

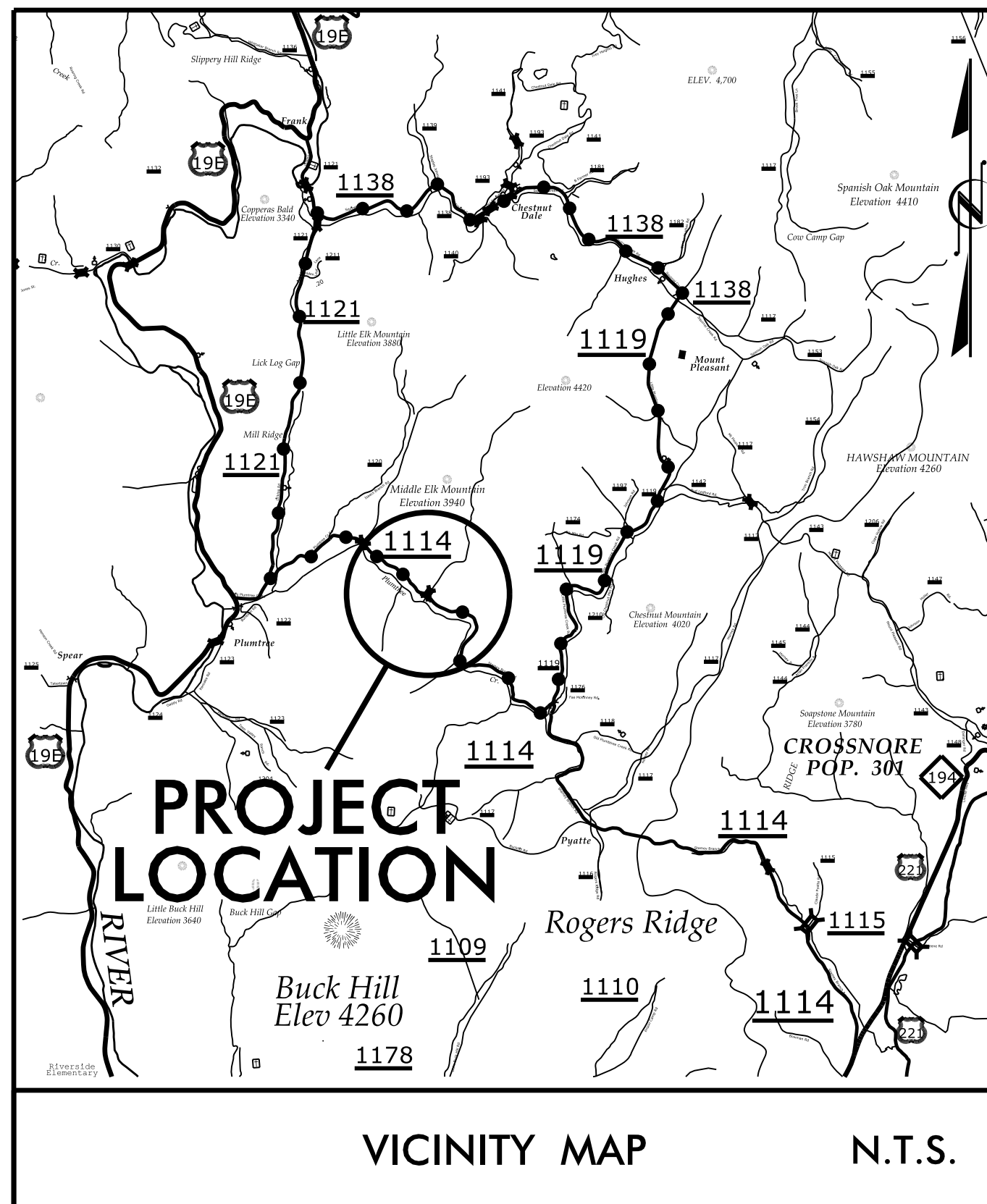
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for the convenience of the user
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with their signature on that page.**

**This file or an individual page
shall not be considered a certified document.**

TIP PROJECT: B-5380

CONTRACT: C203804



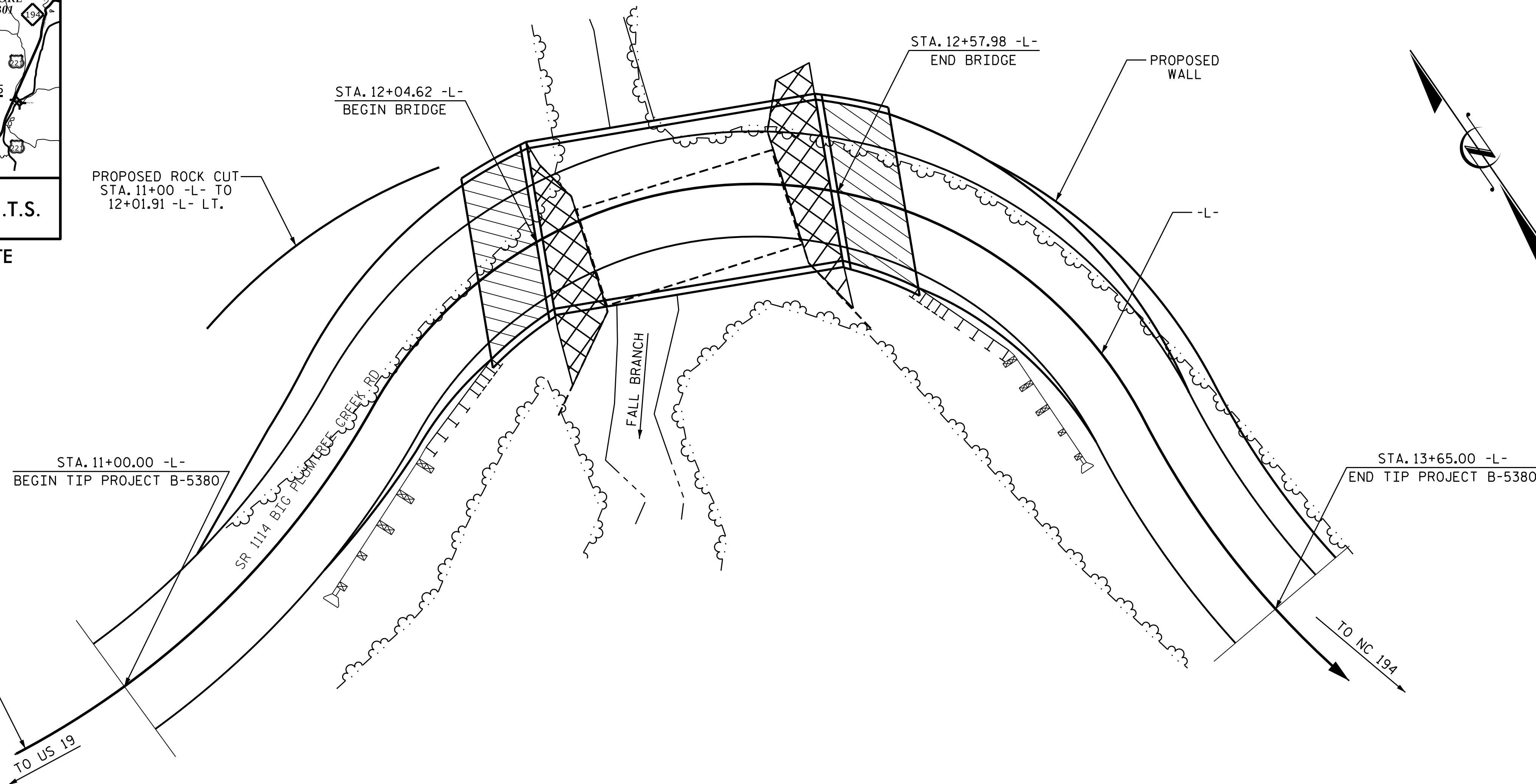
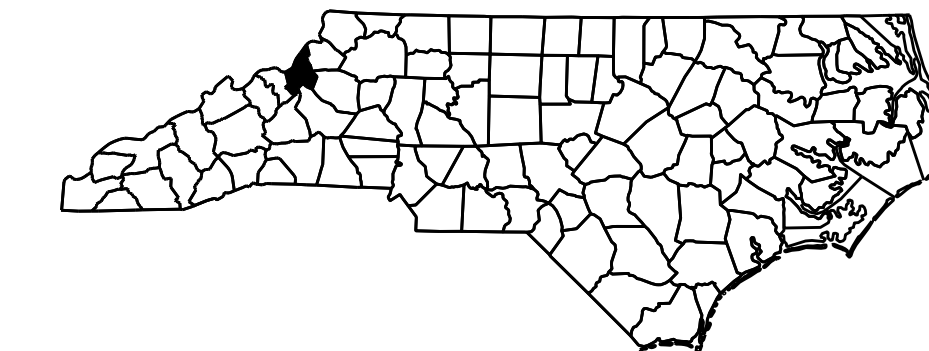
●●●●● OFF-SITE DETOUR ROUTE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
AVERY COUNTY

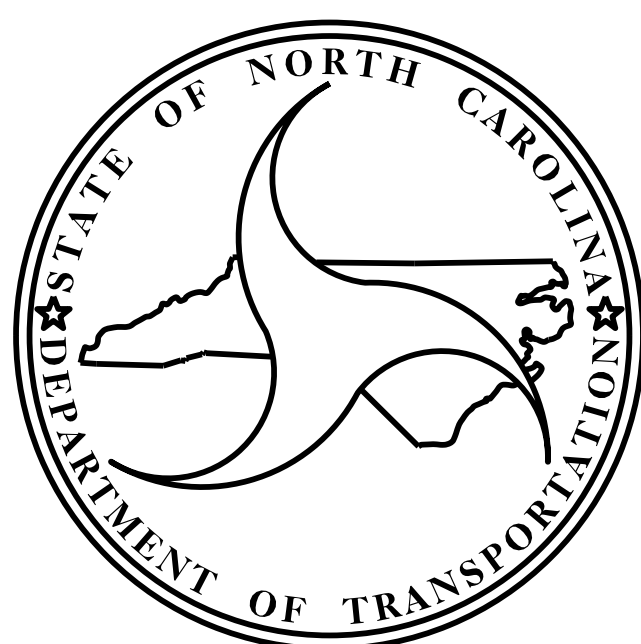
**LOCATION: REPLACE BRIDGE NO. 141 ON SR 1114 OVER
FALL BRANCH**

TYPE OF WORK: GRADING, DRAINAGE, PAVING, BRIDGE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5380		
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
46095.1.1	BRZ-1114(7)	P.E.	
46095.2.1		RW & UTIL	
46095.3.1		CONST.	



STRUCTURES



DESIGN DATA
 ADT 2016 = 215
 ADT 2036 = 286
 K = 12 %
 D = 55 %
 T = 19 % *
 V = 25 MPH
 * TTST = 1% DUAL 18%
 FUNC CLASS =
 LOCAL RURAL
 SUB-REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-5380 = 0.040 MILES
 LENGTH STRUCTURE TIP PROJECT B-5380 = 0.010 MILES
 TOTAL LENGTH TIP PROJECT B-5380 = 0.050 MILES

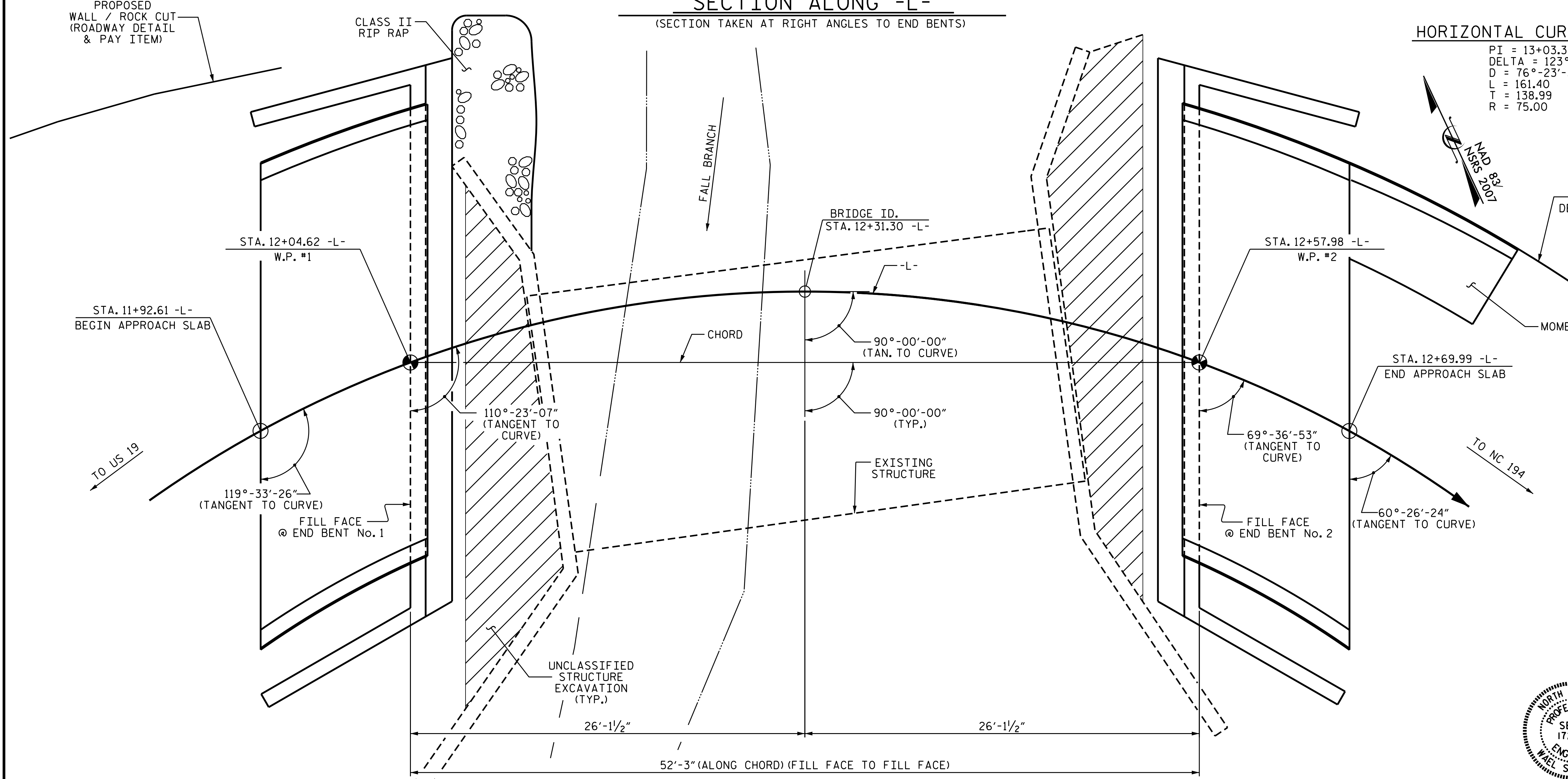
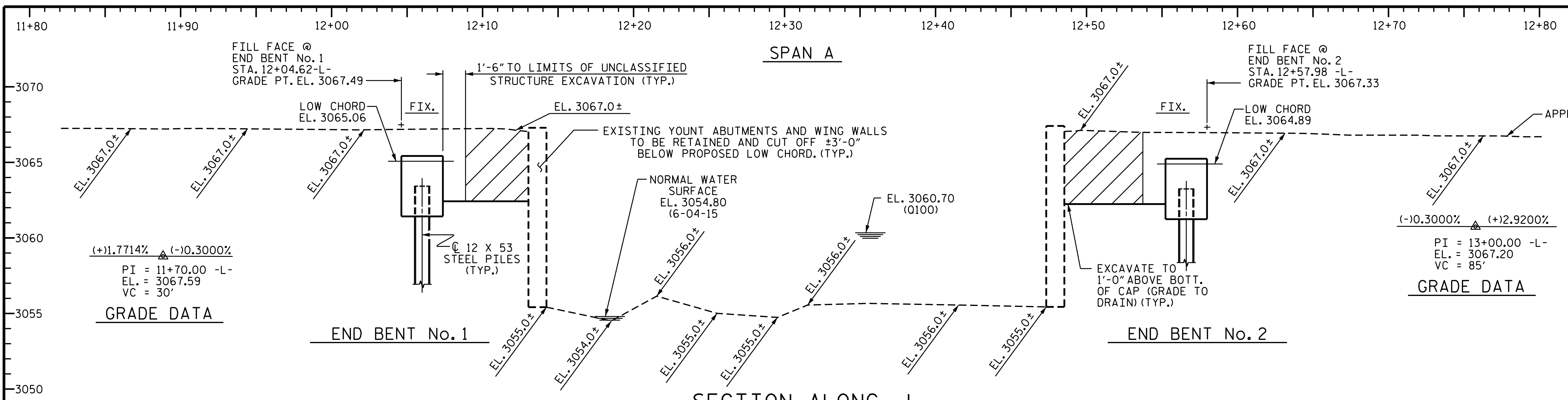
Prepared in the Office of:
DIVISION OF HIGHWAYS
 STRUCTURES MANAGEMENT UNIT
 1000 BIRCH RIDGE DR.
 RALEIGH, N.C. 27610

2012 STANDARD SPECIFICATIONS

LETTING DATE :
 OCTOBER 18, 2016

D.R. CALHOUN, PE
 PROJECT ENGINEER

W.S. ARAFAT, PE
 PROJECT DESIGN ENGINEER



DRAWN BY: H. T. BARBOUR DATE: 4-15-16
 CHECKED BY: V. X. NGUYEN DATE: 6-16
 DESIGN ENGINEER OF RECORD: A. M. LEE DATE: 7-16

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

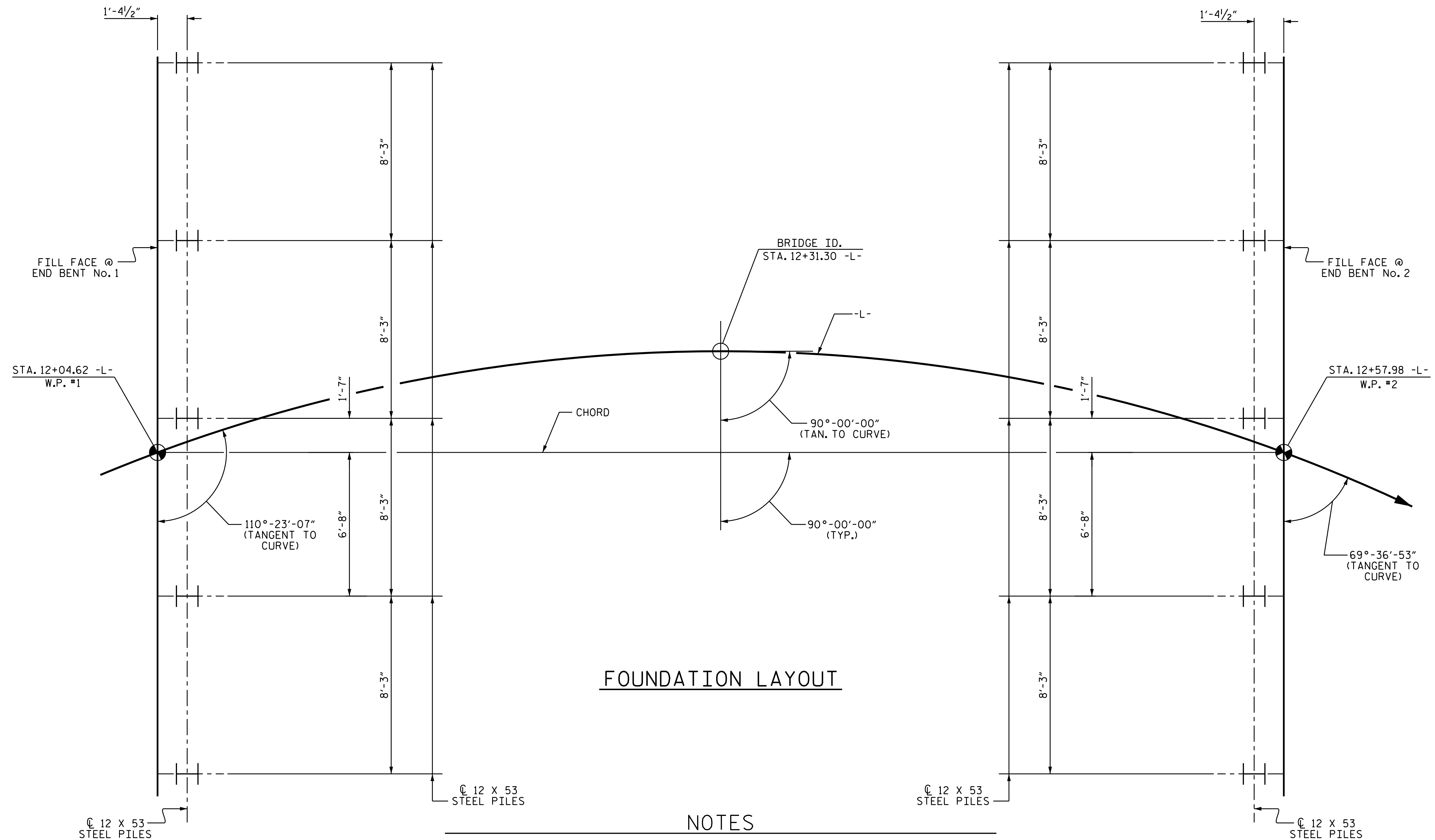
PROJECT NO. B-5380
 AVERY COUNTY
 STATION: 12+31.30 -L-
 SHEET 1 OF 3 REPLACES BRIDGE No. 141



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

**GENERAL DRAWING
 FOR BRIDGE OVER
 FALL BRANCH ON SR 1114
 BETWEEN US 19 AND
 NC 19A**

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



FOUNDATION LAYOUT

NOTES

FOR PILES, SEE GEOTECHNICAL SPECIAL PROVISIONS AND SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 85 TONS PER PILE. DRIVE PILES AT END BENT NO. 1 TO A REQUIRED DRIVING RESISTANCE OF 142 TONS PER PILE.

DRILLED-IN PILES ARE REQUIRED FOR END BENT NO. 1. DRILL AND EXCAVATE HOLES AT PILE LOCATIONS 5 FT. INTO HARD ROCK. FOR PILE EXCAVATION, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 85 TONS PER PILE. DRIVE PILES AT END BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 142 TONS PER PILE.

DRILLED-IN PILES ARE REQUIRED FOR END BENT NO. 2. DRILL AND EXCAVATE HOLES AT PILE LOCATIONS 5 FT. INTO HARD ROCK. FOR PILE EXCAVATION, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

CONCRETE IS REQUIRED TO FILL HOLES FOR PILE EXCAVATION AT END BENT NO. 1 AND END BENT NO. 2.

AFTER COMPLETION OF DRILLING AND PRIOR TO FILLING THE HOLES WITH CONCRETE, THE WESTERN REGIONAL OFFICE GEOTECHNICAL ENGINEER WILL BE NOTIFIED TO INSPECT THE TIP ELEVATIONS OF EACH PILE EXCAVATED HOLE. DRILLING EQUIPMENT WILL NOT BE MOVED FROM WORK AREA BEING INSPECTED UNTIL TIP ELEVATIONS ARE APPROVED BY THE GEOTECH ENGINEER.

DIFFICULT DRILLING CONDITIONS AT THE END BENTS MAY BE ENCOUNTERED DUE TO BOULDERS AND/OR RUBBLE. SPECIALTY TOOLING OR ADDITIONAL EFFORT MAY BE REQUIRED AND IS THE RESPONSIBILITY OF THE DRILLING CONTRACTOR. NO ADDITIONAL COMPENSATION WILL BE MADE BEYOND THE ACCEPTED CONTRACT BID PRICE. SEE SUBSURFACE INVENTORY FOR ADDITIONAL INFORMATION.

PROJECT NO. B-5380
AVERY COUNTY
 STATION: 12+31.30 -L-

SHEET 2 OF 3



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
**GENERAL DRAWING
 FOR BRIDGE OVER
 FALL BRANCH ON SR 1114
 BETWEEN US 19 AND
 NC 194**

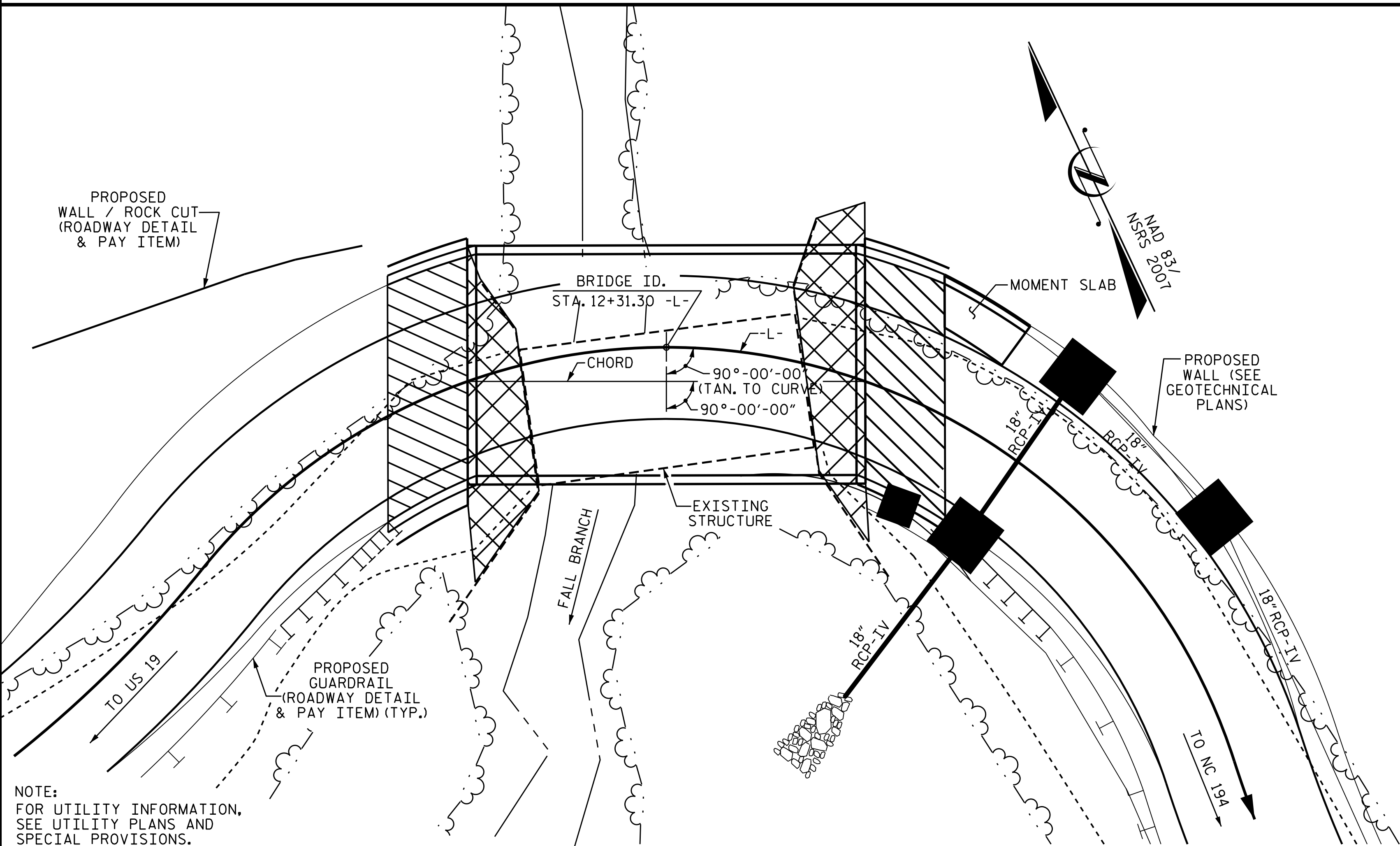
DRAWN BY : H. T. BARBOUR DATE : 4-15-16
 CHECKED BY : V. X. NGUYEN DATE : 6-16
 DESIGN ENGINEER OF RECORD : A. M. LEE DATE : 7-16

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

DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

BENCH MARK #1: 8" SPIKE IN ROOT OF 8" Ø BEECH TREE, STA. 10+94.00 -L- 73' (RT) EL. 3040.50; N 843672. E 1116823.

