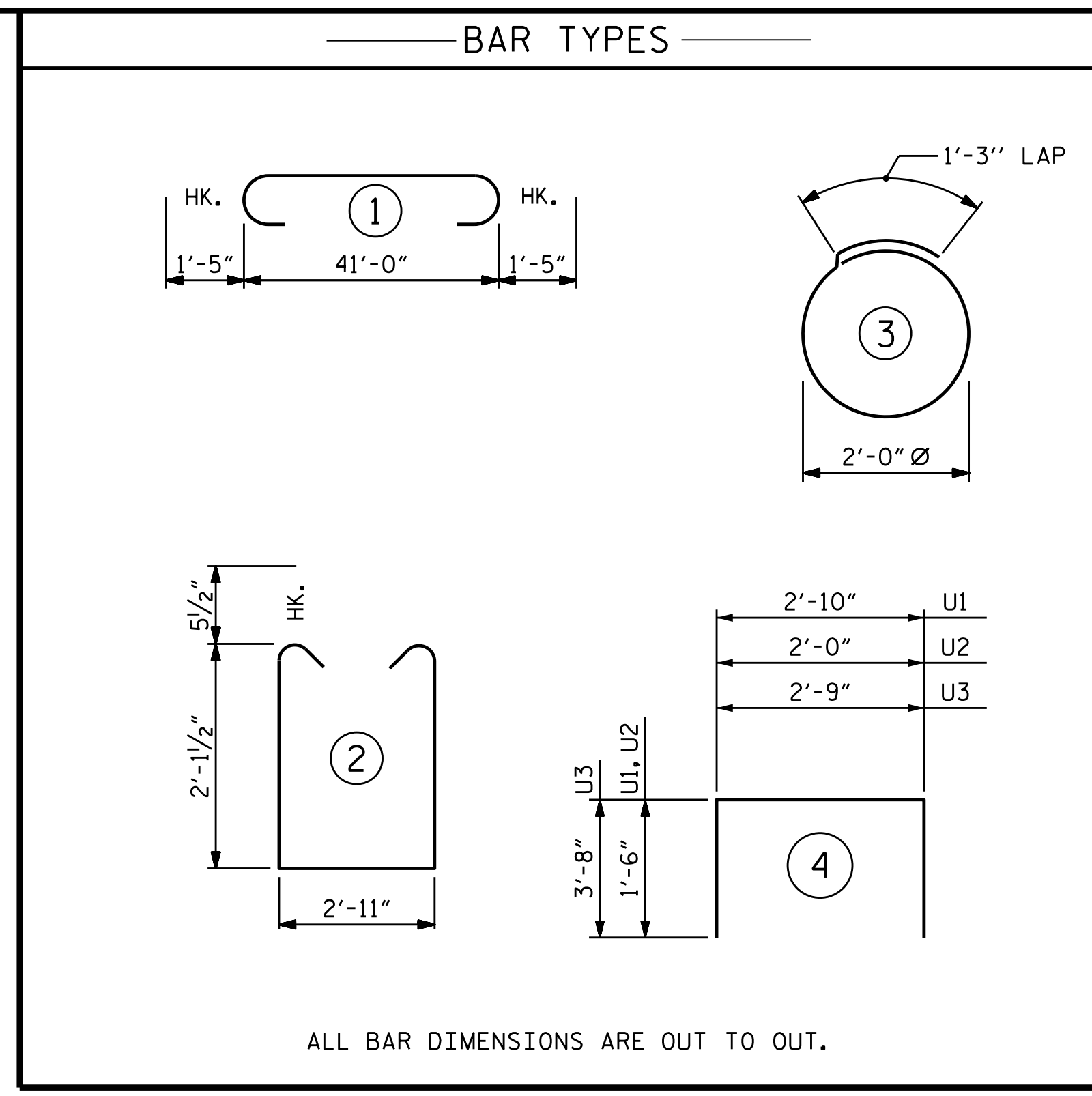
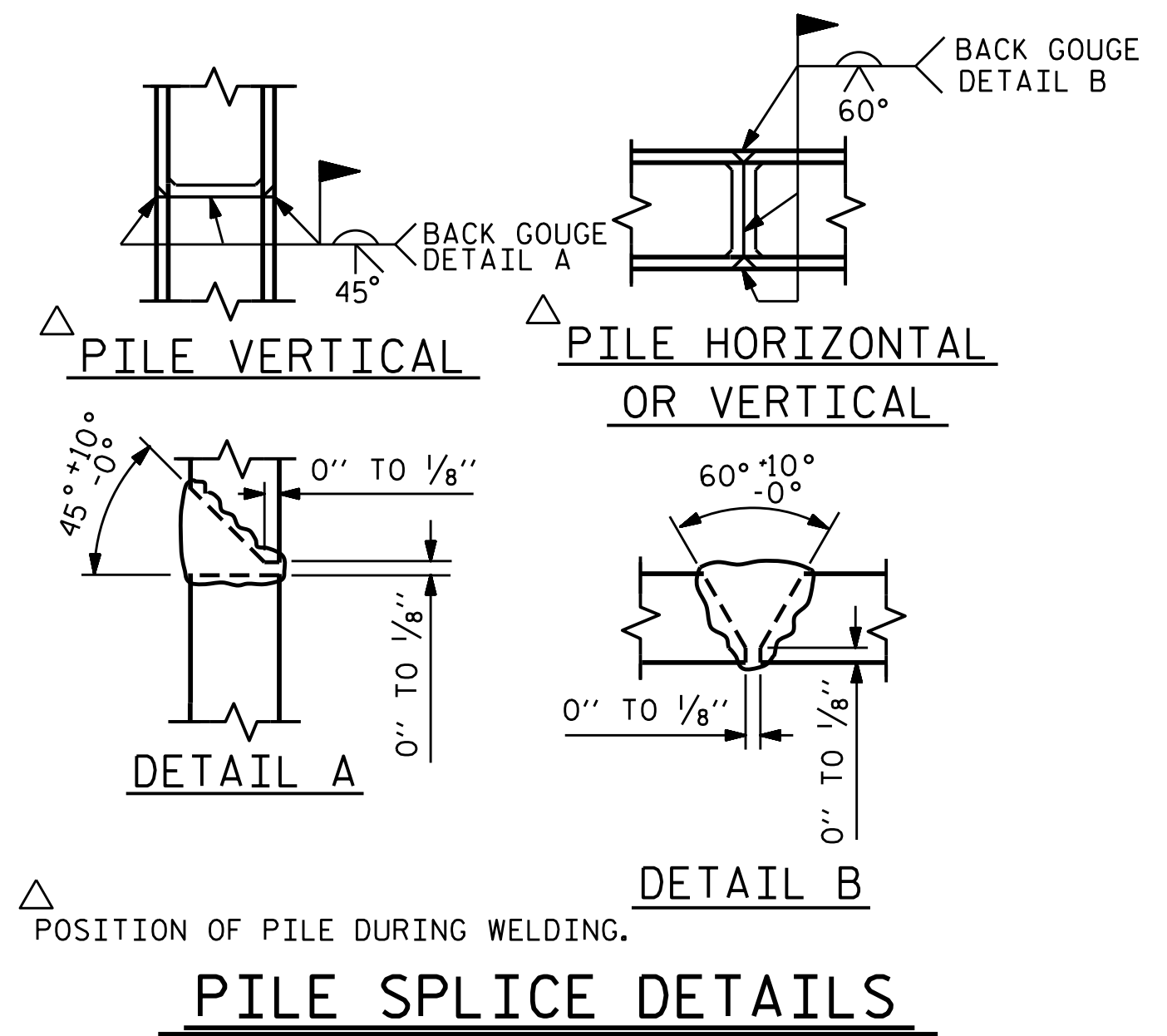


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

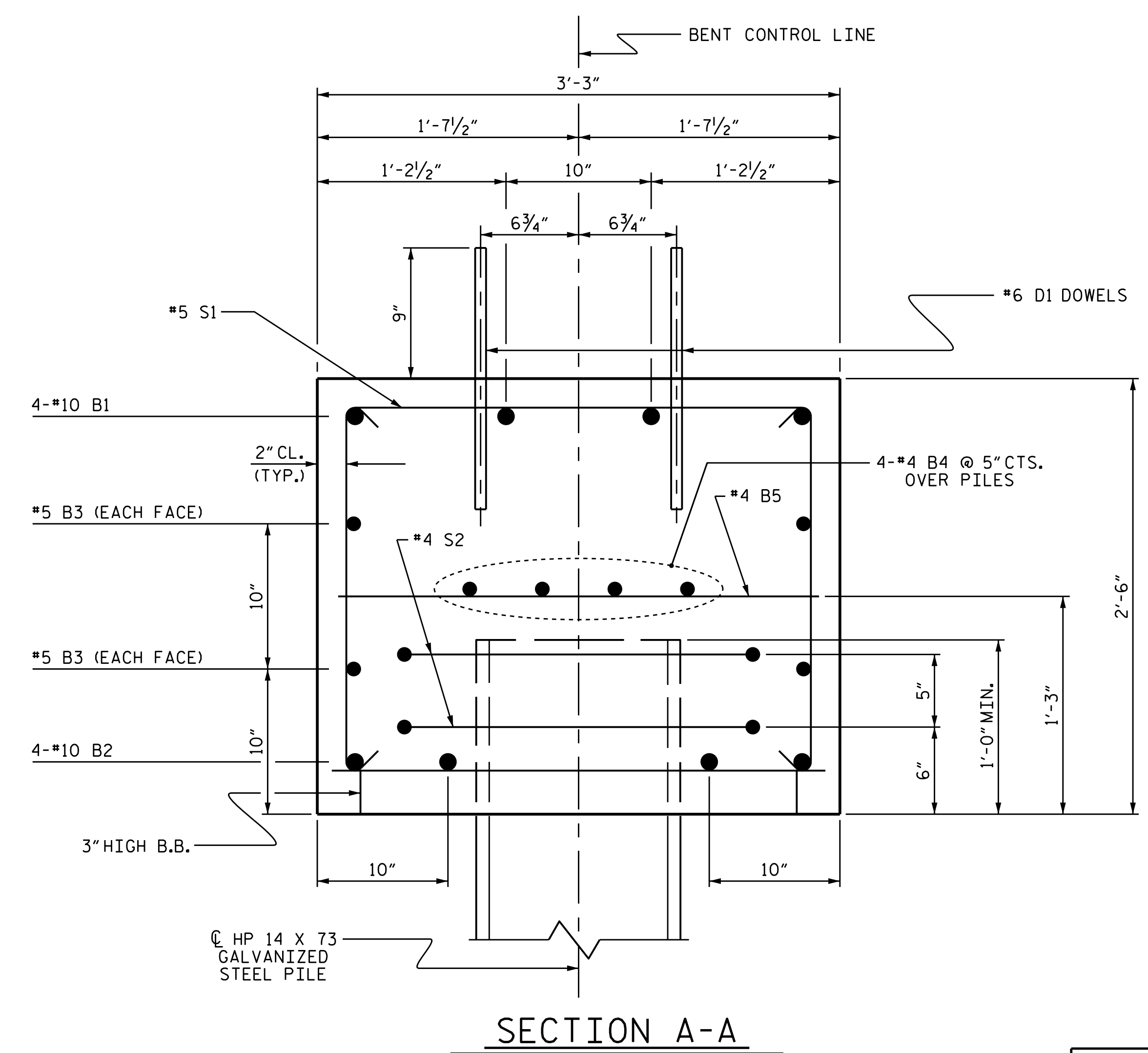
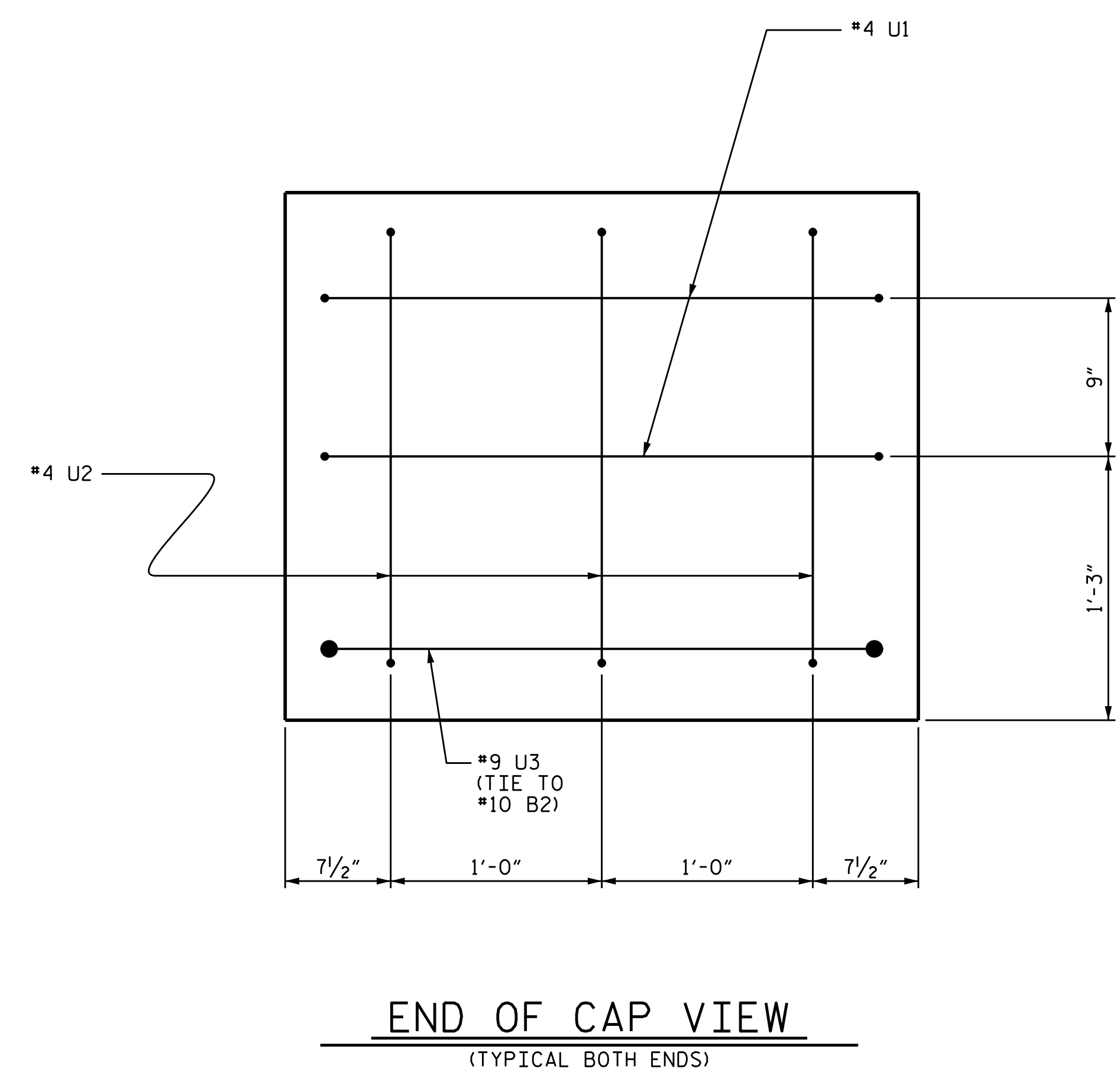
**SUBSTRUCTURE
 BENT No. 2**