NOTES



LOCATION SKETCH

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 AND FORMWORK, SEE SPECIAL PROVISIONS.
 FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
 FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR SALVAGE, PACKAGING AND DELIVERY OF ALL EXISTING STEEL I-BEAMS, INTERNAL BRACING, DIAPHRAGMS AND BEARING PLATES, SEE SPECIAL PROVISIONS.
 THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE, SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.
 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.

IN AS MUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 12+31.30 -L-."

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

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 20 FT. EACH SIDE OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

THE EXISTING STRUCTURE CONSISTING OF ONE SPAN AT 37.0'; WITH A CLEAR ROADWAY WIDTH OF 15.92', WITH A TIMBER DECK ON STEEL FLOOR BEAMS ON YOUNG MASONRY ABUTMENTS AND LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED FOR LOAD LIMIT, SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED BRIDGE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

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

FOR MOMENT SLAB, SEE SPECIAL PROVISIONS.

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

NOTE:
 FOR UTILITY INFORMATION,
 SEE UTILITY PLANS AND
 SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	PILE EXCAVATION IN SOIL	PILE EXCAVATION NOT IN SOIL	UNCLASSIFIED STRUCTURE EXCAVATION	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	HP 12 X 53 STEEL PILES	VERTICAL CONCRETE BARRIER RAIL	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE	ELASTOMERIC BEARINGS	3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLABS	ASBESTOS ASSESSMENT	VERTICAL CONCRETE BARRIER RAIL WITH MOMENT SLAB
	LUMP SUM	LIN. FT.	LIN. FT.	LUMP SUM	CU. YDS.	LUMP SUM	LBS.	NO. LIN. FT.	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	NO. LIN. FT.	LUMP SUM	LIN. FT.
SUPERSTRUCTURE	LUMP SUM			LUMP SUM		LUMP SUM			153.60			LUMP SUM	10 500	LUMP SUM	12.20
END BENT NO. 1		55.0	25.0		20.2		2459	5 60.0		11	12				
END BENT NO. 2		20.0	25.0		20.2		2459	5 80.0							
TOTAL	LUMP SUM	75.0	50.0	LUMP SUM	40.4	LUMP SUM	4918	10 140.0	153.60	11	12	LUMP SUM	10 500	LUMP SUM	12.20

HYDRAULIC DATA

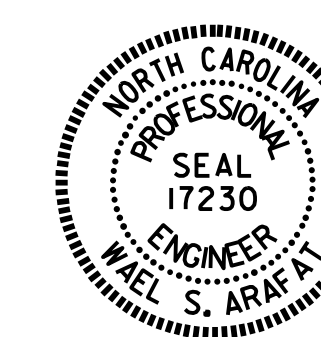
DESIGN DISCHARGE..... 280 CFS
 FREQUENCY OF DESIGN FLOOD..... 25 YEARS
 DESIGN HIGH WATER ELEVATION..... 3060.20
 DRAINAGE AREA..... 0.62 SQ. MI.
 BASE DISCHARGE(Q100)..... 410 CFS
 BASE HIGH WATER ELEVATION..... 3060.70

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE..... N/A
 FREQUENCY OF OVERTOPPING FLOOD..... 500 (+) YR.
 OVERTOPPING FLOOD ELEVATION..... 3067.30

PROJECT NO. B-5380
AVERY COUNTY
 STATION: 12+31.30 -L-

SHEET 3 OF 3



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE OVER
 FALL BRANCH ON SR 1114
 BETWEEN US 19 AND
 NC 194

DRAWN BY : H. T. BARBOUR DATE : 4-14-16
 CHECKED BY : V. X. NGUYEN DATE : 6-16

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			16

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	1.037	--	1.75	0.283	1.83	30'	EL	14.5	0.574	1.04	30'	EL	1.45	0.80	0.283	1.58	30'	EL	14.5		
	HL-93(0pr)	N/A	--	1.344	--	1.35	0.283	2.38	30'	EL	14.5	0.574	1.34	30'	EL	1.45	N/A	--	--	--	--	--		
	HS-20(Inv)	36.000	2	1.183	42.587	1.75	0.283	2.53	30'	EL	11.6	0.574	1.18	30'	EL	1.45	0.80	0.283	2.20	30'	EL	11.6		
	HS-20(0pr)	36.000	--	1.533	55.205	1.35	0.283	3.28	30'	EL	11.6	0.574	1.53	30'	EL	1.45	N/A	--	--	--	--	--		
LEGAL LOAD RATING	SV	SNSH	13.500	--	2.895	39.081	1.40	0.283	5.18	30'	EL	14.5	0.574	2.89	30'	EL	1.45	0.80	0.283	3.56	30'	EL	14.5	
		SNGARBS2	20.000	--	2.240	44.792	1.40	0.283	4.53	30'	EL	11.6	0.574	2.24	30'	EL	1.45	0.80	0.283	3.15	30'	EL	11.6	
		SNAGRIS2	22.000	--	2.157	47.463	1.40	0.283	4.6	30'	EL	11.6	0.574	2.16	30'	EL	1.45	0.80	0.283	3.20	30'	EL	11.6	
		SNCOTTS3	27.250	--	1.462	39.849	1.40	0.283	2.6	30'	EL	14.5	0.574	1.46	30'	EL	1.45	0.80	0.283	1.79	30'	EL	14.5	
		SNAGGRS4	34.925	--	1.346	46.999	1.40	0.283	2.5	30'	EL	14.5	0.574	1.35	30'	EL	1.45	0.80	0.283	1.72	30'	EL	14.5	
		SNS5A	35.550	--	1.427	50.733	1.40	0.283	2.42	30'	EL	14.5	0.574	1.43	30'	EL	1.45	0.80	0.283	1.67	30'	EL	14.5	
		SNS6A	39.950	--	1.341	53.59	1.40	0.283	2.29	30'	EL	14.5	0.574	1.34	30'	EL	1.45	0.80	0.283	1.58	30'	EL	14.5	
	SNS7B	42.000	--	1.369	57.505	1.40	0.283	2.23	30'	EL	14.5	0.574	1.37	30'	EL	1.45	0.80	0.283	1.53	30'	EL	14.5		
	TTST	TNAGRIT3	33.000	--	1.593	52.58	1.40	0.283	2.97	30'	EL	14.5	0.574	1.59	30'	EL	1.45	0.80	0.283	2.04	30'	EL	14.5	
		TNT4A	33.075	--	1.483	49.043	1.40	0.283	2.82	30'	EL	14.5	0.574	1.48	30'	EL	1.45	0.80	0.283	1.94	30'	EL	14.5	
		TNT6A	41.600	--	1.433	59.622	1.40	0.283	2.56	30'	EL	14.5	0.574	1.43	30'	EL	1.45	0.80	0.283	1.76	30'	EL	14.5	
		TNT7A	42.000	--	1.363	57.264	1.40	0.283	2.64	30'	EL	14.5	0.574	1.36	30'	EL	1.45	0.80	0.283	1.82	30'	EL	14.5	
		TNT7B	42.000	--	1.331	55.915	1.40	0.283	2.49	30'	EL	14.5	0.574	1.33	30'	EL	1.45	0.80	0.283	1.72	30'	EL	14.5	
		TNAGRIT4	43.000	--	1.287	55.356	1.40	0.283	2.58	30'	EL	14.5	0.574	1.29	30'	EL	1.45	0.80	0.283	1.78	30'	EL	14.5	
TNAGT5A		45.000	--	1.381	62.151	1.40	0.283	2.5	30'	EL	14.5	0.574	1.38	30'	EL	1.45	0.80	0.283	1.72	30'	EL	14.5		
TNAGT5B	45.000	3	1.212	54.54	1.40	0.283	2.41	30'	EL	11.6	0.574	1.21	30'	EL	1.45	0.80	0.283	1.66	30'	EL	11.6			

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'

PROJECT NO. B-5380
AVERY COUNTY
STATION: 12+31.30 -L-



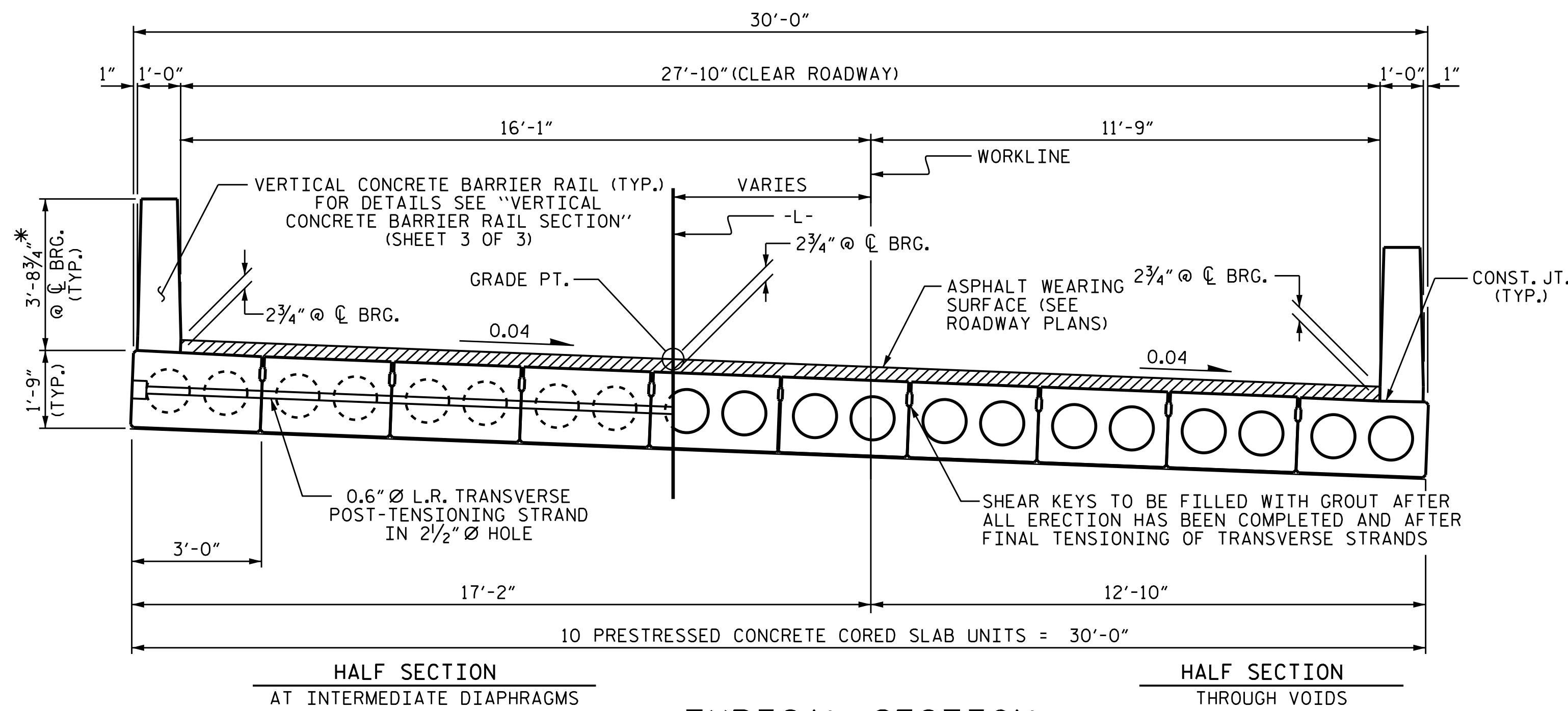
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
LRFR SUMMARY FOR
30' CORED SLAB UNIT
90° SKEW
(NON-INTERSTATE TRAFFIC)

DESIGN ENGINEER OF RECORD:
A. M. LEE DATE: 7-16

ASSEMBLED BY: H. T. BARBOUR DATE: 4-14-16
CHECKED BY: V. X. NGUYEN DATE: 6-16

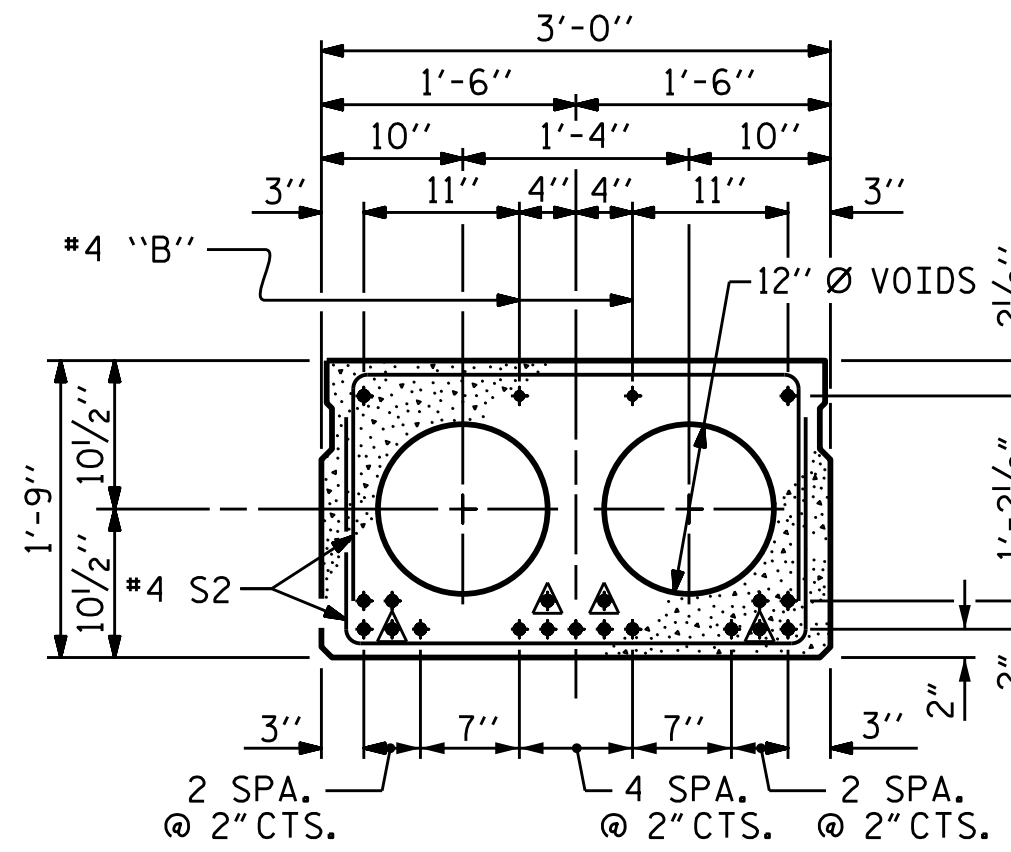
DRAWN BY: CVC 6/10
CHECKED BY: DNS 6/10

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		



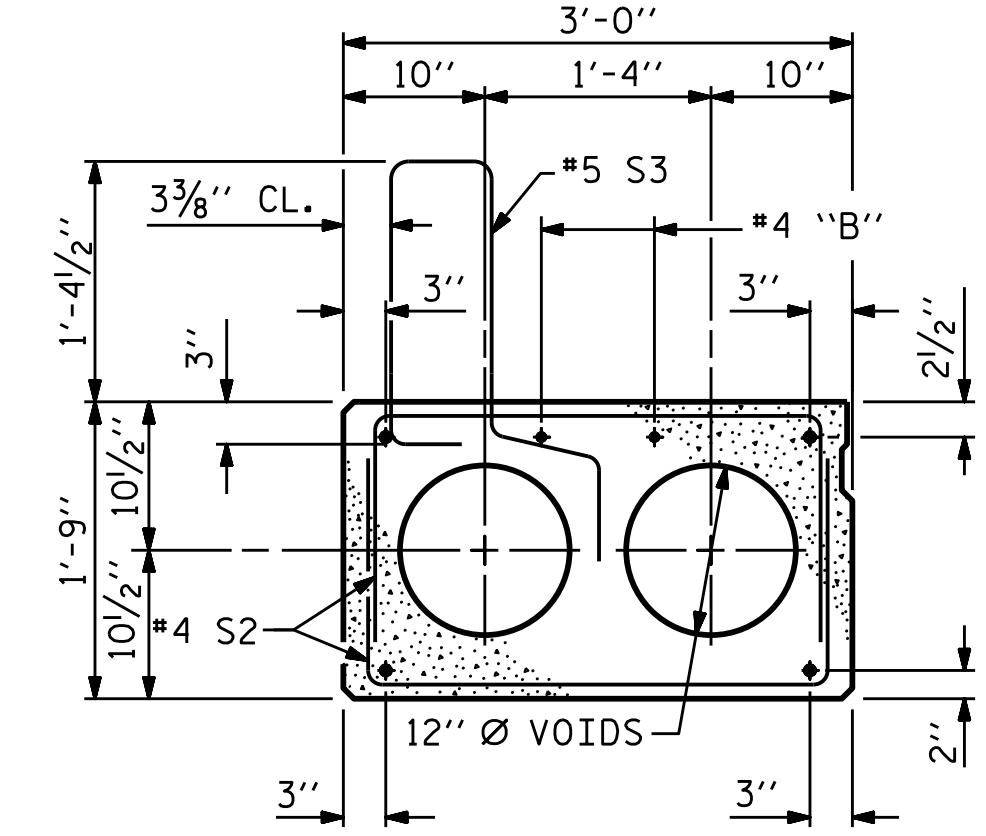
TYPICAL SECTION

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



INTERIOR SLAB SECTION
(19 STRANDS REQUIRED)

0.6" Ø LOW RELAXATION STRAND LAYOUT

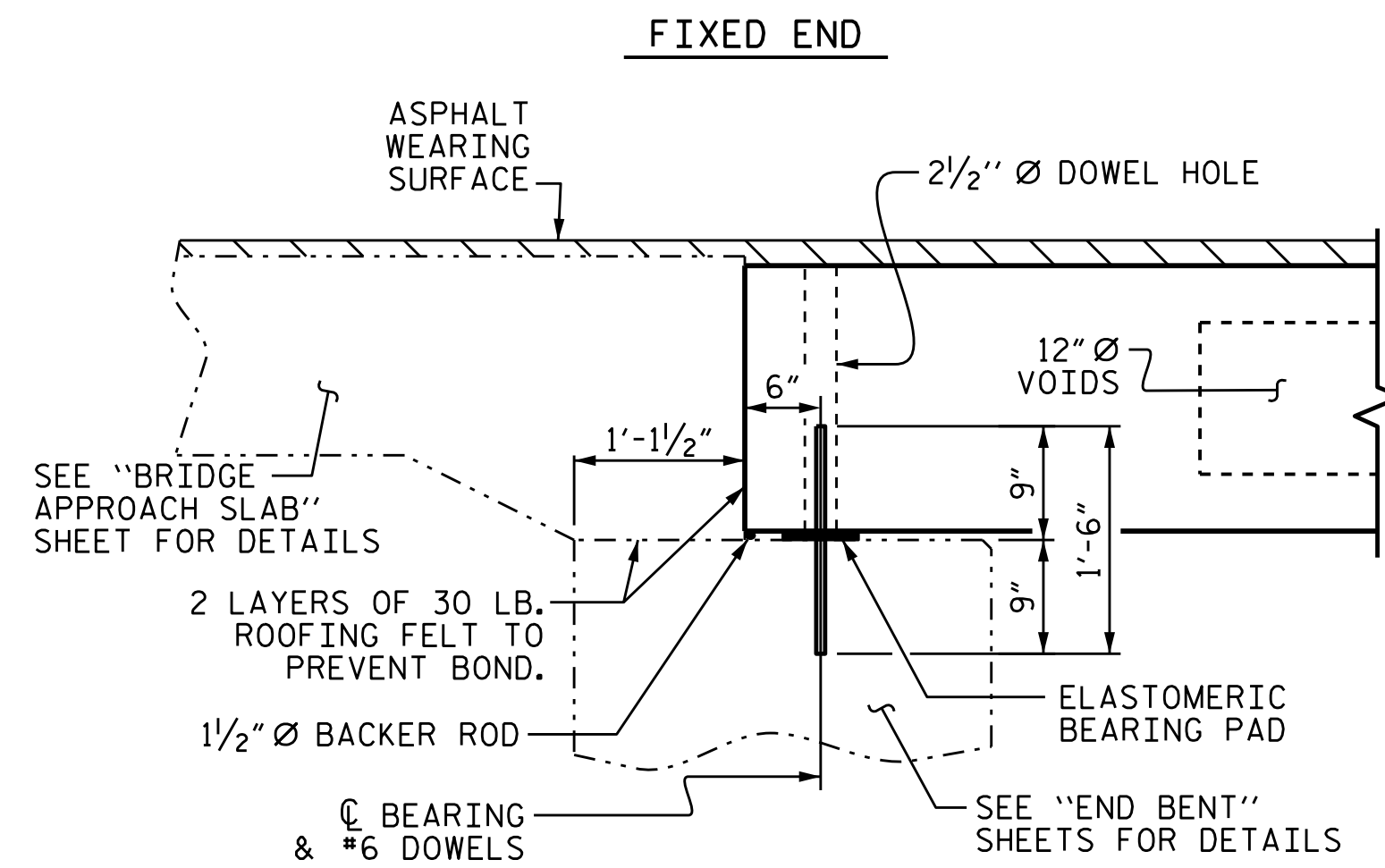


EXT. SLAB SECTION

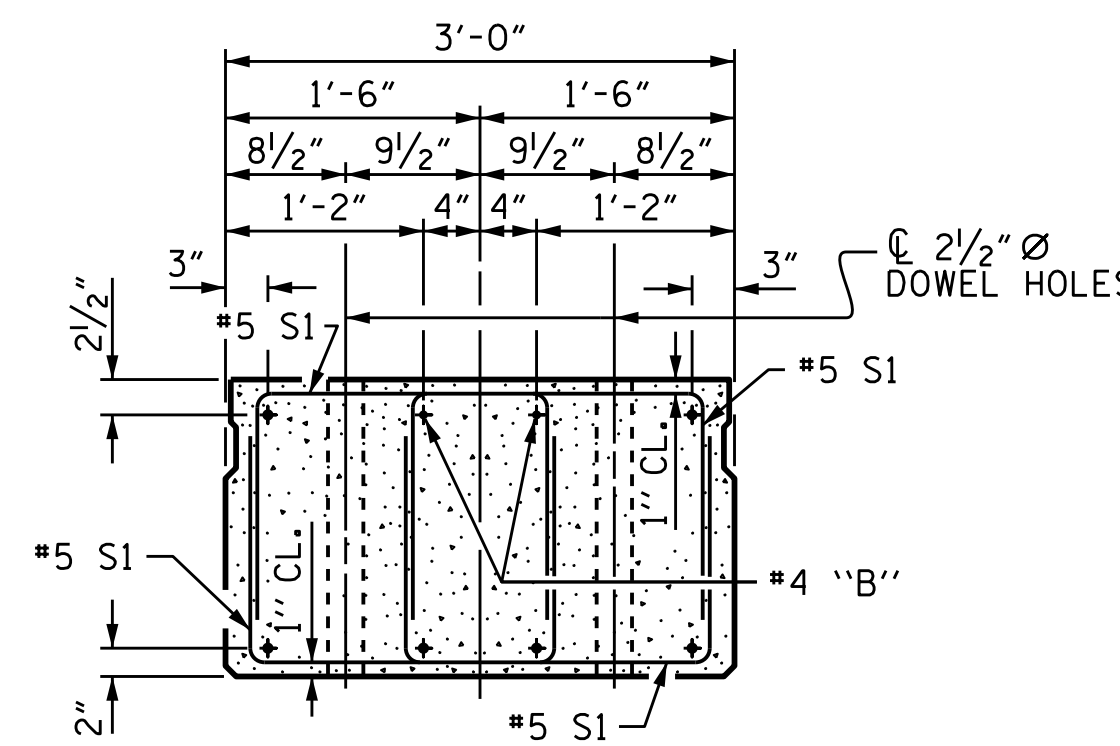
(FOR PRESTRESSED STRAND LAYOUT, SEE INTERIOR SLAB SECTION.)

▲ 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.

DEBONDING LEGEND

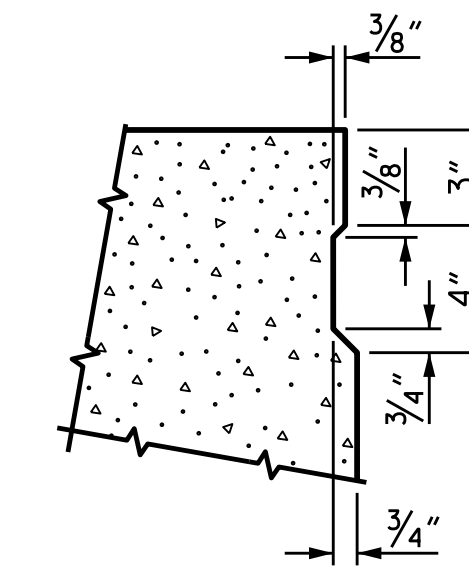


SECTION AT END BENT



END ELEVATION

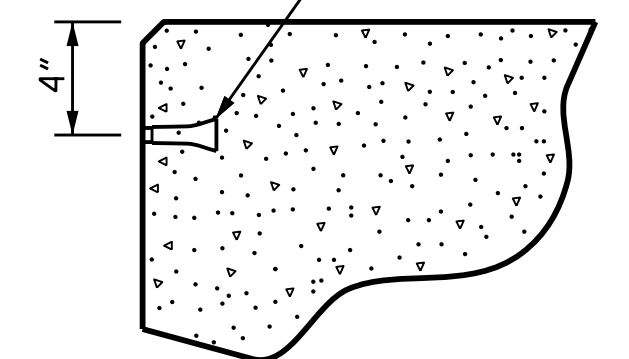
SHOWING PLACEMENT OF DOUBLE STIRRUPS AND LOCATION OF DOWEL HOLES. (STRAND LAYOUT NOT SHOWN.) INTERIOR SLAB UNIT SHOWN-EXTERIOR SLAB UNIT SIMILAR EXCEPT SHEAR KEY LOCATION.



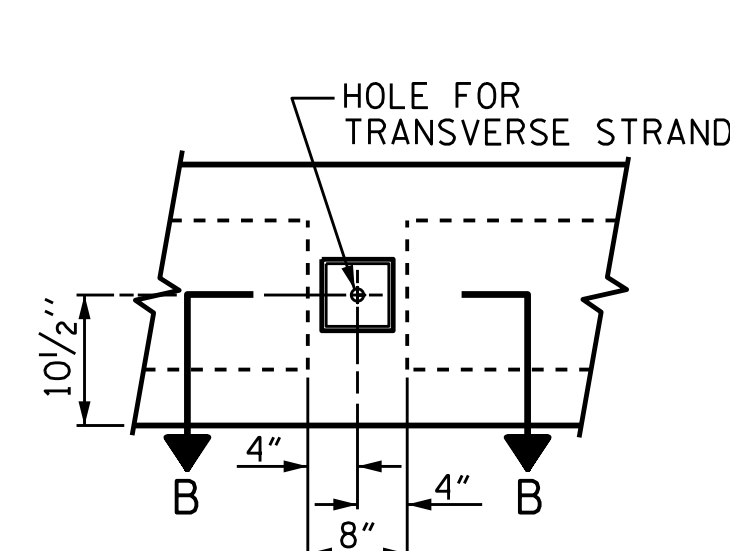
SHEAR KEY DETAIL

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

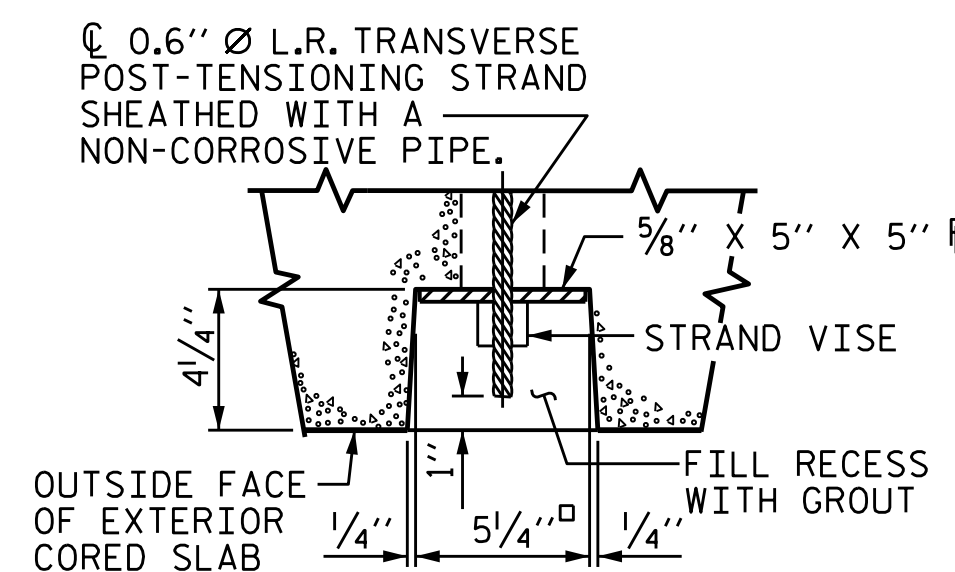
PERMITTED THREADED INSERT CAST IN OUTSIDE FACE OF EXTERIOR UNIT AND RECESSED 3/8" SIZE TO BE DETERMINED BY CONTRACTOR.



THREADED INSERT DETAIL



ELEVATION VIEW

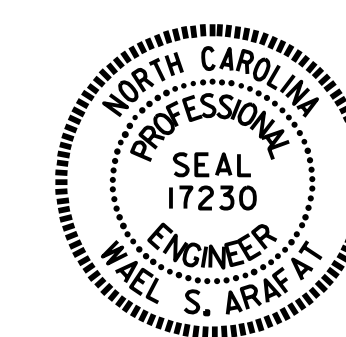


SECTION B-B

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

PROJECT NO. B-5380
AVERY COUNTY
STATION: 12+31.30-L-

SHEET 1 OF 3



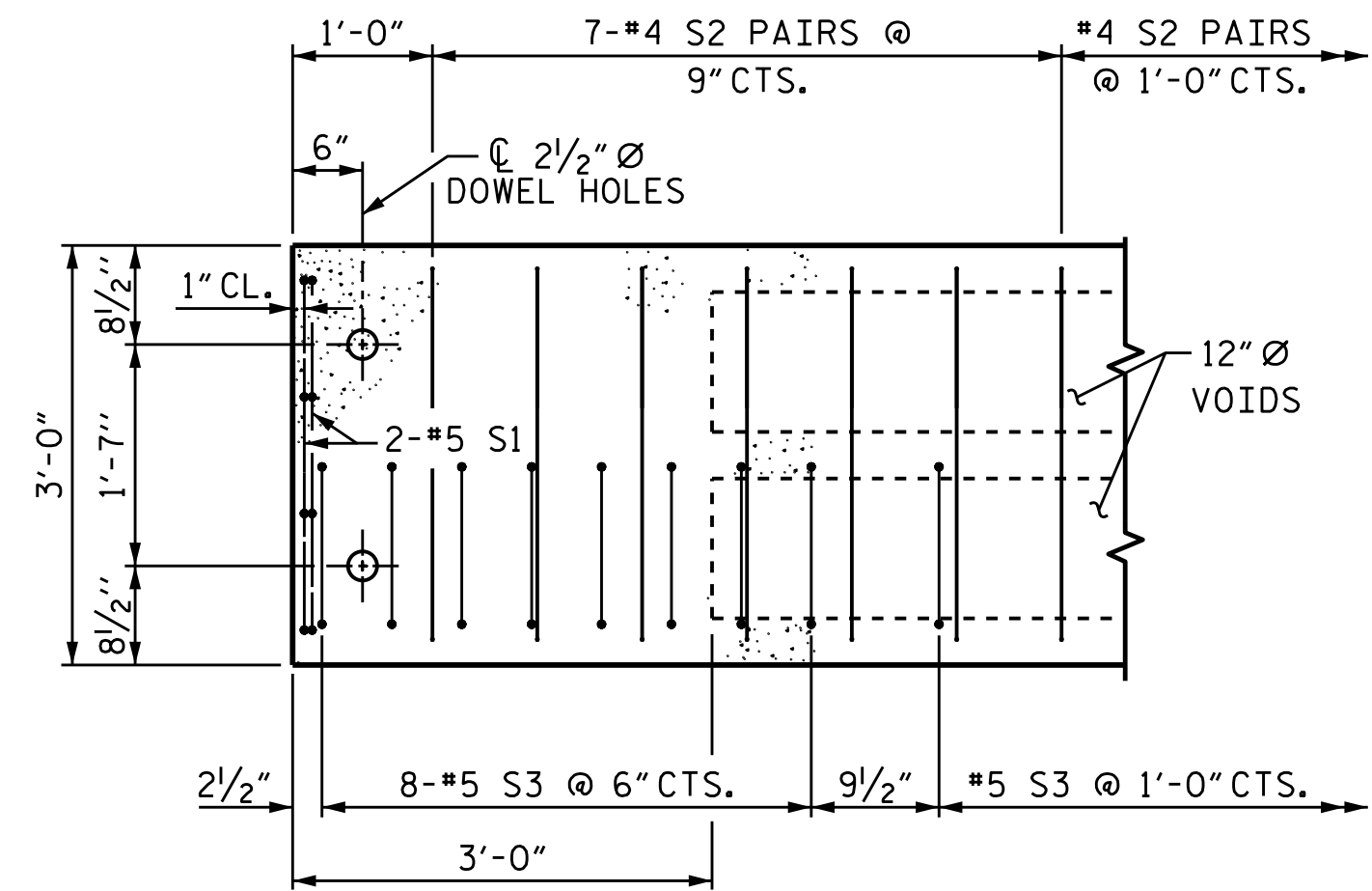
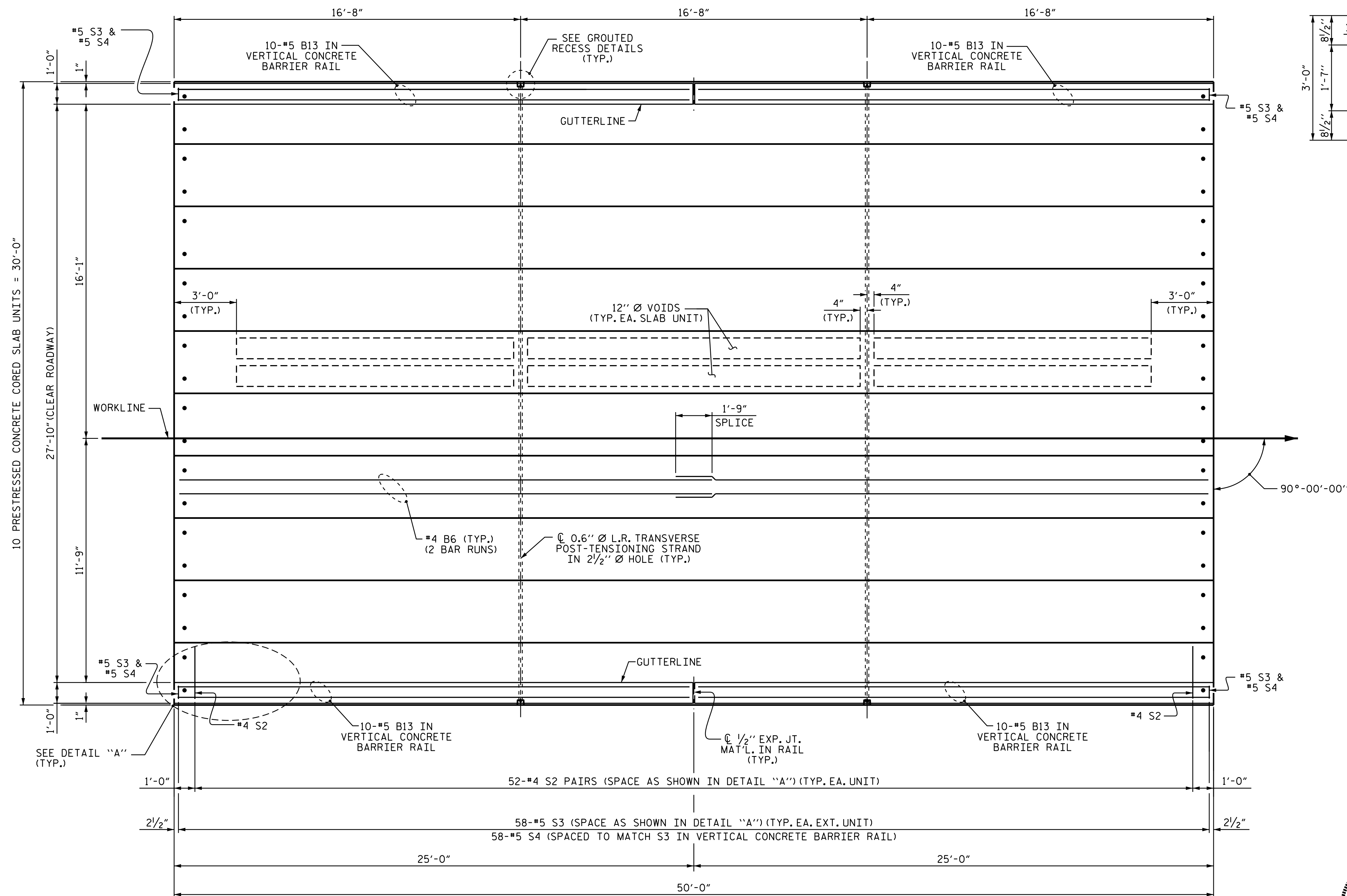
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

3'-0" X 1'-9"
PRESTRESSED CONCRETE
CORED SLAB UNIT
90° SKEW

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO. S-5
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 16
2			4			

ASSEMBLED BY :	H. T. BARBOUR	DATE :	11-10-15
CHECKED BY :	V. X. NGUYEN	DATE :	4-18-16
DRAWN BY :	DGE	5/09	
CHECKED BY :	BCH	6/09	
REV.	8/14	MAA/TMG	

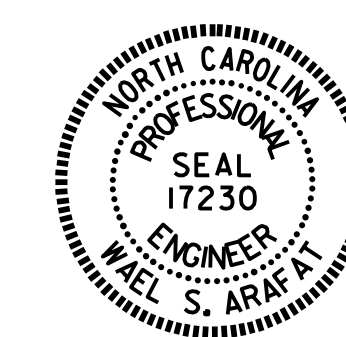


DETAIL "A"

(TYPICAL EACH END OF UNIT)
 NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S3 BARS.

PROJECT NO. B-5380
AVERY COUNTY
 STATION: 12+31.30-L-

SHEET 2 OF 3



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

PLAN OF 50' UNIT
 27'-10" CLEAR ROADWAY
 90° SKEW

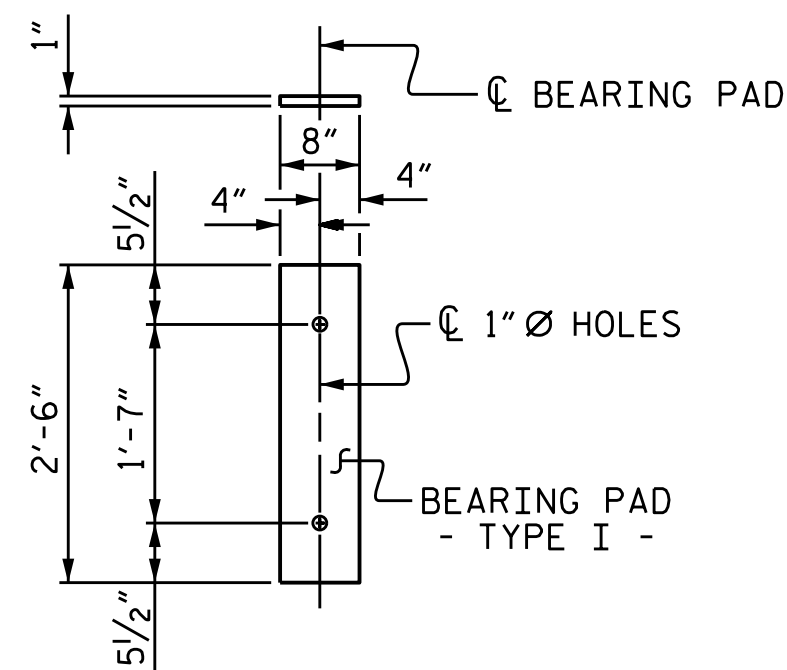
ASSEMBLED BY :	H. T. BARBOUR	DATE :	12-11-15
CHECKED BY :	V. X. NGUYEN	DATE :	4-18-16
DRAWN BY :	DGE 3/09	REV. 12/5/11	MAA/AAC
CHECKED BY :	BCH 3/09	REV. 8/14	MAA/TMG

23-AUG-2016 10:46
 R:\Structures\Final plans\Microstation\B5380.SD.TS.dgn
 warafat

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

STD. NO. 21" PCS_30_90S_50L



FIXED END
(TYPE I - 20 REQ'D)

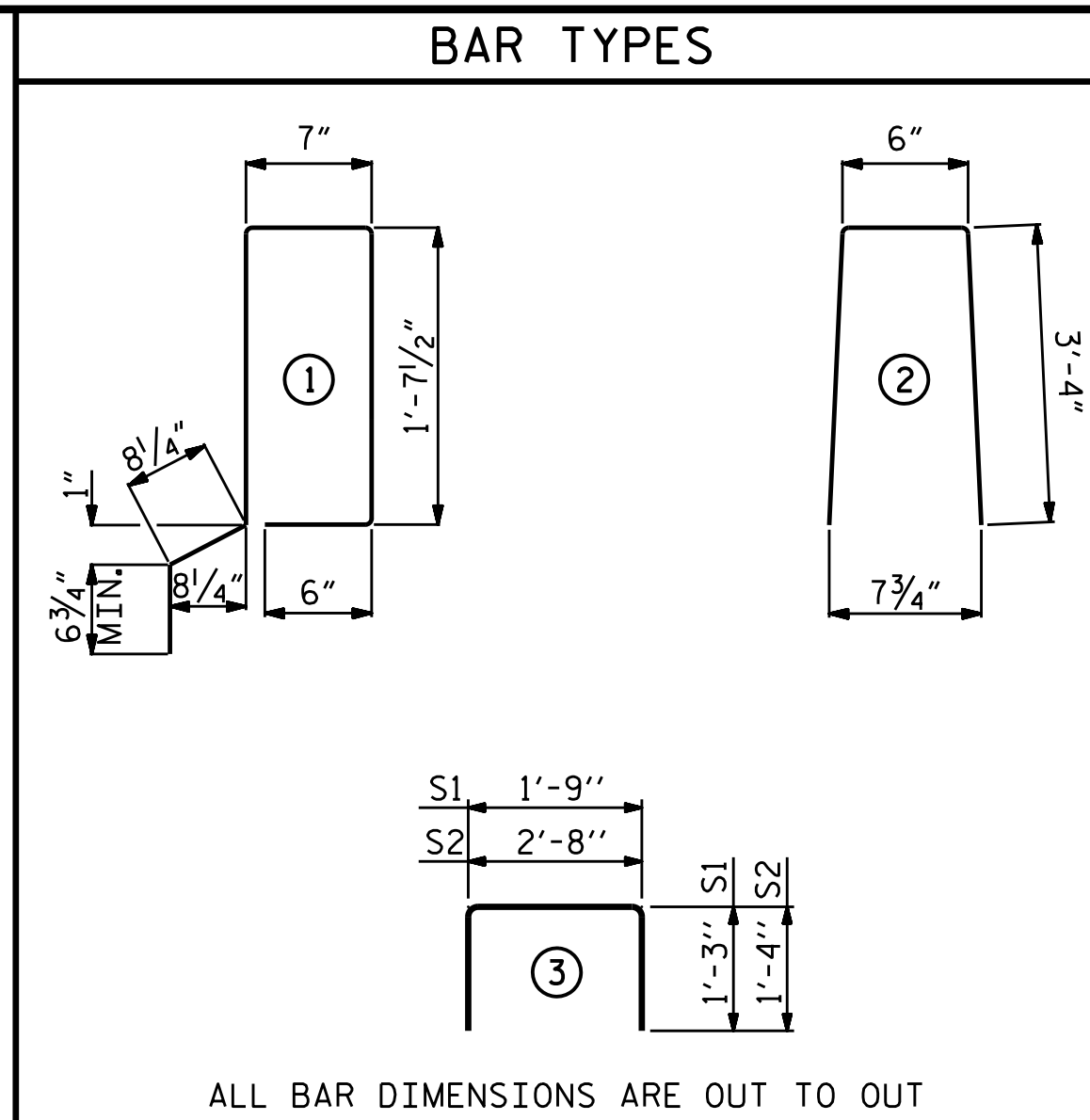
ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 50 DUROMETER HARDNESS.

CORED SLABS REQUIRED			
	NUMBER	LENGTH	TOTAL LENGTH
50' UNIT			
EXTERIOR C.S.	2	50'-0"	100'-0"
INTERIOR C.S.	8	50'-0"	400'-0"
TOTAL	10		500'-0"

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

** INCLUDES FUTURE WEARING SURFACE



NOTES

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

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

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

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

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

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

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

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

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS.

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

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

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

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

THE 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.

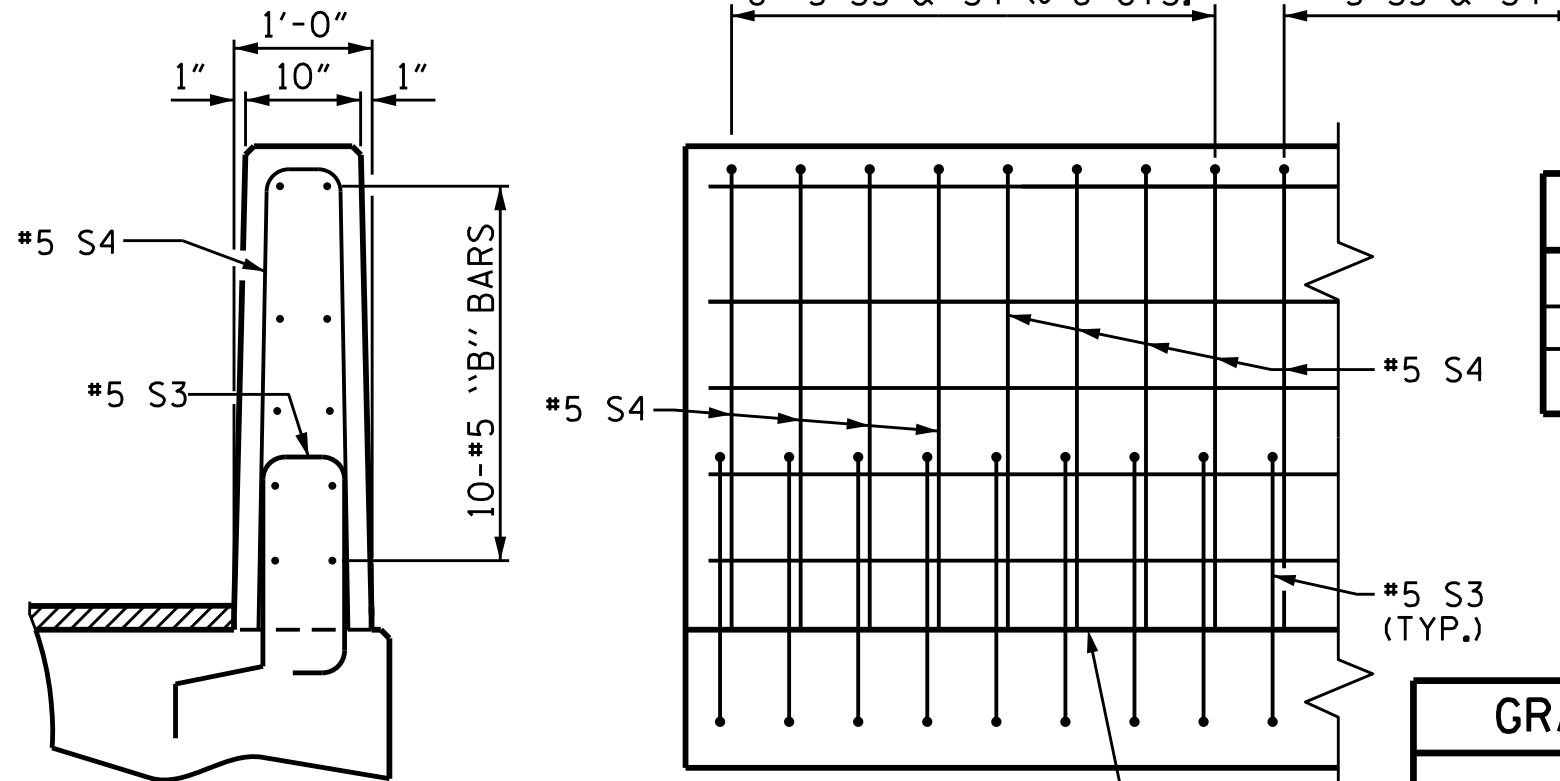
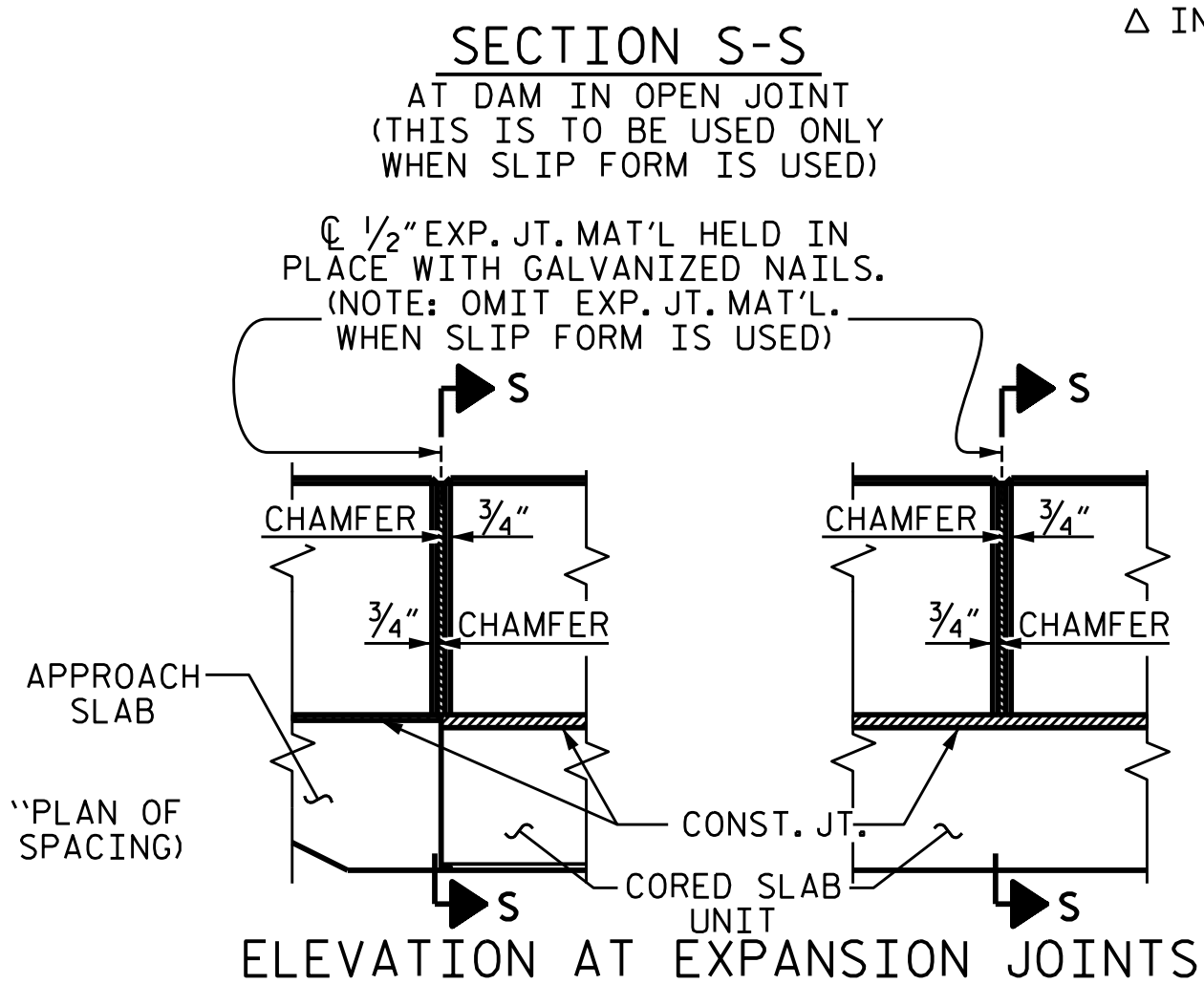
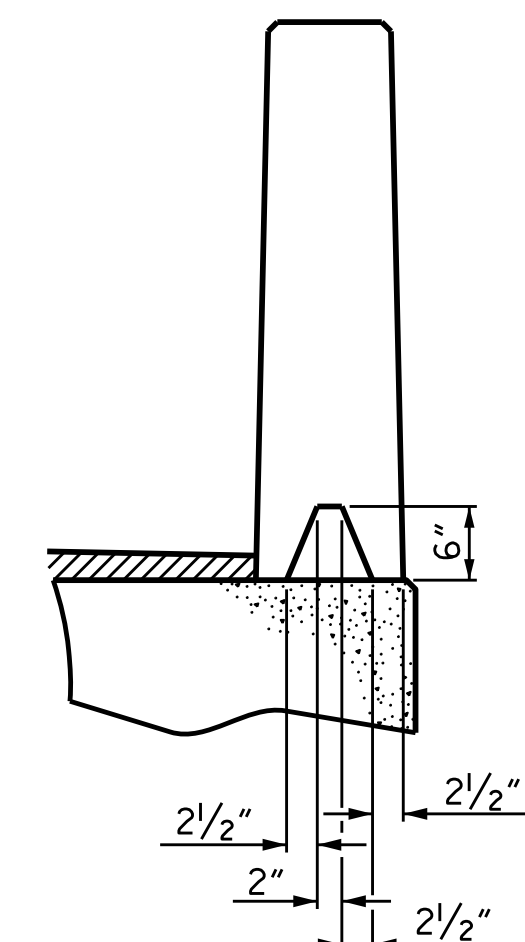
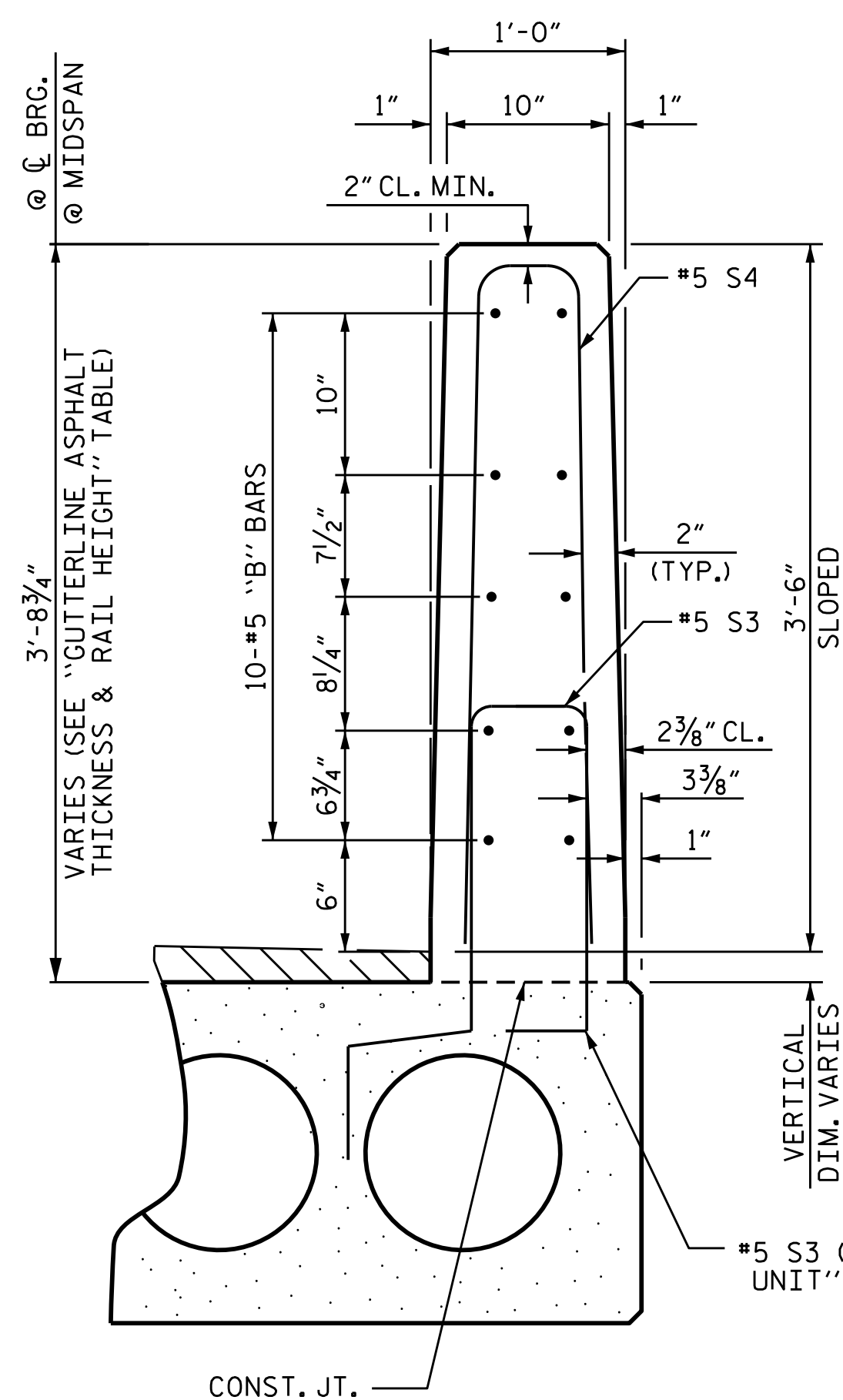
BILL OF MATERIAL FOR ONE 50' CORED SLAB UNIT

		EXTERIOR UNIT	INTERIOR UNIT
BAR	NUMBER	SIZE	TYPE
B6	4	#4	STR
		LENGTH	WEIGHT
		25'-9"	69
		LENGTH	WEIGHT
		25'-9"	69
S1	8	#5	3
		4'-3"	35
S2	104	#4	3
		5'-4"	371
* S3	58	#5	1
		5'-7"	338
REINFORCING STEEL	LBS.	475	475
* EPOXY COATED REINFORCING STEEL	LBS.	338	
6500 P.S.I. CONCRETE	CU. YDS.	7.1	7.1
0.6" Ø L.R. STRANDS	No.	19	19

BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL

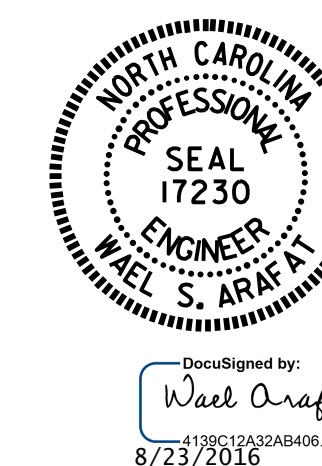
		EXTERIOR UNIT	INTERIOR UNIT
BAR	NUMBER	SIZE	TYPE
* B13	40	#5	STR
		LENGTH	WEIGHT
		24'-7"	1026
* S4	116	#5	2
		7'-2"	867
* EPOXY COATED REINFORCING STEEL	LBS.	1893	
CLASS AA CONCRETE	CU. YDS.	19.5	
Δ TOTAL VERTICAL CONCRETE BARRIER RAIL	LN. FT.	153.6	

Δ INCLUDES VERTICAL CONCRETE BARRIER RAIL ON APPROACH SLABS.