ASSEMBLED BY : S. B. WILLIAMS	DATE : 9-17
CHECKED BY : S. WANCE	DATE : 10/2017
DRAWN BY : DGE	05/10
CHECKED BY : MKT	05/10
REV. 6/17	MAA/THC

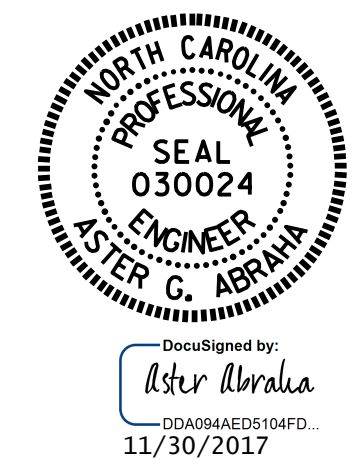
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26
1			3			TOTAL SHEETS
2			4			29



BILL OF MATERIAL					
BENT 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	4	#10	1	43'-10"	754
B2	4	#10	STR	41'-2"	709
B3	4	#5	STR	41'-2"	172
B4	8	#4	STR	21'-10"	117
B5	11	#4	STR	2'-11"	21
D1	52	#6	STR	1'-6"	117
S1	46	#5	2	8'-1"	388
S2	16	#4	3	7'-7"	81
U1	4	#4	4	5'-10"	16
U2	6	#4	4	5'-0"	20
U3	2	#9	4	10'-1"	69
REINFORCING STEEL					2464 LBS
CLASS A CONCRETE BREAKDOWN					
TOTAL CLASS A CONCRETE					12.5 C.Y.
HP 14 X 73 GALVANIZED STEEL PILES					
No. 8					LIN. FT. 400
PILE DRIVING EQUIPMENT SETUP FOR HP 14 X 73 GALVANIZED STEEL PILES					NO: 8
PILE REDRIVES					NO: 4



PROJECT NO. 17.BP.6.R.89
HARNETT COUNTY
 STATION: 17+51.00 -L-
 SHEET 2 OF 2

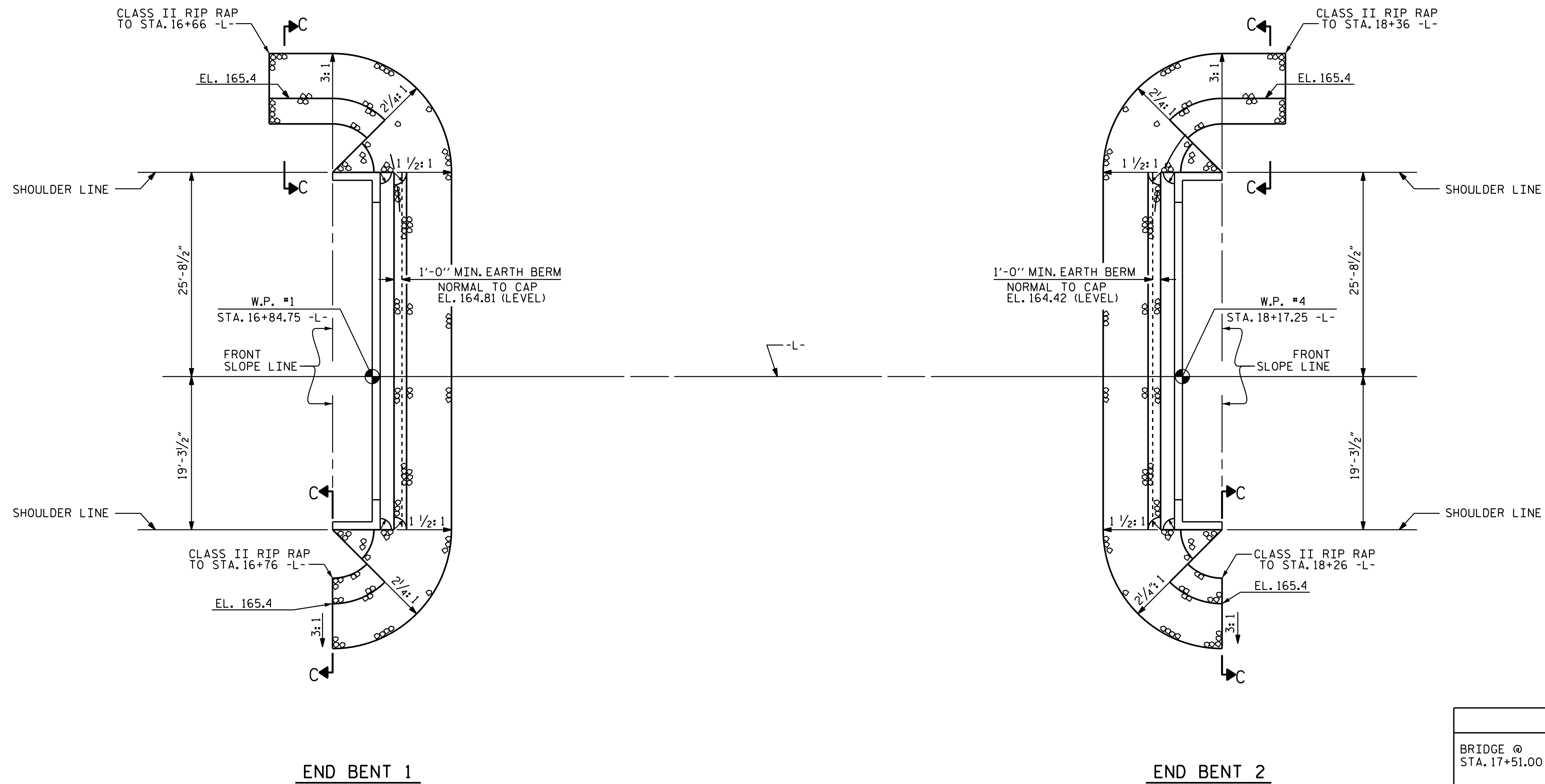


STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE BENT No. 2					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
SHEET NO. S-27					TOTAL SHEETS 29

ASSEMBLED BY : S. B. WILLIAMS	DATE : 9-17
CHECKED BY : S. WANCE	DATE : 10/2017
DRAWN BY : DGE 05/10	REV. 6/17
CHECKED BY : MKT 05/10	MAA/THC

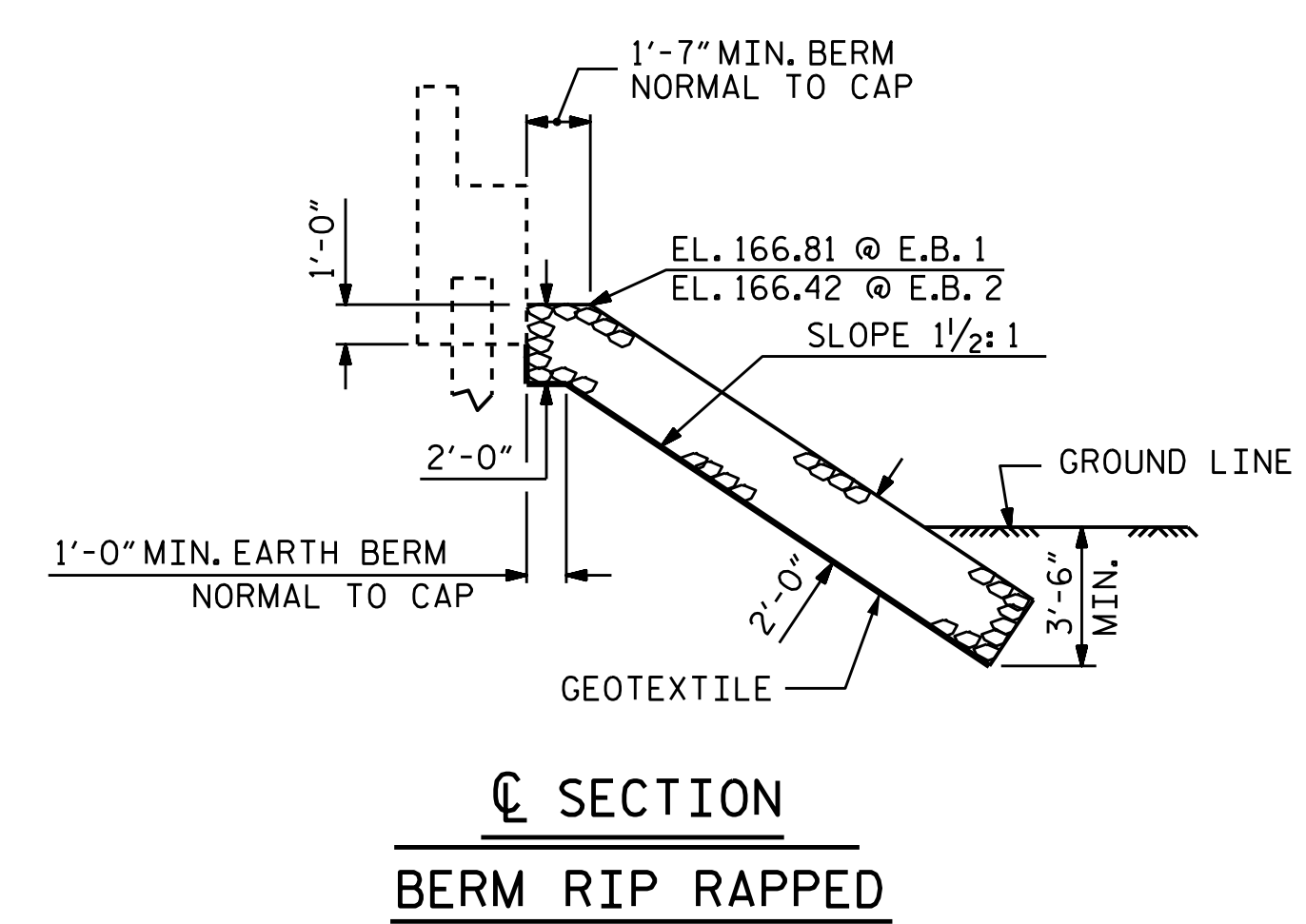
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NOTES :
FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.

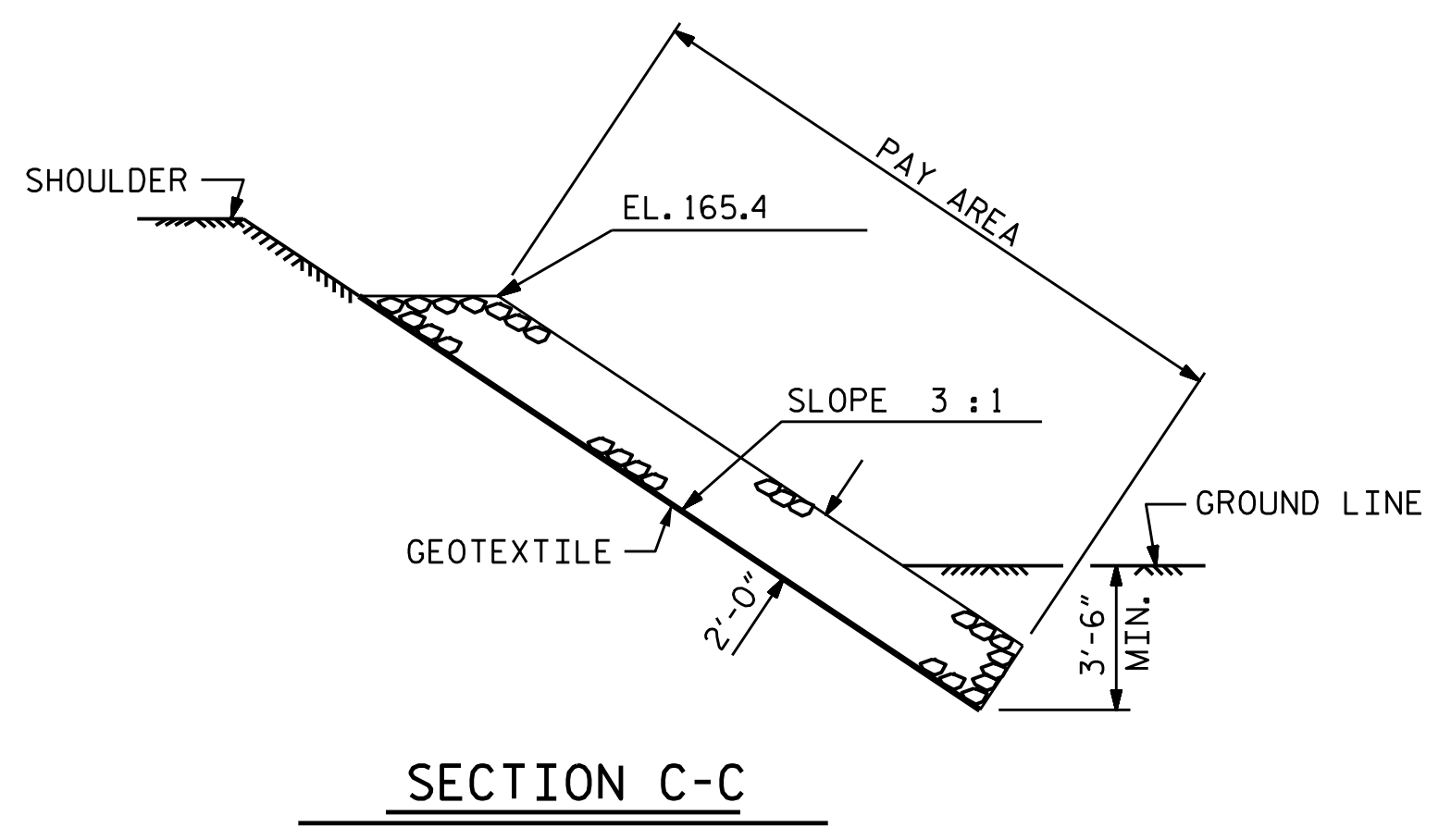


PLAN

ESTIMATED QUANTITIES		
BRIDGE @ STA. 17+51.00 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	123	140
END BENT 2	113	125