CONCRETE RELEASE STRENGTH	
UNIT	PSI
50'	4900

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



GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT		
	ASPHALT OVERLAY THICKNESS	RAIL HEIGHT
	@ MID-SPAN	@ MID-SPAN
50' UNITS	1 5/8"	3'-7 5/8"

PROJECT NO. B-5380
AVERY COUNTY
STATION: 12+31.30-L-

SHEET 3 OF 3

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

ASSEMBLED BY :	H. T. BARBOUR	DATE :	12-11-15
CHECKED BY :	V. X. NGUYEN	DATE :	4-18-16
DRAWN BY :	DGE 5/09	REV. 11/14	MAA/TMG
CHECKED BY :	BCH 6/09		

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

NOTES

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

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

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

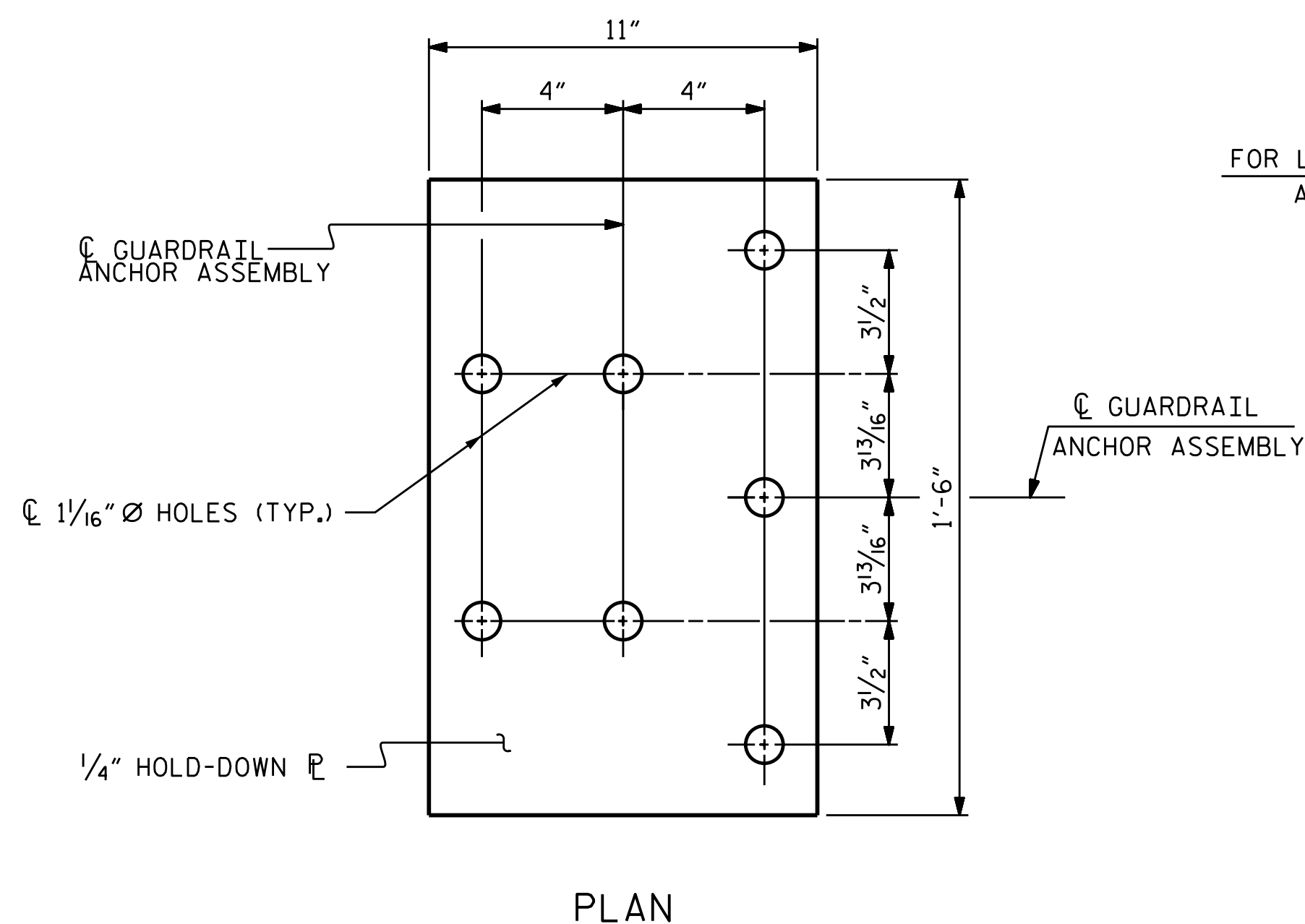
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

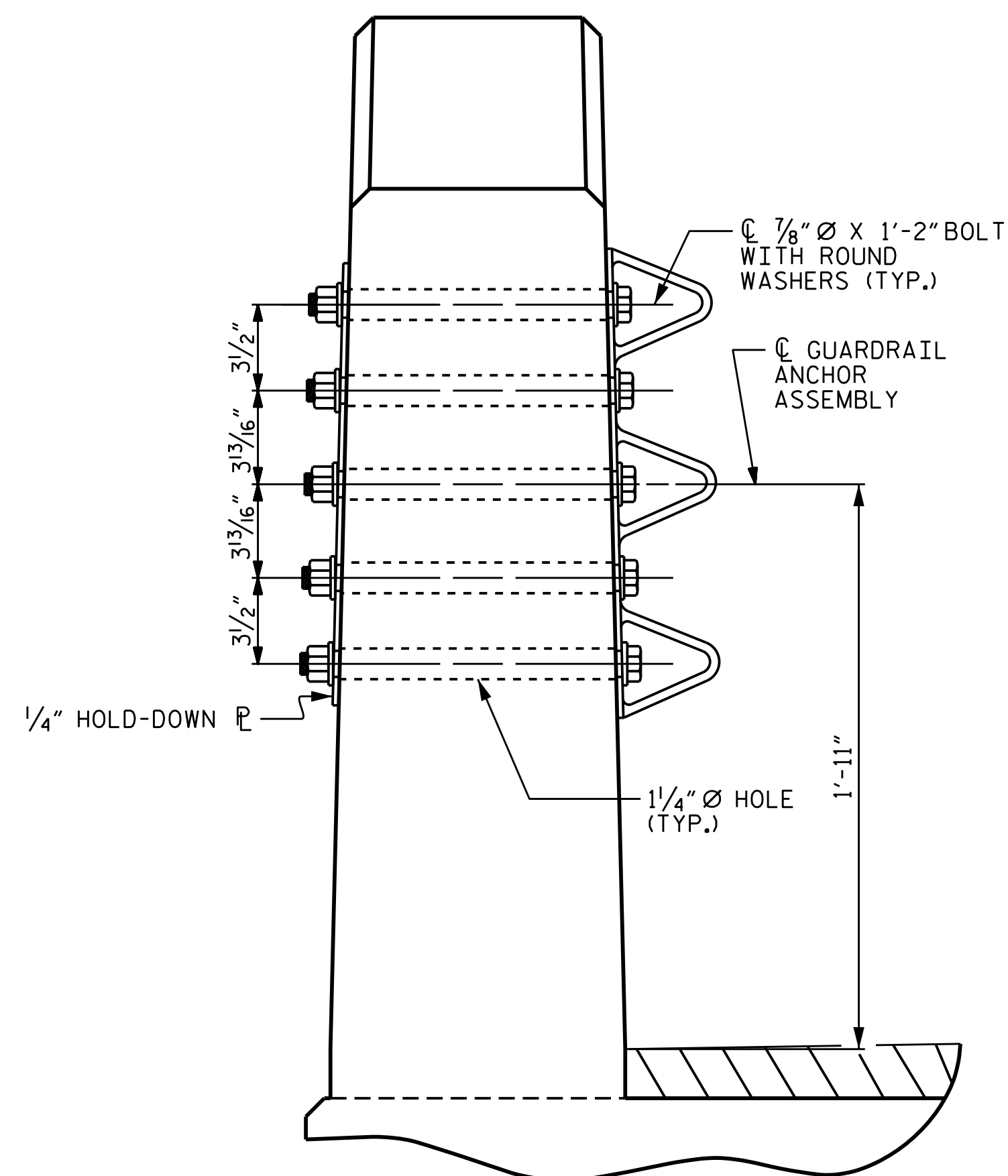
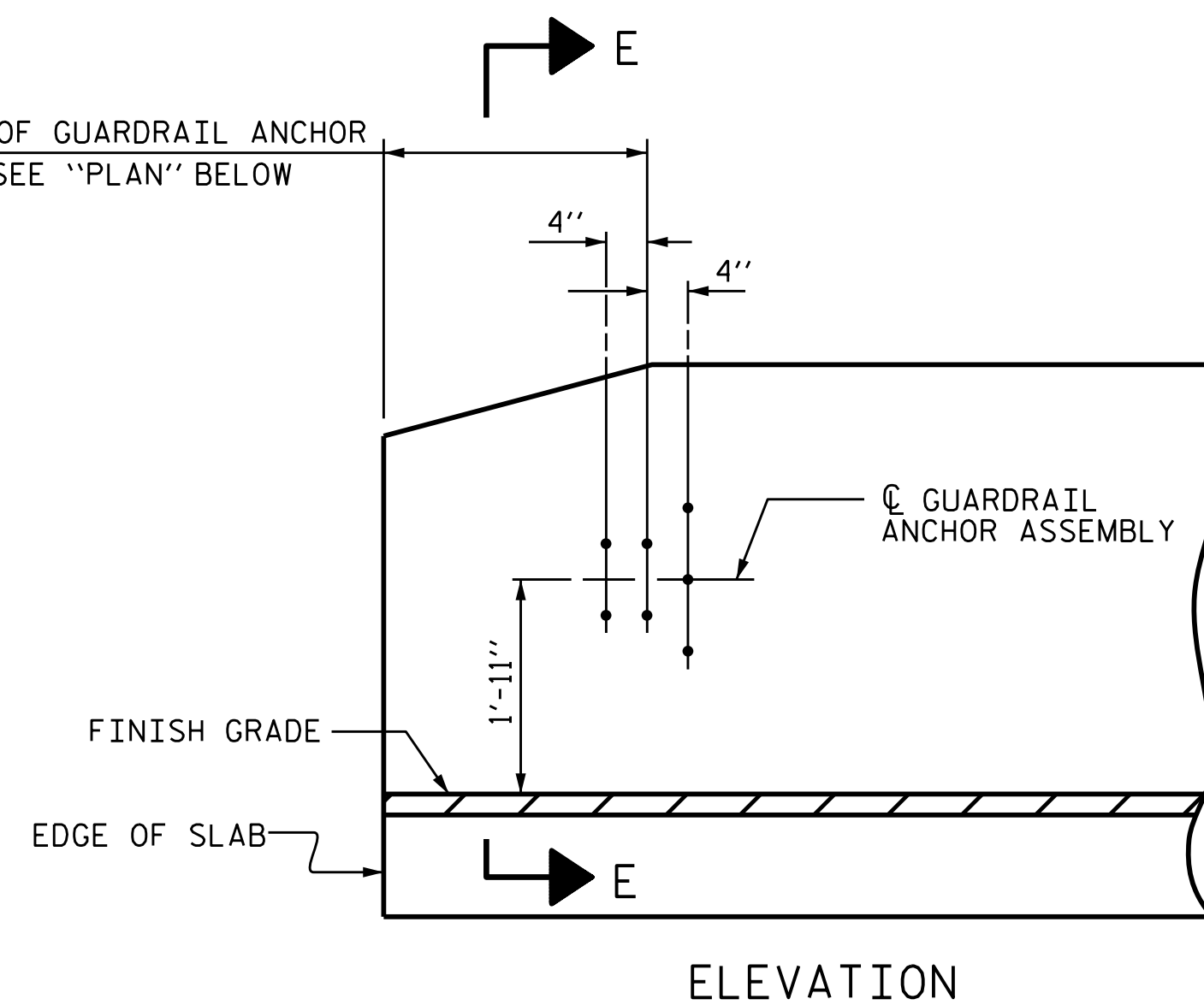
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR VERTICAL CONCRETE BARRIER RAIL.

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

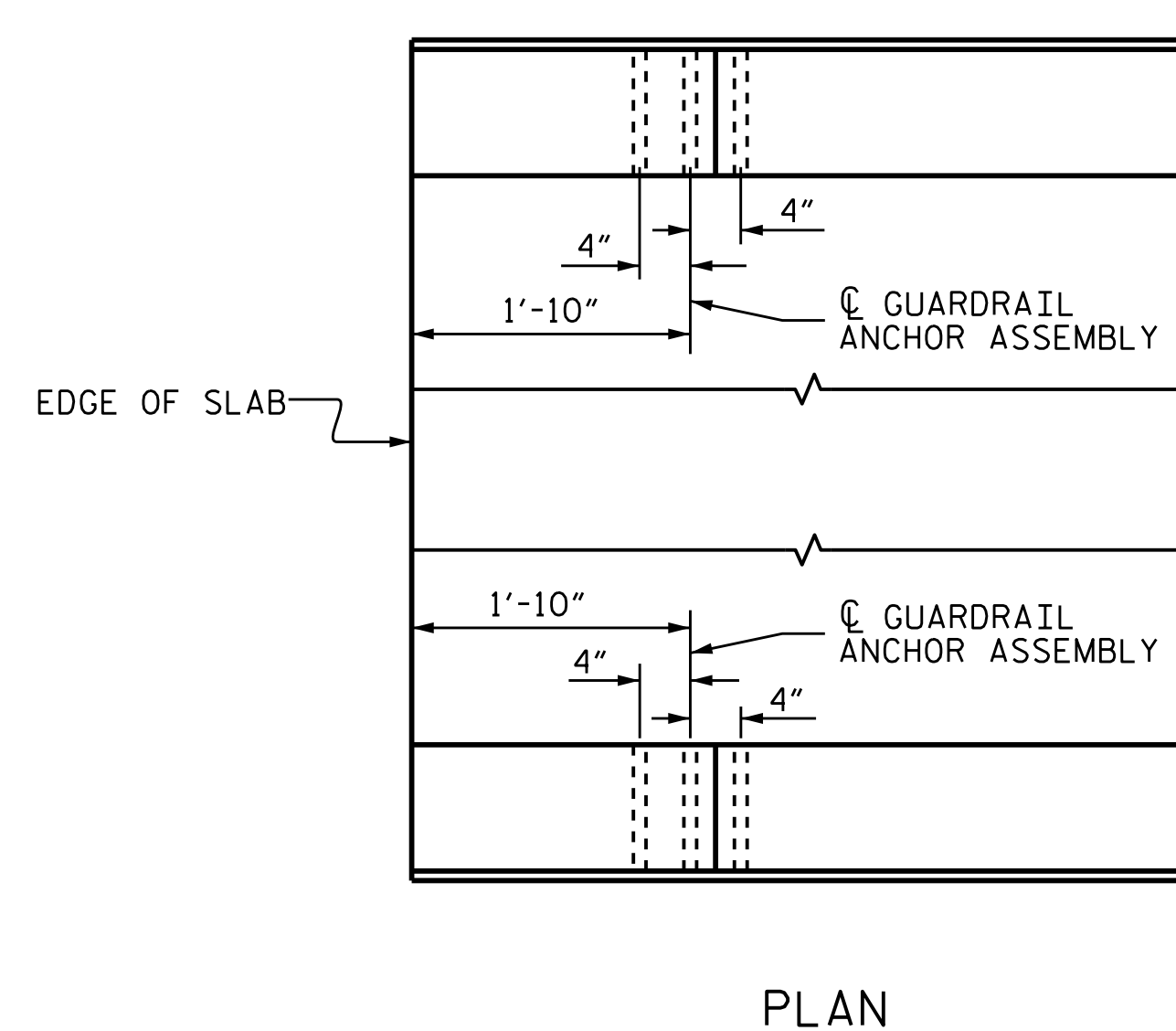
THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



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



SECTION E-E
GUARDRAIL ANCHOR ASSEMBLY DETAILS



LOCATION OF ANCHORS FOR GUARDRAIL

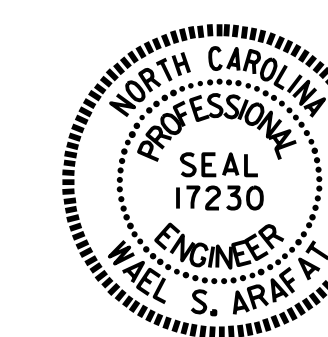
END BENT #1 SHOWN, END BENT #2 SIMILAR.



SKETCH SHOWING POINTS OF ATTACHMENT

* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. B-5380
AVERY COUNTY
 STATION: 12+31.30-L-



DocuSigned by:
Wael Arafat
4198C9A32AB408
8/23/2016

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

ASSEMBLED BY :	H. T. BARBOUR	DATE :	12-11-15
CHECKED BY :	V. X. NGUYEN	DATE :	4-18-16
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

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REVISIONS						SHEET NO. S-8
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 16
2			4			

NOTES

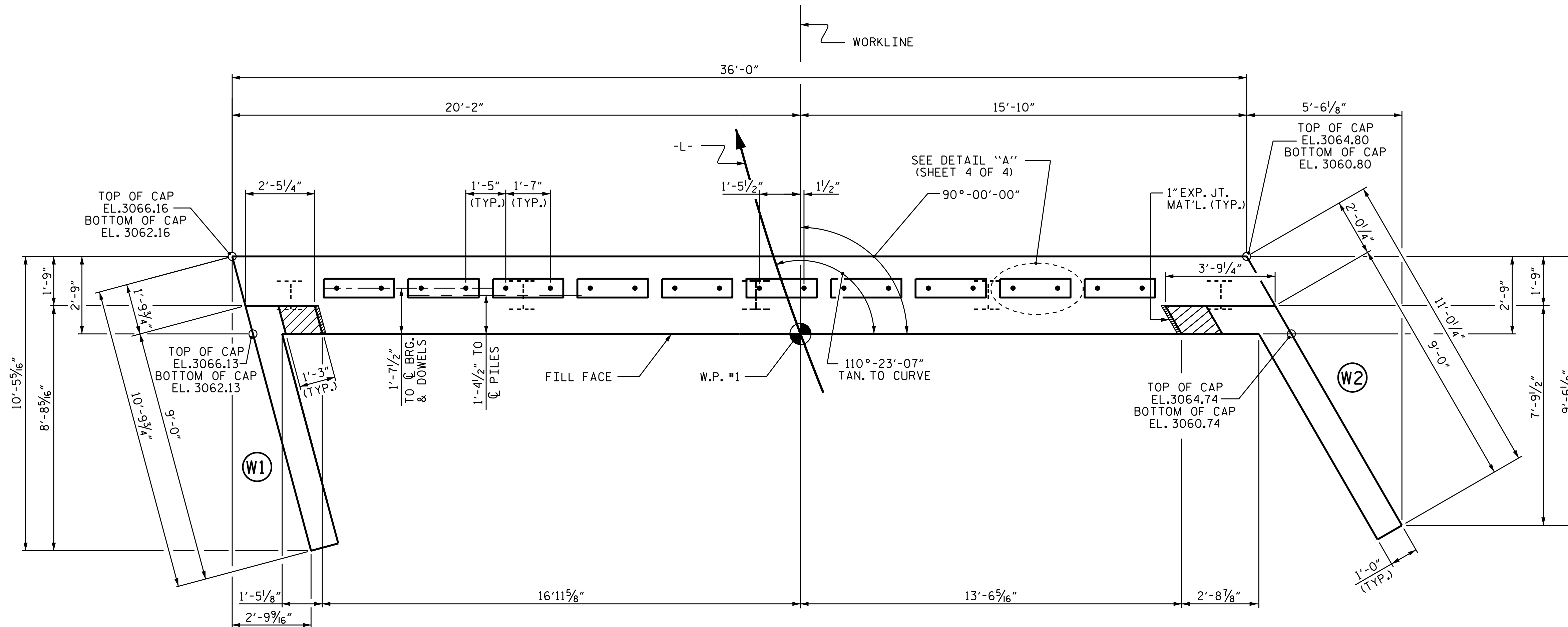
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

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.

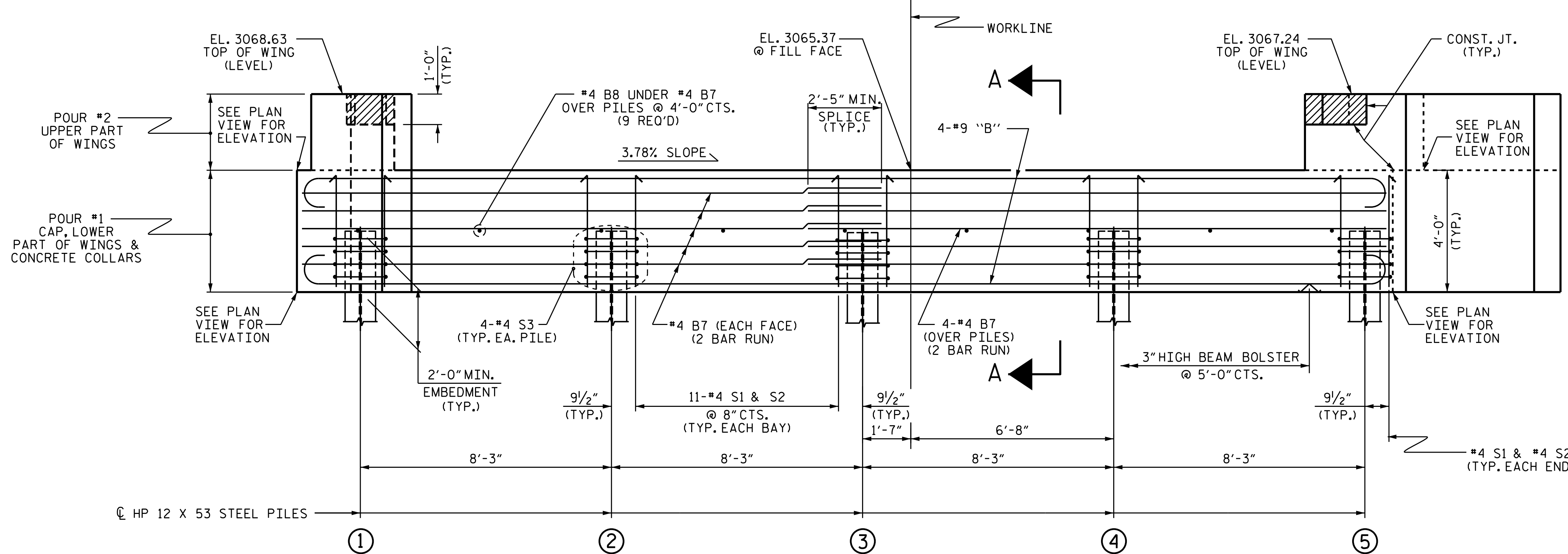
FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.

TOP OF PILE ELEVATIONS	
①	EL. 3064.08
②	EL. 3063.77
③	EL. 3063.46
④	EL. 3063.15
⑤	EL. 3062.83



PLAN



ELEVATION

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

PROJECT NO. B-5380
AVERY COUNTY
 STATION: 12+31.30 -L-

SHEET 1 OF 4



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
SUBSTRUCTURE END BENT No. 1					
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

DRAWN BY: H. T. BARBOUR DATE: 5-4-16
 CHECKED BY: V. X. NGUYEN DATE: 5-16
 DESIGN ENGINEER OF RECORD: A. M. LEE DATE: 7-16

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 SIGNATURES COMPLETED

SHEET NO.
 S-9
 TOTAL SHEETS
 16

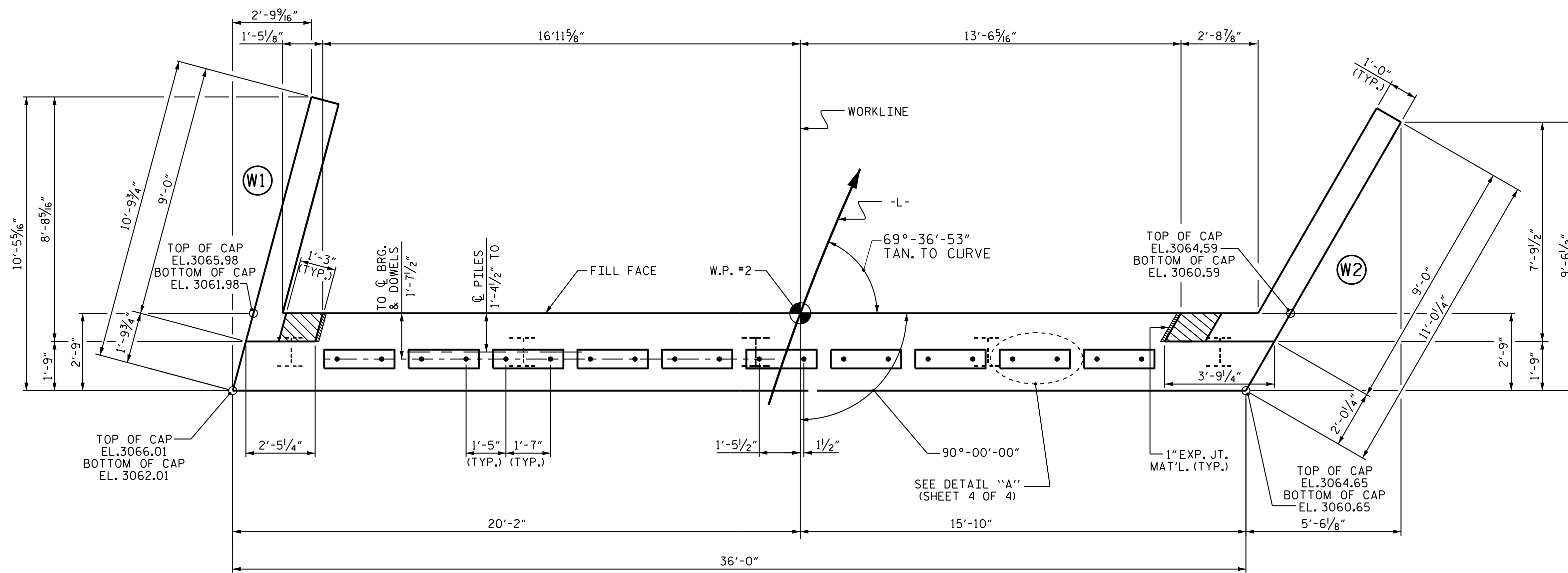
NOTES

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

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

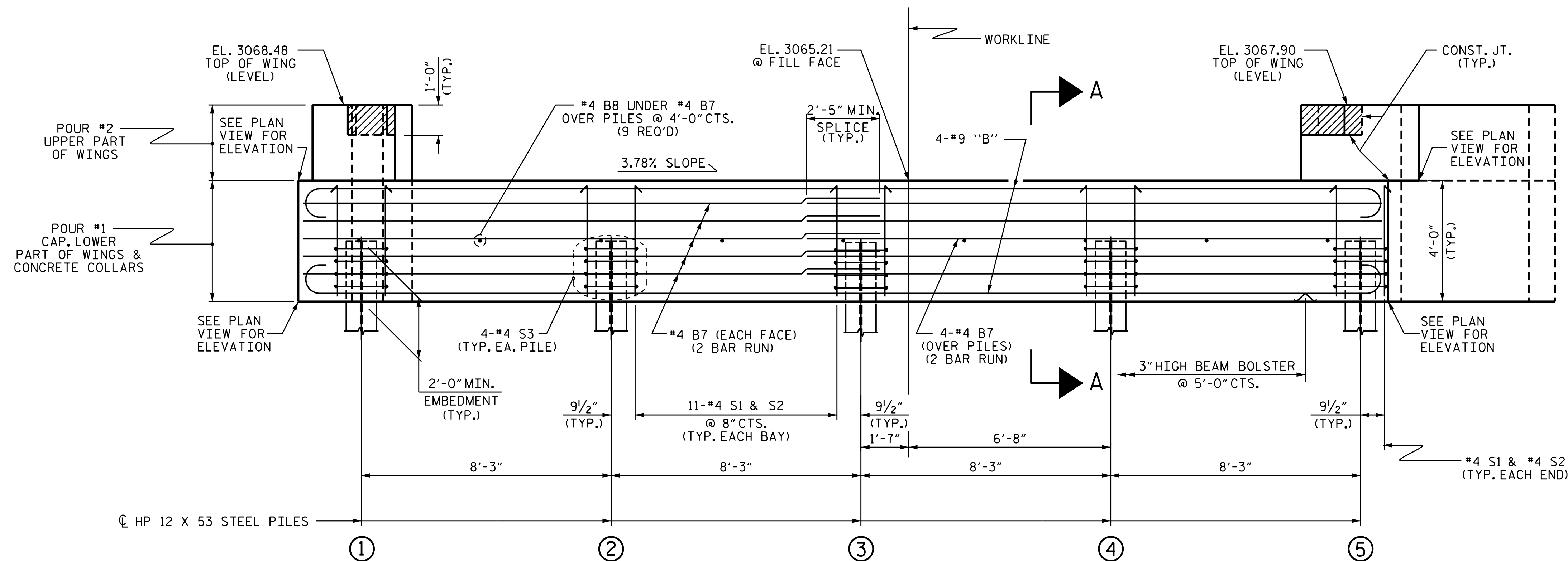
FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.



PLAN

TOP OF PILE ELEVATIONS	
①	EL. 3063.93
②	EL. 3063.62
③	EL. 3063.31
④	EL. 3062.99
⑤	EL. 3062.68



ELEVATION

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

PROJECT NO. B-5380
AVERY COUNTY
 STATION: 12+31.30 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

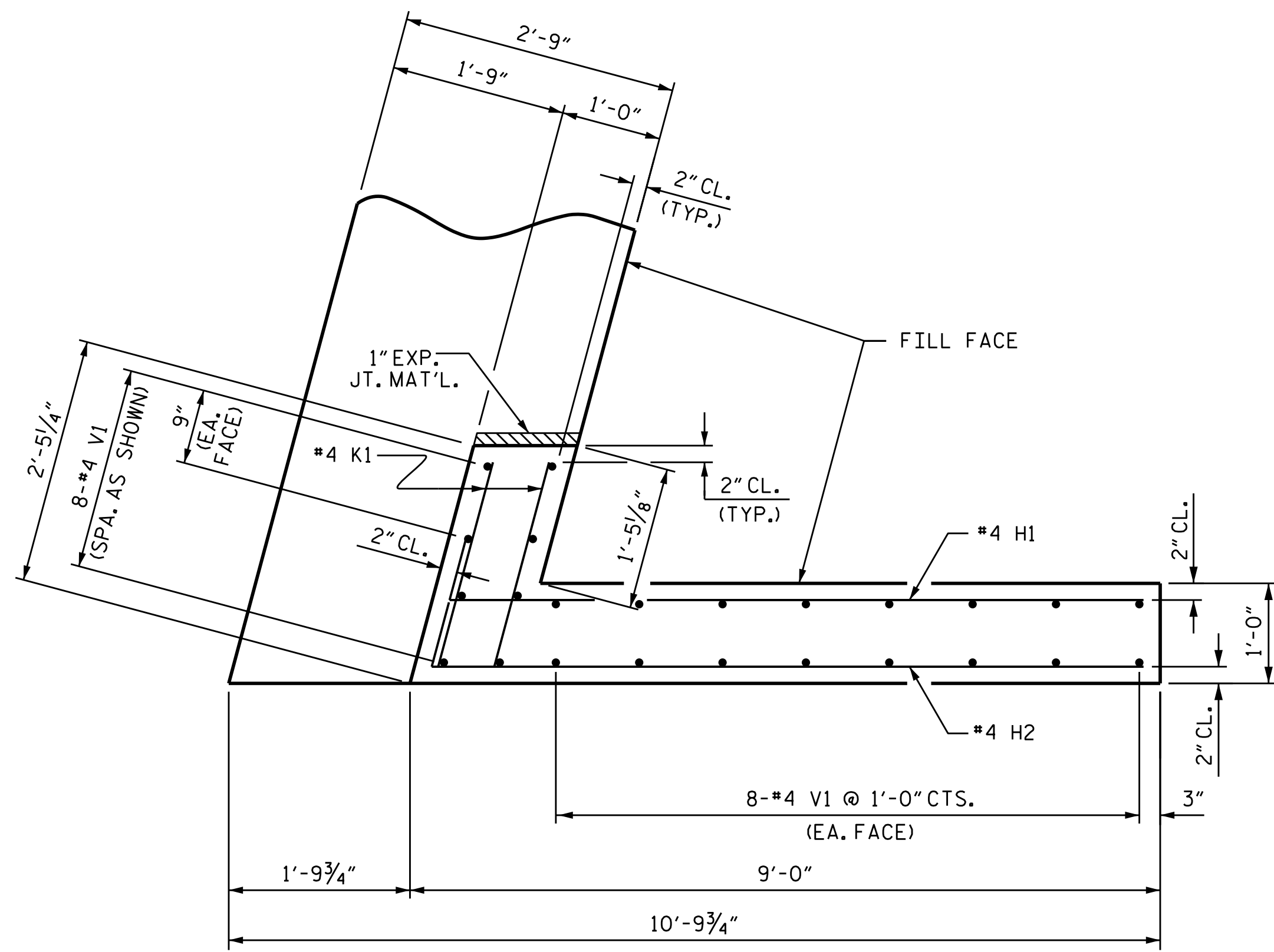
SUBSTRUCTURE
 END BENT No. 2



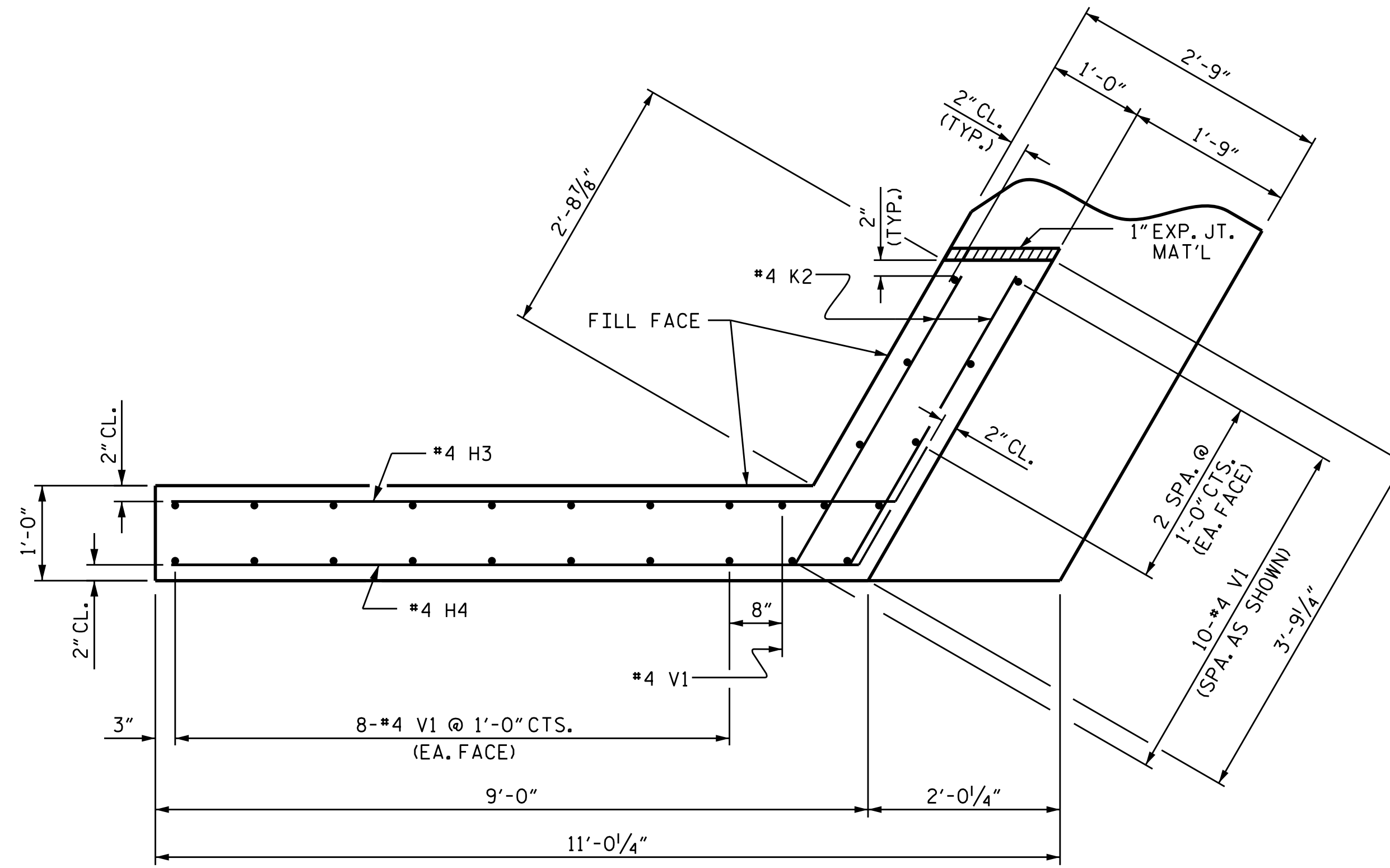
DRAWN BY: H. T. BARBOUR DATE: 5-4-16
 CHECKED BY: V. X. NGUYEN DATE: 5-16
 DESIGN ENGINEER OF RECORD: A. M. LEE DATE: 7-16

DOCUMENT NOT CONSIDERED
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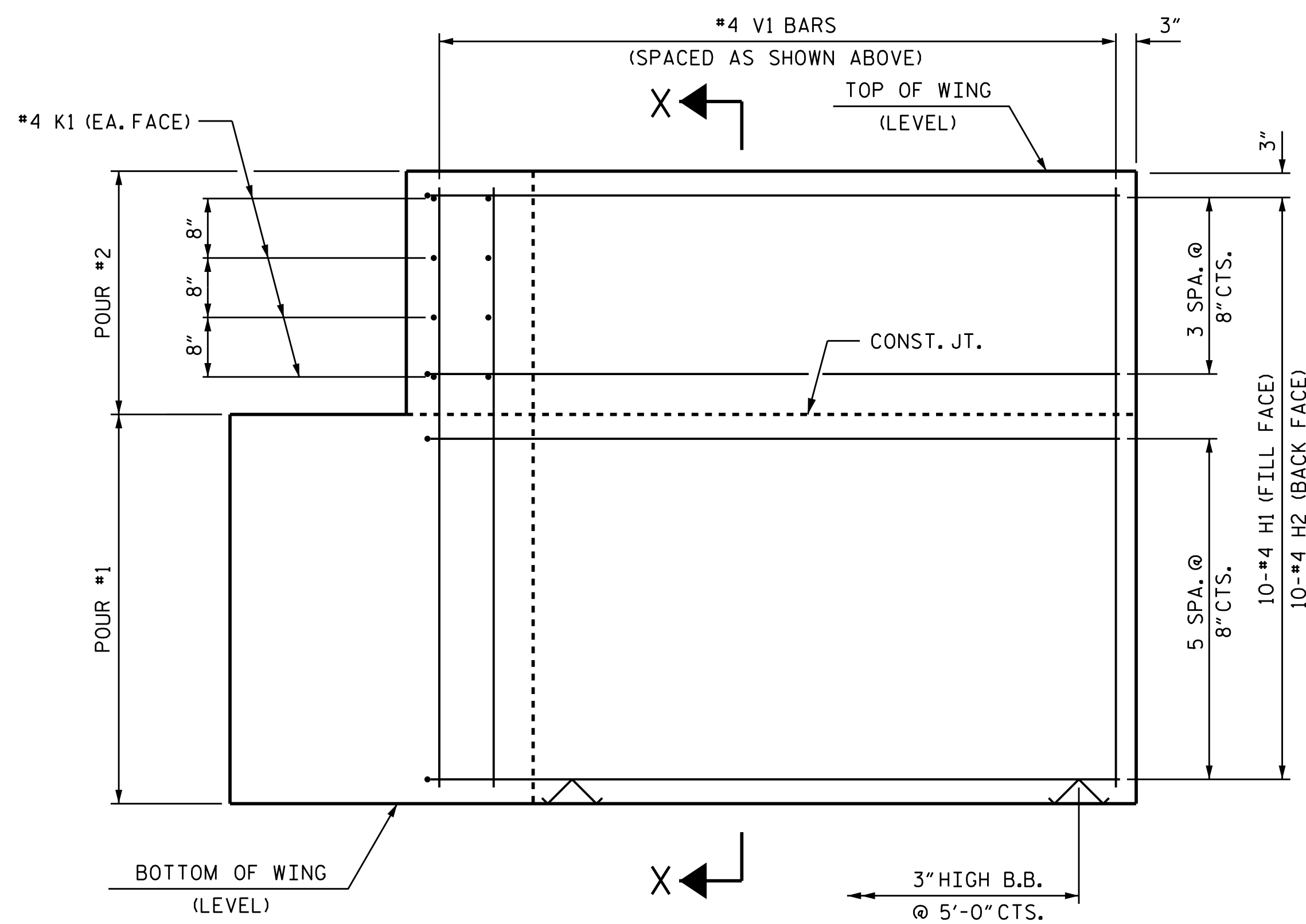
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NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			TOTAL SHEETS 16
2			4			



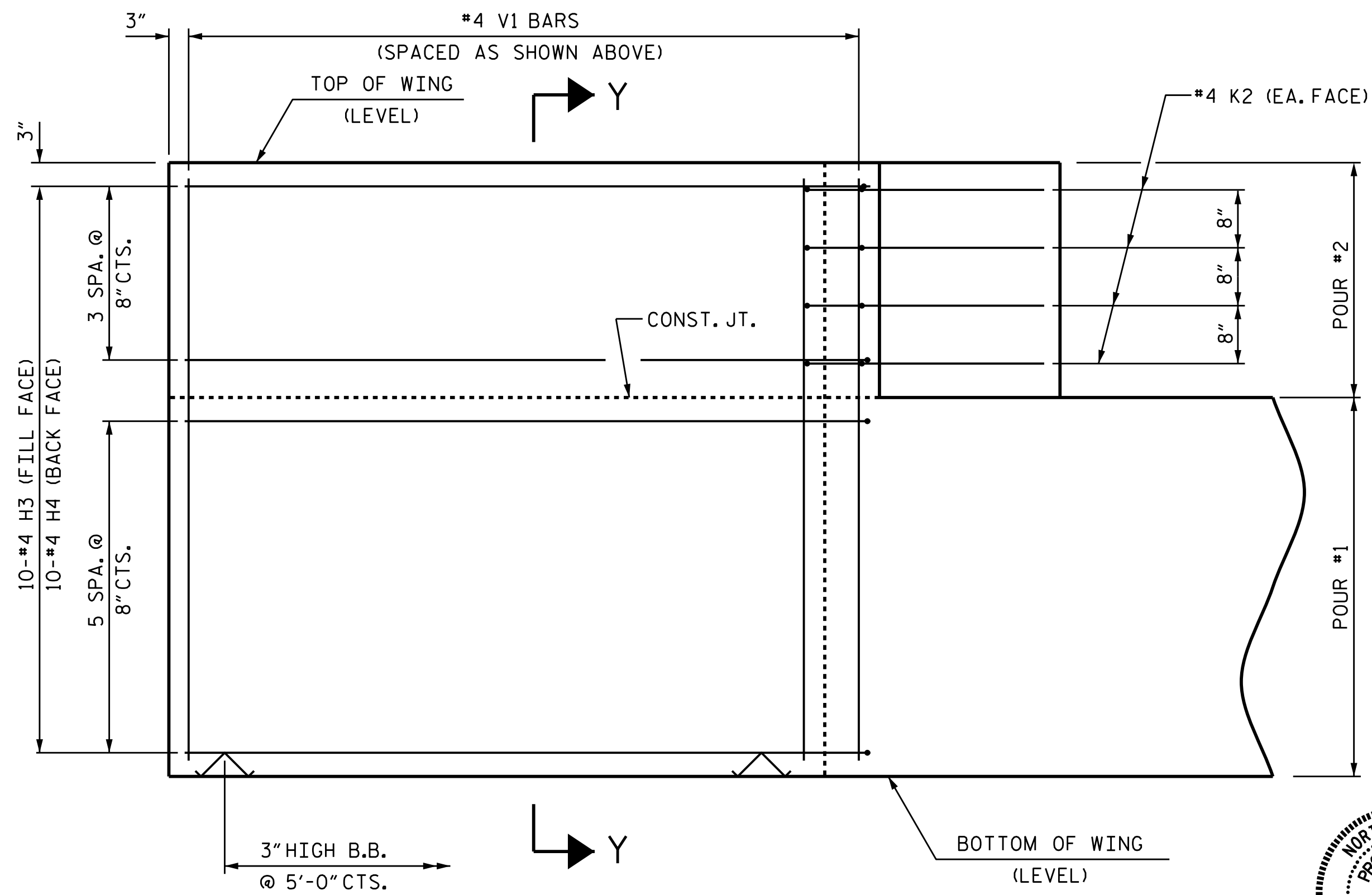
PLAN OF WING (W1)



PLAN OF WING (W2)

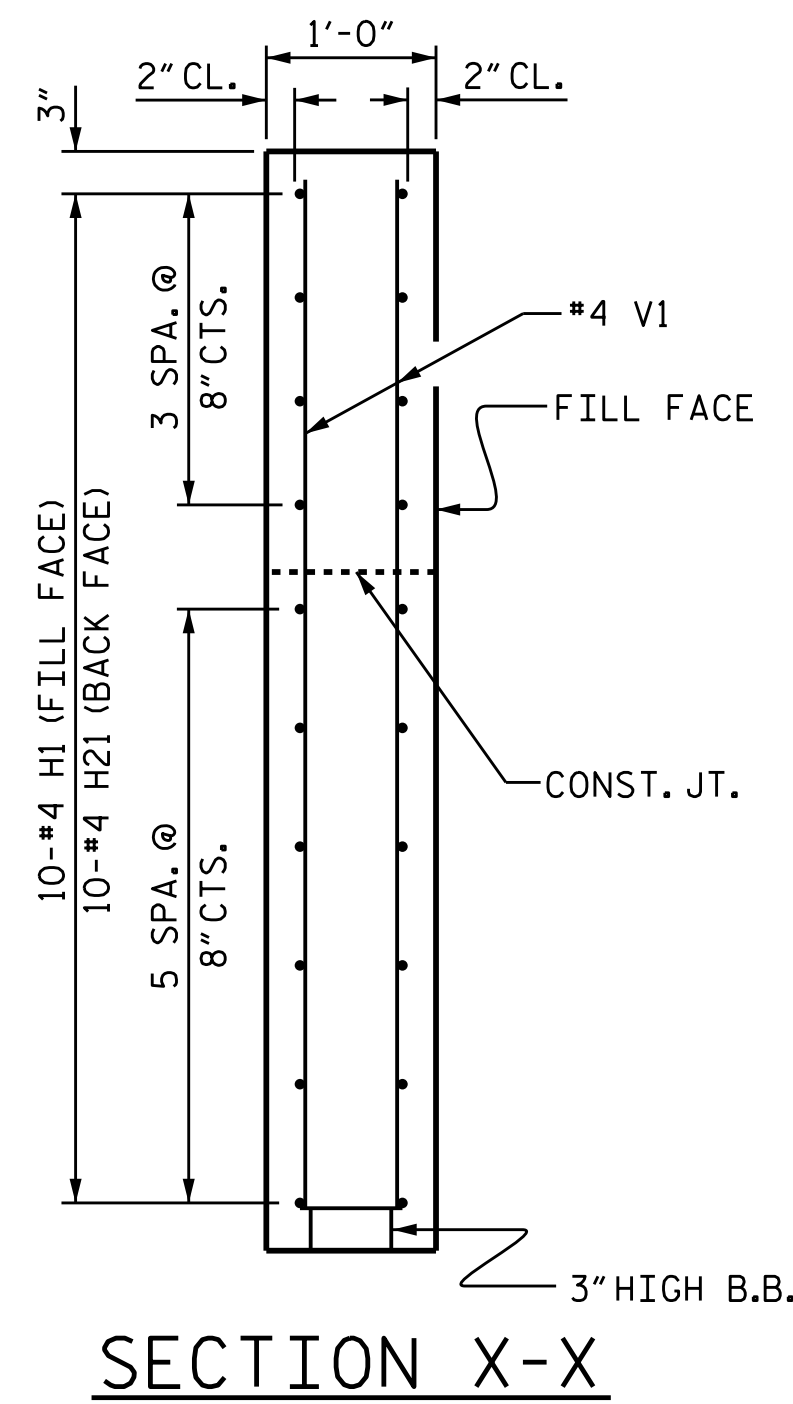


ELEVATION OF WING (W1)

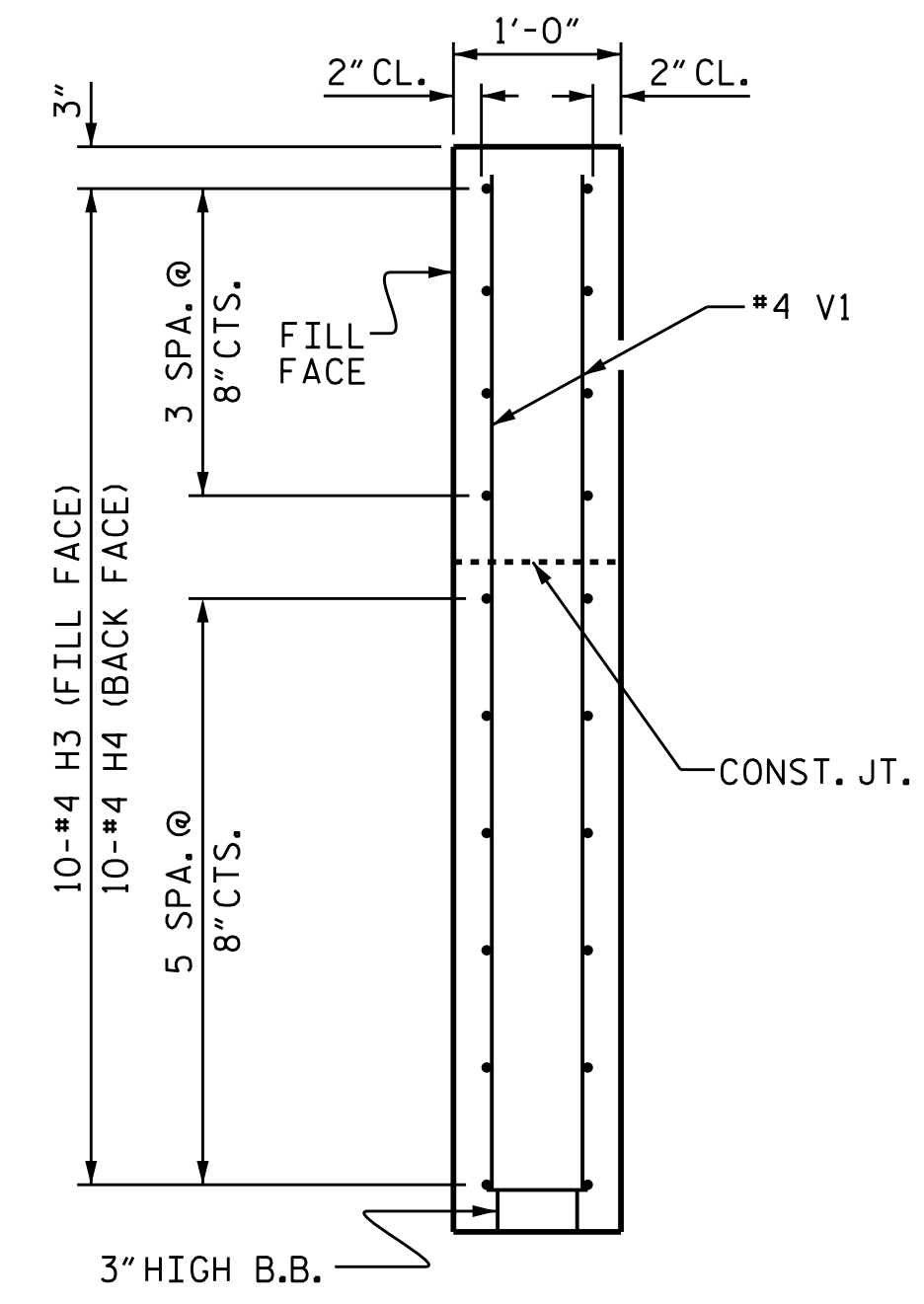


ELEVATION OF WING (W2)