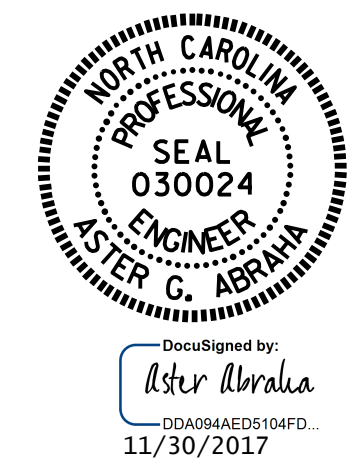


SECTION Q-Q
BERM RIP RAPPED



SECTION C-C

PROJECT NO. 17BP.6.R.89
HARNETT COUNTY
STATION: 17+51.00 -L-



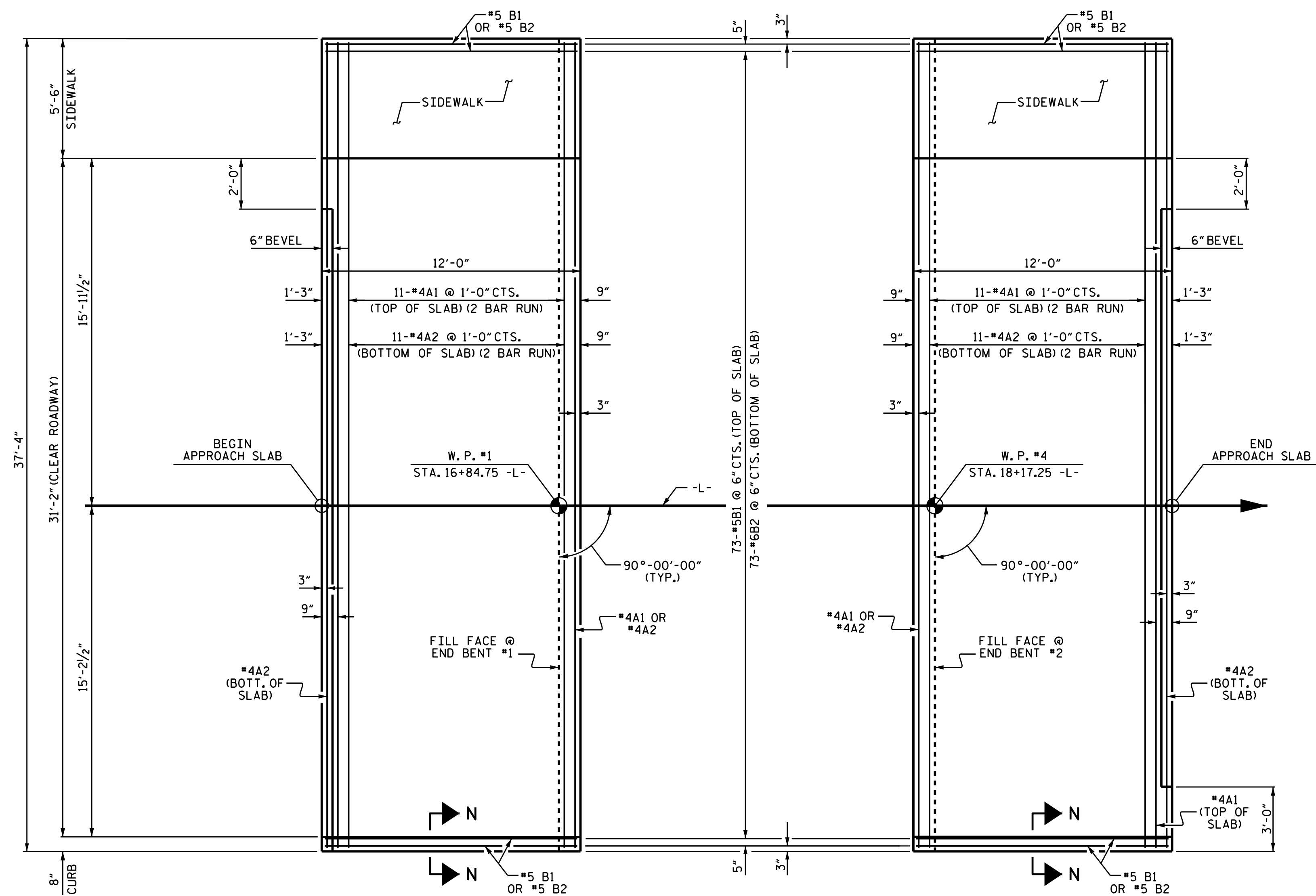
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

—RIP RAP DETAILS—

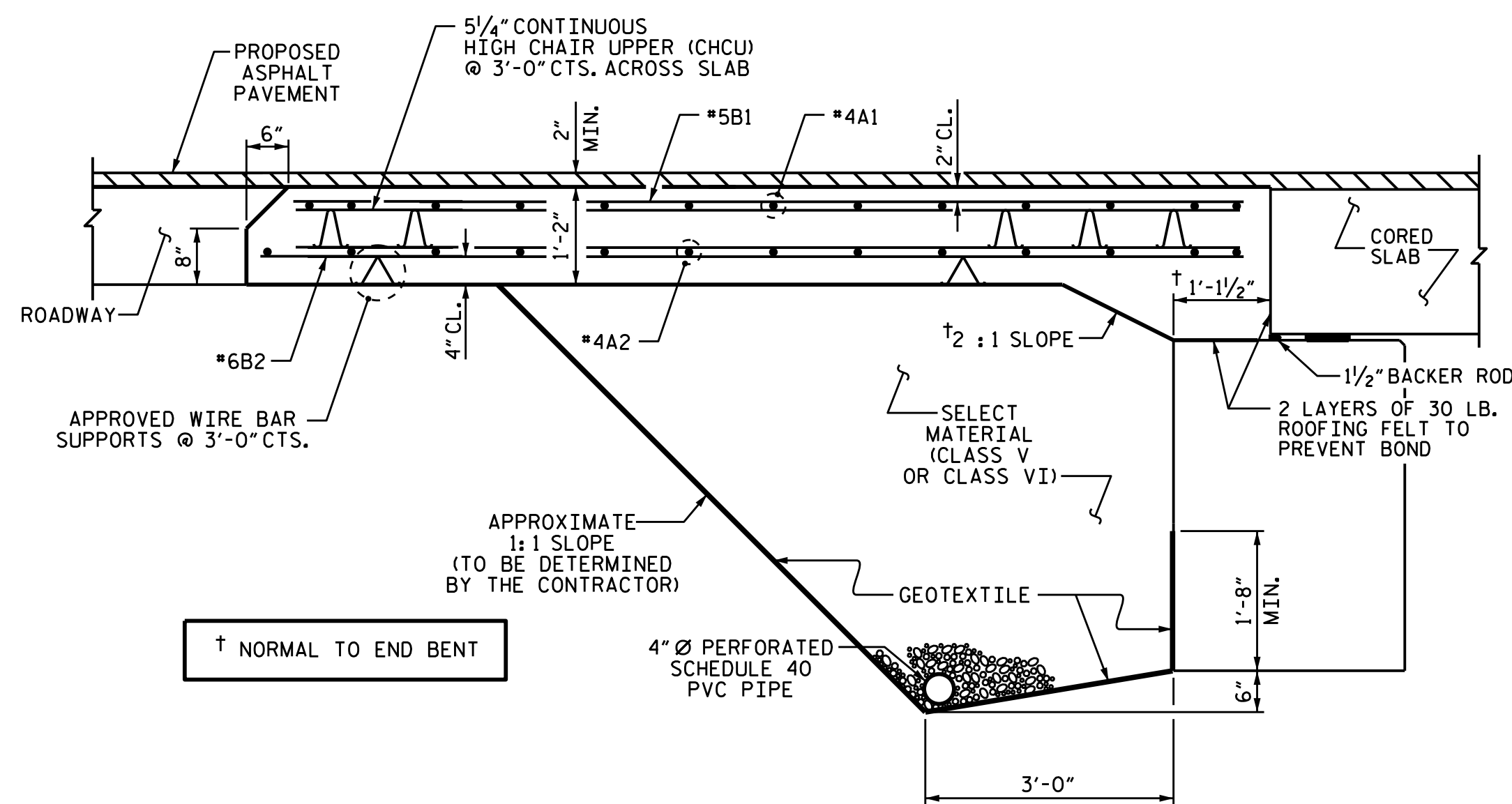
ASSEMBLED BY : S. B. WILLIAMS	DATE : 10-19-17
CHECKED BY : S. WANCE	DATE : 10/17
DRAWN BY : REK 1/84	REV. 5/1/06R TLA/GM
CHECKED BY : ROU 1/84	REV. 10/1/11 MAA/GM
	REV. 12/21/11 MAA/GM

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

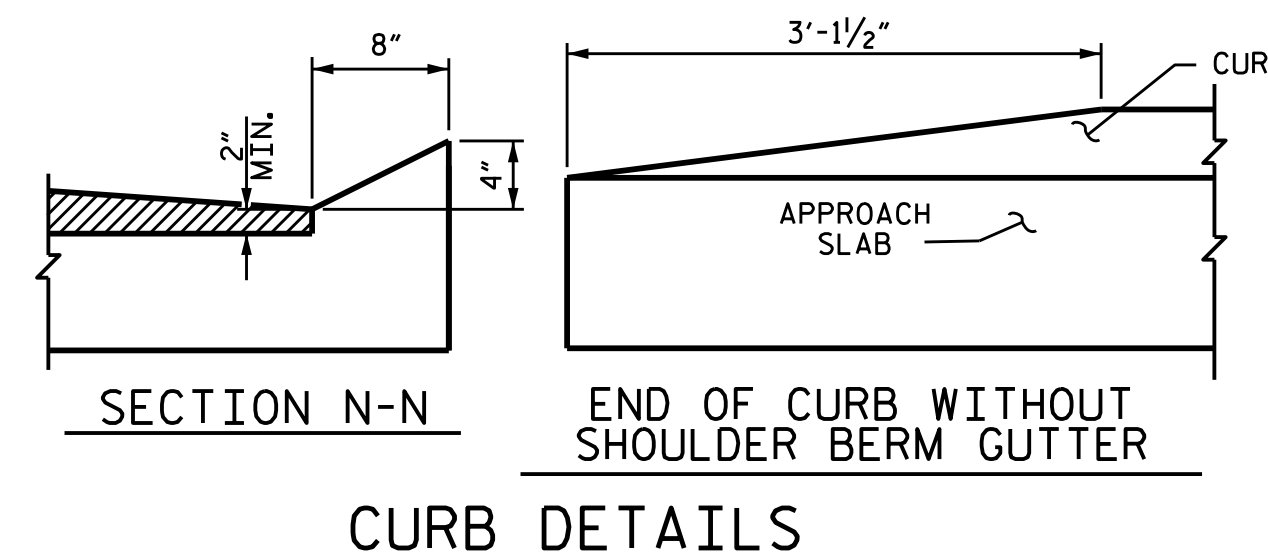
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-28
1			3			TOTAL SHEETS
2			4			29



DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS
SIDEWALK DETAILS NOT SHOWN FOR CLARITY



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



NOTES

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

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

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

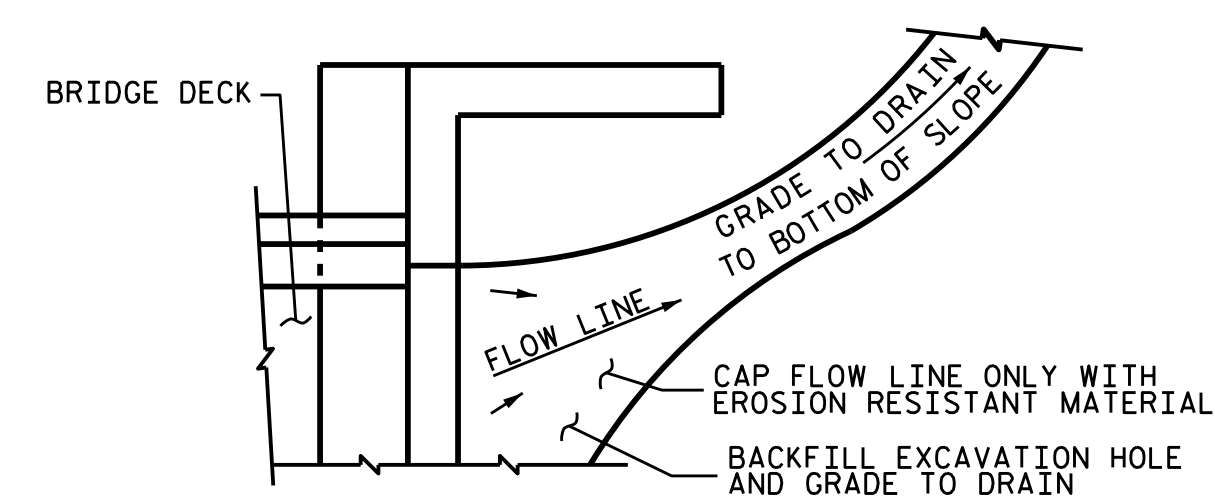
SELECT MATERIAL BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.