WING DETAILS



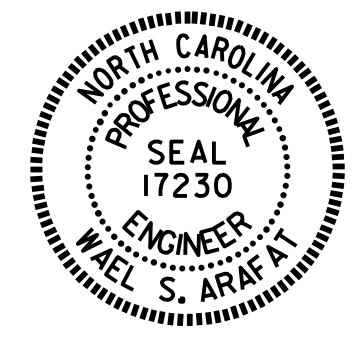
SECTION X-X



SECTION Y-Y

PROJECT NO. B-5380
 AVERY COUNTY
 STATION: 12+31.30 -L-

SHEET 3 OF 4

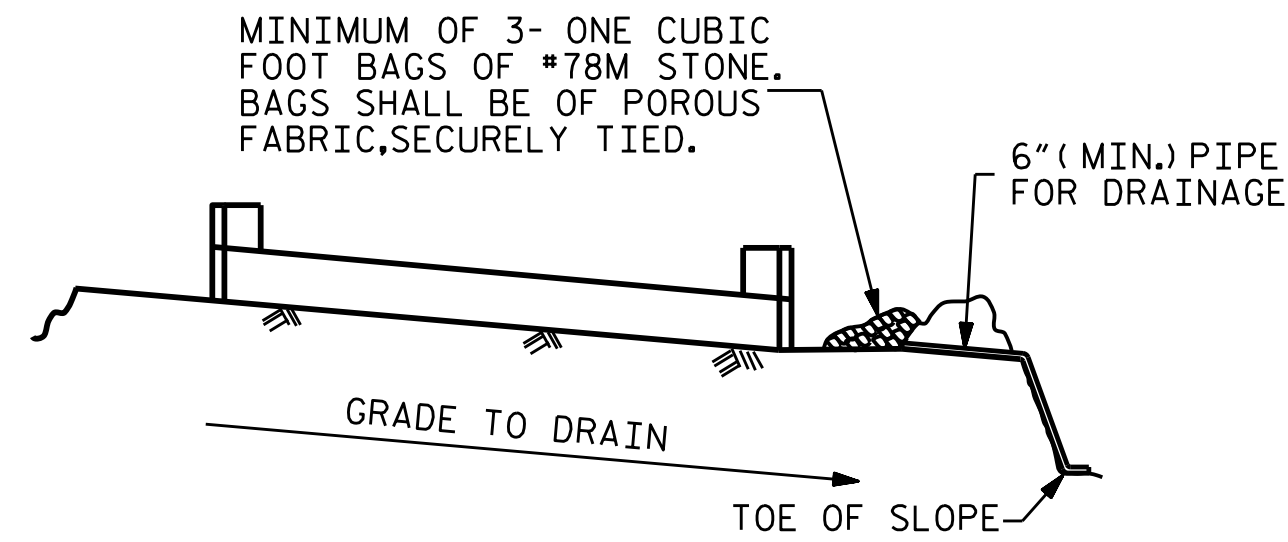


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT
 WING DETAILS

DRAWN BY: H. T. BARBOUR DATE: 5-4-16
 CHECKED BY: V. X. NGUYEN DATE: 5-16
 DESIGN ENGINEER OF RECORD: A. M. LEE DATE: 7-16

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REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11	
1			3			TOTAL SHEETS	
2			4			16	

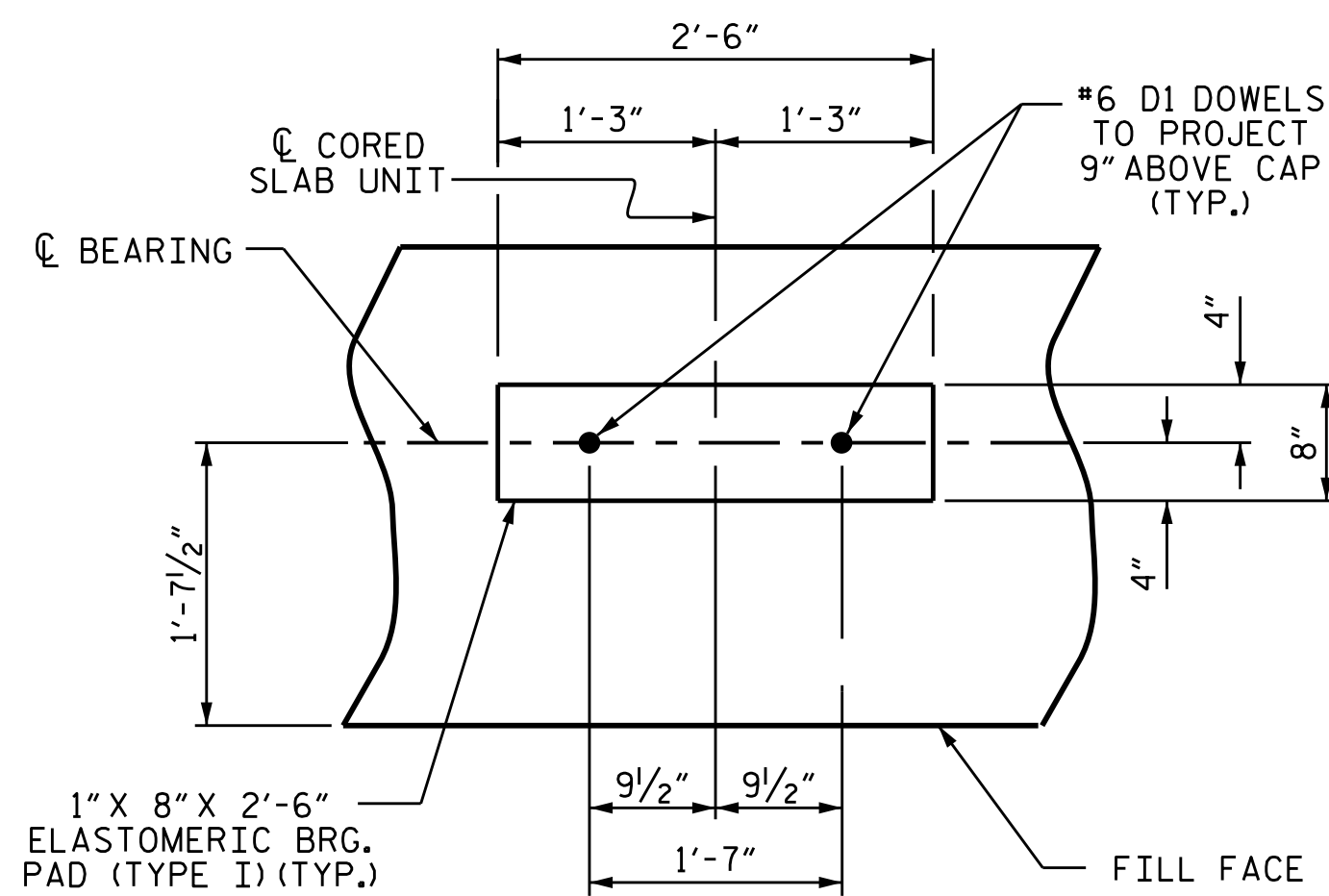


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

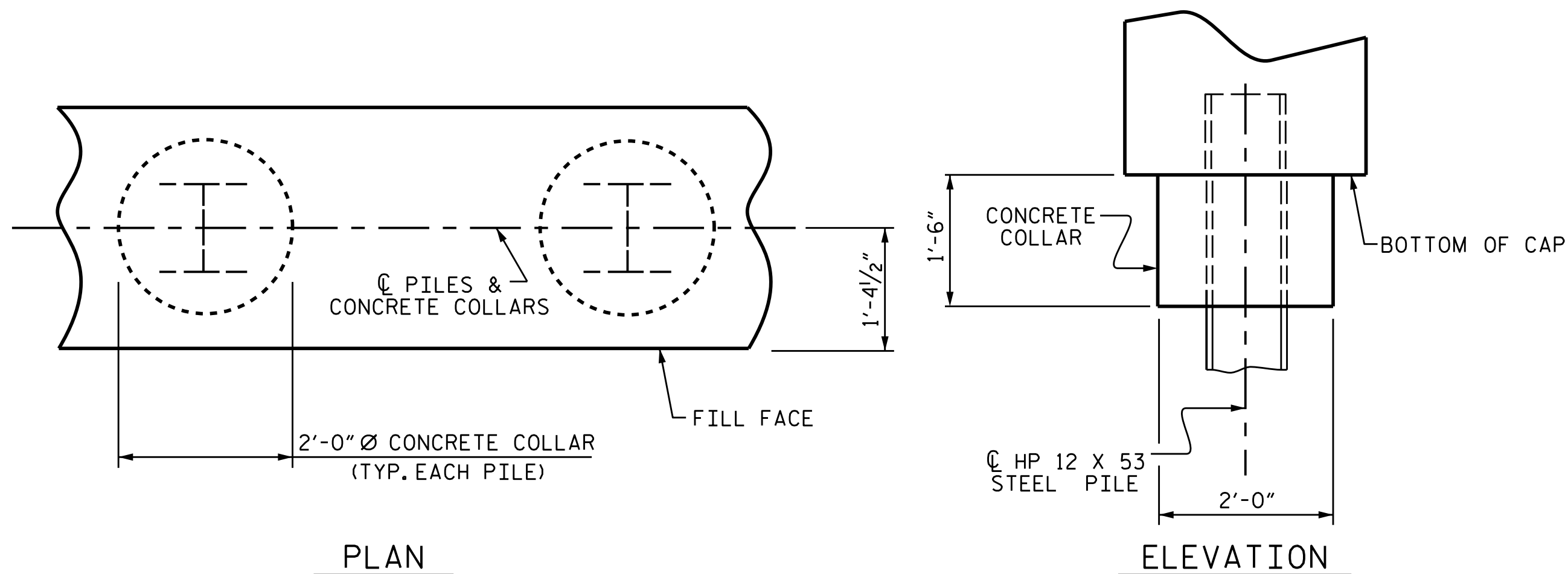
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



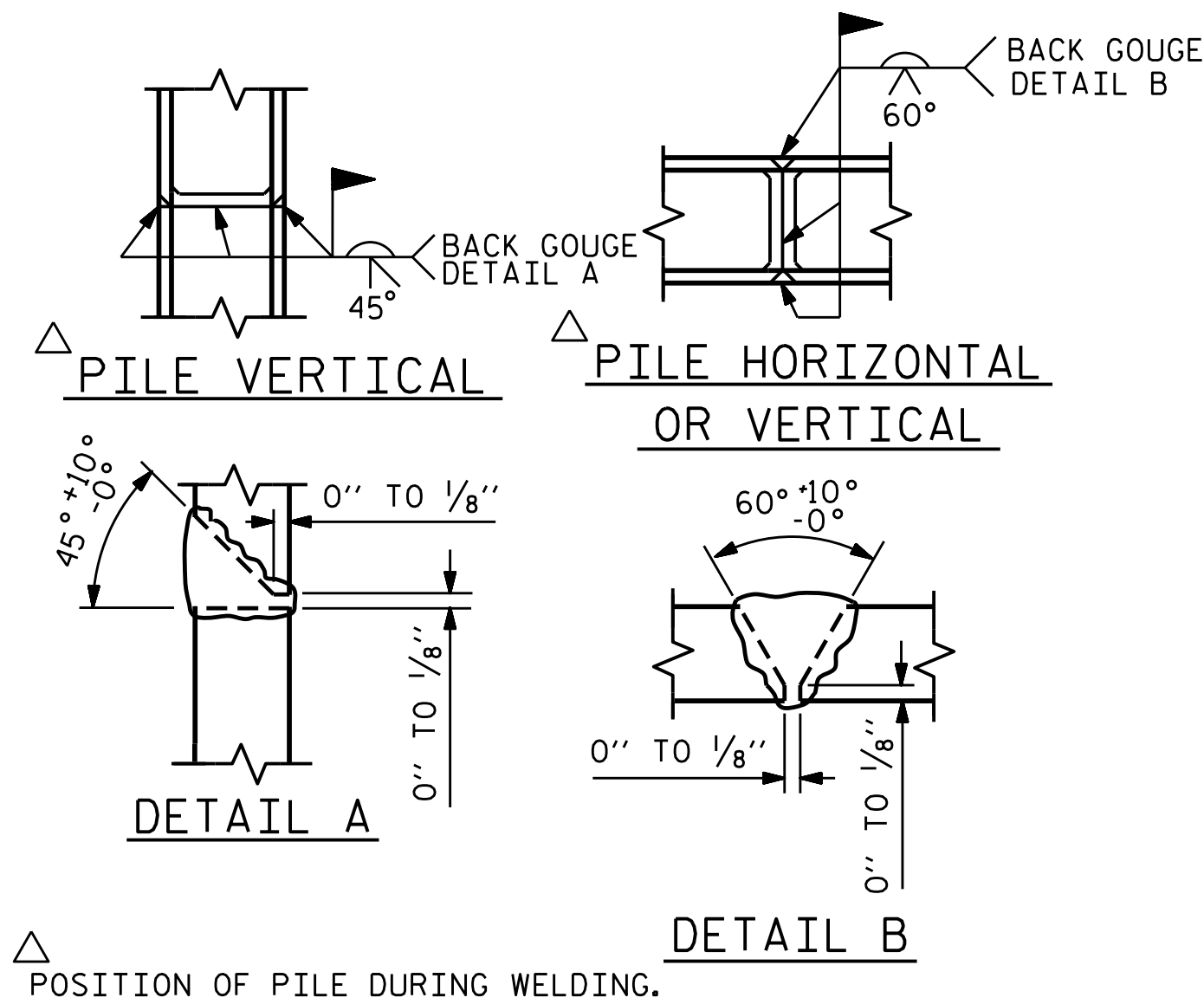
DETAIL "A"

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



CORROSION PROTECTION FOR STEEL PILES DETAIL

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



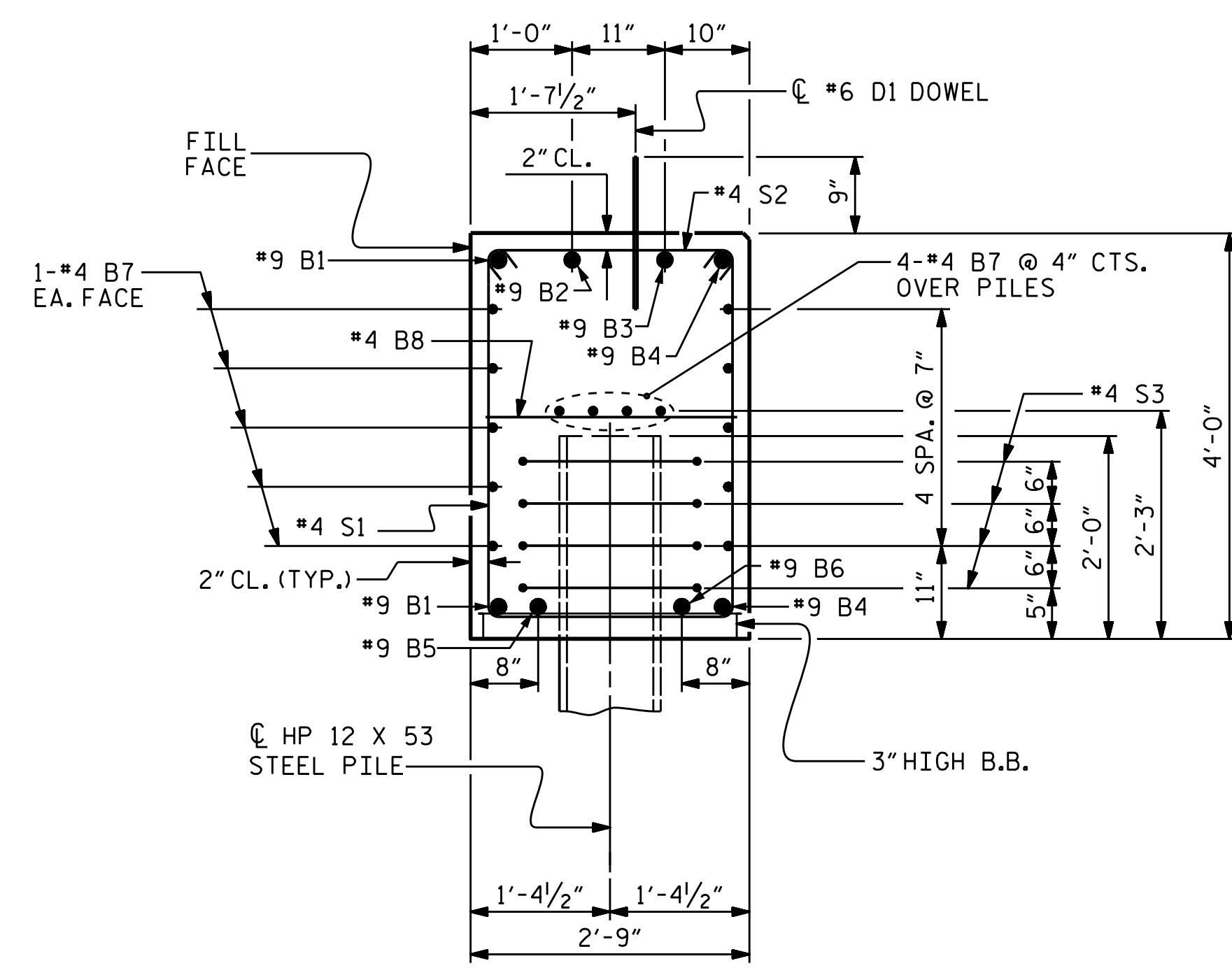
PILE SPLICE DETAILS

BAR TYPES			
HK.	①	HK.	
1'-3"	36'-2"	1'-3"	B1
1'-3"	36'-0"	1'-3"	B2
1'-3"	35'-9"	1'-3"	B3
1'-3"	35'-6"	1'-3"	B4
1'-3"	36'-1"	1'-3"	B5
1'-3"	35'-8"	1'-3"	B6

BILL OF MATERIAL FOR ONE END BENT				
BAR NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	#9	1	38'-8"	263
B2	#9	1	38'-6"	131
B3	#9	1	38'-3"	130
B4	#9	1	38'-0"	258
B5	#9	1	38'-7"	131
B6	#9	1	38'-2"	130
B7	#4	STR	19'-5"	363
B8	#4	STR	2'-5"	15
D1	#6	STR	1'-6"	45
H1	#4	2	9'-1"	61
H2	#4	2	9'-3"	62
H3	#4	3	9'-9"	65
H4	#4	3	9'-4"	62
K1	#4	STR	2'-1"	11
K2	#4	STR	3'-5"	18
S1	#4	4	10'-5"	320
S2	#4	5	3'-2"	97
S3	#4	6	6'-6"	87
V1	#4	STR	6'-2"	210
REINFORCING STEEL (FOR ONE END BENT)				2459 LBS.
CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT)				
POUR #1 CAP, LOWER PART OF WINGS & COLLARS				18.1 C.Y.
POUR #2 UPPER PART OF WINGS				2.1 C.Y.
TOTAL CLASS A CONCRETE				20.2 C.Y.

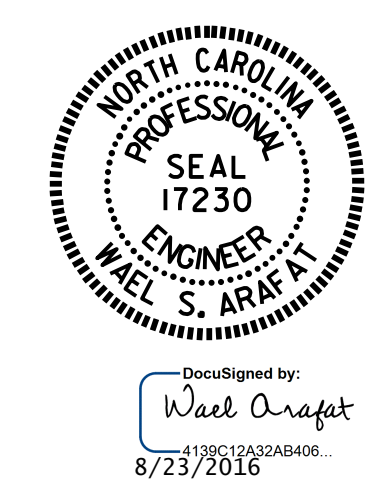
END BENT No. 1		END BENT No. 2	
HP 12 X 53 STEEL PILES	NO: 5	HP 12 X 53 STEEL PILES	NO: 5
LIN. FT. = 60.0		LIN. FT. = 80.0	

ALL BAR DIMENSIONS ARE OUT TO OUT.



SECTION A-A

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



PROJECT NO. B-5380
 AVERY COUNTY
 STATION: 12+31.30 -L-

SHEET 4 OF 4

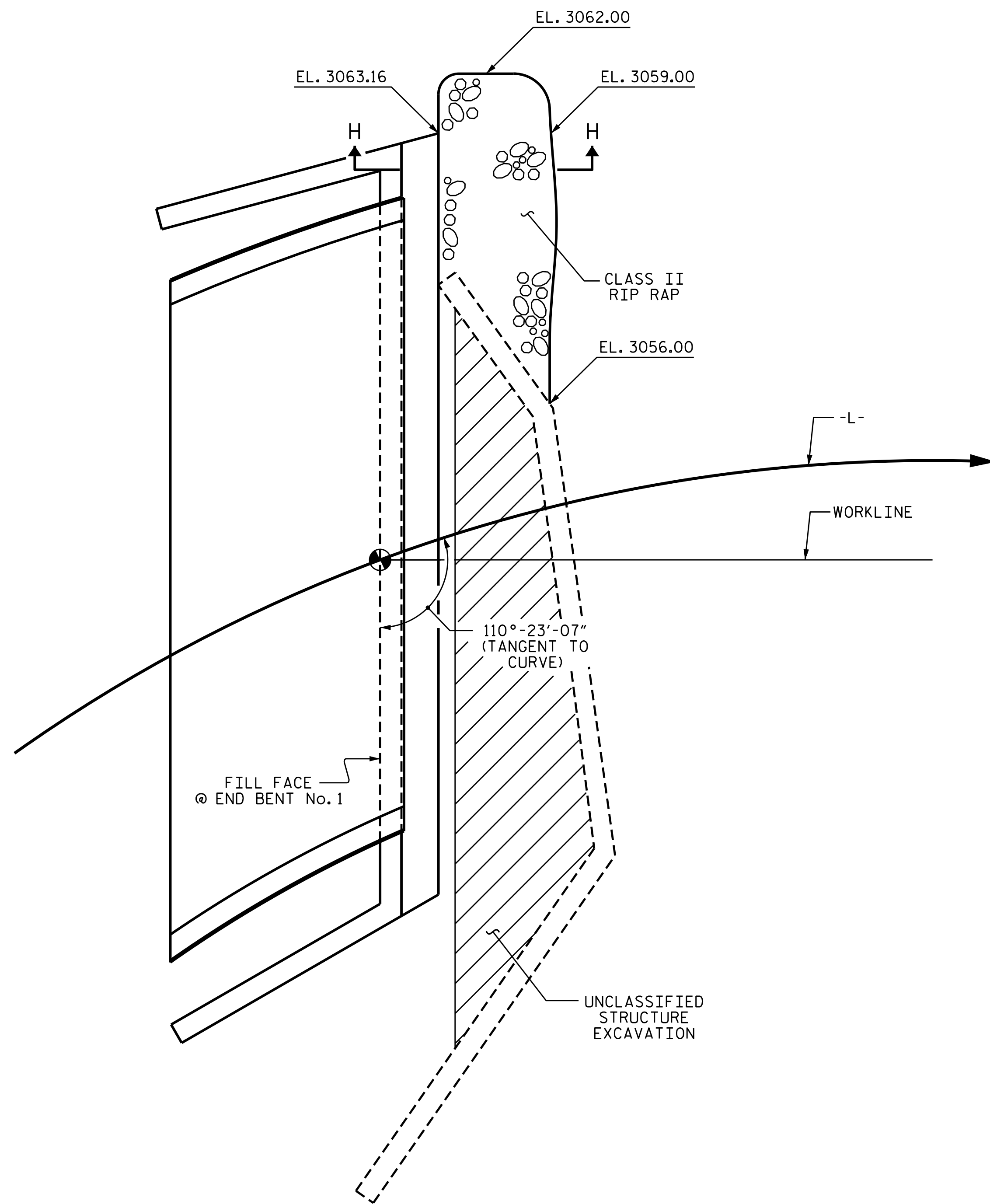
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT No. 1 & 2
 DETAILS

DRAWN BY :	H. T. BARBOUR	DATE :	5-5-16
CHECKED BY :	V. X. NGUYEN	DATE :	5-16
DESIGN ENGINEER OF RECORD :	A. M. LEE	DATE :	7-16

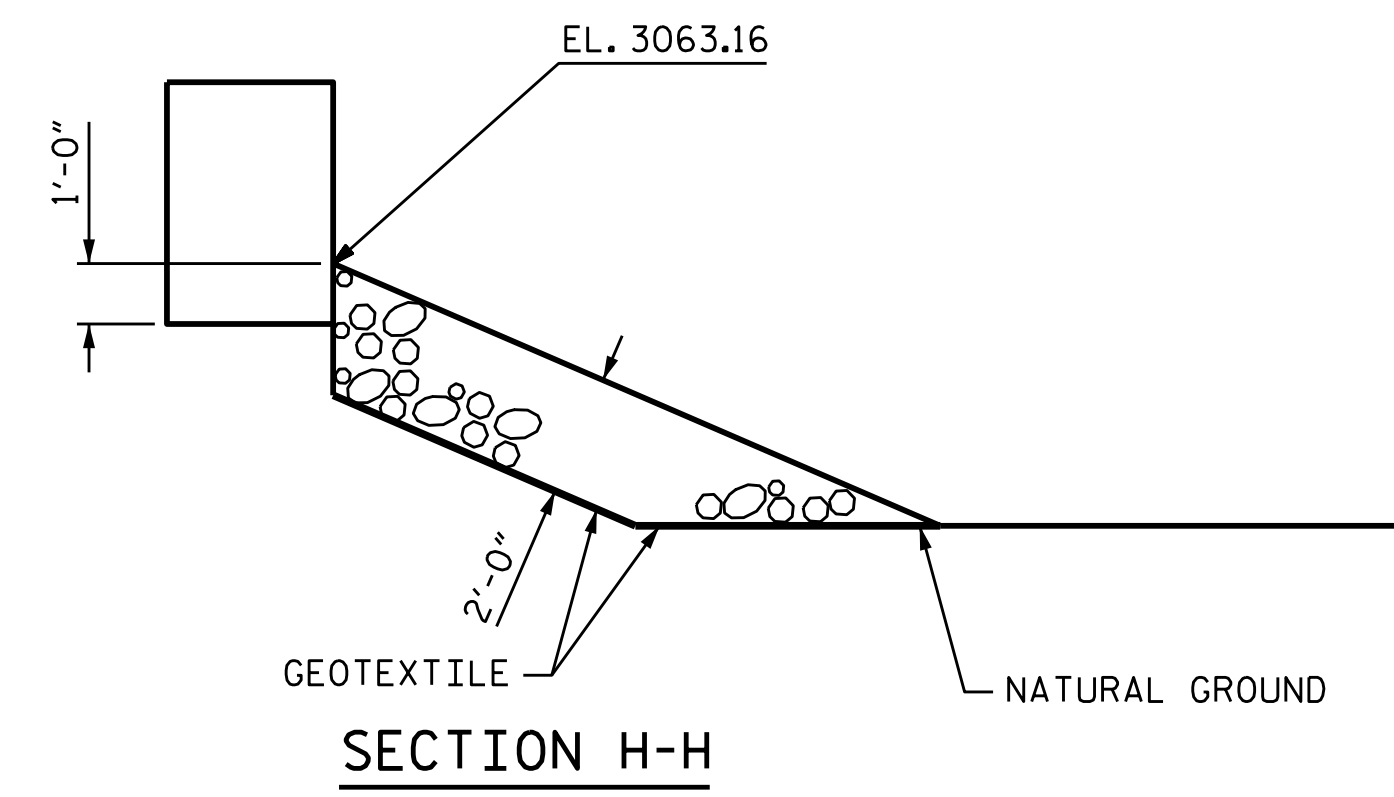
REVISIONS				SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

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PLAN @ END BENT No. 1

ESTIMATED QUANTITIES		
BRIDGE @ STA. 12+31.30 -L-	RIP RAP CLASS II (2'-0" THICK)	GEOTEXTILE FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	11.0	12.0



PROJECT NO. B-5380
AVERY COUNTY
 STATION: 12+31.30 -L-



DocuSigned by:
Wael Arafat
478623232B408
8/23/2016

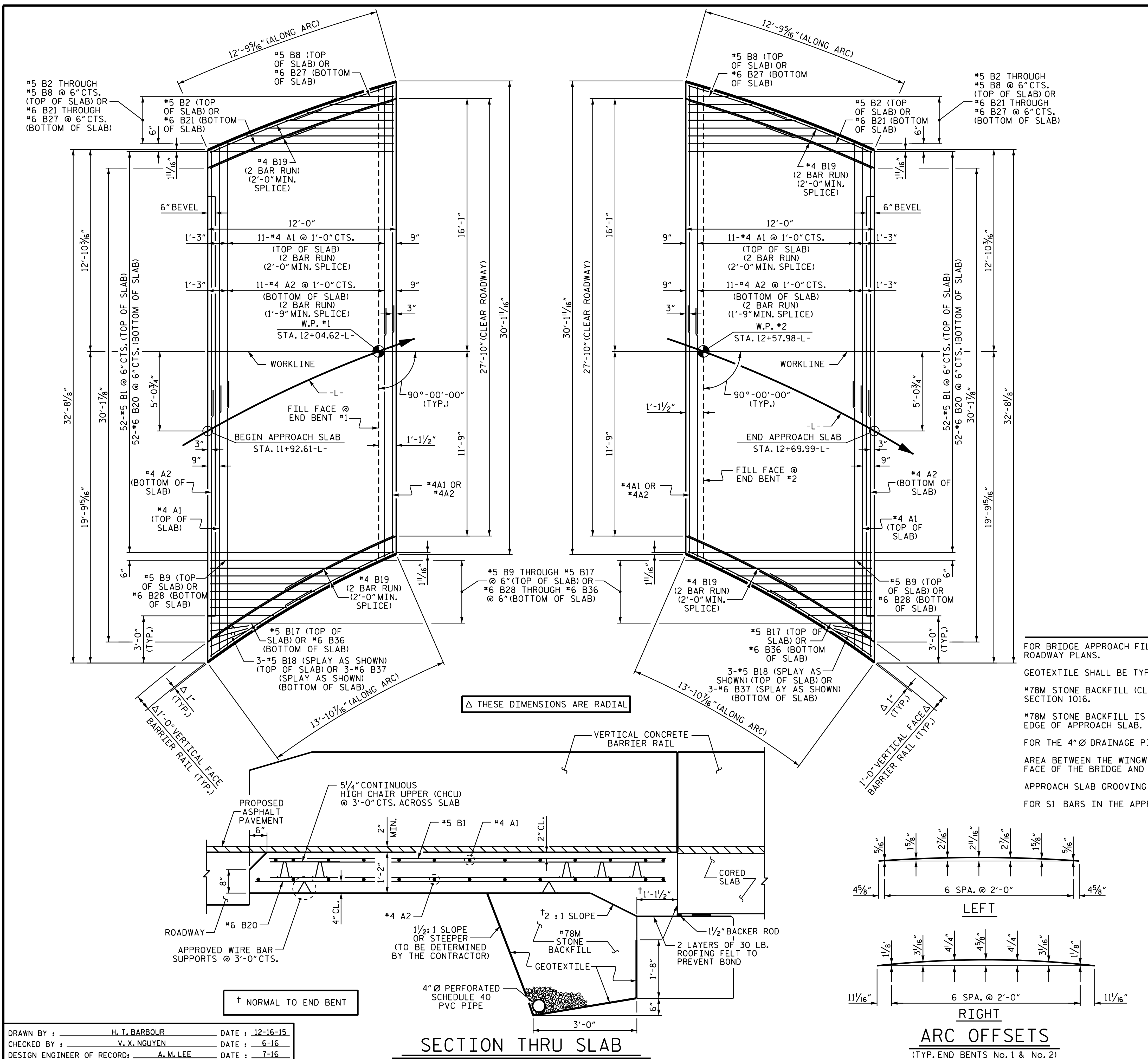
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

RIP RAP

DRAWN BY : H. T. BARBOUR DATE : 5-20-15
 CHECKED BY : V. X. NGUYEN DATE : 7-16

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REVISIONS						SHEET NO.
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1			3			S-13
2			4			16



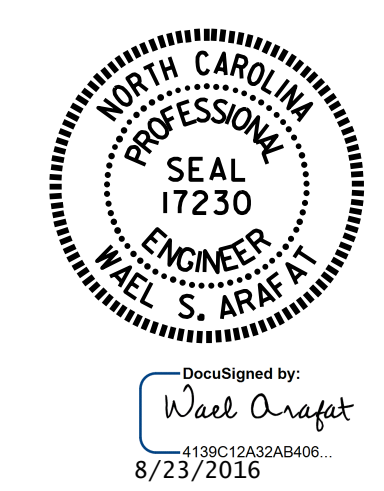
BILL OF MATERIAL													
APPROACH SLAB AT EB #1							APPROACH SLAB AT EB #2						
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT		BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	
*A1	26	#4	STR	17'-1"	297		*A1	26	#4	STR	17'-1"	297	
A2	26	#4	STR	17'-0"	295		A2	26	#4	STR	17'-0"	295	
*B1	52	#5	STR	11'-2"	606		*B1	52	#5	STR	11'-2"	606	
*B2	1	#5	STR	10'-7"	11		*B2	1	#5	STR	10'-7"	11	
*B3	1	#5	STR	9'-4"	10		*B3	1	#5	STR	9'-4"	10	
*B4	1	#5	STR	8'-1"	8		*B4	1	#5	STR	8'-1"	8	
*B5	1	#5	STR	6'-10"	7		*B5	1	#5	STR	6'-10"	7	
*B6	1	#5	STR	5'-6"	6		*B6	1	#5	STR	5'-6"	6	
*B7	1	#5	STR	4'-0"	4		*B7	1	#5	STR	4'-0"	4	
*B8	1	#5	STR	2'-6"	3		*B8	1	#5	STR	2'-6"	3	
*B9	1	#5	STR	10'-1"	11		*B9	1	#5	STR	10'-1"	11	
*B10	1	#5	STR	9'-0"	9		*B10	1	#5	STR	9'-0"	9	
*B11	1	#5	STR	8'-0"	8		*B11	1	#5	STR	8'-0"	8	
*B12	1	#5	STR	7'-0"	7		*B12	1	#5	STR	7'-0"	7	
*B13	1	#5	STR	6'-1"	6		*B13	1	#5	STR	6'-1"	6	
*B14	1	#5	STR	5'-3"	5		*B14	1	#5	STR	5'-3"	5	
*B15	1	#5	STR	4'-4"	5		*B15	1	#5	STR	4'-4"	5	
*B16	1	#5	STR	3'-6"	4		*B16	1	#5	STR	3'-6"	4	
*B17	1	#5	STR	3'-3"	3		*B17	1	#5	STR	3'-3"	3	
*B18	3	#5	STR	2'-6"	9		*B18	3	#5	STR	2'-6"	9	
*B19	8	#4	STR	7'-9"	41		*B19	8	#4	STR	7'-9"	41	
B20	52	#6	STR	11'-8"	911		B20	52	#6	STR	11'-8"	911	
B21	1	#6	STR	10'-7"	16		B21	1	#6	STR	10'-7"	16	
B22	1	#6	STR	9'-4"	14		B22	1	#6	STR	9'-4"	14	
B23	1	#6	STR	8'-1"	12		B23	1	#6	STR	8'-1"	12	
B24	1	#6	STR	6'-10"	10		B24	1	#6	STR	6'-10"	10	
B25	1	#6	STR	5'-6"	8		B25	1	#6	STR	5'-6"	8	
B26	1	#6	STR	4'-0"	6		B26	1	#6	STR	4'-0"	6	
B27	1	#6	STR	2'-6"	4		B27	1	#6	STR	2'-6"	4	
B28	1	#6	STR	10'-7"	16		B28	1	#6	STR	10'-7"	16	
B29	1	#6	STR	9'-6"	14		B29	1	#6	STR	9'-6"	14	
B30	1	#6	STR	8'-6"	13		B30	1	#6	STR	8'-6"	13	
B31	1	#6	STR	7'-6"	11		B31	1	#6	STR	7'-6"	11	
B32	1	#6	STR	6'-7"	10		B32	1	#6	STR	6'-7"	10	
B33	1	#6	STR	5'-9"	9		B33	1	#6	STR	5'-9"	9	
B34	1	#6	STR	4'-10"	7		B34	1	#6	STR	4'-10"	7	
B35	1	#6	STR	4'-0"	6		B35	1	#6	STR	4'-0"	6	
B36	1	#6	STR	3'-3"	5		B36	1	#6	STR	3'-3"	5	
B37	3	#6	STR	2'-6"	11		B37	3	#6	STR	2'-6"	11	
REINFORCING STEEL					LBS.	1378	REINFORCING STEEL					LBS.	1378
* EPOXY COATED REINFORCING STEEL					LBS.	1060	* EPOXY COATED REINFORCING STEEL					LBS.	1060
CLASS AA CONCRETE					C. Y.	17.7	CLASS AA CONCRETE					C. Y.	17.7

NOTES

- FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 4" Ø DRAINAGE PIPE, AND #78M STONE BACKFILL, SEE ROADWAY PLANS.
- GEOTEXTILE SHALL BE TYPE 1 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.
- #78M STONE BACKFILL (CLASS V SELECT MATERIAL) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.
- #78M STONE BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.
- FOR THE 4" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.
- AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.
- APPROACH SLAB GROOVING IS NOT REQUIRED.
- FOR S1 BARS IN THE APPROACH SLABS, SEE SHEET 2 OF 2.

PROJECT NO. B-5380
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 STATION: 12+31.30-L-

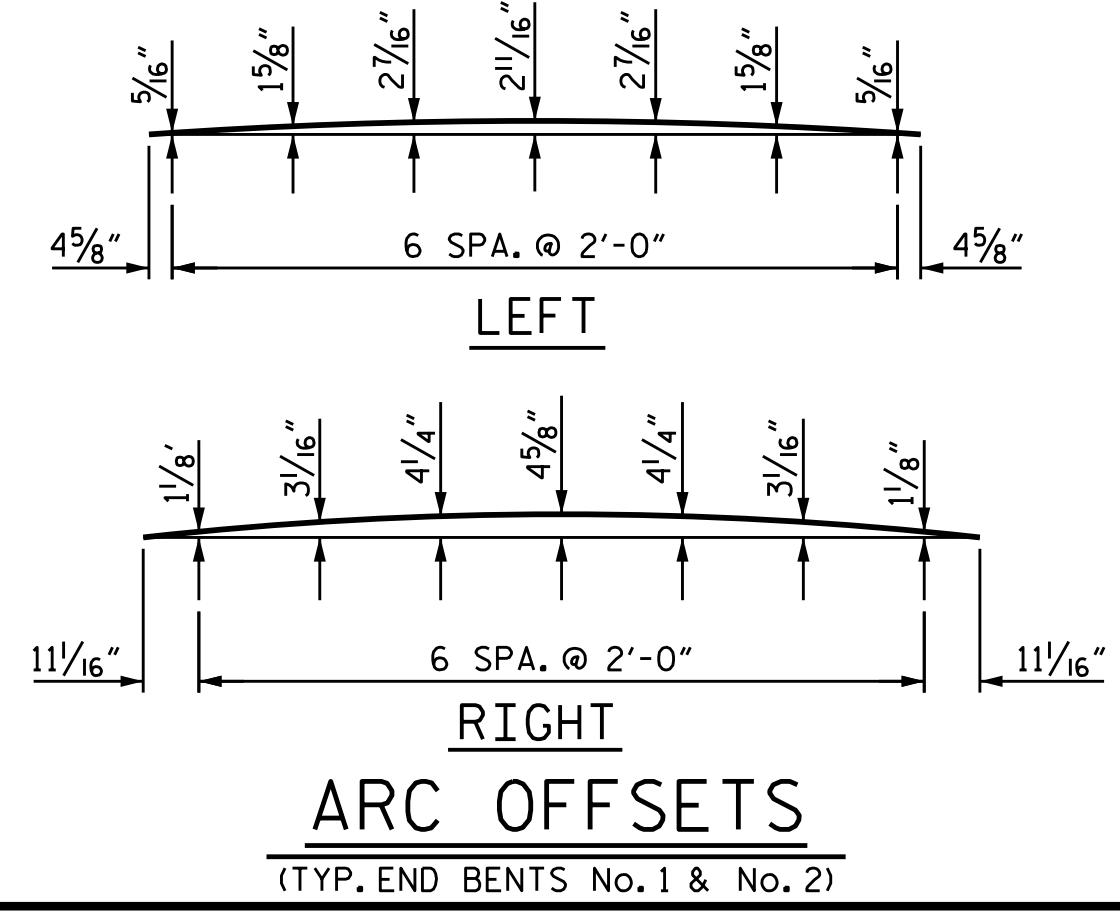
SHEET 1 OF 2



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-14
1			3			TOTAL SHEETS
2			4			16

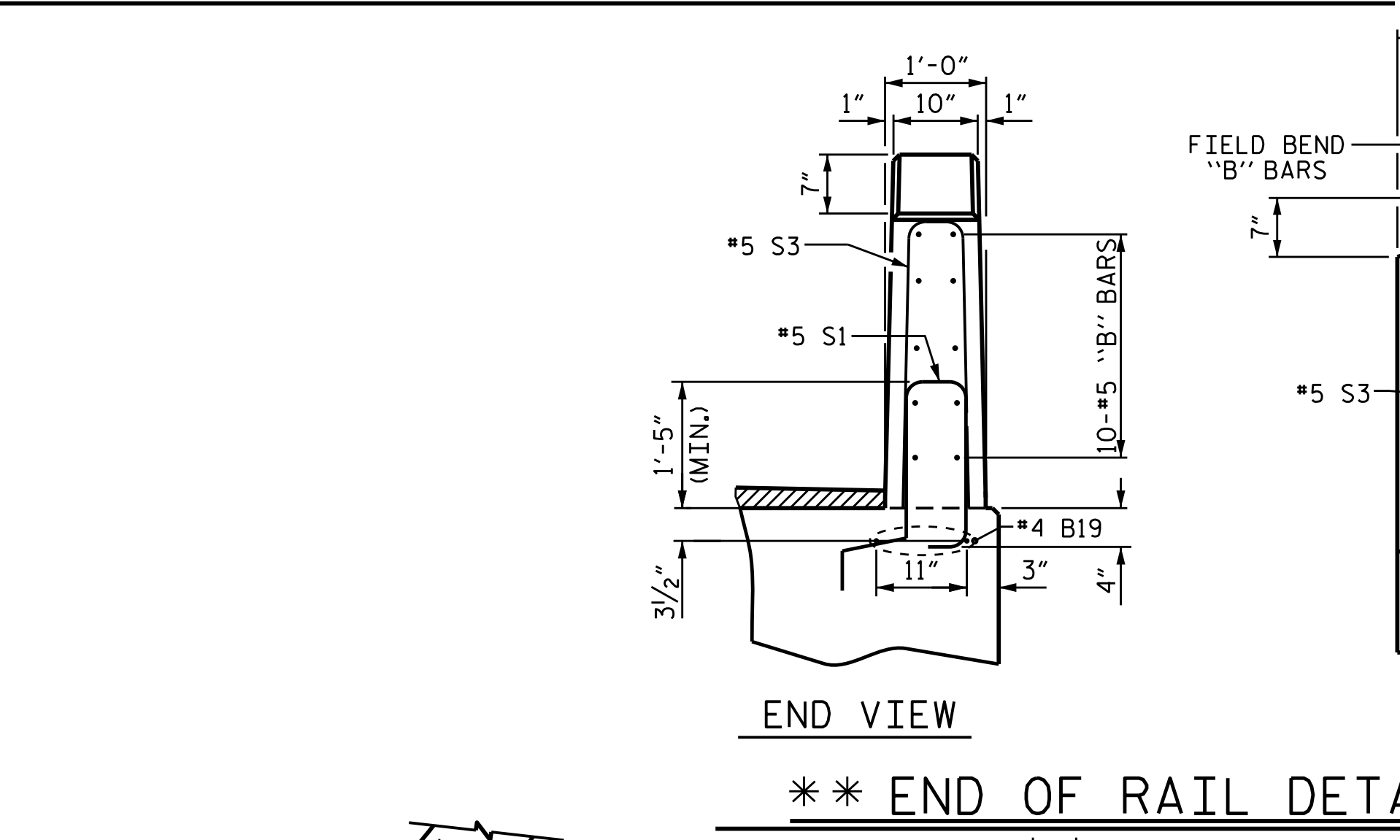
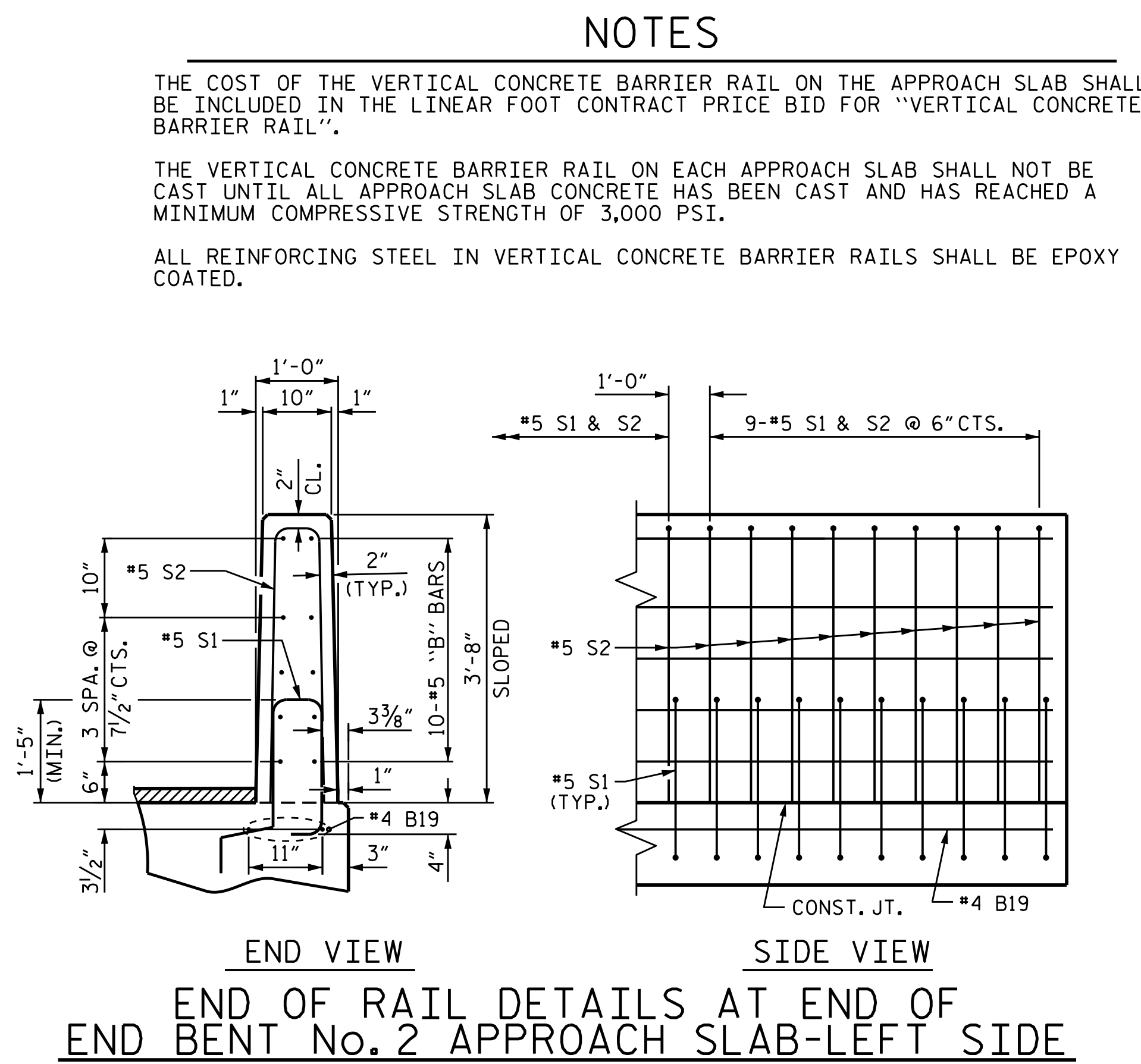
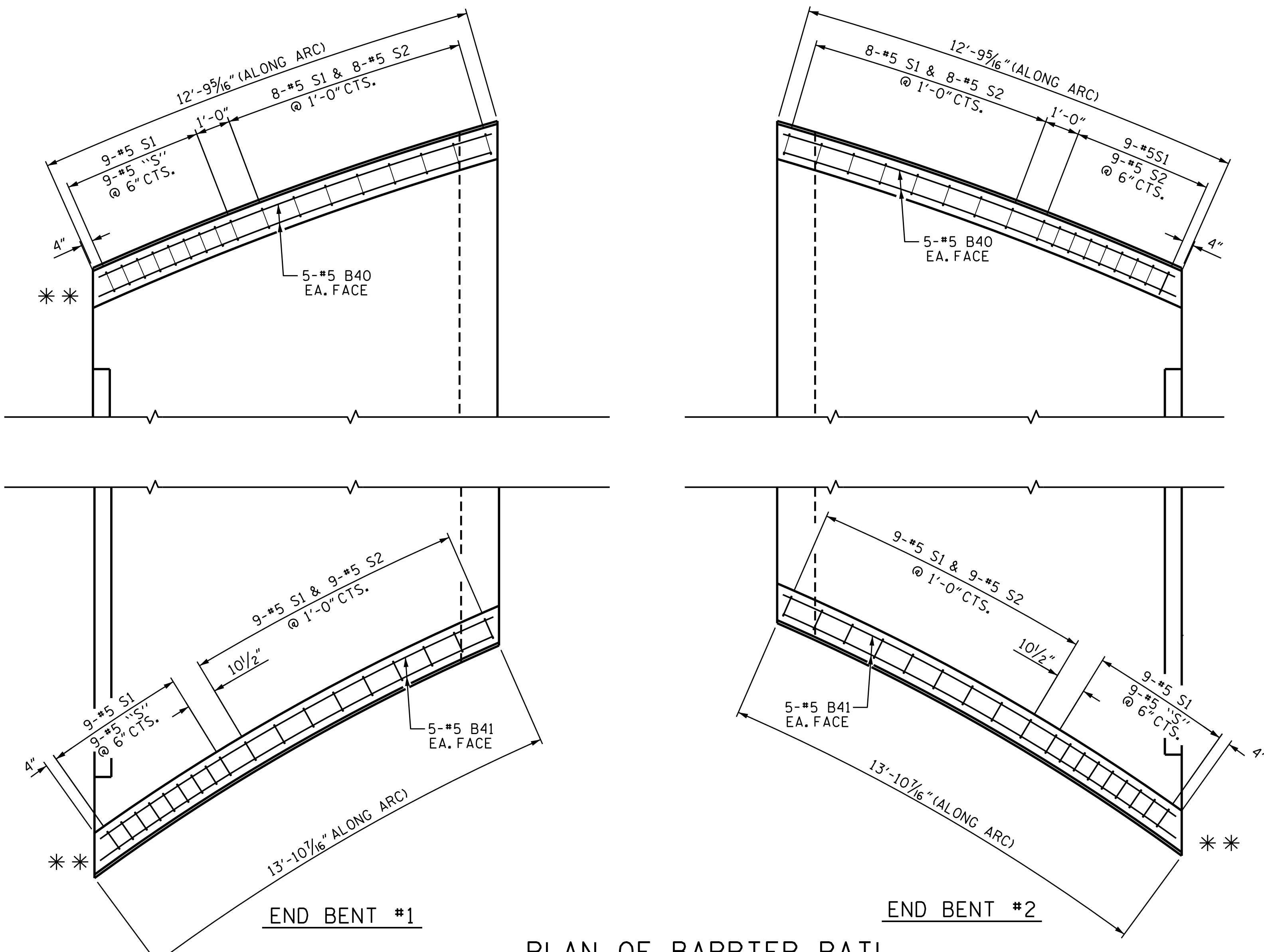
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DRAWN BY: H. T. BARBOUR DATE: 12-16-15
 CHECKED BY: V. X. NGUYEN DATE: 6-16
 DESIGN ENGINEER OF RECORD: A. M. LEE DATE: 7-16

SECTION THRU SLAB

† NORMAL TO END BENT



NOTES

THE COST OF THE VERTICAL CONCRETE BARRIER RAIL ON THE APPROACH SLAB SHALL BE INCLUDED IN THE LINEAR FOOT CONTRACT PRICE BID FOR "VERTICAL CONCRETE BARRIER RAIL".