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

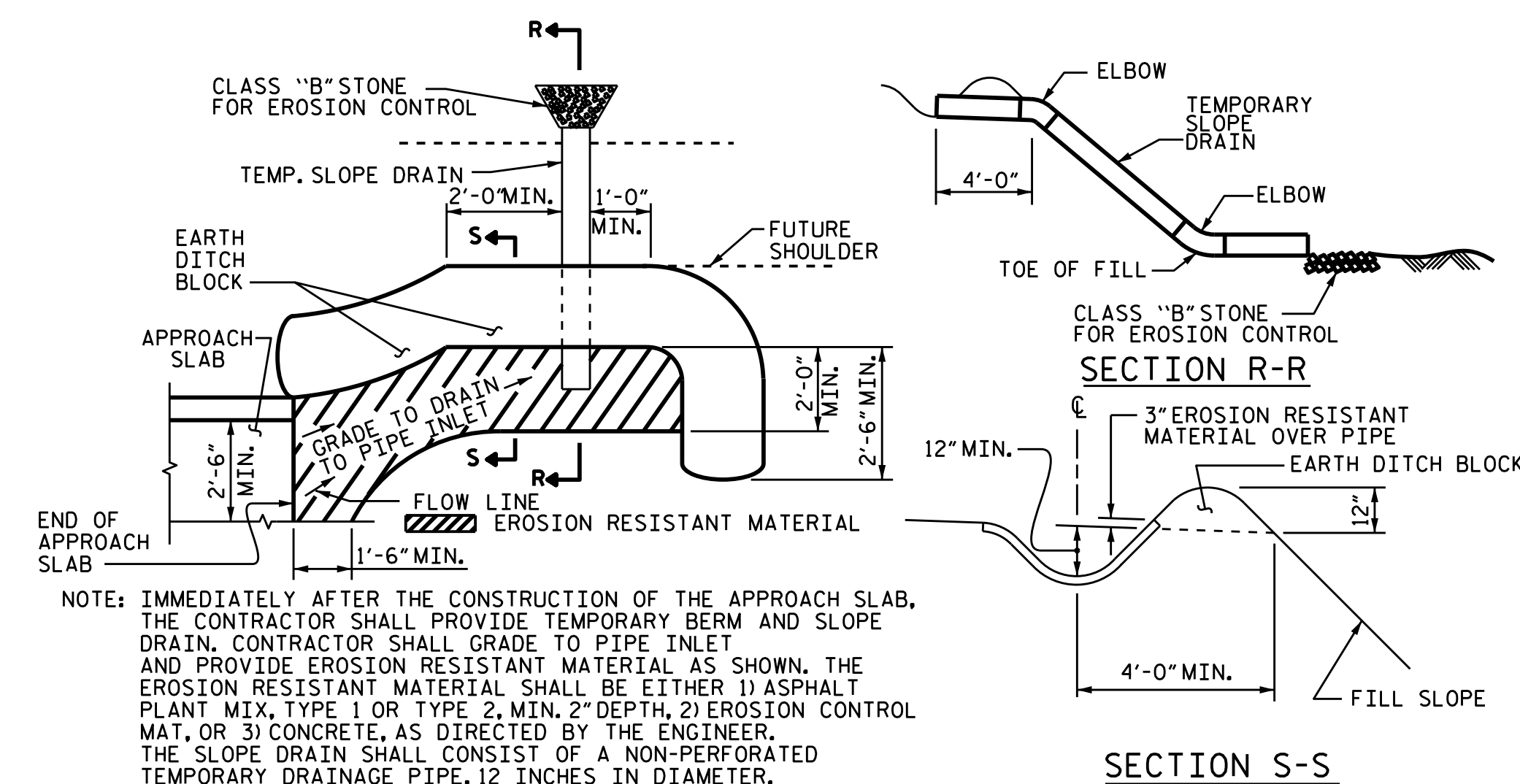
AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

APPROACH SLAB GROOVING IS NOT REQUIRED.

FOR SIDEWALK QUANTITIES AND DETAILS, SEE SHEET S-10.



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.



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

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

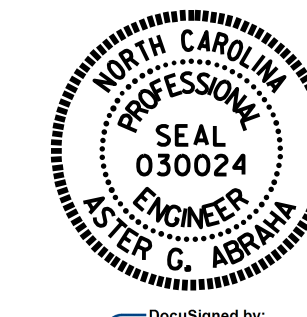
BILL OF MATERIAL						
APPROACH SLAB AT EB #1						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
*A1	26	#4	STR	19'-6"	339	
A2	26	#4	STR	19'-5"	337	
*B1	75	#5	STR	11'-2"	874	
B2	75	#6	STR	11'-8"	1314	
REINFORCING STEEL					LBS.	1651
*EPOXY COATED REINFORCING STEEL					LBS.	1213
CLASS AA CONCRETE					C. Y.	21.4
APPROACH SLAB AT EB #2						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
*A1	26	#4	STR	19'-6"	339	
A2	26	#4	STR	19'-5"	337	
*B1	75	#5	STR	11'-2"	874	
B2	75	#6	STR	11'-8"	1314	
REINFORCING STEEL					LBS.	1651
*EPOXY COATED REINFORCING STEEL					LBS.	1213
CLASS AA CONCRETE					C. Y.	21.4

ASSEMBLED BY : S. B. WILLIAMS DATE : 9-1-17
CHECKED BY : M. AHMED DATE : 10-4-17
DRAWN BY : SHS/MAA 5-09
CHECKED BY : BCH 5-09

REV. 9-15 MAA/TMG

30-NOV-2017 10:07
R:\Structures\FINAL PLANS\17BP.6.R.89_SMU.AS.420246.dgn
adbrano

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



DocuSigned by:
Aster Abramo
11/30/2017

PROJECT NO. 17BP.6.R.89
HARNETT COUNTY
STATION: 17+51.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
BRIDGE APPROACH SLAB
FOR PRESTRESSED CONCRETE
CORED SLAB UNIT
(SUB-REGIONAL TIER)
90° SKEW

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-29	
1			3			TOTAL SHEETS 29	
2			4				

STD. NO. BAS_39_90S

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 2018 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

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

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

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

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

HANDRAILS AND POSTS:

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

METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINS 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.

ENGLISH

JANUARY, 1990

STD. NO. SN

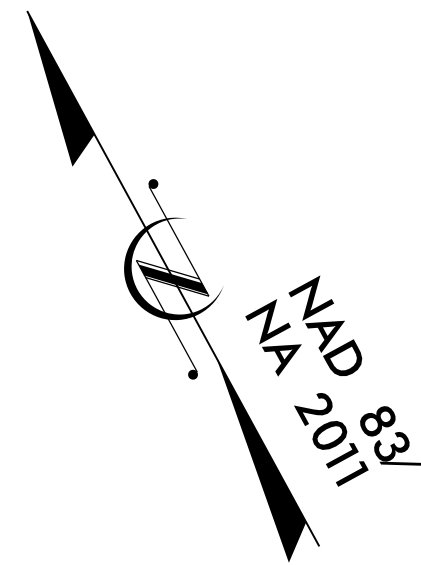
PROJECT: 17BP.6.R.89

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

HARNETT COUNTY

**LOCATION: REPLACE BRIDGE 246 OVER BLACK RIVER
 ON SR 1718 (ERWIN ROAD)**

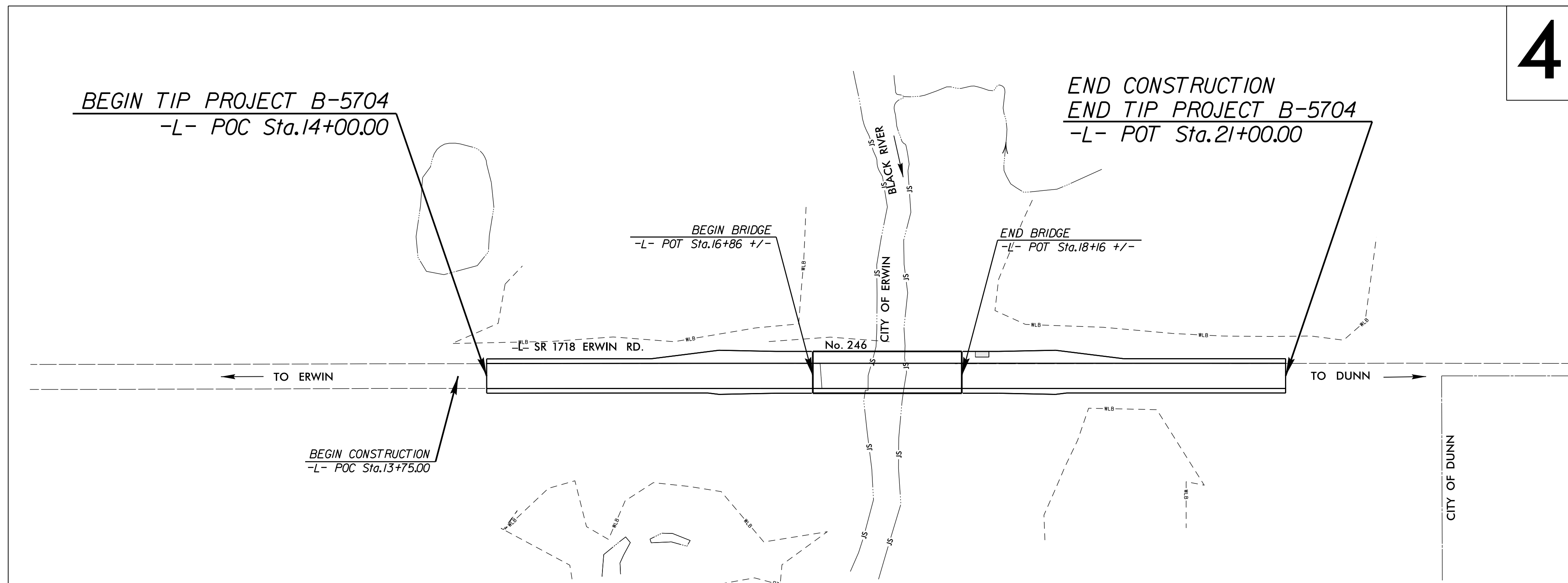
TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND STRUCTURE



STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	17BP.6.R.89	EC-1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	

EROSION AND SEDIMENT CONTROL MEASURES

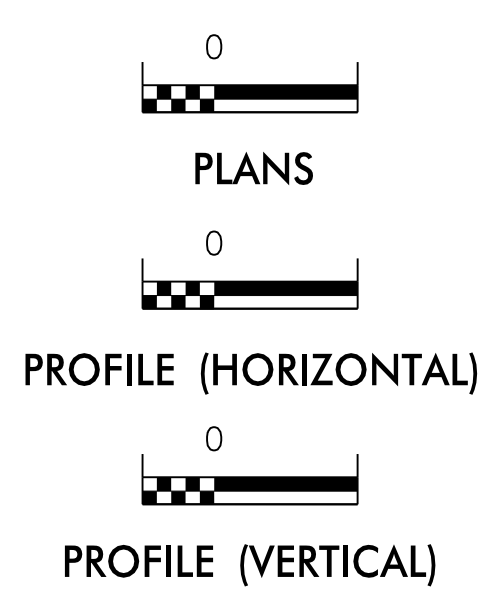
Std. #	Description	Symbol
1630.03	Temporary Silt Ditch	TD
1630.05	Temporary Diversion	TD
1605.01	Temporary Silt Fence	III III III
1606.01	Special Sediment Control Fence	△△△△△△△△
1622.01	Temporary Berms and Slope Drains	—
1630.02	Silt Basin Type B	▨
1633.01	Temporary Rock Silt Check Type-A	▩
	Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM)	▩
1633.02	Temporary Rock Silt Check Type-B	▩
	Wattle/Coir Fiber Wattle	—
	Wattle/Coir Fiber Wattle with Polyacrylamide (PAM)	—
1634.01	Temporary Rock Sediment Dam Type-A	▩
1634.02	Temporary Rock Sediment Dam Type-B	▩
1635.01	Rock Pipe Inlet Sediment Trap Type-A	⊓
1635.02	Rock Pipe Inlet Sediment Trap Type-B	⊓
1630.04	Stilling Basin	▭
1630.06	Special Stilling Basin	▭
	Rock Inlet Sediment Trap:	
1632.01	Type A	A
1632.02	Type B	B
1632.03	Type C	C
	Skimmer Basin	▭
	Tiered Skimmer Basin	▭
	Infiltration Basin	▭



4

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

GRAPHIC SCALE



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 1, 2016
 ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND
 NATURAL RESOURCES DIVISION OF WATER QUALITY.

Prepared in the Office of:
ROADSIDE ENVIRONMENTAL UNIT

1 South Wilmington St.
 Raleigh, NC 27611

2012 STANDARD SPECIFICATIONS

Designed by:

Wes Chandler **3374**
 NAME LEVEL III CERTIFICATION NO.

Roadway Standard Drawings

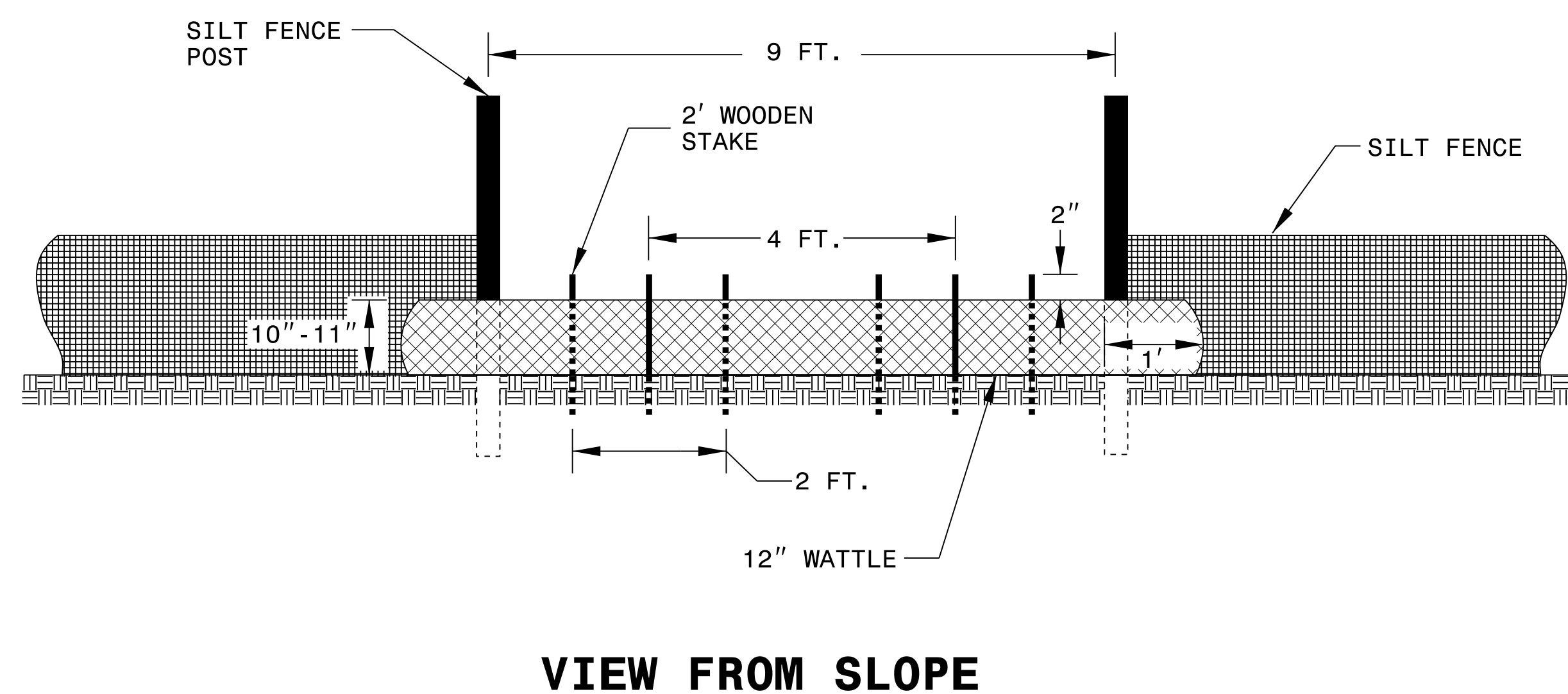
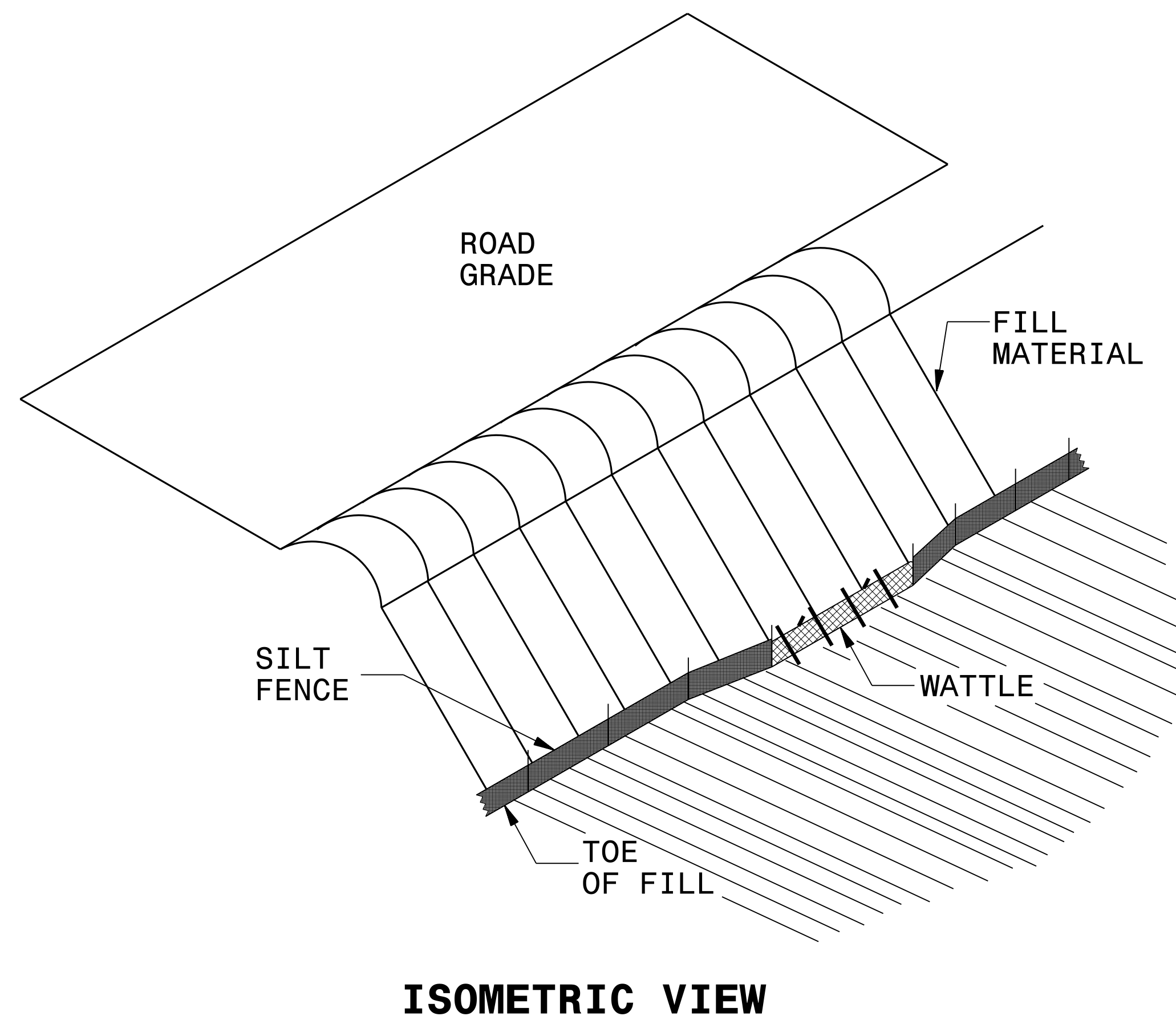
The following roadway english standards as appear in "Roadway Standard Drawings"- Roadway Design Unit - N. C. Department of Transportation - Raleigh, N. C., dated January 2012 and the latest revision thereto are applicable to this project and by reference hereby are considered a part of these plans.

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	

04-DEC-2017, 08:43
 R:\Projects\17BP.6.R.89\Drawings\17BP.6.R.89-5704_EC_tsh.dgn
 wjchandler

SILT FENCE COIR FIBER WATTLE BREAK DETAIL

PROJECT REFERENCE NO. 17BP.6.R.89	SHEET NO. EC-2
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



NOTES:

USE MINIMUM 12 IN. DIAMETER COIR FIBER (COCONUT FIBER) 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.

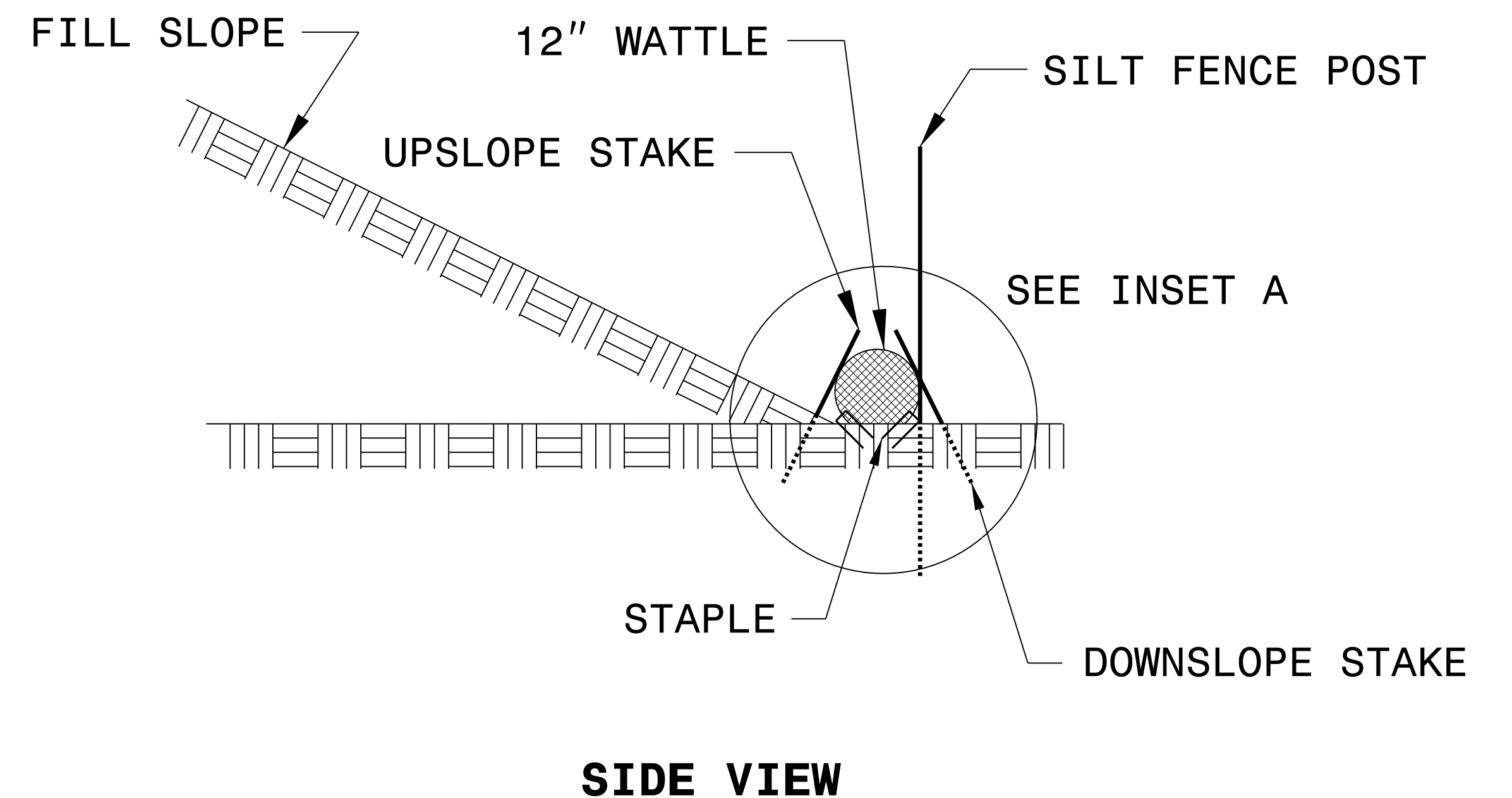
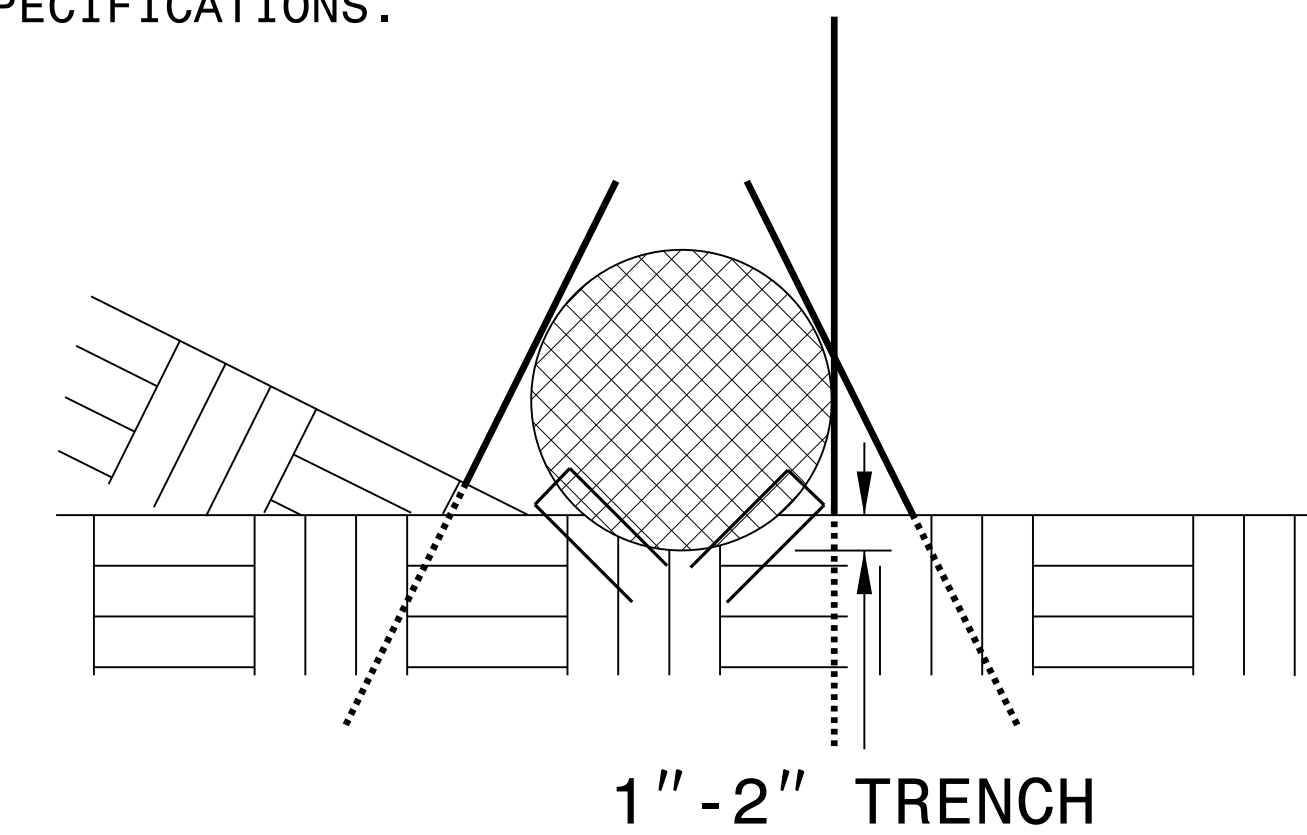
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.