THE VERTICAL CONCRETE BARRIER RAIL ON EACH APPROACH SLAB SHALL NOT BE CAST UNTIL ALL APPROACH SLAB CONCRETE HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

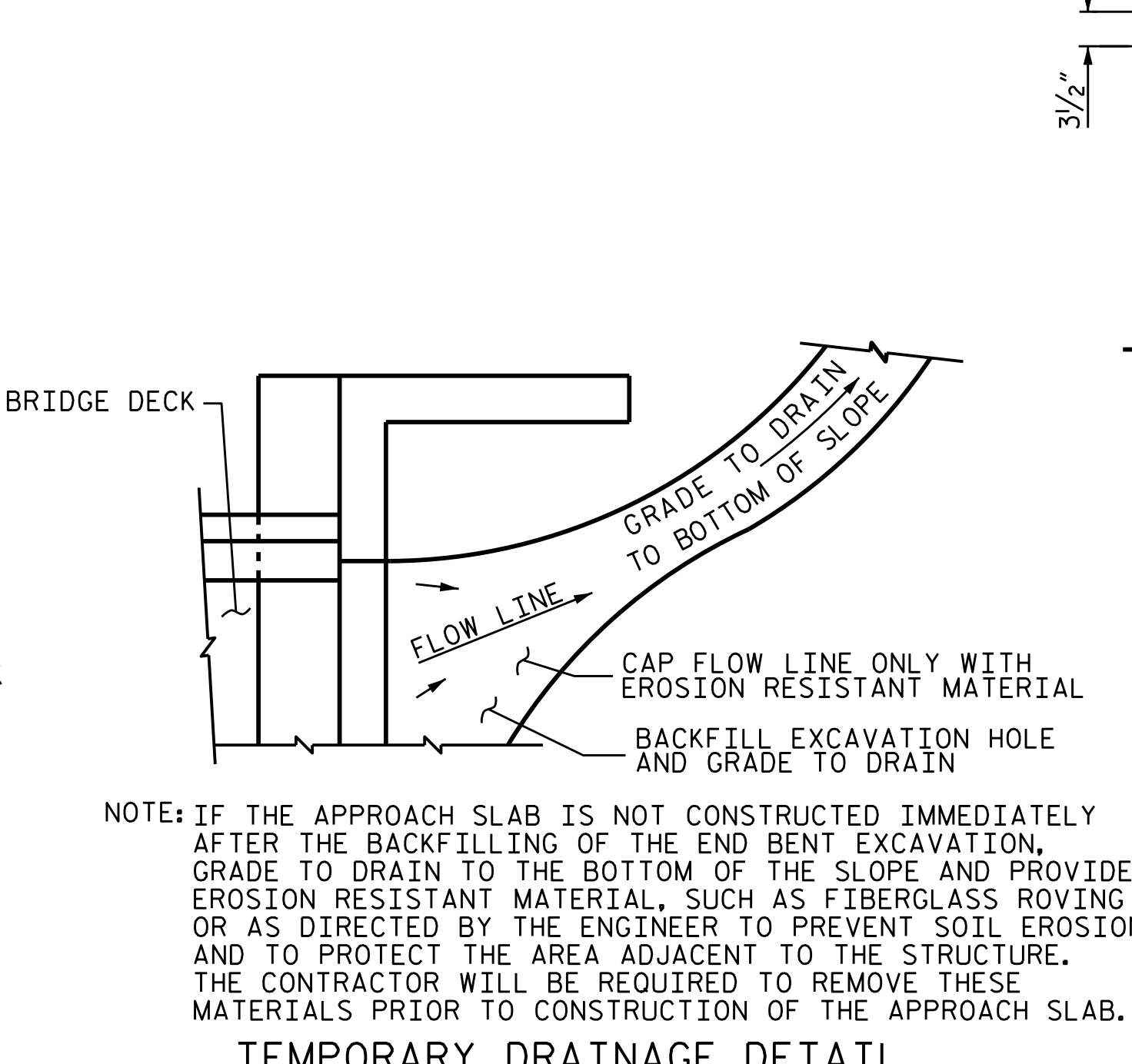
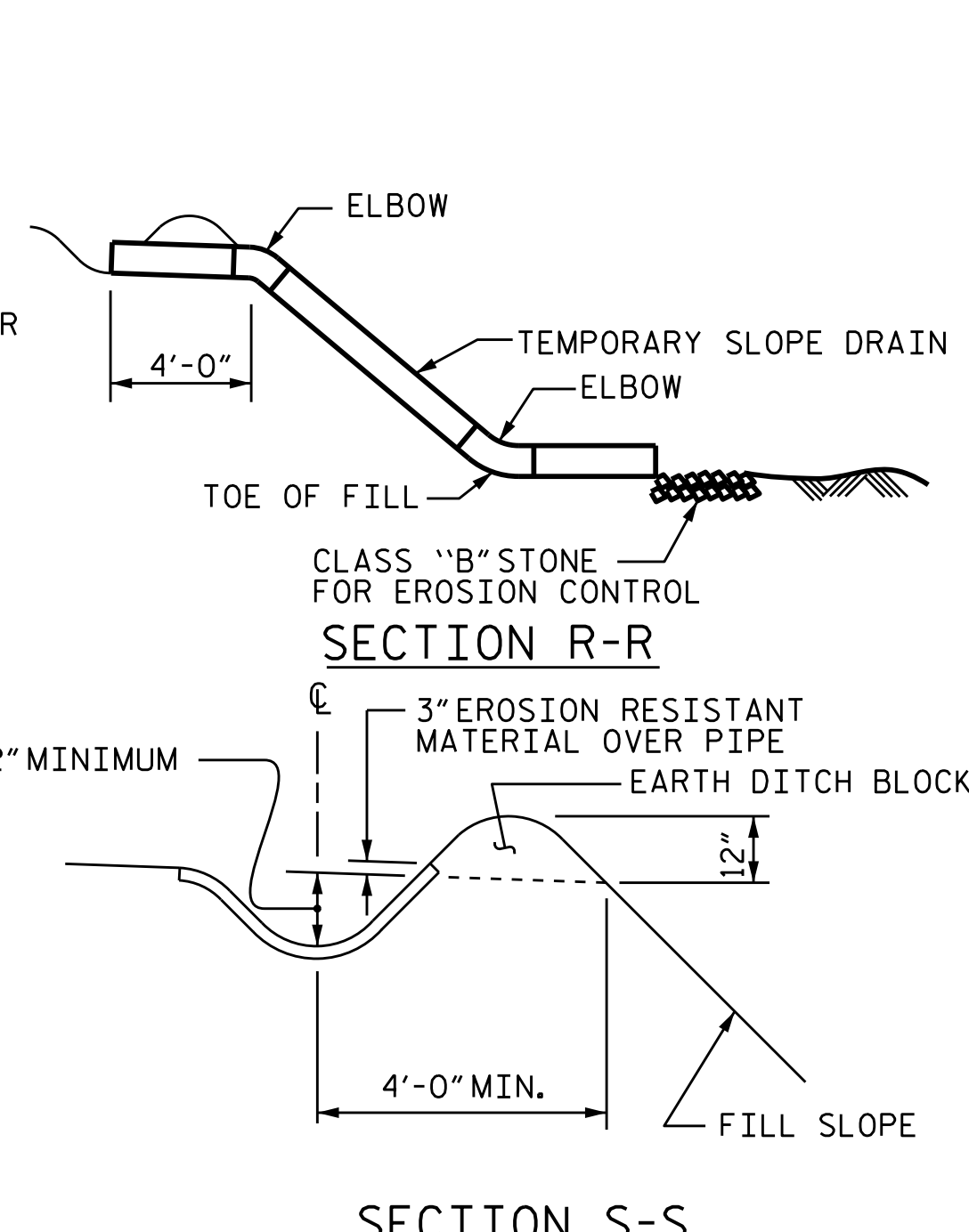
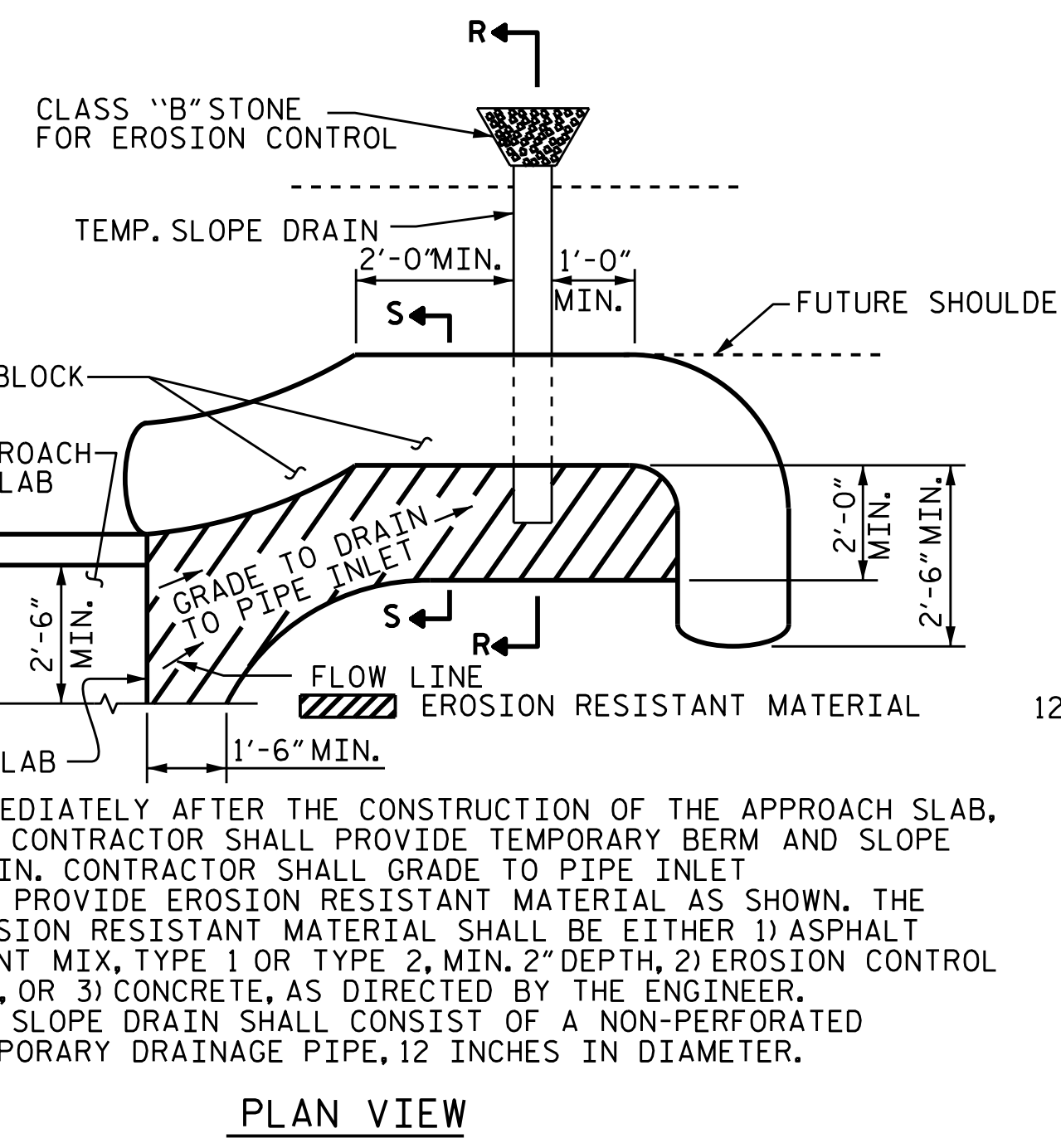
ALL REINFORCING STEEL IN VERTICAL CONCRETE BARRIER RAILS SHALL BE EPOXY COATED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT

BARRIER RAIL ONLY					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B40	20	#5	STR	12'-4"	257
* B41	20	#5	STR	13'-5"	280
* S1	70	#5	1	5'-10"	426
* S2	58	#5	2	7'-2"	434
* S3	12	#5	2	6'-0"	75
* EPOXY COATED REINFORCING STEEL				LBS.	1472
CLASS AA CONCRETE				C. Y.	6.7
CONCRETE BARRIER RAIL				53.3 LIN. FT.	

PLAN OF BARRIER RAIL



TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

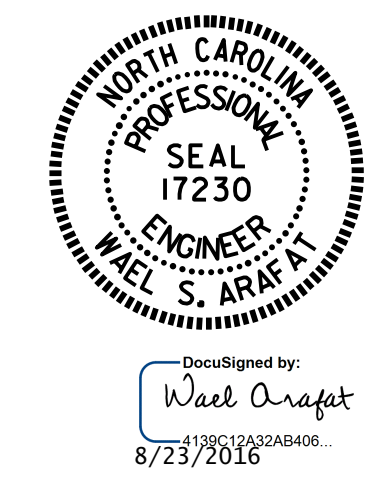
DRAWN BY: H. T. BARBOUR DATE: 5-3-16
 CHECKED BY: V. X. NGUYEN DATE: 6-19
 DESIGN ENGINEER OF RECORD: A. M. LEE DATE: 7-16

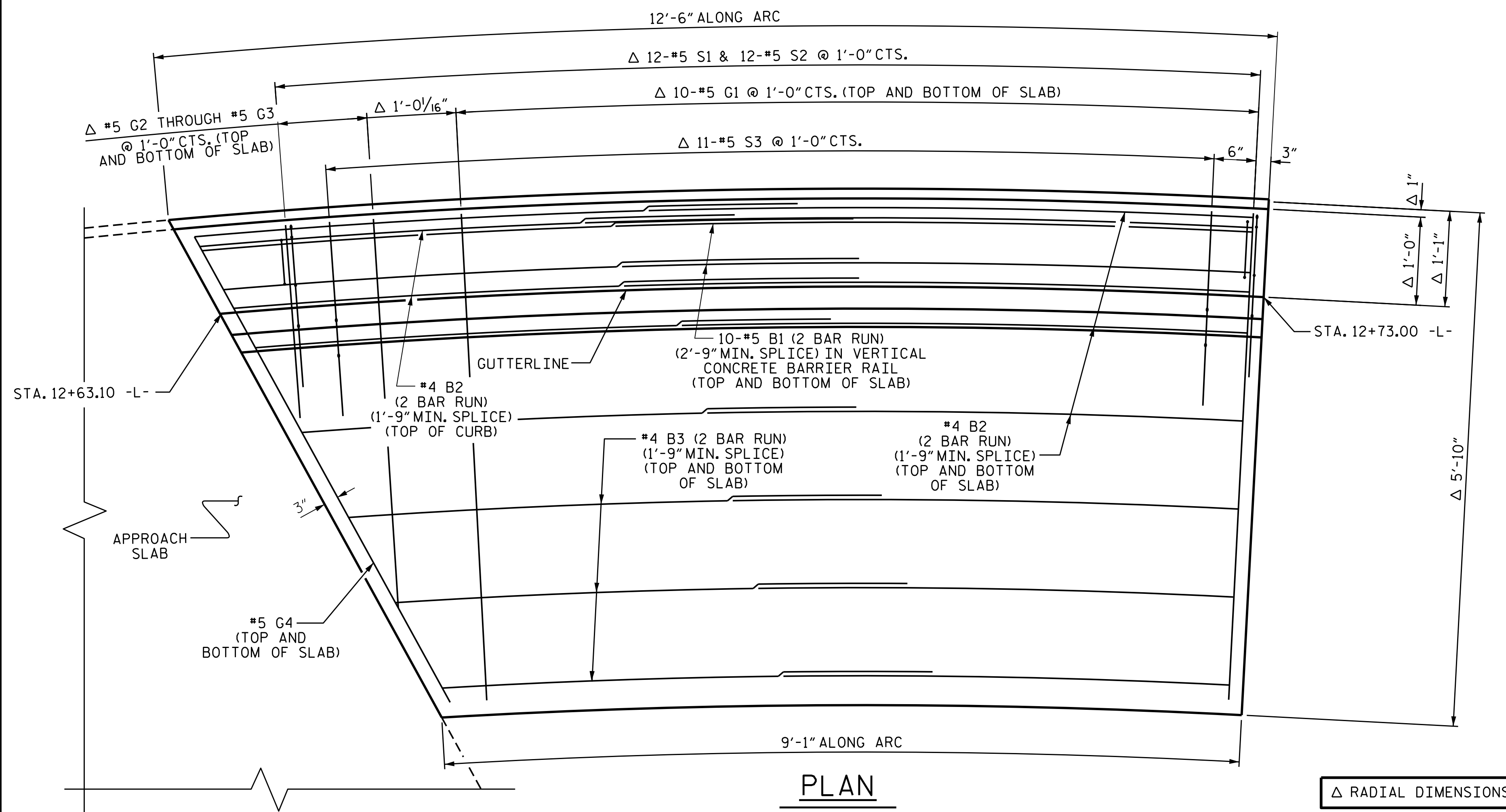
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PROJECT NO. B-5380
 AVERY COUNTY
 STATION: 12+31.30-L-

SHEET 2 OF 2

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





PLAN

Δ RADIAL DIMENSIONS

NOTES

FOR VERTICAL CONCRETE BARRIER RAIL WITH MOMENT SLAB, SEE VERTICAL CONCRETE BARRIER RAIL WITH MOMENT SLAB SPECIAL PROVISION.

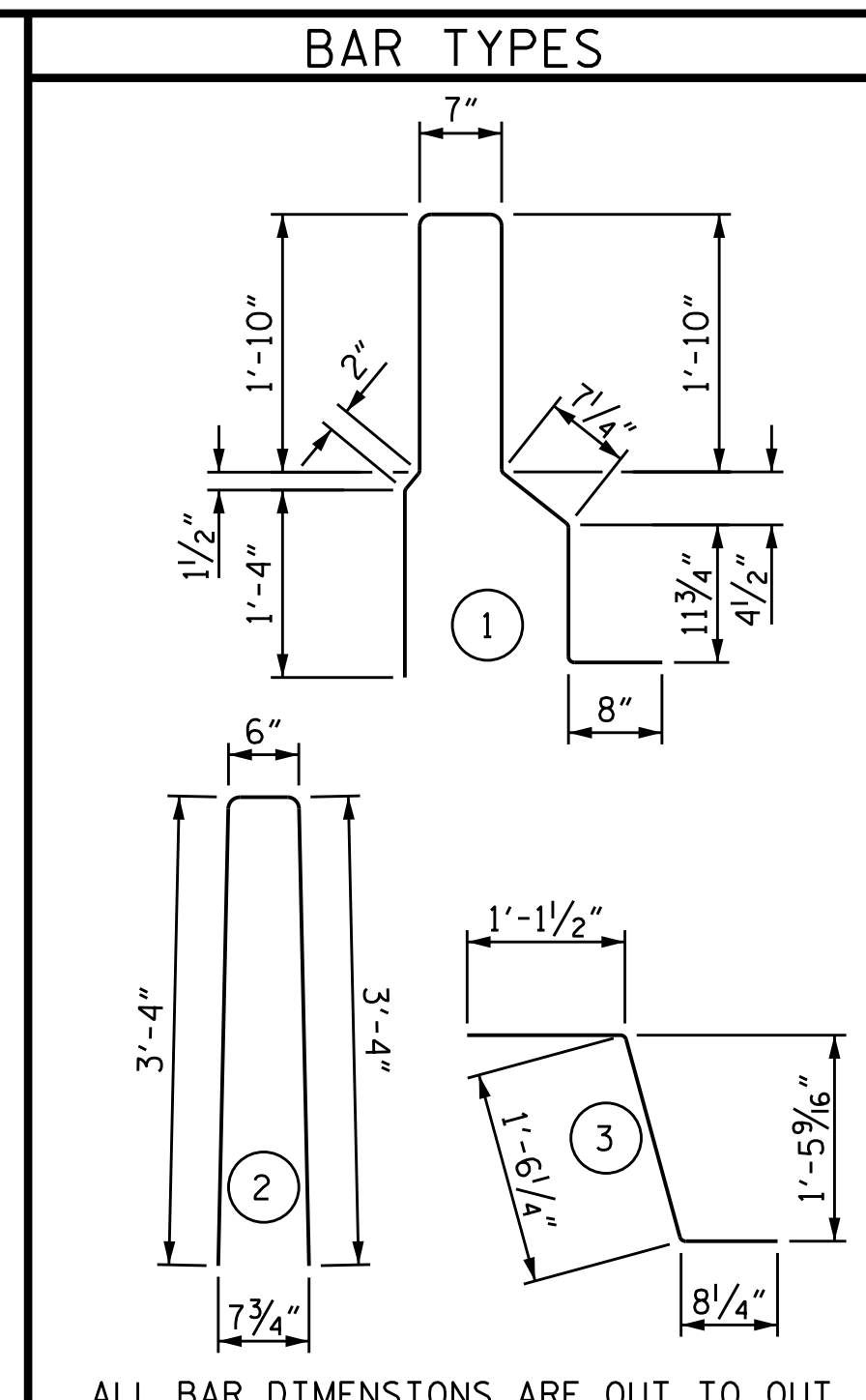
GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED SURFACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MID-POINT OF BARRIER RAIL SEGMENTS LESS THAN 20' IN LENGTH.

THE VERTICAL CONCRETE BARRIER RAIL SHALL NOT BE CAST UNTIL THE MOMENT SLAB HAS ATTAINED AN AGE OF THREE CURING DAYS OR A MINIMUM COMPRESSIVE STRENGTH OF 2,000 PSI. IN ADDITION, NO FILL MATERIAL, ASPHALT, OR CONSTRUCTION EQUIPMENT IS ALLOWED ON THE MOMENT SLAB PRIOR TO SATISFYING THE MINIMUM CONCRETE CURING AND STRENGTH REQUIREMENTS.

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

VERTICAL CONCRETE BARRIER RAIL WITH MOMENT SLAB

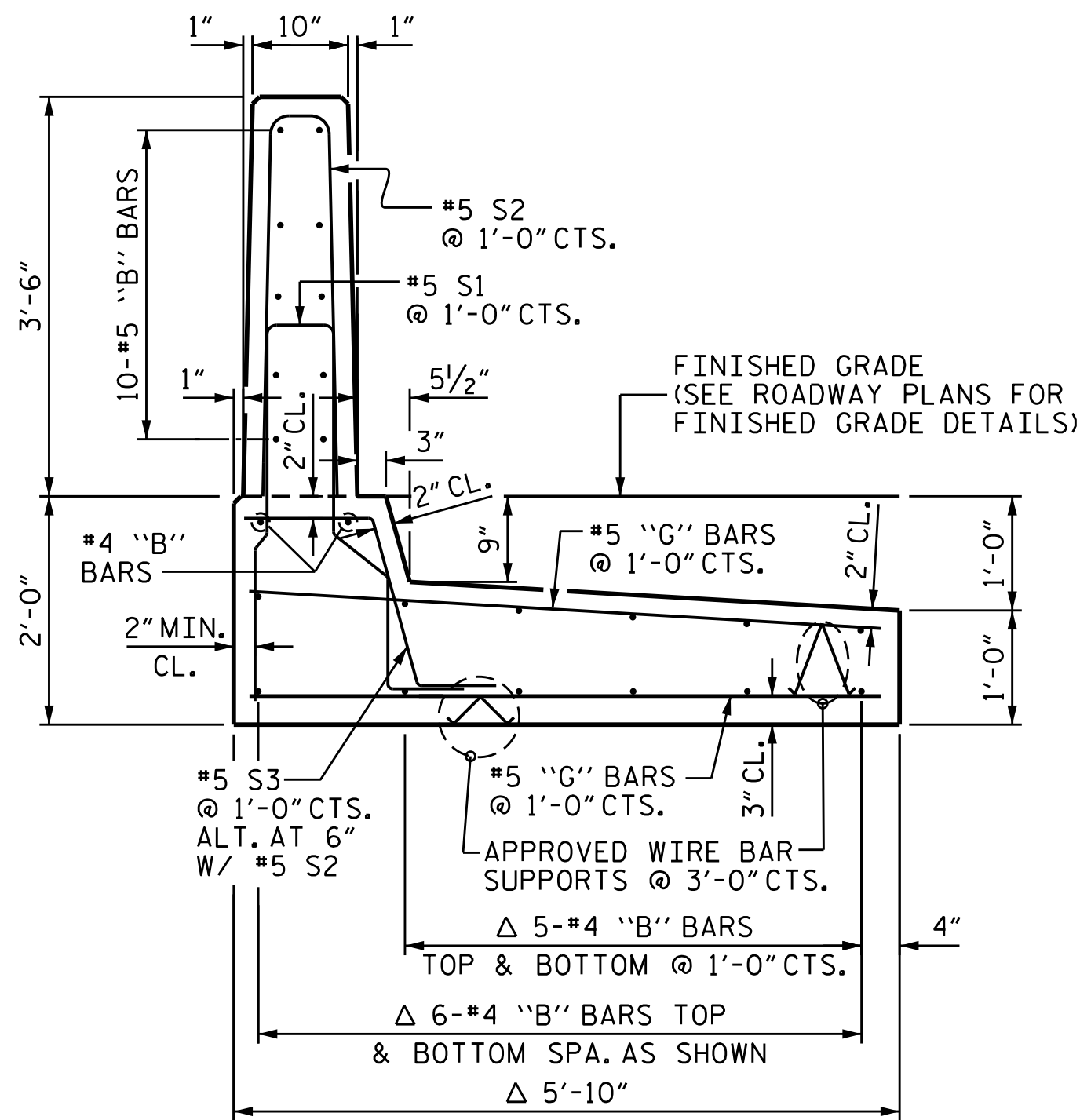
PAY LENGTH = 12.2 LIN FT



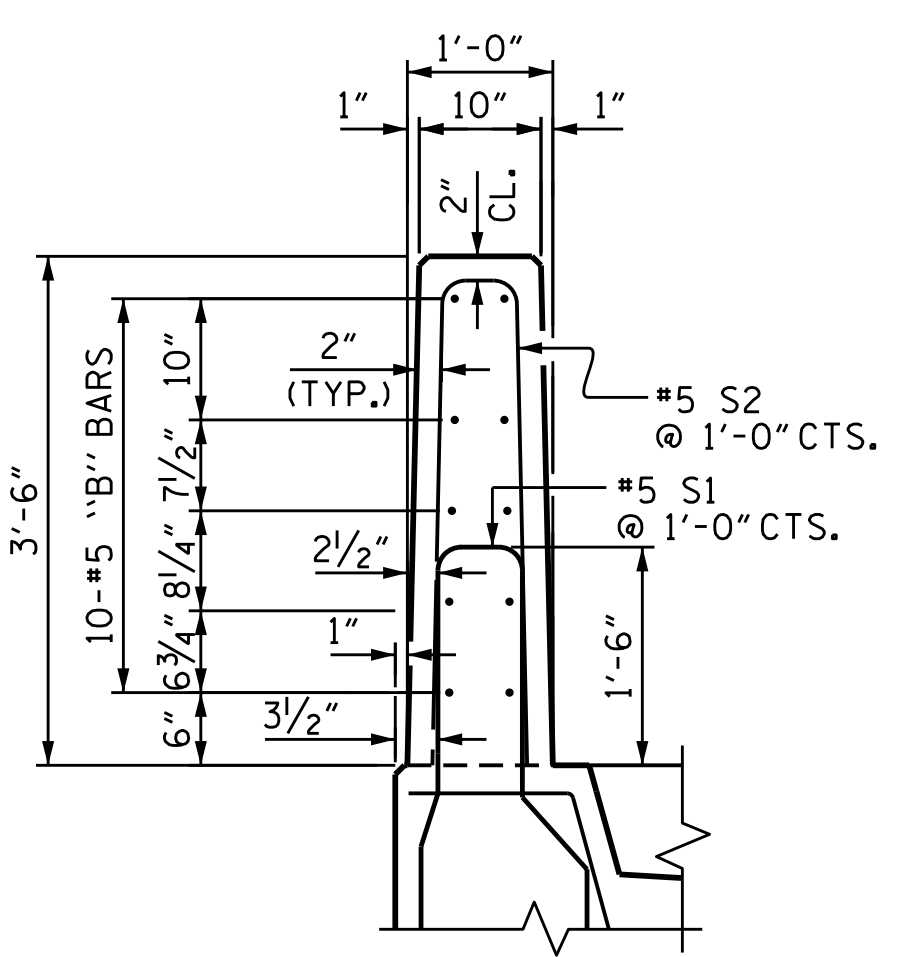
BILL OF MATERIAL

FOR ONE SECTION OF VERTICAL CONCRETE BARRIER RAIL WITH MOMENT SLAB

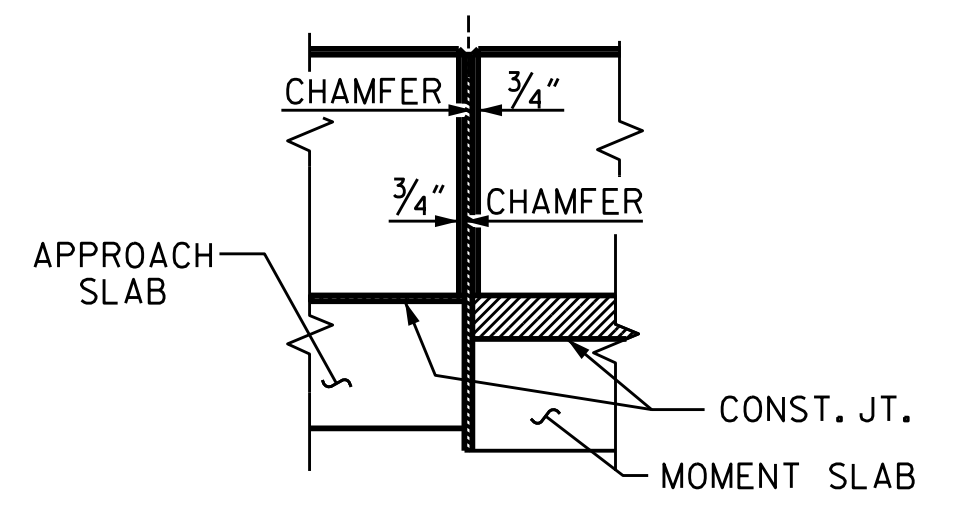
BAR NO.	NO.	SIZE	TYPE	LENGTH	WEIGHT
* B1	20	#5	STR	7'-5"	155
B2	16	#4	STR	7'-0"	75
B3	12	#4	STR	5'-10"	47
G1	20	#5	STR	5'-6"	115
G2	2	#5	STR	4'-4"	9
G3	2	#5	STR	2'-3"	5
G4	2	#5	STR	6'-0"	13
* S1	12	#5	1	8'-0"	100
* S2	12	#5	2	7'-2"	90
S3	11	#5	3	3'-4"	38
REINFORCING STEEL					302 LB
* EPOXY COATED REINFORCING STEEL					345 LB
CLASS AA CONCRETE VERTICAL CONCRETE BARRIER RAIL					1.4 CY
CLASS A CONCRETE MOMENT SLAB					3.1 CY
VERTICAL CONCRETE BARRIER RAIL WITH MOMENT SLAB					12.2 LIN FT



VERTICAL CONCRETE BARRIER RAIL WITH MOMENT SLAB



VERTICAL CONCRETE BARRIER RAIL SECTION

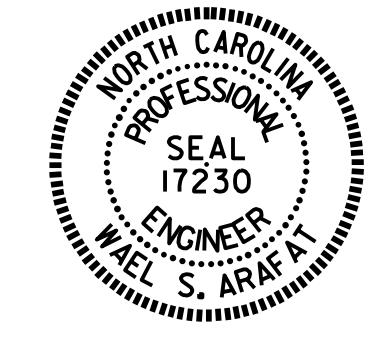


ELEVATION AT EXPANSION JOINTS

PROJECT NO. B-5380

AVERY COUNTY

STATION: 12+31.30 -L-



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

VERTICAL CONCRETE BARRIER RAIL WITH MOMENT SLAB

DRAWN BY: H. T. BARBOUR DATE: 6-7-16

CHECKED BY: V. X. NGUYEN DATE: 7-16

DESIGN ENGINEER OF RECORD: A. M. LEE DATE: 7-16

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1			3			16
2			4			