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



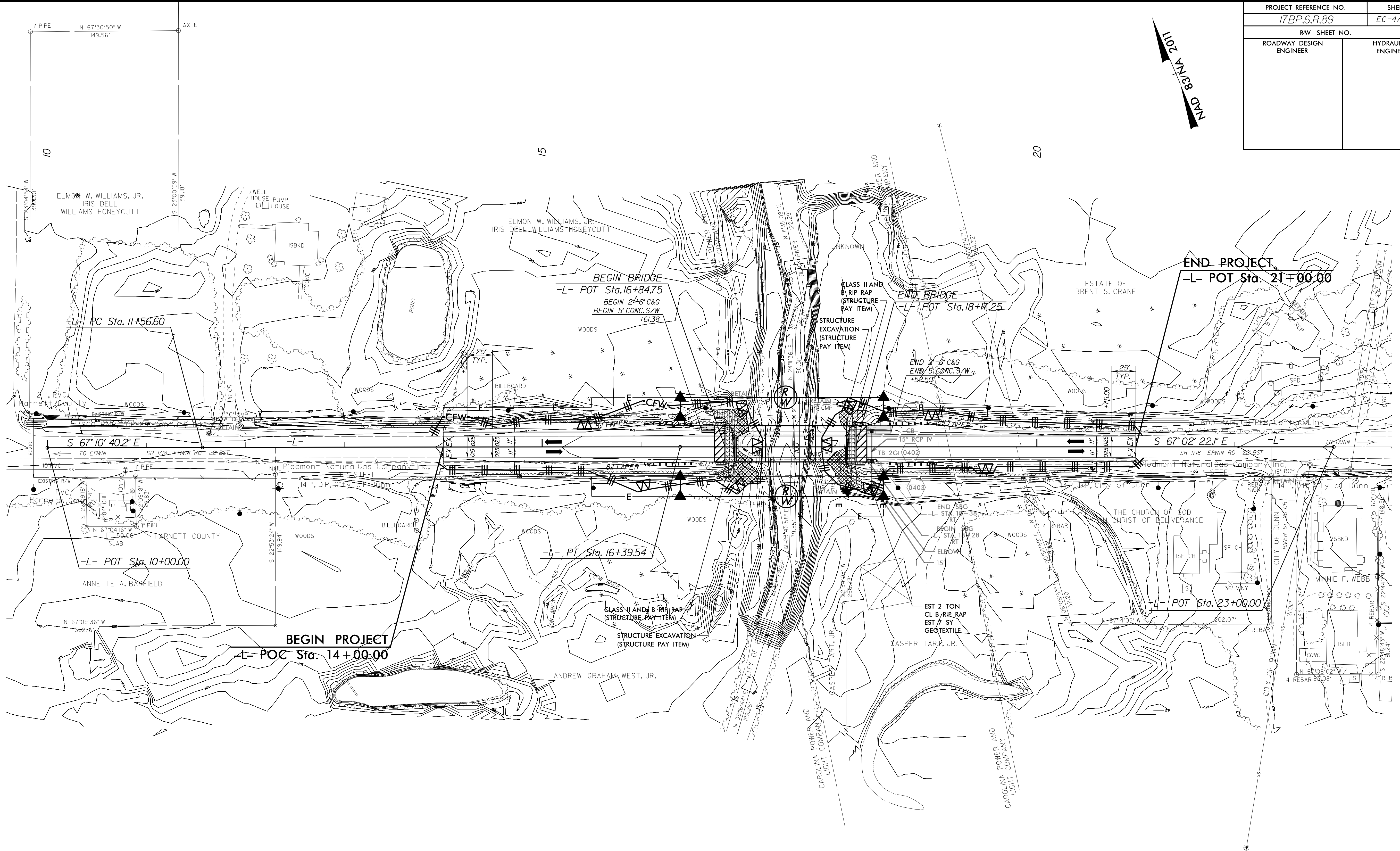
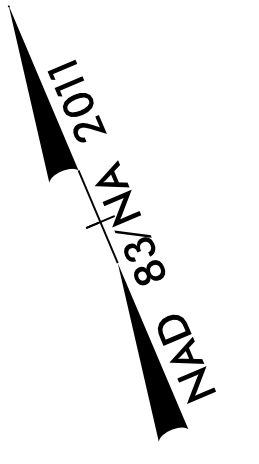
DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

PROJECT REFERENCE NO. <i>17BP.6.R.89</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.

PROJECT REFERENCE NO.	SHEET NO.
17BP.6.R.89	EC-4/CONST.4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 4

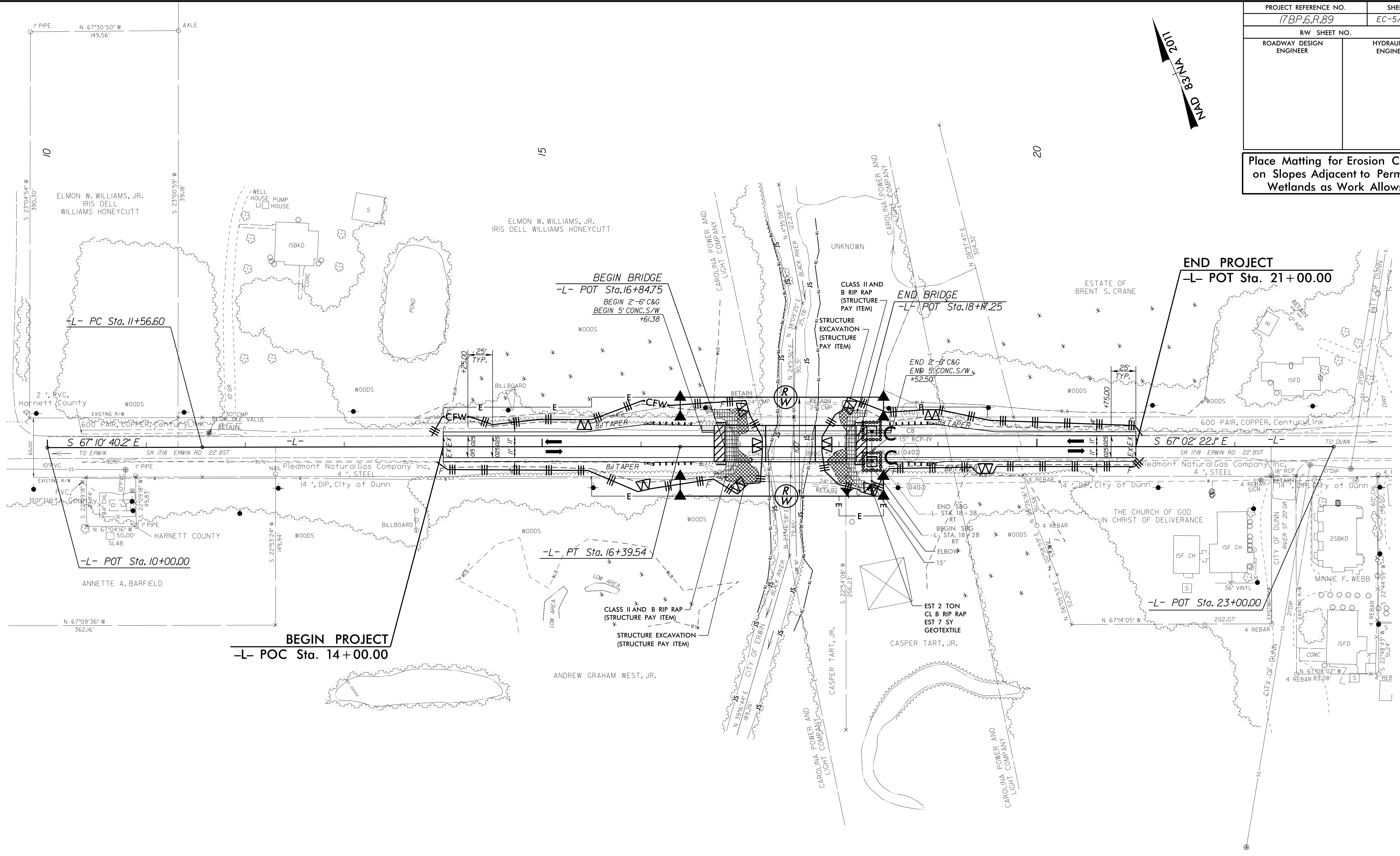
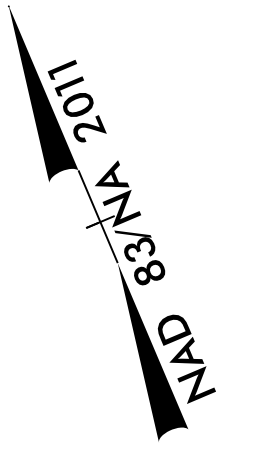
NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE - B
AND TEMPORARY ROCK SILT CHECKS TYPE - A AT
DRAINAGE OUTLETS.

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

8/17/99
04-DEC-2017 08:37 D:\projects\17BP.6.R.89\17BP.6.R.89_EC-4.dgn
R:\projects\17BP.6.R.89\17BP.6.R.89_EC-4.dgn
R:\projects\17BP.6.R.89\17BP.6.R.89_EC-4.dgn

PROJECT REFERENCE NO. 17BP.6.R.89	SHEET NO. EC-5/CONST.4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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



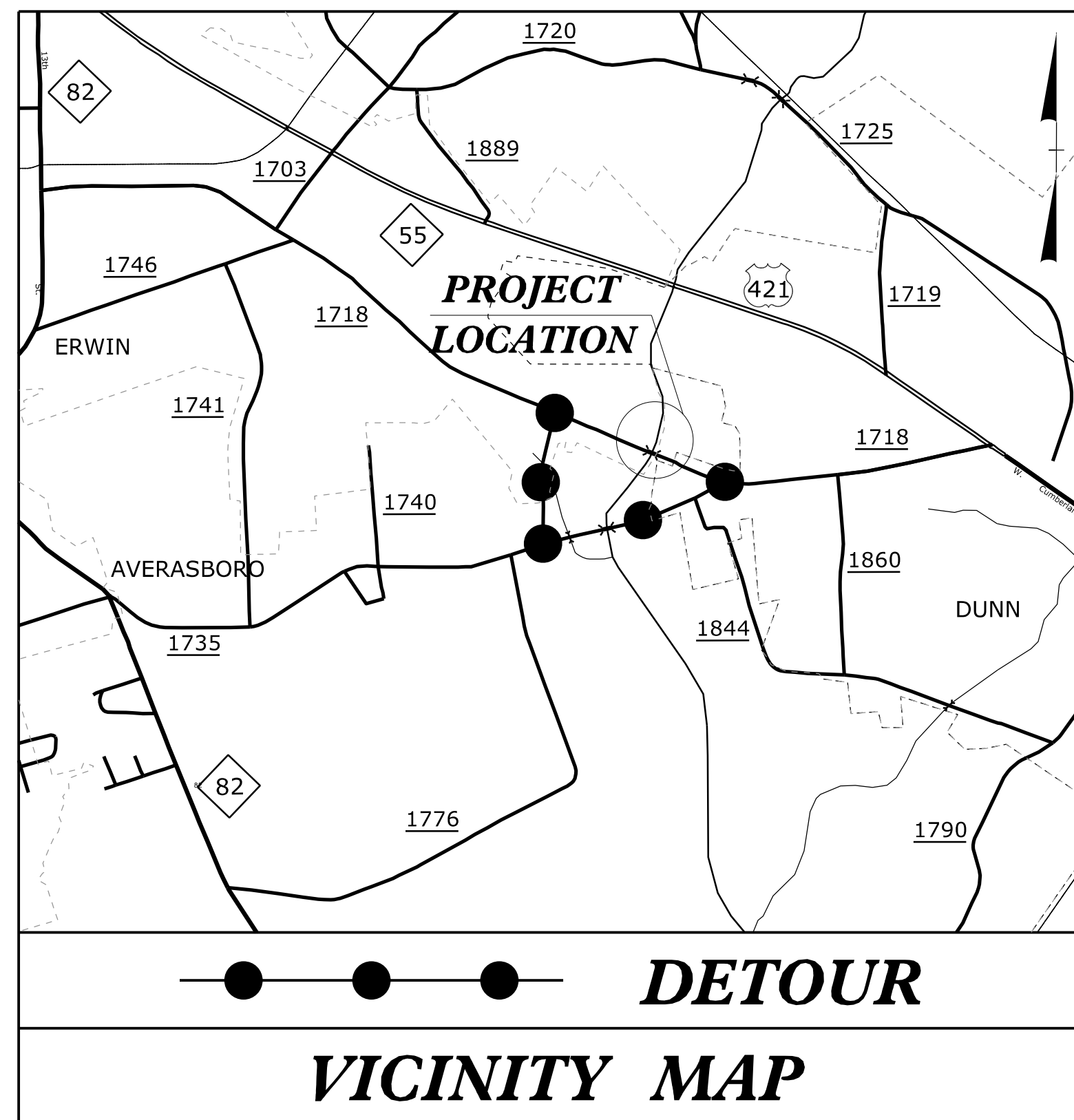
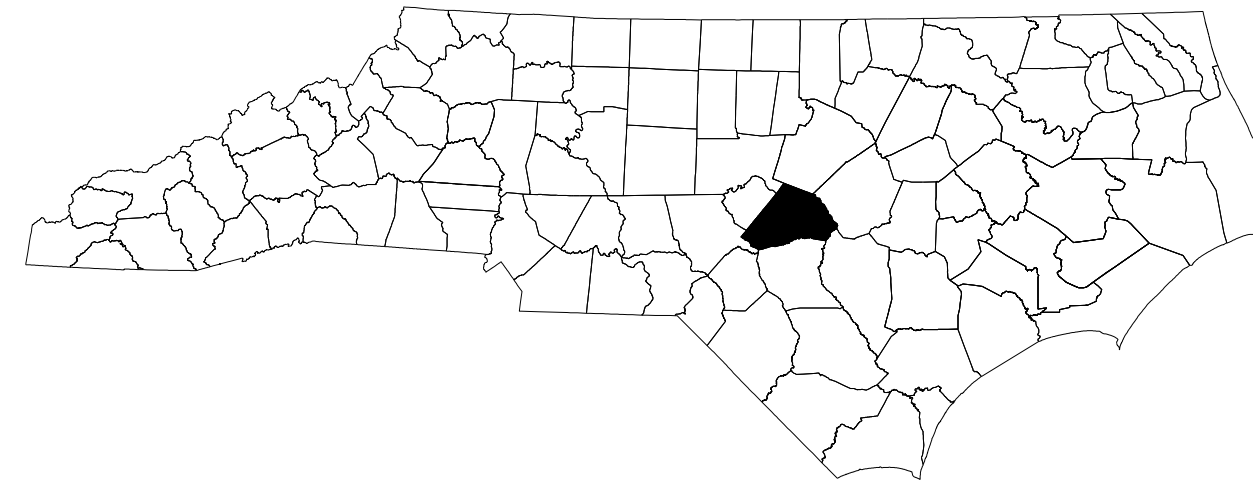
NOTE:
UTILIZE SPECIAL STILLING BASIN(S)
AS STILLING BASIN WHERE APPLICABLE.

8/17/99
04-DEC-2017 08:39
R:\Information\17BP.6.R.89\17BP.6.R.89-5704_EC.pst-4.dgn

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

HARNETT COUNTY



LOCATION: REPLACE BRIDGE 246 OVER BLACK RIVER ON SR 1718 (ERWIN ROAD)

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEEES #F-0326

INDEX OF SHEETS

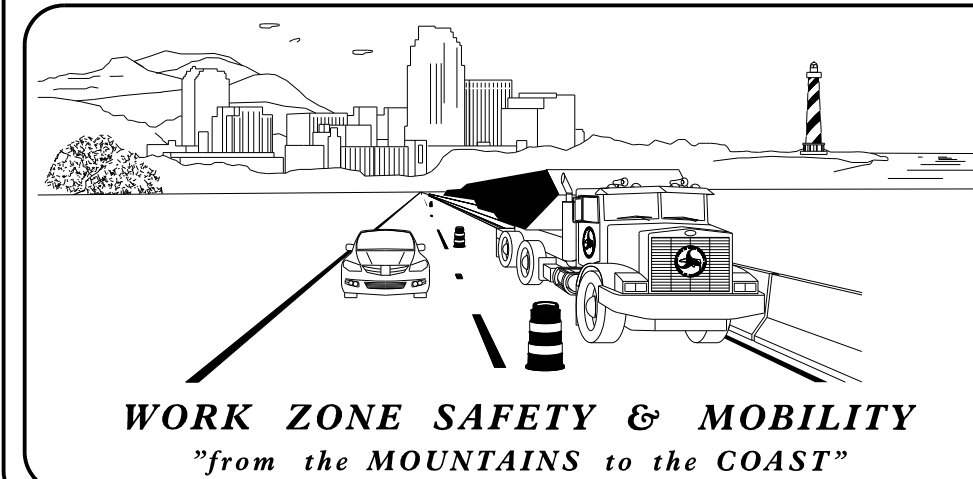
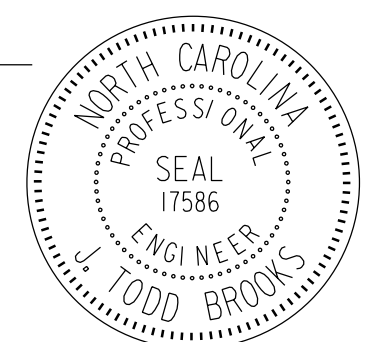
SHEET NO.	TITLE
TMP-1	TITLE SHEET, VICINITY MAP, AND INDEX OF SHEETS
TMP-1A	LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, LEGEND, GENERAL NOTES, AND PHASING
TMP-2	SPECIAL SIGN DESIGN - ERWIN ROAD
TMP-3	SPECIAL SIGN DESIGN - DENIM DRIVE
TMP-4	TEMPORARY TRAFFIC CONTROL - OFF-SITE DETOUR AND DETOUR SIGNS

SHEET NO.
TMP-1

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

APPROVED: _____
DATE: 9/14/2017

SEAL



N.C.D.O.T. WORK ZONE TRAFFIC CONTROL
1561 MAIL SERVICE CENTER (MSC) RALEIGH, NC 27699-1561
750 N. GREENFIELD PARKWAY, GARNER, NC 27529 (DELIVERY)
PHONE: (919) 814-5000 FAX: (919) 711-2745

DR. J. HUMMER, P.E. STATE TRAFFIC MANAGEMENT ENGINEER
J. STEVE KITE, P.E. TRAFFIC CONTROL PROJECT ENGINEER
MATT SPRINGER, P.E. TRAFFIC CONTROL PROJECT DESIGN ENGINEER
_____ TRAFFIC CONTROL DESIGN ENGINEER



14-SEP-2017 16:11
C:\Users\johnc\Documents\TrafficControl\NCDOT 10 Bridges TMP\00053593 - B-5704 TMP Bridge Replace 593\TrafficControl\TCP\B-5704 TCP 01.dgn
FILEZ034 AT DUS300019

PROJECT: 17BP.6.R.89

SIGN NUMBER: SP1 TYPE: STATIONARY QUANTITY: SEE PLANS SIGN WIDTH: 2'-0" HEIGHT: 1'-6" TOTAL AREA: 3.0 Sq.Ft. BORDER TYPE: INSET RECESS: 0.38" WIDTH: 0.5" RADII: 1.5" NO. Z BARS: LENGTH:	BACKG COLOR: Fluorescent Orange COPY COLOR: Black <table border="1" style="width: 100%; text-align: center;"> <tr> <th>SYMBOL</th> <th>X</th> <th>Y</th> <th>WID</th> <th>HT</th> </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> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table> MAT'L: 0.080" (2.0 mm) ALUMINUM	SYMBOL	X	Y	WID	HT																																														DESIGN BY: MB TOTH PROJECT ID: 17BP.6.R.89 CHECKED BY: LOCATION: HARNETT COUNTY DATE: May 02, 2017 DIV: 6
SYMBOL	X	Y	WID	HT																																																

BORDER R=1.5"
TH=0.5"
IN=0.38"

Panel Style: const rect.ssi
M.U.T.C.D.: 2009 Edition

Spacing Factor is 1 unless specified otherwise

LETTER POSITIONS

Letter locations are panel edge to lower left corner

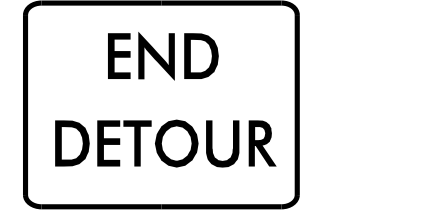
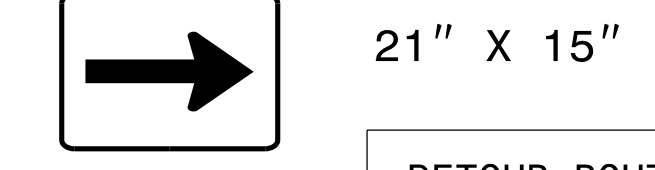
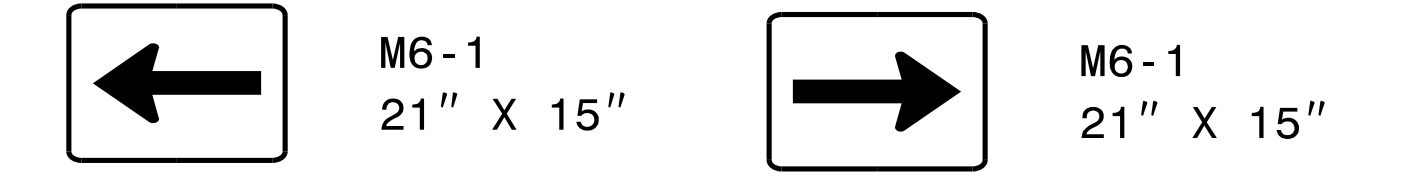
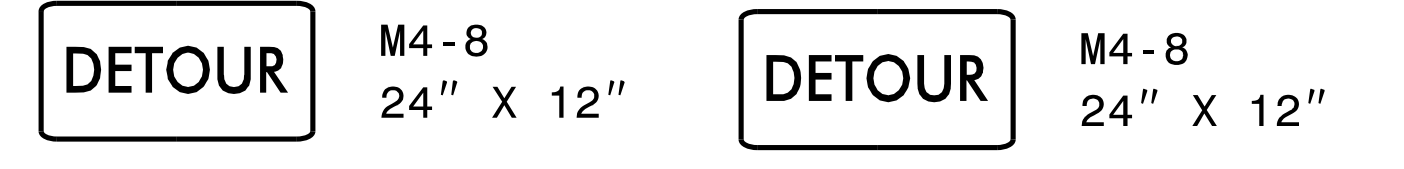
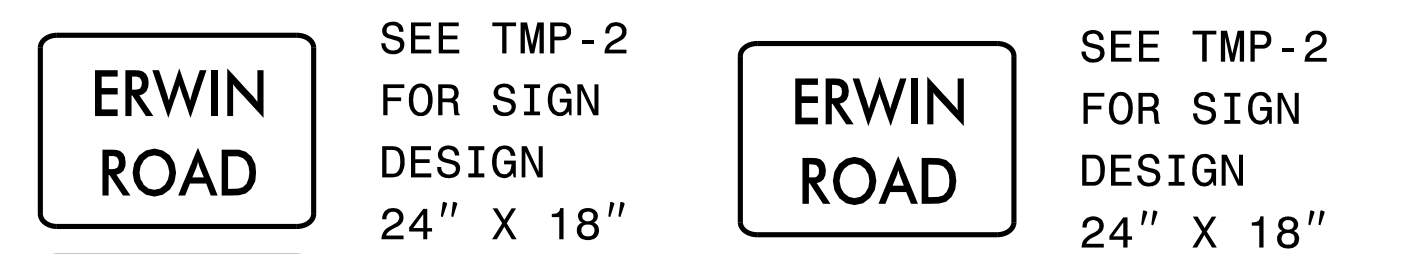
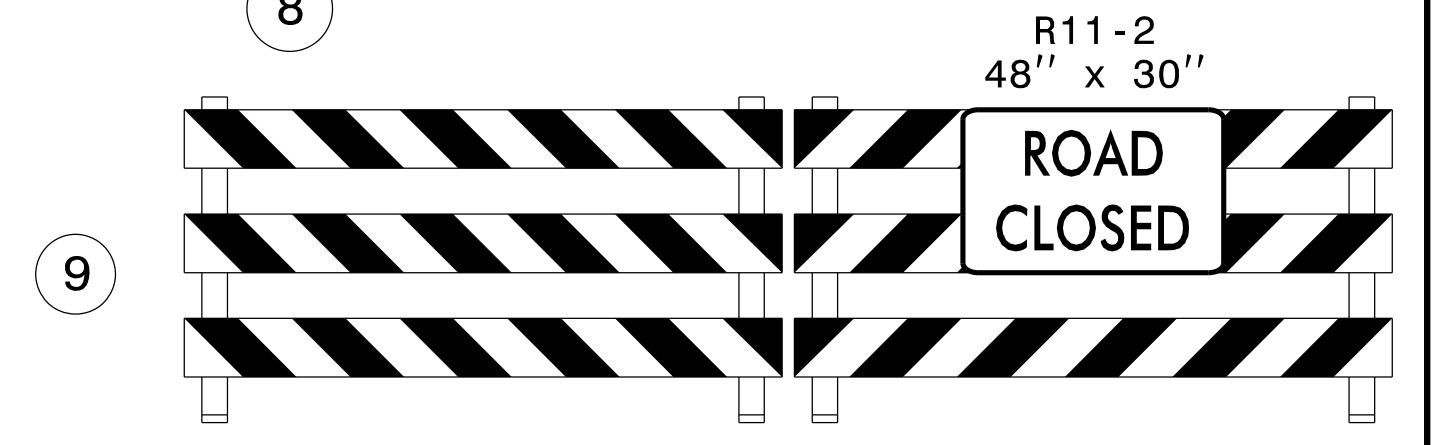
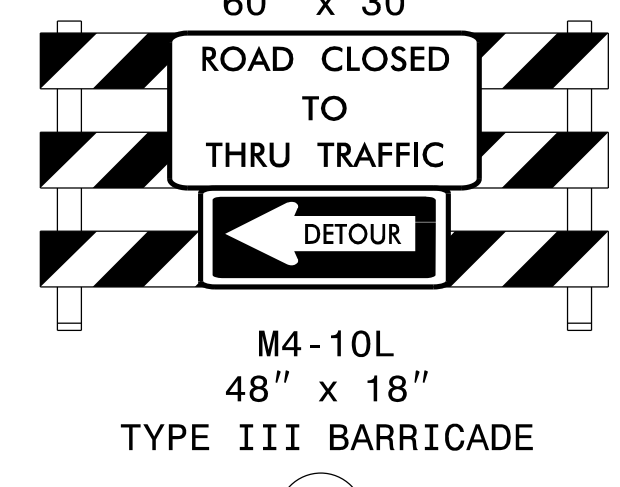
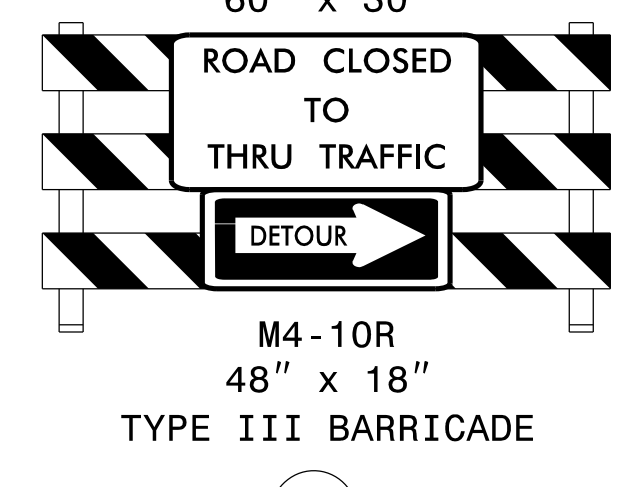
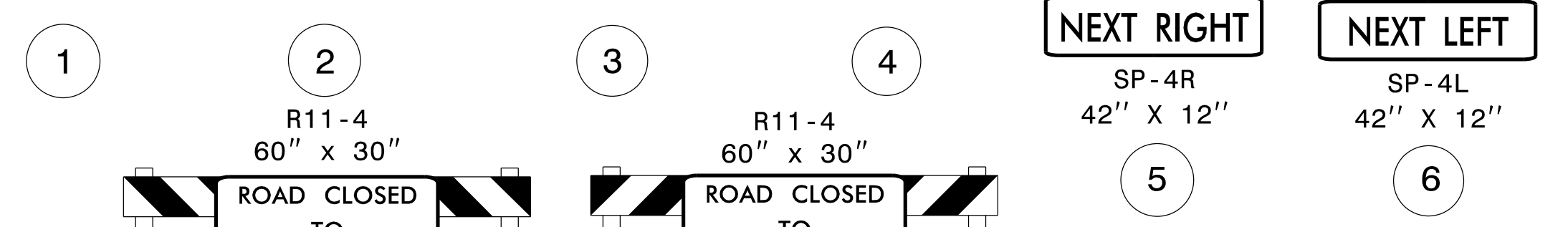
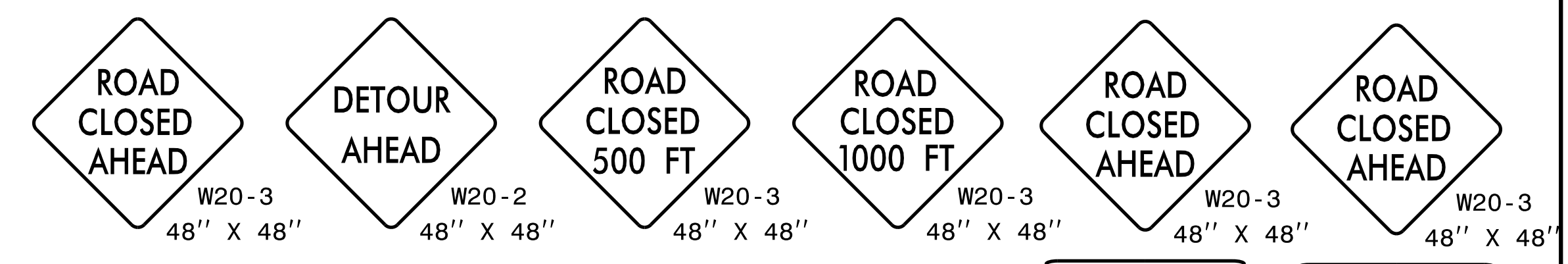
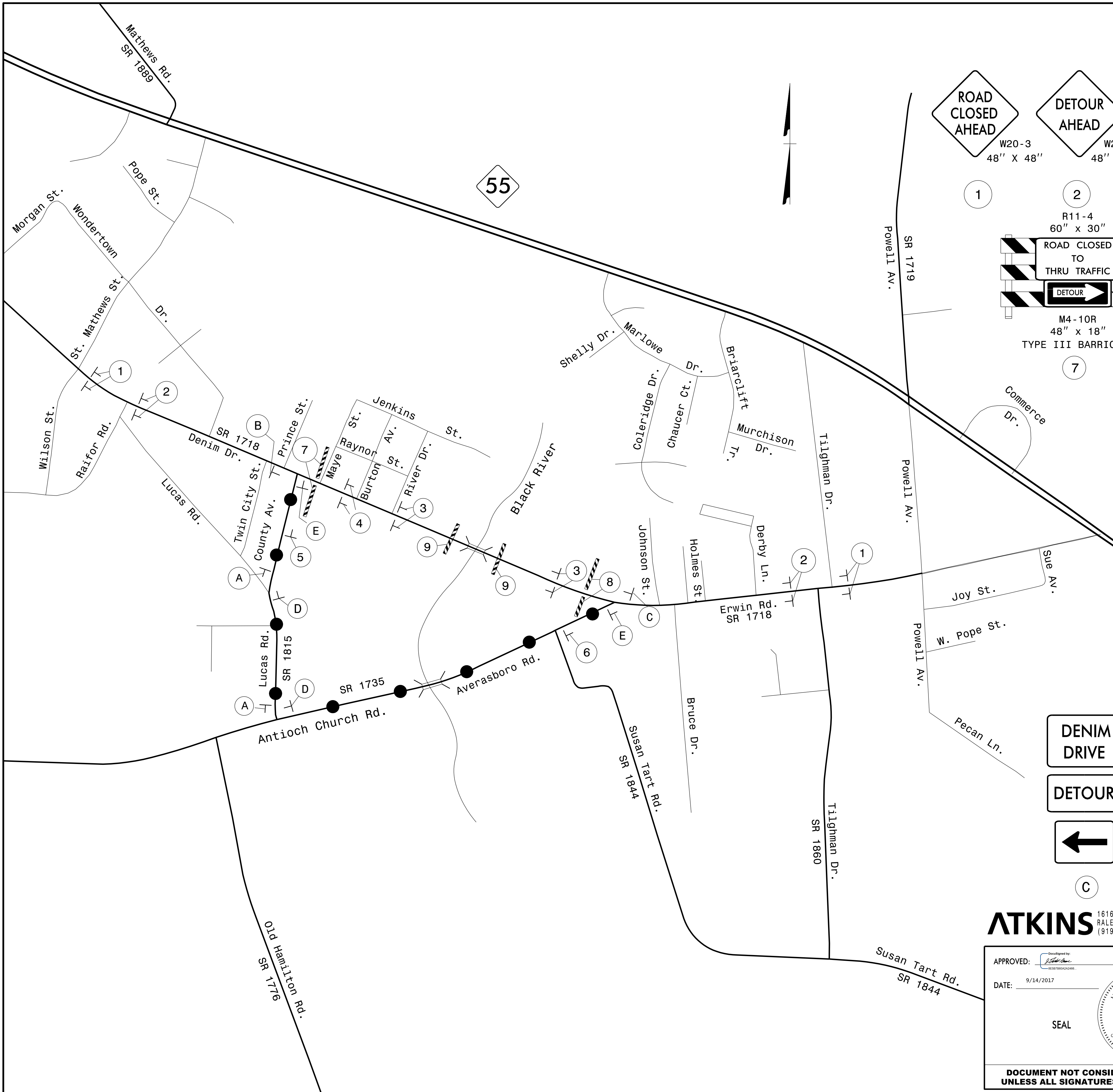
															Series/Size	
															Text Length	
E	R	W	I	N												C 2000
4.1	7.5	10.9	15.4	17.2												15.9
R	O	A	D													C 2000
5.1	8.7	12.2	16.1													13.9

FILENAME: bridge4598 NORTH CAROLINA D.O.T. SIGN DETAIL

14-SEP-2017 16:11
 C:\Users\jtd\Documents\17BP.6.R.89\Traffic\TrafficControl\TCP\B-5704 TCP 02_rev.dgn
 MILE2034 AT DUS300019
 593\Traffic\TrafficControl\TCP\B-5704 TMP Bridge Replace 593\Traffic\TrafficControl\TCP\B-5704 TCP 02_rev.dgn

APPROVED: DATE: 9/14/2017 SEAL			SPECIAL SIGN DESIGN SR 1718 (ERWIN ROAD)
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

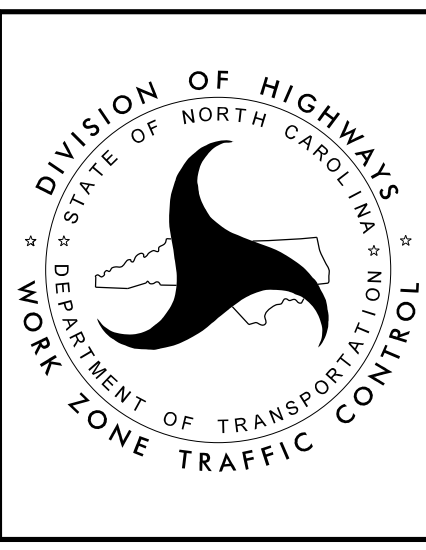
14-SEP-2017 16:11
C:\Users\gmspor\Documents\Traffic\TrafficControl\TCP\B-5704 TCP 04 new.dgn
MILEZ034 - AT - DUS300019



DETOUR ROUTE ●—●—●—●—
SEE RDS 1101.03, SHEET 1 OF 9,
FOR ADDITIONAL INFORMATION
ON SIGN LOCATIONS AND NOTES.

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 160
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCEES #F-0326

APPROVED: [Signature]
DATE: 9/14/2017
SEAL



**TEMP. TRAFFIC CONTROL -
OFF-SITE DETOUR
AND DETOUR SIGNS
SR 1718
(ERWIN ROAD/DENIM DRIVE)**

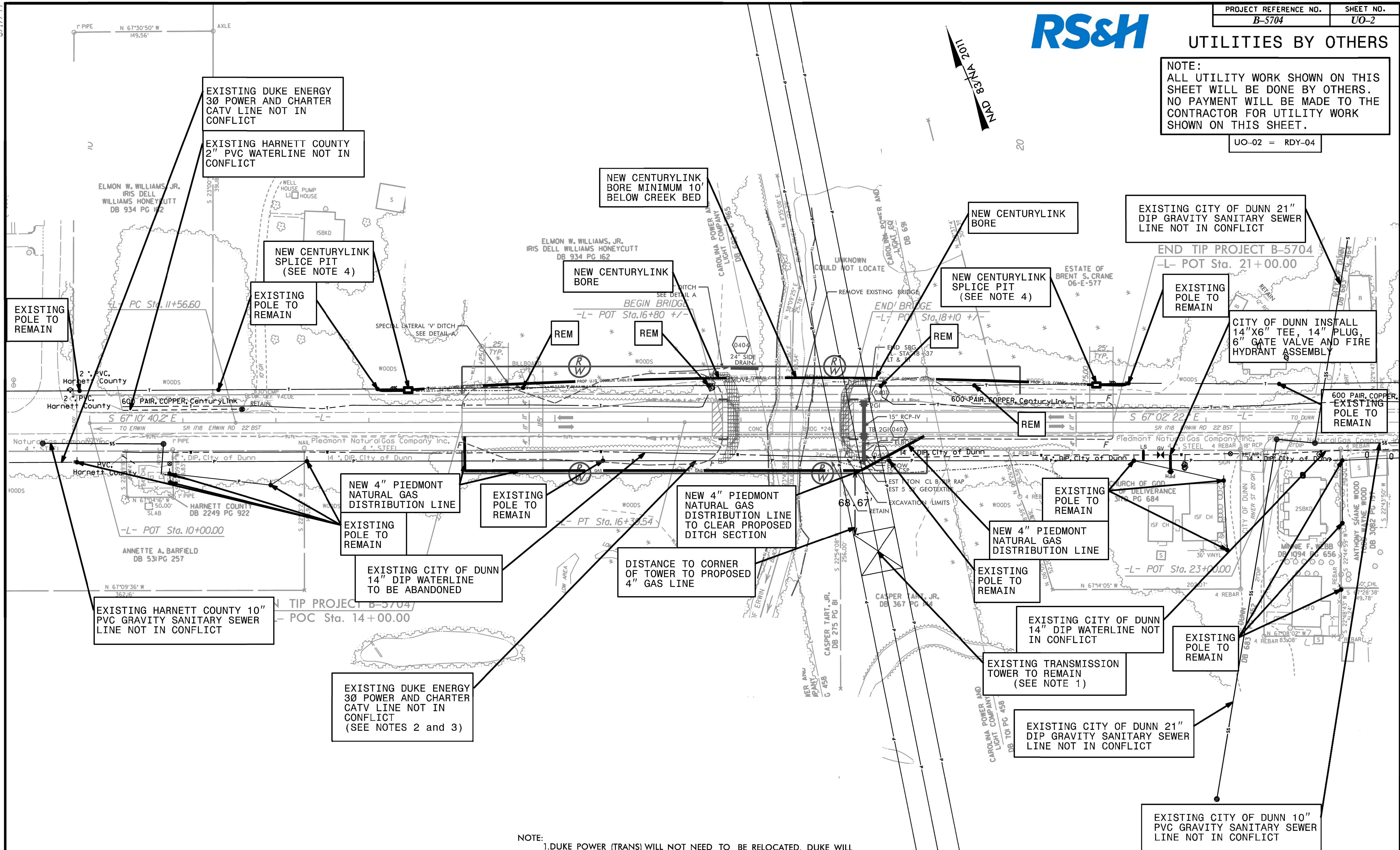
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



UTILITIES BY OTHERS

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

UO-02 = RDY-04



- NOTE:
1. DUKE POWER (TRANS) WILL NOT NEED TO BE RELOCATED. DUKE WILL NEED A ONE MONTH NOTICE PRIOR TO DE-ENERGIZING THE TRANSMISSION LINES, WHICH WILL BE MARCH 15, 2018 THRU MAY 27, 2018. THE CONDUCTORS WILL BE DE-ENERGIZED FOR THE CONSTRUCTION OF THE BRIDGE PILES. CONTRACTOR WILL NEED TO MAINTAIN A MINIMUM CLEARANCE OF 35' TO THE CONDUCTORS WHEN RE-ENERGIZED. THE NAME OF THE TRANSMISSION LINE IS CUMBERLAND - WAKE 500KV LINE. TOWER NAME IS T-147
 2. DUKE POWER (DIST) IS NOT IN CONFLICT AND WILL NOT BE RELOCATED
 3. CHARTER COMMUNICATION CATV IS IN JOINT USE WITH DUKE AND WILL NOT BE RELOCATED
 4. CENTURLINK WILL RELOCATE WITHIN THEIR EXISTING AERIAL EASEMENT

UTILITY OWNERS ON THIS SHEET	
DUKE POWER - POWER (TRANS)	
DUKE POWER - POWER (DIST)	
PIEDMONT NATURAL GAS - NATURAL GAS	
CENTURYLINK - TELECOMMUNICATIONS/FIBER OPTIC	
CHARTER COMMUNICATION - CATV	
CITY OF DUNN WATER - 14" WATERLINE	
CITY OF DUNN SANITARY SEWER - 21" DIP AND 8" PVC SANITARY SEWER	
HARNETT COUNTY WATER - 2" WATERLINE	
HARNETT COUNTY SANITARY SEWER - 10" SANITARY SEWER	

PLANS PREPARED BY:
RK&K
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

7/10/2017
 M:\Projects\2013\13111 Util.tty.Coordination_(NC00)T\F01_B-5704\B-5704\Utilities\Engineering\UBO\Proj\B5704_ut_r.dwg UO02_psh-Option 2.dgn
 8/17/99